



RADIO TEST REPORT

Report No.:STS2202110W04

Issued for

Shenzhen EDUP Electronics Technology Co.,Ltd.

6 Floor, #6 Building, No.48, Kangzheng Road, Liantang Industrial Area, Buji Town, Longgang District, Shenzhen, China

Product Name:	Bluetooth PCI-E WiFi Card
Brand Name:	EDUP, EDUP HOME, EDUP LOVE, WISE TIGER, EPSKY, Card-King, Rosewill
Model Name:	EP-EP9651
Series Model:	EP-9651S, EP-9651GS, EP-9651GS Pro, EP-AX210 Pro, EP-AX210GS, EP-AX210, WT-AX210, EP-AX210S, EH-9651, EH-9651S, EH-9651GS, EH-9651GS Pro, EH-AX210 Pro, EH-AX210GS, EH-AX210, EH-AX210S, WT-AX210, WT-9651, WT-9651S, WT-9651GS, WT-9651GS Pro, WT-AX210 Pro, WT-AX210GS, WT-AX210S, KW-9651, KW-9651, KW-9651GS, KW-9651GS-Pro, KW-AX210Pro, KW-AX210GS, KW-AX210, KW-AX210S, RNX-AX5400Pro, RNX-AX5400GS
FCC ID:	2AHRD-EPEP9651
Test Standard:	FCC Part 15.407

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TEST RESULT CERTIFICATION

Applicant's Name..... : Shenzhen EDUP Electronics Technology Co.,Ltd.
Address : 6 Floor, #6 Building, No.48, Kangzheng Road, Liantang Industrial Area, Buji Town, Longgang District, Shenzhen, China
Manufacturer's Name : Shenzhen EDUP Electronics Technology Co.,Ltd.
Address : 6 Floor, #6 Building, No.48, Kangzheng Road, Liantang Industrial Area, Buji Town, Longgang District, Shenzhen, China

Product Description

Product Name..... : Bluetooth PCI-E WiFi Card
Brand Name : EDUP, EDUP HOME, EDUP LOVE, WISE TIGER, EPSKY, Card-King, Rosewill
Model Name : EP-EP9651
Series Model..... : EP-9651S, EP-9651GS, EP-9651GS Pro, EP-AX210 Pro, EP-AX210GS, EP-AX210, WT-AX210, EP-AX210S, EH-9651, EH-9651S, EH-9651GS, EH-9651GS Pro, EH-AX210 Pro, EH-AX210GS, EH-AX210, EH-AX210S, WT-AX210, WT-9651, WT-9651S, WT-9651GS, WT-9651GS Pro, WT-AX210 Pro, WT-AX210GS, WT-AX210S, KW-9651, KW-9651S, KW-9651GS, KW-9651GS-Pro, KW-AX210Pro, KW-AX210GS, KW-AX210, KW-AX210S, RNX-AX5400Pro, RNX-AX5400GS

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 : 21 Feb. 2022

Date (s) of performance of tests : 21 Feb. 2022 ~ 26 Feb. 2022

Date of Issue..... : 26 Feb. 2022

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	26 Feb. 2022	STS2202110W04	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 (a) /15.407 (e)	26dB/6dB &99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)/15.205/15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	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 $y \pm U$, 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	$\pm 0.87\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.895\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.80\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.09\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.92\text{dB}$
6	All emissions, radiated >6G	$\pm 5.49\text{dB}$
7	Conducted Emission (9KHz-30MHz)	$\pm 2.73\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Bluetooth PCI-E WiFi Card										
Trade Name	EDUP, EDUP HOME, EDUP LOVE, WISE TIGER, EPSKY, Card-King, Rosewill										
Model Name	EP-EP9651										
Series Model	EP-9651S, EP-9651GS, EP-9651GS Pro, EP-AX210 Pro, EP-AX210GS, EP-AX210, WT-AX210, EP-AX210S, EH-9651, EH-9651S, EH-9651GS, EH-9651GS Pro, EH-AX210 Pro, EH-AX210GS, EH-AX210, EH-AX210S, WT-AX210, WT-9651, WT-9651S, WT-9651GS, WT-9651GS Pro, WT-AX210 Pro, WT-AX210GS, WT-AX210S, KW-9651, KW-9651, KW-9651GS, KW-9651GS-Pro, KW-AX210Pro, KW-AX210GS, KW-AX210, KW-AX210S, RNX-AX5400Pro, RNX-AX5400GS										
Model Difference	Different appearance size and shape										
Product Description	The EUT is a Bluetooth PCI-E WiFi Card <table><tr><td rowspan="2">Operation Frequency:</td><td>IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE20):5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80) ax(HE80): 5.210GHz</td></tr><tr><td>IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE40):5.745GHz-5.825GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.755GHz-5.795GHz IEEE 802.11ac(VHT80)/ax(HE80): 5.775GHz</td></tr><tr><td>Modulation Type:</td><td>802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM</td></tr><tr><td>Antenna Designation:</td><td>See Note 2</td></tr><tr><td>Max.Output Power(Conducted):</td><td>18.926 dBm</td></tr></table> More details of EUT technical specification, please refer to the User Manual.		Operation Frequency:	IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE20):5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80) ax(HE80): 5.210GHz	IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE40):5.745GHz-5.825GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.755GHz-5.795GHz IEEE 802.11ac(VHT80)/ax(HE80): 5.775GHz	Modulation Type:	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:	See Note 2	Max.Output Power(Conducted):	18.926 dBm
Operation Frequency:	IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE20):5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80) ax(HE80): 5.210GHz										
	IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE40):5.745GHz-5.825GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.755GHz-5.795GHz IEEE 802.11ac(VHT80)/ax(HE80): 5.775GHz										
Modulation Type:	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:	See Note 2										
Max.Output Power(Conducted):	18.926 dBm										
Test Channel	Please refer to the Note 2.										
Rating	Input: AC 120V/60Hz										
Hardware version number	V1.0										
Software version number	V22.0										
Connecting I/O Port(s)	Please refer to the Note 1.										

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



1.

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

Note:

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

Carrier Frequency Channel

5GHz:

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

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

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



2. KDB 662911 D01 Multiple Transmitter Output v02r01

2) Directional Gain Calculations for In-Band Measurements

a) Basic methodology with NANT transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by NANT transmitter outputs of equal power. Directional gain is to be computed as follows:

(i) If any transmit signals are correlated with each other,

Directional gain = $G_{ANT} + 10 \log(NANT)$ dBi

(ii) If all transmit signals are completely uncorrelated with each other,

Directional gain = G_{ANT}

Antenna number: 2

Antenna A gain : 5dBi

Antenna B gain : 5dBi

$G_{ANT} + 10 \log(NANT)$ dBi

MIMO technology Directional gain=8.01dBi

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	EDUP, EDUP HOME, EDUP LOVE, WISE TIGER, EPSKY, Card-King	EP-EP9651	Dipole	N/A	5	WLAN Ant

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



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 802.11ax HE20 CH36&CH40&CH48	NSS1 MCS0
Mode 6	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 7	TX IEEE 802.11ac VHT20 CH149&CH157&CH165	NSS1 MCS0
Mode 8	TX IEEE 802.11ax HE20 CH149&CH157&CH165	NSS1 MCS0
Mode 9	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 10	TX IEEE 802.11ac VHT40 CH38&CH46	NSS1 MCS0
Mode 11	TX IEEE 802.11ax HE40 CH38&CH46	NSS1 MCS0
Mode 12	TX IEEE 802.11n HT40 CH151&CH159	MCS 0
Mode 13	TX IEEE 802.11ac VHT40 CH151&CH159	NSS1 MCS0
Mode 14	TX IEEE 802.11ax HE40 CH151&CH159	NSS1 MCS0
Mode 15	TX IEEE 802.11ac VHT80 CH42	NSS1 MCS0
Mode 16	TX IEEE 802.11 ax HE80 CH42	NSS1 MCS0
Mode 17	TX IEEE 802.11ac VHT80 CH155	NSS1 MCS0
Mode 18	TX IEEE 802.11 ax HE80 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 fully-charged during the radiated and RF conducted test.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 19: Keeping TX + WLAN Link



2.3 TEST SOFTWARE AND POWER LEVEL

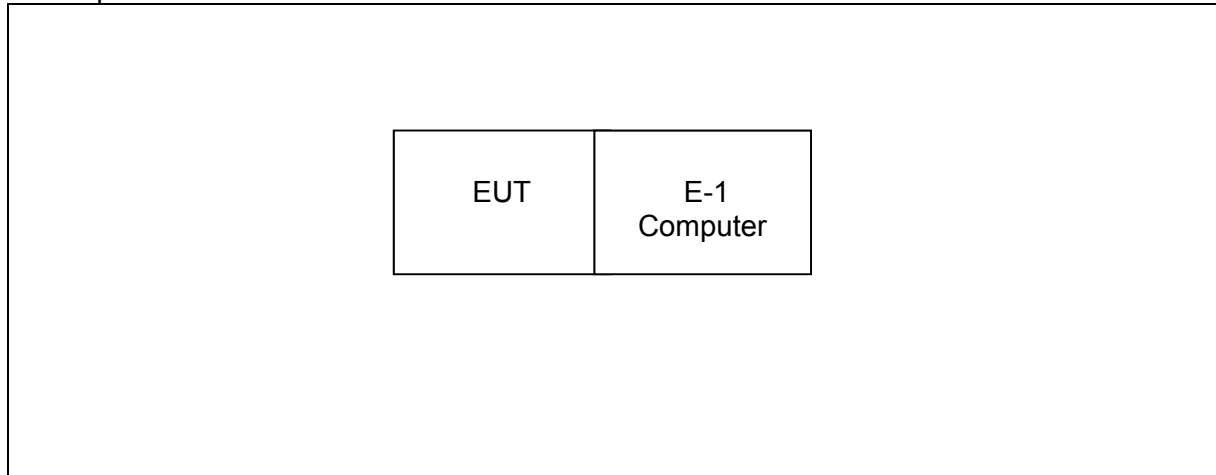
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_A Power Class	ANT_B Power Class	Software For Testing
WIFI(5G)	U-NII-1 (5150MHz-5250MHz)	802.11a	ANT A: 5 ANT B: 5 MIMO A+B: 8.01	Default	Default	DRTU
		802.11n(HT20)		Default	Default	
		802.11n(HT40)		Default	Default	
		802.11ac(VHT20)		Default	Default	
		802.11ac(VHT40)		Default	Default	
		802.11ac(VHT80)		Default	Default	
		802.11ax(HE20)		Default	Default	
		802.11ax(HE40)		Default	Default	
		802.11ax(HE80)		Default	Default	

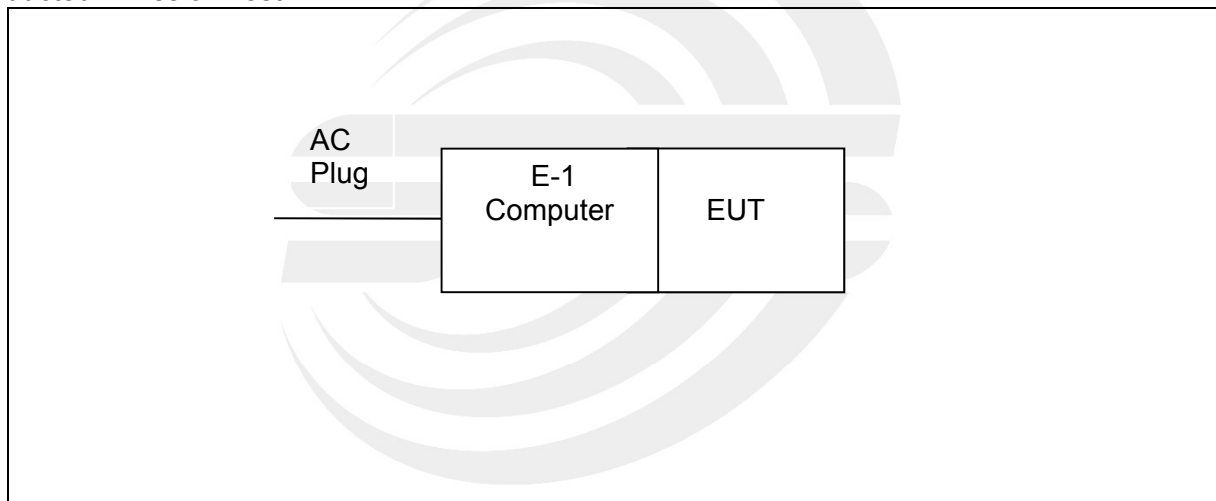
WIFI(5G)	U-NII-3 (5725MHz-5895MHz)	802.11a	ANT A: 5 ANT B: 5 MIMO A+B: 8.01	Default	Default	DRTU
		802.11n(HT20)		Default	Default	
		802.11n(HT40)		Default	Default	
		802.11ac(VHT20)		Default	Default	
		802.11ac(VHT40)		Default	Default	
		802.11ac(VHT80)		Default	Default	
		802.11ax(HE20)		Default	Default	
		802.11ax(HE40)		Default	Default	
		802.11ax(HE80)		Default	Default	

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.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	Computer	HP	880-190cn	N/A	N/A

Note:

- (1) 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
Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29
Signal Analyzer	R&S	FSV 40-N	101823	2021.09.30	2022.09.29
Active loop Antenna	ZHINAN	ZN30900C	16035	2021.04.11	2023.04.10
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2021.10.11	2023.10.10
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2020.10.12	2022.10.11
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2021.10.08	2022.10.07
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2021.09.30	2022.09.29
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2021.09.28	2022.09.27
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29
LISN	R&S	ENV216	101242	2021.09.30	2022.09.29
LISN	EMCO	3810/2NM	23625	2021.09.30	2022.09.29
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			



RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Power Sensor	Keysight	U2021XA	MY55520005	2021.09.30	2022.09.29
			MY55520006	2021.09.30	2022.09.29
			MY56120038	2021.09.30	2022.09.29
			MY56280002	2021.09.30	2022.09.29
Signal Analyzer	Agilent	N9020A	MY51110105	2021.03.04	2022.03.03
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	LZ-RF /LzRf-3A3			





3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

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

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

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ * ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

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

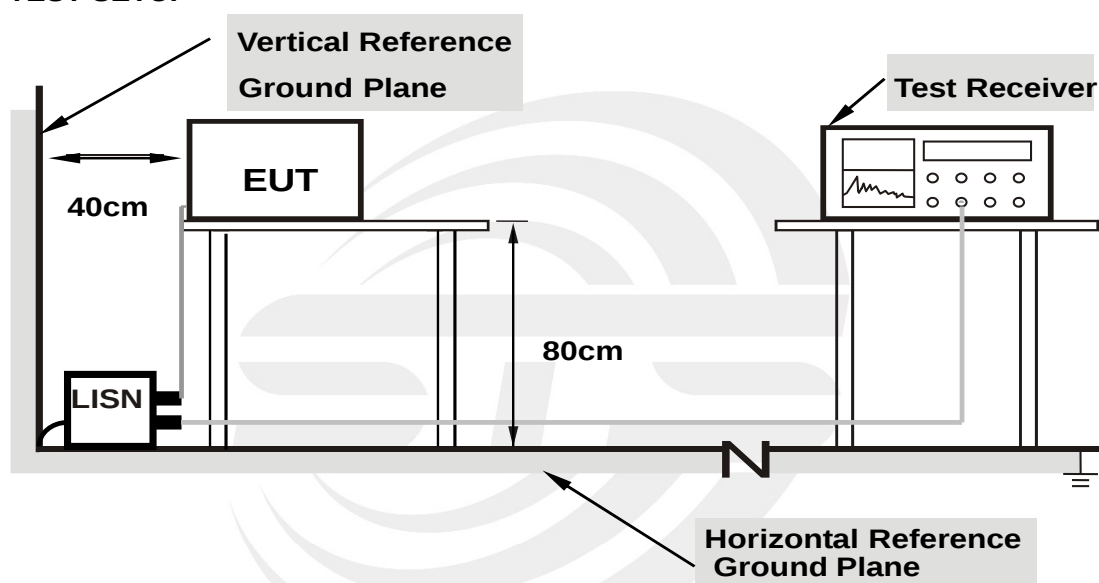
3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.
- 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 is at least 80 cm from the 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 cm from other units and other metal planes support units.

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

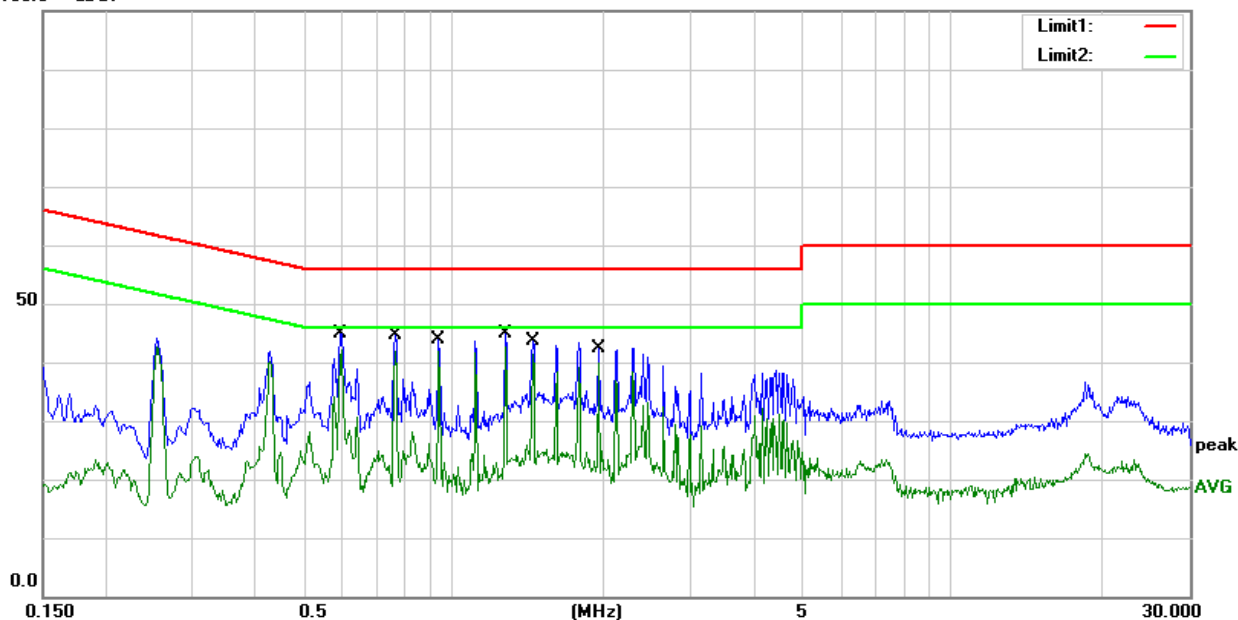
Temperature:	23.2(C)	Relative Humidity:	44%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode :	Mode 19		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5940	24.38	20.43	44.81	56.00	-11.19	QP
2	0.5940	21.72	20.43	42.15	46.00	-3.85	AVG
3	0.7660	24.19	20.35	44.54	56.00	-11.46	QP
4	0.7660	21.64	20.35	41.99	46.00	-4.01	AVG
5	0.9380	23.52	20.31	43.83	56.00	-12.17	QP
6	0.9380	21.48	20.31	41.79	46.00	-4.21	AVG
7	1.2740	24.47	20.33	44.80	56.00	-11.20	QP
8	1.2740	22.28	20.33	42.61	46.00	-3.39	AVG
9	1.4460	23.31	20.34	43.65	56.00	-12.35	QP
10	1.4460	21.03	20.34	41.37	46.00	-4.63	AVG
11	1.9620	21.97	20.39	42.36	56.00	-13.64	QP
12	1.9620	19.38	20.39	39.77	46.00	-6.23	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)

100.0 dBuV



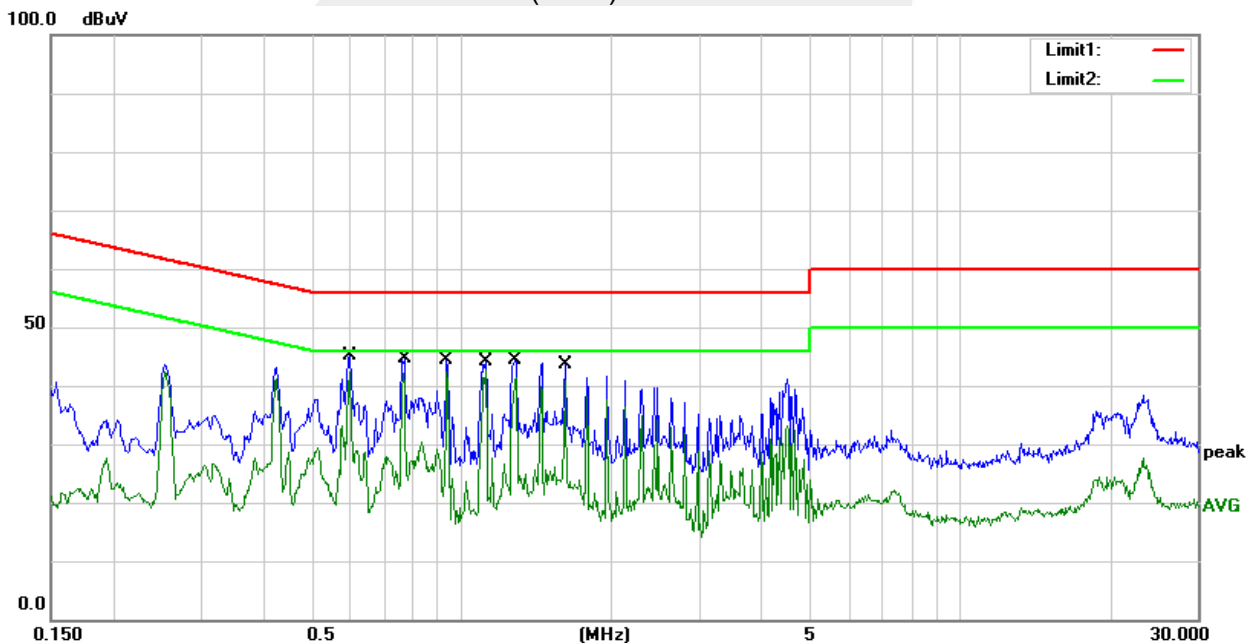


Temperature:	23.2(C)	Relative Humidity:	44%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 19		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5980	24.63	20.43	45.06	56.00	-10.94	QP
2	0.5980	21.86	20.43	42.29	46.00	-3.71	AVG
3	0.7700	24.28	20.35	44.63	56.00	-11.37	QP
4	0.7700	21.72	20.35	42.07	46.00	-3.93	AVG
5	0.9380	24.01	20.31	44.32	56.00	-11.68	QP
6	0.9380	22.10	20.31	42.41	46.00	-3.59	AVG
7	1.1180	23.78	20.31	44.09	56.00	-11.91	QP
8	1.1180	22.21	20.31	42.52	46.00	-3.48	AVG
9	1.2860	24.01	20.33	44.34	56.00	-11.66	QP
10	1.2860	21.05	20.33	41.38	46.00	-4.62	AVG
11	1.6180	23.28	20.35	43.63	56.00	-12.37	QP
12	1.6180	20.58	20.35	40.93	46.00	-5.07	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 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			

Note: In case the emission radiated emission above 1000MHz fall within the restricted band the restricted frequency bands, the peak limit is 74 dBuV/m.

**LIMITS OF EMISSIONS OUTSIDE OF THE FREQUENCY BANDS**

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.

Note: dBuV/m(at 3M) = EIRP(dBm) + 95.2.

Peak Limit = -27dBm/MHz + 95.3 = 68.2 dBuV/m.

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 at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree 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 polarization 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 QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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

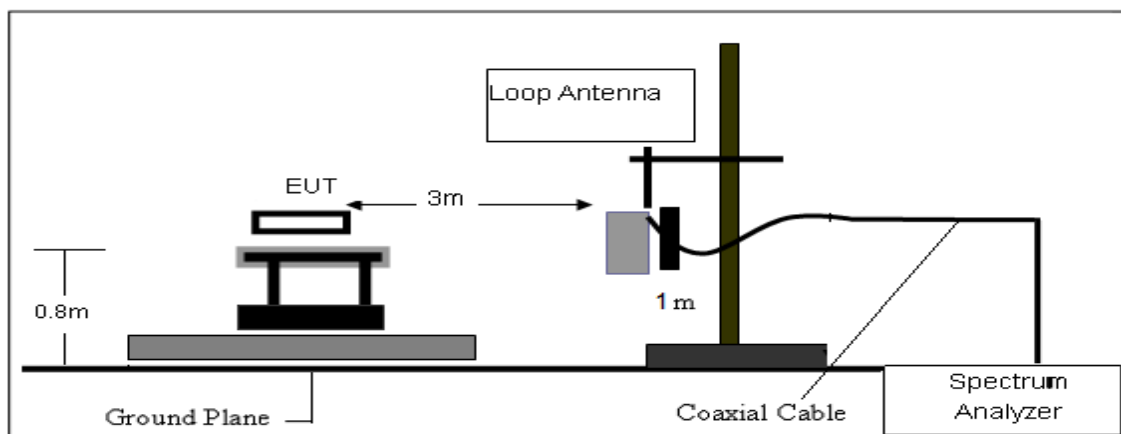
3.2.2 DEVIATION FROM TEST STANDARD

No deviation

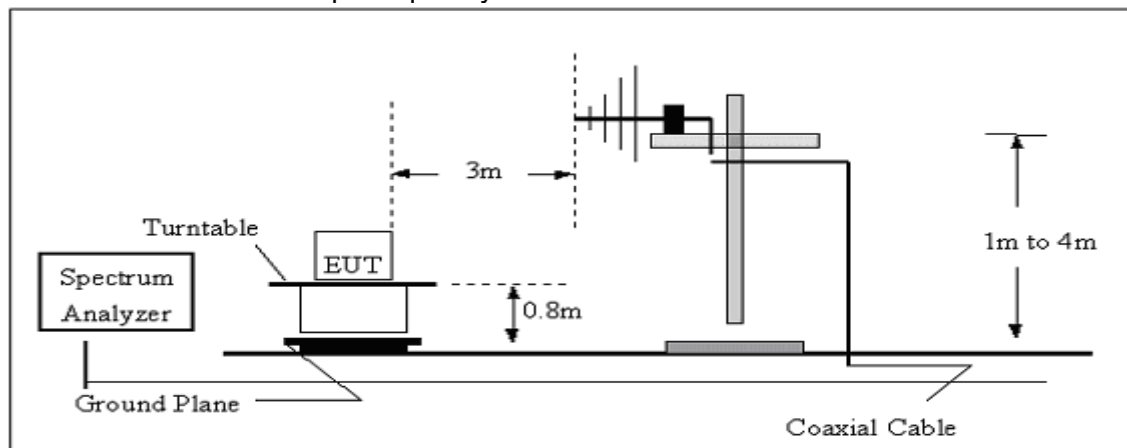


3.2.3 TEST SETUP

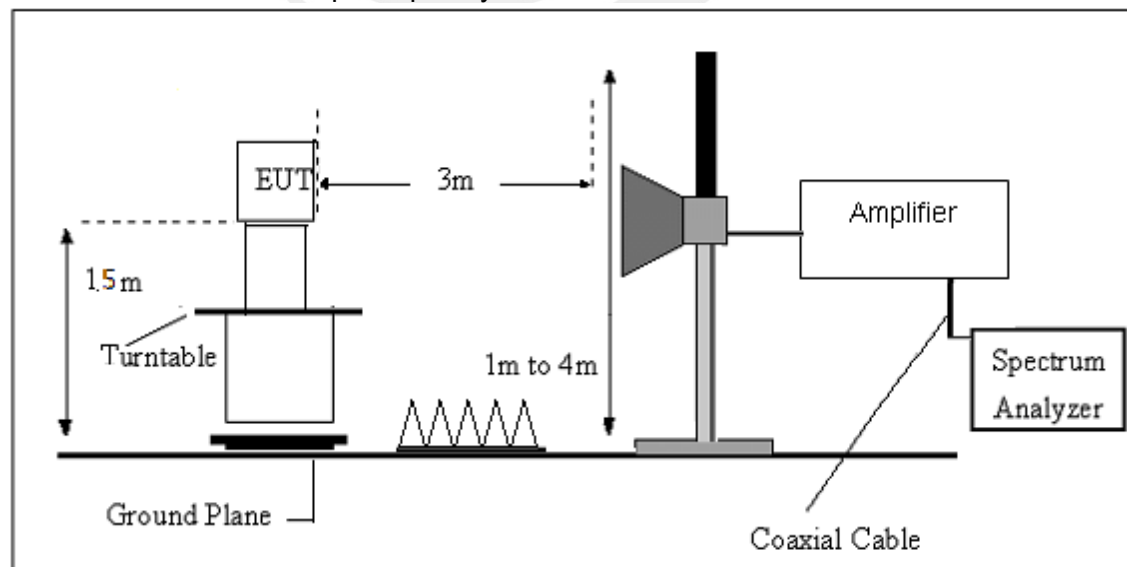
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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

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

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

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Polarization :	--
Test Mode:	TX Mode		

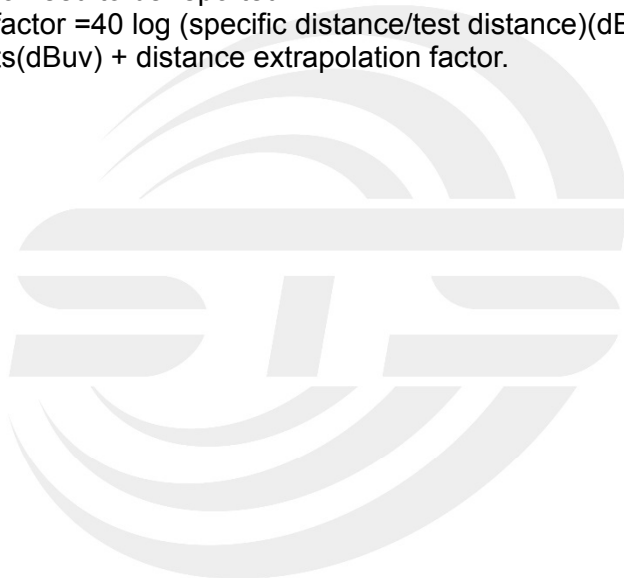
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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 = $40 \log (\text{specific distance/test distance})(\text{dB})$;

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



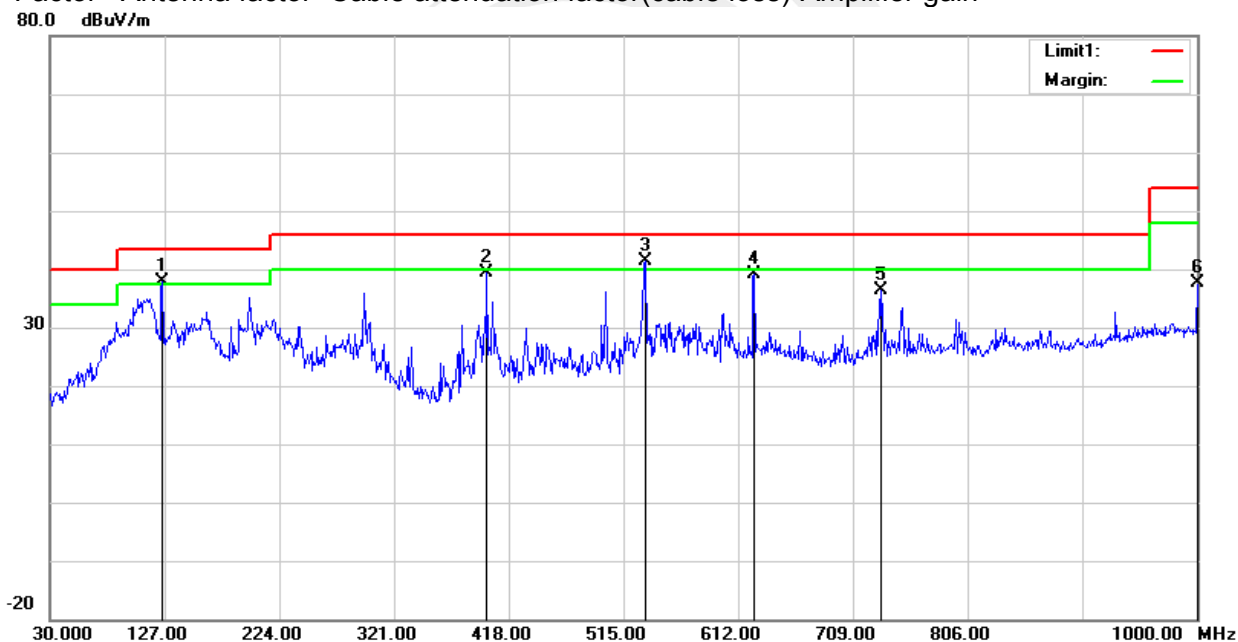
**3.2.7 TEST RESULTS (Between 30MHz – 1GHz)**

Temperature	23.1(C)	Relative Humidity:	60%RH
Test Voltage	AC 120V/60Hz	Polarization:	Horizontal
Test Mode	Mode 1~18(Mode 18 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	125.0600	56.16	-18.22	37.94	43.50	-5.56	peak
2	399.5700	50.50	-11.16	39.34	46.00	-6.66	peak
3	533.4300	48.68	-7.25	41.43	46.00	-4.57	peak
4	625.5800	44.36	-5.25	39.11	46.00	-6.89	peak
5	733.2500	38.80	-2.35	36.45	46.00	-9.55	peak
6	1000.0000	35.57	2.04	37.61	54.00	-16.39	peak

Remark:

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



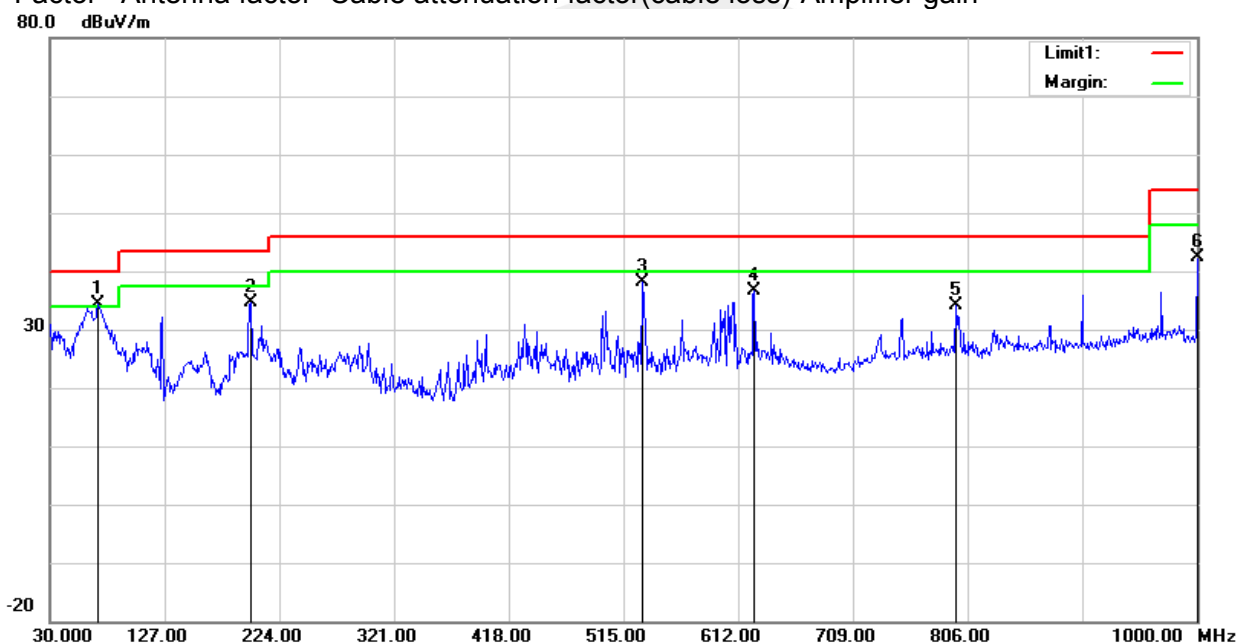


Temperature	23.1(C)	Relative Humidity:	60%RH
Test Voltage	AC 120V/60Hz	Polarization:	Vertical
Test Mode	Mode 1~18(Mode 18 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	70.7400	59.00	-24.73	34.27	40.00	-5.73	peak
2	199.7500	55.80	-21.11	34.69	43.50	-8.81	peak
3	531.4900	45.47	-7.37	38.10	46.00	-7.90	peak
4	625.5800	41.98	-5.25	36.73	46.00	-9.27	peak
5	796.3000	36.18	-2.02	34.16	46.00	-11.84	peak
6	1000.0000	40.37	2.04	42.41	54.00	-11.59	peak

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)	Orrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ax(HE80)/ 5180 MHz)										
3263.71	45.12	44.70	6.70	28.20	-9.80	35.32	74.00	-38.68	Pk	Vertical
3263.71	41.79	44.70	6.70	28.20	-9.80	31.99	54.00	-22.01	AV	Vertical
3260.60	45.03	44.70	6.70	28.20	-9.80	35.23	74.00	-38.77	Pk	Horizontal
3260.60	41.10	44.70	6.70	28.20	-9.80	31.30	54.00	-22.70	AV	Horizontal
3984.80	38.80	44.20	7.90	29.70	-6.60	32.20	74.00	-41.80	Pk	Vertical
3984.80	35.91	44.20	7.90	29.70	-6.60	29.31	54.00	-24.69	AV	Vertical
3986.24	38.99	44.20	7.90	29.70	-6.60	32.39	74.00	-41.61	Pk	Horizontal
3986.24	36.82	44.20	7.90	29.70	-6.60	30.22	54.00	-23.78	AV	Horizontal
7225.49	37.79	43.50	11.40	35.50	3.40	41.19	68.20	-27.01	Pk	Vertical
7225.49	33.60	43.50	11.40	35.50	3.40	37.00	54.00	-17.00	AV	Vertical
7221.44	37.17	43.50	11.40	35.50	3.40	40.57	68.20	-27.63	Pk	Horizontal
7221.44	34.94	43.50	11.40	35.50	3.40	38.34	54.00	-15.66	AV	Horizontal
10360.31	40.19	44.50	13.80	38.80	8.10	48.29	68.20	-19.91	Pk	Vertical
10360.31	36.93	44.50	13.80	38.80	8.10	45.03	54.00	-8.97	AV	Vertical
10359.95	39.49	44.50	13.80	38.80	8.10	47.59	68.20	-20.61	Pk	Horizontal
10359.95	35.94	44.50	13.80	38.80	8.10	44.04	54.00	-9.96	AV	Horizontal
11035.44	33.20	43.60	14.30	39.50	10.20	43.40	74.00	-30.60	Pk	Vertical
11035.44	30.37	43.60	14.30	39.50	10.20	40.57	54.00	-13.43	AV	Vertical
11022.29	33.04	43.60	14.30	39.50	10.20	43.24	74.00	-30.76	Pk	Horizontal
11022.29	30.57	43.60	14.30	39.50	10.20	40.77	54.00	-13.23	AV	Horizontal
13291.67	32.66	42.60	15.90	38.90	12.20	44.86	74.00	-29.14	Pk	Vertical
13291.67	28.97	42.60	15.90	38.90	12.20	41.17	54.00	-12.83	AV	Vertical
13280.08	31.89	42.60	15.90	38.90	12.20	44.09	74.00	-29.91	Pk	Horizontal
13280.08	28.85	42.60	15.90	38.90	12.20	41.05	54.00	-12.95	AV	Horizontal
Mid Channel (802.11ax(HE80)/ 5200 MHz)										
3258.27	44.88	44.70	6.70	28.20	-9.80	35.08	68.20	-33.12	Pk	Vertical
3258.27	42.08	44.70	6.70	28.20	-9.80	32.28	54.00	-21.72	AV	Vertical
3263.36	44.66	44.70	6.70	28.20	-9.80	34.86	74.00	-39.14	Pk	Horizontal
3263.36	40.75	44.70	6.70	28.20	-9.80	30.95	54.00	-23.05	AV	Horizontal
3986.74	39.55	44.20	7.90	29.70	-6.60	32.95	74.00	-41.05	Pk	Vertical
3986.74	35.74	44.20	7.90	29.70	-6.60	29.14	54.00	-24.86	AV	Vertical
3990.26	39.16	44.20	7.90	29.70	-6.60	32.56	74.00	-41.44	Pk	Horizontal
3990.26	35.69	44.20	7.90	29.70	-6.60	29.09	54.00	-24.91	AV	Horizontal
7217.92	37.88	43.50	11.40	35.50	3.40	41.28	68.20	-26.92	Pk	Vertical
7217.92	33.85	43.50	11.40	35.50	3.40	37.25	54.00	-16.75	AV	Vertical
7223.19	37.61	43.50	11.40	35.50	3.40	41.01	68.20	-27.19	Pk	Horizontal
7223.19	34.87	43.50	11.40	35.50	3.40	38.27	54.00	-15.73	AV	Horizontal
10400.07	39.09	44.50	13.80	38.80	8.10	47.19	68.20	-21.01	Pk	Vertical
10400.07	35.73	44.50	13.80	38.80	8.10	43.83	54.00	-10.17	AV	Vertical
10399.97	39.66	44.50	13.80	38.80	8.10	47.76	68.20	-20.44	Pk	Horizontal
10399.97	35.88	44.50	13.80	38.80	8.10	43.98	54.00	-10.02	AV	Horizontal
11023.93	33.81	43.60	14.30	39.50	10.20	44.01	74.00	-29.99	Pk	Vertical
11023.93	30.20	43.60	14.30	39.50	10.20	40.40	54.00	-13.60	AV	Vertical
11022.65	34.06	43.60	14.30	39.50	10.20	44.26	74.00	-29.74	Pk	Horizontal
11022.65	29.79	43.60	14.30	39.50	10.20	39.99	54.00	-14.01	AV	Horizontal
13294.09	32.20	42.60	15.90	38.90	12.20	44.40	74.00	-29.60	Pk	Vertical
13294.09	29.88	42.60	15.90	38.90	12.20	42.08	54.00	-11.92	AV	Vertical
13290.36	31.71	42.60	15.90	38.90	12.20	43.91	74.00	-30.09	Pk	Horizontal
13290.36	29.89	42.60	15.90	38.90	12.20	42.09	54.00	-11.91	AV	Horizontal



High Channel (802.11ax(HE80)/ 5240 MHz)										
3257.37	44.09	44.70	6.70	28.20	-9.80	34.29	68.20	-33.91	Pk	Vertical
3257.37	41.49	44.70	6.70	28.20	-9.80	31.69	54.00	-22.31	AV	Vertical
3245.67	44.94	44.70	6.70	28.20	-9.80	35.14	68.20	-33.06	Pk	Horizontal
3245.67	40.81	44.70	6.70	28.20	-9.80	31.01	54.00	-22.99	AV	Horizontal
3996.48	39.24	44.20	7.90	29.70	-6.60	32.64	74.00	-41.36	Pk	Vertical
3996.48	36.11	44.20	7.90	29.70	-6.60	29.51	54.00	-24.49	AV	Vertical
3988.53	39.57	44.20	7.90	29.70	-6.60	32.97	74.00	-41.03	Pk	Horizontal
3988.53	37.00	44.20	7.90	29.70	-6.60	30.40	54.00	-23.60	AV	Horizontal
7224.42	37.15	43.50	11.40	35.50	3.40	40.55	68.20	-27.65	Pk	Vertical
7224.42	34.28	43.50	11.40	35.50	3.40	37.68	54.00	-16.32	AV	Vertical
7222.49	37.56	43.50	11.40	35.50	3.40	40.96	68.20	-27.24	Pk	Horizontal
7222.49	34.49	43.50	11.40	35.50	3.40	37.89	54.00	-16.11	AV	Horizontal
10480.07	38.83	44.50	13.80	38.80	8.10	46.93	68.20	-21.27	Pk	Vertical
10480.07	35.90	44.50	13.80	38.80	8.10	44.00	54.00	-10.00	AV	Vertical
10480.08	39.40	44.50	13.80	38.80	8.10	47.50	68.20	-20.70	Pk	Horizontal
10480.08	36.02	44.50	13.80	38.80	8.10	44.12	54.00	-9.88	AV	Horizontal
11030.74	33.04	43.60	14.30	39.50	10.20	43.24	74.00	-30.76	Pk	Vertical
11030.74	29.78	43.60	14.30	39.50	10.20	39.98	54.00	-14.02	AV	Vertical
11025.03	33.14	43.60	14.30	39.50	10.20	43.34	74.00	-30.66	Pk	Horizontal
11025.03	29.82	43.60	14.30	39.50	10.20	40.02	54.00	-13.98	AV	Horizontal
13288.00	31.95	42.60	15.90	38.90	12.20	44.15	74.00	-29.85	Pk	Vertical
13288.00	29.31	42.60	15.90	38.90	12.20	41.51	54.00	-12.49	AV	Vertical
13296.94	32.65	42.60	15.90	38.90	12.20	44.85	74.00	-29.15	Pk	Horizontal
13296.94	28.55	42.60	15.90	38.90	12.20	40.75	54.00	-13.25	AV	Horizontal

Remark:

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) , 802.11ax (HE-20),802.11ax (HE-40), 802.11ax HE-80)the worst case is 802.11ax(HE80).
- 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.
- Pre-scan both the SISO and MIMO mode, only the worst-case results were reported.

**Band IV(5.725-5.850) GHz**

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 (802.11ax(HE80)/ 5775 MHz)										
3279.16	44.04	44.70	6.70	28.20	-9.80	34.24	68.20	-33.96	Pk	Vertical
3279.16	41.27	44.70	6.70	28.20	-9.80	31.47	54.00	-22.53	AV	Vertical
3276.77	43.95	44.70	6.70	28.20	-9.80	34.15	68.20	-34.05	Pk	Horizontal
3276.77	41.31	44.70	6.70	28.20	-9.80	31.51	54.00	-22.49	AV	Horizontal
4009.29	38.70	44.20	7.90	29.70	-6.60	32.10	74.00	-41.90	Pk	Vertical
4009.29	36.82	44.20	7.90	29.70	-6.60	30.22	54.00	-23.78	AV	Vertical
4010.06	39.13	44.20	7.90	29.70	-6.60	32.53	74.00	-41.47	Pk	Horizontal
4010.06	36.34	44.20	7.90	29.70	-6.60	29.74	54.00	-24.26	AV	Horizontal
7268.94	37.26	43.50	11.40	35.50	3.40	40.66	74.00	-33.34	Pk	Vertical
7268.94	33.44	43.50	11.40	35.50	3.40	36.84	54.00	-17.16	AV	Vertical
7273.10	36.99	43.50	11.40	35.50	3.40	40.39	74.00	-33.61	Pk	Horizontal
7273.10	34.53	43.50	11.40	35.50	3.40	37.93	54.00	-16.07	AV	Horizontal
10414.41	40.00	44.50	13.80	38.80	8.10	48.10	68.20	-20.10	Pk	Vertical
10414.41	36.19	44.50	13.80	38.80	8.10	44.29	54.00	-9.71	AV	Vertical
10414.53	39.80	44.50	13.80	38.80	8.10	47.90	68.20	-20.30	Pk	Horizontal
10414.53	35.88	44.50	13.80	38.80	8.10	43.98	54.00	-10.02	AV	Horizontal
11085.21	33.15	43.60	14.30	39.50	10.20	43.35	74.00	-30.65	Pk	Vertical
11085.21	29.91	43.60	14.30	39.50	10.20	40.11	54.00	-13.89	AV	Vertical
11086.04	33.00	43.60	14.30	39.50	10.20	43.20	74.00	-30.80	Pk	Horizontal
11086.04	30.44	43.60	14.30	39.50	10.20	40.64	54.00	-13.36	AV	Horizontal
13357.85	32.31	42.60	15.90	38.90	12.20	44.51	74.00	-29.49	Pk	Vertical
13357.85	29.63	42.60	15.90	38.90	12.20	41.83	54.00	-12.17	AV	Vertical
13357.68	33.01	42.60	15.90	38.90	12.20	45.21	74.00	-28.79	Pk	Horizontal
13357.68	29.52	42.60	15.90	38.90	12.20	41.72	54.00	-12.28	AV	Horizontal

Remark:

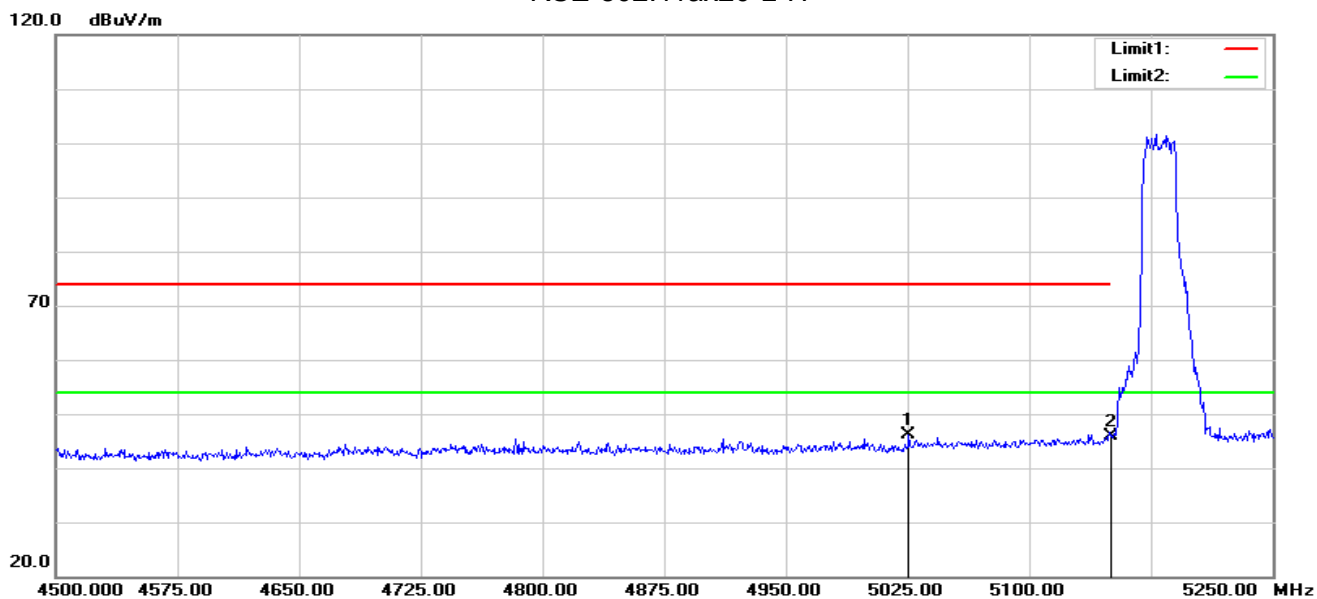
- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) , 802.11ax (HE-20),802.11ax (HE-40), 802.11ax HE-80)the worst case is 802.11ax(HE80).
- The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.
- Pre-scan both the SISO and MIMO mode, only the worst-case results were reported.



3.2.9 RESTRICTED FREQUENCY BANDS AND BAND EDGE

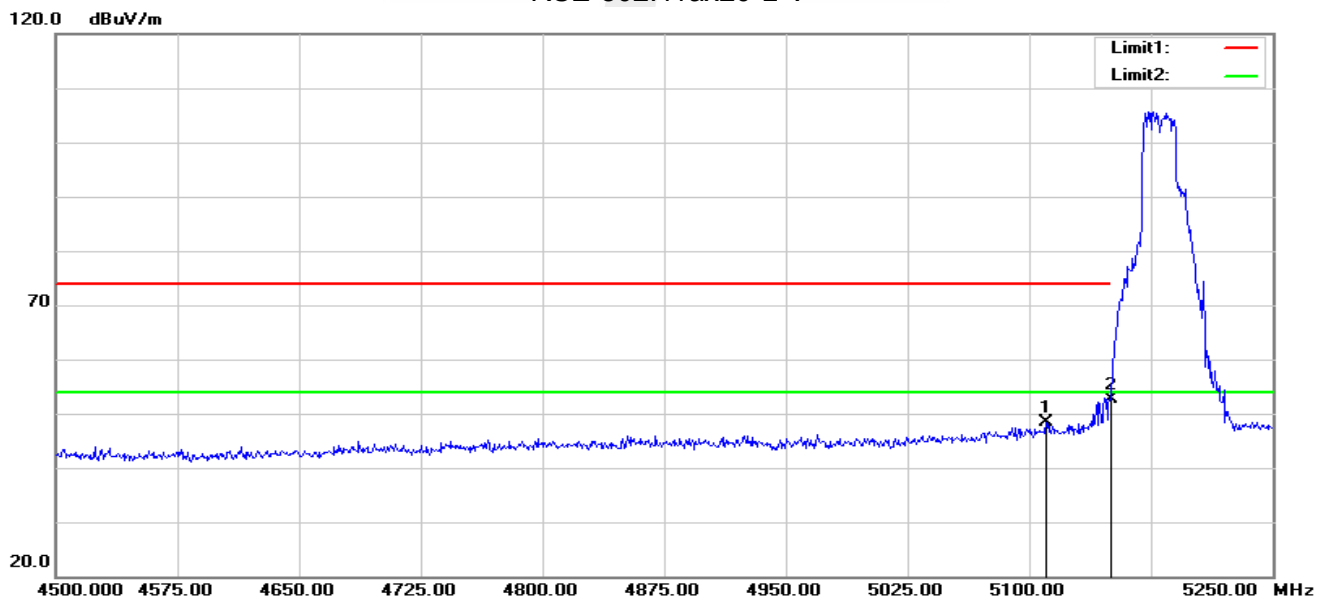
Band I 5150-5250MHz

RSE-802.11ax20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5025.750	52.10	-6.07	46.03	74.00	-27.97	peak
2	5150.000	51.72	-5.73	45.99	74.00	-28.01	peak

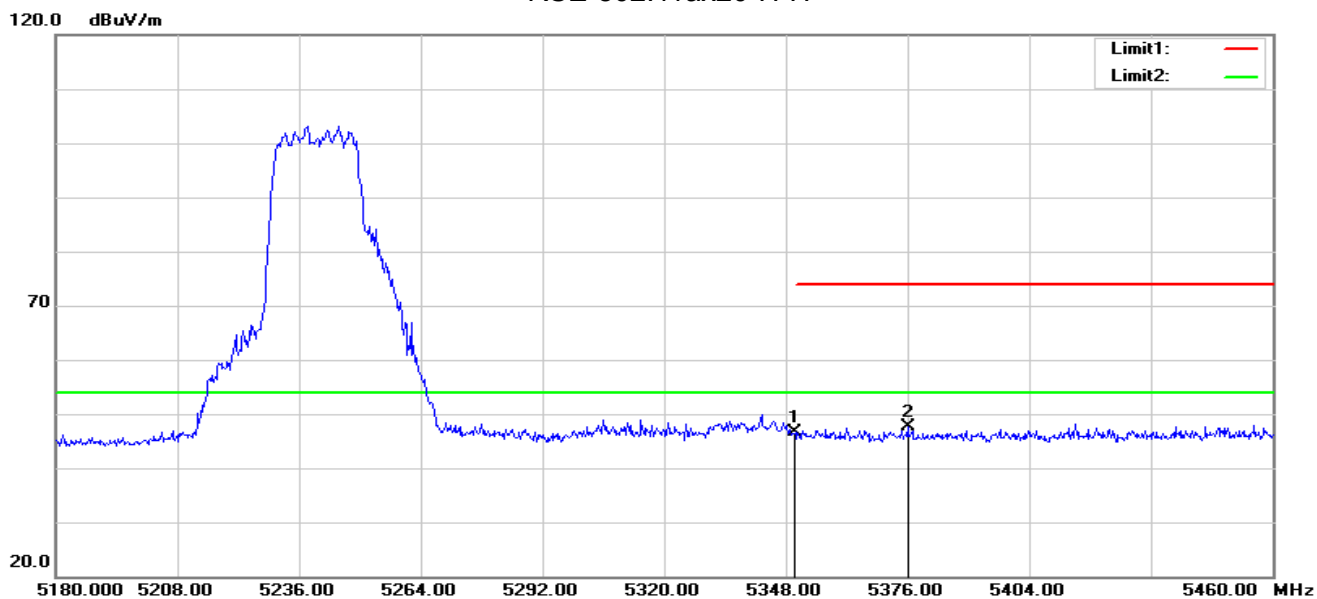
RSE-802.11ax20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5110.500	54.08	-5.74	48.34	74.00	-25.66	peak
2	5150.000	58.24	-5.73	52.51	74.00	-21.49	peak

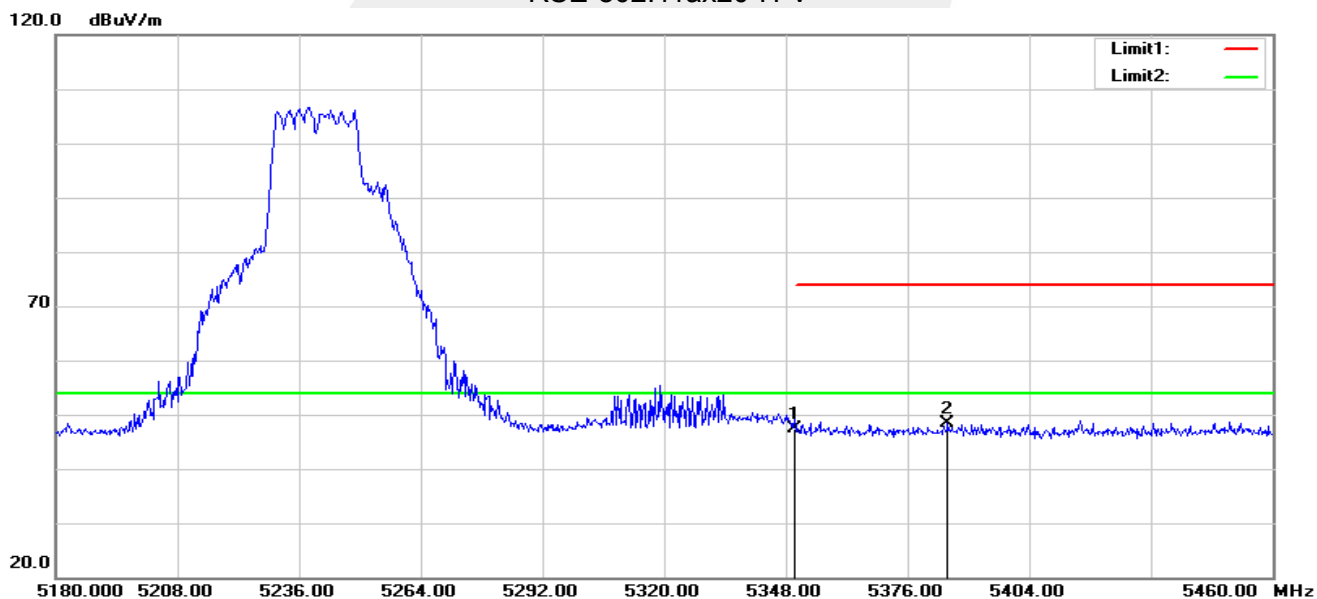


RSE-802.11ax20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.80	-5.23	46.57	74.00	-27.43	peak
2	5376.000	52.82	-5.24	47.58	74.00	-26.42	peak

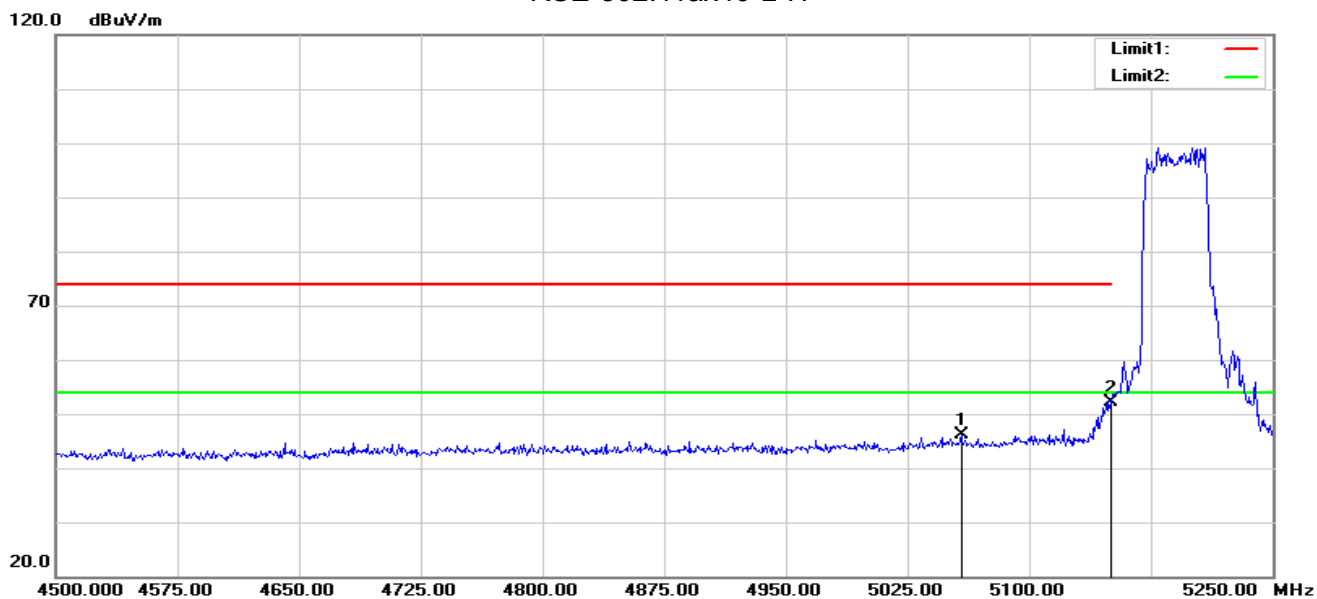
RSE-802.11ax20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.49	-5.23	47.26	74.00	-26.74	peak
2	5385.240	53.56	-5.24	48.32	74.00	-25.68	peak

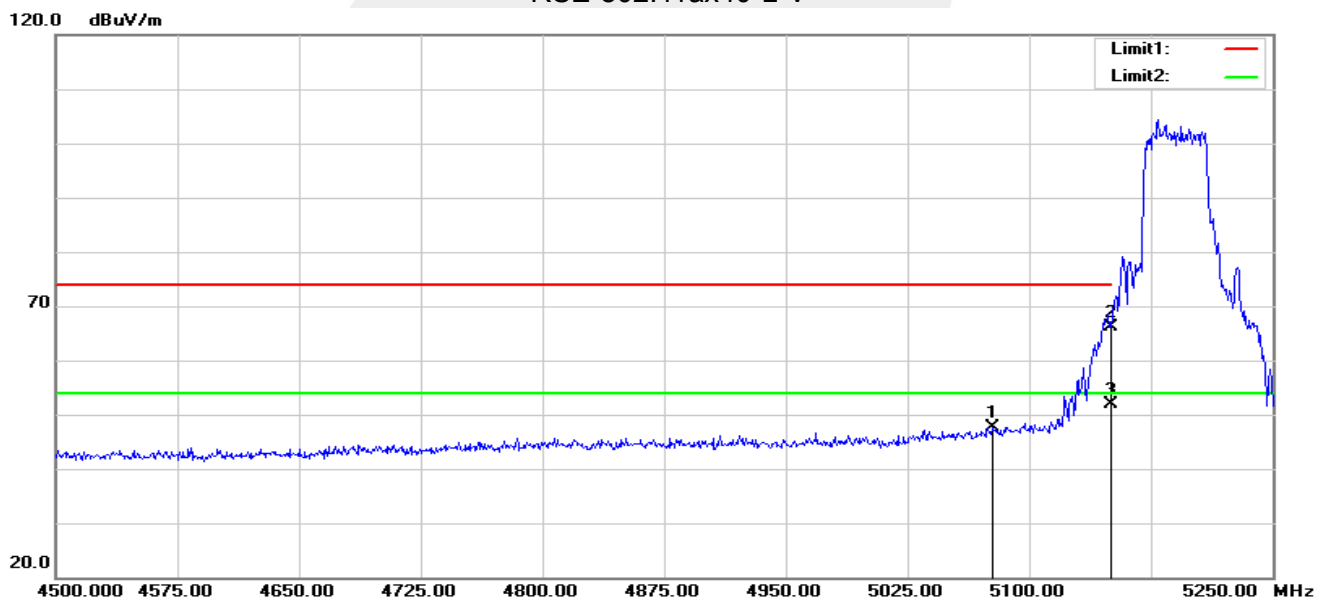


RSE-802.11ax40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5058.000	51.96	-5.93	46.03	74.00	-27.97	peak
2	5150.000	57.90	-5.73	52.17	74.00	-21.83	peak

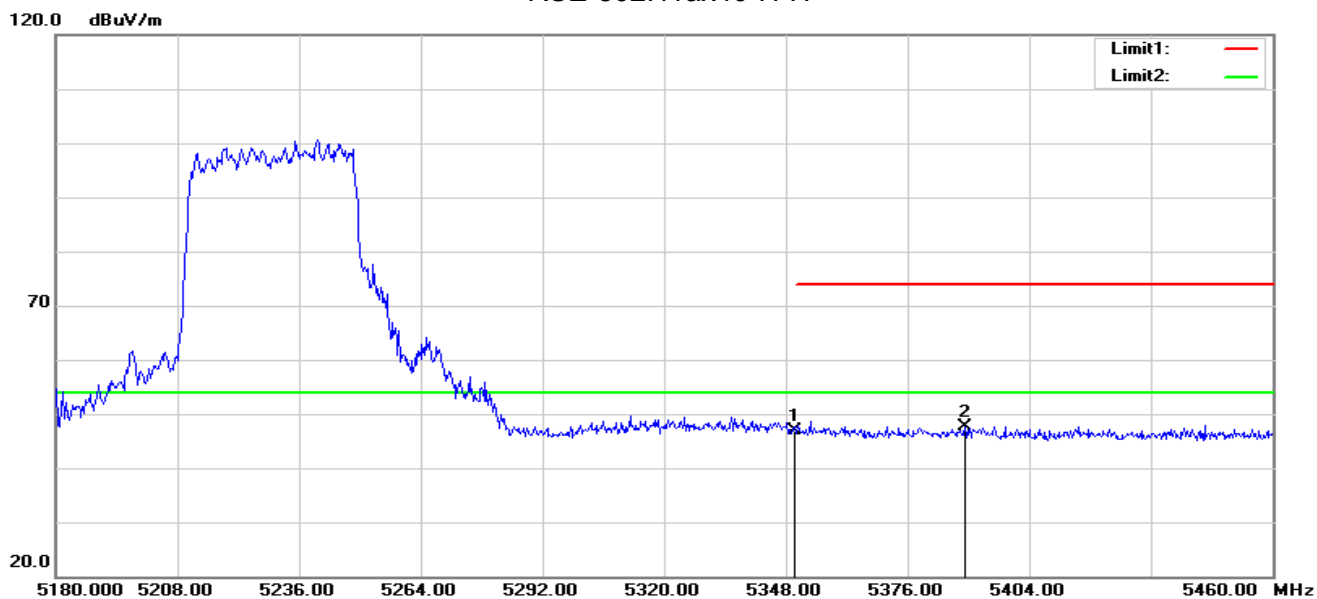
RSE-802.11ax40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5077.500	53.57	-5.84	47.73	74.00	-26.27	peak
2	5150.000	71.87	-5.73	66.14	74.00	-7.86	peak
3	5150.000	57.67	-5.73	51.94	54.00	-2.06	AVG

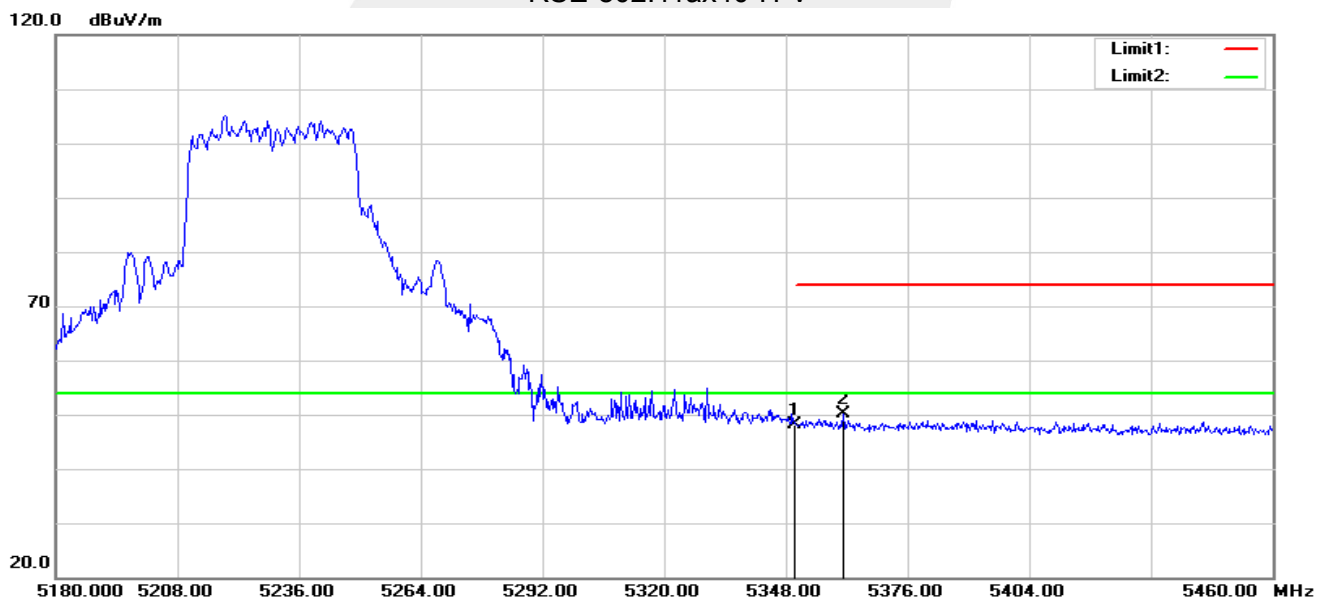


RSE-802.11ax40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.19	-5.23	46.96	74.00	-27.04	peak
2	5389.160	53.00	-5.25	47.75	74.00	-26.25	peak

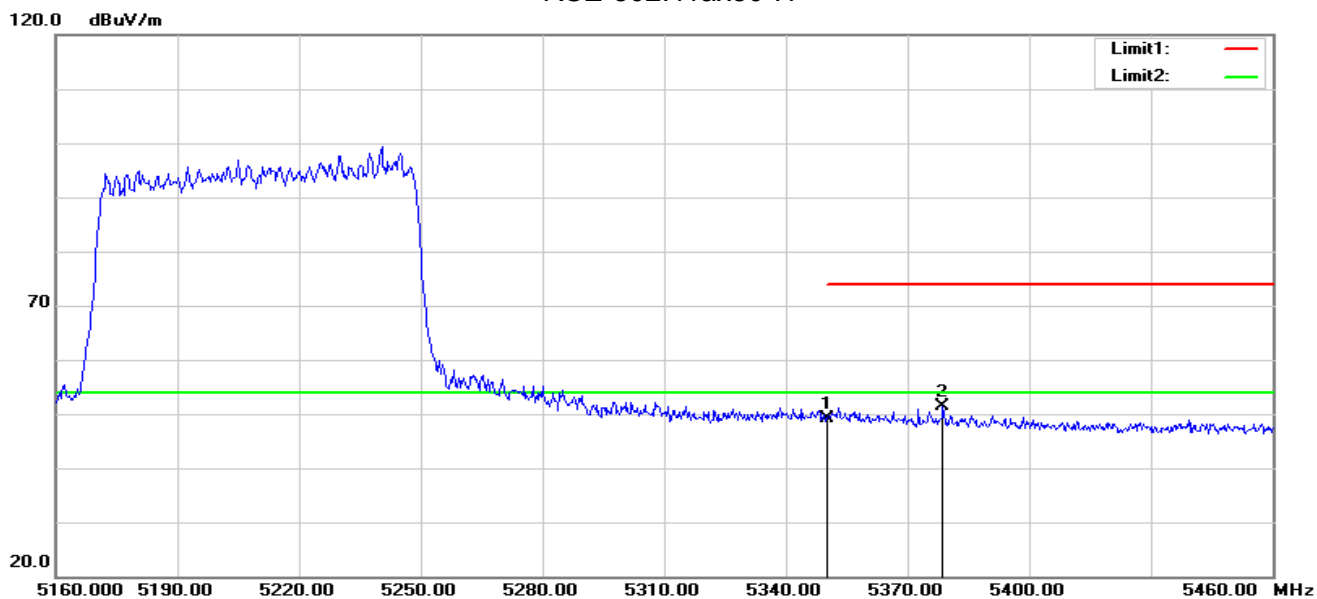
RSE-802.11ax40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	53.46	-5.23	48.23	74.00	-25.77	peak
2	5361.160	55.38	-5.23	50.15	74.00	-23.85	peak

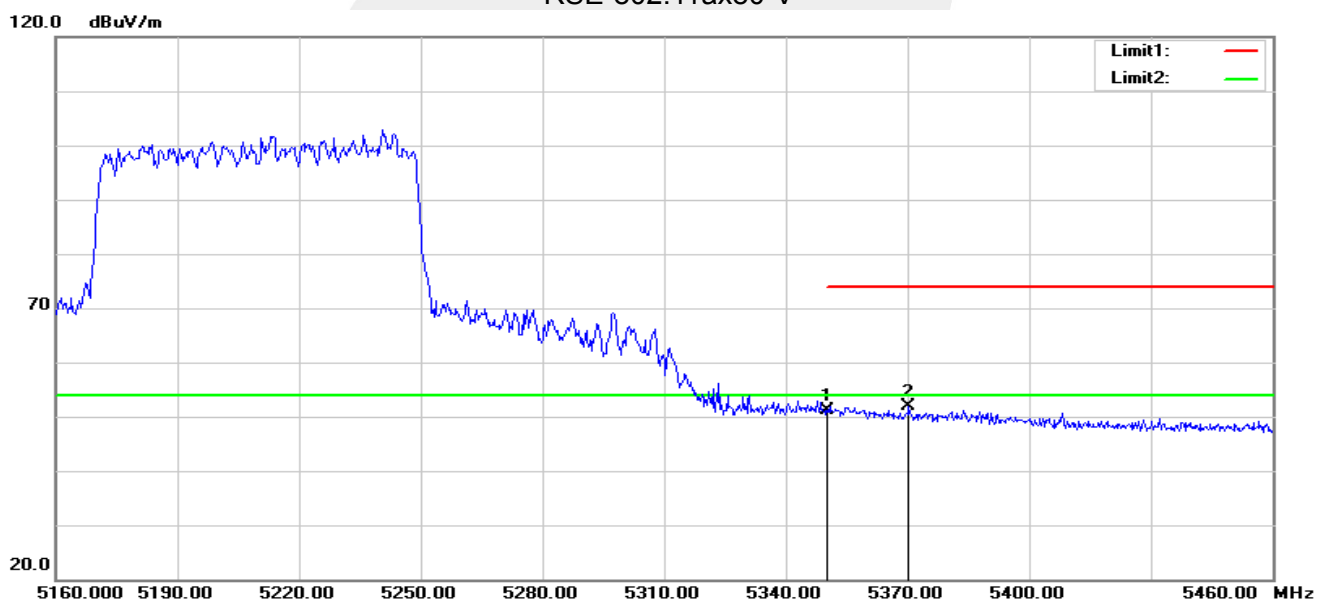


RSE-802.11ax80-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	54.41	-5.23	49.18	74.00	-24.82	peak
2	5378.700	56.59	-5.24	51.35	74.00	-22.65	peak

RSE-802.11ax80-V

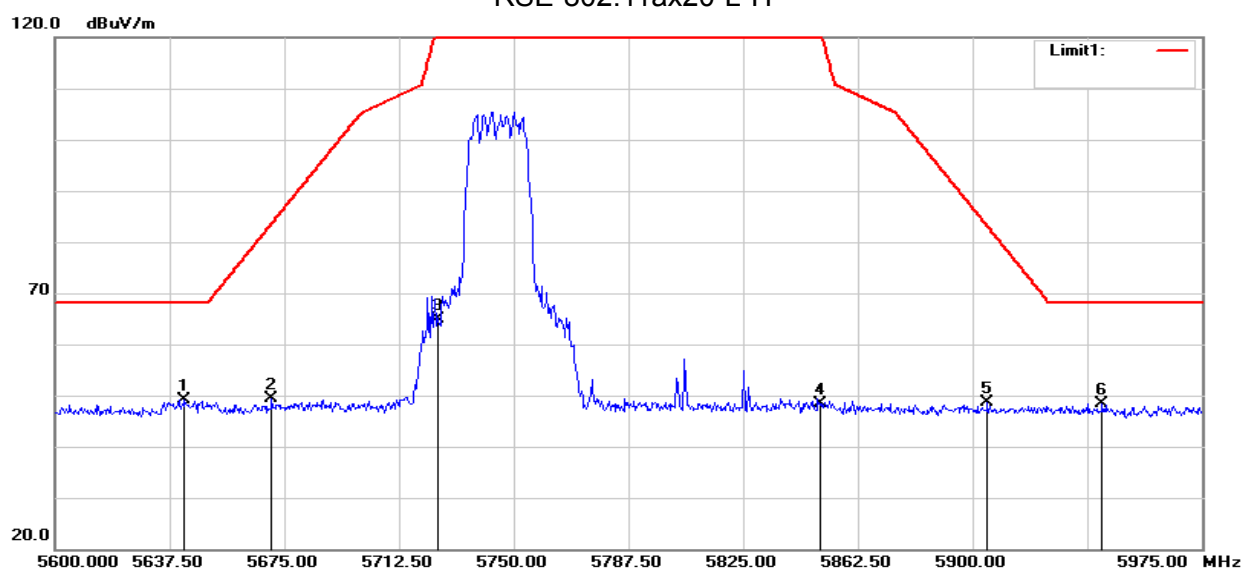


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	56.46	-5.23	51.23	74.00	-22.77	peak
2	5370.300	57.01	-5.23	51.78	74.00	-22.22	peak

Note: All modes have been tested. Only the worst mode shown in the report.

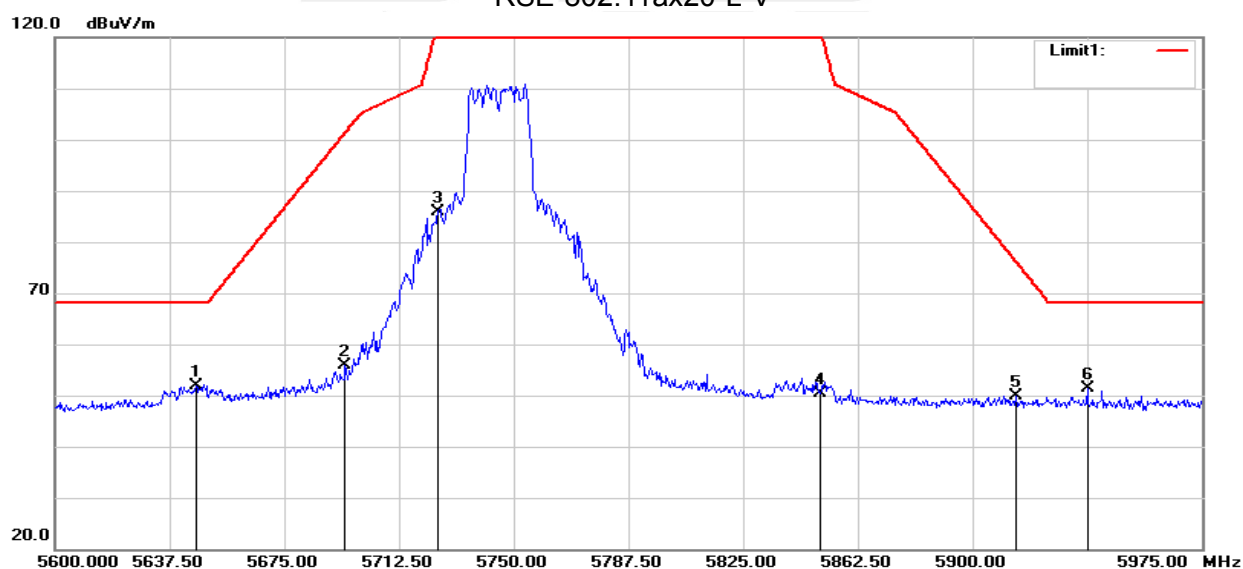
Band IV(5.725-5.85 GHz)

RSE-802.11ax20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5642.375	53.85	-4.68	49.17	68.20	-19.03	peak
2	5670.875	54.00	-4.68	49.32	83.65	-34.33	peak
3	5725.000	69.33	-4.57	64.76	122.20	-57.44	peak
4	5850.000	52.54	-4.10	48.44	122.20	-73.76	peak
5	5904.875	52.41	-3.89	48.52	83.09	-34.57	peak
6	5942.375	52.26	-3.95	48.31	68.20	-19.89	peak

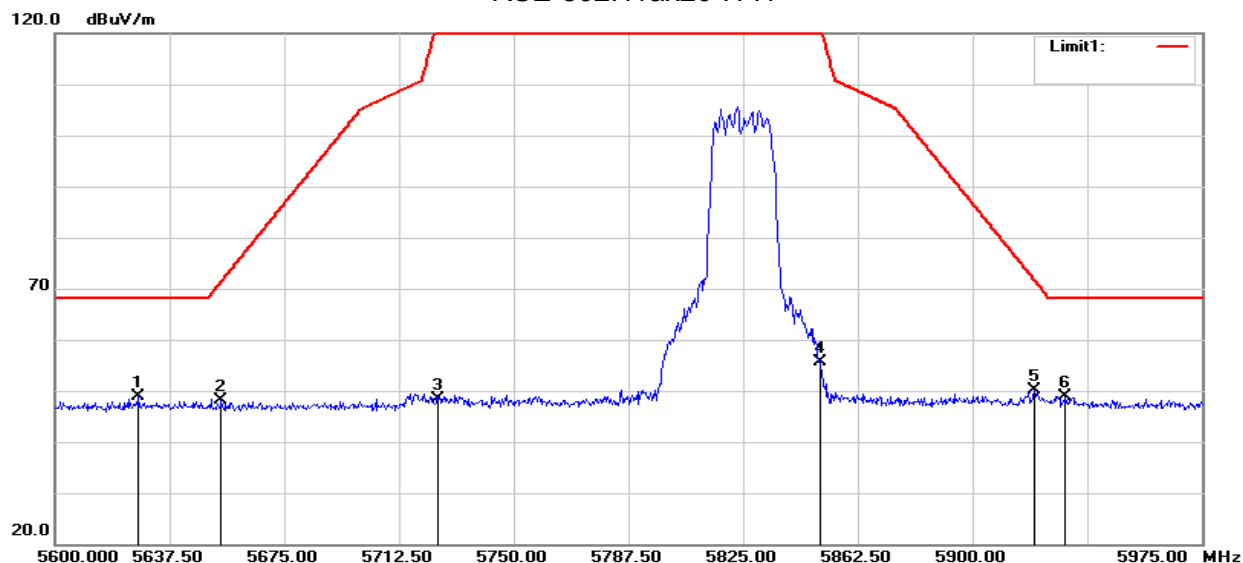
RSE-802.11ax20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5646.125	56.51	-4.69	51.82	68.20	-16.38	peak
2	5694.875	60.54	-4.66	55.88	101.41	-45.53	peak
3	5725.000	90.49	-4.57	85.92	122.20	-36.28	peak
4	5850.000	54.44	-4.10	50.34	122.20	-71.86	peak
5	5914.250	53.80	-3.91	49.89	76.16	-26.27	peak
6	5937.500	55.27	-3.94	51.33	68.20	-16.87	peak

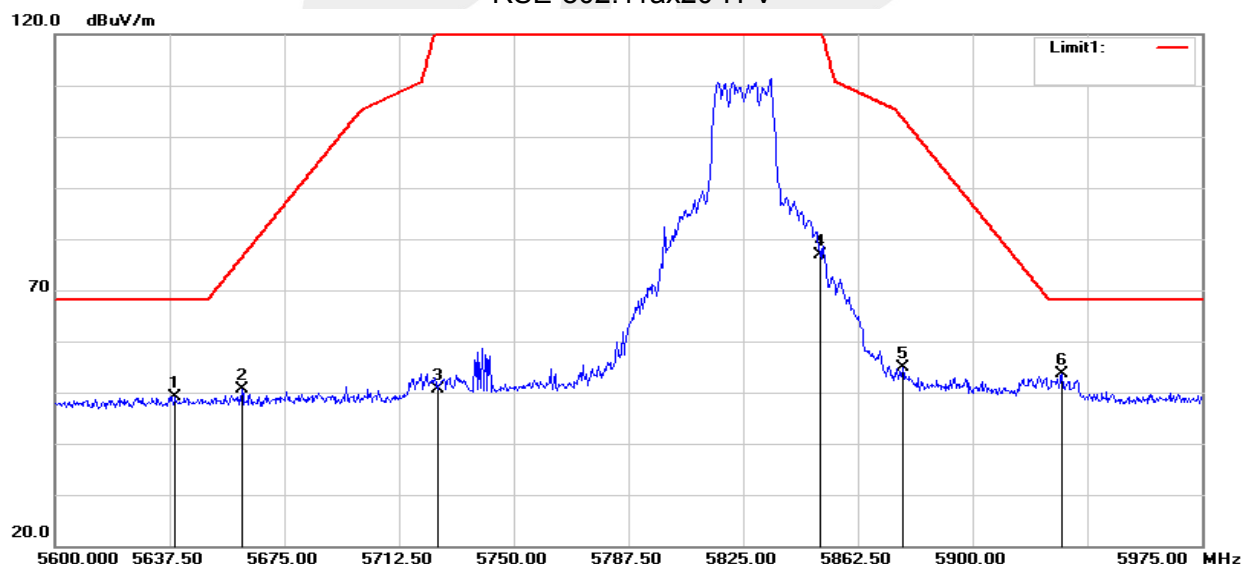


RSE-802.11ax20-H-H



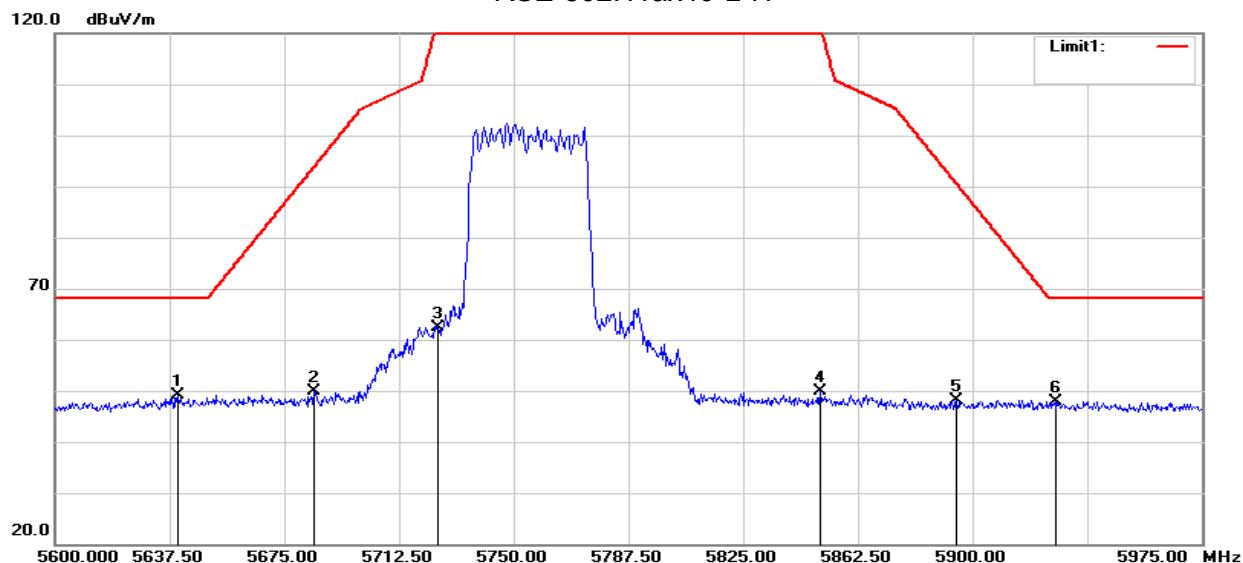
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5627.375	53.46	-4.69	48.77	68.20	-19.43	peak
2	5654.375	52.79	-4.68	48.11	71.44	-23.33	peak
3	5725.000	52.96	-4.57	48.39	122.20	-73.81	peak
4	5850.000	59.82	-4.10	55.72	122.20	-66.48	peak
5	5920.250	54.00	-3.92	50.08	71.72	-21.64	peak
6	5930.375	52.74	-3.93	48.81	68.20	-19.39	peak

RSE-802.11ax20-H-V



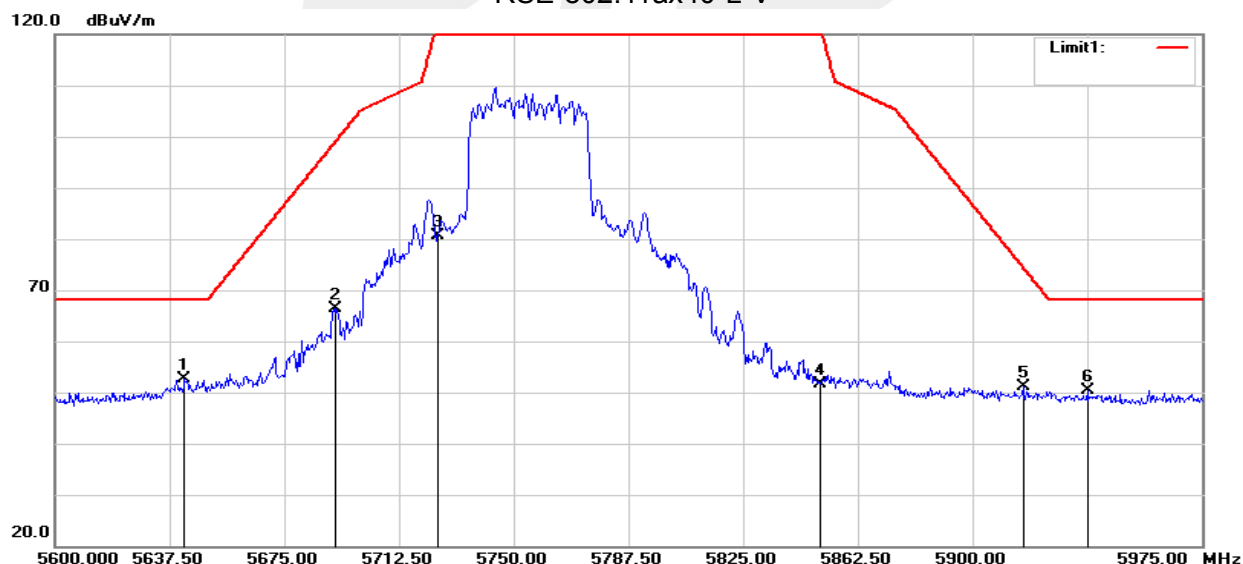
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5639.375	53.87	-4.69	49.18	68.20	-19.02	peak
2	5661.125	55.38	-4.67	50.71	76.43	-25.72	peak
3	5725.000	55.22	-4.57	50.65	122.20	-71.55	peak
4	5850.000	81.02	-4.10	76.92	122.20	-45.28	peak
5	5877.125	58.95	-3.98	54.97	103.63	-48.66	peak
6	5929.250	57.61	-3.93	53.68	68.20	-14.52	peak

RSE-802.11ax40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5640.125	53.87	-4.69	49.18	68.20	-19.02	peak
2	5684.750	54.63	-4.66	49.97	93.92	-43.95	peak
3	5725.000	67.02	-4.57	62.45	122.20	-59.75	peak
4	5850.000	53.87	-4.10	49.77	122.20	-72.43	peak
5	5894.750	52.11	-3.90	48.21	90.59	-42.38	peak
6	5927.000	51.77	-3.93	47.84	68.20	-20.36	peak

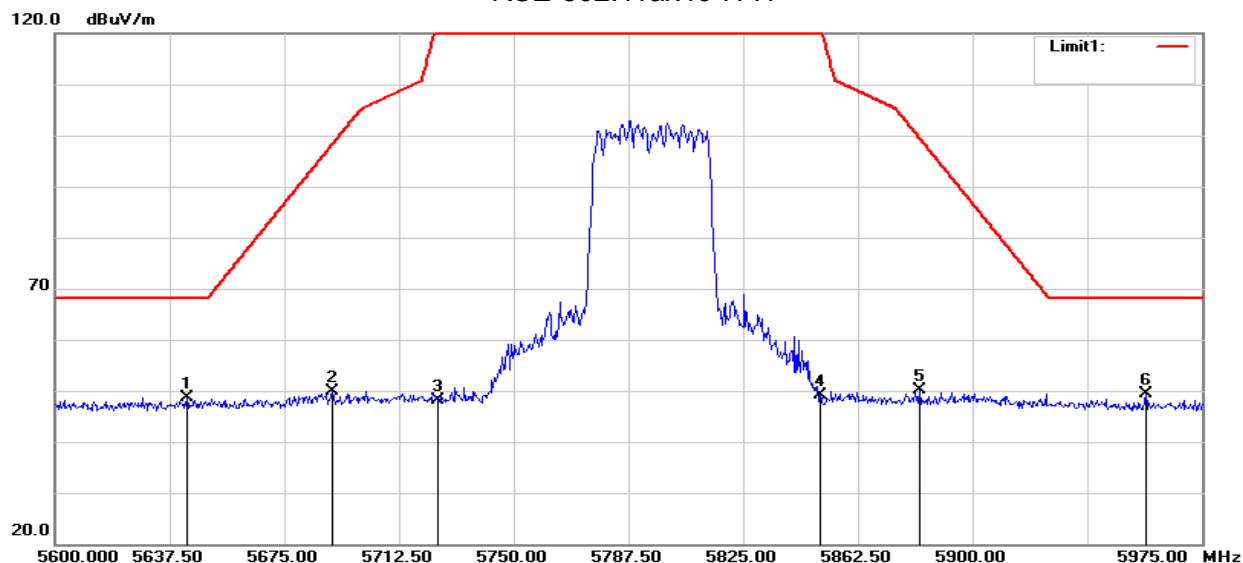
RSE-802.11ax40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5642.375	57.31	-4.68	52.63	68.20	-15.57	peak
2	5691.875	71.11	-4.66	66.45	99.19	-32.74	peak
3	5725.000	85.25	-4.57	80.68	122.20	-41.52	peak
4	5850.000	55.74	-4.10	51.64	122.20	-70.56	peak
5	5916.500	55.09	-3.90	51.19	74.49	-23.30	peak
6	5937.500	54.39	-3.94	50.45	68.20	-17.75	peak

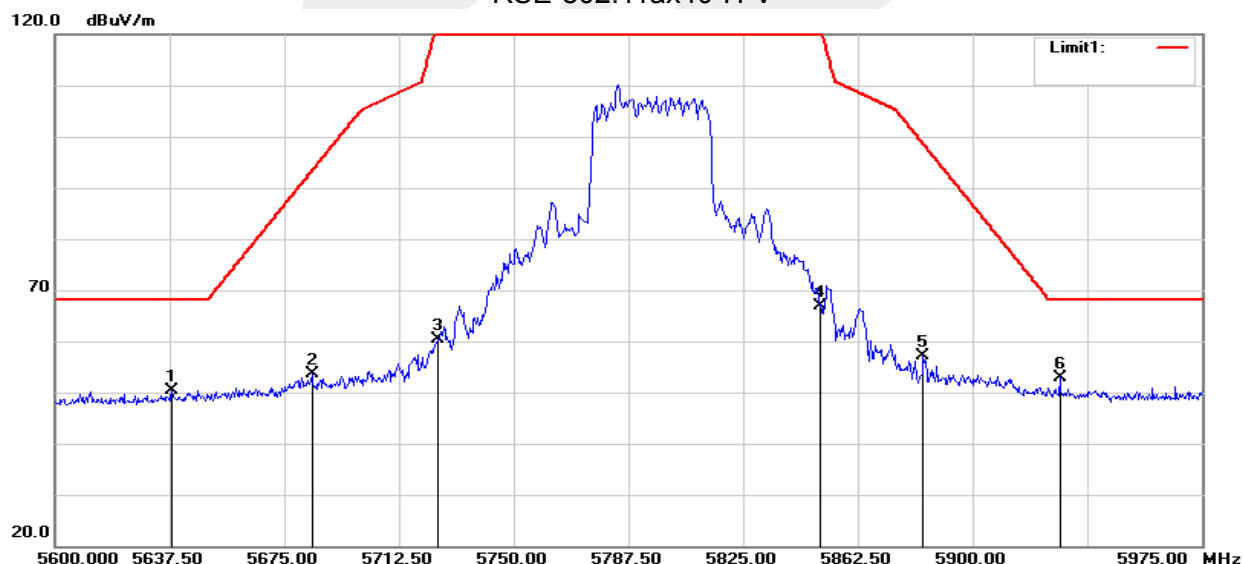


RSE-802.11ax40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5643.125	53.42	-4.68	48.74	68.20	-19.46	peak
2	5690.750	54.63	-4.66	49.97	98.36	-48.39	peak
3	5725.000	52.65	-4.57	48.08	122.20	-74.12	peak
4	5850.000	53.18	-4.10	49.08	122.20	-73.12	peak
5	5882.750	54.09	-3.96	50.13	99.47	-49.34	peak
6	5956.625	53.29	-3.98	49.31	68.20	-18.89	peak

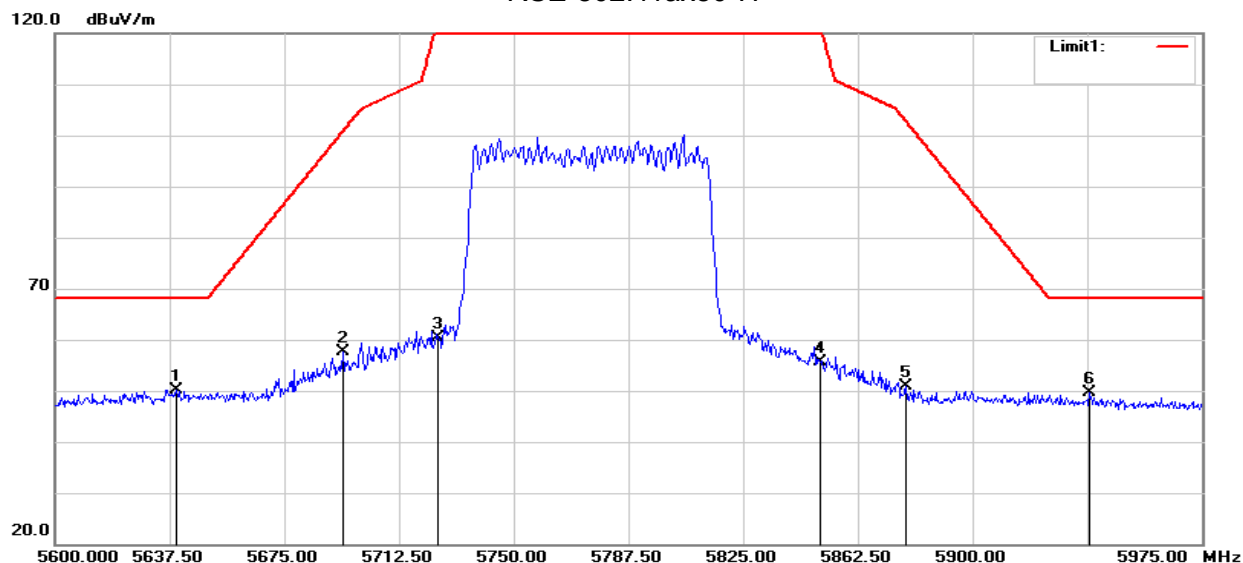
RSE-802.11ax40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5638.250	55.08	-4.69	50.39	68.20	-17.81	peak
2	5684.000	58.34	-4.67	53.67	93.36	-39.69	peak
3	5725.000	64.94	-4.57	60.37	122.20	-61.83	peak
4	5850.000	70.88	-4.10	66.78	122.20	-55.42	peak
5	5883.875	60.99	-3.96	57.03	98.63	-41.60	peak
6	5928.500	56.85	-3.92	52.93	68.20	-15.27	peak

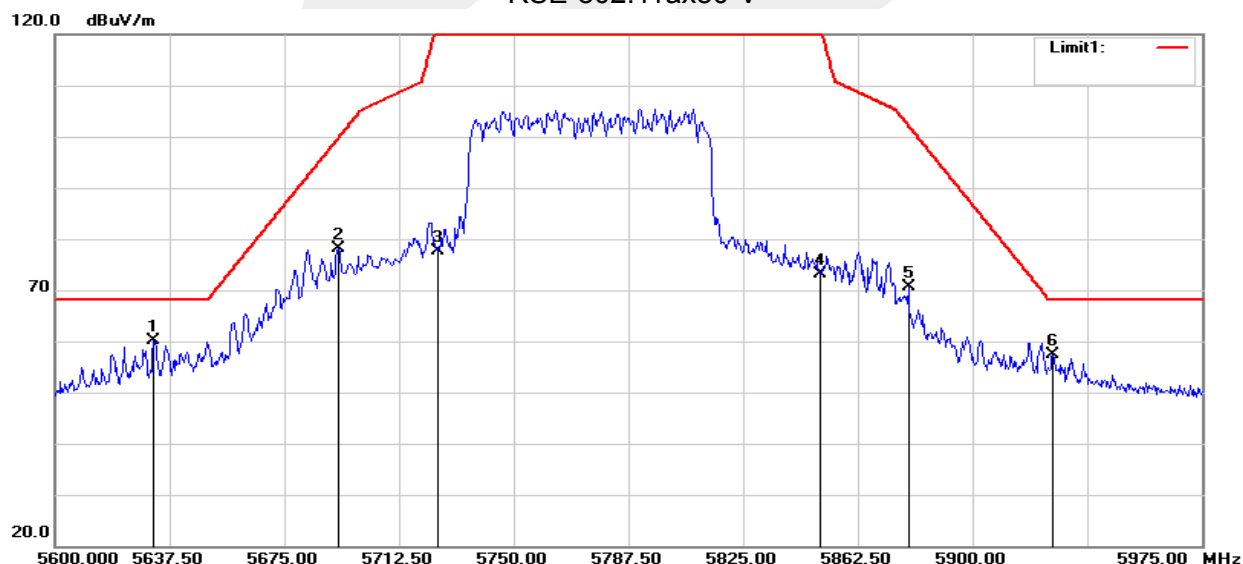


RSE-802.11ax80-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5639.750	54.90	-4.69	50.21	68.20	-17.99	peak
2	5694.125	62.25	-4.66	57.59	100.85	-43.26	peak
3	5725.000	65.05	-4.57	60.48	122.20	-61.72	peak
4	5850.000	59.67	-4.10	55.57	122.20	-66.63	peak
5	5878.250	54.86	-3.97	50.89	102.80	-51.91	peak
6	5938.250	53.66	-3.95	49.71	68.20	-18.49	peak

RSE-802.11ax80-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5632.250	64.93	-4.69	60.24	68.20	-7.96	peak
2	5692.625	82.82	-4.66	78.16	99.74	-21.58	peak
3	5725.000	82.24	-4.57	77.67	122.20	-44.53	peak
4	5850.000	77.35	-4.10	73.25	122.20	-48.95	peak
5	5879.000	74.55	-3.97	70.58	102.24	-31.66	peak
6	5926.250	61.19	-3.93	57.26	68.20	-10.94	peak

Note: All modes have been tested. Only the worst mode shown in the report.



4. POWER SPECTRAL DENSITY TEST

4.1 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.

4.2 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.I.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.

4.3 DEVIATION FROM STANDARD

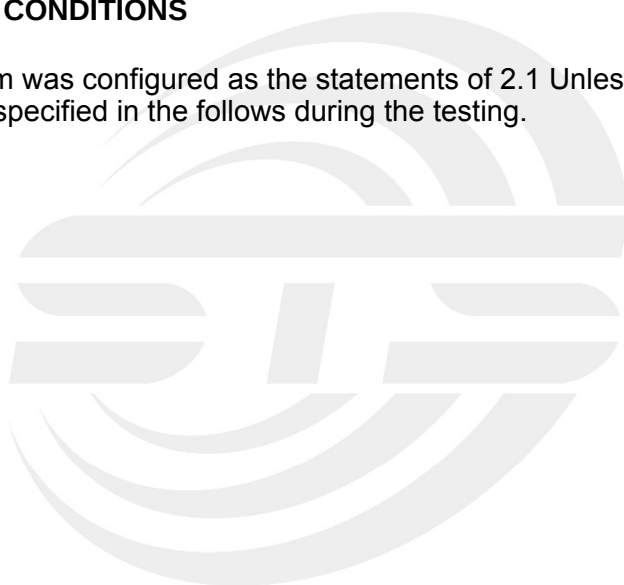
No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

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



**4.6 TEST RESULTS**

5150-5250MHz								
Frequency	Direct measurement Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Duty cycle factor (dB)	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a								
5180	0.307	-0.083	0.292	0.599	0.209	--	11	PASS
5200	0.480	-0.074	0.292	0.772	0.218	--	11	PASS
5240	0.899	0.192	0.292	1.191	0.484	--	11	PASS
802.11n20								
5180	-0.259	-0.749	0.275	0.016	-0.474	2.788	8.99	PASS
5200	-0.273	-0.625	0.275	0.002	-0.350	2.840	8.99	PASS
5240	0.278	-0.344	0.275	0.553	-0.069	3.263	8.99	PASS
802.11n40								
5190	-3.265	-3.841	0.570	-2.695	-3.271	0.037	8.99	PASS
5230	-3.093	-3.450	0.570	-2.523	-2.880	0.313	8.99	PASS
802.11ac20								
5180	0.329	-0.367	0.064	0.393	-0.303	3.069	8.99	PASS
5200	0.076	-0.452	0.064	0.140	-0.388	2.894	8.99	PASS
5240	0.715	0.045	0.064	0.779	0.109	3.467	8.99	PASS
802.11ac40								
5190	-2.859	-3.352	0.152	-2.707	-3.200	0.064	8.99	PASS
5230	-2.826	-3.189	0.152	-2.674	-3.037	0.159	8.99	PASS
802.11ac80								
5210	-5.718	-6.440	0.299	-5.419	-6.141	-2.755	8.99	PASS
802.11ax20								
5180	0.049	-0.755	0.097	0.146	-0.658	2.773	8.99	PASS
5200	0.699	-0.123	0.097	0.796	-0.026	3.415	8.99	PASS
5240	0.403	-0.255	0.097	0.500	-0.158	3.194	8.99	PASS
802.11ax40								
5190	-2.976	-3.333	0.194	-2.782	-3.139	0.053	8.99	PASS
5230	-2.659	-2.918	0.194	-2.465	-2.724	0.417	8.99	PASS
802.11ax80								
5210	-5.570	-6.322	0.390	-5.180	-5.932	-2.530	8.99	PASS



5725-5850MHz										
Frequency	Use RBW 510KHz direct measurement Ant_A Power Density (dBm)	Use RBW 510KHz direct measurement Ant_B Power Density (dBm)	Convert to RBW 500KHz direct measurement Ant_A Power Density (dBm)	Convert to RBW 500KHz direct measurement Ant_B Power Density (dBm)	Duty cycle factor (dB)	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm/500 KHz)	Result
802.11a										
5745	2.066	1.226	1.980	1.140	0.281	2.261	1.421	--	30.00	PASS
5785	1.823	1.434	1.737	1.348	0.281	2.018	1.629	--	30.00	PASS
5825	1.352	0.862	1.266	0.776	0.281	1.547	1.057	--	30.00	PASS
802.11n20										
5745	1.631	1.122	1.545	1.036	0.274	1.819	1.310	4.582	27.99	PASS
5785	1.622	0.647	1.536	0.561	0.274	1.810	0.835	4.360	27.99	PASS
5825	1.353	0.519	1.267	0.433	0.274	1.541	0.707	4.154	27.99	PASS
802.11n40										
5755	-1.996	-1.864	-2.082	-1.950	0.570	-1.512	-1.380	1.565	27.99	PASS
5795	-1.760	-2.503	-1.846	-2.589	0.570	-1.276	-2.019	1.379	27.99	PASS
802.11ac20										
5745	2.146	1.407	2.060	1.321	0.064	2.124	1.385	4.780	27.99	PASS
5785	2.145	0.983	2.059	0.897	0.064	2.123	0.961	4.591	27.99	PASS
5825	1.571	0.778	1.485	0.692	0.064	1.549	0.756	4.180	27.99	PASS
802.11ac40										
5755	-1.323	-1.885	-1.409	-1.971	0.139	-1.270	-1.832	1.468	27.99	PASS
5795	-1.780	-1.933	-1.866	-2.019	0.139	-1.727	-1.880	1.207	27.99	PASS
802.11ac80										
5775	-4.930	-5.137	-5.016	-5.223	0.312	-4.704	-4.911	-1.796	27.99	PASS
802.11ax20										
5745	1.887	1.357	1.801	1.271	0.097	1.898	1.368	4.652	27.99	PASS
5785	1.865	1.008	1.779	0.922	0.097	1.876	1.019	4.479	27.99	PASS
5825	1.746	0.918	1.660	0.832	0.097	1.757	0.929	4.373	27.99	PASS
802.11ax40										
5755	-0.734	-1.620	-0.820	-1.706	0.206	-0.614	-1.500	1.976	27.99	PASS
5795	-1.845	-1.910	-1.931	-1.996	0.206	-1.725	-1.790	1.253	27.99	PASS
802.11ax80										
5775	-4.548	-4.554	-4.634	-4.640	0.377	-4.257	-4.263	-1.250	27.99	PASS

Note: 1. RB conversion formula: $10 \cdot \log(500\text{KHz}/\text{RBW})$

2. Test plots see Attachment A.

5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

5.1.1 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%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 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.



5.1.5 TEST RESULTS

Note: Antenna A Power > Antenna B Power, Both antenna A and B have been test, Only show the worst data of Antenna A.

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5180	20.82	Pass
5200	20.87	Pass
5240	20.93	Pass
802.11n(HT20)		
5180	21.20	Pass
5200	21.38	Pass
5240	21.23	Pass
802.11n(HT40)		
5190	39.38	Pass
5230	39.48	Pass
802.11ac(VHT20)		
5180	20.99	Pass
5200	21.10	Pass
5240	21.04	Pass
802.11ac(VHT40)		
5190	39.27	Pass
5230	39.50	Pass
802.11ac(VHT80)		
5210	80.28	Pass
802.11ax(HE20)		
5180	21.54	Pass
5200	21.52	Pass
5240	21.55	Pass
802.11ax(HE40)		
5190	39.61	Pass
5230	39.76	Pass
802.11ax(HE80)		
5210	80.43	Pass



Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	20.83	Pass
5785	20.89	Pass
5825	20.91	Pass
802.11n(HT20)		
5745	21.23	Pass
5785	21.21	Pass
5825	21.24	Pass
802.11n(HT40)		
5755	39.49	Pass
5795	39.34	Pass
802.11ac(VHT20)		
5745	21.11	Pass
5785	21.05	Pass
5825	20.93	Pass
802.11ac(VHT40)		
5755	39.45	Pass
5795	39.48	Pass
802.11ac(VHT80)		
5775	80.59	Pass
802.11ax(HE20)		
5745	21.57	Pass
5785	21.48	Pass
5825	21.45	Pass
802.11ax(HE40)		
5755	39.94	Pass
5795	39.69	Pass
802.11ax(HE80)		
5775	80.79	Pass

Test plots see Attachment B

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

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

5.2.1 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.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP



5.2.4 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.



5.2.5 TEST RESULTS

Note: Antenna A Power > Antenna B Power, Both antenna A and B have been test, Only show the worst data of Antenna A.

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5180	16.60	Pass
5200	16.61	Pass
5240	16.62	Pass
802.11n(HT20)		
5180	17.78	Pass
5200	17.78	Pass
5240	17.78	Pass
802.11n(HT40)		
5190	36.28	Pass
5230	36.30	Pass
802.11ac(VHT20)		
5180	17.73	Pass
5200	17.72	Pass
5240	17.72	Pass
802.11ac(VHT40)		
5190	36.23	Pass
5230	36.21	Pass
802.11ac(VHT80)		
5210	75.64	Pass
802.11ax(HE20)		
5180	19.08	Pass
5200	19.06	Pass
5240	19.06	Pass
802.11ax(HE40)		
5190	37.46	Pass
5230	37.50	Pass
802.11ax(HE80)		
5210	76.93	Pass



Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.61	Pass
5785	16.60	Pass
5825	16.63	Pass
802.11n(HT20)		
5745	17.78	Pass
5785	17.77	Pass
5825	17.77	Pass
802.11n(HT40)		
5755	36.25	Pass
5795	36.27	Pass
802.11ac(VHT20)		
5745	17.73	Pass
5785	17.73	Pass
5825	17.73	Pass
802.11ac(VHT40)		
5755	36.20	Pass
5795	36.22	Pass
802.11ac(VHT80)		
5775	75.66	Pass
802.11ax(HE20)		
5745	19.07	Pass
5785	19.05	Pass
5825	19.08	Pass
802.11ax(HE40)		
5755	37.53	Pass
5795	37.49	Pass
802.11ax(HE80)		
5775	76.96	Pass

Test plots See Attachment B

5.3 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:

5.3.1 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.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP



5.3.4 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.



5.3.5 TEST RESULTS

Note: Antenna A Power > Antenna B Power, Both antenna A and B have been test, Only show the worst data of Antenna A.

Frequency (MHz)	6dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.34	Pass
5785	16.33	Pass
5825	16.35	Pass
802.11n(HT20)		
5745	17.59	Pass
5785	17.58	Pass
5825	17.58	Pass
802.11n(HT40)		
5755	36.34	Pass
5795	36.35	Pass
802.11ac(VHT20)		
5745	17.61	Pass
5785	17.59	Pass
5825	17.61	Pass
802.11ac(VHT40)		
5755	36.36	Pass
5795	36.36	Pass
802.11ac(VHT80)		
5775	75.79	Pass
802.11ax(HE20)		
5745	18.87	Pass
5785	18.83	Pass
5825	18.89	Pass
802.11ax(HE40)		
5755	37.32	Pass
5795	36.87	Pass
802.11ax(HE80)		
5775	75.62	Pass

Data see Attachment C

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 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	

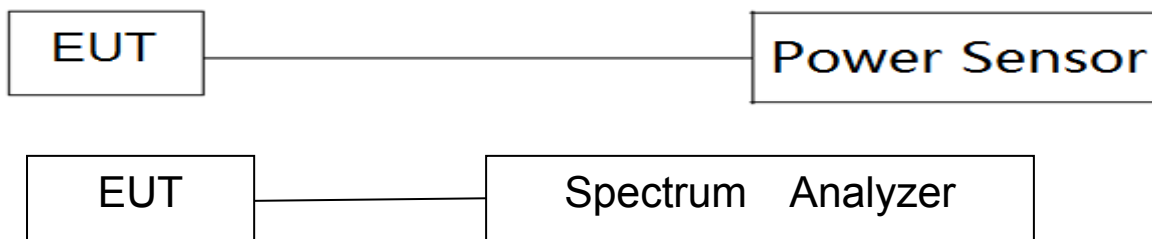
6.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

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

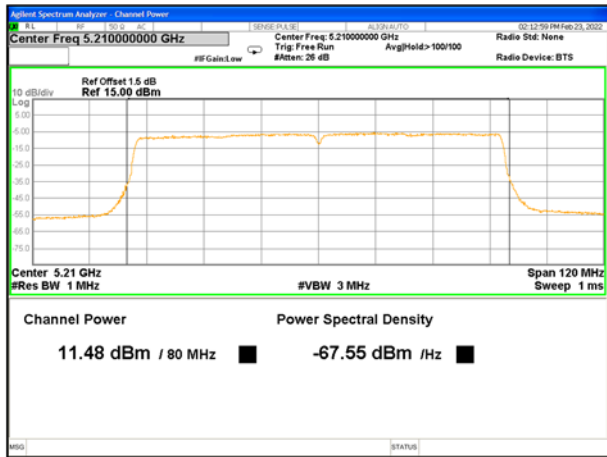


6.6 TEST RESULTS

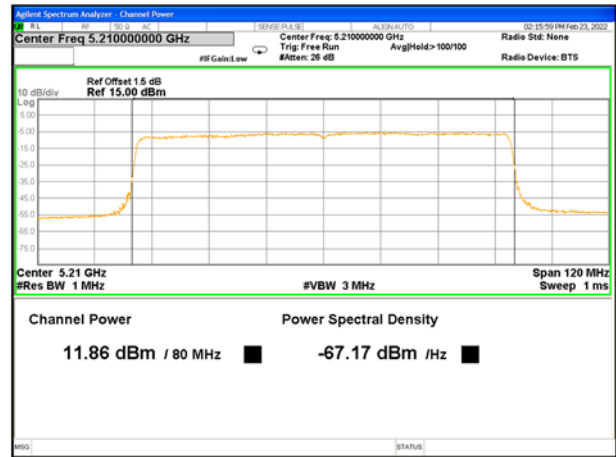
U-NII 1 (5.15-5.25GHz)								
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Duty cycle factor (dB)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a								
36	5180	11.97	11.29	0.292	12.26	11.58	--	23.98
40	5200	11.91	11.39	0.292	12.20	11.68	--	23.98
48	5240	12.04	11.48	0.292	12.33	11.77	--	23.98
802.11n(HT20)								
36	5180	12.06	11.29	0.275	12.33	11.56	14.98	21.97
40	5200	12.01	11.27	0.275	12.28	11.54	14.94	21.97
48	5240	12.18	11.46	0.275	12.45	11.73	15.12	21.97
802.11n(HT40)								
38	5190	11.37	11.06	0.570	11.94	11.63	14.80	21.97
46	5230	11.55	11.18	0.570	12.12	11.75	14.95	21.97
802.11ac(VHT20)								
36	5180	12.27	11.54	0.064	12.33	11.60	14.99	21.97
40	5200	12.40	11.66	0.064	12.46	11.72	15.12	21.97
48	5240	12.47	11.72	0.064	12.53	11.78	15.19	21.97
802.11ac(VHT40)								
38	5190	11.84	11.53	0.152	11.99	11.68	14.85	21.97
46	5230	11.89	11.59	0.152	12.04	11.74	14.90	21.97
802.11ac(VHT80)								
42	5210	11.48	10.81	0.299	11.78	11.11	14.47	21.97
802.11ax(HE20)								
36	5180	12.52	11.81	0.097	12.62	11.91	15.29	21.97
40	5200	12.66	11.83	0.097	12.76	11.93	15.37	21.97
48	5240	12.57	11.93	0.097	12.67	12.03	15.37	21.97
802.11ax(HE40)								
38	5190	12.00	11.67	0.194	12.19	11.86	15.04	21.97
46	5230	12.18	11.70	0.194	12.37	11.89	15.15	21.97
802.11ax(HE80)								
42	5210	11.86	11.15	0.390	12.25	11.54	14.92	21.97



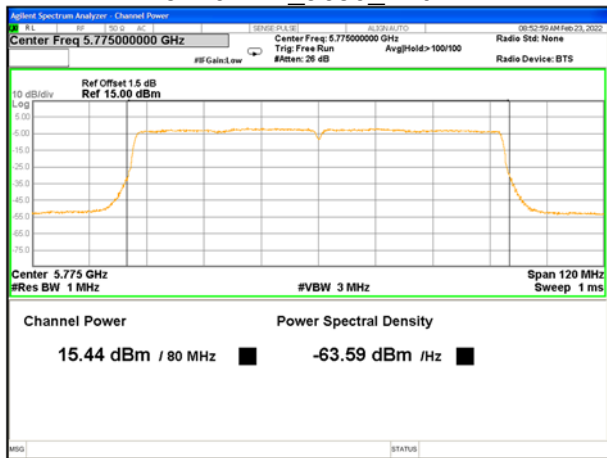
U-NII 3(5.725-5.85GHz)								
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Duty cycle factor (dB)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a								
149	5745	15.62	14.96	0.281	15.90	15.24	--	30.00
157	5785	15.54	14.69	0.281	15.82	14.97	--	30.00
165	5825	15.42	14.65	0.281	15.70	14.93	--	30.00
802.11n(HT20)								
149	5745	15.60	14.84	0.274	15.87	15.11	18.521	27.99
157	5785	15.58	14.70	0.274	15.85	14.97	18.446	27.99
165	5825	15.51	14.58	0.274	15.78	14.85	18.354	27.99
802.11n(HT40)								
151	5755	13.89	13.29	0.570	14.46	13.86	17.181	27.99
159	5795	13.99	13.18	0.570	14.56	13.75	17.184	27.99
802.11ac(VHT20)								
149	5745	15.89	15.17	0.064	15.95	15.23	18.619	27.99
157	5785	15.82	14.98	0.064	15.88	15.04	18.494	27.99
165	5825	15.81	14.88	0.064	15.87	14.94	18.444	27.99
802.11ac(VHT40)								
151	5755	14.41	13.74	0.139	14.55	13.88	17.237	27.99
159	5795	14.57	13.64	0.139	14.71	13.78	17.279	27.99
802.11ac(VHT80)								
155	5775	15.44	15.26	0.312	15.75	15.57	18.673	27.99
802.11ax(HE20)								
149	5745	16.10	15.37	0.097	16.20	15.47	18.858	27.99
157	5785	16.08	15.25	0.097	16.18	15.35	18.792	27.99
165	5825	15.99	15.11	0.097	16.09	15.21	18.680	27.99
802.11ax(HE40)								
151	5755	14.60	13.86	0.206	14.81	14.07	17.462	27.99
159	5795	14.80	13.83	0.206	15.01	14.04	17.558	27.99
802.11ax(HE80)								
155	5775	15.73	15.34	0.377	16.11	15.72	18.926	27.99



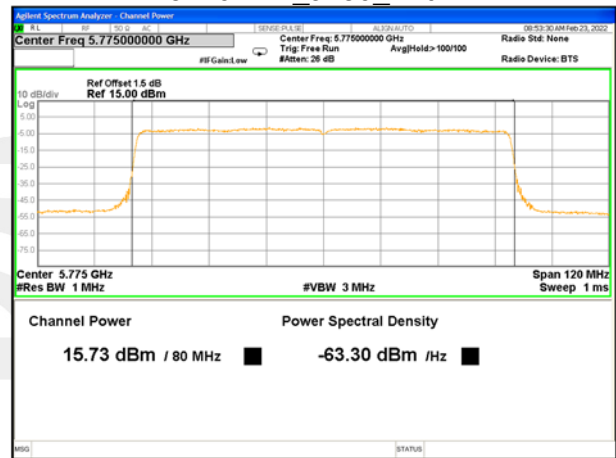
5210MHz_ac80_Ant A



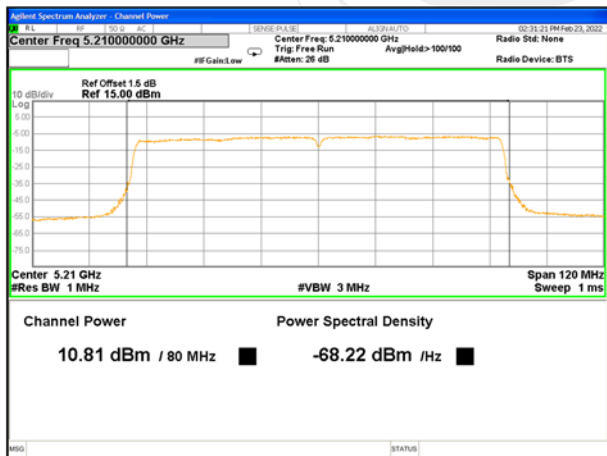
5210MHz_ax80_Ant A



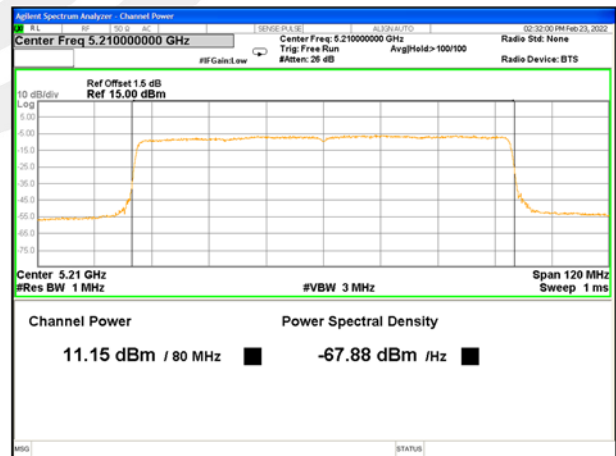
5775MHz_ac80_Ant A



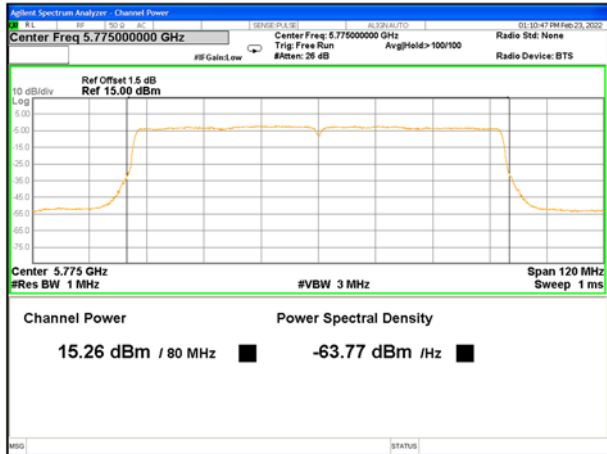
5775MHz_ax80_Ant A



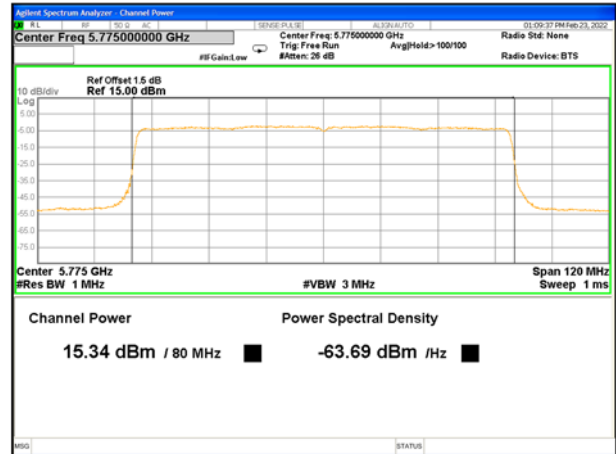
5210MHz_ac80_Ant B



5210MHz_ax80_Ant B



5775MHz_ac80_Ant B

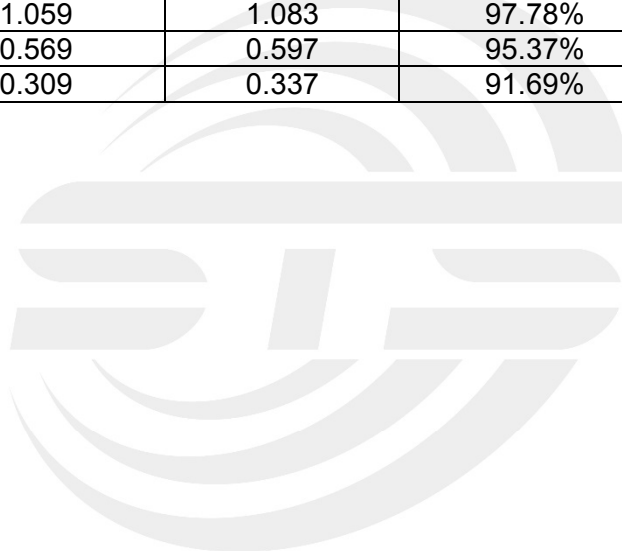


5775MHz_ax80_Ant B





U-NII 1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.436	1.536	93.49%	0.292
n20	1.348	1.436	93.87%	0.275
n40	0.670	0.764	87.70%	0.570
ac20	1.356	1.376	98.55%	0.064
ac40	0.674	0.698	96.56%	0.152
ac80	0.337	0.361	93.35%	0.299
ax20	1.059	1.083	97.78%	0.097
ax40	0.570	0.596	95.64%	0.194
ax80	0.309	0.338	91.42%	0.390
U-NII 3				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.436	1.532	93.73%	0.281
n20	1.352	1.440	93.89%	0.274
n40	0.670	0.764	87.70%	0.570
ac20	1.356	1.376	98.55%	0.064
ac40	0.678	0.700	96.86%	0.139
ac80	0.336	0.361	93.07%	0.312
ax20	1.059	1.083	97.78%	0.097
ax40	0.569	0.597	95.37%	0.206
ax80	0.309	0.337	91.69%	0.377





Band 1-a20



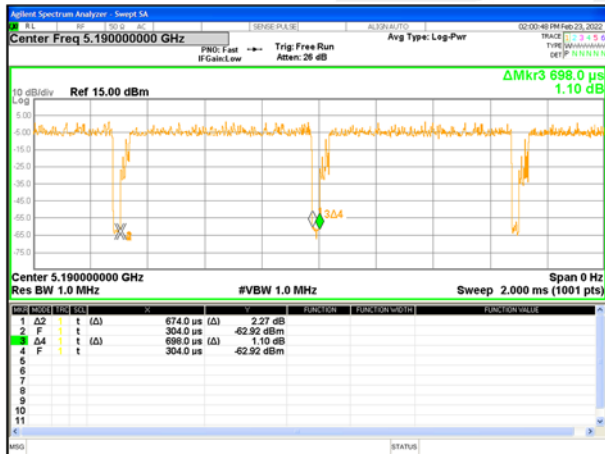
Band 1-n20



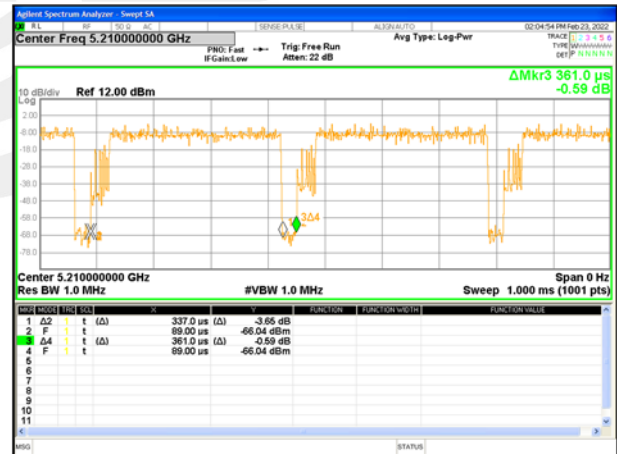
Band 1-n40



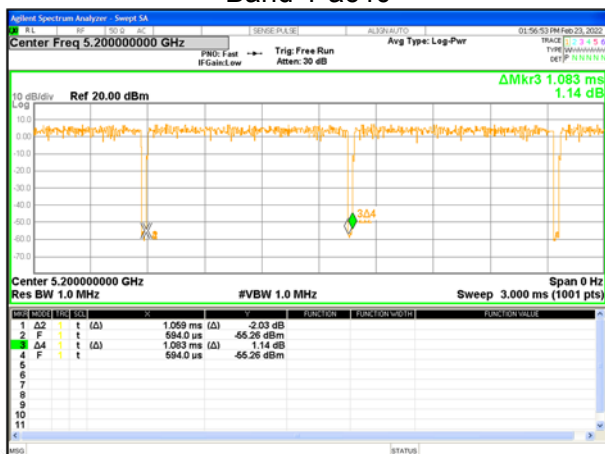
Band 1-ac20



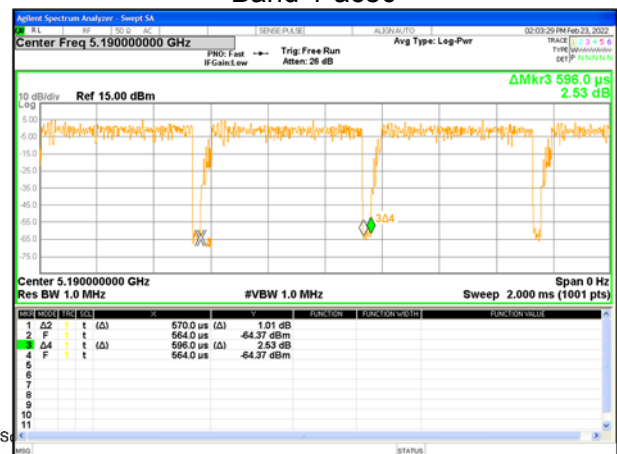
Band 1-ac40



Band 1-ac80



Band 1-ax20



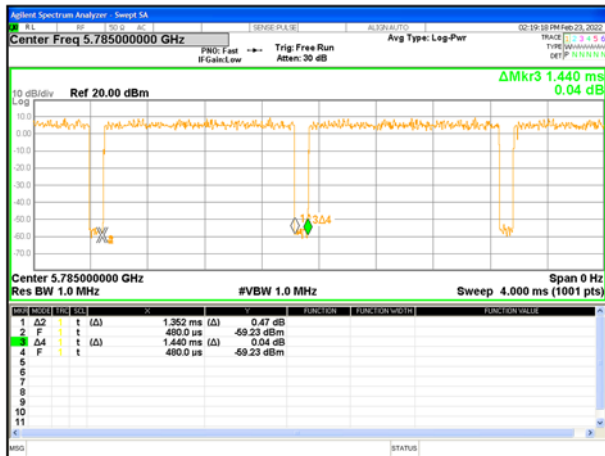
Band 1-ax40



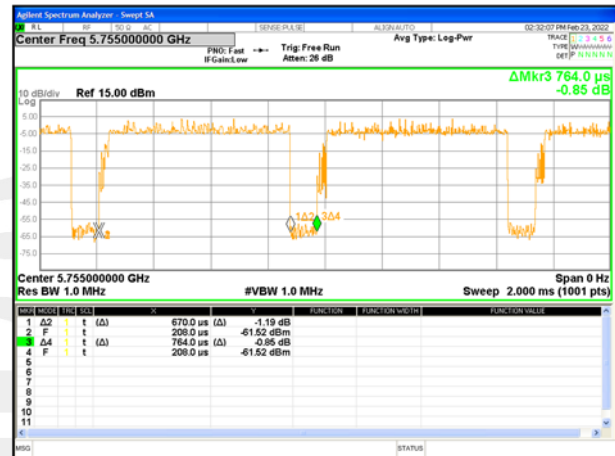
Band 1-ax80



Band 4-a20



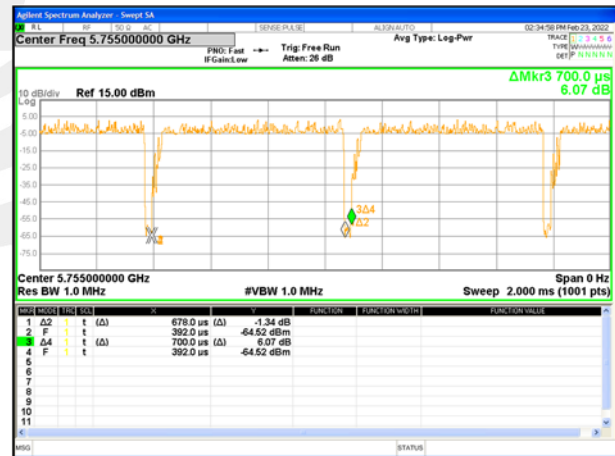
Band 4-n20



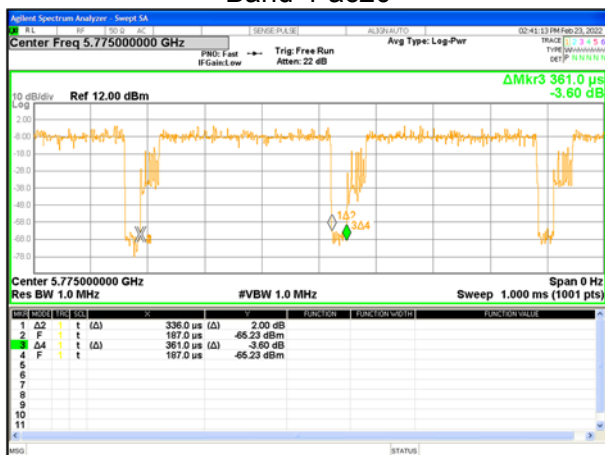
Band 4-n40



Band 4-ac20



Band 4-ac40



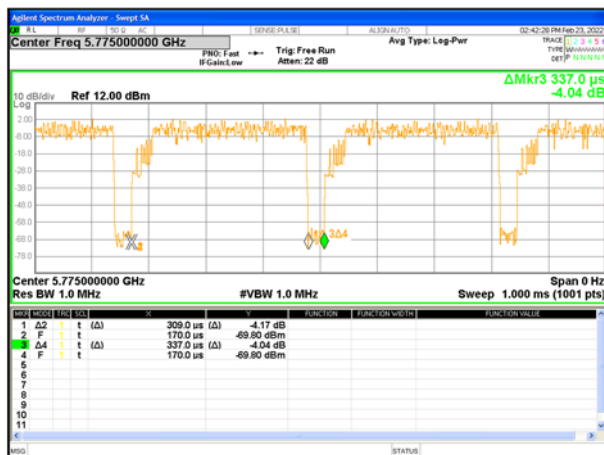
Band 4-ac80



Band 4-ax20



Band 4-ax40



Band 4-ax80





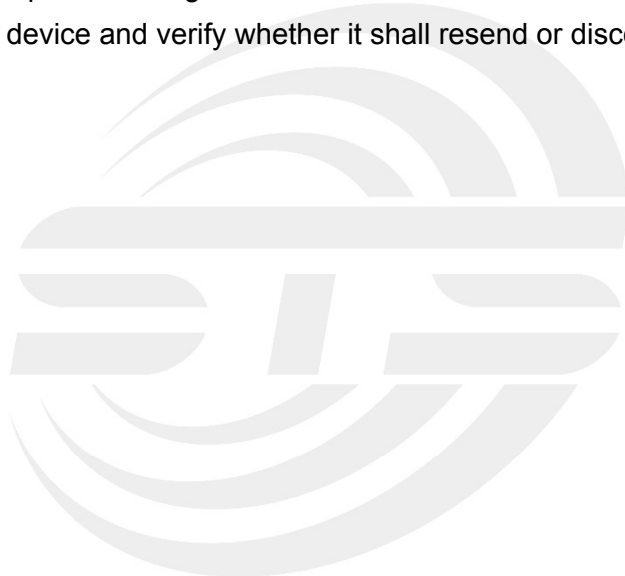
7. AUTOMATICALLY DISCONTINUE TRANSMISSION

7.1 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.

7.2 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.





8. ANTENNA REQUIREMENT

8.1 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.

8.2 EUT ANTENNA

The EUT antenna is Dipole 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※※※※※

