

FCC Part 18 Measurement and Test Report

For

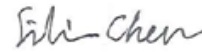
CE LINK LIMITED

Building M, LiCheng Technology Industrial Zone, GongHe Village, ShaJing

Town, ShenZhen City, China

FCC ID: A4X-WPC15-1MWNA

Test Rule(s):	<u>FCC Part 18</u>
Product Description:	<u>Wireless Charger</u>
Tested Model:	<u>WPC15-1MWNA</u>
Report No.:	<u>WTX19X11076575W-1</u>
Sample Receipt Date:	<u>2019-11-05</u>
Tested Date:	<u>2019-11-05 to 2019-12-04</u>
Issued Date:	<u>2019-12-04</u>
Tested By:	<u>Jason Su / Engineer</u>
Reviewed By:	<u>Silin Chen / EMC Manager</u>
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Prepared By:	



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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

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Report version

Version No.	Date of issue	Description
Rev.00	2019-12-04	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: CE LINK LIMITED
Address of applicant: Building M, LiCheng Technology Industrial Zone,
GongHe Village, ShaJing Town, ShenZhen City,
China

Manufacturer: CE LINK LIMITED
Address of manufacturer: Building M, LiCheng Technology Industrial Zone,
GongHe Village, ShaJing Town, ShenZhen City,
China

General Description of EUT	
Product Name:	Wireless Charger
Trade Name:	CE-LINK
Model No.:	WPC15-1MWNA
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	110~205kHz
Antenna Type:	Coil Antenna
Rated Voltage:	DC5V/9V/12V (Wireless output)
Rated Current:	1A/1.1A/1.25A (Wireless output)
Rated Power:	5W/7.5W/10W/15W (Wireless output)

1.2 Test Standards

The tests were performed according to following standards:

FCC Part 18 Subpart C: Industrial, Scientific, and medical medical equipment.

ANSI C63.4-2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Wireless Charger	/	Input:DC5V2A; Output:DC5V1A
TM2	Wireless Charger	/	Input:DC9V1.67A; Output:DC9V1.1A
TM3	Wireless Charger	/	Input:DC12V1.5A; Output:DC12V1.25A

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Fast Charger	Aohai	A138A-120150U-CN 2	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	Without Ferrite

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz ± 3.74 dB
		0.15-30MHz ± 3.34 dB
Radiated Emissions	Radiated	30-200MHz ± 4.52 dB
		0.2-1GHz ± 5.56 dB
		1-6GHz ± 3.84 dB
		6-18GHz ± 3.92 dB

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 18.307 (b)	Conducted Emission	Compliant
§ 18.305 (b)	Radiated Emission	Compliant

3. Conducted Emissions

3.1 Standard Applicable

According to FCC 18.307(b), the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies shall not exceed the limits in the following tables:

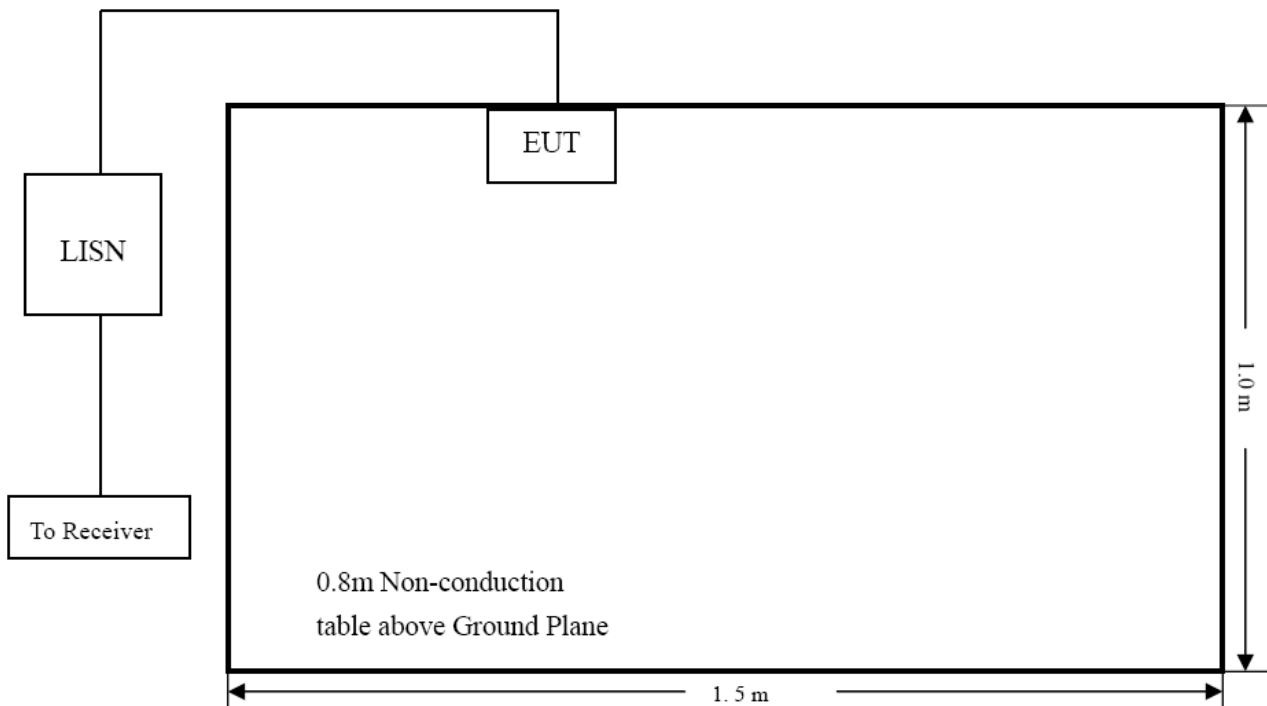
Frequency (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

3.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 18.307 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

3.3 Basic Test Setup Block Diagram



3.4 Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	55%
ATM Pressure:	1016 mbar

3.5 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

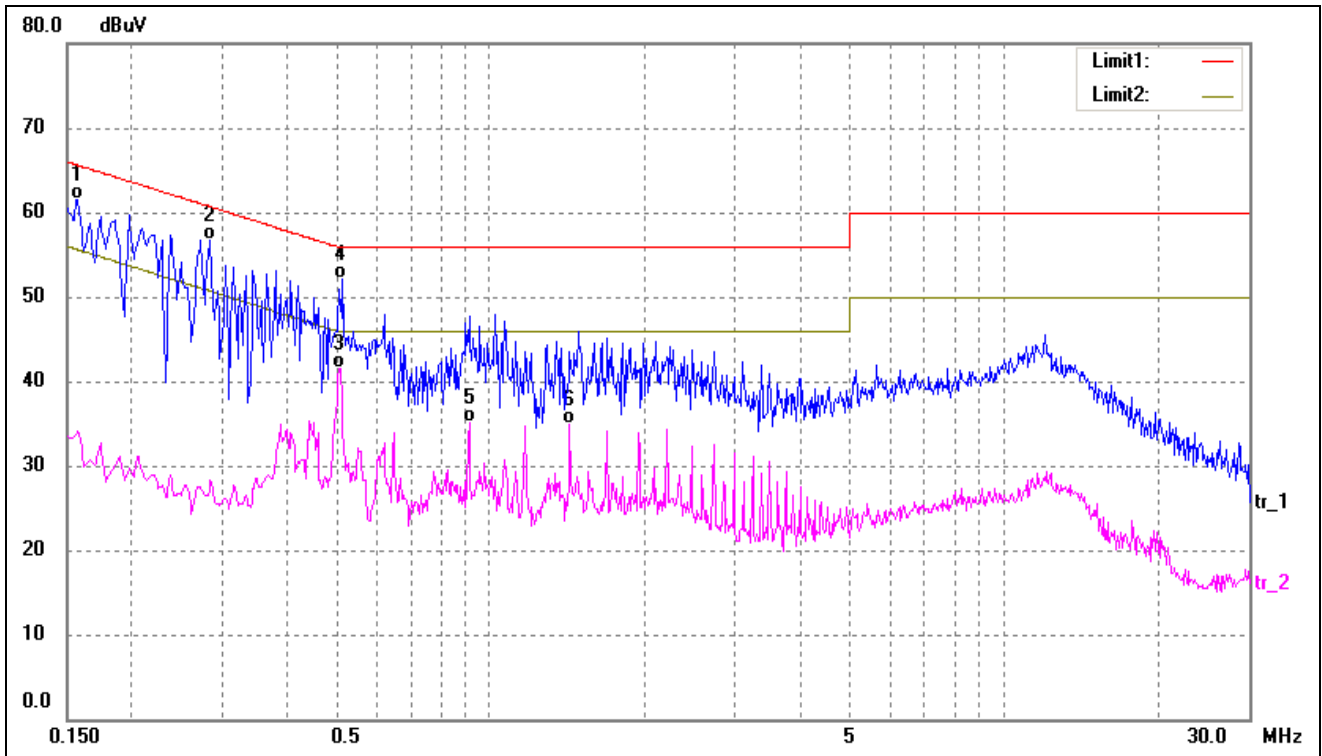
Start Frequency 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth 9 kHz
Quasi-Peak Adapter Mode Normal

3.6 Summary of Test Results/Plots

According to the data in this section, the EUT complied with the FCC Part 18C Conducted margin for Any non-ISM frequency device, with the *worst* margin reading of:

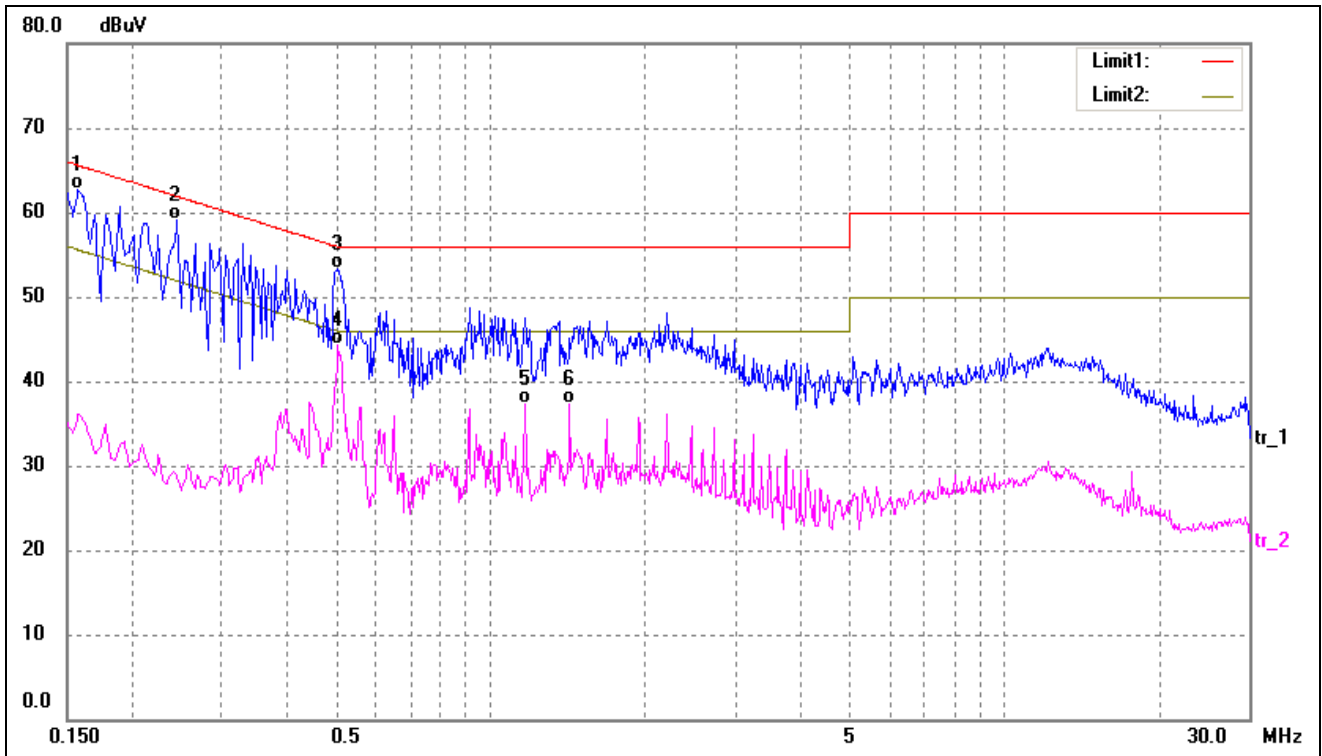
-1.71 dB at 0.5060 MHz in the Neutral, AVG detector, TM1 detector, 0.15-30MHz

Test mode:	TM1	Polarity:	Line
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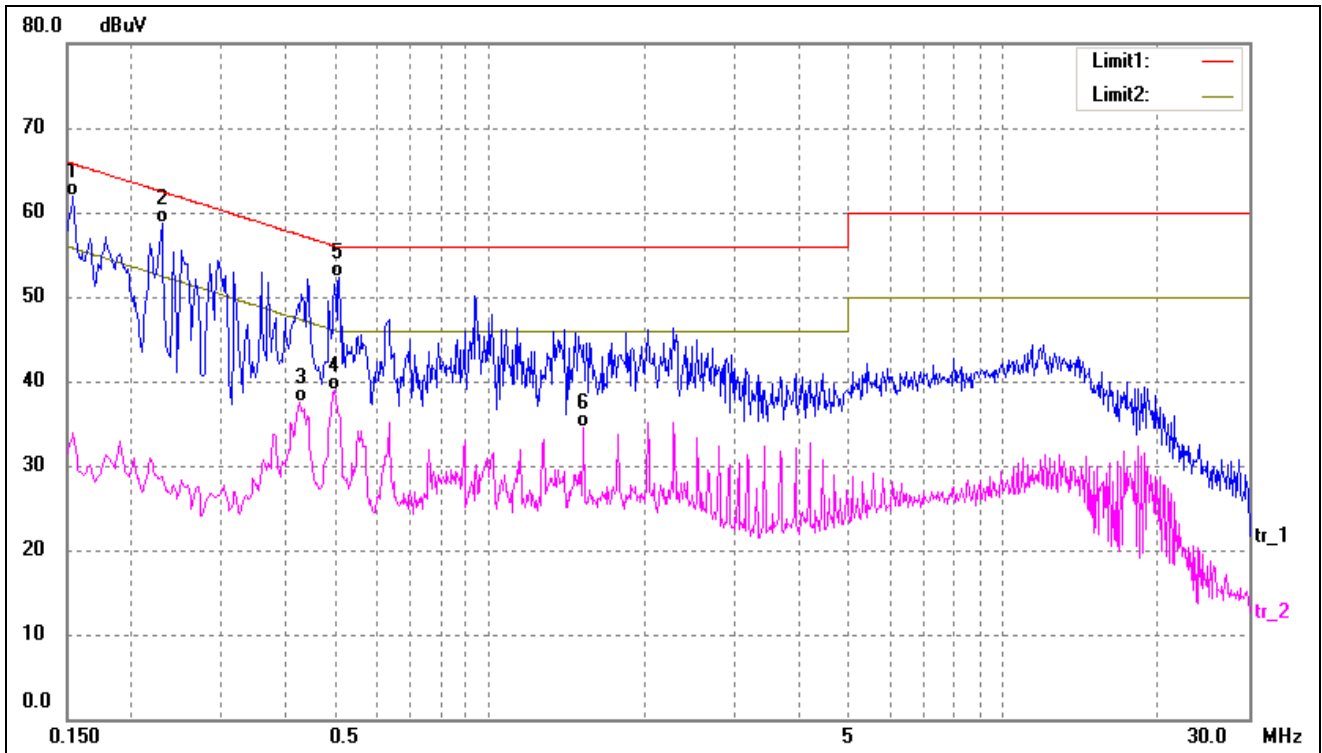
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1556	51.61	9.95	61.56	65.69	-4.13	QP
2	0.2860	46.75	10.01	56.76	60.64	-3.88	QP
3	0.5100	31.54	10.02	41.56	46.00	-4.44	AVG
4*	0.5180	42.17	10.02	52.19	56.00	-3.81	QP
5	0.9100	24.78	10.27	35.05	46.00	-10.95	AVG
6	1.4260	24.49	10.36	34.85	46.00	-11.15	AVG

Test mode:	TM1	Polarity:	Neutral
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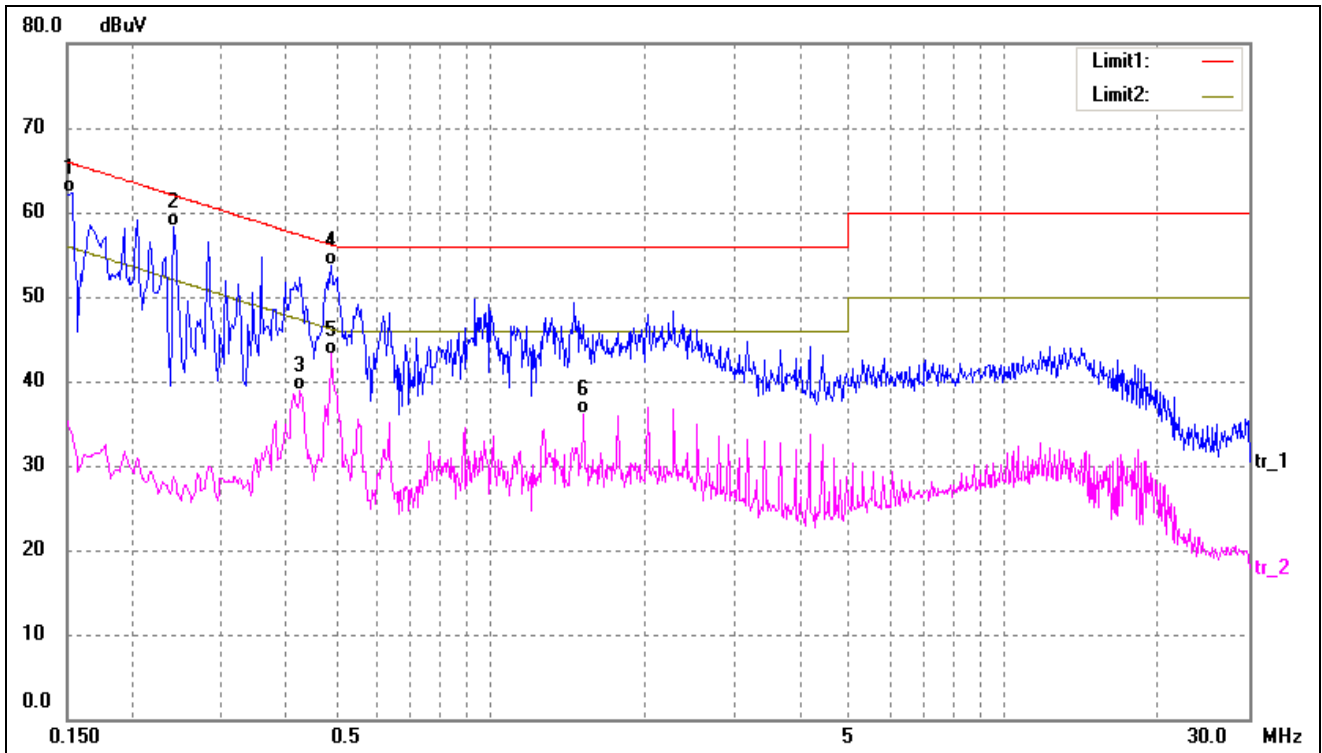
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	52.83	9.95	62.78	65.56	-2.78	QP
2	0.2460	49.01	10.01	59.02	61.89	-2.87	QP
3	0.5060	43.31	10.02	53.33	56.00	-2.67	QP
4*	0.5060	34.27	10.02	44.29	46.00	-1.71	AVG
5	1.1660	26.94	10.38	37.32	46.00	-8.68	AVG
6	1.4260	26.90	10.36	37.26	46.00	-8.74	AVG

Test mode:	TM2	Polarity:	Line
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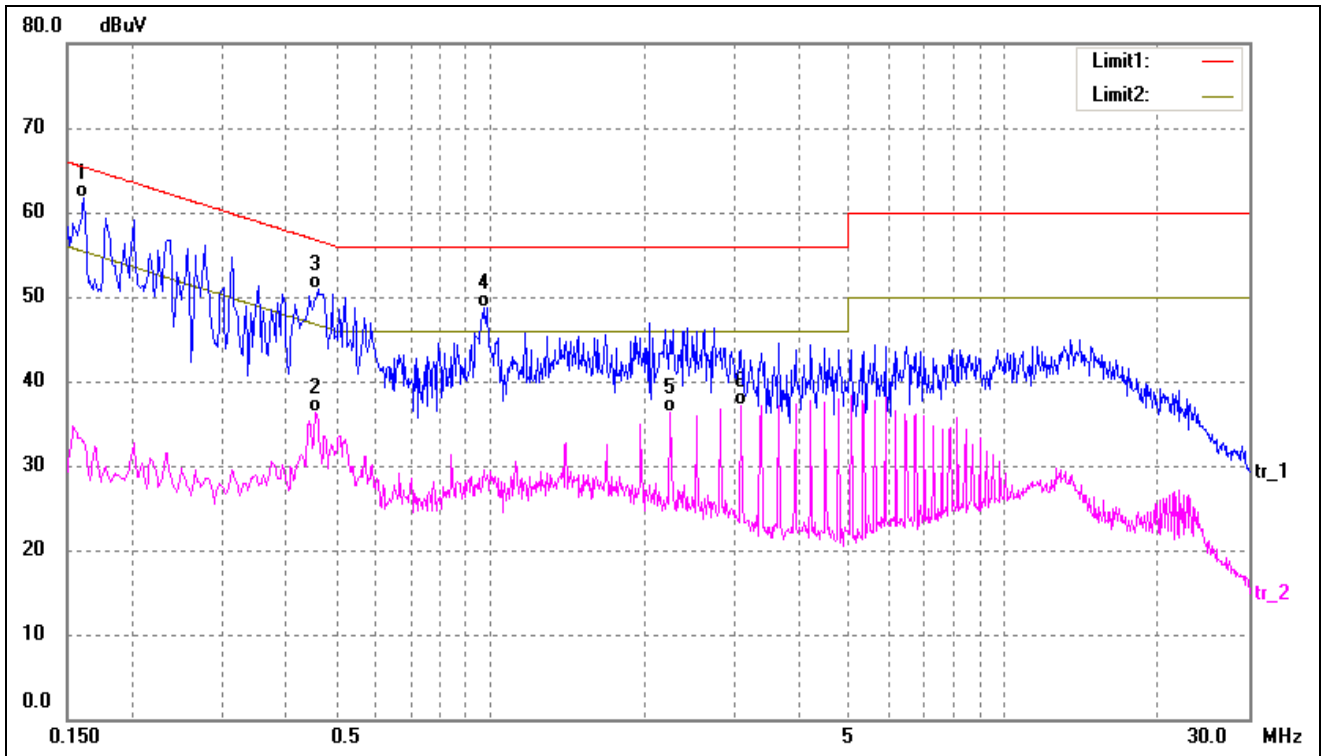
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	52.04	9.95	61.99	65.78	-3.79	QP
2	0.2300	48.63	9.99	58.62	62.45	-3.83	QP
3	0.4260	27.46	10.01	37.47	47.33	-9.86	AVG
4	0.4980	28.89	10.02	38.91	46.03	-7.12	AVG
5*	0.5100	42.19	10.02	52.21	56.00	-3.79	QP
6	1.5220	24.06	10.36	34.42	46.00	-11.58	AVG

Test mode:	TM2	Polarity:	Neutral
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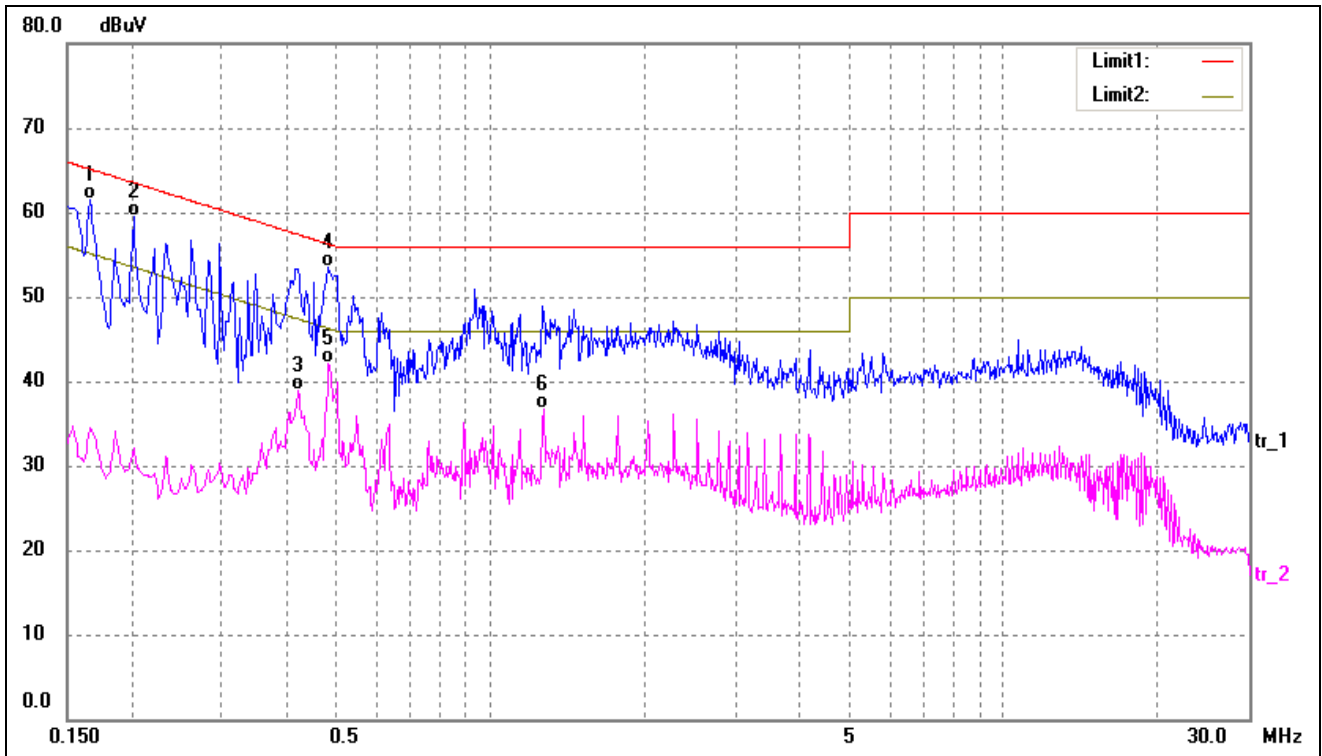
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1532	52.32	9.95	62.27	65.82	-3.55	QP
2	0.2420	48.30	10.00	58.30	62.02	-3.72	QP
3	0.4260	28.97	10.01	38.98	47.33	-8.35	AVG
4*	0.4900	43.59	10.02	53.61	56.17	-2.56	QP
5	0.4900	33.18	10.02	43.20	46.17	-2.97	AVG
6	1.5220	25.81	10.36	36.17	46.00	-9.83	AVG

Test mode:	TM3	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1620	51.77	9.95	61.72	65.36	-3.64	QP
2	0.4580	26.20	10.02	36.22	46.73	-10.51	AVG
3	0.4620	40.82	10.02	50.84	56.66	-5.82	QP
4	0.9700	38.30	10.34	48.64	56.00	-7.36	QP
5	2.2460	25.92	10.37	36.29	46.00	-9.71	AVG
6	3.0860	26.78	10.38	37.16	46.00	-8.84	AVG

Test mode:	TM3	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1660	51.59	9.95	61.54	65.15	-3.61	QP
2	0.2020	49.60	9.97	59.57	63.52	-3.95	QP
3	0.4220	28.94	10.01	38.95	47.41	-8.46	AVG
4*	0.4820	43.41	10.02	53.43	56.30	-2.87	QP
5	0.4860	32.05	10.02	42.07	46.24	-4.17	AVG
6	1.2700	26.25	10.38	36.63	46.00	-9.37	AVG

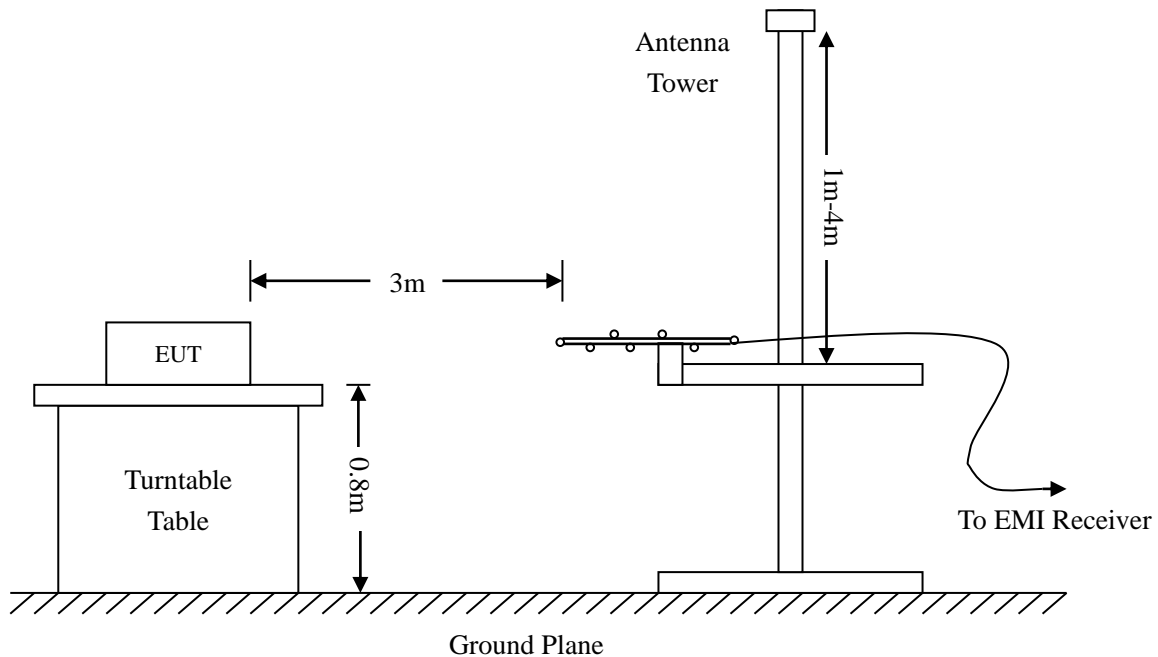
4. Radiated Emissions

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 18.305 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit for Any non-ISM frequency device. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 18.305 Limit

4.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

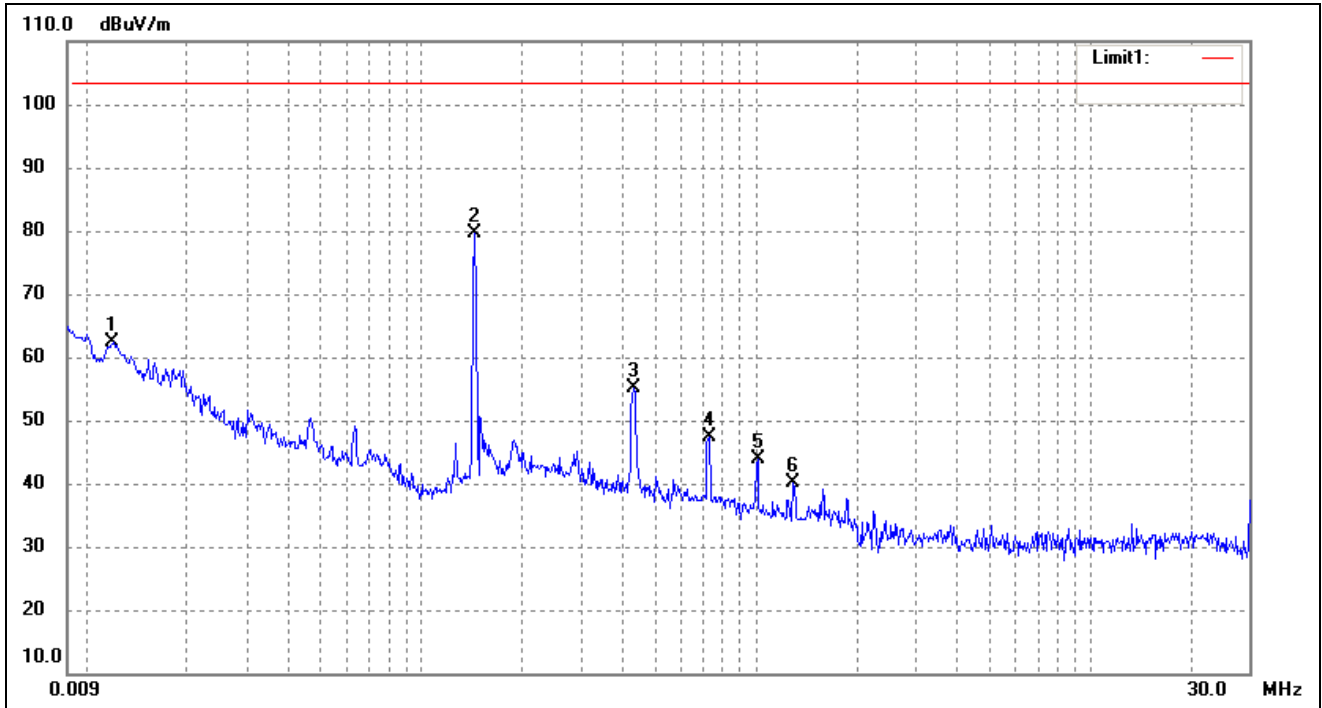
4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 18.305 rule, and had the worst margin of:

-20.96dB at 0.1446 MHz in the Horizontal polarization, TM2 mode, 3Meters

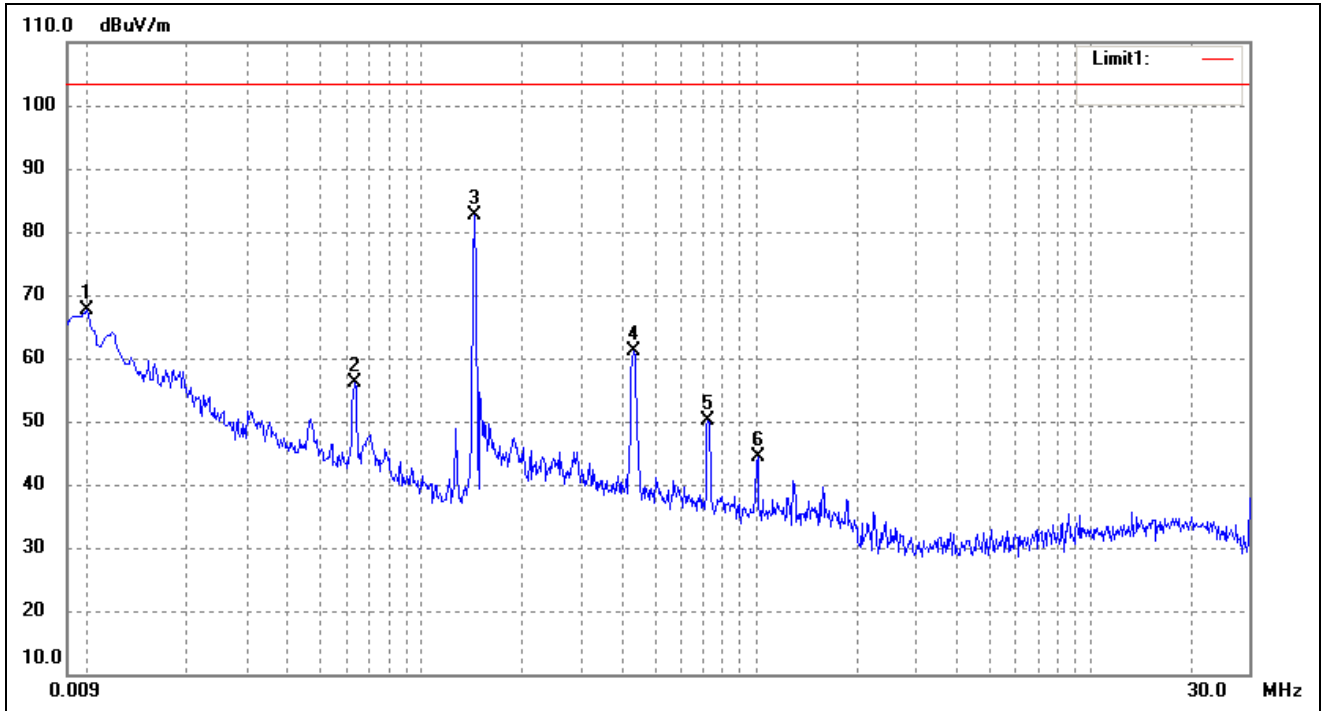
Plot of Radiated Emissions Test Data (Below 30MHz)

Test mode:	TM1	Polarity:	Horizontal
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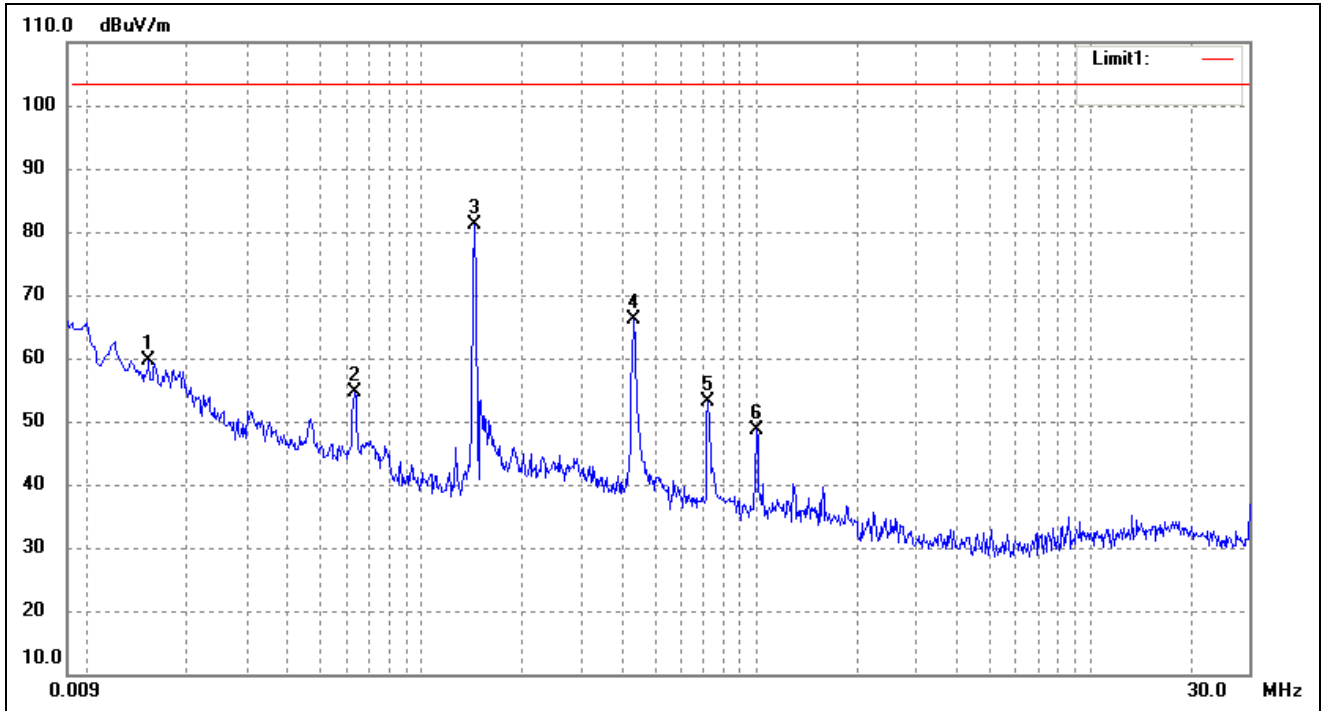
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0120	67.39	-5.03	62.36	103.50	-41.14	296	100	peak
2	0.1446	84.23	-4.69	79.54	103.50	-23.96	95	100	peak
3	0.4328	61.62	-6.43	55.19	103.50	-48.31	173	100	peak
4	0.7236	54.54	-7.23	47.31	103.50	-56.19	102	100	peak
5	1.0101	52.56	-8.75	43.81	103.50	-59.69	237	100	peak
6	1.2960	40.21	0.00	40.21	103.50	-63.29	135	100	peak

Test mode:	TM2	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0100	72.66	-5.05	67.61	103.50	-35.89	214	100	peak
2	0.0634	60.56	-4.52	56.04	103.50	-47.46	311	100	peak
3	0.1446	87.23	-4.69	82.54	103.50	-20.96	65	100	peak
4	0.4328	67.62	-6.43	61.19	103.50	-42.31	321	100	peak
5	0.7198	57.25	-7.21	50.04	103.50	-53.46	194	100	peak
6	1.0103	53.06	-8.75	44.31	103.50	-59.19	345	100	peak

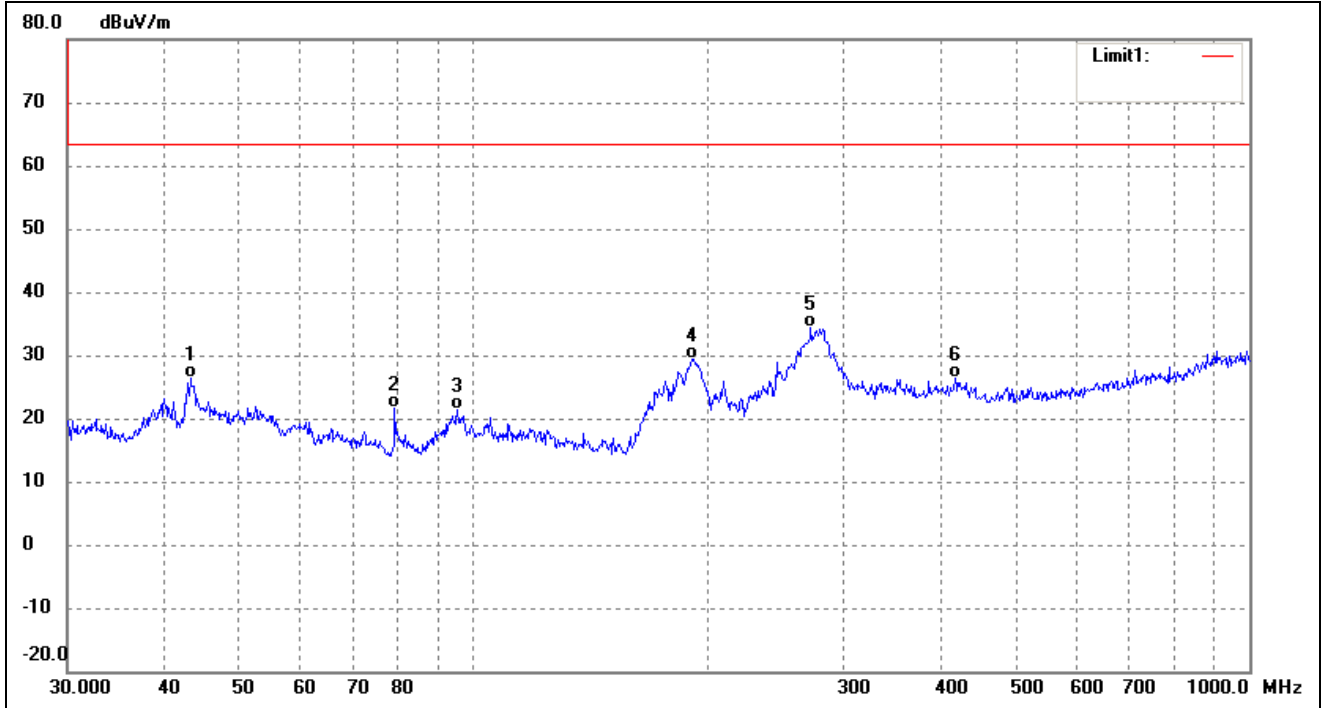
Test mode:	TM3	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0154	64.56	-5.00	59.56	103.50	-43.94	280	100	peak
2	0.0632	59.06	-4.52	54.54	103.50	-48.96	113	100	peak
3	0.1446	85.73	-4.69	81.04	103.50	-22.46	93	100	peak
4	0.4328	72.62	-6.43	66.19	103.50	-37.31	107	100	peak
5	0.7197	60.25	-7.21	53.04	103.50	-50.46	230	100	peak
6	1.0048	57.41	-8.72	48.69	103.50	-54.81	249	100	peak

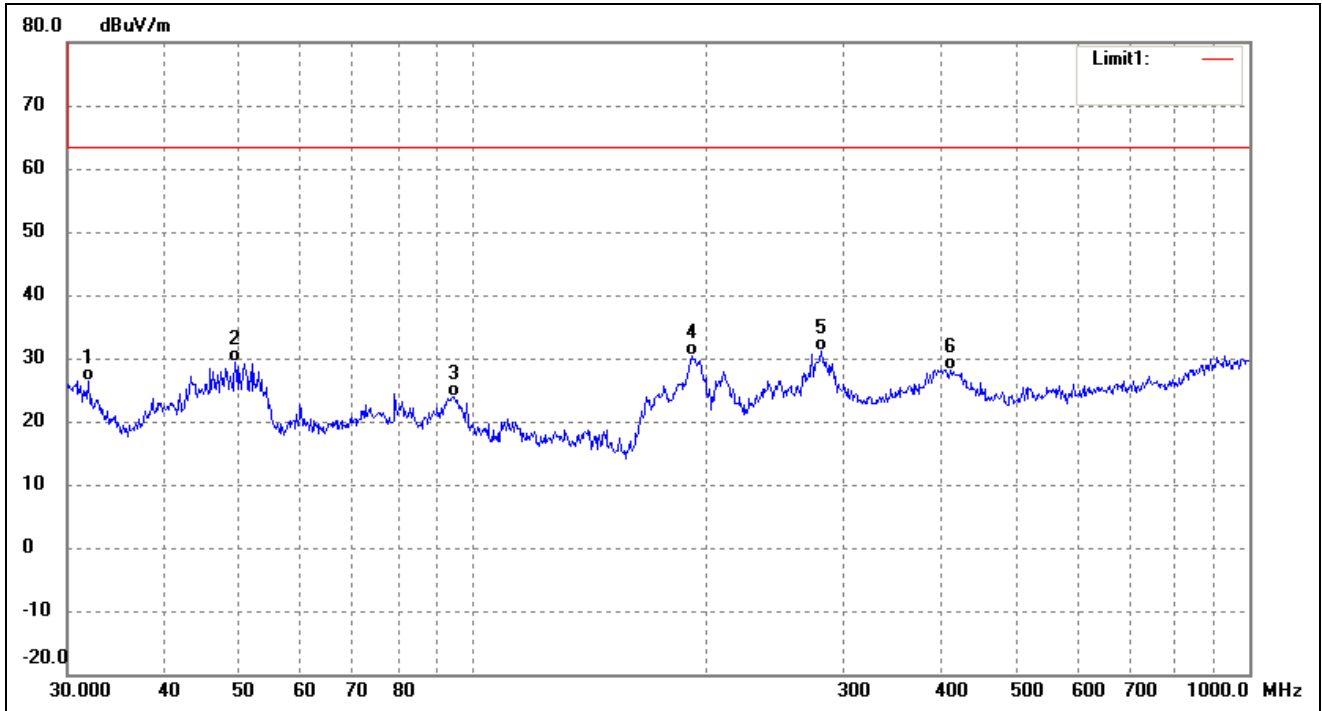
Plot of Radiated Emissions Test Data (Above 30MHz)

Test mode:	TM1	Polarity:	Horizontal
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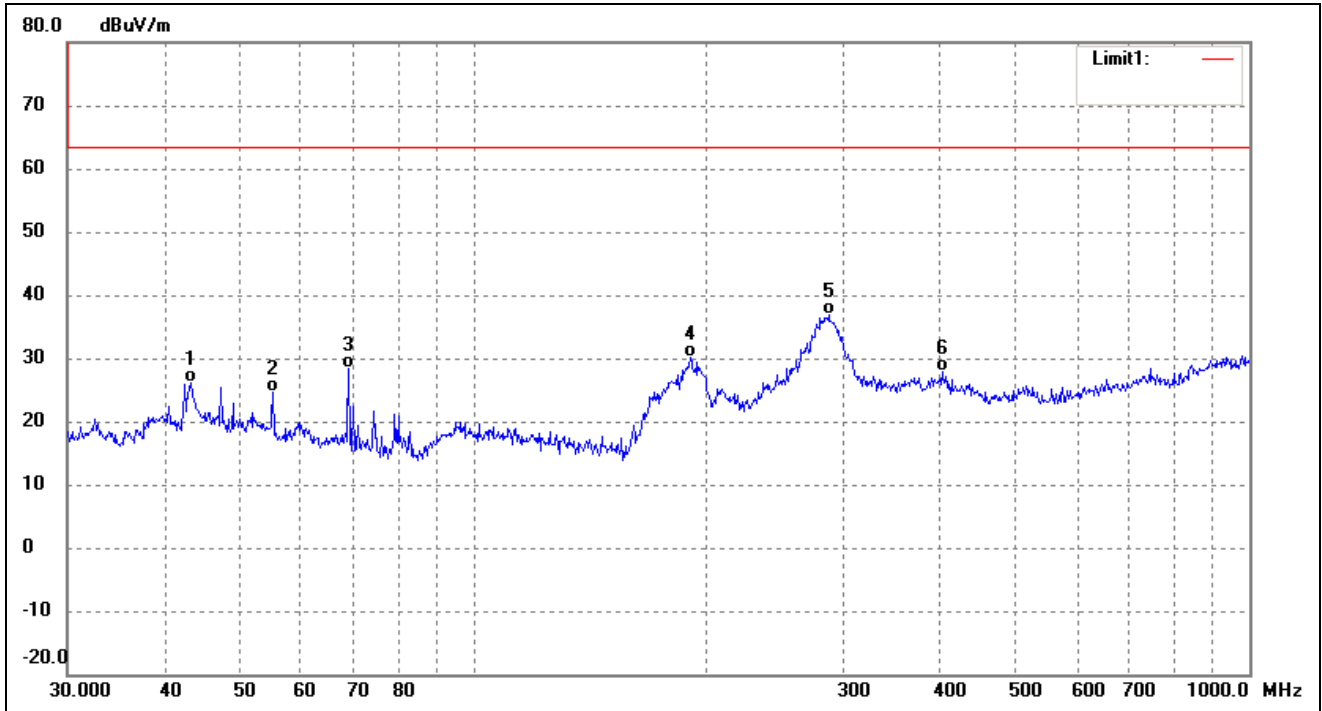
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.2017	40.50	-14.01	26.49	63.50	-37.01	295	100	QP
2	79.2426	40.62	-18.99	21.63	63.50	-41.87	92	100	QP
3	95.4270	37.22	-15.84	21.38	63.50	-42.12	121	100	QP
4	191.0738	42.76	-13.42	29.34	63.50	-34.16	107	100	QP
5	272.2776	44.41	-10.04	34.37	63.50	-29.13	172	100	QP
6	417.6411	34.33	-7.90	26.43	63.50	-37.07	205	100	QP

Test mode:	TM1	Polarity:	Vertical
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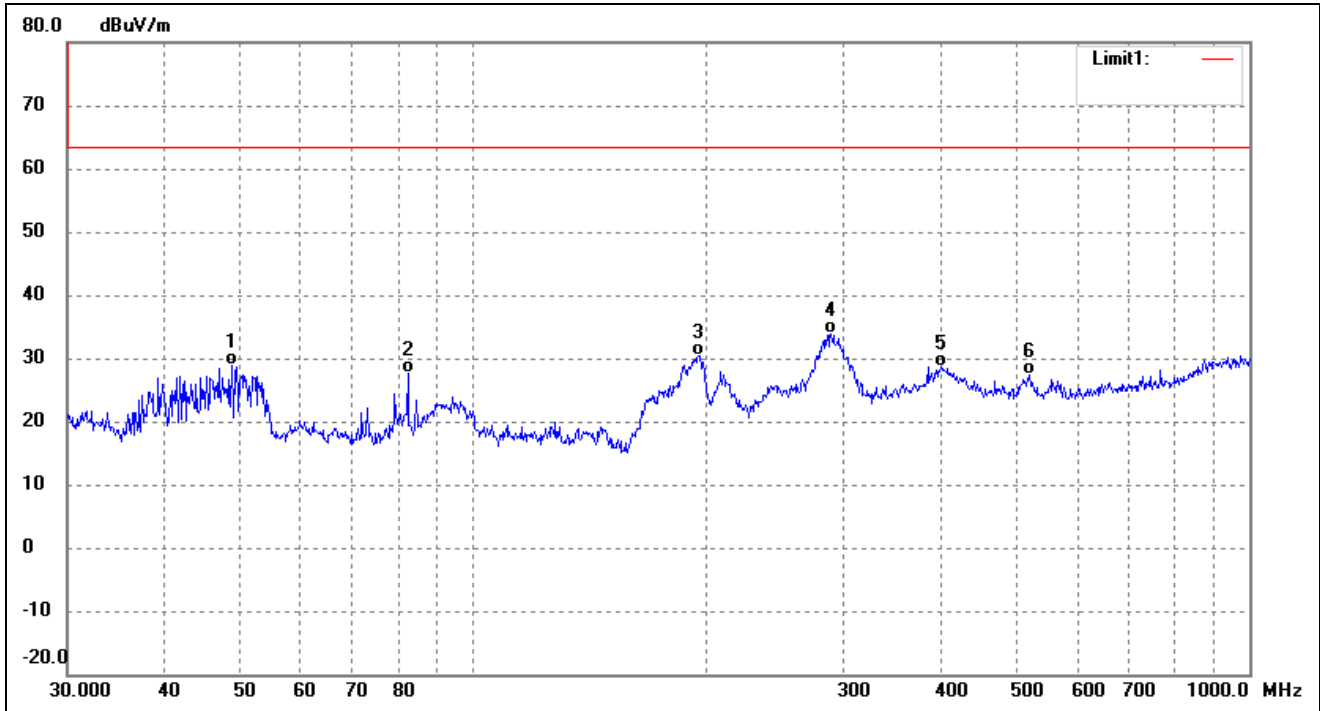
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	31.9546	42.64	-16.27	26.37	63.50	-37.13	349	100	QP
2	49.3594	43.05	-13.67	29.38	63.50	-34.12	277	100	QP
3	94.4284	39.84	-16.03	23.81	63.50	-39.69	68	100	QP
4	191.0738	43.68	-13.42	30.26	63.50	-33.24	161	100	QP
5	281.0075	40.55	-9.48	31.07	63.50	-32.43	150	100	QP
6	411.8240	36.13	-7.88	28.25	63.50	-35.25	328	100	QP

Test mode:	TM2	Polarity:	Horizontal
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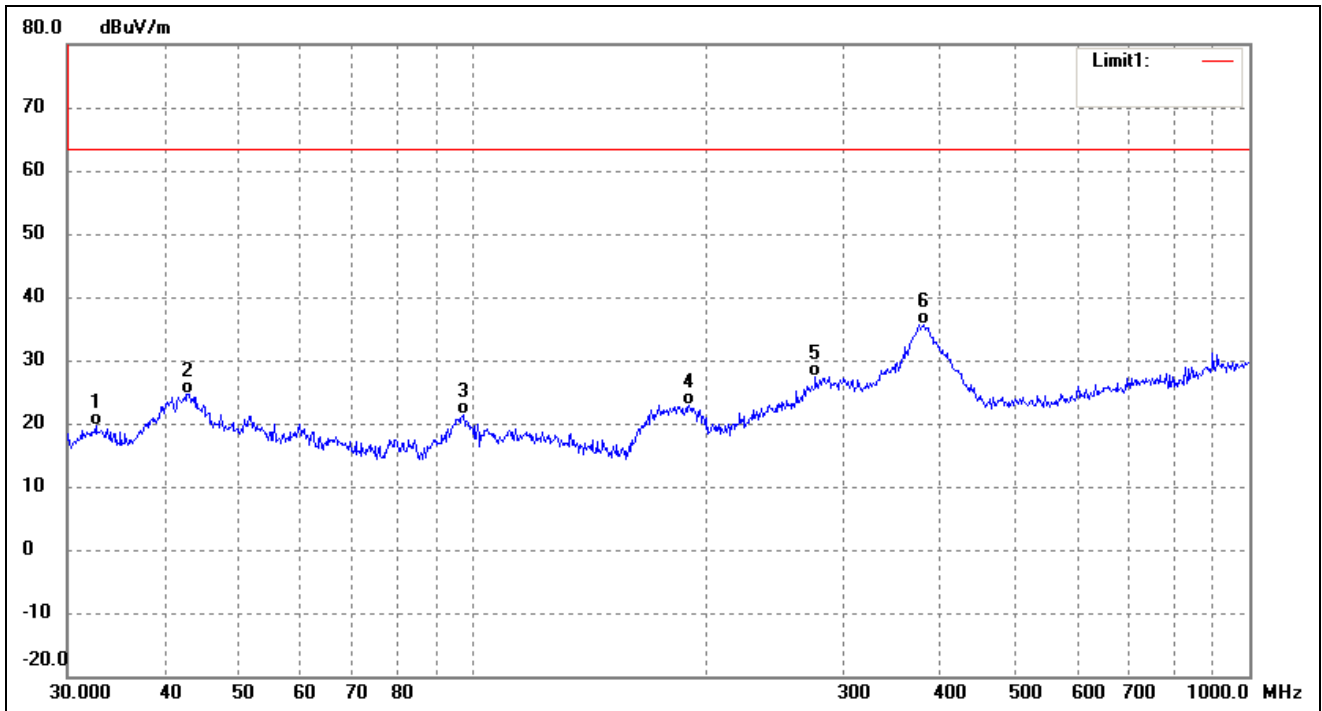
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.3534	40.22	-14.01	26.21	63.50	-37.29	88	100	QP
2	55.2207	39.79	-15.09	24.70	63.50	-38.80	191	100	QP
3	69.1141	45.02	-16.73	28.29	63.50	-35.21	140	100	QP
4	190.4050	43.56	-13.47	30.09	63.50	-33.41	126	100	QP
5	286.9823	45.90	-8.95	36.95	63.50	-26.55	289	100	QP
6	401.8385	35.73	-7.86	27.87	63.50	-35.63	260	100	QP

Test mode:	TM2	Polarity:	Vertical
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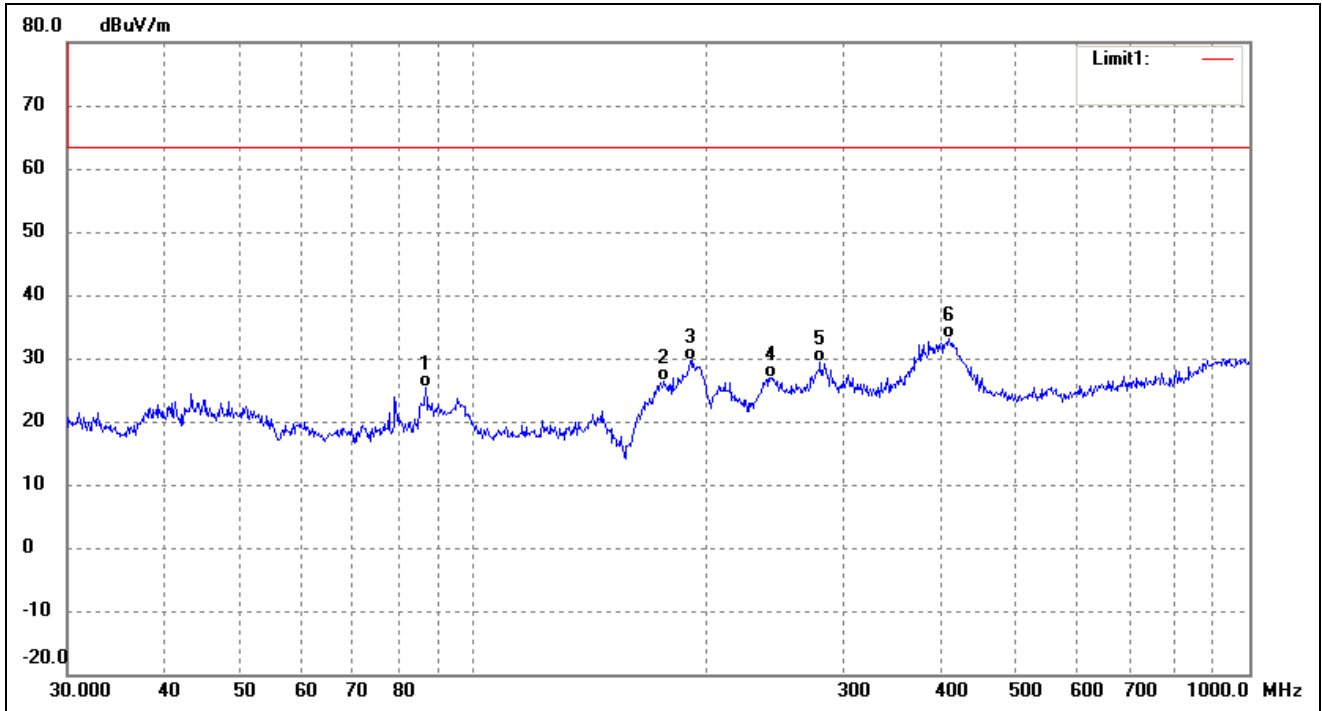
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.8429	42.70	-13.71	28.99	63.50	-34.51	274	100	QP
2	82.3588	46.28	-18.66	27.62	63.50	-35.88	100	100	QP
3	195.1365	43.57	-13.07	30.50	63.50	-33.00	96	100	QP
4	289.0021	42.63	-8.77	33.86	63.50	-29.64	185	100	QP
5	400.4319	36.56	-7.86	28.70	63.50	-34.80	55	100	QP
6	520.8882	35.28	-8.00	27.28	63.50	-36.22	305	100	QP

Test mode:	TM3	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.6340	35.86	-16.23	19.63	63.50	-43.87	70	100	QP
2	42.8998	38.76	-14.03	24.73	63.50	-38.77	193	100	QP
3	97.1148	36.78	-15.50	21.28	63.50	-42.22	81	100	QP
4	189.7385	36.49	-13.54	22.95	63.50	-40.55	150	100	QP
5	276.1235	37.30	-9.90	27.40	63.50	-36.10	297	100	QP
6	381.2487	43.62	-7.94	35.68	63.50	-27.82	114	100	QP

Test mode:	TM3	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	86.8068	43.17	-17.71	25.46	63.50	-38.04	161	100	QP
2	176.2686	41.48	-15.14	26.34	63.50	-37.16	198	100	QP
3	190.4050	43.04	-13.47	29.57	63.50	-33.93	57	100	QP
4	241.6763	37.98	-11.03	26.95	63.50	-36.55	101	100	QP
5	280.0237	38.84	-9.56	29.28	63.50	-34.22	196	100	QP
6	410.3825	40.92	-7.88	33.04	63.50	-30.46	279	100	QP

***** END OFREPORT *****