# TEST REPORT

| | |
|---|---|
| Report No.: | BCTC2502454470-2E |
| Applicant: | NEXXT SOLUTIONS |
| Product Name: | Camera |
| Test Model: | NHC-OP30DL |
| Tested Date: | 2025-02-21 to 2025-06-10 |
| Issued Date: | 2025-06-10 |

**Shenzhen BCTC Testing Co., Ltd.**

# FCC ID: X4YHACOP30DL

| | |
|---|---|
| Product Name: | Camera |
| Trademark: | N/A |
| Model/Type Reference: | NHC-OP30DL |
| Prepared For: | NEXXT SOLUTIONS |
| Address: | 3505 N.W 107TH AVE. MIAMI, Florida 33178, United States |
| Manufacturer: | Sungale Electronics (Shenzhen) Limited |
| Address: | No. 1302, DaHong High-Tech Park, No. 6-18, Xinhe Road,Xinqiao, BaoAn,Shenzhen 518125, CHINA |
| Prepared By: | Shenzhen BCTC Testing Co., Ltd. |
| Address: | 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China |
| Sample Received Date: | 2025-02-21 |
| Sample Tested Date: | 2025-02-21 to 2025-06-10 |
| Issue Date: | 2025-06-10 |
| Report No.: | BCTC2502454470-2E |
| Test Standards: | FCC Part15 15.407<br>ANSI C63.10:2013<br>KDB 662911 D01 v02r01<br>KDB 789033 D02 v02r01 |
| Test Results: | PASS |
| Remark: | This is WIFI-5GHz band radio test report. |

Tested by:

Min Zhi Cheng / Project Handler

Approved by:

Zero Zhou / Reviewer

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 BCTC Testing Co., Ltd, this report can't be reproduced except in full.The tested sample(s) and the sample information are provided by the client.

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(Note: N/A Means Not Applicable)

## 1. Version

| Report No. | Issue Date | Description | Approved |
|---|---|---|---|
| BCTC2502454470-2E | 2025-06-10 | Original | Valid |
| | | | |

## 2. Test Summary

The Product has been tested according to the following specifications:

| 1 | Test Parameter | Clause No. | Results |
|---|---|---|---|
| 1 | Spurious Radiated Emissions | 15.209(a),<br>15.407 (b)(1)<br>15.407 (b)(4)<br>15.407 (b)(8) | PASS |
| 2 | Conducted Emission | 15.207 | PASS |
| 3 | 26 dB and 99% Emission Bandwidth | 15.407 (a)(12)<br>15.1049 | PASS |
| 4 | Minimum 6 dB bandwidth | 15.407(e) | PASS |
| 5 | Maximum Conducted Output Power | 15.407 (a)(1)<br>15.407 (a)(3) | PASS |
| 6 | Band Edge | 2.1051,<br>15.407(b)(1)<br>15.407(b)(4) | PASS |
| 7 | Power Spectral Density | 15.407 (a)(1)<br>15.407 (a)(3) | PASS |
| 8 | Spurious Emissions at Antenna Terminals | 2.1051,<br>15.407(b) | PASS |
| 9 | Antenna Requirement | 15.203 | PASS |

Note: The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure.

## 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.

| No. | Item | Uncertainty |
|---|---|---|
| 1 | 3m chamber Radiated spurious emission(9KHz-30MHz) | U=3.7dB |
| 2 | 3m chamber Radiated spurious emission(30MHz-1GHz) | U=4.3dB |
| 3 | 3m chamber Radiated spurious emission(1GHz-18GHz) | U=4.5dB |
| 4 | 3m chamber Radiated spurious emission(18GHz-40GHz) | U=3.34dB |
| 5 | Conducted Emission (150kHz-30MHz) | U=3.20dB |
| 6 | Conducted Adjacent channel power | U=1.38dB |
| 7 | Power Spectral Density | U=1.19dB |
| 8 | Conducted output power uncertainty Above 1G | U=1.576dB |
| 9 | Conducted output power uncertainty below 1G | U=1.28dB |
| 10 | Conducted spurious emissions | U=0.55dB |
| 11 | Occupied Bandwidth/Frequency Range | U=3.46% |
| 12 | humidity uncertainty | U=5.3% |
| 13 | Temperature uncertainty | U=0.59℃ |
| 14 | Frequency Error | U=53.50Hz |
| 15 | Frequency Drift | U=0.64kHz |

# 4. Product Information And Test Setup

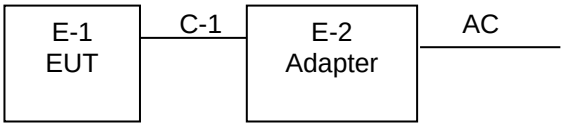
## 4.1 Product Information

| | |
|---|---|
| Model/Type Reference: | NHC-OP30DL |
| Model Differences: | N/A |
| Hardware Version: | N/A |
| Software Version: | N/A |
| IEEE 802.11 WLAN Mode Supported: | 802.11a/n (20MHz channel bandwidth)<br>802.11n (40MHz channel bandwidth) |
| Operation Frequency: | 5180-5240MHz for 802.11a/n(HT20);<br>5190-5230MHz for 802.11n(HT40);<br>5745-5825 MHz for 802.11a/n(HT20);<br>5755-5795 MHz for 802.11a/n(HT40); |
| Data Rate: | 802.11a: 6,9,12,18,24,36,48,54Mbps;<br>802.11n(HT20/HT40): MCS0-MCS15; |
| Type of Modulation: | OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n; |
| Number Of Channel: | 4 channels for 802.11a/n20 in the 5180-5240MHz band;<br>2 channels for 802.11 n40 in the 5190-5230MHz band;<br>5 channels for 802.11a/n20 in the 5745-5825MHz band;<br>2 channels for 802.11 n40 in the 5755-5795MHz band; |
| Antenna installation: | External antenna |
| Antenna Gain: | 5.2G: 2.44dBi<br>5.8G: 3.73dBi<br>Remark:<br>☒ The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information.<br>☐ The antenna gain of the product is provided by the customer, and the test data is affected by the customer information. |
| Ratings: | DC 5V From Adapter |
| Adapter Information: | Manufacture: SHENZHENKEYU POWER SUPPLY TECHNOLOGY CO., LTD<br>Model No.: KA12C-0502000US<br>Input: AC 100-240V 50/60Hz 0.35A Max<br>Output: DC 5V 2000mA |

## 4.2 Test Setup Configuration

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

Conducted Emission and Radiated Spurious Emission:




## 4.3 Support Equipment

| No. | Device Type | Brand | Model | Series No. | Note |
|---|---|---|---|---|---|
| E-1 | Camera | --- | NHC-OP30DL | --- | EUT |
| E-2 | Adapter | --- | KA12C-0502000US | --- | Auxiliary |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| C-1 | --- | --- | 1m | DC cable unshielded |

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

Frequency and Channel list for 802.11a/n (5180-5240MHz):

| 802.11a/n ( 20MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** |
| 36 | 5180 | 44 | 5220 | 40 | 5200 | 48 | 5240 |

| 802.11n (40MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** |
| 38 | 5190 | 46 | 5230 | - | - | - | - |

Frequency and Channel list for 802.11a/n /ac (5745-5825MHz):

| 802.11a/n ( 20MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** |
| 149 | 5745 | 153 | 5765 | 157 | 5785 | 161 | 5805 |
| 165 | 5825 | - | - | - | - | - | - |

| 802.11n (40MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** |
| 151 | 5755 | 159 | 5795 | - | - | - | - |

## 4.5 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|---|---|
| Mode 1 | 802.11a / n 20 CH36/ CH40/ CH 48<br>802.11a /n 20 CH149/ CH157/ CH 165 |
| Mode 2 | 802.11n40 CH38/ CH 46<br>802.11n40 CH 151 / CH 159 |
| Mode 3 | Link Mode |

Note: The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

## 4.6 Table Of Parameters Of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

| Test software Version | ATBM | | |
|---|---|---|---|
| Parameters | DEF | DEF | DEF |

# 5. Test Facility And Test Instrument Used

## 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, 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.
FCC Test Firm Registration Number: 712850
A2LA certificate registration number is: CN1212
ISED Registered No.: 23583
ISED CAB identifier: CN0017

## 5.2 Test Instrument Used

| Conducted Emissions Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model#** | **Serial#** | **Last Cal.** | **Next Cal.** |
| Receiver | R&S | ESR | 102075 | May 16, 2024 | May 15, 2025 |
| LISN | R&S | ENV216 | 101375 | May 16, 2024 | May 15, 2025 |
| Software | Frad | EZ-EMC | EMC-CON 3A1 | \ | \ |
| Pulse limiter | Schwarzbeck | VTSD9561-F | 01323 | May 16, 2024 | May 15, 2025 |

| Conducted Emissions Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model#** | **Serial#** | **Last Cal.** | **Next Cal.** |
| Receiver | R&S | ESR | 102075 | May 08, 2025 | May 07, 2026 |
| LISN | R&S | ENV216 | 101375 | May 14, 2025 | May 13, 2026 |
| Software | Frad | EZ-EMC | EMC-CON 3A1 | \ | \ |
| Pulse limiter | Schwarzbeck | VTSD9561-F | 01323 | May 14, 2025 | May 13, 2026 |

| RF Conducted Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model#** | **Serial#** | **Last Cal.** | **Next Cal.** |
| Power Meter | Keysight | E4419 | \ | May 16, 2024 | May 15, 2025 |
| Power Sensor (AV) | Keysight | E9300A | \ | May 16, 2024 | May 15, 2025 |
| Signal Analyzer 20kHz-26.5GHz | Keysight | N9020A | MY49100060 | May 16, 2024 | May 15, 2025 |
| Spectrum Analyzer 9kHz-40GHz | R&S | FSP40 | 100363 | May 16, 2024 | May 15, 2025 |
| Radio frequency control box | MAIWEI | MW100-RFCB | \ | \ | \ |
| Software | MAIWEI | MTS 8310 | \ | \ | \ |

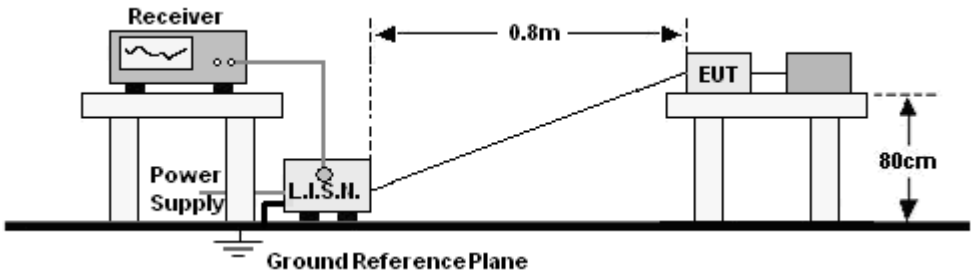
| RF Conducted Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model#** | **Serial#** | **Last Cal.** | **Next Cal.** |
| Power Meter | Keysight | E4419 | \ | May 14, 2025 | May 13, 2026 |
| Power Sensor (AV) | Keysight | E9300A | \ | May 14, 2025 | May 13, 2026 |
| Signal Analyzer 20kHz-26.5GHz | Keysight | N9020A | MY49100060 | May 14, 2025 | May 13, 2026 |
| Spectrum Analyzer 9kHz-40GHz | R&S | FSP40 | 100363 | May 14, 2025 | May 13, 2026 |
| Radio frequency control box | MAIWEI | MW100-RFCB | \ | \ | \ |
| Software | MAIWEI | MTS 8310 | \ | \ | \ |

| Radiated Emissions Test (966 Chamber02) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model#** | **Serial#** | **Last Cal.** | **Next Cal.** |
| 966 chamber | SKET | 966 Room | 966 | Oct. 31. 2024 | Oct. 30. 2027 |
| Receiver | R&S | ESR | 102075 | May 16, 2024 | May 15, 2025 |
| Receiver | R&S | ESRI7 | 100010 | Oct. 31. 2024 | Oct. 30. 2025 |
| Amplifier | SKET | LNPA-30M01G-30 | SK2021082004 | Oct. 31. 2024 | Oct. 30. 2025 |
| TRILOG Broadband Antenna | Schwarzbeck | VULB9168 | 1323 | May 21, 2024 | May 20, 2025 |
| Loop Antenna 9KHz-30MHz | Schwarzbeck | FMZB1519B | 00014 | May 21, 2024 | May 20, 2025 |
| Amplifier | SKET | LAPA_01G18G-45dB | SK2021040901 | May 16, 2024 | May 15, 2025 |
| Horn Antenna | Schwarzbeck | BBHA9120D | 1541 | May 21, 2024 | May 20, 2025 |
| Amplifier 18GHz-40GHz | MITEQ | TTA1840-35-HG | 2034381 | May 16, 2024 | May 15, 2025 |
| Horn Antenna 18GHz-40GHz | Schwarzbeck | BBHA9170 | 00822 | May 21, 2024 | May 20, 2025 |
| Spectrum Analyzer 9kHz-40GHz | R&S | FSP40 | 100363 | May 16, 2024 | May 15, 2025 |
| Software | Frad | EZ-EMC | FA-03A2 RE | \ | \ |

| Radiated Emissions Test (966 Chamber02) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model#** | **Serial#** | **Last Cal.** | **Next Cal.** |
| 966 chamber | SKET | 966 Room | 966 | Oct. 31. 2024 | Oct. 30. 2027 |
| Receiver | R&S | ESR | 102075 | May 08, 2025 | May 07, 2026 |
| Receiver | R&S | ESRI7 | 100010 | Oct. 31. 2024 | Oct. 30. 2025 |
| Amplifier | SKET | LNPA-30M01G-30 | SK2021082004 | Oct. 31. 2024 | Oct. 30. 2025 |
| TRILOG Broadband Antenna | Schwarzbeck | VULB9168 | 1323 | May 24, 2025 | May 23, 2026 |
| Loop Antenna 9KHz-30MHz | Schwarzbeck | FMZB1519B | 00014 | May 24, 2025 | May 23, 2026 |
| Amplifier | SKET | LAPA_01G18G-45dB | SK2021040901 | May 14, 2025 | May 13, 2026 |
| Horn Antenna | Schwarzbeck | BBHA9120D | 1541 | May 24, 2025 | May 23, 2026 |
| Amplifier 18GHz-40GHz | MITEQ | TTA1840-35-HG | 2034381 | May 14, 2025 | May 13, 2026 |
| Horn Antenna(18GHz-40GHz) | Schwarzbeck | BBHA9170 | 00822 | May 24, 2025 | May 23, 2026 |
| Spectrum Analyzer 9kHz-40GHz | R&S | FSP40 | 100363 | May 14, 2025 | May 13, 2026 |
| Software | Frad | EZ-EMC | FA-03A2 RE | \ | \ |

# 6. Conducted Emissions

## 6.1 Block Diagram Of Test Setup




## 6.2 Limit

| Frequency (MHz) | Limit (dBuV) | |
|---|---|---|
| | Quas-peak | Average |
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 56.00 | 46.00 |
| 5.0 -30.0 | 60.00 | 50.00 |
| Notes:<br>1. *Decreasing linearly with logarithm of frequency.<br>2. The lower limit shall apply at the transition frequencies. | | |

## 6.3 Test procedure

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

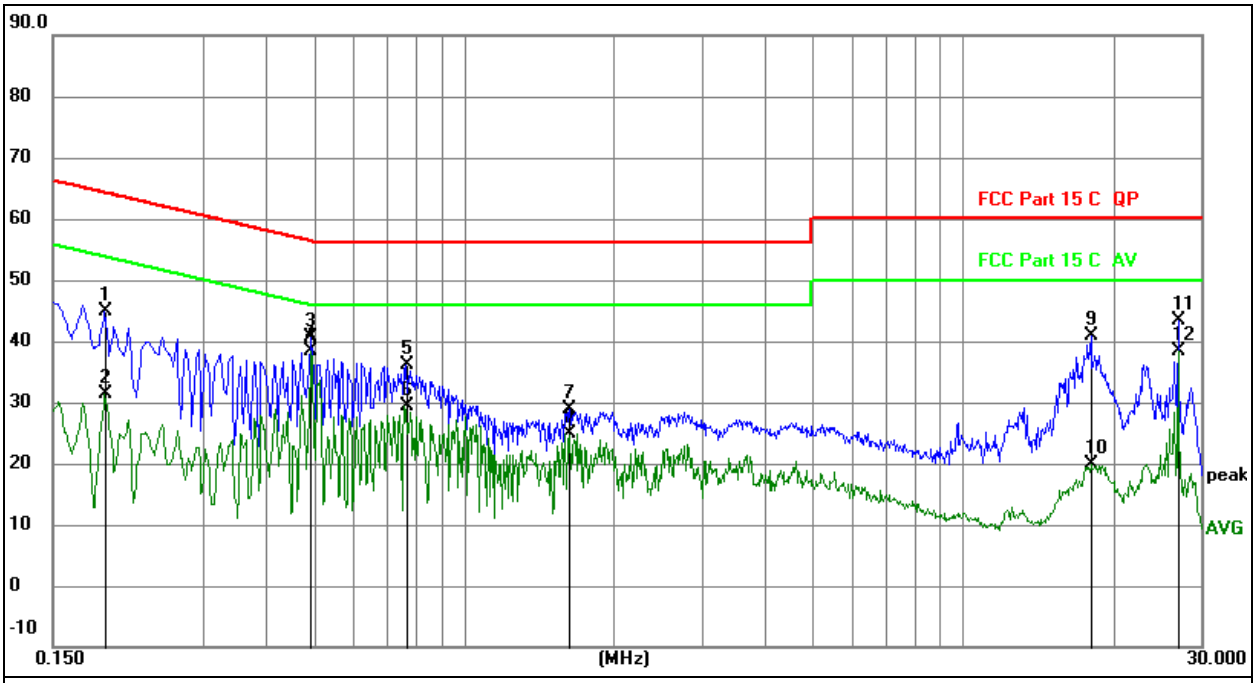
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

## 6.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

## 6.5 Test Result

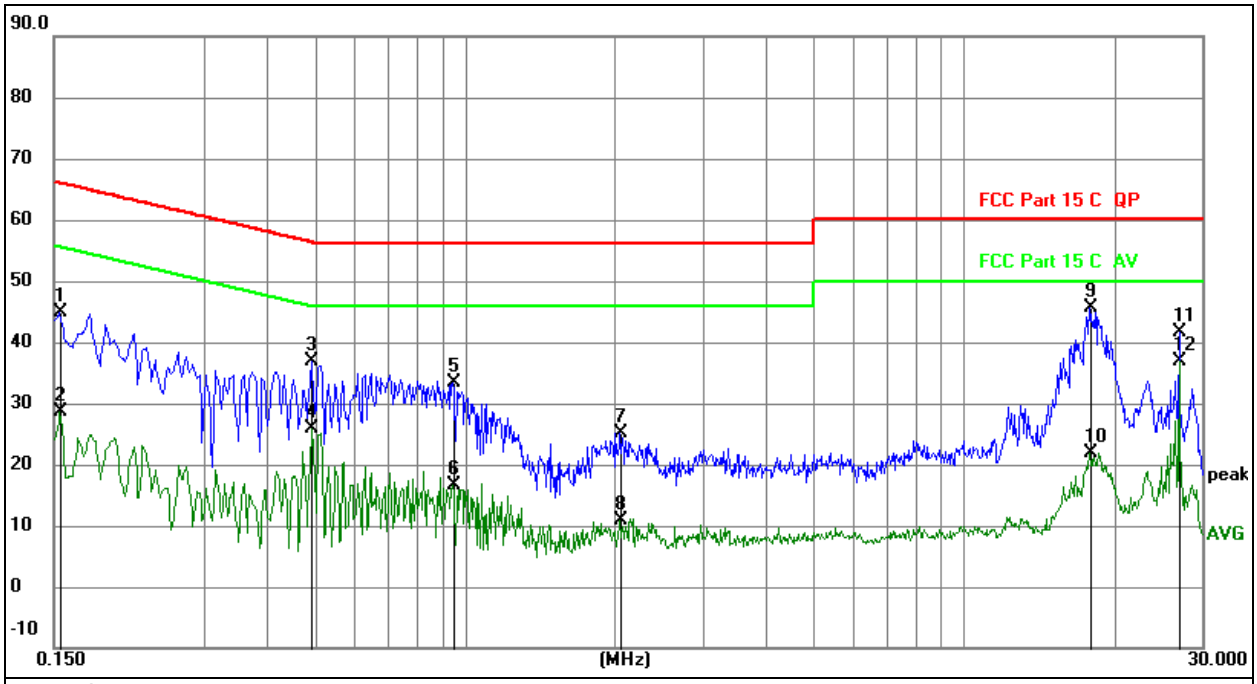
| | | | |
|---|---|---|---|
| Temperature: | 24.3 ℃ | Relative Humidity: | 53%RH |
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | Mode 3 | Polarization : | L |




Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1904 | 24.75 | 20.07 | 44.82 | 64.02 | -19.20 | QP |
| 2 | | 0.1904 | 11.36 | 20.07 | 31.43 | 54.02 | -22.59 | AVG |
| 3 | | 0.4941 | 20.58 | 20.08 | 40.66 | 56.10 | -15.44 | QP |
| 4 | * | 0.4941 | 18.19 | 20.08 | 38.27 | 46.10 | -7.83 | AVG |
| 5 | | 0.7630 | 15.99 | 20.09 | 36.08 | 56.00 | -19.92 | QP |
| 6 | | 0.7630 | 9.21 | 20.09 | 29.30 | 46.00 | -16.70 | AVG |
| 7 | | 1.6276 | 8.72 | 20.10 | 28.82 | 56.00 | -27.18 | QP |
| 8 | | 1.6276 | 4.79 | 20.10 | 24.89 | 46.00 | -21.11 | AVG |
| 9 | | 18.0393 | 20.66 | 20.32 | 40.98 | 60.00 | -19.02 | QP |
| 10 | | 18.0393 | -0.42 | 20.32 | 19.90 | 50.00 | -30.10 | AVG |
| 11 | | 26.9836 | 23.05 | 20.29 | 43.34 | 60.00 | -16.66 | QP |
| 12 | | 26.9836 | 18.18 | 20.29 | 38.47 | 50.00 | -11.53 | AVG |

| Temperature: | 24.3 ℃ | Relative Humidity: | 53%RH |
|---|---|---|---|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | Mode 3 | Polarization: | N |



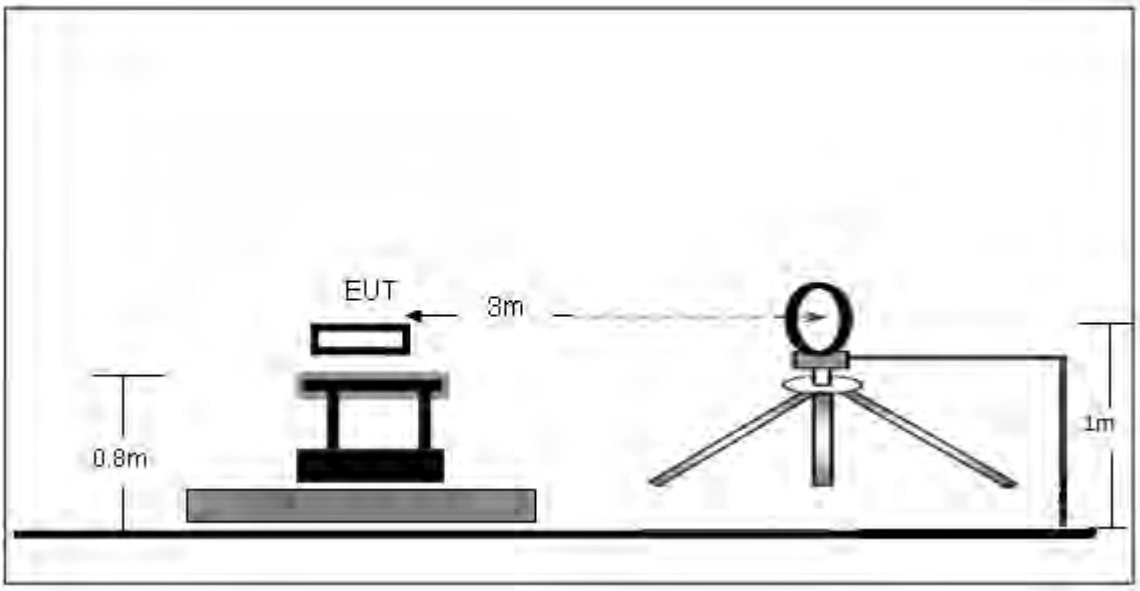

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1545 | 24.74 | 20.07 | 44.81 | 65.75 | -20.94 | QP |
| 2 | | 0.1545 | 8.44 | 20.07 | 28.51 | 55.75 | -27.24 | AVG |
| 3 | | 0.4920 | 16.74 | 20.08 | 36.82 | 56.13 | -19.31 | QP |
| 4 | | 0.4920 | 5.76 | 20.08 | 25.84 | 46.13 | -20.29 | AVG |
| 5 | | 0.9465 | 13.24 | 20.09 | 33.33 | 56.00 | -22.67 | QP |
| 6 | | 0.9465 | -3.35 | 20.09 | 16.74 | 46.00 | -29.26 | AVG |
| 7 | | 2.0490 | 5.05 | 20.10 | 25.15 | 56.00 | -30.85 | QP |
| 8 | | 2.0490 | -9.18 | 20.10 | 10.92 | 46.00 | -35.08 | AVG |
| 9 | | 17.9160 | 25.29 | 20.32 | 45.61 | 60.00 | -14.39 | QP |
| 10 | | 17.9160 | 1.59 | 20.32 | 21.91 | 50.00 | -28.09 | AVG |
| 11 | | 27.0015 | 21.26 | 20.29 | 41.55 | 60.00 | -18.45 | QP |
| 12 | * | 27.0015 | 16.54 | 20.29 | 36.83 | 50.00 | -13.17 | AVG |

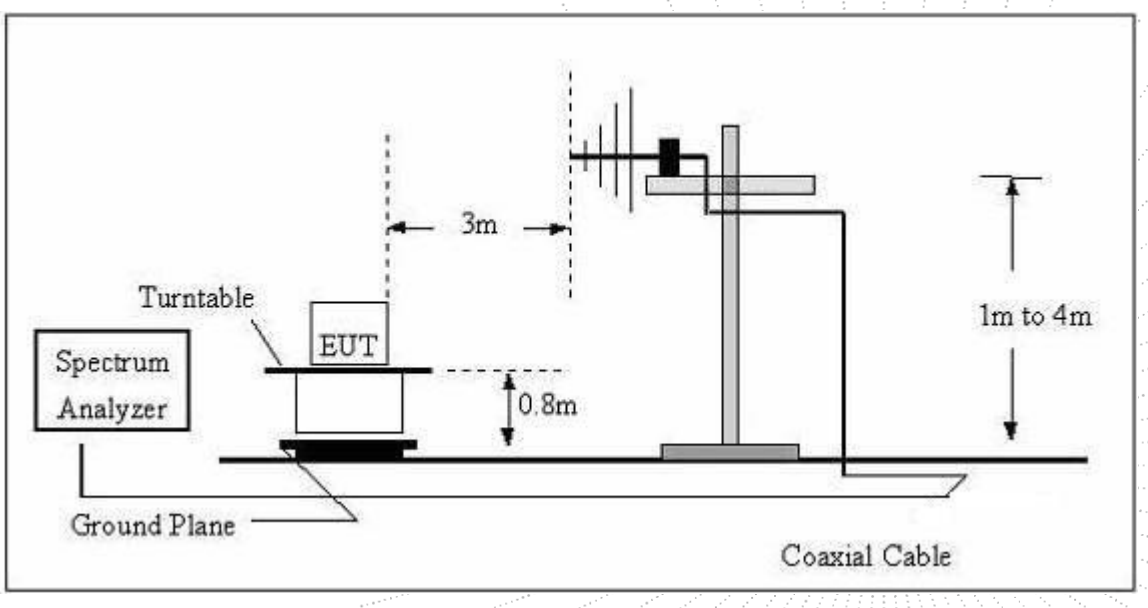
# 7. Radiated Emissions

## 7.1 Block Diagram Of Test Setup

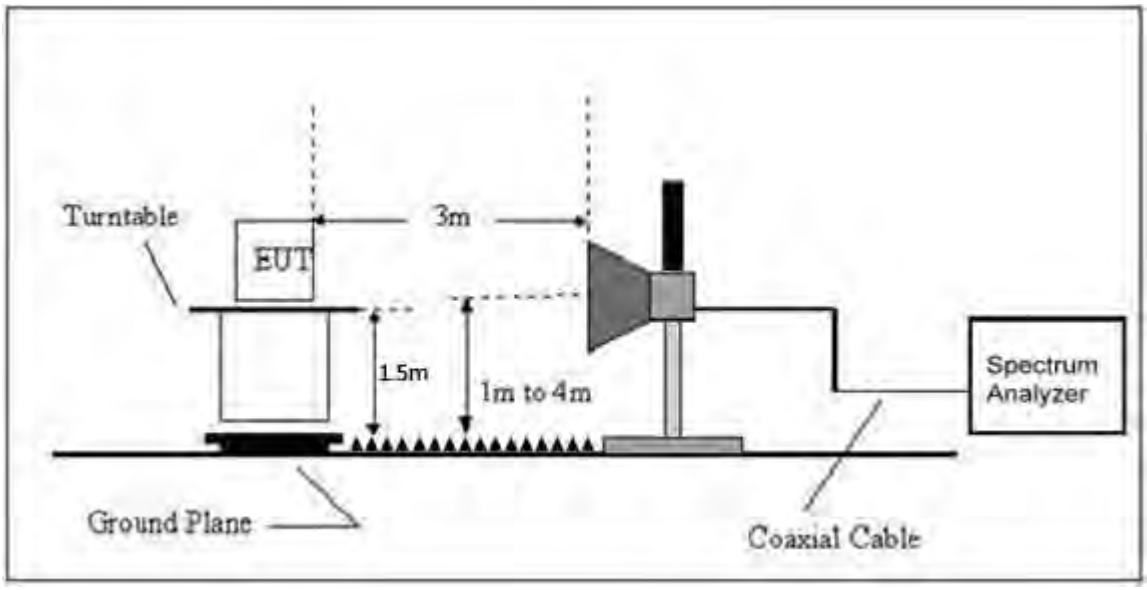
（A）Radiated Emission Test-Up Frequency Below 30MHz




（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz




## 7.2 Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequency | Field Strength | Distance | Field Strength Limit at 3m Distance | |
|---|---|---|---|---|
| (MHz) | uV/m | (m) | uV/m | dBuV/m |
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 | 10000 * 2400/F(kHz) | $20\log^{(2400/F(kHz))}$ + 80 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 | 100 * 24000/F(kHz) | $20\log^{(24000/F(kHz))}$ + 40 |
| 1.705 ~ 30 | 30 | 30 | 100 * 30 | $20\log^{(30)}$ + 40 |
| 30 ~ 88 | 100 | 3 | 100 | $20\log^{(100)}$ |
| 88 ~ 216 | 150 | 3 | 150 | $20\log^{(150)}$ |
| 216 ~ 960 | 200 | 3 | 200 | $20\log^{(200)}$ |
| Above 960 | 500 | 3 | 500 | $20\log^{(500)}$ |

Limits Of Radiated Emission Measurement (Above 1000MHz)

| Frequency (MHz) | Limit (dBuV/m) (at 3M) | |
|---|---|---|
| | Peak | Average |
| Above 1000 | 74 | 54 |

Notes:
(1)The limit for radiated test was performed according to FCC PART 15C.
(2)The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

## 7.3 Test procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205.
It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

| Frequency Band (MHz) | Function | Resolution bandwidth | Video Bandwidth |
|---|---|---|---|
| 30 to 1000 | QP | 120 kHz | 300 kHz |
| Above 1000 | Peak | 1 MHz | 1 MHz |
| | Average | 1 MHz | 10 Hz |

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the
narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

## 7.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 7.5 Test Result

Below 30MHz

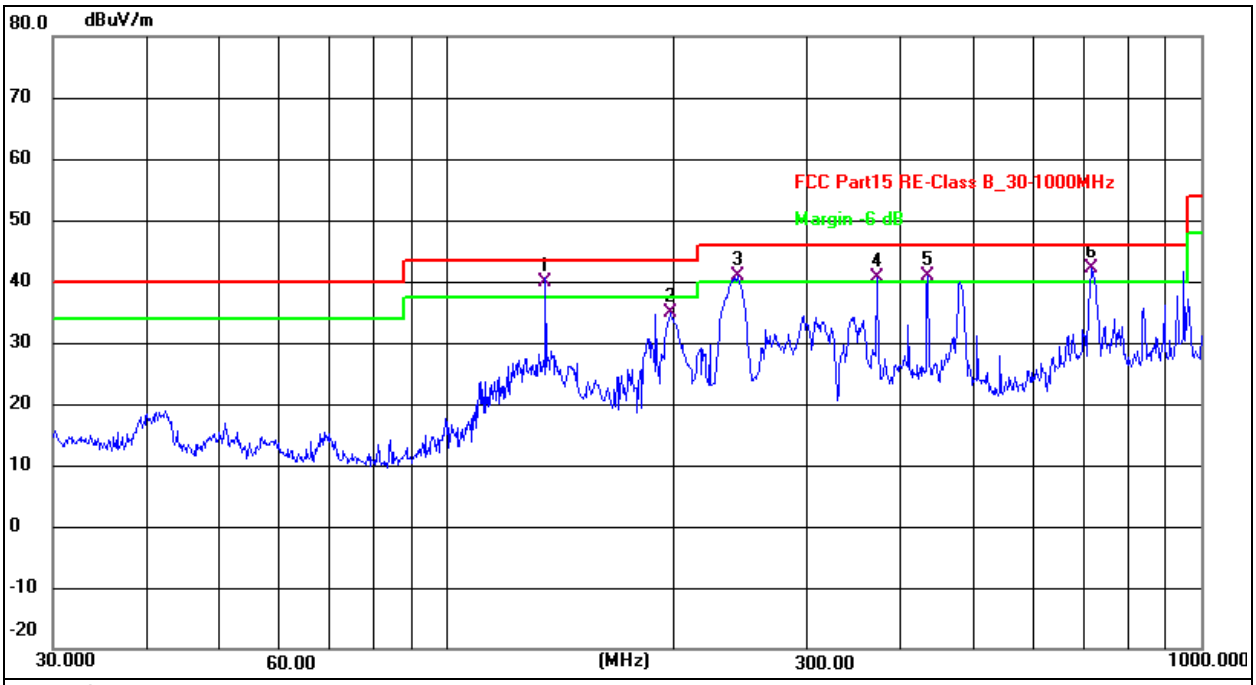
| | | | |
|---|---|---|---|
| Temperature: | 26 ℃ | Relative Humidity: | 54%RH |
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | Mode 3 | | |

| Freq. | Reading | Limit | Margin | State |
|---|---|---|---|---|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB) | P/F |
| -- | -- | -- | -- | PASS |
| -- | -- | -- | -- | PASS |

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1GHz

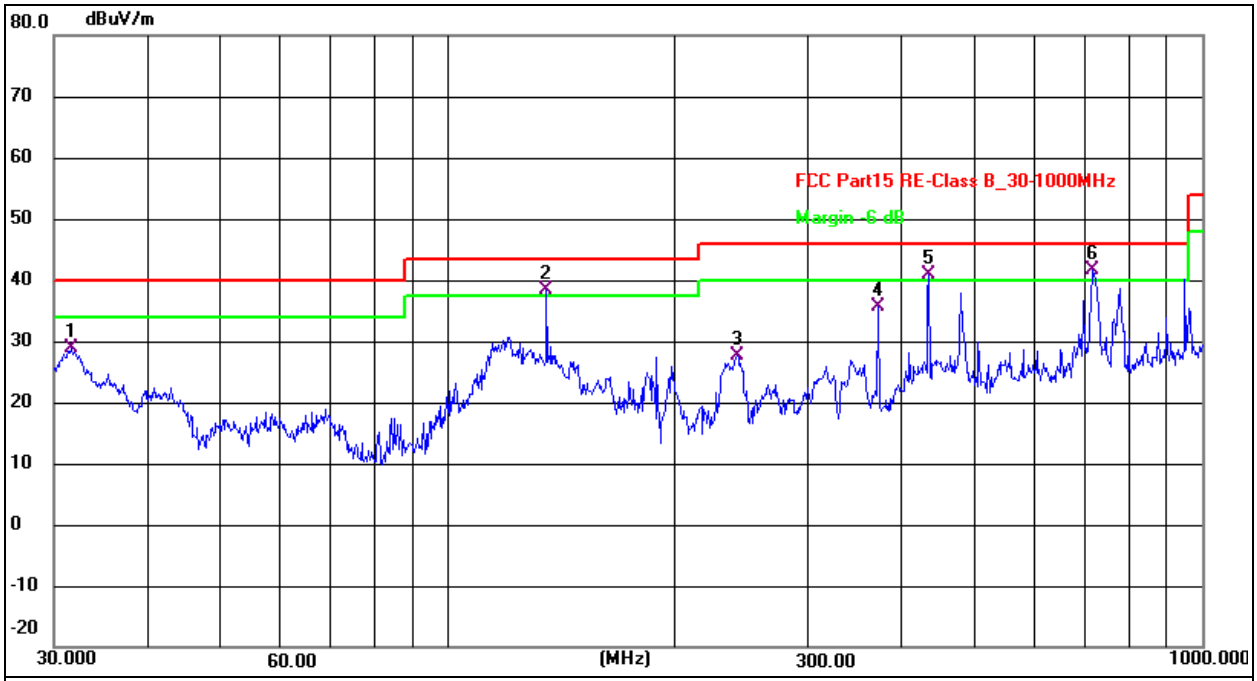
| | | | |
|---|---|---|---|
| Temperature: | 24.1℃ | Relative Humidity: | 51%RH |
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | Mode 3 | Polarization : | Horizontal |




Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 * | 135.0318 | 52.03 | -12.19 | 39.84 | 43.50 | -3.66 | QP |
| 2 | 197.8928 | 49.30 | -14.44 | 34.86 | 43.50 | -8.64 | QP |
| 3 ! | 242.5252 | 53.79 | -12.90 | 40.89 | 46.00 | -5.11 | QP |
| 4 ! | 372.0045 | 49.18 | -8.44 | 40.74 | 46.00 | -5.26 | QP |
| 5 ! | 434.0650 | 47.74 | -6.78 | 40.96 | 46.00 | -5.04 | QP |
| 6 ! | 716.6820 | 42.49 | -0.25 | 42.24 | 46.00 | -3.76 | QP |

| | | | |
|---|---|---|---|
| Temperature: | 24.1℃ | Relative Humidity: | 51%RH |
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | Mode 3 | Polarization: | Vertical |




Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 31.6201 | 41.14 | -12.32 | 28.82 | 40.00 | -11.18 | QP |
| 2 ! | 135.0319 | 50.46 | -12.19 | 38.27 | 43.50 | -5.23 | QP |
| 3 | 241.6763 | 40.46 | -12.93 | 27.53 | 46.00 | -18.47 | QP |
| 4 | 372.0045 | 43.97 | -8.44 | 35.53 | 46.00 | -10.47 | QP |
| 5 ! | 434.0650 | 47.75 | -6.78 | 40.97 | 46.00 | -5.03 | QP |
| 6 * | 716.6820 | 41.93 | -0.25 | 41.68 | 46.00 | -4.32 | QP |

Between 1GHz – 40GHz

☒Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
All the modes has been tested and the worst result 802.11a recorded as below:

Test mode: 802.11a Frequency(MHz): 5180

| Frequency (MHz) | Polarity | PK(dBuV/m) (VBW=3MHz) | Limit 3m (dBuV/m) | AV(dBuV/m) (VBW=10Hz) | Limit 3m (dBuV/m) |
|---|---|---|---|---|---|
| 5149.19 | H | 63.99 | 74 | 45.84 | 54 |
| 5149.56 | V | 55.39 | 74 | 41.62 | 54 |

Test mode: 802.11a Frequency(MHz): 5240

| Frequency (MHz) | Polarity | PK(dBuV/m) (VBW=3MHz) | Limit 3m (dBuV/m) | AV(dBuV/m) (VBW=10Hz) | Limit 3m (dBuV/m) |
|---|---|---|---|---|---|
| 5300.79 | H | 45.60 | 74 | 34.64 | 54 |
| 5300.46 | V | 41.31 | 74 | 28.23 | 54 |

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp

| Test Mode: | TX(5.1G) - 802.11a |
|---|---|

| Polar (H/V) | Frequency (MHz) | Reading Level (dBuV/m) | Correct Factor (dB) | Measurement (dBuV/m) | Limits (dBuV/m) | Over (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| **Low Channel (5180 MHz)-Above 1G** | | | | | | | |
| V | 4434.066 | 71.12 | -20.73 | 50.39 | 68.20 | -17.81 | PK |
| V | 4434.066 | 59.65 | -20.73 | 38.92 | 54.00 | -15.08 | AV |
| V | 10360.061 | 61.20 | -9.36 | 51.84 | 68.20 | -16.36 | PK |
| V | 10360.061 | 49.94 | -9.36 | 40.58 | 54.00 | -13.42 | AV |
| V | 15540.175 | 64.34 | -7.84 | 56.50 | 74.00 | -17.50 | PK |
| V | 15540.175 | 49.44 | -7.84 | 41.60 | 54.00 | -12.40 | AV |
| H | 4434.061 | 73.69 | -20.73 | 52.96 | 68.20 | -15.24 | PK |
| H | 4434.061 | 59.81 | -20.73 | 39.08 | 54.00 | -14.92 | AV |
| H | 10360.093 | 60.80 | -9.36 | 51.44 | 68.20 | -16.76 | PK |
| H | 10360.093 | 49.63 | -9.36 | 40.27 | 54.00 | -13.73 | AV |
| H | 15540.083 | 61.34 | -7.84 | 53.50 | 74.00 | -20.50 | PK |
| H | 15540.083 | 49.43 | -7.84 | 41.59 | 54.00 | -12.41 | AV |
| **Middle Channel (5200 MHz)-Above 1G** | | | | | | | |
| V | 4592.077 | 70.68 | -20.42 | 50.27 | 74.00 | -23.73 | PK |
| V | 4592.077 | 59.37 | -20.42 | 38.96 | 54.00 | -15.04 | AV |
| V | 10400.071 | 63.66 | -9.30 | 54.36 | 68.20 | -13.84 | PK |
| V | 10400.071 | 49.32 | -9.30 | 40.02 | 54.00 | -13.98 | AV |
| V | 15600.128 | 60.29 | -7.82 | 52.47 | 74.00 | -21.53 | PK |
| V | 15600.128 | 49.78 | -7.82 | 41.96 | 54.00 | -12.04 | AV |
| H | 4592.089 | 72.39 | -20.42 | 51.98 | 74.00 | -22.02 | PK |
| H | 4592.089 | 59.61 | -20.42 | 39.19 | 54.00 | -14.81 | AV |
| H | 10400.028 | 64.89 | -9.30 | 55.59 | 68.20 | -12.61 | PK |
| H | 10400.028 | 49.69 | -9.30 | 40.39 | 54.00 | -13.61 | AV |
| H | 15600.051 | 64.99 | -7.82 | 57.17 | 74.00 | -16.83 | PK |
| H | 15600.051 | 49.53 | -7.82 | 41.71 | 54.00 | -12.29 | AV |
| **High Channel (5240 MHz)-Above 1G** | | | | | | | |
| V | 4739.137 | 70.99 | -20.12 | 50.87 | 74.00 | -23.13 | PK |
| V | 4739.137 | 59.23 | -20.12 | 39.10 | 54.00 | -14.90 | AV |
| V | 10480.199 | 61.47 | -9.18 | 52.29 | 68.20 | -15.91 | PK |
| V | 10480.199 | 49.64 | -9.18 | 40.46 | 54.00 | -13.54 | AV |
| V | 15720.194 | 62.13 | -7.78 | 54.35 | 74.00 | -19.65 | PK |
| V | 15720.194 | 49.55 | -7.78 | 41.77 | 54.00 | -12.23 | AV |
| H | 4739.176 | 74.28 | -20.12 | 54.16 | 74.00 | -19.84 | PK |
| H | 4739.176 | 59.65 | -20.12 | 39.53 | 54.00 | -14.47 | AV |
| H | 10480.075 | 62.24 | -9.18 | 53.06 | 68.20 | -15.14 | PK |
| H | 10480.075 | 49.06 | -9.18 | 39.88 | 54.00 | -14.12 | AV |
| H | 15720.065 | 62.44 | -7.78 | 54.66 | 74.00 | -19.34 | PK |
| H | 15720.065 | 49.36 | -7.78 | 41.58 | 54.00 | -12.42 | AV |

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

| Test Mode: | TX(5.1G) - 802.11n-HT20 |
|---|---|

| Polar (H/V) | Frequency (MHz) | Reading Level (dBuV/m) | Correct Factor (dB) | Measurement (dBuV/m) | Limits (dBuV/m) | Over (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| **Low Channel (5180 MHz)-Above 1G** | | | | | | | |
| V | 4434.037 | 74.35 | -20.73 | 53.62 | 68.20 | -14.58 | PK |
| V | 4434.037 | 59.69 | -20.73 | 38.95 | 54.00 | -15.05 | AV |
| V | 10360.183 | 61.19 | -9.36 | 51.83 | 68.20 | -16.37 | PK |
| V | 10360.183 | 49.37 | -9.36 | 40.01 | 54.00 | -13.99 | AV |
| V | 15540.019 | 62.63 | -7.84 | 54.79 | 74.00 | -19.21 | PK |
| V | 15540.019 | 49.01 | -7.84 | 41.17 | 54.00 | -12.83 | AV |
| H | 4434.055 | 73.95 | -20.73 | 53.22 | 68.20 | -14.98 | PK |
| H | 4434.055 | 59.61 | -20.73 | 38.87 | 54.00 | -15.13 | AV |
| H | 10360.122 | 63.24 | -9.36 | 53.88 | 68.20 | -14.32 | PK |
| H | 10360.122 | 49.74 | -9.36 | 40.38 | 54.00 | -13.62 | AV |
| H | 15540.061 | 64.46 | -7.84 | 56.62 | 74.00 | -17.38 | PK |
| H | 15540.061 | 49.87 | -7.84 | 42.03 | 54.00 | -11.97 | AV |
| **Middle Channel (5200 MHz)-Above 1G** | | | | | | | |
| V | 4592.188 | 72.00 | -20.42 | 51.59 | 74.00 | -22.41 | PK |
| V | 4592.188 | 59.36 | -20.42 | 38.95 | 54.00 | -15.05 | AV |
| V | 10400.116 | 64.34 | -9.30 | 55.04 | 68.20 | -13.16 | PK |
| V | 10400.116 | 49.61 | -9.30 | 40.31 | 54.00 | -13.69 | AV |
| V | 15600.112 | 63.61 | -7.82 | 55.79 | 74.00 | -18.21 | PK |
| V | 15600.112 | 49.52 | -7.82 | 41.70 | 54.00 | -12.30 | AV |
| H | 4592.161 | 74.70 | -20.42 | 54.28 | 74.00 | -19.72 | PK |
| H | 4592.161 | 59.13 | -20.42 | 38.72 | 54.00 | -15.28 | AV |
| H | 10400.119 | 63.40 | -9.30 | 54.10 | 68.20 | -14.10 | PK |
| H | 10400.119 | 49.85 | -9.30 | 40.55 | 54.00 | -13.45 | AV |
| H | 15600.019 | 64.47 | -7.82 | 56.65 | 74.00 | -17.35 | PK |
| H | 15600.019 | 49.59 | -7.82 | 41.77 | 54.00 | -12.23 | AV |
| **High Channel (5240 MHz)-Above 1G** | | | | | | | |
| V | 4739.076 | 71.77 | -20.12 | 51.65 | 74.00 | -22.35 | PK |
| V | 4739.076 | 59.57 | -20.12 | 39.45 | 54.00 | -14.55 | AV |
| V | 10480.055 | 62.36 | -9.18 | 53.18 | 68.20 | -15.02 | PK |
| V | 10480.055 | 49.24 | -9.18 | 40.06 | 54.00 | -13.94 | AV |
| V | 15720.184 | 61.46 | -7.78 | 53.68 | 74.00 | -20.32 | PK |
| V | 15720.184 | 49.67 | -7.78 | 41.89 | 54.00 | -12.11 | AV |
| H | 4739.070 | 72.81 | -20.12 | 52.69 | 74.00 | -21.31 | PK |
| H | 4739.070 | 59.40 | -20.12 | 39.28 | 54.00 | -14.72 | AV |
| H | 10480.144 | 63.68 | -9.18 | 54.50 | 68.20 | -13.70 | PK |
| H | 10480.144 | 49.55 | -9.18 | 40.37 | 54.00 | -13.63 | AV |
| H | 15720.166 | 64.79 | -7.78 | 57.01 | 74.00 | -16.99 | PK |
| H | 15720.166 | 49.18 | -7.78 | 41.40 | 54.00 | -12.60 | AV |

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

| Test Mode: | TX(5.1G) - 802.11n-HT40 |
|---|---|

| Polar (H/V) | Frequency (MHz) | Reading Level (dBuV/m) | Correct Factor (dB) | Measurement (dBuV/m) | Limits (dBuV/m) | Over (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| **Low Channel (5190 MHz)-Above 1G** | | | | | | | |
| V | 4434.180 | 74.10 | -20.73 | 53.37 | 68.20 | -14.83 | PK |
| V | 4434.180 | 59.90 | -20.73 | 39.17 | 54.00 | -14.83 | AV |
| V | 10380.187 | 60.51 | -9.33 | 51.18 | 68.20 | -17.02 | PK |
| V | 10380.187 | 49.21 | -9.33 | 39.88 | 54.00 | -14.12 | AV |
| V | 15570.038 | 64.60 | -7.83 | 56.77 | 74.00 | -17.23 | PK |
| V | 15570.038 | 49.13 | -7.83 | 41.30 | 54.00 | -12.70 | AV |
| H | 4434.193 | 73.69 | -20.73 | 52.96 | 74.00 | -21.04 | PK |
| H | 4434.193 | 59.32 | -20.73 | 38.58 | 54.00 | -15.42 | AV |
| H | 10380.196 | 60.53 | -9.33 | 51.20 | 68.20 | -17.00 | PK |
| H | 10380.196 | 49.47 | -9.33 | 40.14 | 54.00 | -13.86 | AV |
| H | 15570.066 | 61.48 | -7.83 | 53.65 | 74.00 | -20.35 | PK |
| H | 15570.066 | 49.22 | -7.83 | 41.39 | 54.00 | -12.61 | AV |
| **High Channel (5230 MHz)-Above 1G** | | | | | | | |
| V | 4739.008 | 73.63 | -20.12 | 53.50 | 68.20 | -14.70 | PK |
| V | 4739.008 | 59.97 | -20.12 | 39.84 | 54.00 | -14.16 | AV |
| V | 10460.172 | 63.97 | -9.21 | 54.76 | 68.20 | -13.44 | PK |
| V | 10460.172 | 49.32 | -9.21 | 40.11 | 54.00 | -13.89 | AV |
| V | 15690.092 | 64.90 | -7.79 | 57.11 | 74.00 | -16.89 | PK |
| V | 15690.092 | 49.50 | -7.79 | 41.71 | 54.00 | -12.29 | AV |
| H | 4739.133 | 71.65 | -20.12 | 51.53 | 68.20 | -16.67 | PK |
| H | 4739.133 | 59.16 | -20.12 | 39.03 | 54.00 | -14.97 | AV |
| H | 10460.147 | 61.68 | -9.21 | 52.47 | 68.20 | -15.73 | PK |
| H | 10460.147 | 49.32 | -9.21 | 40.11 | 54.00 | -13.89 | AV |
| H | 15690.110 | 61.28 | -7.79 | 53.49 | 74.00 | -20.51 | PK |
| H | 15690.110 | 49.44 | -7.79 | 41.65 | 54.00 | -12.35 | AV |

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

| Test Mode: | TX(5.8G) - 802.11a |
|---|---|

| Polar (H/V) | Frequency (MHz) | Reading Level (dBuV/m) | Correct Factor (dB) | Measurement (dBuV/m) | Limits (dBuV/m) | Over (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| **Low Channel (5745 MHz)-Above 1G** | | | | | | | |
| V | 4679.058 | 70.02 | -20.24 | 49.77 | 74.00 | -24.23 | PK |
| V | 4679.058 | 59.87 | -20.24 | 39.63 | 54.00 | -14.37 | AV |
| V | 11490.154 | 61.36 | -8.79 | 52.57 | 68.20 | -15.63 | PK |
| V | 11490.154 | 49.64 | -8.79 | 40.85 | 54.00 | -13.15 | AV |
| V | 17235.120 | 56.57 | -3.18 | 53.39 | 68.20 | -14.81 | PK |
| V | 17235.120 | 44.21 | -3.18 | 41.03 | 54.00 | -12.97 | AV |
| H | 4679.046 | 74.16 | -20.73 | 53.43 | 74.00 | -20.57 | PK |
| H | 4679.046 | 59.31 | -20.73 | 38.58 | 54.00 | -15.42 | AV |
| H | 11490.191 | 62.88 | -8.79 | 54.09 | 68.20 | -14.11 | PK |
| H | 11490.191 | 49.03 | -8.79 | 40.24 | 54.00 | -13.76 | AV |
| H | 17235.072 | 56.26 | -3.18 | 53.08 | 68.20 | -15.12 | PK |
| H | 17235.072 | 44.36 | -3.18 | 41.18 | 54.00 | -12.82 | AV |
| **Middle Channel (5785 MHz)-Above 1G** | | | | | | | |
| V | 4592.006 | 72.77 | -20.42 | 52.35 | 74.00 | -21.65 | PK |
| V | 4592.006 | 59.66 | -20.42 | 39.24 | 54.00 | -14.76 | AV |
| V | 11570.192 | 63.89 | -8.86 | 55.03 | 68.20 | -13.17 | PK |
| V | 11570.192 | 49.17 | -8.86 | 40.31 | 54.00 | -13.69 | AV |
| V | 17355.130 | 58.20 | -2.52 | 55.68 | 68.20 | -12.52 | PK |
| V | 17355.130 | 44.09 | -2.52 | 41.57 | 54.00 | -12.43 | AV |
| H | 4592.162 | 72.58 | -20.42 | 52.17 | 74.00 | -21.83 | PK |
| H | 4592.162 | 59.75 | -20.42 | 39.33 | 54.00 | -14.67 | AV |
| H | 11570.041 | 61.14 | -8.86 | 52.28 | 68.20 | -15.92 | PK |
| H | 11570.041 | 49.43 | -8.86 | 40.57 | 54.00 | -13.43 | AV |
| H | 17355.194 | 58.08 | -2.52 | 55.56 | 68.20 | -12.64 | PK |
| H | 17355.194 | 44.65 | -2.52 | 42.13 | 54.00 | -11.87 | AV |
| **High Channel (5825 MHz)-Above 1G** | | | | | | | |
| V | 6039.087 | 71.67 | -18.93 | 52.73 | 68.20 | -15.47 | PK |
| V | 6039.087 | 59.85 | -18.93 | 40.92 | 54.00 | -13.08 | AV |
| V | 11650.156 | 60.04 | -8.92 | 51.12 | 74.00 | -22.88 | PK |
| V | 11650.156 | 49.42 | -8.92 | 40.50 | 54.00 | -13.50 | AV |
| V | 17475.019 | 57.45 | -1.86 | 55.59 | 68.20 | -12.61 | PK |
| V | 17475.019 | 44.04 | -1.86 | 42.18 | 54.00 | -11.82 | AV |
| H | 6039.189 | 72.20 | -18.93 | 53.27 | 68.20 | -14.93 | PK |
| H | 6039.189 | 59.44 | -18.93 | 40.50 | 54.00 | -13.50 | AV |
| H | 11650.151 | 61.01 | -8.92 | 52.09 | 74.00 | -21.91 | PK |
| H | 11650.151 | 49.04 | -8.92 | 40.12 | 54.00 | -13.88 | AV |
| H | 17475.189 | 59.27 | -1.86 | 57.41 | 68.20 | -10.79 | PK |
| H | 17475.189 | 44.17 | -1.86 | 42.31 | 54.00 | -11.69 | AV |

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

| Test Mode: | TX(5.8G) - 802.11n-HT20 |
|---|---|

| Polar (H/V) | Frequency (MHz) | Reading Level (dBuV/m) | Correct Factor (dB) | Measurement (dBuV/m) | Limits (dBuV/m) | Over (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| **Low Channel (5745 MHz)-Above 1G** | | | | | | | |
| V | 4679.176 | 72.68 | -20.24 | 52.44 | 74.00 | -21.56 | PK |
| V | 4679.176 | 59.31 | -20.24 | 39.06 | 54.00 | -14.94 | AV |
| V | 11490.054 | 61.08 | -8.79 | 52.29 | 68.20 | -15.91 | PK |
| V | 11490.054 | 49.82 | -8.79 | 41.03 | 54.00 | -12.97 | AV |
| V | 17235.157 | 56.57 | -3.18 | 53.39 | 68.20 | -14.81 | PK |
| V | 17235.157 | 44.33 | -3.18 | 41.15 | 54.00 | -12.85 | AV |
| H | 4679.028 | 70.04 | -20.24 | 49.80 | 74.00 | -24.20 | PK |
| H | 4679.028 | 59.88 | -20.24 | 39.64 | 54.00 | -14.36 | AV |
| H | 11490.179 | 61.82 | -8.79 | 53.03 | 68.20 | -15.17 | PK |
| H | 11490.179 | 49.53 | -8.79 | 40.74 | 54.00 | -13.26 | AV |
| H | 17235.059 | 55.81 | -3.18 | 52.63 | 68.20 | -15.57 | PK |
| H | 17235.059 | 44.72 | -3.18 | 41.54 | 54.00 | -12.46 | AV |
| **Middle Channel (5785 MHz)-Above 1G** | | | | | | | |
| V | 4592.170 | 70.92 | -20.42 | 50.50 | 74.00 | -23.50 | PK |
| V | 4592.170 | 59.52 | -20.42 | 39.11 | 54.00 | -14.89 | AV |
| V | 11570.086 | 60.12 | -8.86 | 51.26 | 68.20 | -16.94 | PK |
| V | 11570.086 | 49.96 | -8.86 | 41.10 | 54.00 | -12.90 | AV |
| V | 17355.052 | 56.80 | -2.52 | 54.28 | 68.20 | -13.92 | PK |
| V | 17355.052 | 44.59 | -2.52 | 42.07 | 54.00 | -11.93 | AV |
| H | 4592.166 | 71.12 | -20.42 | 50.70 | 74.00 | -23.30 | PK |
| H | 4592.166 | 59.47 | -20.42 | 39.06 | 54.00 | -14.94 | AV |
| H | 11570.135 | 62.28 | -8.86 | 53.42 | 68.20 | -14.78 | PK |
| H | 11570.135 | 49.56 | -8.86 | 40.70 | 54.00 | -13.30 | AV |
| H | 17355.101 | 57.65 | -2.52 | 55.13 | 68.20 | -13.07 | PK |
| H | 17355.101 | 44.86 | -2.52 | 42.34 | 54.00 | -11.66 | AV |
| **High Channel (5825 MHz)-Above 1G** | | | | | | | |
| V | 6039.062 | 73.73 | -18.93 | 54.80 | 68.20 | -13.40 | PK |
| V | 6039.062 | 59.25 | -18.93 | 40.32 | 54.00 | -13.68 | AV |
| V | 11650.120 | 60.02 | -8.92 | 51.10 | 74.00 | -22.90 | PK |
| V | 11650.120 | 49.19 | -8.92 | 40.27 | 54.00 | -13.73 | AV |
| V | 17475.040 | 55.50 | -1.86 | 53.64 | 68.20 | -14.56 | PK |
| V | 17475.040 | 44.93 | -1.86 | 43.07 | 54.00 | -10.93 | AV |
| H | 6039.037 | 71.31 | -18.93 | 52.38 | 68.20 | -15.82 | PK |
| H | 6039.037 | 59.72 | -18.93 | 40.79 | 54.00 | -13.21 | AV |
| H | 11650.064 | 60.92 | -8.92 | 52.00 | 74.00 | -22.00 | PK |
| H | 11650.064 | 49.88 | -8.92 | 40.96 | 54.00 | -13.04 | AV |
| H | 17475.097 | 55.41 | -1.86 | 53.55 | 68.20 | -14.65 | PK |
| H | 17475.097 | 44.23 | -1.86 | 42.37 | 54.00 | -11.63 | AV |

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

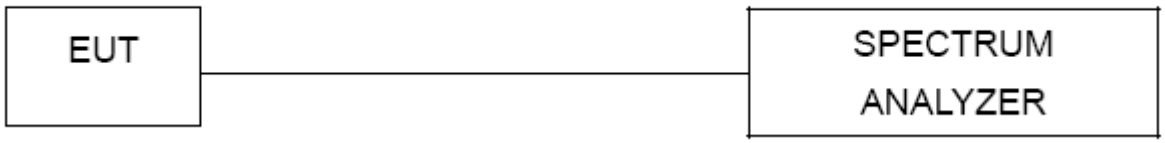
| Test Mode: | TX(5.8G) - 802.11n-HT40 |
|---|---|

| Polar (H/V) | Frequency (MHz) | Reading Level (dBuV/m) | Correct Factor (dB) | Measurement (dBuV/m) | Limits (dBuV/m) | Over (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| **Low Channel (5755 MHz)-Above 1G** | | | | | | | |
| V | 4679.156 | 74.85 | -20.24 | 54.61 | 74.00 | -19.39 | PK |
| V | 4679.156 | 59.84 | -20.24 | 39.60 | 54.00 | -14.40 | AV |
| V | 11510.094 | 64.15 | -8.81 | 55.34 | 74.00 | -18.66 | PK |
| V | 11510.094 | 49.16 | -8.81 | 40.35 | 54.00 | -13.65 | AV |
| V | 17265.103 | 56.13 | -3.01 | 53.12 | 68.20 | -15.08 | PK |
| V | 17265.103 | 44.51 | -3.01 | 41.50 | 54.00 | -12.50 | AV |
| H | 4679.021 | 70.19 | -20.24 | 49.95 | 74.00 | -24.05 | PK |
| H | 4679.021 | 59.92 | -20.24 | 39.68 | 54.00 | -14.32 | AV |
| H | 11510.115 | 64.06 | -8.81 | 55.25 | 74.00 | -18.75 | PK |
| H | 11510.115 | 49.87 | -8.81 | 41.06 | 54.00 | -12.94 | AV |
| H | 17265.099 | 56.57 | -3.01 | 53.56 | 68.20 | -14.64 | PK |
| H | 17265.099 | 44.70 | -3.01 | 41.69 | 54.00 | -12.31 | AV |
| **High Channel (5795 MHz)-Above 1G** | | | | | | | |
| V | 6039.183 | 74.81 | -18.93 | 55.88 | 68.20 | -12.32 | PK |
| V | 6039.183 | 59.10 | -18.93 | 40.17 | 54.00 | -13.83 | AV |
| V | 11590.094 | 60.37 | -8.87 | 51.50 | 74.00 | -22.50 | PK |
| V | 11590.094 | 49.11 | -8.87 | 40.24 | 54.00 | -13.76 | AV |
| V | 17385.171 | 55.13 | -2.35 | 52.78 | 68.20 | -15.42 | PK |
| V | 17385.171 | 44.21 | -2.35 | 41.86 | 54.00 | -12.14 | AV |
| H | 6039.191 | 73.77 | -18.93 | 54.84 | 68.20 | -13.36 | PK |
| H | 6039.191 | 59.71 | -18.93 | 40.78 | 54.00 | -13.22 | AV |
| H | 11590.142 | 62.39 | -8.87 | 53.52 | 74.00 | -20.48 | PK |
| H | 11590.142 | 49.23 | -8.87 | 40.36 | 54.00 | -13.64 | AV |
| H | 17385.008 | 59.95 | -2.35 | 57.60 | 68.20 | -10.60 | PK |
| H | 17385.008 | 44.09 | -2.35 | 41.74 | 54.00 | -12.26 | AV |

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

# 8. Power Spectral Density Test

## 8.1 Block Diagram Of Test Setup




## 8.2 Limit

For the band 5.15-5.25 GHz,
(i)For an outdoor Wifi Repeater operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor Wifi Repeater operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point Wifi Repeaters operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional
gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 8.3 Test procedure

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:
a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

## 8.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 8.5 Test Result

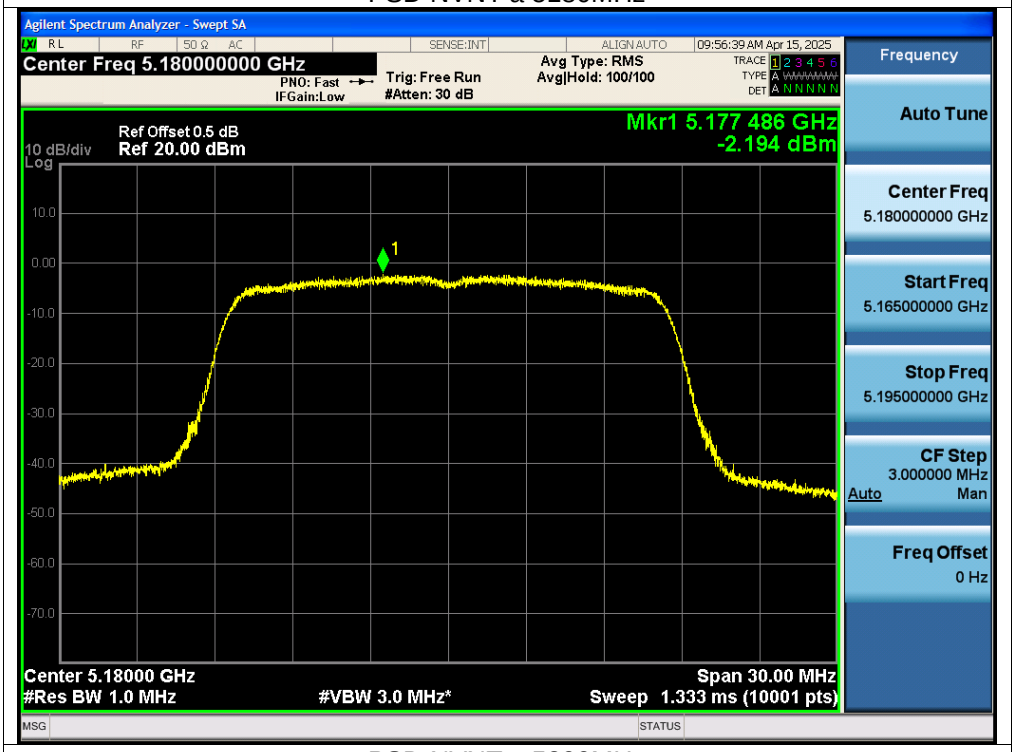
| | | | |
|---|---|---|---|
| Temperature: | 26 ℃ | Relative Humidity: | 54%RH |
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | (5180-5240MHz); (5745-5825MHz) | | |

| Condition | Mode | Frequency (MHz) | Conducted PSD (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|
| NVNT | a | 5180 | -2.19 | 11 | Pass |
| NVNT | a | 5200 | -2.76 | 11 | Pass |
| NVNT | a | 5240 | -3.03 | 11 | Pass |
| NVNT | n20 | 5180 | -3.14 | 11 | Pass |
| NVNT | n20 | 5200 | -3.06 | 11 | Pass |
| NVNT | n20 | 5240 | -3.27 | 11 | Pass |
| NVNT | n40 | 5190 | -7.98 | 11 | Pass |
| NVNT | n40 | 5230 | -8.32 | 11 | Pass |

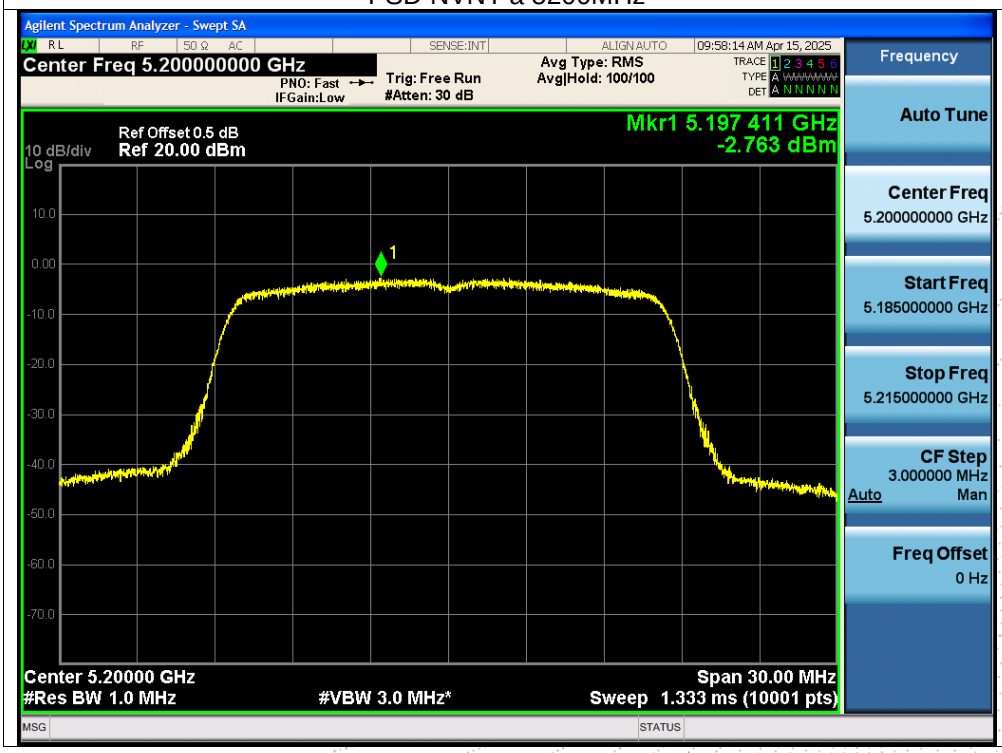
| Condition | Mode | Frequency (MHz) | Conducted PSD (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|
| NVNT | a | 5745 | -2.31 | 30 | Pass |
| NVNT | a | 5785 | -3.19 | 30 | Pass |
| NVNT | a | 5825 | -4.39 | 30 | Pass |
| NVNT | n20 | 5745 | -2.87 | 30 | Pass |
| NVNT | n20 | 5785 | -3.45 | 30 | Pass |
| NVNT | n20 | 5825 | -4.46 | 30 | Pass |
| NVNT | n40 | 5755 | -7.83 | 30 | Pass |
| NVNT | n40 | 5795 | -8.16 | 30 | Pass |

Test Graphs

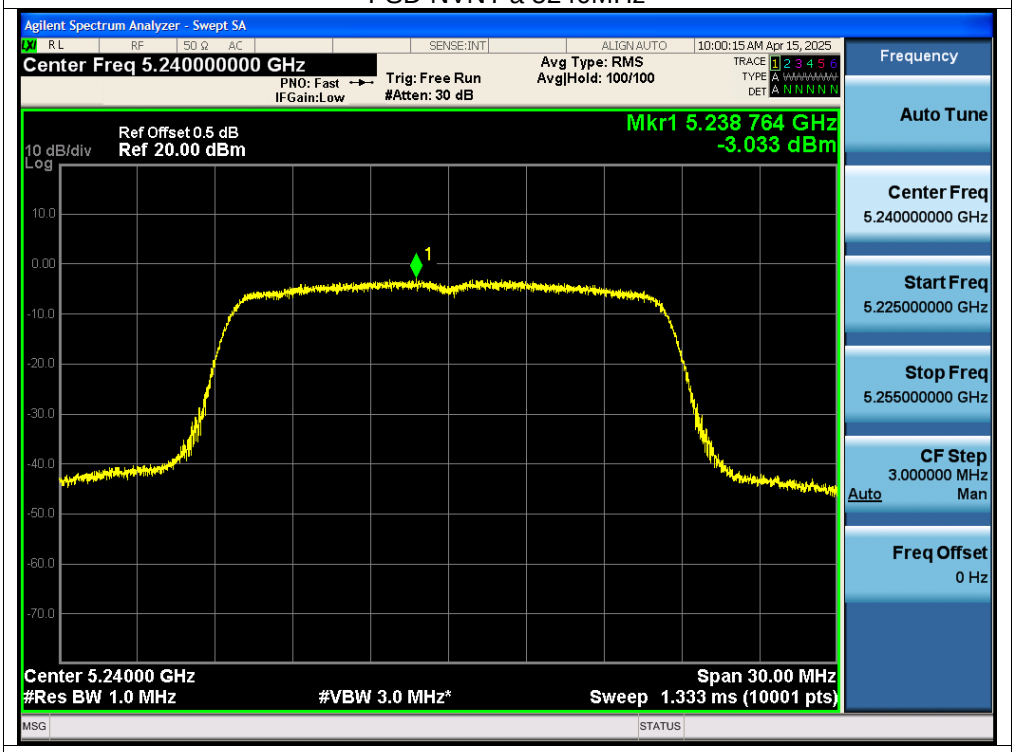
PSD NVNT a 5180MHz



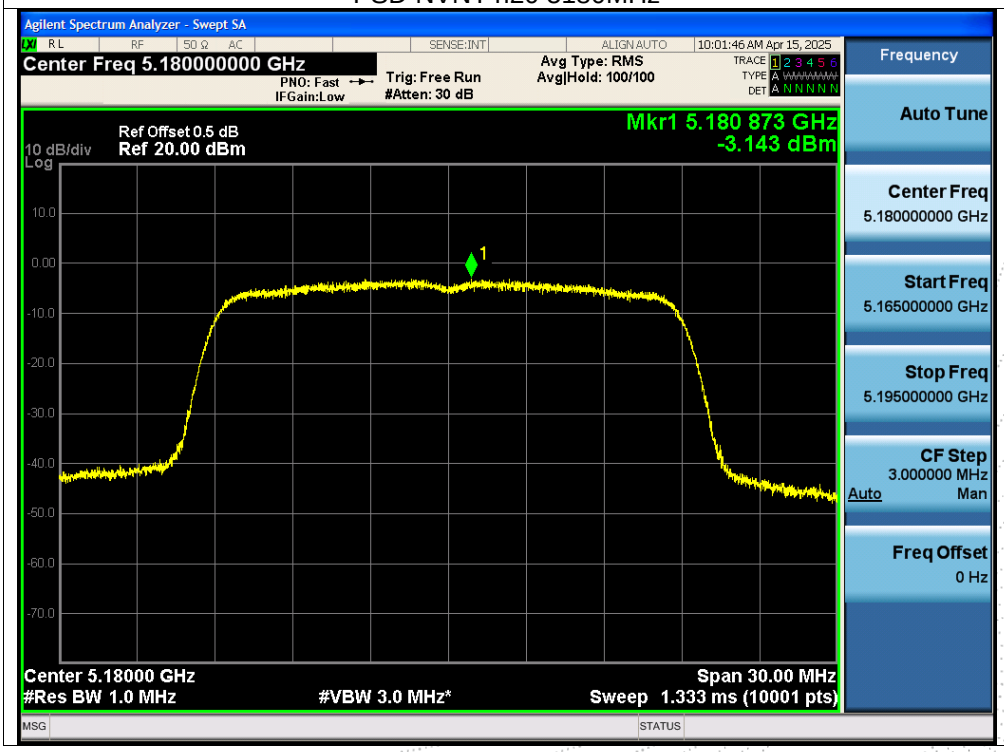

PSD NVNT a 5200MHz



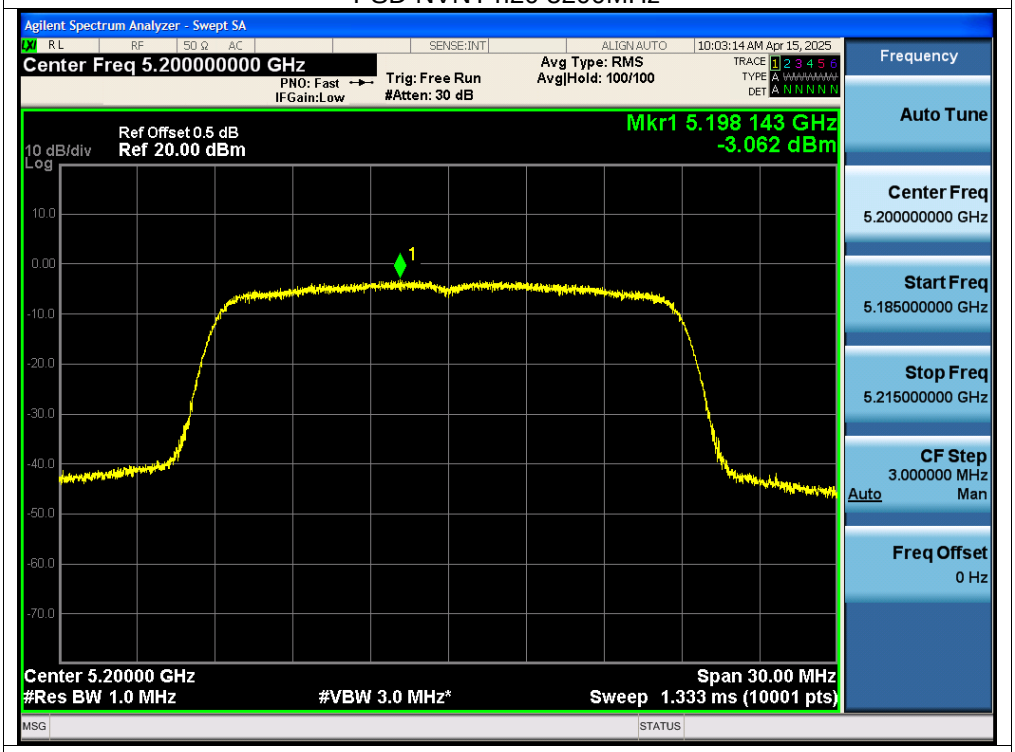
PSD NVNT a 5240MHz



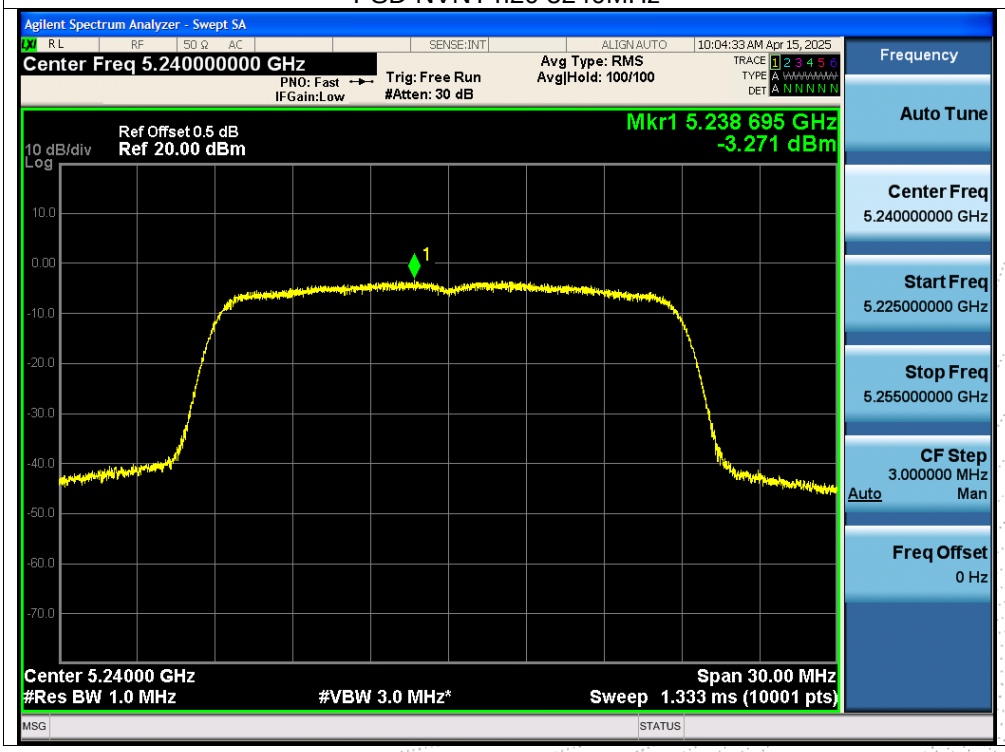

PSD NVNT n20 5180MHz



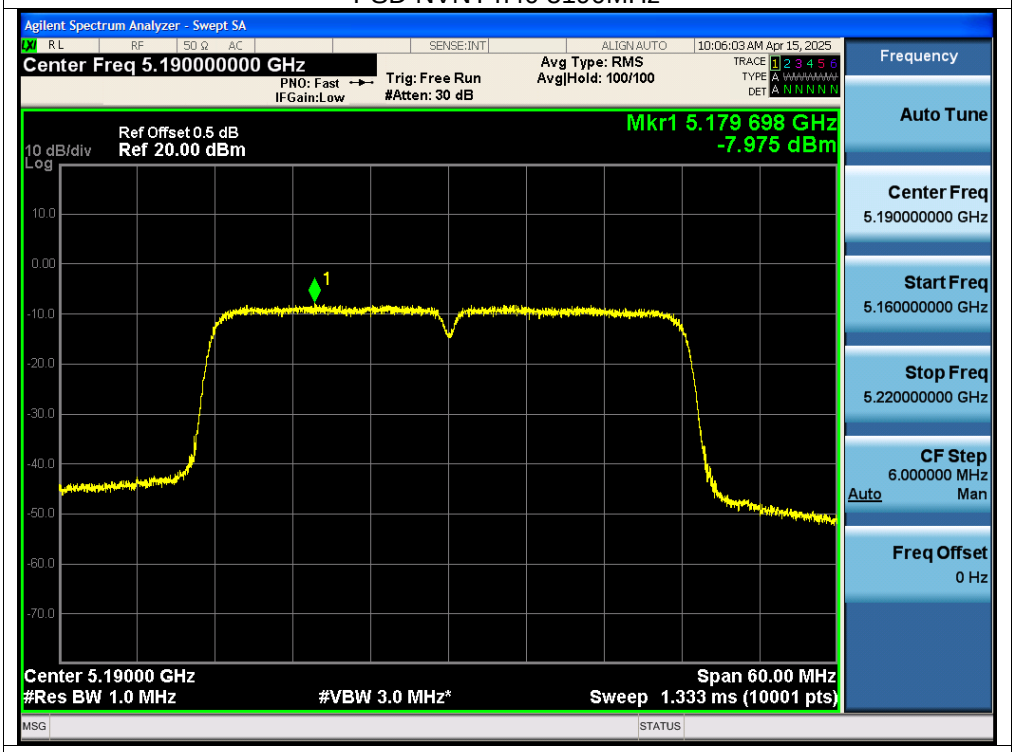
PSD NVNT n20 5200MHz



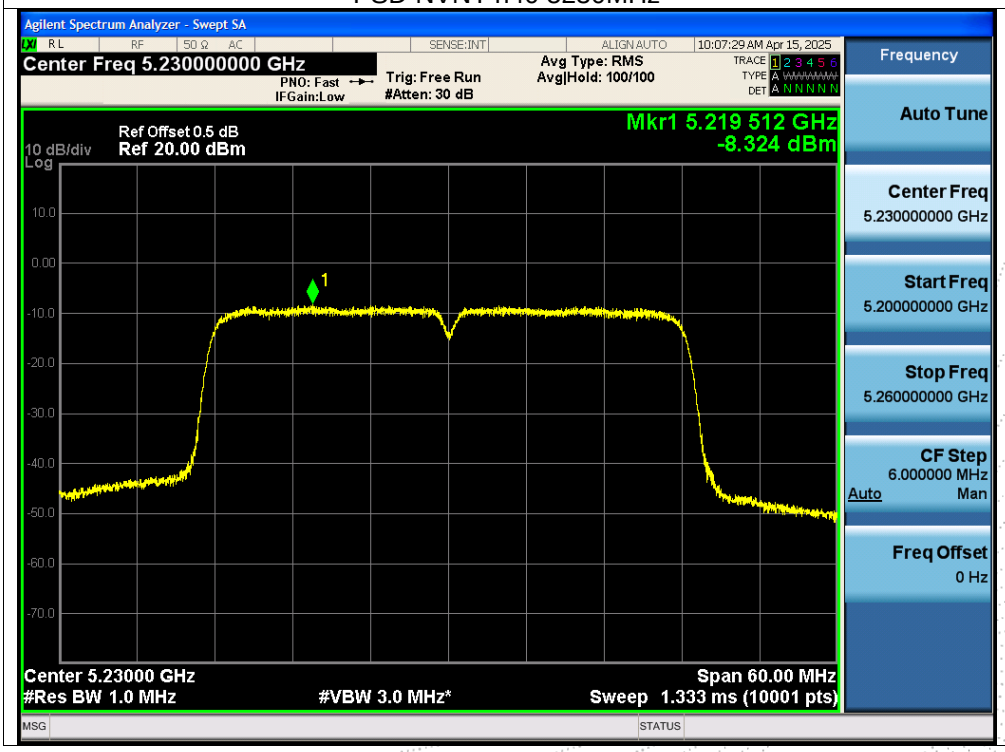

PSD NVNT n20 5240MHz



PSD NVNT n40 5190MHz

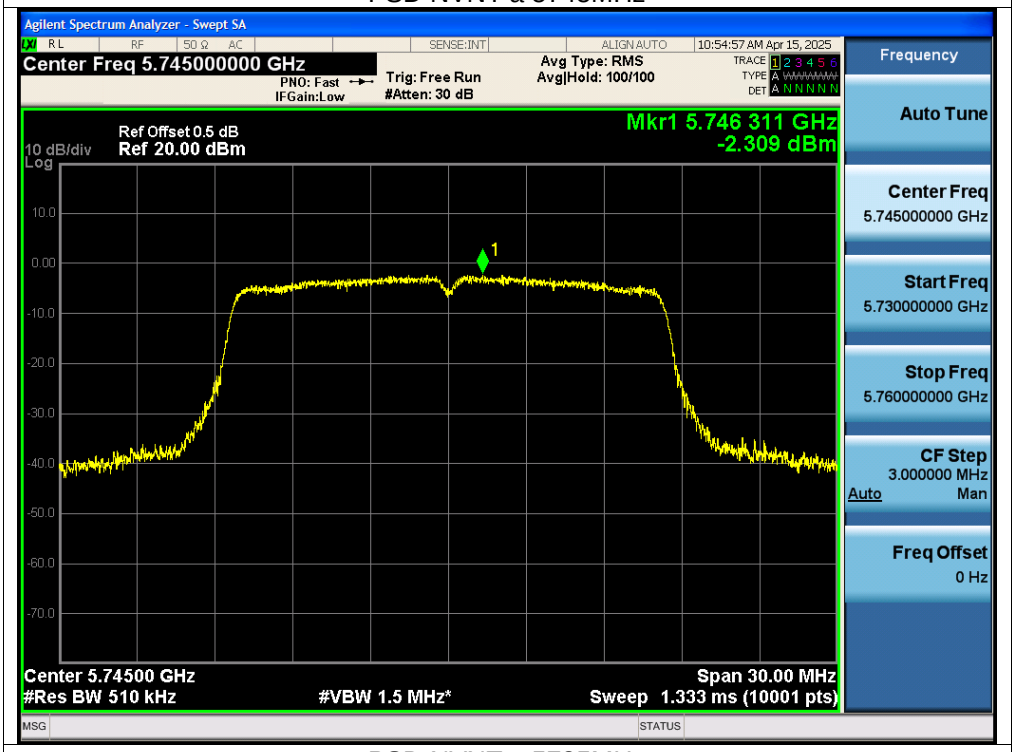



PSD NVNT n40 5230MHz

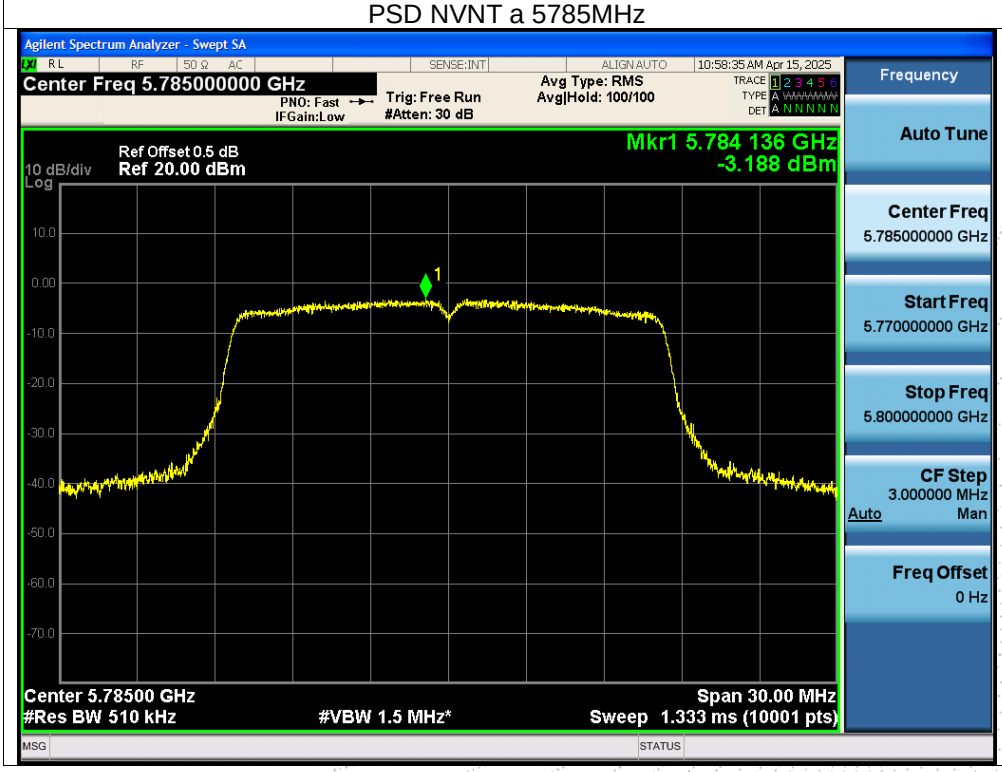


Test Graphs

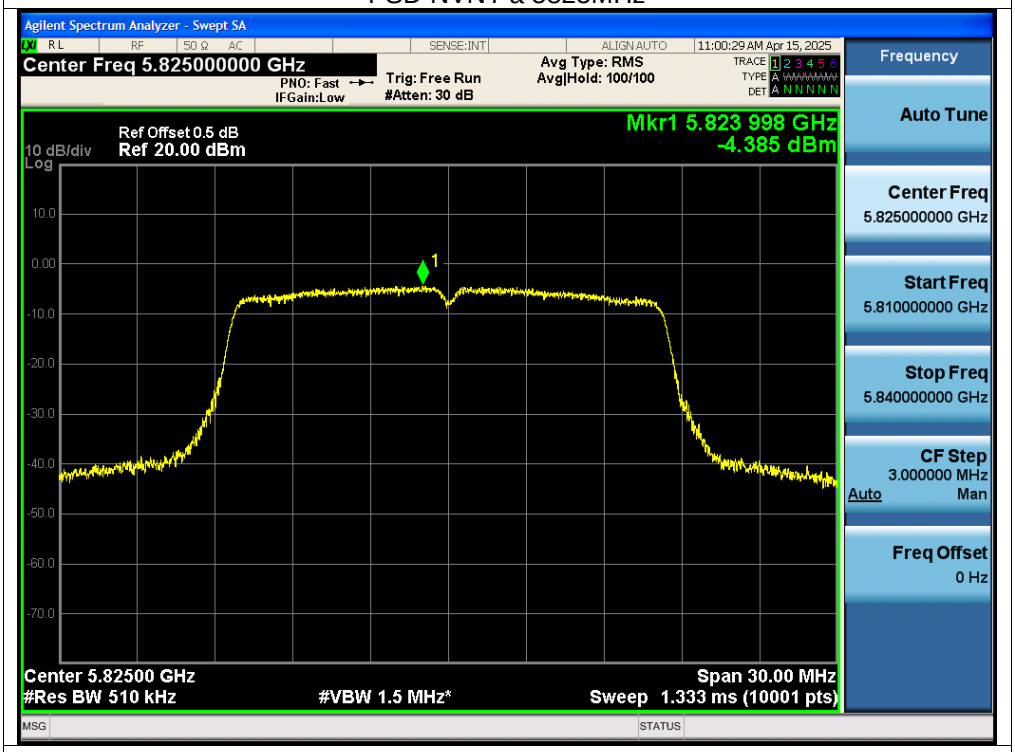
PSD NVNT a 5745MHz



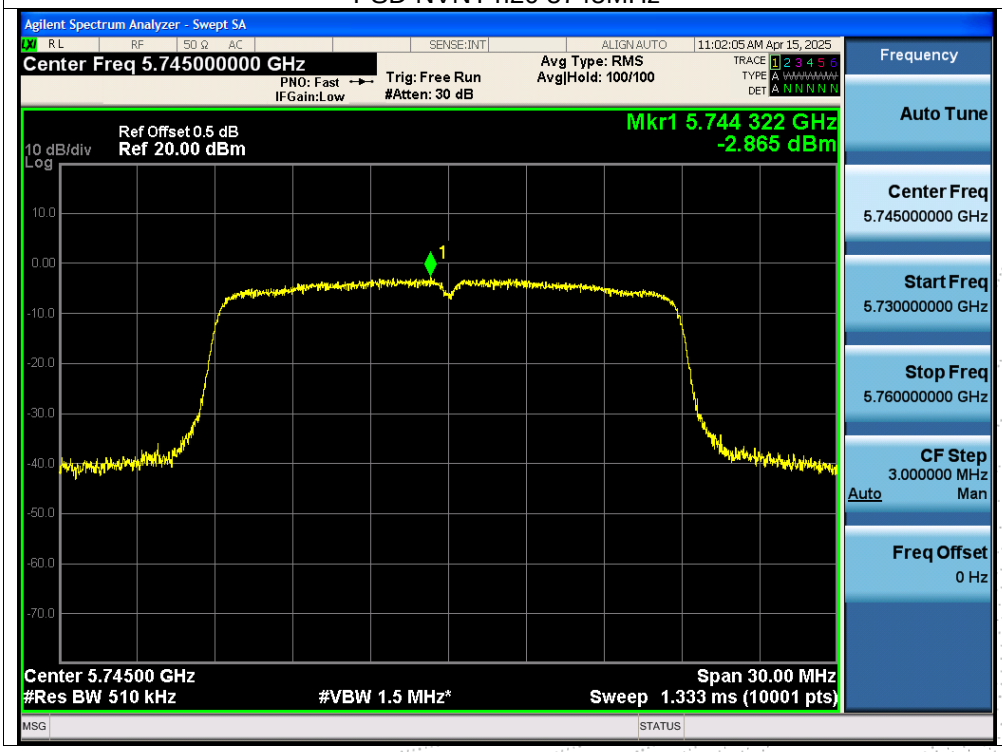

PSD NVNT a 5785MHz



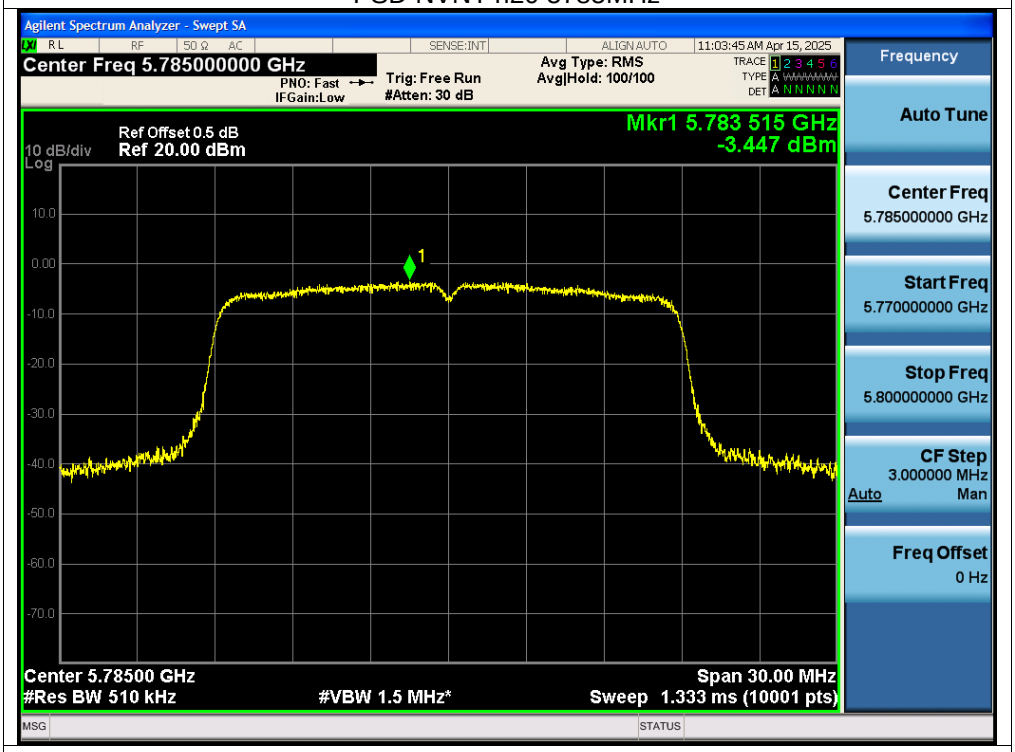
PSD NVNT a 5825MHz



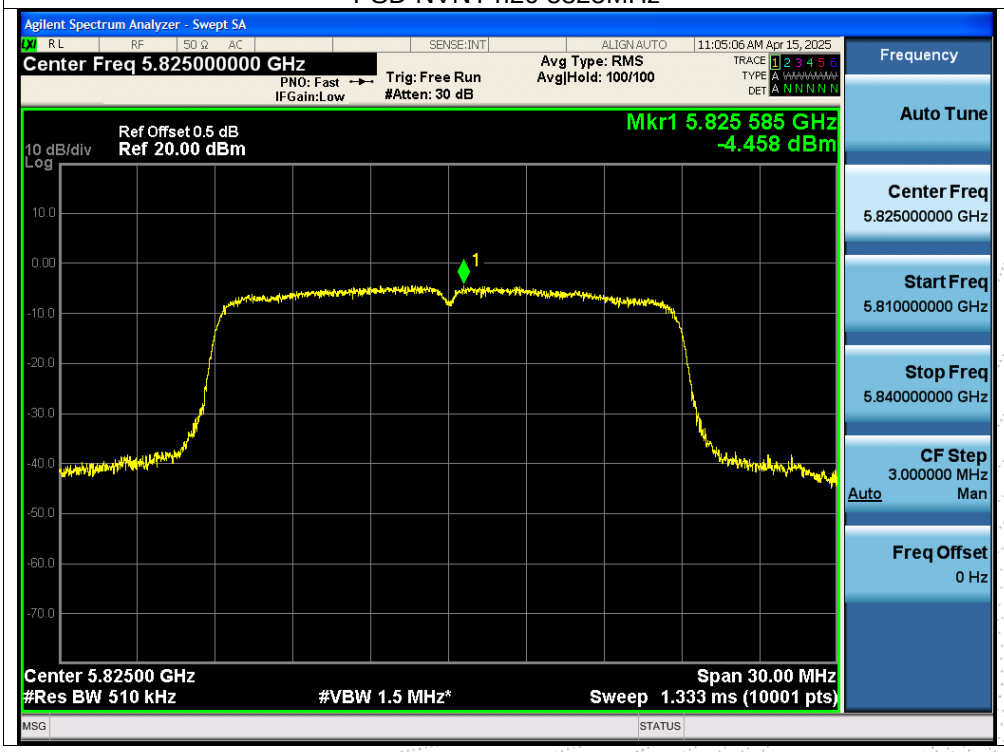

PSD NVNT n20 5745MHz



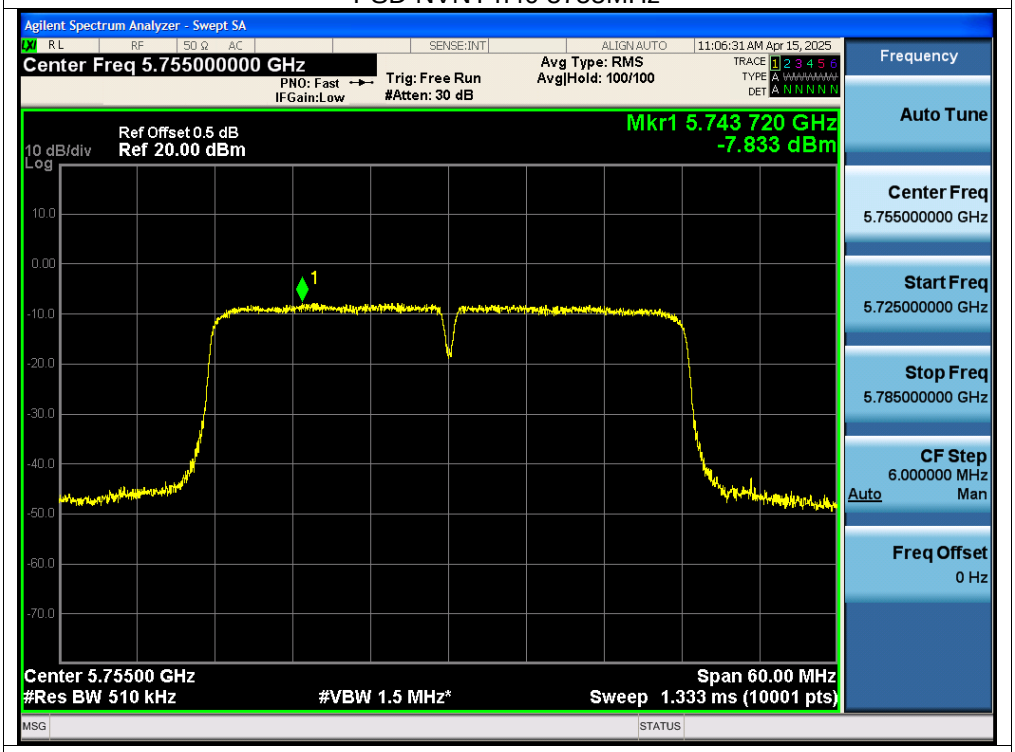
PSD NVNT n20 5785MHz



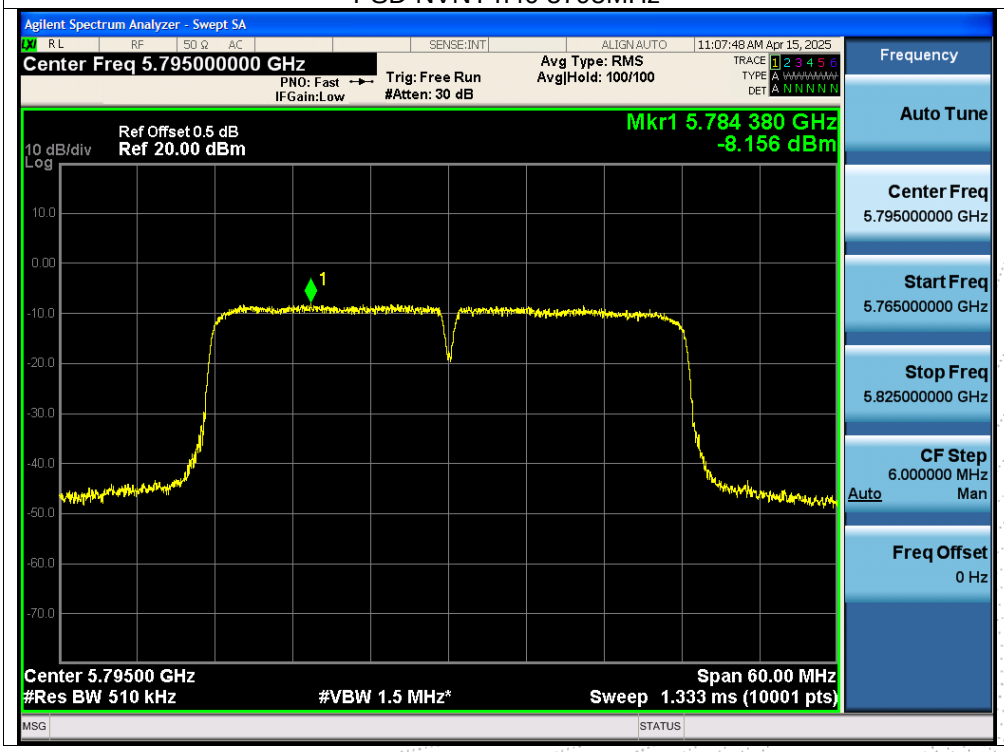

PSD NVNT n20 5825MHz



PSD NVNT n40 5755MHz

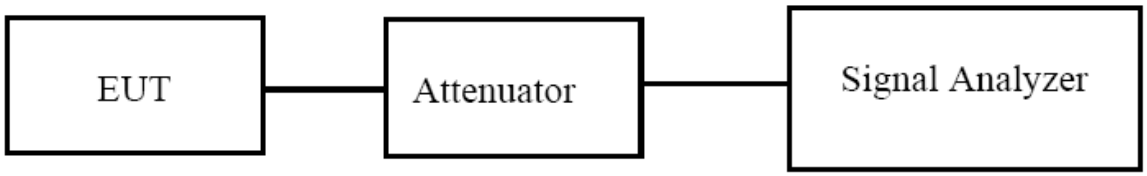



PSD NVNT n40 5795MHz



# 9. 26dB & 6dB & 99% Emission Bandwidth

## 9.1 Block Diagram Of Test Setup




## 9.2 Limit

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power
is integrated over the full reference bandwidth.

## 9.3 Test procedure

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

## 9.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 9.5 Test Result

| | | | |
|---|---|---|---|
| Temperature: | 26 ℃ | Relative Humidity: | 54%RH |
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | (5180-5240MHz) | | |

| Condition | Mode | Frequency (MHz) | -26 dB Bandwidth (MHz) |
|---|---|---|---|
| NVNT | a | 5180 | 18.99 |
| NVNT | a | 5200 | 18.75 |
| NVNT | a | 5240 | 18.90 |
| NVNT | n20 | 5180 | 19.19 |
| NVNT | n20 | 5200 | 19.44 |
| NVNT | n20 | 5240 | 19.45 |
| NVNT | n40 | 5190 | 38.93 |
| NVNT | n40 | 5230 | 38.87 |

| Condition | Mode | Frequency (MHz) | 99% OBW (MHz) |
|---|---|---|---|
| NVNT | a | 5180 | 16.37 |
| NVNT | a | 5200 | 16.38 |
| NVNT | a | 5240 | 16.35 |
| NVNT | n20 | 5180 | 17.41 |
| NVNT | n20 | 5200 | 17.40 |
| NVNT | n20 | 5240 | 17.41 |
| NVNT | n40 | 5190 | 35.87 |
| NVNT | n40 | 5230 | 35.86 |

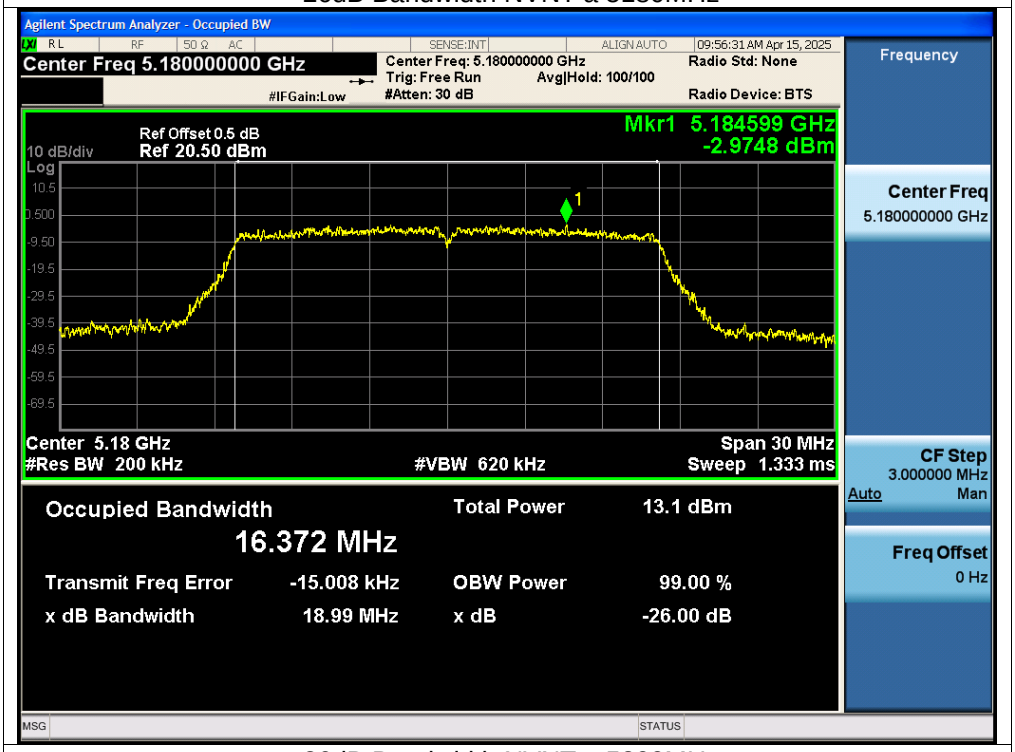
| Temperature: | 26 ℃ | Relative Humidity: | 54%RH |
|---|---|---|---|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | (5745-5825MHz) | | |

| Condition | Mode | Frequency (MHz) | -6 dB Bandwidth (MHz) |
|---|---|---|---|
| NVNT | a | 5745 | 16.39 |
| NVNT | a | 5785 | 16.30 |
| NVNT | a | 5825 | 15.90 |
| NVNT | n20 | 5745 | 17.33 |
| NVNT | n20 | 5785 | 16.93 |
| NVNT | n20 | 5825 | 17.33 |
| NVNT | n40 | 5755 | 35.28 |
| NVNT | n40 | 5795 | 35.33 |

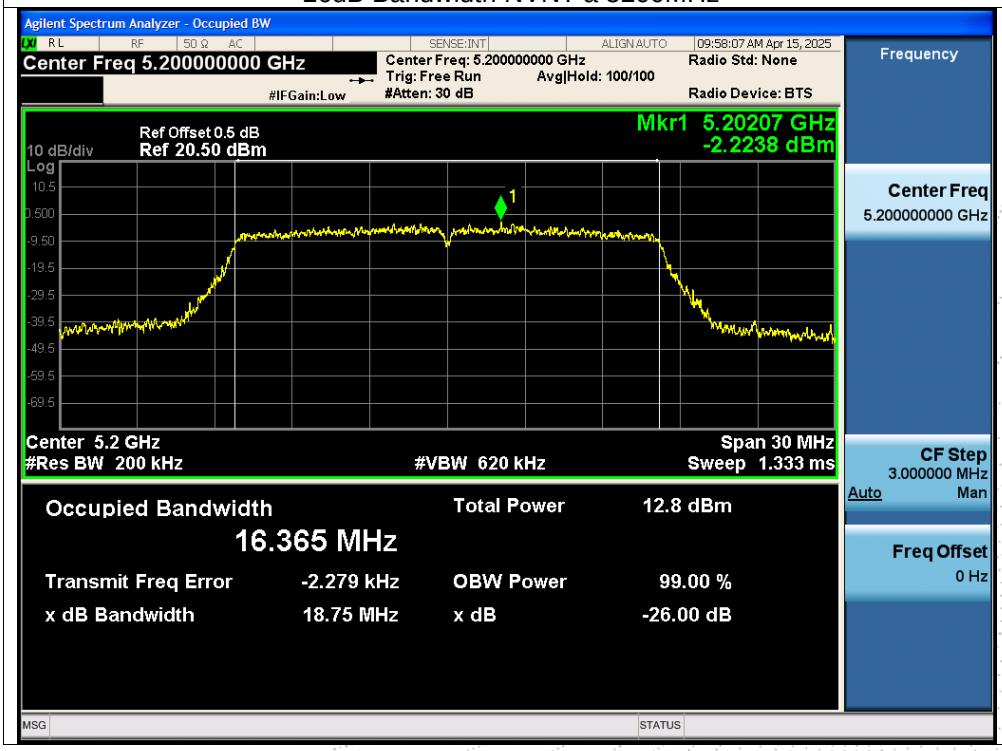
| Condition | Mode | Frequency (MHz) | 99% OBW (MHz) |
|---|---|---|---|
| NVNT | a | 5745 | 16.39 |
| NVNT | a | 5785 | 16.39 |
| NVNT | a | 5825 | 16.38 |
| NVNT | n20 | 5745 | 17.41 |
| NVNT | n20 | 5785 | 17.41 |
| NVNT | n20 | 5825 | 17.40 |
| NVNT | n40 | 5755 | 35.84 |
| NVNT | n40 | 5795 | 35.81 |

Test Graphs

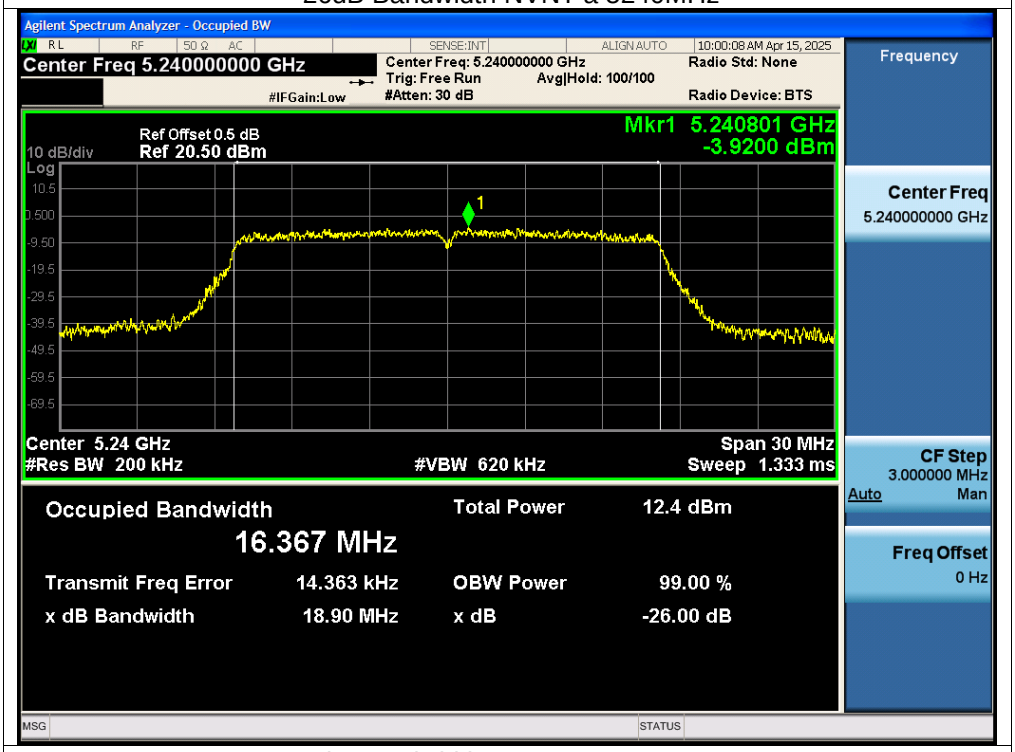
-26dB Bandwidth NVNT a 5180MHz



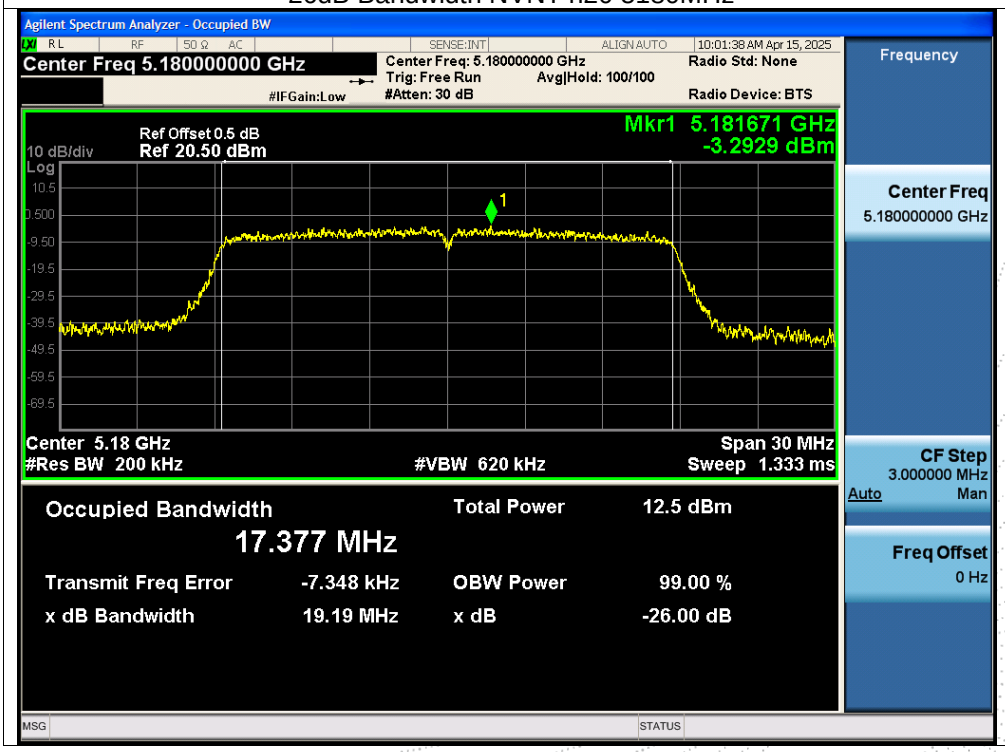

-26dB Bandwidth NVNT a 5200MHz



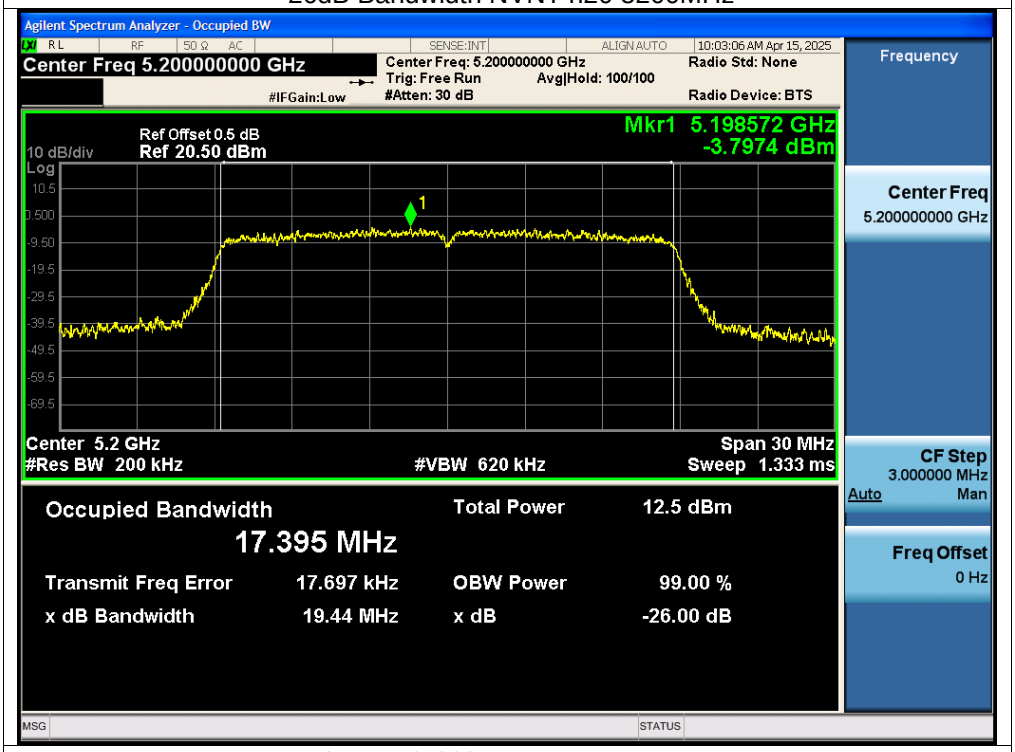
-26dB Bandwidth NVNT a 5240MHz



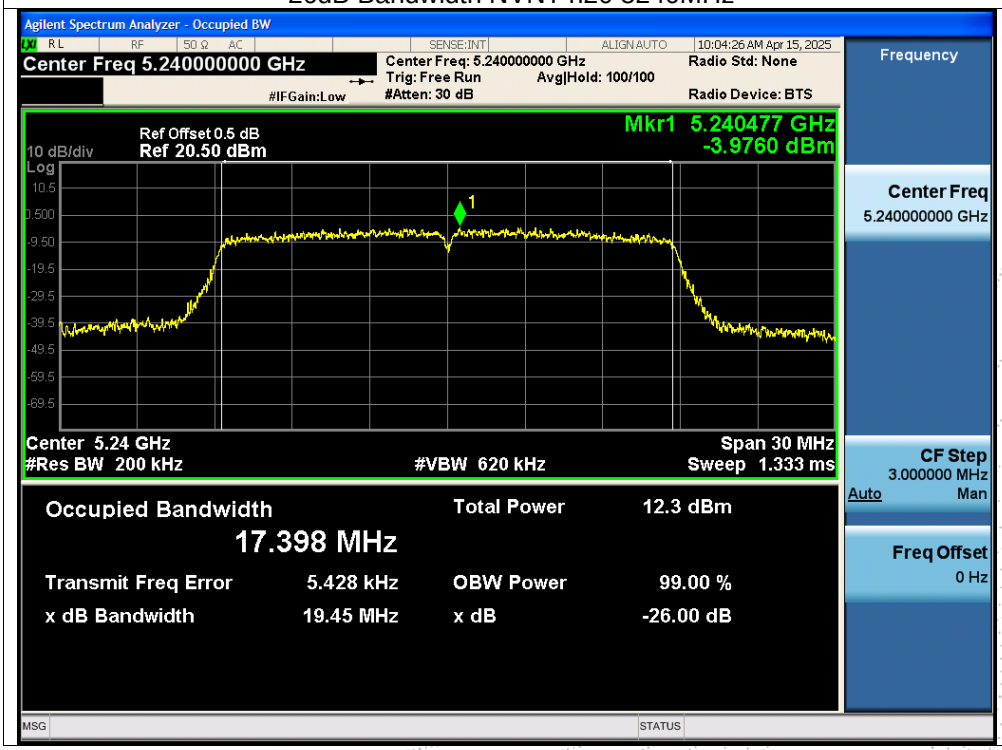

-26dB Bandwidth NVNT n20 5180MHz



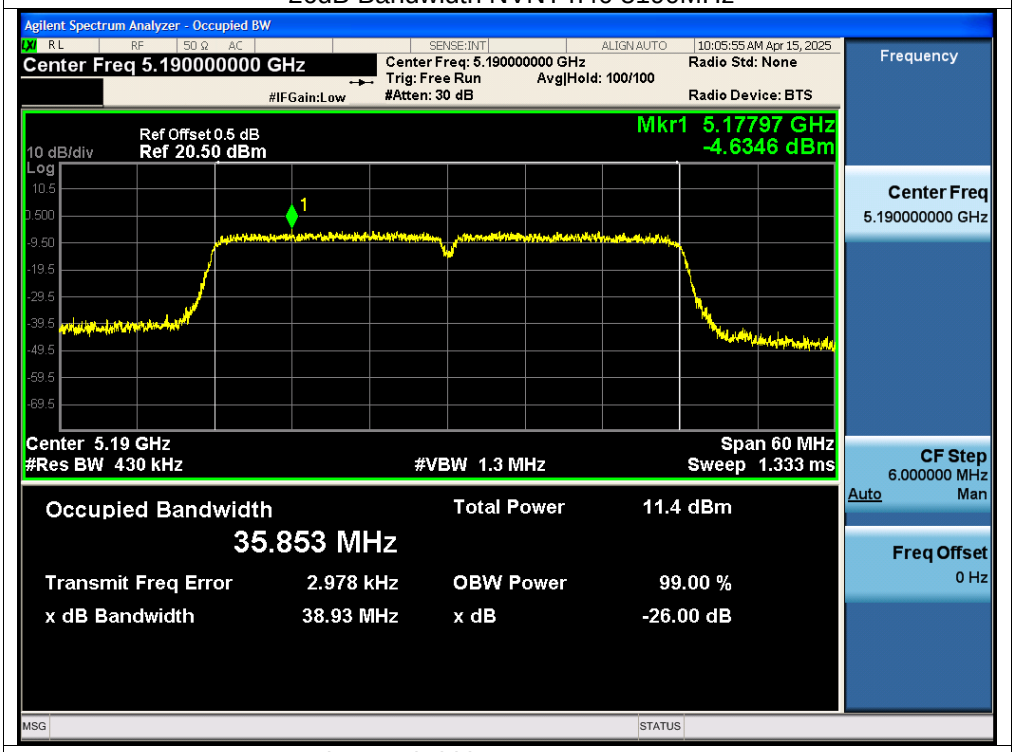
-26dB Bandwidth NVNT n20 5200MHz



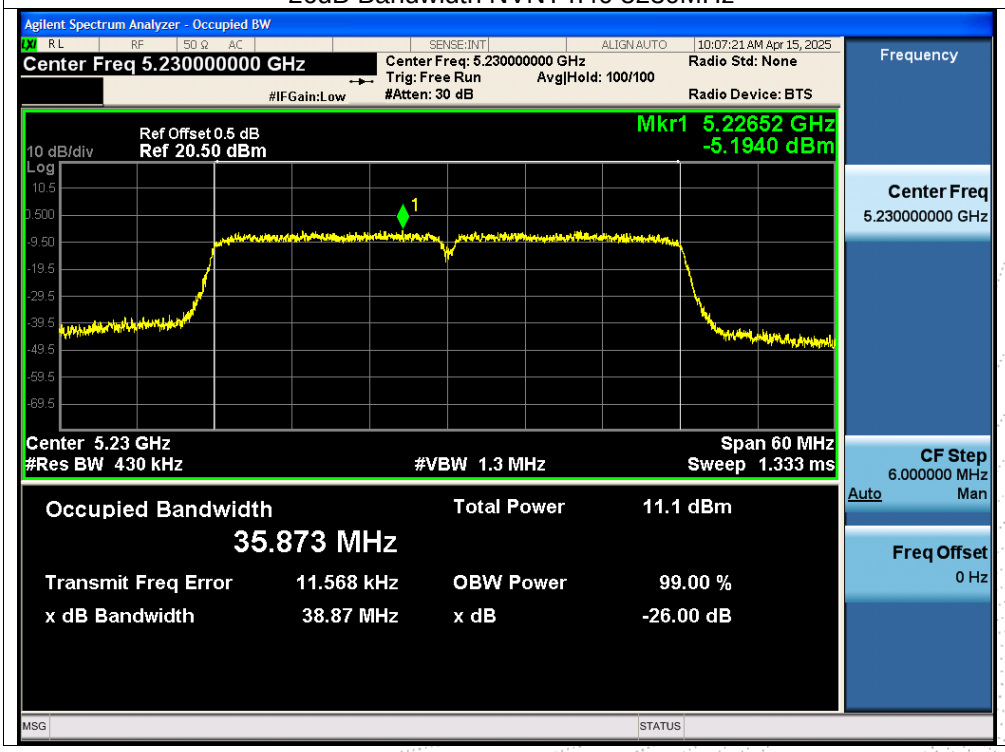

-26dB Bandwidth NVNT n20 5240MHz



-26dB Bandwidth NVNT n40 5190MHz

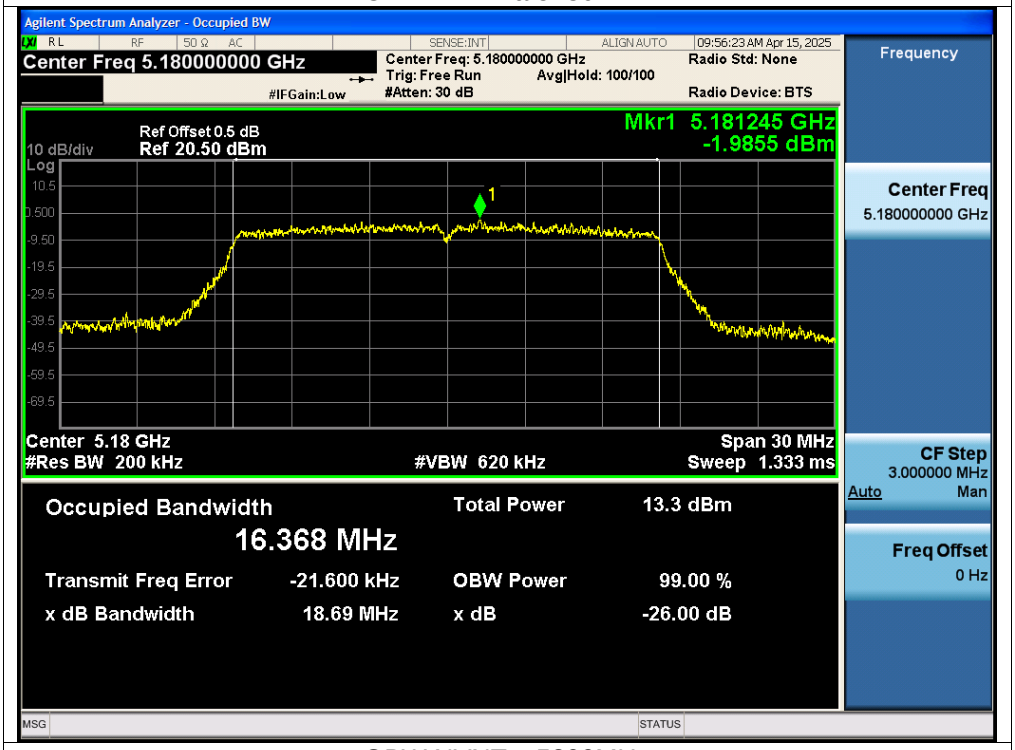



-26dB Bandwidth NVNT n40 5230MHz

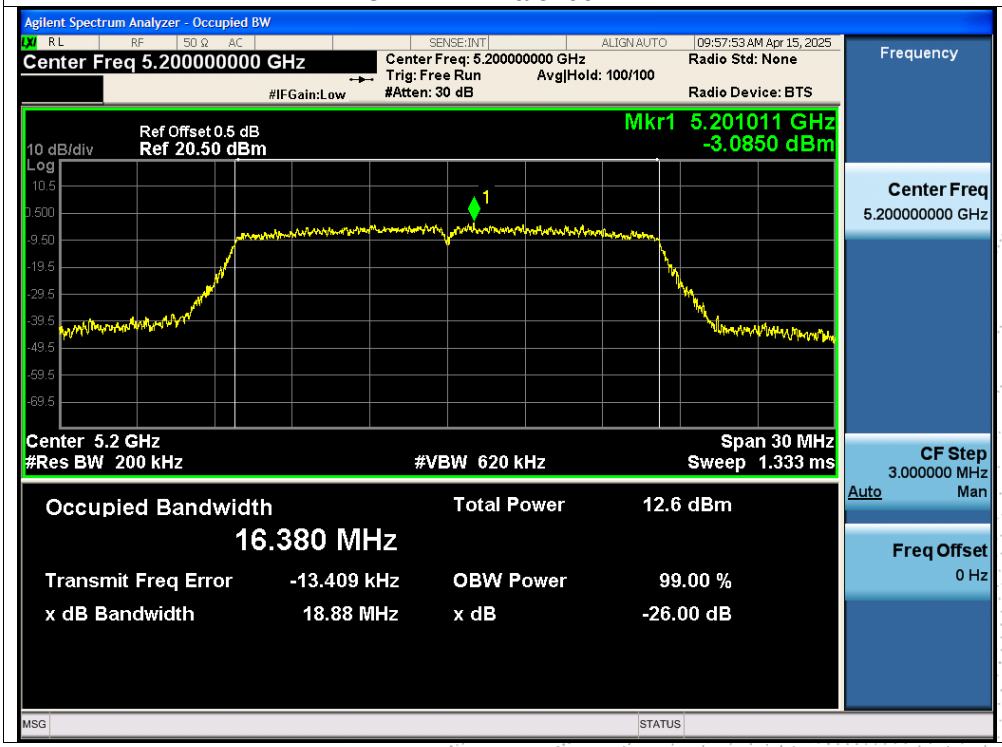


Test Graphs

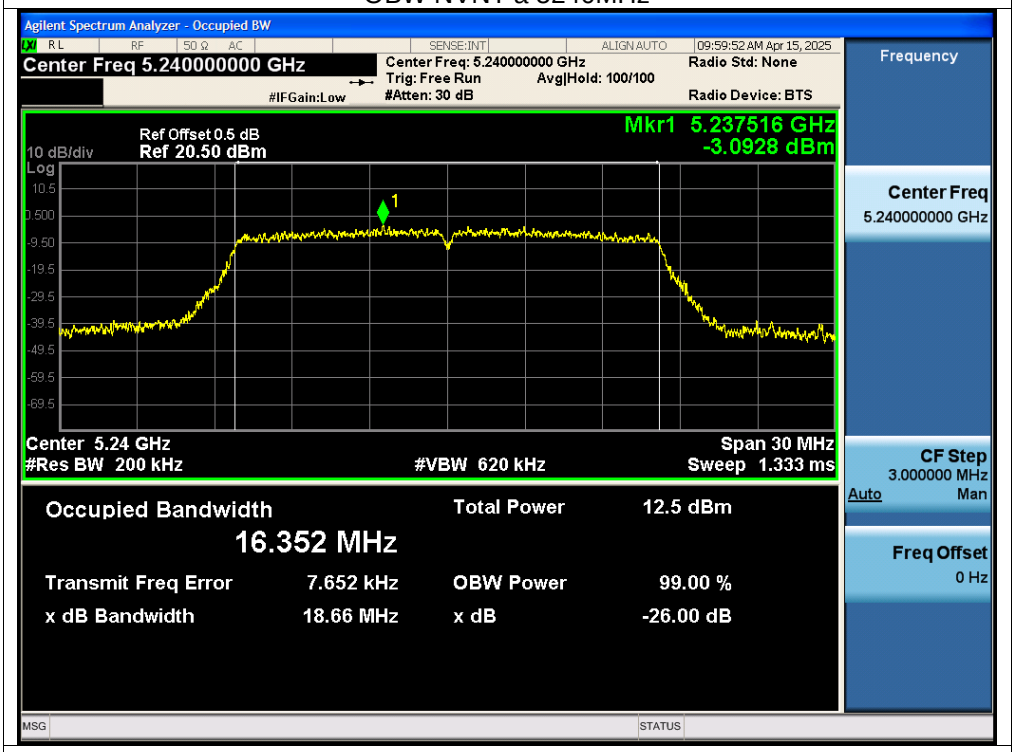
OBW NVNT a 5180MHz



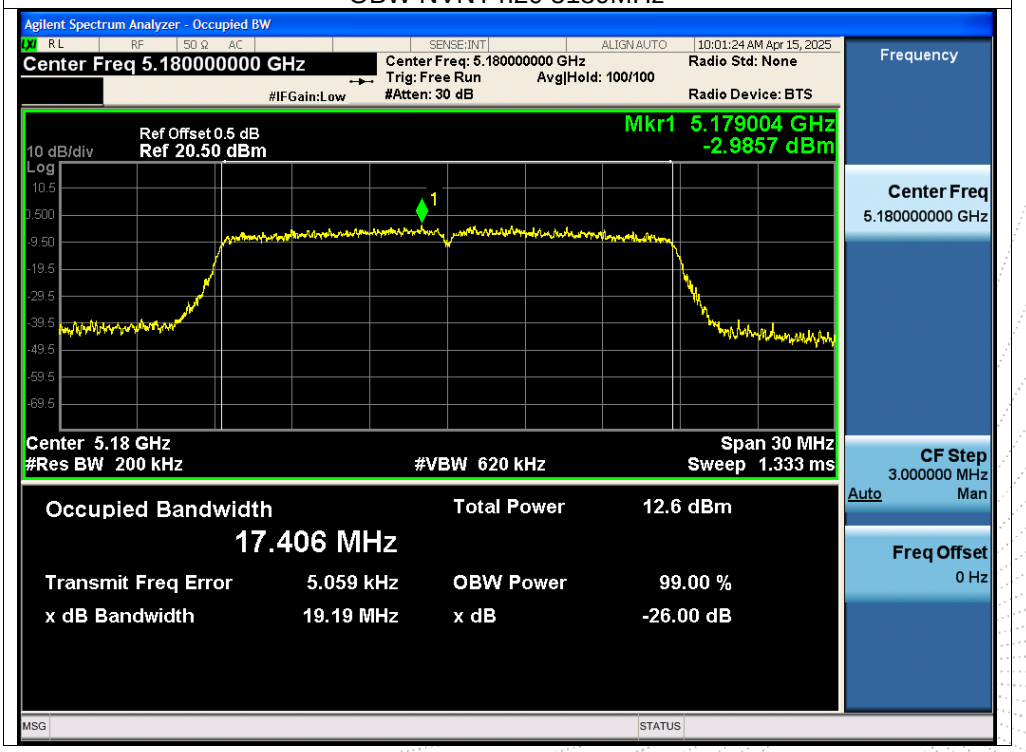

OBW NVNT a 5200MHz



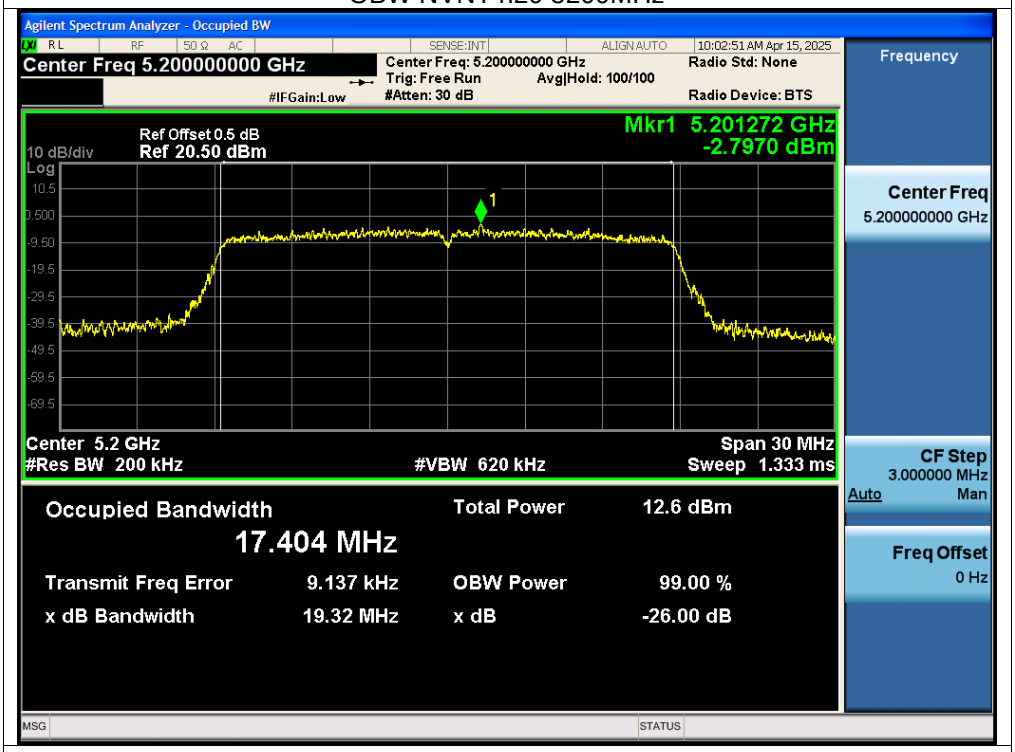
OBW NVNT a 5240MHz



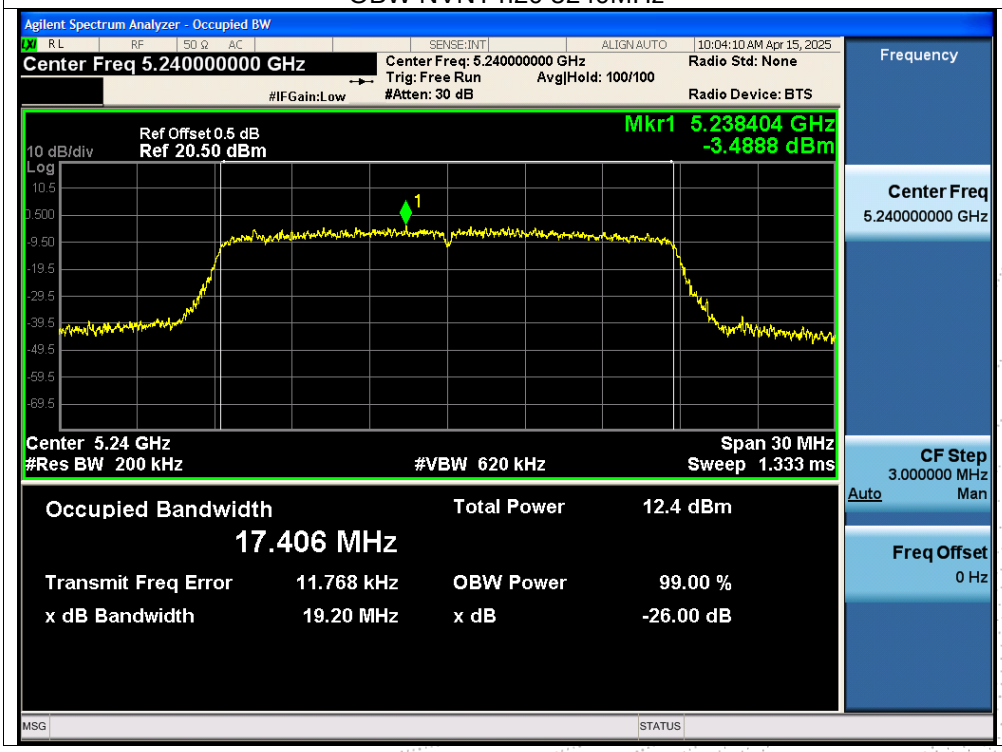

OBW NVNT n20 5180MHz



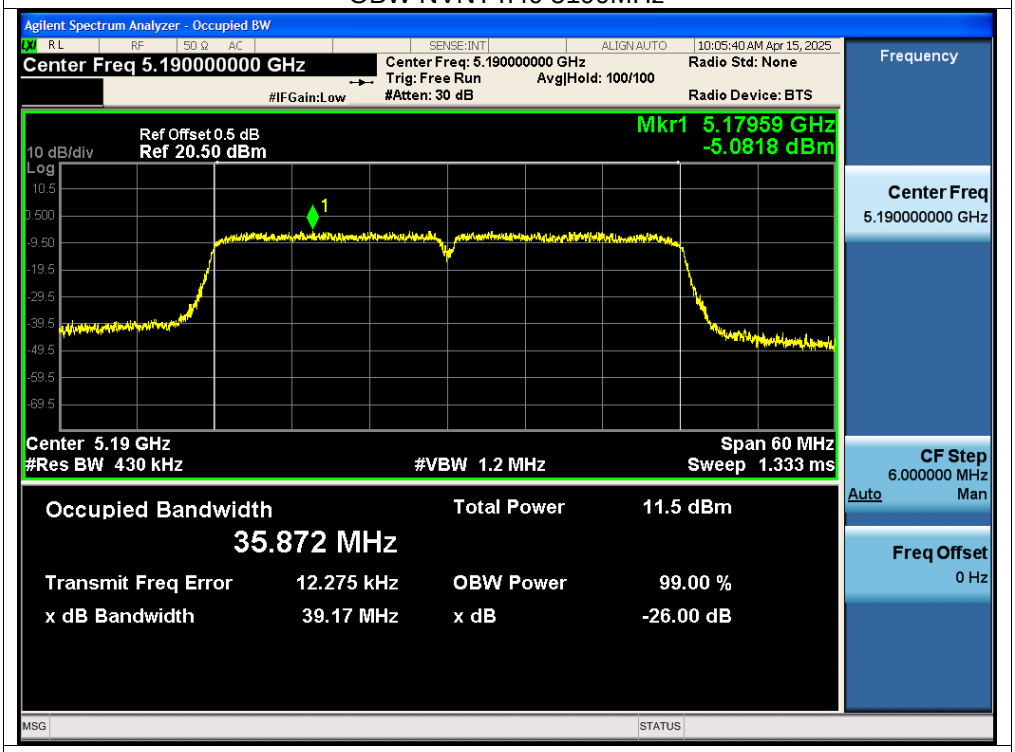
OBW NVNT n20 5200MHz



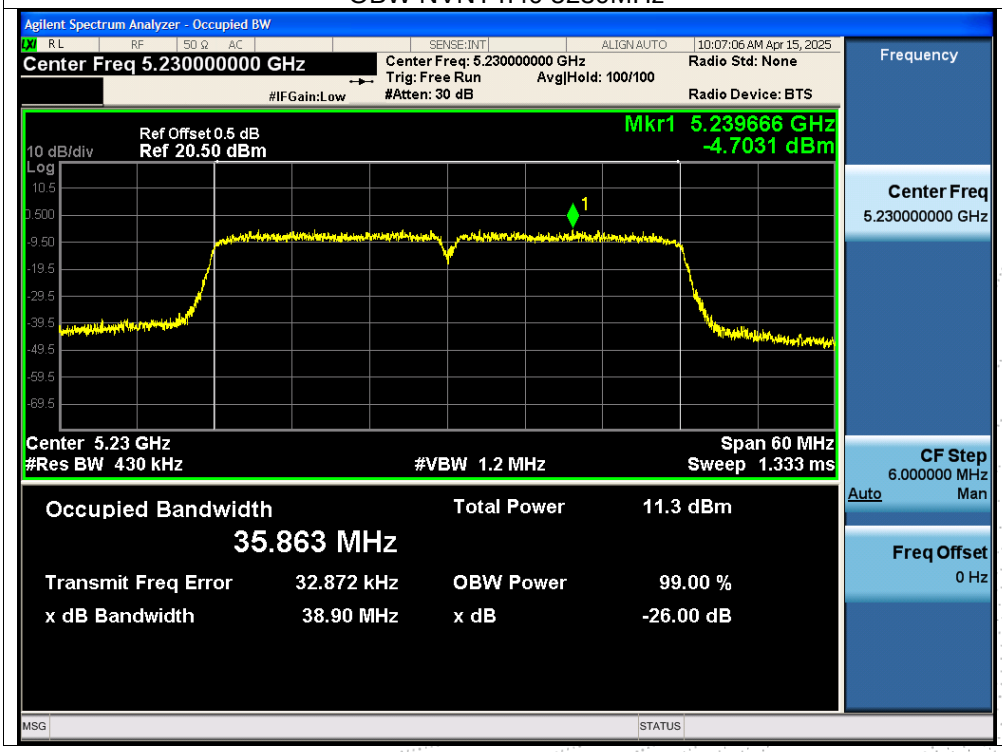

OBW NVNT n20 5240MHz



OBW NVNT n40 5190MHz

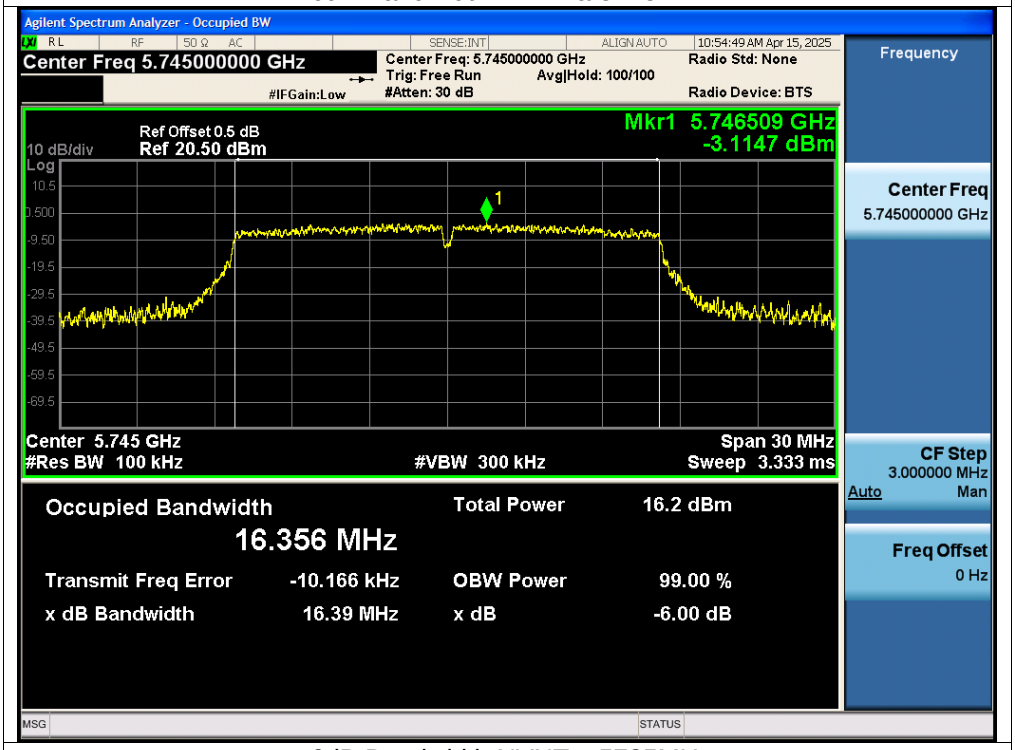



OBW NVNT n40 5230MHz

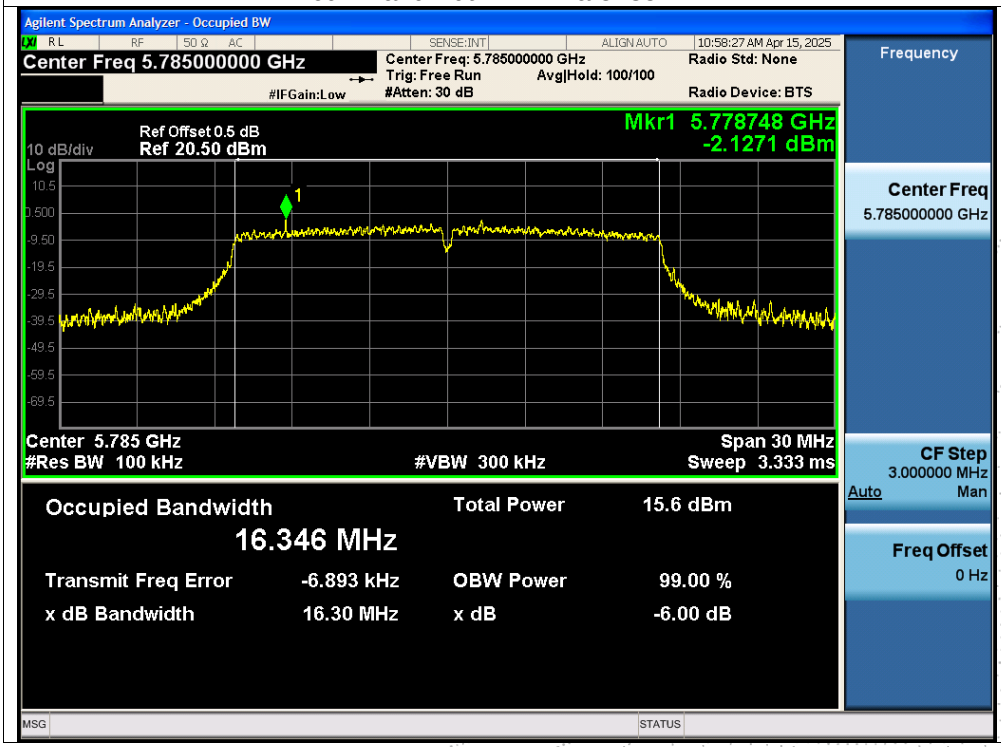


Test Graphs

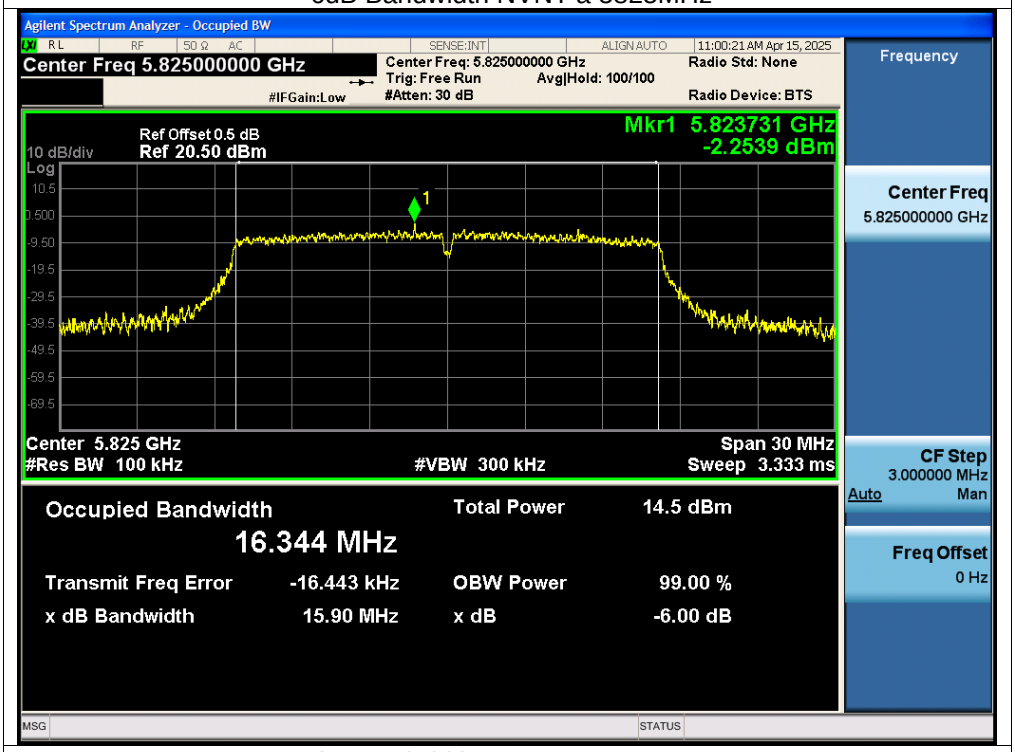
-6dB Bandwidth NVNT a 5745MHz




-6dB Bandwidth NVNT a 5785MHz



-6dB Bandwidth NVNT a 5825MHz




-6dB Bandwidth NVNT n20 5745MHz