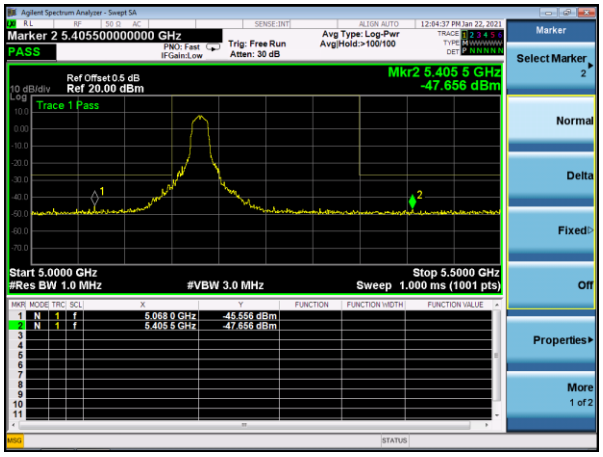
11.5 Test Result

Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz

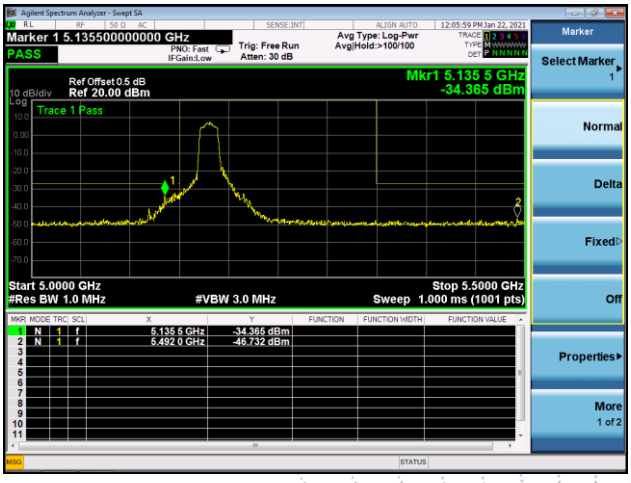
5.1G

5.180~5.240 GHz

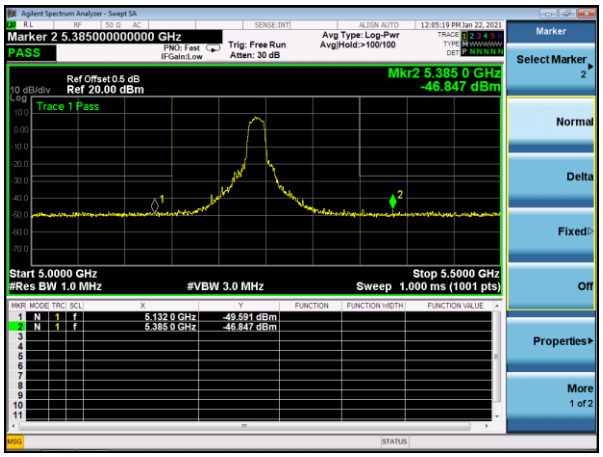
(802.11a) Band Edge, Left Side



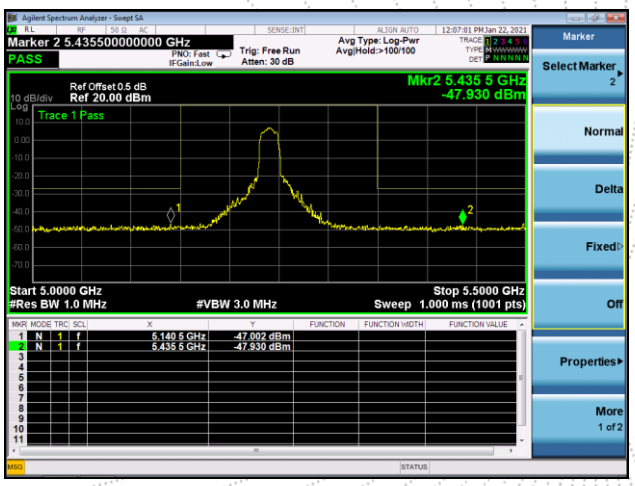
(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

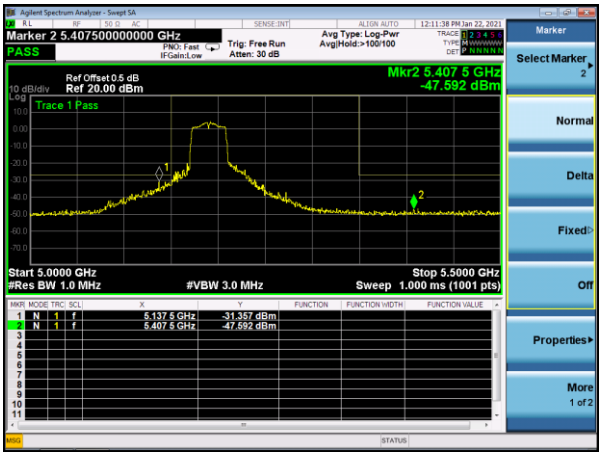


(802.11n20) Band Edge, Right Side

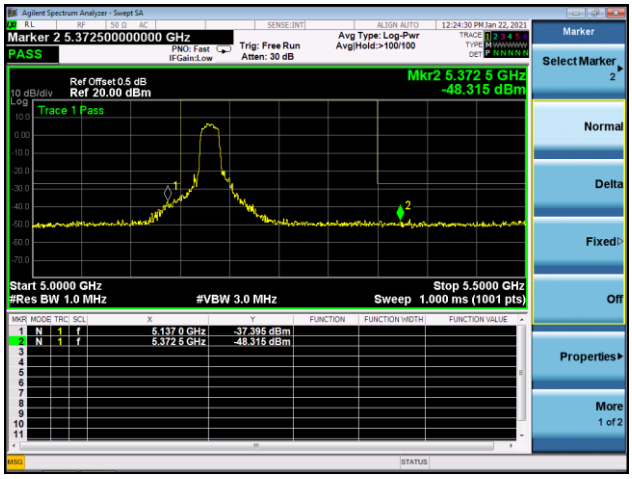


5.180~5.240 GHz

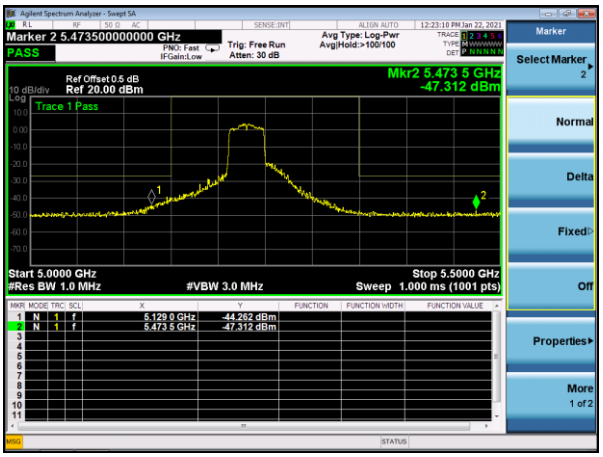
(802.11n40) Band Edge, Left Side



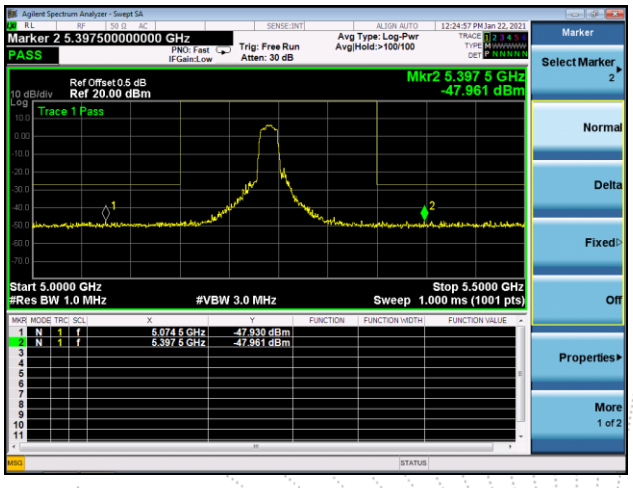
(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Right Side

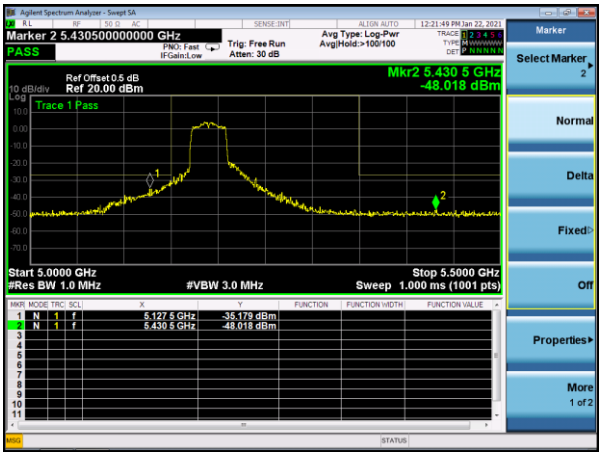


(802.11ac20) Band Edge, Right Side

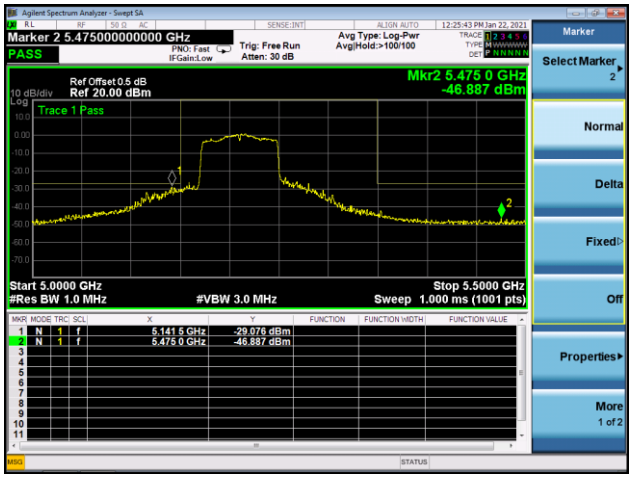


5.180~5.240 GHz

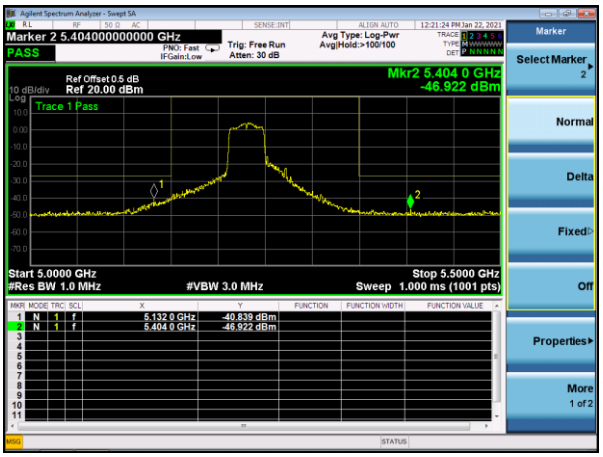
(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge, Left Side



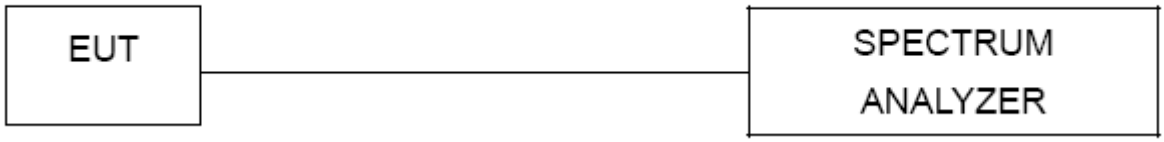
(802.11ac40) Band Edge, Right Side



(802.11ac80) Band Edge, Right Side

12. SPURIOUS RF CONDUCTED EMISSIONS

12.1 Block Diagram Of Test Setup



12.2 Limit

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 5.725-5.85 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..

12.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. 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.
3. 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.

12.4 Test Result

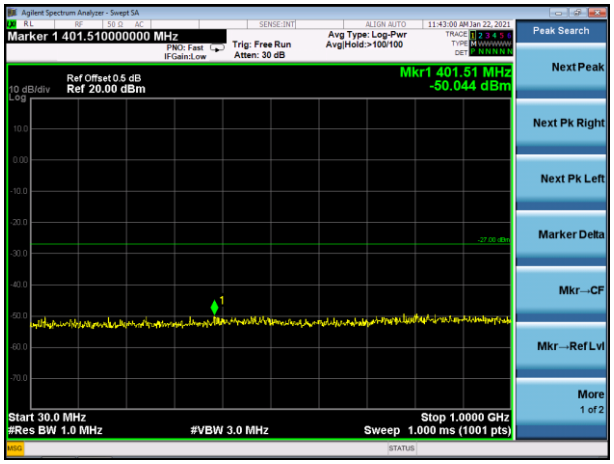
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

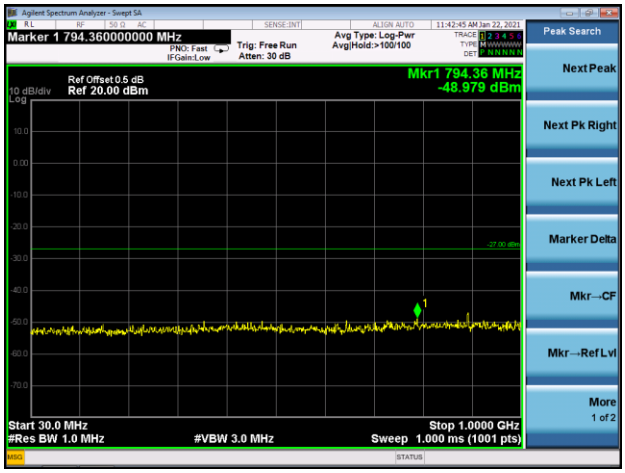
5.1G

Test Plot

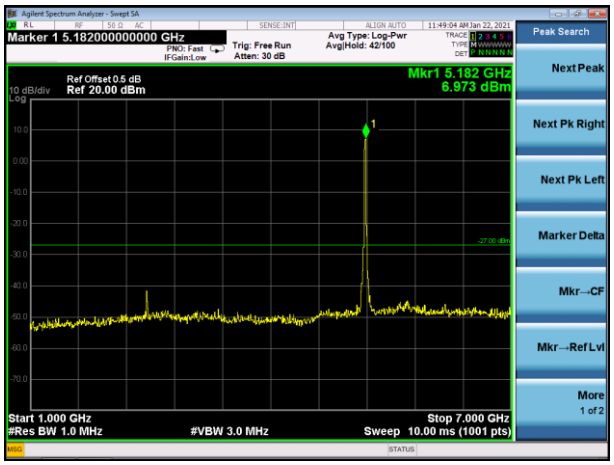
802.11a on channel 36



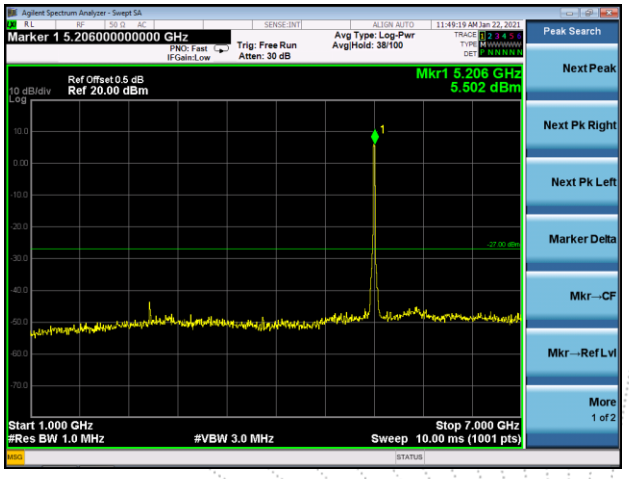
802.11a on channel 40



802.11a on channel 36



802.11a on channel 40

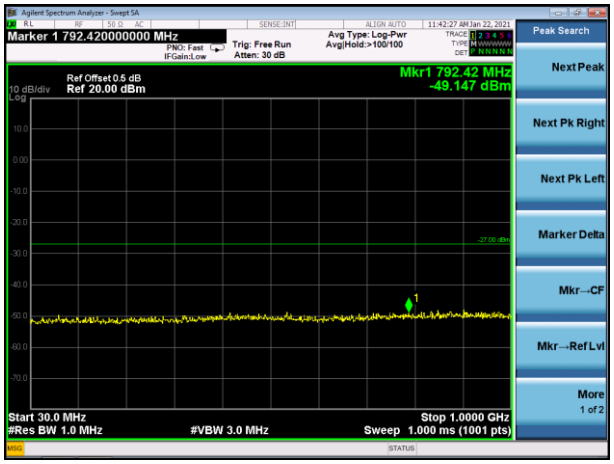


802.11a on channel 36

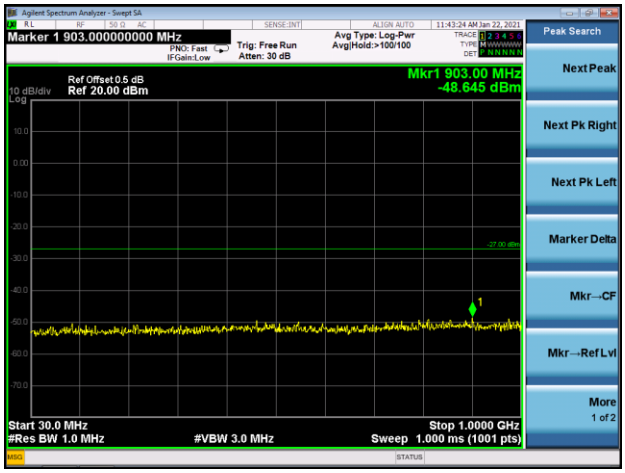
802.11a on channel 40

Test Plot

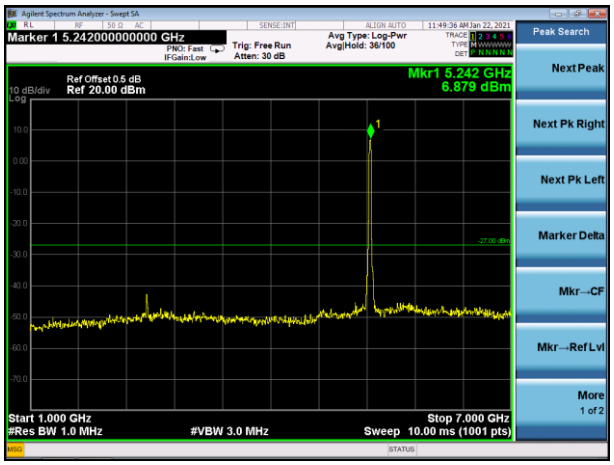
802.11a on channel 48



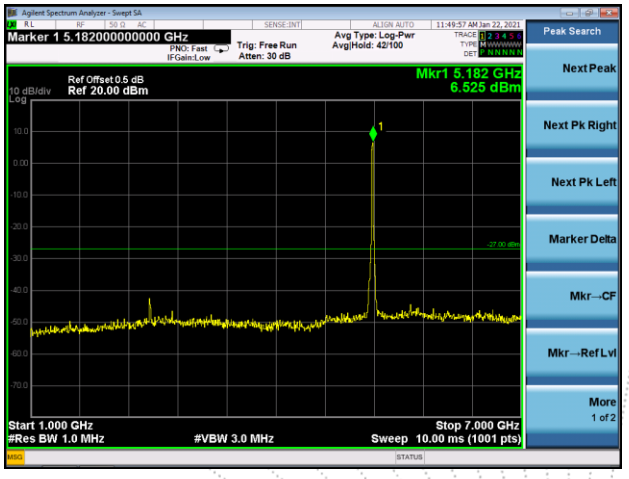
802.11n20 on channel 36



802.11a on channel 48



802.11n20 on channel 36

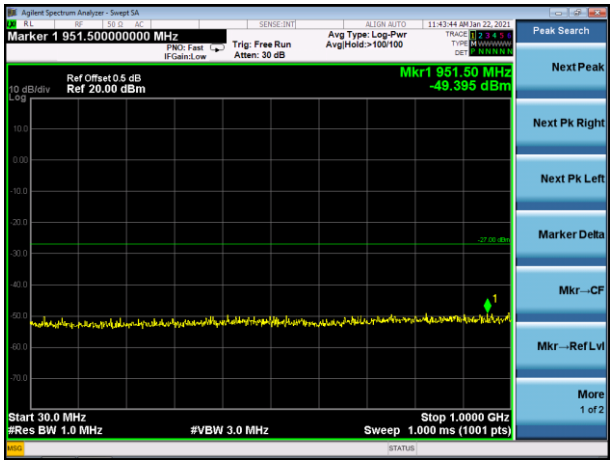


802.11a on channel 48

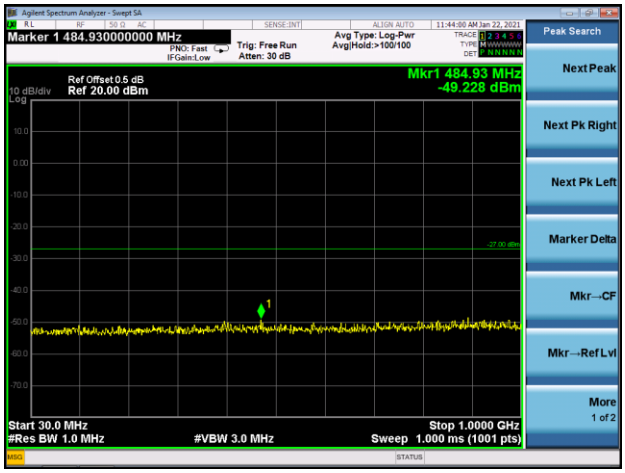
802.11n20 on channel 36

Test Plot

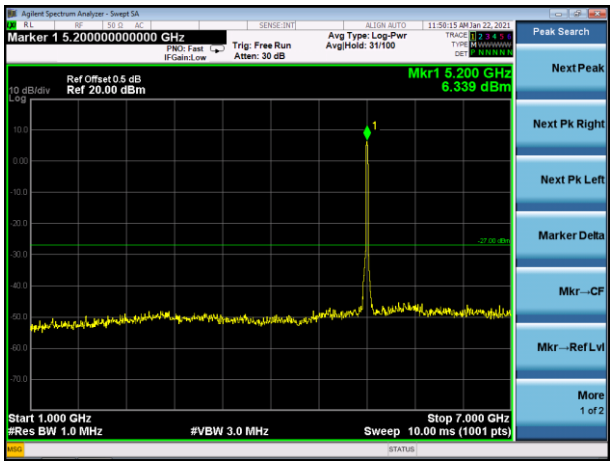
802.11n20 on channel 40



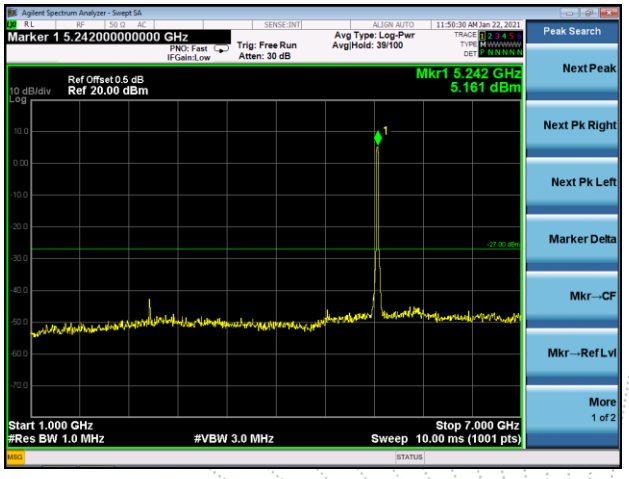
802.11n20 on channel 48



802.11n20 on channel 40



802.11n20 on channel 48

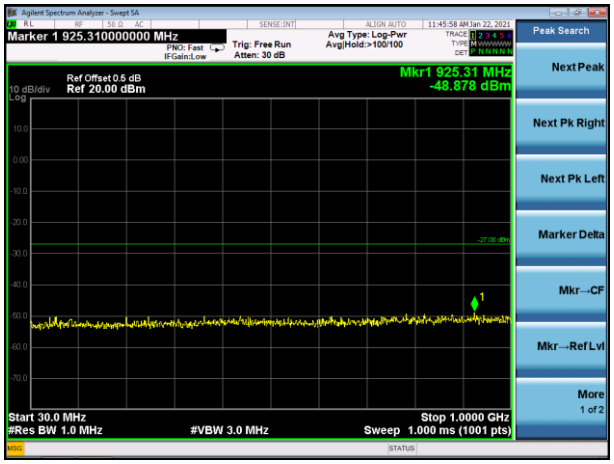


802.11n20 on channel 40

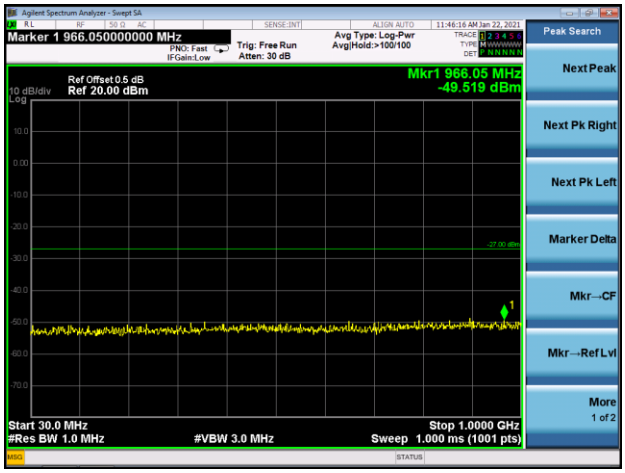
802.11n20 on channel 48

Test Plot

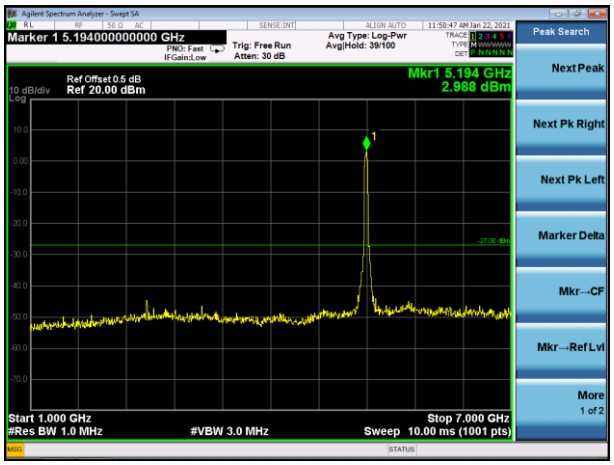
802.11n40 on channel 38



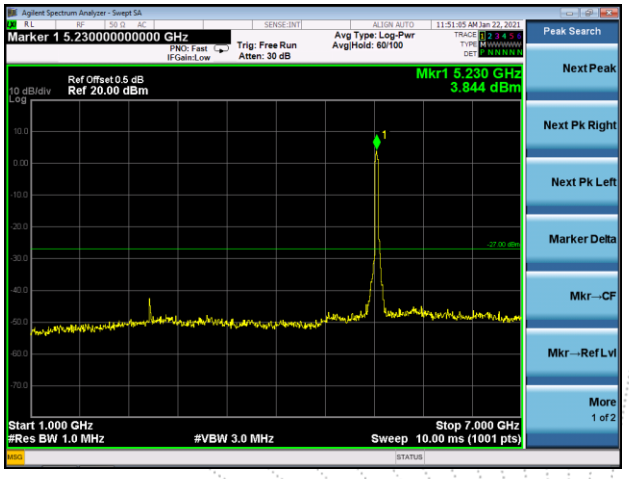
802.11n40 on channel 46



802.11n40 on channel 38



802.11n40 on channel 46

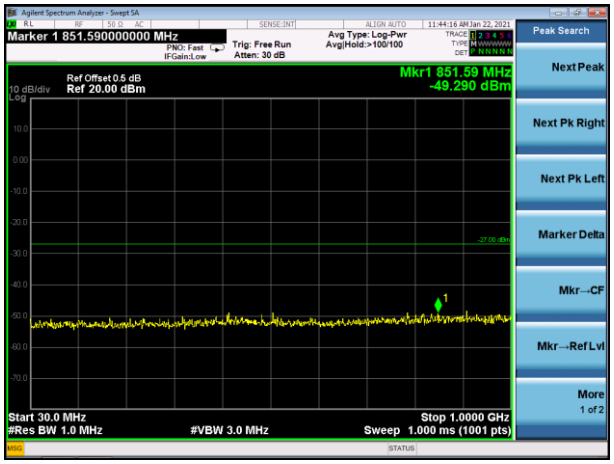


802.11n40 on channel 38

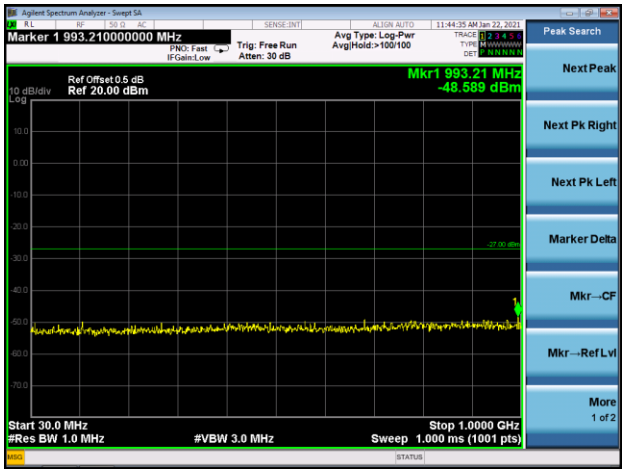
802.11n40 on channel 46

Test Plot

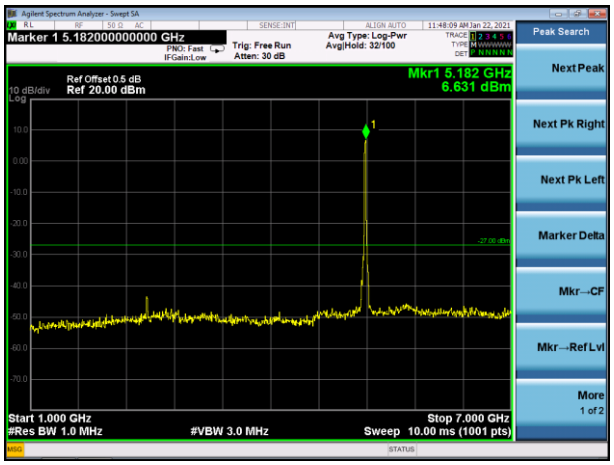
802.11ac20 on channel 36



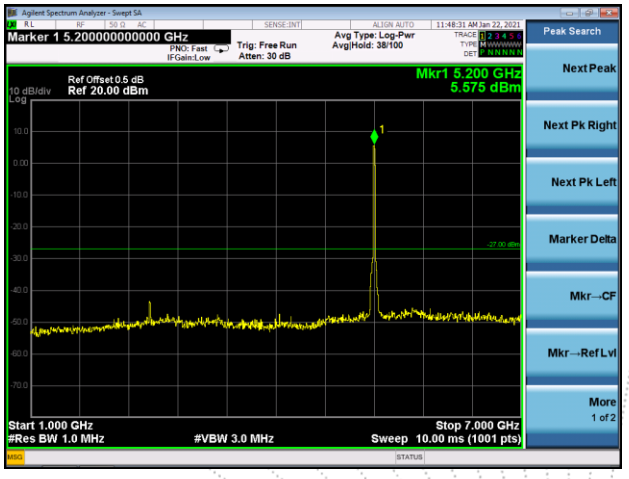
802.11ac20 on channel 40



802.11ac20 on channel 36



802.11ac20 on channel 40

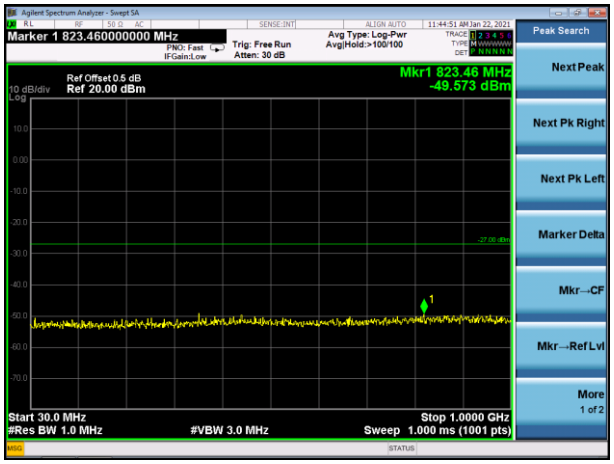


802.11ac20 on channel 36

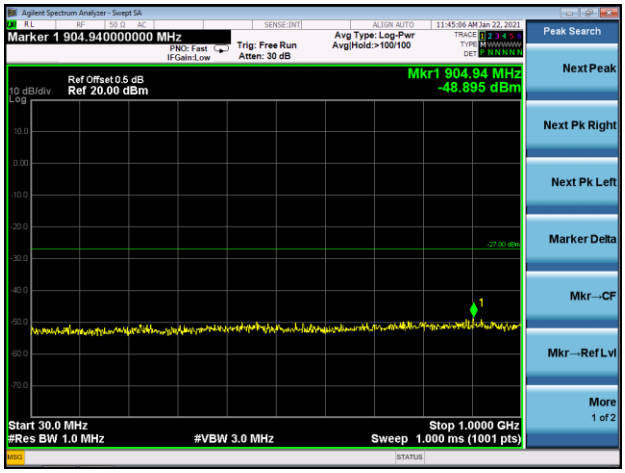
802.11ac20 on channel 40

Test Plot

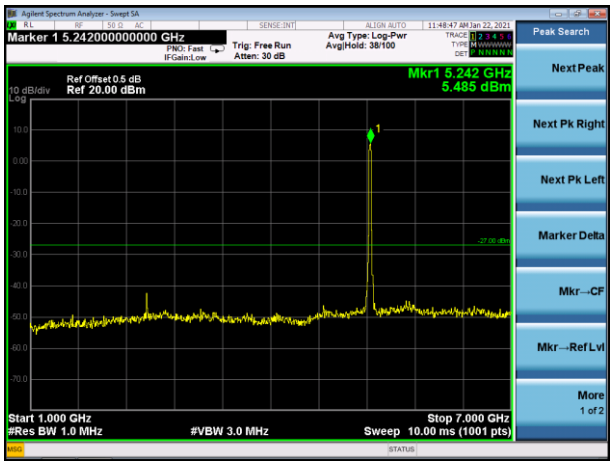
802.11ac20 on channel 48



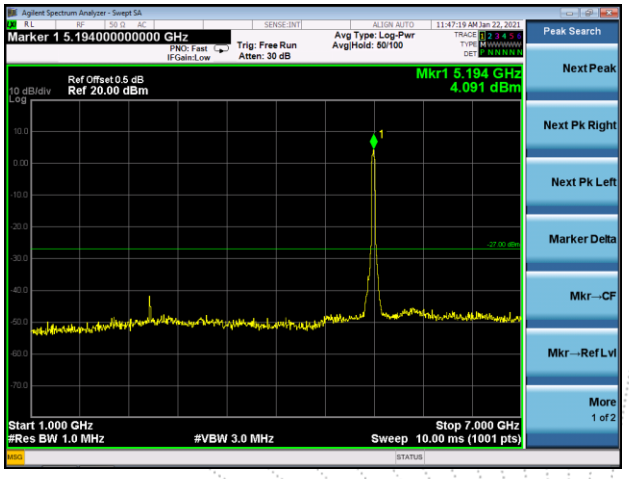
802.11ac40 on channel 38



802.11ac20 on channel 48



802.11ac40 on channel 38

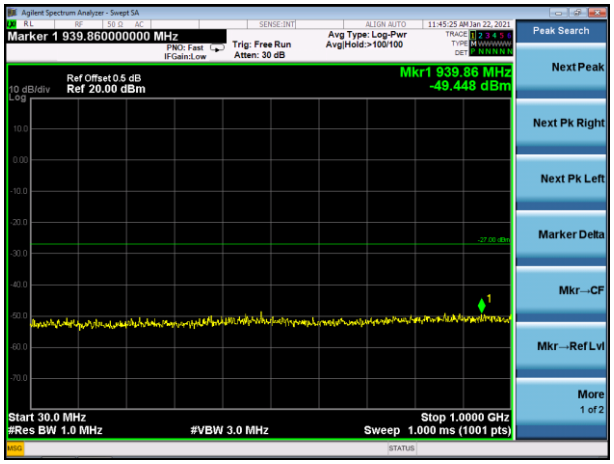


802.11ac20 on channel 48

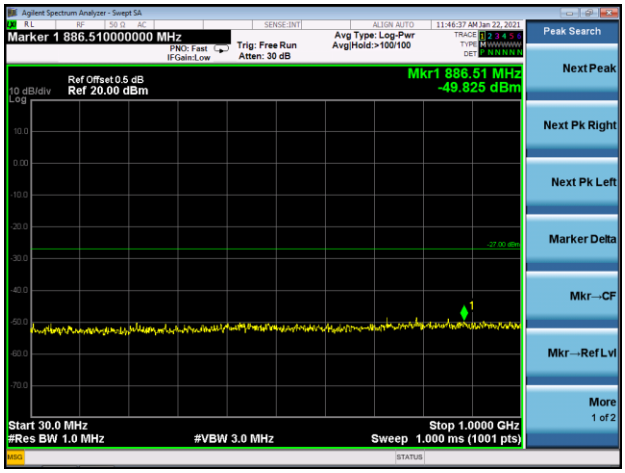
802.11ac40 on channel 38

Test Plot

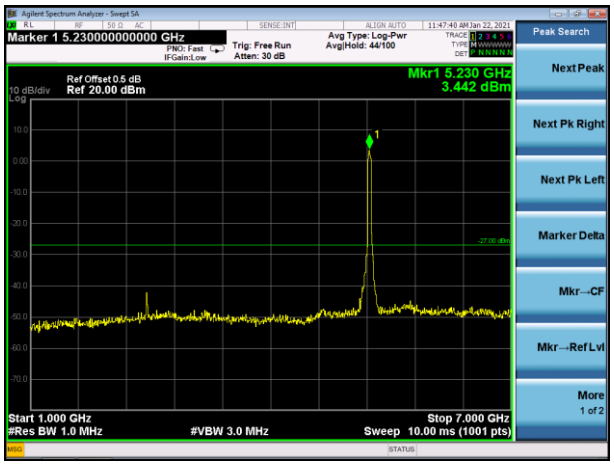
802.11ac40 on channel 46



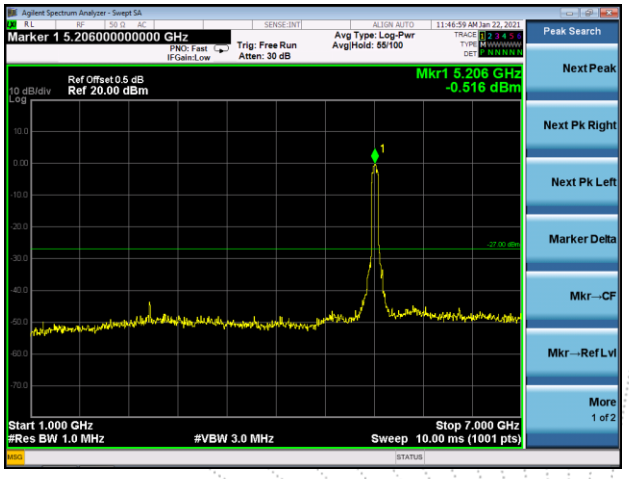
802.11ac80 on channel 42



802.11 ac40 on channel 46



802.11 ac80 on channel 42



802.11 ac40 on channel 46

802.11 ac80 on channel 42

13. FREQUENCY STABILITY MEASUREMENT

13.1 Block Diagram Of Test Setup

13.2 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)..

13.3 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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and he limit is less than ±20ppm (IEEE 802.11nspecification).
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.

13.4 Test Result

Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

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	5180.0016	5180	0.0016	0.3149
		V max (V)	132.00	5180.0209	5180	0.0209	4.0328
		V min (V)	108.00	5180.0192	5180	0.0192	3.7118
Limits				5150-5250 MHz			
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	5180.0063	5180	0.0063	1.2153
		T (°C)	-10	5180.0011	5180	0.0011	0.2158
		T (°C)	0	5180.0036	5180	0.0036	0.6905
		T (°C)	10	5180.0103	5180	0.0103	1.9878
		T (°C)	20	5180.0112	5180	0.0112	2.1709
		T (°C)	30	5180.0059	5180	0.0059	1.1358
		T (°C)	40	5180.0043	5180	0.0043	0.8231
		T (°C)	50	5180.0047	5180	0.0047	0.9030
		T (°C)	60	5180.0015	5180	0.0015	0.2817
		T (°C)	70	5180.0094	5180	0.0094	1.8138
Limits				5150-5250 MHz			
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	5200.0109	5200	0.0109	2.0951
		V max (V)	132.00	5200.0034	5200	0.0034	0.6501
		V min (V)	108.00	5200.0011	5200	0.0011	0.2158
Limits				5725-5850 MHz			
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	5200.00669	5200	0.00669	1.2860
		T (°C)	-10	5200.00180	5200	0.00180	0.3458
		T (°C)	0	5200.00639	5200	0.00639	1.2294
		T (°C)	10	5200.00288	5200	0.00288	0.5535
		T (°C)	20	5200.00900	5200	0.00900	1.7317
		T (°C)	30	5200.01296	5200	0.01296	2.4923
		T (°C)	40	5200.00318	5200	0.00318	0.6114
		T (°C)	50	5200.01104	5200	0.01104	2.1227
		T (°C)	60	5200.01041	5200	0.01041	2.0011
		T (°C)	70	5200.01150	5200	0.01150	2.2121
Limits				5150-5250 MHz			
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	5240.0049	5240	0.0049	0.9322
		V max (V)	132.00	5240.0120	5240	0.0120	2.2845
		V min (V)	108.00	5240.0102	5240	0.0102	1.9524
Limits				5150-5250 MHz			
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	5240.0043	5240	0.0043	0.8131
		T (°C)	-10	5240.0102	5240	0.0102	1.9423
		T (°C)	0	5240.0007	5240	0.0007	0.1398
		T (°C)	10	5240.0074	5240	0.0074	1.4121
		T (°C)	20	5240.0035	5240	0.0035	0.6605
		T (°C)	30	5240.0102	5240	0.0102	1.9529
		T (°C)	40	5240.0066	5240	0.0066	1.2566
		T (°C)	50	5240.0130	5240	0.0130	2.4830
		T (°C)	60	5240.0095	5240	0.0095	1.8044
		T (°C)	70	5240.0118	5240	0.0118	2.2570
Limits				5150-5250 MHz			
Result				Complies			

14. ANTENNA REQUIREMENT

14.1 Limit

15.203 requirement: For intentional device, according to 15.203: 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.

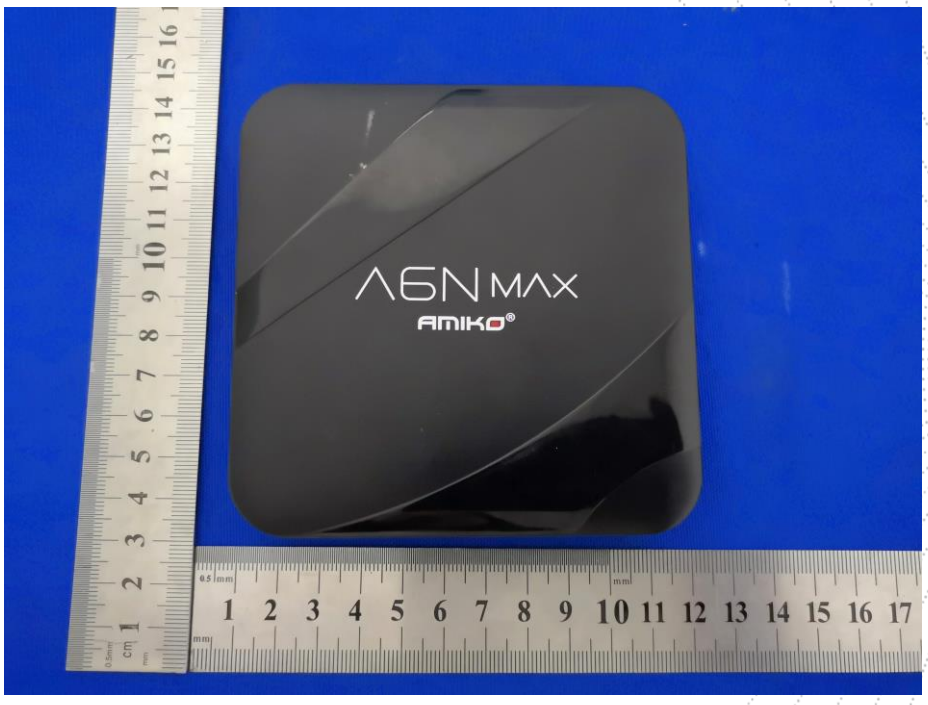
14.2 EUT ANTENNA

The EUT antenna is FPCB antenna (antenna gain: 2dBi). It comply with the standard requirement.

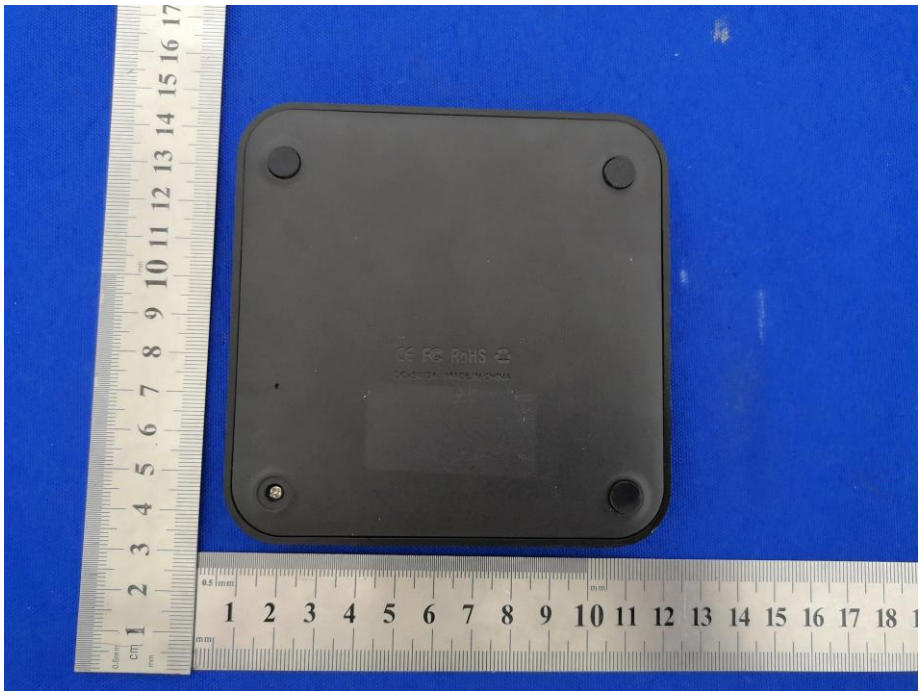
15. EUT PHOTOGRAPHS

EUT Photo 1

EUT Photo 2

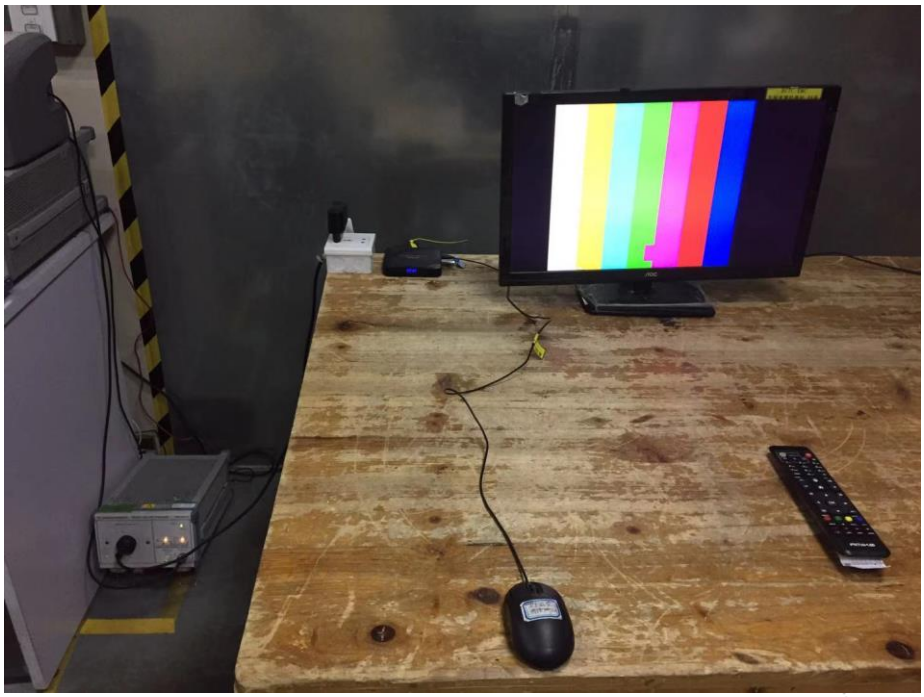


EUT Photo 3

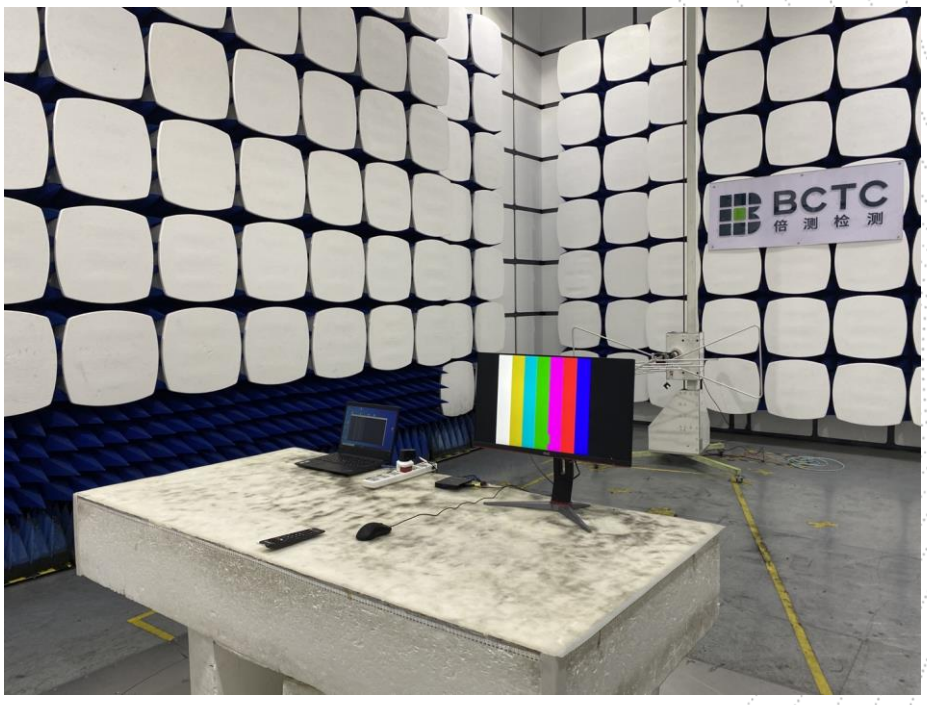


16. EUT TEST SETUP PHOTOGRAPHS

Conducted emissions



Radiated Measurement Photos



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STATEMENT

1.The equipment lists are traceable to the national reference standards.

2.The test report can not be partially copied unless prior written approval is issued from our lab.

3.The test report is invalid without stamp of laboratory.

4.The test report is invalid without signature of person(s) testing and authorizing.

5.The test process and test result is only related to the Unit Under Test.

6.The quality system of our laboratory is in accordance with ISO/IEC17025.

7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:
1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL：400-788-9558

P.C.: 518103

FAX：0755-33229357

Internet：http://www.bctc-lab.com

E-Mail：bctc@bctc-lab.com.cn

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