



Shenzhen Huaxia Testing Technology Co., Ltd.

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Test Report

Report No.: CQASZ20231001865E-03
Applicant: Dynanic (Shenzhen) Technology Limited
Address of Applicant: 20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China

Equipment Under Test (EUT):

EUT Name: Nova S80 5.1.2 Channel Dolby Atmos Soundbar
Model No.: U4120
Test Model No.: U4120
Brand Name: ULTIMEA
FCC ID: 2A9OO-U4120S
Standards: 47 CFR Part 15, Subpart C
Date of Receipt: 2023-10-16
Date of Test: 2023-10-16 to 2023-11-30
Date of Issue: 2023-12-01
Test Result: PASS*

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

Tested By: Lewis Zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack Ai
(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20231001865E-03	Rev.01	Initial report	2023-12-01

Note:

The difference between product #1 and product #2 is that the adaptor model is different including having different adaptor supplier. The key differences are the appearance and the model number. These changes do not affect RF performance.

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2013)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS

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4 General Information

4.1 Client Information

Applicant:	Dynanic (Shenzhen) Technology Limited
Address of Applicant:	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China
Manufacturer:	Dynanic (Shenzhen) Technology Limited
Address of Manufacturer:	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China
Factory:	SOUNDLAB TECHNOLOGY CO., LTD.
Address of Factory:	Microlab Industrial Zone, No. 2, Baozi South Road, Kengzi Sub-district, Pingshan District, Shenzhen City, Guangdong Province, P. R. China

4.2 General Description of EUT

EUT Name:	Nova S80 5.1.2 Channel Dolby Atmos Soundbar
Model No.:	U4120
Test Model No.:	U4120
Trade Mark:	ULTIMEA
Software Version:	U4120
Hardware Version:	U4120
Frequency Range:	5732MHz~5848MHz
Modulation Type:	GFSK
Number of Channels:	59
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Test Software of EUT:	EMI Tool
Antenna Type:	PCB Antenna
Antenna Gain:	0.48dBi
Power Supply:	Model:SMS-00240250-S38 Input:100-240V~50/60Hz 1.5A Output:24V 2.5A 60W
	Model:FX48U-240250C Input:100-240V~50/60Hz 1.0A Output:24V 2.5A

Operation Frequency each of channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5732	21	5772	41	5812
2	5734	22	5774	42	5814
3	5736	23	5776	43	5816
4	5738	24	5778	44	5818
5	5740	25	5780	45	5820
6	5742	26	5782	46	5822
7	5744	27	5784	47	5824
8	5746	28	5786	48	5826
9	5748	29	5788	49	5828
10	5750	30	5790	50	5830
11	5752	31	5792	51	5832
12	5754	32	5794	52	5834
13	5756	33	5796	53	5836
14	5758	34	5798	54	5838
15	5760	35	5800	55	5840
16	5762	36	5802	56	5842
17	5764	37	5804	57	5844
18	5766	38	5806	58	5846
19	5768	39	5808	59	5848
20	5770	40	5810		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel(CH1)	5732MHz
The Middle channel(CH29)	5788MHz
The Highest channel(CH59)	5848MHz

4.3 Test Environment and Mode

Operating Environment:	
Radiated Emissions:	
Temperature:	27 °C
Humidity:	59 % RH
Atmospheric Pressure:	1009mbar
Temperature:	26 °C
Humidity:	59 % RH
Atmospheric Pressure:	1009mbar
Radio conducted item test (RF Conducted test room):	
Temperature:	25.3 °C
Humidity:	55 % RH
Atmospheric Pressure:	1009mbar
Test mode:	
Transmitting mode:	Use test software (RF test) to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
/	/	/	/	/

4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for **CQA** laboratory is reported:

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	5.12dB	(1)
Radiated Emission	Above 1GHz	4.60dB	(1)
Conducted Disturbance	0.15~30MHz	3.34dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.7 Test Facility

- **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Other Information Requested by the Customer

None.

4.11 Equipment List

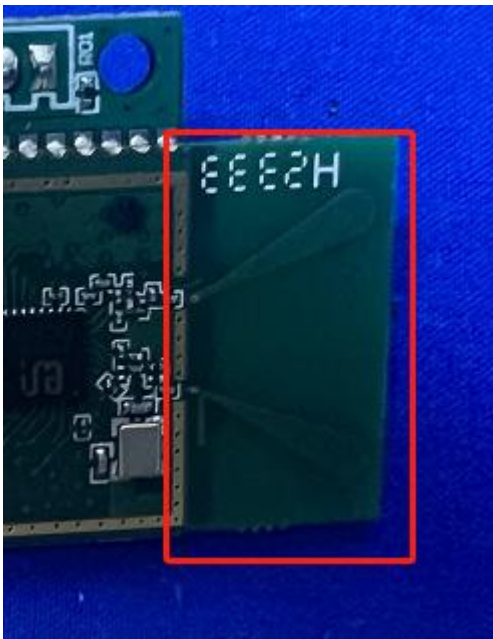
Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2023/09/08	2024/09/07
Spectrum analyzer	R&S	FSU26	CQA-038	2023/09/08	2024/09/07
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2023/09/08	2024/09/07
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2023/09/08	2024/09/07
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2021/09/16	2024/09/15
Bilog Antenna	R&S	HL562	CQA-011	2021/09/16	2024/09/15
Horn Antenna	R&S	HF906	CQA-012	2021/09/16	2024/09/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/09/16	2024/09/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C019	2023/09/08	2024/09/07
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2023/09/08	2024/09/07
Antenna Connector	CQA	RFC-01	CQA-080	2023/09/08	2024/09/07
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2023/09/08	2024/09/07
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2023/09/08	2024/09/07
EMI Test Receiver	R&S	ESPI3	CQA-013	2023/09/08	2024/09/07
LISN	R&S	ENV216	CQA-003	2023/09/08	2024/09/07
Coaxial cable	CQA	N/A	CQA-C009	2023/09/08	2024/09/07

Note:

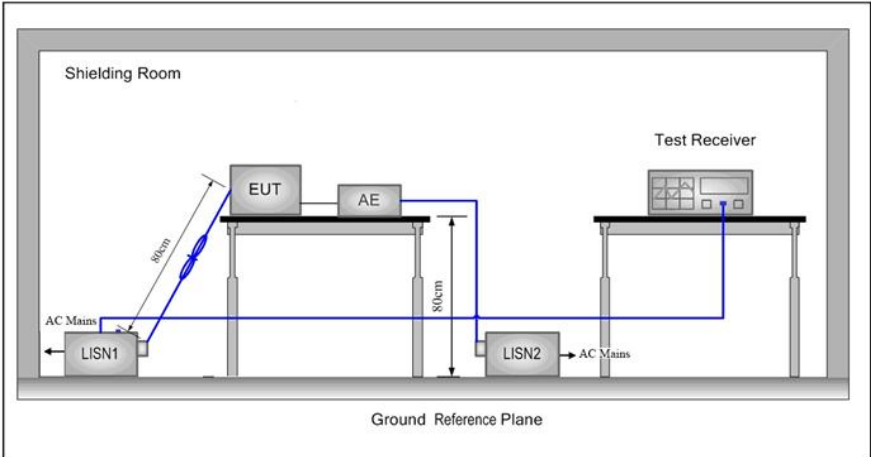
The temporary antenna connector is soldered on the pcb board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is PCB antenna. The best case gain of the antenna is 0.48dBi.	

5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		
Test Setup:			

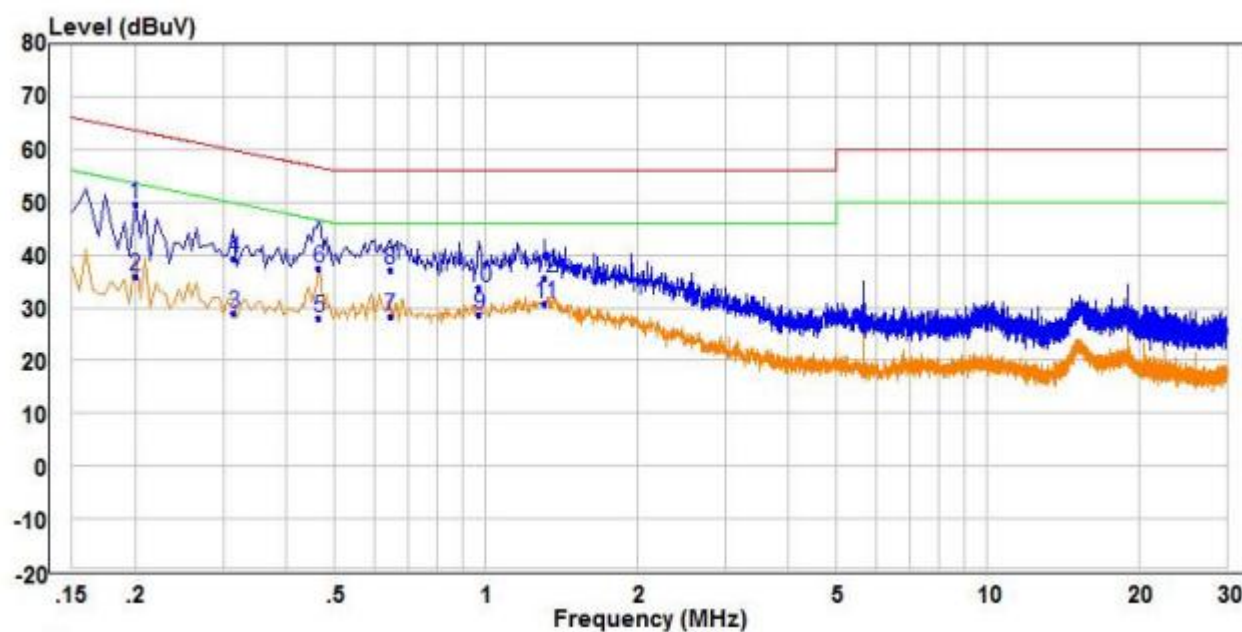
Test Mode:	Charge +Transmitting mode.
Final Test Mode:	Charge +Transmitting mode
Test Results:	Pass

Measurement Data:

1#

ANT1:

Live line:

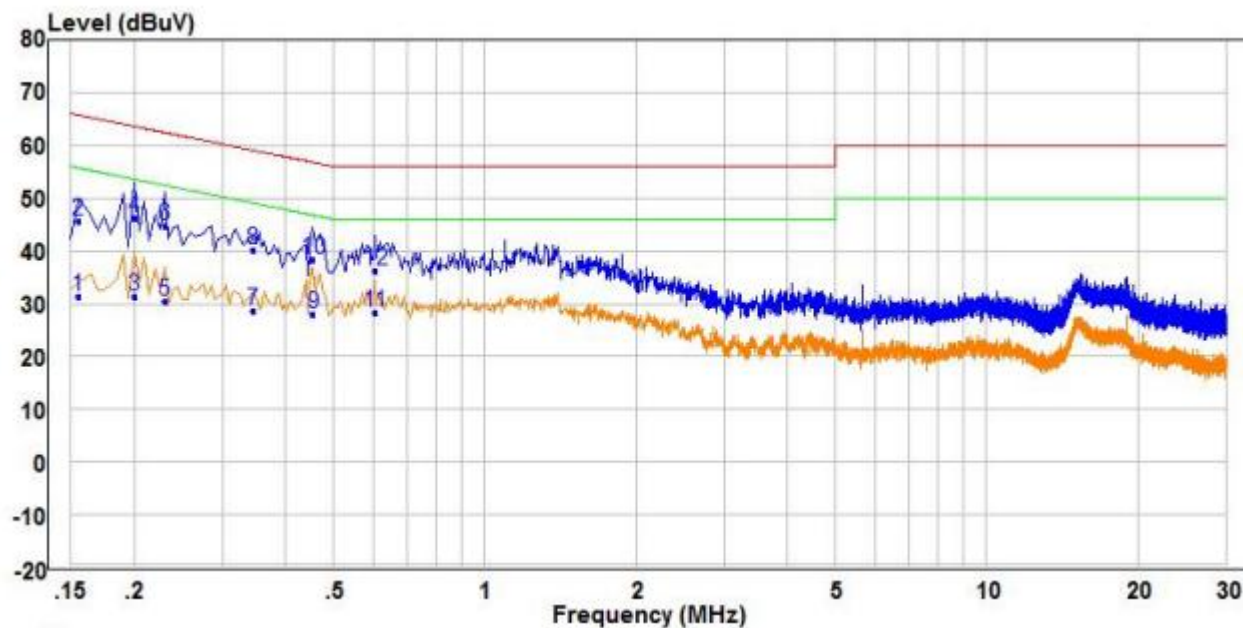


		Read		Limit	Over		
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	Pol/Phase
1	PP	0.200	40.07	9.61	49.68	63.61	-13.93 Peak
2		0.200	26.46	9.61	36.07	63.61	-27.54 QP
3		0.315	19.55	9.51	29.06	49.84	-20.78 Average
4		0.315	29.85	9.51	39.36	59.84	-20.48 QP
5		0.465	18.39	9.67	28.06	46.60	-18.54 Average
6		0.465	27.66	9.67	37.33	56.60	-19.27 QP
7		0.645	18.53	9.85	28.38	46.00	-17.62 Average
8	QP	0.645	27.26	9.85	37.11	56.00	-18.89 QP
9		0.970	18.95	9.72	28.67	46.00	-17.33 Average
10		0.970	24.19	9.72	33.91	56.00	-22.09 QP
11	AV	1.310	20.25	10.46	30.71	46.00	-15.29 Average
12		1.310	25.05	10.46	35.51	56.00	-20.49 QP

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



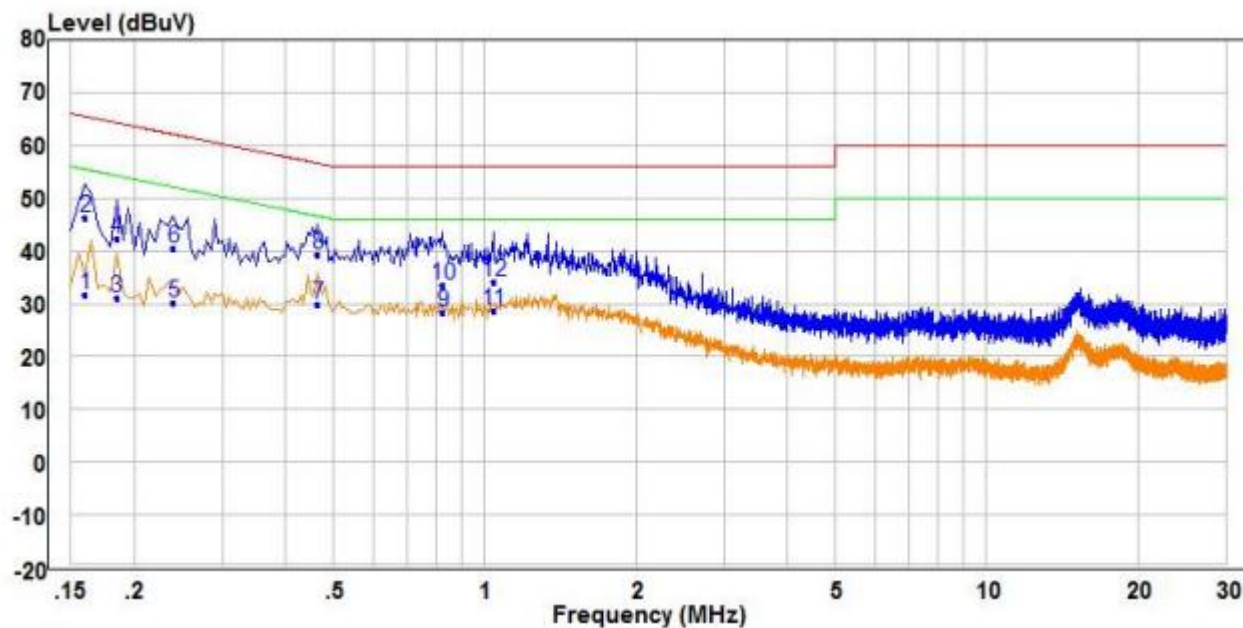
	Freq	Read		Limit	Over		
	MHz	Level	Factor	Line	Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.155	21.63	9.69	31.32	55.73	-24.41	Average
2	0.155	35.92	9.69	45.61	65.73	-20.12	QP
3	0.200	21.73	9.61	31.34	53.61	-22.27	Average
4 PP	0.200	36.59	9.61	46.20	63.61	-17.41	QP
5	0.230	20.86	9.56	30.42	52.45	-22.03	Average
6	0.230	35.17	9.56	44.73	62.45	-17.72	QP
7	0.345	19.22	9.54	28.76	49.08	-20.32	Average
8	0.345	30.75	9.54	40.29	59.08	-18.79	QP
9	0.455	18.48	9.66	28.14	46.78	-18.64	Average
10	0.455	28.58	9.66	38.24	56.78	-18.54	QP
11 AV	0.605	18.50	9.81	28.31	46.00	-17.69	Average
12	0.605	26.42	9.81	36.23	56.00	-19.77	QP

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

ANT2:

Live line:

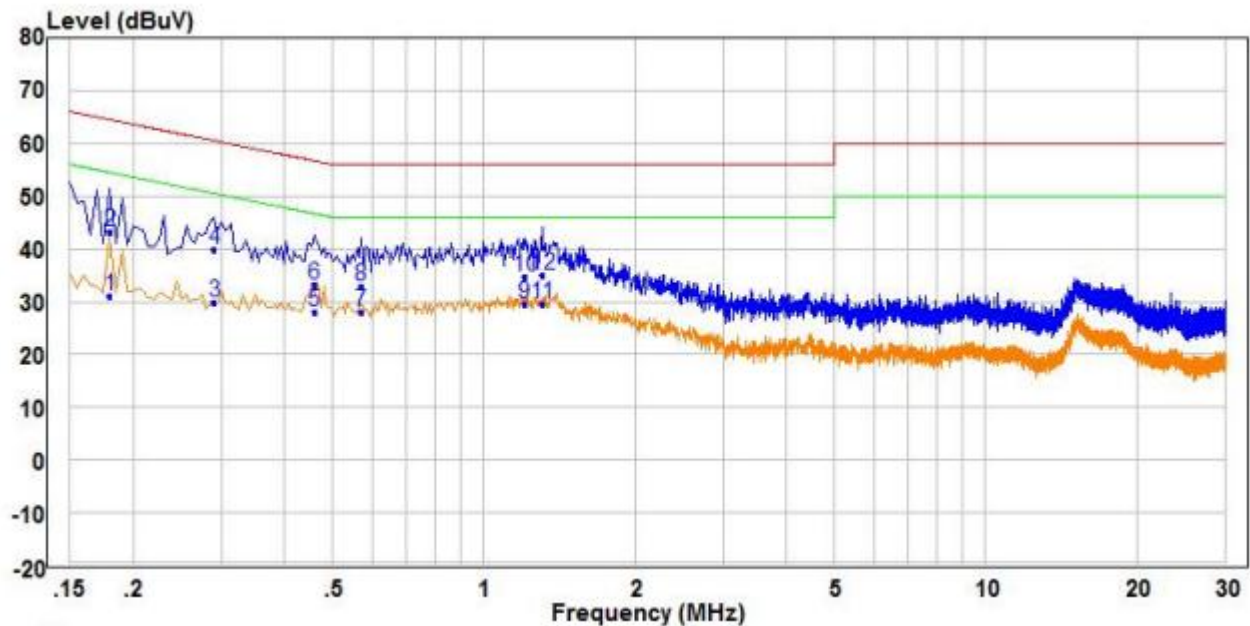


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.160	21.91	9.68	31.59	55.46	-23.87	Average	Line
2	0.160	36.73	9.68	46.41	65.46	-19.05	QP	Line
3	0.185	21.39	9.64	31.03	54.26	-23.23	Average	Line
4	0.185	32.73	9.64	42.37	64.26	-21.89	QP	Line
5	0.240	20.59	9.56	30.15	52.10	-21.95	Average	Line
6	0.240	30.85	9.56	40.41	62.10	-21.69	QP	Line
7 PP	0.465	20.27	9.67	29.94	46.60	-16.66	Average	Line
8 QP	0.465	29.64	9.67	39.31	56.60	-17.29	QP	Line
9	0.825	18.52	9.82	28.34	46.00	-17.66	Average	Line
10	0.825	23.70	9.82	33.52	56.00	-22.48	QP	Line
11	1.040	18.95	9.81	28.76	46.00	-17.24	Average	Line
12	1.040	24.29	9.81	34.10	56.00	-21.90	QP	Line

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



	Freq	Read		Limit	Over		
	MHz	Level	Factor	Line	Limit	Remark	Pol/Phase
		dBuV	dB	dBuV	dBuV	dB	
1	0.180	21.49	9.64	31.13	54.49	-23.36	Average
2	0.180	33.50	9.64	43.14	64.49	-21.35	QP
3	0.290	20.43	9.49	29.92	50.52	-20.60	Average
4 QP	0.290	30.37	9.49	39.86	60.52	-20.66	QP
5	0.460	18.50	9.66	28.16	46.69	-18.53	Average
6	0.460	23.62	9.66	33.28	56.69	-23.41	QP
7	0.570	18.17	9.77	27.94	46.00	-18.06	Average
8	0.570	23.22	9.77	32.99	56.00	-23.01	QP
9 PP	1.205	19.75	9.71	29.46	46.00	-16.54	Average
10	1.205	24.91	9.71	34.62	56.00	-21.38	QP
11	1.305	19.70	9.72	29.42	46.00	-16.58	Average
12	1.305	25.34	9.72	35.06	56.00	-20.94	QP

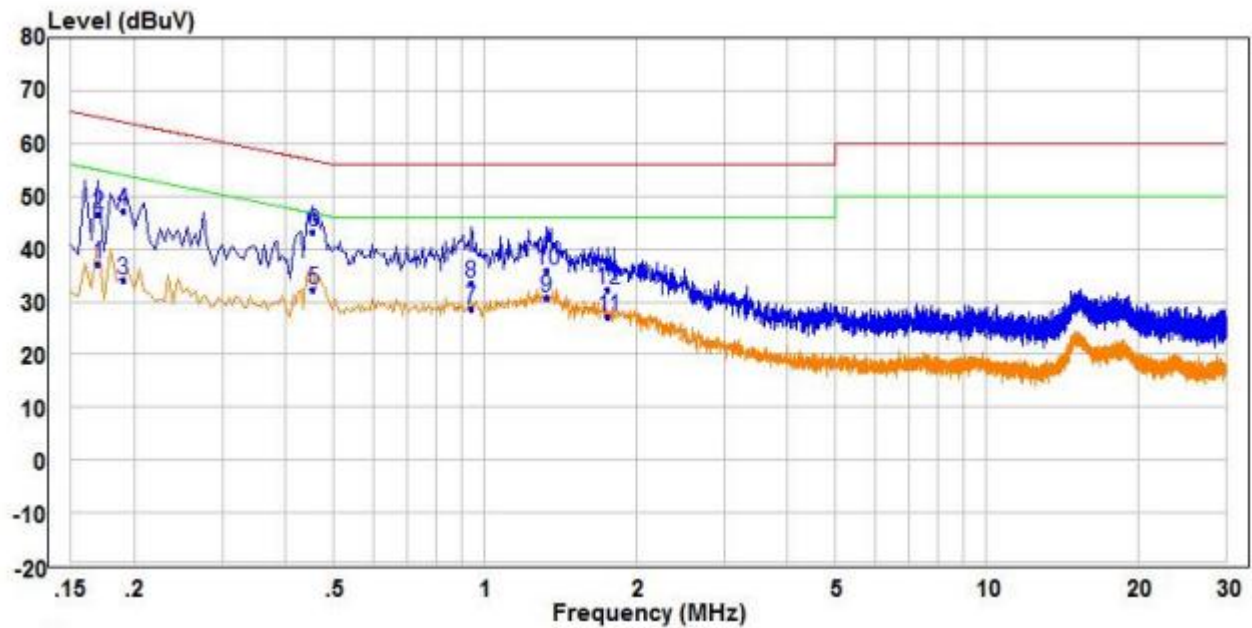
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

2#

ANT1:

Live line:

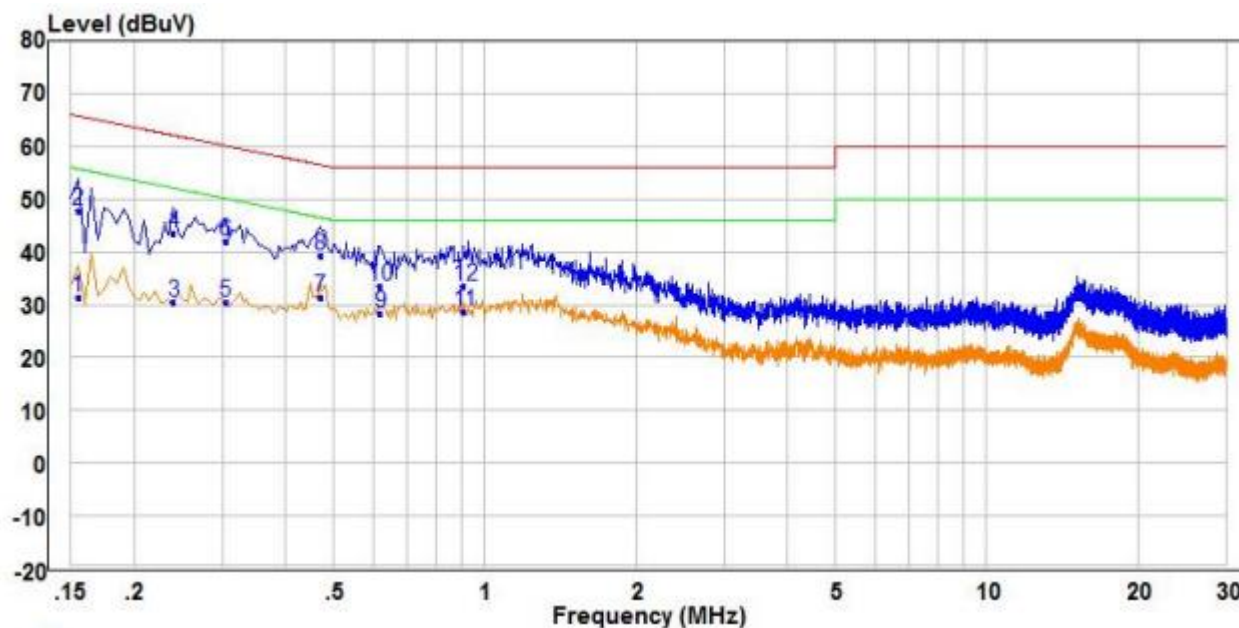


		Read		Limit	Over			
	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.170	27.41	9.66	37.07	54.96	-17.89	Average	Line
2	0.170	36.87	9.66	46.53	64.96	-18.43	QP	Line
3	0.190	24.43	9.63	34.06	54.04	-19.98	Average	Line
4	0.190	37.68	9.63	47.31	64.04	-16.73	QP	Line
5 AV	0.455	22.64	9.66	32.30	46.78	-14.48	Average	Line
6 PP	0.455	33.52	9.66	43.18	56.78	-13.60	QP	Line
7	0.940	18.87	9.74	28.61	46.00	-17.39	Average	Line
8	0.940	23.89	9.74	33.63	56.00	-22.37	QP	Line
9	1.325	20.15	10.49	30.64	46.00	-15.36	Average	Line
10	1.325	25.34	10.49	35.83	56.00	-20.17	QP	Line
11	1.760	15.87	11.29	27.16	46.00	-18.84	Average	Line
12	1.760	20.86	11.29	32.15	56.00	-23.85	QP	Line

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



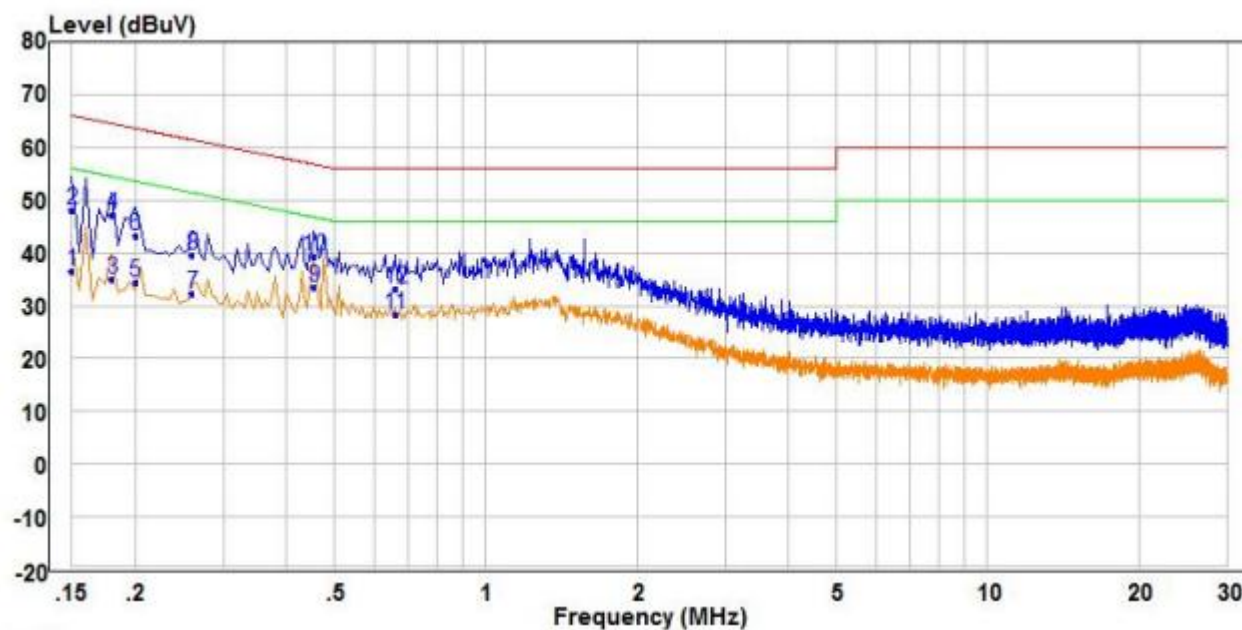
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.155	21.73	9.69	31.42	55.73	-24.31	Average	Neutral
2	0.155	38.04	9.69	47.73	65.73	-18.00	QP	Neutral
3	0.240	20.81	9.55	30.36	52.10	-21.74	Average	Neutral
4	0.240	33.97	9.55	43.52	62.10	-18.58	QP	Neutral
5	0.305	21.05	9.49	30.54	50.11	-19.57	Average	Neutral
6	0.305	32.39	9.49	41.88	60.11	-18.23	QP	Neutral
7 PP	0.470	21.57	9.67	31.24	46.51	-15.27	Average	Neutral
8 QP	0.470	29.74	9.67	39.41	56.51	-17.10	QP	Neutral
9	0.620	18.46	9.82	28.28	46.00	-17.72	Average	Neutral
10	0.620	23.57	9.82	33.39	56.00	-22.61	QP	Neutral
11	0.910	18.77	9.76	28.53	46.00	-17.47	Average	Neutral
12	0.910	23.87	9.76	33.63	56.00	-22.37	QP	Neutral

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

ANT2:

Live line:

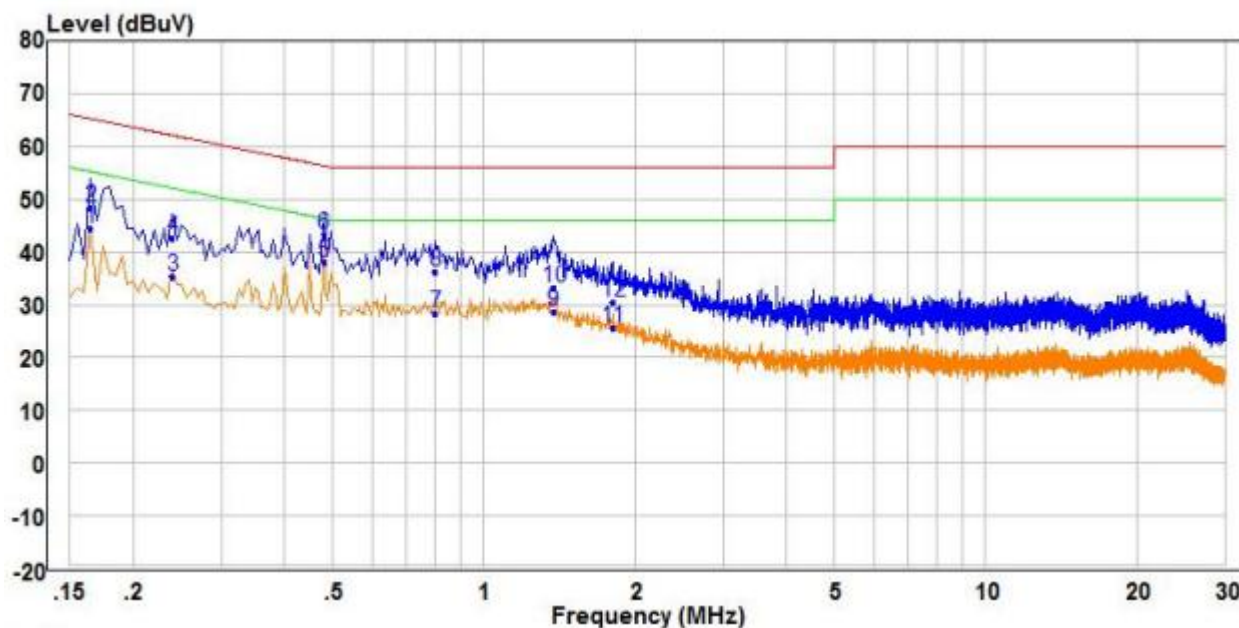


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.150	26.89	9.70	36.59	56.00	-19.41	Average	Line
2	0.150	38.25	9.70	47.95	66.00	-18.05	QP	Line
3	0.180	25.28	9.64	34.92	54.49	-19.57	Average	Line
4 QP	0.180	37.52	9.64	47.16	64.49	-17.33	QP	Line
5	0.200	24.92	9.61	34.53	53.61	-19.08	Average	Line
6	0.200	33.73	9.61	43.34	63.61	-20.27	QP	Line
7	0.260	22.81	9.53	32.34	51.43	-19.09	Average	Line
8	0.260	29.96	9.53	39.49	61.43	-21.94	QP	Line
9 PP	0.455	23.72	9.66	33.38	46.78	-13.40	Average	Line
10	0.455	29.68	9.66	39.34	56.78	-17.44	QP	Line
11	0.660	18.44	9.86	28.30	46.00	-17.70	Average	Line
12	0.660	23.30	9.86	33.16	56.00	-22.84	QP	Line

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.165	34.63	9.67	44.30	55.21	-10.91	Average	Neutral
2	0.165	38.83	9.67	48.50	65.21	-16.71	QP	Neutral
3	0.240	25.73	9.55	35.28	52.10	-16.82	Average	Neutral
4	0.240	32.99	9.55	42.54	62.10	-19.56	QP	Neutral
5 PP	0.480	28.31	9.68	37.99	46.34	-8.35	Average	Neutral
6 QP	0.480	33.59	9.68	43.27	56.34	-13.07	QP	Neutral
7	0.800	18.44	9.83	28.27	46.00	-17.73	Average	Neutral
8	0.800	26.51	9.83	36.34	56.00	-19.66	QP	Neutral
9	1.375	18.94	9.72	28.66	46.00	-17.34	Average	Neutral
10	1.375	23.61	9.72	33.33	56.00	-22.67	QP	Neutral
11	1.805	15.77	9.74	25.51	46.00	-20.49	Average	Neutral
12	1.805	20.72	9.74	30.46	56.00	-25.54	QP	Neutral

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

5.3 Radiated Emission

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Note: For fundamental frequency, RBW=5MHz, VBW=5MHz, Peak detector is for PK value, RMS detector is for Average value.					
Limit: (Spurious Emissions and band edge)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 1) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. 2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	2400MHz-2483.5MHz	94.0		Average Value	
		114.0		Peak Value	

Test Setup:

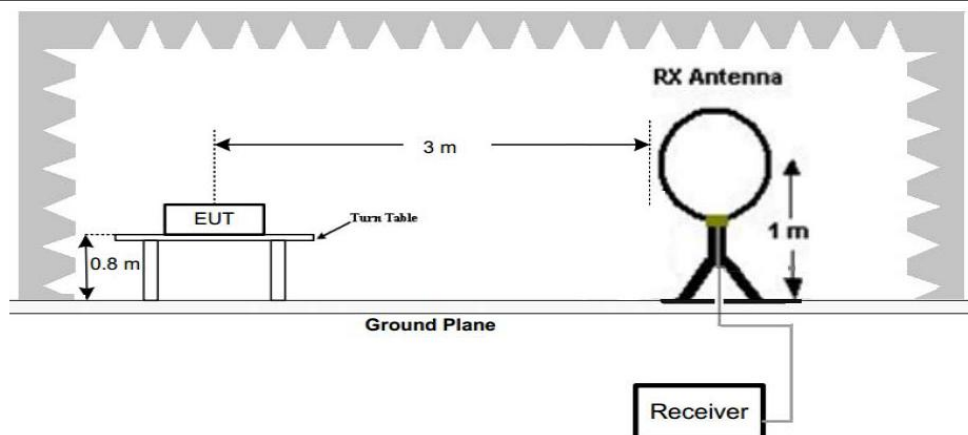


Figure 1. Below 30MHz

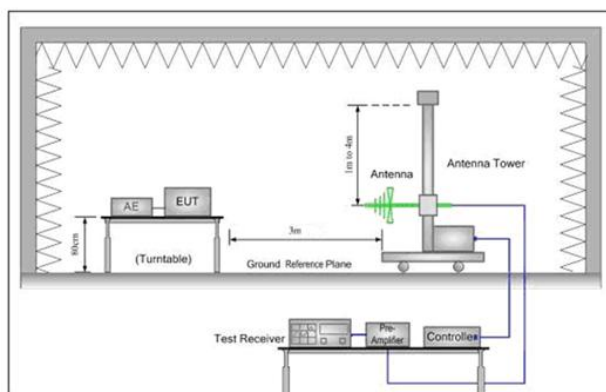


Figure 2. 30MHz to 1GHz

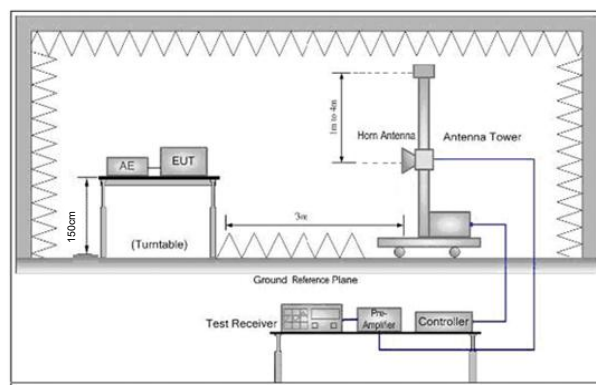


Figure 3. Above 1 GHz

Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
 - 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- Note: For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
 - c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
 - d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table

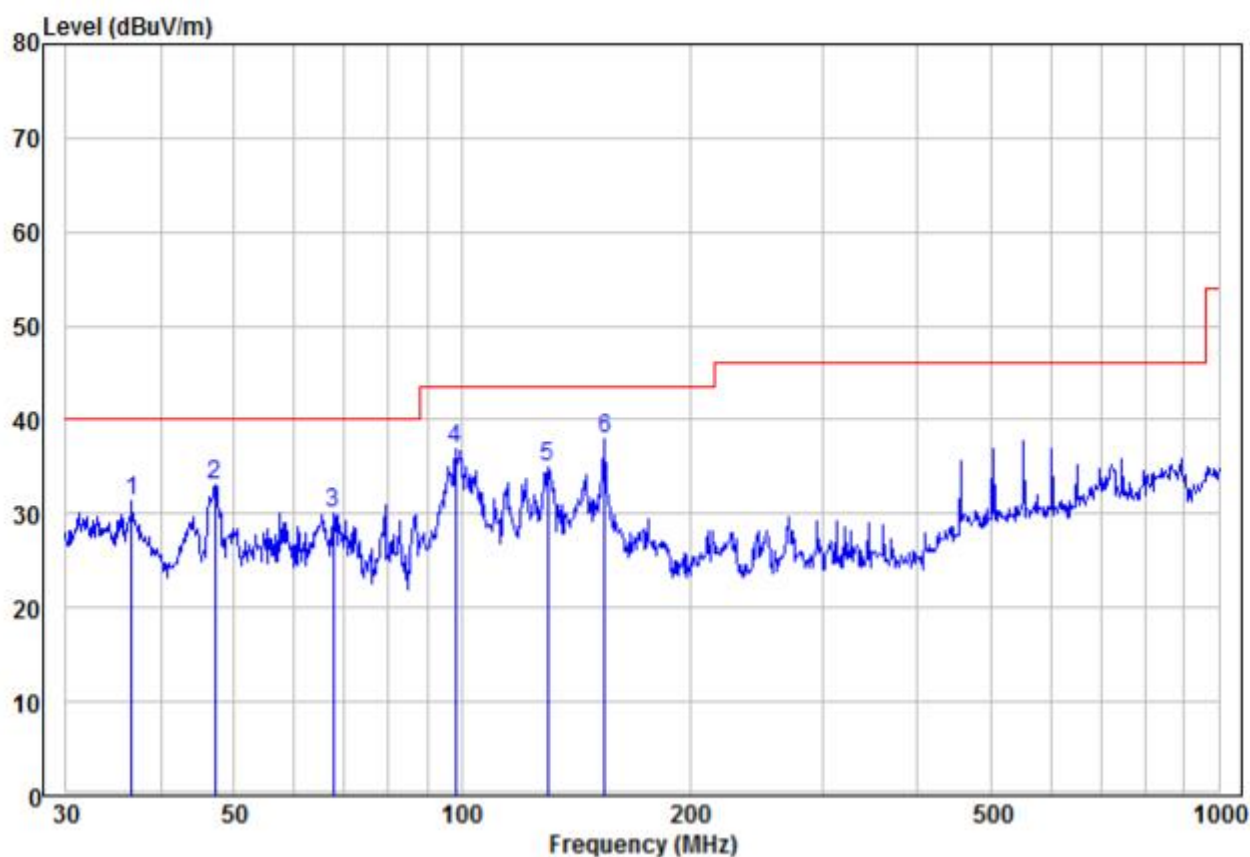
	was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel,the middle channel,the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting mode, Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Charge + Transmitting mode which it is worse case. For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

1#

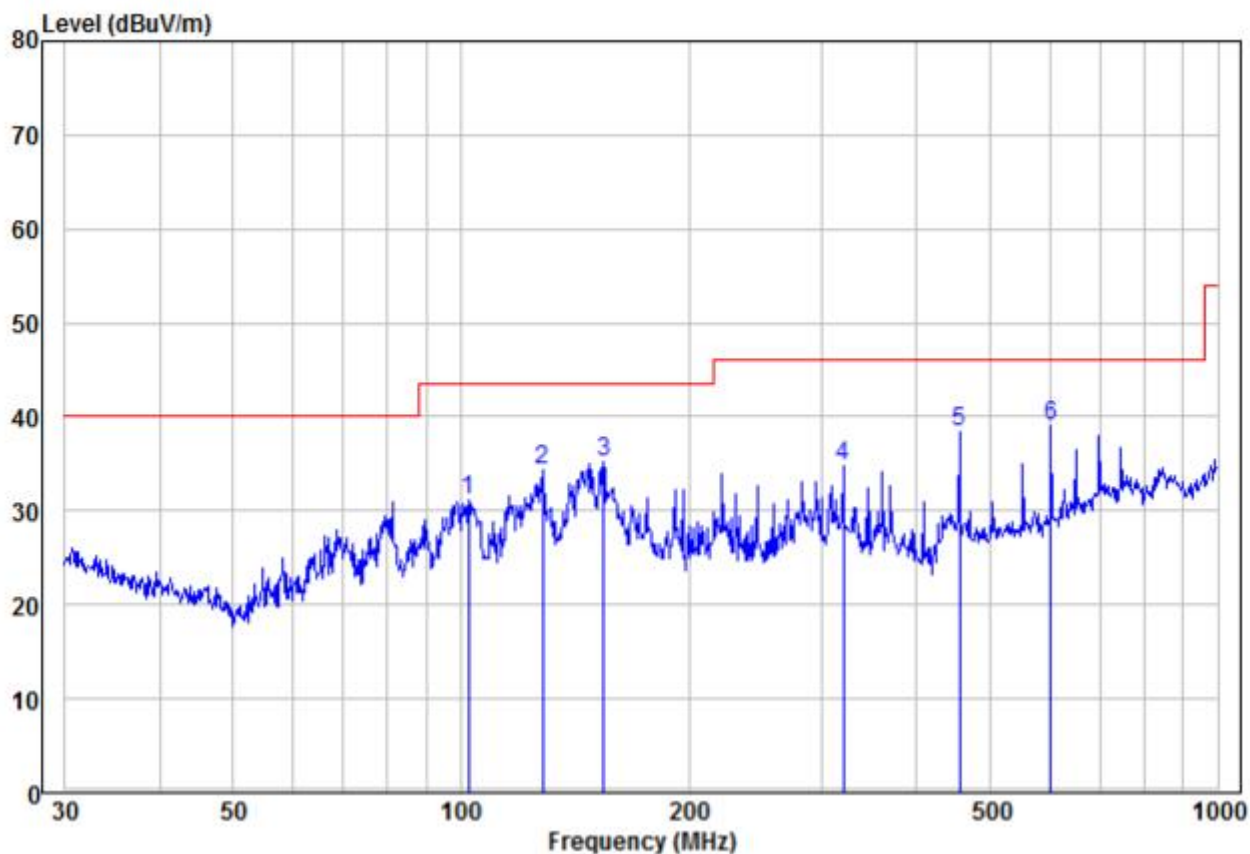
Ant1:

30MHz~1GHz		
Test mode:	Transmitting	Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	36.64	17.44	14.01	31.45	40.00	-8.55	Peak	VERTICAL
2	47.16	23.57	9.43	33.00	40.00	-7.00	Peak	VERTICAL
3	67.68	22.69	7.43	30.12	40.00	-9.88	Peak	VERTICAL
4	98.14	26.33	10.53	36.86	43.50	-6.64	Peak	VERTICAL
5	129.92	24.60	10.32	34.92	43.50	-8.58	Peak	VERTICAL
6 pp	154.28	29.83	8.18	38.01	43.50	-5.49	Peak	VERTICAL

Test mode:	Transmitting	Horizontal
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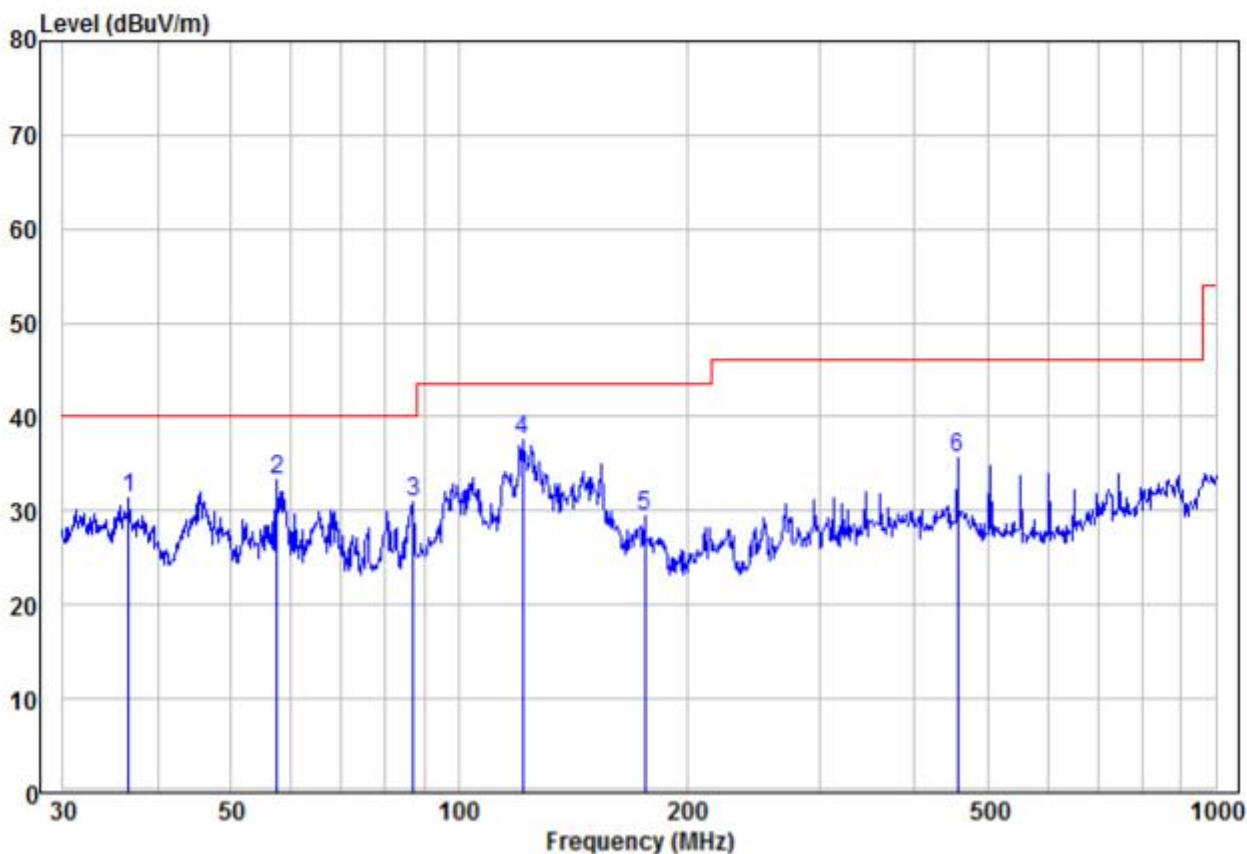


	Read		Limit	Over			
Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	102.36	20.69	10.54	31.23	43.50	-12.27 Peak	HORIZONTAL
2	128.11	23.93	10.40	34.33	43.50	-9.17 Peak	HORIZONTAL
3	154.28	27.00	8.18	35.18	43.50	-8.32 Peak	HORIZONTAL
4	319.94	20.65	14.22	34.87	46.00	-11.13 Peak	HORIZONTAL
5	455.91	21.51	16.91	38.42	46.00	-7.58 Peak	HORIZONTAL
6 pp	601.43	20.22	18.82	39.04	46.00	-6.96 Peak	HORIZONTAL

Ant2:

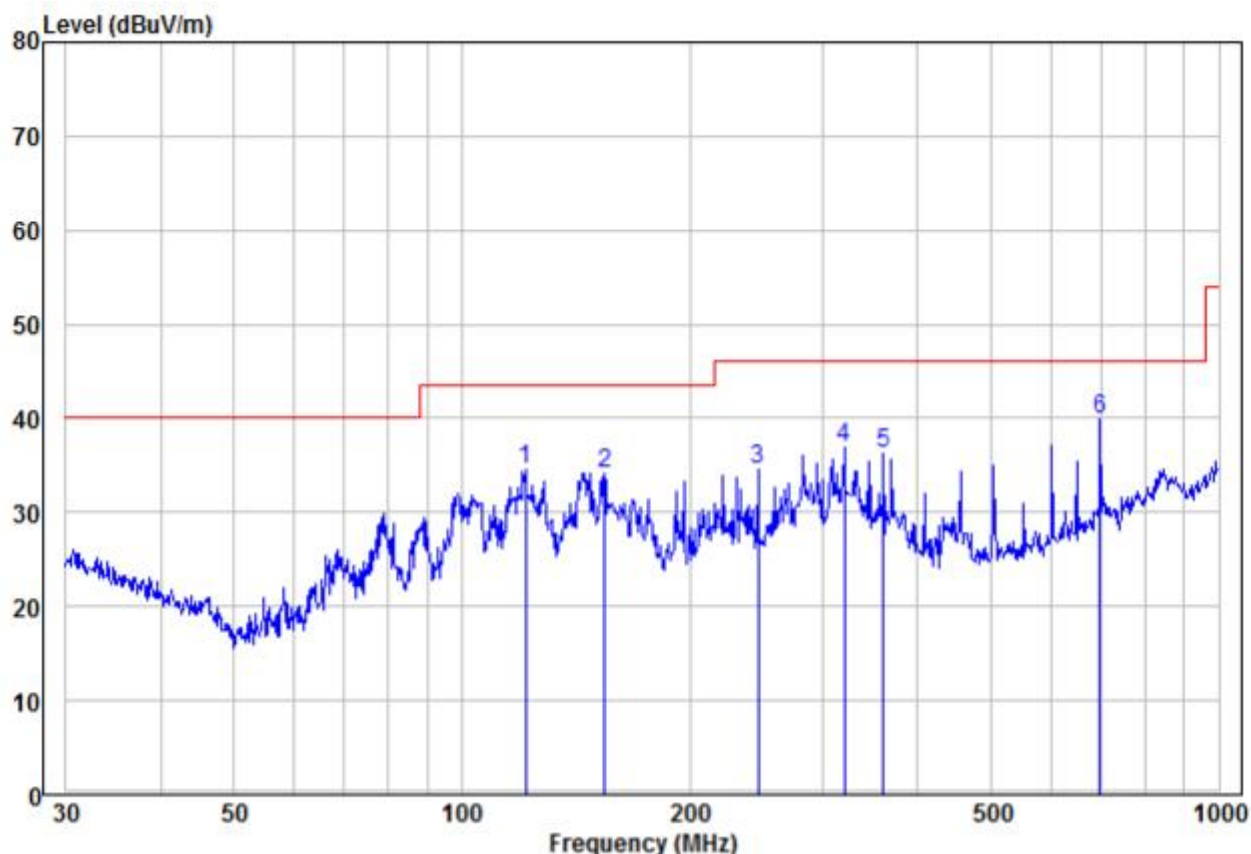
30MHz~1GHz

Test mode:	Transmitting	Vertical
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	Freq	Read Level	Factor	Limit Level	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dB		
1	36.64	17.44	14.01	31.45	40.00	-8.55 Peak	VERTICAL
2	57.59	27.17	6.00	33.17	40.00	-6.83 Peak	VERTICAL
3	87.11	20.98	9.95	30.93	40.00	-9.07 Peak	VERTICAL
4 pp	121.55	26.99	10.64	37.63	43.50	-5.87 Peak	VERTICAL
5	176.27	21.43	8.07	29.50	43.50	-14.00 Peak	VERTICAL
6	455.91	18.78	16.91	35.69	46.00	-10.31 Peak	VERTICAL

Test mode:	Transmitting	Horizontal
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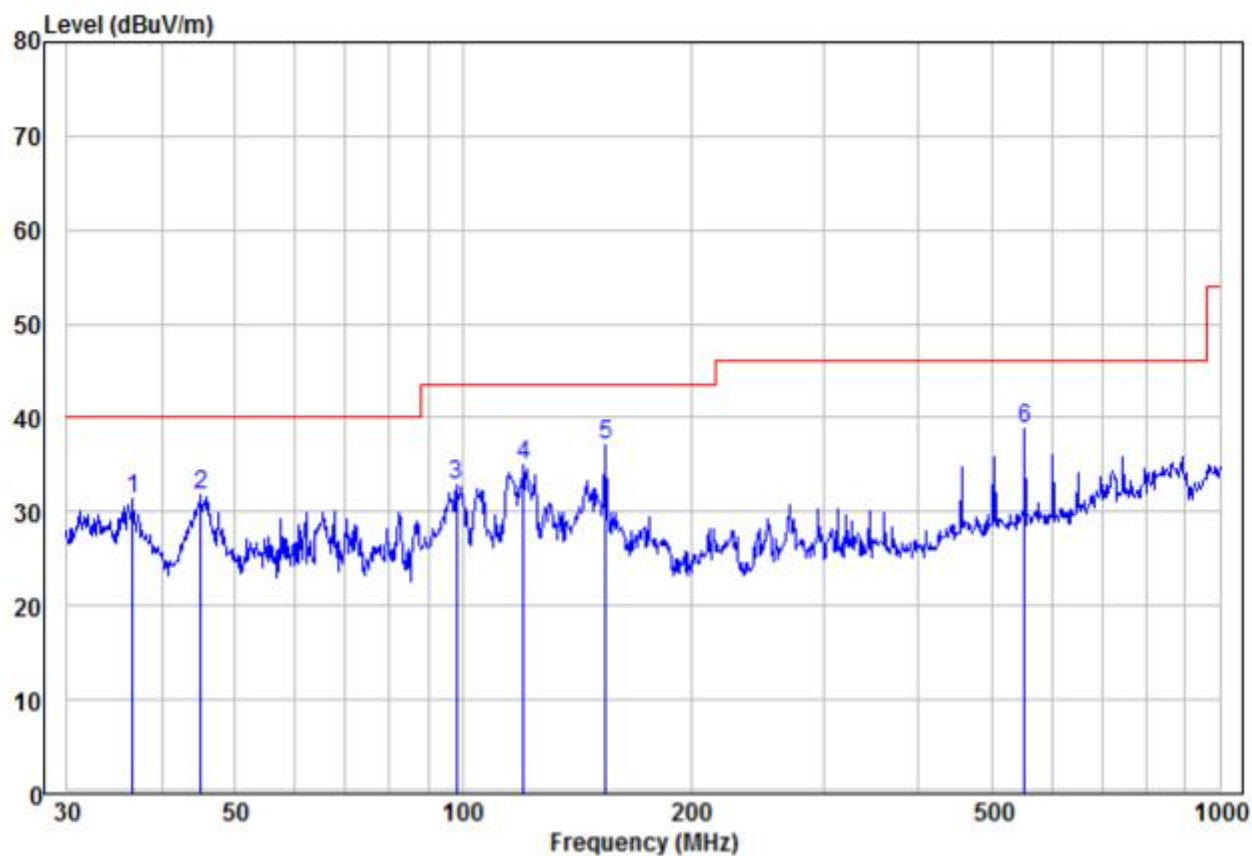
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	121.55	23.85	10.64	34.49	43.50	-9.01	Peak	HORIZONTAL
2	154.28	26.00	8.18	34.18	43.50	-9.32	Peak	HORIZONTAL
3	245.95	22.65	11.95	34.60	46.00	-11.40	Peak	HORIZONTAL
4	319.94	22.65	14.22	36.87	46.00	-9.13	Peak	HORIZONTAL
5	360.45	21.03	15.20	36.23	46.00	-9.77	Peak	HORIZONTAL
6 pp	696.86	18.88	21.04	39.92	46.00	-6.08	Peak	HORIZONTAL

2#

Ant1:

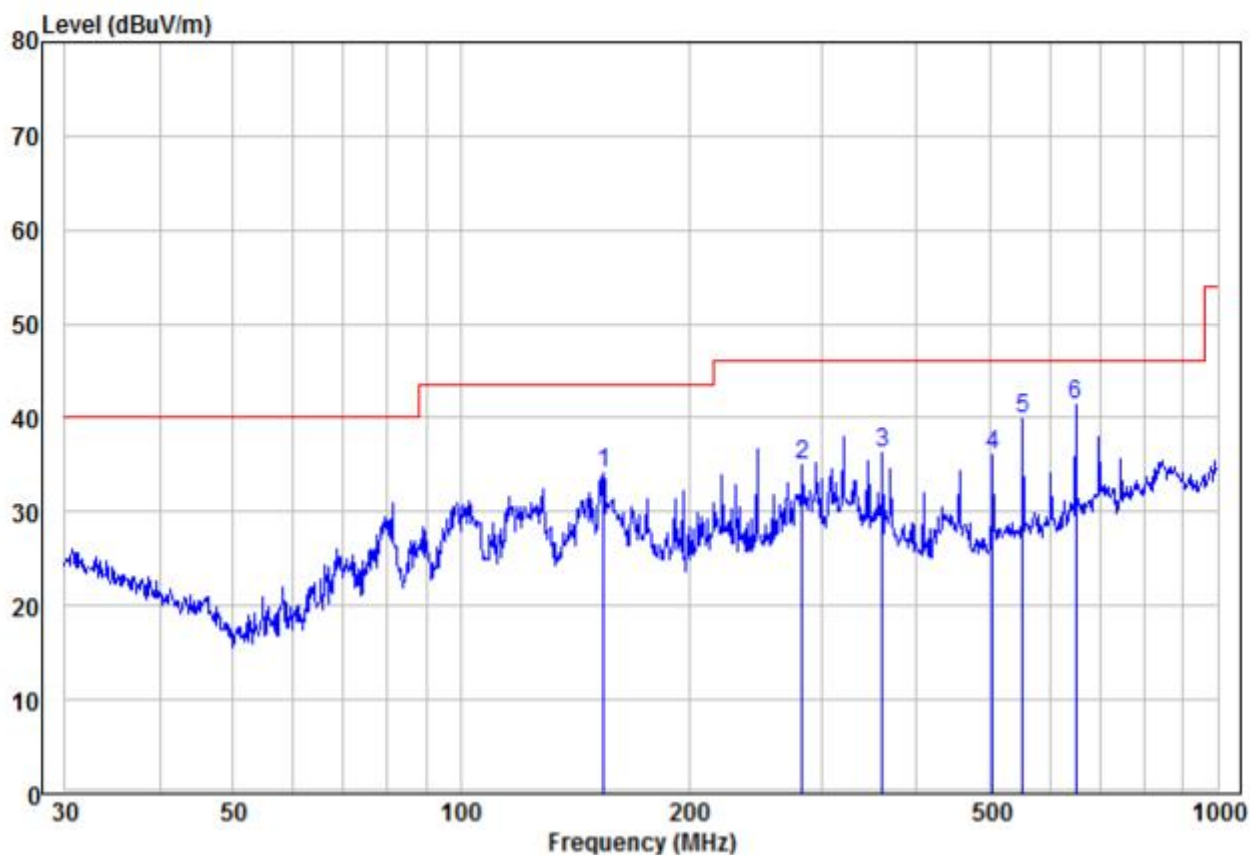
30MHz~1GHz

Test mode:	Transmitting	Vertical
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	Read			Limit	Over		
Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	36.64	17.44	14.01	31.45	40.00	-8.55 Peak	VERTICAL
2	45.06	21.35	10.42	31.77	40.00	-8.23 Peak	VERTICAL
3	98.14	22.33	10.53	32.86	43.50	-10.64 Peak	VERTICAL
4	120.28	24.31	10.69	35.00	43.50	-8.50 Peak	VERTICAL
5 pp	154.28	28.83	8.18	37.01	43.50	-6.49 Peak	VERTICAL
6	552.88	19.91	18.83	38.74	46.00	-7.26 Peak	VERTICAL

Test mode:	Transmitting	Horizontal
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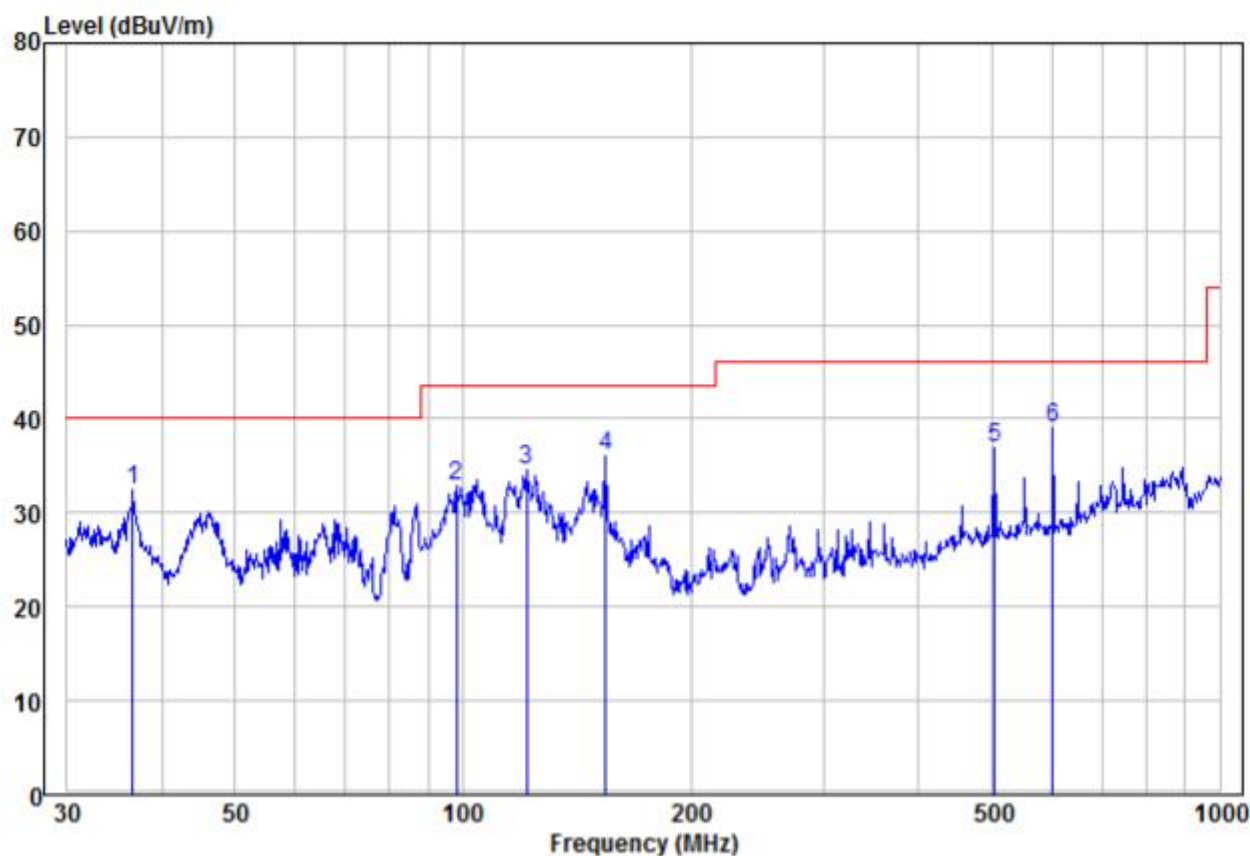


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	154.28	26.00	8.18	34.18	43.50	-9.32	Peak	HORIZONTAL
2	282.99	21.89	13.17	35.06	46.00	-10.94	Peak	HORIZONTAL
3	360.45	21.03	15.20	36.23	46.00	-9.77	Peak	HORIZONTAL
4	504.71	17.71	18.33	36.04	46.00	-9.96	Peak	HORIZONTAL
5	552.88	21.13	18.83	39.96	46.00	-6.04	Peak	HORIZONTAL
6 pp	649.66	21.75	19.67	41.42	46.00	-4.58	Peak	HORIZONTAL

Ant2:

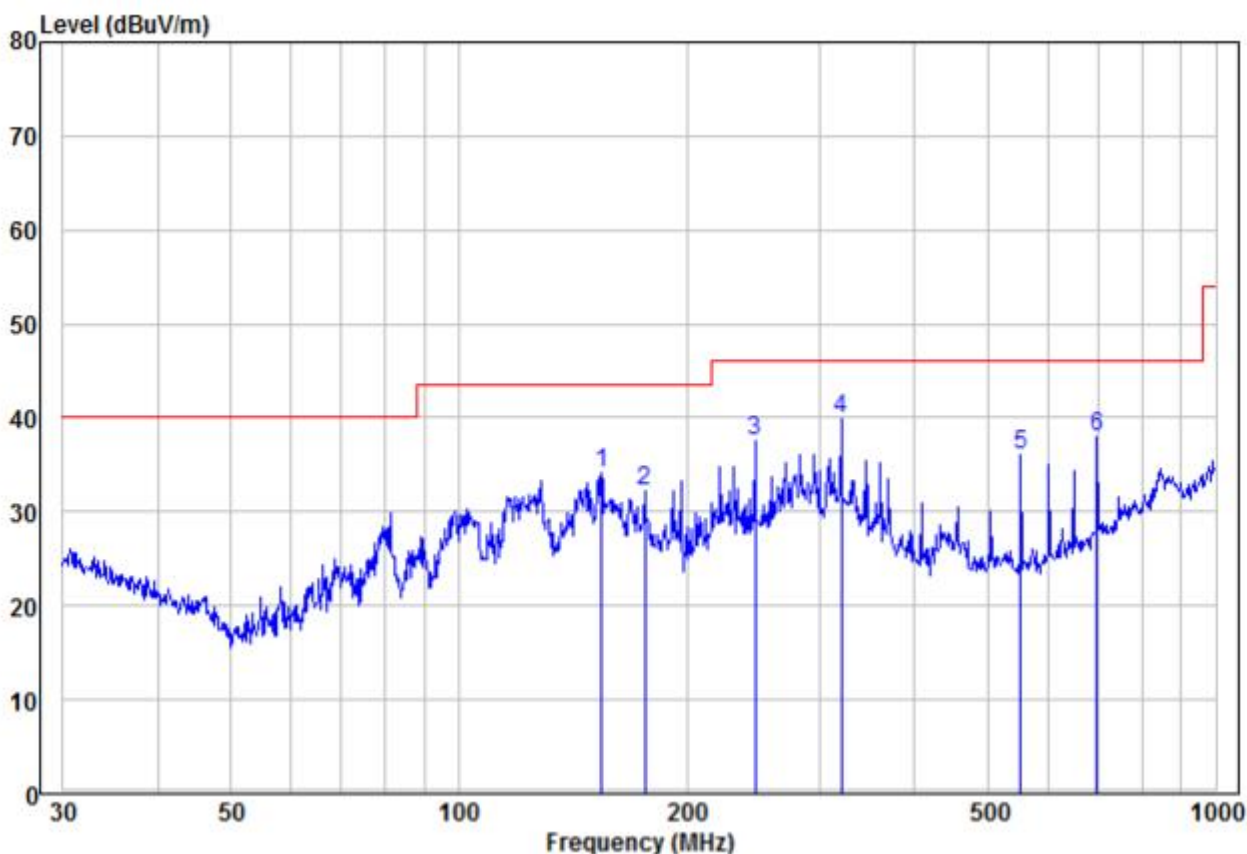
30MHz~1GHz

Test mode:	Transmitting	Vertical
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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	36.64	18.44	14.01	32.45	40.00	-7.55	Peak	VERTICAL
2	98.14	22.33	10.53	32.86	43.50	-10.64	Peak	VERTICAL
3	121.55	23.99	10.64	34.63	43.50	-8.87	Peak	VERTICAL
4	154.28	27.83	8.18	36.01	43.50	-7.49	Peak	VERTICAL
5	504.71	18.50	18.33	36.83	46.00	-9.17	Peak	VERTICAL
6 pp	601.43	20.17	18.82	38.99	46.00	-7.01	Peak	VERTICAL

Test mode:	Transmitting	Horizontal
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	Read			Limit	Over		
Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	154.28	26.00	8.18	34.18	43.50	-9.32	Peak
2	176.27	24.23	8.07	32.30	43.50	-11.20	Peak
3	245.95	25.65	11.95	37.60	46.00	-8.40	Peak
4 pp	319.94	25.65	14.22	39.87	46.00	-6.13	Peak
5	552.88	17.13	18.83	35.96	46.00	-10.04	Peak
6	696.86	16.88	21.04	37.92	46.00	-8.08	Peak

Above 1GHz

Ant1:

Test mode:		Transmitting		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5725	44.76	-9.39	35.37	74	-38.63	Peak	H
5725	44.77	-9.39	35.38	54	-18.62	AVG	H
5732	101.26	-9.33	91.93	114	-22.07	peak	H
5732	98.04	-9.33	88.71	94	-5.29	AVG	H
11464	55.23	-4.28	50.95	74	-23.05	peak	H
11464	41.09	-4.28	36.81	54	-17.19	AVG	H
17196	52.21	1.13	53.34	74	-20.66	peak	H
17196	36.08	1.13	37.21	54	-16.79	AVG	H
5725	60.77	-9.39	51.38	74	-22.62	peak	V
5725	44.66	-9.39	35.27	54	-18.73	AVG	V
5732	95.48	-9.33	86.15	114	-27.85	peak	V
5732	93.20	-9.33	83.87	94	-10.13	AVG	V
11464	54.74	-4.28	50.46	74	-23.54	peak	V
11464	41.36	-4.28	37.08	54	-16.92	AVG	V
17196	52.96	1.13	54.09	74	-19.91	peak	V
17196	36.30	1.13	37.43	54	-16.57	AVG	V

Test mode:		Transmitting		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5788	98.85	-9.37	89.48	114	-24.52	peak	H
5788	96.34	-9.37	86.97	94	-7.03	AVG	H
11576	56.30	-4.14	52.16	74	-21.84	peak	H
11576	42.15	-4.14	38.01	54	-15.99	AVG	H
17364	53.13	0.56	53.69	74	-20.31	peak	H
17364	35.80	0.56	36.36	54	-17.64	AVG	H
5788	97.03	-9.36	87.67	114	-26.33	peak	V
5788	93.13	-9.36	83.77	94	-10.23	AVG	V
11576	57.20	-4.14	53.06	74	-20.94	peak	V
11576	40.71	-4.14	36.57	54	-17.43	AVG	V
17364	51.38	0.56	51.94	74	-22.06	peak	V
17364	35.77	0.56	36.33	54	-17.67	AVG	V

Test mode:		Transmitting		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5848	99.84	-9.23	90.61	114	-23.39	peak	H
5848	95.81	-9.23	86.58	94	-7.42	AVG	H
5850	60.95	-9.29	51.66	74	-22.34	Peak	H
5850	45.02	-9.29	35.73	54	-18.27	AVG	H
11696	57.33	-4.03	53.30	74	-20.70	peak	H
11696	42.03	-4.03	38.00	54	-16.00	AVG	H
17544	52.00	1.68	53.68	74	-20.32	peak	H
17544	36.40	1.68	38.08	54	-15.92	AVG	H
5848	96.18	-9.23	86.95	114	-27.05	peak	V
5848	93.51	-9.23	84.28	94	-9.72	AVG	V
5850	62.60	-9.29	53.31	74	-20.69	peak	V
5850	43.96	-9.29	34.67	54	-19.33	AVG	V
11696	54.71	-4.03	50.68	74	-23.32	peak	V
11696	41.57	-4.03	37.54	54	-16.46	AVG	V
17544	52.29	1.68	53.97	74	-20.03	peak	V
17544	36.56	1.68	38.24	54	-15.76	AVG	V

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, The disturbance above 10GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .

Ant2:

Test mode:		Transmitting		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5725	44.38	-9.39	34.99	74	-39.01	Peak	H
5725	43.91	-9.39	34.52	54	-19.48	AVG	H
5732	100.35	-9.33	91.02	114	-22.98	peak	H
5732	97.26	-9.33	87.93	94	-6.07	AVG	H
11464	57.36	-4.28	53.08	74	-20.92	peak	H
11464	43.04	-4.28	38.76	54	-15.24	AVG	H
17196	51.85	1.13	52.98	74	-21.02	peak	H
17196	37.32	1.13	38.45	54	-15.55	AVG	H
5725	61.38	-9.39	51.99	74	-22.01	peak	V
5725	45.55	-9.39	36.16	54	-17.84	AVG	V
5732	95.43	-9.33	86.10	114	-27.90	peak	V
5732	91.48	-9.33	82.15	94	-11.85	AVG	V
11464	57.03	-4.28	52.75	74	-21.25	peak	V
11464	42.22	-4.28	37.94	54	-16.06	AVG	V
17196	53.41	1.13	54.54	74	-19.46	peak	V
17196	38.32	1.13	39.45	54	-14.55	AVG	V

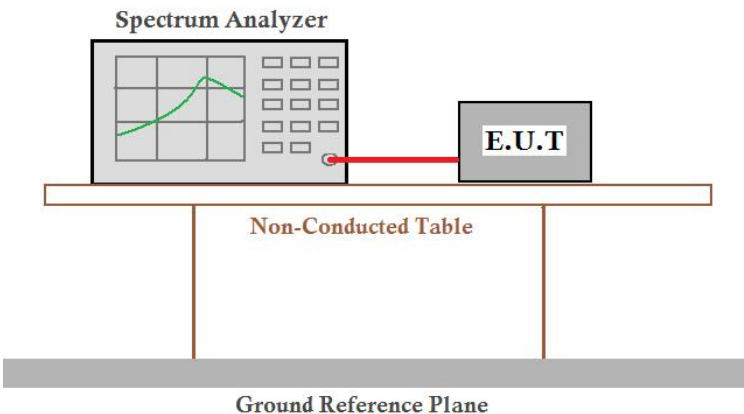
Test mode:		Transmitting		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5788	100.04	-9.37	90.67	114	-23.33	peak	H
5788	98.22	-9.37	88.85	94	-5.15	AVG	H
11576	54.98	-4.14	50.84	74	-23.16	peak	H
11576	42.10	-4.14	37.96	54	-16.04	AVG	H
17364	53.00	0.56	53.56	74	-20.44	peak	H
17364	38.46	0.56	39.02	54	-14.98	AVG	H
5788	96.25	-9.36	86.89	114	-27.11	peak	V
5788	94.42	-9.36	85.06	94	-8.94	AVG	V
11576	54.95	-4.14	50.81	74	-23.19	peak	V
11576	42.92	-4.14	38.78	54	-15.22	AVG	V
17364	52.27	0.56	52.83	74	-21.17	peak	V
17364	37.05	0.56	37.61	54	-16.39	AVG	V

Test mode:		Transmitting		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5848	97.37	-9.23	88.14	114	-25.86	peak	H
5848	95.68	-9.23	86.45	94	-7.55	AVG	H
5850	61.63	-9.29	52.34	74	-21.66	Peak	H
5850	43.06	-9.29	33.77	54	-20.23	AVG	H
11696	56.07	-4.03	52.04	74	-21.96	peak	H
11696	41.26	-4.03	37.23	54	-16.77	AVG	H
17544	52.14	1.68	53.82	74	-20.18	peak	H
17544	38.08	1.68	39.76	54	-14.24	AVG	H
5848	95.83	-9.23	86.60	114	-27.40	peak	V
5848	92.93	-9.23	83.70	94	-10.30	AVG	V
5850	62.29	-9.29	53.00	74	-21.00	peak	V
5850	44.81	-9.29	35.52	54	-18.48	AVG	V
11696	55.00	-4.03	50.97	74	-23.03	peak	V
11696	43.55	-4.03	39.52	54	-14.48	AVG	V
17544	51.75	1.68	53.43	74	-20.57	peak	V
17544	36.80	1.68	38.48	54	-15.52	AVG	V

Remark:

- 3) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 4) Scan from 9kHz to 25GHz, The disturbance above 10GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .

5.4 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013
Test Setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Mode:	Transmitting with GFSK modulation.
Limit:	N/A
Test Results:	Pass

Measurement Data

Ant1:

Test channel	20dB bandwidth (MHz)	Results
Lowest	3.71	Pass
Middle	3.2	Pass
Highest	3.98	Pass

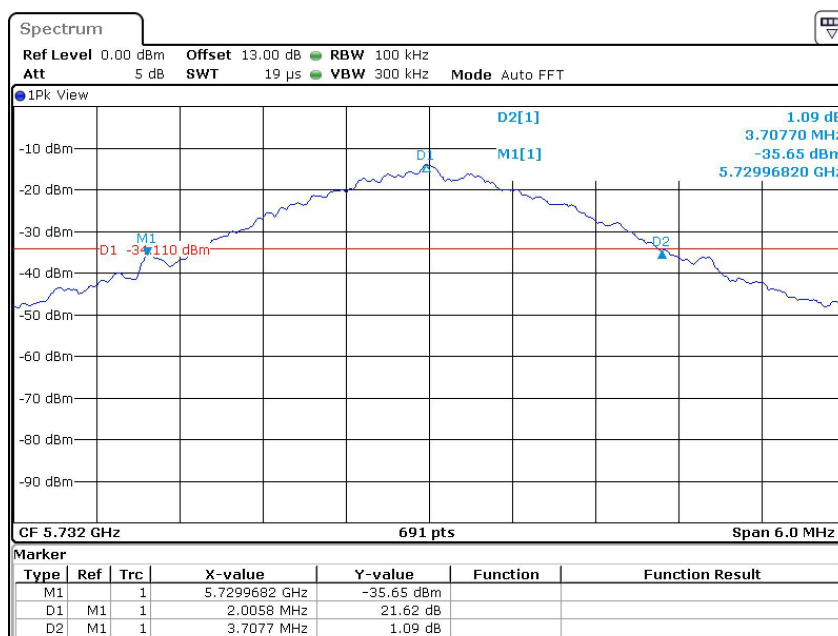
Ant2:

Test channel	20dB bandwidth (MHz)	Results
Lowest	3.65	Pass
Middle	3.76	Pass
Highest	3.99	Pass

Test plot as follows:

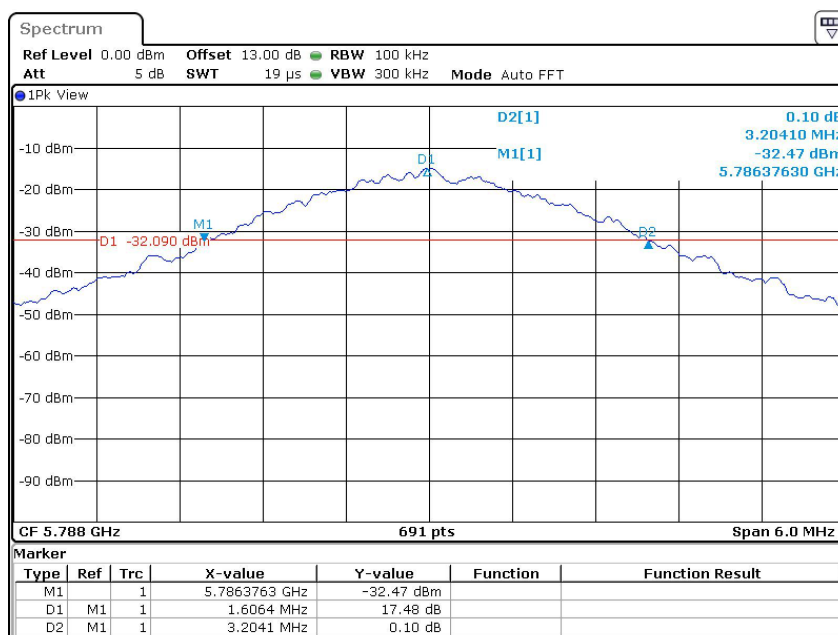
Ant1:

Test channel: Lowest



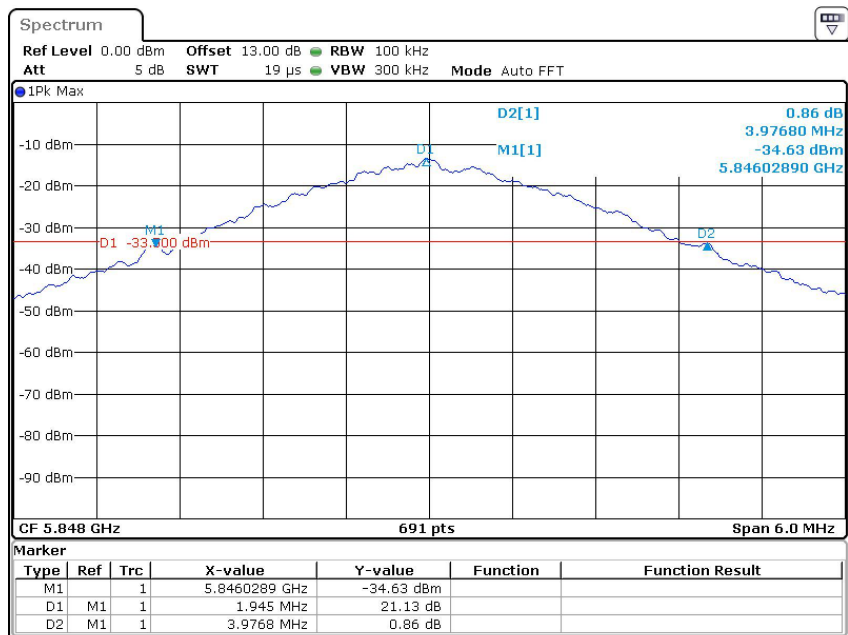
Date: 28.NOV.2023 15:39:35

Test channel: Middle



Date: 28.NOV.2023 15:36:34

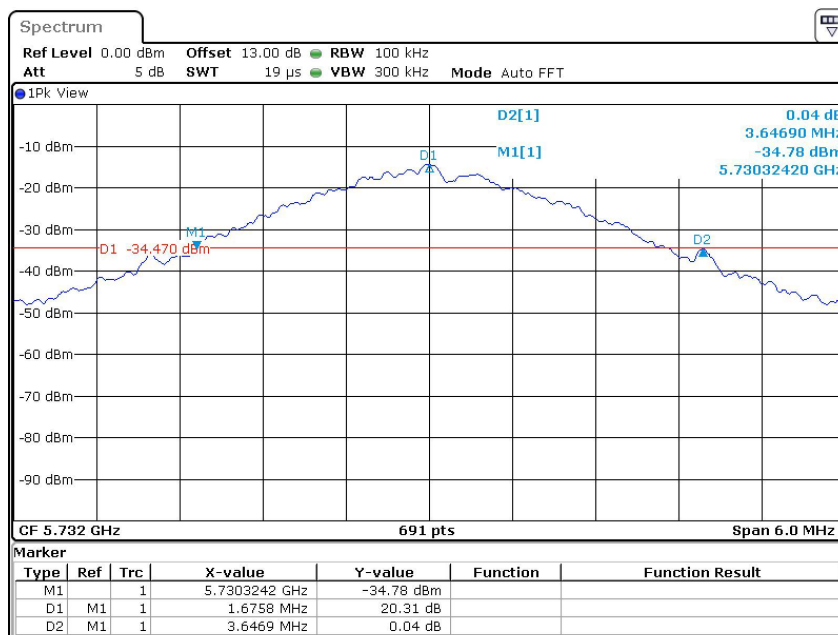
Test channel: Highest



Date: 28.NOV.2023 15:32:39

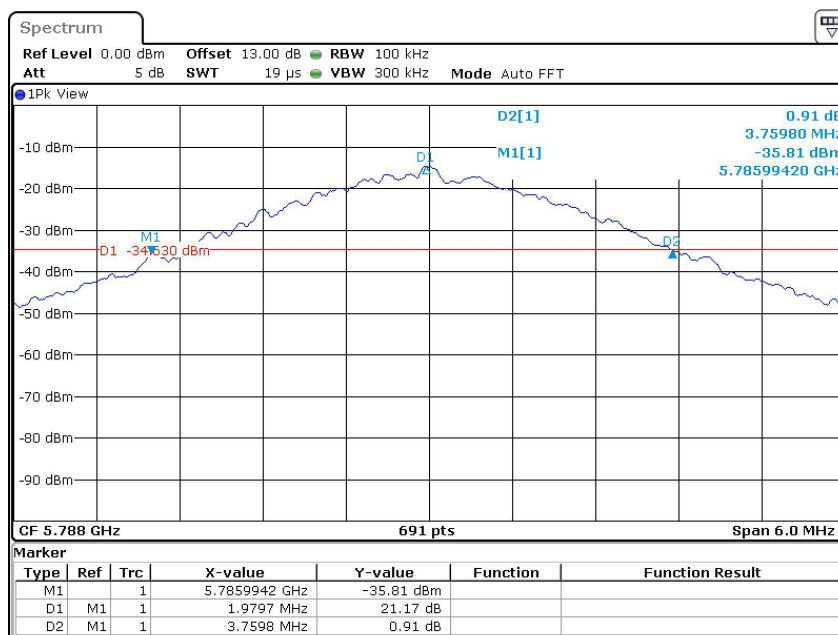
Ant2:

Test channel: Lowest



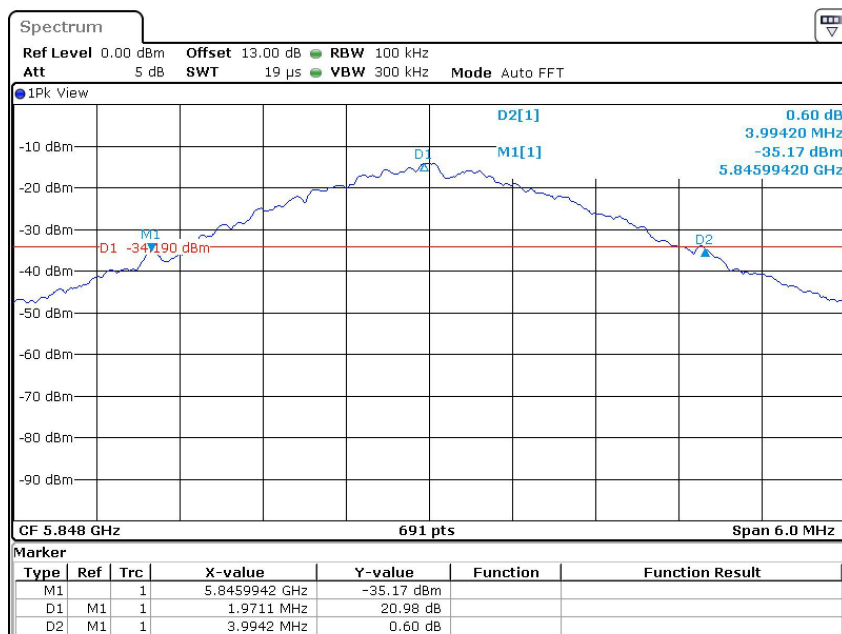
Date: 28.NOV.2023 15:40:37

Test channel: Middle



Date: 28.NOV.2023 15:37:50

Test channel: Highest



Date: 28.NOV.2023 15:33:54

6 Photographs

6.1 Radiated Emission Test Setup

9kHz~30MHz



30MHz~1GHz:



Above 1GHz:



6.2 Conducted Emission Test Setup



6.3 EUT Constructional Details

Refer to Photographs - EUT Constructional Details OF EUT for CQASZ20231001865E-01.

*** END OF REPORT ***