



RADIO TEST REPORT

Report No.:STS2002188W23

Issued for

Winmate Inc.

9F, No.111-6, Shing-De Rd., San-Chung Dist., New Taipei
City, 24158, Taiwan, R.O.C

Product Name:	Rugged Tablet PC
Brand Name:	Winmate
Model Name:	M700DQ8
Series Model:	M700XXXXXXXXXXXX (Where X can be A-Z,a-z ,0-9,"-", Blank or Slash)
FCC ID:	PX9M700DQ8002
Test Standard:	FCC Part 15.407

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TEST RESULT CERTIFICATION

Applicant's Name..... : Winmate Inc.

Address : 9F, No.111-6, Shing-De Rd., San-Chung Dist., New Taipei City,
24158, Taiwan, R.O.C

Manufacture's Name..... : Winmate Inc.

Address : 9F, No.111-6, Shing-De Rd., San-Chung Dist., New Taipei City,
24158, Taiwan, R.O.C

Product Description

Product Name..... : Rugged Tablet PC

Brand Name : Winmate

Model Name : M700DQ8

Series Model..... : M700XXXXXXXXXXXX(Where X can be A-Z,a-z ,0-9,"-", Blank or
Slash)

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..... : 27 Feb. 2020

Date (s) of performance of tests : 27 Feb. 2020 ~ 21 May 2020

Date of Issue..... : 21 May 2020

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

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Vita Li)

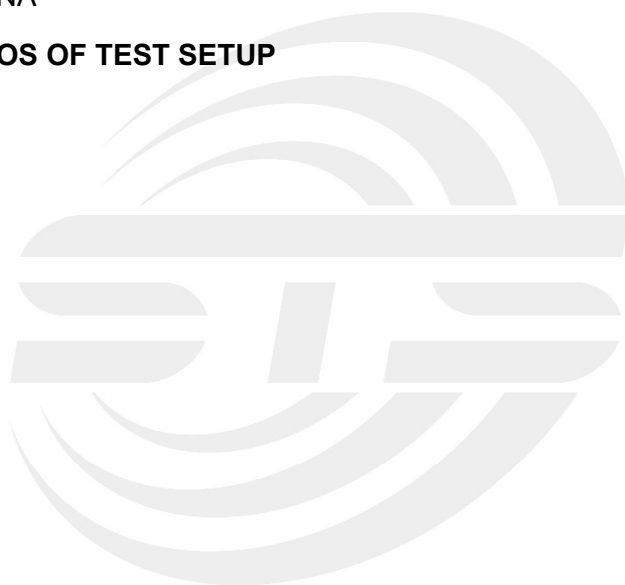




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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	21 May 2020	STS2002188W23	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

§ 15.407, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
§ 15.407 (2) (26 dB) / § 15.407 (e) (6 dB) / § 15.407 (a) (99%)	26dB/6dB & 99% Bandwidth	PASS
15.407(a) (1).(2).(3).(4).(5)	Maximum Conducted Output Power	PASS
15.407(b) & 15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(b)7	Conducted Emission And (bandedge Emissions) Measurement	PASS
15.407(a) (1).(2).(3).(4).(5)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

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

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



1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 30-1GHz	$\pm 6.7\text{dB}$
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)	$\pm 4.43\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 5\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Rugged Tablet PC	
Trade Name	Winmate	
Model Name	M700DQ8	
Series Model	M700XXXXXXXXXXXX(Where X can be A-Z,a-z ,0-9,"-", Blank or Slash)	
Model Difference	Only for marketing purpose	
Product Description	The EUT is a Rugged 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): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz
		IEEE 802.11a/ n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz
		IEEE 802.11a/ n(HT20)/ac(VHT20): 5.745GHz-5.825GHz IEEE 802.11a/ n(HT40)/ac(VHT40): 5.755GHz-5.795GHz IEEE 802.11ac(VHT80): 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:	Please refer to the Note 4.
	Max.Output Power(Conducted):	20.77dBm
	More details of EUT technical specification, please refer to the User Manual.	
Test Channel	Please refer to the Note 3.	
Adapter	Input: AC 100-240V, 50/60 Hz, 0.6A Output: DC 5V 3 A	
Battery	Rated Voltage: 3.7 V Charge Limit: 4.2 V Capacity: 5300 mAh	
Hardware version number	M700DQ8-300	



Software version number	M700DQ8_MB200_STD_P_SIE_200131
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. The EUT not support TPC function.





3. Operation Frequency of channel			
5.180GHz-5.240GHz		5.500GHz-5.720GHz	
Channel	Frequency	Channel	Frequency
36	5180	100	5500
38	5190	102	5510
40	5200	104	5520
42	5210	106	5530
44	5220	108	5540
46	5230	110	5550
48	5240	112	5560
		116	5580
		118	5590
5.260GHz-5.320GHz		120	5600
Channel	Frequency	122	5610
52	5260	124	5620
54	5270	126	5630
56	5280	128	5640
58	5290	132	5660
60	5300	134	5670
62	5310	136	5680
64	5320	140	5700
5.745GHz-5.825GHz			
Channel	Frequency		
149	5745		
151	5755		
153	5765		
155	5775		
157	5785		
159	5795		
161	5805		
165	5825		

Note:

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

Carrier Frequency Channel

5GHz:

For 802.11a/n(HT20)/ac(VHT20)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
36	5180	52	5260
40	5200	60	5300
48	5240	64	5320

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



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

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

For 802.11ac (VHT80)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
42	5210	58	5290

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

4. 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,

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

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

$$\text{Directional gain} = G_{ANT}$$

Antenna number: 2

Antenna A gain : 1.3dBi

Antenna B gain : 1.3dBi

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

$$\text{Directional gain} = 1.3 + 10 \log 2 = 4.31 \text{ dBi}$$

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	Winmate	M700DQ8	PIFA Antenna	N/A	Ant A: 1.3 Ant B: 1.3 MIMO: 4.31	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 CH52&CH60&CH64	6 Mbps
Mode 3	TX IEEE 802.11a HT20 CH100&CH116&CH140	6 Mbps
Mode 4	TX IEEE 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 5	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 6	TX IEEE 802.11ac HT20 CH36&CH40&CH48	NSS1 MCS0
Mode 7	TX IEEE 802.11n HT20 CH52&CH60&CH64	MCS 0
Mode 8	TX IEEE 802.11ac HT20 CH52&CH60&CH64	NSS1 MCS0
Mode 9	TX IEEE 802.11n HT20 CH100&CH116&CH140	MCS 0
Mode 10	TX IEEE 802.11ac HT20 CH100&CH116&CH140	NSS1 MCS0
Mode 11	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 12	TX IEEE 802.11ac HT20 CH149&CH157&CH165	NSS1 MCS0
Mode 13	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 14	TX IEEE 802.11ac HT40 CH38&CH46	NSS1 MCS0
Mode 15	TX IEEE 802.11n HT40 CH54 &CH62	MCS 0
Mode 16	TX IEEE 802.11ac HT40 CH54 &CH62	NSS1 MCS0
Mode 17	TX IEEE 802.11n HT40 CH102&CH110&CH134	MCS 0
Mode 18	TX IEEE 802.11ac HT40 CH102&CH110&CH134	NSS1 MCS0
Mode 19	TX IEEE 802.11n HT40 CH151&CH159	MCS 0
Mode 20	TX IEEE 802.11ac HT40 CH151&CH159	NSS1 MCS0
Mode 21	TX IEEE 802.11ac HT80 CH42	NSS1 MCS0
Mode 22	TX IEEE 802.11ac HT80 CH58	NSS1 MCS0
Mode 23	TX IEEE 802.11ac HT80 CH106&122	NSS1 MCS0
Mode 24	TX IEEE 802.11ac HT80 CH155	NSS1 MCS0

- Note: (1) The measurements are performed at the highest, middle, lowest available channels.
(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
(3) We have 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	Mode 25: Keeping TX + WLAN Link

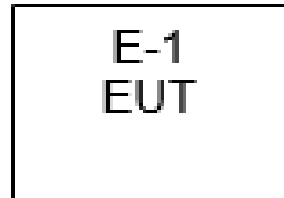
2.3 TEST SOFTWARE AND POWER LEVEL

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

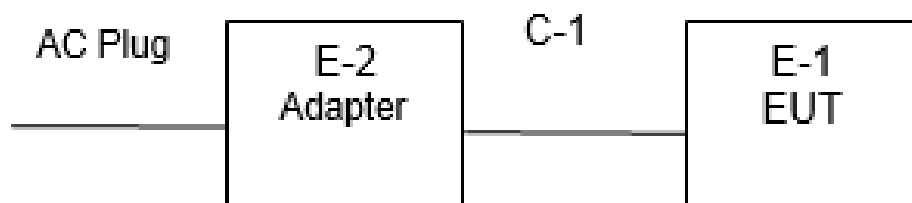
RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
WIFI(5G)	5G WIFI Band1 (5150MHz-5250MHz)	802.11a	Ant A: 1.3 Ant B: 1.3 MIMO: 4.31	15	QRCT4
		802.11n(HT20)		13	
		802.11n(HT40)		12	
		802.11ac(VHT20)		12	
		802.11ac(VHT40)		12	
		802.11ac(VHT80)		10	
	5G WIFI Band2 (5250MHz-5350MHz)	802.11a	Ant A: 1.3 Ant B: 1.3 MIMO: 4.31	15	
		802.11n(HT20)		12	
		802.11n(HT40)		12	
		802.11ac(VHT20)		13	
		802.11ac(VHT40)		12	
		802.11ac(VHT80)		10	
	5G WIFI Band3 (5470MHz-5725MHz)	802.11a	Ant A: 1.3 Ant B: 1.3 MIMO: 4.31	15	
		802.11n(HT20)		12	
		802.11n(HT40)		12	
		802.11ac(VHT20)		12	
		802.11ac(VHT40)		12	
		802.11ac(VHT80)		10	
	5G WIFI Band4 (5725MHz-5875MHz)	802.11a	Ant A: 1.3 Ant B: 1.3 MIMO: 4.31	16	
		802.11n(HT20)		13	
		802.11n(HT40)		12	
		802.11ac(VHT20)		13	
		802.11ac(VHT40)		12	
		802.11ac(VHT80)		13	

2.4 BLOCK DIGRAM 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	6A-181WP05	N/A	N/A
C-1	DC Cable	N/A	140cm	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.



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
Signal Analyzer	Agilent	N9020A	MY51110105	2020.03.05	2021.03.04
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
Horn Antenna (18-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Spectrum Analyzer	R&S	FSV40-N	101823	2019.06.05	2020.06.04
Pre-Amplifier(0.1 M-3GHz)	EM	EM330	060665	2019.10.09	2020.10.08
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-4 5	SK2018080901	2019.10.12	2020.10.11
Pre-mpifier (18G-40G)	SKET	LNPA_1840-50	SK2018101801	2019.10.22	2020.10.21
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 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

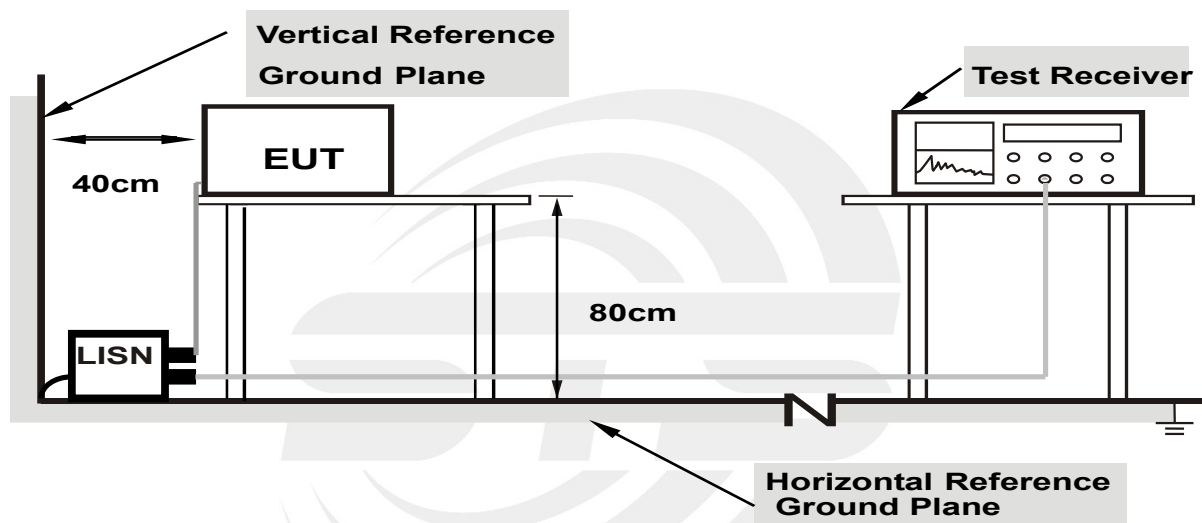
3.1.2 TEST PROCEDURE

- The EUT 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 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 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

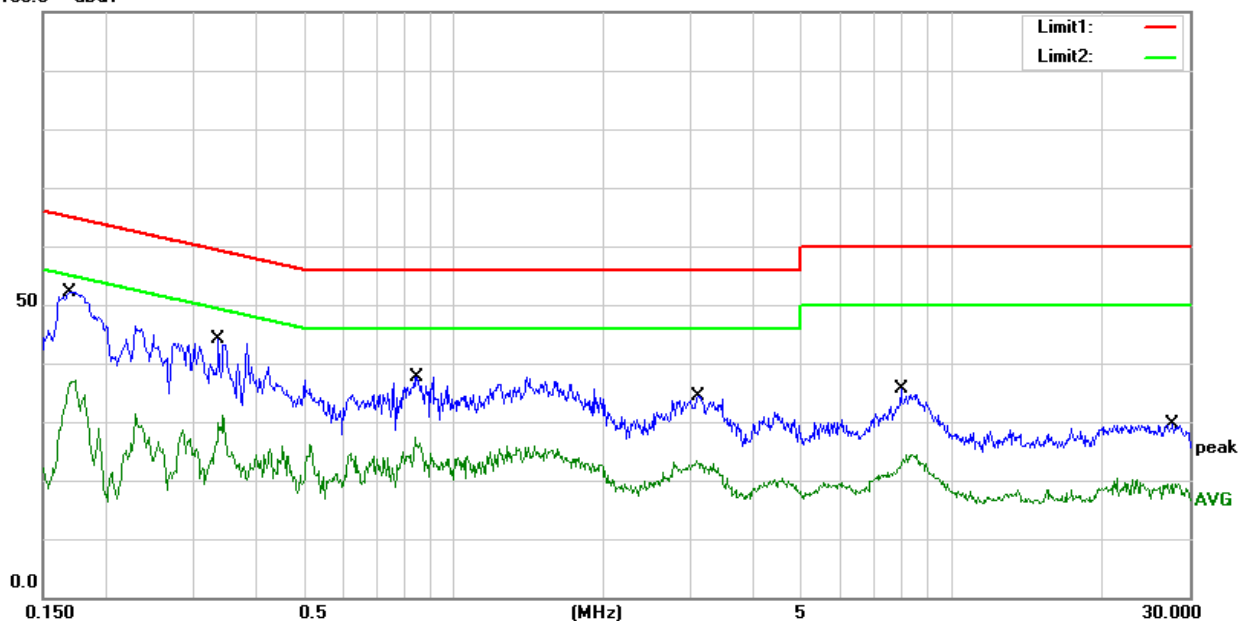
Temperature:	23.6(C)	Relative Humidity:	52%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode :	Mode 25		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1700	32.36	19.79	52.15	64.96	-12.81	QP
2	0.1700	17.29	19.79	37.08	54.96	-17.88	AVG
3	0.3380	23.97	20.15	44.12	59.25	-15.13	QP
4	0.3380	10.94	20.15	31.09	49.25	-18.16	AVG
5	0.8460	17.82	19.83	37.65	56.00	-18.35	QP
6	0.8460	7.46	19.83	27.29	46.00	-18.71	AVG
7	3.1020	14.66	19.81	34.47	56.00	-21.53	QP
8	3.1020	3.49	19.81	23.30	46.00	-22.70	AVG
9	7.8940	15.62	19.98	35.60	60.00	-24.40	QP
10	7.8940	4.35	19.98	24.33	50.00	-25.67	AVG
11	27.7260	9.44	20.23	29.67	60.00	-30.33	QP
12	27.7260	-0.82	20.23	19.41	50.00	-30.59	AVG

Remark:

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

100.0 dBuV



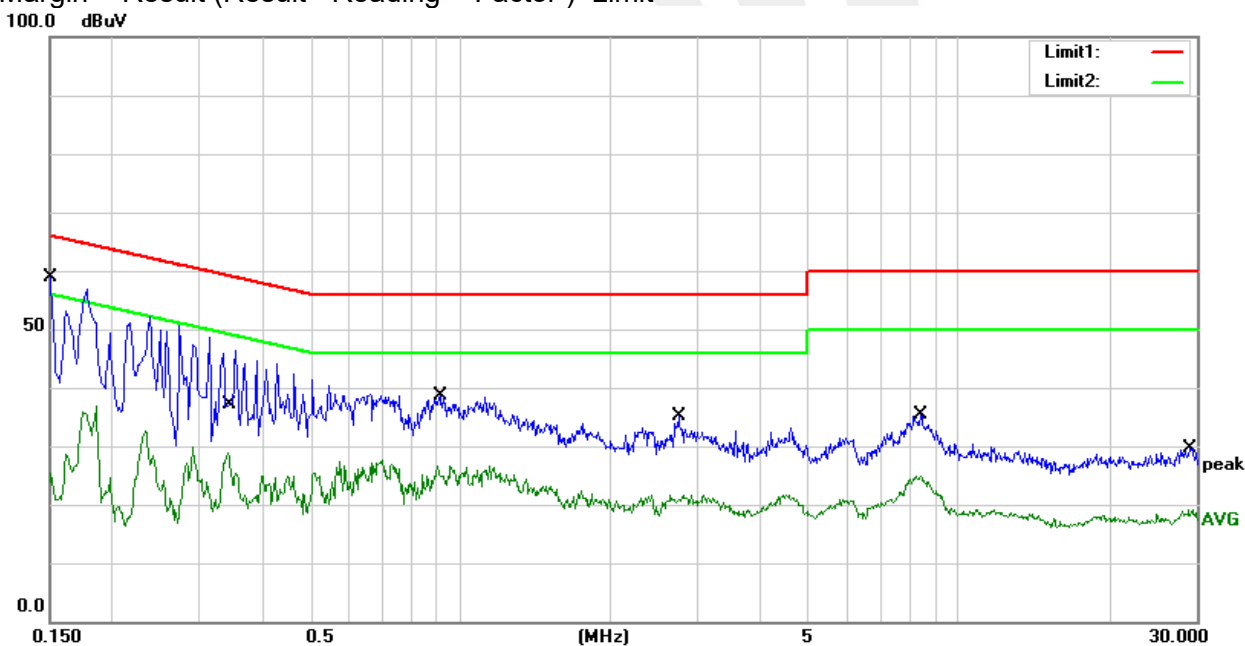


Temperature:	23.6(C)	Relative Humidity:	52%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 25		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	39.17	19.79	58.96	66.00	-7.04	QP
2	0.1500	17.00	19.79	36.79	56.00	-19.21	AVG
3	0.3420	30.50	20.14	50.64	59.15	-8.51	QP
4	0.3420	8.64	20.14	28.78	49.15	-20.37	AVG
5	0.9100	18.78	19.82	38.60	56.00	-17.40	QP
6	0.9100	6.88	19.82	26.70	46.00	-19.30	AVG
7	2.7380	15.25	19.80	35.05	56.00	-20.95	QP
8	2.7380	1.93	19.80	21.73	46.00	-24.27	AVG
9	8.3860	15.30	20.03	35.33	60.00	-24.67	QP
10	8.3860	4.90	20.03	24.93	50.00	-25.07	AVG
11	29.1580	9.41	20.27	29.68	60.00	-30.32	QP
12	29.1580	-1.25	20.27	19.02	50.00	-30.98	AVG

Remark:

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





3.2 RADIATED EMISSION AND (BANDEDGE) MEASUREMENT

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

In case the emission fall within the restricted band specified on 15.407(b)7& 15.205/209(a), then the (a); limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolt/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).

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

- 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 Quasi Peak 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:

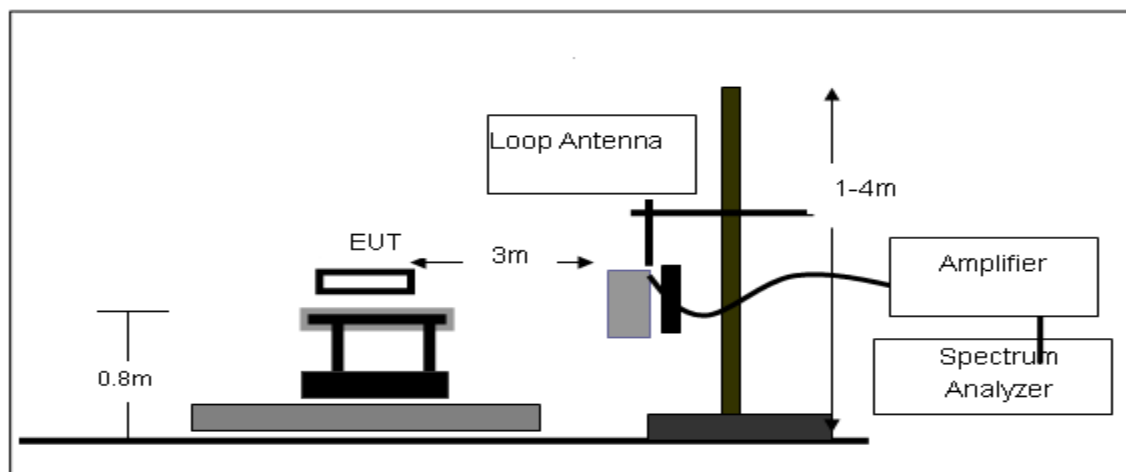
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

3.2.2 DEVIATION FROM TEST STANDARD

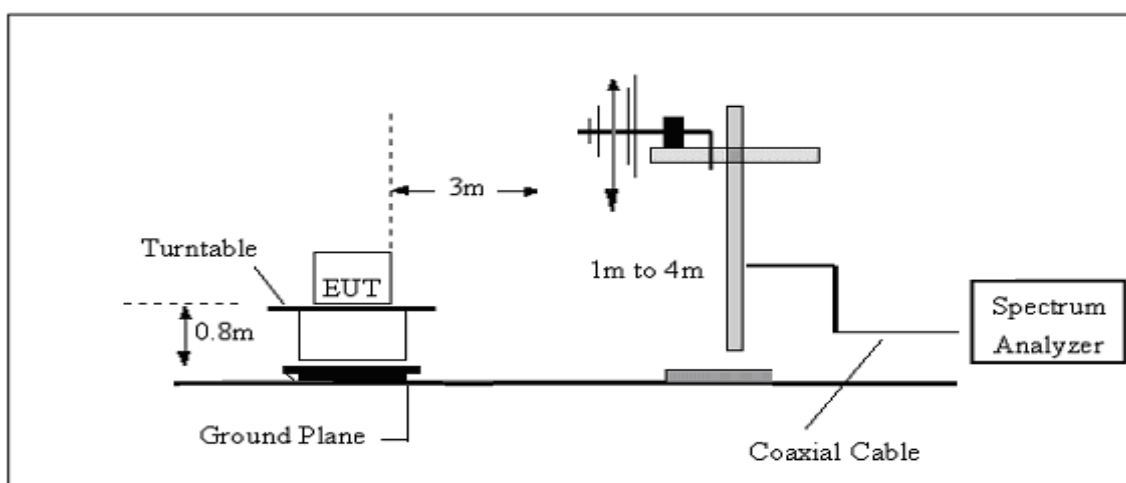
No deviation

3.2.3 TEST SETUP

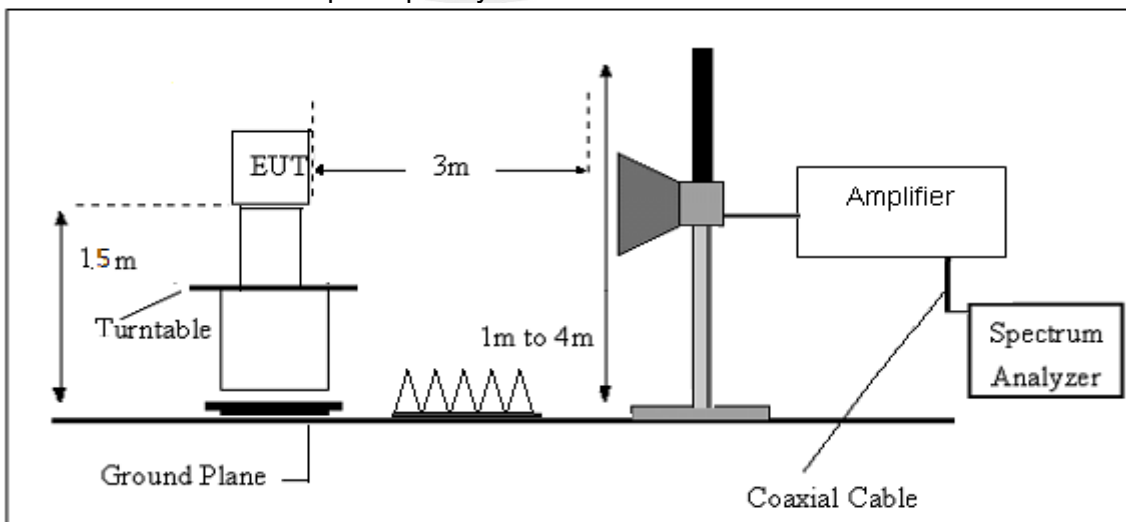
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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

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

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

Temperature:	23.7(C)	Relative Humidity:	58%RH
Test Voltage:	DC 3.7V	Polarization :	--
Test Mode:	TX Mode		

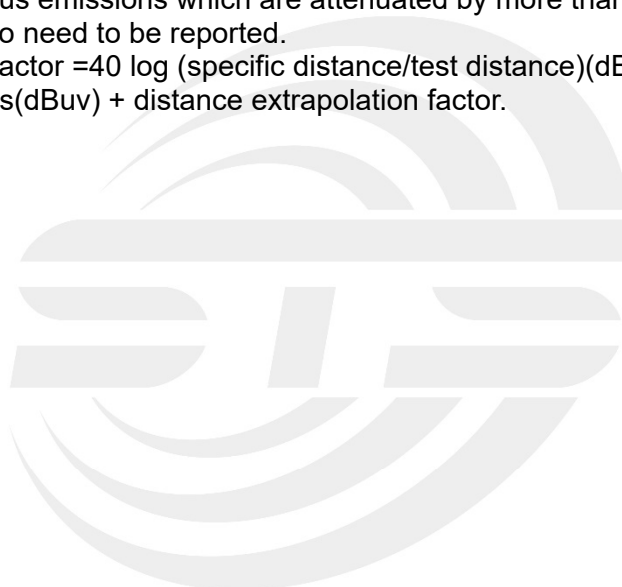
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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

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



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

Temperature	23.7(C)	Relative Humidity:	58%RH
Test Voltage	DC 3.7V	Polarization:	Horizontal
Test Mode	Mode 1~24(Mode 21 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	29.85	-12.85	17.00	40.00	-23.00	QP
2	268.6200	31.22	-15.17	16.05	46.00	-29.95	QP
3	624.6100	37.91	-5.29	32.62	46.00	-13.38	QP
4	724.5200	36.59	-2.89	33.70	46.00	-12.30	QP
5	878.7500	34.60	-0.64	33.96	46.00	-12.04	QP
6	997.0900	34.15	2.04	36.19	54.00	-17.81	QP

Remark:

1. Margin = Result (Result = Reading + Factor)-Limit



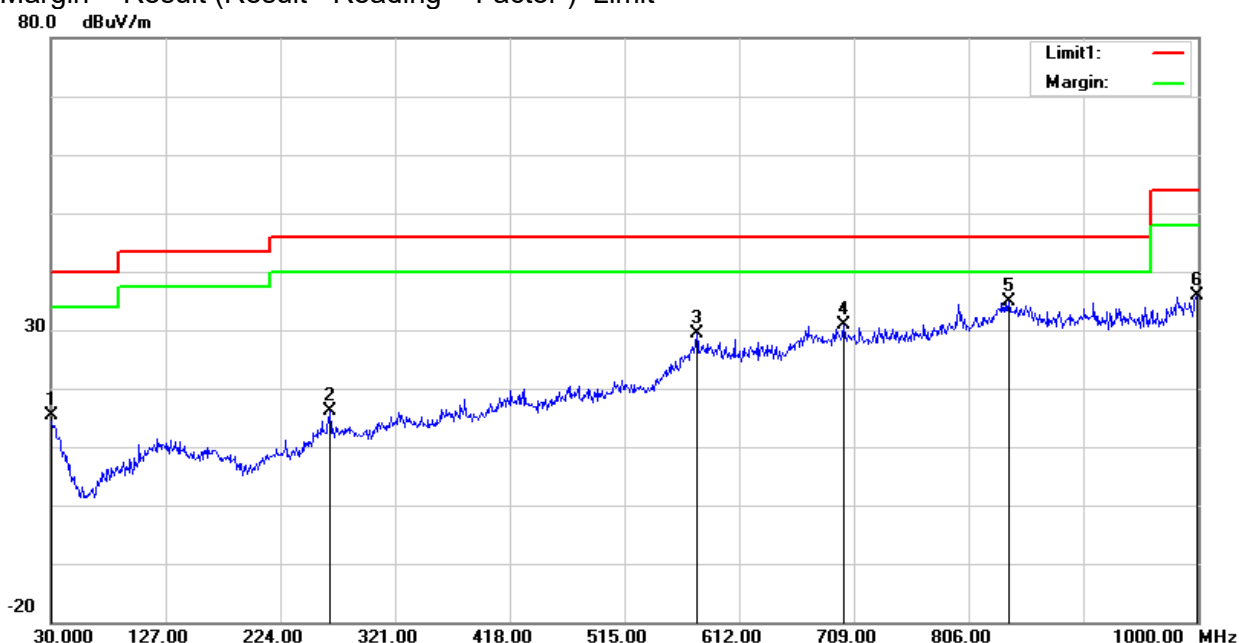


Temperature	23.7(C)	Relative Humidity:	58%RH
Test Voltage	DC 3.7V	Polarization:	Vertical
Test Mode	Mode 1~24(Mode 21 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	28.26	-12.85	15.41	40.00	-24.59	QP
2	265.7100	31.00	-14.83	16.17	46.00	-29.83	QP
3	576.1100	35.18	-5.70	29.48	46.00	-16.52	QP
4	700.2700	35.13	-4.16	30.97	46.00	-15.03	QP
5	839.9500	35.15	-0.34	34.81	46.00	-11.19	QP
6	999.0300	33.91	2.04	35.95	54.00	-18.05	QP

Remark:

1. Margin = Result (Result =Reading + Factor)-Limit





3.2.8 TEST RESULTS (Above 1000 MHz)

Band I 5150-5250MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11n20/ 5180 MHz)										
3261.29	43.85	44.70	6.70	28.20	-9.80	34.05	68.20	-34.15	Pk	Vertical
3261.29	41.50	44.70	6.70	28.20	-9.80	31.70	54.00	-22.30	AV	Vertical
3247.39	44.50	44.70	6.70	28.20	-9.80	34.70	68.20	-33.50	Pk	Horizontal
3247.39	41.78	44.70	6.70	28.20	-9.80	31.98	54.00	-22.02	AV	Horizontal
3996.21	39.29	44.20	7.90	29.70	-6.60	32.69	68.20	-35.51	Pk	Vertical
3996.21	36.86	44.20	7.90	29.70	-6.60	30.26	54.00	-23.74	AV	Vertical
3986.46	39.40	44.20	7.90	29.70	-6.60	32.80	68.20	-35.40	Pk	Horizontal
3986.46	35.80	44.20	7.90	29.70	-6.60	29.20	54.00	-24.80	AV	Horizontal
7227.10	37.75	43.50	11.40	35.50	3.40	41.15	68.20	-27.05	Pk	Vertical
7227.10	34.56	43.50	11.40	35.50	3.40	37.96	54.00	-16.04	AV	Vertical
7217.52	36.63	43.50	11.40	35.50	3.40	40.03	68.20	-28.17	Pk	Horizontal
7217.52	34.13	43.50	11.40	35.50	3.40	37.53	54.00	-16.47	AV	Horizontal
10360.16	39.34	44.50	13.80	38.80	8.10	47.44	68.20	-20.76	Pk	Vertical
10360.16	35.78	44.50	13.80	38.80	8.10	43.88	54.00	-10.12	AV	Vertical
10360.13	39.63	44.50	13.80	38.80	8.10	47.73	68.20	-20.47	Pk	Horizontal
10360.13	36.14	44.50	13.80	38.80	8.10	44.24	54.00	-9.76	AV	Horizontal
11030.69	33.69	43.60	14.30	39.50	10.20	43.89	68.20	-24.31	Pk	Vertical
11030.69	30.83	43.60	14.30	39.50	10.20	41.03	54.00	-12.97	AV	Vertical
11033.18	34.13	43.60	14.30	39.50	10.20	44.33	68.20	-23.87	Pk	Horizontal
11033.18	30.69	43.60	14.30	39.50	10.20	40.89	54.00	-13.11	AV	Horizontal
13292.43	31.96	42.60	15.90	38.90	12.20	44.16	68.20	-24.04	Pk	Vertical
13292.43	29.52	42.60	15.90	38.90	12.20	41.72	54.00	-12.28	AV	Vertical
13292.61	31.83	42.60	15.90	38.90	12.20	44.03	68.20	-24.17	Pk	Horizontal
13292.61	29.62	42.60	15.90	38.90	12.20	41.82	54.00	-12.18	AV	Horizontal
Mid Channel (802.11n20/ 5200 MHz)										
3253.65	45.08	44.70	6.70	28.20	-9.80	35.28	68.20	-32.92	Pk	Vertical
3253.65	40.74	44.70	6.70	28.20	-9.80	30.94	54.00	-23.06	AV	Vertical
3248.50	44.02	44.70	6.70	28.20	-9.80	34.22	68.20	-33.98	Pk	Horizontal
3248.50	41.75	44.70	6.70	28.20	-9.80	31.95	54.00	-22.05	AV	Horizontal
3981.79	39.18	44.20	7.90	29.70	-6.60	32.58	68.20	-35.62	Pk	Vertical
3981.79	36.29	44.20	7.90	29.70	-6.60	29.69	54.00	-24.31	AV	Vertical
3995.27	39.49	44.20	7.90	29.70	-6.60	32.89	68.20	-35.31	Pk	Horizontal
3995.27	36.56	44.20	7.90	29.70	-6.60	29.96	54.00	-24.04	AV	Horizontal
7223.66	37.71	43.50	11.40	35.50	3.40	41.11	68.20	-27.09	Pk	Vertical
7223.66	34.10	43.50	11.40	35.50	3.40	37.50	54.00	-16.50	AV	Vertical
7226.59	37.37	43.50	11.40	35.50	3.40	40.77	68.20	-27.43	Pk	Horizontal
7226.59	33.60	43.50	11.40	35.50	3.40	37.00	54.00	-17.00	AV	Horizontal
10400.24	39.02	44.50	13.80	38.80	8.10	47.12	68.20	-21.08	Pk	Vertical
10400.24	35.90	44.50	13.80	38.80	8.10	44.00	54.00	-10.00	AV	Vertical
10400.37	38.81	44.50	13.80	38.80	8.10	46.91	68.20	-21.29	Pk	Horizontal
10400.37	36.30	44.50	13.80	38.80	8.10	44.40	54.00	-9.60	AV	Horizontal
11036.31	33.22	43.60	14.30	39.50	10.20	43.42	68.20	-24.78	Pk	Vertical
11036.31	30.10	43.60	14.30	39.50	10.20	40.30	54.00	-13.70	AV	Vertical
11024.80	33.77	43.60	14.30	39.50	10.20	43.97	68.20	-24.23	Pk	Horizontal
11024.80	29.88	43.60	14.30	39.50	10.20	40.08	54.00	-13.92	AV	Horizontal
13288.91	31.82	42.60	15.90	38.90	12.20	44.02	68.20	-24.18	Pk	Vertical
13288.91	29.38	42.60	15.90	38.90	12.20	41.58	54.00	-12.42	AV	Vertical
13291.77	32.94	42.60	15.90	38.90	12.20	45.14	68.20	-23.06	Pk	Horizontal
13291.77	29.78	42.60	15.90	38.90	12.20	41.98	54.00	-12.02	AV	Horizontal



High Channel (802.11n20/ 5240 MHz)										
3250.40	44.29	44.70	6.70	28.20	-9.80	34.49	68.20	-33.71	Pk	Vertical
3250.40	41.95	44.70	6.70	28.20	-9.80	32.15	54.00	-21.85	AV	Vertical
3246.77	45.21	44.70	6.70	28.20	-9.80	35.41	68.20	-32.79	Pk	Horizontal
3246.77	41.12	44.70	6.70	28.20	-9.80	31.32	54.00	-22.68	AV	Horizontal
3985.91	39.88	44.20	7.90	29.70	-6.60	33.28	68.20	-34.92	Pk	Vertical
3985.91	36.25	44.20	7.90	29.70	-6.60	29.65	54.00	-24.35	AV	Vertical
3994.01	39.21	44.20	7.90	29.70	-6.60	32.61	68.20	-35.59	Pk	Horizontal
3994.01	37.11	44.20	7.90	29.70	-6.60	30.51	54.00	-23.49	AV	Horizontal
7216.94	37.51	43.50	11.40	35.50	3.40	40.91	68.20	-27.29	Pk	Vertical
7216.94	33.51	43.50	11.40	35.50	3.40	36.91	54.00	-17.09	AV	Vertical
7223.56	37.76	43.50	11.40	35.50	3.40	41.16	68.20	-27.04	Pk	Horizontal
7223.56	33.72	43.50	11.40	35.50	3.40	37.12	54.00	-16.88	AV	Horizontal
10480.24	38.86	44.50	13.80	38.80	8.10	46.96	68.20	-21.24	Pk	Vertical
10480.24	36.17	44.50	13.80	38.80	8.10	44.27	54.00	-9.73	AV	Vertical
10480.43	40.11	44.50	13.80	38.80	8.10	48.21	68.20	-19.99	Pk	Horizontal
10480.43	35.84	44.50	13.80	38.80	8.10	43.94	54.00	-10.06	AV	Horizontal
11027.79	33.34	43.60	14.30	39.50	10.20	43.54	68.20	-24.66	Pk	Vertical
11027.79	29.89	43.60	14.30	39.50	10.20	40.09	54.00	-13.91	AV	Vertical
11025.02	32.71	43.60	14.30	39.50	10.20	42.91	68.20	-25.29	Pk	Horizontal
11025.02	30.09	43.60	14.30	39.50	10.20	40.29	54.00	-13.71	AV	Horizontal
13281.89	32.59	42.60	15.90	38.90	12.20	44.79	68.20	-23.41	Pk	Vertical
13281.89	29.98	42.60	15.90	38.90	12.20	42.18	54.00	-11.82	AV	Vertical
13298.47	31.80	42.60	15.90	38.90	12.20	44.00	68.20	-24.20	Pk	Horizontal
13298.47	28.87	42.60	15.90	38.90	12.20	41.07	54.00	-12.93	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 802.11n (HT-20).
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.
4. Pre-scan both the SISO and MIMO mode, only the worst-case results were reported.



Band II 5250-5350MHz

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 (802.11ac20/ 5260 MHz)										
3262.13	44.22	44.70	6.70	28.20	-9.80	34.42	68.20	-33.78	Pk	Vertical
3262.13	41.17	44.70	6.70	28.20	-9.80	31.37	54.00	-22.63	AV	Vertical
3251.18	44.12	44.70	6.70	28.20	-9.80	34.32	68.20	-33.88	Pk	Horizontal
3251.18	41.21	44.70	6.70	28.20	-9.80	31.41	54.00	-22.59	AV	Horizontal
3994.13	40.13	44.20	7.90	29.70	-6.60	33.53	68.20	-34.67	Pk	Vertical
3994.13	36.40	44.20	7.90	29.70	-6.60	29.80	54.00	-24.20	AV	Vertical
3986.52	39.78	44.20	7.90	29.70	-6.60	33.18	68.20	-35.02	Pk	Horizontal
3986.52	36.47	44.20	7.90	29.70	-6.60	29.87	54.00	-24.13	AV	Horizontal
7220.26	37.01	43.50	11.40	35.50	3.40	40.41	68.20	-27.79	Pk	Vertical
7220.26	33.94	43.50	11.40	35.50	3.40	37.34	54.00	-16.66	AV	Vertical
7228.68	37.79	43.50	11.40	35.50	3.40	41.19	68.20	-27.01	Pk	Horizontal
7228.68	33.81	43.50	11.40	35.50	3.40	37.21	54.00	-16.79	AV	Horizontal
10360.38	38.94	44.50	13.80	38.80	8.10	47.04	68.20	-21.16	Pk	Vertical
10360.38	36.17	44.50	13.80	38.80	8.10	44.27	54.00	-9.73	AV	Vertical
10360.25	39.48	44.50	13.80	38.80	8.10	47.58	68.20	-20.62	Pk	Horizontal
10360.25	37.03	44.50	13.80	38.80	8.10	45.13	54.00	-8.87	AV	Horizontal
11026.50	32.92	43.60	14.30	39.50	10.20	43.12	68.20	-25.08	Pk	Vertical
11026.50	29.90	43.60	14.30	39.50	10.20	40.10	54.00	-13.90	AV	Vertical
11027.54	33.12	43.60	14.30	39.50	10.20	43.32	68.20	-24.88	Pk	Horizontal
11027.54	30.90	43.60	14.30	39.50	10.20	41.10	54.00	-12.90	AV	Horizontal
13296.12	31.88	42.60	15.90	38.90	12.20	44.08	68.20	-24.12	Pk	Vertical
13296.12	29.22	42.60	15.90	38.90	12.20	41.42	54.00	-12.58	AV	Vertical
13294.15	32.79	42.60	15.90	38.90	12.20	44.99	68.20	-23.21	Pk	Horizontal
13294.15	29.31	42.60	15.90	38.90	12.20	41.51	54.00	-12.49	AV	Horizontal
Mid Channel (802.11ac20/ 5300 MHz)										
3250.01	44.83	44.70	6.70	28.20	-9.80	35.03	68.20	-33.17	Pk	Vertical
3250.01	41.81	44.70	6.70	28.20	-9.80	32.01	54.00	-21.99	AV	Vertical
3256.74	45.19	44.70	6.70	28.20	-9.80	35.39	68.20	-32.81	Pk	Horizontal
3256.74	41.76	44.70	6.70	28.20	-9.80	31.96	54.00	-22.04	AV	Horizontal
3992.92	39.07	44.20	7.90	29.70	-6.60	32.47	68.20	-35.73	Pk	Vertical
3992.92	36.86	44.20	7.90	29.70	-6.60	30.26	54.00	-23.74	AV	Vertical
3999.20	39.36	44.20	7.90	29.70	-6.60	32.76	68.20	-35.44	Pk	Horizontal
3999.20	35.93	44.20	7.90	29.70	-6.60	29.33	54.00	-24.67	AV	Horizontal
7228.27	36.92	43.50	11.40	35.50	3.40	40.32	68.20	-27.88	Pk	Vertical
7228.27	33.55	43.50	11.40	35.50	3.40	36.95	54.00	-17.05	AV	Vertical
7229.21	37.65	43.50	11.40	35.50	3.40	41.05	68.20	-27.15	Pk	Horizontal
7229.21	33.62	43.50	11.40	35.50	3.40	37.02	54.00	-16.98	AV	Horizontal
10400.25	39.88	44.50	13.80	38.80	8.10	47.98	68.20	-20.22	Pk	Vertical
10400.25	36.24	44.50	13.80	38.80	8.10	44.34	54.00	-9.66	AV	Vertical
10400.40	40.01	44.50	13.80	38.80	8.10	48.11	68.20	-20.09	Pk	Horizontal
10400.40	36.63	44.50	13.80	38.80	8.10	44.73	54.00	-9.27	AV	Horizontal
11031.41	34.05	43.60	14.30	39.50	10.20	44.25	68.20	-23.95	Pk	Vertical
11031.41	30.14	43.60	14.30	39.50	10.20	40.34	54.00	-13.66	AV	Vertical
11021.73	33.27	43.60	14.30	39.50	10.20	43.47	68.20	-24.73	Pk	Horizontal
11021.73	30.75	43.60	14.30	39.50	10.20	40.95	54.00	-13.05	AV	Horizontal
13281.72	32.25	42.60	15.90	38.90	12.20	44.45	68.20	-23.75	Pk	Vertical
13281.72	29.96	42.60	15.90	38.90	12.20	42.16	54.00	-11.84	AV	Vertical
13299.32	32.55	42.60	15.90	38.90	12.20	44.75	68.20	-23.45	Pk	Horizontal
13299.32	29.25	42.60	15.90	38.90	12.20	41.45	54.00	-12.55	AV	Horizontal



High Channel (802.11ac20/ 5320 MHz)										
3251.99	43.82	44.70	6.70	28.20	-9.80	34.02	68.20	-34.18	Pk	Vertical
3251.99	40.77	44.70	6.70	28.20	-9.80	30.97	54.00	-23.03	AV	Vertical
3245.98	44.56	44.70	6.70	28.20	-9.80	34.76	68.20	-33.44	Pk	Horizontal
3245.98	42.13	44.70	6.70	28.20	-9.80	32.33	54.00	-21.67	AV	Horizontal
3992.76	38.87	44.20	7.90	29.70	-6.60	32.27	68.20	-35.93	Pk	Vertical
3992.76	36.45	44.20	7.90	29.70	-6.60	29.85	54.00	-24.15	AV	Vertical
3987.02	39.87	44.20	7.90	29.70	-6.60	33.27	68.20	-34.93	Pk	Horizontal
3987.02	36.05	44.20	7.90	29.70	-6.60	29.45	54.00	-24.55	AV	Horizontal
7226.02	36.60	43.50	11.40	35.50	3.40	40.00	68.20	-28.20	Pk	Vertical
7226.02	33.82	43.50	11.40	35.50	3.40	37.22	54.00	-16.78	AV	Vertical
7217.60	37.57	43.50	11.40	35.50	3.40	40.97	68.20	-27.23	Pk	Horizontal
7217.60	33.73	43.50	11.40	35.50	3.40	37.13	54.00	-16.87	AV	Horizontal
10480.12	38.86	44.50	13.80	38.80	8.10	46.96	68.20	-21.24	Pk	Vertical
10480.12	36.44	44.50	13.80	38.80	8.10	44.54	54.00	-9.46	AV	Vertical
10480.34	38.98	44.50	13.80	38.80	8.10	47.08	68.20	-21.12	Pk	Horizontal
10480.34	36.11	44.50	13.80	38.80	8.10	44.21	54.00	-9.79	AV	Horizontal
11024.10	34.19	43.60	14.30	39.50	10.20	44.39	68.20	-23.81	Pk	Vertical
11024.10	31.13	43.60	14.30	39.50	10.20	41.33	54.00	-12.67	AV	Vertical
11026.31	33.65	43.60	14.30	39.50	10.20	43.85	68.20	-24.35	Pk	Horizontal
11026.31	29.73	43.60	14.30	39.50	10.20	39.93	54.00	-14.07	AV	Horizontal
13293.28	32.01	42.60	15.90	38.90	12.20	44.21	68.20	-23.99	Pk	Vertical
13293.28	29.31	42.60	15.90	38.90	12.20	41.51	54.00	-12.49	AV	Vertical
13296.32	31.95	42.60	15.90	38.90	12.20	44.15	68.20	-24.05	Pk	Horizontal
13296.32	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 802.11ac (VHT-20).
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.
4. Pre-scan both the SISO and MIMO mode, only the worst-case results were reported.



Band III 5470-5725MHz

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 (802.11ac20/ 5500 MHz)										
3248.44	45.26	44.70	6.70	28.20	-9.80	35.46	68.20	-32.74	Pk	Vertical
3248.44	41.18	44.70	6.70	28.20	-9.80	31.38	54.00	-22.62	AV	Vertical
3254.28	43.96	44.70	6.70	28.20	-9.80	34.16	68.20	-34.04	Pk	Horizontal
3254.28	41.64	44.70	6.70	28.20	-9.80	31.84	54.00	-22.16	AV	Horizontal
3995.12	38.86	44.20	7.90	29.70	-6.60	32.26	68.20	-35.94	Pk	Vertical
3995.12	36.24	44.20	7.90	29.70	-6.60	29.64	54.00	-24.36	AV	Vertical
3981.32	39.71	44.20	7.90	29.70	-6.60	33.11	68.20	-35.09	Pk	Horizontal
3981.32	35.90	44.20	7.90	29.70	-6.60	29.30	54.00	-24.70	AV	Horizontal
7217.22	37.88	43.50	11.40	35.50	3.40	41.28	68.20	-26.92	Pk	Vertical
7217.22	34.48	43.50	11.40	35.50	3.40	37.88	54.00	-16.12	AV	Vertical
7232.58	37.78	43.50	11.40	35.50	3.40	41.18	68.20	-27.02	Pk	Horizontal
7232.58	34.61	43.50	11.40	35.50	3.40	38.01	54.00	-15.99	AV	Horizontal
10360.23	40.15	44.50	13.80	38.80	8.10	48.25	68.20	-19.95	Pk	Vertical
10360.23	36.15	44.50	13.80	38.80	8.10	44.25	54.00	-9.75	AV	Vertical
10360.30	39.94	44.50	13.80	38.80	8.10	48.04	68.20	-20.16	Pk	Horizontal
10360.30	36.08	44.50	13.80	38.80	8.10	44.18	54.00	-9.82	AV	Horizontal
11016.96	33.26	43.60	14.30	39.50	10.20	43.46	68.20	-24.74	Pk	Vertical
11016.96	29.80	43.60	14.30	39.50	10.20	40.00	54.00	-14.00	AV	Vertical
11034.65	33.38	43.60	14.30	39.50	10.20	43.58	68.20	-24.62	Pk	Horizontal
11034.65	29.75	43.60	14.30	39.50	10.20	39.95	54.00	-14.05	AV	Horizontal
13285.86	32.70	42.60	15.90	38.90	12.20	44.90	68.20	-23.30	Pk	Vertical
13285.86	28.80	42.60	15.90	38.90	12.20	41.00	54.00	-13.00	AV	Vertical
13293.89	32.30	42.60	15.90	38.90	12.20	44.50	68.20	-23.70	Pk	Horizontal
13293.89	28.88	42.60	15.90	38.90	12.20	41.08	54.00	-12.92	AV	Horizontal
Mid Channel (802.11ac20/ 5580 MHz)										
3259.23	44.19	44.70	6.70	28.20	-9.80	34.39	68.20	-33.81	Pk	Vertical
3259.23	41.43	44.70	6.70	28.20	-9.80	31.63	54.00	-22.37	AV	Vertical
3248.92	44.04	44.70	6.70	28.20	-9.80	34.24	68.20	-33.96	Pk	Horizontal
3248.92	41.27	44.70	6.70	28.20	-9.80	31.47	54.00	-22.53	AV	Horizontal
3997.02	39.01	44.20	7.90	29.70	-6.60	32.41	68.20	-35.79	Pk	Vertical
3997.02	35.91	44.20	7.90	29.70	-6.60	29.31	54.00	-24.69	AV	Vertical
3984.68	38.83	44.20	7.90	29.70	-6.60	32.23	68.20	-35.97	Pk	Horizontal
3984.68	35.93	44.20	7.90	29.70	-6.60	29.33	54.00	-24.67	AV	Horizontal
7234.52	37.77	43.50	11.40	35.50	3.40	41.17	68.20	-27.03	Pk	Vertical
7234.52	34.62	43.50	11.40	35.50	3.40	38.02	54.00	-15.98	AV	Vertical
7226.02	37.61	43.50	11.40	35.50	3.40	41.01	68.20	-27.19	Pk	Horizontal
7226.02	34.92	43.50	11.40	35.50	3.40	38.32	54.00	-15.68	AV	Horizontal
10400.28	38.91	44.50	13.80	38.80	8.10	47.01	68.20	-21.19	Pk	Vertical
10400.28	36.97	44.50	13.80	38.80	8.10	45.07	54.00	-8.93	AV	Vertical
10400.24	39.03	44.50	13.80	38.80	8.10	47.13	68.20	-21.07	Pk	Horizontal
10400.24	35.75	44.50	13.80	38.80	8.10	43.85	54.00	-10.15	AV	Horizontal
11035.58	32.92	43.60	14.30	39.50	10.20	43.12	68.20	-25.08	Pk	Vertical
11035.58	29.78	43.60	14.30	39.50	10.20	39.98	54.00	-14.02	AV	Vertical
11018.59	32.81	43.60	14.30	39.50	10.20	43.01	68.20	-25.19	Pk	Horizontal
11018.59	30.94	43.60	14.30	39.50	10.20	41.14	54.00	-12.86	AV	Horizontal
13296.77	31.71	42.60	15.90	38.90	12.20	43.91	68.20	-24.29	Pk	Vertical
13296.77	29.81	42.60	15.90	38.90	12.20	42.01	54.00	-11.99	AV	Vertical
13291.70	31.89	42.60	15.90	38.90	12.20	44.09	68.20	-24.11	Pk	Horizontal
13291.70	30.02	42.60	15.90	38.90	12.20	42.22	54.00	-11.78	AV	Horizontal



High Channel (802.11ac20/ 5700 MHz)										
3252.01	44.51	44.70	6.70	28.20	-9.80	34.71	68.20	-33.49	Pk	Vertical
3252.01	41.39	44.70	6.70	28.20	-9.80	31.59	54.00	-22.41	AV	Vertical
3249.92	45.06	44.70	6.70	28.20	-9.80	35.26	68.20	-32.94	Pk	Horizontal
3249.92	41.60	44.70	6.70	28.20	-9.80	31.80	54.00	-22.20	AV	Horizontal
3996.12	39.33	44.20	7.90	29.70	-6.60	32.73	68.20	-35.47	Pk	Vertical
3996.12	35.79	44.20	7.90	29.70	-6.60	29.19	54.00	-24.81	AV	Vertical
3999.90	39.58	44.20	7.90	29.70	-6.60	32.98	68.20	-35.22	Pk	Horizontal
3999.90	35.85	44.20	7.90	29.70	-6.60	29.25	54.00	-24.75	AV	Horizontal
7221.12	36.77	43.50	11.40	35.50	3.40	40.17	68.20	-28.03	Pk	Vertical
7221.12	33.85	43.50	11.40	35.50	3.40	37.25	54.00	-16.75	AV	Vertical
7221.09	36.82	43.50	11.40	35.50	3.40	40.22	68.20	-27.98	Pk	Horizontal
7221.09	34.37	43.50	11.40	35.50	3.40	37.77	54.00	-16.23	AV	Horizontal
10480.11	39.54	44.50	13.80	38.80	8.10	47.64	68.20	-20.56	Pk	Vertical
10480.11	36.61	44.50	13.80	38.80	8.10	44.71	54.00	-9.29	AV	Vertical
10480.24	38.71	44.50	13.80	38.80	8.10	46.81	68.20	-21.39	Pk	Horizontal
10480.24	35.81	44.50	13.80	38.80	8.10	43.91	54.00	-10.09	AV	Horizontal
11035.85	33.74	43.60	14.30	39.50	10.20	43.94	68.20	-24.26	Pk	Vertical
11035.85	30.00	43.60	14.30	39.50	10.20	40.20	54.00	-13.80	AV	Vertical
11032.79	33.57	43.60	14.30	39.50	10.20	43.77	68.20	-24.43	Pk	Horizontal
11032.79	30.40	43.60	14.30	39.50	10.20	40.60	54.00	-13.40	AV	Horizontal
13293.62	31.83	42.60	15.90	38.90	12.20	44.03	68.20	-24.17	Pk	Vertical
13293.62	29.57	42.60	15.90	38.90	12.20	41.77	54.00	-12.23	AV	Vertical
13299.50	32.55	42.60	15.90	38.90	12.20	44.75	68.20	-23.45	Pk	Horizontal
13299.50	28.65	42.60	15.90	38.90	12.20	40.85	54.00	-13.15	AV	Horizontal

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11ac (VHT-20).
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.
4. 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)	Orrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac20/ 5745 MHz)										
3253.40	44.52	44.70	6.70	28.20	-9.80	34.72	68.20	-33.48	Pk	Vertical
3253.40	41.78	44.70	6.70	28.20	-9.80	31.98	54.00	-22.02	AV	Vertical
3262.23	44.00	44.70	6.70	28.20	-9.80	34.20	68.20	-34.00	Pk	Horizontal
3262.23	40.94	44.70	6.70	28.20	-9.80	31.14	54.00	-22.86	AV	Horizontal
3991.82	39.20	44.20	7.90	29.70	-6.60	32.60	68.20	-35.60	Pk	Vertical
3991.82	35.69	44.20	7.90	29.70	-6.60	29.09	54.00	-24.91	AV	Vertical
3981.58	39.65	44.20	7.90	29.70	-6.60	33.05	68.20	-35.15	Pk	Horizontal
3981.58	35.68	44.20	7.90	29.70	-6.60	29.08	54.00	-24.92	AV	Horizontal
7219.66	36.66	43.50	11.40	35.50	3.40	40.06	68.20	-28.14	Pk	Vertical
7219.66	34.40	43.50	11.40	35.50	3.40	37.80	54.00	-16.20	AV	Vertical
7233.53	37.22	43.50	11.40	35.50	3.40	40.62	68.20	-27.58	Pk	Horizontal
7233.53	34.47	43.50	11.40	35.50	3.40	37.87	54.00	-16.13	AV	Horizontal
10360.39	39.83	44.50	13.80	38.80	8.10	47.93	68.20	-20.27	Pk	Vertical
10360.39	35.90	44.50	13.80	38.80	8.10	44.00	54.00	-10.00	AV	Vertical
10360.25	39.38	44.50	13.80	38.80	8.10	47.48	68.20	-20.72	Pk	Horizontal
10360.25	37.11	44.50	13.80	38.80	8.10	45.21	54.00	-8.79	AV	Horizontal
11035.73	33.85	43.60	14.30	39.50	10.20	44.05	68.20	-24.15	Pk	Vertical
11035.73	30.06	43.60	14.30	39.50	10.20	40.26	54.00	-13.74	AV	Vertical
11027.73	34.15	43.60	14.30	39.50	10.20	44.35	68.20	-23.85	Pk	Horizontal
11027.73	30.01	43.60	14.30	39.50	10.20	40.21	54.00	-13.79	AV	Horizontal
13283.09	31.74	42.60	15.90	38.90	12.20	43.94	68.20	-24.26	Pk	Vertical
13283.09	28.91	42.60	15.90	38.90	12.20	41.11	54.00	-12.89	AV	Vertical
13285.03	32.93	42.60	15.90	38.90	12.20	45.13	68.20	-23.07	Pk	Horizontal
13285.03	28.86	42.60	15.90	38.90	12.20	41.06	54.00	-12.94	AV	Horizontal
Mid Channel (802.11ac20/ 5785MHz)										
3260.57	44.19	44.70	6.70	28.20	-9.80	34.39	68.20	-33.81	Pk	Vertical
3260.57	41.66	44.70	6.70	28.20	-9.80	31.86	54.00	-22.14	AV	Vertical
3259.09	44.35	44.70	6.70	28.20	-9.80	34.55	68.20	-33.65	Pk	Horizontal
3259.09	41.89	44.70	6.70	28.20	-9.80	32.09	54.00	-21.91	AV	Horizontal
3996.27	39.82	44.20	7.90	29.70	-6.60	33.22	68.20	-34.98	Pk	Vertical
3996.27	36.32	44.20	7.90	29.70	-6.60	29.72	54.00	-24.28	AV	Vertical
3984.13	39.08	44.20	7.90	29.70	-6.60	32.48	68.20	-35.72	Pk	Horizontal
3984.13	36.21	44.20	7.90	29.70	-6.60	29.61	54.00	-24.39	AV	Horizontal
7234.14	37.69	43.50	11.40	35.50	3.40	41.09	68.20	-27.11	Pk	Vertical
7234.14	33.75	43.50	11.40	35.50	3.40	37.15	54.00	-16.85	AV	Vertical
7235.32	36.78	43.50	11.40	35.50	3.40	40.18	68.20	-28.02	Pk	Horizontal
7235.32	34.27	43.50	11.40	35.50	3.40	37.67	54.00	-16.33	AV	Horizontal
10400.01	39.42	44.50	13.80	38.80	8.10	47.52	68.20	-20.68	Pk	Vertical
10400.01	35.82	44.50	13.80	38.80	8.10	43.92	54.00	-10.08	AV	Vertical
10400.03	39.41	44.50	13.80	38.80	8.10	47.51	68.20	-20.69	Pk	Horizontal
10400.03	37.16	44.50	13.80	38.80	8.10	45.26	54.00	-8.74	AV	Horizontal
11019.66	34.13	43.60	14.30	39.50	10.20	44.33	68.20	-23.87	Pk	Vertical
11019.66	30.64	43.60	14.30	39.50	10.20	40.84	54.00	-13.16	AV	Vertical
11021.03	33.37	43.60	14.30	39.50	10.20	43.57	68.20	-24.63	Pk	Horizontal
11021.03	30.82	43.60	14.30	39.50	10.20	41.02	54.00	-12.98	AV	Horizontal
13286.27	32.57	42.60	15.90	38.90	12.20	44.77	68.20	-23.43	Pk	Vertical
13286.27	29.35	42.60	15.90	38.90	12.20	41.55	54.00	-12.45	AV	Vertical
13286.98	32.46	42.60	15.90	38.90	12.20	44.66	68.20	-23.54	Pk	Horizontal
13286.98	28.81	42.60	15.90	38.90	12.20	41.01	54.00	-12.99	AV	Horizontal



High Channel (802.11ac20/ 5825 MHz)										
3265.03	44.66	44.70	6.70	28.20	-9.80	34.86	68.20	-33.34	Pk	Vertical
3265.03	40.93	44.70	6.70	28.20	-9.80	31.13	54.00	-22.87	AV	Vertical
3248.65	44.30	44.70	6.70	28.20	-9.80	34.50	68.20	-33.70	Pk	Horizontal
3248.65	41.40	44.70	6.70	28.20	-9.80	31.60	54.00	-22.40	AV	Horizontal
3998.26	39.71	44.20	7.90	29.70	-6.60	33.11	68.20	-35.09	Pk	Vertical
3998.26	36.94	44.20	7.90	29.70	-6.60	30.34	54.00	-23.66	AV	Vertical
3992.23	39.96	44.20	7.90	29.70	-6.60	33.36	68.20	-34.84	Pk	Horizontal
3992.23	35.74	44.20	7.90	29.70	-6.60	29.14	54.00	-24.86	AV	Horizontal
7235.25	37.08	43.50	11.40	35.50	3.40	40.48	68.20	-27.72	Pk	Vertical
7235.25	34.13	43.50	11.40	35.50	3.40	37.53	54.00	-16.47	AV	Vertical
7228.64	37.41	43.50	11.40	35.50	3.40	40.81	68.20	-27.39	Pk	Horizontal
7228.64	34.83	43.50	11.40	35.50	3.40	38.23	54.00	-15.77	AV	Horizontal
10480.36	39.16	44.50	13.80	38.80	8.10	47.26	68.20	-20.94	Pk	Vertical
10480.36	37.12	44.50	13.80	38.80	8.10	45.22	54.00	-8.78	AV	Vertical
10479.95	39.67	44.50	13.80	38.80	8.10	47.77	68.20	-20.43	Pk	Horizontal
10479.95	36.93	44.50	13.80	38.80	8.10	45.03	54.00	-8.97	AV	Horizontal
11021.72	33.17	43.60	14.30	39.50	10.20	43.37	68.20	-24.83	Pk	Vertical
11021.72	29.95	43.60	14.30	39.50	10.20	40.15	54.00	-13.85	AV	Vertical
11034.52	32.84	43.60	14.30	39.50	10.20	43.04	68.20	-25.16	Pk	Horizontal
11034.52	30.43	43.60	14.30	39.50	10.20	40.63	54.00	-13.37	AV	Horizontal
13285.47	32.56	42.60	15.90	38.90	12.20	44.76	68.20	-23.44	Pk	Vertical
13285.47	29.04	42.60	15.90	38.90	12.20	41.24	54.00	-12.76	AV	Vertical
13295.87	32.81	42.60	15.90	38.90	12.20	45.01	68.20	-23.19	Pk	Horizontal
13295.87	28.55	42.60	15.90	38.90	12.20	40.75	54.00	-13.25	AV	Horizontal

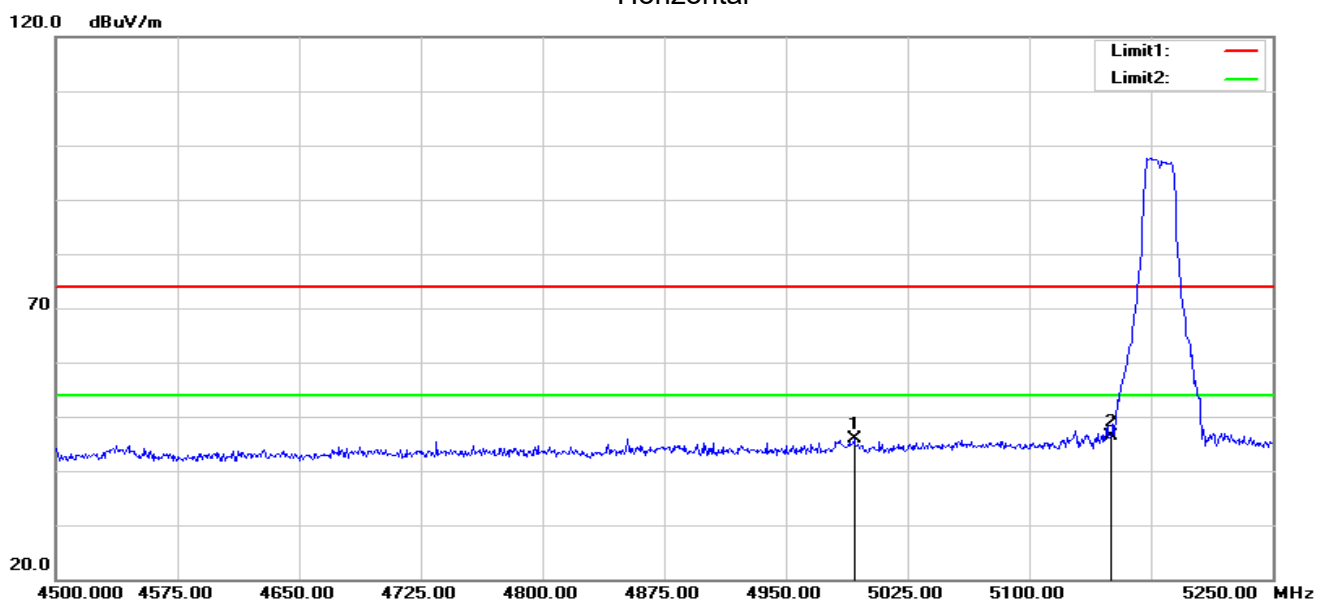
Remark:

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



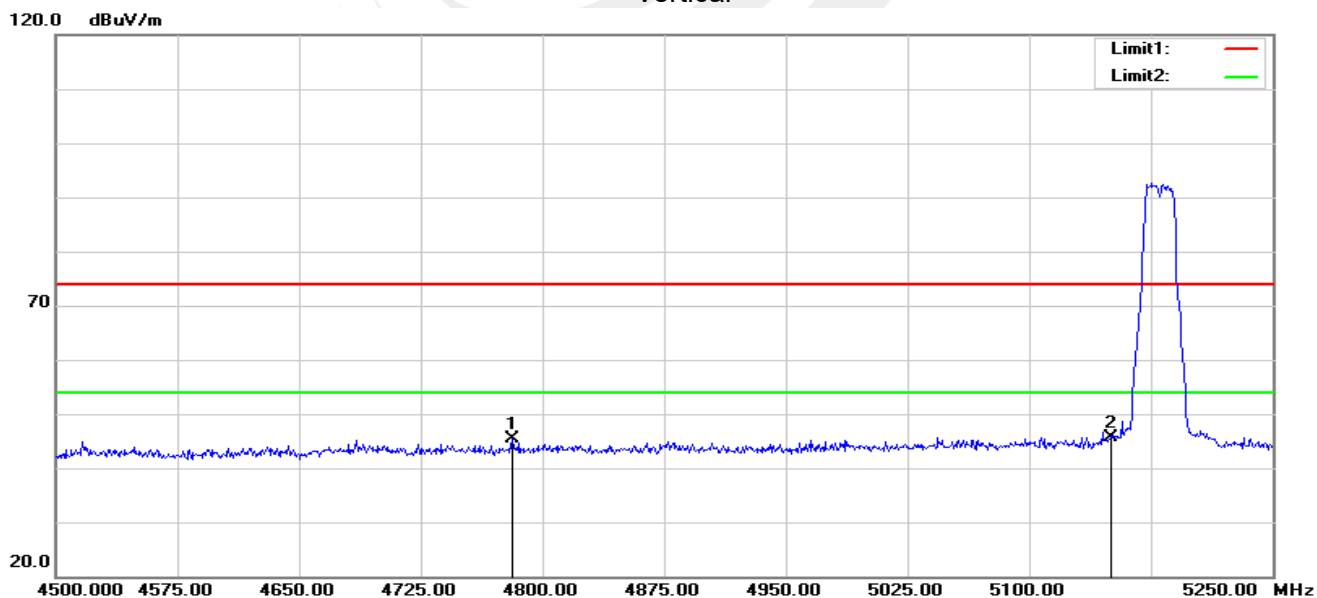
3.2.9 Band Edge

Band I 5150-5250MHz

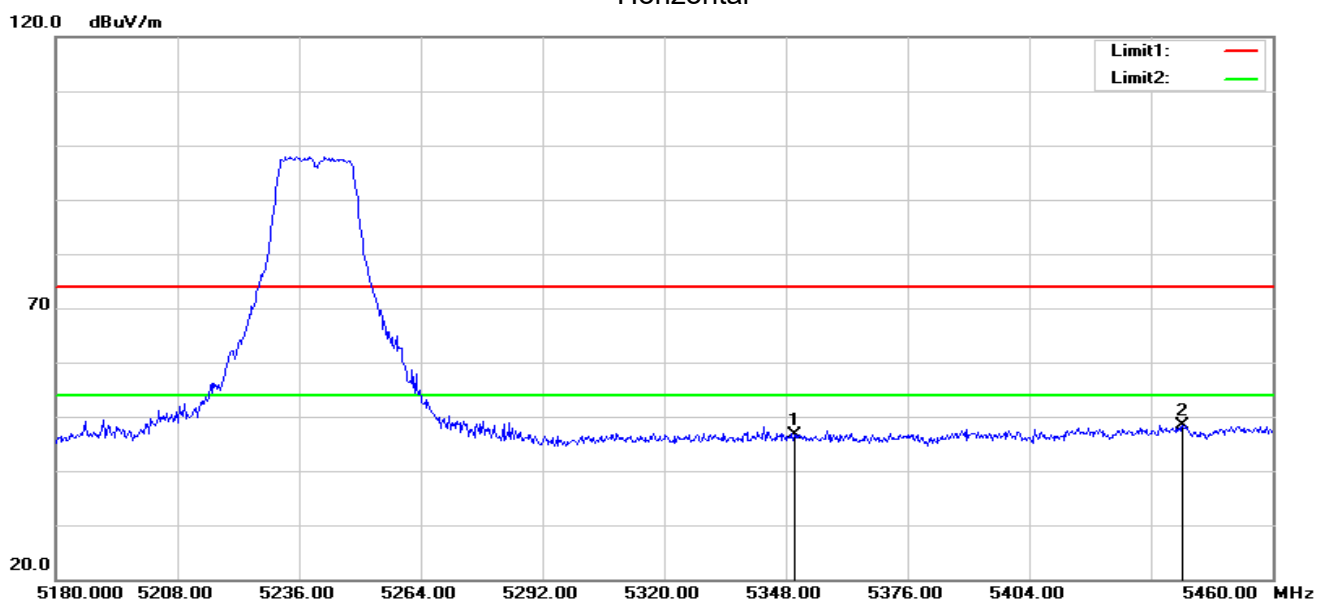
802.11n(HT20) Low
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4992.000	52.23	-6.25	45.98	74.00	-28.02	peak
2	5150.000	52.15	-5.73	46.42	74.00	-27.58	peak

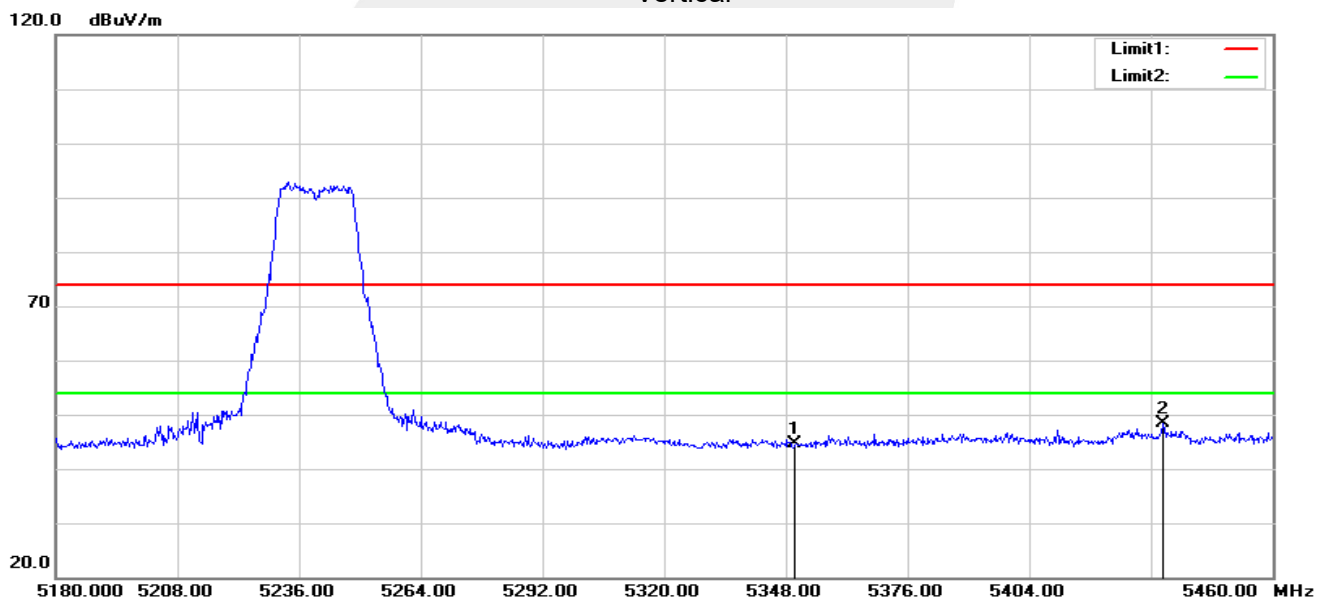
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4781.250	52.64	-7.25	45.39	74.00	-28.61	peak
2	5150.000	51.39	-5.73	45.66	74.00	-28.34	peak

**802.11n(HT20) High
Horizontal**

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.86	-5.23	46.63	74.00	-27.37	peak
2	5439.280	53.58	-5.16	48.42	74.00	-25.58	peak

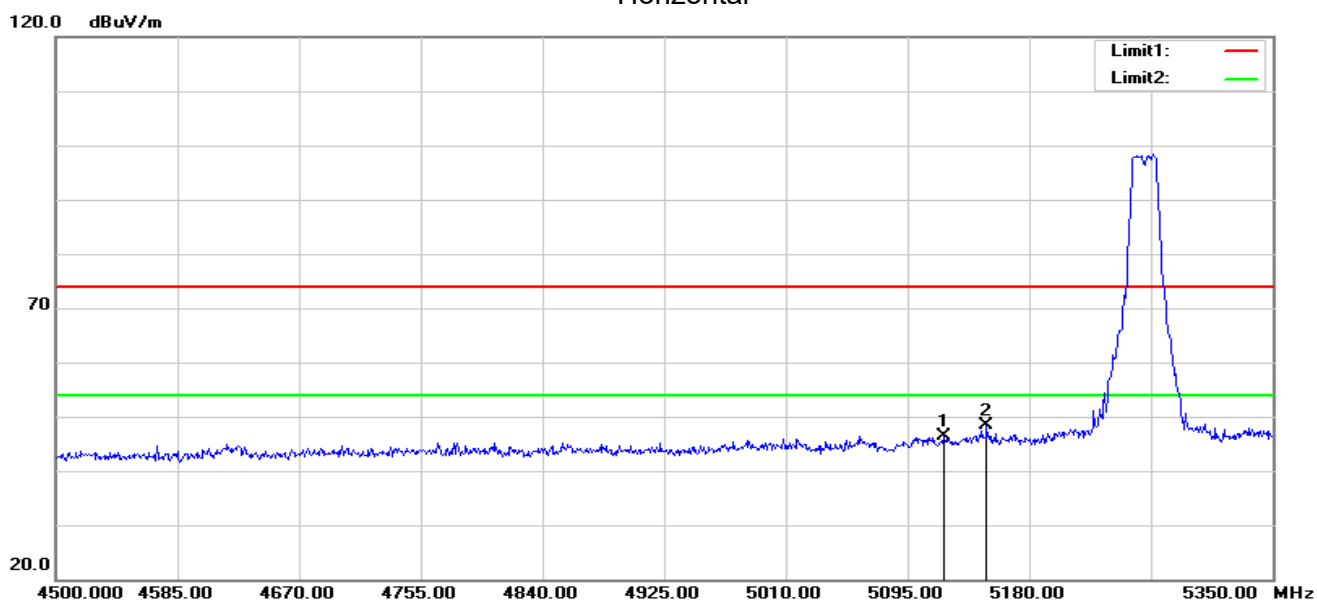
Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.77	-5.23	44.54	74.00	-29.46	peak
2	5434.800	53.61	-5.17	48.44	74.00	-25.56	peak

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

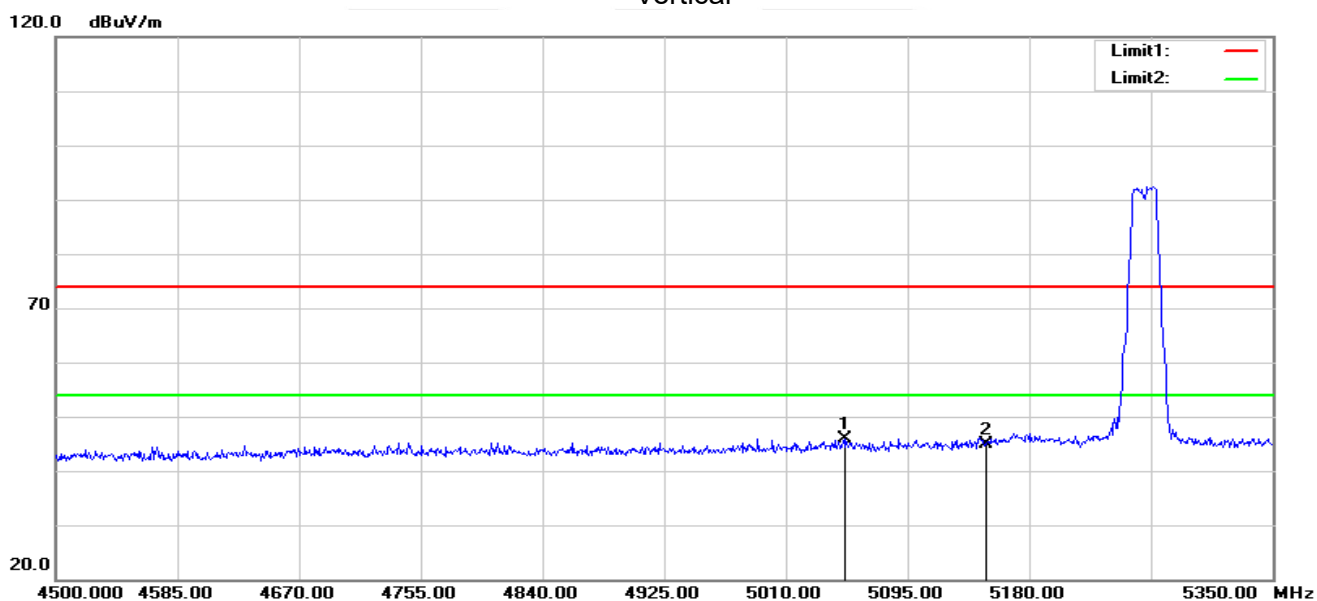


Band II 5250-5350MHz

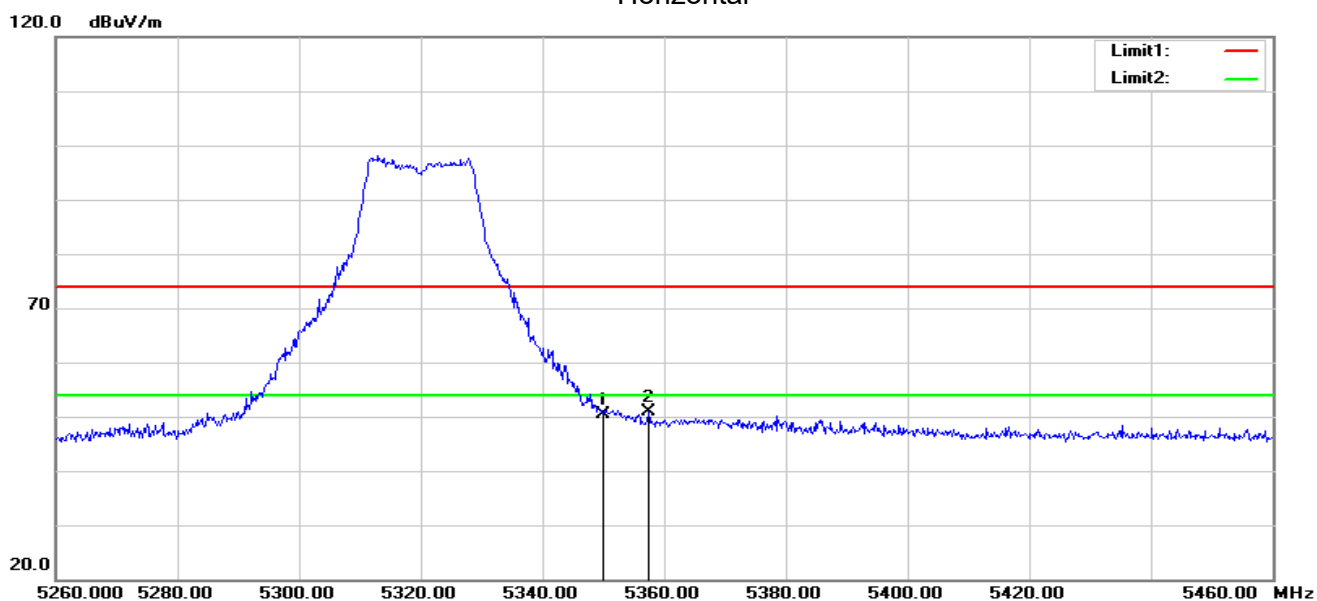
802.11ac(VHT20) Low
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5120.500	52.23	-5.73	46.50	74.00	-27.50	peak
2	5150.000	54.07	-5.73	48.34	74.00	-25.66	peak

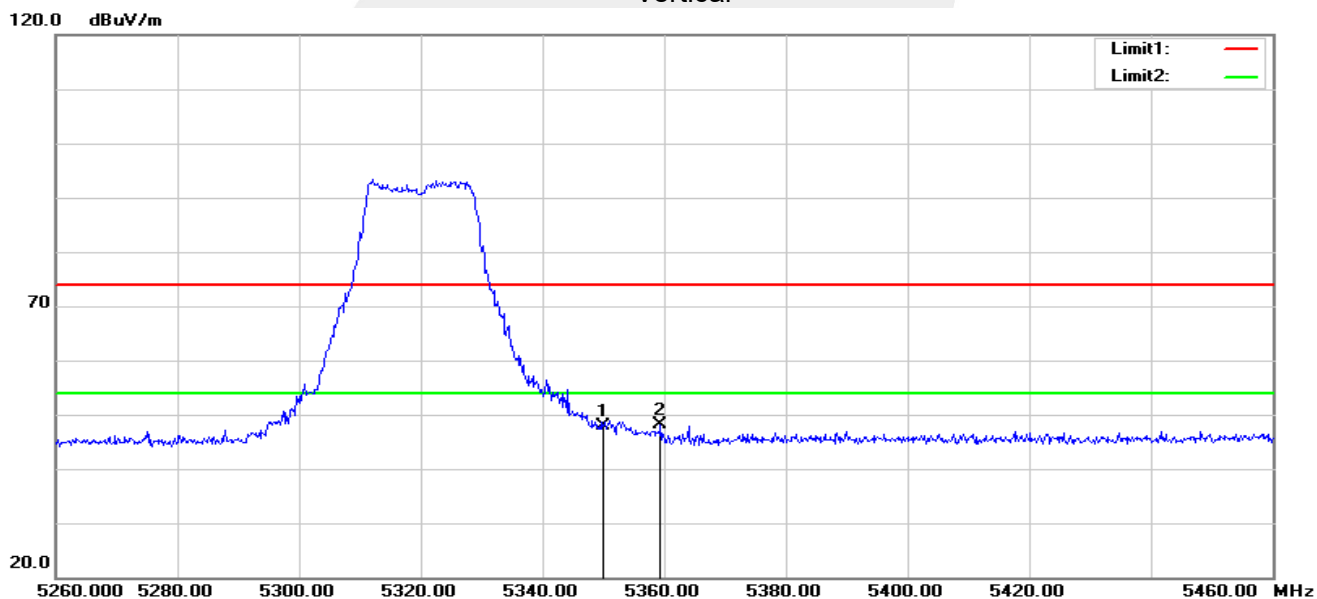
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5050.800	51.86	-5.96	45.90	74.00	-28.10	peak
2	5150.000	50.54	-5.73	44.81	74.00	-29.19	peak

**802.11ac(VHT20) High
Horizontal**

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	55.59	-5.23	50.36	74.00	-23.64	peak
2	5357.400	56.11	-5.23	50.88	74.00	-23.12	peak

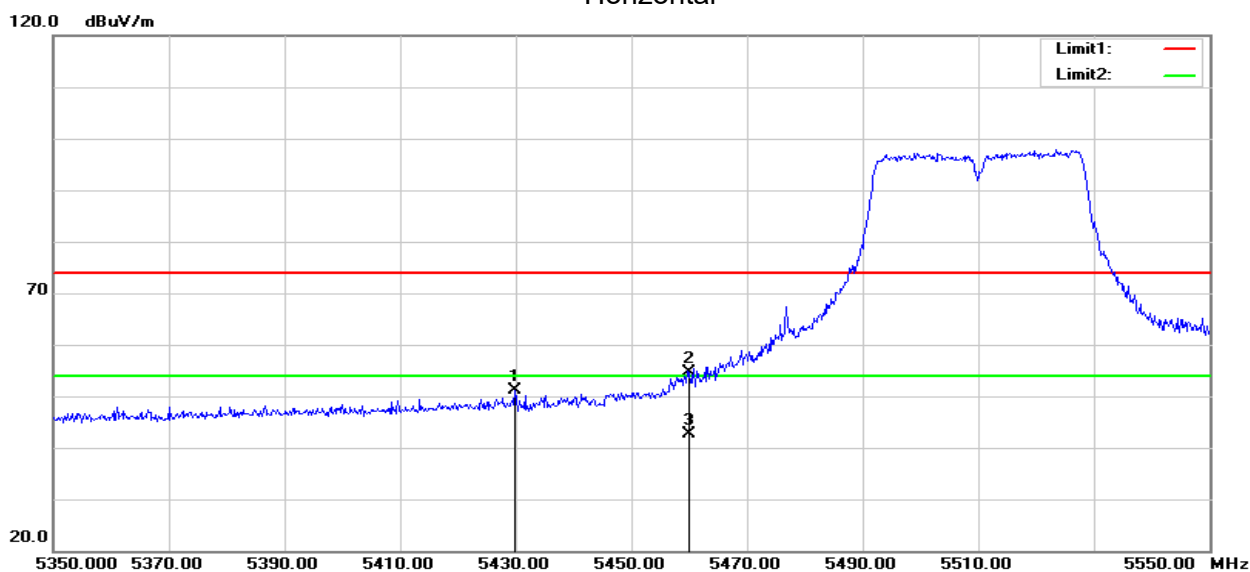
Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.99	-5.23	47.76	74.00	-26.24	peak
2	5359.400	53.32	-5.23	48.09	74.00	-25.91	peak

Note: 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), 802.11ac (VHT-80) all has been tested, the worst case is 802.11ac(VHT20),only shown the worst case.

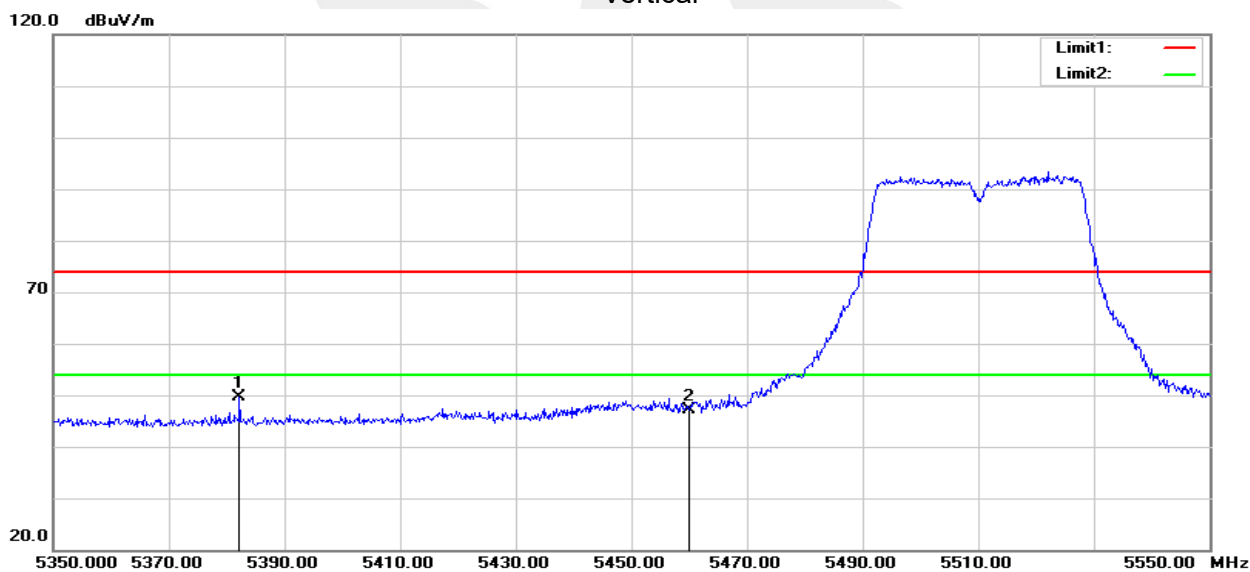


Band III 5470-5725MHz

802.11ac(VHT40) Low
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5429.800	56.22	-5.19	51.03	74.00	-22.97	peak
2	5460.000	59.73	-5.11	54.62	74.00	-19.38	peak
3	5460.000	47.76	-5.11	42.65	54.00	-11.35	AVG

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5382.200	54.84	-5.24	49.60	74.00	-24.40	peak
2	5460.000	52.28	-5.11	47.17	74.00	-26.83	peak

Note: 1. 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.
2. The high channel main frequency is too far away from the restricted band and does not require testing.

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

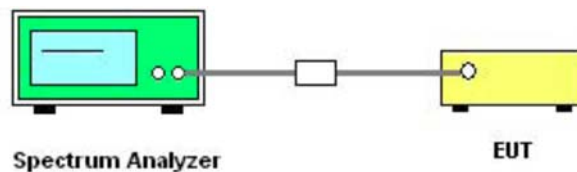
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 5140 to 5775 MHz Upper Band Edge: 5230 to 5950 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 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1000 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.5 EUT OPERATION CONDITIONS

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

4.6 TEST RESULTS

Data See Attachment A





5. POWER SPECTRAL DENSITY TEST

5.1 LIMIT

1. For mobile and portable client devices in the 5.15-5.25 GHz band, , the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2 TEST PROCEDURE

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

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (*i.e.*, 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, 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.



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 Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Ant_A Duty cycle factor	Ant_B Duty cycle factor	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a									
5180	3.956	2.320	0.167	0.167	4.123	2.487	--	11	PASS
5200	4.068	2.004	0.167	0.167	4.235	2.171	--	11	PASS
5240	4.179	2.105	0.167	0.167	4.346	2.272	--	11	PASS
802.11n20									
5180	1.954	-0.095	0.157	0.157	2.111	0.062	4.216	11	PASS
5200	2.016	-0.322	0.157	0.157	2.173	-0.165	4.169	11	PASS
5240	1.570	-0.663	0.157	0.157	1.727	-0.506	3.762	11	PASS
802.11n40									
5190	-2.015	-4.056	0.348	0.348	-1.667	-3.708	0.441	11	PASS
5230	-1.963	-4.160	0.348	0.348	-1.615	-3.812	0.434	11	PASS
802.11ac20									
5180	0.669	-0.096	0.167	0.167	0.836	0.071	3.480	11	PASS
5200	0.431	-0.385	0.167	0.167	0.598	-0.218	3.219	11	PASS
5240	0.907	-0.266	0.167	0.167	1.074	-0.099	3.537	11	PASS
802.11ac40									
5190	-2.236	-4.092	0.344	0.344	-1.892	-3.748	0.289	11	PASS
5230	-2.126	-4.160	0.344	0.344	-1.782	-3.816	0.330	11	PASS
802.11ac80									
5210	-8.459	-10.002	0.678	0.678	-7.781	-9.324	-5.475	11	PASS



5250-5350MHz									
Frequency	Direct measurement Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Ant_A Duty cycle factor	Ant_B Duty cycle factor	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a									
5260	3.748	1.922	0.156	0.156	3.904	2.078	--	11	PASS
5300	3.686	2.030	0.156	0.156	3.842	2.186	--	11	PASS
5320	3.900	2.364	0.156	0.156	4.056	2.520	--	11	PASS
802.11n20									
5260	0.544	-1.252	0.179	0.179	0.723	-1.073	2.928	11	PASS
5300	0.662	-0.956	0.179	0.179	0.841	-0.777	3.117	11	PASS
5320	0.846	-0.909	0.179	0.179	1.025	-0.730	3.246	11	PASS
802.11n40									
5270	-2.054	-4.411	0.334	0.334	-1.720	-4.077	0.269	11	PASS
5310	-2.173	-4.187	0.334	0.334	-1.839	-3.853	0.280	11	PASS
802.11ac20									
5260	1.870	0.011	0.156	0.156	2.026	0.167	4.205	11	PASS
5300	1.786	-0.228	0.156	0.156	1.942	-0.072	4.061	11	PASS
5320	1.720	-0.540	0.156	0.156	1.876	-0.384	3.902	11	PASS
802.11ac40									
5270	-2.458	-4.181	0.370	0.370	-2.088	-3.811	0.146	11	PASS
5310	-1.860	-4.158	0.370	0.370	-1.490	-3.788	0.521	11	PASS
802.11ac80									
5290	-9.262	-9.628	0.678	0.678	-8.584	-8.950	-5.753	11	PASS



5470-5725MHz

Frequency	Direct measurement Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Ant_A Duty cycle factor	Ant_B Duty cycle factor	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a									
5500	3.510	2.720	0.167	0.167	3.677	2.887	--	11	PASS
5580	3.953	2.917	0.167	0.167	4.120	3.084	--	11	PASS
5700	3.698	3.424	0.167	0.167	3.865	3.591	--	11	PASS
802.11n20									
5500	0.451	-0.545	0.179	0.179	0.630	-0.366	3.170	11	PASS
5580	0.747	-0.370	0.179	0.179	0.926	-0.191	3.413	11	PASS
5700	0.497	-0.583	0.179	0.179	0.676	-0.404	3.179	11	PASS
802.11n40									
5510	-2.732	-3.321	0.360	0.360	-2.372	-2.961	0.354	11	PASS
5550	-1.944	-2.800	0.360	0.360	-1.584	-2.440	1.020	11	PASS
5670	-2.920	-2.962	0.360	0.360	-2.560	-2.602	0.430	11	PASS
802.11ac20									
5500	0.171	-0.296	0.167	0.167	0.338	-0.129	3.121	11	PASS
5580	0.610	-0.410	0.167	0.167	0.777	-0.243	3.307	11	PASS
5700	0.632	0.152	0.167	0.167	0.799	0.319	3.576	11	PASS
802.11ac40									
5510	-2.418	-3.269	0.332	0.332	-2.086	-2.937	0.519	11	PASS
5550	-2.112	-2.917	0.332	0.332	-1.780	-2.585	0.846	11	PASS
5670	-2.399	-2.714	0.332	0.332	-2.067	-2.382	0.788	11	PASS
802.11ac80									
5530	-8.393	-8.778	0.694	0.694	-7.699	-8.084	-4.877	11	PASS
5610	-8.402	-8.856	0.694	0.694	-7.708	-8.162	-4.919	11	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)	Ant_A Duty cycle factor (dB)	Ant_B 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											
5745	4.901	4.046	4.815	3.960	0.177	0.177	4.992	4.137	--	30	PASS
5785	5.162	3.905	5.076	3.819	0.177	0.177	5.253	3.996	--	30	PASS
5825	4.164	3.316	4.078	3.230	0.177	0.177	4.255	3.407	--	30	PASS
802.11n20											
5745	1.563	0.419	1.477	0.333	0.168	0.168	1.645	0.501	4.121	30	PASS
5785	1.272	0.472	1.186	0.386	0.168	0.168	1.354	0.554	3.983	30	PASS
5825	0.882	0.715	0.796	0.629	0.168	0.168	0.964	0.797	3.892	30	PASS
802.11n40											
5755	-2.164	-3.068	-2.250	-3.154	0.386	0.386	-1.864	-2.768	0.718	30	PASS
5795	-2.133	-3.437	-2.219	-3.523	0.386	0.386	-1.833	-3.137	0.574	30	PASS
802.11ac20											
5745	1.454	0.369	1.368	0.283	0.189	0.189	1.557	0.472	4.059	30	PASS
5785	1.592	0.745	1.506	0.659	0.189	0.189	1.695	0.848	4.303	30	PASS
5825	0.547	-0.069	0.461	-0.155	0.189	0.189	0.650	0.034	3.363	30	PASS
802.11ac40											
5755	-2.118	-3.491	-2.204	-3.577	0.344	0.344	-1.860	-3.233	0.518	30	PASS
5795	-2.263	-3.171	-2.349	-3.257	0.344	0.344	-2.005	-2.913	0.575	30	PASS
802.11ac80											
5775	-5.006	-6.423	-5.092	-6.509	0.678	0.678	-4.414	-5.831	-2.055	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 BANDWID 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	22.15	Pass
5200	22.10	Pass
5240	21.56	Pass
802.11n(HT20)		
5180	22.55	Pass
5200	22.39	Pass
5240	22.76	Pass
802.11n(HT40)		
5190	40.76	Pass
5230	41.11	Pass
802.11ac(VHT20)		
5180	22.13	Pass
5200	22.60	Pass
5240	22.45	Pass
802.11ac(VHT40)		
5190	41.09	Pass
5230	41.25	Pass
802.11ac(VHT80)		
5210	82.05	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5260	22.01	Pass
5300	22.13	Pass
5320	22.05	Pass
802.11n(HT20)		
5260	22.12	Pass
5300	22.20	Pass
5320	21.67	Pass
802.11n(HT40)		
5270	41.10	Pass
5310	41.19	Pass
802.11ac(VHT20)		
5260	23.20	Pass
5300	21.96	Pass
5320	21.93	Pass
802.11ac(VHT40)		
5270	41.10	Pass
5310	41.29	Pass
802.11ac(VHT80)		
5290	82.84	Pass



Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5500	21.44	Pass
5580	21.46	Pass
5700	22.03	Pass
802.11n(HT20)		
5500	21.81	Pass
5580	22.26	Pass
5700	21.57	Pass
802.11n(HT40)		
5510	40.57	Pass
5550	41.19	Pass
5670	40.93	Pass
802.11ac(VHT20)		
5500	22.03	Pass
5580	22.31	Pass
5700	22.71	Pass
802.11ac(VHT40)		
5510	41.50	Pass
5550	41.24	Pass
5670	41.18	Pass
802.11ac(VHT80)		
5530	81.91	Pass
5610	82.95	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	21.96	Pass
5785	22.11	Pass
5825	21.51	Pass
802.11n(HT20)		
5745	22.10	Pass
5785	22.46	Pass
5825	22.90	Pass
802.11n(HT40)		
5755	41.05	Pass
5795	41.25	Pass
802.11ac(VHT20)		
5745	22.19	Pass
5785	22.35	Pass
5825	22.55	Pass
802.11ac(VHT40)		
5755	41.10	Pass
5795	41.20	Pass
802.11ac(VHT80)		
5775	83.24	Pass

Test plot see Attachment C



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

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

6.2.1 TEST PROCEDURE

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

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

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ 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	16.507	Pass
5200	16.501	Pass
5240	16.505	Pass
802.11n(HT20)		
5180	17.690	Pass
5200	17.673	Pass
5240	17.702	Pass
802.11n(HT40)		
5190	36.172	Pass
5230	36.157	Pass
802.11ac(VHT20)		
5180	17.663	Pass
5200	17.693	Pass
5240	17.662	Pass
802.11ac(VHT40)		
5190	36.189	Pass
5230	36.158	Pass
802.11ac(VHT80)		
5210	75.691	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5260	16.518	Pass
5300	16.505	Pass
5320	16.492	Pass
802.11n(HT20)		
5260	17.689	Pass
5300	17.647	Pass
5320	17.663	Pass
802.11n(HT40)		
5270	36.168	Pass
5310	36.174	Pass
802.11ac(VHT20)		
5260	17.674	Pass
5300	17.656	Pass
5320	17.650	Pass
802.11ac(VHT40)		
5270	36.153	Pass
5310	36.200	Pass
802.11ac(VHT80)		
5290	75.703	Pass



Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5500	16.502	Pass
5580	16.502	Pass
5700	16.611	Pass
802.11n(HT20)		
5500	17.669	Pass
5580	17.641	Pass
5700	17.660	Pass
802.11n(HT40)		
5510	36.136	Pass
5550	36.167	Pass
5670	36.178	Pass
802.11ac(VHT20)		
5500	17.685	Pass
5580	17.638	Pass
5700	17.711	Pass
802.11ac(VHT40)		
5510	36.169	Pass
5550	36.109	Pass
5670	36.202	Pass
802.11ac(VHT80)		
5530	75.684	Pass
5610	75.774	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.481	Pass
5785	16.508	Pass
5825	16.510	Pass
802.11n(HT20)		
5745	17.717	Pass
5785	17.692	Pass
5825	17.709	Pass
802.11n(HT40)		
5755	36.171	Pass
5795	36.152	Pass
802.11ac(VHT20)		
5745	17.701	Pass
5785	17.704	Pass
5825	17.704	Pass
802.11ac(VHT40)		
5755	36.180	Pass
5795	36.170	Pass
802.11ac(VHT80)		
5775	75.707	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	15.60	Pass
5785	15.26	Pass
5825	15.44	Pass
802.11n(HT20)		
5745	15.96	Pass
5785	15.62	Pass
5825	15.97	Pass
802.11n(HT40)		
5755	36.30	Pass
5795	35.73	Pass
802.11ac(VHT20)		
5745	15.41	Pass
5785	15.69	Pass
5825	16.77	Pass
802.11ac(VHT40)		
5755	36.04	Pass
5795	36.32	Pass
802.11ac(VHT80)		
5775	75.17	Pass

Test plots see Attachment D

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

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

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

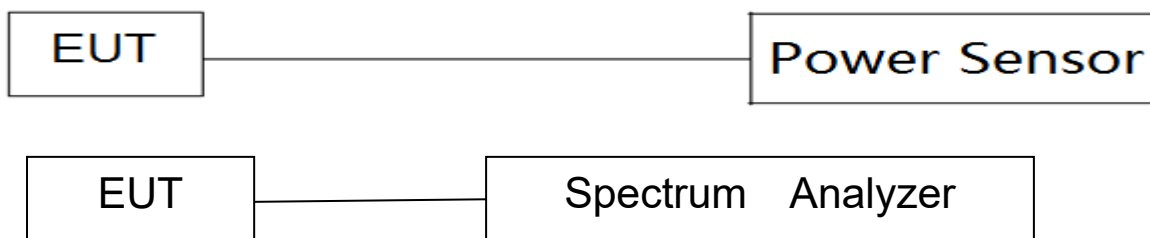
7.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

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



7.6 TEST RESULTS

Band I (5.15-5.25GHz)												
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Ant_A Duty cycle factor (dB)	Ant_B Duty cycle factor (dB)	Ant_A PK Power (dBm)	Ant B_PKPower (dBm)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	PK Power Total(dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a												
36	5180	13.73	12.40	0.167	0.167	18.71	17.31	13.90	12.57	--	--	23.98
40	5200	13.85	12.29	0.167	0.167	18.9	17.19	14.02	12.46	--	--	23.98
48	5240	13.74	12.09	0.167	0.167	18.65	17.08	13.91	12.26	--	--	23.98
802.11n(HT20)												
36	5180	11.69	10.22	0.157	0.157	16.92	15.43	11.85	10.38	19.25	14.18	23.98
40	5200	11.71	9.98	0.157	0.157	16.71	15.01	11.87	10.14	18.95	14.10	23.98
48	5240	11.70	10.09	0.157	0.157	16.92	15.25	11.86	10.25	19.18	14.14	23.98
802.11n(HT40)												
38	5190	10.52	9.14	0.348	0.348	16.36	14.95	10.87	9.49	18.72	13.24	23.98
46	5230	10.59	9.08	0.348	0.348	16.27	14.75	10.94	9.43	18.59	13.26	23.98
802.11ac(VHT20)												
36	5180	10.79	9.14	0.167	0.167	16.04	14.34	10.96	9.31	18.28	13.22	23.98
40	5200	10.82	9.14	0.167	0.167	15.95	14.49	10.99	9.31	18.29	13.24	23.98
48	5240	10.76	8.79	0.167	0.167	15.95	13.95	10.93	8.96	18.07	13.06	23.98
802.11ac(VHT40)												
38	5190	10.58	9.09	0.344	0.344	16.28	14.78	10.92	9.43	18.60	13.25	23.98
46	5230	10.56	9.11	0.344	0.344	16.11	14.89	10.90	9.45	18.55	13.25	23.98
802.11ac(VHT80)												
42	5210	8.57	7.32	0.678	0.678	18.47	16.91	8.57	7.32	20.77	11.00	23.98



Band II(5.25-5.35GHz)												
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Ant_A Duty cycle factor (dB)	Ant_B Duty cycle factor (dB)	Ant_A PK Power (dBm)	Ant B_PKPower (dBm)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	PK Power Total(dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a												
52	5260	13.60	11.99	0.156	0.156	18.55	16.84	13.76	12.15	--	--	23.98
60	5300	13.42	11.77	0.156	0.156	18.41	16.72	13.58	11.93	--	--	23.98
64	5320	13.36	11.82	0.156	0.156	18.32	16.71	13.52	11.98	--	--	23.98
802.11n(HT20)												
52	5260	10.59	8.63	0.179	0.179	15.74	13.75	10.77	8.81	17.87	12.91	23.98
60	5300	10.48	8.42	0.179	0.179	15.62	13.33	10.66	8.60	17.63	12.76	23.98
64	5320	10.39	8.64	0.179	0.179	15.63	13.94	10.57	8.82	17.88	12.79	23.98
802.11n(HT40)												
54	5270	10.53	8.63	0.334	0.334	16.38	14.27	10.86	8.96	18.46	13.03	23.98
62	5310	10.47	8.54	0.334	0.334	16.09	14.33	10.80	8.87	18.31	12.96	23.98
802.11ac(VHT20)												
52	5260	11.47	9.66	0.156	0.156	16.58	14.69	11.63	9.82	18.75	13.82	23.98
60	5300	11.29	9.40	0.156	0.156	16.40	14.41	11.45	9.56	18.53	13.61	23.98
64	5320	11.23	9.65	0.156	0.156	16.32	14.95	11.39	9.81	18.70	13.68	23.98
802.11ac(VHT40)												
54	5270	10.47	8.68	0.370	0.370	16.22	14.41	10.84	9.05	18.42	13.05	23.98
62	5310	10.34	8.55	0.370	0.370	16.15	14.02	10.71	8.92	18.22	12.92	23.98
802.11ac(VHT80)												
58	5290	8.46	7.49	0.678	0.678	18.31	17.14	8.46	7.49	20.77	11.01	23.98

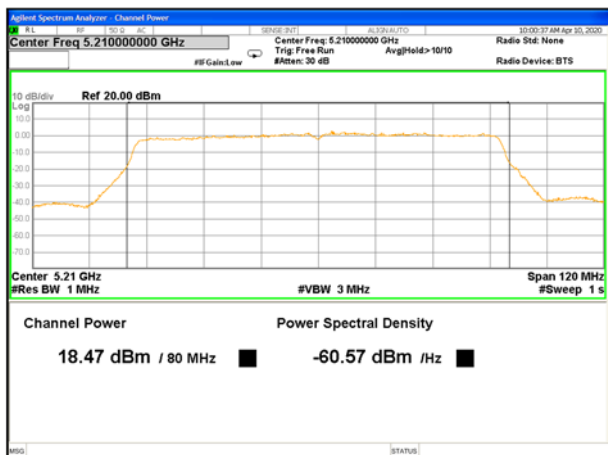


Band III(5.47-5.725GHz)												
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant_B_AV Power (dBm)	Ant_A Duty cycle factor (dB)	Ant_B Duty cycle factor (dB)	Ant_A PK Power (dBm)	Ant_B_PKPower (dBm)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	PK Power Total(dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a												
100	5500	13.25	12.05	0.167	0.167	18.35	17.07	13.42	12.22	--	--	23.98
116	5580	13.63	12.59	0.167	0.167	18.74	17.7	13.80	12.76	--	--	23.98
140	5700	13.80	13.08	0.167	0.167	18.89	18.12	13.97	13.25	--	--	23.98
802.11n(HT20)												
100	5500	10.22	8.96	0.179	0.179	15.45	14.34	10.40	9.14	17.94	12.82	23.98
116	5580	10.64	9.52	0.179	0.179	15.96	14.82	10.82	9.70	18.44	13.30	23.98
140	5700	10.68	9.76	0.179	0.179	15.8	14.88	10.86	9.94	18.37	13.43	23.98
802.11n(HT40)												
102	5510	10.37	9.10	0.360	0.360	16.17	14.82	10.73	9.46	18.56	13.15	23.98
110	5550	10.56	9.31	0.360	0.360	16.43	15.01	10.92	9.67	18.79	13.35	23.98
134	5670	10.82	9.90	0.360	0.360	16.40	15.74	11.18	10.26	19.09	13.76	23.98
802.11ac(VHT20)												
100	5500	10.24	8.80	0.167	0.167	15.49	14.04	10.41	8.97	17.84	12.76	23.98
116	5580	10.52	9.34	0.167	0.167	15.73	14.51	10.69	9.51	18.17	13.15	23.98
140	5700	10.70	9.98	0.167	0.167	15.81	15.3	10.87	10.15	18.57	13.53	23.98
802.11ac(VHT40)												
102	5510	10.31	9.11	0.332	0.332	16.29	14.94	10.64	9.44	18.68	13.09	23.98
110	5550	10.53	9.29	0.332	0.332	16.3	15.14	10.86	9.62	18.77	13.30	23.98
134	5670	10.84	9.93	0.332	0.332	16.59	15.57	11.17	10.26	19.12	13.75	23.98
802.11ac(VHT80)												
106	5530	8.37	6.74	0.694	0.694	18.21	16.26	8.37	6.74	20.35	10.64	23.98
122	5610	8.22	6.45	0.694	0.694	18.07	15.98	8.22	6.45	20.16	10.43	23.98

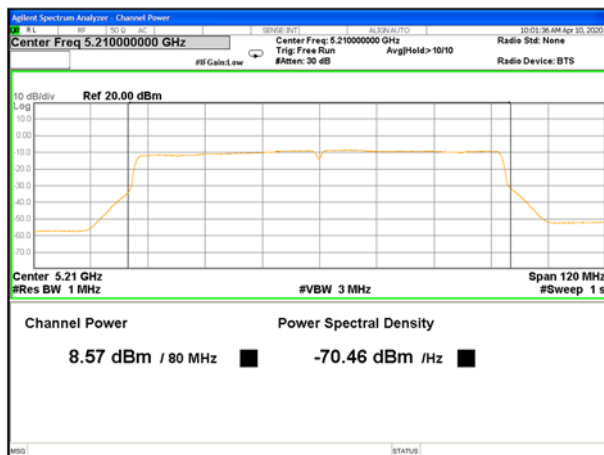


Band IV (5.725-5.85GHz)

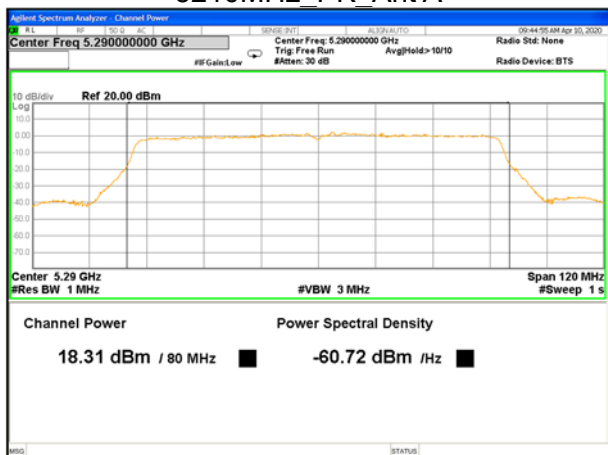
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant_B AV Power (dBm)	Ant_A Duty cycle factor (dB)	Ant_B Duty cycle factor (dB)	Ant_A PK Power (dBm)	Ant_B PK Power (dBm)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	PK Power Total(dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a												
149	5745	14.99	14.25	0.177	0.177	20.04	19.19	15.17	14.43	--	--	30
157	5785	15.15	14.32	0.177	0.177	20.08	19.38	15.33	14.50	--	--	30
165	5825	14.55	13.89	0.177	0.177	19.7	18.97	14.73	14.07	--	--	30
802.11n(HT20)												
149	5745	11.82	11.16	0.168	0.168	17.1	16.45	11.99	11.33	19.80	14.681	30
157	5785	12.06	11.39	0.168	0.168	17.38	16.72	12.23	11.56	20.07	14.916	30
165	5825	11.37	10.77	0.168	0.168	16.57	16.17	11.54	10.94	19.38	14.259	30
802.11n(HT40)												
151	5755	11.04	10.19	0.386	0.386	16.69	15.92	11.43	10.58	19.33	14.032	30
159	5795	11.12	10.42	0.386	0.386	16.79	16.05	11.51	10.81	19.45	14.180	30
802.11ac(VHT20)												
149	5745	11.83	11.08	0.189	0.189	17.33	16.65	12.02	11.27	20.01	14.671	30
157	5785	12.01	11.39	0.189	0.189	17.06	16.76	12.20	11.58	19.92	14.910	30
165	5825	11.30	10.74	0.189	0.189	16.53	15.8	11.49	10.93	19.19	14.228	30
802.11ac(VHT40)												
151	5755	10.83	10.19	0.344	0.344	16.7	15.93	11.17	10.53	19.34	13.877	30
159	5795	10.97	10.43	0.344	0.344	17.08	15.99	11.31	10.77	19.58	14.063	30
802.11ac(VHT80)												
155	5775	11.25	10.59	0.678	0.678	16.86	15.83	11.25	10.59	19.39	13.943	30



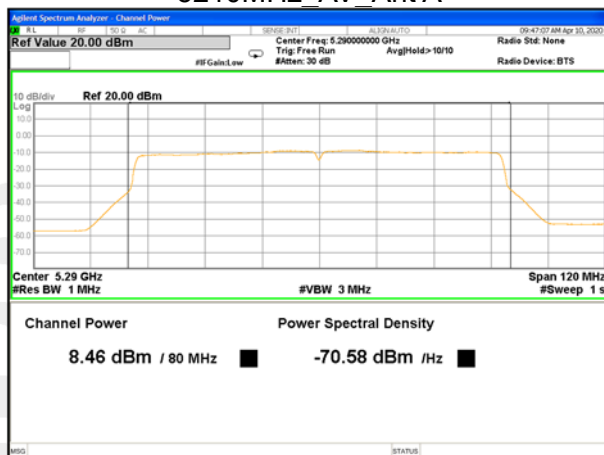
5210MHz_PK_Ant A



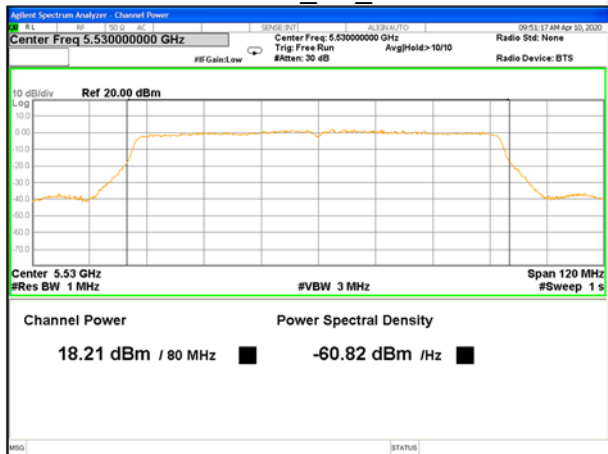
5210MHz_AV_Ant A



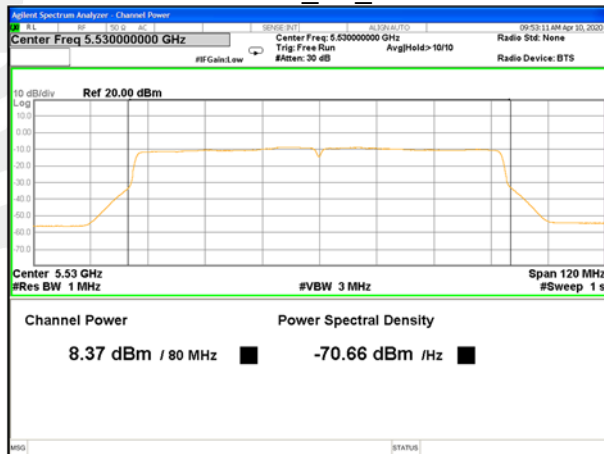
5290MHz_PK_Ant A



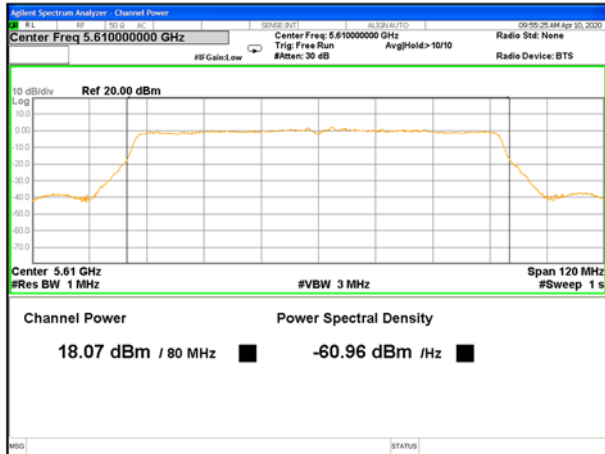
5290MHz_AV_Ant A



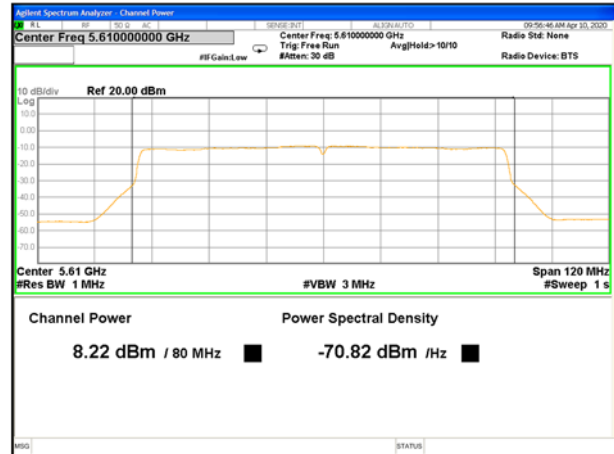
5530MHz_PK_Ant A



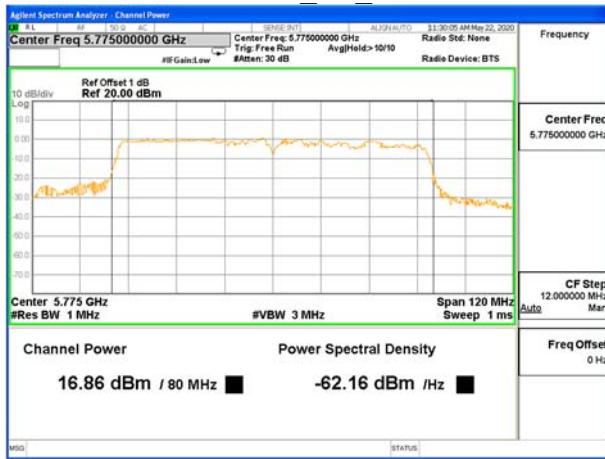
5530MHz_AV_Ant A



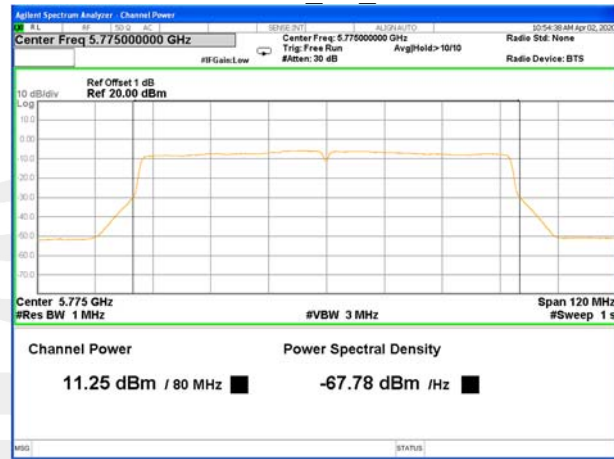
5610MHz_PK_Ant A



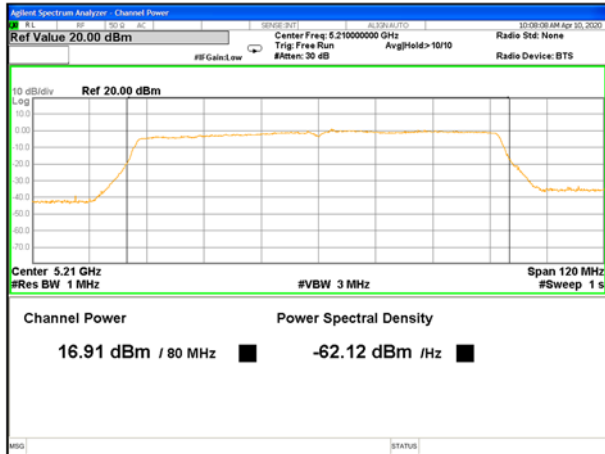
5610MHz_AV_Ant A



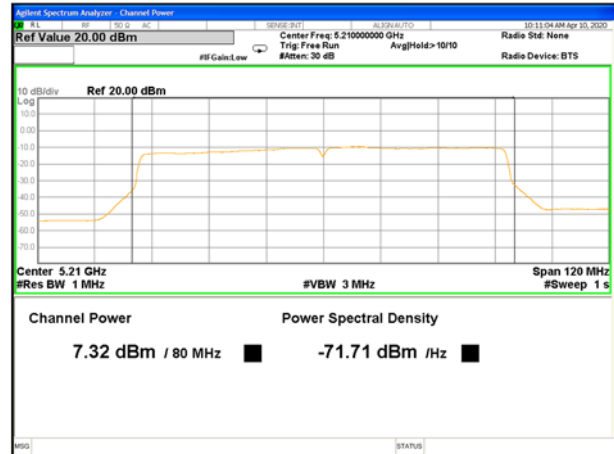
5775MHz_PK_Ant A



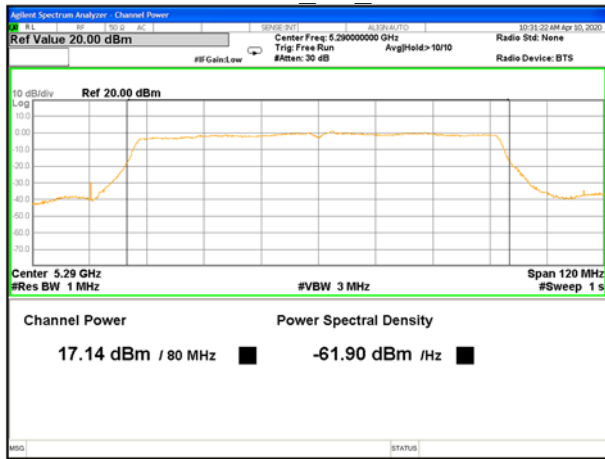
5775MHz_AV_Ant A



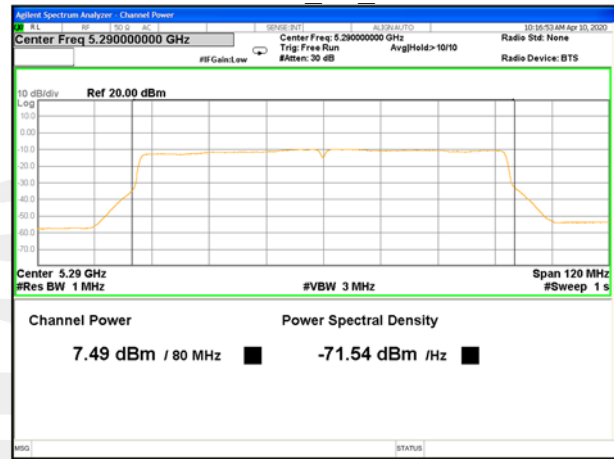
5210MHz_PK_Ant B



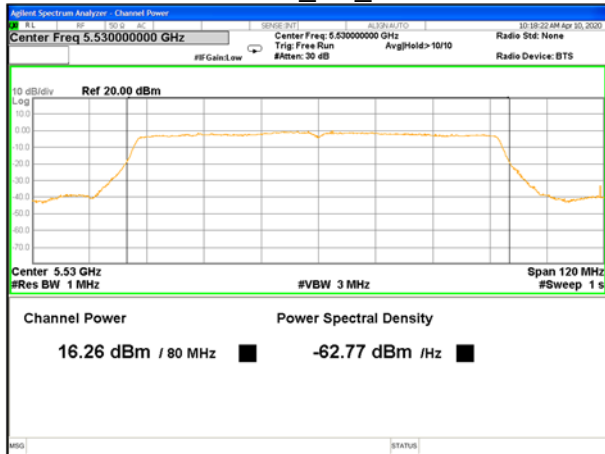
5210MHz_AV_Ant B



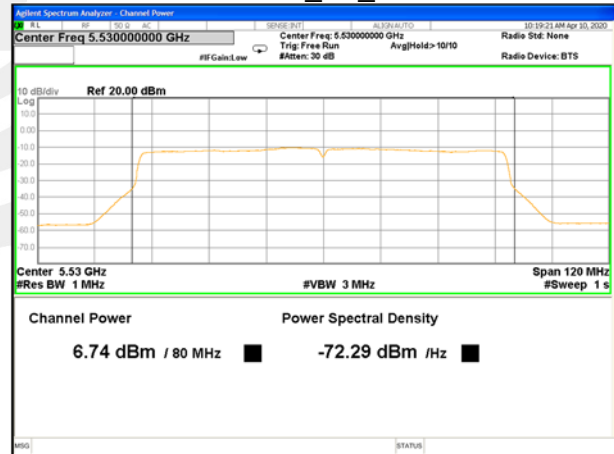
5290MHz_PK_Ant B



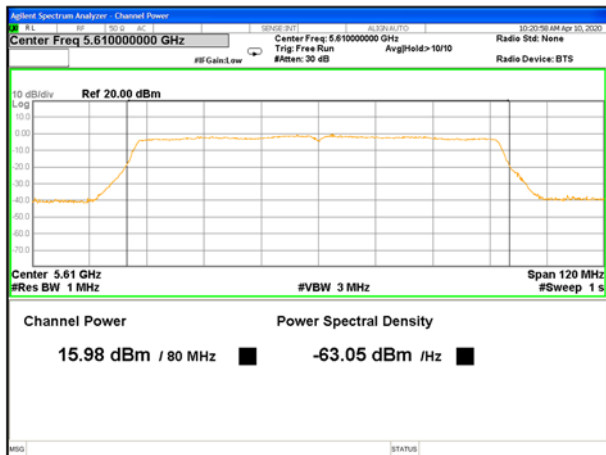
5290MHz_AV_Ant B



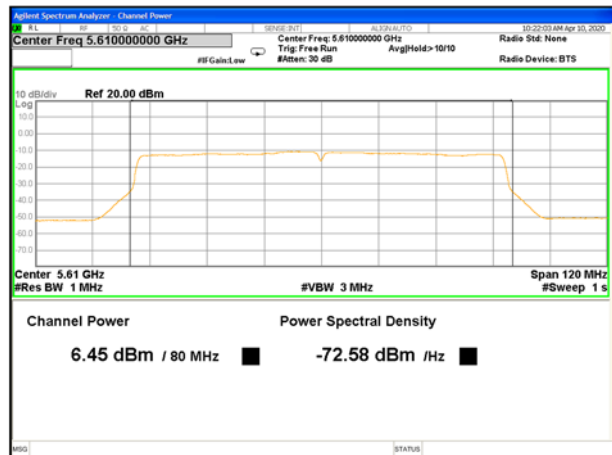
5530MHz_PK_Ant B



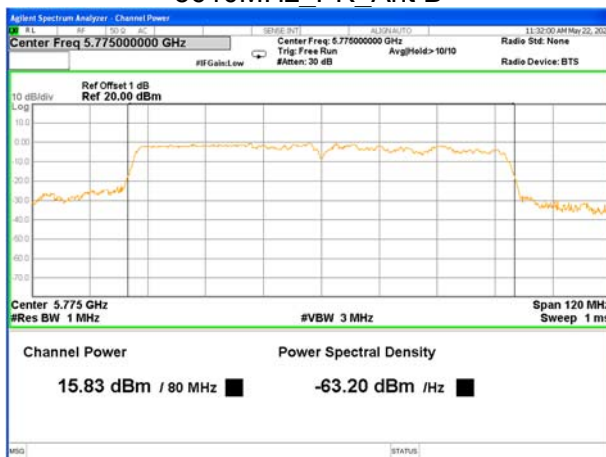
5530MHz_AV_Ant B



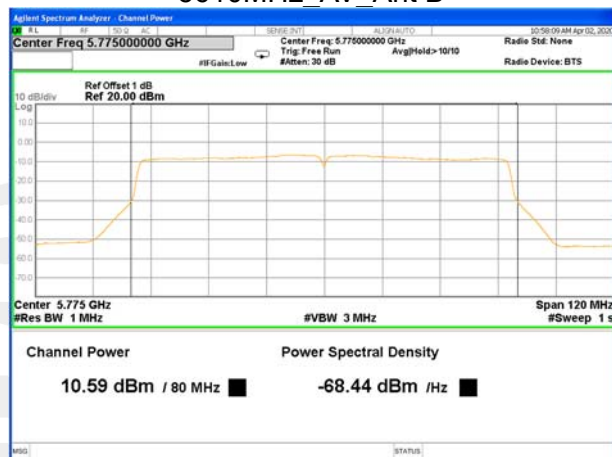
5610MHz_PK_Ant B



5610MHz_AV_Ant B



5775MHz_PK_Ant B



5775MHz_AV_Ant B



Duty cycle

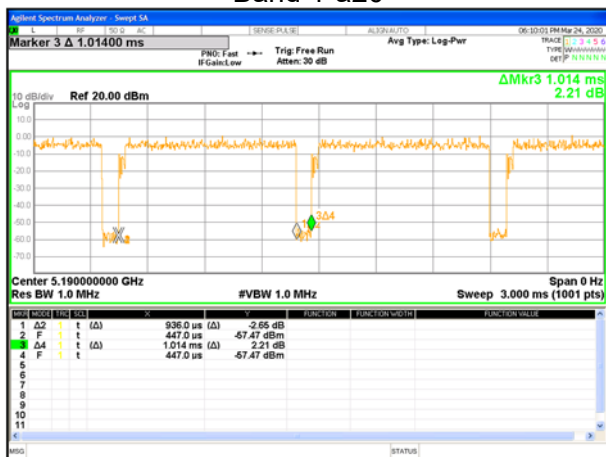
Band1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.040	2.120	96.23%	0.167
n20	1.905	1.975	96.46%	0.157
n40	0.936	1.014	92.31%	0.348
ac20	1.915	1.990	96.23%	0.167
ac40	0.945	1.023	92.38%	0.344
ac80	0.462	0.540	85.56%	0.678
Band2				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.045	2.120	96.46%	0.156
n20	1.900	1.980	95.96%	0.179
n40	0.939	1.014	92.60%	0.334
ac20	1.915	1.985	96.47%	0.156
ac40	0.945	1.029	91.84%	0.370
ac80	0.462	0.540	85.56%	0.678
Band3				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.040	2.120	96.23%	0.167
n20	1.905	1.985	95.97%	0.179
n40	0.936	1.017	92.04%	0.360
ac20	1.915	1.990	96.23%	0.167
ac40	0.945	1.020	92.65%	0.332
ac80	0.462	0.542	85.24%	0.694
Band4				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.040	2.125	96.00%	0.177
n20	1.900	1.975	96.20%	0.168
n40	0.936	1.023	91.50%	0.386
ac20	1.910	1.995	95.74%	0.189
ac40	0.945	1.023	92.38%	0.344
ac80	0.462	0.540	85.56%	0.678



Band 1-a20



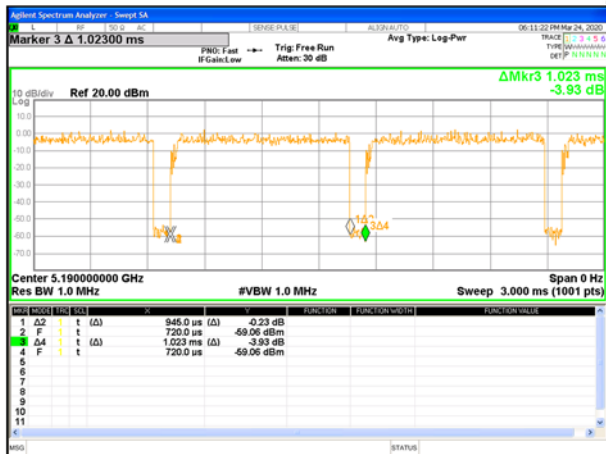
Band 1-n20



Band 1-n40



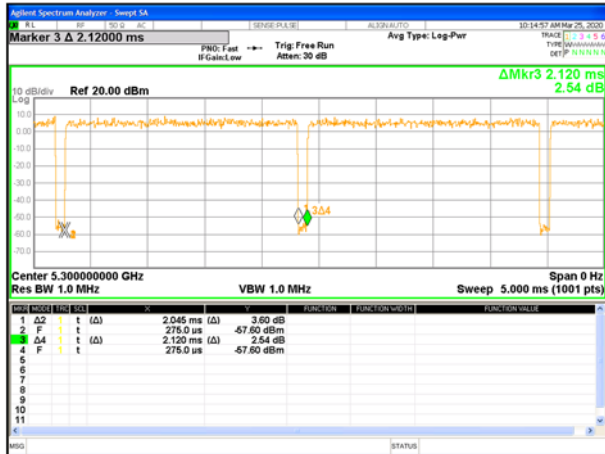
Band 1-ac20



Band 1-ac40



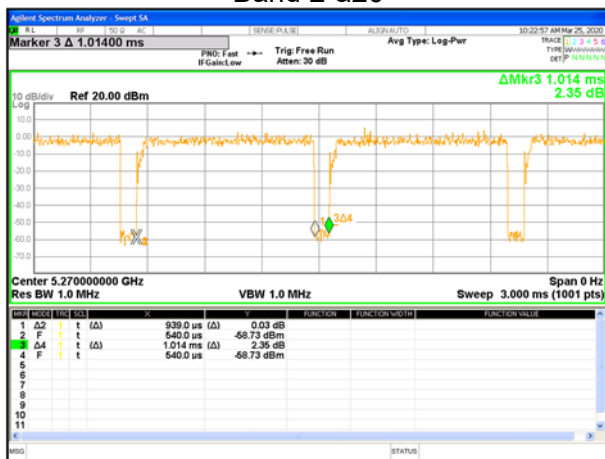
Band 1-ac80



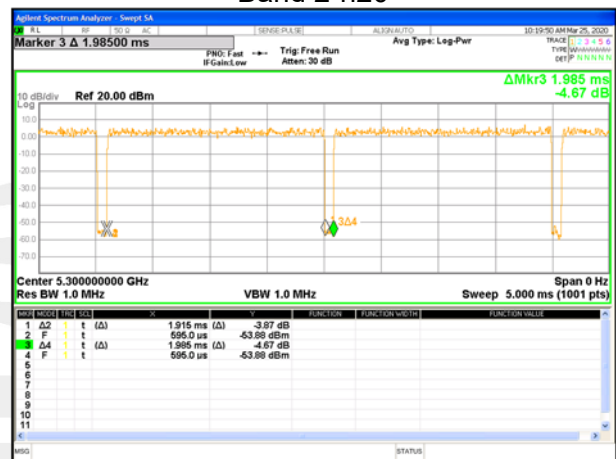
Band 2-a20



Band 2-n20



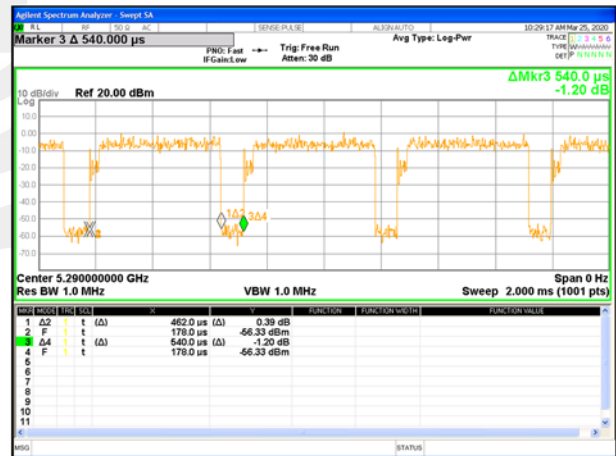
Band 2-n40



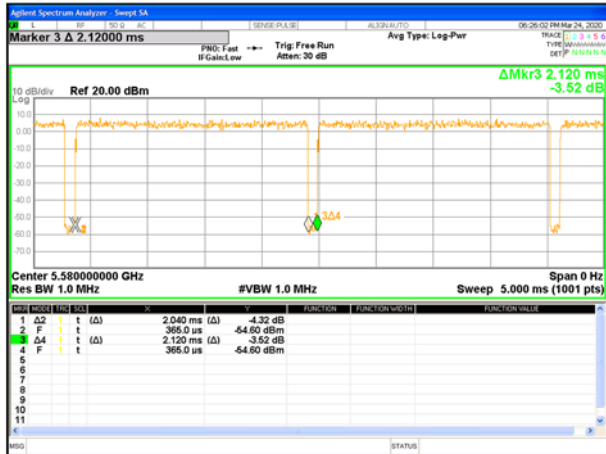
Band 2-ac20



Band 2-ac40



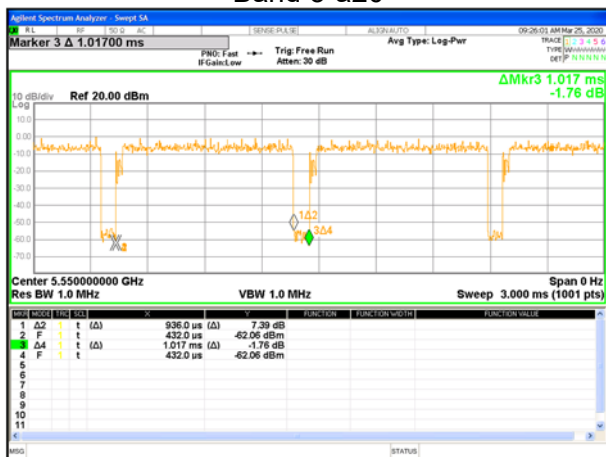
Band 2-ac80



Band 3-a20



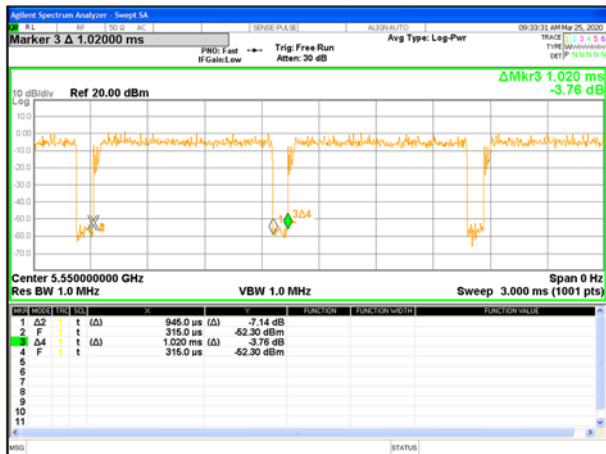
Band 3-n20



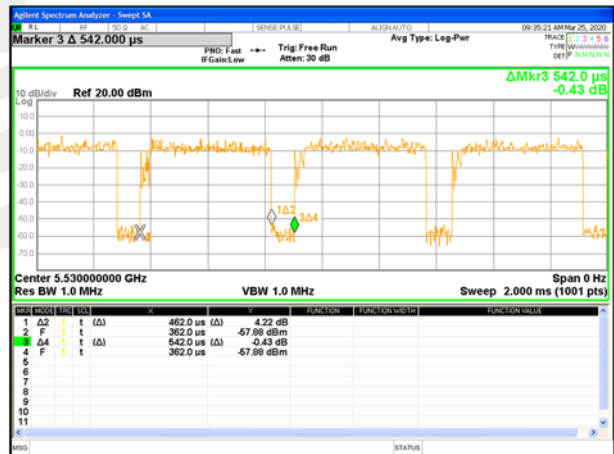
Band 3-n40



Band 3-ac20



Band 3-ac40



Band 3-ac80



Band 4-a20



Band 4-n20



Band 4-n40



Band 4-ac20



Band 4-ac40



Band 4-ac80



8. AUTOMATICALLY DISCONTINUE TRANSMISSION

8.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

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

8.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

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





9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

9.2 EUT ANTENNA

The EUT antenna is PIFA Antenna, the antenna connection port is located inside the product casing that will not be easily opened. It comply with the standard requirement. You can refer to KDB353028 D01 Antennas Part 15 Transmitters v01 (II. A. 2. b).





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※※※※※

