



TEST REPORT

Application No.: GZEM2009015347CR
Applicant: Seamless Integration Electronics Technology Co., Ltd
Address of Applicant: Room 402, Bldg D., No.1 Nanxiang zhi Rd, Huangpu Dis., Guangzhou, China.
Manufacturer: Seamless Integration Electronics Technology Co., Ltd
Address of Manufacturer: Room 402, Bldg D., No.1 Nanxiang zhi Rd, Huangpu Dis., Guangzhou, China.
Factory: Seamless Integration Electronics Technology Co., Ltd
Address of Factory: Room 402, Bldg D., No.1 Nanxiang zhi Rd, Huangpu Dis., Guangzhou, China.
Equipment Under Test (EUT):

FCC ID: 2AC3EG1C96A-G1C160A

EUT Name: Car in-dash Multimedia Navigation

Model No.: G1C096A, G1C129A, G1C097A, G1C130A, G1C098A, G1C131A, G1C099A, G1C132A, G1C100A, G1C133A, G1C101A, G1C134A, G1C102A, G1C135A, G1C103A, G1C136A, G1C104A, G1C137A, G1C105A, G1C138A, G1C106A, G1C139A, G1C107A, G1C140A, G1C108A, G1C141A, G1C109A, G1C142A, G1C110A, G1C143A, G1C111A, G1C144A, G1C112A, G1C145A, G1C113A, G1C146A, G1C114A, G1C147A, G1C115A, G1C148A, G1C116A, G1C149A, G1C117A, G1C150A, G1C118A, G1C151A, G1C119A, G1C152A, G1C120A, G1C153A, G1C121A, G1C154A, G1C122A, G1C155A, G1C123A, G1C156A, G1C124A, G1C157A, G1C125A, G1C158A, G1C126A, G1C159A, G1C127A, G1C160A, G1C128A.□

□

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

Trade Mark: Linkswell
Standard(s): 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2020-09-25
Date of Test: 2020-10-19 to 2020-12-01
Date of Issue: 2020-12-16

Test Result:	Pass*
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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		2020-12-16		Original

Authorized for issue by:			
Tested By		2020-10-19 to 2020-12-01	
Checked By		2020-12-16	



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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
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 15.205 & 15.209	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 15.205 & 15.209	Pass

■ Declaration of EUT Family Grouping:

Model No.: G1C096A, G1C129A, G1C097A, G1C130A, G1C098A, G1C131A, G1C099A, G1C132A, G1C100A, G1C133A, G1C101A, G1C134A, G1C102A, G1C135A, G1C103A, G1C136A, G1C104A, G1C137A, G1C105A, G1C138A, G1C106A, G1C139A, G1C107A, G1C140A, G1C108A, G1C141A, G1C109A, G1C142A, G1C110A, G1C143A, G1C111A, G1C144A, G1C112A, G1C145A, G1C113A, G1C146A, G1C114A, G1C147A, G1C115A, G1C148A, G1C116A, G1C149A, G1C117A, G1C150A, G1C118A, G1C151A, G1C119A, G1C152A, G1C120A, G1C153A, G1C121A, G1C154A, G1C122A, G1C155A, G1C123A, G1C156A, G1C124A, G1C157A, G1C125A, G1C158A, G1C126A, G1C159A, G1C127A, G1C160A, G1C128A.

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 plastic frame.

Therefore only one model **G1C098A** 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	7
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
4.8 Duty cycle of the EUT	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 Minimum 6dB Bandwidth	14
7.1.1 E.U.T. Operation	14
7.1.2 Test Setup Diagram	14
7.1.3 Measurement Procedure and Data	14
7.2 Conducted Peak Output Power	15
7.2.1 E.U.T. Operation	15
7.2.2 Test Setup Diagram	15
7.2.3 Measurement Procedure and Data	15
7.3 Power Spectrum Density	16
7.3.1 E.U.T. Operation	16
7.3.2 Test Setup Diagram	16
7.3.3 Measurement Procedure and Data	16
7.4 Conducted Band Edges Measurement	17
7.4.1 E.U.T. Operation	17
7.4.2 Test Setup Diagram	17
7.4.3 Measurement Procedure and Data	17
7.5 Conducted Spurious Emissions	18
7.5.1 E.U.T. Operation	18
7.5.2 Test Setup Diagram	18
7.5.3 Measurement Procedure and Data	18
7.6 Radiated Emissions which fall in the restricted bands	19
7.6.1 E.U.T. Operation	19
7.6.2 Test Setup Diagram	19



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7.6.3	Measurement Procedure and Data.....	20
7.7	Radiated Spurious Emissions	41
7.7.1	E.U.T. Operation.....	41
7.7.2	Test Setup Diagram.....	42
7.7.3	Measurement Procedure and Data.....	43
8	Appendix.....	76
8.1	Appendix 15.247.....	76
8.2	Appendix A: DTS Bandwidth.....	76
8.2.1	Test Result	76
8.2.2	Test Graphs.....	76
8.3	Appendix B: Maximum conducted output power	84
8.3.1	Test Result	84
8.3.2	Test Graphs.....	84
8.4	Appendix C: Maximum power spectral density.....	92
8.4.1	Test Result	92
8.4.2	Test Graphs.....	92
8.5	Appendix D: Band edge measurements.....	100
8.5.1	Test Result	100
8.5.2	Test Graphs.....	101
8.6	Appendix E: Conducted Spurious Emission	106
8.6.1	Test Result	106
8.6.2	Test Graphs.....	107
8.7	Appendix F: Duty Cycle	130
8.7.1	Test Result	130
8.7.2	Test Graphs.....	130



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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 14.5 V
Test Voltage:	DC 14.5 V
Cable:	DC input cables HDMI IN ports HDMI OUT ports Wi-Fi antenna ports with fixed antenna GPS antenna ports with fixed antenna Camera input ports USB ports AM/FM antenna ports
Function:	Multiple Media & Navigation Equipment use in vehicle
Antenna Number:	3 (1 for BT double mode, 1 for Wi-Fi & 1 for GPS receiving only)
Hardware:	9608_TH V02_0507
Software:	SV01
S/N:	G1C098AH06E0306012122001
Test Software	BlueTest3.exe
BT Version	V 5.0 for classic and BLE 1M only declared by applicant
For BT BLE	
Antenna Gain:	0 dBi declared by applicant
Antenna Type:	Integral Antenna
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz
Power Setting	8 dBm can not be changed by user
For Wi-Fi	
Antenna Gain:	0 dBi declared by applicant
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):11 802.11n(HT40):7
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Power Setting	18 dBm can not be changed by user



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4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
BT test board	SGS EMC	RF 07	RF 07

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	0.68dB
5	RF Power Density	1.50dB
6	Conducted Spurious Emissions	1.04dB
7	RF Radiated Power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious Emission Test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
9	Temperature	$\pm 0.4^{\circ}\text{C}$
10	Humidity	$\pm 1.3\%$
11	Supply Voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
 198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
 Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

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-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

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

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

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

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

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

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

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

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

● CBTL (Lab Code: TL129)

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



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4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Duty cycle of the EUT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percent.

Formula:

$$\text{Duty Cycle} = \text{Ton}/(\text{Ton}+\text{Toff})$$

Measurement Procedure:

1. Set span = Zero
2. RBW=8MHz
3. VBW=8MHz
4. Detector=Peak

Mode	Channel(MHz)	Duty Cycle(%)	Correction Factor(dB)*
BLE_1M	2402	67.60	1.70
	2440	67.70	1.69
	2480	67.60	1.70
11B	2412	88.60	0.53
	2442	93.27	0.30
	2462	91.44	0.39
11G	2412	70.80	1.50
	2442	76.98	1.14
	2462	83.55	0.78
11N20SISO	2412	67.17	1.73
	2442	77.83	1.09
	2462	56.51	2.48
11N40SISO	2422	62.66	2.03
	2442	60.00	2.22
	2452	57.56	2.40

*Correction Factor(dB) =10log(1/Duty Cycle)

Please refer to appendix 15.247 for details.



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5 Equipment List

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
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	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
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	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
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 Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
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 Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
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	2020-11-13	2021-11-12
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
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	2020-11-13	2021-11-12
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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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	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	2020-11-13	2021-11-12
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
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	2020-11-13	2021-11-12
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	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:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi. Please refer to internal photos for details.



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7 Radio Spectrum Matter Test Results

7.1 Minimum 6dB Bandwidth

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

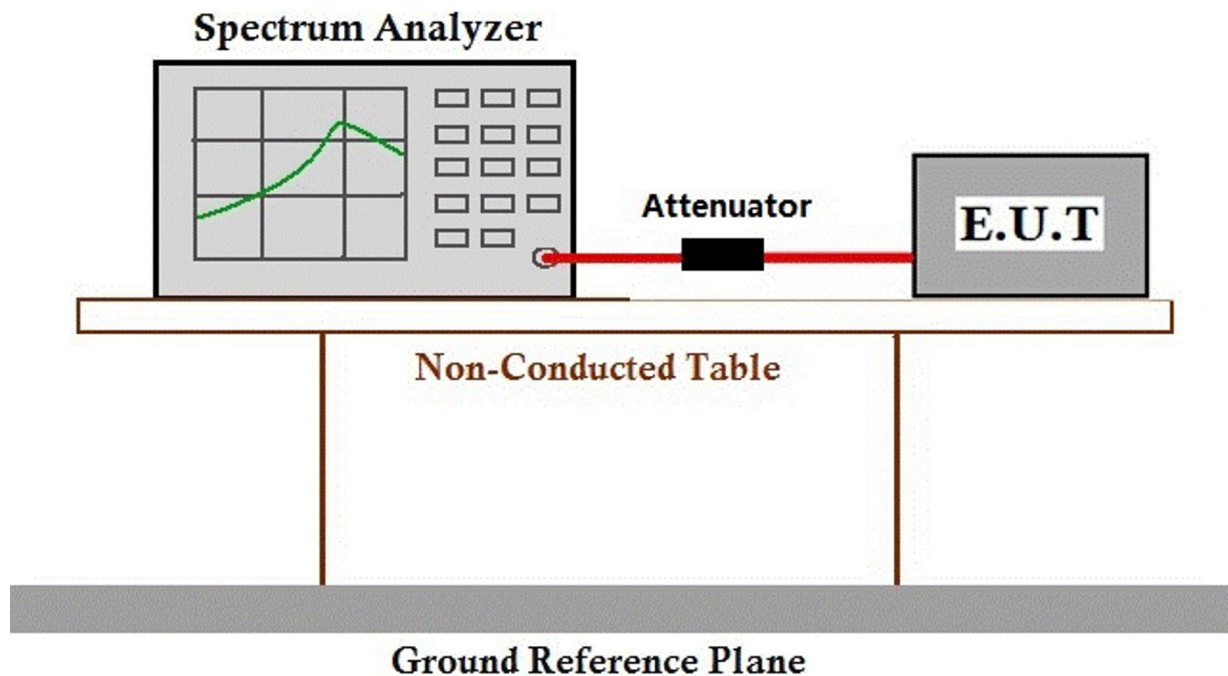
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 55.3 % RH Atmospheric Pressure: 1020 mbar

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

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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7.2 Conducted Peak Output Power

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

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

Limit:

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

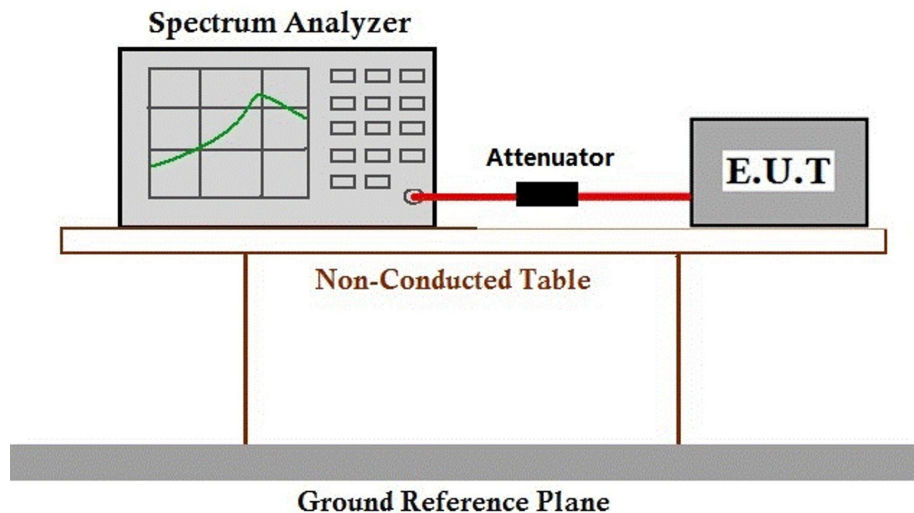
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 55.3 % RH Atmospheric Pressure: 1020 mbar

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

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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7.3 Power Spectrum Density

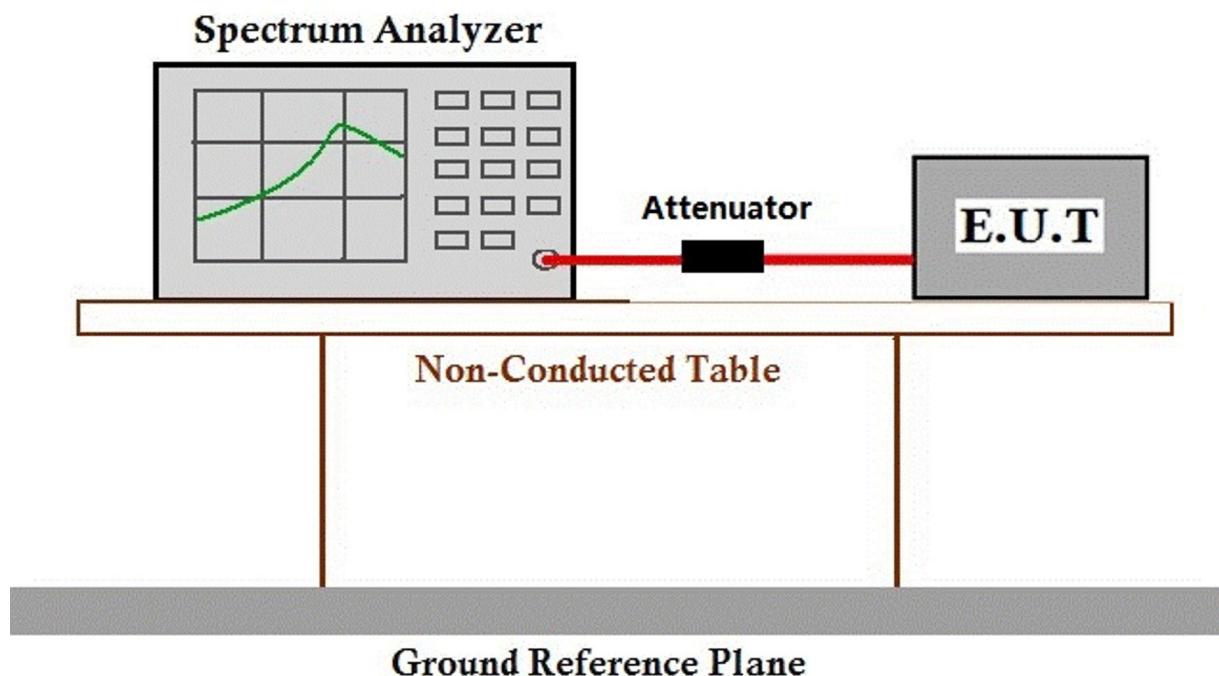
Test Requirement: 47 CFR Part 15, Subpart C 15.247(e)
 Test Method: ANSI C63.10 (2013) Section 11.10.2
 Limit: $\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 55.3 % RH Atmospheric Pressure: 1020 mbar
 Test Mode: d:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation
 e:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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7.4 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))

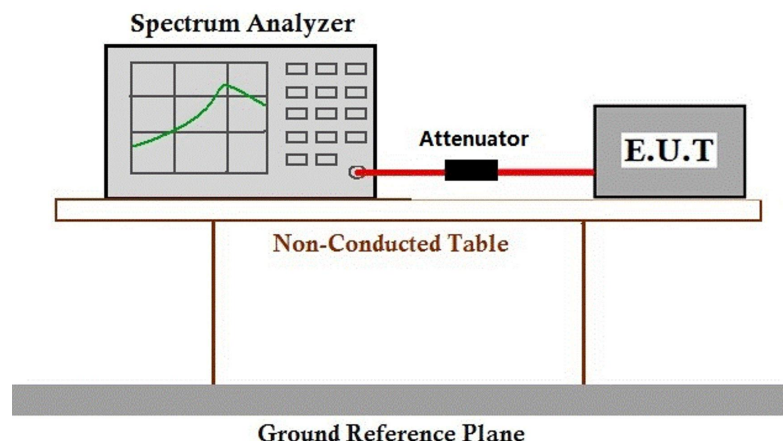
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 55.3 % RH Atmospheric Pressure: 1020 mbar

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

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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7.5 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))

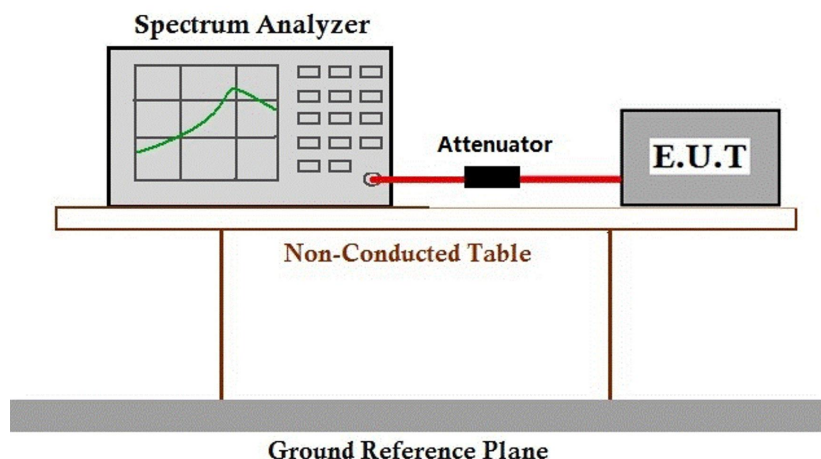
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 55.3 % RH Atmospheric Pressure: 1020 mbar

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

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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7.6 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

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.

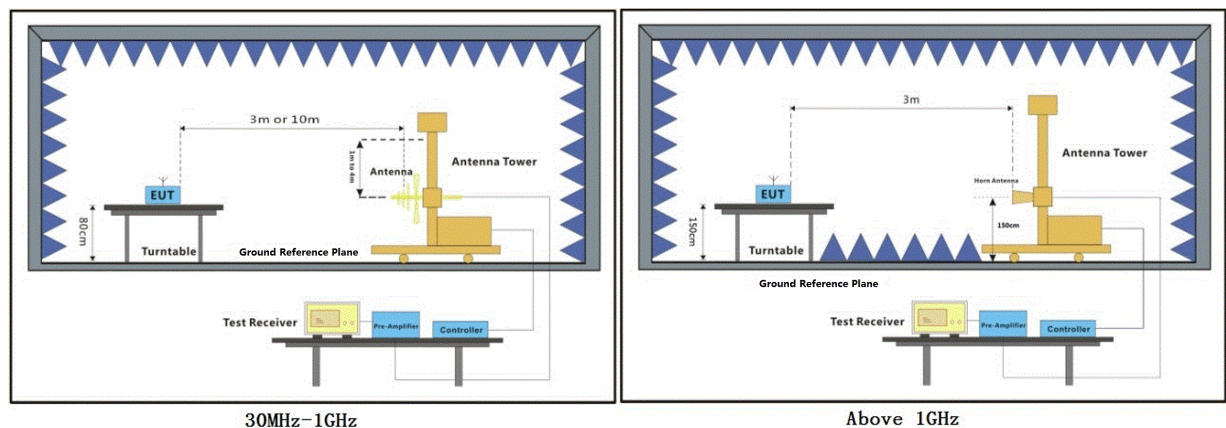
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

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

7.6.2 Test Setup Diagram



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7.6.3 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.

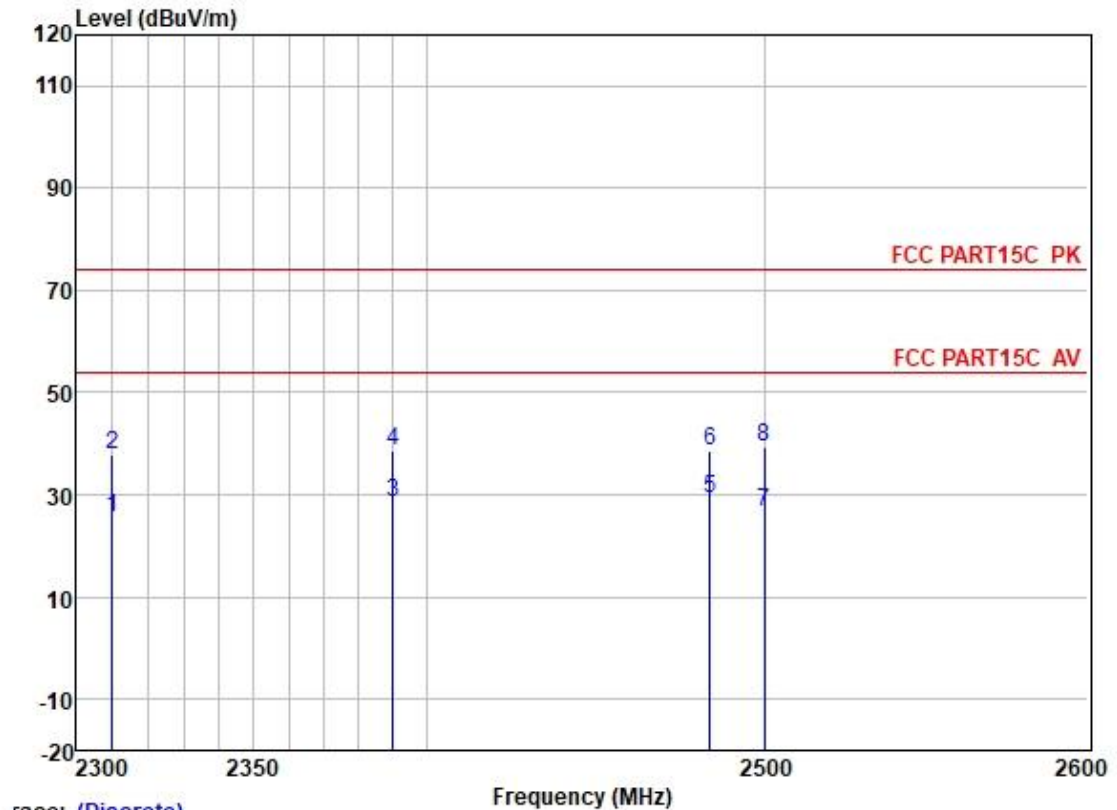
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor



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Mode:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)

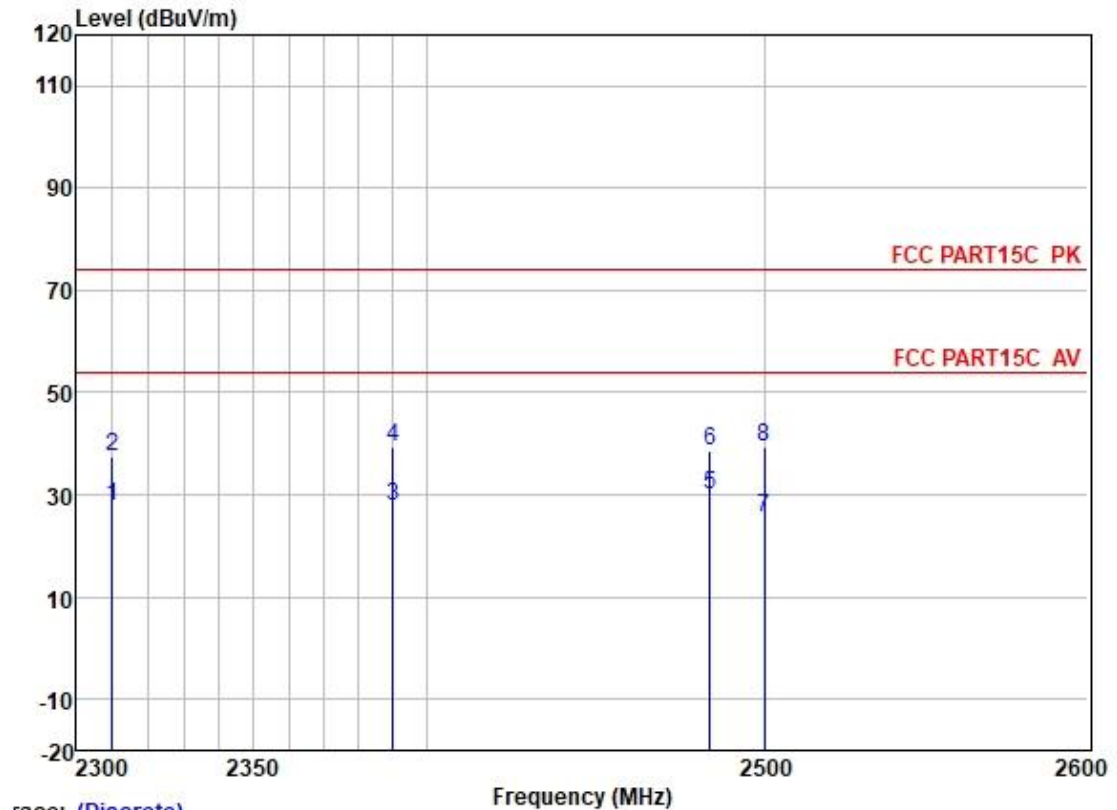
	ReadAntenna	Cable	Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 2310.000	32.08	27.15	3.32	36.94	25.61	54.00	-28.39	HORIZONTAL	Average
2 2310.000	44.39	27.15	3.32	36.94	37.92	74.00	-36.08	HORIZONTAL	Peak
3 2390.000	34.52	27.33	3.48	36.92	28.41	54.00	-25.59	HORIZONTAL	Average
4 2390.000	44.82	27.33	3.48	36.92	38.71	74.00	-35.29	HORIZONTAL	Peak
5 2483.500	34.99	27.48	3.53	36.90	29.10	54.00	-24.90	HORIZONTAL	Average
6 2483.500	44.44	27.48	3.53	36.90	38.55	74.00	-35.45	HORIZONTAL	Peak
7 2500.000	32.73	27.50	3.40	36.89	26.74	54.00	-27.26	HORIZONTAL	Average
8 2500.000	45.38	27.50	3.40	36.89	39.39	74.00	-34.61	HORIZONTAL	Peak



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Mode:d; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)

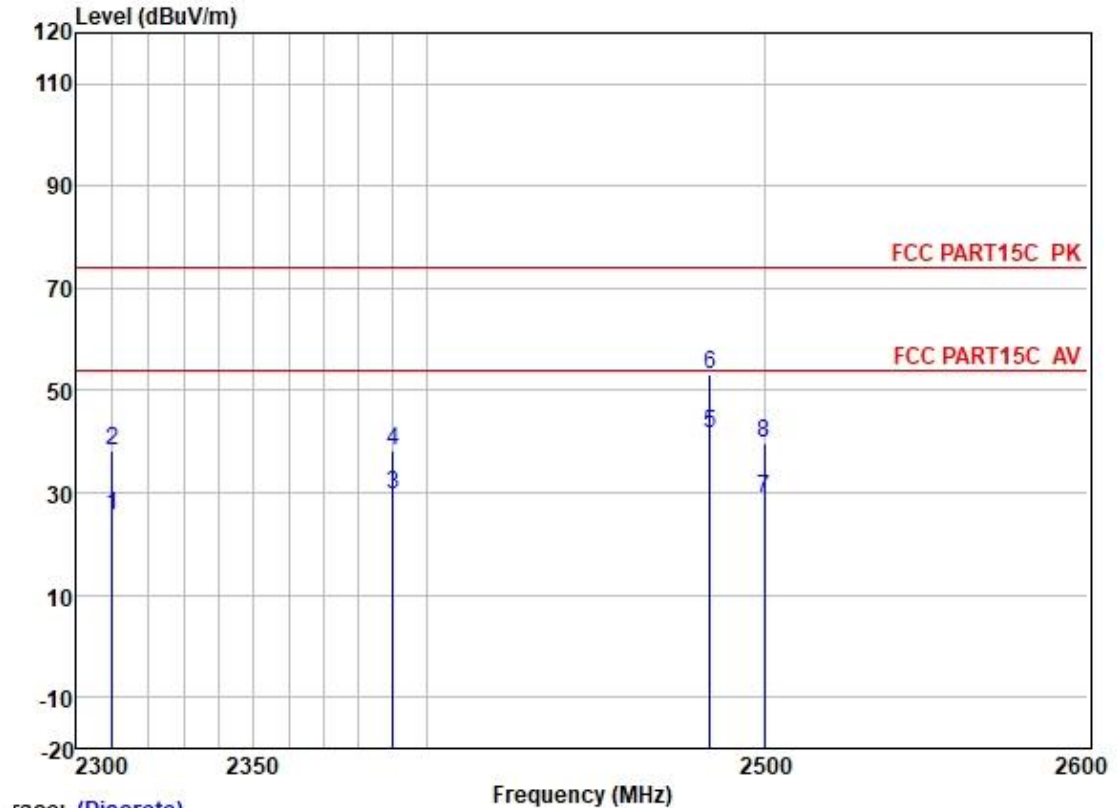
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	34.14	27.15	3.32	36.94	27.67	54.00	-26.33	VERTICAL Average
2	2310.000	43.82	27.15	3.32	36.94	37.35	74.00	-36.65	VERTICAL Peak
3	2390.000	34.02	27.33	3.48	36.92	27.91	54.00	-26.09	VERTICAL Average
4	2390.000	45.59	27.33	3.48	36.92	39.48	74.00	-34.52	VERTICAL Peak
5	2483.500	35.83	27.48	3.53	36.90	29.94	54.00	-24.06	VERTICAL Average
6	2483.500	44.62	27.48	3.53	36.90	38.73	74.00	-35.27	VERTICAL Peak
7	2500.000	31.51	27.50	3.40	36.89	25.52	54.00	-28.48	VERTICAL Average
8	2500.000	45.17	27.50	3.40	36.89	39.18	74.00	-34.82	VERTICAL Peak



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Mode:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	32.12	27.15	3.32	36.94	25.65	54.00	-28.35	HORIZONTAL Average
2	2310.000	44.75	27.15	3.32	36.94	38.28	74.00	-35.72	HORIZONTAL Peak
3	2390.000	35.81	27.33	3.48	36.92	29.70	54.00	-24.30	HORIZONTAL Average
4	2390.000	44.40	27.33	3.48	36.92	38.29	74.00	-35.71	HORIZONTAL Peak
5	2483.500	47.43	27.48	3.53	36.90	41.54	54.00	-12.46	HORIZONTAL Average
6	2483.500	59.06	27.48	3.53	36.90	53.17	74.00	-20.83	HORIZONTAL Peak
7	2500.000	34.93	27.50	3.40	36.89	28.94	54.00	-25.06	HORIZONTAL Average
8	2500.000	45.86	27.50	3.40	36.89	39.87	74.00	-34.13	HORIZONTAL Peak



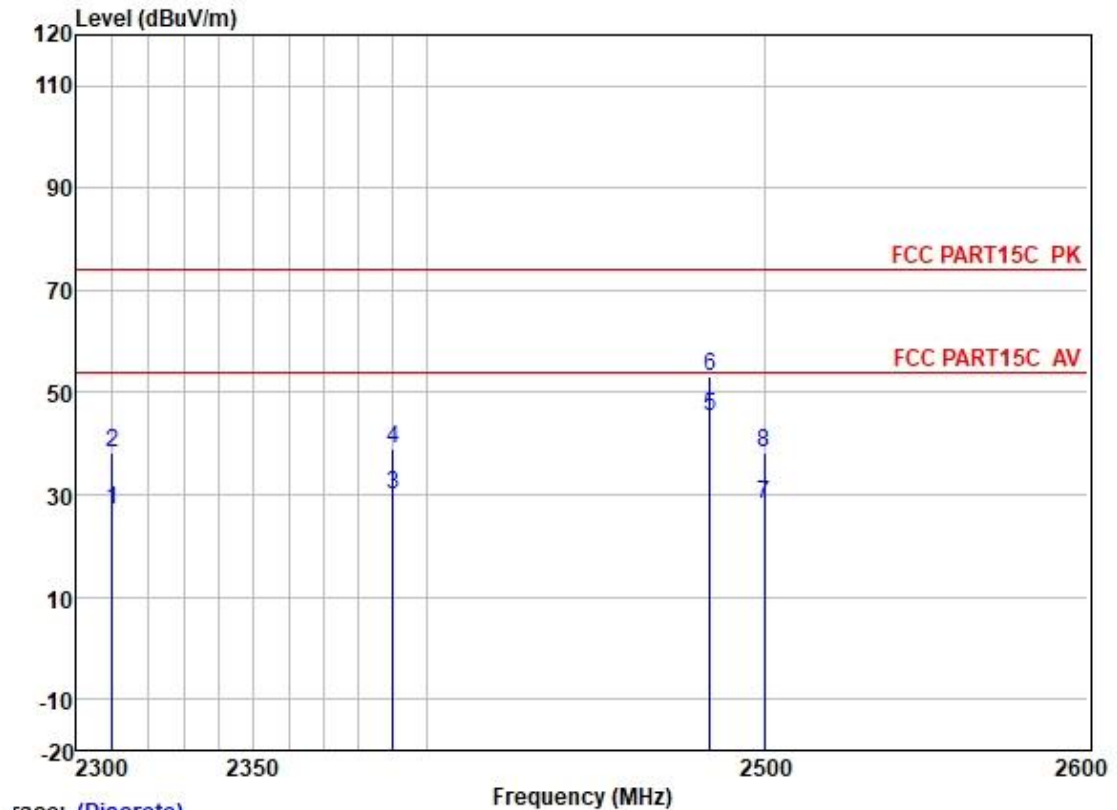
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Mode:d; Polarization:Vertical; Modulation:GFSK; ; Channel:High



Trace: (Discrete)

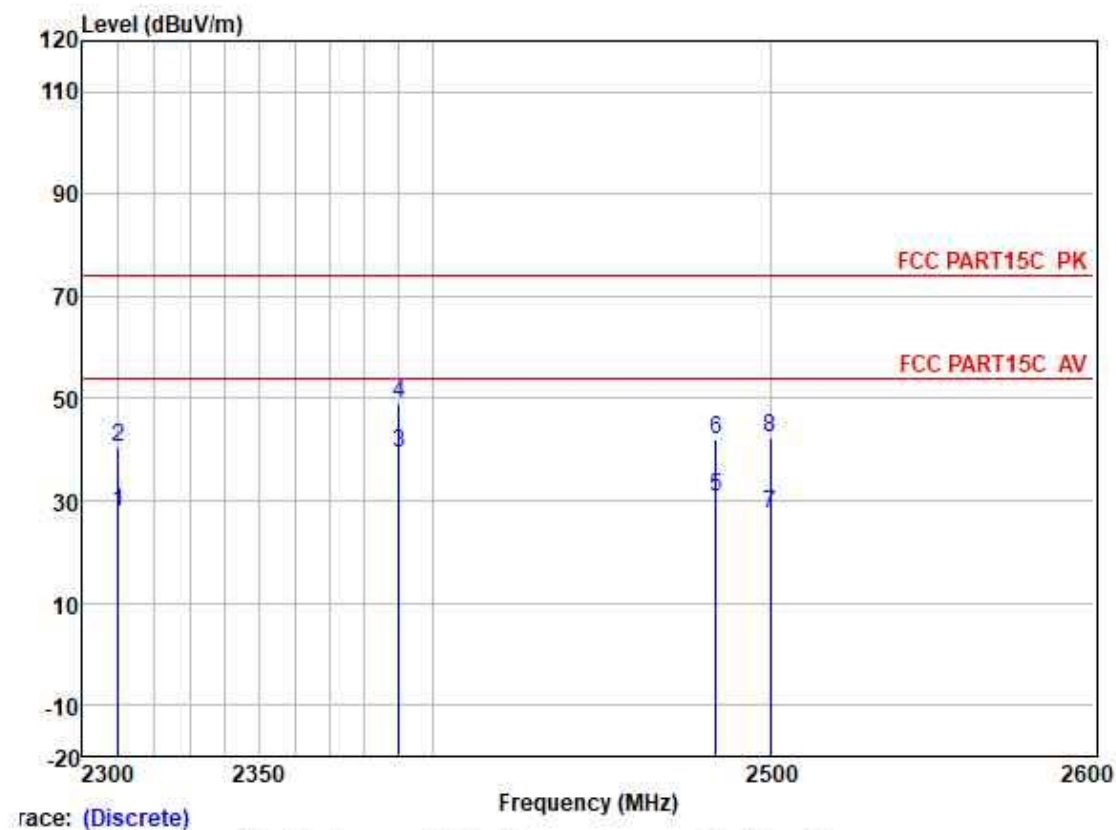
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	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	33.44	27.15	3.32	36.94	26.97	54.00	-27.03	VERTICAL	Average
2	2310.000	44.55	27.15	3.32	36.94	38.08	74.00	-35.92	VERTICAL	Peak
3	2390.000	36.12	27.33	3.48	36.92	30.01	54.00	-23.99	VERTICAL	Average
4	2390.000	45.02	27.33	3.48	36.92	38.91	74.00	-35.09	VERTICAL	Peak
5	2483.500	51.10	27.48	3.53	36.90	45.21	54.00	-8.79	VERTICAL	Average
6	2483.500	59.25	27.48	3.53	36.90	53.36	74.00	-20.64	VERTICAL	Peak
7	2500.000	34.09	27.50	3.40	36.89	28.10	54.00	-25.90	VERTICAL	Average
8	2500.000	44.32	27.50	3.40	36.89	38.33	74.00	-35.67	VERTICAL	Peak



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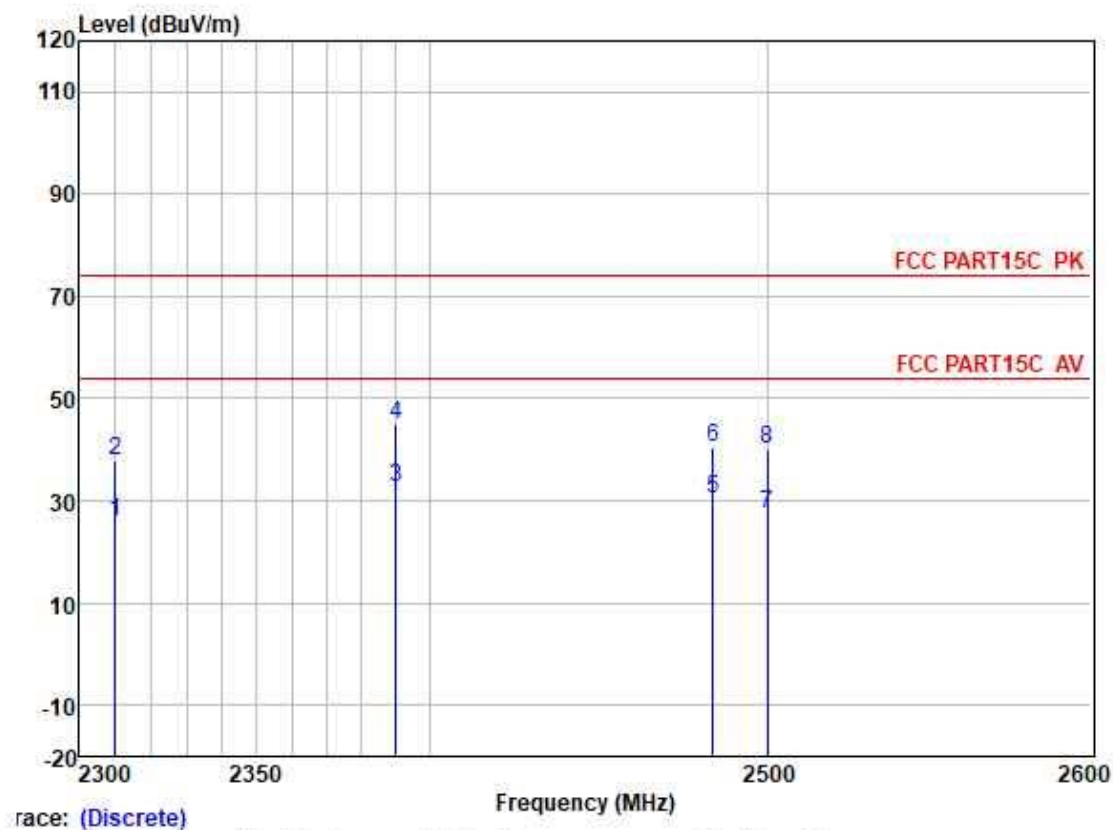
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	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	34.25	27.15	3.32	36.94	27.78	54.00	-26.22	HORIZONTAL Average
2	2310.000	46.80	27.15	3.32	36.94	40.33	74.00	-33.67	HORIZONTAL Peak
3	2390.000	45.34	27.33	3.48	36.92	39.23	54.00	-14.77	HORIZONTAL Average
4	2390.000	55.03	27.33	3.48	36.92	48.92	74.00	-25.08	HORIZONTAL Peak
5	2483.500	36.71	27.48	3.53	36.90	30.82	54.00	-23.18	HORIZONTAL Average
6	2483.500	47.86	27.48	3.53	36.90	41.97	74.00	-32.03	HORIZONTAL Peak
7	2500.000	33.49	27.50	3.40	36.89	27.50	54.00	-26.50	HORIZONTAL Average
8	2500.000	48.47	27.50	3.40	36.89	42.48	74.00	-31.52	HORIZONTAL Peak



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



Trace: (Discrete)

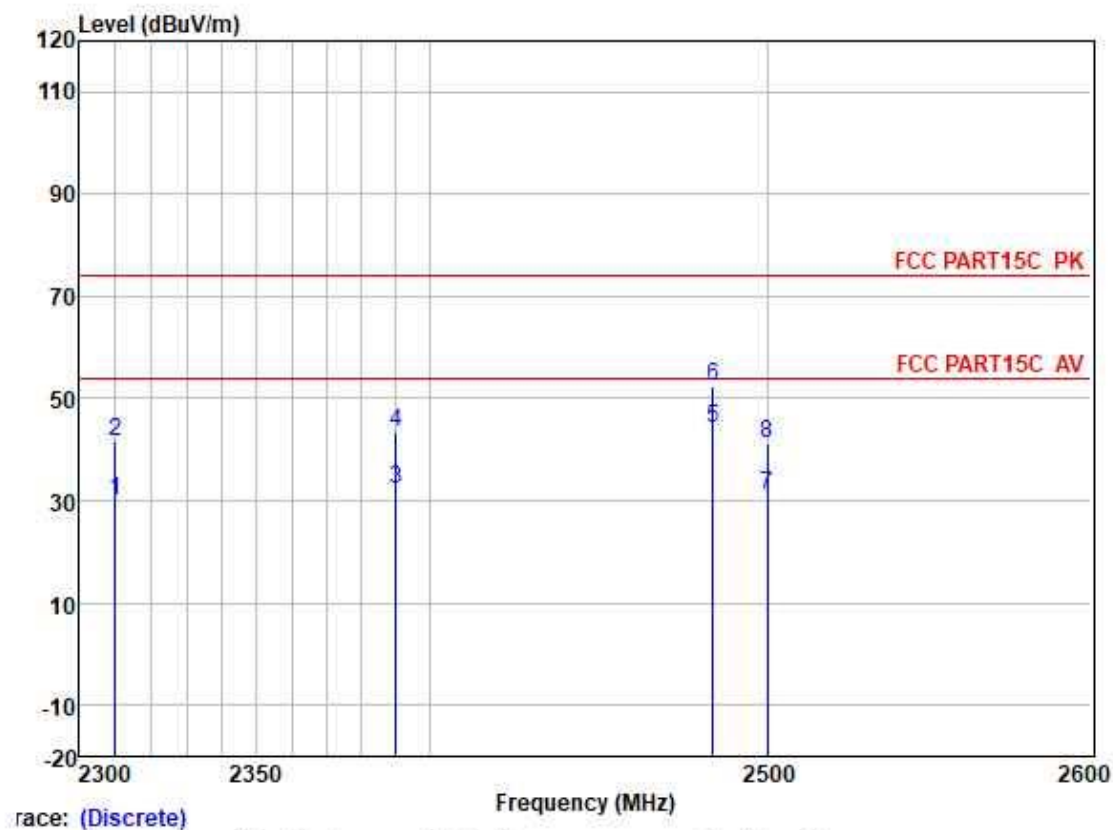
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	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	32.47	27.15	3.32	36.94	26.00	54.00	-28.00	VERTICAL Average
2	2310.000	44.38	27.15	3.32	36.94	37.91	74.00	-36.09	VERTICAL Peak
3	2390.000	38.80	27.33	3.48	36.92	32.69	54.00	-21.31	VERTICAL Average
4	2390.000	50.98	27.33	3.48	36.92	44.87	74.00	-29.13	VERTICAL Peak
5	2483.500	36.20	27.48	3.53	36.90	30.31	54.00	-23.69	VERTICAL Average
6	2483.500	46.23	27.48	3.53	36.90	40.34	74.00	-33.66	VERTICAL Peak
7	2500.000	33.32	27.50	3.40	36.89	27.33	54.00	-26.67	VERTICAL Average
8	2500.000	46.07	27.50	3.40	36.89	40.08	74.00	-33.92	VERTICAL Peak



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



Trace: (Discrete)

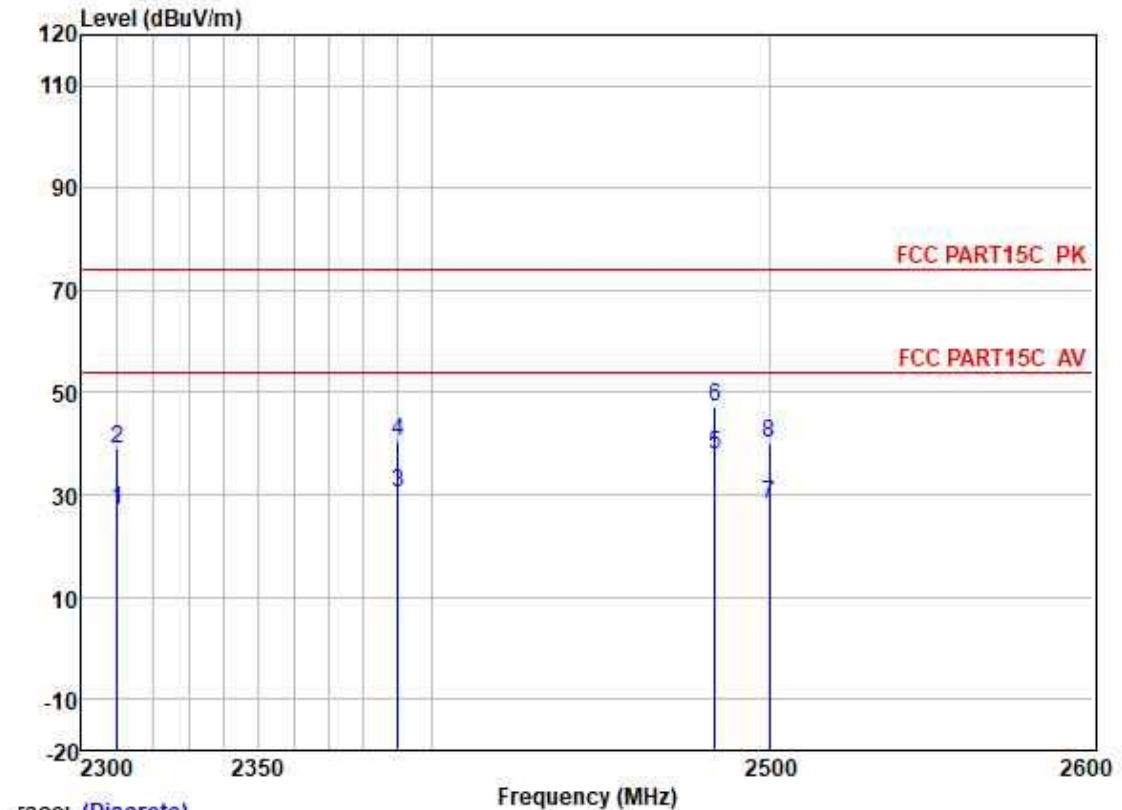
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	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.62	27.15	3.32	36.94	30.15	54.00	-23.85	HORIZONTAL Average
2	2310.000	48.24	27.15	3.32	36.94	41.77	74.00	-32.23	HORIZONTAL Peak
3	2390.000	38.20	27.33	3.48	36.92	32.09	54.00	-21.91	HORIZONTAL Average
4	2390.000	49.49	27.33	3.48	36.92	43.38	74.00	-30.62	HORIZONTAL Peak
5	2483.500	49.97	27.48	3.53	36.90	44.08	54.00	-9.92	HORIZONTAL Average
6	2483.500	58.27	27.48	3.53	36.90	52.38	74.00	-21.62	HORIZONTAL Peak
7	2500.000	37.27	27.50	3.40	36.89	31.28	54.00	-22.72	HORIZONTAL Average
8	2500.000	47.37	27.50	3.40	36.89	41.38	74.00	-32.62	HORIZONTAL Peak



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



Trace: (Discrete)

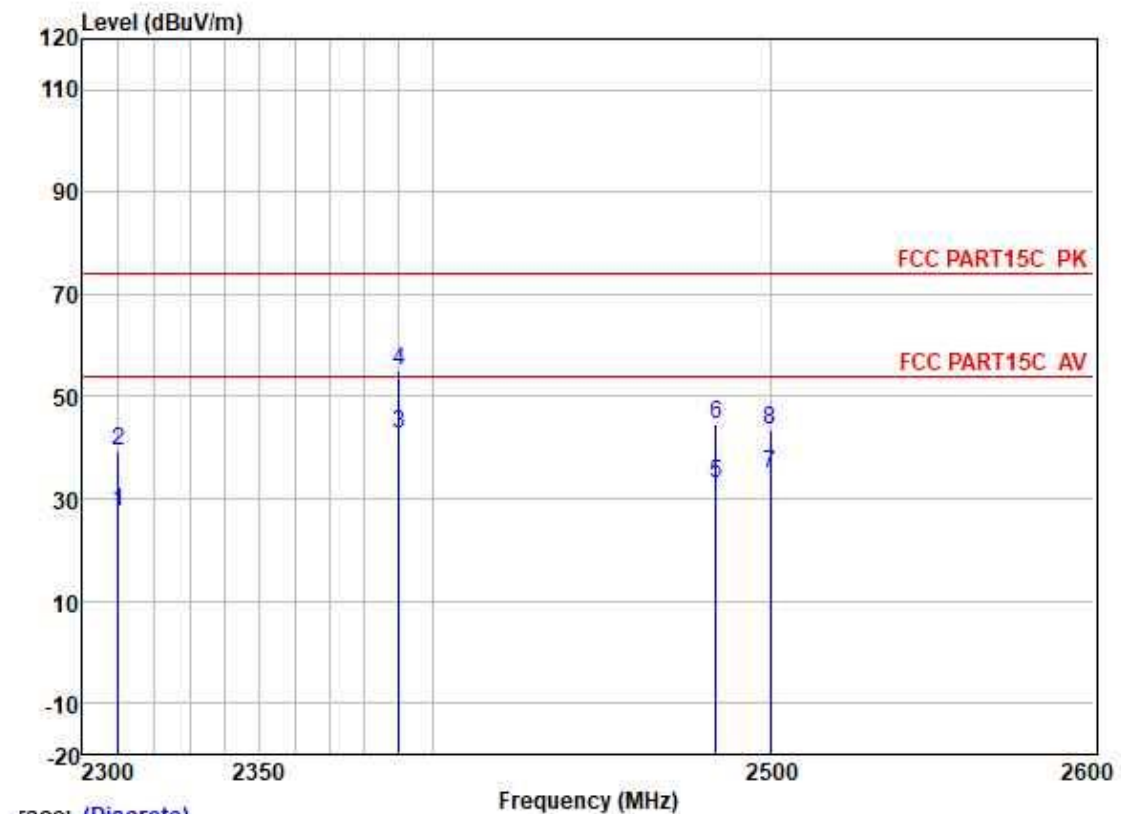
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	33.65	27.15	3.32	36.94	27.18	54.00	-26.82	VERTICAL Average
2	2310.000	45.59	27.15	3.32	36.94	39.12	74.00	-34.88	VERTICAL Peak
3	2390.000	36.38	27.33	3.48	36.92	30.27	54.00	-23.73	VERTICAL Average
4	2390.000	46.74	27.33	3.48	36.92	40.63	74.00	-33.37	VERTICAL Peak
5	2483.500	43.66	27.48	3.53	36.90	37.77	54.00	-16.23	VERTICAL Average
6	2483.500	53.11	27.48	3.53	36.90	47.22	74.00	-26.78	VERTICAL Peak
7	2500.000	34.11	27.50	3.40	36.89	28.12	54.00	-25.88	VERTICAL Average
8	2500.000	46.10	27.50	3.40	36.89	40.11	74.00	-33.89	VERTICAL Peak



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



Trace: (Discrete)

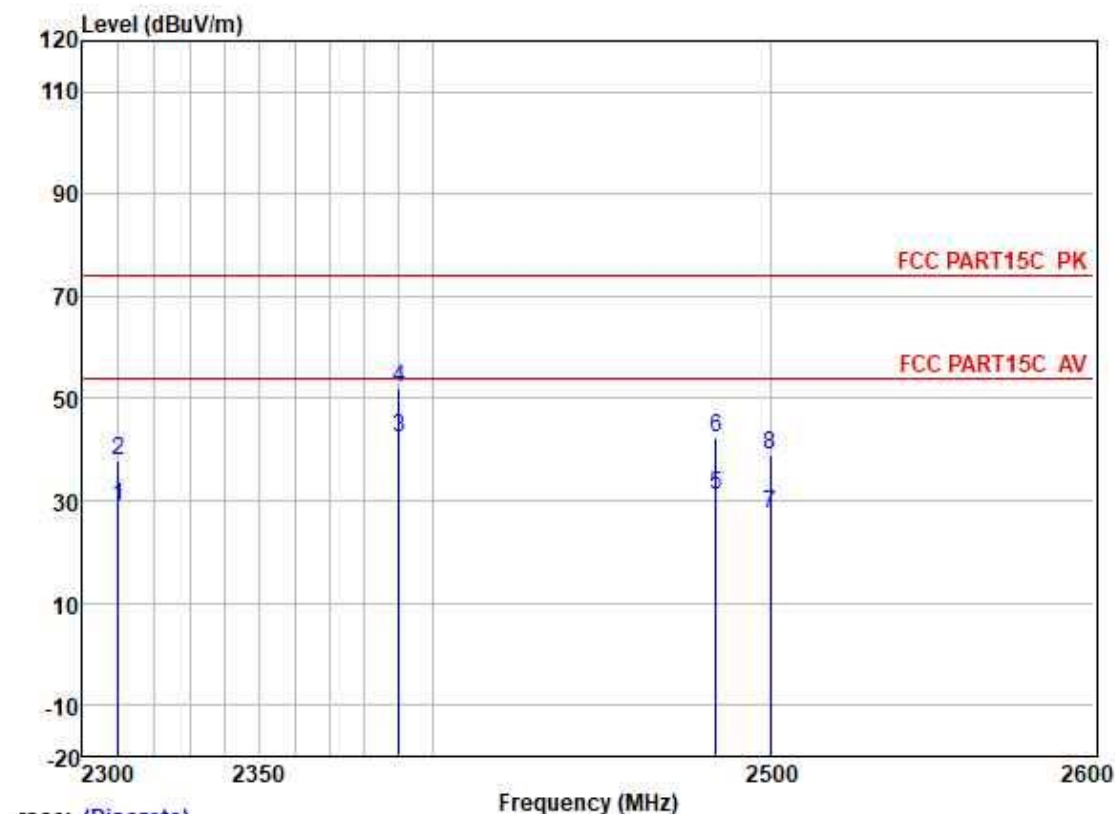
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	33.82	27.15	3.32	36.94	27.35	54.00	-26.65	HORIZONTAL Average
2	2310.000	45.77	27.15	3.32	36.94	39.30	74.00	-34.70	HORIZONTAL Peak
3	2390.000	48.67	27.33	3.48	36.92	42.56	54.00	-11.44	HORIZONTAL Average
4	2390.000	61.18	27.33	3.48	36.92	55.07	74.00	-18.93	HORIZONTAL Peak
5	2483.500	38.98	27.48	3.53	36.90	33.09	54.00	-20.91	HORIZONTAL Average
6	2483.500	50.33	27.48	3.53	36.90	44.44	74.00	-29.56	HORIZONTAL Peak
7	2500.000	40.83	27.50	3.40	36.89	34.84	54.00	-19.16	HORIZONTAL Average
8	2500.000	49.45	27.50	3.40	36.89	43.46	74.00	-30.54	HORIZONTAL Peak



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



Trace: (Discrete)

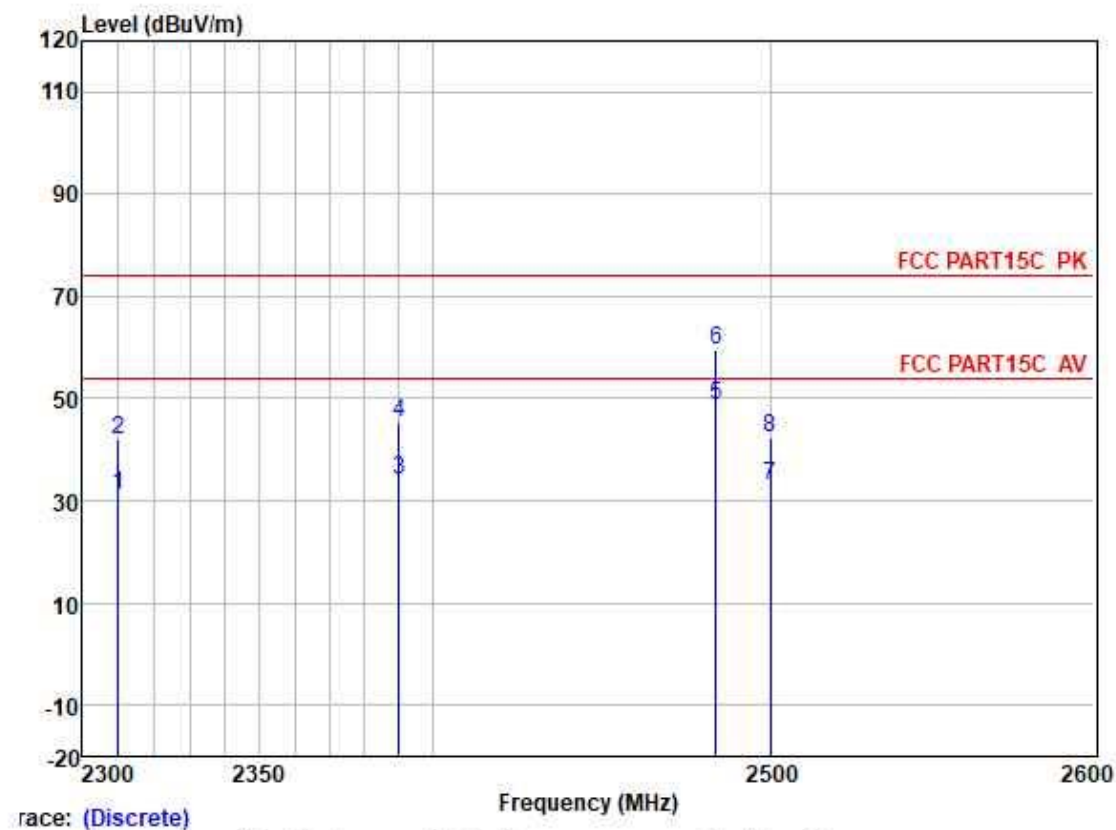
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	35.25	27.15	3.32	36.94	28.78	54.00	-25.22	VERTICAL Average
2	2310.000	44.38	27.15	3.32	36.94	37.91	74.00	-36.09	VERTICAL Peak
3	2390.000	48.62	27.33	3.48	36.92	42.51	54.00	-11.49	VERTICAL Average
4	2390.000	58.23	27.33	3.48	36.92	52.12	74.00	-21.88	VERTICAL Peak
5	2483.500	37.17	27.48	3.53	36.90	31.28	54.00	-22.72	VERTICAL Average
6	2483.500	48.31	27.48	3.53	36.90	42.42	74.00	-31.58	VERTICAL Peak
7	2500.000	33.25	27.50	3.40	36.89	27.26	54.00	-26.74	VERTICAL Average
8	2500.000	45.04	27.50	3.40	36.89	39.05	74.00	-34.95	VERTICAL Peak



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



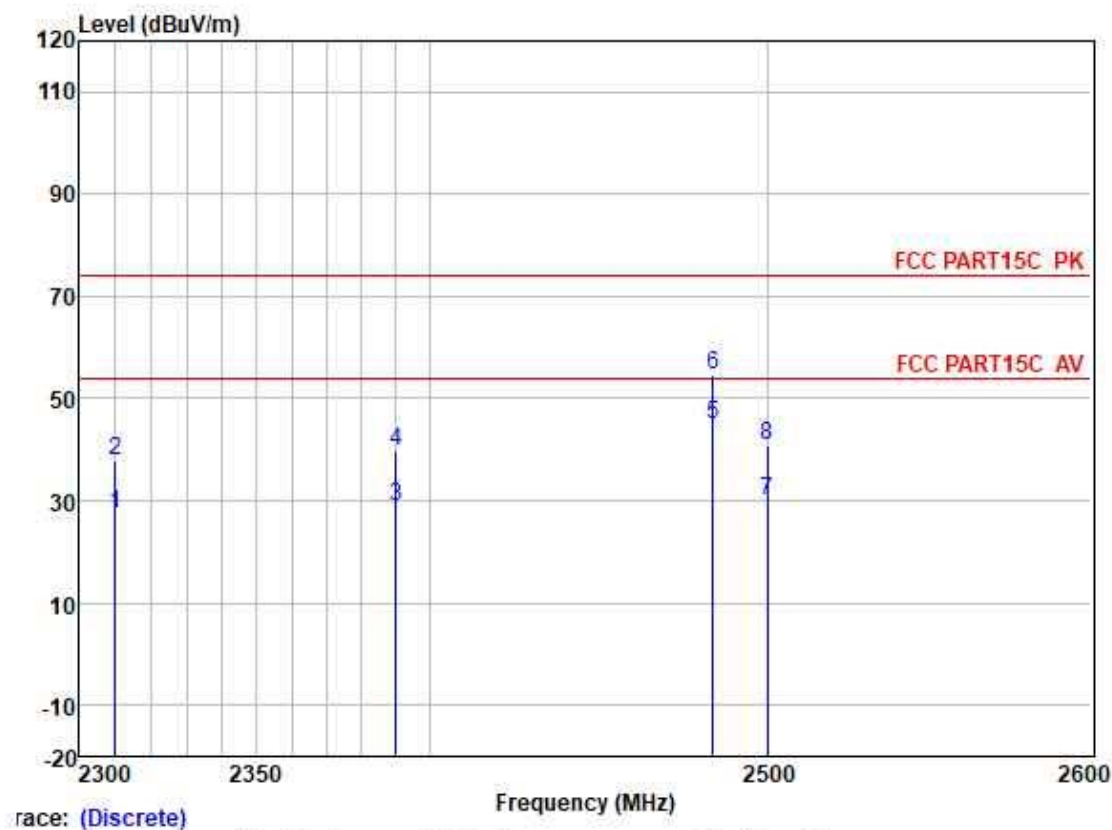
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	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	37.75	27.15	3.32	36.94	31.28	54.00	-22.72	HORIZONTAL Average
2	2310.000	48.51	27.15	3.32	36.94	42.04	74.00	-31.96	HORIZONTAL Peak
3	2390.000	40.38	27.33	3.48	36.92	34.27	54.00	-19.73	HORIZONTAL Average
4	2390.000	51.56	27.33	3.48	36.92	45.45	74.00	-28.55	HORIZONTAL Peak
5	2483.500	54.53	27.48	3.53	36.90	48.64	54.00	-5.36	HORIZONTAL Average
6	2483.500	65.55	27.48	3.53	36.90	59.66	74.00	-14.34	HORIZONTAL Peak
7	2500.000	38.87	27.50	3.40	36.89	32.88	54.00	-21.12	HORIZONTAL Average
8	2500.000	48.33	27.50	3.40	36.89	42.34	74.00	-31.66	HORIZONTAL Peak



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Trace: (Discrete)

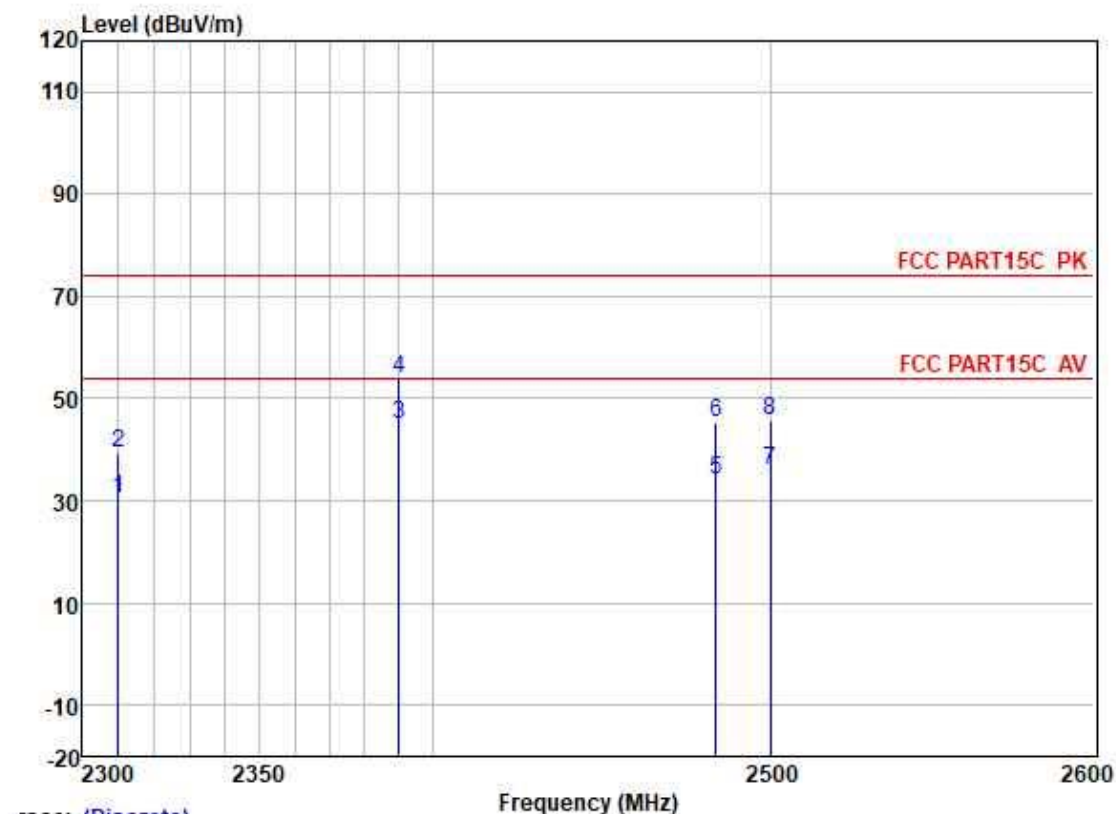
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	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	33.74	27.15	3.32	36.94	27.27	54.00	-26.73	VERTICAL Average
2	2310.000	44.46	27.15	3.32	36.94	37.99	74.00	-36.01	VERTICAL Peak
3	2390.000	34.96	27.33	3.48	36.92	28.85	54.00	-25.15	VERTICAL Average
4	2390.000	45.85	27.33	3.48	36.92	39.74	74.00	-34.26	VERTICAL Peak
5	2483.500	50.81	27.48	3.53	36.90	44.92	54.00	-9.08	VERTICAL Average
6	2483.500	60.42	27.48	3.53	36.90	54.53	74.00	-19.47	VERTICAL Peak
7	2500.000	35.87	27.50	3.40	36.89	29.88	54.00	-24.12	VERTICAL Average
8	2500.000	47.02	27.50	3.40	36.89	41.03	74.00	-32.97	VERTICAL Peak



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



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.91	27.15	3.32	36.94	30.44	54.00	-23.56	HORIZONTAL Average
2	2310.000	45.86	27.15	3.32	36.94	39.39	74.00	-34.61	HORIZONTAL Peak
3	2390.000	51.01	27.33	3.48	36.92	44.90	54.00	-9.10	HORIZONTAL Average
4	2390.000	60.19	27.33	3.48	36.92	54.08	74.00	-19.92	HORIZONTAL Peak
5	2483.500	40.00	27.48	3.53	36.90	34.11	54.00	-19.89	HORIZONTAL Average
6	2483.500	51.34	27.48	3.53	36.90	45.45	74.00	-28.55	HORIZONTAL Peak
7	2500.000	41.98	27.50	3.40	36.89	35.99	54.00	-18.01	HORIZONTAL Average
8	2500.000	51.57	27.50	3.40	36.89	45.58	74.00	-28.42	HORIZONTAL Peak



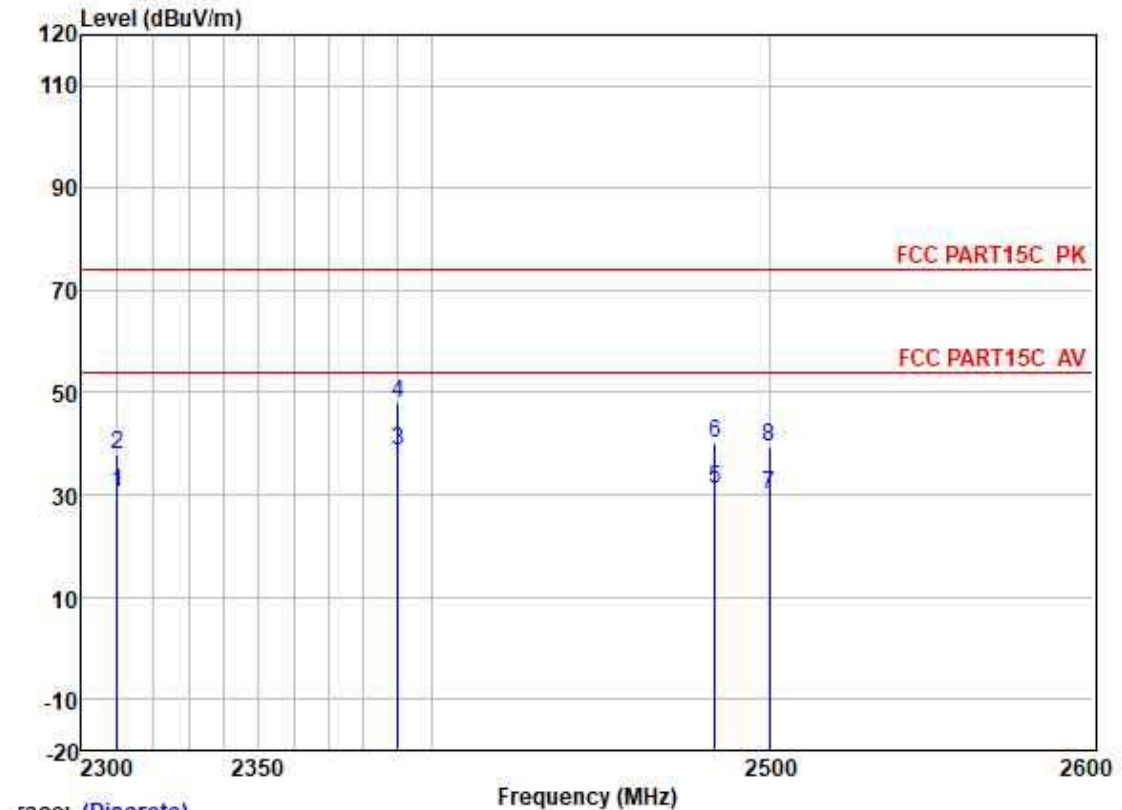
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Guangzhou Branch Testing & Calibration Laboratory

No.198 Kezhu Road, Science Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

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



Trace: (Discrete)

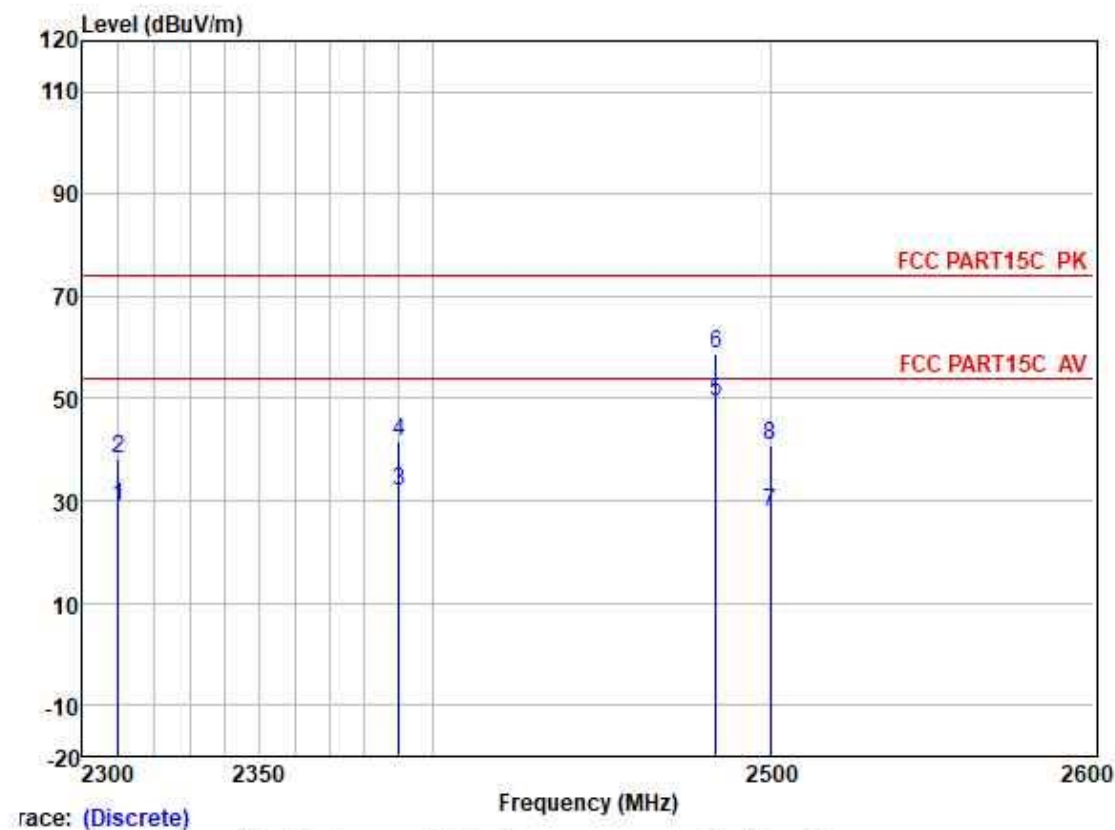
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.83	27.15	3.32	36.94	30.36	54.00	-23.64	VERTICAL Average
2	2310.000	44.51	27.15	3.32	36.94	38.04	74.00	-35.96	VERTICAL Peak
3	2390.000	44.59	27.33	3.48	36.92	38.48	54.00	-15.52	VERTICAL Average
4	2390.000	54.23	27.33	3.48	36.92	48.12	74.00	-25.88	VERTICAL Peak
5	2483.500	37.09	27.48	3.53	36.90	31.20	54.00	-22.80	VERTICAL Average
6	2483.500	46.16	27.48	3.53	36.90	40.27	74.00	-33.73	VERTICAL Peak
7	2500.000	35.95	27.50	3.40	36.89	29.96	54.00	-24.04	VERTICAL Average
8	2500.000	45.51	27.50	3.40	36.89	39.52	74.00	-34.48	VERTICAL Peak



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



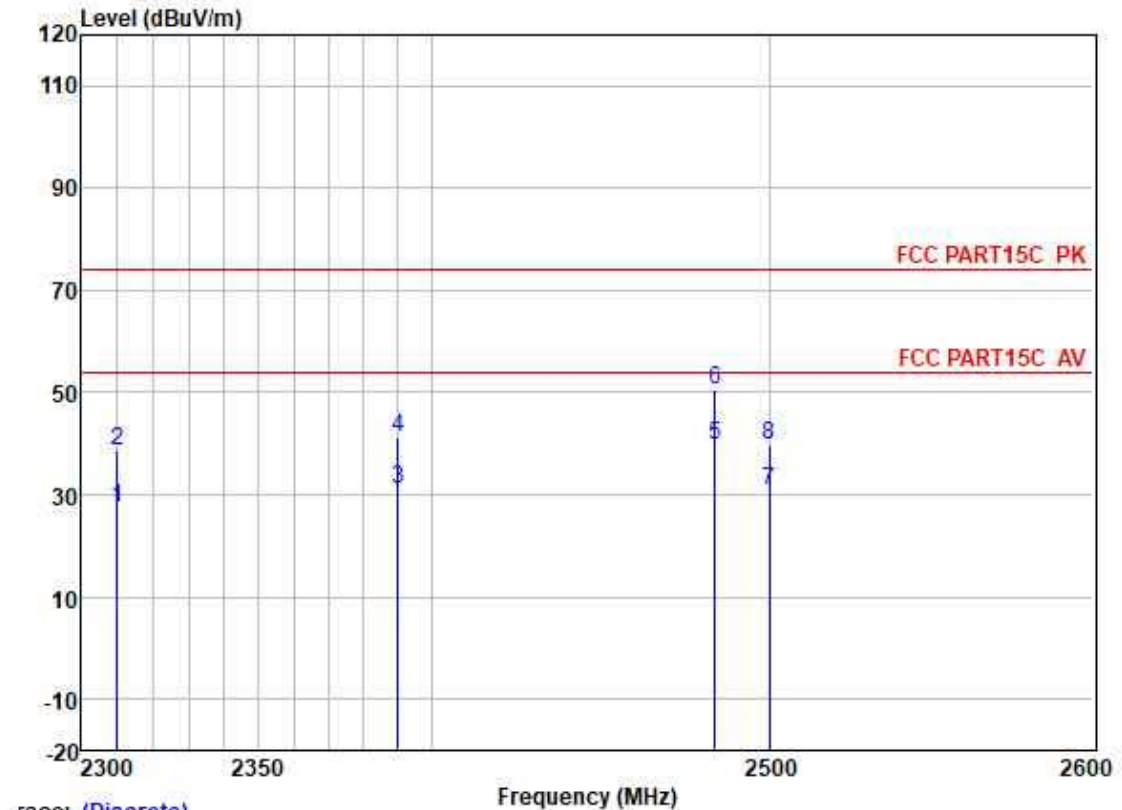
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	35.19	27.15	3.32	36.94	28.72	54.00	-25.28	HORIZONTAL Average
2	2310.000	44.79	27.15	3.32	36.94	38.32	74.00	-35.68	HORIZONTAL Peak
3	2390.000	37.94	27.33	3.48	36.92	31.83	54.00	-22.17	HORIZONTAL Average
4	2390.000	47.81	27.33	3.48	36.92	41.70	74.00	-32.30	HORIZONTAL Peak
5	2483.500	55.30	27.48	3.53	36.90	49.41	54.00	-4.59	HORIZONTAL Average
6	2483.500	64.71	27.48	3.53	36.90	58.82	74.00	-15.18	HORIZONTAL Peak
7	2500.000	33.76	27.50	3.40	36.89	27.77	54.00	-26.23	HORIZONTAL Average
8	2500.000	46.89	27.50	3.40	36.89	40.90	74.00	-33.10	HORIZONTAL Peak



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



Trace: (Discrete)

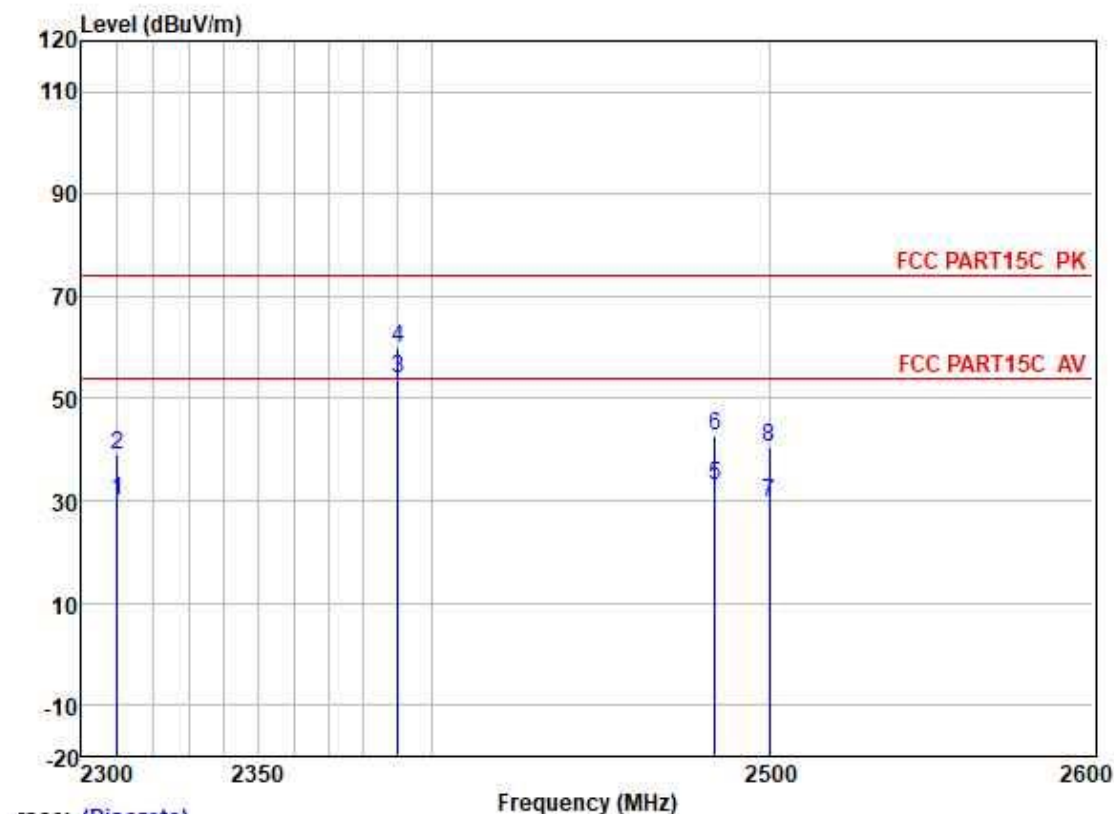
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	33.87	27.15	3.32	36.94	27.40	54.00	-26.60	VERTICAL Average
2	2310.000	44.93	27.15	3.32	36.94	38.46	74.00	-35.54	VERTICAL Peak
3	2390.000	37.14	27.33	3.48	36.92	31.03	54.00	-22.97	VERTICAL Average
4	2390.000	47.42	27.33	3.48	36.92	41.31	74.00	-32.69	VERTICAL Peak
5	2483.500	45.50	27.48	3.53	36.90	39.61	54.00	-14.39	VERTICAL Average
6	2483.500	56.31	27.48	3.53	36.90	50.42	74.00	-23.58	VERTICAL Peak
7	2500.000	36.92	27.50	3.40	36.89	30.93	54.00	-23.07	VERTICAL Average
8	2500.000	45.87	27.50	3.40	36.89	39.88	74.00	-34.12	VERTICAL Peak



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



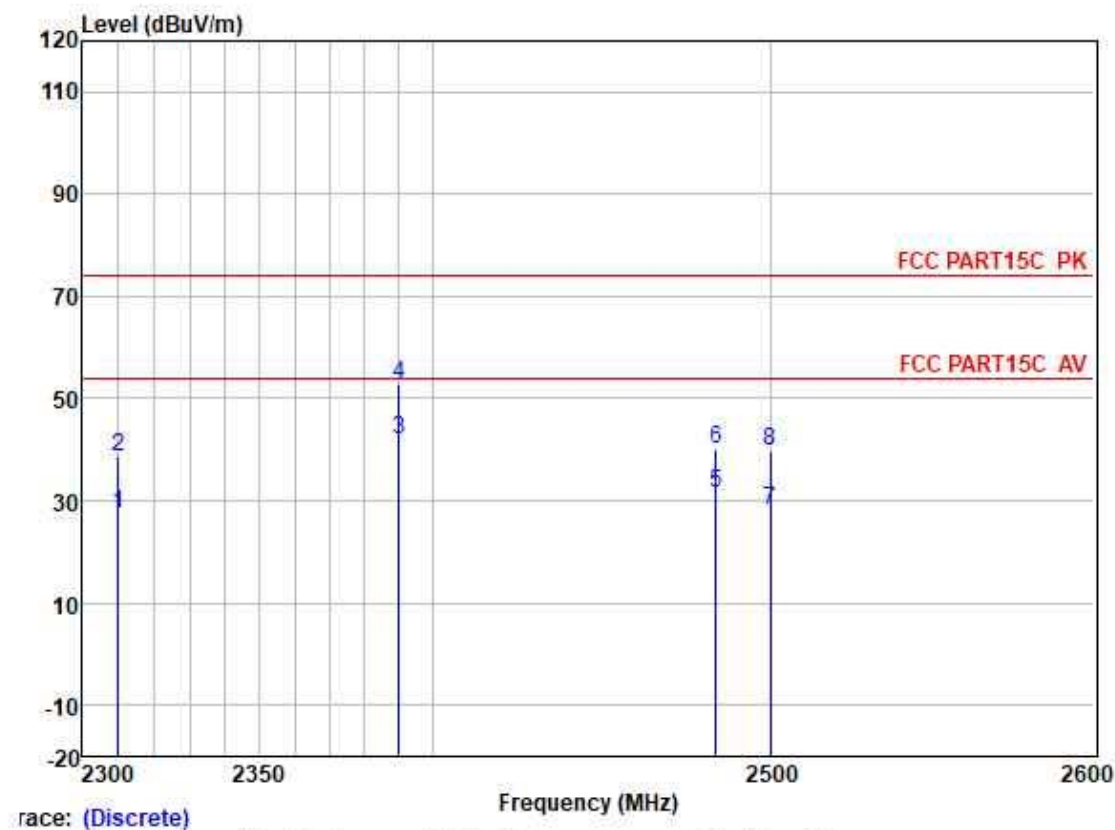
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	36.56	27.15	3.32	36.94	30.09	54.00	-23.91	HORIZONTAL Average
2	2310.000	45.39	27.15	3.32	36.94	38.92	74.00	-35.08	HORIZONTAL Peak
3	2390.000	59.88	27.33	3.48	36.92	53.77	54.00	-0.23	HORIZONTAL Average
4	2390.000	65.97	27.33	3.48	36.92	59.86	74.00	-14.14	HORIZONTAL Peak
5	2483.500	38.86	27.48	3.53	36.90	32.97	54.00	-21.03	HORIZONTAL Average
6	2483.500	48.75	27.48	3.53	36.90	42.86	74.00	-31.14	HORIZONTAL Peak
7	2500.000	35.68	27.50	3.40	36.89	29.69	54.00	-24.31	HORIZONTAL Average
8	2500.000	46.37	27.50	3.40	36.89	40.38	74.00	-33.62	HORIZONTAL Peak



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



Trace: (Discrete)

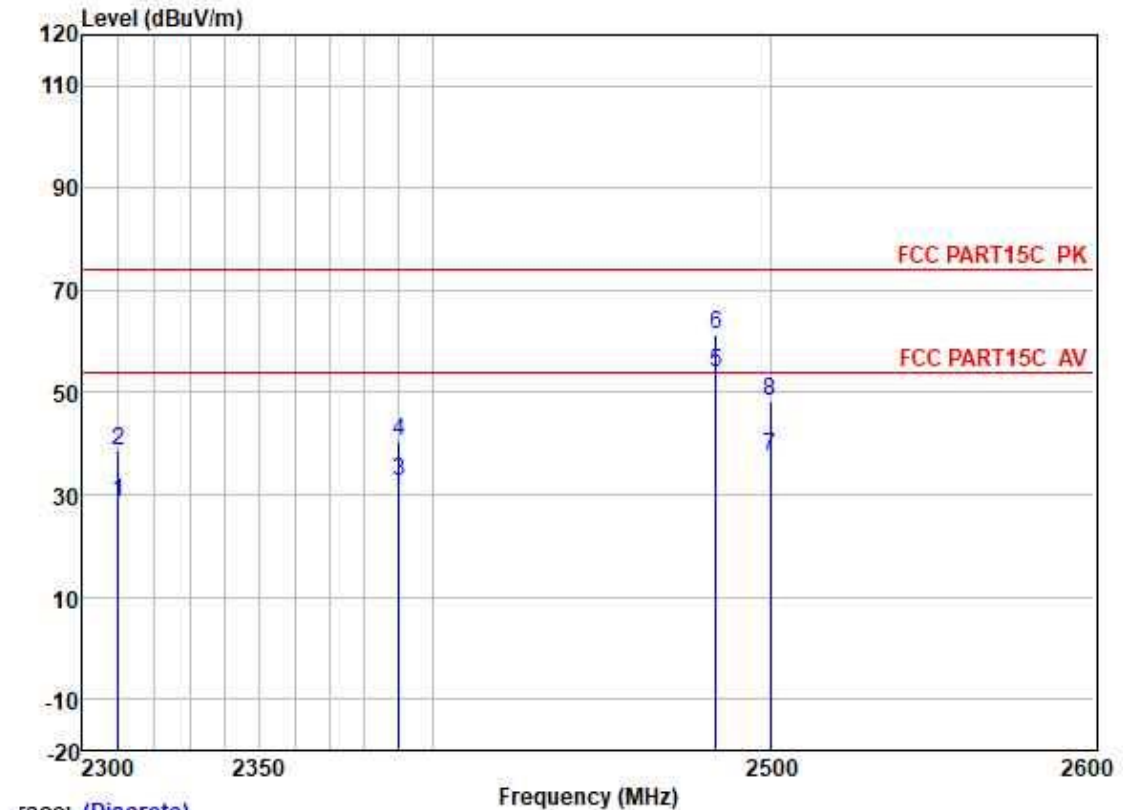
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	33.74	27.15	3.32	36.94	27.27	54.00	-26.73	VERTICAL	Average
2	2310.000	45.19	27.15	3.32	36.94	38.72	74.00	-35.28	VERTICAL	Peak
3	2390.000	48.02	27.33	3.48	36.92	41.91	54.00	-12.09	VERTICAL	Average
4	2390.000	58.82	27.33	3.48	36.92	52.71	74.00	-21.29	VERTICAL	Peak
5	2483.500	37.53	27.48	3.53	36.90	31.64	54.00	-22.36	VERTICAL	Average
6	2483.500	45.81	27.48	3.53	36.90	39.92	74.00	-34.08	VERTICAL	Peak
7	2500.000	34.31	27.50	3.40	36.89	28.32	54.00	-25.68	VERTICAL	Average
8	2500.000	45.69	27.50	3.40	36.89	39.70	74.00	-34.30	VERTICAL	Peak



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



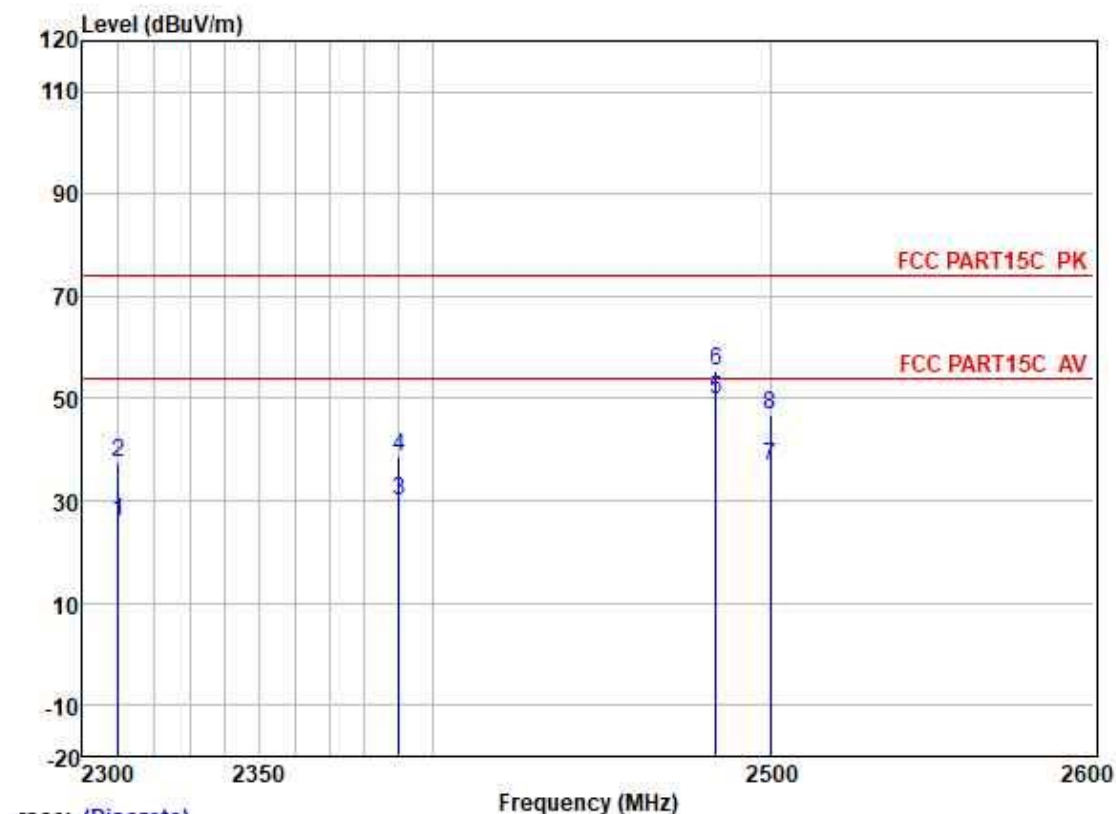
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	35.06	27.15	3.32	36.94	28.59	54.00	-25.41	HORIZONTAL Average
2	2310.000	45.24	27.15	3.32	36.94	38.77	74.00	-35.23	HORIZONTAL Peak
3	2390.000	38.58	27.33	3.48	36.92	32.47	54.00	-21.53	HORIZONTAL Average
4	2390.000	46.52	27.33	3.48	36.92	40.41	74.00	-33.59	HORIZONTAL Peak
5	2483.500	59.66	27.48	3.53	36.90	53.77	54.00	-0.23	HORIZONTAL Average
6	2483.500	67.26	27.48	3.53	36.90	61.37	74.00	-12.63	HORIZONTAL Peak
7	2500.000	43.35	27.50	3.40	36.89	37.36	54.00	-16.64	HORIZONTAL Average
8	2500.000	54.49	27.50	3.40	36.89	48.50	74.00	-25.50	HORIZONTAL Peak



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



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.000	32.38	27.15	3.32	36.94	25.91	54.00	-28.09	VERTICAL Average
2	2310.000	44.02	27.15	3.32	36.94	37.55	74.00	-36.45	VERTICAL Peak
3	2390.000	36.08	27.33	3.48	36.92	29.97	54.00	-24.03	VERTICAL Average
4	2390.000	44.62	27.33	3.48	36.92	38.51	74.00	-35.49	VERTICAL Peak
5	2483.500	55.61	27.48	3.53	36.90	49.72	54.00	-4.28	VERTICAL Average
6	2483.500	61.34	27.48	3.53	36.90	55.45	74.00	-18.55	VERTICAL Peak
7	2500.000	42.80	27.50	3.40	36.89	36.81	54.00	-17.19	VERTICAL Average
8	2500.000	52.98	27.50	3.40	36.89	46.99	74.00	-27.01	VERTICAL Peak



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7.7 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

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.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

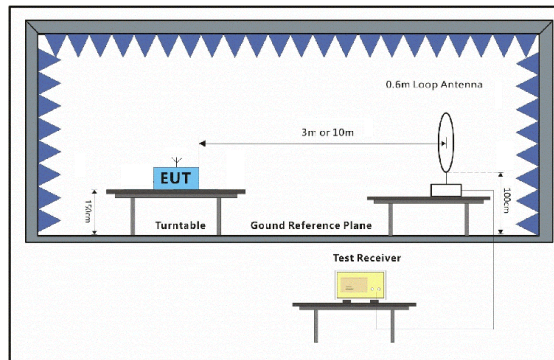
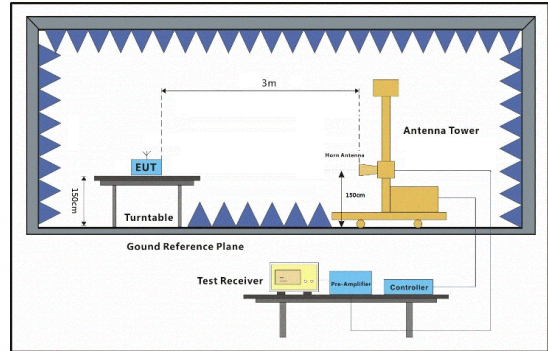
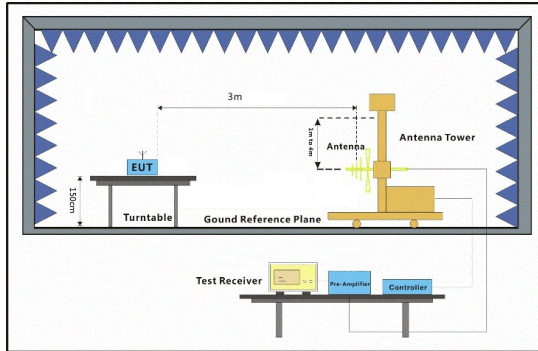
Test Mode: d:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation
e:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data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



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Guangzhou Branch Testing & Calibration EEC Laboratory. 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

7.7.2 Test Setup Diagram



7.7.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

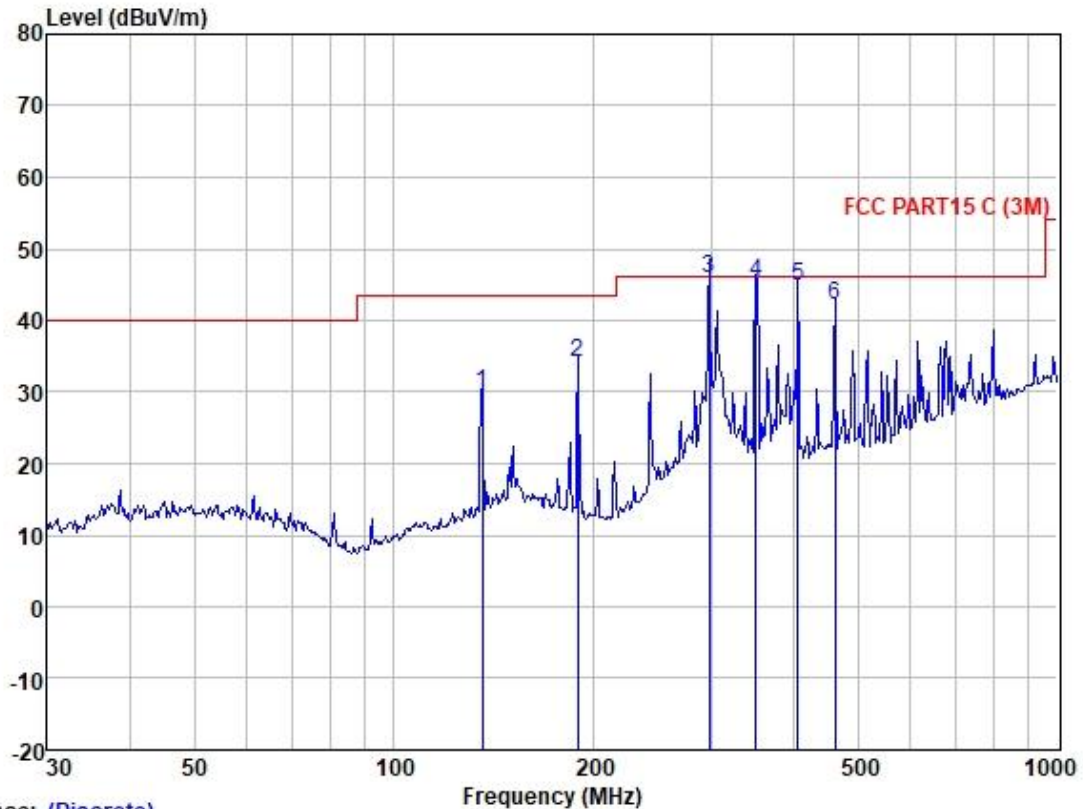
- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel with Modulation GFSK. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation 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:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)

Site : SGS

Condition: FCC PART15 C (3M) 3m HORIZONTAL

Job :

Model :

Power :

Test Mode:

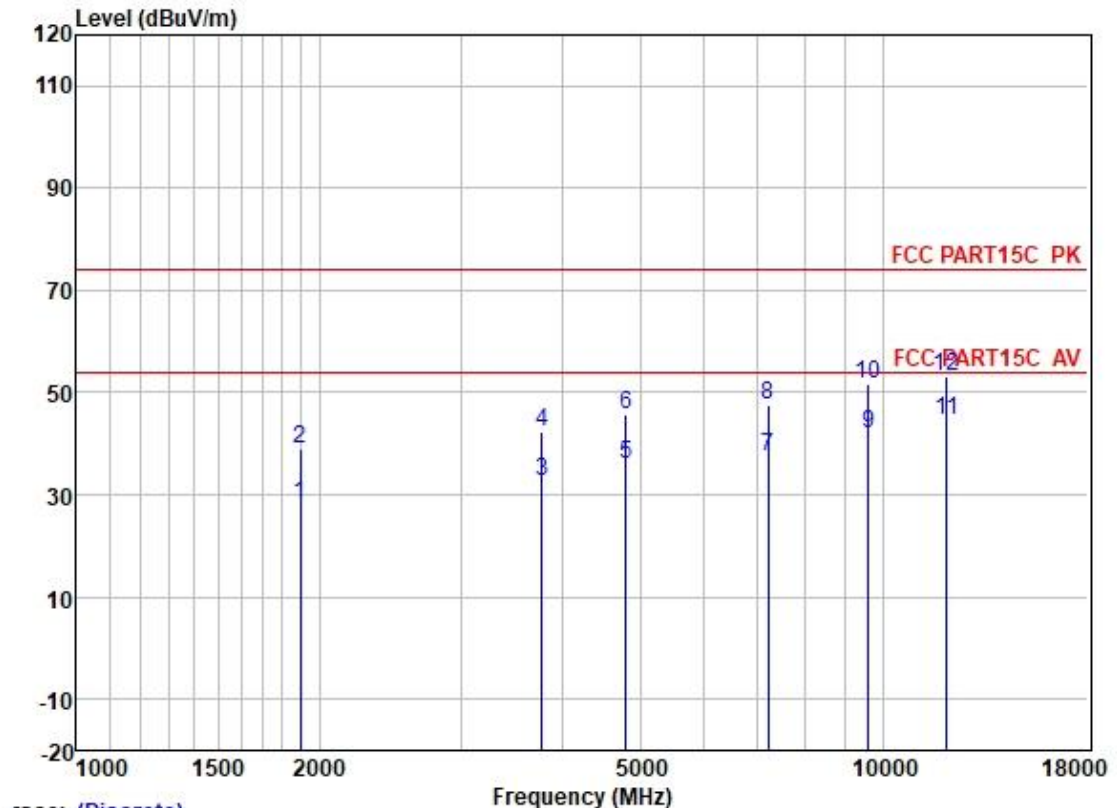
	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		Remark
1	135.982	42.06	12.80	2.03	26.96	29.93	43.50	-13.57	HORIZONTAL QP
2	189.074	47.41	11.03	2.49	26.74	34.19	43.50	-9.31	HORIZONTAL QP
3	298.268	55.67	13.57	3.16	26.55	45.85	46.00	-0.15	HORIZONTAL QP
4	350.477	54.20	14.50	3.63	27.01	45.32	46.00	-0.68	HORIZONTAL QP
5	406.088	52.34	15.82	3.95	27.36	44.75	46.00	-1.25	HORIZONTAL QP
6	462.346	48.26	17.47	4.27	27.81	42.19	46.00	-3.81	HORIZONTAL QP



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Mode:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)

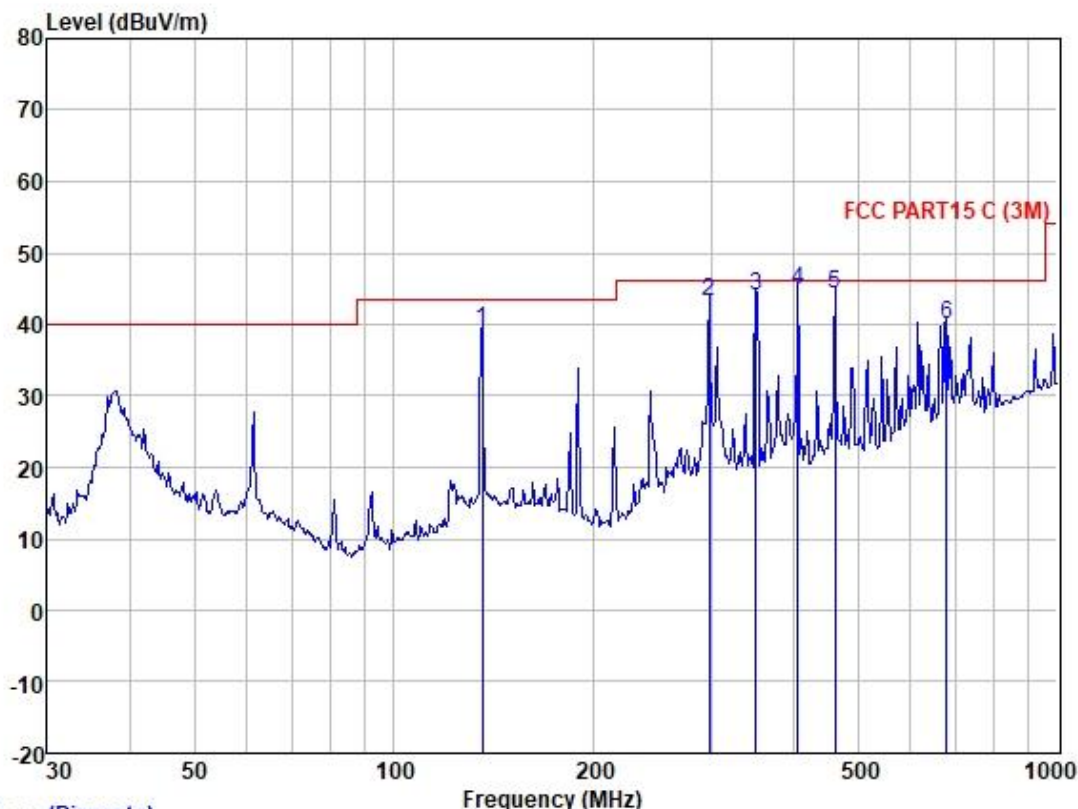
	Freq	ReadAntenna Level Factor	Cable Preamp Loss Factor	Limit Line	Over Limit	Pol/Phase	Remark		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1894.154	36.36	26.04	2.90	37.01	28.29	54.00	-25.71	HORIZONTAL Average
2	1894.154	46.92	26.04	2.90	37.01	38.85	74.00	-35.15	HORIZONTAL Peak
3	3779.422	35.07	29.47	4.59	36.42	32.71	54.00	-21.29	HORIZONTAL Average
4	3779.422	44.86	29.47	4.59	36.42	42.50	74.00	-31.50	HORIZONTAL Peak
5	4804.184	35.77	31.42	5.40	36.48	36.11	54.00	-17.89	HORIZONTAL Average
6	4804.184	45.45	31.42	5.40	36.48	45.79	74.00	-28.21	HORIZONTAL Peak
7	7206.879	32.63	35.54	5.98	36.75	37.40	54.00	-16.60	HORIZONTAL Average
8	7206.879	42.94	35.54	5.98	36.75	47.71	74.00	-26.29	HORIZONTAL Peak
9	9608.123	32.99	38.37	7.07	36.36	42.07	54.00	-11.93	HORIZONTAL Average
10	9608.123	42.55	38.37	7.07	36.36	51.63	74.00	-22.37	HORIZONTAL Peak
11	12010.580	33.85	38.90	8.19	36.40	44.54	54.00	-9.46	HORIZONTAL Average
12	12010.580	42.46	38.90	8.19	36.40	53.15	74.00	-20.85	HORIZONTAL Peak



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Mode:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)

Site : SGS

Condition: FCC PART15 C (3M) 3m VERTICAL

Job :

Model :

Power :

Test Mode:

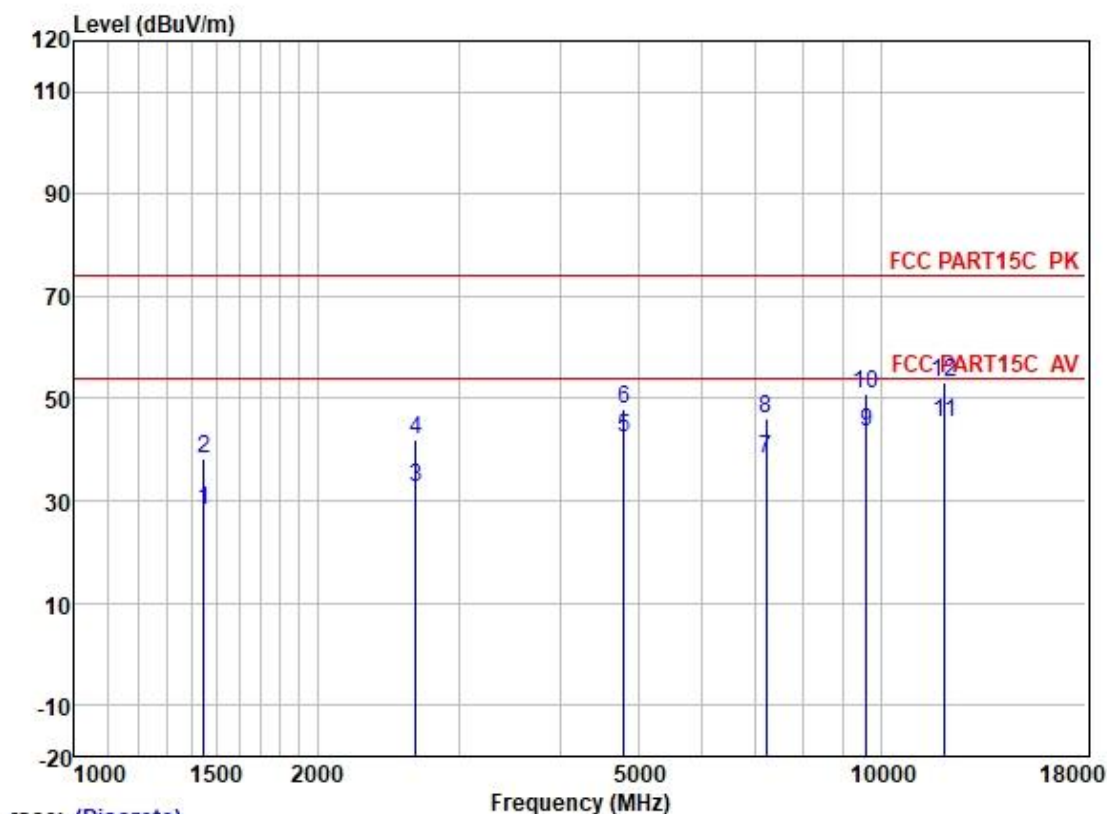
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	135.982	51.25	12.80	2.03	26.96	39.12	43.50	-4.38	VERTICAL QP
2	298.268	52.97	13.57	3.16	26.55	43.15	46.00	-2.85	VERTICAL QP
3	350.477	52.90	14.50	3.63	27.01	44.02	46.00	-1.98	VERTICAL QP
4	406.088	52.47	15.82	3.95	27.36	44.88	46.00	-1.12	VERTICAL QP
5	462.346	50.36	17.47	4.27	27.81	44.29	46.00	-1.71	VERTICAL QP
6	679.960	41.70	20.80	5.70	28.17	40.03	46.00	-5.97	VERTICAL QP



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Mode:d; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)

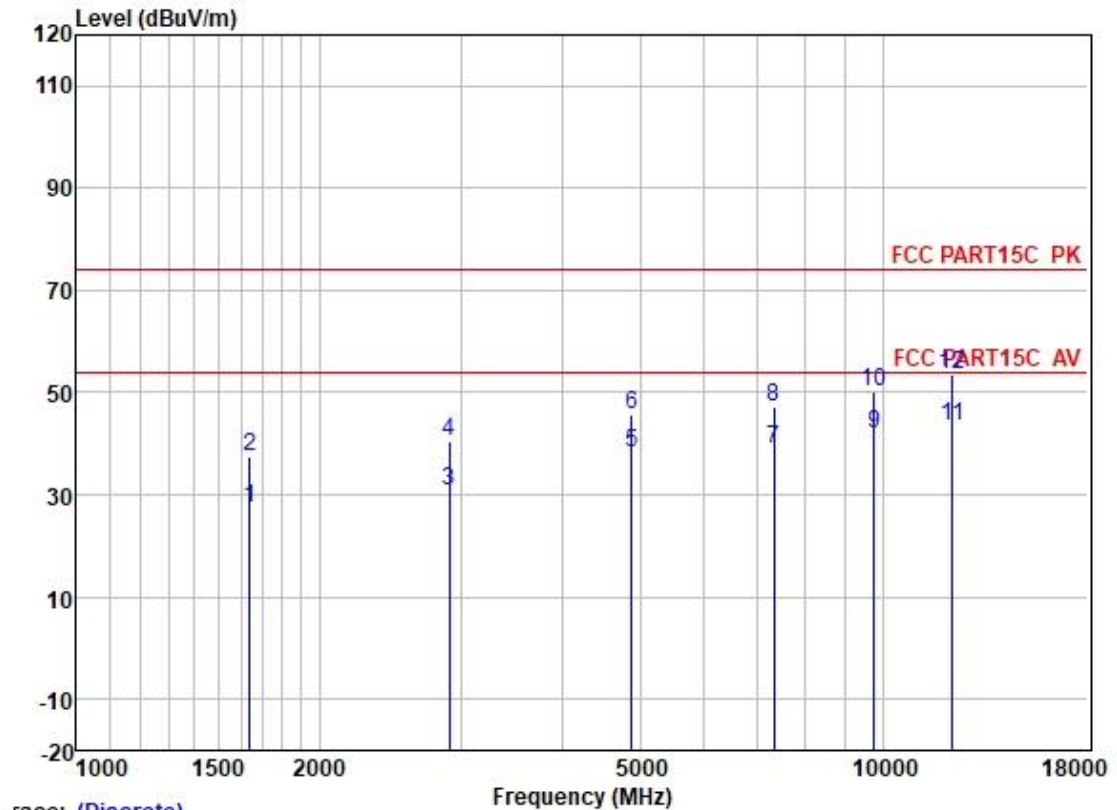
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1447.688	37.19	25.45	2.70	37.15	28.19	54.00	-25.81	VERTICAL Average
2	1447.688	47.40	25.45	2.70	37.15	38.40	74.00	-35.60	VERTICAL Peak
3	2648.664	38.18	27.71	3.54	36.83	32.60	54.00	-21.40	VERTICAL Average
4	2648.664	47.57	27.71	3.54	36.83	41.99	74.00	-32.01	VERTICAL Peak
5	4804.751	41.92	31.42	5.40	36.48	42.26	54.00	-11.74	VERTICAL Average
6	4804.751	47.71	31.42	5.40	36.48	48.05	74.00	-25.95	VERTICAL Peak
7	7206.032	33.57	35.54	5.98	36.75	38.34	54.00	-15.66	VERTICAL Average
8	7206.032	41.24	35.54	5.98	36.75	46.01	74.00	-27.99	VERTICAL Peak
9	9608.254	34.50	38.37	7.07	36.36	43.58	54.00	-10.42	VERTICAL Average
10	9608.254	41.72	38.37	7.07	36.36	50.80	74.00	-23.20	VERTICAL Peak
11	12010.220	34.55	38.90	8.19	36.40	45.24	54.00	-8.76	VERTICAL Average
12	12010.220	42.35	38.90	8.19	36.40	53.04	74.00	-20.96	VERTICAL Peak



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Mode:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:middle



Trace: (Discrete)

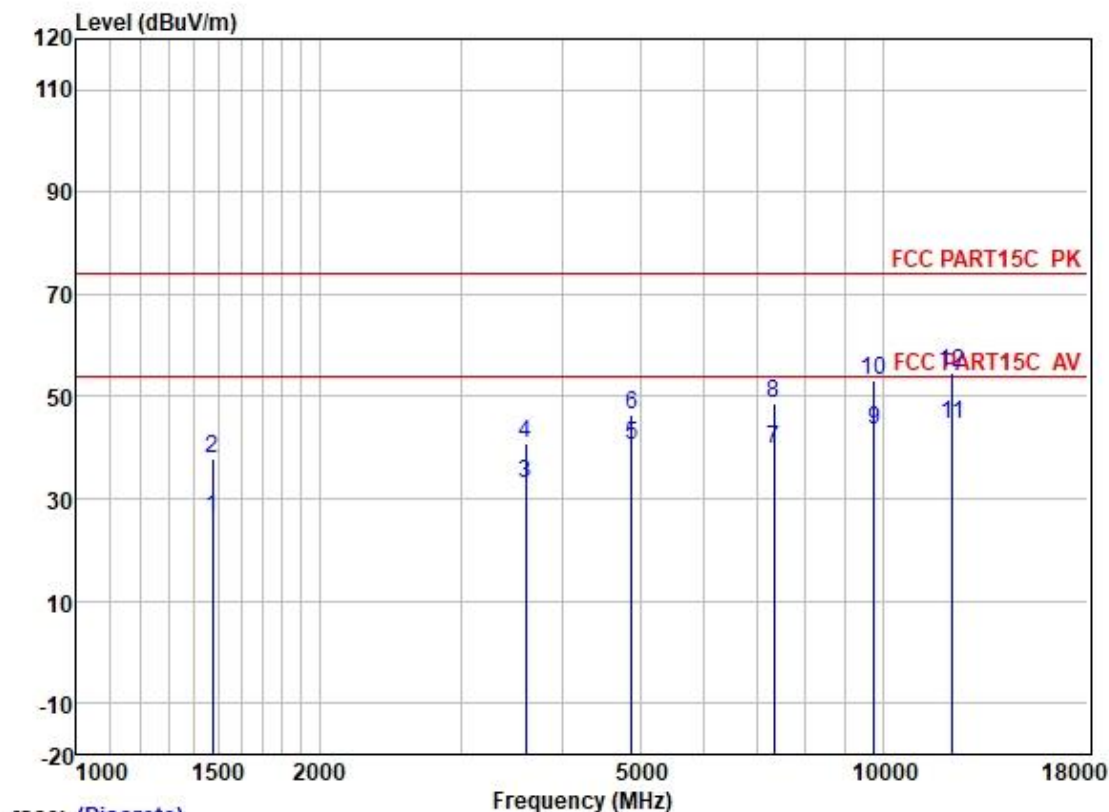
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1639.274	35.93	25.62	2.80	37.06	27.29	54.00	-26.71	HORIZONTAL Average
2	1639.274	46.07	25.62	2.80	37.06	37.43	74.00	-36.57	HORIZONTAL Peak
3	2896.945	35.57	28.29	3.70	36.64	30.92	54.00	-23.08	HORIZONTAL Average
4	2896.945	44.96	28.29	3.70	36.64	40.31	74.00	-33.69	HORIZONTAL Peak
5	4884.833	37.54	31.56	5.52	36.50	38.12	54.00	-15.88	HORIZONTAL Average
6	4884.833	45.12	31.56	5.52	36.50	45.70	74.00	-28.30	HORIZONTAL Peak
7	7326.265	33.44	36.00	6.13	36.76	38.81	54.00	-15.19	HORIZONTAL Average
8	7326.265	41.98	36.00	6.13	36.76	47.35	74.00	-26.65	HORIZONTAL Peak
9	9768.399	32.94	38.53	7.01	36.33	42.15	54.00	-11.85	HORIZONTAL Average
10	9768.399	40.94	38.53	7.01	36.33	50.15	74.00	-23.85	HORIZONTAL Peak
11	12210.200	33.02	38.74	8.08	36.30	43.54	54.00	-10.46	HORIZONTAL Average
12	12210.200	43.02	38.74	8.08	36.30	53.54	74.00	-20.46	HORIZONTAL Peak



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Mode:d; Polarization:Vertical; Modulation:GFSK; ; Channel:middle



Trace: (Discrete)

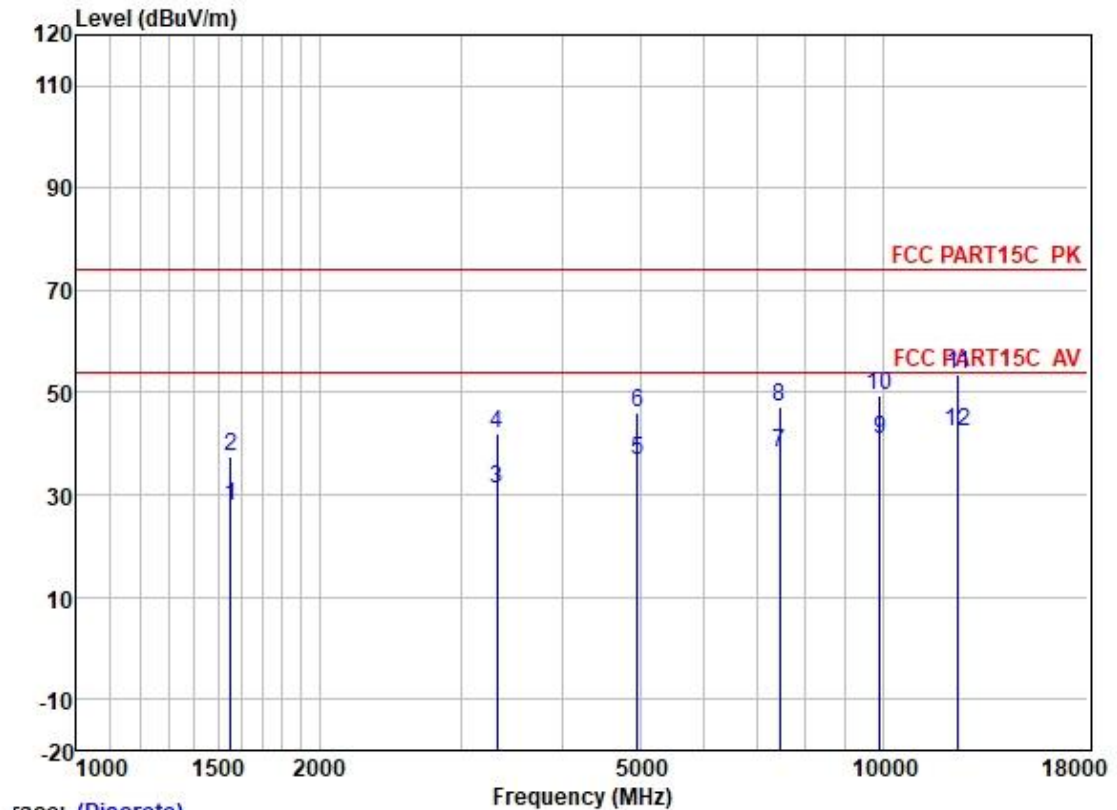
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1473.013	35.22	25.48	2.76	37.13	26.33	54.00	-27.67	VERTICAL Average
2	1473.013	46.62	25.48	2.76	37.13	37.73	74.00	-36.27	VERTICAL Peak
3	3608.619	35.76	29.05	4.50	36.44	32.87	54.00	-21.13	VERTICAL Average
4	3608.619	43.79	29.05	4.50	36.44	40.90	74.00	-33.10	VERTICAL Peak
5	4884.443	40.07	31.56	5.52	36.50	40.65	54.00	-13.35	VERTICAL Average
6	4884.443	45.91	31.56	5.52	36.50	46.49	74.00	-27.51	VERTICAL Peak
7	7326.349	34.20	36.00	6.13	36.76	39.57	54.00	-14.43	VERTICAL Average
8	7326.349	43.43	36.00	6.13	36.76	48.80	74.00	-25.20	VERTICAL Peak
9	9768.432	34.30	38.53	7.01	36.33	43.51	54.00	-10.49	VERTICAL Average
10	9768.432	44.04	38.53	7.01	36.33	53.25	74.00	-20.75	VERTICAL Peak
11	12210.750	33.97	38.74	8.08	36.30	44.49	54.00	-9.51	VERTICAL Average
12	12210.750	44.16	38.74	8.08	36.30	54.68	74.00	-19.32	VERTICAL Peak



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Mode:d; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1551.677	36.68	25.54	2.80	37.09	27.93	54.00	-26.07	HORIZONTAL Average
2	1551.677	46.42	25.54	2.80	37.09	37.67	74.00	-36.33	HORIZONTAL Peak
3	3328.077	34.72	28.78	4.07	36.48	31.09	54.00	-22.91	HORIZONTAL Average
4	3328.077	45.61	28.78	4.07	36.48	41.98	74.00	-32.02	HORIZONTAL Peak
5	4960.307	35.98	31.65	5.65	36.52	36.76	54.00	-17.24	HORIZONTAL Average
6	4960.307	45.29	31.65	5.65	36.52	46.07	74.00	-27.93	HORIZONTAL Peak
7	7440.762	32.66	36.27	6.22	36.77	38.38	54.00	-15.62	HORIZONTAL Average
8	7440.762	41.45	36.27	6.22	36.77	47.17	74.00	-26.83	HORIZONTAL Peak
9	9920.005	31.51	38.65	6.96	36.31	40.81	54.00	-13.19	HORIZONTAL Average
10	9920.005	40.02	38.65	6.96	36.31	49.32	74.00	-24.68	HORIZONTAL Peak
11	12400.260	43.21	38.57	7.97	36.17	53.58	74.00	-20.42	HORIZONTAL Peak
12	12400.260	32.14	38.57	7.97	36.17	42.51	54.00	-11.49	HORIZONTAL Average



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