

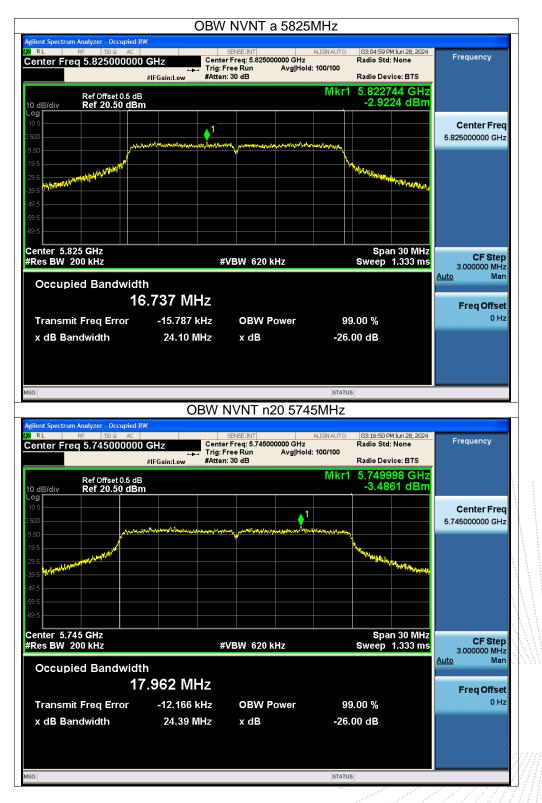




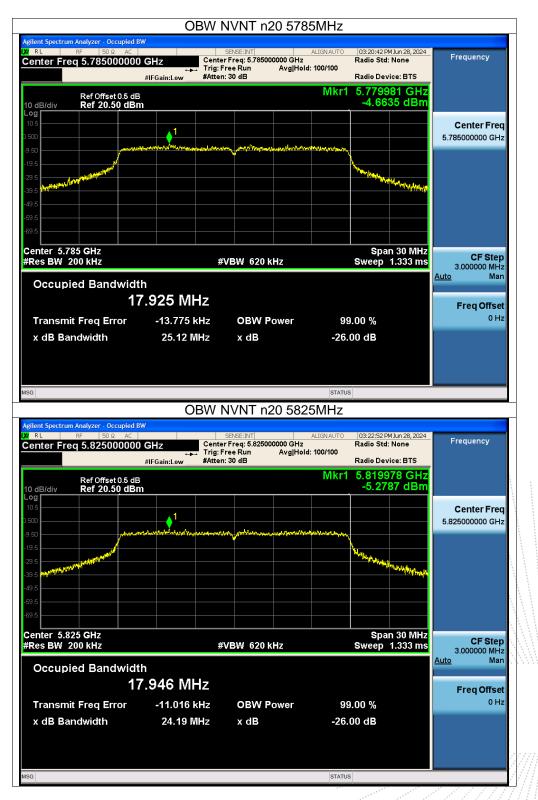


| | | Test Graphs | | |
|--|--|--|---|--|
| | OBW | NVNT a 5745 | 5MHz | |
| gilent Spectrum Analyzer - Occupied B\ | N | | | |
| RL RF 50Ω AC Center Freq 5.745000000 | GHz Center Trig: F | SENSE:INT r Freq: 5.745000000 GHz ree Run Avg Hol : 30 dB | | |
| Ref Offset 0.5 dB 0 dB/div Ref 20.50 dBm | | | Mkr1 5.7512 | |
| 10.5 | | | 1 | Center Fre |
| 3.50 | any and and and and any and a state of the | m power war and a second | -Northeastern | 5.745000000 GH |
| 19.5 29.5 | | | | Rubalin Martinelard |
| 49.5 | | | | |
| 59.5 | | | | |
| Center 5.745 GHz Res BW 200 kHz | # | VBW 620 kHz | | 1 30 MHz 1.333 ms 3.000000 MH |
| Occupied Bandwidt | | | | <u>Auto</u> Ma |
| 16 Transmit Freg Error | .750 MHz -32.391 kHz | OBW Power | 99.00 % | Freq Offse 0 ⊢ |
| x dB Bandwidth | 24.15 MHz | x dB | -26.00 dB | |
| | | | | |
| SG | | | | |
| | | | STATUS | |
| | | NVNT a 5785 | | |
| gilent Spectrum Analyzer - Occupied BV RL RF 50Ω AC | N | SENSE:INT | | 1)un 28, 2024 |
| gilent Spectrum Analyzer - Occupied BV | GHz Cente GHz Trig: F | SENSE:INT | | None Frequency |
| glient Spectrum Analyzer - Occupied B RL RE 50 2 AC center Freq 5.785000000 Ref Offset 0.5 dB 0 dB/div Ref 20.50 dBm | GHz Cente #IFGain:Low #Atten | SENSE:INT r Freq: 5.785000000 GHz ree Run Avg Hol | ALIGN AUTO 03:03:38 PM Radio Std: d: 100/100 Radio Dev MKr1 5.7827 | None Frequency |
| RL RF 50 Q AC RL RF 50 Q AC center Freq 5.785000000 Ref Offset 0.5 dB 0 dB/div Ref 20.50 dBm | GHz Cente #IFGain:Low #Atten | SENSE:INT Freq: 5.76500000 GHz ree Run Avg Hol : 30 dB | ALIGNAUTO 03:03:38 PM ALIGNAUTO Radio Std: Radio Devi Mkr1 5.7827 -2.223 | None Frequency 38 GHz 35 dBm Center Fre |
| glient Spectrum Analyzer - Occupied BY RL RE S0.2 AC center Freq 5.7850000000 S0000000 S000000000000000000000000000000000000 | W GHz Cente #IFGain:Low #Atten | SENSE:INT Freq: 5.785000000 GHz ree Run Avg Hol : 30 dB | ALIGNAUTO 03:03:38 PM Radio Std: d: 100/100 Mkr1 5.7827 -2.225 | None Ice: BTS 38 GHz 95 dBm |
| glient Spectrum Analyzer - Occupied B RL RF 50 02 AC center Freq 5.7850000000 Ref Offset 0.5 dB O dB/div Ref Offset 0.5 dB o g 0 dB/div Ref 20.50 dBm 500 0 0 0 3.50 0 0 0 | W GHz Cente #IFGain:Low #Atten | SENSE:INT Freq: 5.76500000 GHz ree Run Avg Hol : 30 dB | ALIGNAUTO 03:03:38 PM ALIGNAUTO Radio Std: Radio Devi Mkr1 5.7827 -2.223 | None Frequency 38 GHz 35 dBm Center Fre |
| glient Spectrum Analyzer - Occupied B RL RF 50 Q AC center Freq 5.785000000 Ref Offset 0.5 dB Ref Offset 0.5 dB Ref 20.50 dBm 00 0< | W GHz Cente #IFGain:Low #Atten | SENSE:INT Freq: 5.76500000 GHz ree Run Avg Hol : 30 dB | ALIGNAUTO 03:03:38 PM Radio Std: 4: 100/100 Mkr1 5.7827 -2.225 | None Frequency Sa GHZ S5 dBm Center Fre 5.785000000 GH |
| gllent Spectrum Analyzer - Occupied BY RL RF S0.2 AC center Freq 5.7850000000 AC AC AC Ref Offset 0.5 dB AC AC AC O dB/div Ref Offset 0.5 dB AC AC O dB/div Ref 20.50 dBm AC AC O data AC AC AC< | W GHz Cente #IFGain:Low #Atten | SENSE:INT Freq: 5.76500000 GHz ree Run Avg Hol : 30 dB | ALIGN AUTO d: 100/100 Mikr1 5.7827 -2,225 | None Frequency Sa GHZ So dBm Center Fre 5.785000000 GH |
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| glient Spectrum Analyzer - Occupied B RL RF S0.2 AC Genter Freq 5.7850000000 Ref Offset 0.5 dB Ref Offset 0.5 dB Ref Offset 0.5 dB 0 dB/div Ref Offset 0.5 dB Ref 0.000000 Ref 0.0000000 0 dB/div Ref 0.0000000 Ref 0.0000000 Ref 0.0000000000000 0 dB/div Ref 0.00000000000000000000000000000000000 | W GHz #IFGain:Low #Atten ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ | SENSE.INT | ALIGNAUTO ALIGNAUTO d: 100/100 Mikr1 5.7827 -2.225 Mikr1 5.7827 -2.225 Mikr1 5.7827 -2.225 -2.225 -2.5 -2.5 | None Frequency Frequency Frequency Center Fre 5.785000000 GH Center Fre 5.785000000 GH Center Fre 5.785000000 GH Center Fre 5.785000000 GH CE Ste 3.00000 MH Auto Ma |
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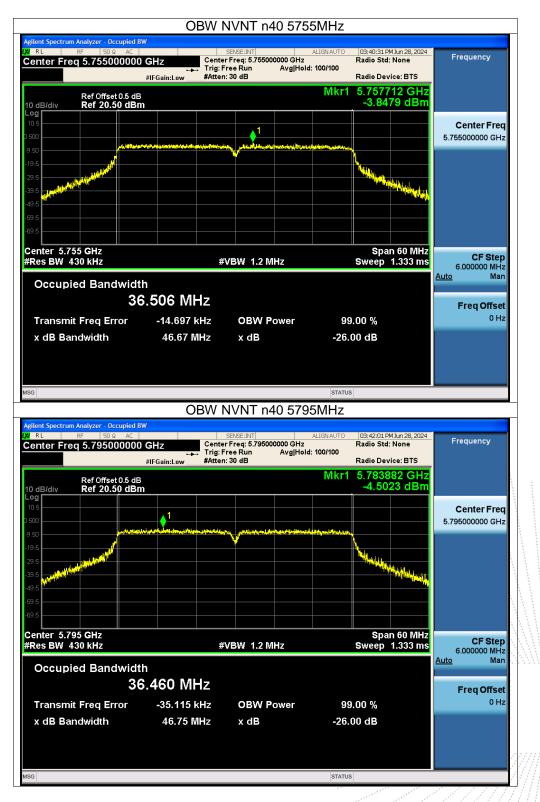




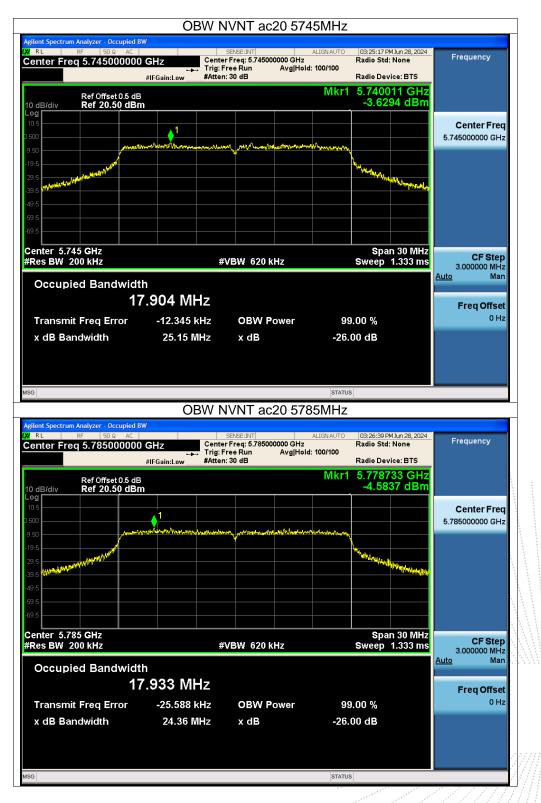








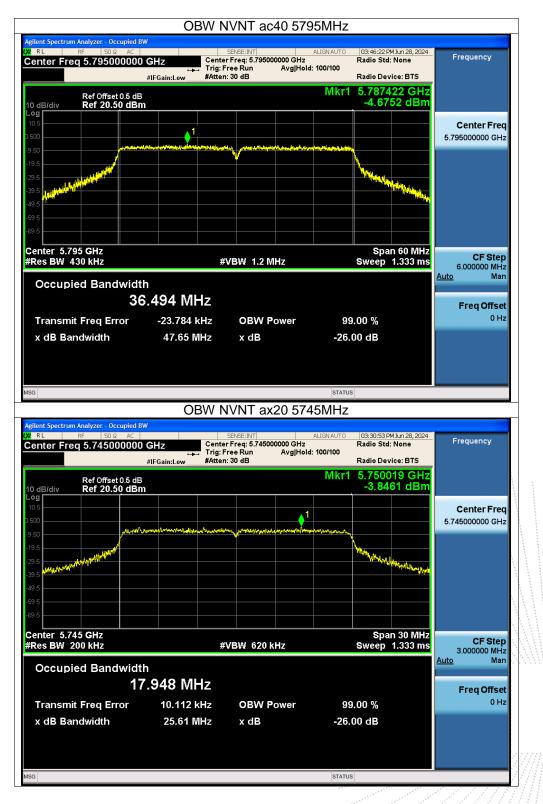




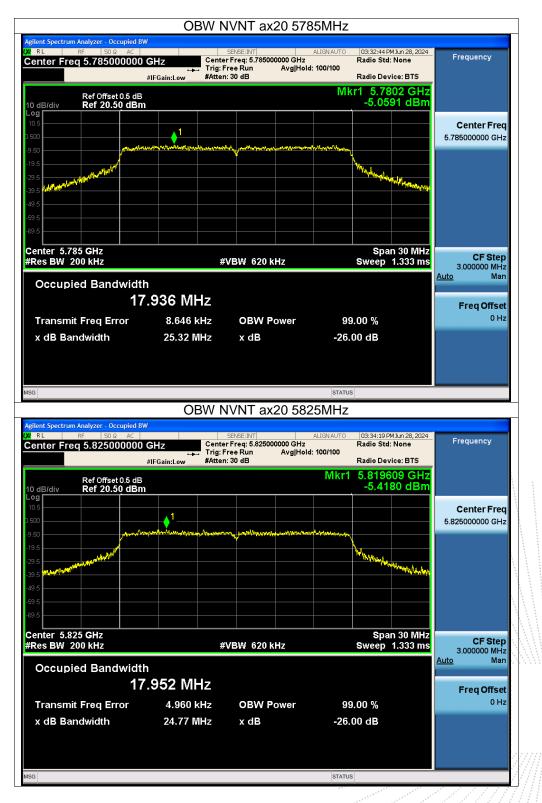




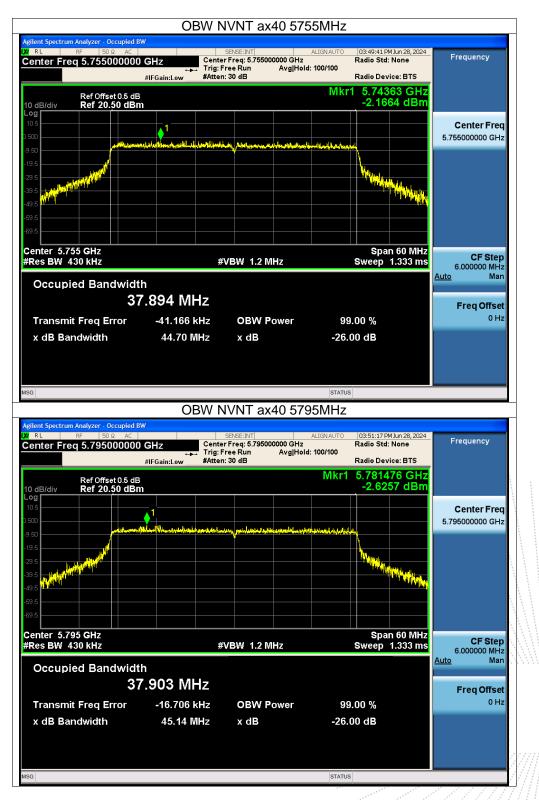














10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conduced output power should not exceed:

| Frequency Band(MHz) | Limit |
|---------------------|-------|
| 5150~5250 | 250mW |
| 5725~5850 | 1W |

10.3 Test Procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

• The EUT transmits continuously (or with a duty cycle ≥ 98 percent).

• Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.



(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle \ge 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 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.



10.5 Test Result

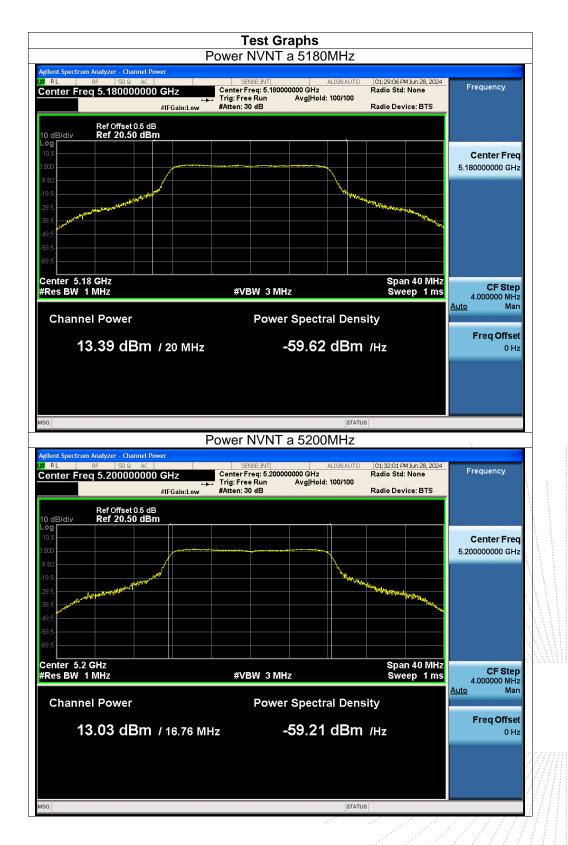
| Temperature: | 26 ℃ | Relative Humidity: | 54% | |
|--------------|--------------------------------|--------------------|--------------|--|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz | |
| Test Mode: | (5180-5240MHz); (5745-5825MHz) | | | |

| Condition | Mode | Frequency (MHz) | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|------|--------------------|--------------------------|-------------|---------|
| NVNT | а | 5180 | 13.39 | 24 | Pass |
| NVNT | а | 5200 | 13.03 | 24 | Pass |
| NVNT | а | 5240 | 13.05 | 24 | Pass |
| NVNT | n20 | 5180 | 10.97 | 24 | Pass |
| NVNT | n20 | 5200 | 10.91 | 24 | Pass |
| NVNT | n20 | 5240 | 10.88 | 24 | Pass |
| NVNT | n40 | 5190 | 8.07 | 24 | Pass |
| NVNT | n40 | 5230 | 7.72 | 24 | Pass |
| NVNT | ac20 | 5180 | 9.16 | 24 | Pass |
| NVNT | ac20 | 5200 | 9.16 | 24 | Pass |
| NVNT | ac20 | 5240 | 9.48 | 24 | Pass |
| NVNT | ac40 | 5190 | 8.1 | 24 | Pass |
| NVNT | ac40 | 5230 | 7.75 | 24 | Pass |
| NVNT | ax20 | 5180 | 8.26 | 24 | Pass |
| NVNT | ax20 | 5200 | 8.21 | 24 . | Pass |
| NVNT | ax20 | 5240 | 8.38 | 24 | Pass |
| NVNT | ax40 | 5190 | 8.14 | 24 | Pass |
| NVNT | ax40 | 5230 | 7.67 | 24 | Pass |
| | | - | | | |

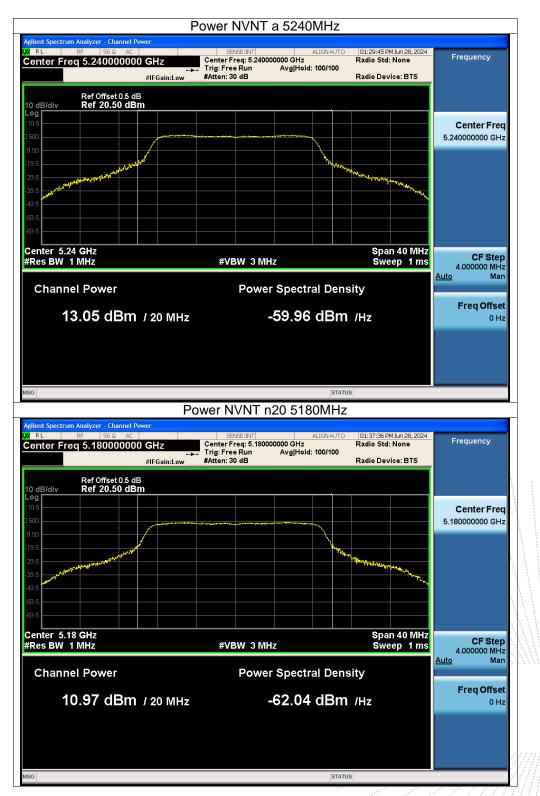
| Condition | Mode | Frequency (MHz) | Conducted Power (dBm) | Limit (dBm) | Verdict |
|----------------|--------|--------------------|--------------------------|-------------|------------|
| NVNT | а | 5745 | 11.4 | 30 | Pass |
| NVNT | а | 5785 | 10.92 | 30 | Pass |
| NVNT | а | 5825 | 9.71 | 30 | Pass |
| NVNT | n20 | 5745 | 9.44 | 30 | Pass |
| NVNT | n20 | 5785 | 8.46 | 30 | Pass |
| NVNT | n20 | 5825 | 7.82 | 30 | Pass |
| NVNT | n40 | 5755 | 9.27 | 30 | Pass |
| NVNT | n40 | 5795 | 8.27 | 30 | Pass |
| NVNT | ac20 | 5745 | 9.28 | 30 | Pass |
| NVNT | ac20 | 5785 | 8.44 | 30 | Pass |
| NVNT | ac20 | 5825 | 7.87 | 30 | Pass |
| NVNT | ac40 | 5755 | 8.96 | 30 | Pass |
| NVNT | ac40 | 5795 | 8.39 | 30 | Pass |
| NVNT | ax20 | 5745 | 9.15 | 30 | Pass |
| NVNT | ax20 | 5785 | 8.6 | 30 | Pass |
| NVNT | ax20 | 5825 | 7.9 | 30 | Pass |
| NVNT | ax40 | 5755 | 9.2 | 30 | Pass |
| NVNT | ax40 | 5795 | 8.51 | 30 | Pass |
| . : BCTC/RF-EI | MC-005 | F | Page: 100 of 174 | | Edition: B |



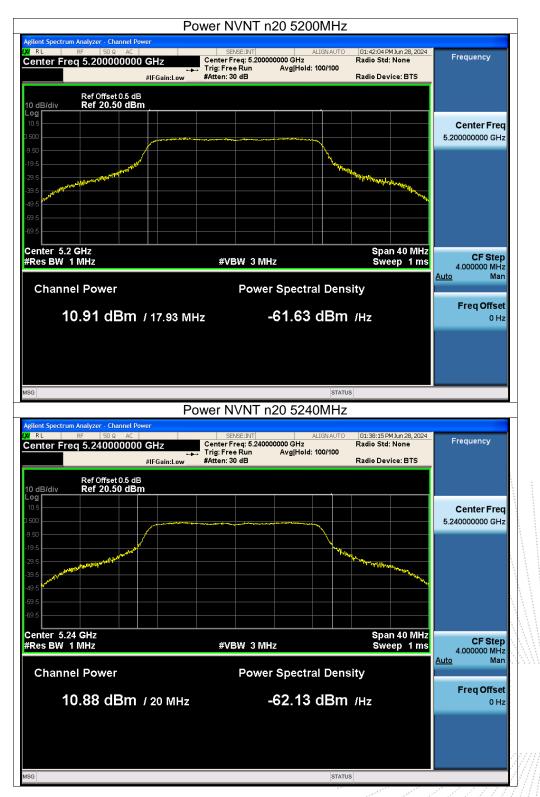




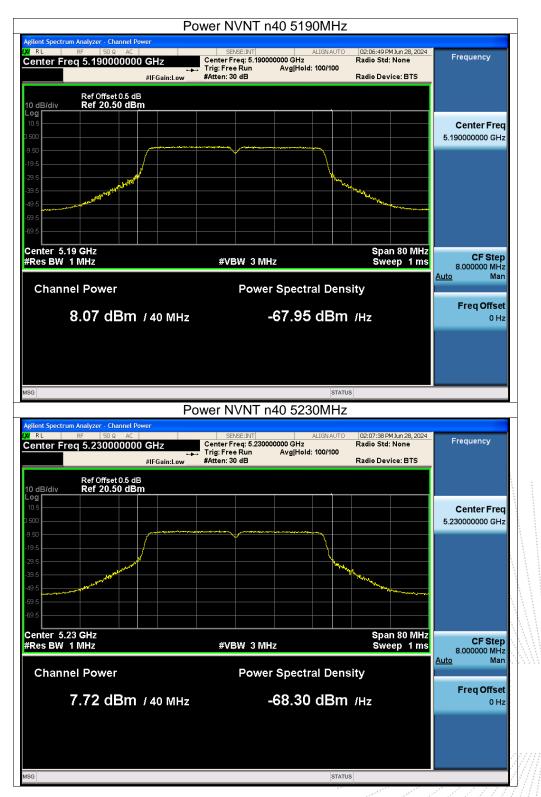




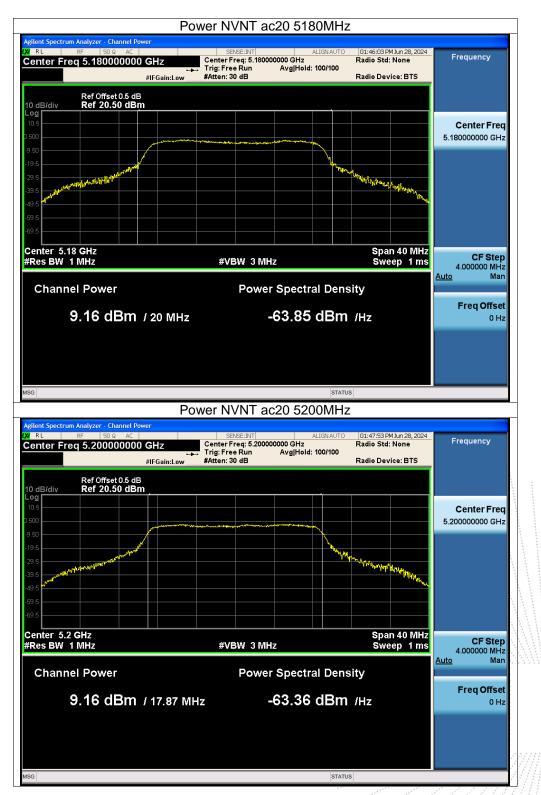




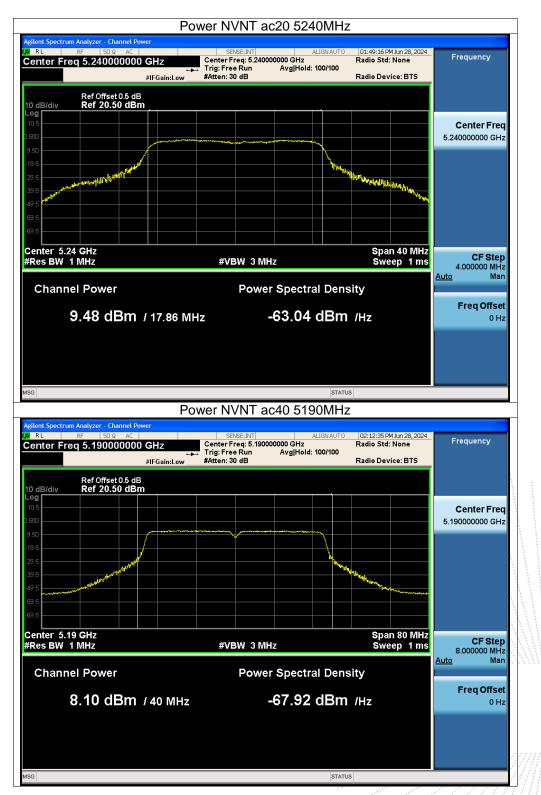




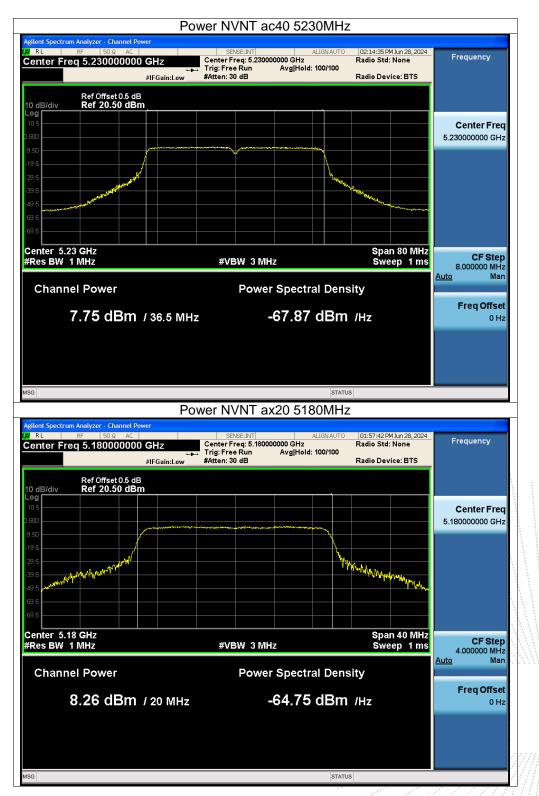




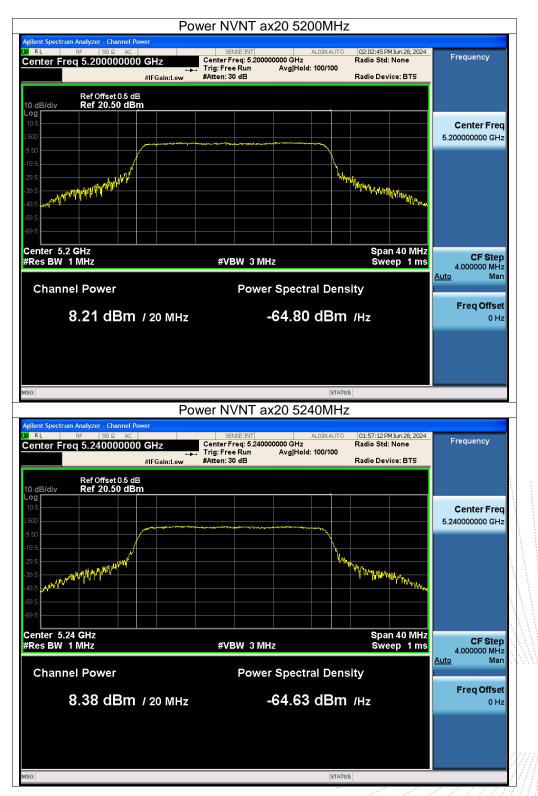




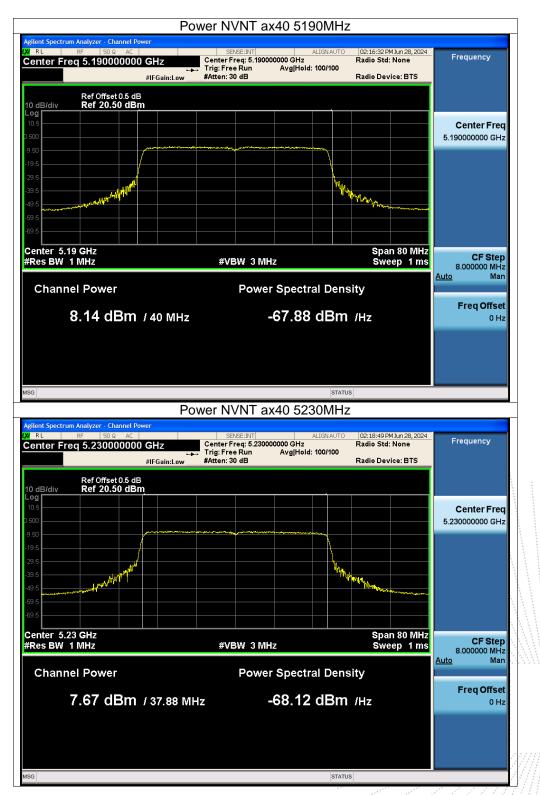






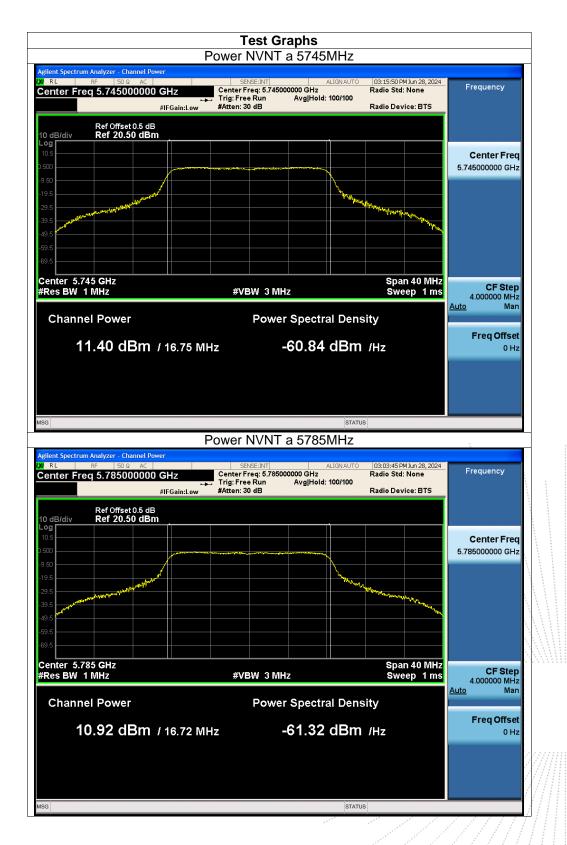




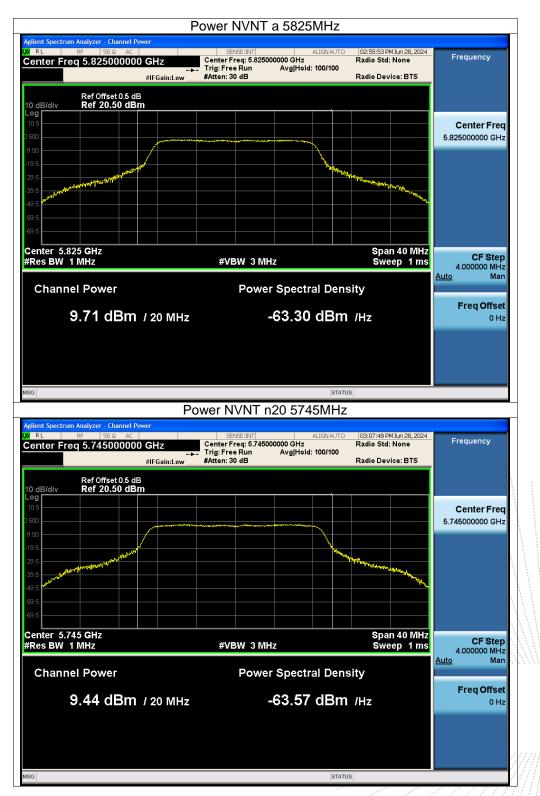




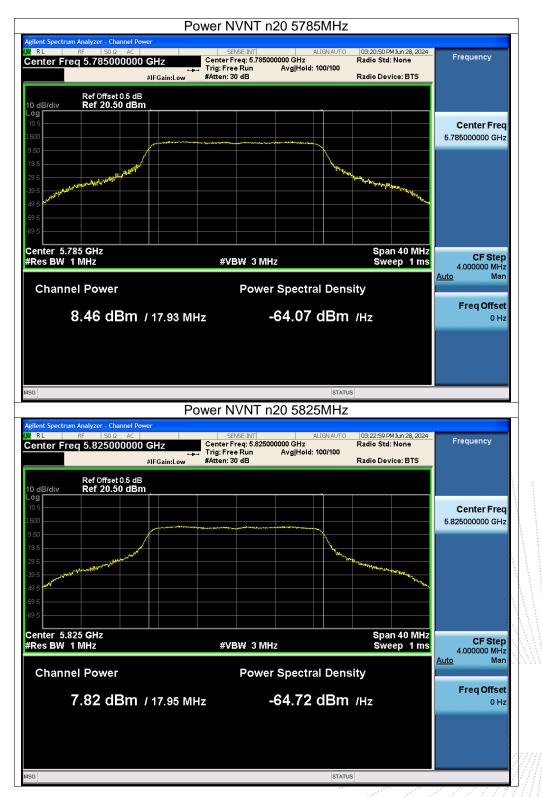




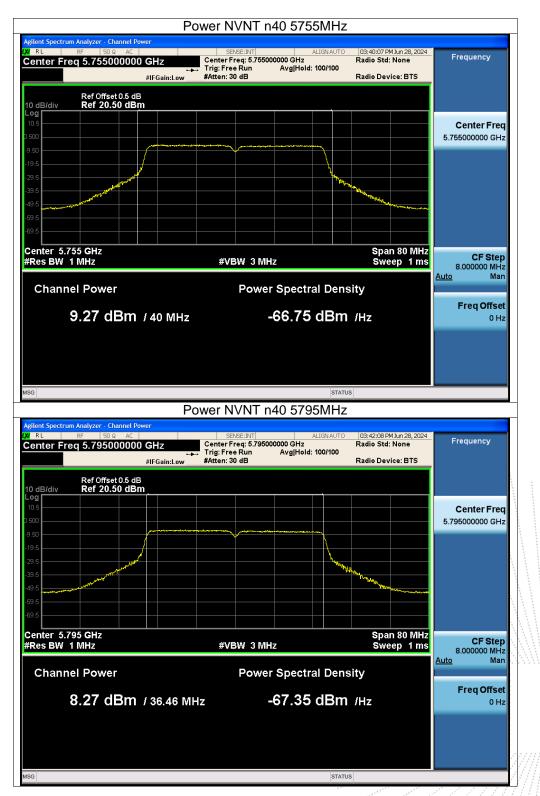




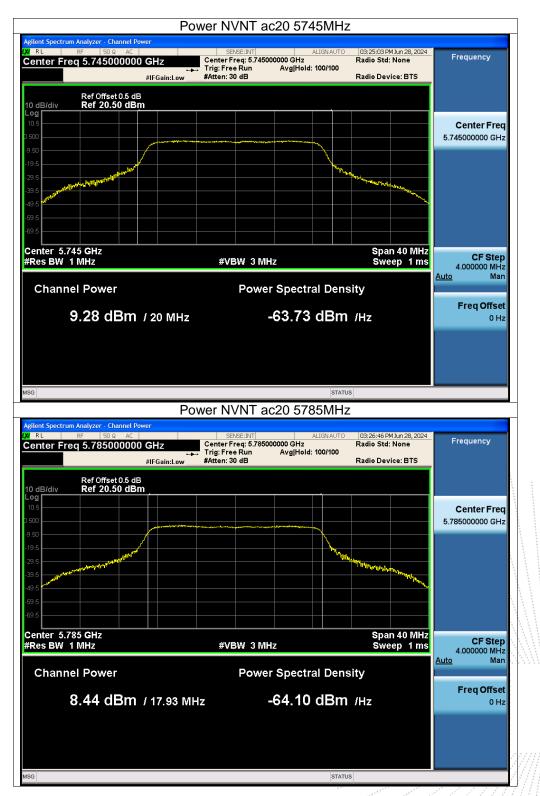




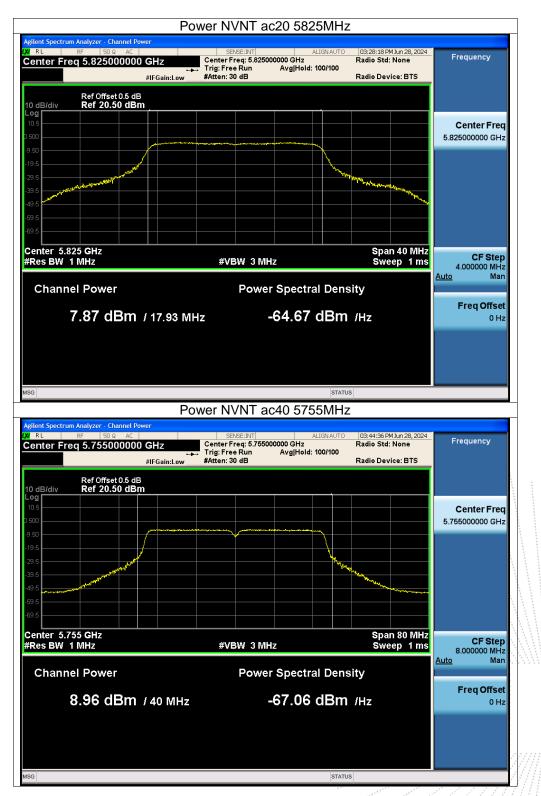




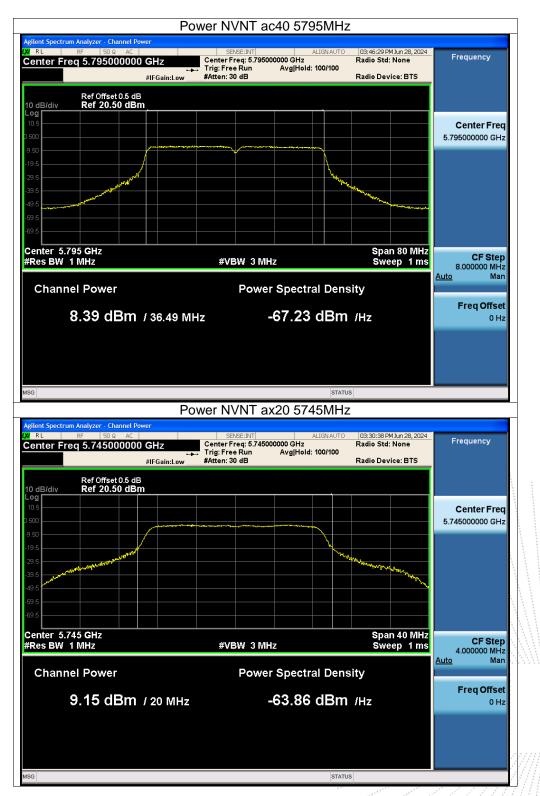




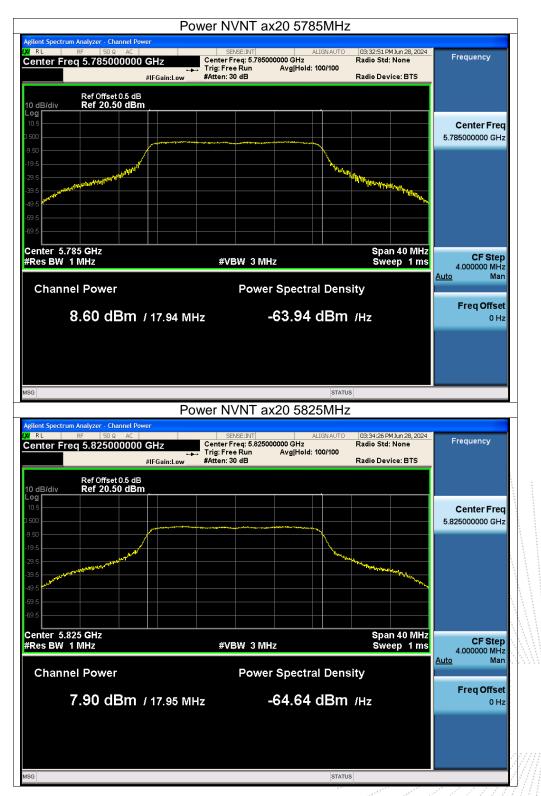




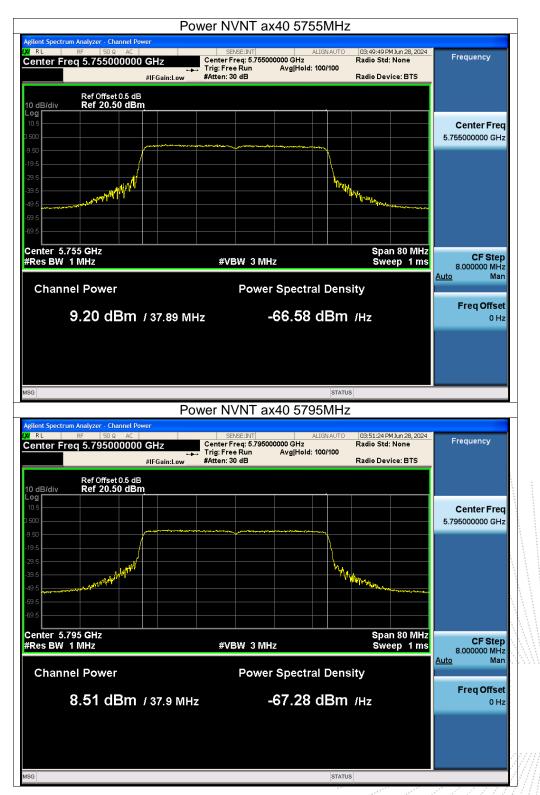














11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits: (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

11.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

 Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
 Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.

4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

5. Repeat above procedures until all measured frequencies were complete.

11.4 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



11.5 Test Result



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