TEST REPORT

FCC ID: 2BHQC-HK1RBOXX50

Product	**:**	**TV BOX**
Model Name	**:**	**HK1 RBOX X50**
Brand	**:**	**HK1 RBOX**
Report No.	**:**	**SZNTT26039376E1-3**

Prepared for

Shenzhen Hua Kewei Technology Co., Ltd

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Prepared by

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TEL: 0755-27889935

1 TEST RESULT CERTIFICATION

Applicant	:	Shenzhen Hua Kewei Technology Co., Ltd
Address	:	4/F, M Building, Guanlan Innovation Industrial Park, LonghuaGuanlan Street, Shenzhen City
Manufacturer	:	Shenzhen Hua Kewei Technology Co., Ltd
Address	:	4/F, M Building, Guanlan Innovation Industrial Park, LonghuaGuanlan Street, Shenzhen City
Product name	:	TV BOX
Model name	:	HK1 RBOX X50
Standards	:	FCC CFR47 Part 15 Section 15.407
Test procedure	:	ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Date of test	:	Sept. 21, 2026 - Oct. 10, 2026
Date of Issue	:	Oct. 10, 2026

This device described above has been tested by NTT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Prepared by(Test Engineer):

Gary Lu

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2 Test Summary

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.207	AC Power Line conducted emission	PASS	
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407(b)	Band Edge	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	

Remark:

1. “N/A” denotes test is not applicable in this Test Report.

3 TEST FACILITY

Site Description

EMC Lab.	:	Designation Number: CN3446 Test Firm Registration Number: 129414 Accredited by ANAB, Dec. 19, 2025 The Certificate Registration Number is AT-3446
Name of Firm	:	Shenzhen NTT Testing Technology Co., Ltd.
Site Location	:	1B, Building 2, Factory Building & 103, Building 3, Factory Building, Dayang Industrial Park No.4, Industrial Avenue, Tangwei Community, Fuhai Sub-district, Bao 'an District, Shenzhen City, China

4 General Information

4.1 General Description of E.U.T.

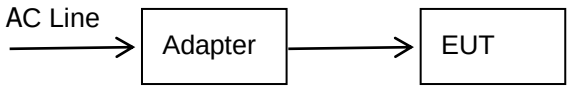
Product Name:	TV BOX
Model No.:	HK1 RBOX X50
Sample ID:	SZNTT26039376E1-001#
Sample(s) Status:	Engineer sample
Series model:	HK1 RBOX S905X5M
Model Different.:	Except for differences in model and exterior color, the circuitry and modules are identical across all models.
Operation Frequency:	UNII-3: 5745MHz~5825MHz(20MHz bandwidth) 5755MHz~5795MHz(40MHz bandwidth)
Number of Channel:	UNII-3: 5 channels for 20MHz bandwidth 2 channels for 40MHz bandwidth
Modulation type:	802.11a: (64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11n: (64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac: (256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM
Antenna Type:	Built-in antenna
Antenna gain:	2.93 dBi
Power supply:	Input: DC 5V/2A
Hardware Version:	V1.0
Software Version:	V1.0
Remark:	the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.

802.11a/n/ac(20 MHz) Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

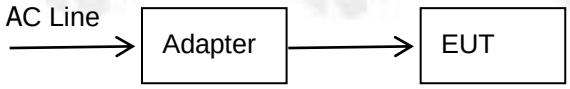
802.11/n/ac(40MHz) Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-

4.2 Test Setup Configuration

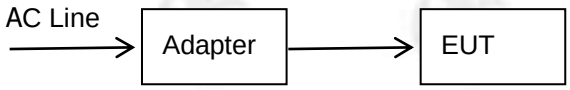
Conducted Emission



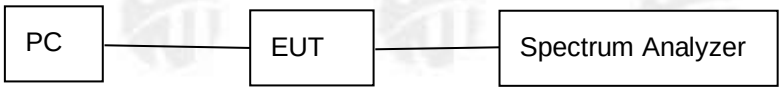
Radiated Emission(30MHz-1GHz)



Radiated Emission(above 1GHz)



RF Conducted Test



4.3 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: 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.	

Test Software	ADB
Power level setup	Default

5 Equipment During Test

5.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	HSRCE944	/	HTEC	2025/04/30	2028/04/29
EMI Test Receiver	ESCI	100881/003	ROHDE&SCHWARZ	2026/09/04	2027/09/03
LISN	AMN6500	101185	ROHDE&SCHWARZ	2026/09/04	2027/09/03
LISN	NNLK 8129	00603	SCHWARZBECK	2026/09/04	2027/09/03
Pulse Limiters	VTSD 9561 F	00343	SCHWARZBECK	2026/09/04	2027/09/03
Cable	RG223-2M	/	RG	2026/09/04	2027/09/03

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2025/07/24	2028/07/23
EMI Test Receiver	ESPI	101018	ROHDE&SCHWARZ	2026/09/04	2027/09/03
Amplifi（30MHz-1GHz）	BBV 9745	00431	SCHWARZBECK	2026/09/09	2027/09/08
Bilog Antenna（30MHz-1GHz）	VULB9168	1858	SCHWARZBECK	2026/09/05	2027/09/04
Horn antenna（1GHz-18GHz）	BBHA 9120 D	02622	SCHWARZBECK	2026/09/05	2027/09/04
Pream plifier（1GHz-18GHz）	BBV 9718D	0024	SCHWARZBECK	2026/09/04	2027/09/03
Spectrum Analyze（10Hz-40GHz）	FSV 40	100952	ROHDE&SCHWARZ	2026/09/04	2027/09/03
Pream plifier（18GHz-40GHz）	BBV 9721	0056	SCHWARZBECK	2026/09/04	2027/09/03
Double Ridge Guide Horn Antenna（18GHz-40GHz）	SAS-574	588	A.H.System	2026/09/05	2027/09/04

Loop Antenna (9KHz-30MHz)	FMZB 1513-60	00115	SCHWARZBECK	2026/09/04	2027/09/03
MXG Signal Analyzer	N9020A	MY49100730	Agilent	2026/09/04	2027/09/03
MXG Vector Signal Generator	N5182A	MY50144920	Agilent	2026/09/04	2027/09/03
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	/	ROHDE&SCHWARZ	2026/09/07	2027/09/06
Power Sensor	MW100-RFCB-2	MW260105NTT-64	MWRFtest	2026/09/04	2027/09/03
RF Swith	MW100-RFCB-1	MW260105NTT-64	MWRFtest	2026/09/04	2027/09/03
Cable	RG223-3M	/	DA	2026/09/04	2027/09/03
Cable	RG223-12M	/	DA	2026/09/04	2027/09/03
Cable	SFT205-NMNMSW-2.5M	/	DA	2026/09/04	2027/09/03
Cable	SFT205-NMNM-12M	/	DA	2026/09/04	2027/09/03
Cable	UCA500-NJWSM-1.5M	017	MWRFtest	2026/09/04	2027/09/03

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ-EMC	Ver.EMC-CON 3A1.1+
2	EMC radiation test system	FALA	EZ-EMC	Ver.FA-03A2 RE+
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10-6
Bandwidth	± 1.5 x 10-6
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9KHz~30MHz)	±4.51dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Radiated Emission(25GHz~40GHz)	±5.36dB
Remark:When making a conformity declaration based on test results for regulations/standards or specifications,the default is to use Clause 4.2.1of ILAC-G8:09/2019 and the guidelines on decision rules and conformity declaration in IEC Guide 115:2023.	

5.3 Description of Support Units

The EUT has been tested as an independent unit .

6 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method:	:	ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
Test Result:	:	PASS
Frequency Range:	:	150kHz to 30MHz
Class/Severity:	:	Class B
Detector:	:	Peak for pre-scan (9kHz Resolution Bandwidth)

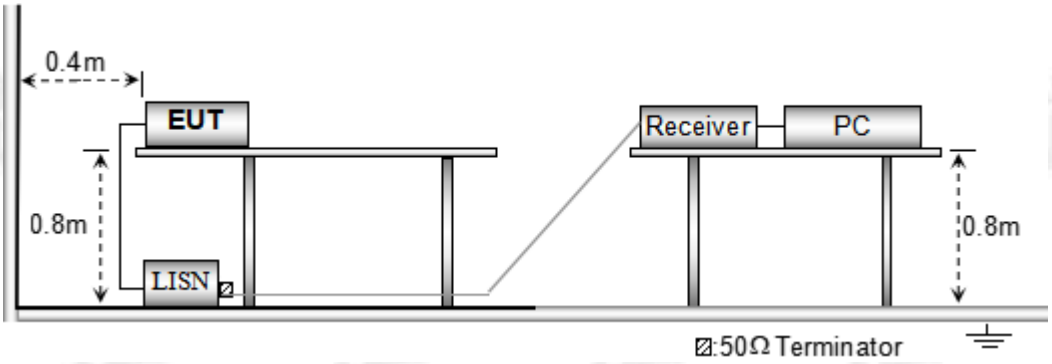
6.1 E.U.T. Operation

Operating Environment **:**

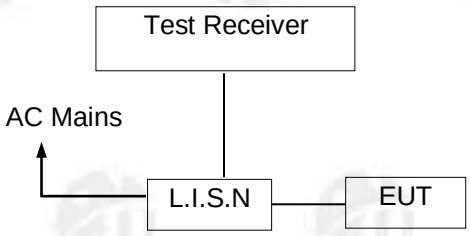
Temperature:	:	25.4°C
Humidity:	:	56 % RH
Atmospheric Pressure:	:	101.12 kPa
Test Voltage	:	DC 5V from adapter AC 120V/60Hz

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024.



6.3 Test SET-UP (Block Diagram of Configuration)



6.4 Measurement Procedure:

1. 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.

2. 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.

3. 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.

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

5.For the actual test configuration, please refer to the related Item – EUT Test Photos.

6.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies

2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

6.6 Measurement Description

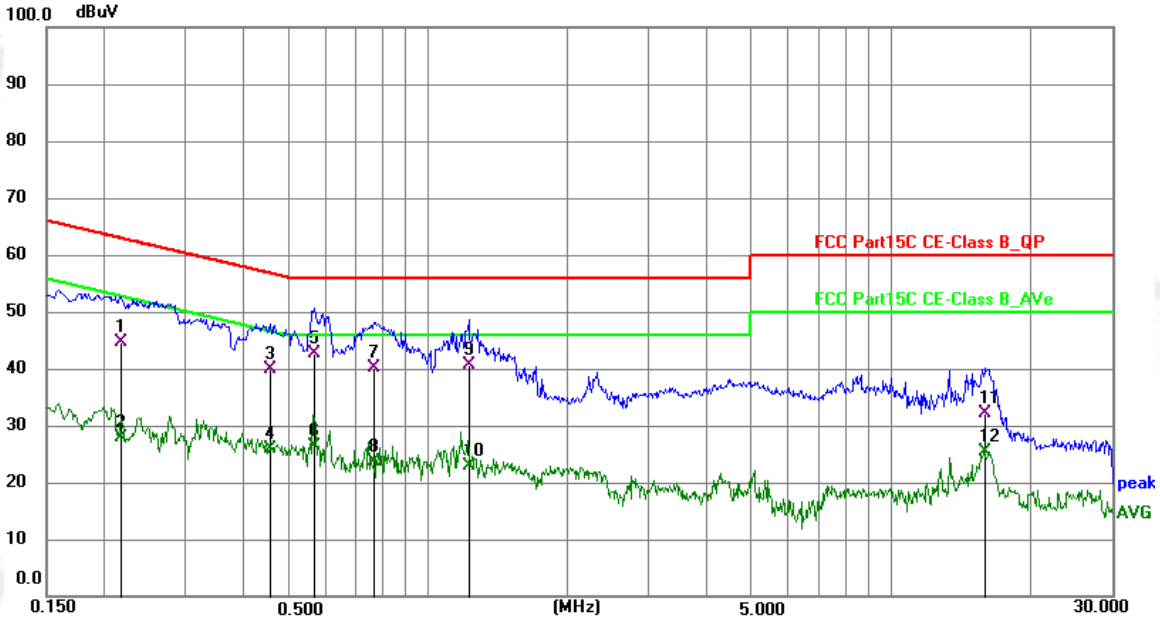
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.7 Conducted Emission Test Result

Pass

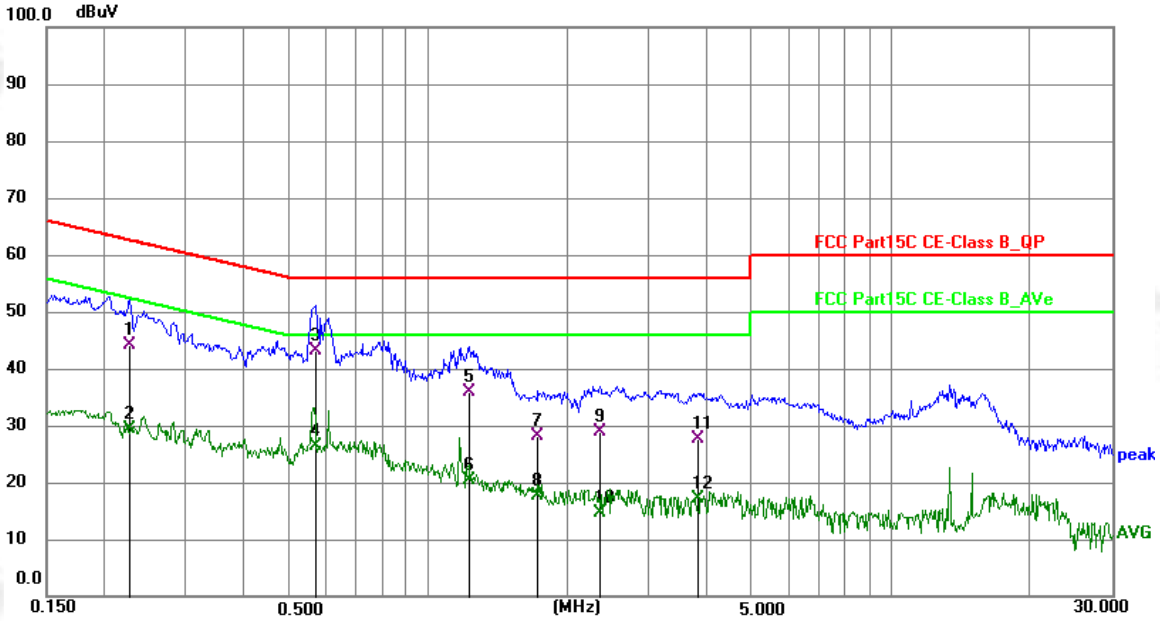
All the modulation modes were tested the data of the worst mode (802.11ac20, middle channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Temperature:	25.4°C	Relative Humidity:	56%
Pressure:	101kPa	Phase :	L
Test Voltage :	DC 5V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2172	24.92	19.66	44.58	62.93	-18.35	QP
2	0.2172	8.14	19.66	27.80	52.93	-25.13	AVG
3	0.4560	20.32	19.63	39.95	56.77	-16.82	QP
4	0.4560	6.22	19.63	25.85	46.77	-20.92	AVG
5 *	0.5685	22.99	19.63	42.62	56.00	-13.38	QP
6	0.5685	6.85	19.63	26.48	46.00	-19.52	AVG
7	0.7661	20.53	19.65	40.18	56.00	-15.82	QP
8	0.7661	4.02	19.65	23.67	46.00	-22.33	AVG
9	1.2255	20.83	19.69	40.52	56.00	-15.48	QP
10	1.2255	3.20	19.69	22.89	46.00	-23.11	AVG
11	15.9990	11.84	20.25	32.09	60.00	-27.91	QP
12	15.9990	5.03	20.25	25.28	50.00	-24.72	AVG

Temperature:	25.4°C	Relative Humidity:	56%
Pressure:	101kPa	Phase :	N
Test Voltage :	DC 5V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2265	24.43	19.66	44.09	62.58	-18.49	QP
2	0.2265	9.73	19.66	29.39	52.58	-23.19	AVG
3 *	0.5700	23.52	19.66	43.18	56.00	-12.82	QP
4	0.5700	6.77	19.66	26.43	46.00	-19.57	AVG
5	1.2255	16.29	19.68	35.97	56.00	-20.03	QP
6	1.2255	0.81	19.68	20.49	46.00	-25.51	AVG
7	1.7340	8.38	19.64	28.02	56.00	-27.98	QP
8	1.7340	-1.93	19.64	17.71	46.00	-28.29	AVG
9	2.3460	9.35	19.61	28.96	56.00	-27.04	QP
10	2.3460	-4.90	19.61	14.71	46.00	-31.29	AVG
11	3.8310	8.17	19.56	27.73	56.00	-28.27	QP
12	3.8310	-2.47	19.56	17.09	46.00	-28.91	AVG

Notes:
1. An initial pre-scan was performed on the line and neutral lines with peak detector.

2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor
Correct Factor = Insertion loss of LISN + Cable loss.
4.Margin= Mesurement Level - Limit

7 Radiated Spurious Emissions

Test Requirement	:	FCC CFR47 Part 15 Section 15.209 & 15.407
Test Method	:	ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
Test Result	:	PASS
Measurement Distance	:	3m
Limit	:	See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

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

Undesirable emission limits

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge

7.1 EUT Operation

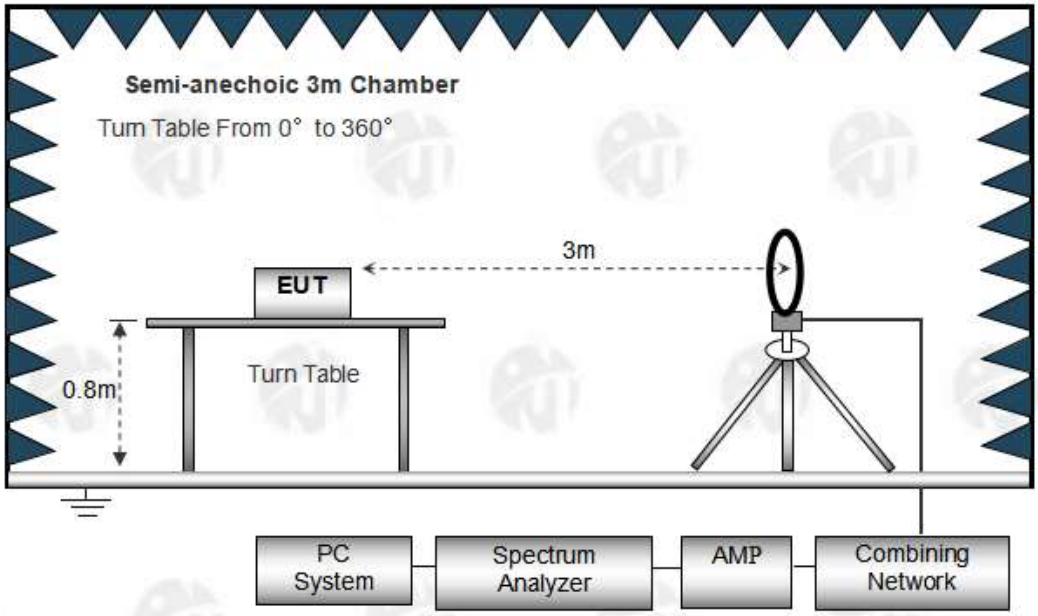
Operating Environment :

Temperature	:	25.5 °C
Humidity	:	52% RH
Atmospheric Pressure	:	101.3kPa
Test Voltage	:	DC 5V from adapter AC 120V/60Hz

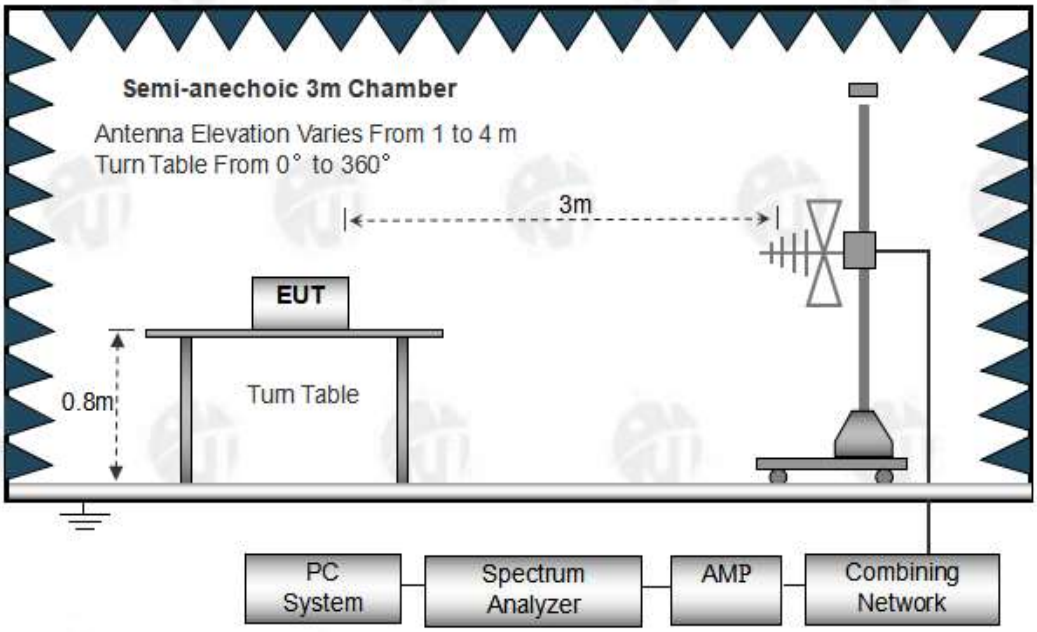
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

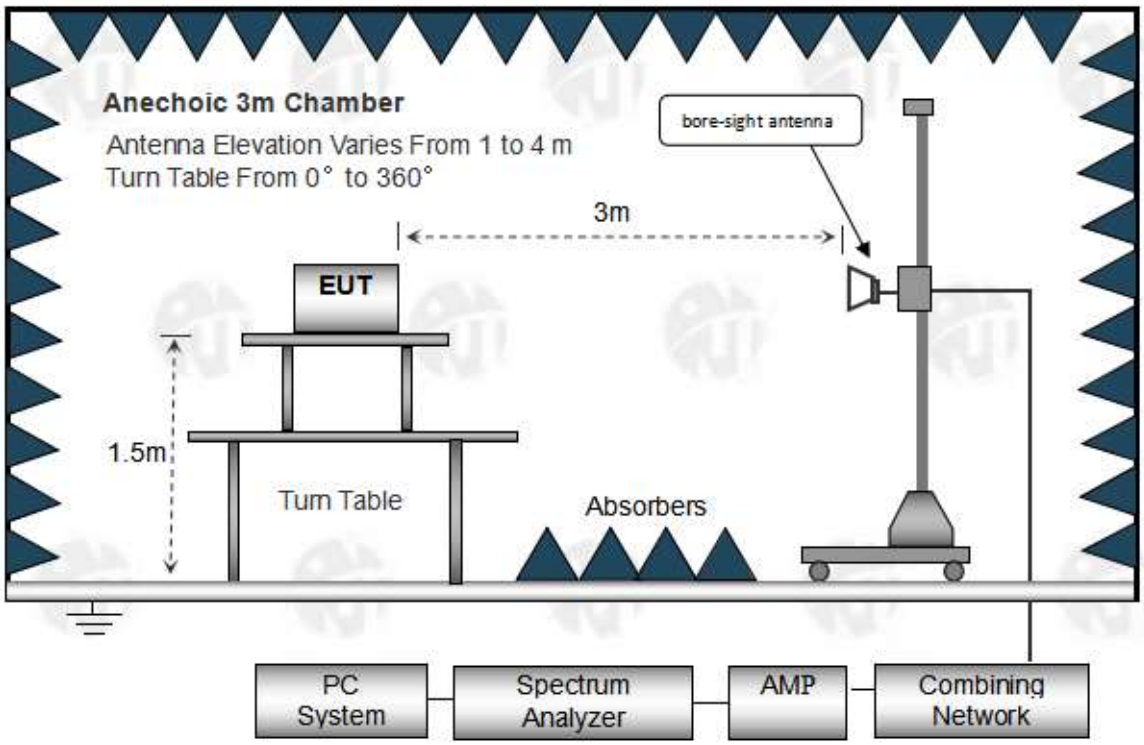
The test setup for emission measurement below 30MHz

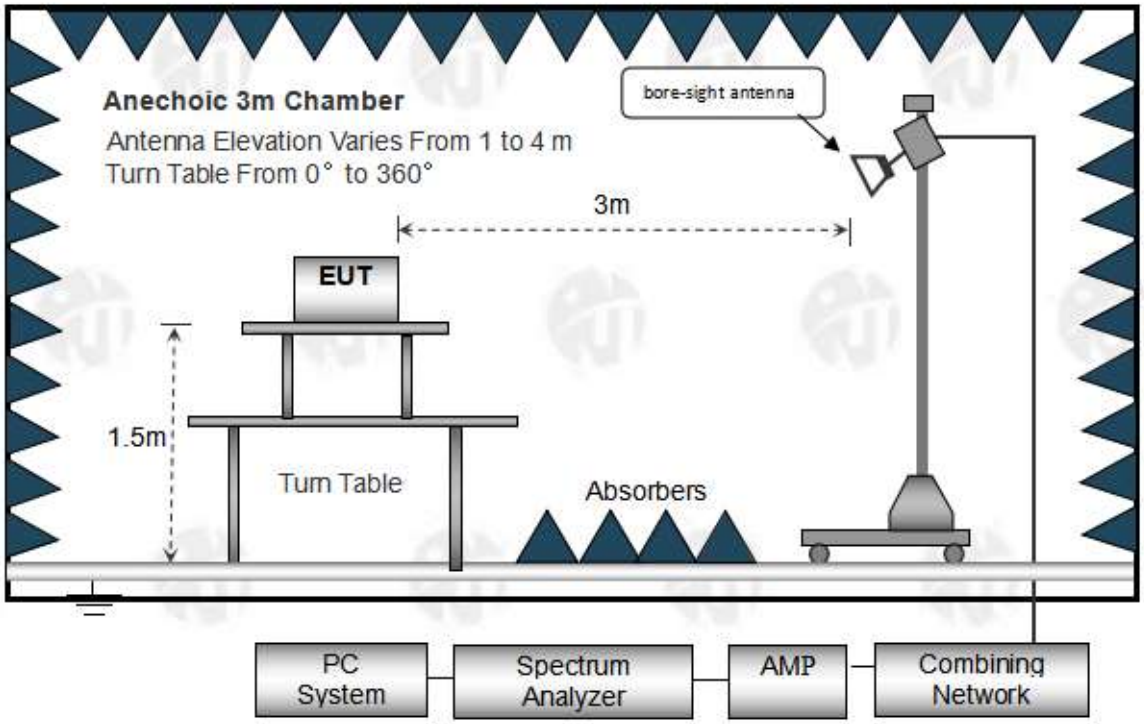


The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz


Anechoic 3m Chamber
Antenna Elevation Varies From 1 to 4 m
Turn Table From 0° to 360°
bore-sight antenna
3m
EUT
1.5m
Turn Table
Absorbers
PC System
Spectrum Analyzer
AMP
Combining Network


Anechoic 3m Chamber
Antenna Elevation Varies From 1 to 4 m
Turn Table From 0° to 360°
bore-sight antenna
3m
EUT
1.5m
Turn Table
Absorbers
PC System
Spectrum Analyzer
AMP
Combining Network

7.3 Spectrum Analyzer Setup

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 3 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

7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024.

2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.

7. Test Procedure of measurement (For Above 1GHz):

1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).

2) Change the antenna polarization and repeat 1) with vertical polarization.

3) Make a hardcopy of the spectrum.

4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.

5) Change the analyser mode to Clear/ Write and found the cone of emission.

6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.

7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.

8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

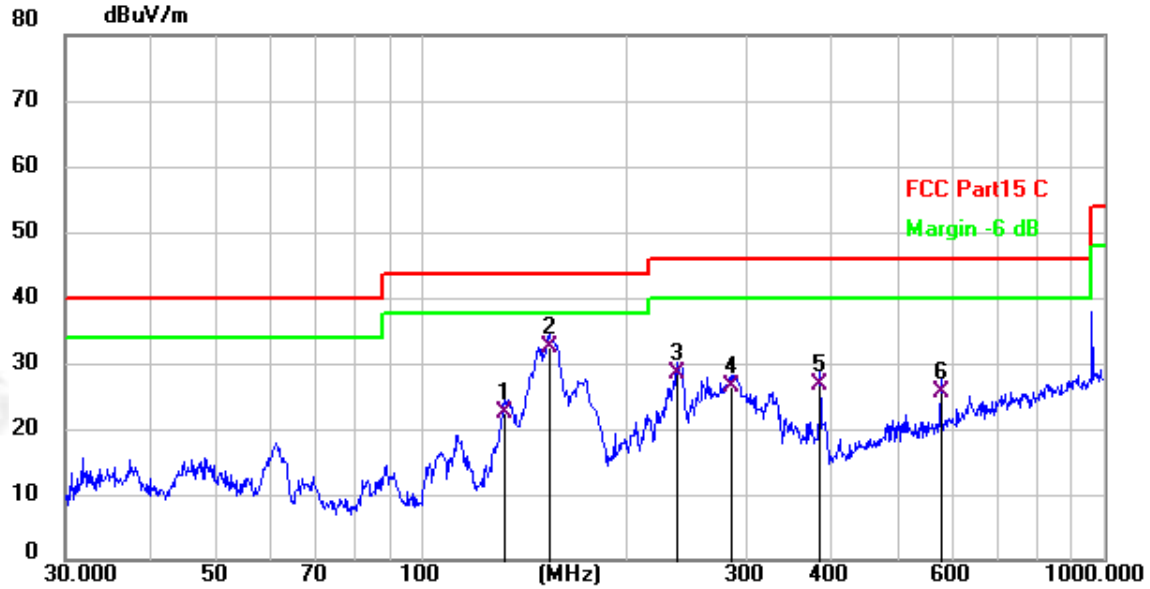
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

UNII-3:

Please refer to the following test plots, Middle Channel Worst case 802.11ac20 for record:

Temperature:	25.5℃	Relative Humidity:	52%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	DC 5V from adapter AC 120V/60Hz		

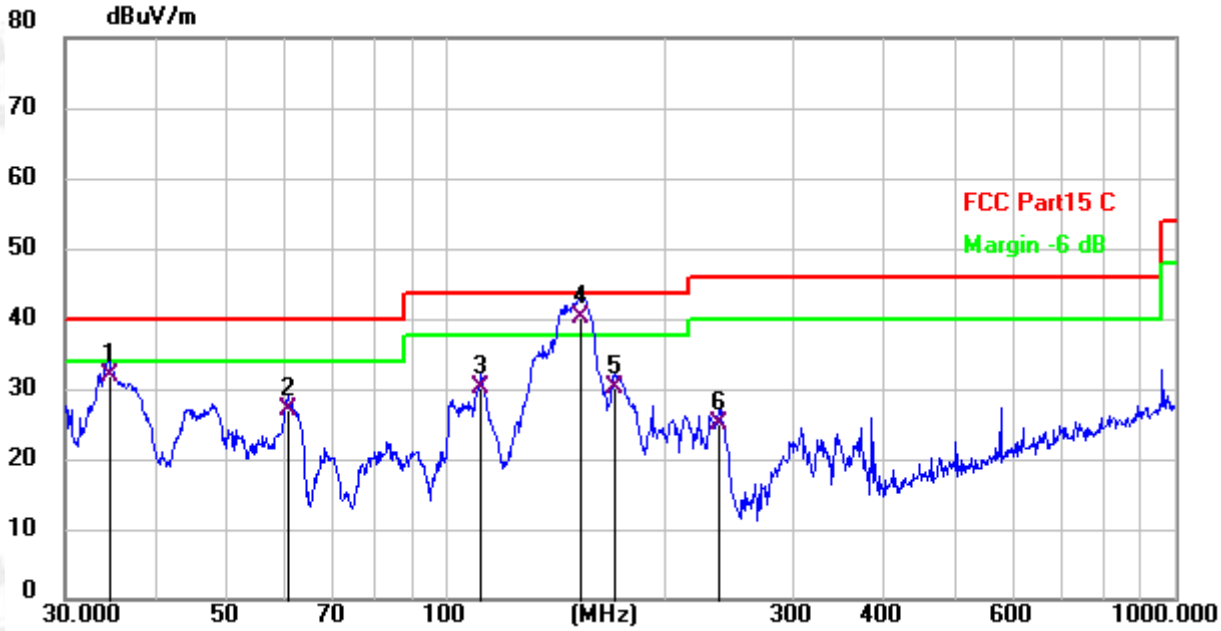


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	132.6850	44.79	-22.29	22.50	43.50	-21.00	QP
2 *	154.2786	54.26	-21.86	32.40	43.50	-11.10	QP
3	237.4760	51.76	-23.46	28.30	46.00	-17.70	QP
4	283.9791	48.24	-21.94	26.30	46.00	-19.70	QP
5	383.9318	46.00	-19.30	26.70	46.00	-19.30	QP
6	576.6443	39.08	-13.58	25.50	46.00	-20.50	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Margin= Emission Level – Limit

Temperature:	25.5℃	Relative Humidity:	52%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	DC 5V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.5172	56.43	-24.53	31.90	40.00	-8.10	QP
2	60.9175	51.52	-24.62	26.90	40.00	-13.10	QP
3	111.7380	54.73	-24.63	30.10	43.50	-13.40	QP
4 *	152.6641	61.76	-21.66	40.10	43.50	-3.40	QP
5	170.1947	52.72	-22.52	30.20	43.50	-13.30	QP
6	237.4760	48.56	-23.46	25.10	46.00	-20.90	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Margin= Emission Level - Limit

Test Frequency 1GHz-40GHz

UNII-3:

802.11ac20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490	44.99	32.29	8.39	38.90	59.99	74.00	-14.01	PK
V	11490	28.8	32.29	8.39	38.90	43.80	54.00	-10.20	AV
V	17233.3	44.74	31.19	9.62	40.37	63.54	74.00	-10.46	PK
V	17233.3	22.44	31.19	9.62	40.37	41.24	54.00	-12.76	AV
V	22980	39.63	27.02	7.20	38.98	58.79	74.00	-15.21	PK
V	22980	23.64	27.02	7.20	38.98	42.80	54.00	-11.20	AV
V	28723.3	39.6	27.10	7.56	40.18	60.24	74.00	-13.76	PK
V	28723.3	21.81	27.10	7.56	40.18	42.45	54.00	-11.55	AV
H	11490	45.95	32.29	8.39	38.90	60.95	74.00	-13.05	PK
H	11490	26.24	32.29	8.39	38.90	41.24	54.00	-12.76	AV
H	17233.3	45.15	31.19	9.62	40.37	63.95	74.00	-10.05	PK
H	17233.3	22.26	31.19	9.62	40.37	41.06	54.00	-12.94	AV
H	22980	41.94	27.02	7.20	38.98	61.10	74.00	-12.90	PK
H	22980	23.11	27.02	7.20	38.98	42.27	54.00	-11.73	AV
H	28723.3	39.28	27.10	7.56	40.18	59.92	74.00	-14.08	PK
H	28723.3	22.46	27.10	7.56	40.18	43.10	54.00	-10.90	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570	40.52	32.26	8.48	38.90	55.64	74.00	-18.36	PK
V	11570	23.93	32.26	8.48	38.90	39.05	54.00	-14.95	AV
V	17353.3	37.47	31.08	9.67	40.61	56.67	74.00	-17.33	PK
V	17353.3	21.08	31.08	9.67	40.61	40.28	54.00	-13.72	AV
V	23140	39.96	27.03	7.24	39.03	59.20	74.00	-14.80	PK
V	23140	18.22	27.03	7.24	39.03	37.46	54.00	-16.54	AV
V	28923.3	40.14	27.10	7.58	40.34	60.96	74.00	-13.04	PK
V	28923.3	16.07	27.10	7.58	40.34	36.89	54.00	-17.11	AV
H	11570	42.86	32.26	8.48	38.90	57.98	74.00	-16.02	PK
H	11570	24.51	32.26	8.48	38.90	39.63	54.00	-14.37	AV
H	17353.3	38.57	31.08	9.67	40.61	57.77	74.00	-16.23	PK
H	17353.3	16.42	31.08	9.67	40.61	35.62	54.00	-18.38	AV
H	23140	36.58	27.03	7.24	39.03	55.82	74.00	-18.18	PK
H	23140	17.68	27.03	7.24	39.03	36.92	54.00	-17.08	AV
H	28923.3	38.42	27.10	7.58	40.34	59.24	74.00	-14.76	PK
H	28923.3	15.65	27.10	7.58	40.34	36.47	54.00	-17.53	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650	46.72	32.23	8.56	38.90	61.95	74.00	-12.05	PK
V	11650	26.46	32.23	8.56	38.90	41.69	54.00	-12.31	AV
V	17473.3	45.52	30.97	9.73	40.85	65.13	74.00	-8.87	PK
V	17473.3	26.87	30.97	9.73	40.85	46.48	54.00	-7.52	AV
V	23300	36.76	27.03	7.26	39.06	56.05	74.00	-17.95	PK
V	23300	21.93	27.03	7.26	39.06	41.22	54.00	-12.78	AV
V	29123.3	39.55	27.10	7.61	40.40	60.46	74.00	-13.54	PK
V	29123.3	22.54	27.10	7.61	40.40	43.45	54.00	-10.55	AV
H	11650	43.15	32.23	8.56	38.90	58.38	74.00	-15.62	PK
H	11650	28.18	32.23	8.56	38.90	43.41	54.00	-10.59	AV
H	17473.3	43.64	30.97	9.73	40.85	63.25	74.00	-10.75	PK
H	17473.3	26.65	30.97	9.73	40.85	46.26	54.00	-7.74	AV
H	23300	45.6	27.03	7.26	39.06	64.89	74.00	-9.11	PK
H	23300	23.6	27.03	7.26	39.06	42.89	54.00	-11.11	AV
H	29123.3	32.91	27.10	7.61	40.40	53.82	74.00	-20.18	PK
H	29123.3	20.99	27.10	7.61	40.40	41.90	54.00	-12.10	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.
4. The worst mode is 802.11ac20, only the worst data is recorded.

Restrict Band EMISSION MEASUREMENT

U-NII-3

Frequency	Meter Reading	antenna Factor	cable loss	preamp factor	Emission Level	Limit	Margin	Polar	Detector Type	Result
(MHz)	(dB μV)	(dB)	(dB)	(dB)	(dB μV/m)	(dB μV/m)	(dB)	(H/V)		
802.11a										
5720	52.23	33.33	5.70	33.42	57.84	111.8	-53.96	V	PK	Pass
5725	53.74	33.34	5.70	33.42	59.36	123.2	-63.84	V	PK	Pass
5850	57.74	33.64	5.78	33.32	63.84	123.2	-59.36	V	PK	Pass
5855	51.13	33.64	5.78	33.32	57.23	111.8	-54.57	V	PK	Pass
5720	53.84	33.33	5.70	33.42	59.45	111.8	-52.35	H	PK	Pass
5725	51.82	33.34	5.70	33.42	57.44	123.2	-65.76	H	PK	Pass
5850	49.25	33.64	5.78	33.32	55.35	123.2	-67.85	H	PK	Pass
5855	48.69	33.64	5.78	33.32	54.79	111.8	-57.01	H	PK	Pass
802.11n20										
5720	52.77	33.33	5.70	33.42	58.38	111.8	-53.42	V	PK	Pass
5725	51.79	33.34	5.70	33.42	57.41	123.2	-65.79	V	PK	Pass
5850	52.15	33.64	5.78	33.32	58.25	123.2	-64.95	V	PK	Pass
5855	52.87	33.64	5.78	33.32	58.97	111.8	-52.83	V	PK	Pass
5720	49.16	33.33	5.70	33.42	54.77	111.8	-57.03	H	PK	Pass
5725	46.47	33.34	5.70	33.42	52.09	123.2	-71.11	H	PK	Pass
5850	50.38	33.64	5.78	33.32	56.48	123.2	-66.72	H	PK	Pass

5855	52.06	33.64	5.78	33.32	58.16	111.8	-53.64	H	PK	Pass
802.11ac20										
5720	53.11	33.33	5.70	33.42	58.72	111.8	-53.08	V	PK	Pass
5725	57.05	33.34	5.70	33.42	62.67	123.2	-60.53	V	PK	Pass
5850	56.13	33.64	5.78	33.32	62.23	123.2	-60.97	V	PK	Pass
5855	51.04	33.64	5.78	33.32	57.14	111.8	-54.66	V	PK	Pass
5720	50.02	33.33	5.70	33.42	55.63	111.8	-56.17	H	PK	Pass
5725	50.01	33.34	5.70	33.42	55.63	123.2	-67.57	H	PK	Pass
5850	52.39	33.64	5.78	33.32	58.49	123.2	-64.71	H	PK	Pass
5855	52.61	33.64	5.78	33.32	58.71	111.8	-53.09	H	PK	Pass
802.11n40										
5720	49.16	33.33	5.70	33.42	54.77	111.8	-57.03	V	PK	Pass
5725	53.97	33.34	5.70	33.42	59.59	123.2	-63.61	V	PK	Pass
5850	57.46	33.64	5.78	33.32	63.56	123.2	-59.64	V	PK	Pass
5855	50.29	33.64	5.78	33.32	56.39	111.8	-55.41	V	PK	Pass
5720	49.05	33.33	5.70	33.42	54.66	111.8	-57.14	H	PK	Pass
5725	51.28	33.34	5.70	33.42	56.90	123.2	-66.30	H	PK	Pass
5850	51.59	33.64	5.78	33.32	57.69	123.2	-65.51	H	PK	Pass
5855	47.96	33.64	5.78	33.32	54.06	111.8	-57.74	H	PK	Pass
802.11ac40										
5720	48.86	33.33	5.70	33.42	54.47	111.8	-57.33	V	PK	Pass
5725	57.77	33.34	5.70	33.42	63.39	123.2	-59.81	V	PK	Pass
5850	57.36	33.64	5.78	33.32	63.46	123.2	-59.74	V	PK	Pass
5855	49.49	33.64	5.78	33.32	55.59	111.8	-56.21	V	PK	Pass
5720	48.35	33.33	5.70	33.42	53.96	111.8	-57.84	H	PK	Pass

5725	52.98	33.34	5.70	33.42	58.60	123.2	-64.60	H	PK	Pass
5850	51.49	33.64	5.78	33.32	57.59	123.2	-65.61	H	PK	Pass
5855	52.46	33.64	5.78	33.32	58.56	111.8	-53.24	H	PK	Pass

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.

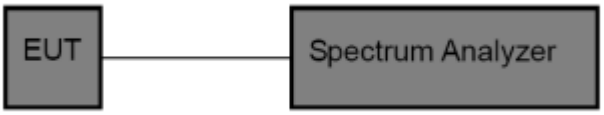
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

8 Duty cycle

8.1 Limit

Test Requirement:	FCC CFR Title 47 Part 15 Subpart C Section 15.407
Test Method:	ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 KDB 789033 D02 v02r01
Test Result:	PASS

8.2 Test Setup



8.3 Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted si gnal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in IILB.1.a), and the number of sweep points across duration T exceds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

8.4 Test Result

Please see the attachment for WIFI5.8G data.

9 POWER SPECTRAL DENSITY TEST

9.1 Test Standard and Limit

According to FCC §15.407(3)

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum

power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

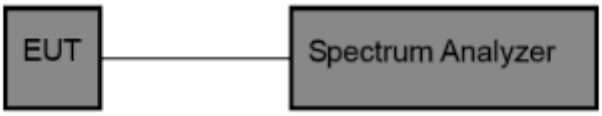
(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi

without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

9.2 Test Setup



9.3 Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,

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-NII-3 Band:

Set RBW=510 kHz, VBW=1.6RBW, 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).

9.4 Test Data

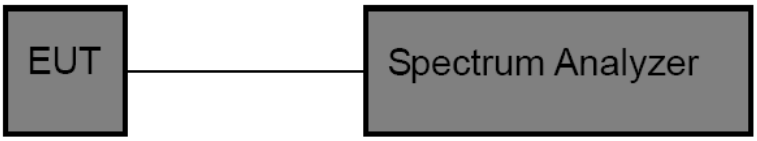
Please see the attachment for WIFI5.8G data.

10 26DB & 6DB & 99% Emission Bandwidth Test

10.1 Test Standard

Test Standard	FCC Part15 C Section 15.407
	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

10.2 Test Setup



10.3 Test Procedure

The following procedure shall be used for measuring 6db bandwidth:

1. Set RBW= 100 kHz.

2. Set the video bandwidth (VBW) ≥ 3 x RBW.

3. Detector = Peak.

4. Trace mode = max hold.

5. Sweep = auto couple.

6. Allow the trace to stabilize.

7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

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

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 3.3 times the OBW.

3. Set RBW = 1 % to 5 % of the OBW

4. Set VBW ≥ 3 · RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99 % power bandwidth fuNCTion of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth fuNCTion, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

The following procedure shall be used for measuring 26db bandwidth:

1) Set RBW = approximately 1% of the emission bandwidth.

2) Set the VBW > RBW.

3) Detector = Peak

4) Trace mode = max hold.

5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

10.4 Test Data

Please see the attachment for and WIFI5.8G data.

11 Maximum Conducted Output Power

11.1 Test Standard and Limit

According to FCC §15.407

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.
Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power.
For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi.
Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

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

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.
Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications,

and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

11.2 Test Setup

11.3 Test Procedure

The EUT was directly connected to the Power meter

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

Measurement using a Power Meter(PM)

a) Method PM (Measurement using an RF average power meter):

(i)Measurements may be performed using a wideband RF power meter with a thermocouple

detector or equivalent if all of the following conditions are satisfied:

● The EUT is configured to transmit continuously or to transmit with a constant duty cycle.

●At all times when the EUT is transmitting, it must be transmitting at its maximum power

control level.

● The integration period of the power meter exceeds the repetition period of the

transmitted signal by at least a factor of five.

(i) If the transmitter does not transmit continuously, measure the duty cycle, x, of the

transmitter output signal as described in IIL.B.

(ii) Measure the average power of the transmitter. This measurement is an average over both

the on and off periods of the transmitter.

(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g. 10 log (1/0.25) if the duty cycle is 25%).

b) Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

11.4 Test Data

Please see the attachment for WIFI5.8G data.

12 Out of Band Emissions and Spurious Emission

12.1 Test Standard and Limit

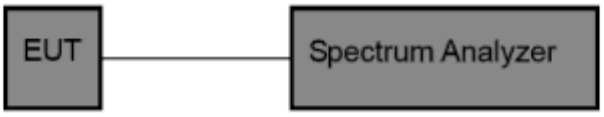
According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 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 e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

12.2 Test Setup



12.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.

3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.

4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

5. Repeat above procedures until all measured frequencies were complete.

12.4 Test Data

Please see the attachment for and WIFI5.8G data.

13 Antenna Requirement

13.1 Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	1) 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

13.2 Antenna Connected Construction

The antenna is Built-in Antenna which permanently attached, and the best case gain of the antenna is 2.93 dBi. It complies with the standard requirement.

14 TEST SETUP & EUT PHOTOGRAPH

Please see the attachment for details.

---------- End of Report ----------