
TEST REPORT FOR

BLUETOOTH TESTING

Report No.: SRTC2024-9004(F)-24013001(D)

Product Name: 5G Module

Product ID: SC151-GL

Brand Name: Fibocom

Applicant: Fibocom Wireless Inc.

Manufacturer: Fibocom Wireless Inc.

Specification: FCC Part 15 Subpart C (2023)

FCC ID: ZMOSC151GL

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China
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1. GENERAL INFORMATION

1.1 Notes of the test report

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1.2 Information about the testing laboratory

Company:	The State Radio Monitoring Center Testing Center (SRTC)
Test Site 1:	15th Building, No.30 Shixing Street, Shijingshan District
Test Site 2:	No.80, Zhaojiachang, Beizang, Daxing District
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
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Designation Number:	CN1267
Registration number:	239125

1.3 Applicant's details

Company:	Fibocom Wireless Inc.
Address:	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
City:	Shenzhen
Country or Region:	China
Contacted person:	Sam Guo
Tel:	15013511563
Email:	sam.guo@fibocom.com

1.4 Manufacturer's details

Company:	Fibocom Wireless Inc.
Address:	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
City:	Shenzhen
Country or Region:	China
Contacted person:	Sam Guo
Tel:	15013511563
Email:	sam.guo@fibocom.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2024/2/4	
Testing Start Date:	2024/2/5	
Testing End Date:	2024/6/25	

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40
Maximum Extreme	75	---
Minimum Extreme	-30	---

Normal Supply Voltage (V d.c.):	3.8
Maximum Extreme Supply Voltage (V d.c.):	4.4
Minimum Extreme Supply Voltage (V d.c.):	3.5

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

Frequency Range:	2.402GHz~2.480GHz
Number of Channel:	79
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Duplex Mode:	TDD
Channel Spacing:	1MHz
Data Rate:	1Mbps, 2 Mbps, 3 Mbps
Power Supply:	DC supply
Software Revision:	SC151-GL-T6.00.07
Hardware Revision:	V1.1
IMEI:	NA
Antenna type:	Refer to Note1
Antenna connector:	Refer to Note1

Antenna requirement (FCC Part 15.203)

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.

- The antenna(s) of the EUT are permanently attached.
- There are no provisions for connection to an external antenna.

Note1: The antenna provide to the EUT, please refer to the following table:

Brand	Model	Antenna gain	Frequency band	Antenna type	Connector Type
N/A	N/A	4.5dBi	2.4GHz~2.4835GHz	External antenna	SMA Male J

The antenna gain is provided by the customer and involved in the calculation and influence of the test results. Our laboratory takes the value declared by the customer as the criterion, and the customer is responsible for the antenna gain value. Manufacturers ensure that their designs will not be modified by the user or third party's arbitrary antenna parameters and performance.

2.2 Description of Test Modes

79 channels are provided to this EUT:

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

2.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
GFSK, π/4DQPSK, 8DPSK	√	√	√	√	-

Where

RE ≥ 1G: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 78	39	GFSK, $\pi/4$ DQPSK, 8DPSK	1Mbps, 2 Mbps, 3 Mbps

Radiated Emission Test (Below 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 78	39	GFSK, $\pi/4$ DQPSK, 8DPSK	1Mbps, 2 Mbps, 3 Mbps

Power Line Conducted Emission Test:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 78	39	GFSK, $\pi/4$ DQPSK, 8DPSK	1Mbps, 2 Mbps, 3 Mbps

Antenna Port Conducted Measurement:

This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

Pre-Scan has been conducted to determine the worst-case mode from all possible

combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 78	0, 39, 78	GFSK, $\pi/4$ DQPSK, 8DPSK	1Mbps, 2 Mbps, 3 Mbps

2.3 Duty Cycle of Test Signal

Modulation Type	Duty Cycle	Correction Factor(dB)
GFSK(DH5)	78.60%	1.05
$\pi/4$ DQPSK(DH5)	78.70%	1.04
8DPSK(DH5)	78.70%	1.04

2.4 EUT operating conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

2.5 Support Equipment

The following support equipment was used to exercise the DUT during testing:N/A

3 REFERENCE SPECIFICATION

Specification	Version	Title
FCC Part15 Subpart C	2023	Intentional radiators
ANSI C63.10	2013	Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074D01 v05r02	April 2, 2019	Guidance for compliance measurements on Digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules

4 KEY TO NOTES AND RESULT CODES

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
N/T	Test case is not tested.

5 RESULT SUMMARY

No.	Test case	Reference	Verdict	Test Site
1	20dB Bandwidth	15.247(a)(1)(iii)	Pass	1
2	Channel Separation	15.247(a)(1)	Pass	1
3	Peak Transmitter Output Power	15.247(b)(1)	Pass	1
4	Dwell Time	15.247(a)(1)(iii)	Pass	1
5	Number of Hopping Frequencies	15.247(a)(1)(iii)	Pass	1
6	Conducted out of band emission measurement	15.247(d)	Pass	1
7	Antenna requirement	15.203	Pass(refer to section 2.1)	1

Note: The device is designed according to specifications of SIG, So it has a full support to Medium access protocol and fully compliant with the KDB558074 standard. The device is compliant Pseudorandom hopping, Equal hopping frequency, receiver bandwidth synchronize and have same bandwidth with transmitted signal. And the ability to have adaptive hopping when encountering other signals.

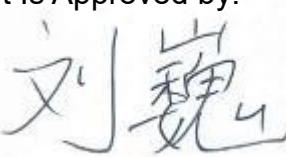
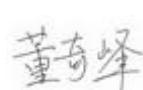
Test Site 1: 15th Building, No.30 Shixing Street, Shijingshan District

This Test Report Is Approved by: Mr. Peng Zhen 	Review by: Mr. Li Bin 
Tested and Issued by: Mr. LiangXisheng 	Approved date: 20240625

No.	Test case	Reference	Verdict	Test Site
8	Band-edge	15.247(d)	Pass	2
9	Spurious Radiated Emissions	15.205/15.209	Pass	2
10	AC Power line Conducted Emission	15.207	Pass	2

Note: The device is designed according to specifications of SIG, So it has a full support to Medium access protocol and fully compliant with the KDB558074 standard. The device is compliant Pseudorandom hopping, Equal hopping frequency, receiver bandwidth synchronize and have same bandwidth with transmitted signal. And the ability to have adaptive hopping when encountering other signals.

Test Site 2: No.80, Zhaojiachang, Beizang, Daxing District

This Test Report Is Approved by: Mr. Liu Wei 	Review by: Mr. Guo Yu 
Tested and Issued by: Mr. Dong Qifeng 	Approved date: 20240621

6 TEST RESULT

6.1 20dB Bandwidth

6.1.1 Test limit

FCC Part15.247 (a.1.iii)

The bandwidth at 20dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

6.1.2 Test Procedure Used

ANSI C63.10-2013 – Section 6.9.2

6.1.3 Test settings

1.The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 20dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 20. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

2.RBW = 1 – 5% OBW

3.VBW \geq 3 x RBW

4.Reference level set to keep signal from exceeding maximum input mixer level for linear operation.

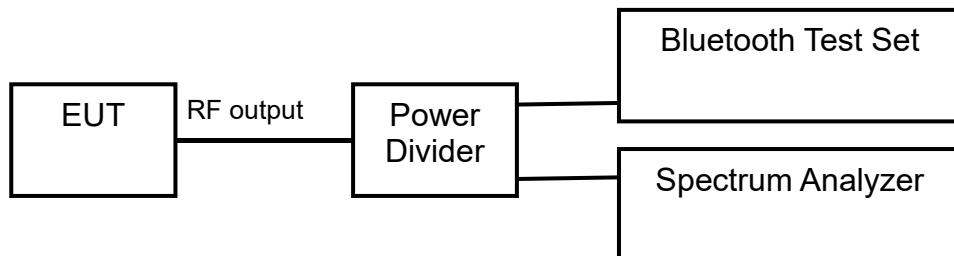
5.Detector = Peak

6.Trace mode = max hold

7.Sweep = auto couple

8.The trace was allowed to stabilize

6.1.4 Test Setup



6.1.5 Test result

The test results are shown in Appendix A.

6.2 Channel Separation

6.2.1 Test limit

FCC Part15.247 (a)(1)

Measurement is made with EUT operating in hopping mode. The minimum permissible channel separation for this system is 2/3 the value of the 20dB BW.

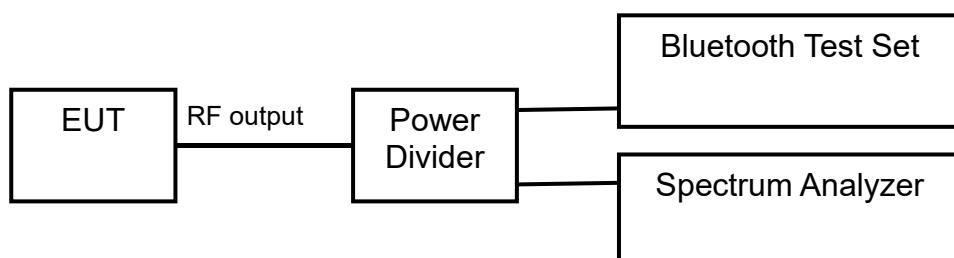
6.2.2 Test Procedure Used

ANSI C63.10-2013 – Section 7.8.2

6.2.3 Test Settings

1. Span = Wide enough to capture peaks of two adjacent channels
2. RBW = 30% of channel spacing. Adjust as necessary to best identify center of each individual channel
3. VBW \geq RBW
4. Sweep = Auto
5. Detector = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize.
8. Marker-delta function used to determine separation between peaks of the adjacent channels

6.2.4 Test Setup



6.2.5 Test result

The test results are shown in Appendix A.

6.3 Peak Transmitter Output Power

6.3.1 Test limit

FCC Part15.247(b)(1)

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:1watt.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW) →

Modulation type	GFSK	$\pi/4$ DQPSK	8DPSK
Maximum Output Power	30.0dBm	30.0dBm	30.0dBm

For all other frequency hopping systems in the 2400-2483.5 MHz band:0.125 watts.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW) →

Modulation type	GFSK	$\pi/4$ DQPSK	8DPSK
Maximum Output Power	21.0dBm	21.0dBm	21.0dBm

6.3.2 Test Procedure Used

ANSI C63.10-2013 – Section 7.8.5

ANSI C63.10-2013 – Section 11.9.2.3.2 method AVGPM-G

6.3.3 Test Settings

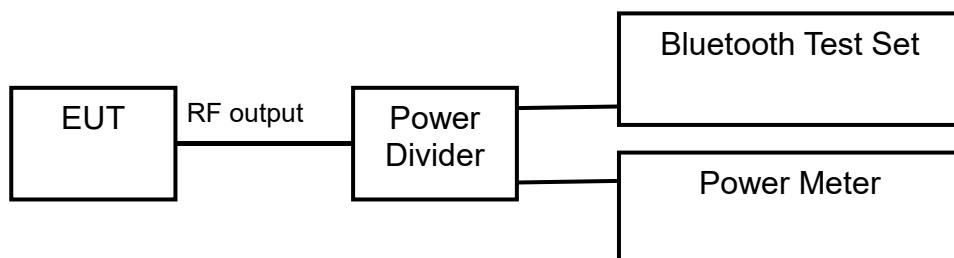
Peak Power Measurement

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than the occupied bandwidth.

Method AVGPM-G (Average Power Measurement)

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

6.3.4 Test Setup



6.3.5 Test result

The test results are shown in Appendix A.

6.4 Dwell Time

6.4.1 Test Description

The Equipment under Test (EUT) was set up in a shielded room to perform the dwell time measurements.

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss.

The time slot length is measured of three different packet types which are available in the Bluetooth technology. Those are DH1, DH3 and DH5 packets. The dwell time is calculated by:

Dwell time = time slot length * hop rate * 31.6/ number of hopping channels with:

- hop rate=1600/2 * 1/s for DH1 packets =800
- hop rate=1600/4 * 1/s for DH3 packets =400
- hop rate=1600/6 * 1/s for DH5 packets =266.67
- Number of hopping channels=79
- 31.6 s=0.4 seconds multiplied by the number of hopping channels=0.4s * 79

6.4.2 Test limit

FCC Part15.247(a)(1)(iii)

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

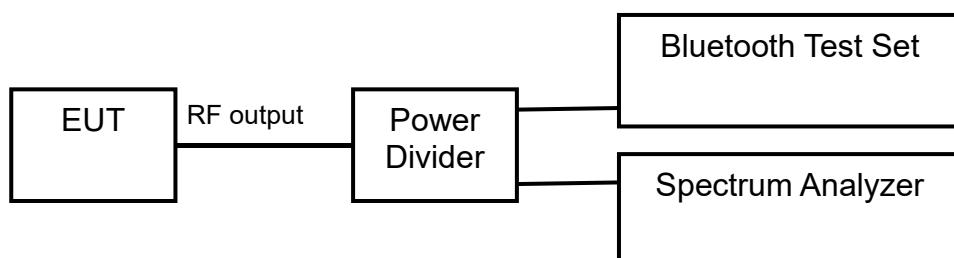
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

6.4.3 Test Settings

ANSI C63.10-2013 Section 7.8.4

1. Span = zero span, centered on a hopping channel
2. RBW \leq channel spacing and $>> 1/T$, where T is expected dwell time per channel
3. Sweep = as necessary to capture entire dwell time. Second plot may be required to demonstrate two successive hops on a channel
4. Trigger is set with appropriate trigger delay to place pulse near the center of the plot
5. Detector = peak
6. Trace mode = max hold
7. Marker-delta function used to determine transmit time per hop

6.4.4 Test Setup



6.4.5 Test result

The test results are shown in Appendix A.

6.5 Number of Hopping Frequencies

6.5.1 Test Description

The Equipment under Test (EUT) was set up in a shielded room to perform the number of hopping frequencies measurement. The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss.

6.5.2 Test limit

FCC Part15.247 (a) (1) (iii)

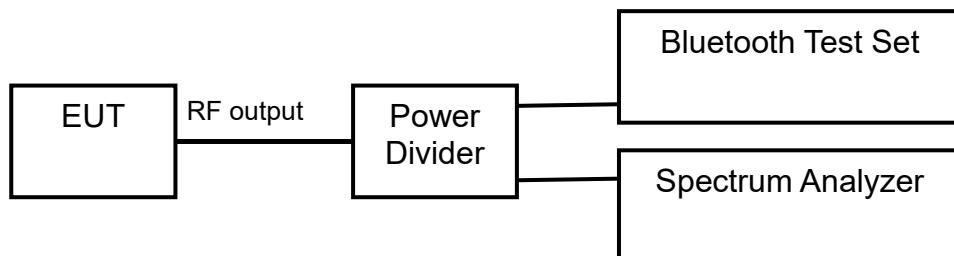
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

6.5.3 Test Settings

ANSI C63.10-2013 Section 7.8.3

1. Span = frequency of band of operation (divided into two plots)
2. RBW < 30% of channel spacing or 20dB bandwidth, whichever is smaller.
3. VBW \geq RBW
4. Sweep = auto
5. Detector = peak
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.5.4 Test Setup



6.5.5 Test result

The test results are shown in Appendix A.

6.6 Conducted out of band emission measurement

6.6.1 Test limit

FCC Part15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

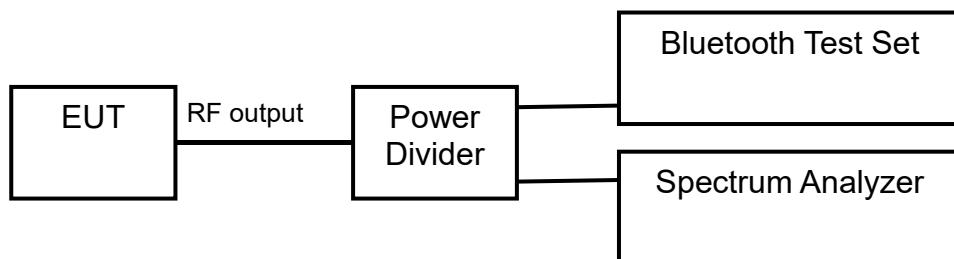
6.6.2 Test Procedure Used

ANSI C63.10-2013 – Section 7.8.8

6.6.3 Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 26GHz
2. RBW = 1MHz* (See note below)
3. VBW = 3MHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

6.6.4 Test Setup



6.6.5 Test result

The test results are shown in Appendix A .

The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

6.7 Band-edge measurement

6.7.1 Test limit

FCC Part15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

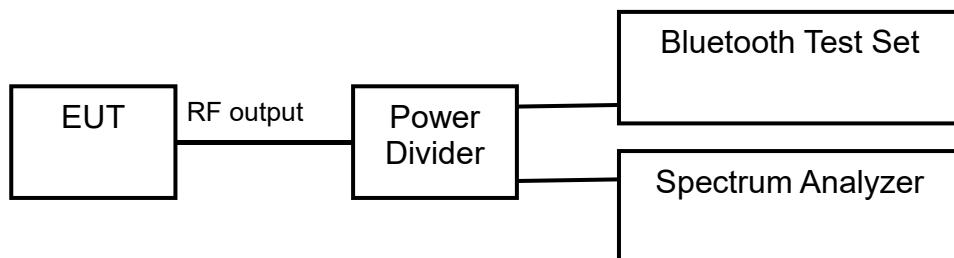
6.7.2 Test Procedure Used

ANSI C63.10-2013 – Section 6.10.4

6.7.3 Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 100kHz
4. VBW = 300kHz
5. Detector = Peak
6. Number of sweep points $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = max hold
8. Sweep time = auto couple
9. The trace was allowed to stabilize

6.7.4 Test Setup



6.7.6 Test result

The test results are shown in Appendix A.

The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

6.8 Spurious Radiated Emissions

6.8.1 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

6.8.2 Test limit

Part15.205, 15.209, 15.247(d)

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209. The spectrum shall be investigated from the lowest radio frequency signal generated in the device.

Frequency [MHz]	Field strength [μ V/m]	Measured Distance [meters]
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Radiated Limits

Part15.35(b):

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

Used conversion factor: Limit (dB μ V/m) = 20 log (Limit (μ V/m)/1 μ V/m)

Frequency [MHz]	Detector	Unit (dB μ V/m)
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

Conversion Radiated limits

6.8.3 Test Procedure Used

KDB 558074 D01 v05r02 – Section 12.2.7

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and recorded the reading with Maximum Hold Mode.

NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer complied the following setting:

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz

2. Signals below 30MHz are not recorded in the report because they are lower than the limits by more than 20dB.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground in chamber room for test. 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 height of antenna 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and recorded the reading with Maximum Hold Mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detector and recorded the reading with Maximum Hold Mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

6.8.4 Test Settings

Average Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)

Frequency	Detector
<1000MHz	Quasi-peak
>1000MHz	Peak and average

Peak Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)

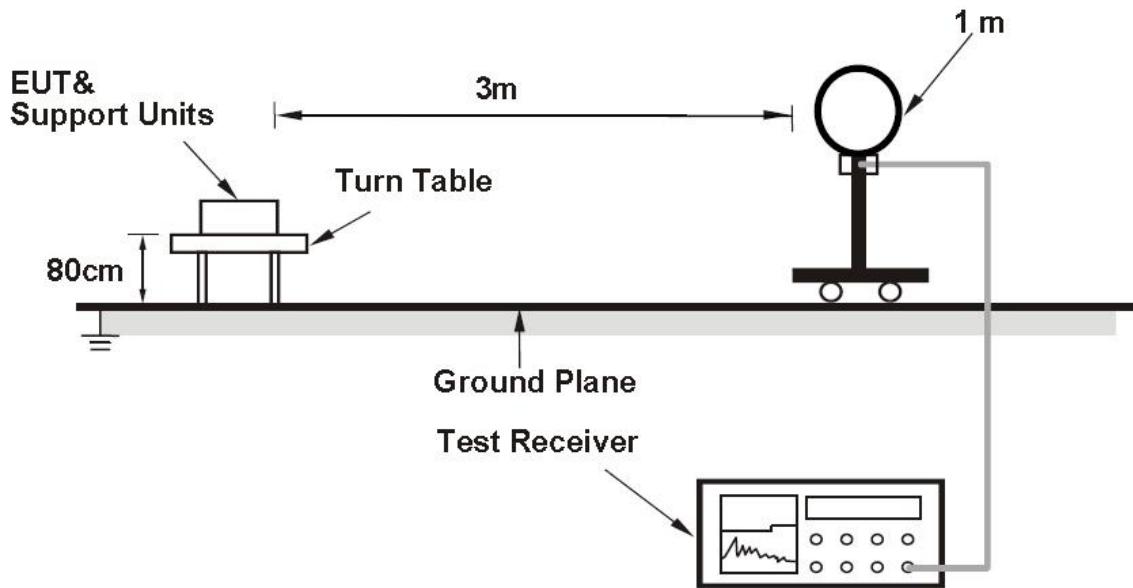
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz
30-1000MHz	100-120kHz
>1000MHz	1MHz

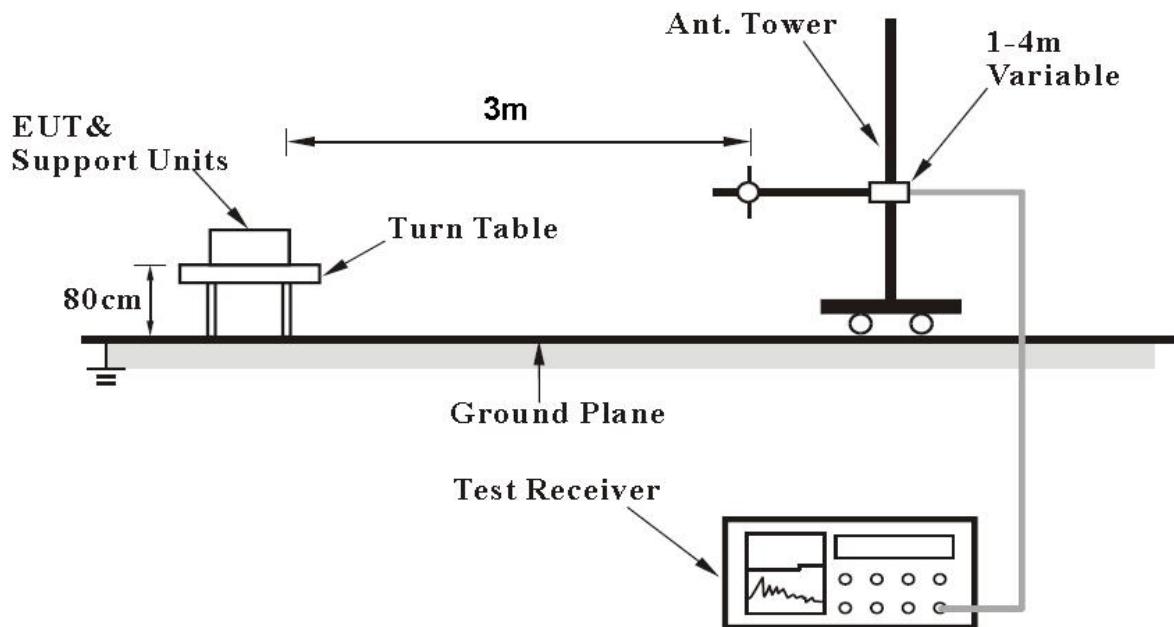
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.8.5 Test Setup

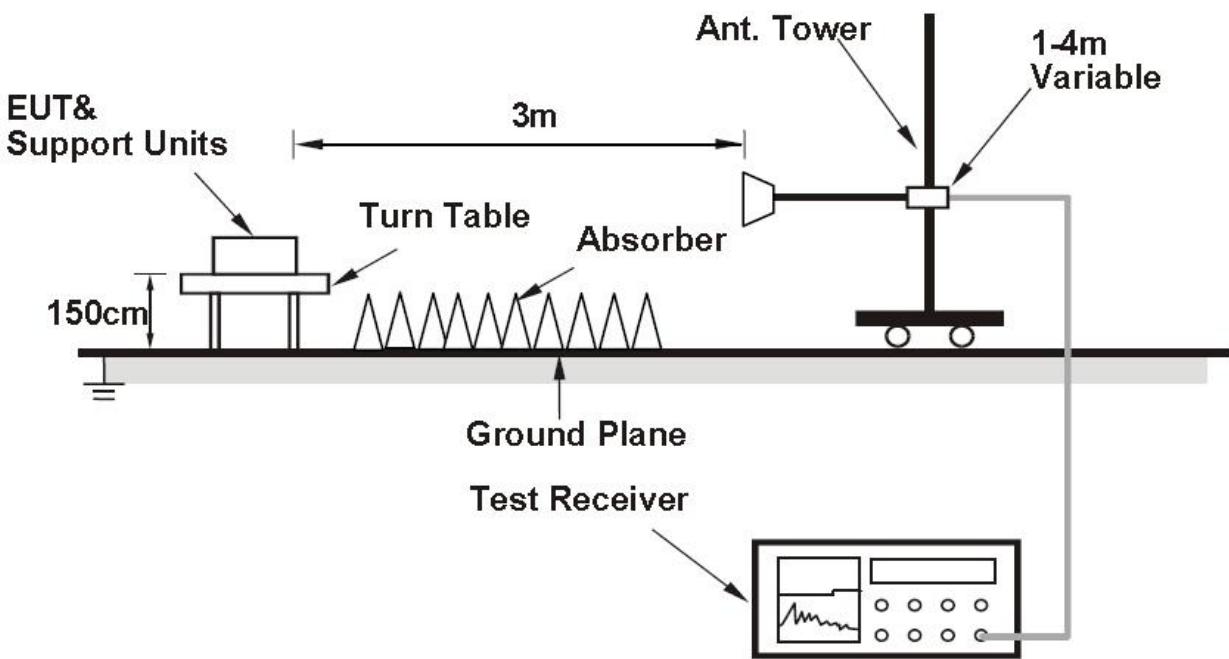
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



6.8.6 Test result

The test results are shown in Appendix B.

6.9 AC Power line Conducted Emission

6.9.1 Test limit

FCC Part15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
0.15-0.5 0.5-5 5-30	Quasi-peak	Average
	66 to 56 *	56 to 46 *
	56	46
	60	50

* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.10-2013

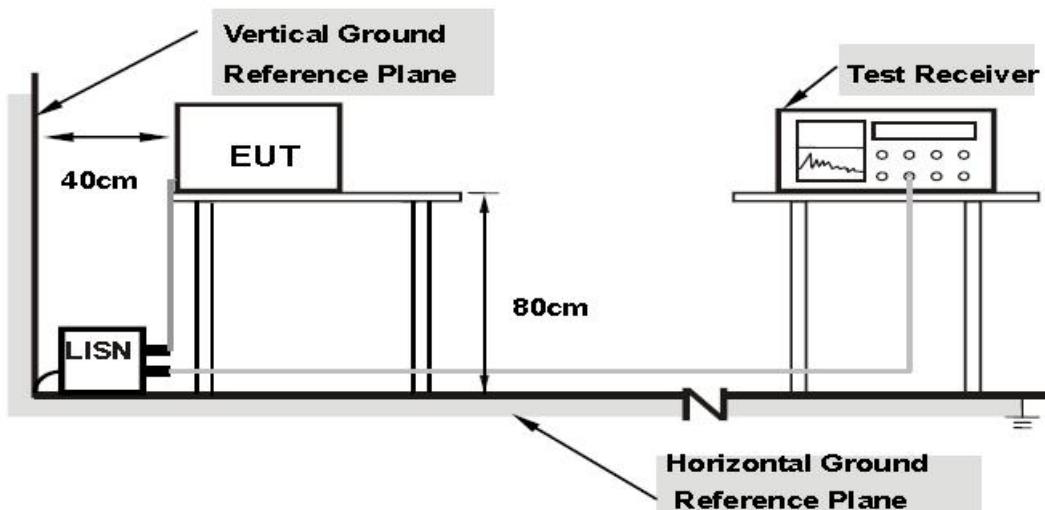
6.9.2 Test Procedures

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

The EUT shall test under the power AC120V/60Hz.

6.9.3 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.9.4 Test result

The test results are shown in Appendix B.

7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
6dB Bandwidth	3kHz	
Peak power output	0.67dB	
Band edge compliance	1.20dB	
Conducted Out of band emission measurement	30MHz~1GHz	2.83dB
	1GHz~12.75GHz	2.50dB
	12.75GHz~25GHz	2.75dB
Spurious Radiated Emissions	30MHz~200MHz	4.88dB
	200MHz~1GHz	4.87dB
	1GHz~18GHz	4.58dB
	18GHz~40GHz	4.35dB
AC Power line Conducted Emission	3.92dB	

8 TEST EQUIPMENTS

No.	Name/ Model	Manufacturer	S/N	Cal date	Cal Due date
1.	Spectrum Analyzer / FSV	ROHDE & SCHWARZ	101065	2024.06.21	2025.06.20
2.	Signal Analyzer / N9020A	Agilent	MY48010771	2024.03.06	2025.03.05
3.	Bluetooth Test Set / MT8852B	Anritsu	1329003	2024.06.21	2025.06.20
4.	Power Divider / 11667A	HP	19632	2024.06.21	2025.06.20
5.	Signal Generator / SMBV100A	R&S	260910	2024.06.21	2025.06.20
6.	Power Meter E4416A	Agilent	MY52370013	2024.03.06	2025.03.05
7.	Power Sensor E9323A	Agilent	MY52150008	2024.03.06	2025.03.05
8.	Temperature chamber / SH241	ESPEC	92013758	2024.06.21	2025.06.20
9.	Fully-Anechoic Chamber / 12.65m×8.03m×7.50m	FRANKONIA	----	----	----
10.	Semi-Anechoic/Chamber / 23.18m×16.88m×9.60m	FRANKONIA	---	----	----
11.	Turn table Diameter:1m	FRANKONIA	----	----	----
12.	Turn table Diameter:5m	FRANKONIA	----	----	----
13.	Antenna master FAC(MA4.0)	MATURO	----	----	----
14.	Antenna master SAC(MA4.0)	MATURO	----	----	----
15.	Shielding room / 9.080m×5.255m×3.525m	FRANKONIA	----	----	----
16.	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2024.06.21	2025.06.20
17.	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2024.06.21	2025.06.20
18.	Ultra log antenna / HL562	R&S	100016	2024.06.21	2025.06.20
19.	Receive antenna /3160-09	SCHWARZ-BECK	002058-002	2024.06.21	2025.06.20
20.	EMI test receiver / ESI 40	R&S	100015	2024.06.21	2025.06.20
21.	EMI test receiver / ESCS30	R&S	100029	2024.06.21	2025.06.20
22.	Receive antenna / HL562	R&S	100167	2024.06.21	2025.06.20
23.	AMN / ENV216	R&S	3560.6550.12	2024.06.21	2025.06.20
24.	WLAN AP WIA3300-20	SKSpruce	8152017060700339	---	---
25.	Notebook E470c	Lenovo	PF10UZW7	---	---
26.	Loop Antenna	R&S	100340	2023.08.21	2024.08.20
27.	FCC auto test system / RT9200BW-2	Radiosky	V2.05	/	/
28.	EMI test software / EMC32	R&S	V10.20.01	/	/

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

BT

Duty Cycle and Antenna Gain

Test Mode	Frequency (MHz)	Plot	Duty Cycle	Correction Factor(dB)	Antenna Gain(dBi)
GFSK(DH5)	2402	Fig.1	78.60%	1.05	4.50

Note: Correction Factor=10*log(1/Duty Cycle)

Test Mode	Frequency (MHz)	Plot	Duty Cycle	Correction Factor(dB)	Antenna Gain(dBi)
$\pi/4$ DQPSK(2D H5)	2402	Fig.2	78.70%	1.04	4.50

Note: Correction Factor=10*log(1/Duty Cycle)

Test Mode	Frequency (MHz)	Plot	Duty Cycle	Correction Factor(dB)	Antenna Gain(dBi)
8DPSK(3DH5)	2402	Fig.3	78.70%	1.04	4.50

Note: Correction Factor=10*log(1/Duty Cycle)

Test Mode: GFSK(DH5)

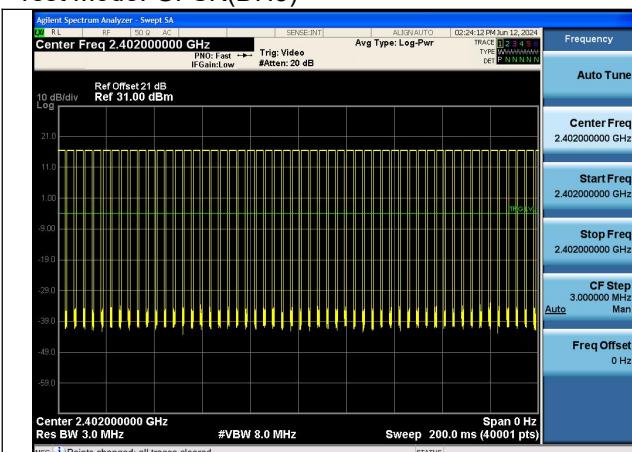


Fig 1

Test Mode: π/4DQPSK(2DH5)

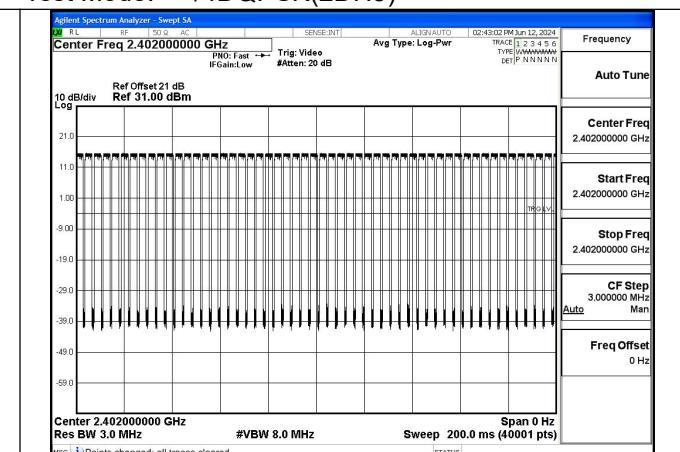


Fig 2

Test Mode: 8DPSK(3DH5)

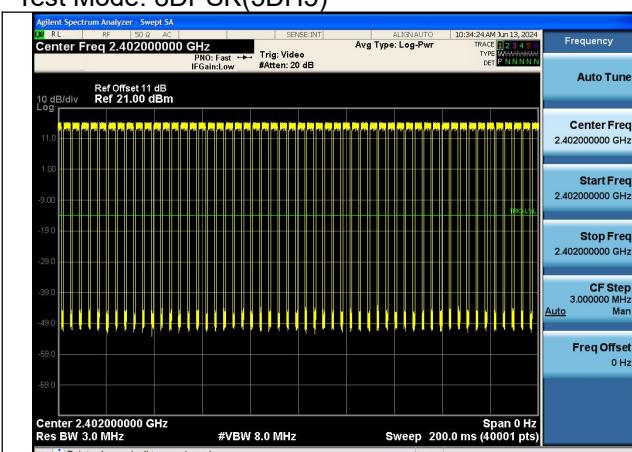


Fig. 3

EIRP

Conducted Power

Modulation type	Conducted Peak Power(dBm)		
	2402MHz	2441MHz	2480MHz
GFSK(DH5)	16.64	16.51	15.50
$\pi/4$ DQPSK(2DH5)	15.45	15.70	14.67
8DPSK(3DH5)	16.17	15.93	14.93

Modulation type	Conducted Average Power(dBm)		
	2402MHz	2441MHz	2480MHz
GFSK(DH5)	17.25	15.77	15.89
$\pi/4$ DQPSK(2DH5)	13.51	13.41	12.02
8DPSK(3DH5)	12.94	10.34	12.51

EIRP

Modulation type	Peak EIRP (dBm)		
	2402MHz	2441MHz	2480MHz
GFSK(DH5)	21.14	21.01	20.00
$\pi/4$ DQPSK(2DH5)	19.95	20.20	19.17
8DPSK(3DH5)	20.67	20.43	19.43

Modulation type	Average EIRP (dBm)		
	2402MHz	2441MHz	2480MHz
GFSK(DH5)	21.75	20.27	20.39
$\pi/4$ DQPSK(2DH5)	18.01	17.91	16.52
8DPSK(3DH5)	17.44	14.84	17.01

EIRP (dBm)=Conducted Power(dBm)+Antenna Gain(dBi)

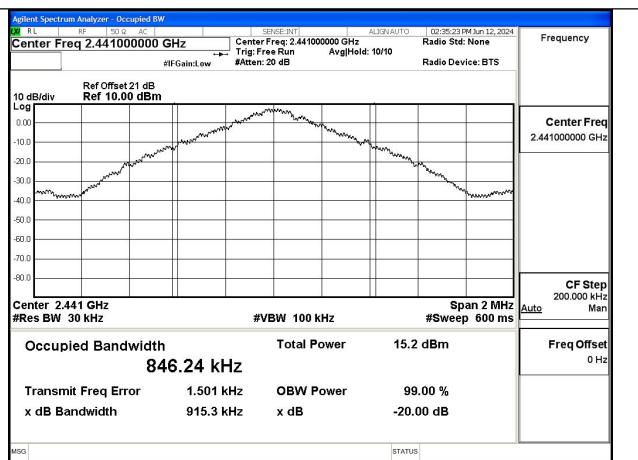
**Occupied Bandwidth
20dB Bandwidth**

Test Mode	Carrier frequency (MHz)	20dB Bandwidth(KHz)
GFSK(DH5)	2402	889.8
GFSK(DH5)	2441	915.3
GFSK(DH5)	2480	886.8

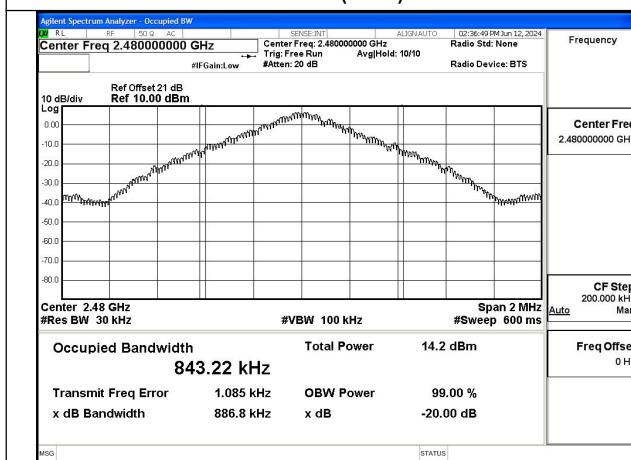
Test Mode	Carrier frequency (MHz)	20dB Bandwidth(KHz)
$\pi/4$ DQPSK(2DH5)	2402	1351.6
$\pi/4$ DQPSK(2DH5)	2441	1351.6
$\pi/4$ DQPSK(2DH5)	2480	1348.5

Test Mode	Carrier frequency (MHz)	20dB Bandwidth(KHz)
8DPSK(3DH5)	2402	1342.2
8DPSK(3DH5)	2441	1358.1
8DPSK(3DH5)	2480	1353.7

Test Mode: GFSK(DH5)



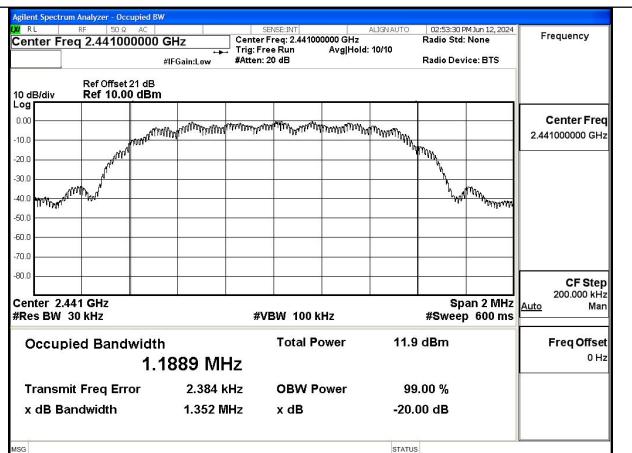
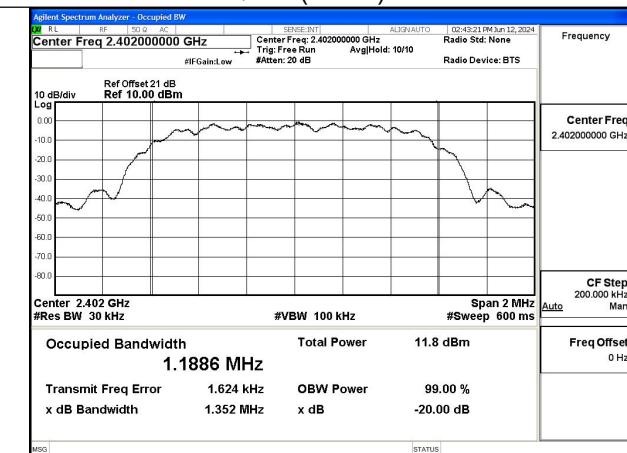
Test Mode:GFSK(DH5) 2402MHz



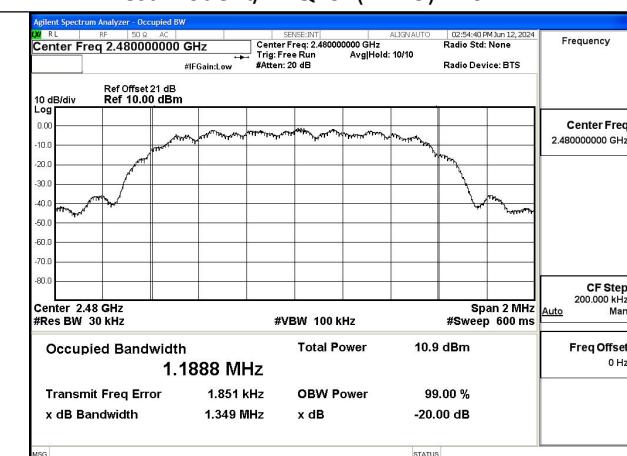
Test Mode:GFSK(DH5) 2441MHz

Test Mode:GFSK(DH5) 2480MHz

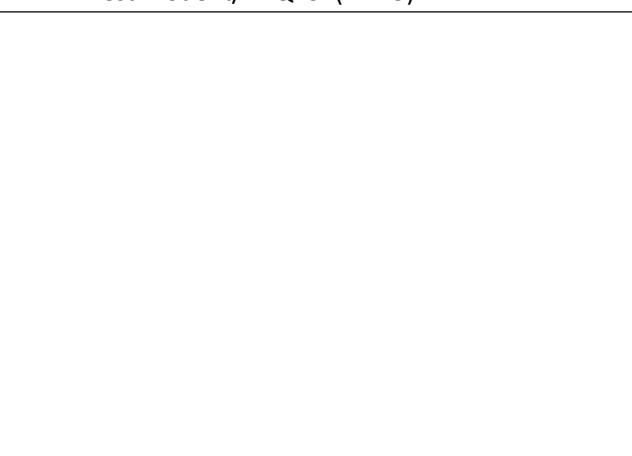
Test Mode: π /4DQPSK(2DH5)



Test Mode: π /4DQPSK(2DH5) 2402MHz

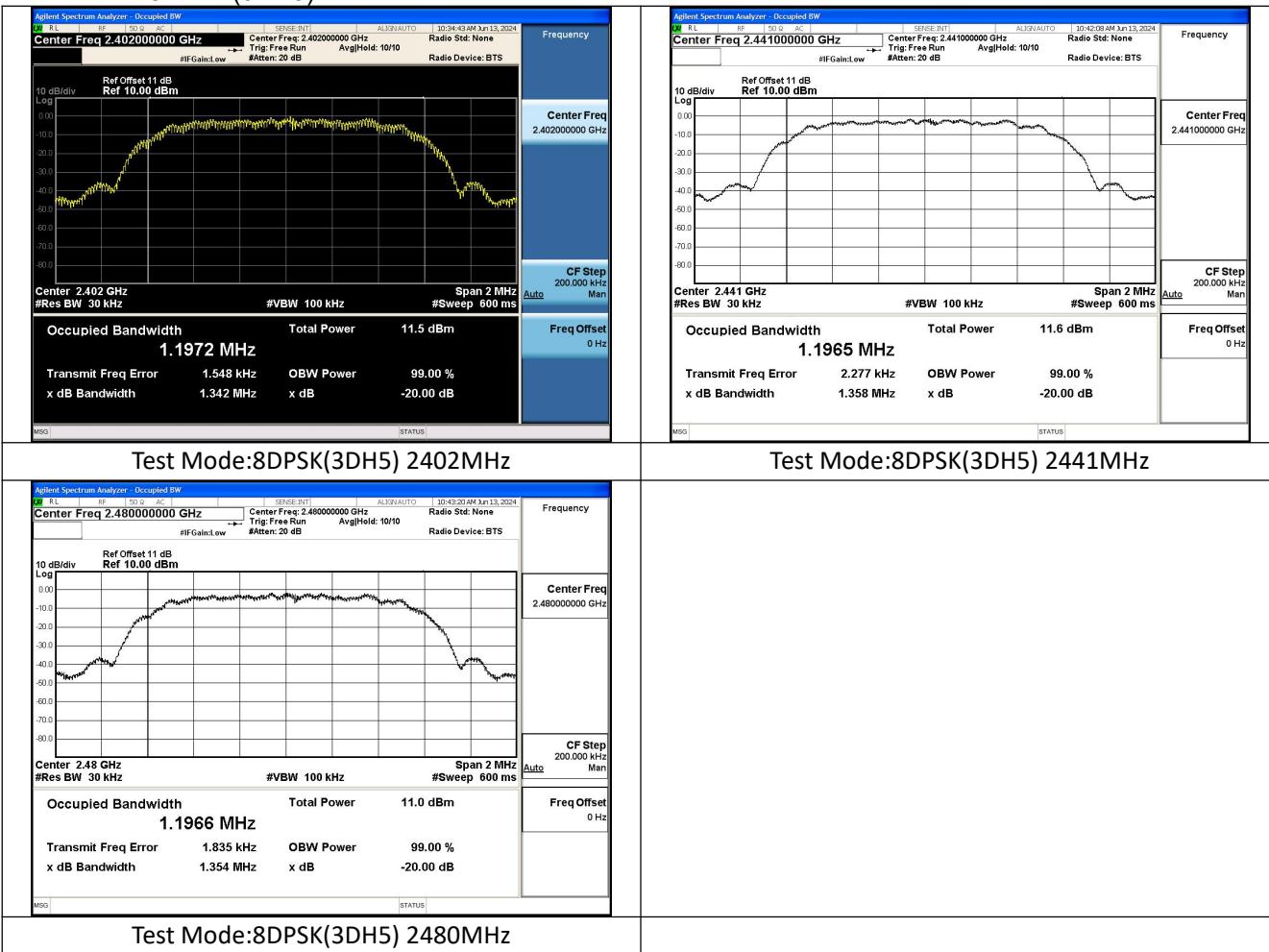


Test Mode: π /4DQPSK(2DH5) 2441MHz



Test Mode: π /4DQPSK(2DH5) 2480MHz

Test Mode: 8DPSK(3DH5)



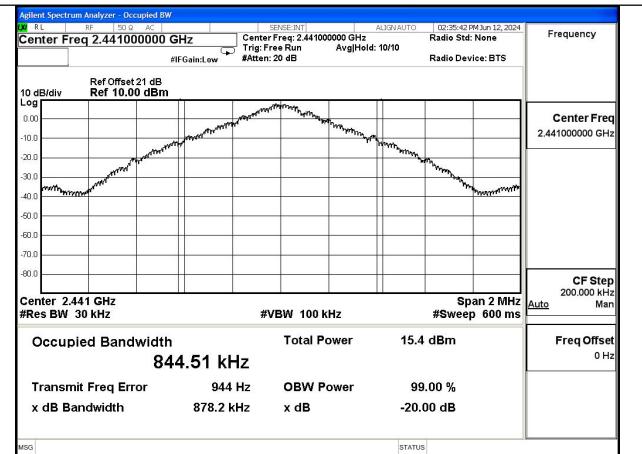
99% Bandwidth

Test Mode	Carrier frequency (MHz)	99% Bandwidth(kHz)
GFSK(DH5)	2402	842.6
GFSK(DH5)	2441	844.5
GFSK(DH5)	2480	842.7

Test Mode	Carrier frequency (MHz)	99% Bandwidth(kHz)
$\pi/4$ DQPSK(2DH5)	2402	1188.6
$\pi/4$ DQPSK(2DH5)	2441	1189.1
$\pi/4$ DQPSK(2DH5)	2480	1188.6

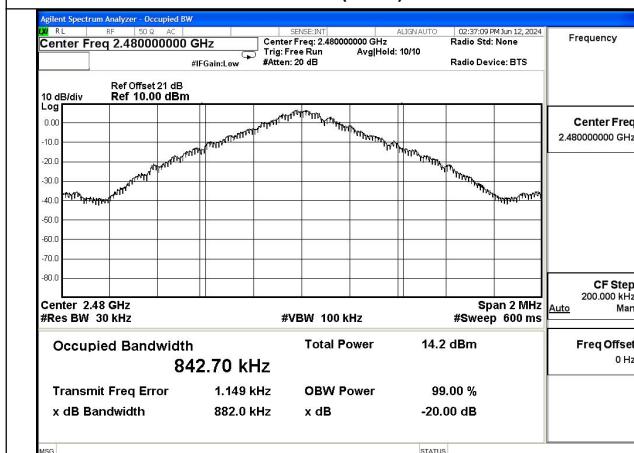
Test Mode	Carrier frequency (MHz)	99% Bandwidth(kHz)
8DPSK(3DH5)	2402	1197.4
8DPSK(3DH5)	2441	1196.9
8DPSK(3DH5)	2480	1197.0

Test Mode: GFSK(DH5)



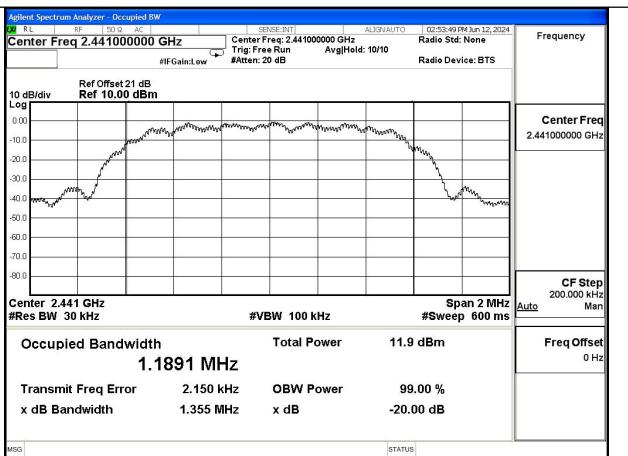
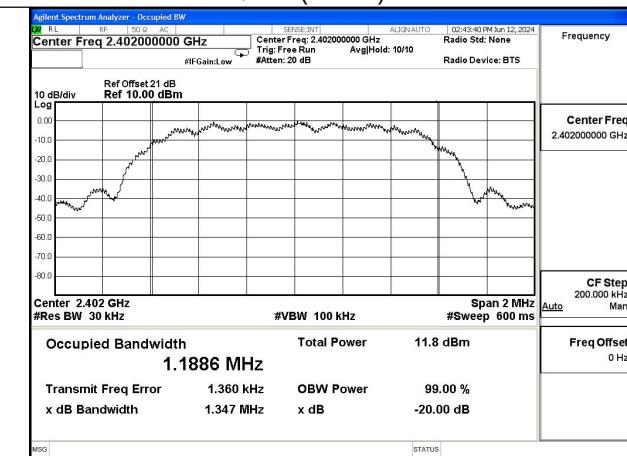
Test Mode:GFSK(DH5) 2402MHz

Test Mode:GFSK(DH5) 2441MHz

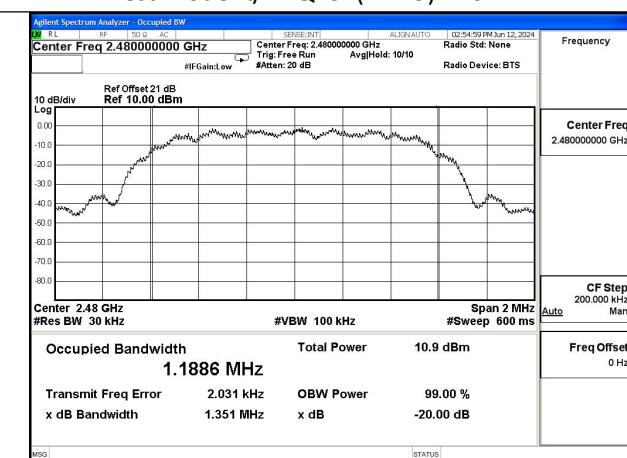


Test Mode:GFSK(DH5) 2480MHz

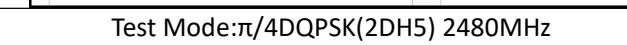
Test Mode: π /4DQPSK(2DH5)



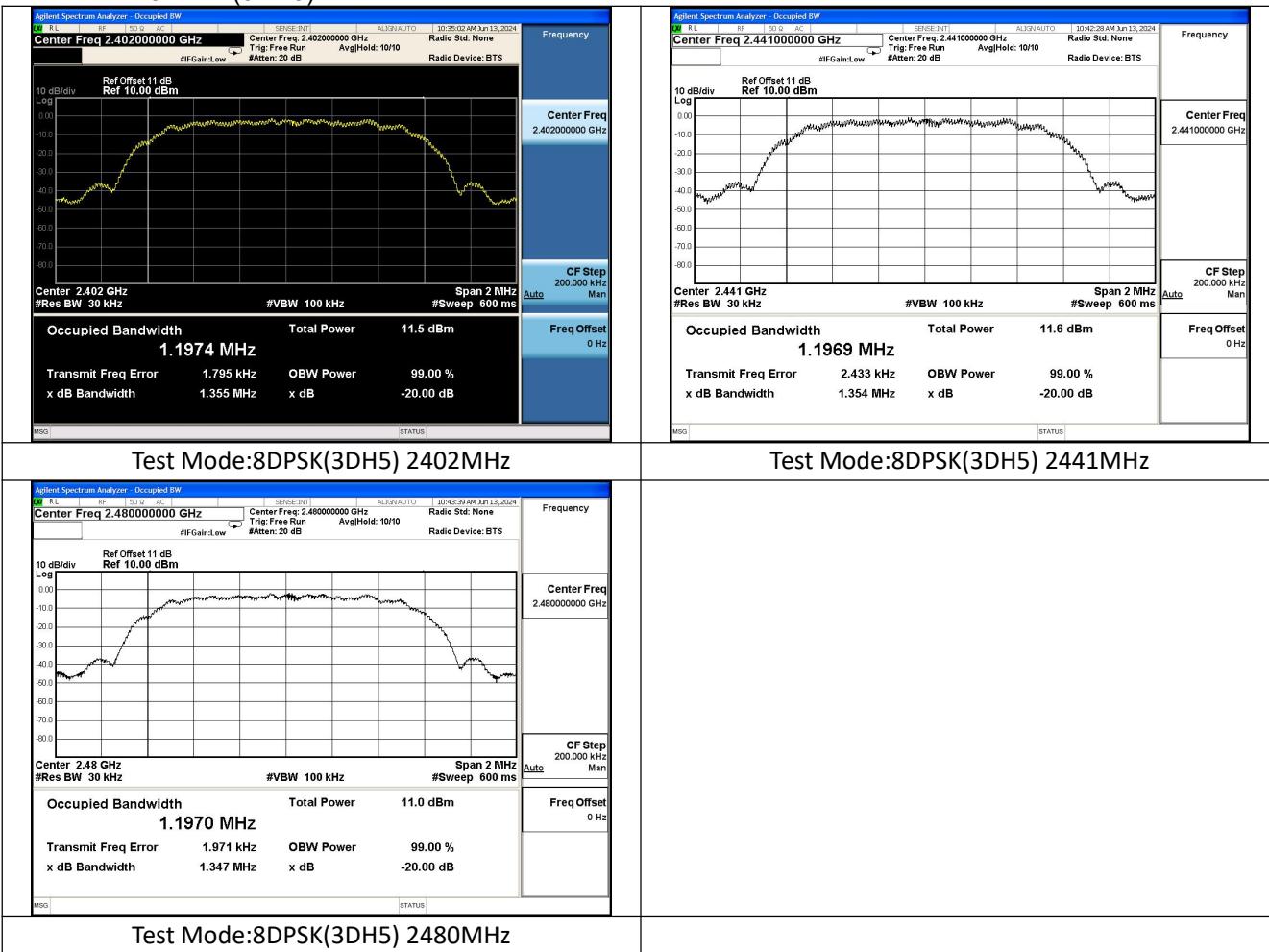
Test Mode: π /4DQPSK(2DH5) 2402MHz



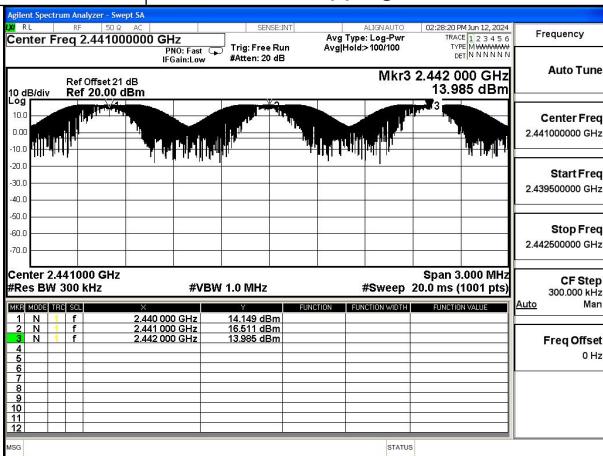
Test Mode: π /4DQPSK(2DH5) 2441MHz



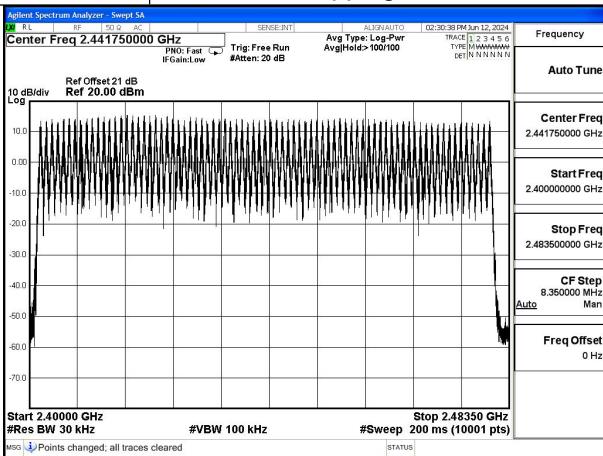
Test Mode: 8DPSK(3DH5)



**Hopping Frequency Separation
Channel separation**

Test Mode	Op-mode	Channel separation (MHz)																																																																																											
GFSK(DH5)	Hopping mode	1																																																																																											
 <table border="1"> <thead> <tr> <th>MR1 MODE</th> <th>MR1 SEQ</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>2.440 000 GHz</td><td>14.149 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>2.441 000 GHz</td><td>16.511 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>2.442 000 GHz</td><td>13.985 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</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></tr> <tr><td>8</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></tr> <tr><td>10</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></tr> <tr><td>12</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>			MR1 MODE	MR1 SEQ	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	2.440 000 GHz	14.149 dBm				2	N	2.441 000 GHz	16.511 dBm				3	N	2.442 000 GHz	13.985 dBm				4							5							6							7							8							9							10							11							12						
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Number of Hopping Frequencies

Test Mode	Op-mode	Result																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Channel separation

Test Mode	Op-mode	Channel separation (MHz)
$\pi/4$ DQPSK(2DH5)	Hopping mode	1

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441000000 GHz

PRC: Fast IF Gain: Low #Atten: 20 dB

Trig: Free Run Avg Type: Log-Pwr Avg Hold: >100/100

Trace 1, 2, 3, 4, 5, 6 Type: N, N, N, N, N, N

Ref Offset 21 dB Ref 20.00 dBm

Log

10.00 0.00 -10.00 -20.00 -30.00 -40.00 -50.00 -60.00 -70.00

Mkr3 2.442 000 GHz 10.141 dBm

Span 3.000 MHz

#Res BW 300 kHz #VBW 1.0 MHz #Sweep 20.0 ms (1001 pts)

Marker 1: 2.440 000 GHz, 10.048 dBm

Marker 2: 2.441 000 GHz, 12.592 dBm

Marker 3: 2.442 000 GHz, 10.141 dBm

Marker 4: 2.443 000 GHz, 10.048 dBm

Marker 5: 2.444 000 GHz, 12.592 dBm

Marker 6: 2.445 000 GHz, 10.141 dBm

Marker 7: 2.446 000 GHz, 10.048 dBm

Marker 8: 2.447 000 GHz, 12.592 dBm

Marker 9: 2.448 000 GHz, 10.141 dBm

Marker 10: 2.449 000 GHz, 10.048 dBm

Marker 11: 2.450 000 GHz, 12.592 dBm

Marker 12: 2.451 000 GHz, 10.141 dBm

Marker 13: 2.452 000 GHz, 10.048 dBm

Marker 14: 2.453 000 GHz, 12.592 dBm

Marker 15: 2.454 000 GHz, 10.141 dBm

Marker 16: 2.455 000 GHz, 10.048 dBm

Marker 17: 2.456 000 GHz, 12.592 dBm

Marker 18: 2.457 000 GHz, 10.141 dBm

Marker 19: 2.458 000 GHz, 10.048 dBm

Marker 20: 2.459 000 GHz, 12.592 dBm

Marker 21: 2.460 000 GHz, 10.141 dBm

Marker 22: 2.461 000 GHz, 10.048 dBm

Marker 23: 2.462 000 GHz, 12.592 dBm

Marker 24: 2.463 000 GHz, 10.141 dBm

Marker 25: 2.464 000 GHz, 10.048 dBm

Marker 26: 2.465 000 GHz, 12.592 dBm

Marker 27: 2.466 000 GHz, 10.141 dBm

Marker 28: 2.467 000 GHz, 10.048 dBm

Marker 29: 2.468 000 GHz, 12.592 dBm

Marker 30: 2.469 000 GHz, 10.141 dBm

Marker 31: 2.470 000 GHz, 10.048 dBm

Marker 32: 2.471 000 GHz, 12.592 dBm

Marker 33: 2.472 000 GHz, 10.141 dBm

Marker 34: 2.473 000 GHz, 10.048 dBm

Marker 35: 2.474 000 GHz, 12.592 dBm

Marker 36: 2.475 000 GHz, 10.141 dBm

Marker 37: 2.476 000 GHz, 10.048 dBm

Marker 38: 2.477 000 GHz, 12.592 dBm

Marker 39: 2.478 000 GHz, 10.141 dBm

Marker 40: 2.479 000 GHz, 10.048 dBm

Marker 41: 2.480 000 GHz, 12.592 dBm

Marker 42: 2.481 000 GHz, 10.141 dBm

Marker 43: 2.482 000 GHz, 10.048 dBm

Marker 44: 2.483 000 GHz, 12.592 dBm

Marker 45: 2.484 000 GHz, 10.141 dBm

Marker 46: 2.485 000 GHz, 10.048 dBm

Marker 47: 2.486 000 GHz, 12.592 dBm

Marker 48: 2.487 000 GHz, 10.141 dBm

Marker 49: 2.488 000 GHz, 10.048 dBm

Marker 50: 2.489 000 GHz, 12.592 dBm

Marker 51: 2.490 000 GHz, 10.141 dBm

Marker 52: 2.491 000 GHz, 10.048 dBm

Marker 53: 2.492 000 GHz, 12.592 dBm

Marker 54: 2.493 000 GHz, 10.141 dBm

Marker 55: 2.494 000 GHz, 10.048 dBm

Marker 56: 2.495 000 GHz, 12.592 dBm

Marker 57: 2.496 000 GHz, 10.141 dBm

Marker 58: 2.497 000 GHz, 10.048 dBm

Marker 59: 2.498 000 GHz, 12.592 dBm

Marker 60: 2.499 000 GHz, 10.141 dBm

Marker 61: 2.500 000 GHz, 10.048 dBm

Marker 62: 2.501 000 GHz, 12.592 dBm

Marker 63: 2.502 000 GHz, 10.141 dBm

Marker 64: 2.503 000 GHz, 10.048 dBm

Marker 65: 2.504 000 GHz, 12.592 dBm

Marker 66: 2.505 000 GHz, 10.141 dBm

Marker 67: 2.506 000 GHz, 10.048 dBm

Marker 68: 2.507 000 GHz, 12.592 dBm

Marker 69: 2.508 000 GHz, 10.141 dBm

Marker 70: 2.509 000 GHz, 10.048 dBm

Marker 71: 2.510 000 GHz, 12.592 dBm

Marker 72: 2.511 000 GHz, 10.141 dBm

Marker 73: 2.512 000 GHz, 10.048 dBm

Marker 74: 2.513 000 GHz, 12.592 dBm

Marker 75: 2.514 000 GHz, 10.141 dBm

Marker 76: 2.515 000 GHz, 10.048 dBm

Marker 77: 2.516 000 GHz, 12.592 dBm

Marker 78: 2.517 000 GHz, 10.141 dBm

Marker 79: 2.518 000 GHz, 10.048 dBm

Marker 80: 2.519 000 GHz, 12.592 dBm

Marker 81: 2.520 000 GHz, 10.141 dBm

Marker 82: 2.521 000 GHz, 10.048 dBm

Marker 83: 2.522 000 GHz, 12.592 dBm

Marker 84: 2.523 000 GHz, 10.141 dBm

Marker 85: 2.524 000 GHz, 10.048 dBm

Marker 86: 2.525 000 GHz, 12.592 dBm

Marker 87: 2.526 000 GHz, 10.141 dBm

Marker 88: 2.527 000 GHz, 10.048 dBm

Marker 89: 2.528 000 GHz, 12.592 dBm

Marker 90: 2.529 000 GHz, 10.141 dBm

Marker 91: 2.530 000 GHz, 10.048 dBm

Marker 92: 2.531 000 GHz, 12.592 dBm

Marker 93: 2.532 000 GHz, 10.141 dBm

Marker 94: 2.533 000 GHz, 10.048 dBm

Marker 95: 2.534 000 GHz, 12.592 dBm

Marker 96: 2.535 000 GHz, 10.141 dBm

Marker 97: 2.536 000 GHz, 10.048 dBm

Marker 98: 2.537 000 GHz, 12.592 dBm

Marker 99: 2.538 000 GHz, 10.141 dBm

Marker 100: 2.539 000 GHz, 10.048 dBm

Marker 101: 2.540 000 GHz, 12.592 dBm

Marker 102: 2.541 000 GHz, 10.141 dBm

Marker 103: 2.542 000 GHz, 10.048 dBm

Marker 104: 2.543 000 GHz, 12.592 dBm

Marker 105: 2.544 000 GHz, 10.141 dBm

Marker 106: 2.545 000 GHz, 10.048 dBm

Marker 107: 2.546 000 GHz, 12.592 dBm

Marker 108: 2.547 000 GHz, 10.141 dBm

Marker 109: 2.548 000 GHz, 10.048 dBm

Marker 110: 2.549 000 GHz, 12.592 dBm

Marker 111: 2.550 000 GHz, 10.141 dBm

Marker 112: 2.551 000 GHz, 10.048 dBm

Marker 113: 2.552 000 GHz, 12.592 dBm

Marker 114: 2.553 000 GHz, 10.141 dBm

Marker 115: 2.554 000 GHz, 10.048 dBm

Marker 116: 2.555 000 GHz, 12.592 dBm

Marker 117: 2.556 000 GHz, 10.141 dBm

Marker 118: 2.557 000 GHz, 10.048 dBm

Marker 119: 2.558 000 GHz, 12.592 dBm

Marker 120: 2.559 000 GHz, 10.141 dBm

Marker 121: 2.560 000 GHz, 10.048 dBm

Marker 122: 2.561 000 GHz, 12.592 dBm

Marker 123: 2.562 000 GHz, 10.141 dBm

Marker 124: 2.563 000 GHz, 10.048 dBm

Marker 125: 2.564 000 GHz, 12.592 dBm

Marker 126: 2.565 000 GHz, 10.141 dBm

Marker 127: 2.566 000 GHz, 10.048 dBm

Marker 128: 2.567 000 GHz, 12.592 dBm

Marker 129: 2.568 000 GHz, 10.141 dBm

Marker 130: 2.569 000 GHz, 10.048 dBm

Marker 131: 2.570 000 GHz, 12.592 dBm

Marker 132: 2.571 000 GHz, 10.141 dBm

Marker 133: 2.572 000 GHz, 10.048 dBm

Marker 134: 2.573 000 GHz, 12.592 dBm

Marker 135: 2.574 000 GHz, 10.141 dBm

Marker 136: 2.575 000 GHz, 10.048 dBm

Marker 137: 2.576 000 GHz, 12.592 dBm

Marker 138: 2.577 000 GHz, 10.141 dBm

Marker 139: 2.578 000 GHz, 10.048 dBm

Marker 140: 2.579 000 GHz, 12.592 dBm

Marker 141: 2.580 000 GHz, 10.141 dBm

Marker 142: 2.581 000 GHz, 10.048 dBm

Marker 143: 2.582 000 GHz, 12.592 dBm

Marker 144: 2.583 000 GHz, 10.141 dBm

Marker 145: 2.584 000 GHz, 10.048 dBm

Marker 146: 2.585 000 GHz, 12.592 dBm

Marker 147: 2.586 000 GHz, 10.141 dBm

Marker 148: 2.587 000 GHz, 10.048 dBm

Marker 149: 2.588 000 GHz, 12.592 dBm

Marker 150: 2.589 000 GHz, 10.141 dBm

Marker 151: 2.590 000 GHz, 10.048 dBm

Marker 152: 2.591 000 GHz, 12.592 dBm

Marker 153: 2.592 000 GHz, 10.141 dBm

Marker 154: 2.593 000 GHz, 10.048 dBm

Marker 155: 2.594 000 GHz, 12.592 dBm

Marker 156: 2.595 000 GHz, 10.141 dBm

Marker 157: 2.596 000 GHz, 10.048 dBm

Marker 158: 2.597 000 GHz, 12.592 dBm

Marker 159: 2.598 000 GHz, 10.141 dBm

Marker 160: 2.599 000 GHz, 10.048 dBm

Marker 161: 2.600 000 GHz, 12.592 dBm

Marker 162: 2.601 000 GHz, 10.141 dBm

Marker 163: 2.602 000 GHz, 10.048 dBm

Marker 164: 2.603 000 GHz, 12.592 dBm

Marker 165: 2.604 000 GHz, 10.141 dBm

Marker 166: 2.605 000 GHz, 10.048 dBm

Marker 167: 2.606 000 GHz, 12.592 dBm

Marker 168: 2.607 000 GHz, 10.141 dBm

Marker 169: 2.608 000 GHz, 10.048 dBm

Marker 170: 2.609 000 GHz, 12.592 dBm

Marker 171: 2.610 000 GHz, 10.141 dBm

Marker 172: 2.611 000 GHz, 10.048 dBm

Marker 173: 2.612 000 GHz, 12.592 dBm

Marker 174: 2.613 000 GHz, 10.141 dBm

Marker 175: 2.614 000 GHz, 10.048 dBm

Marker 176: 2.615 000 GHz, 12.592 dBm

Marker 177: 2.616 000 GHz, 10.141 dBm

Marker 178: 2.617 000 GHz, 10.048 dBm

Marker 179: 2.618 000 GHz, 12.592 dBm

Marker 180: 2.619 000 GHz, 10.141 dBm

Marker 181: 2.620 000 GHz, 10.048 dBm

Marker 182: 2.621 000 GHz, 12.592 dBm

Marker 183: 2.622 000 GHz, 10.141 dBm

Marker 184: 2.623 000 GHz, 10.048 dBm

Marker 185: 2.624 000 GHz, 12.592 dBm

Marker 186: 2.625 000 GHz, 10.141 dBm

Marker 187: 2.626 000 GHz, 10.048 dBm

Marker 188: 2.627 000 GHz, 12.592 dBm

Marker 189: 2.628 000 GHz, 10.141 dBm

Marker 190: 2.629 000 GHz, 10.048 dBm

Marker 191: 2.630 000 GHz, 12.592 dBm

Marker 192: 2.631 000 GHz, 10.141 dBm

Marker 193: 2.632 000 GHz, 10.048 dBm

Marker 194: 2.633 000 GHz, 12.592 dBm

Marker 195: 2.634 000 GHz, 10.141 dBm

Marker 196: 2.635 000 GHz, 10.048 dBm

Marker 197: 2.636 000 GHz, 12.592 dBm

Marker 198: 2.637 000 GHz, 10.141 dBm

Marker 199: 2.638 000 GHz, 10.048 dBm

Marker 200: 2.639 000 GHz, 12.592 dBm

Marker 201: 2.640 000 GHz, 10.141 dBm

Marker 202: 2.641 000 GHz, 10.048 dBm

Marker 203: 2.642 000 GHz, 12.592 dBm

Marker 204: 2.643 000 GHz, 10.141 dBm

Marker 205: 2.644 000 GHz, 10.048 dBm

Marker 206: 2.645 000 GHz, 12.592 dBm

Marker 207: 2.646 000 GHz, 10.141 dBm

Marker 208: 2.647 000 GHz, 10.048 dBm

Marker 209: 2.648 000 GHz, 12.592 dBm

Marker 210: 2.649 000 GHz, 10.141 dBm

Marker 211: 2.650 000 GHz, 10.048 dBm

Marker 212: 2.651 000 GHz, 12.592 dBm

Marker 213: 2.652 000 GHz, 10.141 dBm

Marker 214: 2.653 000 GHz, 10.048 dBm

Marker 215: 2.654 000 GHz, 12.592 dBm

Marker 216: 2.655 000 GHz, 10.141 dBm

Marker 217: 2.656 000 GHz, 10.048 dBm

Marker 218: 2.657 000 GHz, 12.592 dBm

Marker 219: 2.658 000 GHz, 10.141 dBm

Marker 220: 2.659 000 GHz, 10.048 dBm

Marker 221: 2.660 000 GHz, 12.592 dBm

Marker 222: 2.661 000 GHz, 10.141 dBm

Marker 223: 2.662 000 GHz, 10.048 dBm

Marker 224: 2.663 000 GHz, 12.592 dBm

Marker 225: 2.664 000 GHz, 10.141 dBm

Marker 226: 2.665 000 GHz, 10.048 dBm

Marker 227: 2.666 000 GHz, 12.592 dBm

Marker 228: 2.667 000 GHz, 10.141 dBm

Marker 229: 2.668 000 GHz, 10.048 dBm

Marker 230: 2.669 000 GHz, 12.592 dBm

Marker 231: 2.670 000 GHz, 10.141 dBm

Marker 232: 2.671 000 GHz, 10.048 dBm

Marker 233: 2.672 000 GHz, 12.592 dBm

Marker 234: 2.673 000 GHz, 10.141 dBm

Marker 235: 2.674 000 GHz, 10.048 dBm

Marker 236: 2.675 000 GHz, 12.592 dBm

Marker 237: 2.676 000 GHz, 10.141 dBm

Marker 238: 2.677 000 GHz, 10.048 dBm

Marker 239: 2.678 000 GHz, 12.592 dBm

Marker 240: 2.679 000 GHz, 10.141 dBm

Marker 241: 2.680 000 GHz, 10.048 dBm

Marker 242: 2.681 000 GHz, 12.592 dBm

Marker 243: 2.682 000 GHz, 10.141 dBm

Marker 244: 2.683 000 GHz, 10.048 dBm

Marker 245: 2.684 000 GHz, 12.592 dBm

Marker 246: 2.685 000 GHz, 10.141 dBm

Marker 247: 2.686 000 GHz, 10.048 dBm

Marker 248: 2.687 000 GHz, 12.592 dBm

Marker 249: 2.688 000 GHz, 10.141 dBm

Marker 250: 2.689 000 GHz, 10.048 dBm

Marker 251: 2.690 000 GHz, 12.592 dBm

Marker 252: 2.691 000 GHz, 10.141 dBm

Marker 253: 2.692 000 GHz, 10.048 dBm

Marker 254: 2.693 000 GHz, 12.592 dBm

Marker 255: 2.694 000 GHz, 10.141 dBm

Marker 256: 2.695 000 GHz, 10.048 dBm

Marker 257: 2.696 000 GHz, 12.592 dBm

Marker 258: 2.697 000 GHz, 10.141 dBm

Marker 259: 2.698 000 GHz, 10.048 dBm

Marker 260: 2.699 000 GHz, 12.592 dBm

Marker 261: 2.700 000 GHz, 10.141 dBm

Marker 262: 2.701 000 GHz, 10.048 dBm

Marker 263: 2.702 000 GHz, 12.592 dBm

Marker 264: 2.703 000 GHz, 10.141 dBm

Marker 265: 2.704 000 GHz, 10.048 dBm

Marker 266: 2.705 000 GHz, 12.592 dBm

Marker 267: 2.706 000 GHz, 10.141 dBm

Marker 268: 2.707 000 GHz, 10.048 dBm

Marker 269: 2.708 000 GHz, 12.592 dBm

Marker 270: 2.709 000 GHz, 10.141 dBm

Marker 271: 2.710 000 GHz, 10.048 dBm

Marker 272: 2.711 000 GHz, 12.592 dBm

Marker 273: 2.712 000 GHz, 10.141 dBm

Marker 274: 2.713 000 GHz, 10.048 dBm

Marker 275: 2.714 000 GHz, 12.592 dBm

Marker 276: 2.715 000 GHz, 10.141 dBm

Marker 277: 2.716 000 GHz, 10.048 dBm

Marker 278: 2.717 000 GHz, 12.592 dBm

Marker 279: 2.718 000 GHz, 10.141 dBm

Marker 280: 2.719 000 GHz, 10.048 dBm

Marker 281: 2.720 000 GHz, 12.592 dBm

Marker 282: 2.721 000 GHz, 10.141 dBm

Marker 283: 2.722 000 GHz, 10.048 dBm

Marker 284: 2.723 000 GHz, 12.592 dBm

Marker 285: 2.724 000 GHz, 10.141 dBm

Marker 286: 2.725 000 GHz, 10.048 dBm

Marker 287: 2.726 000 GHz, 12.592 dBm

Marker 288: 2.727 000 GHz, 10.141 dBm

Marker 289: 2.728 000 GHz, 10.048 dBm

Marker 290: 2.729 000 GHz, 12.592 dBm

Marker 291: 2.730 000 GHz, 10.141 dBm

Marker 292: 2.731 000 GHz, 10.048 dBm

Marker 293: 2.732 000 GHz, 12.592 dBm

Marker 294: 2.733 000 GHz, 10.141 dBm

Marker 295: 2.734 000 GHz, 10.048 dBm

Marker 296: 2.735 000 GHz, 12.592 dBm

Marker 297: 2.736 000 GHz, 10.141 dBm

Marker 298: 2.737 000 GHz, 10.048 dBm

Marker 299: 2.738 000 GHz, 12.592 dBm

Marker 300: 2.739 000 GHz, 10.141 dBm

Marker 301: 2.740 000 GHz, 10.048 dBm

Marker 302: 2.741 000 GHz, 12.592 dBm

Marker 303: 2.742 000 GHz, 10.141 dBm

Marker 304: 2.743 000 GHz, 10.048 dBm

Marker 305: 2.744 000 GHz, 12.592 dBm

Marker 306: 2.745 000 GHz, 10.141 dBm

Marker 307: 2.746 000 GHz, 10.048 dBm

Marker 308: 2.747 000 GHz, 12.592 dBm

Marker 309: 2.748 000 GHz, 10.141 dBm

Marker 310: 2.749 000 GHz, 10.048 dBm

Marker 311: 2.750 000 GHz, 12.592 dBm

Marker 312: 2.751 000 GHz, 10.141 dBm

Marker 313: 2.752 000 GHz, 10.048 dBm

Marker 314: 2.753 000 GHz, 12.592 dBm

Marker 315: 2.754 000 GHz, 10.141 dBm

Marker 316: 2.755 000 GHz, 10.048 dBm

Marker 317: 2.756 000 GHz, 12.592 dBm

Marker 318: 2.757 000 GHz, 10.141 dBm

Marker 319: 2.758 000 GHz, 10.048 dBm

Marker 320: 2.759 000 GHz, 12.592 dBm

Marker 321: 2.760 000 GHz, 10.141 dBm

Marker 322: 2.761 000 GHz, 10.048 dBm

Marker 323: 2.762 000 GHz, 12.592 dBm

Marker 324: 2.763 000 GHz, 10.141 dBm

Marker 325: 2.764 000 GHz, 10.048 dBm

Marker 326: 2.765 000 GHz, 12.592 dBm

Marker 327: 2.766 000 GHz, 10.141 dBm

Marker 328: 2.767 000 GHz, 10.048 dBm

Marker 329: 2.768 000 GHz, 12.592 dBm

Marker 330: 2.769 000 GHz, 10.141 dBm

Marker 331: 2.770 000 GHz, 10.048 dBm

Marker 332: 2.771 0

Channel separation

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.441000000 GHz

Ref Offset 11 dB

Ref 20.00 dBm

10 dB/div

IFGain:Low

PO: Fast

Trig: Free Run

#Aften: 20 dB

Avg Type: Log-Pwr

AvgHold: 100/100

ALIGNAUTO

TRACE 1 2 3 4 5 6

TIME 1 2 3 4 5 6

DEFIN N N N N N N

Mkr3 2.442 000 GHz 10.193 dBm

Mkr2 2.441 000 GHz 5.149 dBm

Mkr1 2.441 000 GHz 13.438 dBm

Y2

Y3

Y4

Y5

Y6

Y7

Y8

Y9

Y10

Y11

Y12

Y13

Y14

Y15

Y16

Y17

Y18

Y19

Y20

Y21

Y22

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Y1301

Y1302

Y1303

Y1304

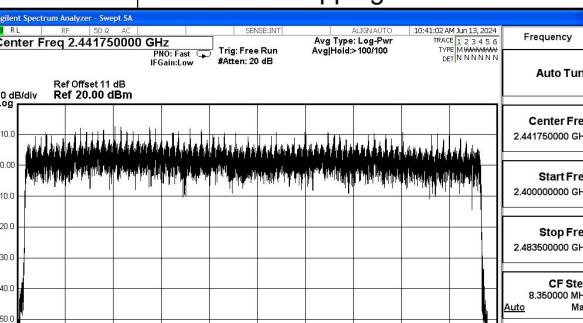
Y1305

Y1306

Y1307

Y13

Number of Hopping Frequencies

Test Mode	Op-mode	Result
8DPSK(3DH5)	Hopping mode	79
 Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz IPN: Fast Trig: Free Run #Atten: 20 dB Avg Type: Log-Pwr AvgHold>100/100 TRACE 1 2 3 4 5 6 TYPE: Spectrum REF IN N N N N Frequency Auto Tune Center Freq 2.441750000 GHz Start Freq 2.400000000 GHz Stop Freq 2.483500000 GHz CF Step 8.350000 MHz Auto Man Freq Offset 0 Hz		

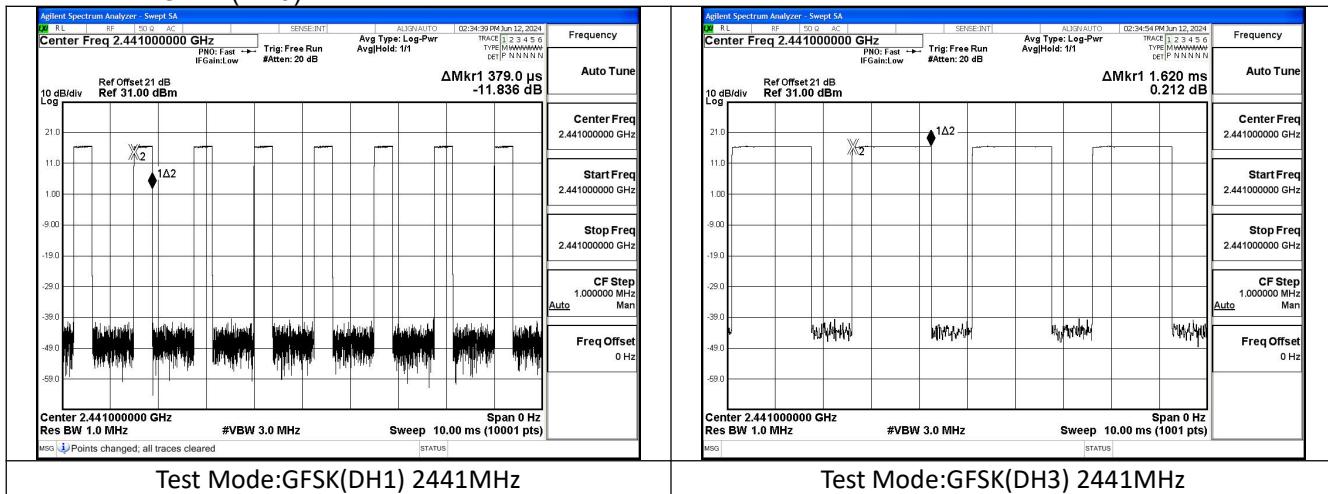
Dwell Time

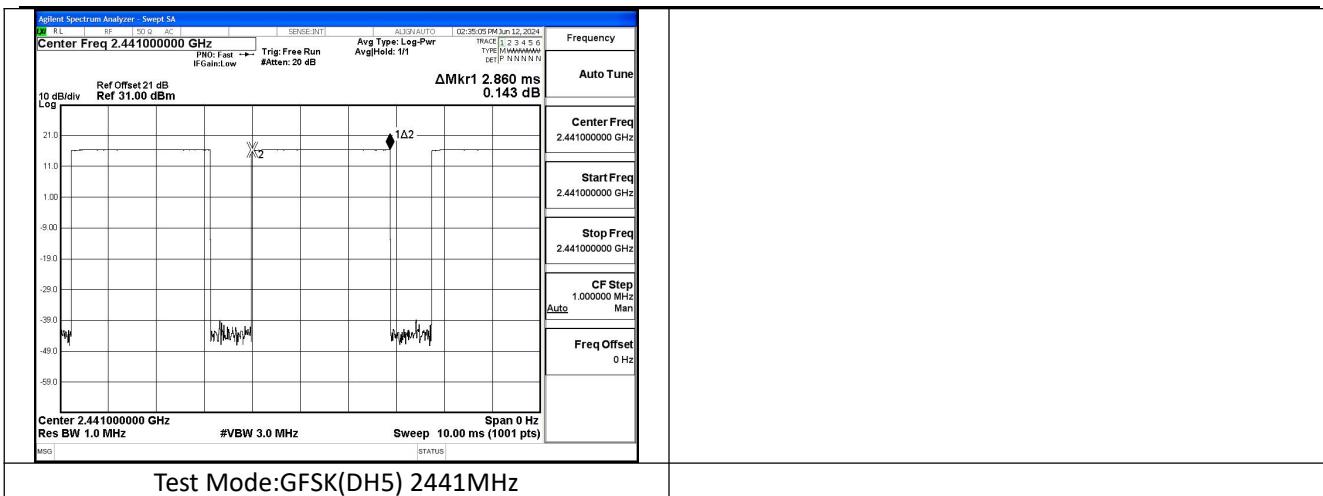
Test Mode	Packet type	Time slot length(μs)	Dwell time	Dwell time(ms)
GFSK(DH1)	DH1	379	Time slot length *31.6*16000/2/79	121.3
GFSK(DH3)	DH3	1620	Time slot length *31.6*16000/4/79	259.2
GFSK(DH5)	DH5	2860	Time slot length *31.6*16000/6/79	305.1

Test Mode	Packet type	Time slot length(μs)	Dwell time	Dwell time(ms)
π/4DQPSK(2DH1)	2DH1	384	Time slot length *31.6*16000/2/79	122.9
π/4DQPSK(2DH3)	2DH3	1620	Time slot length *31.6*16000/4/79	259.2
π/4DQPSK(2DH5)	2DH5	2850	Time slot length *31.6*16000/6/79	304.0

Test Mode	Packet type	Time slot length(μs)	Dwell time	Dwell time(ms)
8DPSK(3DH1)	3DH1	370	Time slot length *31.6*16000/2/79	118.4
8DPSK(3DH3)	3DH3	1610	Time slot length *31.6*16000/4/79	257.6
8DPSK(3DH5)	3DH5	2870	Time slot length *31.6*16000/6/79	306.1

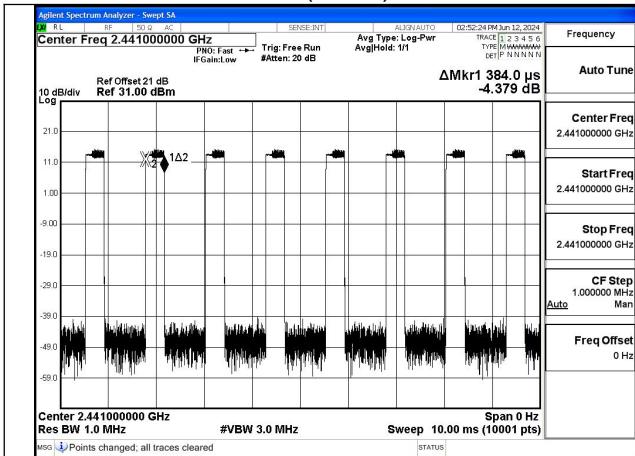
Test Mode: GFSK(DH5)



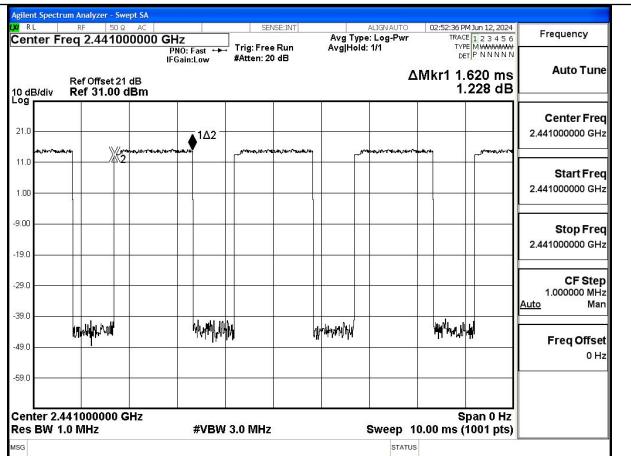


Test Mode:GFSK(DH5) 2441MHz

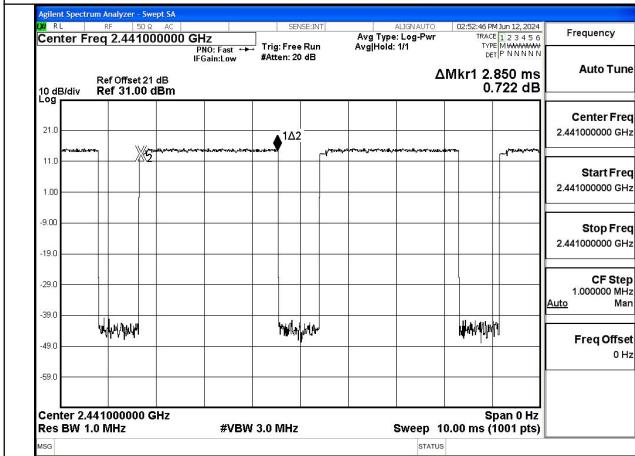
Test Mode: π/4DQPSK(2DH5)



Test Mode: $\pi/4$ DQPSK(2DH1) 2441MHz

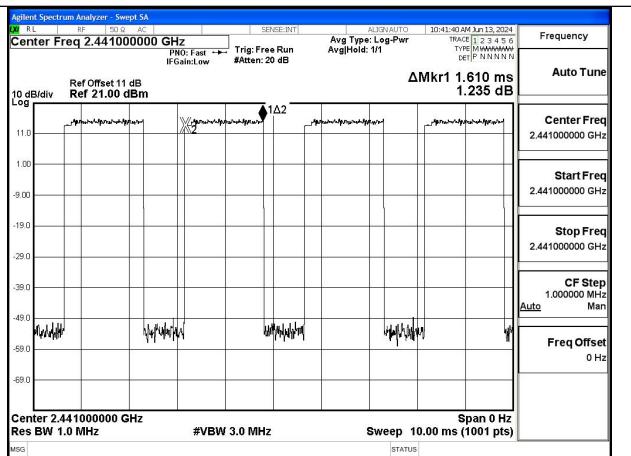
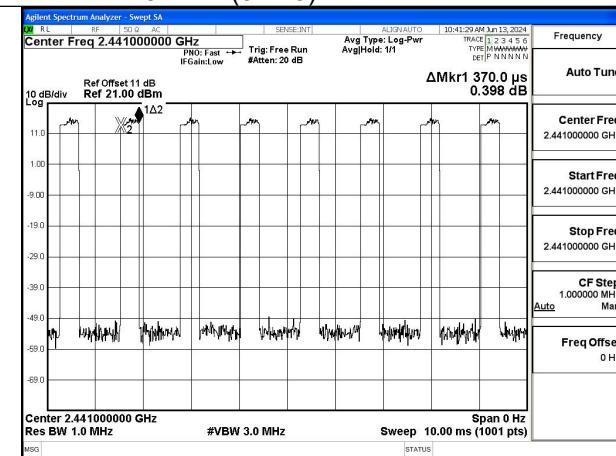


Test Mode: $\pi/4$ DQPSK(2DH3) 2441MHz

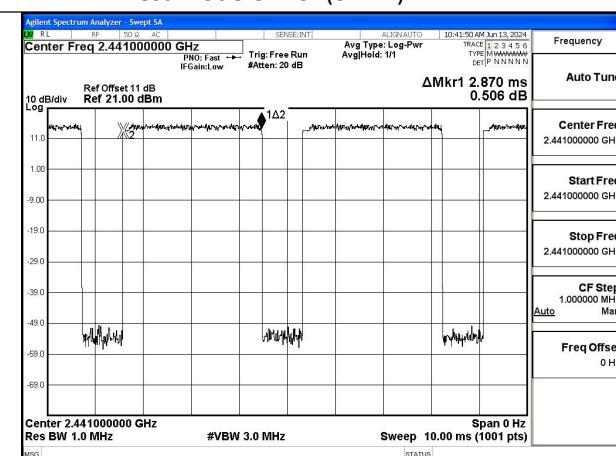


Test Mode: $\pi/4$ DQPSK(2DH5) 2441MHz

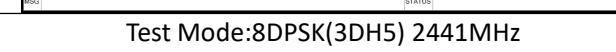
Test Mode: 8DPSK(3DH5)



Test Mode: 8DPSK(3DH1) 2441MHz

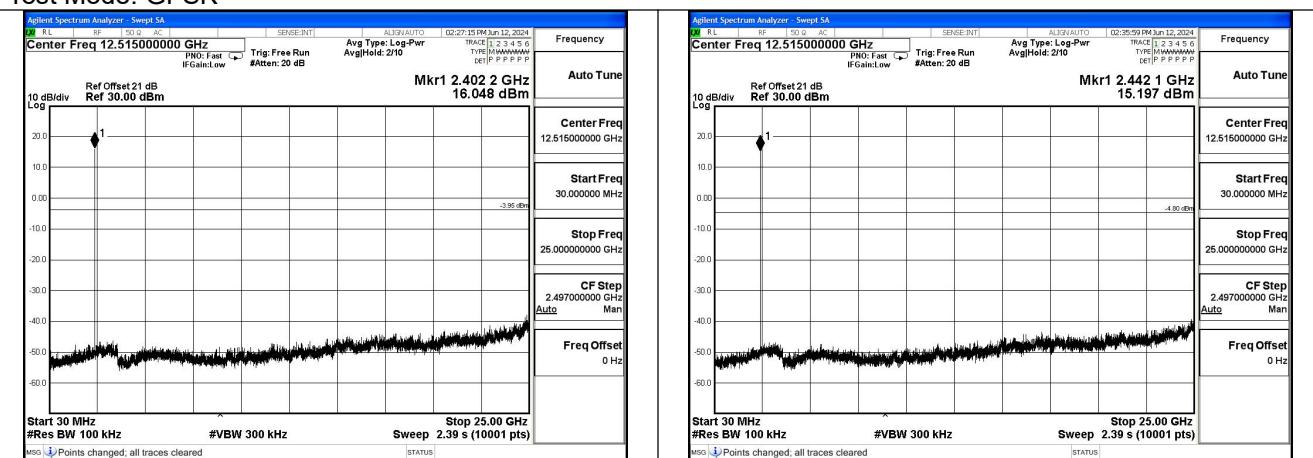


Test Mode: 8DPSK(3DH3) 2441MHz



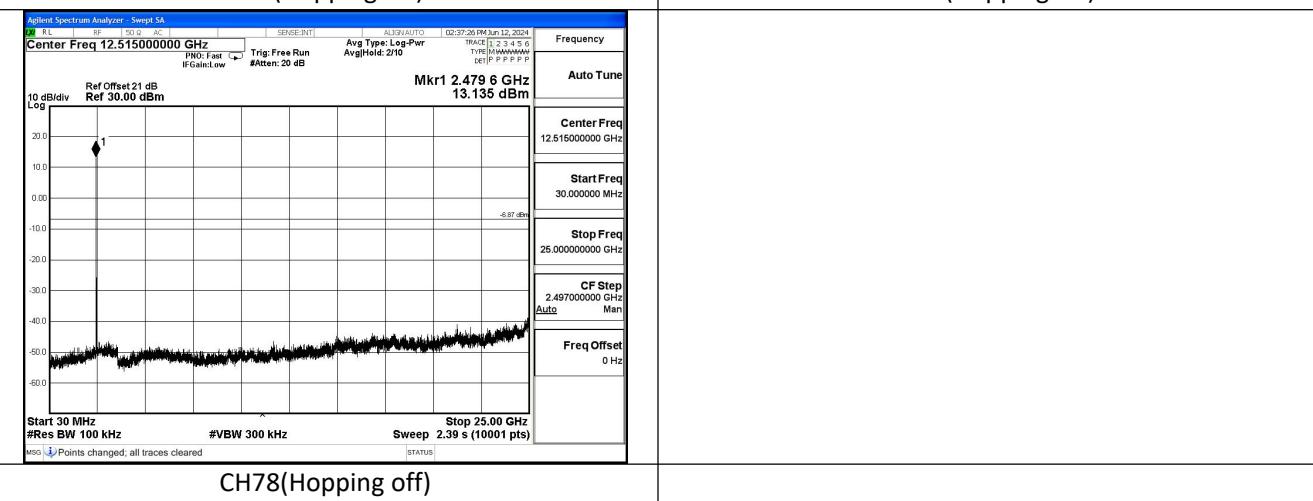
Conducted Out of band emission measurement

Test Mode: GFSK



CH0(Hopping off)

CH39(Hopping off)



CH78(Hopping off)