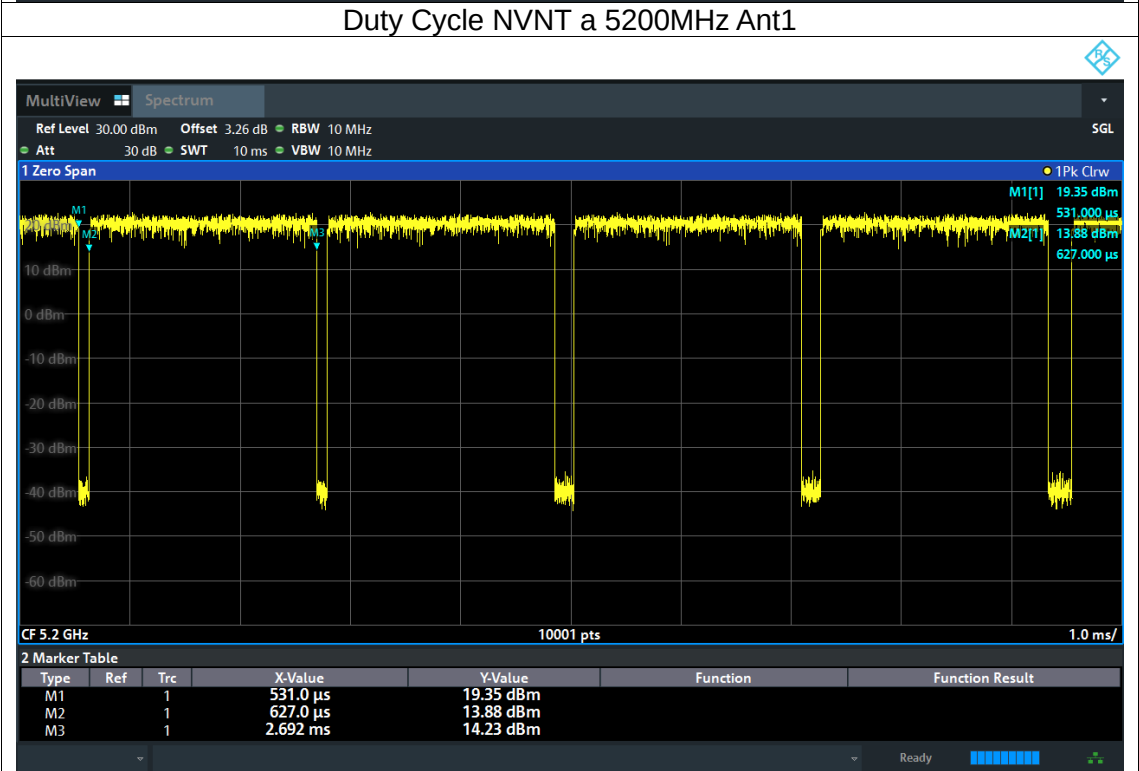
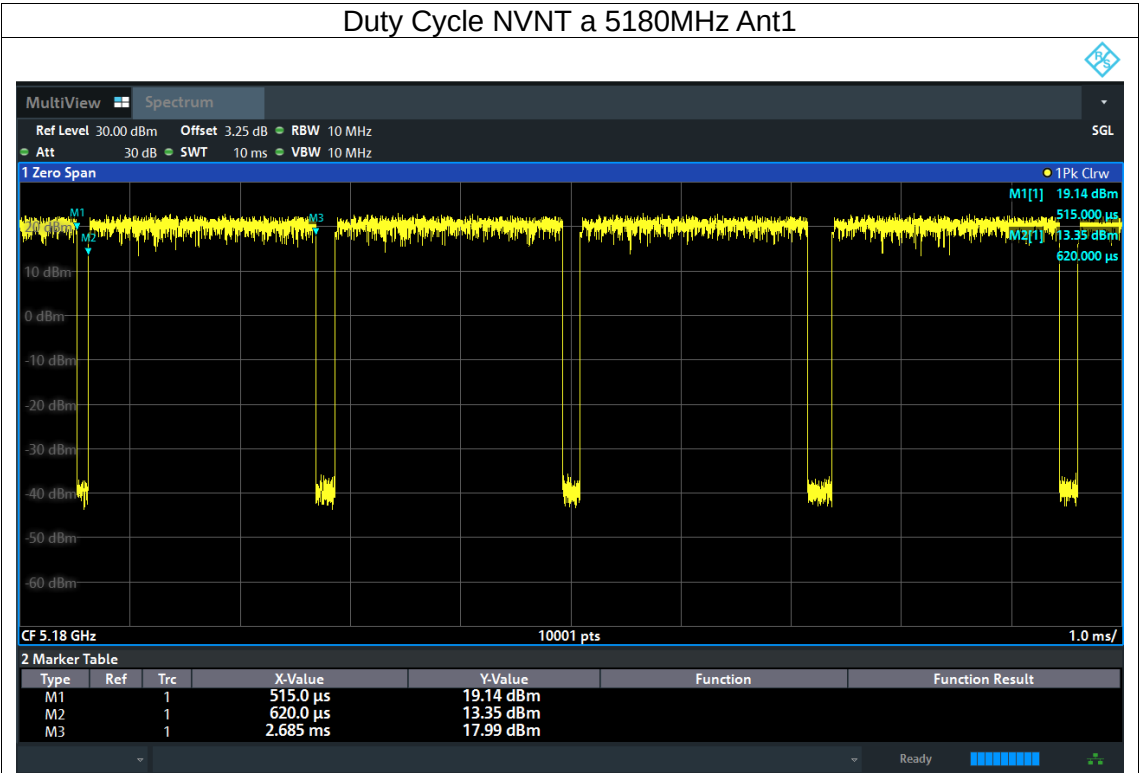
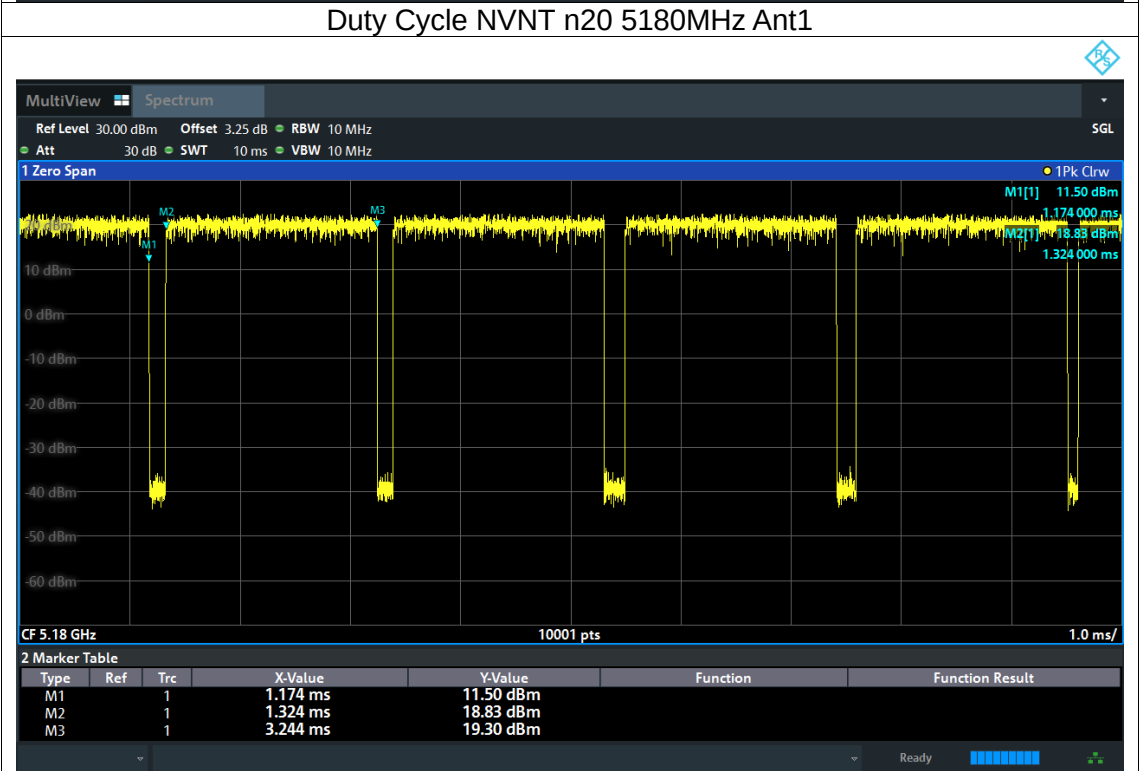
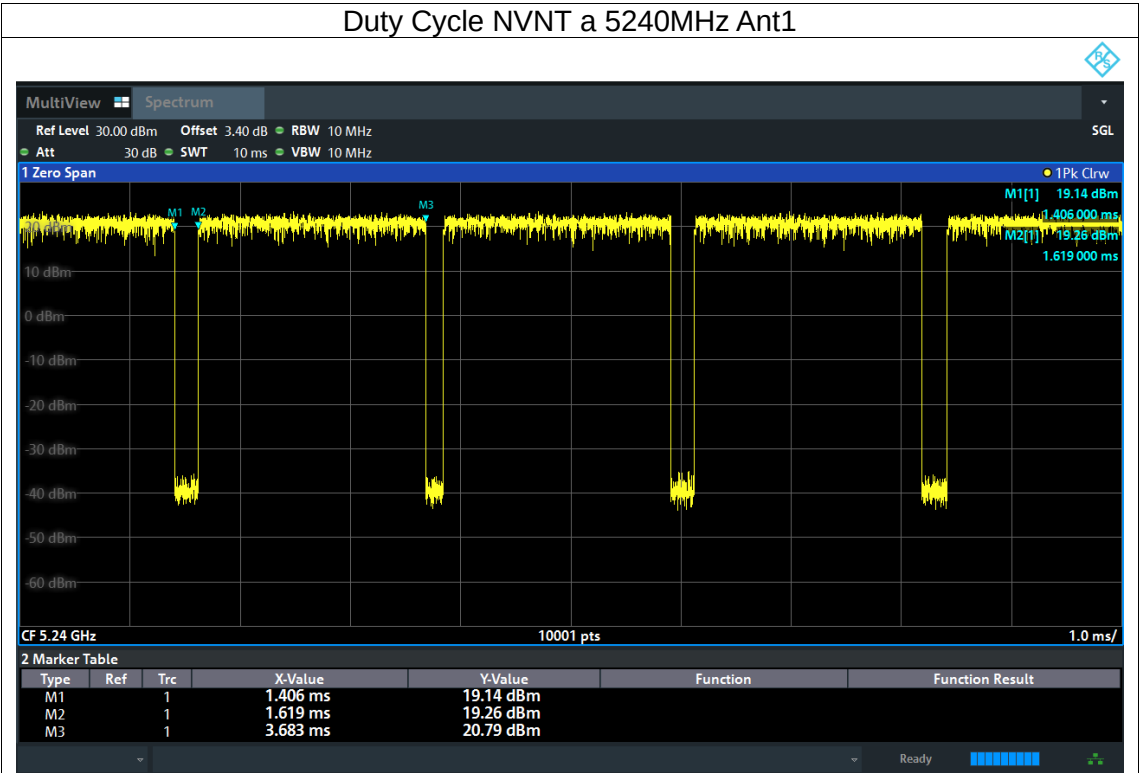


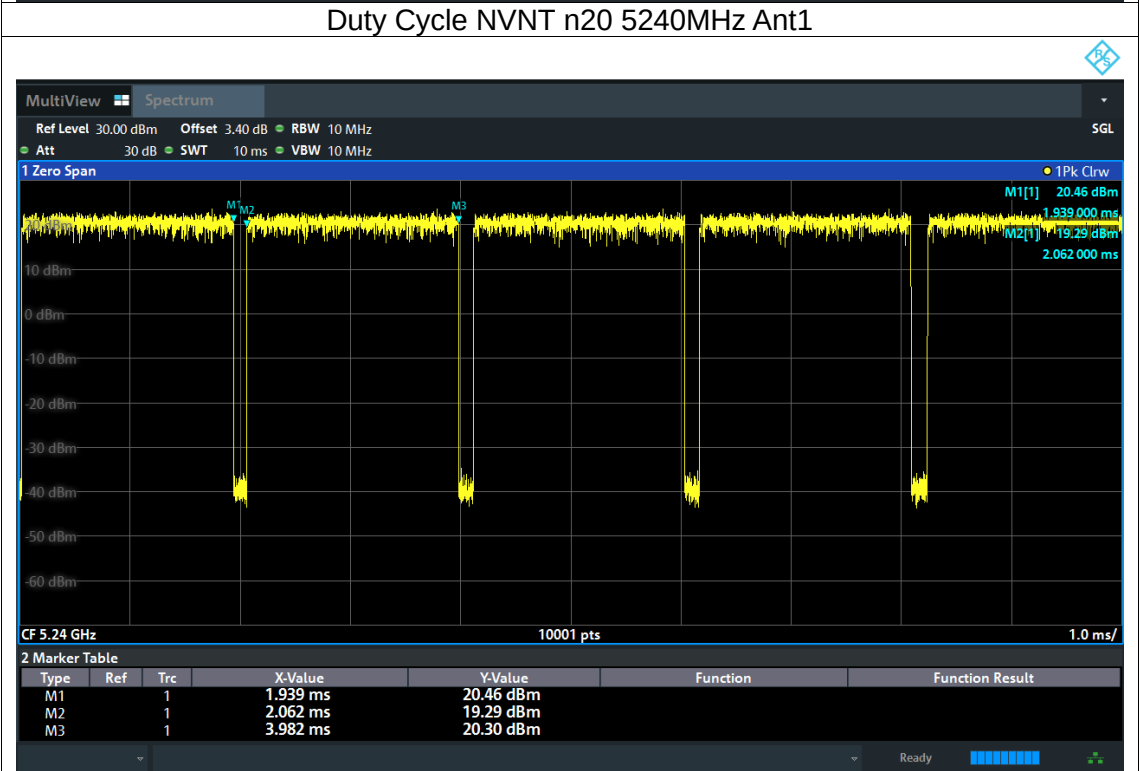
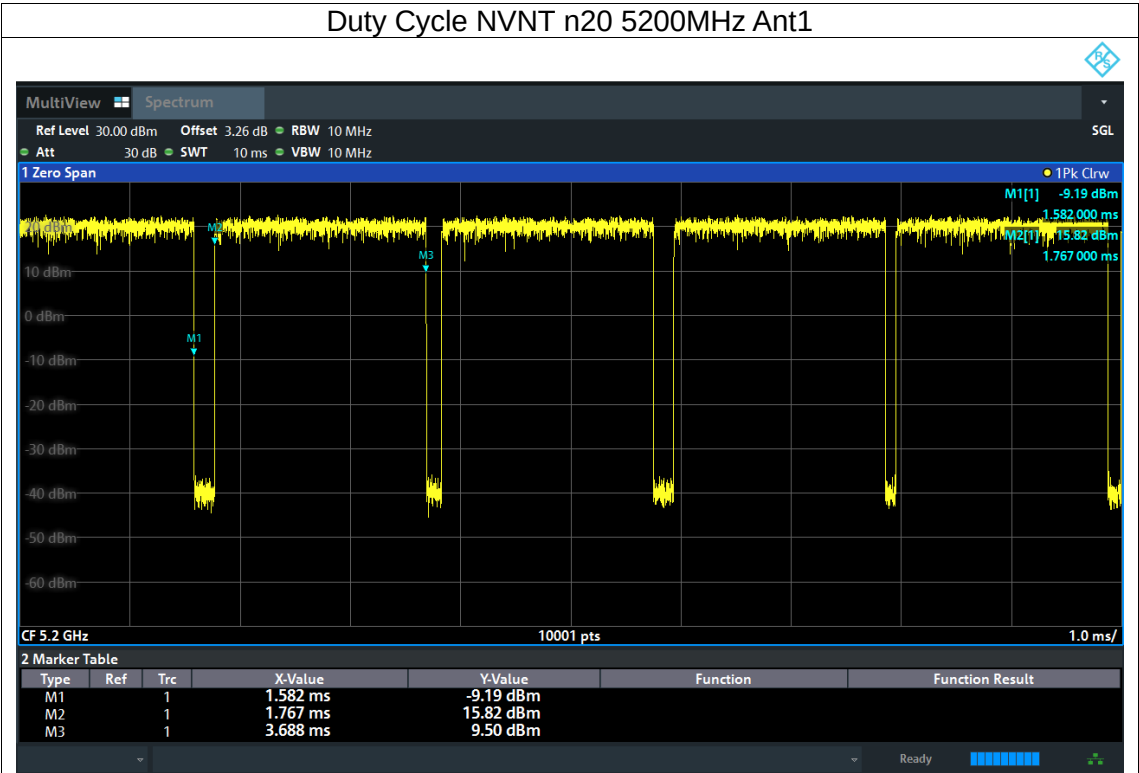
EUT:	Aftermarket Automotive Type-C HUD (Head-Up Display) - V Series	Model Name:	EW-HUDV5-Ultra
Pressure:	1012 hPa	Test Voltage:	DC 12V from battery

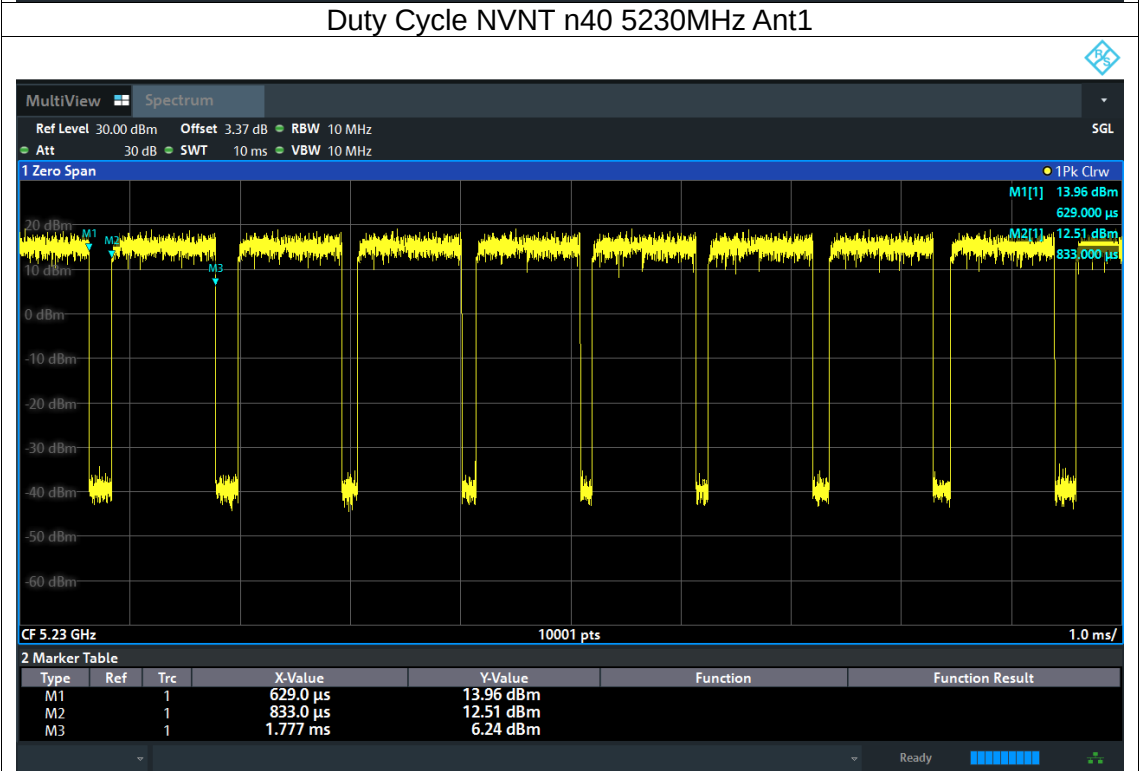
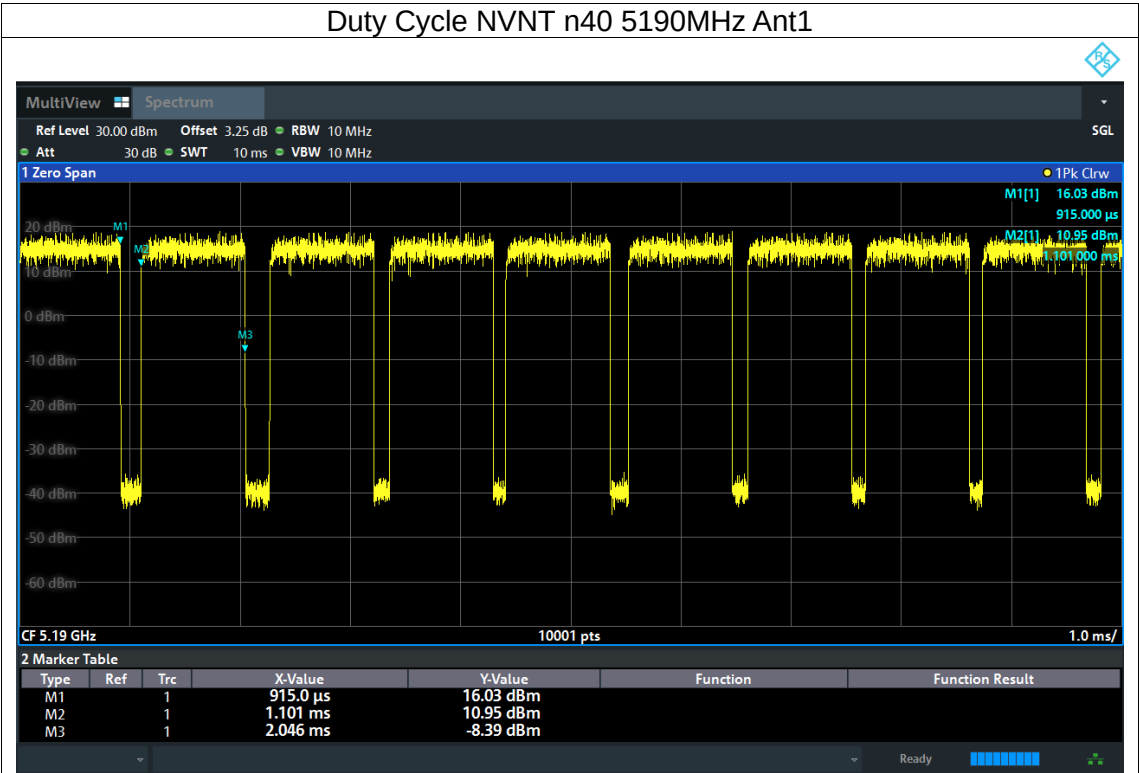
For U-NII-1:

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5180	Ant1	95.16	0.22	0.48
a	5200	Ant1	95.56	0.2	0.48
a	5240	Ant1	90.65	0.43	0.48
n20	5180	Ant1	92.75	0.33	0.52
n20	5200	Ant1	91.22	0.4	0.52
n20	5240	Ant1	93.98	0.27	0.52
n40	5190	Ant1	83.55	0.78	1.06
n40	5230	Ant1	82.23	0.85	1.06



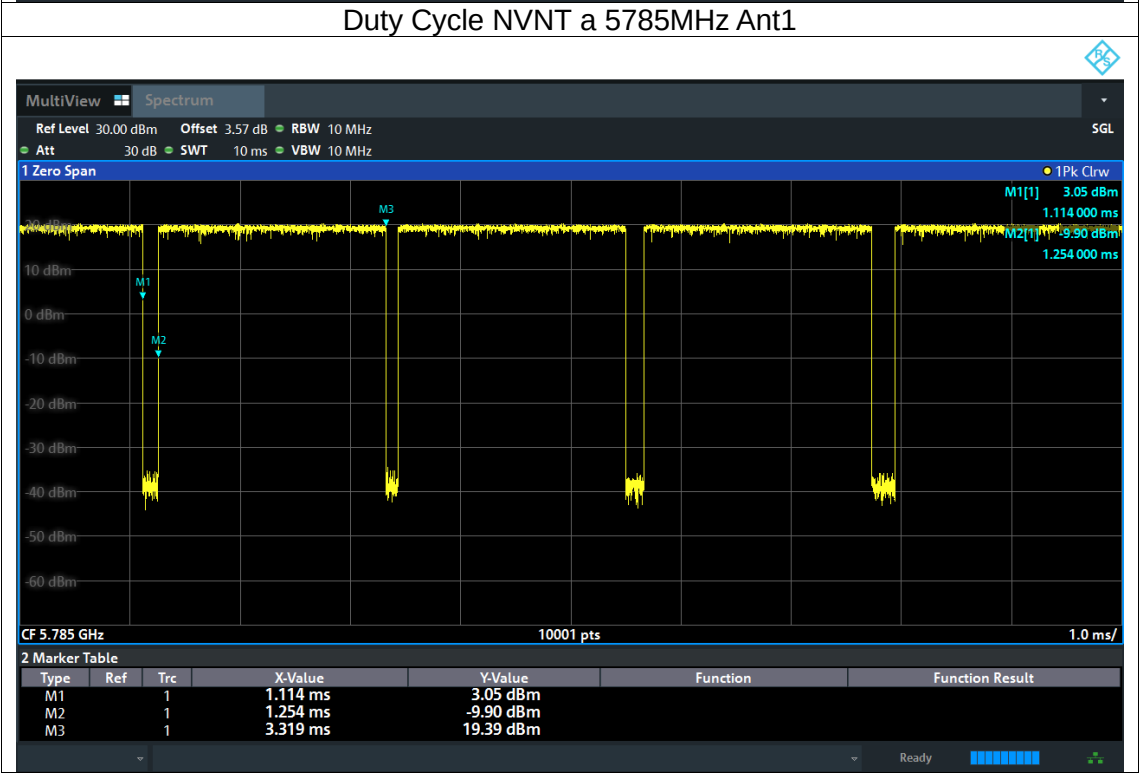
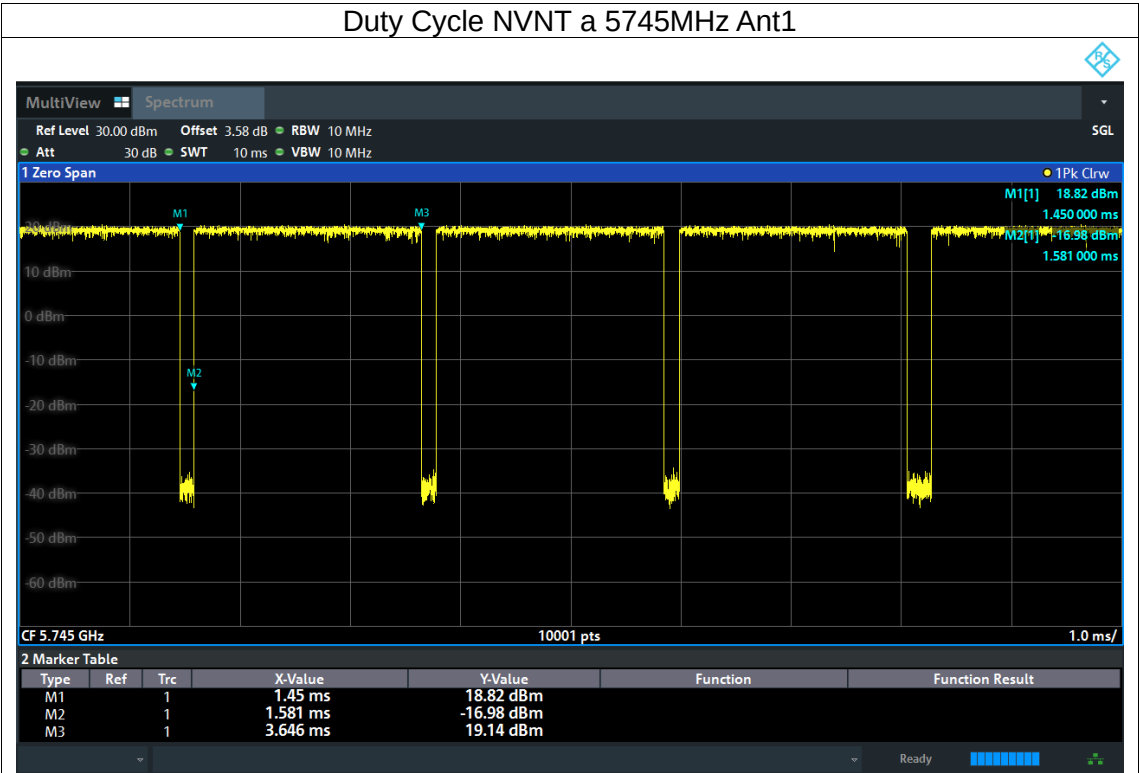


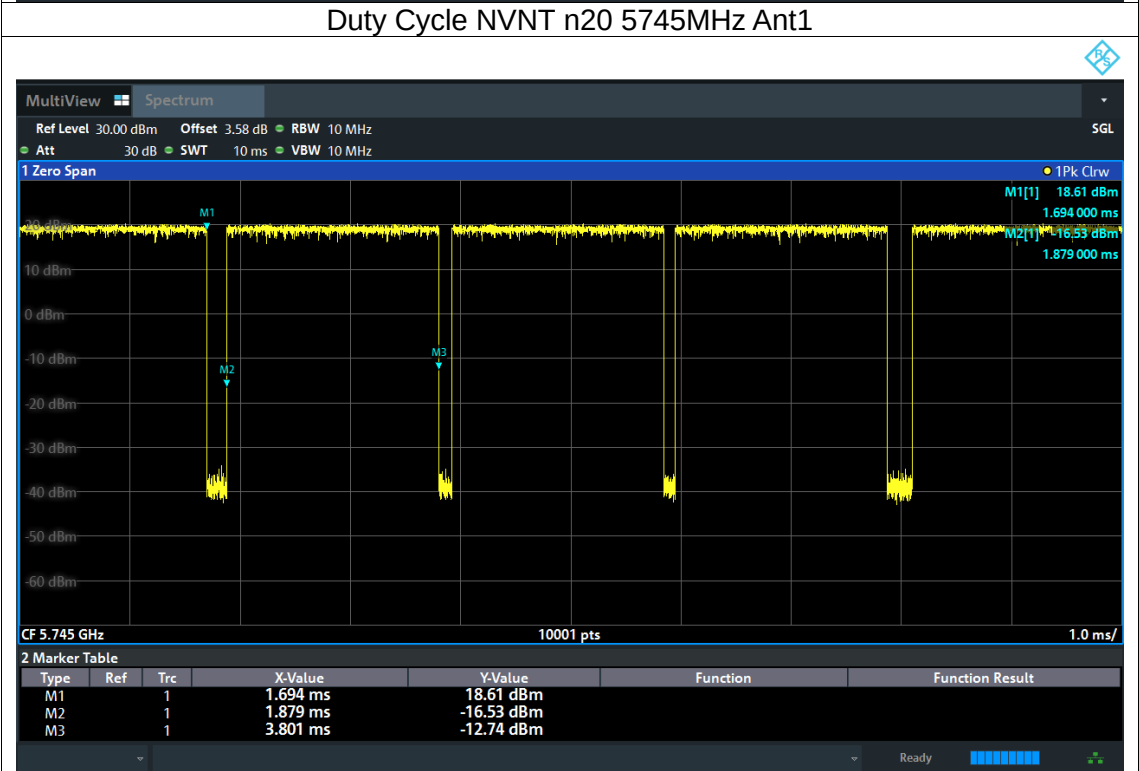
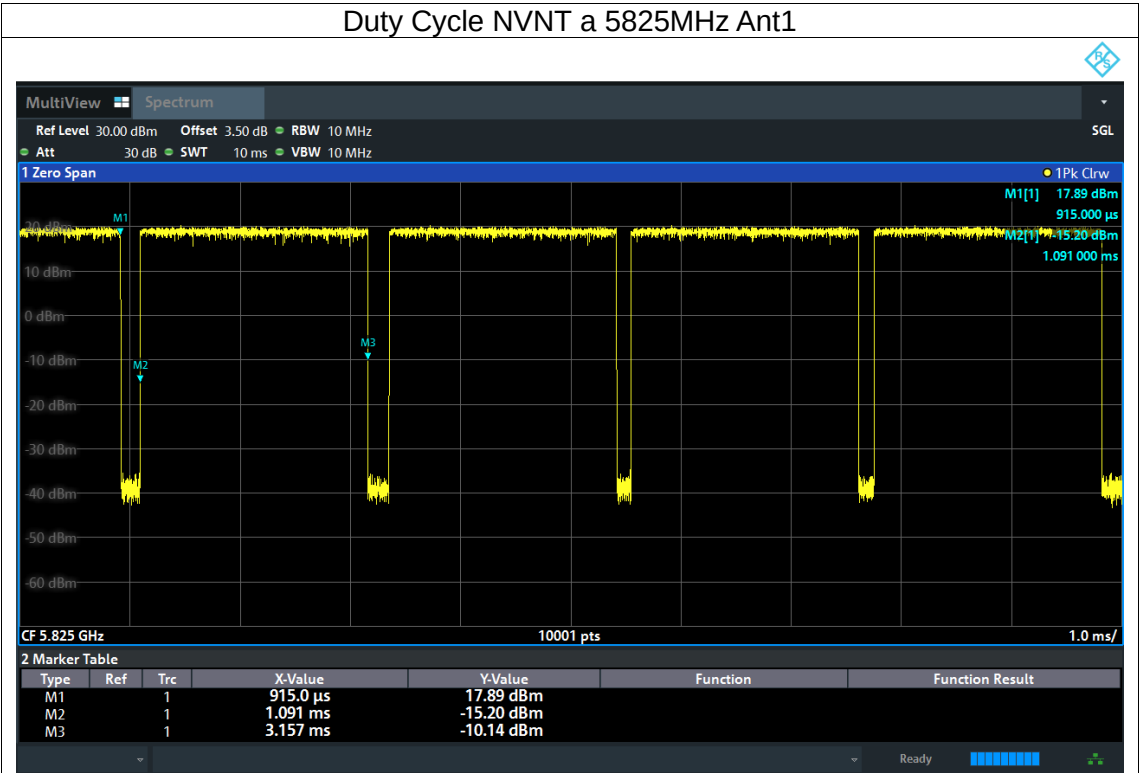


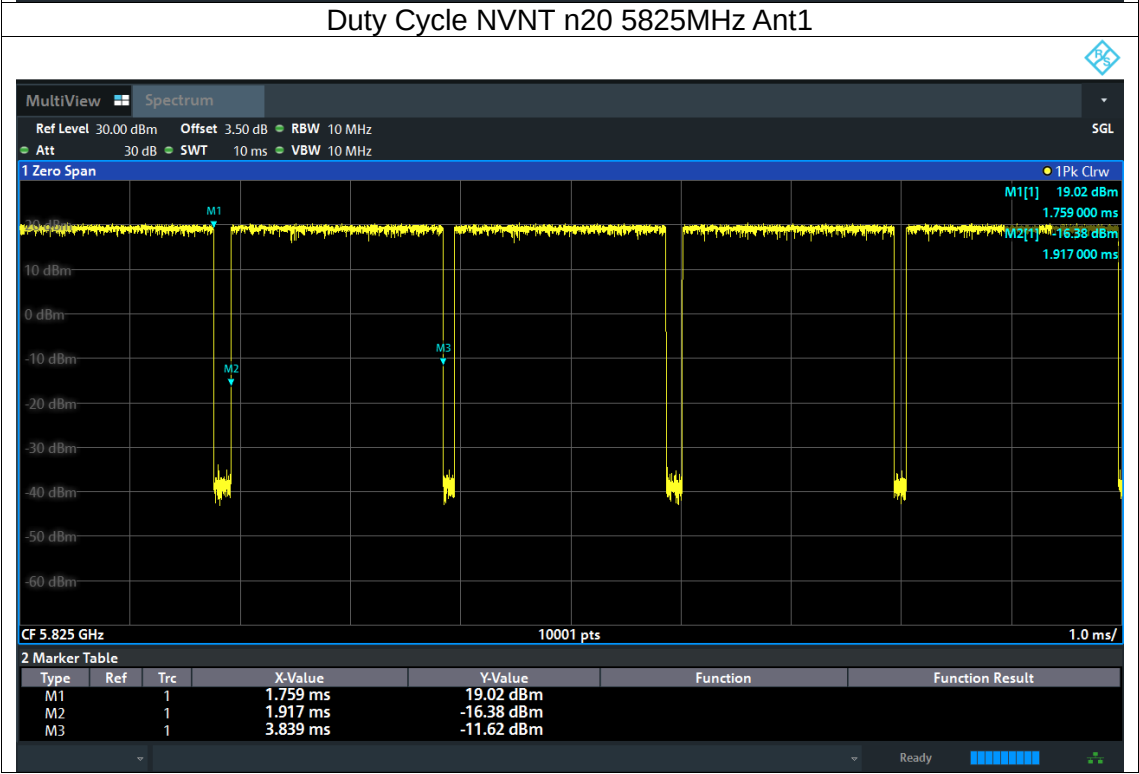
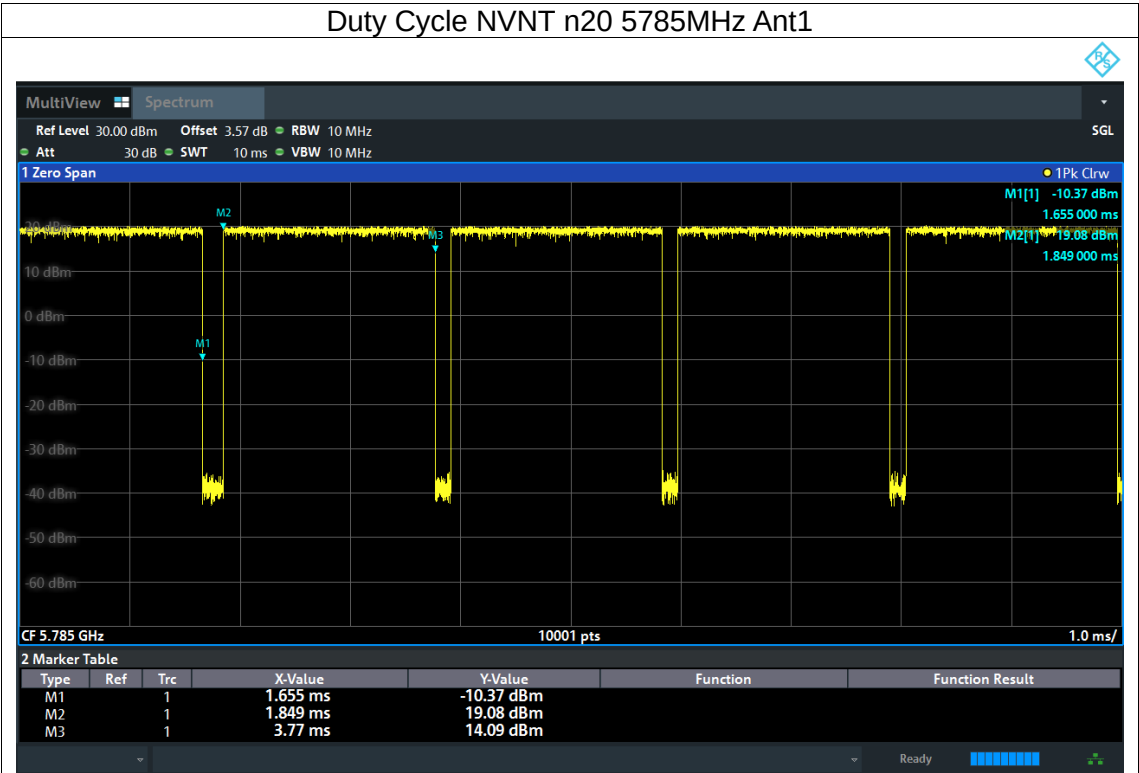


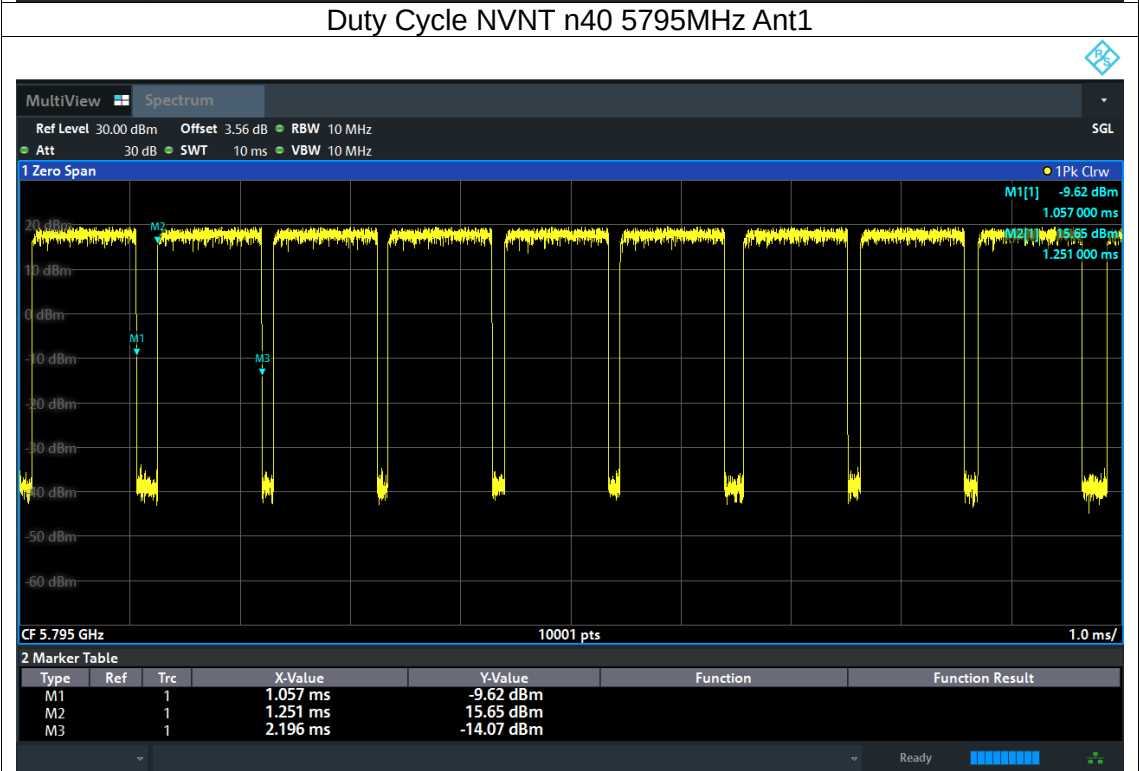
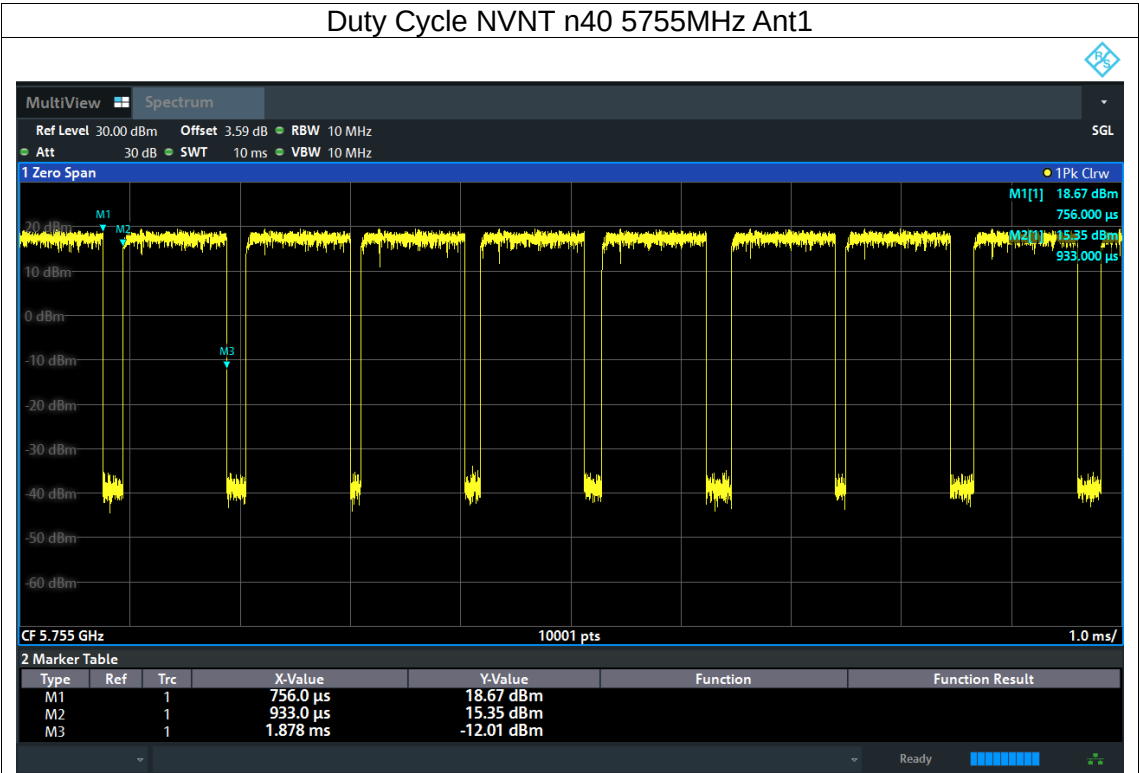
For U-NII-3:

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5745	Ant1	94.03	0.27	0.48
a	5785	Ant1	93.65	0.28	0.48
a	5825	Ant1	92.15	0.36	0.48
n20	5745	Ant1	91.22	0.4	0.52
n20	5785	Ant1	90.83	0.42	0.52
n20	5825	Ant1	92.4	0.34	0.52
n40	5755	Ant1	84.22	0.75	1.06
n40	5795	Ant1	82.97	0.81	1.06









5.9 Out Of Band Emission

5.9.1 Limit

According to FCC §15.407(b).

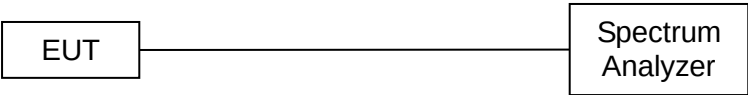
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (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) For transmitters operating in the 5.25–5.35 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.
- (3) For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of –27 dBm/MHz.
- (4) For transmitters operating solely in the 5.725–5.850 GHz band:
 - (i) 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.

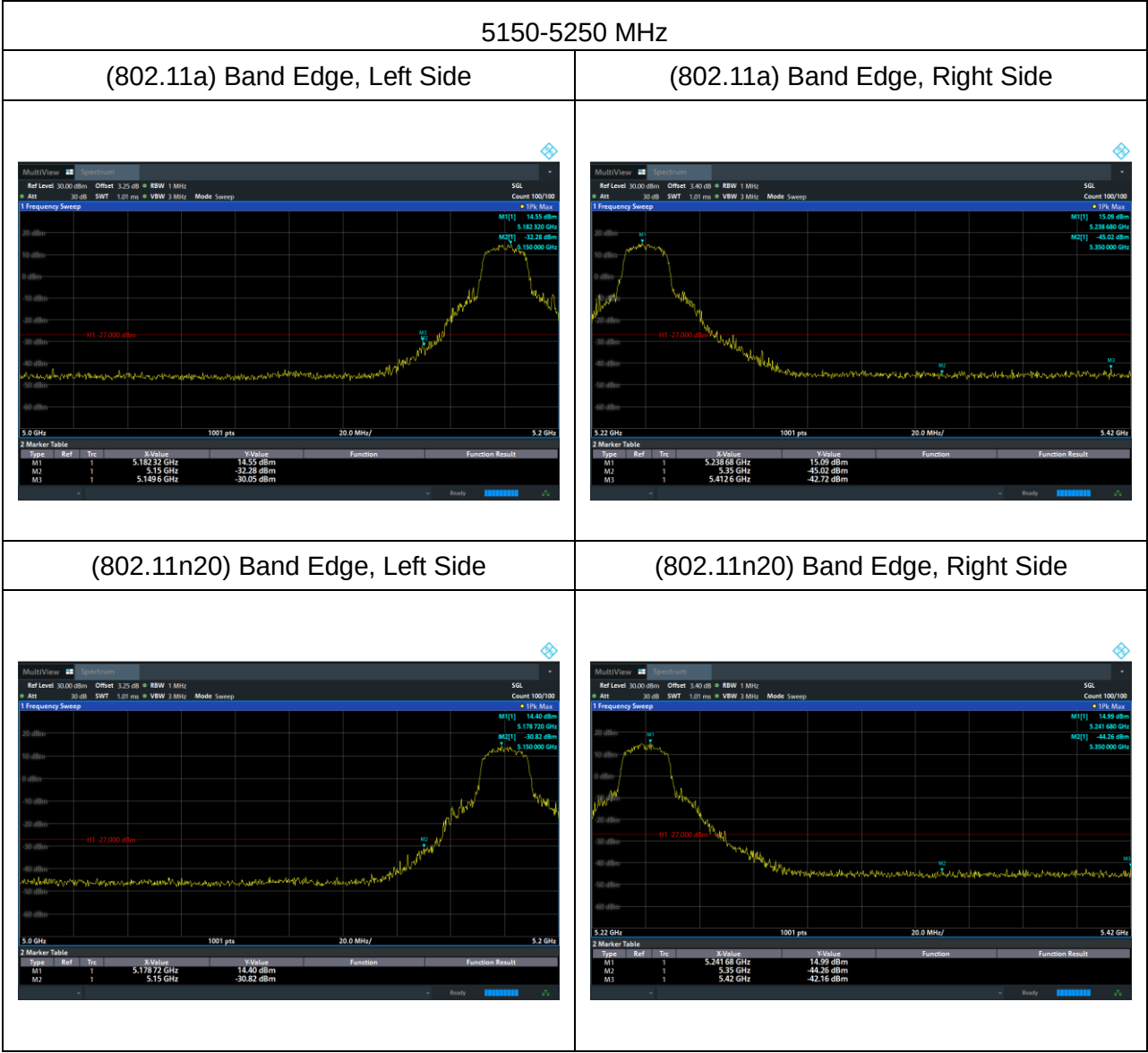
5.9.2 Test Procedure

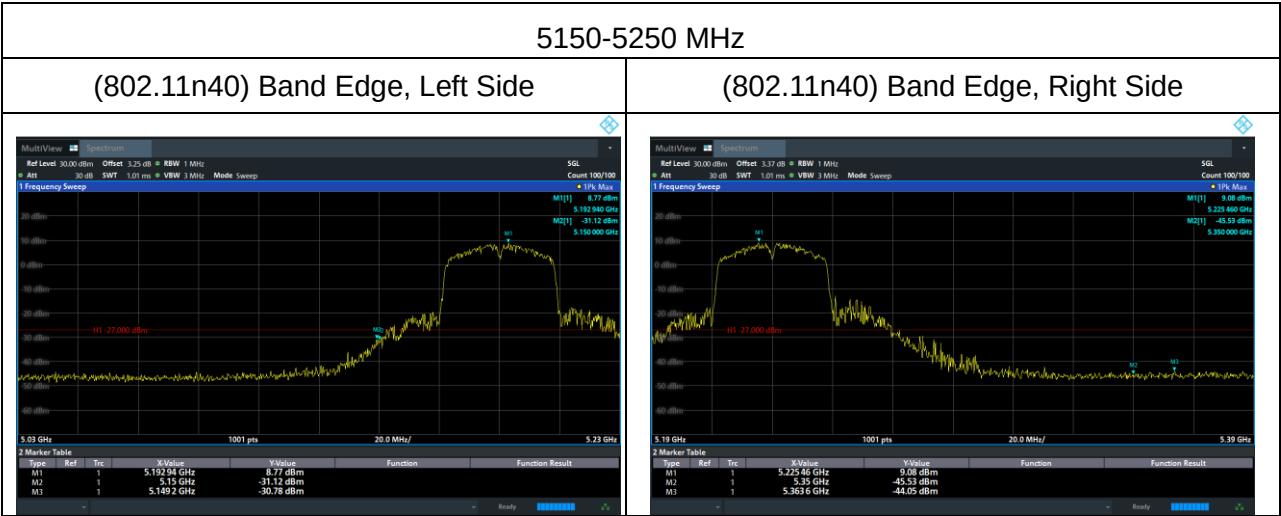
- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
- d. 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.
- e. Repeat above procedures until all measured frequencies were complete.

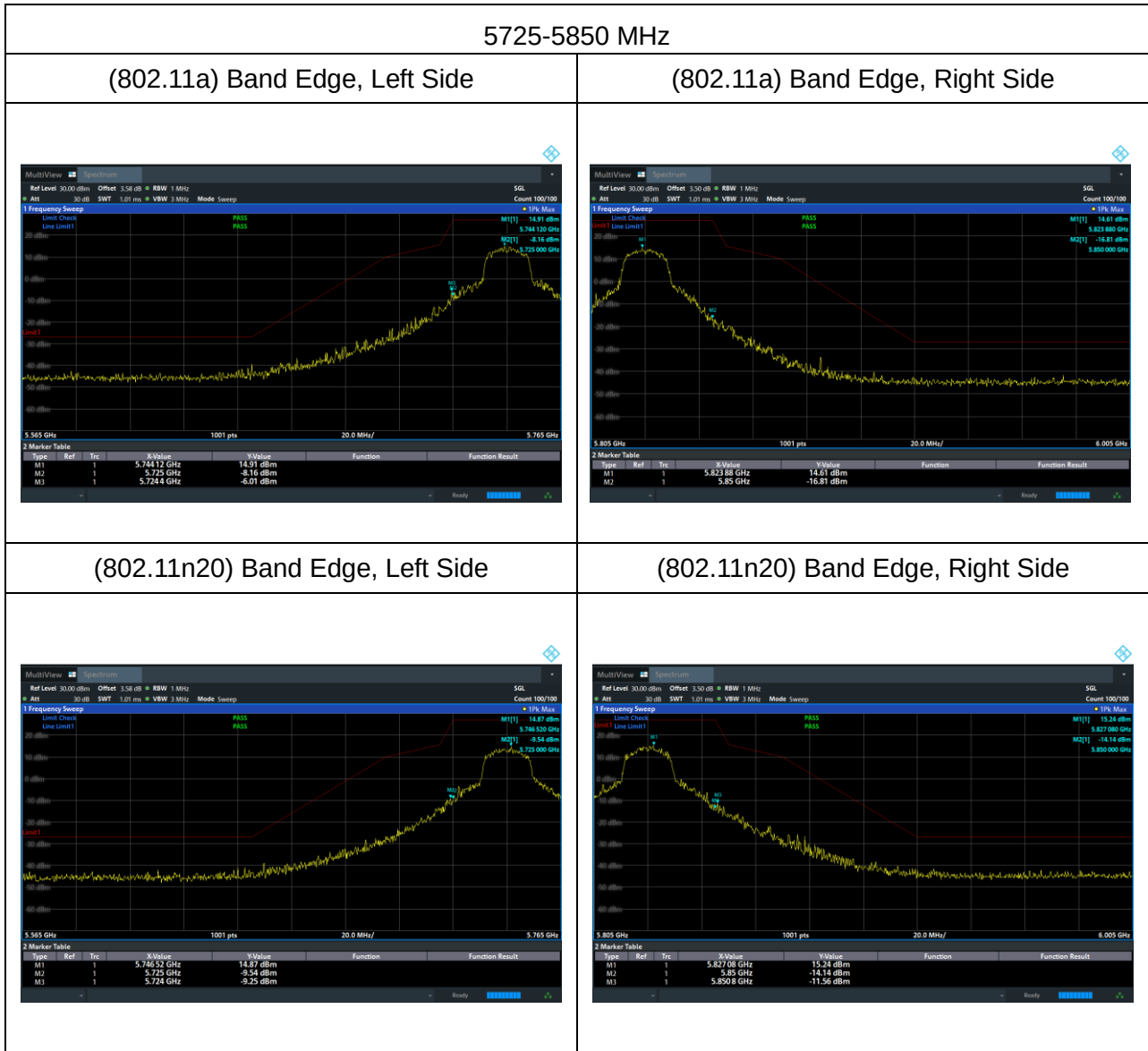
5.9.3 Test Setup

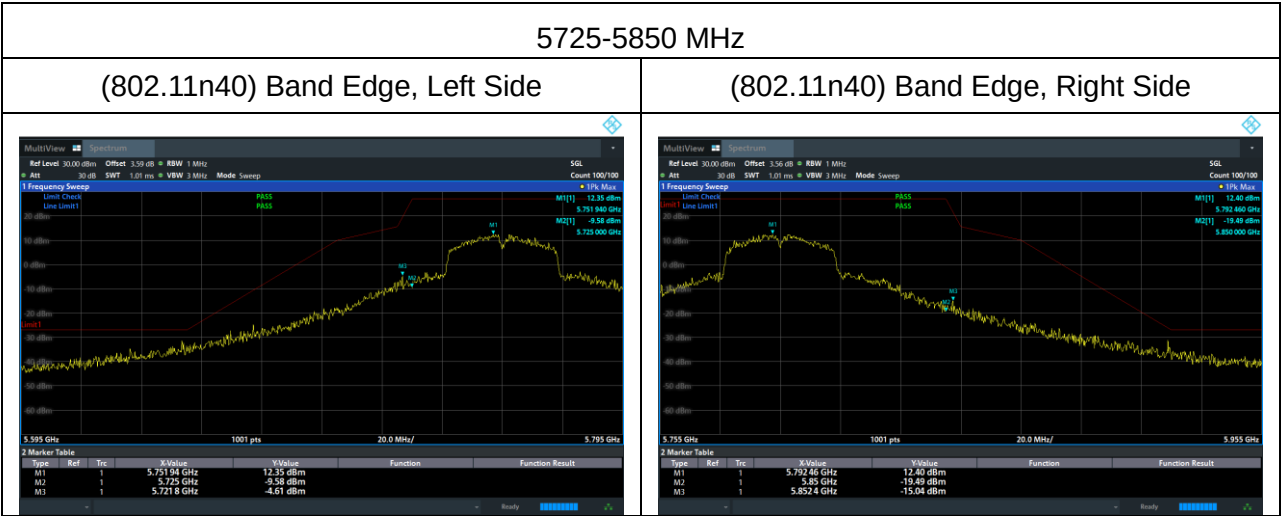


5.9.4 Test Results









5.10 Spurious RF Conducted Emissions

5.10.1 Limit

According to FCC §15.407(b).

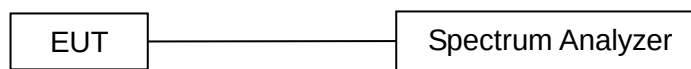
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (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) For transmitters operating in the 5.25–5.35 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.
- (3) For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating solely in the 5.725–5.850 GHz band:
 - (i) 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.

5.10.2 Test Procedure

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2020+Cor.1-2023+C63.10a-2024 + Errata to C63.10a-2024 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBW= 300kHz to measure the avg field strength, and measure frequency range from 9kHz to 26.5GHz.

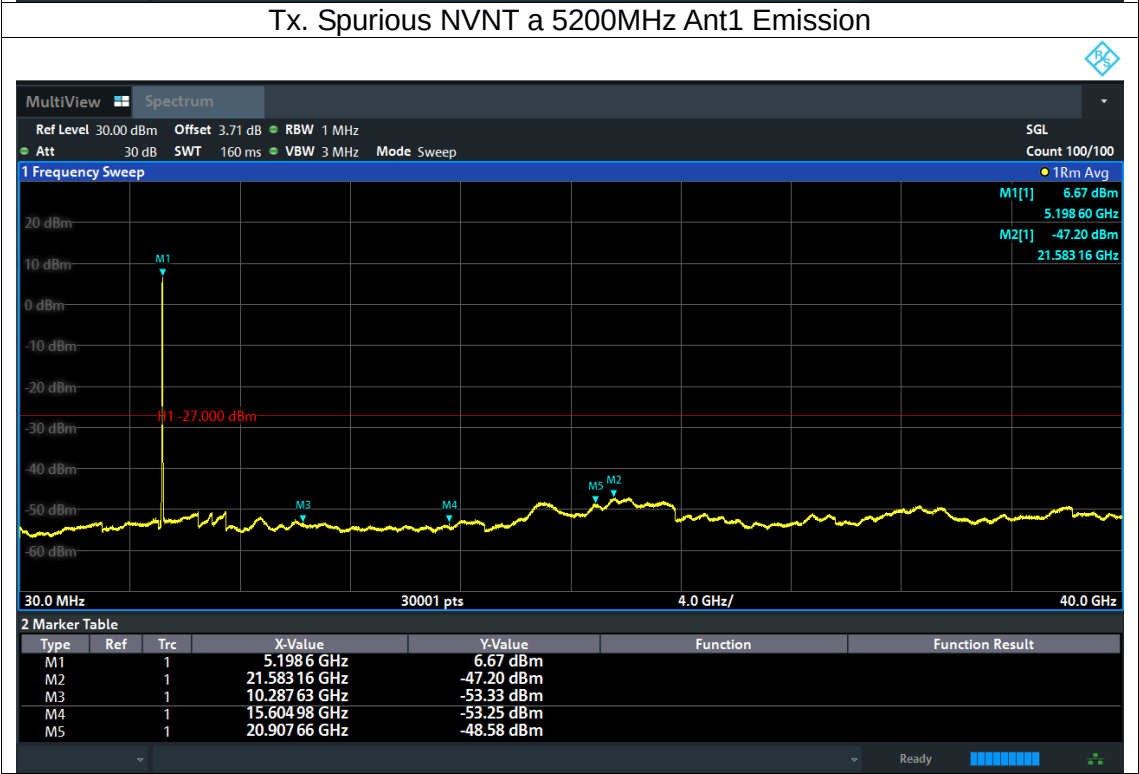
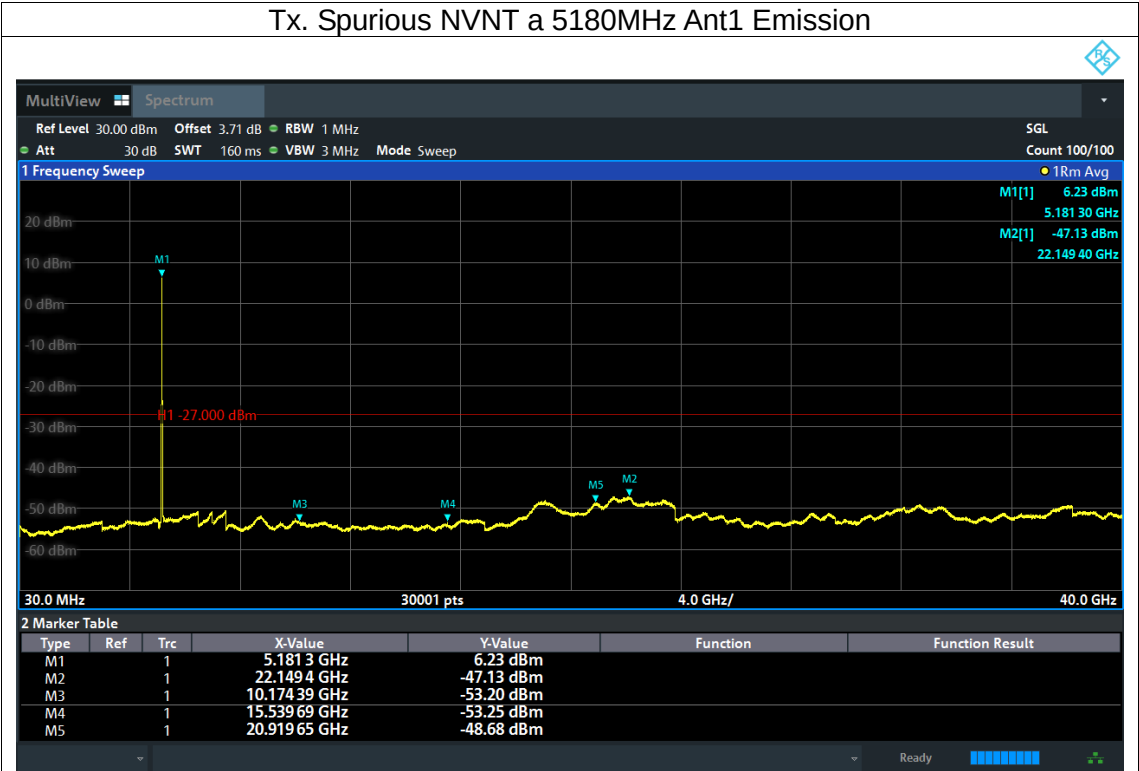
5.10.3 Test Setup

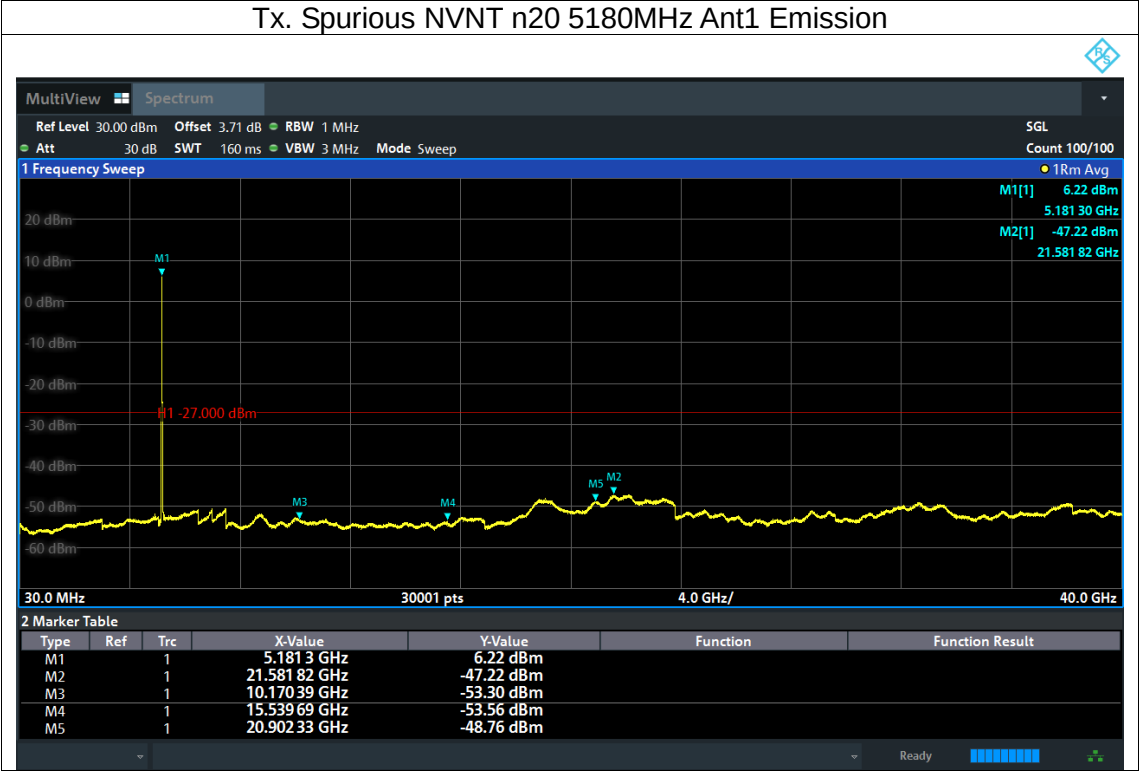
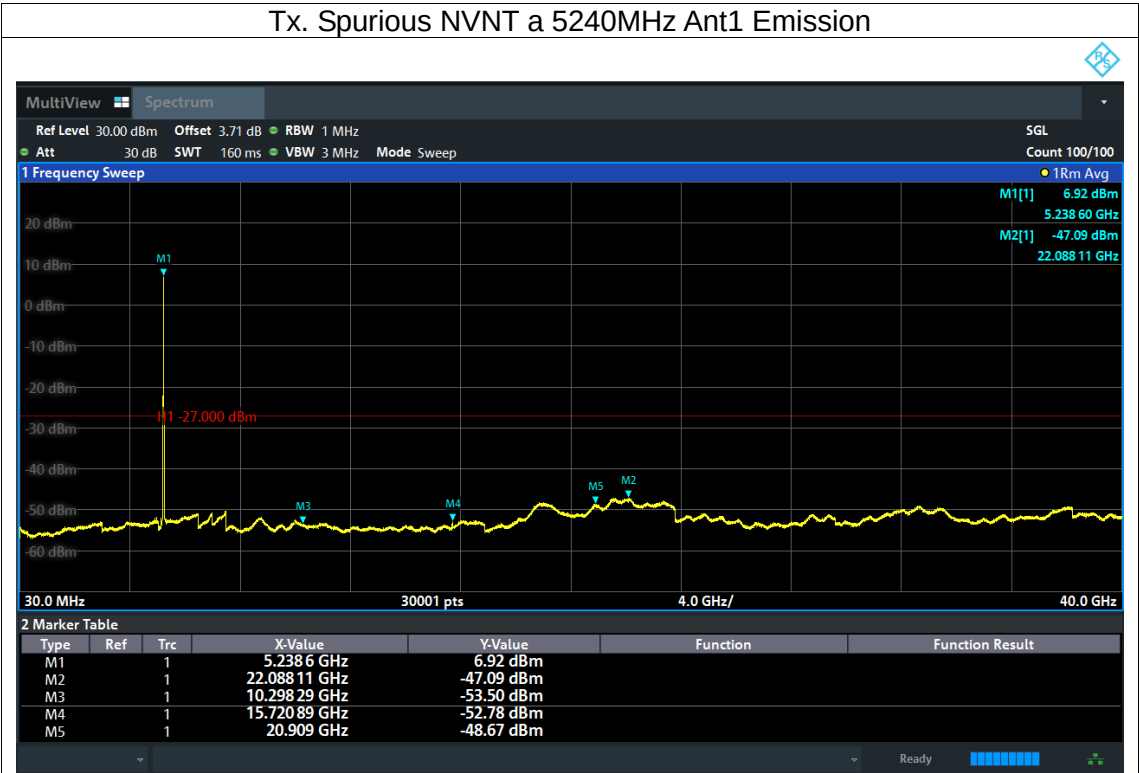


5.10.4 Test Results

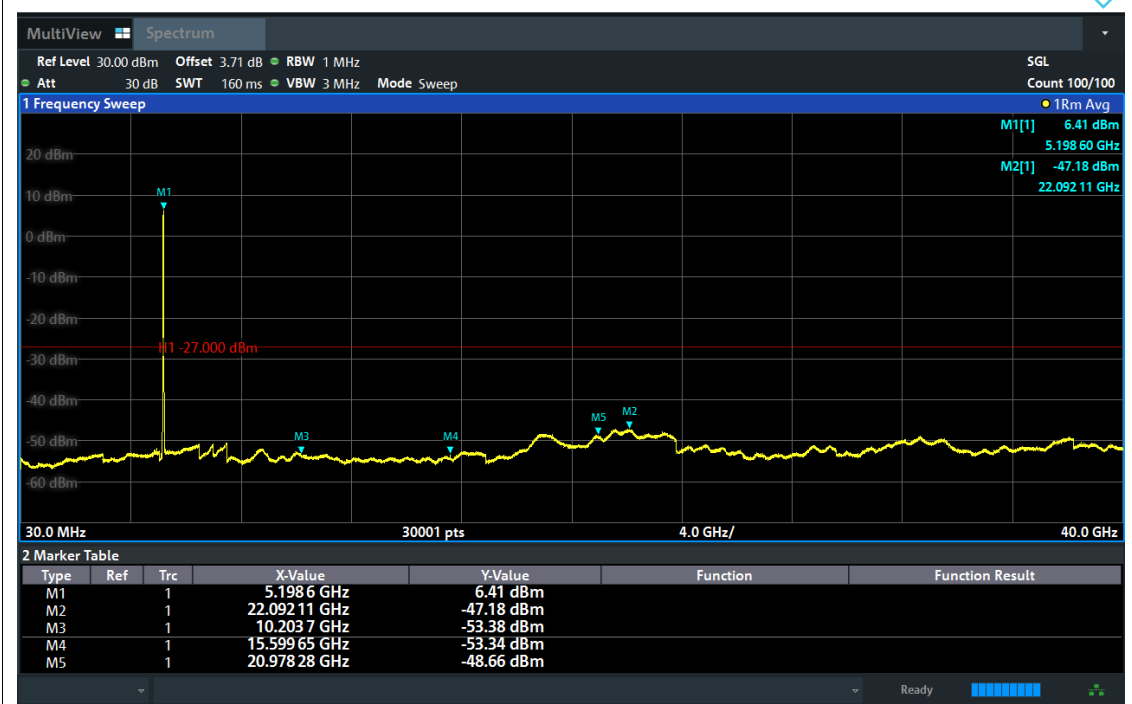
Note: The measurement frequency range is from 9kHz to the 10th harmonic of the fundamental frequency; The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

For U-NII-1:

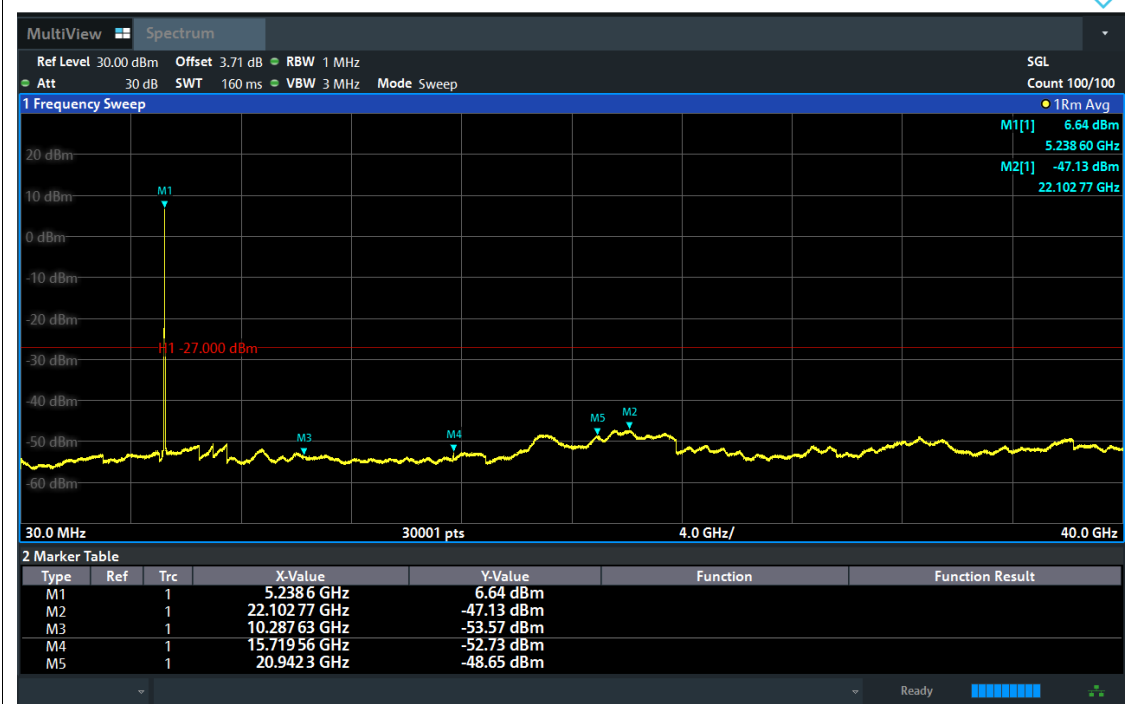




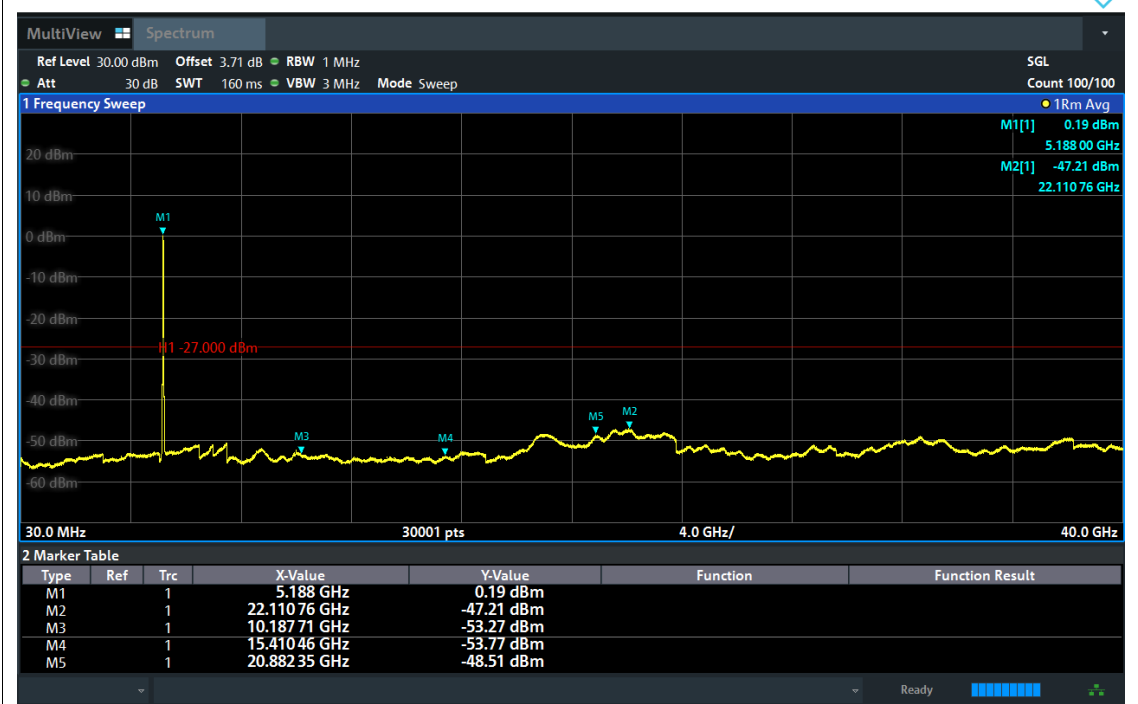
Tx. Spurious NVNT n20 5200MHz Ant1 Emission



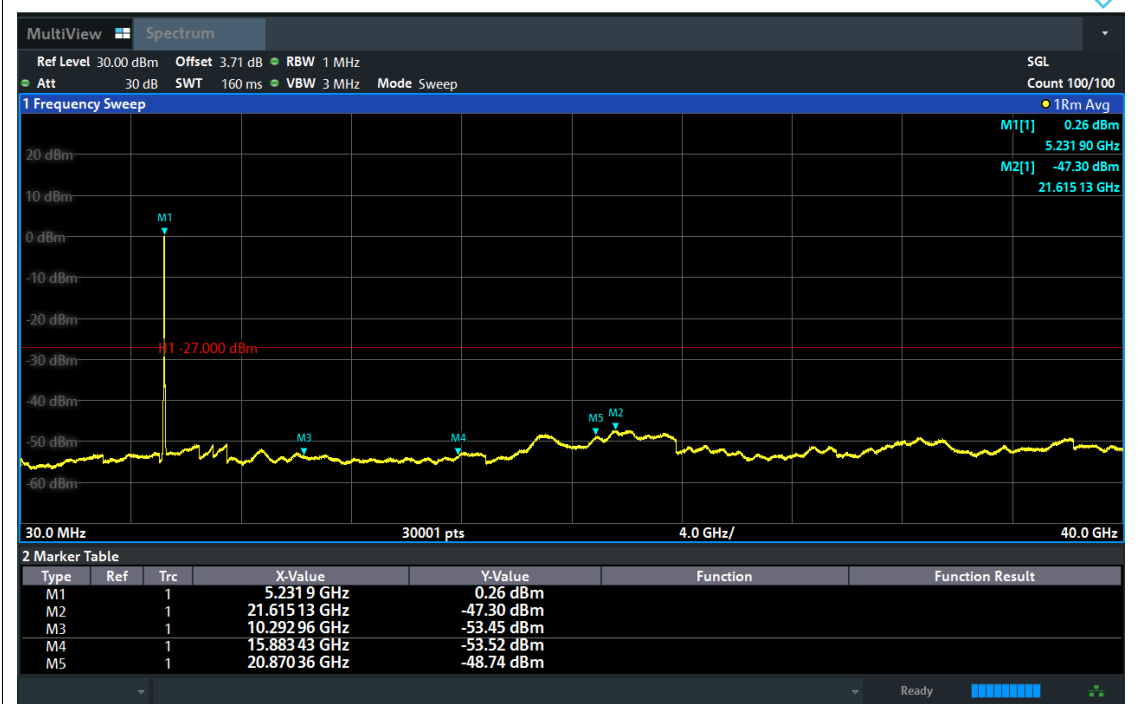
Tx. Spurious NVNT n20 5240MHz Ant1 Emission



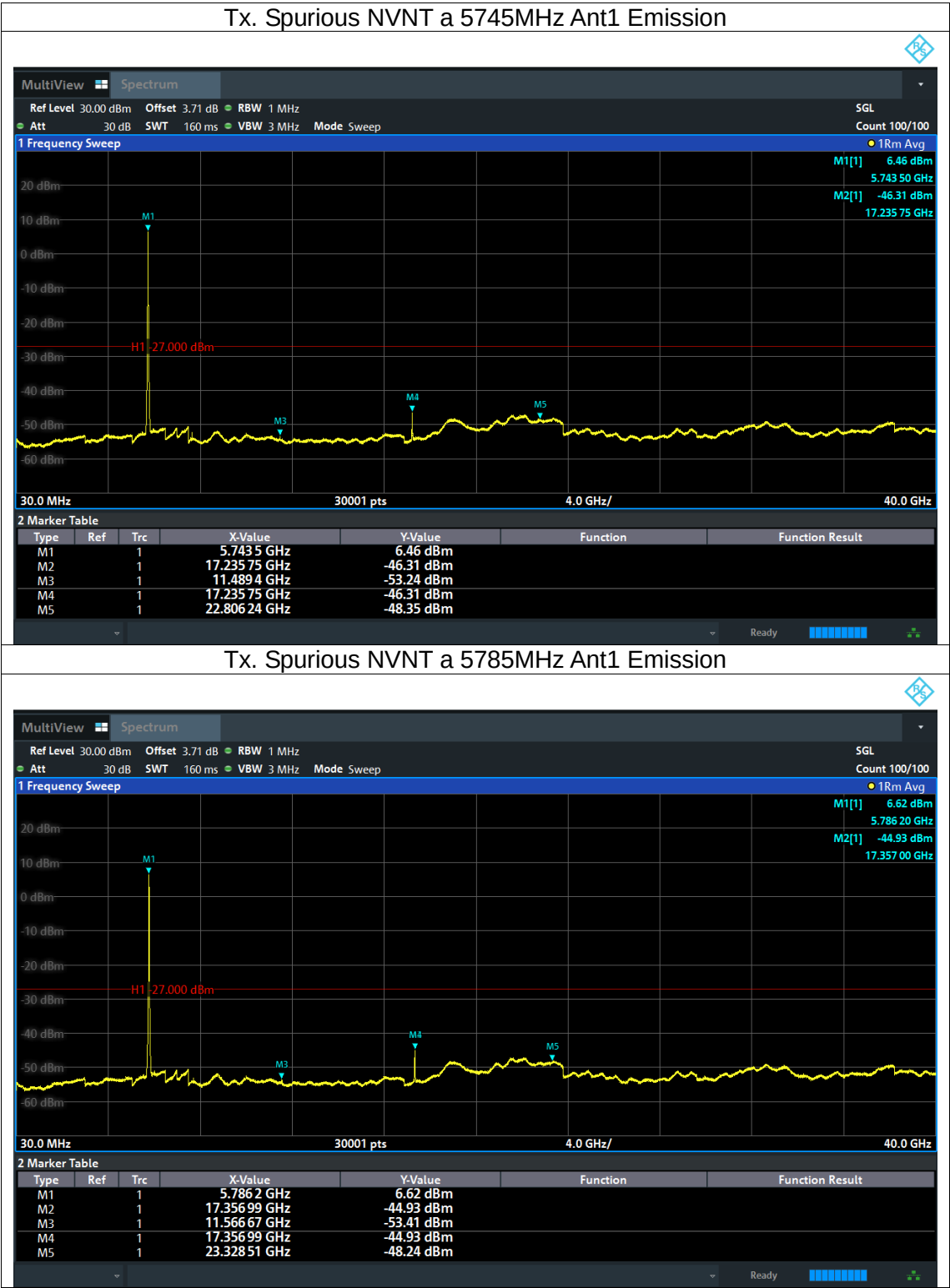
Tx. Spurious NVNT n40 5190MHz Ant1 Emission

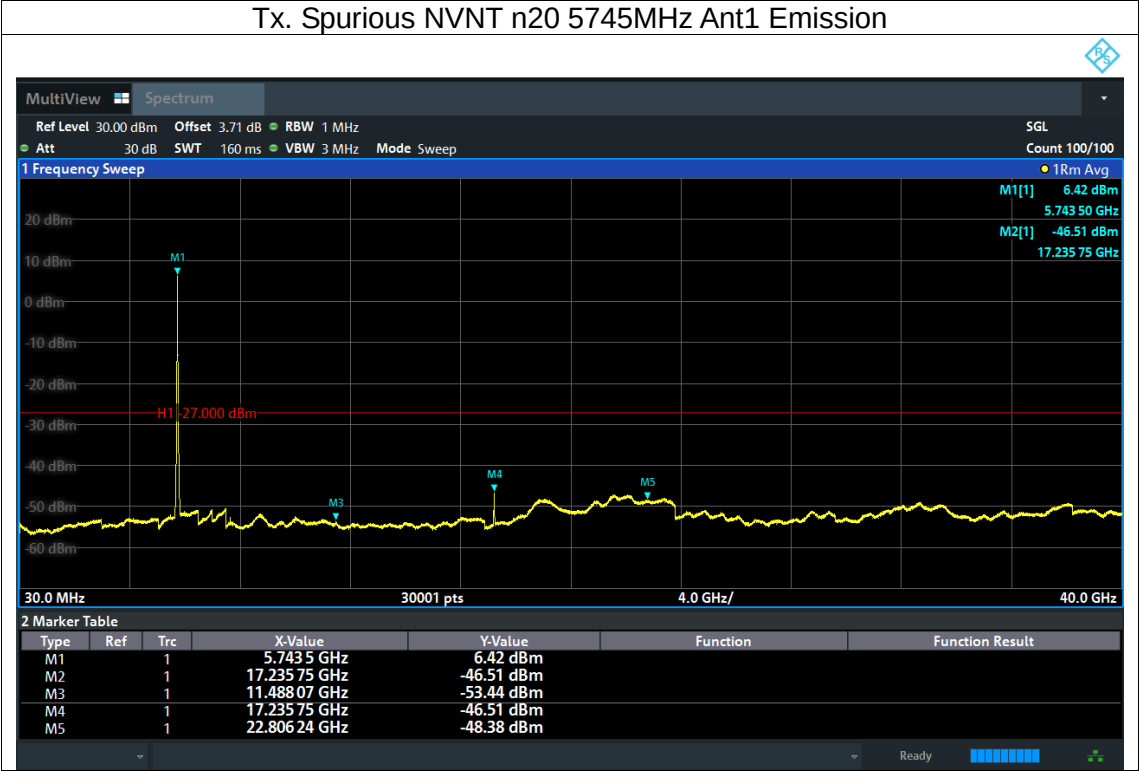
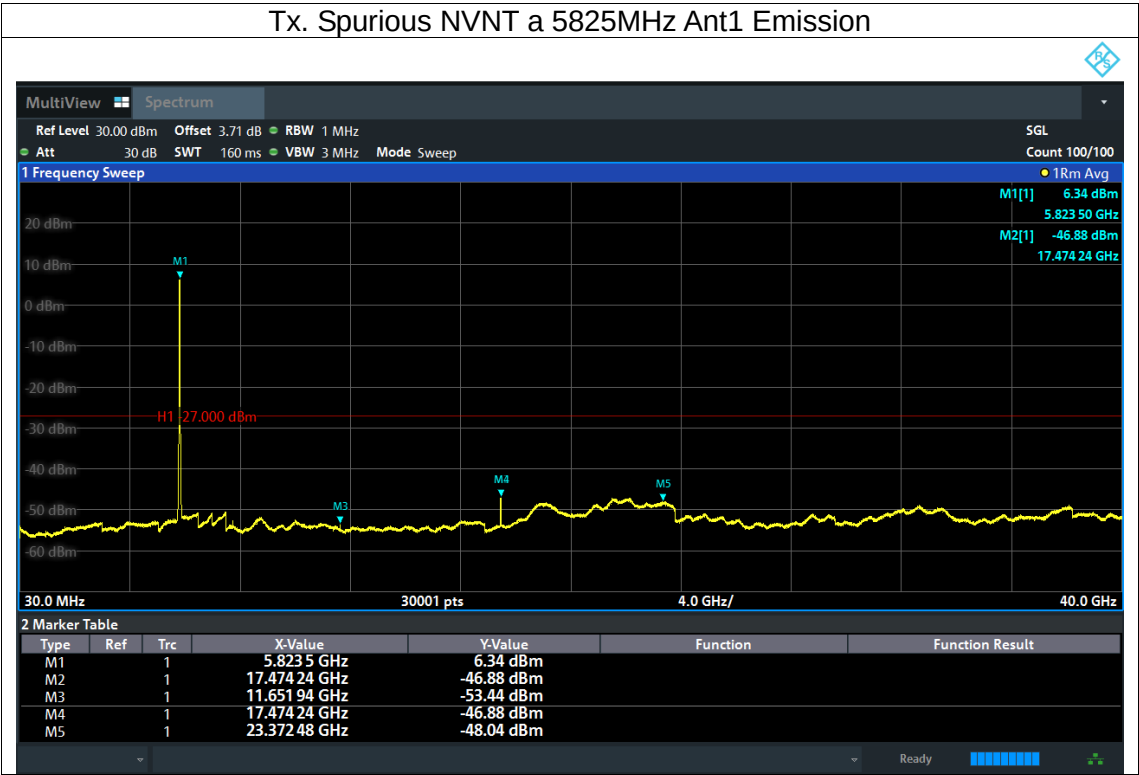


Tx. Spurious NVNT n40 5230MHz Ant1 Emission

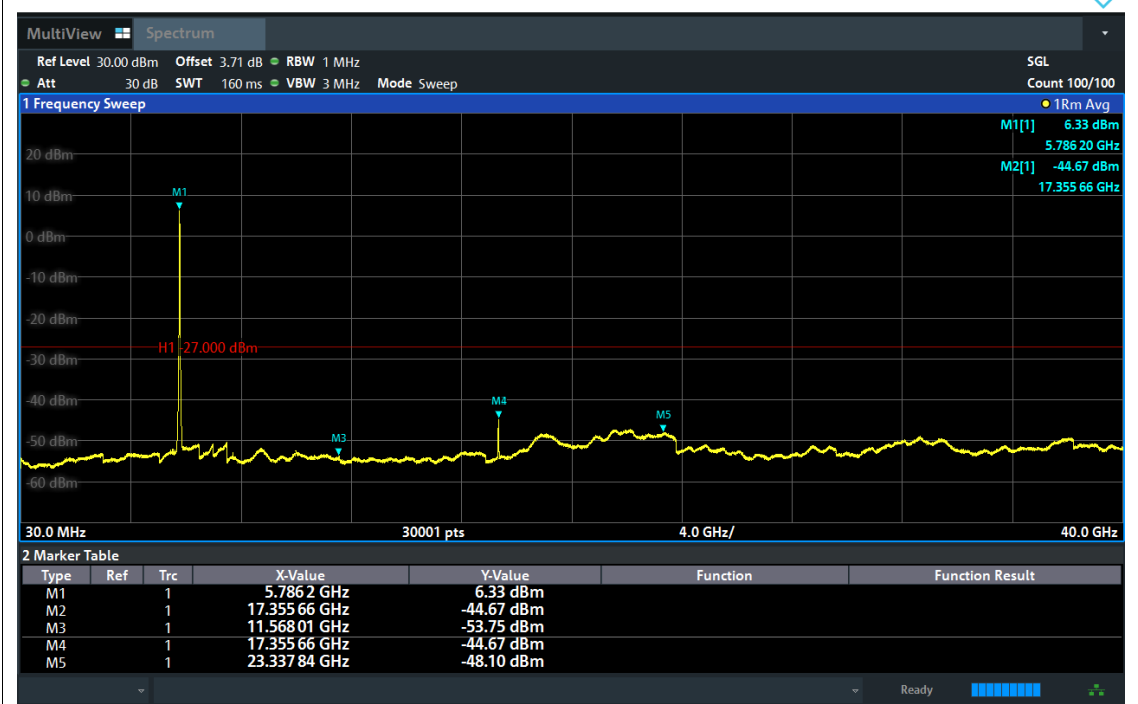


For U-NII-3

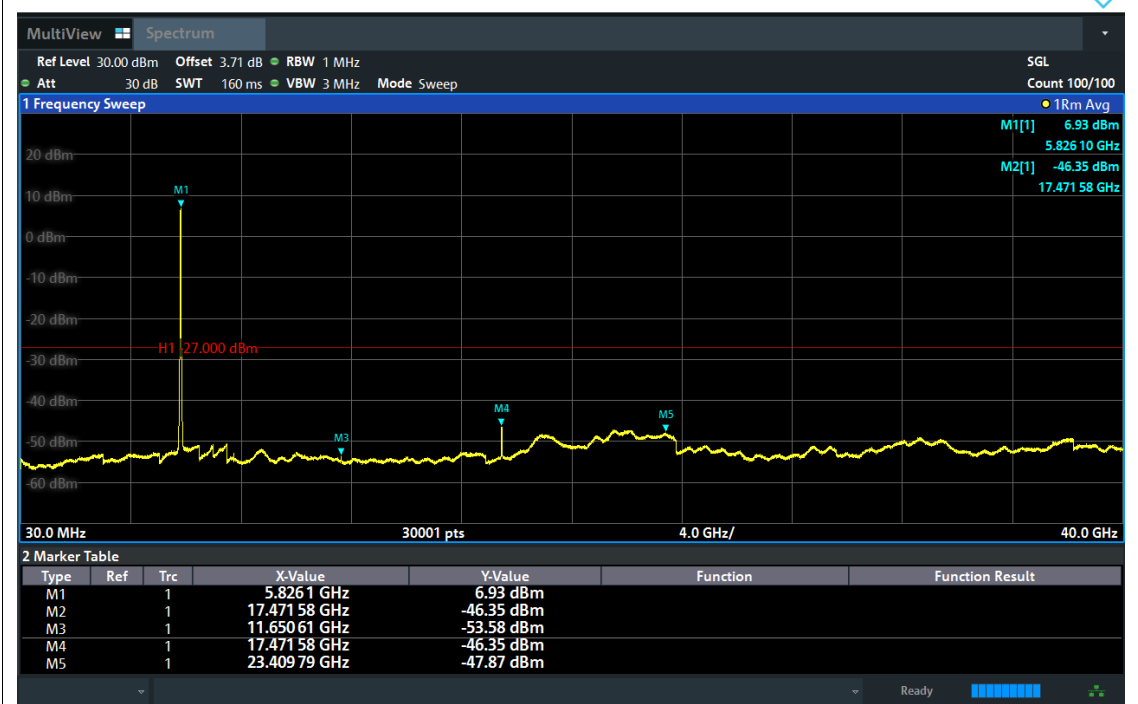




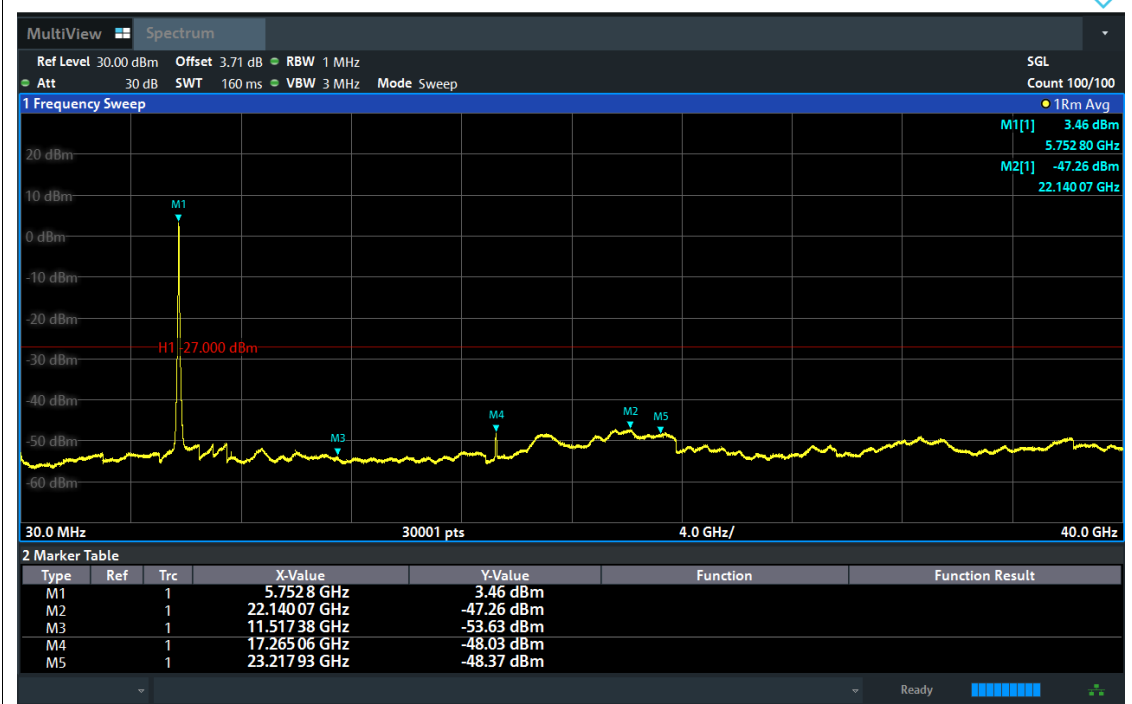
Tx. Spurious NVNT n20 5785MHz Ant1 Emission



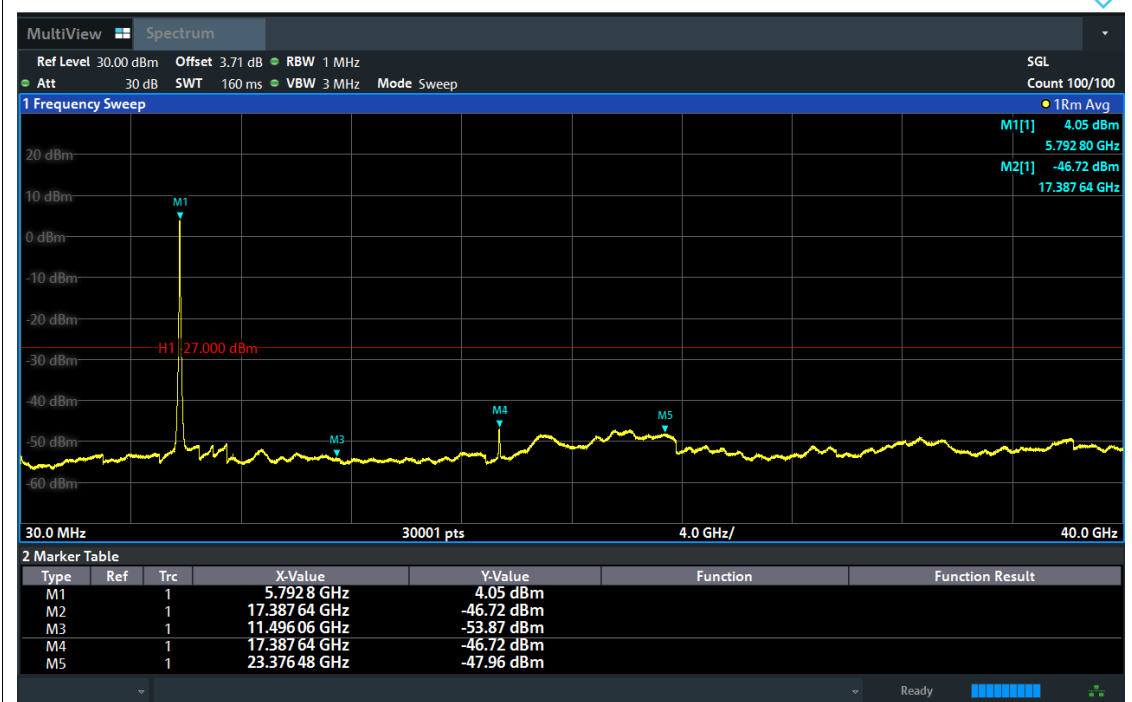
Tx. Spurious NVNT n20 5825MHz Ant1 Emission



Tx. Spurious NVNT n40 5755MHz Ant1 Emission



Tx. Spurious NVNT n40 5795MHz Ant1 Emission



5.11 Frequency Stability

5.11.1 Limit

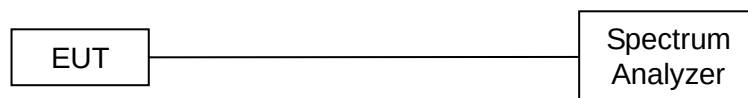
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

5.11.2 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$.

5.11.3 Test Setup



5.11.4 Test Results

EUT:	Aftermarket Automotive Type-C HUD (Head-Up Display) - V Series	Model Name:	EW-HUDV5-Ultra
Test Mode:	TX Mode(5150-5250MHz)	Test Voltage:	DC 12V from battery

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5180.007	5180	0.007	1.36
		V max (V)	10.8	5180.017	5180	0.017	3.24
		V min (V)	13.2	5180.041	5180	0.041	7.99
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5180.005	5180	0.005	0.90
		T (°C)	-10	5180.021	5180	0.021	4.10
		T (°C)	0	5180.042	5180	0.042	8.03
		T (°C)	10	5180.013	5180	0.013	2.47
		T (°C)	20	5180.047	5180	0.047	9.04
		T (°C)	30	5180.017	5180	0.017	3.37
		T (°C)	40	5180.018	5180	0.018	3.42
		T (°C)	50	5180.037	5180	0.037	7.16
		T (°C)	60	5180.024	5180	0.024	4.64
		T (°C)	70	5180.038	5180	0.038	7.39
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5200.005	5200	0.005	0.87
		V max (V)	10.8	5200.002	5200	0.002	0.36
		V min (V)	13.2	5200.005	5200	0.005	0.91
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5200.036	5200	0.036	7.00
		T (°C)	-10	5200.022	5200	0.022	4.25
		T (°C)	0	5200.020	5200	0.020	3.85
		T (°C)	10	5200.027	5200	0.027	5.15
		T (°C)	20	5200.003	5200	0.003	0.49
		T (°C)	30	5200.041	5200	0.041	7.94
		T (°C)	40	5200.036	5200	0.036	6.83
		T (°C)	50	5200.037	5200	0.037	7.03
		T (°C)	60	5200.025	5200	0.025	4.76
		T (°C)	70	5200.014	5200	0.014	2.63
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5240.035	5240	0.035	6.59
		V max (V)	10.8	5240.049	5240	0.049	9.38
		V min (V)	13.2	5240.029	5240	0.029	5.58
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5240.016	5240	0.016	3.10
		T (°C)	-10	5240.028	5240	0.028	5.41
		T (°C)	0	5240.010	5240	0.010	1.86
		T (°C)	10	5240.045	5240	0.045	8.64
		T (°C)	20	5240.002	5240	0.002	0.32
		T (°C)	30	5240.044	5240	0.044	8.47
		T (°C)	40	5240.043	5240	0.043	8.17
		T (°C)	50	5240.012	5240	0.012	2.27
		T (°C)	60	5240.004	5240	0.004	0.69
		T (°C)	70	5240.029	5240	0.029	5.61
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5190MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5190.017	5190	0.017	3.37
		V max (V)	10.8	5190.020	5190	0.020	3.93
		V min (V)	13.2	5190.012	5190	0.012	2.37
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5190MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5190.006	5190	0.006	1.20
		T (°C)	-10	5190.012	5190	0.012	2.36
		T (°C)	0	5190.030	5190	0.030	5.71
		T (°C)	10	5190.041	5190	0.041	7.90
		T (°C)	20	5190.025	5190	0.025	4.90
		T (°C)	30	5190.041	5190	0.041	7.87
		T (°C)	40	5190.037	5190	0.037	7.20
		T (°C)	50	5190.049	5190	0.049	9.35
		T (°C)	60	5190.035	5190	0.035	6.80
		T (°C)	70	5190.015	5190	0.015	2.86
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5230MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5230.043	5230	0.043	8.30
		V max (V)	10.8	5230.024	5230	0.024	4.63
		V min (V)	13.2	5230.012	5230	0.012	2.33
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5230MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5230.028	5230	0.028	5.36
		T (°C)	-10	5230.035	5230	0.035	6.73
		T (°C)	0	5230.024	5230	0.024	4.55
		T (°C)	10	5230.043	5230	0.043	8.15
		T (°C)	20	5230.040	5230	0.040	7.74
		T (°C)	30	5230.044	5230	0.044	8.40
		T (°C)	40	5230.010	5230	0.010	1.84
		T (°C)	50	5230.047	5230	0.047	8.96
		T (°C)	60	5230.024	5230	0.024	4.68
		T (°C)	70	5230.022	5230	0.022	4.23
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5745.032	5745	0.032	5.65
		V max (V)	10.8	5745.042	5745	0.042	7.29
		V min (V)	13.2	5745.040	5745	0.040	7.05
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5745.013	5745	0.013	2.25
		T (°C)	-10	5745.034	5745	0.034	5.94
		T (°C)	0	5745.012	5745	0.012	2.10
		T (°C)	10	5745.022	5745	0.022	3.86
		T (°C)	20	5745.032	5745	0.032	5.60
		T (°C)	30	5745.035	5745	0.035	6.17
		T (°C)	40	5745.041	5745	0.041	7.06
		T (°C)	50	5745.002	5745	0.002	0.33
		T (°C)	60	5745.014	5745	0.014	2.44
		T (°C)	70	5745.003	5745	0.003	0.48
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5785.010	5785	0.010	1.80
		V max (V)	10.8	5785.044	5785	0.044	7.69
		V min (V)	13.2	5785.006	5785	0.006	1.00
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5785.041	5785	0.041	7.08
		T (°C)	-10	5785.011	5785	0.011	1.91
		T (°C)	0	5785.008	5785	0.008	1.33
		T (°C)	10	5785.021	5785	0.021	3.64
		T (°C)	20	5785.035	5785	0.035	6.01
		T (°C)	30	5785.036	5785	0.036	6.24
		T (°C)	40	5785.038	5785	0.038	6.55
		T (°C)	50	5785.043	5785	0.043	7.48
		T (°C)	60	5785.034	5785	0.034	5.84
		T (°C)	70	5785.022	5785	0.022	3.80
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5825.016	5825	0.016	2.73
		V max (V)	10.8	5825.000	5825	0.000	0.03
		V min (V)	13.2	5825.032	5825	0.032	5.54
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5825.016	5825	0.016	2.73
		T (°C)	-10	5825.000	5825	0.000	0.03
		T (°C)	0	5825.032	5825	0.032	5.54
		T (°C)	10	5825.016	5825	0.016	2.73
		T (°C)	20	5825.000	5825	0.000	0.03
		T (°C)	30	5825.032	5825	0.032	5.54
		T (°C)	40	5825.016	5825	0.016	2.73
		T (°C)	50	5825.000	5825	0.000	0.03
		T (°C)	60	5825.032	5825	0.032	5.54
		T (°C)	70	5825.016	5825	0.016	2.73
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5755MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5755.014	5755	0.014	2.35
		V max (V)	10.8	5755.044	5755	0.044	7.58
		V min (V)	13.2	5755.031	5755	0.031	5.36
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5755MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	5	T (°C)	-20	5755.002	5755	0.002	0.41
		T (°C)	-10	5755.033	5755	0.033	5.77
		T (°C)	0	5755.022	5755	0.022	3.80
		T (°C)	10	5755.018	5755	0.018	3.21
		T (°C)	20	5755.019	5755	0.019	3.26
		T (°C)	30	5755.039	5755	0.039	6.83
		T (°C)	40	5755.020	5755	0.020	3.39
		T (°C)	50	5755.015	5755	0.015	2.53
		T (°C)	60	5755.045	5755	0.045	7.86
		T (°C)	70	5755.016	5755	0.016	2.70
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5795MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12	5795.046	5795	0.046	7.99
		V max (V)	10.8	5795.031	5795	0.031	5.44
		V min (V)	13.2	5795.030	5795	0.030	5.13
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5795MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5795.050	5795	0.050	8.57
		T (°C)	-10	5795.002	5795	0.002	0.34
		T (°C)	0	5795.023	5795	0.023	3.99
		T (°C)	10	5795.030	5795	0.030	5.12
		T (°C)	20	5795.046	5795	0.046	7.86
		T (°C)	30	5795.045	5795	0.045	7.71
		T (°C)	40	5795.019	5795	0.019	3.25
		T (°C)	50	5795.002	5795	0.002	0.28
		T (°C)	60	5795.044	5795	0.044	7.66
		T (°C)	70	5795.015	5795	0.015	2.51
Limits				± 20 ppm			
Result				Complies			

6 Photographs of the Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



7 Photographs of the EUT

Please refer to report HB20260519008E-01 for product photos.

******* END OF REPORT *******