

TEST REPORT

Applicant: Brianfay Technology (Shenzhen) Co.,Ltd.

Address of Applicant: Room 15C, Yuehuayuan Building, No. 2008, Nanshan Ave. Xuefu Community, Nanshan St., Nanshan Dist., Shenzhen, China

Manufacturer/Factory: Brianfay Technology (Shenzhen) Co.,Ltd.

Address of Manufacturer/Factory: Room 15C, Yuehuayuan Building, No. 2008, Nanshan Ave. Xuefu Community, Nanshan St., Nanshan Dist., Shenzhen, China

Equipment Under Test (EUT)

Product Name: Guitar/Bass Wireless Transmit and Receive System

Model No.: BF1, BF1-B, BF1-LITE, BF1B-LITE

Trade Mark: BrianFay

FCC ID: 2A2HG-BF1

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249

Date of sample receipt: July 21, 2022

Date of Test: July 22, 2022-September 16, 2022

Date of report issued: September 16, 2022

Test Result : PASS *

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

Authorized Signature:



Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	September 16, 2022	Original

Prepared By:



Date:

September 16, 2022

Project Engineer

Check By:



Date:

September 16, 2022

Reviewer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
4.1 MEASUREMENT UNCERTAINTY	4
5 GENERAL INFORMATION	5
5.1 GENERAL DESCRIPTION OF EUT	5
5.2 TEST MODE	6
5.3 DESCRIPTION OF SUPPORT UNITS	6
5.4 DEVIATION FROM STANDARDS	6
5.5 ABNORMALITIES FROM STANDARD CONDITIONS	6
5.6 TEST FACILITY	6
5.7 TEST LOCATION	6
5.8 ADDITIONAL INSTRUCTIONS	6
6 TEST INSTRUMENTS LIST	7
7 TEST RESULTS AND MEASUREMENT DATA	9
7.1 ANTENNA REQUIREMENT	9
7.2 RADIATED EMISSION METHOD	10
7.2.1 Field Strength of The Fundamental Signal	12
7.2.2 Spurious emissions and Band Edge	13
7.3 20DB OCCUPY BANDWIDTH	25
8 TEST SETUP PHOTO	27
9 EUT CONSTRUCTIONAL DETAILS	27

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	N/A
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remarks:

1. Test according to ANSI C63.10.
2. Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz-30MHz	3.1dB	(1)
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Guitar/Bass Wireless Transmit and Receive System
Model No.:	BF1, BF1-B, BF1-LITE, BF1B-LITE
Test Model No.:	BF1
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits.	
The differences are appearance color and model name for commercial purpose.	
Serial No.:	6974452700006
Hardware Version:	V5
Software Version:	v12
Test sample(s) ID:	GTS202207000195-1
Sample(s) Status	Engineered sample
Operation Frequency:	902.75MHz~924.55MHz
Channel numbers:	5
Modulation type:	pi/4 DQPSK
Antenna Type:	Spring antenna
Antenna gain:	3dBi(Declared by applicant)
Power supply:	TX: DC 3.7V, 600mAh, 2.22Wh for Li-ion battery

Note: The report is only for TX device

Operation Frequency each of channel

Channel	Frequency (MHz)								
1	902.75	2	904.3	3	908.55	4	915.3	5	924.55

The test frequencies are below:

Channel	Frequency
The lowest channel	902.75MHz
The middle channel	908.55MHz
The Highest channel	924.55MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
-------------------	---

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	86.11	88.02	85.73

5.3 Description of Support Units

None.

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

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

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd.
Address: No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480

Fax: 0755-27798960

5.8 Additional Instructions

Test Software	Continuously transmitter provided by manufacturer
Power level setup	Default

Global United Technology Services Co., Ltd.

No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,

Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 02, 2020	July 01, 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 22, 2022	April 21, 2023
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 21, 2022	March 20, 2023
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June 12, 2022	June 11, 2023
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 23, 2022	June 22, 2023
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	April 22, 2022	April 21, 2023
9	Coaxial Cable	GTS	N/A	GTS211	April 22, 2022	April 21, 2023
10	Coaxial cable	GTS	N/A	GTS210	April 22, 2022	April 21, 2023
11	Coaxial Cable	GTS	N/A	GTS212	April 22, 2022	April 21, 2023
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	April 22, 2022	April 21, 2023
13	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 23, 2022	June 22, 2023
14	Band filter	Amindeon	82346	GTS219	June 23, 2022	June 22, 2023
15	Power Meter	Anritsu	ML2495A	GTS540	June 23, 2022	June 22, 2023
16	Power Sensor	Anritsu	MA2411B	GTS541	June 23, 2022	June 22, 2023
17	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 22, 2022	April 21, 2023
18	Splitter	Agilent	11636B	GTS237	June 23, 2022	June 22, 2023
19	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 30, 2021	Nov. 29, 2022
20	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 22, 2022	April 21, 2023
21	Breitband hornantenna	SCHWARZBECK	BBHA 9170	GTS579	Oct. 17, 2021	Oct. 16, 2022
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 17, 2021	Oct. 16, 2022
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 17, 2021	Oct. 16, 2022
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June 23, 2022	June 22, 2023
25	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 22, 2022	April 21, 2023

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 22, 2022	April 21, 2023
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 22, 2022	April 21, 2023
3	Spectrum Analyzer	Agilent	E4440A	GTS536	April 22, 2022	April 21, 2023
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 22, 2022	April 21, 2023
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 22, 2022	April 21, 2023
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 22, 2022	April 21, 2023
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 22, 2022	April 21, 2023
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 22, 2022	April 21, 2023

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	April 25, 2022	April 24, 2023
2	Barometer	KUMAO	SF132	GTS647	July 26, 2022	July 25, 2023

7 Test results and Measurement Data

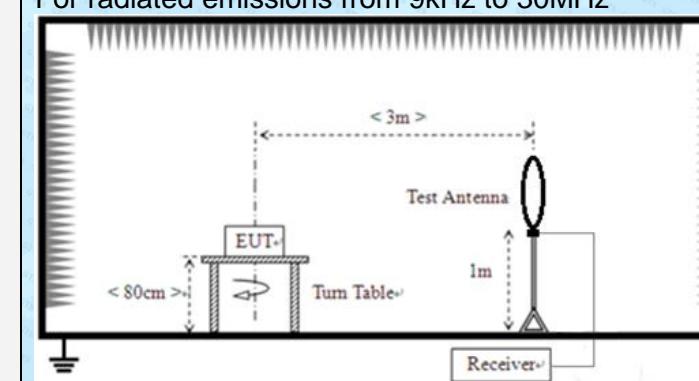
7.1 Antenna requirement

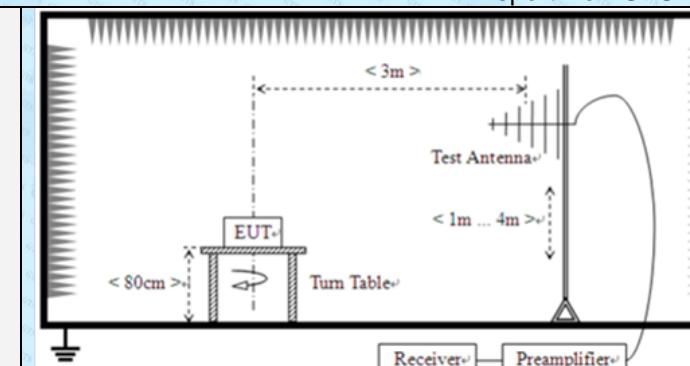
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement:	
<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p>	

EUT Antenna:

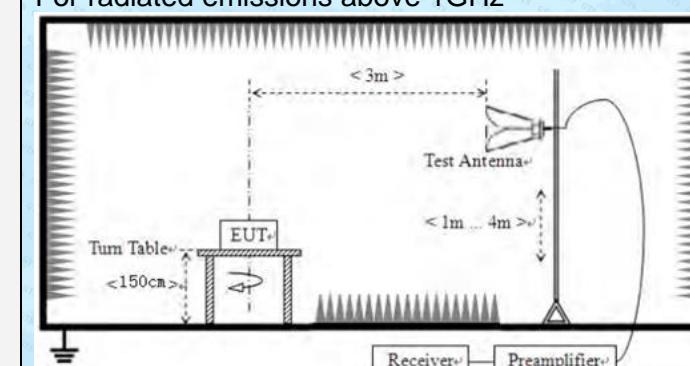
The antenna is spring antenna, reference to the appendix II for details.

7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209, 15.205								
Test Method:	ANSI C63.10								
Test Frequency Range:	9kHz to 10GHz								
Test site:	Measurement Distance: 3m								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value				
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value				
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value				
	Above 1GHz	Peak	1MHz	3MHz	Peak Value				
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark					
	902 MHz~928MHz	94.00		QP Value					
Limit: (Spurious Emissions)	Frequency	Limit (uV/m)		Remark					
	0.009MHz-0.490MHz	2400/F(kHz) @300m		Quasi-peak Value					
	0.490MHz-1.705MHz	24000/F(kHz) @30m		Quasi-peak Value					
	1.705MHz-30.0MHz	30 @30m		Quasi-peak Value					
	30MHz-88MHz	100 @3m		Quasi-peak Value					
	88MHz-216MHz	150 @3m		Quasi-peak Value					
	216MHz-960MHz	200 @3m		Quasi-peak Value					
	960MHz-1GHz	500 @3m		Quasi-peak Value					
Limit: (band edge)	Above 1GHz	500 @3m		Average Value					
		5000 @3m		Peak Value					
Test setup:	For radiated emissions from 9kHz to 30MHz								
									
	For radiated emissions from 30MHz to 1GHz								



For radiated emissions above 1GHz



Test Procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. 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.
4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. 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 Instruments:

Refer to section 6.0 for details

Test mode:

Refer to section 5.2 for details

Test environment:

Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
--------	-------	---------	-----	---------	----------

Test voltage:

DC 3.7V

Test results:

Pass

Measurement data:

7.2.1 Field Strength of The Fundamental Signal

QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
902.75	90.04	23.93	4.87	37.36	81.48	94.00	-12.52	Horizontal
902.75	83.47	23.93	4.87	37.36	74.91	94.00	-19.09	Vertical
908.55	94.82	23.98	4.88	37.36	86.32	94.00	-7.68	Horizontal
908.55	79.33	23.98	4.88	37.36	70.83	94.00	-23.17	Vertical
924.55	96.33	24.11	4.95	37.37	88.02	94.00	-5.98	Horizontal
924.55	84.29	24.11	4.95	37.37	75.98	94.00	-18.02	Vertical

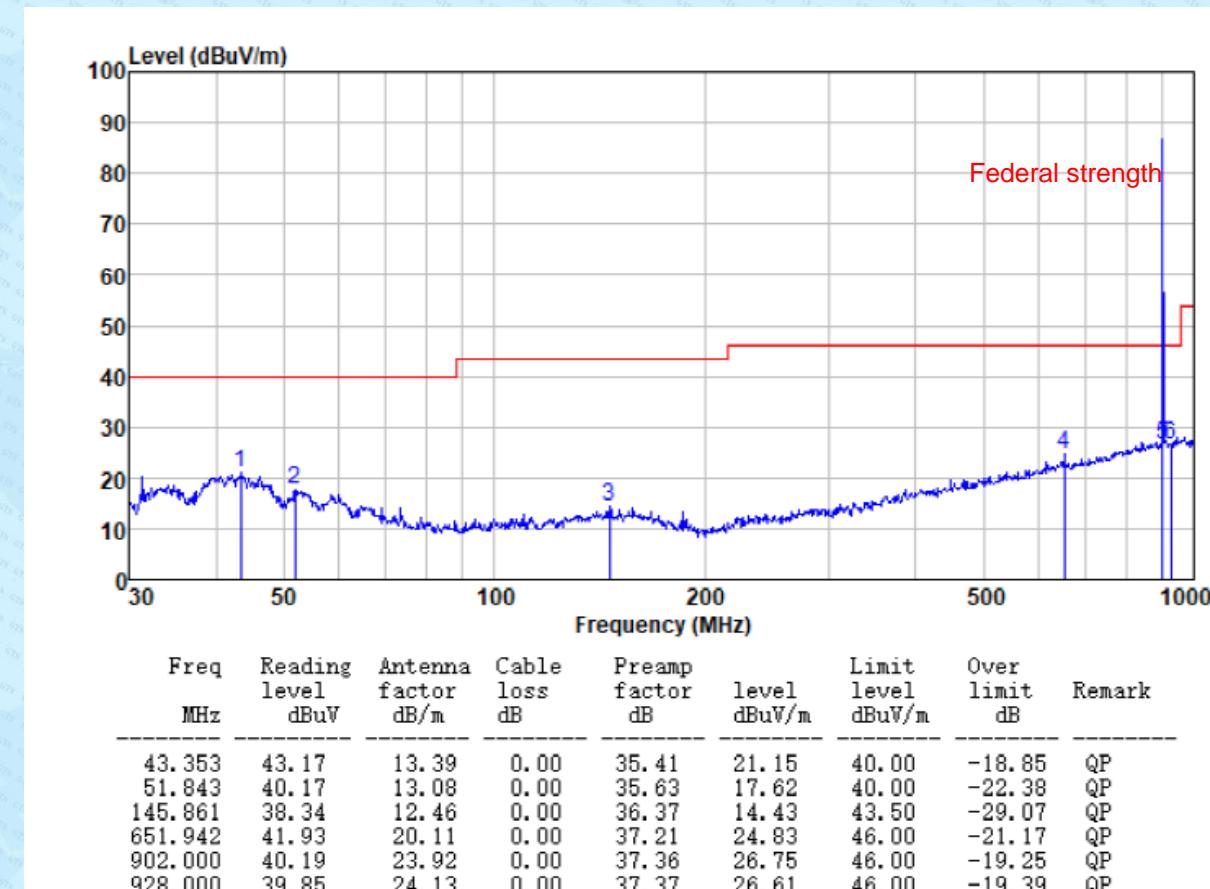
7.2.2 Spurious emissions and Band Edge

■ Below 30MHz

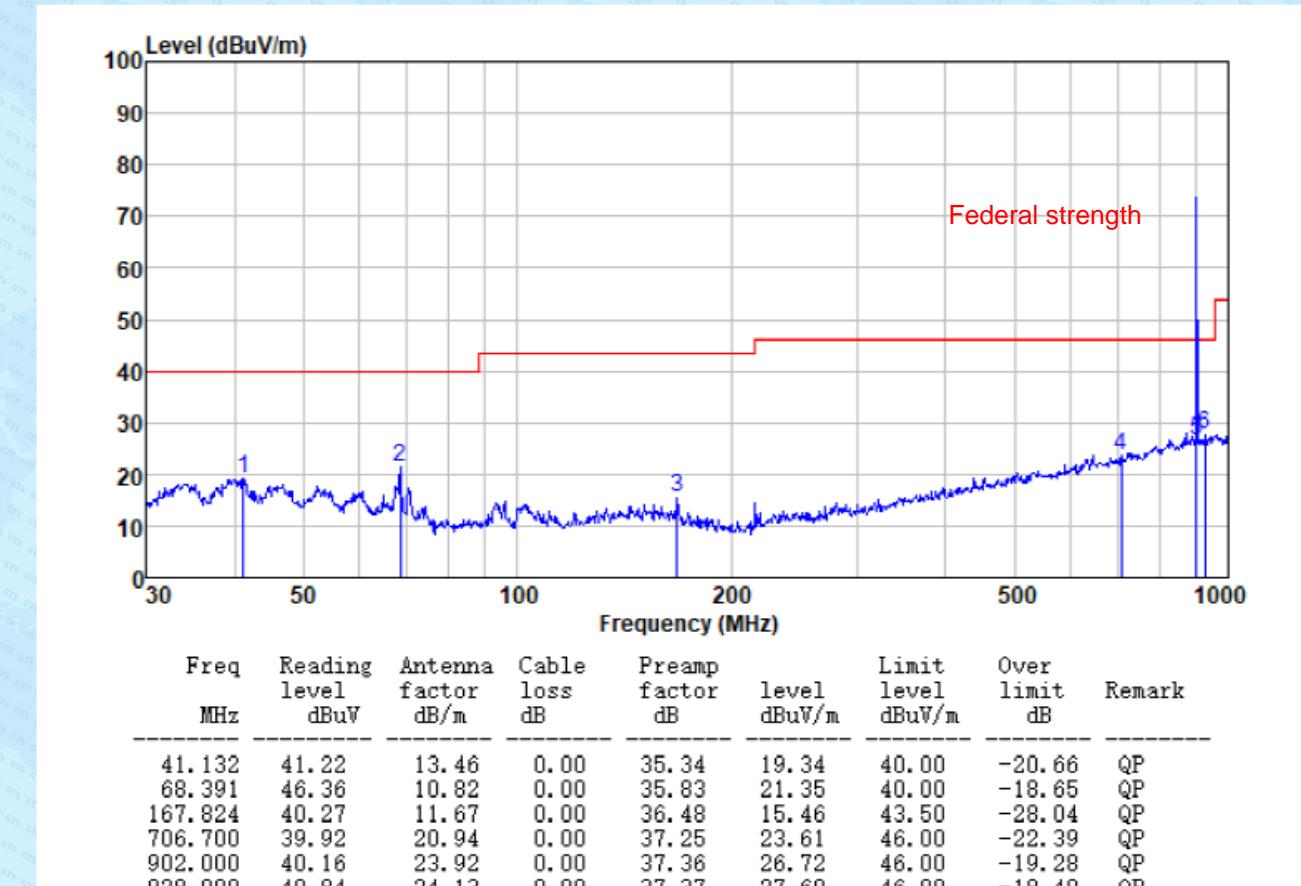
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

■ Below 1GHz

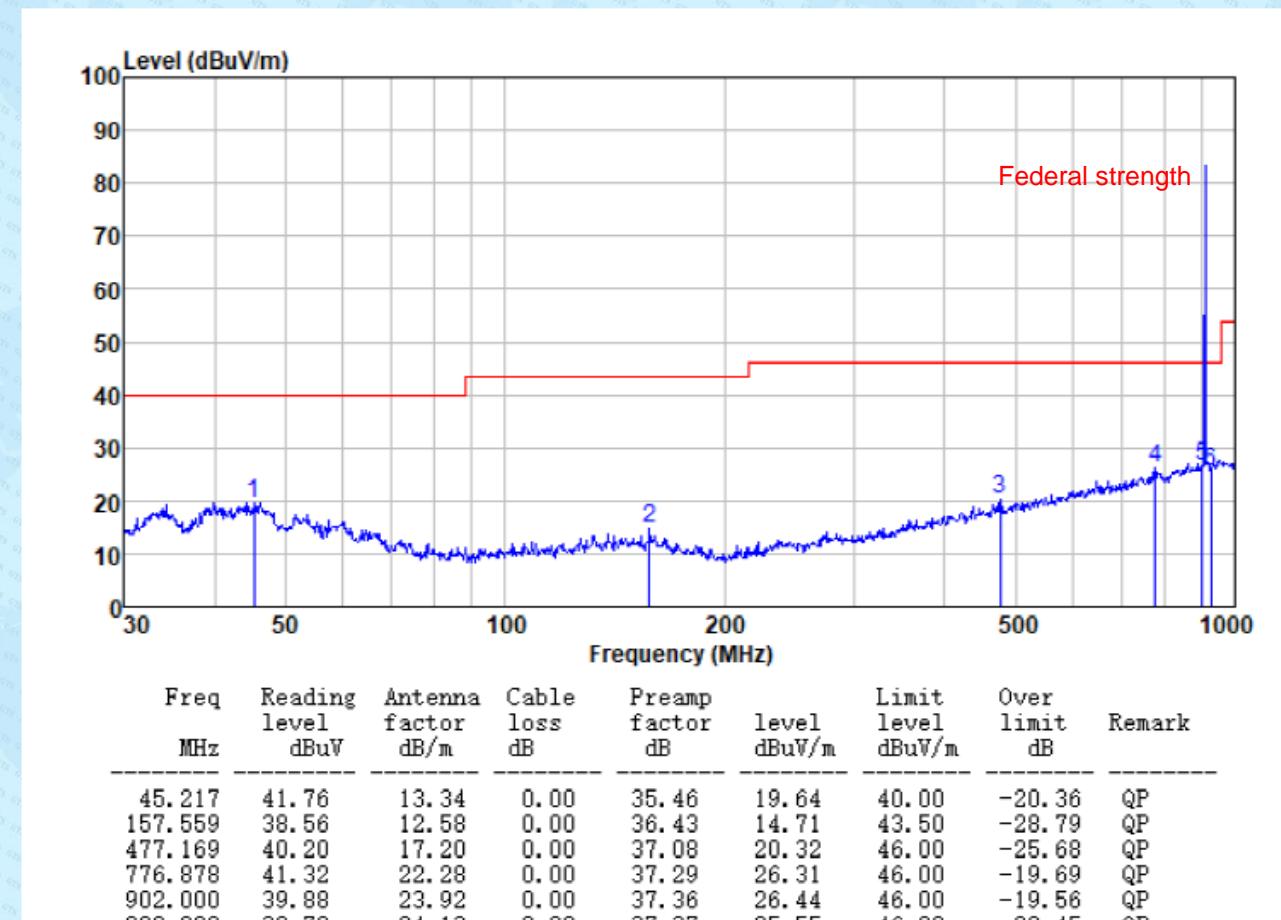
Test channel:	Lowest	Polarization:	Horizontal
---------------	--------	---------------	------------



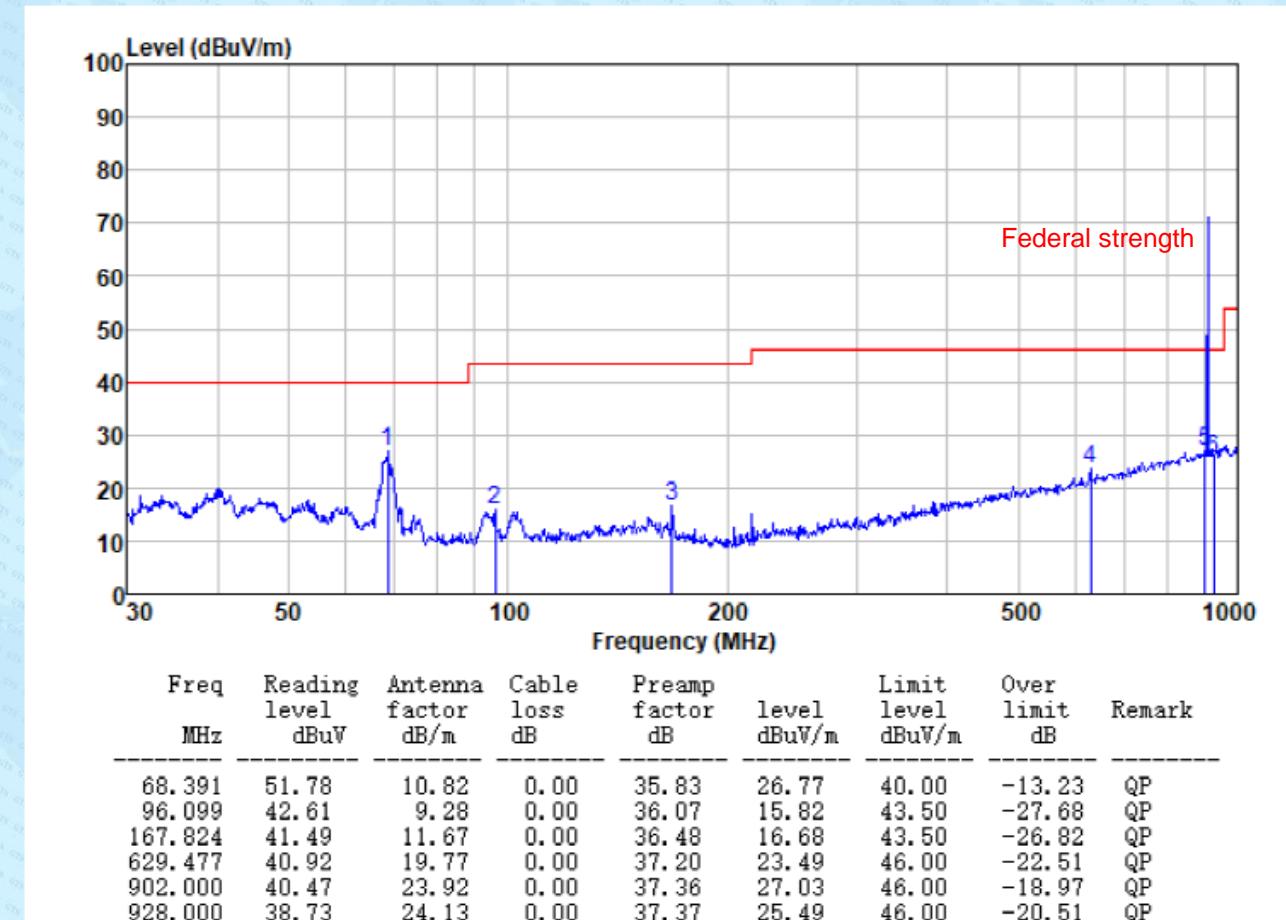
Test channel:	Lowest	Polarization:	Vertical
---------------	--------	---------------	----------



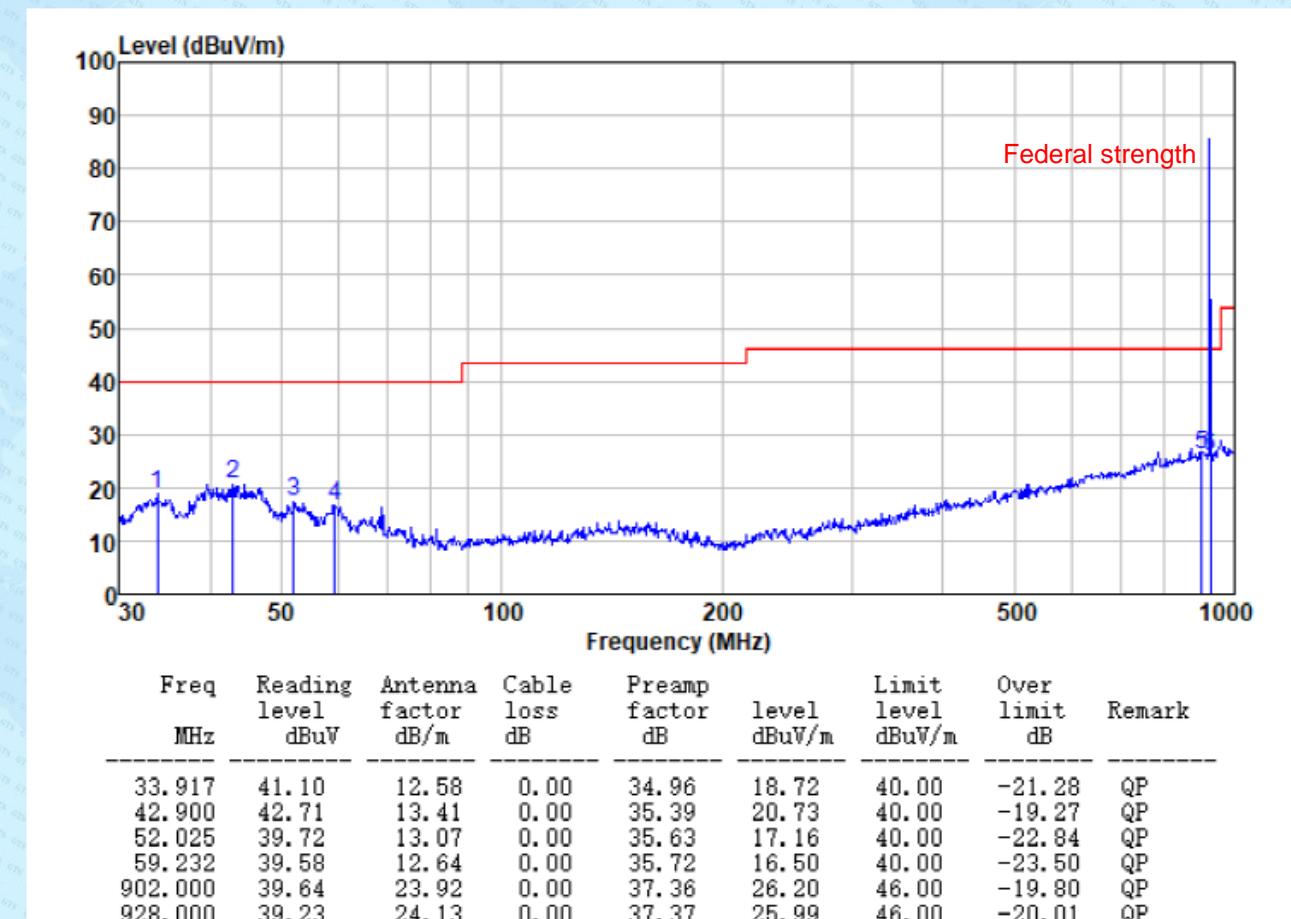
Test channel:	Middle	Polarization:	Horizontal
---------------	--------	---------------	------------



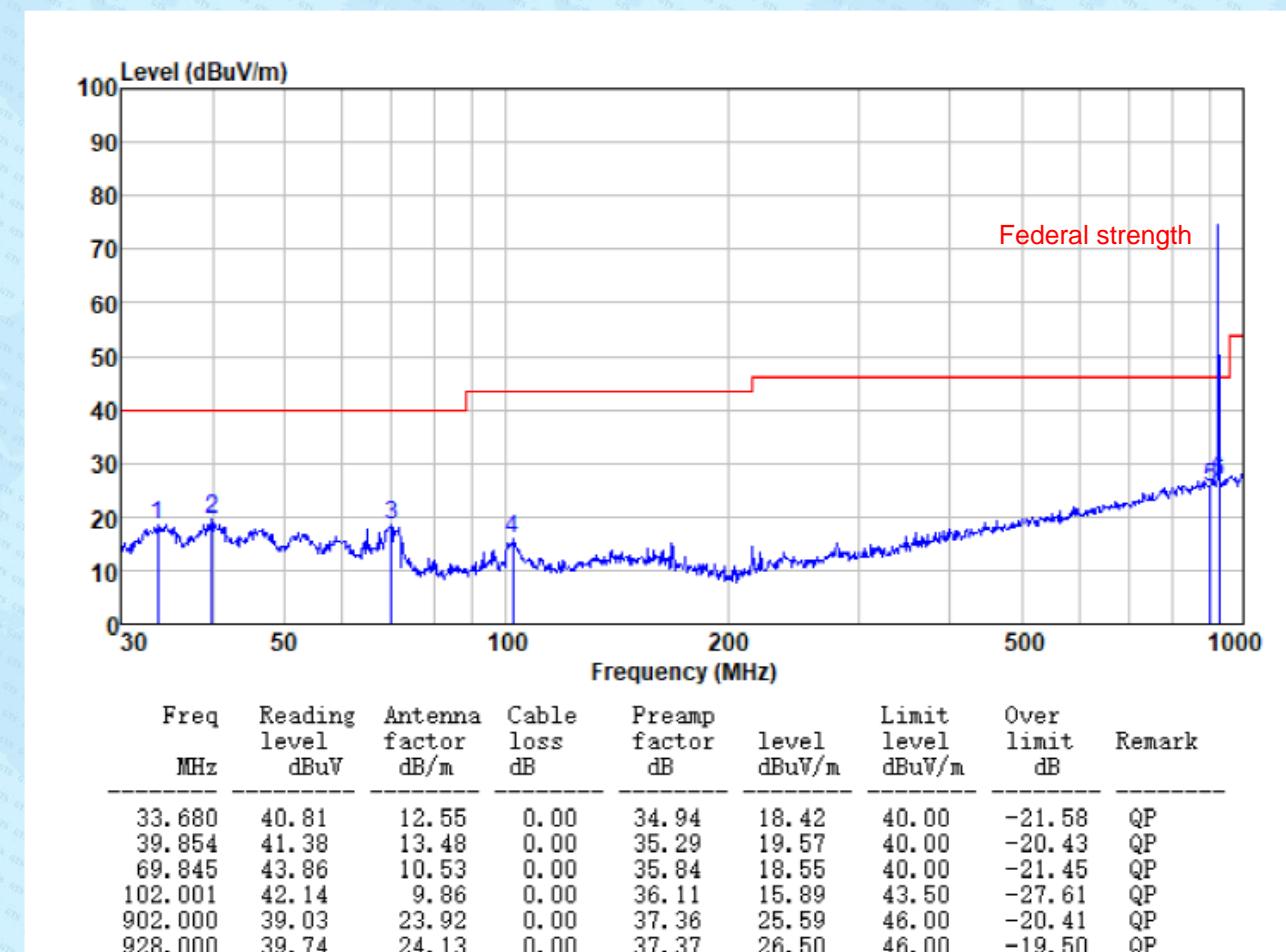
Test channel:	Middle	Polarization:	Vertical
---------------	--------	---------------	----------



Test channel:	Highest	Polarization:	Horizontal
---------------	---------	---------------	------------

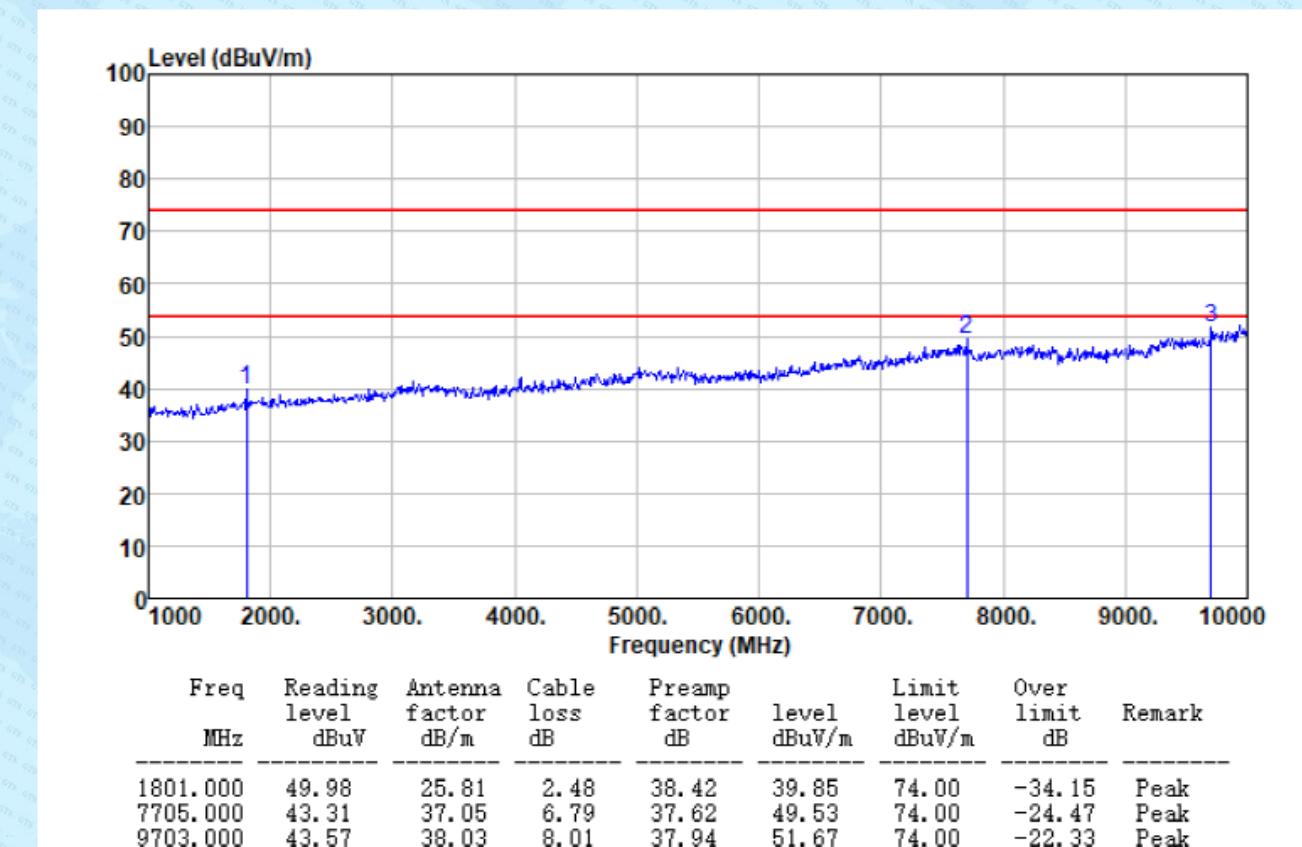


Test channel:	Highest	Polarization:	Vertical
---------------	---------	---------------	----------

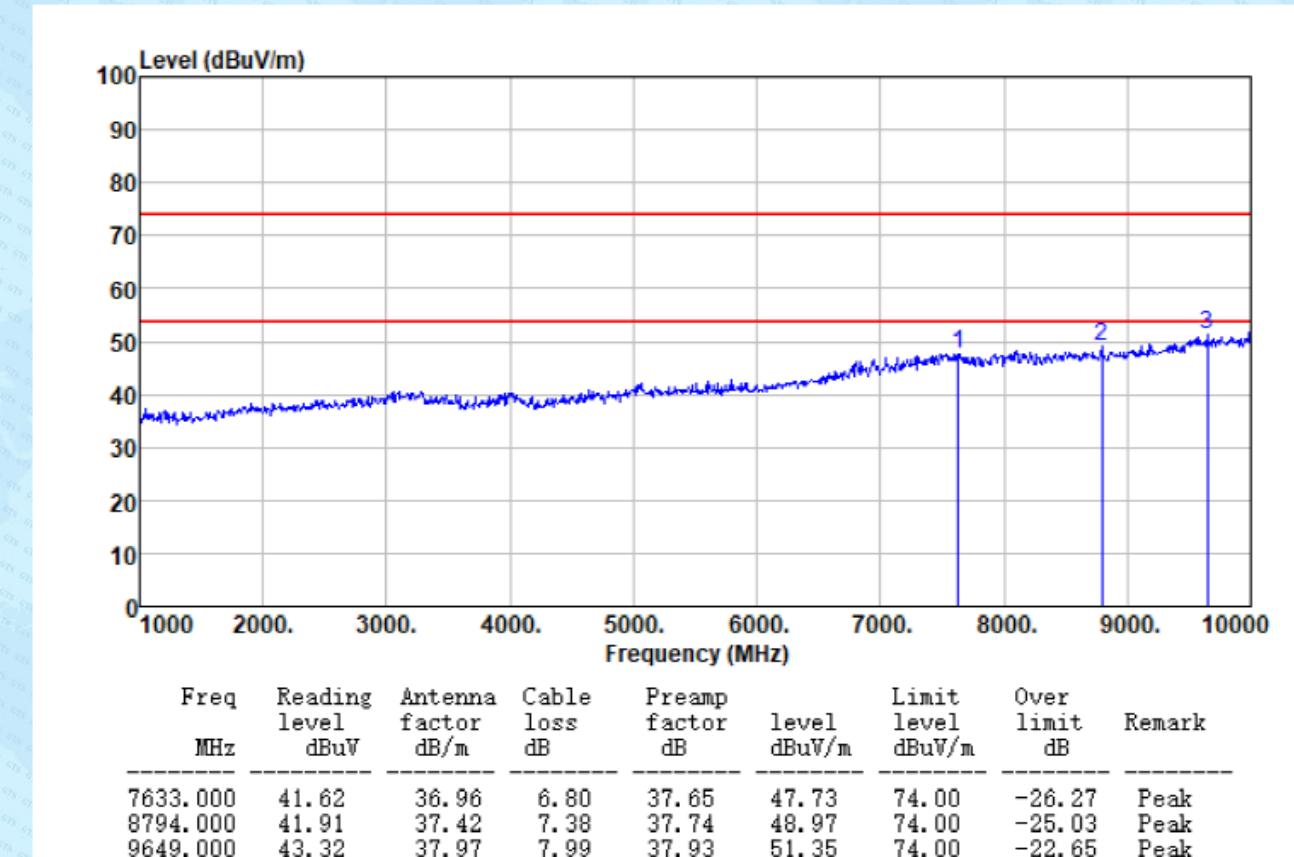


■ Above 1GHz

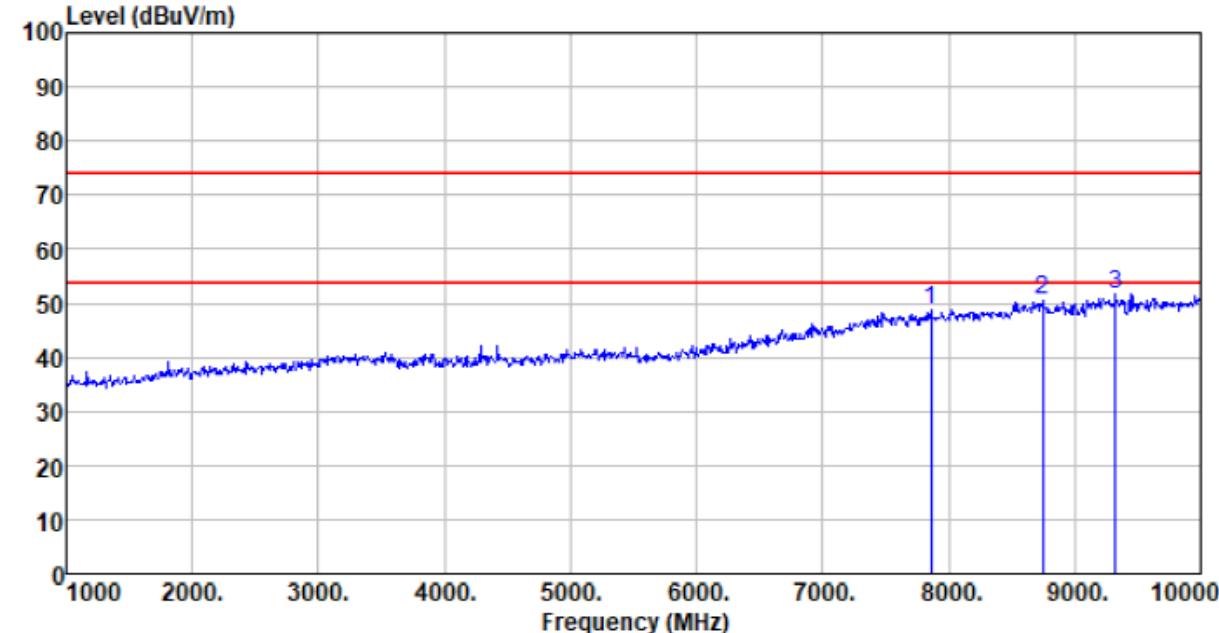
Test channel:	Lowest	Polarization:	Horizontal
---------------	--------	---------------	------------



Test channel:	Lowest	Polarization:	Vertical
---------------	--------	---------------	----------

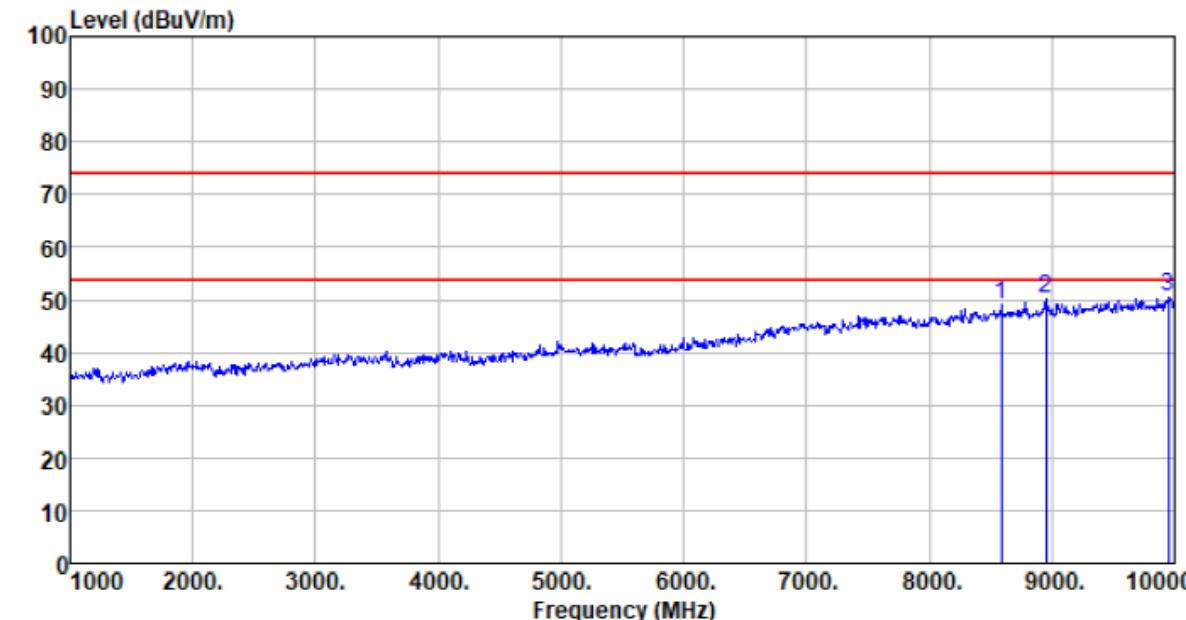


Test channel:	Middle	Polarization:	Horizontal
---------------	--------	---------------	------------



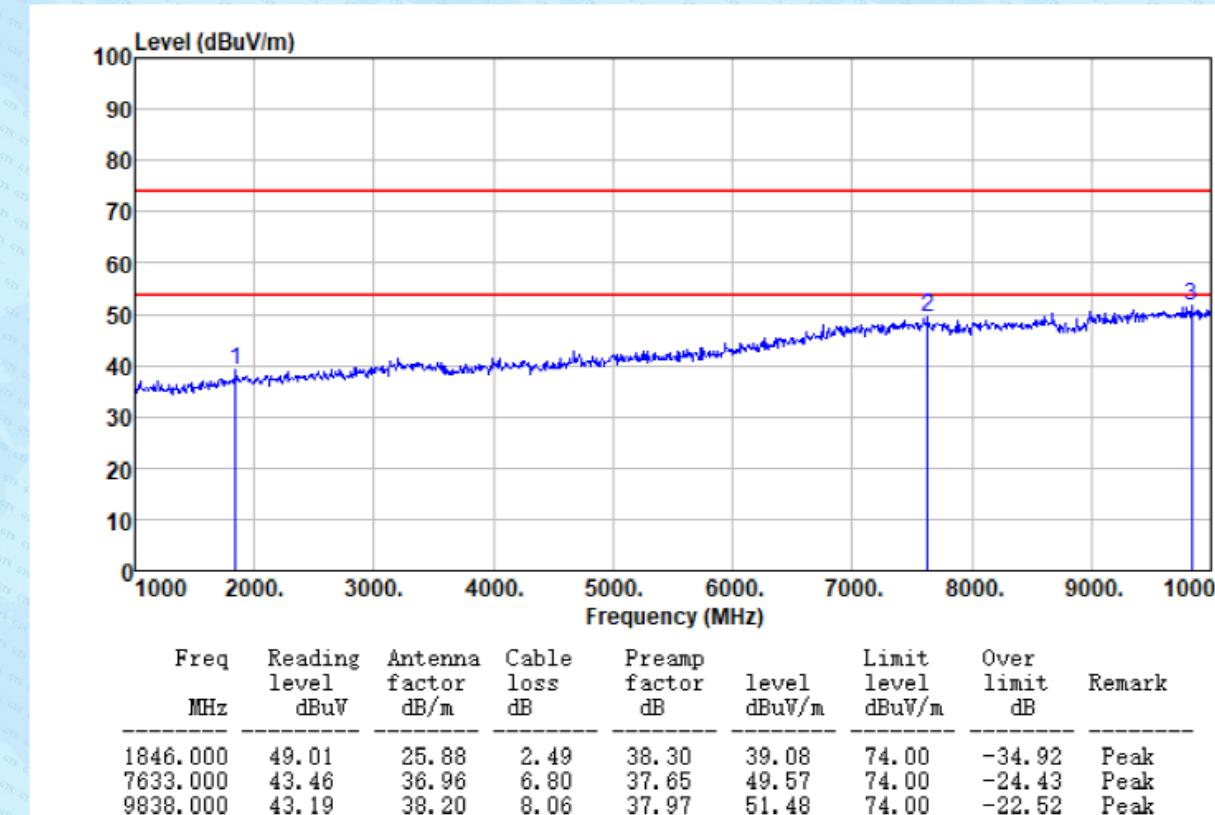
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	Limit level dBuV/m	Over limit dB	Remark
7858.000	42.38	37.24	6.76	37.56	48.82	74.00	-25.18
8749.000	43.53	37.40	7.35	37.72	50.56	74.00	-23.44
9325.000	44.16	37.69	7.81	37.86	51.80	74.00	-22.20

Test channel:	Middle	Polarization:	Vertical
---------------	--------	---------------	----------

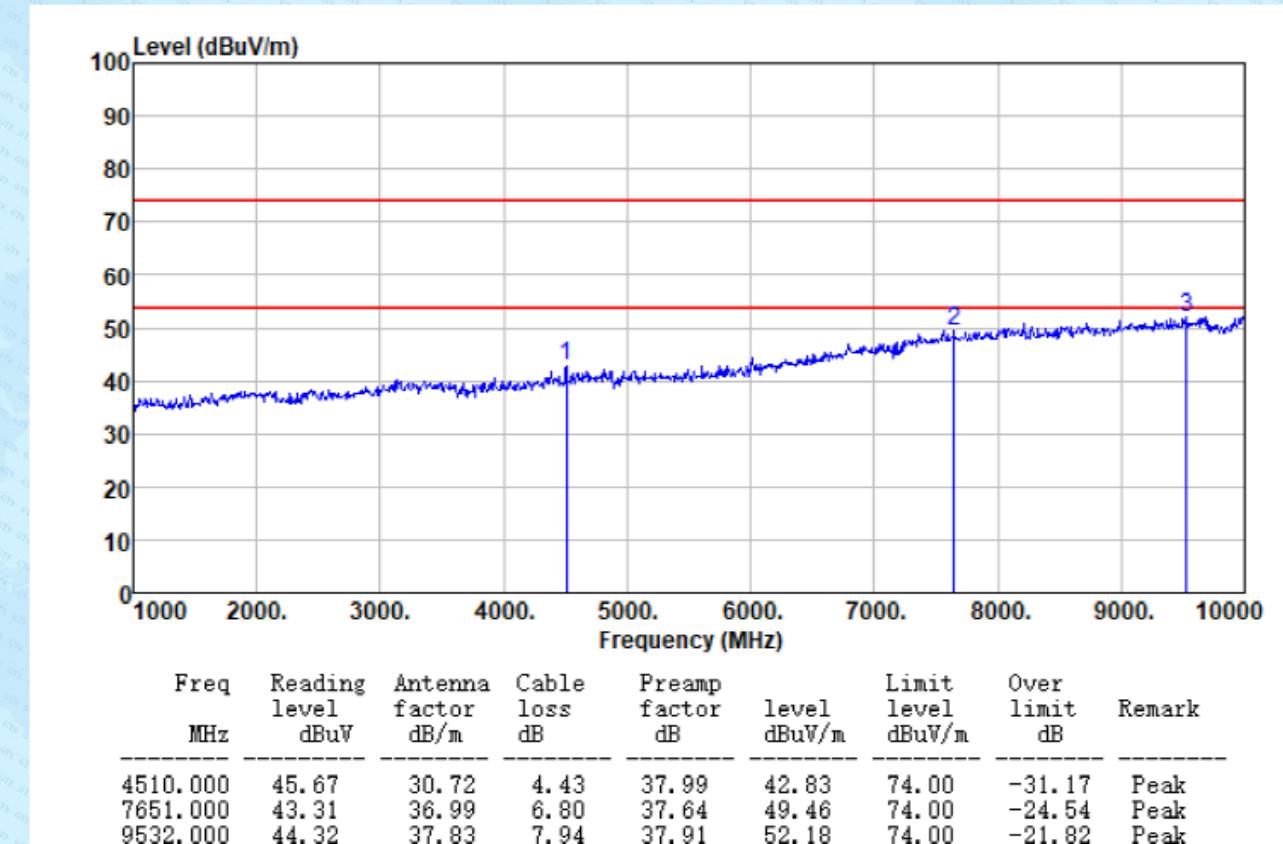


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
8587.000	42.12	37.34	7.20	37.68	48.98	74.00	-25.02	Peak
8956.000	42.91	37.48	7.53	37.79	50.13	74.00	-23.87	Peak
9946.000	42.09	38.33	8.10	37.99	50.53	74.00	-23.47	Peak

Test channel:	Highest	Polarization:	Horizontal
---------------	---------	---------------	------------



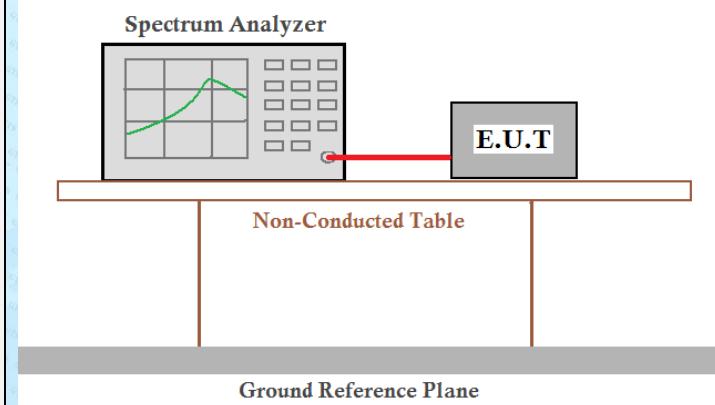
Test channel:	Highest	Polarization:	Vertical
---------------	---------	---------------	----------



Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

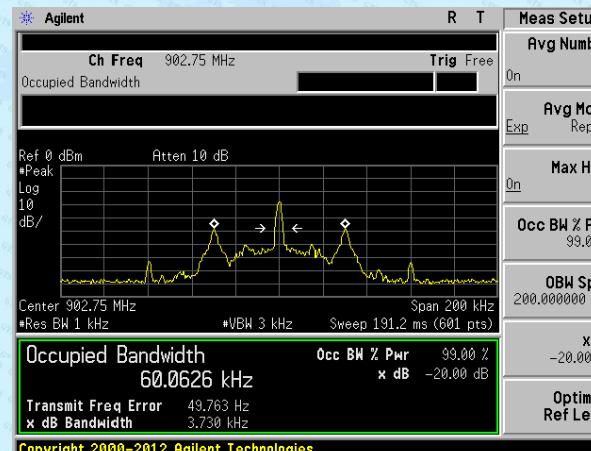
7.3 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10
Limit:	Operation Frequency range 902MHz~928MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

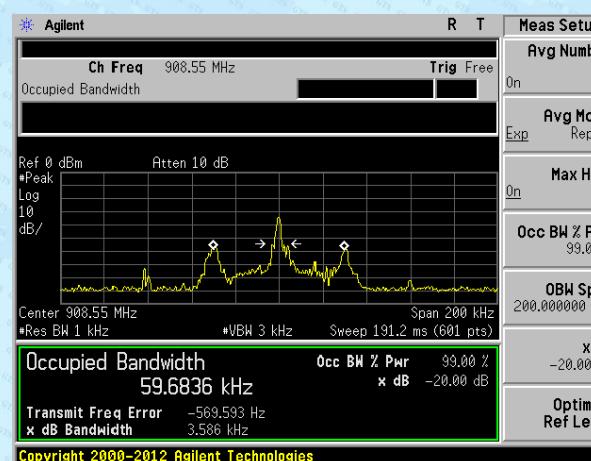
Measurement Data

Test Frequency	20dB bandwidth(kHz)	Result
Lowest	3.730	Pass
Middle	3.586	Pass
Highest	5.397	Pass

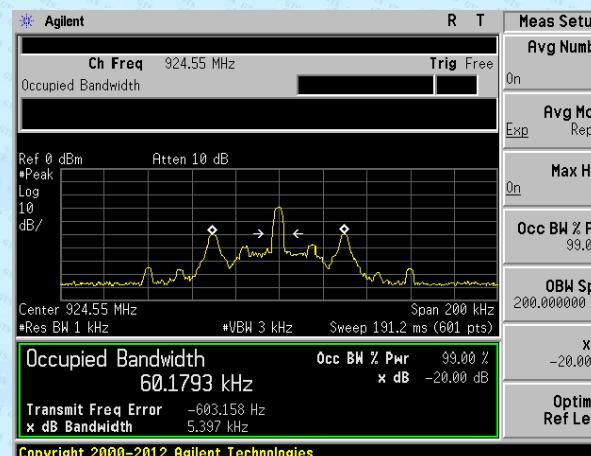
Test plot as follows:



Lowest channel



Middle channel



Highest channel

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----