FCC Part 15E Test Report
FCC ID: 2BGH8-GY500

Applicant:	Chengdu Guoying Technology Co., Ltd
Address:	Guoying Technology, Building 1, Leping Grain Warehouse, No. 820 Riyue Avenue, Qingyang District, Chengdu City, Sichuan Province
Manufacturer:	Chengdu Guoying Technology Co., Ltd
Address:	Guoying Technology, Building 1, Leping Grain Warehouse, No. 820 Riyue Avenue, Qingyang District, Chengdu City, Sichuan Province
EUT:	Intelligent projector
Trade Mark:	GUOIMG
Model Number:	GY500
Date of Receipt:	Sep. 19, 2024
Test Date:	Sep. 19, 2024 - Oct. 13, 2024
Date of Report:	Oct. 13, 2024
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Applicable Standards:	FCC PART 15 E 15.407 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DL-240919033ER

Prepared (Test Engineer):	Alisa Song
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	Jade Yang

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 E			
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	
15.407(e)	6dB 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

Test lab: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456
Designation Number: CN1307
IC Registered No.: 27485
CAB ID.: CN0118

1.1 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	±2.56dB
2	RF power,conducted	±0.42dB
3	Spurious emissions,conducted	±2.76dB
4	All emissions,radiated(<1G)	±3.65dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%
8	Bandwidth	±0.2MHz
9	Power Spectral Density	±2.45dBm
10	Frequency Stability	±0.3MHz
11	DUTY CYCLE	±0.53dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Intelligent projector
Trademark	GUOIMG
Model No.:	GY500
Model Difference	N/A
Operation Frequency:	IEEE 802.11a/n(HT20)/ac/ax(HT20): 5.745GHz-5.825GHz IEEE 802.11a/n(HT40)/ac/ax(HT40): 5.755GHz-5.795GHz
Channel numbers:	See channel list
Channel separation:	20MHz/40MHz
Modulation technology:	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 802.11ax(OFDM):BPSK,QPSK,16-QAM,64-QAM,256-QAM, 1024-QAM
Rate of Transmitter	802.11a: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps 802.11n/ac/ax: Up to 500Mbps
Antenna Type:	Internal Antenna
Antenna gain:	3.1dBi
Power supply:	100-240V~ 50/60Hz

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 product supports only the SU mode.

2. Channel List

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

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

2.1.1 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.

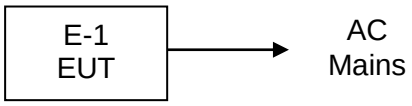
For Conducted Emission		
Pretest Mode	Channel	Band 4
Mode 1	802.11a/n(HT20)/ac/ax(HT20)	CH149, CH157, CH165
Mode 2	802.11n(HT40)/ac/ax(HT40)	CH151, CH159
Mode 3	Link Mode	

For Radiated Emission		
Pretest Mode	Channel	Band 4
Mode 1	802.11a/n(HT20)/ac/ax(HT20)	CH149, CH157, CH165
Mode 2	802.11n(HT40)/ac/ax(HT40)	CH151, CH159
Mode 3	Link Mode	

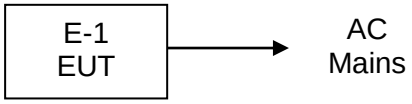
Note: 1. The measurements are performed at the highest, middle, lowest available channels.
2. During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

2.2 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Spurious Emission Test



2.3 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	Intelligent projector	GY500	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

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

2.4 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: AW869A			
Mode	802.11a	802.11n HT20	802.11n HT40	802.11ac/ax HT20/HT40
Data Rate	6Mbps	MSC0	MSC0	MSC0
Power Setting of Softwave	60	60	66	66

2.5 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. 05, 2023	Nov. 04, 2024
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 05, 2023	Nov. 04, 2024
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 05, 2023	Nov. 04, 2024
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 05, 2023	Nov. 04, 2024
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 05, 2023	Nov. 04, 2024
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 05, 2023	Nov. 04, 2024
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 05, 2023	Nov. 04, 2024
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 05, 2023	Nov. 04, 2024
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 05, 2023	Nov. 04, 2024
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 05, 2023	Nov. 04, 2024
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 05, 2023	Nov. 04, 2024
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 05, 2023	Nov. 04, 2024
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 05, 2023	Nov. 04, 2024
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 05, 2023	Nov. 04, 2024
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 05, 2023	Nov. 04, 2024
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 05, 2023	Nov. 04, 2024

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Sep. 20, 2022	Sep. 19, 2025
2	EMI Receiver	R&S	ESR	101421	Nov. 05, 2023	Nov. 04, 2024
3	LISN	R&S	ENV216	102417	Nov. 05, 2023	Nov. 04, 2024
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 05, 2023	Nov. 04, 2024

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	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.

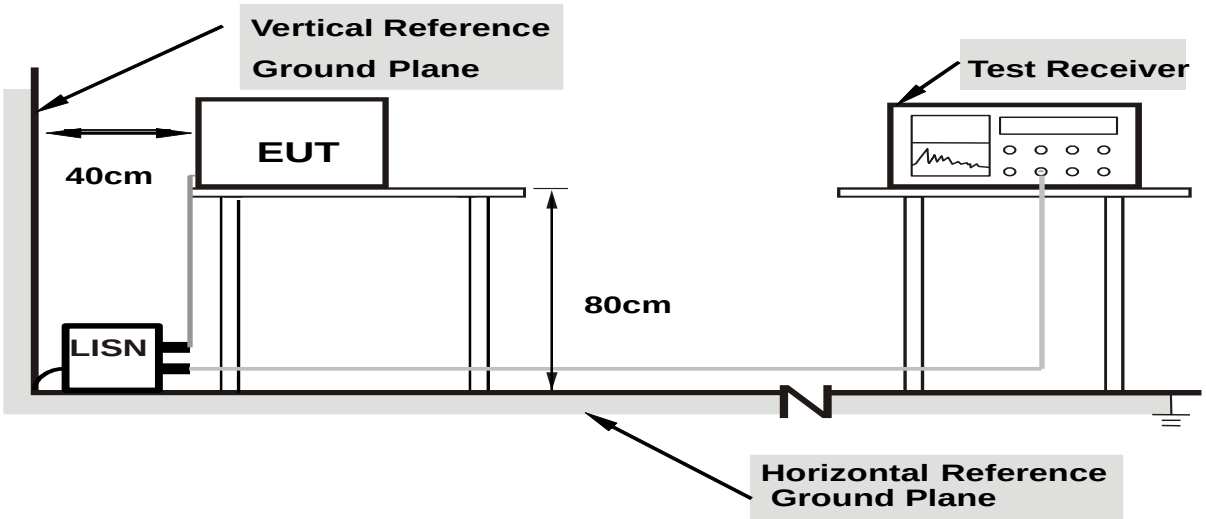
d. LISN at least 80 cm from nearest part of EUT chassis.

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



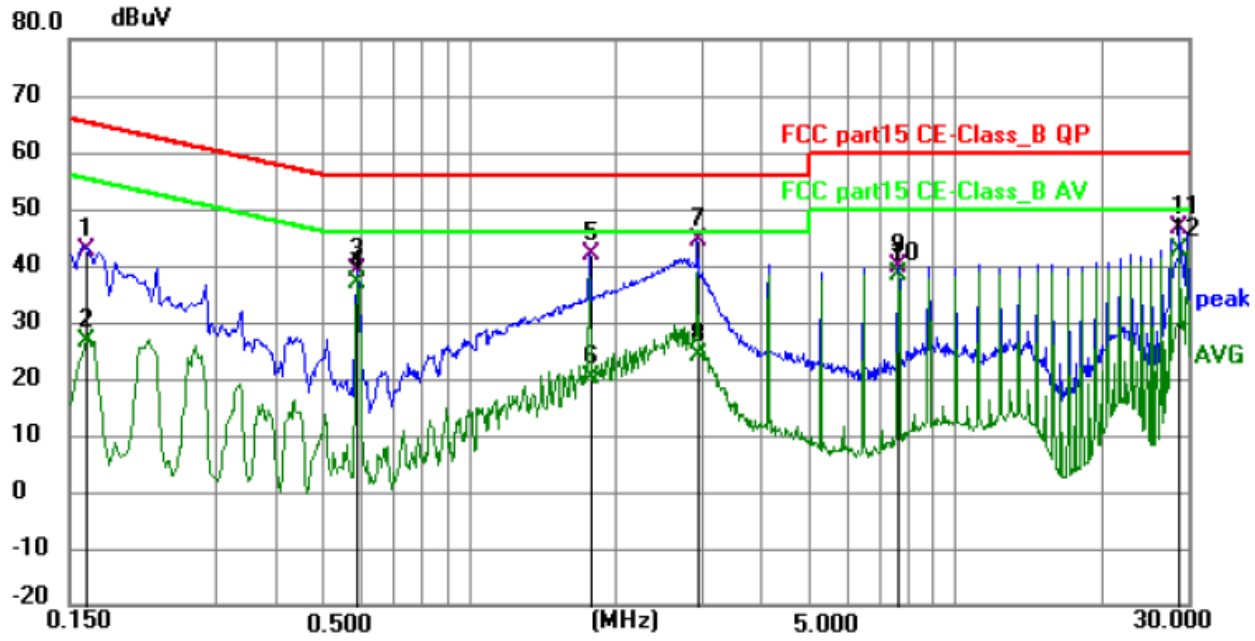
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

3.1.6 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4

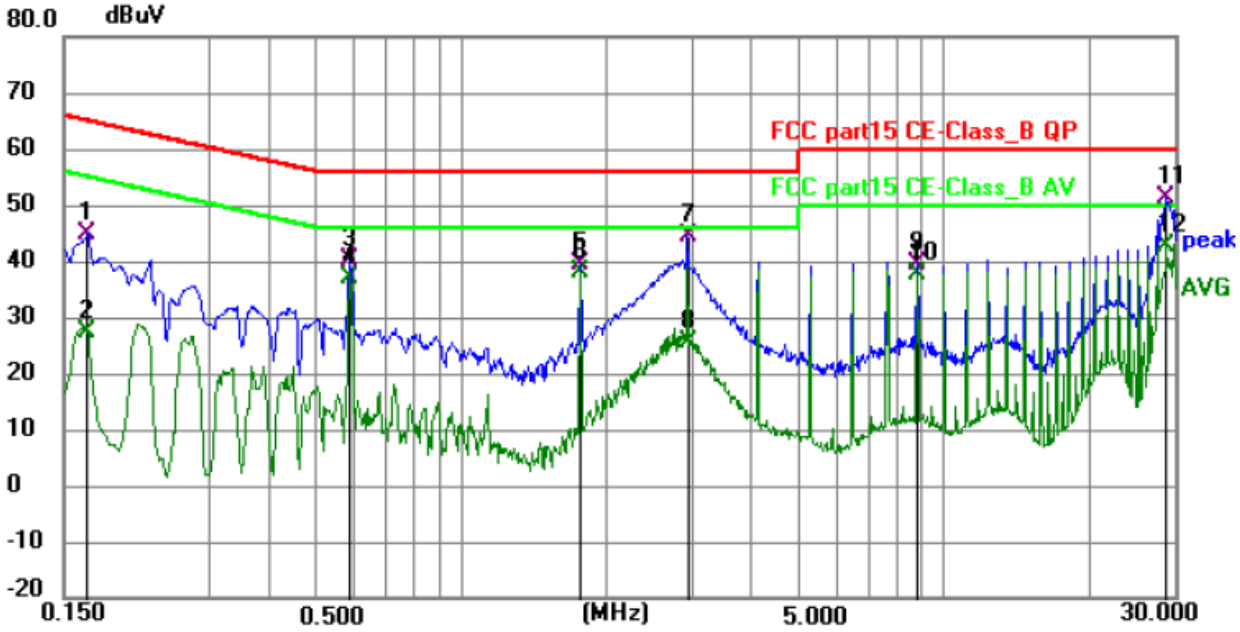


Remark:

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	0.1632	33.08	9.68	42.76	65.30	-22.54	QP	P	
2	0.1632	16.98	9.68	26.66	55.30	-28.64	AVG	P	
3	0.5910	29.31	9.75	39.06	56.00	-16.94	QP	P	
4	0.5910	27.08	9.75	36.83	46.00	-9.17	AVG	P	
5	1.7790	32.12	9.99	42.11	56.00	-13.89	QP	P	
6	1.7790	10.11	9.99	20.10	46.00	-25.90	AVG	P	
7	2.9490	34.64	9.95	44.59	56.00	-11.41	QP	P	
8	2.9490	14.22	9.95	24.17	46.00	-21.83	AVG	P	
9	7.6425	29.72	9.99	39.71	60.00	-20.29	QP	P	
10	7.6425	28.48	9.99	38.47	50.00	-11.53	AVG	P	
11	28.8060	36.16	10.35	46.51	60.00	-13.49	QP	P	
12 *	28.8060	32.33	10.35	42.68	50.00	-7.32	AVG	P	

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4



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	0.1680	35.19	9.57	44.76	65.06	-20.30	QP	P	
2	0.1680	17.91	9.57	27.48	55.06	-27.58	AVG	P	
3	0.5910	30.59	9.75	40.34	56.00	-15.66	QP	P	
4	0.5910	27.20	9.75	36.95	46.00	-9.05	AVG	P	
5	1.7655	29.39	9.99	39.38	56.00	-16.62	QP	P	
6	1.7655	27.90	9.99	37.89	46.00	-8.11	AVG	P	
7	2.9490	34.55	9.95	44.50	56.00	-11.50	QP	P	
8	2.9490	15.48	9.95	25.43	46.00	-20.57	AVG	P	
9	8.8170	29.44	9.94	39.38	60.00	-20.62	QP	P	
10	8.8170	27.64	9.94	37.58	50.00	-12.42	AVG	P	
11	28.8060	41.01	10.35	51.36	60.00	-8.64	QP	P	
12 *	28.8060	32.23	10.35	42.58	50.00	-7.42	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.

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	40GHz
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:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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:

g. 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).
h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

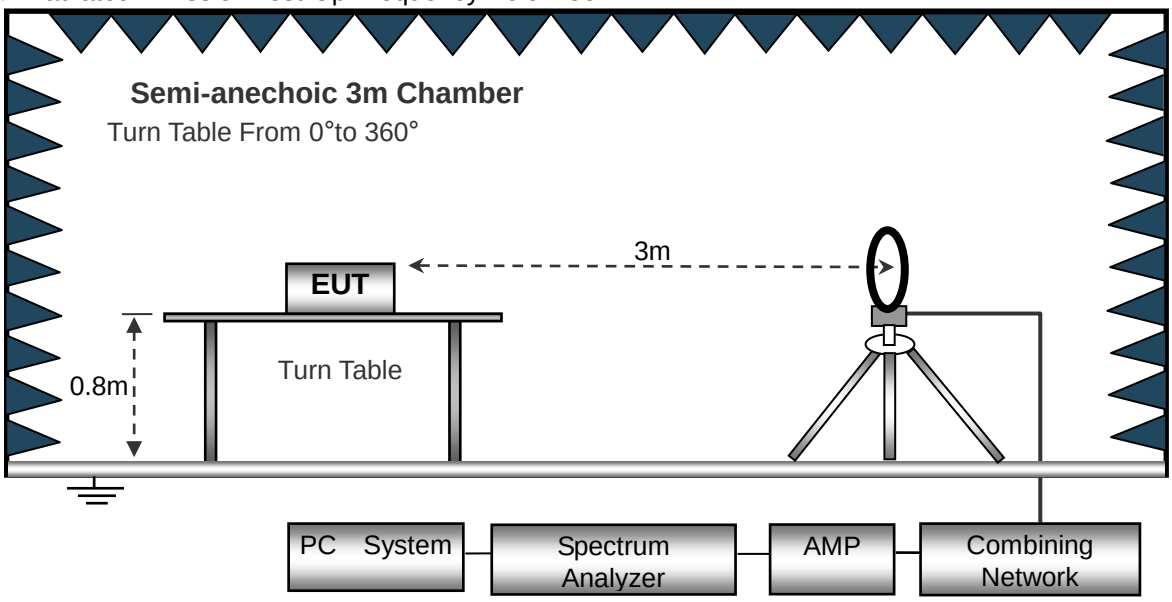
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

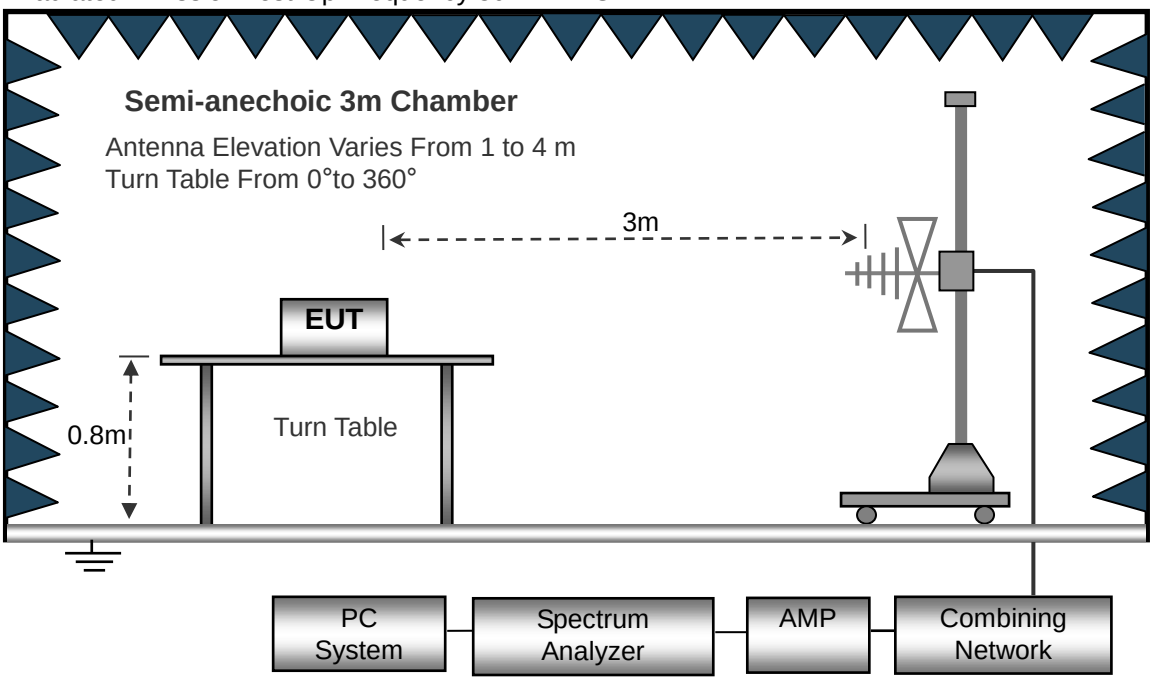
No deviation

3.2.4 TEST SETUP

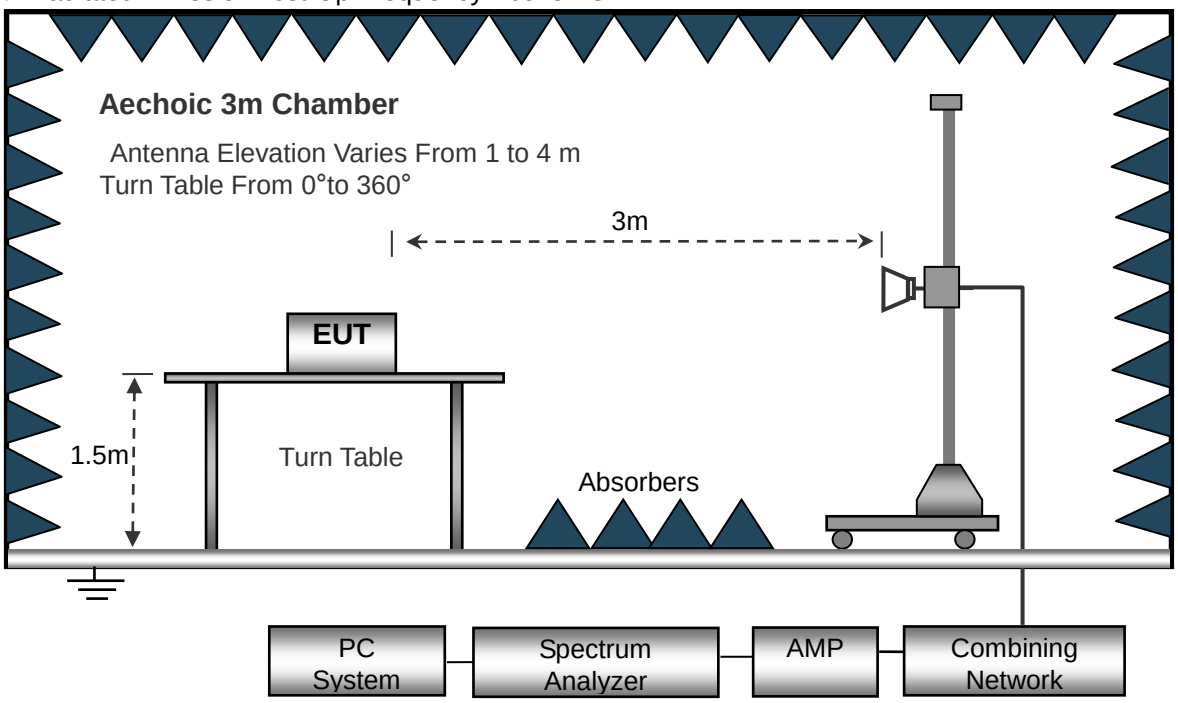
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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℃	Relative Humidtity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 4	Polarization :	--

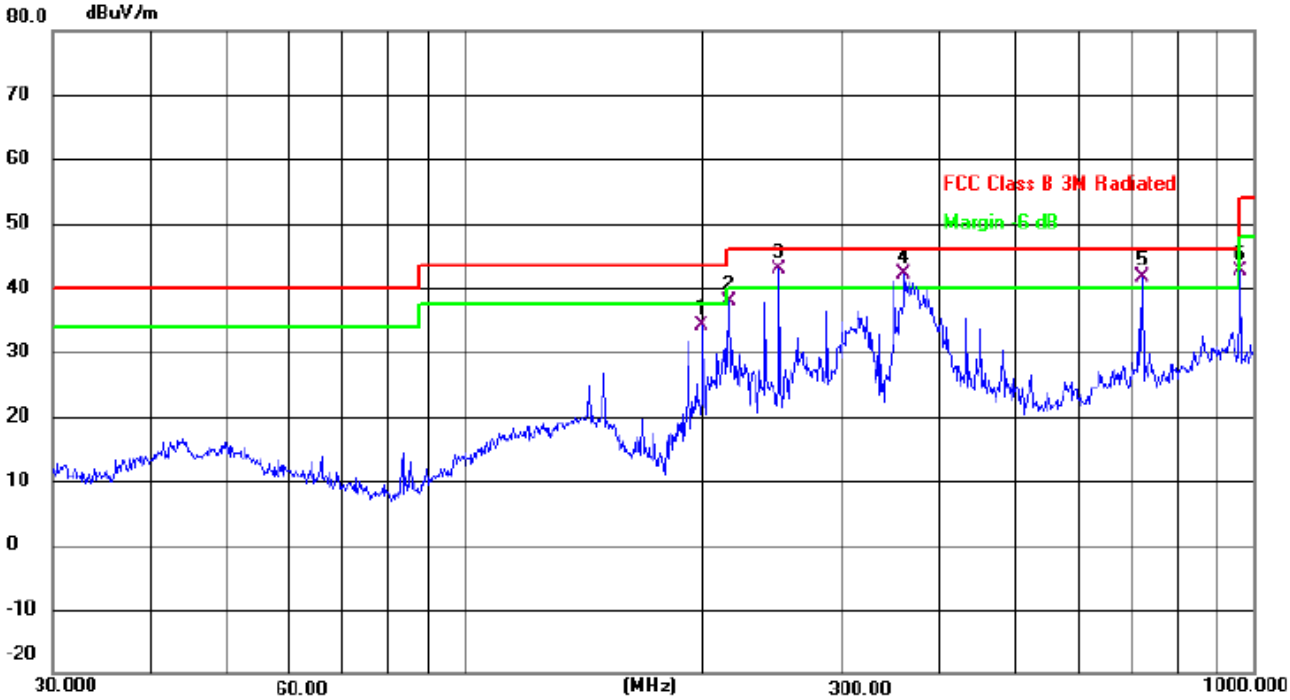
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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 (specific distance/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 4		



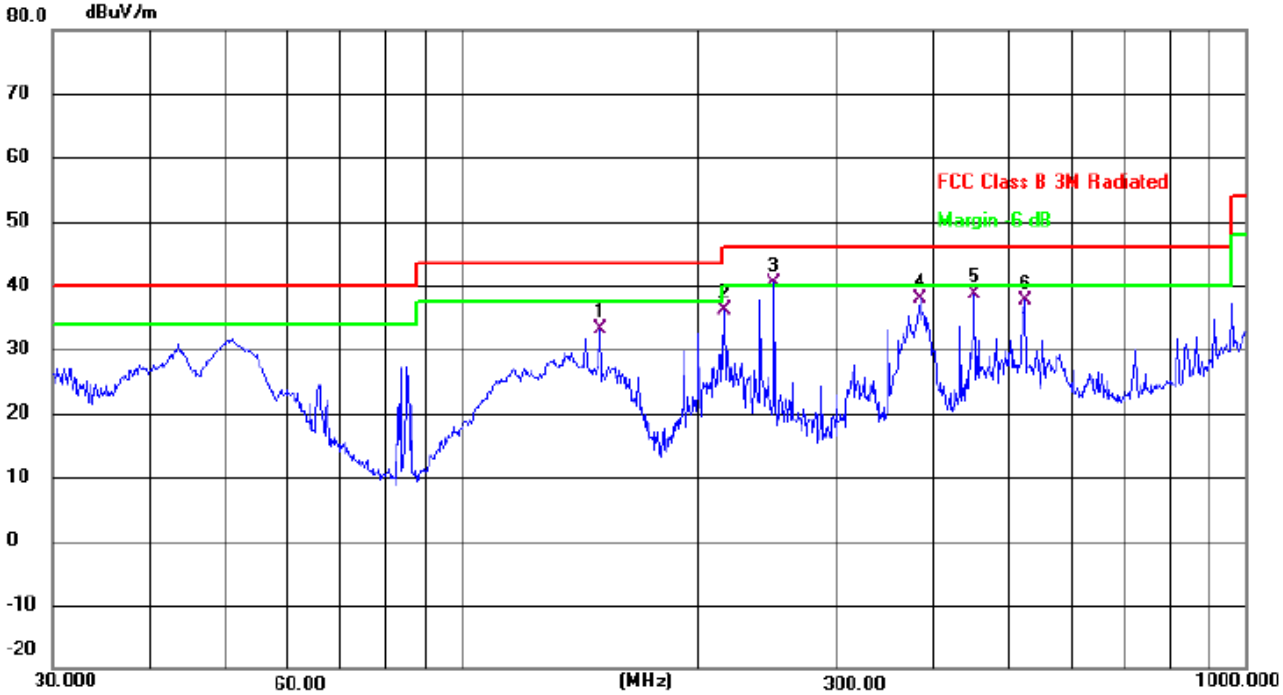
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		199.9855	49.20	-15.08	34.12	43.50	-9.38	QP
2		216.0239	52.16	-14.27	37.89	46.00	-8.11	QP
3	*	250.3011	56.21	-13.30	42.91	46.00	-3.09	QP
4	!	360.4476	52.39	-10.30	42.09	46.00	-3.91	QP
5	!	721.7258	45.43	-3.83	41.60	46.00	-4.40	QP
6		962.1622	42.62	0.01	42.63	54.00	-11.37	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 4		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		150.0108	51.23	-18.14	33.09	43.50	-10.41	QP
2		216.0239	50.39	-14.27	36.12	46.00	-9.88	QP
3	*	250.3011	53.61	-13.30	40.31	46.00	-5.69	QP
4		383.9318	47.73	-9.77	37.96	46.00	-8.04	QP
5		451.1350	46.74	-8.14	38.60	46.00	-7.40	QP
6		522.7179	44.67	-7.06	37.61	46.00	-8.39	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

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

3.2.8 TEST RESULTS (1ghz~40ghZ)

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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5745									
V	11490	54.35	49.05	15.3	37.39	57.99	74	-16.01	PK
V	11490	41.85	49.05	15.3	37.39	45.49	54	-8.51	AV
V	17235	55.59	49.16	15.27	40.45	62.15	68.2	-6.05	PK
V	17235	40.25	49.16	15.27	40.45	46.81	54	-7.19	AV
H	11490	52.74	49.05	15.3	37.39	56.38	74	-17.62	PK
H	11490	42.33	49.05	15.3	37.39	45.97	54	-8.03	AV
H	17235	51.85	49.16	15.27	40.45	58.41	68.2	-9.79	PK
H	17235	40.96	49.16	15.27	40.45	47.52	54	-6.48	AV
operation frequency:5785									
V	11570	51.25	49.09	15.34	37.42	54.92	74	-19.08	PK
V	11570	41.21	49.09	15.34	37.42	44.88	54	-9.12	AV
V	17355	50.56	49.18	15.29	40.47	57.14	68.2	-11.06	PK
V	17355	40.52	49.18	15.29	40.47	47.1	54	-6.90	AV
H	11570	50.76	49.09	15.34	37.42	54.43	74	-19.57	PK
H	11570	42.34	49.09	15.34	37.42	46.01	54	-7.99	AV
H	17355	48.63	49.18	15.29	40.47	55.21	68.2	-12.99	PK
H	17355	40.27	49.18	15.29	40.47	46.85	54	-7.15	AV
operation frequency:5825									
V	11650	52.35	49.11	15.37	37.46	56.07	74	-17.93	PK
V	11650	41.69	49.11	15.37	37.46	45.41	54	-8.59	AV
V	17475	49.52	49.21	15.34	40.51	56.16	68.2	-12.04	PK
V	17475	40.34	49.21	15.34	40.51	46.98	54	-7.02	AV
H	11650	57.63	49.11	15.37	31.31	55.2	74	-18.80	PK
H	11650	48.37	49.11	15.37	31.31	45.94	54	-8.06	AV
H	17475	49.36	49.21	15.34	40.51	56	68.2	-12.20	PK
H	17475	40.52	49.21	15.34	40.51	47.16	54	-6.84	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.

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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5745									
V	11490	49.14	49.05	15.3	37.39	52.78	74	-21.22	PK
V	11490	42.36	49.05	15.3	37.39	46	54	-8.00	AV
V	17235	48.58	49.16	15.27	40.45	55.14	68.2	-13.06	PK
V	17235	40.14	49.16	15.27	40.45	46.7	54	-7.30	AV
H	11490	49.36	49.05	15.3	37.39	53	74	-21.00	PK
H	11490	41.28	49.05	15.3	37.39	44.92	54	-9.08	AV
H	17235	48.85	49.16	15.27	40.45	55.41	68.2	-12.79	PK
H	17235	40.64	49.16	15.27	40.45	47.2	54	-6.80	AV
operation frequency:5785									
V	11570	52.58	49.09	15.34	37.42	56.25	74	-17.75	PK
V	11570	42.36	49.09	15.34	37.42	46.03	54	-7.97	AV
V	17355	49.52	49.18	15.29	40.47	56.1	68.2	-12.10	PK
V	17355	40.69	49.18	15.29	40.47	47.27	54	-6.73	AV
H	11570	49.52	49.09	15.34	37.42	53.19	74	-20.81	PK
H	11570	43.84	49.09	15.34	37.42	47.51	54	-6.49	AV
H	17355	49.63	49.18	15.29	40.47	56.21	68.2	-11.99	PK
H	17355	40.27	49.18	15.29	40.47	46.85	54	-7.15	AV
operation frequency:5825									
V	11650	51.36	49.11	15.37	37.46	55.08	74	-18.92	PK
V	11650	41.52	49.11	15.37	37.46	45.24	54	-8.76	AV
V	17475	48.85	49.21	15.34	40.51	55.49	68.2	-12.71	PK
V	17475	40.64	49.21	15.34	40.51	47.28	54	-6.72	AV
H	11650	57.15	49.11	15.37	31.31	54.72	74	-19.28	PK
H	11650	44.53	49.11	15.37	31.31	42.1	54	-11.90	AV
H	17475	49.89	49.21	15.34	40.51	56.53	68.2	-11.67	PK
H	17475	40.32	49.21	15.34	40.51	46.96	54	-7.04	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.

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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5755									
V	11510	49.25	49.07	15.33	37.41	52.92	74	-21.08	PK
V	11510	41.36	49.07	15.33	37.41	45.03	54	-8.97	AV
V	17265	49.54	49.17	15.28	40.46	56.11	68.2	-12.09	PK
V	17265	40.69	49.17	15.28	40.46	47.26	54	-6.74	AV
H	11510	48.52	49.07	15.33	37.41	52.19	74	-21.81	PK
H	11510	41.13	49.07	15.33	37.41	44.8	54	-9.20	AV
H	17265	49.56	49.17	15.28	40.46	56.13	68.2	-12.07	PK
H	17265	40.74	49.17	15.28	40.46	47.31	54	-6.69	AV
operation frequency:5795									
V	11590	49.13	49.11	15.37	37.46	52.85	74	-21.15	PK
V	11590	41.25	49.11	15.37	37.46	44.97	54	-9.03	AV
V	17385	48.23	49.21	15.34	40.51	54.87	68.2	-13.33	PK
V	17385	40.78	49.21	15.34	40.51	47.42	54	-6.58	AV
H	11590	57.63	49.11	15.37	31.31	55.2	74	-18.80	PK
H	11590	44.35	49.11	15.37	31.31	41.92	54	-12.08	AV
H	17385	48.36	49.21	15.34	40.51	55	68.2	-13.20	PK
H	17385	40.87	49.21	15.34	40.51	47.51	54	-6.49	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

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5745									
V	11490	49.69	49.05	15.3	37.39	53.33	74	-20.67	PK
V	11490	42.24	49.05	15.3	37.39	45.88	54	-8.12	AV
V	17235	48.49	49.16	15.27	40.45	55.05	68.2	-13.15	PK
V	17235	40.58	49.16	15.27	40.45	47.14	54	-6.86	AV
H	11490	48.63	49.05	15.3	37.39	52.27	74	-21.73	PK
H	11490	41.54	49.05	15.3	37.39	45.18	54	-8.82	AV
H	17235	48.89	49.16	15.27	40.45	55.45	68.2	-12.75	PK
H	17235	40.65	49.16	15.27	40.45	47.21	54	-6.79	AV
operation frequency:5785									
V	11570	48.33	49.09	15.34	37.42	52	74	-22.00	PK
V	11570	41.41	49.09	15.34	37.42	45.08	54	-8.92	AV
V	17355	49.55	49.18	15.29	40.47	56.13	68.2	-12.07	PK
V	17355	40.36	49.18	15.29	40.47	46.94	54	-7.06	AV
H	11570	49.57	49.09	15.34	37.42	53.24	74	-20.76	PK
H	11570	43.33	49.09	15.34	37.42	47	54	-7.00	AV
H	17355	49.25	49.18	15.29	40.47	55.83	68.2	-12.37	PK
H	17355	40.63	49.18	15.29	40.47	47.21	54	-6.79	AV
operation frequency:5825									
V	11650	49.64	49.11	15.37	37.46	53.36	74	-20.64	PK
V	11650	41.98	49.11	15.37	37.46	45.7	54	-8.30	AV
V	17475	48.36	49.21	15.34	40.51	55	68.2	-13.20	PK
V	17475	40.14	49.21	15.34	40.51	46.78	54	-7.22	AV
H	11650	57.23	49.11	15.37	31.31	54.8	74	-19.20	PK
H	11650	44.67	49.11	15.37	31.31	42.24	54	-11.76	AV
H	17475	48.63	49.21	15.34	40.51	55.27	68.2	-12.93	PK
H	17475	40.65	49.21	15.34	40.51	47.29	54	-6.71	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.

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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5745									
V	11490	49.63	49.07	15.33	37.41	53.3	74	-20.70	PK
V	11490	42.54	49.07	15.33	37.41	46.21	54	-7.79	AV
V	17235	48.85	49.17	15.28	40.46	55.42	68.2	-12.78	PK
V	17235	41.63	49.17	15.28	40.46	48.2	54	-5.80	AV
H	11490	48.74	49.07	15.33	37.41	52.41	74	-21.59	PK
H	11490	42.33	49.07	15.33	37.41	46	54	-8.00	AV
H	17235	48.58	49.17	15.28	40.46	55.15	68.2	-13.05	PK
H	17235	40.36	49.17	15.28	40.46	46.93	54	-7.07	AV
operation frequency:5785									
V	11570	49.57	49.11	15.37	37.46	53.29	74	-20.71	PK
V	11570	41.64	49.11	15.37	37.46	45.36	54	-8.64	AV
V	17355	48.36	49.21	15.34	40.51	55	68.2	-13.20	PK
V	17355	40.45	49.21	15.34	40.51	47.09	54	-6.91	AV
H	11570	57.36	49.11	15.37	31.31	54.93	74	-19.07	PK
H	11570	44.87	49.11	15.37	31.31	42.44	54	-11.56	AV
H	17355	48.35	49.21	15.34	40.51	54.99	68.2	-13.21	PK
H	17355	40.29	49.21	15.34	40.51	46.93	54	-7.07	AV
operation frequency:5825									
V	11650	48.21	49.07	15.33	37.41	51.88	74	-22.12	PK
V	11650	42.69	49.07	15.33	37.41	46.36	54	-7.64	AV
V	17475	49.55	49.17	15.28	40.46	56.12	68.2	-12.08	PK
V	17475	40.14	49.17	15.28	40.46	46.71	54	-7.29	AV
H	11650	48.39	49.07	15.33	37.41	52.06	74	-21.94	PK
H	11650	41.52	49.07	15.33	37.41	45.19	54	-8.81	AV
H	17475	48.66	49.17	15.28	40.46	55.23	68.2	-12.97	PK
H	17475	40.27	49.17	15.28	40.46	46.84	54	-7.16	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

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5755									
V	11510	49.25	49.07	15.33	37.41	52.92	74	-21.08	PK
V	11510	42.11	49.07	15.33	37.41	45.78	54	-8.22	AV
V	17265	48.83	49.17	15.28	40.46	55.4	68.2	-12.80	PK
V	17265	41.68	49.17	15.28	40.46	48.25	54	-5.75	AV
H	11510	48.74	49.07	15.33	37.41	52.41	74	-21.59	PK
H	11510	42.35	49.07	15.33	37.41	46.02	54	-7.98	AV
H	17265	48.53	49.17	15.28	40.46	55.1	68.2	-13.10	PK
H	17265	40.37	49.17	15.28	40.46	46.94	54	-7.06	AV
operation frequency:5795									
V	11590	49.36	49.11	15.37	37.46	53.08	74	-20.92	PK
V	11590	41.65	49.11	15.37	37.46	45.37	54	-8.63	AV
V	17385	48.34	49.21	15.34	40.51	54.98	68.2	-13.22	PK
V	17385	40.45	49.21	15.34	40.51	47.09	54	-6.91	AV
H	11590	57.37	49.11	15.37	31.31	54.94	74	-19.06	PK
H	11590	44.63	49.11	15.37	31.31	42.2	54	-11.80	AV
H	17385	48.31	49.21	15.34	40.51	54.95	68.2	-13.25	PK
H	17385	40.29	49.21	15.34	40.51	46.93	54	-7.07	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.

802.11ax HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5755									
V	11510	49.69	49.07	15.33	37.41	53.36	74	-20.64	PK
V	11510	42.52	49.07	15.33	37.41	46.19	54	-7.81	AV
V	17265	48.33	49.17	15.28	40.46	54.9	68.2	-13.30	PK
V	17265	41.64	49.17	15.28	40.46	48.21	54	-5.79	AV
H	11510	48.78	49.07	15.33	37.41	52.45	74	-21.55	PK
H	11510	42.36	49.07	15.33	37.41	46.03	54	-7.97	AV
H	17265	48.58	49.17	15.28	40.46	55.15	68.2	-13.05	PK
H	17265	40.63	49.17	15.28	40.46	47.2	54	-6.80	AV
operation frequency:5795									
V	11590	49.52	49.11	15.37	37.46	53.24	74	-20.76	PK
V	11590	41.64	49.11	15.37	37.46	45.36	54	-8.64	AV
V	17385	48.96	49.21	15.34	40.51	55.6	68.2	-12.60	PK
V	17385	40.44	49.21	15.34	40.51	47.08	54	-6.92	AV
H	11590	57.85	49.11	15.37	31.31	55.42	74	-18.58	PK
H	11590	44.66	49.11	15.37	31.31	42.23	54	-11.77	AV
H	17385	48.38	49.21	15.34	40.51	55.02	68.2	-13.18	PK
H	17385	40.52	49.21	15.34	40.51	47.16	54	-6.84	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.

3.3 CONDUCTED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.407

(4) 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	5725MHz
Stop Frequency	5850MHz
RB / VB (emission in restricted band)	RBW = 1MHz, VBW⩾3*RBW

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

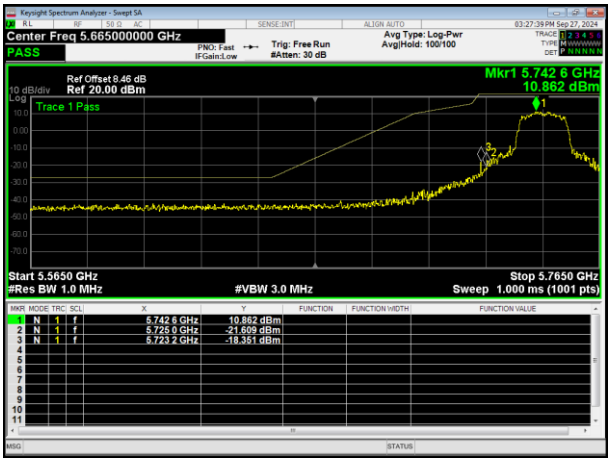
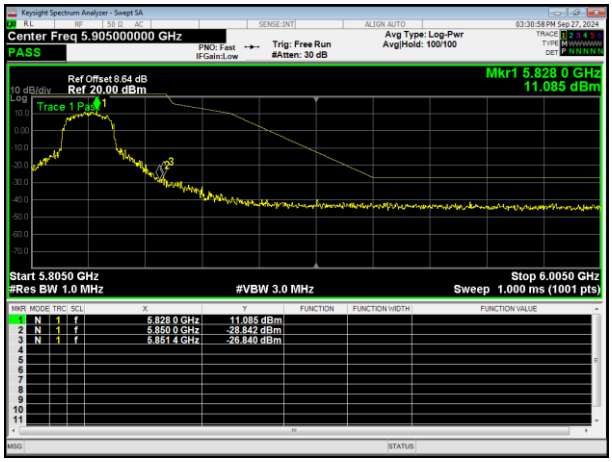
3.3.4 TEST SETUP

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

The antenna gain is compensated in the test data.

802.11a	
	
5745MHz	5825MHz

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	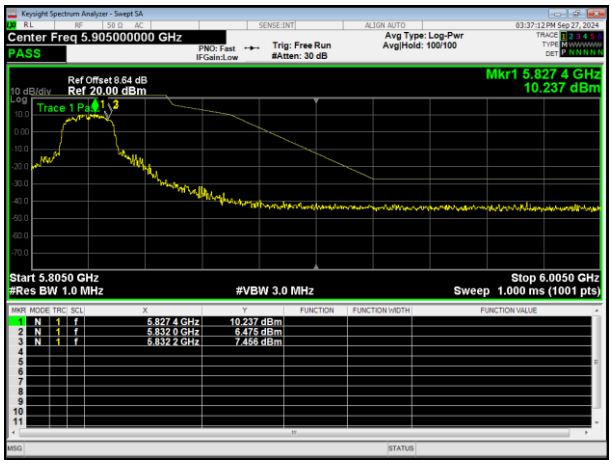
5745MHz	5825MHz

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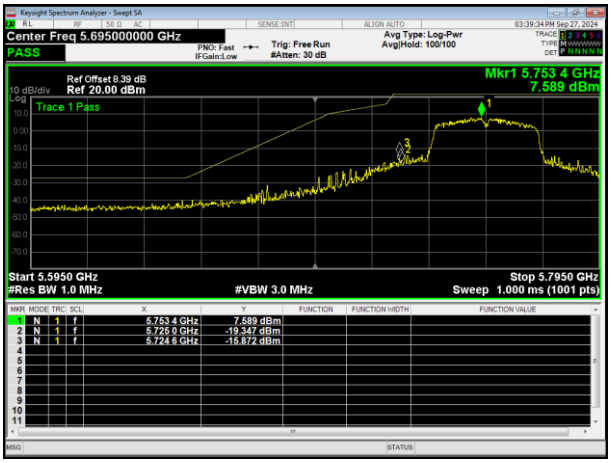	
5755MHz	5795MHz

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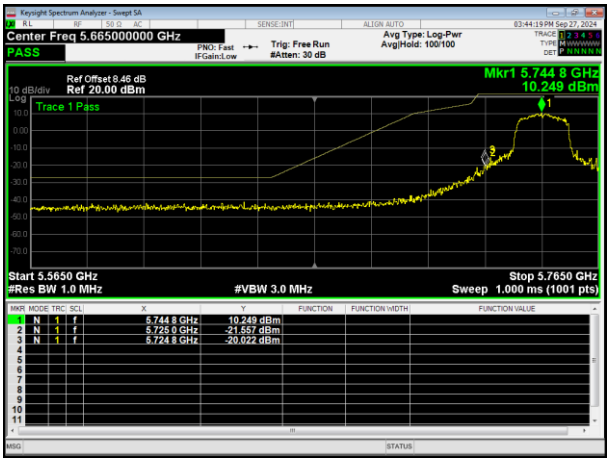	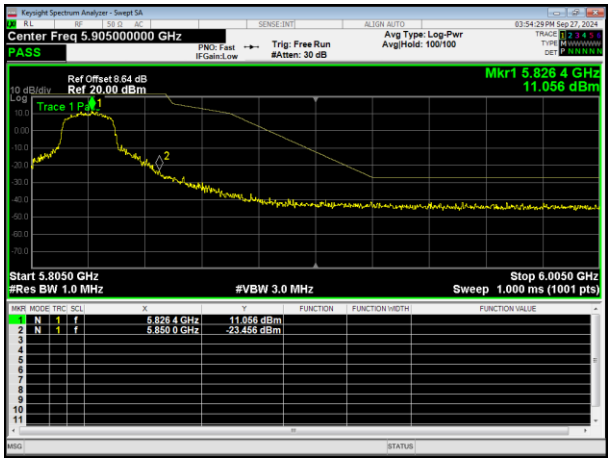
5745MHz	5825MHz
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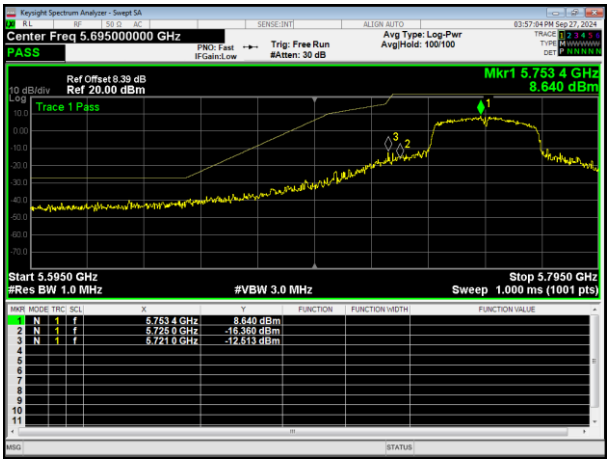
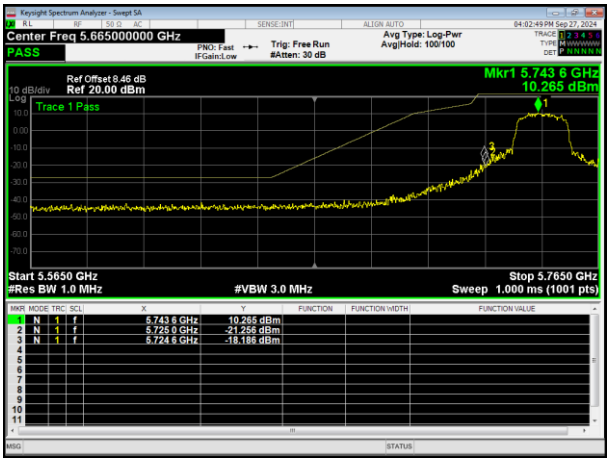
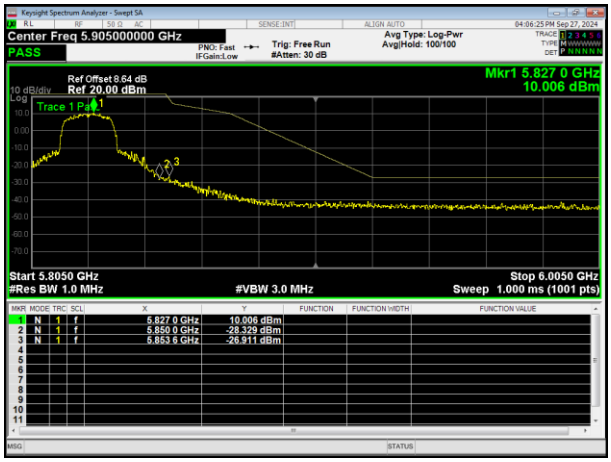
	
5755MHz	5795MHz

802.11ax HT20	
	
5745MHz	5825MHz
802.11ax 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. Spectrum Setting : RBW = 1MHz
Span≥99%OBW(30MHz/60MHz/120MHz etc.)
VBW≥3*RBW
Sweep = auto
Detector function = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
Trace = max hold

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP

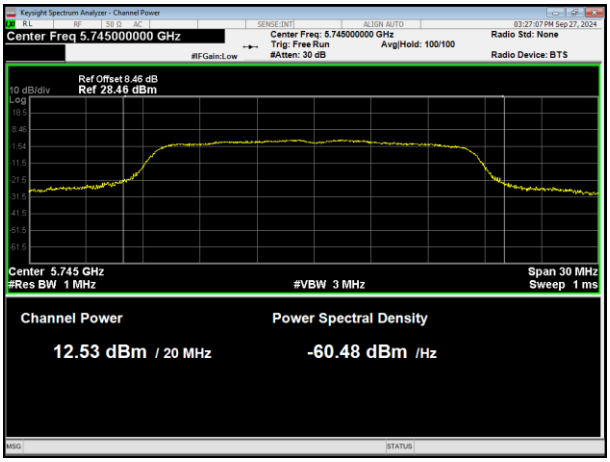
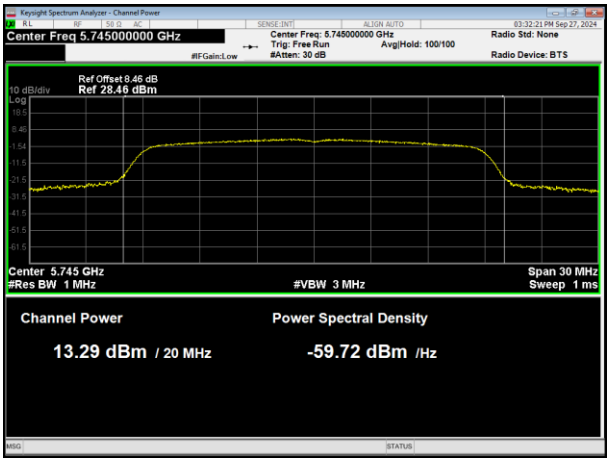
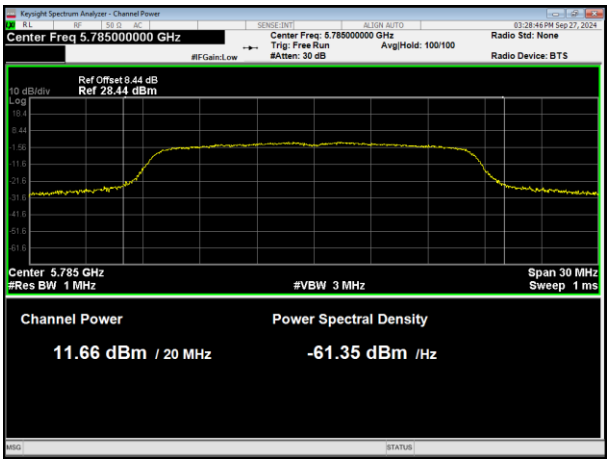
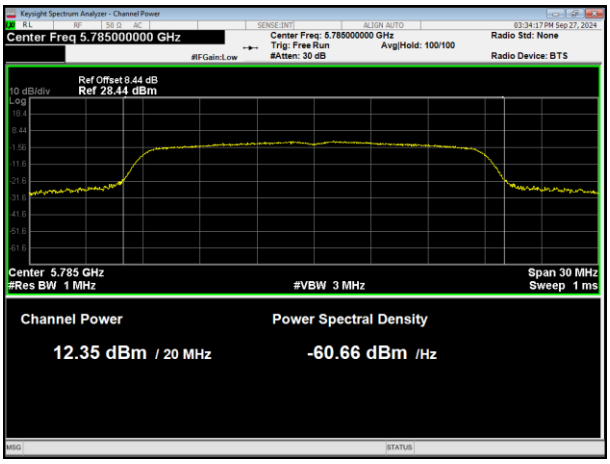
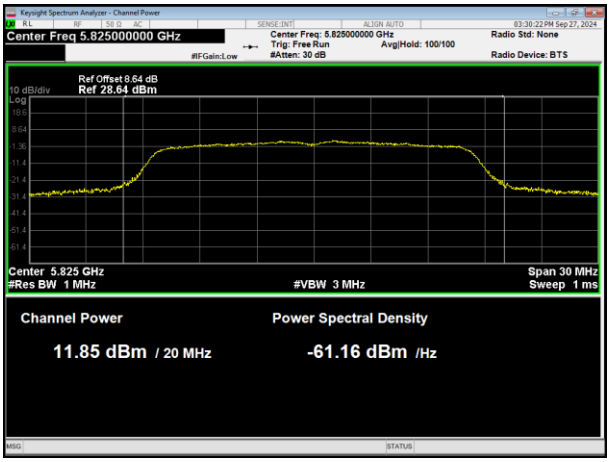
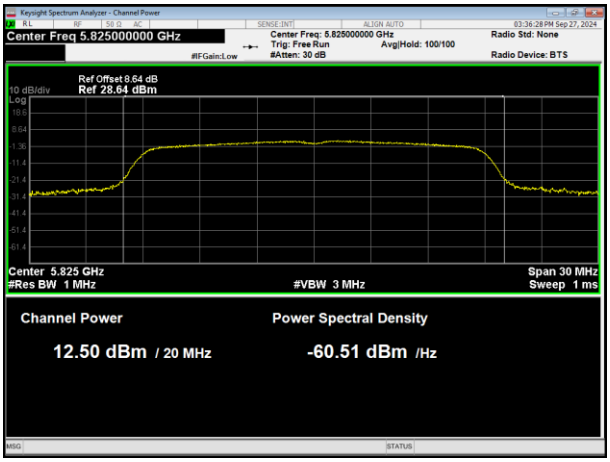
4.1.4 EUT OPERATION CONDITIONS

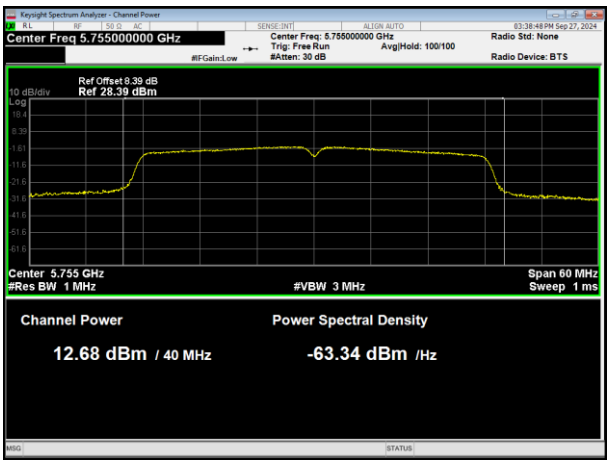
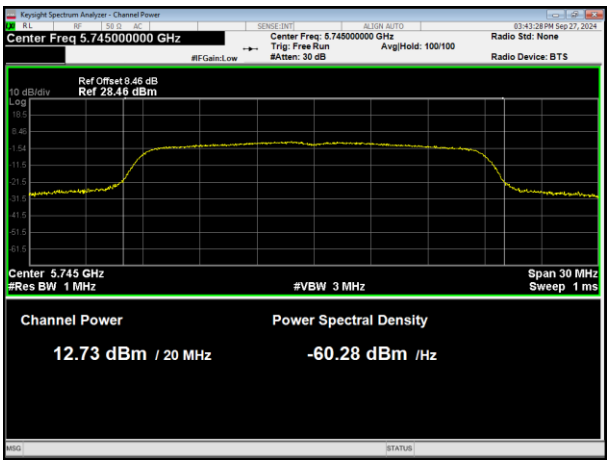
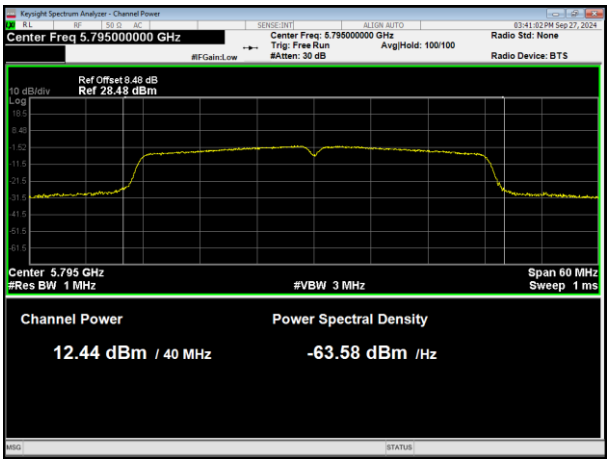
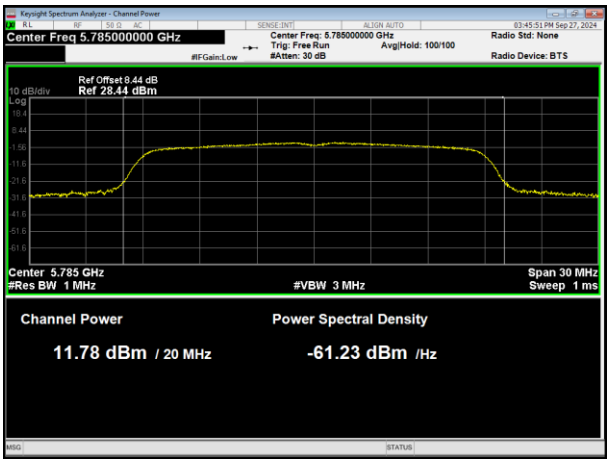
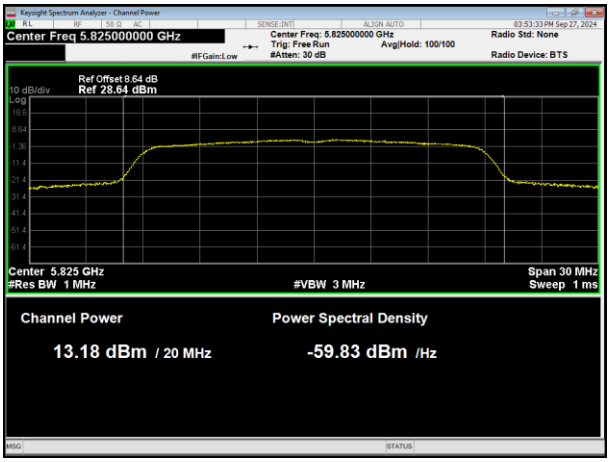
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

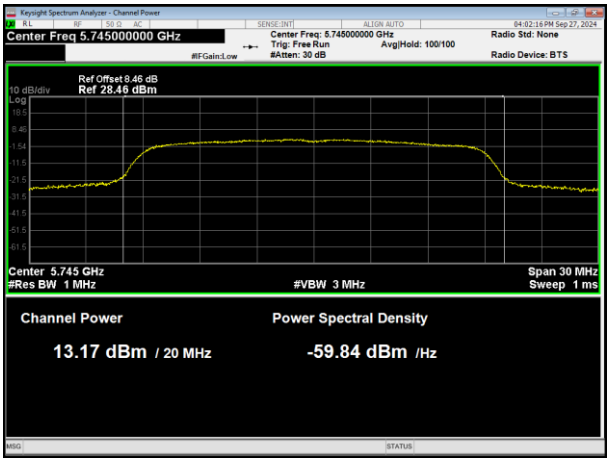
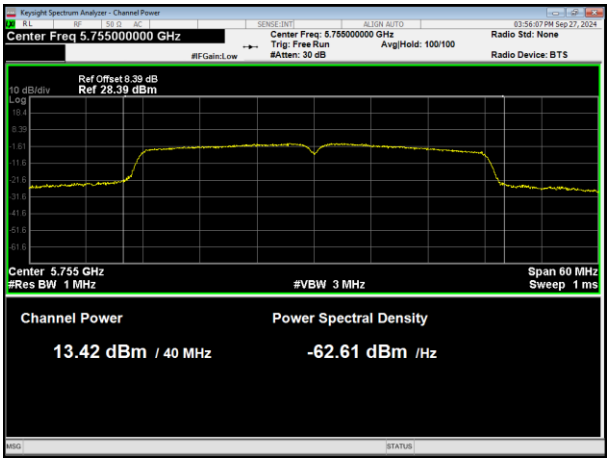
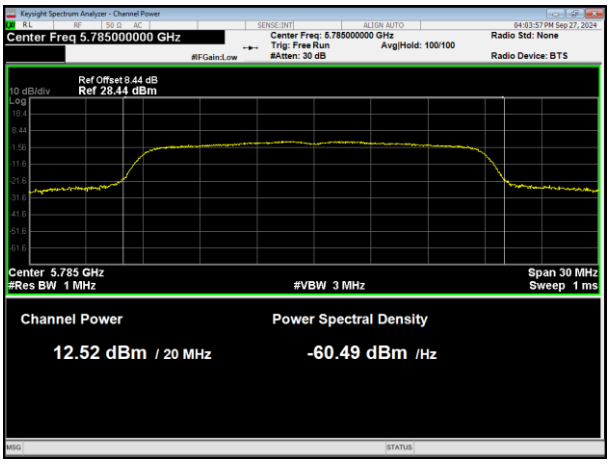
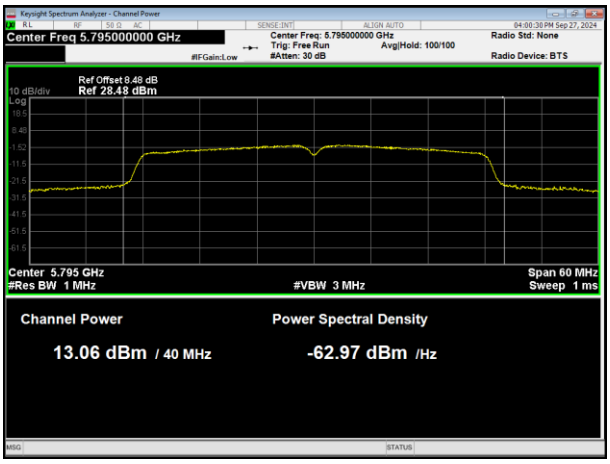
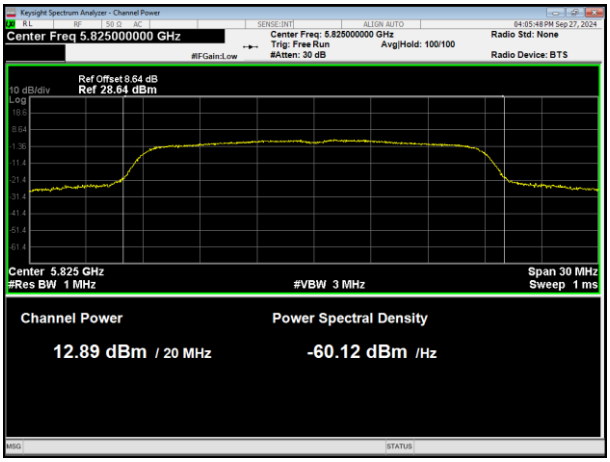
4.1.5 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	AC 120V/60Hz

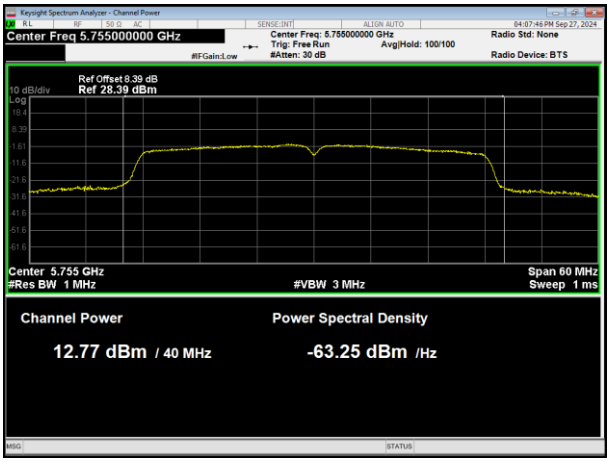
Mode	Test Channel	Average Output Power (dBm)	Duty factor (dB)	Total Output Power(dBm)	LIMIT (dBm)
802.11a	Low	12.531	0.87	13.401	30
	Middle	11.656	0.87	12.526	30
	High	11.853	0.87	12.723	30
802.11n HT20	Low	13.289	0.16	13.449	30
	Middle	12.35	0.16	12.51	30
	High	12.504	0.16	12.664	30
802.11n HT40	Low	12.678	0.33	13.008	30
	High	12.44	0.33	12.77	30
802.11ac HT20	Low	12.729	0.31	13.039	30
	Middle	11.78	0.31	12.09	30
	High	13.176	0.31	13.486	30
802.11ac HT40	Low	13.415	0.47	13.885	30
	High	13.056	0.47	13.526	30
802.11ax HT20	Low	13.175	0.35	13.525	30
	Middle	12.52	0.35	12.87	30
	High	12.886	0.35	13.236	30
802.11ax HT40	Low	12.769	0.82	13.589	30
	High	12.502	0.82	13.322	30

802.11a	802.11n HT20
	
5745MHz	5745MHz
	
5785MHz	5785MHz
	
5825MHz	5825MHz

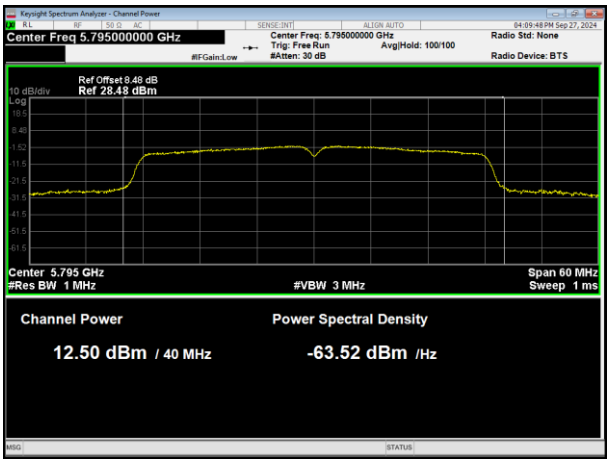
802.11n HT40	802.11ac HT20
	
5755MHz	5745MHz
	
5795MHz	5785MHz
	
	5825MHz

802.11ax HT20	802.11ac HT40
	
5745MHz	5755MHz
	
5785MHz	5795MHz
	
5825MHz	

802.11ax HT40



5755MHz



5795MHz

5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 1MHz for band 1 RBW ≥ 510KHz for band 4
VB	VBW ≥ 3RBW
Detector	RMS (i.e., power averaging).
Trace	Averaging
Sweep Time	Auto

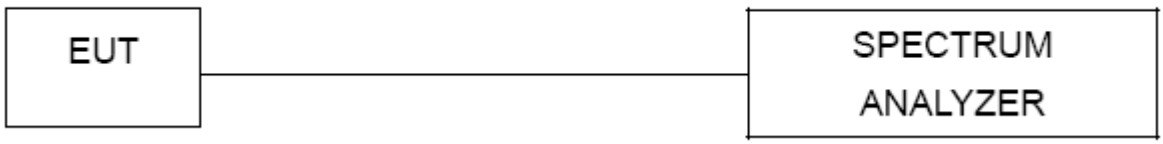
5.1.1 TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. User the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
   we test all antennas, the antenna 1 was worst mode and the data recording in the report.
7. Duty factor Reference is made to the test results in Section 7.1.5.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

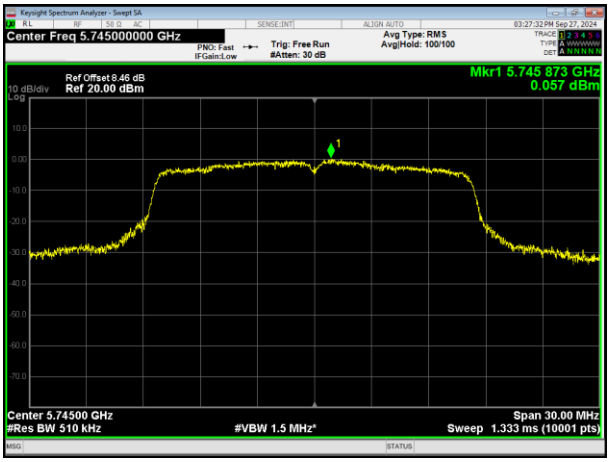
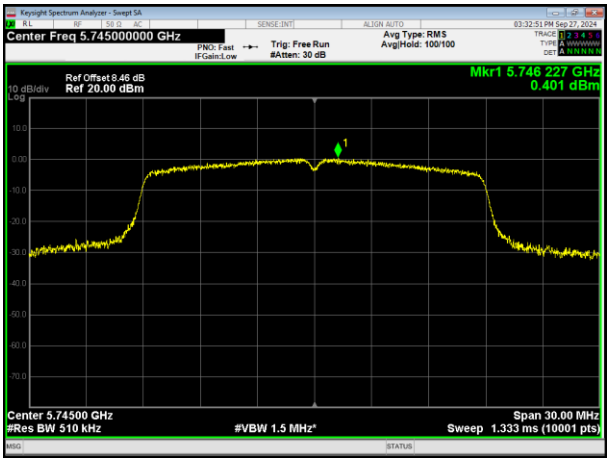
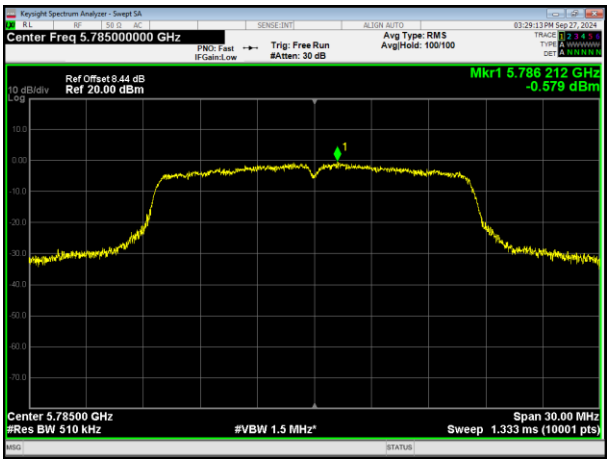
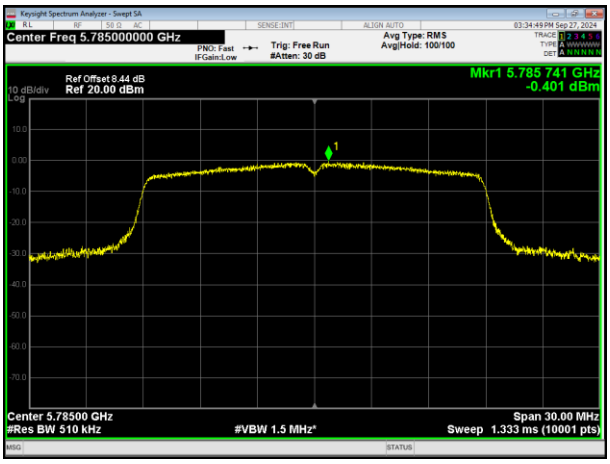
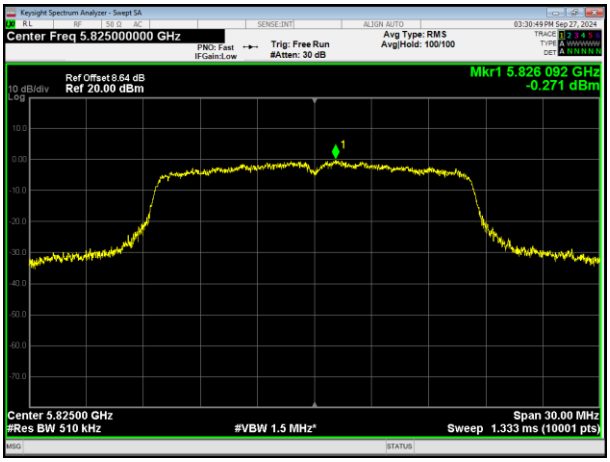
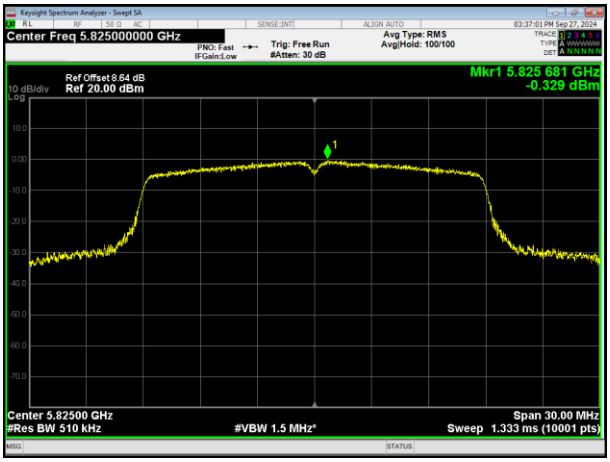


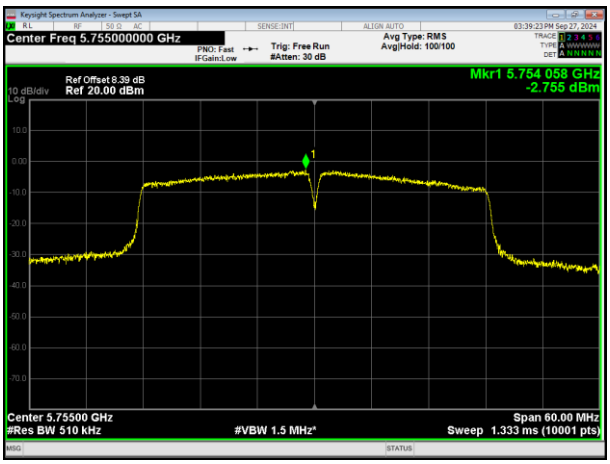
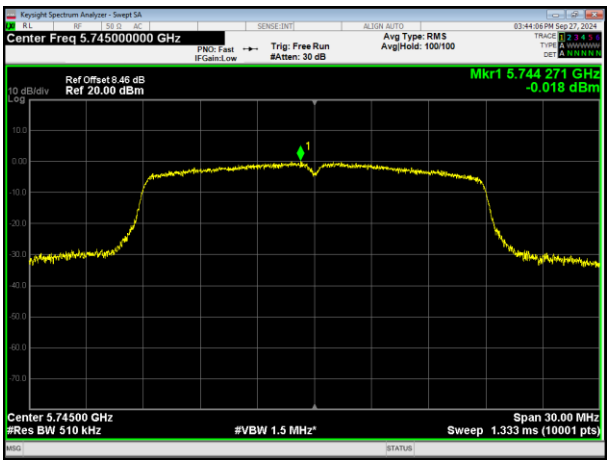
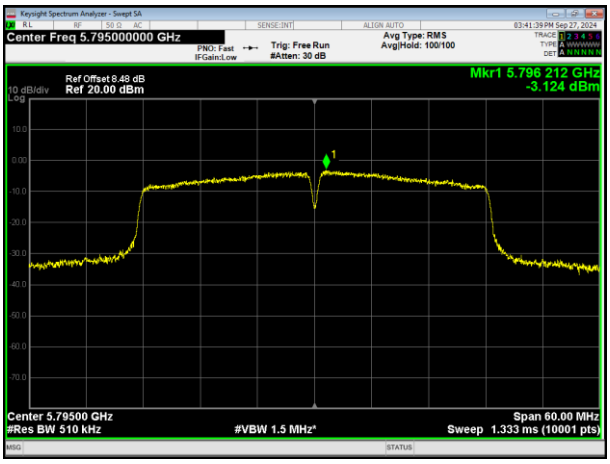
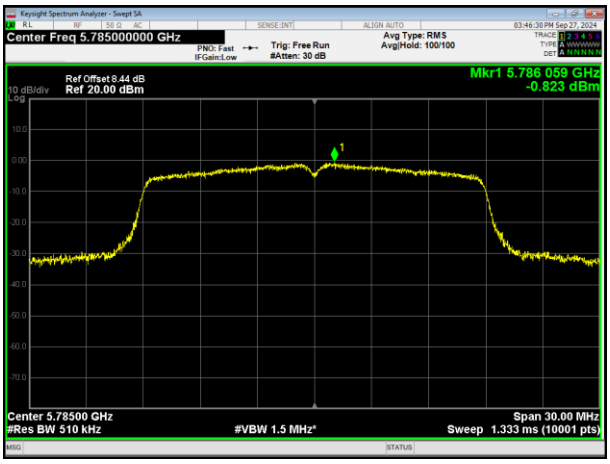
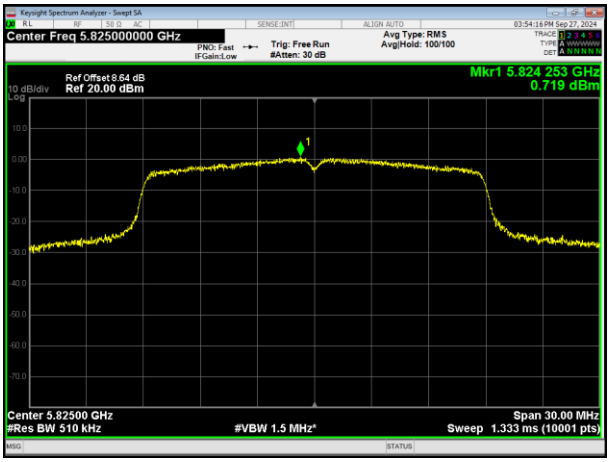
5.1.4 EUT OPERATION CONDITIONS

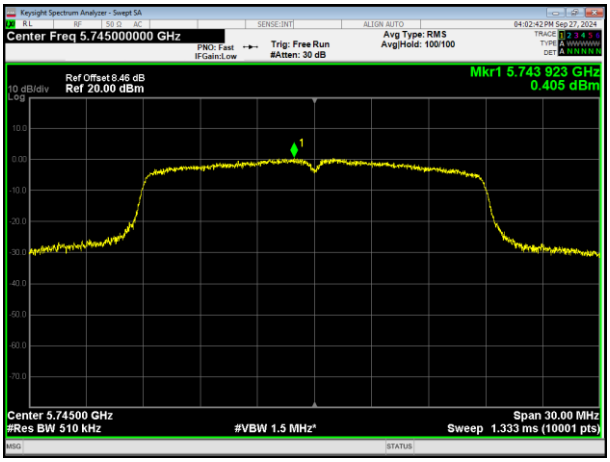
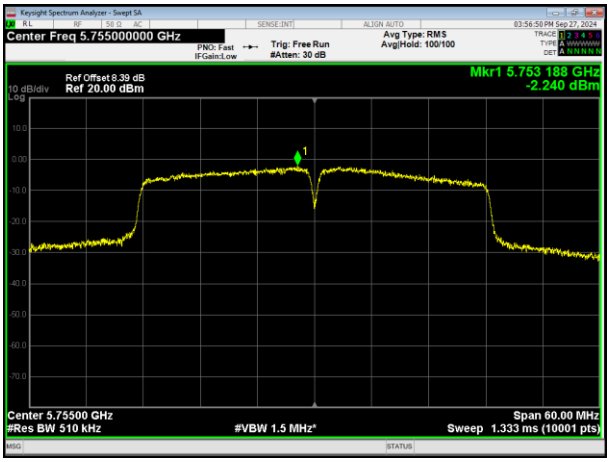
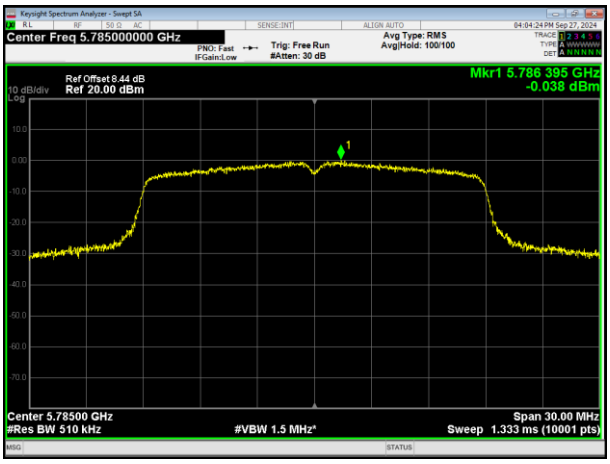
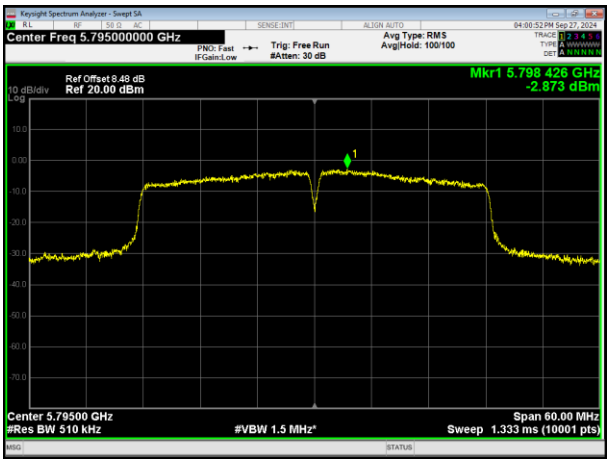
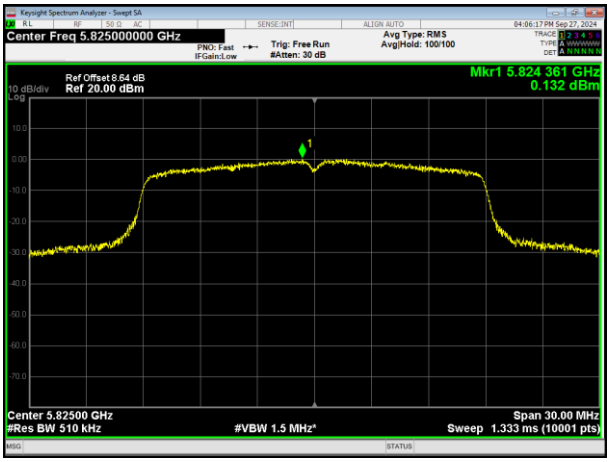
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

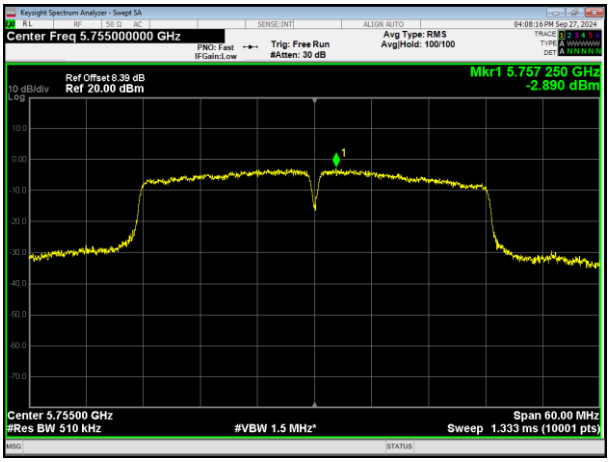
5.1.5 TEST RESULTS

	Mode	Test Channel	Reading Level (dBm)	Duty factor (dB)	PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Band4	802.11a	Low	0.057	0.87	0.927	30.00	PASS
		Middle	-0.579	0.87	0.291	30.00	PASS
		High	-0.271	0.87	0.599	30.00	PASS
	802.11n20	Low	0.401	0.16	0.561	30.00	PASS
		Middle	-0.401	0.16	-0.241	30.00	PASS
		High	-0.329	0.16	-0.169	30.00	PASS
	802.11n40	Low	-2.755	0.33	-2.425	30.00	PASS
		High	-3.124	0.33	-2.794	30.00	PASS
	802.11ac20	Low	-0.018	0.31	0.292	30.00	PASS
		Middle	-0.823	0.31	-0.513	30.00	PASS
		High	0.719	0.31	1.029	30.00	PASS
	802.11ac40	Low	-2.24	0.47	-1.77	30.00	PASS
		High	-2.873	0.47	-2.403	30.00	PASS
	802.11ax20	Low	0.405	0.35	0.755	30.00	PASS
		Middle	-0.038	0.35	0.312	30.00	PASS
		High	0.132	0.35	0.482	30.00	PASS
	802.11ax40	Low	-2.89	0.82	-2.07	30.00	PASS
		High	-3.014	0.82	-2.194	30.00	PASS

802.11a	802.11n HT20
	
5745MHz	5745MHz
	
5785MHz	5785MHz
	
5825MHz	5825MHz

802.11n HT40	802.11ac HT20
	
5755MHz	5745MHz
	
5795MHz	5785MHz
	
	5825MHz

802.11ax HT20	802.11ac HT40
	
5745MHz	5755MHz
	
5785MHz	5795MHz
	
5825MHz	

802.11ax HT40

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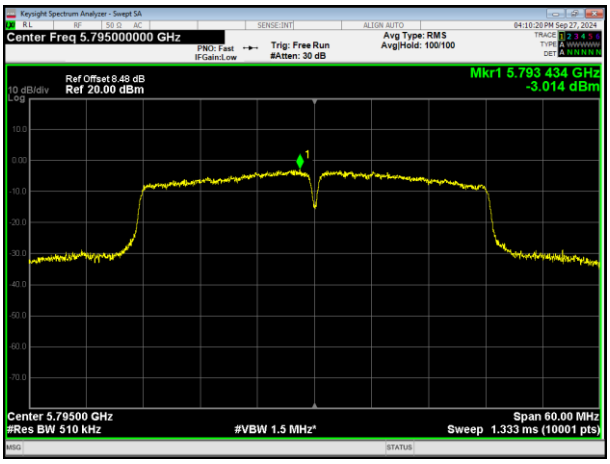

5795MHz

6. 6DB BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.1.1 TEST PROCEDURE

6dB Bandwidth	
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.1.2 DEVIATION FROM STANDARD

No deviation.

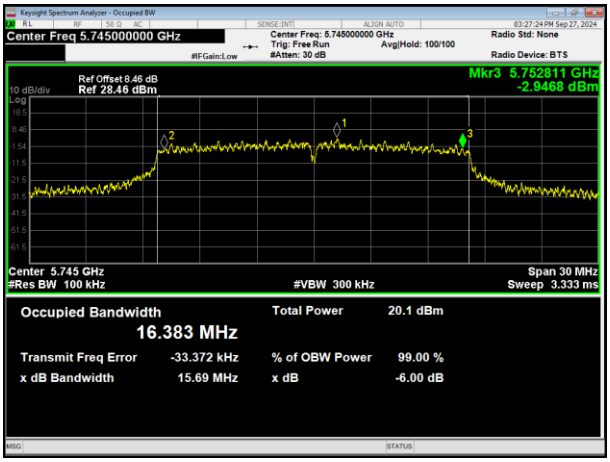
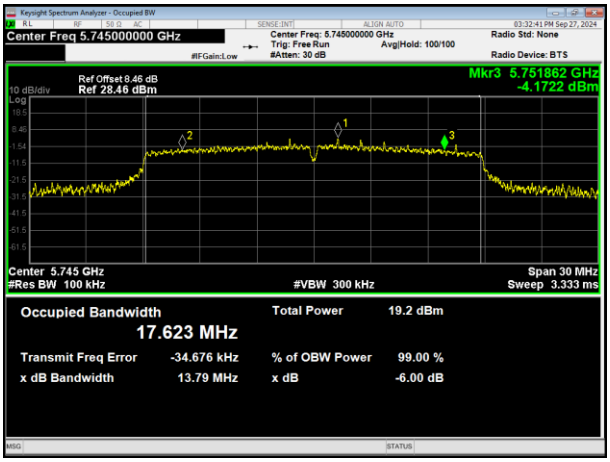
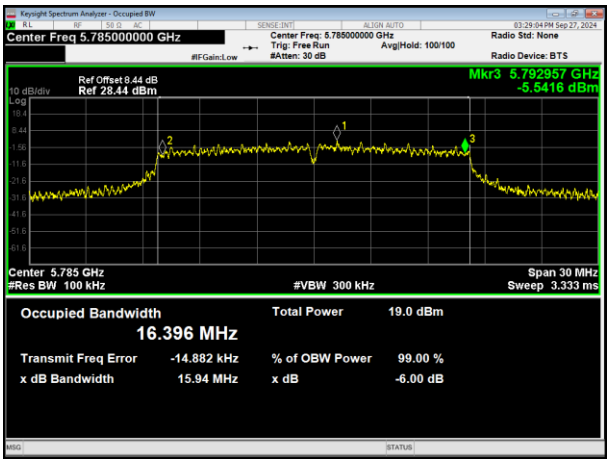
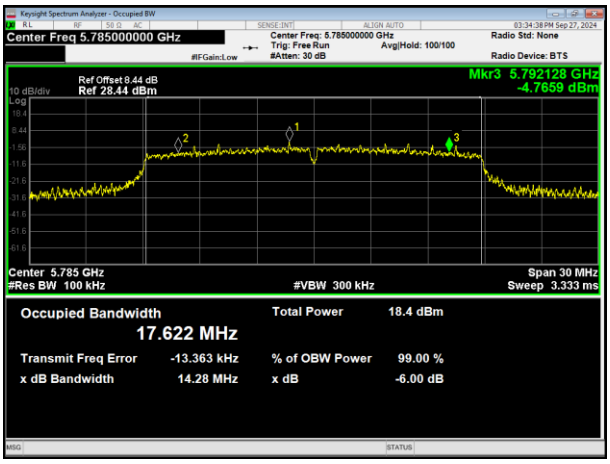
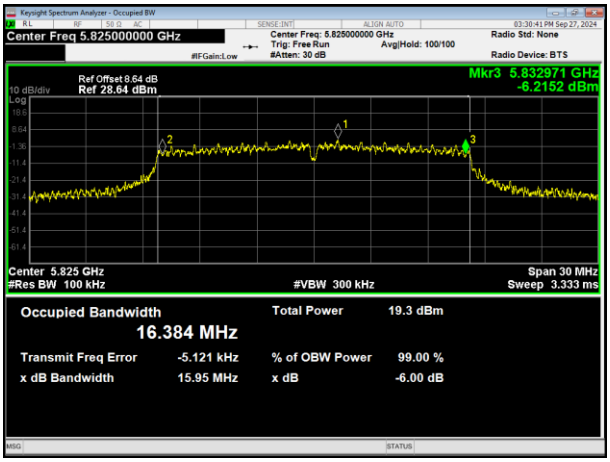
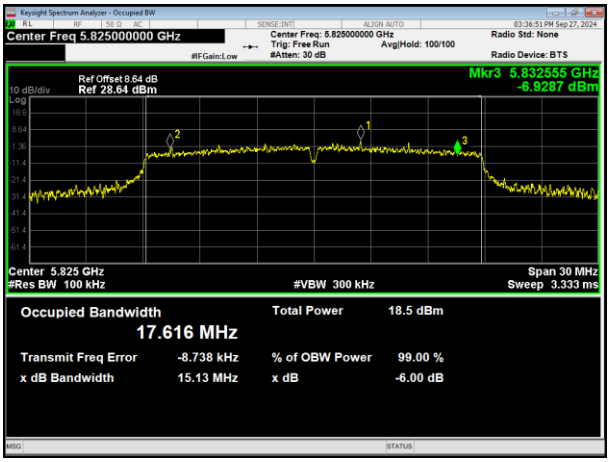
6.1.3 TEST SETUP

6.1.4 EUT OPERATION CONDITIONS

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

6.1.5 TEST RESULTS

		Test Channel	6dB Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
Band 4	802.11a	Low	15.688	>0.5	Pass
		Middle	15.943	>0.5	Pass
		High	15.953	>0.5	Pass
	802.11n HT20	Low	13.793	>0.5	Pass
		Middle	14.282	>0.5	Pass
		High	15.127	>0.5	Pass
	802.11n HT40	Low	35.049	>0.5	Pass
		High	35.056	>0.5	Pass
	802.11ac HT20	Low	15.095	>0.5	Pass
		Middle	14.454	>0.5	Pass
		High	15.086	>0.5	Pass
	802.11ac HT40	Low	35.099	>0.5	Pass
		High	35.097	>0.5	Pass
	802.11ax HT20	Low	15.043	>0.5	Pass
		Middle	15.085	>0.5	Pass
		High	15.112	>0.5	Pass
	802.11ax HT40	Low	35.1	>0.5	Pass
		High	35.092	>0.5	Pass

802.11a	802.11n HT20
	
5745MHz	5745MHz
	
5785MHz	5785MHz
	
5825MHz	5825MHz