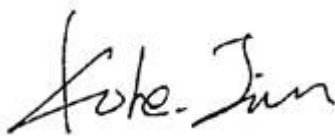


## TEST REPORT

**Application No.:** GZEM2005012238HS  
**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:** 1, Guangdong Galanz Microwave Electrical Appliances Manufacturing Co., Ltd.  
 2, Guangdong Galanz Microwave Oven and Electrical Appliances Manufacturing Co., Ltd.  
**Address of Factory:** 1, 3 Xingpu Avenue, Huangpu, Zhongshan, Guangdong, China.  
 2, 25 Ronggui Nan Road, Shunde, Foshan, Guangdong, China  
**Equipment Under Test (EUT):**  
**FCC ID:** UHW11030002  
**EUT Name:** Microwave Oven  
**Model No.:** P110J30AP-F1, P110J30(X)-Y Series  
 P: with microwave function only  
 110: denote the output power is 1100W  
 J30: denote different cavity in 30 liters.  
 Variable (X) may be  
 L, P, SL, SP, TL, TP, AL, AP, ASL, ASP, ATL, ATP, EL, EP, ESL, ESP, ETL, ETP, ML, MP, MSL, MSP, MTL, MTP, MYL.  
 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. ▣  
 ▣ 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:** 2020-05-12  
**Date of Test:** 2020-05-15 to 2020-05-22  
**Date of Issue:** 2020-07-14

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

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




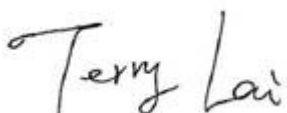
Kobe Jian  
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-07-14		Original

Authorized for issue by:			
Tested By	 Damon_Guan /Project Engineer		2020-05-15 to 2020-05-22
			Date
Checked By	 Terry_Lai /Reviewer		2020-07-14
			Date



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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	18.307	Pass
Output Power Measurement	47 CFR Part 18	FCC OST/MP-5:1986	FCC OST/MP-5:1986 Clause 4.3	Pass
Operating Frequency Measurement	47 CFR Part 18	FCC OST/MP-5:1986	18.301	Pass
Radiation Hazard Test	47 CFR Part 18	FCC OST/MP-5:1986	1 mW/cm <sup>2</sup>	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 18	FCC OST/MP-5:1986	18.305	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 18	FCC OST/MP-5:1986	18.305	Pass
Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)	47 CFR Part 18	FCC OST/MP-5:1986	18.305	Pass

### ✧ Declaration of EUT Family Grouping:

Model No.: P110J30AP-F1, P110J30(X)-Y Series

P: with microwave function only

110: denote the output power is 1100W

J30: denote different cavity in 30 liters.

Variable (X) may be

L, P, SL, SP, TL, TP, AL, AP, ASL, ASP, ATL, ATP, EL, EP, ESL, ESP, ETL, ETP, ML, MP, MSL, MSP, MTL, MTP, MYL.

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 appearance and model name.

Therefore only one model P110J30AP-F1 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 1.0m x 3 wires unscreened AC mains cable.

### 4.2 Description of Support Units

Load for microwave ovens for testing:

1100mL of water in the beaker for power output and frequency measurement.
One of 770 and the other of 330mL of water for second and third harmonic radiation measurement, just the worst case (770mL) was recorded in this report.
770mL 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 (9kHz-30MHz)
		±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-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

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

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

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

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

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

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

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

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

● **CBTL (Lab Code: TL129)**

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



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#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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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	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	N/A	N/A
Two-Line V-Netwok	Rohde & Schwarz	ENV216	EMC0118	2020-01-10	2021-01-09
LISN	Rohde & Schwarz	ENV216	EMC2135	2019-09-16	2020-09-15
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2019-11-18	2020-11-17
Coaxial Cable	HangTianXing	2m	EMC0107	2018-09-20	2020-09-19
Voltage Probe	SGS-EMC	N/A	EMC0106	2019-05-10	2021-05-09
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2020-04-19	2022-04-18
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A

Radiation hazard test					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Electric Field Probe(100kHz-3GHz)	WANDEL & GOLTERMANN	EMR-20	EMC0907	2020-05-29	2021-05-28

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 25MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Bi-log Type Antenna	Schaffner Chase	CBL6143	EMC0519	2017-06-01	2020-05-31
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Horn Antenna	SCHWARZBECKME SS-ELEKTRONIK	BBHA 9120D	EMC2016	2019-09-25	2022-09-24
Horn Antenna 1GHz-18GHz	Rohde & Schwarz	HF906	EMC0518	2018-09-02	2021-09-01



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1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2021-03-04
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

## 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	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

## General used equipment

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2019-07-16	2020-07-15
DMM	Fluke	73	EMC0007	2019-07-16	2020-07-15
AC Power Source	California	50001iX	EMC0608	2020-03-27	2021-03-26
Power Analyzer	California	PACS	EMC0607	2020-03-27	2021-03-26
Test Software CTS4	California	Ver 4.14.0	GZE100-66	N/A	N/A



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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: 21.8 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

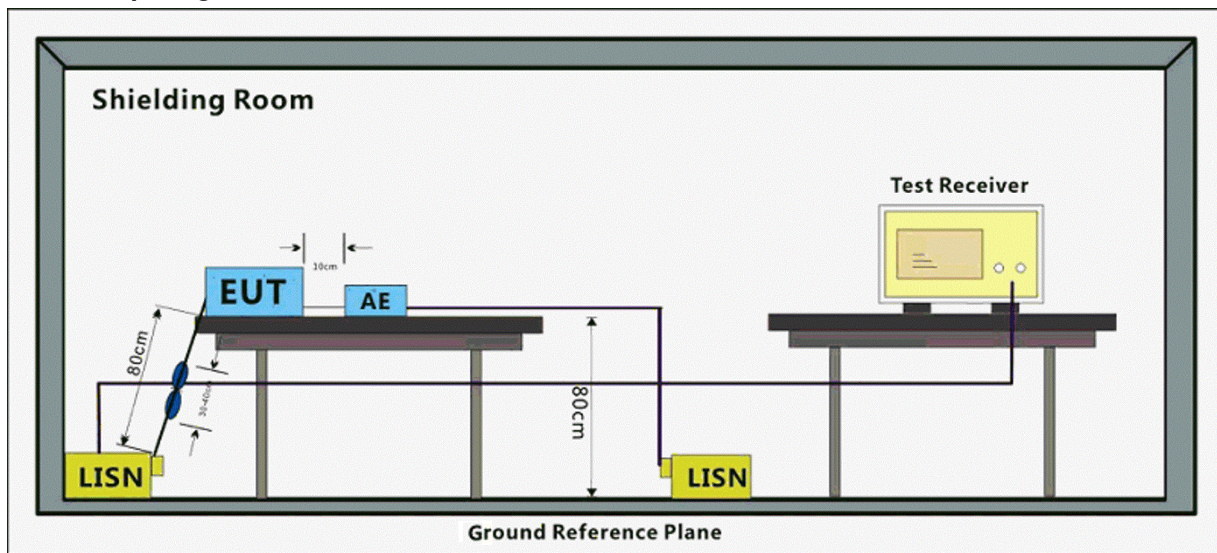
Pretest these modes to find the worst case:

- a: Test the EUT in microwave mode with maximum power.
- b: Test the EUT in microwave mode with middle power.
- c: Test the EUT in microwave mode with lowest power.

The worst case for final test:

- 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

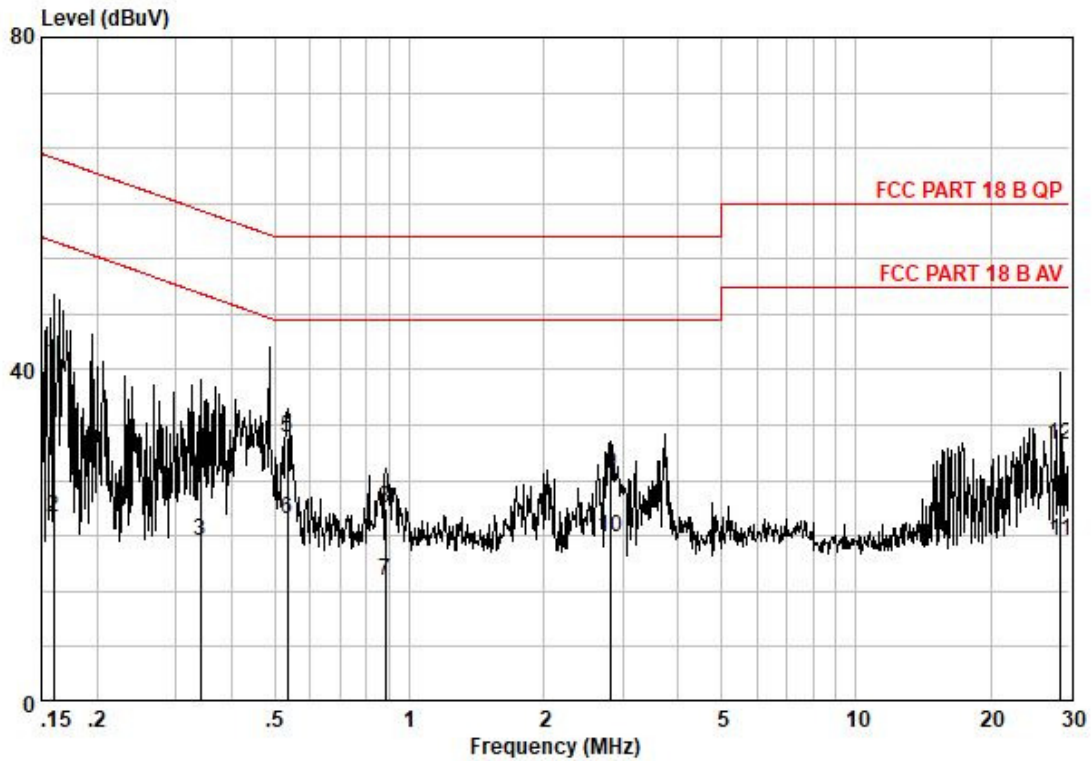


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Mode:a; Line:Live Line

Pol :LIVE  
No :  
Model :

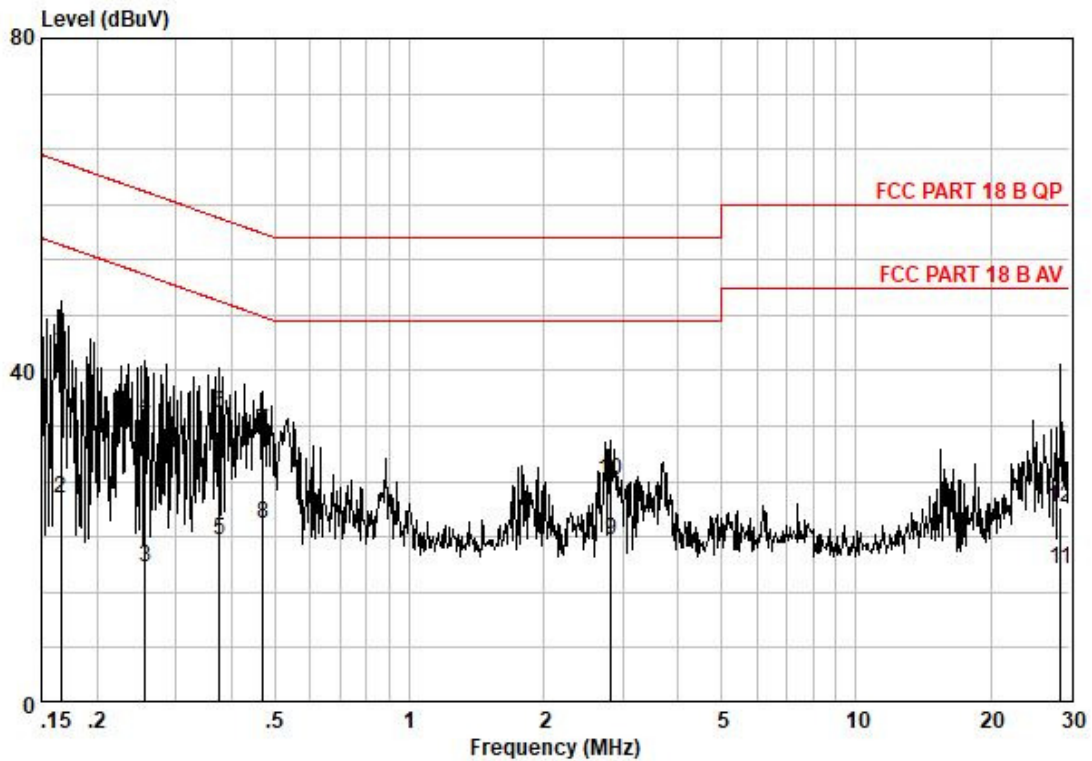
Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.16	31.10	0.10	9.66	40.86	65.47	-24.61	QP
0.16	12.41	0.10	9.66	22.17	55.47	-33.30	AVERAGE
0.34	9.70	0.10	9.66	19.46	49.18	-29.72	AVERAGE
0.34	18.40	0.10	9.66	28.16	59.18	-31.02	QP
0.53	21.95	0.10	9.67	31.72	56.00	-24.28	QP
0.53	12.26	0.10	9.67	22.03	46.00	-23.97	AVERAGE
0.88	4.94	0.10	9.67	14.71	46.00	-31.29	AVERAGE
0.88	13.53	0.10	9.67	23.30	56.00	-32.70	QP
2.82	17.50	0.19	9.69	27.38	56.00	-28.62	QP
2.82	9.92	0.19	9.69	19.80	46.00	-26.20	AVERAGE
28.75	9.19	0.40	9.75	19.34	50.00	-30.66	AVERAGE
28.75	20.80	0.40	9.75	30.95	60.00	-29.05	QP



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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
0.17	32.63	0.10	9.60	42.33	65.16	-22.84	QP
0.17	14.89	0.10	9.60	24.59	55.16	-30.58	AVERAGE
0.26	6.60	0.10	9.59	16.29	51.56	-35.27	AVERAGE
0.26	24.74	0.10	9.59	34.43	61.56	-27.13	QP
0.38	9.93	0.10	9.59	19.62	48.39	-28.77	AVERAGE
0.38	25.15	0.10	9.59	34.84	58.39	-23.55	QP
0.47	23.07	0.10	9.60	32.77	56.49	-23.73	QP
0.47	11.91	0.10	9.60	21.61	46.49	-24.89	AVERAGE
2.82	9.92	0.19	9.62	19.73	46.00	-26.27	AVERAGE
2.82	17.08	0.19	9.62	26.89	56.00	-29.11	QP
28.75	5.71	0.40	10.10	16.21	50.00	-33.80	AVERAGE
28.75	13.01	0.40	10.10	23.51	60.00	-36.50	QP



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**6.2 Output Power Measurement**

Test Requirement: 47 CFR Part 18

Test Method: FCC OST/MP-5:1986

**6.2.1 E.U.T. Operation**

Operating Environment:

Temperature: 23.2 °C Humidity: 51.7 % RH Atmospheric Pressure: 1018 mbar

Test mode a: Test the EUT in microwave heating mode, setting at maximum power level.

**6.2.2 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)
1102	410	19.7	10.2	21.0	46	1089.7

**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 gramsm<sub>c</sub> is the mass of the container, in gramsT<sub>0</sub> is the ambient temperature, in degrees CelsiusT<sub>1</sub> is the initial temperature of the water, in degrees CelsiusT<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.

**6.2.3 Input Power Measurement**

The EUT was set up according to the MP-5 for input power measurement, the input power and current was measured using a power analyzer. Water load in a beaker was located in the center of the oven and the microwave oven was set to maximum power.

Base on the measured input power it was found that the microwave oven can operating as the user manual's specifications.

Input Voltage (V)	Input Current (A)	Power Factor	Measured input power (W)	Rated input power (W)
120.2	13.57	0.938	1530	1550



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### 6.3 Radiation Hazard Test

Test Requirement: 47 CFR Part 18  
 Test Method: FCC OST/MP-5:1986  
 Test distance: Five centimeters from the oven surface

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

Operating Environment:  
 Temperature: 23.2 °C Humidity: 51.7 % RH Atmospheric Pressure: 1018 mbar  
 Test mode a: Test the EUT in microwave heating mode, setting at maximum power level.

#### 6.3.2 Measurement Data

Maximum measure level (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Pass/Fail
0.17	1.00	Pass



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## 6.4 Operating Frequency

Test Requirement: 47 CFR Part 18  
 Test Method: FCC OST/MP-5:1986  
 Frequency Range: 2400-2500 MHz  
 Detector: Average for the final result for outside ISM band(2450MHz±50MHz)  
 Outside band 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 = 1089.7 W according to clause 6.1.2

Limit =  $20\lg(25 \cdot \sqrt{\text{power}/500}) + 20\lg(300/3) = 31.34 + 40 = 71.34 \text{ dBuV/m @ 3m distance.}$

ISM band: 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
<b>2450MHz</b>	<b>±50.0MHz</b>
5800MHz	±75.0MHz
24125MHz	±125.0MHz
61.25GHz	±250.0MHz
122.5GHz	±500.0MHz
245.00GHz	±1.0GHz

### 6.4.1 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 heating mode, setting at maximum power level.  
 b: Test the EUT in microwave heating mode, setting at middle power level.  
 c: Test the EUT in microwave heating mode, setting at lowest power level.

Worst mode  
 a: Test the EUT in microwave heating mode, setting at maximum power level.



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#### 6.4.2 Measurement Data

##### 1) The variation of frequency with time

The operating frequency was measured using a spectrum analyzer, the supply voltage was setting at the rated AC voltage, measured was start with EUT at room temperature, the operating frequency was monitored until the water load was reduced to 20 percent of the original quantity.

Test record was found the worst situation is when the water load is reduced to 20 percent of the original quantity.

ISM frequency(MHz)	Tolerance(MHz)	Measurement Data(MHz)
2450	$\pm 50$	2459

##### 2) The variation of frequency with line voltage.

The operating frequency was measured using a spectrum analyzer, the supply voltage was setting at the rated AC voltage, measured was start with EUT at room temperature. The EUT was started to warm by at least 10 minutes, the operating frequency was monitored as the rated voltage was varied from 80% to 125%.

Test record was found the worst situation is when the line voltage is 125% of rated AC voltage.

ISM frequency(MHz)	Tolerance(MHz)	Measurement Data(MHz)
2450	$\pm 50$	2458

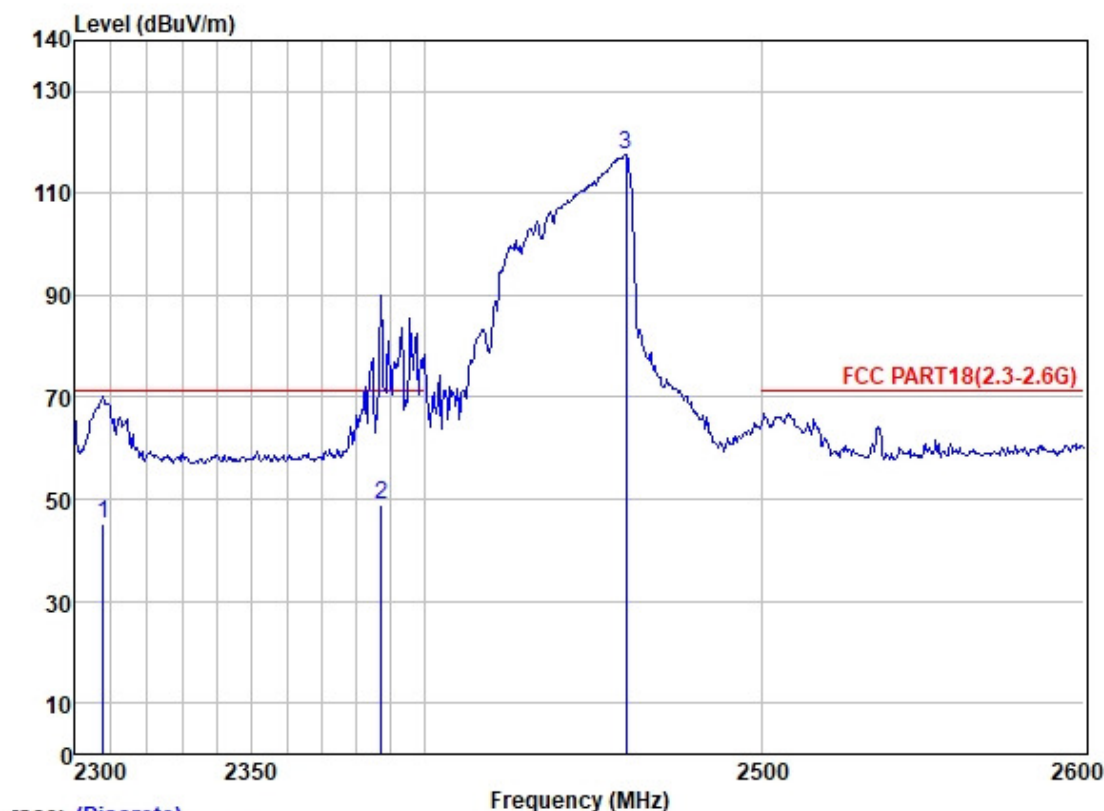


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## 1)The variation of frequency with time



Trace: (Discrete)

	Read	Antenna	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 2307.909	15.71	26.23	3.31	0.00	45.25	71.34	-26.09	VERTICAL	Average
2 2387.048	19.06	26.43	3.48	0.00	48.97	71.34	-22.37	VERTICAL	Average
3 2459.234	87.54	26.54	3.45	0.00	117.53	-----	-----	VERTICAL	Peak



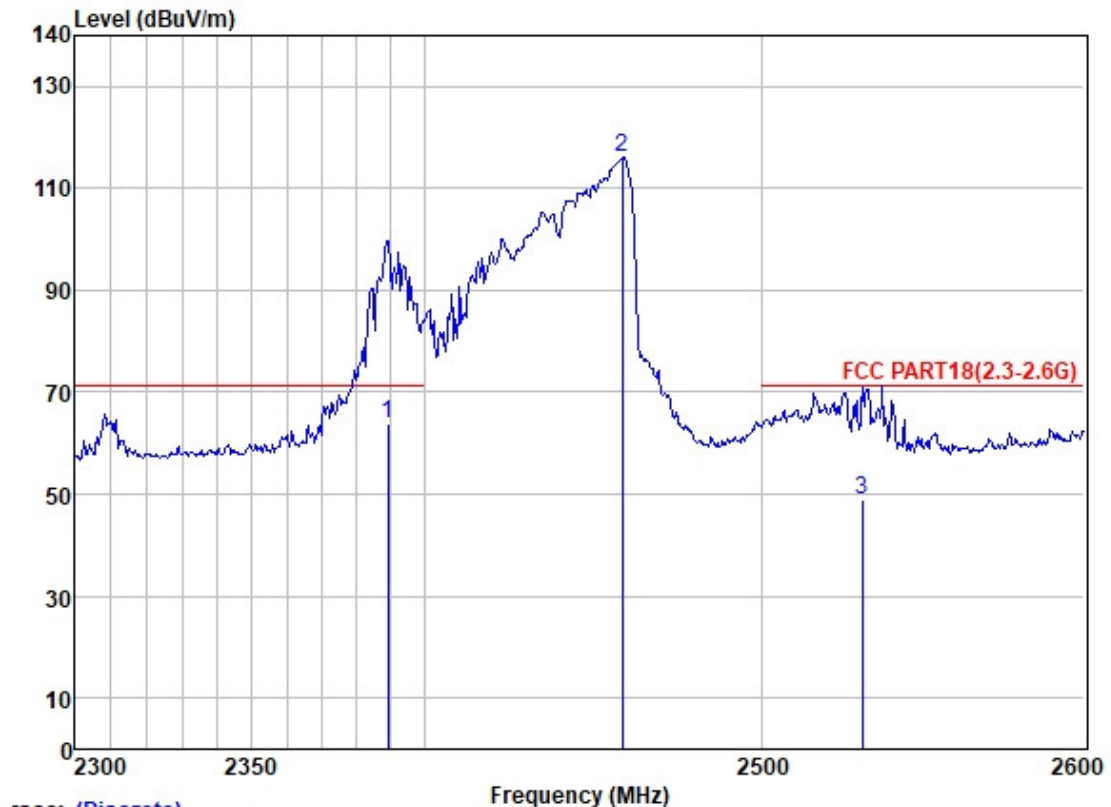
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## 2) The variation of frequency with line voltage



Trace: (Discrete)

	Read	Antenna	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	2389.098	33.85	26.43	3.48	0.00	63.76	71.34	-7.58	HORIZONTAL Average
2	2458.028	85.95	26.54	3.45	0.00	115.94	-----	-----	HORIZONTAL Peak
3	2530.809	18.71	26.65	3.43	0.00	48.79	71.34	-22.55	HORIZONTAL Average



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## 6.5 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	$25 \times \sqrt{\text{power}/500}$

Power = 1089.7 W according to clause 6.1.2

Limit =  $20 \lg(25 \times \sqrt{\text{power}/500}) + 20 \lg(300/3) = 31.34 + 40 = 71.34 \text{ dBuV/m}$   
 @ 3m distance.

### 6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C Humidity: 47.1 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:

- a: Test the EUT in microwave mode with maximum power.
- b: Test the EUT in microwave mode with middle power.
- c: Test the EUT in microwave mode with lowest power.

The worst case for final test:

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

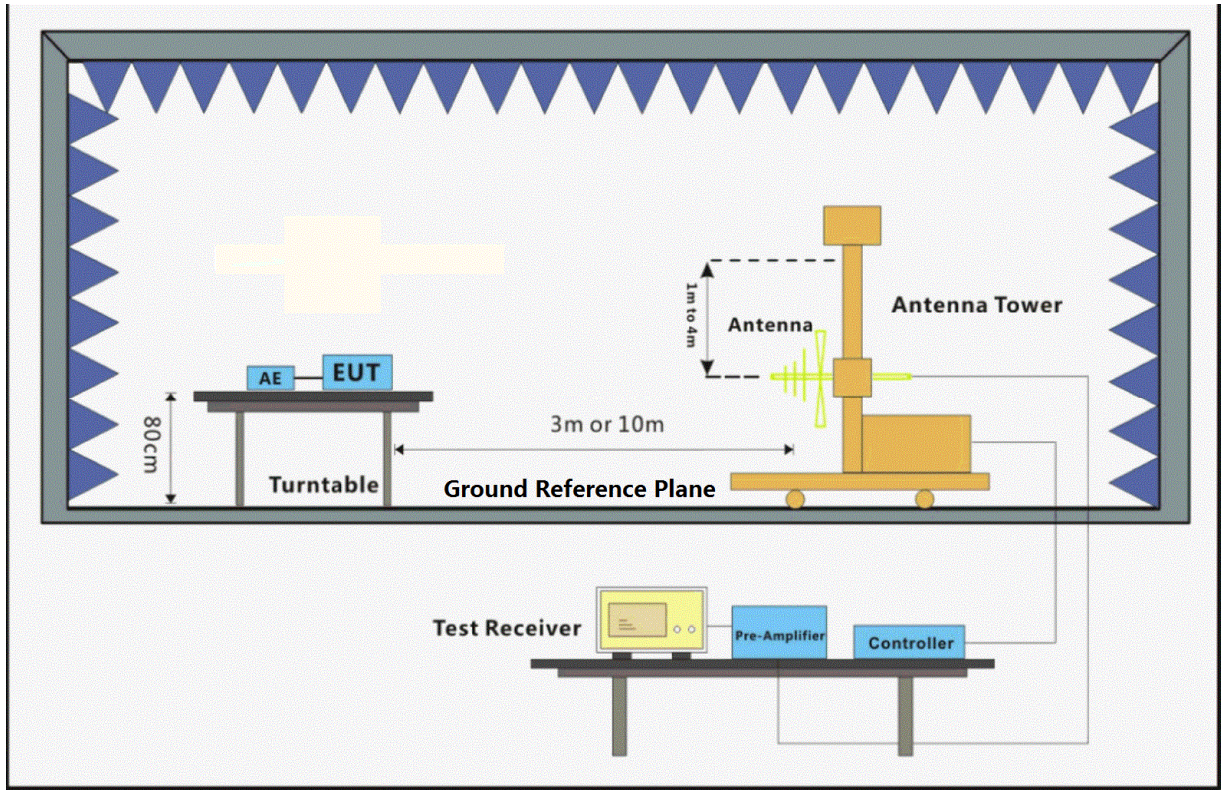


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### 6.5.2 Test Setup Diagram



### 6.5.3 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



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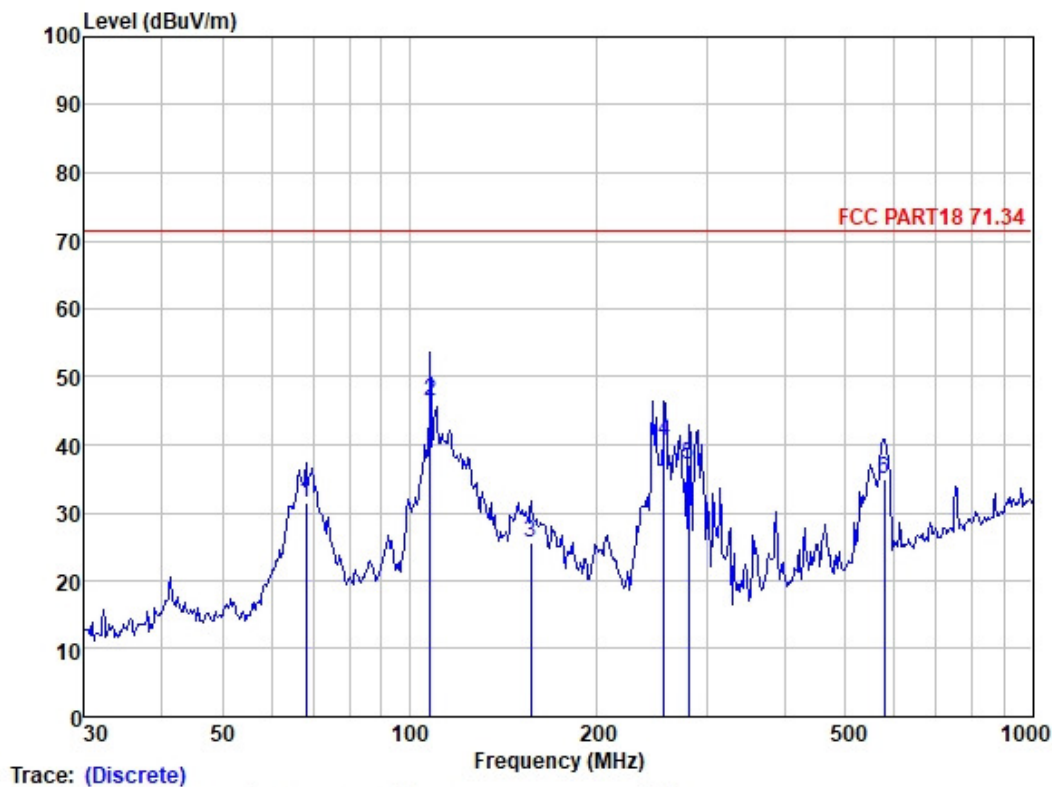
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Mode:a; Polarization:Horizontal



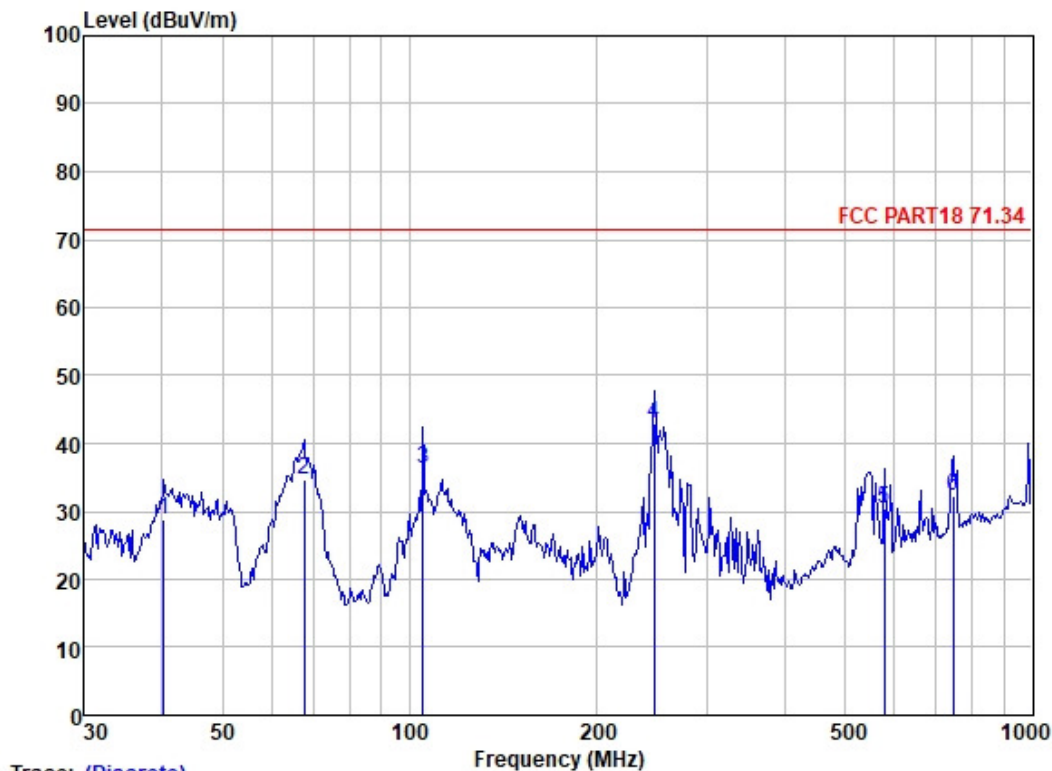
		ReadAntenna	Cable	Preamp		Limit	Over			
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	68.151	45.00	12.17	1.36	27.14	31.39	71.34	-39.95	HORIZONTAL	Average
2	107.888	61.60	10.30	1.69	27.08	46.51	71.34	-24.83	HORIZONTAL	Average
3	156.458	36.73	13.70	2.10	26.86	25.67	71.34	-45.67	HORIZONTAL	Average
4	255.623	52.58	12.12	2.70	26.96	40.44	71.34	-30.90	HORIZONTAL	Average
5	280.024	48.07	13.20	2.79	27.07	36.99	71.34	-34.35	HORIZONTAL	Average
6	578.670	39.07	19.15	4.70	28.06	34.86	71.34	-36.48	HORIZONTAL	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	40.276	41.27	13.52	1.07	27.18	28.68	71.34	-42.66	VERTICAL	Average
2	67.675	48.17	12.24	1.34	27.15	34.60	71.34	-36.74	VERTICAL	Average
3	104.903	51.90	9.86	1.68	27.09	36.35	71.34	-34.99	VERTICAL	Average
4	246.815	55.05	12.03	2.69	26.92	42.85	71.34	-28.49	VERTICAL	Average
5	578.670	34.57	19.15	4.70	28.06	30.36	71.34	-40.98	VERTICAL	Average
6	744.866	32.97	22.10	5.28	28.11	32.24	71.34	-39.10	VERTICAL	Average



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## 6.6 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  
 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 = 1089.7 W according to clause 6.1.2

Limit =  $20\lg(25 \cdot \sqrt{\text{power}/500}) + 20\lg(300/3) = 31.34 + 40 = 71.34 \text{ dBuV/m}$   
 @ 3m distance.

### 6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C Humidity: 52.2 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:  
 a: Test the EUT in microwave mode with maximum power.  
 b: Test the EUT in microwave mode with middle power.  
 c: Test the EUT in microwave mode with lowest power.

The worst case for final test:  
 a: Test the EUT in microwave mode with maximum power.

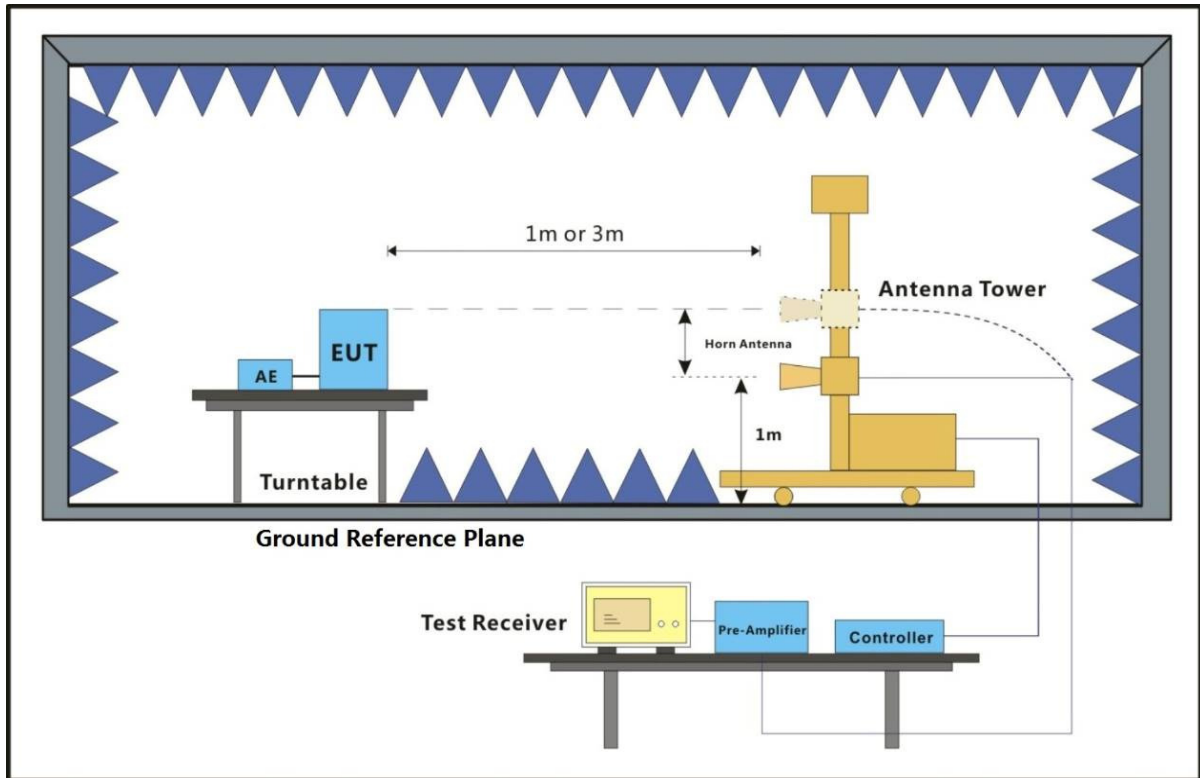


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### 6.6.2 Test Setup Diagram



### 6.6.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. 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

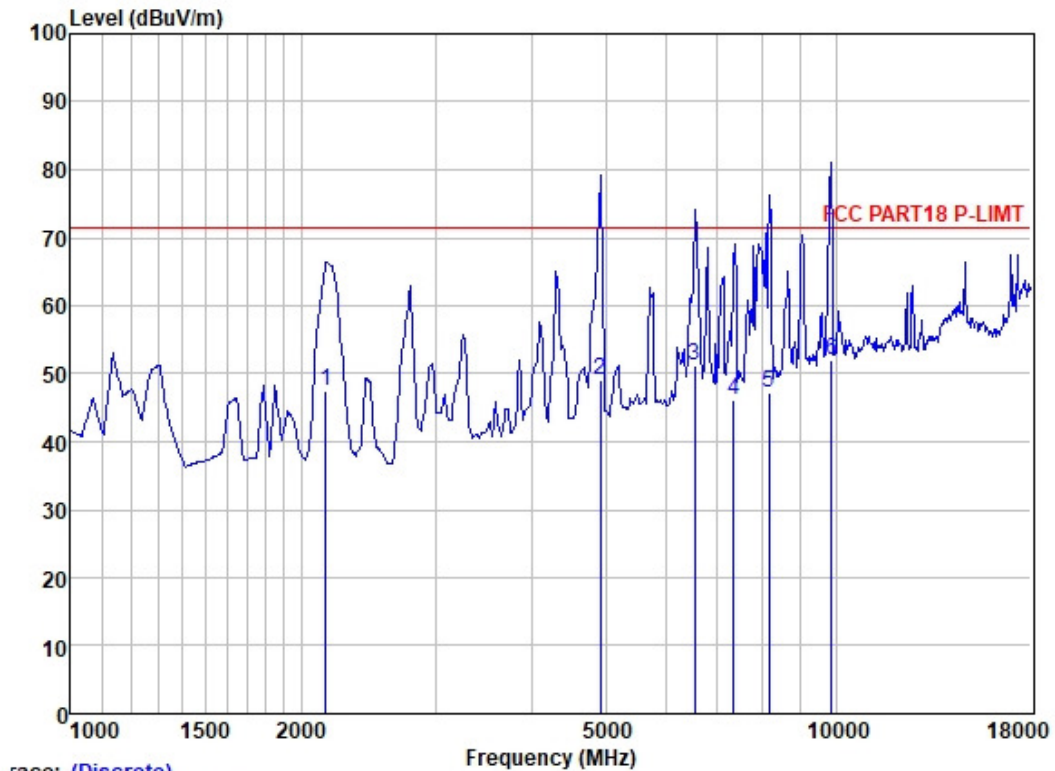


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Mode:a; Polarization:Horizontal



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	2157.260	55.64	25.55	3.18	36.97	47.40	71.34	-23.94	HORIZONTAL Average
2	4927.122	48.99	31.01	5.60	36.50	49.10	71.34	-22.24	HORIZONTAL Average
3	6545.263	47.54	34.35	5.84	36.64	51.09	71.34	-20.25	HORIZONTAL Average
4	7359.282	40.95	35.82	6.17	36.76	46.18	71.34	-25.16	HORIZONTAL Average
5	8176.795	41.24	36.37	6.33	36.77	47.17	71.34	-24.17	HORIZONTAL Average
6	9866.789	43.42	37.86	6.98	36.32	51.94	71.34	-19.40	HORIZONTAL Average



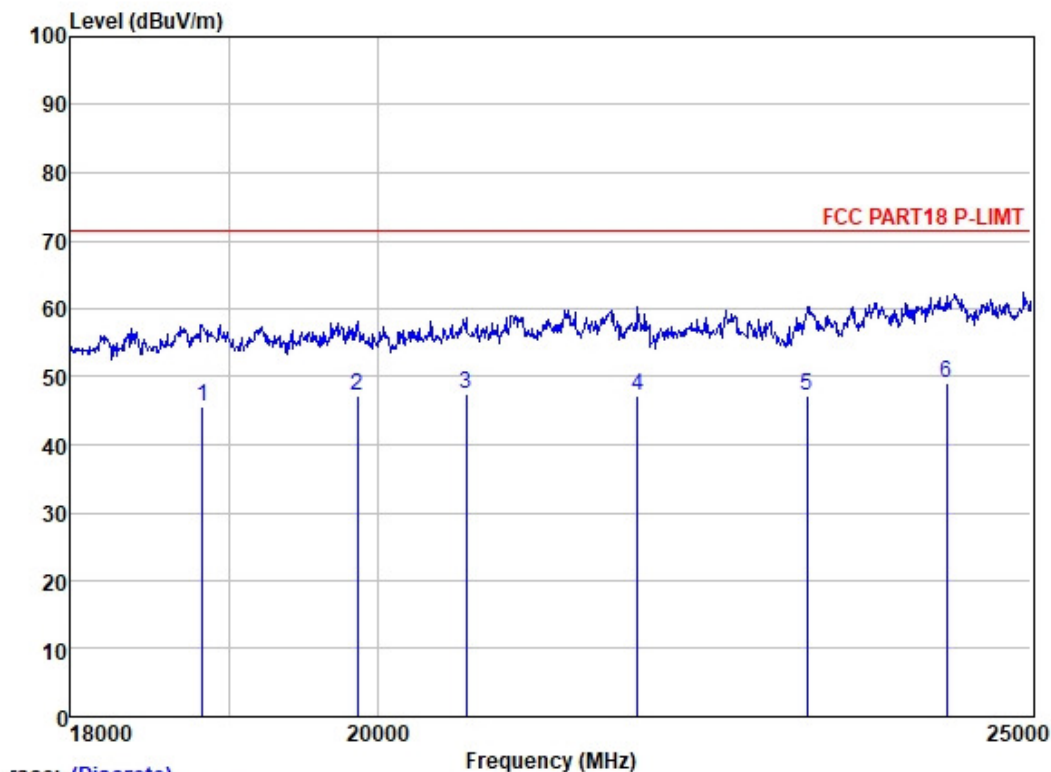
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Mode:a; Polarization:Horizontal



Trace: (Discrete)

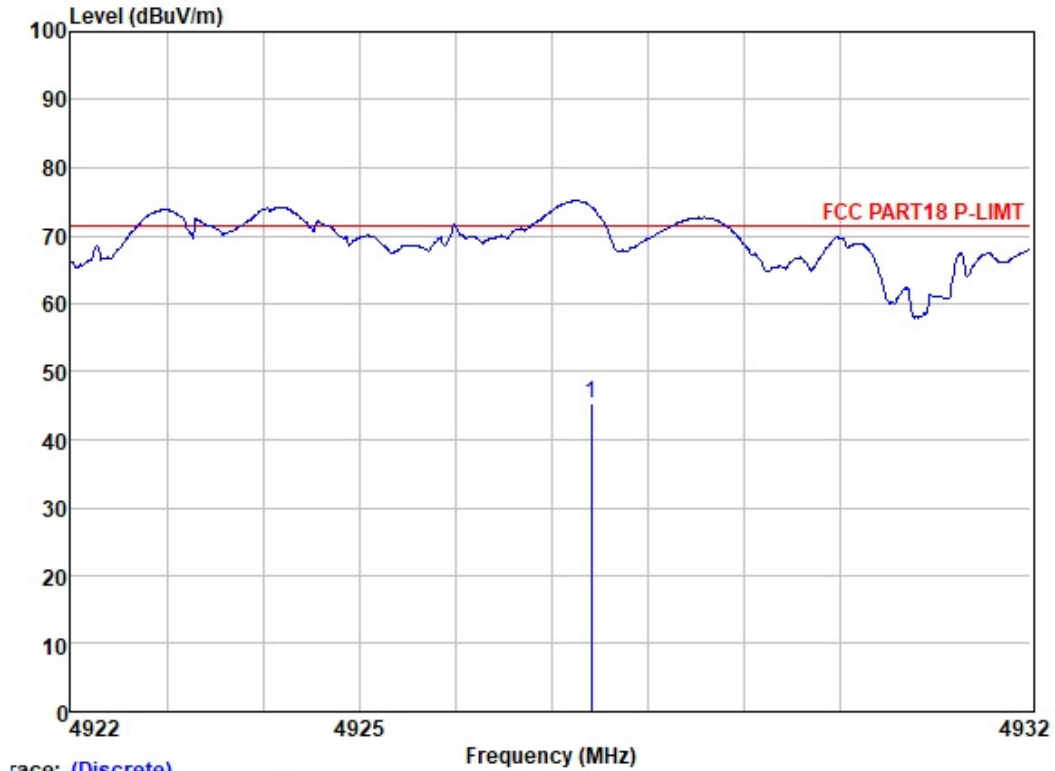
	ReadAntenna	Cable	Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 18828.600	26.32	37.99	16.86	35.60	45.57	71.34	-25.77	HORIZONTAL	Average
2 19857.750	27.57	38.00	17.27	35.60	47.24	71.34	-24.10	HORIZONTAL	Average
3 20608.740	27.38	37.93	17.78	35.52	47.57	71.34	-23.77	HORIZONTAL	Average
4 21849.740	25.86	38.17	18.55	35.31	47.27	71.34	-24.07	HORIZONTAL	Average
5 23157.860	24.18	39.60	19.33	35.79	47.32	71.34	-24.02	HORIZONTAL	Average
6 24287.640	24.97	39.54	20.57	36.11	48.97	71.34	-22.37	HORIZONTAL	Average



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Mode:a; Polarization:Horizontal



Trace: (Discrete)

		ReadAntenna	Cable	Preamplifier		Limit	Over		
	Freq	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	4927.417	45.14	31.01	5.60	36.50	45.25	71.34	-26.09	HORIZONTAL Average



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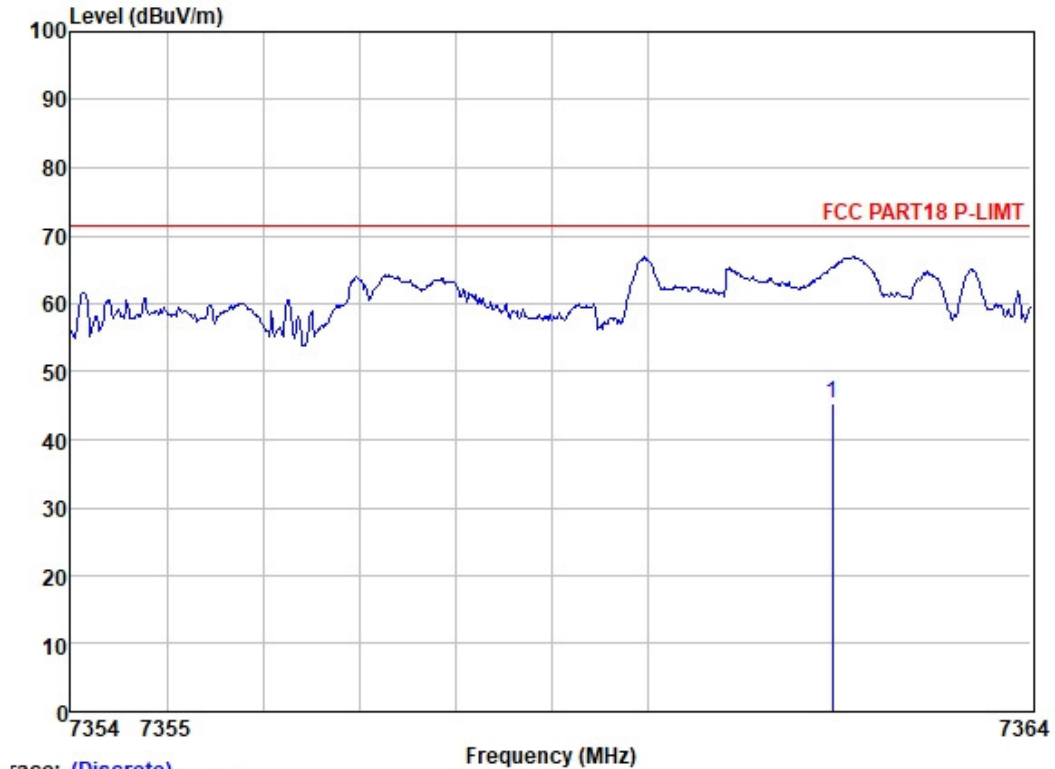
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Mode:a; Polarization:Horizontal



Trace: (Discrete)

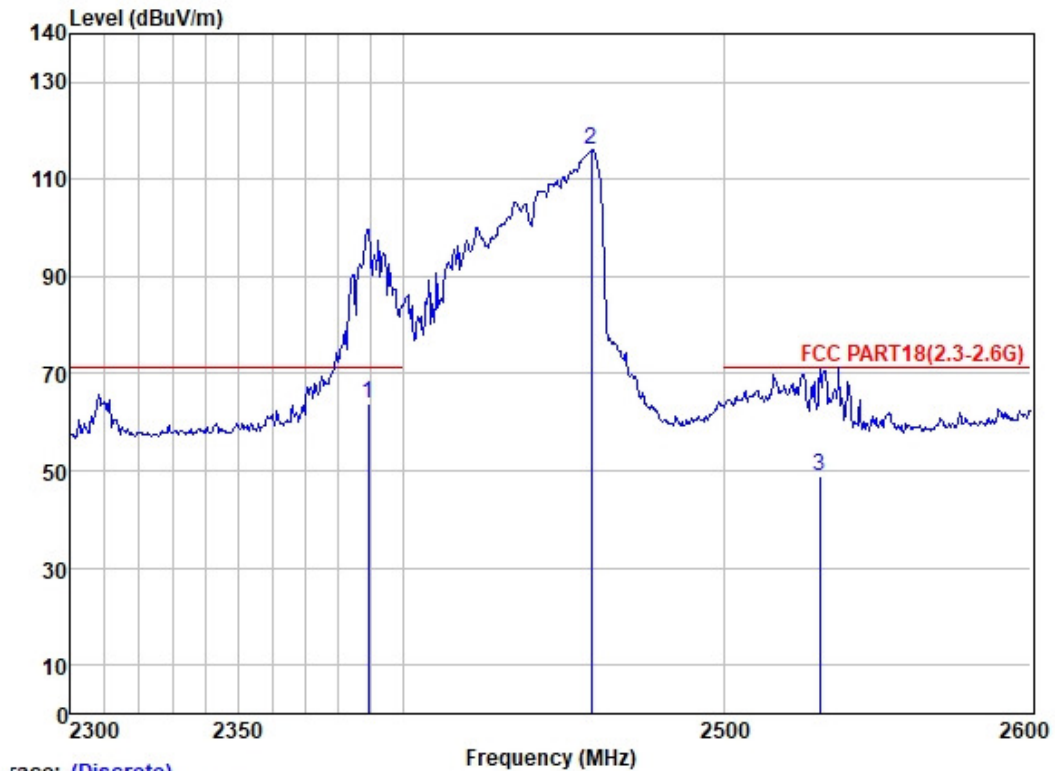
	Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	7361.929	40.14	35.82	6.17	36.76	45.37	71.34	-25.97	HORIZONTAL Average



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Mode:a; Polarization:Horizontal



Trace: (Discrete)

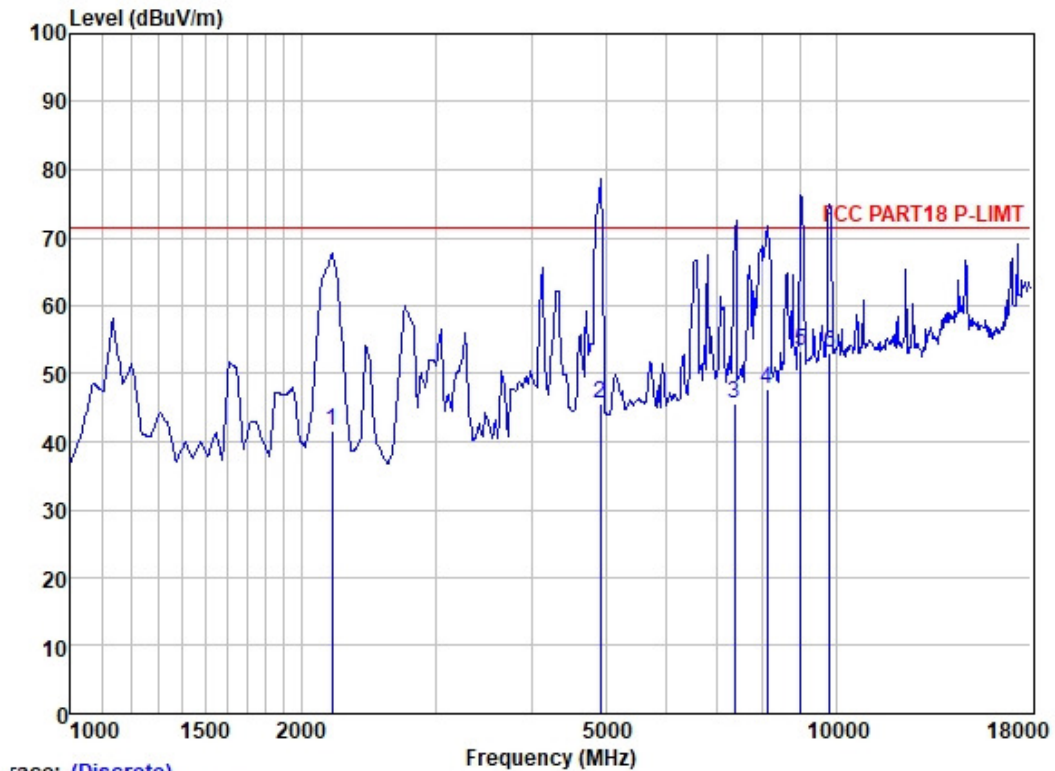
	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.098	33.85	26.43	3.48	0.00	63.76	71.34	-7.58	HORIZONTAL Average
2	2458.028	85.95	26.54	3.45	0.00	115.94	-----	-----	HORIZONTAL Peak
3	2530.809	18.71	26.65	3.43	0.00	48.79	71.34	-22.55	HORIZONTAL Average



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Mode:a; Polarization:Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2194.998	49.78	25.69	3.20	36.97	41.70	71.34	-29.64	VERTICAL Average
2	4920.308	45.53	30.99	5.58	36.50	45.60	71.34	-25.74	VERTICAL Average
3	7376.631	40.43	35.82	6.17	36.76	45.66	71.34	-25.68	VERTICAL Average
4	8129.664	41.72	36.41	6.27	36.78	47.62	71.34	-23.72	VERTICAL Average
5	8995.123	45.85	36.50	7.56	36.52	53.39	71.34	-17.95	VERTICAL Average
6	9809.916	44.50	37.79	7.00	36.32	52.97	71.34	-18.37	VERTICAL Average

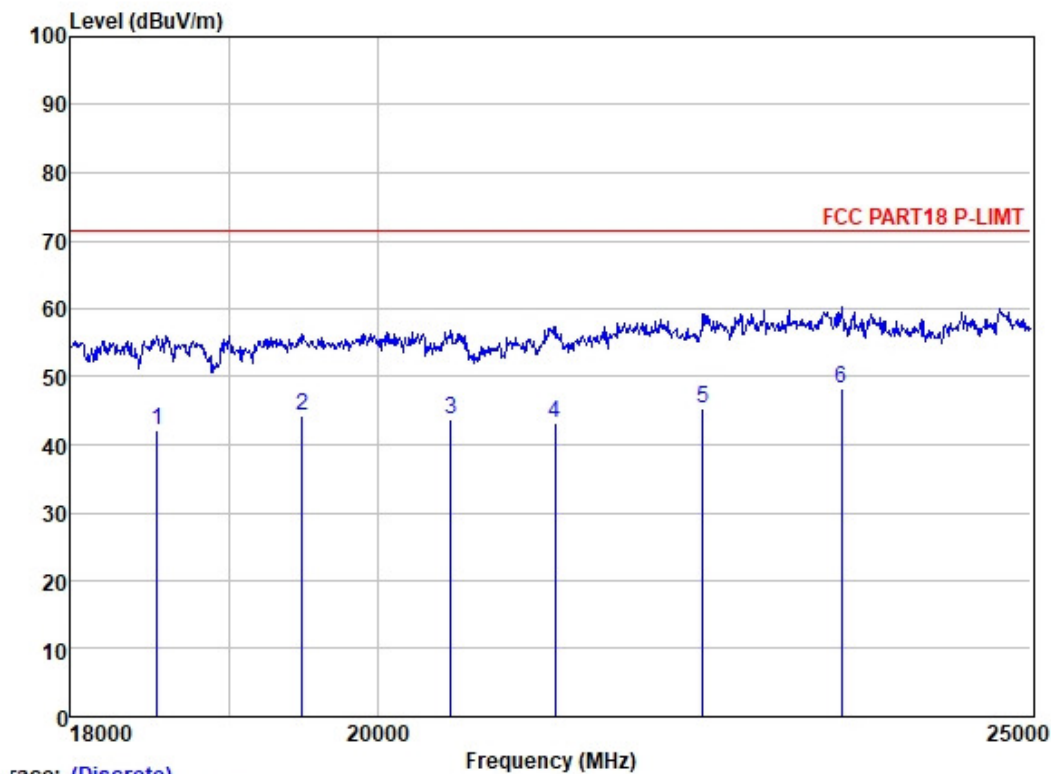


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Mode:a; Polarization:Vertical



Trace: (Discrete)

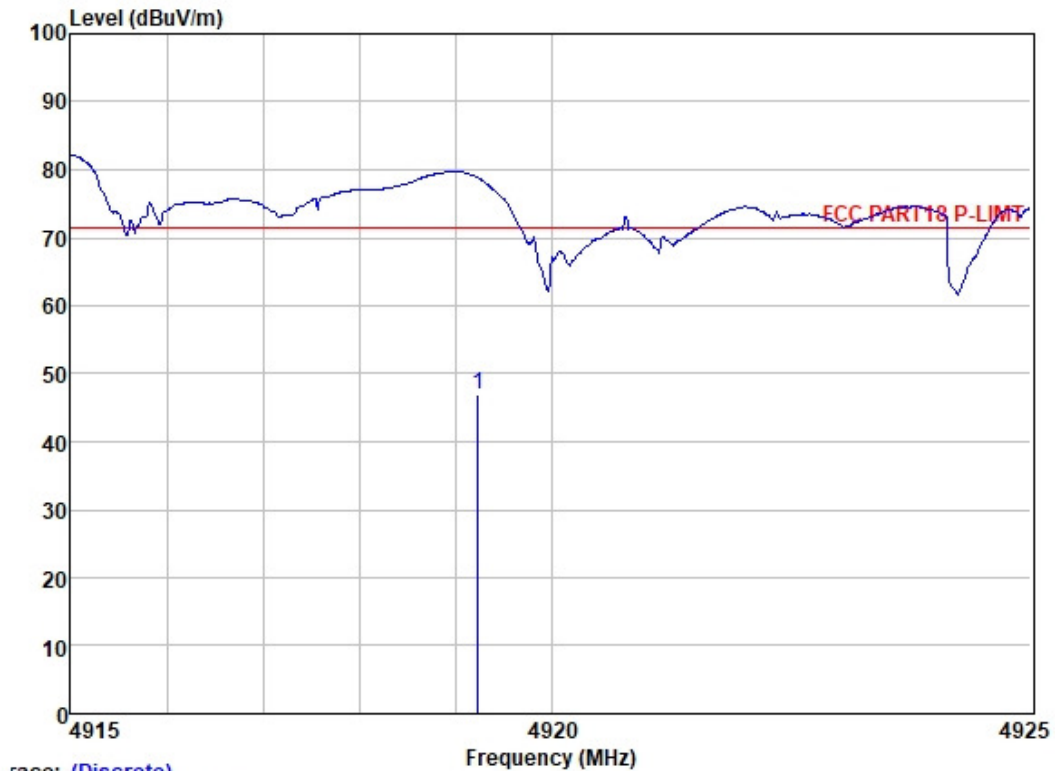
	Freq	ReadAntenna	Cable	Preamplifier	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	18540.120	22.93	37.96	16.74	35.60	42.03	71.34	-29.31	VERTICAL Average
2	19482.980	24.80	38.00	17.09	35.60	44.29	71.34	-27.05	VERTICAL Average
3	20500.710	23.77	37.95	17.67	35.54	43.85	71.34	-27.49	VERTICAL Average
4	21241.100	22.62	37.96	18.10	35.39	43.29	71.34	-28.05	VERTICAL Average
5	22343.320	23.36	38.59	18.77	35.39	45.33	71.34	-26.01	VERTICAL Average
6	23425.660	24.82	39.60	19.65	35.93	48.14	71.34	-23.20	VERTICAL Average



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Mode:a; Polarization:Vertical



race: (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 4919.237	46.74	30.99	5.58	36.50	46.81	71.34	-24.53	VERTICAL

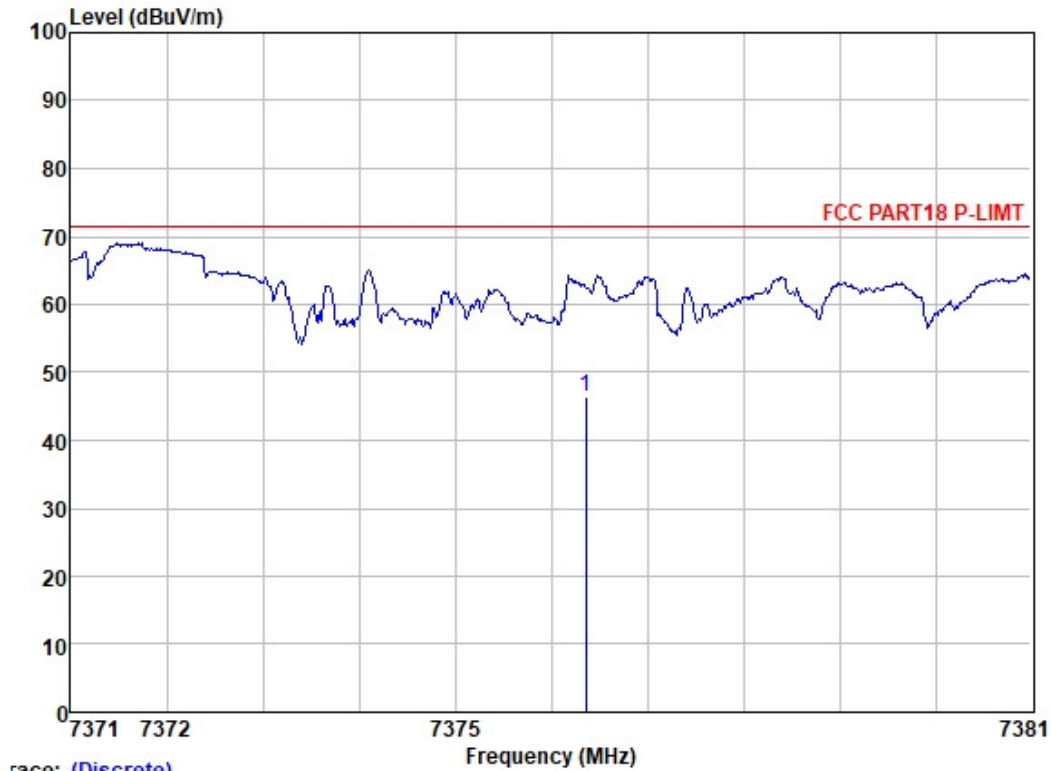
Average



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Mode:a; Polarization:Vertical



race: (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 7376.358	41.27	35.82	6.17	36.76	46.50	71.34	-24.84	VERTICAL	Average



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## 6.7 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: 10m

Detector: Peak for pre-scan, Average for the final result  
 (200Hz Resolution Bandwidth for 9kHz to 150kHz;  
 9kHz Resolution Bandwidth for 150kHz to 30MHz)

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	$25 \cdot \sqrt{\text{power}/500}$

Power = 1089.7 W according to clause 6.1.2

Limit =  $20 \lg(25 \cdot \sqrt{\text{power}/500}) + 20 \lg(300/10) = 60.88 \text{ dBuV/m @ 10m distance.}$

### 6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23.2 °C Humidity: 53.2 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:  
 a: Test the EUT in microwave mode with maximum power.  
 b: Test the EUT in microwave mode with middle power.  
 c: Test the EUT in microwave mode with lowest power.

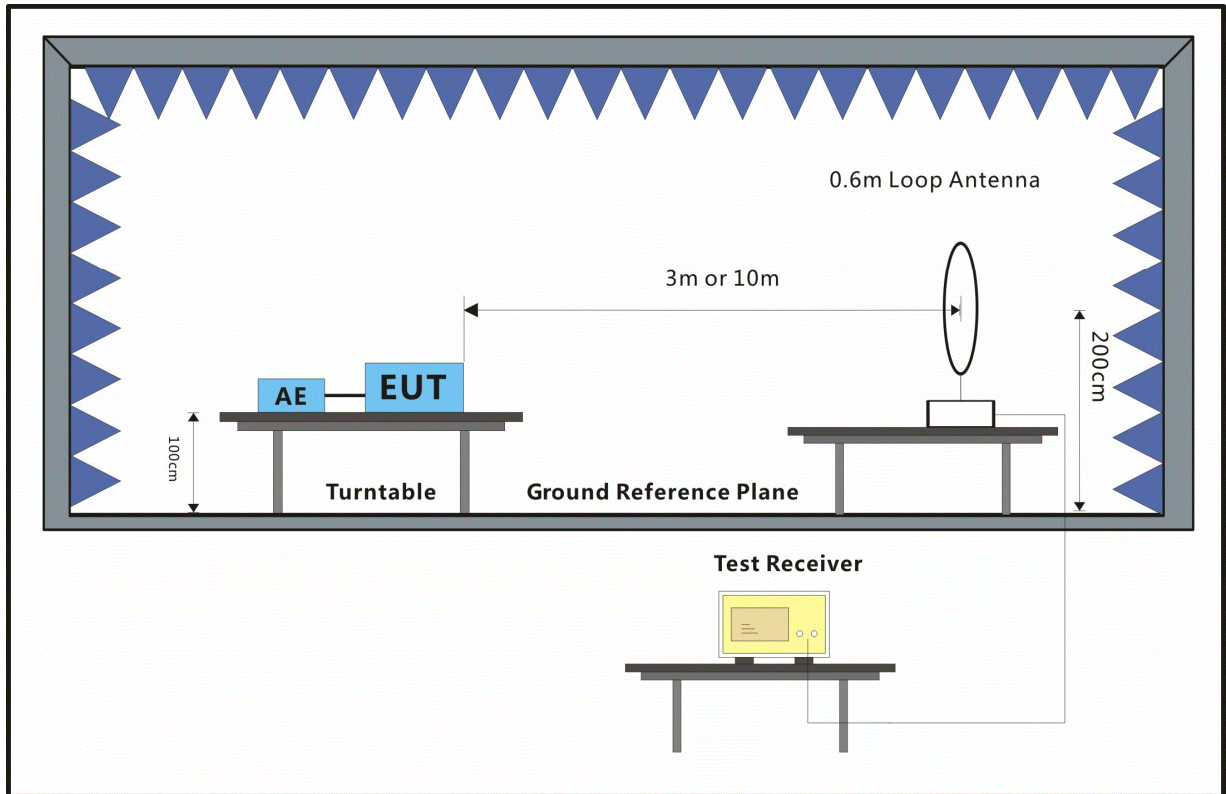
The worst case for final test: a: Test the EUT in microwave mode with maximum power.



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### 6.7.2 Test Setup Diagram



### 6.7.3 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 radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

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



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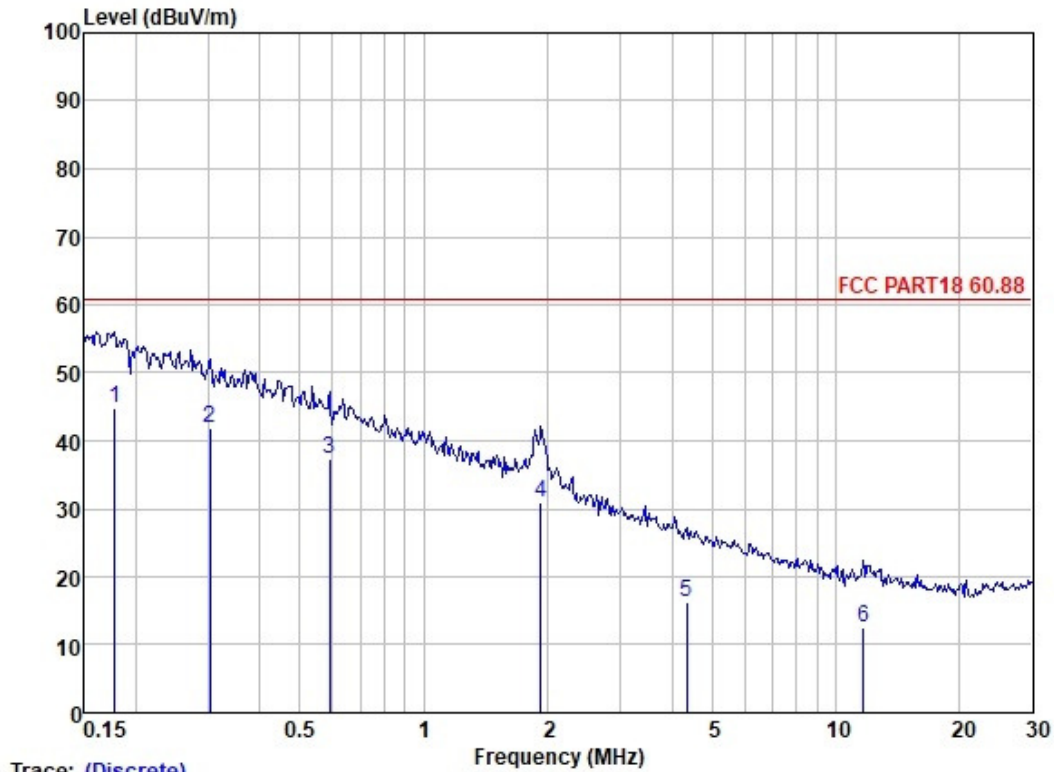
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Mode:a; Polarization:X



Trace: (Discrete)

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.178	61.97	12.37	0.00	29.43	44.91	60.88	-15.97 Average
2	0.302	59.01	12.26	0.10	29.42	41.95	60.88	-18.93 Average
3	0.592	54.43	12.14	0.10	29.40	37.27	60.88	-23.61 Average
4	1.918	47.69	12.59	0.10	29.36	31.02	60.88	-29.86 Average
5	4.338	33.75	11.55	0.20	29.33	16.17	60.88	-44.71 Average
6	11.683	30.69	10.64	0.37	29.28	12.42	60.88	-48.46 Average



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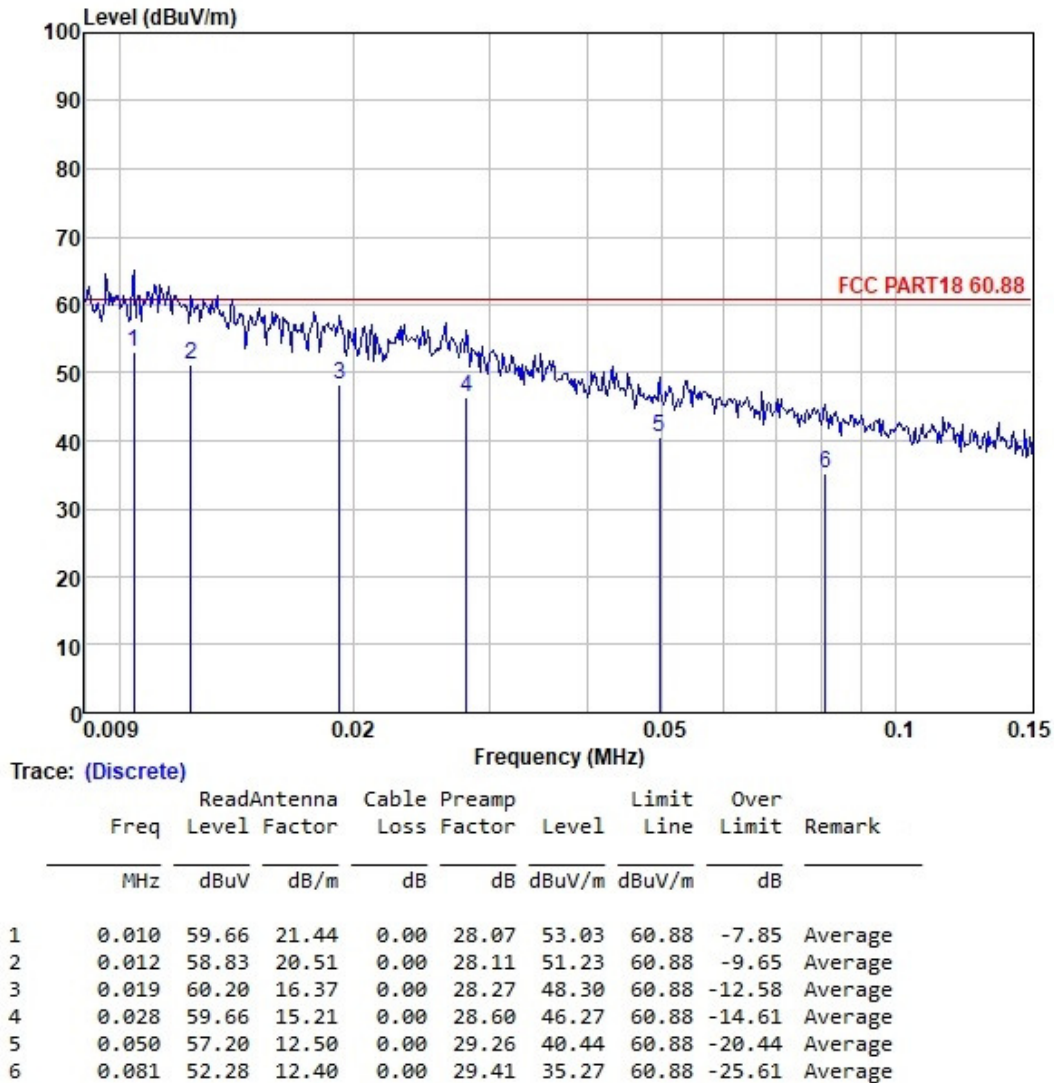
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Mode:a; Polarization:X



--End of Report--



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