Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

TEST REPORT
FCC PART 15.407

Report Reference No. ..... :	**CTA24072900904**
FCC ID. ..... :	**2AY4C-MG01**
Compiled by (position+printed name+signature). :	File administrators Jinghua Xiao
Supervised by (position+printed name+signature). :	Project Engineer Xudong Zhang
Approved by (position+printed name+signature). :	RF Manager Eric Wang
Date of issue ..... :	Oct. 16, 2024
Testing Laboratory Name ..... :	**Shenzhen CTA Testing Technology Co., Ltd.**
Address ..... :	Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name ..... :	**ShenZhen Jiteng Network Technology Co., Ltd.**
Address ..... :	Floor 7, Building B, Boton Science and Technology Park, Chaguang Road, Xili Street, Nanshan District, Shenzhen, 518055, China
Test specification ..... **:**	
Standard ..... :	**FCC Part 15.407: UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES**

Test item description..... :	**Gaming Mini PC**
Trade Mark..... :	N/A
Manufacturer..... :	ShenZhen Jiteng Network Technology Co., Ltd.
Model/Type reference..... :	MegaMini2
Listed Models ..... :	N/A
Modulation Type ..... :	DSSS, OFDM
Operation Frequency ..... :	From 5180MHz to 5320MHz, 5500MHz to 5700MHz, 5745MHz to 5825MHz
Rating..... :	DC 19.5V From external circuit
Result..... :	**PASS**

TEST REPORT

Equipment under Test	:	Gaming Mini PC
Model /Type	:	MegaMini2
Series Model No.		N/A
Applicant	:	**ShenZhen Jiteng Network Technology Co., Ltd.**
Address	:	Floor 7, Building B, Boton Science and Technology Park, Chaguang Road, Xili Street, Nanshan District, Shenzhen, 518055, China
Manufacturer	:	**ShenZhen Jiteng Network Technology Co., Ltd.**
Address	:	Floor 7, Building B, Boton Science and Technology Park, Chaguang Road, Xili Street, Nanshan District, Shenzhen, 518055, China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.407: UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices
KDB 789033 D02: GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORAMTION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Aug. 05, 2024
Testing commenced on	:	Aug. 05, 2024
Testing concluded on	:	Oct. 16, 2024

2.2. Product Description

Product Name:	Gaming Mini PC
Model/Typereference:	MegaMini2
Power supply:	DC 19.5V From external circuit
Adapter information:	Model: HKA300195A5-0A7 Input: AC 100-240V 50/60Hz 5.0A Output: DC 19.5V 15.38A 299.9W
testing sample ID:	CTA240729009-1# (Engineer sample) CTA240729009-2# (Normal sample)
Hardware version:	V1.0
Software version:	V1.0
WIFI	
WLAN	Supported 802.11 a/n/ac/ax
Modulation Type	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT80: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT160: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax HE20: OFDMA (64QAM, 16QAM, 256QAM, 1024QAM, QPSK, BPSK) IEEE 802.11ax HE40: OFDMA (64QAM, 16QAM, 256QAM, 1024QAM, QPSK, BPSK) IEEE 802.11ax HE80: OFDMA (64QAM, 16QAM, 256QAM, 1024QAM, QPSK, BPSK) IEEE 802.11ax HE160: OFDMA (64QAM, 16QAM, 256QAM, 1024QAM, QPSK, BPSK)
Operation frequency	IEEE 802.11a:5180--5320MHz,5500-5700MHz,5745-5825MHz IEEE 802.11n HT20: 5180--5320MHz,5500-5700MHz,5745-5825MHz IEEE 802.11n HT40: 5190-5310MHz,5510-5670MHz,5755-5795MHz IEEE 802.11ac/ax20: 5180--5320MHz,5500-5700MHz,5745-5825MHz IEEE 802.11ac/ax40: 5190-5310MHz,5510-5670MHz,5755-5795MHz IEEE 802.11ac/ax80:5210MHz,5290MHz,5530MHz,5775MHz IEEE 802.11ac/ax160: 5250MHz, 5570MHz
Antenna type:	Internal antenna
Antenna gain:	4.31 dBi for Ant 1 and 3.83 dBi for Ant2
Directional gain	Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + … + $10^{GN/20}$)^2 /NANT] dBi Directional gain=7.08dBi

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 19.5V From external circuit

2.4. Short description of the Equipment under Test (EUT)

This is a Gaming Mini PC.
For more details, refer to the user's manual of the EUT.

2.5. EUT operation mode

The application provider specific test software to control sample in continuous TX and RX.

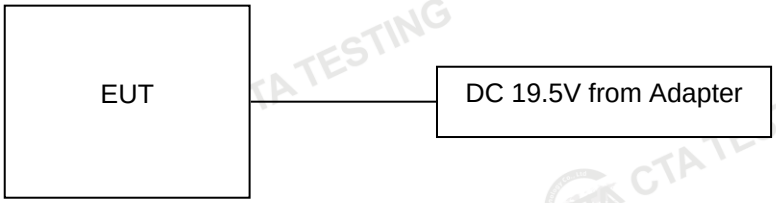
IEEE 802.11a/ac20/ax20/ac40/ax40/ac80/ax80/n20/n40/ac160/ax160:

U-NII-1 and U-NII-2A		U-NII-1 and U-NII-2A		U-NII-1 and U-NII-2A		U-NII-1 and U-NII-2A	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210	50	5250
40	5200	46	5230				
44	5220						
48	5240						
52	5260	54	5270	58	5290	50	5250
56	5280	62	5310				
60	5300						
64	5320						

U-NII-2C		U-NII-2C		U-NII-2C		U-NII-2C	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530	114	5570
104	5520	110	5550				
108	5540	118	5590				
112	5560	126	5630				
116	5580	134	5670				
120	5600						
124	5620						
128	5640						
132	5660						
136	5680						
140	5700						

U-NII-3		U-NII-3		U-NII-3		U-NI-3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	**5745**	151	5755	155	5775		
153	5765	159	5795				
157	**5785**						
161	5805						
165	**5825**						

2.6. Block Diagram of Test Setup



2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:
FCC-Registration No.: 517856 Designation Number: CN1318

Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6534.01

Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

Test Specification clause	Test case	Test Mode	Test Channel	Recorded In Report		Pass	Fail	NA	NP	Remark
§15.203	Antenna gain	802.11ac	☒ Lowest ☒ Middle ☒ Highest	802.11ac	☒ Lowest ☒ Middle ☒ Highest	☒	☐	☐	☐	complies
§15.407(a)	Power spectral density	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	☒	☐	☐	☐	complies
§15.407(a)	Spectrum bandwidth – 26 dB bandwidth	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	☒ ☒	☐	☐	☐	complies
§15.407(e)	Spectrum bandwidth – 6 dB bandwidth	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	☒ ☒	☐	☐	☐	complies
§15.407(a)	Maximum output power	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/	☒ Lowest ☒ Middle ☒ Highest	802.11a/ac20/ax20/ac40/ax40/ac80/ac160/ax8	☒ Lowest ☒ Middle ☒ Highest	☒ ☒ ☒	☐	☐	☐	complies

		ax80/ax160 802.11n HT20/40		0/ax160 802.11n HT20/40						
§15.407(b)	Band edge compliance conducted	802.11a/ac20/ ax20/ac40/ax4 0/ac80/ac160/ ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Highest	802.11a/ac20/a x20/ac40/ax40/ ac80/ac160/ax8 0/ax160 802.11n HT20/40	☒ Lowest ☒ Highest	☒ ☒	☐	☐	☐	complies
§15.407(b)	Band edge compliance radiated	802.11a/ac20/ ax20/ac40/ax4 0/ac80/ac160/ ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Highest	802.11a/ac20/a x20/ac40/ax40/ ac80/ac160/ax8 0/ax160 802.11n HT20/40	☒ Lowest ☒ Highest	☒	☐	☐	☐	complies
§15.407(a)	TX spurious emissions conducted	-/-	-/-	-/-	-/-	☐	☐	☒	☐	complies
§15.407(a)	TX spurious emissions radiated	802.11a/ac20/ ax20/ac40/ax4 0/ac80/ac160/ ax80/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	802.11a/ac20/a x20/ac40/ax40/ ac80/ac160/ax8 0/ax160 802.11n HT20/40	☒ Lowest ☒ Middle ☒ Highest	☒	☐	☐	☐	complies
§15.407(g)	Frequency Stability	-/-	-/-	-/-	-/-	☒	☐	☐	☐	complies
§15.109	RX spurious emissions radiated	-/-	-/-	-/-	-/-	☐	☐	☒	☐	complies
§15.209(a)	TX spurious Emissions radiated < 30 MHz	802.11a/ac20/ ax20/ac40/ax4 0/ac80/ac160/ ax80/ax160 802.11n HT20/40	-/-	802.11ac	-/-	☒	☐	☐	☐	complies
§15.107(a) §15.207	Conducted Emissions < 30 MHz	802.11a/ac20/ ax20/ac40/ax4 0/ac80/ac160/ ax80/ax160 802.11n HT20/40	-/-	802.11ac	-/-	☒	☐	☐	☐	complies

Remark:
1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen CTA Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTA Testing Technology Co., Ltd. :

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	9KHz~30MHz	3.02 dB	(1)
Radiated Emission	30~1000MHz	4.06 dB	(1)

Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)
Output Peak power	30MHz~18GHz	0.55 dB	(1)
Power spectral density	/	0.57 dB	(1)
Spectrum bandwidth	/	1.1%	(1)
Radiated spurious emission (30MHz-1GHz)	30~1000MHz	4.10 dB	(1)
Radiated spurious emission (1GHz-18GHz)	1~18GHz	4.32 dB	(1)
Radiated spurious emission (18GHz-40GHz)	18-40GHz	5.54 dB	(1)

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2024/08/03	2025/08/02
LISN	R&S	ENV216	CTA-314	2024/08/03	2025/08/02
EMI Test Receiver	R&S	ESPI	CTA-307	2024/08/03	2025/08/02
EMI Test Receiver	R&S	ESCI	CTA-306	2024/08/03	2025/08/02
Spectrum Analyzer	Agilent	N9020A	CTA-301	2024/08/03	2025/08/02
Spectrum Analyzer	R&S	FSU	CTA-337	2024/08/03	2025/08/02
Spectrum Analyzer	R&S	FSV40	CTA-368	2024/08/03	2025/08/02
Vector Signal generator	Agilent	N5182A	CTA-305	2024/08/03	2025/08/02
Analog Signal Generator	R&S	SML03	CTA-304	2024/08/03	2025/08/02
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	R&S	CTA-302	2024/08/03	2025/08/02
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2024/08/03	2025/08/02
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2024/10/16
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2024/10/12
Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2024/10/16
Broadband Horn Antenna	A-INFOMW	LB-180500H-2.4F	CTA-336	2023/09/13	2026/09/12
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2024/08/03	2025/08/02
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2024/08/03	2025/08/02
Directional coupler	NARDA	4226-10	CTA-303	2024/08/03	2025/08/02
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2024/08/03	2025/08/02
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2024/08/03	2025/08/02

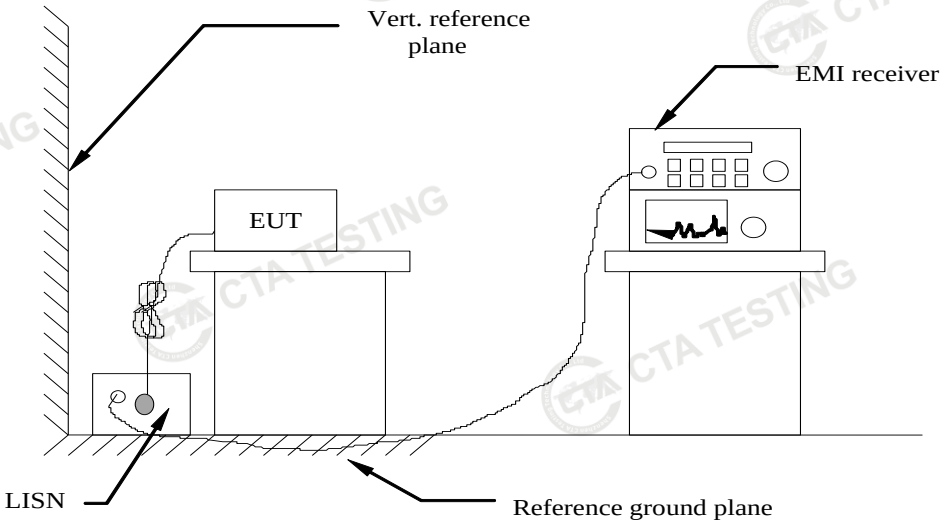
Automated filter bank	Tonscend	JS0806-F	CTA-404	2024/08/03	2025/08/02
Power Sensor	Agilent	U2021XA	CTA-405	2024/08/03	2025/08/02
Amplifier	Schwarzbeck	BBV9719	CTA-406	2024/08/03	2025/08/02

Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date
EMI Test Software	Tonscend	TS®JS32-RE	5.0.0.2	N/A	N/A
EMI Test Software	Tonscend	TS®JS32-CE	5.0.0.1	N/A	N/A
RF Test Software	Tonscend	TS®JS1120-3	3.1.65	N/A	N/A
RF Test Software	Tonscend	TS®JS1120	3.1.46	N/A	N/A

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC 12V power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT.The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

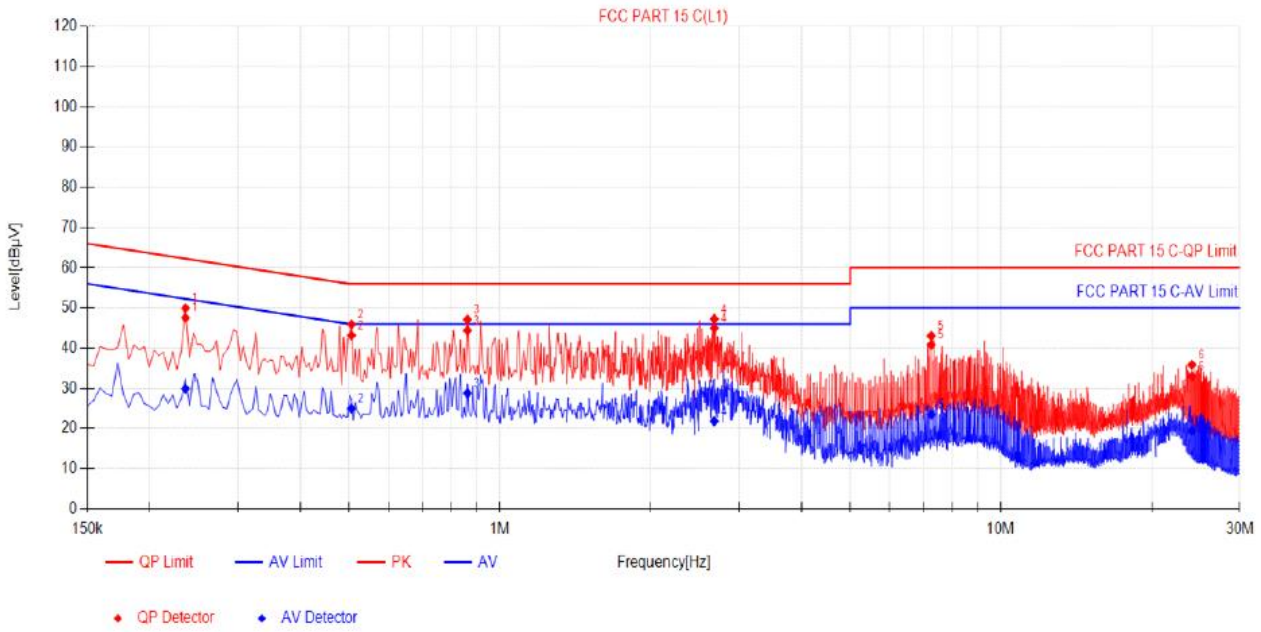
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

TEST RESULTS

Remark: We measured Conducted Emission at all mode in AC 120V/60Hz, the worst case was recorded .

Power supply:	DC 19.5V From Adapter AC 120V/60Hz	Polarization	L

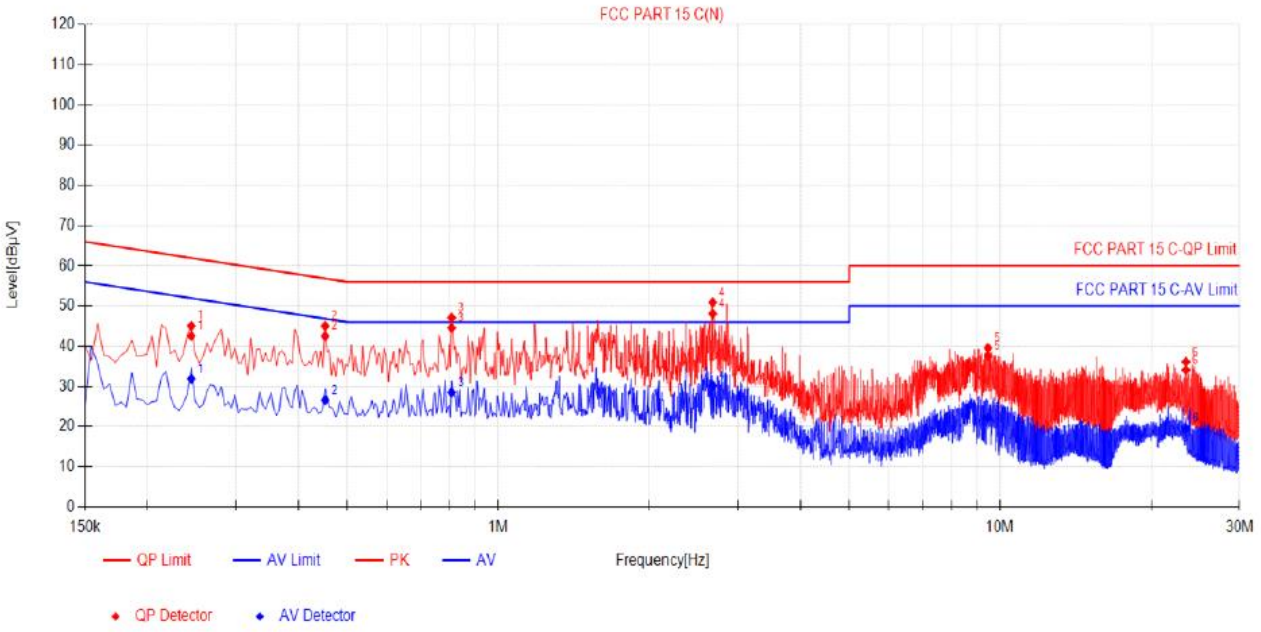


Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.2355	9.98	37.57	47.55	62.25	14.70	19.90	29.88	52.25	22.37	PASS
2	0.5055	10.02	33.16	43.18	56.00	12.82	14.94	24.96	46.00	21.04	PASS
3	0.861	10.00	34.39	44.39	56.00	11.61	18.76	28.76	46.00	17.24	PASS
4	2.679	10.07	34.89	44.96	56.00	11.04	11.75	21.82	46.00	24.18	PASS
5	7.2645	10.29	30.55	40.84	60.00	19.16	13.18	23.47	50.00	26.53	PASS
6	24.081	10.49	22.46	32.95	60.00	27.05	8.91	19.40	50.00	30.60	PASS

Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)
4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

Power supply:	DC 19.5V From Adapter AC 120V/60Hz	Polarization	N



Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.2445	10.01	32.53	42.54	61.94	19.40	21.85	31.86	51.94	20.08	PASS
2	0.4515	9.98	32.54	42.52	56.85	14.33	16.60	26.58	46.85	20.27	PASS
3	0.807	10.14	34.43	44.57	56.00	11.43	18.37	28.51	46.00	17.49	PASS
4	2.6745	10.16	37.91	48.07	56.00	7.93	20.01	30.17	46.00	15.83	PASS
5	9.4515	10.40	27.16	37.56	60.00	22.44	11.74	22.14	50.00	27.86	PASS
6	23.4645	10.66	23.42	34.08	60.00	25.92	8.94	19.60	50.00	30.40	PASS

Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)
4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

4.2. Radiated Emission

Limit

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.

Undesirable emission limits

Requirement	Limit(EIRP)	Limit (Field strength at 3m) Note1
15.407(b)(1)	PK:-27(dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)		

Note1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

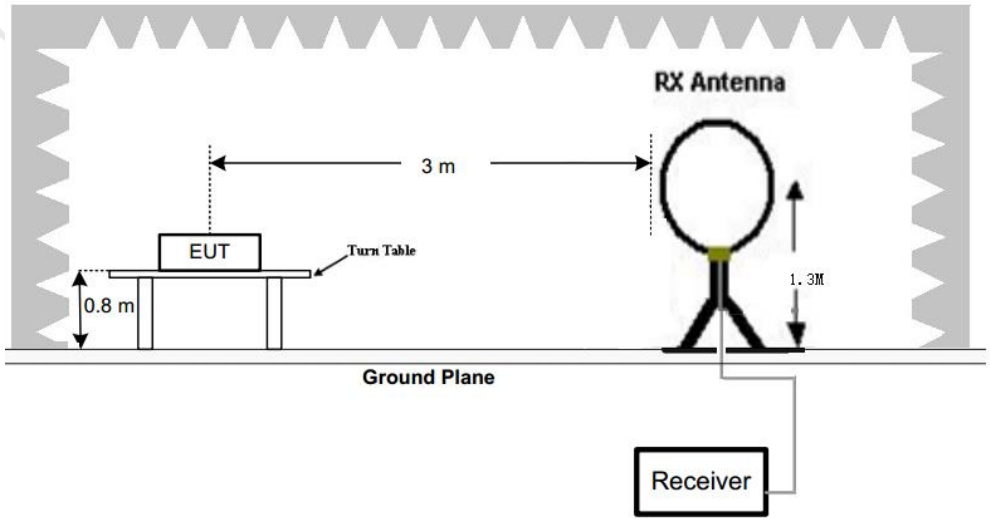
(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209
(6)In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

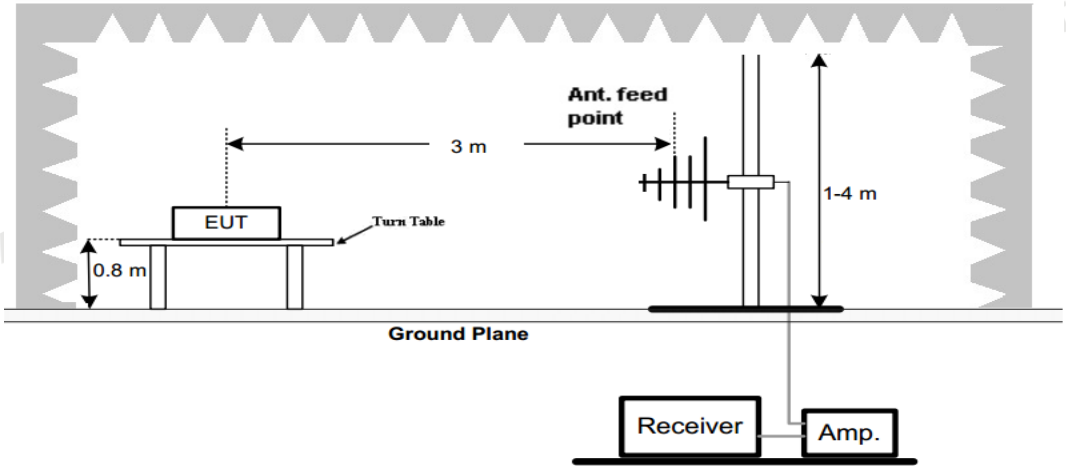
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

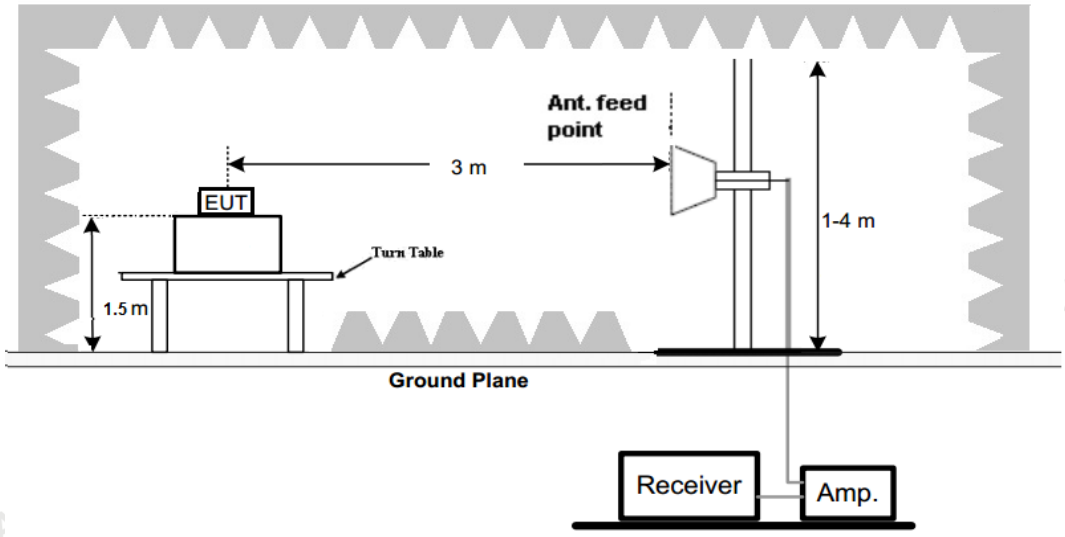
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz

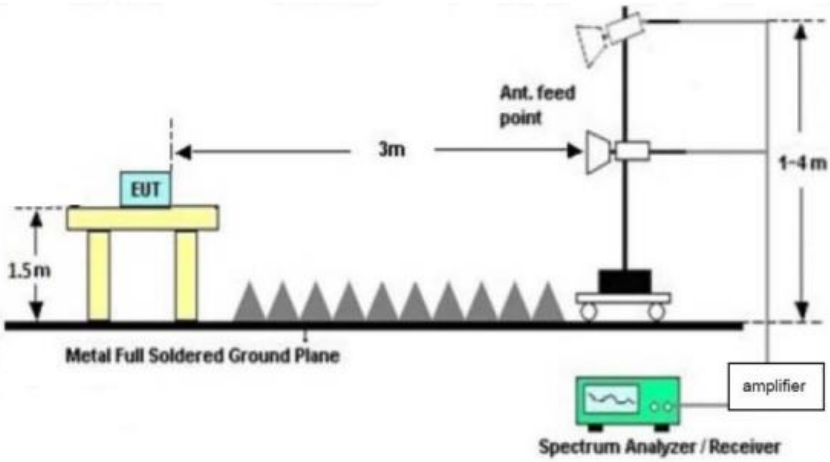


(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz





Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 40GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

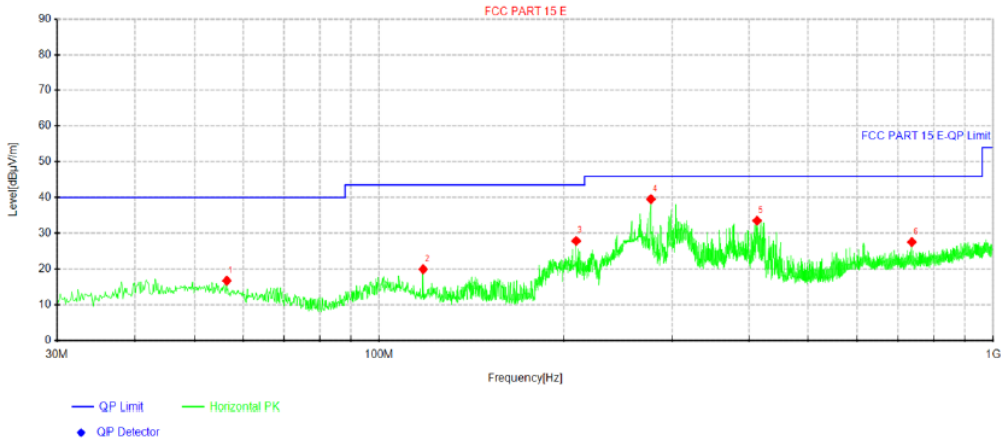
Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

Remark:
1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. All 802.11a / 802.11n/ac/ax (HT20) /802.11n/ac/ax (HT40)/ 802.11ac/ax (HT80) / 802.11ac/ax (HT160) modes have been tested for above 1GHz test, for below 1GHz test, only the worst case 802.11a low channel of U-NII 1 band was recorded.
3. All 802.11a / 802.11n/ac/ax (HT20) /802.11n/ac/ax (HT40)/ 802.11ac/ax (HT80) / 802.11ac/ax (HT160) modes have been tested for above 1GHz test, for above 1GHz test, only the worst case 802.11a was recorded.
4. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

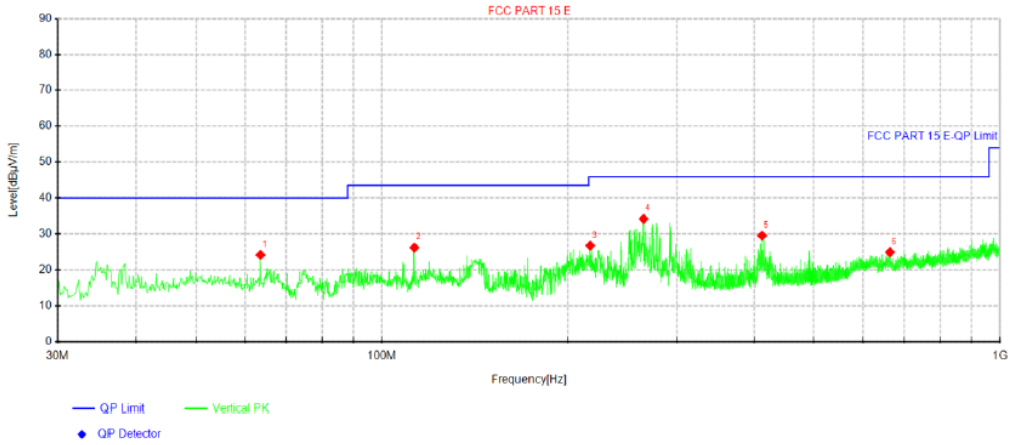


Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	56.4325	29.04	16.74	-12.30	40.00	23.26	100	92	Horizontal
2	117.906	34.13	19.96	-14.17	43.50	23.54	100	304	Horizontal
3	209.328	41.10	27.86	-13.24	43.50	15.64	200	338	Horizontal
4	277.107	51.58	39.56	-12.02	46.00	6.44	100	245	Horizontal
5	412.422	43.90	33.54	-10.36	46.00	12.46	200	0	Horizontal
6	737.251	32.53	27.53	-5.00	46.00	18.47	100	257	Horizontal

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

Vertical



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	63.5862	38.16	24.16	-14.00	40.00	15.84	100	69	Vertical
2	112.813	40.09	26.21	-13.88	43.50	17.29	100	173	Vertical
3	217.331	39.90	26.77	-13.13	46.00	19.23	200	334	Vertical
4	265.103	46.52	34.20	-12.32	46.00	11.80	100	91	Vertical
5	411.937	39.92	29.56	-10.36	46.00	16.44	200	359	Vertical
6	663.773	30.17	24.93	-5.24	46.00	21.07	100	254	Vertical

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

For 1GHz to 40GHz

Note: All MIMO and 802.11a / 802.11n/ac/ax (HT20) /802.11n/ac/ax (HT40)/ 802.11ac/ax (HT80) /802.11ac /ax (HT160) modes have been tested for above 1GHz test, only the worst case 802.11n MIMO was recorded.

5150-5250MHz:

U-NII 1 & 802.11a Mode (above 1GHz)

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
36.00 5180MHz	5150.00	58.53	PK	H	68.20	9.67	61.96	33.04	5.45	41.92	-3.43
	5150.00	50.12	AV	H	54.00	3.88	53.55	33.04	5.45	41.92	-3.43
	10360.00	51.87	PK	H	68.20	16.33	38.83	38.83	10.12	45.28	3.67
	--		--	--	--	--	--	--	--	--	--
44.00 5220MHz	10440.00	53.21	PK	H	68.20	14.99	49.53	38.85	10.13	45.3	3.68
	--		--	--	--	--	--	--	--	--	--
48.00 5240MHz	5350.50	57.85	PK	H	68.20	10.35	61.12	32.84	5.97	42.08	-3.27
	5350.50	48.38	AV	H	54.00	5.62	51.65	32.84	5.97	42.08	-3.27
	10480.00	52.65	PK	H	68.20	15.55	48.91	38.89	10.19	45.34	3.74

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
36.00 5180MHz	5150.00	54.65	PK	V	68.20	13.55	58.08	33.04	5.45	41.92	-3.43
	5150.00	47.73	AV	V	54.00	6.27	51.16	33.04	5.45	41.92	-3.43
	10360.00	53.68	PK	V	68.20	14.52	50.01	38.83	10.12	45.28	3.67
	--		--	--	--	--	--	--	--	--	--
44.00 5220MHz	10440.00	53.71	PK	V	68.20	14.49	50.03	38.85	10.13	45.3	3.68
	--		--	--	--	--	--	--	--	--	--
48.00 5240MHz	5350.50	57.22	PK	V	68.20	10.98	60.49	32.84	5.97	42.08	-3.27
	5350.50	49.31	AV	V	54.00	4.69	52.58	32.84	5.97	42.08	-3.27
	10480.00	52.85	PK	V	68.20	15.35	49.11	38.89	10.19	45.34	3.74

5260-5320MHz:

U-NII 1 & 802.11a Mode (above 1GHz)

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
52.00 5260MHz	5150.00	57.75	PK	H	68.20	10.45	61.18	33.04	5.45	41.92	-3.43
	5150.00	45.21	AV	H	54.00	8.79	48.64	33.04	5.45	41.92	-3.43
	10520.00	52.17	PK	H	68.20	16.03	38.83	38.91	10.2	45.35	3.76
	--	--	--	--	--	--	--	--	--	--	--
60.00 5300MHz	10600.00	52.65	PK	H	68.20	15.55	48.90	38.92	10.21	45.38	3.75
	--	--	--	--	--	--	--	--	--	--	--
64.00 5320MHz	5350.50	54.81	PK	H	68.20	13.39	58.08	32.84	5.97	42.08	-3.27
	5350.50	47.26	AV	H	54.00	6.74	50.53	32.84	5.97	42.08	-3.27
	10480.00	52.95	PK	H	68.20	15.25	49.19	38.94	10.23	45.41	3.76

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
52.00 5260MHz	5150.00	57.82	PK	H	68.20	10.38	61.25	33.04	5.45	41.92	-3.43
	5150.00	43.78	AV	H	54.00	10.22	47.21	33.04	5.45	41.92	-3.43
	10520.00	52.39	PK	H	68.20	15.81	38.83	38.91	10.2	45.35	3.76
	--		--	--	--	--	--	--	--	--	--
60.00 5300MHz	10600.00	53.17	PK	H	68.20	15.03	49.42	38.92	10.21	45.38	3.75
	--		--	--	--	--	--	--	--	--	--
64.00 5320MHz	5350.50	57.39	PK	H	68.20	10.81	60.66	32.84	5.97	42.08	-3.27
	5350.50	42.12	AV	H	54.00	11.88	45.39	32.84	5.97	42.08	-3.27
	10480.00	52.86	PK	H	68.20	15.34	49.10	38.94	10.23	45.41	3.76

5500-5700MHz:

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
	5460.00	59.21	PK	V	68.20	8.99	62.03	33.39	6.01	42.22	-2.82
100.00	5460.00	48.75	AV	V	54.00	5.25	51.57	33.39	6.01	42.22	-2.82
5500MHz	11000.00	53.46	PK	V	68.20	14.74	49.03	39.12	10.85	45.54	4.43
	--		--	--	--	--	--	--	--	--	--
120.00	11160.00	52.39	PK	V	68.20	15.81	47.93	39.07	10.87	45.48	4.46
5580MHz	--		--	--	--	--	--	--	--	--	--
140.00	5855.00	56.61	PK	V	68.20	11.59	58.80	33.91	6.17	42.27	-2.19
5700MHz	5855.00	45.83	AV	V	54.00	8.17	48.02	33.91	6.17	42.27	-2.19
	11400.00	53.41	PK	V	68.20	14.79	48.93	39.05	10.9	45.47	4.48

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
	5460.00	57.83	PK	V	68.20	10.37	60.65	33.39	6.01	42.22	-2.82
100.00	5460.00	46.64	AV	V	54.00	7.36	49.46	33.39	6.01	42.22	-2.82
5500MHz	11000.00	52.49	PK	V	68.20	15.71	48.06	39.12	10.85	45.54	4.43
	--		--	--	--	--	--	--	--	--	--
120.00	11160.00	53.01	PK	V	68.20	15.19	48.55	39.07	10.87	45.48	4.46
5580MHz	--		--	--	--	--	--	--	--	--	--
140.00	5855.00	55.65	PK	V	68.20	12.55	57.84	33.91	6.17	42.27	-2.19
5700MHz	5855.00	44.64	AV	V	54.00	9.36	46.83	33.91	6.17	42.27	-2.19
	11400.00	53.01	PK	V	68.20	15.19	48.53	39.05	10.9	45.47	4.48

5725-5850MHz:

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
	5720.00	56.31	PK	H	68.20	11.89	59.09	33.42	6.04	42.24	-2.78
149.00	5720.00	48.24	AV	H	54.00	5.76	51.02	33.42	6.04	42.24	-2.78
5745MHz	11490.00	50.23	PK	H	68.20	17.97	45.75	39.02	10.91	45.45	4.48
	--		--	--	--	--		--	--	--	--
157.00	11570.00	53.24	PK	H	68.20	14.96	48.79	38.93	10.95	45.43	4.45
5785MHz	--		--	--	--	--	--	--	--	--	--
165.00	5855.00	56.64	PK	H	68.20	11.56	58.83	33.91	6.17	42.27	-2.19
5825MHz	5855.00	48.42	AV	H	54.00	5.58	50.61	33.91	6.17	42.27	-2.19
	11650.00	52.13	PK	H	68.20	16.07	47.55	38.83	11.16	45.41	4.58

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
	5720.00	57.49	PK	V	68.20	10.71	60.27	33.42	6.04	42.24	-2.78
149.00	5720.00	49.76	AV	V	54.00	4.24	52.54	33.42	6.04	42.24	-2.78
5745MHz	11490.00	53.34	PK	V	68.20	14.86	48.86	39.02	10.91	45.45	4.48
	--		--	--	--	--	--	--	--	--	--
157.00	11570.00	53.69	PK	V	68.20	14.51	49.24	38.93	10.95	45.43	4.45
5785MHz	--		--	--	--	--	--	--	--	--	--
165.00	5855.00	58.43	PK	V	68.20	9.77	60.62	33.91	6.17	42.27	-2.19
5825MHz	5855.00	49.16	AV	V	54.00	4.84	51.35	33.91	6.17	42.27	-2.19
	11650.00	53.46	PK	V	68.20	14.74	48.88	38.83	11.16	45.41	4.58

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the other emission levels were very low against the limit.
5. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
6. Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac/ax VHT20 ,IEEE 802.11ac/ax VHT40 and IEEE 802.11ac/ax VHT80, IEEE 802.11ac/ax VHT160;

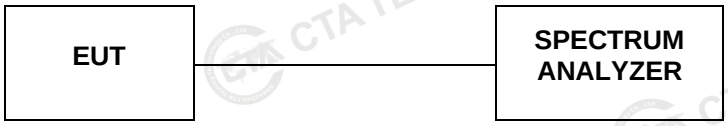
4.3. For Conducted Band edge Measurement

The test results have included the antenna gain

Please refer to Appendix E.

4.4. Duty Cycle

TEST CONFIGURATION



TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 B Duty Cycle (x), Transmission Duration (T):

a. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal
b. 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 signal. 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 zerospan measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in section II.B.1.a), and the number of sweep points across duration T exceeds 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.)

TEST RESULTS

For reporting purpose only.
Please refer to Appendix B.