

TEST REPORT

Product : Wireless RGB Mousepad
Trade mark : N/A
Model/Type reference : HD033
Serial Number : N/A
Report Number : EED32P80939301
FCC ID : 2BBUN-HD033
Date of Issue : Sep. 14, 2023
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

Guangzhou Huadong Computer Technology Co.,Ltd.
FIFTH FLOOR OF HONGTAI INDUSTRIAL ZONE(PLANT A4),
HUDIELING, XINTANG TOWN, ZENGCHENG DISTRICT, GUANGZHOU

Prepared by:

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Date:

Sep. 14, 2023



Check No.:6344250623

1 Version

Version No.	Date	Description
00	Sep. 14, 2023	Original

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
Radiated Emissions	47 CFR Part 15 Subpart C Section 15.209	ANSI C63.10:2013	PASS

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

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4 General Information

4.1 Client Information

Applicant:	Guangzhou Huadong Computer Technology Co.,Ltd.
Address of Applicant:	FIFTH FLOOR OF HONGTAI INDUSTRIAL ZONE(PLANT A4), HUDIELING, XINTANG TOWN, ZENGCHENG DISTRICT, GUANGZHOU
Manufacturer:	Guangzhou Huadong Computer Technology Co.,Ltd.
Address of Manufacturer:	FIFTH FLOOR OF HONGTAI INDUSTRIAL ZONE(PLANT A4), HUDIELING, XINTANG TOWN, ZENGCHENG DISTRICT, GUANGZHOU
Factory:	Guangzhou Huadong Computer Technology Co.,Ltd.
Address of Factory:	FIFTH FLOOR OF HONGTAI INDUSTRIAL ZONE(PLANT A4), HUDIELING, XINTANG TOWN, ZENGCHENG DISTRICT, GUANGZHOU

4.2 General Description of EUT

Product Name:	Wireless RGB Mousepad	
Model No.:	HD033	
Trade Mark:	N/A	
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location	
Frequency Range:	111kHz-200kHz	
Number of Channels:	1	
Center Frequency:	128kHz	
Modulation Type:	ASK	
Antenna Type:	Coil antenna	
Power Supply:	USB port:	DC 5.0V/DC 9.0V/DC 12.0V
Test Power Grade:	Default	
Test Software of EUT:	RF test	
Sample Received Date:	Jun. 26, 2023	
Sample tested Date:	Jun. 26, 2023 to Jun. 29, 2023	

4.3 Test Environment and Mode

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Conducted Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Test mode: Transmitting mode	
Mode a:	Wireless charging mode(Null load)(Connect to adapter)
Mode b:	Wireless charging mode(33.3% load)(Connect to adapter)
Mode c:	Wireless charging mode(66.7% load)(Connect to adapter)
Mode d:	Wireless charging mode(Half load)(Connect to adapter)
Mode e:	Wireless charging mode(Full load)(Connect to adapter)
Note: 1.Wireless output:5W,7.5W,10W,15W(maximum wireless output 15W during charging); 2.Through Pre-scan,when EUT power by DC 12.0V was the worst case, only the worst case data was recorded in the report.	

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
Fast charging source adapter	MI	/	FCC ID and DOC	CTI
Intelligent wireless charging full function test module	YBZ	/	FCC ID and DOC	Client

4.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.

4.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

5 Equipment List

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	04-25-2023	04-24-2024
LISN	R&S	ENV216	100098	09-27-2022	09-26-2023
Capacitive voltage probe	Schwarzbeck	CVP 9222C	00124	07-13-2022	07-12-2023
ISN	TESEQ	ISN T800	30297	12-29-2022	12-28-2023
Barometer	changchun	DYM3	1188	---	---
Temperature/ Humidity Indicator	Defu	TH128	---	---	---
Test software	Fara	EZ-EMC	EMC-CON 3A1.1	---	---

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-22-2022	05-21-2025
Receiver	R&S	ESCI7	100938-003	09-28-2022	09-27-2023
Spectrum Analyzer	R&S	FSV40	101200	07-29-2022	07-28-2023
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-15-2021	04-14-2024
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	05-21-2023	05-20-2024
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1869	04-17-2021	04-16-2024
Horn Antenna	A.H.SYSTEMS	SAS-574	374	05-29-2021	05-28-2024
Preamplifier	Agilent	11909A	12-1	03-28-2023	03-27-2024
Preamplifier	EMCI	EMC051845 SE	980380	12-23-2022	12-22-2023
Preamplifier	CD	PAP-1840-60	6041.6042	07-05-2022	07-04-2023
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---
Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---

6 Test results and Measurement Data

6.1 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:	Please see Internal photos
The antenna is attached on the main PCB and no consideration of replacement.	

6.2 Conducted Emissions

Test Requirement: 47 CFR Part 15C Section 15.207

Test Method: ANSI C63.10: 2013

Test Frequency Range: 150kHz to 30MHz

Limit:

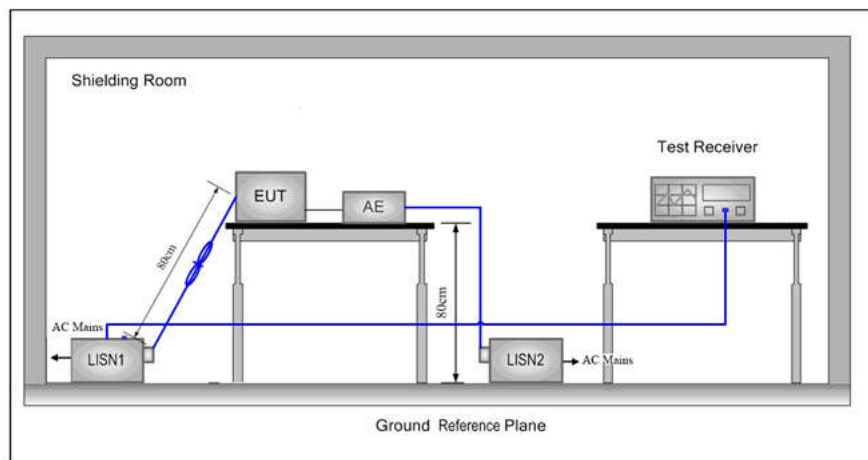
Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* 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:

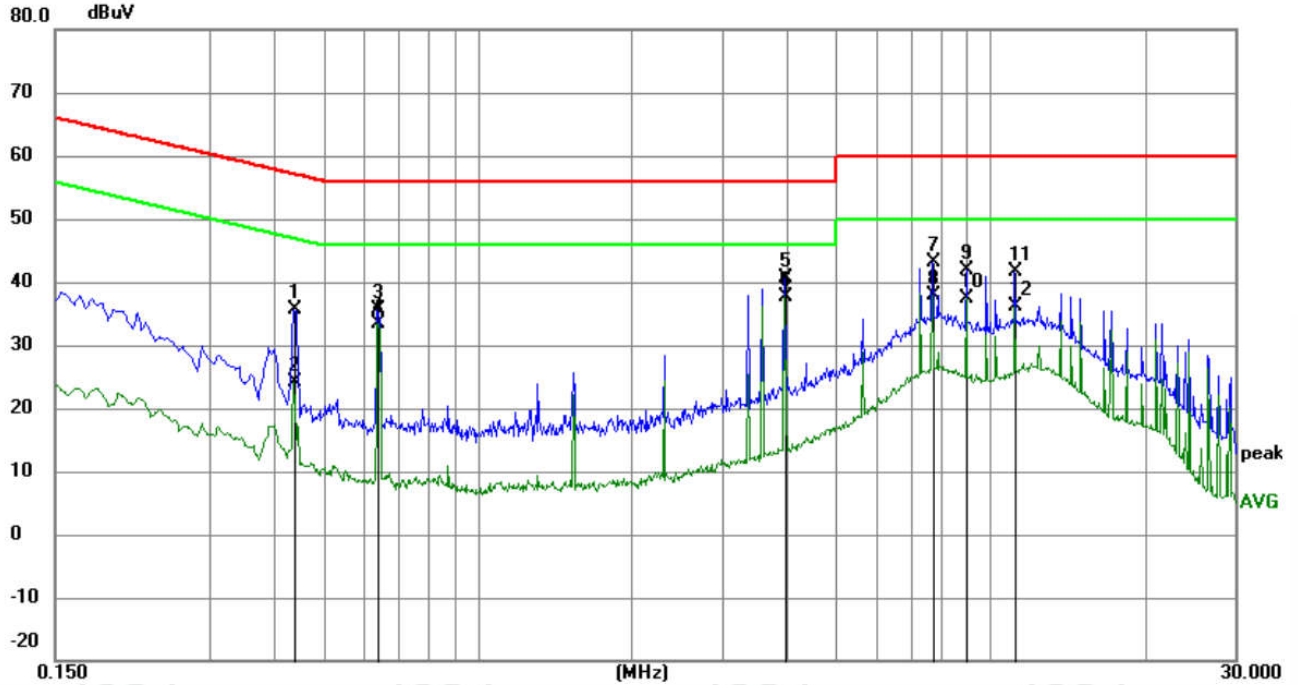
Transmitting mode, refer to section 4.3

Test Results:

Pass

Measurement Data (Mode a):

Live line:

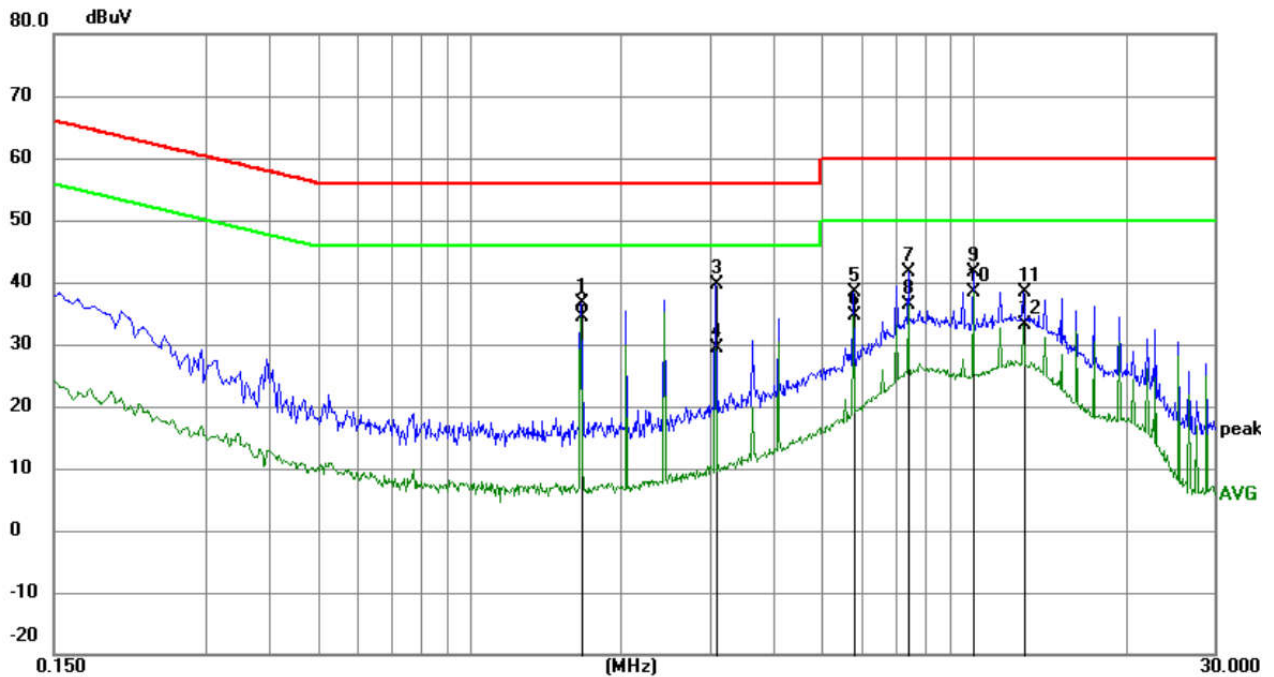


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.4380	25.57	9.96	35.53	57.10	-21.57	QP	
2		0.4380	14.27	9.96	24.23	47.10	-22.87	AVG	
3		0.6405	25.56	9.99	35.55	56.00	-20.45	QP	
4		0.6405	23.33	9.99	33.32	46.00	-12.68	AVG	
5		3.9795	30.76	9.78	40.54	56.00	-15.46	QP	
6	*	3.9795	27.83	9.78	37.61	46.00	-8.39	AVG	
7		7.7055	33.24	9.79	43.03	60.00	-16.97	QP	
8		7.7055	27.97	9.79	37.76	50.00	-12.24	AVG	
9		8.9880	32.11	9.78	41.89	60.00	-18.11	QP	
10		8.9880	27.50	9.78	37.28	50.00	-12.72	AVG	
11		11.1660	31.88	9.81	41.69	60.00	-18.31	QP	
12		11.1660	26.38	9.81	36.19	50.00	-13.81	AVG	

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:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		1.6665	26.84	9.80	36.64	56.00	-19.36	QP	
2	*	1.6665	24.51	9.80	34.31	46.00	-11.69	AVG	
3		3.0795	29.94	9.79	39.73	56.00	-16.27	QP	
4		3.0795	19.48	9.79	29.27	46.00	-16.73	AVG	
5		5.7750	28.67	9.78	38.45	60.00	-21.55	QP	
6		5.7750	24.94	9.78	34.72	50.00	-15.28	AVG	
7		7.4445	31.74	9.79	41.53	60.00	-18.47	QP	
8		7.4445	26.62	9.79	36.41	50.00	-13.59	AVG	
9		10.0095	31.87	9.78	41.65	60.00	-18.35	QP	
10		10.0095	28.48	9.78	38.26	50.00	-11.74	AVG	
11		12.5745	28.44	9.86	38.30	60.00	-21.70	QP	
12		12.5745	23.27	9.86	33.13	50.00	-16.87	AVG	

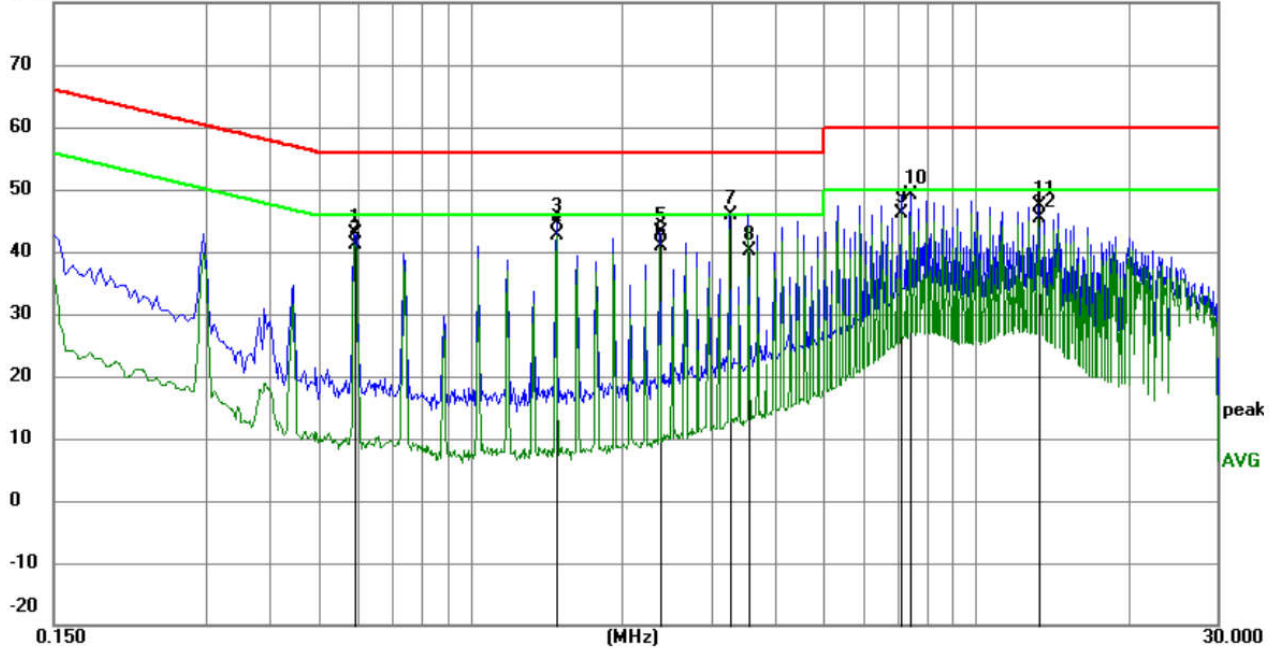
Remark:

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.

Measurement Data (Mode b):

Live line:

80.0 dBuV

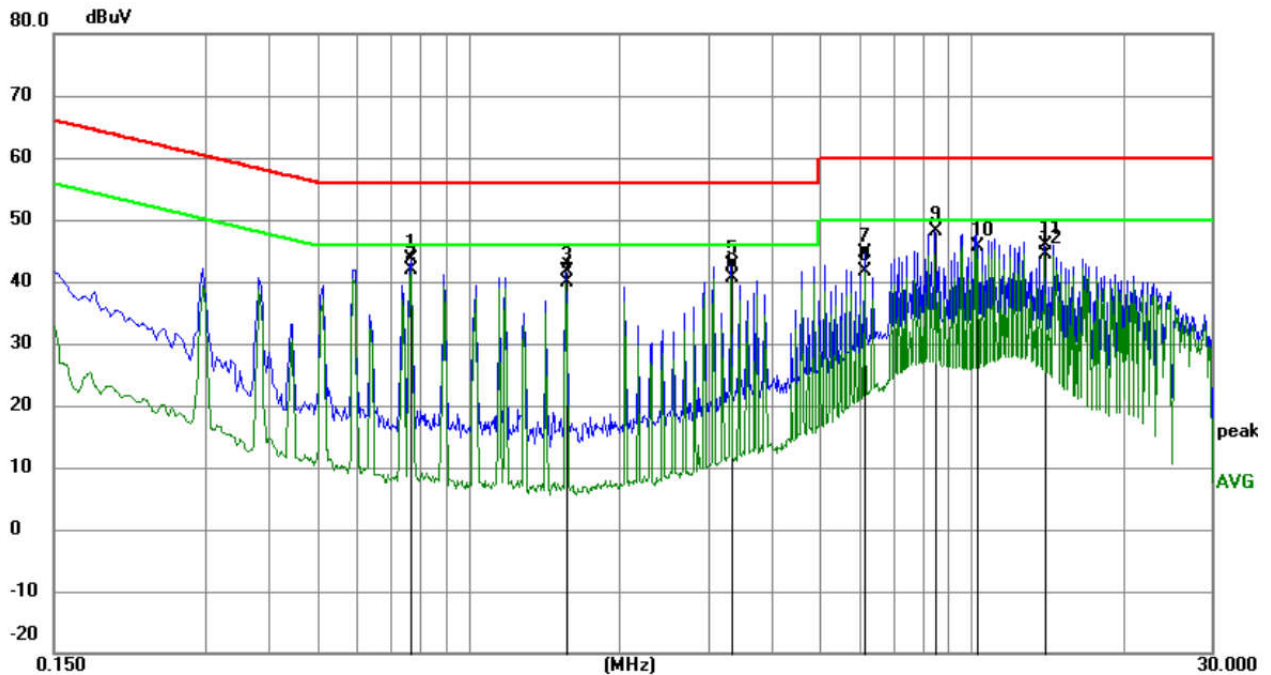


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.5910	32.93	10.06	42.99	56.00	-13.01	peak	
2		0.5910	31.01	10.06	41.07	46.00	-4.93	AVG	
3		1.4819	34.85	9.81	44.66	56.00	-11.34	peak	
4	*	1.4819	32.87	9.81	42.68	46.00	-3.32	AVG	
5		2.3730	33.33	9.79	43.12	56.00	-12.88	peak	
6		2.3730	31.02	9.79	40.81	46.00	-5.19	AVG	
7		3.2595	36.07	9.79	45.86	56.00	-10.14	peak	
8		3.5565	30.42	9.78	40.20	46.00	-5.80	AVG	
9		7.1115	36.41	9.79	46.20	50.00	-3.80	AVG	
10		7.4085	39.43	9.79	49.22	60.00	-10.78	peak	
11		13.3350	37.46	9.88	47.34	60.00	-12.66	peak	
12		13.3350	35.41	9.88	45.29	50.00	-4.71	AVG	

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:



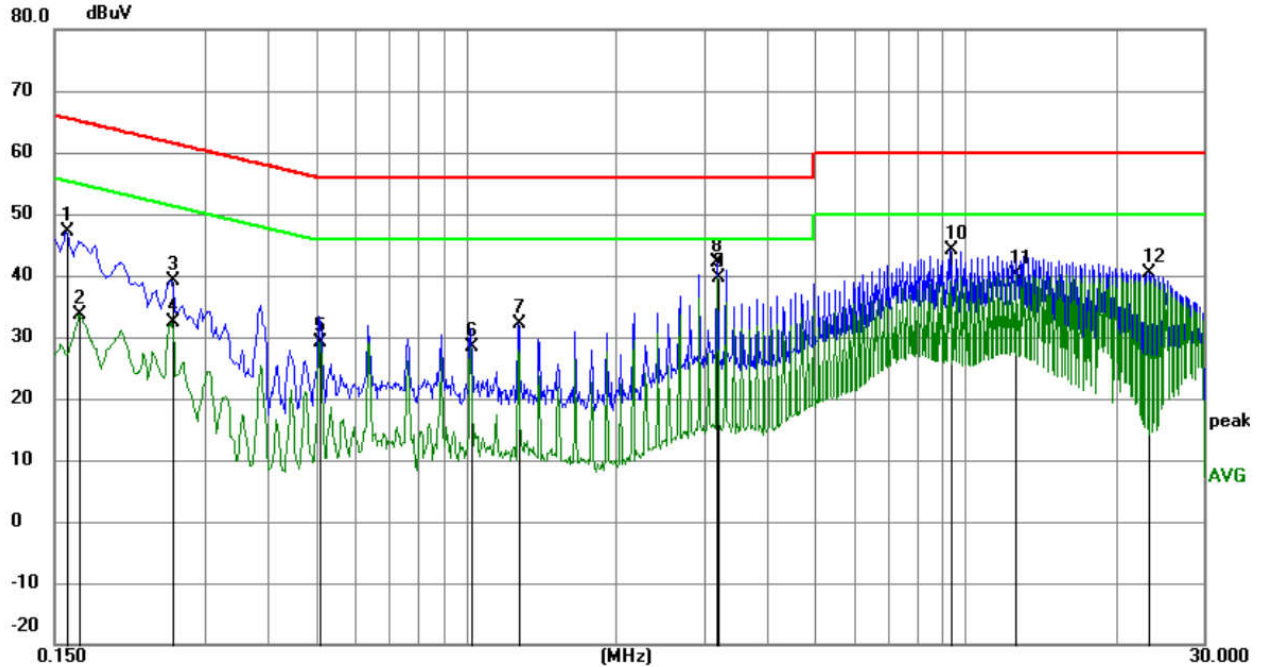
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.7710	33.89	9.86	43.75	56.00	-12.25	peak	
2	*	0.7710	32.03	9.86	41.89	46.00	-4.11	AVG	
3		1.5675	31.75	9.81	41.56	56.00	-14.44	peak	
4		1.5675	30.05	9.81	39.86	46.00	-6.14	AVG	
5		3.3315	32.83	9.79	42.62	56.00	-13.38	peak	
6		3.3315	30.85	9.79	40.64	46.00	-5.36	AVG	
7		6.1530	34.86	9.79	44.65	60.00	-15.35	peak	
8		6.1530	31.91	9.79	41.70	50.00	-8.30	AVG	
9		8.4570	38.25	9.79	48.04	60.00	-11.96	peak	
10		10.2840	35.84	9.79	45.63	50.00	-4.37	AVG	
11		13.9335	36.05	9.90	45.95	60.00	-14.05	peak	
12		13.9335	34.59	9.90	44.49	50.00	-5.51	AVG	

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.

Measurement Data (Mode c):

Live line:

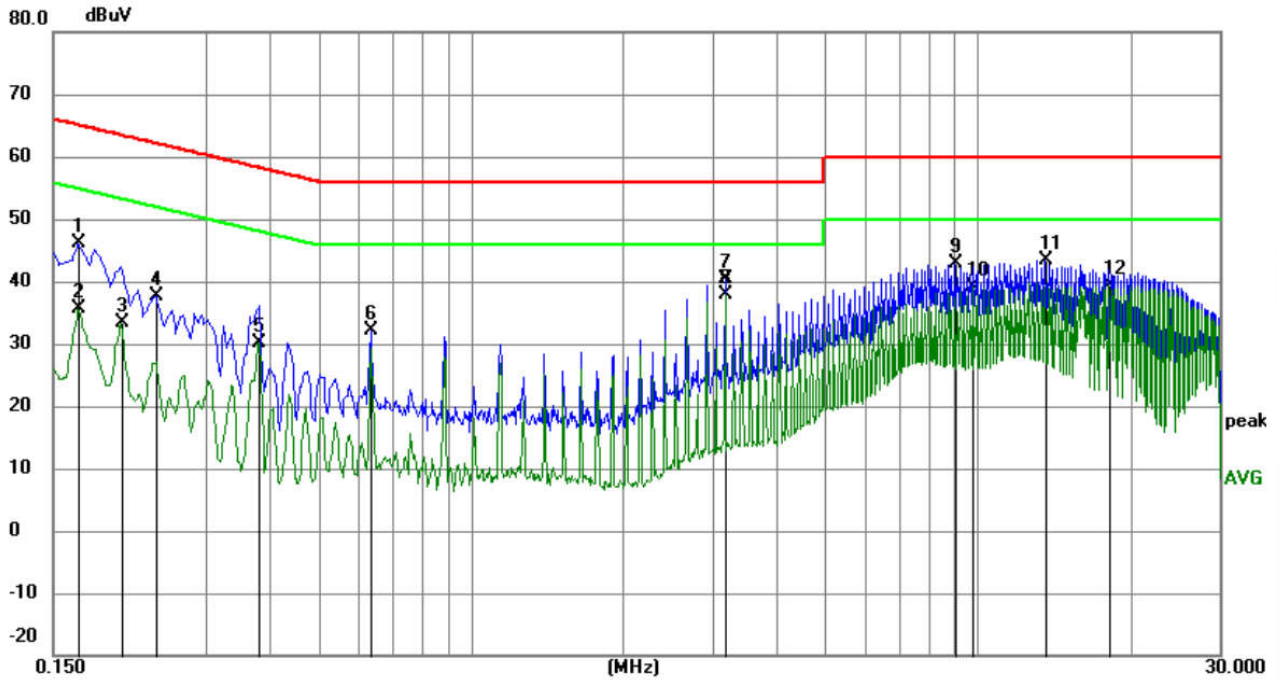


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1590	37.36	9.87	47.23	65.52	-18.29	QP	
2		0.1680	23.82	9.87	33.69	55.06	-21.37	AVG	
3		0.2580	29.11	9.99	39.10	61.50	-22.40	QP	
4		0.2580	22.34	9.99	32.33	51.50	-19.17	AVG	
5		0.5100	19.19	9.96	29.15	46.00	-16.85	AVG	
6		1.0229	18.43	9.83	28.26	46.00	-17.74	AVG	
7		1.2749	22.35	9.82	32.17	56.00	-23.83	QP	
8		3.1875	32.28	9.79	42.07	56.00	-13.93	QP	
9	*	3.1920	29.87	9.79	39.66	46.00	-6.34	AVG	
10		9.3030	34.24	9.78	44.02	60.00	-15.98	QP	
11		12.6105	30.15	9.86	40.01	50.00	-9.99	AVG	
12		23.2890	30.33	9.99	40.32	60.00	-19.68	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:



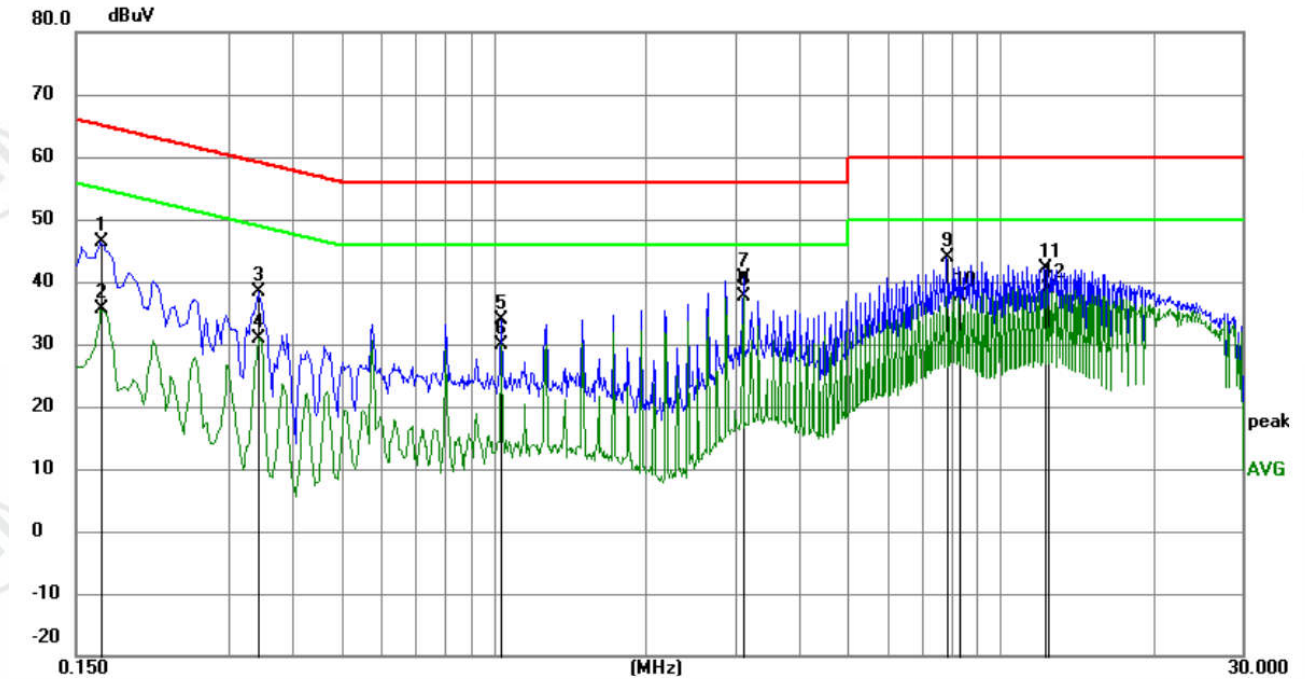
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1680	36.21	9.87	46.08	65.06	-18.98	QP	
2		0.1680	25.83	9.87	35.70	55.06	-19.36	AVG	
3		0.2040	23.38	9.88	33.26	53.45	-20.19	AVG	
4		0.2400	27.76	9.95	37.71	62.10	-24.39	QP	
5		0.3795	20.06	9.99	30.05	48.29	-18.24	AVG	
6		0.6360	22.23	10.00	32.23	56.00	-23.77	QP	
7		3.1785	30.51	9.79	40.30	56.00	-15.70	QP	
8	*	3.1785	28.03	9.79	37.82	46.00	-8.18	AVG	
9		9.0239	33.02	9.78	42.80	60.00	-17.20	QP	
10		9.7890	29.33	9.78	39.11	50.00	-10.89	AVG	
11		13.6005	33.43	9.89	43.32	60.00	-16.68	QP	
12		18.1725	29.37	9.96	39.33	50.00	-10.67	AVG	

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.

Measurement Data (Mode d):

Live line:



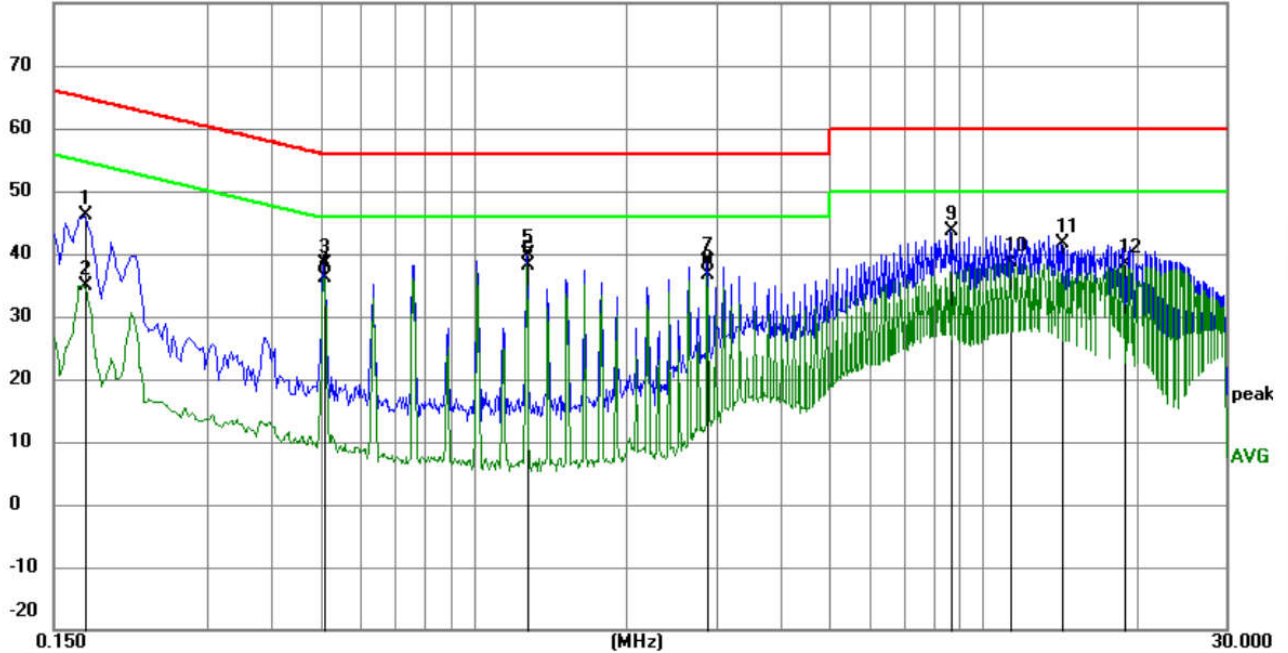
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1680	36.50	9.87	46.37	65.06	-18.69	QP	
2		0.1680	25.67	9.87	35.54	55.06	-19.52	AVG	
3		0.3435	28.36	10.03	38.39	59.12	-20.73	QP	
4		0.3435	20.88	10.03	30.91	49.12	-18.21	AVG	
5		1.0365	24.05	9.83	33.88	56.00	-22.12	QP	
6		1.0365	19.97	9.83	29.80	46.00	-16.20	AVG	
7		3.1110	30.88	9.79	40.67	56.00	-15.33	QP	
8	*	3.1110	27.87	9.79	37.66	46.00	-8.34	AVG	
9		7.8360	34.07	9.79	43.86	60.00	-16.14	QP	
10		8.2950	27.93	9.79	37.72	50.00	-12.28	AVG	
11		12.2100	32.38	9.85	42.23	60.00	-17.77	QP	
12		12.4395	28.95	9.85	38.80	50.00	-11.20	AVG	

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:

80.0 dBuV



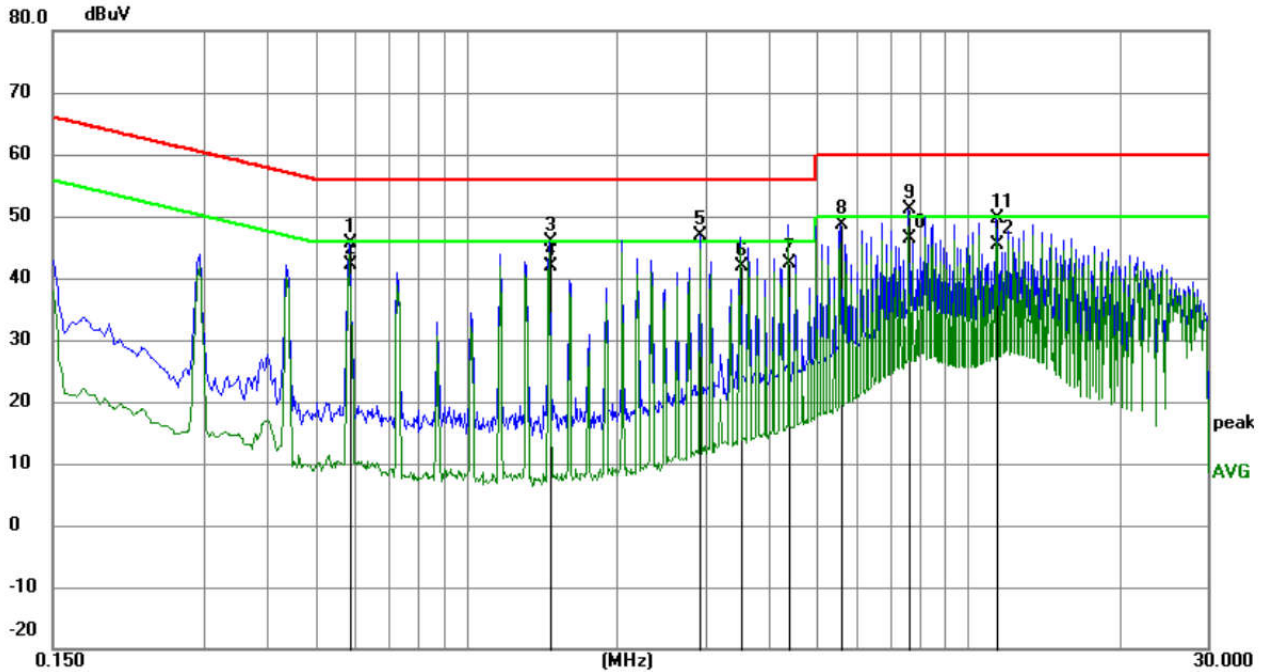
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1725	36.28	9.87	46.15	64.84	-18.69	QP	
2		0.1725	25.06	9.87	34.93	54.84	-19.91	AVG	
3		0.5100	28.37	9.96	38.33	56.00	-17.67	QP	
4		0.5100	26.28	9.96	36.24	46.00	-9.76	AVG	
5		1.2750	30.08	9.82	39.90	56.00	-16.10	QP	
6	*	1.2750	28.40	9.82	38.22	46.00	-7.78	AVG	
7		2.8815	28.91	9.79	38.70	56.00	-17.30	QP	
8		2.8815	26.75	9.79	36.54	46.00	-9.46	AVG	
9		8.6595	33.78	9.78	43.56	60.00	-16.44	QP	
10		11.2785	28.71	9.82	38.53	50.00	-11.47	AVG	
11		14.2620	31.83	9.91	41.74	60.00	-18.26	QP	
12		19.0140	28.50	9.96	38.46	50.00	-11.54	AVG	

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.

Measurement Data (Mode e):

Live line:



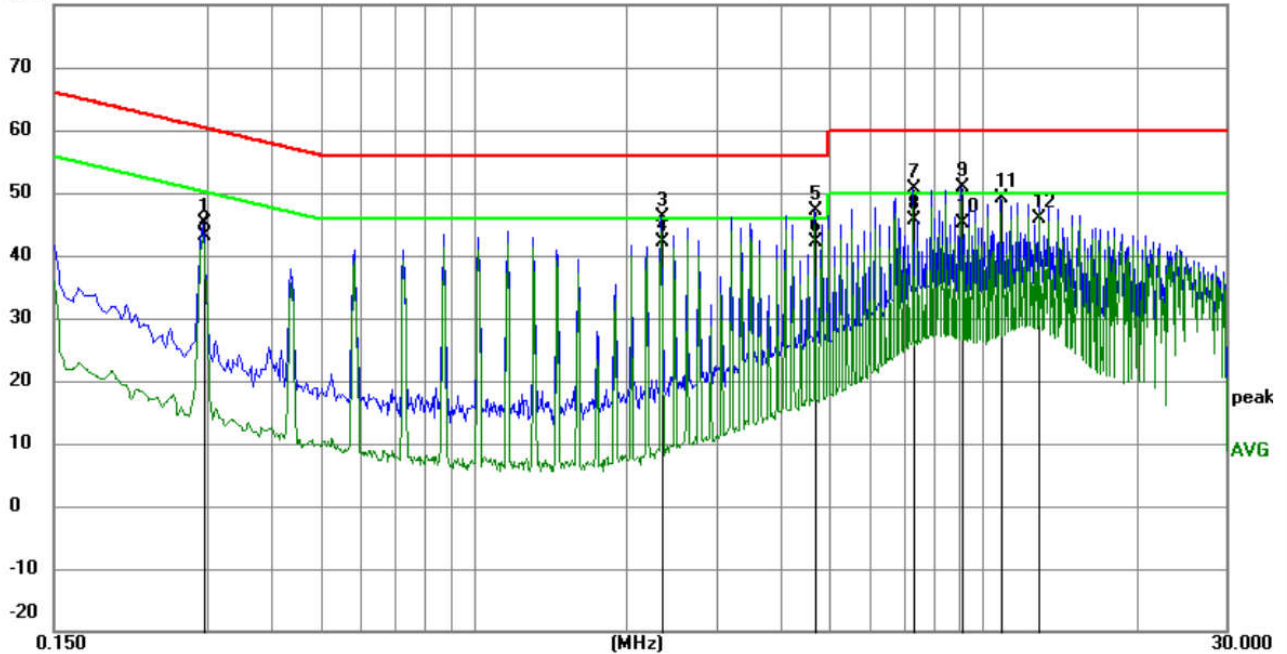
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.5865	35.53	10.05	45.58	56.00	-10.42	QP	
2		0.5865	32.05	10.05	42.10	46.00	-3.90	AVG	
3		1.4640	35.95	9.81	45.76	56.00	-10.24	QP	
4		1.4640	32.19	9.81	42.00	46.00	-4.00	AVG	
5		2.9265	37.12	9.79	46.91	56.00	-9.09	QP	
6		3.5160	32.02	9.78	41.80	46.00	-4.20	AVG	
7	*	4.3935	32.72	9.78	42.50	46.00	-3.50	AVG	
8		5.5680	38.87	9.78	48.65	60.00	-11.35	QP	
9		7.6200	41.35	9.79	51.14	60.00	-8.86	QP	
10		7.6200	36.51	9.79	46.30	50.00	-3.70	AVG	
11		11.4360	39.79	9.82	49.61	60.00	-10.39	QP	
12		11.4360	35.48	9.82	45.30	50.00	-4.70	AVG	

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:

80.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2940	35.07	10.06	45.13	60.41	-15.28	QP	
2		0.2940	33.08	10.06	43.14	50.41	-7.27	AVG	
3		2.3370	36.23	9.79	46.02	56.00	-9.98	QP	
4	*	2.3370	32.31	9.79	42.10	46.00	-3.90	AVG	
5		4.6815	37.27	9.78	47.05	56.00	-8.95	QP	
6		4.6815	32.32	9.78	42.10	46.00	-3.90	AVG	
7		7.3185	40.77	9.79	50.56	60.00	-9.44	QP	
8		7.3185	35.91	9.79	45.70	50.00	-4.30	AVG	
9		9.0780	41.05	9.78	50.83	60.00	-9.17	QP	
10		9.0780	35.42	9.78	45.20	50.00	-4.80	AVG	
11		10.8375	39.24	9.81	49.05	60.00	-10.95	QP	
12		12.8940	35.93	9.87	45.80	50.00	-4.20	AVG	

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.

6.3 Radiated Emissions

Test Requirement: 47 CFR Part 15C Section 15.231(b) and 15.209

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

Test Setup:

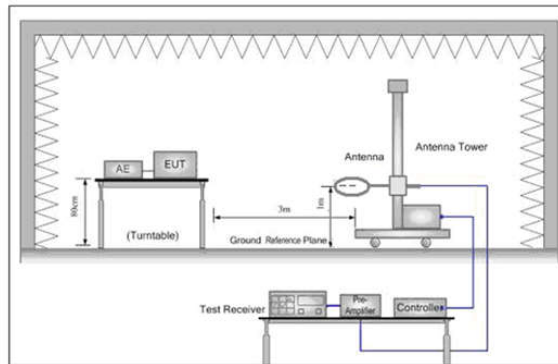


Figure . Below 30MHz

Test Procedure:

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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 rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.

Limit:
(Spurious
Emissions)

Frequency	Field strength (microvolt/meter)	Limit (dBμV/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

Note: 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.

Test Mode:

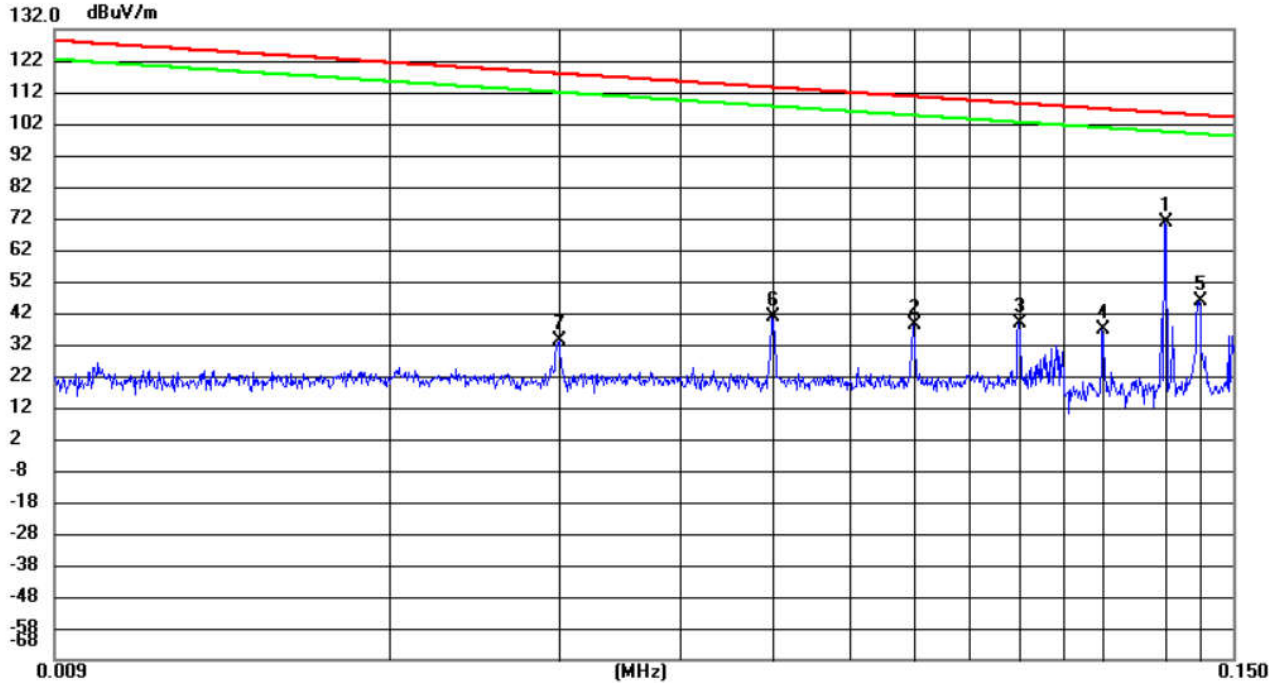
Transmitting mode, refer to section 4.3

Test Results:

Pass

9kHz~150kHz:

Measurement Data (Mode a):



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	0.1276	49.74	20.89	70.63	105.42	-34.79	peak		
2		0.0700	17.18	20.83	38.01	110.60	-72.59	peak		
3		0.0900	18.02	20.85	38.87	108.43	-69.56	peak		
4		0.1100	16.07	20.84	36.91	106.70	-69.79	peak		
5		0.1383	24.73	20.91	45.64	104.72	-59.08	peak		
6		0.0500	19.79	20.90	40.69	113.50	-72.81	peak		
7		0.0300	12.30	20.92	33.22	117.91	-84.69	peak		

Remark:

1.The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

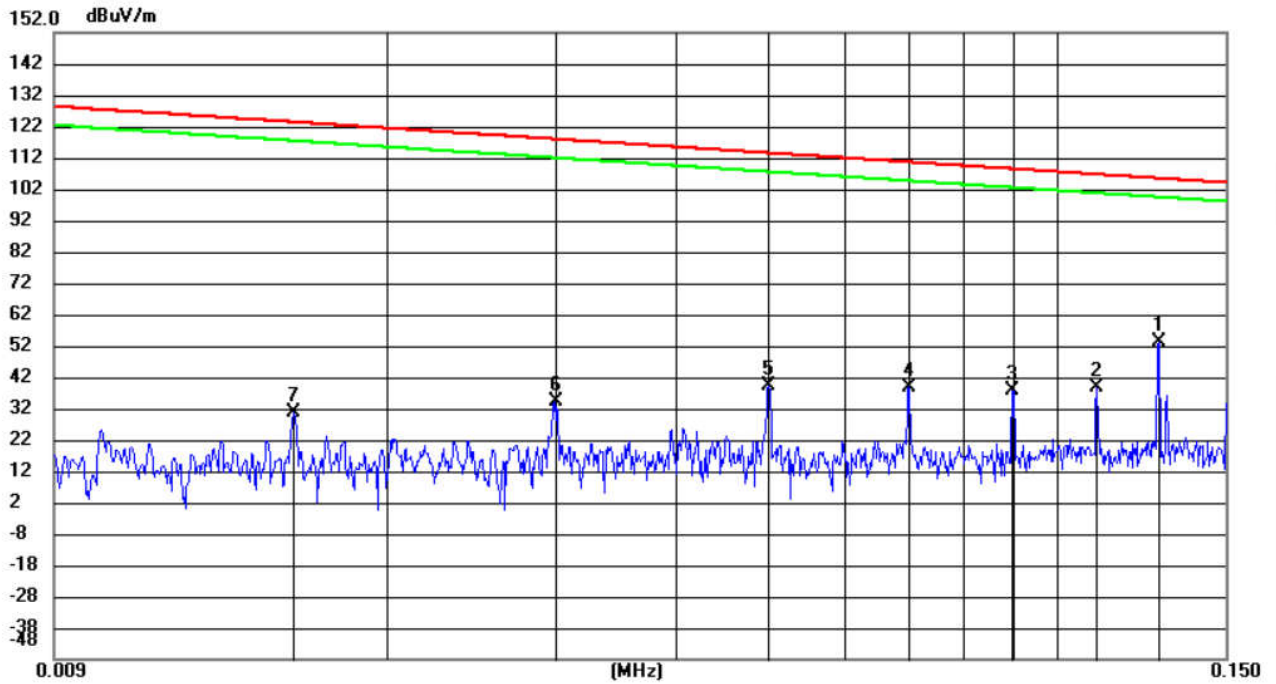
2.The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

3. The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode b):

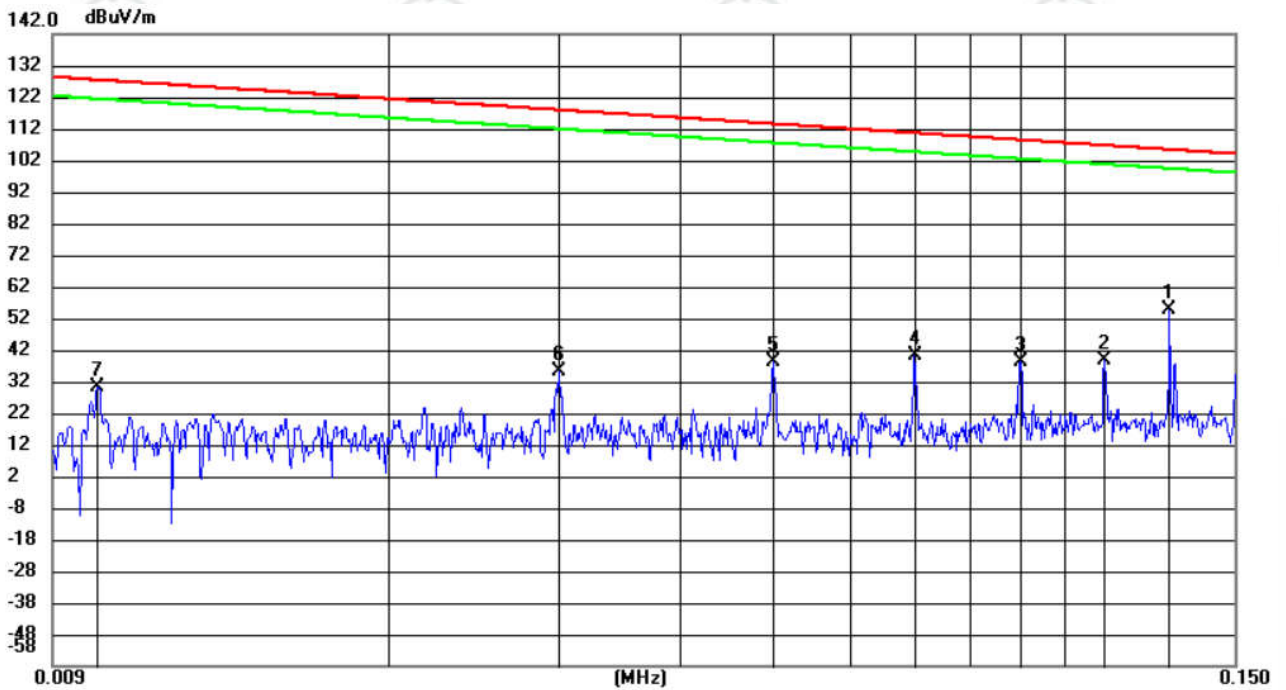


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	0.1276	32.35	20.89	53.24	105.42	-52.18	peak			
2		0.1100	17.77	20.84	38.61	106.70	-68.09	peak			
3		0.0898	16.82	20.85	37.67	108.45	-70.78	peak			
4		0.0701	17.91	20.83	38.74	110.59	-71.85	peak			
5		0.0500	18.18	20.90	39.08	113.50	-74.42	peak			
6		0.0300	13.56	20.92	34.48	117.91	-83.43	peak			
7		0.0160	9.72	21.02	30.74	123.34	-92.60	peak			

Remark:

- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- 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 - Correct Factor
Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor
- The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode c):

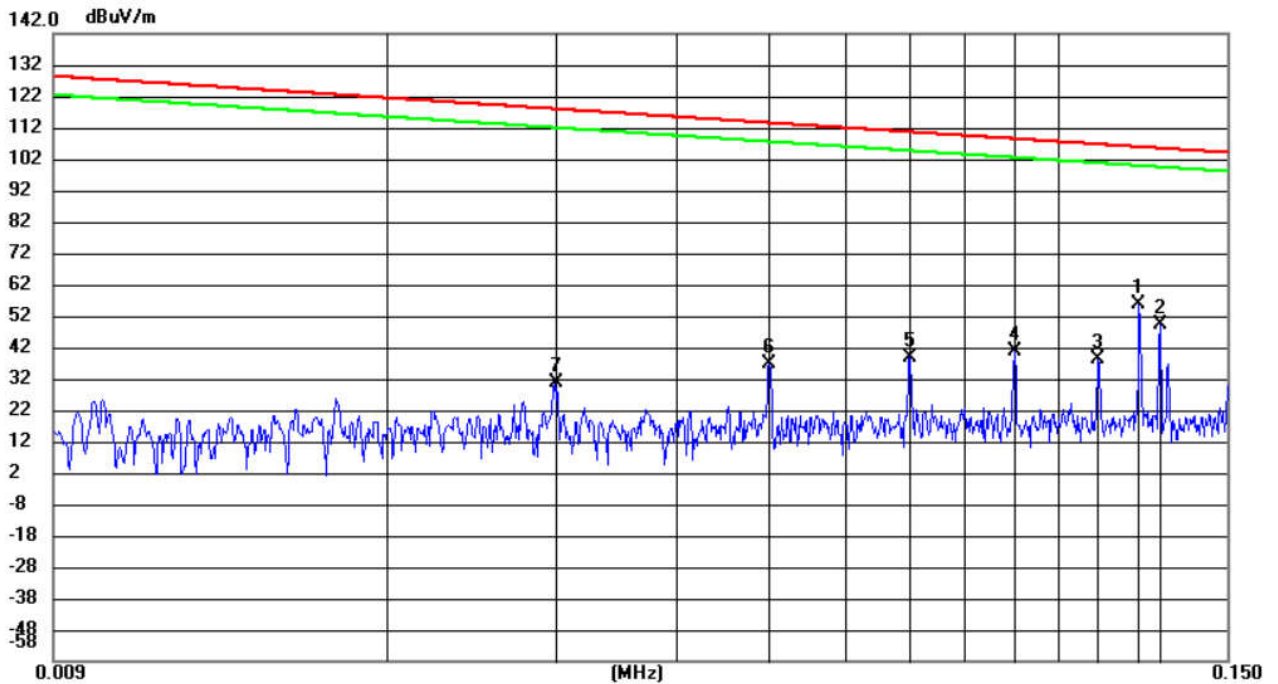


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	0.1284	33.96	20.89	54.85	105.36	-50.51	peak			
2		0.1100	18.04	20.84	38.88	106.70	-67.82	peak			
3		0.0901	17.53	20.85	38.38	108.42	-70.04	peak			
4		0.0700	19.34	20.83	40.17	110.60	-70.43	peak			
5		0.0500	17.22	20.90	38.12	113.50	-75.38	peak			
6		0.0300	14.25	20.92	35.17	117.91	-82.74	peak			
7		0.0100	8.75	21.30	30.05	127.40	-97.35	peak			

Remark:

- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- 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 - Correct Factor
Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor
- The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode d):



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	0.1214	34.92	20.87	55.79	105.85	-50.06	peak		
2		0.1276	28.54	20.89	49.43	105.42	-55.99	peak		
3		0.1100	17.23	20.84	38.07	106.70	-68.63	peak		
4		0.0901	19.81	20.85	40.66	108.42	-67.76	peak		
5		0.0701	18.11	20.83	38.94	110.59	-71.65	peak		
6		0.0500	16.01	20.90	36.91	113.50	-76.59	peak		
7		0.0300	9.84	20.92	30.76	117.91	-87.15	peak		

Remark:

1.The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

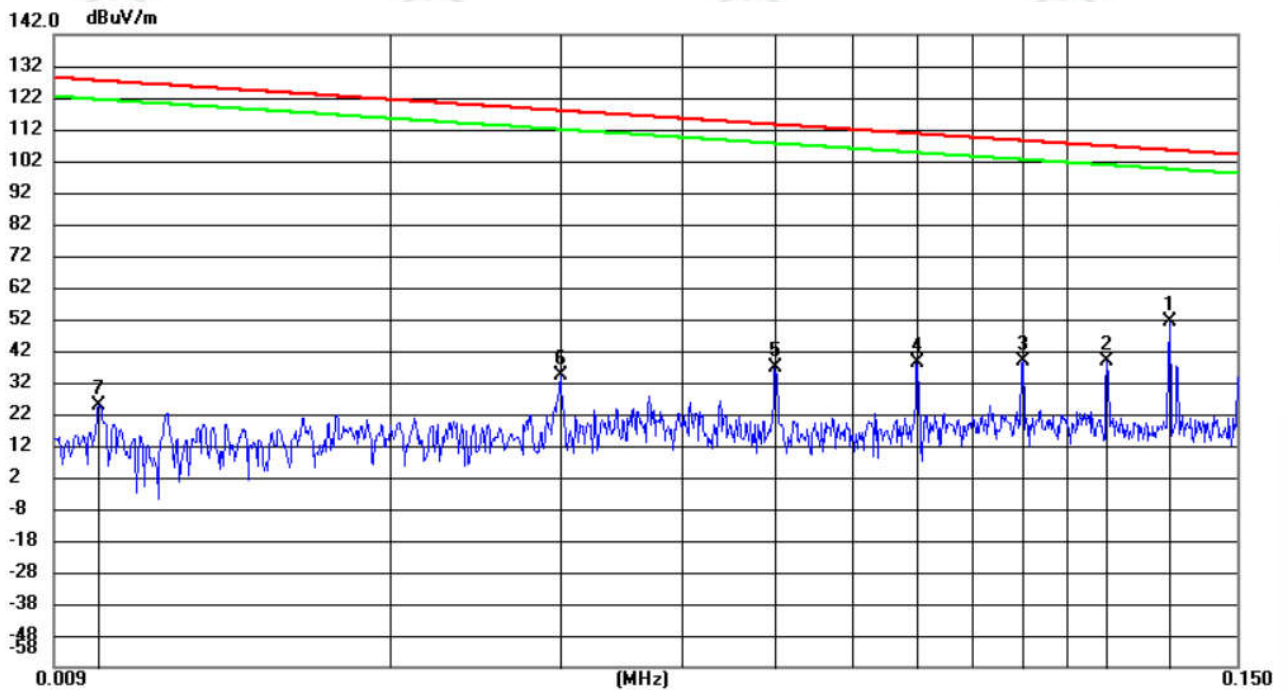
2.The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

3. The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode e):



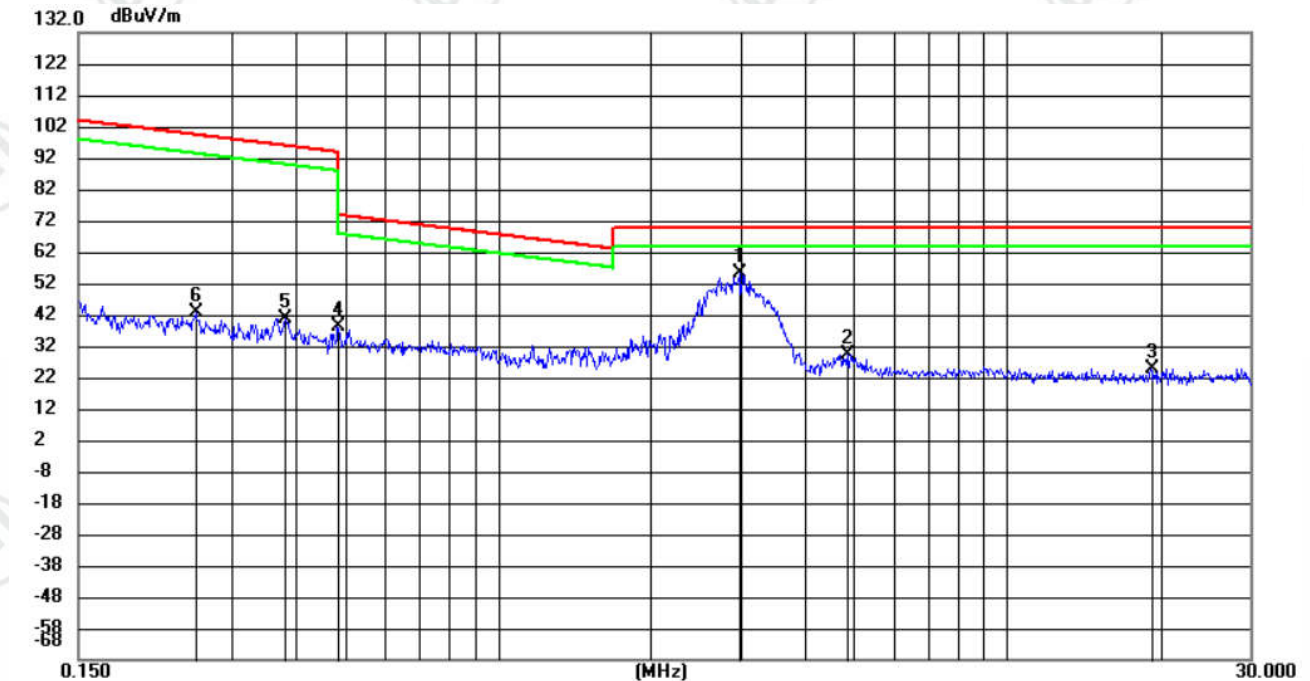
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Detector	Comment
1	*	0.1276	30.21	20.89	51.10	105.42	-54.32	peak			
2		0.1100	18.00	20.84	38.84	106.70	-67.86	peak			
3		0.0901	17.98	20.85	38.83	108.42	-69.59	peak			
4		0.0700	17.29	20.83	38.12	110.60	-72.48	peak			
5		0.0500	15.84	20.90	36.74	113.50	-76.76	peak			
6		0.0300	13.16	20.92	34.08	117.91	-83.83	peak			
7		0.0100	3.32	21.30	24.62	127.40	-102.78	peak			

Remark:

- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- 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 - Correct Factor
 Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor
- The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

150kHz~30MHz:

Measurement Data (Mode a):

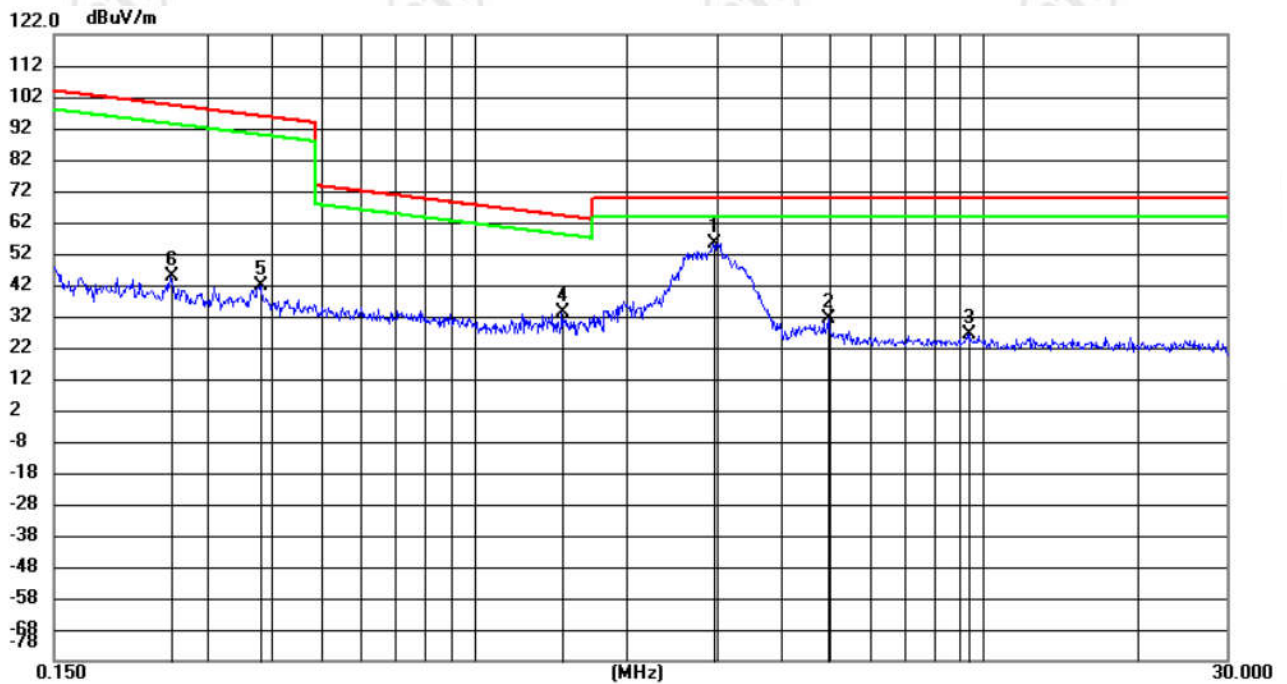


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1	*	2.9894	34.64	20.41	55.05	70.00	-14.95	peak		
2		4.8673	9.03	20.41	29.44	70.00	-40.56	peak		
3		19.1727	4.18	20.55	24.73	70.00	-45.27	peak		
4		0.4863	17.53	20.57	38.10	93.87	-55.77	peak		
5		0.3825	20.17	20.78	40.95	95.94	-54.99	peak		
6		0.2553	21.53	21.03	42.56	99.43	-56.87	peak		

Remark:

- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- 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 - Correct Factor
Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor
- The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode b):



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	2.9501	34.74	20.41	55.15	70.00	-14.85	peak		
2		4.9702	11.05	20.41	31.46	70.00	-38.54	peak		
3		9.3369	5.98	20.47	26.45	70.00	-43.55	peak		
4		1.4890	12.93	20.47	33.40	64.17	-30.77	peak		
5		0.3823	20.78	20.78	41.56	95.94	-54.38	peak		
6		0.2543	23.75	21.03	44.78	99.46	-54.68	peak		

Remark:

1.The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

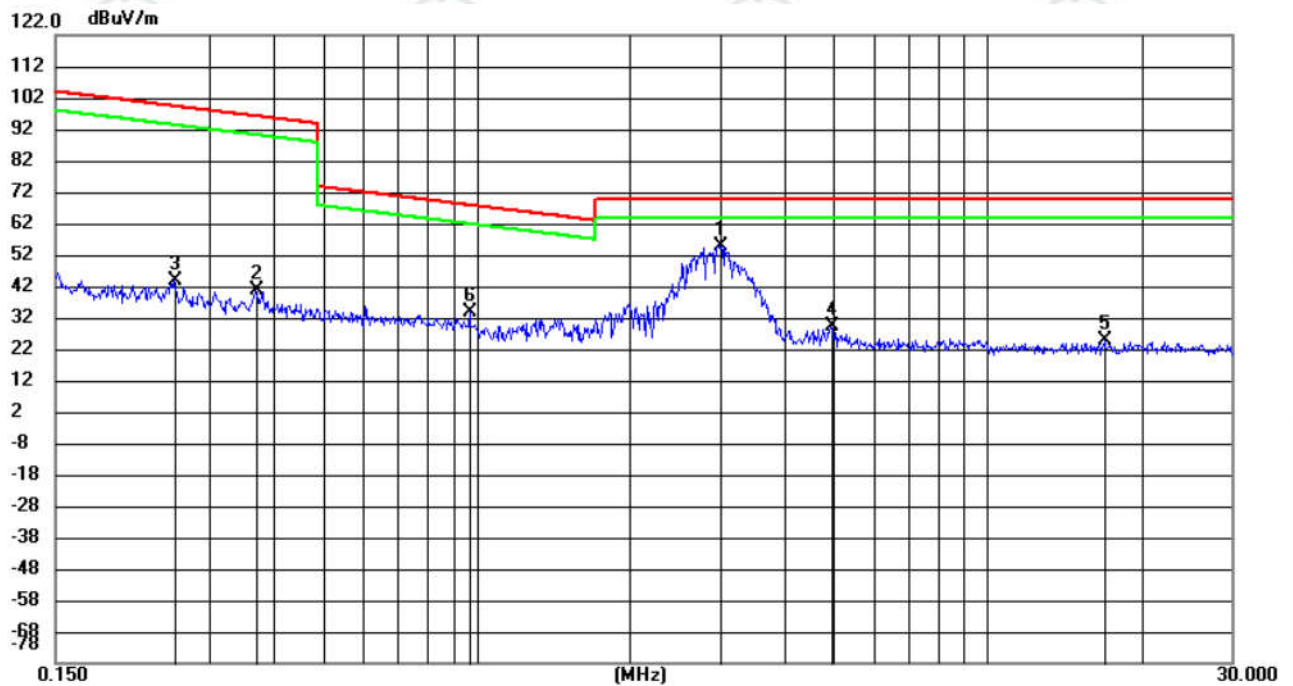
2.The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor- Antenna Factor-Cable Factor

3. The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode c):



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree	Comment
1	*	3.0093	34.33	20.41	54.74	70.00	-15.26	peak			
2		0.3700	19.76	20.80	40.56	96.22	-55.66	peak			
3		0.2565	22.63	21.03	43.66	99.39	-55.73	peak			
4		4.9492	8.68	20.41	29.09	70.00	-40.91	peak			
5		16.9326	4.10	20.51	24.61	70.00	-45.39	peak			
6		0.9701	13.03	20.49	33.52	67.88	-34.36	peak			

Remark:

1.The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

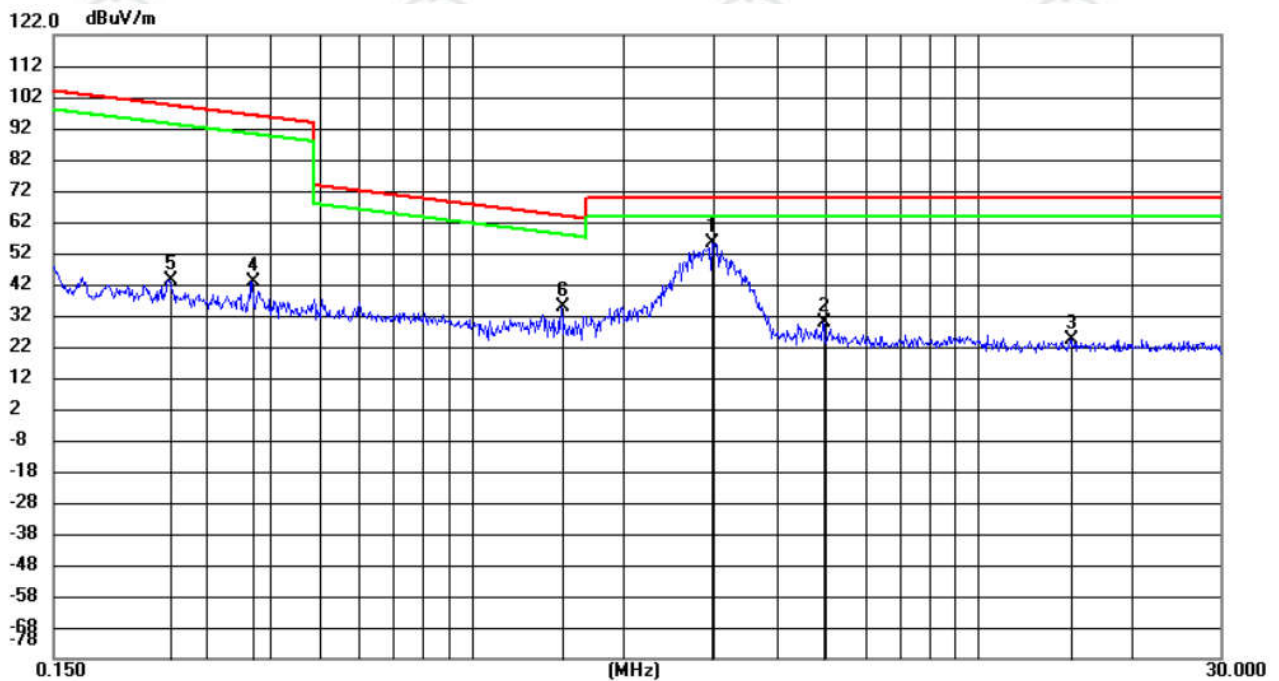
2.The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

3. The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode d):



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1	*	2.9902	34.71	20.41	55.12	70.00	-14.88	peak		
2		4.9492	9.54	20.41	29.95	70.00	-40.05	peak		
3		15.1818	3.99	20.50	24.49	70.00	-45.51	peak		
4		0.3693	22.19	20.80	42.99	96.24	-53.25	peak		
5		0.2535	22.45	21.03	43.48	99.49	-56.01	peak		
6		1.5088	14.33	20.47	34.80	64.06	-29.26	peak		

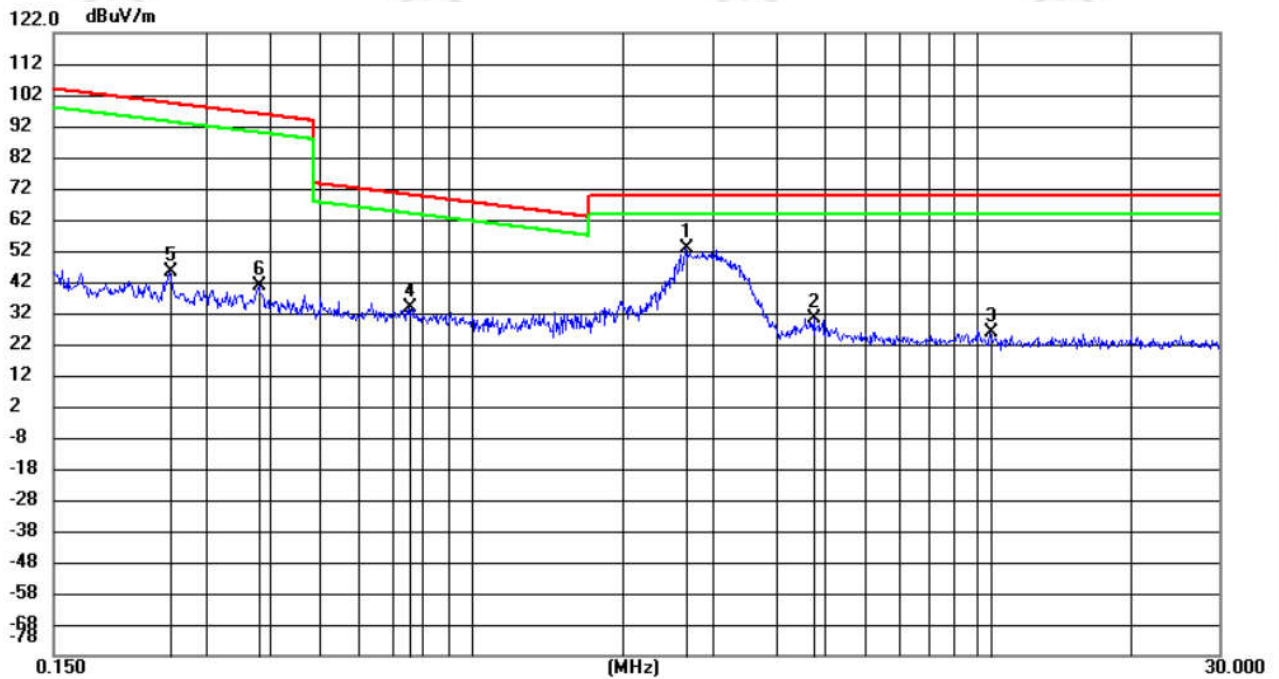
Remark:

- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} - \text{Correct Factor}$$

$$\text{Correct Factor} = \text{Preamplifier Factor} - \text{Antenna Factor} - \text{Cable Factor}$$
- The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.

Measurement Data (Mode e):



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	2.6591	32.30	20.43	52.73	70.00	-17.27	peak			
2		4.7476	9.82	20.41	30.23	70.00	-39.77	peak			
3		10.5777	5.18	20.48	25.66	70.00	-44.34	peak			
4		0.7559	13.22	20.53	33.75	70.05	-36.30	peak			
5		0.2540	24.46	21.03	45.49	99.47	-53.98	peak			
6		0.3818	20.10	20.78	40.88	95.95	-55.07	peak			

Remark:

1.The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

2.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 - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

3. The highest frequency is 128kHz of the EUT, so upper frequency of measurement range is 30MHz.