RADIO TEST REPORT

Report No:STS1906072W09

Issued for

eInfochips Inc

2025 Gateway Place Suite 270, San Jose, Ca 95110, USA

Product Name:	Eragon™ 624
Brand Name:	Eragon™ 624
Model Name:	Eragon™ 624 SOM
Series Model:	EIC-Q624-300
FCC ID:	2ATUP-Q624300
IC:	25301-Q624300
Test Standard:	FCC Part 15.407
	RSS-247 Issue 2, February 2017

Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com

TEST RESULT CERTIFICATION

Applicant's Name	:	eInfochips Inc
Address	:	2025 Gateway Place Suite 270, San Jose, Ca 95110, USA
Manufacture's Name	:	eInfochips Inc
Address	:	2025 Gateway Place Suite 270, San Jose, Ca 95110, USA

Product Description

Product Name	:	Eragon™ 624
Brand Name	:	Eragon™ 624
Model Name	:	Eragon™ 624 SOM
Series Model	:	EIC-Q624-300
Test Standards	:	FCC Part15.407
		RSS-247 Issue 2, February 2017
Test Procedure		ANSI C63.10-2013

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC/IC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test	:	
Date (s) of performance of tests	:	24 July 2019 ~ 12 Oct. 2019
Date of Issue	:	12 Oct. 2019
Test Result	:	**Pass**

Testing Engineer : Chris Chen
(Chris Chen)

Technical Manager : Sunday Hu
(Sunday Hu)

Authorized Signatory : Vita Li
(Vita Li)

Table of Contents **Page**

Table of Contents **Page**

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	12 Oct. 2019	STS1906072W09	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
§ 15.407,KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407 RSS-247 Issue 2, February 2017		
FCC standard	Test Item	Results
15.207 RSS-Gen Issue 5, Amendment 1, March 2019	AC Conducted Emission	PASS
§ 15.407 (2) (26 dB) / § 15.407 (e) (6 dB)/ § 15.407 (a) (99%) RSS-Gen Issue 5, Amendment 1, March 2019	26dB/6dB &99% Bandwidth	PASS
15.407(a) (1).(2).(3).(4).(5) RSS-247 Issue 2, February 2017	Maximum Conducted Output Power	PASS
15.407(b)& 15.209 RSS-247 Issue 2, February 2017	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.205 RSS-Gen Issue 5, Amendment 1, March 2019	Restricted frequency bands	PASS
15.407(b)7 RSS-247 Issue 2, February 2017	Conducted Emission Measurement	PASS
15.407(a) (1).(2).(3).(4).(5) RSS-247 Issue 2, February 2017	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204 RSS-Gen Issue 5, Amendment 1, March 2019	Antenna Requirement	PASS
RSS-Gen Issue 5, Amendment 1, March 2019	Frequency Stability	PASS

NOTE:

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

(2)all tests are according to ANSI C63.10-2013

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District,Bao'an District, Shenzhen, Guang Dong, China
FCC test Firm Registration Number: 625569
IC test Firm Registration Number: 12108A
A2LA Certificate No.: 4338.01

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	RF output power, conducted	±0.71dB
2	Unwanted Emissions, conducted	±0.63dB
3	All emissions, radiated 30-200MHz	±3.43dB
4	All emissions, radiated 200MHz-1GHz	±3.57dB
5	All emissions, radiated>1G	±4.13dB
6	Conducted Emission (9KHz-150KHz)	±3.18dB
7	Conducted Emission (150KHz-30MHz)	±2.70dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

<table>
<tr><td>Product Name</td><td>Eragon™ 624</td></tr>
<tr><td>Trade Name</td><td>Eragon™ 624</td></tr>
<tr><td>Model Name</td><td>Eragon™ 624 SOM</td></tr>
<tr><td>Series Model</td><td>EIC-Q624-300</td></tr>
<tr><td>Model Difference</td><td>Only different in model name.</td></tr>
<tr><td>Product Description</td><td>The EUT is a Eragon™ 624
<table>
<tr><td>Operation Frequency:</td><td>IEEE 802.11a/ n(HT20)/ac(VHT20): 5.180GHz-5.240GHz
IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.230GHz
IEEE 802.11ac(VHT80): 5.210GHz</td></tr>
<tr><td></td><td>IEEE 802.11a/ n(HT20)/ac(VHT20): 5.745GHz-5.825GHz
IEEE 802.11n(HT40)/ac(VHT40): 5.755GHz-5.795GHz
IEEE 802.11ac(VHT80): 5.775GHz</td></tr>
<tr><td>Modulation Type:</td><td>802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM
802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM
802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM</td></tr>
<tr><td>Antenna Designation:</td><td>See Note 2</td></tr>
<tr><td>Max.Output Power(Conducted):</td><td>16.83dBm</td></tr>
<tr><td>Duty Cycle:</td><td>>98%</td></tr>
</table>
More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Test Channel</td><td>Please refer to the Note 1.</td></tr>
<tr><td>Adapter</td><td>Input: AC 100-240V, 1500mA, 50/60Hz
Output: DC 12V, 3000 mA</td></tr>
<tr><td>Power Rating</td><td>Input: 3.8V --- 6.67A
(As the 3.8V supply is coming from Carrier Board.)</td></tr>
<tr><td>Hardware version number</td><td>SOM: Rev 1.2</td></tr>
<tr><td>Software version number</td><td>AND.8.1.0_EI.1.2.0</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
</table>

Note:For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.

Operation Frequency of channel			
5.180GHz-5.240GHz		5.745GHz-5.825GHz	
Channel	Frequency	Channel	Frequency
36	5180	149	5745
38	5190	151	5755
40	5200	153	5765
42	5210	157	5785
44	5220	159	5795
46	5230	161	5805
48	5240	165	5825

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:
Carrier Frequency Channel

5GHz:

For 802.11a/n(HT20) /ac (VHT20)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
36	5180	149	5745
40	5200	157	5785
48	5240	165	5825

For 802.11n(HT40) /ac (VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
38	5190	151	5755
46	5230	159	5795

For 802.11ac (VHT80)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
42	5210	155	5775

2.

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	Eragon™ 624	Eragon™ 624 SOM	Ceramic	N/A	4.7 dBi	WLAN Ant.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH36&CH40&CH48	6 Mbps
Mode 2	TX IEEE 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 3	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 4	TX IEEE 802.11ac VHT20 CH36&CH40&CH48	NSS1 MCS0
Mode 5	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 6	TX IEEE 802.11ac VHT20 CH149&CH157&CH165	NSS1 MCS0
Mode 7	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 8	TX IEEE 802.11ac VHT40 CH38&CH46	NSS1 MCS0
Mode 9	TX IEEE 802.11n HT40 CH151&CH159	MCS 0
Mode 10	TX IEEE 802.11ac VHT40 CH151&CH159	NSS1 MCS0
Mode 11	TX IEEE 802.11ac VHT80 CH42	NSS1 MCS0
Mode 12	TX IEEE 802.11ac VHT80 CH155	NSS1 MCS0

Note: (1) The measurements are performed at the highest, middle, lowest available channels.

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

(3) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.

AC Conducted Emission

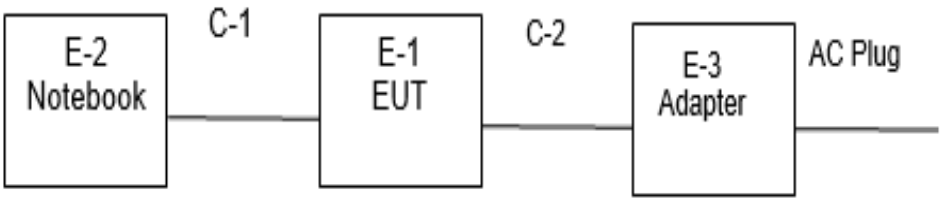
Test Case	
AC Conducted Emission	Mode 13: Keeping TX + WLAN Link

Power class

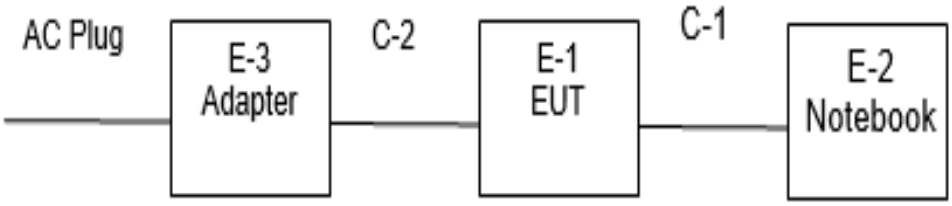
Mode	Power class
5.2G WIFI	10
5.8G WIFI	17

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



Conducted Emission Test



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-3	Adapter	N/A	YHY-12003000	N/A	N/A
E-2	DC Cable	N/A	110cm	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	DELL	3480	N/A	N/A
C-1	USB Cable	N/A	100cm	N/A	N/A

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.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
Signal Analyzer	Agilent	N9020A	MY51110105	2019.03.02	2020.03.01
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.1
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier(0.1 M-3GHz)	EM	EM330	060665	2018.10.13, 2019.10.09	2019.10.12, 2020.10.08
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2018.10.13, 2019.10.09	2019.10.12, 2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11, 2019.10.09	2019.10.10, 2020.10.08
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	BULUN	BL410-E/18.905			

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
LISN	R&S	ENV216	101242	2018.10.11, 2019.10.09	2019.10.10, 2020.10.08
LISN	EMCO	3810/2NM	23625	2018.10.11, 2019.10.09	2019.10.10, 2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11, 2019.10.09	2019.10.10, 2020.10.08
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2018.10.13, 2019.10.09	2019.10.12, 2020.10.08
Signal Analyzer	Agilent	N9020A	MY49100060	2018.10.13, 2019.10.09	2019.10.12, 2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11, 2019.10.09	2019.10.10, 2020.10.08
Test SW	FARAD	LZ-RF /LzRf-3A3			

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
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

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

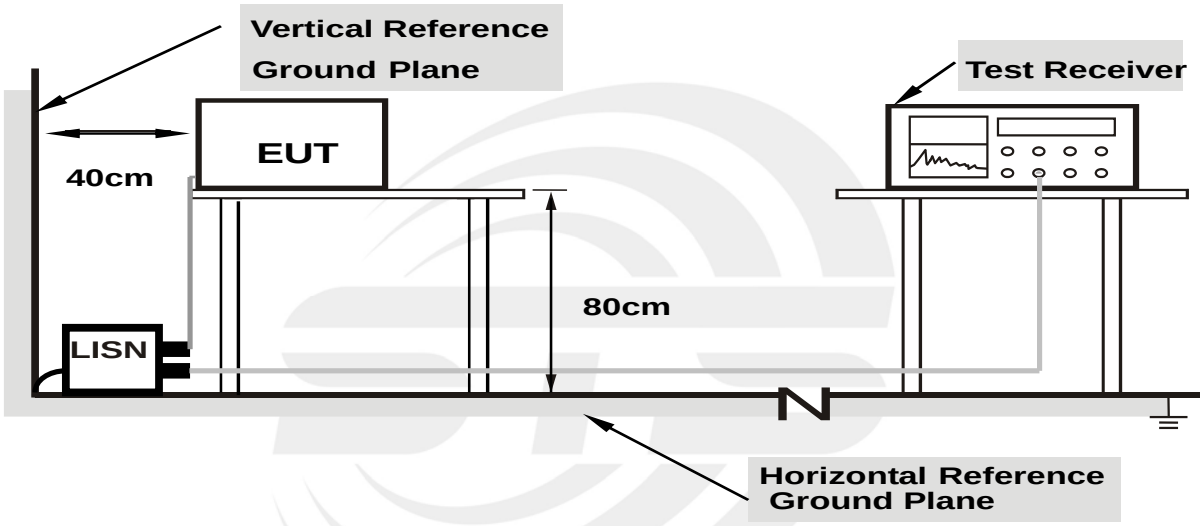
3.1.2 TEST PROCEDURE

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

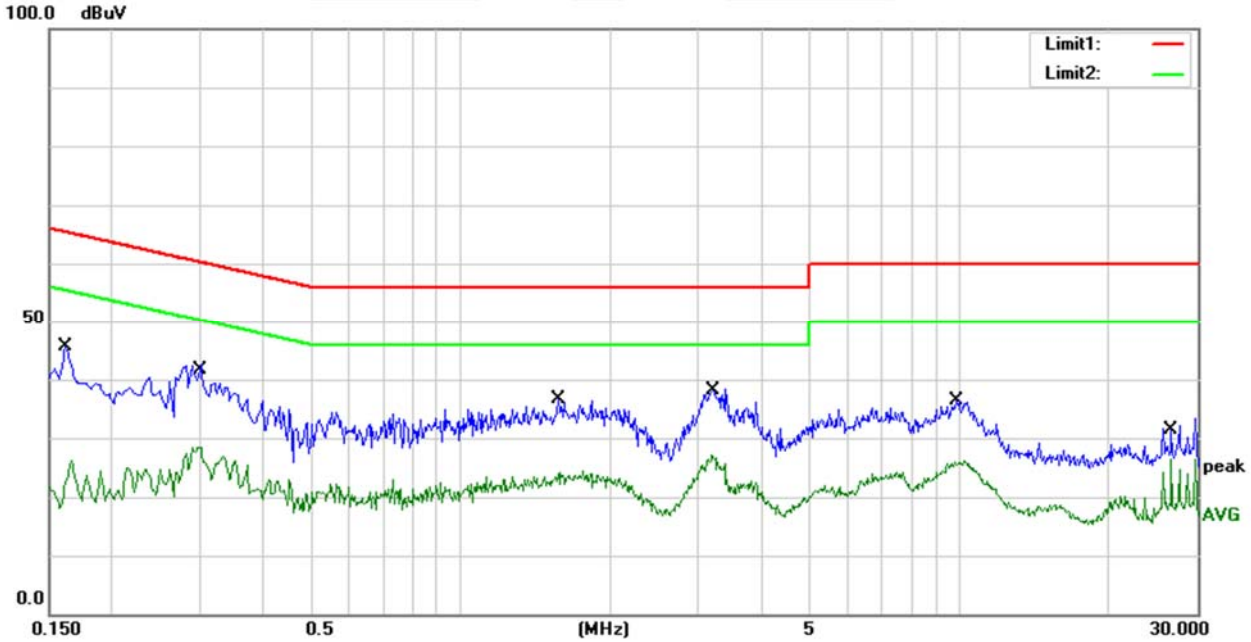
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

Temperature:	25.3(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode：	Mode 13		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1620	-10.13	55.85	45.72	65.36	-19.64	QP
2	0.1620	-29.83	55.85	26.02	55.36	-29.34	AVG
3	0.2980	-13.13	55.66	42.53	60.30	-17.77	QP
4	0.2980	-27.27	55.66	28.39	50.30	-21.91	AVG
5	1.5740	-18.47	55.02	36.55	56.00	-19.45	QP
6	1.5740	-31.05	55.02	23.97	46.00	-22.03	AVG
7	3.1940	-14.72	53.13	38.41	56.00	-17.59	QP
8	3.1940	-26.09	53.13	27.04	46.00	-18.96	AVG
9	9.8740	-9.28	45.75	36.47	60.00	-23.53	QP
10	9.8740	-19.74	45.75	26.01	50.00	-23.99	AVG
11	26.6220	-5.73	39.22	33.49	60.00	-26.51	QP
12	26.6220	-12.81	39.22	26.41	50.00	-23.59	AVG

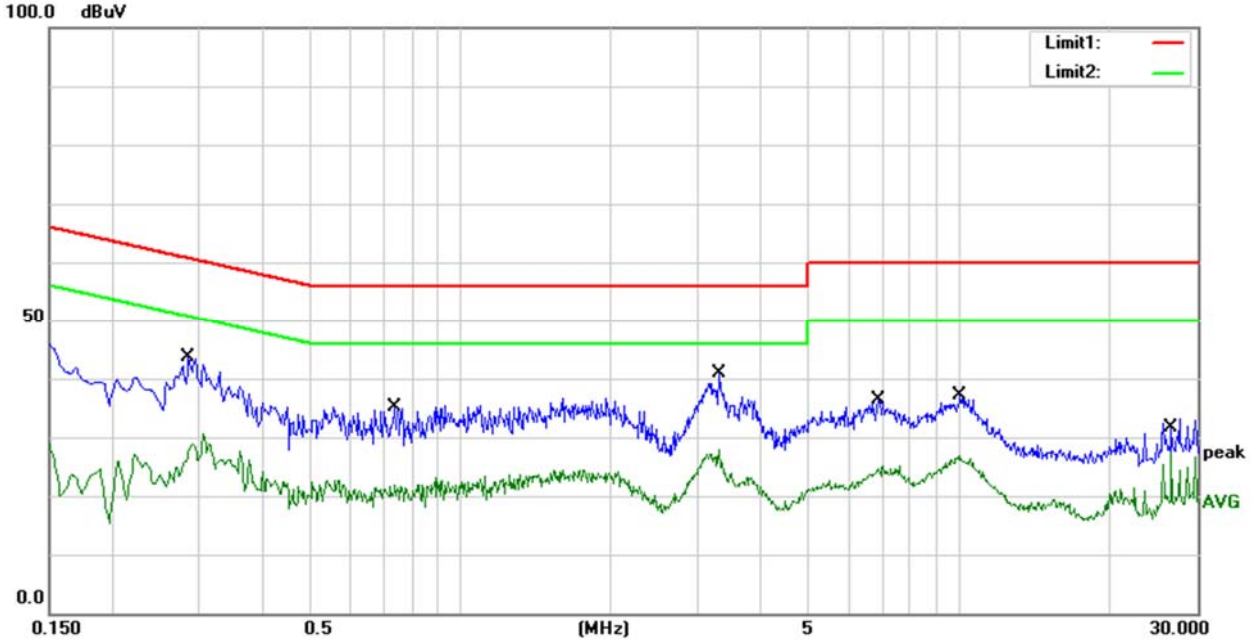
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.3(C)	Relative Humidity:	62%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 13		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2860	-11.98	55.69	43.71	60.64	-16.93	QP
2	0.2860	-25.19	55.69	30.50	50.64	-20.14	AVG
3	0.7420	-20.47	55.52	35.05	56.00	-20.95	QP
4	0.7420	-33.54	55.52	21.98	46.00	-24.02	AVG
5	3.3060	-12.15	52.98	40.83	56.00	-15.17	QP
6	3.3060	-25.09	52.98	27.89	46.00	-18.11	AVG
7	6.8980	-12.50	48.97	36.47	60.00	-23.53	QP
8	6.8980	-23.80	48.97	25.17	50.00	-24.83	AVG
9	10.0580	-8.57	45.57	37.00	60.00	-23.00	QP
10	10.0580	-19.13	45.57	26.44	50.00	-23.56	AVG
11	26.6260	-6.00	39.22	33.22	60.00	-26.78	QP
12	26.6260	-11.83	39.22	27.39	50.00	-22.61	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



3.2 RADIATED EMISSION AND (BANDEDGE) MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band; limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	68.2	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15E.

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

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

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 – 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	

12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 – 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 – 8500	
108 – 138		

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz 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 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. 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:

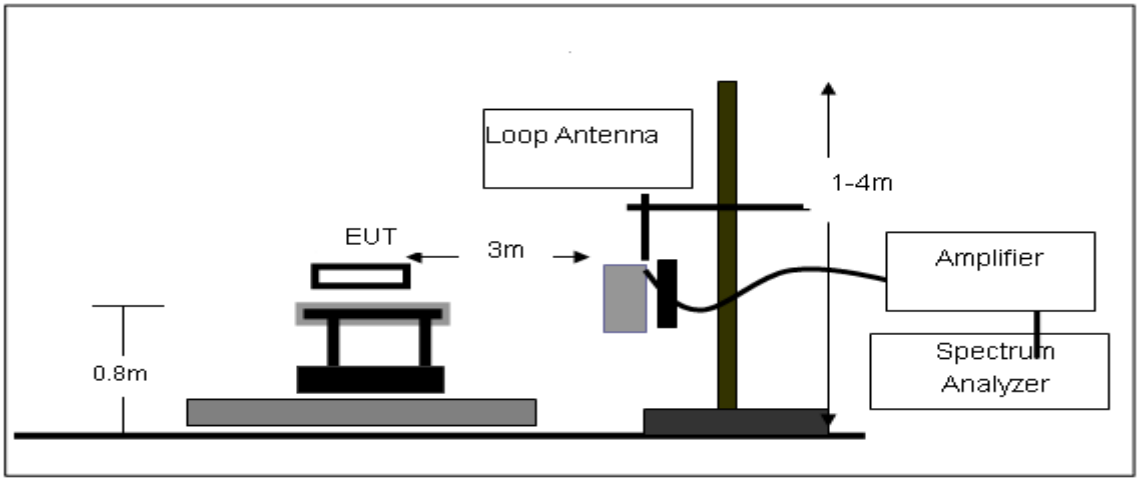
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

3.2.2 DEVIATION FROM TEST STANDARD

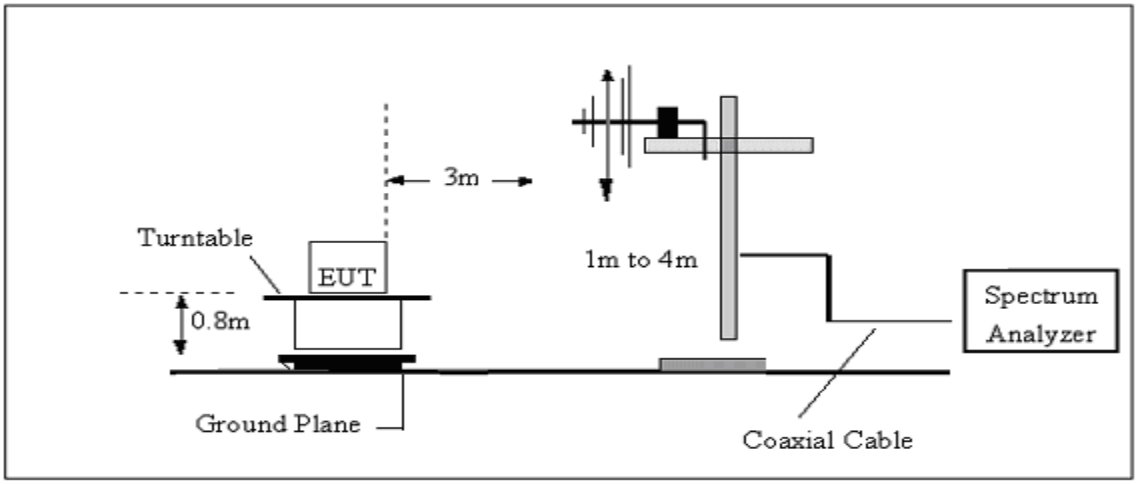
No deviation

3.2.3 TEST SETUP

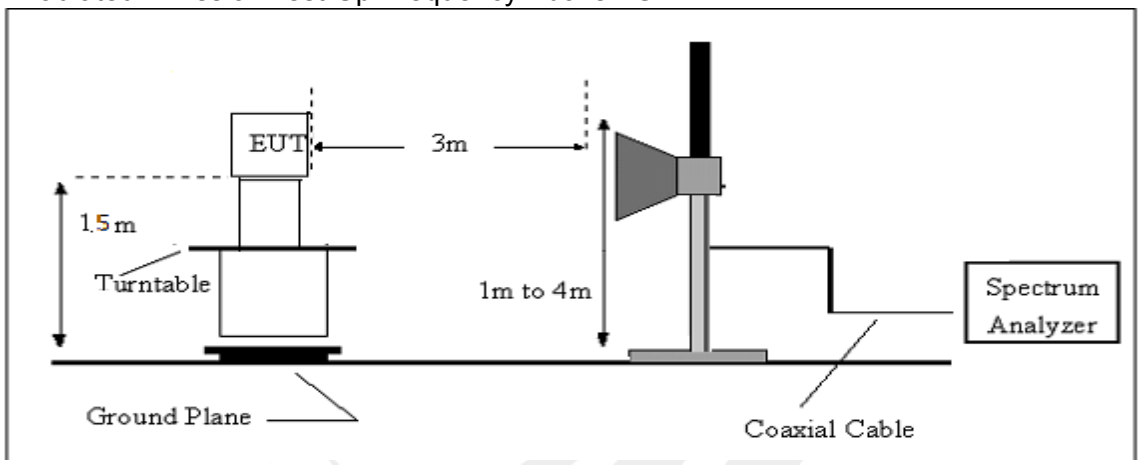
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.4 EUT OPERATING 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.

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

3.2.6 TEST RESULTS (Between 9KHz – 30 MHz)

Temperature：	25.7(C)	Relative Humidtity:	67%RH
Test Voltage ：	AC 120V/60Hz	Polarization :	--
Test Mode ：	TX Mode		

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

Note:

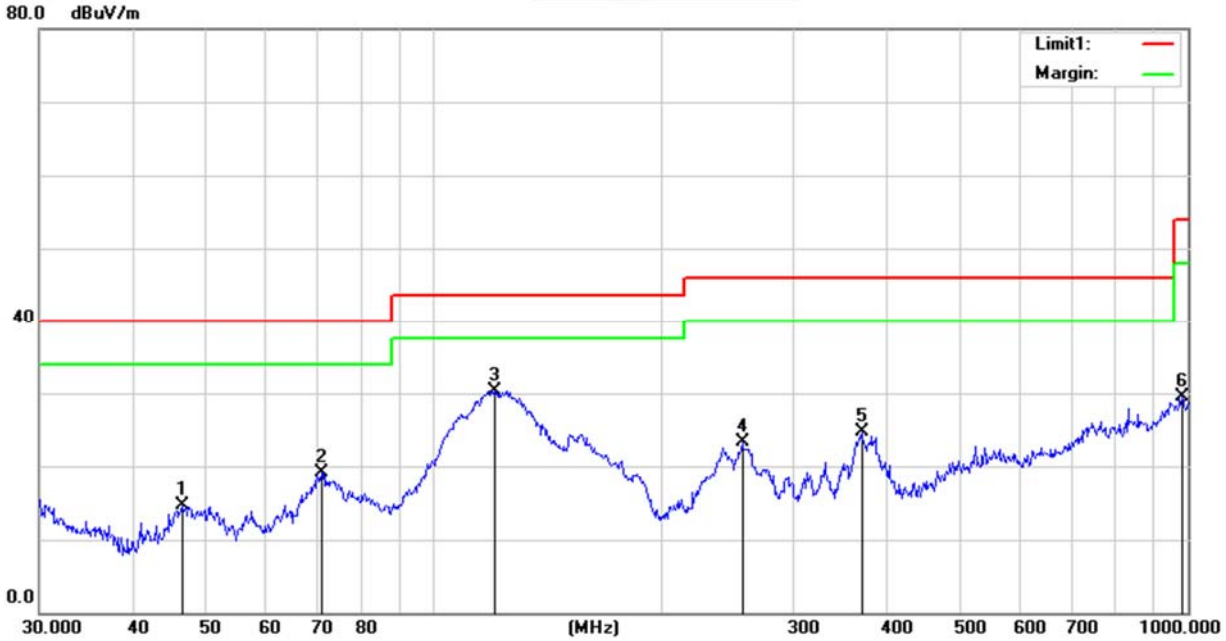
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (Between 30MHz – 1GHz)

Temperature	25.7(C)	Relative Humidtity:	67%RH
Test Voltage	AC 120V/60Hz	Polarization:	Horizontal
Test Mode	Mode 1~12 (Mode 5 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	46.3402	36.03	-21.33	14.70	40.00	-25.30	QP
2	71.0803	43.70	-24.67	19.03	40.00	-20.97	QP
3	120.2766	48.74	-18.35	30.39	43.50	-13.11	QP
4	256.5211	38.41	-15.18	23.23	46.00	-22.77	QP
5	369.4047	37.22	-12.52	24.70	46.00	-21.30	QP
6	982.6200	27.00	2.51	29.51	54.00	-24.49	QP

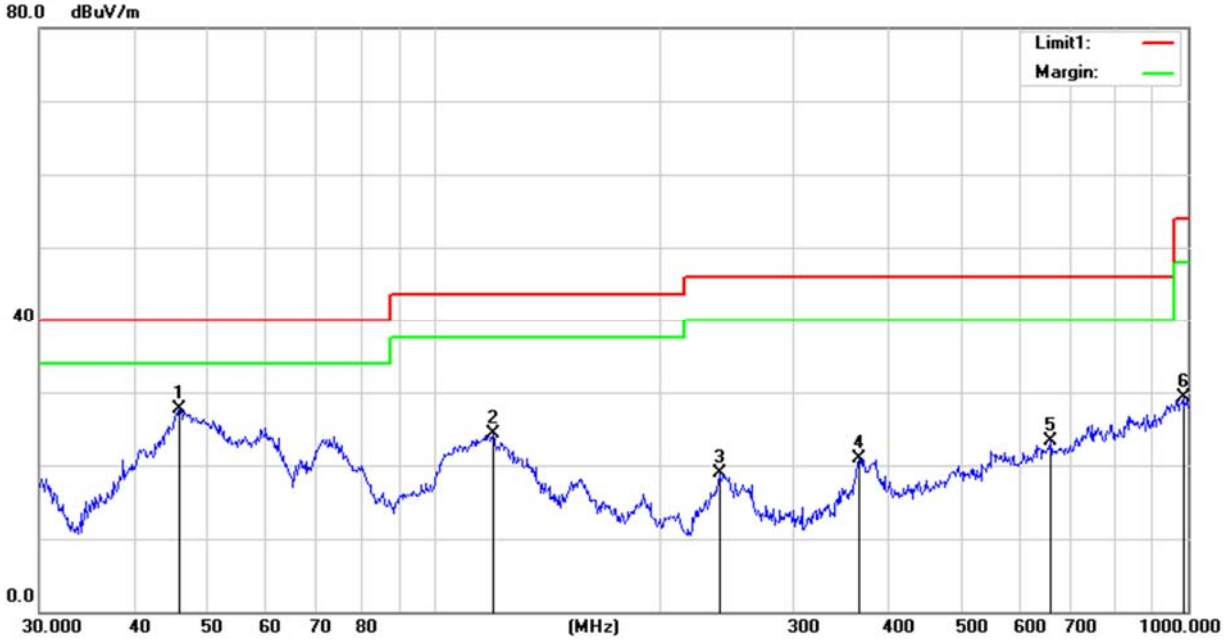
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature	25.7(C)	Relative Humidtity:	67%RH
Test Voltage	AC 120V/60Hz	Polarization:	Vertical
Test Mode	Mode 1~12 (Mode 5 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	DRemark
1	46.0164	48.83	-21.16	27.67	40.00	-12.33	QP
2	119.8556	42.58	-18.35	24.23	43.50	-19.27	QP
3	239.1473	37.00	-18.15	18.85	46.00	-27.15	QP
4	366.8231	33.43	-12.61	20.82	46.00	-25.18	QP
5	658.8362	28.05	-4.82	23.23	46.00	-22.77	QP
6	986.0717	26.94	2.29	29.23	54.00	-24.77	QP

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit

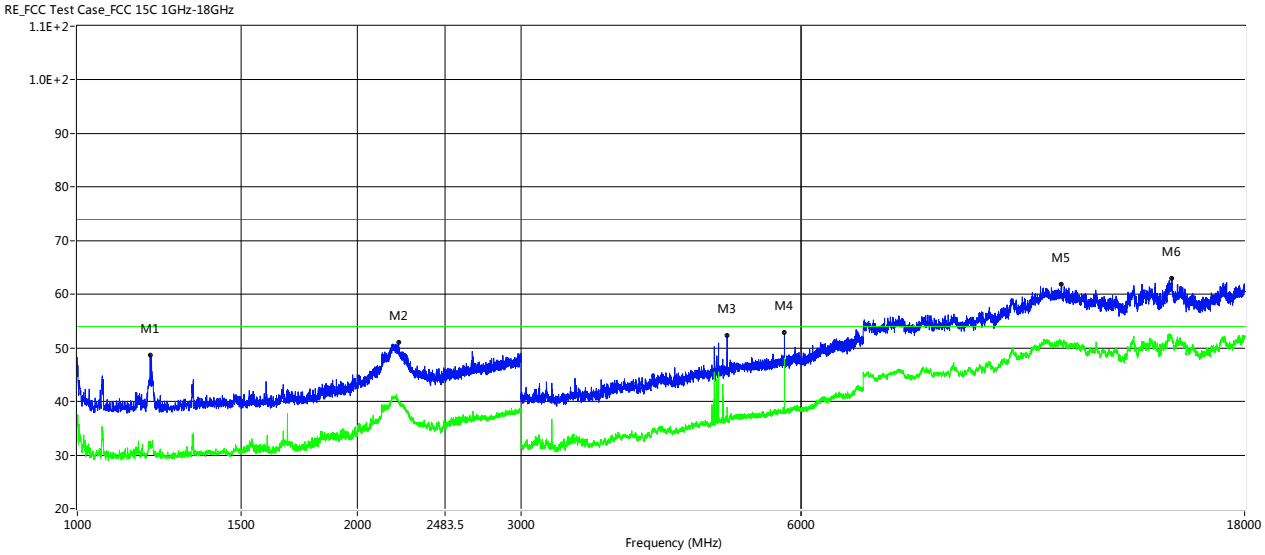


3.2.8 TEST RESULTS (Above 1000 MHz)

Band I 5150-5250MHz

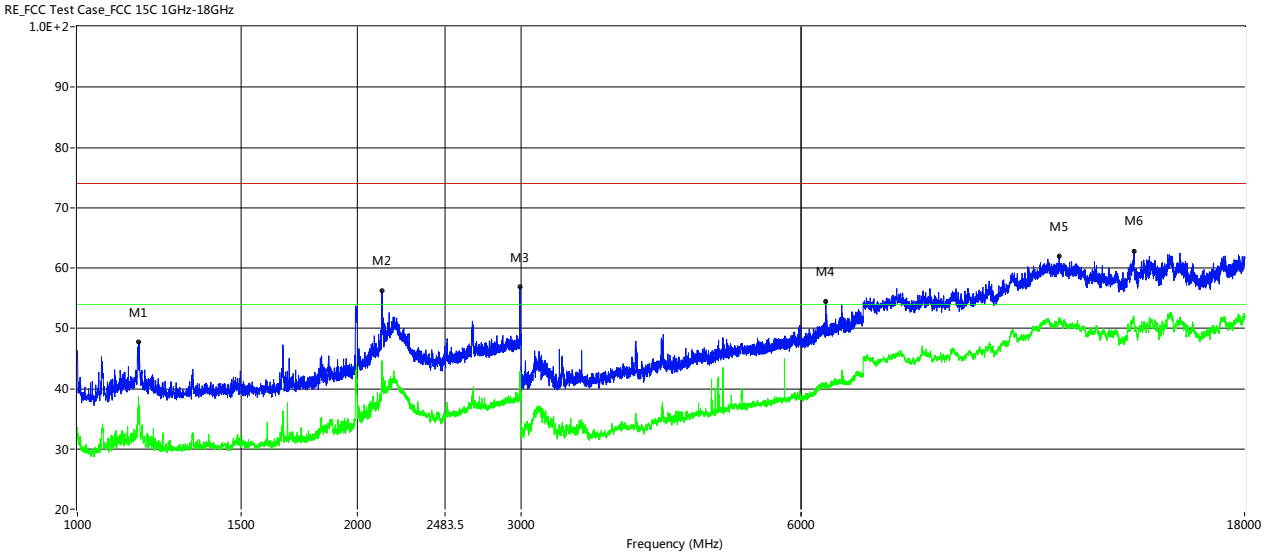
802.11 n(HT20)-Low

Horizontal



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1197.500	48.61	--	32.33	-0.74	68.20	--	54.0	-19.59	Horizontal	Pass
2216.000	51.08	--	39.56	9.27	68.20	--	54.0	-14.44	Horizontal	Pass
4998.000	52.29	--	38.91	-4.55	68.20	--	54.0	-15.09	Horizontal	Pass
5760.000	52.79	--	48.13	-2.48	68.20	--	54.0	-5.87	Horizontal	Pass
11441.250	61.87	--	50.86	11.08	68.20	--	54.0	-3.14	Horizontal	Pass
15035.500	62.98	--	51.74	11.79	68. 2	--	54.0	-2.26	Horizontal	Pass

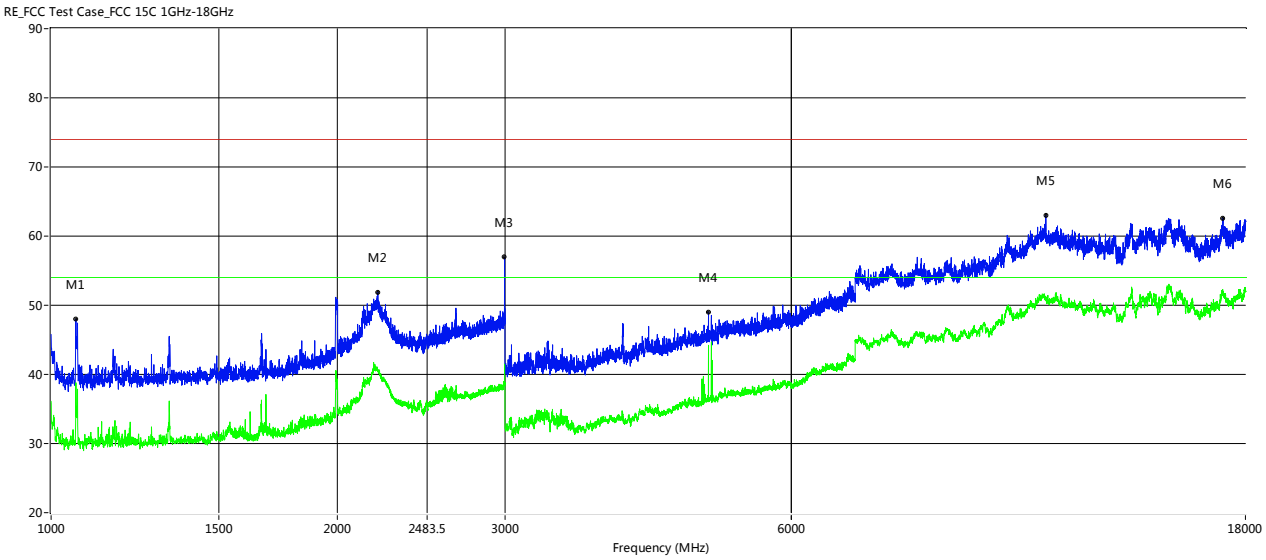
Vertical



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1163.500	47.70	--	38.04	-1.08	68.20	--	54.0	-15.96	Vertical	Pass
2125.000	56.25	--	44.51	6.41	68.20	--	54.0	-9.49	Vertical	Pass
2992.000	56.85	--	42.85	7.88	68.20	--	54.0	-11.15	Vertical	Pass
6381.000	54.42	--	41.09	-0.06	68.20	--	54.0	-12.91	Vertical	Pass
11372.500	61.92	--	51.07	10.73	68.20	--	54.0	-2.93	Vertical	Pass
13685.250	62.76	--	51.70	12.10	68.20	--	54.0	-2.30	Vertical	Pass

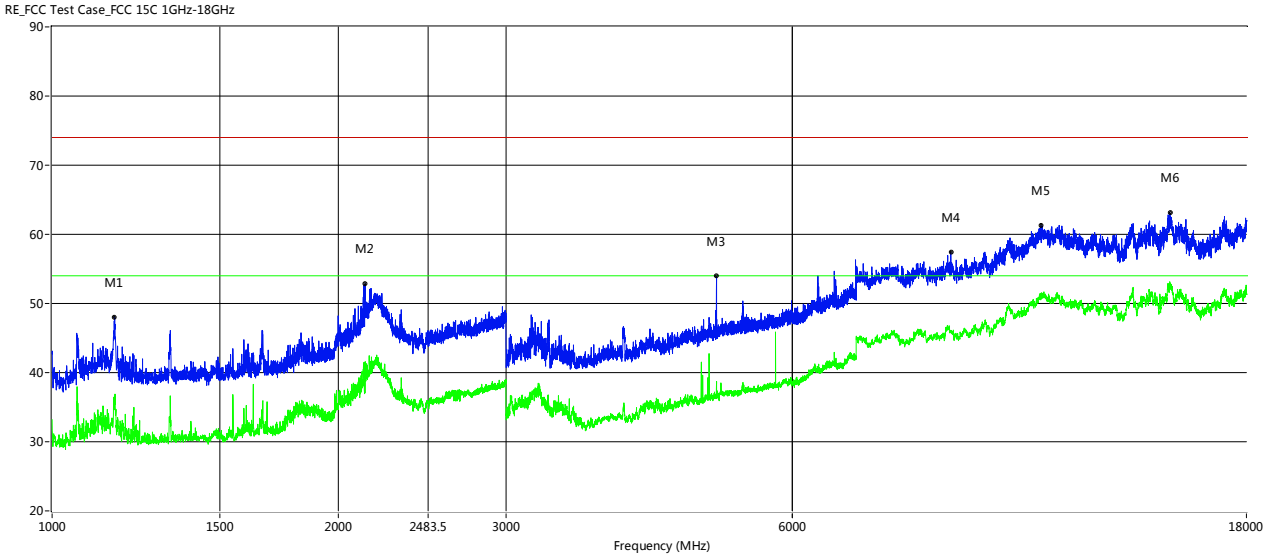
802.11 n(HT20)-Mid

Horizontal



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1062.000	48.00	--	38.78	-1.50	68.20	--	54.0	-15.22	Horizontal	Pass
2205.500	51.87	--	40.37	9.87	68.20	--	54.0	-13.63	Horizontal	Pass
2997.000	56.95	--	41.47	8.07	68.20	--	54.0	-11.25	Horizontal	Pass
4909.000	49.01	--	44.22	-4.66	68.20	--	54.0	-9.78	Horizontal	Pass
11108.500	62.99	--	50.84	10.64	68.20	--	54.0	-3.16	Horizontal	Pass
17048.500	62.62	--	52.02	11.50	68.20	--	54.0	-1.98	Horizontal	Pass

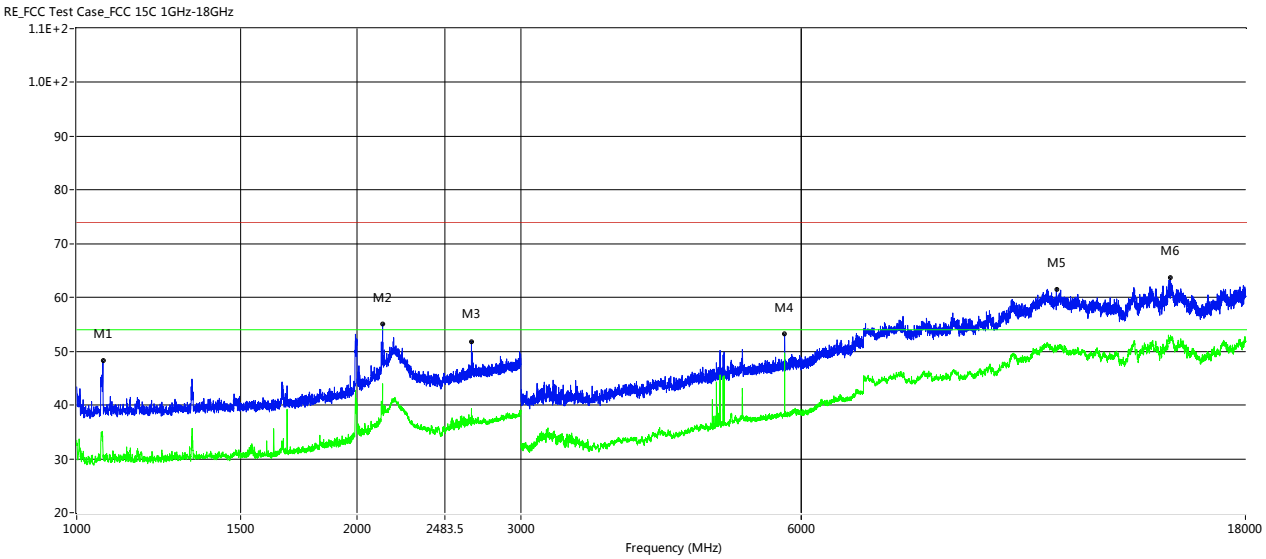
Vertical



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1163.500	48.07	--	35.89	-1.08	68.20	--	54.0	-18.11	Vertical	Pass
2131.000	56.67	--	43.33	7.03	68.20	--	54.0	-10.67	Vertical	Pass
4993.000	53.99	--	38.68	-4.56	68.20	--	54.0	-14.21	Vertical	Pass
8804.000	57.42	--	46.03	5.43	68.20	--	54.0	-7.97	Vertical	Pass
10951.750	61.28	--	51.05	10.92	68.20	--	54.0	-2.95	Vertical	Pass
14961.250	63.10	--	52.62	12.39	68.20	--	54.0	-1.38	Vertical	Pass

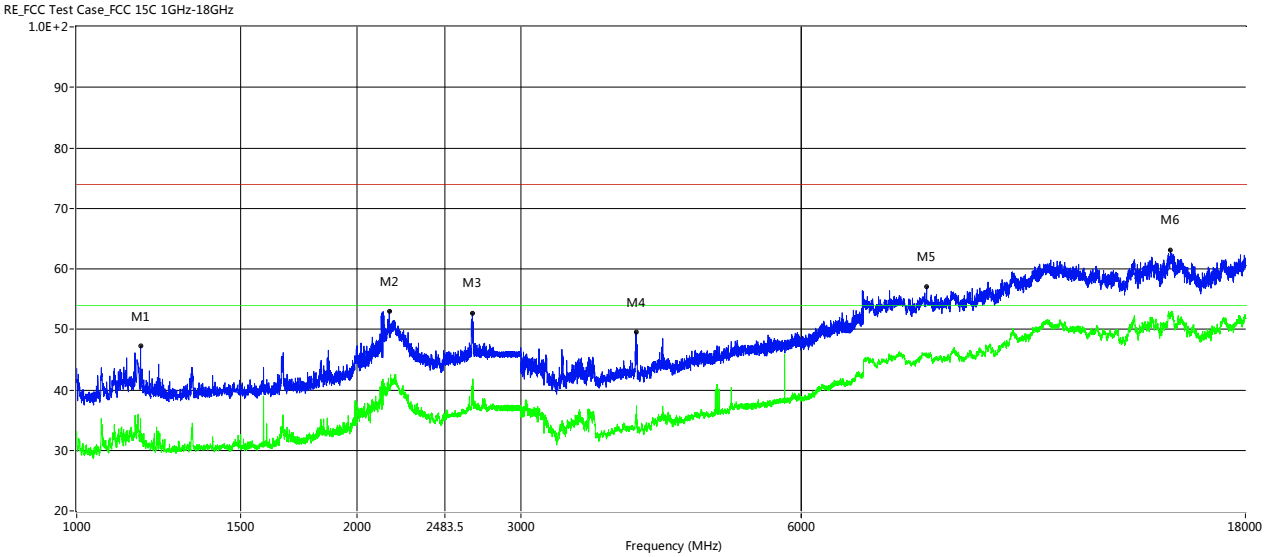
802.11 n(HT20)-High

Horizontal



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1067.000	48.23	--	31.68	-1.49	68.20	--	54.0	-22.32	Horizontal	Pass
2131.000	55.03	--	43.99	7.03	68.20	--	54.0	-10.01	Horizontal	Pass
2654.500	51.85	--	38.85	6.18	68.20	--	54.0	-15.15	Horizontal	Pass
5760.000	53.16	--	49.67	-2.48	68.20	--	54.0	-4.33	Horizontal	Pass
11279.000	61.55	--	50.27	10.37	68.20	--	54.0	-3.73	Horizontal	Pass
14958.500	63.65	--	53.00	12.39	68.20	--	54.0	-1.00	Horizontal	Pass

Vertical



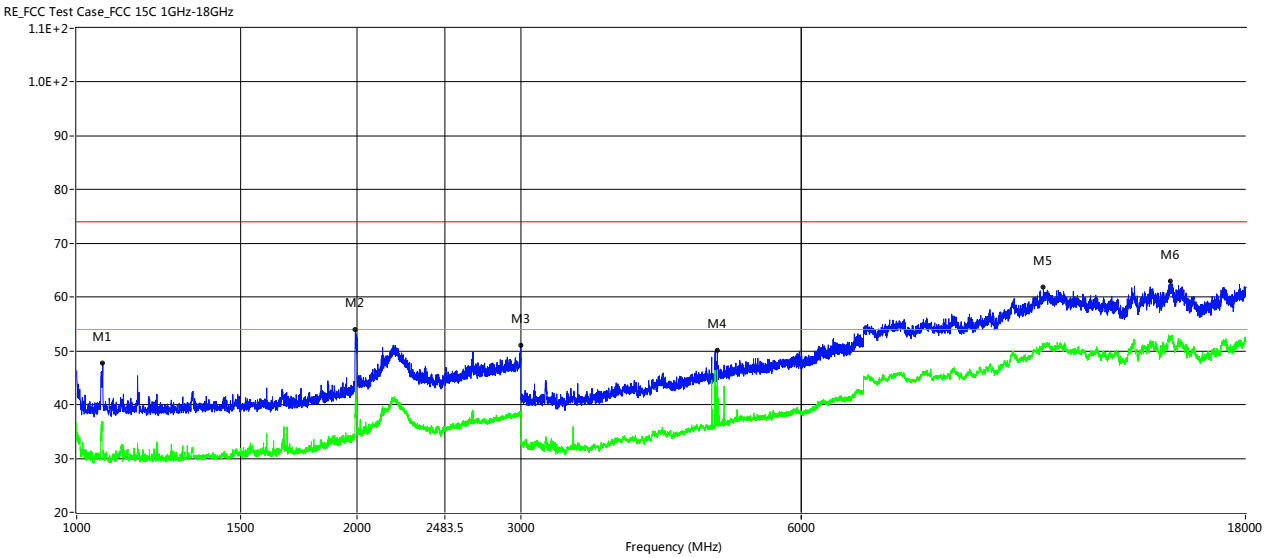
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1171.000	47.23	--	35.29	-1.03	68.20	--	54.0	-18.71	Vertical	Pass
2166.000	52.93	--	40.70	8.62	68.20	--	54.0	-13.30	Vertical	Pass
2661.000	52.63	--	38.86	6.08	68.20	--	54.0	-15.14	Vertical	Pass
3988.000	49.49	--	35.91	-8.21	68.20	--	54.0	-18.09	Vertical	Pass
8182.500	57.03	--	45.74	5.11	68.20	--	54.0	-8.26	Vertical	Pass
14958.500	63.10	--	52.73	12.39	68.20	--	54.0	-1.27	Vertical	Pass

Note: 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) all has been tested, the worst case is 802.11 n(HT20),only shown the worst case.

Band IV(5.725-5.850) GHz

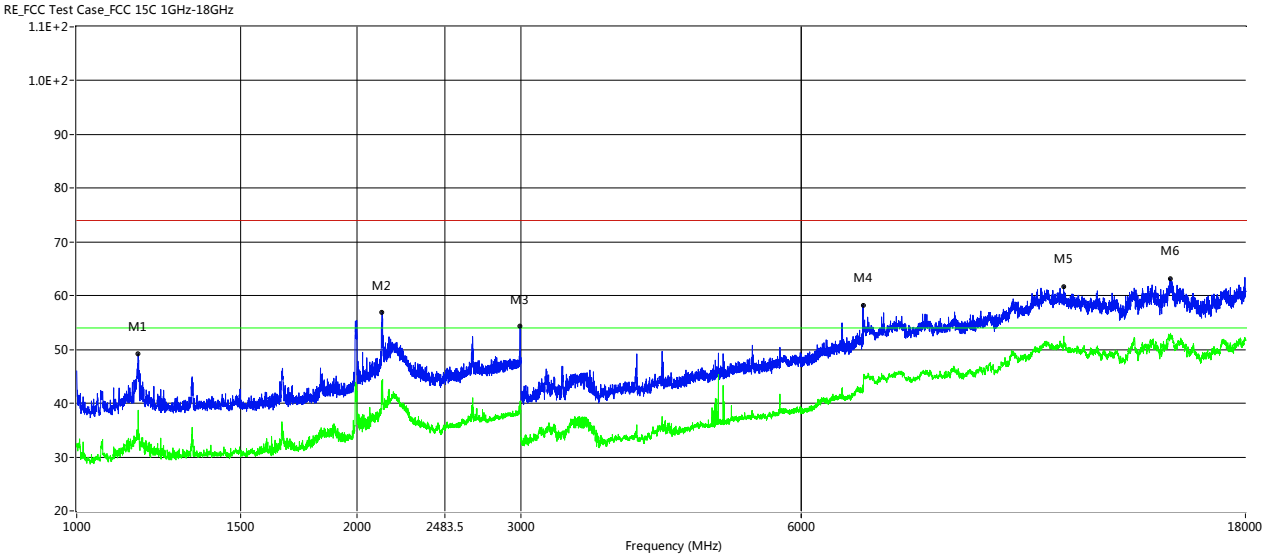
802.11 n(HT20)-Low

Horizontal



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1054.000	39.49	--	30.88	-1.54	68.20	--	54.0	-23.12	Horizontal	Pass
1992.000	53.97	--	41.68	2.57	68.20	--	54.0	-12.32	Horizontal	Pass
2999.000	51.08	--	38.54	8.14	68.20	--	54.0	-15.46	Horizontal	Pass
4877.000	50.10	--	46.48	-4.92	68.20	--	54.0	-7.52	Horizontal	Pass
10924.250	61.85	--	51.07	10.81	68.20	--	54.0	-2.93	Horizontal	Pass
14966.750	62.94	--	52.48	12.39	68.20	--	54.0	-1.52	Horizontal	Pass

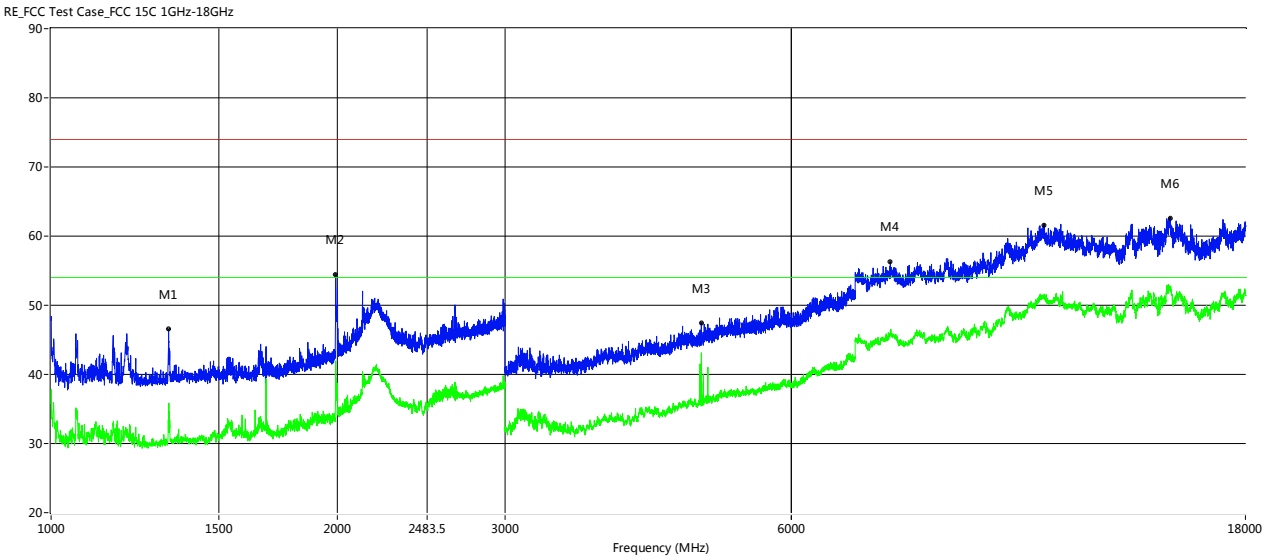
Vertical



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1164.000	49.23	--	38.72	-1.08	68.20	--	54.0	-15.28	Vertical	Pass
2128.500	56.97	--	41.82	6.77	68.20	--	54.0	-11.23	Vertical	Pass
2994.500	54.27	--	40.36	7.97	68.20	--	54.0	-13.64	Vertical	Pass
6991.000	58.26	--	43.46	2.29	68.20	--	54.0	-9.94	Vertical	Pass
11479.750	61.75	--	51.70	11.26	68.20	--	54.0	-2.30	Vertical	Pass
14942.000	63.24	--	52.03	12.38	68.20	--	54.0	-1.97	Vertical	Pass

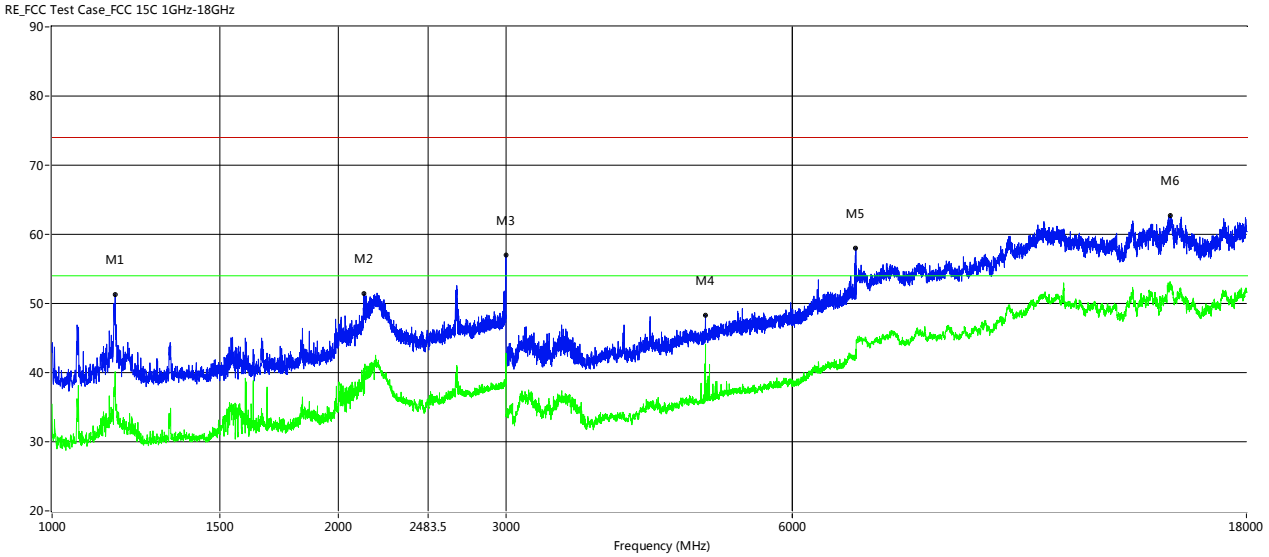
802.11 n(HT20)-Mid

Horizontal



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1329.000	46.52	--	33.17	-0.25	68.20	--	54.0	-20.83	Horizontal	Pass
1991.500	54.50	--	41.93	2.56	68.20	--	54.0	-12.07	Horizontal	Pass
4825.000	47.45	--	43.09	-5.47	68.20	--	54.0	-10.91	Horizontal	Pass
7624.250	56.26	--	45.80	5.16	68.20	--	54.0	-8.20	Horizontal	Pass
11059.000	61.59	--	51.59	10.83	68.20	--	54.0	-2.41	Horizontal	Pass
14997.000	62.63	--	52.48	12.39	68.20	--	54.0	-1.52	Horizontal	Pass

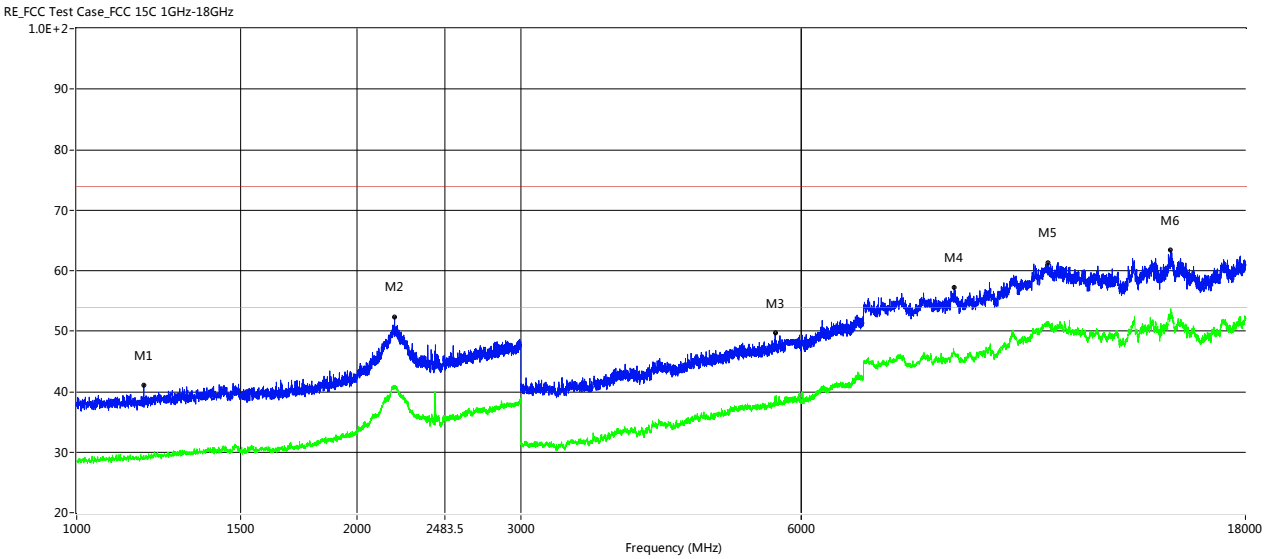
Vertical



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1165.000	51.31	--	40.14	-1.07	68.20	--	54.0	-13.86	Vertical	Pass
2157.500	53.74	--	40.31	8.01	68.20	--	54.0	-13.69	Vertical	Pass
2999.000	57.02	--	42.83	8.14	68.20	--	54.0	-11.17	Vertical	Pass
4861.000	48.27	--	44.11	-5.09	68.20	--	54.0	-9.89	Vertical	Pass
6995.000	58.04	--	43.38	2.29	68.20	--	54.0	-10.16	Vertical	Pass
14972.250	62.75	--	52.56	12.39	68.20	--	54.0	-1.44	Vertical	Pass

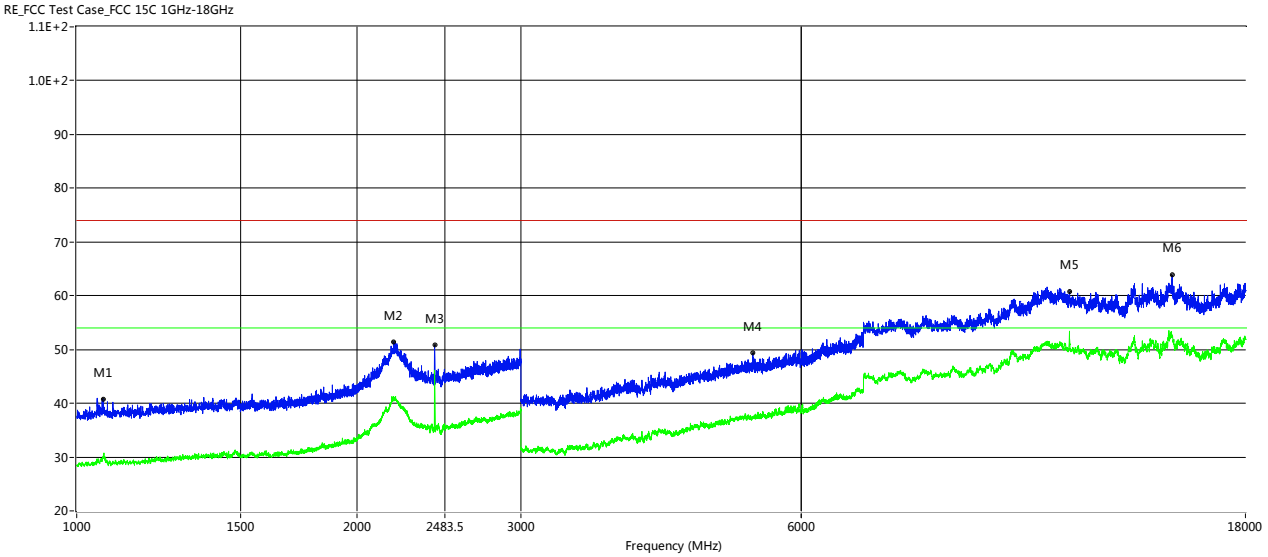
802.11 n(HT20)-High

Horizontal



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1180.500	41.03	--	29.46	-0.97	68.20	--	54.0	-24.54	Horizontal	Pass
2195.500	52.33	--	40.80	10.15	68.20	--	54.0	-13.20	Horizontal	Pass
5626.000	49.68	--	39.27	-2.61	68.20	--	54.0	-14.73	Horizontal	Pass
8760.001	57.20	--	46.36	5.52	68.20	--	54.0	-7.64	Horizontal	Pass
11045.250	61.23	--	51.35	10.89	68.20	--	54.0	-2.65	Horizontal	Pass
14966.750	63.35	--	52.56	12.39	68.20	--	54.0	-1.44	Horizontal	Pass

Vertical



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1067.500	40.84	--	30.15	-1.49	68.20	--	54.0	-23.85	Vertical	Pass
2189.000	51.44	--	40.67	10.10	68.20	--	54.0	-13.33	Vertical	Pass
2423.000	50.82	--	46.15	5.39	68.20	--	54.0	-7.85	Vertical	Pass
5324.000	49.35	--	37.47	-3.52	68.20	--	54.0	-16.53	Vertical	Pass
11650.250	60.69	--	53.41	10.82	68.20	--	54.0	-0.59	Vertical	Pass
15016.250	63.85	--	52.27	12.11	68.20	--	54.0	-1.73	Vertical	Pass

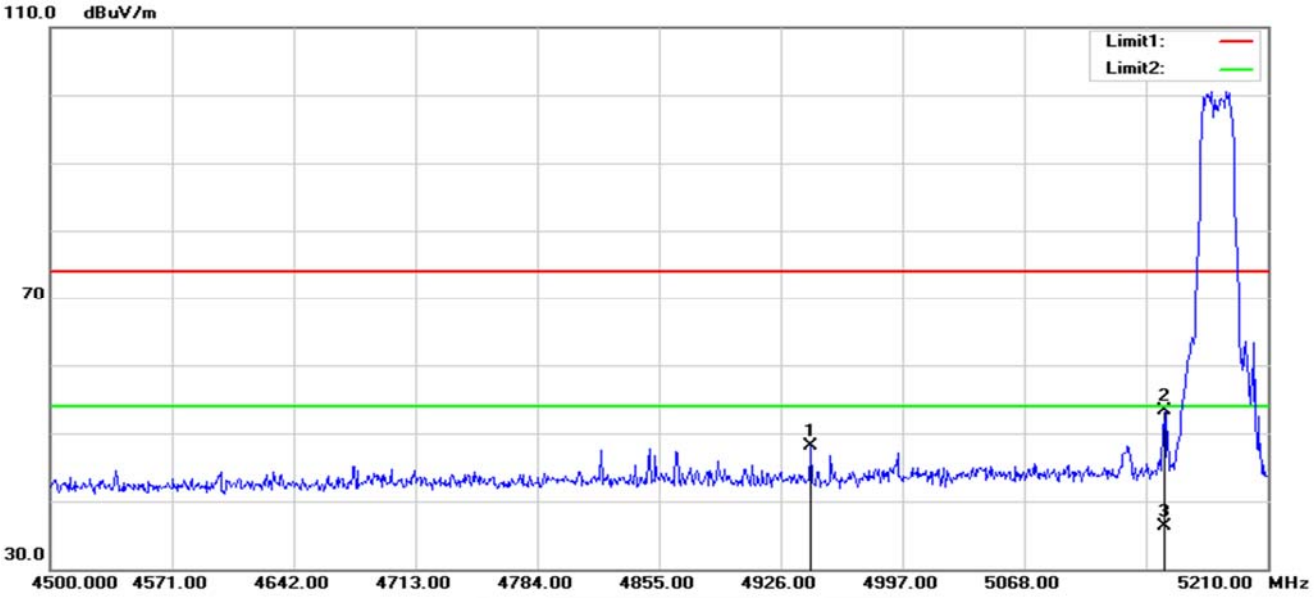
Note: 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) all has been tested, the worst case is 802.11 n(HT20),only shown the worst case.

3.2.9 Band Edge

Band I 5150-5250MHz

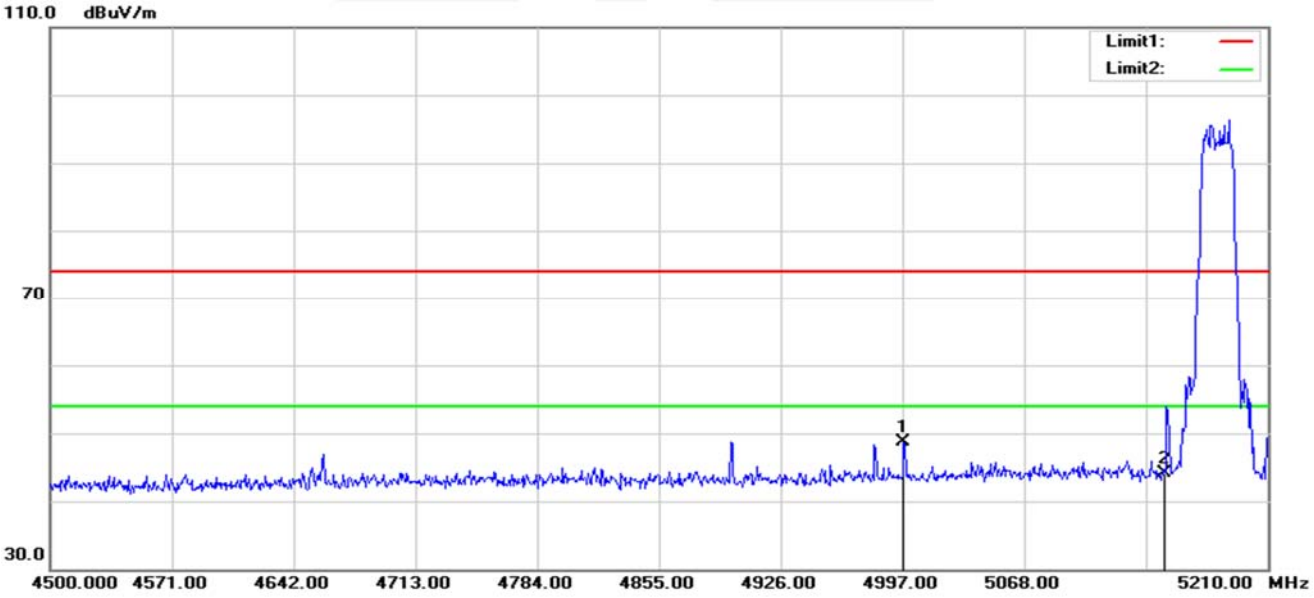
802.11n(HT20) Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4943.750	54.61	-6.55	48.06	74.00	-25.94	peak
2	5150.000	58.94	-5.73	53.21	74.00	-20.79	peak

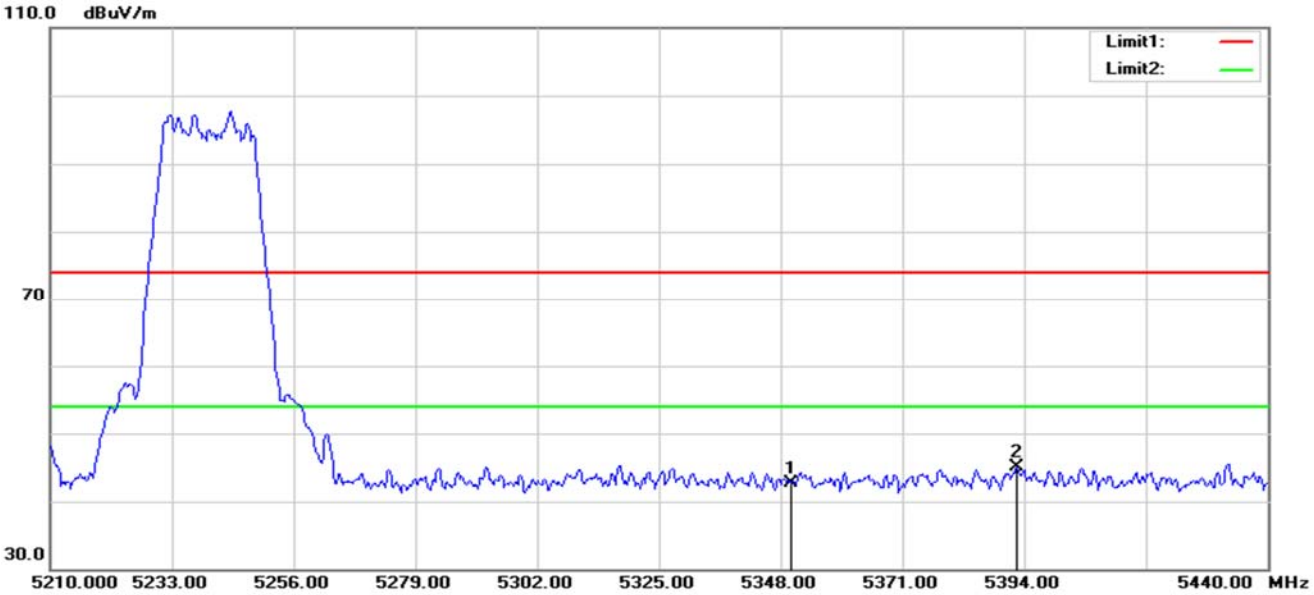
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4997.710	54.85	-6.20	48.65	74.00	-25.35	peak
2	5150.000	49.90	-5.73	44.17	74.00	-29.83	peak

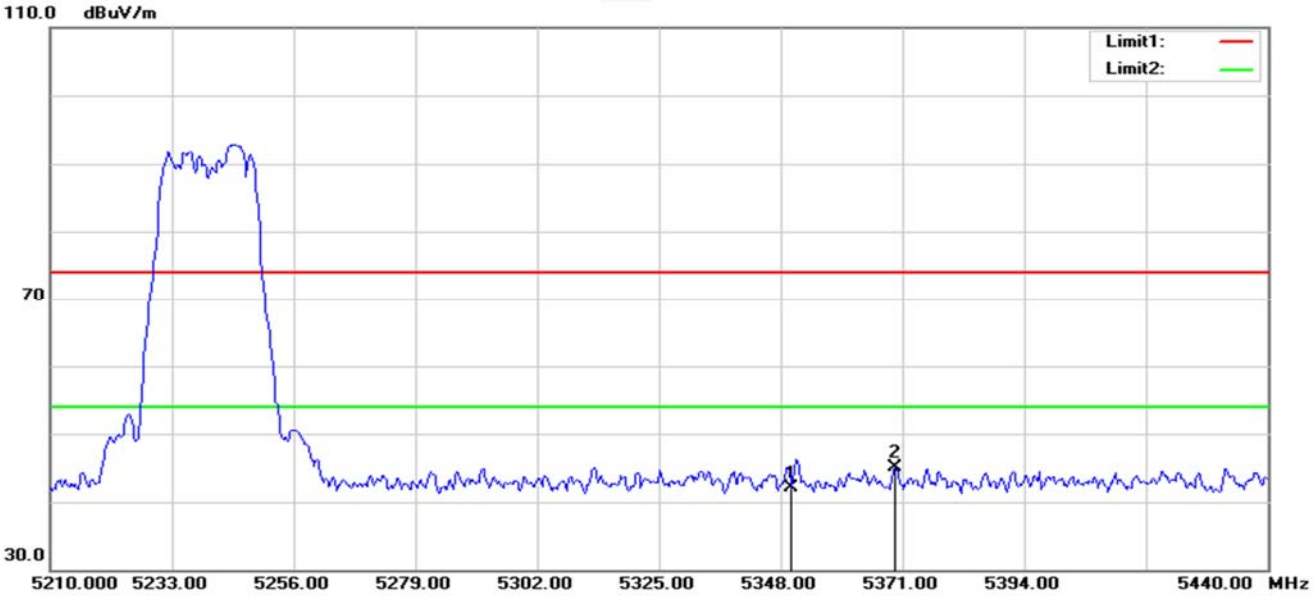
802.11n(HT20) High

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5350.000	48.00	-5.23	42.77	74.00	-31.23	peak
2	5392.620	50.31	-5.25	45.06	74.00	-28.94	peak

Vertical



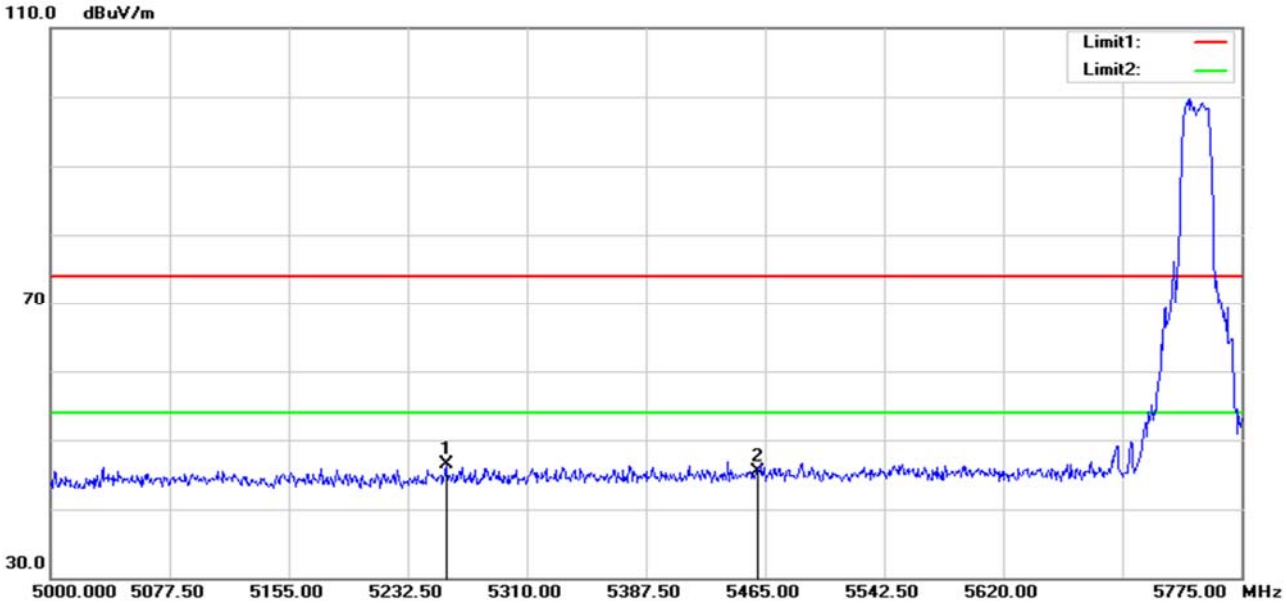
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5350.000	47.30	-5.23	42.07	74.00	-31.93	peak
2	5369.620	50.24	-5.23	45.01	74.00	-28.99	peak

Note: 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) all has been tested, the worst case is 802.11n(HT20),only shown the worst case.

Band IV(5.725-5.85 GHz)

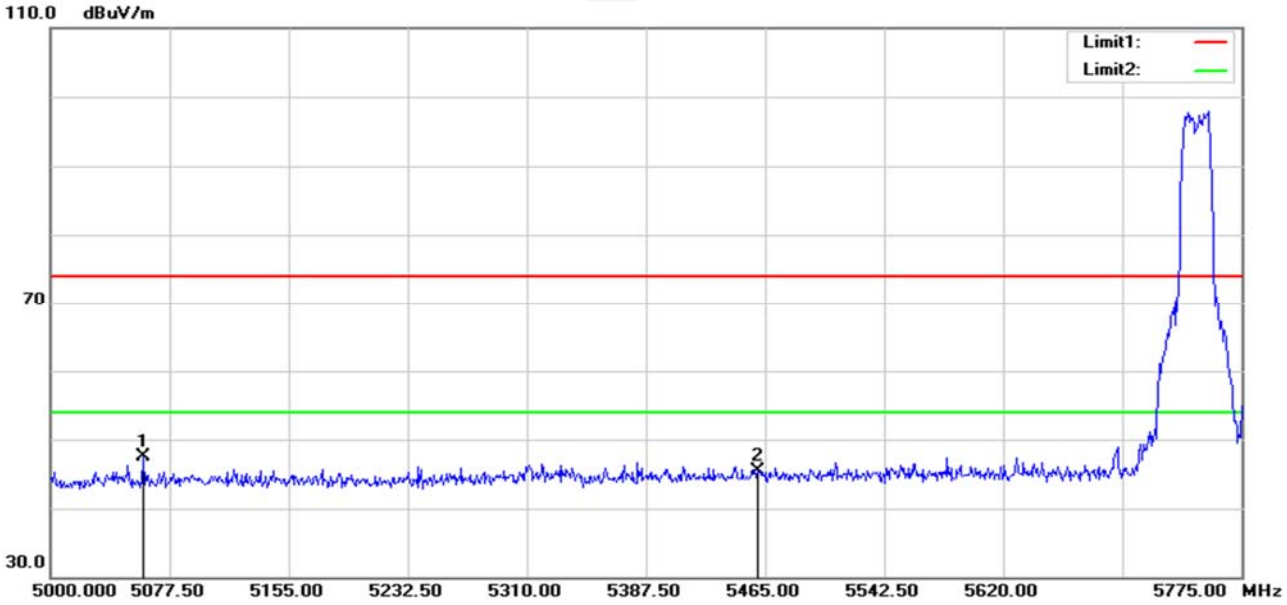
802.11n(HT20) Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5257.300	51.98	-5.43	46.55	74.00	-27.45	peak
2	5460.000	50.61	-5.11	45.50	74.00	-28.50	peak

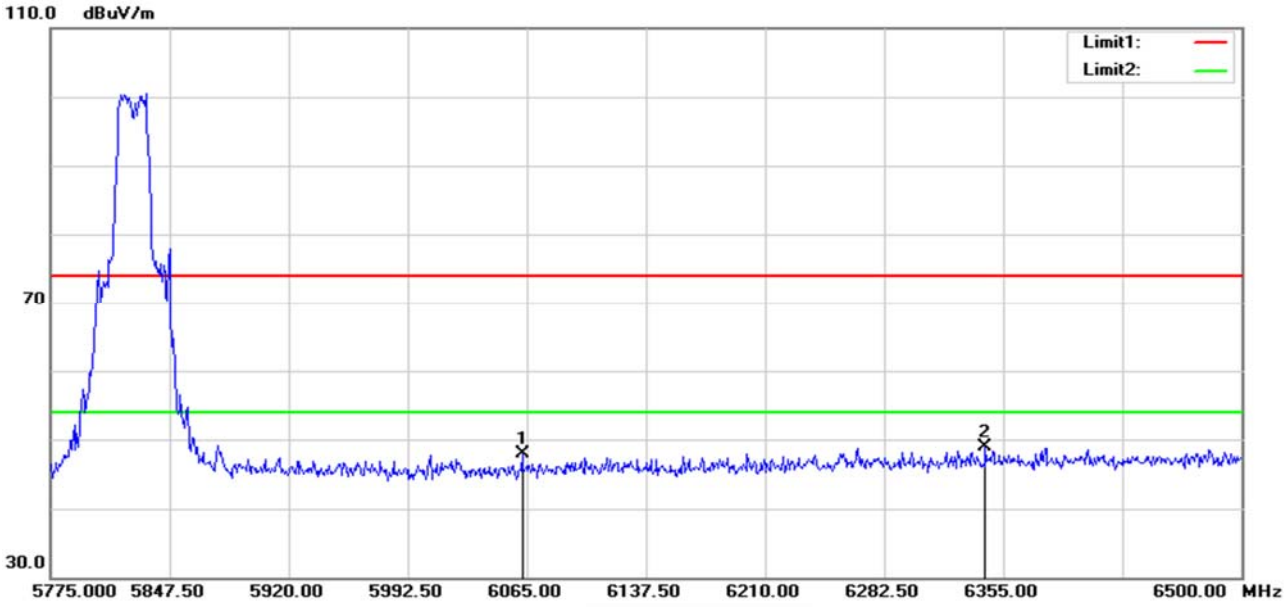
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5060.450	53.41	-5.92	47.49	74.00	-26.51	peak
2	5460.000	50.62	-5.11	45.51	74.00	-28.49	peak

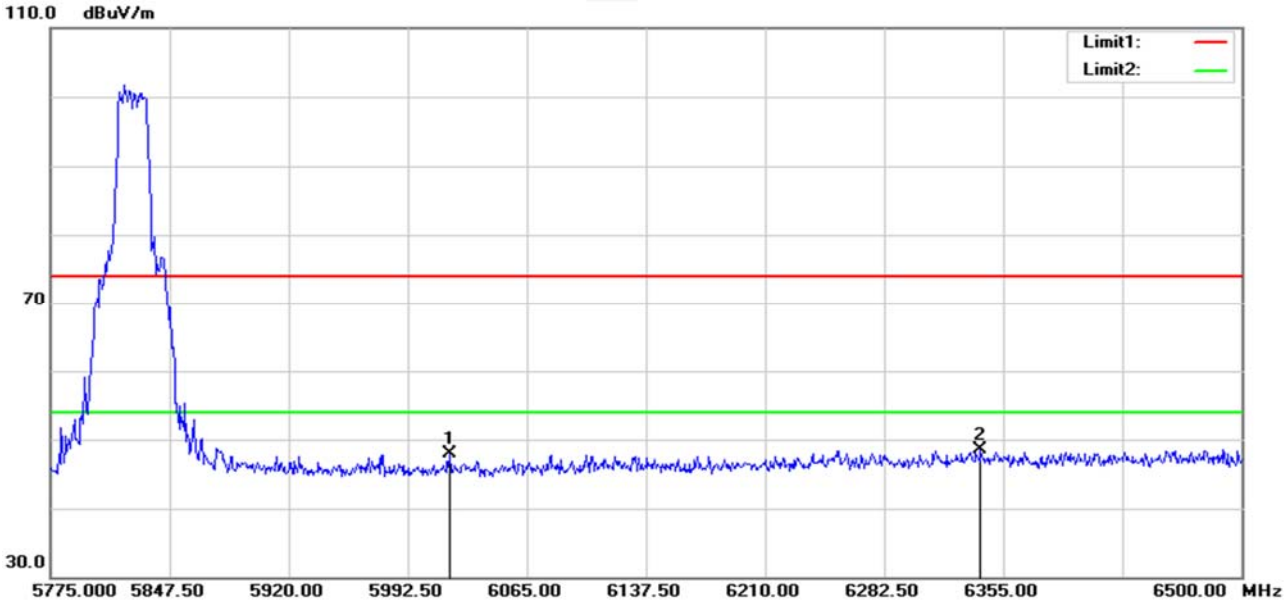
802.11n(HT20) High

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	6062.100	51.48	-3.61	47.87	74.00	-26.13	peak
2	6344.125	51.17	-2.34	48.83	74.00	-25.17	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	6017.875	51.78	-3.92	47.86	74.00	-26.14	peak
2	6341.225	50.94	-2.35	48.59	74.00	-25.41	peak

Note: 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) all has been tested, the worst case is 802.11n(HT20),only shown the worst case.

4. CONDUCTED SPURIOUS EMISSIONS AND BANDEDGE

4.1 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 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

(4) For transmitters operating 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.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	1000 KHz/3000 KHz
Trace-Mode:	Max hold

.

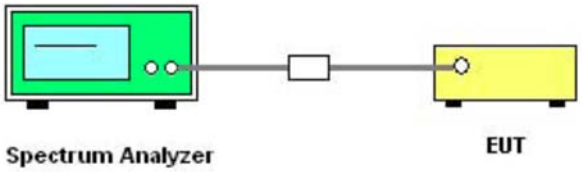
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 5700 to 5725 MHz Upper Band Edge: 5850 to 5870 MHz
RB / VB (emission in restricted band)	1000 KHz/3000 KHz
Trace-Mode:	Max hold

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.
Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1000 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

Data See Attachment A

5. POWER SPECTRAL DENSITY TEST

5.1 LIMIT

FCC:

1. For mobile and portable 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.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC:

1. For the 5.15-5.25 GHz, The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
3. The output 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 output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-pointoperations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information

5.2 TEST PROCEDURE

1. The setting follows Method SA-1 of KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

For devices operating in the band, 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 10 log (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 10 log (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 sections5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

5.5 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.

5.6 TEST RESULTS

5150-5250MHz			
Frequency	EIRP Power Density(dBm)	Limit	Result
802.11a			
5180	9.740	10	PASS
5200	9.424	10	PASS
5240	9.793	10	PASS
802.11n20			
5180	9.776	10	PASS
5200	9.781	10	PASS
5240	9.773	10	PASS
802.11n40			
5190	7.442	10	PASS
5230	7.367	10	PASS
802.11ac20			
5180	9.775	10	PASS
5200	9.454	10	PASS
5240	9.254	10	PASS
802.11ac40			
5190	7.874	10	PASS
5230	7.209	10	PASS
802.11ac80			
5210	3.770	10	PASS

5725-5850MHz			
Frequency	EIRP Power Density(dBm)	Limit	Result
802.11a			
5745	15.489	30	PASS
5785	15.072	30	PASS
5825	15.499	30	PASS
802.11n20			
5745	15.477	30	PASS
5785	15.336	30	PASS
5825	15.068	30	PASS
802.11n40			
5755	7.105	30	PASS
5795	6.751	30	PASS
802.11ac20			
5745	15.264	30	PASS
5785	15.418	30	PASS
5825	15.208	30	PASS
802.11ac40			
5755	13.287	30	PASS
5795	12.635	30	PASS
802.11ac80			
5775	2.943	30	PASS

Test plot see Attachment B

6. BANDWIDTH MEASUREMENT

6.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

See list of measuring instruments of this test report.

6.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > =RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak 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%.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

6.1.4 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.

6.1.5 TEST RESULTS

5150-5250MHz		
Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5180	21.53	Pass
5200	21.67	Pass
5240	21.60	Pass
802.11n(HT20)		
5180	21.72	Pass
5200	22.17	Pass
5240	21.98	Pass
802.11n(HT40)		
5180	42.66	Pass
5200	43.23	Pass
802.11ac(VHT20)		
5180	21.59	Pass
5200	21.58	Pass
5240	21.88	Pass
802.11ac(VHT40)		
5180	41.91	Pass
5200	42.15	Pass
802.11ac(VHT80)		
5210	82.19	Pass

5725-5850MHz		
Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	21.62	Pass
5785	21.65	Pass
5825	22.17	Pass
802.11n(HT20)		
5745	23.21	Pass
5785	22.00	Pass
5825	22.72	Pass
802.11n(HT40)		
5755	43.47	Pass
5795	43.69	Pass
802.11ac(VHT20)		
5745	21.70	Pass
5785	21.67	Pass
5825	21.65	Pass
802.11ac(VHT40)		
5755	43.36	Pass
5795	42.68	Pass
802.11ac(VHT80)		
5775	82.33	Pass

Test plot see Attachment C

6.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

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

6.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
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

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.

6.2.2 DEVIATION FROM STANDARD

No deviation.

6.2.3 TEST SETUP

6.2.4 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.

6.2.5 TEST RESULTS

5150-5250MHz		
Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5180	16.71	Pass
5200	16.72	Pass
5240	16.72	Pass
802.11n(HT20)		
5180	17.80	Pass
5200	17.81	Pass
5240	17.82	Pass
802.11n(HT40)		
5180	36.14	Pass
5200	36.11	Pass
802.11ac(VHT20)		
5180	17.80	Pass
5200	17.80	Pass
5240	17.84	Pass
802.11ac(VHT40)		
5180	36.13	Pass
5200	36.19	Pass
802.11ac(VHT80)		
5210	74.72	Pass

5725-5850MHz		
Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.72	Pass
5785	16.73	Pass
5825	16.76	Pass
802.11n(HT20)		
5745	17.81	Pass
5785	17.84	Pass
5825	17.81	Pass
802.11n(HT40)		
5755	36.16	Pass
5795	36.13	Pass
802.11ac(VHT20)		
5745	17.83	Pass
5785	17.81	Pass
5825	17.81	Pass
802.11ac(VHT40)		
5755	36.18	Pass
5795	36.16	Pass
802.11ac(VHT80)		
5775	74.69	Pass

Test plot See Attachment C

6.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

The minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

6.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3.2 DEVIATION FROM STANDARD

No deviation.

6.3.3 TEST SETUP

6.3.4 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.

6.3.5 TEST RESULTS

5725-5850MHz		
Frequency (MHz)	6dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.38	Pass
5785	13.38	Pass
5825	16.39	Pass
802.11n(HT20)		
5745	17.59	Pass
5785	17.61	Pass
5825	17.61	Pass
802.11n(HT40)		
5755	35.16	Pass
5795	35.16	Pass
802.11ac(VHT20)		
5745	17.61	Pass
5785	17.59	Pass
5825	17.59	Pass
802.11ac(VHT40)		
5755	35.36	Pass
5795	35.17	Pass
802.11ac(VHT80)		
5775	75.04	Pass

Test plot see Attachment D

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz,If transmitting antennas of directional gain greater than 6 dBi are used.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used.

<table>
<tr><td colspan="5">FCC Part15 (15.407) , Subpart E</td></tr>
<tr><td>Section</td><td>Test Item</td><td>Limit</td><td>Frequency Range (MHz)</td><td>Result</td></tr>
<tr><td rowspan="2">15.407(a) (1) (iv)</td><td rowspan="3">Peak Output Power</td><td>0.25 watt</td><td>5150-5250</td><td rowspan="3">PASS</td></tr>
<tr><td>The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)</td><td>5250-5350
5470-5725</td></tr>
<tr><td>15.407(a) (3)</td><td>1 watt</td><td>5725-5825</td></tr>
</table>

1. For devices in the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
3. The maximum conducted output power shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-pointoperations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information

RSS-247 Issue 2, February 2017				
Section	Test Item	Limit	Frequency Range (MHz)	Result
6.2.1.1	Peak Output Power	200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz	5150-5250	PASS
6.2.2.1 6.2.3.1		The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)	5250-5350 5470-5725	
6.2.4.1		1 watt	5725-5825	

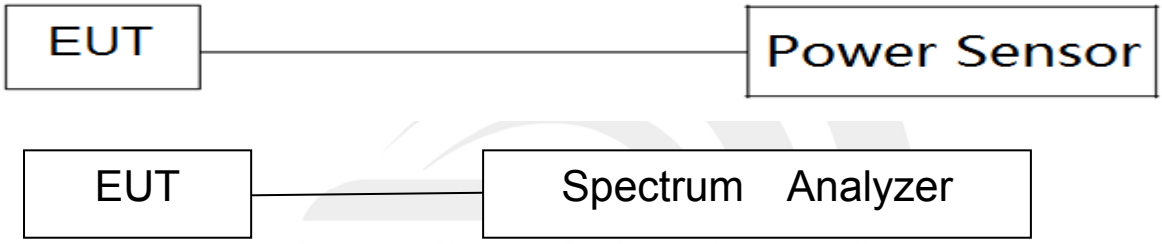
7.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

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 5 Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULTS

Band I (5.15-5.25GHz)

Band I (5.15-5.25GHz)			
Test Channel	Frequency (MHz)	AV Power (dBm)	LIMIT (dBm)
802.11a			
36	5180	8.39	23.98
40	5200	8.42	23.98
48	5240	8.23	23.98
802.11n(HT20)			
36	5180	8.41	23.98
40	5200	8.47	23.98
48	5240	8.25	23.98
802.11n(HT40)			
38	5190	7.94	23.98
46	5230	7.73	23.98
802.11ac(HT20)			
36	5180	8.28	23.98
40	5200	8.29	23.98
48	5240	8.06	23.98
802.11ac(HT40)			
38	5190	7.70	23.98
46	5230	7.41	23.98
802.11ac(HT80)			
42	5210	7.21	23.98

Note:

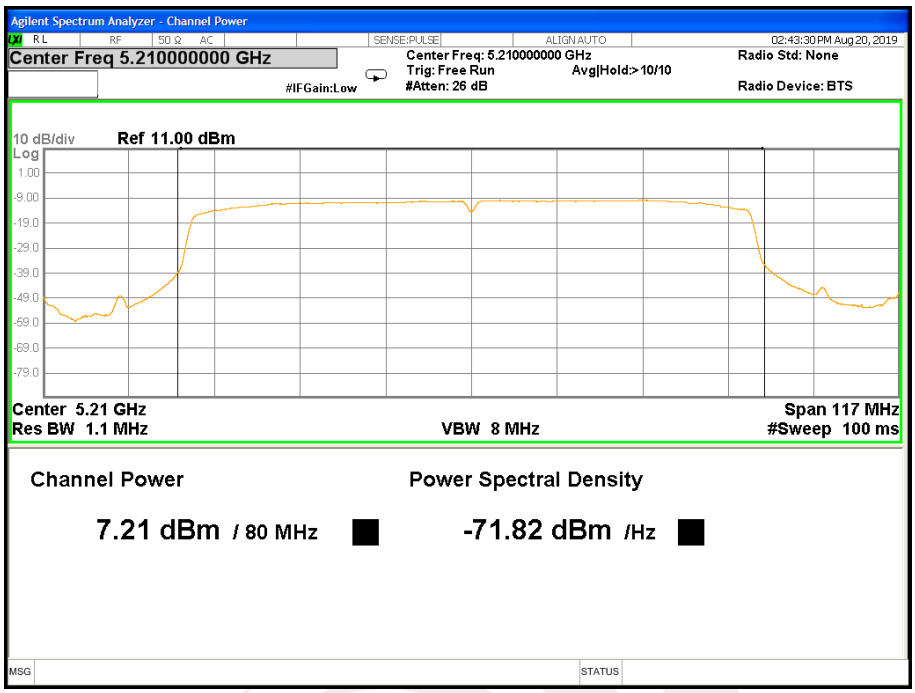
1. For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.

Band I (5.15-5.25GHz)					
Test Channel	Frequency (MHz)	AV Power (dBm)	Antenna Gain(dBi)	EIRP Power(dBm)	LIMIT (dBm)
802.11a					
36	5180	8.39	4.7	13.09	23.01
40	5200	8.42	4.7	13.12	23.01
48	5240	8.23	4.7	12.93	23.01
802.11n(HT20)					
36	5180	8.41	4.7	13.11	23.01
40	5200	8.47	4.7	13.17	23.01
48	5240	8.25	4.7	12.95	23.01
802.11n(HT40)					
38	5190	7.94	4.7	12.64	23.01
46	5230	7.73	4.7	12.43	23.01
802.11ac(HT20)					
36	5180	8.28	4.7	12.98	23.01
40	5200	8.29	4.7	12.99	23.01
48	5240	8.06	4.7	12.76	23.01
802.11ac(HT40)					
38	5190	7.70	4.7	12.40	23.01
46	5230	7.41	4.7	12.11	23.01
802.11ac(HT80)					
42	5210	7.21	4.7	11.91	23.01

Note:

1. For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW.

802.11ac HT80(5210MHz)



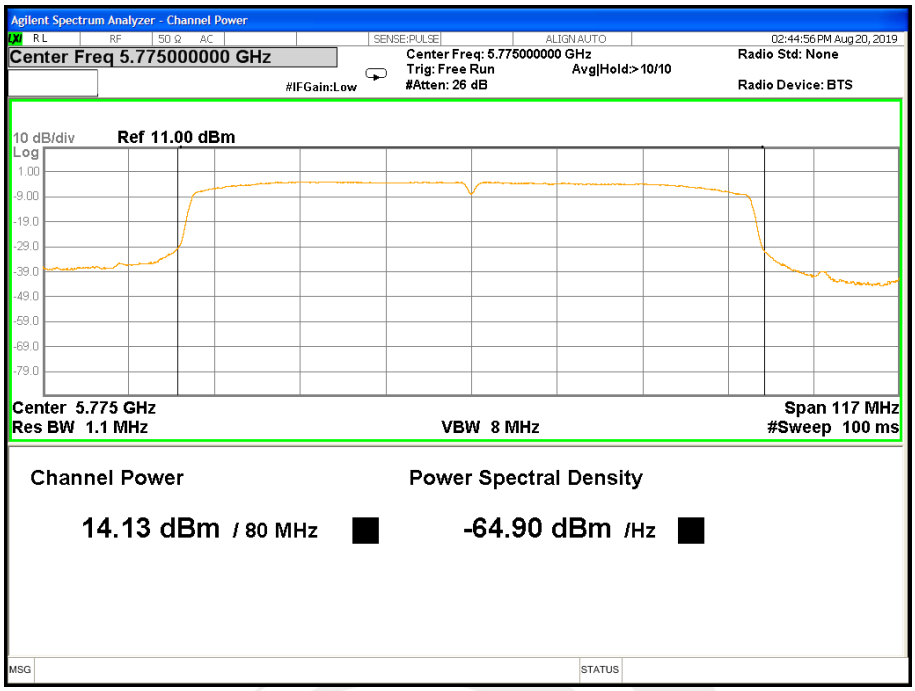
Band IV (5.725-5.85GHz)

Band IV (5.725-5.85GHz)			
Test Channel	Frequency (MHz)	AV Power (dBm)	LIMIT (dBm)
802.11a			
149	5745	16.23	30
157	5785	16.30	30
165	5825	16.78	30
802.11n(HT20)			
149	5745	16.25	30
157	5785	16.29	30
165	5825	16.83	30
802.11n(HT40)			
151	5755	16.01	30
159	5795	15.88	30
802.11ac(HT20)			
149	5745	16.06	30
157	5785	16.02	30
165	5825	16.65	30
802.11ac(HT40)			
151	5755	15.63	30
159	5795	15.65	30
802.11ac(HT80)			
155	5775	14.13	30

Note:

1. For the band 5.745-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W.

802.11ac HT80(5775MHz)



8. AUTOMATICALLY DISCONTINUE TRANSMISSION

8.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

8.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission

9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

15.203 and RSS-Gen Issue 5 requirement: For intentional device, according to 15.203 and RSS-Gen Issue 5: 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.

9.2 EUT ANTENNA

The EUT antenna is Ceramic Antenna. It comply with the standard requirement.

10. FREQUENCY STABILITY

10.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/-0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage,and for a variation in primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees.

10.2 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize,turn the EUT on and measure the operating frequency after 2,5,and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes.The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

10.3 TEST RESULT

Channel 40 (5200MHz)

Voltage vs. Frequency Stability

Voltage(V)	Measurement Frequency(MHz)
AC 138V/60Hz	5200.0032
AC 120V/60Hz	5200.0024
AC 102V/60Hz	5200.0022
Max.Deviation(MHz)	0.0032
Max.Deviation(ppm)	0.62

Rated working voltage: AC 120V/60Hz

Temperature vs. Frequency Stability

Temperature(℃)	Measurement Frequency(MHz)
-30	5200.0039
-20	5200.0030
-10	5200.0036
0	5200.0036
10	5200.0030
20	5200.0037
30	5200.0030
40	5200.0033
50	5200.0033
Max.Deviation(MHz)	0.0039
Max.Deviation(ppm)	0.75

Channel 157 (5785MHz)

Voltage vs. Frequency Stability

Voltage(V)	Measurement Frequency(MHz)
AC 138V/60Hz	5785.0029
AC 120V/60Hz	5785.0027
AC 102V/60Hz	5785.0021
Max.Deviation(MHz)	0.0029
Max.Deviation(ppm)	0.50

Rated working voltage: AC 120V/60Hz

Temperature vs. Frequency Stability

Temperature(℃)	Measurement Frequency(MHz)
-30	5785.0033
-20	5785.0033
-10	5785.0029
0	5785.0026
10	5785.0033
20	5785.0029
30	5785.0024
40	5785.0028
50	5785.0024
Max.Deviation(MHz)	0.0033
Max.Deviation(ppm)	0.57

APPENDIX - PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※