

## 18 ANTENNA REQUIREMENT

|               |                                  |
|---------------|----------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.247 |
| Test Method   | N/A                              |

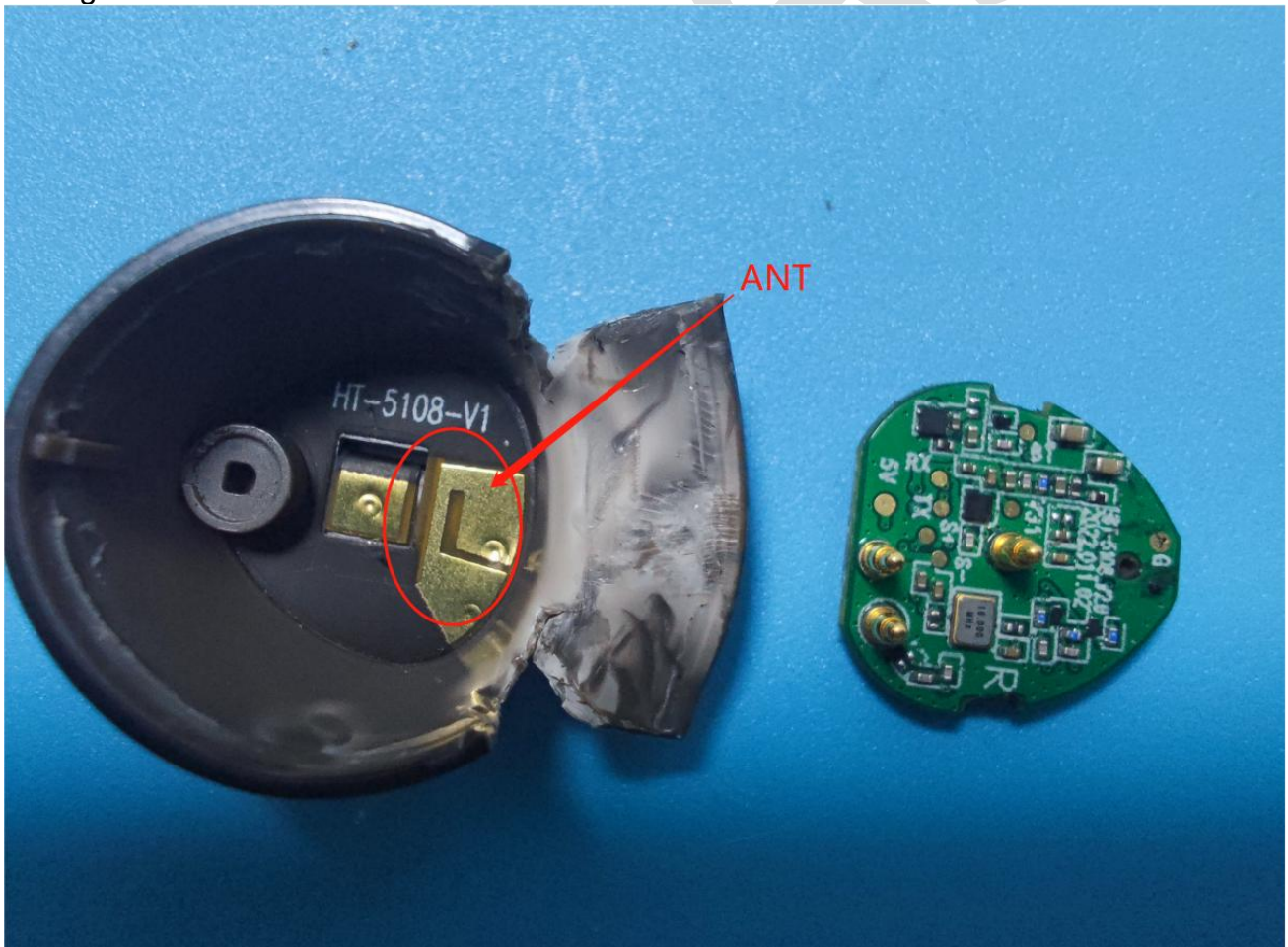
### 18.1 CONCLUSION

Standard Requirement:

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

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.5dBi.



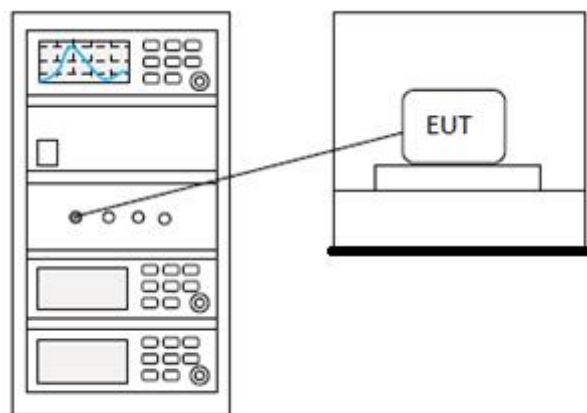
## 19 CONDUCTED SPURIOUS EMISSIONS

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

### 19.1 LIMITS

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Limit:</b> | 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)). |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 19.2 BLOCK DIAGRAM OF TEST SETUP



**19.3 TEST DATA****Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia

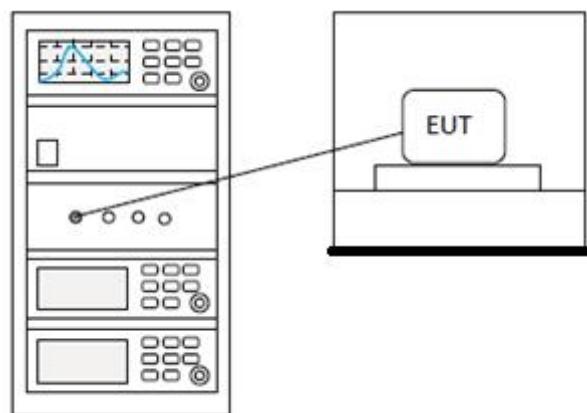
## 20 CONDUCTED BAND EDGES MEASUREMENT

|                               |                                                      |
|-------------------------------|------------------------------------------------------|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.247                     |
| <b>Test Method</b>            | ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2 |
| <b>Test Mode (Pre-Scan)</b>   | TX                                                   |
| <b>Test Mode (Final Test)</b> | TX                                                   |
| <b>Tester</b>                 | Charlie                                              |
| <b>Temperature</b>            | 25°C                                                 |
| <b>Humidity</b>               | 60%                                                  |

### 20.1 LIMITS

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Limit:</b> | 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)). |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 20.2 BLOCK DIAGRAM OF TEST SETUP



**20.3 TEST DATA****Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia

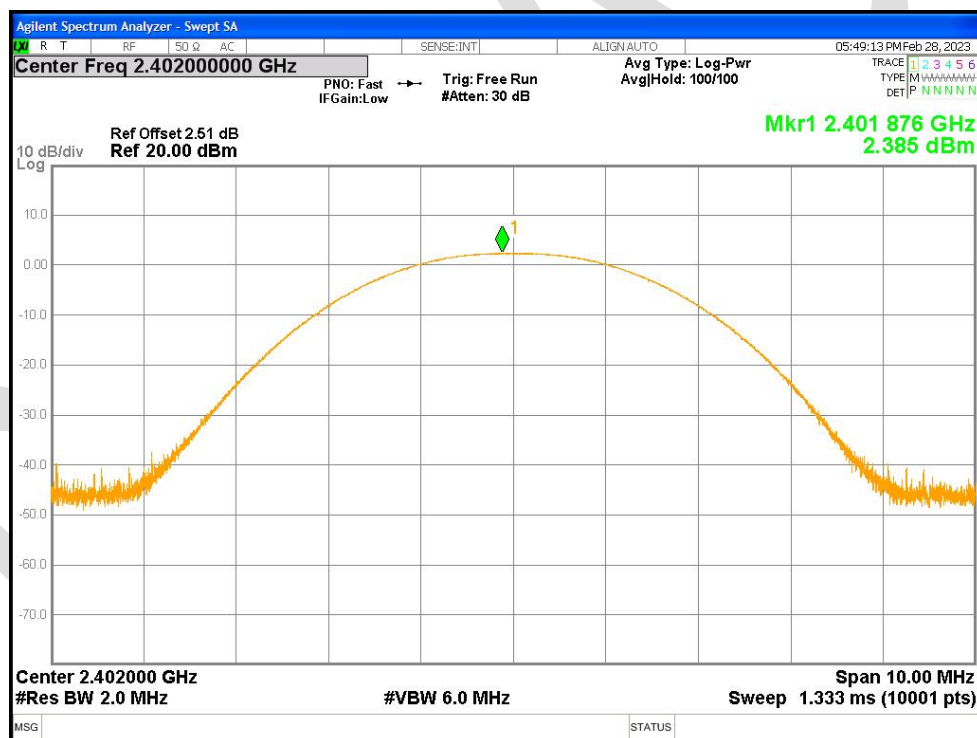
## 21 APPENDIX

### Appendix1

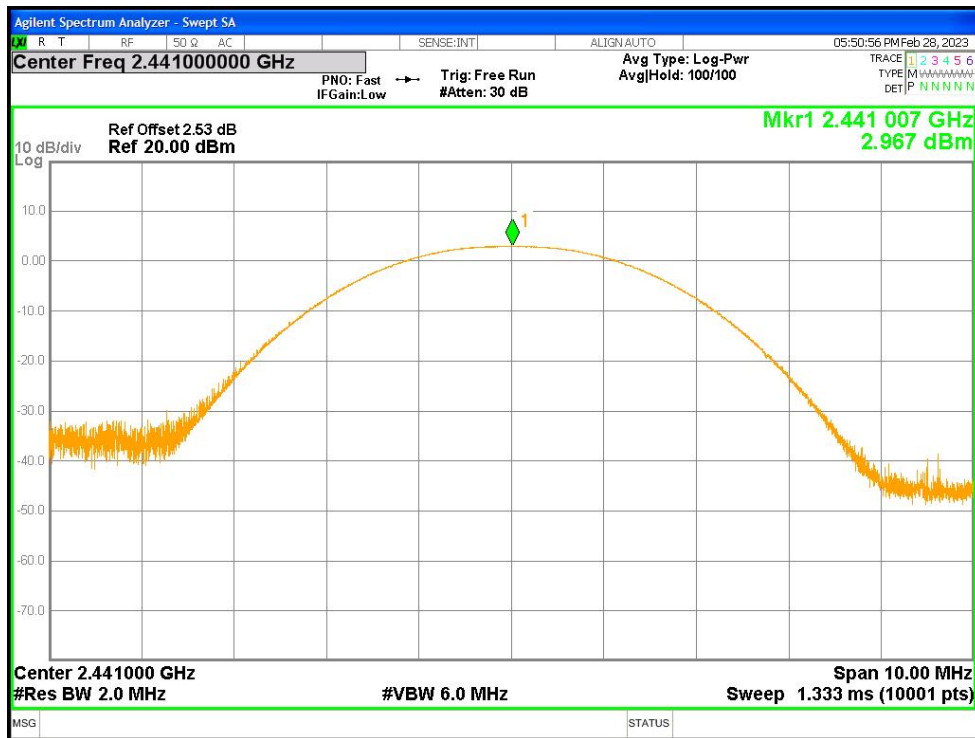
#### 21.1 MAXIMUM CONDUCTED OUTPUT POWER

| Condition | Mode  | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|-------|-----------------|---------|-----------------------|-------------|---------|
| NVNT      | 1-DH1 | 2402            | Ant1    | 2.385                 | 21          | Pass    |
| NVNT      | 1-DH1 | 2441            | Ant1    | 2.967                 | 21          | Pass    |
| NVNT      | 1-DH1 | 2480            | Ant1    | 2.442                 | 21          | Pass    |
| NVNT      | 2-DH1 | 2402            | Ant1    | 2.407                 | 21          | Pass    |
| NVNT      | 2-DH1 | 2441            | Ant1    | 2.989                 | 21          | Pass    |
| NVNT      | 2-DH1 | 2480            | Ant1    | 2.63                  | 21          | Pass    |
| NVNT      | 3-DH1 | 2402            | Ant1    | 1.061                 | 21          | Pass    |
| NVNT      | 3-DH1 | 2441            | Ant1    | 1.783                 | 21          | Pass    |
| NVNT      | 3-DH1 | 2480            | Ant1    | 1.26                  | 21          | Pass    |

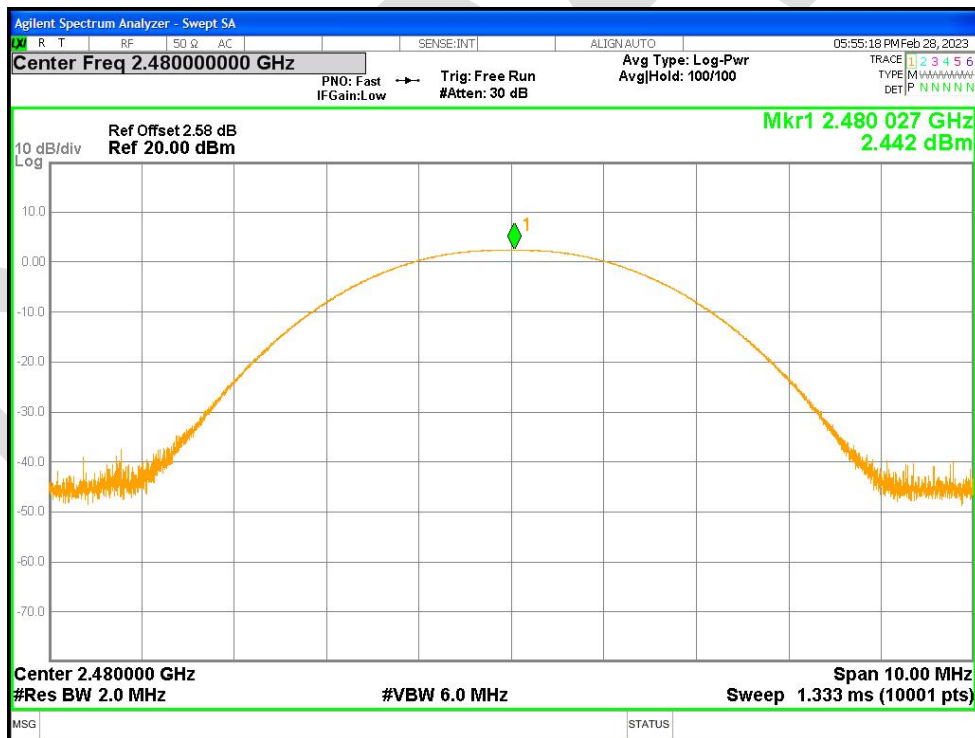
Power NVNT 1-DH1 2402MHz Ant1



Power NVNT 1-DH1 2441MHz Ant1

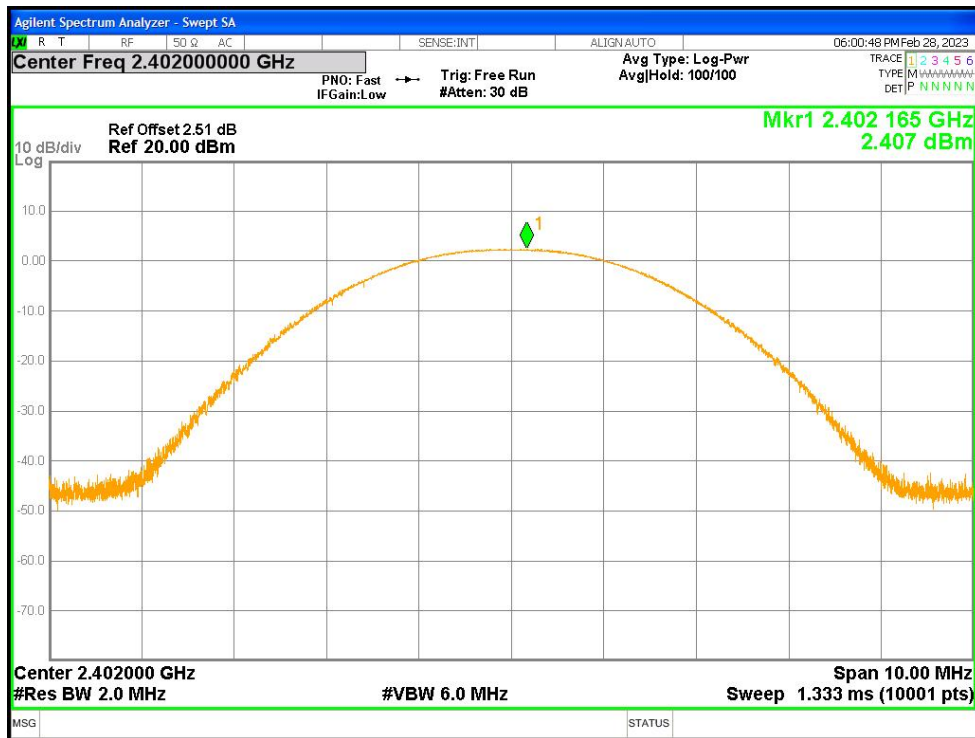


Power NVNT 1-DH1 2480MHz Ant1

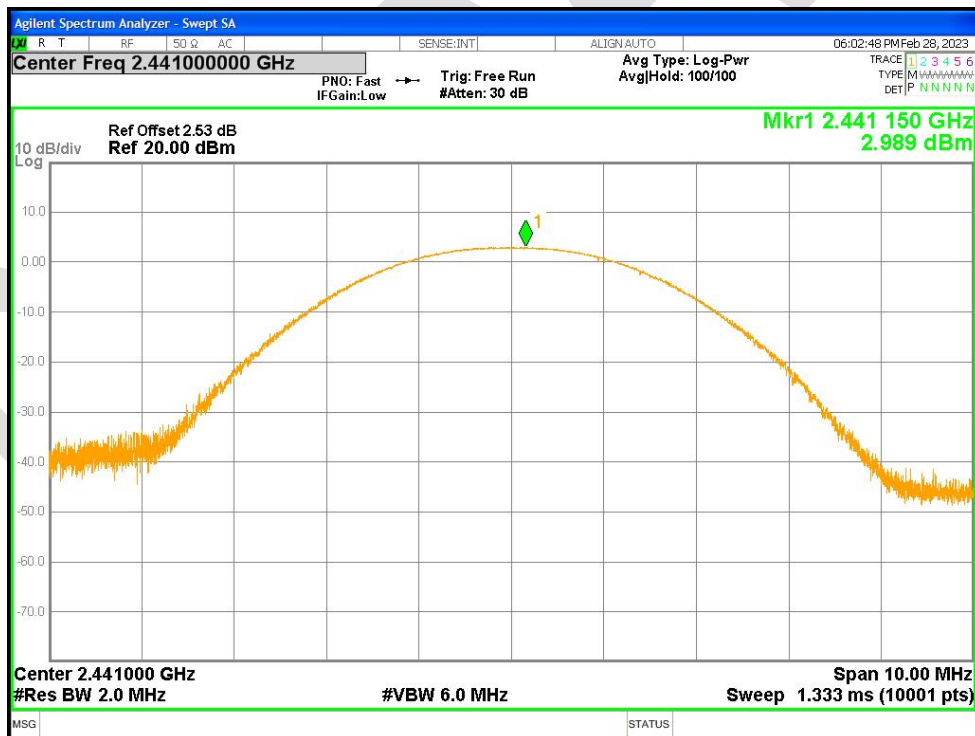


Power NVNT 2-DH1 2402MHz Ant1



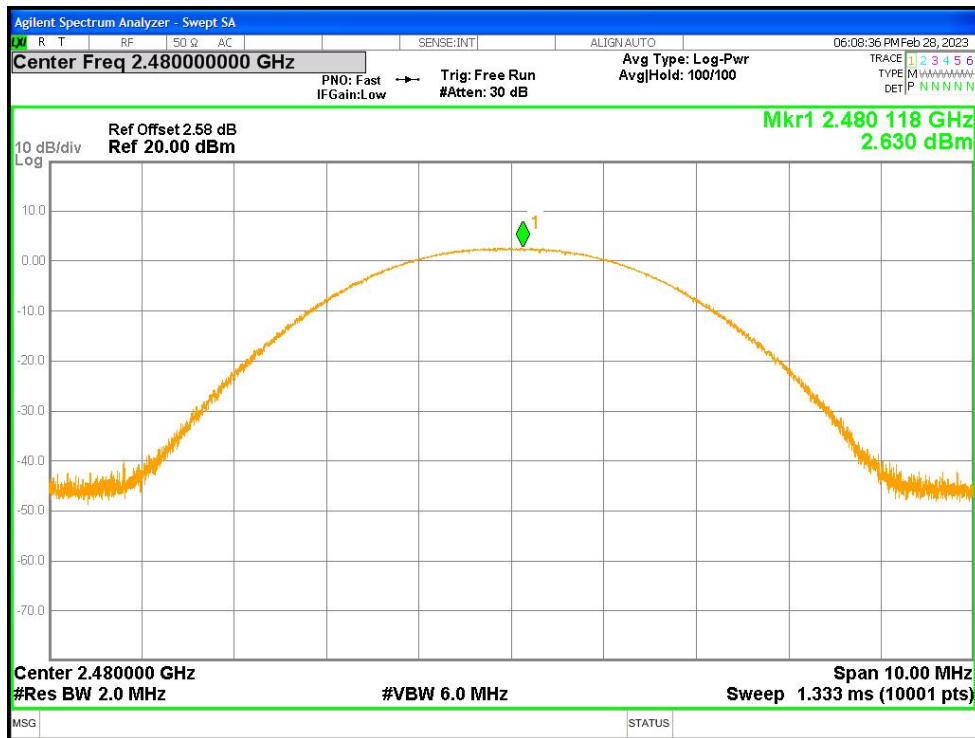


Power NVNT 2-DH1 2441MHz Ant1

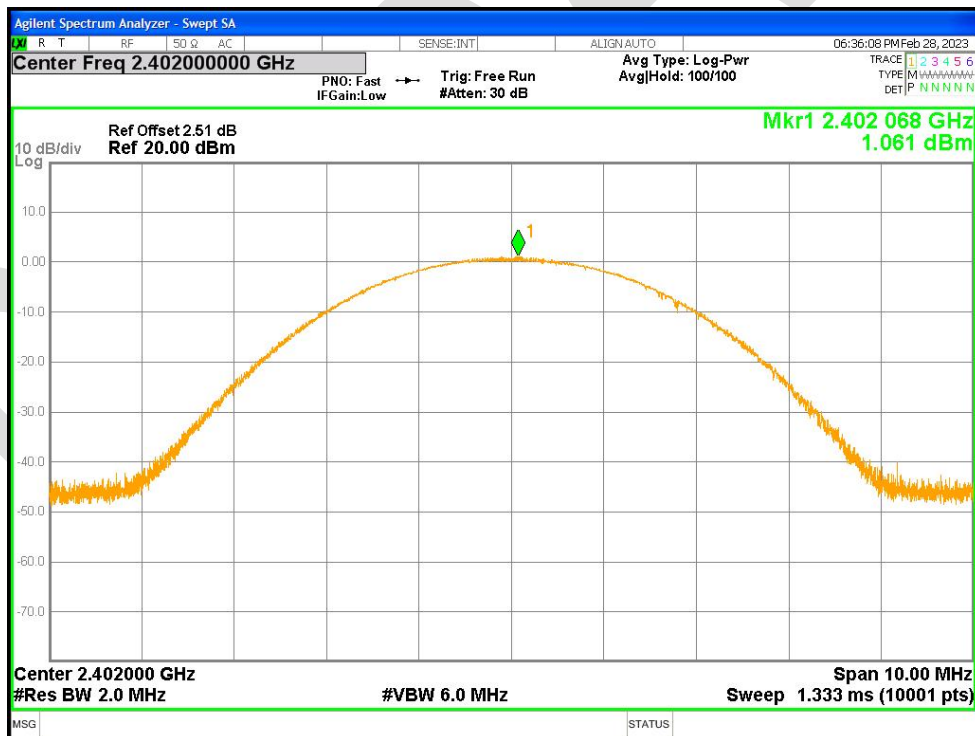


Power NVNT 2-DH1 2480MHz Ant1

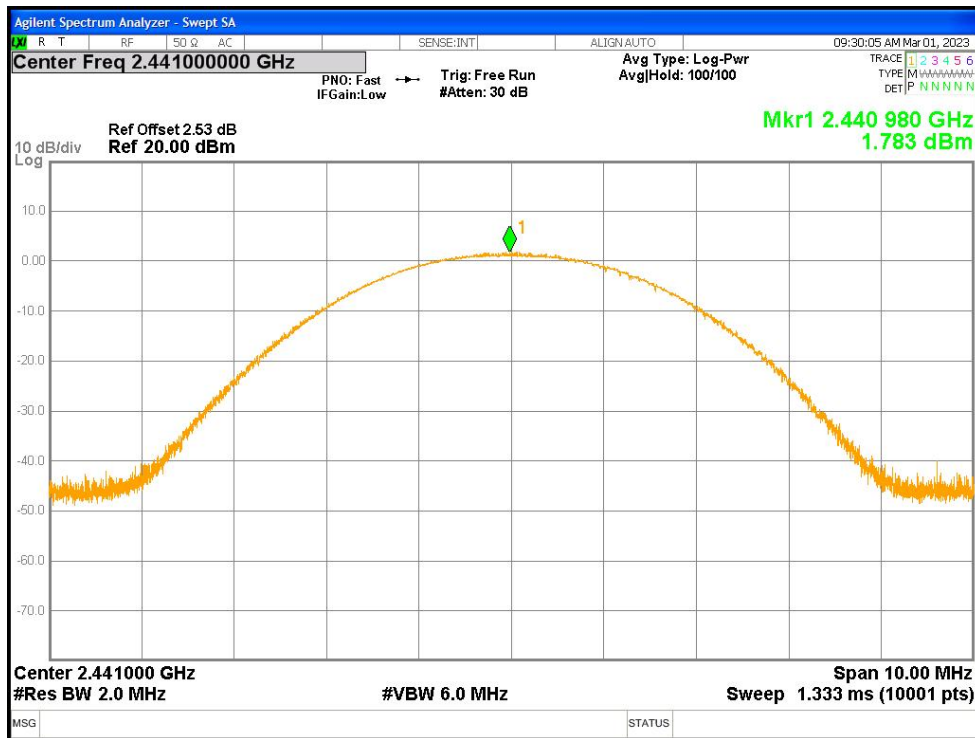




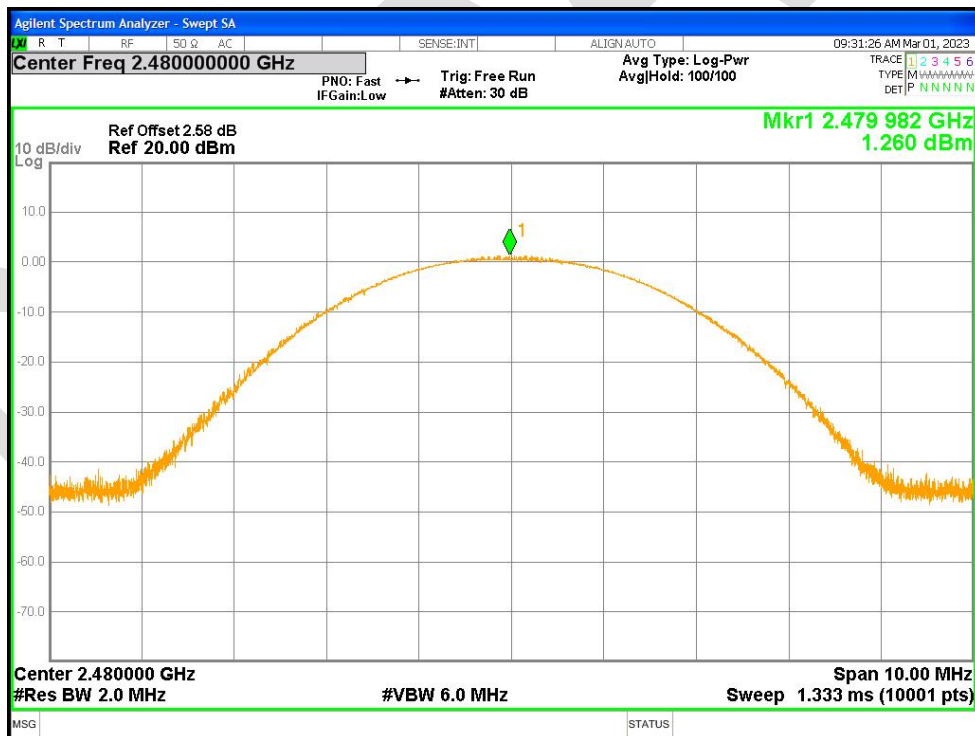
Power NVNT 3-DH1 2402MHz Ant1



Power NVNT 3-DH1 2441MHz Ant1



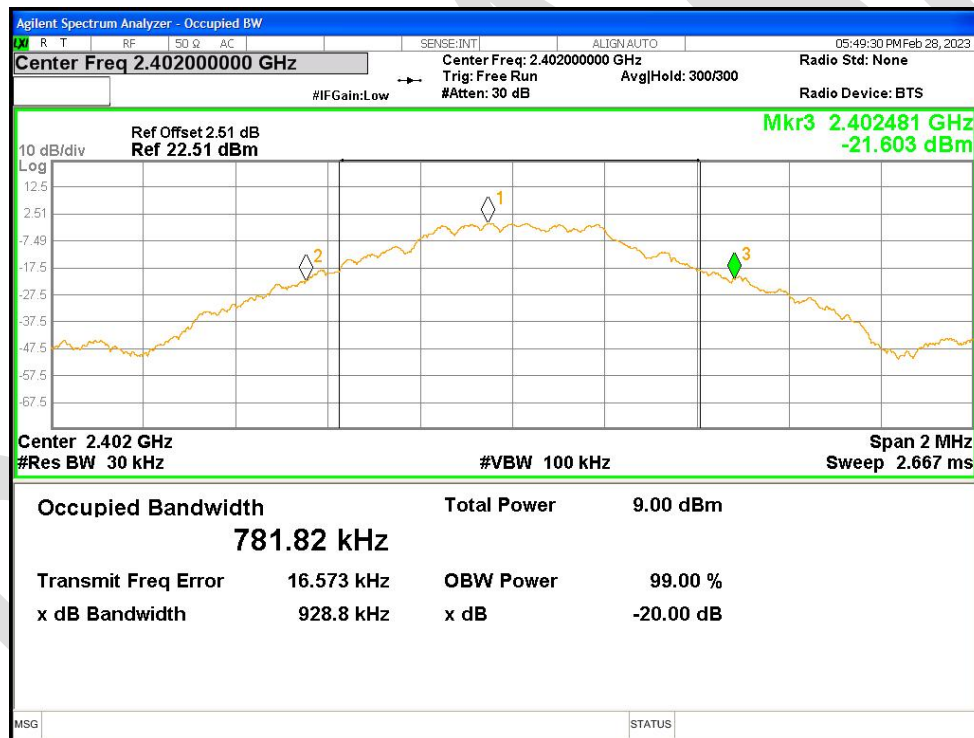
Power NVNT 3-DH1 2480MHz Ant1



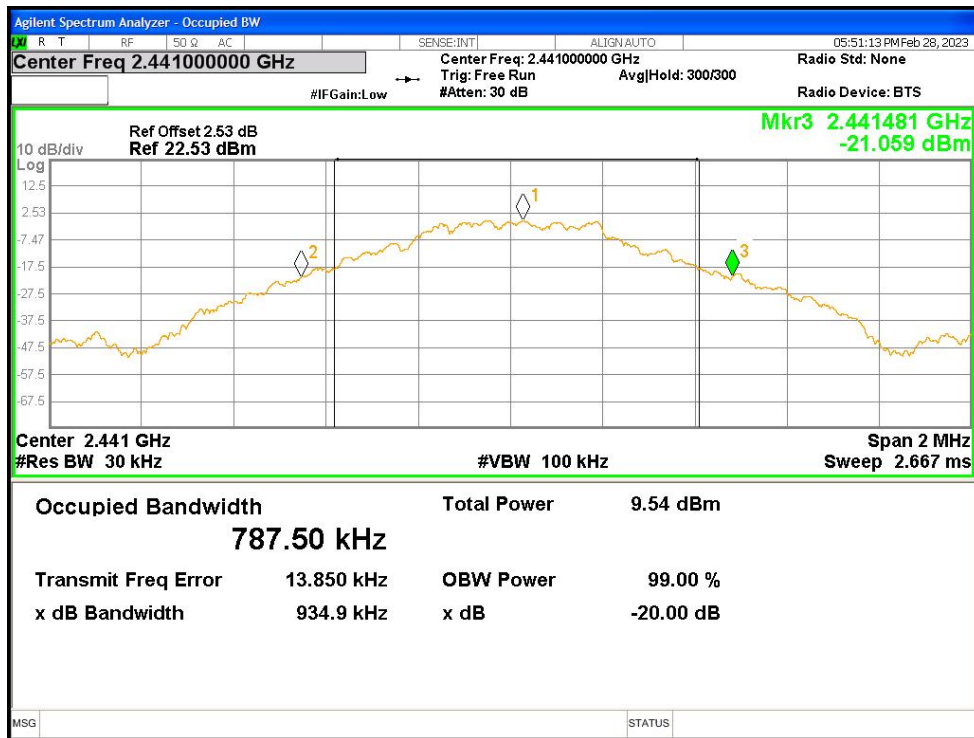
## 21.2 -20DB BANDWIDTH

| Condition | Mode  | Frequency (MHz) | Antenna | -20 dB Bandwidth (MHz) | Limit -20 dB Bandwidth (MHz) | Verdict |
|-----------|-------|-----------------|---------|------------------------|------------------------------|---------|
| NVNT      | 1-DH1 | 2402            | Ant1    | 0.929                  | 0                            | Pass    |
| NVNT      | 1-DH1 | 2441            | Ant1    | 0.935                  | 0                            | Pass    |
| NVNT      | 1-DH1 | 2480            | Ant1    | 0.937                  | 0                            | Pass    |
| NVNT      | 2-DH1 | 2402            | Ant1    | 1.225                  | 0                            | Pass    |
| NVNT      | 2-DH1 | 2441            | Ant1    | 1.228                  | 0                            | Pass    |
| NVNT      | 2-DH1 | 2480            | Ant1    | 1.238                  | 0                            | Pass    |
| NVNT      | 3-DH1 | 2402            | Ant1    | 1.216                  | 0                            | Pass    |
| NVNT      | 3-DH1 | 2441            | Ant1    | 1.216                  | 0                            | Pass    |
| NVNT      | 3-DH1 | 2480            | Ant1    | 1.218                  | 0                            | Pass    |

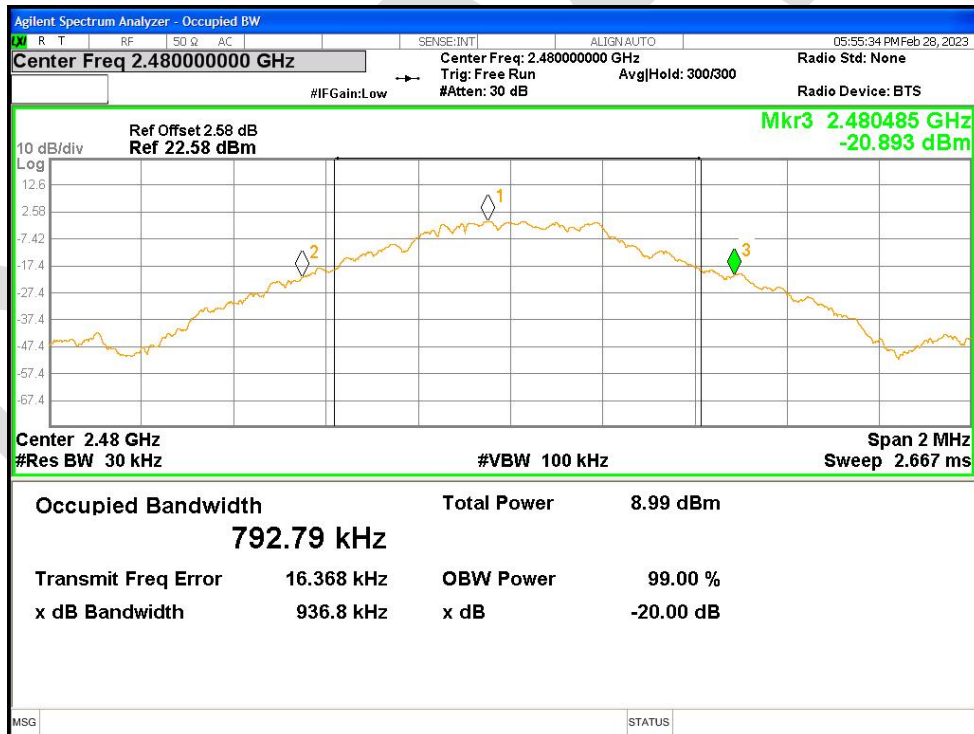
-20dB Bandwidth NVNT 1-DH1 2402MHz Ant1



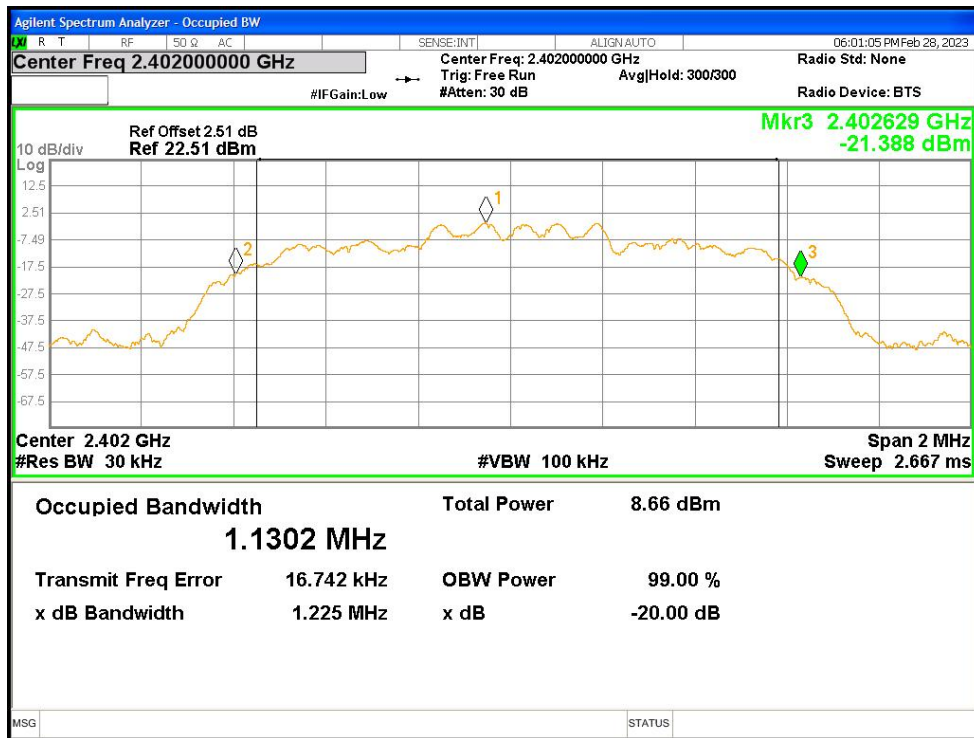
-20dB Bandwidth NVNT 1-DH1 2441MHz Ant1



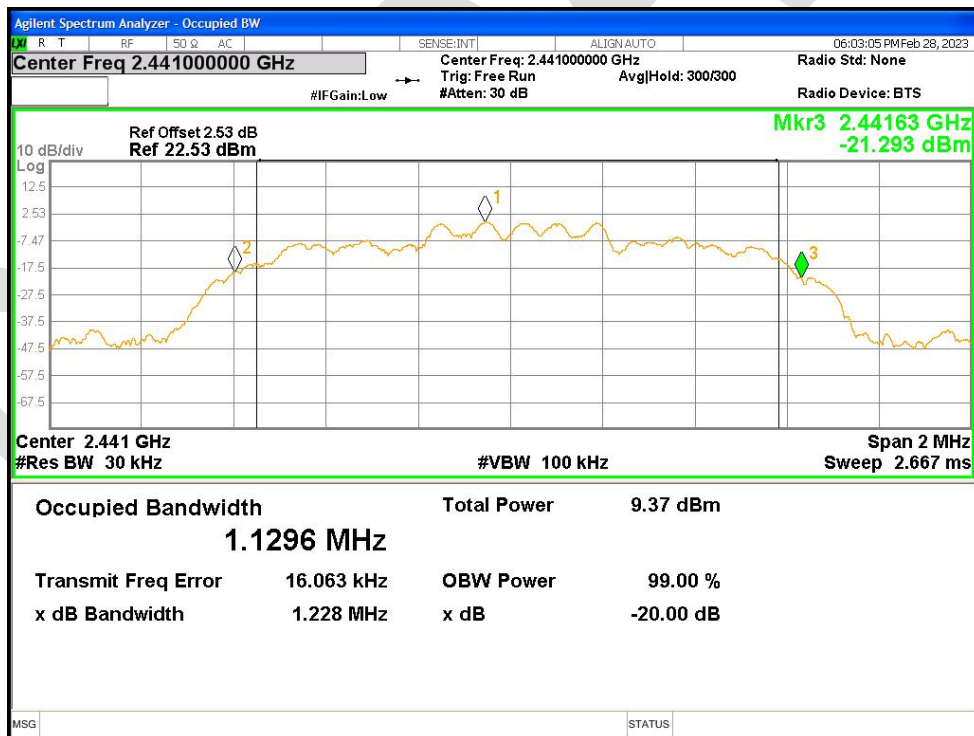
-20dB Bandwidth NVNT 1-DH1 2480MHz Ant1



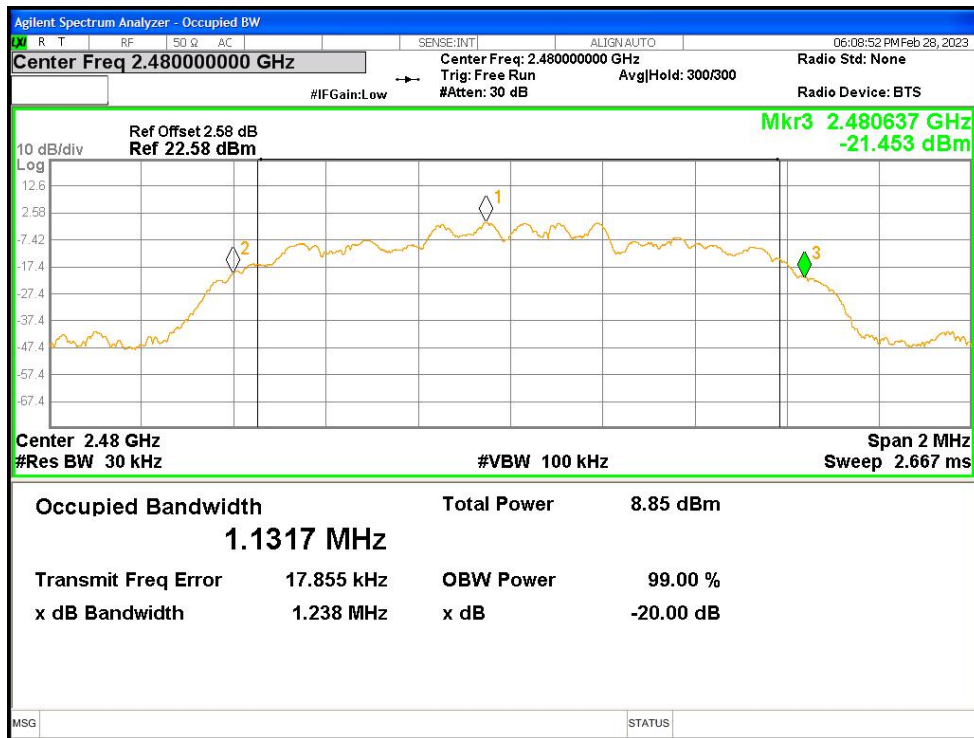
-20dB Bandwidth NVNT 2-DH1 2402MHz Ant1



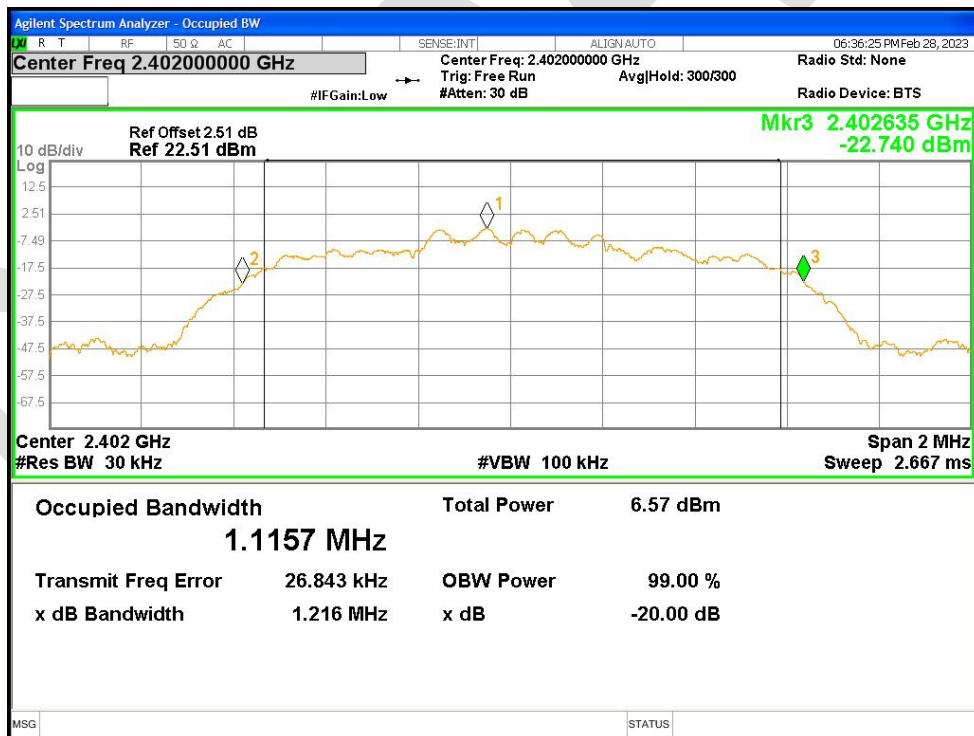
-20dB Bandwidth NVNT 2-DH1 2441MHz Ant1



-20dB Bandwidth NVNT 2-DH1 2480MHz Ant1

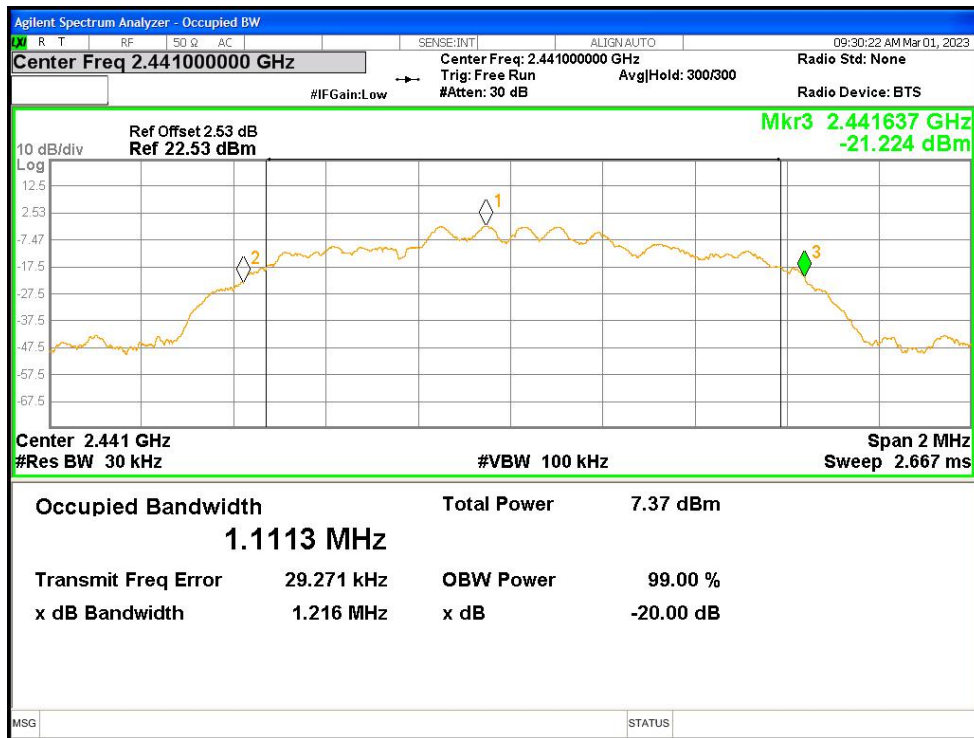


-20dB Bandwidth NVNT 3-DH1 2402MHz Ant1

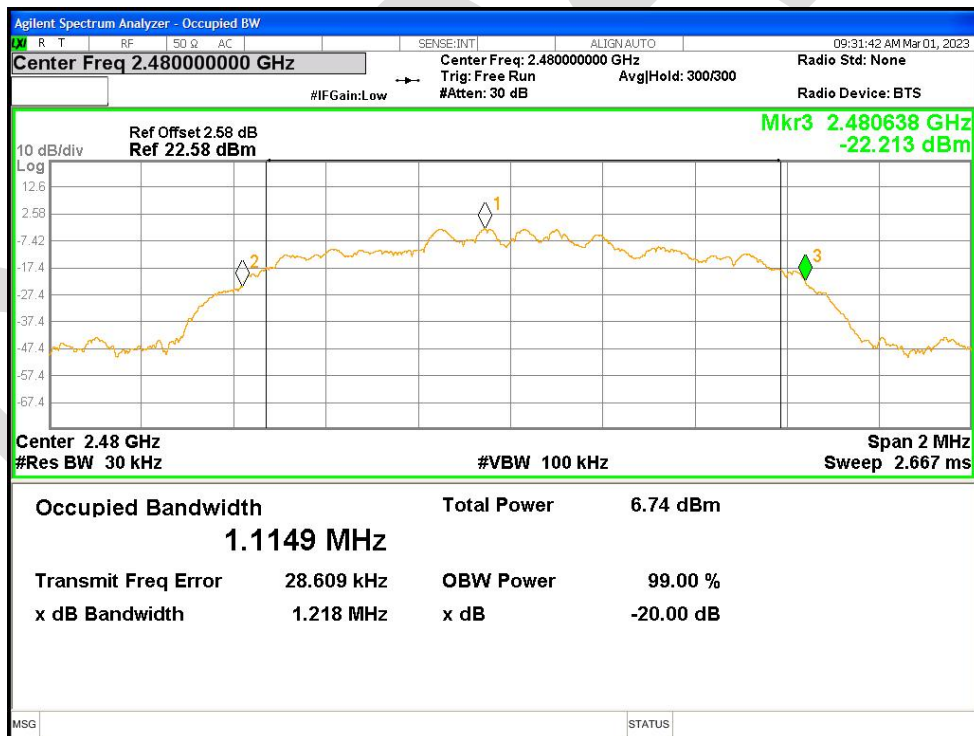


-20dB Bandwidth NVNT 3-DH1 2441MHz Ant1





-20dB Bandwidth NVNT 3-DH1 2480MHz Ant1

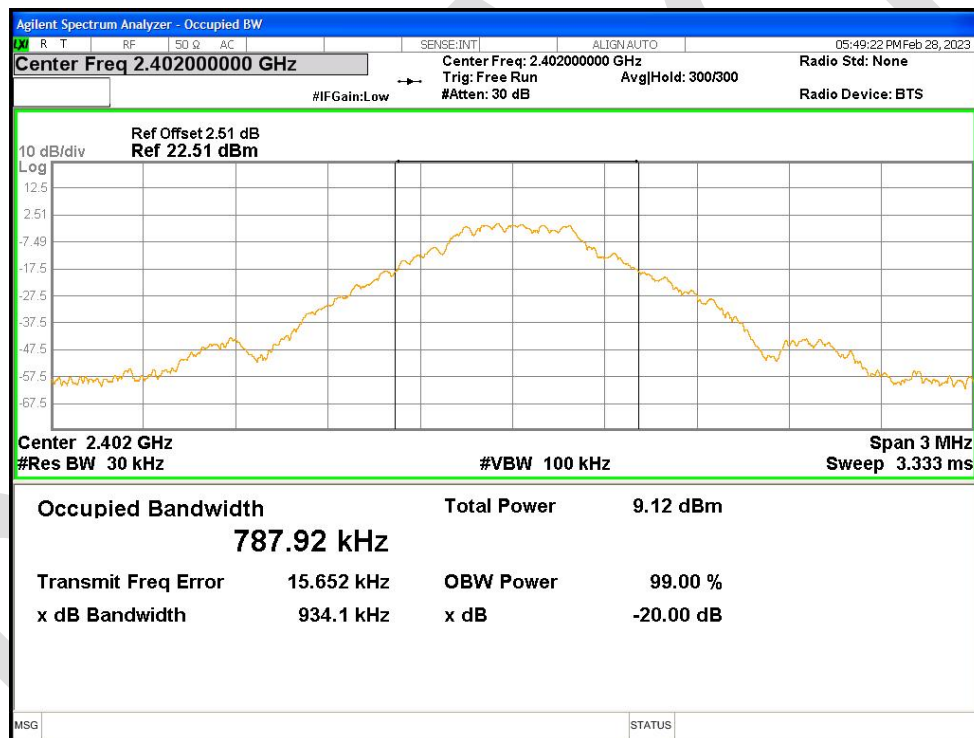




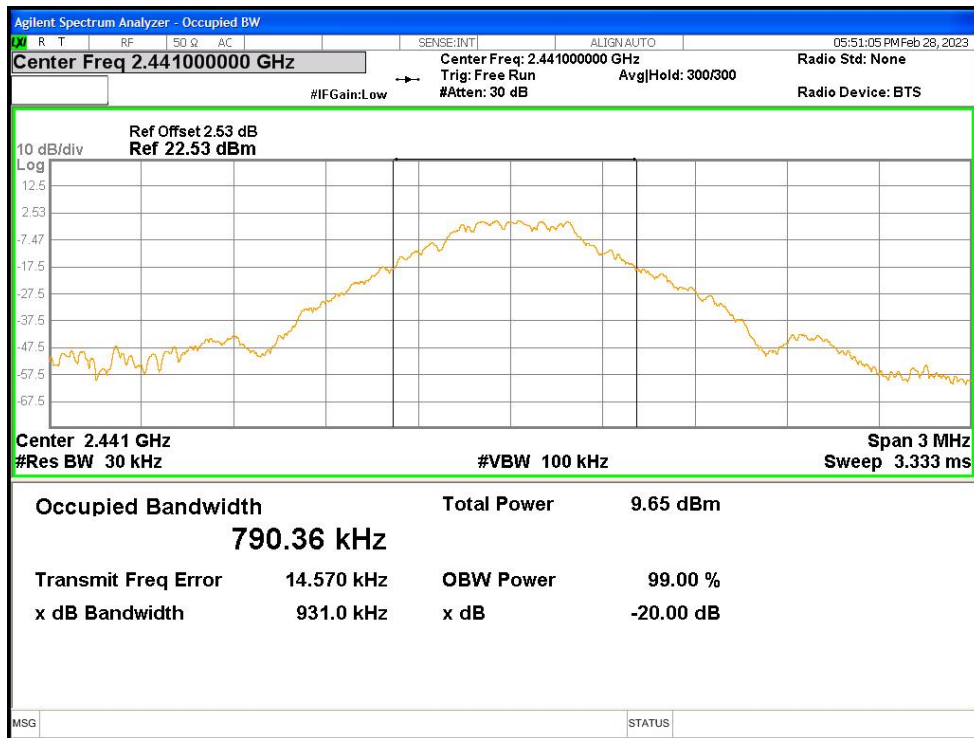
### 21.3 OCCUPIED CHANNEL BANDWIDTH

| Condition | Mode  | Frequency (MHz) | Antenna | 99% OBW (MHz) |
|-----------|-------|-----------------|---------|---------------|
| NVNT      | 1-DH1 | 2402            | Ant1    | 0.78792       |
| NVNT      | 1-DH1 | 2441            | Ant1    | 0.79036       |
| NVNT      | 1-DH1 | 2480            | Ant1    | 0.79071       |
| NVNT      | 2-DH1 | 2402            | Ant1    | 1.1312        |
| NVNT      | 2-DH1 | 2441            | Ant1    | 1.1321        |
| NVNT      | 2-DH1 | 2480            | Ant1    | 1.1308        |
| NVNT      | 3-DH1 | 2402            | Ant1    | 1.1137        |
| NVNT      | 3-DH1 | 2441            | Ant1    | 1.1165        |
| NVNT      | 3-DH1 | 2480            | Ant1    | 1.1143        |

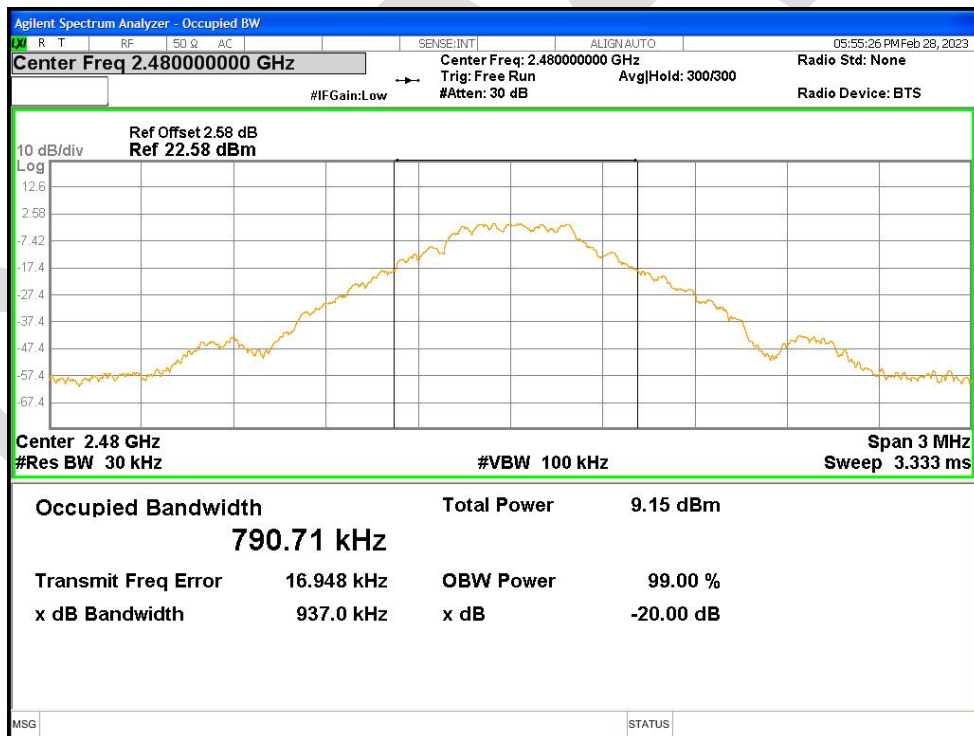
OBW NVNT 1-DH1 2402MHz Ant1



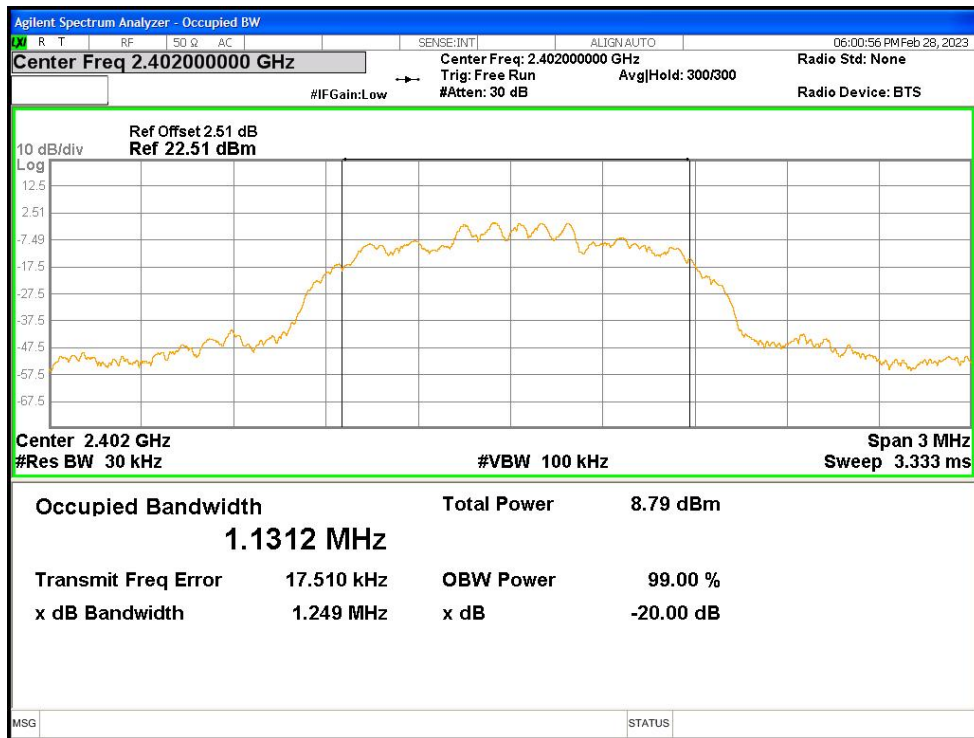
OBW NVNT 1-DH1 2441MHz Ant1



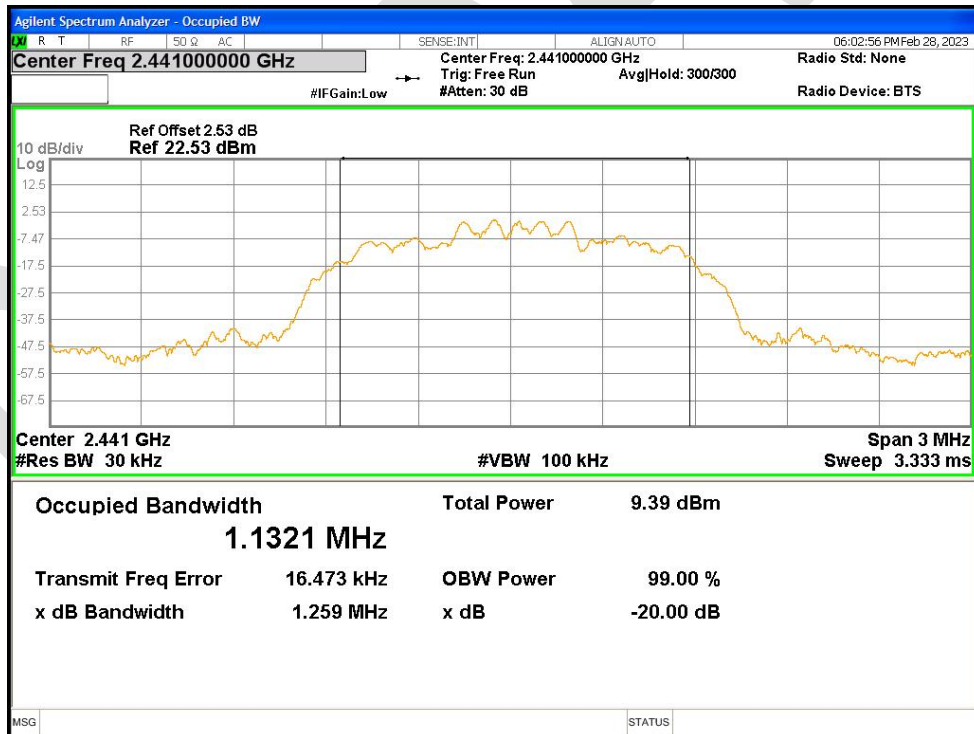
OBW NVNT 1-DH1 2480MHz Ant1



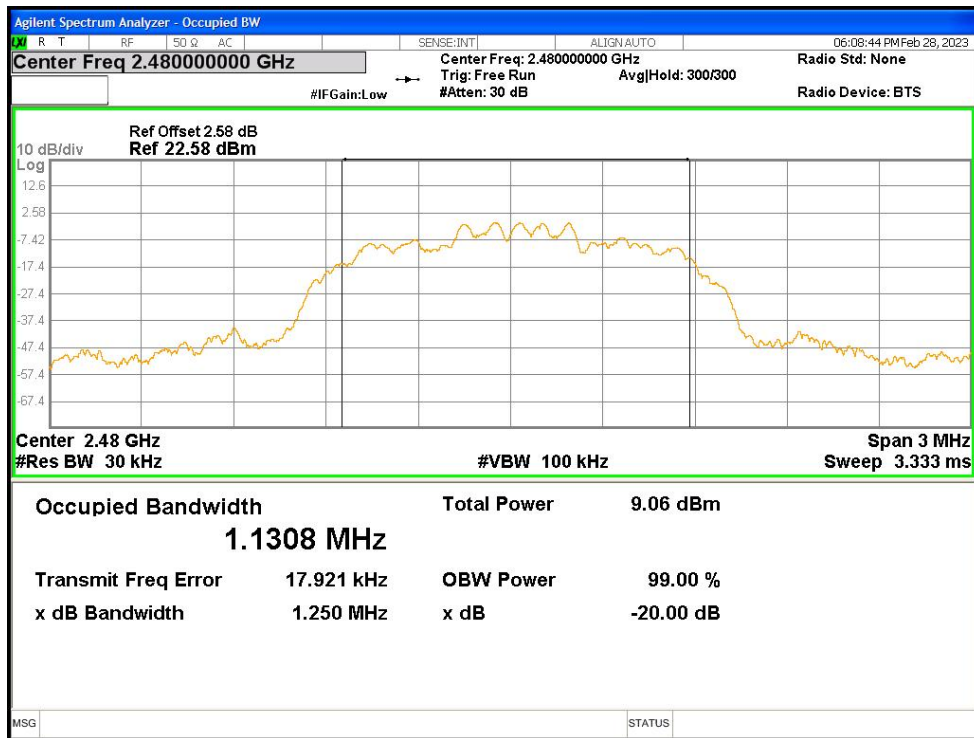
OBW NVNT 2-DH1 2402MHz Ant1



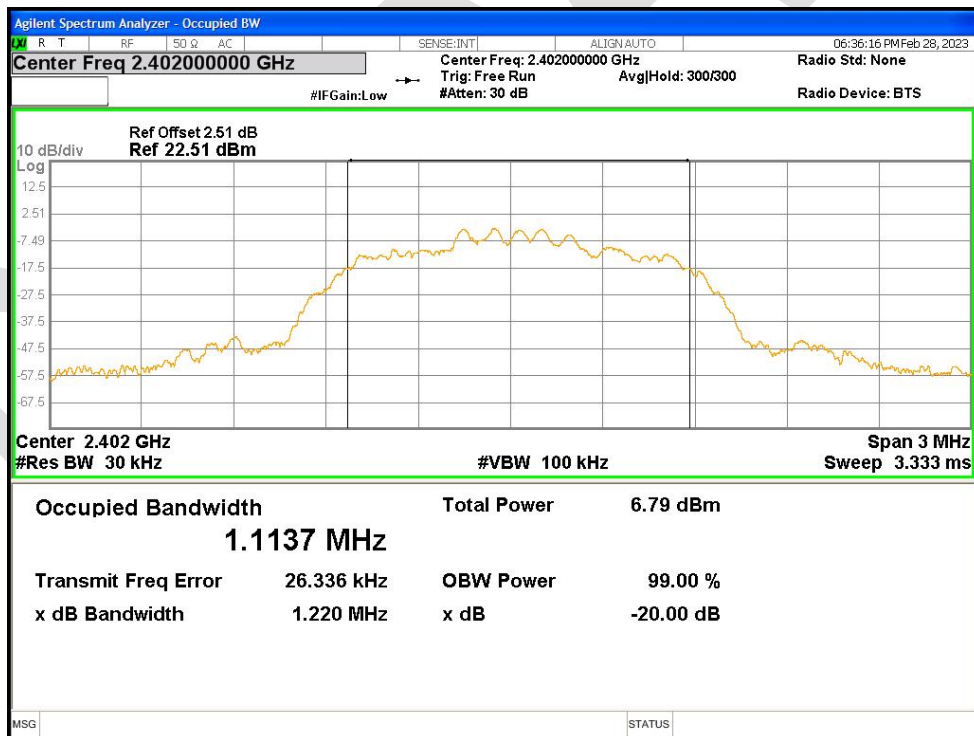
OBW NVNT 2-DH1 2441MHz Ant1



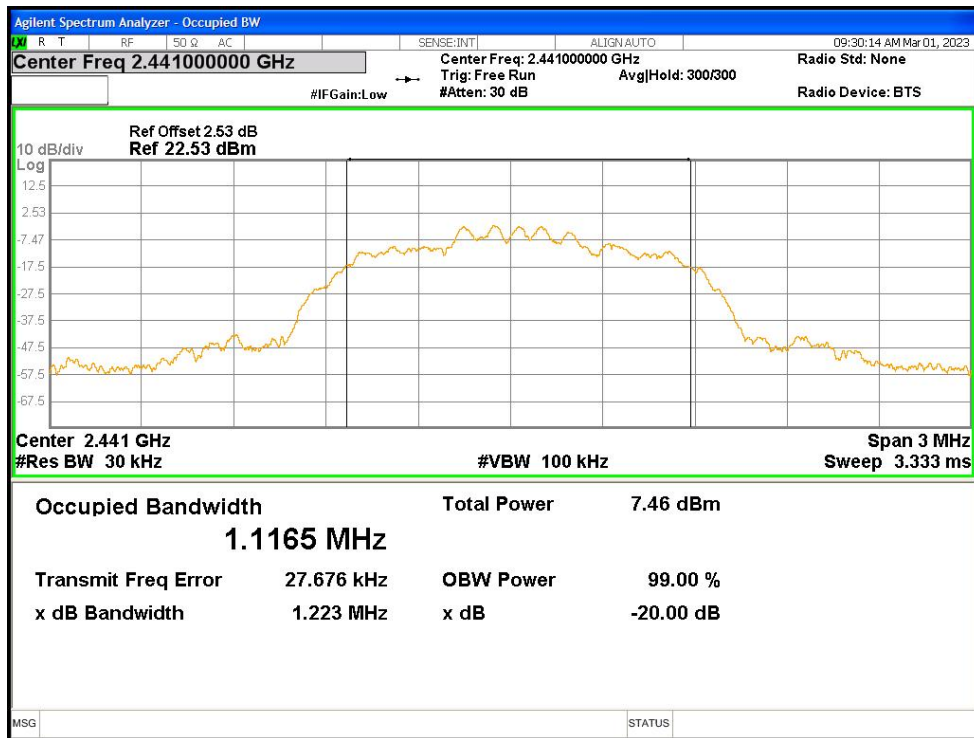
OBW NVNT 2-DH1 2480MHz Ant1



OBW NVNT 3-DH1 2402MHz Ant1



OBW NVNT 3-DH1 2441MHz Ant1



OBW NVNT 3-DH1 2480MHz Ant1

