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TEST REPORT

Application No.:	GZEM1905013070CR
Applicant:	GREE Electric Appliances, Inc. of Zhuhai
Address of Applicant:	West Jinji Rd, Qianshan, Zhuhai, Guangdong, China 519070
Manufacturer:	GREE Electric Appliances, Inc. of Zhuhai
Address of Manufacturer:	West Jinji Rd, Qianshan, Zhuhai, Guangdong, China 519070
Factory:	GREE Electric Appliances, Inc. of Zhuhai
Address of Factory:	West Jinji Rd, Qianshan, Zhuhai, Guangdong, China 519070
Equipment Under Test (EUT):	
FCC ID:	2ADAP-GRJW04J1
EUT Name:	wifi module
Model No.:	GRJW04-J1
Trade Mark:	GREE
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2019-05-24
Date of Test:	2019-06-06 to 2019-07-02
Date of Issue:	2019-08-12
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2019-08-12		Original

Authorized for issue by:				
Tested By		**Curry_Wu /Project Engineer**		2019-06-06 to 2019-07-02 **Date**
Checked By		**Ricky_Liu /Reviewer**		2019-07-05 **Date**

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a (2)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass

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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 5V
Test Voltage:	DC 5V
Antenna Gain	1.0 dBi
Antenna Type	PCB antenna
Channel Spacing	5MHz
Modulation Type	802.11b: DSSS (CCK, DQPSK, DBPSK)
	802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels	802.11b/g/n(HT20):11
	802.11n(HT40):7
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz
	802.11n(HT40): 2422MHz to 2452MHz
Software for setting EUT power:	UI_mptool.exe
Power level setting:	802.11b:39
	802.11g:39
	802.11n (HT20):39
	802.11n (HT40):39

4.2 Environment Parameter

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Value	Temperature (℃)	Voltage(V)
TNVN	25	5
TLVN	0	5
THVN	50	5

Note:

VN: Normal Voltage

TN: Normal Temperature

TL: Low Extreme Test Temperature

TH: High Extreme Test Temperature

Operation Frequency each of channel (802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	5	2432MHz	9	2452MHz		
2	2417MHz	6	2437MHz	10	2457MHz		
3	2422MHz	7	2442MHz	11	2462MHz		
4	2427MHz	8	2447MHz				

Operation Frequency each of channel (802.11n HT40)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422MHz	6	2437MHz	9	2452MHz
4	2427MHz	7	2442MHz		
5	2432MHz	8	2447MHz		

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

For 802.11b/g/n (HT20):

Channel	Frequency
The lowest channel (CH1)	2412MHz
The middle channel (CH7)	2442MHz
The highest channel (CH11)	2462MHz

For 802.11n (HT40):

Channel	Frequency
The lowest channel (CH3)	2422MHz
The middle channel (CH7)	2442MHz
The highest channel (CH9)	2452MHz

4.3 Description of Support Units

The EUT has been tested with corresponding accessories as below:

Supplied by SGS:

Description	Manufacturer	Model No.	SN/Certificate NO
Note Book	IBM	T40	99-FBAF9 03/09

4.4 Measurement Uncertainty

RF

No.	Item	Measurement Uncertainty
1	Radio Frequency	±5.5 x 10^{-8}
2	Duty cycle	±0.57%
3	Occupied Bandwidth	±3%
4	RF Conducted power	±0.68dB
5	RF Power Density	±1.50dB
6	Conducted Spurious Emissions	±1.04dB
7	RF Radiated Power	±4.5dB (below 1GHz)
		±4.8dB (above 1GHz)
8	Radiated Spurious Emission Test	±4.5dB (30MHz-1GHz)
		±4.8dB (1GHz-18GHz)
9	Temperature	±0.4°C
10	Humidity	±1.3%
11	Supply Voltages	±1.5%
12	Time	±3%

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to

ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized 2.948 Listed Test Firm(Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

- **Industry Canada (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584，G-10449 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Shielding Room	Zhong Yu	8m x 3m x 3.8m	EMC0306	N/A	N/A
Two-Line V-Netwok	R&S	ENV216	EMC0118	2019-01-11	2020-01-10
LISN	R&S	ENV216	EMC2135	2018-09-21	2019-09-20
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2018-11-19	2019-11-18
Coaxial Cable	HangTianXing	2m	EMC0107	2017-07-23	2019-07-22
Voltage Probe	SGS	N/A	EMC0106	2018-04-04	2020-04-03
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2018-04-19	2020-04-18
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A

Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Power Spectrum Density					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2019-01-20	2020-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2019-01-20	2020-01-19
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2019-01-07	2020-01-08
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2019-01-11	2020-01-10
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2019-01-11	2020-01-10
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2018-12-08	2019-12-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2019-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2018-11-19	2019-11-18
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2018-11-19	2019-11-18

Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Spurious Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2019-01-20	2020-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2019-01-20	2020-01-19
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2019-01-07	2020-01-08
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2019-01-11	2020-01-10
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2019-01-11	2020-01-10
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2018-12-08	2019-12-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2019-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2018-11-19	2019-11-18
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2018-11-19	2019-11-18
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2018-07-20	2019-07-19
DMM	Fluke	73	EMC0007	2018-07-19	2019-07-18

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(c)

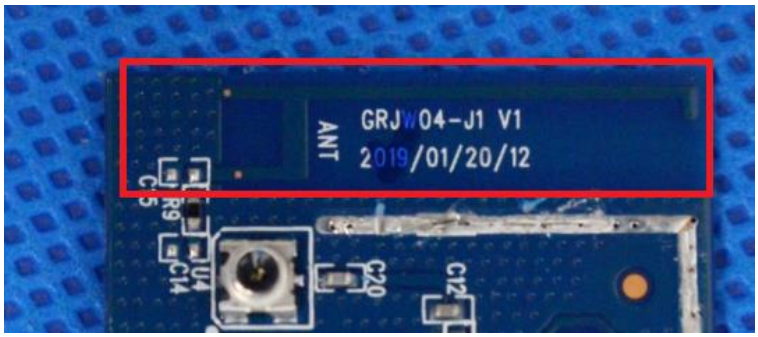
6.1.2 Conclusion

Standard Requirement:

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

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.0 dBi.

7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	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.		

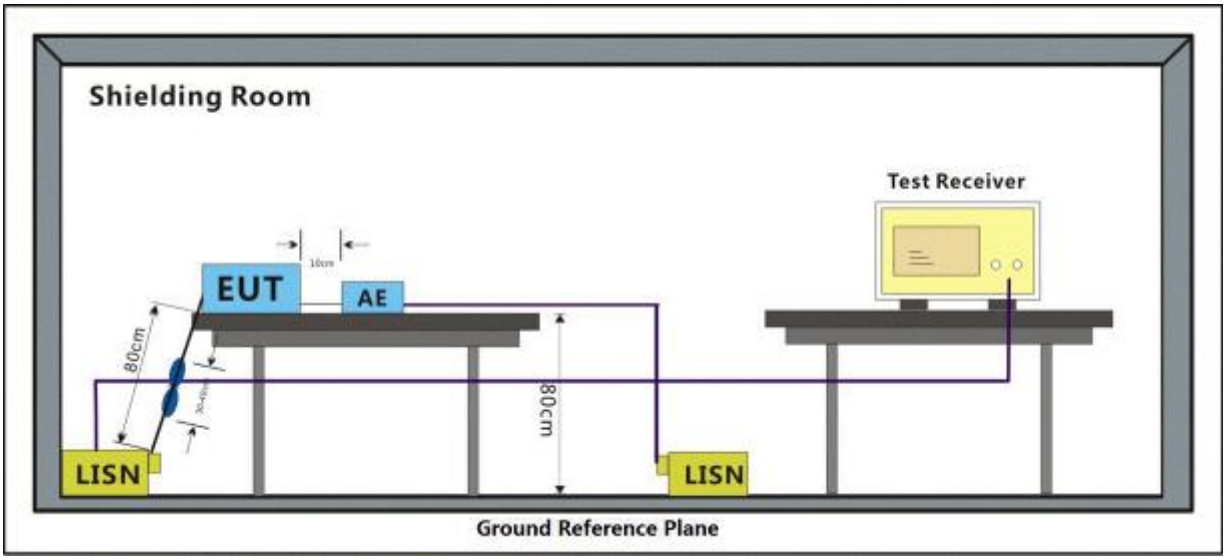
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 27.9 °C Humidity: 72.4 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

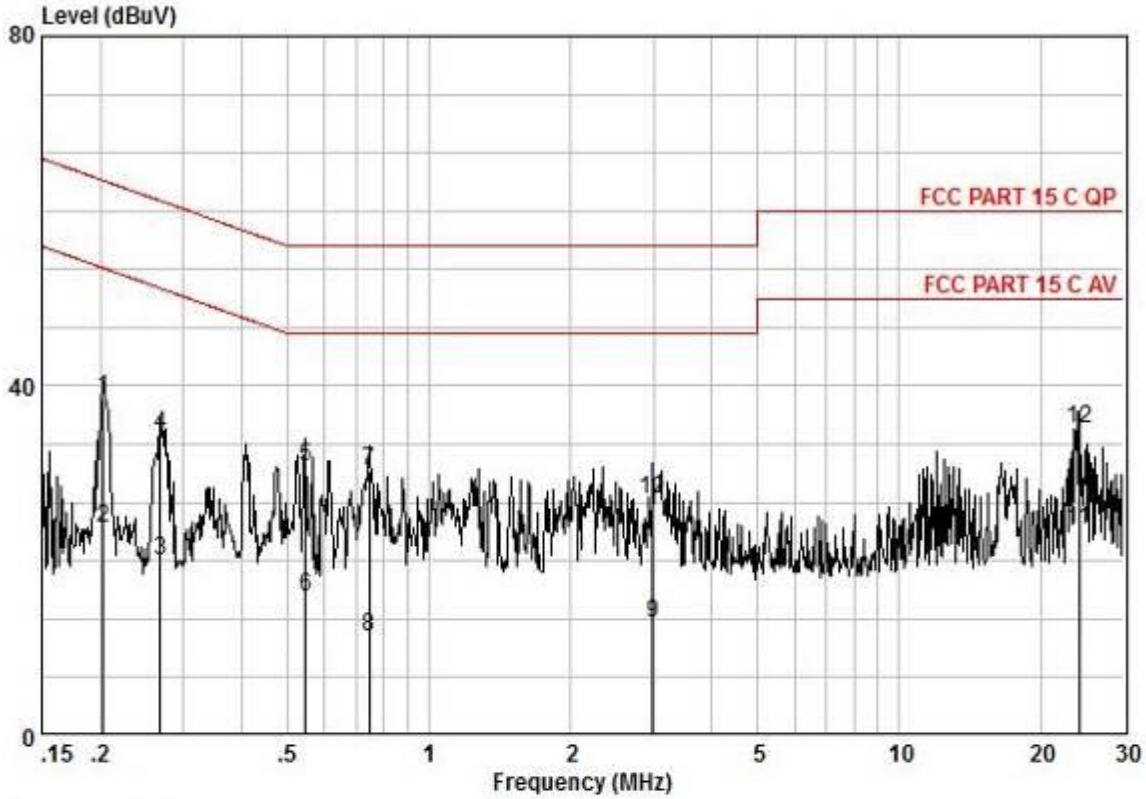
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

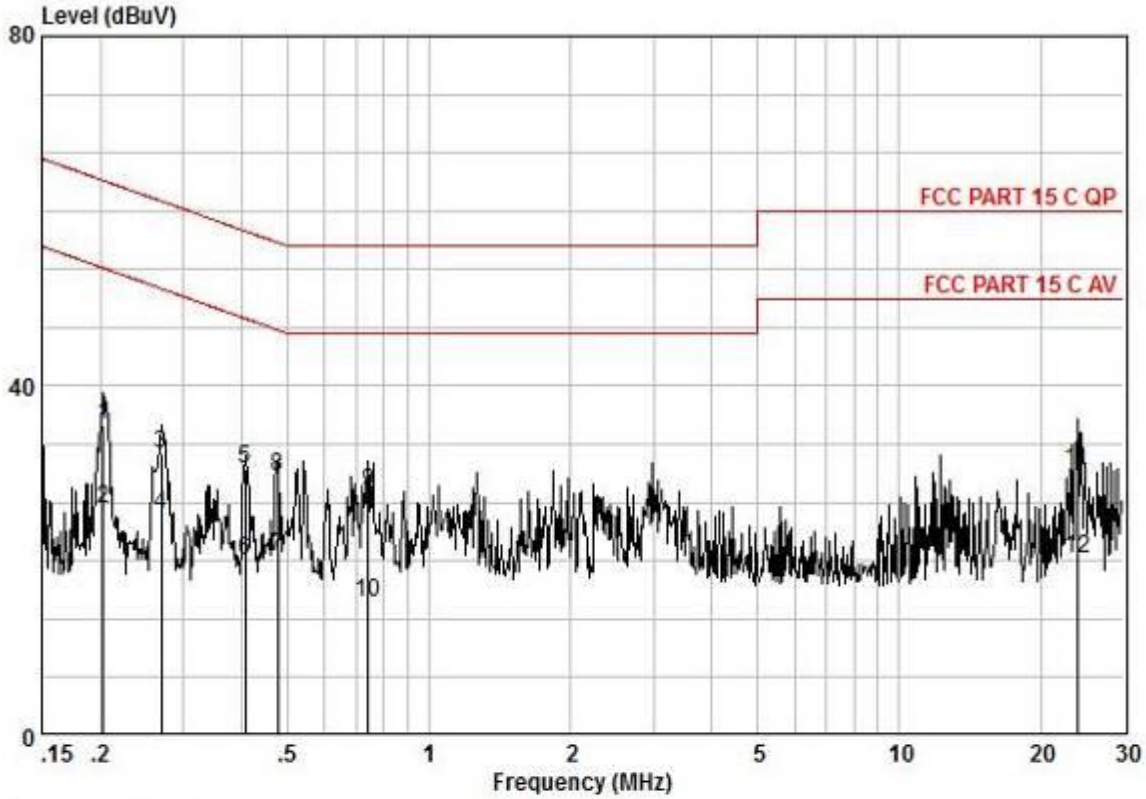
Mode: a; Line: Live Line



Pol :LIVE
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0,20	28,88	0,10	9,62	38,60	63,49	-24,89	QP
0,20	14,13	0,10	9,62	23,85	53,49	-29,64	AVERAGE
0,27	10,32	0,13	9,63	20,08	51,16	-31,08	AVERAGE
0,27	24,58	0,13	9,63	34,34	61,16	-26,82	QP
0,55	20,89	0,21	9,64	30,74	56,00	-25,26	QP
0,55	6,06	0,21	9,64	15,91	46,00	-30,09	AVERAGE
0,75	20,35	0,26	9,61	30,22	56,00	-25,78	QP
0,75	1,47	0,26	9,61	11,34	46,00	-34,66	AVERAGE
2,99	2,61	0,53	9,62	12,76	46,00	-33,24	AVERAGE
2,99	16,95	0,53	9,62	27,10	56,00	-28,90	QP
24,14	13,09	0,69	9,66	23,45	50,00	-26,55	AVERAGE
24,14	24,74	0,69	9,66	35,10	60,00	-24,90	QP

Mode: a; Line: Neutral Line



Pol :NEUTRAL
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.20	25.91	0.10	9.59	35.60	63.49	-27.89	QP
0.20	16.17	0.10	9.59	25.86	53.49	-27.63	AVERAGE
0.27	22.49	0.13	9.58	32.20	61.12	-28.92	QP
0.27	15.57	0.13	9.58	25.28	51.12	-25.84	AVERAGE
0.41	20.70	0.18	9.56	30.44	57.73	-27.29	QP
0.41	10.39	0.18	9.56	20.13	47.73	-27.60	AVERAGE
0.48	10.83	0.19	9.55	20.58	46.41	-25.83	AVERAGE
0.48	19.91	0.19	9.55	29.66	56.41	-26.75	QP
0.74	18.11	0.26	9.59	27.96	56.00	-28.04	QP
0.74	5.41	0.26	9.59	15.26	46.00	-30.74	AVERAGE
23.89	19.88	0.70	9.68	30.26	60.00	-29.74	QP
23.89	9.83	0.70	9.68	20.21	50.00	-29.79	AVERAGE

7.2 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a (2)

Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit: ≥500 kHz

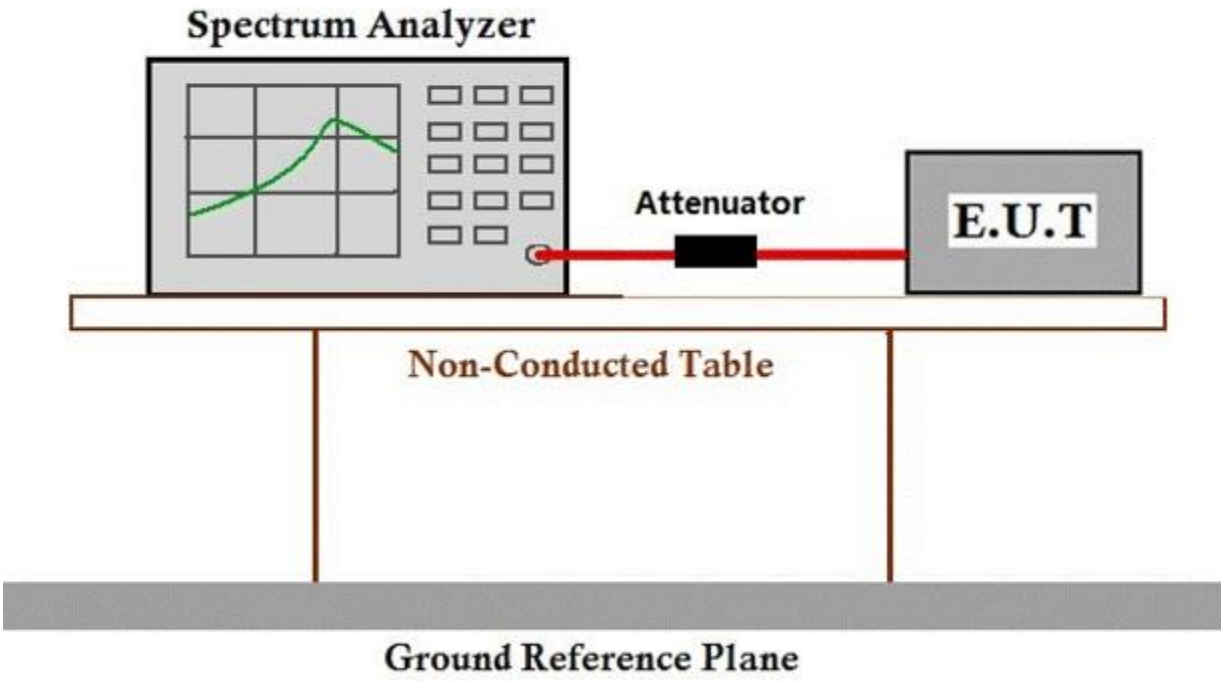
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.3 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.1

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

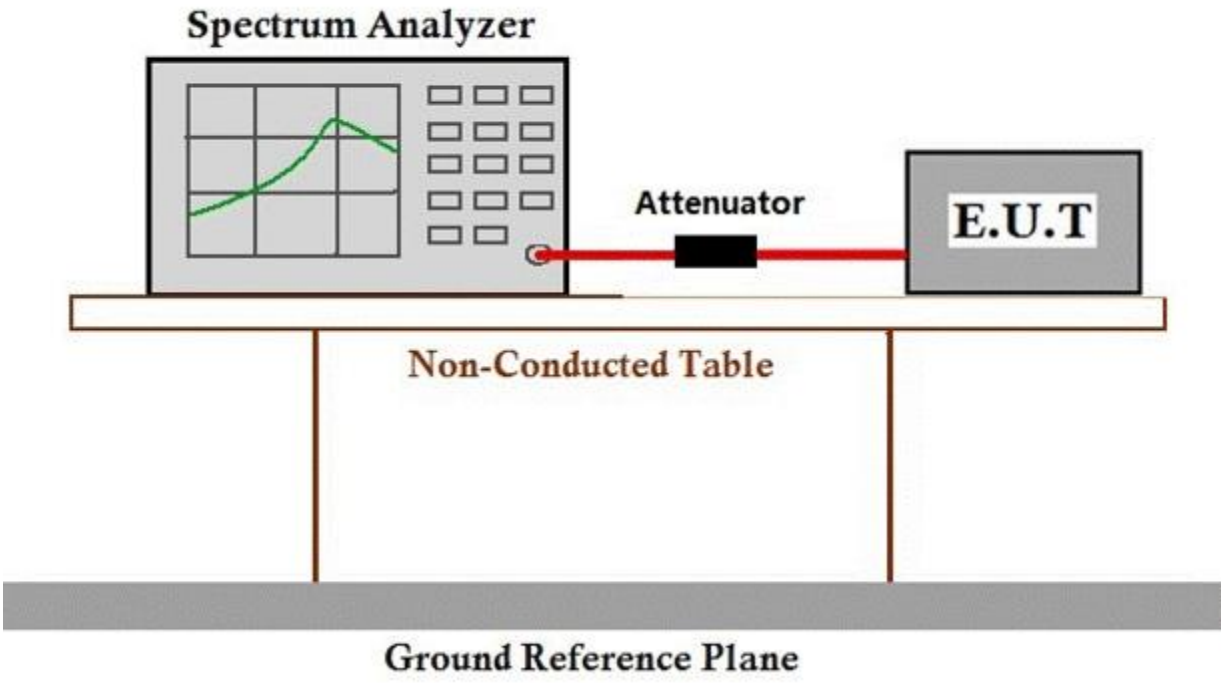
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.4 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit: ≤8dBm in any 3 kHz band during any time interval of continuous transmission

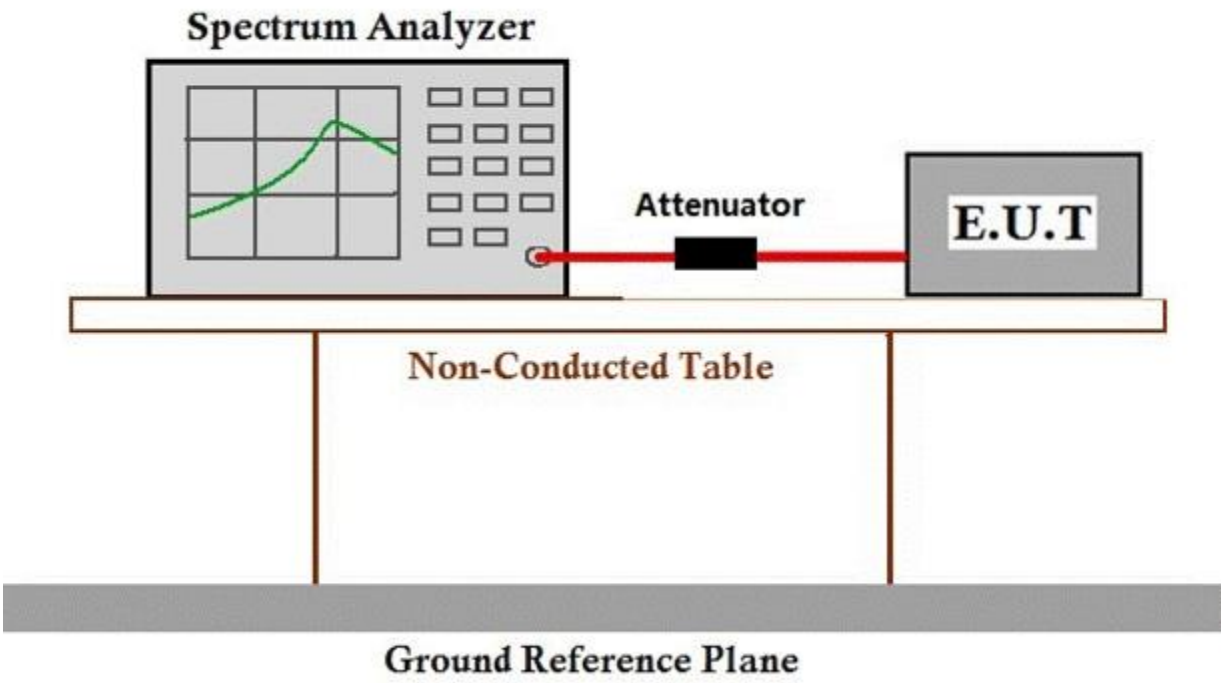
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.5 Conducted Band Edges Measurement

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.13.3.2
Limit:	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)

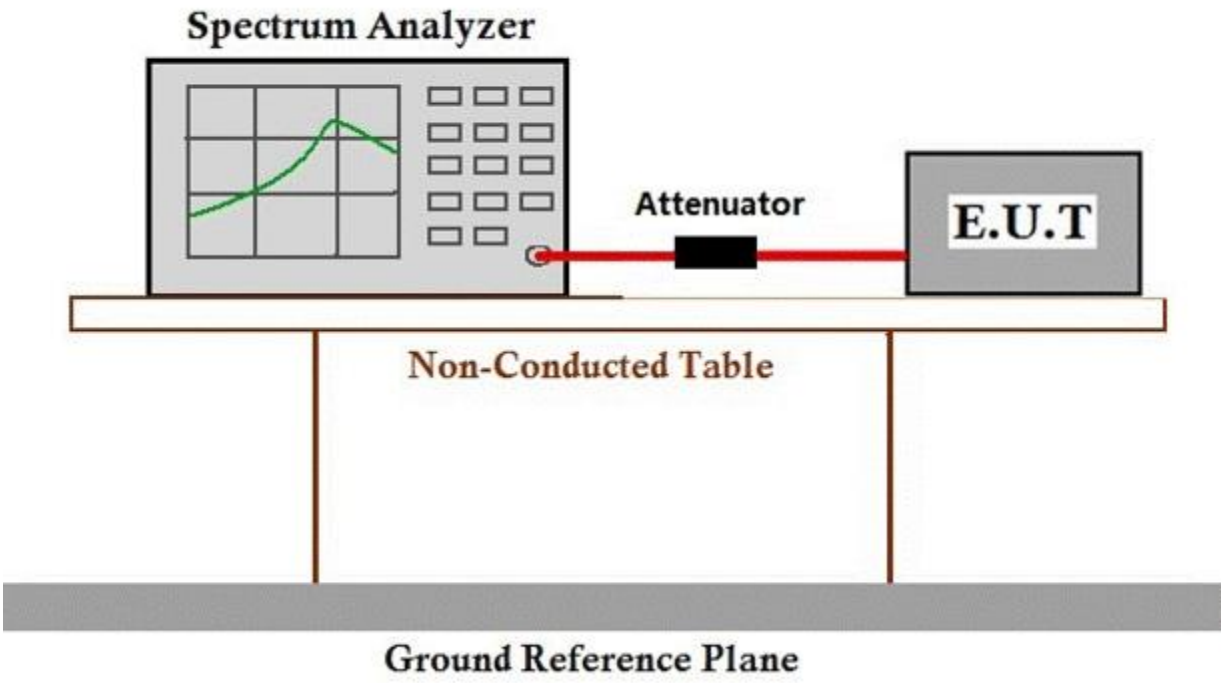
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.6 Conducted Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.11
Limit:	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)

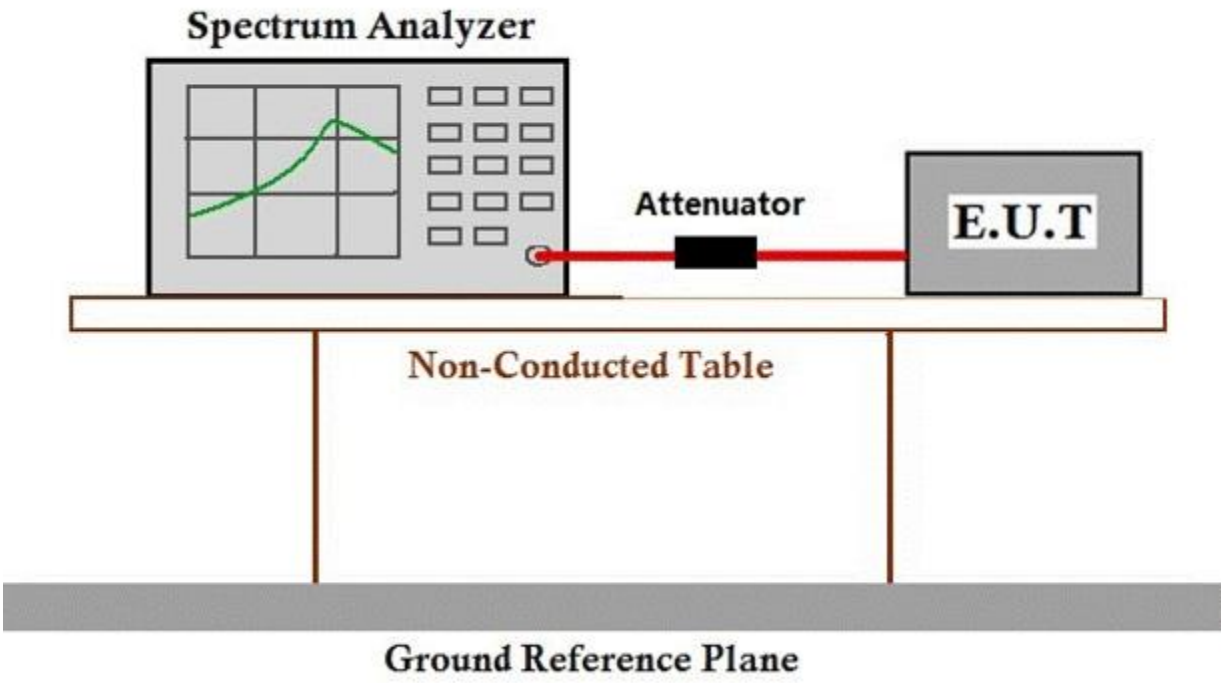
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)

Test Method: ANSI C63.10 (2013) Section 6.10.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

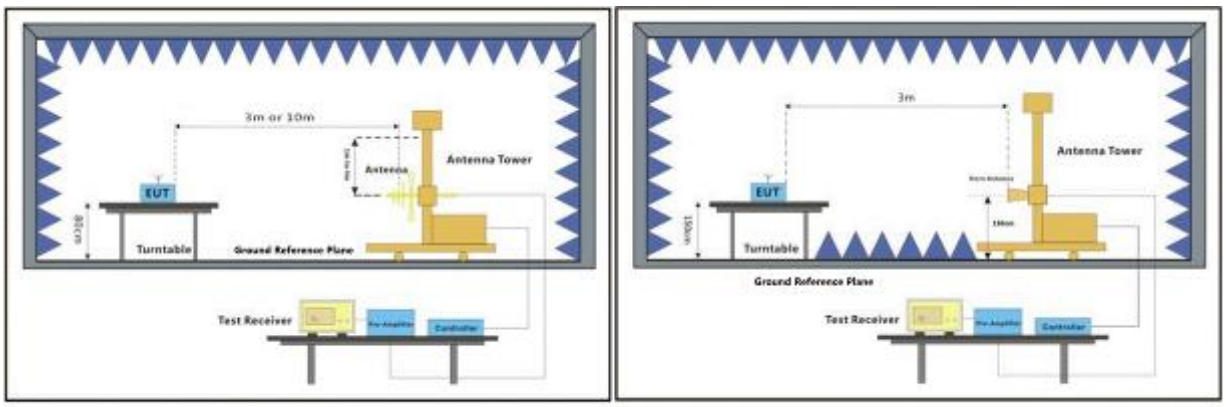
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 26.7 °C Humidity: 51.3 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.7.2 Test Setup Diagram



30MHz-1GHz Above 1GHz

7.7.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.51	26.25	5.03	38.08	37.71	54.00	-16.29	HORIZONTAL	Average
2	2310.000	53.48	26.25	5.03	38.08	46.68	74.00	-27.32	HORIZONTAL	Peak
3	2390.000	46.05	26.43	4.88	37.92	39.44	54.00	-14.56	HORIZONTAL	Average
4	2390.000	56.28	26.43	4.88	37.92	49.67	74.00	-24.33	HORIZONTAL	Peak
5	2483.500	44.52	26.58	5.23	38.37	37.96	54.00	-16.04	HORIZONTAL	Average
6	2483.500	55.37	26.58	5.23	38.37	48.81	74.00	-25.19	HORIZONTAL	Peak
7	2550.000	42.02	26.69	5.03	38.00	35.74	54.00	-18.26	HORIZONTAL	Average
8	2550.000	54.81	26.69	5.03	38.00	48.53	74.00	-25.47	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	42.20	26.25	5.03	38.08	35.40	54.00	-18.60	VERTICAL	Average
2	2310.000	50.51	26.25	5.03	38.08	43.71	74.00	-30.29	VERTICAL	Peak
3	2390.000	42.06	26.43	4.88	37.92	35.45	54.00	-18.55	VERTICAL	Average
4	2390.000	51.97	26.43	4.88	37.92	45.36	74.00	-28.64	VERTICAL	Peak
5	2483.500	43.21	26.58	5.23	38.37	36.65	54.00	-17.35	VERTICAL	Average
6	2483.500	52.16	26.58	5.23	38.37	45.60	74.00	-28.40	VERTICAL	Peak
7	2500.000	41.09	26.60	4.95	38.10	34.54	54.00	-19.46	VERTICAL	Average
8	2500.000	51.54	26.60	4.95	38.10	44.99	74.00	-29.01	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	40.49 26.25	5.03	38.08	33.69	54.00	-20.31	HORIZONTAL	Average
2	2310.000	53.77 26.25	5.03	38.08	46.97	74.00	-27.03	HORIZONTAL	Peak
3	2390.000	43.76 26.43	4.88	37.92	37.15	54.00	-16.85	HORIZONTAL	Average
4	2390.000	54.58 26.43	4.88	37.92	47.97	74.00	-26.03	HORIZONTAL	Peak
5	2483.500	41.58 26.58	5.23	38.37	35.02	54.00	-18.98	HORIZONTAL	Average
6	2483.500	54.69 26.58	5.23	38.37	48.13	74.00	-25.87	HORIZONTAL	Peak
7	2500.000	41.24 26.60	4.95	38.10	34.69	54.00	-19.31	HORIZONTAL	Average
8	2500.000	56.07 26.60	4.95	38.10	49.52	74.00	-24.48	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	43.02 26.25	5.03	38.08	36.22	54.00	-17.78	VERTICAL	Average
2	2310.000	52.38 26.25	5.03	38.08	45.58	74.00	-28.42	VERTICAL	Peak
3	2390.000	40.02 26.43	4.88	37.92	33.41	54.00	-20.59	VERTICAL	Average
4	2390.000	51.32 26.43	4.88	37.92	44.71	74.00	-29.29	VERTICAL	Peak
5	2483.500	41.31 26.58	5.23	38.37	34.75	54.00	-19.25	VERTICAL	Average
6	2483.500	52.94 26.58	5.23	38.37	46.38	74.00	-27.62	VERTICAL	Peak
7	2500.000	38.07 26.60	4.95	38.10	31.52	54.00	-22.48	VERTICAL	Average
8	2500.000	52.54 26.60	4.95	38.10	45.99	74.00	-28.01	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	35.95	26.25	5.03	38.08	29.15	54.00	-24.85	HORIZONTAL	Average
2	2310.000	51.51	26.25	5.03	38.08	44.71	74.00	-29.29	HORIZONTAL	Peak
3	2390.000	38.55	26.43	4.88	37.92	31.94	54.00	-22.06	HORIZONTAL	Average
4	2390.000	54.68	26.43	4.88	37.92	48.07	74.00	-25.93	HORIZONTAL	Peak
5	2483.500	38.14	26.58	5.23	38.37	31.58	54.00	-22.42	HORIZONTAL	Average
6	2483.500	53.79	26.58	5.23	38.37	47.23	74.00	-26.77	HORIZONTAL	Peak
7	2500.000	36.39	26.60	4.95	38.10	29.84	54.00	-24.16	HORIZONTAL	Average
8	2500.000	54.69	26.60	4.95	38.10	48.14	74.00	-25.86	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	35.75	26.25	5.03	38.08	28.95	54.00	-25.05	VERTICAL	Average
2	2310.000	51.43	26.25	5.03	38.08	44.63	74.00	-29.37	VERTICAL	Peak
3	2390.000	36.08	26.43	4.88	37.92	29.47	54.00	-24.53	VERTICAL	Average
4	2390.000	51.45	26.43	4.88	37.92	44.84	74.00	-29.16	VERTICAL	Peak
5	2483.500	35.87	26.58	5.23	38.37	29.31	54.00	-24.69	VERTICAL	Average
6	2483.500	53.28	26.58	5.23	38.37	46.72	74.00	-27.28	VERTICAL	Peak
7	2500.000	36.21	26.60	4.95	38.10	29.66	54.00	-24.34	VERTICAL	Average
8	2500.000	53.52	26.60	4.95	38.10	46.97	74.00	-27.03	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	38.92 26.25	5.03	38.08	32.12	54.00	-21.88	HORIZONTAL	Average
2	2310.000	51.08 26.25	5.03	38.08	44.28	74.00	-29.72	HORIZONTAL	Peak
3	2390.000	41.18 26.43	4.88	37.92	34.57	54.00	-19.43	HORIZONTAL	Average
4	2390.000	51.89 26.43	4.88	37.92	45.28	74.00	-28.72	HORIZONTAL	Peak
5	2483.500	41.77 26.58	5.23	38.37	35.21	54.00	-18.79	HORIZONTAL	Average
6	2483.500	55.10 26.58	5.23	38.37	48.54	74.00	-25.46	HORIZONTAL	Peak
7	2500.000	37.66 26.60	4.95	38.10	31.11	54.00	-22.89	HORIZONTAL	Average
8	2500.000	54.14 26.60	4.95	38.10	47.59	74.00	-26.41	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	34.10 26.25	5.03	38.08	27.30	54.00	-26.70	VERTICAL	Average
2	2310.000	51.23 26.25	5.03	38.08	44.43	74.00	-29.57	VERTICAL	Peak
3	2390.000	37.76 26.43	4.88	37.92	31.15	54.00	-22.85	VERTICAL	Average
4	2390.000	50.50 26.43	4.88	37.92	43.89	74.00	-30.11	VERTICAL	Peak
5	2483.500	38.32 26.58	5.23	38.37	31.76	54.00	-22.24	VERTICAL	Average
6	2483.500	51.85 26.58	5.23	38.37	45.29	74.00	-28.71	VERTICAL	Peak
7	2500.000	41.12 26.60	4.95	38.10	34.57	54.00	-19.43	VERTICAL	Average
8	2500.000	51.84 26.60	4.95	38.10	45.29	74.00	-28.71	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	37.67 26.25	5.03	38.08	30.87	54.00	-23.13	HORIZONTAL	Average
2	2310.000	52.52 26.25	5.03	38.08	45.72	74.00	-28.28	HORIZONTAL	Peak
3	2390.000	37.96 26.43	4.88	37.92	31.35	54.00	-22.65	HORIZONTAL	Average
4	2390.000	54.42 26.43	4.88	37.92	47.81	74.00	-26.19	HORIZONTAL	Peak
5	2483.500	39.93 26.58	5.23	38.37	33.37	54.00	-20.63	HORIZONTAL	Average
6	2483.500	53.87 26.58	5.23	38.37	47.31	74.00	-26.69	HORIZONTAL	Peak
7	2500.000	37.27 26.60	4.95	38.10	30.72	54.00	-23.28	HORIZONTAL	Average
8	2500.000	53.55 26.60	4.95	38.10	47.00	74.00	-27.00	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	39.27 26.25	5.03	38.08	32.47	54.00	-21.53	VERTICAL	Average
2	2310.000	51.03 26.25	5.03	38.08	44.23	74.00	-29.77	VERTICAL	Peak
3	2390.000	39.85 26.43	4.88	37.92	33.24	54.00	-20.76	VERTICAL	Average
4	2390.000	52.66 26.43	4.88	37.92	46.05	74.00	-27.95	VERTICAL	Peak
5	2483.500	38.97 26.58	5.23	38.37	32.41	54.00	-21.59	VERTICAL	Average
6	2483.500	54.12 26.58	5.23	38.37	47.56	74.00	-26.44	VERTICAL	Peak
7	2500.000	38.90 26.60	4.95	38.10	32.35	54.00	-21.65	VERTICAL	Average
8	2500.000	52.85 26.60	4.95	38.10	46.30	74.00	-27.70	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	39.78	26.25	5.03	38.08	32.98	54.00	-21.02	HORIZONTAL	Average
2	2310.000	51.31	26.25	5.03	38.08	44.51	74.00	-29.49	HORIZONTAL	Peak
3	2390.000	37.91	26.43	4.88	37.92	31.30	54.00	-22.70	HORIZONTAL	Average
4	2390.000	53.18	26.43	4.88	37.92	46.57	74.00	-27.43	HORIZONTAL	Peak
5	2483.500	40.06	26.58	5.23	38.37	33.50	54.00	-20.50	HORIZONTAL	Average
6	2483.500	61.09	26.58	5.23	38.37	54.53	74.00	-19.47	HORIZONTAL	Peak
7	2500.000	38.59	26.60	4.95	38.10	32.04	54.00	-21.96	HORIZONTAL	Average
8	2500.000	53.99	26.60	4.95	38.10	47.44	74.00	-26.56	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	35.45	26.25	5.03	38.08	28.65	54.00	-25.35	VERTICAL	Average
2	2310.000	57.27	26.25	5.03	38.08	50.47	74.00	-23.53	VERTICAL	Peak
3	2390.000	37.38	26.43	4.88	37.92	30.77	54.00	-23.23	VERTICAL	Average
4	2390.000	51.01	26.43	4.88	37.92	44.40	74.00	-29.60	VERTICAL	Peak
5	2483.500	36.75	26.58	5.23	38.37	30.19	54.00	-23.81	VERTICAL	Average
6	2483.500	52.14	26.58	5.23	38.37	45.58	74.00	-28.42	VERTICAL	Peak
7	2500.000	37.65	26.60	4.95	38.10	31.10	54.00	-22.90	VERTICAL	Average
8	2500.000	51.60	26.60	4.95	38.10	45.05	74.00	-28.95	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	45.52 26.25	5.03	38.08	38.72	54.00	-15.28	HORIZONTAL	Average
2	2310.000	53.72 26.25	5.03	38.08	46.92	74.00	-27.08	HORIZONTAL	Peak
3	2390.000	38.73 26.43	4.88	37.92	32.12	54.00	-21.88	HORIZONTAL	Average
4	2390.000	54.51 26.43	4.88	37.92	47.90	74.00	-26.10	HORIZONTAL	Peak
5	2483.500	40.14 26.58	5.23	38.37	33.58	54.00	-20.42	HORIZONTAL	Average
6	2483.500	56.82 26.58	5.23	38.37	50.26	74.00	-23.74	HORIZONTAL	Peak
7	2500.000	38.68 26.60	4.95	38.10	32.13	54.00	-21.87	HORIZONTAL	Average
8	2500.000	53.55 26.60	4.95	38.10	47.00	74.00	-27.00	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	36.49 26.25	5.03	38.08	29.69	54.00	-24.31	VERTICAL	Average
2	2310.000	50.95 26.25	5.03	38.08	44.15	74.00	-29.85	VERTICAL	Peak
3	2390.000	38.12 26.43	4.88	37.92	31.51	54.00	-22.49	VERTICAL	Average
4	2390.000	52.46 26.43	4.88	37.92	45.85	74.00	-28.15	VERTICAL	Peak
5	2483.500	36.44 26.58	5.23	38.37	29.88	54.00	-24.12	VERTICAL	Average
6	2483.500	51.62 26.58	5.23	38.37	45.06	74.00	-28.94	VERTICAL	Peak
7	2500.000	37.37 26.60	4.95	38.10	30.82	54.00	-23.18	VERTICAL	Average
8	2500.000	51.91 26.60	4.95	38.10	45.36	74.00	-28.64	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	39.13 26.25	5.03	38.08	32.33	54.00	-21.67	HORIZONTAL	Average
2	2310.000	57.29 26.25	5.03	38.08	50.49	74.00	-23.51	HORIZONTAL	Peak
3	2390.000	38.25 26.43	4.88	37.92	31.64	54.00	-22.36	HORIZONTAL	Average
4	2390.000	54.28 26.43	4.88	37.92	47.67	74.00	-26.33	HORIZONTAL	Peak
5	2483.500	41.12 26.58	5.23	38.37	34.56	54.00	-19.44	HORIZONTAL	Average
6	2483.500	63.72 26.58	5.23	38.37	57.16	74.00	-16.84	HORIZONTAL	Peak
7	2500.000	35.96 26.60	4.95	38.10	29.41	54.00	-24.59	HORIZONTAL	Average
8	2500.000	54.56 26.60	4.95	38.10	48.01	74.00	-25.99	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High

	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	38.37 26.25	5.03	38.08	31.57	54.00	-22.43	VERTICAL	Average
2	2310.000	58.10 26.25	5.03	38.08	51.30	74.00	-22.70	VERTICAL	Peak
3	2390.000	38.18 26.43	4.88	37.92	31.57	54.00	-22.43	VERTICAL	Average
4	2390.000	50.53 26.43	4.88	37.92	43.92	74.00	-30.08	VERTICAL	Peak
5	2483.500	36.78 26.58	5.23	38.37	30.22	54.00	-23.78	VERTICAL	Average
6	2483.500	57.01 26.58	5.23	38.37	50.45	74.00	-23.55	VERTICAL	Peak
7	2500.000	35.44 26.60	4.95	38.10	28.89	54.00	-25.11	VERTICAL	Average
8	2500.000	50.80 26.60	4.95	38.10	44.25	74.00	-29.75	VERTICAL	Peak

7.8 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)
Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6
Measurement Distance: 3m
Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

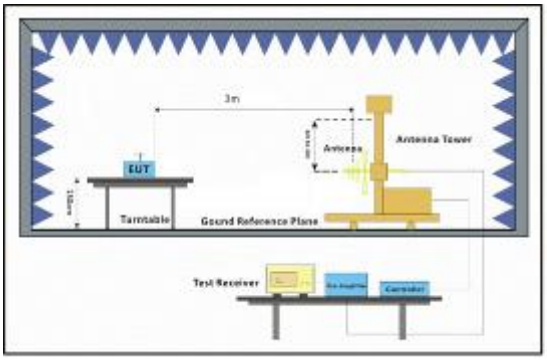
7.8.1 E.U.T. Operation

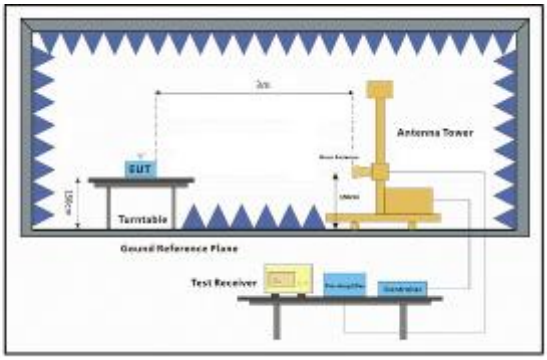
Operating Environment:

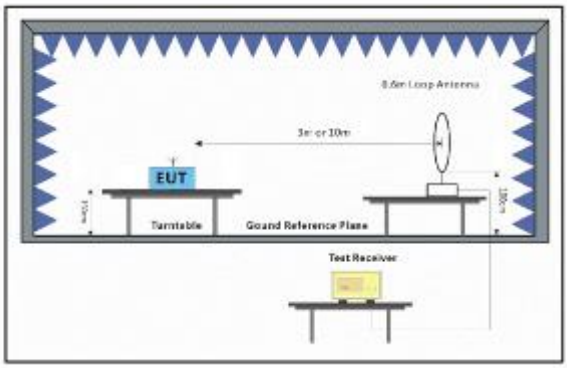
Temperature: 26.8 °C Humidity: 51.3 % RH Atmospheric Pressure: 1020 mbar

Test mode a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.8.2 Test Setup Diagram







7.8.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	31.955	25.63	12.25	0.11	29.81	8.18	40.00	-31.82	HORIZONTAL	QP
2	44.275	23.63	12.76	0.70	29.53	7.56	40.00	-32.44	HORIZONTAL	QP
3	85.298	29.22	7.97	0.83	29.40	8.62	40.00	-31.38	HORIZONTAL	QP
4	144.842	27.46	13.16	1.09	29.40	12.31	43.50	-31.19	HORIZONTAL	QP
5	631.688	29.05	20.82	2.10	29.49	22.48	46.00	-23.52	HORIZONTAL	QP
6	881.407	28.98	23.84	2.90	28.87	26.85	46.00	-19.15	HORIZONTAL	QP

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3856.668	33.01	29.19	7.73	38.12	31.81	54.00	-22.19	HORIZONTAL	Average
2	3856.668	48.15	29.19	7.73	38.12	46.95	74.00	-27.05	HORIZONTAL	Peak
3	4824.016	36.31	30.82	6.01	38.11	35.03	54.00	-18.97	HORIZONTAL	Average
4	4824.016	50.37	30.82	6.01	38.11	49.09	74.00	-24.91	HORIZONTAL	Peak
5	7266.879	28.93	35.60	7.36	37.44	34.45	54.00	-19.55	HORIZONTAL	Average
6	7266.879	44.43	35.60	7.36	37.44	49.95	74.00	-24.05	HORIZONTAL	Peak
7	8129.664	28.03	36.41	8.29	37.36	35.37	54.00	-18.63	HORIZONTAL	Average
8	8129.664	46.08	36.41	8.29	37.36	53.42	74.00	-20.58	HORIZONTAL	Peak
9	9648.970	28.85	37.54	8.18	37.40	37.17	54.00	-16.83	HORIZONTAL	Average
10	9648.970	46.00	37.54	8.18	37.40	54.32	74.00	-19.68	HORIZONTAL	Peak
11	12060.740	28.54	39.46	10.71	37.42	41.29	54.00	-12.71	HORIZONTAL	Average
12	12060.740	45.90	39.46	10.71	37.42	58.65	74.00	-15.35	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	45.535	27.97	12.86	0.70	29.52	12.01	40.00	-27.99	VERTICAL	QP
2	87.112	31.56	7.78	0.84	29.40	10.78	40.00	-29.22	VERTICAL	QP
3	163.755	28.06	13.29	1.28	29.40	13.23	43.50	-30.27	VERTICAL	QP
4	470.523	29.14	17.87	2.05	29.78	19.28	46.00	-26.72	VERTICAL	QP
5	704.226	29.67	21.44	2.58	29.44	24.25	46.00	-21.75	VERTICAL	QP
6	818.834	30.43	22.90	2.79	29.32	26.80	46.00	-19.20	VERTICAL	QP

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3856.668	33.06	29.19	7.73	38.12	31.86	54.00	-22.14	VERTICAL	Average
2	3856.668	47.34	29.19	7.73	38.12	46.14	74.00	-27.86	VERTICAL	Peak
3	4824.058	38.06	30.82	6.01	38.11	36.78	54.00	-17.22	VERTICAL	Average
4	4824.058	52.89	30.82	6.01	38.11	51.61	74.00	-22.39	VERTICAL	Peak
5	7236.052	30.65	35.55	7.35	37.43	36.12	54.00	-17.88	VERTICAL	Average
6	7236.052	48.12	35.55	7.35	37.43	53.59	74.00	-20.41	VERTICAL	Peak
7	9648.430	29.52	37.54	8.18	37.40	37.84	54.00	-16.16	VERTICAL	Average
8	9648.430	46.16	37.54	8.18	37.40	54.48	74.00	-19.52	VERTICAL	Peak
9	11044.130	45.63	39.96	9.99	37.41	58.17	74.00	-15.83	VERTICAL	Peak
10	11044.130	27.03	39.96	9.99	37.41	39.57	54.00	-14.43	VERTICAL	Average
11	12060.620	30.03	39.46	10.71	37.42	42.78	54.00	-11.22	VERTICAL	Average
12	12060.620	45.43	39.46	10.71	37.42	58.18	74.00	-15.82	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:middle

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3890.255	32.16	29.27	7.61	38.14	30.90	54.00	-23.10	HORIZONTAL	Average
2	3890.255	47.34	29.27	7.61	38.14	46.08	74.00	-27.92	HORIZONTAL	Peak
3	4884.043	32.17	30.95	6.86	38.14	31.84	54.00	-22.16	HORIZONTAL	Average
4	4884.043	46.18	30.95	6.86	38.14	45.85	74.00	-28.15	HORIZONTAL	Peak
5	5763.617	37.21	32.12	7.10	37.50	38.93	54.00	-15.07	HORIZONTAL	Average
6	5763.617	50.25	32.12	7.10	37.50	51.97	74.00	-22.03	HORIZONTAL	Peak
7	7326.122	28.03	35.74	7.39	37.46	33.70	54.00	-20.30	HORIZONTAL	Average
8	7326.122	45.79	35.74	7.39	37.46	51.46	74.00	-22.54	HORIZONTAL	Peak
9	9768.018	28.21	37.74	8.37	37.37	36.95	54.00	-17.05	HORIZONTAL	Average
10	9768.018	45.03	37.74	8.37	37.37	53.77	74.00	-20.23	HORIZONTAL	Peak
11	12210.350	25.87	39.21	10.98	37.30	38.76	54.00	-15.24	HORIZONTAL	Average
12	12210.350	45.52	39.21	10.98	37.30	58.41	74.00	-15.59	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:middle

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3856.668	32.50	29.19	7.73	38.12	31.30	54.00	-22.70	VERTICAL	Average
2	3856.668	47.51	29.19	7.73	38.12	46.31	74.00	-27.69	VERTICAL	Peak
3	4884.887	31.64	30.95	6.86	38.14	31.31	54.00	-22.69	VERTICAL	Average
4	4884.887	47.28	30.95	6.86	38.14	46.95	74.00	-27.05	VERTICAL	Peak
5	5730.396	37.31	32.08	6.99	37.50	38.88	54.00	-15.12	VERTICAL	Average
6	5730.396	50.02	32.08	6.99	37.50	51.59	74.00	-22.41	VERTICAL	Peak
7	7326.267	30.02	35.74	7.39	37.46	35.69	54.00	-18.31	VERTICAL	Average
8	7326.267	45.67	35.74	7.39	37.46	51.34	74.00	-22.66	VERTICAL	Peak
9	9768.018	28.22	37.74	8.37	37.37	36.96	54.00	-17.04	VERTICAL	Average
10	9768.018	45.05	37.74	8.37	37.37	53.79	74.00	-20.21	VERTICAL	Peak
11	12210.520	24.10	39.21	10.98	37.30	36.99	54.00	-17.01	VERTICAL	Average
12	12210.520	45.43	39.21	10.98	37.30	58.32	74.00	-15.68	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4133.699	31.23	29.62	6.79	38.41	29.23	54.00	-24.77	HORIZONTAL	Average
2	4133.699	47.62	29.62	6.79	38.41	45.62	74.00	-28.38	HORIZONTAL	Peak
3	4924.490	28.22	31.01	7.49	38.17	28.55	54.00	-25.45	HORIZONTAL	Average
4	4924.490	48.03	31.01	7.49	38.17	48.36	74.00	-25.64	HORIZONTAL	Peak
5	6071.417	29.29	32.51	7.04	37.34	31.50	54.00	-22.50	HORIZONTAL	Average
6	6071.417	44.90	32.51	7.04	37.34	47.11	74.00	-26.89	HORIZONTAL	Peak
7	7385.286	44.02	35.85	7.42	36.92	50.37	54.00	-3.63	HORIZONTAL	Average
8	7385.286	51.06	35.85	7.42	36.92	57.41	74.00	-16.59	HORIZONTAL	Peak
9	9848.717	27.21	37.82	8.46	37.36	36.13	54.00	-17.87	HORIZONTAL	Average
10	9848.717	45.20	37.82	8.46	37.36	54.12	74.00	-19.88	HORIZONTAL	Peak
11	12310.270	26.89	39.03	11.10	37.25	39.77	54.00	-14.23	HORIZONTAL	Average
12	12310.270	44.08	39.03	11.10	37.25	56.96	74.00	-17.04	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3779.422	34.13	28.92	7.78	38.08	32.75	54.00	-21.25	VERTICAL	Average
2	3779.422	46.74	28.92	7.78	38.08	45.36	74.00	-28.64	VERTICAL	Peak
3	4924.993	31.75	31.01	7.49	38.17	32.08	54.00	-21.92	VERTICAL	Average
4	4924.993	48.29	31.01	7.49	38.17	48.62	74.00	-25.38	VERTICAL	Peak
5	7386.461	33.21	35.85	7.42	37.48	39.00	54.00	-15.00	VERTICAL	Average
6	7386.461	49.05	35.85	7.42	37.48	54.84	74.00	-19.16	VERTICAL	Peak
7	8688.480	31.42	36.25	7.94	37.50	38.11	54.00	-15.89	VERTICAL	Average
8	8688.480	46.75	36.25	7.94	37.50	53.44	74.00	-20.56	VERTICAL	Peak
9	9848.151	32.51	37.82	8.46	37.36	41.43	54.00	-12.57	VERTICAL	Average
10	9848.151	44.95	37.82	8.46	37.36	53.87	74.00	-20.13	VERTICAL	Peak
11	12310.760	33.97	39.03	11.10	37.25	46.85	54.00	-7.15	VERTICAL	Average
12	12310.760	45.09	39.03	11.10	37.25	57.97	74.00	-16.03	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	37.812	23.06	12.55	0.46	29.61	6.46	40.00	-33.54	HORIZONTAL	QP
2	62.871	24.70	11.89	0.61	29.45	7.75	40.00	-32.25	HORIZONTAL	QP
3	142.324	27.00	13.13	1.06	29.40	11.79	43.50	-31.71	HORIZONTAL	QP
4	574.626	30.97	20.22	1.92	29.52	23.59	46.00	-22.41	HORIZONTAL	QP
5	766.057	30.22	22.37	2.83	29.41	26.01	46.00	-19.99	HORIZONTAL	QP
6	906.482	30.01	24.05	3.13	28.57	28.62	46.00	-17.38	HORIZONTAL	QP

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4206.011	35.23	29.73	6.61	38.50	33.07	54.00	-20.93	HORIZONTAL	Average
2	4206.011	48.04	29.73	6.61	38.50	45.88	74.00	-28.12	HORIZONTAL	Peak
3	4824.058	33.25	30.82	6.01	38.11	31.97	54.00	-22.03	HORIZONTAL	Average
4	4824.058	48.07	30.82	6.01	38.11	46.79	74.00	-27.21	HORIZONTAL	Peak
5	6249.464	29.53	33.30	6.94	37.21	32.56	54.00	-21.44	HORIZONTAL	Average
6	6249.464	46.41	33.30	6.94	37.21	49.44	74.00	-24.56	HORIZONTAL	Peak
7	7236.052	29.60	35.55	7.35	37.43	35.07	54.00	-18.93	HORIZONTAL	Average
8	7236.052	45.56	35.55	7.35	37.43	51.03	74.00	-22.97	HORIZONTAL	Peak
9	9648.479	28.22	37.54	8.18	37.40	36.54	54.00	-17.46	HORIZONTAL	Average
10	9648.479	44.63	37.54	8.18	37.40	52.95	74.00	-21.05	HORIZONTAL	Peak
11	12060.610	26.06	39.46	10.71	37.42	38.81	54.00	-15.19	HORIZONTAL	Average
12	12060.610	44.99	39.46	10.71	37.42	57.74	74.00	-16.26	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	45.535	26.36	12.86	0.70	29.52	10.40	40.00	-29.60	VERTICAL	QP
2	64.887	26.24	11.50	0.65	29.44	8.95	40.00	-31.05	VERTICAL	QP
3	149.486	28.58	13.25	1.17	29.40	13.60	43.50	-29.90	VERTICAL	QP
4	552.883	28.95	19.65	2.08	29.55	21.13	46.00	-24.87	VERTICAL	QP
5	694.417	31.01	21.38	2.25	29.45	25.19	46.00	-20.81	VERTICAL	QP
6	919.287	29.67	24.16	3.74	28.43	29.14	46.00	-16.86	VERTICAL	QP

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3935.493	31.52	29.37	7.43	38.17	30.15	54.00	-23.85	VERTICAL	Average
2	3935.493	46.85	29.37	7.43	38.17	45.48	74.00	-28.52	VERTICAL	Peak
3	4982.058	30.57	31.08	8.14	38.19	31.60	54.00	-22.40	VERTICAL	Average
4	4982.058	46.62	31.08	8.14	38.19	47.65	74.00	-26.35	VERTICAL	Peak
5	7236.373	29.22	35.55	7.35	37.43	34.69	54.00	-19.31	VERTICAL	Average
6	7236.373	44.44	35.55	7.35	37.43	49.91	74.00	-24.09	VERTICAL	Peak
7	8129.664	28.46	36.41	8.29	37.36	35.80	54.00	-18.20	VERTICAL	Average
8	8129.664	46.62	36.41	8.29	37.36	53.96	74.00	-20.04	VERTICAL	Peak
9	9648.710	29.22	37.54	8.18	37.40	37.54	54.00	-16.46	VERTICAL	Average
10	9648.710	48.32	37.54	8.18	37.40	56.64	74.00	-17.36	VERTICAL	Peak
11	12060.750	26.58	39.46	10.71	37.42	39.33	54.00	-14.67	VERTICAL	Average
12	12060.750	45.06	39.46	10.71	37.42	57.81	74.00	-16.19	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:middle

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3823.371	31.43	29.08	7.83	38.11	30.23	54.00	-23.77	HORIZONTAL	Average
2	3823.371	46.08	29.08	7.83	38.11	44.88	74.00	-29.12	HORIZONTAL	Peak
3	4884.633	31.26	30.95	6.86	38.14	30.93	54.00	-23.07	HORIZONTAL	Average
4	4884.633	45.83	30.95	6.86	38.14	45.50	74.00	-28.50	HORIZONTAL	Peak
5	6285.695	29.20	33.51	6.95	37.21	32.45	54.00	-21.55	HORIZONTAL	Average
6	6285.695	45.17	33.51	6.95	37.21	48.42	74.00	-25.58	HORIZONTAL	Peak
7	7326.114	28.75	35.74	7.39	37.46	34.42	54.00	-19.58	HORIZONTAL	Average
8	7326.114	45.83	35.74	7.39	37.46	51.50	74.00	-22.50	HORIZONTAL	Peak
9	9768.430	28.60	37.74	8.37	37.37	37.34	54.00	-16.66	HORIZONTAL	Average
10	9768.430	45.05	37.74	8.37	37.37	53.79	74.00	-20.21	HORIZONTAL	Peak
11	12210.620	26.29	39.21	10.98	37.30	39.18	54.00	-14.82	HORIZONTAL	Average
12	12210.620	45.28	39.21	10.98	37.30	58.17	74.00	-15.83	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:middle

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4027.554	30.07	29.52	7.17	38.23	28.53	54.00	-25.47	VERTICAL	Average
2	4027.554	47.54	29.52	7.17	38.23	46.00	74.00	-28.00	VERTICAL	Peak
3	4884.497	33.46	30.95	6.86	38.14	33.13	54.00	-20.87	VERTICAL	Average
4	4884.497	47.34	30.95	6.86	38.14	47.01	74.00	-26.99	VERTICAL	Peak
5	6285.695	30.82	33.51	6.95	37.21	34.07	54.00	-19.93	VERTICAL	Average
6	6285.695	45.59	33.51	6.95	37.21	48.84	74.00	-25.16	VERTICAL	Peak
7	7326.267	29.97	35.74	7.39	37.46	35.64	54.00	-18.36	VERTICAL	Average
8	7326.267	45.56	35.74	7.39	37.46	51.23	74.00	-22.77	VERTICAL	Peak
9	9768.540	27.22	37.74	8.37	37.37	35.96	54.00	-18.04	VERTICAL	Average
10	9768.540	45.24	37.74	8.37	37.37	53.98	74.00	-20.02	VERTICAL	Peak
11	12210.270	26.05	39.21	10.98	37.30	38.94	54.00	-15.06	VERTICAL	Average
12	12210.270	45.11	39.21	10.98	37.30	58.00	74.00	-16.00	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3958.309	31.75	29.42	7.35	38.18	30.34	54.00	-23.66	HORIZONTAL	Average
2	3958.309	47.16	29.42	7.35	38.18	45.75	74.00	-28.25	HORIZONTAL	Peak
3	4924.490	30.88	31.01	7.49	38.17	31.21	54.00	-22.79	HORIZONTAL	Average
4	4924.490	45.89	31.01	7.49	38.17	46.22	74.00	-27.78	HORIZONTAL	Peak
5	6756.708	30.79	34.75	7.19	37.30	35.43	54.00	-18.57	HORIZONTAL	Average
6	6756.708	45.69	34.75	7.19	37.30	50.33	74.00	-23.67	HORIZONTAL	Peak
7	7386.646	28.25	35.85	7.42	37.48	34.04	54.00	-19.96	HORIZONTAL	Average
8	7386.646	46.62	35.85	7.42	37.48	52.41	74.00	-21.59	HORIZONTAL	Peak
9	9848.018	28.79	37.82	8.46	37.36	37.71	54.00	-16.29	HORIZONTAL	Average
10	9848.018	45.06	37.82	8.46	37.36	53.98	74.00	-20.02	HORIZONTAL	Peak
11	12310.130	25.27	39.03	11.10	37.25	38.15	54.00	-15.85	HORIZONTAL	Average
12	12310.130	45.48	39.03	11.10	37.25	58.36	74.00	-15.64	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3958.309	32.01	29.42	7.35	38.18	30.60	54.00	-23.40	VERTICAL	Average
2	3958.309	47.57	29.42	7.35	38.18	46.16	74.00	-27.84	VERTICAL	Peak
3	4924.662	30.78	31.01	7.49	38.17	31.11	54.00	-22.89	VERTICAL	Average
4	4924.662	46.13	31.01	7.49	38.17	46.46	74.00	-27.54	VERTICAL	Peak
5	5797.032	30.88	32.16	7.47	37.80	32.71	54.00	-21.29	VERTICAL	Average
6	5797.032	46.56	32.16	7.47	37.80	48.39	74.00	-25.61	VERTICAL	Peak
7	7386.461	29.97	35.85	7.42	37.48	35.76	54.00	-18.24	VERTICAL	Average
8	7386.461	45.43	35.85	7.42	37.48	51.22	74.00	-22.78	VERTICAL	Peak
9	9848.432	27.23	37.82	8.46	37.36	36.15	54.00	-17.85	VERTICAL	Average
10	9848.432	45.21	37.82	8.46	37.36	54.13	74.00	-19.87	VERTICAL	Peak
11	12310.760	24.76	39.03	11.10	37.25	37.64	54.00	-16.36	VERTICAL	Average
12	12310.760	44.52	39.03	11.10	37.25	57.40	74.00	-16.60	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	61.995	23.45	12.00	0.60	29.46	6.59	40.00	-33.41	HORIZONTAL	QP
2	129.015	26.09	12.23	0.96	29.40	9.88	43.50	-33.62	HORIZONTAL	QP
3	160.909	26.99	13.37	1.27	29.40	12.23	43.50	-31.27	HORIZONTAL	QP
4	428.019	28.65	16.80	1.85	29.87	17.43	46.00	-28.57	HORIZONTAL	QP
5	616.372	28.98	20.70	2.10	29.50	22.28	46.00	-23.72	HORIZONTAL	QP
6	929.008	28.24	24.27	3.68	28.35	27.84	46.00	-18.16	HORIZONTAL	QP

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3992.781	31.61	29.48	7.26	38.20	30.15	54.00	-23.85	HORIZONTAL	Average
2	3992.781	46.63	29.48	7.26	38.20	45.17	74.00	-28.83	HORIZONTAL	Peak
3	4824.948	31.21	30.82	6.01	38.11	29.93	54.00	-24.07	HORIZONTAL	Average
4	4824.948	46.97	30.82	6.01	38.11	45.69	74.00	-28.31	HORIZONTAL	Peak
5	7236.727	29.45	35.55	7.35	37.43	34.92	54.00	-19.08	HORIZONTAL	Average
6	7236.727	45.17	35.55	7.35	37.43	50.64	74.00	-23.36	HORIZONTAL	Peak
7	8224.200	28.01	36.33	8.23	37.38	35.19	54.00	-18.81	HORIZONTAL	Average
8	8224.200	46.67	36.33	8.23	37.38	53.85	74.00	-20.15	HORIZONTAL	Peak
9	9648.543	26.04	37.54	8.18	37.40	34.36	54.00	-19.64	HORIZONTAL	Average
10	9648.543	45.32	37.54	8.18	37.40	53.64	74.00	-20.36	HORIZONTAL	Peak
11	12060.350	25.11	39.46	10.71	37.42	37.86	54.00	-16.14	HORIZONTAL	Average
12	12060.350	44.71	39.46	10.71	37.42	57.46	74.00	-16.54	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	31.620	25.93	12.24	0.10	29.82	8.45	40.00	-31.55	VERTICAL	QP
2	44.275	25.73	12.76	0.70	29.53	9.66	40.00	-30.34	VERTICAL	QP
3	64.887	26.21	11.50	0.65	29.44	8.92	40.00	-31.08	VERTICAL	QP
4	160.909	27.04	13.37	1.27	29.40	12.28	43.50	-31.22	VERTICAL	QP
5	595.133	30.96	20.55	2.05	29.51	24.05	46.00	-21.95	VERTICAL	QP
6	932.272	29.34	24.31	3.66	28.33	28.98	46.00	-17.02	VERTICAL	QP

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3757.637	31.20	28.82	7.65	38.07	29.60	54.00	-24.40	VERTICAL	Average
2	3757.637	47.81	28.82	7.65	38.07	46.21	74.00	-27.79	VERTICAL	Peak
3	4824.016	32.60	30.82	6.01	38.11	31.32	54.00	-22.68	VERTICAL	Average
4	4824.016	48.11	30.82	6.01	38.11	46.83	74.00	-27.17	VERTICAL	Peak
5	7236.150	29.22	35.55	7.35	37.43	34.69	54.00	-19.31	VERTICAL	Average
6	7236.150	45.52	35.55	7.35	37.43	50.99	74.00	-23.01	VERTICAL	Peak
7	8129.664	31.22	36.41	8.29	37.36	38.56	54.00	-15.44	VERTICAL	Average
8	8129.664	46.43	36.41	8.29	37.36	53.77	74.00	-20.23	VERTICAL	Peak
9	9648.717	29.13	37.54	8.18	37.40	37.45	54.00	-16.55	VERTICAL	Average
10	9648.717	46.38	37.54	8.18	37.40	54.70	74.00	-19.30	VERTICAL	Peak
11	12060.350	28.21	39.46	10.71	37.42	40.96	54.00	-13.04	VERTICAL	Average
12	12060.350	45.31	39.46	10.71	37.42	58.06	74.00	-15.94	VERTICAL	Peak

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:middle

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4027.554	32.14	29.52	7.17	38.23	30.60	54.00	-23.40	HORIZONTAL	Average
2	4027.554	47.09	29.52	7.17	38.23	45.55	74.00	-28.45	HORIZONTAL	Peak
3	4884.887	32.14	30.95	6.86	38.14	31.81	54.00	-22.19	HORIZONTAL	Average
4	4884.887	47.84	30.95	6.86	38.14	47.51	74.00	-26.49	HORIZONTAL	Peak
5	5599.412	30.88	31.96	7.30	37.80	32.34	54.00	-21.66	HORIZONTAL	Average
6	5599.412	46.30	31.96	7.30	37.80	47.76	74.00	-26.24	HORIZONTAL	Peak
7	7326.429	29.46	35.74	7.39	37.46	35.13	54.00	-18.87	HORIZONTAL	Average
8	7326.429	45.70	35.74	7.39	37.46	51.37	74.00	-22.63	HORIZONTAL	Peak
9	9768.717	29.12	37.74	8.37	37.37	37.86	54.00	-16.14	HORIZONTAL	Average
10	9768.717	46.09	37.74	8.37	37.37	54.83	74.00	-19.17	HORIZONTAL	Peak
11	12210.690	27.25	39.21	10.98	37.30	40.14	54.00	-13.86	HORIZONTAL	Average
12	12210.690	46.99	39.21	10.98	37.30	59.88	74.00	-14.12	HORIZONTAL	Peak

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:middle

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3958.309	31.06	29.42	7.35	38.18	29.65	54.00	-24.35	VERTICAL	Average
2	3958.309	47.12	29.42	7.35	38.18	45.71	74.00	-28.29	VERTICAL	Peak
3	4884.058	30.06	30.95	6.86	38.14	29.73	54.00	-24.27	VERTICAL	Average
4	4884.058	47.91	30.95	6.86	38.14	47.58	74.00	-26.42	VERTICAL	Peak
5	7362.015	29.69	35.82	7.41	37.47	35.45	54.00	-18.55	VERTICAL	Average
6	7362.015	46.02	35.82	7.41	37.47	51.78	74.00	-22.22	VERTICAL	Peak
7	8013.020	30.50	36.49	8.35	37.32	38.02	54.00	-15.98	VERTICAL	Average
8	8013.020	46.31	36.49	8.35	37.32	53.83	74.00	-20.17	VERTICAL	Peak
9	9768.312	28.24	37.74	8.37	37.37	36.98	54.00	-17.02	VERTICAL	Average
10	9768.312	45.79	37.74	8.37	37.37	54.53	74.00	-19.47	VERTICAL	Peak
11	12210.950	26.18	39.21	10.98	37.30	39.07	54.00	-14.93	VERTICAL	Average
12	12210.950	44.95	39.21	10.98	37.30	57.84	74.00	-16.16	VERTICAL	Peak