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Report No.: GZEM180400185401
Page: 1 of 106
FCC ID: 2APEYX12000001

TEST REPORT

Application No.: GZEM1804001854ME
Applicant: CHONGQING YEASN SCIENCE-TECHNOLOGY CO., LTD
Address of Applicant: 5 Danlong Road, Nan'an District, Chongqing, 400060, P.R.China
Manufacturer: The same as Applicant
Address of Manufacturer: The same as Applicant
Factory: The same as Applicant
Address of Factory: The same as Applicant
Equipment Under Test (EUT):
FCC ID: 2APEYX12000001
EUT Name: DIGITAL REFRACTOR
Model No.: YPA-2100
Trade Mark: YEASN
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2018-04-12
Date of Test: 2018-04-14 to 2018-04-19
Date of Issue: 2018-07-10

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



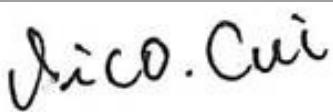
Kobe Jian

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.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-07-10		Original

Authorized for issue by:			
Tested By	 Vico_Cui /Project Engineer		2018-04-14 to 2018-04-19
Checked By	 Ricky_Liu /Reviewer		Date 2018-05-02

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 11.12,6.3,6.5 and 6.6	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 11.12,6.3,6.5 and 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 15V for EUT. 120V 60Hz for support unit DC power input.
Cable:	2 wires x about 5.4m unscreened DC cable for EUT power supply.
Antenna Gain	1.5dBi
Antenna Type	integrated PCB antenna
Channel Spacing	5MHz
Modulation Type	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n(HT20 and HT40): 802.11b/g/n(HT20):11 802.11n(HT40):7
Number of Channels	802.11b/g/n(HT20):2412MHz to 2462MHz 802.11n(HT40):2422MHz to 2452MHz
Operation Frequency	

4.2 Description of Support Units

The EUT has been tested with below support unit.

Description	Manufacturer	Model No.	SN/Certificate NO
Adapter 1(EMCA021)	Minji	MJ4105	N/A
DC Power supply(EMC 0008)	Instek	PS-6010	L9905E037.11

4.3 Measurement Uncertainty

RF

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF Conducted power	0.75dB
5	RF Power Density	2.84dB
6	Conducted Spurious Emissions	0.75dB
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%

4.4 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.

4.5 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-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

● **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

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-2460, C-2584, G-449 and T-1179 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, IEC60068-0-2 and Rules of procedure IEC60068-0-13, and the relevant IEC60068-0-27 Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2017-11-15	2018-11-14
ATTENUATOR	HP	8941A	EMC2062	2018-04-12	2020-04-12

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2017-11-15	2018-11-14
ATTENUATOR	HP	8941A	EMC2062	2018-04-12	2020-04-12

Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2017-11-15	2018-11-14
ATTENUATOR	HP	8941A	EMC2062	2018-04-12	2020-04-12

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2018-03-10	2019-03-09
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2018-04-10	2019-04-10
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_C h2	SEM009-02	2017-09-19	2018-09-18
Power Meter	AgilentTechnologies	U2021XA_C h3	SEM009-03	2017-09-19	2018-09-18
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2017-11-15	2018-11-14
ATTENUATOR	HP	8941A	EMC2062	2018-04-12	2020-04-12

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2017-11-15	2018-11-14
ATTENUATOR	HP	8941A	EMC2062	2018-04-12	2020-04-12

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	2018-01-19	2019-01-18
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2018-01-19	2019-01-18
chamber cable	HangTianXing	N/A	EMC0542	2017-06-30	2019-06-30
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	2018-01-08	2019-01-07
Amplifier	HP	8447F	EMC2065	2017-06-19	2018-06-18
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2017-11-20	2018-11-19
Active Loop Antenna	EMCO	6502	EMC0523	2018-02-24	2019-02-23
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2018-01-19	2019-01-18
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2018-01-08	2019-01-07
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2016-04-30	2018-04-29
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-11-29	2018-11-28
MXE EMI Receiver	Keysight	N9038A	EMC2139	2017-11-15	2018-11-14
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2017-11-15	2018-11-14

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2018-01-19	2019-01-18
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2018-01-19	2019-01-18
chamber cable	HangTianXing	N/A	EMC0542	2017-06-30	2019-06-30
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	2018-01-08	2019-01-07
Amplifier	HP	8447F	EMC2065	2017-06-19	2018-06-18
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2017-11-20	2018-11-19
Active Loop Antenna	EMCO	6502	EMC0523	2018-02-24	2019-02-23
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2018-01-19	2019-01-18
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2018-01-08	2019-01-07
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2016-04-30	2018-04-29
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-11-29	2018-11-28
MXE EMI Receiver	Keysight	N9038A	EMC2139	2017-11-15	2018-11-14
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2017-11-15	2018-11-14

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2017-07-26	2018-07-25
DMM	Fluke	73	EMC0007	2017-07-26	2018-07-25

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:

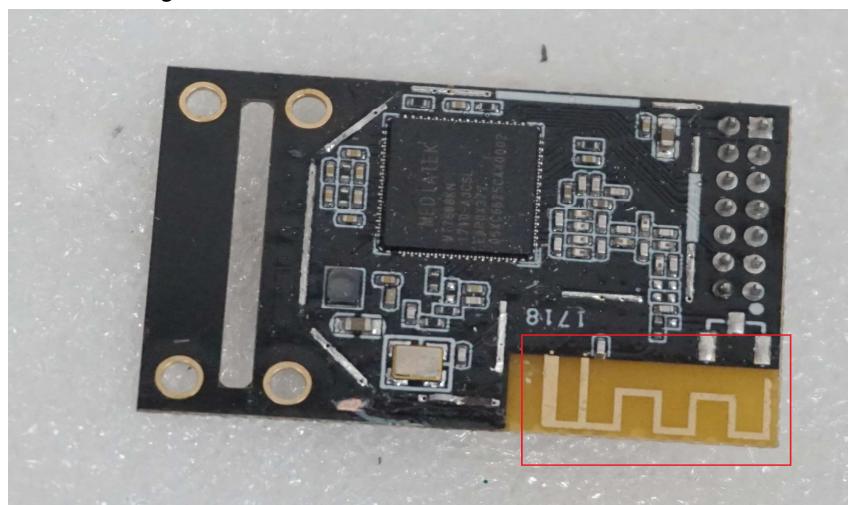
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 integral PCB antenna and integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.5dBi.



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(dB μ V)	
	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.

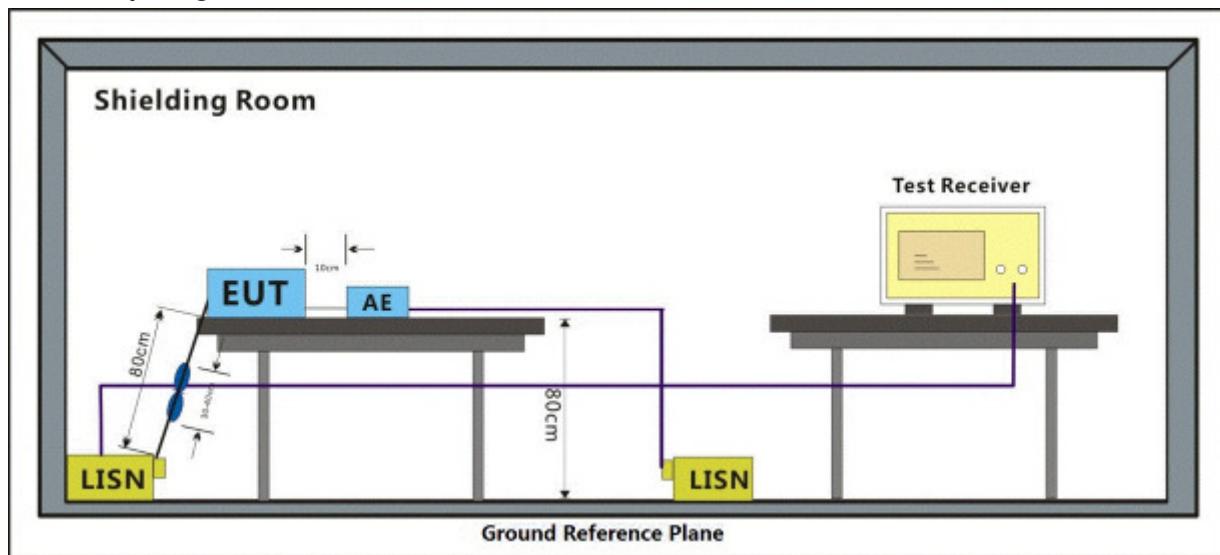
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 57.9 % 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

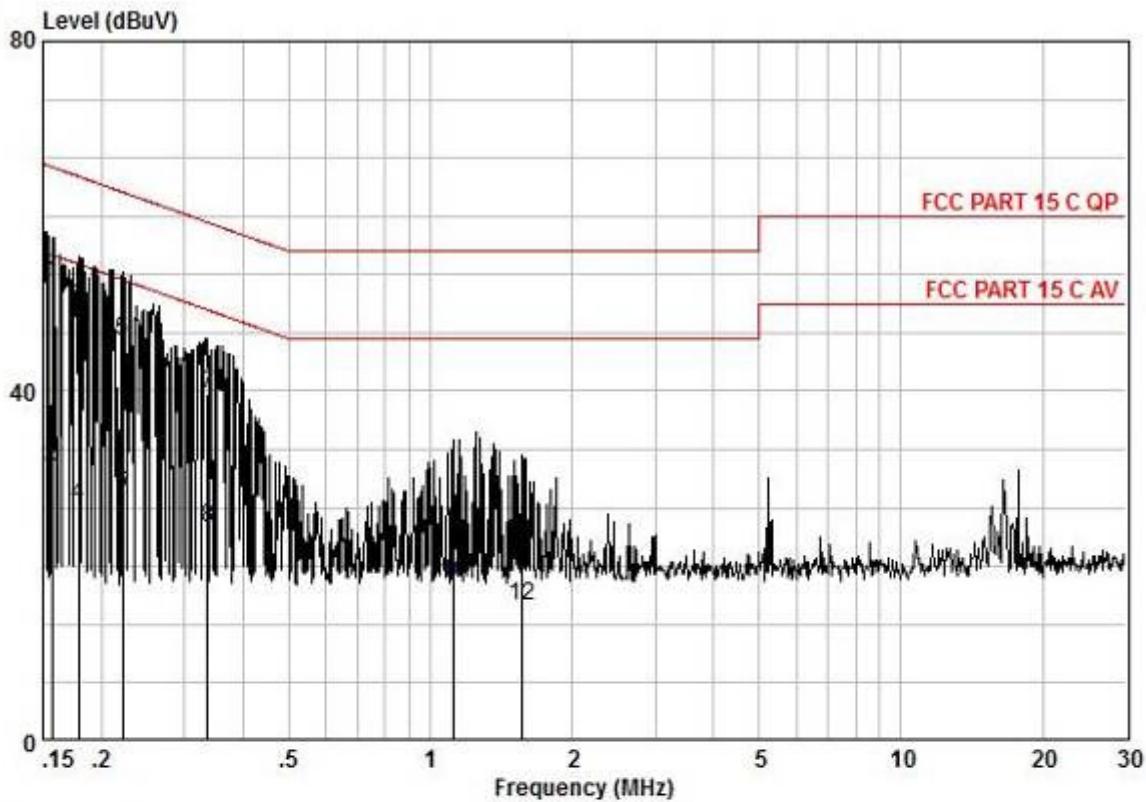


7.1.3 Measurement Procedure and Data

- 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/50 μ H + 50hm 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

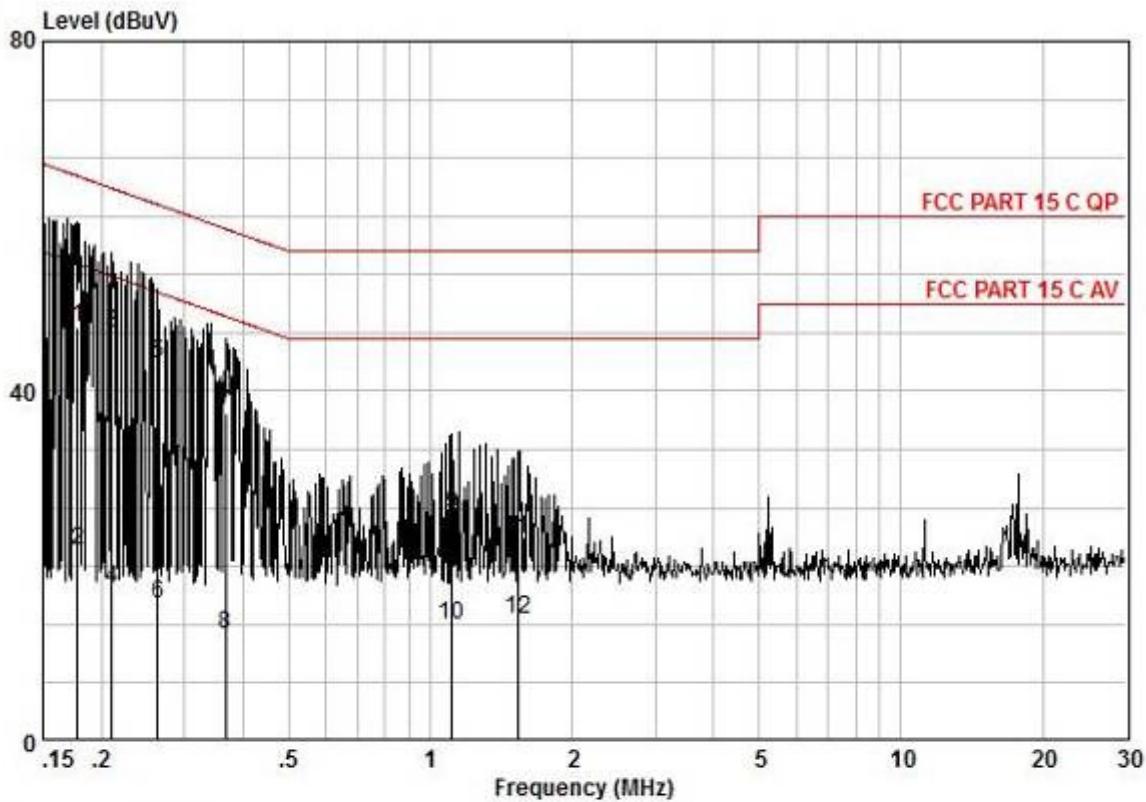
Mode:a; Line:Live Line



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
0.16	42.52	0.10	9.65	52.27	65.65	-13.38	QP
0.16	21.54	0.10	9.65	31.29	55.65	-24.36	AVERAGE
0.18	39.70	0.10	9.65	49.45	64.55	-15.10	QP
0.18	17.19	0.10	9.65	26.94	54.55	-27.61	AVERAGE
0.22	35.98	0.11	9.64	45.73	62.74	-17.01	QP
0.22	18.62	0.11	9.64	28.37	52.74	-24.37	AVERAGE
0.34	29.78	0.16	9.64	39.58	59.31	-19.73	QP
0.34	14.52	0.16	9.64	24.32	49.31	-24.99	AVERAGE
1.12	14.26	0.30	9.66	24.22	56.00	-31.78	QP
1.12	8.10	0.30	9.66	18.06	46.00	-27.94	AVERAGE
1.56	12.62	0.31	9.66	22.59	56.00	-33.41	QP
1.56	5.45	0.31	9.66	15.42	46.00	-30.58	AVERAGE

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
0.18	37.54	0.10	9.67	47.31	64.59	-17.28	QP
0.18	11.93	0.10	9.67	21.70	54.59	-32.89	AVERAGE
0.21	36.84	0.11	9.67	46.61	63.18	-16.57	QP
0.21	7.59	0.11	9.67	17.36	53.18	-35.82	AVERAGE
0.26	33.44	0.13	9.66	43.23	61.34	-18.11	QP
0.26	5.98	0.13	9.66	15.77	51.34	-35.57	AVERAGE
0.37	27.60	0.17	9.66	37.43	58.56	-21.13	QP
0.37	2.35	0.17	9.66	12.18	48.56	-36.38	AVERAGE
1.11	15.98	0.30	9.68	25.96	56.00	-30.04	QP
1.11	3.37	0.30	9.68	13.35	46.00	-32.65	AVERAGE
1.54	13.20	0.31	9.68	23.19	56.00	-32.81	QP
1.54	3.96	0.31	9.68	13.95	46.00	-32.05	AVERAGE

7.2 Minimum 6dB Bandwidth

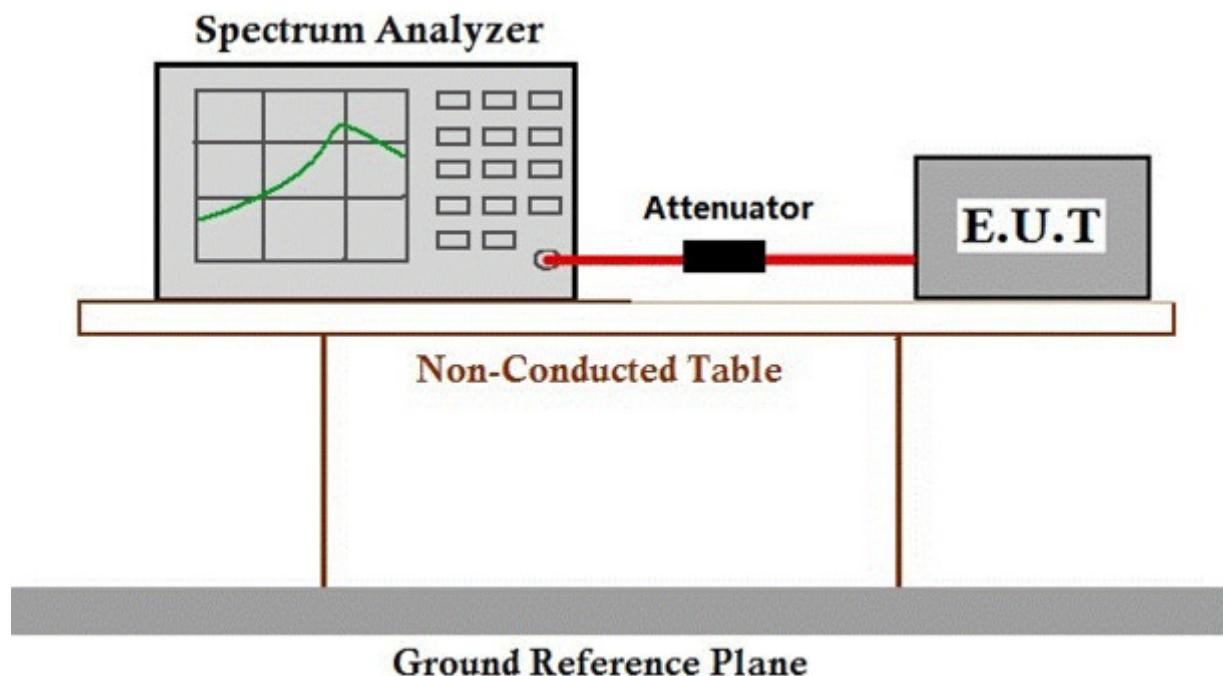
Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1
Limit: ≥ 500 kHz

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 27.6 °C Humidity: 54.4 % 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.

7.2.2 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 $25 \leq$ 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

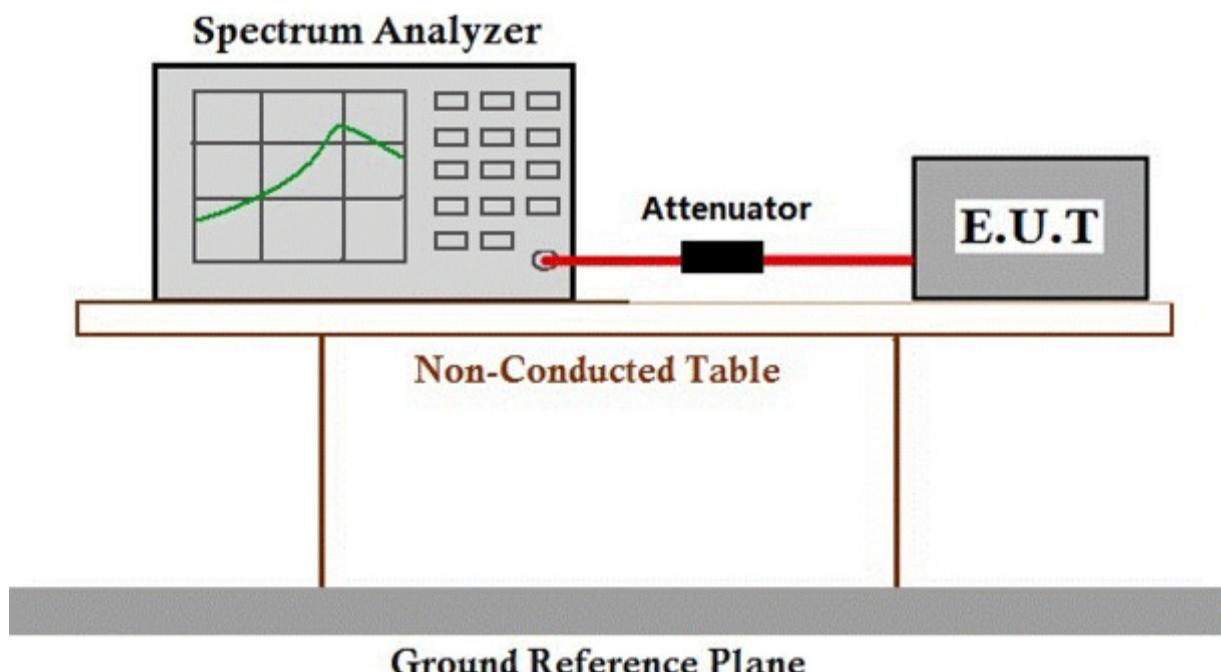
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 27.6 °C Humidity: 54.4 % 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.

7.3.2 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:

$\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

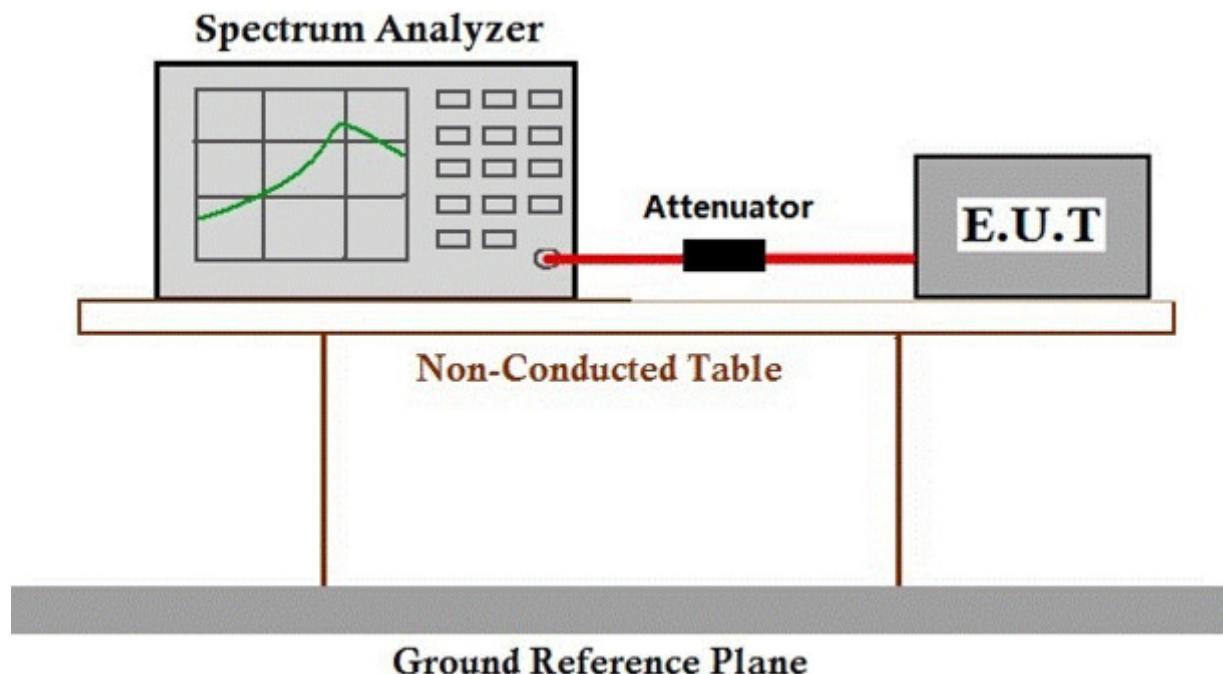
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 27.6 °C Humidity: 54.5 % 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

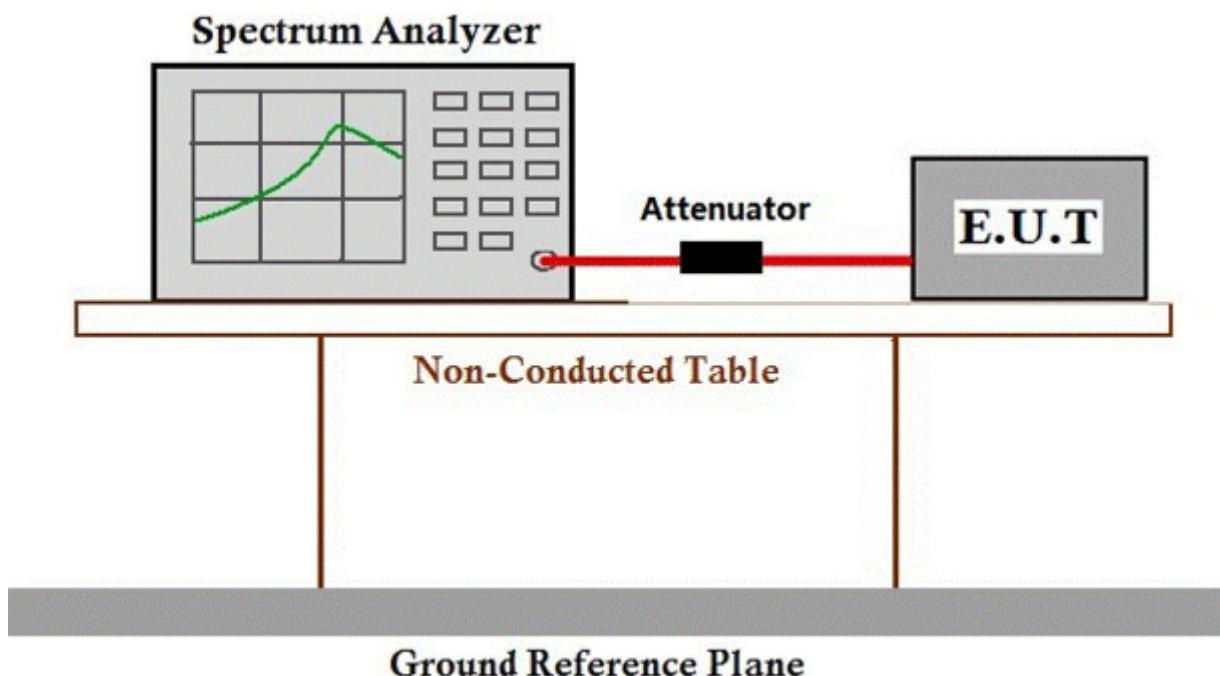
Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.13.3.2
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional 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: 27.6 °C Humidity: 54.5 % 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

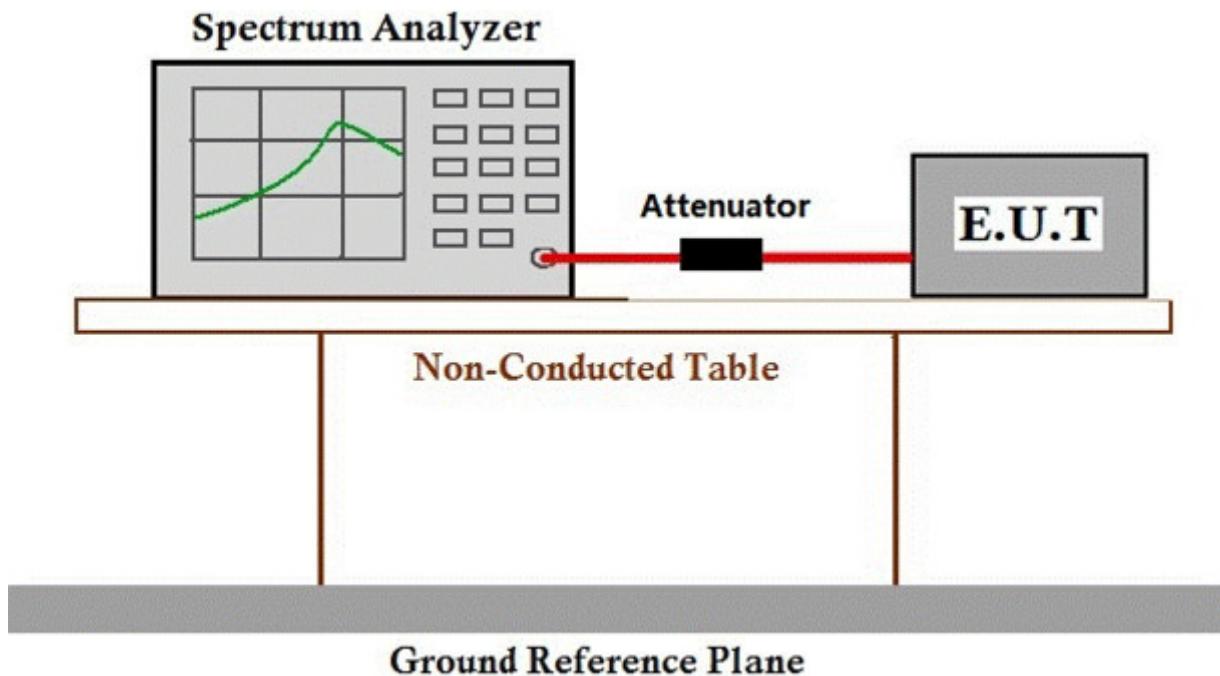
Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.11
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional 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: 27.6 °C Humidity: 54.5 % 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 11.12,6.3,6.5 and 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.

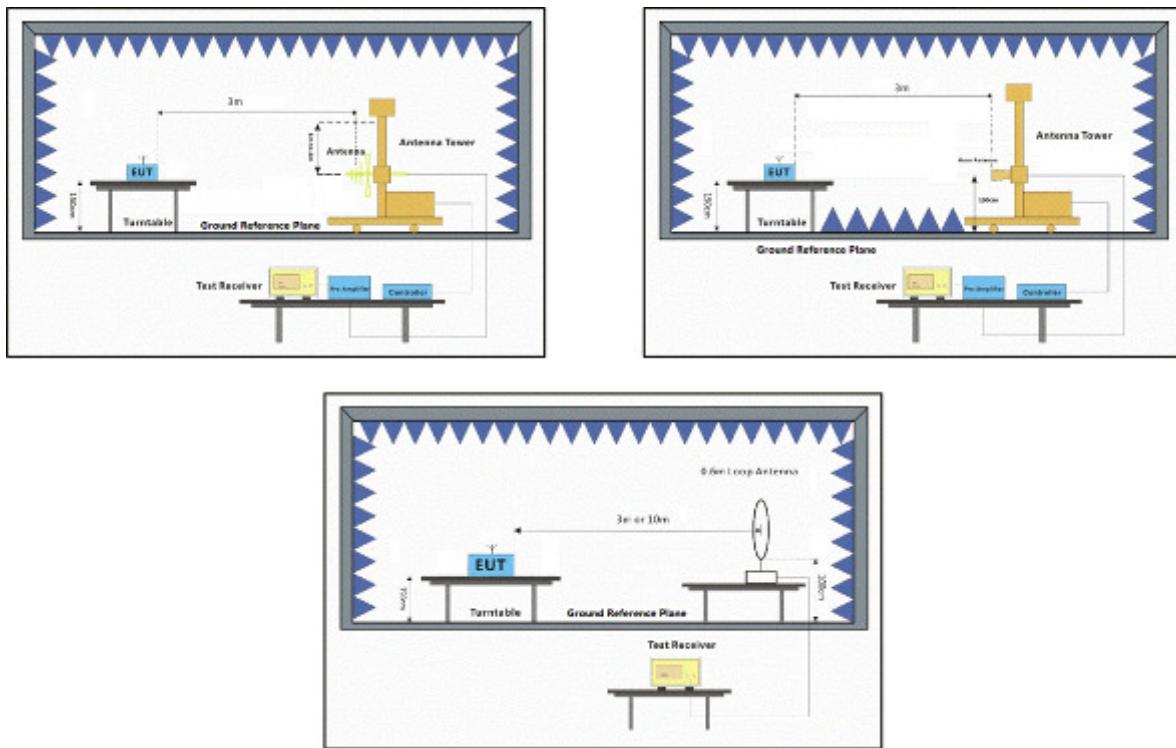
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C Humidity: 51 % 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



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

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	30.45	26.25	5.03	38.08	23.65	54.00	-30.35	HORIZONTAL	Average
2	2310.000	46.94	26.25	5.03	38.08	40.14	74.00	-33.86	HORIZONTAL	Peak
3	2390.000	34.90	26.43	4.88	37.92	28.29	54.00	-25.71	HORIZONTAL	Average
4	2390.000	53.15	26.43	4.88	37.92	46.54	74.00	-27.46	HORIZONTAL	Peak
5	2483.500	33.60	26.58	5.23	38.37	27.04	54.00	-26.96	HORIZONTAL	Average
6	2483.500	50.16	26.58	5.23	38.37	43.60	74.00	-30.40	HORIZONTAL	Peak
7	2500.000	33.55	26.60	4.95	38.10	27.00	54.00	-27.00	HORIZONTAL	Average
8	2500.000	49.96	26.60	4.95	38.10	43.41	74.00	-30.59	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	33.33	26.25	5.03	38.08	26.53	54.00	-27.47	VERTICAL	Average
2	2310.000	47.23	26.25	5.03	38.08	40.43	74.00	-33.57	VERTICAL	Peak
3	2390.000	43.70	26.43	4.88	37.92	37.09	54.00	-16.91	VERTICAL	Average
4	2390.000	51.96	26.43	4.88	37.92	45.35	74.00	-28.65	VERTICAL	Peak
5	2483.500	37.54	26.58	5.23	38.37	30.98	54.00	-23.02	VERTICAL	Average
6	2483.500	48.48	26.58	5.23	38.37	41.92	74.00	-32.08	VERTICAL	Peak
7	2500.000	36.61	26.60	4.95	38.10	30.06	54.00	-23.94	VERTICAL	Average
8	2500.000	48.05	26.60	4.95	38.10	41.50	74.00	-32.50	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	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	48.99	26.25	5.03	38.08	42.19	74.00	-31.81	HORIZONTAL	Peak
3	2390.000	37.43	26.43	4.88	37.92	30.82	54.00	-23.18	HORIZONTAL	Average
4	2390.000	52.48	26.43	4.88	37.92	45.87	74.00	-28.13	HORIZONTAL	Peak
5	2483.500	38.76	26.58	5.23	38.37	32.20	54.00	-21.80	HORIZONTAL	Average
6	2483.500	52.92	26.58	5.23	38.37	46.36	74.00	-27.64	HORIZONTAL	Peak
7	2500.000	34.82	26.60	4.95	38.10	28.27	54.00	-25.73	HORIZONTAL	Average
8	2500.000	54.03	26.60	4.95	38.10	47.48	74.00	-26.52	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	36.70	26.25	5.03	38.08	29.90	54.00	-24.10	VERTICAL	Average
2	2310.000	48.43	26.25	5.03	38.08	41.63	74.00	-32.37	VERTICAL	Peak
3	2390.000	36.89	26.43	4.88	37.92	30.28	54.00	-23.72	VERTICAL	Average
4	2390.000	48.52	26.43	4.88	37.92	41.91	74.00	-32.09	VERTICAL	Peak
5	2483.500	42.63	26.58	5.23	38.37	36.07	54.00	-17.93	VERTICAL	Average
6	2483.500	51.74	26.58	5.23	38.37	45.18	74.00	-28.82	VERTICAL	Peak
7	2500.000	39.84	26.60	4.95	38.10	33.29	54.00	-20.71	VERTICAL	Average
8	2500.000	49.18	26.60	4.95	38.10	42.63	74.00	-31.37	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	35.55	26.25	5.03	38.08	28.75	54.00	-25.25	HORIZONTAL	Average
2	2310.000	46.54	26.25	5.03	38.08	39.74	74.00	-34.26	HORIZONTAL	Peak
3	2390.000	42.01	26.43	4.88	37.92	35.40	54.00	-18.60	HORIZONTAL	Average
4	2390.000	51.47	26.43	4.88	37.92	44.86	74.00	-29.14	HORIZONTAL	Peak
5	2483.500	38.43	26.58	5.23	38.37	31.87	54.00	-22.13	HORIZONTAL	Average
6	2483.500	46.72	26.58	5.23	38.37	40.16	74.00	-33.84	HORIZONTAL	Peak
7	2500.000	35.56	26.60	4.95	38.10	29.01	54.00	-24.99	HORIZONTAL	Average
8	2500.000	45.95	26.60	4.95	38.10	39.40	74.00	-34.60	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	32.55	26.25	5.03	38.08	25.75	54.00	-28.25	VERTICAL	Average
2	2310.000	47.62	26.25	5.03	38.08	40.82	74.00	-33.18	VERTICAL	Peak
3	2390.000	47.23	26.43	4.88	37.92	40.62	54.00	-13.38	VERTICAL	Average
4	2390.000	51.28	26.43	4.88	37.92	44.67	74.00	-29.33	VERTICAL	Peak
5	2483.500	44.97	26.58	5.23	38.37	38.41	54.00	-15.59	VERTICAL	Average
6	2483.500	52.20	26.58	5.23	38.37	45.64	74.00	-28.36	VERTICAL	Peak
7	2500.000	44.12	26.60	4.95	38.10	37.57	54.00	-16.43	VERTICAL	Average
8	2500.000	53.13	26.60	4.95	38.10	46.58	74.00	-27.42	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	32.27	26.25	5.03	38.08	25.47	54.00	-28.53	HORIZONTAL Average
2	2310.000	46.65	26.25	5.03	38.08	39.85	74.00	-34.15	HORIZONTAL Peak
3	2390.000	32.48	26.43	4.88	37.92	25.87	54.00	-28.13	HORIZONTAL Average
4	2390.000	46.45	26.43	4.88	37.92	39.84	74.00	-34.16	HORIZONTAL Peak
5	2483.500	33.68	26.58	5.23	38.37	27.12	54.00	-26.88	HORIZONTAL Average
6	2483.500	51.02	26.58	5.23	38.37	44.46	74.00	-29.54	HORIZONTAL Peak
7	2500.000	35.07	26.60	4.95	38.10	28.52	54.00	-25.48	HORIZONTAL Average
8	2500.000	51.77	26.60	4.95	38.10	45.22	74.00	-28.78	HORIZONTAL Peak

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	38.16	26.25	5.03	38.08	31.36	54.00	-22.64	VERTICAL Average
2	2310.000	46.16	26.25	5.03	38.08	39.36	74.00	-34.64	VERTICAL Peak
3	2390.000	34.14	26.43	4.88	37.92	27.53	54.00	-26.47	VERTICAL Average
4	2390.000	46.05	26.43	4.88	37.92	39.44	74.00	-34.56	VERTICAL Peak
5	2483.500	37.45	26.58	5.23	38.37	30.89	54.00	-23.11	VERTICAL Average
6	2483.500	48.54	26.58	5.23	38.37	41.98	74.00	-32.02	VERTICAL Peak
7	2500.000	37.16	26.60	4.95	38.10	30.61	54.00	-23.39	VERTICAL Average
8	2500.000	48.04	26.60	4.95	38.10	41.49	74.00	-32.51	VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	35.58	26.25	5.03	38.08	28.78	54.00	-25.22	HORIZONTAL	Average
2	2310.000	46.55	26.25	5.03	38.08	39.75	74.00	-34.25	HORIZONTAL	Peak
3	2390.000	36.37	26.43	4.88	37.92	29.76	54.00	-24.24	HORIZONTAL	Average
4	2390.000	49.69	26.43	4.88	37.92	43.08	74.00	-30.92	HORIZONTAL	Peak
5	2483.500	34.81	26.58	5.23	38.37	28.25	54.00	-25.75	HORIZONTAL	Average
6	2483.500	45.47	26.58	5.23	38.37	38.91	74.00	-35.09	HORIZONTAL	Peak
7	2500.000	35.73	26.60	4.95	38.10	29.18	54.00	-24.82	HORIZONTAL	Average
8	2500.000	47.69	26.60	4.95	38.10	41.14	74.00	-32.86	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	34.57	26.25	5.03	38.08	27.77	54.00	-26.23	VERTICAL	Average
2	2310.000	46.88	26.25	5.03	38.08	40.08	74.00	-33.92	VERTICAL	Peak
3	2390.000	38.64	26.43	4.88	37.92	32.03	54.00	-21.97	VERTICAL	Average
4	2390.000	49.91	26.43	4.88	37.92	43.30	74.00	-30.70	VERTICAL	Peak
5	2483.500	35.52	26.58	5.23	38.37	28.96	54.00	-25.04	VERTICAL	Average
6	2483.500	45.98	26.58	5.23	38.37	39.42	74.00	-34.58	VERTICAL	Peak
7	2500.000	35.58	26.60	4.95	38.10	29.03	54.00	-24.97	VERTICAL	Average
8	2500.000	47.81	26.60	4.95	38.10	41.26	74.00	-32.74	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.65	26.25	5.03	38.08	29.85	54.00	-24.15	HORIZONTAL Average
2	2310.000	46.75	26.25	5.03	38.08	39.95	74.00	-34.05	HORIZONTAL Peak
3	2390.000	33.99	26.43	4.88	37.92	27.38	54.00	-26.62	HORIZONTAL Average
4	2390.000	47.16	26.43	4.88	37.92	40.55	74.00	-33.45	HORIZONTAL Peak
5	2483.500	37.61	26.58	5.23	38.37	31.05	54.00	-22.95	HORIZONTAL Average
6	2483.500	52.27	26.58	5.23	38.37	45.71	74.00	-28.29	HORIZONTAL Peak
7	2500.000	37.33	26.60	4.95	38.10	30.78	54.00	-23.22	HORIZONTAL Average
8	2500.000	50.03	26.60	4.95	38.10	43.48	74.00	-30.52	HORIZONTAL Peak

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.51	26.25	5.03	38.08	29.71	54.00	-24.29	VERTICAL Average
2	2310.000	47.05	26.25	5.03	38.08	40.25	74.00	-33.75	VERTICAL Peak
3	2390.000	33.72	26.43	4.88	37.92	27.11	54.00	-26.89	VERTICAL Average
4	2390.000	45.55	26.43	4.88	37.92	38.94	74.00	-35.06	VERTICAL Peak
5	2483.500	33.84	26.58	5.23	38.37	27.28	54.00	-26.72	VERTICAL Average
6	2483.500	51.73	26.58	5.23	38.37	45.17	74.00	-28.83	VERTICAL Peak
7	2500.000	34.18	26.60	4.95	38.10	27.63	54.00	-26.37	VERTICAL Average
8	2500.000	49.52	26.60	4.95	38.10	42.97	74.00	-31.03	VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	36.11	26.25	5.03	38.08	29.31	54.00	-24.69	HORIZONTAL	Average
2	2310.000	47.67	26.25	5.03	38.08	40.87	74.00	-33.13	HORIZONTAL	Peak
3	2390.000	34.55	26.43	4.88	37.92	27.94	54.00	-26.06	HORIZONTAL	Average
4	2390.000	47.19	26.43	4.88	37.92	40.58	74.00	-33.42	HORIZONTAL	Peak
5	2483.500	34.42	26.58	5.23	38.37	27.86	54.00	-26.14	HORIZONTAL	Average
6	2483.500	47.45	26.58	5.23	38.37	40.89	74.00	-33.11	HORIZONTAL	Peak
7	2500.000	34.26	26.60	4.95	38.10	27.71	54.00	-26.29	HORIZONTAL	Average
8	2500.000	47.59	26.60	4.95	38.10	41.04	74.00	-32.96	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	31.58	26.25	5.03	38.08	24.78	54.00	-29.22	VERTICAL	Average
2	2310.000	46.75	26.25	5.03	38.08	39.95	74.00	-34.05	VERTICAL	Peak
3	2390.000	31.95	26.43	4.88	37.92	25.34	54.00	-28.66	VERTICAL	Average
4	2390.000	46.79	26.43	4.88	37.92	40.18	74.00	-33.82	VERTICAL	Peak
5	2483.500	33.45	26.58	5.23	38.37	26.89	54.00	-27.11	VERTICAL	Average
6	2483.500	47.12	26.58	5.23	38.37	40.56	74.00	-33.44	VERTICAL	Peak
7	2500.000	33.82	26.60	4.95	38.10	27.27	54.00	-26.73	VERTICAL	Average
8	2500.000	48.53	26.60	4.95	38.10	41.98	74.00	-32.02	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	34.09	26.25	5.03	38.08	27.29	54.00	-26.71	HORIZONTAL	Average
2	2310.000	47.28	26.25	5.03	38.08	40.48	74.00	-33.52	HORIZONTAL	Peak
3	2390.000	35.40	26.43	4.88	37.92	28.79	54.00	-25.21	HORIZONTAL	Average
4	2390.000	45.29	26.43	4.88	37.92	38.68	74.00	-35.32	HORIZONTAL	Peak
5	2483.500	39.85	26.58	5.23	38.37	33.29	54.00	-20.71	HORIZONTAL	Average
6	2483.500	50.48	26.58	5.23	38.37	43.92	74.00	-30.08	HORIZONTAL	Peak
7	2500.000	38.85	26.60	4.95	38.10	32.30	54.00	-21.70	HORIZONTAL	Average
8	2500.000	51.03	26.60	4.95	38.10	44.48	74.00	-29.52	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	33.91	26.25	5.03	38.08	27.11	54.00	-26.89	VERTICAL	Average
2	2310.000	46.21	26.25	5.03	38.08	39.41	74.00	-34.59	VERTICAL	Peak
3	2390.000	34.84	26.43	4.88	37.92	28.23	54.00	-25.77	VERTICAL	Average
4	2390.000	47.03	26.43	4.88	37.92	40.42	74.00	-33.58	VERTICAL	Peak
5	2483.500	35.50	26.58	5.23	38.37	28.94	54.00	-25.06	VERTICAL	Average
6	2483.500	49.44	26.58	5.23	38.37	42.88	74.00	-31.12	VERTICAL	Peak
7	2500.000	33.68	26.60	4.95	38.10	27.13	54.00	-26.87	VERTICAL	Average
8	2500.000	51.26	26.60	4.95	38.10	44.71	74.00	-29.29	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 11.12,6.3,6.5 and 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.

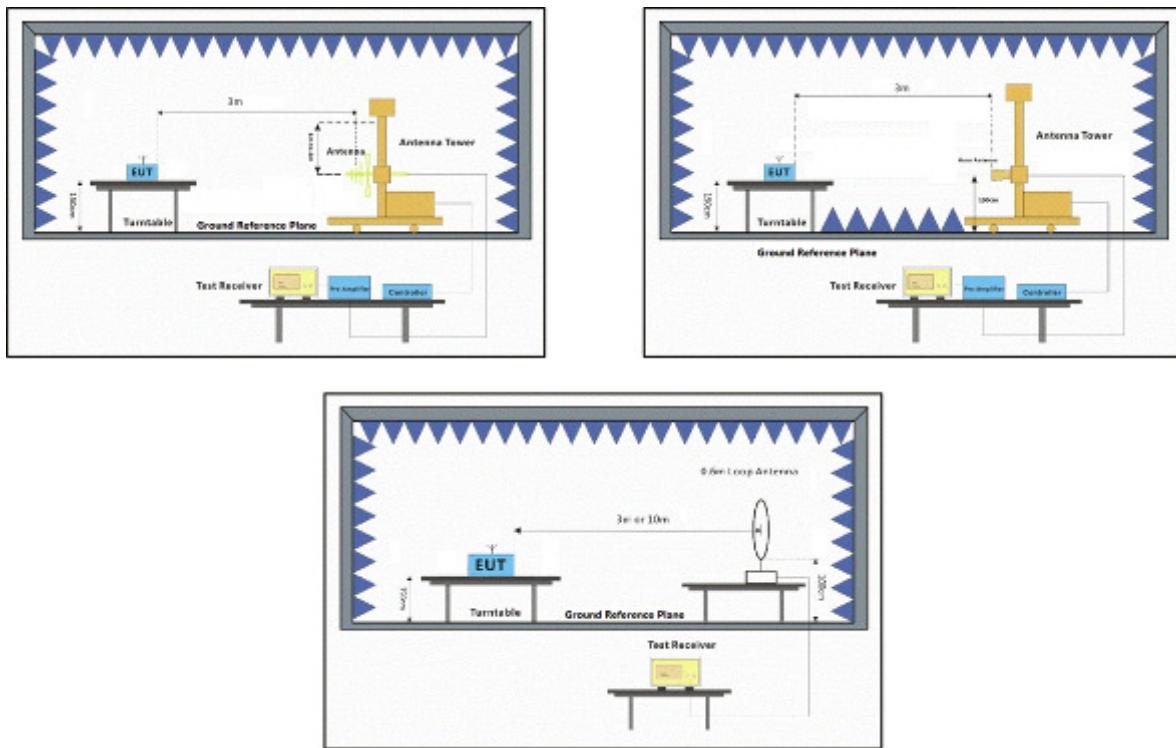
7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C Humidity: 51 % 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		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	30.962	23.97	12.22	0.07	21.63	14.63	40.00	-25.37	HORIZONTAL	QP
2	48.502	23.87	12.97	0.63	24.78	12.69	40.00	-27.31	HORIZONTAL	QP
3	71.832	26.23	10.50	0.73	25.58	11.88	40.00	-28.12	HORIZONTAL	QP
4	104.536	28.04	9.93	0.86	27.32	11.51	43.50	-31.99	HORIZONTAL	QP
5	180.649	28.87	12.67	1.34	28.09	14.79	43.50	-28.71	HORIZONTAL	QP
6	866.088	28.64	23.66	2.95	28.37	26.88	46.00	-19.12	HORIZONTAL	QP

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4824.962	38.10	30.82	6.01	38.11	36.82	54.00	-17.18	HORIZONTAL	Average
2	4824.962	41.20	30.82	6.01	36.94	41.09	74.00	-32.91	HORIZONTAL	Peak
3	5746.982	38.01	32.10	7.05	36.99	40.17	54.00	-13.83	HORIZONTAL	Average
4	5746.982	46.96	32.10	7.05	36.99	49.12	74.00	-24.88	HORIZONTAL	Peak
5	6507.536	38.63	34.30	7.07	36.98	43.02	54.00	-10.98	HORIZONTAL	Average
6	6507.536	45.39	34.30	7.07	36.98	49.78	74.00	-24.22	HORIZONTAL	Peak
7	7236.857	36.25	35.55	7.35	37.43	41.72	54.00	-12.28	HORIZONTAL	Average
8	7236.857	43.38	35.55	7.35	36.93	49.35	74.00	-24.65	HORIZONTAL	Peak
9	9648.432	34.83	37.54	8.18	37.40	43.15	54.00	-10.85	HORIZONTAL	Average
10	9648.432	42.11	37.54	8.18	37.08	50.75	74.00	-23.25	HORIZONTAL	Peak
11	12060.860	31.41	39.46	10.71	37.17	44.41	54.00	-9.59	HORIZONTAL	Average
12	12060.860	38.59	39.46	10.71	37.17	51.59	74.00	-22.41	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	35.875	20.42	12.49	0.27	22.84	10.34	40.00	-29.66	VERTICAL	QP
2	50.942	22.55	12.95	0.60	24.89	11.21	40.00	-28.79	VERTICAL	QP
3	67.913	24.23	11.00	0.70	25.48	10.45	40.00	-29.55	VERTICAL	QP
4	130.837	26.70	12.48	0.97	28.18	11.97	43.50	-31.53	VERTICAL	QP
5	180.649	27.69	12.67	1.34	28.09	13.61	43.50	-29.89	VERTICAL	QP
6	842.130	28.59	23.23	2.90	28.49	26.23	46.00	-19.77	VERTICAL	QP

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4824.962	41.06	30.82	6.01	36.94	40.95	54.00	-13.05	VERTICAL	Average
2	4824.962	47.90	30.82	6.01	36.94	47.79	74.00	-26.21	VERTICAL	Peak
3	6659.763	43.63	34.53	7.15	36.97	48.34	54.00	-5.66	VERTICAL	Average
4	6659.763	43.78	34.53	7.15	36.97	48.49	74.00	-25.51	VERTICAL	Peak
5	7236.254	38.58	35.55	7.35	36.93	44.55	54.00	-9.45	VERTICAL	Average
6	7236.254	42.97	35.55	7.35	36.93	48.94	74.00	-25.06	VERTICAL	Peak
7	9648.540	37.80	37.54	8.18	37.08	46.44	54.00	-7.56	VERTICAL	Average
8	9648.540	41.06	37.54	8.18	37.08	49.70	74.00	-24.30	VERTICAL	Peak
9	12060.540	33.71	39.46	10.71	37.17	46.71	54.00	-7.29	VERTICAL	Average
10	12060.540	37.98	39.46	10.71	37.17	50.98	74.00	-23.02	VERTICAL	Peak
11	12433.620	35.08	38.88	11.20	36.86	48.30	54.00	-5.70	VERTICAL	Average
12	12433.620	37.63	38.88	11.20	36.86	50.85	74.00	-23.15	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4884.721	38.29	30.95	6.86	38.14	37.96	54.00	-16.04	HORIZONTAL	Average
2	4884.721	47.37	30.95	6.86	38.14	47.04	74.00	-26.96	HORIZONTAL	Peak
3	5746.982	41.78	32.10	7.05	37.50	43.43	54.00	-10.57	HORIZONTAL	Average
4	5746.982	51.18	32.10	7.05	37.50	52.83	74.00	-21.17	HORIZONTAL	Peak
5	7326.349	33.18	35.74	7.39	37.46	38.85	54.00	-15.15	HORIZONTAL	Average
6	7326.349	41.72	35.74	7.39	37.46	47.39	74.00	-26.61	HORIZONTAL	Peak
7	9047.272	36.90	36.57	8.29	37.57	44.19	54.00	-9.81	HORIZONTAL	Average
8	9047.272	45.24	36.57	8.29	37.57	52.53	74.00	-21.47	HORIZONTAL	Peak
9	9768.640	33.05	37.74	8.37	37.37	41.79	54.00	-12.21	HORIZONTAL	Average
10	9768.640	40.85	37.74	8.37	37.37	49.59	74.00	-24.41	HORIZONTAL	Peak
11	12210.070	30.16	39.21	10.98	37.30	43.05	54.00	-10.95	HORIZONTAL	Average
12	12210.070	39.36	39.21	10.98	37.30	52.25	74.00	-21.75	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4267.237	37.56	29.85	6.46	38.36	35.51	54.00	-18.49	VERTICAL	Average
2	4267.237	46.72	29.85	6.46	38.36	44.67	74.00	-29.33	VERTICAL	Peak
3	4884.721	38.87	30.95	6.86	38.14	38.54	54.00	-15.46	VERTICAL	Average
4	4884.721	45.42	30.95	6.86	38.14	45.09	74.00	-28.91	VERTICAL	Peak
5	6564.209	35.22	34.37	7.11	37.27	39.43	54.00	-14.57	VERTICAL	Average
6	6564.209	45.38	34.37	7.11	37.27	49.59	74.00	-24.41	VERTICAL	Peak
7	7326.857	34.14	35.74	7.39	37.46	39.81	54.00	-14.19	VERTICAL	Average
8	7326.857	42.21	35.74	7.39	37.46	47.88	74.00	-26.12	VERTICAL	Peak
9	9768.925	33.22	37.74	8.37	37.37	41.96	54.00	-12.04	VERTICAL	Average
10	9768.925	39.80	37.74	8.37	37.37	48.54	74.00	-25.46	VERTICAL	Peak
11	12210.920	25.97	39.21	10.98	37.30	38.86	54.00	-15.14	VERTICAL	Average
12	12210.920	35.81	39.21	10.98	37.30	48.70	74.00	-25.30	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.721	37.60	31.01	7.49	38.17	37.93	54.00	-16.07	HORIZONTAL	Average
2	4924.721	44.71	31.01	7.49	38.17	45.04	74.00	-28.96	HORIZONTAL	Peak
3	5746.982	36.78	32.10	7.05	37.50	38.43	54.00	-15.57	HORIZONTAL	Average
4	5746.982	45.18	32.10	7.05	37.50	46.83	74.00	-27.17	HORIZONTAL	Peak
5	7386.349	35.35	35.85	7.42	37.48	41.14	54.00	-12.86	HORIZONTAL	Average
6	7386.349	39.60	35.85	7.42	37.48	45.39	74.00	-28.61	HORIZONTAL	Peak
7	9047.272	35.90	36.57	8.29	37.57	43.19	54.00	-10.81	HORIZONTAL	Average
8	9047.272	36.24	36.57	8.29	37.57	43.53	74.00	-30.47	HORIZONTAL	Peak
9	9848.800	35.34	37.82	8.46	37.36	44.26	54.00	-9.74	HORIZONTAL	Average
10	9848.800	40.50	37.82	8.46	37.36	49.42	74.00	-24.58	HORIZONTAL	Peak
11	12310.070	29.45	39.03	11.10	37.25	42.33	54.00	-11.67	HORIZONTAL	Average
12	12310.070	35.37	39.03	11.10	37.25	48.25	74.00	-25.75	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.721	35.79	31.01	7.49	38.17	36.12	54.00	-17.88	VERTICAL	Average
2	4924.721	46.76	31.01	7.49	38.17	47.09	74.00	-26.91	VERTICAL	Peak
3	5746.982	36.24	32.10	7.05	37.50	37.89	54.00	-16.11	VERTICAL	Average
4	5746.982	45.83	32.10	7.05	37.50	47.48	74.00	-26.52	VERTICAL	Peak
5	7386.209	30.49	35.85	7.42	37.48	36.28	54.00	-17.72	VERTICAL	Average
6	7386.209	40.80	35.85	7.42	37.48	46.59	74.00	-27.41	VERTICAL	Peak
7	7852.524	31.22	36.39	8.32	37.32	38.61	54.00	-15.39	VERTICAL	Average
8	7852.524	41.03	36.39	8.32	37.32	48.42	74.00	-25.58	VERTICAL	Peak
9	9848.164	27.89	37.82	8.46	37.36	36.81	54.00	-17.19	VERTICAL	Average
10	9848.164	38.90	37.82	8.46	37.36	47.82	74.00	-26.18	VERTICAL	Peak
11	12310.310	27.13	39.03	11.10	37.25	40.01	54.00	-13.99	VERTICAL	Average
12	12310.310	36.47	39.03	11.10	37.25	49.35	74.00	-24.65	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Over Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	32.864	21.27	12.29	0.16	22.26	11.46	40.00	-28.54	HORIZONTAL QP
2	36.766	22.67	12.52	0.34	23.01	12.52	40.00	-27.48	HORIZONTAL QP
3	56.197	22.82	12.43	0.59	25.12	10.72	40.00	-29.28	HORIZONTAL QP
4	137.903	25.39	13.01	1.02	28.16	11.26	43.50	-32.24	HORIZONTAL QP
5	180.649	27.44	12.67	1.34	28.09	13.36	43.50	-30.14	HORIZONTAL QP
6	863.056	27.82	23.62	2.95	28.40	25.99	46.00	-20.01	HORIZONTAL QP

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Over Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	4824.962	39.26	30.82	6.01	38.11	37.98	54.00	-16.02	HORIZONTAL Average
2	4824.962	46.67	30.82	6.01	38.11	45.39	74.00	-28.61	HORIZONTAL Peak
3	6285.695	33.68	33.51	6.95	37.21	36.93	54.00	-17.07	HORIZONTAL Average
4	6285.695	43.35	33.51	6.95	37.21	46.60	74.00	-27.40	HORIZONTAL Peak
5	7236.034	32.53	35.55	7.35	37.43	38.00	54.00	-16.00	HORIZONTAL Average
6	7236.034	41.56	35.55	7.35	37.43	47.03	74.00	-26.97	HORIZONTAL Peak
7	8943.274	31.63	36.47	8.18	37.55	38.73	54.00	-15.27	HORIZONTAL Average
8	8943.274	42.63	36.47	8.18	37.55	49.73	74.00	-24.27	HORIZONTAL Peak
9	9848.020	27.41	37.82	8.46	37.36	36.33	54.00	-17.67	HORIZONTAL Average
10	9848.020	39.04	37.82	8.46	37.36	47.96	74.00	-26.04	HORIZONTAL Peak
11	12060.070	29.69	39.46	10.71	37.42	42.44	54.00	-11.56	HORIZONTAL Average
12	12060.070	37.17	39.46	10.71	37.42	49.92	74.00	-24.08	HORIZONTAL Peak

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Over Limit Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	33.917	20.94	12.34	0.20	22.53	10.95	40.00	-29.05	VERTICAL QP
2	48.502	22.46	12.97	0.63	24.78	11.28	40.00	-28.72	VERTICAL QP
3	61.132	25.67	12.10	0.59	25.25	13.11	40.00	-26.89	VERTICAL QP
4	128.113	26.60	12.12	0.96	28.18	11.50	43.50	-32.00	VERTICAL QP
5	180.649	28.05	12.67	1.34	28.09	13.97	43.50	-29.53	VERTICAL QP
6	854.025	28.34	23.47	2.94	28.45	26.30	46.00	-19.70	VERTICAL QP

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

Freq	ReadAntenna		Cable		Preamp Level	Limit Line	Over Limit	Over Limit Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3619.064	35.53	28.20	6.52	37.92	32.33	54.00	-21.67	VERTICAL Average
2	3619.064	47.09	28.20	6.52	37.92	43.89	74.00	-30.11	VERTICAL Peak
3	4824.948	34.74	30.82	6.01	38.11	33.46	54.00	-20.54	VERTICAL Average
4	4824.948	44.23	30.82	6.01	38.11	42.95	74.00	-31.05	VERTICAL Peak
5	6698.373	33.48	34.61	7.17	37.29	37.97	54.00	-16.03	VERTICAL Average
6	6698.373	43.30	34.61	7.17	36.97	48.11	74.00	-25.89	VERTICAL Peak
7	7236.020	33.69	35.55	7.35	37.43	39.16	54.00	-14.84	VERTICAL Average
8	7236.020	41.53	35.55	7.35	37.43	47.00	74.00	-27.00	VERTICAL Peak
9	9648.257	29.53	37.54	8.18	37.40	37.85	54.00	-16.15	VERTICAL Average
10	9648.257	39.46	37.54	8.18	37.40	47.78	74.00	-26.22	VERTICAL Peak
11	12060.100	24.23	39.46	10.71	37.42	36.98	54.00	-17.02	VERTICAL Average
12	12060.100	35.23	39.46	10.71	37.42	47.98	74.00	-26.02	VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4884.721	35.58	30.95	6.86	38.14	35.25	54.00	-18.75	HORIZONTAL	Average
2	4884.721	49.00	30.95	6.86	38.14	48.67	74.00	-25.33	HORIZONTAL	Peak
3	5746.982	35.99	32.10	7.05	37.50	37.64	54.00	-16.36	HORIZONTAL	Average
4	5746.982	47.04	32.10	7.05	37.50	48.69	74.00	-25.31	HORIZONTAL	Peak
5	7326.040	29.44	35.74	7.39	37.46	35.11	54.00	-18.89	HORIZONTAL	Average
6	7326.040	39.69	35.74	7.39	37.46	45.36	74.00	-28.64	HORIZONTAL	Peak
7	8295.823	29.62	36.25	8.17	37.40	36.64	54.00	-17.36	HORIZONTAL	Average
8	8295.823	40.63	36.25	8.17	37.40	47.65	74.00	-26.35	HORIZONTAL	Peak
9	9768.450	28.16	37.74	8.37	37.37	36.90	54.00	-17.10	HORIZONTAL	Average
10	9768.450	37.98	37.74	8.37	37.37	46.72	74.00	-27.28	HORIZONTAL	Peak
11	12210.930	24.95	39.21	10.98	37.30	37.84	54.00	-16.16	HORIZONTAL	Average
12	12210.930	34.76	39.21	10.98	37.30	47.65	74.00	-26.35	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4884.721	38.69	30.95	6.86	38.14	38.36	54.00	-15.64	VERTICAL	Average
2	4884.721	40.02	30.95	6.86	38.14	39.69	74.00	-34.31	VERTICAL	Peak
3	5780.300	33.53	32.14	7.15	37.50	35.32	54.00	-18.68	VERTICAL	Average
4	5780.300	44.35	32.14	7.15	37.50	46.14	74.00	-27.86	VERTICAL	Peak
5	7326.741	29.09	35.74	7.39	37.46	34.76	54.00	-19.24	VERTICAL	Average
6	7326.741	41.38	35.74	7.39	37.46	47.05	74.00	-26.95	VERTICAL	Peak
7	7966.832	29.65	36.48	8.37	37.31	37.19	54.00	-16.81	VERTICAL	Average
8	7966.832	41.53	36.48	8.37	37.31	49.07	74.00	-24.93	VERTICAL	Peak
9	9768.240	25.93	37.74	8.37	37.37	34.67	54.00	-19.33	VERTICAL	Average
10	9768.240	37.39	37.74	8.37	37.37	46.13	74.00	-27.87	VERTICAL	Peak
11	12110.250	26.92	39.37	10.82	37.38	39.73	54.00	-14.27	VERTICAL	Average
12	12110.250	37.65	39.37	10.82	37.38	50.46	74.00	-23.54	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.721	32.89	31.01	7.49	38.17	33.22	54.00	-20.78	HORIZONTAL	Average
2	4924.721	45.34	31.01	7.49	38.17	45.67	74.00	-28.33	HORIZONTAL	Peak
3	5746.982	31.99	32.10	7.05	37.50	33.64	54.00	-20.36	HORIZONTAL	Average
4	5746.982	43.04	32.10	7.05	37.50	44.69	74.00	-29.31	HORIZONTAL	Peak
5	7386.052	28.25	35.85	7.42	37.48	34.04	54.00	-19.96	HORIZONTAL	Average
6	7386.052	40.30	35.85	7.42	37.48	46.09	74.00	-27.91	HORIZONTAL	Peak
7	8295.823	26.62	36.25	8.17	37.40	33.64	54.00	-20.36	HORIZONTAL	Average
8	8295.823	38.63	36.25	8.17	37.40	45.65	74.00	-28.35	HORIZONTAL	Peak
9	9848.450	27.79	37.82	8.46	37.36	36.71	54.00	-17.29	HORIZONTAL	Average
10	9848.450	38.80	37.82	8.46	37.36	47.72	74.00	-26.28	HORIZONTAL	Peak
11	12310.930	23.73	39.03	11.10	37.25	36.61	54.00	-17.39	HORIZONTAL	Average
12	12310.930	34.77	39.03	11.10	37.25	47.65	74.00	-26.35	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.721	34.99	31.01	7.49	38.17	35.32	54.00	-18.68	VERTICAL	Average
2	4924.721	45.36	31.01	7.49	38.17	45.69	74.00	-28.31	VERTICAL	Peak
3	5780.300	31.53	32.14	7.15	37.50	33.32	54.00	-20.68	VERTICAL	Average
4	5780.300	43.35	32.14	7.15	37.50	45.14	74.00	-28.86	VERTICAL	Peak
5	7386.122	29.74	35.85	7.42	37.48	35.53	54.00	-18.47	VERTICAL	Average
6	7386.122	39.74	35.85	7.42	37.48	45.53	74.00	-28.47	VERTICAL	Peak
7	9152.479	26.47	36.73	8.37	37.59	33.98	54.00	-20.02	VERTICAL	Average
8	9152.479	37.97	36.73	8.37	37.59	45.48	74.00	-28.52	VERTICAL	Peak
9	9768.540	27.67	37.74	8.37	37.37	36.41	54.00	-17.59	VERTICAL	Average
10	9768.540	37.86	37.74	8.37	37.37	46.60	74.00	-27.40	VERTICAL	Peak
11	12310.390	20.75	39.03	11.10	37.25	33.63	54.00	-20.37	VERTICAL	Average
12	12310.390	32.58	39.03	11.10	37.25	45.46	74.00	-28.54	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	31.071	21.36	12.23	0.08	21.65	12.02	40.00	-27.98	HORIZONTAL	QP
2	46.503	21.65	12.90	0.68	24.57	10.66	40.00	-29.34	HORIZONTAL	QP
3	62.871	23.61	11.89	0.61	25.29	10.82	40.00	-29.18	HORIZONTAL	QP
4	127.218	26.54	12.02	0.95	28.18	11.33	43.50	-32.17	HORIZONTAL	QP
5	159.225	27.34	13.40	1.26	28.10	13.90	43.50	-29.60	HORIZONTAL	QP
6	896.997	27.12	23.98	2.85	27.93	26.02	46.00	-19.98	HORIZONTAL	QP

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4824.962	36.09	30.82	6.01	38.11	34.81	54.00	-19.19	HORIZONTAL	Average
2	4824.962	44.88	30.82	6.01	38.11	43.60	74.00	-30.40	HORIZONTAL	Peak
3	5830.640	31.84	32.19	7.45	37.55	33.93	54.00	-20.07	HORIZONTAL	Average
4	5830.640	44.46	32.19	7.45	37.55	46.55	74.00	-27.45	HORIZONTAL	Peak
5	7236.420	29.10	35.55	7.35	37.43	34.57	54.00	-19.43	HORIZONTAL	Average
6	7236.420	39.99	35.55	7.35	37.43	45.46	74.00	-28.54	HORIZONTAL	Peak
7	8013.020	28.88	36.49	8.35	37.32	36.40	54.00	-17.60	HORIZONTAL	Average
8	8013.020	40.20	36.49	8.35	37.32	47.72	74.00	-26.28	HORIZONTAL	Peak
9	9648.430	27.34	37.54	8.18	37.40	35.66	54.00	-18.34	HORIZONTAL	Average
10	9648.430	38.48	37.54	8.18	37.40	46.80	74.00	-27.20	HORIZONTAL	Peak
11	12060.070	21.03	39.46	10.71	37.42	33.78	54.00	-20.22	HORIZONTAL	Average
12	12060.070	35.31	39.46	10.71	37.42	48.06	74.00	-25.94	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	30.962	22.25	12.22	0.07	21.63	12.91	40.00	-27.09	VERTICAL	QP
2	36.509	20.03	12.51	0.32	22.95	9.91	40.00	-30.09	VERTICAL	QP
3	47.492	22.55	12.94	0.65	24.67	11.47	40.00	-28.53	VERTICAL	QP
4	120.277	25.97	11.52	0.92	28.19	10.22	43.50	-33.28	VERTICAL	QP
5	180.649	29.33	12.67	1.34	28.09	15.25	43.50	-28.25	VERTICAL	QP
6	872.183	29.00	23.73	2.93	28.29	27.37	46.00	-18.63	VERTICAL	QP

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4824.962	36.36	30.82	6.01	38.11	35.08	54.00	-18.92	VERTICAL	Average
2	4824.962	46.73	30.82	6.01	38.11	45.45	74.00	-28.55	VERTICAL	Peak
3	5780.300	30.86	32.14	7.15	37.50	32.65	54.00	-21.35	VERTICAL	Average
4	5780.300	44.66	32.14	7.15	37.50	46.45	74.00	-27.55	VERTICAL	Peak
5	7236.144	31.43	35.55	7.35	37.43	36.90	54.00	-17.10	VERTICAL	Average
6	7236.144	40.09	35.55	7.35	37.43	45.56	74.00	-28.44	VERTICAL	Peak
7	8082.804	29.38	36.44	8.32	37.34	36.80	54.00	-17.20	VERTICAL	Average
8	8082.804	40.42	36.44	8.32	37.34	47.84	74.00	-26.16	VERTICAL	Peak
9	9648.717	26.09	37.54	8.18	37.40	34.41	54.00	-19.59	VERTICAL	Average
10	9648.717	38.12	37.54	8.18	37.40	46.44	74.00	-27.56	VERTICAL	Peak
11	12060.100	22.52	39.46	10.71	37.42	35.27	54.00	-18.73	VERTICAL	Average
12	12060.100	34.79	39.46	10.71	37.42	47.54	74.00	-26.46	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4884.043	31.05	30.95	6.86	38.14	30.72	54.00	-23.28	HORIZONTAL	Average
2	4884.043	44.64	30.95	6.86	38.14	44.31	74.00	-29.69	HORIZONTAL	Peak
3	5813.812	27.74	32.17	7.46	37.68	29.69	54.00	-24.31	HORIZONTAL	Average
4	5813.812	44.36	32.17	7.46	37.68	46.31	74.00	-27.69	HORIZONTAL	Peak
5	7326.763	25.30	35.74	7.39	37.46	30.97	54.00	-23.03	HORIZONTAL	Average
6	7326.763	39.55	35.74	7.39	37.46	45.22	74.00	-28.78	HORIZONTAL	Peak
7	8013.020	23.23	36.49	8.35	37.32	30.75	54.00	-23.25	HORIZONTAL	Average
8	8013.020	38.28	36.49	8.35	37.32	45.80	74.00	-28.20	HORIZONTAL	Peak
9	9768.221	21.98	37.74	8.37	37.37	30.72	54.00	-23.28	HORIZONTAL	Average
10	9768.221	36.72	37.74	8.37	37.37	45.46	74.00	-28.54	HORIZONTAL	Peak
11	12210.250	16.53	39.21	10.98	37.30	29.42	54.00	-24.58	HORIZONTAL	Average
12	12210.250	32.67	39.21	10.98	37.30	45.56	74.00	-28.44	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4884.151	32.91	30.95	6.86	38.14	32.58	54.00	-21.42	VERTICAL	Average
2	4884.151	45.42	30.95	6.86	38.14	45.09	74.00	-28.91	VERTICAL	Peak
3	5780.300	30.61	32.14	7.15	37.50	32.40	54.00	-21.60	VERTICAL	Average
4	5780.300	44.20	32.14	7.15	37.50	45.99	74.00	-28.01	VERTICAL	Peak
5	7326.038	29.01	35.74	7.39	37.46	34.68	54.00	-19.32	VERTICAL	Average
6	7326.038	40.03	35.74	7.39	37.46	45.70	74.00	-28.30	VERTICAL	Peak
7	8082.804	26.54	36.44	8.32	37.34	33.96	54.00	-20.04	VERTICAL	Average
8	8082.804	38.39	36.44	8.32	37.34	45.81	74.00	-28.19	VERTICAL	Peak
9	9648.603	28.33	37.54	8.18	37.40	36.65	54.00	-17.35	VERTICAL	Average
10	9648.603	38.99	37.54	8.18	37.40	47.31	74.00	-26.69	VERTICAL	Peak
11	12210.160	25.82	39.21	10.98	37.30	38.71	54.00	-15.29	VERTICAL	Average
12	12210.160	35.29	39.21	10.98	37.30	48.18	74.00	-25.82	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.721	30.66	31.01	7.49	38.17	30.99	54.00	-23.01	HORIZONTAL	Average
2	4924.721	43.46	31.01	7.49	38.17	43.79	74.00	-30.21	HORIZONTAL	Peak
3	5780.300	29.40	32.14	7.15	37.50	31.19	54.00	-22.81	HORIZONTAL	Average
4	5780.300	43.82	32.14	7.15	37.50	45.61	74.00	-28.39	HORIZONTAL	Peak
5	7386.857	24.93	35.85	7.42	37.48	30.72	54.00	-23.28	HORIZONTAL	Average
6	7386.857	40.25	35.85	7.42	37.48	46.04	74.00	-27.96	HORIZONTAL	Peak
7	9848.497	21.89	37.82	8.46	37.36	30.81	54.00	-23.19	HORIZONTAL	Average
8	9848.497	36.16	37.82	8.46	37.36	45.08	74.00	-28.92	HORIZONTAL	Peak
9	10729.480	22.11	39.42	9.74	37.46	33.81	54.00	-20.19	HORIZONTAL	Average
10	10729.480	36.11	39.42	9.74	37.46	47.81	74.00	-26.19	HORIZONTAL	Peak
11	12310.700	22.05	39.03	11.10	37.25	34.93	54.00	-19.07	HORIZONTAL	Average
12	12310.700	34.46	39.03	11.10	37.25	47.34	74.00	-26.66	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level	Line				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.721	30.67	31.01	7.49	38.17	31.00	54.00	-23.00	VERTICAL	Average
2	4924.721	44.55	31.01	7.49	38.17	44.88	74.00	-29.12	VERTICAL	Peak
3	5746.982	28.60	32.10	7.05	37.50	30.25	54.00	-23.75	VERTICAL	Average
4	5746.982	42.09	32.10	7.05	37.50	43.74	74.00	-30.26	VERTICAL	Peak
5	7386.092	25.56	35.85	7.42	37.48	31.35	54.00	-22.65	VERTICAL	Average
6	7386.092	39.42	35.85	7.42	37.48	45.21	74.00	-28.79	VERTICAL	Peak
7	8082.804	24.87	36.44	8.32	37.34	32.29	54.00	-21.71	VERTICAL	Average
8	8082.804	38.45	36.44	8.32	37.34	45.87	74.00	-28.13	VERTICAL	Peak
9	9848.789	25.11	37.82	8.46	37.36	34.03	54.00	-19.97	VERTICAL	Average
10	9848.789	37.53	37.82	8.46	37.36	46.45	74.00	-27.55	VERTICAL	Peak
11	12310.280	20.72	39.03	11.10	37.25	33.60	54.00	-20.40	VERTICAL	Average
12	12310.280	32.91	39.03	11.10	37.25	45.79	74.00	-28.21	VERTICAL	Peak