Shenzhen CTA Testing Technology Co., Ltd.

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

FCC PART 15 SUBPART C TEST REPORT
FCC PART 15.407

Report Reference No. ..... :	**CTA25072501504**
FCC ID. ..... :	**2A4GN-N6**
Compiled by (position+printed name+signature) . :	File administrators Zoey Cao
Supervised by (position+printed name+signature) . :	Project Engineer Ace Chai
Approved by (position+printed name+signature) . :	RF Manager Eric Wang
Date of issue ..... :	Aug. 02, 2025
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 Ruiying Electronic Co., Ltd**
Address ..... :	R401, Building 3, TangweiFuyuan Industrial, Fengtang Road, Fuhai Street,Baoan District ShenzhenCity,Guangdong China
Test specification..... **:**	
Standard ..... :	**FCC Part 15 Subpart E 15.407** **KDB 789033 D02 General UNII Test Procedures New Rules v02r01**

Test item description..... :	**Projector**
Trade Mark..... :	N/A
Manufacturer..... :	**Shenzhen Ruiying Electronic Co., Ltd**
Model/Type reference..... :	N5
Listed Models ..... :	Refer to page 2
Modulation Type ..... :	DSSS,OFDM
Operation Frequency ..... :	From 5180MHz to 5240MHz,5260MHz to 5320MHz, 5500MHz to 5700MHz, 5745MHz to 5825MHz
Rating..... :	Input:100-240V~, 50/60Hz, 1.2A
Result..... :	**PASS**

TEST REPORT

Equipment under Test	:	Projector
Model /Type	:	N5
Listed Models	:	V1, V2, V3, V5, V6, V7, V8, V9, V10, A1, A2, A3, A5, A6, A7, A8, A9, A10, A11, A12, A13, A15, N1, N2, N3, N6, N7, N8, N9, H1, H2, H3, H5, H6, H7, H8, H9, H10, T1, T2, T3, T5, T6, T7, T8, T9, T10, R1, R2, R3, R5, R6, R7, R8, R9, SN1, P1, P2, P3, P5, P6, P7, P8, P9, S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S20, Y1, Y2, Y3, Y4, Y5, Y6, Y7, Y8, Y9, HQ2, HQ3, HQ4, HQ5, HQ8, Q1, Q2, Q3, Q5, Q6, Q7, Q8, Q1 Pro, M10, M11, M12, M15, M16, M17, M18, M19, M20, M21, M22, M23, M24, M25, M26, M27, M28, T4, G1, O1, Y3, P61, P65, KP1, KP1 PRO, KP1 PLUS, KP1 Mini, KP1 SE, KP3, KP4, IPP1, IPP1 Pro, IPP2, IPP2 Pro, SAIL1, SAIL3, SAIL3 Pro, SAIL5, SAIL5 Pro, RY100, RY200,RY300,RY500,RY600,RY700,RY800,RY900,O1,O2,O3,O5, O6, O7, O8, O9, P61, P61 Pro, P62 Pro, G1 Pro, K12s, P65,TP4,TP4 Pro,TP5,TP5 Pro,S36,S36 Pro,S37,S37 Pro,S38, S38 Pro, S39,S39 Pro,S40,G3,G3 Pro,G4,G4 Pro,G5,G6,K13,K13 Pro, K14,K14 Pro,K15,K16
Model difference	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Applicant	:	**Shenzhen Ruiying Electronic Co., Ltd**
Address	:	R401, Building 3, TangweiFuyuan Industrial, Fengtang Road, Fuhai Street,Baoan District ShenzhenCity,Guangdong China
Manufacturer	:	**Shenzhen Ruiying Electronic Co., Ltd**
Address	:	R401, Building 3, TangweiFuyuan Industrial, Fengtang Road, Fuhai Street,Baoan District ShenzhenCity,Guangdong 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	:	Jul. 25, 2025
Testing commenced on	:	Jul. 25, 2025
Testing concluded on	:	Aug. 02, 2025

2.2. Product Description

Product Name:	Projector
Model/Typereference:	N5
Power supply:	Input:100-240V~, 50/60Hz, 1.2A
Hardware version:	2800-A92637
Software version:	V5.02.28-110447
testing sample ID：	CTA250725015-1# (Engineer sample) CTA250725015-2# (Normal sample)
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 802.11ac20/ac40: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax20/ax40: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Operation frequency	IEEE 802.11a:5180-5240MHz,5260-5320MHz,5500-5700MHz,5745-5825MHz IEEE 802.11n HT20: 5180-5240MHz,5260-5320MHz,5500-5700MHz,5745-5825MHz IEEE 802.11n HT40: 5190-5230MHz,5270-5310MHz,5510-5670MHz,5755-5795MHz IEEE 802.11ac/ax20: 5180-5240MHz,5260-5320MHz,5500-5700MHz,5745-5825MHz IEEE 802.11ac/ax40: 5190-5230MHz,5270-5310MHz,5510-5670MHz,5755-5795MHz
Channel number	4 Channels for 20MHz bandwidth(5180-5240MHz) 4 Channels for 20MHz bandwidth(5260-5320MHz) 11 Channels for 20MHz bandwidth(5500-5700MHz) 5 channels for 20MHz bandwidth(5745-5825MHz) 2 channels for 40MHz bandwidth(5190~5230MHz) 2 channels for 40MHz bandwidth(5270~5310MHz) 5 Channels for 40MHz bandwidth(5510-5670MHz) 2 channels for 40MHz bandwidth(5755~5795MHz)
Antenna type:	FPC Antenna
Antenna gain:	ANT1: 3.4dBi ANT2: 3.4dBi

2.3. Equipment Under Test

Power supply system utilised

Refer to section 2.2

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

This is a Projector.

For more details, refer to the user's manual of the EUT.

Test Software Version	Tools software(ADB command)		
Frequency	5180 MHz	5220 MHz	5240 MHz
802.11a	Default	Default	Default
802.11n20	Default	Default	Default
802.11ac20	Default	Default	Default
802.11ax20	Default	Default	Default
Frequency	5190 MHz	/	5230 MHz
802.11n40	Default	/	Default
802.11ac40	Default	/	Default
802.11ax40	Default	/	Default

Test Software Version	Tools software(ADB command)		
Frequency	5260 MHz	5300 MHz	5320 MHz
802.11a	Default	Default	Default
802.11n20	Default	Default	Default
802.11ac20	Default	Default	Default
802.11ax20	Default	Default	Default
Frequency	5270 MHz	/	5310 MHz
802.11n40	Default	/	Default
802.11ac40	Default	/	Default
802.11ax40	Default	/	Default

Test Software Version	Tools software(ADB command)		
Frequency	5500 MHz	5580 MHz	5700 MHz
802.11a	Default	Default	Default
802.11n20	Default	Default	Default
802.11ac20	Default	Default	Default
802.11ax20	Default	Default	Default
Frequency	5510 MHz	5550 MHz	5670 MHz
802.11n40	Default	/	Default
802.11ac40	Default	/	Default
802.11ax40	Default	/	Default

Test Software Version	Tools software(ADB command)		
Frequency	5745 MHz	5785 MHz	5825 MHz
802.11a	Default	Default	Default
802.11n20	Default	Default	Default
802.11ac20	Default	Default	Default
802.11ax20	Default	Default	Default
Frequency	5755 MHz	/	5795 MHz
802.11n40	Default	/	Default
802.11ac40	Default	/	Default
802.11ax40	Default	/	Default

2.5. EUT operation mode

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

IEEE 802.11a/ax20/ax40/n20/n40:

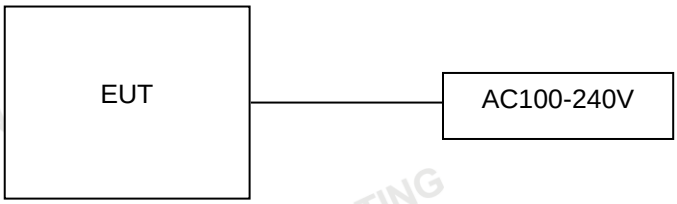
U-NI-1		U-NI-1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190
40	5200	46	5230
44	5220		
48	5240		

U-NI-2A		U-NI-2A	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270
56	5280	62	5310
60	5300		
64	5320		

U-NI-2C		U-NI-2C	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510
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-NI-3		U-NI-3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	**5745**	151	5755
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

FCC Requirement		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.407(a)	Emission Bandwidth(26dBm Bandwidth)	PASS
FCC Part 15.407(e)	Minimum Emission Bandwidth(6dBm Bandwidth)	PASS
FCC Part 15.407(a)	Maximum Conducted Output Power	PASS
FCC Part 15.407(a)	Peak Power Spectral Density	PASS
FCC Part 15.407(g)	Frequency Stability	PASS
FCC Part 15.407(b)	Undesirable emission	PASS
FCC Part 15.407(b)/15.205/15.209	Radiated Emissions	PASS
FCC Part 15.407(h)	Dynamic Frequency Selection	PASS
FCC Part 15.203/15.247(b)	Antenna Requirement	PASS

Remark:
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)
Time	/	±2%	(1)

(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

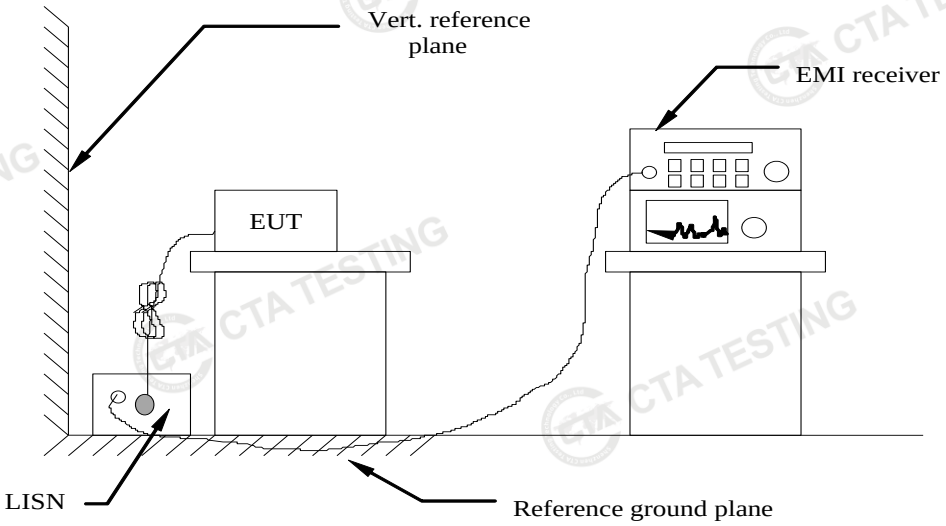
Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2024/08/03	2025/08/02
LISN	R&S	ENV216	CTA-314	2024/08/03	2025/08/02
EMI Test Receiver	R&S	ESPI	CTA-307	2024/08/03	2025/08/02
EMI Test Receiver	R&S	ESCI	CTA-306	2024/08/03	2025/08/02
Spectrum Analyzer	Agilent	N9020A	CTA-301	2024/08/03	2025/08/02
Spectrum Analyzer	R&S	FSU	CTA-337	2024/08/03	2025/08/02
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
Universal Radio Communication	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	2026/10/16
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2026/10/12
Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2026/10/16
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
Spectrum analyzer	R&S	FSV40-N	CTA-344	2025/05/17	2026/05/16
Programmable Constant Temperature And Humidity Test Chamber	DONGGUAN JINGYU	HT-H-408	CTA-053	2024/8/3	2025/8/02
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

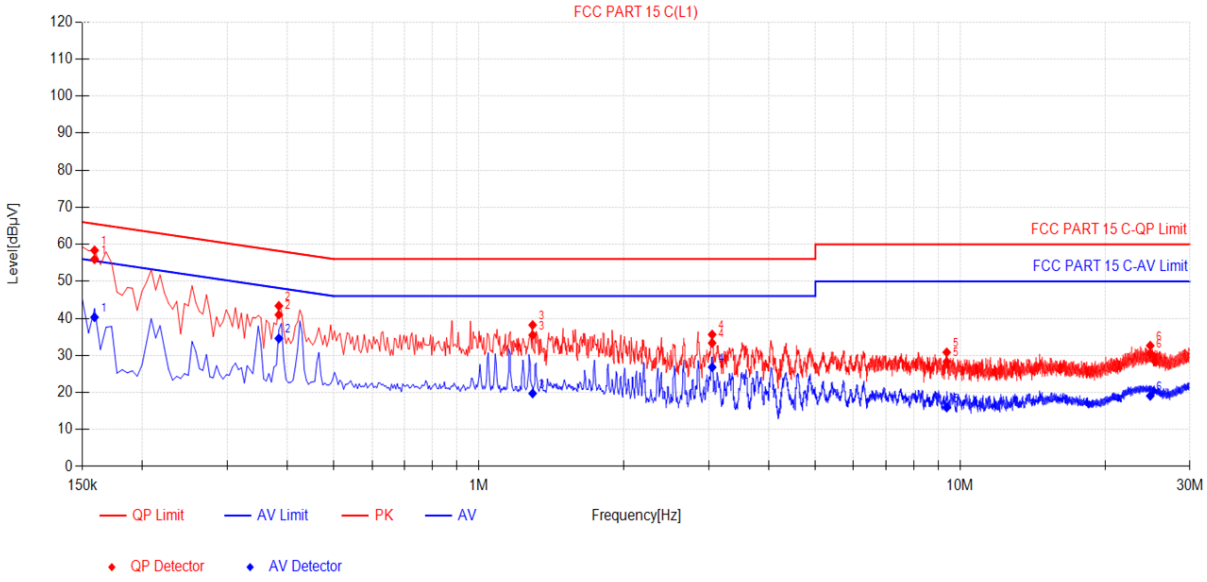
Remark:

1. All modes of 802.11a/n/ac/ax were test at Low, Middle, and High channel; only the worst result of 802.11a Middle Channel was reported as below:

Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

UNII-1:

Power supply:	AC 120V/60Hz	Polarization	L

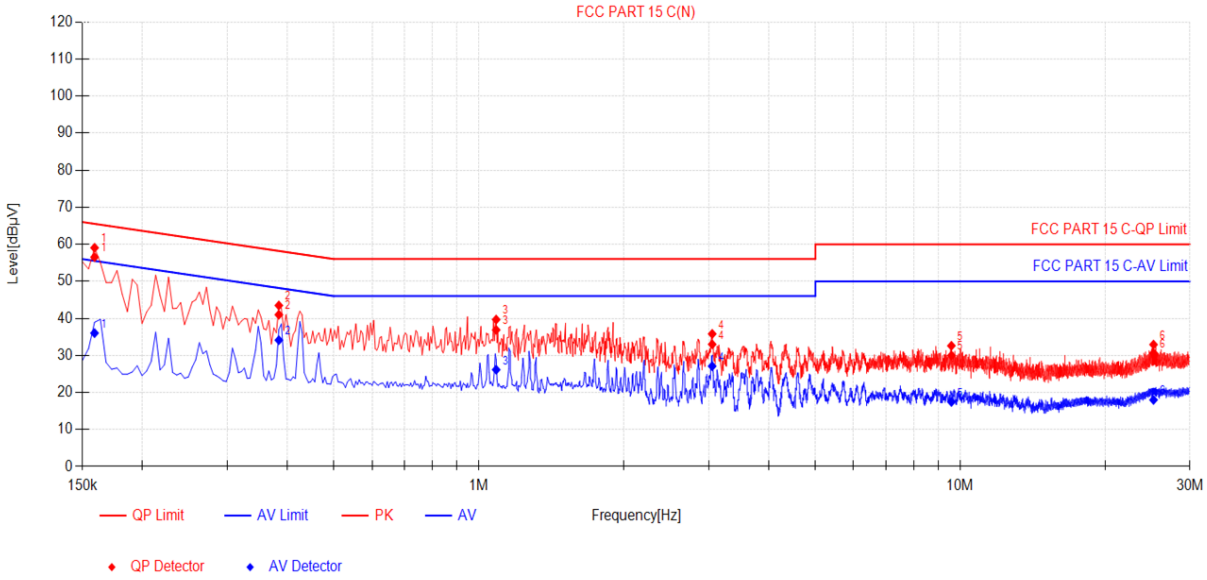


Final Data List

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	0.159	9.91	46.03	55.94	65.52	9.58	30.38	40.29	55.52	15.23	PASS
2	0.384	9.87	31.10	40.97	58.19	17.22	24.71	34.58	48.19	13.61	PASS
3	1.293	9.90	25.60	35.50	56.00	20.50	9.83	19.73	46.00	26.27	PASS
4	3.0525	10.01	23.32	33.33	56.00	22.67	16.80	26.81	46.00	19.19	PASS
5	9.375	10.26	18.06	28.32	60.00	31.68	5.68	15.94	50.00	34.06	PASS
6	24.8235	10.50	19.99	30.49	60.00	29.51	8.57	19.07	50.00	30.93	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:	AC 120V/60Hz	Polarization	N



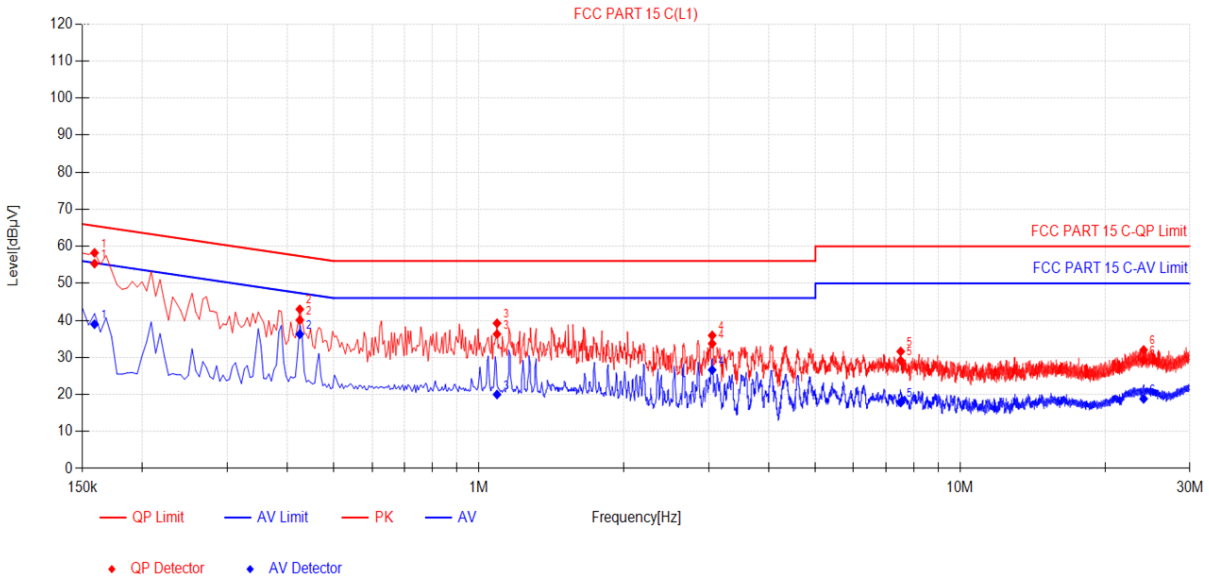
Final Data List

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	0.159	10.03	46.50	56.53	65.52	8.99	26.00	36.03	55.52	19.49	PASS
2	0.384	9.91	31.07	40.98	58.19	17.21	24.21	34.12	48.19	14.07	PASS
3	1.086	10.15	26.72	36.87	56.00	19.13	15.99	26.14	46.00	19.86	PASS
4	3.0525	10.24	22.75	32.99	56.00	23.01	16.85	27.09	46.00	18.91	PASS
5	9.5865	10.40	19.58	29.98	60.00	30.02	7.05	17.45	50.00	32.55	PASS
6	25.215	10.70	19.96	30.66	60.00	29.34	7.29	17.99	50.00	32.01	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)

UNII-2A:

Power supply:	AC 120V/60Hz	Polarization	L

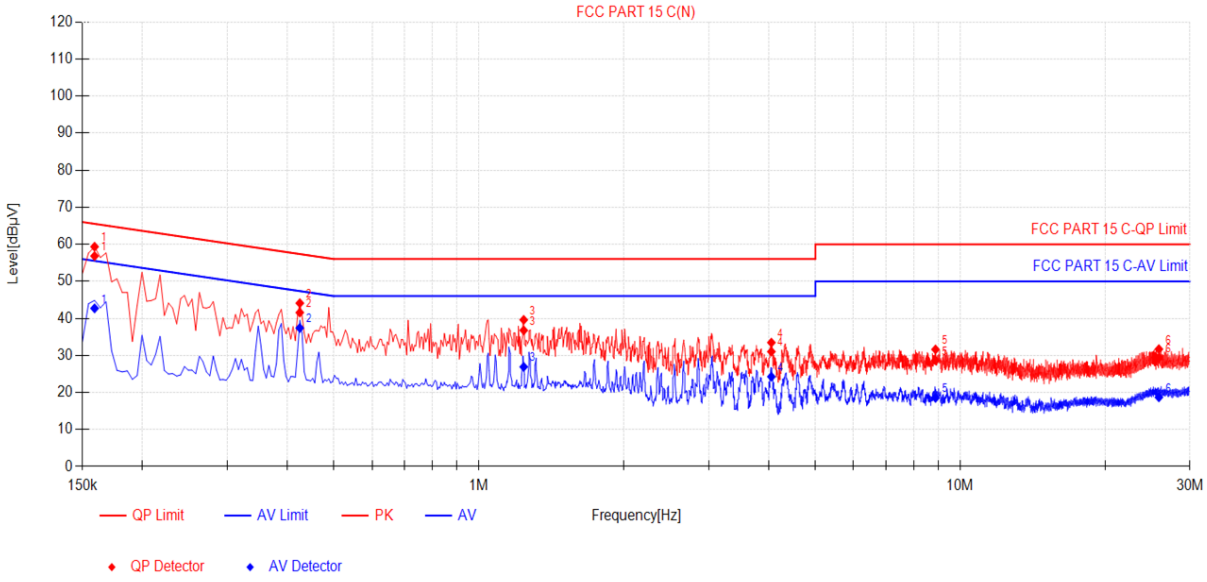


Final Data List

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	0.159	9.91	45.41	55.32	65.52	10.20	29.05	38.96	55.52	16.56	PASS
2	0.4245	9.91	30.16	40.07	57.36	17.29	26.36	36.27	47.36	11.09	PASS
3	1.0905	9.91	26.39	36.30	56.00	19.70	10.07	19.98	46.00	26.02	PASS
4	3.0525	10.01	23.70	33.71	56.00	22.29	16.61	26.62	46.00	19.38	PASS
5	7.521	10.29	18.88	29.17	60.00	30.83	7.54	17.83	50.00	32.17	PASS
6	24.0495	10.49	18.77	29.26	60.00	30.74	8.33	18.82	50.00	31.18	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:	AC 120V/60Hz	Polarization	N



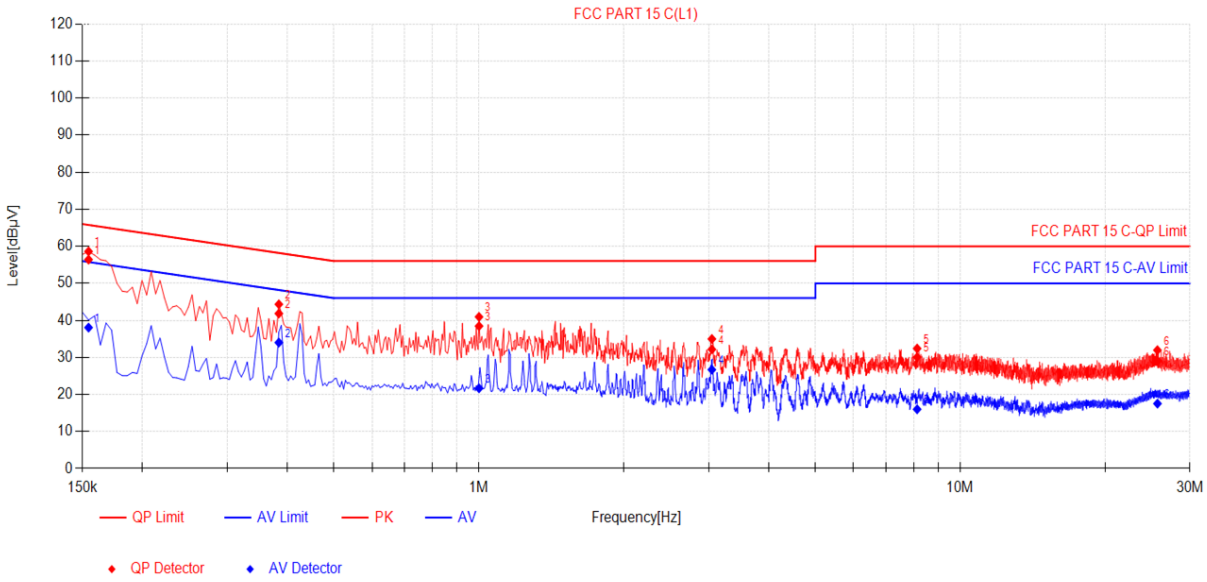
Final Data List

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	0.159	10.03	46.78	56.81	65.52	8.71	32.68	42.71	55.52	12.81	PASS
2	0.4245	9.96	31.61	41.57	57.36	15.79	27.44	37.40	47.36	9.96	PASS
3	1.239	10.17	26.60	36.77	56.00	19.23	16.74	26.91	46.00	19.09	PASS
4	4.0515	10.12	20.90	31.02	56.00	24.98	14.13	24.25	46.00	21.75	PASS
5	8.8845	10.41	18.25	28.66	60.00	31.34	8.12	18.53	50.00	31.47	PASS
6	25.8675	10.72	18.71	29.43	60.00	30.57	7.98	18.70	50.00	31.30	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)

UNII-2C:

Power supply:	AC 120V/60Hz	Polarization	L

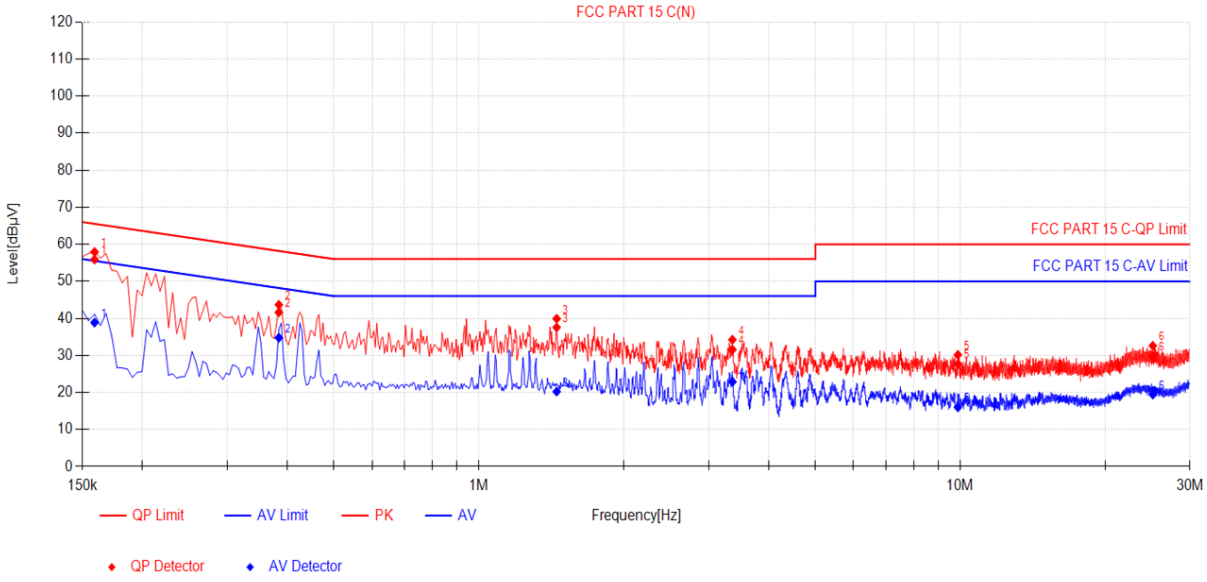


Final Data List

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	0.1545	9.89	46.51	56.40	65.75	9.35	28.16	38.05	55.75	17.70	PASS
2	0.384	9.87	31.98	41.85	58.19	16.34	24.14	34.01	48.19	14.18	PASS
3	1.0005	9.91	28.53	38.44	56.00	17.56	11.75	21.66	46.00	24.34	PASS
4	3.048	10.01	22.15	32.16	56.00	23.84	16.67	26.68	46.00	19.32	PASS
5	8.1375	10.28	19.80	30.08	60.00	29.92	5.72	16.00	50.00	34.00	PASS
6	25.692	10.52	18.49	29.01	60.00	30.99	7.01	17.53	50.00	32.47	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:	AC 120V/60Hz	Polarization	N



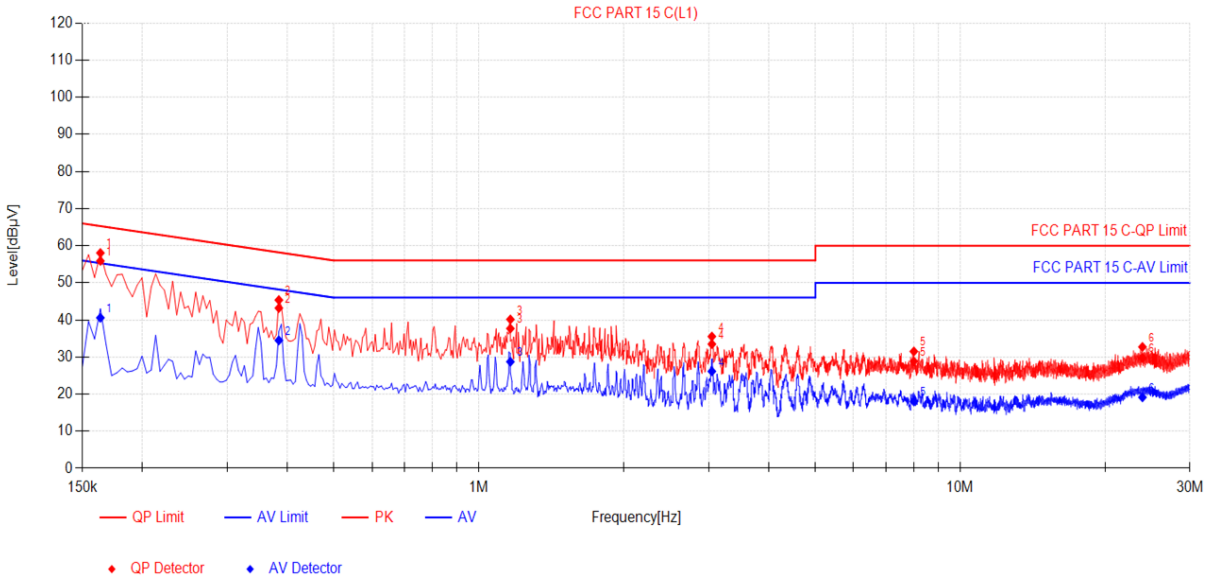
Final Data List

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	0.159	10.03	45.85	55.88	65.52	9.64	28.83	38.86	55.52	16.66	PASS
2	0.384	9.91	31.71	41.62	58.19	16.57	24.86	34.77	48.19	13.42	PASS
3	1.4505	10.14	27.41	37.55	56.00	18.45	10.09	20.23	46.00	25.77	PASS
4	3.363	10.20	21.37	31.57	56.00	24.43	12.67	22.87	46.00	23.13	PASS
5	9.8925	10.40	17.28	27.68	60.00	32.32	5.58	15.98	50.00	34.02	PASS
6	25.125	10.70	19.11	29.81	60.00	30.19	8.74	19.44	50.00	30.56	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)

UNII-3:

Power supply:	AC 120V/60Hz	Polarization	L

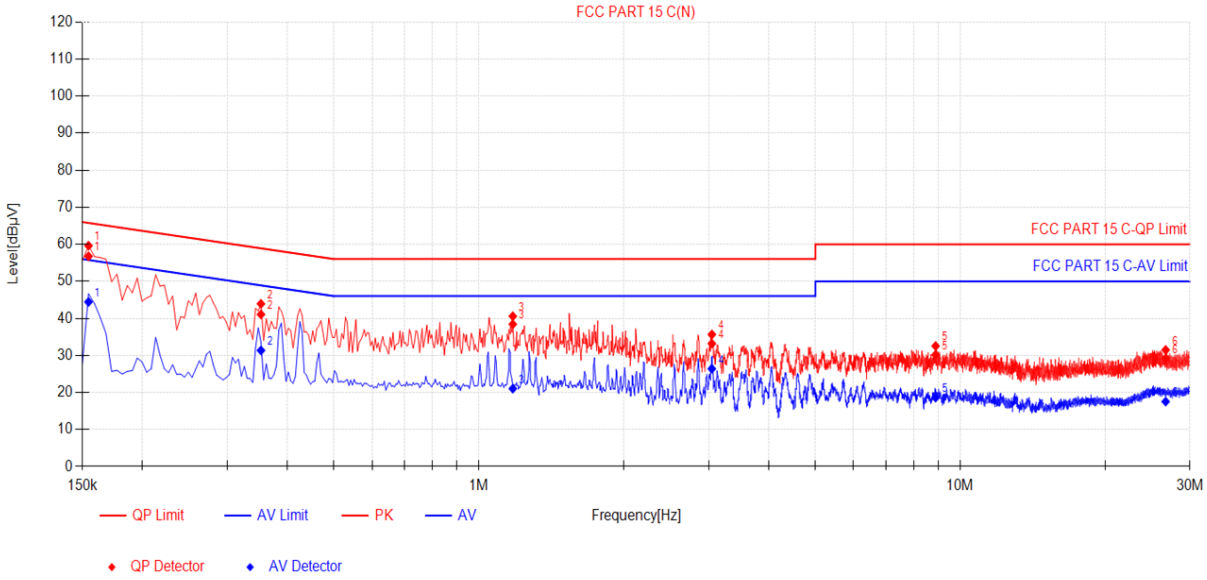


Final Data List

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	0.1635	9.93	45.97	55.90	65.28	9.38	30.64	40.57	55.28	14.71	PASS
2	0.384	9.87	33.33	43.20	58.19	14.99	24.62	34.49	48.19	13.70	PASS
3	1.1625	9.90	27.78	37.68	56.00	18.32	18.82	28.72	46.00	17.28	PASS
4	3.048	10.01	23.47	33.48	56.00	22.52	16.12	26.13	46.00	19.87	PASS
5	8.0115	10.28	18.56	28.84	60.00	31.16	7.74	18.02	50.00	31.98	PASS
6	23.91	10.49	19.24	29.73	60.00	30.27	8.66	19.15	50.00	30.85	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:	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	0.1545	10.00	46.75	56.75	65.75	9.00	34.44	44.44	55.75	11.31	PASS
2	0.3525	9.86	31.20	41.06	58.90	17.84	21.49	31.35	48.90	17.55	PASS
3	1.176	10.17	28.24	38.41	56.00	17.59	10.86	21.03	46.00	24.97	PASS
4	3.048	10.24	22.94	33.18	56.00	22.82	16.15	26.39	46.00	19.61	PASS
5	8.889	10.41	19.75	30.16	60.00	29.84	8.23	18.64	50.00	31.36	PASS
6	26.718	10.75	18.43	29.18	60.00	30.82	6.79	17.54	50.00	32.46	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

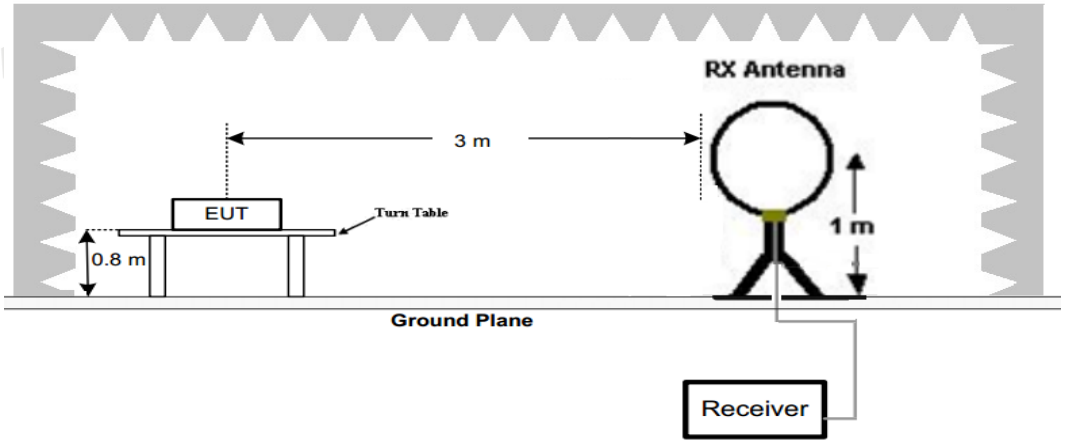
(6)In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

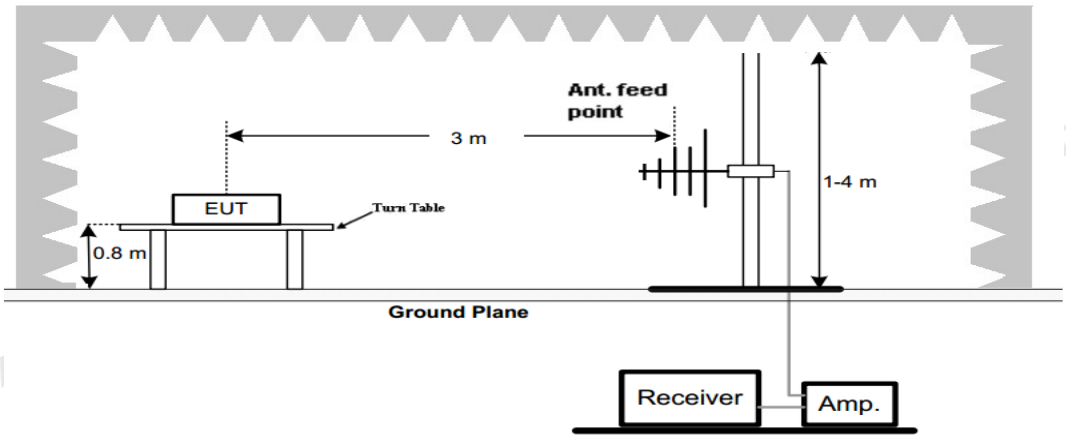
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

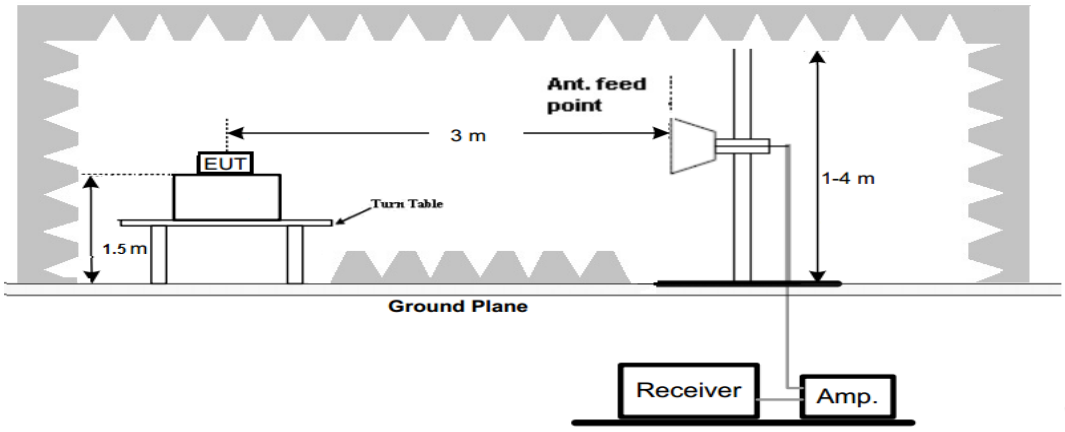
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz

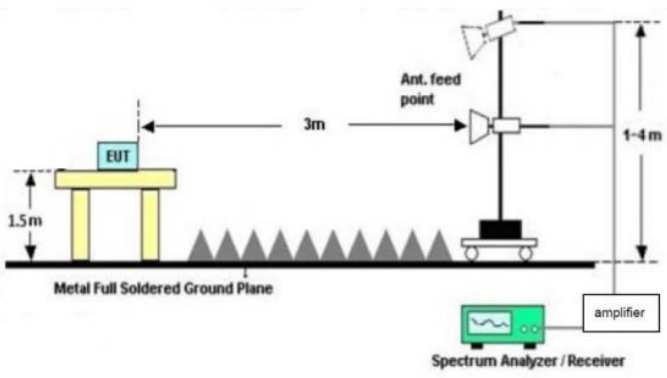


(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(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

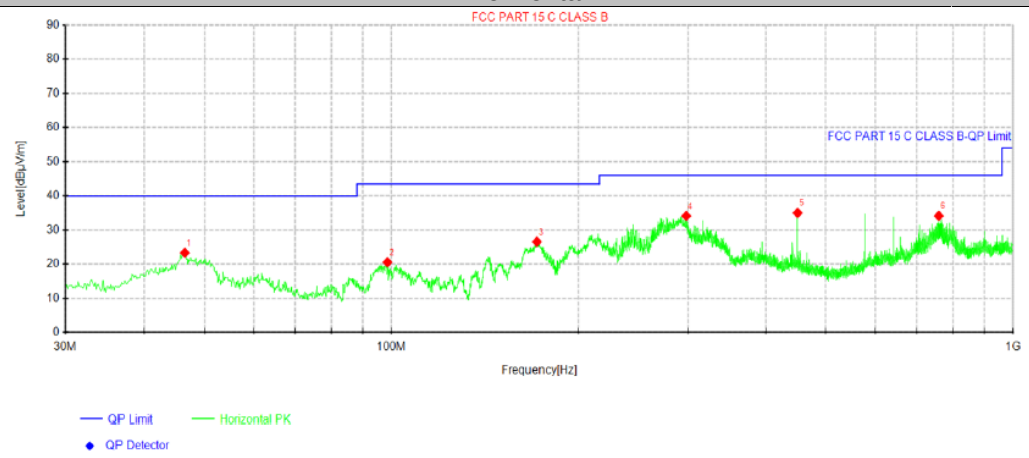
Remark:

1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
1. All 802.11a / 802.11n/ac/ax (HT20) /802.11n/ac/ax (HT40)modes have been tested for above 1GHz test, for below 1GHz test, only the worst case 802.11a low channel was recorded.
2. All 802.11a / 802.11n/ac/ax (HT20) /802.11n/ac/ax (HT40) modes have been tested for above 1GHz test, for above 1GHz test, only the worst case 802.11a was recorded.
3. 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.

UNII-1:

For 30MHz-1GHz

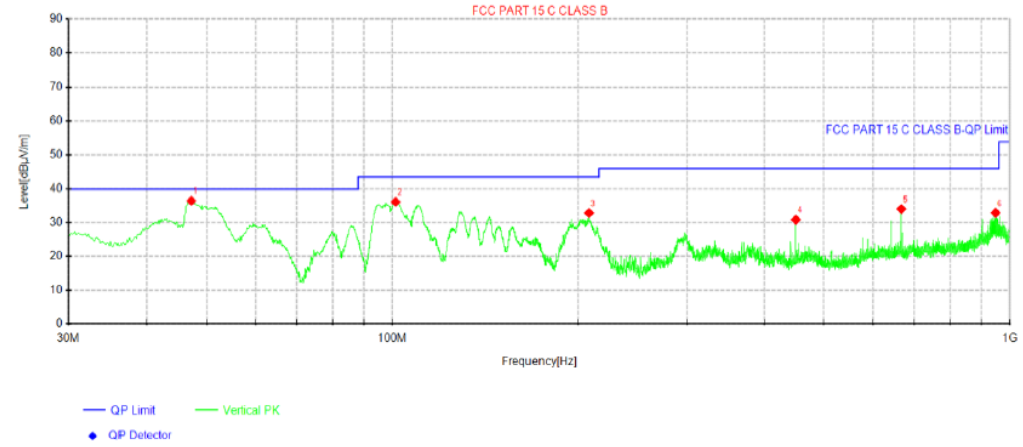
Horizontal



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.49	34.67	23.32	-11.35	40.00	16.68	100	332	Horizontal
2	98.5062	33.76	20.54	-13.22	43.50	22.96	100	142	Horizontal
3	171.377	41.51	26.56	-14.95	43.50	16.94	100	142	Horizontal
4	298.083	45.08	34.13	-10.95	46.00	11.87	100	184	Horizontal
5	450.373	44.80	35.02	-9.78	46.00	10.98	100	38	Horizontal
6	759.561	38.99	34.15	-4.84	46.00	11.85	100	158	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



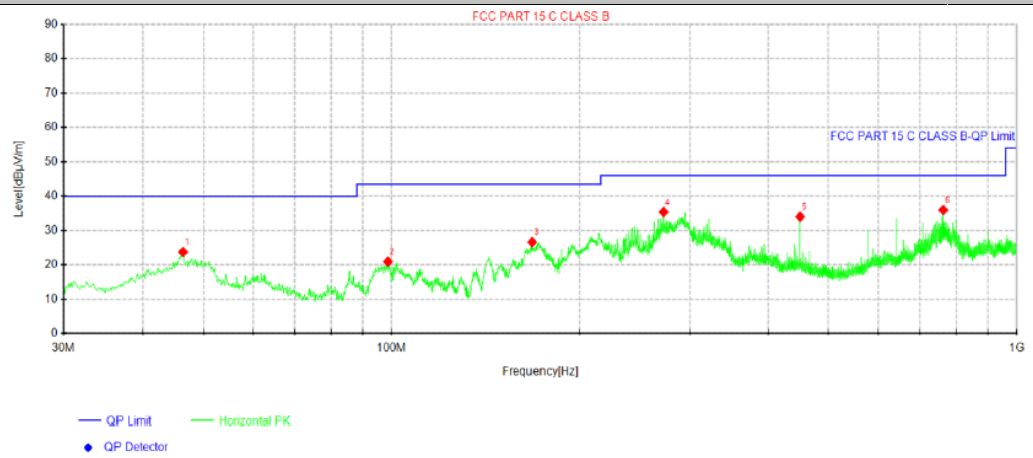
Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	47.2175	47.86	36.54	-11.32	40.00	3.46	100	3	Vertical
2	101.173	49.17	36.21	-12.96	43.50	7.29	100	221	Vertical
3	208.237	45.54	32.79	-12.75	43.50	10.71	100	19	Vertical
4	450.373	40.58	30.80	-9.78	46.00	15.20	100	248	Vertical
5	667.532	39.44	33.99	-5.45	46.00	12.01	100	354	Vertical
6	948.347	35.25	32.85	-2.40	46.00	13.15	100	239	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)

UNII-2A:

For 30MHz-1GHz

Horizontal

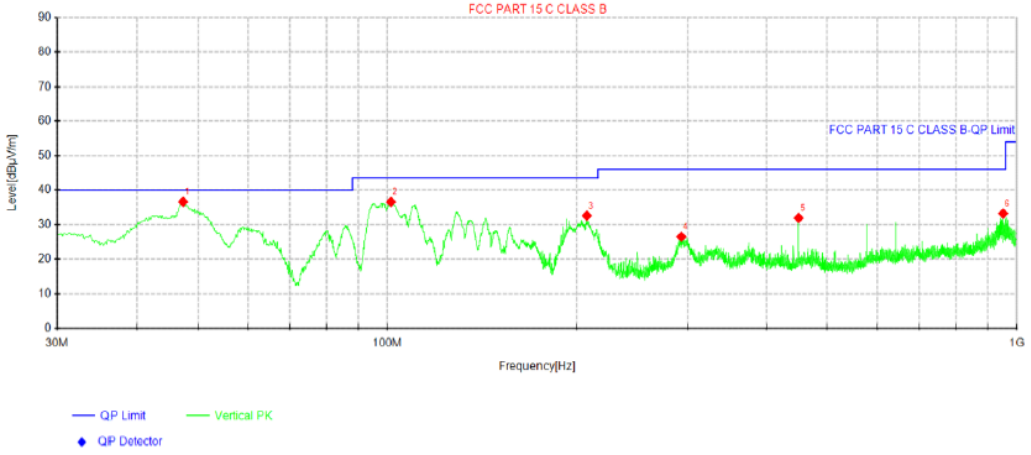


Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.3688	35.11	23.75	-11.36	40.00	16.25	100	350	Horizontal
2	98.6275	34.14	20.94	-13.20	43.50	22.56	100	132	Horizontal
3	167.861	41.80	26.62	-15.18	43.50	16.88	100	323	Horizontal
4	272.378	47.00	35.43	-11.57	46.00	10.57	100	168	Horizontal
5	450.373	43.79	34.01	-9.78	46.00	11.99	100	271	Horizontal
6	763.077	40.75	35.97	-4.78	46.00	10.03	100	175	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

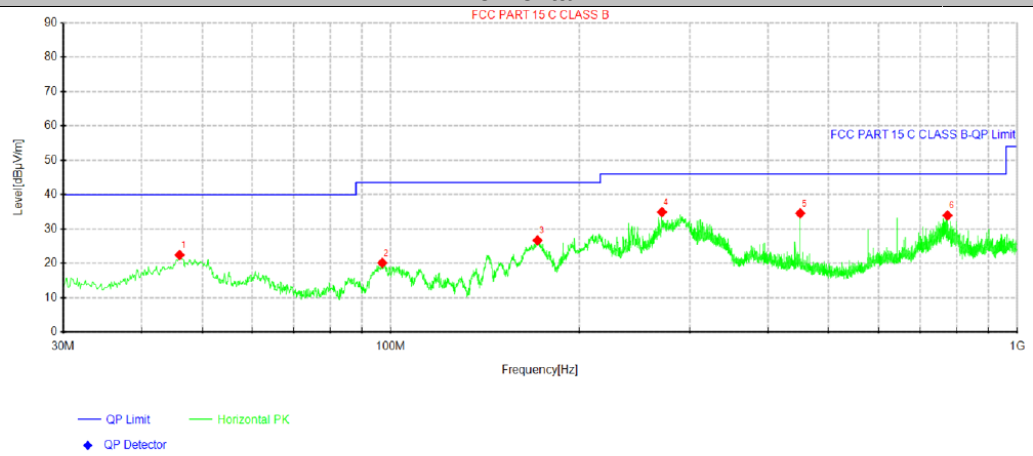
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	47.3388	47.87	36.57	-11.30	40.00	3.43	100	360	Vertical
2	101.295	49.51	36.54	-12.97	43.50	6.96	100	282	Vertical
3	207.51	45.31	32.56	-12.75	43.50	10.94	100	360	Vertical
4	293.112	37.59	26.45	-11.14	46.00	19.55	100	274	Vertical
5	450.373	41.67	31.89	-9.78	46.00	14.11	100	168	Vertical
6	951.621	35.54	33.18	-2.36	46.00	12.82	100	211	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)

UNII-2C:

For 30MHz-1GHz

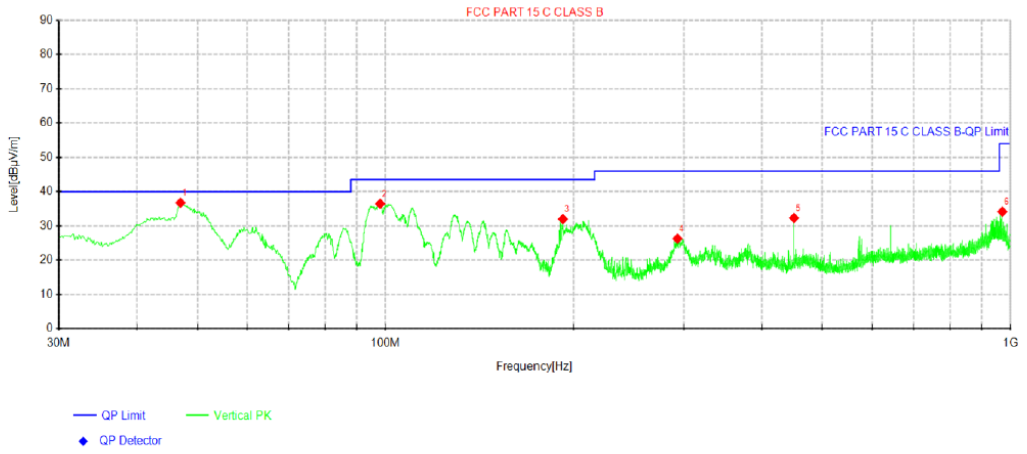
Horizontal



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.005	33.82	22.43	-11.39	40.00	17.57	100	0	Horizontal
2	96.93	33.64	20.13	-13.51	43.50	23.37	100	136	Horizontal
3	171.498	41.62	26.67	-14.95	43.50	16.83	100	324	Horizontal
4	270.923	46.53	34.92	-11.61	46.00	11.08	100	128	Horizontal
5	450.373	44.35	34.57	-9.78	46.00	11.43	100	45	Horizontal
6	773.747	38.59	33.94	-4.65	46.00	12.06	100	145	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



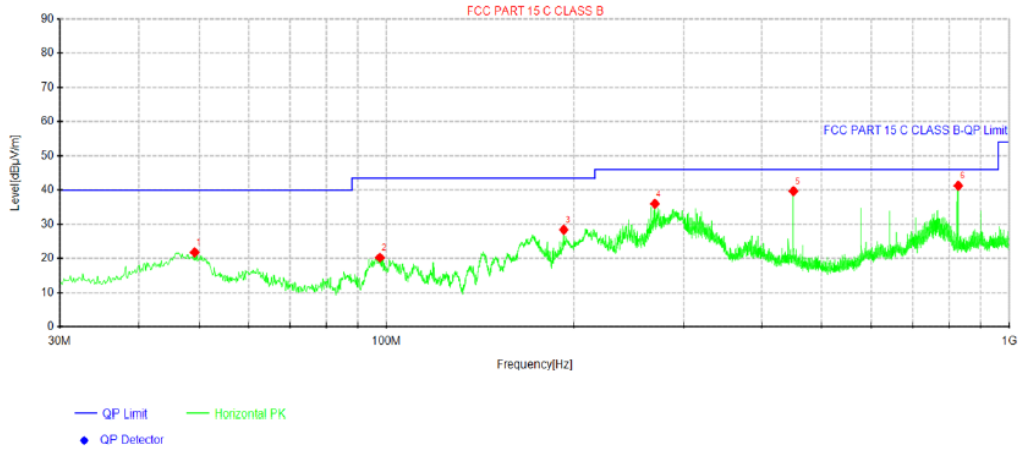
Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.975	48.08	36.76	-11.32	40.00	3.24	100	359	Vertical
2	98.0212	49.77	36.46	-13.31	43.50	7.04	100	258	Vertical
3	192.232	45.39	32.00	-13.39	43.50	11.50	100	130	Vertical
4	293.112	37.41	26.27	-11.14	46.00	19.73	100	294	Vertical
5	450.373	42.10	32.32	-9.78	46.00	13.68	100	19	Vertical
6	970.293	36.06	34.16	-1.90	54.00	19.84	100	223	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)

UNII-3:

For 30MHz-1GHz

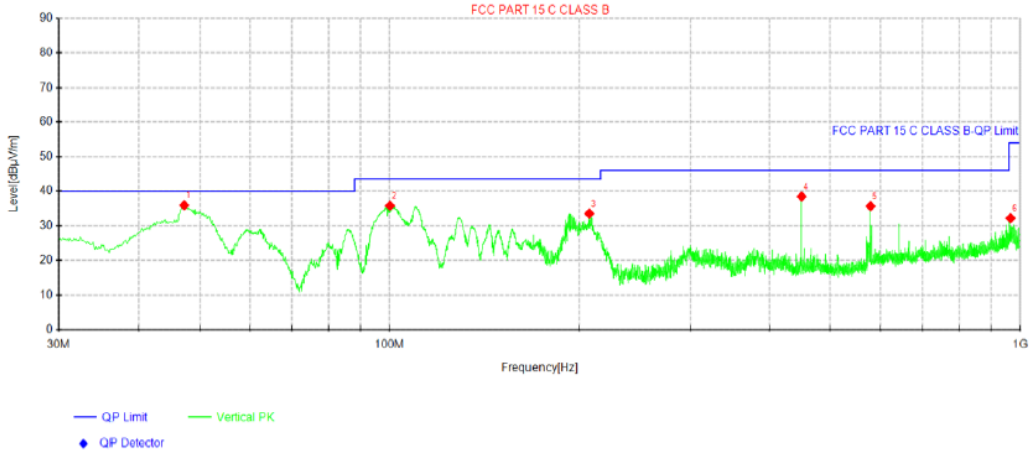
Horizontal



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	49.1575	32.96	21.77	-11.19	40.00	18.23	100	263	Horizontal
2	97.5362	33.64	20.24	-13.40	43.50	23.26	100	0	Horizontal
3	192.596	41.76	28.40	-13.36	43.50	15.10	100	122	Horizontal
4	269.711	47.62	35.99	-11.63	46.00	10.01	100	158	Horizontal
5	450.373	49.48	39.70	-9.78	46.00	6.30	100	52	Horizontal
6	828.188	45.58	41.28	-4.30	46.00	4.72	100	79	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	47.2175	47.22	35.90	-11.32	40.00	4.10	100	3	Vertical
2	100.082	48.70	35.76	-12.94	43.50	7.74	100	157	Vertical
3	207.388	46.25	33.49	-12.76	43.50	10.01	100	131	Vertical
4	450.373	48.20	38.42	-9.78	46.00	7.58	100	27	Vertical
5	579.141	42.66	35.63	-7.03	46.00	10.37	100	27	Vertical
6	965.201	34.18	32.17	-2.01	54.00	21.83	100	148	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 802.11a / 802.11n/ac/ax (HT20) /802.11n/ac/ax (HT40) modes have been tested for above 1GHz test, only the worst case 802.11a was recorded.

5150-5250MHz:

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

Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
36.00	10360.00	53.70	PK	H	68.30	14.60	50.03	38.83	10.12	45.28	3.67
(5180MHz)	--	--	AV	H	--	--	--	--	--	--	--
44.00	10440.00	51.74	PK	H	68.30	16.56	48.06	38.85	10.13	45.3	3.68
(5220MHz)	--	--	AV	H	--	--	--	--	--	--	--
48.00	10480.00	52.72	PK	H	68.30	15.58	48.98	38.89	10.19	45.34	3.74
(5240MHz)	--	--	AV	H	--	--	--	--	--	--	--

Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
36.00	10360.00	51.90	PK	V	68.30	16.40	48.23	38.83	10.12	45.28	3.67
(5180MHz)	--	--	--	V	--	--	--	--	--	--	--
44.00	10440.00	51.72	PK	V	68.30	16.58	48.04	38.85	10.13	45.3	3.68
(5220MHz)	--	--	--	V	--	--	--	--	--	--	--
48.00	10480.00	52.70	PK	V	68.30	15.60	48.96	38.89	10.19	45.34	3.74
(5240MHz)	--	--	AV	V	--	--	--	--	--	--	--

5260-5320MHz:

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

Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
52.0	10520	48.95	PK	H	68.30	19.35	45.19	38.91	10.2	45.35	3.76
(5260MHz)	--	--	AV	H	--	--	--	--	--	--	--
60.0	10600	51.83	PK	H	68.30	16.47	48.08	38.92	10.21	45.38	3.75
(5300MHz)	--	--	AV	H	--	--	--	--	--	--	--
64.0	10640	51.73	PK	H	68.30	16.57	47.97	38.94	10.23	45.41	3.76
(5320MHz)	--	--	AV	H	--	--	--	--	--	--	--

Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
52.0	10520	50.03	PK	V	68.30	18.27	46.27	38.91	10.2	45.35	3.76
(5260MHz)	--	--	AV	V	--	--	--	--	--	--	--
60.0	10600	52.84	PK	V	68.30	15.46	49.09	38.92	10.21	45.38	3.75
(5300MHz)	--	--	AV	V	--	--	--	--	--	--	--
64.0	10640	51.81	PK	V	68.30	16.49	48.05	38.94	10.23	45.41	3.76
(5320MHz)	--	--	AV	V	--	--	--	--	--	--	--

5500-5700MHz:

Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
100.0	11000	49.45	PK	H	68.30	18.85	45.02	39.12	10.85	45.54	4.43
5500MHz	--		--	--	--	--	--	--	--	--	--
120.0	11160	52.57	PK	H	68.30	15.73	48.11	39.07	10.87	45.48	4.46
5580MHz	--		AV	H	--	--	--	--	--	--	--
140.0	11400	52.55	PK	H	68.30	15.75	48.07	39.05	10.9	45.47	4.48
5700MHz	--	--	AV	H	--	--	--	--	--	--	--

Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
100.0	11000	50.57	PK	V	68.30	17.73	46.14	39.12	10.85	45.54	4.43
5500MHz	--		--	--	--	--	--	--	--	--	--
120.0	11160	52.53	PK	V	68.30	15.77	48.07	39.07	10.87	45.48	4.46
5580MHz	--		AV	V	--	--	--	--	--	--	--
140.0	11400	52.58	PK	V	68.30	15.72	48.10	39.05	10.9	45.47	4.48
5700MHz	--	--	PK	V	--	--	--	--	--	--	--

5725-5850MHz:

Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
149.00	11490.00	53.67	PK	H	68.30	14.63	49.19	39.02	10.91	45.45	4.48
(5745MHz)	--	--	AV	H	--	--		--	--	--	--
157.00	11570.00	52.69	PK	H	68.30	15.61	48.24	38.93	10.95	45.43	4.45
(5785MHz)	--	--	AV	H	--	--	--	--	--	--	--
165.00	11650.00	52.66	PK	H	68.30	15.64	48.08	38.83	11.16	45.41	4.58
(5825MHz)	--	--	AV	H	--	--	--	--	--	--	--

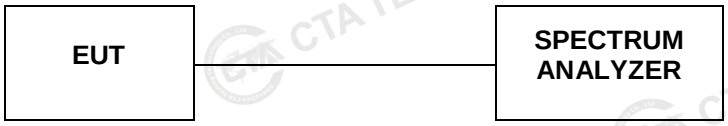
Tested	Frequency	Emission	Detector	ANT	Limit	Margin	Raw	Antenna	Cable	Pre	Correction
Channel	(MHz)	Level	Mode	Pol	(dBuV/m)	(dB)	Value	Factor	Factor	amplifier	Factor
		(dBuV/m)					(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
149.00	11490.00	52.44	PK	V	68.30	15.86	47.96	39.02	10.91	45.45	4.48
(5745MHz)	--	--	AV	V	--	--		--	--	--	--
157.00	11570.00	53.51	PK	V	68.30	14.79	49.06	38.93	10.95	45.43	4.45
(5785MHz)	--	--	AV	V	--	--	--	--	--	--	--
165.00	11650.00	52.75	PK	V	68.30	15.55	48.17	38.83	11.16	45.41	4.58
(5825MHz)	--	--	AV	V	--	--	--	--	--	--	--

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;

4.3. Duty Cycle

TEST CONFIGURATION



TEST PROCEDURE

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

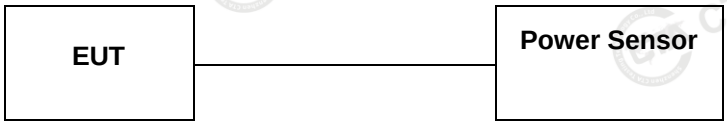
a. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal
b. The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient 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.
FCC Appendix RF Test Data for 5.2GWIFI
FCC Appendix RF Test Data for 5.3GWIFI
FCC Appendix RF Test Data for 5.5GWIFI
FCC Appendix RF Test Data for 5.8GWIFI

4.4. Maximum Average Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 Section E3 Measurement using a Power Meter (PM):

a. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied
   1. The EUT is configured to transmit continuously or to transmit with a constant duty cycle
   2. At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
   3. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B

c. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

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 percent).

LIMIT

According to §15.407(a): The maximum output power should be not exceed follow:

Frequency Range (MHz)	Limit
5150-5250	Fixed:1 Watt (30dBm) Mobile and portable: 250mW (24dBm)
5250-5350	250mW (24dBm)
5470-5725	250mW (24dBm)
5725-5850	1 Watt (30dBm)
Note: The maximum e.i.r.p at anyelevation angle above 30 degrees as measured from the horizon must not exceed 125mW(21dBm)	

TEST RESULTS

Please refer to.
FCC Appendix RF Test Data for 5.2GWIFI
FCC Appendix RF Test Data for 5.3GWIFI
FCC Appendix RF Test Data for 5.5GWIFI
FCC Appendix RF Test Data for 5.8GWIFI

4.5. Power Spectral Density

TEST CONFIGURATION

TEST PROCEDURE

According to KDB 789033 D02 General UNII Test Procedures New Rules v01 F: The rules requires "maximum power spectral density" measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission

a. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power…". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
b. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
c. Make the following adjustments to the peak value of the spectrum, if applicable:
    1. If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.
    2.) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
d. The result is the Maximum PSD over 1 MHz reference bandwidth.
e. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:
    1. Set RBW ≥ 1/T, where T is defined in section II.B.I.a).
    2. Set VBW ≥ 3 RBW.
    3. If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
    4. If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
    5. Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

    Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHz is available on nearly all spectrum analyzers.
f. 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 percent).

LIMIT

According to §15.407(a): The maximum output power should be not exceed follow:

Frequency Range (MHz)	Limit
5150-5250	Other then Mobile and portable:17dBm/MHz Mobile and portable:11dBm/MHz
5250-5350	11dBm/MHz
5470-5725	11dBm/MHz
5725-5850	30dBm/500kHz

TEST RESULTS

Please refer to.
FCC Appendix RF Test Data for 5.2GWIFI
FCC Appendix RF Test Data for 5.3GWIFI
FCC Appendix RF Test Data for 5.5GWIFI
FCC Appendix RF Test Data for 5.8GWIFI

4.6. 6dB Bandwidth

TEST CONFIGURATION

TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 for one of the following procedures may be used for section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a. Set RBW = 100 kHz.
b. Set the video bandwidth (VBW) ≥ 3 × RBW
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize
g. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

LIMIT

For Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz

TEST RESULTS

Please refer to.
FCC Appendix RF Test Data for 5.8GWIFI

4.7. 26dB Bandwidth

TEST CONFIGURATION

TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 for one of the following procedures may be used for Emission Bandwidth (EBW) measurement:

a. Set RBW = 300 kHz (approximately 1% of the emission bandwidth).
b. Set the video bandwidth (VBW) = 1000 KHz (VBW > RBW)
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize
g. Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

LIMIT

No Limits for 26dBc Bandwith

TEST RESULTS

Please refer to.
FCC Appendix RF Test Data for 5.2GWIFI
FCC Appendix RF Test Data for 5.3GWIFI
FCC Appendix RF Test Data for 5.5GWIFI

4.8. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Antenna Information

Test Result:

The FPC Antenna maximum gain of antenna was ANT1: 3.4dBi, ANT2: 3.4dBi.

Remark: The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Shenzhen CTA Testing Technology Co., Ltd. does not assume any responsibility.

4.9. Emissions at Restricted Band

Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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) (see §15.205(c)).

TEST CONFIGURATION

Test Procedures

According to ANSI C63.10 Field Strength Approach (linear terms):

eirp = p_t x g_t = $(E \times d)^2/30$

Where:

p_t = transmitter output power in watts,

g_t = numeric gain of the transmitting antenna (unit less),

E = electric field strength in V/m,

d = measurement distance in meters (m).

erp = eirp/1.64 = $(E \times d)^2/(30 \times 1.64)$

Where all terms are as previously defined.

1). Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2). Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to an EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3). Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=1/T for Peak detector.
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.
6). Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7). Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8). Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9). For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10). Compare the resultant electric field strength level to the applicable regulatory limit.
11). Perform radiated spurious emission test duress until all measured frequencies were complete.

Test Results

Please refer to.
FCC Appendix RF Test Data for 5.2GWIFI
FCC Appendix RF Test Data for 5.3GWIFI
FCC Appendix RF Test Data for 5.5GWIFI
FCC Appendix RF Test Data for 5.8GWIFI

Remark:
1). Test results including cable loss;
2). Measured at difference Packet Type for each mode and recorded worst case for each mode.
3). "---"means that the fundamental frequency not for 15.209 limits requirement.
4). Measured at Hopping and Non-Hopping mode, recorded worst at Non-Hopping mode.
5). The other emission levels were very low against the limit.
6). The average measurement was not performed when the peak measured data under the limit of average detection.
7). Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=1/T/Sweep time=Auto/Detector=Peak.
8). Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.

5. Test Setup Photos of the EUT

Please refer to separated files for Test Setup Photos of the EUT.

6. External and Internal Photos of the EUT

Please refer to separated files for External Photos & Internal Photos of the EUT.

.....End of Report.....