



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

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Report No.: GZEM190101044601  
Page: 1 of 37  
FCC ID: UHW9023009

## TEST REPORT

**Application No.:** GZEM1901010446HS  
**Applicant:** Guangdong Galanz Enterprises Co., Ltd.  
**Address of Applicant:** 25 Ronggui Nan Road, Shunde, Foshan, Guangdong, China  
**Manufacturer:** Guangdong Galanz Microwave Electrical Appliances Manufacturing Co., Ltd.  
**Address of Manufacturer:** 3 Xingpu Avenue, Huangpu, Zhongshan, Guangdong, China.  
**Factory:** Guangdong Galanz Microwave Electrical Appliances Manufacturing Co., Ltd.  
**Address of Factory:** 3 Xingpu Avenue, Huangpu, Zhongshan, Guangdong, China.  
**Equipment Under Test (EUT):**  
**FCC ID: UHW9023009**  
**EUT Name:** Microwave oven  
**Model No.:** P90D23 (X) -(Y), P90D23 (X) II-(Y). ✕  
✕ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade Mark:** Galanz  
**Standard(s) :** 47 CFR Part 18  
**Date of Receipt:** 2019-01-24  
**Date of Test:** 2019-01-30 to 2019-02-02  
**Date of Issue:** 2019-04-04

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

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



Kobe Jian  
Lab Manager

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



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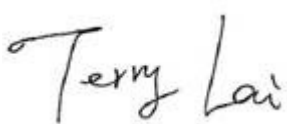
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Guangzhou Branch

Report No.: GZEM190101044601  
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-04-04		Original

Authorized for issue by:			
Tested By		2019-01-30 to 2019-02-02	
Checked By		2019-03-27	
	Damon_Guan /Project Engineer	Date	
	Terry_Lai /Reviewer	Date	



SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch Testing Center EEC Laboratory

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## 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 18	FCC OST/MP-5:1986	N/A	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 18	FCC OST/MP-5:1986	N/A	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 18	FCC OST/MP-5:1986	N/A	Pass
Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)	47 CFR Part 18	FCC OST/MP-5:1986	N/A	Pass
Operating Frequency	47 CFR Part 18	FCC OST/MP-5:1986	N/A	Pass

N/A: Not Applicable

### ■ Declaration of EUT Family Grouping:

**Model No.:** P90D23 (X) -(Y), P90D23 (X) II-(Y)

Variable (X) may be

L,P, SL,SP, TL, TP,AL,AP, AL,AP, ASL,ASP,ATL,ATP,EL,EP, ESL,ESP, ETL,ETP.

“L” is pull-out type door, P is push-button type door. When there is no letter before “L”, “P”, denotes mechanical control model; When there is “A”, “E” denote the electrical control model. “S” denotes stainless steel cavity; “T” denotes the painted cavity; When there is neither “S” nor “T” before “L”, “P”, denotes the epoxy painted cavity.

Variable (Y) may compose by one to five characters from A to Z and/or numbers from 0 to 9. It represents the differences of the appearance.

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

Therefore only one model **P90D23APII-ZJ** was tested in this report.



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## 4 General Information

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

Power Supply: AC 120V 60Hz  
Test Voltage: AC 120V 60Hz  
Cable: About 1.8m x 3 wires unscreened AC mains cable.

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
1000mL of water in the beaker for power output and frequency measurement.	/	/	/
One of 700 and the other of 300mL of water for second and third harmonic radiation measurement.	/	/	/
700mL of water for all other measurement	/	/	/

### 4.3 Measurement Uncertainty

EMC

No.	Item	Measurement Uncertainty
1	Conducted Disturbance Voltage at Mains Terminals	±3.63dB (9kHz to 150kHz)
		±3.22dB (150kHz to 30MHz)
2	Disturbance Power	±3.78dB
3	Radiated Emissions	±5.0dB (30MHz-1GHz)
		±5.0dB (1GHz-6GHz)
4	Temperature	±0.4 °C
5	Humidity	±1.3%
6	DC power	±0.5 %

### 4.4 Test Location

All tests were performed at:

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

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



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#### 4.5 Test Facility

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

● **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

● **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to

ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

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

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

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

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

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

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

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

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

● **CBTL (Lab Code: TL129)**

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



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#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	Zhong Yu	8m x 3m x 3.8m	EMC0306	N/A	N/A
Two-Line V-Netwok	R&S	ENV216	EMC0118	2019-01-11	2020-01-10
LISN	R&S	ENV216	EMC2135	2018-09-21	2019-09-20
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2018-11-19	2019-11-18
Coaxial Cable	HangTianXing	2m	EMC0107	2017-07-23	2019-07-22
Voltage Probe	SGS	N/A	EMC0106	2018-04-04	2020-04-03
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2018-04-19	2020-04-18
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A



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<b>Radiated Emissions (30MHz-1GHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2019-01-20	2020-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2019-01-20	2020-01-19
Chamber cable	HangTianXing	N/A	EMC0542	2017-06-30	2019-06-30
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2016-06-29	2019-06-28
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2019-01-11	2020-01-10
Amplifier	HP	8447F	EMC2065	2018-06-01	2019-05-31
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2019-01-11	2020-01-10
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2019-01-11	2020-01-10
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2017-06-18	2019-06-18
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2019-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2018-11-19	2019-11-18
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2018-11-19	2019-11-18
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2019-01-20	2020-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2019-01-20	2020-01-19
Chamber cable	HangTianXing	N/A	EMC0542	2017-06-30	2019-06-30
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2019-01-07	2020-01-08
Amplifier	HP	8447F	EMC2065	2018-06-01	2019-05-31
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-02-24	2019-02-23
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2019-01-11	2020-01-10
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2019-01-11	2020-01-10
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2017-06-18	2019-06-18
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2019-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2018-11-19	2019-11-18
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2018-11-19	2019-11-18
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2016-06-29	2019-06-28
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2019-01-20	2020-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2019-01-20	2020-01-19
Chamber cable	HangTianXing	N/A	EMC0542	2017-06-30	2019-06-30
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2016-06-29	2019-06-28
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2019-01-11	2020-01-10
Amplifier	HP	8447F	EMC2065	2018-06-01	2019-05-31
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2019-01-11	2020-01-10
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2019-01-11	2020-01-10
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2017-06-18	2019-06-18
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2019-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2018-11-19	2019-11-18
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2018-11-19	2019-11-18
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2018-07-20	2019-07-19
DMM	Fluke	73	EMC0007	2018-07-19	2019-07-18



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## 6 Emission Test Results

### 6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	47 CFR Part 18
Test Method:	FCC OST/MP-5:1986
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

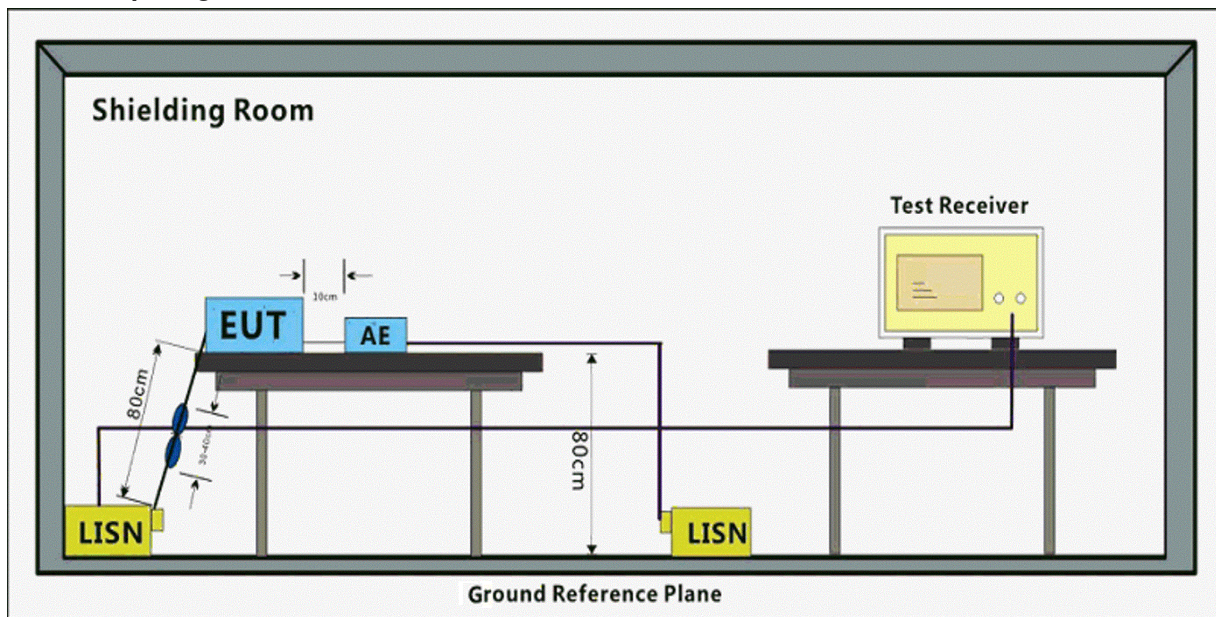
#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.9 °C Humidity: 51.5 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Test the EUT in microwave mode with maximum power.

#### 6.1.2 Test Setup Diagram

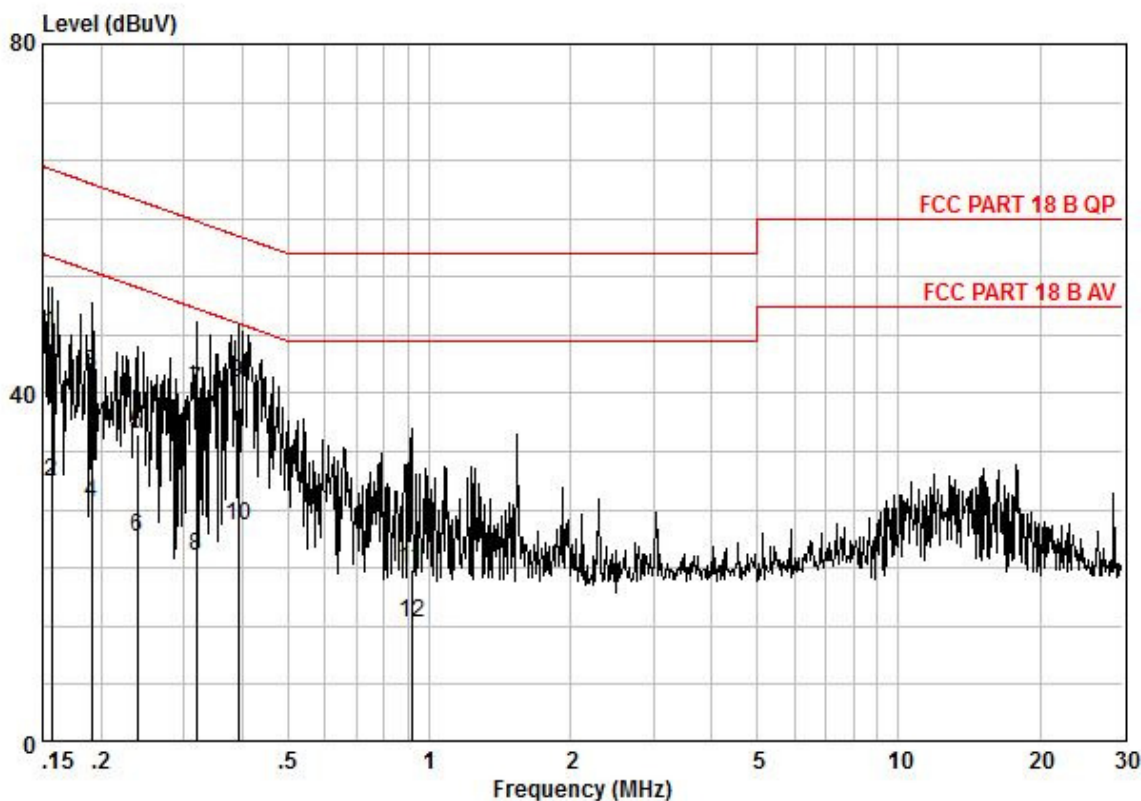


#### 6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Measured Level = Read level + Cable Loss + LISN Factor

Mode:a; Line:Live Line



Pol :LIVE  
No :  
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.16	37.32	0.10	9.48	46.90	65.65	-18.75	QP
0.16	20.20	0.10	9.48	29.78	55.65	-25.87	AVERAGE
0.19	32.70	0.10	9.59	42.39	64.02	-21.63	QP
0.19	17.87	0.10	9.59	27.56	54.02	-26.46	AVERAGE
0.24	25.58	0.12	9.63	35.33	62.13	-26.80	QP
0.24	13.81	0.12	9.63	23.56	52.13	-28.57	AVERAGE
0.32	30.64	0.15	9.64	40.43	59.75	-19.32	QP
0.32	11.54	0.15	9.64	21.33	49.75	-28.42	AVERAGE
0.39	31.44	0.17	9.64	41.26	58.03	-16.78	QP
0.39	14.97	0.17	9.64	24.79	48.03	-23.25	AVERAGE
0.92	10.03	0.29	9.63	19.94	56.00	-36.06	QP
0.92	3.81	0.29	9.63	13.72	46.00	-32.28	AVERAGE

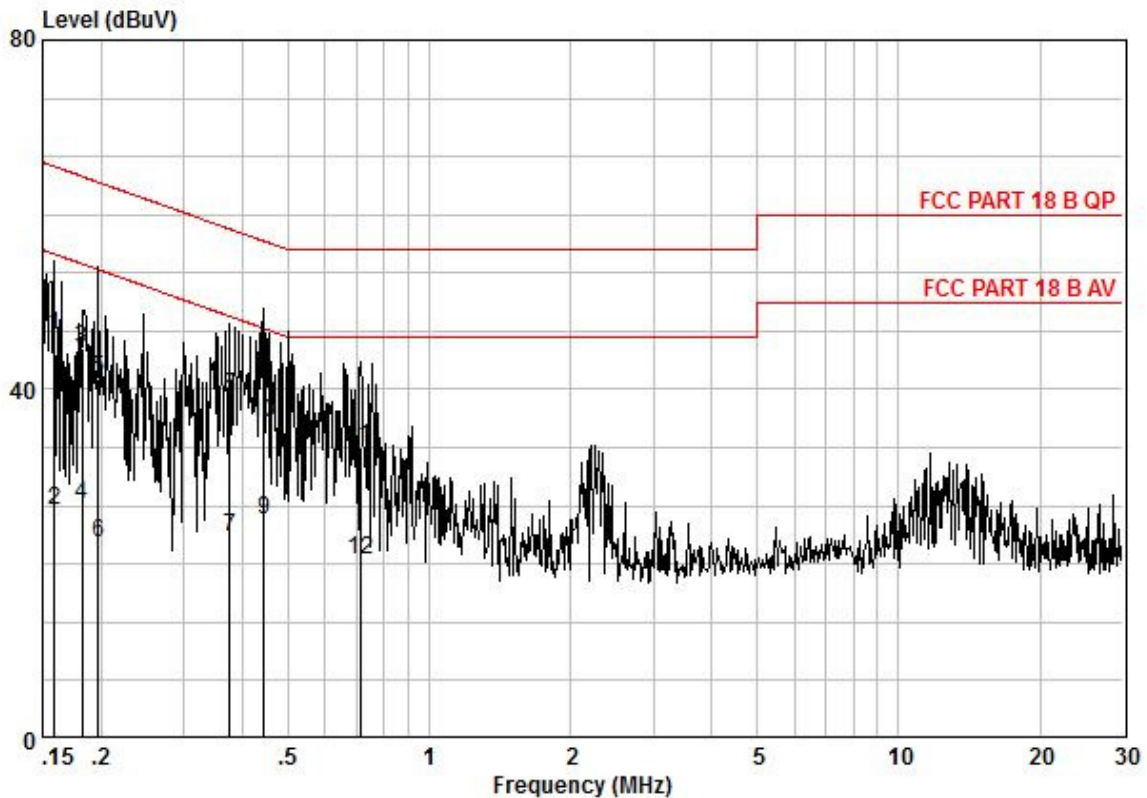


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Mode:a; Line:Neutral Line



Pol : NEUTRAL  
No :  
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.16	36.61	0.10	9.42	46.13	65.52	-19.38	QP
0.16	16.57	0.10	9.42	26.09	55.52	-29.42	AVERAGE
0.18	34.99	0.10	9.52	44.61	64.37	-19.76	QP
0.18	17.26	0.10	9.52	26.88	54.37	-27.49	AVERAGE
0.20	31.43	0.10	9.58	41.11	63.71	-22.60	QP
0.20	12.85	0.10	9.58	22.53	53.71	-31.18	AVERAGE
0.38	13.39	0.17	9.56	23.12	48.39	-25.27	AVERAGE
0.38	29.59	0.17	9.56	39.32	58.39	-19.07	QP
0.44	15.25	0.19	9.55	24.99	46.98	-21.99	AVERAGE
0.44	26.55	0.19	9.55	36.29	56.98	-20.69	QP
0.71	23.51	0.25	9.59	33.35	56.00	-22.65	QP
0.71	10.72	0.25	9.59	20.56	46.00	-25.44	AVERAGE



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## 6.2 Operating Frequency

Test Requirement: 47 CFR Part 18  
Test Method: FCC OST/MP-5:1986  
Frequency Range: 2400-2500 MHz  
Detector: Peak  
Limit:

ISM equipment may be operated on any frequency above 9 kHz.

And the frequency band 2400-2500MHz is allocated for use by ISM equipment.  
(§18.301)

ISM frequency	Tolerance
6.78MHz	±15.0kHz
13.56MHz	±7.0kHz
27.12MHz	±163.0kHz
40.68MHz	±20.0kHz
915MHz	±13.0MHz
2450MHz	±50.0MHz
5800MHz	±75.0MHz
24125MHz	±125.0MHz
61.25GHz	±250.0MHz
122.5GHz	±500.0MHz
245.00GHz	±1.0GHz

### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 54.9 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Test the EUT in microwave mode with maximum power.

### 6.2.2 Measurement Data

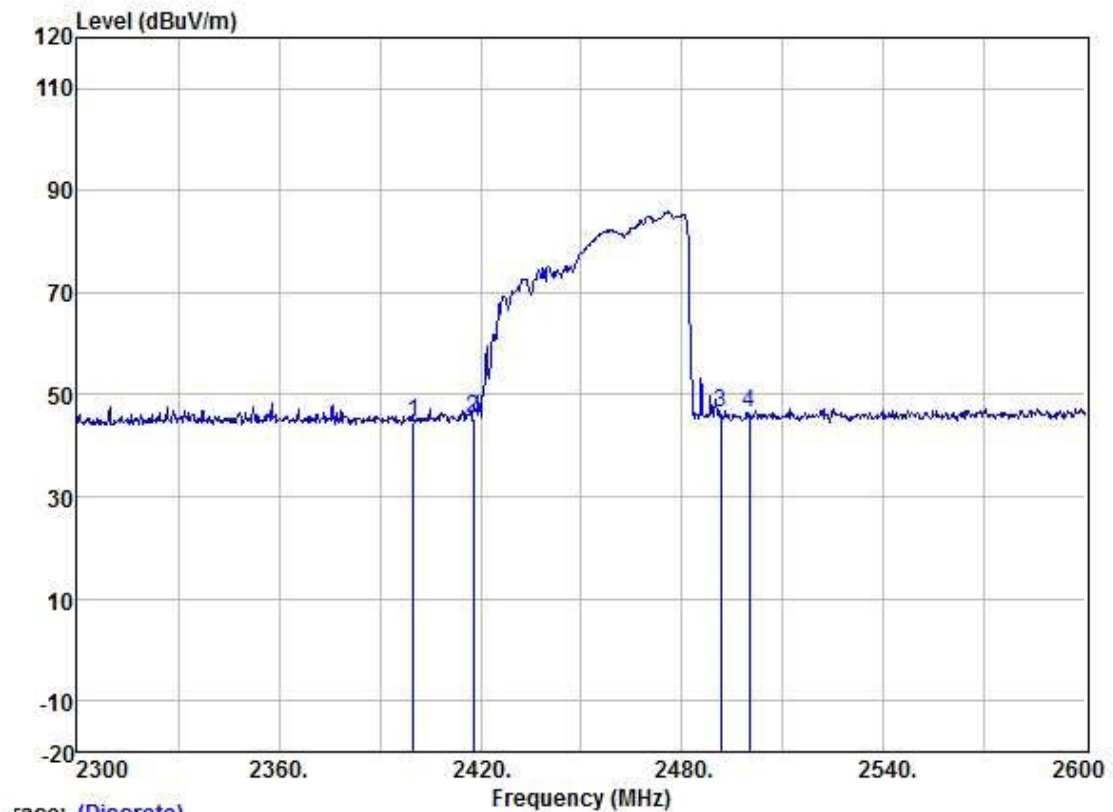
Polarization	ISM frequency(MHz)	Tolerance(MHz)	Measurement Data(MHz)
Horizontal	2450	±50	2418-2491.4
Vertical	2450	±50	2415.8-2488.4



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Mode:a; Polarization:Horizontal



Trace: (Discrete)

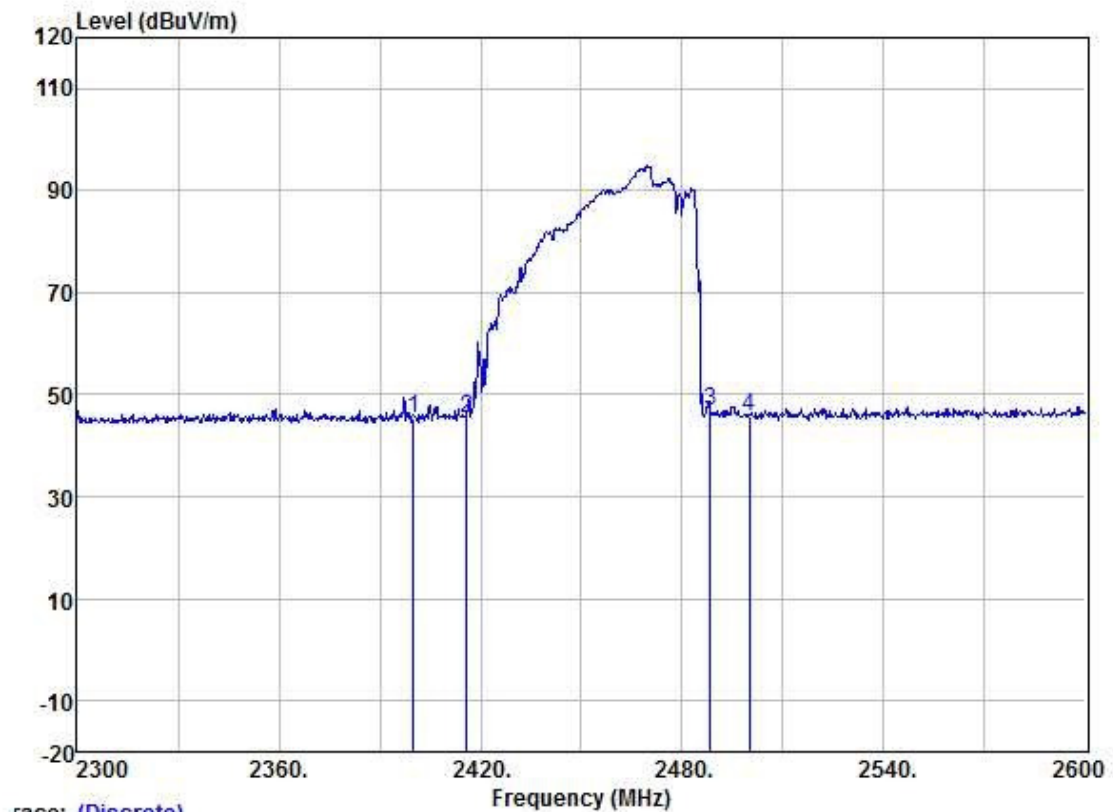
	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2400.000	13.37	26.45	4.86	0.00	44.68	-----	-----	HORIZONTAL Peak
2	2417.976	14.06	26.48	4.95	0.00	45.49	-----	-----	HORIZONTAL Peak
3	2491.403	14.92	26.59	5.09	0.00	46.60	-----	-----	HORIZONTAL Peak
4	2500.000	14.87	26.60	4.95	0.00	46.42	-----	-----	HORIZONTAL Peak



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Mode:a; Polarization:Vertical



	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2400.000	13.99	26.45	4.86	0.00	45.30	-----	-----	VERTICAL	Peak
2	2415.800	13.79	26.48	4.95	0.00	45.22	-----	-----	VERTICAL	Peak
3	2488.400	14.92	26.58	5.23	0.00	46.73	-----	-----	VERTICAL	Peak
4	2500.000	14.20	26.60	4.95	0.00	45.75	-----	-----	VERTICAL	Peak



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### 6.3 RF Output Power Measurement

Test Requirement: 47 CFR Part 18  
Test Method: FCC OST/MP-5:1986

#### 6.3.1 E.U.T. Operation

Operating Environment:  
Temperature: 23.7 °C Humidity: 54.9 % RH Atmospheric Pressure: 1020 mbar  
Test mode a: Test the EUT in microwave mode with maximum power.

#### 6.3.2 Measurement Data

Mass of water (g)	Mass of the container (g)	Ambient temperature (°C)	Initial temperature (°C)	Final temperature (°C)	Heating time(S)	Power output (watts)
1000	368	19.6	19.3	46.8	125	968.0

Formula :

$$P = \frac{4,187 \cdot m_w (T_2 - T_1) + 0,55 \cdot m_c (T_2 - T_0)}{t}$$

**NOTE :**

**P** is the microwave power output, in watts  
**m<sub>w</sub>** is the mass of the water, in grams  
**m<sub>c</sub>** is the mass of the container, in grams  
**T<sub>0</sub>** is the ambient temperature, in degrees Celsius  
**T<sub>1</sub>** is the initial temperature of the water, in degrees Celsius  
**T<sub>2</sub>** is the final temperature of the water, in degrees Celsius  
**t** is the heating time, in seconds, excluding the magnetron filament heating-up time.





#### 6.4 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 18  
Test Method: FCC OST/MP-5:1986  
Frequency Range: 30MHz to 1GHz  
Measurement Distance: 3m  
Detector: Peak for pre-scan, Average for the final result  
( 100 kHz Resolution Bandwidth for 30MHz to 1,000MHz)  
Limit: (a) ISM equipment operation on a frequency specified in §18.301 is permitted unlimited radiated energy in the band specified for that frequency.  
(b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

RF Power generated by equipment(watts)	Field strength Limit(uV/m) @300m
Below 500	25
500 or more	25*SQRT(power/500)

Power =968.0 W according to cluse6.3.2

Limit= $20\lg(25*\sqrt{\text{power}/500})+20\lg(300/3)=30.83+40=70.83\text{dBuV/m}$   
@ 3m distance.

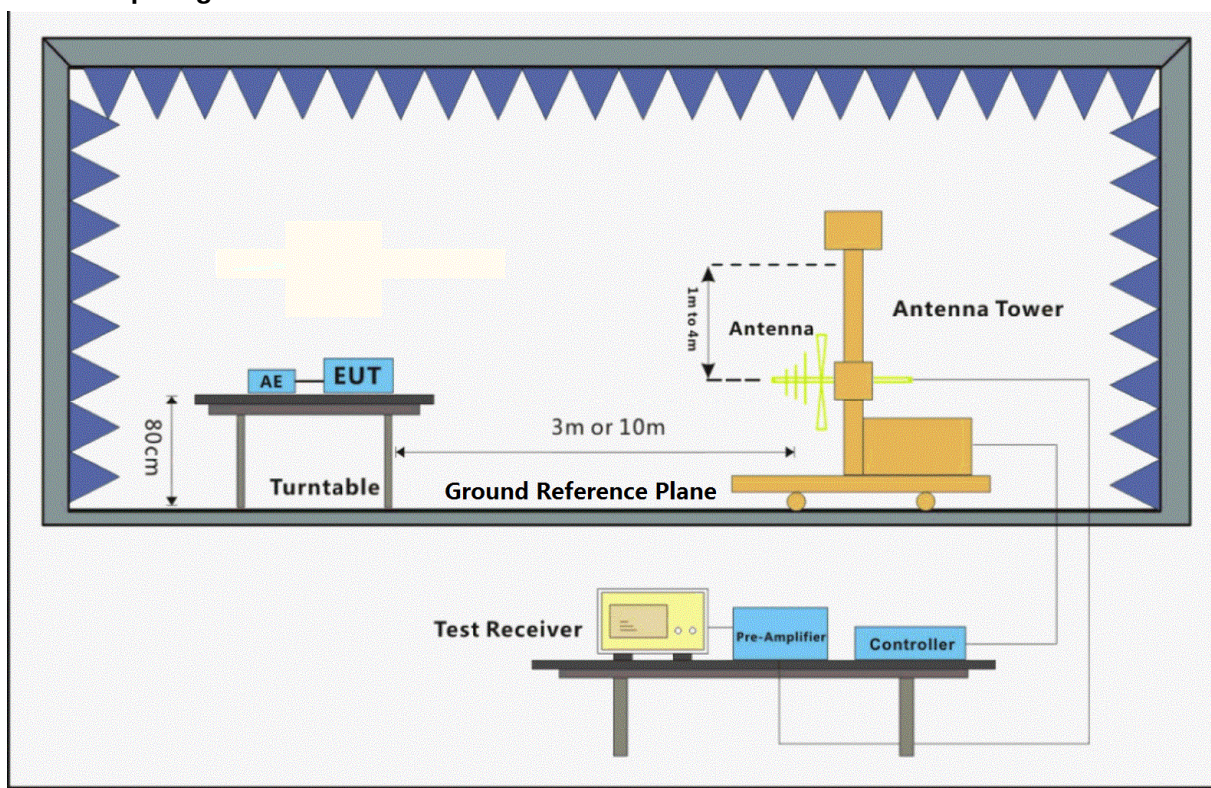
##### 6.4.1 E.U.T. Operation

Operating Environment:  
Temperature: 22.8 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar  
Test mode a: Test the EUT in microwave mode with maximum power.



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#### 6.4.2 Test Setup Diagram



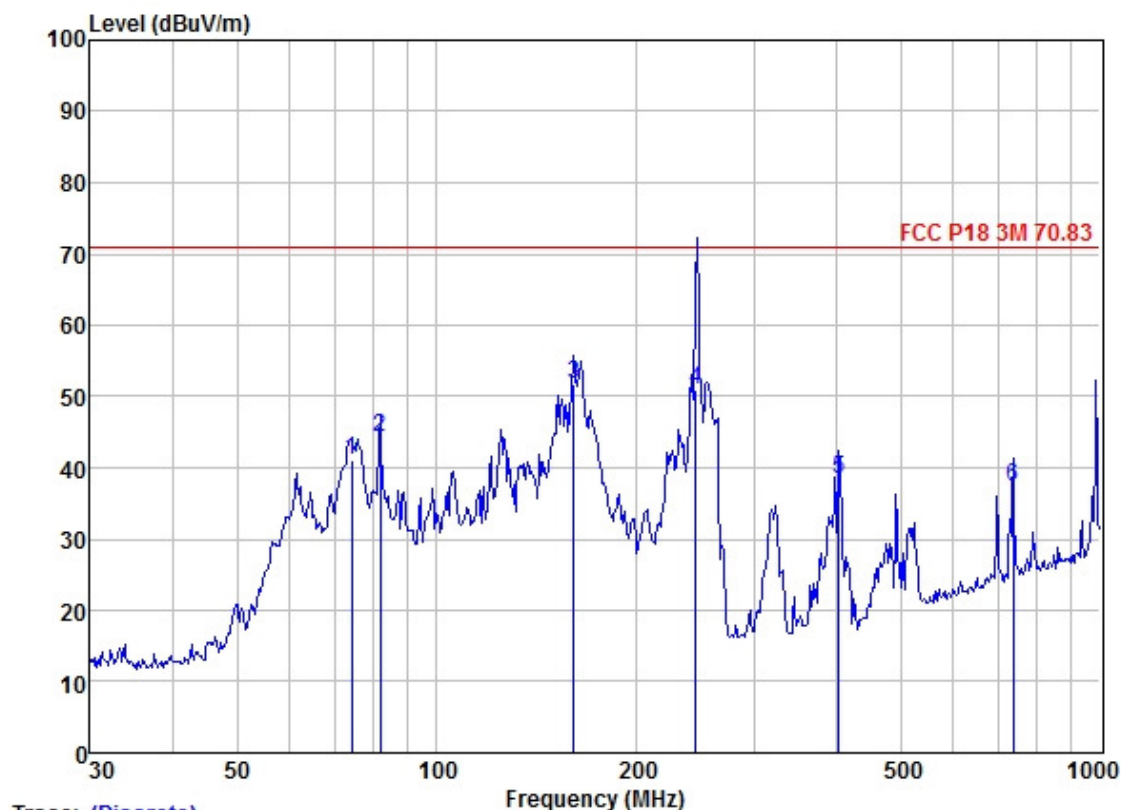
#### 6.4.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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



Mode:a; Polarization:Horizontal

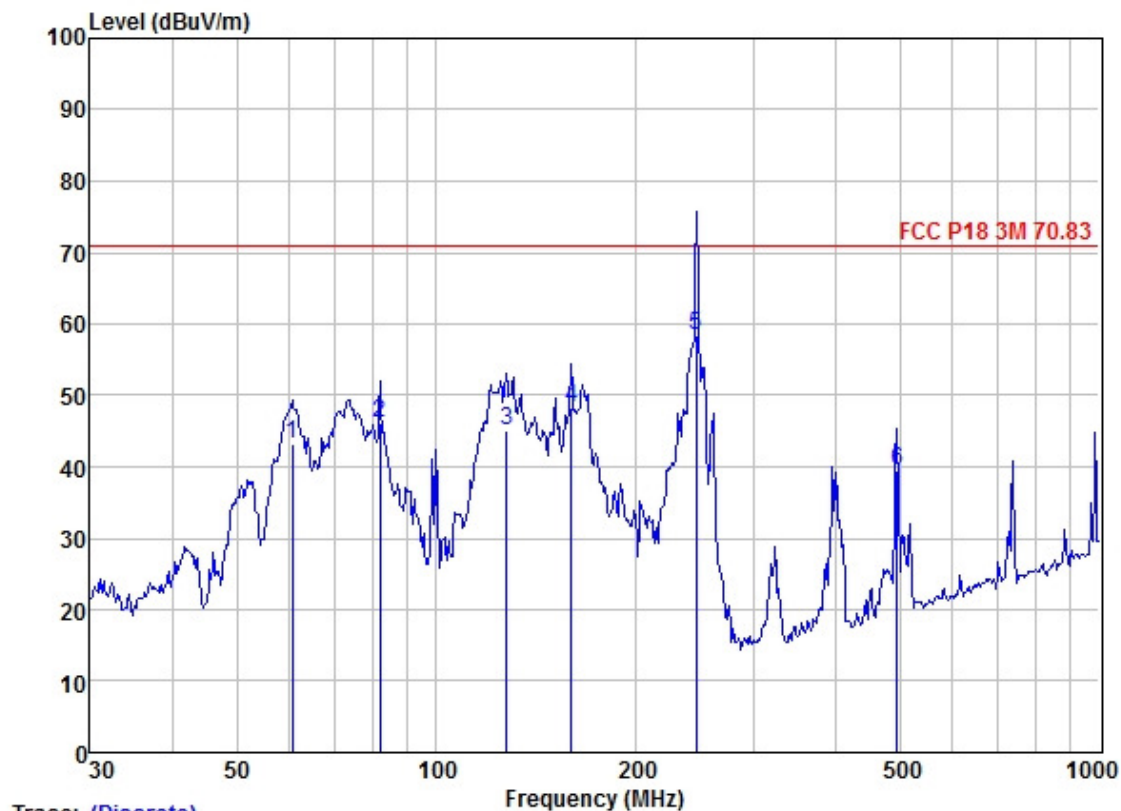


Trace: (Discrete)

		ReadAntenna	Cable	Preamp		Limit	Over			
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	74.396	55.18	11.42	0.90	26.43	41.07	70.83	-29.76	HORIZONTAL	Average
2	82.071	60.40	9.26	1.00	26.42	44.24	70.83	-26.59	HORIZONTAL	Average
3	160.909	63.29	13.66	1.34	26.44	51.85	70.83	-18.98	HORIZONTAL	Average
4	245.850	63.45	12.48	1.64	26.56	51.01	70.83	-19.82	HORIZONTAL	Average
5	403.250	47.14	16.33	2.22	27.36	38.33	70.83	-32.50	HORIZONTAL	Average
6	739.661	40.05	21.71	2.90	27.31	37.35	70.83	-33.48	HORIZONTAL	Average



Mode:a; Polarization:Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	60.492	54.84	14.06	0.80	26.48	43.22	70.83	-27.61	VERTICAL	Average
2	82.071	62.27	9.26	1.00	26.42	46.11	70.83	-24.72	VERTICAL	Average
3	127.665	58.59	11.71	1.22	26.41	45.11	70.83	-25.72	VERTICAL	Average
4	159.784	59.72	13.70	1.33	26.44	48.31	70.83	-22.52	VERTICAL	Average
5	246.110	70.89	12.48	1.64	26.56	58.45	70.83	-12.38	VERTICAL	Average
6	495.934	46.38	18.07	2.40	27.47	39.38	70.83	-31.45	VERTICAL	Average



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## 6.5 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 18  
Test Method: FCC OST/MP-5:1986  
Frequency Range: Above 1GHz  
Measurement Distance: 3m  
Detector: Peak for pre-scan, Average for the final result  
(1 MHz Resolution Bandwidth for 1,000MHz to 25,000MHz)

Limit:

(a) ISM equipment operation on a frequency specified in §18.301 is permitted unlimited radiated energy in the band specified for that frequency.

(b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

RF Power generated by equipment(watts)	Field strength Limit(uV/m) @300m
Below 500	25
500 or more	$25 \cdot \text{SQRT}(\text{power}/500)$

Power =968.0 W according to cluse6.3.2

Limit= $20\lg(25 \cdot \text{SQRT}(\text{power}/500)) + 20\lg(300/3) = 30.83 + 40 = 70.83\text{dBuV/m}$   
@ 3m distance.

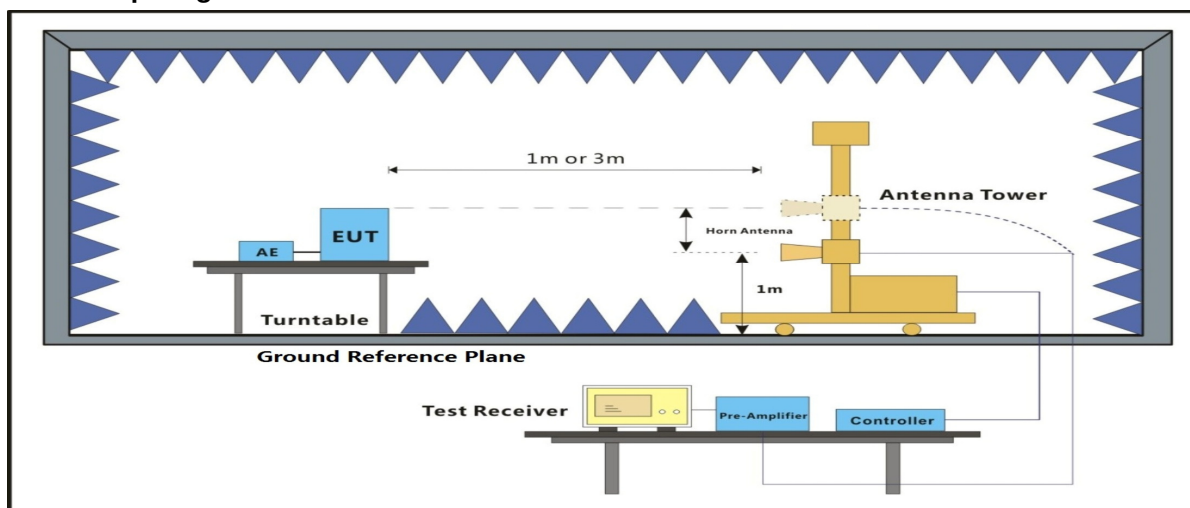
### 6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22.8 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Test the EUT in microwave mode with maximum power.

### 6.5.2 Test Setup Diagram



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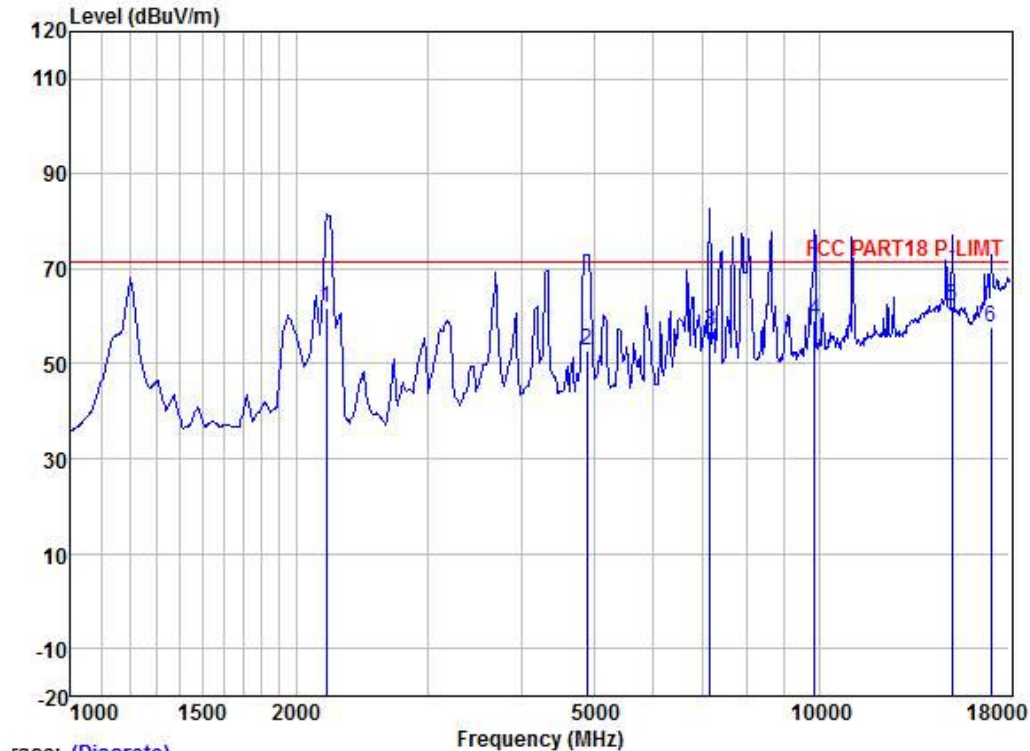


### 6.5.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

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

Mode:a; Polarization:Horizontal



Trace: (Discrete)

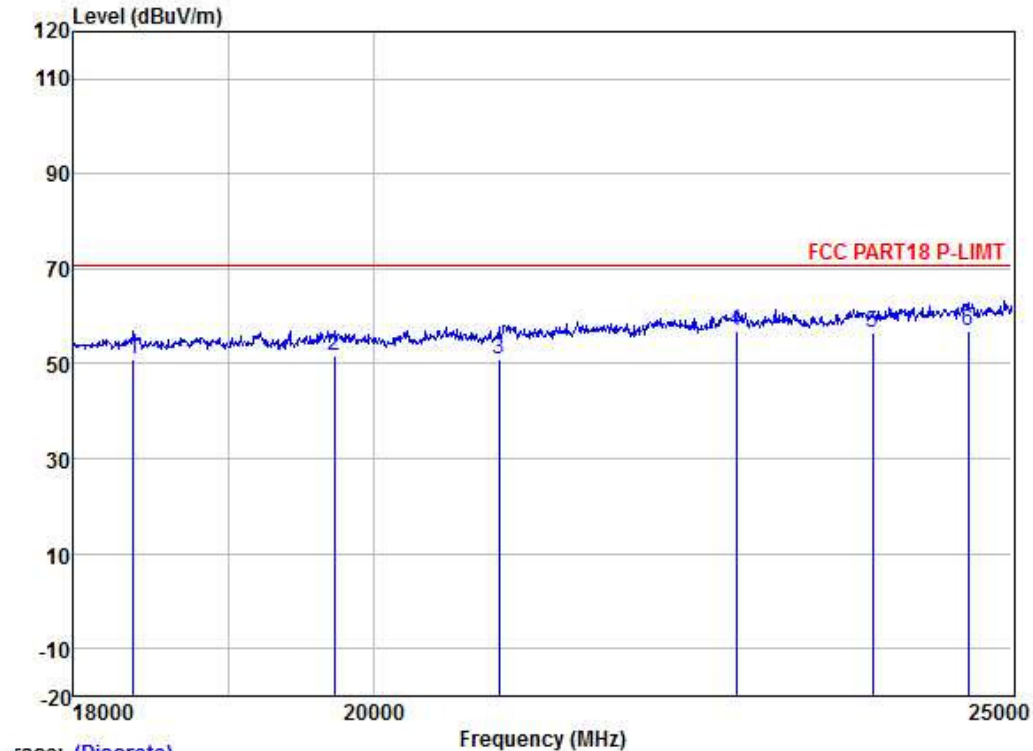
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2194.998	65.97	25.69	7.40	37.47	61.59	70.83	-9.24	HORIZONTAL Average
2	4893.578	51.80	30.95	6.86	36.95	52.66	70.83	-18.17	HORIZONTAL Average
3	7159.119	51.14	35.36	7.33	36.93	56.90	70.83	-13.93	HORIZONTAL Average
4	9866.789	49.72	37.86	8.52	37.09	59.01	70.83	-11.82	HORIZONTAL Average
5	15046.850	44.59	40.09	13.13	35.78	62.03	70.83	-8.80	HORIZONTAL Average
6	16988.970	35.46	41.80	16.47	35.90	57.83	70.83	-13.00	HORIZONTAL Average



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Mode:a; Polarization:Horizontal



Trace: (Discrete)

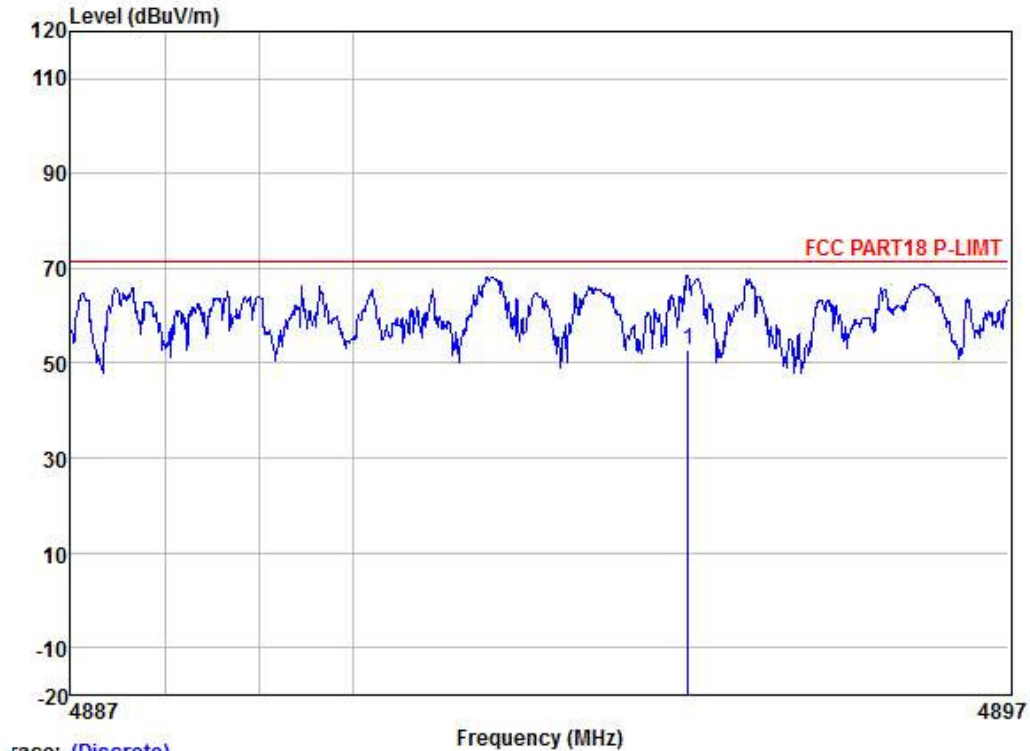
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	18382.440	32.14	37.93	16.62	35.60	51.09	70.83	-19.74	HORIZONTAL	Average
2	19721.230	32.21	38.00	17.22	35.60	51.83	70.83	-19.00	HORIZONTAL	Average
3	20888.190	30.41	37.91	17.95	35.47	50.80	70.83	-20.03	HORIZONTAL	Average
4	22698.430	34.20	39.28	19.07	35.54	57.01	70.83	-13.82	HORIZONTAL	Average
5	23805.790	32.86	39.60	20.25	36.06	56.65	70.83	-14.18	HORIZONTAL	Average
6	24616.970	32.67	39.40	20.95	36.13	56.89	70.83	-13.94	HORIZONTAL	Average



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Mode:a; Polarization:Horizontal



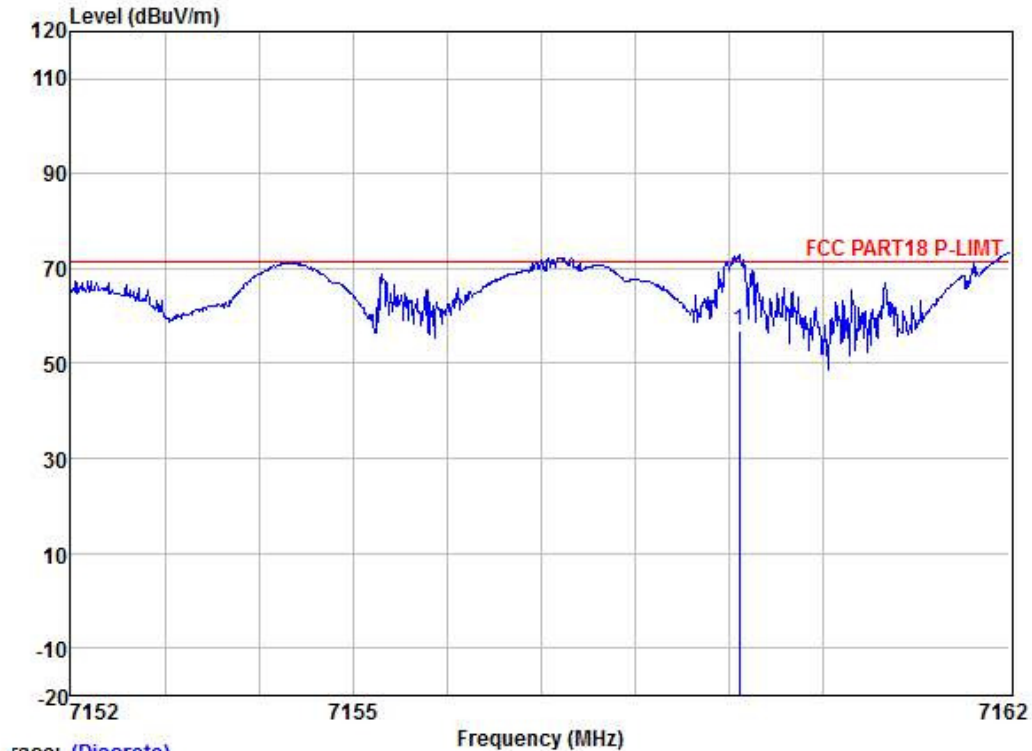
Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	4893.578	51.80	30.95	6.86	36.95	52.66	70.83	-18.17	HORIZONTAL Average





Mode:a; Polarization:Horizontal

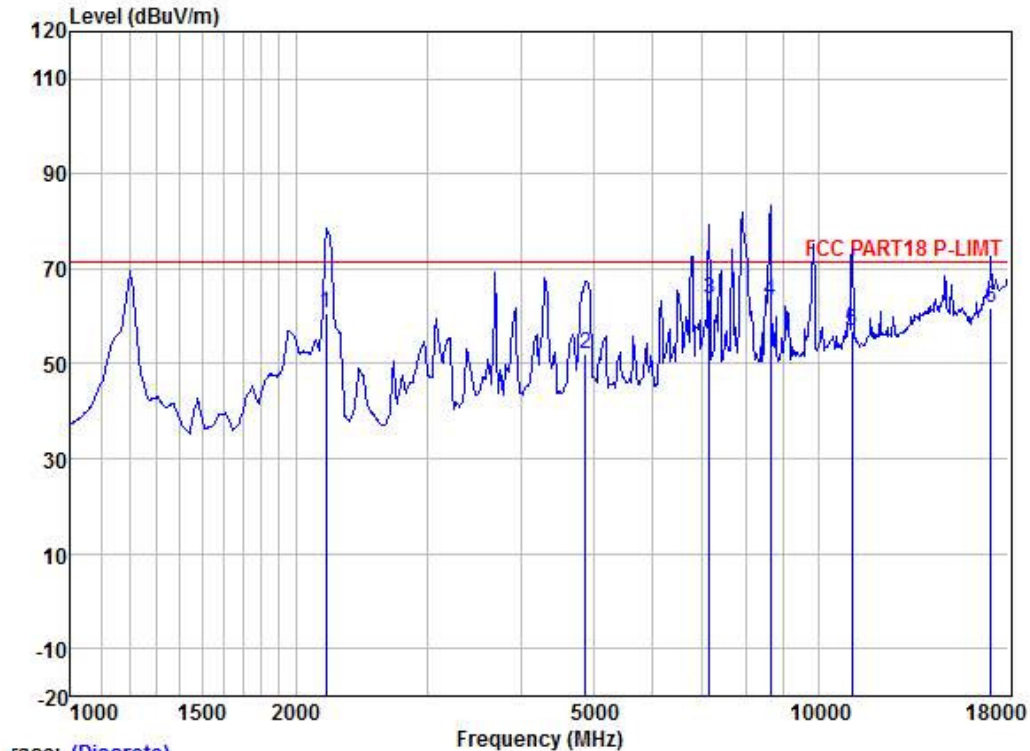


Trace: (Discrete)

	ReadAntenna	Cable	Preamp		Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 7159.119	51.15	35.36	7.33	36.93	56.91	70.83	-13.92	HORIZONTAL Peak



Mode:a; Polarization:Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2194.998	64.97	25.69	7.40	37.47	60.59	70.83	-10.24	VERTICAL	Average
2	4888.399	51.02	30.95	6.86	36.95	51.88	70.83	-18.95	VERTICAL	Average
3	7153.329	57.82	35.36	7.33	36.93	63.58	70.83	-7.25	VERTICAL	Average
4	8638.399	56.12	36.20	7.96	36.95	63.33	70.83	-7.50	VERTICAL	Average
5	11108.160	44.23	39.86	9.98	37.16	56.91	70.83	-13.92	VERTICAL	Average
6	17038.150	38.90	41.87	16.71	35.87	61.61	70.83	-9.22	VERTICAL	Average

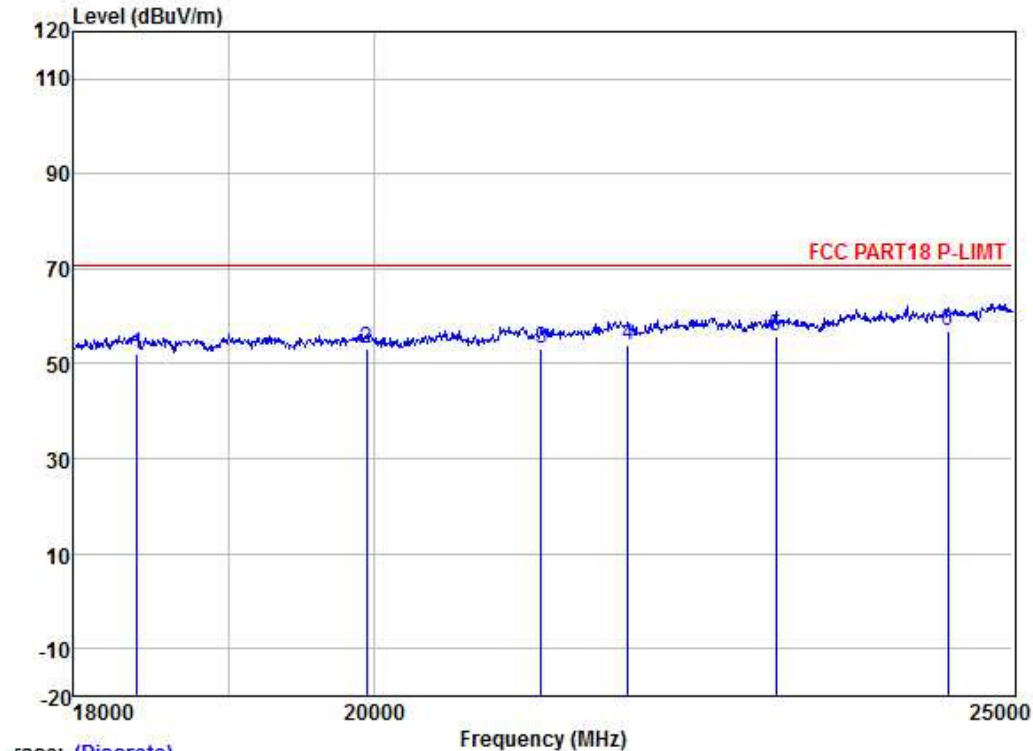


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Mode:a; Polarization:Vertical



Trace: (Discrete)

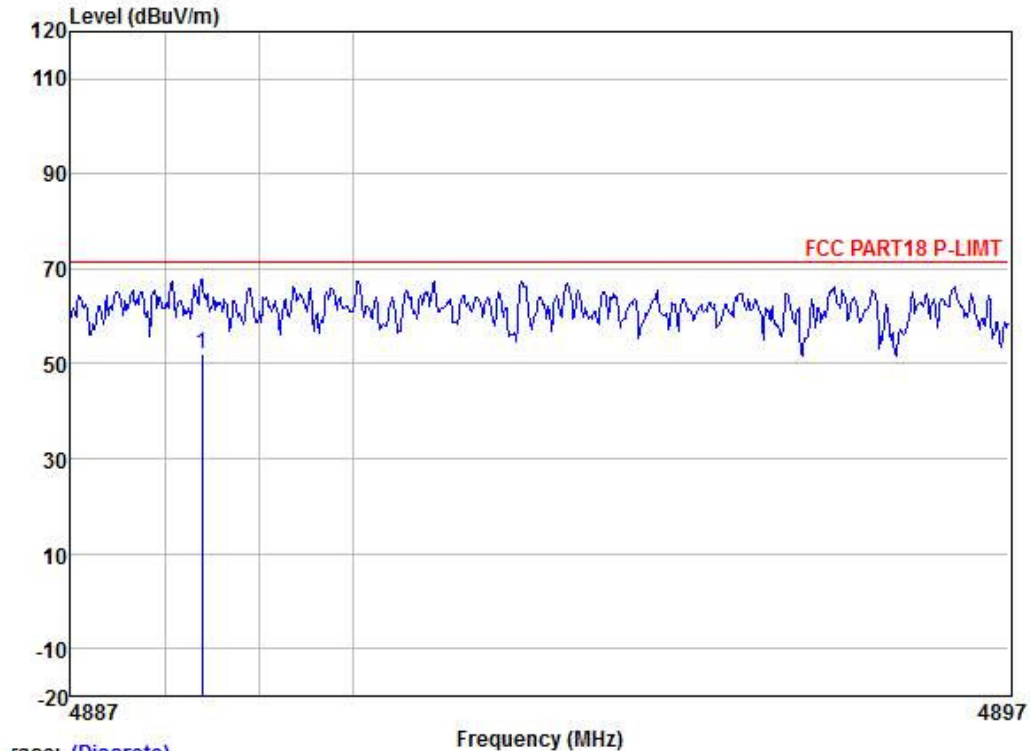
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	18400.570	33.05	37.93	16.64	35.60	52.02	70.83	-18.81	VERTICAL	Average
2	19942.740	33.56	38.00	17.29	35.60	53.25	70.83	-17.58	VERTICAL	Average
3	21199.270	32.51	37.95	18.08	35.41	53.13	70.83	-17.70	VERTICAL	Average
4	21849.740	32.34	38.17	18.55	35.31	53.75	70.83	-17.08	VERTICAL	Average
5	23013.770	32.78	39.60	19.21	35.75	55.84	70.83	-14.99	VERTICAL	Average
6	24439.710	32.80	39.47	20.72	36.12	56.87	70.83	-13.96	VERTICAL	Average



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Mode:a; Polarization:Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	4888.399	51.02	30.95	6.86	36.95	51.88	70.83	-18.95	VERTICAL
									Average

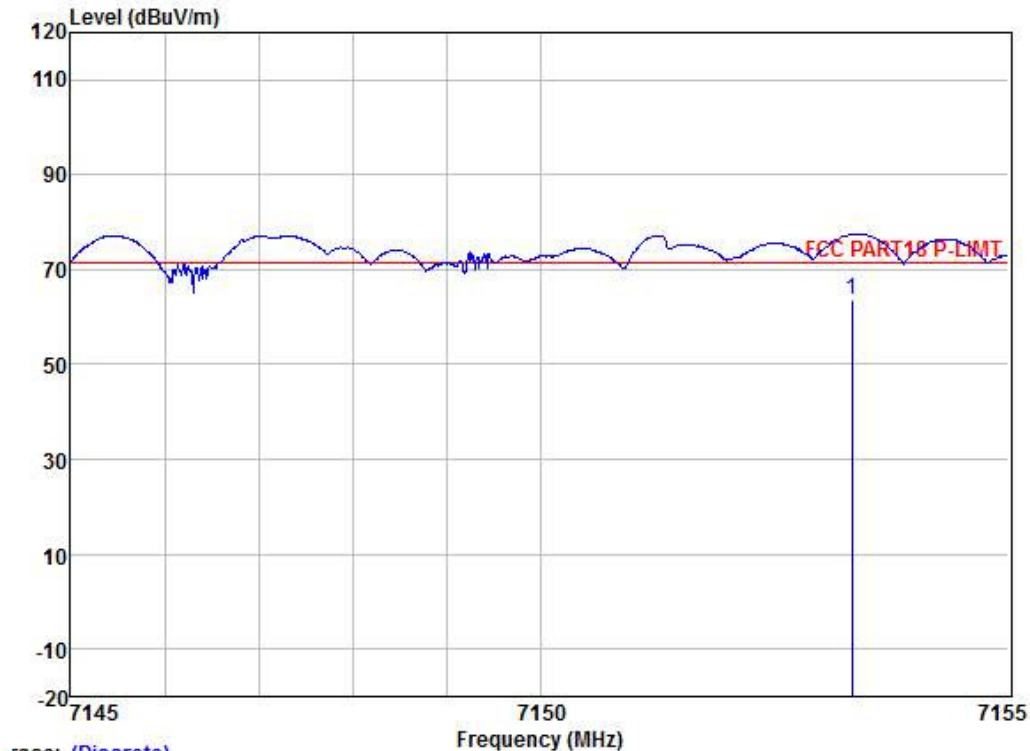


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Mode:a; Polarization:Vertical



Trace: (Discrete)

	ReadAntenna	Cable	Preamp		Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 7153.329	57.83	35.36	7.33	36.93	63.59	70.83	-7.24	VERTICAL	Average





## 6.6 Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)

Test Requirement: 47 CFR Part 18  
Test Method: FCC OST/MP-5:1986  
Frequency Range: 9kHz to 30MHz  
Measurement Distance: 3m  
Detector: Peak for pre-scan, Average for the final result  
(200 Hz Resolution Bandwidth for 9 kHz to 150 kHz  
9 kHz Resolution Bandwidth for 150 kHz to 30 MHz )  
Limit: (a) ISM equipment operation on a frequency specified in §18.301 is permitted unlimited radiated energy in the band specified for that frequency.  
(b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

RF Power generated by equipment(watts)	Field strength Limit(uV/m) @300m
Below 500	25
500 or more	$25 \times \sqrt{\text{power}/500}$

Power =968.0 W according to cluse6.3.2

Limit= $20\lg(25 \times \sqrt{\text{power}/500}) + 20\lg(300/3) = 30.83 + 40 = 70.83 \text{ dBuV/m}$   
@ 3m distance.

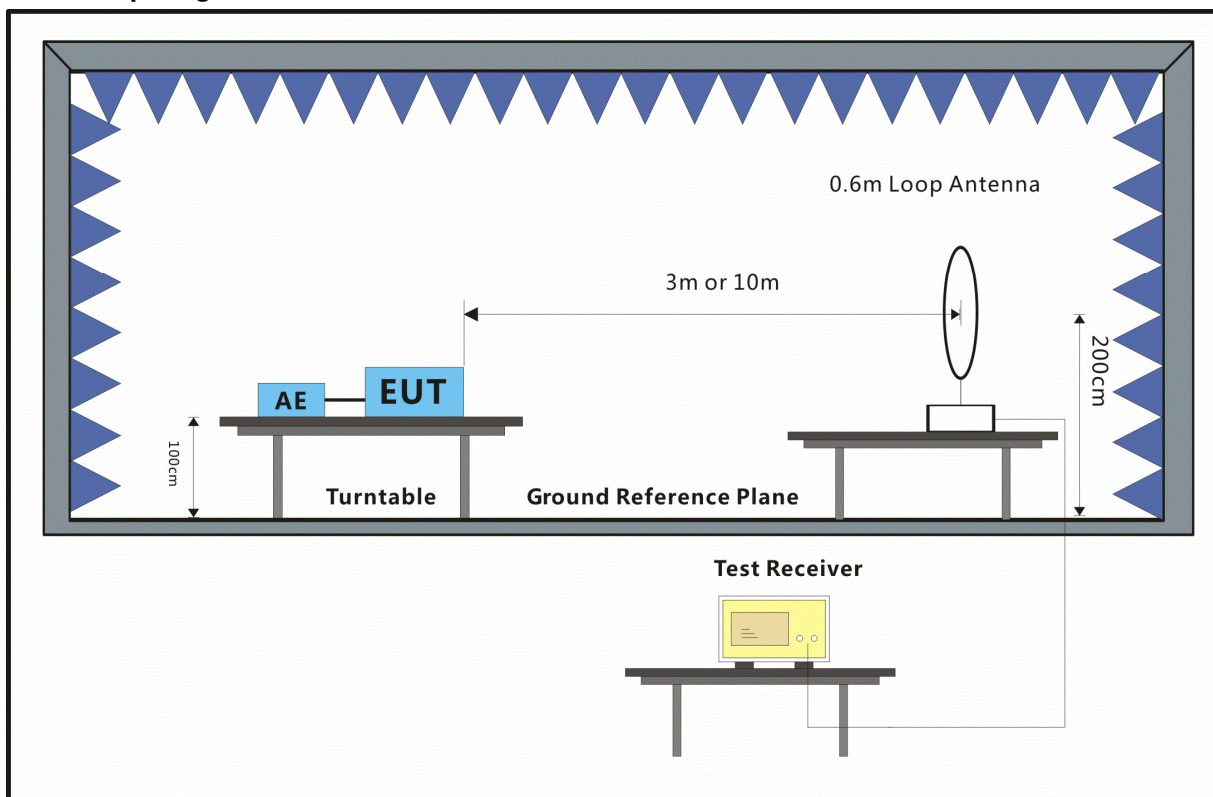
### 6.6.1 E.U.T. Operation

Operating Environment:  
Temperature: 22.8 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar  
Test mode a: Test the EUT in microwave mode with maximum power.



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## 6.6.2 Test Setup Diagram



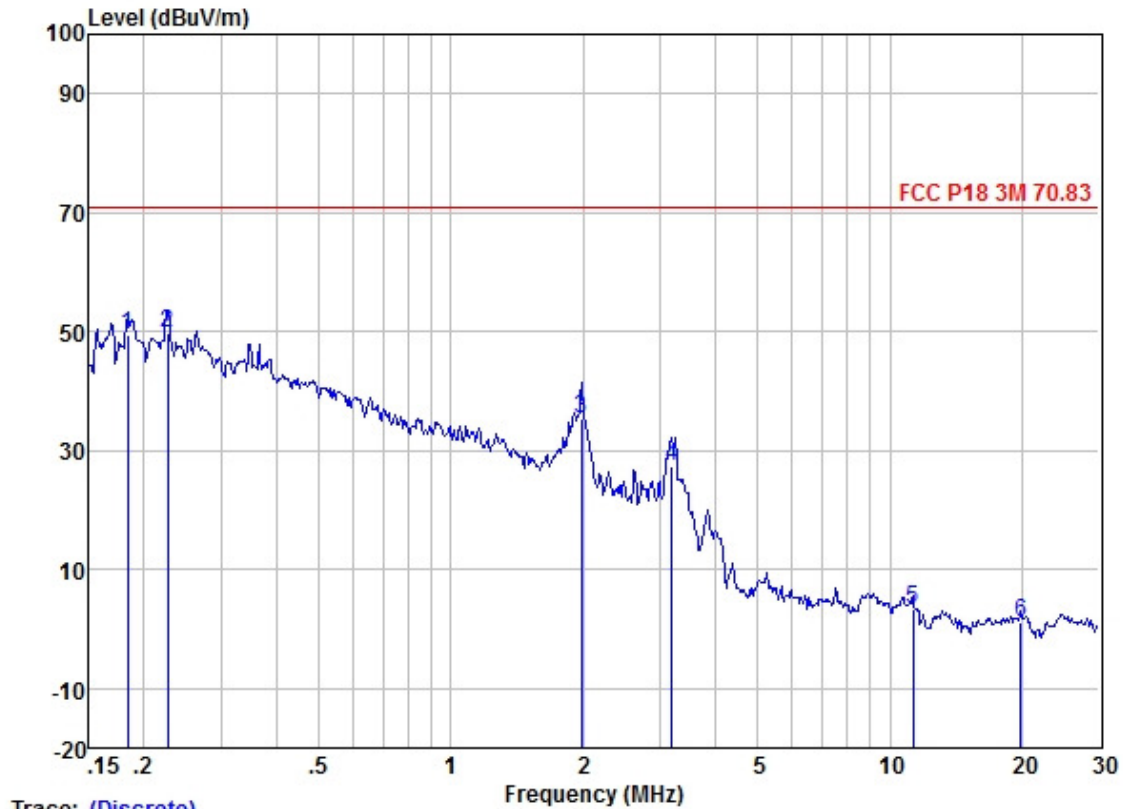
## 6.6.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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



Mode:a; Polarization:Horizontal

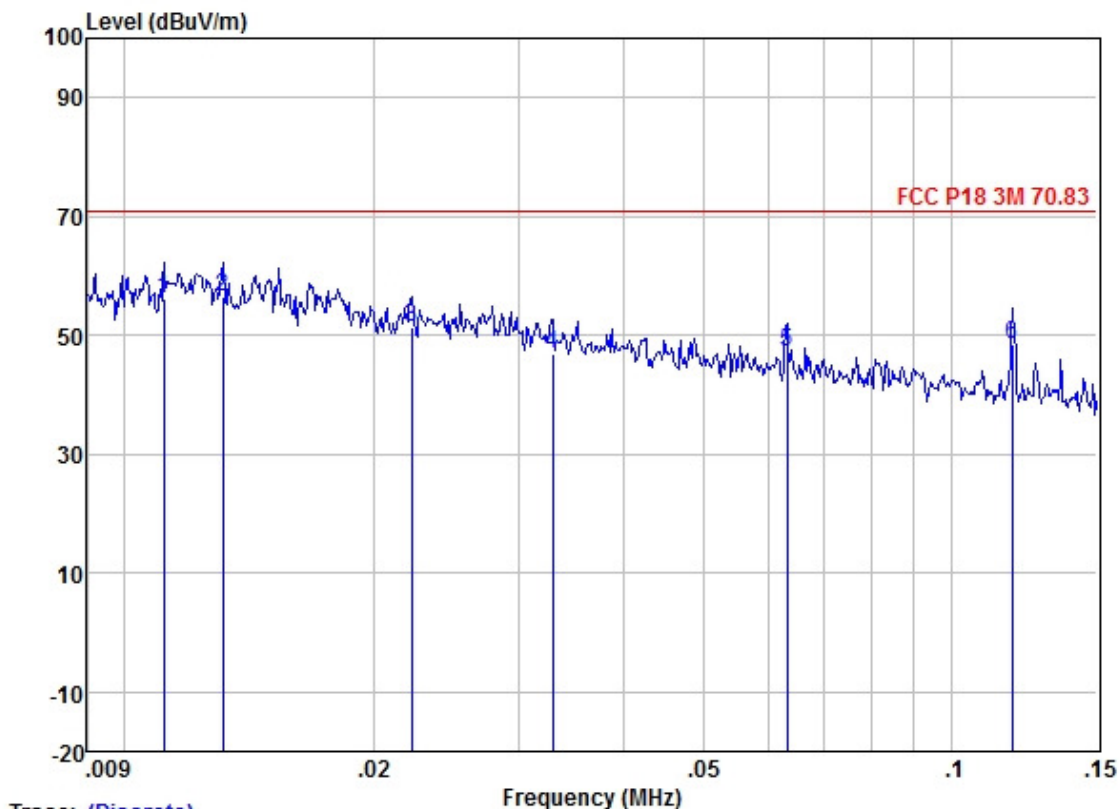


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.183	66.66	12.37	0.00	29.49	49.54	70.83	-21.29	HORIZONTAL Average
2	0.227	66.79	12.31	0.06	29.49	49.67	70.83	-21.16	HORIZONTAL Average
3	1.980	52.07	12.60	0.10	29.29	35.48	70.83	-35.35	HORIZONTAL Average
4	3.190	44.40	11.95	0.20	29.26	27.29	70.83	-43.54	HORIZONTAL Average
5	11.317	21.55	10.66	0.32	29.06	3.47	70.83	-67.36	HORIZONTAL Average
6	19.845	19.15	10.30	0.50	28.94	1.01	70.83	-69.82	HORIZONTAL Average



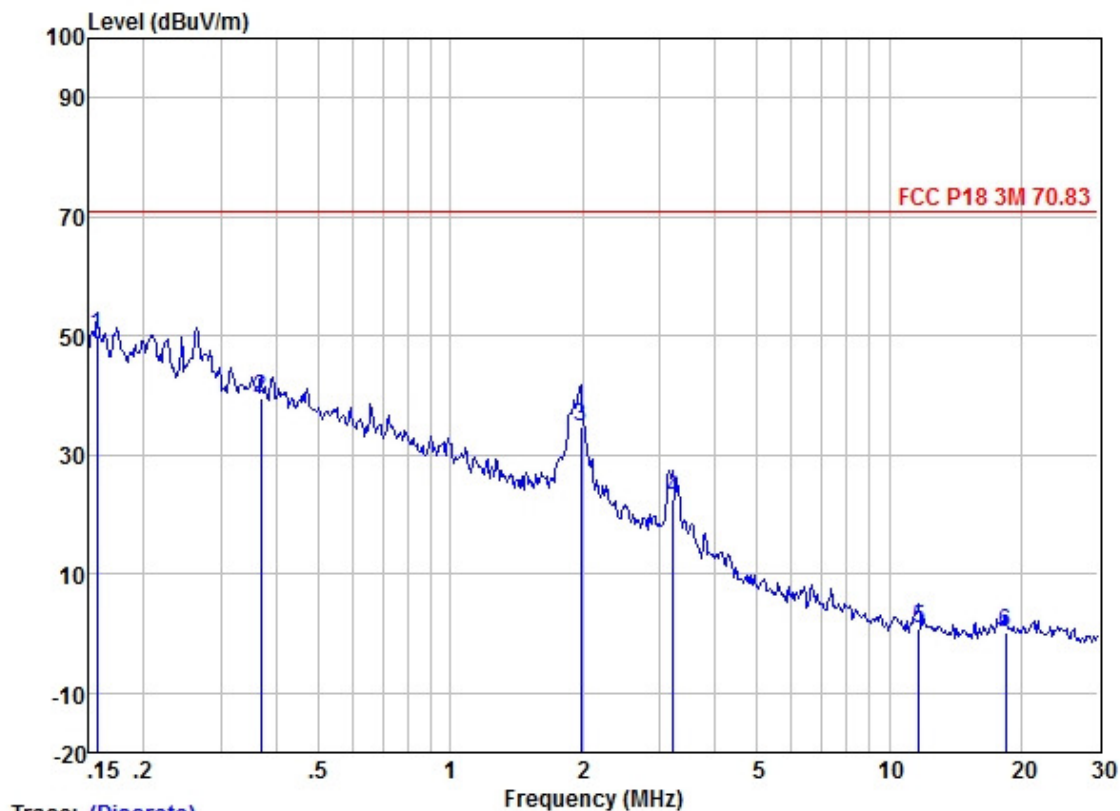
Mode:a; Polarization:Horizontal



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	0.011	64.60	21.14	0.00	29.50	56.24	70.83	-14.59	HORIZONTAL Average
2	0.013	65.87	20.02	0.00	29.50	56.39	70.83	-14.44	HORIZONTAL Average
3	0.022	64.99	15.98	0.00	29.48	51.49	70.83	-19.34	HORIZONTAL Average
4	0.033	62.32	13.89	0.00	29.45	46.76	70.83	-24.07	HORIZONTAL Average
5	0.063	64.14	12.44	0.00	29.43	47.15	70.83	-23.68	HORIZONTAL Average
6	0.118	65.57	12.40	0.00	29.43	48.54	70.83	-22.29	HORIZONTAL Average

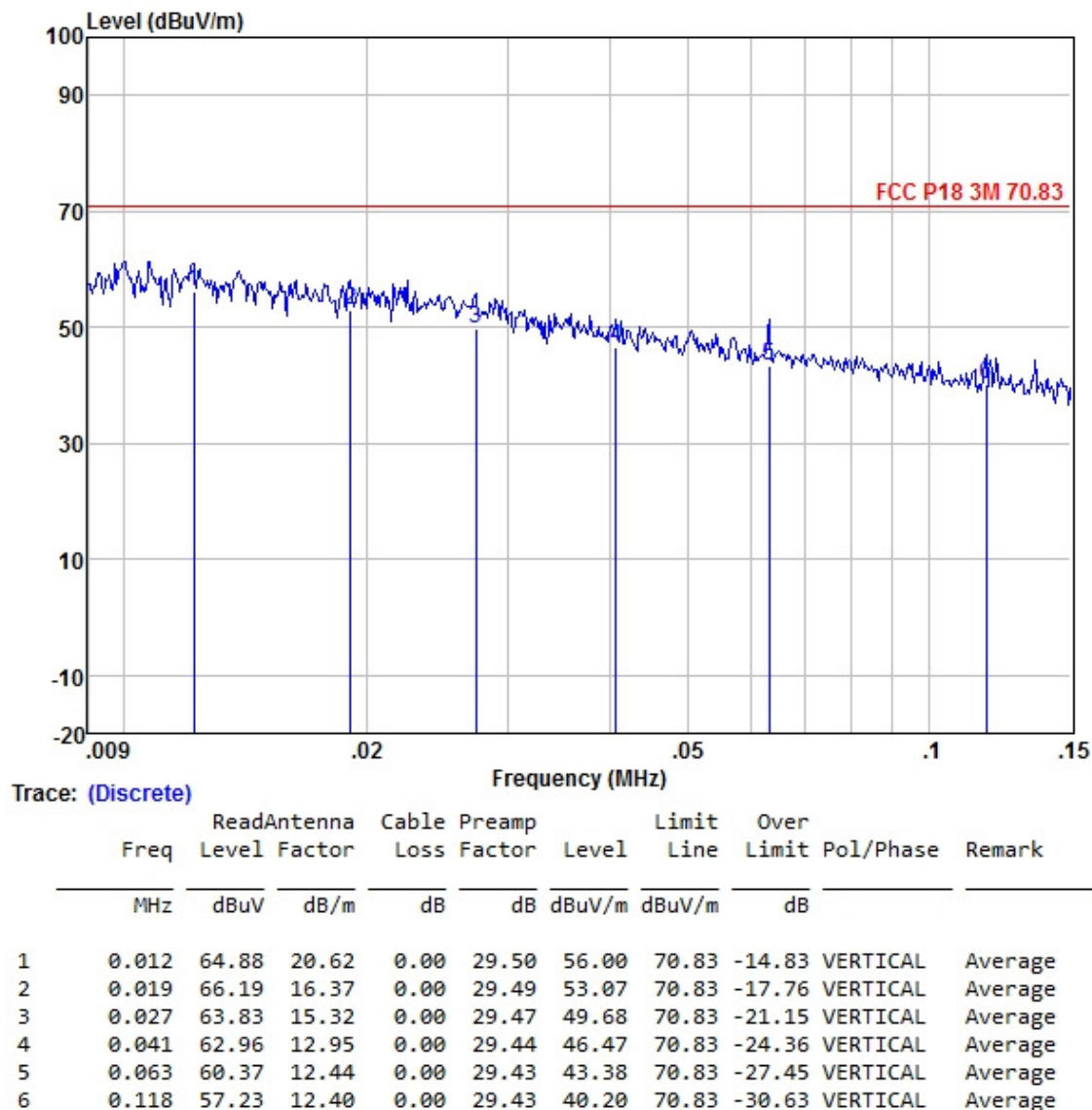
Mode:a; Polarization:Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.156	67.23	12.40	0.00	29.48	50.15	70.83	-20.68	VERTICAL	Average
2	0.369	56.53	12.17	0.10	29.38	39.42	70.83	-31.41	VERTICAL	Average
3	1.980	51.20	12.60	0.10	29.29	34.61	70.83	-36.22	VERTICAL	Average
4	3.224	39.61	11.94	0.20	29.26	22.49	70.83	-48.34	VERTICAL	Average
5	11.683	18.94	10.64	0.37	29.06	0.89	70.83	-69.94	VERTICAL	Average
6	18.426	18.37	10.34	0.45	28.96	0.20	70.83	-70.63	VERTICAL	Average

Mode:a; Polarization:Vertical



--End of Report--



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