



FCC Part 15C Test Report

FCC ID: 2A6IP-CPE350S

Applicant: Shenzhen Kangda Xin Intelligent Network Technology Co., Ltd.

Address: Room 208, No. 151, polao village, Dafu community, Guanlan street, Longhua District, Shenzhen, China

Manufacturer: Shenzhen Kangda Xin Intelligent Network Technology Co., Ltd.

Address: Room 208, No. 151, polao village, Dafu community, Guanlan street, Longhua District, Shenzhen, China

EUT: Indoor & outdoor enterprise wireless bridge/CPE

Trade Mark: DODOLINK

Model Number: CPE350S
CPE300S, CPE300D, CPE350D, CPE352S, CPE352D, CPE353S, CPE353D, CPE355S, CPE355D, CPE356S, CPE358S, CPE359S, CPE520S, CPE520GS, CPE550S, CPE550GS, CPE580S, CPE920S, CPE980S

Date of Receipt: Apr. 20, 2022

Test Date: Apr. 20, 2022 – Apr. 29, 2022

Date of Report: Apr. 29, 2022

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

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Applicable Standards: FCC PART 15 C 15.407
ANSI C63.10:2013

Test Result: Pass

Report Number: DL-20220426038E

Prepared (Test Engineer): Pxing Huang

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This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.407 (b)	Band Edge Emission	PASS	
15.407 (a)	Average Output Power	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.403(i) 15.407(e)	6dB bandwidth and 99%dB Bandwidth	PASS	
15.407(g)	Frequency Stability	PASS	
15.407(c)	Transmission in case of Absence of Information	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

1.1 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	Conducted Emission Test	$\pm 2.56\text{dB}$
2	RF power,conducted	$\pm 0.42\text{dB}$
3	Spurious emissions,conducted	$\pm 2.76\text{dB}$
4	All emissions,radiated(<1G)	$\pm 3.65\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Indoor & outdoor enterprise wireless bridge/CPE
Trademark	N/A
Model No.:	CPE350S CPE300S,CPE300D,CPE350D,CPE352S,CPE352D,CPE353S,CPE353D,CPE355S,CPE355D,CPE356S,CPE358S,CPE359S,CPE520S,CPE520GS,CPE550S,CPE550GS,CPE580S,CPE920S,CPE980S
Model Difference	All samples are the same except the model name, so we prepare "CPE350S" for test only.
Operation Frequency:	5745-5825MHz(802.11a/n/ac(HT20)) 5755-5795MHz(802.11n/ac(HT40))
Channel numbers:	See channel list
Channel separation:	20MHz/40MHz
Modulation technology:	64QAM, 16QAM, QPSK, BPSK for OFDM
Rate of Transmitter	802.11a: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps 802.11n: Up to 500Mbps
Antenna Type:	Internal antenna*2
Antenna gain:	12dBi
Power supply:	DC 24V from charger
Adapter:	Model:LZD101-24W-24V Input: AC 100-240V 50/60Hz Output: DC 24V 1A

Note:

- 1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.The EUT's all information provided by client.
3. The max antenna gain is 12dBi, the Mimo mode gain is 15dBi



2. Channel List

Channel List for 802.11a/n(HT20)/ac(HT20)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

Channel List for 802.11n(HT40)/ac(HT40)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

2.2 DESCRIPTION OF TEST MODES

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

Description		
Pretest Mode	Channel	Band 4
Mode 1	802.11a/n/acHT20	CH149, CH157, CH165
Mode 2	802.11n/acHT40	CH151, CH159
Mode 3	Other	Link Mode

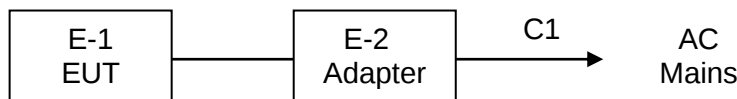
For Radiated Emission		
Pretest Mode	Channel	Band 4
Mode 1	802.11a/n/acHT20	CH149, CH157, CH165
Mode 2	802.11n/acHT40	CH151, CH159
Mode 3	Other	Link Mode

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



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted & Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.

Item	Equipment	Model/Type No.	Series No.	Note
E-1	Indoor & outdoor enterprise wireless bridge/CPE	CPE350S	N/A	EUT
E-2	Adapter	LZD101-24W-24V	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C1	No	No	0.5m	Mini USB Line

Note:

(1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the end product.

Max output power Setting				
Test software Version	Test program: AXDN-0002.0			
Mode	802.11a	802.11n HT20	802.11n HT40	802.11ac HT20/HT40
Data Rate	6Mbps	MSC0	MSC0	MSC0
Power Setting of Softwave	60	60	66	66



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 06, 2021	Nov. 05, 2022
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 06, 2021	Nov. 05, 2022
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 06, 2021	Nov. 05, 2022
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 06, 2021	Nov. 05, 2022
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 06, 2021	Nov. 05, 2022
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 06, 2021	Nov. 05, 2022
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 06, 2021	Nov. 05, 2022
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 06, 2021	Nov. 05, 2022
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 06, 2021	Nov. 05, 2022
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 06, 2021	Nov. 05, 2022
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 06, 2021	Nov. 05, 2022
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 06, 2021	Nov. 05, 2022
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 06, 2021	Nov. 05, 2022
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 06, 2021	Nov. 05, 2022
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 06, 2021	Nov. 05, 2022
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 06, 2021	Nov. 05, 2022

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Nov. 25, 2019	Nov. 24, 2022
2	EMI Receiver	R&S	ESR	101421	Nov. 06, 2021	Nov. 05, 2022
3	LISN	R&S	ENV216	102417	Nov. 06, 2021	Nov. 05, 2022
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 06, 2021	Nov. 05, 2022

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMCC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMCC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 - 0.5	66 - 56 *	56 - 46 *	FCC
0.5 - 5.0	56.00	46.00	FCC
5.0 - 30.0	60.00	50.00	FCC

Note:

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

The following table is the setting of the receiver

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

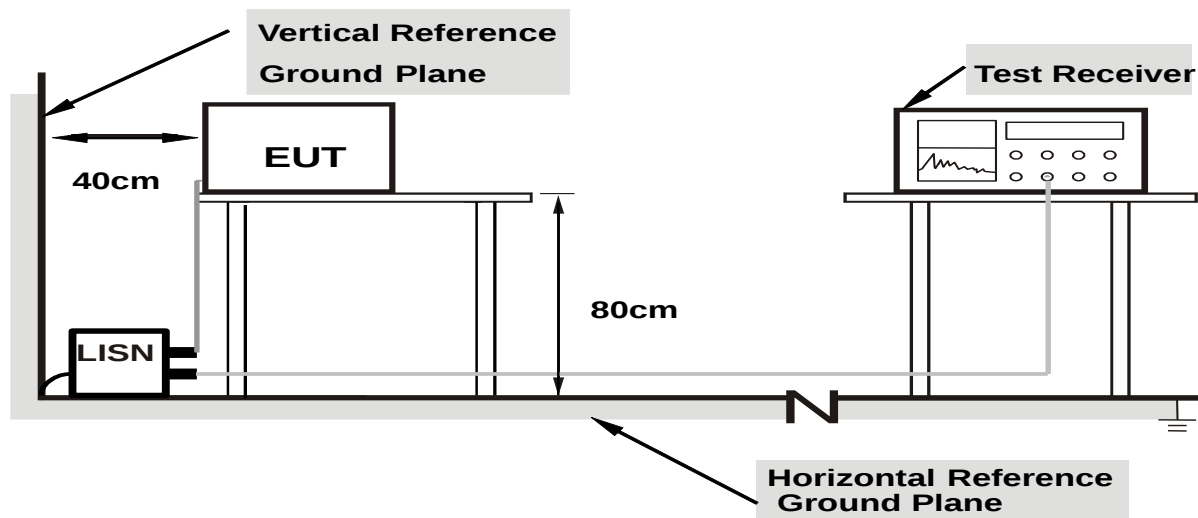
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



- Note:**
- 1.Support units were connected to second LISN.
 - 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

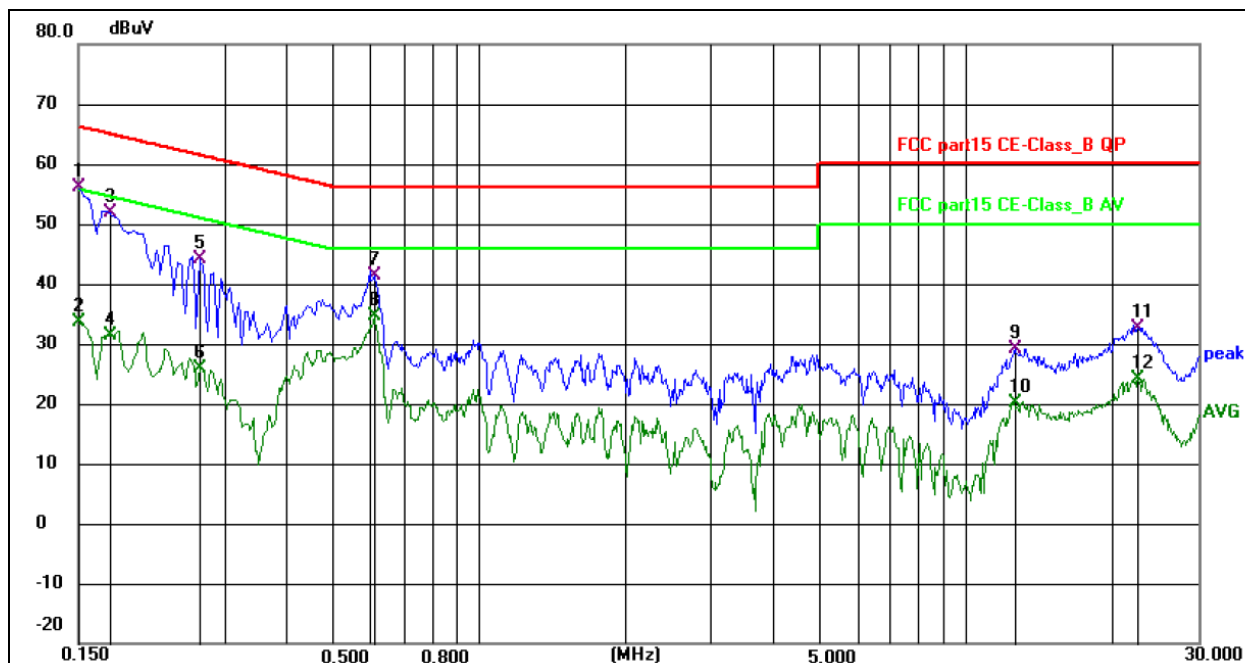
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 24.0V and AC 230V, the worst voltage was AC 24.0V and the data recording in the report.

3.1.6 TEST RESULTS



Temperature:	25 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 3



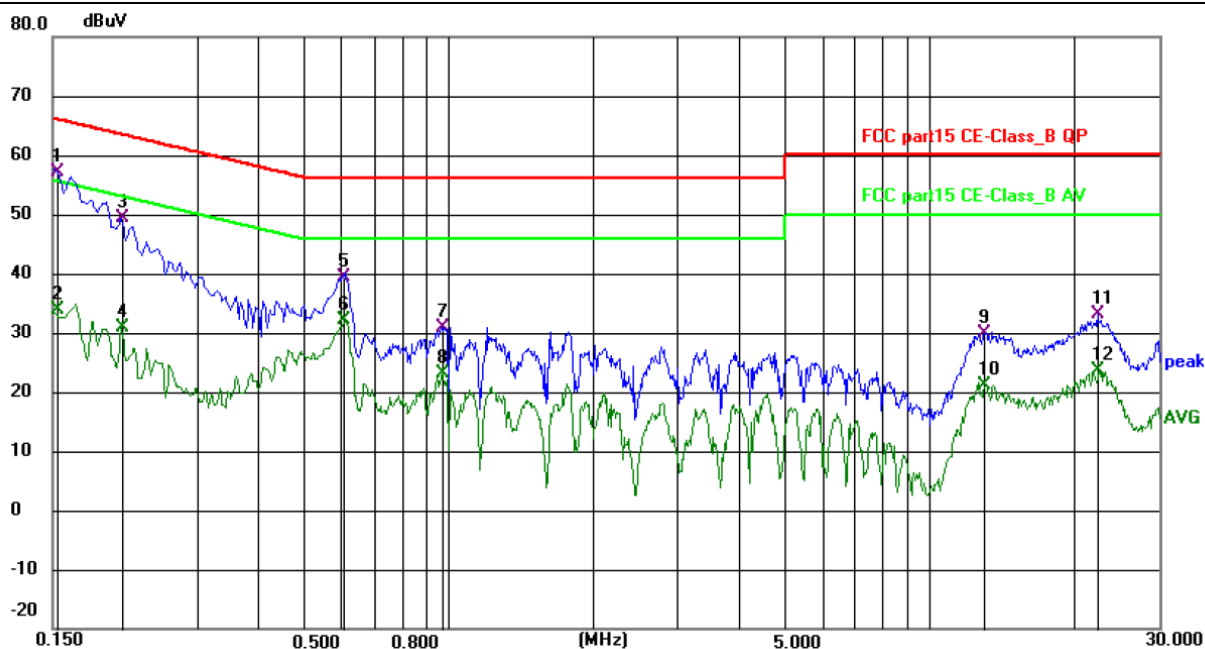
Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1500	45.60	10.50	56.10	66.00	9.90	QP	P	
2	0.1500	23.06	10.50	33.56	56.00	22.44	AVG	P	
3	0.1730	41.93	10.03	51.96	64.82	12.86	QP	P	
4	0.1730	21.44	10.03	31.47	54.82	23.35	AVG	P	
5	0.2670	34.80	9.22	44.02	61.21	17.19	QP	P	
6	0.2670	16.78	9.22	26.00	51.21	25.21	AVG	P	
7	0.6089	32.08	9.33	41.41	56.00	14.59	QP	P	
8	0.6089	25.18	9.33	34.51	46.00	11.49	AVG	P	
9	12.6420	19.07	10.01	29.08	60.00	30.92	QP	P	
10	12.6420	10.17	10.01	20.18	50.00	29.82	AVG	P	
11	22.5419	21.75	10.88	32.63	60.00	27.37	QP	P	
12	22.5419	13.15	10.88	24.03	50.00	25.97	AVG	P	



Temperature:	25 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 3



Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1532	46.99	10.25	57.24	65.82	8.58	QP	P	
2	0.1532	23.60	10.25	33.85	55.82	21.97	AVG	P	
3	0.2085	40.46	8.87	49.33	63.26	13.93	QP	P	
4	0.2085	21.94	8.87	30.81	53.26	22.45	AVG	P	
5	0.6011	30.24	9.25	39.49	56.00	16.51	QP	P	
6	0.6011	22.87	9.25	32.12	46.00	13.88	AVG	P	
7	0.9645	21.50	9.39	30.89	56.00	25.11	QP	P	
8	0.9645	13.86	9.39	23.25	46.00	22.75	AVG	P	
9	13.0470	19.67	10.19	29.86	60.00	30.14	QP	P	
10	13.0470	11.05	10.19	21.24	50.00	28.76	AVG	P	
11	22.4025	22.18	10.87	33.05	60.00	26.95	QP	P	
12	22.4025	12.86	10.87	23.73	50.00	26.27	AVG	P	



3.2 RADIATED EMISSION MEASUREMENT

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

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

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)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

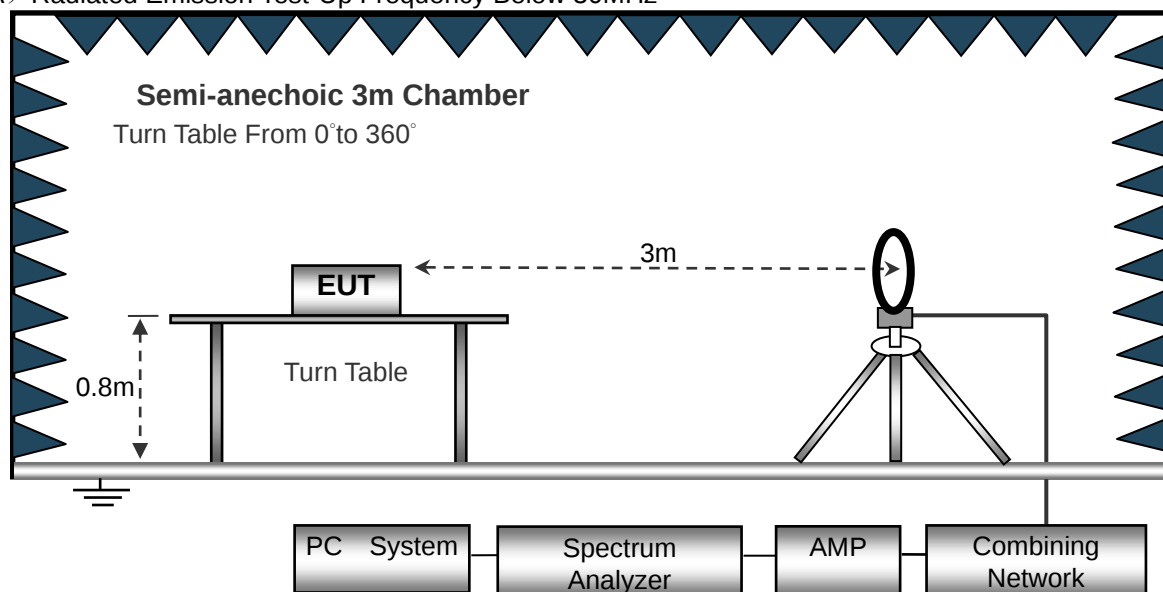
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

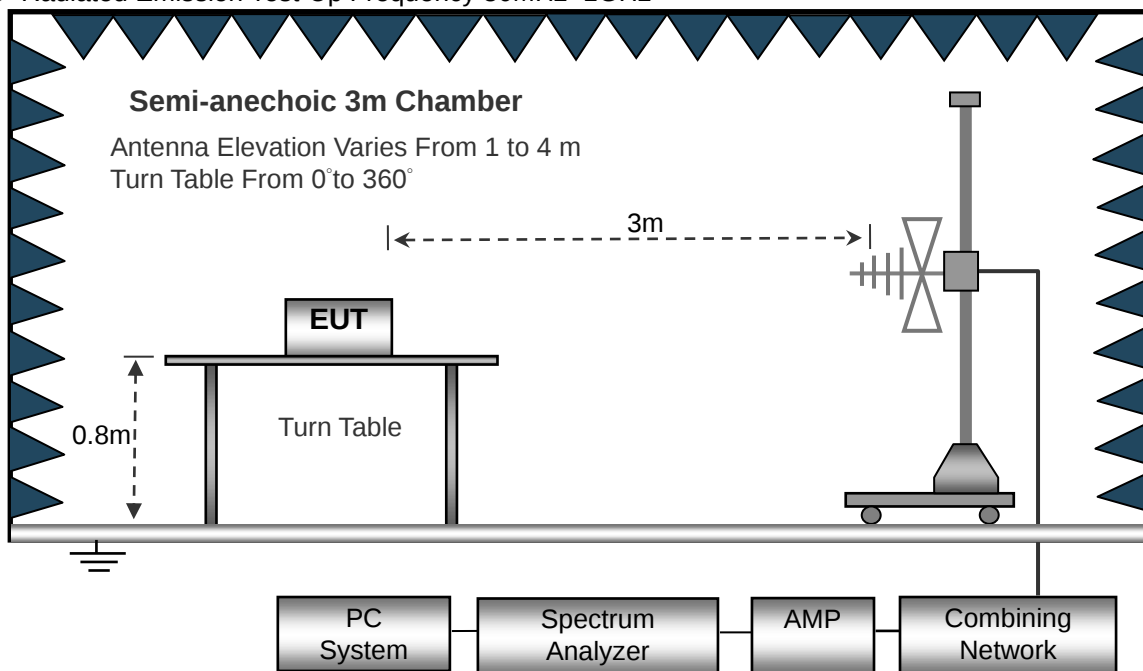
No deviation

3.2.4 TEST SETUP

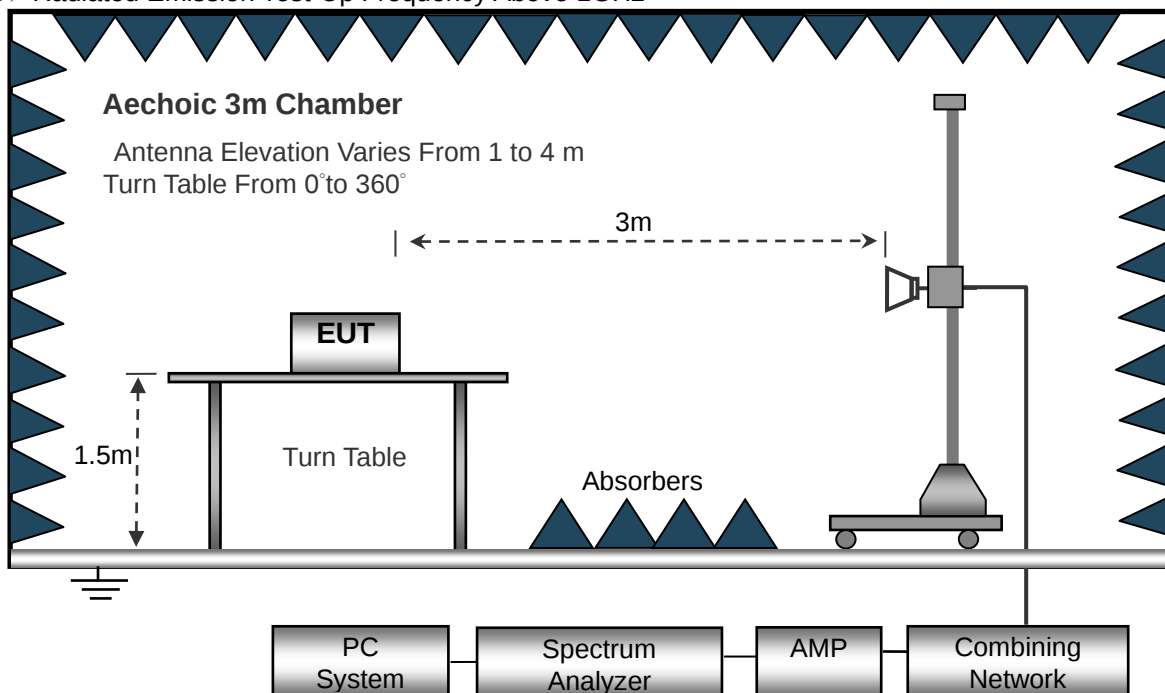
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 EUT OPERATING 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.

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

Temperature:	20°C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 3	Polarization :	--

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

NOTE:

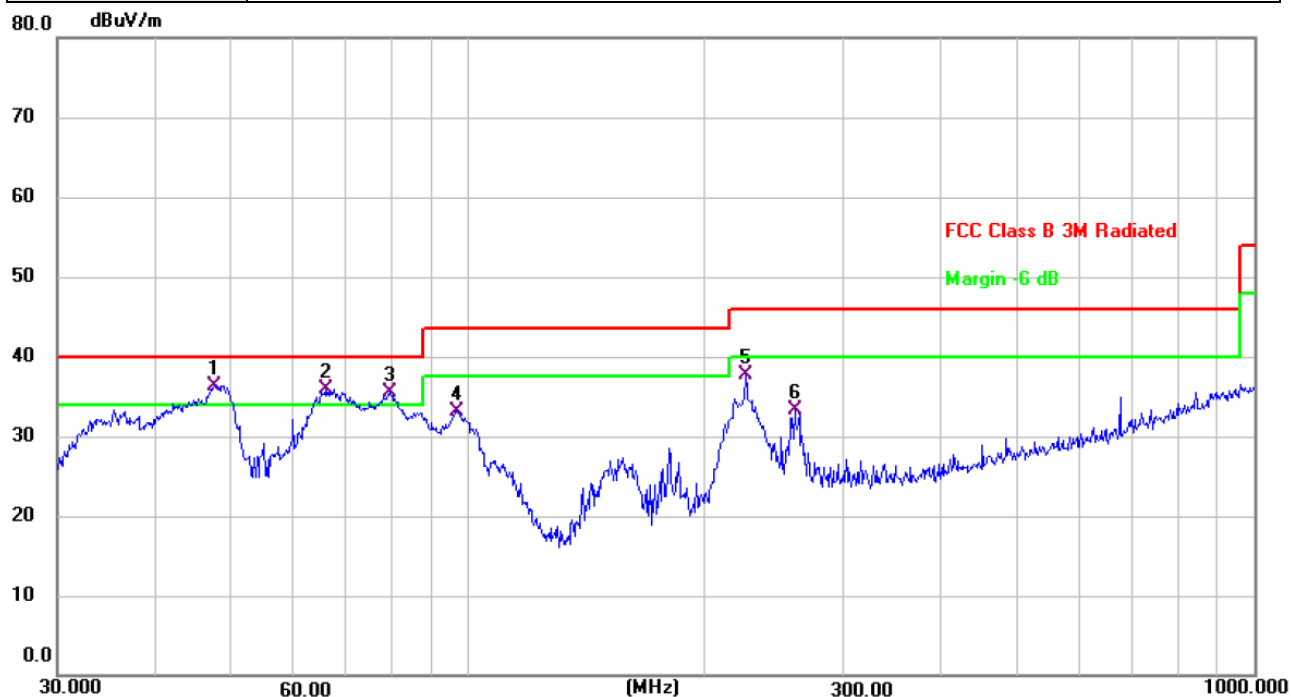
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

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

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 3		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	47.4918	47.88	-11.48	36.40	40.00	-3.60	QP
2	!	66.0342	49.80	-13.81	35.99	40.00	-4.01	QP
3	!	79.5209	52.66	-17.07	35.59	40.00	-4.41	QP
4		96.7749	48.27	-15.18	33.09	43.50	-10.41	QP
5		225.3080	49.65	-11.96	37.69	46.00	-8.31	QP
6		260.1444	44.01	-10.68	33.33	46.00	-12.67	QP

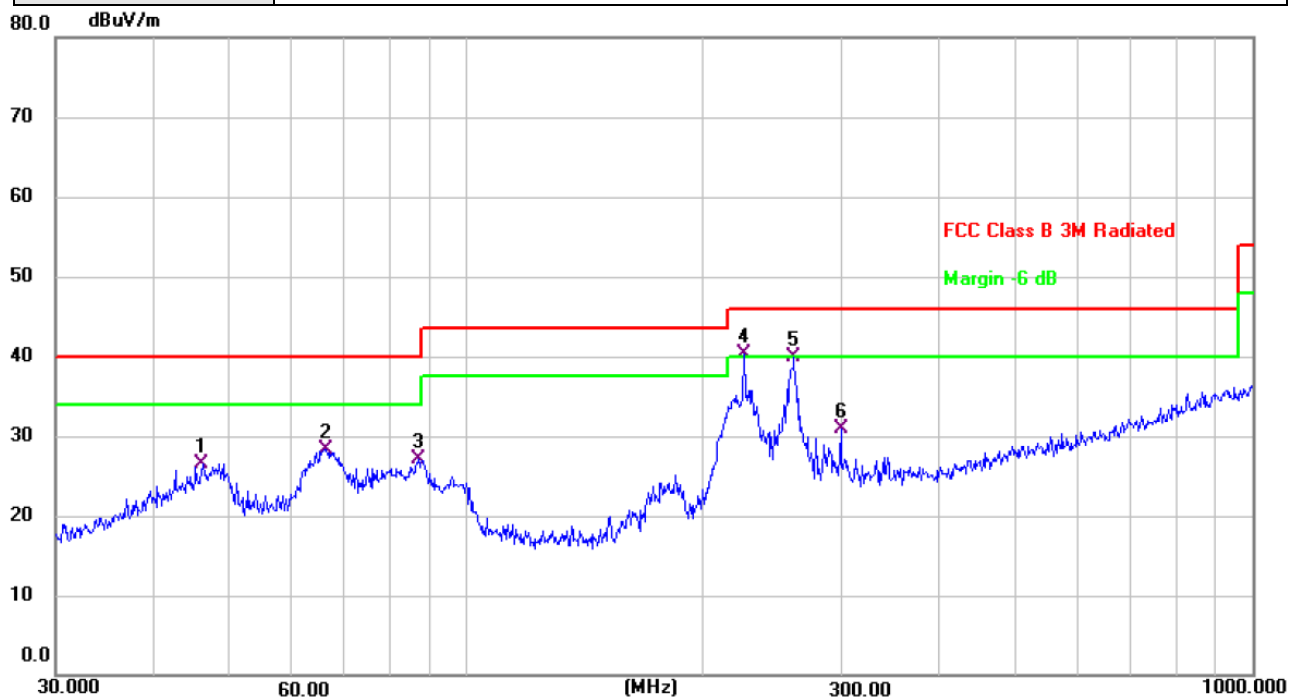
Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;



Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
test voltage :	AC 120V/60Hz		
Test Mode :	Mode 3		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Margin dB	Detector
1		46.1779	38.27	-11.73	26.54	40.00	-13.46	QP
2		66.2662	41.25	-12.88	28.37	40.00	-11.63	QP
3		86.8068	43.02	-15.87	27.15	40.00	-12.85	QP
4	*	225.3080	52.80	-12.51	40.29	46.00	-5.71	QP
5		261.0583	51.42	-11.52	39.90	46.00	-6.10	QP
6		299.3158	41.61	-10.71	30.90	46.00	-15.10	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

**3.2.8 TEST RESULTS (1ghz~40ghZ)**

802.11a ant1

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	53.53	49.05	15.3	37.39	57.17	74.0	-16.83	PK
V	11490	41.30	49.05	15.3	37.39	44.94	54.0	-9.06	AV
V	17235	51.00	49.16	15.27	40.45	57.56	68.2	-10.64	PK
V	17235	43.62	49.16	15.27	40.45	50.18	68.2	-18.02	AV
H	11490	50.57	49.05	15.3	37.39	54.21	74.0	-19.79	PK
H	11490	45.24	49.05	15.3	37.39	48.88	54.0	-5.12	AV
H	17235	50.91	49.16	15.27	40.45	57.47	68.2	-10.73	PK
H	17235	43.49	49.16	15.27	40.45	50.05	68.2	-18.15	AV
operation frequency:5785									
V	11570	51.10	49.09	15.34	37.42	54.77	74.0	-19.23	PK
V	11570	45.19	49.09	15.34	37.42	48.86	54.0	-5.14	AV
V	17355	50.80	49.18	15.29	40.47	57.38	68.2	-10.82	PK
V	17355	43.28	49.18	15.29	40.47	49.86	68.2	-18.34	AV
H	11570	50.44	49.09	15.34	37.42	54.11	74.0	-19.89	PK
H	11570	45.50	49.09	15.34	37.42	49.17	54.0	-4.83	AV
H	17355	48.61	49.18	15.29	40.47	55.19	68.2	-13.01	PK
H	17355	43.22	49.18	15.29	40.47	49.80	68.2	-18.40	AV
operation frequency:5825									
V	11650	52.47	49.11	15.37	37.46	56.19	74.0	-17.81	PK
V	11650	45.13	49.11	15.37	37.46	48.85	54.0	-5.15	AV
V	17475	49.58	49.21	15.34	40.51	56.22	68.2	-11.98	PK
V	17475	43.49	49.21	15.34	40.51	50.13	68.2	-18.07	AV
H	11650	57.16	49.11	15.37	31.31	54.73	74.0	-19.27	PK
H	11650	51.44	49.11	15.37	31.31	49.01	54.0	-4.99	AV
H	17475	49.90	49.21	15.34	40.51	56.54	68.2	-11.66	PK
H	17475	42.53	49.21	15.34	40.51	49.17	68.2	-19.03	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11a ant2

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	53.49	49.05	15.3	37.39	57.13	74.0	-16.87	PK
V	11490	41.27	49.05	15.3	37.39	44.91	54.0	-9.09	AV
V	17235	50.96	49.16	15.27	40.45	57.52	68.2	-10.68	PK
V	17235	43.58	49.16	15.27	40.45	50.14	68.2	-18.06	AV
H	11490	50.53	49.05	15.3	37.39	54.17	74.0	-19.83	PK
H	11490	45.20	49.05	15.3	37.39	48.84	54.0	-5.16	AV
H	17235	50.87	49.16	15.27	40.45	57.43	68.2	-10.77	PK
H	17235	43.45	49.16	15.27	40.45	50.01	68.2	-18.19	AV
operation frequency:5785									
V	11570	51.06	49.09	15.34	37.42	54.73	74.0	-19.27	PK
V	11570	45.15	49.09	15.34	37.42	48.82	54.0	-5.18	AV
V	17355	50.76	49.18	15.29	40.47	57.34	68.2	-10.86	PK
V	17355	43.24	49.18	15.29	40.47	49.82	68.2	-18.38	AV
H	11570	50.40	49.09	15.34	37.42	54.07	74.0	-19.93	PK
H	11570	45.46	49.09	15.34	37.42	49.13	54.0	-4.87	AV
H	17355	48.57	49.18	15.29	40.47	55.15	68.2	-13.05	PK
H	17355	43.18	49.18	15.29	40.47	49.76	68.2	-18.44	AV
operation frequency:5825									
V	11650	52.43	49.11	15.37	37.46	56.15	74.0	-17.85	PK
V	11650	45.09	49.11	15.37	37.46	48.81	54.0	-5.19	AV
V	17475	49.54	49.21	15.34	40.51	56.18	68.2	-12.02	PK
V	17475	43.45	49.21	15.34	40.51	50.09	68.2	-18.11	AV
H	11650	57.11	49.11	15.37	31.31	54.68	74.0	-19.32	PK
H	11650	51.40	49.11	15.37	31.31	48.97	54.0	-5.03	AV
H	17475	49.86	49.21	15.34	40.51	56.50	68.2	-11.70	PK
H	17475	42.50	49.21	15.34	40.51	49.14	68.2	-19.06	AV
Remark: 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit 2. If peak below the average limit, the average emission was no test. 3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.									



802.11n HT20 mimo

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	49.13	49.05	15.3	37.39	52.77	74.0	-21.23	PK
V	11490	45.29	49.05	15.3	37.39	48.93	54.0	-5.07	AV
V	17235	48.21	49.16	15.27	40.45	54.77	68.2	-13.43	PK
V	17235	43.50	49.16	15.27	40.45	50.06	68.2	-18.14	AV
H	11490	49.27	49.05	15.3	37.39	52.91	74.0	-21.09	PK
H	11490	45.39	49.05	15.3	37.39	49.03	54.0	-4.97	AV
H	17235	48.14	49.16	15.27	40.45	54.70	68.2	-13.50	PK
H	17235	44.52	49.16	15.27	40.45	51.08	68.2	-17.12	AV
operation frequency:5785									
V	11570	52.33	49.09	15.34	37.42	56.00	74.0	-18.00	PK
V	11570	44.42	49.09	15.34	37.42	48.09	54.0	-5.91	AV
V	17355	49.19	49.18	15.29	40.47	55.77	68.2	-12.43	PK
V	17355	43.61	49.18	15.29	40.47	50.19	68.2	-18.01	AV
H	11570	49.27	49.09	15.34	37.42	52.94	74.0	-21.06	PK
H	11570	43.48	49.09	15.34	37.42	47.15	54.0	-6.85	AV
H	17355	49.31	49.18	15.29	40.47	55.89	68.2	-12.31	PK
H	17355	43.13	49.18	15.29	40.47	49.71	68.2	-18.49	AV
operation frequency:5825									
V	11650	51.32	49.11	15.37	37.46	55.04	74.0	-18.96	PK
V	11650	44.68	49.11	15.37	37.46	48.40	54.0	-5.60	AV
V	17475	48.30	49.21	15.34	40.51	54.94	68.2	-13.26	PK
V	17475	43.54	49.21	15.34	40.51	50.18	68.2	-18.02	AV
H	11650	57.10	49.11	15.37	31.31	54.67	74.0	-19.33	PK
H	11650	44.29	49.11	15.37	31.31	41.86	54.0	-12.14	AV
H	17475	49.10	49.21	15.34	40.51	55.74	68.2	-12.46	PK
H	17475	44.51	49.21	15.34	40.51	51.15	68.2	-17.05	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11n HT40 mimo

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBUV)	(dB)	(dB)	(dB/m)	(dBUV/m)	(dBUV/m)	(dB)	
operation frequency:5755									
V	11510	49.24	49.07	15.33	37.41	52.91	74.0	-21.09	PK
V	11510	45.12	49.07	15.33	37.41	48.79	54.0	-5.21	AV
V	17265	49.08	49.17	15.28	40.46	55.65	68.2	-12.55	PK
V	17265	43.53	49.17	15.28	40.46	50.10	68.2	-18.10	AV
H	11510	48.22	49.07	15.33	37.41	51.89	74.0	-22.11	PK
H	11510	45.41	49.07	15.33	37.41	49.08	54.0	-4.92	AV
H	17265	49.49	49.17	15.28	40.46	56.06	68.2	-12.14	PK
H	17265	44.50	49.17	15.28	40.46	51.07	68.2	-17.13	AV
operation frequency:5795									
V	11590	49.27	49.11	15.37	37.46	52.99	74.0	-21.01	PK
V	11590	44.51	49.11	15.37	37.46	48.23	54.0	-5.77	AV
V	17385	48.30	49.21	15.34	40.51	54.94	68.2	-13.26	PK
V	17385	43.47	49.21	15.34	40.51	50.11	68.2	-18.09	AV
H	11590	57.23	49.11	15.37	31.31	54.80	74.0	-19.20	PK
H	11590	44.44	49.11	15.37	31.31	42.01	54.0	-11.99	AV
H	17385	48.13	49.21	15.34	40.51	54.77	68.2	-13.43	PK
H	17385	44.62	49.21	15.34	40.51	51.26	68.2	-16.94	AV
Remark: 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit 2. If peak below the average limit, the average emission was no test. 3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.									



802.11ac HT20 mimo

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	49.30	49.05	15.3	37.39	52.94	74.0	-21.06	PK
V	11490	45.48	49.05	15.3	37.39	49.12	54.0	-4.88	AV
V	17235	48.34	49.16	15.27	40.45	54.90	68.2	-13.30	PK
V	17235	43.38	49.16	15.27	40.45	49.94	68.2	-18.26	AV
H	11490	48.31	49.05	15.3	37.39	51.95	74.0	-22.05	PK
H	11490	45.42	49.05	15.3	37.39	49.06	54.0	-4.94	AV
H	17235	48.24	49.16	15.27	40.45	54.80	68.2	-13.40	PK
H	17235	44.19	49.16	15.27	40.45	50.75	68.2	-17.45	AV
operation frequency:5785									
V	11570	48.30	49.09	15.34	37.42	51.97	74.0	-22.03	PK
V	11570	44.81	49.09	15.34	37.42	48.48	54.0	-5.52	AV
V	17355	49.38	49.18	15.29	40.47	55.96	68.2	-12.24	PK
V	17355	43.14	49.18	15.29	40.47	49.72	68.2	-18.48	AV
H	11570	49.57	49.09	15.34	37.42	53.24	74.0	-20.76	PK
H	11570	43.42	49.09	15.34	37.42	47.09	54.0	-6.91	AV
H	17355	49.10	49.18	15.29	40.47	55.68	68.2	-12.52	PK
H	17355	43.49	49.18	15.29	40.47	50.07	68.2	-18.13	AV
operation frequency:5825									
V	11650	49.13	49.11	15.37	37.46	52.85	74.0	-21.15	PK
V	11650	44.59	49.11	15.37	37.46	48.31	54.0	-5.69	AV
V	17475	48.54	49.21	15.34	40.51	55.18	68.2	-13.02	PK
V	17475	43.50	49.21	15.34	40.51	50.14	68.2	-18.06	AV
H	11650	57.10	49.11	15.37	31.31	54.67	74.0	-19.33	PK
H	11650	44.54	49.11	15.37	31.31	42.11	54.0	-11.89	AV
H	17475	48.22	49.21	15.34	40.51	54.86	68.2	-13.34	PK
H	17475	44.27	49.21	15.34	40.51	50.91	68.2	-17.29	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11ac HT40 mimo

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5755									
V	11510	49.40	49.07	15.33	37.41	53.07	74.0	-20.93	PK
V	11510	45.19	49.07	15.33	37.41	48.86	54.0	-5.14	AV
V	17265	48.24	49.17	15.28	40.46	54.81	68.2	-13.39	PK
V	17265	43.60	49.17	15.28	40.46	50.17	68.2	-18.03	AV
H	11510	48.28	49.07	15.33	37.41	51.95	74.0	-22.05	PK
H	11510	45.12	49.07	15.33	37.41	48.79	54.0	-5.21	AV
H	17265	48.50	49.17	15.28	40.46	55.07	68.2	-13.13	PK
H	17265	44.23	49.17	15.28	40.46	50.80	68.2	-17.40	AV
operation frequency:5795									
V	11590	49.51	49.11	15.37	37.46	53.23	74.0	-20.77	PK
V	11590	44.33	49.11	15.37	37.46	48.05	54.0	-5.95	AV
V	17385	48.11	49.21	15.34	40.51	54.75	68.2	-13.45	PK
V	17385	43.62	49.21	15.34	40.51	50.26	68.2	-17.94	AV
H	11590	57.10	49.11	15.37	31.31	54.67	74.0	-19.33	PK
H	11590	44.83	49.11	15.37	31.31	42.40	54.0	-11.60	AV
H	17385	48.61	49.21	15.34	40.51	55.25	68.2	-12.95	PK
H	17385	44.49	49.21	15.34	40.51	51.13	68.2	-17.07	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

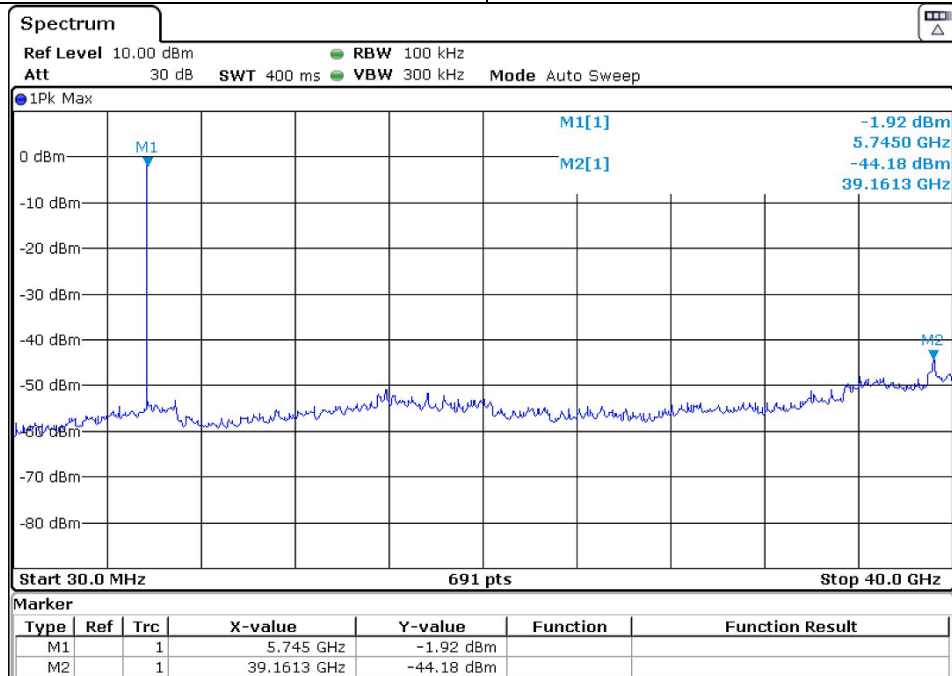


For Conducted

During the test, pre-scan the all modulation, the modulation below were found ant1 (802.11a Lowest channel, 802.11n(HT40) Lowest channel) to have the worst test results, Only the worst test results are shown in the report.

Test channel:

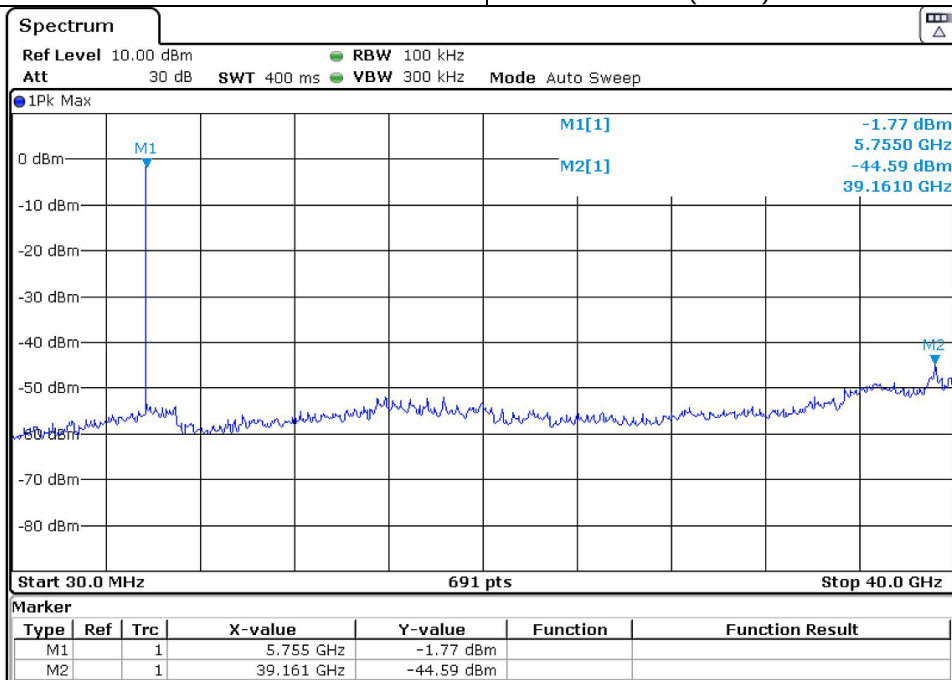
Band 4/802.11a Lowest channel



30MHz~40GHz

Test channel:

Band 4/802.11n(HT40) Lowest channel



30MHz~40GHz



3.3 BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.407

For transmitters operating in the 5.725-5.85 GHz band: 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 10dBm/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.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	5565MHz
Stop Frequency	6005MHz
RB / VB (emission in restricted band)	1 MHz / 3 MHz

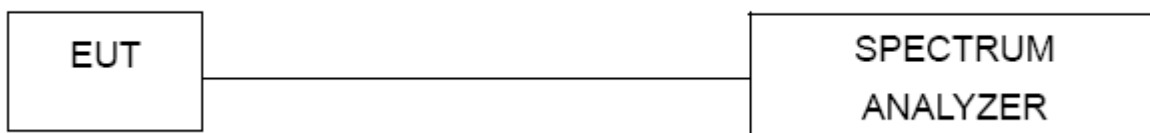
3.3.2 TEST PROCEDURE

Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



3.3.5 EUT OPERATING 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.

3.3.6 TEST RESULT

Note: the test result of ANT1 and ANT2 are all attenuated 3dB below the limit, So the MIMO is passed.

For Conducted
Ant1

802.11a

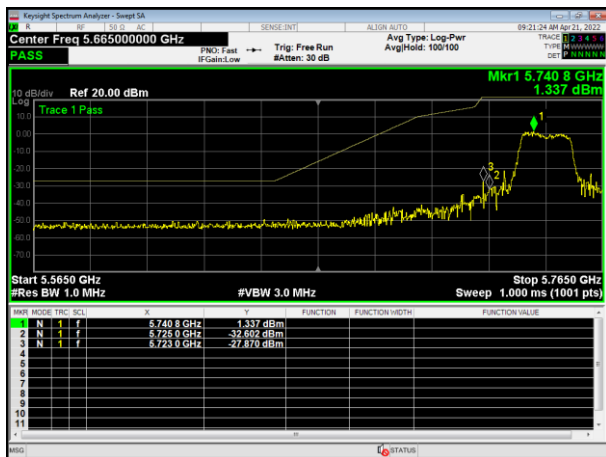


5745MHz



5825MHz

802.11n HT20

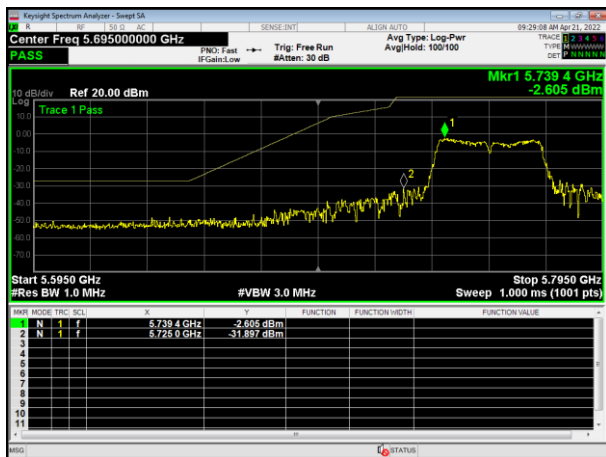


5745MHz



5825MHz

802.11n HT40



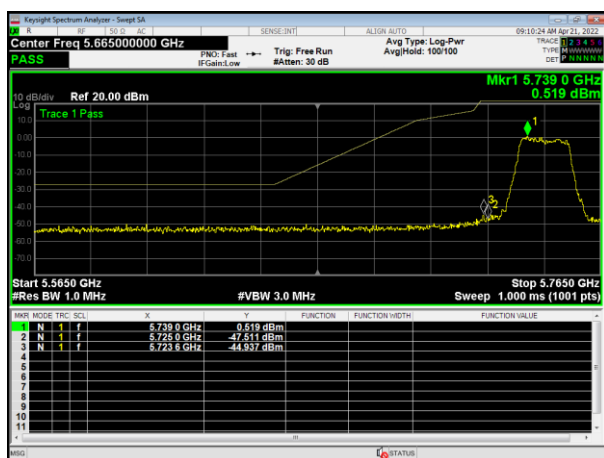
5755MHz



5795MHz



802.11ac HT20

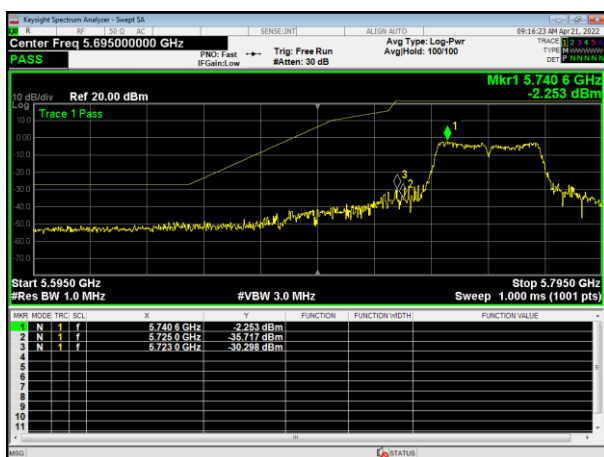


5745MHz



5825MHz

802.11ac HT40



5755MHz



5795MHz



Ant2

802.11a



5745MHz

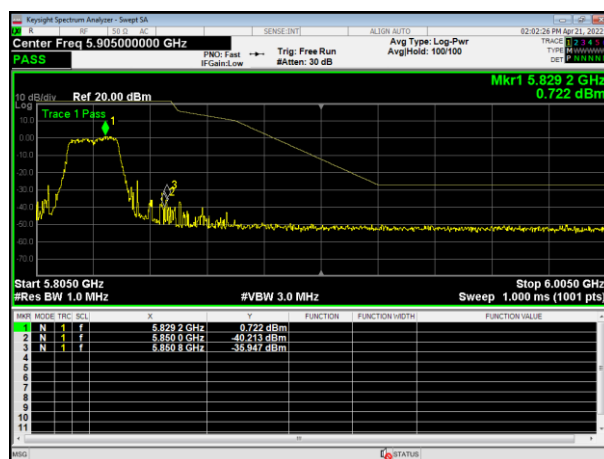


5825MHz

802.11n HT20

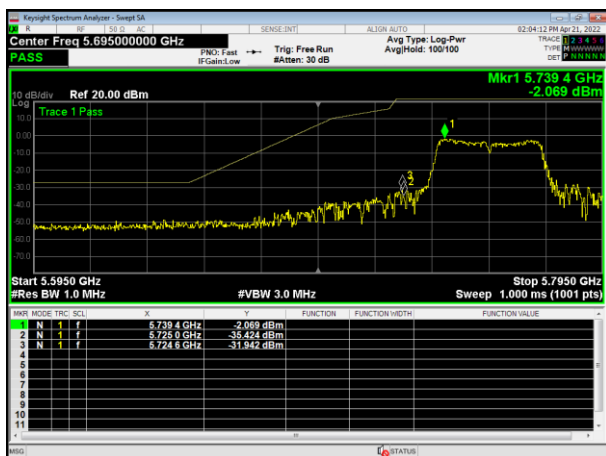


5745MHz



5825MHz

802.11n HT40



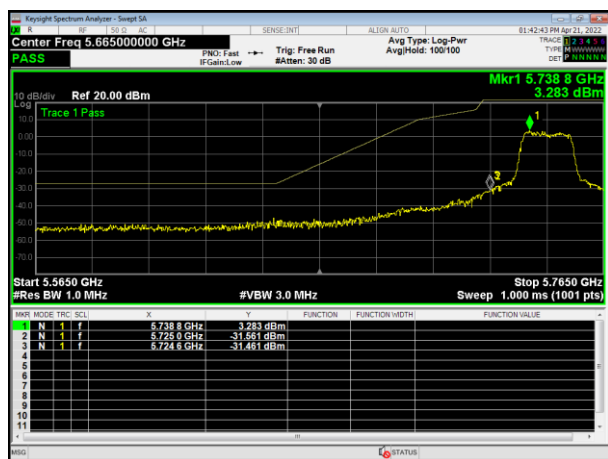
5755MHz



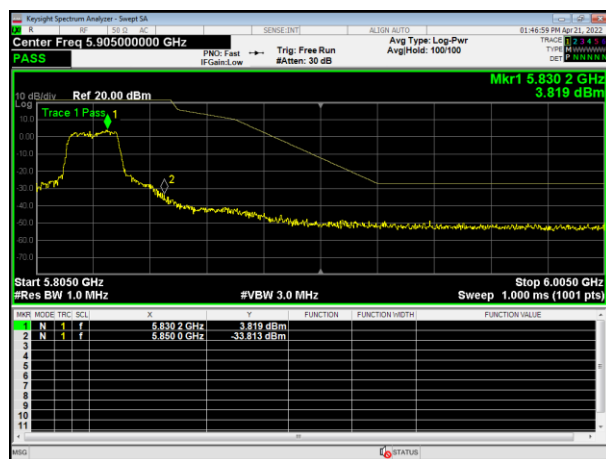
5795MHz



802.11ac HT20

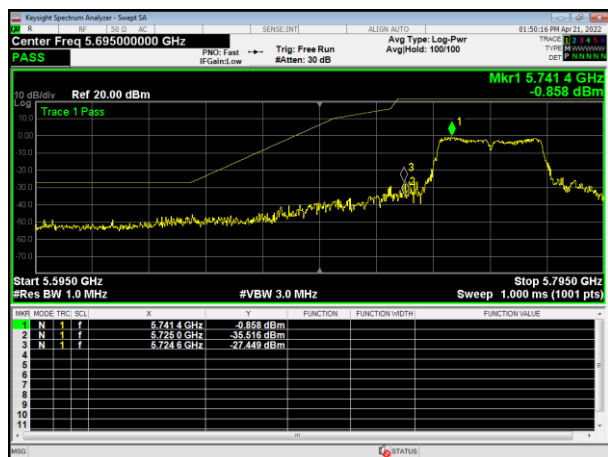


5745MHz



5825MHz

802.11ac HT40



5755MHz



5795MHz



4. AVERAGE OUTPUT POWER

4.1 APPLIED PROCEDURES / LIMIT

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

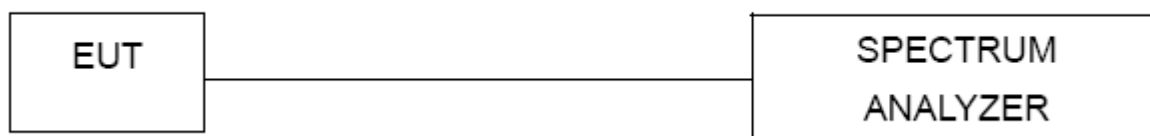
4.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- b. Measure the duty cycle D of the transmitter output signal as described in 11.6.
Set span to at least 1.5 times the OBW.
Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
Set VBW $\geq [3 \times \text{RBW}]$.
Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
Sweep time = auto.
Detector = RMS (i.e., power averaging), if available. Otherwise, use the sample detector mode.
Do not use sweep triggering. Allow the sweep to “free run.”
Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
Compute power by integrating the spectrum across the OBW of the signal using the instrument’ s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ if the duty cycle is 25%.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 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.

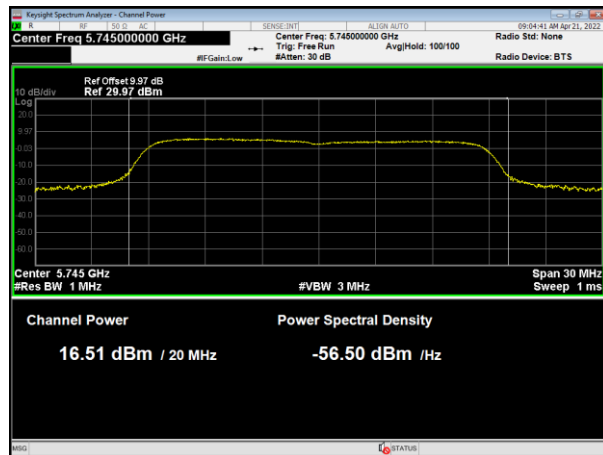
**4.1.5 TEST RESULTS**

Band	Mode	Test Channel	Read Level (dBm)		Duty Fator (dB)	Total Output Power(dB)			LIMIT (dBm)
			Ant1	Ant2		Ant1	Ant2	MIMO	
Band 4	802.11a	Low	16.51	16.39	0.14	16.65	16.53		24
		Moddle	16.93	16.08	0.13	17.06	16.21		24
		High	15.88	16.09	0.13	16.01	16.22		24
	802.11ac HT20	Low	13.95	15.13	0.82	14.77	15.95	18.41	21
		Moddle	15.12	13.90	0.86	15.98	14.76	18.42	21
		High	15.03	13.72	0.77	15.80	14.49	18.20	21
	802.11ac HT40	Low	12.72	13.59	0.28	13.00	13.87	16.47	21
		High	13.49	13.01	0.3	13.79	13.31	16.57	21
	802.11n HT20	Low	12.70	15.29	0.14	12.84	15.43	17.34	21
		Moddle	13.47	15.31	0.14	13.61	15.45	17.64	21
		High	13.41	15.77	0.14	13.55	15.91	17.90	21
	802.11n HT40	Low	13.21	15.04	0.27	13.48	15.31	17.50	21
		High	13.73	14.62	0.27	14.00	14.89	17.48	21

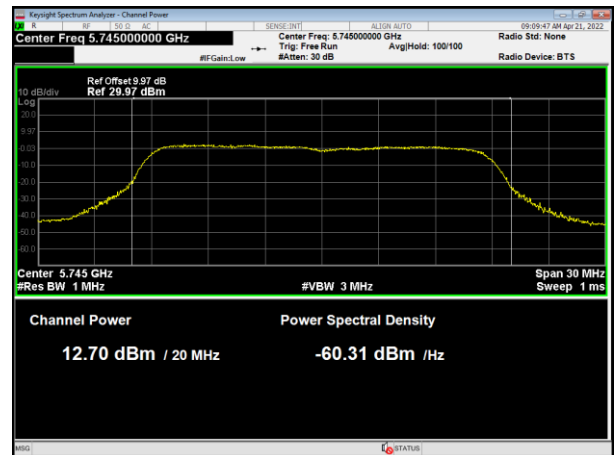


ANT1

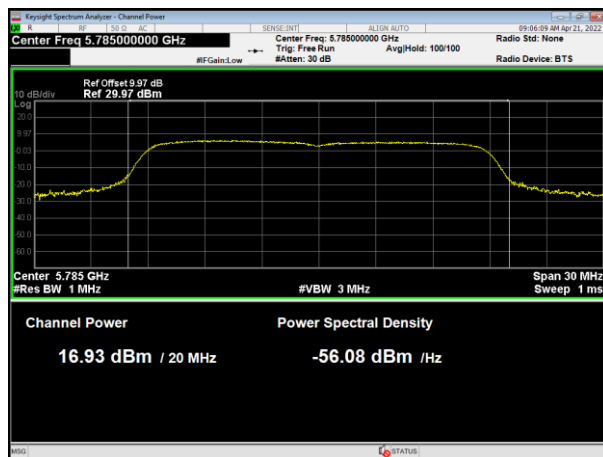
802.11a



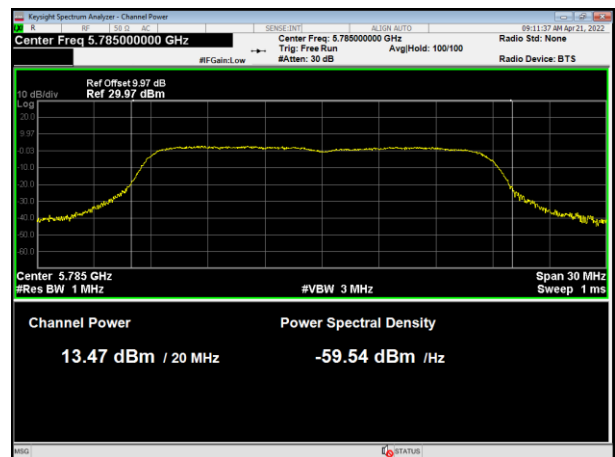
802.11n HT20



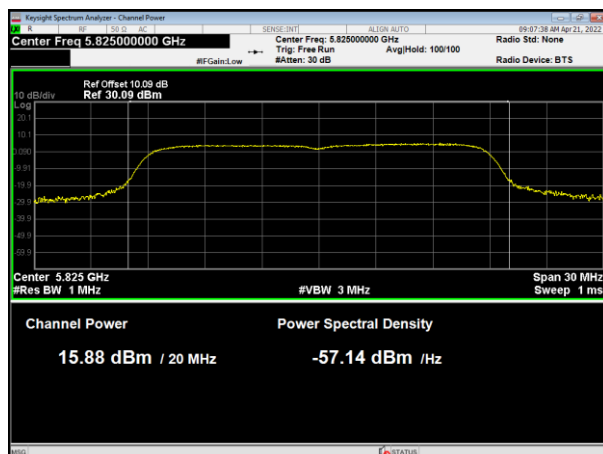
5745MHz



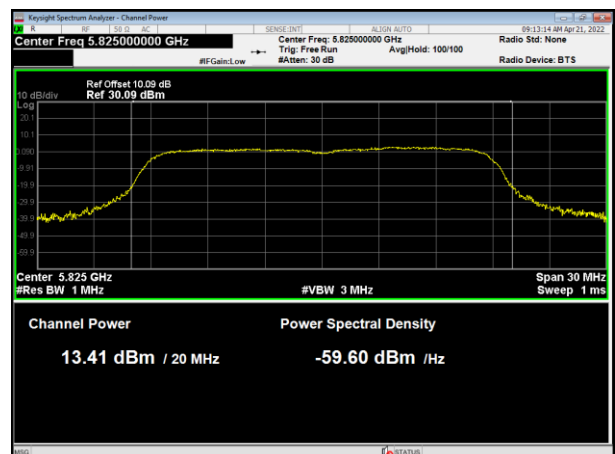
5745MHz



5785MHz



5785MHz

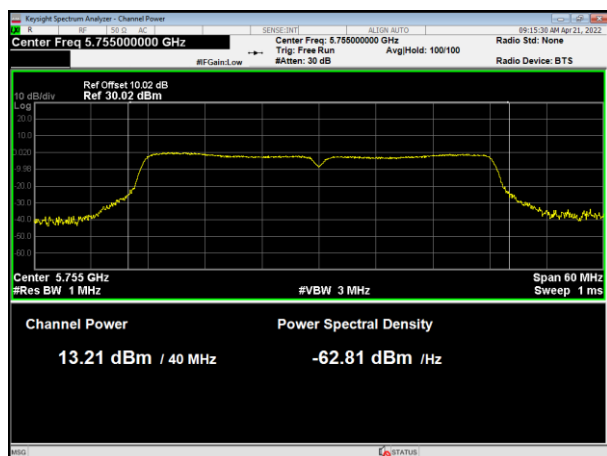


5825MHz

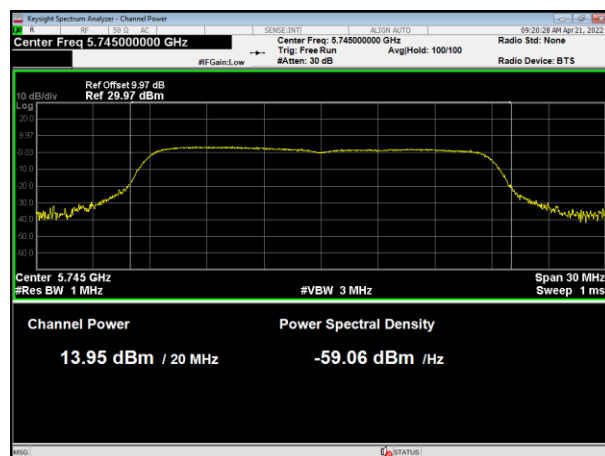
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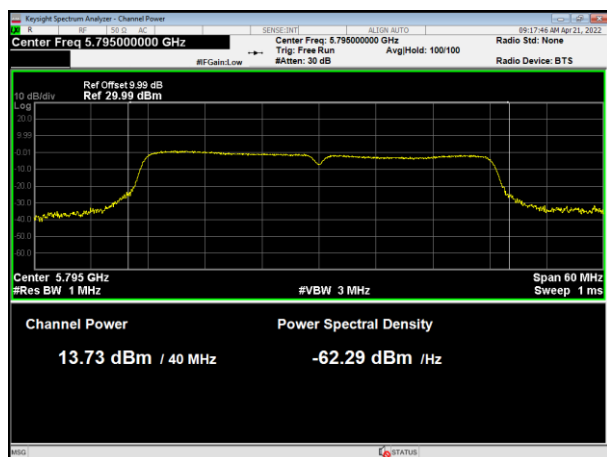
802.11n HT40



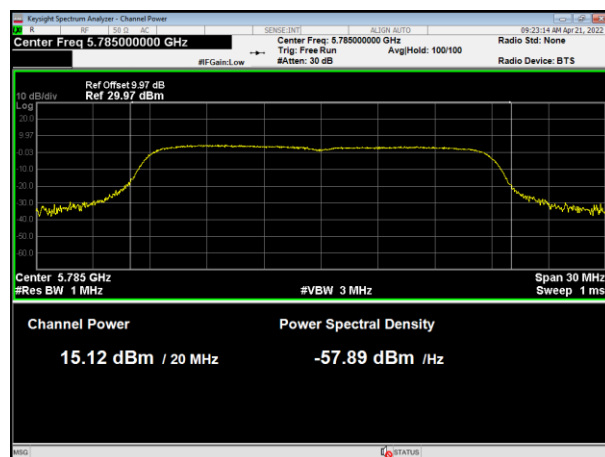
802.11ac HT20



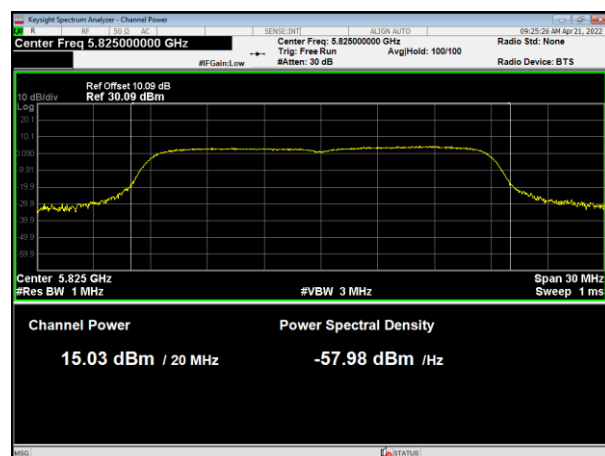
5755MHz



5745MHz



5795MHz

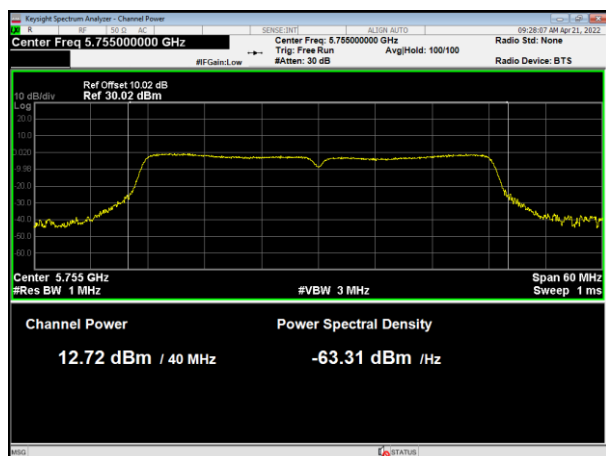


5785MHz

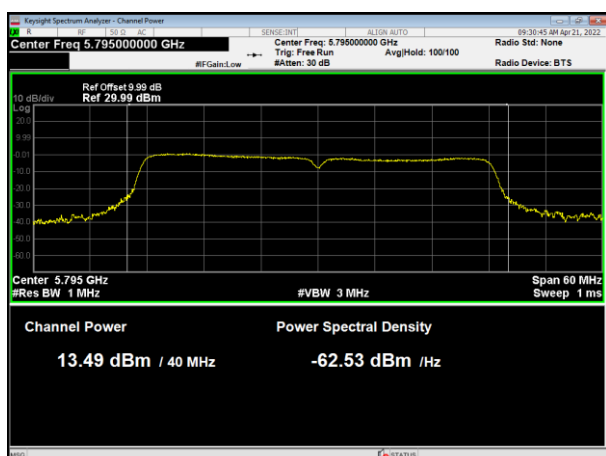
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802.11ac HT40



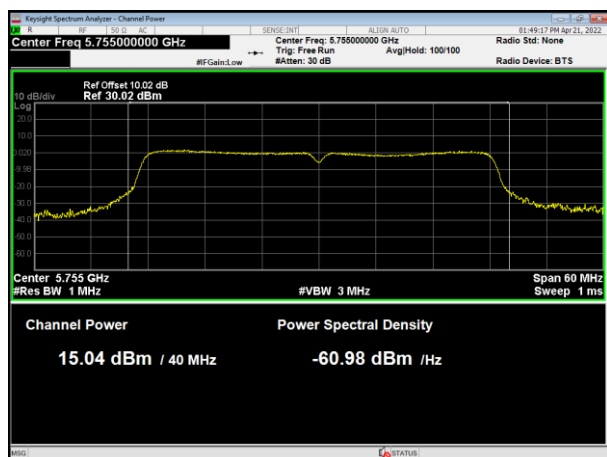
5755MHz



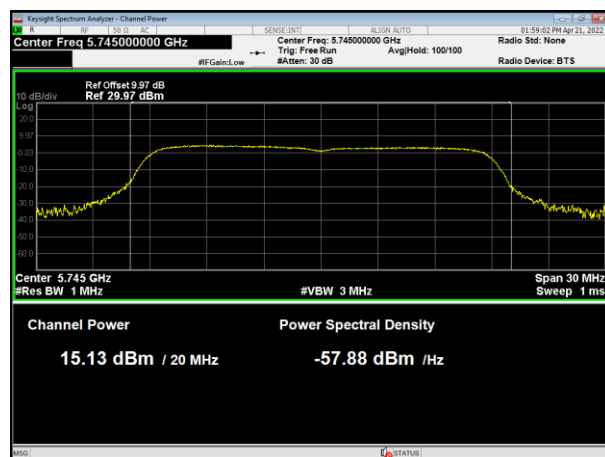
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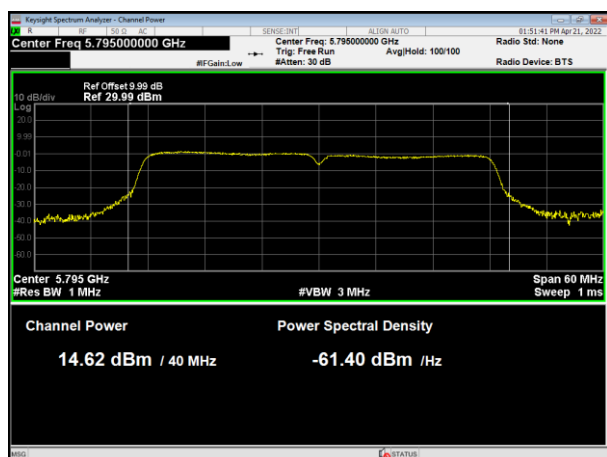
802.11n HT40



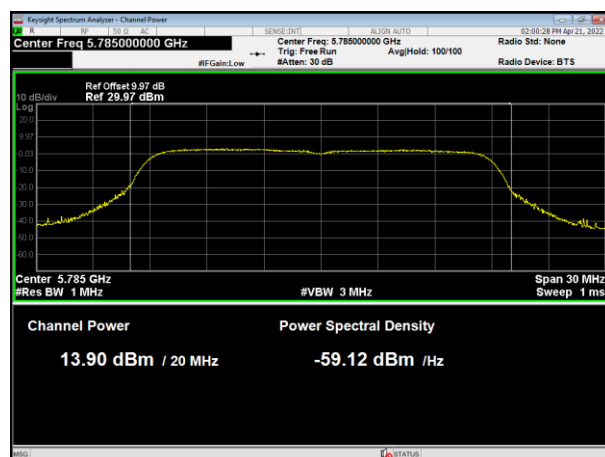
802.11ac HT20



5755MHz

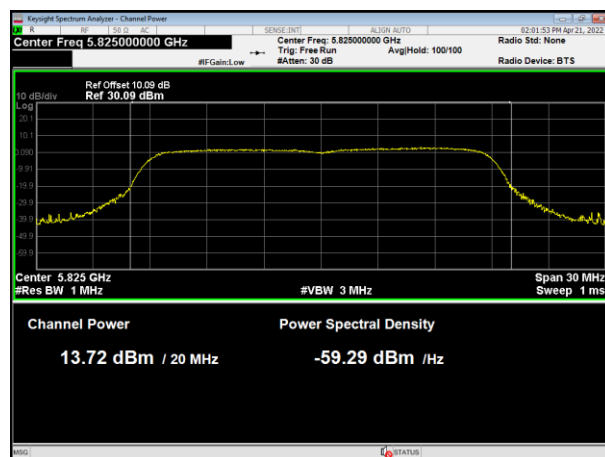


5745MHz



5795MHz

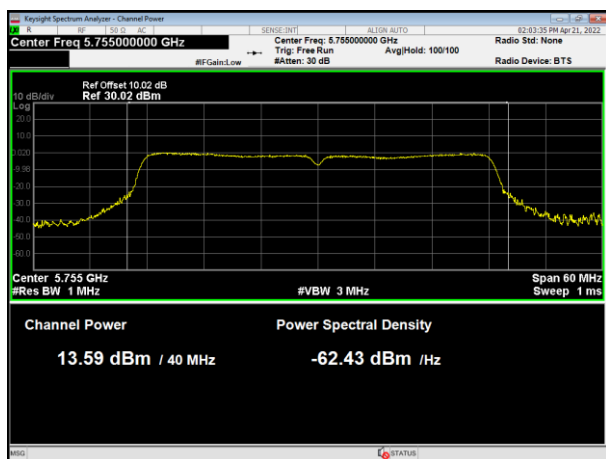
5785MHz



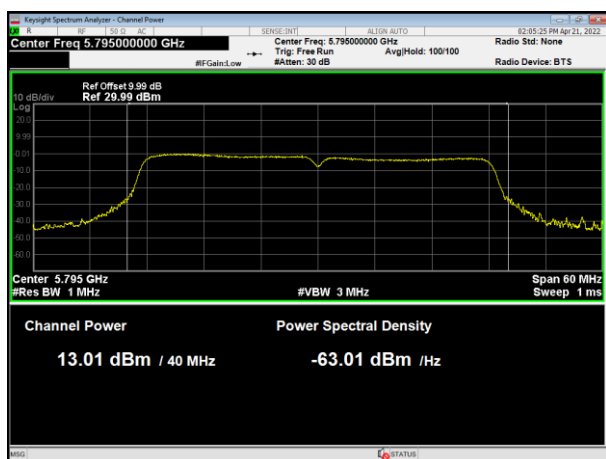
5825MHz



802.11ac HT40



5755MHz



5795MHz