FCC Part 15E Test Report

FCC ID:2ADZC-9802B

Product Name:	wireless transmission system
Trademark:	HOLLYLAND
Model Name :	Mars 400 Mars 400S, Mars X
Prepared For : Address :	Shenzhen Hollyland Technology Co.,Ltd 8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street, Baoan District ,Shenzhen 518055, China
Prepared By : Address :	Shenzhen BCTC Testing Co., Ltd. BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	Aug. 09, 2019 – Aug. 20, 2019
Date of Report :	Aug. 20, 2019
Report No.:	BCTC-LH190800810E

TEST RESULT CERTIFICATION

Applicant's name ..... :	Shenzhen Hollyland Technology Co.,Ltd
Address ..... :	8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street, Baoan District ,Shenzhen 518055, China
Manufacture's Name..... :	Shenzhen Hollyland Technology Co.,Ltd
Address ..... :	8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street, Baoan District ,Shenzhen 518055, China
Product description	
Product name..... :	wireless transmission system
Trademark..... :	HOLLYLAND
Model and/or type reference .:	Mars 400 Mars 400S, Mars X
Standards..... :	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v01r02

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Prepared by(Engineer):	Leke Xie	Leke Xie
Reviewer(Supervisor):	Eric Yang	Eric Yang
Approved(Manager):	Zero Zhou	Zero Zhou

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Revision History

Report No.	Version	Description	Issued Date
BCTC-LH190800810E	Rev.01	Initial issue of report	Aug. 20, 2019

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.209(a), 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(6)	Spurious Radiated Emissions	PASS	
15.207	Conducted Emission	PASS	
15.407 (a)(1) 15.407 (a)(3) 15.1049	26 dB and 99% Emission Bandwidth	PASS	
15.407(e)	Minimum 6 dB bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
2.1051, 15.407(b)(1) 15.407(b)(4)	Band Edge	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
2.1051, 15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

Outsourcing: The 26G-40G Spurious Radiated Emissions in this test were outsourced to the Shenzhen Academy of Metrology & Quality Inspection

1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.
Add. : BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
FCC Test Firm Registration Number: 712850
IC Registered No.: 23583

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59℃

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	wireless transmission system	
Trade Name	HOLLYLAND	
Model Name	Mars 400 Mars 400S, Mars X	
Model Difference	All the model are the same circuit and RF module, except model names .	
Product Description	IEEE 802.11 WLAN Mode Supported	☒802.11n (20MHz channel bandwidth)
	Data Rate	802.11n(HT20):MCS0-MCS15;
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11n;
	Operating Frequency Range	☒5180-5240MHz for 802.11n(HT20) ☒5745-5825 MHz for 802.11n(HT20)
	Number of Channels	☒4 channels for 802.11n20 in the 5180-5240MHz band ; ☒5 channels for 802.11n20 in the 5745-5825MHz band ;
	Antenna Type	External antenna A External antenna B
	Antenna Gain	5.01dBi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Ratings	DC 12V	
Adapter	MODEL: R122-1201000ID INPUT: 100-240V~50/60Hz 0.4A OUTPUT: 12V 1000mA	
hardware version	H1.0	
Software version	S1.0	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Frequency and Channel list for 802.11n(20MHz) band I (5180-5240MHz):

802.11a/n/ac(20MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	-	-	-	-
40	5200	48	5240	-	-	-	-

Frequency and Channel list for 802.11n(20 MHz) band IV (5745-5825MHz):

802.11n (20 MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

Antenna A gain: 2dBi, Antenna B gain: 2dBi,
For MIMO mode for 802.11a / n / ac, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Tx Antenna

Ant.	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	External antenna	2	
B	N/A	N/A	External antenna	2	

2.2 DESCRIPTION OF TEST MODES

Pretest Mode	Description
Mode 1	802.11n 20 CH36/ CH40/ CH 48 802.11n 20 CH149/ CH157/ CH 165
Mode 2	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 2	Link Mode

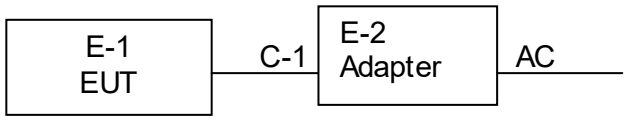
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11n 20 CH36/ CH40/ CH 48 802.11n 20 CH149/ CH157/ CH 165
Mode 2	Link Mode

Note:

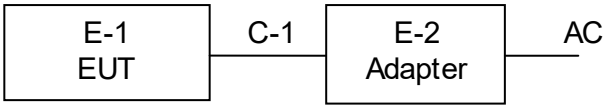
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	wireless transmission system	HOLLYLAND	Mars 400	N/A	EUT
E-2	Adapter	N/A	R122-1201000ID	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2M	DC cableunshielded

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45109572	Jun. 13, 2019	Jun. 12, 2020
2	Test Receiver (9kHz-7GHz)	R&S	ESR7	101154	Jun. 13, 2019	Jun. 12, 2020
3	Bilog Antenna (30MHz-3GHz)	SCHWARZBECK	VULB9163	VULB9163-942	Jun. 22, 2019	Jun. 21, 2020
4	Horn Antenna (1GHz-18GHz)	SCHWARZBECK	BBHA9120D	1541	Jun. 22, 2019	Jun. 21, 2020
5	Horn Antenna (18GHz-40GHz)	SCHWARZBECK	BBHA9170	822	Jun. 22, 2019	Jun. 21, 2020
6	Amplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	9744-0037	Jun. 25, 2019	Jun. 24, 2020
7	Amplifier (0.5GHz-18GHz)	SCHWARZBECK	BBV9718	9718-309	Jun. 25, 2019	Jun. 24, 2020
8	Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	Jun. 17, 2019	Jun. 16, 2020
9	Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	014	Jul. 02, 2019	Jul. 01, 2020
10	RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 25, 2019	Jun. 24, 2020
11	RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	Jun. 25, 2019	Jun. 24, 2020
12	RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	Jun. 25, 2019	Jun. 24, 2020
13	Power Metter	Keysight	E4419	\	Jun. 17, 2019	Jun. 16, 2020
14	Power Sensor (AV)	Keysight	E9 300A	\	Jun. 17, 2019	Jun. 16, 2020
15	Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	Jun. 13, 2019	Jun. 12, 2020
16	Spectrum Analyzer 9kHz-40GHz	Aglient	FSP40	100363	Jun. 13, 2019	Jun. 12, 2020
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun. 12, 2020
2	LISN	SCHWARZBECK	NSLK8127	8127739	Jun. 13, 2019	Jun. 12, 2020
3	LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun. 12, 2020
4	RF cables	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 25, 2019	Jun. 24, 2020
5	Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC/ RSS-247
0.50 -5.0	56.00	46.00	FCC/ RSS-247
5.0 -30.0	60.00	50.00	FCC/ RSS-247

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

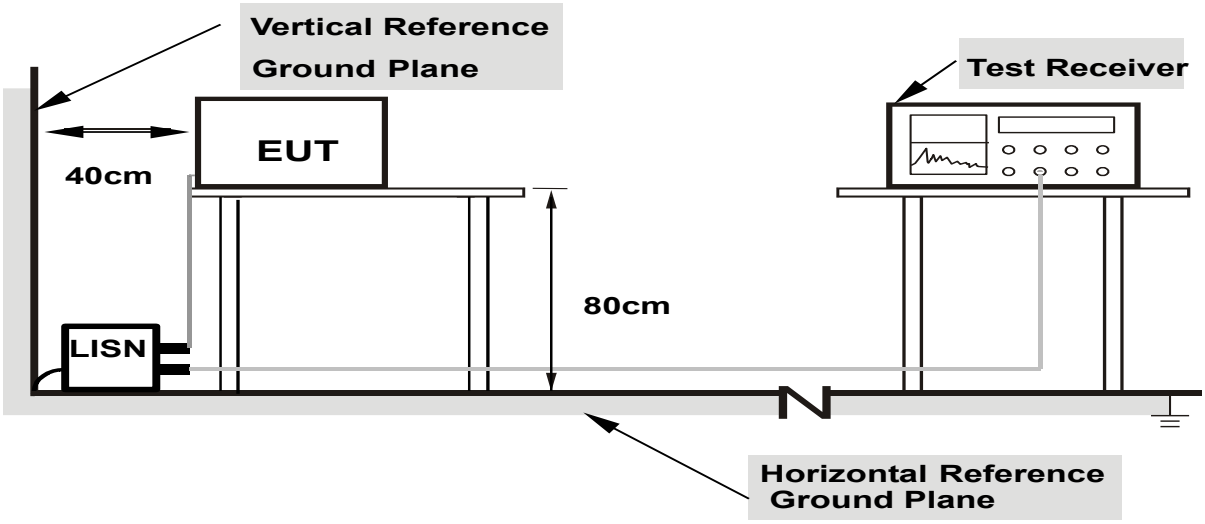
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP

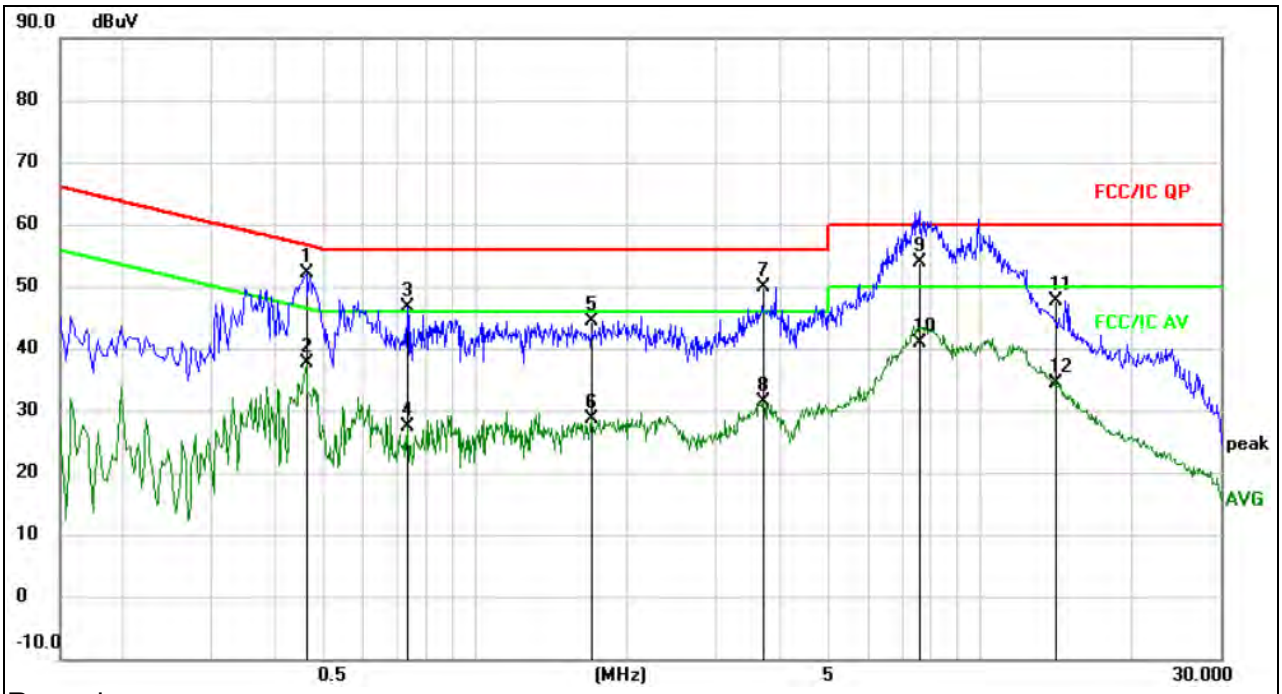


Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 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.

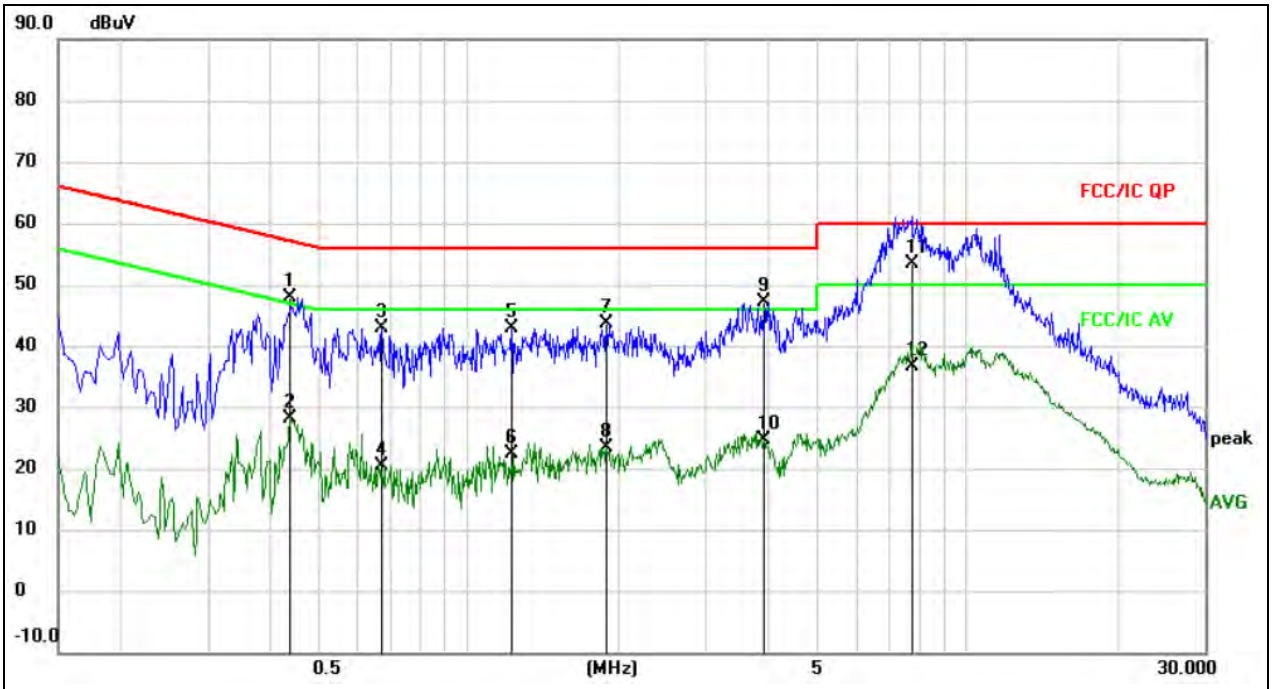
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Phase：	L
Test Voltage ：	AC120V 60Hz	Test Mode：	Mode 2



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV		dBuV	dBuV	dB	Detector	Comment
1	*	0.4620	42.66	9.56	52.22	56.66	-4.44	QP	
2		0.4620	28.05	9.56	37.61	46.66	-9.05	AVG	
3		0.7340	36.91	9.64	46.55	56.00	-9.45	QP	
4		0.7340	17.80	9.64	27.44	46.00	-18.56	AVG	
5		1.7020	34.80	9.58	44.38	56.00	-11.62	QP	
6		1.7020	19.10	9.58	28.68	46.00	-17.32	AVG	
7		3.7300	40.08	9.71	49.79	56.00	-6.21	QP	
8		3.7300	21.62	9.71	31.33	46.00	-14.67	AVG	
9		7.5570	44.28	9.71	53.99	60.00	-6.01	QP	
10		7.5570	31.20	9.71	40.91	50.00	-9.09	AVG	
11		14.1540	38.04	9.70	47.74	60.00	-12.26	QP	
12		14.1540	24.63	9.70	34.33	50.00	-15.67	AVG	

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Phase：	N
Test Voltage ：	AC120V 60Hz	Test Mode：	Mode 2



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV		dBuV	dBuV	dB	Detector	Comment
1		0.4380	38.36	9.53	47.89	57.10	-9.21	QP	
2		0.4380	18.72	9.53	28.25	47.10	-18.85	AVG	
3		0.6700	33.10	9.75	42.85	56.00	-13.15	QP	
4		0.6700	10.57	9.75	20.32	46.00	-25.68	AVG	
5		1.2180	33.23	9.57	42.80	56.00	-13.20	QP	
6		1.2180	12.82	9.57	22.39	46.00	-23.61	AVG	
7		1.8940	34.01	9.59	43.60	56.00	-12.40	QP	
8		1.8940	13.69	9.59	23.28	46.00	-22.72	AVG	
9		3.9140	37.44	9.72	47.16	56.00	-8.84	QP	
10		3.9140	15.00	9.72	24.72	46.00	-21.28	AVG	
11	*	7.7520	43.63	9.71	53.34	60.00	-6.66	QP	
12		7.7520	26.81	9.71	36.52	50.00	-13.48	AVG	

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): 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)).
According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

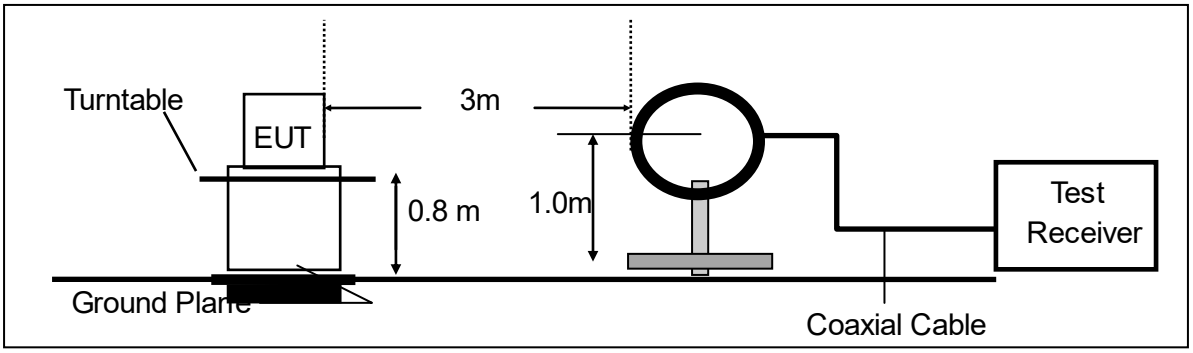
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

3.2.3 MEASURING INSTRUMENTS

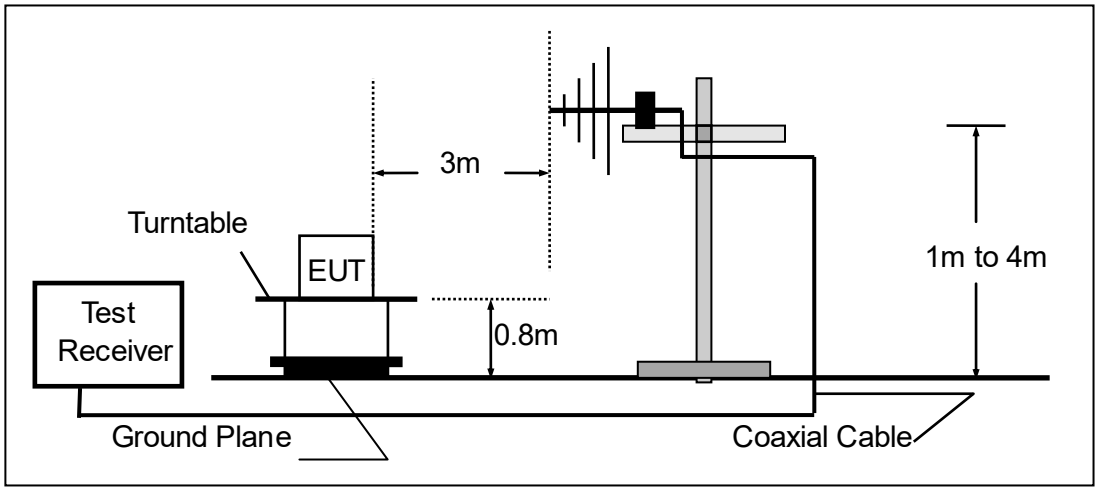
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

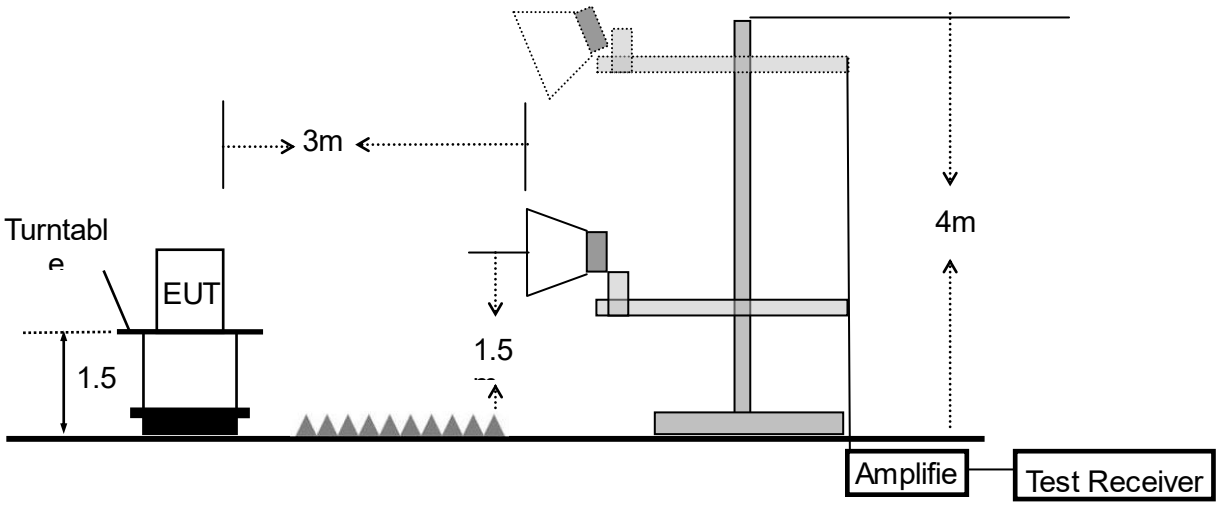
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



3.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

3.2.6 TEST RESULTS (9KHZ – 30 MHZ)

Temperature:	26℃	Relative Humidtity:	54%
Pressure:	101kPa	Test Voltage :	AC120V 60Hz
Test Mode :	Mode 2	Polarization :	--

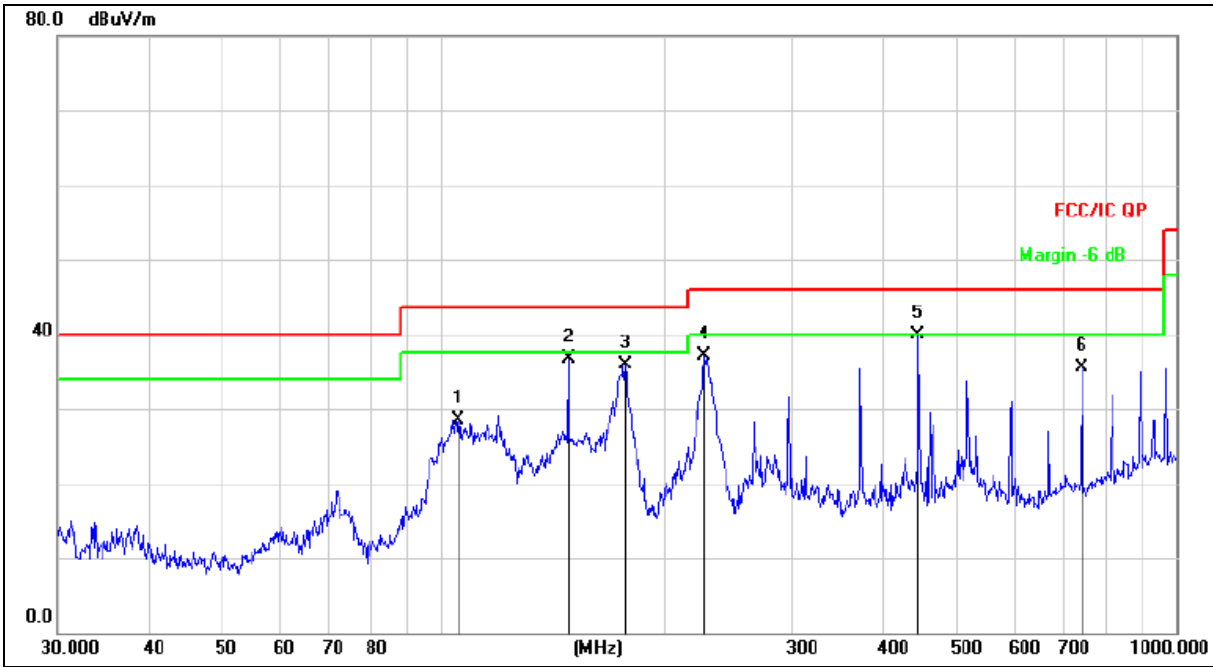
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (30MHZ – 1GHZ)

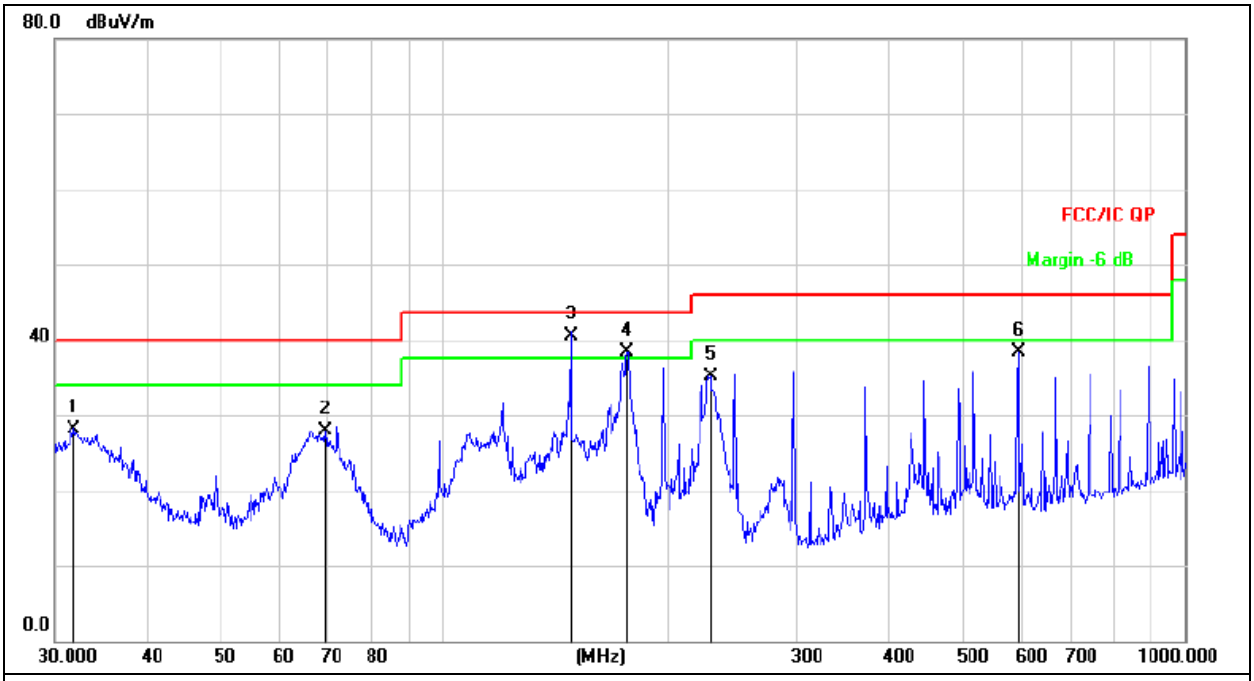
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kPa	Polarization：	Horizontal
Test Voltage ：	AC120V 60Hz		
Test Mode ：	Mode 2		



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		105.2718	45.19	-16.62	28.57	43.50	-14.93	QP
2		148.4410	56.03	-19.40	36.63	43.50	-6.87	QP
3		177.5092	53.67	-17.74	35.93	43.50	-7.57	QP
4		227.6906	52.78	-15.66	37.12	46.00	-8.88	QP
5	*	444.8514	50.06	-10.09	39.97	46.00	-6.03	QP
6		742.2587	40.04	-4.46	35.58	46.00	-10.42	QP

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Polarization：	Vertical
Test Voltage ：	AC120V 60Hz		
Test Mode ：	Mode 2		



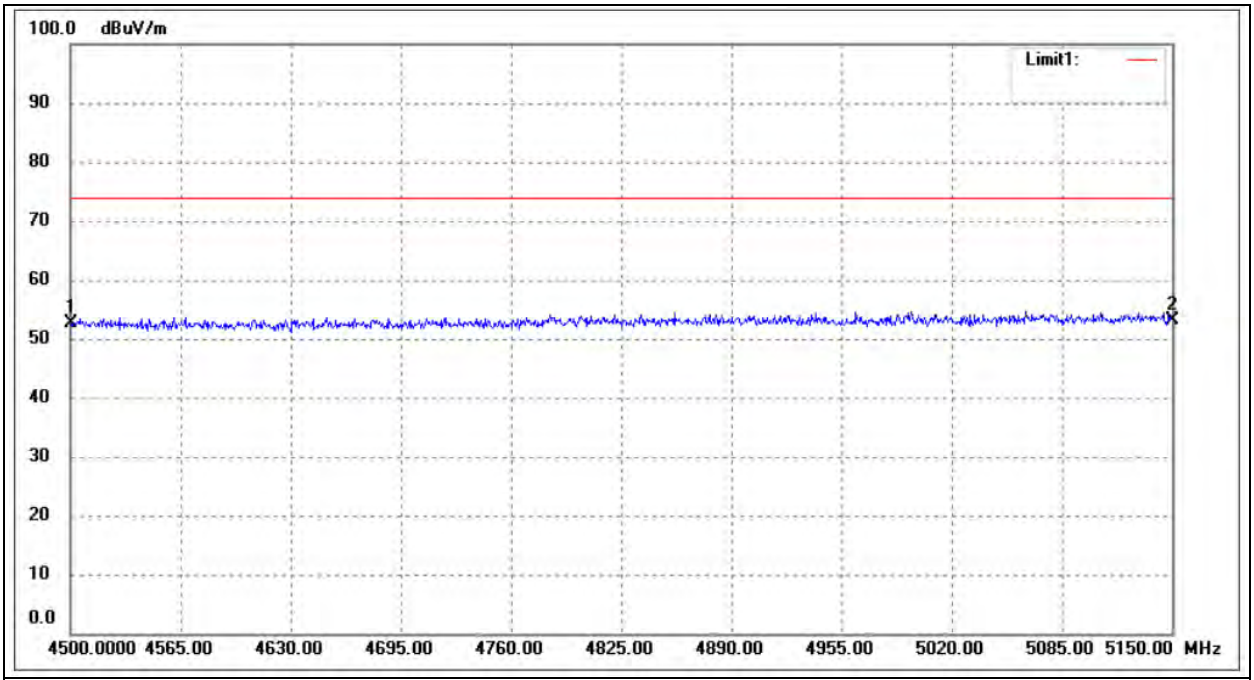
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		31.8427	45.14	-16.94	28.20	40.00	-11.80	QP
2		69.3568	45.97	-18.04	27.93	40.00	-12.07	QP
3	*	148.3610	59.93	-19.39	40.54	43.50	-2.96	QP
4	!	176.8878	56.18	-17.78	38.40	43.50	-5.10	QP
5		229.2931	50.81	-15.63	35.18	46.00	-10.82	QP
6		595.1329	45.00	-6.63	38.37	46.00	-7.63	QP

3.2.8 TEST RESULTS (ABOVE 1GHz)

Radiated bandedge

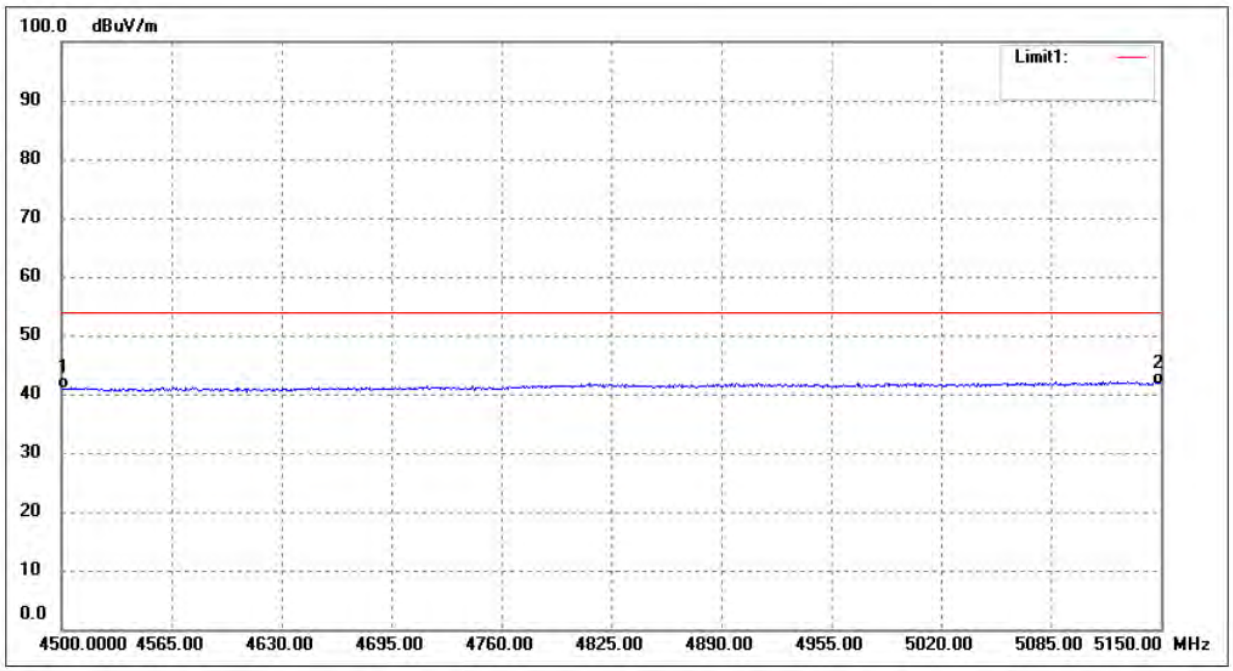
Test Mode：	TX(5.2G) - 802.11n ANTB		
Test Channel：	Band 4500 - 5150 MHz	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	4500.000	53.39	-0.65	52.74	74.00	-21.26
2	5150.000	52.51	0.69	53.20	74.00	-20.80

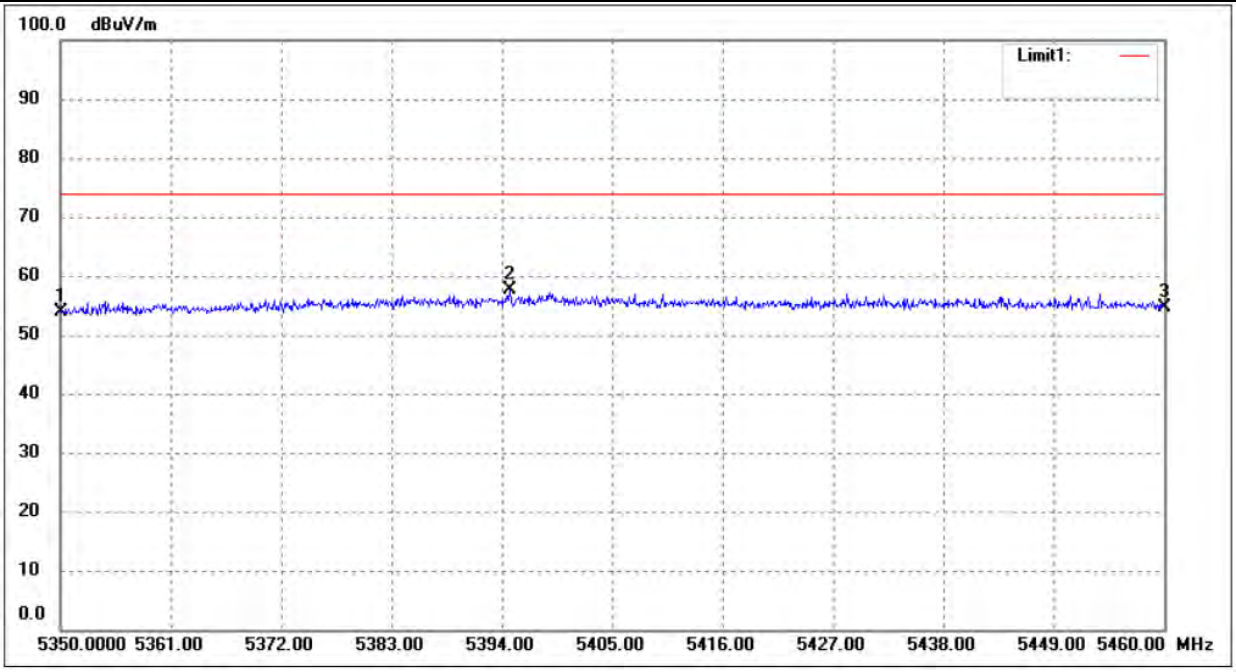
Test Mode：	TX(5.2G) - 802.11n ANTB		
Test Channel：	Band 4500 - 5150 MHz	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	4500.000	41.46	-0.65	40.81	54.00	-13.19
2	5150.000	40.90	0.69	41.59	54.00	-12.41

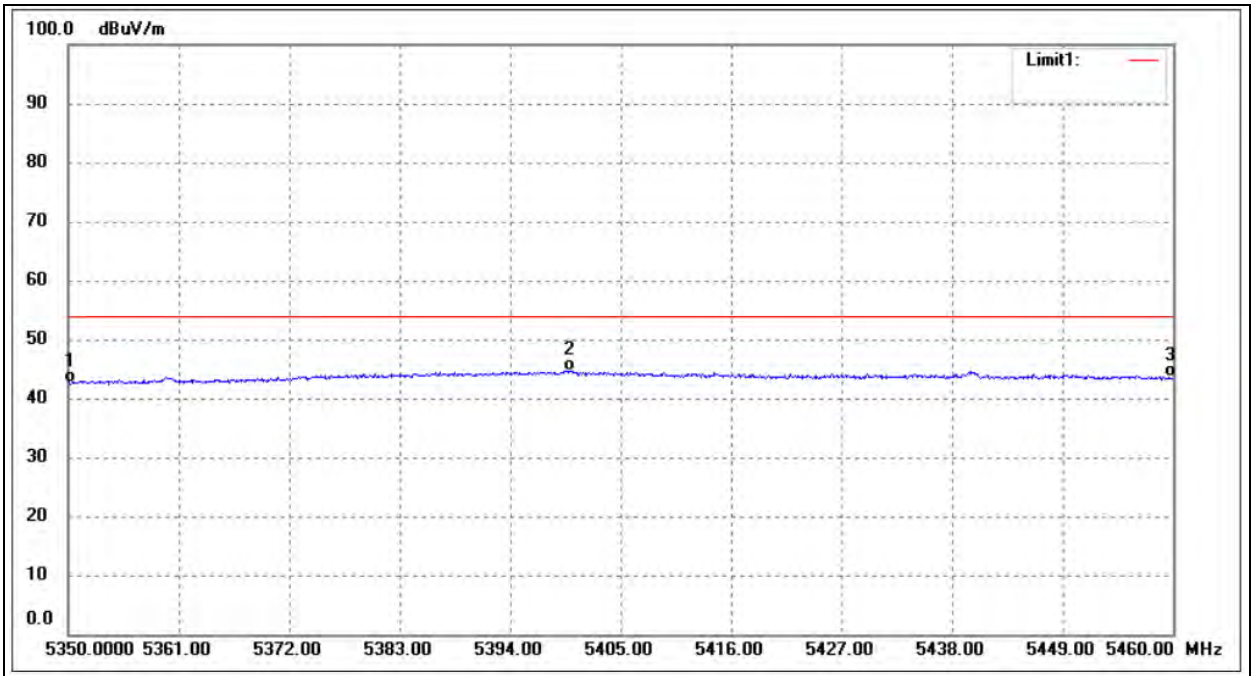
Test Mode：	TX(5.2G) - 802.11n ANTB		
Test Channel：	Band 5350 - 5460 MHz	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	5350.000	52.62	1.19	53.81	74.00	-20.19
2	5394.770	56.23	1.31	57.54	74.00	-16.46
3	5460.000	53.05	1.47	54.52	74.00	-19.48

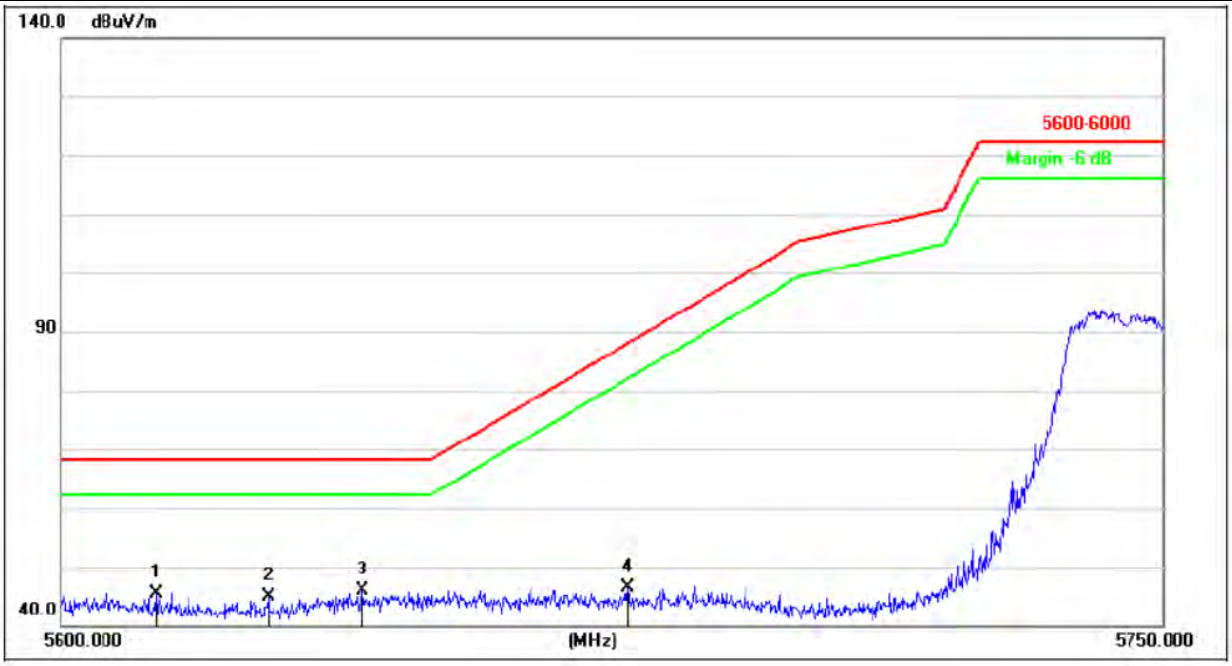
Test Mode：	TX(5.2G) - 802.11n ANTB		
Test Channel：	Band 5350 - 5460 MHz	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5350.000	41.32	1.19	42.51	54.00	-11.49
2	5399.940	43.37	1.32	44.69	54.00	-9.31
3	5460.000	42.04	1.47	43.51	54.00	-10.49

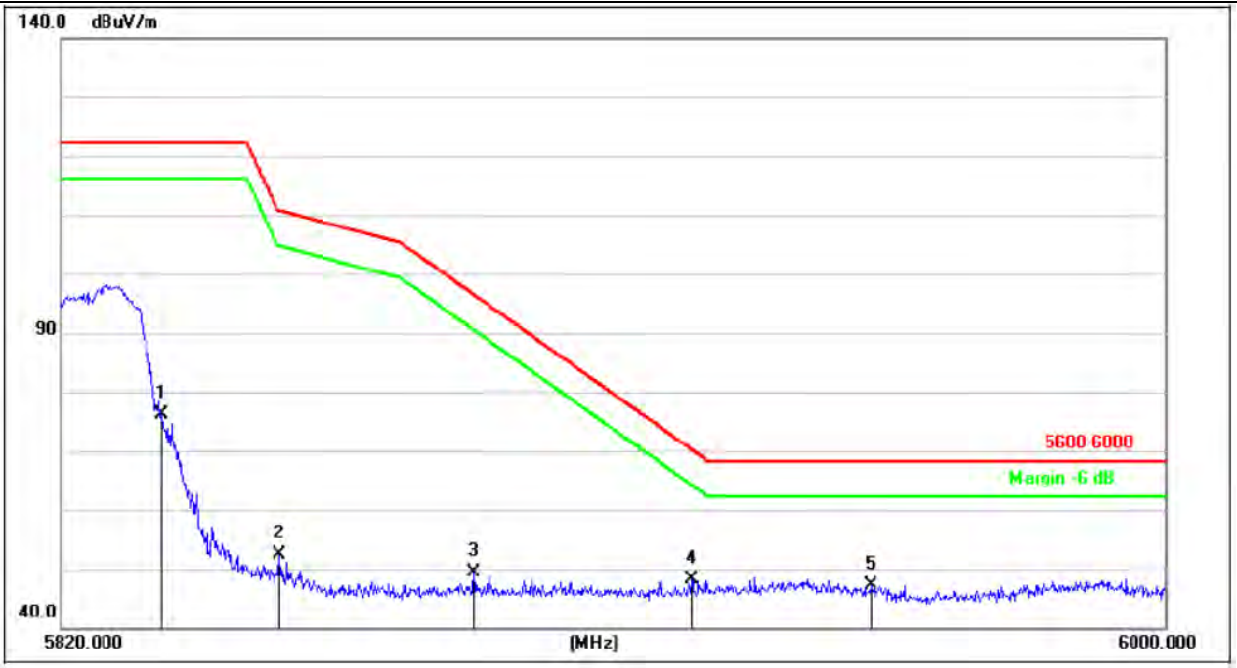
Test Mode：	TX(5.8G) - 802.11n ANTB		
Test Channel：	Band 5650 - 5725 MHz	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5612.900	42.99	2.31	45.30	68.20	-22.90
2	5627.900	42.40	2.38	44.78	68.20	-23.42
3	5640.800	43.36	2.43	45.79	68.20	-22.41
4	5676.800	43.86	2.59	46.45	88.07	-41.62

Test Mode：	TX(5.8G) - 802.11n ANTB		
Test Channel：	Band 5850 - 5925 MHz	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5836.200	72.96	3.26	76.22	122.20	-45.98
2	5855.280	49.14	3.34	52.48	110.72	-58.24
3	5886.780	45.93	3.48	49.41	96.45	-47.04
4	5922.240	44.38	3.63	48.01	70.23	-22.22
5	5951.760	43.37	3.75	47.12	68.20	-21.08

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

Test Mode ：	TX(5.2G) - 802.11n

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
Vertical	4434.157	62.25	5.94	35.40	44.00	59.59	74.00	-14.41	Pk
Vertical	4434.157	46.51	5.94	35.40	44.00	43.85	54.00	-10.15	AV
Vertical	10370.362	60.42	8.46	39.75	44.50	64.13	74.00	-9.87	Pk
Vertical	10370.362	42.92	8.46	39.75	44.50	46.63	54.00	-7.37	AV
Vertical	15540.196	61.48	10.12	38.80	44.10	66.3	68.20	-1.9	Pk
Vertical	15540.196	37.51	10.12	38.80	42.70	43.73	48.20	-4.47	AV
Horizontal	4434.521	66.53	5.94	35.18	44.00	63.65	74.00	-10.35	Pk
Horizontal	4434.521	44.17	5.94	35.18	44.00	41.29	54.00	-12.71	AV
Horizontal	10370.623	58.96	8.46	38.71	44.50	61.63	74.00	-12.37	Pk
Horizontal	10370.623	41.08	8.46	38.71	44.50	43.75	54.00	-10.25	AV
Horizontal	10540.865	56.99	10.12	38.38	44.10	61.39	68.20	-6.81	Pk
Horizontal	10540.865	38.83	10.12	38.38	44.10	43.23	48.20	-4.97	AV
middle Channel (5200 MHz)-Above 1G									
Vertical	4592.093	60.26	6.48	36.35	44.05	59.04	74.00	-14.96	Pk
Vertical	4592.093	41.98	6.48	36.35	44.05	40.76	54.00	-13.24	AV
Vertical	10401.424	59.65	8.47	37.88	44.51	61.49	74.00	-12.51	Pk
Vertical	10401.424	42.72	8.47	37.88	44.51	44.56	54.00	-9.44	AV
Vertical	15600.218	56.52	10.12	38.8	44.10	61.34	68.20	-6.86	Pk
Vertical	15600.218	36.62	10.12	38.8	42.70	42.84	48.20	-5.36	AV
Horizontal	4592.691	59.87	6.48	36.37	44.05	58.67	74.00	-15.33	Pk
Horizontal	4592.691	43.11	6.48	36.37	44.05	41.91	54.00	-12.09	AV
Horizontal	10400.114	58.87	8.47	38.64	44.50	61.48	74.00	-12.52	Pk
Horizontal	10400.114	42.22	8.47	38.64	44.50	44.83	54.00	-9.17	AV
Horizontal	15600.187	59.86	10.12	38.38	44.10	64.26	68.20	-3.94	Pk
Horizontal	15600.187	38.71	10.12	38.38	44.10	43.11	48.20	-5.09	AV
High Channel (5240 MHz)-Above 1G									
Vertical	4739.246	61.22	7.10	37.24	43.50	62.06	74.00	-11.94	Pk
Vertical	4739.246	44.41	7.10	37.24	43.50	45.25	54.00	-8.75	AV
Vertical	10480.371	60.52	8.46	37.68	44.50	62.16	74.00	-11.84	Pk
Vertical	10480.371	40.37	8.46	37.68	44.50	42.01	54.00	-11.99	AV
Vertical	15720.359	61.74	10.12	38.8	44.10	66.56	68.20	-1.64	Pk
Vertical	15720.359	39.66	10.12	38.8	42.70	45.88	48.20	-2.32	AV
Horizontal	4739.352	62.25	7.10	37.24	43.50	63.09	74.00	-10.91	Pk
Horizontal	4739.352	43.27	7.10	37.24	43.50	44.11	54.00	-9.89	AV
Horizontal	10481.111	62.58	8.46	38.57	44.50	65.11	74.00	-8.89	Pk
Horizontal	10481.111	43.35	8.46	38.57	44.50	45.88	54.00	-8.12	AV
Horizontal	15720.357	60.78	10.12	38.38	44.10	65.18	68.20	-3.02	Pk
Horizontal	15720.357	42.27	10.12	38.38	44.10	46.67	48.20	-1.53	AV

Note:"802.11n20(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value

has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX (5.8G) -- 802.11n

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5745 MHz)-Above 1G									
Vertical	4679.195	59.94	5.94	35.40	44.00	57.28	74.00	-16.72	Pk
Vertical	4679.195	39.69	5.94	35.40	44.00	37.03	54.00	-16.97	AV
Vertical	11490.364	59.53	8.46	39.75	44.50	63.24	68.20	-4.96	Pk
Vertical	11490.364	42.15	8.46	39.75	44.50	45.86	48.20	-2.34	AV
Vertical	17235.101	55.53	10.12	38.80	44.10	60.35	74.00	-13.65	Pk
Vertical	17235.101	38.67	10.12	38.80	42.70	44.89	54.00	-9.11	AV
Horizontal	4679.332	57.93	5.94	35.18	44.00	55.05	74.00	-18.95	Pk
Horizontal	4679.332	44.56	5.94	35.18	44.00	41.68	54.00	-12.32	AV
Horizontal	11490.164	56.63	8.46	38.71	44.50	59.3	68.20	-8.9	Pk
Horizontal	11490.164	40.17	8.46	38.71	44.50	42.84	48.20	-5.36	AV
Horizontal	17235.196	58.62	10.12	38.38	44.10	63.02	74.00	-10.98	Pk
Horizontal	17235.196	42.22	10.12	38.38	44.10	46.62	54.00	-7.38	AV
middle Channel (5785 MHz)-Above 1G									
Vertical	4592.228	59.84	6.48	36.35	44.05	58.62	74.00	-15.38	Pk
Vertical	4592.228	43.32	6.48	36.35	44.05	42.1	54.00	-11.9	AV
Vertical	11570.203	61.17	8.47	37.88	44.51	63.01	68.20	-5.19	Pk
Vertical	11570.203	43.21	8.47	37.88	44.51	45.05	48.20	-3.15	AV
Vertical	17355.147	59.52	10.12	38.8	44.10	64.34	74.00	-9.66	Pk
Vertical	17355.147	42.24	10.12	38.8	42.70	48.46	54.00	-5.54	AV
Horizontal	4592.526	58.61	6.48	36.37	44.05	57.41	74.00	-16.59	Pk
Horizontal	4592.526	43.37	6.48	36.37	44.05	42.17	54.00	-11.83	AV
Horizontal	11570.123	60.02	8.47	38.64	44.50	62.63	68.20	-5.57	Pk
Horizontal	11570.123	42.28	8.47	38.64	44.50	44.89	48.20	-3.31	AV
Horizontal	17355.269	57.52	10.12	38.38	44.10	61.92	74.00	-12.08	Pk
Horizontal	17355.269	42.26	10.12	38.38	44.10	46.66	54.00	-7.34	AV
High Channel (5825 MHz)-Above 1G									
Vertical	6039.199	57.66	7.10	37.24	43.50	58.5	74.00	-15.5	Pk
Vertical	6039.199	42.22	7.10	37.24	43.50	43.06	54.00	-10.94	AV
Vertical	11652.562	58.97	8.46	37.68	44.50	60.61	68.20	-7.59	Pk
Vertical	11652.562	41.13	8.46	37.68	44.50	42.77	48.20	-5.43	AV
Vertical	17475.128	58.56	10.12	38.8	44.10	63.38	74.00	-10.62	Pk
Vertical	17475.128	40.32	10.12	38.8	42.70	46.54	54.00	-7.46	AV
Horizontal	6039.232	59.95	7.10	37.24	43.50	60.79	74.00	-13.21	Pk
Horizontal	6039.232	43.38	7.10	37.24	43.50	44.22	54.00	-9.78	AV
Horizontal	11652.319	52.22	8.46	38.57	44.50	54.75	68.20	-13.45	Pk
Horizontal	11652.319	40.13	8.46	38.57	44.50	42.66	48.20	-5.54	AV
Horizontal	17475.062	57.78	10.12	38.38	44.10	62.18	74.00	-11.82	Pk
Horizontal	17475.062	40.25	10.12	38.38	44.10	44.65	54.00	-9.35	AV

Note:"802.11a(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value

has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(3)

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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4.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

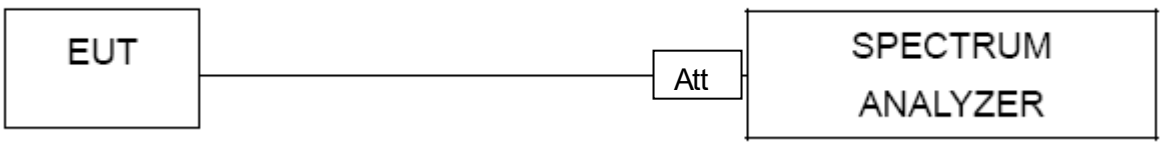
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX Frequency Band I (5180-5240MHz)		

Antenna A gain: 2dBi, Antenna B gain: 2dBi, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Mode	Frequency	Measured Power Density (dBm/MHz)			Limit (dBm/MHz)
		ANT A	ANT B	Total	
802.11 n20	5180 MHz	2.968	3.155	6.07	11
	5200 MHz	2.440	2.365	5.41	11
	5240 MHz	2.550	2.575	5.57	11

(802.11n20) PSD plot on channel 36(ANT A)

(802.11n20) PSD plot on channel 36 (ANT B)

(802.11n20) PSD plot on channel 40

(802.11n20) PSD plot on channel 40

(802.11n20) PSD plot on channel 48

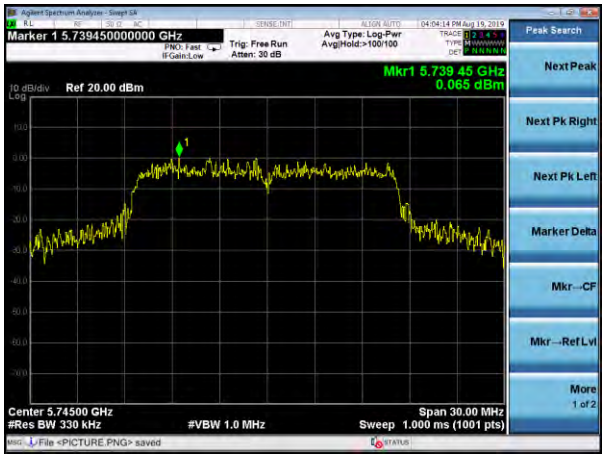
(802.11n20) PSD plot on channel 48

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX Frequency Band Ⅳ (5745-5825MHz)		

Antenna A gain: 2dBi, Antenna B gain: 2dBi, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Mode	Frequency	Measured Power Density (dBm/MHz)							Limit (dBm/MHz)
		ANT A			ANT B			Total	
		dBm/330kHz	Factor	dBm/500kHz	dBm/330kHz	Factor	dBm/500kHz		
802.11 n20	5745 MHz	0.065	1.8	1.865	-0.074	1.8	1.726	4.81	30
	5785 MHz	-1.948	1.8	-0.148	-2.411	1.8	-0.611	2.64	30
	5825 MHz	-5.129	1.8	-3.329	-5.217	1.8	-3.417	-0.36	30

802.11n20) PSD plot on channel 149(ANT A)



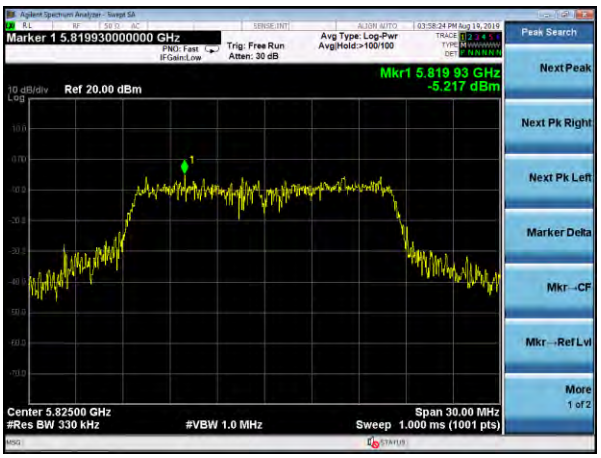
(802.11n20) PSD plot on channel 149(ANT B)

(802.11n20) PSD plot on channel 157

(802.11n20) PSD plot on channel 157

(802.11n20) PSD plot on channel 165

(802.11n20) PSD plot on channel 165



5. 26DB & 6DB & 99% EMISSION BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

5.2 TEST PROCEDURE

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

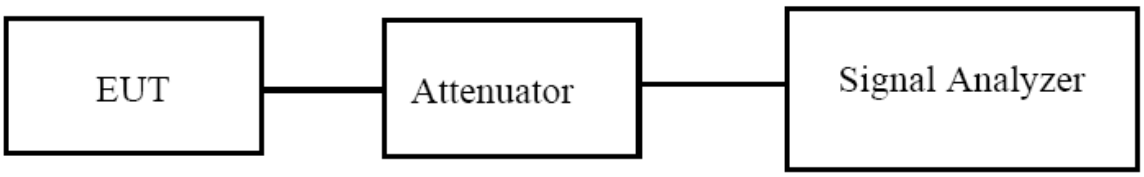
The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW

The following procedure shall be used for measuring (6dB) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.4 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX Frequency Band I (5180-5240MHz)		

ANT A

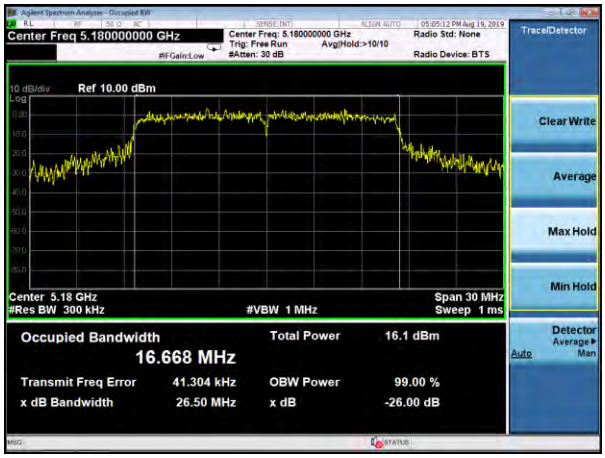
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth (MHz)	Limit MHz	Result
			ANT A	ANT A		
802.11 n20	CH36	5180	16.668	26.50	≥500	Pass
	CH40	5200	16.777	28.33	≥500	Pass
	CH48	5240	17.012	29.14	≥500	Pass

ANT B

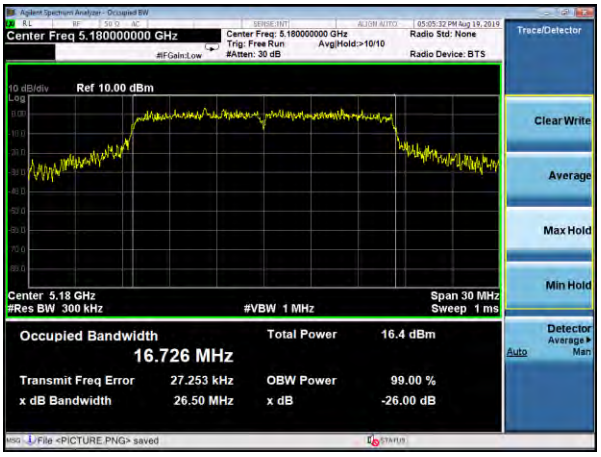
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth (MHz)	Limit MHz	Result
			ANT B	ANT B		
802.11 n20	CH36	5180	16.726	26.50	≥500	Pass
	CH40	5200	16.812	29.51	≥500	Pass
	CH48	5240	17.021	29.14	≥500	Pass

Test plot

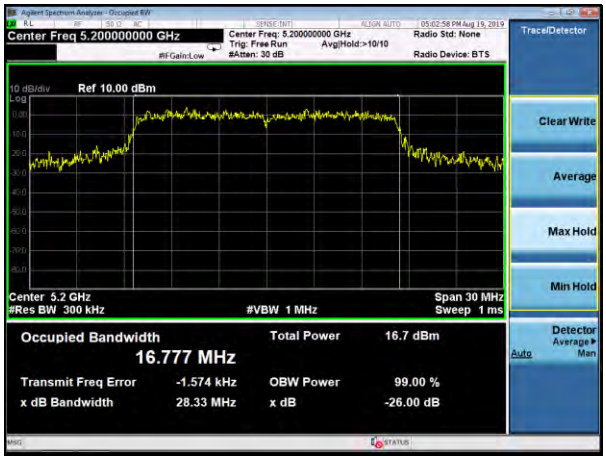
(802.11 n20) 26dB&99%Bandwidth plot on channel 36(ANT A)



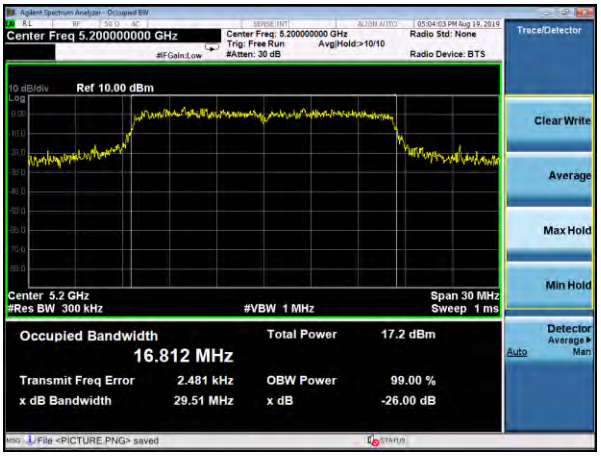
(802.11 n20) 26dB&99%Bandwidth plot on channel 36(ANT B)



(802.11 n20) 26dB&99%Bandwidth plot on channel 40

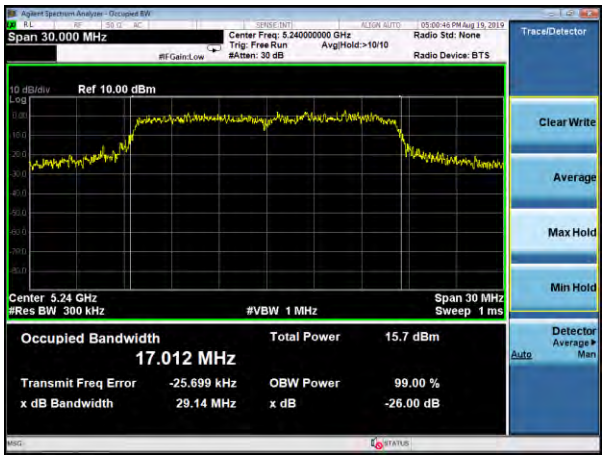


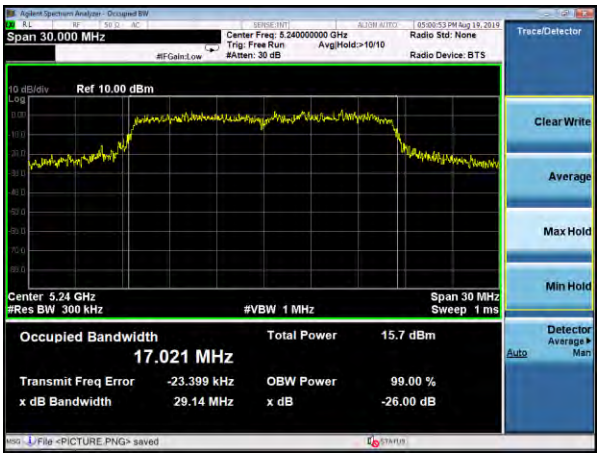
(802.11 n20)26dB&99%Bandwidth plot on channel 40



(802.11 n20) 26dB&99%Bandwidth plot on channel 48

(802.11 n20) 26dB&99%Bandwidth plot on channel 48


Agilent Spectrum Analyzer - Occupied BW
Span 30.000 MHz
Center Freq: 5.240000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 5.24 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.012 MHz
Total Power
15.7 dBm
Transmit Freq Error
-25.699 kHz
OBW Power
99.00 %
x dB Bandwidth
29.14 MHz
x dB
-26.00 dB
Detector
Auto
Man
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Span 30.000 MHz
Center Freq: 5.240000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 5.24 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.021 MHz
Total Power
15.7 dBm
Transmit Freq Error
-23.399 kHz
OBW Power
99.00 %
x dB Bandwidth
29.14 MHz
x dB
-26.00 dB
Detector
Auto
Man
MSG
File <PICTURE.PNG> saved
STATUS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX Frequency Band Ⅳ(5745-5825MHz)		

ANT A

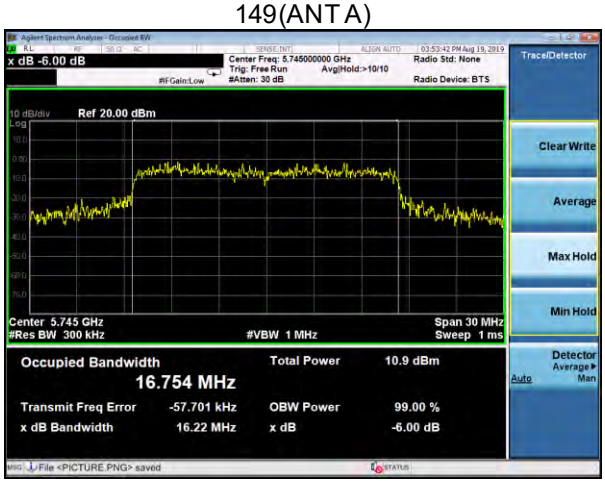
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT A	ANT A		
802.11 n20	CH149	5745	16.754	17.586	≥500	Pass
	CH157	5785	16.684	17.579	≥500	Pass
	CH165	5825	16.684	17.587	≥500	Pass

ANT B

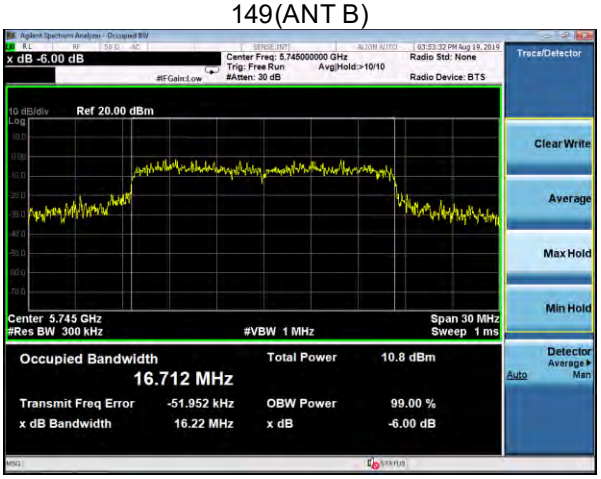
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT B	ANT B		
802.11 n20	CH149	5745	16.712	17.586	≥500	Pass
	CH157	5785	16.679	17.567	≥500	Pass
	CH165	5825	16.676	17.578	≥500	Pass

Test plot

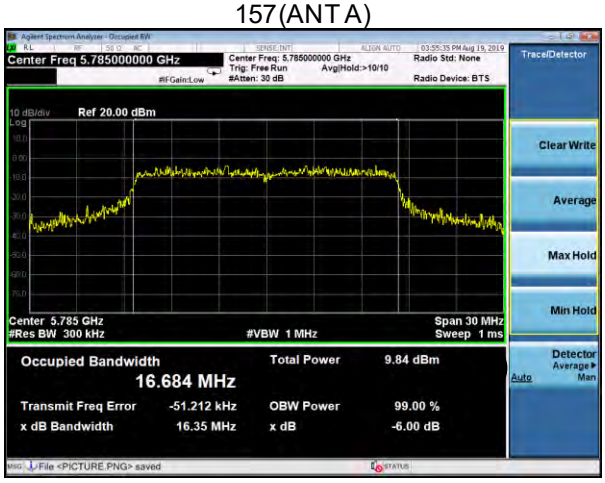
(802.11 n20) 99%Bandwidth plot on channel 149(ANT A)



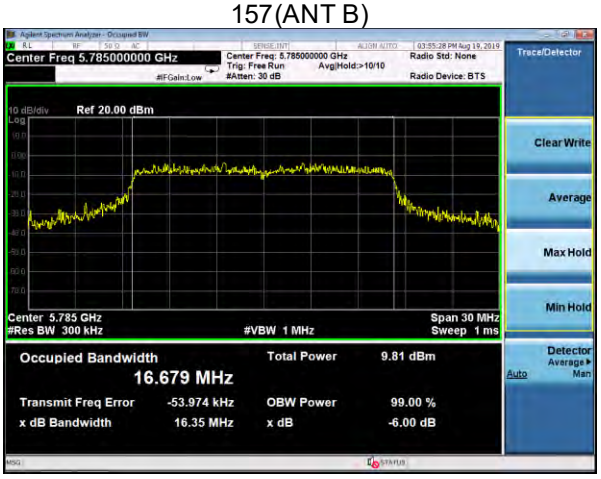
(802.11 n20) 99%Bandwidth plot on channel 149(ANT B)



(802.11 n20) 99%Bandwidth plot on channel 157(ANT A)

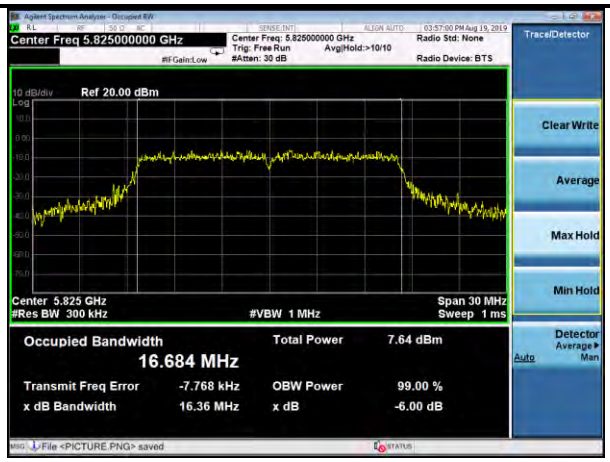


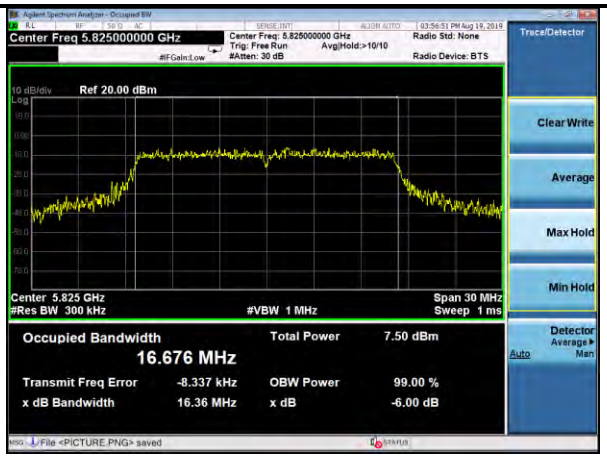
(802.11 n20) 99%Bandwidth plot on channel 157(ANT B)



(802.11 n20) 99%Bandwidth plot on channel 165(ANT A)

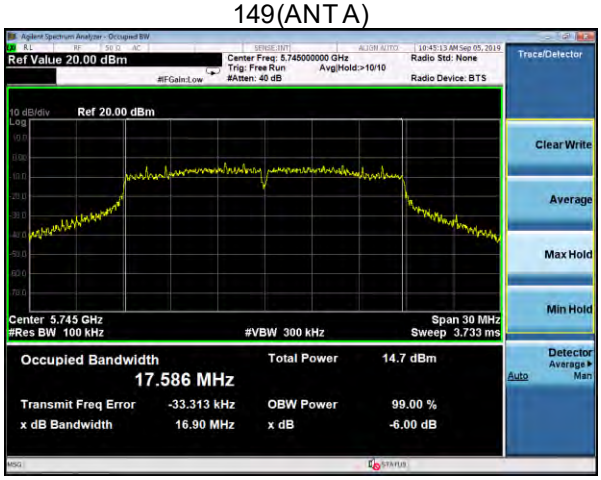
(802.11 n20) 99%Bandwidth plot on channel 165(ANT B)



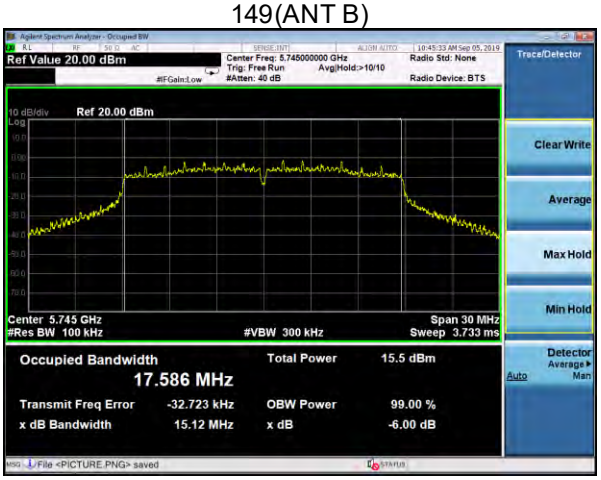


Test plot

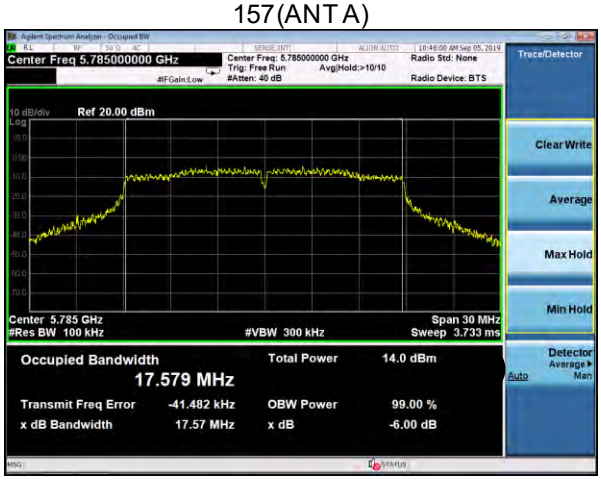
(802.11 n20) 6dB Bandwidth plot on channel 149(ANT A)



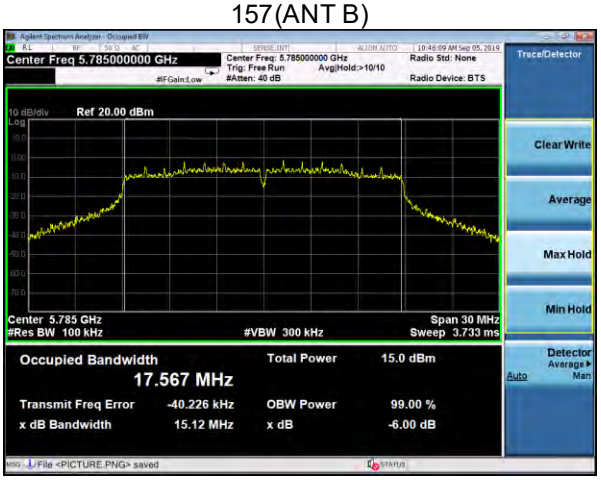
(802.11 n20) 6dB Bandwidth plot on channel 149(ANT B)



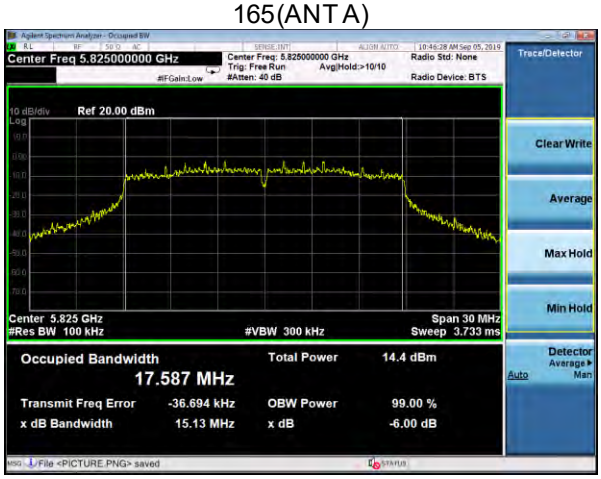
(802.11 n20) 6dB Bandwidth plot on channel 157(ANT A)



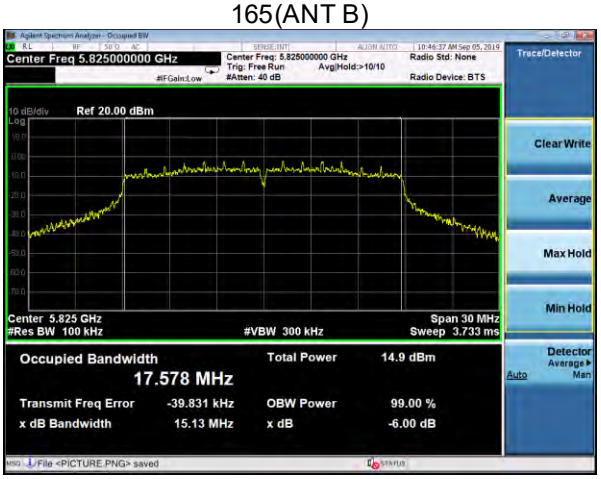
(802.11 n20) 6dB Bandwidth plot on channel 157(ANT B)



(802.11 n20) 6dB Bandwidth plot on channel 165(ANT A)



(802.11 n20) 6dB Bandwidth plot on channel 165(ANT B)



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

The maximum conduced output power should not exceed:

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

The maximum e.i.r.p should not exceed:

Frequency Band(MHz)	Limit
5150~5250	200mW or 10dBm +10logB whichever is less
5725~5850	N/A

Note: Where “B” is the 99% emission bandwidth in MHz

6.2 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 ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ 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 ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

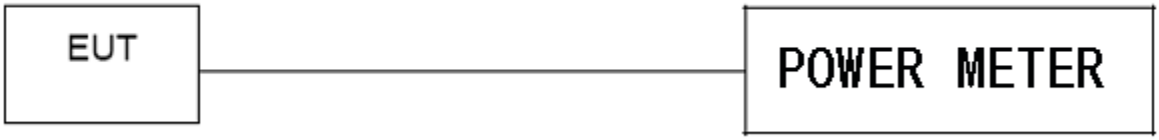
(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(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

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX (5G) Mode Frequency Band I (5180-5240MHz)		

Antenna A gain: 2dBi, Antenna B gain: 2dBi, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Test Channel	Frequency	Maximum output power. Antenna port (AV)			LIMIT	Result
	(MHz)	ANT A(dBm)	ANT B(dBm)	Total	dBm	
TX 802.11 n20M Mode						
CH36	5180	15.358	15.899	18.65	23.98	Pass
CH40	5200	15.800	15.318	18.58	23.98	Pass
CH48	5240	14.016	14.125	17.08	23.98	Pass

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX (5G) Mode Frequency Band IV (5745-5825MHz)		

Antenna A gain: 2dBi, Antenna B gain: 2dBi, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Test Channel	Frequency	Maximum output power. Antenna port (AV)			LIMIT	Result
	(MHz)	ANT A(dBm)	ANT B(dBm)	Total	dBm	
TX 802.11 n20M Mode						
CH 149	5745	15.876	15.921	18.91	30	Pass
CH 157	5785	14.992	15.148	18.08	30	Pass
CH 165	5825	15.821	14.956	18.42	30	Pass

7. OUT OF BAND EMISSIONS

7.1 APPLICABLE STANDARD

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 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

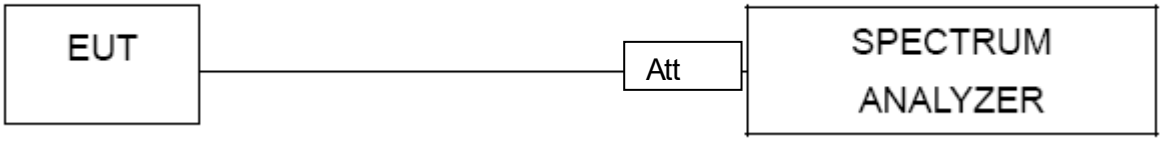
7.2 TEST PROCEDURE

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.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

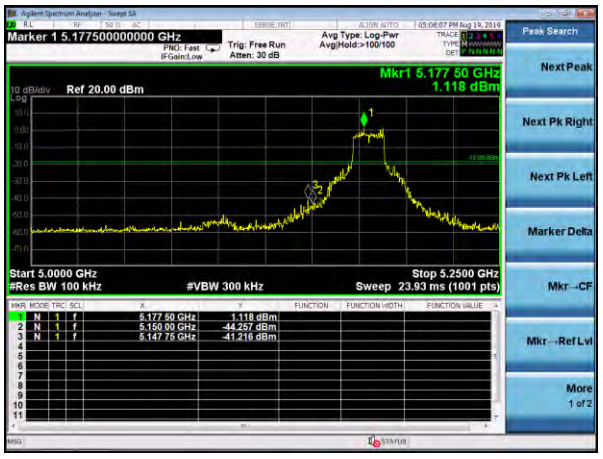
7.6 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V

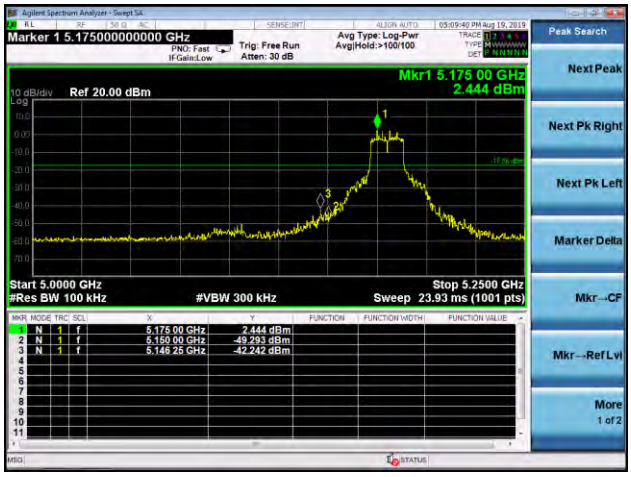
5.2G

5.15~5.25 GHz

(802.11n20) Band Edge, Left Side(ANT A)



(802.11n20) Band Edge, Left Side(ANT B)



(802.11n20) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

5.8G

5.45~5.82 GHz

(802.11n20) Band Edge, Left Side(ANT A)

(802.11n20) Band Edge, Left Side(ANT B)

(802.11n20) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

8.SPURIOUS RF CONDUCTED EMISSIONS

8.1CONFORMANCE LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

8.2MEASURING INSTRUMENTS

The Measuring equipment is listed in the section 6.3 of this test report.

8.3TEST SETUP

Please refer to Section 6.1 of this test report.

8.4TEST PROCEDURE

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2013 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 mwasure frequeny range from 9KHz to 26.5GHz.

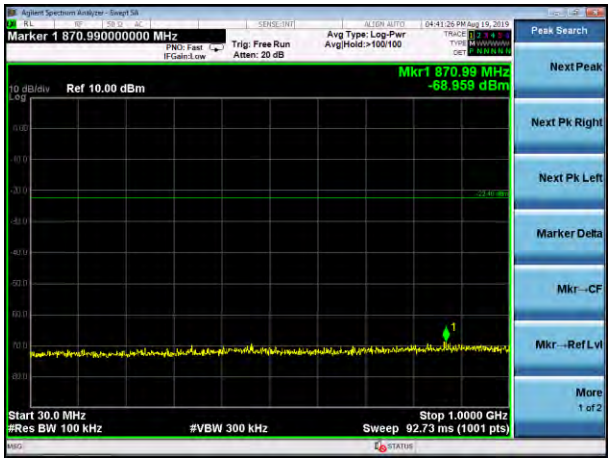
8.5TEST RESULTS

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.

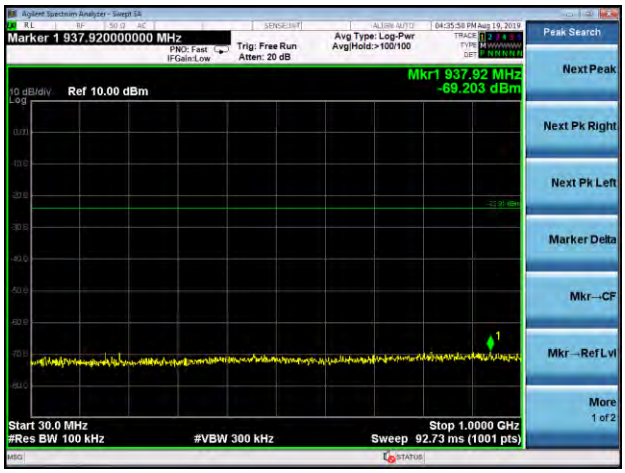
5.2G

Test Plot

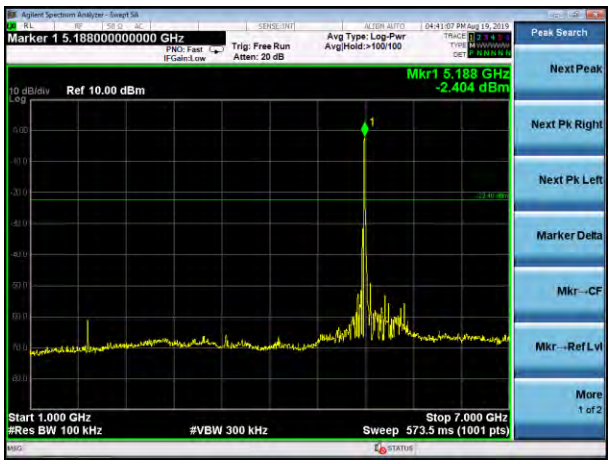
802.11n20 on channel 36(ANT A)



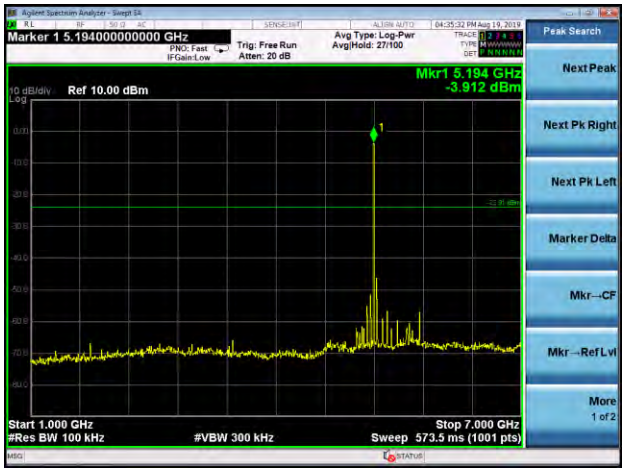
802.11n20 on channel 40(ANT A)



802.11n20 on channel 36



802.11n20 on channel 40

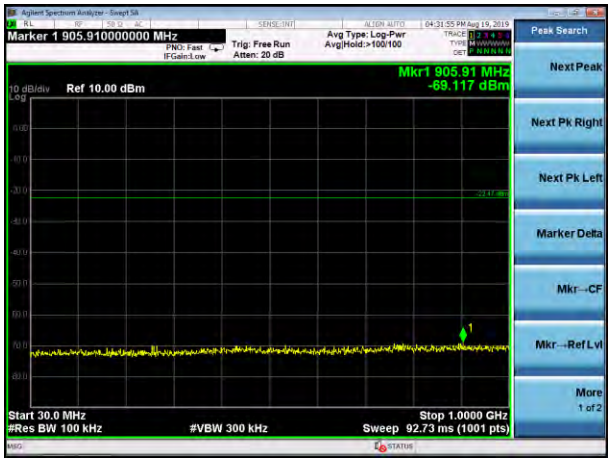


802.11n20 on channel 36

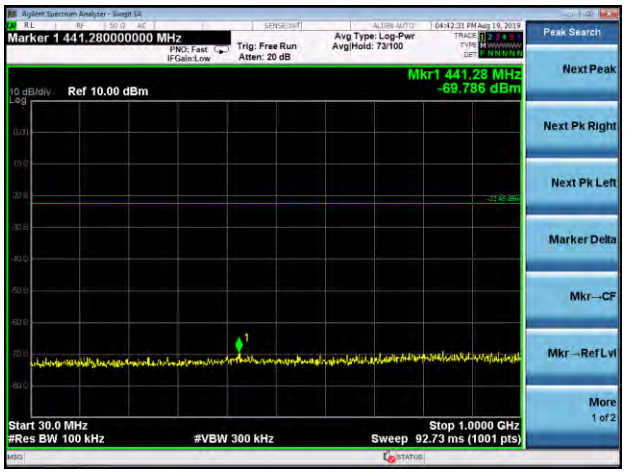
802.11n20 on channel 40

Test Plot

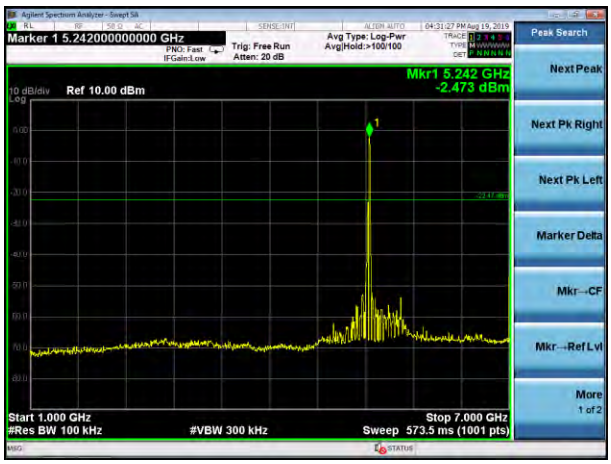
802.11n20 on channel 48



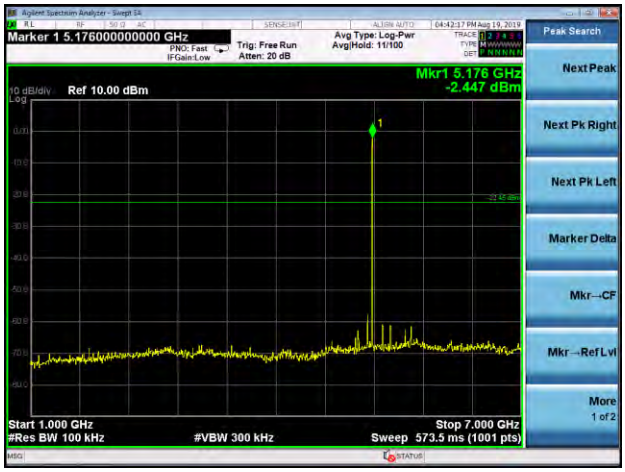
802.11n20 on channel 36(ANT B)



802.11n20 on channel 48



802.11n20 on channel 36

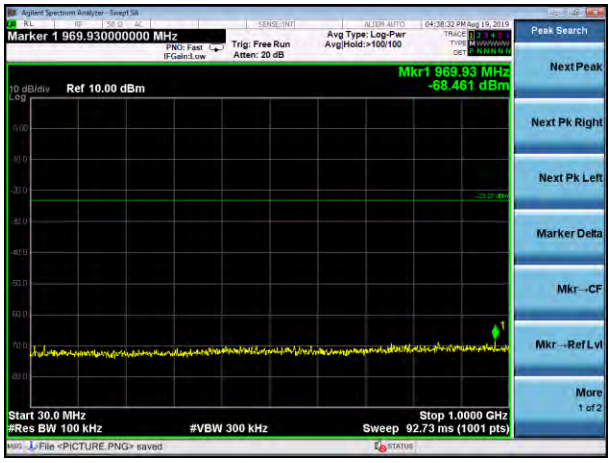


802.11n20 on channel 48

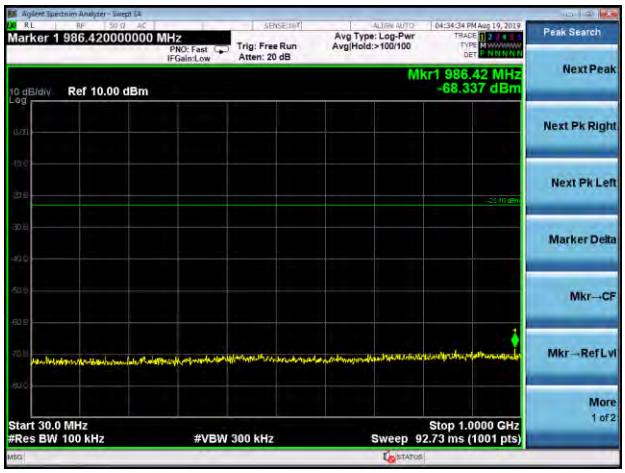
802.11n20 on channel 36

Test Plot

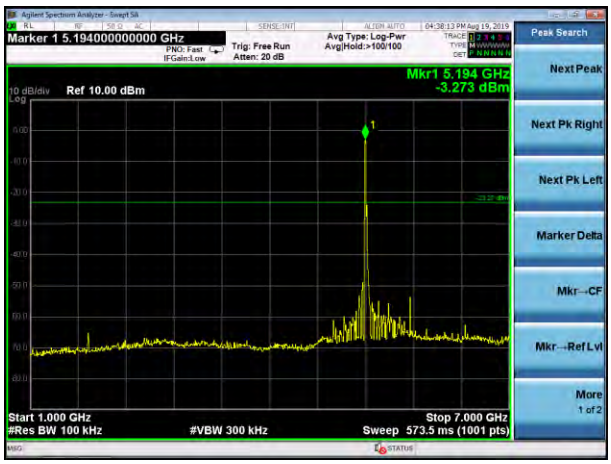
802.11n20 on channel 40 (ANT B)



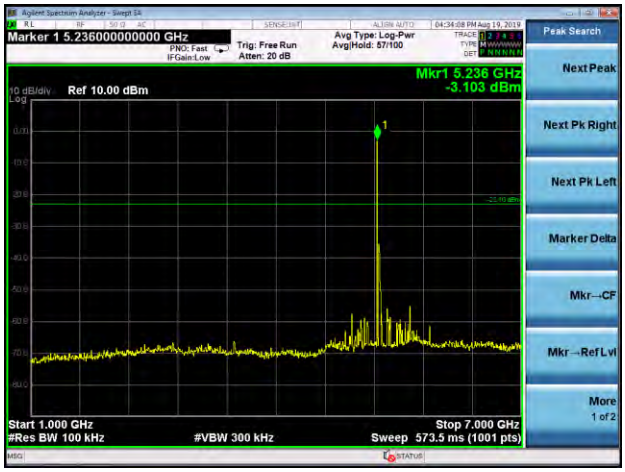
802.11n20 on channel 48(ANT B)



802.11n20 on channel 40



802.11n20 on channel 48



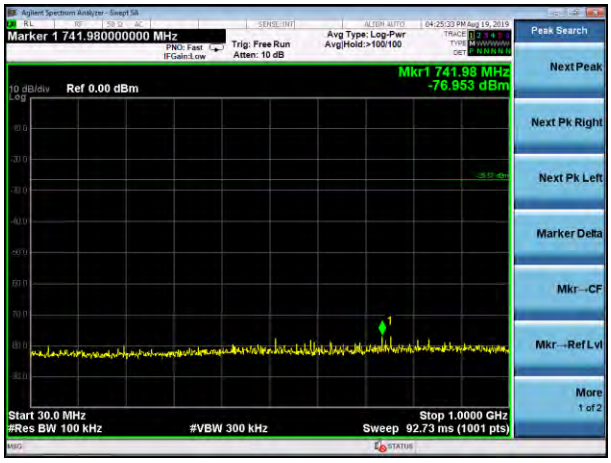
802.11n20 on channel 40

802.11n20 on channel 48

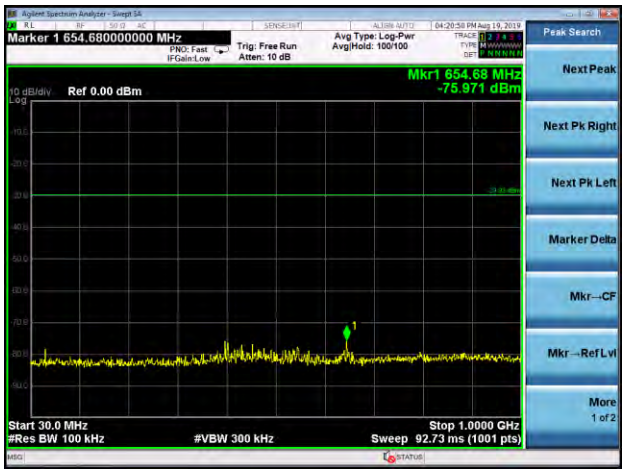
5.8G

Test Plot

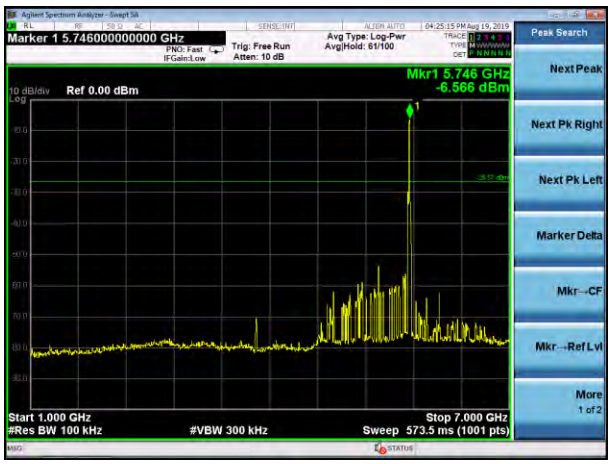
802.11n20 on channel 149(ANT A)



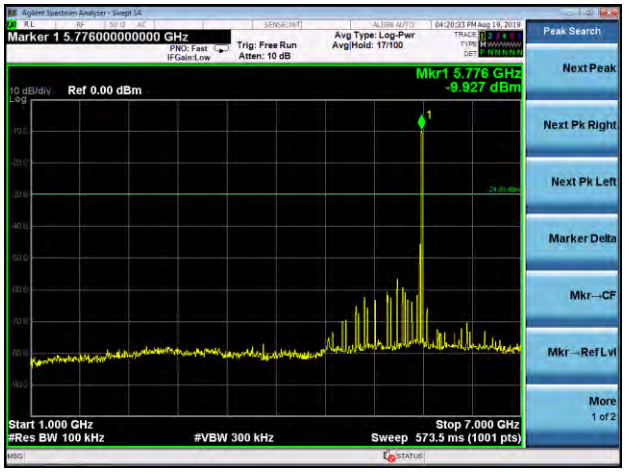
802.11n20 on channel 157(ANT A)



802.11n20 on channel 149



802.11n20 on channel 157

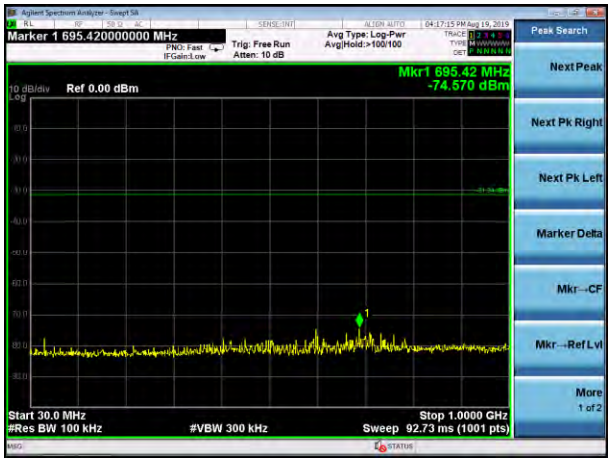


802.11n20 on channel 149

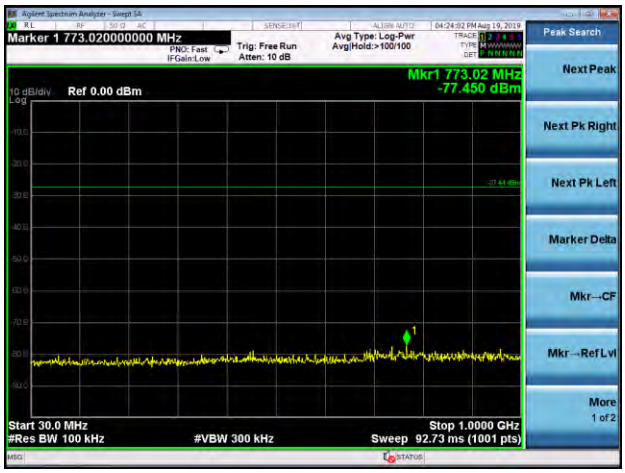
802.11n20 on channel 157

Test Plot

802.11n20 on channel 165(ANT A)

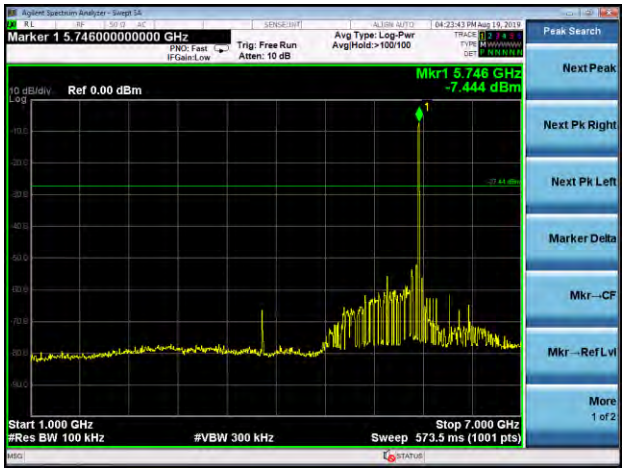


802.11n20 on channel 149(ANT B)



802.11n20 on channel 165

802.11n20 on channel 149

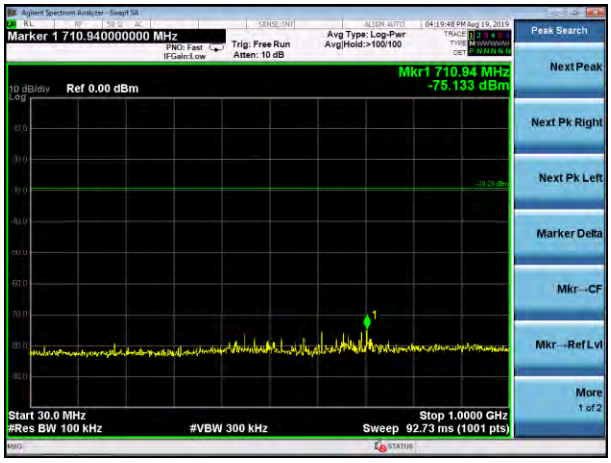


802.11n20 on channel 165

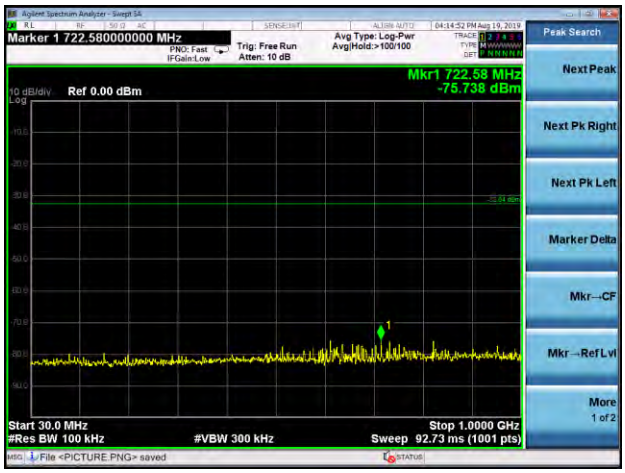
802.11n20 on channel 149

Test Plot

802.11n20 on channel 157 (ANT B)



802.11n20 on channel 165(ANT B)



802.11n20 on channel 157

802.11n20 on channel 165

802.11n20 on channel 157

802.11n20 on channel 165

9. Frequency Stability Measurement

9.1 LIMIT

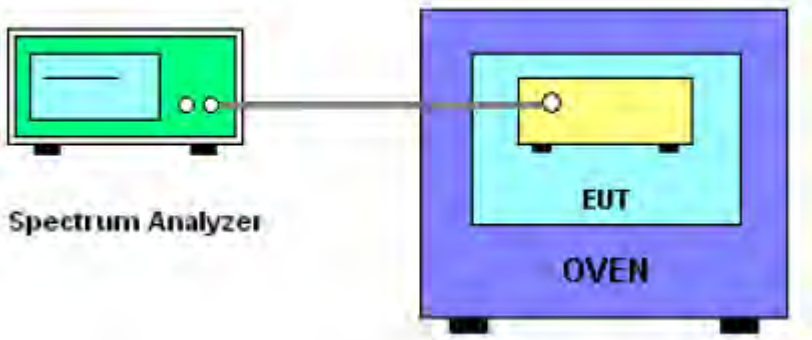
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

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

9.2 TEST PROCEDURES

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 × 10_6 ppm and the 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.

9.3 TEST SETUP LAYOUT



9.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

9.5 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX Frequency Band I (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)	12.00	5180.0521	5180	0.0521	-10.0579
		V max (V)	13.80	5180.0323	5180	0.0323	-6.2355
		V min (V)	10.20	5180.0244	5180	0.0244	-4.7104
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	5180.0055	5180	0.0055	-1.0618
		T (°C)	-10	5180.0107	5180	0.0107	-2.0656
		T (°C)	0	5180.0323	5180	0.0323	-6.2355
		T (°C)	10	5180.0385	5180	0.0385	-7.4324
		T (°C)	20	5180.0294	5180	0.0294	-5.6757
		T (°C)	30	5180.0215	5180	0.0215	-4.1506
		T (°C)	40	5180.0123	5180	0.0123	-2.3745
		T (°C)	50	5180.0095	5180	0.0095	-1.8340
		T (°C)	60	5180.0412	5180	0.0412	-7.9537
		T (°C)	70	5180.0691	5180	0.0691	-13.3398
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)	12.00	5200.0252	5200	0.0252	-4.8462
		V max (V)	13.80	5200.0423	5200	0.0423	-8.1346
		V min (V)	10.20	5200.0694	5200	0.0694	-13.3462
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	5200.0633	5200	0.0633	-12.1731
		T (°C)	-10	5200.0525	5200	0.0525	-10.0962
		T (°C)	0	5200.0431	5200	0.0431	-8.2885
		T (°C)	10	5200.0927	5200	0.0927	-17.8269
		T (°C)	20	5200.0632	5200	0.0632	-12.1538
		T (°C)	30	5200.0125	5200	0.0125	-2.4038
		T (°C)	40	5200.0738	5200	0.0738	-14.1923
		T (°C)	50	5200.0413	5200	0.0413	-7.9423
		T (°C)	60	5200.0322	5200	0.0322	-6.1923
		T (°C)	70	5200.0426	5200	0.0426	-8.1923
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)	12.00	5240.0138	5240	0.0138	-2.6336
		V max (V)	13.80	5240.0412	5240	0.0412	-7.8626
		V min (V)	10.20	5240.0091	5240	0.0091	-1.7366
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	5240.0092	5240	0.0092	-1.7557
		T (°C)	-10	5240.0036	5240	0.0036	-0.6870
		T (°C)	0	5240.0143	5240	0.0143	-2.7290
		T (°C)	10	5240.0854	5240	0.0854	-16.2977
		T (°C)	20	5240.0113	5240	0.0113	-2.1565
		T (°C)	30	5240.0125	5240	0.0125	-2.3855
		T (°C)	40	5240.0062	5240	0.0062	-1.1832
		T (°C)	50	5240.0071	5240	0.0071	-1.3550
		T (°C)	60	5240.0052	5240	0.0052	-0.9924
		T (°C)	70	5240.0103	5240	0.0103	-1.9656
Limits				± 20 ppm			
Result				Complies			

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Mode ：	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5745.00433	5745	0.00433	-0.7541
		V max (V)	13.80	5745.00453	5745	0.00453	-0.7879
		V min (V)	10.20	5745.00727	5745	0.00727	-1.2648
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	5745.01115	5745	0.01115	-1.9415
		T (°C)	-10	5745.01175	5745	0.01175	-2.0458
		T (°C)	0	5745.00793	5745	0.00793	-1.3808
		T (°C)	10	5745.00176	5745	0.00176	-0.3064
		T (°C)	20	5745.00021	5745	0.00021	-0.0359
		T (°C)	30	5745.01007	5745	0.01007	-1.7537
		T (°C)	40	5745.00824	5745	0.00824	-1.4336
		T (°C)	50	5745.00868	5745	0.00868	-1.5111
		T (°C)	60	5745.01352	5745	0.01352	-2.3535
		T (°C)	70	5745.01046	5745	0.01046	-1.8209
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)	12.00	5785.00872	5785	0.00872	-1.5076
		V max (V)	13.80	5785.00986	5785	0.00986	-1.7045
		V min (V)	10.20	5785.00926	5785	0.00926	-1.6000
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	5785.00234	5785	0.00234	-0.4041
		T (°C)	-10	5785.00226	5785	0.00226	-0.3901
		T (°C)	0	5785.00745	5785	0.00745	-1.2885
		T (°C)	10	5785.00917	5785	0.00917	-1.5857
		T (°C)	20	5785.00676	5785	0.00676	-1.1692
		T (°C)	30	5785.00571	5785	0.00571	-0.9876
		T (°C)	40	5785.00810	5785	0.00810	-1.3993
		T (°C)	50	5785.00152	5785	0.00152	-0.2630
		T (°C)	60	5785.00350	5785	0.00350	-0.6053
		T (°C)	70	5785.00966	5785	0.00966	-1.6701
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)	12.00	5825.00663	5825	0.00663	-1.1375
		V max (V)	13.80	5825.01167	5825	0.01167	-2.0039
		V min (V)	10.20	5825.00121	5825	0.00121	-0.2078
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	5825.00688	5825	0.00688	-1.1812
		T (°C)	-10	5825.00505	5825	0.00505	-0.8676
		T (°C)	0	5825.00202	5825	0.00202	-0.3461
		T (°C)	10	5825.00775	5825	0.00775	-1.3302
		T (°C)	20	5825.00231	5825	0.00231	-0.3961
		T (°C)	30	5825.00266	5825	0.00266	-0.4574
		T (°C)	40	5825.00991	5825	0.00991	-1.7020
		T (°C)	50	5825.00185	5825	0.00185	-0.3172
		T (°C)	60	5825.00804	5825	0.00804	-1.3803
		T (°C)	70	5825.00146	5825	0.00146	-0.2502
Limits				± 20 ppm			
Result				Complies			

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

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.

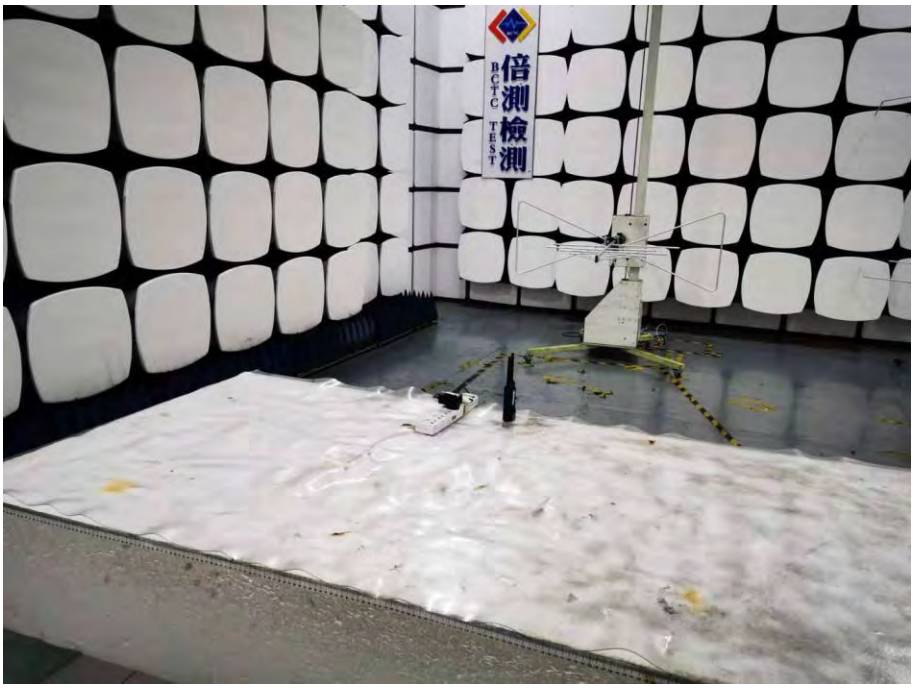
10.2 EUT ANTENNA

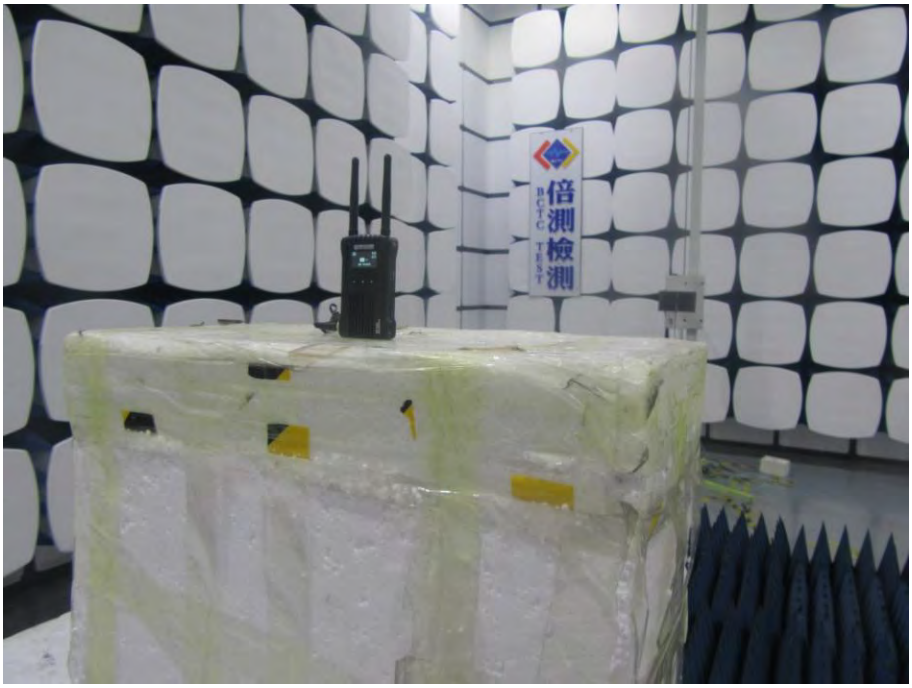
The EUT antenna is External antenna(antenna gain: 5.01dBi). It comply with the standard requirement.

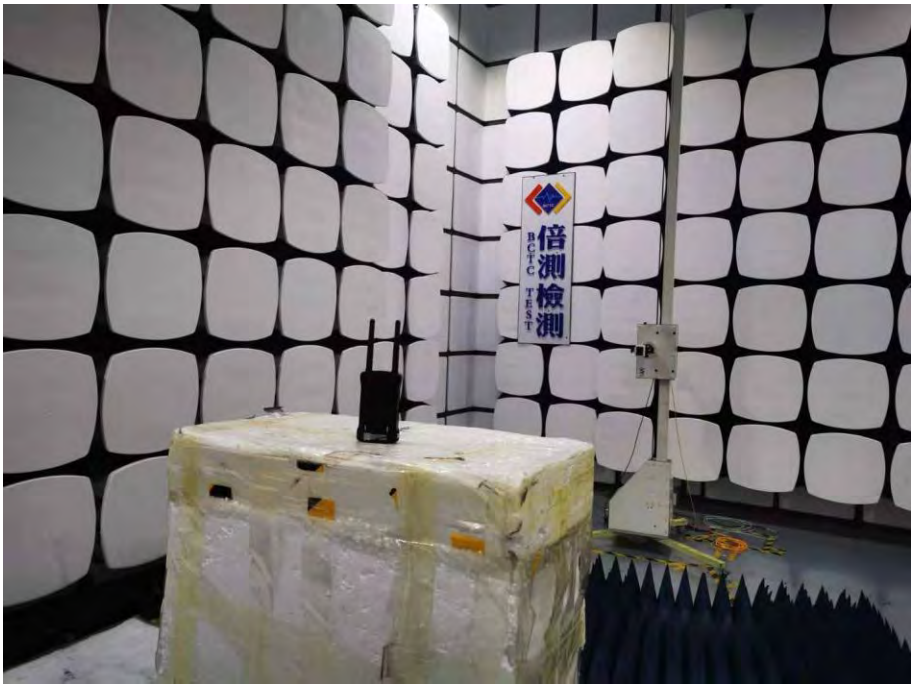
11. EUT TEST PHOTO

Conducted Measurement Photos

Radiated Measurement Photos




倍测检测
BCTC TEST


倍测检测
BCTC TEST

12. EUT PHOTO

※※※※※ **END OF REPORT** ※※※※※