RADIO TEST REPORT

Report No.:STS2005025W02

Issued for

Justice Tech Solutions, LLC

13530 Fifth Street, Chino, CA 91710 United States

Product Name:	Securebook 5.0
Brand Name:	Justice Tech Solutions
Model Name:	JTS-SD50W
Series Model:	JTS-SDB50W
FCC ID:	2AS4KJTS-SD50W
Test Standard:	FCC Part 15.407

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

TEST RESULT CERTIFICATION

Applicant's Name	:	Justice Tech Solutions, LLC
Address	:	13530 Fifth Street, Chino, CA 91710 United States
Manufacture's Name	:	Justice Tech Solutions, LLC
Address	:	13530 Fifth Street, Chino, CA 91710 United States

Product Description

Product Name	:	Securebook 5.0
Brand Name	:	Justice Tech Solutions
Model Name	:	JTS-SD50W
Series Model	:	JTS-SDB50W
Test Standards	:	FCC Part15.407
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 requirements. And it is applicable only to the tested sample identified in the report.
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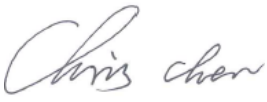
Date of Test	:	
Date of receipt of test item	:	18 May 2020
Date (s) of performance of tests	:	18 May 2020 ~ 27 May 2020
Date of Issue	:	28 May 2020
Test Result	:	**Pass**

Testing Engineer : 

(Chris Chen)

Technical Manager : 

(Sean she)

Authorized Signatory : 

(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	28 May 2020	STS2005025W02	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		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
§ 15.407 (2) (26 dB) / § 15.407 (e) (6 dB)/ § 15.407 (a) (99%)	26dB/6dB &99% Bandwidth	PASS
15.407(a) (1).(2).(3).(4).(5)	Maximum Conducted Output Power	PASS
15.407(b)& 15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(b)7	Conducted Emission And (bandedge Emissions) Measurement	PASS
15.407(a) (1).(2).(3).(4).(5)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	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	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 30-1GHz	±6.7dB
4	All emissions, radiated 1G-6GHz	±5.5dB
5	All emissions, radiated>6G	±5.8dB
6	Conducted Emission (9KHz-150KHz)	±4.43dB
7	Conducted Emission (150KHz-30MHz)	±5dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

<table>
<tr><td>Product Name</td><td>Securebook 5.0</td></tr>
<tr><td>Trade Name</td><td>Justice Tech Solutions</td></tr>
<tr><td>Model Name</td><td>JTS-SD50W</td></tr>
<tr><td>Series Model</td><td>JTS-SDB50W</td></tr>
<tr><td>Model Difference</td><td>JTS-SDB50W: remove the USB, HDMI, RJ45 connectors</td></tr>
<tr><td>Product Description</td><td>The EUT is a Securebook 5.0
<table>
<tr><td rowspan="4">Operation Frequency:</td><td>IEEE 802.11a/ n(HT20)/ac(VHT20): 5.180GHz-5.240GHz
IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.310GHz
IEEE 802.11ac(VHT80): 5.210GHz</td></tr>
<tr><td>IEEE 802.11a/ n(HT20)/ac(VHT20): 5.260GHz-5.320GHz
IEEE 802.11n(HT40)/ac(VHT40): 5.270GHz-5.310GHz
IEEE 802.11ac(VHT80): 5.290GHz</td></tr>
<tr><td>IEEE 802.11a/ n(HT20)/ac(VHT20): 5.500GHz-5.700GHz
IEEE 802.11n(HT40)/ac(VHT40): 5.510GHz-5.670GHz
IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz</td></tr>
<tr><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>Please refer to the Note 3.</td></tr>
<tr><td>Max.Output Power(Conducted):</td><td>13.50dBm</td></tr>
</table>
More details of EUT technical specification, please refer to the User Manual.</td></tr>
<tr><td>Test Channel</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Adapter</td><td>1. SOY-1200300US-214
Input: AC100-240V~50/60Hz 1.5A Max
Output: DC 12V/3A
2. JHD-AP045U-120300-AS
Input: AC100-240V~50/60Hz,1.5A
Output: DC 12V/3A</td></tr>
<tr><td>Hardware version number</td><td>N/A</td></tr>
<tr><td>Software version number</td><td>N/A</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the Note 1.</td></tr>
</table>

Note:

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

2.

Operation Frequency of channel			
5.180GHz-5.240GHz		5.500GHz-5.720GHz	
Channel	Frequency	Channel	Frequency
36	5180	100	5500
38	5190	102	5510
40	5200	104	5520
42	5210	106	5530
44	5220	108	5540
46	5230	110	5550
48	5240	112	5560
		118	116
5.260GHz-5.320GHz		120	118
Channel	Frequency	120	5600
52	5260	124	5620
54	5270	126	5630
56	5280	128	5640
58	5290	132	5660
60	5300	134	5670
62	5310	136	5680
64	5320	140	5700
5.745GHz-5.825GHz			
Channel	Frequency		
149	5745		
151	5755		
153	5765		
157	5785		
159	5795		
161	5805		
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	52	5260
40	5200	60	5300
48	5240	64	5320

For 802.11a/n(HT20) /ac (VHT20)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
100	5500	149	5745
116	5580	157	5785
140	5700	165	5825

For 802.11n(HT40) /ac (VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
38	5190	54	5270
46	5230	62	5310

For 802.11n(HT40) /ac (VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
102	5510	151	5755
110	5550	159	5795
134	5670		

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

For 802.11ac (VHT80)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
106	5530	155	5775
122	5610		

3.

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	Justice Tech Solutions	JTS-SD50W	PIFA	N/A	1.5dBi	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 CH52&CH60&CH64	6 Mbps
Mode 3	TX IEEE 802.11a HT20 CH100&CH116&CH140	6 Mbps
Mode 4	TX IEEE 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 5	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 6	TX IEEE 802.11ac HT20 CH36&CH40&CH48	NSS1 MCS0
Mode 7	TX IEEE 802.11n HT20 CH52&CH60&CH64	MCS 0
Mode 8	TX IEEE 802.11ac HT20 CH52&CH60&CH64	NSS1 MCS0
Mode 9	TX IEEE 802.11n HT20 CH100&CH116&CH140	MCS 0
Mode 10	TX IEEE 802.11ac HT20 CH100&CH116&CH140	NSS1 MCS0
Mode 11	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 12	TX IEEE 802.11ac HT20 CH149&CH157&CH165	NSS1 MCS0
Mode 13	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 14	TX IEEE 802.11ac HT40 CH38&CH46	NSS1 MCS0
Mode 15	TX IEEE 802.11n HT40 CH54 &CH62	MCS 0
Mode 16	TX IEEE 802.11ac HT40 CH54 &CH62	NSS1 MCS0
Mode 17	TX IEEE 802.11n HT40 CH102&CH110&CH134	MCS 0
Mode 18	TX IEEE 802.11ac HT40 CH102&CH110&CH134	NSS1 MCS0
Mode 19	TX IEEE 802.11n HT40 CH151&CH159	MCS 0
Mode 20	TX IEEE 802.11ac HT40 CH151&CH159	NSS1 MCS0
Mode 21	TX IEEE 802.11ac HT80 CH42	NSS1 MCS0
Mode 22	TX IEEE 802.11ac HT80 CH58	NSS1 MCS0
Mode 23	TX IEEE 802.11ac HT80 CH106&122	NSS1 MCS0
Mode 24	TX IEEE 802.11ac HT80 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 25: Keeping TX + WLAN Link

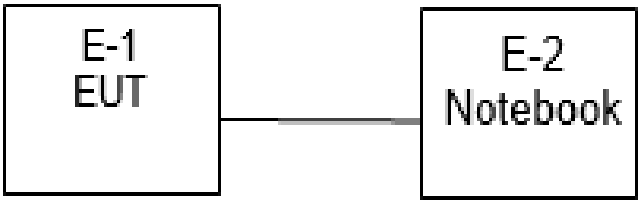
2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

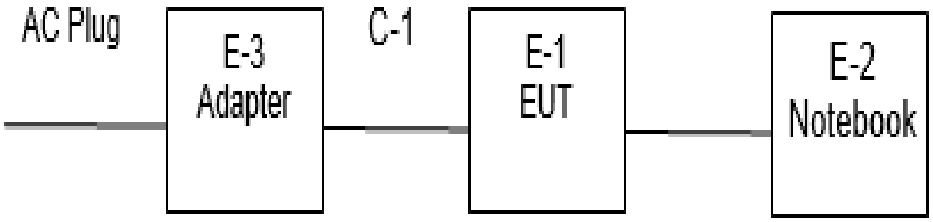
RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
WIFI(5G)	5G WIFI Band1 (5150MHz-5250MHz)	802.11a	1.5	0	MT76xxU.exe
		802.11n(HT20)		6	
		802.11n(HT40)		7	
		802.11ac(VHT20)		6	
		802.11ac(VHT40)		7	
		802.11ac(VHT80)		4	
	5G WIFI Band2 (5250MHz-5350MHz)	802.11a	1.5	6	
		802.11n(HT20)		5	
		802.11n(HT40)		6	
		802.11ac(VHT20)		5	
		802.11ac(VHT40)		6	
		802.11ac(VHT80)		5	
	5G WIFI Band3 (5470MHz-5725MHz)	802.11a	1.5	3	
		802.11n(HT20)		3	
		802.11n(HT40)		4	
		802.11ac(VHT20)		3	
		802.11ac(VHT40)		4	
		802.11ac(VHT80)		1	
	5G WIFI Band4 (5725MHz-5875MHz)	802.11a	1.5	4	
		802.11n(HT20)		5	
		802.11n(HT40)		6	
		802.11ac(VHT20)		5	
		802.11ac(VHT40)		6	
		802.11ac(VHT80)		2	

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



Conducted Emission Test



Note: JTS-SD50W and JTS-SDB50W has been tested, the report only shows worst data, and JTS-SD50W is worst.

2.5 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	No	SOY-1200300US-214	N/A	N/A
C-1	DC Cable	N/A	110cm	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	Justice Tech Solutions	JTS-SB50	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.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
Signal Analyzer	Agilent	N9020A	MY51110105	2020.03.05	2021.03.04
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
Horn Antenna (18-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier (18G-40G)	SKET	LNPA_1840-50	SK2018101801	2019.10.22	2020.10.21
Spectrum Analyzer	R&S	FSV40-N	101823	2019.06.05	2020.06.04
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2019.10.09	2020.10.08
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2019.10.12	2020.10.11
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
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	2019.10.09	2020.10.08
LISN	EMCO	3810/2NM	23625	2019.10.09	2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
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	2019.10.09	2020.10.08
Signal Analyzer	Agilent	N9020A	MY49100060	2019.10.09	2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
Test SW	FARAD	LZ-RF /LzRf-3A3			

3. EMC EMISSION TEST

3.1CONDUCTED 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

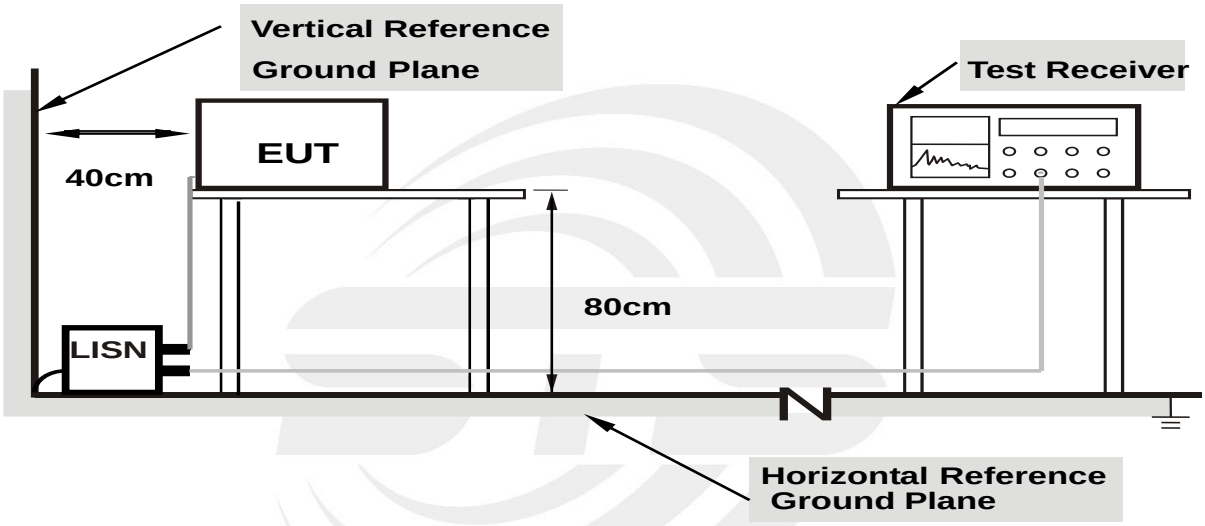
3.1.2 TEST PROCEDURE

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

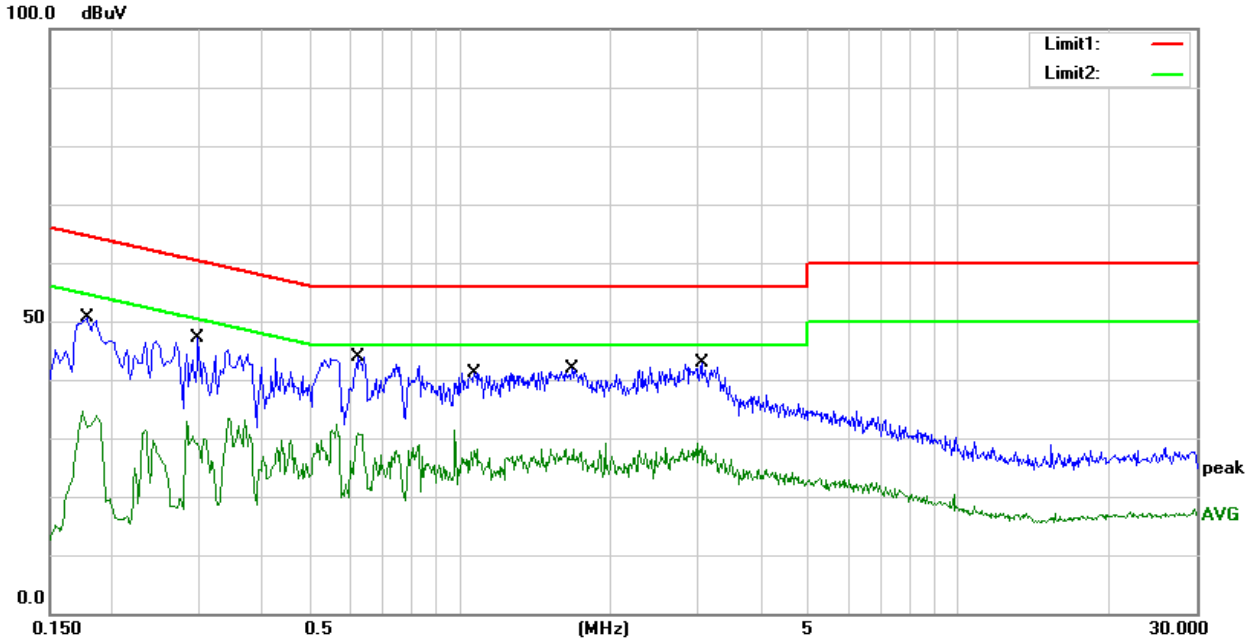
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

Temperature:	26.2(C)	Relative Humidity:	64%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode：	Mode 25	Power supply model:	SOY-1200300US-214

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1780	30.36	20.23	50.59	64.58	-13.99	QP
2	0.1780	11.94	20.23	32.17	54.58	-22.41	AVG
3	0.2980	26.53	20.71	47.24	60.30	-13.06	QP
4	0.2980	6.56	20.71	27.27	50.30	-23.03	AVG
5	0.6260	23.58	20.34	43.92	56.00	-12.08	QP
6	0.6260	10.32	20.34	30.66	46.00	-15.34	AVG
7	1.0660	20.95	20.15	41.10	56.00	-14.90	QP
8	1.0660	5.24	20.15	25.39	46.00	-20.61	AVG
9	1.6780	21.87	20.10	41.97	56.00	-14.03	QP
10	1.6780	7.58	20.10	27.68	46.00	-18.32	AVG
11	3.0540	22.78	19.98	42.76	56.00	-13.24	QP
12	3.0540	7.84	19.98	27.82	46.00	-18.18	AVG

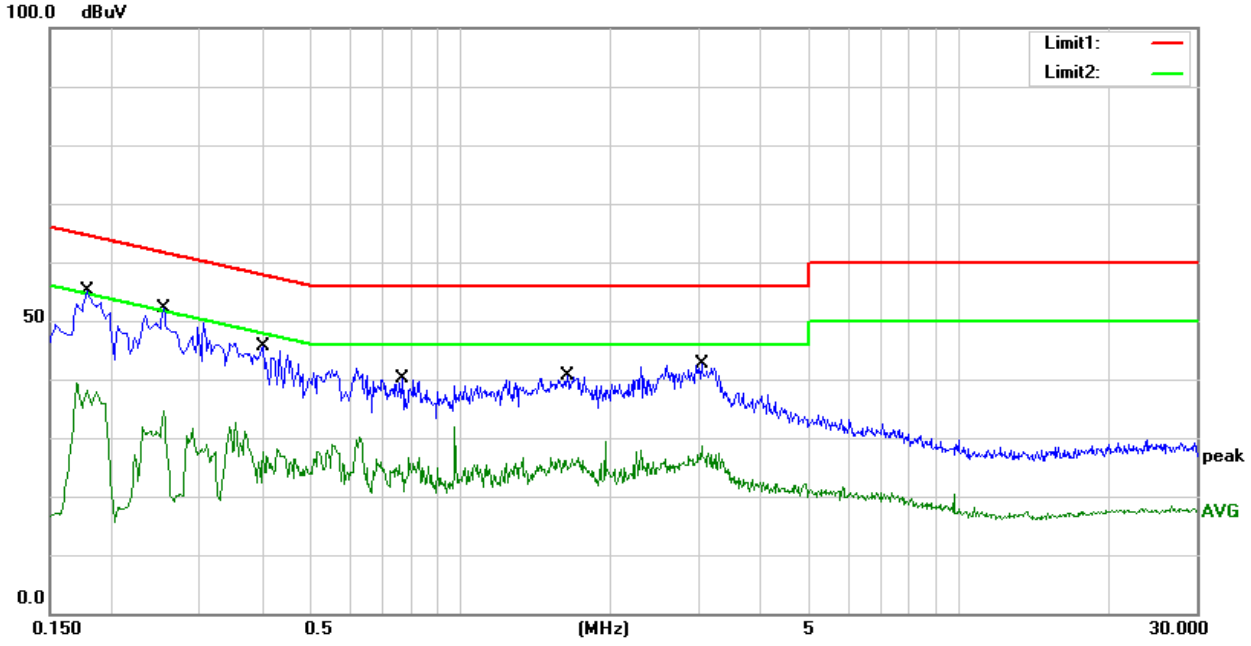
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	26.2(C)	Relative Humidity:	64%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 25	Power supply model:	SOY-1200300US-214

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1780	34.87	20.23	55.10	64.58	-9.48	QP
2	0.1780	16.33	20.23	36.56	54.58	-18.02	AVG
3	0.2540	31.67	20.49	52.16	61.63	-9.47	QP
4	0.2540	10.19	20.49	30.68	51.63	-20.95	AVG
5	0.4020	25.06	20.49	45.55	57.81	-12.26	QP
6	0.4020	7.12	20.49	27.61	47.81	-20.20	AVG
7	0.7660	19.85	20.24	40.09	56.00	-15.91	QP
8	0.7660	6.28	20.24	26.52	46.00	-19.48	AVG
9	1.6380	20.49	20.10	40.59	56.00	-15.41	QP
10	1.6380	5.19	20.10	25.29	46.00	-20.71	AVG
11	3.0500	22.54	19.98	42.52	56.00	-13.48	QP
12	3.0500	6.92	19.98	26.90	46.00	-19.10	AVG

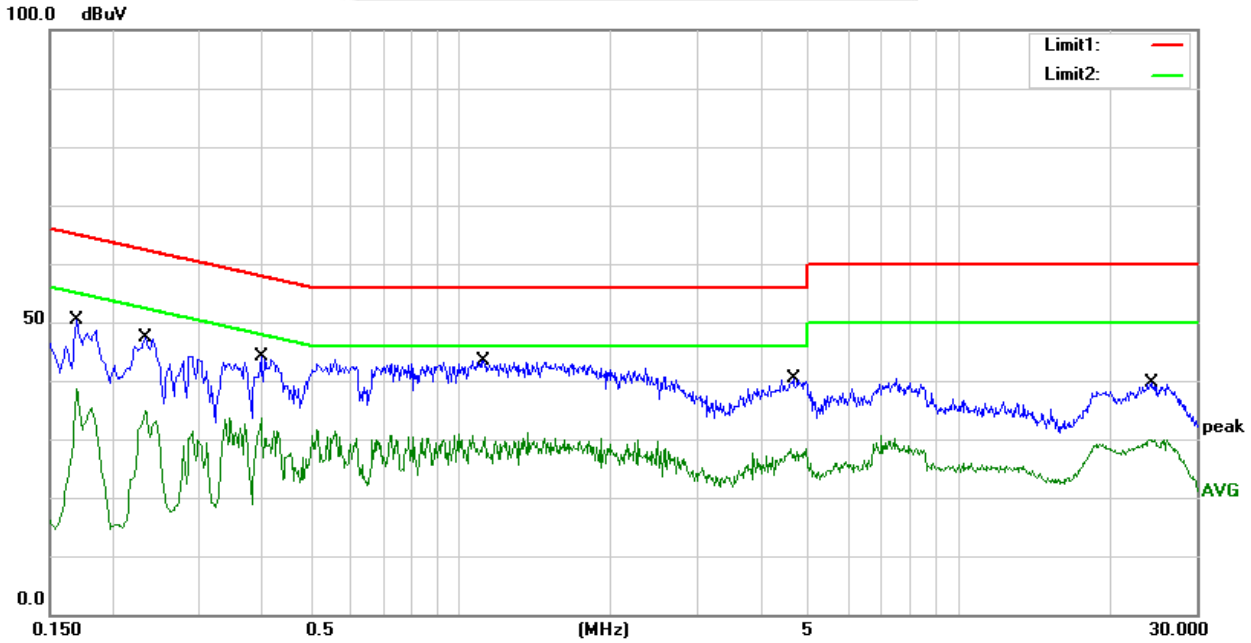
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	26.2(C)	Relative Humidity:	64%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode：	Mode 25	Power supply model:	JHD-AP045U-120300-AS

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1700	30.05	20.23	50.28	64.96	-14.68	QP
2	0.1700	16.30	20.23	36.53	54.96	-18.43	AVG
3	0.2340	26.89	20.40	47.29	62.31	-15.02	QP
4	0.2340	12.43	20.40	32.83	52.31	-19.48	AVG
5	0.3980	23.54	20.49	44.03	57.90	-13.87	QP
6	0.3980	9.65	20.49	30.14	47.90	-17.76	AVG
7	1.1140	23.34	20.15	43.49	56.00	-12.51	QP
8	1.1140	10.11	20.15	30.26	46.00	-15.74	AVG
9	4.6060	20.34	19.95	40.29	56.00	-15.71	QP
10	4.6060	8.30	19.95	28.25	46.00	-17.75	AVG
11	24.3100	19.00	20.58	39.58	60.00	-20.42	QP
12	24.3100	8.37	20.58	28.95	50.00	-21.05	AVG

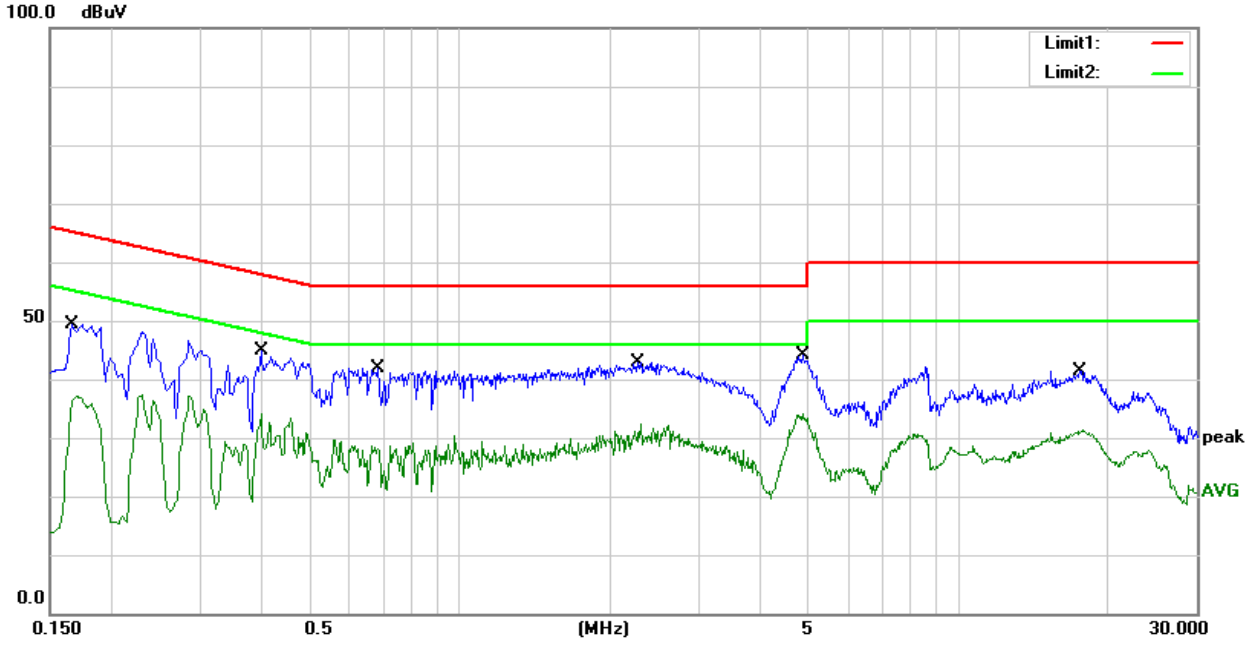
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	26.2(C)	Relative Humidity:	64%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 25	Power supply model:	JHD-AP045U-120300-AS

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1660	29.09	20.23	49.32	65.16	-15.84	QP
2	0.1660	16.82	20.23	37.05	55.16	-18.11	AVG
3	0.3980	24.39	20.49	44.88	57.90	-13.02	QP
4	0.3980	7.96	20.49	28.45	47.90	-19.45	AVG
5	0.6860	21.49	20.27	41.76	56.00	-14.24	QP
6	0.6860	1.38	20.27	21.65	46.00	-24.35	AVG
7	2.2700	22.86	20.04	42.90	56.00	-13.10	QP
8	2.2700	9.48	20.04	29.52	46.00	-16.48	AVG
9	4.8580	24.15	19.95	44.10	56.00	-11.90	QP
10	4.8580	12.92	19.95	32.87	46.00	-13.13	AVG
11	17.5420	20.88	20.44	41.32	60.00	-18.68	QP
12	17.5420	10.63	20.44	31.07	50.00	-18.93	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 specified on 15.407(b)7& 15.205/209(a), then the (a); 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 (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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	Above 38.6
13.36-13.41			

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:

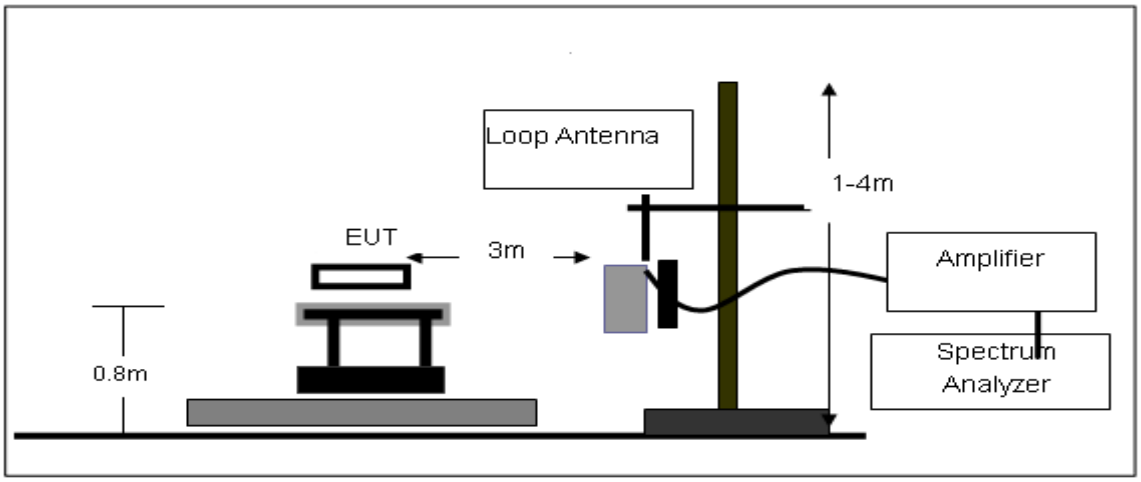
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

3.2.2 DEVIATION FROM TEST STANDARD

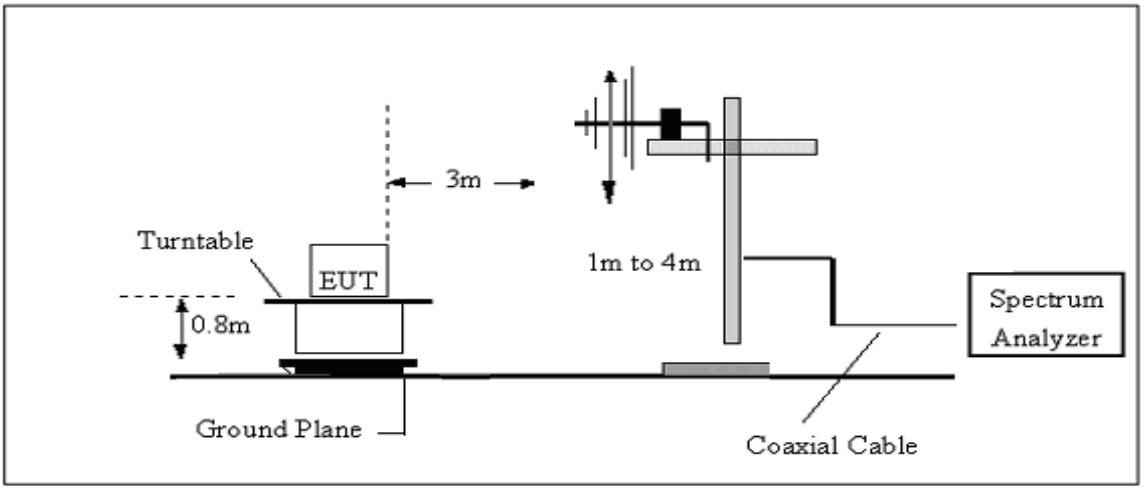
No deviation

3.2.3 TEST SETUP

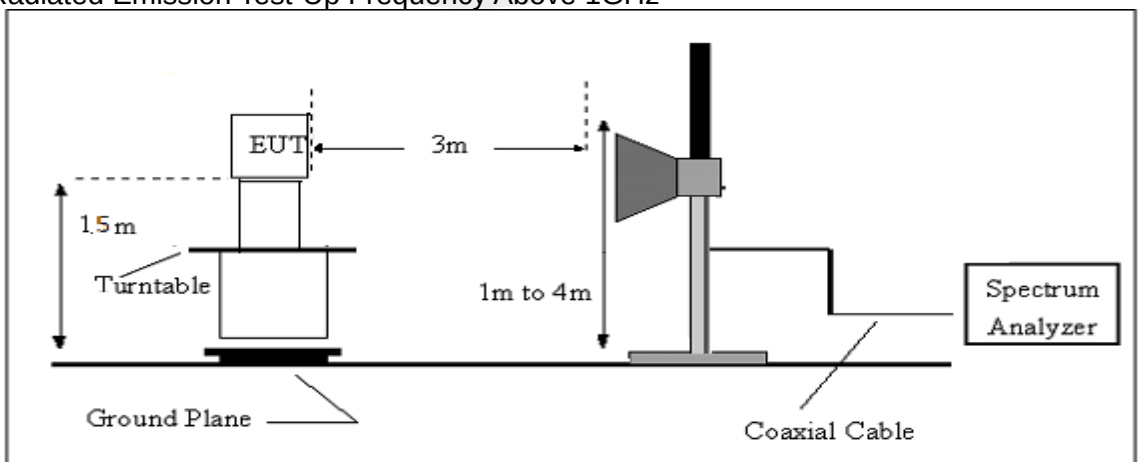
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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：	23.5(C)	Relative Humidtity:	63%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:

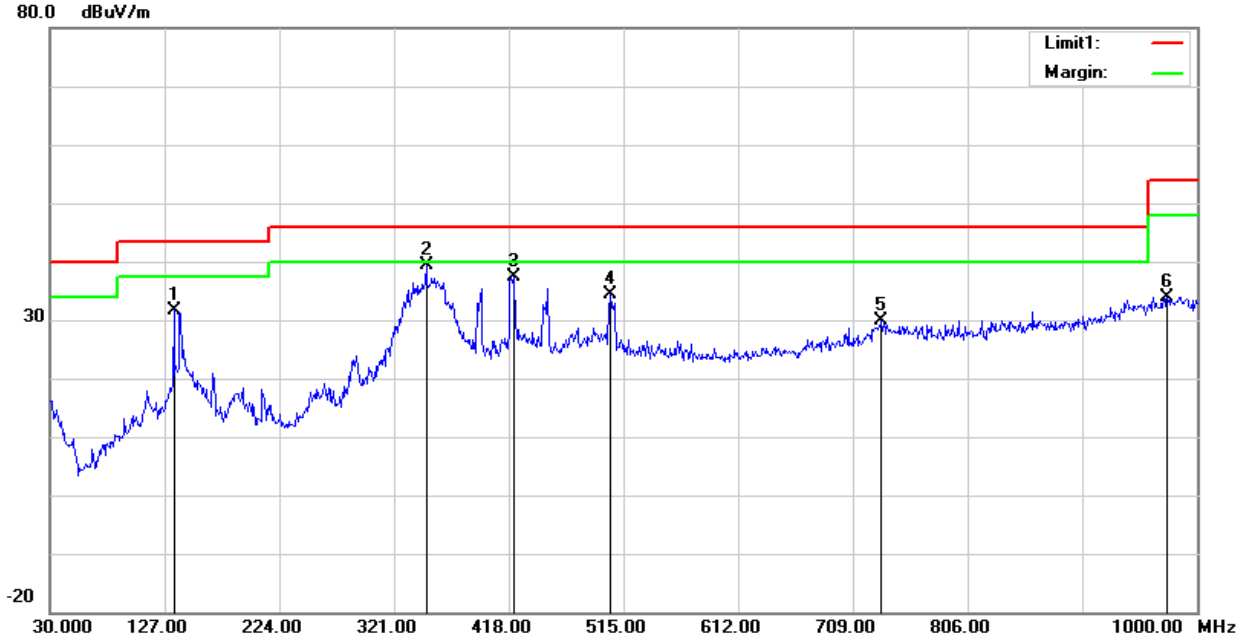
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (Between 30MHz – 1GHz)

Temperature	23.5(C)	Relative Humidtity:	63%RH
Test Voltage	AC 120V/60Hz	Polarization:	Horizontal
Test Mode	Mode 1~24(Mode 23 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	134.7600	49.86	-18.11	31.75	43.50	-11.75	QP
2	348.1600	52.53	-13.13	39.40	46.00	-6.60	QP
3	421.8800	47.49	-10.10	37.39	46.00	-8.61	QP
4	504.3300	42.27	-7.98	34.29	46.00	-11.71	QP
5	733.2500	32.23	-2.35	29.88	46.00	-16.12	QP
6	974.7800	31.64	2.32	33.96	54.00	-20.04	QP

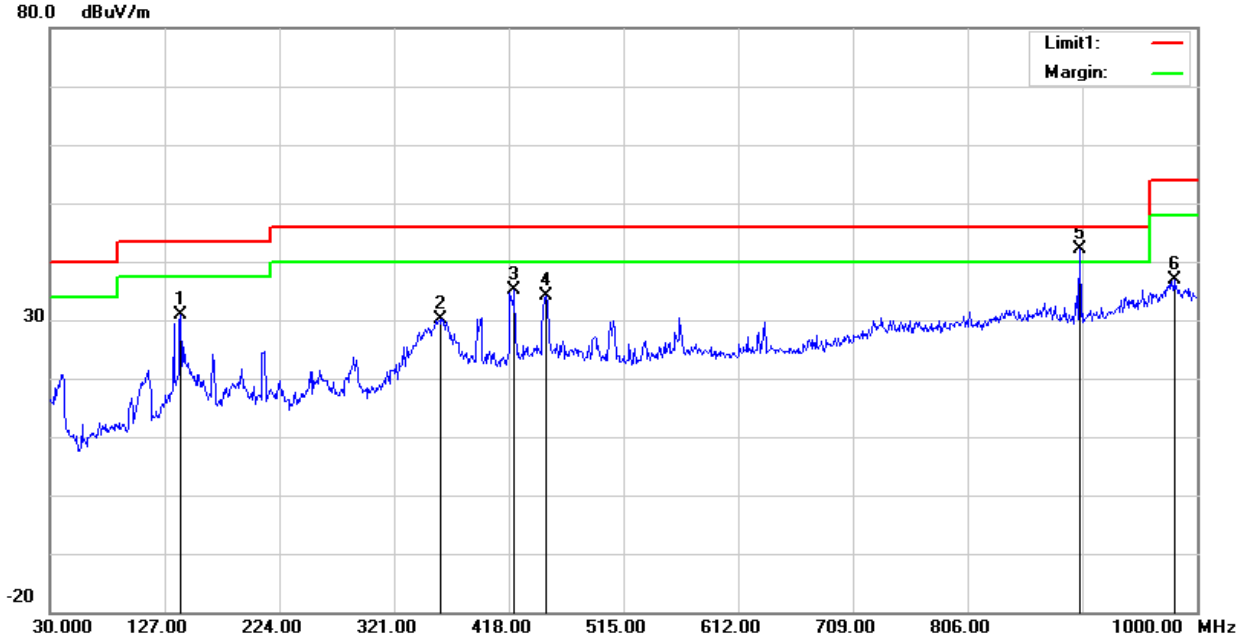
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature	23.5(C)	Relative Humidtity:	63%RH
Test Voltage	AC 120V/60Hz	Polarization:	Vertical
Test Mode	Mode 1~24(Mode 23 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	140.5800	48.95	-18.05	30.90	43.50	-12.60	QP
2	359.8000	42.93	-12.87	30.06	46.00	-15.94	QP
3	422.8500	45.22	-10.11	35.11	46.00	-10.89	QP
4	449.0400	43.74	-9.71	34.03	46.00	-11.97	QP
5	901.0600	42.50	-0.43	42.07	46.00	-3.93	QP
6	980.6000	34.26	2.63	36.89	54.00	-17.11	QP

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



3.2.8 TEST RESULTS (Above 1000 MHz)

Band I 5150-5250MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac80/ 5210 MHz)										
3281.59	44.25	44.70	6.70	28.20	-9.80	34.45	68.20	-33.75	Pk	Vertical
3281.59	42.09	44.70	6.70	28.20	-9.80	32.29	54.00	-21.71	AV	Vertical
3281.49	44.47	44.70	6.70	28.20	-9.80	34.67	68.20	-33.53	Pk	Horizontal
3281.49	41.81	44.70	6.70	28.20	-9.80	32.01	54.00	-21.99	AV	Horizontal
4022.31	39.90	44.20	7.90	29.70	-6.60	33.30	68.20	-34.90	Pk	Vertical
4022.31	36.16	44.20	7.90	29.70	-6.60	29.56	54.00	-24.44	AV	Vertical
4021.19	40.06	44.20	7.90	29.70	-6.60	33.46	68.20	-34.74	Pk	Horizontal
4021.19	36.74	44.20	7.90	29.70	-6.60	30.14	54.00	-23.86	AV	Horizontal
7267.10	37.52	43.50	11.40	35.50	3.40	40.92	68.20	-27.28	Pk	Vertical
7267.10	33.69	43.50	11.40	35.50	3.40	37.09	54.00	-16.91	AV	Vertical
7262.55	37.71	43.50	11.40	35.50	3.40	41.11	68.20	-27.09	Pk	Horizontal
7262.55	34.50	43.50	11.40	35.50	3.40	37.90	54.00	-16.10	AV	Horizontal
10420.09	39.81	44.50	13.80	38.80	8.10	47.91	68.20	-20.29	Pk	Vertical
10420.09	36.31	44.50	13.80	38.80	8.10	44.41	54.00	-9.59	AV	Vertical
10420.43	40.01	44.50	13.80	38.80	8.10	48.11	68.20	-20.09	Pk	Horizontal
10420.43	36.26	44.50	13.80	38.80	8.10	44.36	54.00	-9.64	AV	Horizontal
11089.62	33.08	43.60	14.30	39.50	10.20	43.28	68.20	-24.92	Pk	Vertical
11089.62	30.90	43.60	14.30	39.50	10.20	41.10	54.00	-12.90	AV	Vertical
11095.79	33.30	43.60	14.30	39.50	10.20	43.50	68.20	-24.70	Pk	Horizontal
11095.79	29.72	43.60	14.30	39.50	10.20	39.92	54.00	-14.08	AV	Horizontal
13365.59	31.60	42.60	15.90	38.90	12.20	43.80	68.20	-24.40	Pk	Vertical
13365.59	29.88	42.60	15.90	38.90	12.20	42.08	54.00	-11.92	AV	Vertical
13369.28	32.08	42.60	15.90	38.90	12.20	44.28	68.20	-23.92	Pk	Horizontal
13369.28	29.49	42.60	15.90	38.90	12.20	41.69	54.00	-12.31	AV	Horizontal

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11ac (VHT-80).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Band II 5250-5350MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac80/ 5290 MHz)										
3279.85	44.44	44.70	6.70	28.20	-9.80	34.64	68.20	-33.56	Pk	Vertical
3279.85	41.38	44.70	6.70	28.20	-9.80	31.58	54.00	-22.42	AV	Vertical
3282.91	43.82	44.70	6.70	28.20	-9.80	34.02	68.20	-34.18	Pk	Horizontal
3282.91	40.93	44.70	6.70	28.20	-9.80	31.13	54.00	-22.87	AV	Horizontal
4008.09	39.32	44.20	7.90	29.70	-6.60	32.72	68.20	-35.48	Pk	Vertical
4008.09	36.70	44.20	7.90	29.70	-6.60	30.10	54.00	-23.90	AV	Vertical
4004.62	38.73	44.20	7.90	29.70	-6.60	32.13	68.20	-36.07	Pk	Horizontal
4004.62	36.24	44.20	7.90	29.70	-6.60	29.64	54.00	-24.36	AV	Horizontal
7271.59	36.72	43.50	11.40	35.50	3.40	40.12	68.20	-28.08	Pk	Vertical
7271.59	33.51	43.50	11.40	35.50	3.40	36.91	54.00	-17.09	AV	Vertical
7273.69	37.17	43.50	11.40	35.50	3.40	40.57	68.20	-27.63	Pk	Horizontal
7273.69	34.08	43.50	11.40	35.50	3.40	37.48	54.00	-16.52	AV	Horizontal
10580.25	38.85	44.50	13.90	38.80	8.20	47.05	68.20	-21.15	Pk	Vertical
10580.25	36.93	44.50	13.90	38.80	8.20	45.13	54.00	-8.87	AV	Vertical
10580.08	39.44	44.50	13.90	38.80	8.20	47.64	68.20	-20.56	Pk	Horizontal
10580.08	36.36	44.50	13.90	38.80	8.20	44.56	54.00	-9.44	AV	Horizontal
11091.36	33.30	43.60	14.30	39.50	10.20	43.50	68.20	-24.70	Pk	Vertical
11091.36	29.70	43.60	14.30	39.50	10.20	39.90	54.00	-14.10	AV	Vertical
11089.84	34.18	43.60	14.30	39.50	10.20	44.38	68.20	-23.82	Pk	Horizontal
11089.84	30.02	43.60	14.30	39.50	10.20	40.22	54.00	-13.78	AV	Horizontal
13365.76	32.78	42.60	15.90	38.90	12.20	44.98	68.20	-23.22	Pk	Vertical
13365.76	29.32	42.60	15.90	38.90	12.20	41.52	54.00	-12.48	AV	Vertical
13359.98	32.89	42.60	15.90	38.90	12.20	45.09	68.20	-23.11	Pk	Horizontal
13359.98	29.24	42.60	15.90	38.90	12.20	41.44	54.00	-12.56	AV	Horizontal

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11ac (VHT-80).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Band III 5470-5725MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac80/ 5530 MHz)										
3266.83	44.81	44.70	6.70	28.20	-9.80	35.01	68.20	-33.19	Pk	Vertical
3266.83	41.65	44.70	6.70	28.20	-9.80	31.85	54.00	-22.15	AV	Vertical
3266.18	43.85	44.70	6.70	28.20	-9.80	34.05	68.20	-34.15	Pk	Horizontal
3266.18	41.47	44.70	6.70	28.20	-9.80	31.67	54.00	-22.33	AV	Horizontal
4012.83	39.09	44.20	7.90	29.70	-6.60	32.49	68.20	-35.71	Pk	Vertical
4012.83	36.04	44.20	7.90	29.70	-6.60	29.44	54.00	-24.56	AV	Vertical
4006.86	38.77	44.20	7.90	29.70	-6.60	32.17	68.20	-36.03	Pk	Horizontal
4006.86	36.33	44.20	7.90	29.70	-6.60	29.73	54.00	-24.27	AV	Horizontal
7272.50	37.63	43.50	11.40	35.50	3.40	41.03	68.20	-27.17	Pk	Vertical
7272.50	33.89	43.50	11.40	35.50	3.40	37.29	54.00	-16.71	AV	Vertical
7264.42	37.54	43.50	11.40	35.50	3.40	40.94	68.20	-27.26	Pk	Horizontal
7264.42	34.54	43.50	11.40	35.50	3.40	37.94	54.00	-16.06	AV	Horizontal
10409.82	39.53	44.50	13.80	38.80	8.10	47.63	68.20	-20.57	Pk	Vertical
10409.82	37.02	44.50	13.80	38.80	8.10	45.12	54.00	-8.88	AV	Vertical
10404.20	39.64	44.50	13.80	38.80	8.10	47.74	68.20	-20.46	Pk	Horizontal
10404.20	35.96	44.50	13.80	38.80	8.10	44.06	54.00	-9.94	AV	Horizontal
11060.32	32.76	43.60	14.30	39.50	10.20	42.96	68.20	-25.24	Pk	Vertical
11060.32	31.04	43.60	14.30	39.50	10.20	41.24	54.00	-12.76	AV	Vertical
11060.43	34.14	43.60	14.30	39.50	10.20	44.34	68.20	-23.86	Pk	Horizontal
11060.43	30.38	43.60	14.30	39.50	10.20	40.58	54.00	-13.42	AV	Horizontal
13363.82	32.68	42.60	15.90	38.90	12.20	44.88	68.20	-23.32	Pk	Vertical
13363.82	29.60	42.60	15.90	38.90	12.20	41.80	54.00	-12.20	AV	Vertical
13365.04	32.61	42.60	15.90	38.90	12.20	44.81	68.20	-23.39	Pk	Horizontal
13365.04	29.19	42.60	15.90	38.90	12.20	41.39	54.00	-12.61	AV	Horizontal
High Channel (802.11ac80/ 5610 MHz)										
3195.58	44.79	44.70	6.70	28.20	-9.80	34.99	68.20	-33.21	Pk	Vertical
3195.58	41.80	44.70	6.70	28.20	-9.80	32.00	54.00	-22.00	AV	Vertical
3210.23	44.43	44.70	6.70	28.20	-9.80	34.63	68.20	-33.57	Pk	Horizontal
3210.23	41.13	44.70	6.70	28.20	-9.80	31.33	54.00	-22.67	AV	Horizontal
3934.39	39.47	44.20	7.90	29.70	-6.60	32.87	68.20	-35.33	Pk	Vertical
3934.39	36.06	44.20	7.90	29.70	-6.60	29.46	54.00	-24.54	AV	Vertical
3920.58	39.19	44.20	7.90	29.70	-6.60	32.59	68.20	-35.61	Pk	Horizontal
3920.58	36.46	44.20	7.90	29.70	-6.60	29.86	54.00	-24.14	AV	Horizontal
7109.61	36.64	43.50	11.40	35.50	3.40	40.04	68.20	-28.16	Pk	Vertical
7109.61	33.72	43.50	11.40	35.50	3.40	37.12	54.00	-16.88	AV	Vertical
7106.79	37.89	43.50	11.40	35.50	3.40	41.29	68.20	-26.91	Pk	Horizontal
7106.79	33.96	43.50	11.40	35.50	3.40	37.36	54.00	-16.64	AV	Horizontal
10301.79	39.75	44.50	13.80	38.80	8.10	47.85	68.20	-20.35	Pk	Vertical
10301.79	35.74	44.50	13.80	38.80	8.10	43.84	54.00	-10.16	AV	Vertical
10299.47	39.58	44.50	13.80	38.80	8.10	47.68	68.20	-20.52	Pk	Horizontal
10299.47	36.14	44.50	13.80	38.80	8.10	44.24	54.00	-9.76	AV	Horizontal
11220.14	33.02	43.60	14.30	39.50	10.20	43.22	68.20	-24.98	Pk	Vertical
11220.14	30.13	43.60	14.30	39.50	10.20	40.33	54.00	-13.67	AV	Vertical
11220.21	33.11	43.60	14.30	39.50	10.20	43.31	68.20	-24.89	Pk	Horizontal
11220.21	30.74	43.60	14.30	39.50	10.20	40.94	54.00	-13.06	AV	Horizontal
13072.28	32.49	42.60	15.90	38.90	12.20	44.69	68.20	-23.51	Pk	Vertical
13072.28	29.01	42.60	15.90	38.90	12.20	41.21	54.00	-12.79	AV	Vertical
13073.09	32.61	42.60	15.90	38.90	12.20	44.81	68.20	-23.39	Pk	Horizontal
13073.09	28.86	42.60	15.90	38.90	12.20	41.06	54.00	-12.94	AV	Horizontal

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11ac (VHT-80).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Band IV(5.725-5.850) GHz

Frequency (MHz)	Reading (dBuV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Orrected Factor （dB）	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac80/ 5775 MHz)										
3265.27	45.14	44.70	6.70	28.20	-9.80	35.34	68.20	-32.86	Pk	Vertical
3265.27	42.14	44.70	6.70	28.20	-9.80	32.34	54.00	-21.66	AV	Vertical
3272.92	44.06	44.70	6.70	28.20	-9.80	34.26	68.20	-33.94	Pk	Horizontal
3272.92	41.85	44.70	6.70	28.20	-9.80	32.05	54.00	-21.95	AV	Horizontal
4007.57	40.11	44.20	7.90	29.70	-6.60	33.51	68.20	-34.69	Pk	Vertical
4007.57	36.00	44.20	7.90	29.70	-6.60	29.40	54.00	-24.60	AV	Vertical
4010.75	38.95	44.20	7.90	29.70	-6.60	32.35	68.20	-35.85	Pk	Horizontal
4010.75	36.45	44.20	7.90	29.70	-6.60	29.85	54.00	-24.15	AV	Horizontal
7262.21	36.82	43.50	11.40	35.50	3.40	40.22	68.20	-27.98	Pk	Vertical
7262.21	34.28	43.50	11.40	35.50	3.40	37.68	54.00	-16.32	AV	Vertical
7263.71	37.28	43.50	11.40	35.50	3.40	40.68	68.20	-27.52	Pk	Horizontal
7263.71	34.66	43.50	11.40	35.50	3.40	38.06	54.00	-15.94	AV	Horizontal
10563.58	39.45	44.50	13.90	38.80	8.20	47.65	68.20	-20.55	Pk	Vertical
10563.58	35.77	44.50	13.90	38.80	8.20	43.97	54.00	-10.03	AV	Vertical
10556.60	40.04	44.50	13.90	38.80	8.20	48.24	68.20	-19.96	Pk	Horizontal
10556.60	36.99	44.50	13.90	38.80	8.20	45.19	54.00	-8.81	AV	Horizontal
11550.41	33.70	43.60	14.30	39.50	10.20	43.90	68.20	-24.30	Pk	Vertical
11550.41	30.60	43.60	14.30	39.50	10.20	40.80	54.00	-13.20	AV	Vertical
11550.05	33.86	43.60	14.30	39.50	10.20	44.06	68.20	-24.14	Pk	Horizontal
11550.05	30.19	43.60	14.30	39.50	10.20	40.39	54.00	-13.61	AV	Horizontal
13357.82	32.01	42.60	15.90	38.90	12.20	44.21	68.20	-23.99	Pk	Vertical
13357.82	28.96	42.60	15.90	38.90	12.20	41.16	54.00	-12.84	AV	Vertical
13359.19	31.90	42.60	15.90	38.90	12.20	44.10	68.20	-24.10	Pk	Horizontal
13359.19	29.66	42.60	15.90	38.90	12.20	41.86	54.00	-12.14	AV	Horizontal

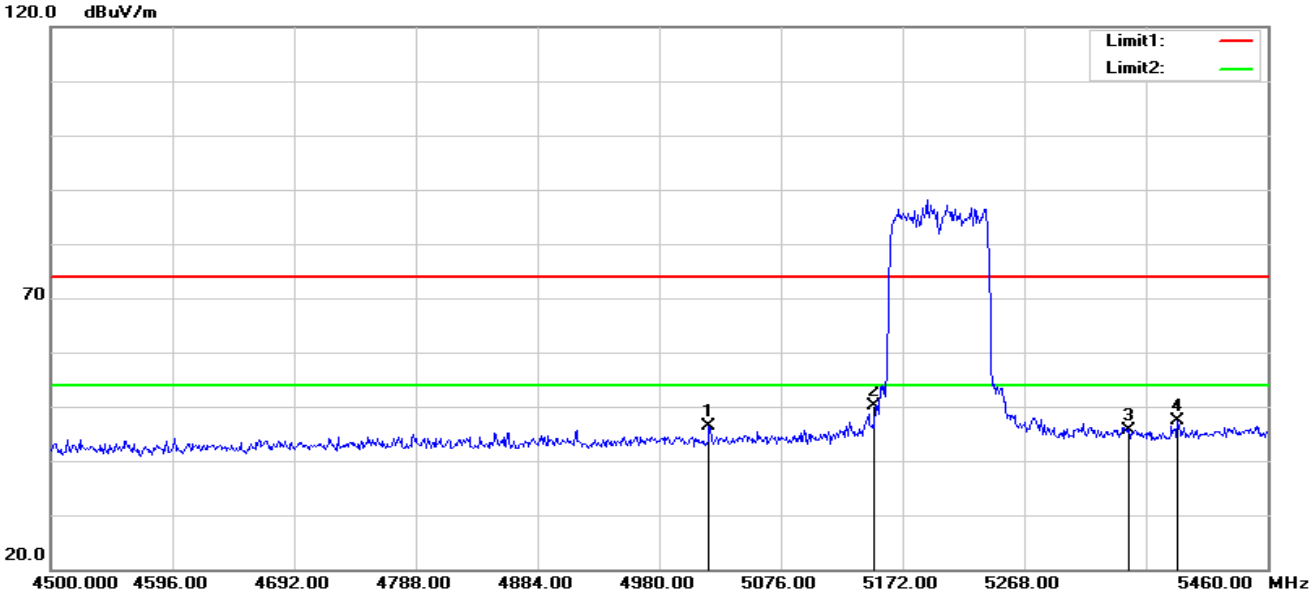
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11ac (VHT-80).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

3.2.9 Band Edge

Band I 5150-5250MHz

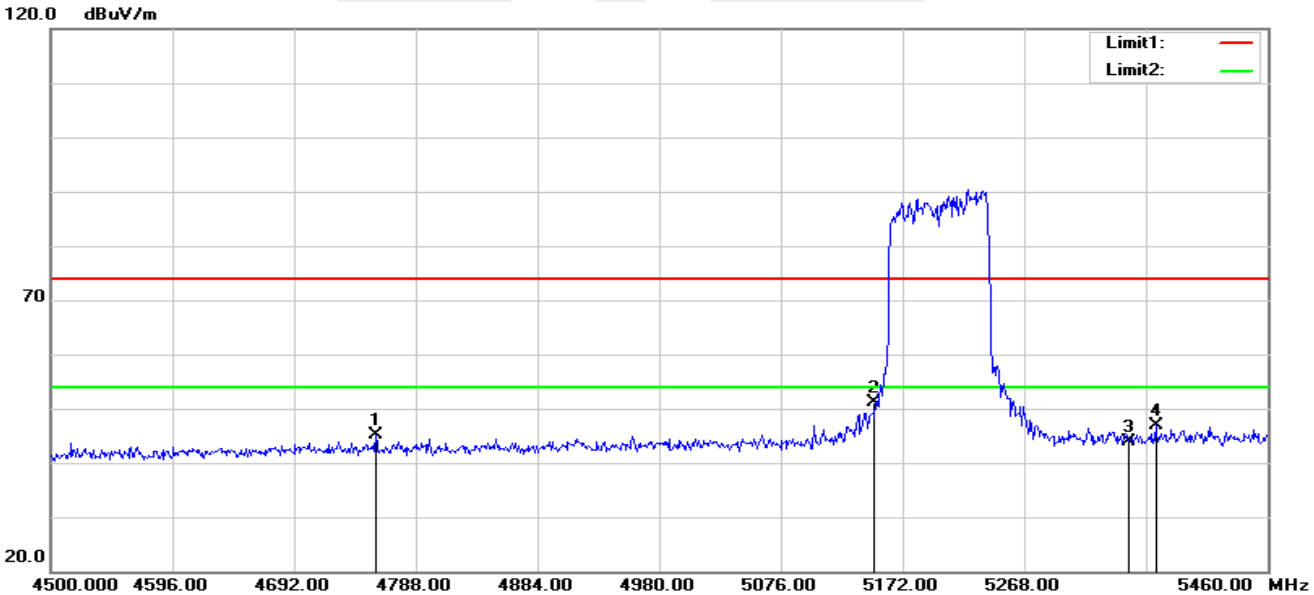
802.11ac (VHT-80)

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5019.360	52.54	-6.10	46.44	74.00	-27.56	peak
2	5150.000	55.92	-5.73	50.19	74.00	-23.81	peak
3	5350.000	50.98	-5.23	45.75	74.00	-28.25	peak
4	5388.960	52.65	-5.25	47.40	74.00	-26.60	peak

Vertical



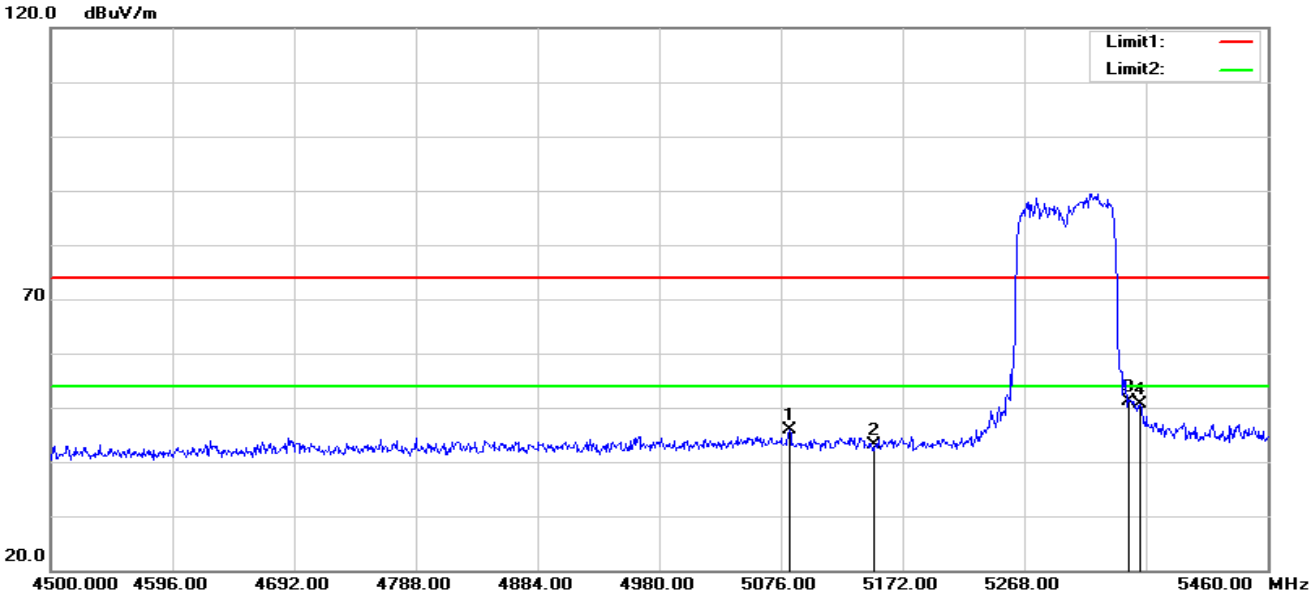
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4756.320	52.36	-7.28	45.08	74.00	-28.92	peak
2	5150.000	56.78	-5.73	51.05	74.00	-22.95	peak
3	5350.000	49.00	-5.23	43.77	74.00	-30.23	peak
4	5371.680	52.00	-5.24	46.76	74.00	-27.24	peak

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 802.11ac (VHT-80),only shown the worst case.

Band II 5250-5350MHz

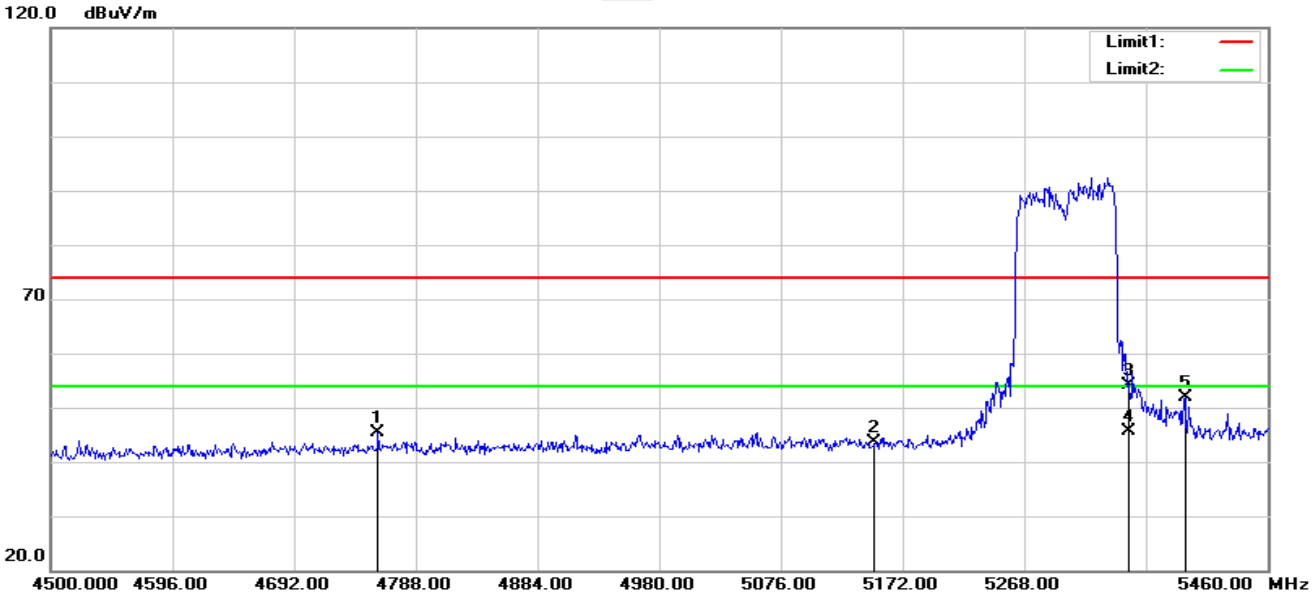
802.11ac (VHT-80)

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5082.720	51.72	-5.81	45.91	74.00	-28.09	peak
2	5150.000	48.95	-5.73	43.22	74.00	-30.78	peak
3	5350.000	56.32	-5.23	51.09	74.00	-22.91	peak
4	5359.200	55.87	-5.23	50.64	74.00	-23.36	peak

Vertical



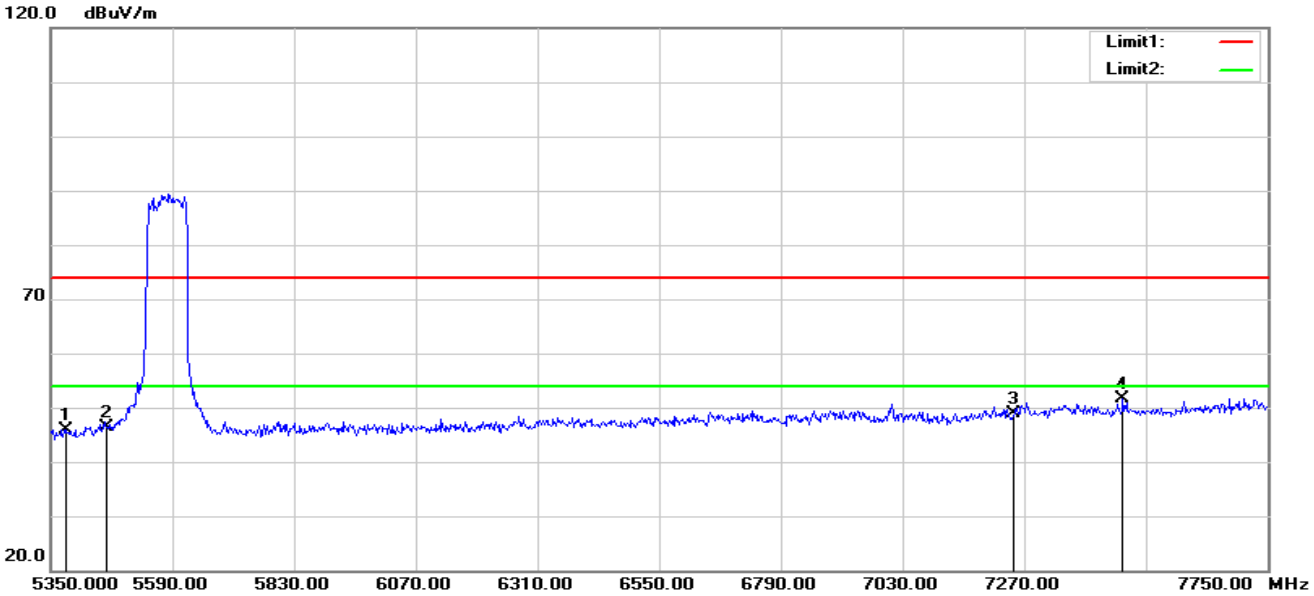
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4758.240	52.54	-7.27	45.27	74.00	-28.73	peak
2	5150.000	49.25	-5.73	43.52	74.00	-30.48	peak
3	5350.000	59.45	-5.23	54.22	74.00	-19.78	peak
4	5350.000	50.85	-5.23	45.62	54.00	-8.38	AVG
5	5394.720	57.13	-5.24	51.89	74.00	-22.11	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 802.11ac (VHT-80),only shown the worst case.

Band III 5470-5725MHz

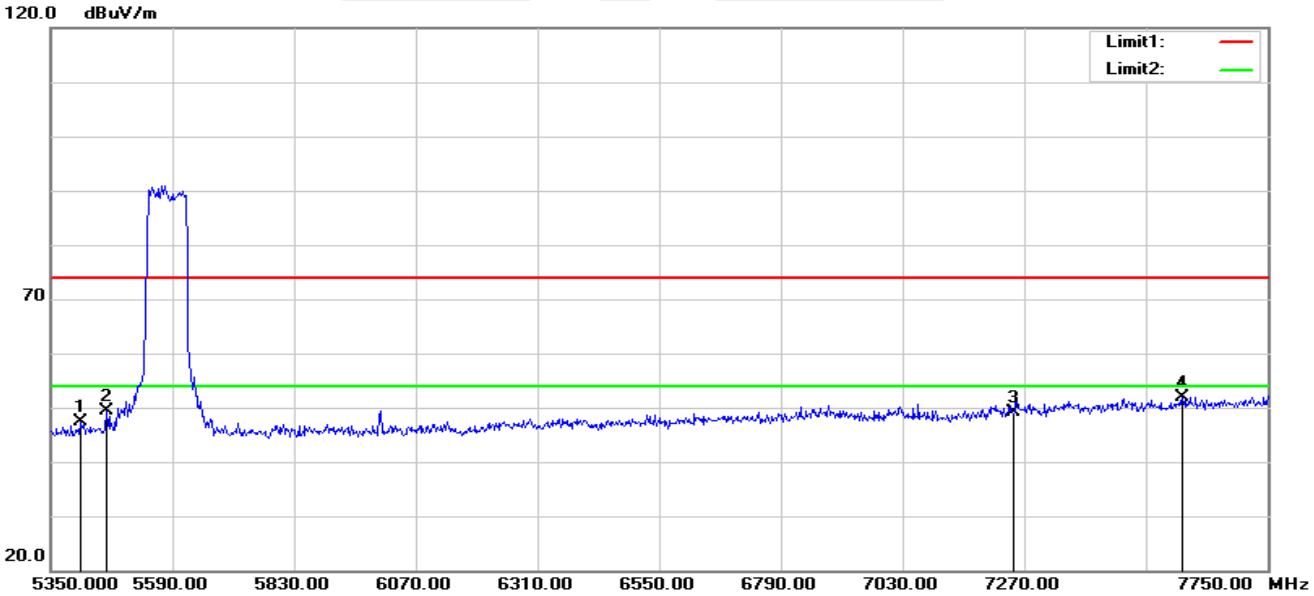
802.11ac (VHT-80)

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5378.800	51.23	-5.24	45.99	74.00	-28.01	peak
2	5460.000	51.37	-5.11	46.26	74.00	-27.74	peak
3	7250.000	48.23	0.72	48.95	74.00	-25.05	peak
4	7464.400	50.13	1.50	51.63	74.00	-22.37	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5410.000	52.57	-5.23	47.34	74.00	-26.66	peak
2	5460.000	54.38	-5.11	49.27	74.00	-24.73	peak
3	7250.000	48.47	0.72	49.19	74.00	-24.81	peak
4	7582.000	50.17	1.72	51.89	74.00	-22.11	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 802.11ac (VHT-80),only shown the worst case.

Band IV(5.725-5.85 GHz)

Note: The main frequency is too far away from the restricted band and does not require testing.

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

.

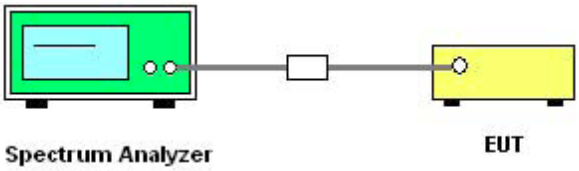
For Band edge

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

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.

5.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB D02 General UNII Test Procedures New Rules v01r03.

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.

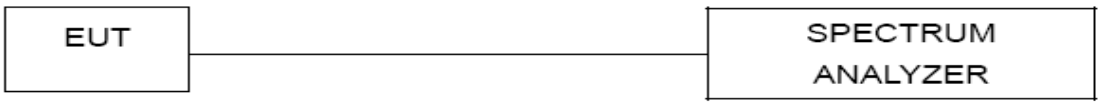
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

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	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5180	3.305	0.548	3.853	11	PASS
5200	3.541	0.548	4.089	11	PASS
5240	4.177	0.548	4.725	11	PASS
802.11n20					
5180	-0.666	0.568	-0.098	11	PASS
5200	-0.380	0.568	0.188	11	PASS
5240	0.563	0.568	1.131	11	PASS
802.11n40					
5190	-3.323	1.102	-2.221	11	PASS
5230	-2.864	1.102	-1.762	11	PASS
802.11ac20					
5180	-0.489	0.562	0.073	11	PASS
5200	-0.121	0.562	0.441	11	PASS
5240	0.594	0.562	1.156	11	PASS
802.11ac40					
5190	-3.179	1.089	-2.090	11	PASS
5230	-2.653	1.089	-1.564	11	PASS
802.11ac80					
5210	-8.290	1.977	-6.313	11	PASS

5250-5350MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5260	0.761	0.521	1.282	11	PASS
5300	1.637	0.521	2.158	11	PASS
5320	0.995	0.521	1.516	11	PASS
802.11n20					
5260	0.114	0.573	0.687	11	PASS
5300	0.982	0.573	1.555	11	PASS
5320	0.916	0.573	1.489	11	PASS
802.11n40					
5270	-2.032	1.098	-0.934	11	PASS
5310	-2.145	1.098	-1.047	11	PASS
802.11ac20					
5260	-0.146	0.551	0.405	11	PASS
5300	0.708	0.551	1.259	11	PASS
5320	1.116	0.551	1.667	11	PASS
802.11ac40					
5270	-3.120	1.089	-2.031	11	PASS
5310	-1.925	1.089	-0.836	11	PASS
802.11ac80					
5290	-6.138	1.977	-4.161	11	PASS

5470-5725MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5500	2.507	0.539	3.046	11	PASS
5580	2.342	0.539	2.881	11	PASS
5700	1.596	0.539	2.135	11	PASS
802.11n20					
5500	2.288	0.573	2.861	11	PASS
5580	1.484	0.573	2.057	11	PASS
5700	1.134	0.573	1.707	11	PASS
802.11n40					
5510	-0.699	1.102	0.403	11	PASS
5550	-1.197	1.102	-0.095	11	PASS
5670	-2.183	1.102	-1.081	11	PASS
802.11ac20					
5500	2.203	0.568	2.771	11	PASS
5580	1.045	0.568	1.613	11	PASS
5700	1.133	0.568	1.701	11	PASS
802.11ac40					
5510	-0.774	1.094	0.320	11	PASS
5550	-1.424	1.094	-0.330	11	PASS
5670	-1.815	1.094	-0.721	11	PASS
802.11ac80					
5530	-5.769	1.993	-3.776	11	PASS
5610	-5.501	1.993	-3.508	11	PASS

5725-5850MHz						
Frequency	Use RBW 510KHz direct measurement Direct measurement Power Density (dBm)	Convert to RBW 500KHz direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a						
5745	-1.459	-1.631	0.539	-1.092	30	PASS
5785	-1.588	-1.760	0.539	-1.221	30	PASS
5825	-1.406	-1.578	0.539	-1.039	30	PASS
802.11n20						
5745	-0.736	-0.908	0.573	-0.335	30	PASS
5785	-1.409	-1.581	0.573	-1.008	30	PASS
5825	-1.933	-2.105	0.573	-1.532	30	PASS
802.11n40						
5755	-3.972	-4.144	1.102	-3.042	30	PASS
5795	-4.471	-4.643	1.102	-3.541	30	PASS
802.11ac20						
5745	-1.577	-1.749	0.568	-1.181	30	PASS
5785	-1.349	-1.521	0.568	-0.953	30	PASS
5825	-1.301	-1.473	0.568	-0.905	30	PASS
802.11ac40						
5755	-4.535	-4.707	1.074	-3.633	30	PASS
5795	-4.566	-4.738	1.074	-3.664	30	PASS
802.11ac80						
5775	-9.212	-9.384	1.968	-7.416	30	PASS

Note:
1. RB Conversion formula: 20*LOG(510KHz/500KHz)
2. Data 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

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5180	20.29	Pass
5200	21.31	Pass
5240	21.48	Pass
802.11n(HT20)		
5180	19.88	Pass
5200	19.70	Pass
5240	19.85	Pass
802.11n(HT40)		
5190	40.32	Pass
5230	39.89	Pass
802.11ac(VHT20)		
5180	19.75	Pass
5200	19.82	Pass
5240	19.78	Pass
802.11ac(VHT40)		
5190	39.93	Pass
5230	40.19	Pass
802.11ac(VHT80)		
5210	81.36	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5260	19.27	Pass
5300	19.86	Pass
5320	20.23	Pass
802.11n(HT20)		
5260	19.76	Pass
5300	19.86	Pass
5320	19.95	Pass
802.11n(HT40)		
5270	40.01	Pass
5310	39.99	Pass
802.11ac(VHT20)		
5260	19.90	Pass
5300	19.85	Pass
5320	19.83	Pass
802.11ac(VHT40)		
5270	39.83	Pass
5310	40.00	Pass
802.11ac(VHT80)		
5290	81.22	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5500	19.89	Pass
5580	20.26	Pass
5700	20.31	Pass
802.11n(HT20)		
5500	19.88	Pass
5580	19.86	Pass
5700	19.98	Pass
802.11n(HT40)		
5510	40.23	Pass
5550	39.96	Pass
5670	40.11	Pass
802.11ac(VHT20)		
5500	19.85	Pass
5580	19.93	Pass
5700	19.91	Pass
802.11ac(VHT40)		
5510	39.91	Pass
5550	39.89	Pass
5670	39.88	Pass
802.11ac(VHT80)		
5530	82.03	Pass
5610	84.50	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	19.29	Pass
5785	19.82	Pass
5825	20.25	Pass
802.11n(HT20)		
5745	19.85	Pass
5785	19.88	Pass
5825	19.91	Pass
802.11n(HT40)		
5755	39.95	Pass
5795	40.28	Pass
802.11ac(VHT20)		
5745	19.81	Pass
5785	20.00	Pass
5825	19.90	Pass
802.11ac(VHT40)		
5755	40.05	Pass
5795	40.19	Pass
802.11ac(VHT80)		
5775	83.51	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.

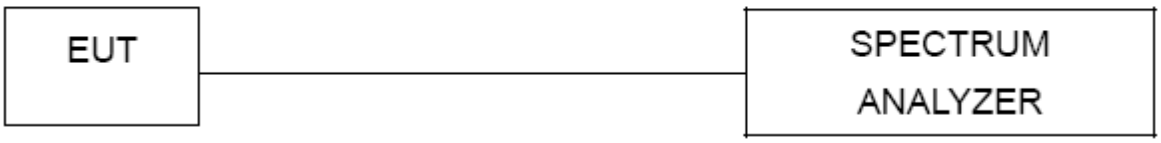
6. Use the 99 % power bandwidth function of the instrument (if available).

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

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5180	16.521	Pass
5200	16.527	Pass
5240	16.537	Pass
802.11n(HT20)		
5180	17.496	Pass
5200	17.480	Pass
5240	17.490	Pass
802.11n(HT40)		
5190	36.157	Pass
5230	36.134	Pass
802.11ac(VHT20)		
5180	17.492	Pass
5200	17.500	Pass
5240	17.502	Pass
802.11ac(VHT40)		
5190	36.129	Pass
5230	36.144	Pass
802.11ac(VHT80)		
5210	75.627	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5260	16.512	Pass
5300	16.513	Pass
5320	16.537	Pass
802.11n(HT20)		
5260	17.485	Pass
5300	17.487	Pass
5320	17.482	Pass
802.11n(HT40)		
5270	36.158	Pass
5310	36.152	Pass
802.11ac(VHT20)		
5260	17.495	Pass
5300	17.501	Pass
5320	17.497	Pass
802.11ac(VHT40)		
5270	36.126	Pass
5310	36.138	Pass
802.11ac(VHT80)		
5290	75.704	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5500	16.529	Pass
5580	16.534	Pass
5700	16.515	Pass
802.11n(HT20)		
5500	17.492	Pass
5580	17.495	Pass
5700	17.494	Pass
802.11n(HT40)		
5510	36.136	Pass
5550	36.146	Pass
5670	36.164	Pass
802.11ac(VHT20)		
5500	17.486	Pass
5580	17.501	Pass
5700	17.495	Pass
802.11ac(VHT40)		
5510	36.142	Pass
5550	36.115	Pass
5670	36.145	Pass
802.11ac(VHT80)		
5530	75.643	Pass
5610	75.712	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.511	Pass
5785	16.529	Pass
5825	16.515	Pass
802.11n(HT20)		
5745	17.494	Pass
5785	17.498	Pass
5825	17.503	Pass
802.11n(HT40)		
5755	36.151	Pass
5795	36.172	Pass
802.11ac(VHT20)		
5745	17.494	Pass
5785	17.497	Pass
5825	17.506	Pass
802.11ac(VHT40)		
5755	36.169	Pass
5795	36.176	Pass
802.11ac(VHT80)		
5775	75.760	Pass

Test plot See Attachment C

6.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies 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.

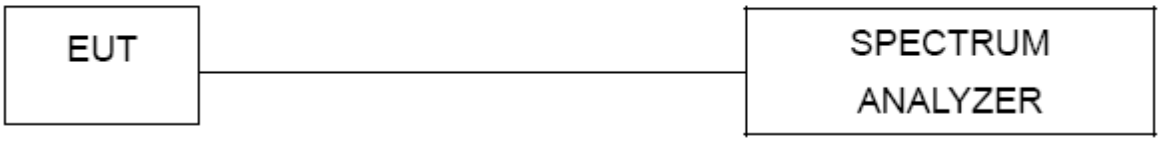
f) Allow the trace to stabilize.

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

Frequency (MHz)	6dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.30	Pass
5785	16.31	Pass
5825	16.32	Pass
802.11n(HT20)		
5745	16.99	Pass
5785	16.91	Pass
5825	16.54	Pass
802.11n(HT40)		
5755	35.48	Pass
5795	35.76	Pass
802.11ac(VHT20)		
5745	16.93	Pass
5785	16.99	Pass
5825	16.80	Pass
802.11ac(VHT40)		
5755	35.92	Pass
5795	35.77	Pass
802.11ac(VHT80)		
5775	75.97	Pass

Test plots 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.

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

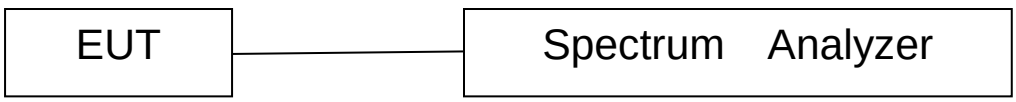
7.2 TEST PROCEDURE

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

Note:

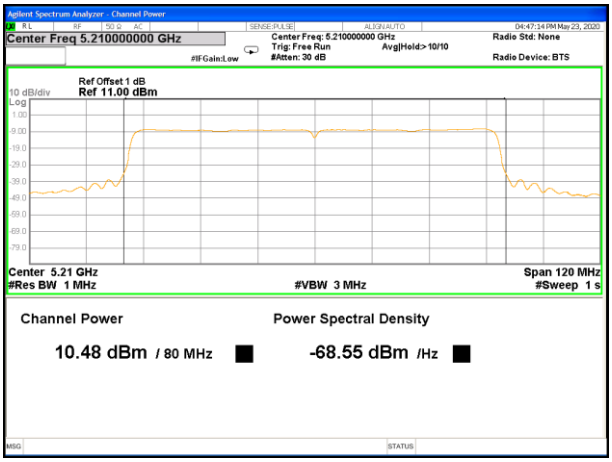
1. For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.
2. For mobile and portable client devices in the 5.25-5.35 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.
3. For mobile and portable client devices in the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.
4. 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.

Band I (5.15-5.25GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
36	5180	10.70	0.548	11.25	23.98
40	5200	10.43	0.548	10.98	23.98
48	5240	10.10	0.548	10.65	23.98
802.11n(HT20)					
36	5180	10.25	0.568	10.82	23.98
40	5200	10.27	0.568	10.84	23.98
48	5240	10.49	0.568	11.06	23.98
802.11n(HT40)					
38	5190	10.24	1.102	11.34	23.98
46	5230	10.61	1.102	11.71	23.98
802.11ac(VHT20)					
36	5180	10.36	0.562	10.92	23.98
40	5200	10.45	0.562	11.01	23.98
48	5240	10.78	0.562	11.34	23.98
802.11ac(VHT40)					
38	5190	10.32	1.089	11.41	23.98
46	5230	10.52	1.089	11.61	23.98
802.11ac(VHT80)					
42	5210	10.48	1.977	12.46	23.98

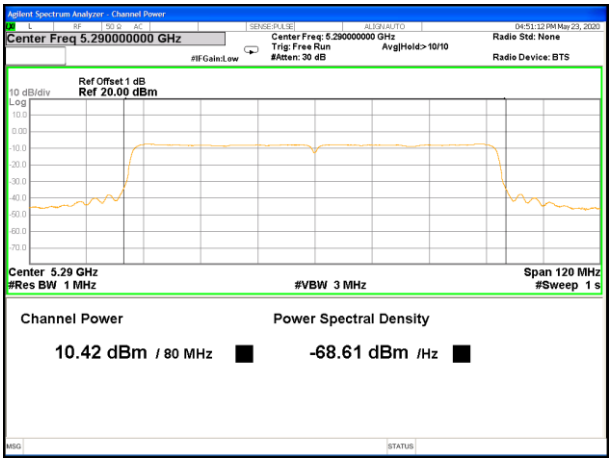
Band II(5.25-5.35GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
52	5260	10.98	0.521	11.50	23.85
60	5300	11.28	0.521	11.80	23.98
64	5320	11.29	0.521	11.81	23.98
802.11n(HT20)					
52	5260	10.42	0.573	10.99	23.96
60	5300	10.40	0.573	10.97	23.98
64	5320	10.81	0.573	11.38	23.98
802.11n(HT40)					
54	5270	10.17	1.098	11.27	23.98
62	5310	10.59	1.098	11.69	23.98
802.11ac(VHT20)					
52	5260	10.46	0.551	11.01	23.98
60	5300	10.71	0.551	11.26	23.98
64	5320	10.89	0.551	11.44	23.97
802.11ac(VHT40)					
54	5270	10.52	1.089	11.61	23.98
62	5310	10.67	1.089	11.76	23.98
802.11ac(VHT80)					
58	5290	10.42	1.977	12.40	23.98

Band III(5.47-5.725GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
100	5500	11.90	0.539	12.44	23.98
116	5580	11.85	0.539	12.39	23.98
140	5700	10.84	0.539	11.38	23.98
802.11n(HT20)					
100	5500	11.81	0.573	12.38	23.98
116	5580	11.48	0.573	12.05	23.98
140	5700	10.69	0.573	11.26	23.98
802.11n(HT40)					
102	5510	11.64	1.102	12.74	23.98
110	5550	11.69	1.102	12.79	23.98
134	5670	10.52	1.102	11.62	23.98
802.11ac(VHT20)					
100	5500	11.78	0.568	12.35	23.98
116	5580	11.79	0.568	12.36	23.98
140	5700	10.53	0.568	11.10	23.98
802.11ac(VHT40)					
102	5510	11.66	1.094	12.75	23.98
110	5550	11.72	1.094	12.81	23.98
134	5670	10.59	1.094	11.68	23.98
802.11ac(VHT80)					
106	5530	11.33	1.993	13.32	23.98
122	5610	11.51	1.993	13.50	23.98

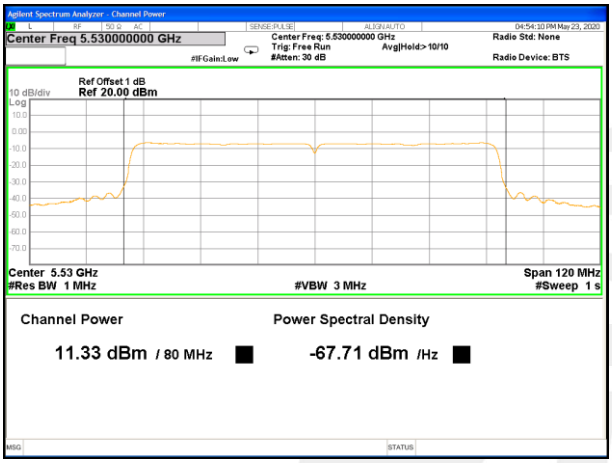
Band IV (5.725-5.85GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
149	5745	10.93	0.539	11.47	30.00
157	5785	10.71	0.539	11.25	30.00
165	5825	10.43	0.539	10.97	30.00
802.11n(HT20)					
149	5745	11.15	0.573	11.72	30.00
157	5785	10.99	0.573	11.56	30.00
165	5825	10.19	0.573	10.76	30.00
802.11n(HT40)					
151	5755	11.02	1.102	12.12	30.00
159	5795	10.62	1.102	11.72	30.00
802.11ac(VHT20)					
149	5745	11.22	0.568	11.79	30.00
157	5785	11.05	0.568	11.62	30.00
165	5825	10.83	0.568	11.40	30.00
802.11ac(VHT40)					
151	5755	10.67	1.074	11.74	30.00
159	5795	10.66	1.074	11.73	30.00
802.11ac(VHT80)					
155	5775	10.64	1.968	12.61	30.00



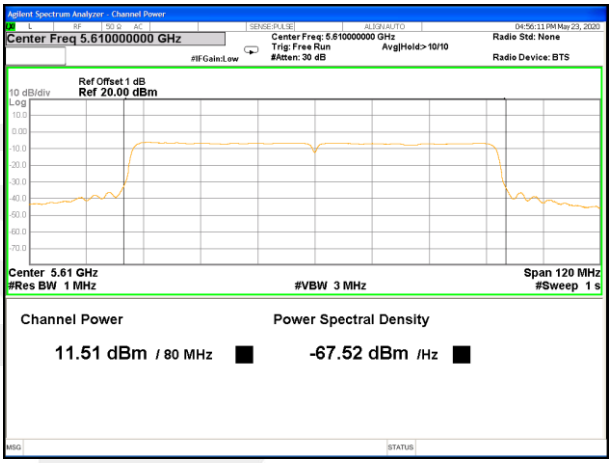
5210MHz



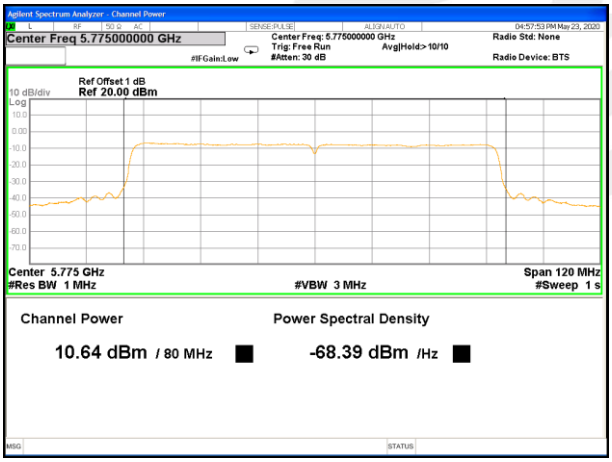
5290MHz



5530MHz



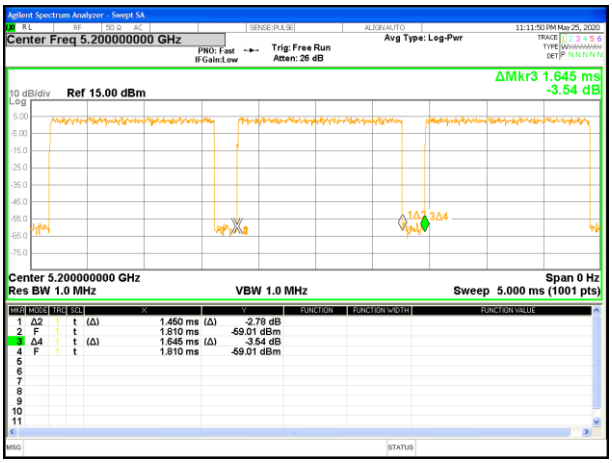
5610MHz



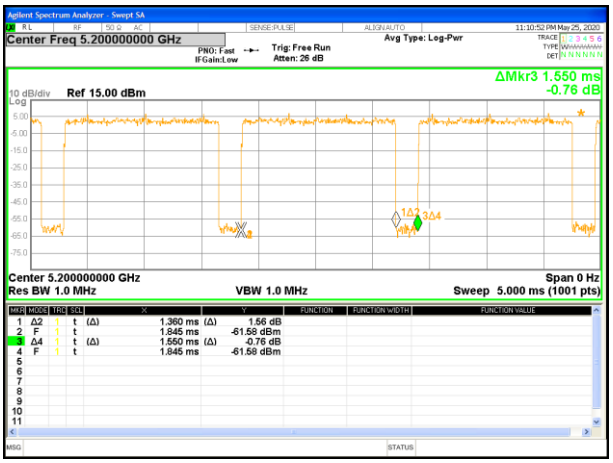
5775MHz

Duty Cycle

Band1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.450	1.645	88.15%	0.548
n20	1.360	1.550	87.74%	0.568
n40	0.675	0.870	77.59%	1.102
ac20	1.375	1.565	87.86%	0.562
ac40	0.684	0.879	77.82%	1.089
ac80	0.340	0.537	63.42%	1.977
Band2				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.458	1.644	88.69%	0.521
n20	1.362	1.554	87.64%	0.573
n40	0.678	0.873	77.66%	1.098
ac20	1.374	1.560	88.08%	0.551
ac40	0.684	0.879	77.82%	1.089
ac80	0.340	0.536	63.43%	1.977
Band3				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.452	1.644	88.32%	0.539
n20	1.362	1.554	87.64%	0.573
n40	0.675	0.870	77.59%	1.102
ac20	1.374	1.566	87.74%	0.568
ac40	0.681	0.876	77.74%	1.094
ac80	0.340	0.538	63.20%	1.993
Band4				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.452	1.644	88.32%	0.539
n20	1.362	1.554	87.64%	0.573
n40	0.675	0.870	77.59%	1.102
ac20	1.374	1.566	87.74%	0.568
ac40	0.684	0.876	78.08%	1.074
ac80	0.342	0.538	63.57%	1.968



Band 1-a20



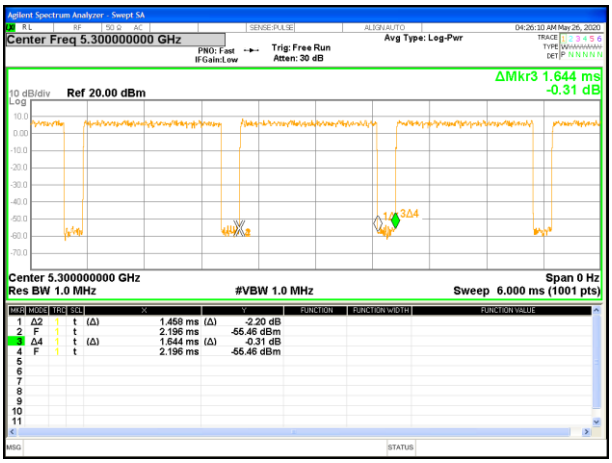
Band 1-n20

Band 1-n40

Band 1-ac20

Band 1-ac40

Band 1-ac80



Band 2-a20

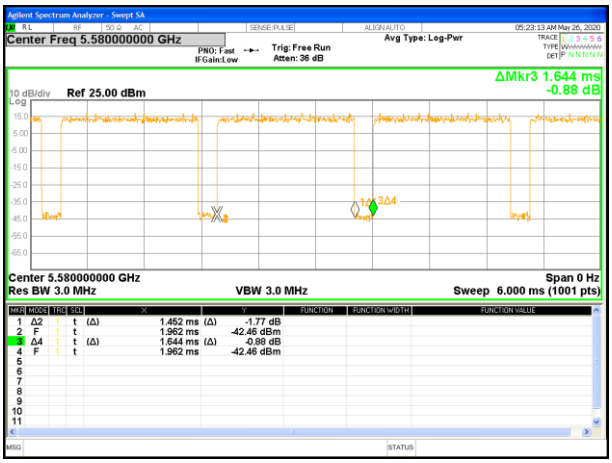
Band 2-n20

Band 2-n40

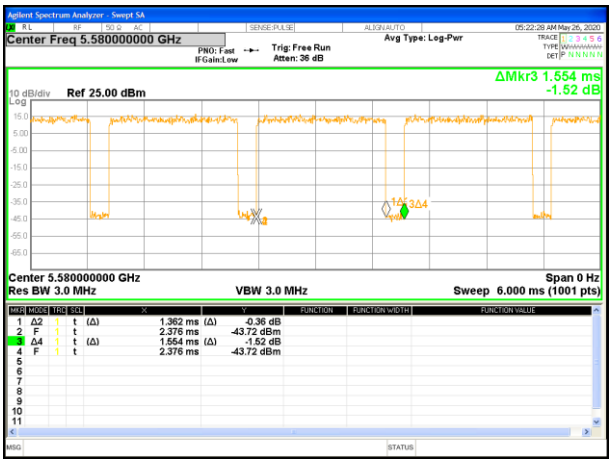
Band 2-ac20

Band 2-ac40

Band 2-ac80

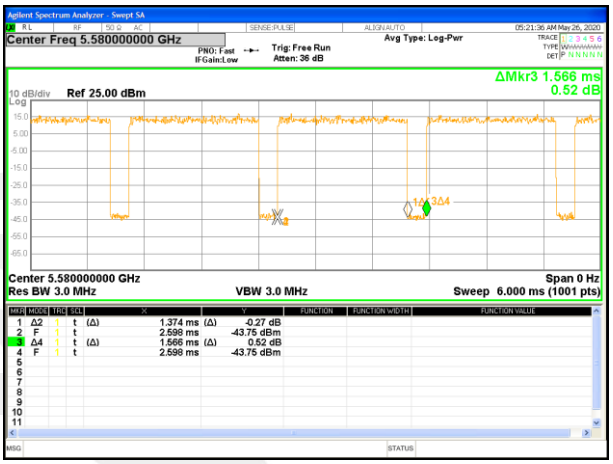


Band 3-a20



Band 3-n20

Band 3-n40



Band 3-ac20

Band 3-ac40

Band 3-ac80

Band 4-a20

Band 4-n20

Band 4-n40

Band 4-ac20

Band 4-ac40

Band 4-ac80

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 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.

9.2 EUT ANTENNA

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

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※※※※※