

14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

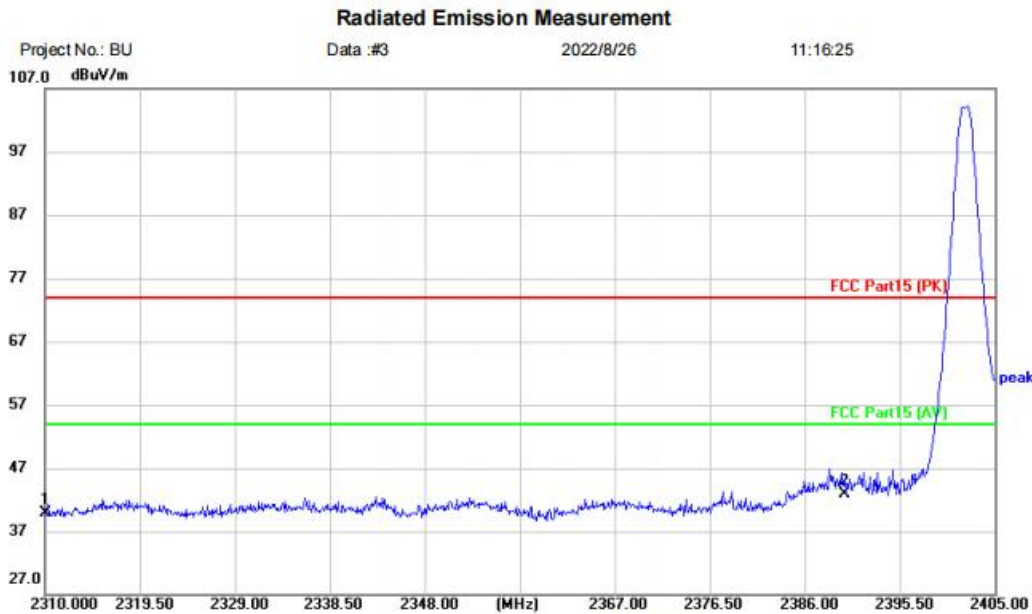
Remark 1: $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

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14.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Horizontal]



Site: Polarization: **Horizontal** Temperature: (C)
 Limit: FCC Part15 (PK) Power: Humidity: %RH
 EUT: HAYLOU RT3
 M/N: LS16
 Mode: BLE 1M TX-L
 Note:

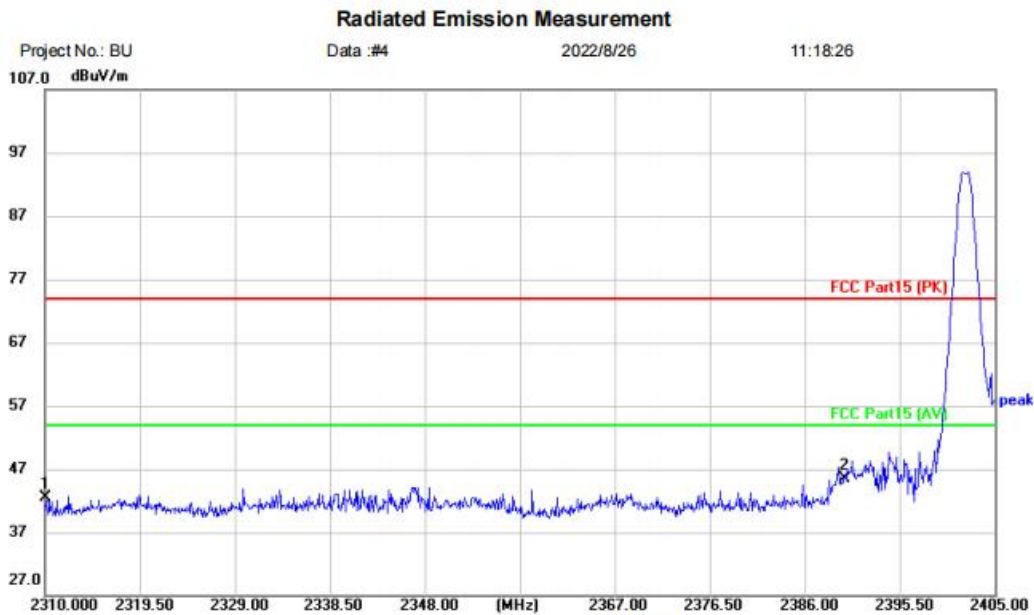
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Detector | Comment |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | |
| 1 | | 2310.000 | 42.96 | -3.02 | 39.94 | 74.00 | -34.06 | peak | |
| 2 | * | 2390.000 | 45.38 | -2.50 | 42.88 | 74.00 | -31.12 | peak | |

*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Vertical]



| | | |
|------------------------|-------------------------------|------------------|
| Site | Polarization: Vertical | Temperature: (C) |
| Limit: FCC Part15 (PK) | Power: | Humidity: %RH |
| EUT: HAYLOU RT3 | | |
| M/N: LS16 | | |
| Mode: BLE 1M TX-L | | |
| Note: | | |

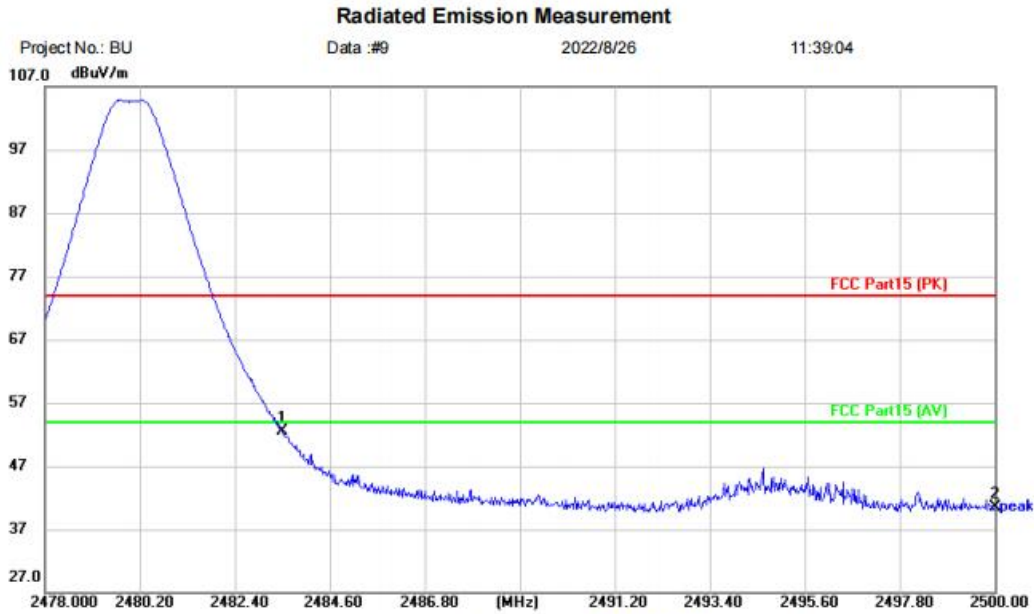
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB/m | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 2310.000 | 45.58 | -3.02 | 42.56 | 74.00 | -31.44 | peak | |
| 2 | * | 2390.000 | 47.91 | -2.50 | 45.41 | 74.00 | -28.59 | peak | |

*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode: TX High channel]; [Polarity: Horizontal]



| | | |
|------------------------|---------------------------------|------------------|
| Site | Polarization: Horizontal | Temperature: (C) |
| Limit: FCC Part15 (PK) | Power: | Humidity: %RH |
| EUT: HAYLOU RT3 | | |
| M/N: LS16 | | |
| Mode: BLE 1M TX-H | | |
| Note: | | |

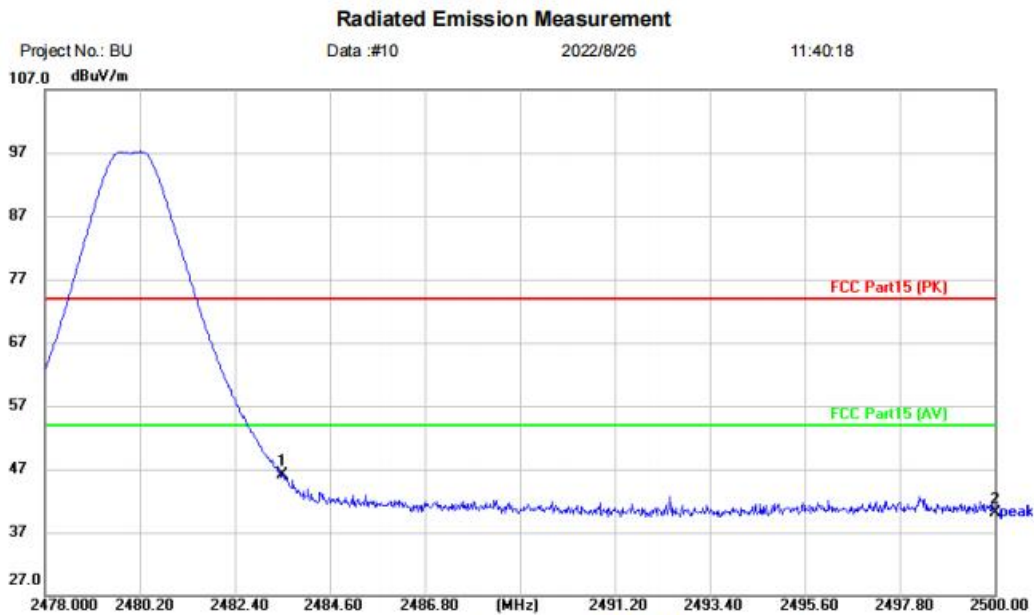
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Detector | Comment |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | |
| 1 | * | 2483.500 | 55.00 | -2.52 | 52.48 | 74.00 | -21.52 | peak | |
| 2 | | 2500.000 | 43.13 | -2.55 | 40.58 | 74.00 | -33.42 | peak | |

*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode: TX High channel]; [Polarity: Vertical]



| | | |
|------------------------|-------------------------------|------------------|
| Site | Polarization: Vertical | Temperature: (C) |
| Limit: FCC Part15 (PK) | Power: | Humidity: %RH |
| EUT: HAYLOU RT3 | | |
| M/N: LS16 | | |
| Mode: BLE 1M TX-H | | |
| Note: | | |

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Detector | Comment |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | |
| 1 | * | 2483.500 | 48.67 | -2.52 | 46.15 | 74.00 | -27.85 | peak | |
| 2 | | 2500.000 | 42.74 | -2.55 | 40.19 | 74.00 | -33.81 | peak | |

*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

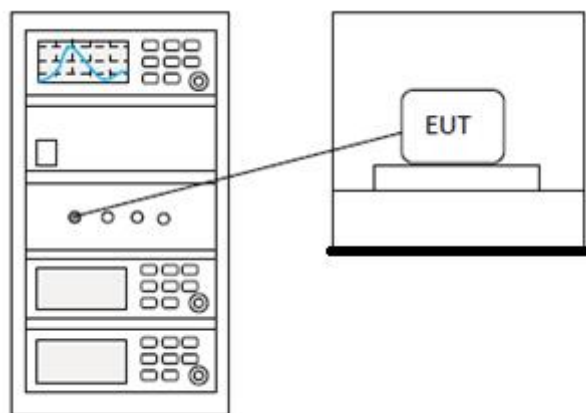
15 CONDUCTED SPURIOUS EMISSIONS

| | |
|------------------------|--|
| Test Standard | 47 CFR Part 15, Subpart C 15.247 |
| Test Method | ANSI C63.10 (2013) Section 7.8.6 & Section 11.11 |
| Test Mode (Pre-Scan) | TX |
| Test Mode (Final Test) | TX |
| Tester | Charlie |
| Temperature | 25°C |
| Humidity | 60% |

15.1 LIMITS

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

15.2 BLOCK DIAGRAM OF TEST SETUP



15.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

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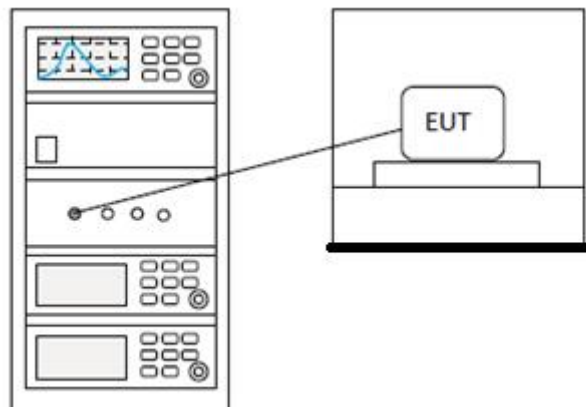
16 POWER SPECTRUM DENSITY

| | |
|------------------------|------------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.247 |
| Test Method | ANSI C63.10 (2013) Section 11.10.2 |
| Test Mode (Pre-Scan) | TX |
| Test Mode (Final Test) | TX |
| Tester | Charlie |
| Temperature | 25°C |
| Humidity | 60% |

16.1 LIMITS

Limit: $\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

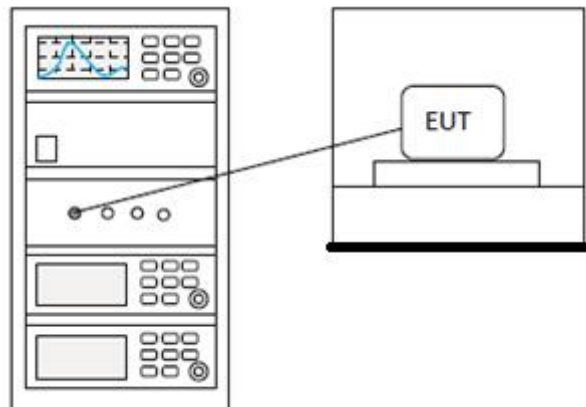
17 CONDUCTED PEAK OUTPUT POWER

| | |
|------------------------|----------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.247 |
| Test Method | ANSI C63.10 (2013) Section 7.8.5 |
| Test Mode (Pre-Scan) | TX |
| Test Mode (Final Test) | TX |
| Tester | Charlie |
| Temperature | 25°C |
| Humidity | 60% |

17.1 LIMITS

| Frequency range(MHz) | Output power of the intentional radiator(watt) |
|----------------------|--|
| 902-928 | 1 for ≥ 50 hopping channels |
| | 0.25 for $25 \leq$ hopping channels < 50 |
| | 1 for digital modulation |
| 2400-2483.5 | 1 for ≥ 75 non-overlapping hopping channels |
| | 0.125 for all other frequency hopping systems |
| | 1 for digital modulation |
| 5725-5850 | 1 for frequency hopping systems and digital modulation |

17.2 BLOCK DIAGRAM OF TEST SETUP



17.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

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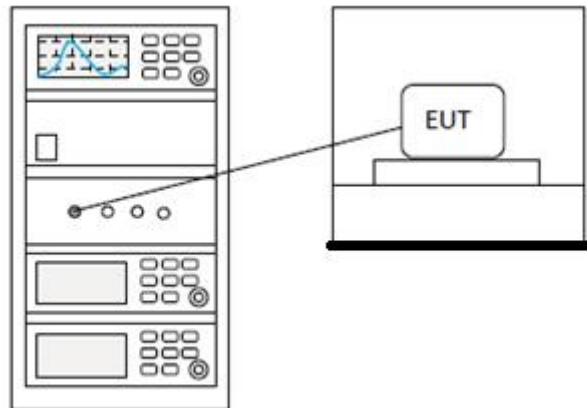
18 MINIMUM 6DB BANDWIDTH

| | |
|------------------------|-----------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.247 |
| Test Method | ANSI C63.10 (2013) Section 11.8.1 |
| Test Mode (Pre-Scan) | TX |
| Test Mode (Final Test) | TX |
| Tester | Charlie |
| Temperature | 25°C |
| Humidity | 60% |

18.1 LIMITS

| | |
|--------|----------|
| Limit: | ≥500 kHz |
|--------|----------|

18.2 BLOCK DIAGRAM OF TEST SETUP



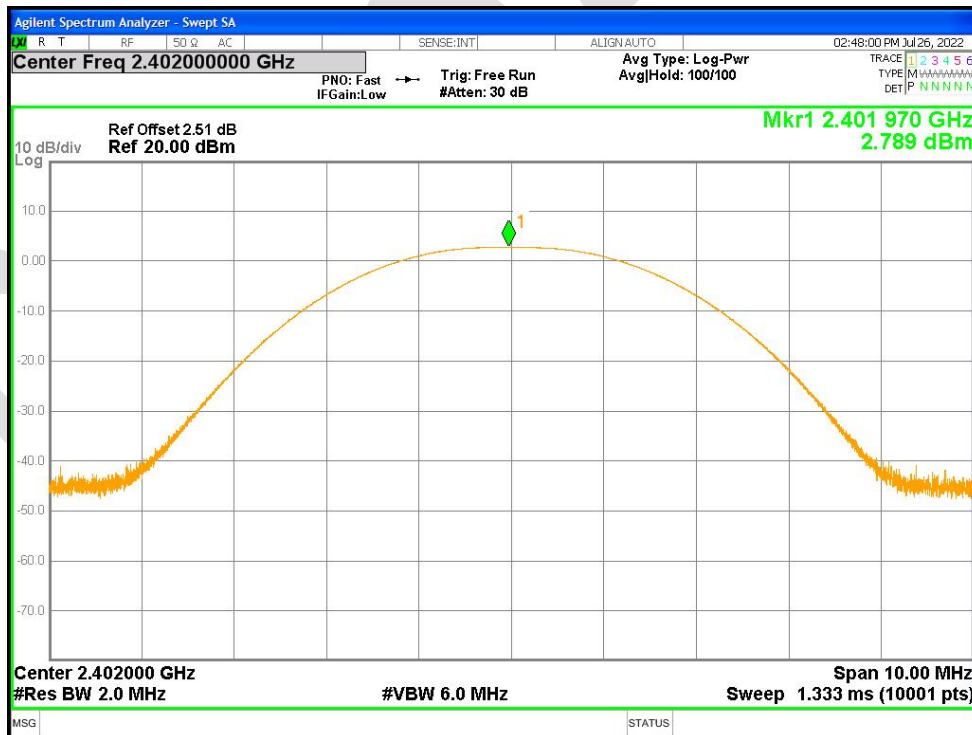
18.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

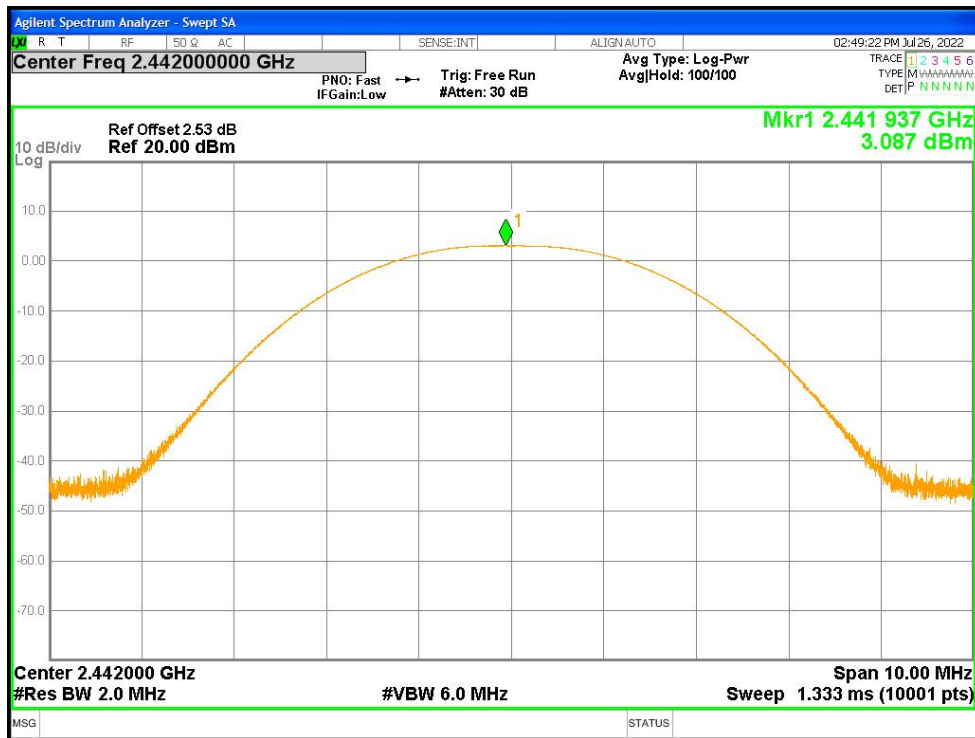
19 APPENDIX
Appendix1
Maximum Conducted Output Power

| Condition | Mode | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-------------|---------|
| NVNT | BLE 1M | 2402 | Ant1 | 2.789 | 30 | Pass |
| NVNT | BLE 1M | 2442 | Ant1 | 3.087 | 30 | Pass |
| NVNT | BLE 1M | 2480 | Ant1 | 2.88 | 30 | Pass |
| NVNT | BLE 2M | 2402 | Ant1 | 3.01 | 30 | Pass |
| NVNT | BLE 2M | 2442 | Ant1 | 2.94 | 30 | Pass |
| NVNT | BLE 2M | 2480 | Ant1 | 2.694 | 30 | Pass |

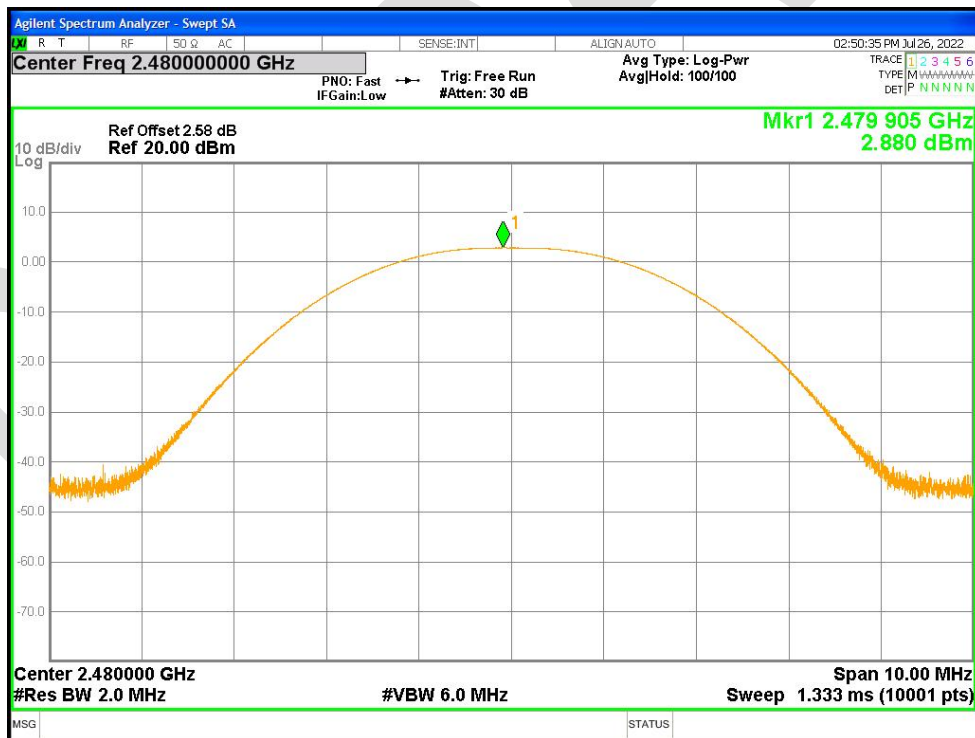
Power NVNT BLE 1M 2402MHz Ant1



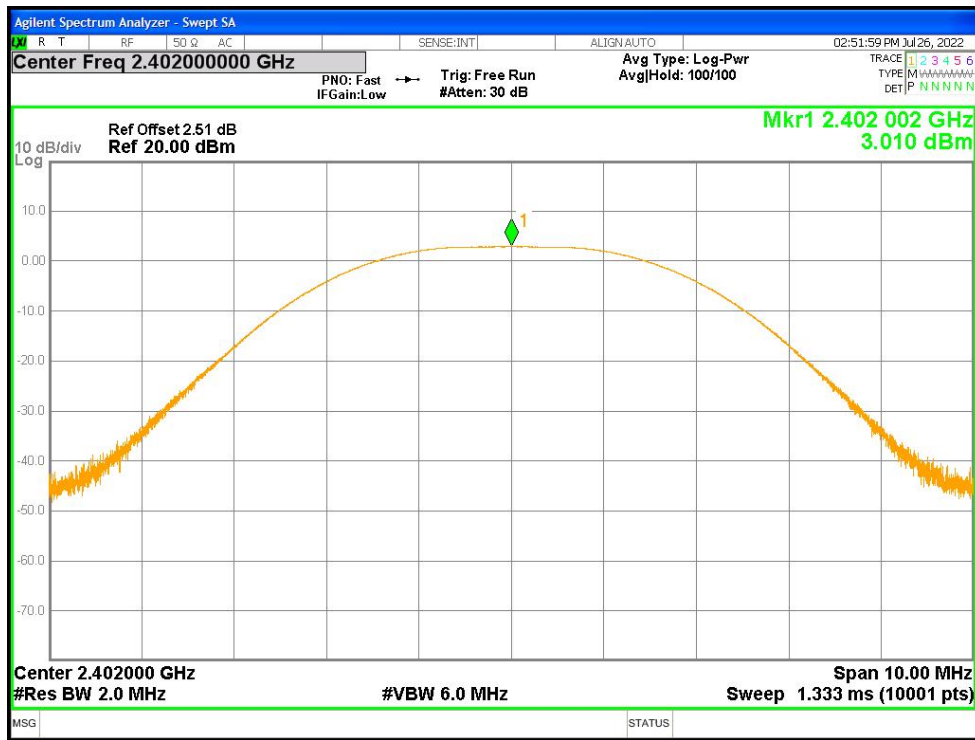
Power NVNT BLE 1M 2442MHz Ant1



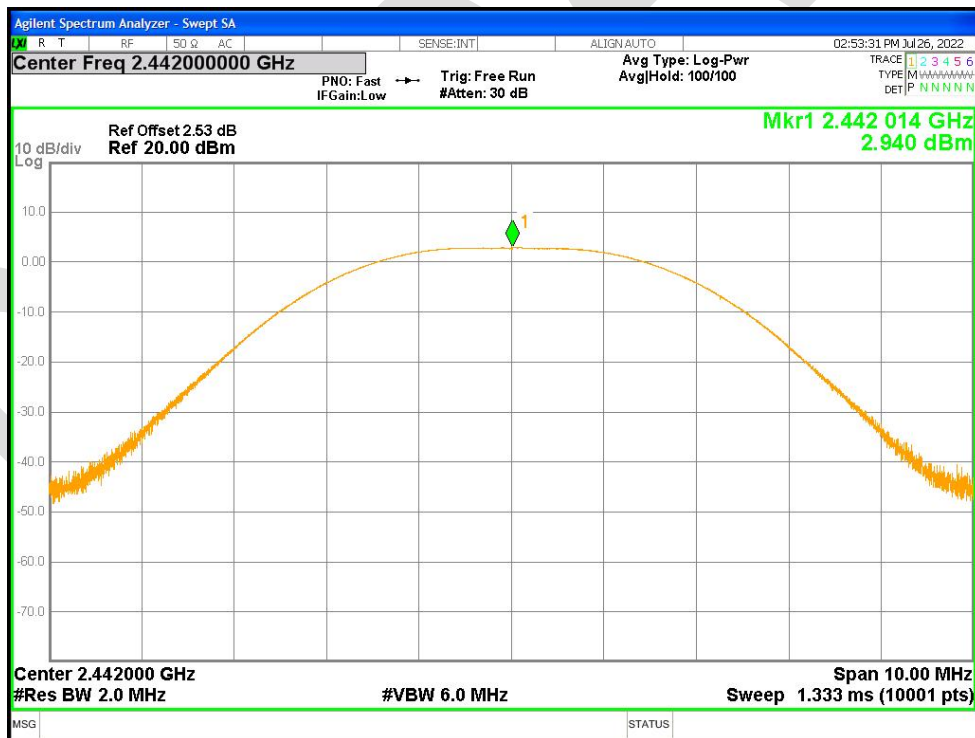
Power NVNT BLE 1M 2480MHz Ant1



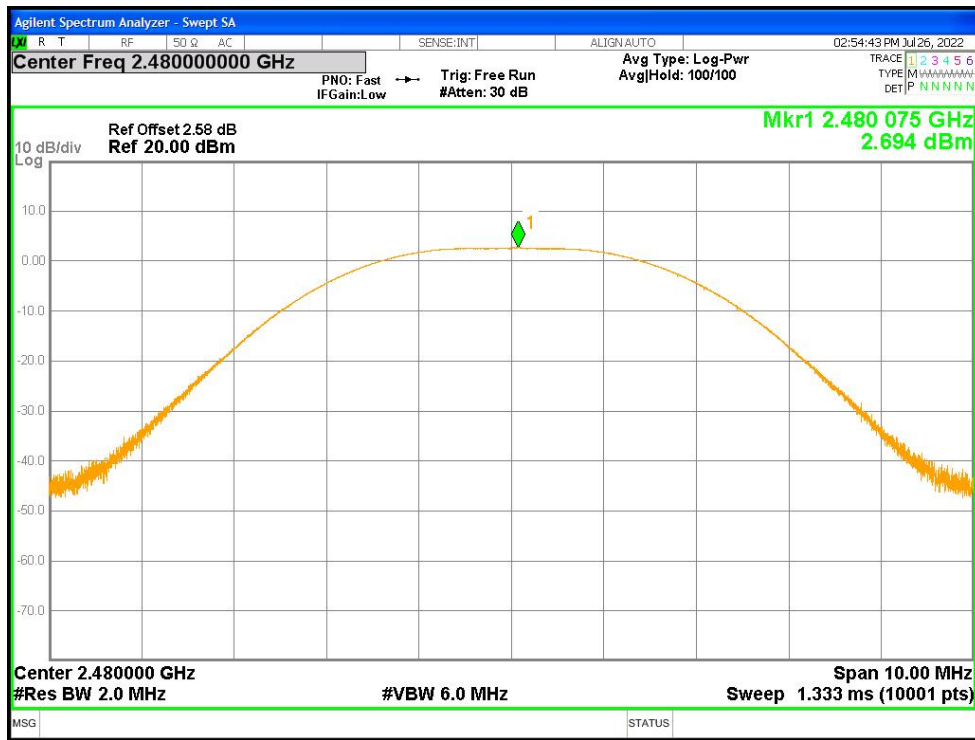
Power NVNT BLE 2M 2402MHz Ant1



Power NVNT BLE 2M 2442MHz Ant1

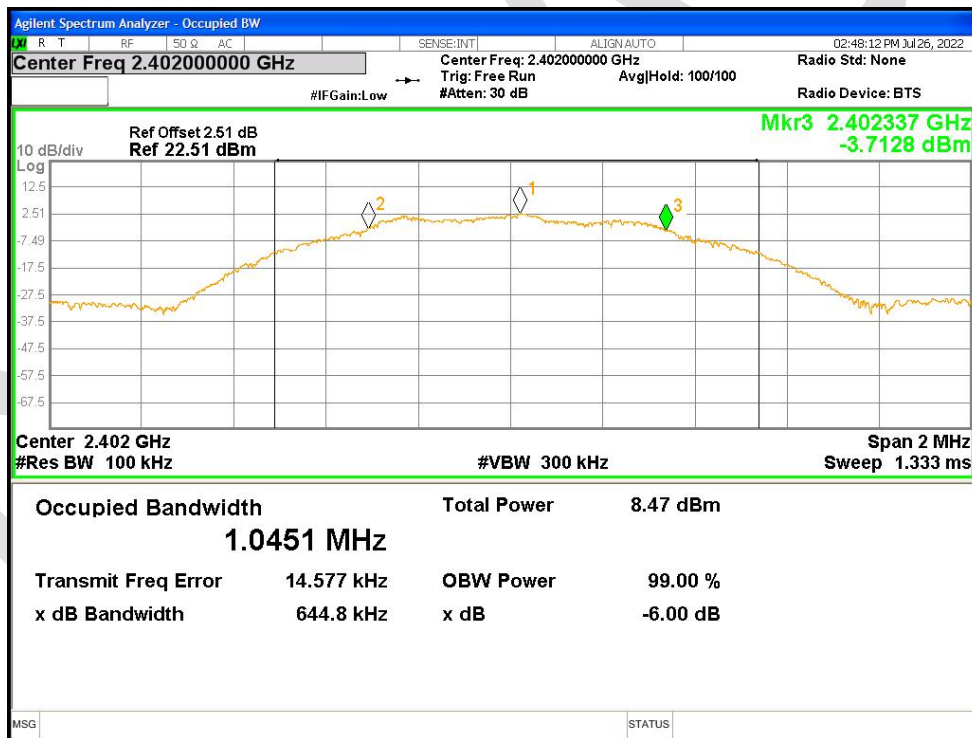


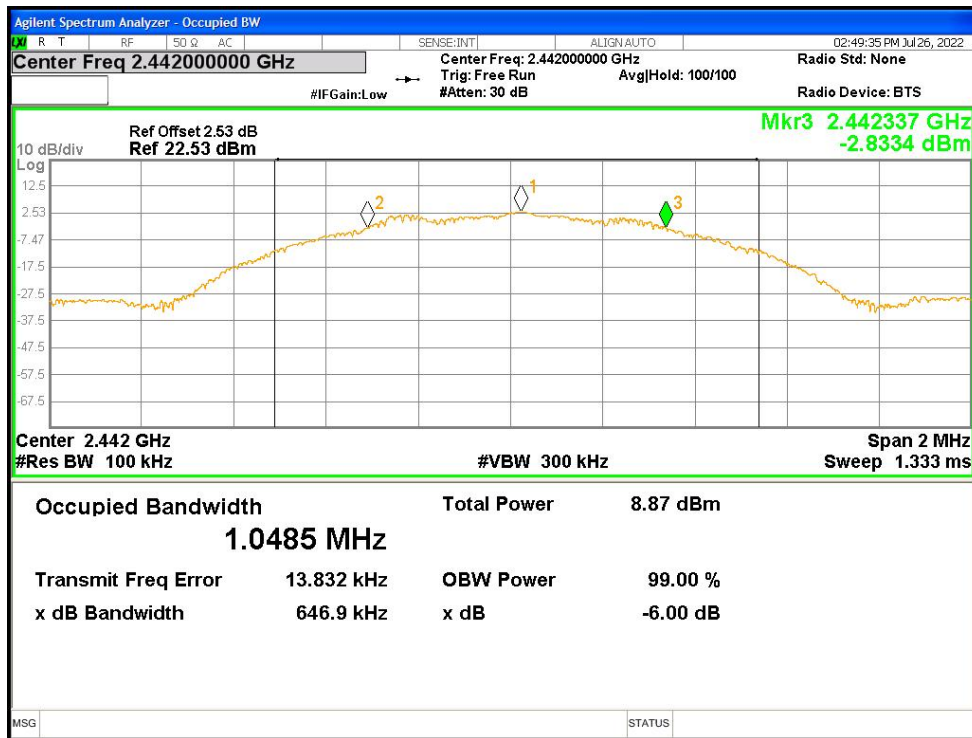
Power NVNT BLE 2M 2480MHz Ant1



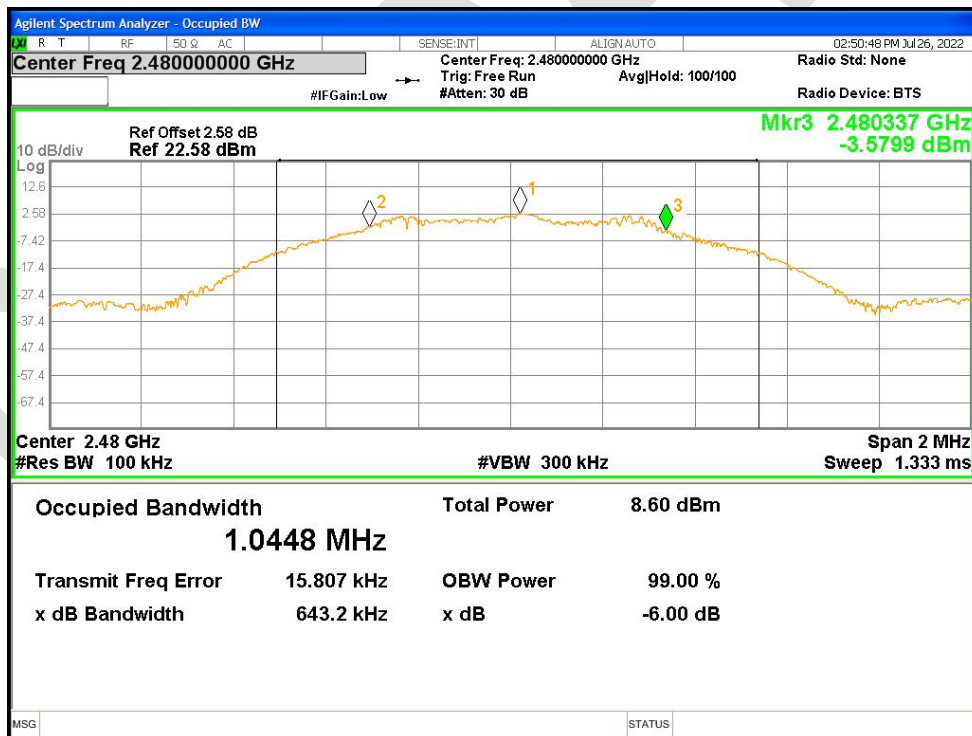
-6dB Bandwidth

| Condition | Mode | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT | BLE 1M | 2402 | Ant1 | 0.645 | 0.5 | Pass |
| NVNT | BLE 1M | 2442 | Ant1 | 0.647 | 0.5 | Pass |
| NVNT | BLE 1M | 2480 | Ant1 | 0.643 | 0.5 | Pass |
| NVNT | BLE 2M | 2402 | Ant1 | 1.102 | 0.5 | Pass |
| NVNT | BLE 2M | 2442 | Ant1 | 1.054 | 0.5 | Pass |
| NVNT | BLE 2M | 2480 | Ant1 | 1.085 | 0.5 | Pass |

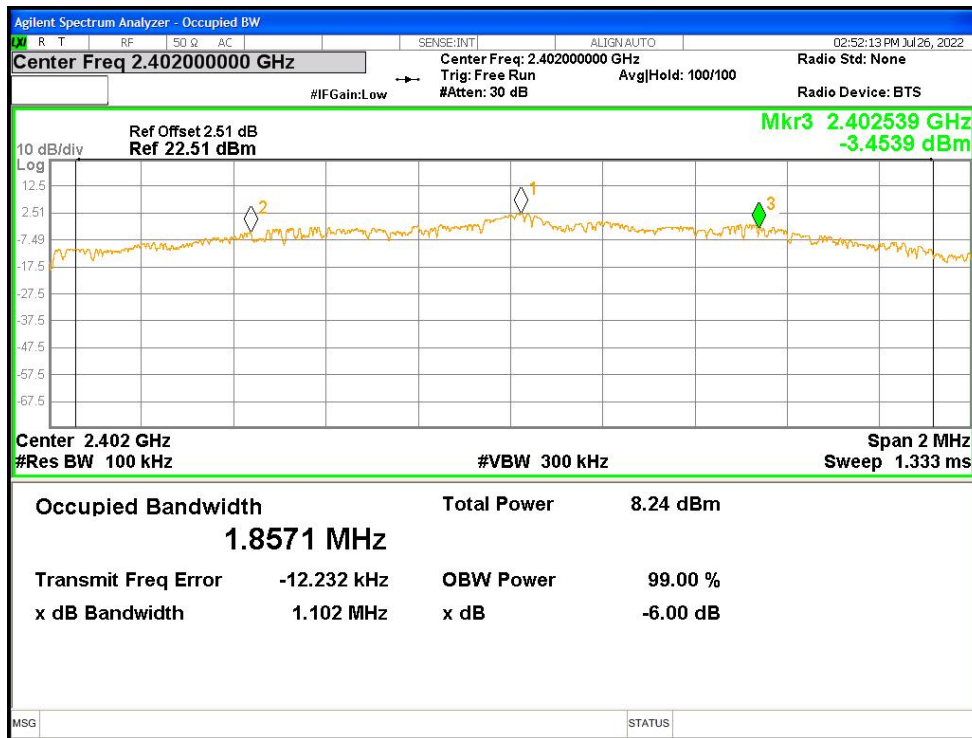
-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1

-6dB Bandwidth NVNT BLE 1M 2442MHz Ant1



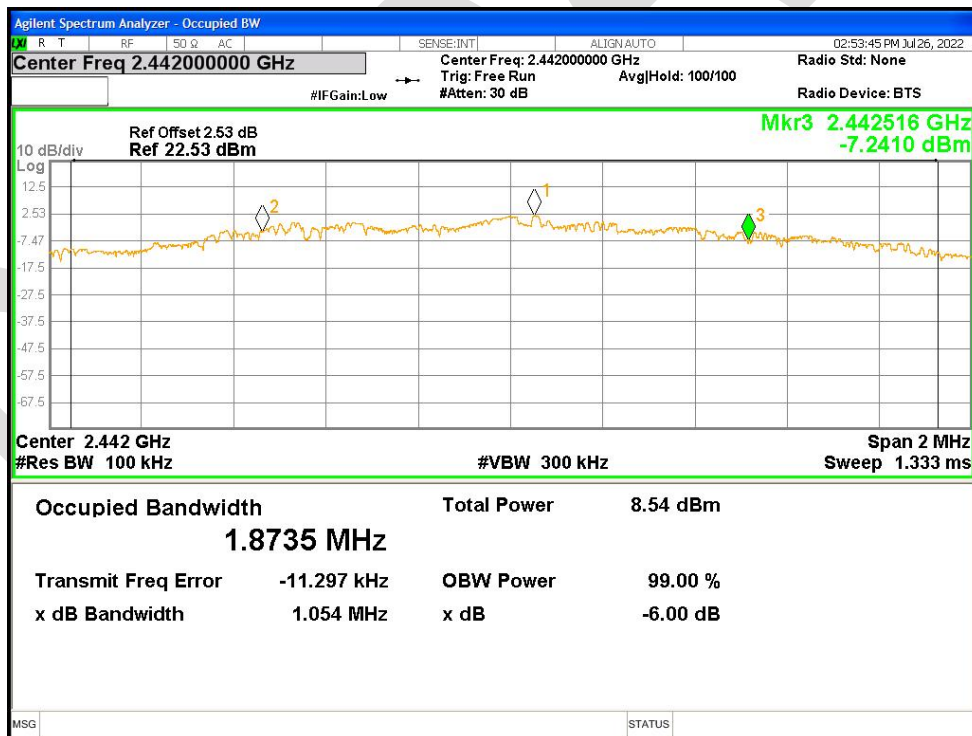
-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



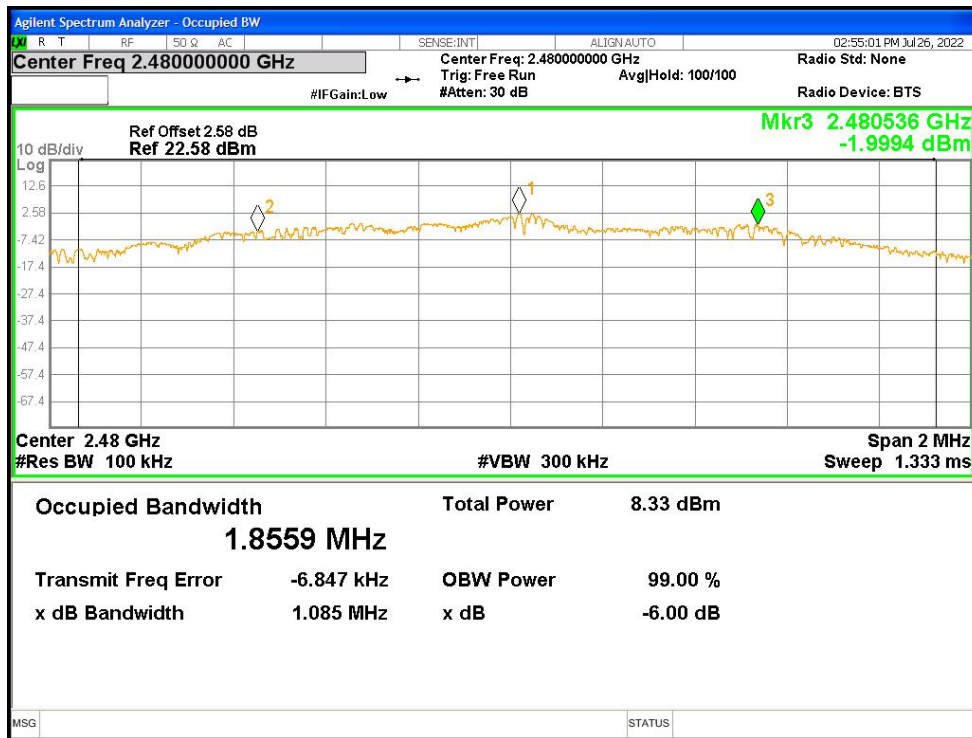
-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2442MHz Ant1



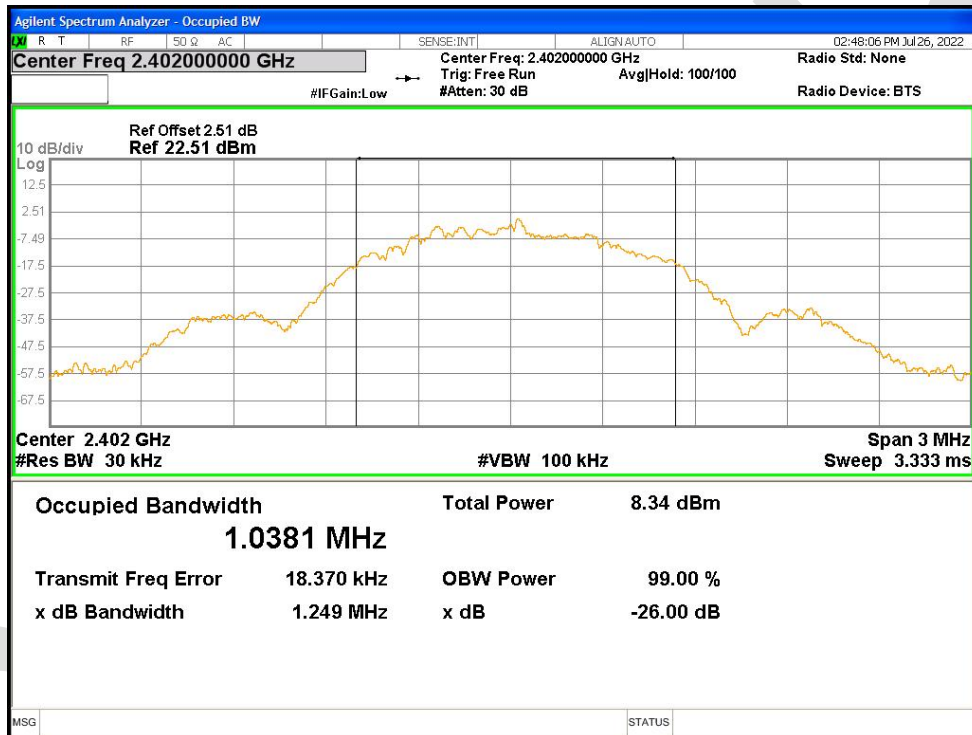
-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1



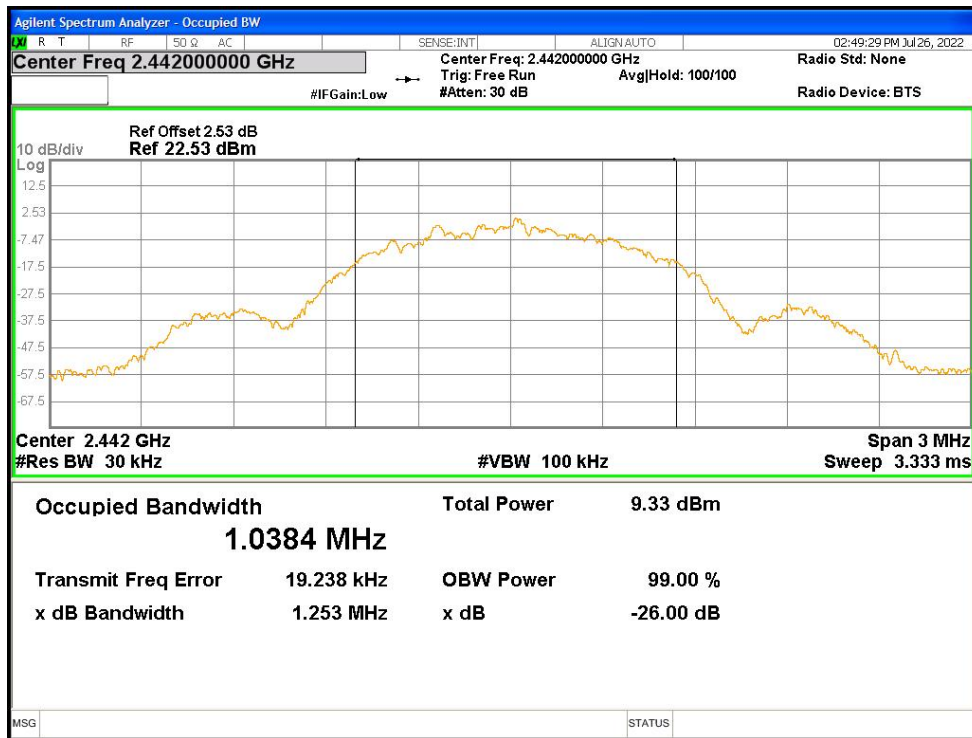
Occupied Channel Bandwidth

| Condition | Mode | Frequency (MHz) | Antenna | 99% OBW (MHz) |
|-----------|--------|-----------------|---------|---------------|
| NVNT | BLE 1M | 2402 | Ant1 | 1.0381 |
| NVNT | BLE 1M | 2442 | Ant1 | 1.0384 |
| NVNT | BLE 1M | 2480 | Ant1 | 1.0325 |
| NVNT | BLE 2M | 2402 | Ant1 | 2.0452 |
| NVNT | BLE 2M | 2442 | Ant1 | 2.03980 |
| NVNT | BLE 2M | 2480 | Ant1 | 2.03070 |

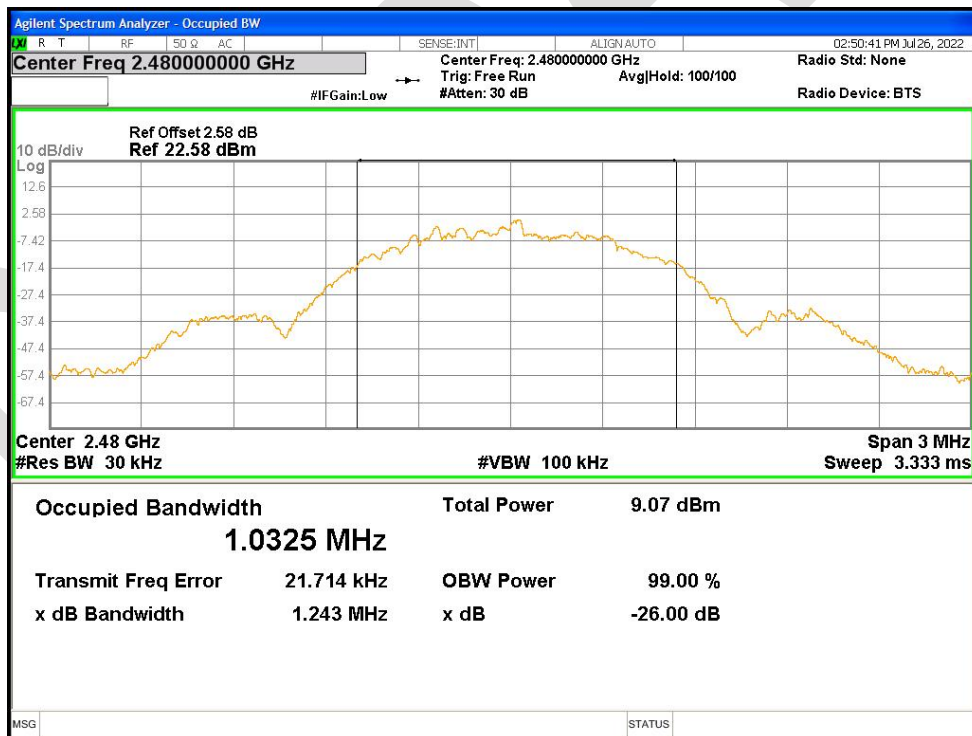
OBW NVNT BLE 1M 2402MHz Ant1



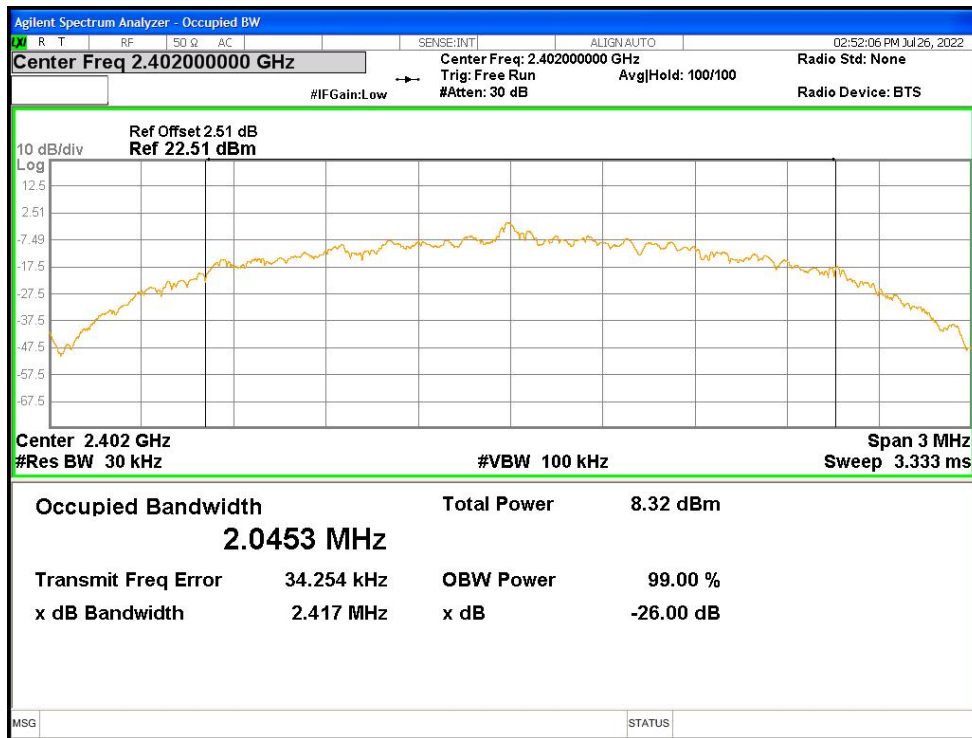
OBW NVNT BLE 1M 2442MHz Ant1



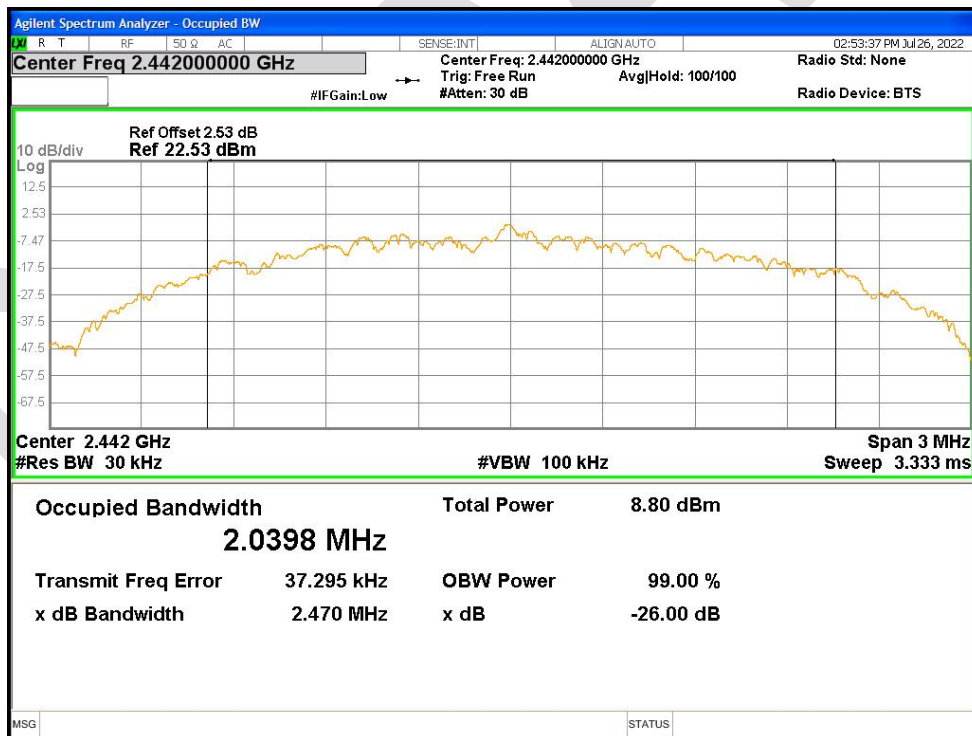
OBW NVNT BLE 1M 2480MHz Ant1



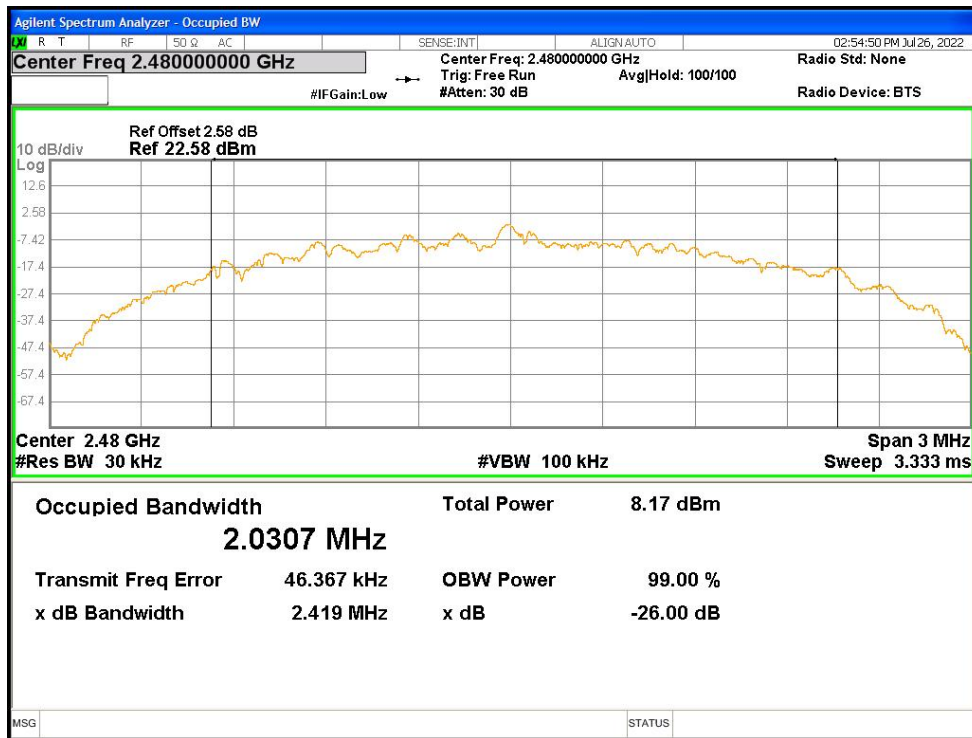
OBW NVNT BLE 2M 2402MHz Ant1



OBW NVNT BLE 2M 2442MHz Ant1



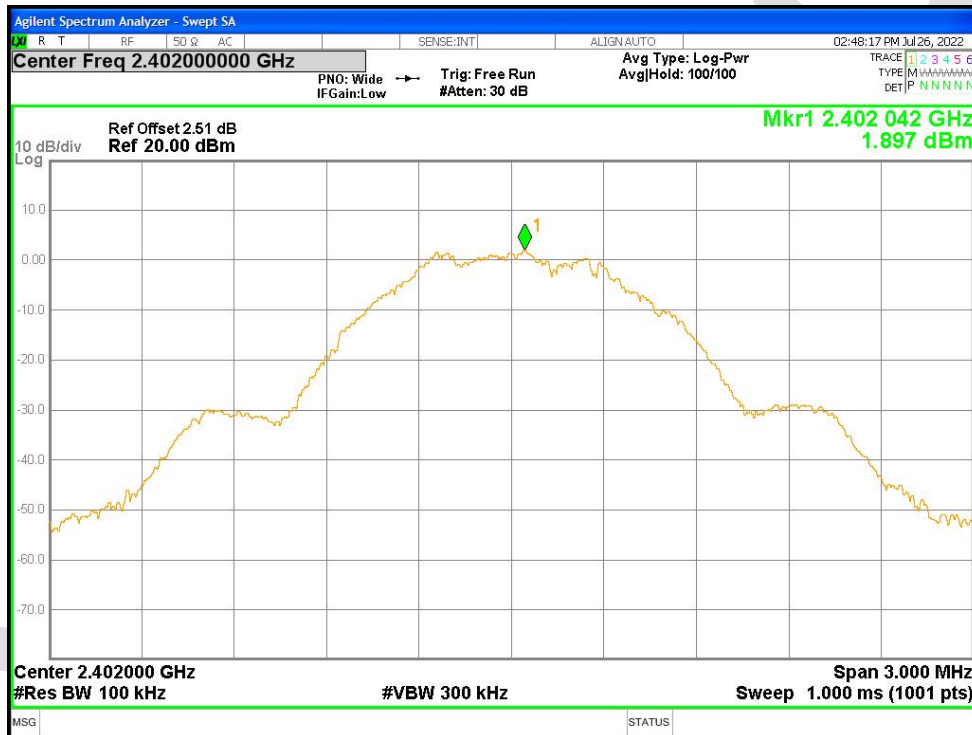
OBW NVNT BLE 2M 2480MHz Ant1



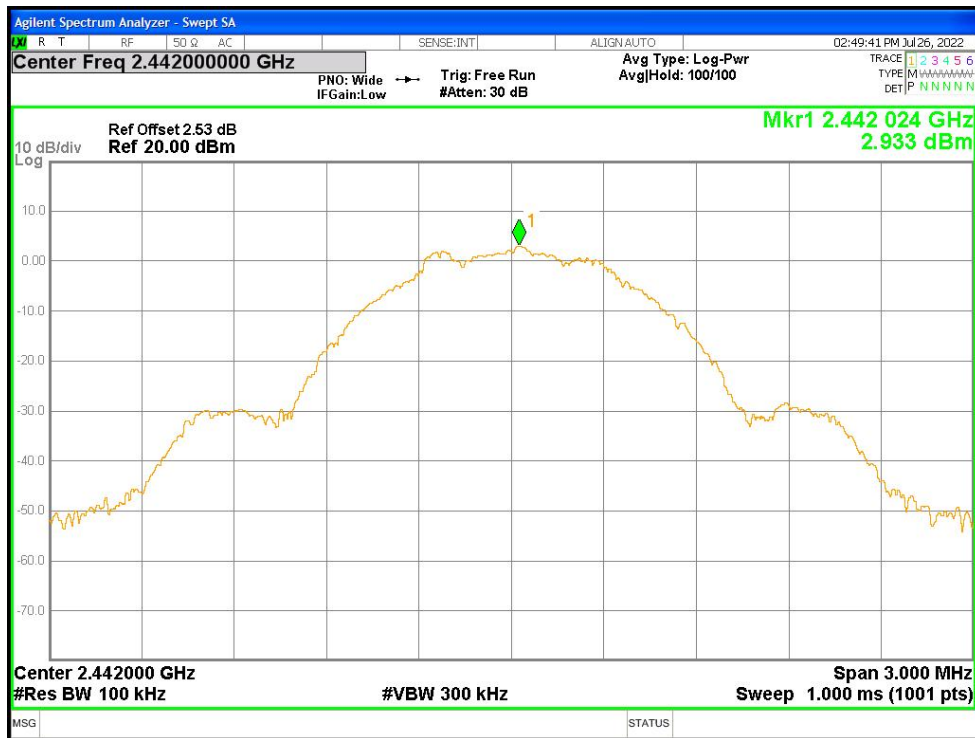
Maximum Power Spectral Density Level

| Condition | Mode | Frequency (MHz) | Antenna | Max PSD (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|---------------|-------------|---------|
| NVNT | BLE 1M | 2402 | Ant1 | 1.897 | 8 | Pass |
| NVNT | BLE 1M | 2442 | Ant1 | 2.933 | 8 | Pass |
| NVNT | BLE 1M | 2480 | Ant1 | 2.771 | 8 | Pass |
| NVNT | BLE 2M | 2402 | Ant1 | 2.005 | 8 | Pass |
| NVNT | BLE 2M | 2442 | Ant1 | 2.559 | 8 | Pass |
| NVNT | BLE 2M | 2480 | Ant1 | 2.383 | 8 | Pass |

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2442MHz Ant1



PSD NVNT BLE 1M 2480MHz Ant1



PSD NVNT BLE 2M 2402MHz Ant1



PSD NVNT BLE 2M 2442MHz Ant1



PSD NVNT BLE 2M 2480MHz Ant1