



## TEST REPORT

Product Name: Outdoor Bluetooth Speaker  
FCC ID: 2BNC4-GT-05  
Trademark: Alitayee, Beeiker, Cknityra, Etykir, Ibntte, Kakahigh, Leekyrin, Meta-ant, Naketeto, Navoltio, Newbosli, Okleeic, Popowell, Rootoma, Waksmart  
Model Number: GT-05, GT-01, GT-02, GT-03, GT-04, GT-06, GT-07, GT-08, GT-09, GT-10, GT-11, GT-12, GT-13, GT-14, GT-15, GT-16, GT-17, GT-18, GT-19, GT-20  
Prepared For: Dongguan Gwtee Electric Manufacture Co.,Ltd.  
Address: Getian Industrial Zone, Chaolang Village, Chashan Town, Dongguan City, Guangdong Province 523393  
Manufacturer: Dongguan Gwtee Electric Manufacture Co.,Ltd.  
Address: Getian Industrial Zone, Chaolang Village, Chashan Town, Dongguan City, Guangdong Province 523393  
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.  
Address: 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China  
Sample Received Date: Dec. 23, 2024  
Sample tested Date: Dec. 23, 2024 to Jan. 04, 2025  
Issue Date: Jan. 04, 2025  
Report No.: CTB24122310101RF02  
Test Standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247  
ANSI C63.10:2013  
Test Results: PASS  
Remark: This is Bluetooth radio test report.

Compiled by:

Zhou kui

Zhou Kui

Reviewed by:

Arron Liu

Arron Liu

Approved by:

Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "\*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

## TABLE OF CONTENT

|                                                         |           |
|---------------------------------------------------------|-----------|
| Test Report Declaration                                 | Page      |
| <b>1. VERSION</b>                                       | <b>4</b>  |
| <b>2. TEST SUMMARY</b>                                  | <b>5</b>  |
| <b>3. MEASUREMENT UNCERTAINTY</b>                       | <b>6</b>  |
| <b>4. PRODUCT INFORMATION AND TEST SETUP</b>            | <b>7</b>  |
| 4.1 Product Information                                 | 7         |
| 4.2 Test Setup Configuration                            | 7         |
| 4.3 Support Equipment                                   | 7         |
| 4.4 Channel List                                        | 8         |
| 4.5 Test Mode                                           | 8         |
| 4.6 Test Environment                                    | 8         |
| <b>5. TEST FACILITY AND TEST INSTRUMENT USED</b>        | <b>9</b>  |
| 5.1 Test Facility                                       | 9         |
| 5.2 Test Instrument Used                                | 9         |
| <b>6. AC POWER LINE CONDUCTED EMISSION</b>              | <b>12</b> |
| 6.1 Block Diagram Of Test Setup                         | 12        |
| 6.2 Limit                                               | 12        |
| 6.3 Test procedure                                      | 12        |
| 6.4 Test Result                                         | 14        |
| <b>7. RADIATED SPURIOUS EMISSION</b>                    | <b>16</b> |
| 7.1 Block Diagram Of Test Setup                         | 16        |
| 7.2 Limit                                               | 16        |
| 7.3 Test procedure                                      | 17        |
| 7.4 Test Result                                         | 18        |
| <b>8. BAND EDGE AND RF CONDUCTED SPURIOUS EMISSIONS</b> | <b>27</b> |
| 8.1 Block Diagram Of Test Setup                         | 27        |
| 8.2 Limit                                               | 27        |
| 8.3 Test procedure                                      | 27        |
| 8.4 Test Result                                         | 28        |
| <b>9. CONDUCTED PEAK OUTPUT POWER</b>                   | <b>35</b> |
| 9.1 Block Diagram Of Test Setup                         | 35        |
| 9.2 Limit                                               | 35        |
| 9.3 Test procedure                                      | 35        |
| 9.4 Test Result                                         | 35        |
| <b>10. 20DB OCCUPIED BANDWIDTH</b>                      | <b>39</b> |
| 10.1 Block Diagram Of Test Setup                        | 39        |
| 10.2 Limit                                              | 39        |
| 10.3 Test procedure                                     | 39        |
| 10.4 Test Result                                        | 39        |
| <b>11. CARRIER FREQUENCIES SEPARATION</b>               | <b>43</b> |
| 11.1 Block Diagram Of Test Setup                        | 43        |
| 11.2 Limit                                              | 43        |
| 11.3 Test procedure                                     | 43        |
| 11.4 Test Result                                        | 43        |
| <b>12. HOPPING CHANNEL NUMBER</b>                       | <b>47</b> |
| 12.1 Block Diagram Of Test Setup                        | 47        |
| 12.2 Limit                                              | 47        |
| 12.3 Test procedure                                     | 47        |
| 12.4 Test Result                                        | 47        |
| <b>13. DWELL TIME</b>                                   | <b>49</b> |
| 13.1 Block Diagram Of Test Setup                        | 49        |
| 13.2 Limit                                              | 49        |
| 13.3 Test procedure                                     | 49        |



|            |                                        |           |
|------------|----------------------------------------|-----------|
| 13.4       | Test Result .....                      | 49        |
| <b>14.</b> | <b>PSEUDORANDOM FREQUENCY .....</b>    | <b>53</b> |
| 14.1       | Limit.....                             | 53        |
| 14.2       | Test procedure .....                   | 53        |
| 14.3       | Test Result .....                      | 53        |
| <b>15.</b> | <b>ANTENNA REQUIREMENT .....</b>       | <b>54</b> |
| <b>16.</b> | <b>EUT TEST SETUP PHOTOGRAPHS.....</b> | <b>55</b> |

(Note: N/A means not applicable)



1. VERSION

| Report No.         | Issue Date    | Description | Approved |
|--------------------|---------------|-------------|----------|
| CTB24122310101RF02 | Jan. 04, 2025 | Original    | Valid    |

## 2. TEST SUMMARY

The Product has been tested according to the following specifications:

| Test Item                                     | Test Requirement                                                            | Test method      | Result |
|-----------------------------------------------|-----------------------------------------------------------------------------|------------------|--------|
| AC Power Line Conducted Emission              | 47 CFR Part 15 Subpart C Section 15.207                                     | ANSI C63.10-2013 | PASS   |
| Radiated Spurious emissions                   | 47 CFR Part 15 Subpart C Section 15.205/15.209                              | ANSI C63.10-2013 | PASS   |
| Band edge and RF Conducted Spurious Emissions | 47 CFR Part 15 Subpart C Section 15.247(d)/15.205(a)                        | ANSI C63.10-2013 | PASS   |
| Conducted Peak Output Power                   | 47 CFR Part 15 Subpart C Section 15.247 (b)(1)                              | ANSI C63.10-2013 | PASS   |
| 20dB Occupied Bandwidth                       | 47 CFR Part 15 Subpart C Section 15.247 (a)(1)                              | ANSI C63.10-2013 | PASS   |
| Carrier Frequencies Separation                | 47 CFR Part 15 Subpart C Section 15.247 (a)(1)                              | ANSI C63.10-2013 | PASS   |
| Hopping Channel Number                        | 47 CFR Part 15 Subpart C Section 15.247 (b)                                 | ANSI C63.10-2013 | PASS   |
| Dwell Time                                    | 47 CFR Part 15 Subpart C Section 15.247 (a)(1)                              | ANSI C63.10-2013 | PASS   |
| Pseudorandom Frequency Hopping Sequence       | 47 CFR Part 15 Subpart C Section 15.247(a)&TCB Exclusion List (7 July 2002) | ANSI C63.10-2013 | PASS   |
| Antenna Requirement                           | 47 CFR Part 15 Subpart C Section 15.203/15.247 (b)                          | /                | PASS   |
| RF Exposure Evaluation                        | 47 CFR Part 15 Subpart C Section 15.247 (i)/1.1310/2.1093                   | KDB447498D01v06  | PASS   |

Remark:

Test according to ANSI C63.10-2013.

### 3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Item                                               | Uncertainty        |
|----------------------------------------------------|--------------------|
| Occupancy bandwidth                                | 54.3kHz            |
| Conducted output power Above 1G                    | 0.9dB              |
| Conducted output power below 1G                    | 0.9dB              |
| Power Spectral Density , Conduction                | 0.9dB              |
| Conduction spurious emissions                      | 2.0dB              |
| Out of band emission                               | 2.0dB              |
| 3m chamber Radiated spurious emission(9KHz-30MHz)  | 4.8dB              |
| 3m chamber Radiated spurious emission(30MHz-1GHz)  | 4.6dB              |
| 3m chamber Radiated spurious emission(1GHz-18GHz)  | 5.1dB              |
| 3m chamber Radiated spurious emission(18GHz-40GHz) | 3.4dB              |
| humidity uncertainty                               | 5.5%               |
| Temperature uncertainty                            | 0.63°C             |
| frequency                                          | 1×10 <sup>-7</sup> |
| Conducted Emission (150KHz-30MHz)                  | 3.2 dB             |
| Radiated Emission(30MHz ~ 1000MHz)                 | 4.8 dB             |
| Radiated Emission(1GHz ~6GHz)                      | 4.9 dB             |

#### 4. PRODUCT INFORMATION AND TEST SETUP

##### 4.1 Product Information

|                       |                                                                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Model(s):             | GT-05, GT-01, GT-02, GT-03, GT-04, GT-06, GT-07, GT-08, GT-09, GT-10, GT-11, GT-12, GT-13, GT-14, GT-15, GT-16, GT-17, GT-18, GT-19, GT-20 |
| Model Description:    | All the model are the same circuit and RF module, only the model names are different. Test sample model: GT-05                             |
| Bluetooth Version:    | Bluetooth 5.1                                                                                                                              |
| Hardware Version:     | V1.0                                                                                                                                       |
| Software Version:     | V1.0                                                                                                                                       |
| Operation Frequency:  | Bluetooth: 2402-2480MHz                                                                                                                    |
| Max. RF output power: | Bluetooth: 3.146dBm                                                                                                                        |
| Type of Modulation:   | Bluetooth: GFSK, $\pi/4$ DQPSK, 8DPSK                                                                                                      |
| Antenna installation: | Bluetooth: PCB antenna                                                                                                                     |
| Antenna Gain:         | Bluetooth: -0.76dBi                                                                                                                        |
| Ratings:              | DC 5V charging from adapter<br>DC 3.7V by battery                                                                                          |

##### 4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

##### 4.3 Support Equipment

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-----------|-----------|----------------|------------|------|
| 1.   | Adapter   | JIYIN     | JY-05100C      | /          | AE   |

##### Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

#### 4.4 Channel List

| CH | Frequency (MHz) | CH | Frequency (MHz) | CH | Frequency (MHz) | CH | Frequency (MHz) |
|----|-----------------|----|-----------------|----|-----------------|----|-----------------|
| 0  | 2402            | 1  | 2403            | 2  | 2404            | 3  | 2405            |
| 4  | 2406            | 5  | 2407            | 6  | 2408            | 7  | 2409            |
| 8  | 2410            | 9  | 2411            | 10 | 2412            | 11 | 2413            |
| 12 | 2414            | 13 | 2415            | 14 | 2416            | 15 | 2417            |
| 16 | 2418            | 17 | 2419            | 18 | 2420            | 19 | 2421            |
| 20 | 2422            | 21 | 2423            | 22 | 2424            | 23 | 2425            |
| 24 | 2426            | 25 | 2427            | 26 | 2428            | 27 | 2429            |
| 28 | 2430            | 29 | 2431            | 30 | 2432            | 31 | 2433            |
| 32 | 2434            | 33 | 2435            | 34 | 2436            | 35 | 2437            |
| 36 | 2438            | 37 | 2439            | 38 | 2440            | 39 | 2441            |
| 40 | 2442            | 41 | 2443            | 42 | 2444            | 43 | 2445            |
| 44 | 2446            | 45 | 2447            | 46 | 2448            | 47 | 2449            |
| 48 | 2450            | 49 | 2451            | 50 | 2452            | 51 | 2453            |
| 52 | 2454            | 53 | 2455            | 54 | 2456            | 55 | 2457            |
| 56 | 2458            | 57 | 2459            | 58 | 2460            | 59 | 2461            |
| 60 | 2462            | 61 | 2463            | 62 | 2464            | 63 | 2465            |
| 64 | 2466            | 65 | 2467            | 66 | 2468            | 67 | 2469            |
| 68 | 2470            | 69 | 2471            | 70 | 2472            | 71 | 2473            |
| 72 | 2474            | 73 | 2475            | 74 | 2476            | 75 | 2477            |
| 76 | 2478            | 77 | 2479            | 78 | 2480            | 79 | /               |

#### 4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

| Test mode                                    | Low channel | Middle channel | High channel |
|----------------------------------------------|-------------|----------------|--------------|
| Transmitting<br>(GFSK, $\pi/4$ DQPSK, 8DPSK) | 2402MHz     | 2441MHz        | 2480MHz      |
| Receiving<br>(GFSK, $\pi/4$ DQPSK, 8DPSK)    | 2402MHz     | 2441MHz        | 2480MHz      |

#### 4.6 Test Environment

|                                   |      |
|-----------------------------------|------|
| Humidity(%):                      | 54   |
| Atmospheric Pressure(kPa):        | 101  |
| Normal Voltage(DC):               | 3.7V |
| Normal Temperature( $^{\circ}$ C) | 23   |
| Low Temperature( $^{\circ}$ C)    | 0    |
| High Temperature( $^{\circ}$ C)   | 40   |

## 5. TEST FACILITY AND TEST INSTRUMENT USED

### 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinghe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

### 5.2 Test Instrument Used

| No. | Equipment                                 | Manufacturer | Type No.                  | Serial No.   | Firmware Version           | Calibrated until |
|-----|-------------------------------------------|--------------|---------------------------|--------------|----------------------------|------------------|
| 1   | Spectrum Analyzer                         | Agilent      | N9020A                    | MY52090073   | A.14.16                    | 2025/6/28        |
| 2   | Power Sensor                              | Agilent      | U2021XA                   | MY56120032   | /                          | 2025/6/28        |
| 3   | Power Sensor                              | Agilent      | U2021XA                   | MY56120034   | /                          | 2025/6/28        |
| 4   | Communication test set                    | R&S          | CMW500                    | 108058       | V3.5.80                    | 2025/6/28        |
| 5   | Spectrum Analyzer                         | KEYSIGHT     | N9020A                    | MY51289897   | A.14.16                    | 2025/6/28        |
| 6   | Signal Generator                          | Agilent      | N5181A                    | MY50140365   | A.01.60                    | 2025/6/28        |
| 7   | Vector signal generator                   | Agilent      | N5182A                    | MY47420195   | A.01.87                    | 2025/6/28        |
| 8   | Communication test set                    | Agilent      | E5515C                    | MY50102567   | B.19.07<br>(E1962B)        | 2025/6/28        |
| 9   | 2.4 GHz Filter                            | Shenxiang    | MSF2400-24<br>83.5MS-1154 | 20181015001  | /                          | 2025/6/30        |
| 10  | 5 GHz Filter                              | Shenxiang    | MSF5150-58<br>50MS-1155   | 20181015001  | /                          | 2025/6/30        |
| 11  | Filter                                    | Xingbo       | XBLBQ-DZA<br>120          | 190821-1-1   | /                          | 2025/6/30        |
| 12  | BT&WI-FI Automatic test software          | Microwave    | MTS8310                   | Ver. 2.0.0.0 | /                          | /                |
| 13  | Rohde & Schwarz SFU Broadcast Test System | R&S          | SFU                       | 101017       | /                          | 2025/6/28        |
| 14  | Temperature humidity chamber              | Hongjing     | TH-80CH                   | DG-15174     | /                          | 2025/6/28        |
| 15  | 234G Automatic test software              | Microwave    | MTS8200                   | Ver. 2.0.0.0 | /                          | /                |
| 16  | 966 chamber                               | C.R.T.       | 966                       | /            | /                          | 2027/6/21        |
| 17  | Receiver                                  | R&S          | ESPI                      | 100362       | RF_ATTEN_7<br>(104489/003) | 2025/6/28        |
| 18  | Amplifier                                 | HP           | 8447E                     | 2945A02747   | /                          | 2025/6/28        |
| 19  | Amplifier                                 | Agilent      | 8449B                     | 3008A01838   | /                          | 2025/6/28        |
| 20  | TRILOG Broadband Antenna                  | Schwarzbeck  | VULB 9168                 | 00869        | /                          | 2025/6/28        |
| 21  | Double Ridged Broadband Horn Antenna      | Schwarzbeck  | BBHA9120D                 | 01911        | /                          | 2025/6/28        |

|    |                   |             |            |            |         |           |
|----|-------------------|-------------|------------|------------|---------|-----------|
| 22 | EMI test software | Fala        | EZ-EMC     | FA-03A2 RE | /       | /         |
| 23 | Loop Antenna      | Schwarzbeck | FMZB 1519B | 1519B-224  | /       | 2025/6/28 |
| 24 | loop antenna      | ZHINAN      | ZN30900A   | GTS534     | /       | /         |
| 25 | 40G Horn antenna  | A/H/System  | SAS-574    | 588        | /       | 2025/6/28 |
| 26 | Amplifier         | AEROFLEX    | Aeroflex   | 097        | /       | 2025/6/28 |
| 27 | Power Metter      | KEYSIGHT    | N1912AP    | N/A        | A.05.00 | 2025/6/28 |

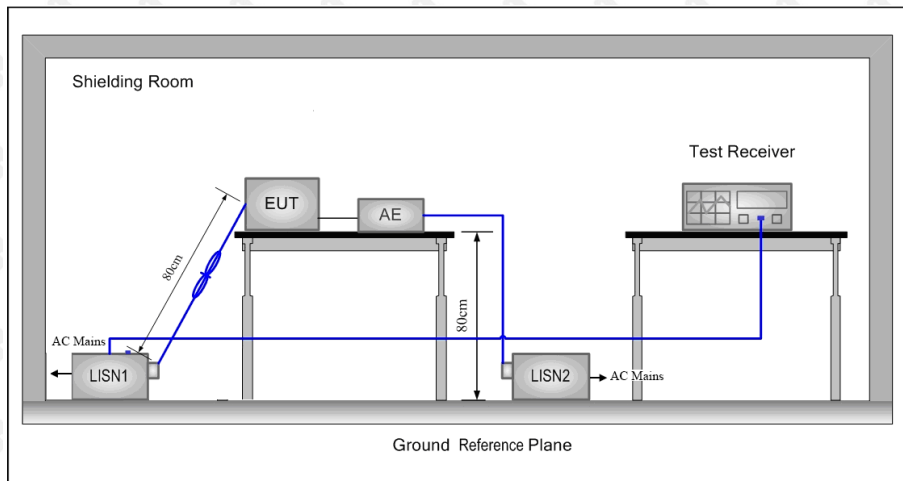
| Continuous disturbance |                        |               |              |            |                     |                  |
|------------------------|------------------------|---------------|--------------|------------|---------------------|------------------|
| No.                    | Equipment              | Manufacturer  | Model No.    | Serial No. | Firmware version    | Calibrated until |
| 1                      | 843 Shield Room        | C/ R/ T       | 843          | /          | /                   | 2027/6/21        |
| 2                      | AMN                    | ROHDE&SCHWARZ | ESH3-Z5      | 831551852  | /                   | 2025/6/30        |
| 3                      | Pulse limiter          | ROHDE&SCHWARZ | ESH3Z2       | 357881052  | /                   | 2025/6/28        |
| 4                      | EMI TEST RECEIVER      | ROHDE&SCHWARZ | ESCI         | 100428     | V4.42.SP3           | 2025/6/30        |
| 5                      | Coaxial cable          | ZDECL         | Z302S        | 18091904   | /                   | 2025/6/30        |
| 6                      | ISN                    | Schwarzbeck   | NTFM8158     | 183        | /                   | 2025/6/30        |
| 7                      | Voltage sensor         | Schwarzbeck   | TK 9420      | 01189      | /                   | 2025/10/25       |
| 8                      | EZ-EMC                 | Frad          | EMC-con3A1.1 | /          | /                   | /                |
| 9                      | Current Probe          | FCC           | F-52B        | 199453     | /                   | 2025/5/27        |
| 10                     | Communication test set | R&S           | CMW500       | 108058     | B.19.07<br>(E1962B) | 2025/6/28        |
| 11                     | Communication test set | Agilent       | E5515C       | MY50102567 | V3.5.80             | 2025/6/28        |

| Radiated emission(No.2 Chamber) |                                      |              |             |            |                  |                  |
|---------------------------------|--------------------------------------|--------------|-------------|------------|------------------|------------------|
| No.                             | Equipment                            | Manufacturer | Model No.   | Serial No. | Firmware version | Calibrated until |
| 1                               | 966 Chamber                          | C/ R/ T      | 966         | /          | /                | 2026/11/14       |
| 2                               | Double Ridged Broadband Horn Antenna | Schwarzbeck  | BBHA 9120 D | 01911      | /                | 2026/7/07        |
| 3                               | Broadband Antenna                    | Schwarzbeck  | VULB 9168   | 1471       | /                | 2025/7/06        |
| 4                               | Amplifier                            | Agilent      | 8449B       | 3008A01838 | /                | 2025/6/30        |
| 5                               | Preamplifier                         | Schwarzbeck  | BBV 9743 B  | 00500      | /                | 2025/5/23        |
| 6                               | EMI TEST RECEIVER                    | R&S          | ESCI7       | 100861     | /                | 2025/10/25       |
| 7                               | Spectrum Analyzer                    | KEYSIGHT     | N9020A      | MY51289897 | A.14.16          | 2025/6/28        |
| 8                               | EMI test software                    | Farad        | EZ-EMC      | /          | Ver. FARAD-3A1+  | /                |
| 9                               | Coaxial cable                        | Rosenberg    | 8m          | /          | /                | 2025/10/25       |
| 10                              | Coaxial cable                        | Times        | 2m          | /          | /                | 2025/10/25       |

|    |                        |             |            |            |                     |            |
|----|------------------------|-------------|------------|------------|---------------------|------------|
| 11 | Coaxial cable          | Times       | 2m         | /          | /                   | 2025/10/25 |
| 12 | Coaxial cable          | Times       | 1m         | /          | /                   | 2025/10/25 |
| 13 | loop antenna           | Schwarzbeck | FMZB 1519B | 1519B-224  | /                   | 2025/6/29  |
| 14 | Communication test set | R&S         | CMW500     | 108058     | B.19.07<br>(E1962B) | 2025/6/28  |
| 15 | Communication test set | Agilent     | E5515C     | MY50102567 | V3.5.80             | 2025/6/28  |

## 6. AC POWER LINE CONDUCTED EMISSION

### 6.1 Block Diagram Of Test Setup



### 6.2 Limit

Table 4 – AC power-line conducted emissions limits

| Frequency (MHz) | Conducted limit (dB $\mu$ V) |                            |
|-----------------|------------------------------|----------------------------|
|                 | Quasi-peak                   | Average                    |
| 0.15 - 0.5      | 66 to 56 <sup>Note 1</sup>   | 56 to 46 <sup>Note 1</sup> |
| 0.5 - 5         | 56                           | 46                         |
| 5 - 30          | 60                           | 50                         |

**Note 1:** The level decreases linearly with the logarithm of the frequency.

\* Decreasing linearly with the logarithm of the frequency

### 6.3 Test procedure

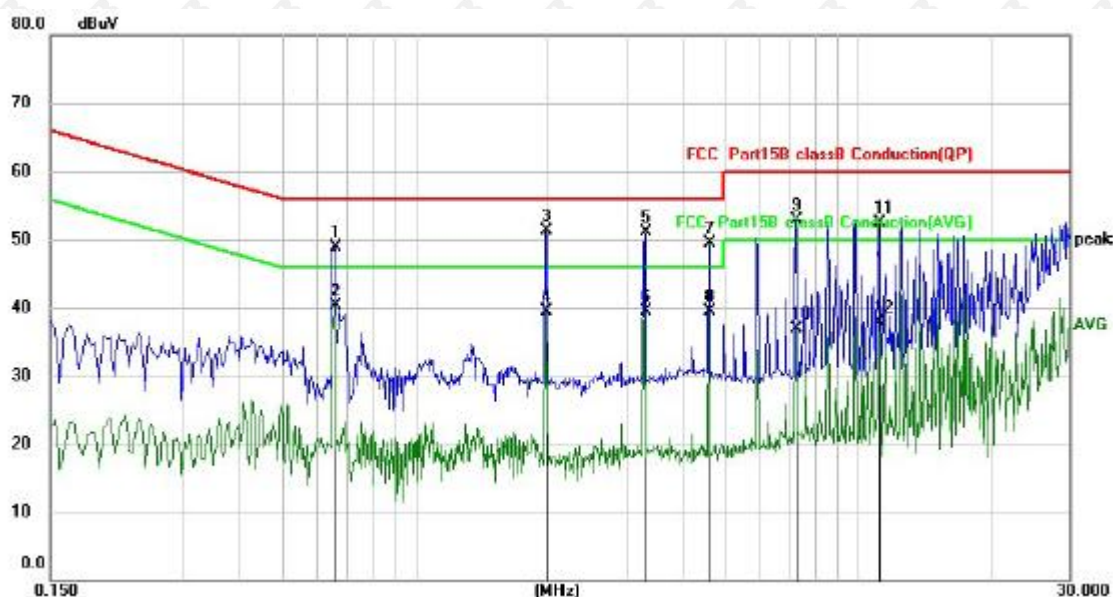
- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50 $\Omega$ /50 $\mu$ H + 5 $\Omega$  linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane.

This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.
- 6) All modes were tested at AC 120V and 240V, only the worst result of AC 120V 60Hz was reported.
- 7) If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.

## 6.4 Test Result

### L: Worst case-GFSK(low channel)

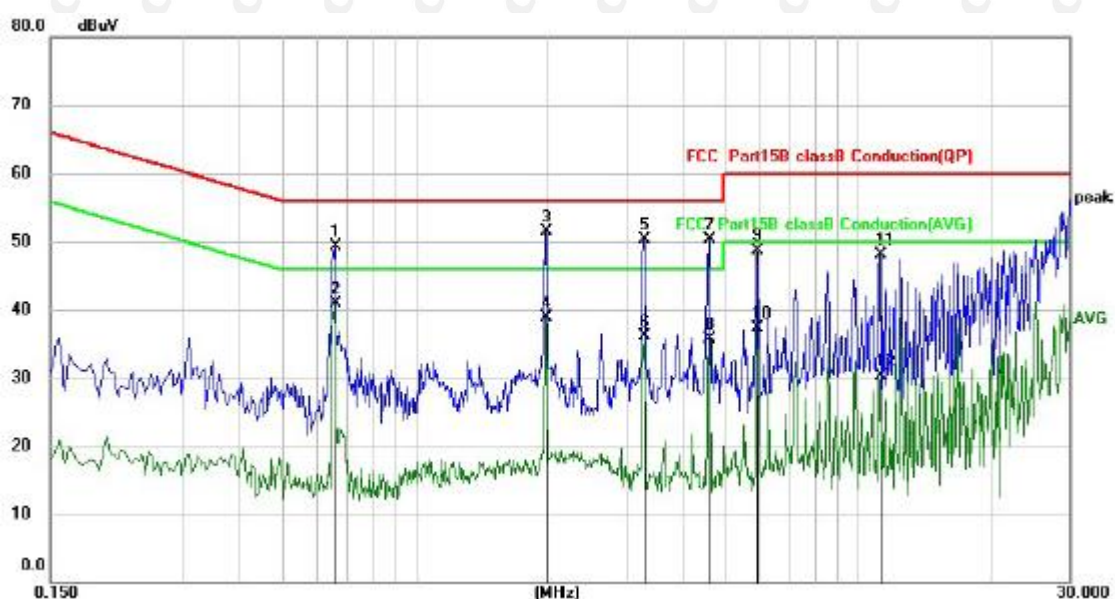


| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|
| 1   |     | 0.6580       | 38.23                    | 10.67                   | 48.90                    | 56.00         | -7.10      | QP       |
| 2   |     | 0.6580       | 29.57                    | 10.67                   | 40.24                    | 46.00         | -5.76      | AVG      |
| 3   | *   | 1.9737       | 39.75                    | 11.56                   | 51.31                    | 56.00         | -4.69      | QP       |
| 4   |     | 1.9737       | 28.03                    | 11.56                   | 39.59                    | 46.00         | -6.41      | AVG      |
| 5   |     | 3.2940       | 39.31                    | 11.86                   | 51.17                    | 56.00         | -4.83      | QP       |
| 6   |     | 3.2940       | 27.72                    | 11.86                   | 39.58                    | 46.00         | -6.42      | AVG      |
| 7   |     | 4.6100       | 37.40                    | 12.15                   | 49.55                    | 56.00         | -6.45      | QP       |
| 8   |     | 4.6100       | 27.42                    | 12.15                   | 39.57                    | 46.00         | -6.43      | AVG      |
| 9   |     | 7.2419       | 39.88                    | 12.96                   | 52.84                    | 60.00         | -7.16      | QP       |
| 10  |     | 7.2419       | 23.93                    | 12.96                   | 36.89                    | 50.00         | -13.11     | AVG      |
| 11  |     | 11.1936      | 39.34                    | 13.26                   | 52.60                    | 60.00         | -7.40      | QP       |
| 12  |     | 11.1936      | 24.73                    | 13.26                   | 37.99                    | 50.00         | -12.01     | AVG      |

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N: Worst case-GFSK(low channel)



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|
| 1   |     | 0.6580       | 38.69                    | 10.67                   | 49.36                    | 56.00         | -6.64      | QP       |
| 2   |     | 0.6580       | 30.19                    | 10.67                   | 40.86                    | 46.00         | -5.14      | AVG      |
| 3   | *   | 1.9778       | 39.93                    | 11.57                   | 51.50                    | 56.00         | -4.50      | QP       |
| 4   |     | 1.9778       | 27.27                    | 11.57                   | 38.84                    | 46.00         | -7.16      | AVG      |
| 5   |     | 3.2780       | 38.47                    | 11.86                   | 50.33                    | 56.00         | -5.67      | QP       |
| 6   |     | 3.2780       | 24.26                    | 11.86                   | 36.12                    | 46.00         | -9.88      | AVG      |
| 7   |     | 4.6100       | 38.20                    | 12.15                   | 50.35                    | 56.00         | -5.65      | QP       |
| 8   |     | 4.6100       | 23.52                    | 12.15                   | 35.67                    | 46.00         | -10.33     | AVG      |
| 9   |     | 5.9259       | 36.20                    | 12.56                   | 48.76                    | 60.00         | -11.24     | QP       |
| 10  |     | 5.9259       | 24.82                    | 12.56                   | 37.38                    | 50.00         | -12.62     | AVG      |
| 11  |     | 11.1979      | 34.82                    | 13.26                   | 48.08                    | 60.00         | -11.92     | QP       |
| 12  |     | 11.1979      | 16.97                    | 13.26                   | 30.23                    | 50.00         | -19.77     | AVG      |

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

## 7. RADIATED SPURIOUS EMISSION

### 7.1 Block Diagram Of Test Setup

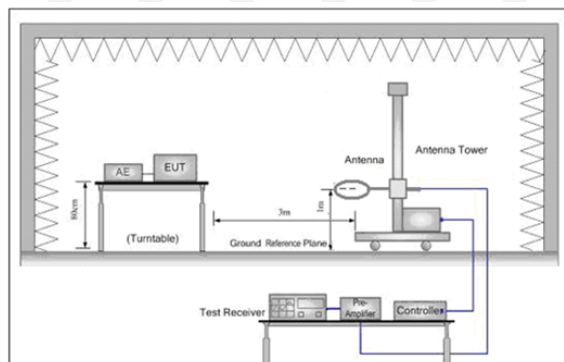


Figure 1. Below 30MHz

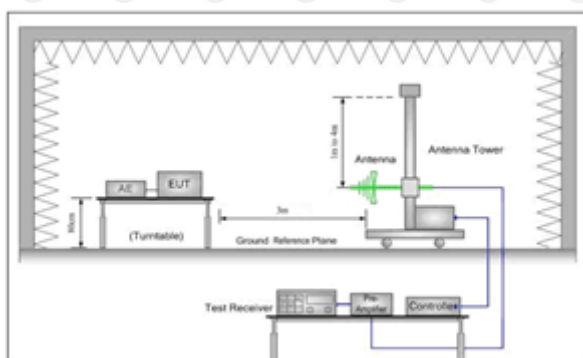


Figure 2. 30MHz to 1GHz

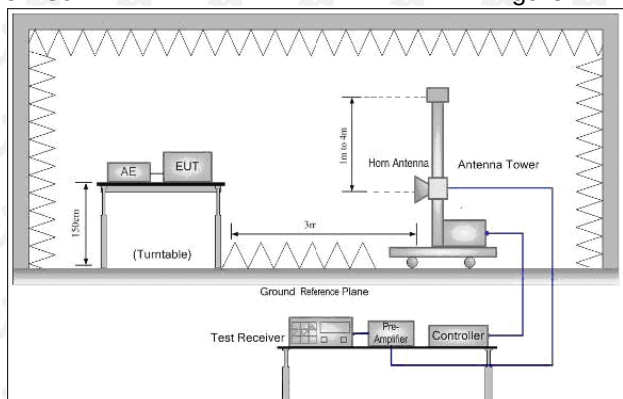


Figure 3. Above 1GHz

### 7.2 Limit

Spurious Emissions:

| Frequency         | Field strength (microvolt/meter) | Limit (dBμV/m ) | Remark     | Measurement distance (m) |
|-------------------|----------------------------------|-----------------|------------|--------------------------|
| 0.009MHz-0.490MHz | 2400/F(kHz)                      | -               | -          | 300                      |
| 0.490MHz-1.705MHz | 24000/F(kHz)                     | -               | -          | 30                       |
| 1.705MHz-30MHz    | 30                               | -               | -          | 30                       |
| 30MHz-88MHz       | 100                              | 40.0            | Quasi-peak | 3                        |
| 88MHz-216MHz      | 150                              | 43.5            | Quasi-peak | 3                        |
| 216MHz-960MHz     | 200                              | 46.0            | Quasi-peak | 3                        |
| 960MHz-1GHz       | 500                              | 54.0            | Quasi-peak | 3                        |
| Above 1GHz        | 500                              | 54.0            | Average    | 3                        |

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

### 7.3 Test procedure

#### Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter( Above 18GHz the distance is 1 meter and table is 1.5 meter).
- h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel
- i. Repeat above procedures until all frequencies measured was complete.
- j. Full battery is used during test.

Receiver set:

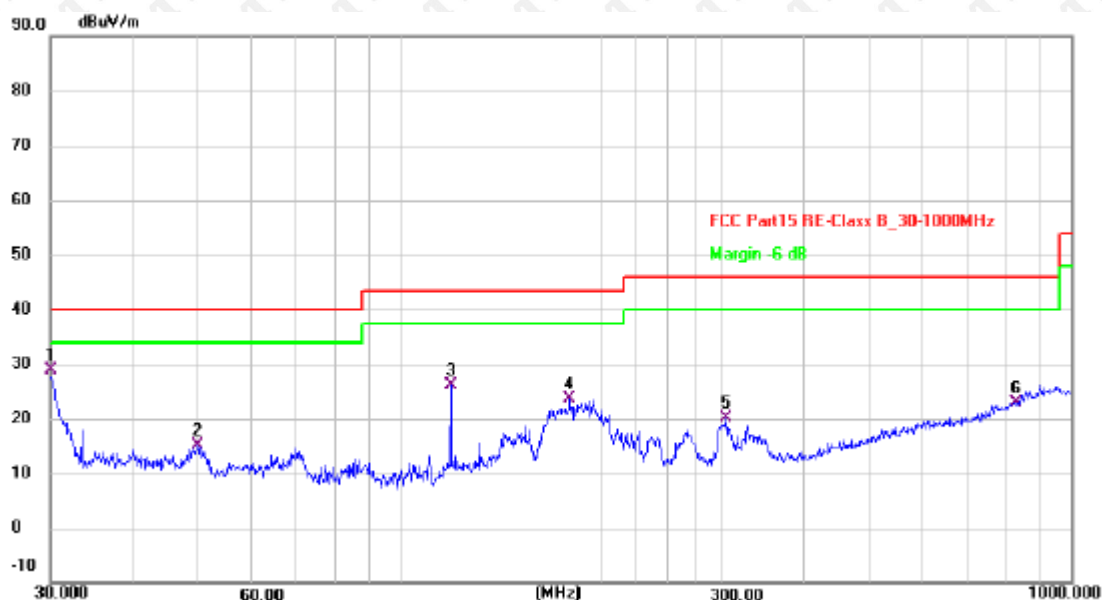
| Frequency         | Detector   | RBW     | VBW    | Remark     |
|-------------------|------------|---------|--------|------------|
| 0.009MHz-0.090MHz | Peak       | 10kHz   | 30KHz  | Peak       |
| 0.009MHz-0.090MHz | Average    | 10kHz   | 30KHz  | Average    |
| 0.090MHz-0.110MHz | Quasi-peak | 10kHz   | 30KHz  | Quasi-peak |
| 0.110MHz-0.490MHz | Peak       | 10kHz   | 30KHz  | Peak       |
| 0.110MHz-0.490MHz | Average    | 10kHz   | 30KHz  | Average    |
| 0.490MHz -30MHz   | Quasi-peak | 10kHz   | 30kHz  | Quasi-peak |
| 30MHz-1GHz        | Quasi-peak | 120 kHz | 300KHz | Quasi-peak |
| Above 1GHz        | Peak       | 1MHz    | 3MHz   | Peak       |
|                   | Peak       | 1MHz    | 10Hz   | Average    |

## 7.4 Test Result

Below 1GHz Test Results:

Antenna polarity: H

Worst case-GFSK(low channel)



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1 * | 30.0000         | 41.93          | -12.93        | 29.00          | 40.00          | -11.00      | QP       |
| 2   | 49.8814         | 29.60          | -14.56        | 15.04          | 40.00          | -24.96      | QP       |
| 3   | 118.6013        | 42.18          | -16.09        | 26.09          | 43.50          | -17.41      | QP       |
| 4   | 178.7584        | 39.38          | -15.71        | 23.67          | 43.50          | -19.83      | QP       |
| 5   | 305.6800        | 33.93          | -13.71        | 20.22          | 46.00          | -25.78      | QP       |
| 6   | 827.4934        | 24.99          | -2.06         | 22.93          | 46.00          | -23.07      | QP       |

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement- Limit

Antenna polarity: V  
Worst case-GFSK(low channel)



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 30.0000         | 41.52          | -12.93        | 28.59          | 40.00          | -11.41      | QP       |
| 2 * | 49.5328         | 45.17          | -14.49        | 30.68          | 40.00          | -9.32       | QP       |
| 3   | 84.1100         | 40.37          | -18.41        | 21.96          | 40.00          | -18.04      | QP       |
| 4   | 167.8242        | 40.56          | -14.13        | 26.43          | 43.50          | -17.07      | QP       |
| 5   | 256.5210        | 32.77          | -16.07        | 16.70          | 46.00          | -29.30      | QP       |
| 6   | 739.6604        | 25.16          | -4.35         | 20.81          | 46.00          | -25.19      | QP       |

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Measurement- Limit

# Above 1 GHz Test Results:

CH Low (2402MHz)

Horizontal:

| Frequency | Reading Result | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|----------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)         | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4804      | 59.28          | -3.65  | 55.63          | 74.00    | -18.37 | peak          |
| 4804      | 49.72          | -3.65  | 46.07          | 54.00    | -7.93  | AVG           |
| 7206      | 60.69          | -0.95  | 59.74          | 74.00    | -14.26 | peak          |
| 7206      | 40.85          | -0.95  | 39.90          | 54.00    | -14.10 | AVG           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|----------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)         | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4804      | 58.69          | -3.65  | 55.04          | 74.00    | -18.96 | peak          |
| 4804      | 49.95          | -3.65  | 46.30          | 54.00    | -7.70  | AVG           |
| 7206      | 61.22          | -0.95  | 60.27          | 74.00    | -13.73 | peak          |
| 7206      | 40.17          | -0.95  | 39.22          | 54.00    | -14.78 | AVG           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

CH Middle (2441MHz)

Horizontal:

| Frequency                                                                                                                                | Reading Result | Factor | Emission Level | Limits   | Margin | Detector Type |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                                                    | (dBμV)         | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4882.00                                                                                                                                  | 58.27          | -3.54  | 54.73          | 74.00    | -19.27 | peak          |
| 4882.00                                                                                                                                  | 48.87          | -3.54  | 45.33          | 54.00    | -8.67  | AVG           |
| 7323.00                                                                                                                                  | 55.37          | -0.81  | 54.56          | 74.00    | -19.44 | peak          |
| 7323.00                                                                                                                                  | 41.77          | -0.81  | 40.96          | 54.00    | -13.04 | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |                |        |                |          |        |               |

Vertical:

| Frequency                                                                                                                                | Reading Result | Factor | Emission Level | Limits   | Margin | Detector Type |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                                                    | (dBμV)         | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4882.00                                                                                                                                  | 59.13          | -3.54  | 55.59          | 74.00    | -18.41 | peak          |
| 4882.00                                                                                                                                  | 49.22          | -3.54  | 45.68          | 54.00    | -8.32  | AVG           |
| 7323.00                                                                                                                                  | 57.23          | -0.81  | 56.42          | 74.00    | -17.58 | peak          |
| 7323.00                                                                                                                                  | 43.79          | -0.81  | 42.98          | 54.00    | -11.02 | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |                |        |                |          |        |               |

CH High (2480MHz)  
Horizontal:

| Frequency | Reading Result | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|----------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)         | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4960      | 58.01          | -3.43  | 54.58          | 74.00    | -19.42 | peak          |
| 4960      | 48.72          | -3.44  | 45.28          | 54.00    | -8.72  | AVG           |
| 7440      | 59.38          | -0.77  | 58.61          | 74.00    | -15.39 | peak          |
| 7440      | 41.88          | -0.77  | 41.11          | 54.00    | -12.89 | AVG           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|----------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)         | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4960      | 58.78          | -3.43  | 55.35          | 74.00    | -18.65 | peak          |
| 4960      | 49.35          | -3.44  | 45.91          | 54.00    | -8.09  | AVG           |
| 7440      | 60.97          | -0.77  | 60.20          | 74.00    | -13.80 | peak          |
| 7440      | 42.03          | -0.77  | 41.26          | 54.00    | -12.74 | AVG           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report

### Restricted bands around fundamental frequency (Radiated)

hopping

Operation Mode: TX CH Low (2402MHz)

Horizontal (Worst case-GFSK)

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector<br>Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------------|
| 2310.00            | 57.72                   | -5.81          | 51.91                      | 74.00              | -22.09         | peak             |
| 2310.00            | /                       | -5.81          | /                          | 54.00              | /              | AVG              |
| 2390.00            | 56.18                   | -5.84          | 50.34                      | 74.00              | -23.66         | peak             |
| 2390.00            | /                       | -5.84          | /                          | 54.00              | /              | AVG              |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Vertical:

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector<br>Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------------|
| 2310.00            | 56.78                   | -5.81          | 50.97                      | 74.00              | -23.03         | peak             |
| 2310.00            | /                       | -5.81          | /                          | 54.00              | /              | AVG              |
| 2390.00            | 56.85                   | -5.84          | 51.01                      | 74.00              | -22.99         | peak             |
| 2390.00            | /                       | -5.84          | /                          | 54.00              | /              | AVG              |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)  
Horizontal (Worst case-GFSK)

| Frequency                                                                                                                                | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                                                    | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.50                                                                                                                                  | 55.90         | -5.81  | 50.09          | 74.00    | -23.91 | peak          |
| 2483.50                                                                                                                                  | /             | -5.81  | /              | 54.00    | /      | AVG           |
| 2500.00                                                                                                                                  | 53.41         | -6.06  | 47.35          | 74.00    | -26.65 | peak          |
| 2500.00                                                                                                                                  | /             | -6.06  | /              | 54.00    | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |               |        |                |          |        |               |

Vertical:

| Frequency                                                                                                                                | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                                                    | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.50                                                                                                                                  | 57.04         | -5.81  | 51.23          | 74.00    | -22.77 | peak          |
| 2483.50                                                                                                                                  | /             | -5.81  | /              | 54.00    | /      | AVG           |
| 2500.00                                                                                                                                  | 55.23         | -6.06  | 49.17          | 74.00    | -24.83 | peak          |
| 2500.00                                                                                                                                  | /             | -6.06  | /              | 54.00    | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |               |        |                |          |        |               |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.                                   |               |        |                |          |        |               |

When the peak value is smaller than the AVG limit, AVG is not reflected.

NO hopping

Operation Mode: TX CH Low (2402MHz)  
Horizontal (Worst case-GFSK)

| Frequency<br>(MHz)                                                                                                                       | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector<br>Type |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------------|
| 2310.00                                                                                                                                  | 55.31                   | -5.81          | 49.50                      | 74.00              | -24.50         | peak             |
| 2310.00                                                                                                                                  | /                       | -5.81          | /                          | 54.00              | /              | AVG              |
| 2390.00                                                                                                                                  | 54.26                   | -5.84          | 48.42                      | 74.00              | -25.58         | peak             |
| 2390.00                                                                                                                                  | /                       | -5.84          | /                          | 54.00              | /              | AVG              |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |                         |                |                            |                    |                |                  |

Vertical:

| Frequency<br>(MHz)                                                                                                                       | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector<br>Type |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------------|
| 2310.00                                                                                                                                  | 56.34                   | -5.81          | 50.53                      | 74.00              | -23.47         | peak             |
| 2310.00                                                                                                                                  | /                       | -5.81          | /                          | 54.00              | /              | AVG              |
| 2390.00                                                                                                                                  | 53.85                   | -5.84          | 48.01                      | 74.00              | -25.99         | peak             |
| 2390.00                                                                                                                                  | /                       | -5.84          | /                          | 54.00              | /              | AVG              |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |                         |                |                            |                    |                |                  |

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: TX CH High (2480MHz)  
Horizontal (Worst case-GFSK)

| Frequency                                                                                                                                | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                                                    | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.50                                                                                                                                  | 55.21         | -5.81  | 49.40          | 74.00    | -24.60 | peak          |
| 2483.50                                                                                                                                  | /             | -5.81  | /              | 54.00    | /      | AVG           |
| 2500.00                                                                                                                                  | 54.46         | -6.06  | 48.40          | 74.00    | -25.60 | peak          |
| 2500.00                                                                                                                                  | /             | -6.06  | /              | 54.00    | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |               |        |                |          |        |               |

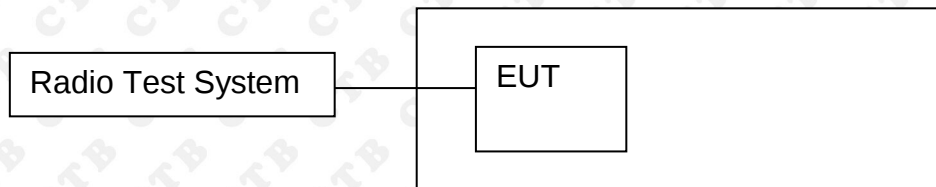
Vertical:

| Frequency                                                                                                                                | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                                                    | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.50                                                                                                                                  | 56.31         | -5.81  | 50.50          | 74.00    | -23.50 | peak          |
| 2483.50                                                                                                                                  | /             | -5.81  | /              | 54.00    | /      | AVG           |
| 2500.00                                                                                                                                  | 54.61         | -6.06  | 48.55          | 74.00    | -25.45 | peak          |
| 2500.00                                                                                                                                  | /             | -6.06  | /              | 54.00    | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits |               |        |                |          |        |               |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.                                   |               |        |                |          |        |               |

When the peak value is smaller than the AVG limit, AVG is not reflected.

## 8. BAND EDGE AND RF CONDUCTED SPURIOUS EMISSIONS

### 8.1 Block Diagram Of Test Setup



### 8.2 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 8.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:

Below 30MHz:

RBW = 100kHz, VBW = 300kHz, Sweep = auto

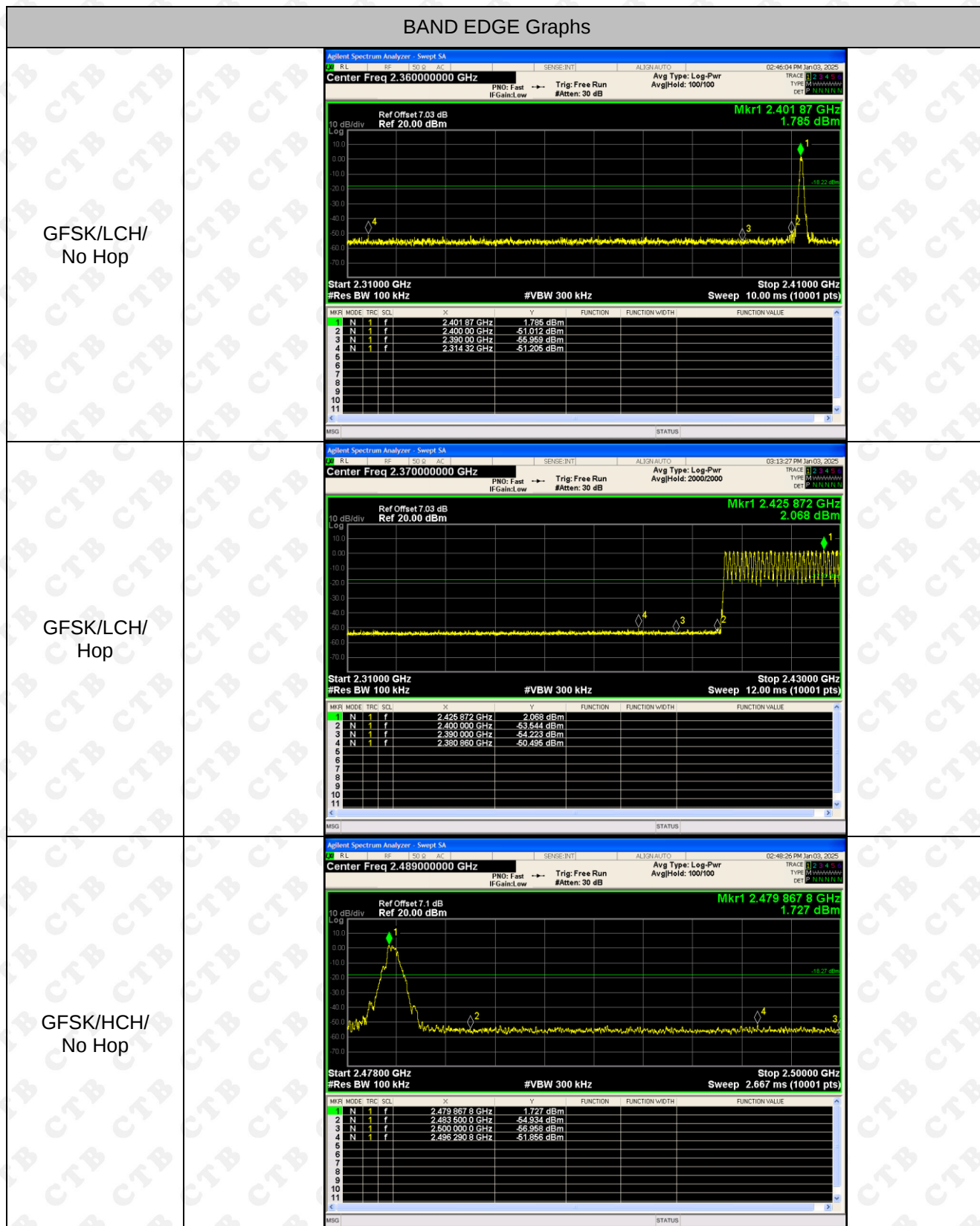
Detector function = peak, Trace = max hold

Above 30MHz:

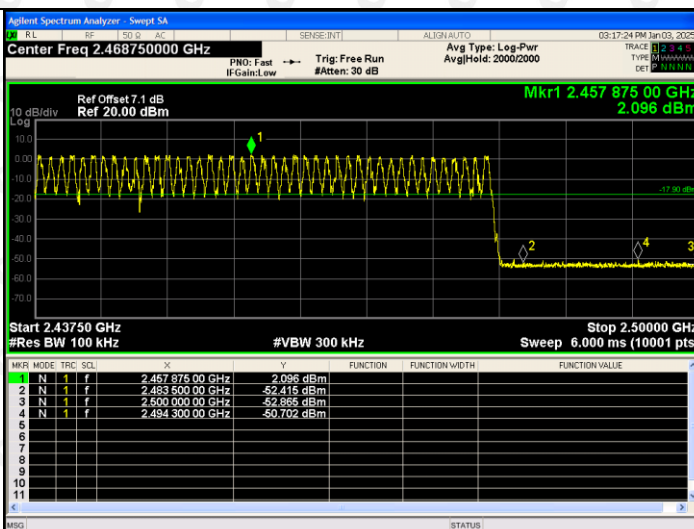
RBW = 100kHz, VBW = 300kHz, Sweep = auto

Detector function = peak, Trace = max hold

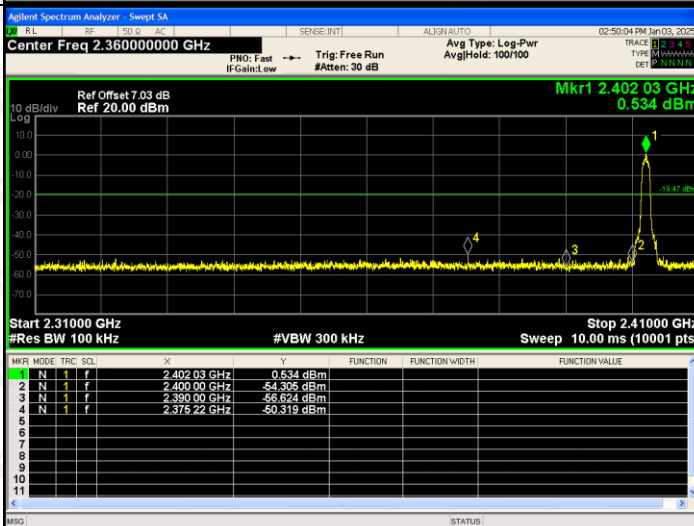
## 8.4 Test Result



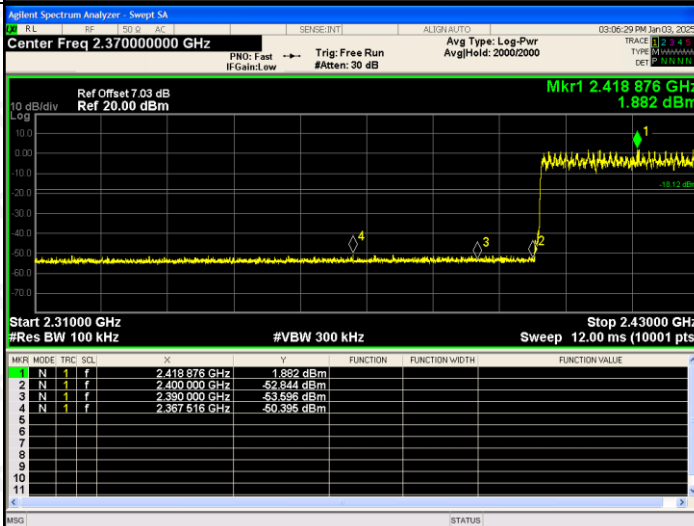
GFSK/HCH/  
Hop

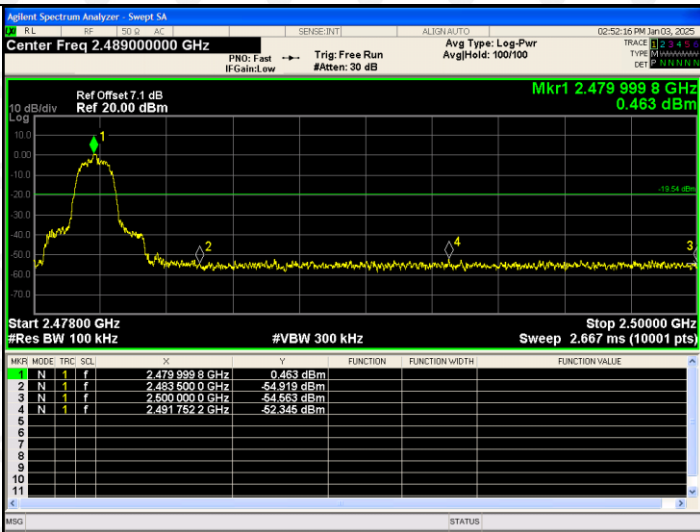
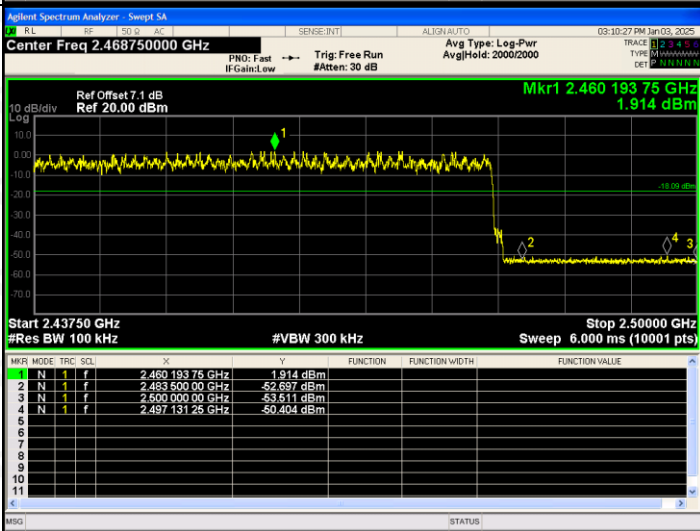
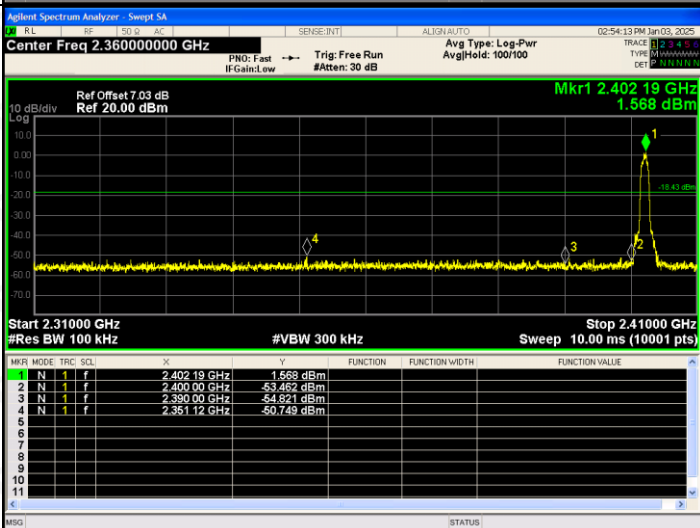


$\pi/4$ DQPSK/LCH/  
No Hop

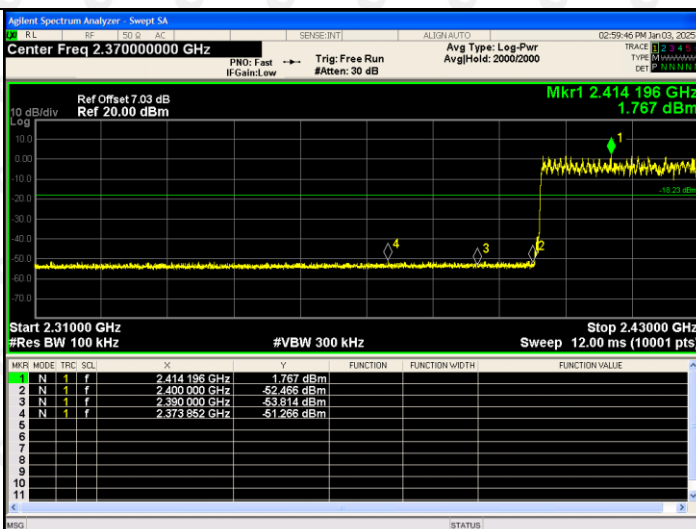


$\pi/4$ DQPSK/LCH/  
Hop

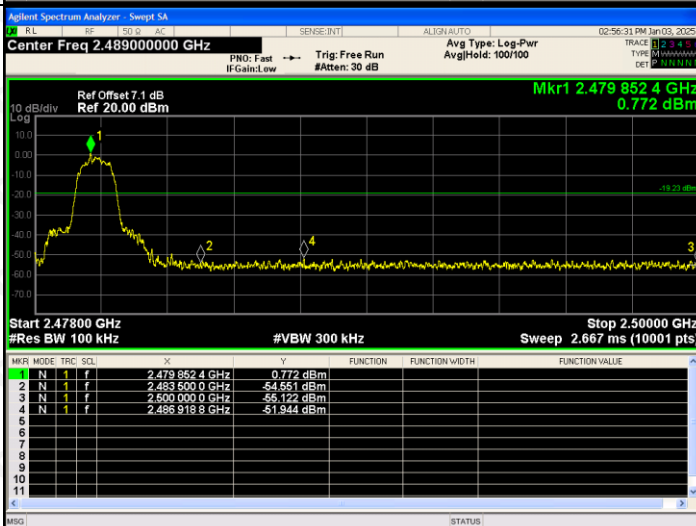


| $\pi/4$ DQPSK/HCH/<br>No Hop |  <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.48900000 GHz</p> <p>Ref Offset 7.1 dB<br/>Ref 20.00 dBm</p> <p>Mkr1 2.479 999 8 GHz<br/>0.463 dBm</p> <p>Start 2.47800 GHz<br/>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Stop 2.50000 GHz<br/>Sweep 2.667 ms (10001 pts)</p> <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.479 999 8 GHz</td><td>0.463 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.483 500 0 GHz</td><td>-54.919 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.500 000 0 GHz</td><td>-54.663 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.491 752 2 GHz</td><td>-52.345 dBm</td><td></td><td></td><td></td></tr></table>       | MKR | MODE | TRC              | SOL         | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.479 999 8 GHz  | 0.463 dBm |  |  |  | 2 | N | 1 | f | 2.483 500 0 GHz  | -54.919 dBm |  |  |  | 3 | N | 1 | f | 2.500 000 0 GHz  | -54.663 dBm |  |  |  | 4 | N | 1 | f | 2.491 752 2 GHz  | -52.345 dBm |  |  |  |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------------------|-------------|----------|----------------|----------------|----------------|----------------|---|---|---|---|------------------|-----------|--|--|--|---|---|---|---|------------------|-------------|--|--|--|---|---|---|---|------------------|-------------|--|--|--|---|---|---|---|------------------|-------------|--|--|--|
| MKR                          | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TRC | SOL  | X                | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 1                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.479 999 8 GHz  | 0.463 dBm   |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 2                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.483 500 0 GHz  | -54.919 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 3                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.500 000 0 GHz  | -54.663 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 4                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.491 752 2 GHz  | -52.345 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| $\pi/4$ DQPSK/HCH/<br>Hop    |  <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.46875000 GHz</p> <p>Ref Offset 7.1 dB<br/>Ref 20.00 dBm</p> <p>Mkr1 2.460 193 75 GHz<br/>1.914 dBm</p> <p>Start 2.43750 GHz<br/>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Stop 2.50000 GHz<br/>Sweep 6.000 ms (10001 pts)</p> <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.460 193 75 GHz</td><td>1.914 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.483 500 00 GHz</td><td>-52.697 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.500 000 00 GHz</td><td>-53.511 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.497 131 25 GHz</td><td>-50.404 dBm</td><td></td><td></td><td></td></tr></table> | MKR | MODE | TRC              | SOL         | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.460 193 75 GHz | 1.914 dBm |  |  |  | 2 | N | 1 | f | 2.483 500 00 GHz | -52.697 dBm |  |  |  | 3 | N | 1 | f | 2.500 000 00 GHz | -53.511 dBm |  |  |  | 4 | N | 1 | f | 2.497 131 25 GHz | -50.404 dBm |  |  |  |
| MKR                          | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TRC | SOL  | X                | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 1                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.460 193 75 GHz | 1.914 dBm   |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 2                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.483 500 00 GHz | -52.697 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 3                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.500 000 00 GHz | -53.511 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 4                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.497 131 25 GHz | -50.404 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 8DPSK/LCH/No<br>Hop          |  <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.36000000 GHz</p> <p>Ref Offset 7.03 dB<br/>Ref 20.00 dBm</p> <p>Mkr1 2.402 19 GHz<br/>1.568 dBm</p> <p>Start 2.31000 GHz<br/>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Stop 2.41000 GHz<br/>Sweep 10.00 ms (10001 pts)</p> <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.402 19 GHz</td><td>1.568 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 00 GHz</td><td>-53.462 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.390 00 GHz</td><td>-54.821 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.361 12 GHz</td><td>-50.749 dBm</td><td></td><td></td><td></td></tr></table>                   | MKR | MODE | TRC              | SOL         | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.402 19 GHz     | 1.568 dBm |  |  |  | 2 | N | 1 | f | 2.400 00 GHz     | -53.462 dBm |  |  |  | 3 | N | 1 | f | 2.390 00 GHz     | -54.821 dBm |  |  |  | 4 | N | 1 | f | 2.361 12 GHz     | -50.749 dBm |  |  |  |
| MKR                          | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TRC | SOL  | X                | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 1                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.402 19 GHz     | 1.568 dBm   |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 2                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.400 00 GHz     | -53.462 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 3                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.390 00 GHz     | -54.821 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |
| 4                            | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1   | f    | 2.361 12 GHz     | -50.749 dBm |          |                |                |                |                |   |   |   |   |                  |           |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |   |   |   |   |                  |             |  |  |  |

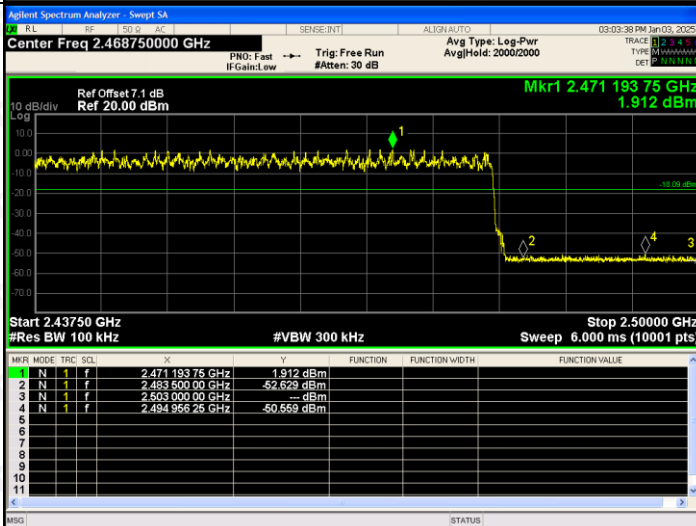
8DPSK  
/LCH/Hop



8DPSK /HCH/No  
Hop

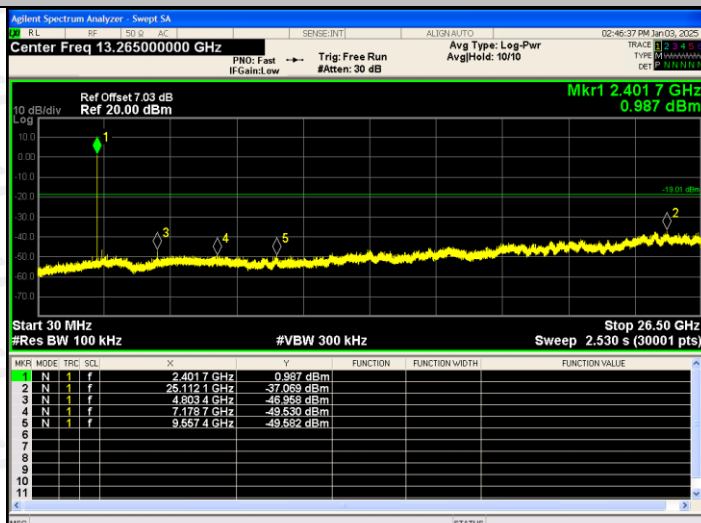


8DPSK  
/HCH/Hop

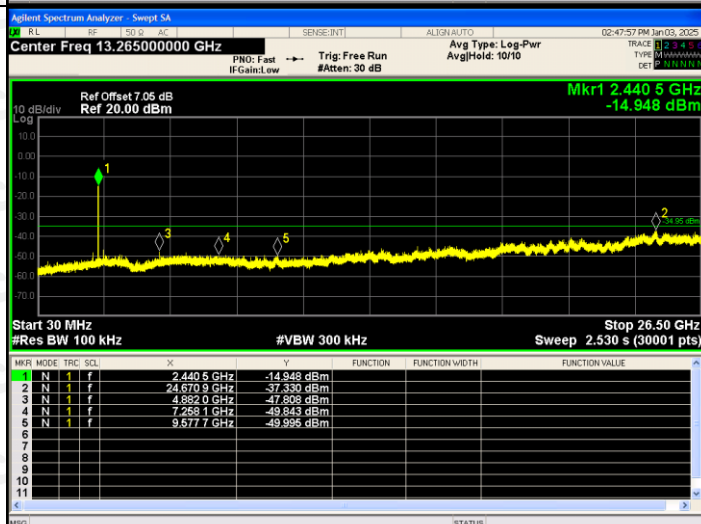


## RF Conducted Spurious Emissions Graphs

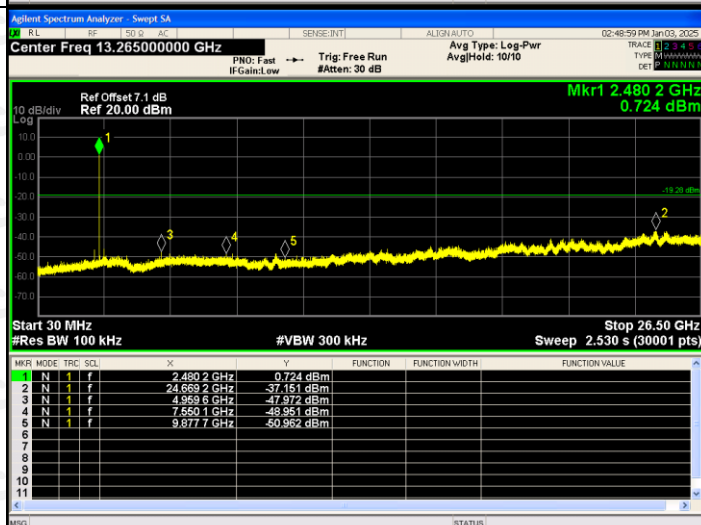
GFSK/LCH



GFSK/MCH

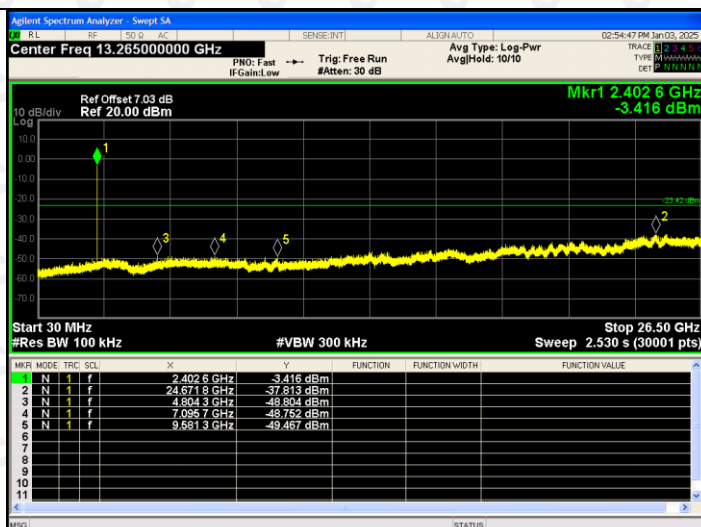


GFSK/HCH

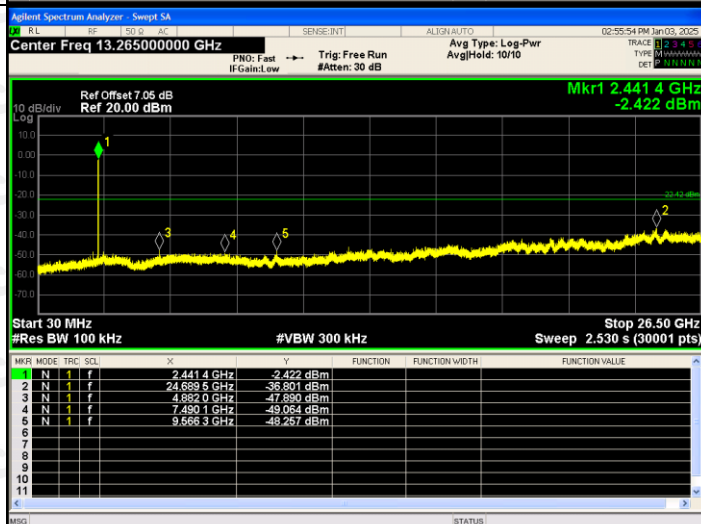


| $\pi/4$ DQPSK /LCH | <div><div>Agilent Spectrum Analyzer - Sweep SA</div><div><div>RL</div><div>RF</div><div>IF</div><div>SD</div><div>AC</div></div><div>SENSE:INT</div><div>ALIGN:AUTO</div><div>02:50:37 PM Jan 03, 2025</div></div> <div><div>Center Freq 13.265000000 GHz</div><div>PNO: Fast</div><div>IF Gain:Low</div><div>Trig: Free Run</div><div>Avg Type: Log-Pwr</div><div>AvgHold: 10/10</div><div>TRACETYPE: M</div><div>DET: P</div></div> <div><div>Ref Offset 7.03 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.401 7 GHz</div><div>0.336 dBm</div></div> <div></div> <div><div>Start 30 MHz</div><div>#Res BW 100 kHz</div><div>#VBW 300 kHz</div><div>Stop 26.50 GHz</div><div>Sweep 2.530 s (30001 pts)</div></div> <div><table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SQ</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.401 7 GHz</td><td>0.336 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>24.630 3 GHz</td><td>-36.799 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>4.804 3 GHz</td><td>-46.394 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>7.309 3 GHz</td><td>-49.478 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td>N</td><td>1</td><td>f</td><td>9.649 5 GHz</td><td>-49.172 dBm</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table></div> <div><div>MSO</div><div>STATUS</div></div>   | MNR | MODE | TRC          | SQ          | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.401 7 GHz | 0.336 dBm  |  |  |  | 2 | N | 1 | f | 24.630 3 GHz | -36.799 dBm |  |  |  | 3 | N | 1 | f | 4.804 3 GHz | -46.394 dBm |  |  |  | 4 | N | 1 | f | 7.309 3 GHz | -49.478 dBm |  |  |  | 5 | N | 1 | f | 9.649 5 GHz | -49.172 dBm |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  | $\pi/4$ DQPSK/MCH | <div><div>Agilent Spectrum Analyzer - Sweep SA</div><div><div>RL</div><div>RF</div><div>IF</div><div>SD</div><div>AC</div></div><div>SENSE:INT</div><div>ALIGN:AUTO</div><div>02:51:43 PM Jan 03, 2025</div></div> <div><div>Center Freq 13.265000000 GHz</div><div>PNO: Fast</div><div>IF Gain:Low</div><div>Trig: Free Run</div><div>Avg Type: Log-Pwr</div><div>AvgHold: 10/10</div><div>TRACETYPE: M</div><div>DET: P</div></div> <div><div>Ref Offset 7.06 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.441 4 GHz</div><div>-1.068 dBm</div></div> <div></div> <div><div>Start 30 MHz</div><div>#Res BW 100 kHz</div><div>#VBW 300 kHz</div><div>Stop 26.50 GHz</div><div>Sweep 2.530 s (30001 pts)</div></div> <div><table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SQ</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.441 4 GHz</td><td>-1.068 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>24.680 3 GHz</td><td>-37.596 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>4.882 0 GHz</td><td>-47.066 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>7.384 8 GHz</td><td>-49.659 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td>N</td><td>1</td><td>f</td><td>9.683 0 GHz</td><td>-49.724 dBm</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table></div> <div><div>MSO</div><div>STATUS</div></div> | MNR | MODE | TRC | SQ | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.441 4 GHz | -1.068 dBm |  |  |  | 2 | N | 1 | f | 24.680 3 GHz | -37.596 dBm |  |  |  | 3 | N | 1 | f | 4.882 0 GHz | -47.066 dBm |  |  |  | 4 | N | 1 | f | 7.384 8 GHz | -49.659 dBm |  |  |  | 5 | N | 1 | f | 9.683 0 GHz | -49.724 dBm |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  | $\pi/4$ DQPSK/HCH | <div><div>Agilent Spectrum Analyzer - Sweep SA</div><div><div>RL</div><div>RF</div><div>IF</div><div>SD</div><div>AC</div></div><div>SENSE:INT</div><div>ALIGN:AUTO</div><div>02:52:50 PM Jan 03, 2025</div></div> <div><div>Center Freq 13.265000000 GHz</div><div>PNO: Fast</div><div>IF Gain:Low</div><div>Trig: Free Run</div><div>Avg Type: Log-Pwr</div><div>AvgHold: 10/10</div><div>TRACETYPE: M</div><div>DET: P</div></div> <div><div>Ref Offset 7.1 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.480 2 GHz</div><div>-0.049 dBm</div></div> <div></div> <div><div>Start 30 MHz</div><div>#Res BW 100 kHz</div><div>#VBW 300 kHz</div><div>Stop 26.50 GHz</div><div>Sweep 2.530 s (30001 pts)</div></div> <div><table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SQ</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.480 2 GHz</td><td>-0.049 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>24.678 0 GHz</td><td>-36.846 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>4.761 1 GHz</td><td>-49.674 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>7.499 8 GHz</td><td>-49.709 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td>N</td><td>1</td><td>f</td><td>9.828 3 GHz</td><td>-50.837 dBm</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table></div> <div><div>MSO</div><div>STATUS</div></div> | MNR | MODE | TRC | SQ | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.480 2 GHz | -0.049 dBm |  |  |  | 2 | N | 1 | f | 24.678 0 GHz | -36.846 dBm |  |  |  | 3 | N | 1 | f | 4.761 1 GHz | -49.674 dBm |  |  |  | 4 | N | 1 | f | 7.499 8 GHz | -49.709 dBm |  |  |  | 5 | N | 1 | f | 9.828 3 GHz | -50.837 dBm |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|--------------|-------------|----------|----------------|----------------|----------------|----------------|---|---|---|---|-------------|------------|--|--|--|---|---|---|---|--------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-----|----|---|---|----------|----------------|----------------|---|---|---|---|-------------|------------|--|--|--|---|---|---|---|--------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-----|----|---|---|----------|----------------|----------------|---|---|---|---|-------------|------------|--|--|--|---|---|---|---|--------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|---|---|---|-------------|-------------|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|
| MNR                | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TRC | SQ   | X            | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 1                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 2.401 7 GHz  | 0.336 dBm   |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 2                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 24.630 3 GHz | -36.799 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 3                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 4.804 3 GHz  | -46.394 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 4                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 7.309 3 GHz  | -49.478 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 5                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 9.649 5 GHz  | -49.172 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 6                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 7                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 8                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 9                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 10                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 11                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| $\pi/4$ DQPSK/MCH  | <div><div>Agilent Spectrum Analyzer - Sweep SA</div><div><div>RL</div><div>RF</div><div>IF</div><div>SD</div><div>AC</div></div><div>SENSE:INT</div><div>ALIGN:AUTO</div><div>02:51:43 PM Jan 03, 2025</div></div> <div><div>Center Freq 13.265000000 GHz</div><div>PNO: Fast</div><div>IF Gain:Low</div><div>Trig: Free Run</div><div>Avg Type: Log-Pwr</div><div>AvgHold: 10/10</div><div>TRACETYPE: M</div><div>DET: P</div></div> <div><div>Ref Offset 7.06 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.441 4 GHz</div><div>-1.068 dBm</div></div> <div></div> <div><div>Start 30 MHz</div><div>#Res BW 100 kHz</div><div>#VBW 300 kHz</div><div>Stop 26.50 GHz</div><div>Sweep 2.530 s (30001 pts)</div></div> <div><table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SQ</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.441 4 GHz</td><td>-1.068 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>24.680 3 GHz</td><td>-37.596 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>4.882 0 GHz</td><td>-47.066 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>7.384 8 GHz</td><td>-49.659 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td>N</td><td>1</td><td>f</td><td>9.683 0 GHz</td><td>-49.724 dBm</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table></div> <div><div>MSO</div><div>STATUS</div></div> | MNR | MODE | TRC          | SQ          | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.441 4 GHz | -1.068 dBm |  |  |  | 2 | N | 1 | f | 24.680 3 GHz | -37.596 dBm |  |  |  | 3 | N | 1 | f | 4.882 0 GHz | -47.066 dBm |  |  |  | 4 | N | 1 | f | 7.384 8 GHz | -49.659 dBm |  |  |  | 5 | N | 1 | f | 9.683 0 GHz | -49.724 dBm |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  | $\pi/4$ DQPSK/HCH | <div><div>Agilent Spectrum Analyzer - Sweep SA</div><div><div>RL</div><div>RF</div><div>IF</div><div>SD</div><div>AC</div></div><div>SENSE:INT</div><div>ALIGN:AUTO</div><div>02:52:50 PM Jan 03, 2025</div></div> <div><div>Center Freq 13.265000000 GHz</div><div>PNO: Fast</div><div>IF Gain:Low</div><div>Trig: Free Run</div><div>Avg Type: Log-Pwr</div><div>AvgHold: 10/10</div><div>TRACETYPE: M</div><div>DET: P</div></div> <div><div>Ref Offset 7.1 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.480 2 GHz</div><div>-0.049 dBm</div></div> <div></div> <div><div>Start 30 MHz</div><div>#Res BW 100 kHz</div><div>#VBW 300 kHz</div><div>Stop 26.50 GHz</div><div>Sweep 2.530 s (30001 pts)</div></div> <div><table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SQ</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.480 2 GHz</td><td>-0.049 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>24.678 0 GHz</td><td>-36.846 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>4.761 1 GHz</td><td>-49.674 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>7.499 8 GHz</td><td>-49.709 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td>N</td><td>1</td><td>f</td><td>9.828 3 GHz</td><td>-50.837 dBm</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table></div> <div><div>MSO</div><div>STATUS</div></div>  | MNR | MODE | TRC | SQ | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.480 2 GHz | -0.049 dBm |  |  |  | 2 | N | 1 | f | 24.678 0 GHz | -36.846 dBm |  |  |  | 3 | N | 1 | f | 4.761 1 GHz | -49.674 dBm |  |  |  | 4 | N | 1 | f | 7.499 8 GHz | -49.709 dBm |  |  |  | 5 | N | 1 | f | 9.828 3 GHz | -50.837 dBm |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| MNR                | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TRC | SQ   | X            | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 1                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 2.441 4 GHz  | -1.068 dBm  |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 2                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 24.680 3 GHz | -37.596 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 3                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 4.882 0 GHz  | -47.066 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 4                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 7.384 8 GHz  | -49.659 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 5                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 9.683 0 GHz  | -49.724 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 6                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 7                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 8                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 9                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 10                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 11                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| $\pi/4$ DQPSK/HCH  | <div><div>Agilent Spectrum Analyzer - Sweep SA</div><div><div>RL</div><div>RF</div><div>IF</div><div>SD</div><div>AC</div></div><div>SENSE:INT</div><div>ALIGN:AUTO</div><div>02:52:50 PM Jan 03, 2025</div></div> <div><div>Center Freq 13.265000000 GHz</div><div>PNO: Fast</div><div>IF Gain:Low</div><div>Trig: Free Run</div><div>Avg Type: Log-Pwr</div><div>AvgHold: 10/10</div><div>TRACETYPE: M</div><div>DET: P</div></div> <div><div>Ref Offset 7.1 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.480 2 GHz</div><div>-0.049 dBm</div></div> <div></div> <div><div>Start 30 MHz</div><div>#Res BW 100 kHz</div><div>#VBW 300 kHz</div><div>Stop 26.50 GHz</div><div>Sweep 2.530 s (30001 pts)</div></div> <div><table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SQ</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.480 2 GHz</td><td>-0.049 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>24.678 0 GHz</td><td>-36.846 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>4.761 1 GHz</td><td>-49.674 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td>N</td><td>1</td><td>f</td><td>7.499 8 GHz</td><td>-49.709 dBm</td><td></td><td></td><td></td></tr><tr><td>5</td><td>N</td><td>1</td><td>f</td><td>9.828 3 GHz</td><td>-50.837 dBm</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table></div> <div><div>MSO</div><div>STATUS</div></div>  | MNR | MODE | TRC          | SQ          | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 2.480 2 GHz | -0.049 dBm |  |  |  | 2 | N | 1 | f | 24.678 0 GHz | -36.846 dBm |  |  |  | 3 | N | 1 | f | 4.761 1 GHz | -49.674 dBm |  |  |  | 4 | N | 1 | f | 7.499 8 GHz | -49.709 dBm |  |  |  | 5 | N | 1 | f | 9.828 3 GHz | -50.837 dBm |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| MNR                | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TRC | SQ   | X            | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 1                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 2.480 2 GHz  | -0.049 dBm  |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 2                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 24.678 0 GHz | -36.846 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 3                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 4.761 1 GHz  | -49.674 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 4                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 7.499 8 GHz  | -49.709 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 5                  | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | f    | 9.828 3 GHz  | -50.837 dBm |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 6                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 7                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 8                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 9                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 10                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |
| 11                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |              |             |          |                |                |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |     |    |   |   |          |                |                |   |   |   |   |             |            |  |  |  |   |   |   |   |              |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |   |   |   |             |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |

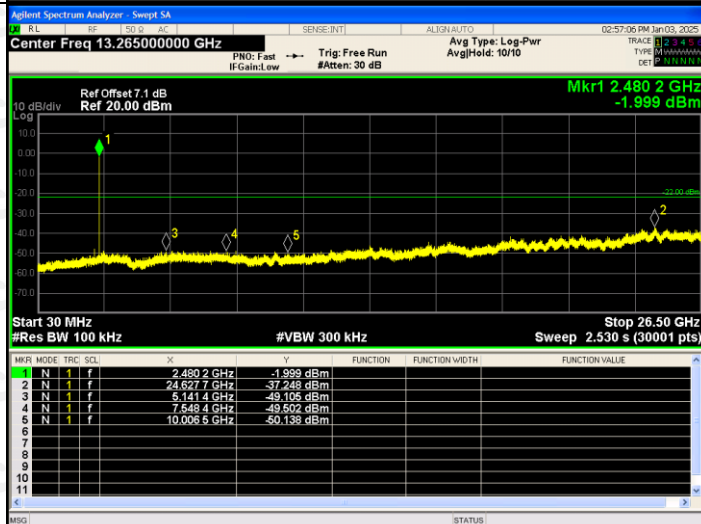
8DPSK /LCH



8DPSK /MCH

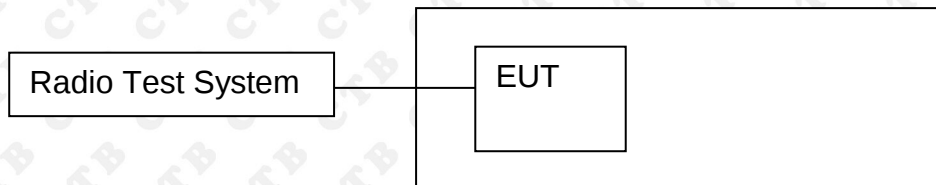


8DPSK /HCH



## 9. COUDUCTED PEAK OUTPUT POWER

### 9.1 Block Diagram Of Test Setup



### 9.2 Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

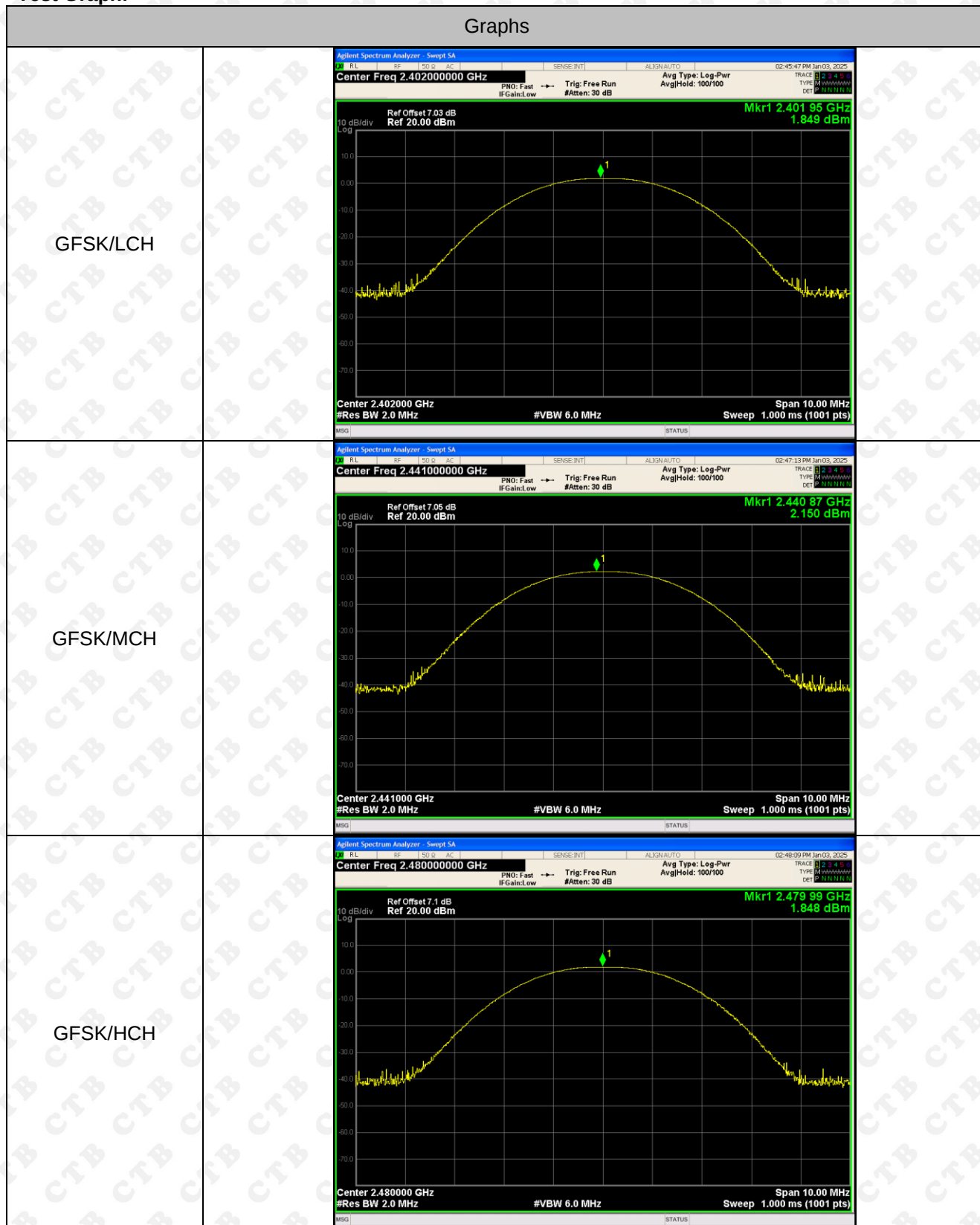
### 9.3 Test procedure

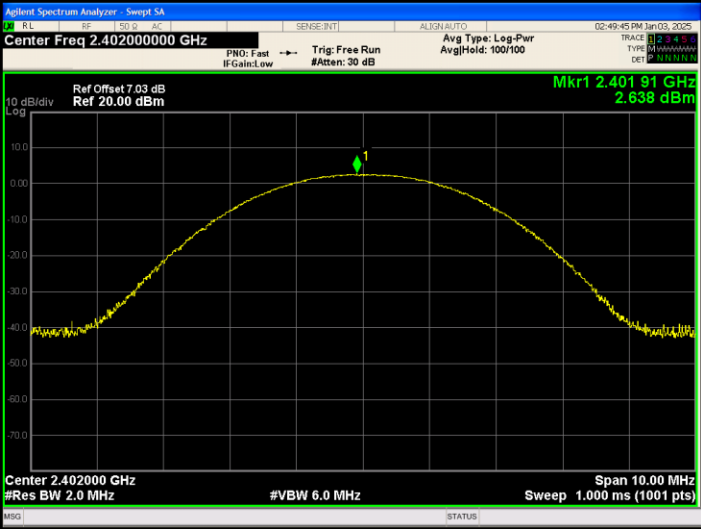
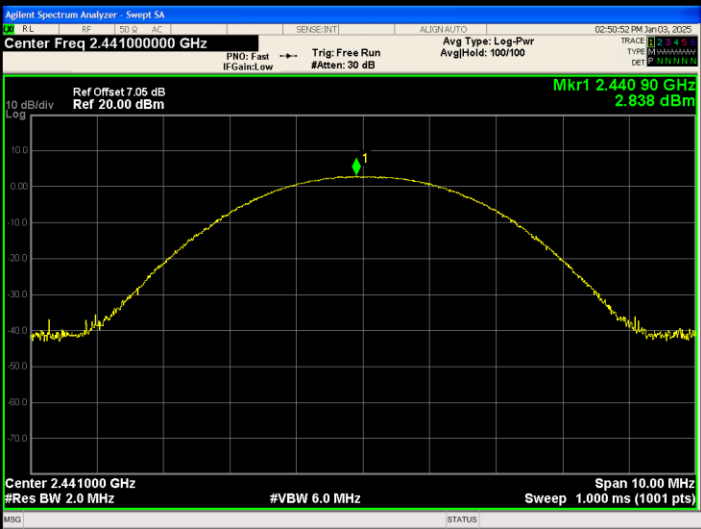
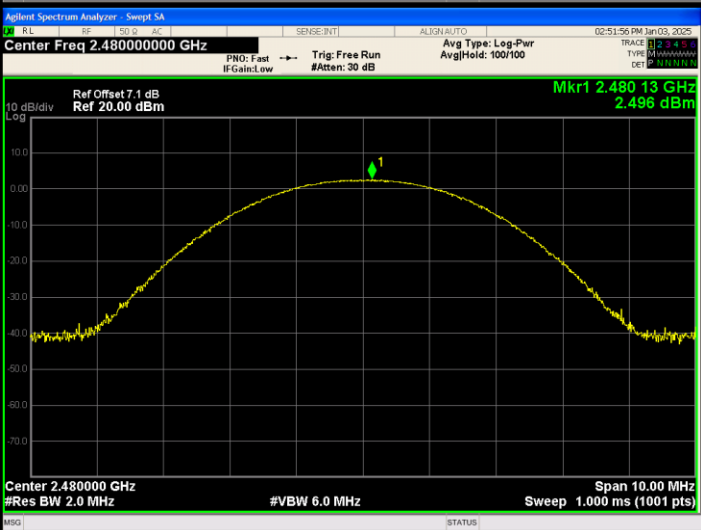
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

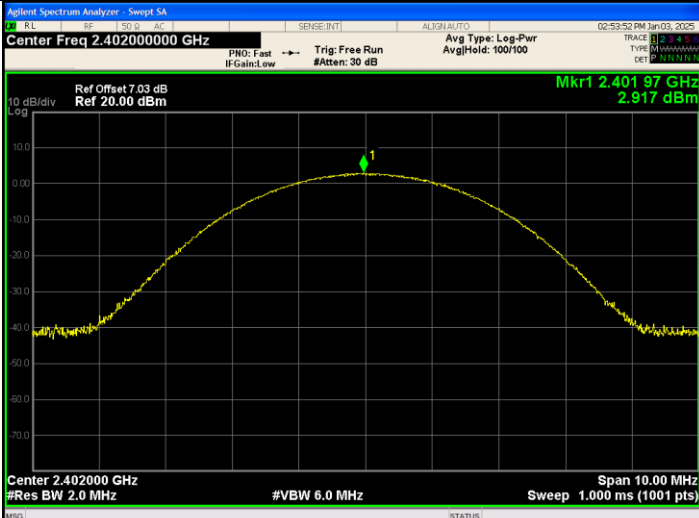
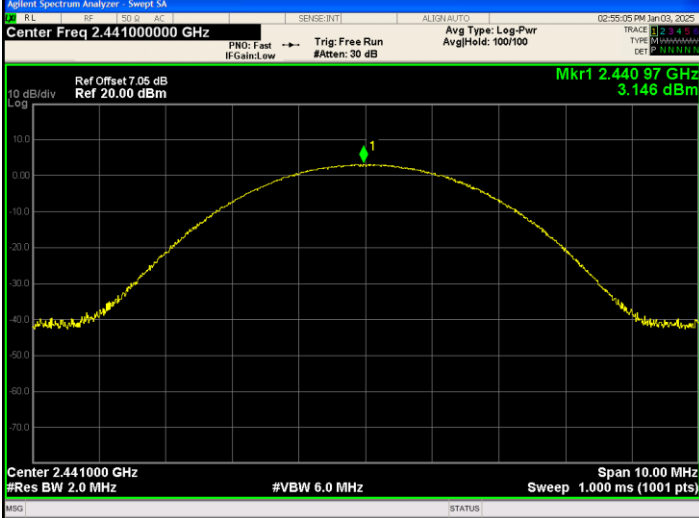
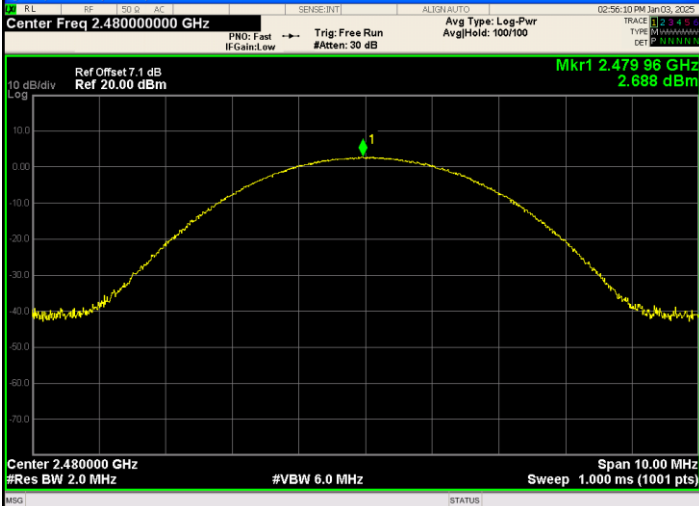
### 9.4 Test Result

| Mode                      | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------------------|----------|---------------------------------|-------------|---------|
| EDR mode (GFSK)           | LCH      | 1.849                           | 20.97       | PASS    |
|                           | MCH      | 2.150                           | 20.97       | PASS    |
|                           | HCH      | 1.848                           | 20.97       | PASS    |
| EDR mode ( $\pi/4$ DQPSK) | LCH      | 2.638                           | 20.97       | PASS    |
|                           | MCH      | 2.838                           | 20.97       | PASS    |
|                           | HCH      | 2.496                           | 20.97       | PASS    |
| EDR mode (8DPSK)          | LCH      | 2.917                           | 20.97       | PASS    |
|                           | MCH      | 3.146                           | 20.97       | PASS    |
|                           | HCH      | 2.688                           | 20.97       | PASS    |

# Test Graph:

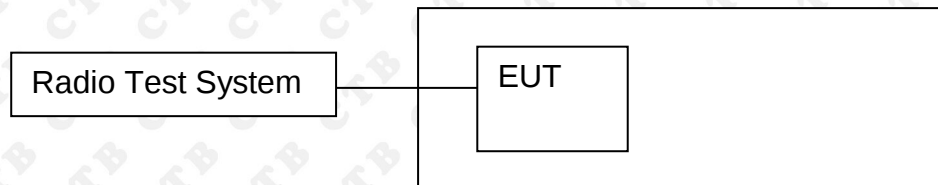


|                   |                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\pi/4$ DQPSK/LCH |  <p>Agilent Spectrum Analyzer - Sweep SA<br/>Center Freq 2.40200000 GHz<br/>Ref Offset 7.03 dB<br/>Ref 20.00 dBm<br/>Mkr1 2.401 91 GHz<br/>2.638 dBm<br/>Center 2.402000 GHz<br/>#Res BW 2.0 MHz<br/>#VBW 6.0 MHz<br/>Span 10.00 MHz<br/>Sweep 1.000 ms (1001 pts)</p>  |
| $\pi/4$ DQPSK/MCH |  <p>Agilent Spectrum Analyzer - Sweep SA<br/>Center Freq 2.44100000 GHz<br/>Ref Offset 7.05 dB<br/>Ref 20.00 dBm<br/>Mkr1 2.440 90 GHz<br/>2.838 dBm<br/>Center 2.441000 GHz<br/>#Res BW 2.0 MHz<br/>#VBW 6.0 MHz<br/>Span 10.00 MHz<br/>Sweep 1.000 ms (1001 pts)</p> |
| $\pi/4$ DQPSK/HCH |  <p>Agilent Spectrum Analyzer - Sweep SA<br/>Center Freq 2.48000000 GHz<br/>Ref Offset 7.1 dB<br/>Ref 20.00 dBm<br/>Mkr1 2.480 13 GHz<br/>2.496 dBm<br/>Center 2.480000 GHz<br/>#Res BW 2.0 MHz<br/>#VBW 6.0 MHz<br/>Span 10.00 MHz<br/>Sweep 1.000 ms (1001 pts)</p> |

|            |                                                                                                                                                                                                                                                                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8DPSK/LCH  |  <p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq: 2.40200000 GHz</p> <p>Ref Offset: 7.03 dB, Ref: 20.00 dBm</p> <p>Mkr1 2.40197 GHz, 2.917 dBm</p> <p>Center 2.402000 GHz, #Res BW 2.0 MHz, #VBW 6.0 MHz, Span 10.00 MHz, Sweep 1.000 ms (1001 pts)</p>  |
| 8DPSK /MCH |  <p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq: 2.44100000 GHz</p> <p>Ref Offset: 7.05 dB, Ref: 20.00 dBm</p> <p>Mkr1 2.44097 GHz, 3.146 dBm</p> <p>Center 2.441000 GHz, #Res BW 2.0 MHz, #VBW 6.0 MHz, Span 10.00 MHz, Sweep 1.000 ms (1001 pts)</p> |
| 8DPSK /HCH |  <p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq: 2.48000000 GHz</p> <p>Ref Offset: 7.1 dB, Ref: 20.00 dBm</p> <p>Mkr1 2.47996 GHz, 2.688 dBm</p> <p>Center 2.480000 GHz, #Res BW 2.0 MHz, #VBW 6.0 MHz, Span 10.00 MHz, Sweep 1.000 ms (1001 pts)</p> |

## 10. 20DB OCCUPIED BANDWIDTH

### 10.1 Block Diagram Of Test Setup



### 10.2 Limit

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mw.

### 10.3 Test procedure

1. Rem1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

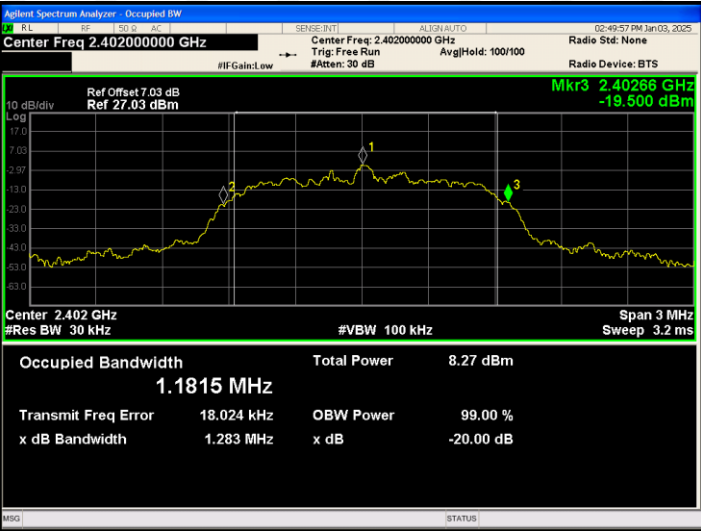
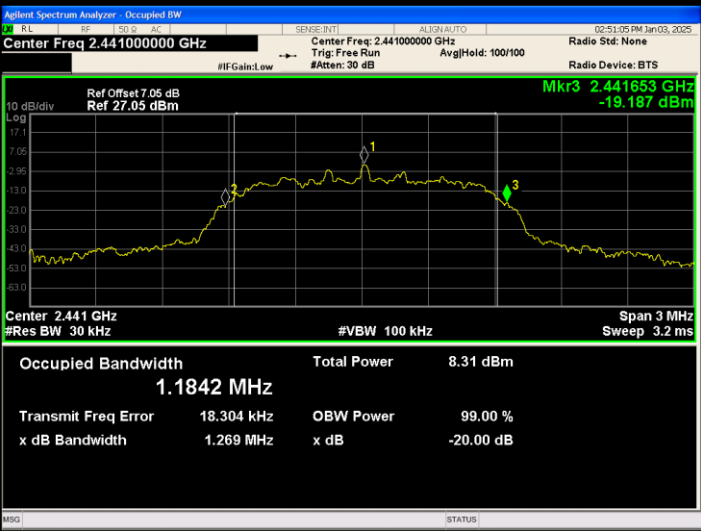
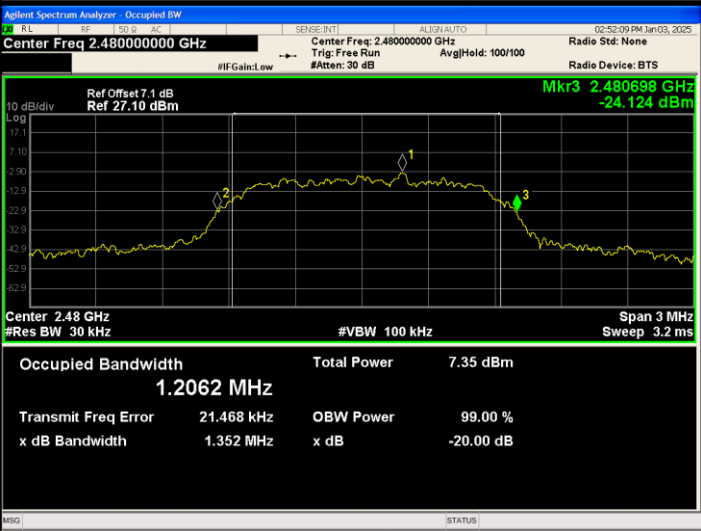
### 10.4 Test Result

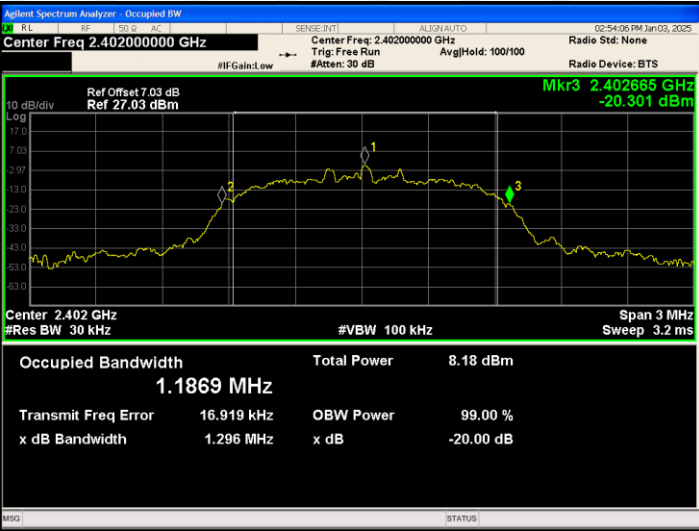
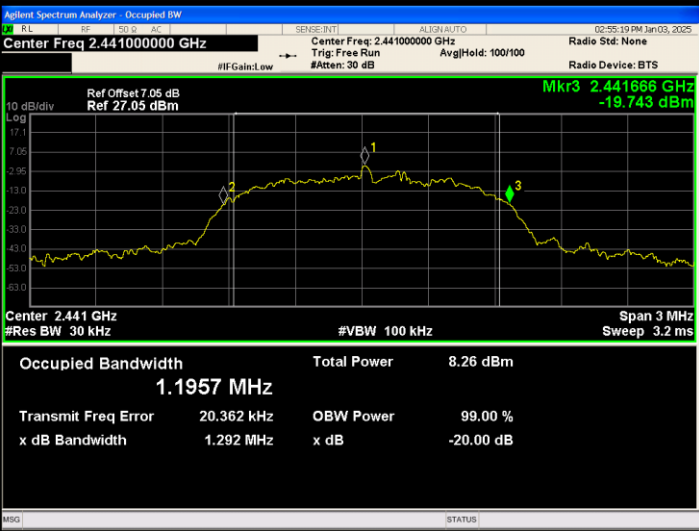
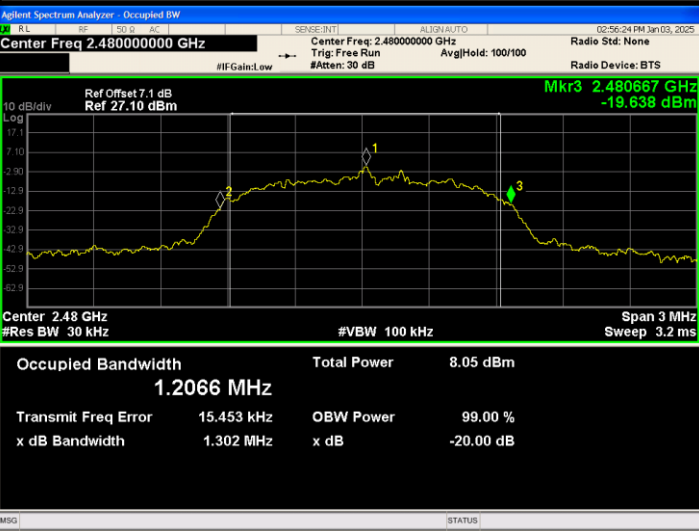
| Test Mode     | Frequency    | 20dB Bandwidth (MHz) | Result      |
|---------------|--------------|----------------------|-------------|
| GFSK          | Low channel  | 0.878                | <b>PASS</b> |
|               | Mid channel  | 0.870                | <b>PASS</b> |
|               | High channel | 0.875                | <b>PASS</b> |
| $\pi/4$ DQPSK | Low channel  | 1.283                | <b>PASS</b> |
|               | Mid channel  | 1.269                | <b>PASS</b> |
|               | High channel | 1.352                | <b>PASS</b> |
| 8DPSK         | Low channel  | 1.296                | <b>PASS</b> |
|               | Mid channel  | 1.292                | <b>PASS</b> |
|               | High channel | 1.302                | <b>PASS</b> |

Note: All modes of operation were Pre-scan and the worst-case emissions are reported.

## Test Graph:

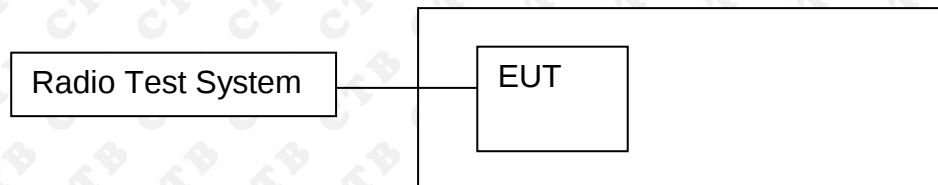


|                                                  |                                                                                      |
|--------------------------------------------------|--------------------------------------------------------------------------------------|
| <p><math>\pi/4</math>-DQPSK<br/>Low channel</p>  |    |
| <p><math>\pi/4</math>-DQPSK<br/>Mid channel</p>  |   |
| <p><math>\pi/4</math>-DQPSK<br/>High channel</p> |  |

|                               |                                                                                      |
|-------------------------------|--------------------------------------------------------------------------------------|
| <p>8DPSK<br/>Low channel</p>  |    |
| <p>8DPSK<br/>Mid channel</p>  |   |
| <p>8DPSK<br/>High channel</p> |  |

## 11. CARRIER FREQUENCIES SEPARATION

### 11.1 Block Diagram Of Test Setup



### 11.2 Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125W.

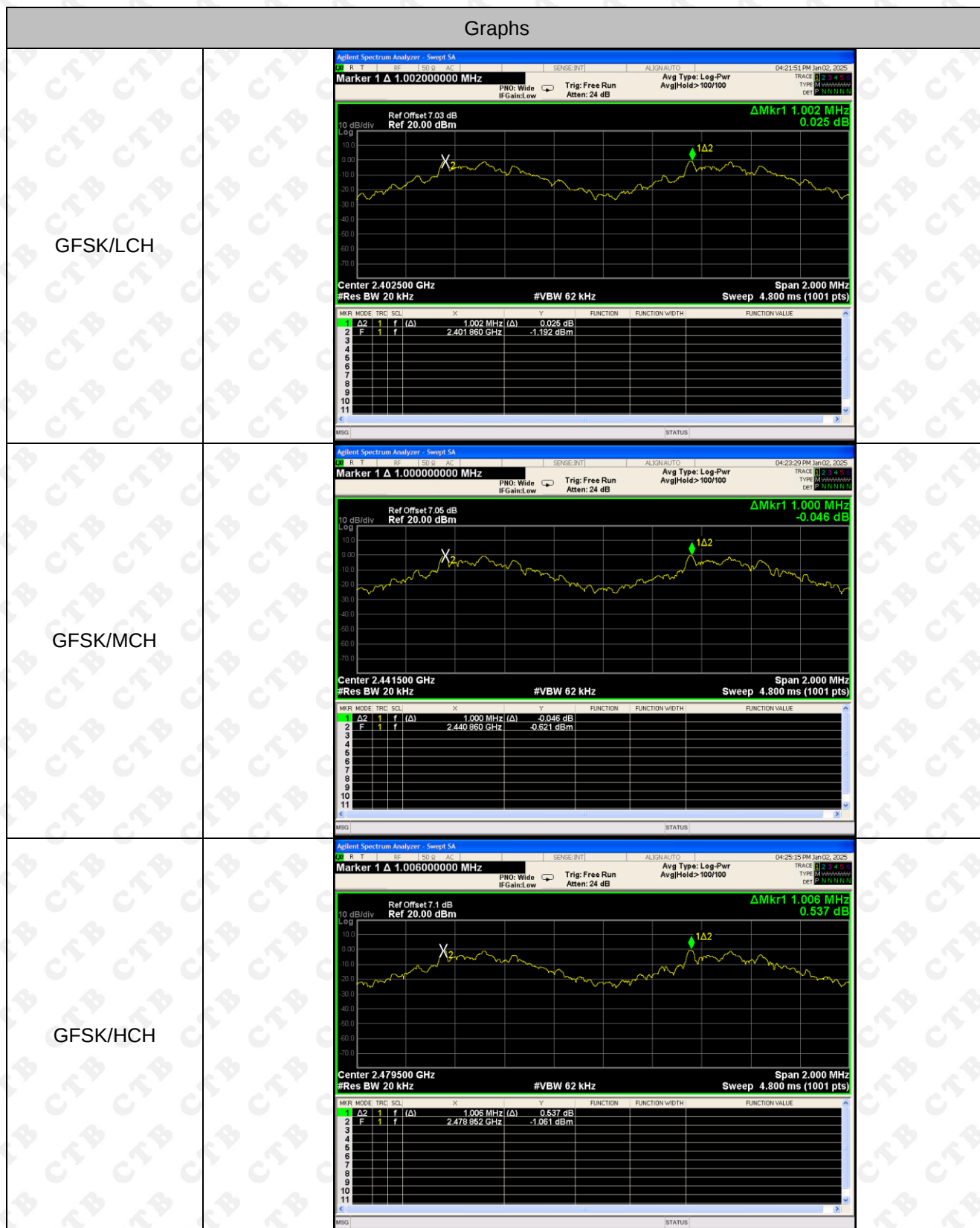
### 11.3 Test procedure

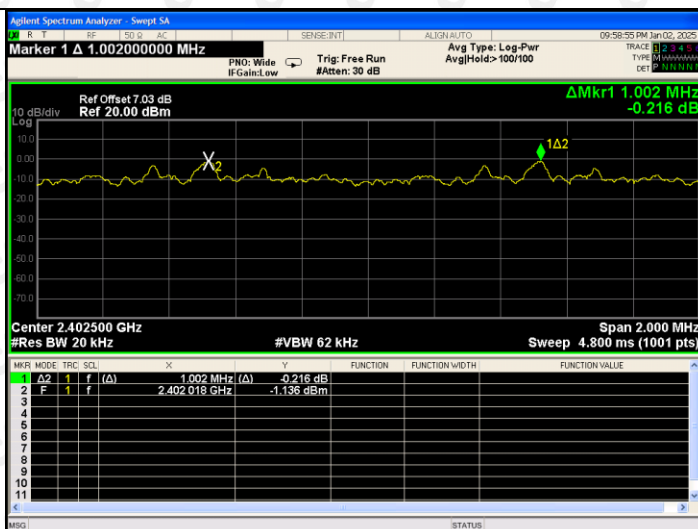
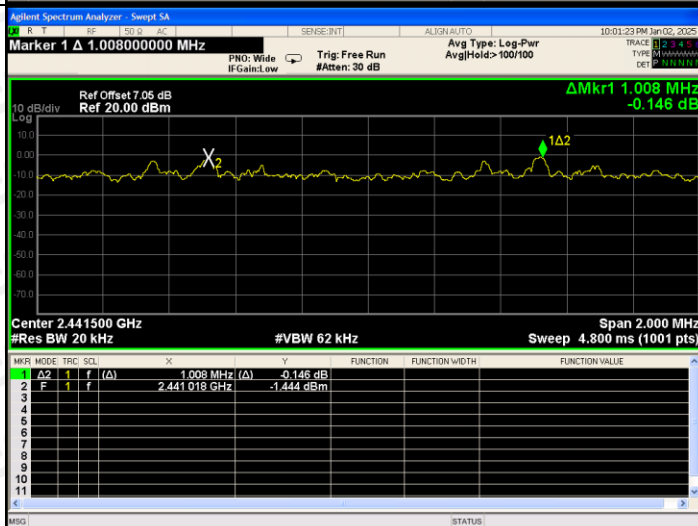
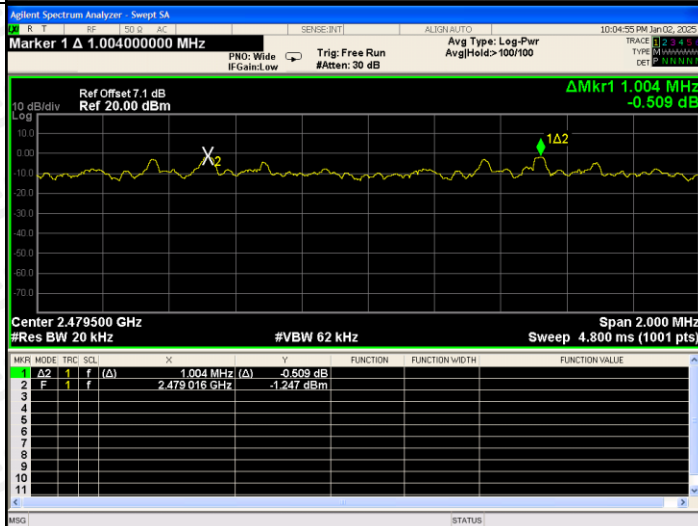
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 20kHz. VBW = 60kHz , Span = 2MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

### 11.4 Test Result

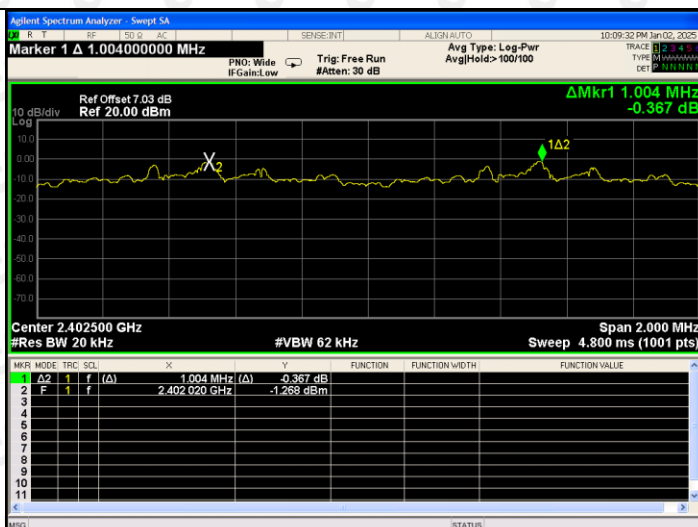
| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit(2/3 of the 20dB bandwidth MHz) | Verdict |
|---------------|----------|------------------------------------|--------------------------------------|---------|
| GFSK          | LCH      | 1.002                              | 0.585                                | PASS    |
| GFSK          | MCH      | 1.000                              | 0.580                                | PASS    |
| GFSK          | HCH      | 1.006                              | 0.583                                | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.002                              | 0.855                                | PASS    |
| $\pi/4$ DQPSK | MCH      | 1.008                              | 0.846                                | PASS    |
| $\pi/4$ DQPSK | HCH      | 1.004                              | 0.901                                | PASS    |
| 8DPSK         | LCH      | 1.004                              | 0.864                                | PASS    |
| 8DPSK         | MCH      | 1.008                              | 0.861                                | PASS    |
| 8DPSK         | HCH      | 1.006                              | 0.868                                | PASS    |

## Test Graph

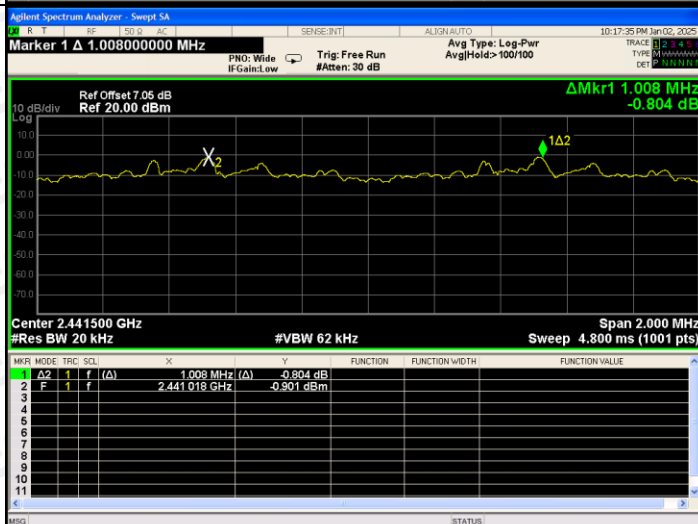


$\pi/4$ DQPSK/LCH

 $\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


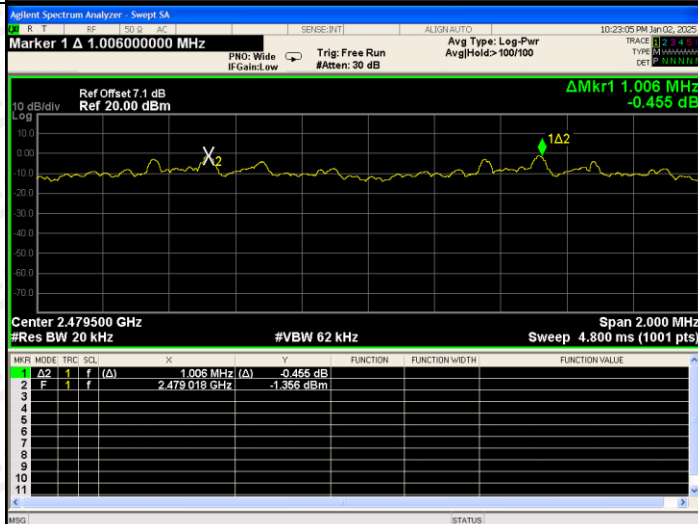
8DPSK/LCH



8DPSK /MCH

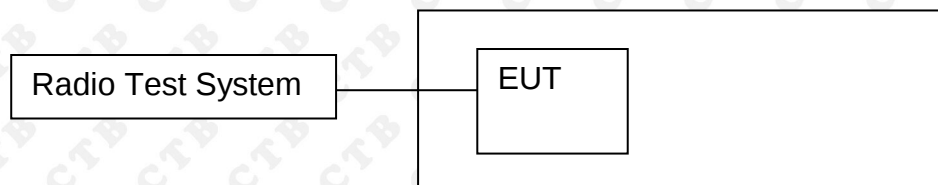


8DPSK /HCH



## 12. HOPPING CHANNEL NUMBER

### 12.1 Block Diagram Of Test Setup



### 12.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### 12.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

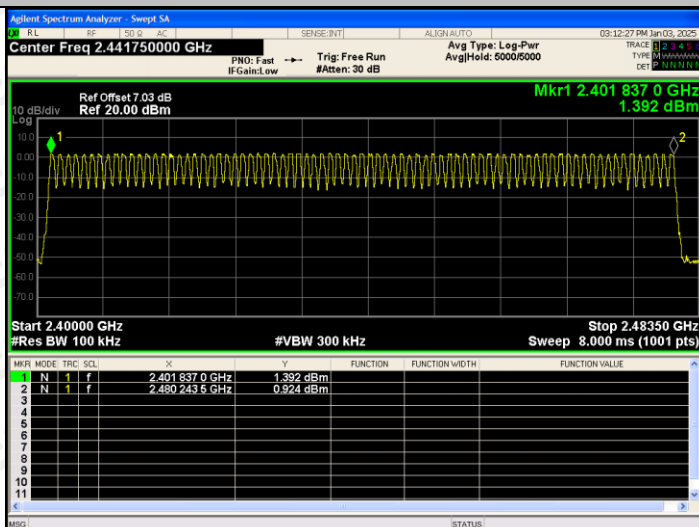
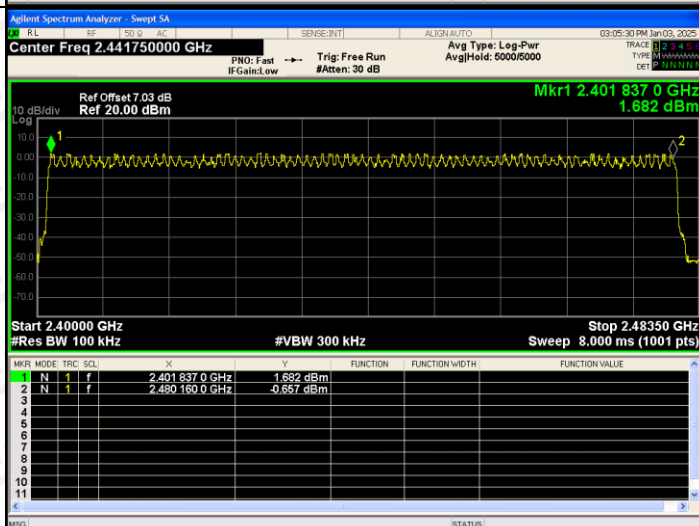
### 12.4 Test Result

| Mode          | Channel. | Number of Hopping Channel | Limit     | Verdict |
|---------------|----------|---------------------------|-----------|---------|
| GFSK          | Hop      | 79                        | $\geq 15$ | PASS    |
| $\pi/4$ DQPSK | Hop      | 79                        | $\geq 15$ | PASS    |
| 8DPSK         | Hop      | 79                        | $\geq 15$ | PASS    |

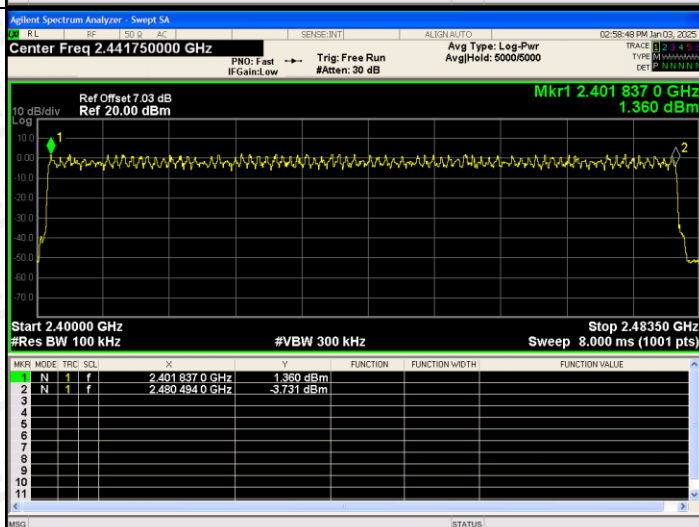
## Test Graph

## Graphs

GFSK/Hop

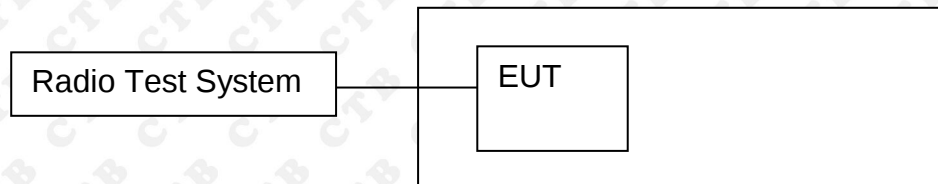

 $\pi/4$ DQPSK/Hop


8DPSK/Hop



### 13. DWELL TIME

#### 13.1 Block Diagram Of Test Setup



#### 13.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

#### 13.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. Centred on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

#### 13.4 Test Result

Worst case-GFSK:

| Mode | Packet | Channel | Pulse Time (ms) | Total Dwell Time (ms) | Limit (ms) | Verdict |
|------|--------|---------|-----------------|-----------------------|------------|---------|
| GFSK | DH1    | LCH     | 0.383           | 122.56                | 400        | PASS    |
|      | DH1    | MCH     | 0.383           | 122.56                | 400        | PASS    |
|      | DH1    | HCH     | 0.383           | 122.56                | 400        | PASS    |
|      | DH3    | LCH     | 1.644           | 263.04                | 400        | PASS    |
|      | DH3    | MCH     | 1.637           | 261.92                | 400        | PASS    |
|      | DH3    | HCH     | 1.644           | 263.04                | 400        | PASS    |
|      | DH5    | LCH     | 2.894           | 308.693               | 400        | PASS    |
|      | DH5    | MCH     | 2.894           | 308.693               | 400        | PASS    |
|      | DH5    | HCH     | 2.894           | 308.693               | 400        | PASS    |

Remark: DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel (5 time slots RX, 1 time slot TX).

DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 / 2 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the Dwell Time can be calculated as follows:

DH5:  $1600/79/6 \times 0.4 \times 79 \times (\text{MkrDelta})/1000$

DH3:  $1600/79/4 \times 0.4 \times 79 \times (\text{MkrDelta})/1000$

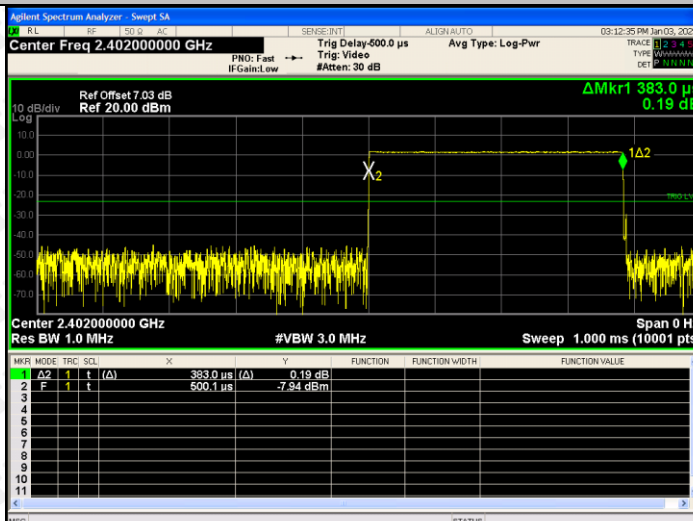
DH1:  $1600/79/2 \times 0.4 \times 79 \times (\text{MkrDelta})/1000$

Remark: Mkr Delta is once pulse time.

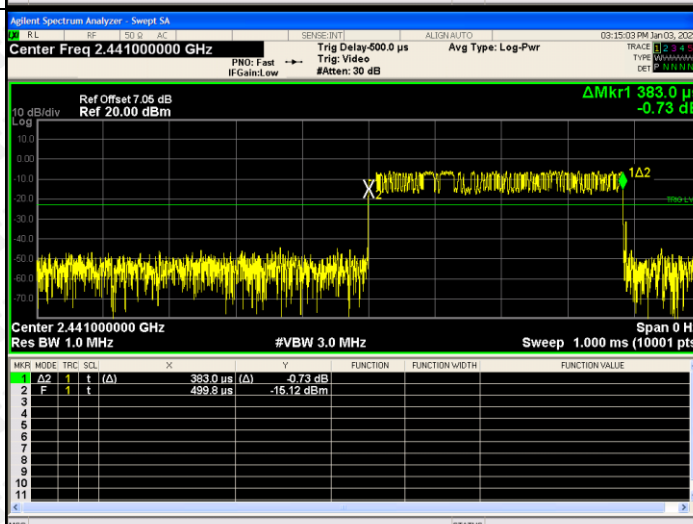
# Test Graph

## Graphs

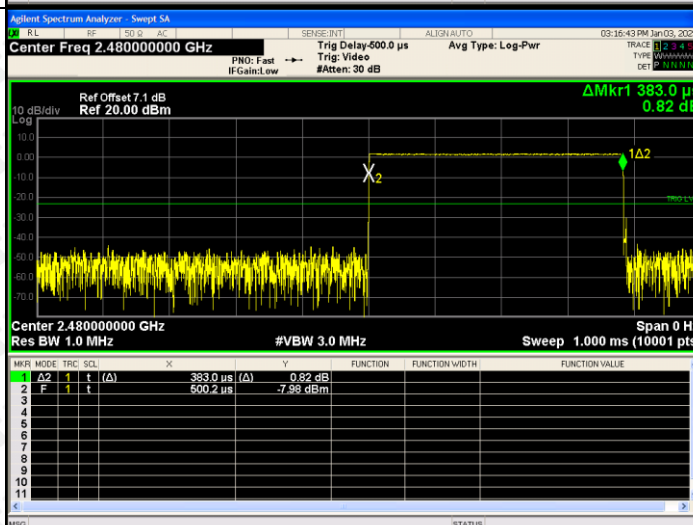
GFSK\_DH1/LCH



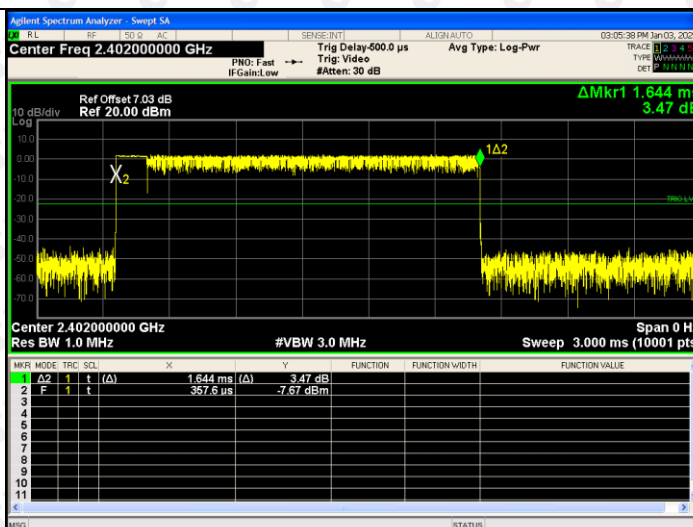
GFSK\_DH1/MCH



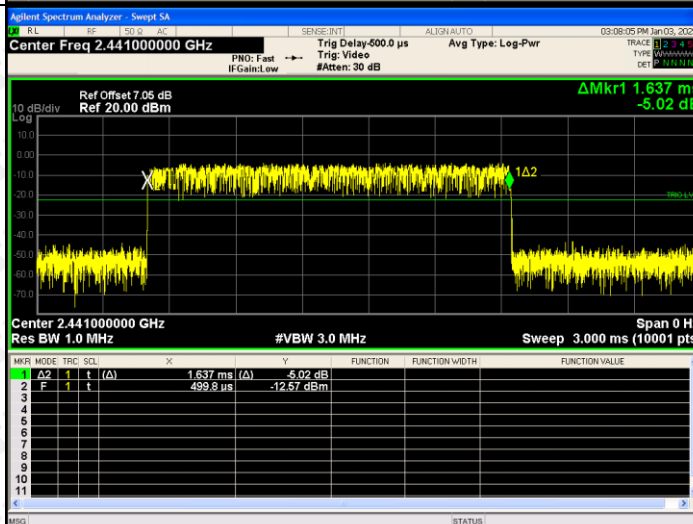
GFSK\_DH1/HCH



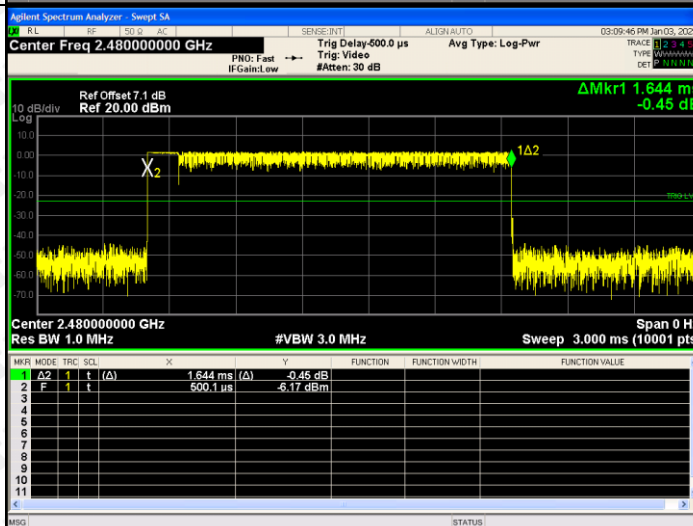
GFSK\_DH3/LCH



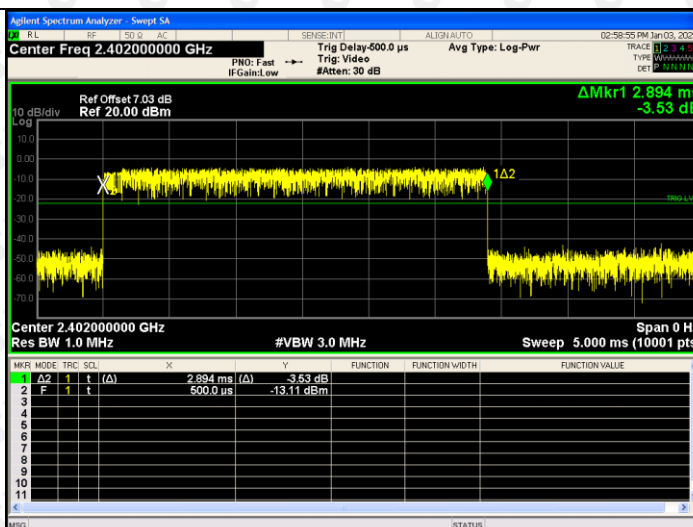
GFSK\_DH3/MCH



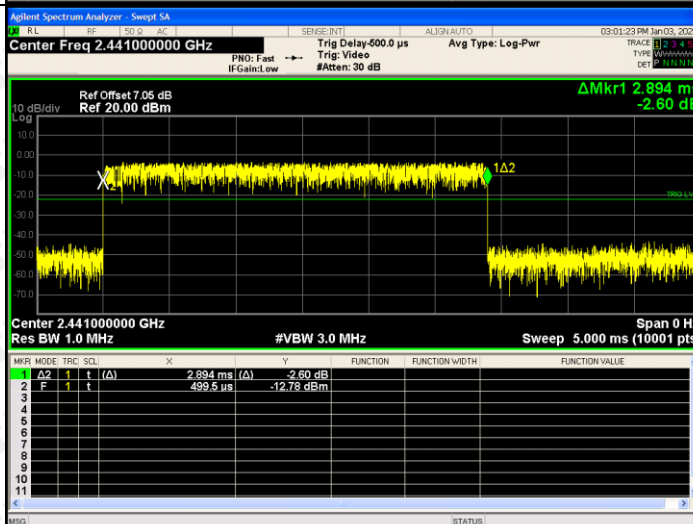
GFSK\_DH3/HCH



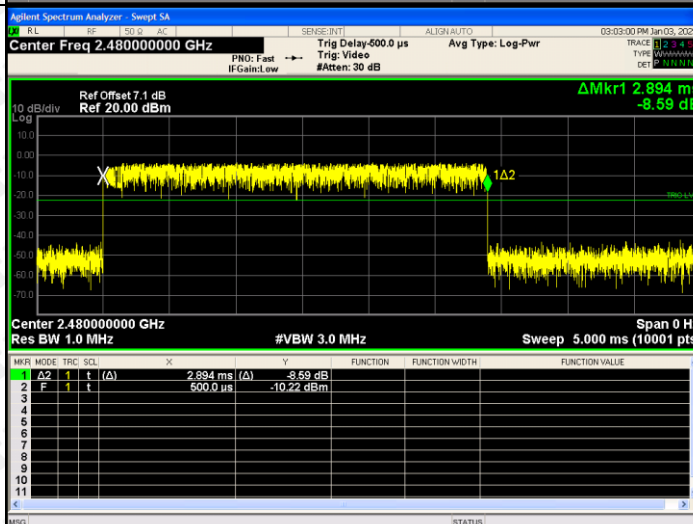
GFSK\_DH5/LCH



GFSK\_DH5/MCH



GFSK\_DH5/HCH



## 14. PSEUDORANDOM FREQUENCY

### 14.1 Limit

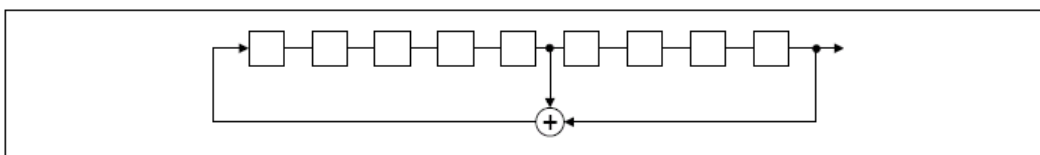
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

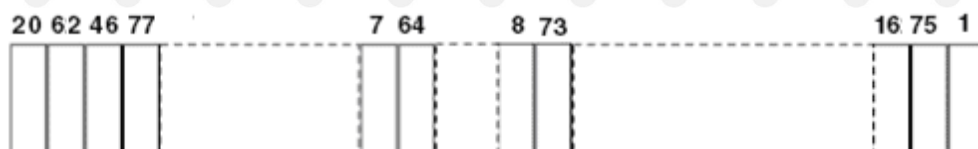
### 14.2 Test procedure

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence:  $2^9 - 1 = 511$  bits
- Longest sequence of zeros: 8 (non-inverted signal)



An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their Corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

### 14.3 Test Result

The device does not have the ability to be coordinated with other FHSS systems in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

## 15. ANTENNA REQUIREMENT

### 15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### 15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

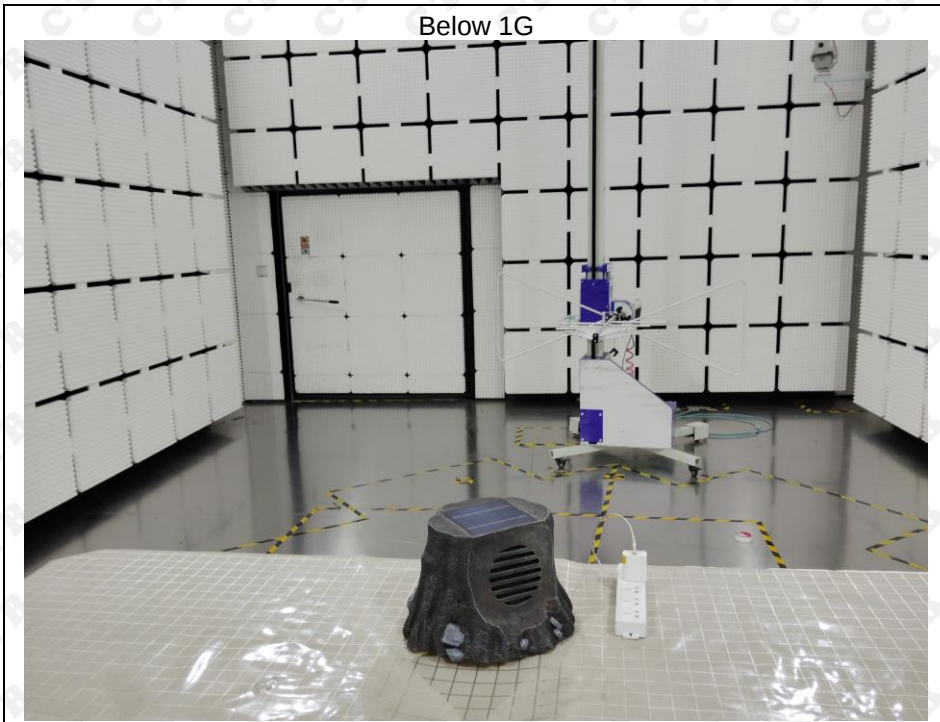
### EUT Antenna:

The antenna is PCB antenna. The best case gain of the antenna is -0.76dBi.

## 16. EUT TEST SETUP PHOTOGRAPHS

### Radiated Emission

Below 1G



Above 1G



## Conducted emissions



\*\*\*\*\* END OF REPORT \*\*\*\*\*