



RADIOTESTREPORT

Report No.:STS2006255W05

Issued for

XTRATECH COMPUTERS S.A

Ciudadela Profesor Aguirre Abad, solar 40, manzana 118,
Guayaquil, Ecuador.

Product Name:	Tablet PC
Brand Name:	XTRATECH
Model Name:	X8MT87
Series Model:	N/A
FCC ID:	2ADVA-X8MT87
Test Standard:	FCC Part 15.407

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**TEST RESULT CERTIFICATION**

Applicant's Name..... : XTRATECH COMPUTERS S.A
Address : Ciudadela Profesor Aguirre Abad, solar 40, manzana 118,
Guayaquil, Ecuador.
Manufacture's Name..... : Shenzhen Jilicheng Technology Co., Ltd
Address : 2ND FLOOR, BLOCK A6, DONGHUAN INDUSTRIAL PARK,
NO.293, NANPU ROAD, SHANGLIAO COMMUNITY, XINQIAO
STREET, BAOAN DISTRICT, SHENZHEN, China.

Product Description

Product Name..... : Tablet PC
Brand Name : XTRATECH
Model Name : X8MT87
Series Model..... : N/A

Test Standards..... : FCC Part 15.407

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 : 17 June 2020

Date (s) of performance of tests..... : 17 June 2020 ~ 30 June 2020

Date of Issue..... : 01 July 2020

Test Result..... : **Pass**

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Vita Li)

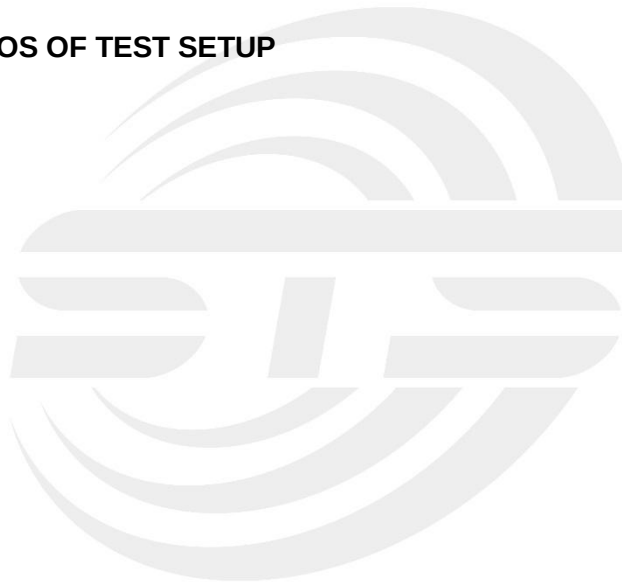




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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	01 July 2020	STS2006255W05	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

§ 15.407, KDB789033 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 (a) / 15.407 (e)	26dB/6dB&99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)& 15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(b)	Conducted Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203	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 $y \pm U$, where expanded 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	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 30-1GHz	$\pm 5.6\text{dB}$
4	All emissions, radiated 1G-6GHz	$\pm 5.5\text{dB}$
5	All emissions, radiated >6G	$\pm 5.8\text{dB}$
6	Conducted Emission (9KHz-150KHz)	$\pm 3.37\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 3.83\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Tablet PC	
Trade Name	XTRATECH	
Model Name	X8MT87	
Series Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a Tablet PC	
	Operation Frequency:	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
		IEEE 802.11a/ n(HT20)/ac(VHT20): 5.745GHz-5.825GHz
		IEEE 802.11n(HT40)/ac(VHT40): 5.755GHz-5.795GHz
	Modulation Type:	IEEE 802.11ac(VHT80): 5.775GHz
		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
	Antenna Designation:	Please refer to the Note 3.
	Max.Output Power(Conducted):	10.64 dBm
More details of EUT technical specification, please refer to the User's Manual.		
Test Channel	Please refer to the Note 2.	
Adapter	Input: 100-240 50/60Hz 0.3A Output:5V 2A	
Battery	Rated Voltage: 3.7V Charge Limit: 4.2V Capacity: 4000mAh	
Hardware version number	BND-MT8768-R863-V1.0	
Software version number	full_tb8768p1_64_bsp-userdebug 2020061006 release-keys	
Connecting I/O Port(s)	Please refer to the Note 1.	

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		5.745GHz-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

3. Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	XTRATEC H	X8MT87	PIFA	N/A	0dBi	WLAN Ant.



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly 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 802.11acVHT20 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 802.11acVHT80 CH42	NSS1 MCS0
Mode 12	TX IEEE 802.11acVHT80 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 been tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.
 (4) The battery is full-charged during the radiated and RF conducted test.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode13: 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	0	16	Engineering Mode
		802.11n(HT20)		16	
		802.11n(HT40)		16	
		802.11ac(VHT20)		16	
		802.11ac(VHT40)		16	
		802.11ac(VHT80)		14	



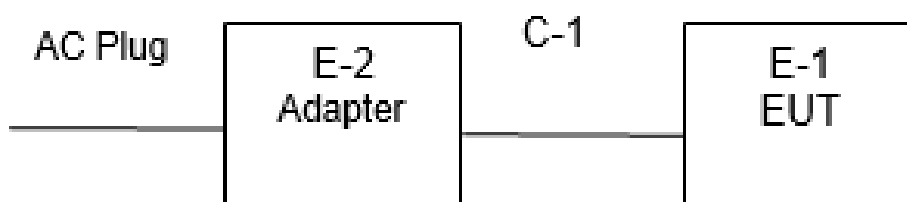
RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
WIFI(5G)	5G WIFI Band4 (5725MHz-5875MHz)	802.11a	0	16	Engineering Mode
		802.11n(HT20)		16	
		802.11n(HT40)		16	
		802.11ac(VHT20)		16	
		802.11ac(VHT40)		16	
		802.11ac(VHT80)		14	

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Emission Test





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-2	Adapter	N/A	N/A	N/A	N/A
C-1	DC Cable	N/A	150cm	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	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.

**2.6EQUIPMENTS 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

3.1 CONDUCTED EMISSION MEASUREMENT

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

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

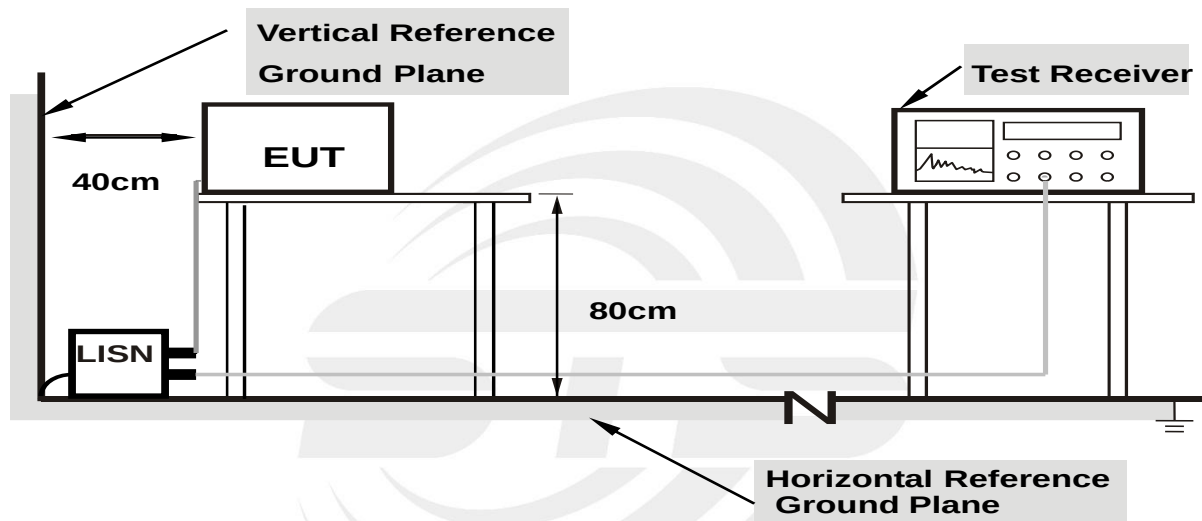
3.1.2 TEST PROCEDURE

- 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.
- Interconnecting cables that hang closer than 40 cm to the groundplane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- 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.



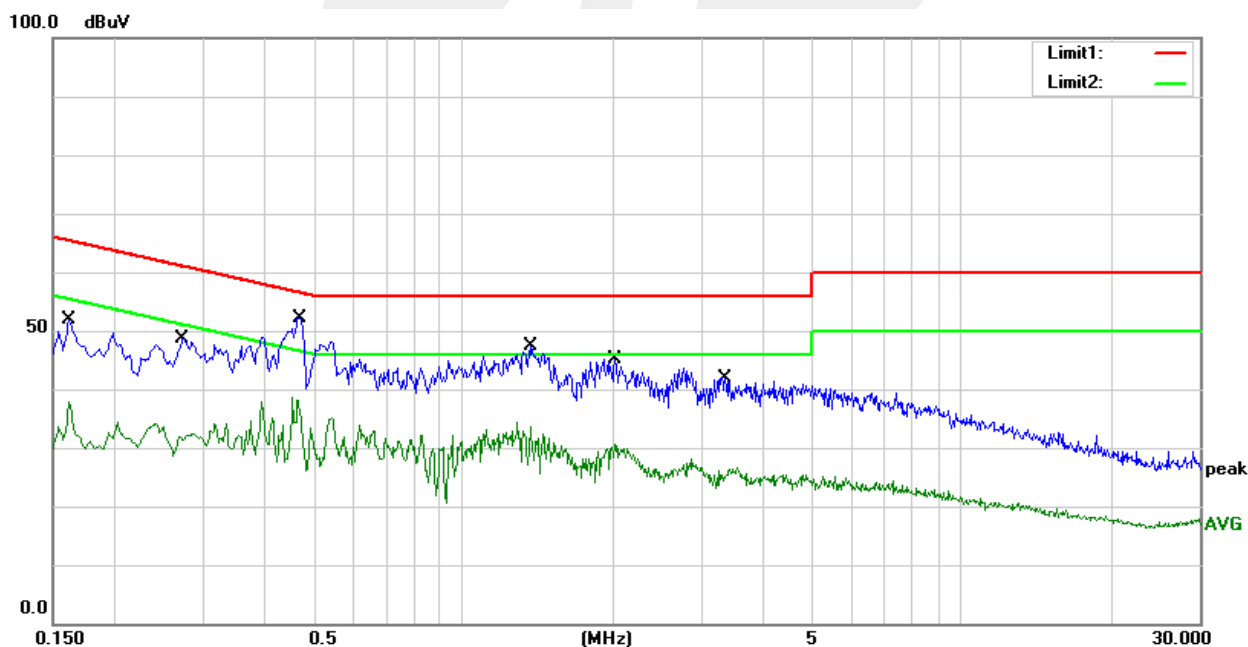
3.1.6 TEST RESULTS

Temperature:	27.1(C)	Relative Humidity:	67%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	31.66	20.22	51.88	65.36	-13.48	QP
2	0.1620	17.55	20.22	37.77	55.36	-17.59	AVG
3	0.2740	28.08	20.65	48.73	61.00	-12.27	QP
4	0.2740	10.70	20.65	31.35	51.00	-19.65	AVG
5	0.4700	31.78	20.45	52.23	56.51	-4.28	QP
6	0.4700	15.19	20.45	35.64	46.51	-10.87	AVG
7	1.3700	27.10	20.16	47.26	56.00	-8.74	QP
8	1.3700	11.55	20.16	31.71	46.00	-14.29	AVG
9	2.0140	24.92	20.15	45.07	56.00	-10.93	QP
10	2.0140	10.45	20.15	30.60	46.00	-15.40	AVG
11	3.3540	21.85	20.07	41.92	56.00	-14.08	QP
12	3.3540	4.70	20.07	24.77	46.00	-21.23	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = LISN factor + Cable loss + Limiter (10dB)



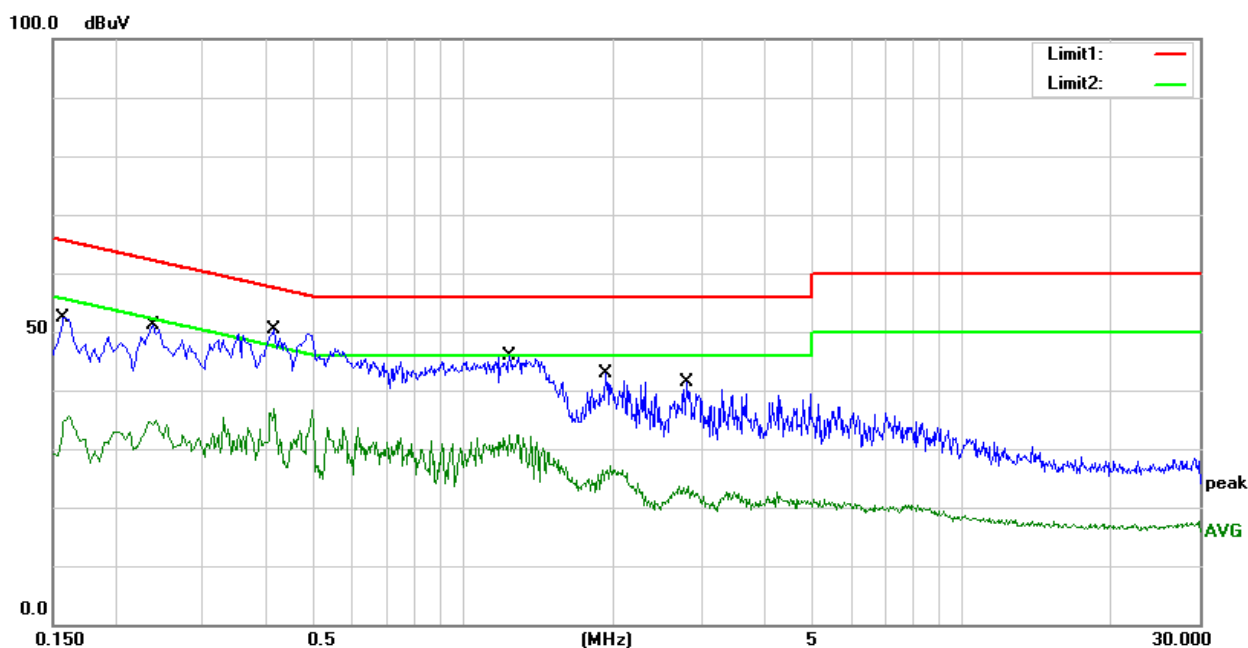


Temperature:	27.1(C)	Relative Humidity:	67%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 13		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1580	32.42	20.21	52.63	65.57	-12.94	QP
2	0.1580	13.43	20.21	33.64	55.57	-21.93	AVG
3	0.2420	29.75	20.51	50.26	62.03	-11.77	QP
4	0.2420	15.70	20.51	36.21	52.03	-15.82	AVG
5	0.4180	29.82	20.51	50.33	57.49	-7.16	QP
6	0.4180	13.72	20.51	34.23	47.49	-13.26	AVG
7	1.2980	25.34	20.16	45.50	56.00	-10.50	QP
8	1.2980	9.70	20.16	29.86	46.00	-16.14	AVG
9	1.9460	22.86	20.15	43.01	56.00	-12.99	QP
10	1.9460	5.07	20.15	25.22	46.00	-20.78	AVG
11	4.6700	19.15	20.03	39.18	56.00	-16.82	QP
12	4.6700	0.40	20.03	20.43	46.00	-25.57	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = LISN factor + Cable loss + Limiter (10dB)





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)	1MHz / 1MHz, AV=1 MHz /3 MHz

For Band edge

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

- 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.
- 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.
- 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.
- 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 QuasiPeak detector mode re-measured.
- 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

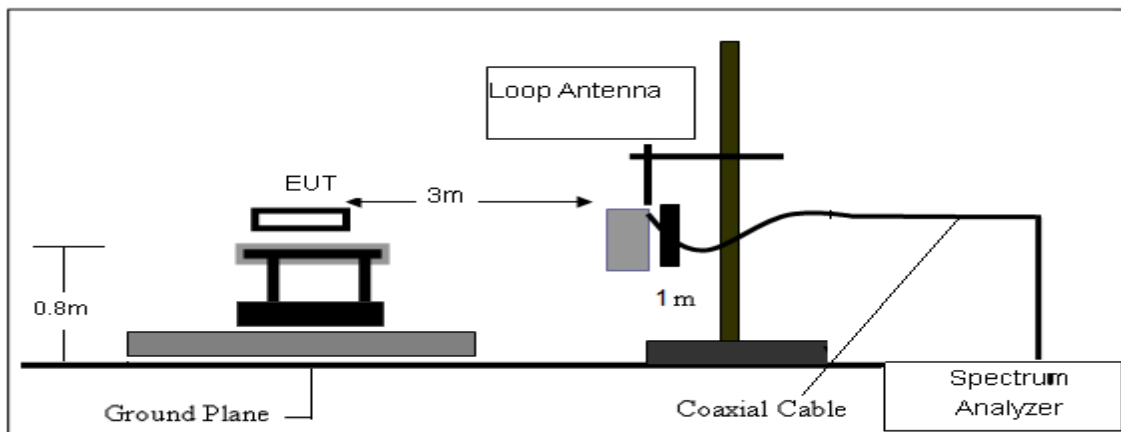
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported.

3.2.2 DEVIATION FROM TEST STANDARD

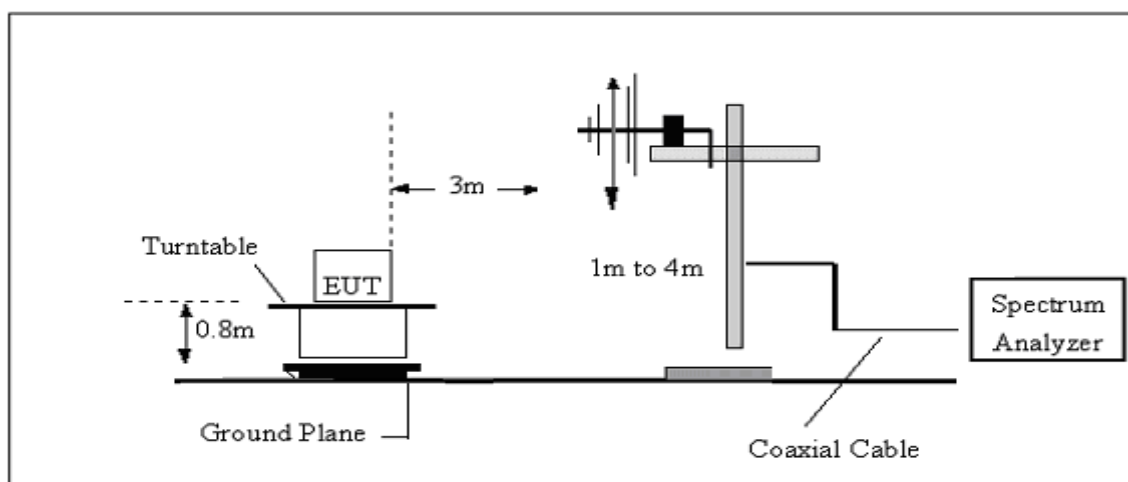
No deviation

3.2.3 TESTSETUP

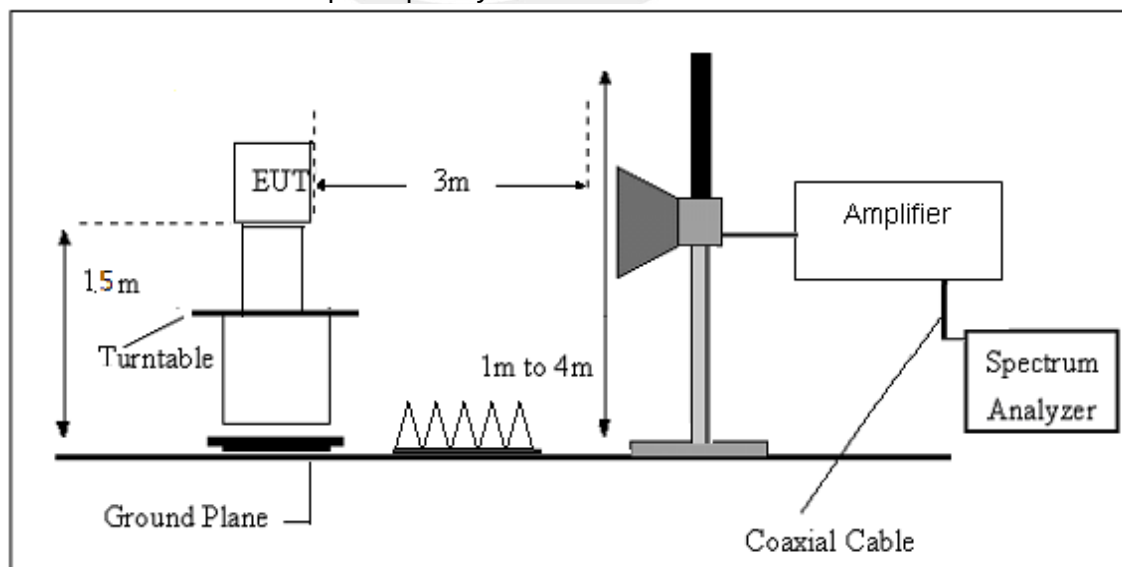
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$

**3.2.6 TEST RESULTS (Between 9KHz – 30 MHz)**

Temperature:	23.5(C)	Relative Humidity:	54%RH
Test Voltage:	DC 3.7V	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 = $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.



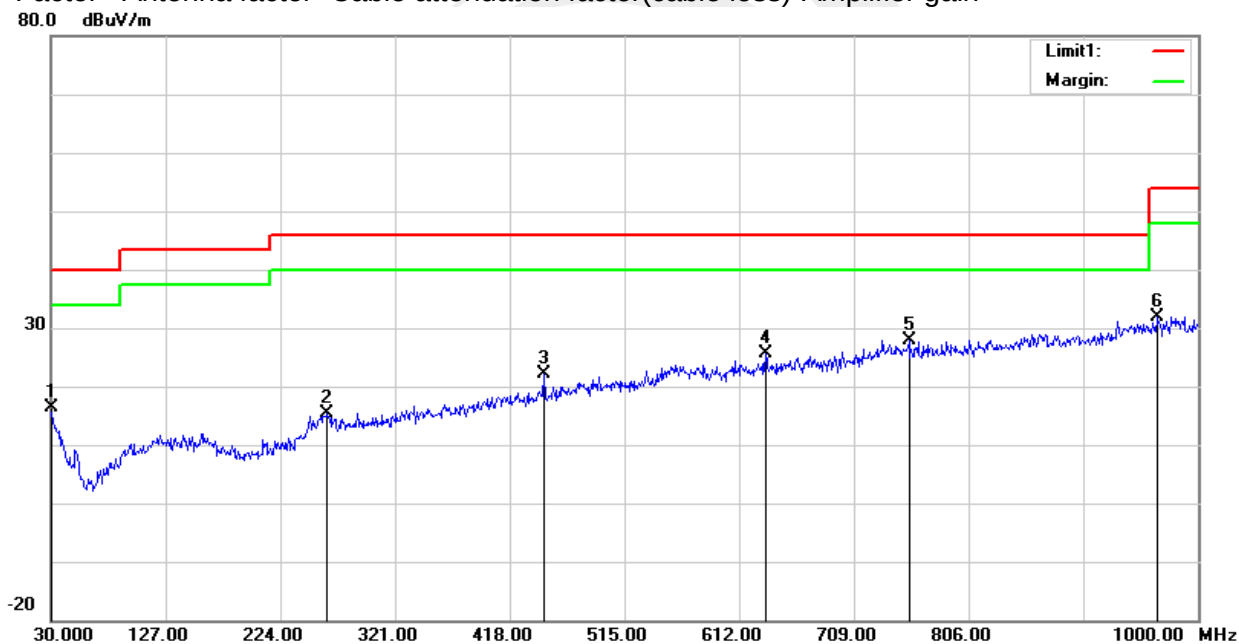
3.2.7 TEST RESULTS(Between 30MHz – 1GHz)

Temperature	23.5(C)	Relative Humidity:	54%RH
Test Voltage	DC 3.7V	Polarization:	Horizontal
Test Mode	Mode 1~12(Mode 1 worst mode)		

No.	Frequency (MHz)	Reading (dBUV)	Correct Factor(dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Remark
1	30.0000	29.20	-12.85	16.35	40.00	-23.65	QP
2	263.7700	30.23	-14.75	15.48	46.00	-30.52	QP
3	447.1000	31.92	-9.79	22.13	46.00	-23.87	QP
4	634.3100	30.47	-4.95	25.52	46.00	-20.48	QP
5	755.5600	30.09	-2.17	27.92	46.00	-18.08	QP
6	966.0500	30.09	1.90	31.99	54.00	-22.01	QP

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) – Amplifier gain



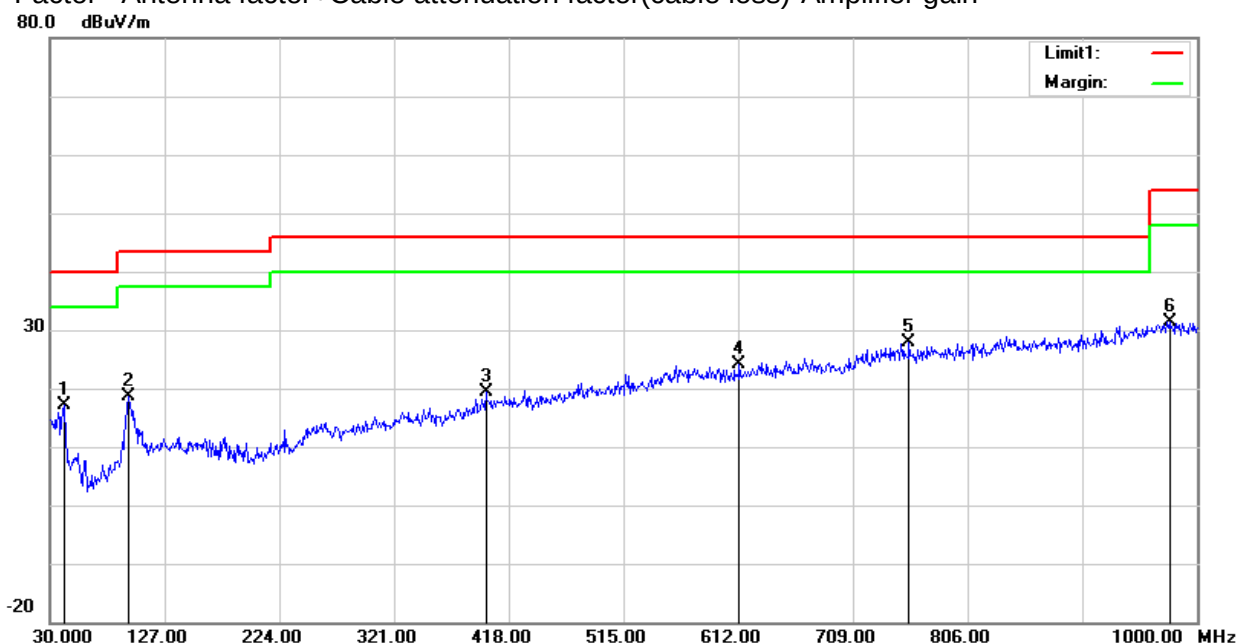


Temperature	23.5(C)	Relative Humidity:	54%RH
Test Voltage	DC 3.7V	Polarization:	Vertical
Test Mode	Mode 1~12(Mode 1 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	41.6400	35.94	-18.93	17.01	40.00	-22.99	QP
2	95.9600	39.24	-20.67	18.57	43.50	-24.93	QP
3	398.6000	30.62	-11.20	19.42	46.00	-26.58	QP
4	612.9700	29.53	-5.49	24.04	46.00	-21.96	QP
5	756.5300	30.00	-2.17	27.83	46.00	-18.17	QP
6	976.7200	28.92	2.45	31.37	54.00	-22.63	QP

Remark:

1. Margin = Result (Result = Reading + Factor) - Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain





3.2.8 TEST RESULTS(Above 1000 MHz)

Band I 5150-5250MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11a/ 5180 MHz)										
3247.57	45.12	44.70	6.70	28.20	-9.80	35.32	68.20	-32.88	Pk	Vertical
3247.57	42.04	44.70	6.70	28.20	-9.80	32.24	54.00	-21.76	AV	Vertical
3260.74	44.82	44.70	6.70	28.20	-9.80	35.02	68.20	-33.18	Pk	Horizontal
3260.74	42.18	44.70	6.70	28.20	-9.80	32.38	54.00	-21.62	AV	Horizontal
3982.71	39.43	44.20	7.90	29.70	-6.60	32.83	68.20	-35.37	Pk	Vertical
3982.71	37.01	44.20	7.90	29.70	-6.60	30.41	54.00	-23.59	AV	Vertical
3982.46	39.70	44.20	7.90	29.70	-6.60	33.10	68.20	-35.10	Pk	Horizontal
3982.46	36.87	44.20	7.90	29.70	-6.60	30.27	54.00	-23.73	AV	Horizontal
7226.09	36.85	43.50	11.40	35.50	3.40	40.25	68.20	-27.95	Pk	Vertical
7226.09	33.75	43.50	11.40	35.50	3.40	37.15	54.00	-16.85	AV	Vertical
7234.58	36.99	43.50	11.40	35.50	3.40	40.39	68.20	-27.81	Pk	Horizontal
7234.58	33.47	43.50	11.40	35.50	3.40	36.87	54.00	-17.13	AV	Horizontal
10360.19	39.26	44.50	13.80	38.80	8.10	47.36	68.20	-20.84	Pk	Vertical
10360.19	35.95	44.50	13.80	38.80	8.10	44.05	54.00	-9.95	AV	Vertical
10360.26	39.07	44.50	13.80	38.80	8.10	47.17	68.20	-21.03	Pk	Horizontal
10360.26	36.97	44.50	13.80	38.80	8.10	45.07	54.00	-8.93	AV	Horizontal
11016.92	33.39	43.60	14.30	39.50	10.20	43.59	68.20	-24.61	Pk	Vertical
11016.92	30.27	43.60	14.30	39.50	10.20	40.47	54.00	-13.53	AV	Vertical
11020.74	33.57	43.60	14.30	39.50	10.20	43.77	68.20	-24.43	Pk	Horizontal
11020.74	30.00	43.60	14.30	39.50	10.20	40.20	54.00	-13.80	AV	Horizontal
13282.85	31.61	42.60	15.90	38.90	12.20	43.81	68.20	-24.39	Pk	Vertical
13282.85	28.54	42.60	15.90	38.90	12.20	40.74	54.00	-13.26	AV	Vertical
13289.71	32.82	42.60	15.90	38.90	12.20	45.02	68.20	-23.18	Pk	Horizontal
13289.71	29.77	42.60	15.90	38.90	12.20	41.97	54.00	-12.03	AV	Horizontal
Mid Channel (802.11a/ 5200 MHz)										
3250.33	43.86	44.70	6.70	28.20	-9.80	34.06	68.20	-34.14	Pk	Vertical
3250.33	41.54	44.70	6.70	28.20	-9.80	31.74	54.00	-22.26	AV	Vertical
3258.91	45.22	44.70	6.70	28.20	-9.80	35.42	68.20	-32.78	Pk	Horizontal
3258.91	41.54	44.70	6.70	28.20	-9.80	31.74	54.00	-22.26	AV	Horizontal
3996.88	39.43	44.20	7.90	29.70	-6.60	32.83	68.20	-35.37	Pk	Vertical
3996.88	35.73	44.20	7.90	29.70	-6.60	29.13	54.00	-24.87	AV	Vertical
3993.68	39.67	44.20	7.90	29.70	-6.60	33.07	68.20	-35.13	Pk	Horizontal
3993.68	35.91	44.20	7.90	29.70	-6.60	29.31	54.00	-24.69	AV	Horizontal
7217.62	36.81	43.50	11.40	35.50	3.40	40.21	68.20	-27.99	Pk	Vertical
7217.62	33.97	43.50	11.40	35.50	3.40	37.37	54.00	-16.63	AV	Vertical
7232.08	36.66	43.50	11.40	35.50	3.40	40.06	68.20	-28.14	Pk	Horizontal
7232.08	33.88	43.50	11.40	35.50	3.40	37.28	54.00	-16.72	AV	Horizontal
10400.07	39.20	44.50	13.80	38.80	8.10	47.30	68.20	-20.90	Pk	Vertical
10400.07	36.46	44.50	13.80	38.80	8.10	44.56	54.00	-9.44	AV	Vertical
10400.34	39.47	44.50	13.80	38.80	8.10	47.57	68.20	-20.63	Pk	Horizontal
10400.34	36.09	44.50	13.80	38.80	8.10	44.19	54.00	-9.81	AV	Horizontal
11017.05	32.90	43.60	14.30	39.50	10.20	43.10	68.20	-25.10	Pk	Vertical
11017.05	30.25	43.60	14.30	39.50	10.20	40.45	54.00	-13.55	AV	Vertical
11031.18	33.18	43.60	14.30	39.50	10.20	43.38	68.20	-24.82	Pk	Horizontal
11031.18	30.90	43.60	14.30	39.50	10.20	41.10	54.00	-12.90	AV	Horizontal
13286.56	32.02	42.60	15.90	38.90	12.20	44.22	68.20	-23.98	Pk	Vertical
13286.56	29.43	42.60	15.90	38.90	12.20	41.63	54.00	-12.37	AV	Vertical
13285.81	32.18	42.60	15.90	38.90	12.20	44.38	68.20	-23.82	Pk	Horizontal
13285.81	29.50	42.60	15.90	38.90	12.20	41.70	54.00	-12.30	AV	Horizontal



High Channel (802.11a/ 5240 MHz)										
3262.88	44.96	44.70	6.70	28.20	-9.80	35.16	68.20	-33.04	Pk	Vertical
3262.88	40.78	44.70	6.70	28.20	-9.80	30.98	54.00	-23.02	AV	Vertical
3249.40	43.93	44.70	6.70	28.20	-9.80	34.13	68.20	-34.07	Pk	Horizontal
3249.40	41.08	44.70	6.70	28.20	-9.80	31.28	54.00	-22.72	AV	Horizontal
3988.29	39.13	44.20	7.90	29.70	-6.60	32.53	68.20	-35.67	Pk	Vertical
3988.29	36.83	44.20	7.90	29.70	-6.60	30.23	54.00	-23.77	AV	Vertical
4000.01	40.08	44.20	7.90	29.70	-6.60	33.48	68.20	-34.72	Pk	Horizontal
4000.01	36.82	44.20	7.90	29.70	-6.60	30.22	54.00	-23.78	AV	Horizontal
7235.24	37.24	43.50	11.40	35.50	3.40	40.64	68.20	-27.56	Pk	Vertical
7235.24	34.80	43.50	11.40	35.50	3.40	38.20	54.00	-15.80	AV	Vertical
7230.57	36.95	43.50	11.40	35.50	3.40	40.35	68.20	-27.85	Pk	Horizontal
7230.57	34.77	43.50	11.40	35.50	3.40	38.17	54.00	-15.83	AV	Horizontal
10480.08	39.70	44.50	13.80	38.80	8.10	47.80	68.20	-20.40	Pk	Vertical
10480.08	36.44	44.50	13.80	38.80	8.10	44.54	54.00	-9.46	AV	Vertical
10480.32	39.40	44.50	13.80	38.80	8.10	47.50	68.20	-20.70	Pk	Horizontal
10480.32	35.86	44.50	13.80	38.80	8.10	43.96	54.00	-10.04	AV	Horizontal
11030.52	33.09	43.60	14.30	39.50	10.20	43.29	68.20	-24.91	Pk	Vertical
11030.52	31.03	43.60	14.30	39.50	10.20	41.23	54.00	-12.77	AV	Vertical
11024.55	33.84	43.60	14.30	39.50	10.20	44.04	68.20	-24.16	Pk	Horizontal
11024.55	29.78	43.60	14.30	39.50	10.20	39.98	54.00	-14.02	AV	Horizontal
13281.17	32.21	42.60	15.90	38.90	12.20	44.41	68.20	-23.79	Pk	Vertical
13281.17	29.14	42.60	15.90	38.90	12.20	41.34	54.00	-12.66	AV	Vertical
13291.61	32.49	42.60	15.90	38.90	12.20	44.69	68.20	-23.51	Pk	Horizontal
13291.61	29.87	42.60	15.90	38.90	12.20	42.07	54.00	-11.93	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 802.11a.

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 (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11a/ 5745 MHz)										
3264.75	43.84	44.70	6.70	28.20	-9.80	34.04	68.20	-34.16	Pk	Vertical
3264.75	41.20	44.70	6.70	28.20	-9.80	31.40	54.00	-22.60	AV	Vertical
3259.69	45.07	44.70	6.70	28.20	-9.80	35.27	68.20	-32.93	Pk	Horizontal
3259.69	41.89	44.70	6.70	28.20	-9.80	32.09	54.00	-21.91	AV	Horizontal
3997.65	38.90	44.20	7.90	29.70	-6.60	32.30	68.20	-35.90	Pk	Vertical
3997.65	35.74	44.20	7.90	29.70	-6.60	29.14	54.00	-24.86	AV	Vertical
3988.03	38.91	44.20	7.90	29.70	-6.60	32.31	68.20	-35.89	Pk	Horizontal
3988.03	36.76	44.20	7.90	29.70	-6.60	30.16	54.00	-23.84	AV	Horizontal
7216.45	37.32	43.50	11.40	35.50	3.40	40.72	68.20	-27.48	Pk	Vertical
7216.45	34.34	43.50	11.40	35.50	3.40	37.74	54.00	-16.26	AV	Vertical
7229.39	36.62	43.50	11.40	35.50	3.40	40.02	68.20	-28.18	Pk	Horizontal
7229.39	34.30	43.50	11.40	35.50	3.40	37.70	54.00	-16.30	AV	Horizontal
10513.55	39.59	44.50	13.90	38.80	8.20	47.79	68.20	-20.41	Pk	Vertical
10513.55	36.65	44.50	13.90	38.80	8.20	44.85	54.00	-9.15	AV	Vertical
10520.02	38.83	44.50	13.90	38.80	8.20	47.03	68.20	-21.17	Pk	Horizontal
10520.02	36.18	44.50	13.90	38.80	8.20	44.38	54.00	-9.62	AV	Horizontal
11490.08	34.07	43.60	14.30	39.50	10.20	44.27	68.20	-23.93	Pk	Vertical
11490.08	30.93	43.60	14.30	39.50	10.20	41.13	54.00	-12.87	AV	Vertical
11490.13	32.74	43.60	14.30	39.50	10.20	42.94	68.20	-25.26	Pk	Horizontal
11490.13	30.61	43.60	14.30	39.50	10.20	40.81	54.00	-13.19	AV	Horizontal
13292.14	32.78	42.60	15.90	38.90	12.20	44.98	68.20	-23.22	Pk	Vertical
13292.14	29.99	42.60	15.90	38.90	12.20	42.19	54.00	-11.81	AV	Vertical
13299.38	32.42	42.60	15.90	38.90	12.20	44.62	68.20	-23.58	Pk	Horizontal
13299.38	29.97	42.60	15.90	38.90	12.20	42.17	54.00	-11.83	AV	Horizontal
Mid Channel (802.11a/ 5785 MHz)										
3250.23	44.10	44.70	6.70	28.20	-9.80	34.30	68.20	-33.90	Pk	Vertical
3250.23	41.65	44.70	6.70	28.20	-9.80	31.85	54.00	-22.15	AV	Vertical
3251.29	45.09	44.70	6.70	28.20	-9.80	35.29	68.20	-32.91	Pk	Horizontal
3251.29	42.10	44.70	6.70	28.20	-9.80	32.30	54.00	-21.70	AV	Horizontal
3998.51	39.09	44.20	7.90	29.70	-6.60	32.49	68.20	-35.71	Pk	Vertical
3998.51	36.73	44.20	7.90	29.70	-6.60	30.13	54.00	-23.87	AV	Vertical
3998.11	39.61	44.20	7.90	29.70	-6.60	33.01	68.20	-35.19	Pk	Horizontal
3998.11	36.14	44.20	7.90	29.70	-6.60	29.54	54.00	-24.46	AV	Horizontal
7230.23	37.63	43.50	11.40	35.50	3.40	41.03	68.20	-27.17	Pk	Vertical
7230.23	34.00	43.50	11.40	35.50	3.40	37.40	54.00	-16.60	AV	Vertical
7218.77	36.98	43.50	11.40	35.50	3.40	40.38	68.20	-27.82	Pk	Horizontal
7218.77	34.66	43.50	11.40	35.50	3.40	38.06	54.00	-15.94	AV	Horizontal
10596.32	38.94	44.50	13.80	38.80	8.10	47.04	68.20	-21.16	Pk	Vertical
10596.32	36.51	44.50	13.80	38.80	8.10	44.61	54.00	-9.39	AV	Vertical
10581.37	39.29	44.50	13.80	38.80	8.10	47.39	68.20	-20.81	Pk	Horizontal
10581.37	36.08	44.50	13.80	38.80	8.10	44.18	54.00	-9.82	AV	Horizontal
11570.14	33.26	43.60	14.30	39.50	10.20	43.46	68.20	-24.74	Pk	Vertical
11570.14	30.80	43.60	14.30	39.50	10.20	41.00	54.00	-13.00	AV	Vertical
11570.15	33.43	43.60	14.30	39.50	10.20	43.63	68.20	-24.57	Pk	Horizontal
11570.15	29.78	43.60	14.30	39.50	10.20	39.98	54.00	-14.02	AV	Horizontal
13295.14	32.06	42.60	15.90	38.90	12.20	44.26	68.20	-23.94	Pk	Vertical
13295.14	29.47	42.60	15.90	38.90	12.20	41.67	54.00	-12.33	AV	Vertical
13299.87	31.65	42.60	15.90	38.90	12.20	43.85	68.20	-24.35	Pk	Horizontal
13299.87	28.88	42.60	15.90	38.90	12.20	41.08	54.00	-12.92	AV	Horizontal



High Channel (802.11a/ 5825 MHz)										
3258.59	45.15	44.70	6.70	28.20	-9.80	35.35	68.20	-32.85	Pk	Vertical
3258.59	42.22	44.70	6.70	28.20	-9.80	32.42	54.00	-21.58	AV	Vertical
3259.72	44.08	44.70	6.70	28.20	-9.80	34.28	68.20	-33.92	Pk	Horizontal
3259.72	41.85	44.70	6.70	28.20	-9.80	32.05	54.00	-21.95	AV	Horizontal
3997.03	39.76	44.20	7.90	29.70	-6.60	33.16	68.20	-35.04	Pk	Vertical
3997.03	35.80	44.20	7.90	29.70	-6.60	29.20	54.00	-24.80	AV	Vertical
3985.11	39.93	44.20	7.90	29.70	-6.60	33.33	68.20	-34.87	Pk	Horizontal
3985.11	36.80	44.20	7.90	29.70	-6.60	30.20	54.00	-23.80	AV	Horizontal
7235.87	36.89	43.50	11.40	35.50	3.40	40.29	68.20	-27.91	Pk	Vertical
7235.87	33.55	43.50	11.40	35.50	3.40	36.95	54.00	-17.05	AV	Vertical
7221.10	36.70	43.50	11.40	35.50	3.40	40.10	68.20	-28.10	Pk	Horizontal
7221.10	34.21	43.50	11.40	35.50	3.40	37.61	54.00	-16.39	AV	Horizontal
10632.20	39.04	44.50	13.80	38.80	8.10	47.14	68.20	-21.06	Pk	Vertical
10632.20	36.28	44.50	13.80	38.80	8.10	44.38	54.00	-9.62	AV	Vertical
10640.19	38.89	44.50	13.80	38.80	8.10	46.99	68.20	-21.21	Pk	Horizontal
10640.19	36.76	44.50	13.80	38.80	8.10	44.86	54.00	-9.14	AV	Horizontal
11649.99	33.23	43.60	14.30	39.50	10.20	43.43	68.20	-24.77	Pk	Vertical
11649.99	30.50	43.60	14.30	39.50	10.20	40.70	54.00	-13.30	AV	Vertical
11650.38	33.64	43.60	14.30	39.50	10.20	43.84	68.20	-24.36	Pk	Horizontal
11650.38	29.78	43.60	14.30	39.50	10.20	39.98	54.00	-14.02	AV	Horizontal
13284.00	31.65	42.70	18.00	37.10	12.40	44.05	68.20	-24.15	Pk	Vertical
13284.00	29.95	42.70	18.00	37.10	12.40	42.35	54.00	-11.65	AV	Vertical
13297.11	32.73	42.70	18.00	37.10	12.40	45.13	68.20	-23.07	Pk	Horizontal
13297.11	29.06	42.70	18.00	37.10	12.40	41.46	54.00	-12.54	AV	Horizontal

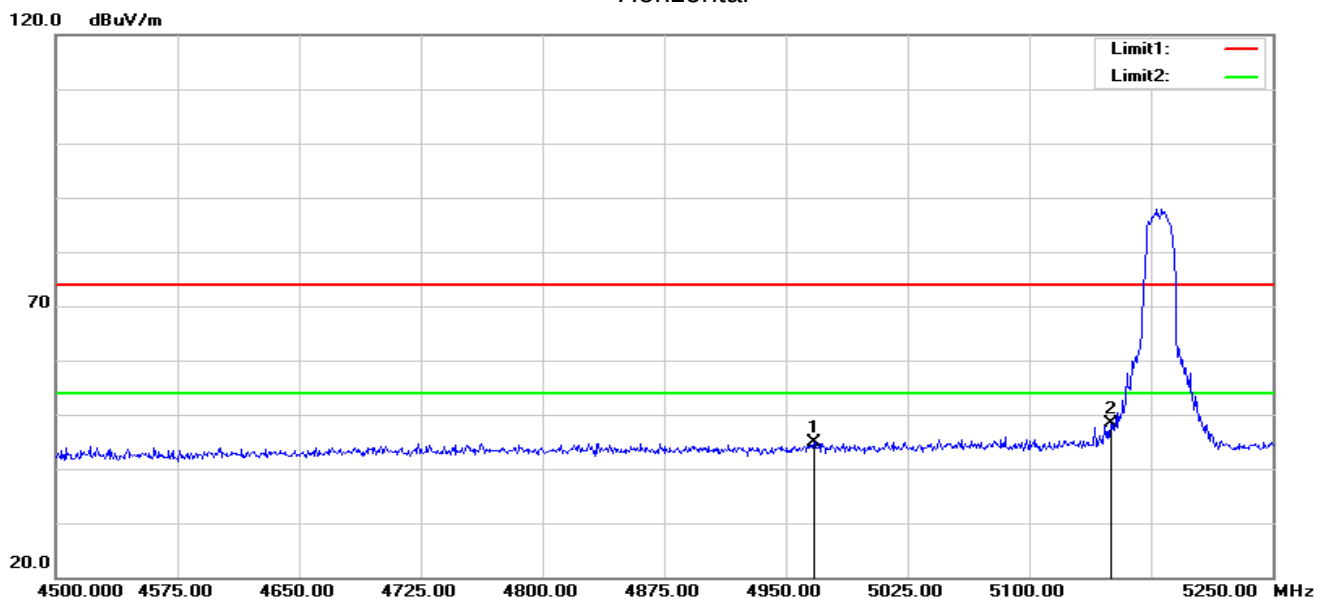
Remark:

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 802.11a.
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.



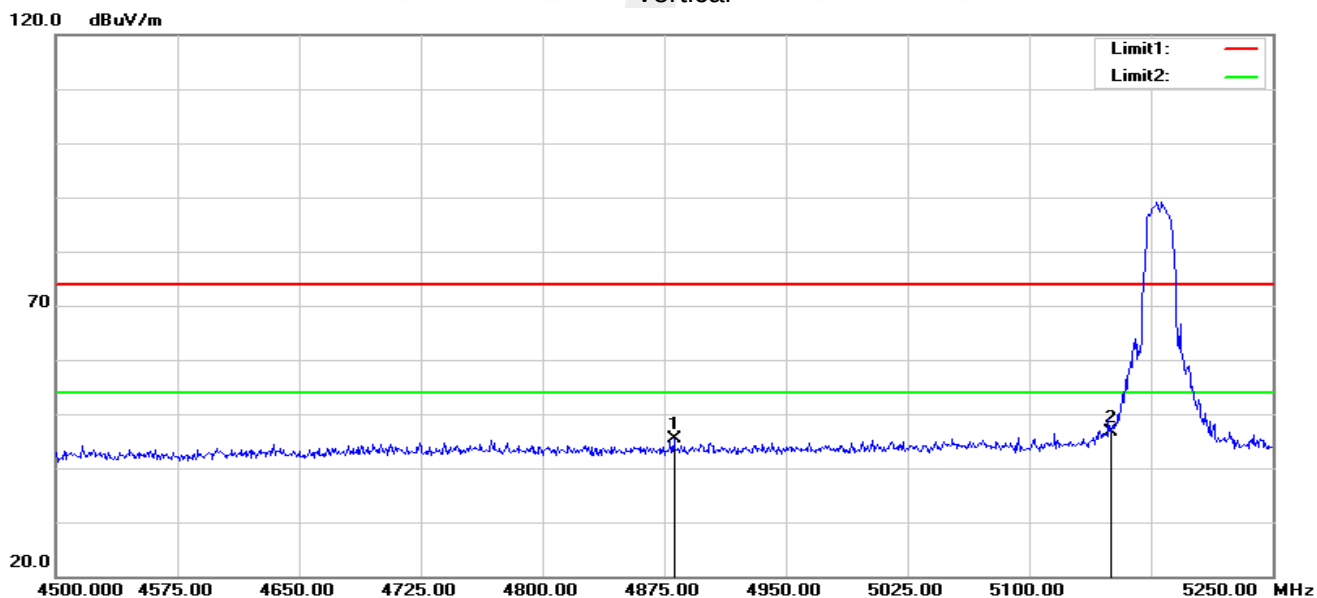
3.2.9 Band Edge

Band I 5150-5250 MHz

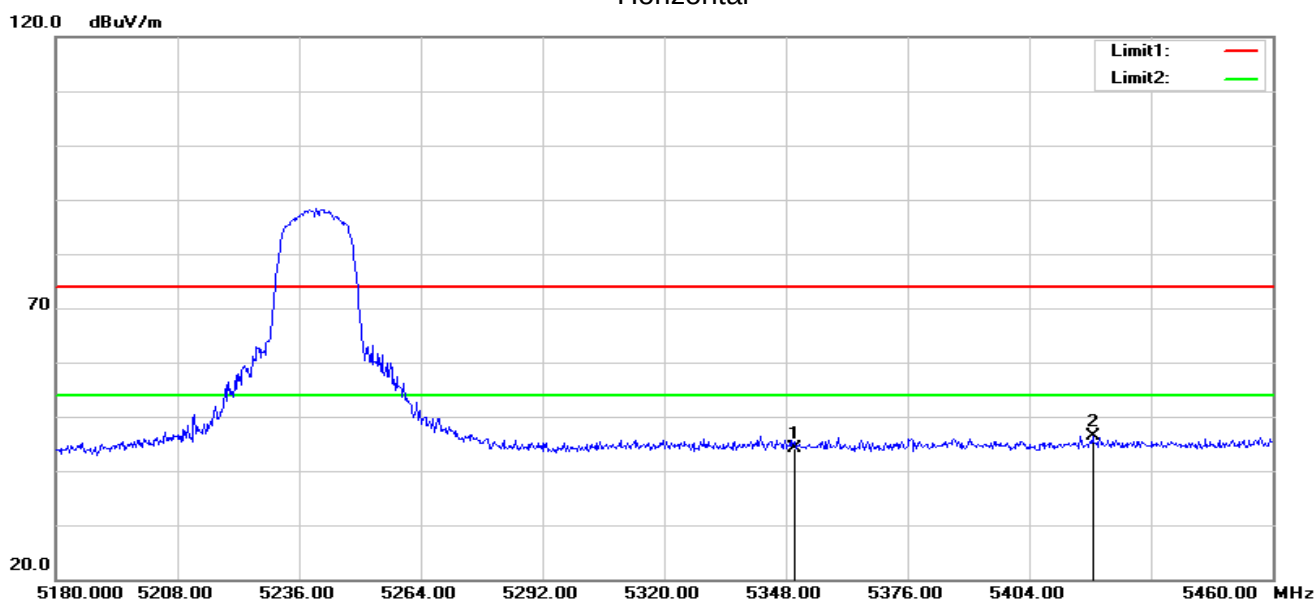
802.11a Low
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4967.250	51.36	-6.41	44.95	74.00	-29.05	peak
2	5150.000	54.01	-5.73	48.28	74.00	-25.72	peak

Vertical

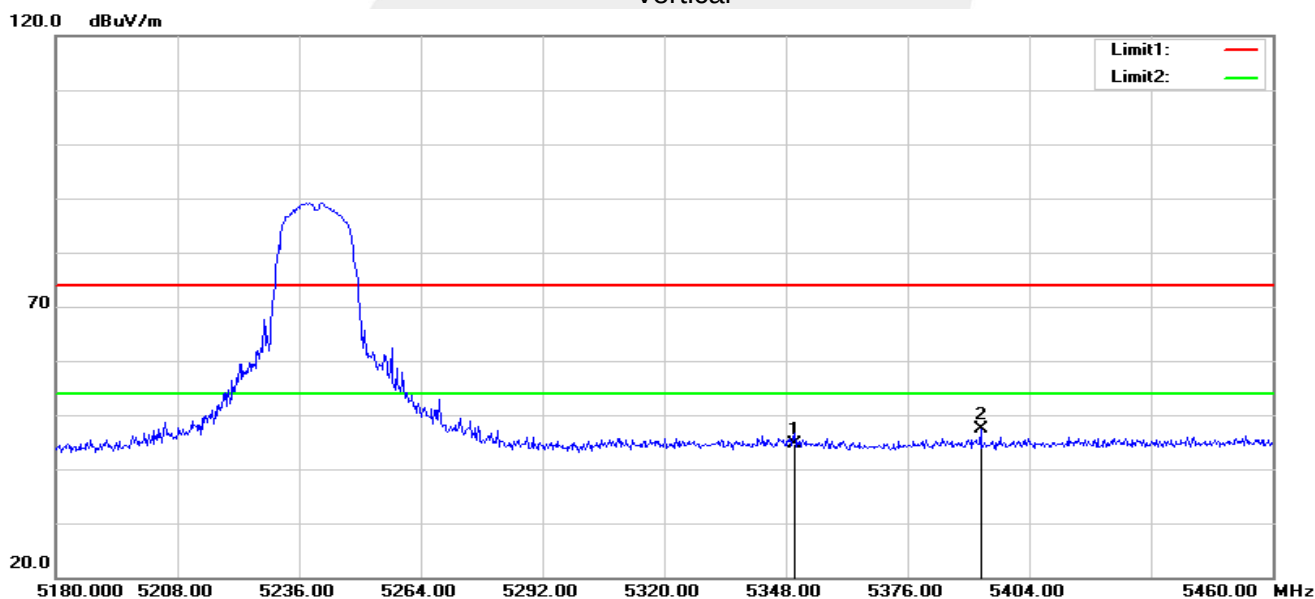


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4881.000	52.20	-6.91	45.29	74.00	-28.71	peak
2	5150.000	52.30	-5.73	46.57	74.00	-27.43	peak

**802.11a High**
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.30	-5.23	44.07	74.00	-29.93	peak
2	5418.560	51.56	-5.21	46.35	74.00	-27.65	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.95	-5.23	44.72	74.00	-29.28	peak
2	5392.800	52.70	-5.25	47.45	74.00	-26.55	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 802.11a, 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

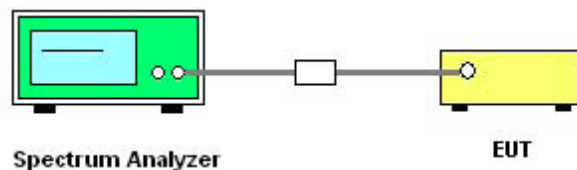
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 5140to5775 MHz Upper Band Edge: 5230to5950 MHz (The specific test chart shall prevail)
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 50 Ohm; 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 500 kHz 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 $RBW \geq 1/T$, where T is defined in section II.B.1.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ 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 $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

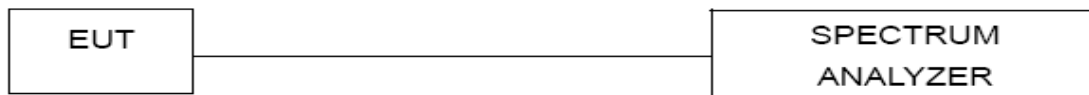
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHZ}$ is available on nearly all spectrum analyzers.



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	0.956	0.107	1.063	11	PASS
5200	0.213	0.107	0.320	11	PASS
5240	-0.522	0.107	-0.415	11	PASS
802.11n20					
5180	0.468	0.105	0.573	11	PASS
5200	-0.959	0.105	-0.854	11	PASS
5240	-2.042	0.105	-1.937	11	PASS
802.11n40					
5190	-4.102	0.232	-3.870	11	PASS
5230	-5.011	0.232	-4.779	11	PASS
802.11ac20					
5180	-1.138	0.091	-1.047	11	PASS
5200	-1.294	0.091	-1.203	11	PASS
5240	-2.436	0.091	-2.345	11	PASS
802.11ac40					
5190	-4.116	0.218	-3.898	11	PASS
5230	-5.208	0.218	-4.990	11	PASS
802.11ac80					
5210	-9.601	0.487	-9.114	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	-2.356	-2.442	0.110	-2.332	30	PASS
5785	-1.656	-1.742	0.110	-1.632	30	PASS
5825	-1.897	-1.983	0.110	-1.873	30	PASS
802.11n20						
5745	-2.344	-2.430	0.105	-2.325	30	PASS
5785	-2.110	-2.196	0.105	-2.091	30	PASS
5825	-2.447	-2.533	0.105	-2.428	30	PASS
802.11n40						
5755	-5.562	-5.648	0.245	-5.403	30	PASS
5795	-5.588	-5.674	0.245	-5.429	30	PASS
802.11ac20						
5745	-2.578	-2.664	0.104	-2.560	30	PASS
5785	-1.787	-1.873	0.104	-1.769	30	PASS
5825	-2.500	-2.586	0.104	-2.482	30	PASS
802.11ac40						
5755	-5.414	-5.500	0.244	-5.256	30	PASS
5795	-5.307	-5.393	0.244	-5.149	30	PASS
802.11ac80						
5775	-11.008	-11.094	0.498	-10.596	30	PASS

Note: 1. RB conversion formula= $10 * \text{LOG} (500\text{KHz} / \text{RBW})$
2. Data see Attachment B

6. BANDWIDTH MEASUREMENT

6.1. EMISSION BANDWIDTH (EBW) 26 BANDWIDTH PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

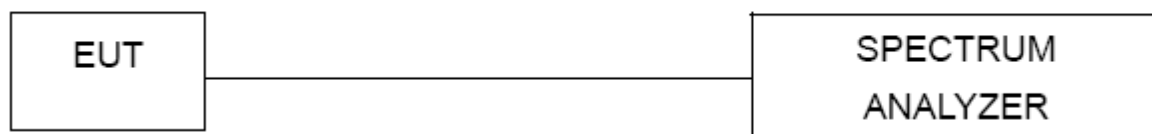
6.1.1. TEST PROCEDURE

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 $\geq$ 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	19.76	Pass
5200	19.90	Pass
5240	19.76	Pass
802.11n(HT20)		
5180	20.10	Pass
5200	20.03	Pass
5240	20.07	Pass
802.11n(HT40)		
5190	40.12	Pass
5230	39.73	Pass
802.11ac(VHT20)		
5180	20.23	Pass
5200	19.92	Pass
5240	19.91	Pass
802.11ac(VHT40)		
5190	40.60	Pass
5230	40.59	Pass
802.11ac(VHT80)		
5210	80.78	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	19.69	Pass
5785	19.77	Pass
5825	19.65	Pass
802.11n(HT20)		
5745	20.11	Pass
5785	20.10	Pass
5825	19.96	Pass
802.11n(HT40)		
5755	40.27	Pass
5795	40.08	Pass
802.11ac(VHT20)		
5745	20.16	Pass
5785	20.07	Pass
5825	20.18	Pass
802.11ac(VHT40)		
5755	40.06	Pass
5795	40.12	Pass
802.11ac(VHT80)		
5775	80.41	Pass

Test plot see AttachmentC



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 $\geq 3 \cdot$ 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	16.39	Pass
5200	16.41	Pass
5240	16.40	Pass
802.11n(HT20)		
5180	17.53	Pass
5200	17.55	Pass
5240	17.53	Pass
802.11n(HT40)		
5190	35.95	Pass
5230	35.93	Pass
802.11ac(VHT20)		
5180	17.53	Pass
5200	17.56	Pass
5240	17.53	Pass
802.11ac(VHT40)		
5190	35.98	Pass
5230	35.96	Pass
802.11ac(VHT80)		
5210	75.25	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.39	Pass
5785	16.41	Pass
5825	16.39	Pass
802.11n(HT20)		
5745	17.53	Pass
5785	17.53	Pass
5825	17.54	Pass
802.11n(HT40)		
5755	35.96	Pass
5795	35.95	Pass
802.11ac(VHT20)		
5745	17.53	Pass
5785	17.51	Pass
5825	17.53	Pass
802.11ac(VHT40)		
5755	35.94	Pass
5795	35.96	Pass
802.11ac(VHT80)		
5775	75.18	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) $\geq 3 \times$ 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	15.10	Pass
5785	15.10	Pass
5825	15.07	Pass
802.11n(HT20)		
5745	15.10	Pass
5785	15.08	Pass
5825	15.07	Pass
802.11n(HT40)		
5755	35.10	Pass
5795	35.11	Pass
802.11ac(VHT20)		
5745	15.05	Pass
5785	15.12	Pass
5825	15.11	Pass
802.11ac(VHT40)		
5755	35.10	Pass
5795	35.11	Pass
802.11ac(VHT80)		
5775	75.11	Pass

Test plot see AttachmentD



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	

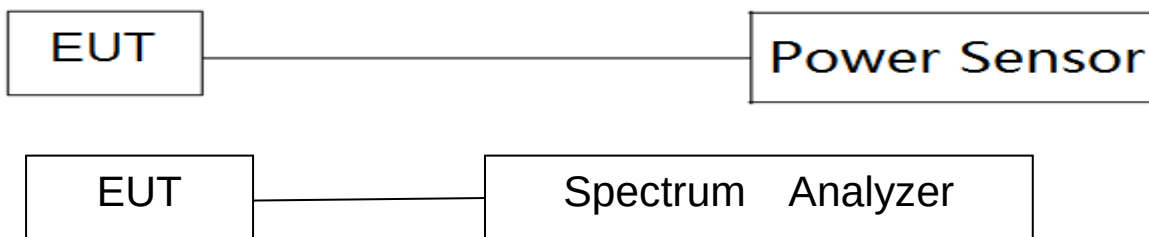
7.2 TEST PROCEDURE

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

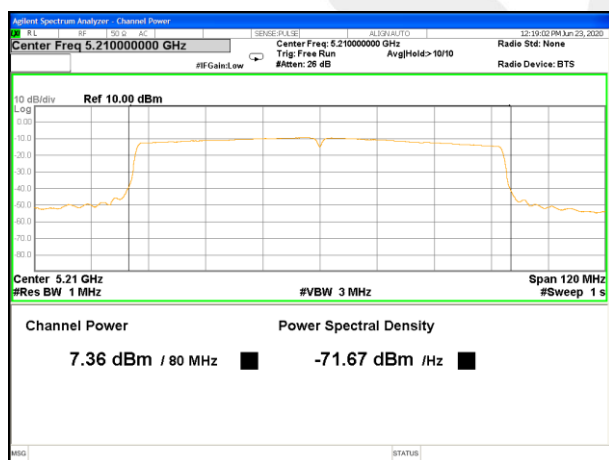
The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

**7.6 TEST RESULTS**

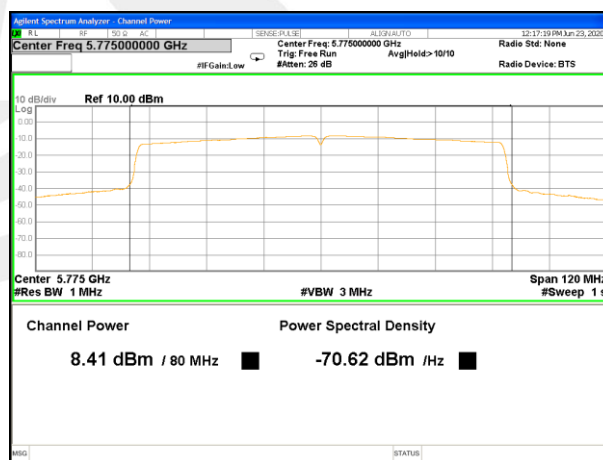
Band I (5.15-5.25GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
36	5180	10.53	0.107	10.64	23.98
40	5200	10.15	0.107	10.26	23.98
48	5240	9.50	0.107	9.61	23.98
802.11n(HT20)					
36	5180	10.22	0.105	10.32	23.98
40	5200	10.03	0.105	10.13	23.98
48	5240	9.37	0.105	9.47	23.98
802.11n(HT40)					
38	5190	9.91	0.232	10.14	23.98
46	5230	9.08	0.232	9.31	23.98
802.11ac(VHT20)					
36	5180	10.27	0.091	10.36	23.98
40	5200	10.00	0.091	10.09	23.98
48	5240	9.36	0.091	9.45	23.98
802.11ac(VHT40)					
38	5190	9.91	0.218	10.13	23.98
46	5230	8.78	0.218	9.00	23.98
802.11ac(VHT80)					
42	5210	7.36	0.487	7.85	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	9.56	0.110	9.67	30.00
157	5785	9.75	0.110	9.86	30.00
165	5825	9.78	0.110	9.89	30.00
802.11n(HT20)					
149	5745	9.42	0.105	9.52	30.00
157	5785	9.62	0.105	9.72	30.00
165	5825	9.70	0.105	9.80	30.00
802.11n(HT40)					
151	5755	9.15	0.245	9.40	30.00
159	5795	9.25	0.245	9.50	30.00
802.11ac(VHT20)					
149	5745	9.31	0.104	9.41	30.00
157	5785	9.67	0.104	9.77	30.00
165	5825	9.72	0.104	9.82	30.00
802.11ac(VHT40)					
151	5755	9.11	0.244	9.35	30.00
159	5795	9.19	0.244	9.43	30.00
802.11ac(VHT80)					
155	5775	8.41	0.498	8.91	30.00



5210MHz



5775MHz



Duty cycle

Band1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.401	1.436	97.56%	0.107
n20	1.312	1.344	97.62%	0.105
n40	0.656	0.692	94.80%	0.232
ac20	1.324	1.352	97.93%	0.091
ac40	0.660	0.694	95.10%	0.218
ac80	0.329	0.368	89.40%	0.487
Band4				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.400	1.436	97.49%	0.110
n20	1.312	1.344	97.62%	0.105
n40	0.654	0.692	94.51%	0.245
ac20	1.324	1.356	97.64%	0.104
ac40	0.658	0.696	94.54%	0.244
ac80	0.329	0.369	89.16%	0.498





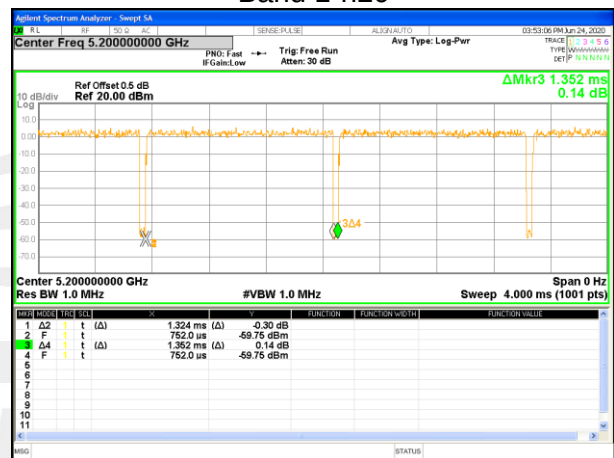
Band 1-a20



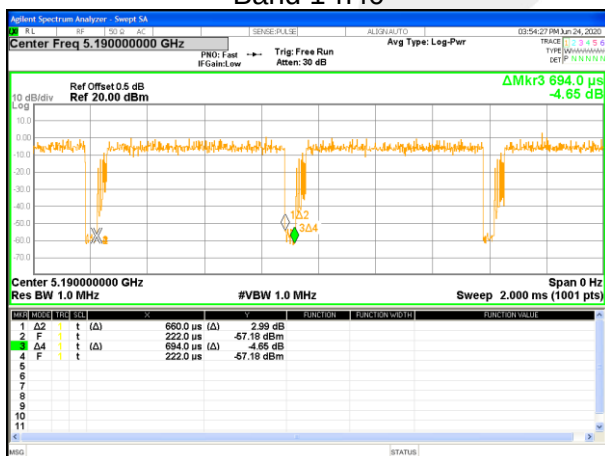
Band 1-n20



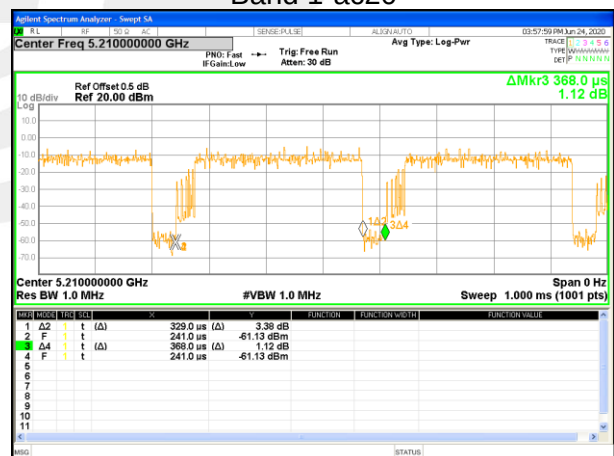
Band 1-n40



Band 1-ac20



Band 1-ac40



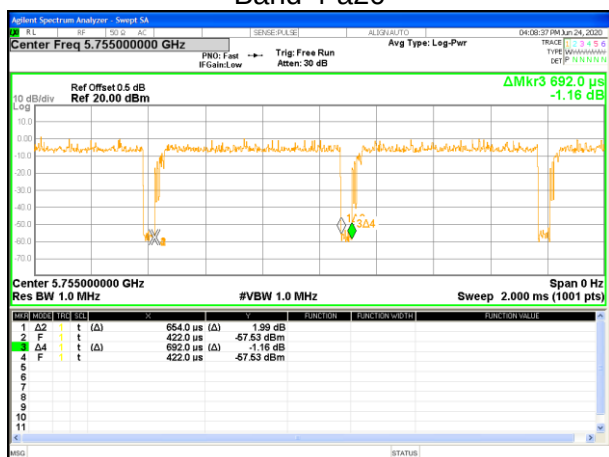
Band 1-ac80



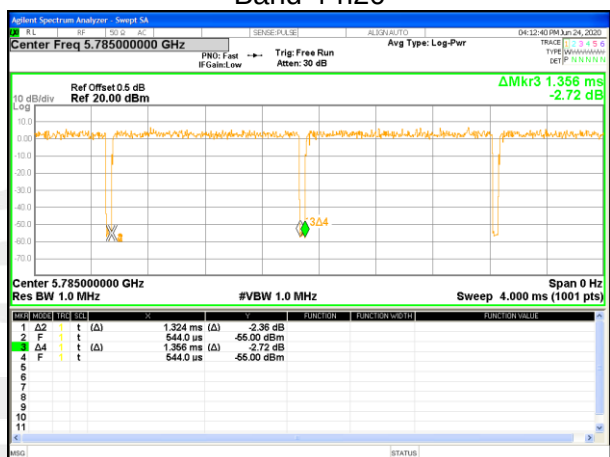
Band 4-a20



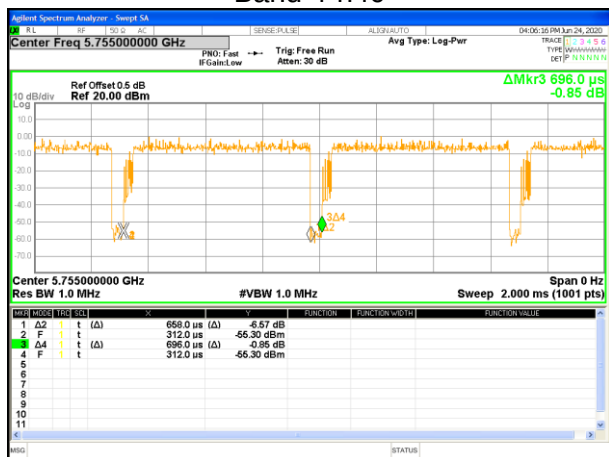
Band 4-n20



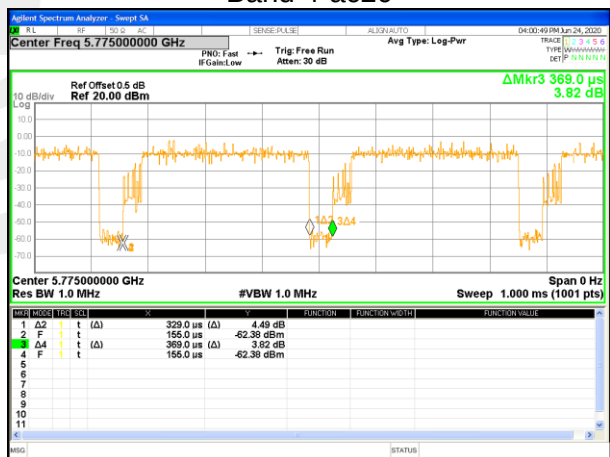
Band 4-n40



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 complies 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※※※※※

