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Report No.: GZEM181200018101  
Page: 1 of 113  
FCC ID: 2ATKHSVC

## TEST REPORT

**Application No.:** GZEM1812000181CR  
**Applicant:** Zhongshan Perfect Electronics Co., Ltd  
**Address of Applicant:** Floor 1-2, Building (1), No.9, Xingtang 2nd Road, Baishi, Sanxiang, Zhongshan, China  
**Manufacturer:** Same as applicant  
**Address of Manufacturer:** Same as applicant  
**Factory:** Same as applicant  
**Address of Factory:** Same as applicant

**Equipment Under Test (EUT):**

**FCC ID:** 2ATKHSVC

**EUT Name:** Sous Vide Circulator

**Model No.:** SV-612, SV-613, SV-615, SV-616, SV-617, SV-618, SV-619.

Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

**Standard(s) :** 47 CFR Part 15, Subpart C 15.247

**Date of Receipt:** 2018-12-27

**Date of Test:** 2019-03-08 to 2019-03-18

**Date of Issue:** 2019-06-20

<b>Test Result:</b>	<b>Pass*</b>
---------------------	--------------

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



Kobe Jian

Lab 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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# SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Report No.: GZEM181200018101  
Page: 2 of 113

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-06-20		Original

Authorized for issue by:			
Tested By			
		Curry_Wu /Project Engineer	2019-03-08 to 2019-03-18
Checked By			
		Ricky_Liu /Reviewer	Date
			2019-03-20
			Date



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## 2 Test Summary

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

<b>Radio Spectrum Matter Part</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
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

### ¤ Declaration of EUT Family Grouping:

**Model No.:** SV-612, SV-613, SV-615, SV-616, SV-617, SV-618, SV-619

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the outer decoration.

Therefore only one model **SV-612** was tested in this report.

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## 4 General Information

### 4.1 Details of E.U.T.

Power Supply:	AC 120V 60Hz 1000W
Test Voltage:	AC 120V 60Hz
Cable:	about 1m x 2 wires unscreened AC mains cable
Antenna Gain	3.23dBi
Antenna Type	Integral 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
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz
Test Software	QA tools
Power setting	Default

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

RF

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

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#### 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

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No tests were sub-contracted.



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## 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, 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)**

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**● 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, IEC60068-2-27 and Rules of procedure IEC60068-2-27, and the relevant IEC60068-2-27 CB-Scheme Operational documents.



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#### **4.6 Deviation from Standards**

None

#### **4.7 Abnormalities from Standard Conditions**

None



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## 5 Equipment List

<b>Conducted Emissions at AC Power Line (150kHz-30MHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
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

<b>Minimum 6dB Bandwidth</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
EXA Signal Analyzer	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	1102098	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	1111736	EMC2137	2017-11-02	2019-11-01

<b>Conducted Peak Output Power</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
EXA Signal Analyzer	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	1102098	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	1111736	EMC2137	2017-11-02	2019-11-01

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Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	Agilent Technologies	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	1102098	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	1111736	EMC2137	2017-11-02	2019-11-01

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	Agilent Technologies	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	1102098	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	1111736	EMC2137	2017-11-02	2019-11-01

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	Agilent Technologies	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	1102098	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	1111736	EMC2137	2017-11-02	2019-11-01

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<b>Radiated Emissions which fall in the restricted bands</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
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	2017-06-30	2019-06-30
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-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	2018-06-01	2019-05-31
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-02-24	2019-02-23
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	2017-06-18	2019-06-18
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	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2016-06-29	2019-06-28
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

<b>Radiated Spurious Emissions</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
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	2017-06-30	2019-06-30
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-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

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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	2018-06-01	2019-05-31
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-02-24	2019-02-23
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	2017-06-18	2019-06-18
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	SCHWARZBECK ME SS-ELEKTRONIK	VULB 9168	SEM003-18	2016-06-29	2019-06-28
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

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## 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)

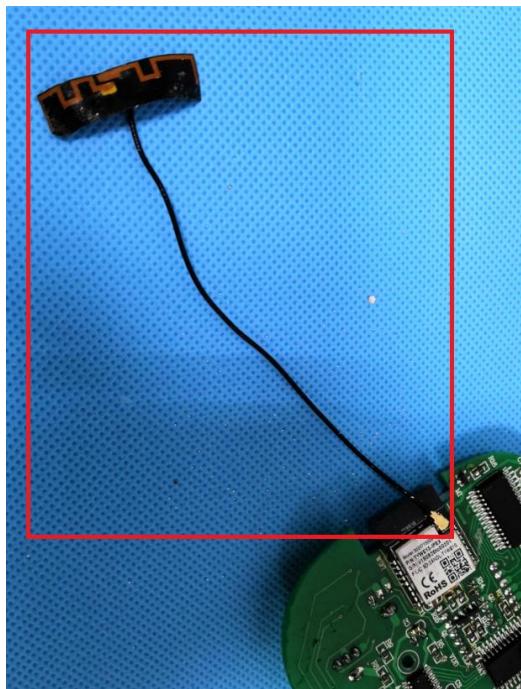
#### 6.1.2 Conclusion

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 3.23dBi.



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## 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 $\mu$ 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.

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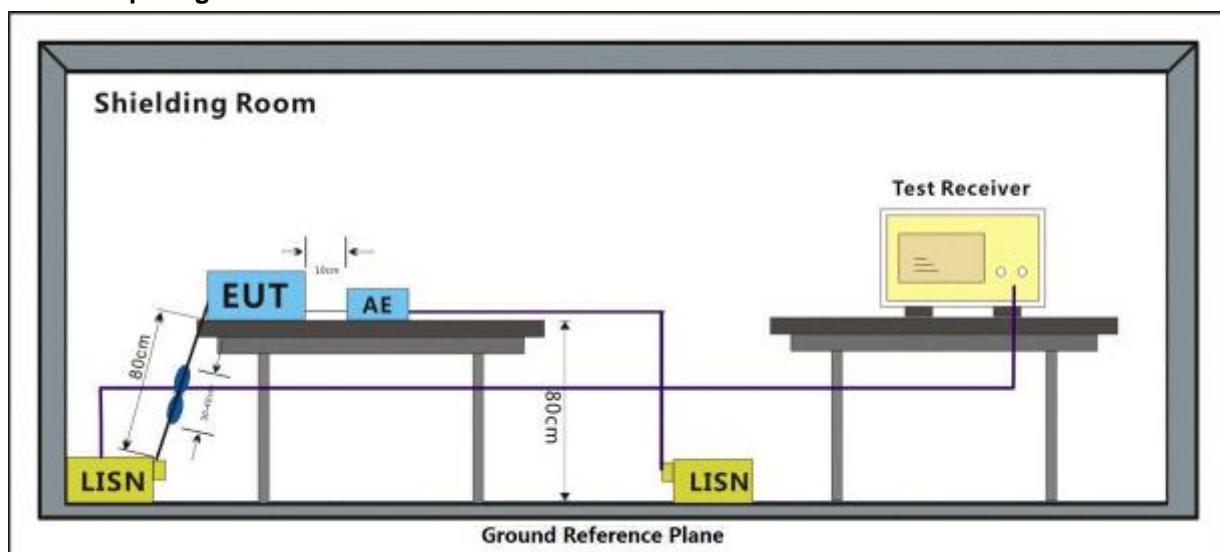
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### 7.1.1 E.U.T. Operation

#### Operating Environment:

Temperature: 22.7 °C      Humidity: 58.9 % 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). 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.

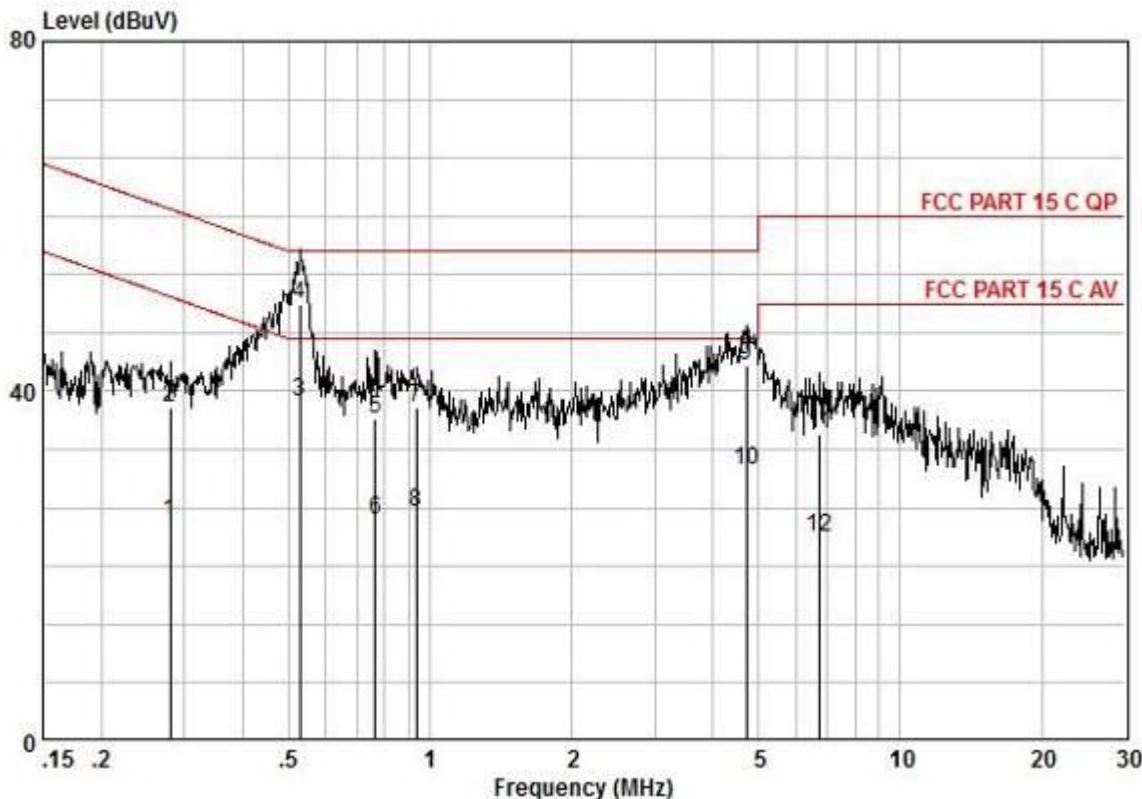
Remark: LISN=Read Level+ Cable Loss+ LISN Factor



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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
0.28	15.38	0.10	9.67	25.15	50.81	-25.66	AVERAGE
0.28	28.46	0.10	9.67	38.23	60.81	-22.58	QP
0.53	29.05	0.10	9.67	38.82	46.00	-7.18	AVERAGE
0.53	40.25	0.10	9.67	50.02	56.00	-5.98	QP
0.76	27.02	0.10	9.68	36.80	56.00	-19.20	QP
0.76	15.48	0.10	9.68	25.26	46.00	-20.74	AVERAGE
0.93	28.47	0.10	9.67	38.24	56.00	-17.76	QP
0.93	16.36	0.10	9.67	26.13	46.00	-19.87	AVERAGE
4.70	32.99	0.20	9.71	42.90	56.00	-13.10	QP
4.70	20.94	0.20	9.71	30.85	46.00	-15.15	AVERAGE
6.73	25.16	0.27	9.74	35.17	60.00	-24.83	QP
6.73	13.30	0.27	9.74	23.31	50.00	-26.69	AVERAGE

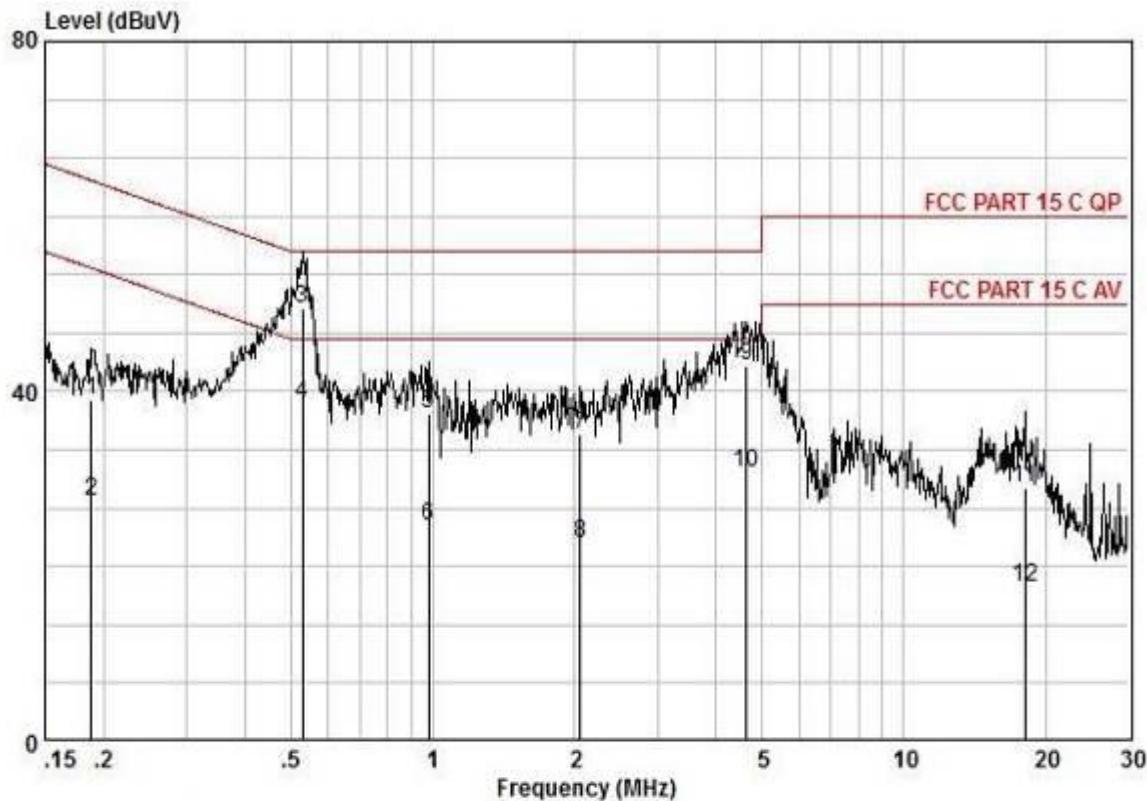
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Mode:a; Line:Neutral Line



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
0.19	29.39	0.10	9.60	39.09	64.11	-25.02	QP
0.19	17.72	0.10	9.60	27.42	54.11	-26.69	AVERAGE
0.53	39.84	0.10	9.60	49.54	56.00	-6.46	QP
0.53	28.80	0.10	9.60	38.50	46.00	-7.50	AVERAGE
0.98	27.74	0.10	9.61	37.45	56.00	-18.55	QP
0.98	14.99	0.10	9.61	24.70	46.00	-21.30	AVERAGE
2.05	25.33	0.11	9.62	35.06	56.00	-20.94	QP
2.05	12.88	0.11	9.62	22.61	46.00	-23.39	AVERAGE
4.65	33.07	0.20	9.64	42.91	56.00	-13.09	QP
4.65	20.87	0.20	9.64	30.71	46.00	-15.29	AVERAGE
18.04	18.77	0.40	9.91	29.08	60.00	-30.92	QP
18.04	7.38	0.40	9.91	17.69	50.00	-32.31	AVERAGE

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## 7.2 Minimum 6dB Bandwidth

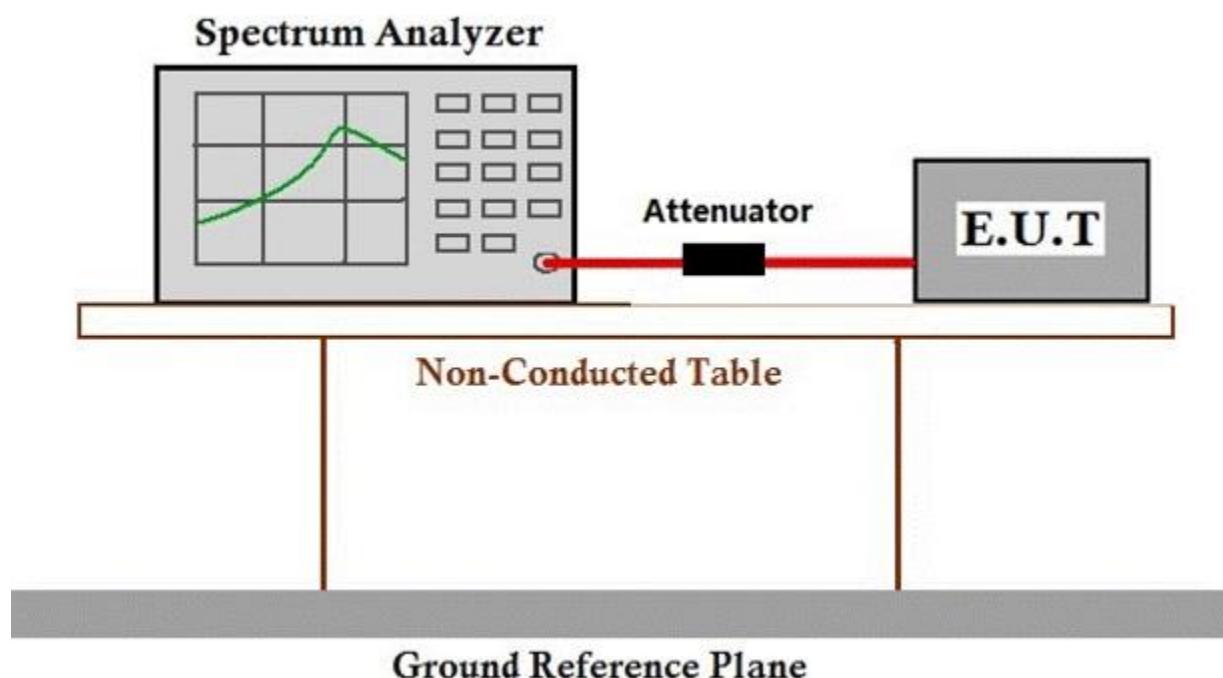
Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)  
Test Method: ANSI C63.10 (2013) Section 11.8.1  
Limit:  $\geq 500$  kHz

### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C      Humidity: 61.9 % 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). 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

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### 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 $\geq 50$ hopping channels
	0.25 for $25 \leq$ hopping channels $< 50$
	1 for digital modulation
2400-2483.5	1 for $\geq 75$ 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



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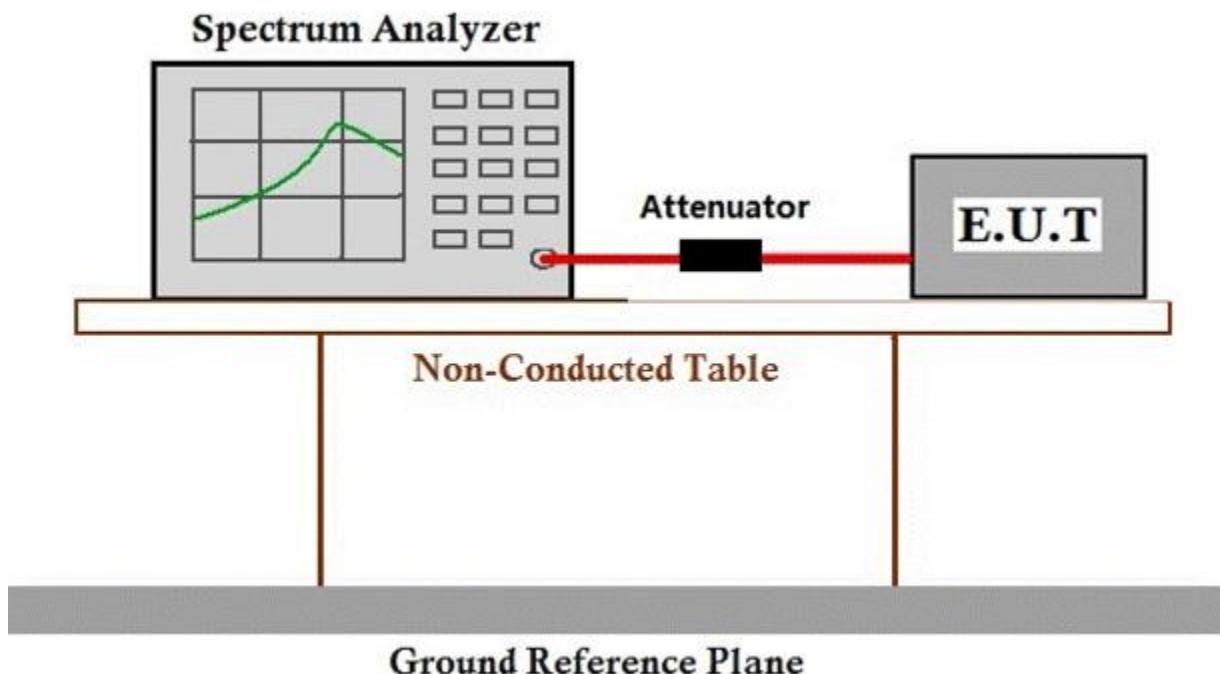
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**7.3.1 E.U.T. Operation**

Operating Environment:

Temperature: 24.3 °C Humidity: 61.9 % 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). 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

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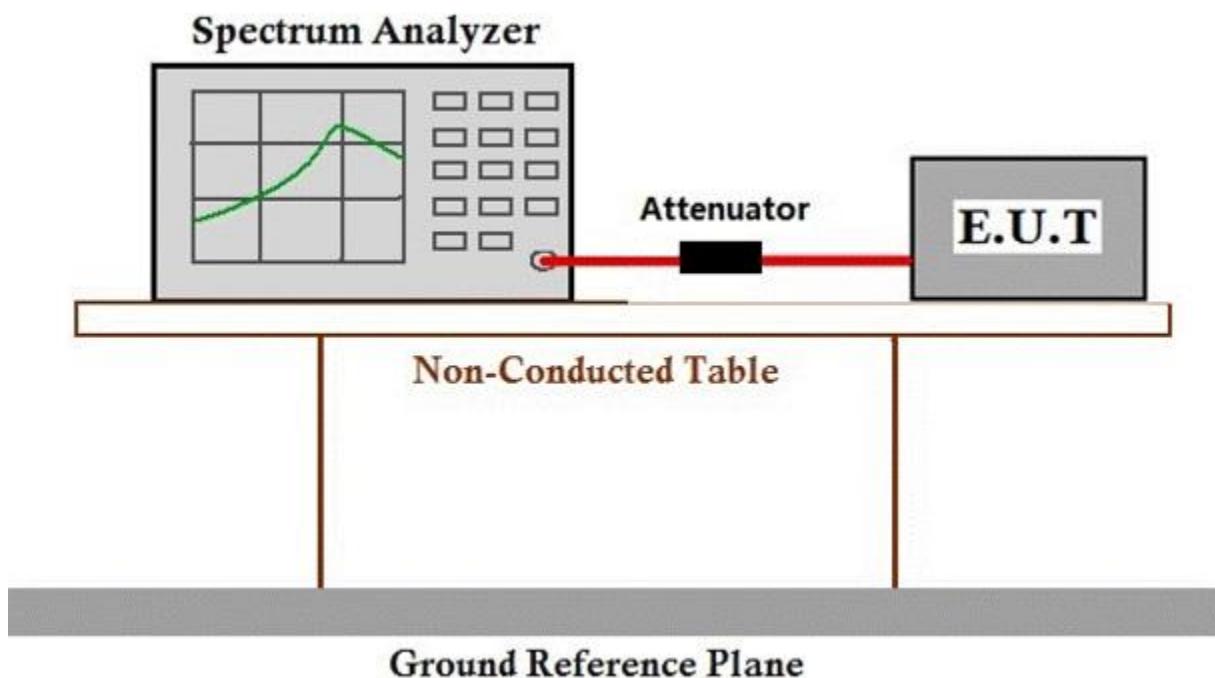
## 7.4 Power Spectrum Density

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: 24.3 °C Humidity: 61.9 % 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). 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

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## 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))



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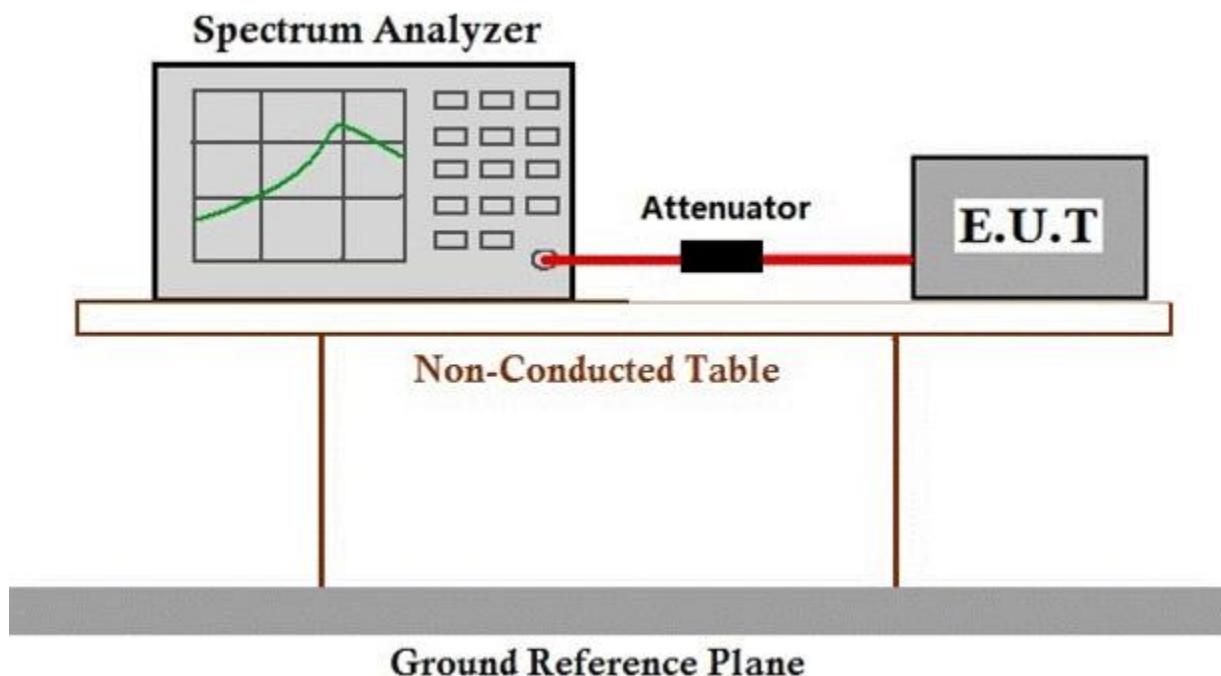
### 7.5.1 E.U.T. Operation

#### Operating Environment:

Temperature: 24.3 °C Humidity: 61.9 % 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). 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

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## 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))



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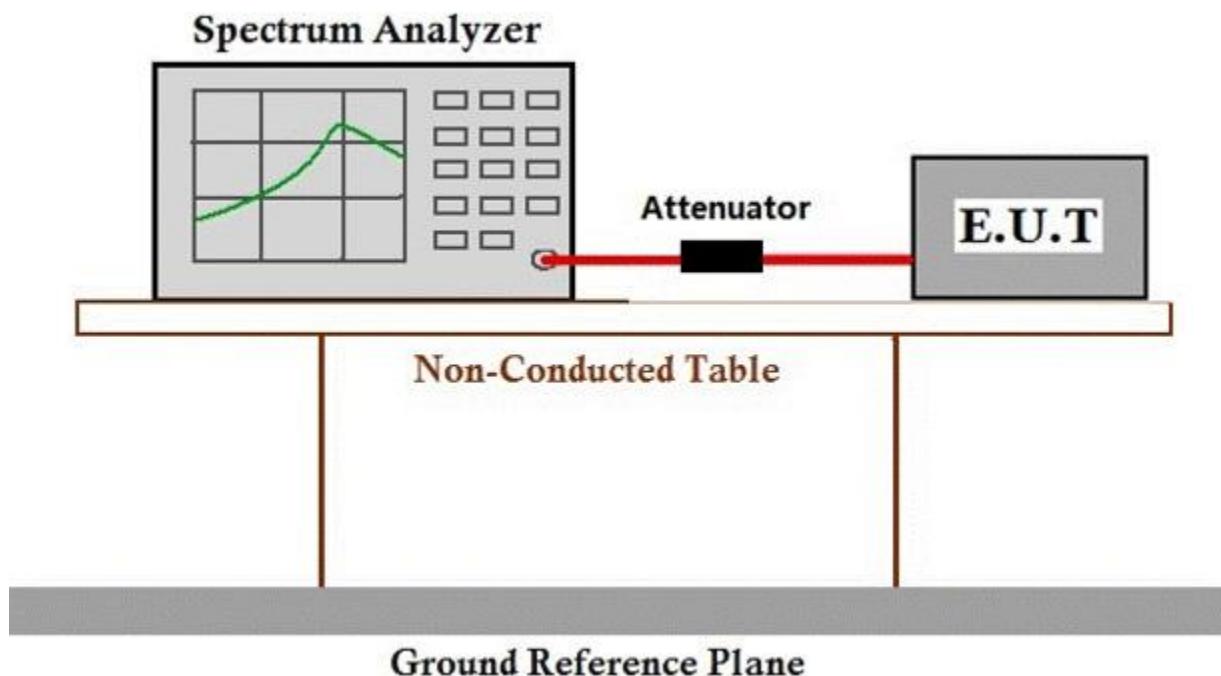
### 7.6.1 E.U.T. Operation

#### Operating Environment:

Temperature: 24.3 °C      Humidity: 61.9 % 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). 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

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## 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.



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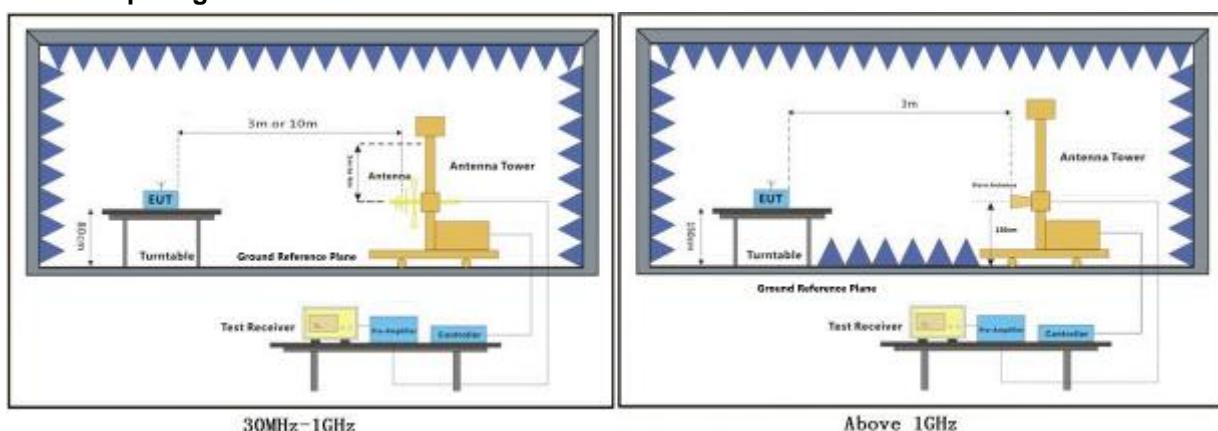
### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C      Humidity: 55 % 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). Only the data of worst case is recorded in the report.

### 7.7.2 Test Setup Diagram



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### 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



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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	40.59	26.25	5.03	37.44	34.43	54.00	-19.57	HORIZONTAL	Average
2	2310.000	50.69	26.25	5.03	37.44	44.53	74.00	-29.47	HORIZONTAL	Peak
3	2390.000	42.29	26.43	4.88	37.42	36.18	54.00	-17.82	HORIZONTAL	Average
4	2390.000	52.63	26.43	4.88	37.42	46.52	74.00	-27.48	HORIZONTAL	Peak
5	2483.500	40.19	26.58	5.23	37.40	34.60	54.00	-19.40	HORIZONTAL	Average
6	2483.500	54.34	26.58	5.23	37.40	48.75	74.00	-25.25	HORIZONTAL	Peak
7	2500.000	40.85	26.60	4.95	37.39	35.01	54.00	-18.99	HORIZONTAL	Average
8	2500.000	54.61	26.60	4.95	37.39	48.77	74.00	-25.23	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	38.75	26.25	5.03	37.44	32.59	54.00	-21.41	VERTICAL	Average
2	2310.000	50.46	26.25	5.03	37.44	44.30	74.00	-29.70	VERTICAL	Peak
3	2390.000	40.44	26.43	4.88	37.42	34.33	54.00	-19.67	VERTICAL	Average
4	2390.000	51.14	26.43	4.88	37.42	45.03	74.00	-28.97	VERTICAL	Peak
5	2483.500	39.79	26.58	5.23	37.40	34.20	54.00	-19.80	VERTICAL	Average
6	2483.500	51.37	26.58	5.23	37.40	45.78	74.00	-28.22	VERTICAL	Peak
7	2500.000	38.31	26.60	4.95	37.39	32.47	54.00	-21.53	VERTICAL	Average
8	2500.000	51.08	26.60	4.95	37.39	45.24	74.00	-28.76	VERTICAL	Peak

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

Freq	ReadAntenna		Cable Preamp		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	34.84	26.25	5.03	37.44	28.68	54.00	-25.32 HORIZONTAL Average
2	2310.000	47.17	26.25	5.03	37.44	41.01	74.00	-32.99 HORIZONTAL Peak
3	2390.000	36.64	26.43	4.88	37.42	30.53	54.00	-23.47 HORIZONTAL Average
4	2390.000	50.22	26.43	4.88	37.42	44.11	74.00	-29.89 HORIZONTAL Peak
5	2483.500	43.63	26.58	5.23	37.40	38.04	54.00	-15.96 HORIZONTAL Average
6	2483.500	57.65	26.58	5.23	37.40	52.06	74.00	-21.94 HORIZONTAL Peak
7	2500.000	42.57	26.60	4.95	37.39	36.73	54.00	-17.27 HORIZONTAL Average
8	2500.000	55.67	26.60	4.95	37.39	49.83	74.00	-24.17 HORIZONTAL Peak

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

Freq	ReadAntenna		Cable Preamp		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	34.24	26.25	5.03	37.44	28.08	54.00	-25.92 VERTICAL Average
2	2310.000	46.81	26.25	5.03	37.44	40.65	74.00	-33.35 VERTICAL Peak
3	2390.000	36.31	26.43	4.88	37.42	30.20	54.00	-23.80 VERTICAL Average
4	2390.000	47.00	26.43	4.88	37.42	40.89	74.00	-33.11 VERTICAL Peak
5	2483.500	37.55	26.58	5.23	37.40	31.96	54.00	-22.04 VERTICAL Average
6	2483.500	51.10	26.58	5.23	37.40	45.51	74.00	-28.49 VERTICAL Peak
7	2500.000	35.90	26.60	4.95	37.39	30.06	54.00	-23.94 VERTICAL Average
8	2500.000	49.68	26.60	4.95	37.39	43.84	74.00	-30.16 VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	45.66	26.25	5.03	37.44	39.50	54.00	-14.50	HORIZONTAL	Average
2	2310.000	56.37	26.25	5.03	37.44	50.21	74.00	-23.79	HORIZONTAL	Peak
3	2390.000	51.29	26.43	4.88	37.42	45.18	54.00	-8.82	HORIZONTAL	Average
4	2390.000	68.36	26.43	4.88	37.42	62.25	74.00	-11.75	HORIZONTAL	Peak
5	2483.500	48.59	26.58	5.23	37.40	43.00	54.00	-11.00	HORIZONTAL	Average
6	2483.500	66.43	26.58	5.23	37.40	60.84	74.00	-13.16	HORIZONTAL	Peak
7	2500.000	48.43	26.60	4.95	37.39	42.59	54.00	-11.41	HORIZONTAL	Average
8	2500.000	66.20	26.60	4.95	37.39	60.36	74.00	-13.64	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	35.33	26.25	5.03	37.44	29.17	54.00	-24.83	VERTICAL	Average
2	2310.000	47.40	26.25	5.03	37.44	41.24	74.00	-32.76	VERTICAL	Peak
3	2390.000	47.29	26.43	4.88	37.42	41.18	54.00	-12.82	VERTICAL	Average
4	2390.000	59.84	26.43	4.88	37.42	53.73	74.00	-20.27	VERTICAL	Peak
5	2483.500	42.61	26.58	5.23	37.40	37.02	54.00	-16.98	VERTICAL	Average
6	2483.500	57.34	26.58	5.23	37.40	51.75	74.00	-22.25	VERTICAL	Peak
7	2500.000	42.65	26.60	4.95	37.39	36.81	54.00	-17.19	VERTICAL	Average
8	2500.000	57.23	26.60	4.95	37.39	51.39	74.00	-22.61	VERTICAL	Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	37.49	26.25	5.03	37.44	31.33	54.00	-22.67	HORIZONTAL Average
2	2310.000	50.82	26.25	5.03	37.44	44.66	74.00	-29.34	HORIZONTAL Peak
3	2390.000	43.69	26.43	4.88	37.42	37.58	54.00	-16.42	HORIZONTAL Average
4	2390.000	56.65	26.43	4.88	37.42	50.54	74.00	-23.46	HORIZONTAL Peak
5	2483.500	52.19	26.58	5.23	37.40	46.60	74.00	-27.40	HORIZONTAL Peak
6	2483.500	69.72	26.58	5.23	37.40	64.13	74.00	-9.87	HORIZONTAL Peak
7	2500.000	51.28	26.60	4.95	37.39	45.44	54.00	-8.56	HORIZONTAL Average
8	2500.000	68.39	26.60	4.95	37.39	62.55	74.00	-11.45	HORIZONTAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	33.01	26.25	5.03	37.44	26.85	54.00	-27.15	VERTICAL Average
2	2310.000	46.87	26.25	5.03	37.44	40.71	74.00	-33.29	VERTICAL Peak
3	2390.000	38.17	26.43	4.88	37.42	32.06	54.00	-21.94	VERTICAL Average
4	2390.000	51.89	26.43	4.88	37.42	45.78	74.00	-28.22	VERTICAL Peak
5	2483.500	50.63	26.58	5.23	37.40	45.04	54.00	-8.96	VERTICAL Average
6	2483.500	63.72	26.58	5.23	37.40	58.13	74.00	-15.87	VERTICAL Peak
7	2500.000	47.33	26.60	4.95	37.39	41.49	54.00	-12.51	VERTICAL Average
8	2500.000	62.07	26.60	4.95	37.39	56.23	74.00	-17.77	VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	41.45	26.25	5.03	37.44	35.29	54.00	-18.71	HORIZONTAL Average
2	2310.000	54.20	26.25	5.03	37.44	48.04	74.00	-25.96	HORIZONTAL Peak
3	2390.000	48.57	26.43	4.88	37.42	42.46	54.00	-11.54	HORIZONTAL Average
4	2390.000	60.57	26.43	4.88	37.42	54.46	74.00	-19.54	HORIZONTAL Peak
5	2483.500	48.74	26.58	5.23	37.40	43.15	54.00	-10.85	HORIZONTAL Average
6	2483.500	63.40	26.58	5.23	37.40	57.81	74.00	-16.19	HORIZONTAL Peak
7	2500.000	47.11	26.60	4.95	37.39	41.27	54.00	-12.73	HORIZONTAL Average
8	2500.000	62.64	26.60	4.95	37.39	56.80	74.00	-17.20	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				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	37.18	26.25	5.03	37.44	31.02	54.00	-22.98	VERTICAL Average
2	2310.000	49.21	26.25	5.03	37.44	43.05	74.00	-30.95	VERTICAL Peak
3	2390.000	45.63	26.43	4.88	37.42	39.52	54.00	-14.48	VERTICAL Average
4	2390.000	58.34	26.43	4.88	37.42	52.23	74.00	-21.77	VERTICAL Peak
5	2483.500	44.13	26.58	5.23	37.40	38.54	54.00	-15.46	VERTICAL Average
6	2483.500	57.64	26.58	5.23	37.40	52.05	74.00	-21.95	VERTICAL Peak
7	2500.000	43.04	26.60	4.95	37.39	37.20	54.00	-16.80	VERTICAL Average
8	2500.000	57.49	26.60	4.95	37.39	51.65	74.00	-22.35	VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	40.10	26.25	5.03	37.44	33.94	54.00	-20.06	HORIZONTAL	Average
2	2310.000	51.78	26.25	5.03	37.44	45.62	74.00	-28.38	HORIZONTAL	Peak
3	2390.000	48.86	26.43	4.88	37.42	42.75	54.00	-11.25	HORIZONTAL	Average
4	2390.000	58.61	26.43	4.88	37.42	52.50	74.00	-21.50	HORIZONTAL	Peak
5	2483.500	46.72	26.58	5.23	37.40	41.13	54.00	-12.87	HORIZONTAL	Average
6	2483.500	60.61	26.58	5.23	37.40	55.02	74.00	-18.98	HORIZONTAL	Peak
7	2500.000	46.42	26.60	4.95	37.39	40.58	54.00	-13.42	HORIZONTAL	Average
8	2500.000	60.23	26.60	4.95	37.39	54.39	74.00	-19.61	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	37.41	26.25	5.03	37.44	31.25	54.00	-22.75	VERTICAL	Average
2	2310.000	48.26	26.25	5.03	37.44	42.10	74.00	-31.90	VERTICAL	Peak
3	2390.000	46.29	26.43	4.88	37.42	40.18	54.00	-13.82	VERTICAL	Average
4	2390.000	57.64	26.43	4.88	37.42	51.53	74.00	-22.47	VERTICAL	Peak
5	2483.500	43.21	26.58	5.23	37.40	37.62	54.00	-16.38	VERTICAL	Average
6	2483.500	57.45	26.58	5.23	37.40	51.86	74.00	-22.14	VERTICAL	Peak
7	2500.000	43.13	26.60	4.95	37.39	37.29	54.00	-16.71	VERTICAL	Average
8	2500.000	56.86	26.60	4.95	37.39	51.02	74.00	-22.98	VERTICAL	Peak

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## 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.



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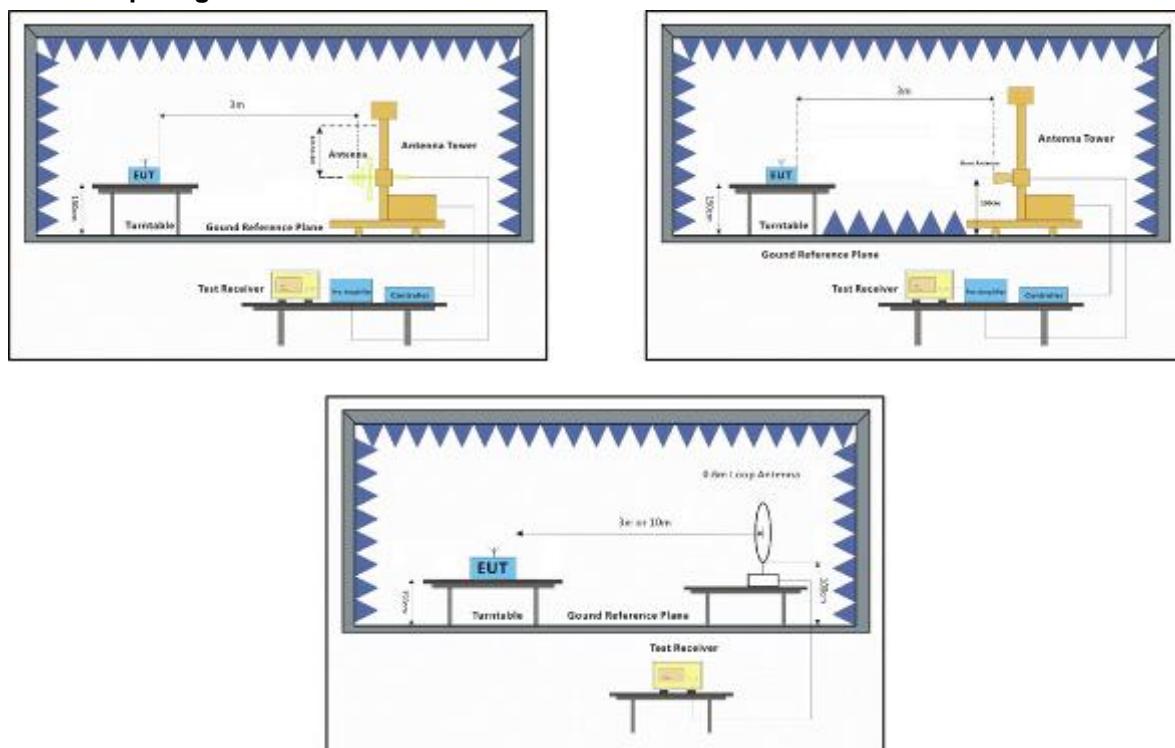
### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C      Humidity: 55 % 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). Only the data of worst case is recorded in the report.

### 7.8.2 Test Setup Diagram



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### 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



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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	50.409	23.90	12.98	0.60	29.50	7.98	40.00	-32.02 HORIZONTAL QP
2	120.277	32.99	11.52	0.92	29.40	16.03	43.50	-27.47 HORIZONTAL QP
3	174.424	26.38	12.84	1.32	29.40	11.14	43.50	-32.36 HORIZONTAL QP
4	520.888	28.83	18.58	2.31	29.60	20.12	46.00	-25.88 HORIZONTAL QP
5	716.682	28.97	21.57	3.49	29.43	24.60	46.00	-21.40 HORIZONTAL QP
6	878.322	31.36	23.88	2.91	28.90	29.17	46.00	-16.83 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				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	4098.010	33.24	29.58	6.92	36.90	32.84	54.00	-21.16 HORIZONTAL Average
2	4098.010	45.19	29.58	6.92	36.90	44.79	74.00	-29.21 HORIZONTAL Peak
3	4824.016	48.94	30.82	6.01	36.94	48.83	54.00	-5.17 HORIZONTAL Average
4	4824.016	52.61	30.82	6.01	36.94	52.50	74.00	-21.50 HORIZONTAL Peak
5	7236.172	33.19	35.55	7.35	36.93	39.16	54.00	-14.84 HORIZONTAL Average
6	7236.172	45.16	35.55	7.35	36.93	51.13	74.00	-22.87 HORIZONTAL Peak
7	8738.852	31.78	36.30	7.98	36.96	39.10	54.00	-14.90 HORIZONTAL Average
8	8738.852	44.19	36.30	7.98	36.96	51.51	74.00	-22.49 HORIZONTAL Peak
9	9648.371	31.38	37.54	8.18	37.08	40.02	54.00	-13.98 HORIZONTAL Average
10	9648.371	44.58	37.54	8.18	37.08	53.22	74.00	-20.78 HORIZONTAL Peak
11	12060.420	27.26	39.46	10.71	37.17	40.26	54.00	-13.74 HORIZONTAL Average
12	12060.420	40.97	39.46	10.71	37.17	53.97	74.00	-20.03 HORIZONTAL Peak

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Guangzhou Branch**

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

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	30.962	24.28	12.22	0.07	29.83	6.74	40.00	-33.26 VERTICAL QP
2	48.502	24.10	12.97	0.63	29.51	8.19	40.00	-31.81 VERTICAL QP
3	120.699	30.35	11.54	0.92	29.40	13.41	43.50	-30.09 VERTICAL QP
4	180.649	26.68	12.67	1.34	29.40	11.29	43.50	-32.21 VERTICAL QP
5	656.530	27.98	21.12	2.12	29.48	21.74	46.00	-24.26 VERTICAL QP
6	878.322	29.69	23.88	2.91	28.90	27.50	46.00	-18.50 VERTICAL QP

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

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	4824.016	50.27	30.82	6.01	36.94	50.16	54.00	-3.84 VERTICAL Average
2	4824.016	53.65	30.82	6.01	36.94	53.54	74.00	-20.46 VERTICAL Peak
3	5864.443	31.93	32.22	7.44	37.00	34.59	54.00	-19.41 VERTICAL Average
4	5864.443	44.28	32.22	7.44	37.00	46.94	74.00	-27.06 VERTICAL Peak
5	7236.052	31.67	35.55	7.35	36.93	37.64	54.00	-16.36 VERTICAL Average
6	7236.052	45.50	35.55	7.35	36.93	51.47	74.00	-22.53 VERTICAL Peak
7	8638.399	31.93	36.20	7.96	36.95	39.14	54.00	-14.86 VERTICAL Average
8	8638.399	44.41	36.20	7.96	36.95	51.62	74.00	-22.38 VERTICAL Peak
9	9648.151	30.13	37.54	8.18	37.08	38.77	54.00	-15.23 VERTICAL Average
10	9648.151	44.76	37.54	8.18	37.08	53.40	74.00	-20.60 VERTICAL Peak
11	12060.270	28.11	39.46	10.71	37.17	41.11	54.00	-12.89 VERTICAL Average
12	12060.270	42.23	39.46	10.71	37.17	55.23	74.00	-18.77 VERTICAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3252.005	41.04	27.90	5.83	37.00	37.77	54.00	-16.23 HORIZONTAL Average
2	3252.005	50.02	27.90	5.83	37.00	46.75	74.00	-27.25 HORIZONTAL Peak
3	4884.151	45.43	30.95	6.86	36.95	46.29	54.00	-7.71 HORIZONTAL Average
4	4884.151	52.06	30.95	6.86	36.95	52.92	74.00	-21.08 HORIZONTAL Peak
5	7326.267	34.51	35.74	7.39	36.92	40.72	54.00	-13.28 HORIZONTAL Average
6	7326.267	45.85	35.74	7.39	36.92	52.06	74.00	-21.94 HORIZONTAL Peak
7	8588.607	31.25	36.16	7.98	36.95	38.44	54.00	-15.56 HORIZONTAL Average
8	8588.607	45.21	36.16	7.98	36.95	52.40	74.00	-21.60 HORIZONTAL Peak
9	9768.710	31.62	37.74	8.37	37.09	40.64	54.00	-13.36 HORIZONTAL Average
10	9768.710	43.92	37.74	8.37	37.09	52.94	74.00	-21.06 HORIZONTAL Peak
11	12210.380	28.66	39.21	10.98	37.06	41.79	54.00	-12.21 HORIZONTAL Average
12	12210.380	42.14	39.21	10.98	37.06	55.27	74.00	-18.73 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				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3790.361	32.59	28.97	7.83	36.92	32.47	54.00	-21.53 VERTICAL Average
2	3790.361	45.17	28.97	7.83	36.92	45.05	74.00	-28.95 VERTICAL Peak
3	4884.948	47.63	30.95	6.86	36.95	48.49	54.00	-5.51 VERTICAL Average
4	4884.948	53.14	30.95	6.86	36.95	54.00	74.00	-20.00 VERTICAL Peak
5	7326.646	34.35	35.74	7.39	36.92	40.56	54.00	-13.44 VERTICAL Average
6	7326.646	44.85	35.74	7.39	36.92	51.06	74.00	-22.94 VERTICAL Peak
7	8764.146	31.01	36.33	8.00	36.97	38.37	54.00	-15.63 VERTICAL Average
8	8764.146	44.57	36.33	8.00	36.97	51.93	74.00	-22.07 VERTICAL Peak
9	9768.717	30.88	37.74	8.37	37.09	39.90	54.00	-14.10 VERTICAL Average
10	9768.717	44.26	37.74	8.37	37.09	53.28	74.00	-20.72 VERTICAL Peak
11	12210.390	29.39	39.21	10.98	37.06	42.52	54.00	-11.48 VERTICAL Average
12	12210.390	41.78	39.21	10.98	37.06	54.91	74.00	-19.09 VERTICAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3280.326	43.17	27.90	5.75	36.99	39.83	54.00	-14.17 HORIZONTAL Average
2	3280.326	51.54	27.90	5.75	36.99	48.20	74.00	-25.80 HORIZONTAL Peak
3	4924.490	46.81	31.01	7.49	36.95	48.36	54.00	-5.64 HORIZONTAL Average
4	4924.490	50.48	31.01	7.49	36.95	52.03	74.00	-21.97 HORIZONTAL Peak
5	7386.006	33.14	35.85	7.42	36.92	39.49	54.00	-14.51 HORIZONTAL Average
6	7386.006	44.36	35.85	7.42	36.92	50.71	74.00	-23.29 HORIZONTAL Peak
7	8943.274	32.01	36.47	8.18	37.00	39.66	54.00	-14.34 HORIZONTAL Average
8	8943.274	44.03	36.47	8.18	37.00	51.68	74.00	-22.32 HORIZONTAL Peak
9	9848.371	32.17	37.82	8.46	37.09	41.36	54.00	-12.64 HORIZONTAL Average
10	9848.371	44.56	37.82	8.46	37.09	53.75	74.00	-20.25 HORIZONTAL Peak
11	12310.070	28.56	39.03	11.10	36.97	41.72	54.00	-12.28 HORIZONTAL Average
12	12310.070	41.60	39.03	11.10	36.97	54.76	74.00	-19.24 HORIZONTAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3252.005	37.27	27.90	5.83	37.00	34.00	54.00	-20.00 VERTICAL Average
2	3252.005	48.23	27.90	5.83	37.00	44.96	74.00	-29.04 VERTICAL Peak
3	4924.490	48.63	31.01	7.49	36.95	50.18	54.00	-3.82 VERTICAL Average
4	4924.490	51.81	31.01	7.49	36.95	53.36	74.00	-20.64 VERTICAL Peak
5	7386.122	32.70	35.85	7.42	36.92	39.05	54.00	-14.95 VERTICAL Average
6	7386.122	44.44	35.85	7.42	36.92	50.79	74.00	-23.21 VERTICAL Peak
7	8764.146	31.51	36.33	8.00	36.97	38.87	54.00	-15.13 VERTICAL Average
8	8764.146	44.03	36.33	8.00	36.97	51.39	74.00	-22.61 VERTICAL Peak
9	9848.349	31.56	37.82	8.46	37.09	40.75	54.00	-13.25 VERTICAL Average
10	9848.349	45.43	37.82	8.46	37.09	54.62	74.00	-19.38 VERTICAL Peak
11	12310.450	29.36	39.03	11.10	36.97	42.52	54.00	-11.48 VERTICAL Average
12	12310.450	42.01	39.03	11.10	36.97	55.17	74.00	-18.83 VERTICAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	31.955	24.43	12.25	0.11	29.81	6.98	40.00	-33.02 HORIZONTAL QP
2	61.995	30.90	12.00	0.60	29.46	14.04	40.00	-25.96 HORIZONTAL QP
3	120.277	31.02	11.52	0.92	29.40	14.06	43.50	-29.44 HORIZONTAL QP
4	144.335	28.94	13.15	1.09	29.40	13.78	43.50	-29.72 HORIZONTAL QP
5	656.530	28.53	21.12	2.12	29.48	22.29	46.00	-23.71 HORIZONTAL QP
6	878.322	30.18	23.88	2.91	28.90	27.99	46.00	-18.01 HORIZONTAL QP

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3214.623	38.42	27.90	5.91	37.01	35.22	54.00	-18.78 HORIZONTAL Average
2	3214.623	50.17	27.90	5.91	37.01	46.97	74.00	-27.03 HORIZONTAL Peak
3	4824.016	34.97	30.82	6.01	36.94	34.86	54.00	-19.14 HORIZONTAL Average
4	4824.016	46.48	30.82	6.01	36.94	46.37	74.00	-27.63 HORIZONTAL Peak
5	7236.015	31.85	35.55	7.35	36.93	37.82	54.00	-16.18 HORIZONTAL Average
6	7236.015	44.61	35.55	7.35	36.93	50.58	74.00	-23.42 HORIZONTAL Peak
7	8764.146	31.95	36.33	8.00	36.97	39.31	54.00	-14.69 HORIZONTAL Average
8	8764.146	44.65	36.33	8.00	36.97	52.01	74.00	-21.99 HORIZONTAL Peak
9	9648.018	30.72	37.54	8.18	37.08	39.36	54.00	-14.64 HORIZONTAL Average
10	9648.018	45.86	37.54	8.18	37.08	54.50	74.00	-19.50 HORIZONTAL Peak
11	12060.350	28.50	39.46	10.71	37.17	41.50	54.00	-12.50 HORIZONTAL Average
12	12060.350	41.20	39.46	10.71	37.17	54.20	74.00	-19.80 HORIZONTAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	50.409	24.43	12.98	0.60	29.50	8.51	40.00	-31.49 VERTICAL QP
2	61.995	24.61	12.00	0.60	29.46	7.75	40.00	-32.25 VERTICAL QP
3	121.123	33.10	11.57	0.92	29.40	16.19	43.50	-27.31 VERTICAL QP
4	162.611	26.00	13.33	1.28	29.40	11.21	43.50	-32.29 VERTICAL QP
5	570.610	29.89	20.14	1.94	29.53	22.44	46.00	-23.56 VERTICAL QP
6	878.322	31.13	23.88	2.91	28.90	28.94	46.00	-17.06 VERTICAL QP

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3214.623	39.20	27.90	5.91	37.01	36.00	54.00	-18.00 VERTICAL Average
2	3214.623	49.92	27.90	5.91	37.01	46.72	74.00	-27.28 VERTICAL Peak
3	4824.016	33.45	30.82	6.01	36.94	33.34	54.00	-20.66 VERTICAL Average
4	4824.016	45.80	30.82	6.01	36.94	45.69	74.00	-28.31 VERTICAL Peak
5	7236.267	31.99	35.55	7.35	36.93	37.96	54.00	-16.04 VERTICAL Average
6	7236.267	44.46	35.55	7.35	36.93	50.43	74.00	-23.57 VERTICAL Peak
7	8738.852	31.71	36.30	7.98	36.96	39.03	54.00	-14.97 VERTICAL Average
8	8738.852	44.51	36.30	7.98	36.96	51.83	74.00	-22.17 VERTICAL Peak
9	9648.018	32.44	37.54	8.18	37.08	41.08	54.00	-12.92 VERTICAL Average
10	9648.018	45.32	37.54	8.18	37.08	53.96	74.00	-20.04 VERTICAL Peak
11	12060.470	27.19	39.46	10.71	37.17	40.19	54.00	-13.81 VERTICAL Average
12	12060.470	40.45	39.46	10.71	37.17	53.45	74.00	-20.55 VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor	Level				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3252.005	40.94	27.90	5.83	37.00	37.67	54.00	-16.33	HORIZONTAL Average
2	3252.005	50.44	27.90	5.83	37.00	47.17	74.00	-26.83	HORIZONTAL Peak
3	4884.977	34.76	30.95	6.86	36.95	35.62	54.00	-18.38	HORIZONTAL Average
4	4884.977	46.69	30.95	6.86	36.95	47.55	74.00	-26.45	HORIZONTAL Peak
5	7326.015	32.49	35.74	7.39	36.92	38.70	54.00	-15.30	HORIZONTAL Average
6	7326.015	44.99	35.74	7.39	36.92	51.20	74.00	-22.80	HORIZONTAL Peak
7	8764.146	34.41	36.33	8.00	36.97	41.77	54.00	-12.23	HORIZONTAL Average
8	8764.146	45.18	36.33	8.00	36.97	52.54	74.00	-21.46	HORIZONTAL Peak
9	9768.018	31.04	37.74	8.37	37.09	40.06	54.00	-13.94	HORIZONTAL Average
10	9768.018	44.76	37.74	8.37	37.09	53.78	74.00	-20.22	HORIZONTAL Peak
11	12210.600	28.44	39.21	10.98	37.06	41.57	54.00	-12.43	HORIZONTAL Average
12	12210.600	41.24	39.21	10.98	37.06	54.37	74.00	-19.63	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				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3252.005	37.07	27.90	5.83	37.00	33.80	54.00	-20.20	VERTICAL Average
2	3252.005	48.23	27.90	5.83	37.00	44.96	74.00	-29.04	VERTICAL Peak
3	4884.993	35.20	30.95	6.86	36.95	36.06	54.00	-17.94	VERTICAL Average
4	4884.993	47.20	30.95	6.86	36.95	48.06	74.00	-25.94	VERTICAL Peak
5	7326.052	31.45	35.74	7.39	36.92	37.66	54.00	-16.34	VERTICAL Average
6	7326.052	44.64	35.74	7.39	36.92	50.85	74.00	-23.15	VERTICAL Peak
7	8588.607	33.15	36.16	7.98	36.95	40.34	54.00	-13.66	VERTICAL Average
8	8588.607	45.63	36.16	7.98	36.95	52.82	74.00	-21.18	VERTICAL Peak
9	9768.349	31.56	37.74	8.37	37.09	40.58	54.00	-13.42	VERTICAL Average
10	9768.349	45.05	37.74	8.37	37.09	54.07	74.00	-19.93	VERTICAL Peak
11	12210.280	29.48	39.21	10.98	37.06	42.61	54.00	-11.39	VERTICAL Average
12	12210.280	41.89	39.21	10.98	37.06	55.02	74.00	-18.98	VERTICAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3252.005	43.06	27.90	5.83	37.00	39.79	54.00	-14.21 HORIZONTAL Average
2	3252.005	51.23	27.90	5.83	37.00	47.96	74.00	-26.04 HORIZONTAL Peak
3	4924.058	33.75	31.01	7.49	36.95	35.30	54.00	-18.70 HORIZONTAL Average
4	4924.058	45.15	31.01	7.49	36.95	46.70	74.00	-27.30 HORIZONTAL Peak
5	7386.172	32.52	35.85	7.42	36.92	38.87	54.00	-15.13 HORIZONTAL Average
6	7386.172	44.14	35.85	7.42	36.92	50.49	74.00	-23.51 HORIZONTAL Peak
7	8663.404	31.47	36.22	7.95	36.96	38.68	54.00	-15.32 HORIZONTAL Average
8	8663.404	44.37	36.22	7.95	36.96	51.58	74.00	-22.42 HORIZONTAL Peak
9	9848.018	32.94	37.82	8.46	37.09	42.13	54.00	-11.87 HORIZONTAL Average
10	9848.018	44.03	37.82	8.46	37.09	53.22	74.00	-20.78 HORIZONTAL Peak
11	12310.380	29.18	39.03	11.10	36.97	42.34	54.00	-11.66 HORIZONTAL Average
12	12310.380	42.01	39.03	11.10	36.97	55.17	74.00	-18.83 HORIZONTAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3823.371	34.52	29.08	7.83	36.91	34.52	54.00	-19.48 VERTICAL Average
2	3823.371	44.16	29.08	7.83	36.91	44.16	74.00	-29.84 VERTICAL Peak
3	4924.490	32.85	31.01	7.49	36.95	34.40	54.00	-19.60 VERTICAL Average
4	4924.490	45.32	31.01	7.49	36.95	46.87	74.00	-27.13 VERTICAL Peak
5	7386.070	32.63	35.85	7.42	36.92	38.98	54.00	-15.02 VERTICAL Average
6	7386.070	44.29	35.85	7.42	36.92	50.64	74.00	-23.36 VERTICAL Peak
7	8688.480	30.36	36.25	7.94	36.96	37.59	54.00	-16.41 VERTICAL Average
8	8688.480	44.78	36.25	7.94	36.96	52.01	74.00	-21.99 VERTICAL Peak
9	9848.430	31.71	37.82	8.46	37.09	40.90	54.00	-13.10 VERTICAL Average
10	9848.430	44.38	37.82	8.46	37.09	53.57	74.00	-20.43 VERTICAL Peak
11	12310.600	27.72	39.03	11.10	36.97	40.88	54.00	-13.12 VERTICAL Average
12	12310.600	41.36	39.03	11.10	36.97	54.52	74.00	-19.48 VERTICAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	49.359	23.60	12.99	0.61	29.50	7.70	40.00	-32.30 HORIZONTAL QP
2	72.592	26.05	10.34	0.74	29.41	7.72	40.00	-32.28 HORIZONTAL QP
3	120.277	31.94	11.52	0.92	29.40	14.98	43.50	-28.52 HORIZONTAL QP
4	144.335	29.35	13.15	1.09	29.40	14.19	43.50	-29.31 HORIZONTAL QP
5	716.682	28.30	21.57	3.49	29.43	23.93	46.00	-22.07 HORIZONTAL QP
6	878.322	31.93	23.88	2.91	28.90	29.74	46.00	-16.26 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				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3177.672	39.18	27.90	5.86	37.01	35.93	54.00	-18.07 HORIZONTAL Average
2	3177.672	50.22	27.90	5.86	37.01	46.97	74.00	-27.03 HORIZONTAL Peak
3	4824.631	34.00	30.82	6.01	36.94	33.89	54.00	-20.11 HORIZONTAL Average
4	4824.631	46.27	30.82	6.01	36.94	46.16	74.00	-27.84 HORIZONTAL Peak
5	7236.309	30.10	35.55	7.35	36.93	36.07	54.00	-17.93 HORIZONTAL Average
6	7236.309	43.66	35.55	7.35	36.93	49.63	74.00	-24.37 HORIZONTAL Peak
7	8588.607	30.76	36.16	7.98	36.95	37.95	54.00	-16.05 HORIZONTAL Average
8	8588.607	44.31	36.16	7.98	36.95	51.50	74.00	-22.50 HORIZONTAL Peak
9	9648.684	30.27	37.54	8.18	37.08	38.91	54.00	-15.09 HORIZONTAL Average
10	9648.684	45.08	37.54	8.18	37.08	53.72	74.00	-20.28 HORIZONTAL Peak
11	12060.270	28.64	39.46	10.71	37.17	41.64	54.00	-12.36 HORIZONTAL Average
12	12060.270	41.95	39.46	10.71	37.17	54.95	74.00	-19.05 HORIZONTAL Peak

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

Freq	ReadAntenna		Cable Preamp		Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	42.600	23.83	12.68	0.66	29.55	7.62	40.00	-32.38 VERTICAL QP
2	55.221	23.88	12.54	0.59	29.49	7.52	40.00	-32.48 VERTICAL QP
3	121.123	31.87	11.57	0.92	29.40	14.96	43.50	-28.54 VERTICAL QP
4	157.007	26.32	13.37	1.25	29.40	11.54	43.50	-31.96 VERTICAL QP
5	556.774	30.04	19.78	2.04	29.54	22.32	46.00	-23.68 VERTICAL QP
6	878.322	30.66	23.88	2.91	28.90	28.47	46.00	-17.53 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				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3214.623	38.57	27.90	5.91	37.01	35.37	54.00	-18.63 VERTICAL Average
2	3214.623	49.18	27.90	5.91	37.01	45.98	74.00	-28.02 VERTICAL Peak
3	4824.016	34.85	30.82	6.01	36.94	34.74	54.00	-19.26 VERTICAL Average
4	4824.016	46.05	30.82	6.01	36.94	45.94	74.00	-28.06 VERTICAL Peak
5	7236.741	30.78	35.55	7.35	36.93	36.75	54.00	-17.25 VERTICAL Average
6	7236.741	44.64	35.55	7.35	36.93	50.61	74.00	-23.39 VERTICAL Peak
7	8738.852	31.81	36.30	7.98	36.96	39.13	54.00	-14.87 VERTICAL Average
8	8738.852	44.93	36.30	7.98	36.96	52.25	74.00	-21.75 VERTICAL Peak
9	9648.151	31.75	37.54	8.18	37.08	40.39	54.00	-13.61 VERTICAL Average
10	9648.151	44.54	37.54	8.18	37.08	53.18	74.00	-20.82 VERTICAL Peak
11	12060.250	28.30	39.46	10.71	37.17	41.30	54.00	-12.70 VERTICAL Average
12	12060.250	41.68	39.46	10.71	37.17	54.68	74.00	-19.32 VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss	Factor					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3890.255	33.21	29.27	7.61	36.91	33.18	54.00	-20.82	HORIZONTAL Average
2	3890.255	45.18	29.27	7.61	36.91	45.15	74.00	-28.85	HORIZONTAL Peak
3	4884.977	33.98	30.95	6.86	36.95	34.84	54.00	-19.16	HORIZONTAL Average
4	4884.977	46.70	30.95	6.86	36.95	47.56	74.00	-26.44	HORIZONTAL Peak
5	7326.267	32.25	35.74	7.39	36.92	38.46	54.00	-15.54	HORIZONTAL Average
6	7326.267	44.72	35.74	7.39	36.92	50.93	74.00	-23.07	HORIZONTAL Peak
7	8764.146	30.79	36.33	8.00	36.97	38.15	54.00	-15.85	HORIZONTAL Average
8	8764.146	44.56	36.33	8.00	36.97	51.92	74.00	-22.08	HORIZONTAL Peak
9	9768.312	30.04	37.74	8.37	37.09	39.06	54.00	-14.94	HORIZONTAL Average
10	9768.312	44.51	37.74	8.37	37.09	53.53	74.00	-20.47	HORIZONTAL Peak
11	12210.610	28.02	39.21	10.98	37.06	41.15	54.00	-12.85	HORIZONTAL Average
12	12210.610	42.37	39.21	10.98	37.06	55.50	74.00	-18.50	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					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3252.005	36.36	27.90	5.83	37.00	33.09	54.00	-20.91	VERTICAL Average
2	3252.005	49.01	27.90	5.83	37.00	45.74	74.00	-28.26	VERTICAL Peak
3	4884.151	34.65	30.95	6.86	36.95	35.51	54.00	-18.49	VERTICAL Average
4	4884.151	47.98	30.95	6.86	36.95	48.84	74.00	-25.16	VERTICAL Peak
5	7326.267	31.86	35.74	7.39	36.92	38.07	54.00	-15.93	VERTICAL Average
6	7326.267	44.85	35.74	7.39	36.92	51.06	74.00	-22.94	VERTICAL Peak
7	8789.516	31.62	36.35	8.02	36.97	39.02	54.00	-14.98	VERTICAL Average
8	8789.516	44.70	36.35	8.02	36.97	52.10	74.00	-21.90	VERTICAL Peak
9	9768.151	31.37	37.74	8.37	37.09	40.39	54.00	-13.61	VERTICAL Average
10	9768.151	45.48	37.74	8.37	37.09	54.50	74.00	-19.50	VERTICAL Peak
11	12210.390	26.02	39.21	10.98	37.06	39.15	54.00	-14.85	VERTICAL Average
12	12210.390	41.56	39.21	10.98	37.06	54.69	74.00	-19.31	VERTICAL Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	4924.751	30.40	31.01	7.49	36.95	31.95	54.00	-22.05	HORIZONTAL	Average
2	4924.751	44.13	31.01	7.49	36.95	45.68	74.00	-28.32	HORIZONTAL	Peak
3	6414.167	31.11	34.03	7.01	36.99	35.16	54.00	-18.84	HORIZONTAL	Average
4	6414.167	44.13	34.03	7.01	36.99	48.18	74.00	-25.82	HORIZONTAL	Peak
5	7386.461	29.46	35.85	7.42	36.92	35.81	54.00	-18.19	HORIZONTAL	Average
6	7386.461	44.10	35.85	7.42	36.92	50.45	74.00	-23.55	HORIZONTAL	Peak
7	8638.399	29.59	36.20	7.96	36.95	36.80	54.00	-17.20	HORIZONTAL	Average
8	8638.399	44.68	36.20	7.96	36.95	51.89	74.00	-22.11	HORIZONTAL	Peak
9	9848.349	29.07	37.82	8.46	37.09	38.26	54.00	-15.74	HORIZONTAL	Average
10	9848.349	45.37	37.82	8.46	37.09	54.56	74.00	-19.44	HORIZONTAL	Peak
11	12310.210	26.66	39.03	11.10	36.97	39.82	54.00	-14.18	HORIZONTAL	Average
12	12310.210	40.84	39.03	11.10	36.97	54.00	74.00	-20.00	HORIZONTAL	Peak

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

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Pol/Phase	Remark
	Level	Factor	Loss	Factor						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3280.326	34.89	27.90	5.75	36.99	31.55	54.00	-22.45	VERTICAL	Average
2	3280.326	47.64	27.90	5.75	36.99	44.30	74.00	-29.70	VERTICAL	Peak
3	4924.490	32.59	31.01	7.49	36.95	34.14	54.00	-19.86	VERTICAL	Average
4	4924.490	45.28	31.01	7.49	36.95	46.83	74.00	-27.17	VERTICAL	Peak
5	7386.172	30.83	35.85	7.42	36.92	37.18	54.00	-16.82	VERTICAL	Average
6	7386.172	43.84	35.85	7.42	36.92	50.19	74.00	-23.81	VERTICAL	Peak
7	8738.852	30.72	36.30	7.98	36.96	38.04	54.00	-15.96	VERTICAL	Average
8	8738.852	45.24	36.30	7.98	36.96	52.56	74.00	-21.44	VERTICAL	Peak
9	9848.689	29.24	37.82	8.46	37.09	38.43	54.00	-15.57	VERTICAL	Average
10	9848.689	43.99	37.82	8.46	37.09	53.18	74.00	-20.82	VERTICAL	Peak
11	12310.350	28.99	39.03	11.10	36.97	42.15	54.00	-11.85	VERTICAL	Average
12	12310.350	43.57	39.03	11.10	36.97	56.73	74.00	-17.27	VERTICAL	Peak

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## 8 Appendix

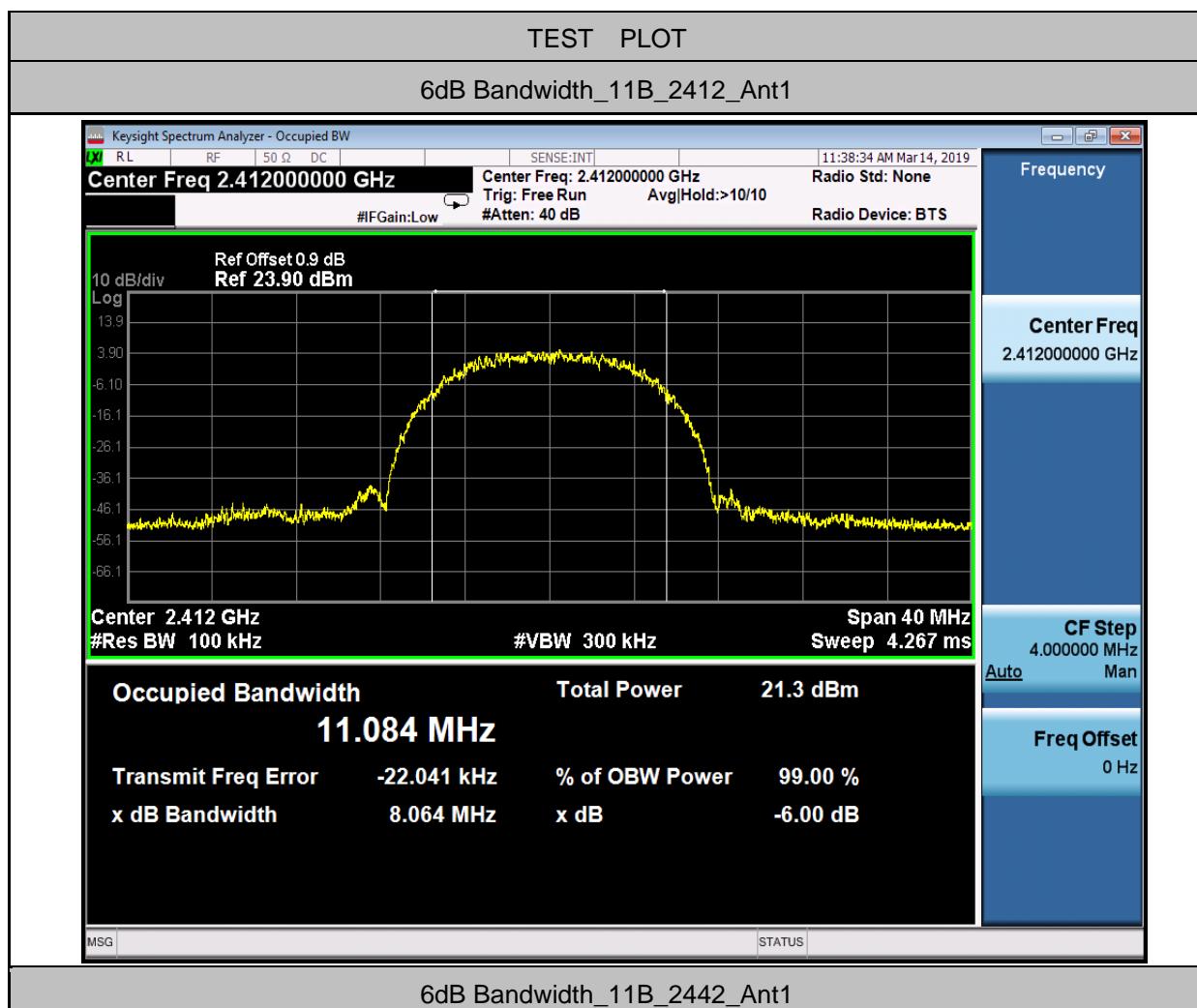
### 8.1 Appendix 15.247

#### 1.6dB Bandwidth

Test Mode	Test Channel	Ant	OBW[MHz]	EBW[MHz]	Limit	Verdict
11B	2412	Ant1	11.090	8.064	0.5	PASS
11B	2442	Ant1	11.030	7.820	0.5	PASS
11B	2462	Ant1	11.042	8.119	0.5	PASS
11G	2412	Ant1	16.502	16.50	0.5	PASS
11G	2442	Ant1	16.493	16.48	0.5	PASS
11G	2462	Ant1	16.502	16.50	0.5	PASS
11N20SISO	2412	Ant1	17.675	17.60	0.5	PASS
11N20SISO	2442	Ant1	17.672	17.59	0.5	PASS
11N20SISO	2462	Ant1	17.680	17.61	0.5	PASS

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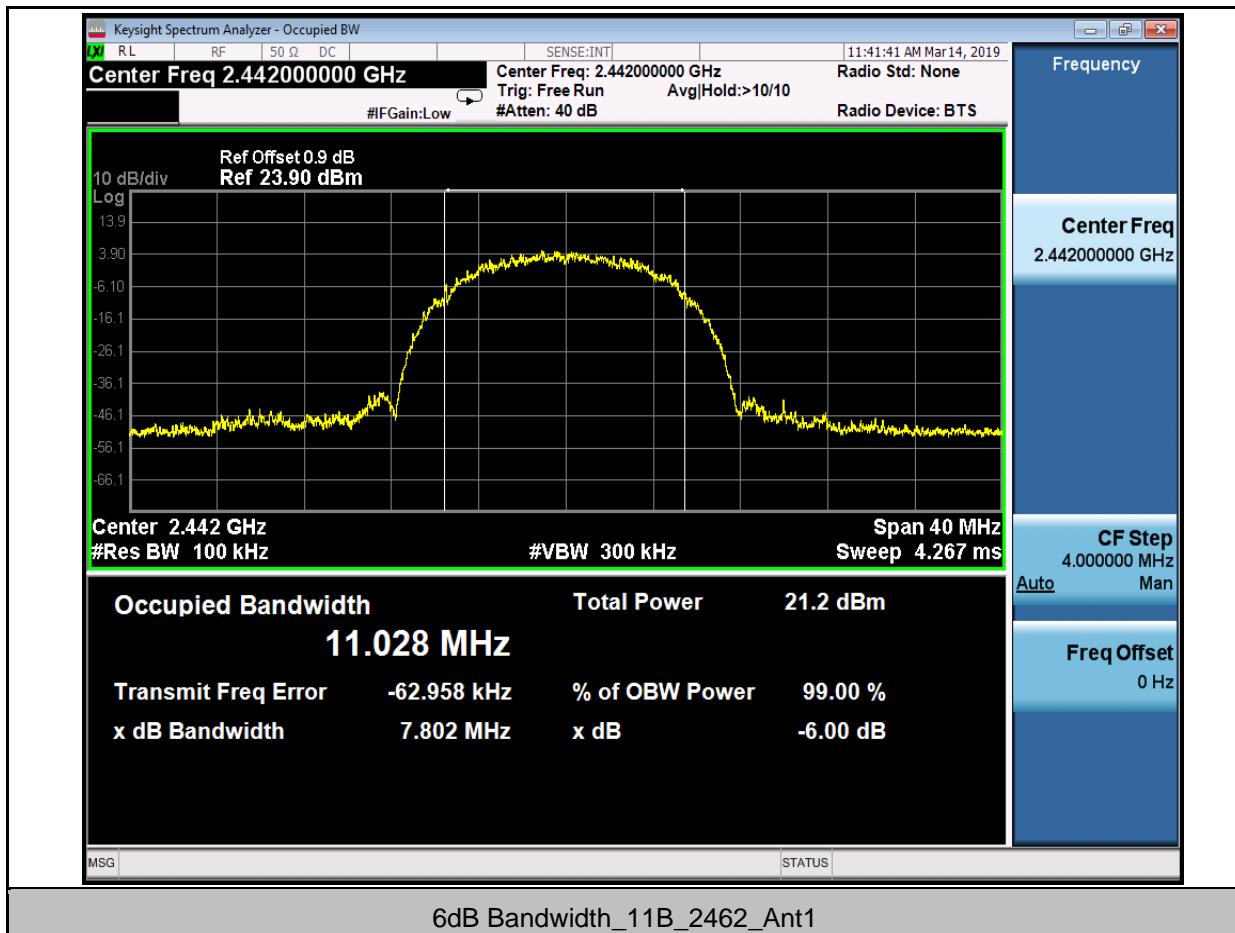
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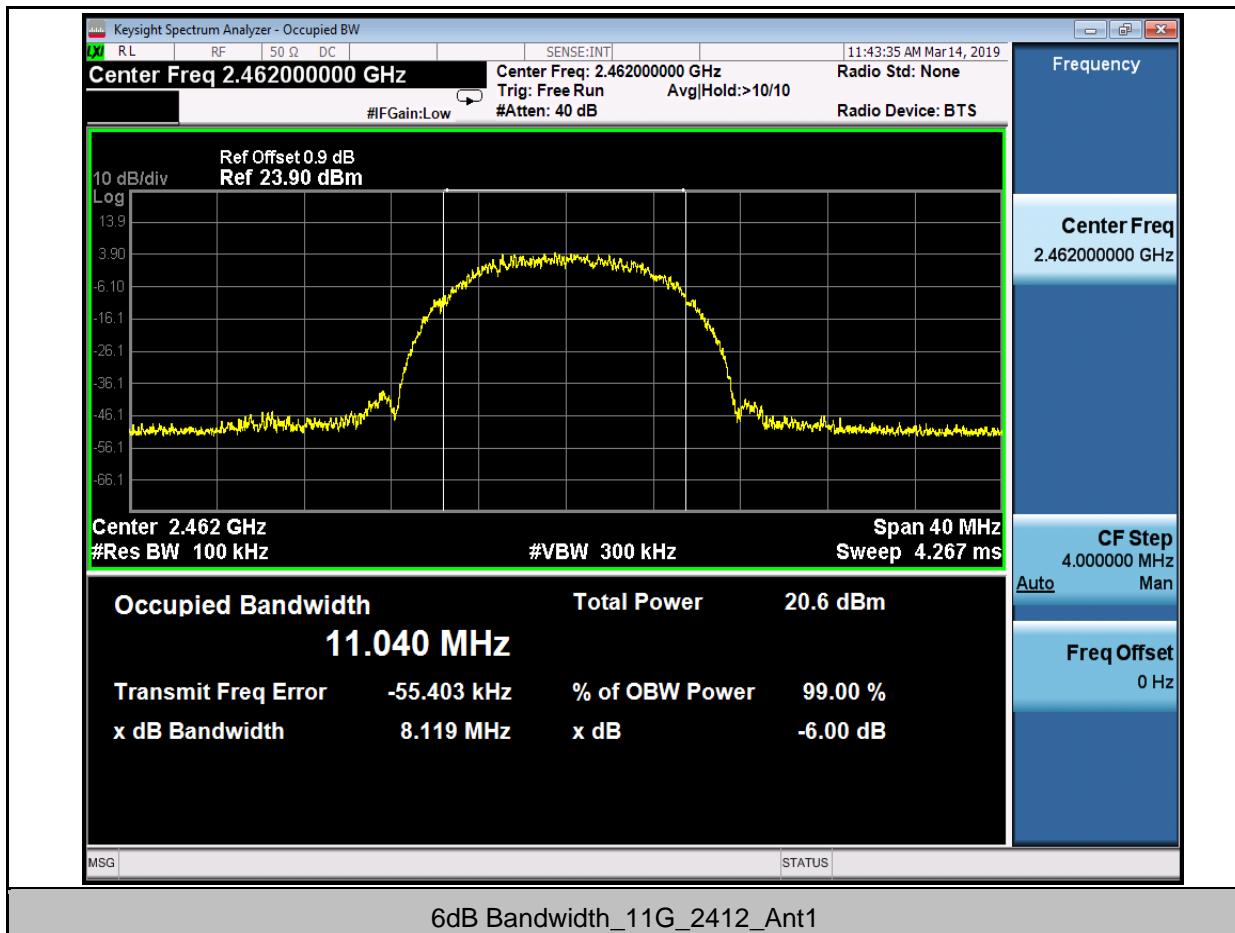
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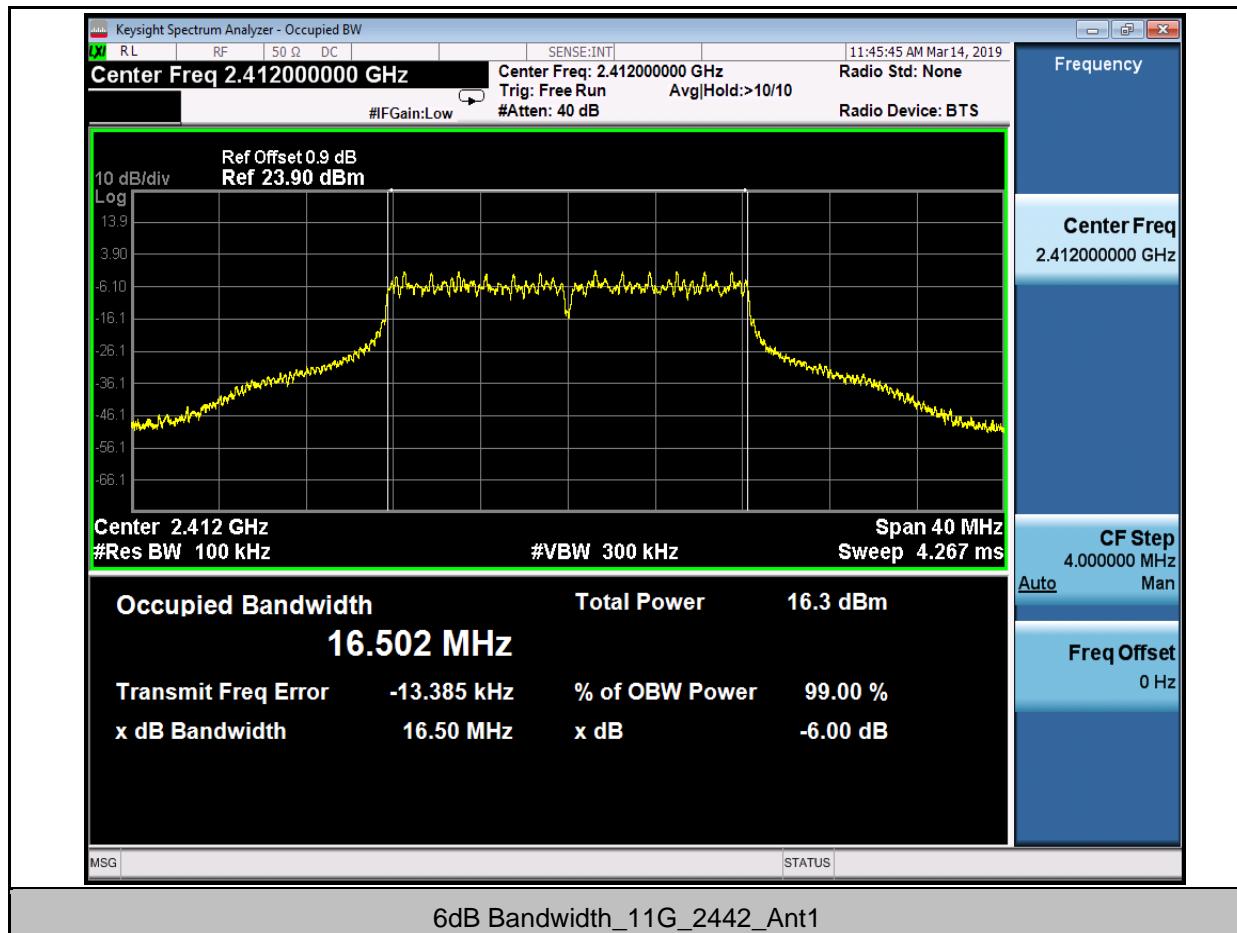


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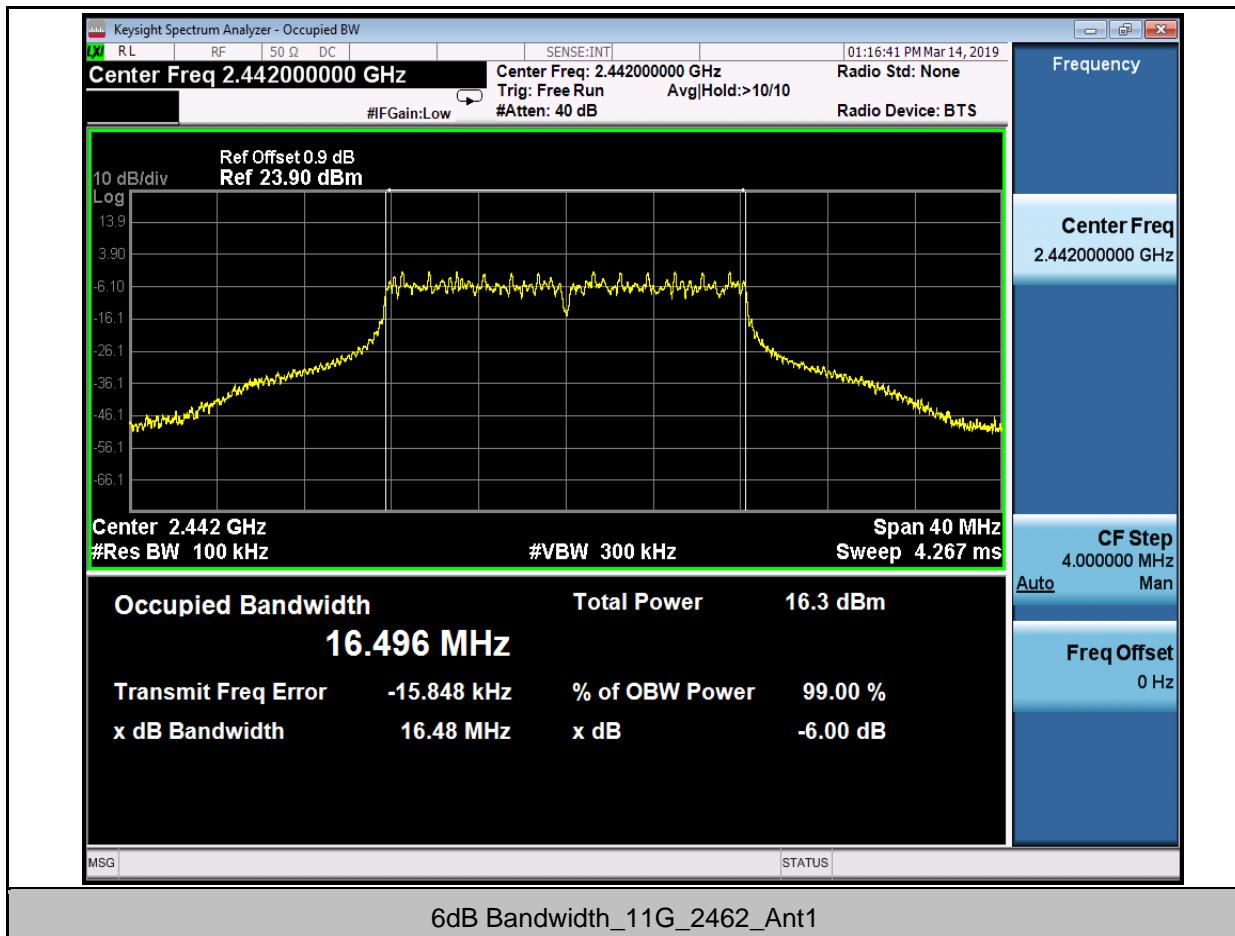


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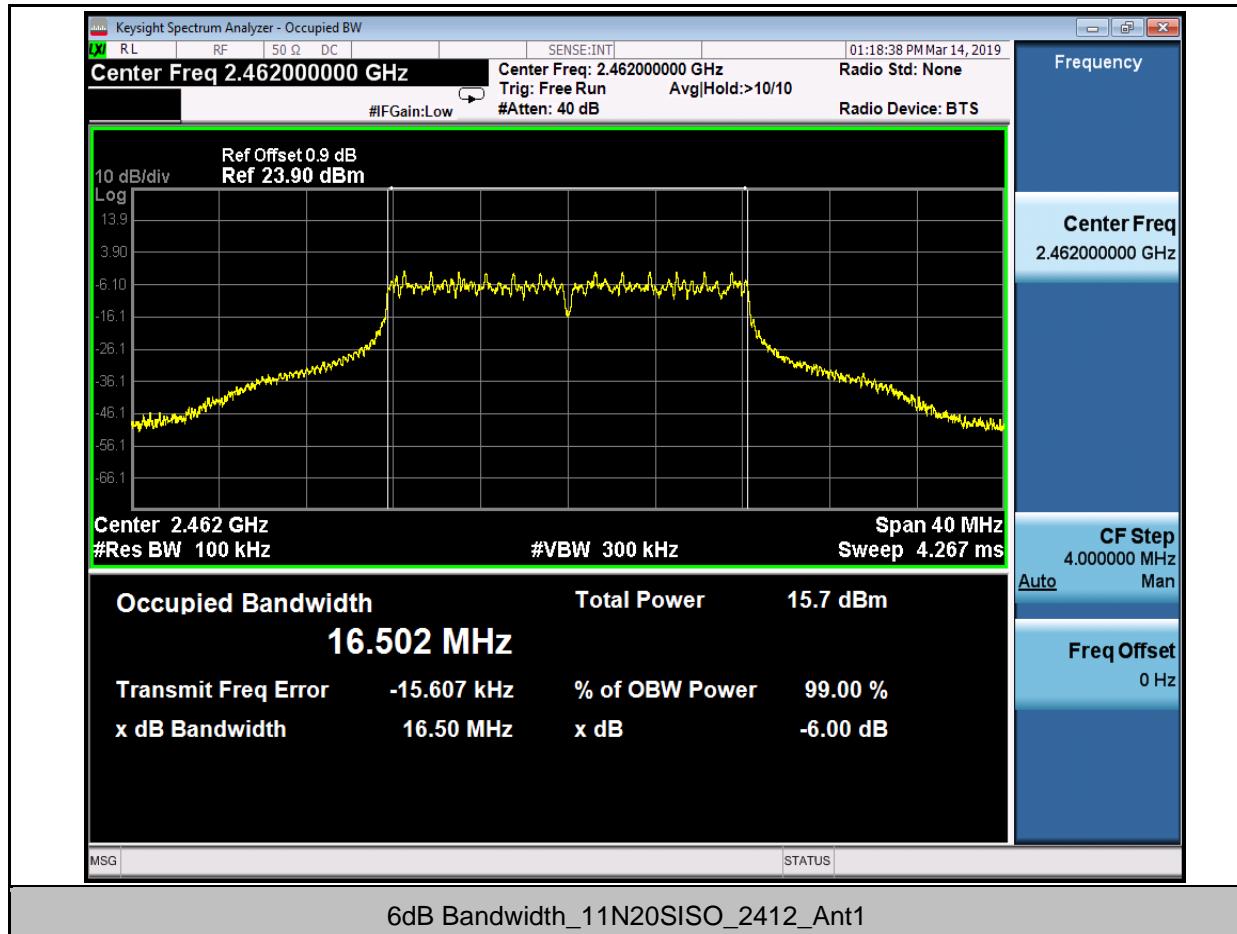
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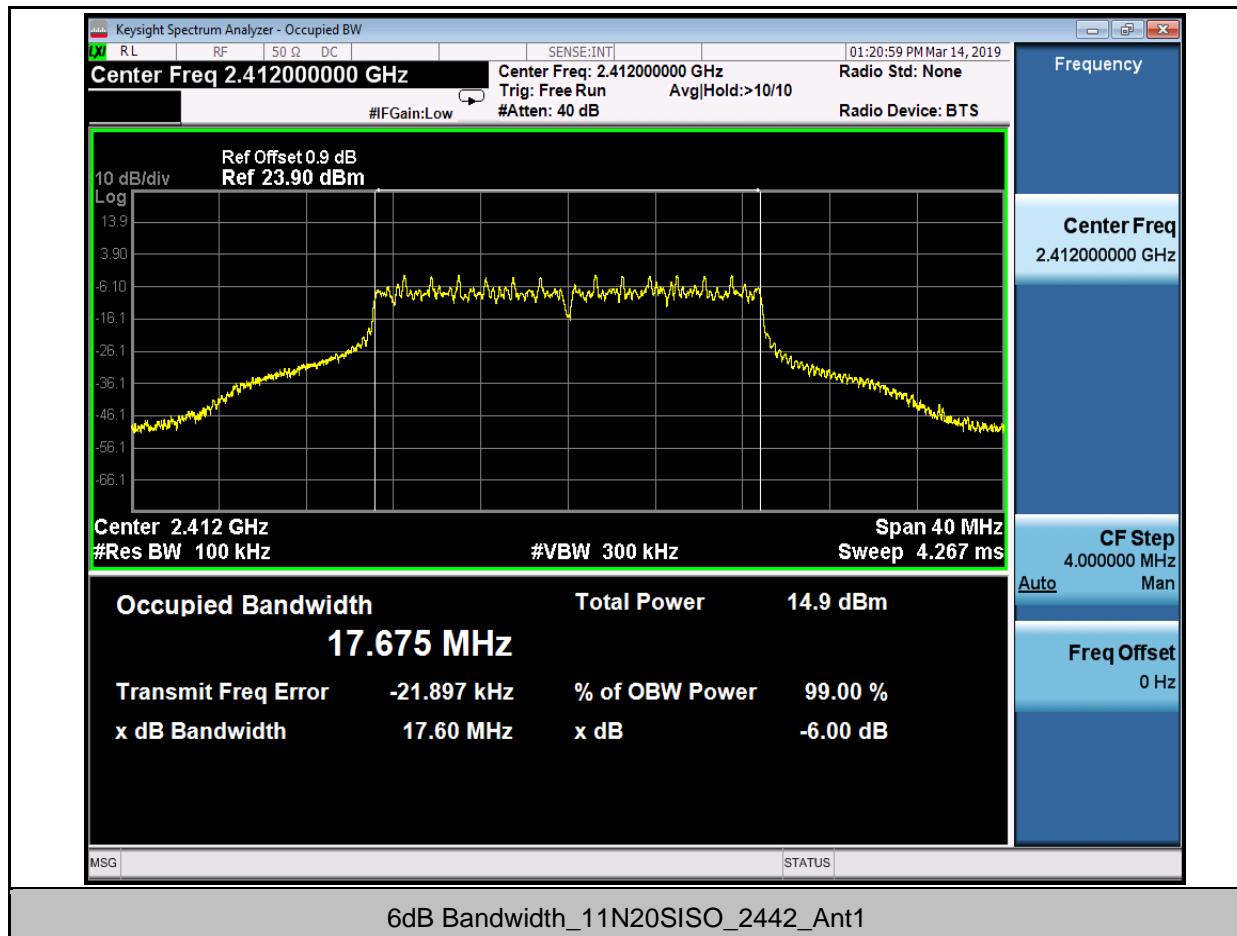
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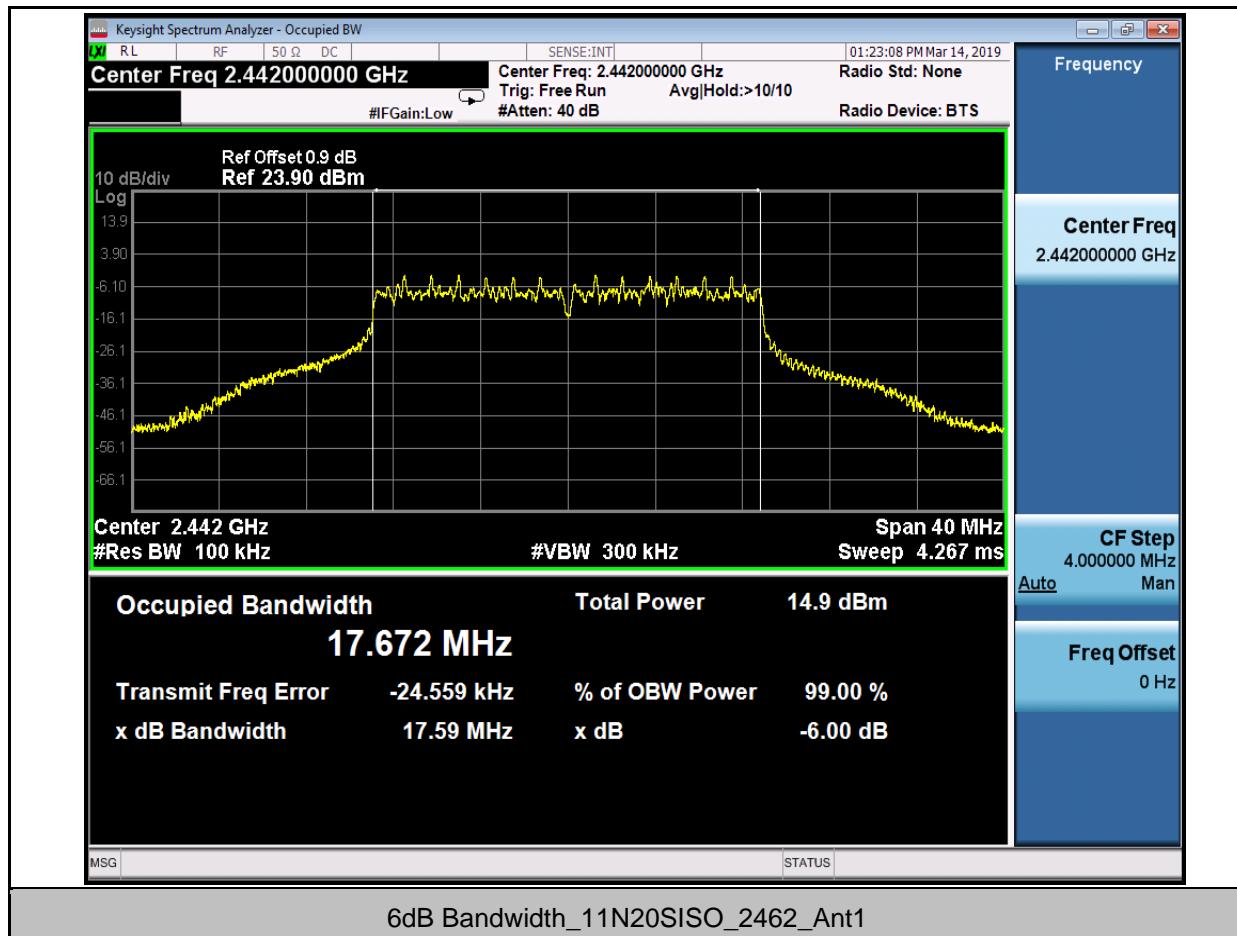


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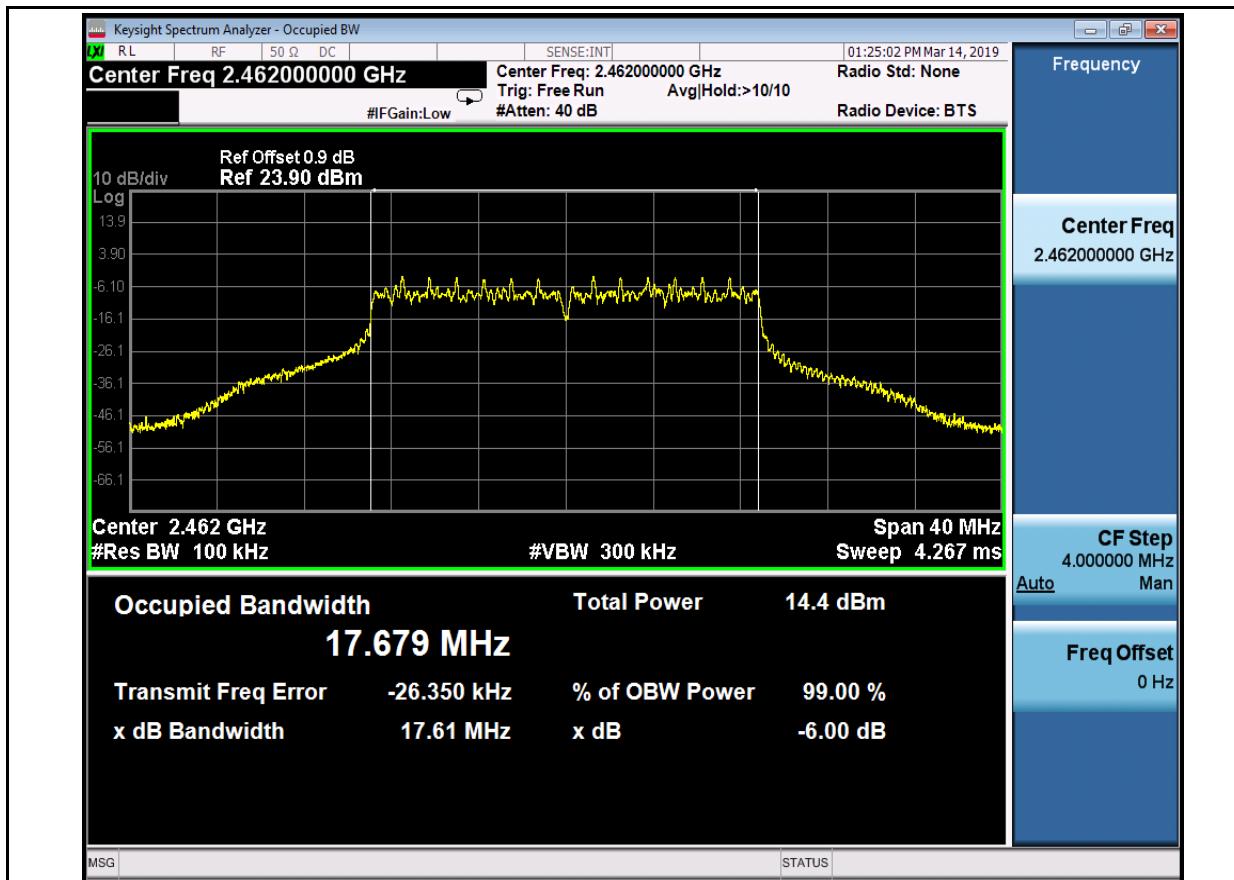
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