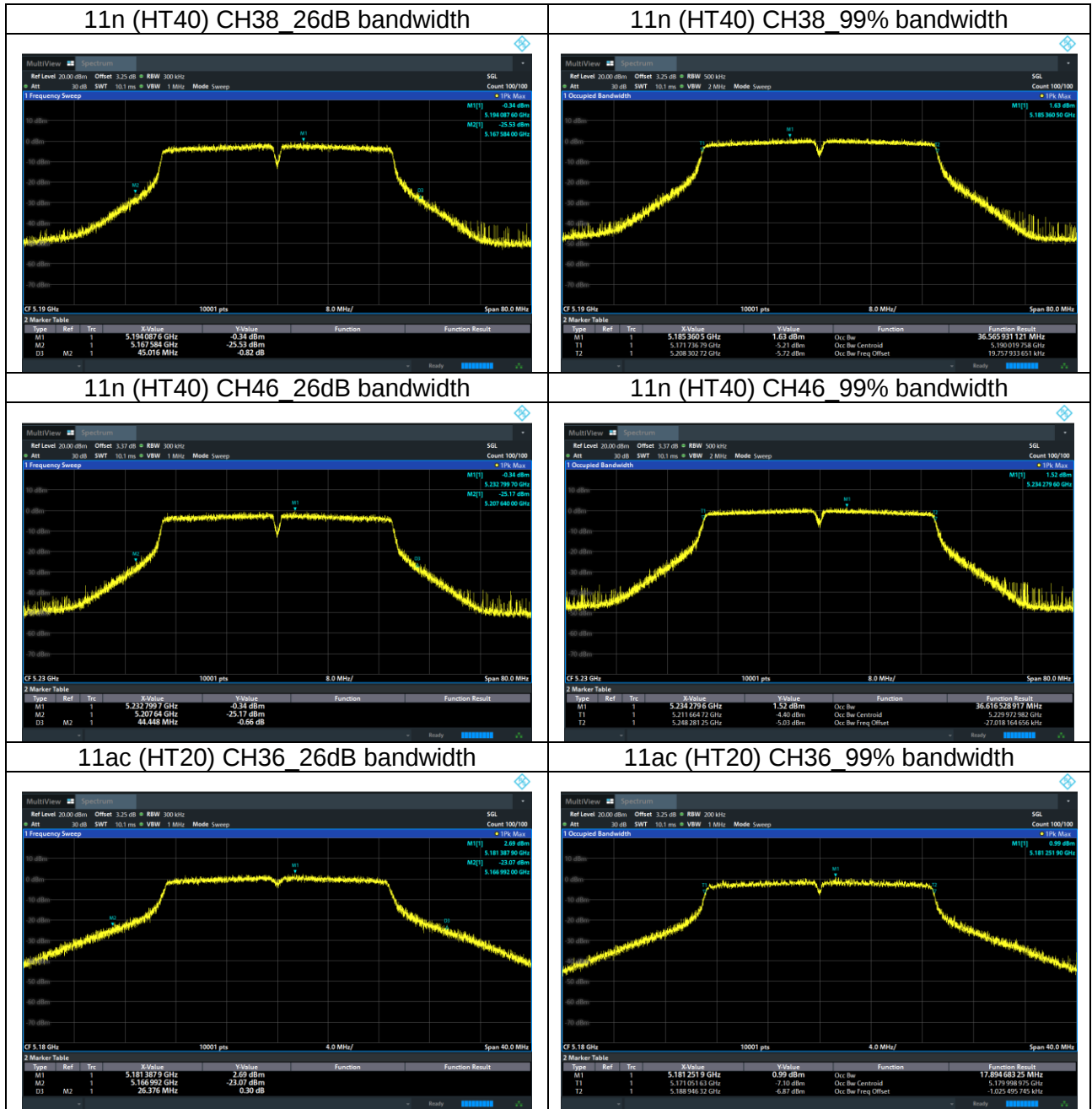
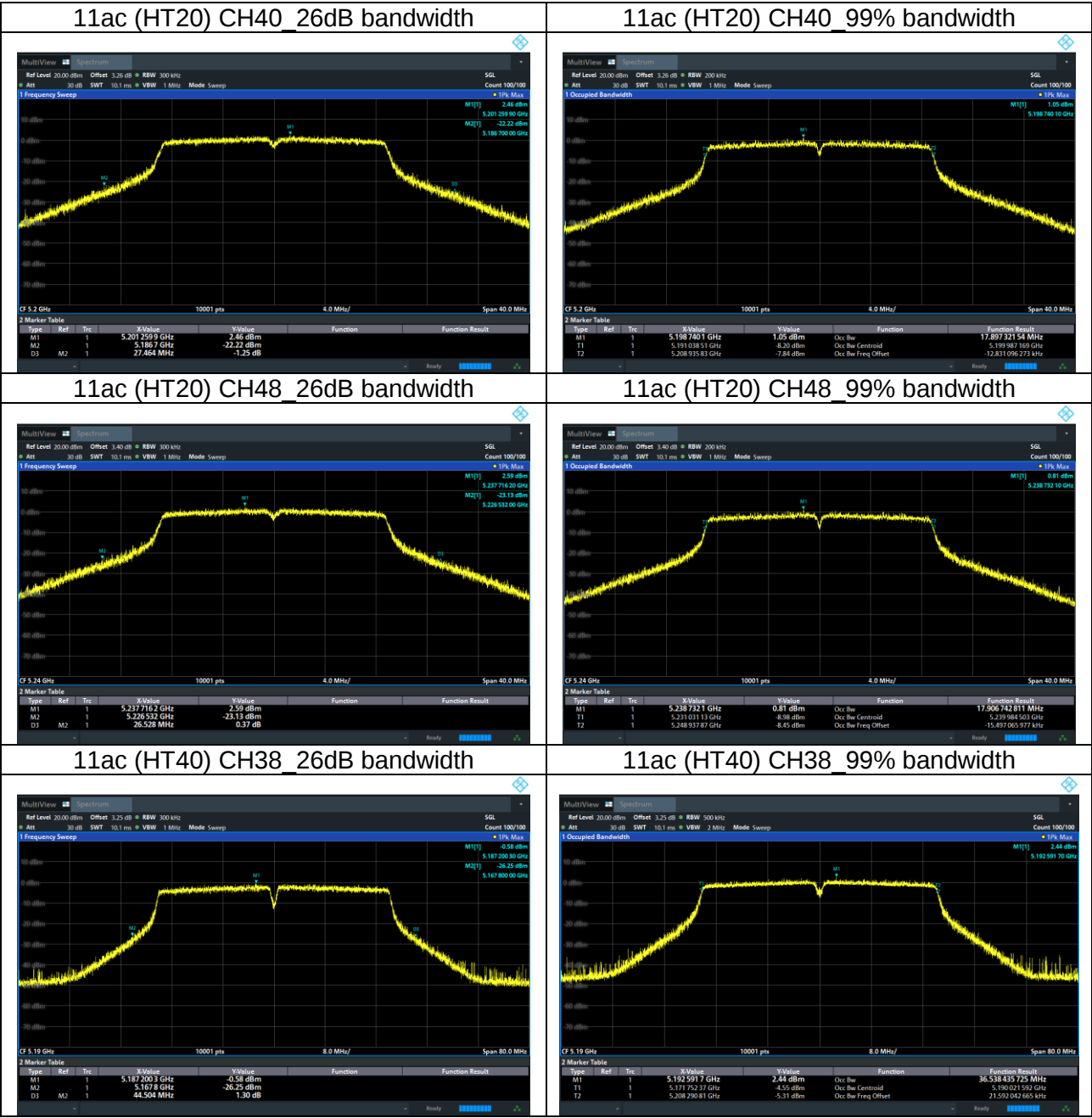
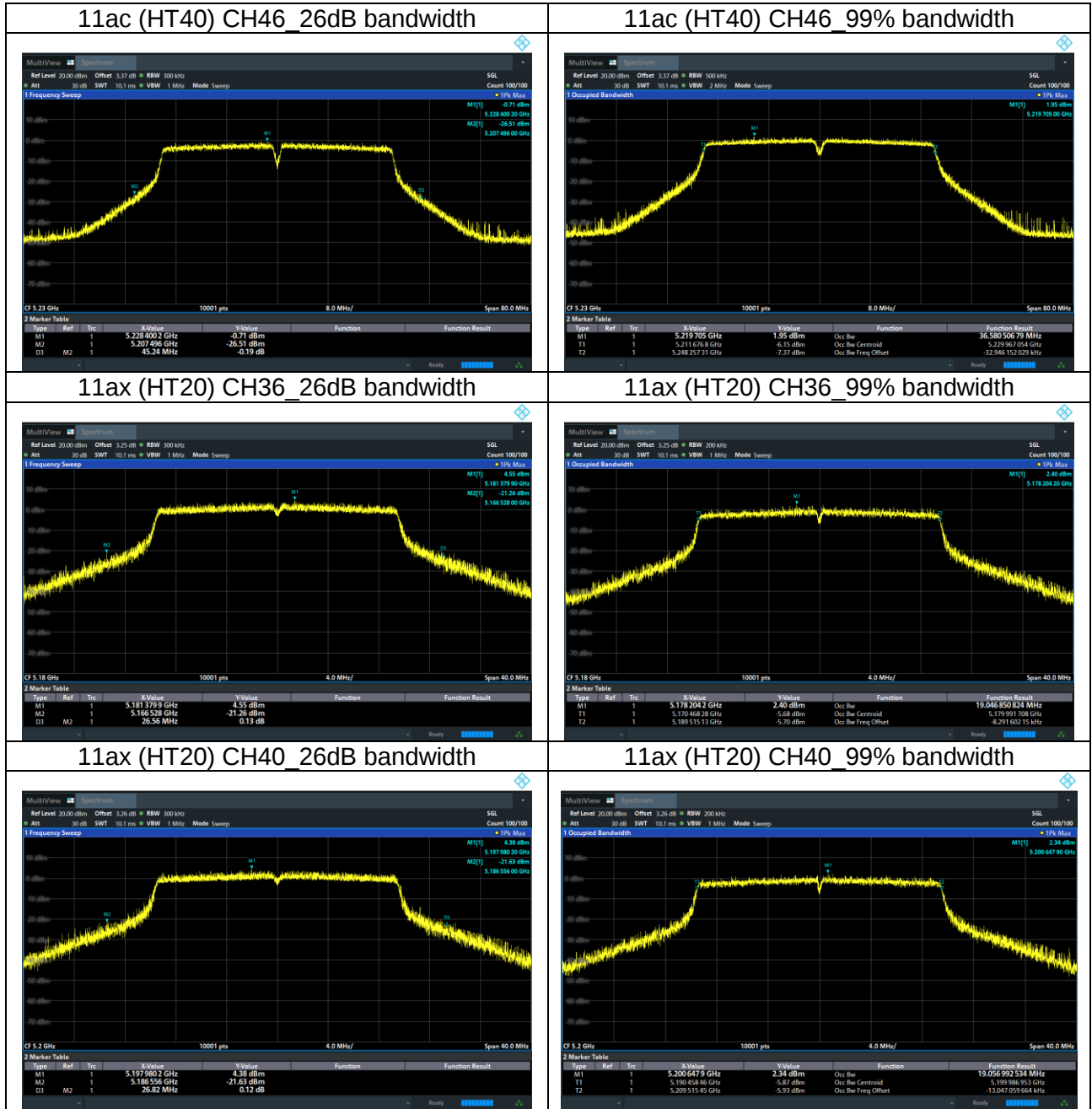
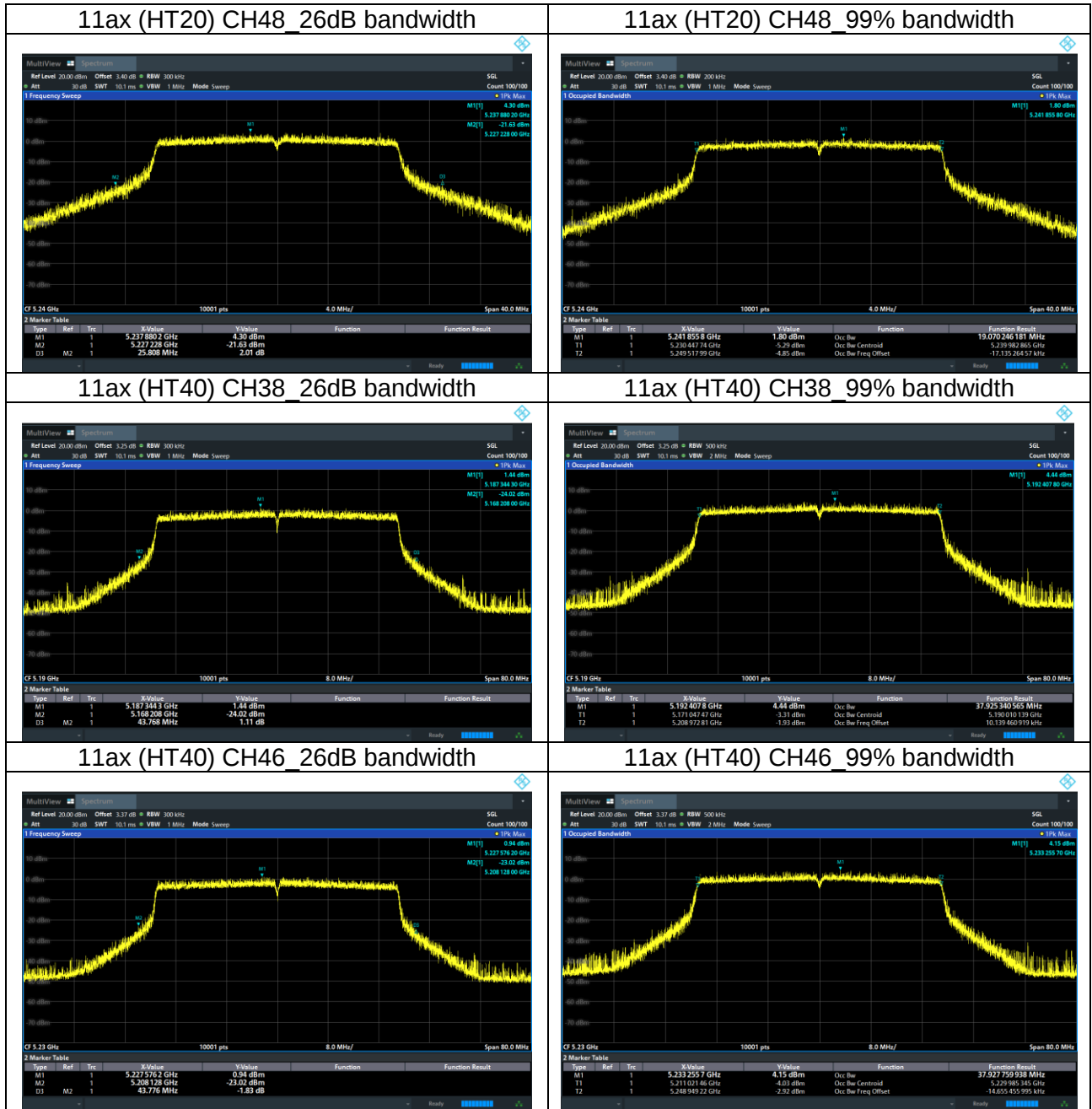










5.7 6 dB Bandwidth

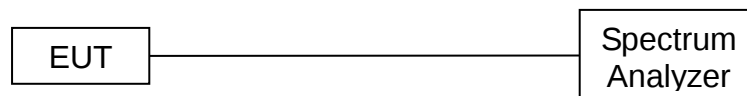
5.7.1 Limit

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

5.7.2 Test Procedure

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

5.7.3 Test Setup



5.7.4 Test Results

Note: The frequency of the prototype is not within 5.725-5.85 GHz, so it is not applicable.

5.8 Out Of Band Emission

5.8.1 Limit

According to FCC §15.407(b).

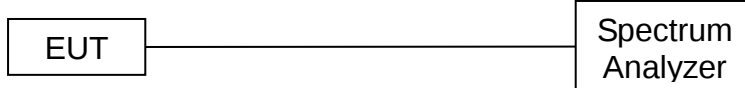
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (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.

5.8.2 Test Procedure

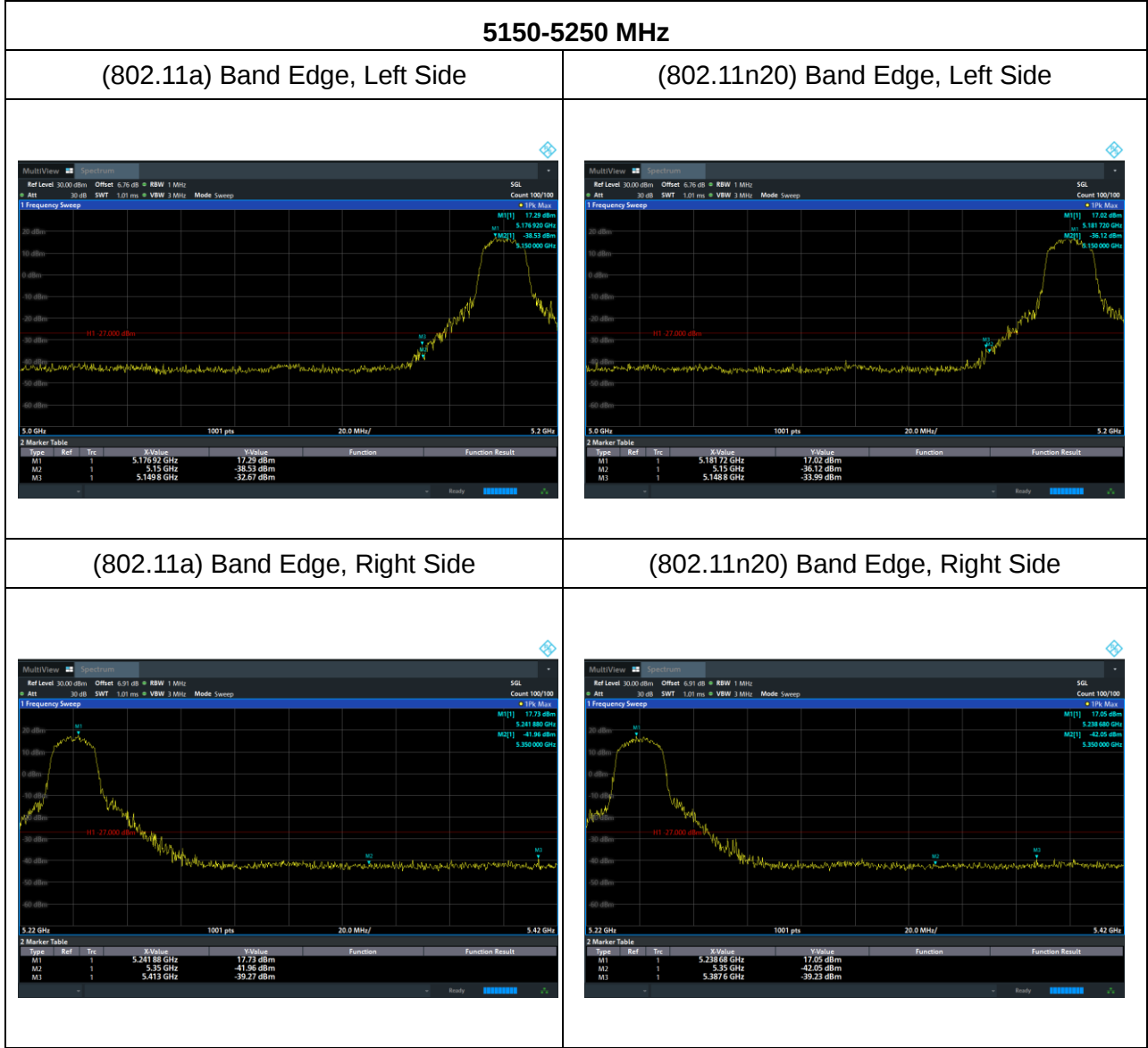
- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. 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.

5.8.3 Test Setup



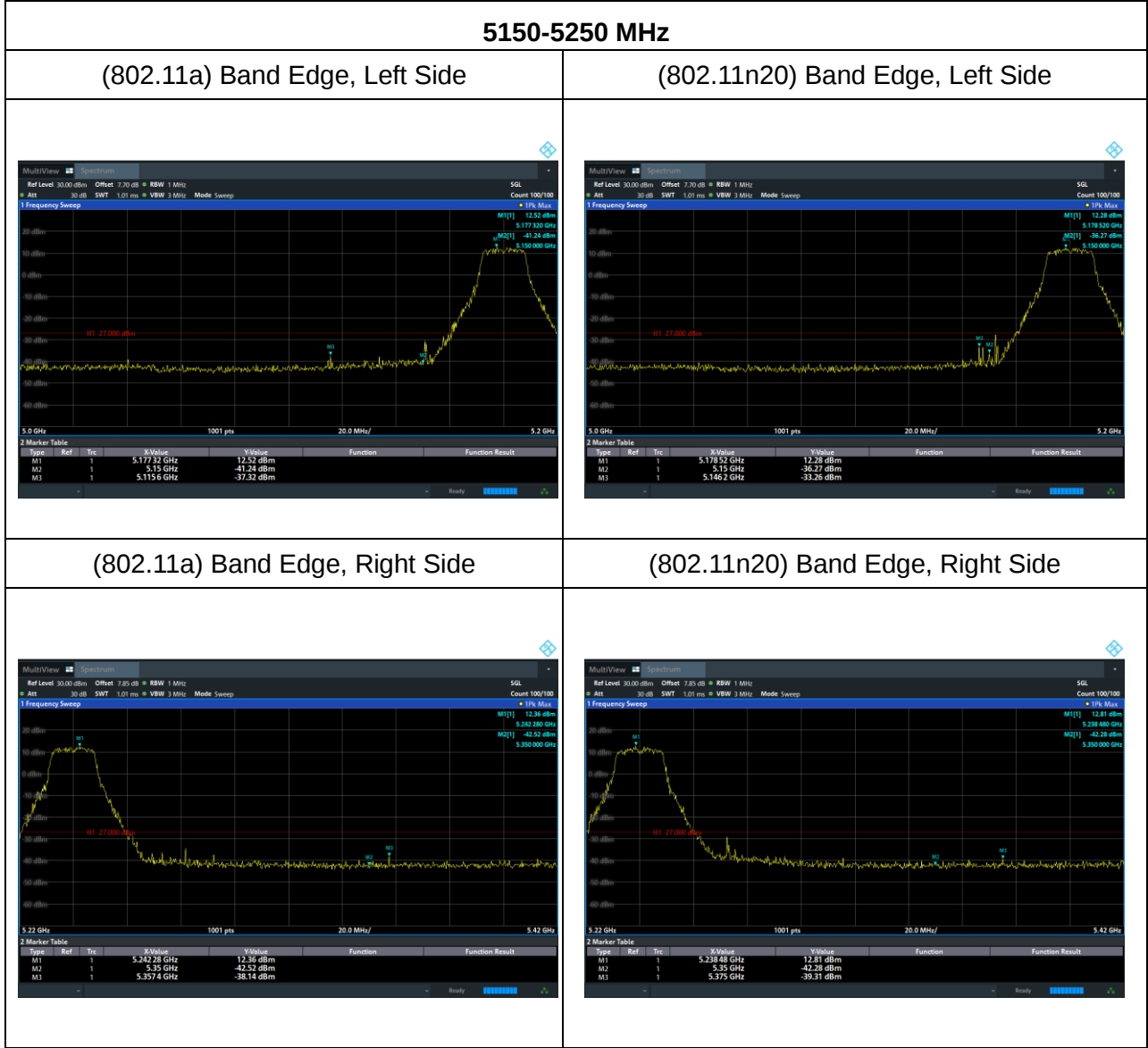
5.8.4 Test Results

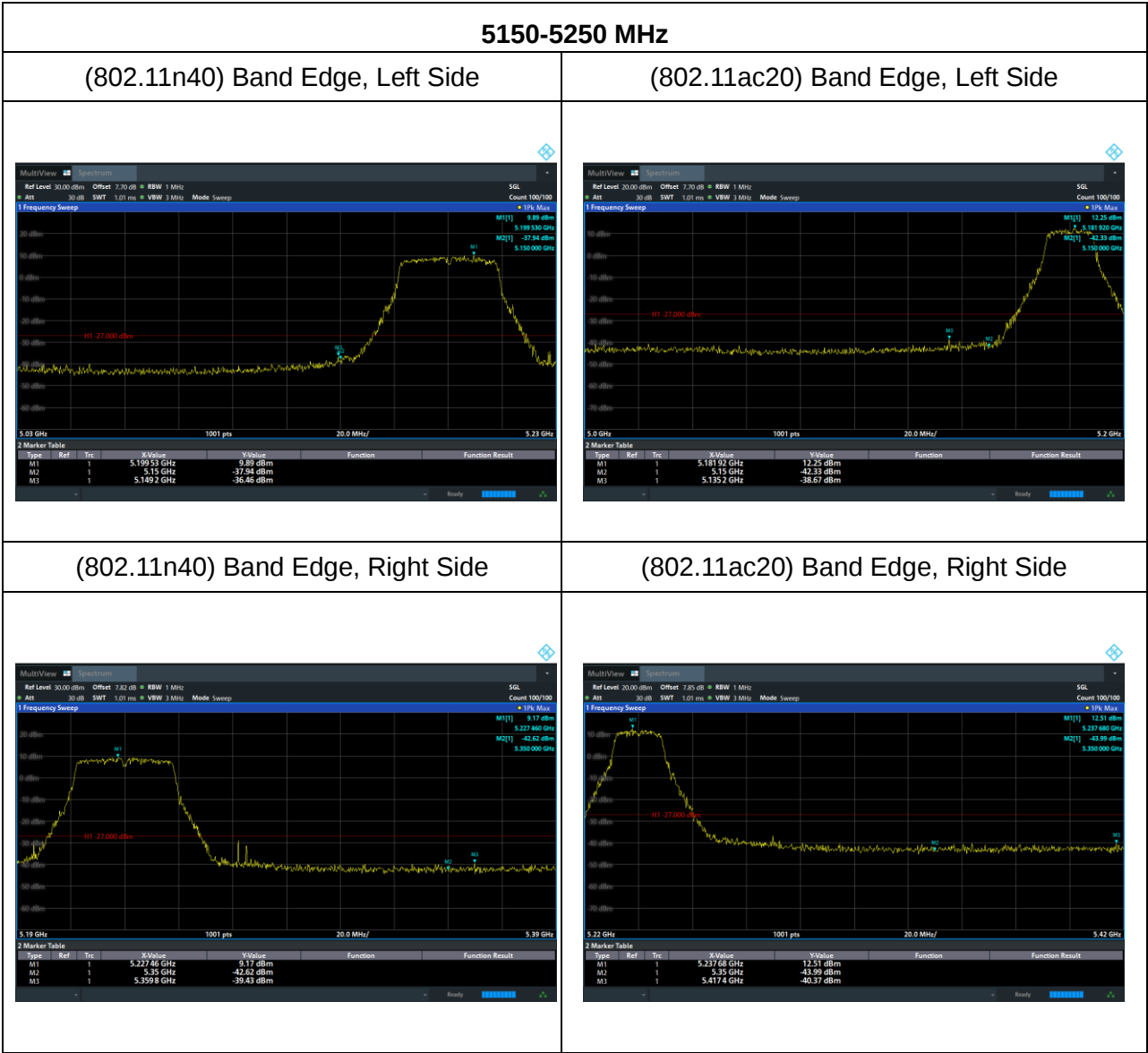
8733 Bluetooth chip:

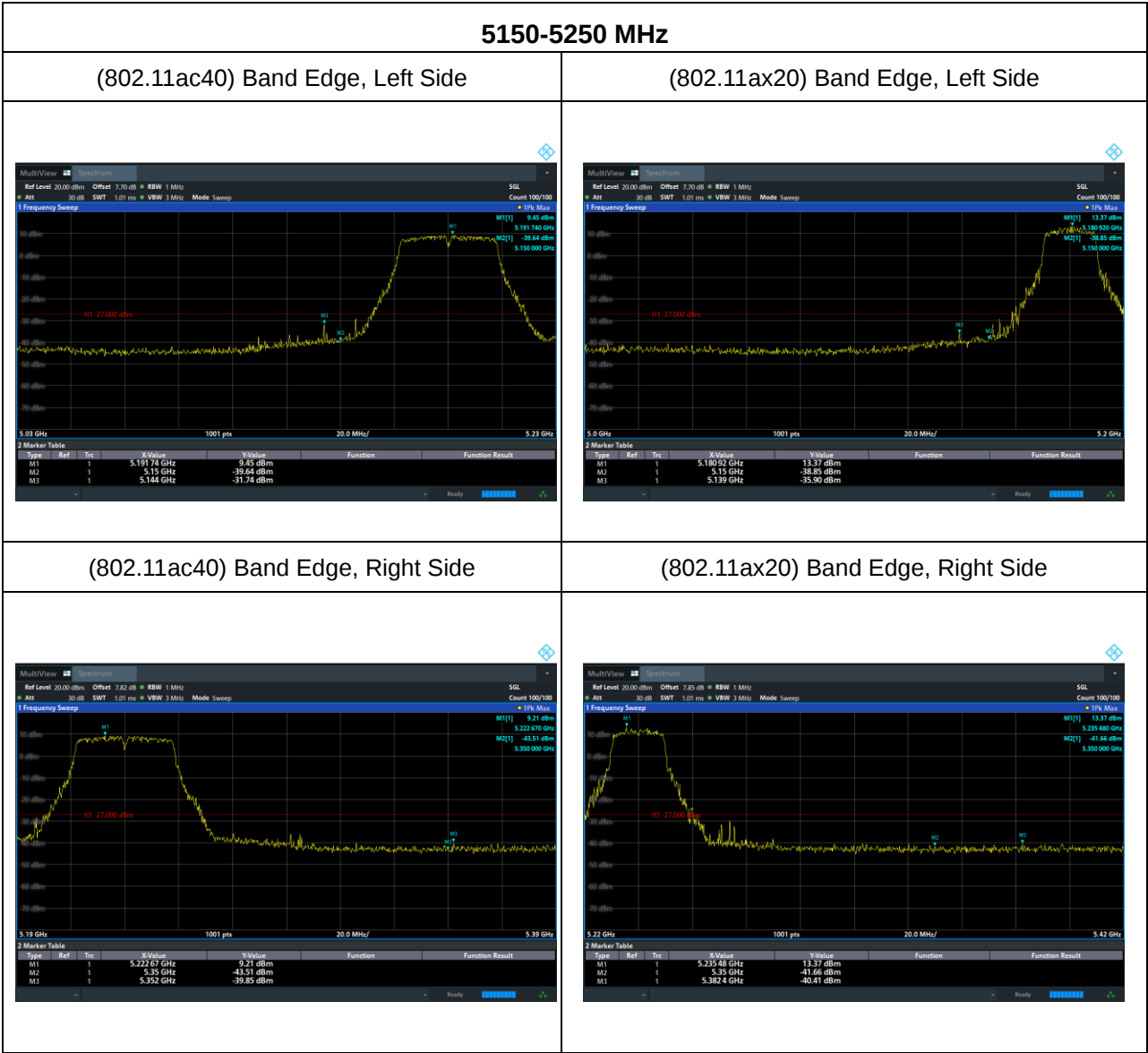


5150-5250 MHz	
(802.11n40) Band Edge, Left Side	/
	/
(802.11n40) Band Edge, Right Side	/
	/

8800 Bluetooth chip:







5150-5250 MHz	
(802.11ax40) Band Edge, Right Side	/
	/
(802.11ax40) Band Edge, Left Side	/
	/

5.9 Spurious RF Conducted Emissions

5.9.1 Limit

According to FCC §15.407(b).

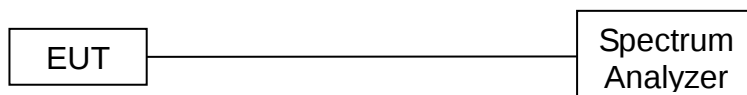
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (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

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2020 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 peak field strength, and measure frequency range from 9kHz to 26.5GHz.

5.9.3 Test Setup



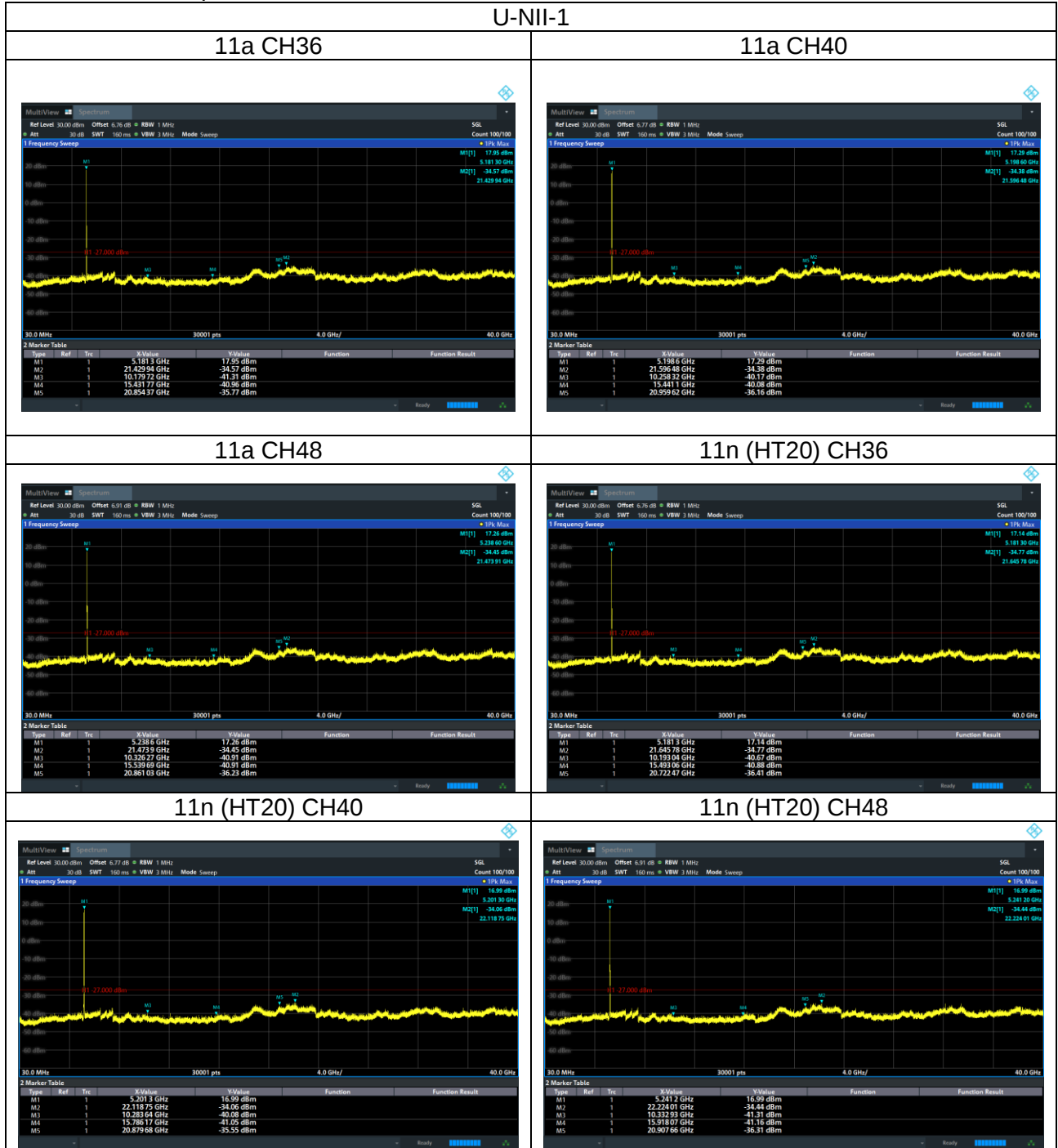
5.9.4 Test Results

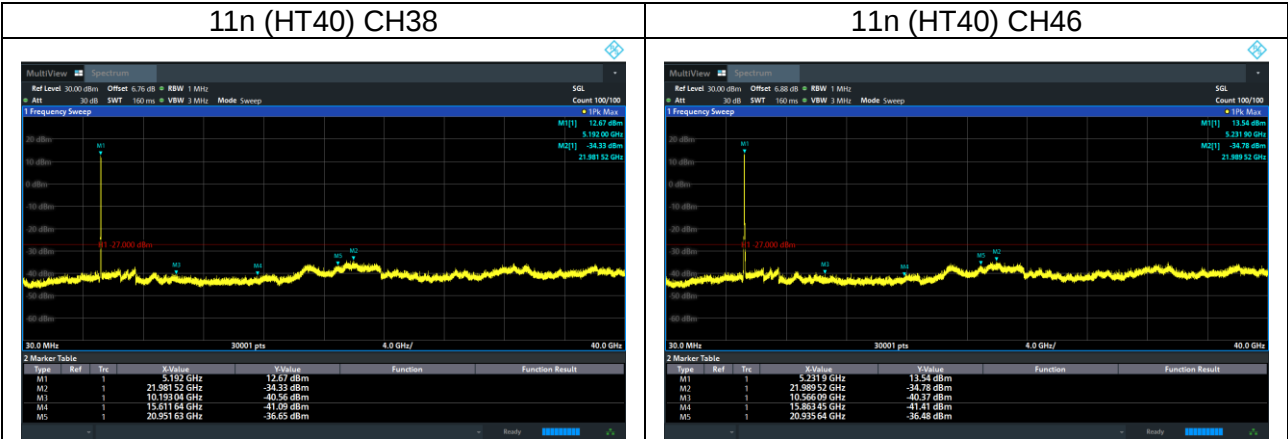
Note:

- 1: The measurement frequency range is from 9kHz to the 10th harmonic of the fundamental

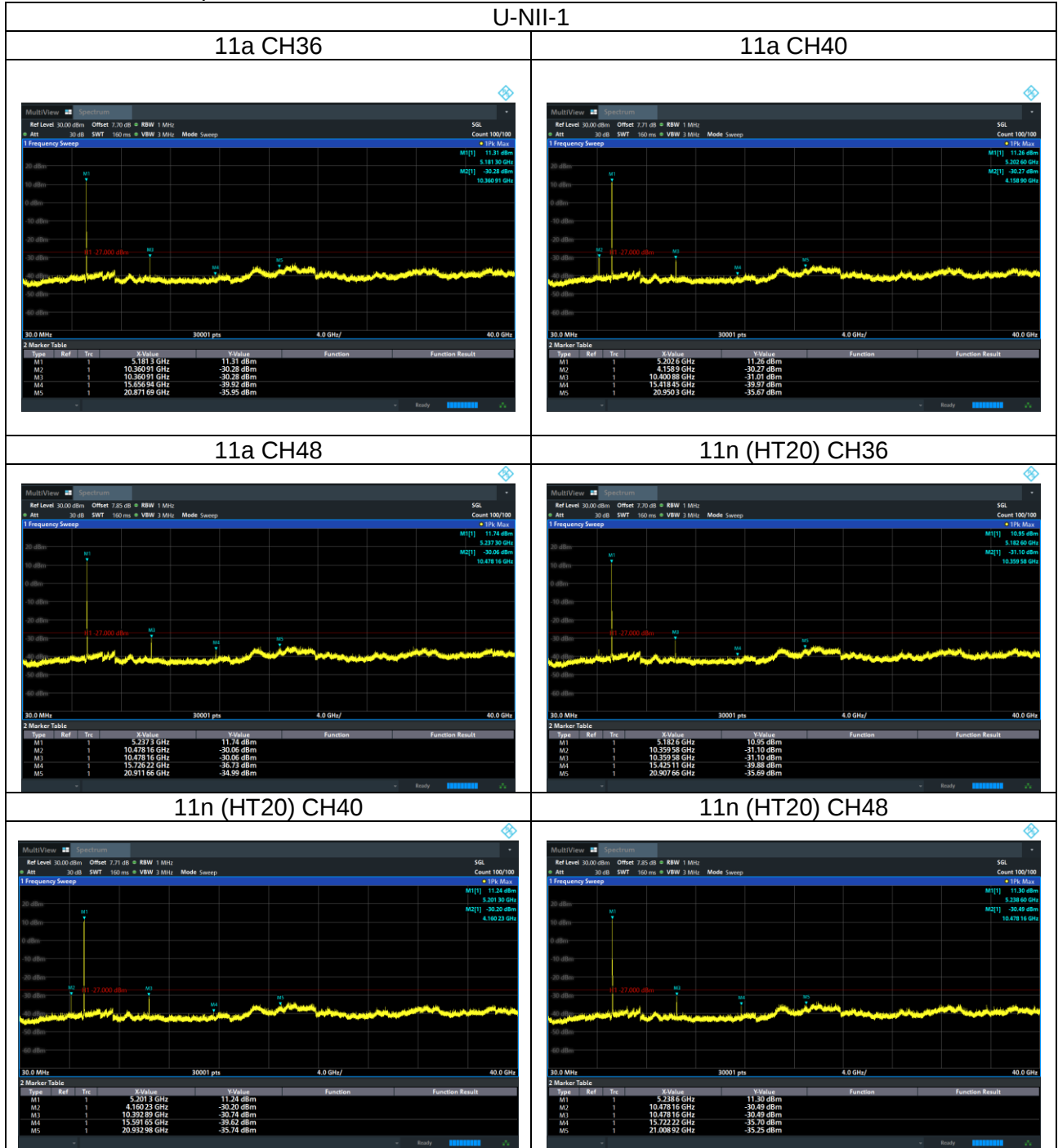
frequency; The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

8733 Bluetooth chip:

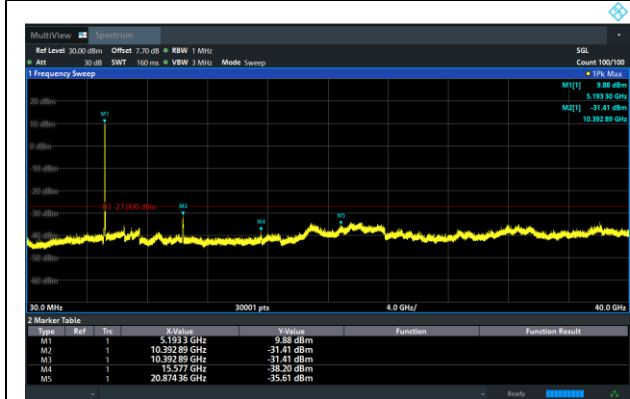




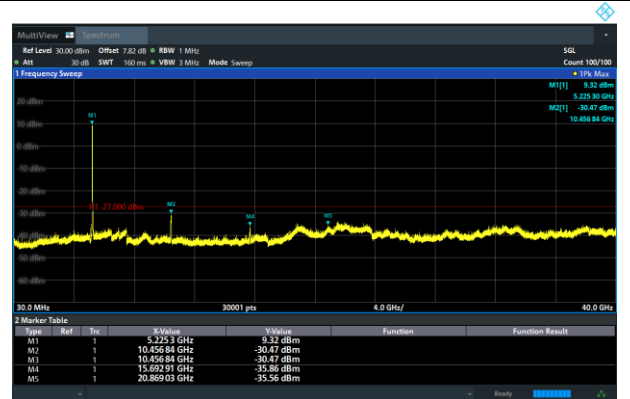
8800 Bluetooth chip:



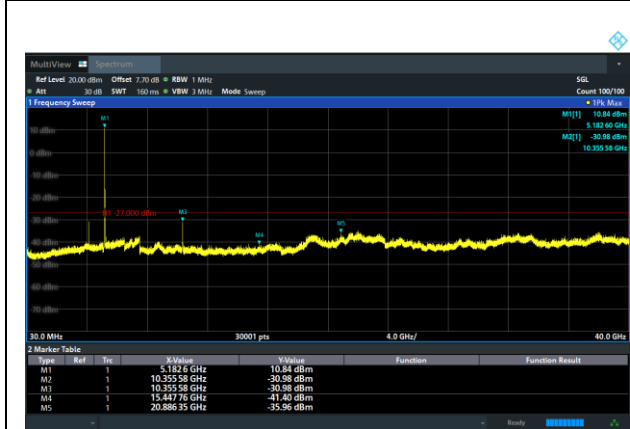
11n (HT40) CH38



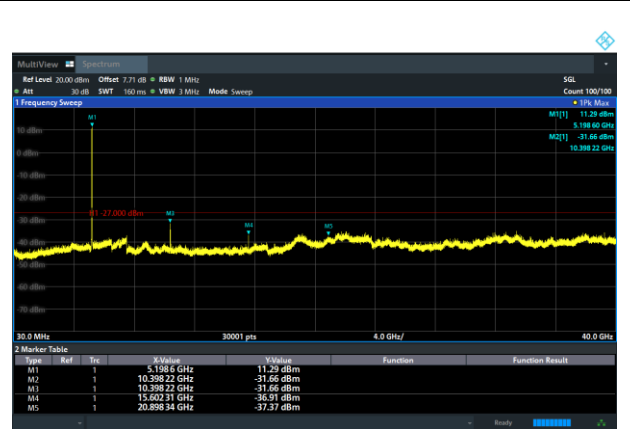
11n (HT40) CH46



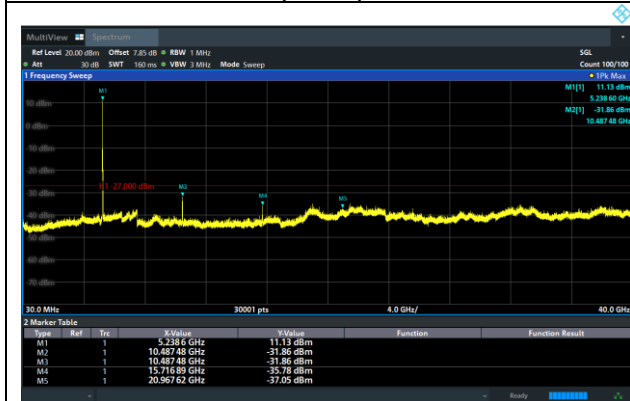
11ac (HT20) CH36



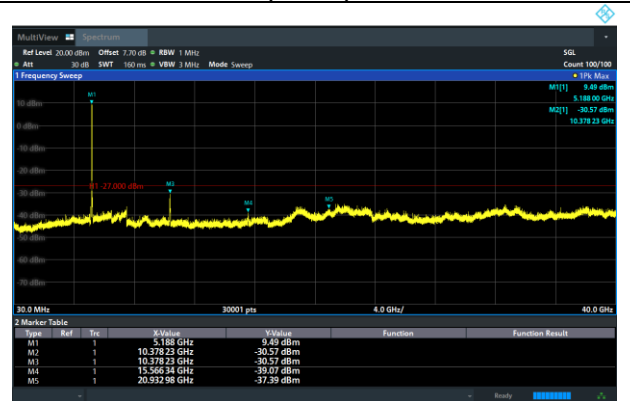
11ac (HT20) CH40



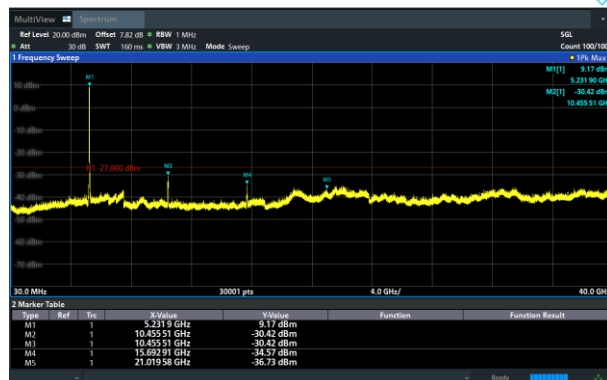
11ac (HT20) CH48



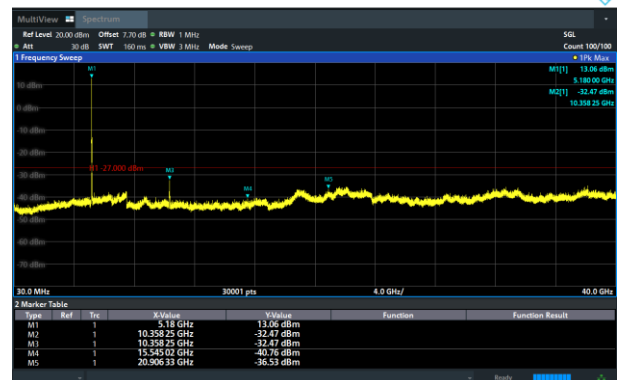
11ac (HT40) CH38



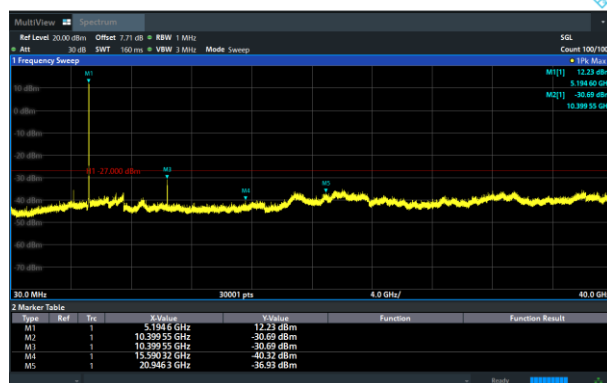
11ac (HT40) CH46



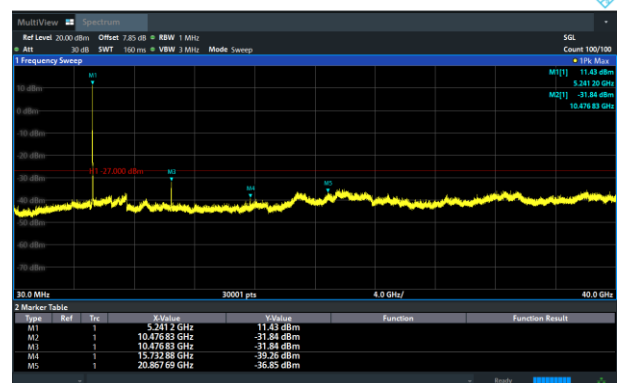
11ax (HT20) CH36



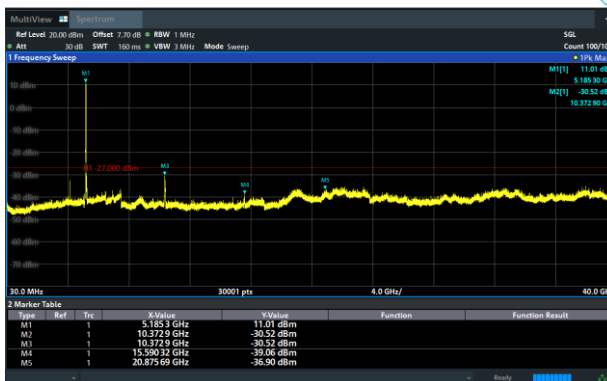
11ax (HT20) CH40



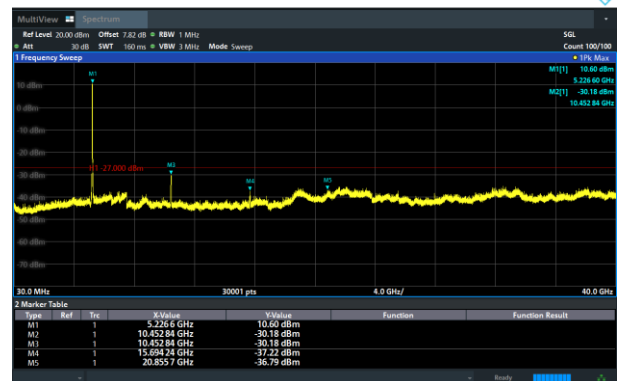
11ax (HT20) CH48



11ax (HT40) CH38



11ax (HT40) CH46



5.10 Frequency Stability

5.10.1 Limit

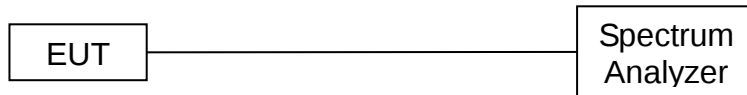
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

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

5.10.2 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°C ~ 70°C .

5.10.3 Test Setup



5.10.4 Test Results

EUT:	CarPlay/Android Auto AI BOX	Model Name:	CP04
Test Mode:	Charging+TX	Test Voltage:	DC 5V from adapter AC 120/60Hz

8733 Bluetooth chip:

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5180.0542	5180	0.0542	10.463
		V max (V)	138.00	5180.0325	5180	0.0325	6.274
		V min (V)	102.00	5180.0141	5180	0.0141	2.722
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5180.0034	5180	0.0034	0.656
		T (°C)	-10	5180.0105	5180	0.0105	2.027
		T (°C)	0	5180.0254	5180	0.0254	4.903
		T (°C)	10	5180.0331	5180	0.0331	6.390
		T (°C)	20	5180.0214	5180	0.0214	4.131
		T (°C)	30	5180.0205	5180	0.0205	3.958
		T (°C)	40	5180.0114	5180	0.0114	2.201
		T (°C)	50	5180.0054	5180	0.0054	1.042
		T (°C)	60	5180.0312	5180	0.0312	6.023
		T (°C)	70	5180.0547	5180	0.0547	10.560
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)	120.00	5200.0324	5200	0.0324	6.231
		V max (V)	138.00	5200.0277	5200	0.0277	5.327
		V min (V)	102.00	5200.0544	5200	0.0544	10.462
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)	120	T (°C)	-20	5200.0452	5200	0.0452	8.692
		T (°C)	-10	5200.0365	5200	0.0365	7.019
		T (°C)	0	5200.0245	5200	0.0245	4.712
		T (°C)	10	5200.0345	5200	0.0345	6.635
		T (°C)	20	5200.0552	5200	0.0552	10.615
		T (°C)	30	5200.0375	5200	0.0375	7.212
		T (°C)	40	5200.0257	5200	0.0257	4.942
		T (°C)	50	5200.0635	5200	0.0635	12.212
		T (°C)	60	5200.0278	5200	0.0278	5.346
		T (°C)	70	5200.0363	5200	0.0363	6.981
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)	120.00	5240.0455	5240	0.0455	8.683
		V max (V)	138.00	5240.0358	5240	0.0358	6.832
		V min (V)	102.00	5240.0142	5240	0.0142	2.710
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)	120	T (°C)	-20	5240.0241	5240	0.0241	4.599
		T (°C)	-10	5240.0145	5240	0.0145	2.767
		T (°C)	0	5240.0136	5240	0.0136	2.595
		T (°C)	10	5240.0441	5240	0.0441	8.416
		T (°C)	20	5240.0417	5240	0.0417	7.958
		T (°C)	30	5240.0145	5240	0.0145	2.767
		T (°C)	40	5240.0112	5240	0.0112	2.137
		T (°C)	50	5240.0142	5240	0.0142	2.710
		T (°C)	60	5240.0052	5240	0.0052	0.992
		T (°C)	70	5240.0096	5240	0.0096	1.832
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)	120.00	5190.0245	5190	0.0245	4.721
		V max (V)	138.00	5190.0365	5190	0.0365	7.033
		V min (V)	102.00	5190.0133	5190	0.0133	2.563
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5190MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5190.0185	5190	0.0185	3.565
		T (°C)	-10	5190.0247	5190	0.0247	4.759
		T (°C)	0	5190.0135	5190	0.0135	2.601
		T (°C)	10	5190.0412	5190	0.0412	7.938
		T (°C)	20	5190.0365	5190	0.0365	7.033
		T (°C)	30	5190.0177	5190	0.0177	3.410
		T (°C)	40	5190.0045	5190	0.0045	0.867
		T (°C)	50	5190.0157	5190	0.0157	3.025
		T (°C)	60	5190.0044	5190	0.0044	0.848
		T (°C)	70	5190.0078	5190	0.0078	1.503
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)	120.00	5200.0345	5200	0.0345	6.635
		V max (V)	138.00	5200.0285	5200	0.0285	5.481
		V min (V)	102.00	5200.0163	5200	0.0163	3.135
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)	120	T (°C)	-20	5200.0412	5200	0.0412	7.923
		T (°C)	-10	5200.0144	5200	0.0144	2.769
		T (°C)	0	5200.0122	5200	0.0122	2.346
		T (°C)	10	5200.0356	5200	0.0356	6.846
		T (°C)	20	5200.0248	5200	0.0248	4.769
		T (°C)	30	5200.0111	5200	0.0111	2.135
		T (°C)	40	5200.0145	5200	0.0145	2.788
		T (°C)	50	5200.0121	5200	0.0121	2.327
		T (°C)	60	5200.0163	5200	0.0163	3.135
		T (°C)	70	5200.0196	5200	0.0196	3.769
Limits				± 20 ppm			
Result				Complies			

8800 Bluetooth chip:

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5180.0242	5180	0.0242	4.672
		V max (V)	138.00	5180.0145	5180	0.0145	2.799
		V min (V)	102.00	5180.0335	5180	0.0335	6.467
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)	120	T (°C)	-20	5180.0145	5180	0.0145	2.799
		T (°C)	-10	5180.0125	5180	0.0125	2.413
		T (°C)	0	5180.0241	5180	0.0241	4.653
		T (°C)	10	5180.0314	5180	0.0314	6.062
		T (°C)	20	5180.0255	5180	0.0255	4.923
		T (°C)	30	5180.0235	5180	0.0235	4.537
		T (°C)	40	5180.0111	5180	0.0111	2.143
		T (°C)	50	5180.0063	5180	0.0063	1.216
		T (°C)	60	5180.0405	5180	0.0405	7.819
		T (°C)	70	5180.0414	5180	0.0414	7.992
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)	120.00	5200.0315	5200	0.0315	6.058
		V max (V)	138.00	5200.0425	5200	0.0425	8.173
		V min (V)	102.00	5200.0622	5200	0.0622	11.962
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5200.0412	5200	0.0412	7.923
		T (°C)	-10	5200.0352	5200	0.0352	6.769
		T (°C)	0	5200.0221	5200	0.0221	4.250
		T (°C)	10	5200.0411	5200	0.0411	7.904
		T (°C)	20	5200.0325	5200	0.0325	6.250
		T (°C)	30	5200.0214	5200	0.0214	4.115
		T (°C)	40	5200.0362	5200	0.0362	6.962
		T (°C)	50	5200.0344	5200	0.0344	6.615
		T (°C)	60	5200.0214	5200	0.0214	4.115
		T (°C)	70	5200.0063	5200	0.0063	1.212
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)	120.00	5240.0345	5240	0.0345	6.584
		V max (V)	138.00	5240.0258	5240	0.0258	4.924
		V min (V)	102.00	5240.0365	5240	0.0365	6.966
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5240.0145	5240	0.0145	2.767
		T (°C)	-10	5240.0152	5240	0.0152	2.901
		T (°C)	0	5240.0135	5240	0.0135	2.576
		T (°C)	10	5240.0441	5240	0.0441	8.416
		T (°C)	20	5240.0365	5240	0.0365	6.966
		T (°C)	30	5240.0127	5240	0.0127	2.424
		T (°C)	40	5240.0036	5240	0.0036	0.687
		T (°C)	50	5240.0154	5240	0.0154	2.939
		T (°C)	60	5240.0014	5240	0.0014	0.267
		T (°C)	70	5240.0117	5240	0.0117	2.233
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)	120.00	5190.0325	5190	0.0325	6.262
		V max (V)	138.00	5190.0284	5190	0.0284	5.472
		V min (V)	102.00	5190.0163	5190	0.0163	3.141
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)	120	T (°C)	-20	5190.0452	5190	0.0452	8.709
		T (°C)	-10	5190.0154	5190	0.0154	2.967
		T (°C)	0	5190.0198	5190	0.0198	3.815
		T (°C)	10	5190.0322	5190	0.0322	6.204
		T (°C)	20	5190.0274	5190	0.0274	5.279
		T (°C)	30	5190.0136	5190	0.0136	2.620
		T (°C)	40	5190.0024	5190	0.0024	0.462
		T (°C)	50	5190.0145	5190	0.0145	2.794
		T (°C)	60	5190.0034	5190	0.0034	0.655
		T (°C)	70	5190.0115	5190	0.0115	2.216
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)	120.00	5200.0474	5200	0.0474	9.115
		V max (V)	138.00	5200.0636	5200	0.0636	12.231
		V min (V)	102.00	5200.0175	5200	0.0175	3.365
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)	120	T (°C)	-20	5200.0185	5200	0.0185	3.558
		T (°C)	-10	5200.0145	5200	0.0145	2.788
		T (°C)	0	5200.0135	5200	0.0135	2.596
		T (°C)	10	5200.0147	5200	0.0147	2.827
		T (°C)	20	5200.0263	5200	0.0263	5.058
		T (°C)	30	5200.0134	5200	0.0134	2.577
		T (°C)	40	5200.0047	5200	0.0047	0.904
		T (°C)	50	5200.0128	5200	0.0128	2.462
		T (°C)	60	5200.0014	5200	0.0014	0.269
		T (°C)	70	5200.0133	5200	0.0133	2.558
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

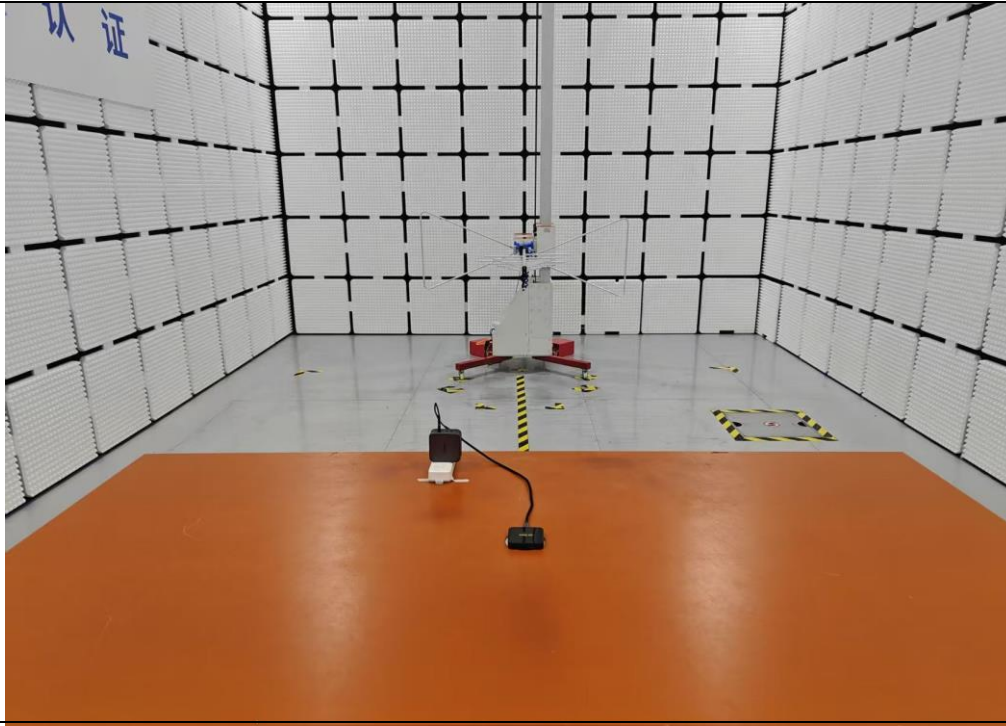
TEST CONDITIONS				Reference Frequency: 5210MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5210.0265	5210	0.0265	5.086
		V max (V)	138.00	5210.0147	5210	0.0147	2.821
		V min (V)	102.00	5210.0352	5210	0.0352	6.756
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5210MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5210.0158	5210	0.0158	3.033
		T (°C)	-10	5210.0188	5210	0.0188	3.608
		T (°C)	0	5210.0135	5210	0.0135	2.591
		T (°C)	10	5210.0417	5210	0.0417	8.004
		T (°C)	20	5210.0285	5210	0.0285	5.470
		T (°C)	30	5210.0127	5210	0.0127	2.438
		T (°C)	40	5210.0014	5210	0.0014	0.269
		T (°C)	50	5210.0142	5210	0.0142	2.726
		T (°C)	60	5210.0177	5210	0.0177	3.397
		T (°C)	70	5210.0136	5210	0.0136	2.610
Limits				± 20 ppm			
Result				Complies			

6 Photographs of the Test Setup

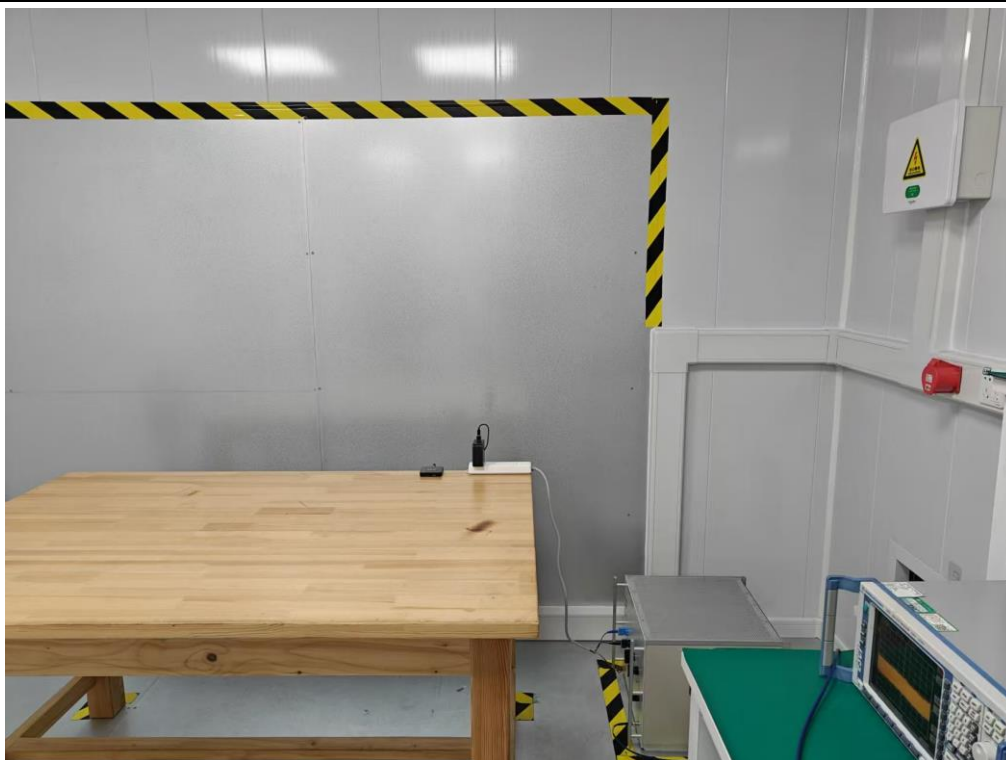
Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



Conducted emission



7 Photographs of the EUT

Please refer to report HB20250228007E-01 for product photos.

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