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Report No.: SHEM180800704104

Page: 1 of 107

## **TEST REPORT**

**Application No.:** SHEM1808007041CR  
**FCC ID:** SVC-PM2I  
**IC:** 152C-PM2I  
**Applicant:** Lenbrook Industries Limited  
**Address of Applicant:** 633 Granite Court, Pickering Ontario, Canada L1W 3K1,  
**Manufacturer:** Lenbrook Industries Limited  
**Address of Manufacturer:** 633 Granite Court, Pickering Ontario, Canada L1W 3K1,  
**Factory:** HANSONG(NANJING) TECHNOLOGY LTD.  
**Address of Factory:** 8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China.

**Equipment Under Test (EUT):**

**EUT Name:** Compact Wireless Streaming Speaker

**Model No.:** Pulse Mini 2i

**Trade mark:** Bluesound

**Standard(s) :** 47 CFR Part 15, Subpart E 15.407

RSS-247 Issue 2, February 2017

RSS-Gen Issue 5, April 2018

**Date of Receipt:** 2018-08-16

**Date of Test:** 2018-08-27 to 2018-09-12

**Date of Issue:** 2018-11-13

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



Parlam Zhan  
E&E Section Manager

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

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Revision Record			
Version	Description	Date	Remark
00	Original	2018-11-13	/

Authorized for issue by:			
			
		<hr/>	
		Bill Wu / Project Engineer	
			
		<hr/>	
		Parlam Zhan / Reviewer	



## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	FCC Requirement	IC Requirement	Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.203	RSS-Gen Section 6.8	N/A	Pass
Transmission in the Absence of Data	47 CFR Part 15, Subpart C 15.407 (c)	RSS-247 Section 6.4(a)	N/A	Pass

N/A: Not applicable

Radio Spectrum Matter Part				
Item	FCC Requirement	IC Requirement	Method	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)	RSS-Gen Section 8.8	ANSI C63.10 (2013) Section 6.2	Pass
99% Bandwidth	N/A	RSS-Gen Section 6.6	KDB 789033 II D	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart C 15.407 (a)	RSS-247 Section 6.2.1(1)	KDB 789033 D02 II C 1	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band )	47 CFR Part 15, Subpart C 15.407 (e)	RSS-247 Section 6.2.4	KDB 789033 D02 II C 2	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart C 15.407 (a)	RSS-247 Section 6.2.1&6.2.2&6.2.3&6.2.4	KDB 789033 D02 II E	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart C 15.407 (a)	RSS-247 Section 6.2.1&6.2.2&6.2.3&6.2.4	KDB 789033 D02 II F	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Section 3.3 & RSS-Gen Section 8.9	KDB 789033 D02 II G	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Section 3.3 & RSS-Gen Section 8.9	KDB 789033 D02 II G	Pass
Frequency Stability	47 CFR Part 15, Subpart C 15.407 (g)	RSS-Gen Section 8.11	ANSI C63.10 (2013) Section 6.8& RSS-Gen Section 6.11	Pass

N/A: Not applicable



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## 4 General Information

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

Power supply:	100-240V~50/60Hz
Test voltage:	AC 120V/60Hz
Cable:	AC Cable 1.8m
Antenna Gain	2.53dBi
Antenna Type	PIFA Antenna
DFS Function	Slave without Radar detection
TPC Function	Not Support

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Router	FIR302M	FIR302M	/
Laptop	Lenovo	ThinkPad X100e	/

#### Power level setting using in test:

Band	802.11 a	802.11 n (HT20)	802.11 n (HT40)	802.11 ac (VHT20)	802.11 ac (VHT40)	802.11 ac (VHT80)
U-NII 1	15	14	13	13	12	11
U-NII 3	15	14	13	13	12	11



### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Timeout	$\pm 2s$
3	Duty cycle	$\pm 0.37\%$
4	Occupied Bandwidth	$\pm 3\%$
5	RF conducted power	$\pm 0.75dB$
6	RF power density	$\pm 2.84dB$
7	Conducted Spurious emissions	$\pm 0.75dB$
8	RF Radiated power	$\pm 4.5dB$ (Below 1GHz)
		$\pm 4.8dB$ (Above 1GHz)
9	Radiated Spurious emission test	$\pm 4.2dB$ (Below 30MHz)
		$\pm 4.4dB$ (30MHz-1GHz)
		$\pm 4.6dB$ (1GHz-18GHz)
		$\pm 5.2dB$ (Above 18GHz)
10	Temperature test	$\pm 1^{\circ}C$
11	Humidity test	$\pm 3\%$
12	Supply voltages	$\pm 1.5\%$
13	Time	$\pm 3\%$

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



#### **4.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

#### **4.5 Test Facility**

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

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

None

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

None



## 5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
<b>Conducted Emission at AC Power Line</b>					
EMI test receiver	R&S	ESR7	SHEM162-1	2017-12-20	2018-12-19
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
LISN	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
CE test Cable	/	CE01	/	2017-12-26	2018-12-25
<b>Conducted Test</b>					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2018-08-13	2019-08-12
Signal Generator	R&S	SMR20	SHEM006-1	2018-08-13	2019-08-12
Signal Generator	Agilent	N5182A	SHEM182-1	2018-08-13	2019-08-12
Communication Tester	R&S	CMW270	SHEM183-1	2018-08-13	2019-08-12
Switcher	Tonscend	JS0806	SHEM184-1	2018-08-13	2019-08-12
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2018-08-13	2019-08-12
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2017-09-25	2020-09-24
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-12-26	2018-12-25
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-12-26	2018-12-25
Conducted test Cable	/	RF01~RF04	/	2017-12-26	2018-12-25
<b>Radiated Test</b>					
EMI test Receiver	R&S	ESU40	SHEM051-1	2017-12-20	2018-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2020-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2020-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2017-10-24	2020-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2020-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-12-03	2020-12-02
Pre-amplifier (9kHz-2GHz)	CLAVIO	BDLNA-0001	SHEM164-1	2018-08-13	2019-08-12
Pre-amplifier (1-18GHz)	CLAVIO	BDLNA-0118	SHEM050-2	2018-08-13	2019-08-12
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2017-12-20	2018-12-19
Signal Generator	R&S	SMR40	SHEM058-1	2018-08-13	2019-08-12
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
RE test Cable	/	RE01, RE02, RE06	/	2017-12-26	2018-12-25





## 6 Radio Spectrum Technical Requirement

### 6.1 Test Channel

Band	802.11a			802.11 n(HT20)			802.11n(HT40)		
	Channel	Freq	Rate	Chan	Freq	Rate	Channel	Freq	Rate
U-NII 1	36	5180	6Mbps	36	5180	MCS0	38	5190	MCS0
	44	5220	6Mbps	44	5220	MCS0	-	-	-
	48	5240	6Mbps	48	5240	MCS0	46	5230	MCS0
U-NII 3	149	5745	6Mbps	149	5745	MCS0	151	5755	MCS0
	157	5785	6Mbps	157	5785	MCS0	-	-	-
	165	5825	6Mbps	165	5825	MCS0	159	5795	MCS0
Band	802.11ac(HT20)			802.11 ac(HT40)			802.11ac(HT80)		
	Channel	Freq	Rate	Chan	Freq	Rate	Channel	Freq	Rate
U-NII 1	36	5180	MCS0	38	5190	MCS0	42	5210	MCS0
	44	5220	MCS0	-	-	-	-	-	-
	48	5240	MCS0	46	5230	MCS0			
U-NII 3	149	5745	MCS0	151	5755	MCS0	155	5775	MCS0
	157	5785	MCS0	-	-	-	-	-	-
	165	5825	MCS0	159	5795		-	-	-

## 6.2 Antenna Requirement

### 6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

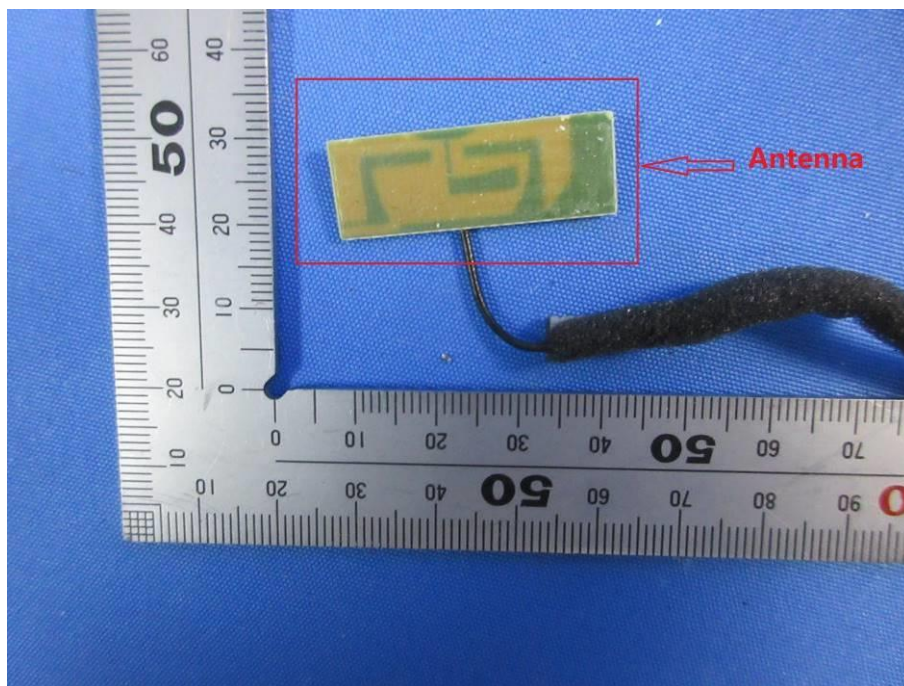
### 6.2.2 Conclusion

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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is PIFA Antenna and no consideration of replacement. The best case gain of the antenna is 2.53dBi.





### **6.3 Transmission in the Absence of Data**

#### **6.3.1 Test Requirement:**

47 CFR Part 15, Subpart C 15.407 (c)

#### **6.3.2 Conclusion**

Standard Requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Applicants shall include in their application for equipment authorization a description of how this requirement is met.

EUT Details:

WIFI chip (8223A-SR) support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.



## 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 & 15.407 b(6)

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

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

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

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

at these mode to find the  
worst case:

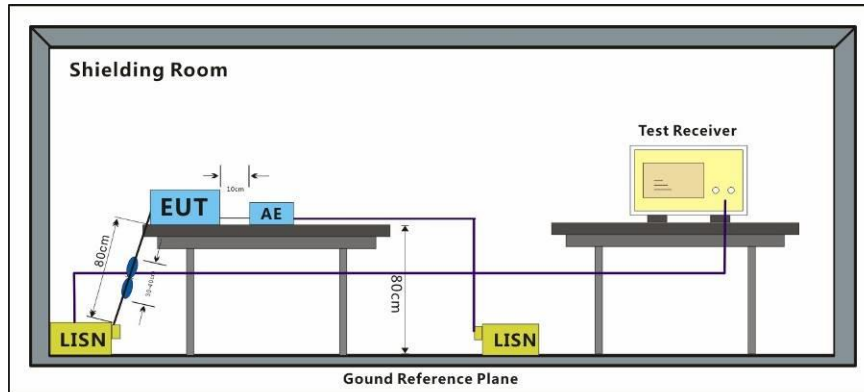
b:TX mode (Band 1)\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

worst case for final test:

:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

### 7.1.2 Test Setup Diagram



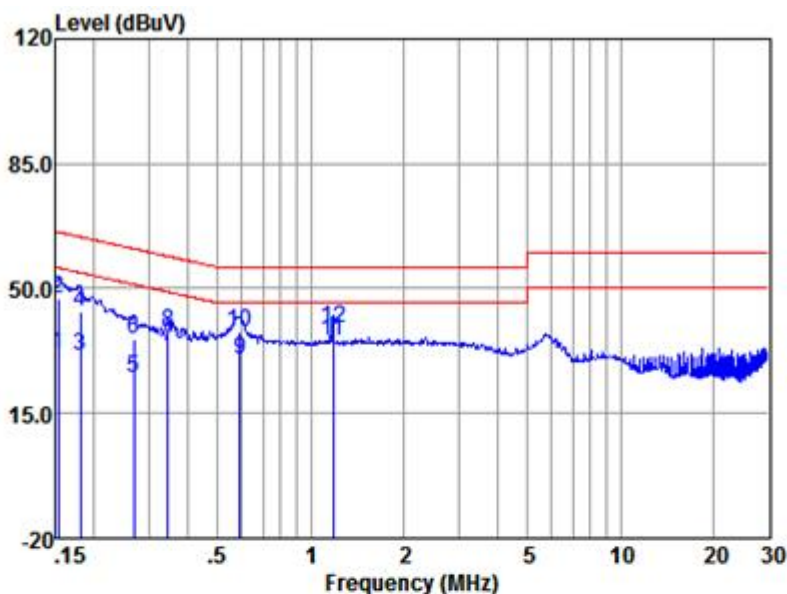
### 7.1.3 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

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



Mode:b; Line:Live Line



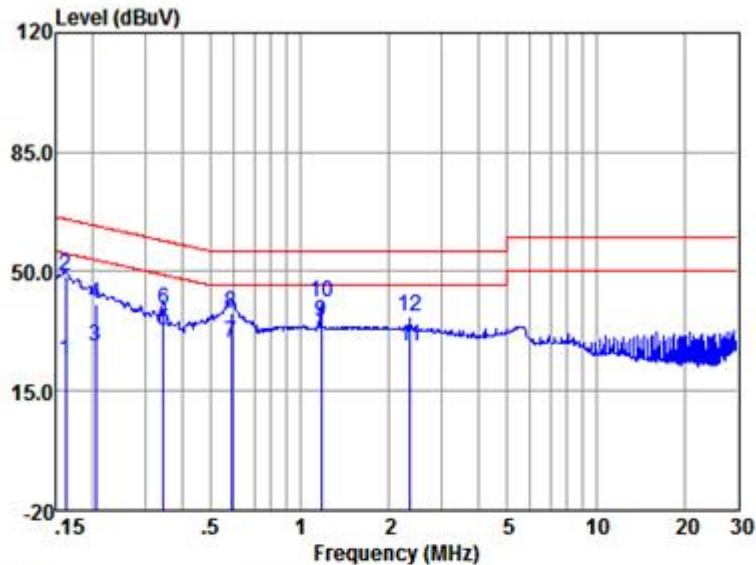
LISN		: LINE						
	Freq	Read	LISN	Cable	Emission		Over	
	(MHz)	level	Factor	Loss	Level	Limit	Limit	Remark
		(dBuV)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.15	21.83	0.11	9.82	31.76	55.87	-24.11	Average
2	0.15	37.43	0.11	9.82	47.36	65.87	-18.51	QP
3	0.18	21.40	0.11	9.83	31.34	54.50	-23.16	Average
4	0.18	33.70	0.11	9.83	43.64	64.50	-20.86	QP
5	0.27	15.12	0.11	9.85	25.08	51.16	-26.08	Average
6	0.27	25.58	0.11	9.85	35.54	61.16	-25.62	QP
7	0.35	23.72	0.11	9.84	33.67	49.05	-15.38	Average
8	0.35	27.99	0.11	9.84	37.94	59.05	-21.11	QP
9	0.59	20.10	0.11	9.77	29.98	46.00	-16.02	Average
10	0.59	28.15	0.11	9.77	38.03	56.00	-17.97	QP
11	1.18	25.46	0.11	9.82	35.39	46.00	-10.61	Average
12	1.18	28.89	0.11	9.82	38.82	56.00	-17.18	QP

Notes: Emission Level = Read Level + LISN Factor + Cable loss





Mode:b; Line:Neutral Line



LISN : NEUTRAL

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.16	13.76	0.12	9.82	23.70	55.38	-31.68	Average
2	0.16	38.68	0.12	9.82	48.62	65.38	-16.76	QP
3	0.20	18.13	0.12	9.83	28.08	53.45	-25.37	Average
4	0.20	30.25	0.12	9.83	40.20	63.45	-23.25	QP
5	0.35	22.76	0.11	9.84	32.71	49.05	-16.34	Average
6	0.35	28.80	0.11	9.84	38.75	59.05	-20.30	QP
7	0.59	19.10	0.11	9.77	28.98	46.00	-17.02	Average
8	0.59	27.81	0.11	9.77	37.69	56.00	-18.31	QP
9	1.18	25.41	0.11	9.82	35.34	46.00	-10.66	Average
10	1.18	30.79	0.11	9.82	40.72	56.00	-15.28	QP
11	2.36	17.98	0.13	9.87	27.98	46.00	-18.02	Average
12	2.36	26.68	0.13	9.87	36.68	56.00	-19.32	QP

Notes: Emission Level = Read Level + LISN Factor + Cable loss



## 7.2 99% Bandwidth

Test Requirement N/A

Test Method: KDB 789033 II D

### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

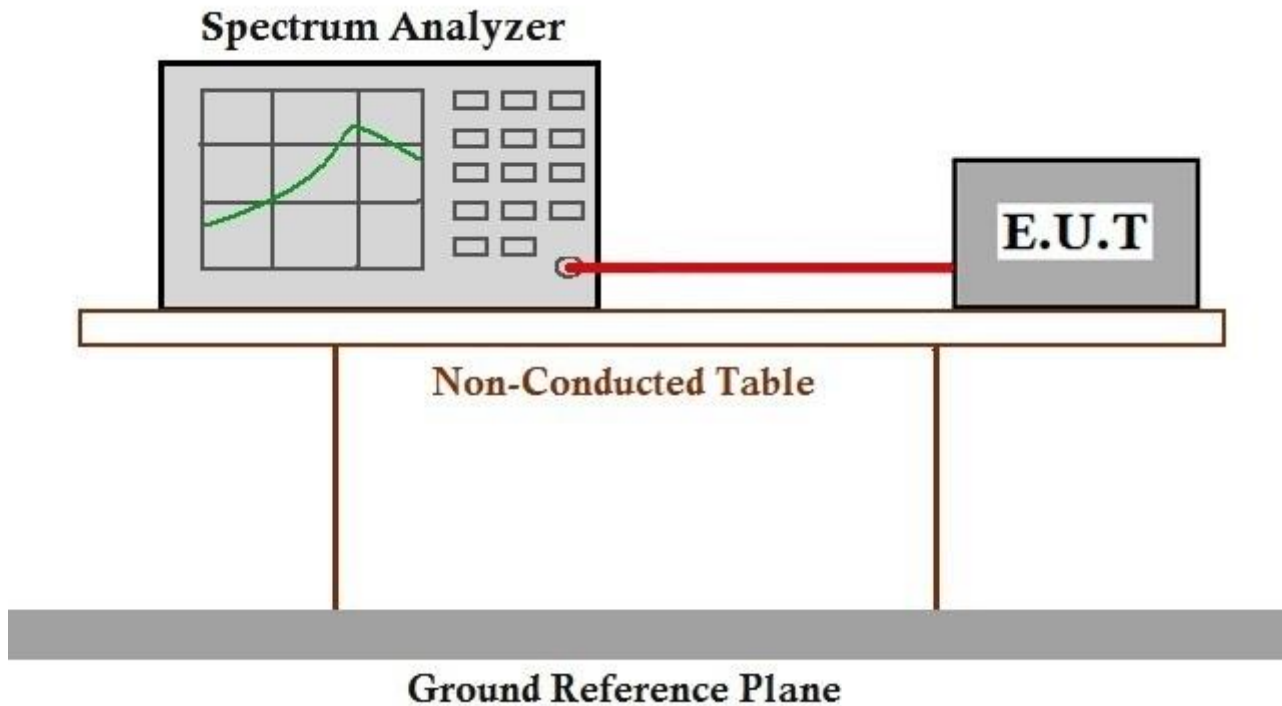
Pretest these mode to find the worst case: b:TX mode (Band 1)\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). 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 D for SHEM180800704104



### 7.3 26dB Emission bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II C 1

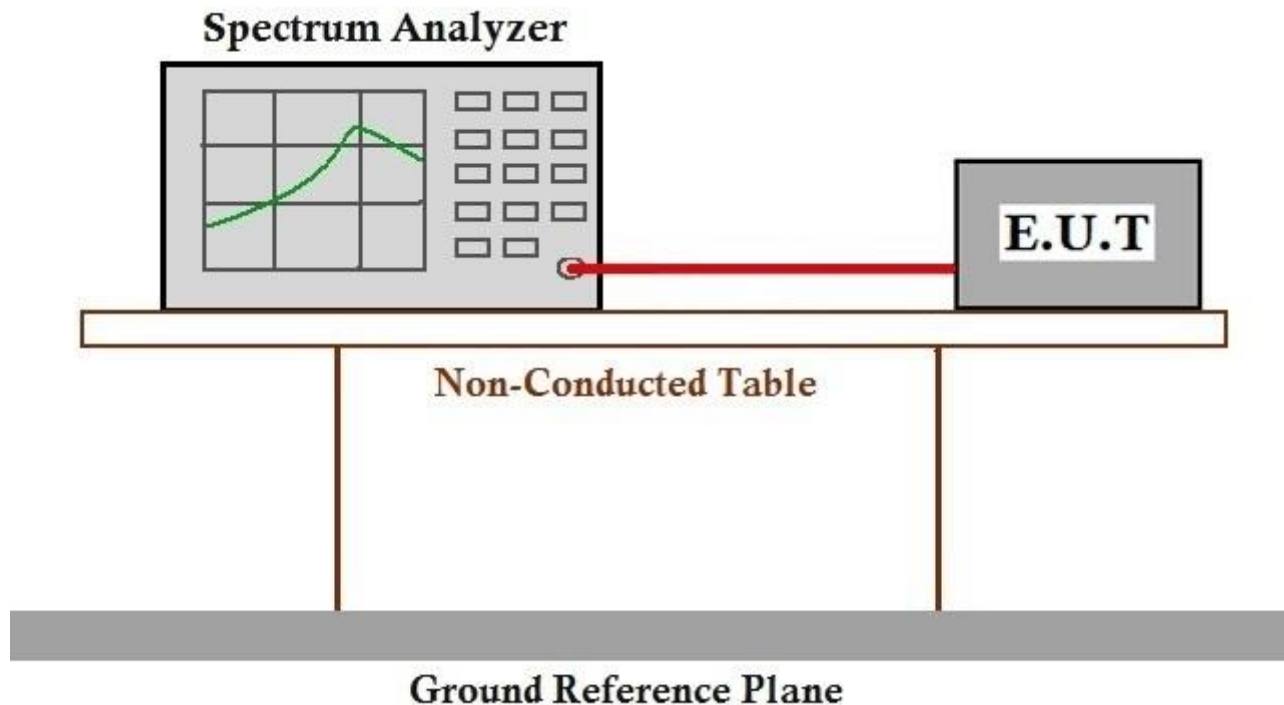
#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). 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 D for SHEM180800704104

#### 7.4 Minimum 6 dB bandwidth (5.725-5.85 GHz band )

Test Requirement 47 CFR Part 15, Subpart C 15.407 (e)  
 Test Method: KDB 789033 D02 II C 2  
 Limit:  $\geq 500$  kHz

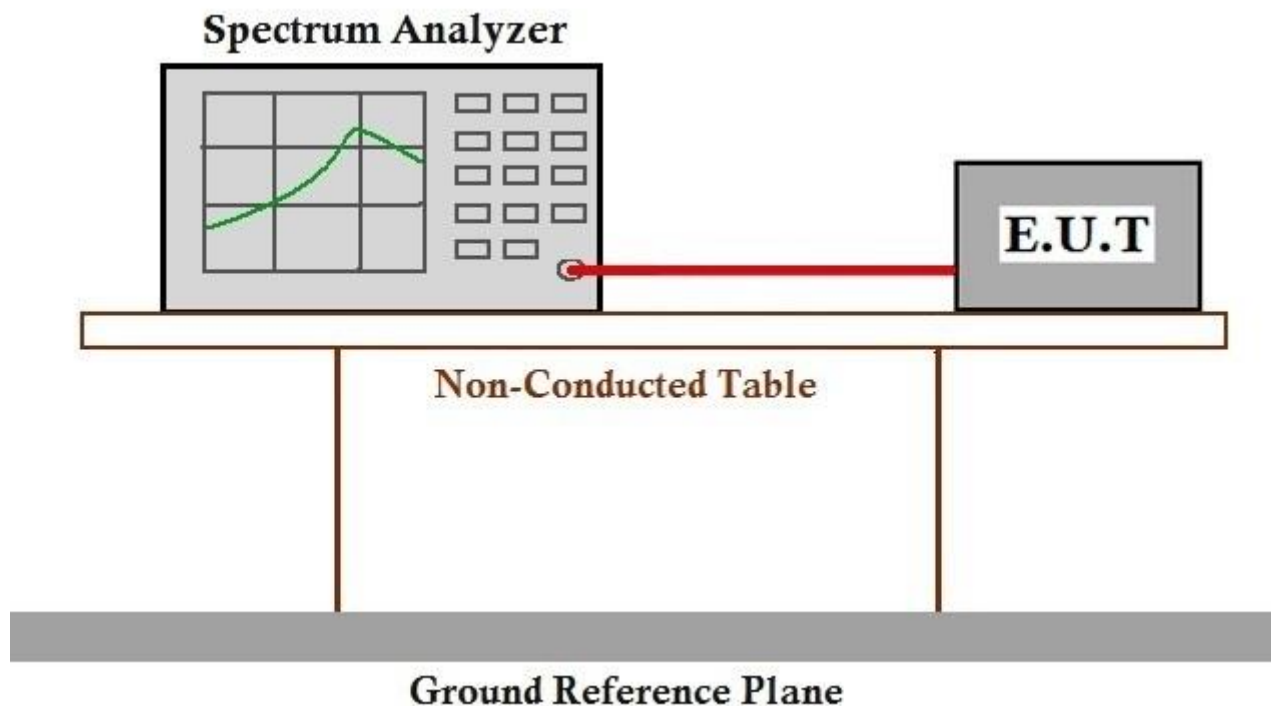
##### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). 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 D for SHEM180800704104



## 7.5 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II E

Limit:

Frequency band(MHz)	Limit
5150-5250	$\leq 1W(30dBm)$ for master device
	$\leq 250mW(24dBm)$ for client device
5250-5350	$\leq 250mW(24dBm)$ for client device or $11dBm+10\log B^*$
5470-5725	$\leq 250mW(24dBm)$ for client device or $11dBm+10\log B^*$
5725-5850	$\leq 1W(30dBm)$
Remark:	<p>* Where B is the 26dB emission bandwidth in MHz.</p> <p>The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</p>

### 7.5.1 E.U.T. Operation

Operating Environment:

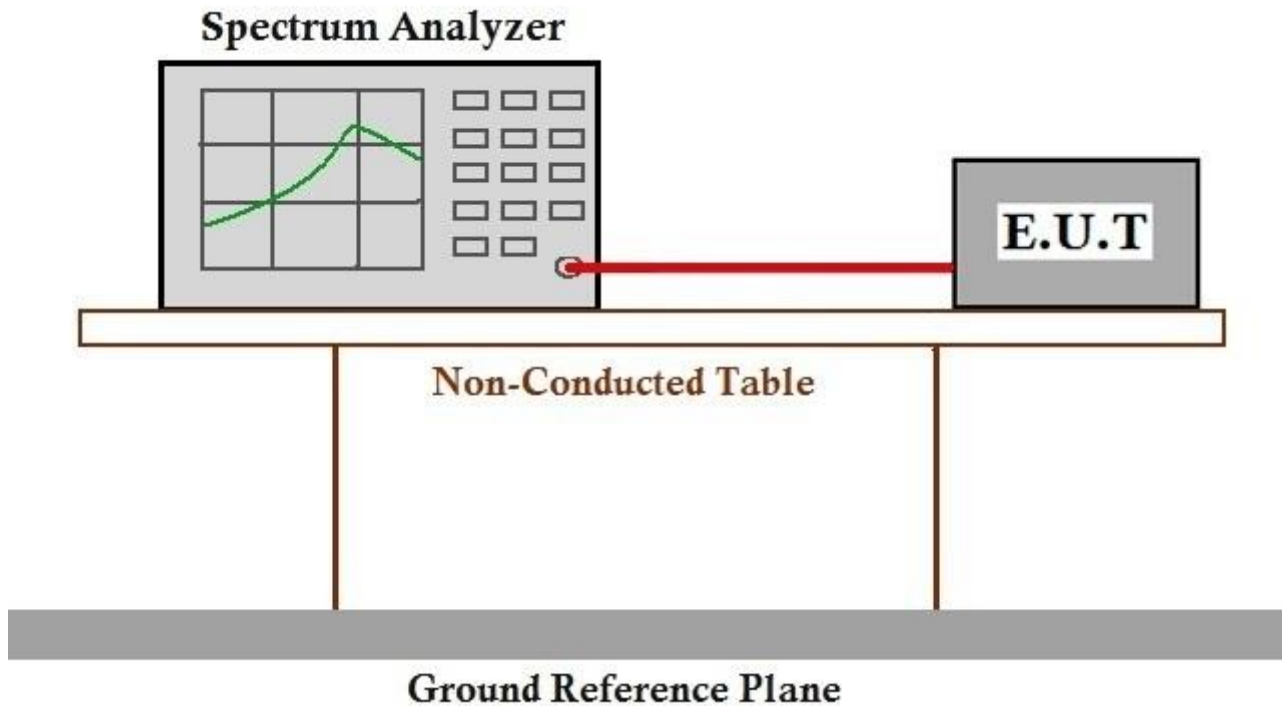
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Pretest these mode to find the worst case: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). 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 D for SHEM180800704104



## 7.6 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II F

Limit:

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

### 7.6.1 E.U.T. Operation

Operating Environment:

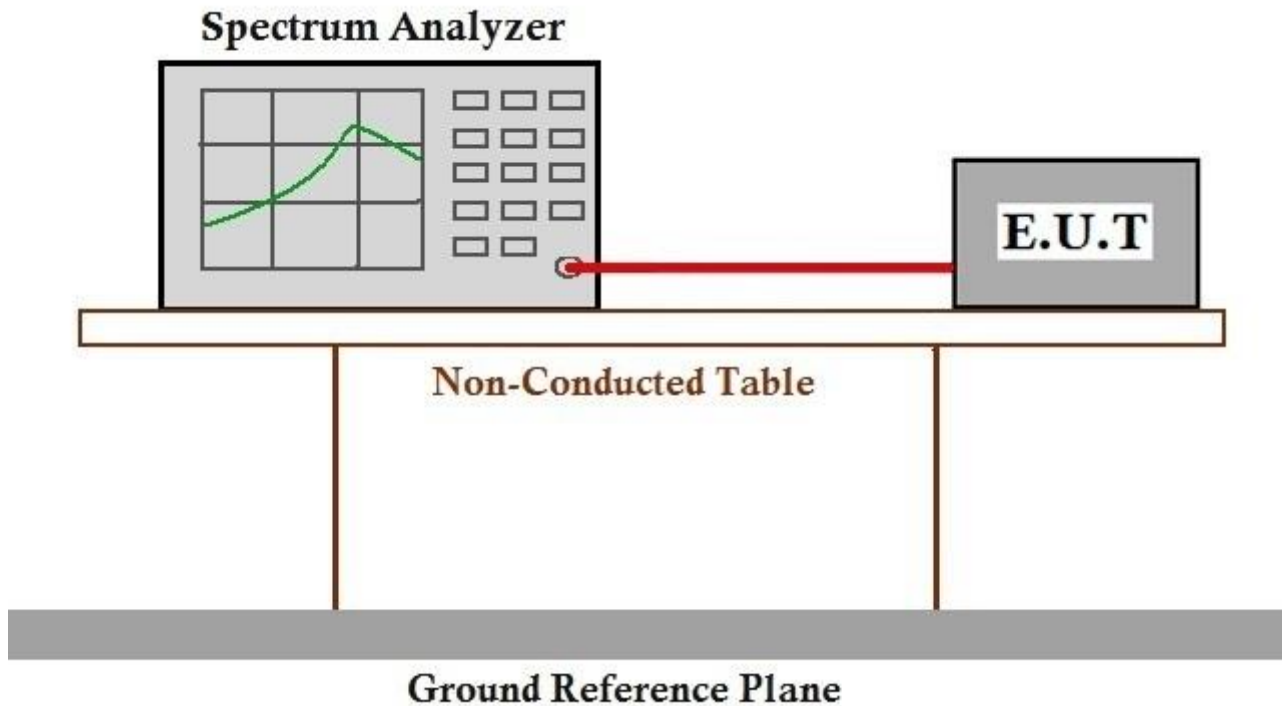
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Pretest these mode to find the worst case: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). 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 D for SHEM180800704104





## 7.7 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)

Test Method: KDB 789033 D02 II G

### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

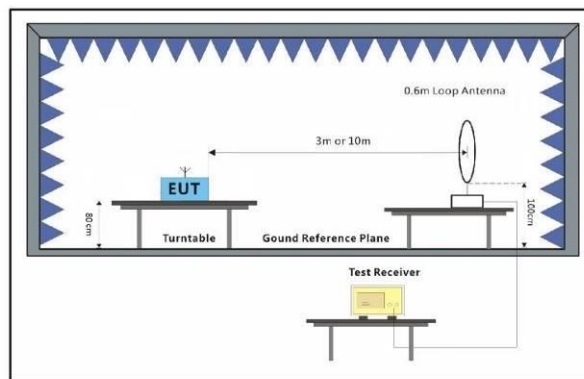
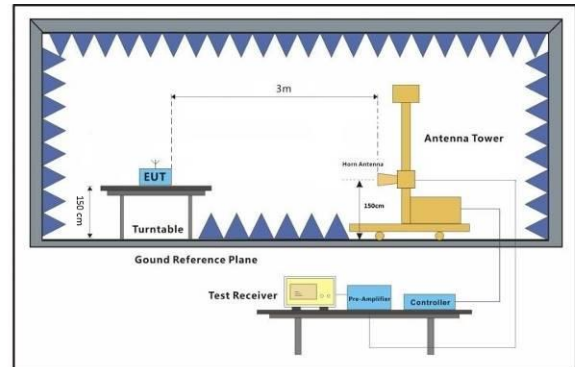
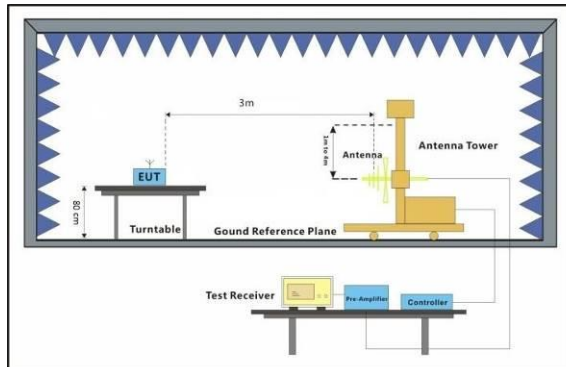
Pretest these mode to find the worst case: b:TX mode (Band 1)\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.



### 7.7.2 Test Setup Diagram





### **7.7.3 Measurement Procedure and Data**

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

**Remark:**

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.
3. Scan from 9kHz to 40GHz, 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. As shown in this section, 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.



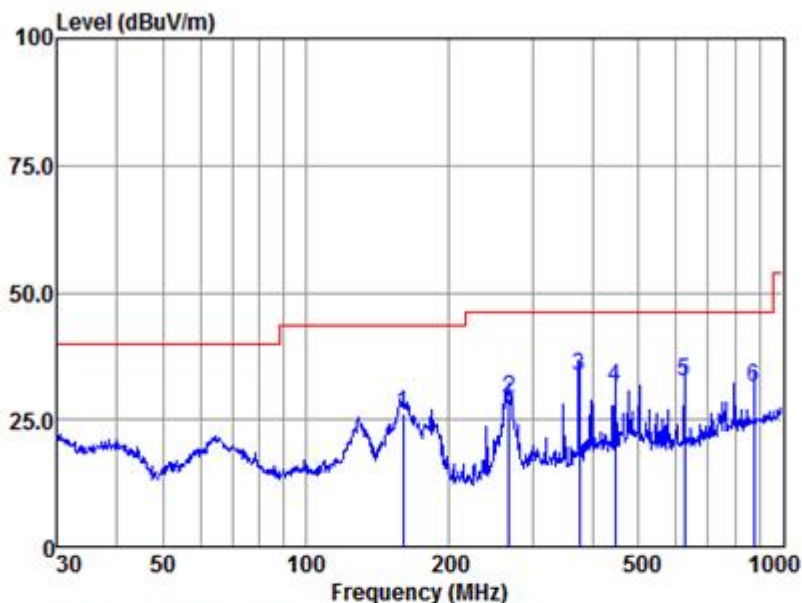
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Below 1GHz:

Mode:b; Polarization:Horizontal



Antenna Polarity :HORIZONTAL

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	159.78	55.00	13.10	0.63	42.59	26.14	43.50	-17.36	QP
2	267.55	58.61	12.12	0.79	42.43	29.09	46.00	-16.91	QP
3	375.94	60.19	14.68	0.95	42.16	33.66	46.00	-12.34	QP
4	446.41	56.28	16.13	1.08	42.12	31.37	46.00	-14.63	QP
5	625.08	53.70	19.62	1.41	42.19	32.54	46.00	-13.46	QP
6	875.25	48.79	22.51	2.35	42.10	31.55	46.00	-14.45	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

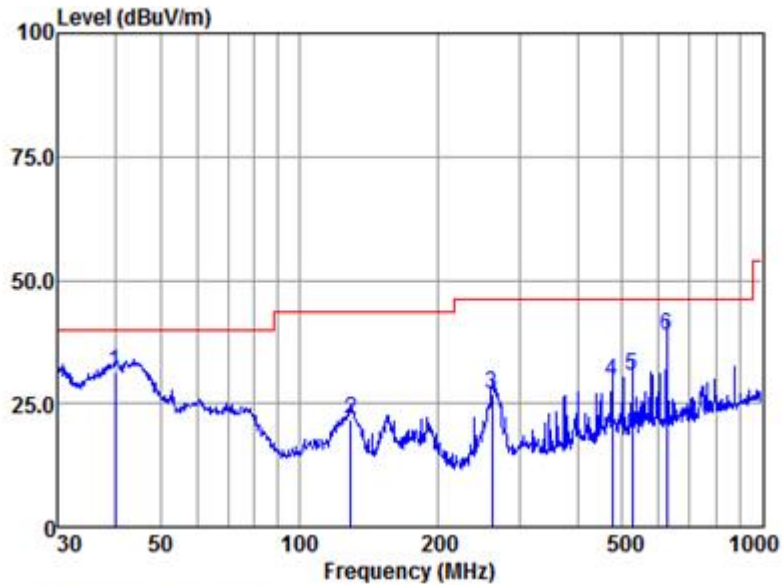


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Mode:b; Polarization:Vertical



Antenna Polarity :VERTICAL

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	39.85	57.33	16.29	0.22	42.62	31.22	40.00	-8.78	QP
2	129.47	51.12	12.68	0.58	42.66	21.72	43.50	-21.78	QP
3	261.06	56.54	11.89	0.78	42.44	26.77	46.00	-19.23	QP
4	475.50	53.79	16.73	1.15	42.13	29.54	46.00	-16.46	QP
5	526.40	53.60	17.83	1.23	42.16	30.50	46.00	-15.50	QP
6	625.08	59.93	19.62	1.41	42.19	38.77	46.00	-7.23	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Above 1GHz:

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10360	35.55	14.28	49.83	68.2	-18.37	peak
15540	26.87	21.58	48.45	54	-5.55	peak
20720	29.64	23.16	52.80	54	-1.20	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10360	31.63	14.28	45.91	68.2	-22.29	peak
15540	29.20	21.58	50.78	54	-3.22	peak
20720	28.06	23.16	51.22	54	-2.78	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10440	32.20	14.14	46.34	68.2	-21.86	peak
15660	29.32	21.22	50.54	54	-3.46	peak
20880	27.01	23.24	50.25	54	-3.75	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10440	31.95	14.14	46.09	68.2	-22.11	peak
15660	28.57	21.22	49.79	54	-4.21	peak
20880	27.45	23.24	50.69	54	-3.31	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10480	32.59	14.08	46.67	68.2	-21.53	peak
15720	30.25	21.10	51.35	54	-2.65	peak
20960	30.11	23.64	53.75	54	-0.25	peak



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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10480	35.91	14.08	49.99	68.2	-18.21	peak
15720	26.41	21.10	47.51	54	-6.49	peak
20960	25.10	23.64	48.74	54	-5.26	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10360	29.03	14.28	43.31	68.2	-24.89	peak
15540	27.74	21.58	49.32	54	-4.68	peak
20720	27.21	23.16	50.37	54	-3.63	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10360	31.54	14.28	45.82	68.2	-22.38	peak
15540	26.78	21.58	48.36	54	-5.64	peak
20720	29.12	23.16	52.28	54	-1.72	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10440	32.21	14.14	46.35	68.2	-21.85	peak
15660	27.66	21.22	48.88	54	-5.12	peak
20880	29.25	23.24	52.49	54	-1.51	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10440	31.81	14.14	45.95	68.2	-22.25	peak
15660	26.45	21.22	47.67	54	-6.33	peak
20880	30.44	23.24	53.68	54	-0.32	peak





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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10480	30.25	14.08	44.33	68.2	-23.87	peak
15720	27.20	21.10	48.30	54	-5.70	peak
20960	29.57	23.64	53.21	54	-0.79	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10480	32.31	14.08	46.39	68.2	-21.81	peak
15720	28.92	21.10	50.02	54	-3.98	peak
20960	26.80	23.64	50.44	54	-3.56	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10380	34.69	14.25	48.94	68.2	-19.26	peak
15570	31.00	21.49	52.49	54	-1.51	peak
20760	27.83	23.16	50.99	54	-3.01	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10380	34.60	14.25	48.85	68.2	-19.35	peak
15570	28.09	21.49	49.58	54	-4.42	peak
20760	28.46	23.16	51.62	54	-2.38	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10460	34.14	14.11	48.25	68.2	-19.95	peak
15690	28.04	21.14	49.18	54	-4.82	peak
20920	27.18	23.31	50.49	54	-3.51	peak



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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10460	30.17	14.11	44.28	68.2	-23.92	peak
15690	29.45	21.14	50.59	54	-3.41	peak
20920	29.06	23.31	52.37	54	-1.63	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10360	35.01	14.28	49.29	68.2	-18.91	peak
15540	31.76	21.58	53.34	54	-0.66	peak
20720	28.00	23.16	51.16	54	-2.84	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10360	30.77	14.28	45.05	68.2	-23.15	peak
15540	30.06	21.58	51.64	54	-2.36	peak
20720	26.20	23.16	49.36	54	-4.64	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10440	30.17	14.14	44.31	68.2	-23.89	peak
15660	29.34	21.22	50.56	54	-3.44	peak
20880	29.51	23.24	52.75	54	-1.25	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10440	33.09	14.14	47.23	68.2	-20.97	peak
15660	27.20	21.22	48.42	54	-5.58	peak
20880	29.93	23.24	53.17	54	-0.83	peak

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





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Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10480	33.08	14.08	47.16	68.2	-21.04	peak
15720	29.49	21.10	50.59	54	-3.41	peak
20960	25.79	23.64	49.43	54	-4.57	peak



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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10480	34.84	14.08	48.92	68.2	-19.28	peak
15720	29.93	21.10	51.03	54	-2.97	peak
20960	28.51	23.64	52.15	54	-1.85	peak

Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10380	30.82	14.25	45.07	68.2	-23.13	peak
15570	29.07	21.49	50.56	54	-3.44	peak
20760	26.92	23.16	50.08	54	-3.92	peak

Mode:b; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10380	31.06	14.25	45.31	68.2	-22.89	peak
15570	30.89	21.49	52.38	54	-1.62	peak
20760	28.95	23.16	52.11	54	-1.89	peak

Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10460	30.89	14.11	45.00	68.2	-23.20	peak
15690	26.05	21.14	47.19	54	-6.81	peak
20920	28.00	23.31	51.31	54	-2.69	peak

Mode:b; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
10460	34.50	14.11	48.61	68.2	-19.59	peak
15690	28.36	21.14	49.50	54	-4.50	peak
20920	28.70	23.31	52.01	54	-1.99	peak



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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:Low

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10420	30.46	14.17	44.63	68.2	-23.57	peak
15630	26.03	21.32	47.35	54	-6.65	peak
20840	28.00	23.54	51.54	54	-2.46	peak

Mode:b; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:Low

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
10420	33.89	14.17	48.06	68.2	-20.14	peak
15630	28.98	21.32	50.30	54	-3.70	peak
20840	29.91	23.54	53.45	54	-0.55	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11490	31.89	14.41	46.30	54	-7.70	peak
17235	28.88	22.57	51.45	68.2	-16.75	peak
22980	23.89	24.45	48.34	54	-5.66	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11490	34.66	14.41	49.07	54	-4.93	peak
17235	28.41	22.57	50.98	68.2	-17.22	peak
22980	27.83	24.45	52.28	54	-1.72	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11570	35.54	14.25	49.79	54	-4.21	peak
17355	29.50	21.86	51.36	68.2	-16.84	peak
23140	27.28	24.68	51.96	68.2	-16.24	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11570	32.44	14.25	46.69	54	-7.31	peak
17355	26.80	21.86	48.66	68.2	-19.54	peak
23140	27.69	24.68	52.37	68.2	-15.83	peak



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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11650	33.50	14.06	47.56	54	-6.44	peak
17475	29.45	21.15	50.60	68.2	-17.60	peak
23300	28.07	25.11	53.18	68.2	-15.02	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11650	33.64	14.06	47.70	54	-6.30	peak
17475	28.89	21.15	50.04	68.2	-18.16	peak
23300	25.59	25.11	50.70	68.2	-17.50	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11490	35.03	14.41	49.44	54	-4.56	peak
17235	27.53	22.57	50.10	68.2	-18.10	peak
22980	27.69	24.45	52.14	54	-1.86	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11490	33.91	14.41	48.32	54	-5.68	peak
17235	29.92	22.57	52.49	68.2	-15.71	peak
22980	25.69	24.45	50.14	54	-3.86	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11570	33.99	14.25	48.24	54	-5.76	peak
17355	26.60	21.86	48.46	68.2	-19.74	peak
23140	25.09	24.68	49.77	68.2	-18.43	peak



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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11570	35.03	14.25	49.28	54	-4.72	peak
17355	27.07	21.86	48.93	68.2	-19.27	peak
23140	25.43	24.68	50.11	68.2	-18.09	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11650	31.30	14.06	45.36	54	-8.64	peak
17475	25.85	21.15	47.00	68.2	-21.20	peak
23300	27.17	25.11	52.28	68.2	-15.92	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11650	33.49	14.06	47.55	54	-6.45	peak
17475	29.62	21.15	50.77	68.2	-17.43	peak
23300	29.32	25.11	54.43	68.2	-13.77	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11510	34.23	14.40	48.63	54	-5.37	peak
17265	26.50	22.40	48.90	68.2	-19.30	peak
23020	26.65	24.68	51.33	54	-2.67	peak

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

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11510	35.01	14.40	49.41	54	-4.59	peak
17265	27.99	22.40	50.39	68.2	-17.81	peak
23020	25.72	24.68	50.40	54	-3.60	peak



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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11590	31.96	14.20	46.16	54	-7.84	peak
17385	28.19	21.68	49.87	68.2	-18.33	peak
23180	25.22	24.72	49.94	68.2	-18.26	peak

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

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11590	36.57	14.20	50.77	54	-3.23	peak
17385	28.34	21.68	50.02	68.2	-18.18	peak
23180	25.49	24.72	50.21	68.2	-17.99	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:Low

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11490	36.05	14.41	50.46	54	-3.54	peak
17235	28.72	22.57	51.29	68.2	-16.91	peak
22980	27.26	24.45	51.71	54	-2.29	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:Low

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11490	34.70	14.41	49.11	54	-4.89	peak
17235	28.03	22.57	50.60	68.2	-17.60	peak
22980	27.93	24.45	52.38	54	-1.62	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:middle

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11570	33.89	14.25	48.14	54	-5.86	peak
17355	26.06	21.86	47.92	68.2	-20.28	peak
23140	25.36	24.68	50.04	68.2	-18.16	peak



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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11570	32.00	14.25	46.25	54	-7.75	peak
17355	30.95	21.86	52.81	68.2	-15.39	peak
23140	29.20	24.68	53.88	68.2	-14.32	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11650	33.11	14.06	47.17	54	-6.83	peak
17475	26.52	21.15	47.67	68.2	-20.53	peak
23300	28.39	25.11	53.50	68.2	-14.70	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11650	33.78	14.06	47.84	54	-6.16	peak
17475	28.36	21.15	49.51	68.2	-18.69	peak
23300	26.57	25.11	51.68	68.2	-16.52	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11510	30.90	14.40	45.30	54	-8.70	peak
17265	30.39	22.40	52.79	68.2	-15.41	peak
23020	26.91	24.68	51.59	54	-2.41	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11510	34.99	14.40	49.39	54	-4.61	peak
17265	30.53	22.40	52.93	68.2	-15.27	peak
23020	26.84	24.68	51.52	54	-2.48	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
11590	32.92	14.20	47.12	54	-6.88	peak
17385	30.29	21.68	51.97	68.2	-16.23	peak
23180	23.07	24.72	47.79	68.2	-20.41	peak



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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:High

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11590	32.08	14.20	46.28	54	-7.72	peak
17385	27.60	21.68	49.28	68.2	-18.92	peak
23180	26.87	24.72	51.59	68.2	-16.61	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:Low

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11550	32.64	14.30	46.94	54	-7.06	peak
17325	28.11	22.04	50.15	68.2	-18.05	peak
23100	27.90	24.60	52.50	54	-1.50	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:Low

Frequency MHz	RX_R dBuV	Factor dB	Emission dBuV/m	Limit dBuV/m	Over Limit dB	Detector
11550	32.08	14.30	46.38	54	-7.62	peak
17325	29.58	22.04	51.62	68.2	-16.58	peak
23100	25.33	24.60	49.93	54	-4.07	peak





## 7.8 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)

Test Method: KDB 789033 D02 II G

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:

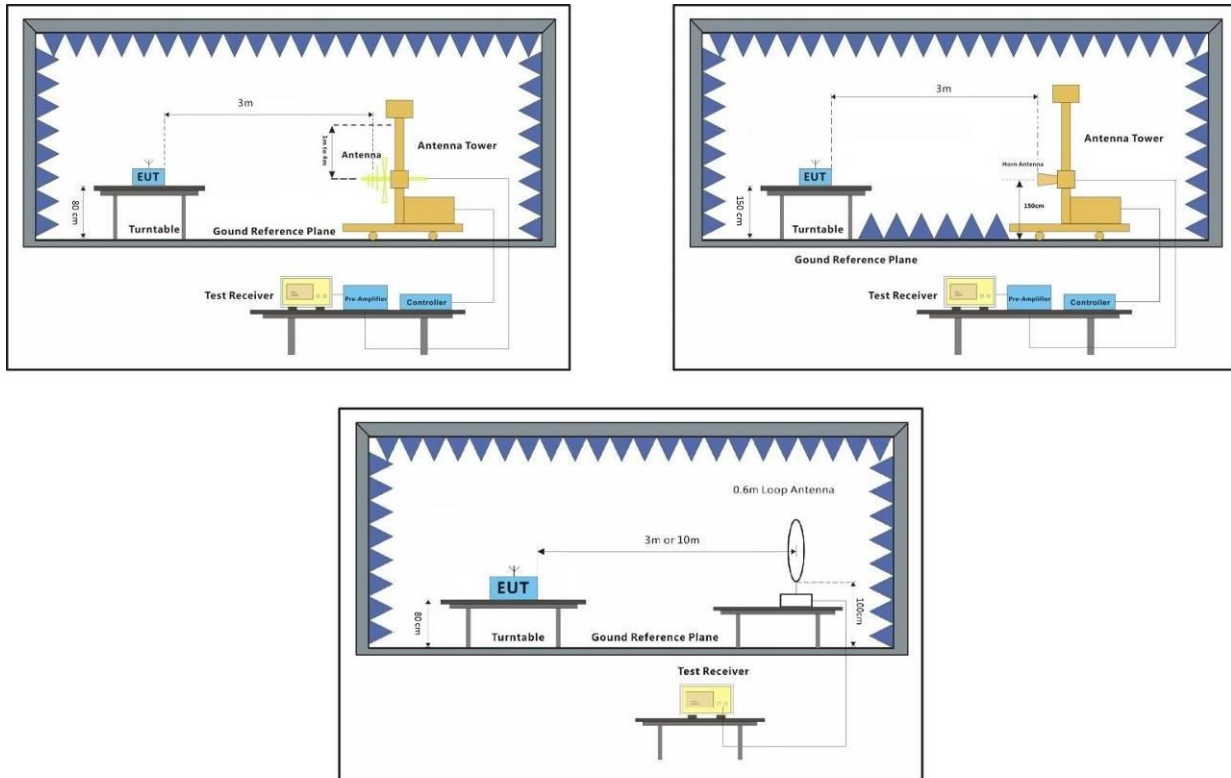
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Pretest these mode to find the worst case: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

### 7.8.2 Test Setup Diagram



### 7.8.3 Measurement Procedure and Data

- 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.
- 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.
- 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.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

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

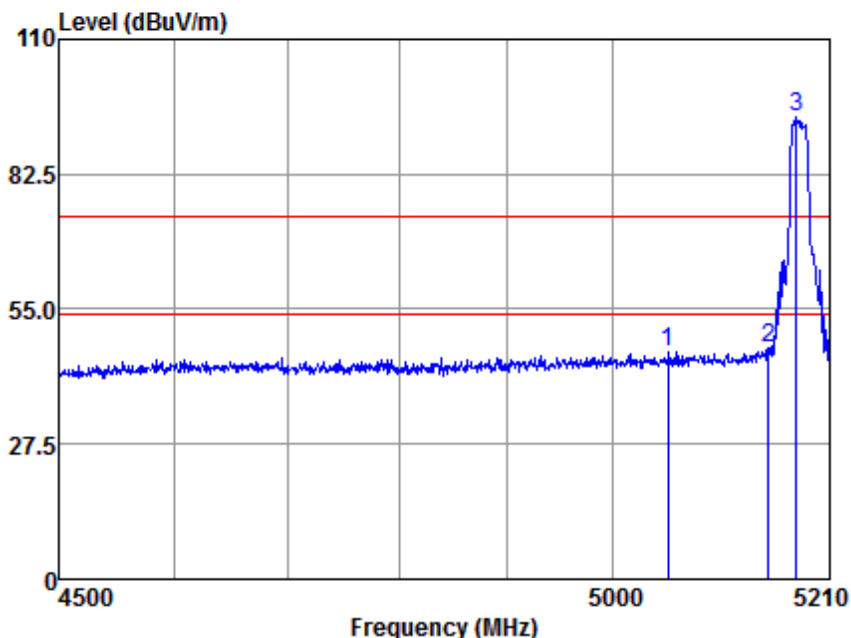


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Mode:b; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5052.89	44.10	31.46	9.63	38.87	46.32	74.00	-27.68	Peak
5150.00	45.13	31.61	9.06	38.81	46.99	74.00	-27.01	Peak
5177.28	92.26	31.65	8.86	38.80	93.97	74.00	19.97	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

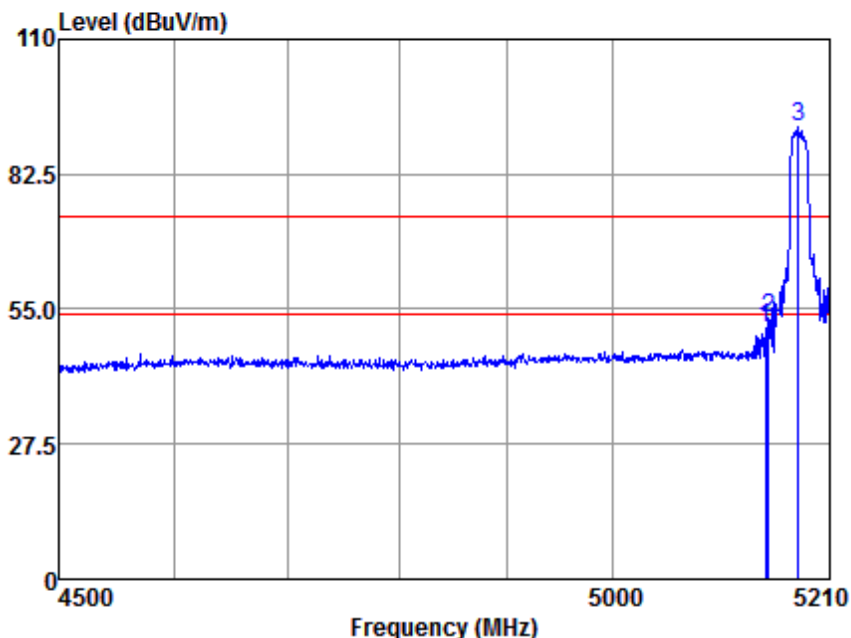


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Mode:b; Polarization:Vertical; Modulation:a; bandwidth:20MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5147.79	49.11	31.61	9.06	38.81	50.97	74.00	-23.03	Peak
5150.00	51.50	31.61	9.06	38.81	53.36	74.00	-20.64	Peak
5179.56	90.39	31.65	8.86	38.80	92.10	74.00	18.10	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

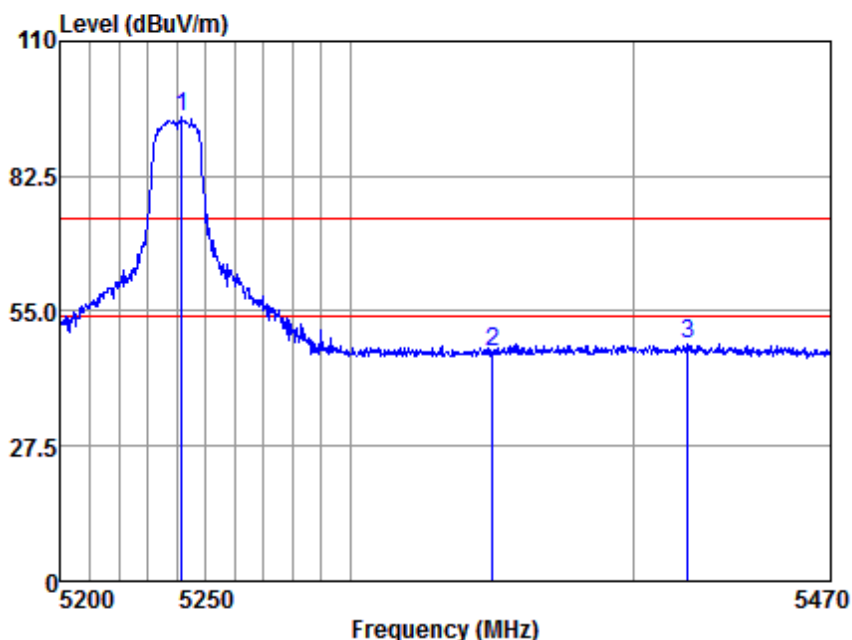


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Mode:b; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5241.76	92.91	31.74	8.68	38.77	94.56	74.00	20.56	Peak
5350.00	44.19	31.89	9.20	38.70	46.58	74.00	-27.42	Peak
5419.01	45.70	31.99	9.34	38.66	48.37	74.00	-25.63	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

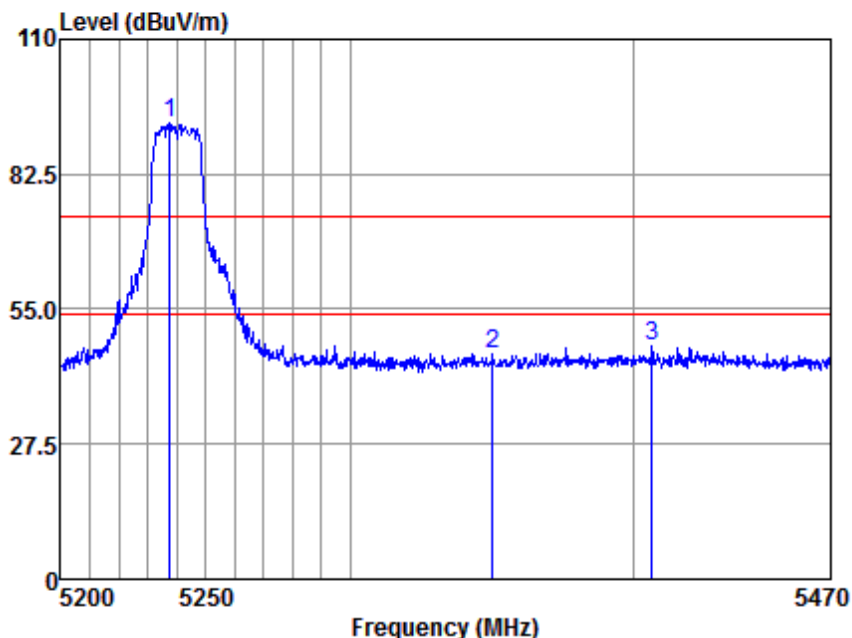


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Mode:b; Polarization:Vertical; Modulation:a; bandwidth:20MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5237.51	91.23	31.74	8.68	38.77	92.88	74.00	18.88	Peak
5350.00	43.40	31.89	9.20	38.70	45.79	74.00	-28.21	Peak
5406.41	44.64	31.97	9.44	38.67	47.38	74.00	-26.62	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

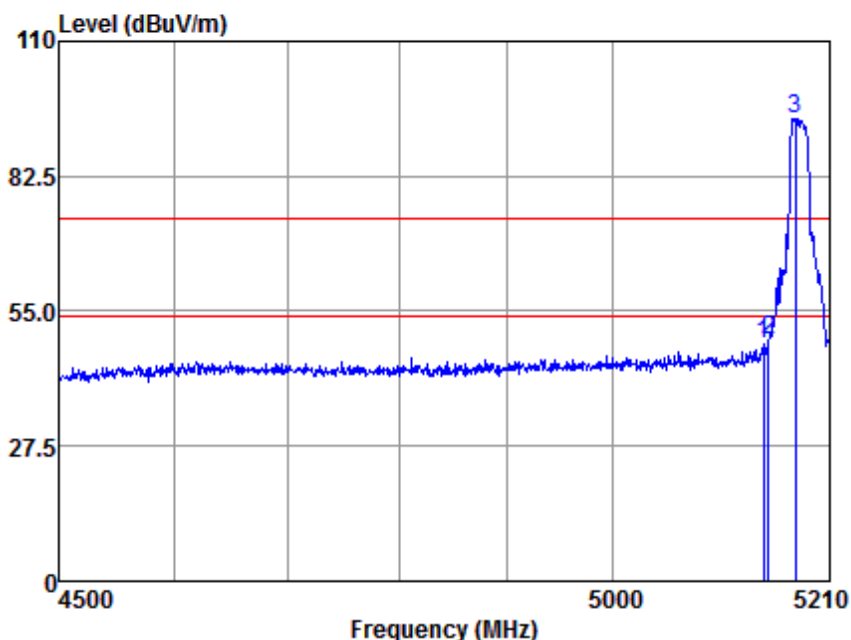


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Mode:b; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5145.52	46.31	31.61	9.06	38.81	48.17	74.00	-25.83	Peak
5150.00	47.17	31.61	9.06	38.81	49.03	74.00	-24.97	Peak
5176.52	92.52	31.65	8.86	38.80	94.23	74.00	20.23	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



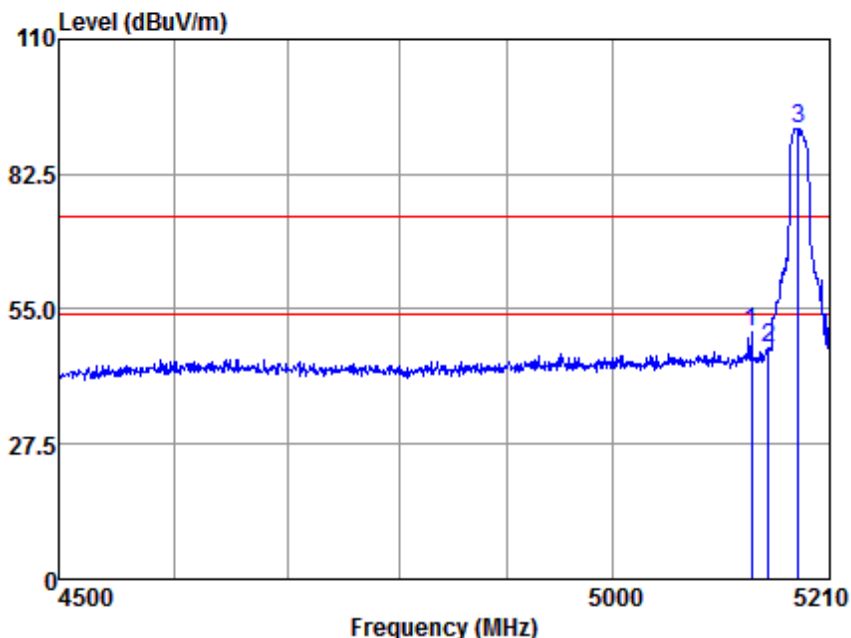


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Mode:b; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5133.48	48.42	31.59	9.06	38.82	50.25	74.00	-23.75	Peak
5150.00	45.41	31.61	9.06	38.81	47.27	74.00	-26.73	Peak
5179.56	90.13	31.65	8.86	38.80	91.84	74.00	17.84	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

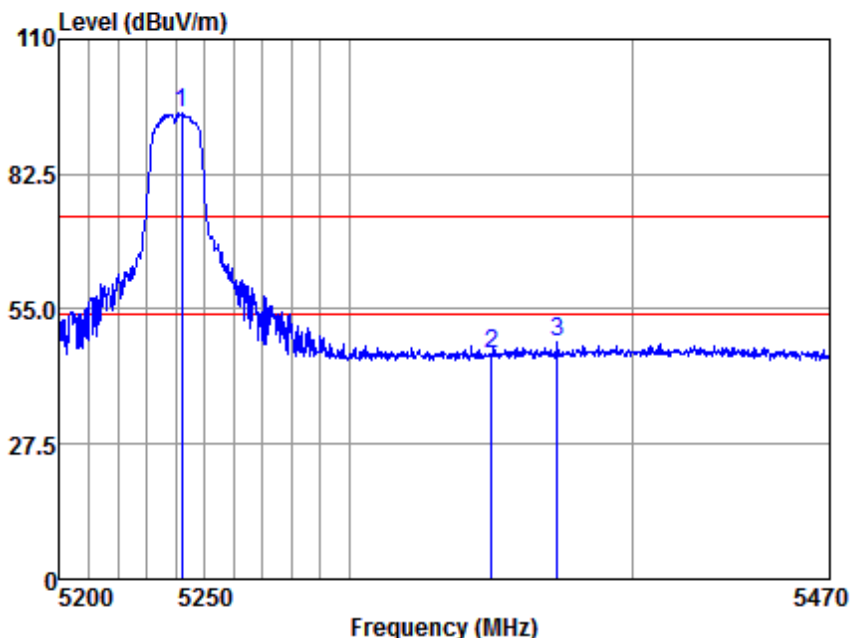


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Mode:b; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5242.02	93.35	31.74	8.68	38.77	95.00	74.00	21.00	Peak
5350.00	43.57	31.89	9.20	38.70	45.96	74.00	-28.04	Peak
5373.13	46.04	31.93	9.20	38.68	48.49	74.00	-25.51	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

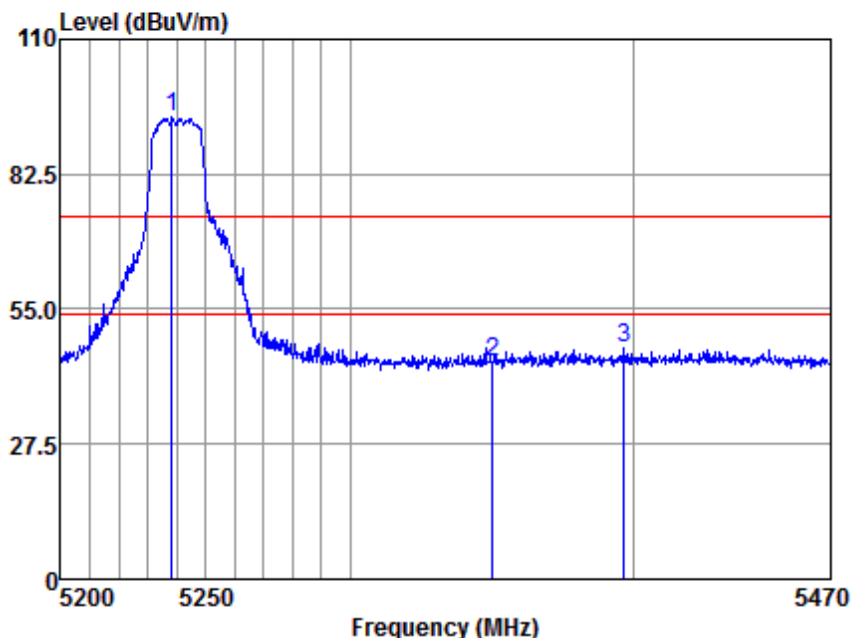


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Mode:b; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5238.31	92.36	31.74	8.68	38.77	94.01	74.00	20.01	Peak
5350.00	41.79	31.89	9.20	38.70	44.18	74.00	-29.82	Peak
5396.57	44.31	31.95	9.44	38.68	47.02	74.00	-26.98	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

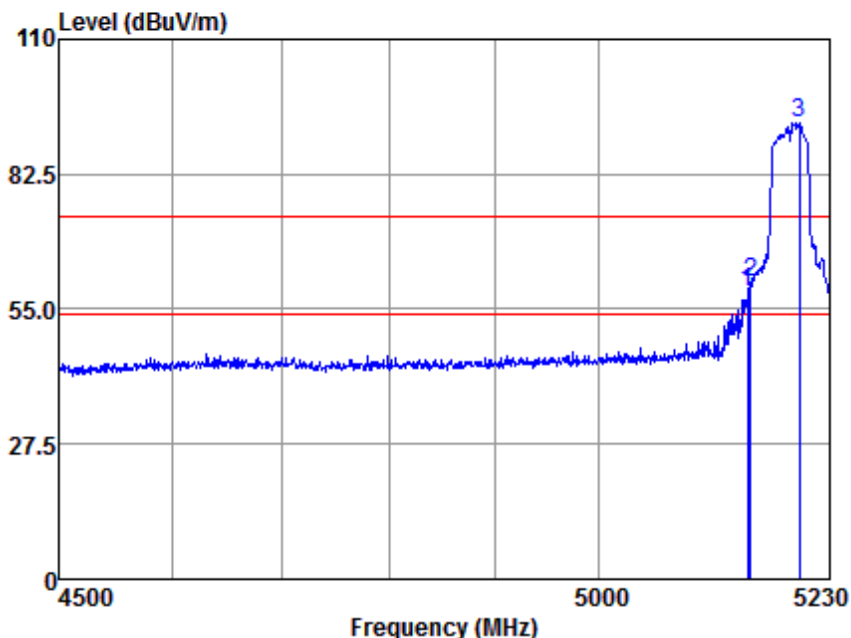


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Mode:b; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5147.32	56.60	31.61	9.06	38.81	58.46	74.00	-15.54	Peak
5150.00	58.80	31.61	9.06	38.81	60.66	74.00	-13.34	Peak
5199.43	91.54	31.68	8.66	38.79	93.09	74.00	19.09	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

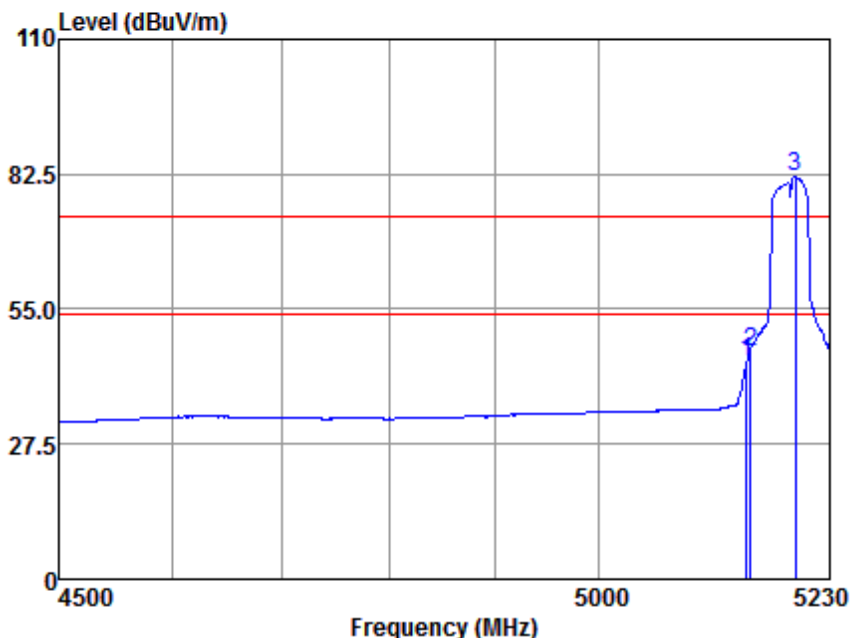


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Mode:b; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5146.54	42.50	31.61	9.06	38.81	44.36	54.00	-9.64	Average
5150.00	44.34	31.61	9.06	38.81	46.20	54.00	-7.80	Average
5195.52	80.21	31.68	8.86	38.79	81.96	54.00	27.96	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

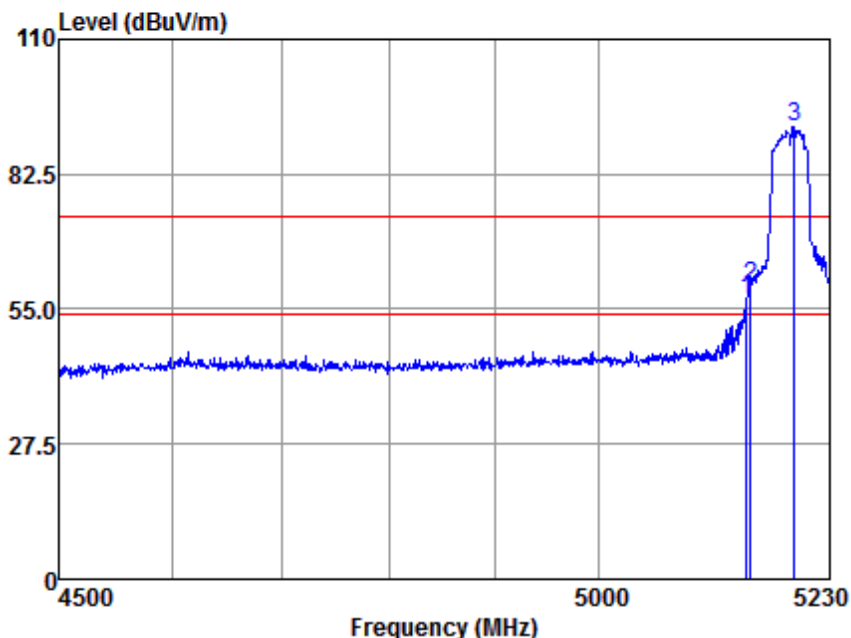


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Mode:b; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5146.54	54.84	31.61	9.06	38.81	56.70	74.00	-17.30	Peak
5150.00	57.84	31.61	9.06	38.81	59.70	74.00	-14.30	Peak
5194.74	90.28	31.68	8.86	38.79	92.03	74.00	18.03	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

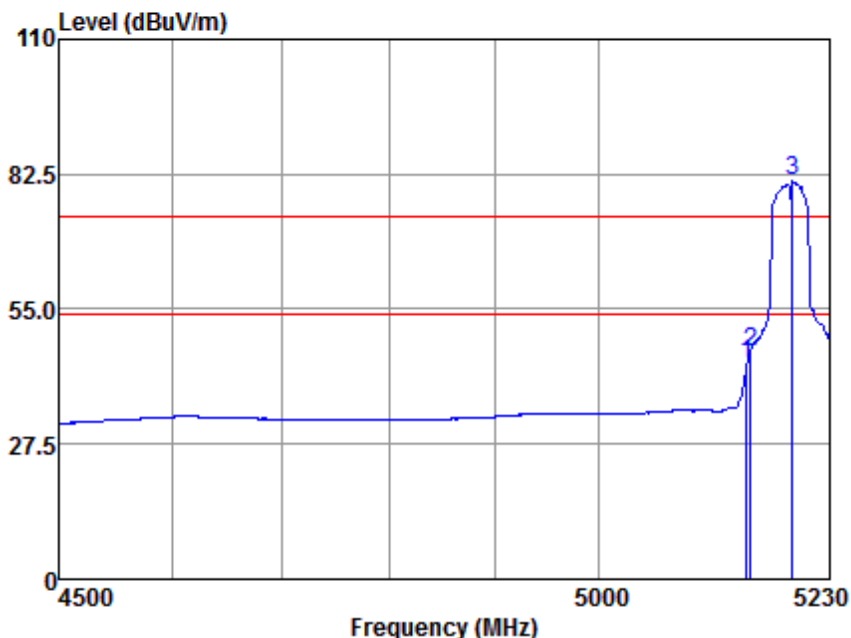


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Mode:b; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5146.54	41.89	31.61	9.06	38.81	43.75	54.00	-10.25	Average
5150.00	44.30	31.61	9.06	38.81	46.16	54.00	-7.84	Average
5193.18	79.24	31.68	8.86	38.79	80.99	54.00	26.99	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



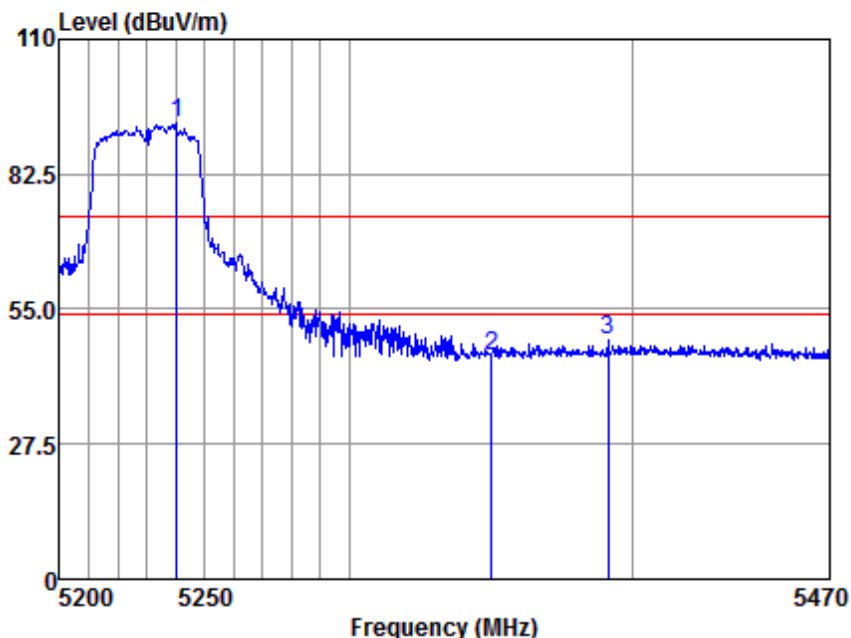


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Mode:b; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit	Over Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5240.17	91.12	31.74	8.68	38.77	92.77	74.00	18.77	Peak
5350.00	43.07	31.89	9.20	38.70	45.46	74.00	-28.54	Peak
5391.11	45.95	31.95	9.44	38.68	48.66	74.00	-25.34	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

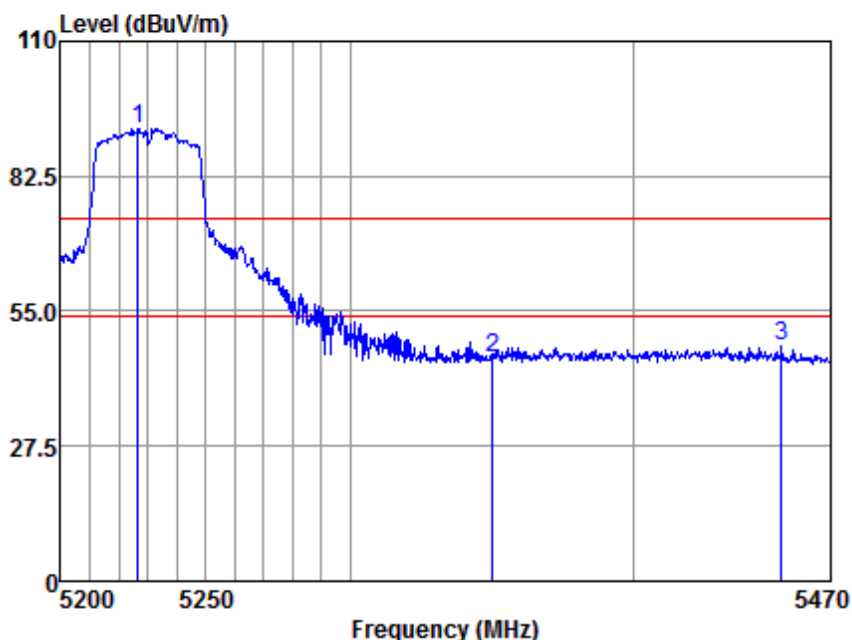


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Mode:b; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5226.65	90.66	31.72	8.66	38.78	92.26	74.00	18.26	Peak
5350.00	43.26	31.89	9.20	38.70	45.65	74.00	-28.35	Peak
5452.58	45.42	32.04	9.23	38.64	48.05	74.00	-25.95	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

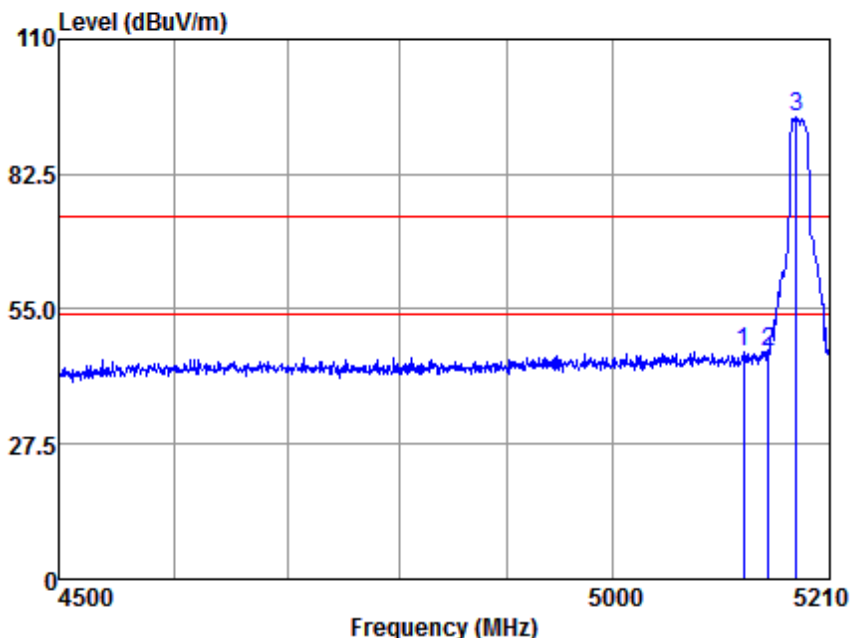


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5125.96	44.32	31.57	9.26	38.83	46.32	74.00	-27.68	Peak
5150.00	44.60	31.61	9.06	38.81	46.46	74.00	-27.54	Peak
5177.28	92.53	31.65	8.86	38.80	94.24	74.00	20.24	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

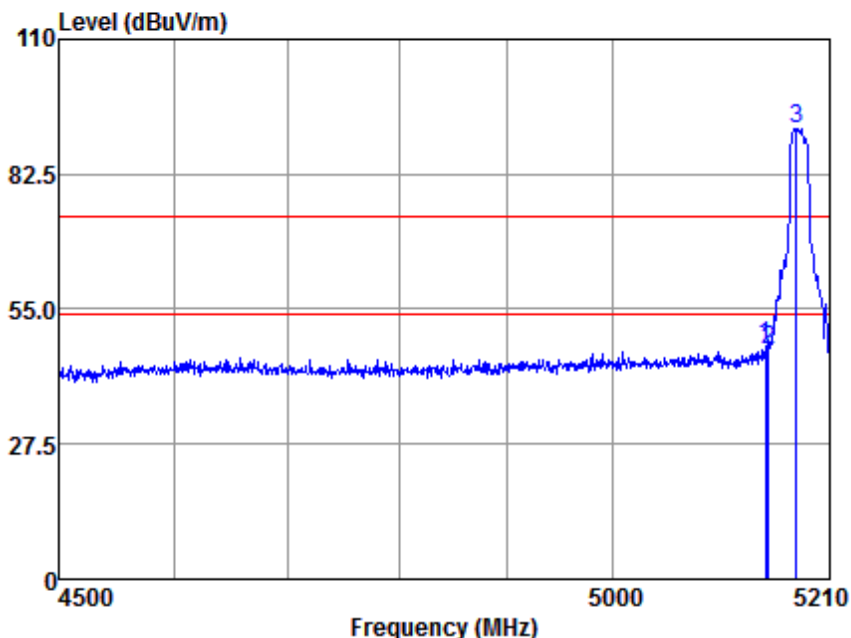


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5147.03	45.51	31.61	9.06	38.81	47.37	74.00	-26.63	Peak
5150.00	44.77	31.61	9.06	38.81	46.63	74.00	-27.37	Peak
5177.28	90.08	31.65	8.86	38.80	91.79	74.00	17.79	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

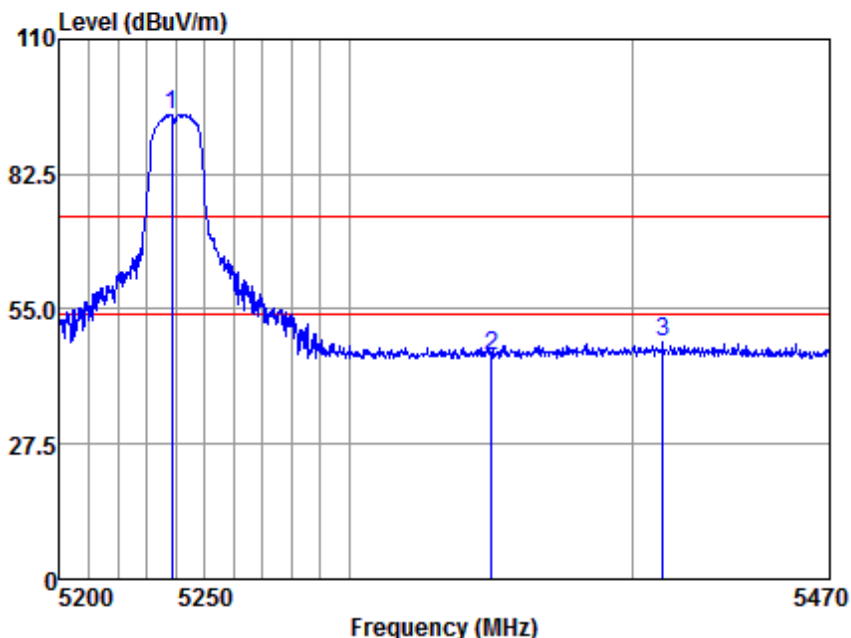


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5238.57	92.99	31.74	8.68	38.77	94.64	74.00	20.64	Peak
5350.00	43.19	31.89	9.20	38.70	45.58	74.00	-28.42	Peak
5410.52	45.39	31.97	9.44	38.67	48.13	74.00	-25.87	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

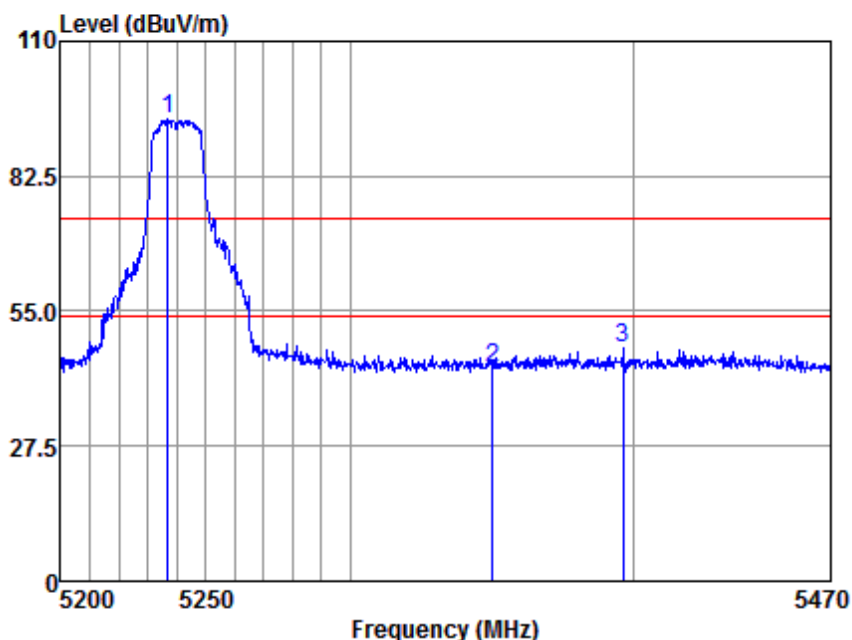


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5236.98	92.43	31.74	8.68	38.77	94.08	74.00	20.08	Peak
5350.00	41.04	31.89	9.20	38.70	43.43	74.00	-30.57	Peak
5396.02	44.76	31.95	9.44	38.68	47.47	74.00	-26.53	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

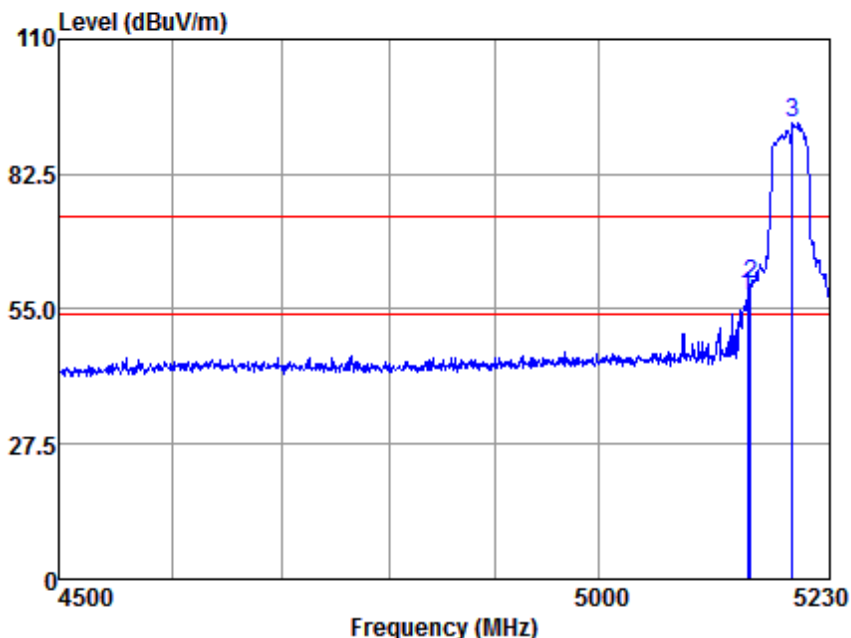


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5147.32	55.60	31.61	9.06	38.81	57.46	74.00	-16.54	Peak
5150.00	58.28	31.61	9.06	38.81	60.14	74.00	-13.86	Peak
5193.18	91.16	31.68	8.86	38.79	92.91	74.00	18.91	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



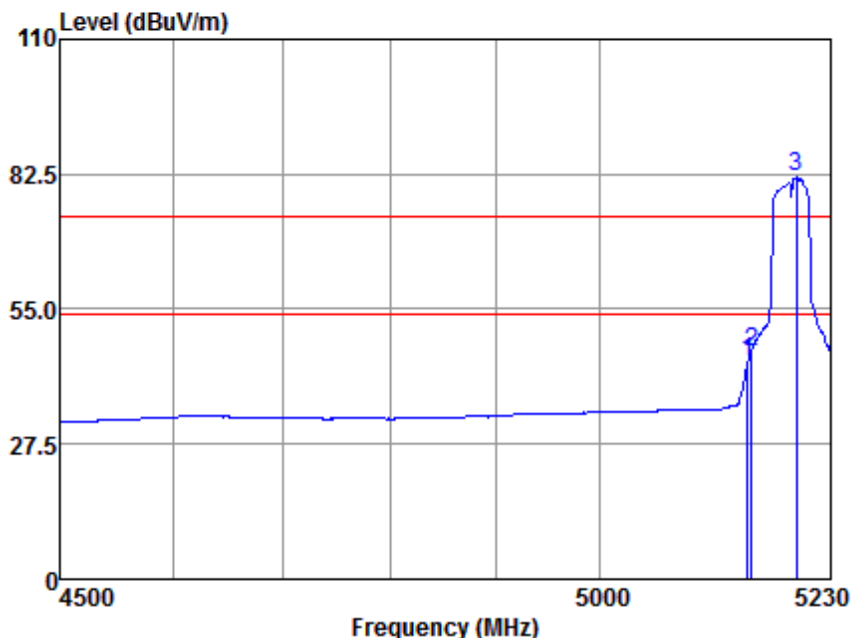


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5146.54	42.42	31.61	9.06	38.81	44.28	54.00	-9.72	Average
5150.00	44.35	31.61	9.06	38.81	46.21	54.00	-7.79	Average
5195.52	80.05	31.68	8.86	38.79	81.80	54.00	27.80	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

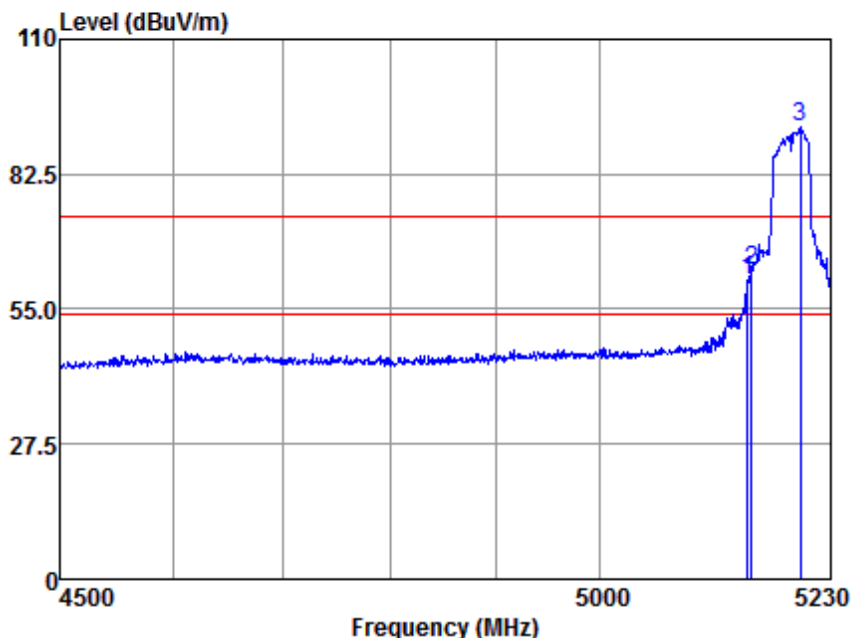


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5146.54	59.15	31.61	9.06	38.81	61.01	74.00	-12.99	Peak
5150.00	61.06	31.61	9.06	38.81	62.92	74.00	-11.08	Peak
5199.43	90.40	31.68	8.66	38.79	91.95	74.00	17.95	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

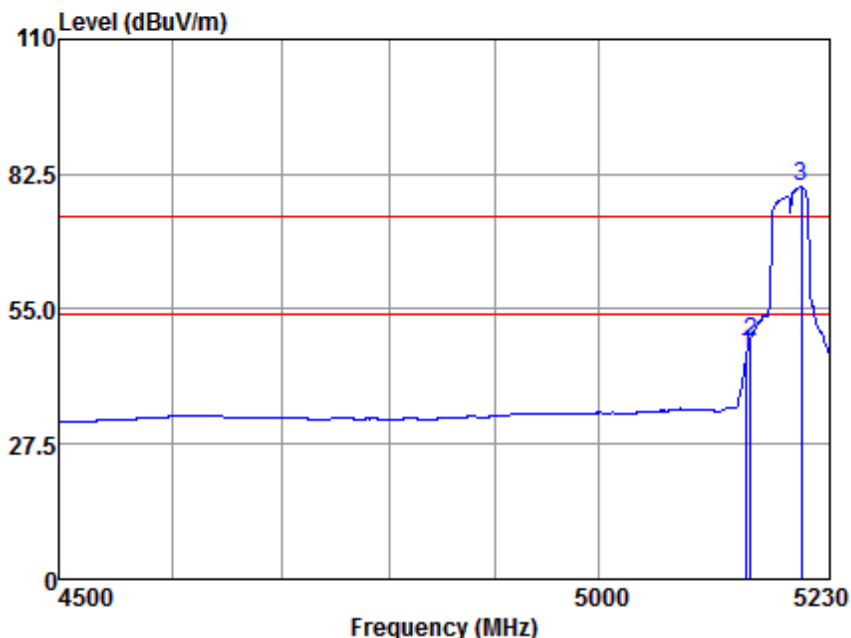


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5146.54	44.07	31.61	9.06	38.81	45.93	54.00	-8.07	Average
5150.00	46.55	31.61	9.06	38.81	48.41	54.00	-5.59	Average
5201.77	78.50	31.70	8.66	38.78	80.08	54.00	26.08	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

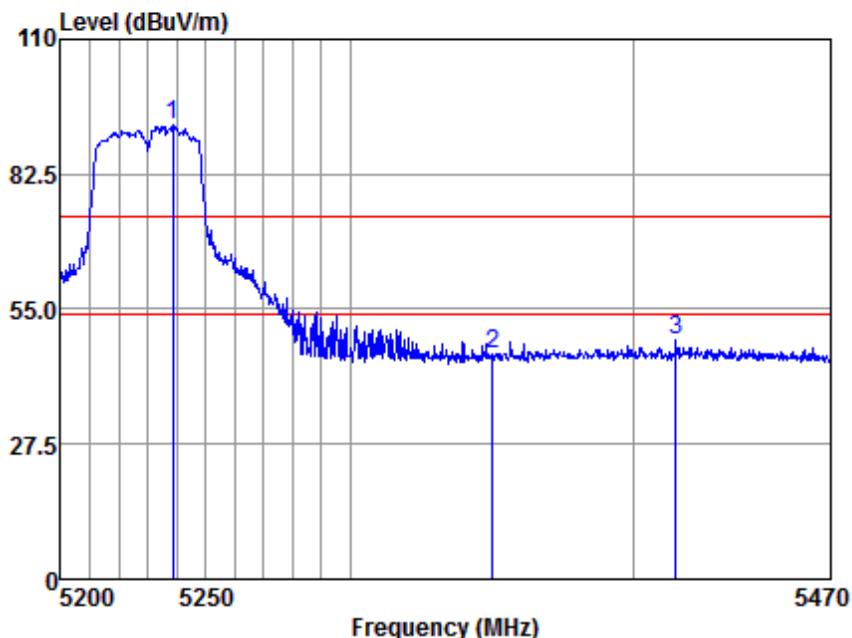


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5238.57	90.97	31.74	8.68	38.77	92.62	74.00	18.62	Peak
5350.00	43.34	31.89	9.20	38.70	45.73	74.00	-28.27	Peak
5414.90	45.95	31.97	9.34	38.67	48.59	74.00	-25.41	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

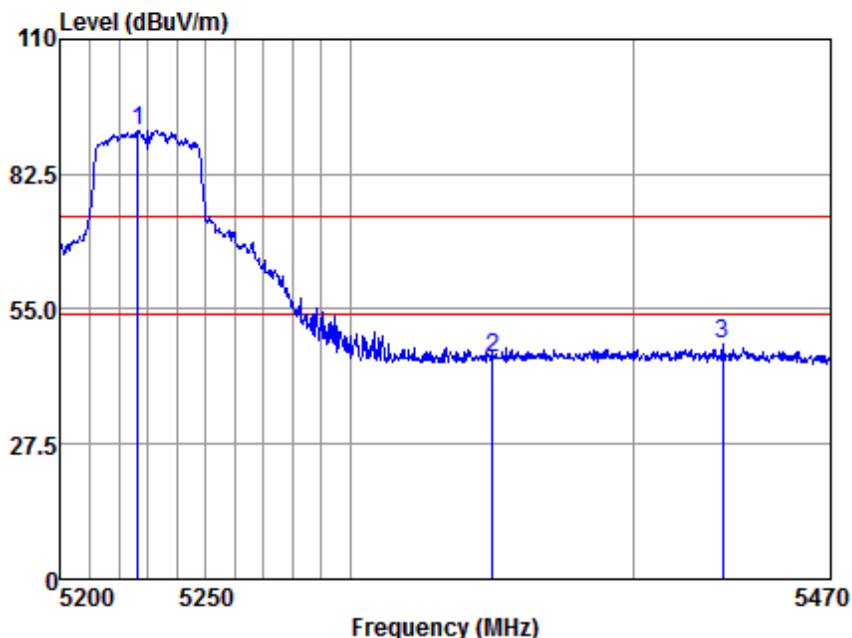


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5226.65	89.89	31.72	8.66	38.78	91.49	74.00	17.49	Peak
5350.00	42.72	31.89	9.20	38.70	45.11	74.00	-28.89	Peak
5431.65	45.27	31.99	9.34	38.66	47.94	74.00	-26.06	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

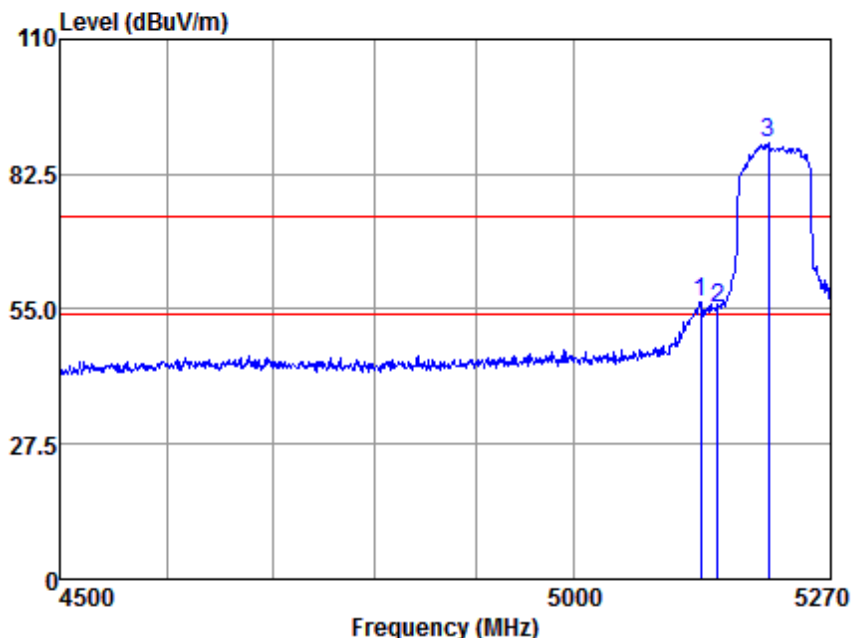


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5131.76	54.73	31.59	9.06	38.82	56.56	74.00	-17.44	Peak
5150.00	53.38	31.61	9.06	38.81	55.24	74.00	-18.76	Peak
5204.39	87.12	31.70	8.66	38.78	88.70	74.00	14.70	Peak
5350.00	43.12	31.89	9.20	38.70	45.51	74.00	-28.49	Peak
5364.26	44.90	31.91	9.20	38.69	47.32	74.00	-26.68	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

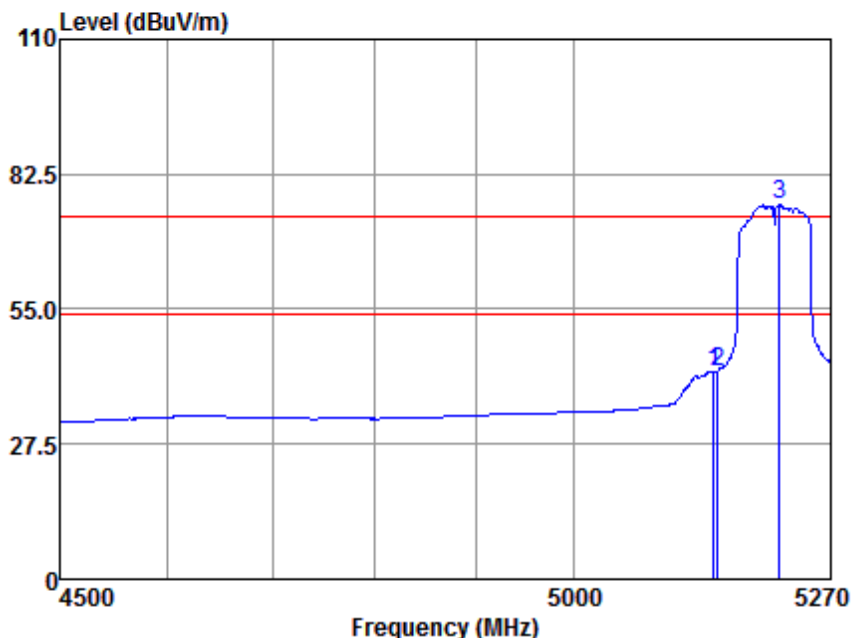


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Mode:b; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5145.80	40.55	31.61	9.06	38.81	42.41	54.00	-11.59	Average
5150.00	40.32	31.61	9.06	38.81	42.18	54.00	-11.82	Average
5215.58	74.60	31.70	8.66	38.78	76.18	54.00	22.18	Average
5350.00	32.23	31.89	9.20	38.70	34.62	54.00	-19.38	Average
5371.60	32.42	31.93	9.20	38.68	34.87	54.00	-19.13	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



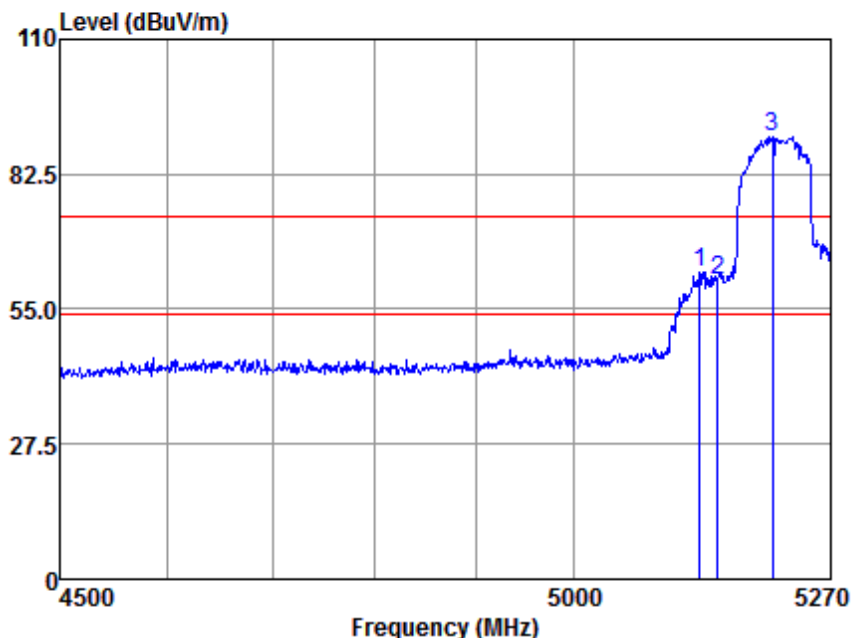


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:Low



**Antenna Polarity :VERTICAL**

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5130.75	60.82	31.59	9.06	38.82	62.65	74.00	-11.35	Peak
5150.00	58.92	31.61	9.06	38.81	60.78	74.00	-13.22	Peak
5208.45	88.56	31.70	8.66	38.78	90.14	74.00	16.14	Peak
5350.00	43.50	31.89	9.20	38.70	45.89	74.00	-28.11	Peak
5445.50	44.13	32.02	9.34	38.65	46.84	74.00	-27.16	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

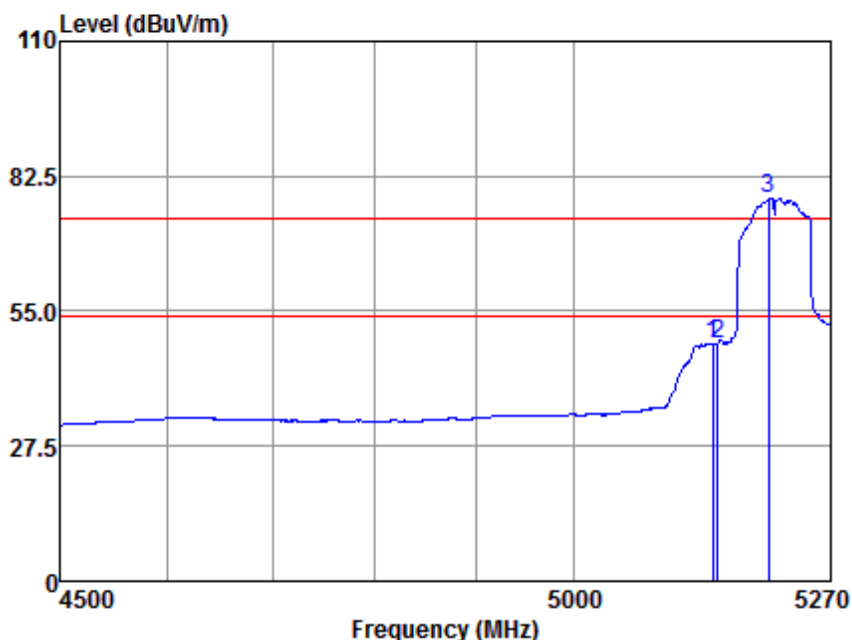


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Mode:b; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5144.79	46.49	31.61	9.06	38.81	48.35	54.00	-5.65	Average
5150.00	46.33	31.61	9.06	38.81	48.19	54.00	-5.81	Average
5204.39	76.51	31.70	8.66	38.78	78.09	54.00	24.09	Average
5350.00	32.18	31.89	9.20	38.70	34.57	54.00	-19.43	Average
5357.98	32.36	31.91	9.20	38.69	34.78	54.00	-19.22	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

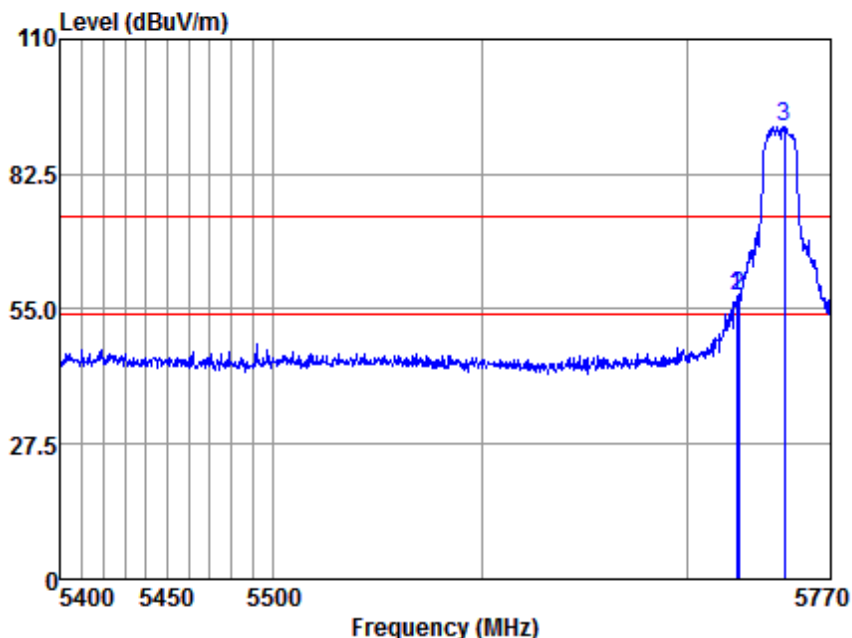


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Mode:c; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5723.92	55.27	32.15	9.00	38.75	57.67	74.00	-16.33	Peak
5725.00	55.09	32.15	9.00	38.75	57.49	74.00	-16.51	Peak
5747.48	89.81	32.15	9.00	38.76	92.20	74.00	18.20	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

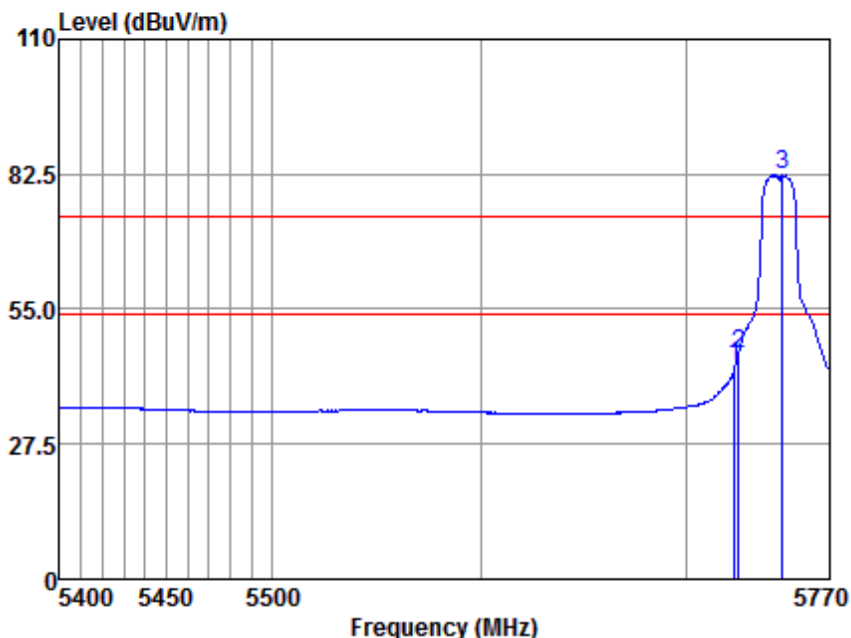


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Mode:c; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5723.54	40.91	32.15	9.00	38.75	43.31	54.00	-10.69	Average
5725.05	43.53	32.15	9.00	38.75	45.93	54.00	-8.07	Average
5746.72	79.89	32.15	9.00	38.76	82.28	54.00	28.28	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

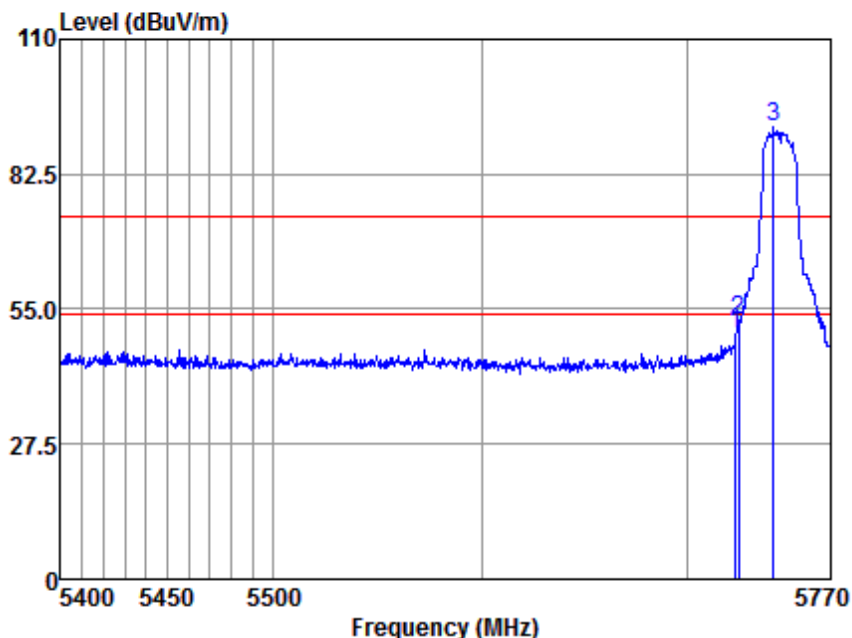


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Mode:c; Polarization:Vertical; Modulation:a; bandwidth:20MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5723.54	47.48	32.15	9.00	38.75	49.88	74.00	-24.12	Peak
5725.00	50.20	32.15	9.00	38.75	52.60	74.00	-21.40	Peak
5742.15	89.58	32.15	9.00	38.76	91.97	74.00	17.97	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

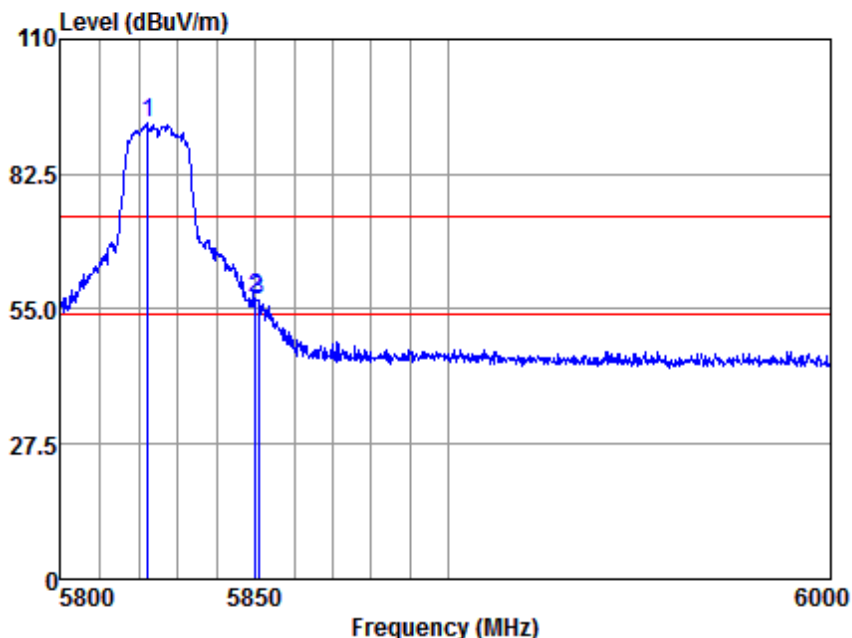


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Mode:c; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5822.26	90.49	32.17	8.87	38.77	92.76	74.00	18.76	Peak
5850.00	54.90	32.17	8.90	38.75	57.22	74.00	-16.78	Peak
5850.75	54.68	32.17	8.90	38.75	57.00	74.00	-17.00	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

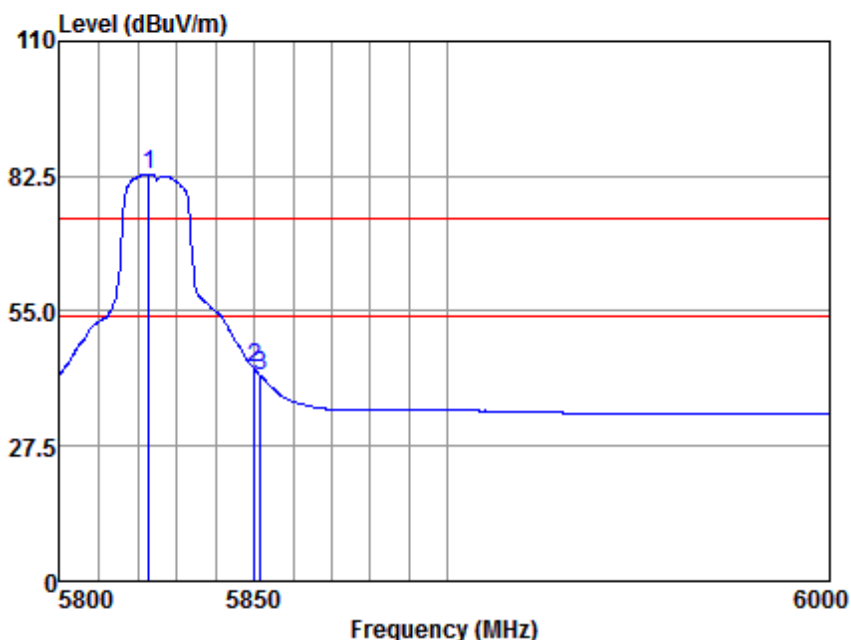


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Mode:c; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5822.85	80.64	32.17	8.87	38.77	82.91	54.00	28.91	Average
5850.00	40.99	32.17	8.90	38.75	43.31	54.00	-10.69	Average
5851.55	39.49	32.17	8.90	38.75	41.81	54.00	-12.19	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

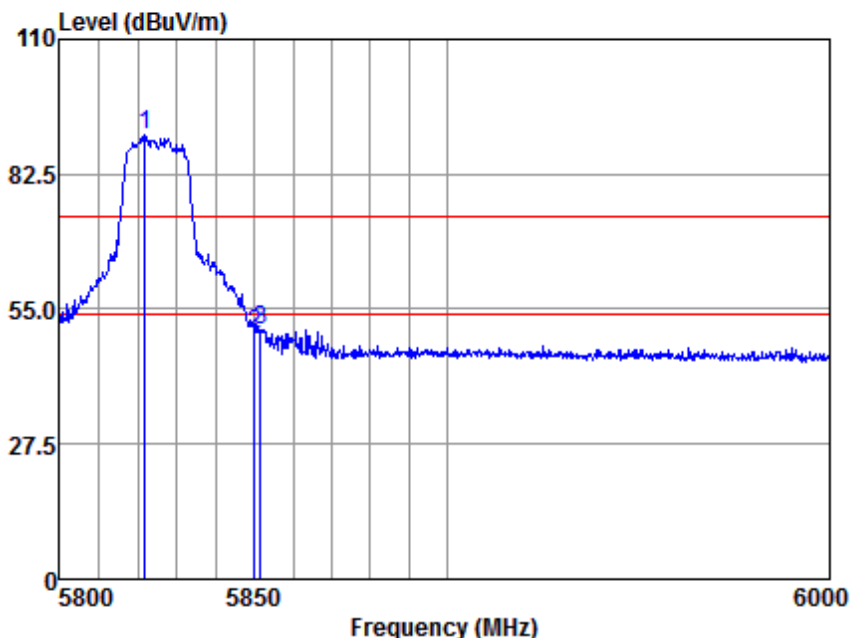


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Mode:c; Polarization:Vertical; Modulation:a; bandwidth:20MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5821.87	88.17	32.16	8.87	38.78	90.42	74.00	16.42	Peak
5850.00	47.79	32.17	8.90	38.75	50.11	74.00	-23.89	Peak
5851.55	48.57	32.17	8.90	38.75	50.89	74.00	-23.11	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



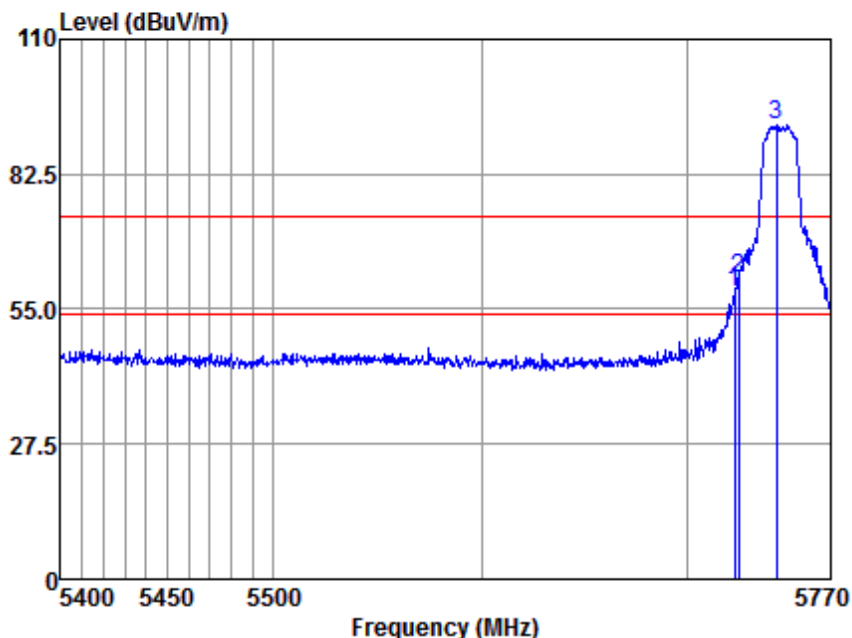


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5722.78	56.24	32.15	9.00	38.75	58.64	74.00	-15.36	Peak
5725.00	58.86	32.15	9.00	38.75	61.26	74.00	-12.74	Peak
5743.68	90.12	32.15	9.00	38.76	92.51	74.00	18.51	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

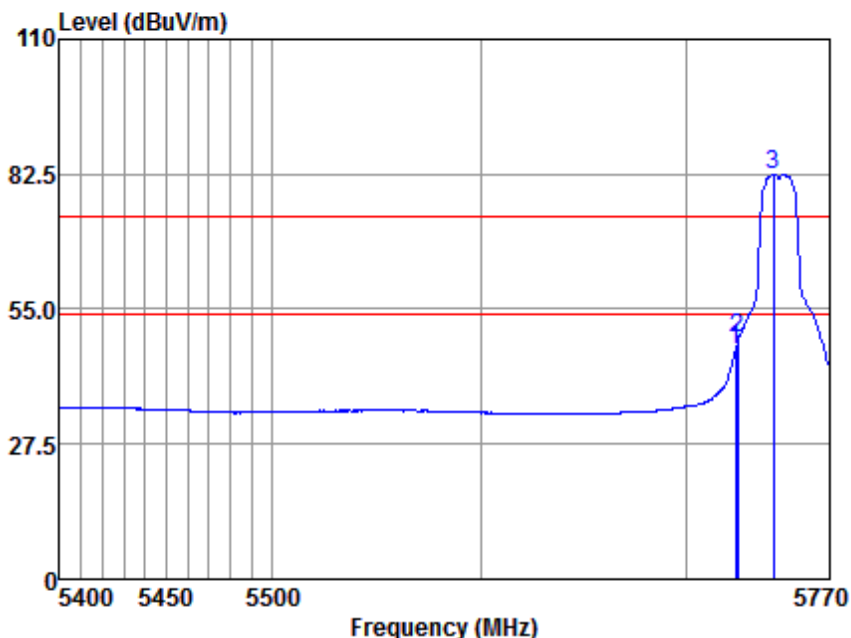


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5723.92	44.30	32.15	9.00	38.75	46.70	54.00	-7.30	Average
5725.00	46.56	32.15	9.00	38.75	48.96	54.00	-5.04	Average
5742.53	80.15	32.15	9.00	38.76	82.54	54.00	28.54	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

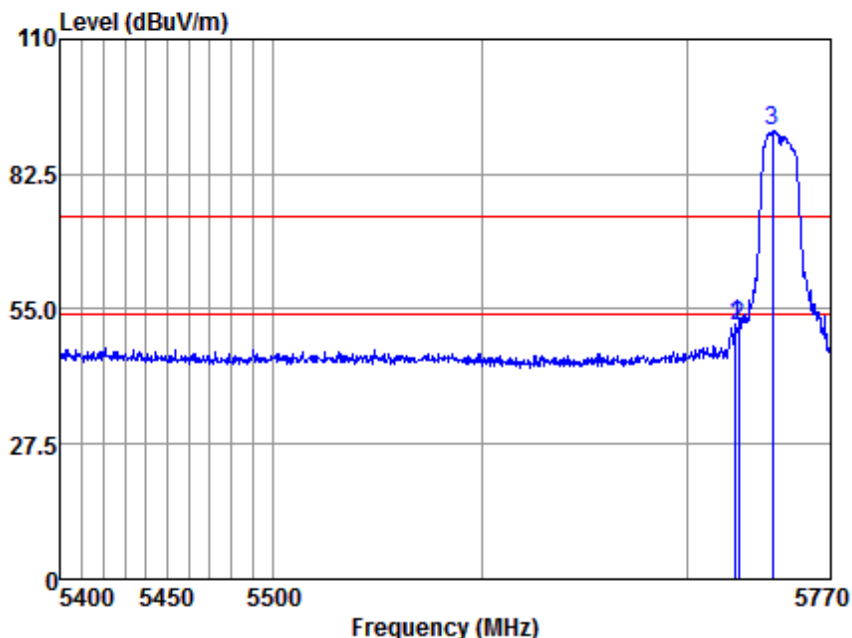


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Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5723.54	49.62	32.15	9.00	38.75	52.02	74.00	-21.98	Peak
5725.00	49.14	32.15	9.00	38.75	51.54	74.00	-22.46	Peak
5741.39	89.07	32.15	9.00	38.76	91.46	74.00	17.46	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

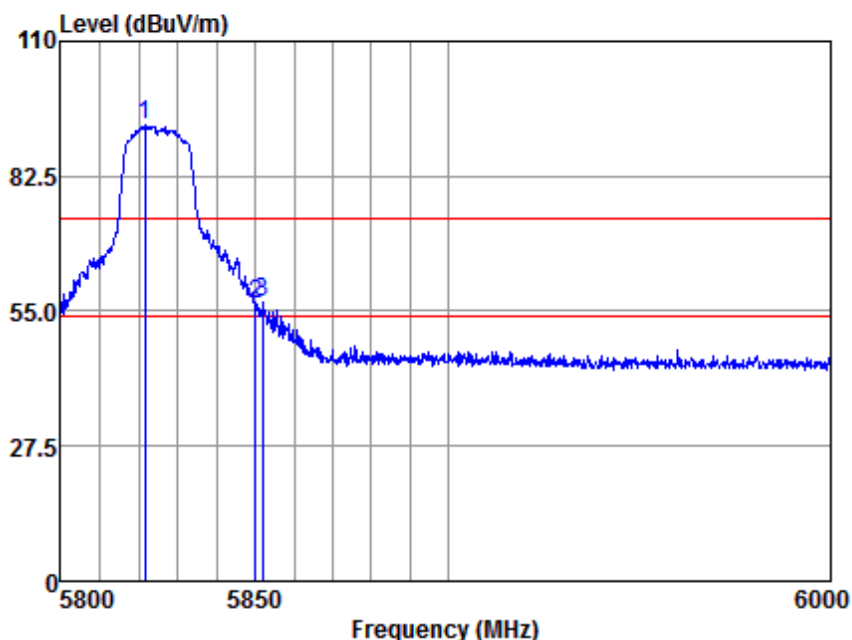


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5821.67	90.70	32.16	8.87	38.78	92.95	74.00	18.95	Peak
5850.00	53.94	32.17	8.90	38.75	56.26	74.00	-17.74	Peak
5851.95	54.42	32.17	8.90	38.75	56.74	74.00	-17.26	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

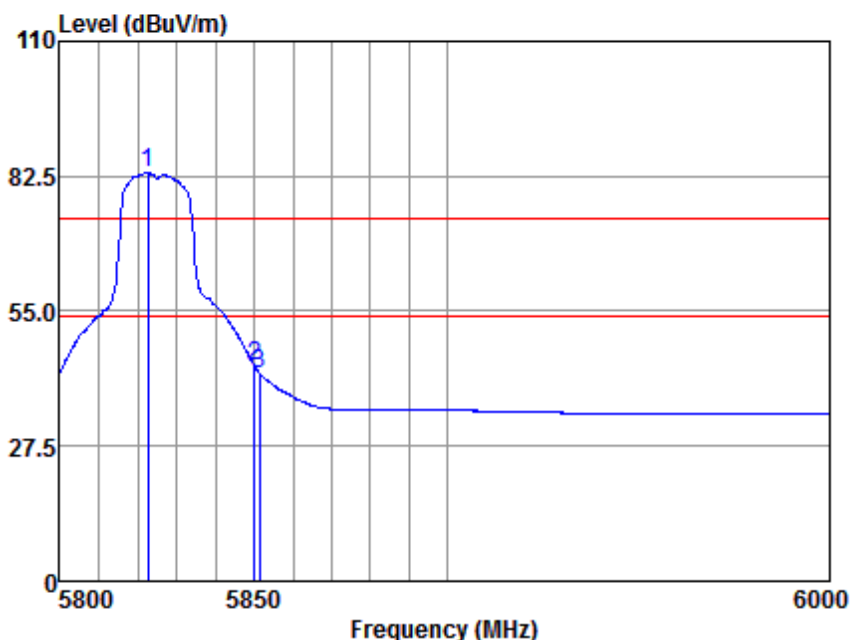


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5822.66	80.86	32.17	8.87	38.77	83.13	54.00	29.13	Average
5850.00	41.64	32.17	8.90	38.75	43.96	54.00	-10.04	Average
5851.35	39.91	32.17	8.90	38.75	42.23	54.00	-11.77	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

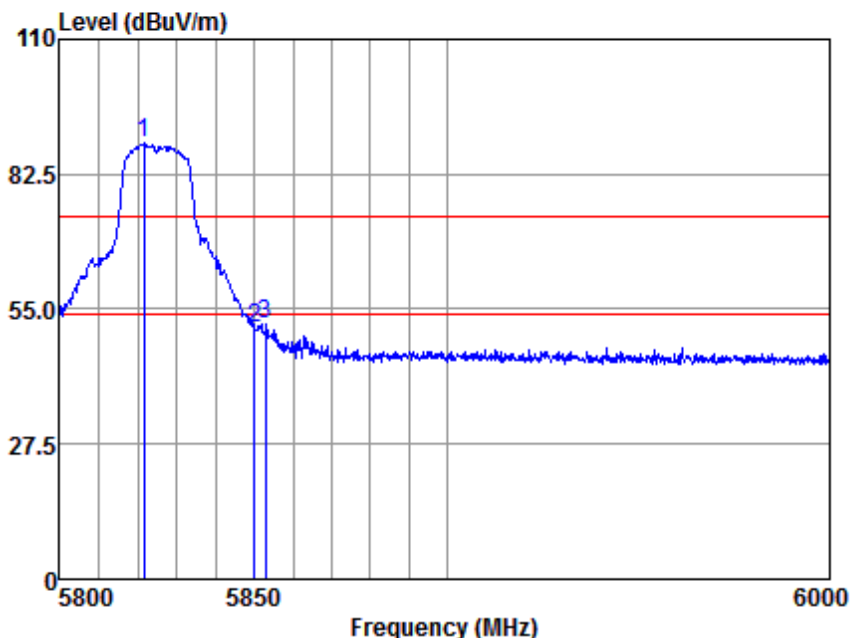


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Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5821.67	86.76	32.16	8.87	38.78	89.01	74.00	15.01	Peak
5850.00	48.96	32.17	8.90	38.75	51.28	74.00	-22.72	Peak
5852.94	49.68	32.17	8.90	38.75	52.00	74.00	-22.00	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

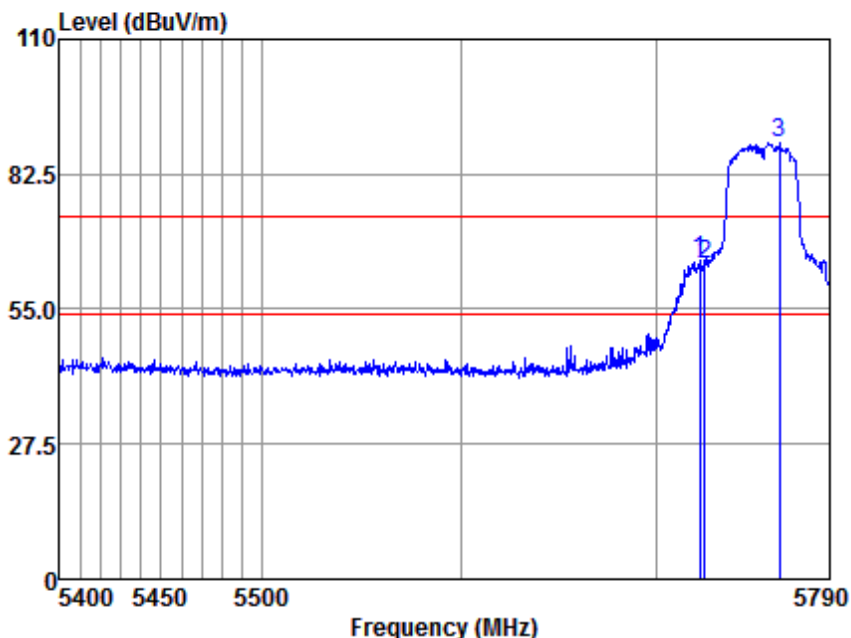


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5722.57	62.60	32.15	9.00	38.75	65.00	74.00	-9.00	Peak
5725.00	61.73	32.15	9.00	38.75	64.13	74.00	-9.87	Peak
5764.22	86.55	32.15	8.93	38.78	88.85	74.00	14.85	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

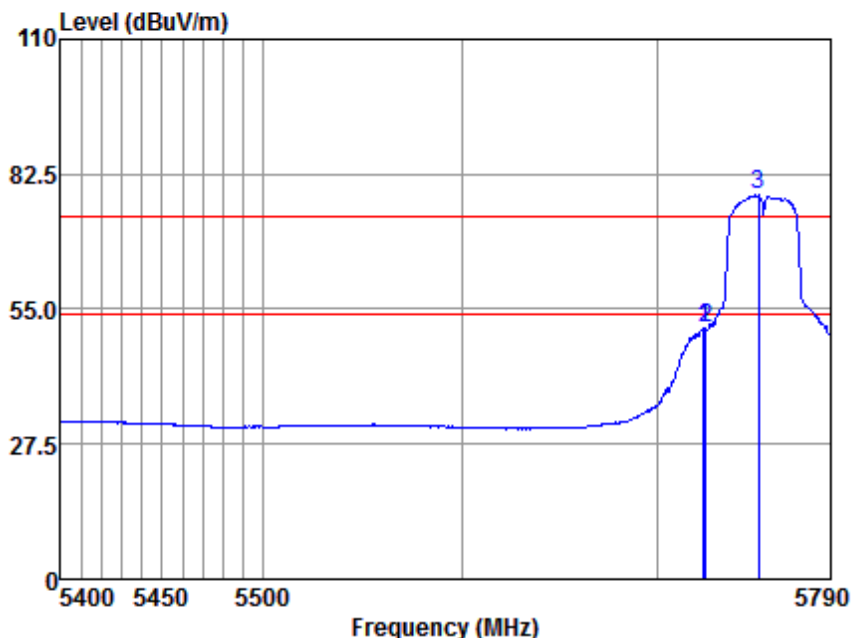


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5724.16	48.73	32.15	9.00	38.75	51.13	54.00	-2.87	Average
5725.00	48.63	32.15	9.00	38.75	51.03	54.00	-2.97	Average
5752.57	75.87	32.15	8.93	38.76	78.19	54.00	24.19	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



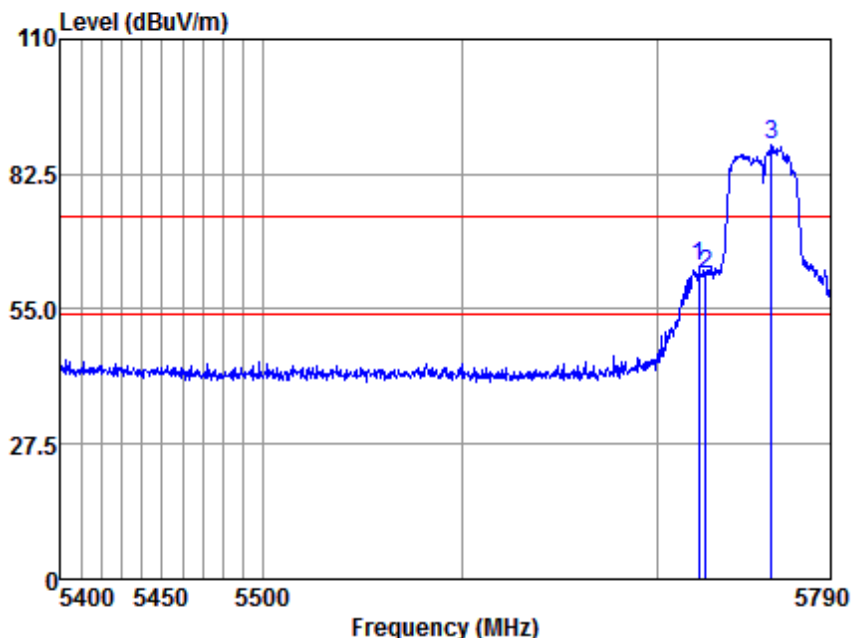


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Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5721.77	61.31	32.14	9.00	38.74	63.71	74.00	-10.29	Peak
5725.00	59.77	32.15	9.00	38.75	62.17	74.00	-11.83	Peak
5759.40	86.00	32.15	8.93	38.78	88.30	74.00	14.30	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

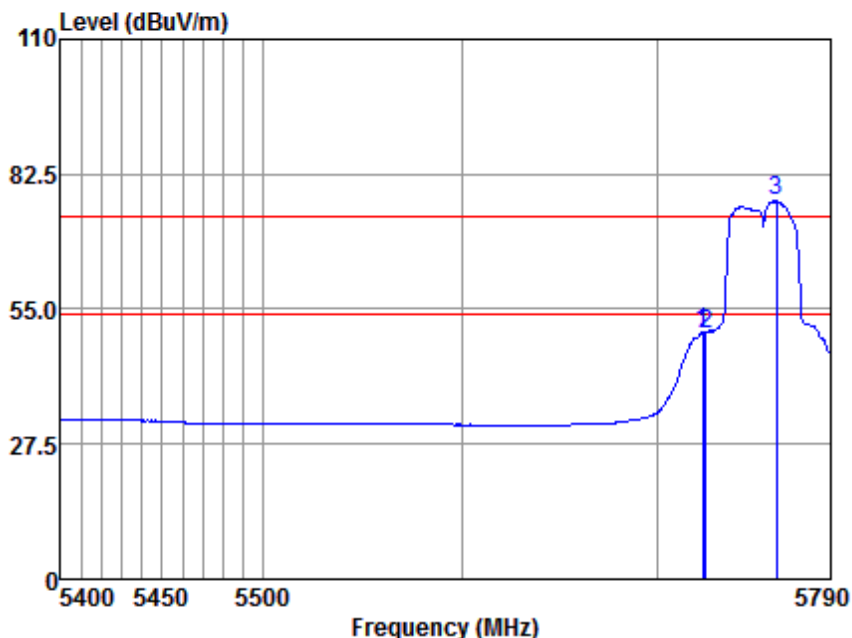


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Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5723.76	47.77	32.15	9.00	38.75	50.17	54.00	-3.83	Average
5725.00	47.69	32.15	9.00	38.75	50.09	54.00	-3.91	Average
5761.81	74.71	32.15	8.93	38.78	77.01	54.00	23.01	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

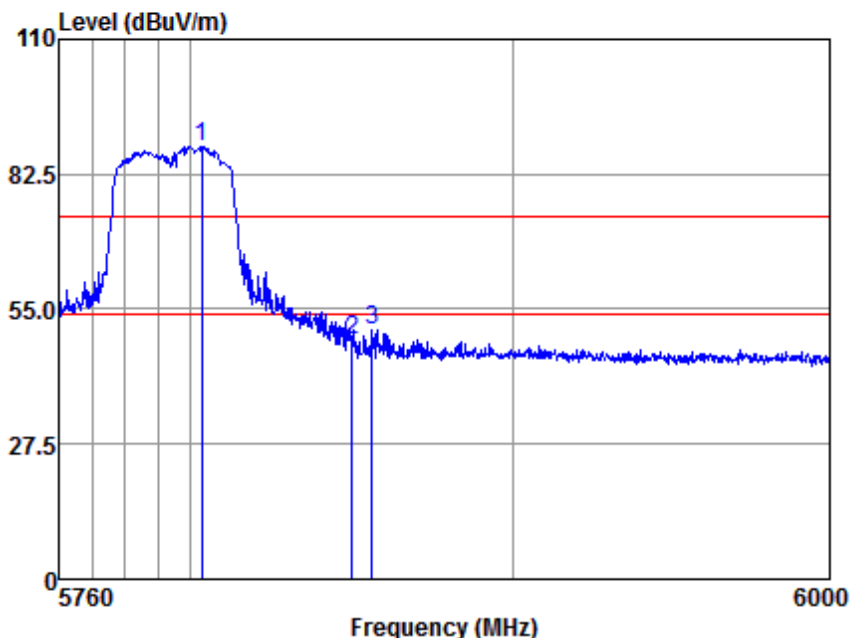


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Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5803.67	85.95	32.16	8.87	38.80	88.18	74.00	14.18	Peak
5850.00	46.55	32.17	8.90	38.75	48.87	74.00	-25.13	Peak
5856.26	48.59	32.17	8.90	38.74	50.92	74.00	-23.08	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

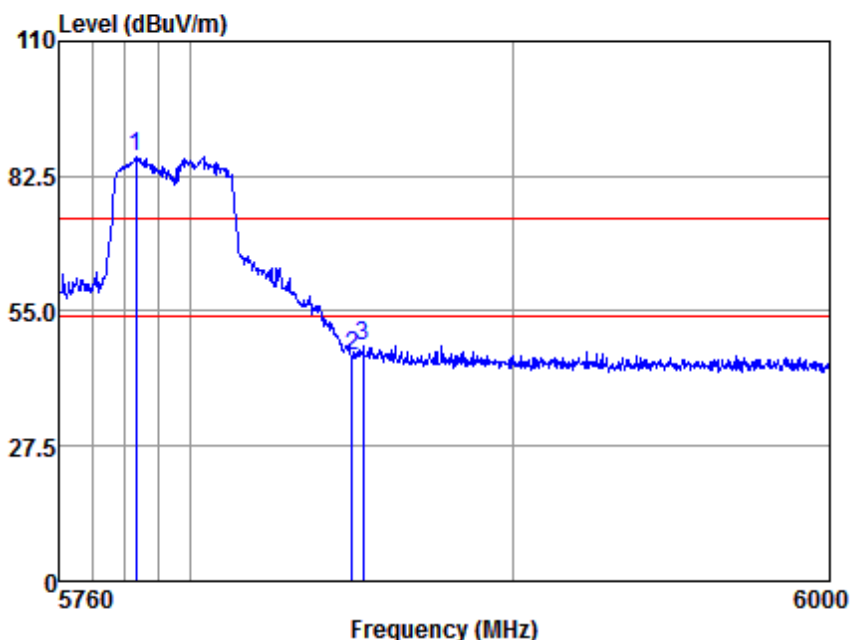


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Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5783.33	83.97	32.16	8.93	38.79	86.27	74.00	12.27	Peak
5850.00	43.48	32.17	8.90	38.75	45.80	74.00	-28.20	Peak
5853.63	45.57	32.17	8.90	38.75	47.89	74.00	-26.11	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

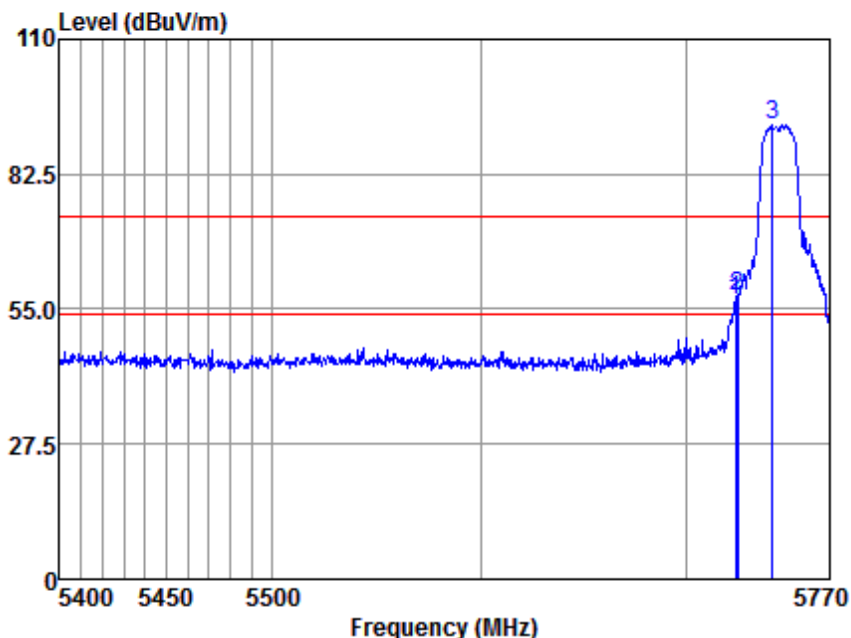


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5723.92	54.40	32.15	9.00	38.75	56.80	74.00	-17.20	Peak
5725.00	55.22	32.15	9.00	38.75	57.62	74.00	-16.38	Peak
5742.15	90.28	32.15	9.00	38.76	92.67	74.00	18.67	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

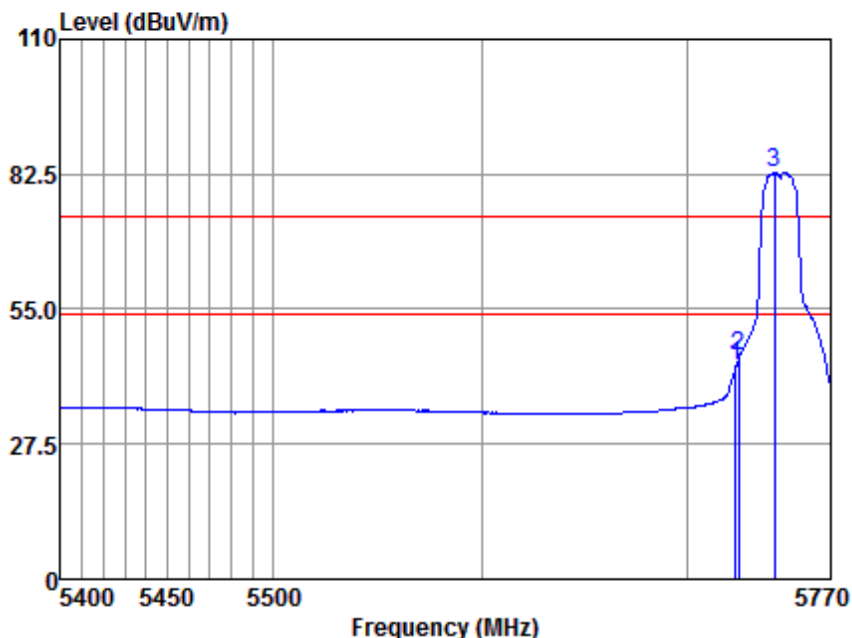


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5723.54	40.90	32.15	9.00	38.75	43.30	54.00	-10.70	Average
5725.00	42.94	32.15	9.00	38.75	45.34	54.00	-8.66	Average
5742.53	80.43	32.15	9.00	38.76	82.82	54.00	28.82	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

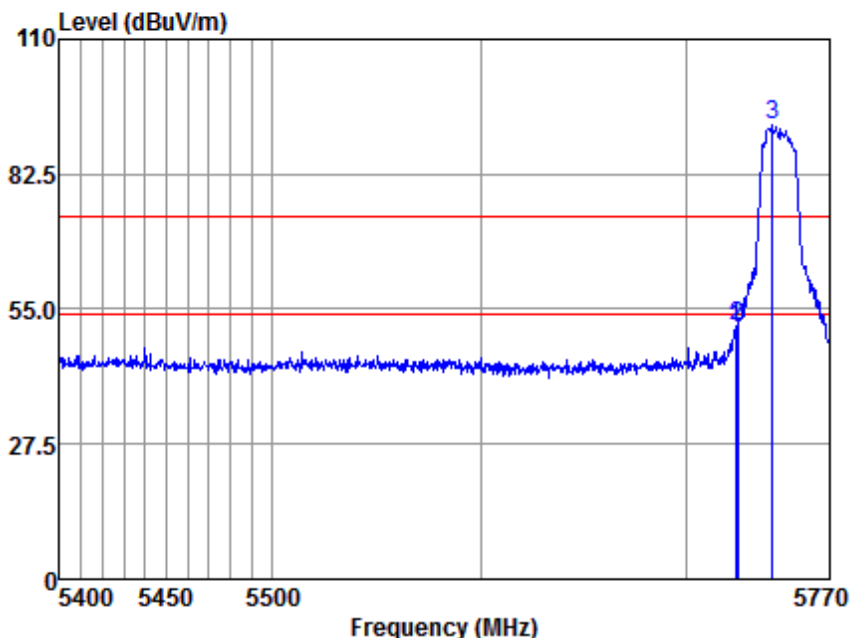


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5723.92	48.83	32.15	9.00	38.75	51.23	74.00	-22.77	Peak
5725.00	49.22	32.15	9.00	38.75	51.62	74.00	-22.38	Peak
5741.77	90.07	32.15	9.00	38.76	92.46	74.00	18.46	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

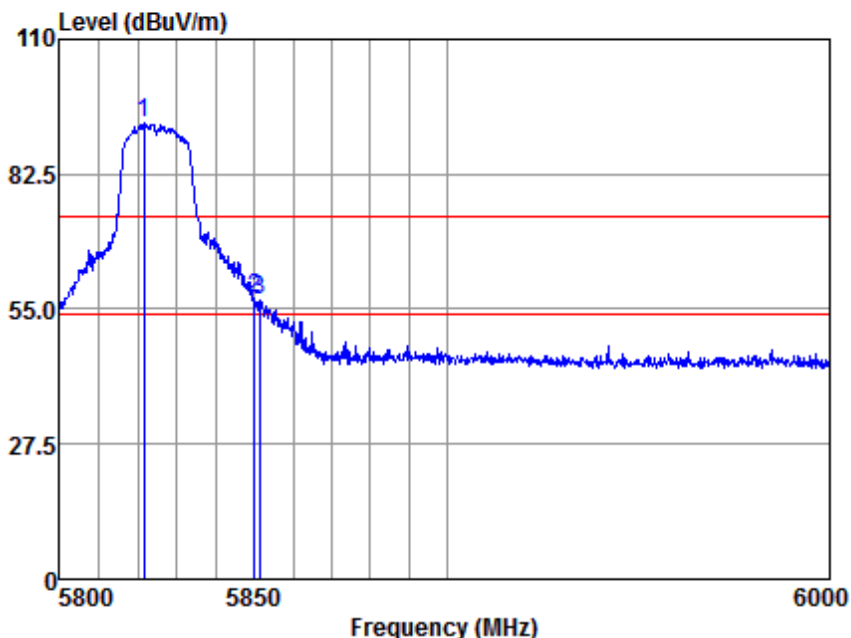


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5821.67	90.54	32.16	8.87	38.78	92.79	74.00	18.79	Peak
5850.00	54.94	32.17	8.90	38.75	57.26	74.00	-16.74	Peak
5851.35	54.42	32.17	8.90	38.75	56.74	74.00	-17.26	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



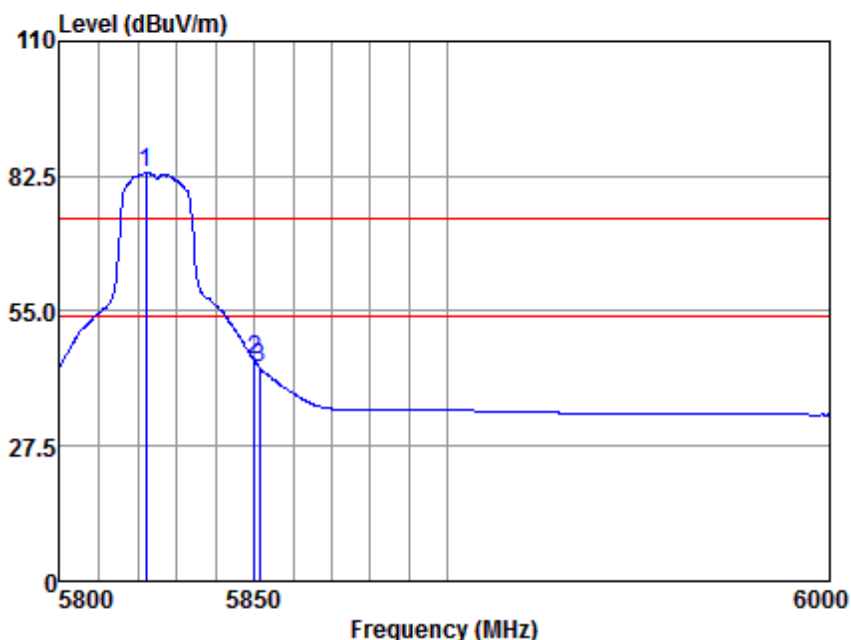


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5822.06	80.87	32.16	8.87	38.78	83.12	54.00	29.12	Average
5850.00	42.69	32.17	8.90	38.75	45.01	54.00	-8.99	Average
5851.35	41.16	32.17	8.90	38.75	43.48	54.00	-10.52	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

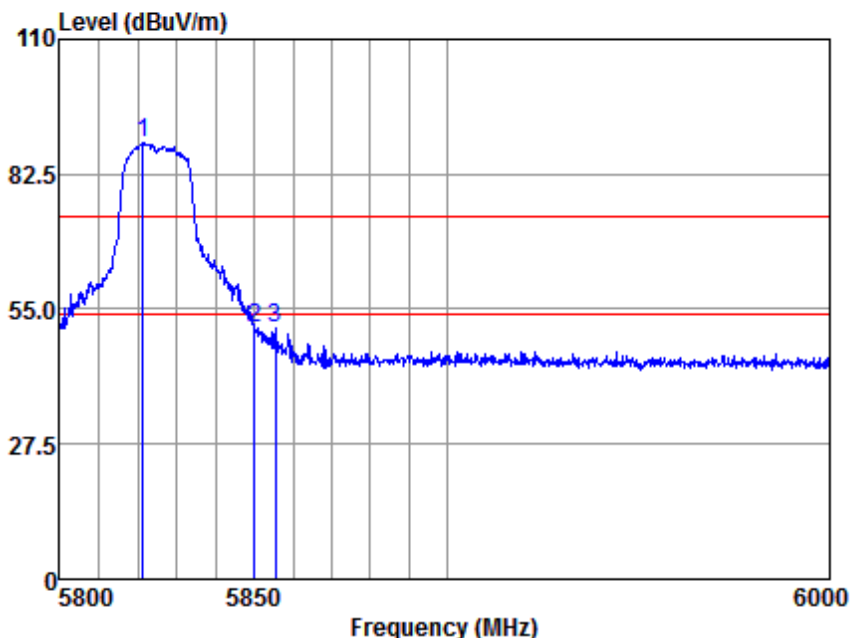


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5821.28	86.58	32.16	8.87	38.78	88.83	74.00	14.83	Peak
5850.00	48.78	32.17	8.90	38.75	51.10	74.00	-22.90	Peak
5855.32	48.86	32.17	8.90	38.75	51.18	74.00	-22.82	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

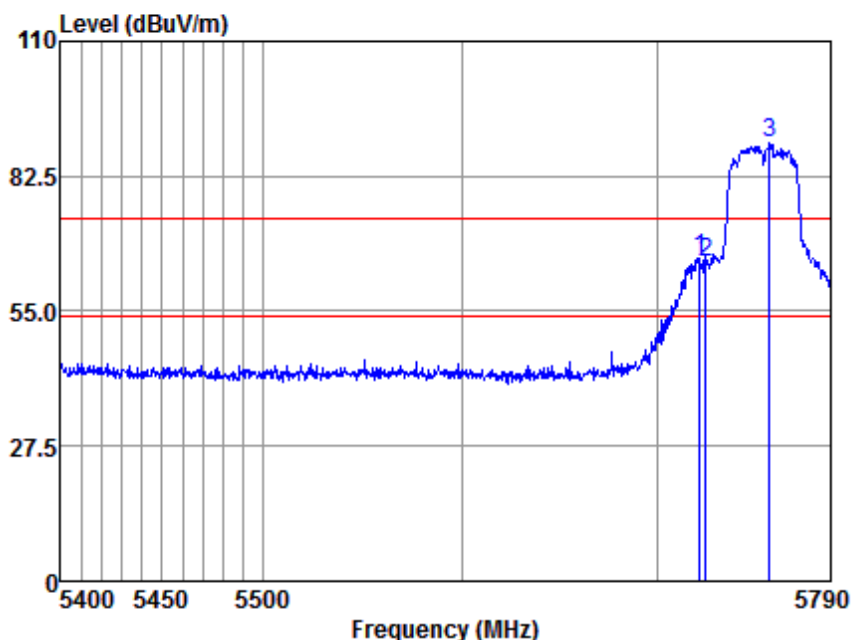


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5722.17	63.54	32.15	9.00	38.75	65.94	74.00	-8.06	Peak
5725.00	62.40	32.15	9.00	38.75	64.80	74.00	-9.20	Peak
5758.59	86.87	32.15	8.93	38.78	89.17	74.00	15.17	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

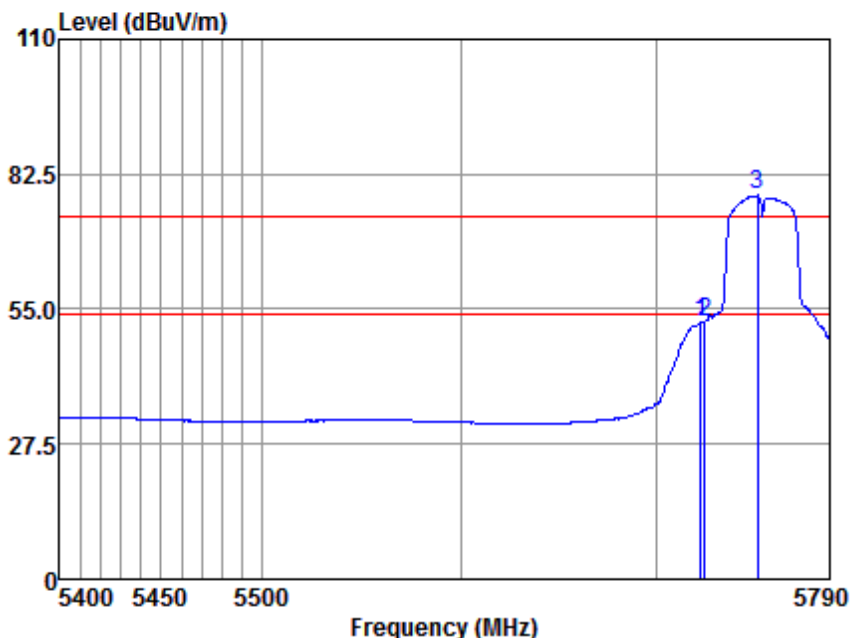


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
5723.36	50.03	32.15	9.00	38.75	52.43	54.00	-1.57	Average
5725.00	50.12	32.15	9.00	38.75	52.52	54.00	-1.48	Average
5752.57	75.83	32.15	8.93	38.76	78.15	54.00	24.15	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

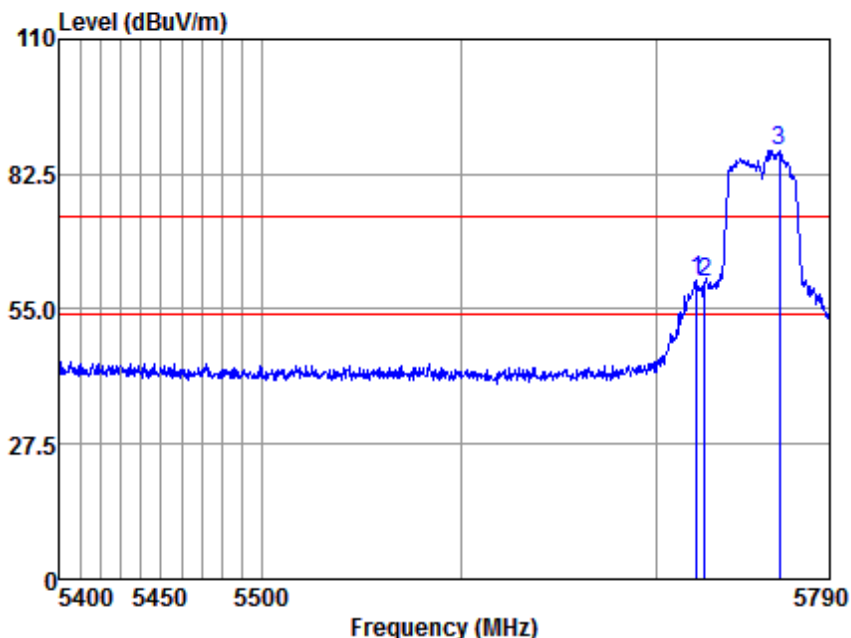


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5720.97	58.60	32.14	9.00	38.74	61.00	74.00	-13.00	Peak
5725.00	58.15	32.15	9.00	38.75	60.55	74.00	-13.45	Peak
5764.22	85.12	32.15	8.93	38.78	87.42	74.00	13.42	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

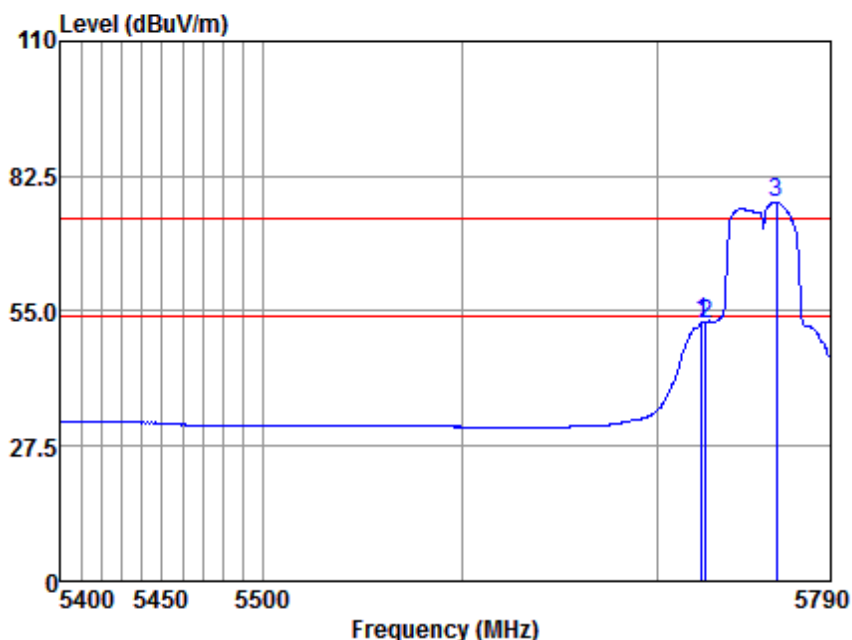


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5722.96	50.20	32.15	9.00	38.75	52.60	54.00	-1.40	Average
5725.00	50.10	32.15	9.00	38.75	52.50	54.00	-1.50	Average
5762.21	74.87	32.15	8.93	38.78	77.17	54.00	23.17	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

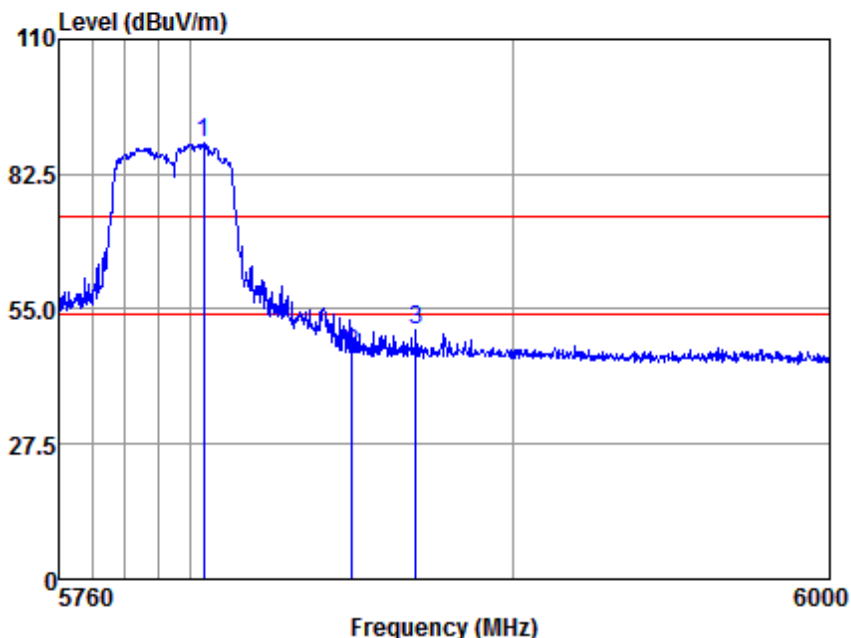


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5804.14	86.72	32.16	8.87	38.80	88.95	74.00	14.95	Peak
5850.00	43.58	32.17	8.90	38.75	45.90	74.00	-28.10	Peak
5869.90	48.47	32.17	8.93	38.74	50.83	74.00	-23.17	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

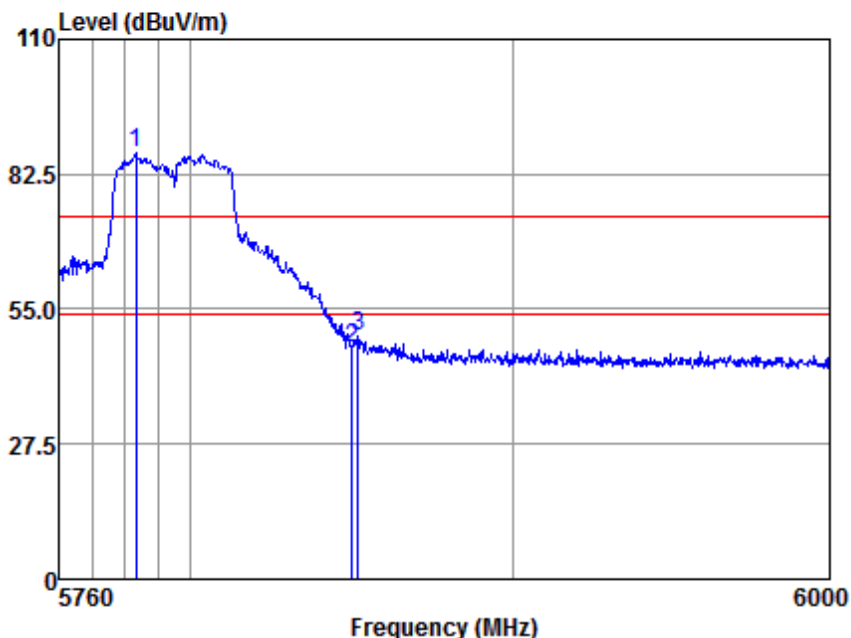


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:High



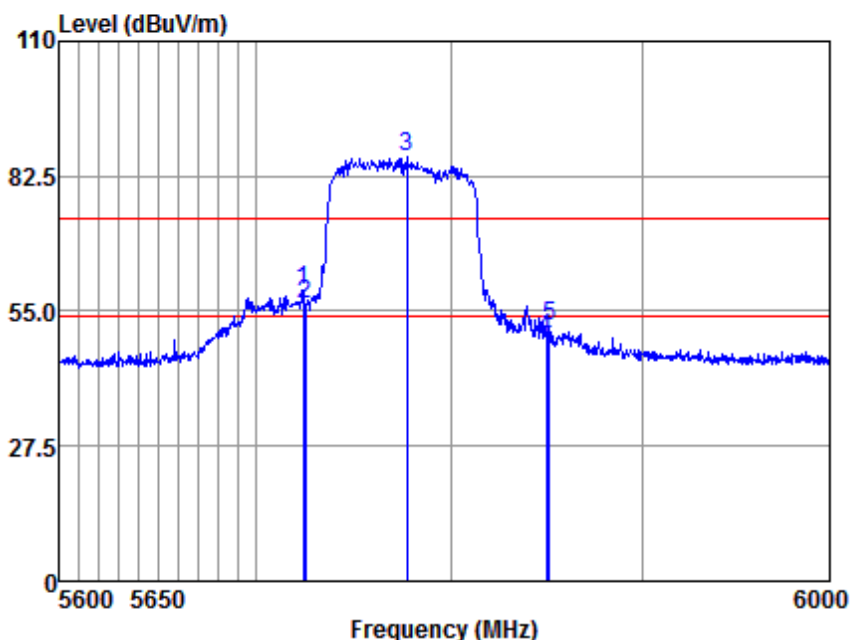
Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5783.33	84.72	32.16	8.93	38.79	87.02	74.00	13.02	Peak
5850.00	44.95	32.17	8.90	38.75	47.27	74.00	-26.73	Peak
5851.96	47.24	32.17	8.90	38.75	49.56	74.00	-24.44	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5723.83	56.98	32.15	9.00	38.75	59.38	74.00	-14.62	Peak
5725.00	54.18	32.15	9.00	38.75	56.58	74.00	-17.42	Peak
5776.99	84.23	32.16	8.93	38.79	86.53	74.00	12.53	Peak
5850.00	47.37	32.17	8.90	38.75	49.69	74.00	-24.31	Peak
5851.20	49.63	32.17	8.90	38.75	51.95	74.00	-22.05	Peak

Note: Emission Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

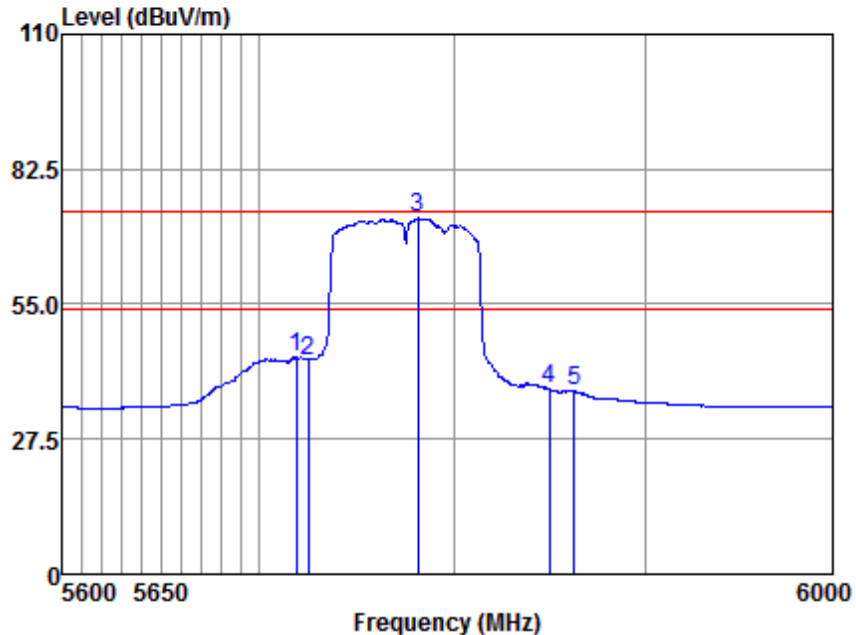


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Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:High



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5718.69	41.81	32.14	9.00	38.74	44.21	54.00	-9.79	Average
5725.00	41.18	32.15	9.00	38.75	43.58	54.00	-10.42	Average
5781.37	70.28	32.16	8.93	38.79	72.58	54.00	18.58	Average
5850.00	35.30	32.17	8.90	38.75	37.62	54.00	-16.38	Average
5862.92	35.03	32.17	8.90	38.74	37.36	54.00	-16.64	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

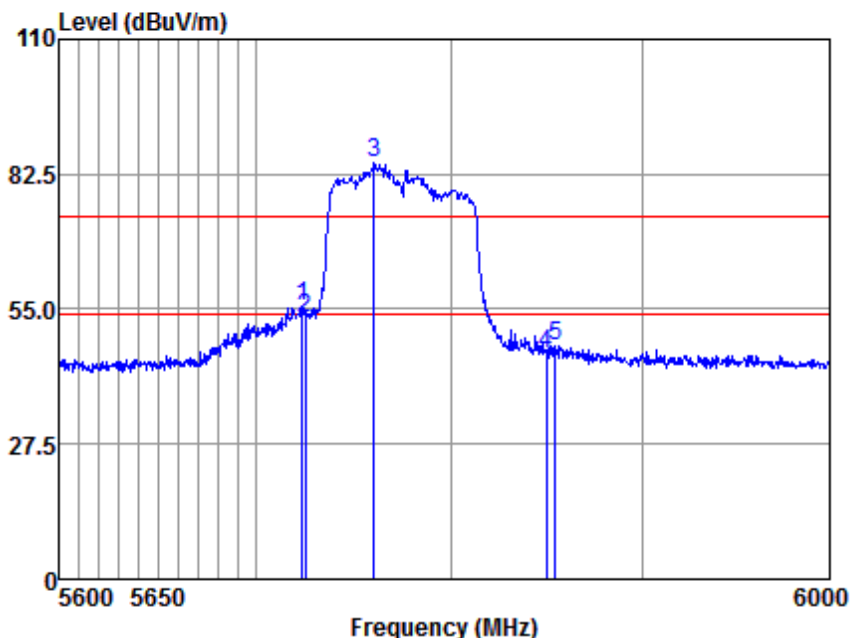


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5723.43	53.38	32.15	9.00	38.75	55.78	74.00	-18.22	Peak
5725.00	50.77	32.15	9.00	38.75	53.17	74.00	-20.83	Peak
5760.27	82.46	32.15	8.93	38.78	84.76	74.00	10.76	Peak
5850.00	43.47	32.17	8.90	38.75	45.79	74.00	-28.21	Peak
5854.43	45.19	32.17	8.90	38.75	47.51	74.00	-26.49	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

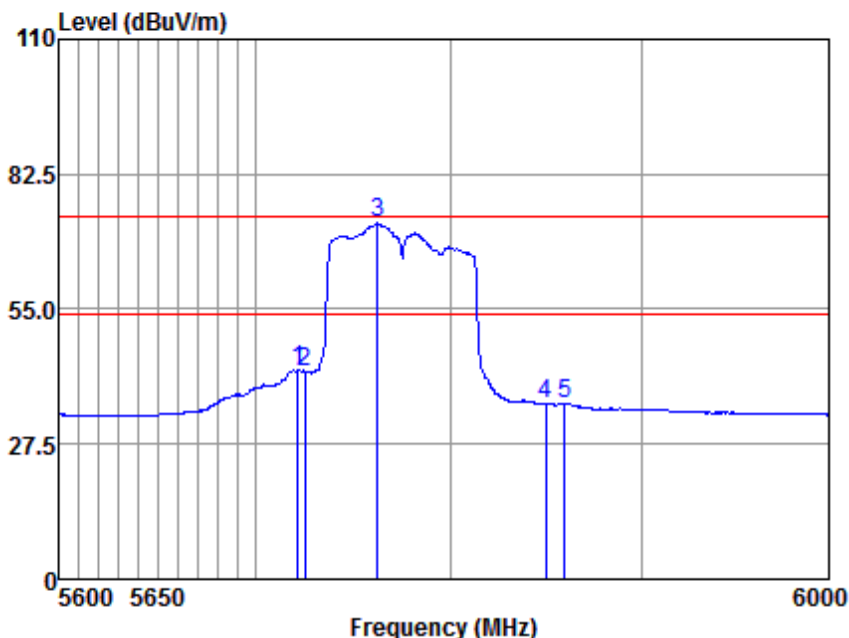


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Mode:c; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
5721.06	40.21	32.14	9.00	38.74	42.61	54.00	-11.39	Average
5725.00	39.69	32.15	9.00	38.75	42.09	54.00	-11.91	Average
5762.26	70.20	32.15	8.93	38.78	72.50	54.00	18.50	Average
5850.00	33.24	32.17	8.90	38.75	35.56	54.00	-18.44	Average
5859.68	33.31	32.17	8.90	38.74	35.64	54.00	-18.36	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



## 7.9 Frequency Stability

Test Requirement	47 CFR Part 15, Subpart C 15.407 (g)
Test Method:	ANSI C63.10 (2013) Section 6.8
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

### 7.9.1 E.U.T. Operation

Operating Environment:

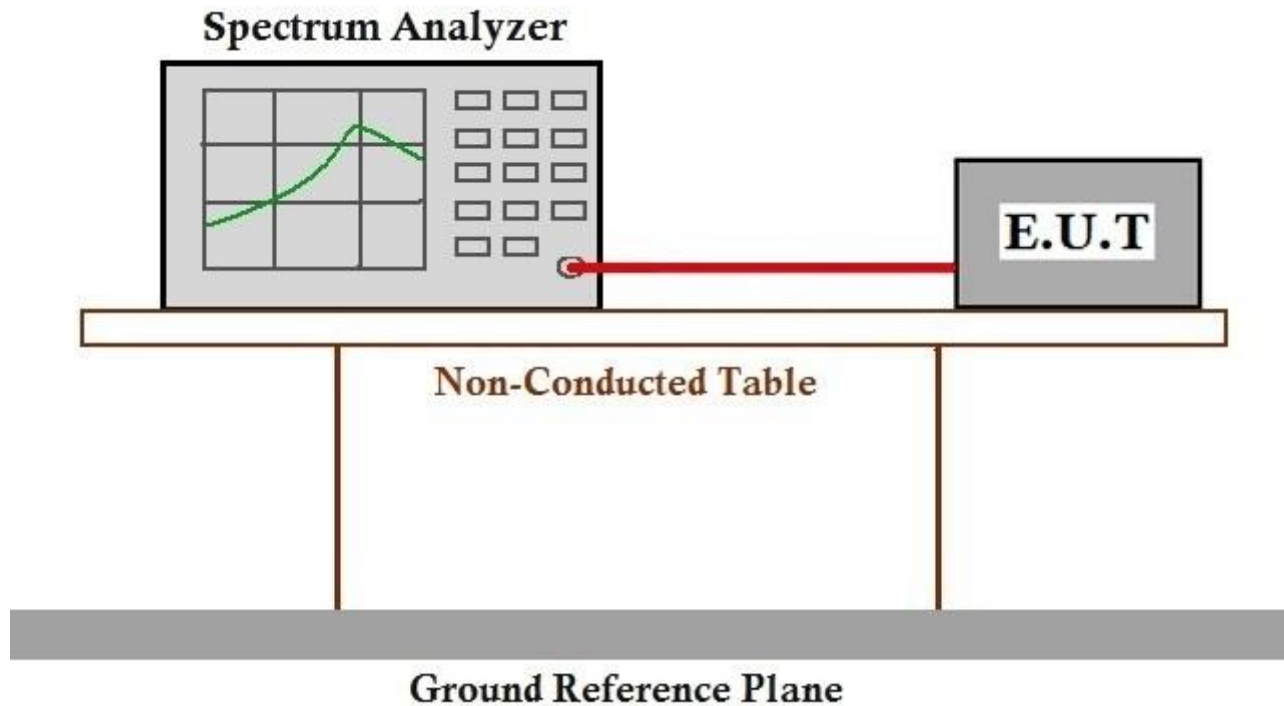
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Pretest these mode to find the worst case: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c:TX mode (Band 3)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: b:TX mode (Band 1)\_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

### 7.9.2 Test Setup Diagram



### 7.9.3 Measurement Procedure and Data

The detailed test data see: Appendix D for SHEM180800704104



## **8 Test Setup Photographs**

Refer to the < Test Setup photos-FCC>.

## **9 EUT Constructional Details**

Refer to the < External Photos > & < Internal Photos >.

**- End of the Report -**