

Report No.: GZEM200701344201

Page: 1 of 95

FCC ID: 2AWVAKJ120F-A5

## TEST REPORT

**Application No.:**

GZEM2007013442CR

**Applicant:**

TCL Household Appliances (Zhongshan) Co., Ltd.

**Address of Applicant:**

1st-3rd Building, No.38 Fengshuo Road, Nantou Town, Zhongshan City, Guangdong, China

**Manufacturer:**

TCL Household Appliances (Zhongshan) Co., Ltd.

**Address of Manufacturer:**

1st-3rd Building, No.38 Fengshuo Road, Nantou Town, Zhongshan City, Guangdong, China

**Factory:**

TCL Household Appliances (Zhongshan) Co., Ltd.

**Address of Factory:**

1st-3rd Building, No.38 Fengshuo Road, Nantou Town, Zhongshan City, Guangdong, China

**Equipment Under Test (EUT):**

**FCC ID: 2AWVAKJ120F-A5**

**EUT Name:** Air Purifier

**Model No.:** KJ120F-A5, BREEVA A1W

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

**Trade Mark:** TCL

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

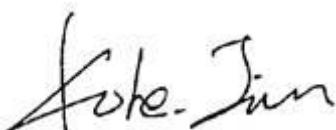
**Date of Receipt:** 2020-07-01

**Date of Test:** 2020-07-04 to 2020-07-30

**Date of Issue:** 2020-08-07

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.



Kobe Jian

EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-08-07		Original

Authorized for issue by:			
Tested By	 Jackson Yuan		2020-07-04 to 2020-07-30
	Jackson_Yuan /Project Engineer	Date	
Checked By	 Ricky Liu		2020-08-07
	Ricky_Liu /Reviewer	Date	



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## 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

N/A: Not Applicable

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

### ¤ Declaration of EUT Family Grouping:

Model No.: KJ120F-A5, BREEVA A1W

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 model name.

Therefore only one model BREEVA A1W was tested in this report.

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### 3 Contents

	Page
1 Cover Page .....	1
2 Test Summary .....	3
3 Contents .....	4
4 General Information .....	6
4.1 Details of E.U.T .....	6
4.2 Description of Support Units .....	6
4.3 Measurement Uncertainty .....	7
4.4 Test Location .....	7
4.5 Test Facility .....	8
4.6 Deviation from Standards .....	9
4.7 Abnormalities from Standard Conditions .....	9
5 Equipment List .....	10
6 Radio Spectrum Technical Requirement .....	13
6.1 Antenna Requirement .....	13
6.1.1 Test Requirement: .....	13
6.1.2 Conclusion .....	13
7 Radio Spectrum Matter Test Results .....	14
7.1 Conducted Emissions at AC Power Line (150kHz-30MHz) .....	14
7.1.1 E.U.T. Operation .....	14
7.1.2 Test Setup Diagram .....	14
7.1.3 Measurement Procedure and Data .....	15
7.2 Minimum 6dB Bandwidth .....	18
7.2.1 E.U.T. Operation .....	18
7.2.2 Test Setup Diagram .....	18
7.2.3 Measurement Procedure and Data .....	18
7.3 Conducted Peak Output Power .....	19
7.3.1 E.U.T. Operation .....	19
7.3.2 Test Setup Diagram .....	19
7.3.3 Measurement Procedure and Data .....	19
7.4 Power Spectrum Density .....	20
7.4.1 E.U.T. Operation .....	20
7.4.2 Test Setup Diagram .....	20
7.4.3 Measurement Procedure and Data .....	20
7.5 Conducted Band Edges Measurement .....	21
7.5.1 E.U.T. Operation .....	21
7.5.2 Test Setup Diagram .....	21
7.5.3 Measurement Procedure and Data .....	21
7.6 Conducted Spurious Emissions .....	22
7.6.1 E.U.T. Operation .....	22
7.6.2 Test Setup Diagram .....	22
7.6.3 Measurement Procedure and Data .....	22



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7.7	Radiated Emissions which fall in the restricted bands.....	23
7.7.1	E.U.T. Operation.....	23
7.7.2	Test Setup Diagram.....	23
7.7.3	Measurement Procedure and Data .....	24
7.8	Radiated Spurious Emissions.....	37
7.8.1	E.U.T. Operation.....	37
7.8.2	Test Setup Diagram.....	38
7.8.3	Measurement Procedure and Data .....	39
<b>8</b>	<b>Appendix .....</b>	<b>59</b>
8.1	Appendix 15.247 .....	59



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## 4 General Information

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

Power Supply:	DC 24 V powered by AC/DC adapter as below:
	Model: LY015AHU240060;
	INPUT: AC 100-240 V, 50/60Hz, 0.5A
	OUTPUT: DC 24 V, 0.6 A
Test Voltage:	AC 120 V, 60 Hz
Cable:	For main unit: DC input ports For AC/DC adapter: AC plug; DC output cables (unshielded, 1.2m)
Antenna Gain:	0 dBi
Antenna Type:	PCB Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
SN:	A1
Hardware:	KJ120F-C1-X V1.1
Firmware:	1.0
Test Software:	UI_mptool_1V3
Power Setting:	84 (16dBm max)
Remark:	All above parameters are offered by the applicant.

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800



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#### 4.3 Measurement Uncertainty

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	$\pm 3\%$

#### 4.4 Test Location

All tests were performed at:

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Guangzhou, China 510663

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No tests were sub-contracted.

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

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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)

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### ● 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)

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

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### ● CBTL (Lab Code: TL129)

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**4.6 Deviation from Standards**

None

**4.7 Abnormalities from Standard Conditions**

None



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## 5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	N/A	N/A	
Two-Line V-Network	Rohde & Schwarz	ENV216	EMC0118	2020-01-10	2021-01-09	
LISN	Rohde & Schwarz	ENV216	EMC2135	2019-09-16	2020-09-15	
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2019-11-18	2020-11-17	
Coaxial Cable	HangTianXing	2m	EMC0107	2018-09-20	2020-09-19	
Voltage Probe	SGS-EMC	N/A	EMC0106	2019-05-10	2021-05-09	
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2020-04-19	2022-04-18	
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A	

Minimum 6dB Bandwidth						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EXA Signal Analyzer	Agilent Technologies	N9010A	EMC2138	2019-11-18	2020-11-17	
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14	
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A	
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01	
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01	

Conducted Peak Output Power						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EXA Signal Analyzer	Agilent Technologies	N9010A	EMC2138	2019-11-18	2020-11-17	
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14	
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A	
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01	
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01	

Power Spectrum Density						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EXA Signal Analyzer	Agilent Technologies	N9010A	EMC2138	2019-11-18	2020-11-17	
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14	
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A	
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01	
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01	

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## Conducted Band Edges Measurement

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2020-03-31	2021-03-30
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2020-07-15	2021-07-14
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2020-05-26	2021-05-25
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2020-05-26	2021-05-25
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

## Conducted Spurious Emissions

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

## Radiated Emissions which fall in the restricted bands

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 25MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Bi-log Type Antenna	Schaffner Chase	CBL6143	EMC0519	2020-06-08	2023-06-07
Horn Antenna	SCHWARZBECKME SS-ELEKTRONIK	BBHA 9120D	EMC2016	2019-09-25	2022-09-24
Horn Antenna 1GHz-18GHz	Rohde & Schwarz	HF906	EMC0518	2018-09-02	2021-09-01
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2020-05-26	2021-05-25
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2021-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09

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2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESTE ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

**Radiated Spurious Emissions**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 25MHz-1GHz	SCHWARZBECKMESTE ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESTE ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Bi-log Type Antenna	Schaffner Chase	CBL6143	EMC0519	2020-06-08	2023-06-07
Horn Antenna 1GHz-18GHz	Rohde & Schwarz	HF906	EMC0518	2018-09-02	2021-09-01
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2020-05-26	2021-05-25
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
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	2020-07-09	2021-07-08
DMM	Fluke	73	EMC0007	2020-07-09	2021-07-08

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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 (Please refer to the appendix A):

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.



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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 <sub>PuV</sub> )	
	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.

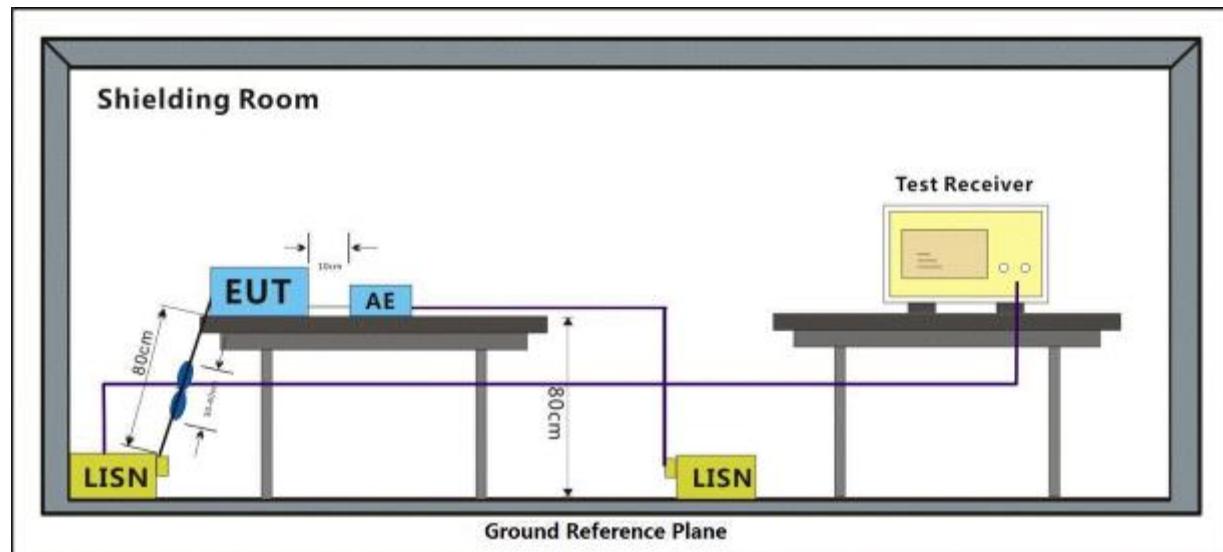
#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 26.7 °C Humidity: 52 % 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



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**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



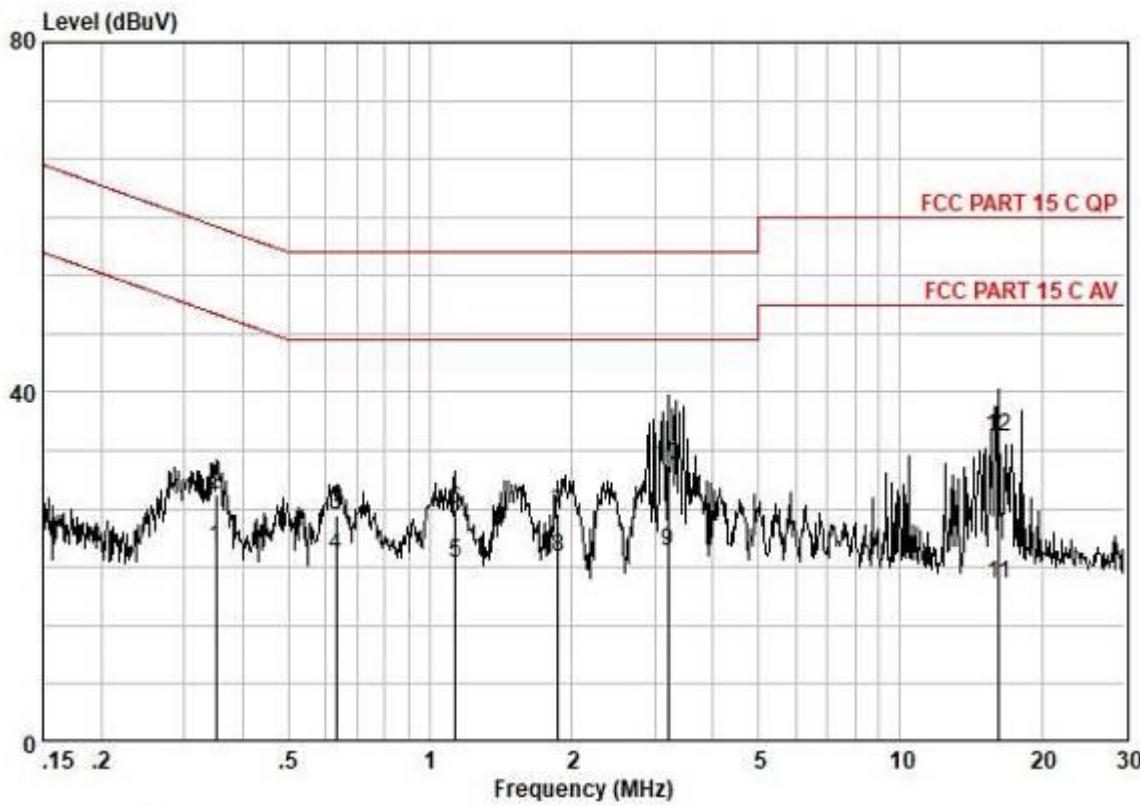
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Mode:a; Line:Live Line



Pol	:LIVE
No	:
Model	:
<b>Frequency</b>	
0.35	read
0.35	Measured
0.63	Measured
0.63	Measured
1.13	Measured
1.13	Measured
1.88	Measured
1.88	Measured
3.21	Measured
3.21	Measured
16.23	Measured
16.23	Measured
0.35	Line
0.35	Line
0.63	Line
0.63	Line
1.13	Line
1.13	Line
1.88	Line
1.88	Line
3.21	Line
3.21	Line
16.23	Line
16.23	Line
0.35	Over
0.35	Over
0.63	Over
0.63	Over
1.13	Over
1.13	Over
1.88	Over
1.88	Over
3.21	Over
3.21	Over
16.23	Over
16.23	Over
0.35	Remark
0.35	QP
0.63	QP
0.63	QP
1.13	QP
1.13	QP
1.88	QP
1.88	QP
3.21	QP
3.21	QP
16.23	QP
16.23	QP

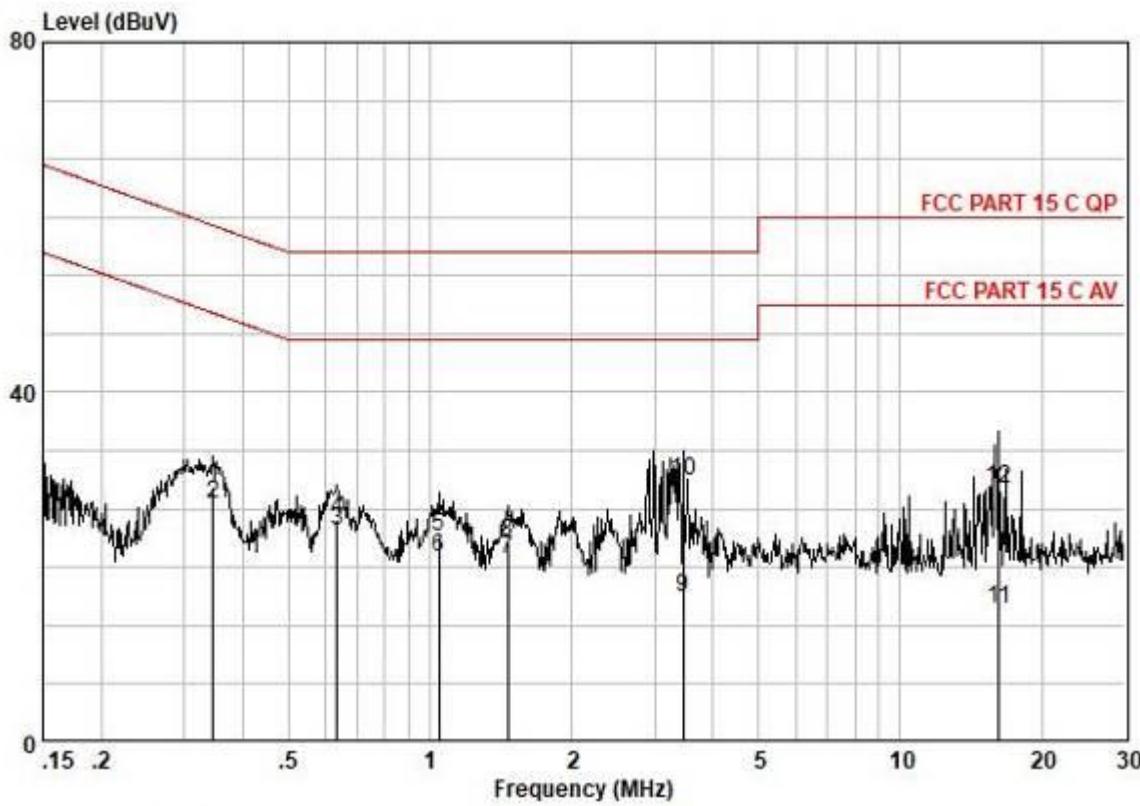
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Mode:a; Line:Neutral Line



Pol	: NEUTRAL						
No	:						
Model	:						
<hr/>							
Frequency	read	Cable	LISN	Measured	Limit	Over	Remark
MHz	level	Loss	Factor	level	Line	limit	
0.34	19.50	0.10	9.59	29.19	59.09	-29.90	QP
0.34	17.57	0.10	9.59	27.26	49.09	-21.83	AVERAGE
0.63	14.40	0.10	9.60	24.10	46.00	-21.90	AVERAGE
0.63	15.86	0.10	9.60	25.56	56.00	-30.44	QP
1.04	13.88	0.10	9.61	23.59	56.00	-32.41	QP
1.04	11.33	0.10	9.61	21.04	46.00	-24.96	AVERAGE
1.48	11.17	0.10	9.61	20.88	46.00	-25.12	AVERAGE
1.48	13.19	0.10	9.61	22.90	56.00	-33.10	QP
3.45	6.66	0.20	9.63	16.49	46.00	-29.52	AVERAGE
3.45	20.05	0.20	9.63	29.58	56.00	-26.13	QP
16.23	4.95	0.40	9.86	15.21	50.00	-34.79	AVERAGE
16.23	18.82	0.40	9.86	29.08	60.00	-30.92	QP

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## 7.2 Minimum 6dB Bandwidth

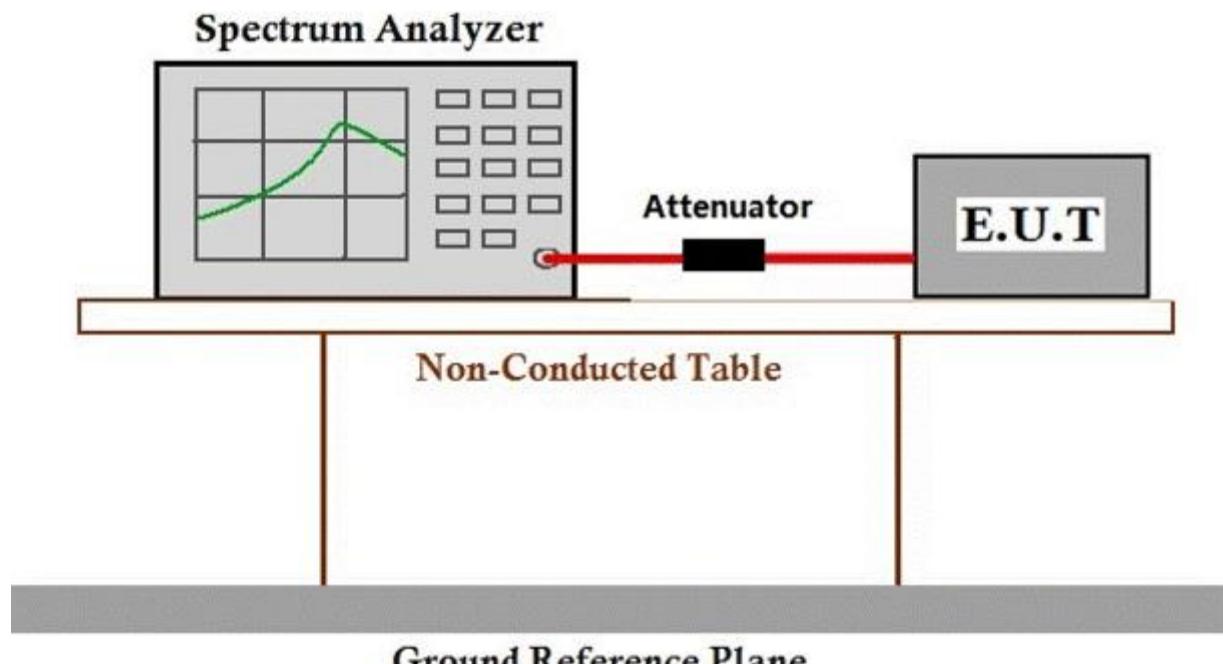
Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)  
Test Method: ANSI C63.10 (2013) Section 11.8.1  
Limit:  $\geq 500$  kHz

### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar  
Test Mode: a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). 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

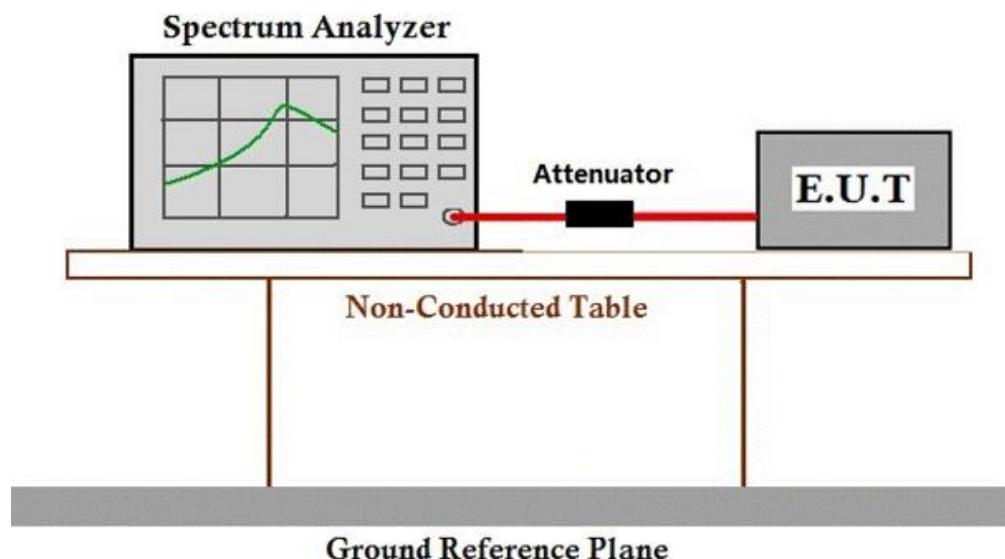
#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). 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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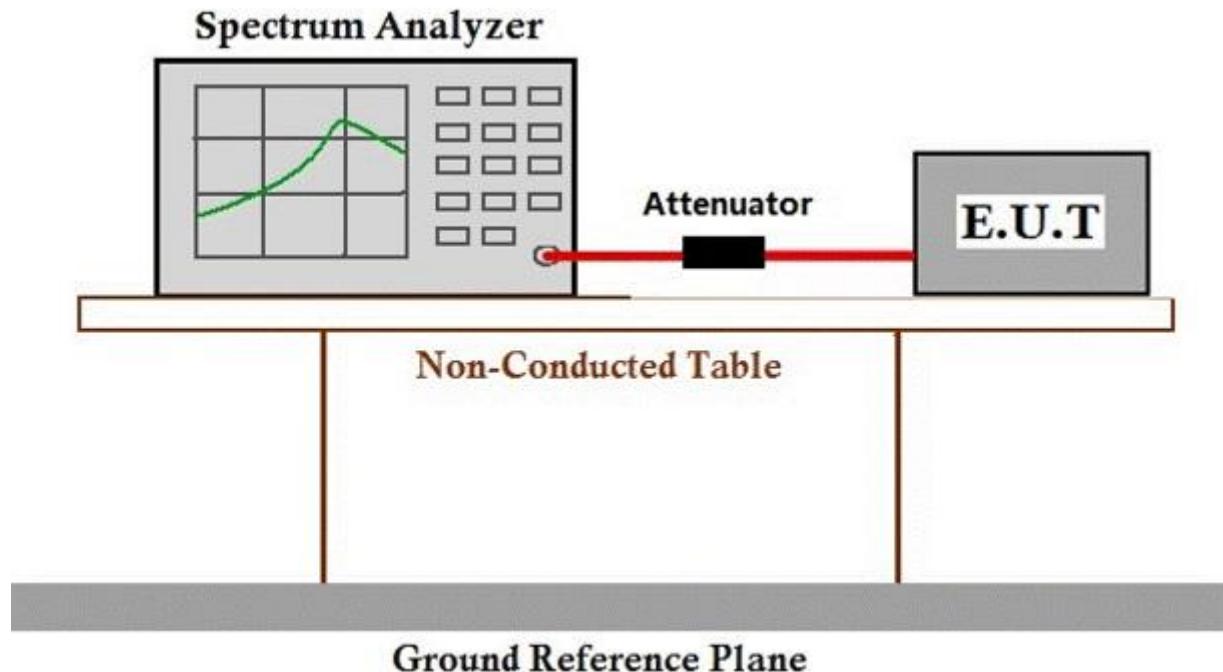
## 7.4 Power Spectrum Density

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: 25 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar  
Test Mode: a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). 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))

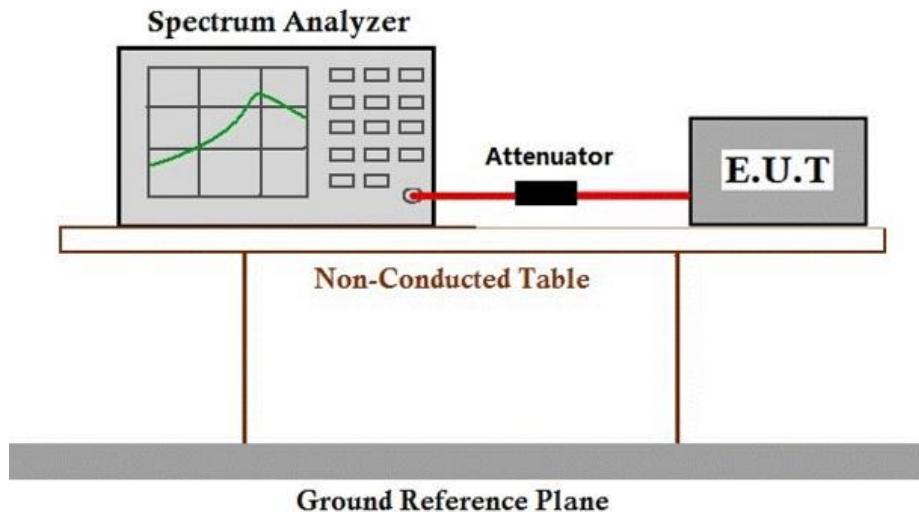
### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

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

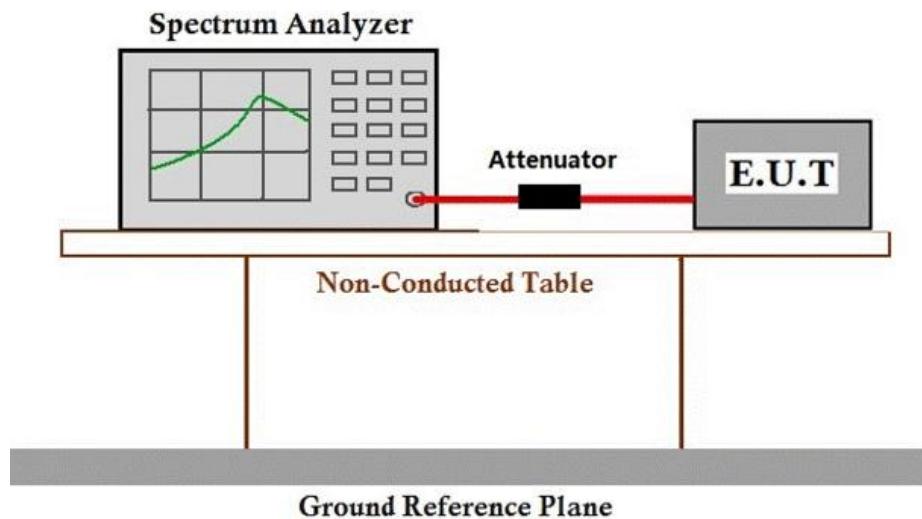
### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

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

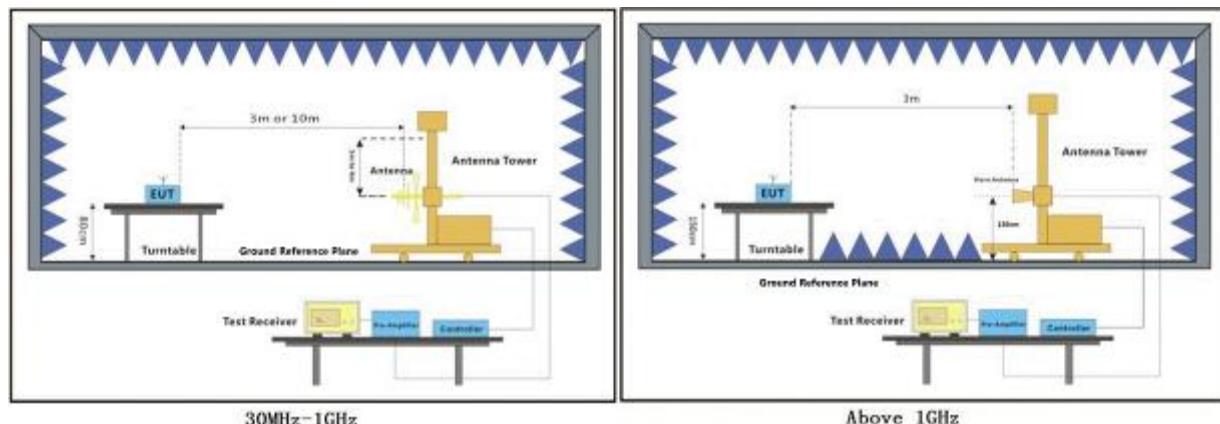
### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % 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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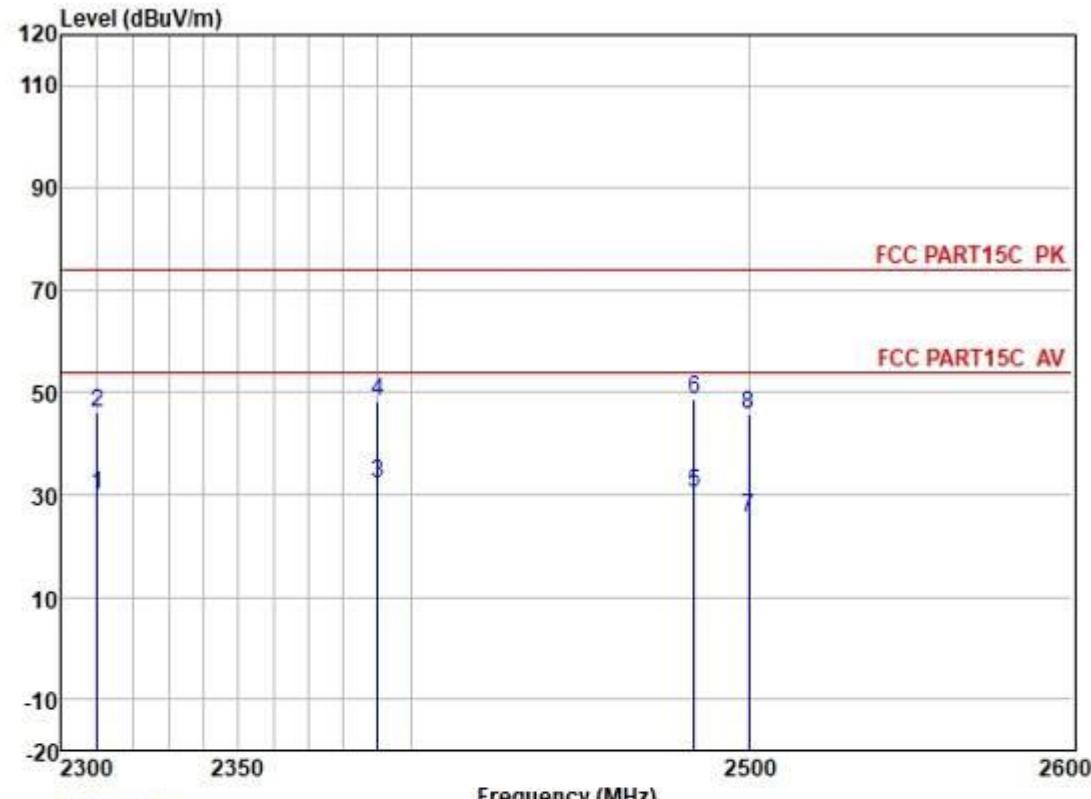
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.59	27.15	3.32	36.94	30.12	54.00	-23.88	HORIZONTAL Average
2	2310.000	52.51	27.15	3.32	36.94	46.04	74.00	-27.96	HORIZONTAL Peak
3	2390.000	38.31	27.33	3.48	36.92	32.20	54.00	-21.80	HORIZONTAL Average
4	2390.000	54.39	27.33	3.48	36.92	48.28	74.00	-25.72	HORIZONTAL Peak
5	2483.500	36.10	27.48	3.53	36.90	30.21	54.00	-23.79	HORIZONTAL Average
6	2483.500	54.46	27.48	3.53	36.90	48.57	74.00	-25.43	HORIZONTAL Peak
7	2500.000	31.60	27.50	3.40	36.89	25.61	54.00	-28.39	HORIZONTAL Average
8	2500.000	51.64	27.50	3.40	36.89	45.65	74.00	-28.35	HORIZONTAL Peak

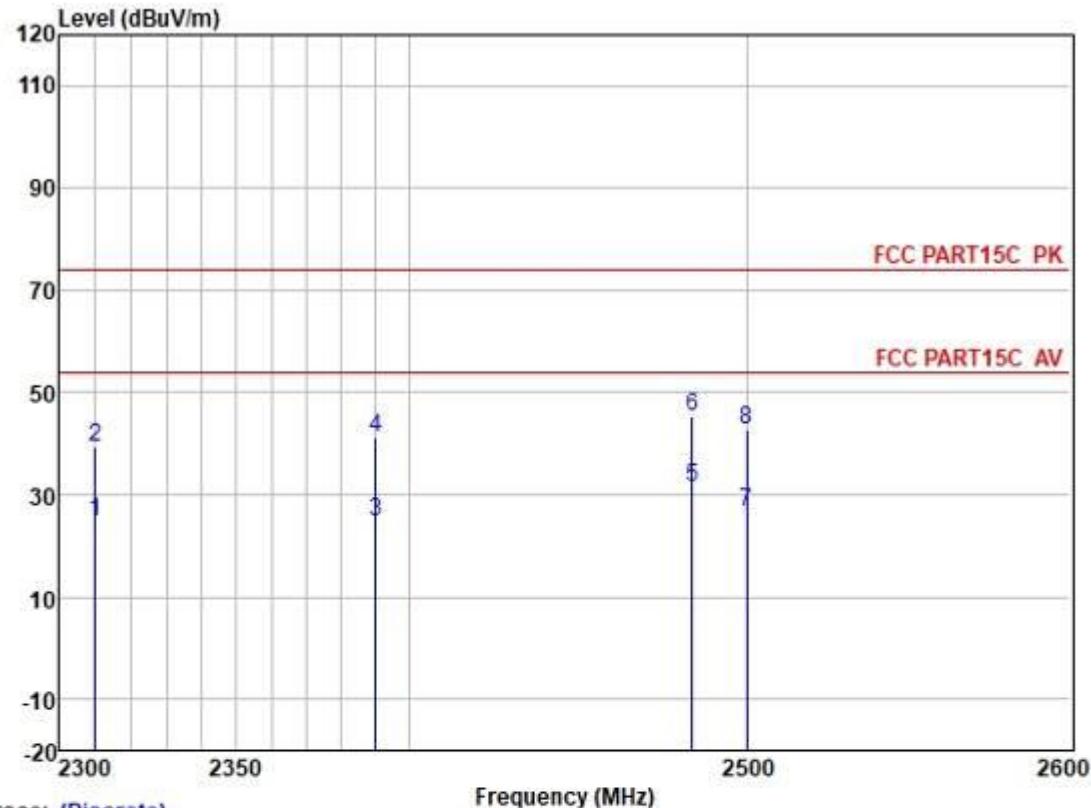
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low



Trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	31.42	27.15	3.32	36.94	24.95	54.00	-29.05	VERTICAL Average
2	2310.000	45.96	27.15	3.32	36.94	39.49	74.00	-34.51	VERTICAL Peak
3	2390.000	30.95	27.33	3.48	36.92	24.84	54.00	-29.16	VERTICAL Average
4	2390.000	47.26	27.33	3.48	36.92	41.15	74.00	-32.85	VERTICAL Peak
5	2483.500	37.26	27.48	3.53	36.90	31.37	54.00	-22.63	VERTICAL Average
6	2483.500	51.12	27.48	3.53	36.90	45.23	74.00	-28.77	VERTICAL Peak
7	2500.000	32.52	27.50	3.40	36.89	26.53	54.00	-27.47	VERTICAL Average
8	2500.000	48.60	27.50	3.40	36.89	42.61	74.00	-31.39	VERTICAL Peak

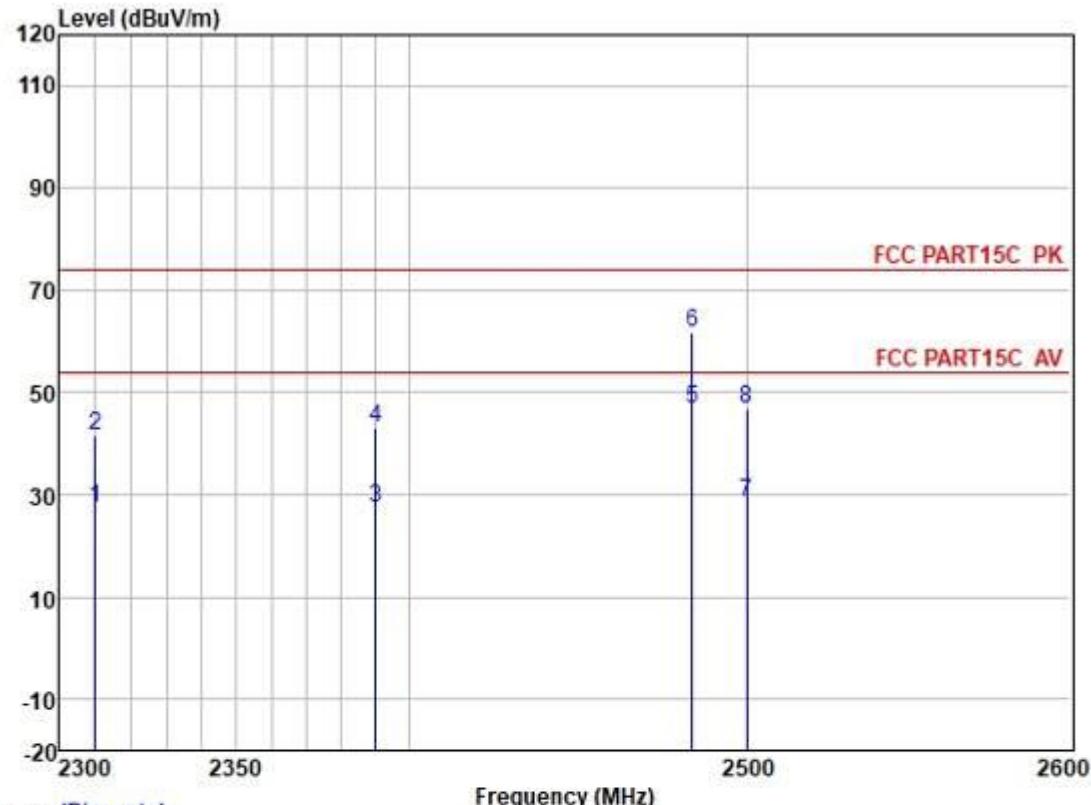
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	33.98	27.15	3.32	36.94	27.51	54.00	-26.49	HORIZONTAL Average
2	2310.000	48.18	27.15	3.32	36.94	41.71	74.00	-32.29	HORIZONTAL Peak
3	2390.000	33.60	27.33	3.48	36.92	27.49	54.00	-26.51	HORIZONTAL Average
4	2390.000	49.04	27.33	3.48	36.92	42.93	74.00	-31.07	HORIZONTAL Peak
5	2483.500	52.68	27.48	3.53	36.90	46.79	54.00	-7.21	HORIZONTAL Average
6	2483.500	67.54	27.48	3.53	36.90	61.65	74.00	-12.35	HORIZONTAL Peak
7	2500.000	34.51	27.50	3.40	36.89	28.52	54.00	-25.48	HORIZONTAL Average
8	2500.000	52.70	27.50	3.40	36.89	46.71	74.00	-27.29	HORIZONTAL Peak

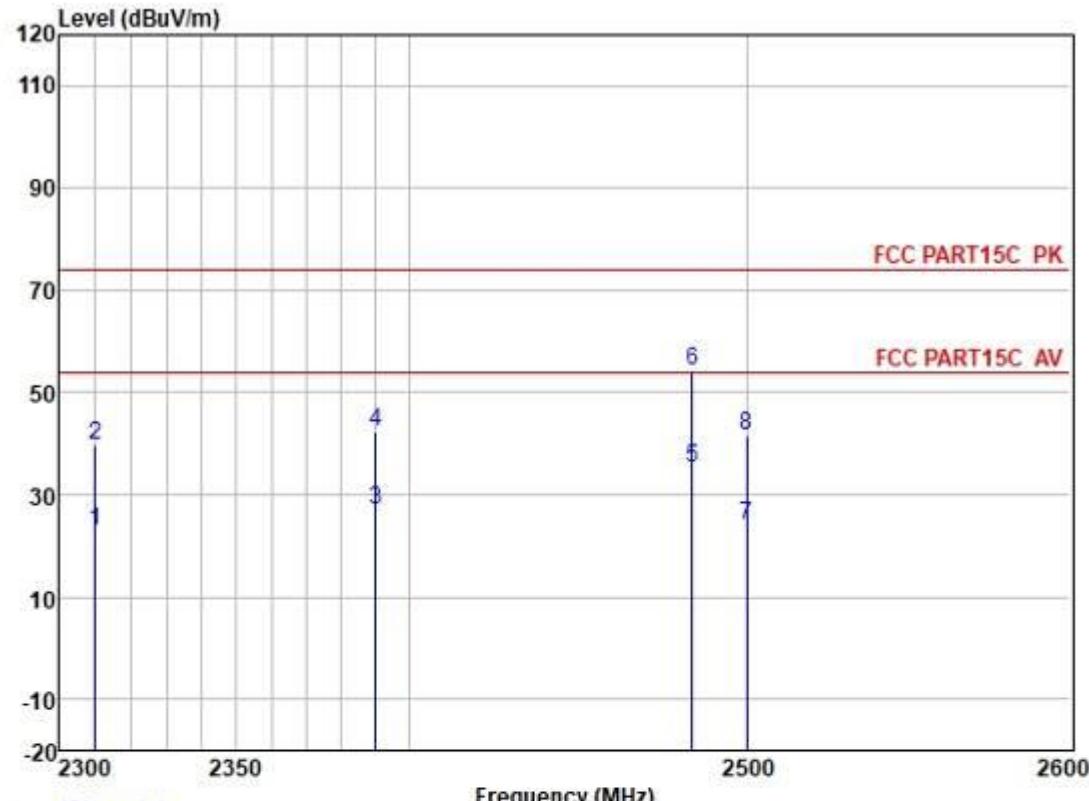
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	29.52	27.15	3.32	36.94	23.05	54.00	-30.95	VERTICAL Average
2	2310.000	46.37	27.15	3.32	36.94	39.90	74.00	-34.10	VERTICAL Peak
3	2390.000	33.25	27.33	3.48	36.92	27.14	54.00	-26.86	VERTICAL Average
4	2390.000	48.27	27.33	3.48	36.92	42.16	74.00	-31.84	VERTICAL Peak
5	2483.500	41.25	27.48	3.53	36.90	35.36	54.00	-18.64	VERTICAL Average
6	2483.500	60.27	27.48	3.53	36.90	54.38	74.00	-19.62	VERTICAL Peak
7	2500.000	30.14	27.50	3.40	36.89	24.15	54.00	-29.85	VERTICAL Average
8	2500.000	47.76	27.50	3.40	36.89	41.77	74.00	-32.23	VERTICAL Peak

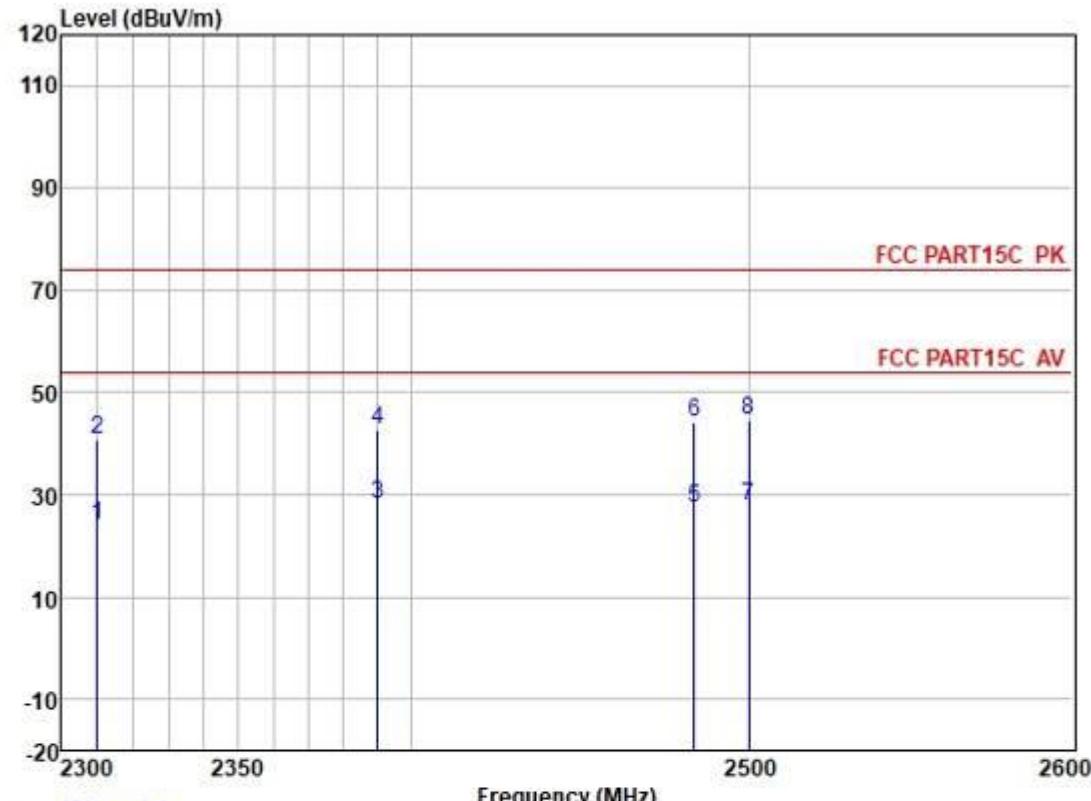
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Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	30.40	27.15	3.32	36.94	23.93	54.00	-30.07	HORIZONTAL Average
2	2310.000	47.41	27.15	3.32	36.94	40.94	74.00	-33.06	HORIZONTAL Peak
3	2390.000	34.16	27.33	3.48	36.92	28.05	54.00	-25.95	HORIZONTAL Average
4	2390.000	48.85	27.33	3.48	36.92	42.74	74.00	-31.26	HORIZONTAL Peak
5	2483.500	33.39	27.48	3.53	36.90	27.50	54.00	-26.50	HORIZONTAL Average
6	2483.500	50.11	27.48	3.53	36.90	44.22	74.00	-29.78	HORIZONTAL Peak
7	2500.000	33.73	27.50	3.40	36.89	27.74	54.00	-26.26	HORIZONTAL Average
8	2500.000	50.75	27.50	3.40	36.89	44.76	74.00	-29.24	HORIZONTAL Peak

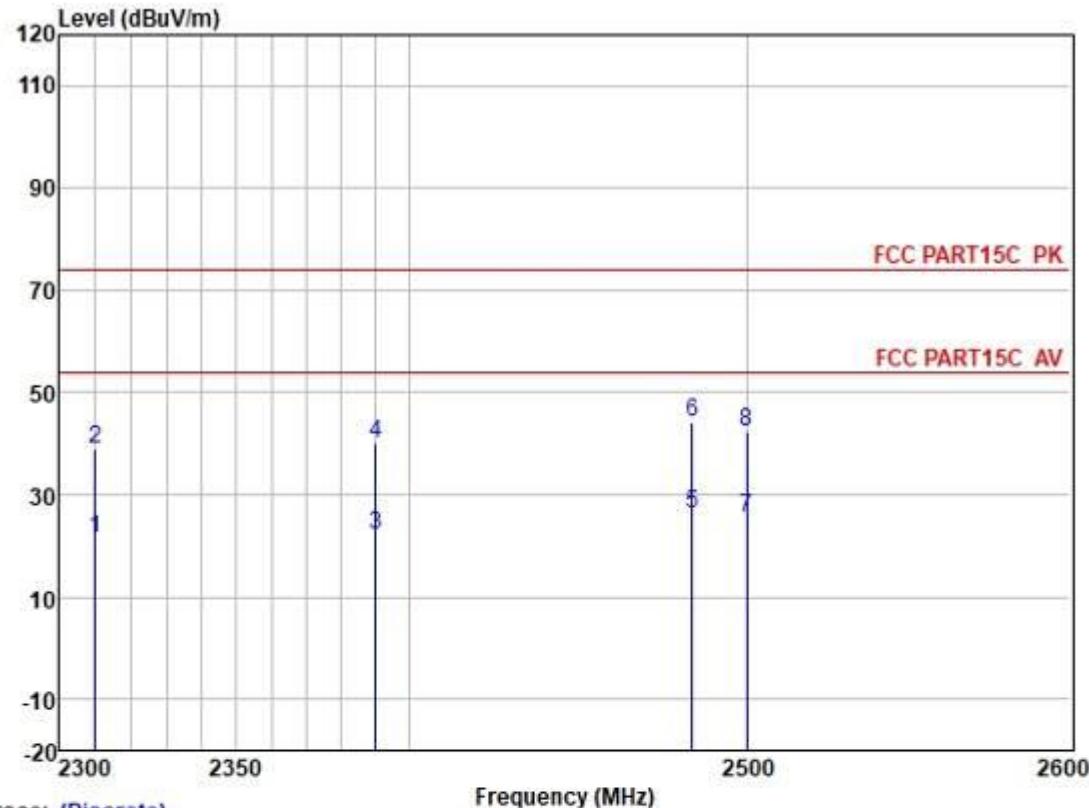
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Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	28.04	27.15	3.32	36.94	21.57	54.00	-32.43	VERTICAL Average
2	2310.000	45.32	27.15	3.32	36.94	38.85	74.00	-35.15	VERTICAL Peak
3	2390.000	28.44	27.33	3.48	36.92	22.33	54.00	-31.67	VERTICAL Average
4	2390.000	46.28	27.33	3.48	36.92	40.17	74.00	-33.83	VERTICAL Peak
5	2483.500	32.15	27.48	3.53	36.90	26.26	54.00	-27.74	VERTICAL Average
6	2483.500	50.13	27.48	3.53	36.90	44.24	74.00	-29.76	VERTICAL Peak
7	2500.000	31.42	27.50	3.40	36.89	25.43	54.00	-28.57	VERTICAL Average
8	2500.000	48.16	27.50	3.40	36.89	42.17	74.00	-31.83	VERTICAL Peak

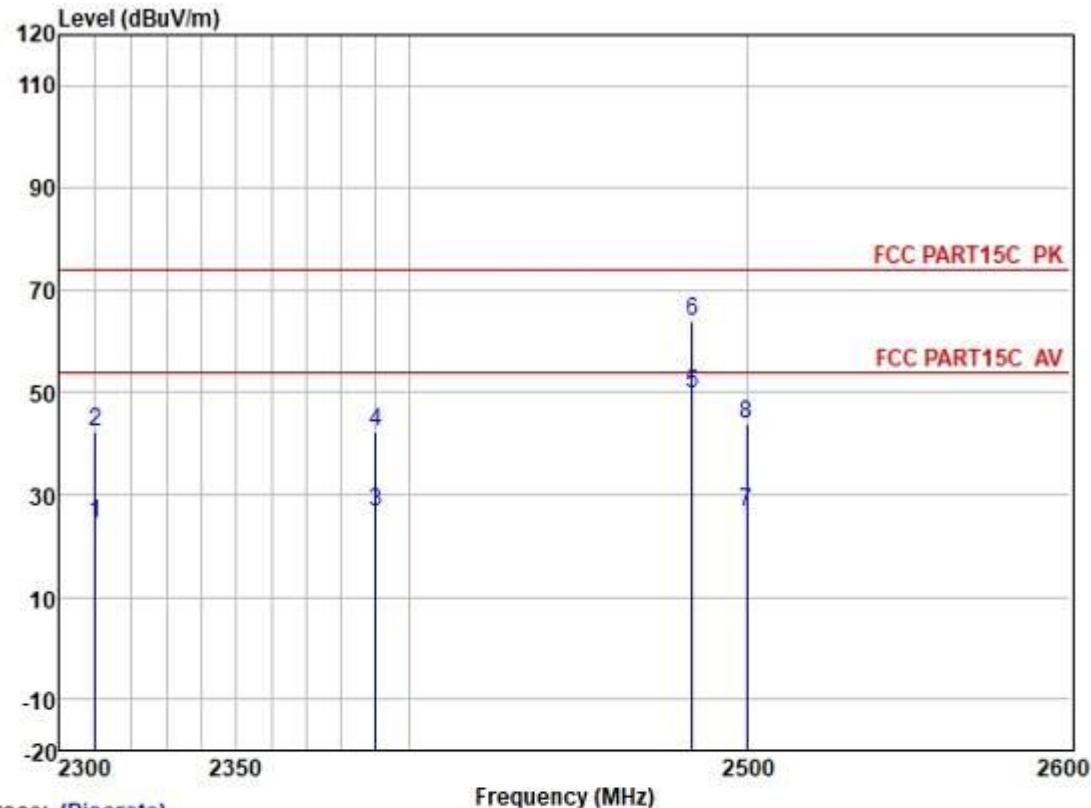
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Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High



Trace: (Discrete)	Frequency (MHz)							Over Limit Pol/Phase	Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Line Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	31.03	27.15	3.32	36.94	24.56	54.00	-29.44	HORIZONTAL Average
2	2310.000	48.97	27.15	3.32	36.94	42.50	74.00	-31.50	HORIZONTAL Peak
3	2390.000	32.87	27.33	3.48	36.92	26.76	54.00	-27.24	HORIZONTAL Average
4	2390.000	48.43	27.33	3.48	36.92	42.32	74.00	-31.68	HORIZONTAL Peak
5	2483.500	55.61	27.48	3.53	36.90	49.72	54.00	-4.28	HORIZONTAL Average
6	2483.500	70.00	27.48	3.53	36.90	64.11	74.00	-9.89	HORIZONTAL Peak
7	2500.000	32.72	27.50	3.40	36.89	26.73	54.00	-27.27	HORIZONTAL Average
8	2500.000	49.82	27.50	3.40	36.89	43.83	74.00	-30.17	HORIZONTAL Peak

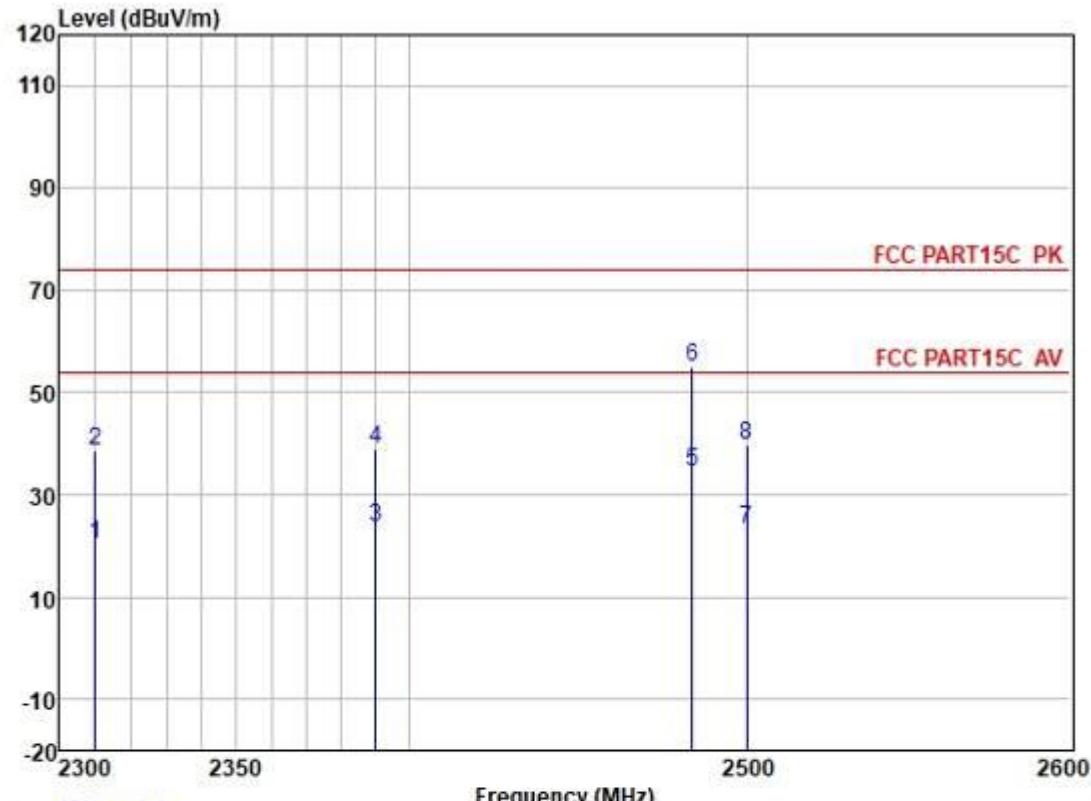
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Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	26.89	27.15	3.32	36.94	20.42	54.00	-33.58	VERTICAL Average
2	2310.000	45.00	27.15	3.32	36.94	38.53	74.00	-35.47	VERTICAL Peak
3	2390.000	29.74	27.33	3.48	36.92	23.63	54.00	-30.37	VERTICAL Average
4	2390.000	45.12	27.33	3.48	36.92	39.01	74.00	-34.99	VERTICAL Peak
5	2483.500	40.46	27.48	3.53	36.90	34.57	54.00	-19.43	VERTICAL Average
6	2483.500	60.91	27.48	3.53	36.90	55.02	74.00	-18.98	VERTICAL Peak
7	2500.000	29.22	27.50	3.40	36.89	23.23	54.00	-30.77	VERTICAL Average
8	2500.000	45.57	27.50	3.40	36.89	39.58	74.00	-34.42	VERTICAL Peak

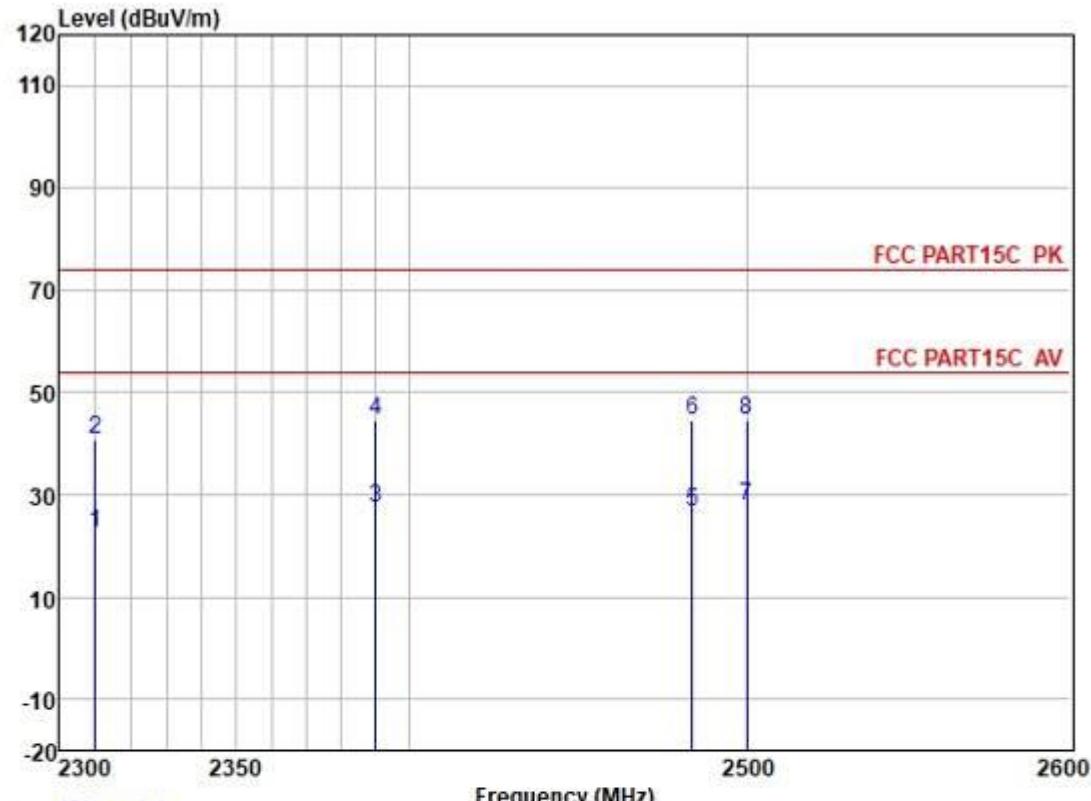
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	29.15	27.15	3.32	36.94	22.68	54.00	-31.32	HORIZONTAL Average
2	2310.000	47.27	27.15	3.32	36.94	40.80	74.00	-33.20	HORIZONTAL Peak
3	2390.000	33.62	27.33	3.48	36.92	27.51	54.00	-26.49	HORIZONTAL Average
4	2390.000	50.66	27.33	3.48	36.92	44.55	74.00	-29.45	HORIZONTAL Peak
5	2483.500	32.68	27.48	3.53	36.90	26.79	54.00	-27.21	HORIZONTAL Average
6	2483.500	50.63	27.48	3.53	36.90	44.74	74.00	-29.26	HORIZONTAL Peak
7	2500.000	33.64	27.50	3.40	36.89	27.65	54.00	-26.35	HORIZONTAL Average
8	2500.000	50.54	27.50	3.40	36.89	44.55	74.00	-29.45	HORIZONTAL Peak

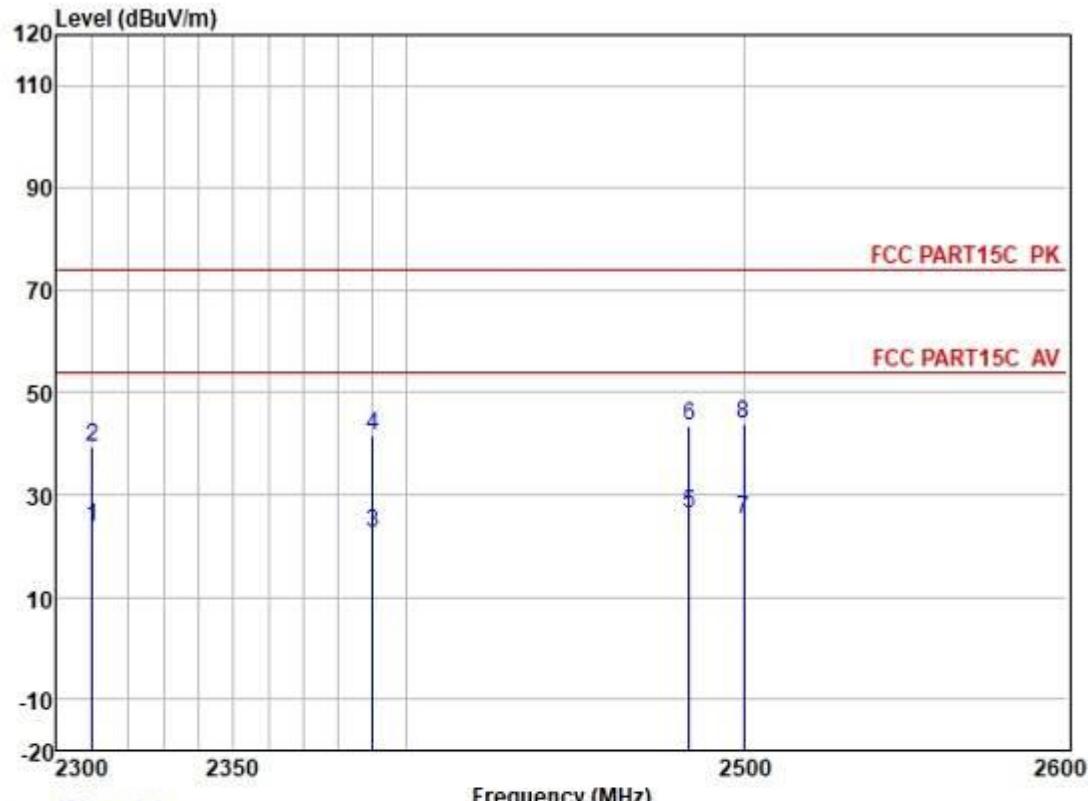
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	30.09	27.15	3.32	36.94	23.62	54.00	-30.38	VERTICAL Average
2	2310.000	45.71	27.15	3.32	36.94	39.24	74.00	-34.76	VERTICAL Peak
3	2390.000	28.66	27.33	3.48	36.92	22.55	54.00	-31.45	VERTICAL Average
4	2390.000	47.76	27.33	3.48	36.92	41.65	74.00	-32.35	VERTICAL Peak
5	2483.500	32.05	27.48	3.53	36.90	26.16	54.00	-27.84	VERTICAL Average
6	2483.500	49.45	27.48	3.53	36.90	43.56	74.00	-30.44	VERTICAL Peak
7	2500.000	31.24	27.50	3.40	36.89	25.25	54.00	-28.75	VERTICAL Average
8	2500.000	49.95	27.50	3.40	36.89	43.96	74.00	-30.04	VERTICAL Peak

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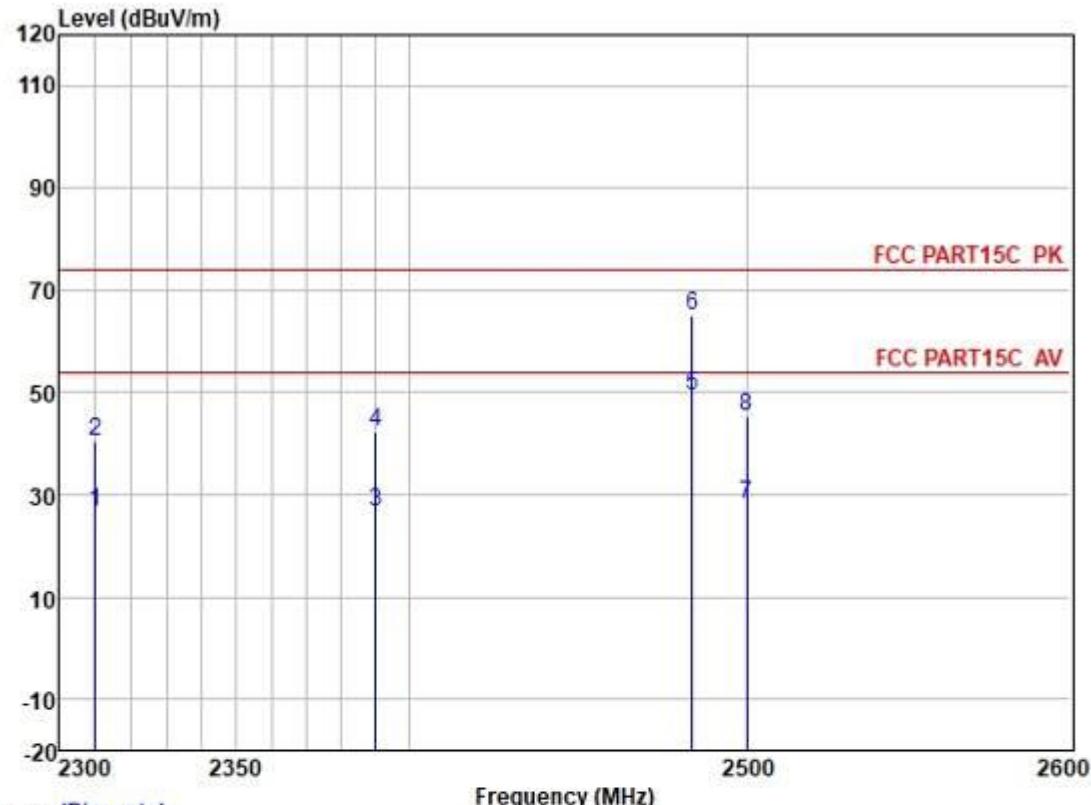
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	32.97	27.15	3.32	36.94	26.50	54.00	-27.50	HORIZONTAL Average
2	2310.000	47.14	27.15	3.32	36.94	40.67	74.00	-33.33	HORIZONTAL Peak
3	2390.000	32.70	27.33	3.48	36.92	26.59	54.00	-27.41	HORIZONTAL Average
4	2390.000	48.52	27.33	3.48	36.92	42.41	74.00	-31.59	HORIZONTAL Peak
5	2483.500	55.36	27.48	3.53	36.90	49.47	54.00	-4.53	HORIZONTAL Average
6	2483.500	70.97	27.48	3.53	36.90	65.08	74.00	-8.92	HORIZONTAL Peak
7	2500.000	34.30	27.50	3.40	36.89	28.31	54.00	-25.69	HORIZONTAL Average
8	2500.000	51.50	27.50	3.40	36.89	45.51	74.00	-28.49	HORIZONTAL Peak

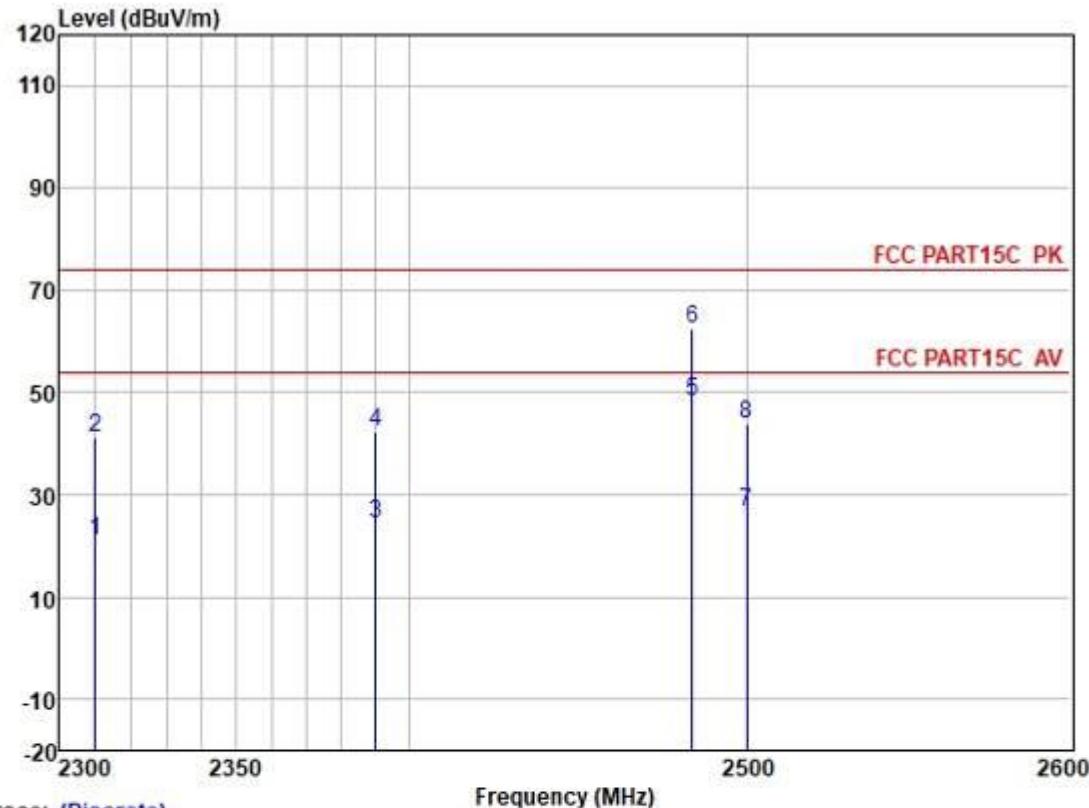
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



trace: (Discrete)	Frequency (MHz)								Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	27.36	27.15	3.32	36.94	20.89	54.00	-33.11	VERTICAL Average
2	2310.000	47.76	27.15	3.32	36.94	41.29	74.00	-32.71	VERTICAL Peak
3	2390.000	30.36	27.33	3.48	36.92	24.25	54.00	-29.75	VERTICAL Average
4	2390.000	48.41	27.33	3.48	36.92	42.30	74.00	-31.70	VERTICAL Peak
5	2483.500	54.08	27.48	3.53	36.90	48.19	54.00	-5.81	VERTICAL Average
6	2483.500	68.44	27.48	3.53	36.90	62.55	74.00	-11.45	VERTICAL Peak
7	2500.000	32.82	27.50	3.40	36.89	26.83	54.00	-27.17	VERTICAL Average
8	2500.000	49.81	27.50	3.40	36.89	43.82	74.00	-30.18	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.

### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % 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.

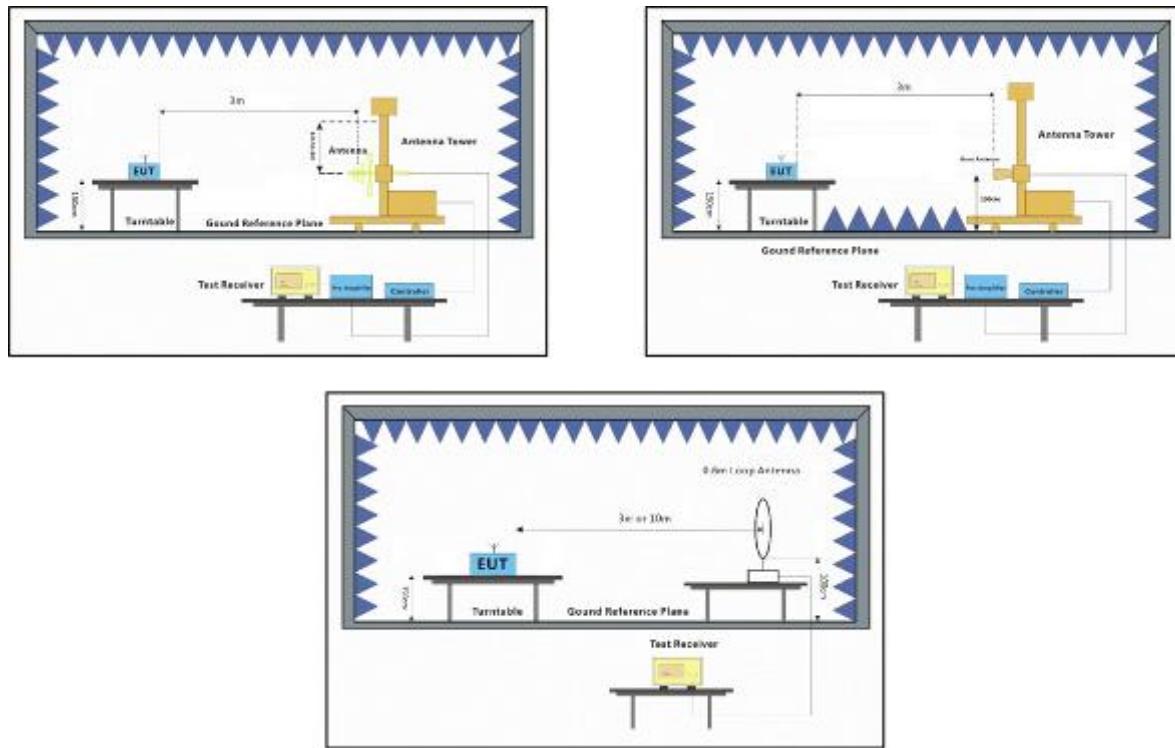
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## 7.8.2 Test Setup Diagram



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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



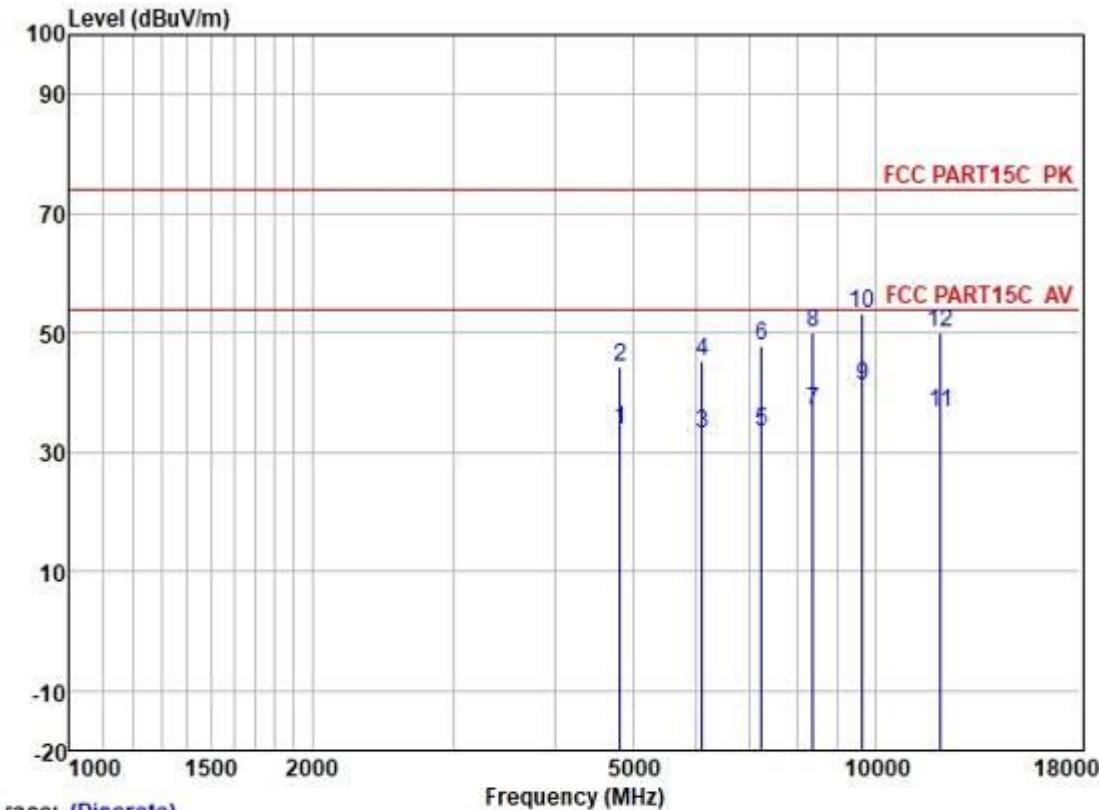
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit	Over	Pol/Phase	Remark
		MHz	Level	Factor	Loss								
1	4824.751	33.24	31.45	5.42	36.48	33.63	54.00	-20.37	HORIZONTAL	Average			
2	4824.751	44.09	31.45	5.42	36.48	44.48	74.00	-29.52	HORIZONTAL	Peak			
3	6106.616	30.88	32.66	6.14	36.61	33.07	54.00	-20.93	HORIZONTAL	Average			
4	6106.616	43.18	32.66	6.14	36.61	45.37	74.00	-28.63	HORIZONTAL	Peak			
5	7236.015	28.55	35.70	6.03	36.75	33.53	54.00	-20.47	HORIZONTAL	Average			
6	7236.015	42.72	35.70	6.03	36.75	47.70	74.00	-26.30	HORIZONTAL	Peak			
7	8368.069	30.12	37.06	6.59	36.74	37.03	54.00	-16.97	HORIZONTAL	Average			
8	8368.069	43.32	37.06	6.59	36.74	50.23	74.00	-23.77	HORIZONTAL	Peak			
9	9648.018	31.92	38.40	7.06	36.35	41.03	54.00	-12.97	HORIZONTAL	Average			
10	9648.018	44.33	38.40	7.06	36.35	53.44	74.00	-20.56	HORIZONTAL	Peak			
11	12060.130	26.05	38.88	8.17	36.38	36.72	54.00	-17.28	HORIZONTAL	Average			
12	12060.130	39.47	38.88	8.17	36.38	50.14	74.00	-23.86	HORIZONTAL	Peak			

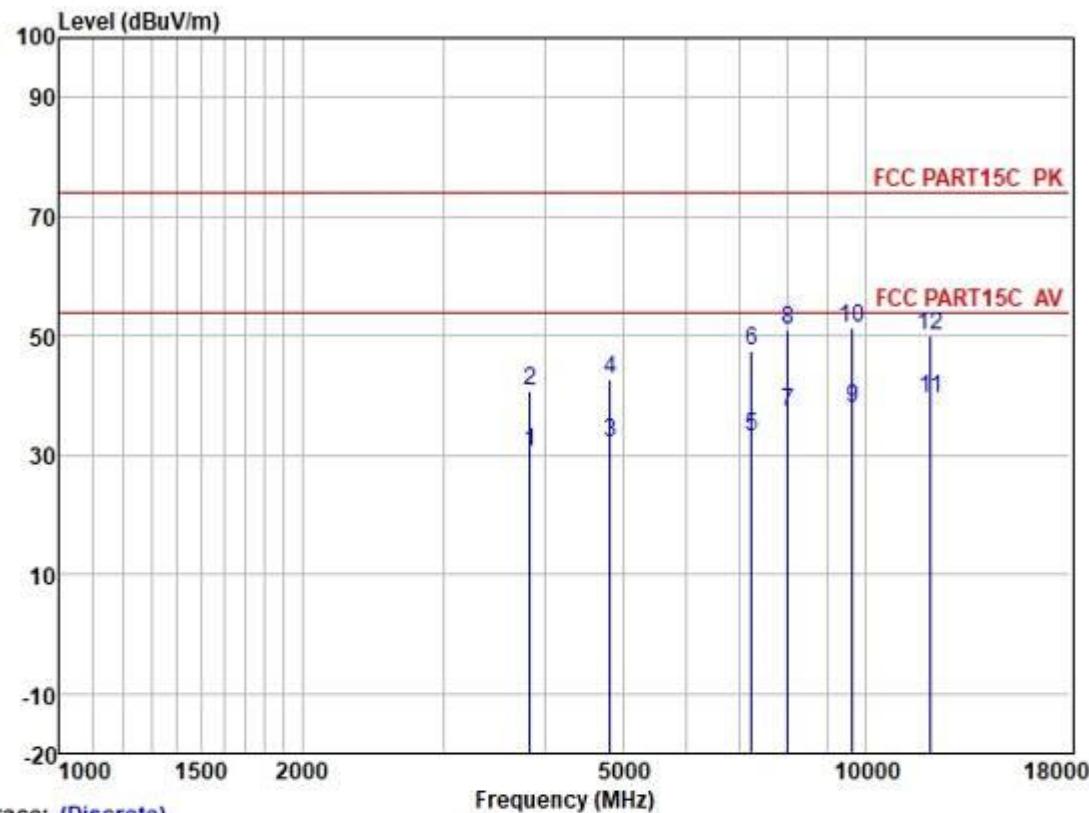
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low



Index: (Discrete)	Frequency (MHz)							Over Limit Pol/Phase	Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Line Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3845.537	32.92	29.60	4.60	36.41	30.71	54.00	-23.29	VERTICAL Average
2	3845.537	42.88	29.60	4.60	36.41	40.67	74.00	-33.33	VERTICAL Peak
3	4824.993	31.61	31.47	5.44	36.48	32.04	54.00	-21.96	VERTICAL Average
4	4824.993	42.41	31.47	5.44	36.48	42.84	74.00	-31.16	VERTICAL Peak
5	7236.092	28.20	35.70	6.03	36.75	33.18	54.00	-20.82	VERTICAL Average
6	7236.092	42.45	35.70	6.03	36.75	47.43	74.00	-26.57	VERTICAL Peak
7	8013.020	31.01	36.91	6.17	36.80	37.29	54.00	-16.71	VERTICAL Average
8	8013.020	44.70	36.91	6.17	36.80	50.98	74.00	-23.02	VERTICAL Peak
9	9648.063	28.76	38.40	7.06	36.35	37.87	54.00	-16.13	VERTICAL Average
10	9648.063	42.16	38.40	7.06	36.35	51.27	74.00	-22.73	VERTICAL Peak
11	12060.520	28.98	38.88	8.17	36.38	39.65	54.00	-14.35	VERTICAL Average
12	12060.520	39.51	38.88	8.17	36.38	50.18	74.00	-23.82	VERTICAL Peak

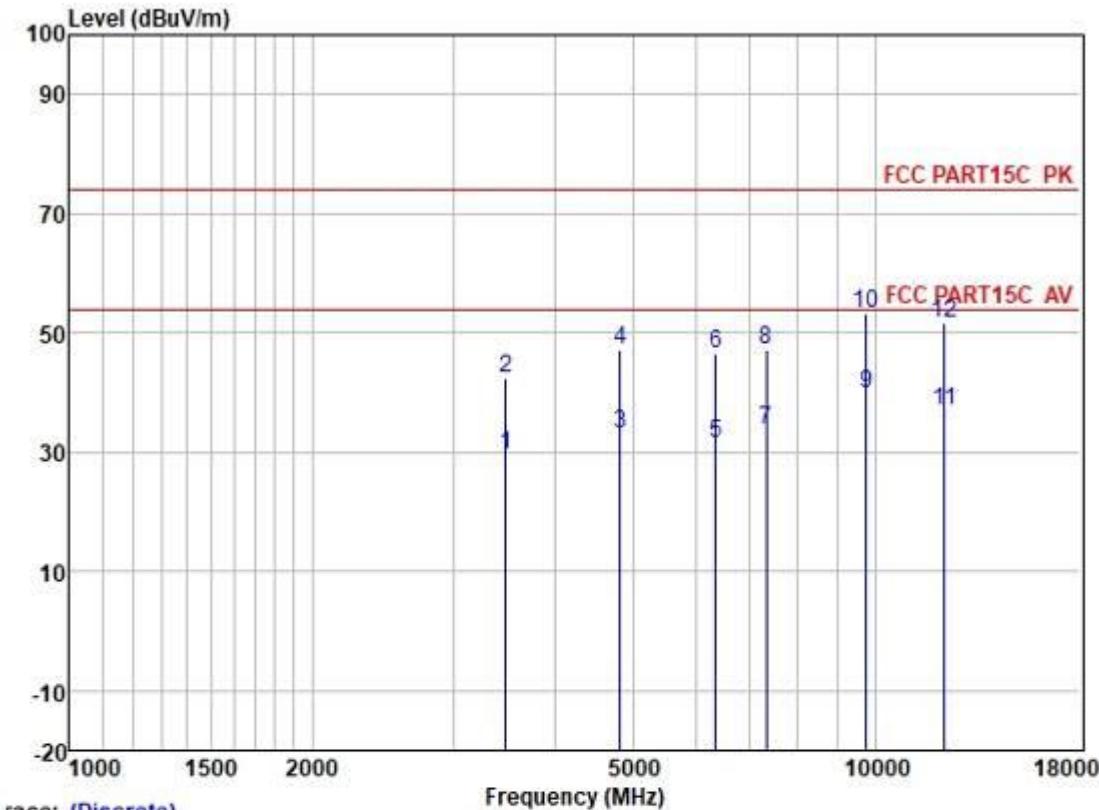
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:middle



Index: (Discrete)	Frequency (MHz)						Limit Line	Over Limit	Pol/Phase	Remark
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level				
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m				
1	3485.601	32.88	28.89	4.27	36.46	29.58	54.00	-24.42	HORIZONTAL	Average
2	3485.601	45.59	28.89	4.27	36.46	42.29	74.00	-31.71	HORIZONTAL	Peak
3	4824.948	32.77	31.45	5.42	36.48	33.16	54.00	-20.84	HORIZONTAL	Average
4	4824.948	46.92	31.45	5.42	36.48	47.31	74.00	-26.69	HORIZONTAL	Peak
5	6340.436	28.74	33.57	5.94	36.62	31.63	54.00	-22.37	HORIZONTAL	Average
6	6340.436	43.57	33.57	5.94	36.62	46.46	74.00	-27.54	HORIZONTAL	Peak
7	7326.788	28.42	36.00	6.13	36.76	33.79	54.00	-20.21	HORIZONTAL	Average
8	7326.788	41.97	36.00	6.13	36.76	47.34	74.00	-26.66	HORIZONTAL	Peak
9	9768.018	30.72	38.53	7.01	36.33	39.93	54.00	-14.07	HORIZONTAL	Average
10	9768.018	44.07	38.53	7.01	36.33	53.28	74.00	-20.72	HORIZONTAL	Peak
11	12210.450	26.59	38.74	8.08	36.30	37.11	54.00	-16.89	HORIZONTAL	Average
12	12210.450	41.02	38.74	8.08	36.30	51.54	74.00	-22.46	HORIZONTAL	Peak

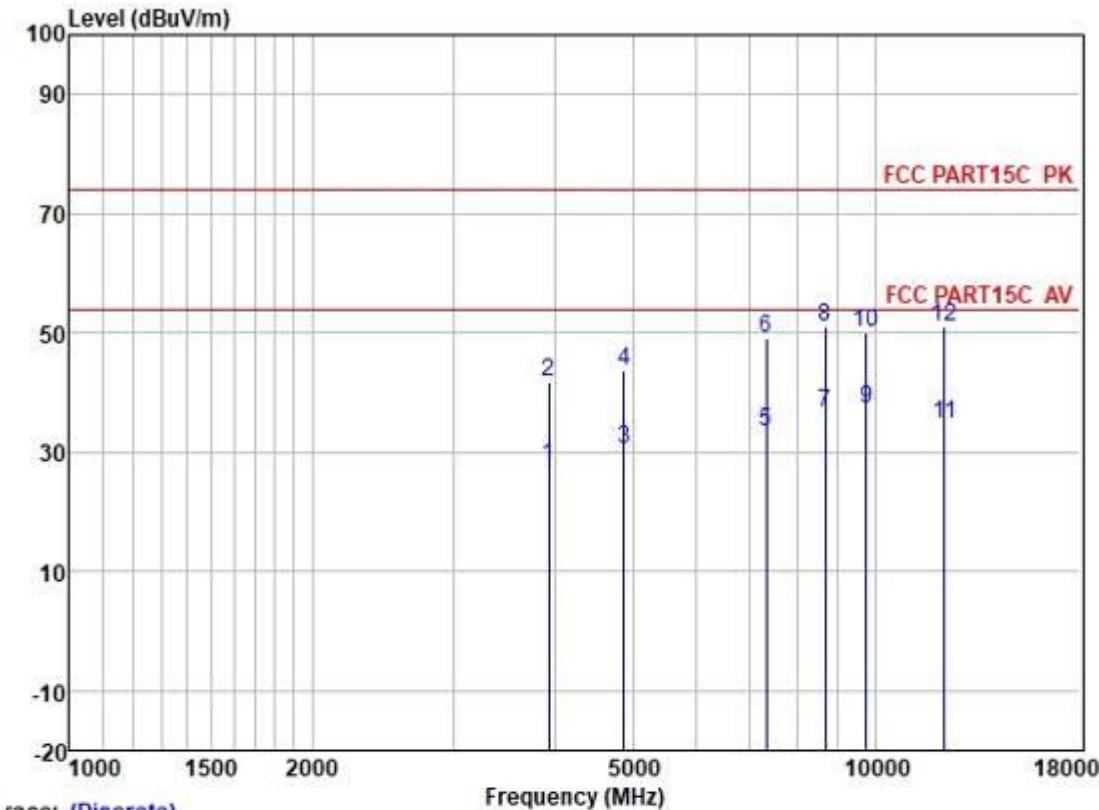
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:middle



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit	Pol/Phase	Remark
		MHz	Level	Factor	Loss							
1	3935.493	29.73	29.73	4.60	36.40	27.66	54.00	-26.34	VERTICAL	Average		
2	3935.493	43.68	29.73	4.60	36.40	41.61	74.00	-32.39	VERTICAL	Peak		
3	4884.260	30.11	31.56	5.52	36.50	30.69	54.00	-23.31	VERTICAL	Average		
4	4884.260	43.12	31.56	5.52	36.50	43.70	74.00	-30.30	VERTICAL	Peak		
5	7326.006	27.92	36.00	6.13	36.76	33.29	54.00	-20.71	VERTICAL	Average		
6	7326.006	43.61	36.00	6.13	36.76	48.98	74.00	-25.02	VERTICAL	Peak		
7	8688.480	28.98	37.28	7.02	36.65	36.63	54.00	-17.37	VERTICAL	Average		
8	8688.480	43.42	37.28	7.02	36.65	51.07	74.00	-22.93	VERTICAL	Peak		
9	9768.820	28.21	38.53	7.01	36.33	37.42	54.00	-16.58	VERTICAL	Average		
10	9768.820	41.02	38.53	7.01	36.33	50.23	74.00	-23.77	VERTICAL	Peak		
11	12210.750	24.27	38.74	8.08	36.30	34.79	54.00	-19.21	VERTICAL	Average		
12	12210.750	40.61	38.74	8.08	36.30	51.13	74.00	-22.87	VERTICAL	Peak		

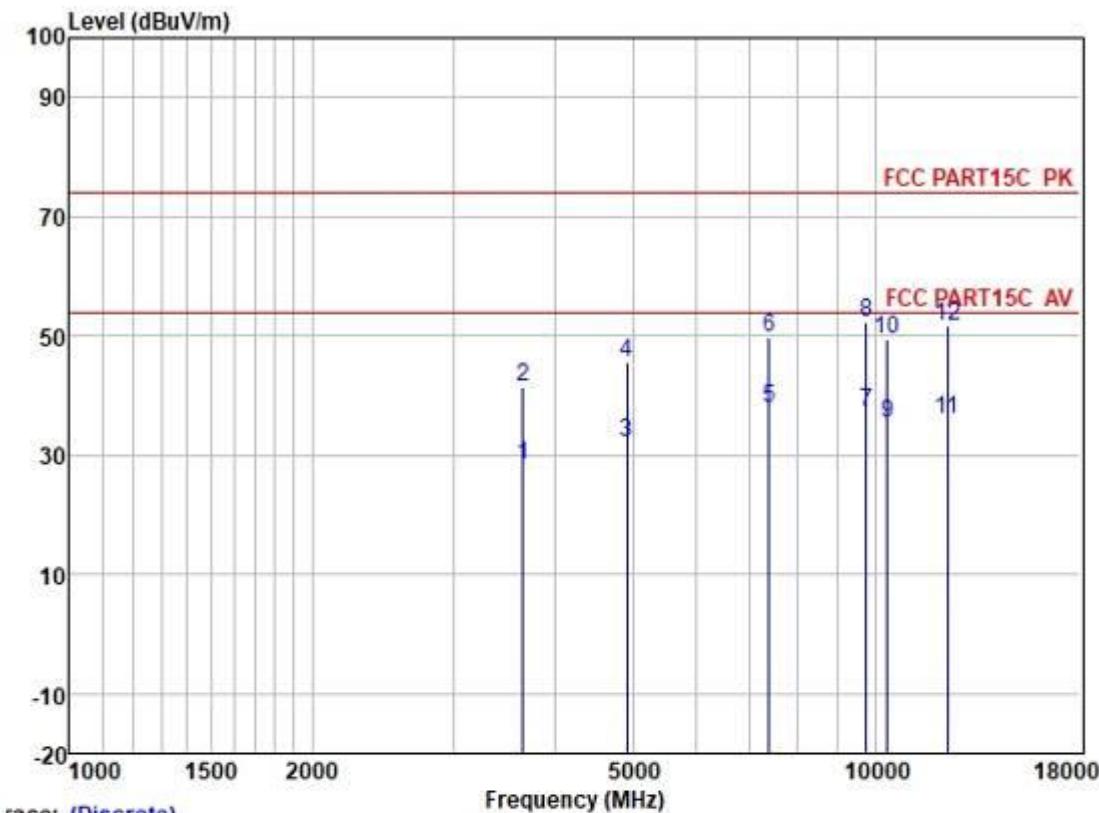
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit	Pol/Phase	Remark
		MHz	Level	Factor	Loss							
1	3661.149	30.93	29.15	4.53	36.43	28.18	54.00	-25.82	HORIZONTAL	Average		
2	3661.149	44.29	29.15	4.53	36.43	41.54	74.00	-32.46	HORIZONTAL	Peak		
3	4924.490	31.56	31.62	5.60	36.50	32.28	54.00	-21.72	HORIZONTAL	Average		
4	4924.490	44.90	31.62	5.60	36.50	45.62	74.00	-28.38	HORIZONTAL	Peak		
5	7386.006	32.48	36.17	6.19	36.77	38.07	54.00	-15.93	HORIZONTAL	Average		
6	7386.006	44.22	36.17	6.19	36.77	49.81	74.00	-24.19	HORIZONTAL	Peak		
7	9764.710	28.24	38.50	7.02	36.33	37.43	54.00	-16.57	HORIZONTAL	Average		
8	9764.710	43.10	38.50	7.02	36.33	52.29	74.00	-21.71	HORIZONTAL	Peak		
9	10363.710	25.08	39.28	7.29	36.31	35.34	54.00	-18.66	HORIZONTAL	Average		
10	10363.710	39.29	39.28	7.29	36.31	49.55	74.00	-24.45	HORIZONTAL	Peak		
11	12310.380	25.45	38.63	8.01	36.23	35.86	54.00	-18.14	HORIZONTAL	Average		
12	12310.380	41.11	38.63	8.01	36.23	51.52	74.00	-22.48	HORIZONTAL	Peak		

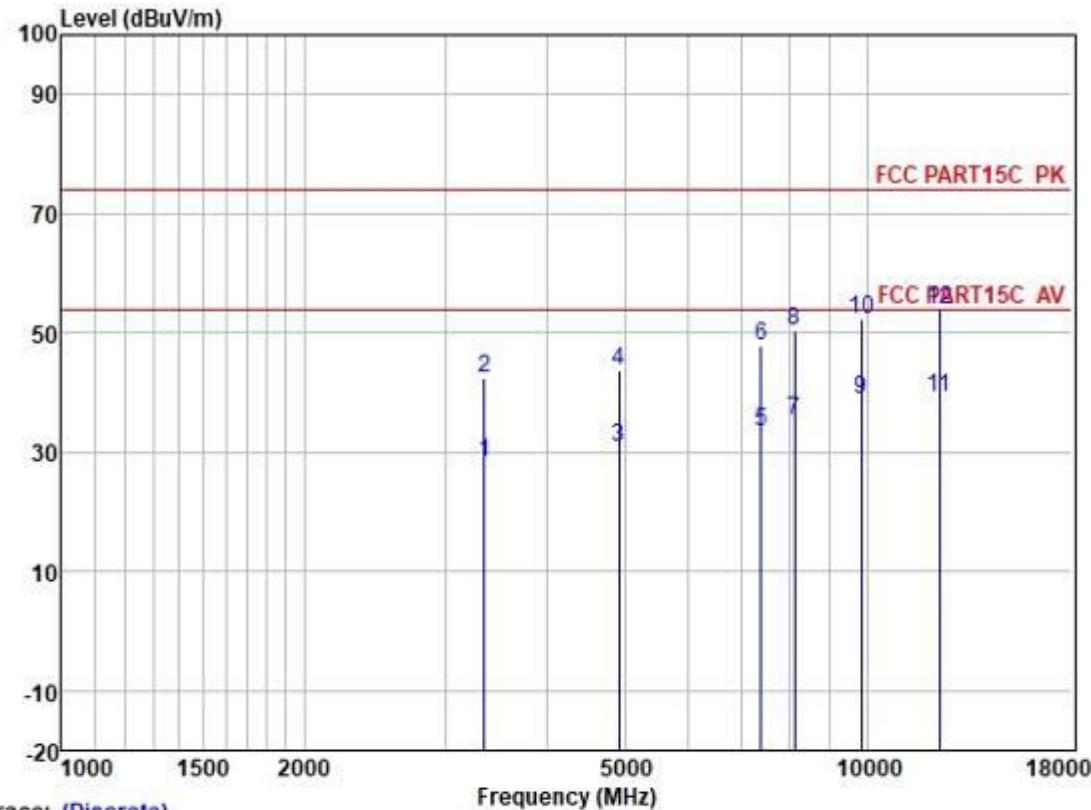
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit Pol/Phase	Remark
		MHz	Level	Factor	Loss						
1	3347.371	32.08	28.80	4.08	36.48	28.48	54.00	-25.52	VERTICAL	Average	
2	3347.371	45.95	28.80	4.08	36.48	42.35	74.00	-31.65	VERTICAL	Peak	
3	4924.339	30.24	31.62	5.60	36.50	30.96	54.00	-23.04	VERTICAL	Average	
4	4924.339	43.07	31.62	5.60	36.50	43.79	74.00	-30.21	VERTICAL	Peak	
5	7386.172	27.69	36.17	6.19	36.77	33.28	54.00	-20.72	VERTICAL	Average	
6	7386.172	42.35	36.17	6.19	36.77	47.94	74.00	-26.06	VERTICAL	Peak	
7	8129.664	28.80	36.95	6.27	36.78	35.24	54.00	-18.76	VERTICAL	Average	
8	8129.664	43.85	36.95	6.27	36.78	50.29	74.00	-23.71	VERTICAL	Peak	
9	9848.724	29.49	38.58	6.99	36.32	38.74	54.00	-15.26	VERTICAL	Average	
10	9848.724	43.12	38.58	6.99	36.32	52.37	74.00	-21.63	VERTICAL	Peak	
11	12310.380	28.78	38.63	8.01	36.23	39.19	54.00	-14.81	VERTICAL	Average	
12	12310.380	43.44	38.63	8.01	36.23	53.85	74.00	-20.15	VERTICAL	Peak	

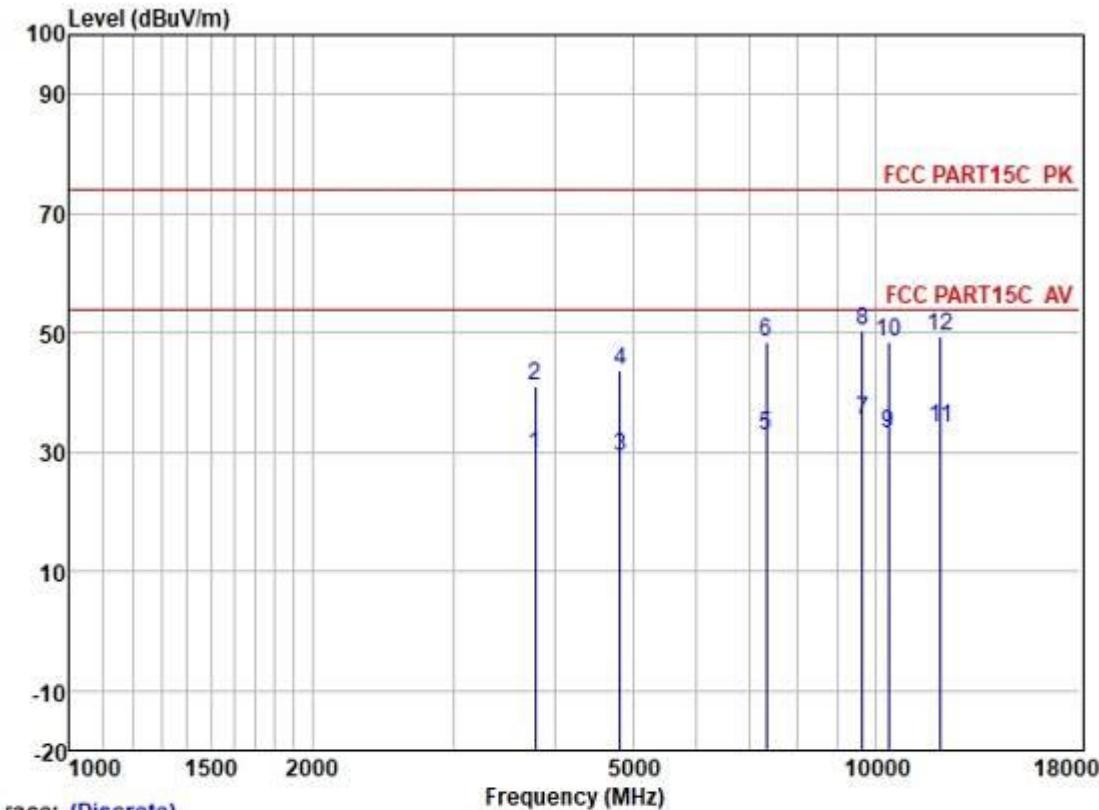
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Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit	Over	Pol/Phase	Remark
		MHz	Level	Factor	Loss								
1	3790.361	31.78	29.50	4.60	36.42	29.46	54.00	-24.54	HORIZONTAL	Average			
2	3790.361	43.36	29.50	4.60	36.42	41.04	74.00	-32.96	HORIZONTAL	Peak			
3	4828.887	28.79	31.47	5.44	36.48	29.22	54.00	-24.78	HORIZONTAL	Average			
4	4828.887	43.41	31.47	5.44	36.48	43.84	74.00	-30.16	HORIZONTAL	Peak			
5	7326.267	27.38	36.00	6.13	36.76	32.75	54.00	-21.25	HORIZONTAL	Average			
6	7326.267	43.11	36.00	6.13	36.76	48.48	74.00	-25.52	HORIZONTAL	Peak			
7	9648.588	26.10	38.40	7.06	36.35	35.21	54.00	-18.79	HORIZONTAL	Average			
8	9648.588	41.24	38.40	7.06	36.35	50.35	74.00	-23.65	HORIZONTAL	Peak			
9	10393.710	22.90	39.33	7.32	36.31	33.24	54.00	-20.76	HORIZONTAL	Average			
10	10393.710	38.06	39.33	7.32	36.31	48.40	74.00	-25.60	HORIZONTAL	Peak			
11	12060.380	23.32	38.88	8.17	36.38	33.99	54.00	-20.01	HORIZONTAL	Average			
12	12060.380	38.74	38.88	8.17	36.38	49.41	74.00	-24.59	HORIZONTAL	Peak			

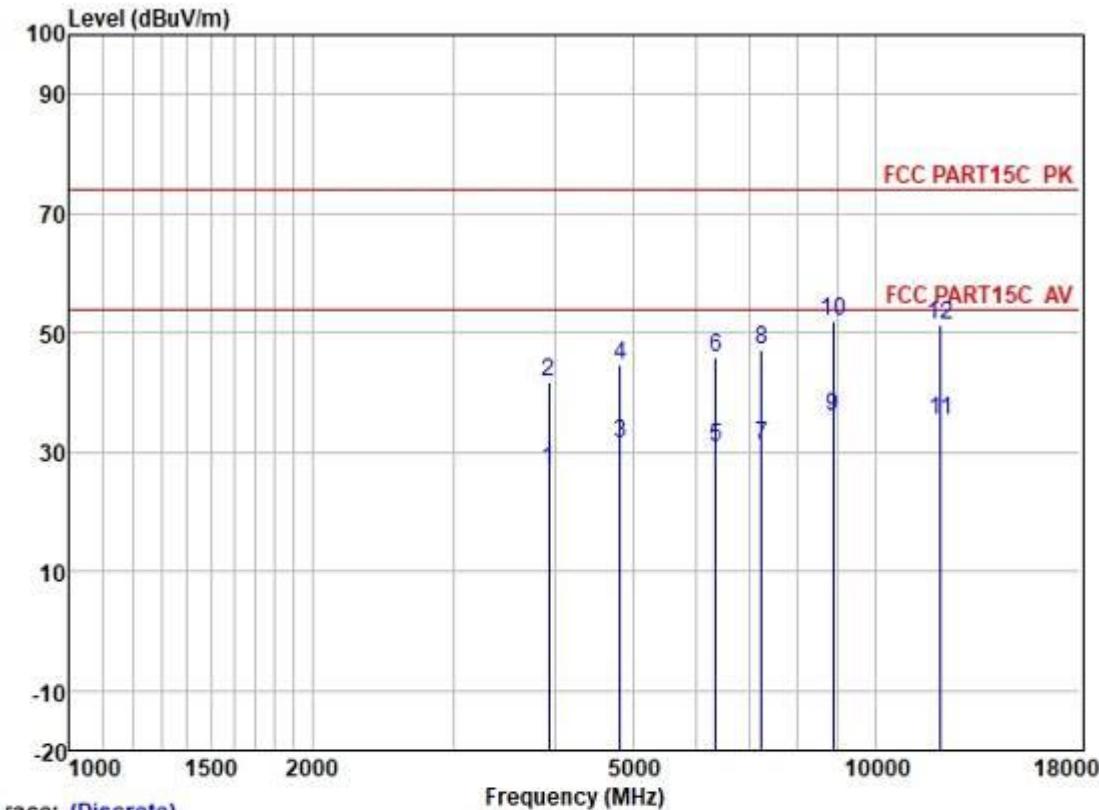
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Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



Race: (Discrete)	Frequency (MHz)						Limit Line	Over Limit	Pol/Phase	Remark
	Freq	Read	Antenna	Cable	Preamp	Level				
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m				
1	3935.493	29.23	29.73	4.60	36.40	27.16	54.00	-26.84	VERTICAL	Average
2	3935.493	43.99	29.73	4.60	36.40	41.92	74.00	-32.08	VERTICAL	Peak
3	4824.419	31.13	31.45	5.42	36.48	31.52	54.00	-22.48	VERTICAL	Average
4	4824.419	44.18	31.45	5.42	36.48	44.57	74.00	-29.43	VERTICAL	Peak
5	6340.436	28.05	33.57	5.94	36.62	30.94	54.00	-23.06	VERTICAL	Average
6	6340.436	43.04	33.57	5.94	36.62	45.93	74.00	-28.07	VERTICAL	Peak
7	7236.015	26.12	35.70	6.03	36.75	31.10	54.00	-22.90	VERTICAL	Average
8	7236.015	42.22	35.70	6.03	36.75	47.20	74.00	-26.80	VERTICAL	Peak
9	8866.062	27.70	37.36	7.38	36.58	35.86	54.00	-18.14	VERTICAL	Average
10	8866.062	43.79	37.36	7.38	36.58	51.95	74.00	-22.05	VERTICAL	Peak
11	12060.160	24.84	38.88	8.17	36.38	35.51	54.00	-18.49	VERTICAL	Average
12	12060.160	40.77	38.88	8.17	36.38	51.44	74.00	-22.56	VERTICAL	Peak

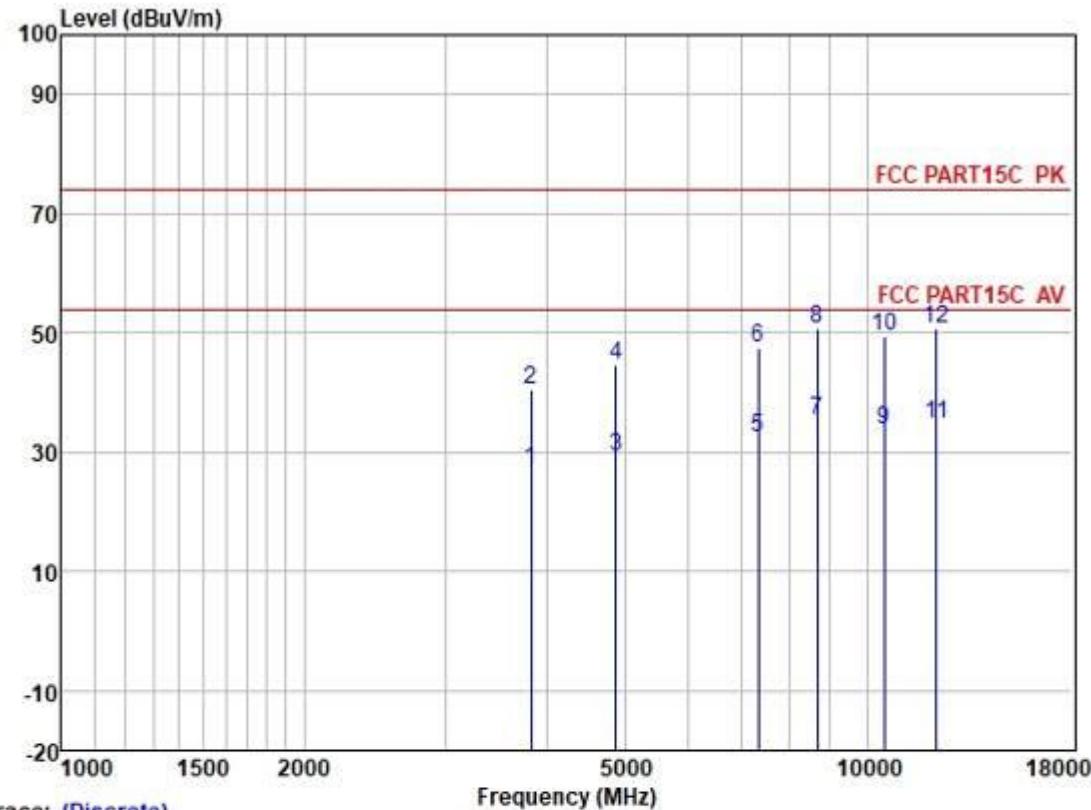
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Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:middle



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit Pol/Phase	Remark
		MHz	dBuV	Level	Factor						
		MHz	dB/m		dB	dB	dBuV/m	dBuV/m			
1	3834.438	29.14	29.59	4.60	36.41	26.92	54.00	-27.08	VERTICAL	Average	
2	3834.438	42.80	29.59	4.60	36.41	40.58	74.00	-33.42	VERTICAL	Peak	
3	4884.197	28.61	31.56	5.52	36.50	29.19	54.00	-24.81	VERTICAL	Average	
4	4884.197	44.22	31.56	5.52	36.50	44.80	74.00	-29.20	VERTICAL	Peak	
5	7326.172	27.26	36.00	6.13	36.76	32.63	54.00	-21.37	VERTICAL	Average	
6	7326.172	42.05	36.00	6.13	36.76	47.42	74.00	-26.58	VERTICAL	Peak	
7	8688.480	27.67	37.28	7.02	36.65	35.32	54.00	-18.68	VERTICAL	Average	
8	8688.480	43.17	37.28	7.02	36.65	50.82	74.00	-23.18	VERTICAL	Peak	
9	10514.580	23.22	39.50	7.42	36.32	33.82	54.00	-20.18	VERTICAL	Average	
10	10514.580	38.86	39.50	7.42	36.32	49.46	74.00	-24.54	VERTICAL	Peak	
11	12210.750	24.17	38.74	8.08	36.30	34.69	54.00	-19.31	VERTICAL	Average	
12	12210.750	40.27	38.74	8.08	36.30	50.79	74.00	-23.21	VERTICAL	Peak	

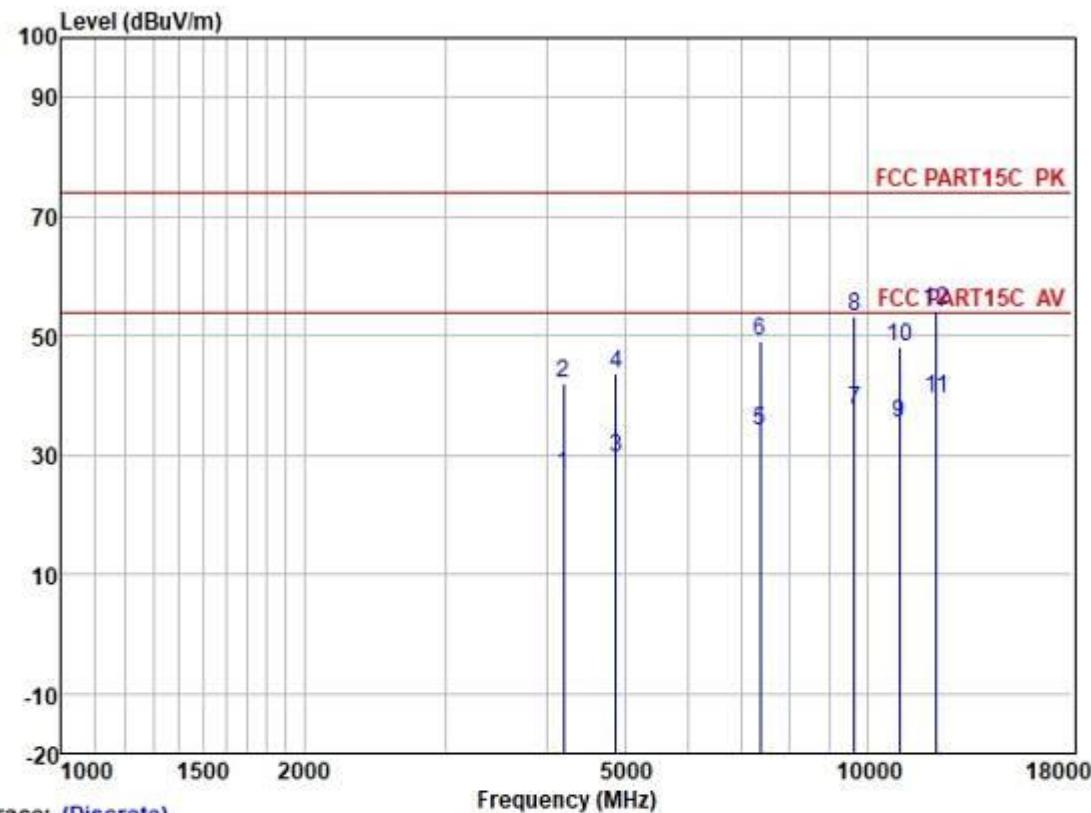
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Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit	Pol/Phase	Remark
		MHz	Level	Factor	Loss							
1	4206.011	28.31	30.18	4.60	36.41	26.68	54.00	-27.32	HORIZONTAL	Average		
2	4206.011	43.67	30.18	4.60	36.41	42.04	74.00	-31.96	HORIZONTAL	Peak		
3	4884.993	29.13	31.56	5.52	36.50	29.71	54.00	-24.29	HORIZONTAL	Average		
4	4884.993	43.20	31.56	5.52	36.50	43.78	74.00	-30.22	HORIZONTAL	Peak		
5	7368.741	28.61	36.12	6.17	36.76	34.14	54.00	-19.86	HORIZONTAL	Average		
6	7368.741	43.61	36.12	6.17	36.76	49.14	74.00	-24.86	HORIZONTAL	Peak		
7	9648.018	28.43	38.40	7.06	36.35	37.54	54.00	-16.46	HORIZONTAL	Average		
8	9648.018	44.03	38.40	7.06	36.35	53.14	74.00	-20.86	HORIZONTAL	Peak		
9	10980.470	23.90	40.07	7.70	36.35	35.32	54.00	-18.68	HORIZONTAL	Average		
10	10980.470	36.66	40.07	7.70	36.35	48.08	74.00	-25.92	HORIZONTAL	Peak		
11	12210.610	29.01	38.74	8.08	36.30	39.53	54.00	-14.47	HORIZONTAL	Average		
12	12210.610	43.59	38.74	8.08	36.30	54.11	74.00	-19.89	HORIZONTAL	Peak		

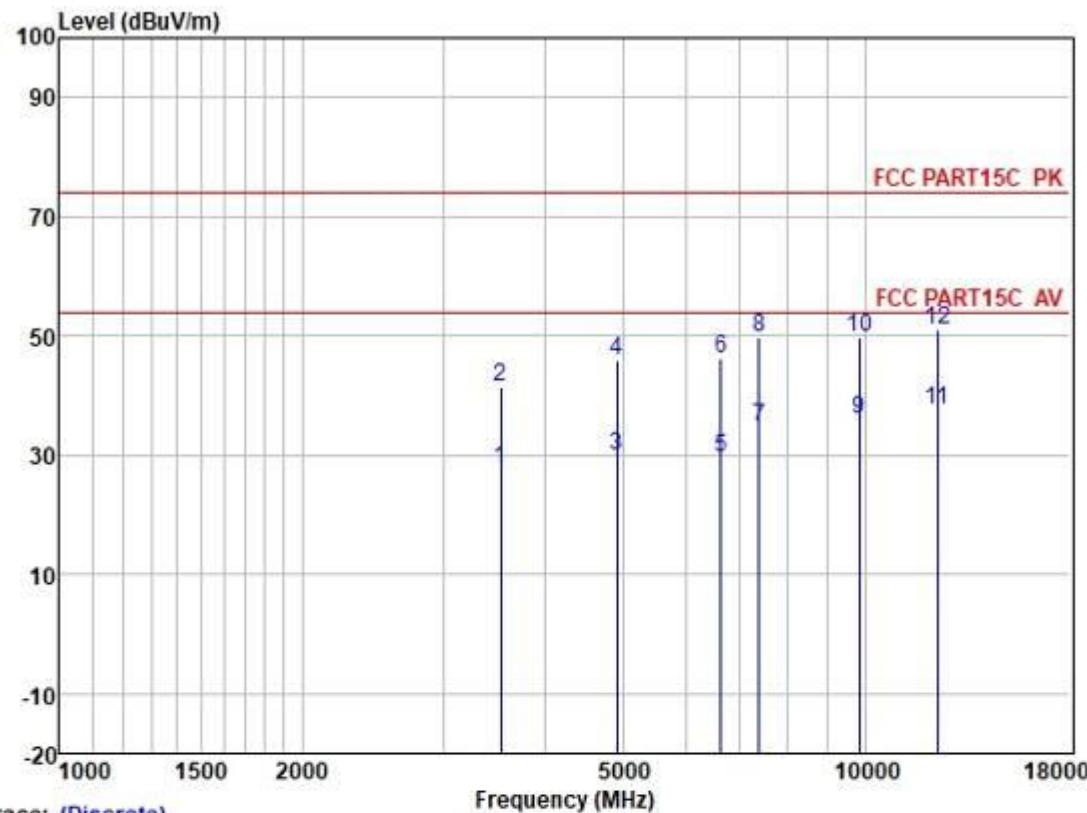
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Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



Trace: (Discrete)	Frequency (MHz)						Limit Line	Over Limit	Pol/Phase	Remark
	Freq	Read	Antenna Level	Cable Factor	Preamp Loss	Level				
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m				
1	3526.134	30.77	28.94	4.38	36.45	27.64	54.00	-26.36	VERTICAL	Average
2	3526.134	44.55	28.94	4.38	36.45	41.42	74.00	-32.58	VERTICAL	Peak
3	4924.058	29.07	31.62	5.60	36.50	29.79	54.00	-24.21	VERTICAL	Average
4	4924.058	45.06	31.62	5.60	36.50	45.78	74.00	-28.22	VERTICAL	Peak
5	6621.375	26.07	34.20	5.83	36.65	29.45	54.00	-24.55	VERTICAL	Average
6	6621.375	42.93	34.20	5.83	36.65	46.31	74.00	-27.69	VERTICAL	Peak
7	7386.838	29.24	36.17	6.19	36.77	34.83	54.00	-19.17	VERTICAL	Average
8	7386.838	44.03	36.17	6.19	36.77	49.62	74.00	-24.38	VERTICAL	Peak
9	9848.525	26.82	38.58	6.99	36.32	36.07	54.00	-17.93	VERTICAL	Average
10	9848.525	40.66	38.58	6.99	36.32	49.91	74.00	-24.09	VERTICAL	Peak
11	12310.610	27.21	38.63	8.01	36.23	37.62	54.00	-16.38	VERTICAL	Average
12	12310.610	40.73	38.63	8.01	36.23	51.14	74.00	-22.86	VERTICAL	Peak

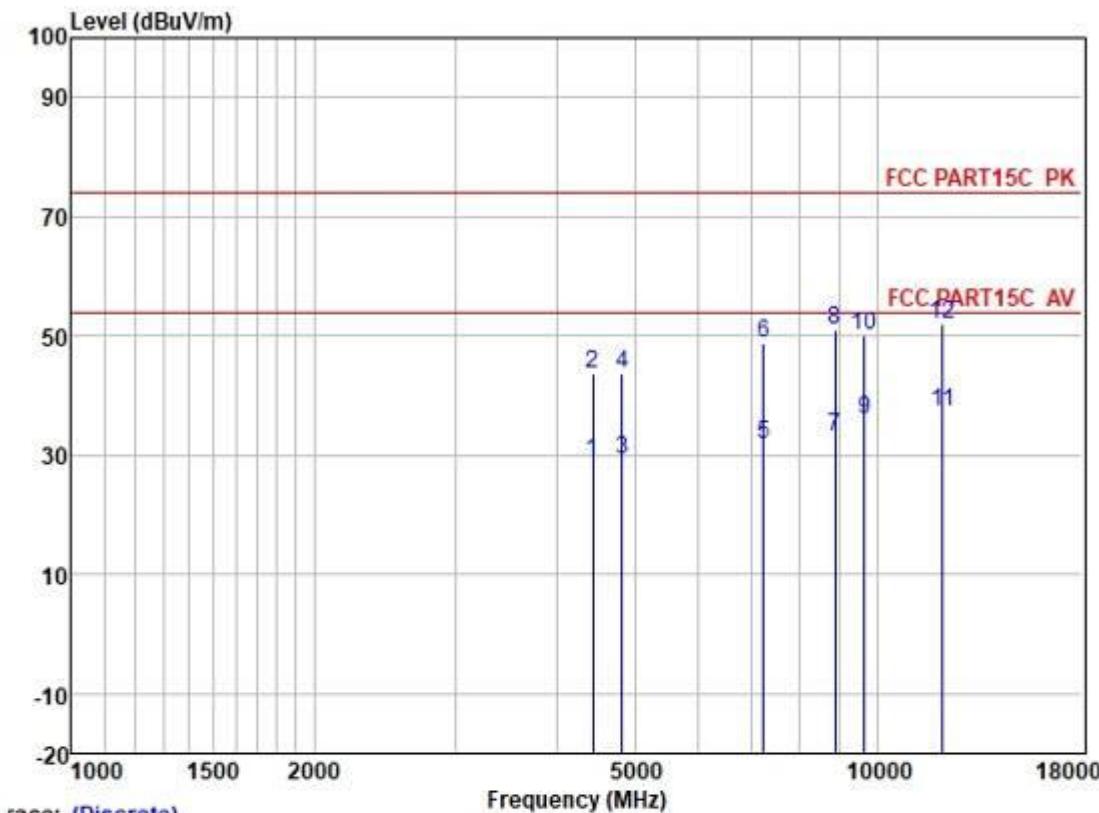
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit	Pol/Phase	Remark
		MHz	Level	Factor	Loss							
1	4440.339	29.73	30.73	4.83	36.43	28.86	54.00	-25.14	HORIZONTAL	Average		
2	4440.339	44.68	30.73	4.83	36.43	43.81	74.00	-30.19	HORIZONTAL	Peak		
3	4824.136	28.80	31.45	5.42	36.48	29.19	54.00	-24.81	HORIZONTAL	Average		
4	4824.136	43.34	31.45	5.42	36.48	43.73	74.00	-30.27	HORIZONTAL	Peak		
5	7236.429	26.90	35.70	6.03	36.75	31.88	54.00	-22.12	HORIZONTAL	Average		
6	7236.429	43.75	35.70	6.03	36.75	48.73	74.00	-25.27	HORIZONTAL	Peak		
7	8866.062	25.04	37.36	7.38	36.58	33.20	54.00	-20.80	HORIZONTAL	Average		
8	8866.062	42.91	37.36	7.38	36.58	51.07	74.00	-22.93	HORIZONTAL	Peak		
9	9648.600	26.82	38.40	7.06	36.35	35.93	54.00	-18.07	HORIZONTAL	Average		
10	9648.600	40.89	38.40	7.06	36.35	50.00	74.00	-24.00	HORIZONTAL	Peak		
11	12060.690	26.70	38.88	8.17	36.38	37.37	54.00	-16.63	HORIZONTAL	Average		
12	12060.690	41.47	38.88	8.17	36.38	52.14	74.00	-21.86	HORIZONTAL	Peak		

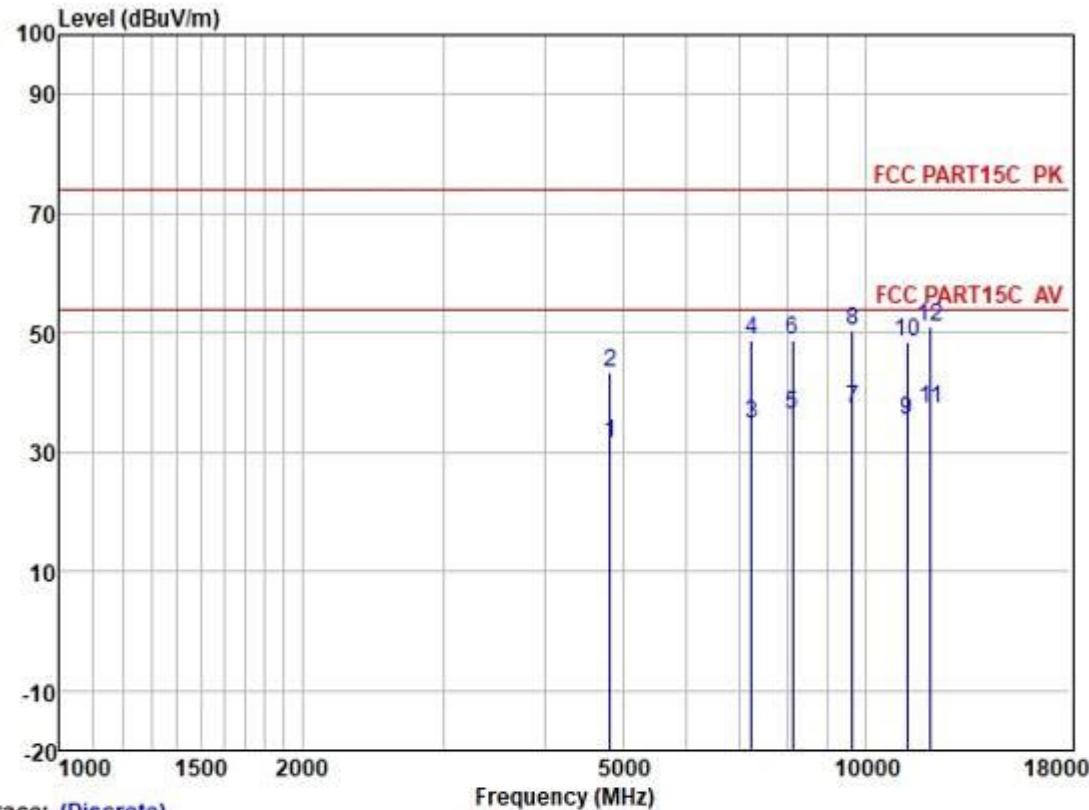
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



Index	Freq	Read		Antenna		Cable		Preamp		Limit Line	Over Limit	Pol/Phase	Remark
		Antenna	Level	Antenna	Factor	Loss	Factor	Level	dBuV/m				
	MHz	MHz	dBuV	dB/m		dB		dB					
1	4824.058	31.13	31.45	5.42	36.48	31.52	54.00	-22.48	VERTICAL			Average	
2	4824.058	43.00	31.45	5.42	36.48	43.39	74.00	-30.61	VERTICAL			Peak	
3	7236.741	29.81	35.70	6.03	36.75	34.79	54.00	-19.21	VERTICAL			Average	
4	7236.741	43.93	35.70	6.03	36.75	48.91	74.00	-25.09	VERTICAL			Peak	
5	8129.664	29.97	36.95	6.27	36.78	36.41	54.00	-17.59	VERTICAL			Average	
6	8129.664	42.43	36.95	6.27	36.78	48.87	74.00	-25.13	VERTICAL			Peak	
7	9648.432	28.16	38.40	7.06	36.35	37.27	54.00	-16.73	VERTICAL			Average	
8	9648.432	41.38	38.40	7.06	36.35	50.49	74.00	-23.51	VERTICAL			Peak	
9	11269.860	23.54	40.00	8.06	36.37	35.23	54.00	-18.77	VERTICAL			Average	
10	11269.860	36.82	40.00	8.06	36.37	48.51	74.00	-25.49	VERTICAL			Peak	
11	12060.210	26.69	38.88	8.17	36.38	37.36	54.00	-16.64	VERTICAL			Average	
12	12060.210	40.35	38.88	8.17	36.38	51.02	74.00	-22.98	VERTICAL			Peak	

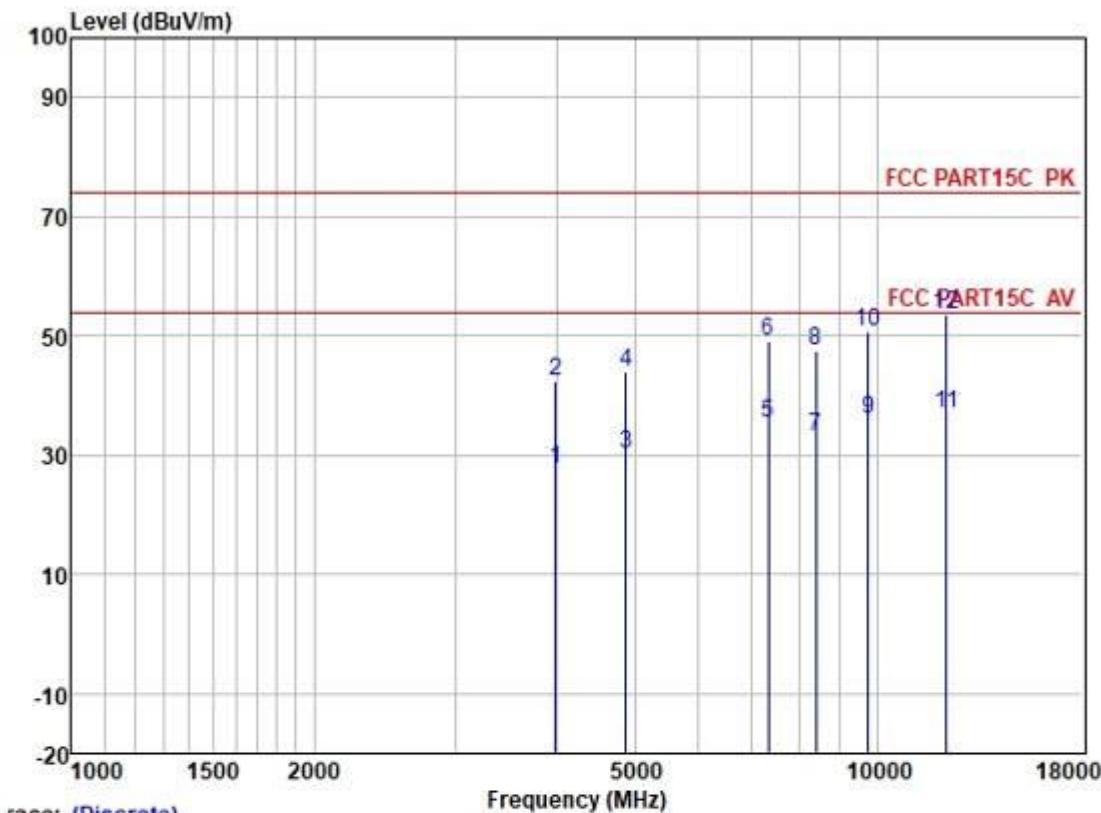
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:middle



Index: (Discrete)	Frequency (MHz)						Limit Line	Over Limit	Pol/Phase	Remark
	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Level	dBuV/m				
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB			
1	3992.781	29.73	29.79	4.60	36.40	27.72	54.00	-26.28	HORIZONTAL	Average
2	3992.781	44.29	29.79	4.60	36.40	42.28	74.00	-31.72	HORIZONTAL	Peak
3	4884.993	29.73	31.56	5.52	36.50	30.31	54.00	-23.69	HORIZONTAL	Average
4	4884.993	43.35	31.56	5.52	36.50	43.93	74.00	-30.07	HORIZONTAL	Peak
5	7326.267	30.02	36.00	6.13	36.76	35.39	54.00	-18.61	HORIZONTAL	Average
6	7326.267	43.86	36.00	6.13	36.76	49.23	74.00	-24.77	HORIZONTAL	Peak
7	8393.689	26.27	37.08	6.61	36.73	33.23	54.00	-20.77	HORIZONTAL	Average
8	8393.689	40.60	37.08	6.61	36.73	47.56	74.00	-26.44	HORIZONTAL	Peak
9	9768.930	26.69	38.53	7.01	36.33	35.90	54.00	-18.10	HORIZONTAL	Average
10	9768.930	41.51	38.53	7.01	36.33	50.72	74.00	-23.28	HORIZONTAL	Peak
11	12210.690	26.54	38.74	8.08	36.30	37.06	54.00	-16.94	HORIZONTAL	Average
12	12210.690	42.96	38.74	8.08	36.30	53.48	74.00	-20.52	HORIZONTAL	Peak

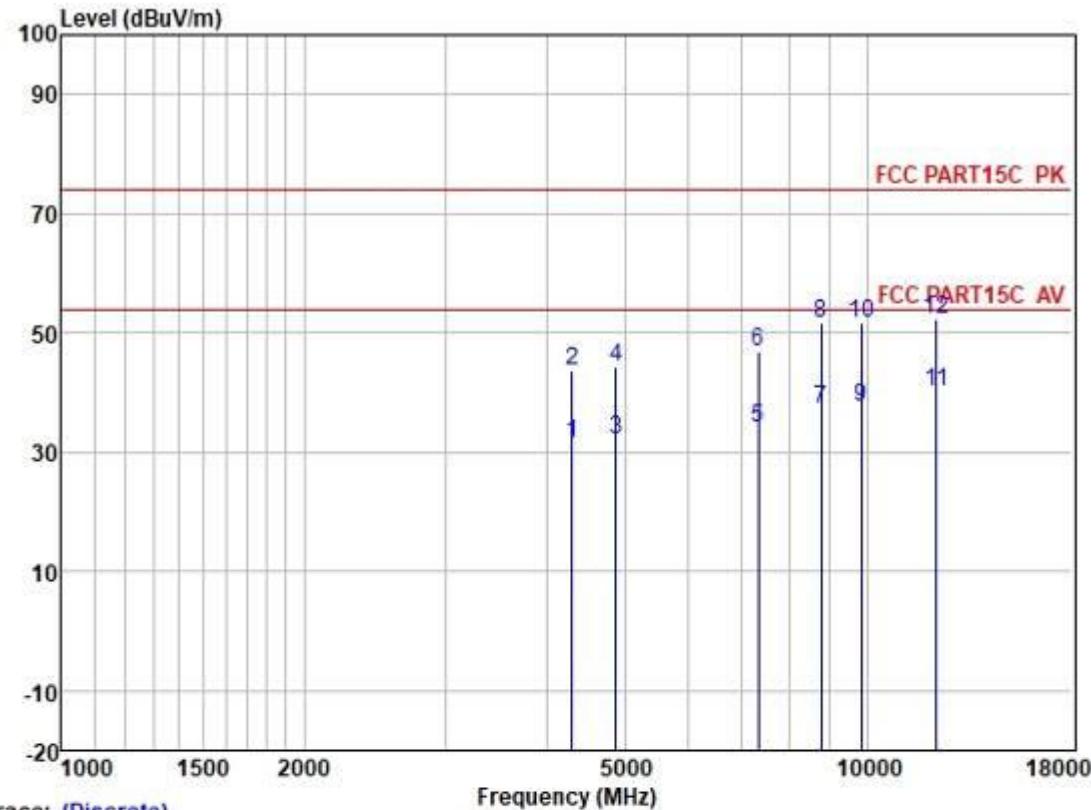
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:middle



Index	Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit Pol/Phase	Remark
		MHz	Level	Factor	Loss					
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	4308.136	32.77	30.48	4.65	36.42	31.48	54.00	-22.52	VERTICAL	Average
2	4308.136	44.87	30.48	4.65	36.42	43.58	74.00	-30.42	VERTICAL	Peak
3	4884.209	31.43	31.56	5.52	36.50	32.01	54.00	-21.99	VERTICAL	Average
4	4884.209	43.79	31.56	5.52	36.50	44.37	74.00	-29.63	VERTICAL	Peak
5	7326.600	28.80	36.00	6.13	36.76	34.17	54.00	-19.83	VERTICAL	Average
6	7326.600	41.54	36.00	6.13	36.76	46.91	74.00	-27.09	VERTICAL	Peak
7	8764.146	29.54	37.32	7.19	36.63	37.42	54.00	-16.58	VERTICAL	Average
8	8764.146	43.69	37.32	7.19	36.63	51.57	74.00	-22.43	VERTICAL	Peak
9	9848.560	28.24	38.58	6.99	36.32	37.49	54.00	-16.51	VERTICAL	Average
10	9848.560	42.40	38.58	6.99	36.32	51.65	74.00	-22.35	VERTICAL	Peak
11	12210.930	29.73	38.74	8.08	36.30	40.25	54.00	-13.75	VERTICAL	Average
12	12210.930	41.82	38.74	8.08	36.30	52.34	74.00	-21.66	VERTICAL	Peak

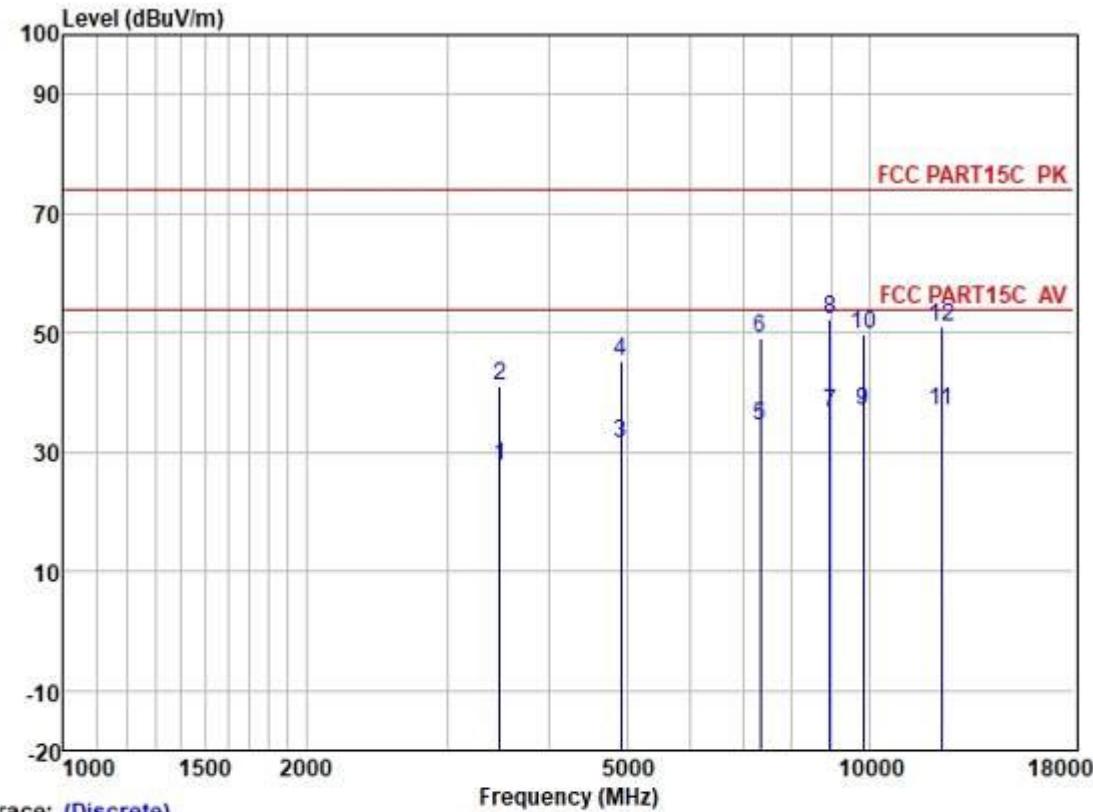
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Index	Frequency (MHz)	Read Antenna Level		Cable Preamp		Limit Line	Over Limit	Pol/Phase	Remark
		Freq	Level	Antenna Factor	Cable Loss				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3485.601	31.09	28.89	4.27	36.46	27.79	54.00	-26.21	HORIZONTAL Average
2	3485.601	44.39	28.89	4.27	36.46	41.09	74.00	-32.91	HORIZONTAL Peak
3	4924.440	30.73	31.62	5.60	36.50	31.45	54.00	-22.55	HORIZONTAL Average
4	4924.440	44.56	31.62	5.60	36.50	45.28	74.00	-28.72	HORIZONTAL Peak
5	7326.034	29.10	36.00	6.13	36.76	34.47	54.00	-19.53	HORIZONTAL Average
6	7326.034	43.85	36.00	6.13	36.76	49.22	74.00	-24.78	HORIZONTAL Peak
7	8943.274	28.41	37.38	7.49	36.55	36.73	54.00	-17.27	HORIZONTAL Average
8	8943.274	43.99	37.38	7.49	36.55	52.31	74.00	-21.69	HORIZONTAL Peak
9	9848.800	27.83	38.58	6.99	36.32	37.08	54.00	-16.92	HORIZONTAL Average
10	9848.800	40.60	38.58	6.99	36.32	49.85	74.00	-24.15	HORIZONTAL Peak
11	12310.470	26.60	38.63	8.01	36.23	37.01	54.00	-16.99	HORIZONTAL Average
12	12310.470	40.59	38.63	8.01	36.23	51.00	74.00	-23.00	HORIZONTAL Peak

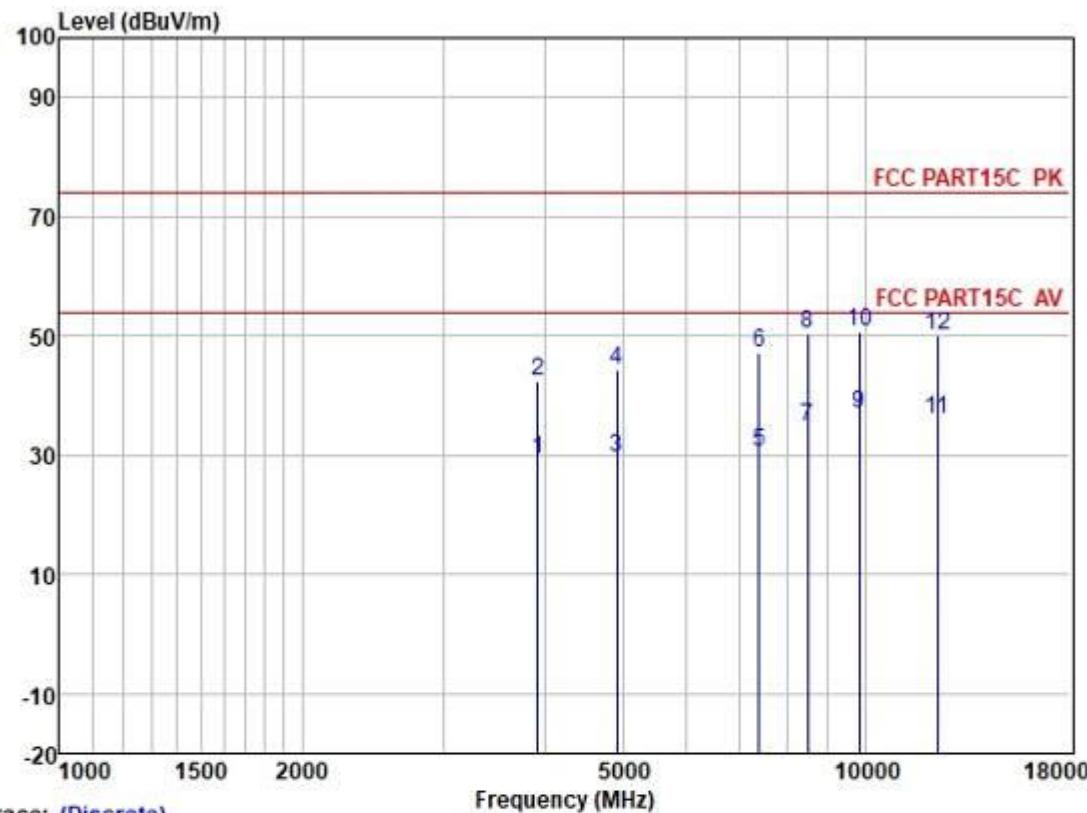
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



Index	Freq	ReadAntenna		Cable		Preamp	Level	Limit	Over	Limit Pol/Phase	Remark
		MHz	Level	Factor	Loss						
1	3924.135	31.35	29.72	4.60	36.41	29.26	54.00	-24.74	VERTICAL	Average	
2	3924.135	44.48	29.72	4.60	36.41	42.39	74.00	-31.61	VERTICAL	Peak	
3	4924.016	28.98	31.62	5.60	36.50	29.70	54.00	-24.30	VERTICAL	Average	
4	4924.016	43.69	31.62	5.60	36.50	44.41	74.00	-29.59	VERTICAL	Peak	
5	7386.646	24.88	36.17	6.19	36.77	30.47	54.00	-23.53	VERTICAL	Average	
6	7386.646	41.73	36.17	6.19	36.77	47.32	74.00	-26.68	VERTICAL	Peak	
7	8489.882	27.72	37.15	6.70	36.71	34.86	54.00	-19.14	VERTICAL	Average	
8	8489.882	43.25	37.15	6.70	36.71	50.39	74.00	-23.61	VERTICAL	Peak	
9	9848.349	27.70	38.58	6.99	36.32	36.95	54.00	-17.05	VERTICAL	Average	
10	9848.349	41.53	38.58	6.99	36.32	50.78	74.00	-23.22	VERTICAL	Peak	
11	12310.390	25.50	38.63	8.01	36.23	35.91	54.00	-18.09	VERTICAL	Average	
12	12310.390	39.67	38.63	8.01	36.23	50.08	74.00	-23.92	VERTICAL	Peak	

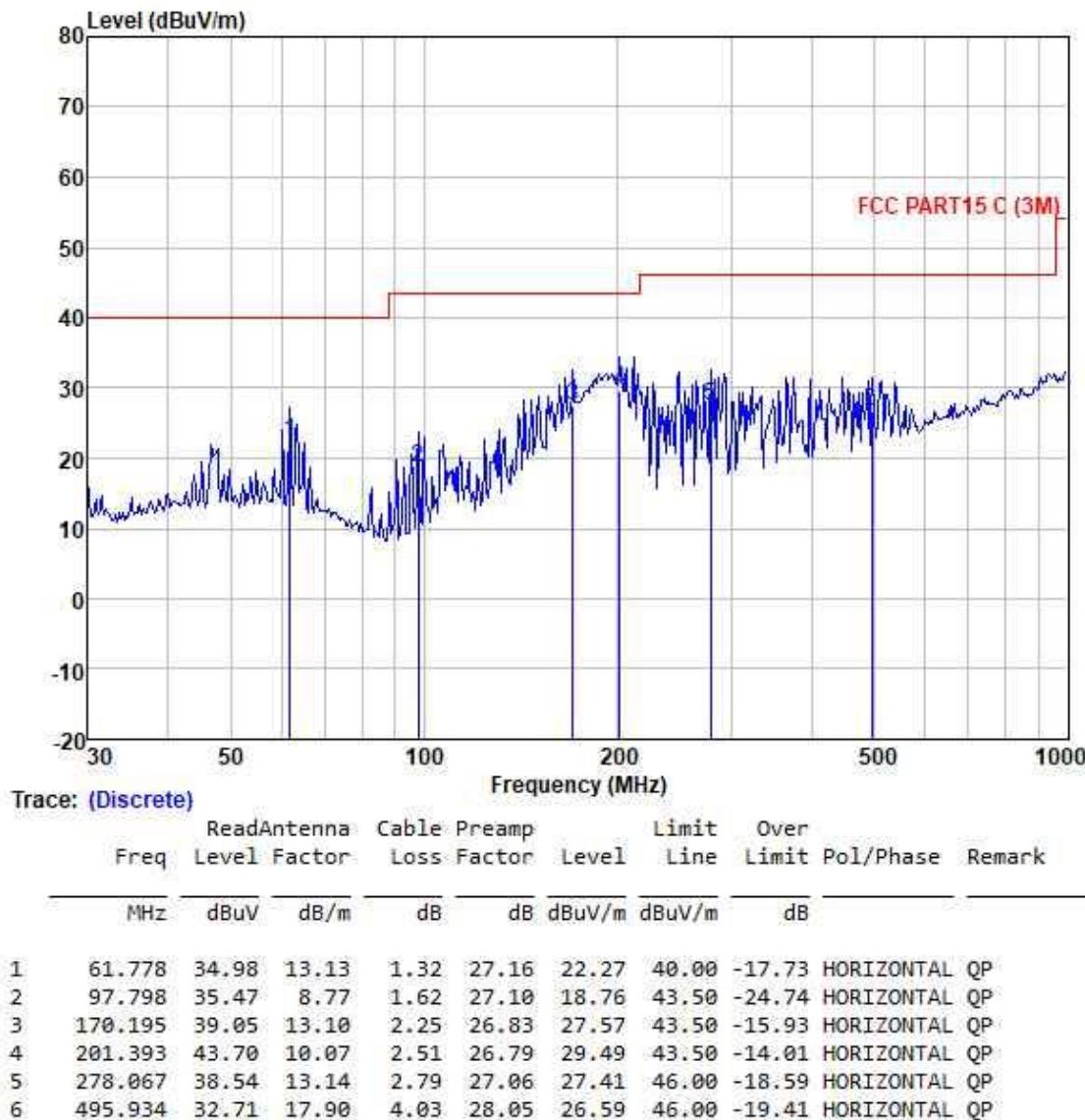
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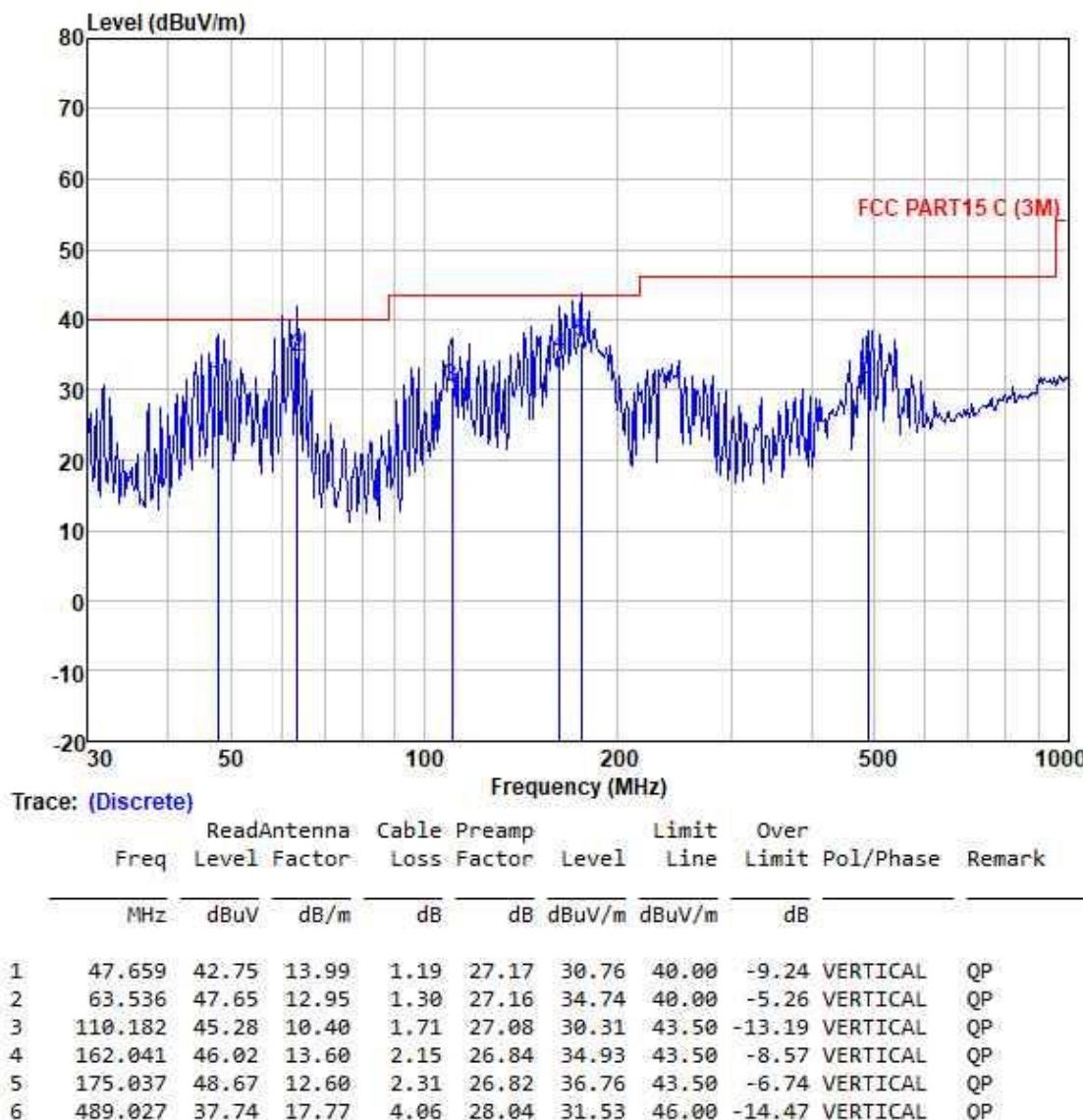
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## 8 Appendix

### 8.1 Appendix 15.247

**Cable Loss=0.9dB**

#### 1. 6dB Bandwidth

Test Mode	Test Channel	Ant	6dB Bandwidth [MHz]	Limit	Verdict
11B	2412	Ant1	10.12	0.5	PASS
11B	2442	Ant1	8.691	0.5	PASS
11B	2462	Ant1	8.579	0.5	PASS
11G	2412	Ant1	16.44	0.5	PASS
11G	2442	Ant1	16.39	0.5	PASS
11G	2462	Ant1	16.37	0.5	PASS
11N20SISO	2412	Ant1	17.65	0.5	PASS
11N20SISO	2442	Ant1	17.59	0.5	PASS
11N20SISO	2462	Ant1	17.47	0.5	PASS

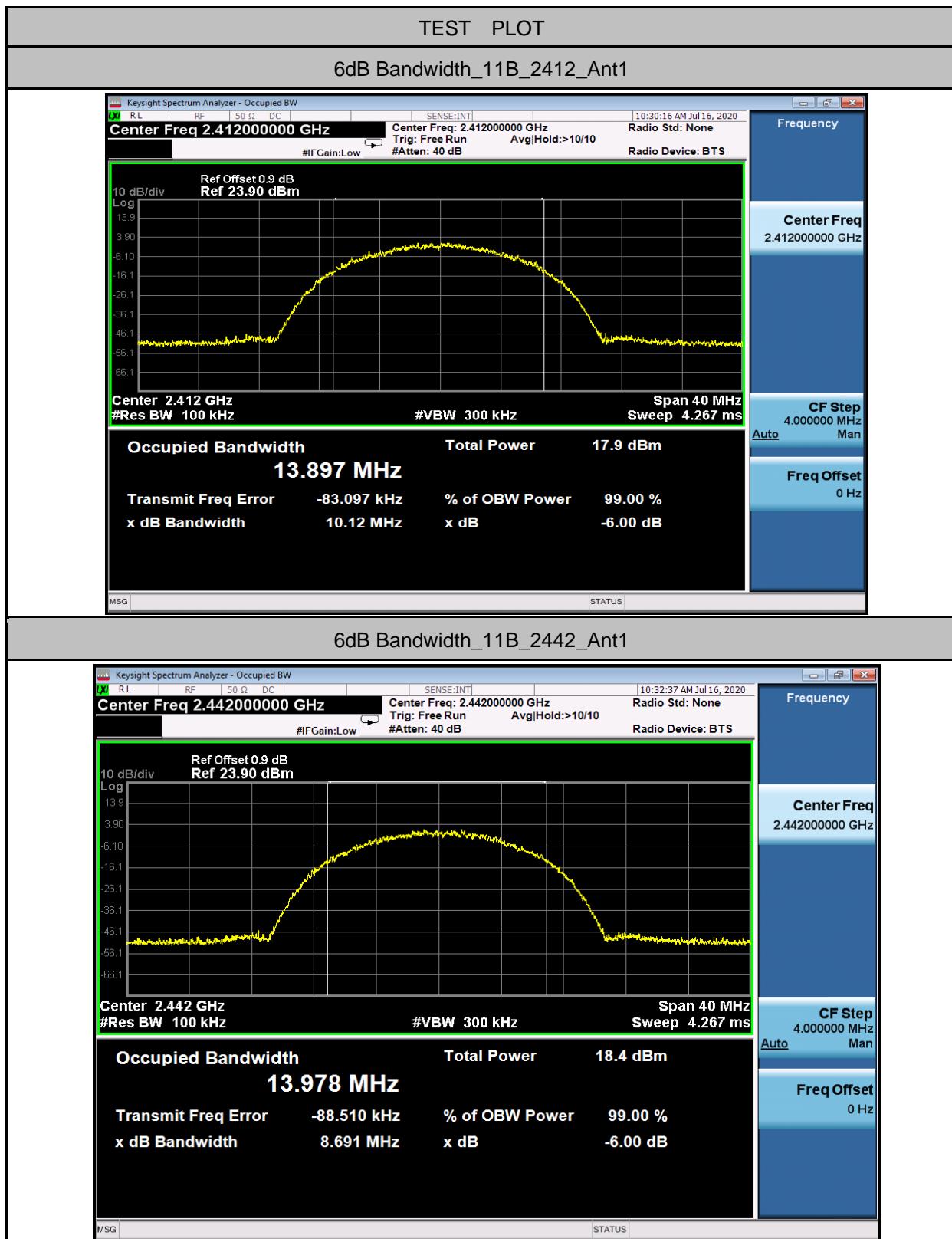


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Guangzhou Branch, SGS-CEC Laboratory

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