

TEST REPORT

Application No.: GZEM2209005191HS
Applicant: Breville Pty Ltd
Address of Applicant: Ground Floor, Suite 2, 170-180 Bourke Rd, Alexandria, NSW 2015, Australia
Manufacturer: Breville Pty Ltd
Address of Manufacturer: Ground Floor, Suite 2, 170-180 Bourke Rd, Alexandria, NSW 2015, Australia
Factory: Guangdong Midea Kitchen Appliance Manufacturing Co., Ltd
Address of Factory: No.6, Yongan Rd, Beijiao, Shunde, Foshan, Guangdong, 528311 China
Equipment Under Test (EUT):
EUT Name: Microwave Oven
Model No.: BM0850 XXXYYY /ZZ (X, Y, Z=0-9 or A-Z or blank, when ZZ=blank, "/" is ignored) ♣
 ♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Trade Mark: Breville
Standard(s) : 47 CFR Part 18
Date of Receipt: 2022-09-20
Date of Test: 2022-10-27 to 2022-11-08
Date of Issue: 2023-02-06

Test Result:

Pass*

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

Ricky Liu

Ricky Liu
Manager



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Revision Record			
Version	Report No.	Date	Remark
01	GZEM220900519102	2023-02-06	Original

Authorized for issue by			
		Pank Feng	
		Pank Feng/Project Engineer	
		Terry Lai	
		Terry Lai/Reviewer	

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
Radiated Emissions (Magnetic field Strength)(9kHz-30MHz)		FCC/OST MP-5:1986	18.305(b)	Pass
Radiated Emissions (30MHz-1GHz)		FCC/OST MP-5:1986	18.305(b)	Pass
Radiated Emissions (above 1GHz)		FCC/OST MP-5:1986	18.305(c)	Pass
Output Power Measurement		FCC OST/MP-5:1986	FCC OST/MP-5:1986 Clause 4.3	Pass
Operating Frequency Measurement		FCC OST/MP-5:1986	18.301	Pass
Radiation Hazard Test		FCC OST/MP-5:1986	1 mW/cm ²	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

✦ Declaration of EUT Family Grouping:

Model No.: BM0850 XXXYYY /ZZ (X, Y, Z=0-9 or A-Z or blank, when ZZ=blank, "/" is ignored)

Model BM0850 XXXYYY /ZZ, where "XXX" indicates a different colour; "YYY" indicates different country or region; "ZZ" indicates for internal use.

Each "XXX" or "YYY" or "ZZ" can be "0-9", "A-Z" or "blank" will be added in the product description.

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 model name, trade mark and colour.

Therefore, only one model **BM0850** with two new different configurations as below of IGBT was tested in this report.

	Model No.	Manufacture
Alternative1 IGBT	H30MR5	Infineon
Alternative2 IGBT	TGAN30N135FD1	Trinno



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4 General Information

4.1 Details of E.U.T.

Power supply: AC 120V 60Hz
Rated Power:1400W
Test voltage: AC 120V 60Hz
Cable(s): AC mains cable:3 wires 1.0m unshielded

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.

770mL of water for all other measurement

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	2.76dB (150kHz to 30MHz)
Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)	3.08dB(9kHz to 150kHz), 3.12dB(150kHz to 30MHz) (LLAS)
Radiated Emissions (30MHz-1GHz)	5.00dB (30MHz-1GHz):3m; 4.38dB (30MHz-1GHz):10m
Radiated Emissions (above 1GHz)	5.12dB (1GHz-6GHz); 5.38dB (6GHz-18GHz); 5.61(18GHz-40GHz)

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:

● ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● 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.

● 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.

● ISED (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-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 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-20107 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 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

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
Coaxial Cable	HangTianXing	2m	EMC0107	2022-08-24	2023-08-23
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2022-10-16	2025-10-15
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2022-09-09	2023-09-08
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2022-05-20	2023-05-19
Test Software E3r	Audix	Ver.6.11812	GZE100-77	N/A	N/A
Artificial Mains Network (LISN)	AFJ Instruments	LT32C	EMC2046	2022-10-21	2023-10-20

Radiated Emissions (Magnetic field Strength)(9kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2022-10-16	2025-10-15
Chamber cable	HangTianXing	N/A	EMC0542	2022-08-24	2023-08-23
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2022-06-21	2023-06-20
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2022-04-06	2024-04-05
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2022-05-20	2023-05-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2022-10-16	2025-10-15
Chamber cable	HangTianXing	N/A	EMC0542	2022-08-24	2023-08-23
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2022-06-21	2023-06-20
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2022-05-20	2023-05-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	EMC2174	2022-06-19	2025-06-18



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Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2022-08-24	2024-08-23
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-21	2025-09-20
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Operating Frequency Measurement					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2022-08-24	2024-08-23
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-21	2025-09-20
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	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	2022-05-13	2023-05-12

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2022-06-24	2023-06-23



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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
 Limit:
 Frequency Range: 150kHz to 30MHz
 0.15 to 0.5 MHz: 66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
 0.5 to 5 MHz: 56dB(μV) quasi-peak, 46dB(μV) average
 5 to 30 MHz: 60dB(μV) quasi-peak, 50dB(μV) average
 Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

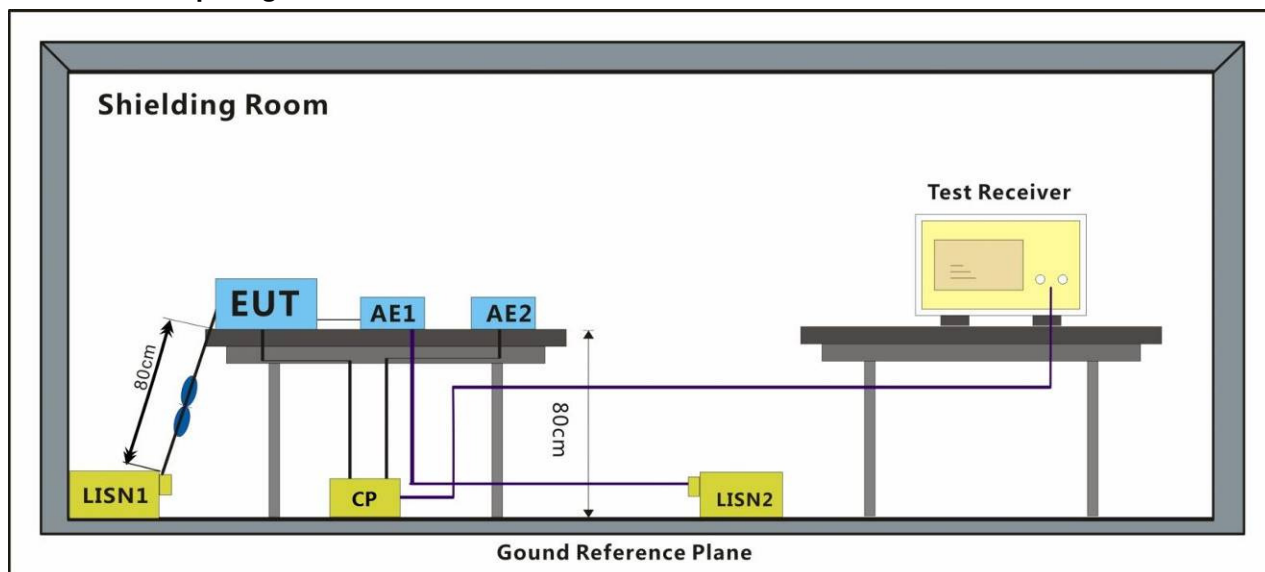
6.1.1 E.U.T. Operation

Operating Environment:
 Temperature: 26.5 °C Humidity: 57.8 % RH Atmospheric Pressure: 1015 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative1 IGBT)
Pre-scan	01	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative1 IGBT)
Pre-scan	02	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative1 IGBT)
Final test	04	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative2 IGBT)
Pre-scan	05	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative2 IGBT)
Pre-scan	06	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative2 IGBT)

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

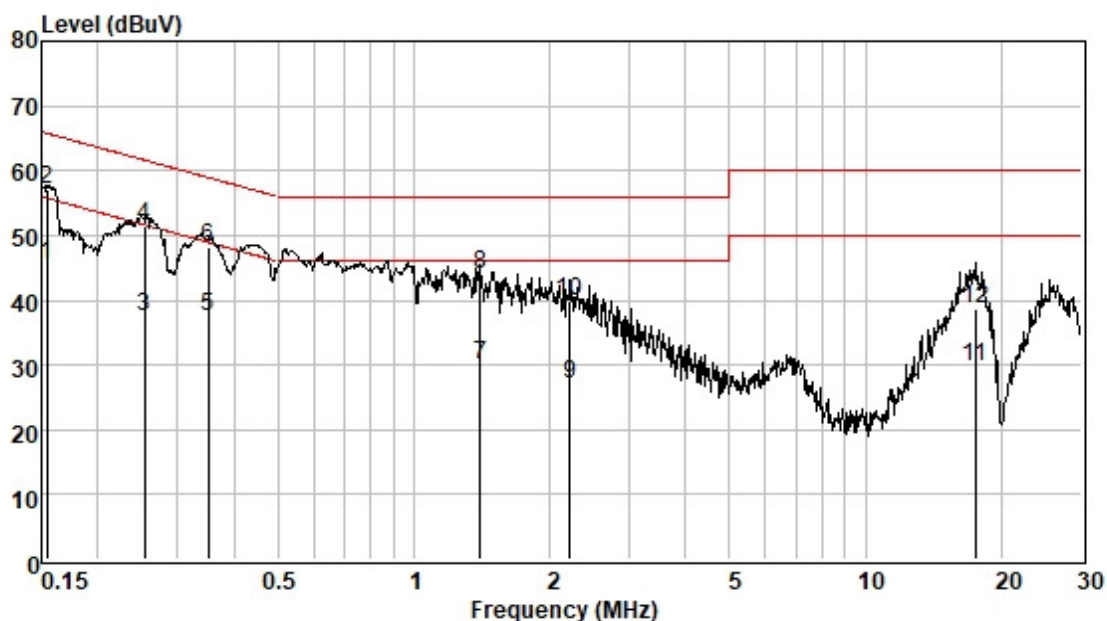
Frequency range: 150KHz-30MHz

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.

The red line show in graphic is the limit in standard used in this section.

Measured Level = Read level + Cable Loss + LISN Factor

Test Mode: 00; Line: Live line



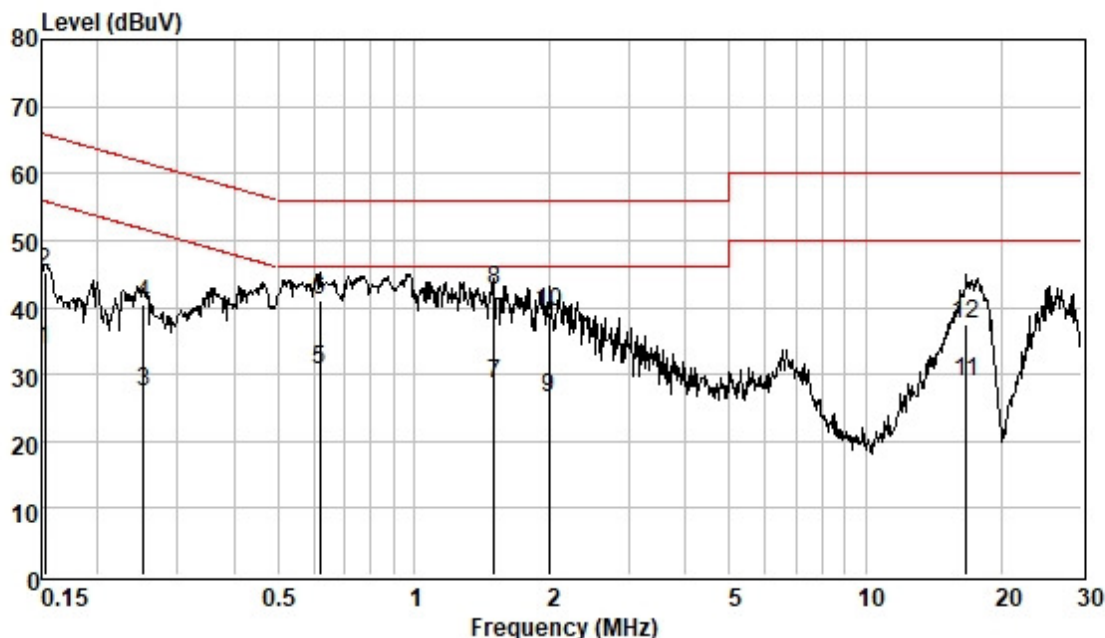
Pol : LINE
Mode :
Model :

	Freque	Read	Cable	LISN	Measured	Limit	Over	Remark
	ncy	Level	Loss	Factor	Level	Line	Limit	
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	36.03	0.06	9.54	45.63	55.78	-10.15	Average
2	0.154	47.64	0.06	9.54	57.24	65.78	-8.54	QP
3	0.253	27.77	0.06	9.57	37.40	51.64	-14.24	Average
4	0.253	41.72	0.06	9.57	51.35	61.64	-10.29	QP
5	0.350	27.72	0.06	9.58	37.36	48.96	-11.60	Average
6	0.350	38.66	0.06	9.58	48.30	58.96	-10.66	QP
7	1.403	20.24	0.09	9.60	29.93	46.00	-16.07	Average
8	1.403	34.36	0.09	9.60	44.05	56.00	-11.95	QP
9	2.213	17.44	0.12	9.60	27.16	46.00	-18.84	Average
10	2.213	30.13	0.12	9.60	39.85	56.00	-16.15	QP
11	17.475	19.57	0.32	9.84	29.73	50.00	-20.27	Average
12	17.475	28.46	0.32	9.84	38.62	60.00	-21.38	QP



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Test Mode: 00; Line: Neutral Line



Pol : NEUTRAL

Mode :

Model :

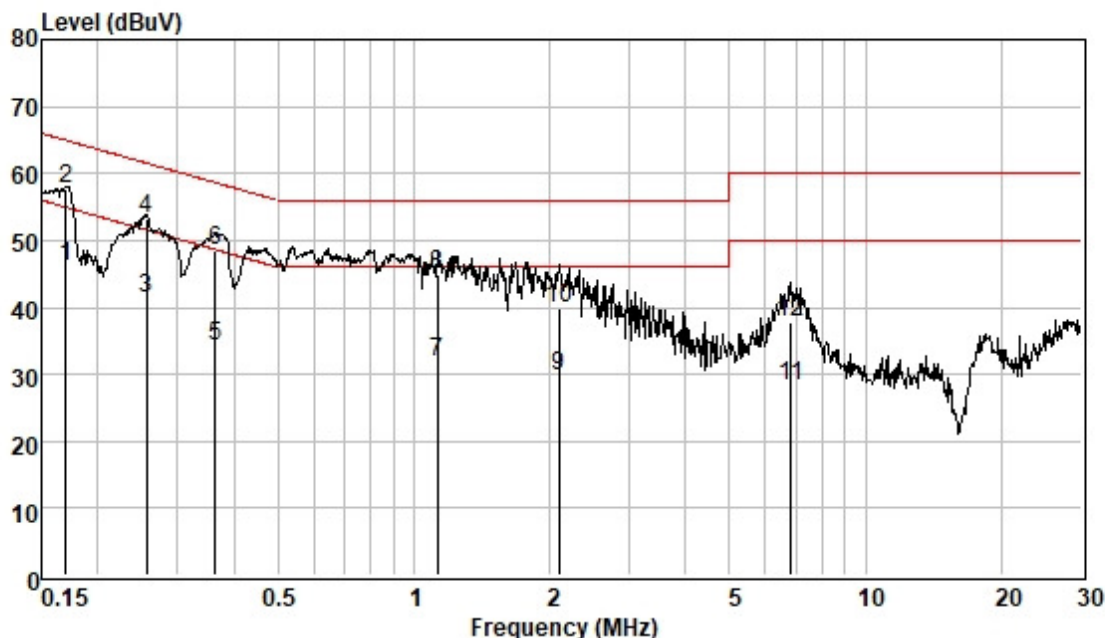
	Freque MHz	Read Level dBUV	Cable Loss dB	LISN Factor dB	Measured Level dBUV	Limit Line dBUV	Over Limit dB	Remark
1	0.152	24.10	0.06	9.53	33.69	55.87	-22.18	Average
2	0.152	35.57	0.06	9.53	45.16	65.87	-20.71	QP
3	0.252	17.77	0.06	9.56	27.39	51.69	-24.30	Average
4	0.252	30.96	0.06	9.56	40.58	61.69	-21.11	QP
5	0.621	20.99	0.07	9.58	30.64	46.00	-15.36	Average
6	0.621	31.42	0.07	9.58	41.07	56.00	-14.93	QP
7	1.503	19.00	0.10	9.59	28.69	46.00	-17.31	Average
8	1.503	32.88	0.10	9.59	42.57	56.00	-13.43	QP
9	1.991	16.81	0.12	9.59	26.52	46.00	-19.48	Average
10	1.991	29.57	0.12	9.59	39.28	56.00	-16.72	QP
11	16.661	18.52	0.32	9.87	28.71	50.00	-21.29	Average
12	16.661	27.14	0.32	9.87	37.33	60.00	-22.67	QP



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Test Mode: 04; Line: Live line



Pol : LINE

Mode :

Model :

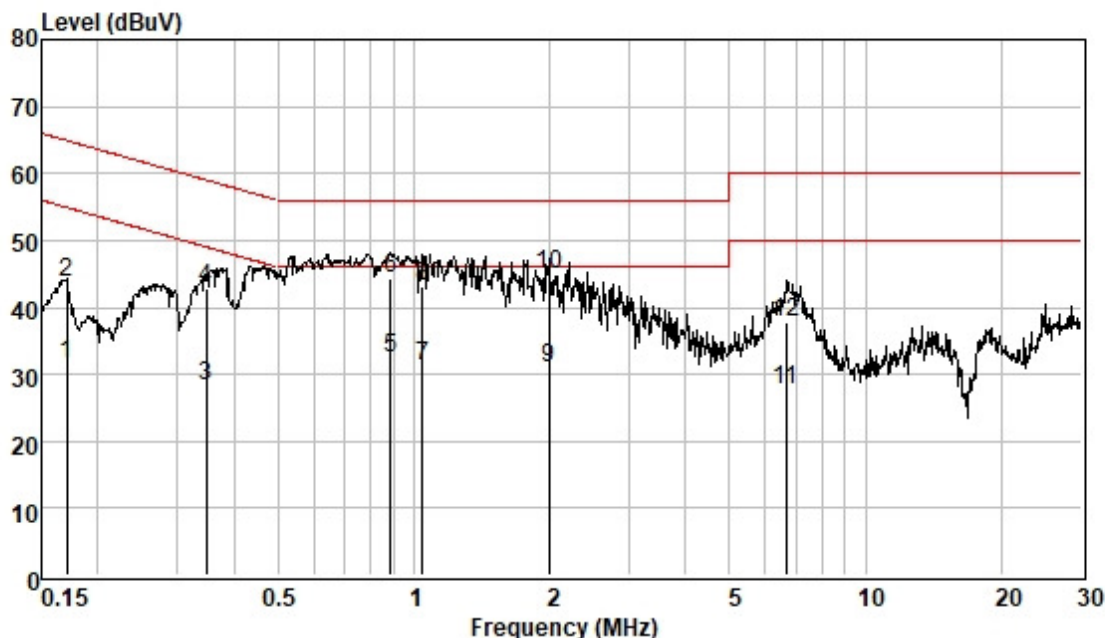
	Freque	Read	Cable	LISN	Measured	Limit	Over	
	MHz	Level	Loss	Factor	Level	Line	Limit	Remark
		dBuV	dB	dB	dBuV	dBuV	dB	
1	0.169	36.45	0.06	9.55	46.06	54.99	-8.93	Average
2	0.169	48.20	0.06	9.55	57.81	64.99	-7.18	QP
3	0.256	31.81	0.06	9.57	41.44	51.56	-10.12	Average
4	0.256	43.63	0.06	9.57	53.26	61.56	-8.30	QP
5	0.363	24.66	0.06	9.58	34.30	48.65	-14.35	Average
6	0.363	38.74	0.06	9.58	48.38	58.65	-10.27	QP
7	1.129	22.10	0.08	9.60	31.78	46.00	-14.22	Average
8	1.129	35.31	0.08	9.60	44.99	56.00	-11.01	QP
9	2.099	19.99	0.12	9.60	29.71	46.00	-16.29	Average
10	2.099	30.24	0.12	9.60	39.96	56.00	-16.04	QP
11	6.841	18.42	0.20	9.74	28.36	50.00	-21.64	Average
12	6.841	27.90	0.20	9.74	37.84	60.00	-22.16	QP



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Test Mode: 04; Line: Neutral Line



Pol : NEUTRAL

Mode :

Model :

	Freque	Read	Cable	LISN	Measured	Limit	Over	
	MHz	Level	Loss	Factor	Level	Line	Limit	Remark
		dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	21.97	0.06	9.54	31.57	54.94	-23.37	Average
2	0.170	34.08	0.06	9.54	43.68	64.94	-21.26	QP
3	0.348	18.61	0.06	9.57	28.24	49.00	-20.76	Average
4	0.348	33.29	0.06	9.57	42.92	59.00	-16.08	QP
5	0.890	22.90	0.07	9.59	32.56	46.00	-13.44	Average
6	0.890	34.54	0.07	9.59	44.20	56.00	-11.80	QP
7	1.043	21.59	0.07	9.59	31.25	46.00	-14.75	Average
8	1.043	33.52	0.07	9.59	43.18	56.00	-12.82	QP
9	1.991	21.20	0.12	9.59	30.91	46.00	-15.09	Average
10	1.991	35.18	0.12	9.59	44.89	56.00	-11.11	QP
11	6.662	17.74	0.19	9.74	27.67	50.00	-22.33	Average
12	6.662	27.88	0.19	9.74	37.81	60.00	-22.19	QP



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6.2 Output Power Measurement

Test Requirement: 47 CFR Part 18

Test Method: FCC OST/MP-5:1986

6.5.1 Operating Environment:

Temperature: 24.5 °C Humidity: 52.8 % RH Atmospheric Pressure: 1017 mbar

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

6.5.2 Measurement Data

Alternative1 IGBT::

Mass of water (g)	Mass of the container (g)	Ambient temperature (°C)	Initial temperature (°C)	Final temperature (°C)	Heating time(s)	Power output (watts)
1200	368	20.1	20	32.5	57	1145.9

Alternative2 IGBT:

Mass of water (g)	Mass of the container (g)	Ambient temperature (°C)	Initial temperature (°C)	Final temperature (°C)	Heating time(s)	Power output (watts)
1200	368	20.2	19.6	32.3	58	1142.4

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_w is the mass of the water, in grams

m_c is the mass of the container, in grams

T₀ is the ambient temperature, in degrees Celsius

T₁ is the initial temperature of the water, in degrees Celsius

T₂ is the final temperature of the water, in degrees Celsius

t is the heating time, in seconds, excluding the magnetron filament heating-up time.

6.2.1 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.

Alternative1 IGBT:

Input Voltage (V)	Input Current (A)	Power Factor	Measured input power (W)	Rated input power (W)
120	13.18	0.986	1578	1250

Alternative2 IGBT:

Input Voltage (V)	Input Current (A)	Power Factor	Measured input power (W)	Rated input power (W)
120.03	12.72	0.99	1515	1250

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

Test Requirement: 47 CFR Part 18
Test Method: FCC/OST MP-5:1986
Measurement Distance: 10 m
Frequency Range: 9kHz to 30MHz
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:

Alternative1 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1145.9	Limit=20lg(25*SQRT(power/500))+20lg(300/10)= 61.10 dBuV/m

Alternative2 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1142.4	Limit=20lg(25*SQRT(power/500))+20lg(300/10)= 61.09 dBuV/m

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 56.3 % RH Atmospheric Pressure: 1015 mbar

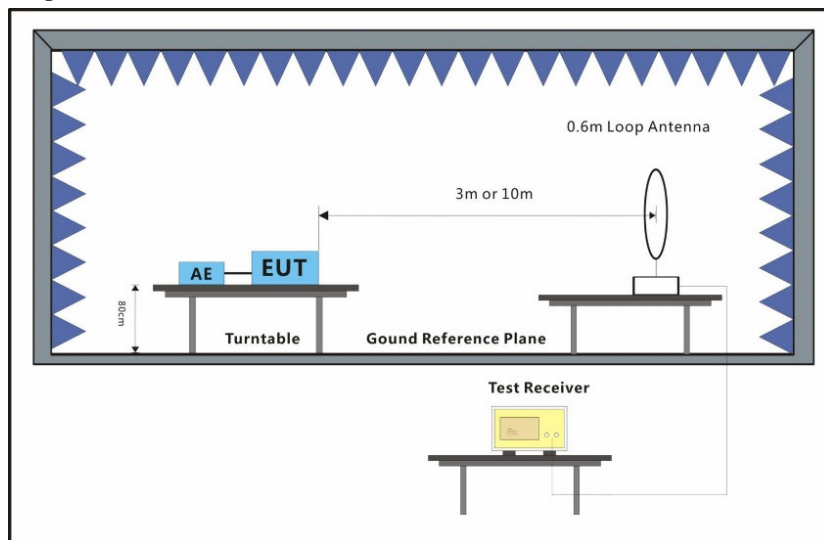
6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative1 IGBT)
Pre-scan	01	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative1 IGBT)
Pre-scan	02	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative1 IGBT)
Final test	04	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative2 IGBT)
Pre-scan	05	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative2 IGBT)

Pre-scan 06

Test the EUT in microwave mode, setting in 10% microwave power. (with alternative2 IGBT)

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

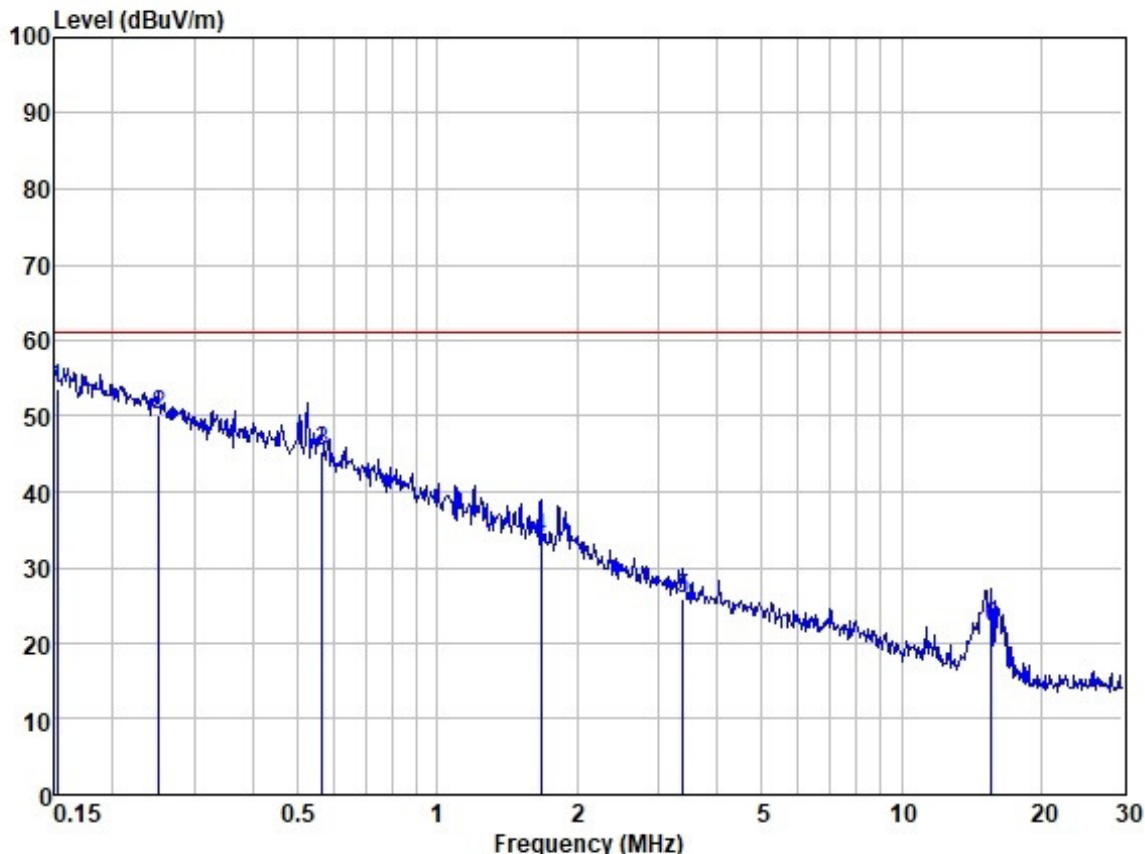
Frequency range: 9KHz-30MHz

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 loop antenna with 2 orthogonal polarities.

The red line show in graphic is the limit in standard used in this section.

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

Test Mode: 00; Polarity: Horizontal



Site : SGS
Job :
Model :
Power :
Test Mode :

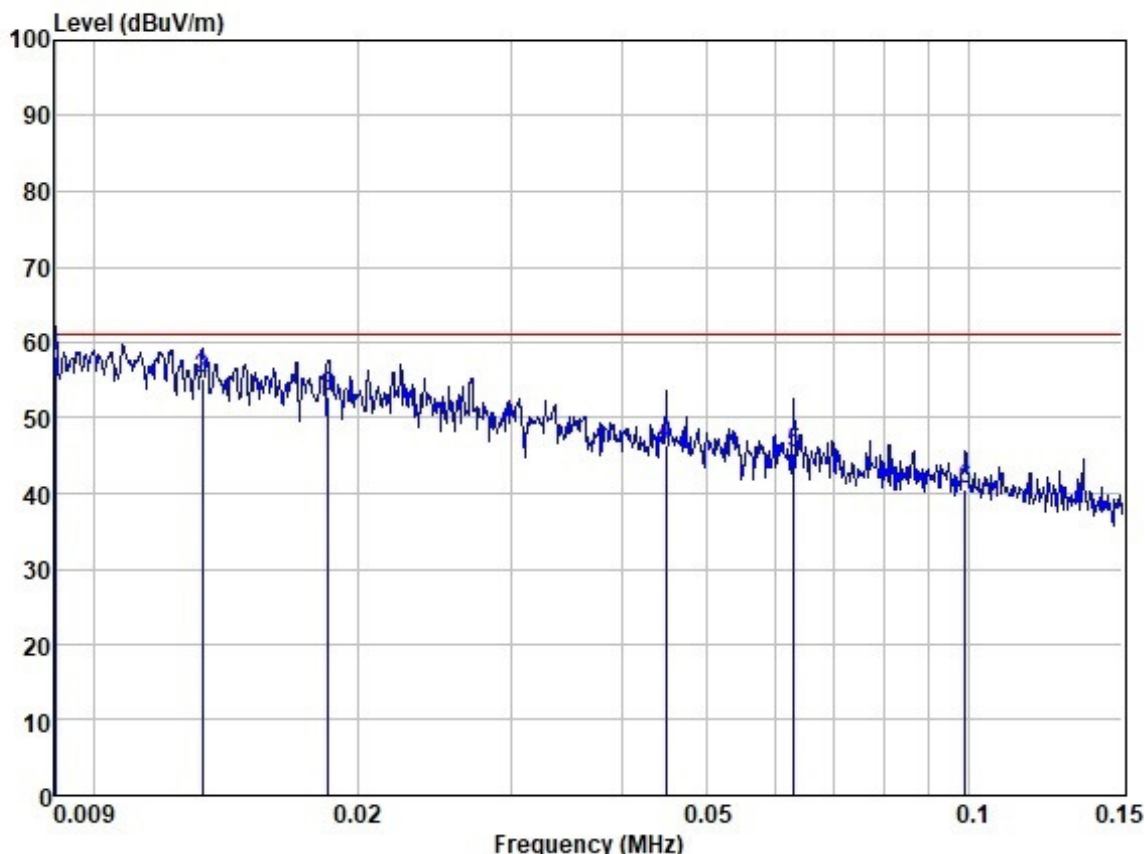
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.152	70.97	11.88	0.05	29.40	53.50	61.10	-7.60	HORIZONTAL	Average
2	0.252	67.55	11.86	0.05	29.40	50.06	61.10	-11.04	HORIZONTAL	Average
3	0.564	62.97	11.81	0.08	29.40	45.46	61.10	-15.64	HORIZONTAL	Average
4	1.671	51.23	11.84	0.16	29.40	33.83	61.10	-27.27	HORIZONTAL	Average
5	3.381	43.23	11.77	0.31	29.33	25.98	61.10	-35.12	HORIZONTAL	Average
6	15.635	41.10	9.66	0.60	29.20	22.16	61.10	-38.94	HORIZONTAL	Average



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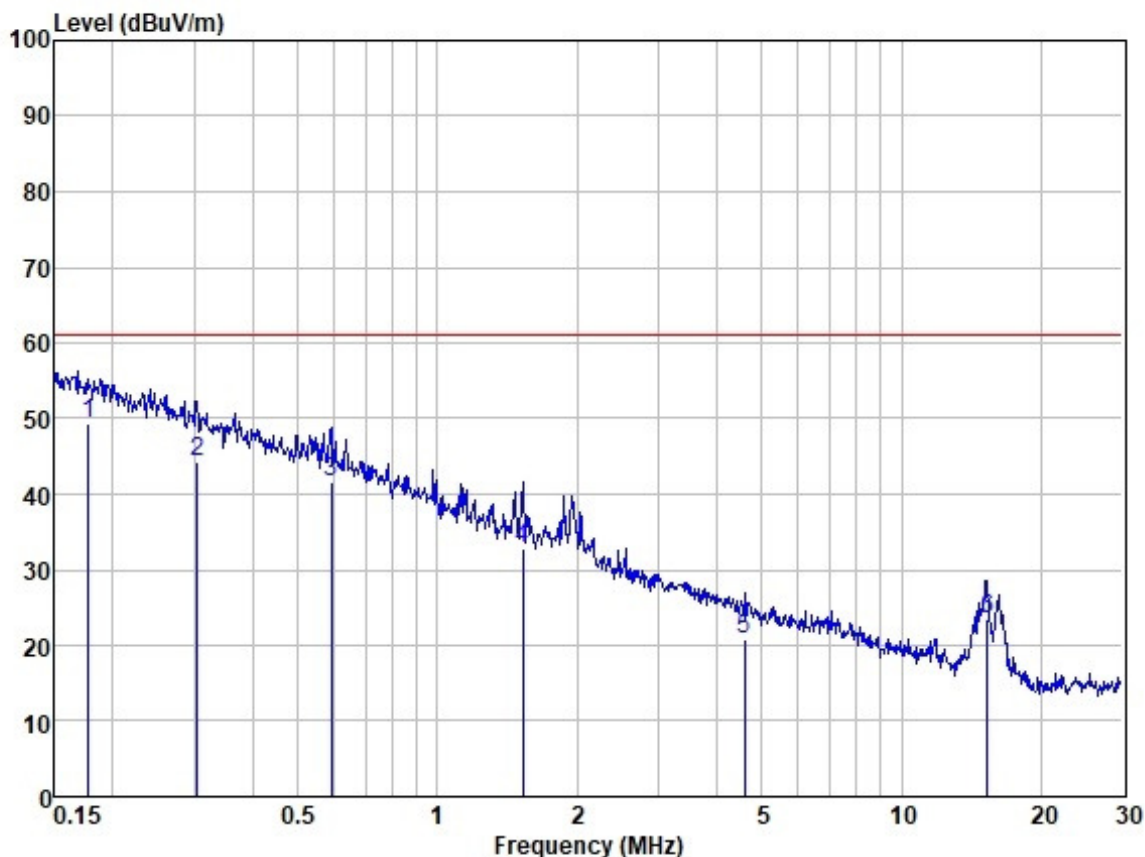
Test Mode: 00; Polarity: Horizontal



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.009	67.48	18.96	0.02	28.40	58.06	61.10	-3.04	HORIZONTAL	Average
2	0.013	66.97	16.71	0.02	28.47	55.23	61.10	-5.87	HORIZONTAL	Average
3	0.018	66.77	14.43	0.02	28.55	52.67	61.10	-8.43	HORIZONTAL	Average
4	0.045	63.39	12.32	0.03	29.22	46.52	61.10	-14.58	HORIZONTAL	Average
5	0.063	62.63	12.08	0.04	29.32	45.43	61.10	-15.67	HORIZONTAL	Average
6	0.099	57.94	11.95	0.05	29.40	40.54	61.10	-20.56	HORIZONTAL	Average

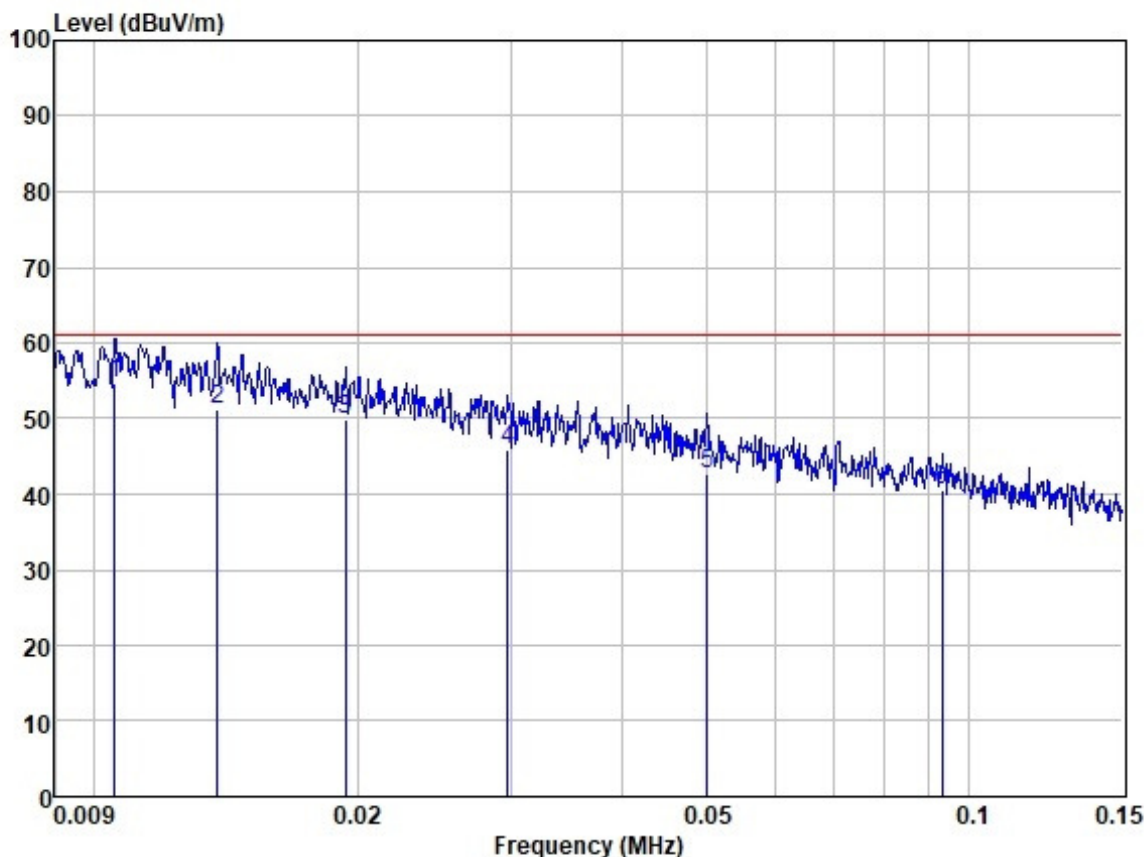
Test Mode: 00; Polarity: Vertical



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.178	66.78	11.86	0.05	29.40	49.29	61.10	-11.81	VERTICAL	Average
2	0.303	61.79	11.87	0.05	29.40	44.31	61.10	-16.79	VERTICAL	Average
3	0.592	59.19	11.81	0.09	29.40	41.69	61.10	-19.41	VERTICAL	Average
4	1.527	50.14	11.84	0.15	29.40	32.73	61.10	-28.37	VERTICAL	Average
5	4.598	38.34	11.50	0.33	29.30	20.87	61.10	-40.23	VERTICAL	Average
6	15.307	42.48	9.73	0.59	29.20	23.60	61.10	-37.50	VERTICAL	Average

Test Mode: 00; Polarity: Vertical



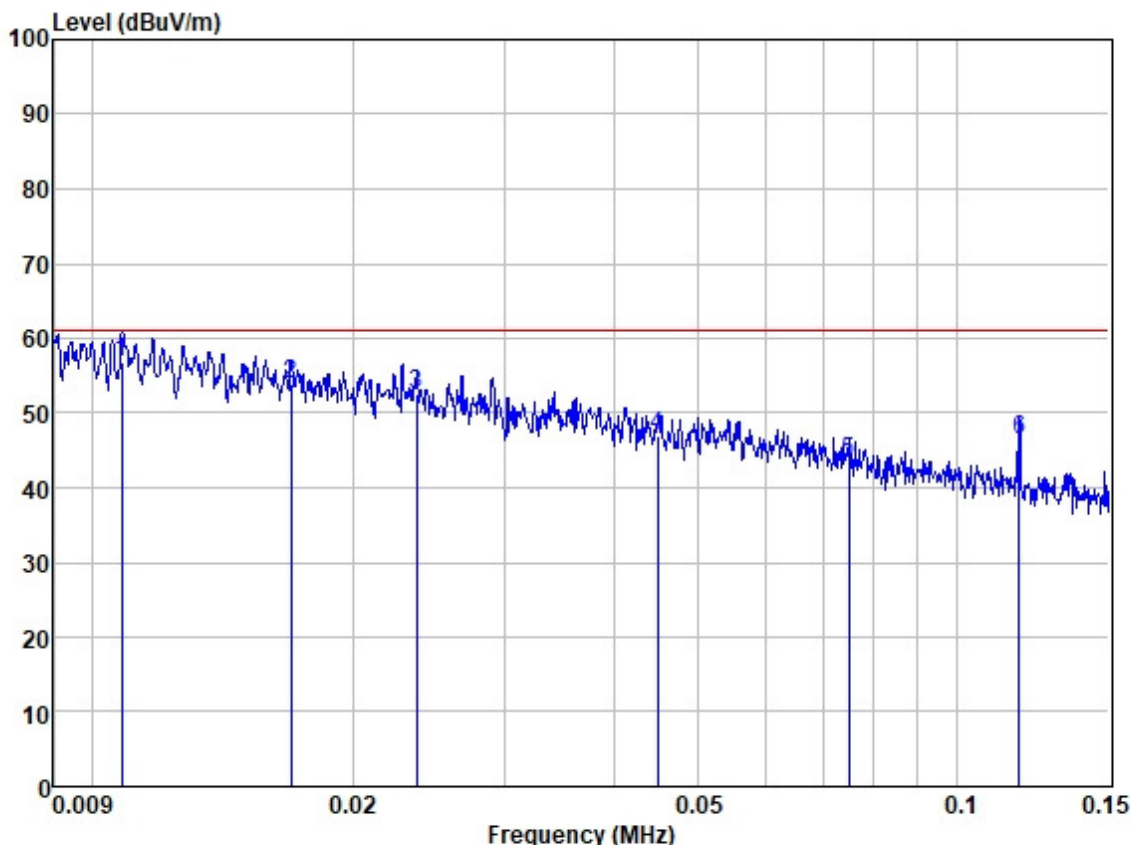
Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.011	64.60	18.44	0.02	28.42	54.64	61.10	-6.46	VERTICAL	Average
2	0.014	63.44	16.13	0.02	28.47	51.12	61.10	-9.98	VERTICAL	Average
3	0.019	64.10	14.30	0.02	28.56	49.86	61.10	-11.24	VERTICAL	Average
4	0.030	61.84	12.96	0.03	28.88	45.95	61.10	-15.15	VERTICAL	Average
5	0.050	59.76	12.20	0.03	29.26	42.73	61.10	-18.37	VERTICAL	Average
6	0.093	57.80	11.96	0.04	29.39	40.41	61.10	-20.69	VERTICAL	Average



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Test Mode: 04; Polarity: Horizontal



Site : SGS
Job :
Model :
Power :
Test Mode :

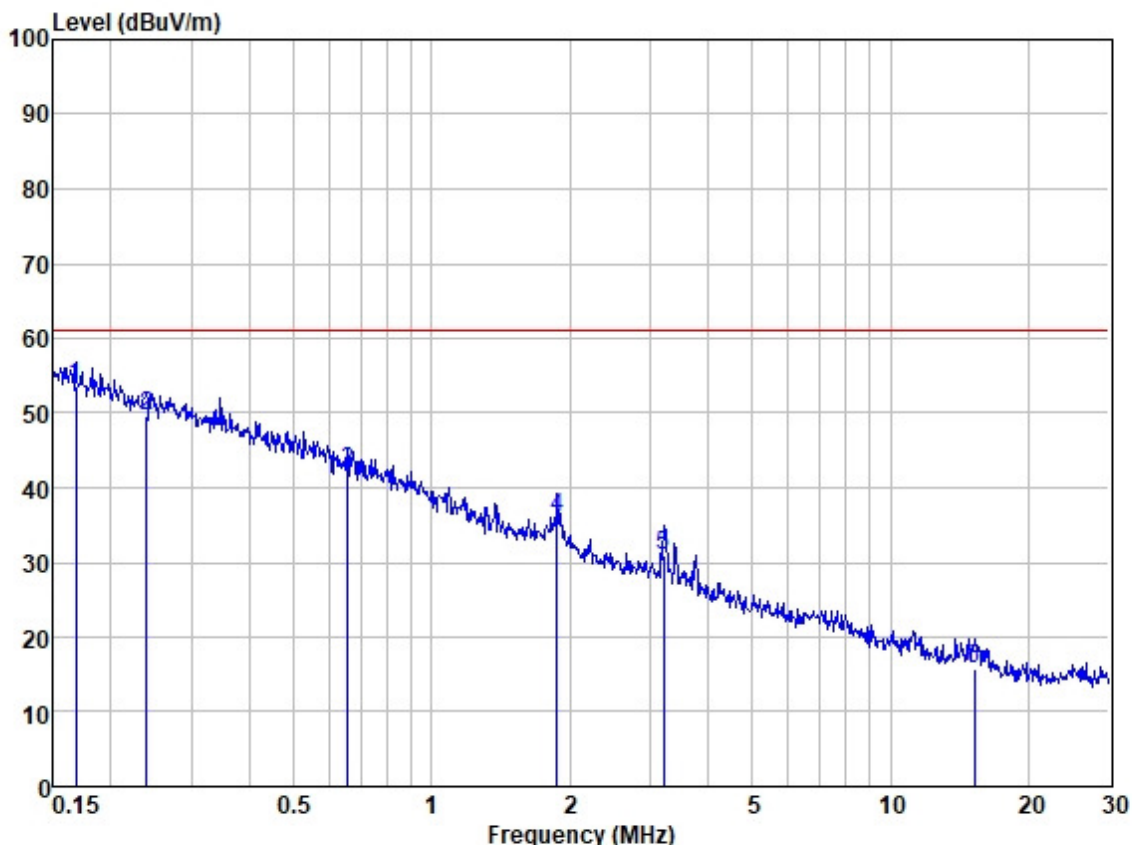
	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.011	66.83	18.30	0.02	28.43	56.72	61.09	-4.37	HORIZONTAL	Average
2	0.017	67.73	14.76	0.02	28.52	53.99	61.09	-7.10	HORIZONTAL	Average
3	0.024	67.45	13.75	0.02	28.65	52.57	61.09	-8.52	HORIZONTAL	Average
4	0.045	63.75	12.32	0.03	29.22	46.88	61.09	-14.21	HORIZONTAL	Average
5	0.075	60.71	11.99	0.04	29.35	43.39	61.09	-17.70	HORIZONTAL	Average
6	0.118	63.70	11.94	0.05	29.40	46.29	61.09	-14.80	HORIZONTAL	Average



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Test Mode: 04; Polarity: Horizontal



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.168	71.17	11.87	0.05	29.40	53.69	61.09	-7.40	HORIZONTAL	Average
2	0.239	67.16	11.86	0.05	29.40	49.67	61.09	-11.42	HORIZONTAL	Average
3	0.658	59.70	11.82	0.10	29.40	42.22	61.09	-18.87	HORIZONTAL	Average
4	1.878	53.51	11.84	0.18	29.40	36.13	61.09	-24.96	HORIZONTAL	Average
5	3.207	48.16	11.81	0.30	29.35	30.92	61.09	-30.17	HORIZONTAL	Average
6	15.226	34.61	9.75	0.59	29.20	15.75	61.09	-45.34	HORIZONTAL	Average



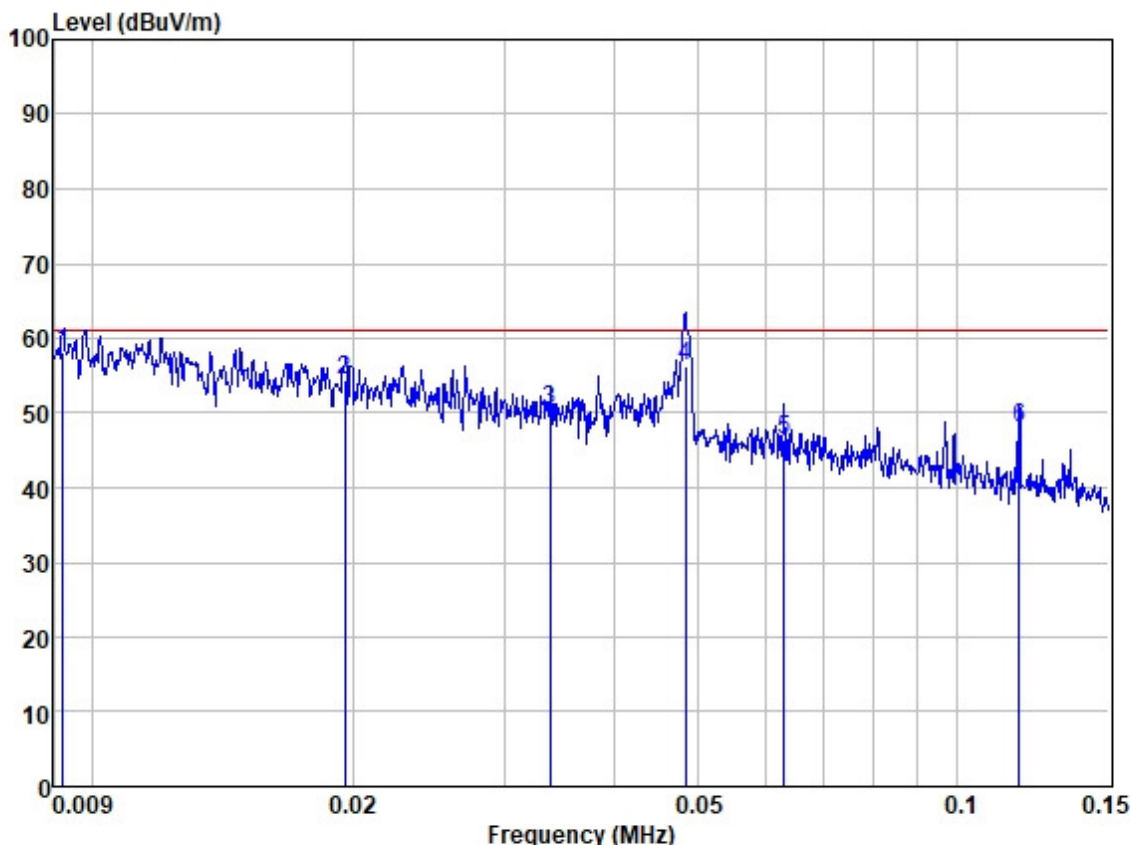
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Test Mode: 04; Polarity: Vertical



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.009	67.57	18.89	0.02	28.40	58.08	61.09	-3.01	VERTICAL	Average
2	0.020	68.71	14.26	0.02	28.57	54.42	61.09	-6.67	VERTICAL	Average
3	0.034	66.64	12.76	0.03	29.07	50.36	61.09	-10.73	VERTICAL	Average
4	0.049	73.38	12.22	0.03	29.25	56.38	61.09	-4.71	VERTICAL	Average
5	0.063	63.50	12.08	0.04	29.32	46.30	61.09	-14.79	VERTICAL	Average
6	0.118	65.49	11.94	0.05	29.40	48.08	61.09	-13.01	VERTICAL	Average



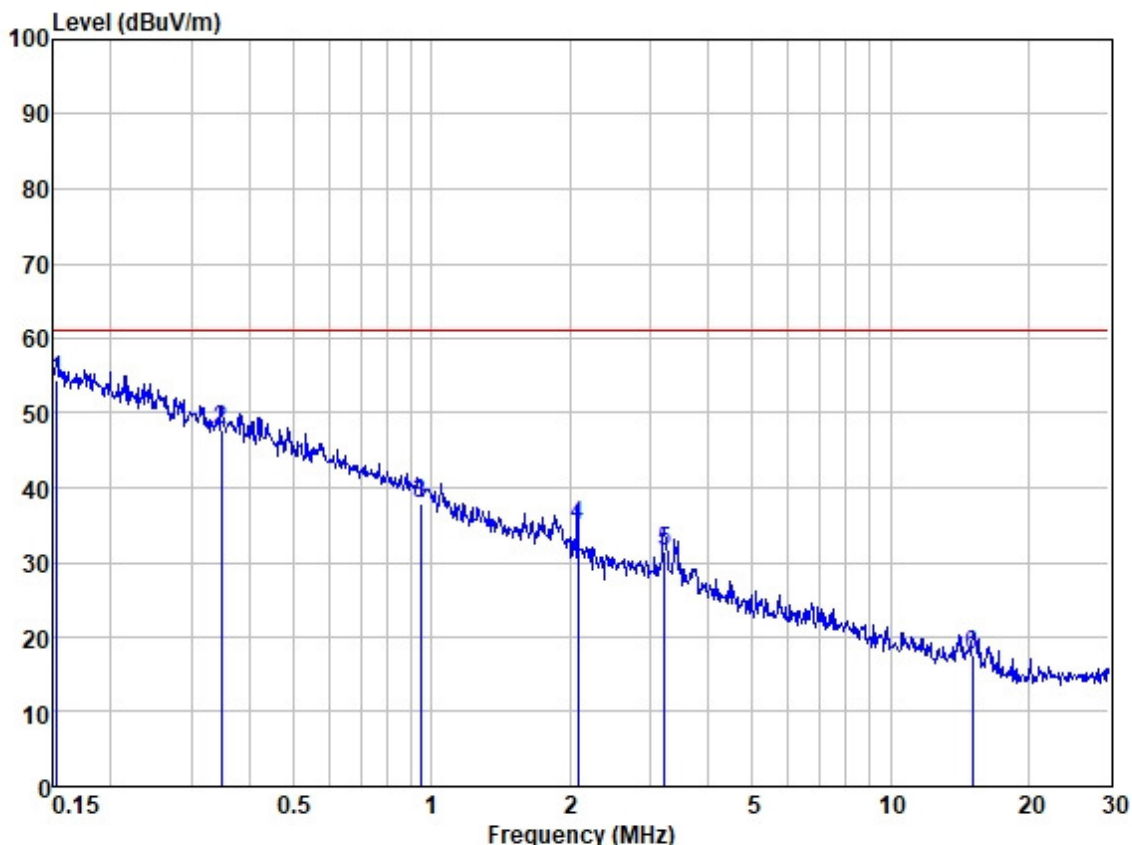
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Test Mode: 04; Polarity: Vertical



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	0.152	71.88	11.88	0.05	29.40	54.41	61.09	-6.68	VERTICAL	Average
2	0.348	65.33	11.86	0.05	29.40	47.84	61.09	-13.25	VERTICAL	Average
3	0.948	55.35	11.85	0.11	29.40	37.91	61.09	-23.18	VERTICAL	Average
4	2.088	52.35	11.84	0.20	29.40	34.99	61.09	-26.10	VERTICAL	Average
5	3.224	48.68	11.81	0.30	29.34	31.45	61.09	-29.64	VERTICAL	Average
6	15.066	36.52	9.77	0.59	29.20	17.68	61.09	-43.41	VERTICAL	Average



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6.4 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 18
 Test Method: FCC/OST MP-5:1986
 Measurement Distance: 3 m
 Frequency Range: 30 MHz to 1 GHz
 Detector: Peak for pre-scan, average for the final result (120 kHz Resolution Bandwidth for 30 MHz to 1 GHz)

Limit:

Alternative1 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1145.9	Limit=20lg(25*SQRT(power/500))+20lg(300/3)= 71.56 dBuV/m

Alternative2 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1142.4	Limit=20lg(25*SQRT(power/500))+20lg(300/3)= 71.55 dBuV/m

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 56.3 % RH Atmospheric Pressure: 1015 mbar

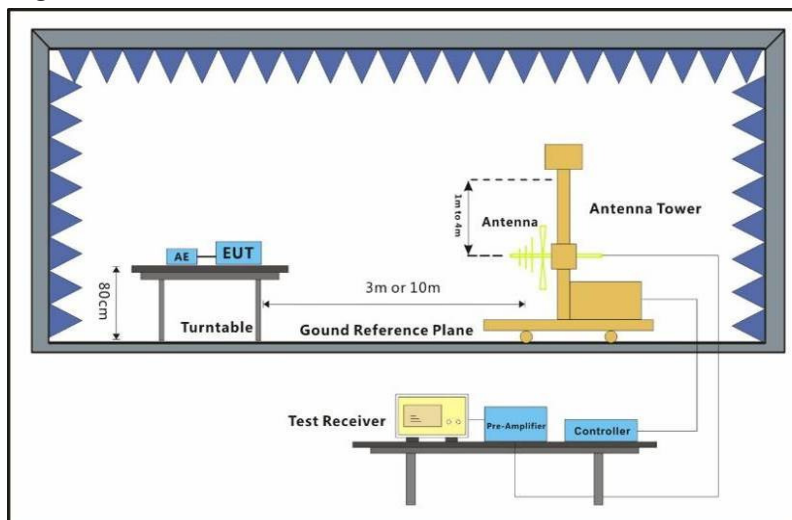
6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative1 IGBT)
Pre-scan	01	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative1 IGBT)
Pre-scan	02	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative1 IGBT)
Final test	04	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative2 IGBT)
Pre-scan	05	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative2 IGBT)
Pre-scan	06	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative2 IGBT)



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6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

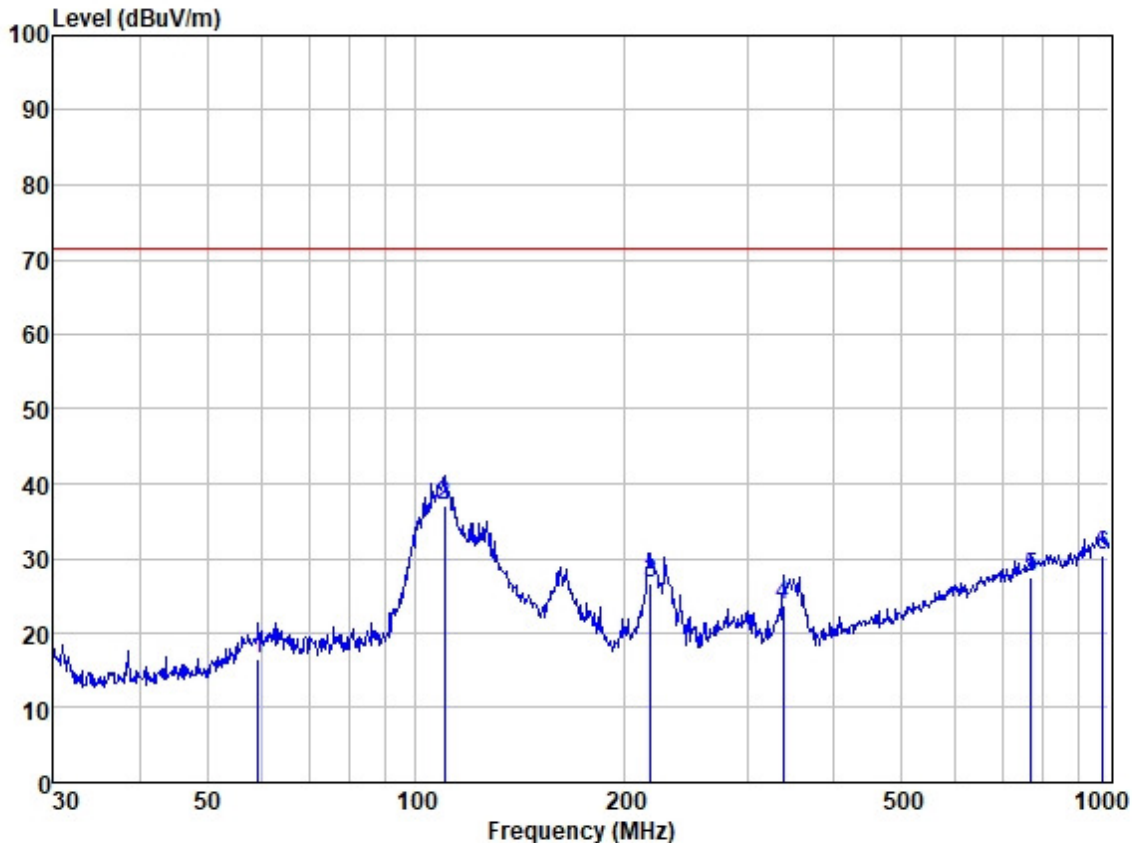
Frequency range: 30MHz-1GHz

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.

The red line show in graphic is the limit in standard used in this section.

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

Test Mode: 00; Polarity: Horizontal



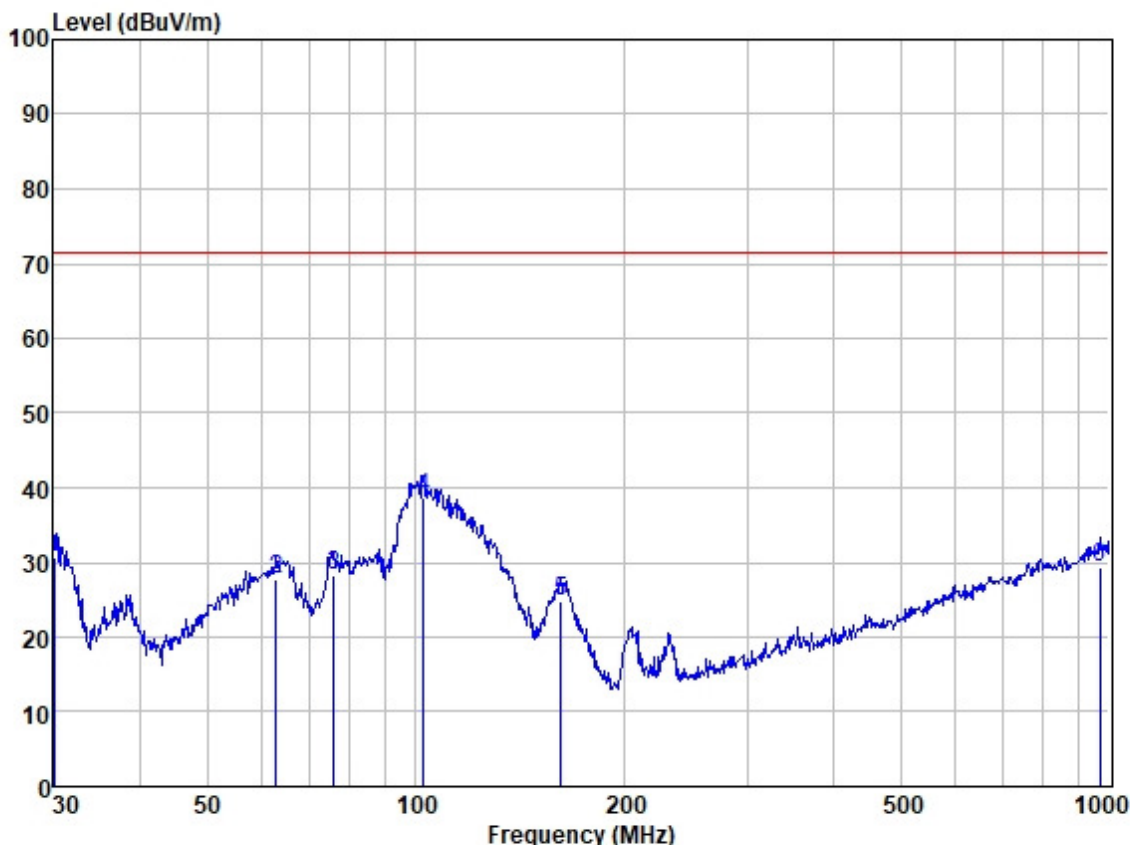
Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	59.232	29.37	13.45	1.24	27.60	16.46	71.56	-55.10	HORIZONTAL	Average
2	109.796	52.40	10.41	1.76	27.58	36.99	71.56	-34.57	HORIZONTAL	Average
3	218.309	41.28	10.02	2.64	27.29	26.65	71.56	-44.91	HORIZONTAL	Average
4	338.400	33.34	14.32	3.51	27.48	23.69	71.56	-47.87	HORIZONTAL	Average
5	771.449	28.08	22.17	5.92	28.62	27.55	71.56	-44.01	HORIZONTAL	Average
6	979.180	27.25	24.27	7.00	28.03	30.49	71.56	-41.07	HORIZONTAL	Average



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Test Mode: 00; Polarity: Vertical



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	30.105	44.43	12.94	1.01	27.67	30.71	71.56	-40.85	VERTICAL	Average
2	62.871	41.24	12.91	1.31	27.60	27.86	71.56	-43.70	VERTICAL	Average
3	76.244	44.67	9.88	1.45	27.60	28.40	71.56	-43.16	VERTICAL	Average
4	102.360	55.20	9.42	1.71	27.60	38.73	71.56	-32.83	VERTICAL	Average
5	162.041	36.25	13.56	2.33	27.35	24.79	71.56	-46.77	VERTICAL	Average
6	968.934	26.26	24.32	6.90	28.05	29.43	71.56	-42.13	VERTICAL	Average

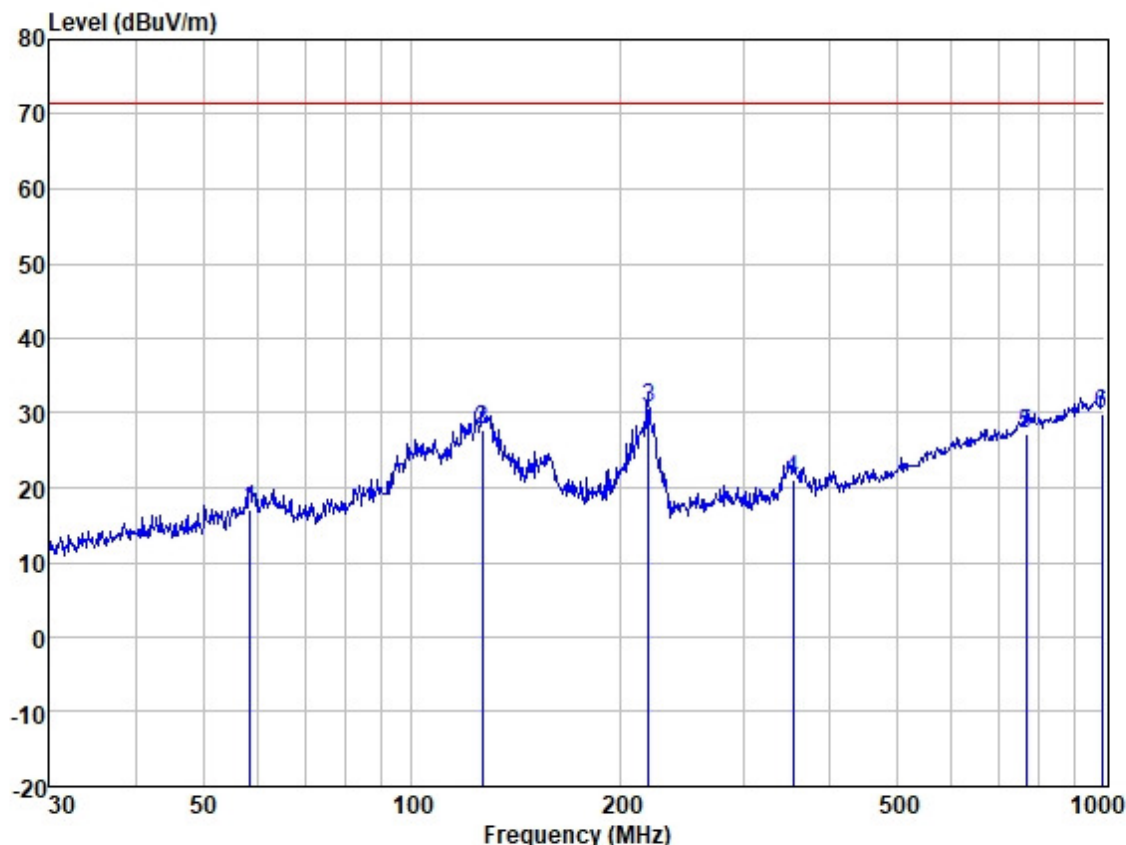


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Test Mode: 04; Polarity: Horizontal



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	58.407	30.43	13.06	1.23	27.60	17.12	71.55	-54.43	HORIZONTAL	Average
2	126.329	41.89	11.54	1.90	27.54	27.79	71.55	-43.76	HORIZONTAL	Average
3	219.075	45.56	9.69	2.64	27.29	30.60	71.55	-40.95	HORIZONTAL	Average
4	354.183	30.82	14.23	3.65	27.72	20.98	71.55	-50.57	HORIZONTAL	Average
5	768.748	27.87	22.07	5.87	28.62	27.19	71.55	-44.36	HORIZONTAL	Average
6	989.536	26.43	24.24	7.10	28.02	29.75	71.55	-41.80	HORIZONTAL	Average



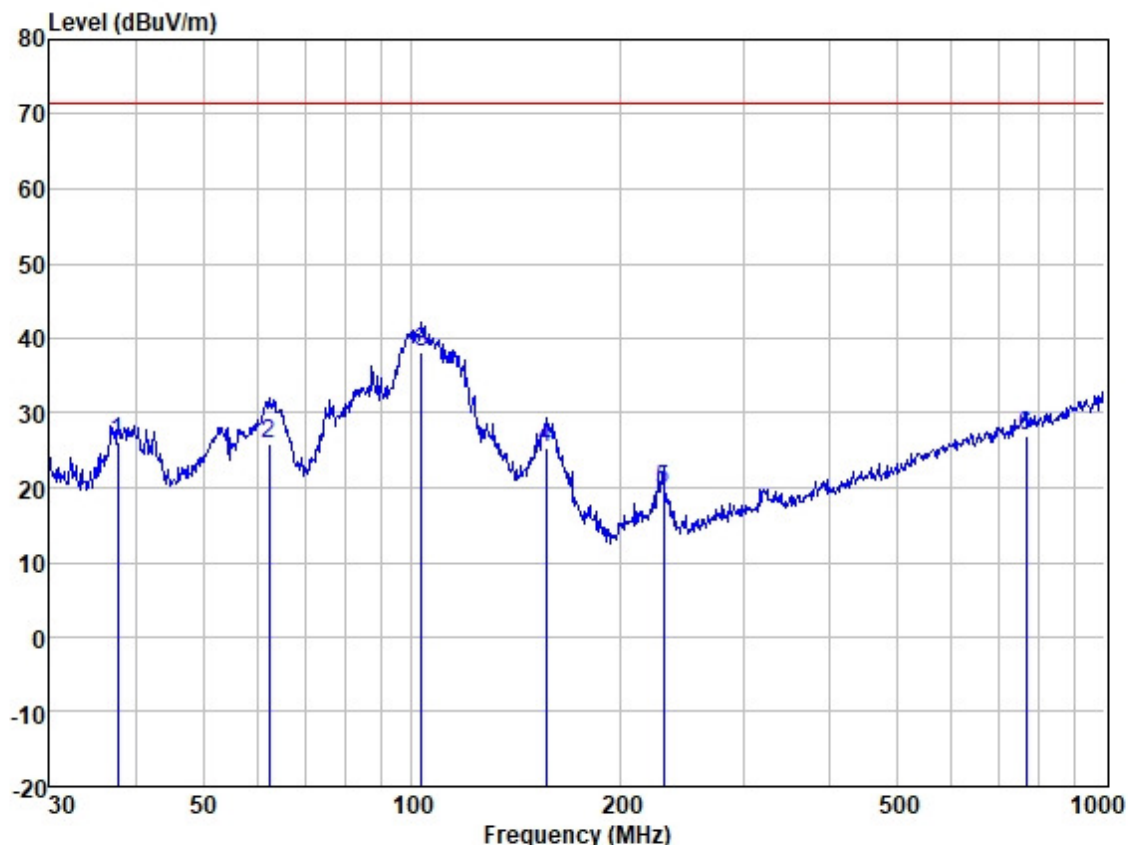
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Test Mode: 04; Polarity: Vertical



Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	37.680	39.84	12.79	1.07	27.62	26.08	71.55	-45.47	VERTICAL	Average
2	62.213	39.66	12.59	1.29	27.60	25.94	71.55	-45.61	VERTICAL	Average
3	103.080	55.04	9.10	1.71	27.59	38.26	71.55	-33.29	VERTICAL	Average
4	155.910	36.96	13.34	2.28	27.37	25.21	71.55	-46.34	VERTICAL	Average
5	230.907	33.70	10.53	2.75	27.28	19.70	71.55	-51.85	VERTICAL	Average
6	768.748	27.59	22.07	5.87	28.62	26.91	71.55	-44.64	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
Measurement Distance: 3 m
Frequency Range: Above 1GHz
Detector: Peak for pre-scan, Average for the final result
(1MHz Resolution Bandwidth for above 1000MHz)

Limit:

Alternative1 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1145.9	Limit=20lg(25*SQRT(power/500))+20lg(300/3)= 71.56 dBuV/m

Alternative2 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1142.4	Limit=20lg(25*SQRT(power/500))+20lg(300/3)= 71.55 dBuV/m

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 54.8 % RH Atmospheric Pressure: 1015 mbar

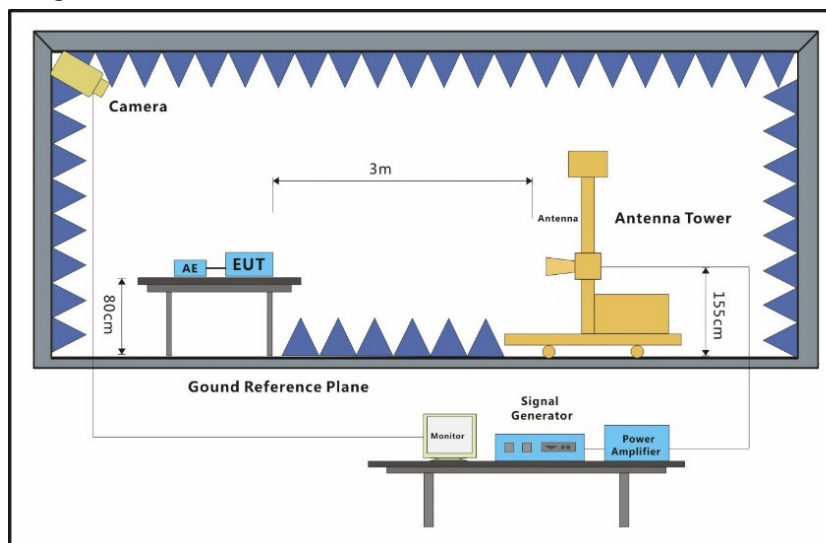
6.5.2 Test Mode Description

Pre-scan / Mode	Code	Description
Final test	00	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative1 IGBT)
Pre-scan	01	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative1 IGBT)
Pre-scan	02	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative1 IGBT)
Final test	04	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative2 IGBT)
Pre-scan	05	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative2 IGBT)
Pre-scan	06	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative2 IGBT)



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6.5.3 Test Setup Diagram



6.5.4 Measurement Procedure and Data

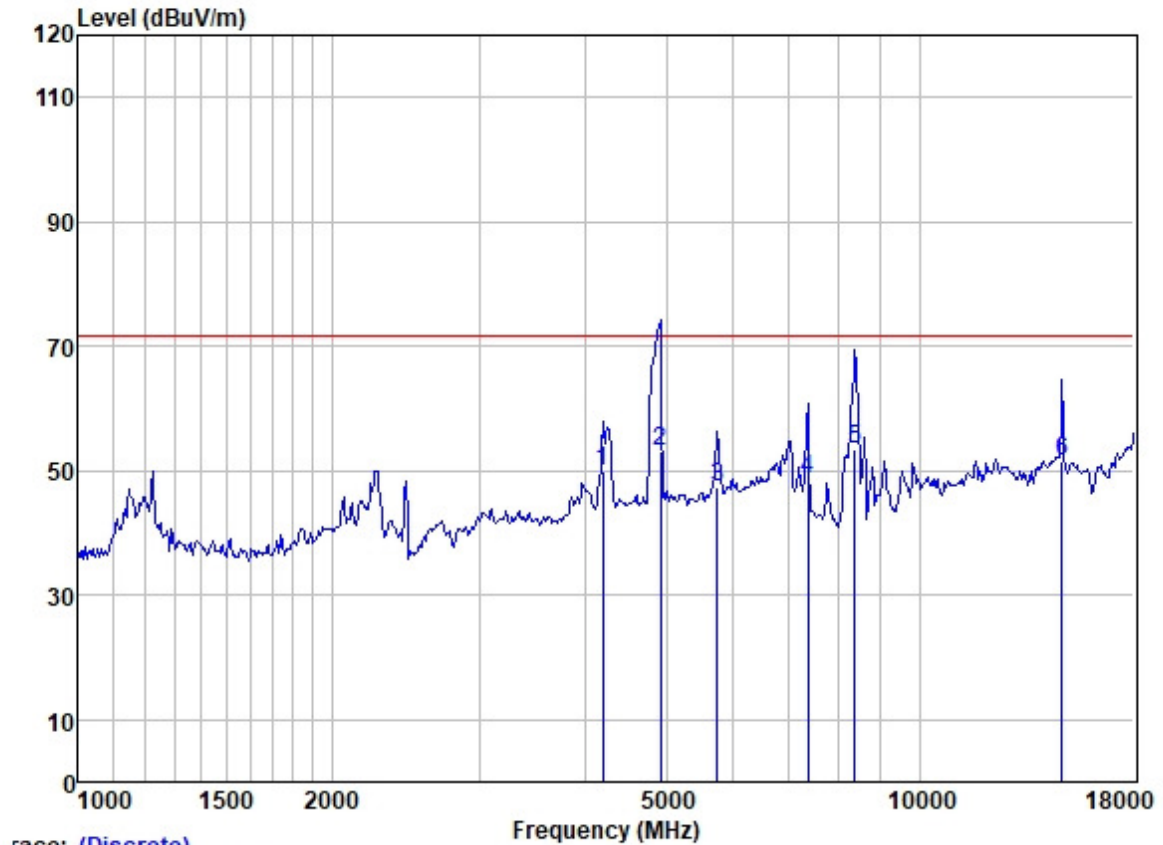
Frequency range: Above 1GHz

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.

The red line show in graphic is the limit in standard used in this section.

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

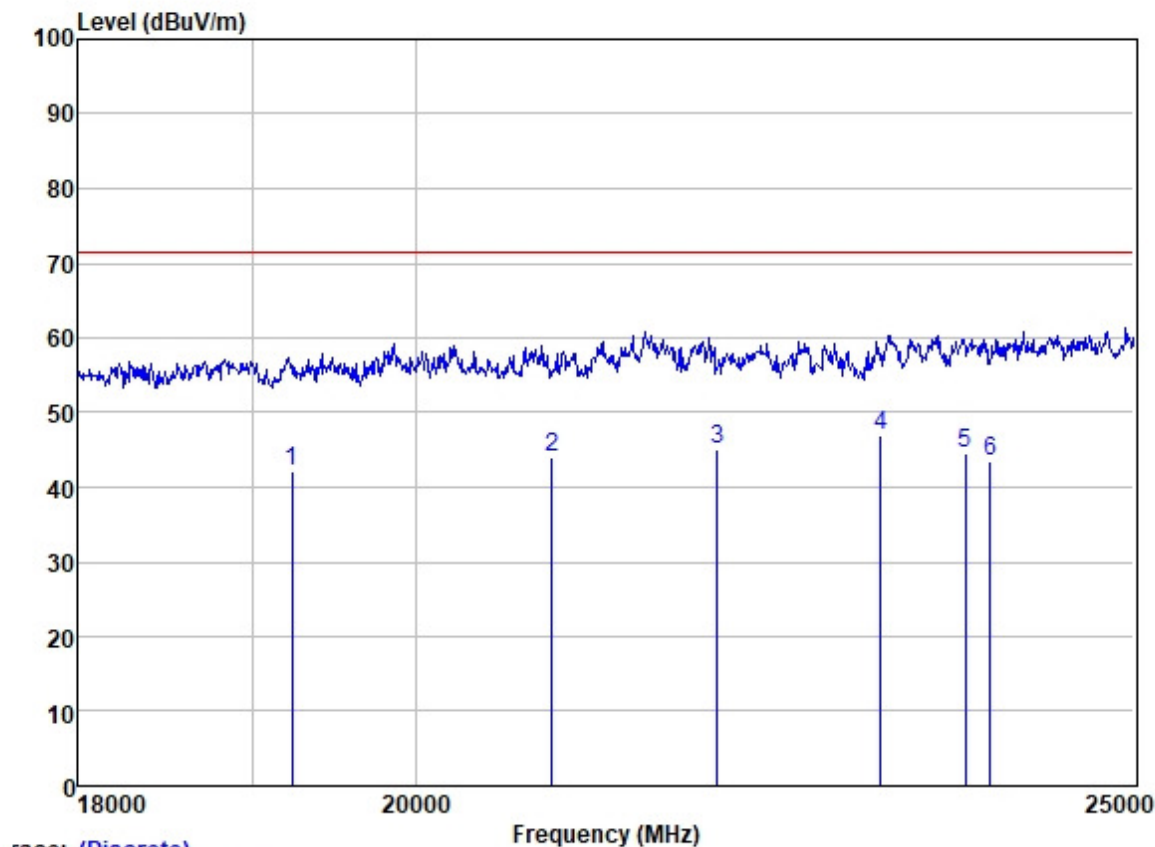
Test Mode: 00; Polarity: Horizontal



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	4206.011	49.97	31.30	5.21	36.61	49.87	71.56	-21.69	HORIZONTAL	Average
2	4916.490	51.41	32.96	5.51	36.64	53.24	71.56	-18.32	HORIZONTAL	Average
3	5746.982	44.35	33.88	5.70	36.69	47.24	71.56	-24.32	HORIZONTAL	Average
4	7368.741	42.66	36.47	6.31	36.78	48.66	71.56	-22.90	HORIZONTAL	Average
5	8368.069	46.54	37.36	6.47	36.84	53.53	71.56	-18.03	HORIZONTAL	Average
6	14788.150	39.88	40.02	7.10	35.44	51.56	71.56	-20.00	HORIZONTAL	Average

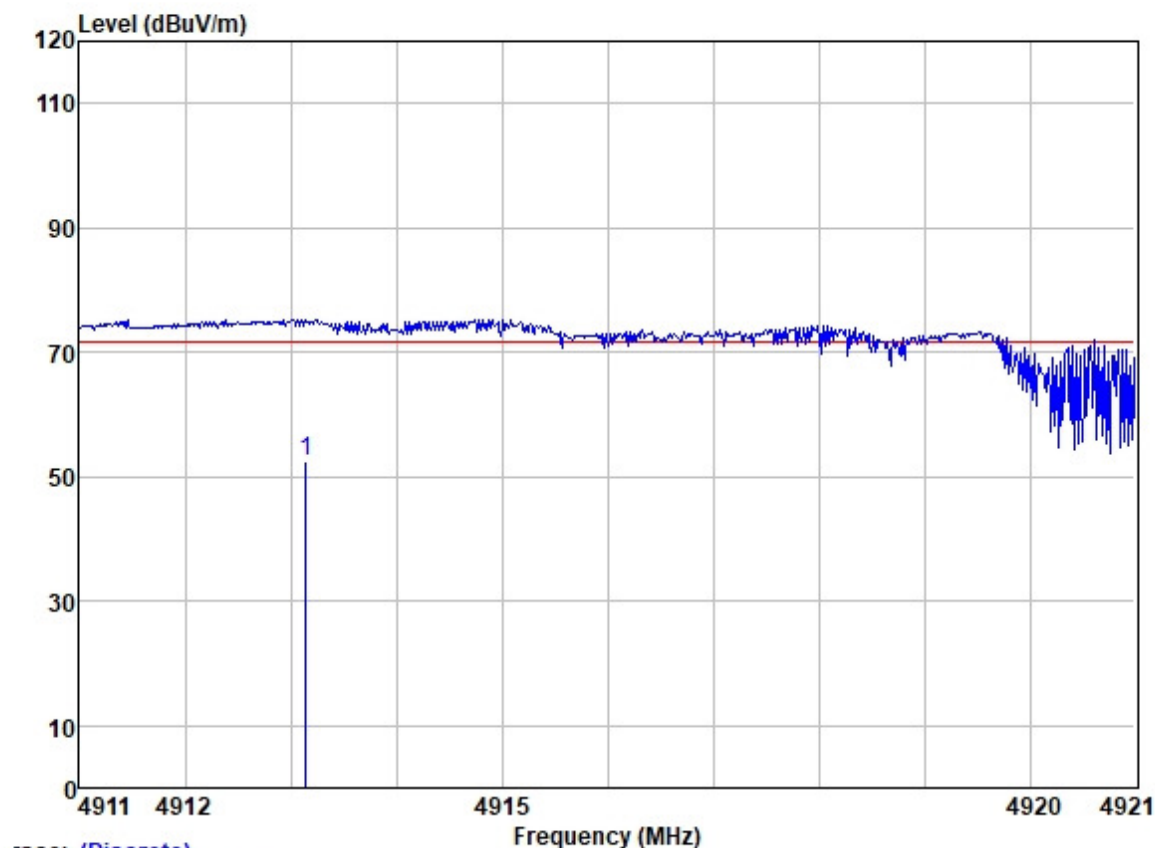
Test Mode: 00; Polarity: Horizontal



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 19234.960	22.81	38.00	16.96	35.60	42.17	71.56	-29.39	HORIZONTAL	Average
2 20860.760	23.58	37.91	17.95	35.48	43.96	71.56	-27.60	HORIZONTAL	Average
3 21957.670	23.47	38.20	18.59	35.31	44.95	71.56	-26.61	HORIZONTAL	Average
4 23104.670	23.89	39.60	19.28	35.79	46.98	71.56	-24.58	HORIZONTAL	Average
5 23719.920	20.85	39.60	20.17	36.03	44.59	71.56	-26.97	HORIZONTAL	Average
6 23907.670	19.72	39.60	20.33	36.08	43.57	71.56	-27.99	HORIZONTAL	Average

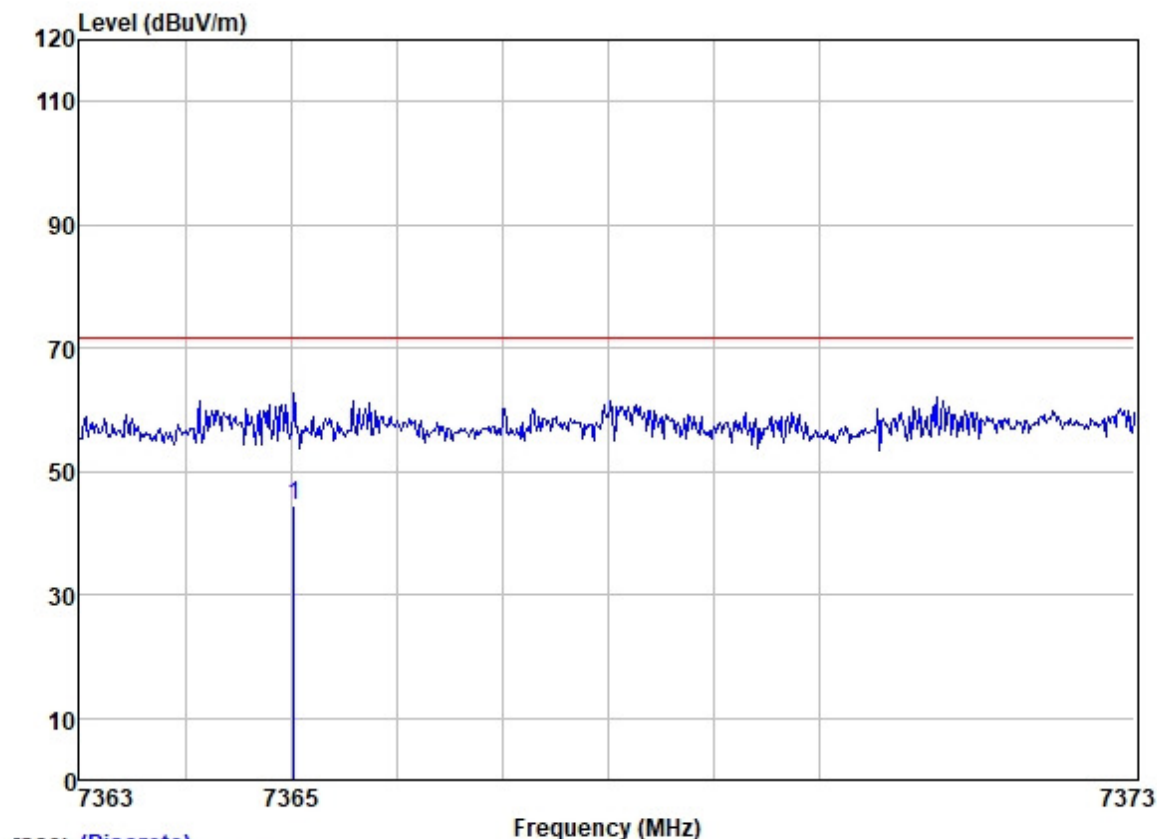
Test Mode: 00; Polarity: Horizontal



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	4913.148	50.49	32.96	5.51	36.64	52.32	71.56	-19.24	HORIZONTAL Average

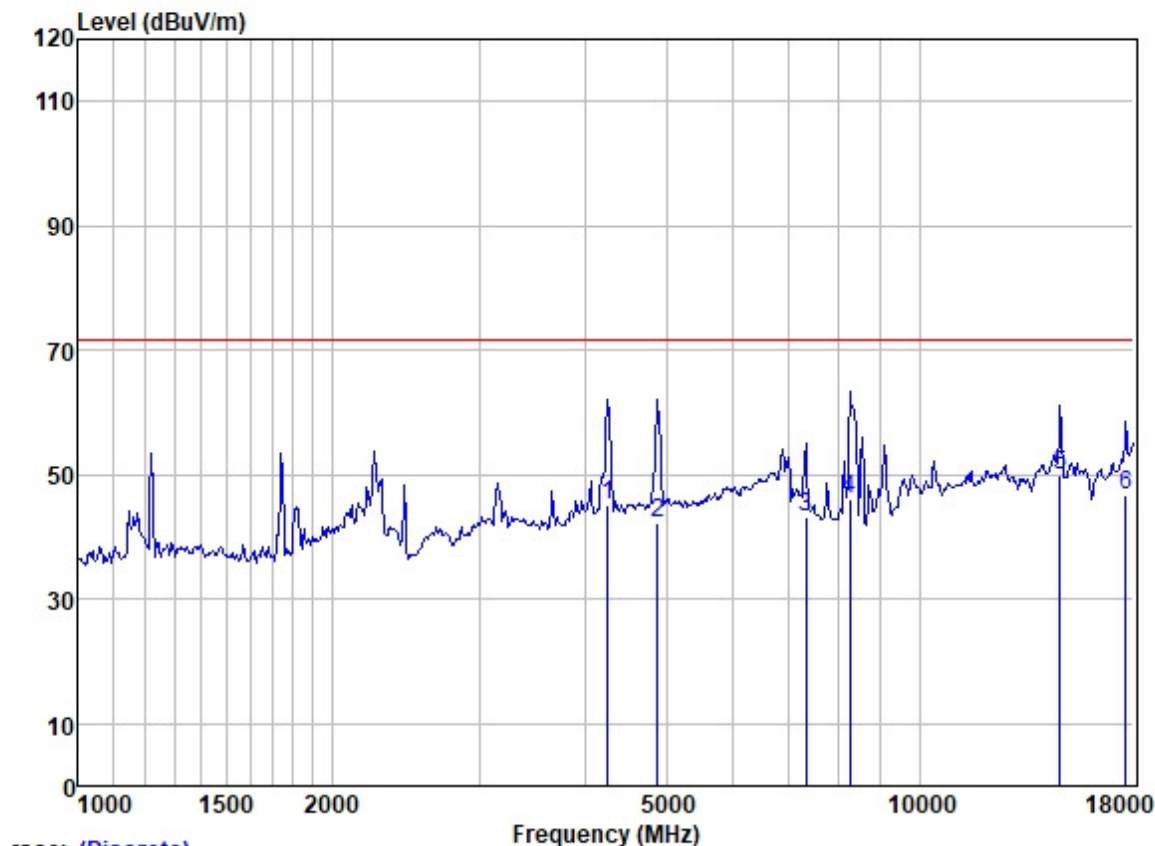
Test Mode: 00; Polarity: Horizontal



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	7365.029	38.57	36.47	6.31	36.78	44.57	71.56	-26.99
								HORIZONTAL
								Average

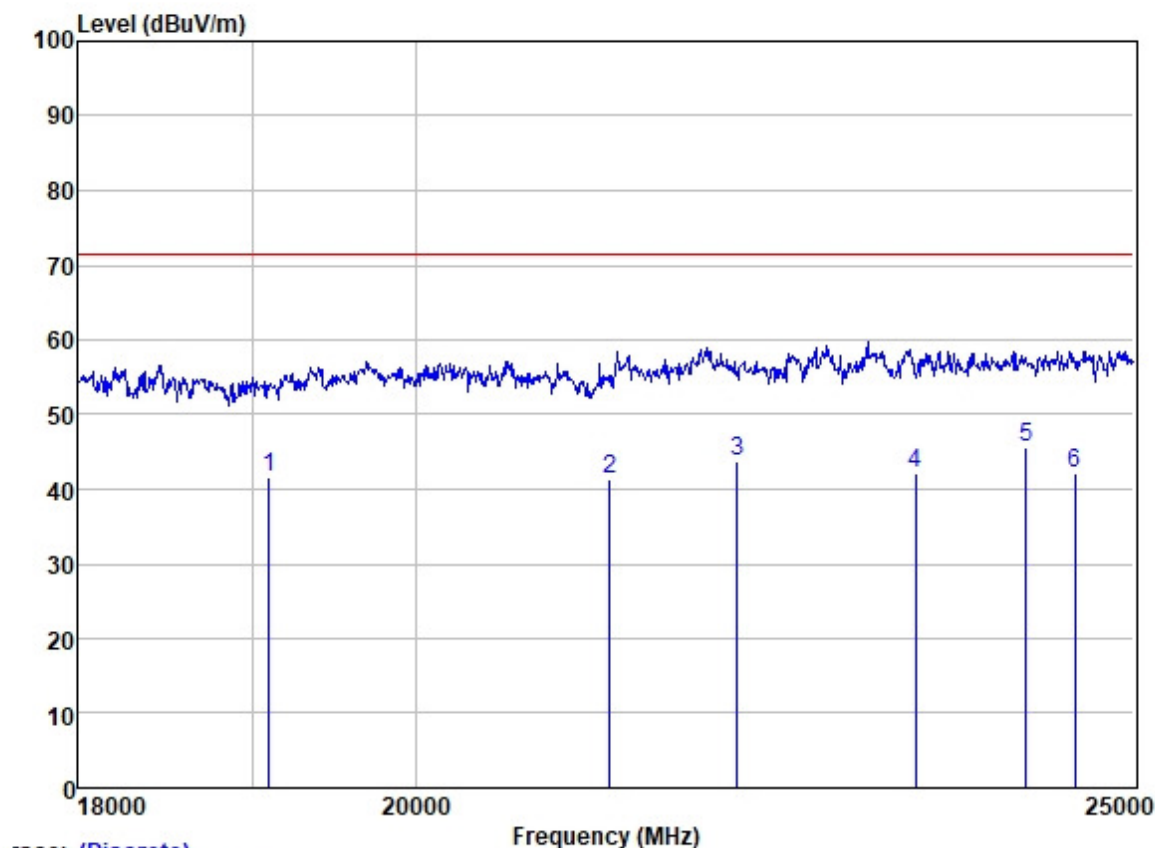
Test Mode: 00; Polarity: Vertical



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	4254.921	45.03	31.45	5.24	36.61	45.11	71.56	-26.45	VERTICAL	Average
2	4888.151	40.47	32.88	5.49	36.64	42.20	71.56	-29.36	VERTICAL	Average
3	7326.267	37.00	36.61	6.32	36.77	43.16	71.56	-28.40	VERTICAL	Average
4	8271.880	39.70	37.15	6.20	36.83	46.22	71.56	-25.34	VERTICAL	Average
5	14702.910	37.96	40.26	7.21	35.35	50.08	71.56	-21.48	VERTICAL	Average
6	17588.560	32.80	40.86	8.22	35.17	46.71	71.56	-24.85	VERTICAL	Average

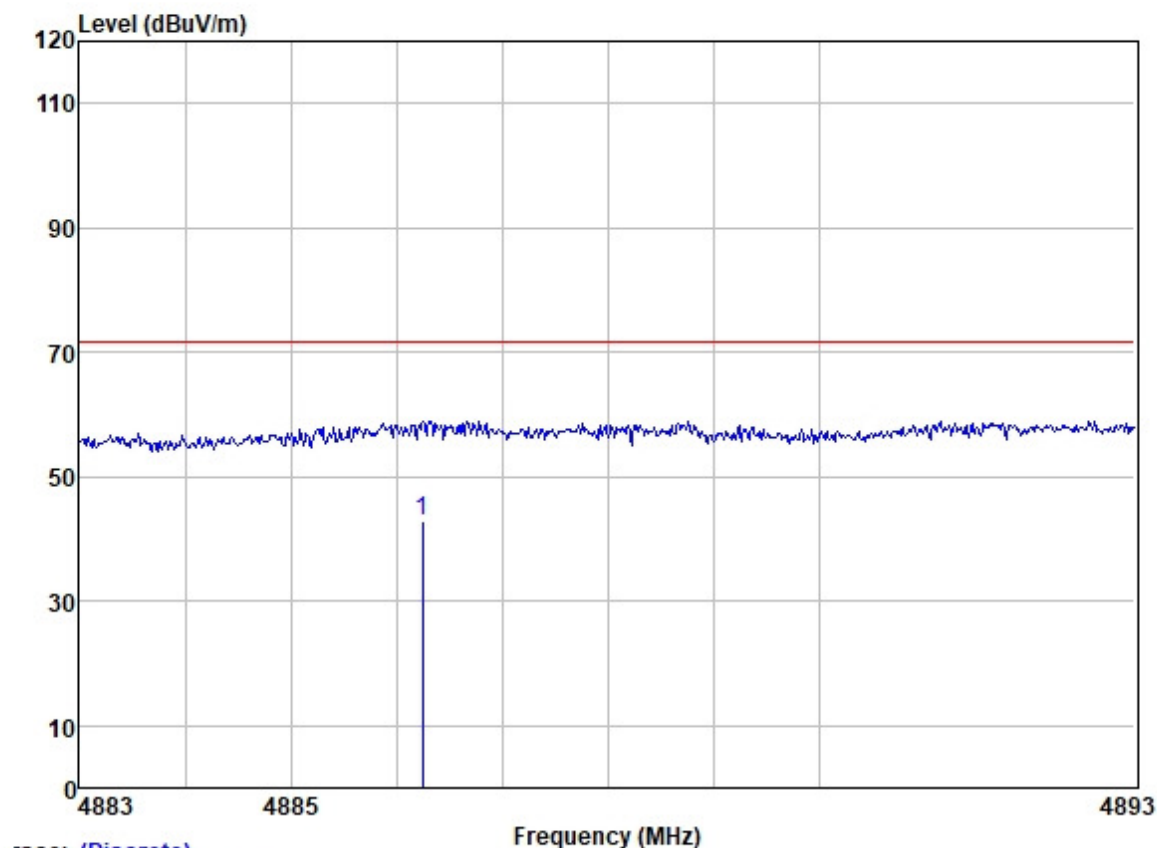
Test Mode: 00; Polarity: Vertical



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	19102.720	22.36	38.00	16.92	35.60	41.68	71.56	-29.88	VERTICAL
2	21234.120	20.59	37.95	18.10	35.39	41.25	71.56	-30.31	VERTICAL
3	22095.150	22.11	38.30	18.64	35.32	43.73	71.56	-27.83	VERTICAL
4	23356.500	18.77	39.60	19.53	35.89	42.01	71.56	-29.55	VERTICAL
5	24176.190	21.62	39.56	20.49	36.11	45.56	71.56	-26.00	VERTICAL
6	24544.300	17.83	39.43	20.86	36.12	42.00	71.56	-29.56	VERTICAL
									Average

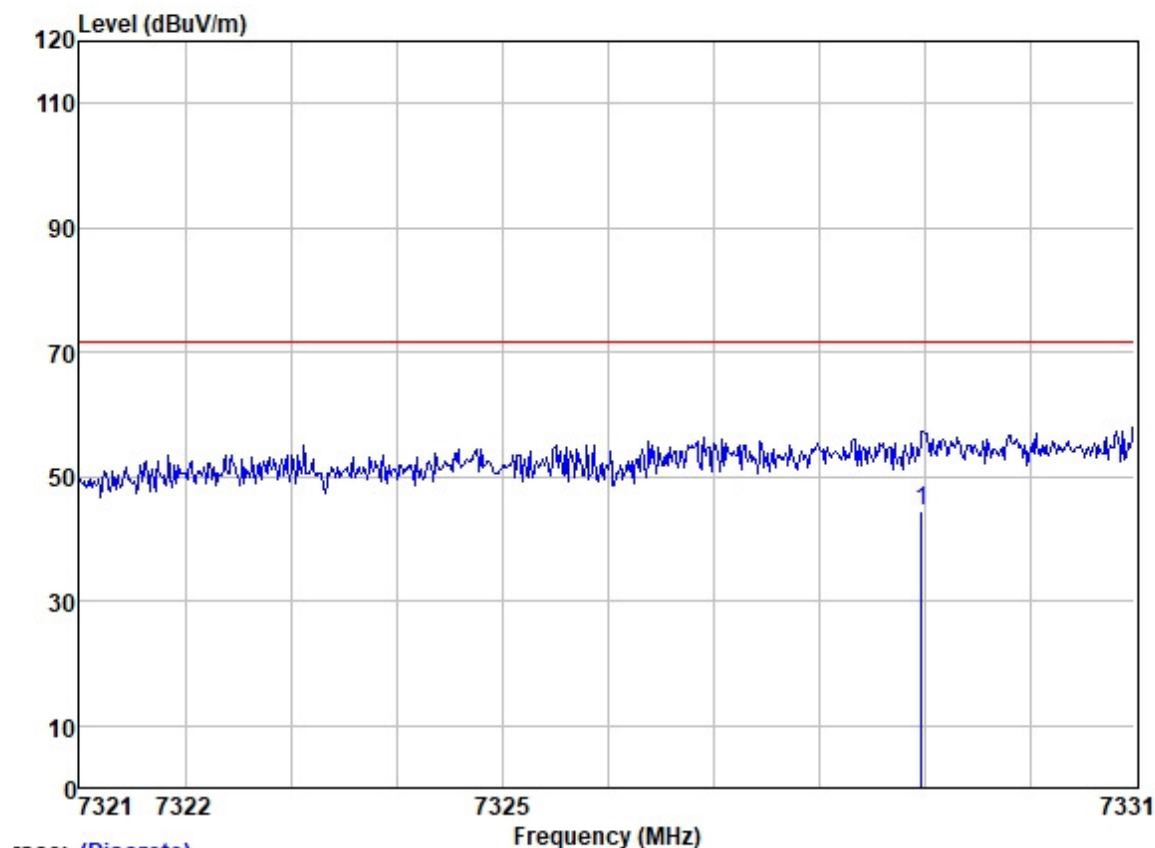
Test Mode: 00; Polarity: Vertical



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	4886.248	41.24	32.88	5.49	36.64	42.97	71.56	-28.59 VERTICAL
								Average

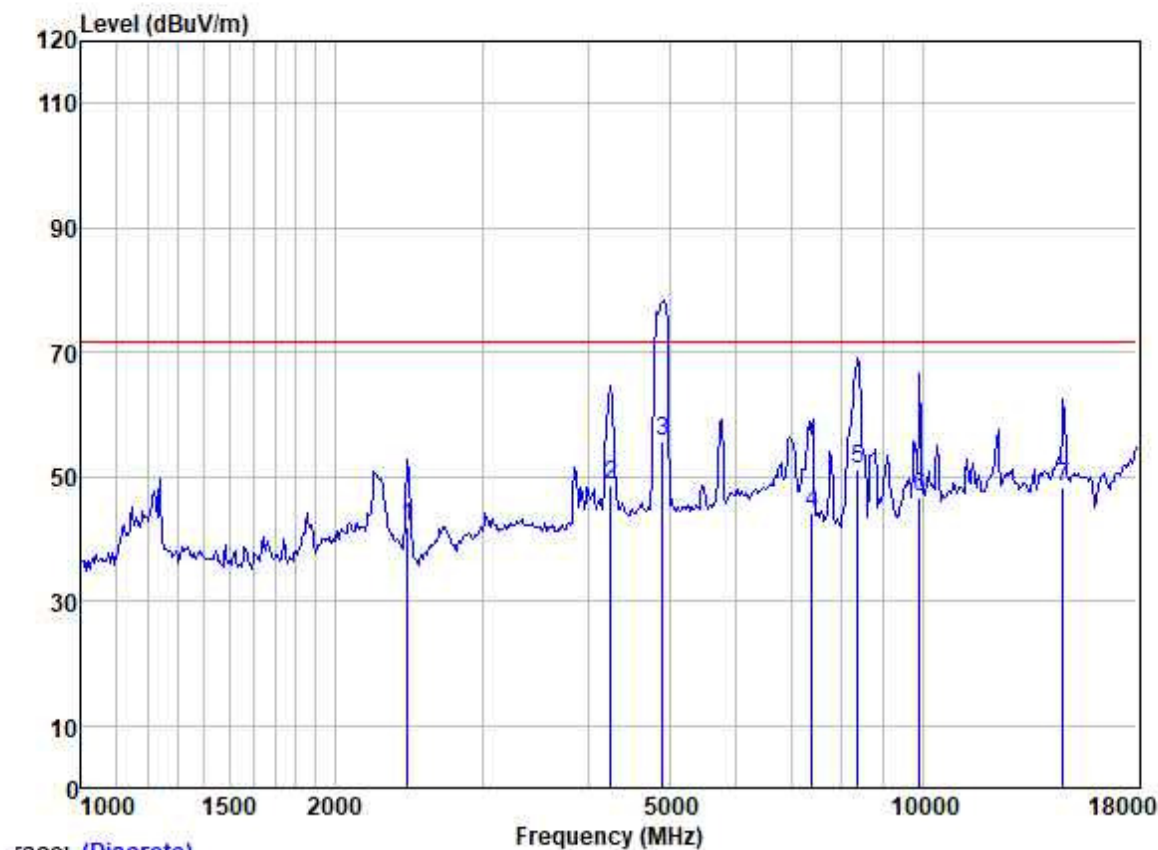
Test Mode: 00; Polarity: Vertical



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 7328.979	38.20	36.61	6.32	36.77	44.36	71.56	-27.20	VERTICAL	Average

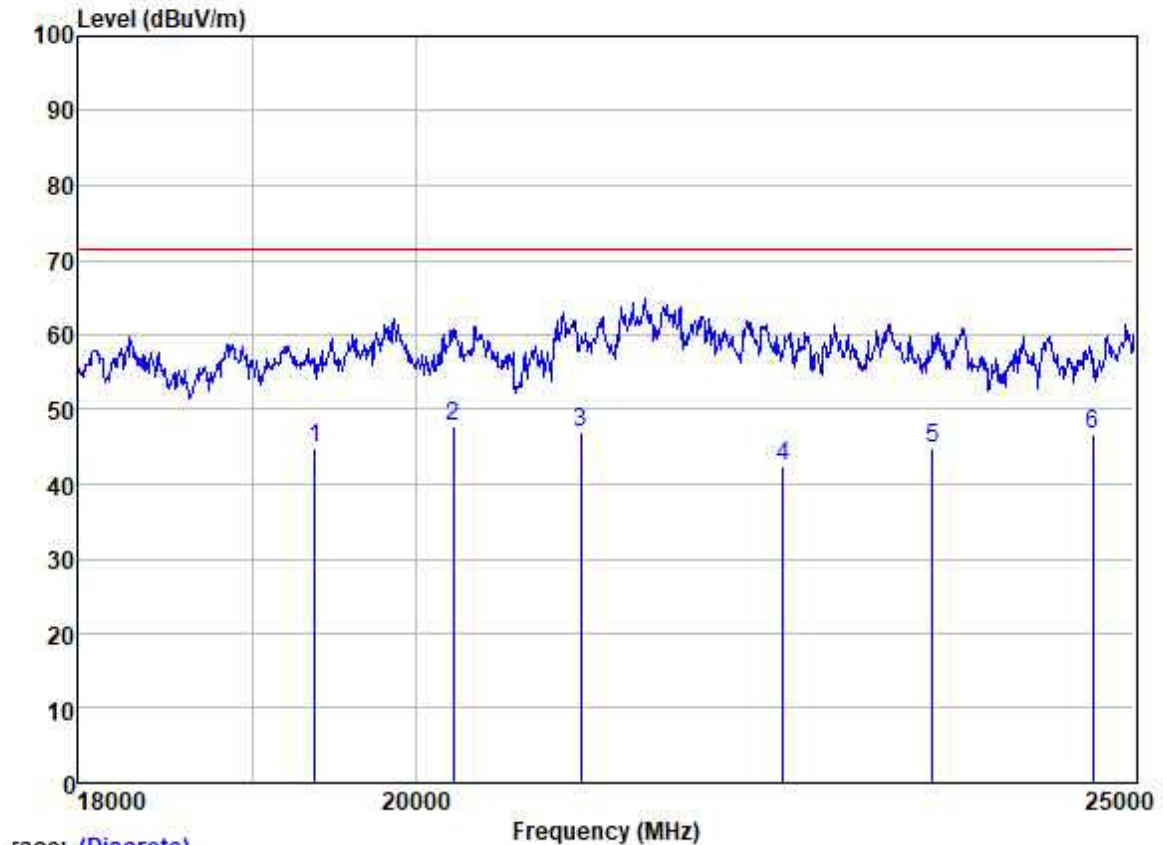
Test Mode: 04; Polarity: Horizontal



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	2442.751	47.60	27.62	3.82	37.11	41.93	71.55	-29.62	HORIZONTAL	Average
2	4254.921	48.40	31.45	5.24	36.61	48.48	71.55	-23.07	HORIZONTAL	Average
3	4907.230	53.74	32.93	5.50	36.64	55.53	71.55	-16.02	HORIZONTAL	Average
4	7387.900	38.21	36.40	6.30	36.78	44.13	71.55	-27.42	HORIZONTAL	Average
5	8368.069	44.25	37.36	6.47	36.84	51.24	71.55	-20.31	HORIZONTAL	Average
6	9923.991	38.68	38.34	6.77	37.19	46.60	71.55	-24.95	HORIZONTAL	Average
7	14702.910	36.13	40.26	7.21	35.35	48.25	71.55	-23.30	HORIZONTAL	Average

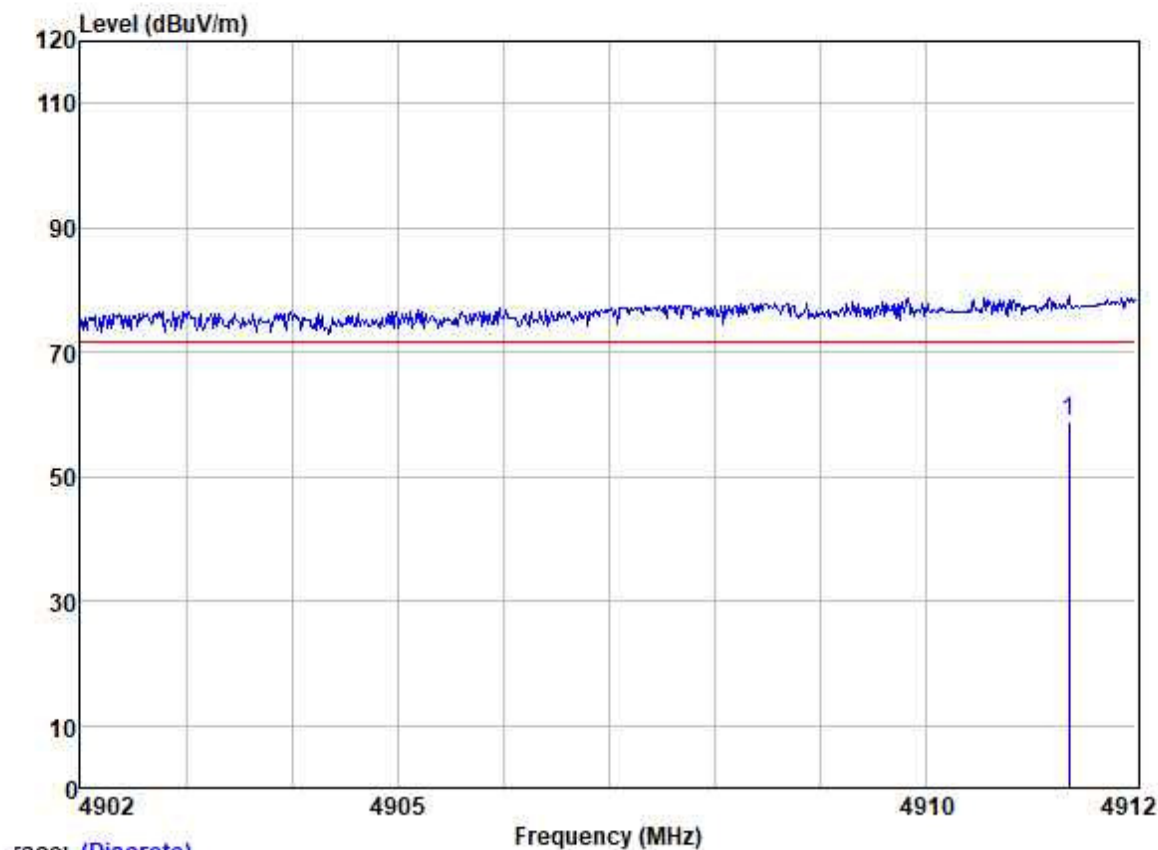
Test Mode: 04; Polarity: Horizontal



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	19374.480	25.29	38.00	17.02	35.60	44.71	71.55	-26.84	HORIZONTAL	Average
2	20226.440	27.80	37.98	17.41	35.57	47.62	71.55	-23.93	HORIZONTAL	Average
3	21046.610	26.33	37.91	18.02	35.43	46.83	71.55	-24.72	HORIZONTAL	Average
4	22409.480	20.35	38.70	18.81	35.42	42.44	71.55	-29.11	HORIZONTAL	Average
5	23479.590	21.35	39.60	19.76	35.95	44.76	71.55	-26.79	HORIZONTAL	Average
6	24681.750	22.47	39.37	21.00	36.13	46.71	71.55	-24.84	HORIZONTAL	Average

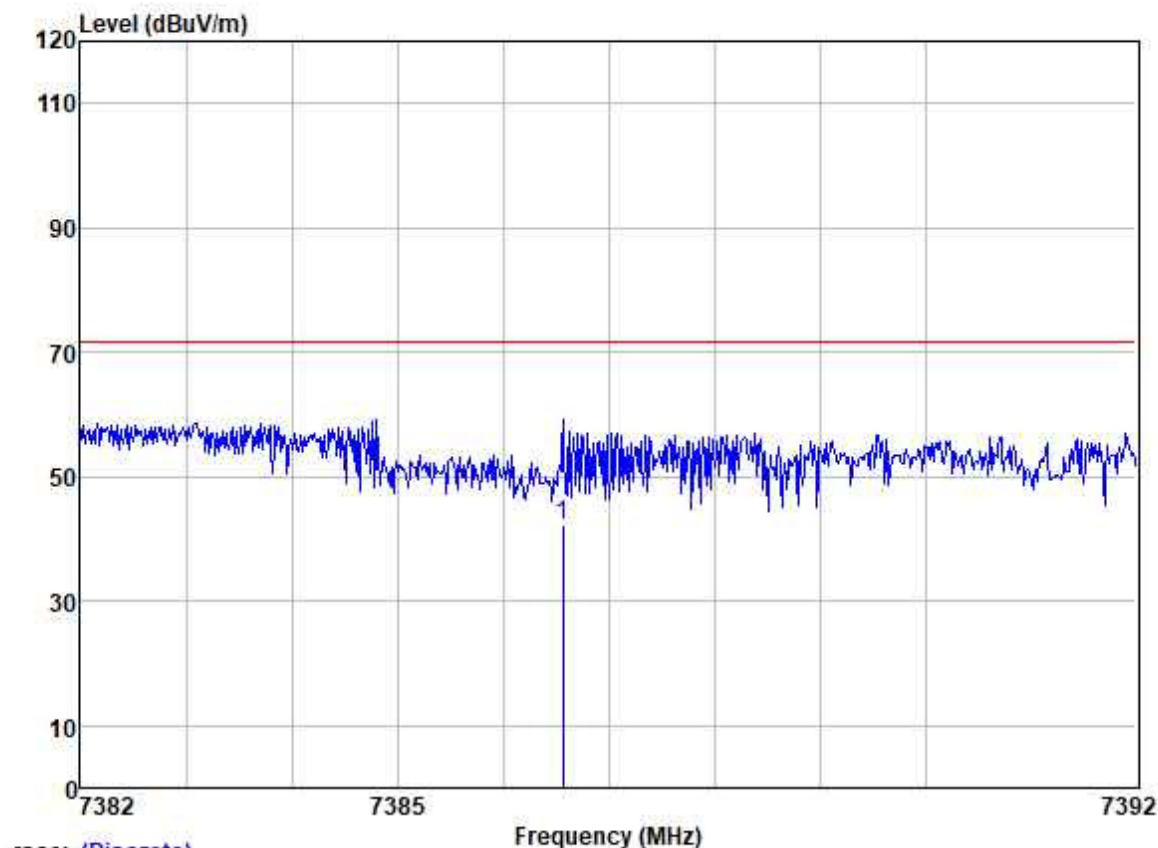
Test Mode: 04; Polarity: Horizontal



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	4911.359	57.16	32.96	5.51	36.64	58.99	71.55	-12.56 HORIZONTAL

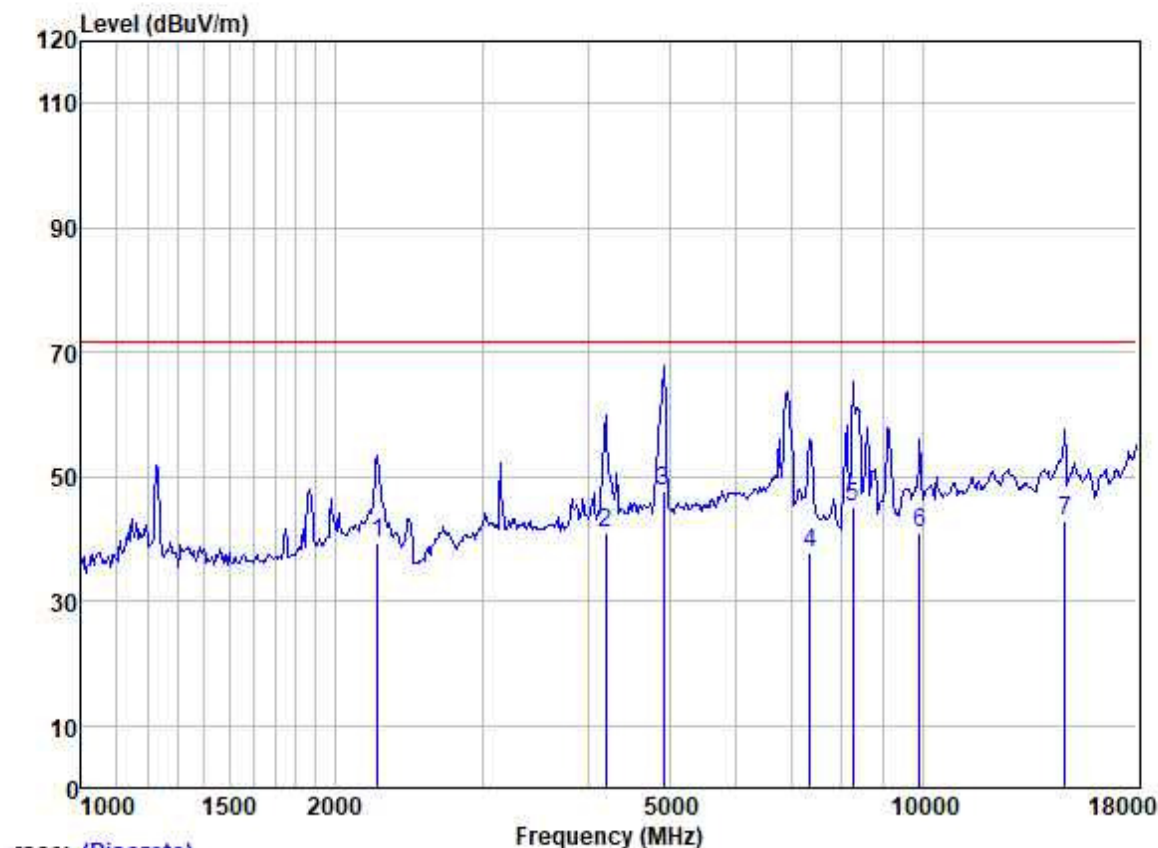
Test Mode: 04; Polarity: Horizontal



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 7386.568	36.31	36.40	6.30	36.78	42.23	71.55	-29.32	HORIZONTAL	Average

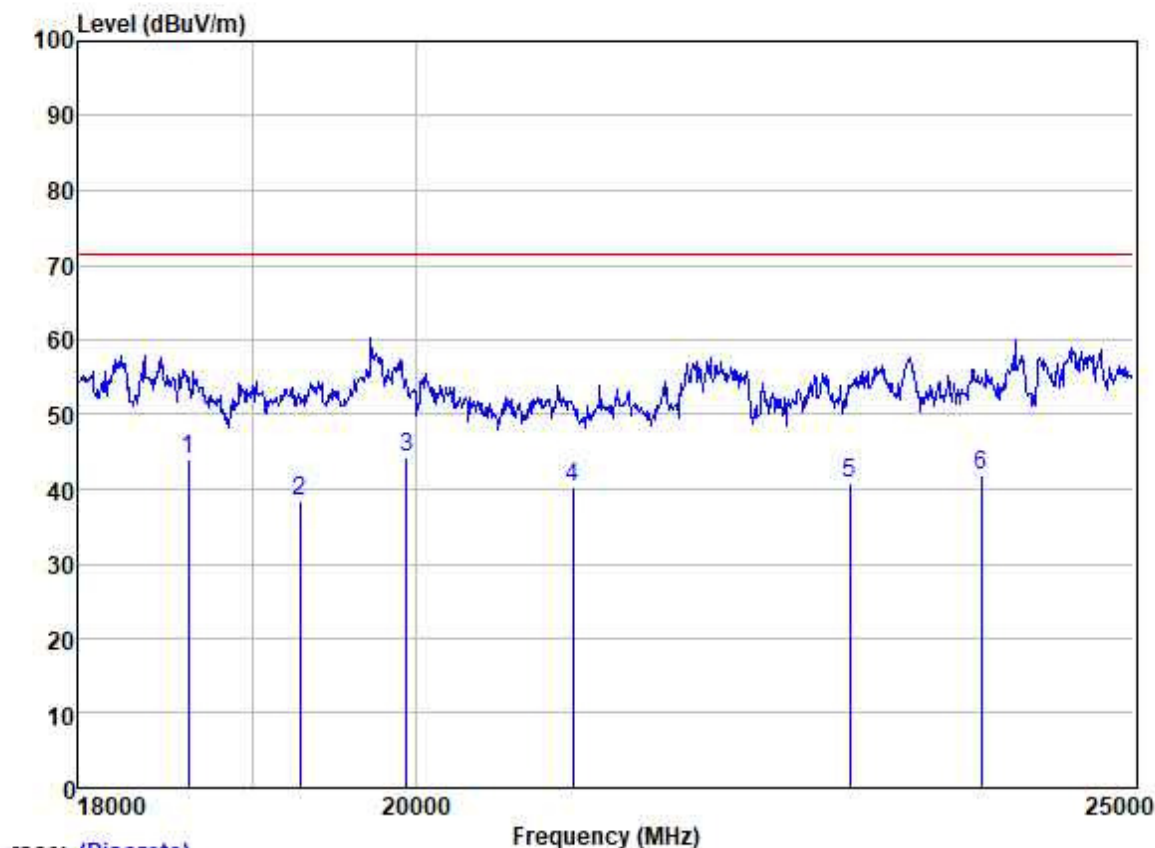
Test Mode: 04; Polarity: Vertical



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	2252.846	43.26	27.40	5.95	37.16	39.45	71.55	-32.10	VERTICAL	Average
2	4206.011	40.95	31.30	5.21	36.61	40.85	71.55	-30.70	VERTICAL	Average
3	4922.460	45.93	32.96	5.51	36.64	47.76	71.55	-23.79	VERTICAL	Average
4	7356.320	31.55	36.54	6.31	36.78	37.62	71.55	-33.93	VERTICAL	Average
5	8271.880	38.75	37.15	6.20	36.83	45.27	71.55	-26.28	VERTICAL	Average
6	9923.991	33.04	38.34	6.77	37.19	40.96	71.55	-30.59	VERTICAL	Average
7	14788.150	31.05	40.02	7.10	35.44	42.73	71.55	-28.82	VERTICAL	Average

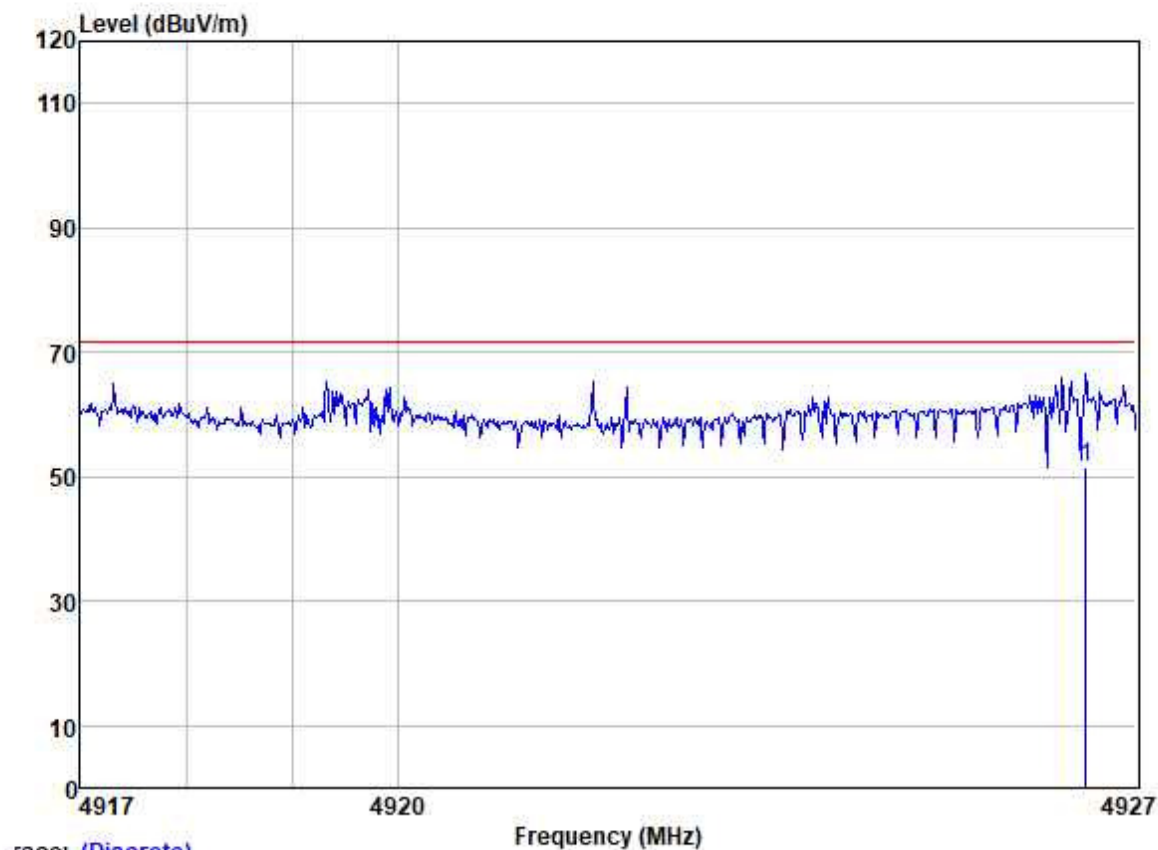
Test Mode: 04; Polarity: Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
		Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	18625.590	24.86	37.97	16.79	35.60	44.02	71.55	-27.53	VERTICAL Average
2	19285.580	19.04	38.00	16.98	35.60	38.42	71.55	-33.13	VERTICAL Average
3	19936.190	24.62	38.00	17.29	35.60	44.31	71.55	-27.24	VERTICAL Average
4	20991.380	19.83	37.90	18.00	35.45	40.28	71.55	-31.27	VERTICAL Average
5	22885.610	17.74	39.50	19.16	35.65	40.75	71.55	-30.80	VERTICAL Average
6	23837.090	18.10	39.60	20.28	36.06	41.92	71.55	-29.63	VERTICAL Average

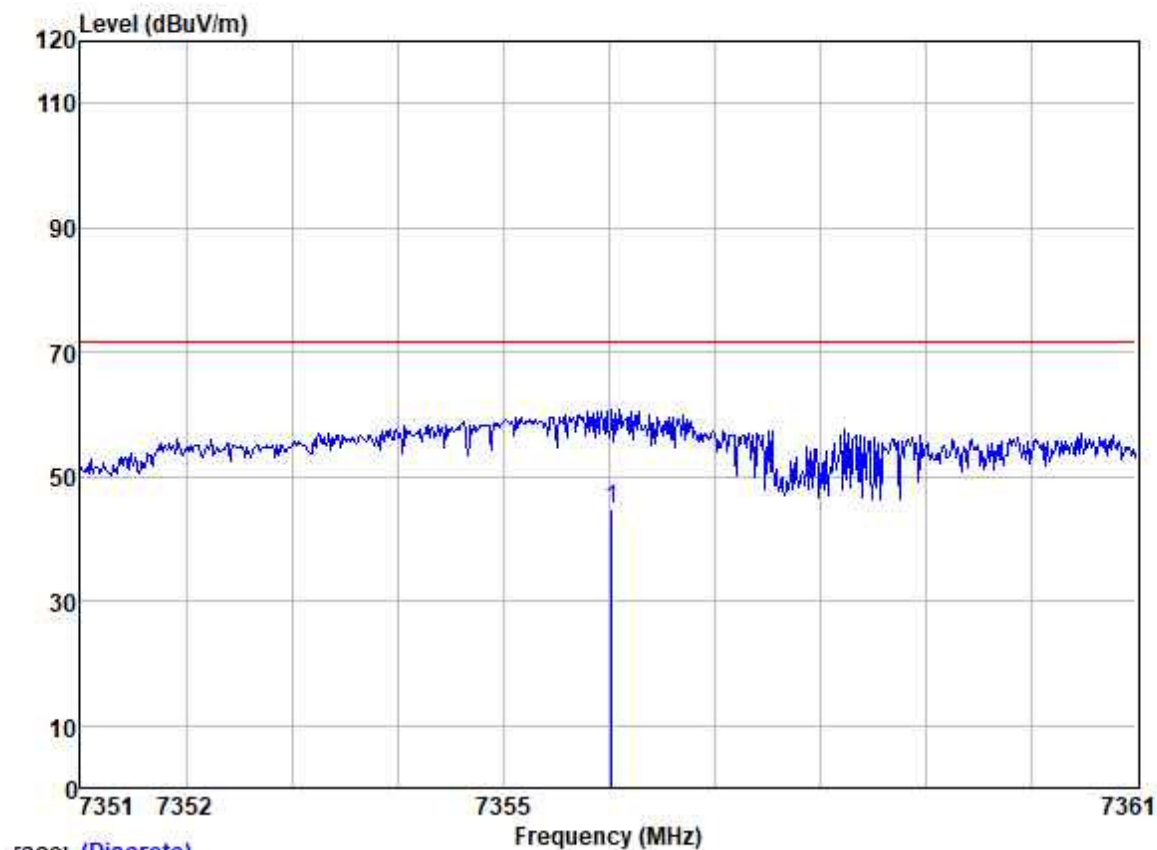
Test Mode: 04; Polarity: Vertical



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 4926.520	49.78	33.00	5.51	36.64	51.65	71.55	-19.90	VERTICAL
								Average

Test Mode: 04; Polarity: 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 7356.028	38.82	36.54	6.31	36.78	44.89	71.55	-26.66	VERTICAL	Average

6.6 Operating Frequency Measurement

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

Alternative1 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1145.9	Limit=20lg(25*SQRT(power/500))+20lg(300/3)= 71.56 dBuV/m

Alternative2 IGBT:

Equipment:	Operating frequency:	RF Power generated by equipment (watts):	Limit dB(uV/m) average:
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	1142.4	Limit=20lg(25*SQRT(power/500))+20lg(300/3)= 71.55 dBuV/m

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
2450MHz	±50.0MHz
5800MHz	±75.0MHz
24125MHz	±125.0MHz
61.25GHz	±250.0MHz
122.5GHz	±500.0MHz
245.00GHz	±1.0GHz

6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

Humidity: 53 % RH

Atmospheric Pressure: 1015 mbar

6.6.2 Test Mode Description

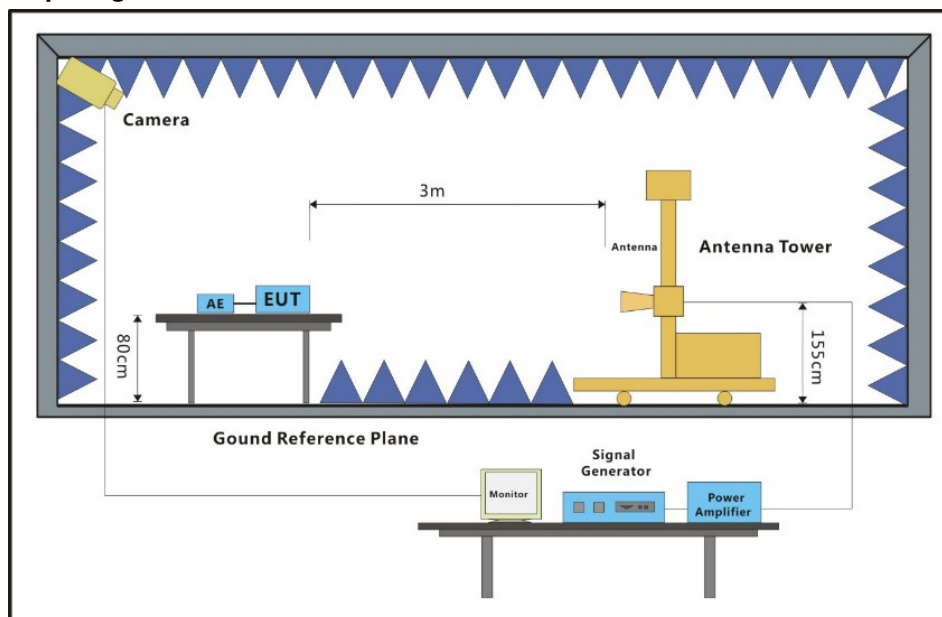
Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative1 IGBT)
Pre-scan	01	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative1 IGBT)
Pre-scan	02	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative1 IGBT)
Final test	04	Test the EUT in microwave mode, setting in 100% microwave power. (with alternative2 IGBT)
Pre-scan	05	Test the EUT in microwave mode, setting in 50% microwave power. (with alternative2 IGBT)
Pre-scan	06	Test the EUT in microwave mode, setting in 10% microwave power. (with alternative2 IGBT)



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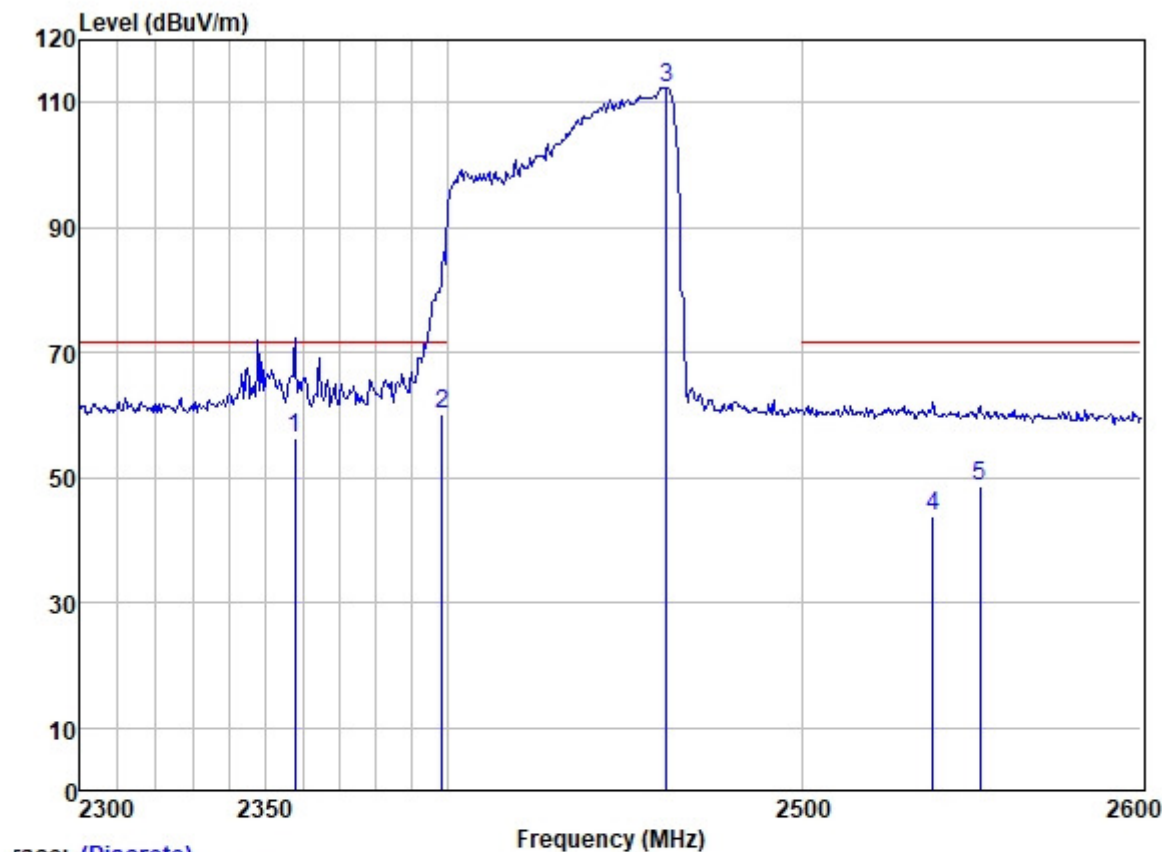
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6.6.3 Test Setup Diagram



6.6.4 Measurement Procedure and Data

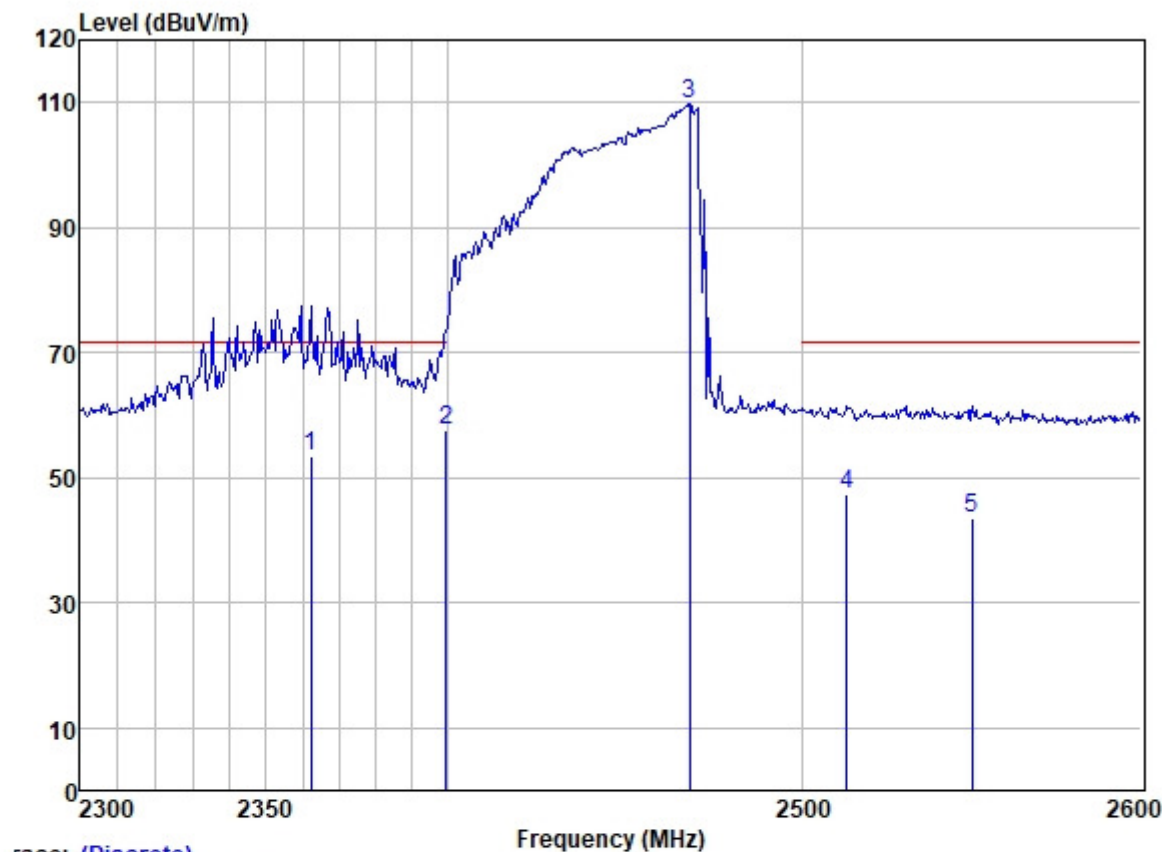
Test Mode: 00; Polarity: Horizontal



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	2357.672	24.54	27.41	4.46	0.00	56.41	71.55	-15.14	HORIZONTAL Average
2	2398.195	28.72	27.46	4.11	0.00	60.29	71.55	-11.26	HORIZONTAL Average
3	2461.044	81.10	27.72	3.64	0.00	112.46	-----	-----	HORIZONTAL Peak
4	2537.955	13.16	27.96	2.83	0.00	43.95	71.55	-27.60	HORIZONTAL Average
5	2551.996	17.80	28.02	2.70	0.00	48.52	71.55	-23.03	HORIZONTAL Average

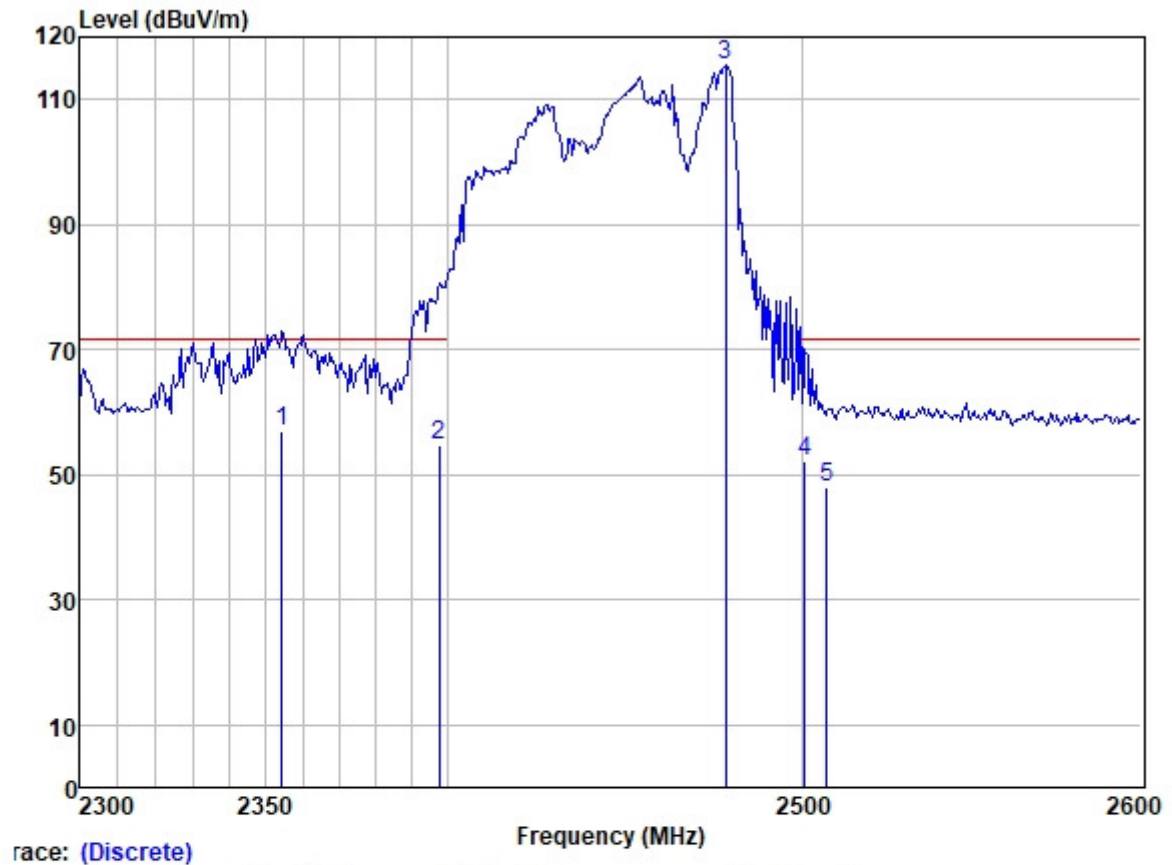
Test Mode: 00; Polarity: Vertical



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Loss	Factor	dBuV/m	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	2362.012	21.70	27.41	4.46	0.00	53.57	71.55	-17.98	VERTICAL Average
2	2399.372	26.15	27.46	4.11	0.00	57.72	71.55	-13.83	VERTICAL Average
3	2467.691	78.43	27.75	3.57	0.00	109.75	-----	-----	VERTICAL Peak
4	2512.876	16.57	27.89	3.05	0.00	47.51	71.55	-24.04	VERTICAL Average
5	2549.494	12.71	28.02	2.70	0.00	43.43	71.55	-28.12	VERTICAL Average

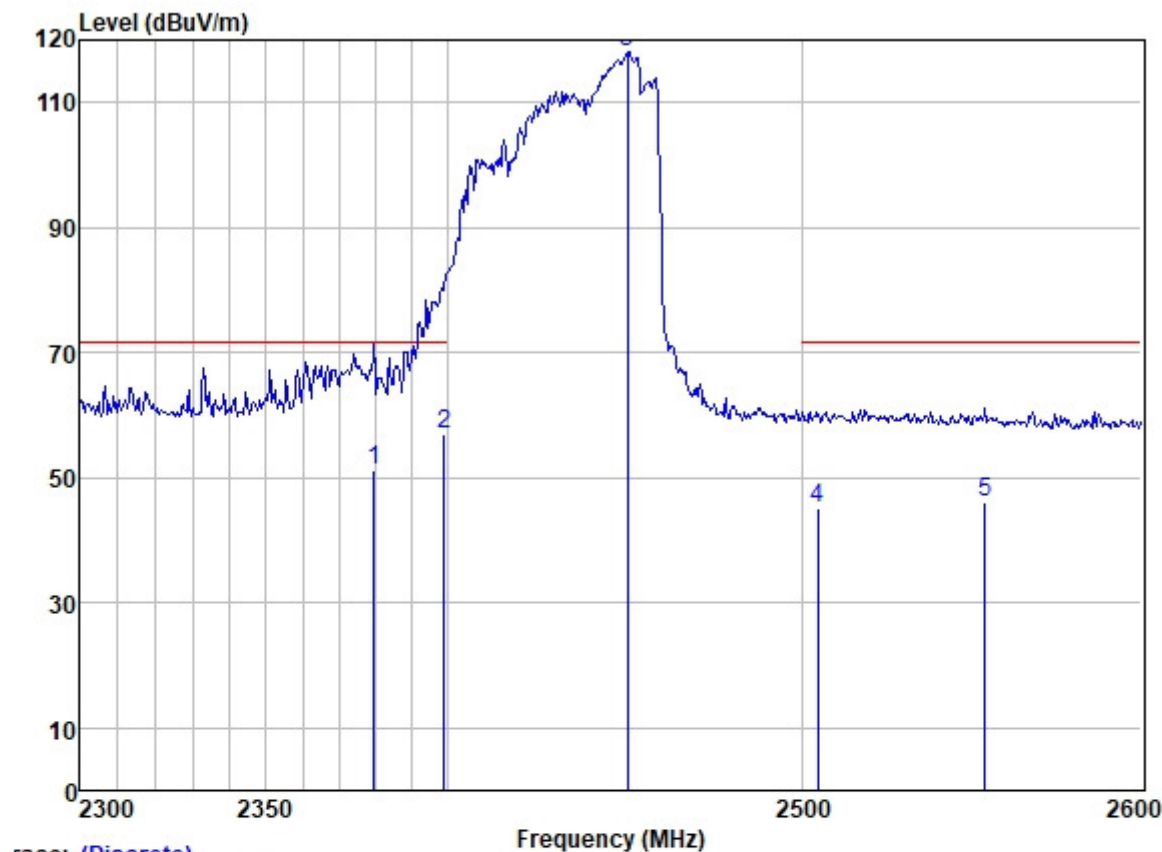
Test Mode: 04; Polarity: Horizontal



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2354.206	24.95	27.40	4.53	0.00	56.88	71.55	-14.67	HORIZONTAL Average
2	2397.313	23.16	27.46	4.11	0.00	54.73	71.55	-16.82	HORIZONTAL Average
3	2477.999	84.13	27.78	3.50	0.00	115.41	-----	-----	HORIZONTAL Peak
4	2500.890	21.12	27.85	3.24	0.00	52.21	71.55	-19.34	HORIZONTAL Average
5	2507.030	17.01	27.87	3.14	0.00	48.02	71.55	-23.53	HORIZONTAL Average

Test Mode: 04; Polarity: Vertical



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2379.451	19.60	27.44	4.27	0.00	51.31	71.55	-20.24	VERTICAL Average
2	2398.783	25.27	27.46	4.11	0.00	56.84	71.55	-14.71	VERTICAL Average
3	2450.206	86.78	27.65	3.77	0.00	118.20	-----	-----	VERTICAL Peak
4	2504.572	14.26	27.87	3.14	0.00	45.27	71.55	-26.28	VERTICAL Average
5	2553.248	15.52	28.02	2.70	0.00	46.24	71.55	-25.31	VERTICAL Average

ISM frequency(MHz)	Tolerance(MHz)	Measurement Data(MHz)
2450	±50	2478
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	±50	2450
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.		



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6.1 Radiation Hazard Test

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

6.1.1 E.U.T. Operation

Operating Environment:
 Temperature: 23.6 °C Humidity: 56.3 % RH Atmospheric Pressure: 1015 mbar

6.1.2 Test Mode Description

Pre-scan / Mode	Code	Description
Final test	00	Test the EUT in microwave mode, setting in 100% microwave power. (alternative1 IGBT)
Final test	04	Test the EUT in microwave mode, setting in 100% microwave power. (alternative2 IGBT)

6.1.3 Measurement Data

Original IGBT:

Maximum measure level (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
0.31	1.00	Pass

Alternative IGBT:

Maximum measure level (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
0.308	1.00	Pass

7 Test Setup Photo

Refer to Appendix - Test Setup Photo for GZEM220900519102



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8 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZEM2209005191HS

- End of the Report -