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-PC1P18PNA

Test Rule(s):	FCC Part 18
Product Description:	Wireless Power Bank
Tested Model:	PC1P18PNA-WPC10
Report No.:	WTX20X04017271W-1
Sample Receipt Date:	Apr. 08, 2020
Tested Date:	Apr. 08, 2020 to Apr. 23, 2020
Issued Date:	May. 26, 2020
Tested By:	Jason Su / Engineer
Reviewed By:	Lion Cai / RF Manager
Approved & Authorized By:	Silin Chen / Manager

Prepared By:

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Report version

Version No.	Date of issue	Description
Rev.00	May. 26, 2020	Original
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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
Factory:	SuiChuan CE LINK LIMITED.
Address of factory	SuiChuan county industrial park east zone, Ji’an city, Jiangxi province，China.

General Description of EUT	
Product Name:	Wireless Power Bank
Trade Name:	CE-LINK
Model No.:	PC1P18PNA-WPC10
Adding Model(s):	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	110~205kHz
Antenna Type:	Coil Antenna
Rated Voltage:	DC5V / DC9V
Rated Current:	1A / 1.1A
Rated Power:	5W / 10W

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

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101）

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintain ed in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) 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 Charging	/	USB-C Input DC5V/3A; Output:DC5V/1A
TM2	Wireless Charging	/	Battery DC3.7V; Output:DC9V/1.1A

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
Power Port Speed	ANKER	A2025	/

Special Cable List and Details

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

1.6 Measurement Uncertainty

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

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

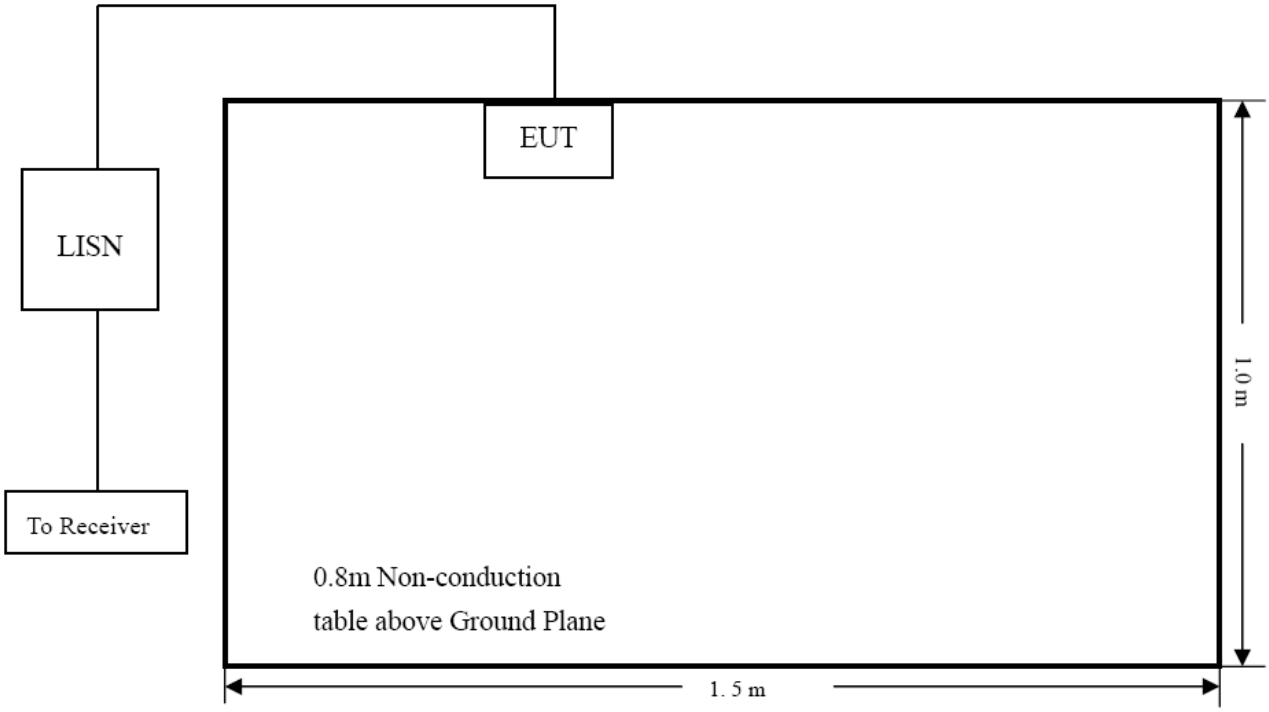
According to FCC 18.307(b), the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies shall not exceed the limits in the following tables:

Frequency (MHz)	Conducted limit (dBμV)	
	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:	26° C
Relative Humidity:	60%
ATM Pressure:	1016 mbar

3.5 Test Receiver Setup

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

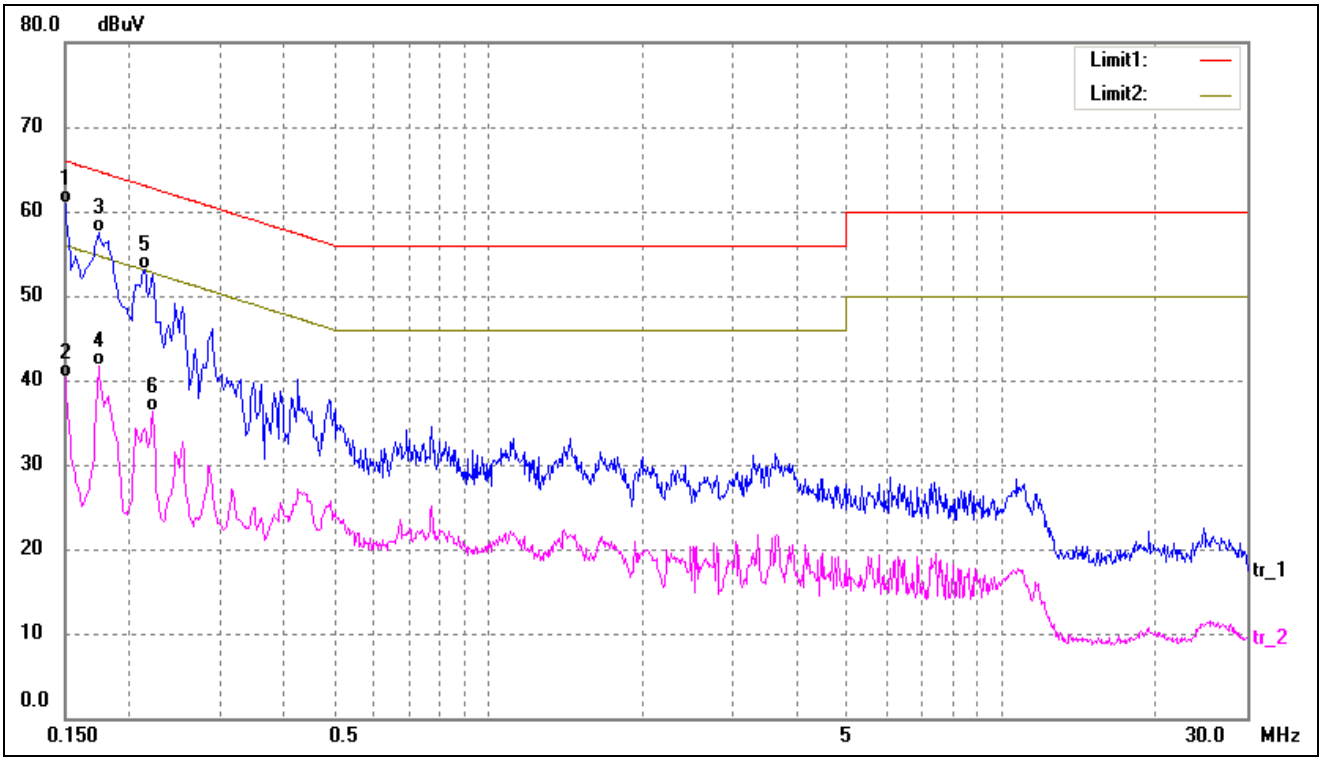
Start Frequency ..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

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:

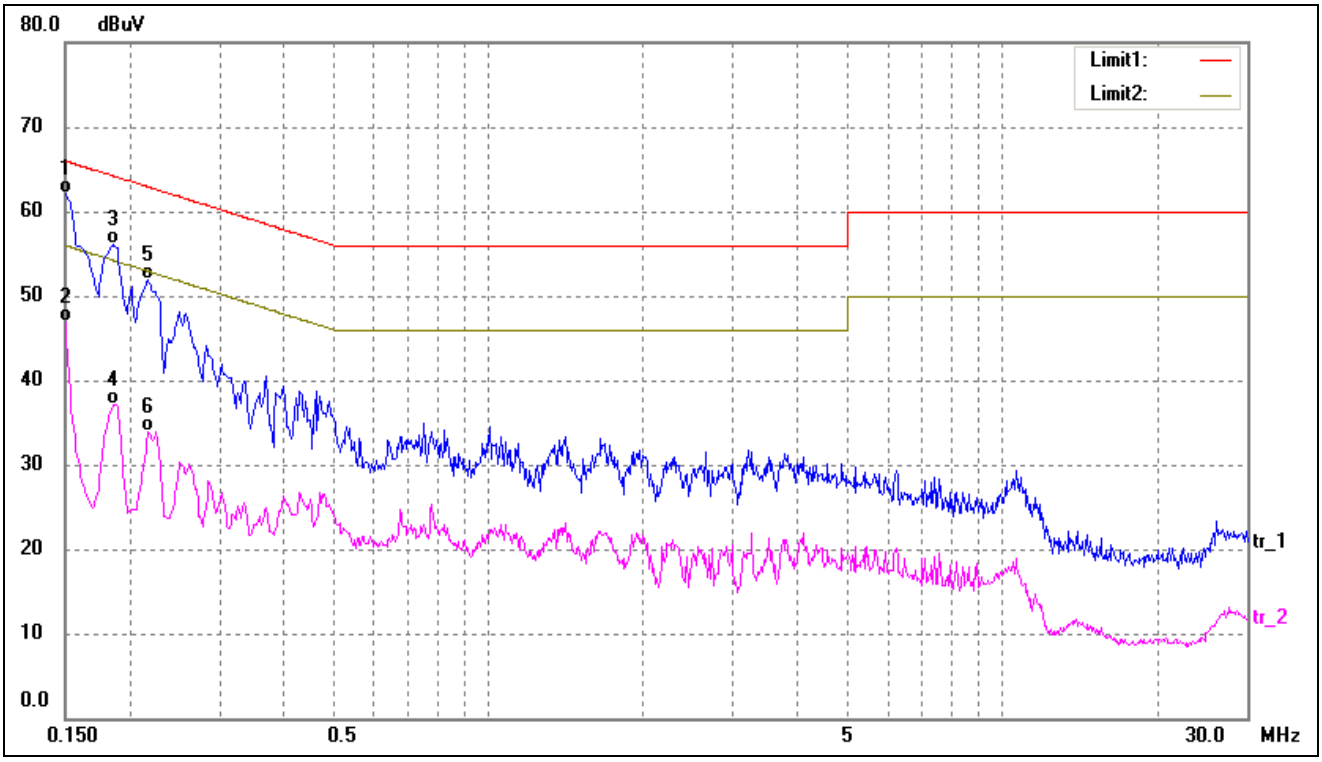
-3.79 dB at **0.1500MHz** in the **Neutral**, **QP** detector, **0.15-30MHz**

Test mode:	TM1	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1500	50.92	9.95	60.87	65.99	-5.12	QP
2	0.1500	30.26	9.95	40.21	55.99	-15.78	AVG
3	0.1740	47.62	9.95	57.57	64.76	-7.19	QP
4	0.1740	31.73	9.95	41.68	54.76	-13.08	AVG
5	0.2140	43.22	9.98	53.20	63.04	-9.84	QP
6	0.2220	26.25	9.99	36.24	52.74	-16.50	AVG

Test mode:	TM1	Polarity:	Neutral

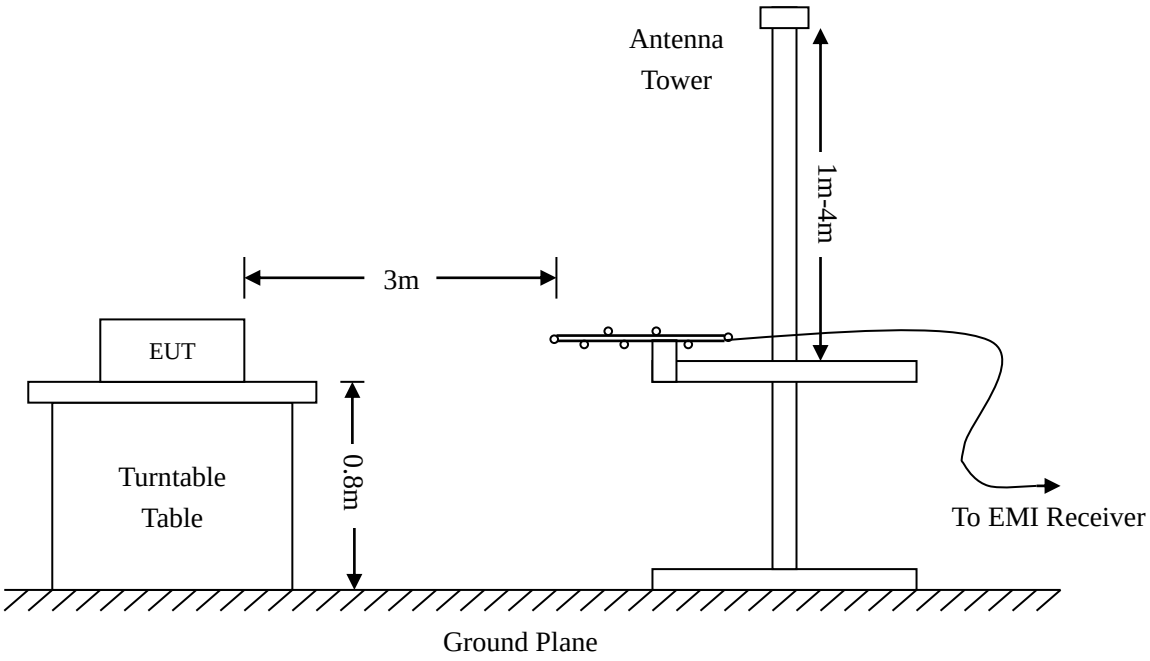


No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1500	52.25	9.95	62.20	65.99	-3.79	QP
2	0.1500	37.02	9.95	46.97	55.99	-9.02	AVG
3	0.1860	46.11	9.96	56.07	64.21	-8.14	QP
4	0.1860	27.22	9.96	37.18	54.21	-17.03	AVG
5	0.2180	41.91	9.98	51.89	62.89	-11.00	QP
6	0.2180	23.96	9.98	33.94	52.89	-18.95	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	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	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:

Corr. Ampl. = Indicated Reading – Corr. Factor

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The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV 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

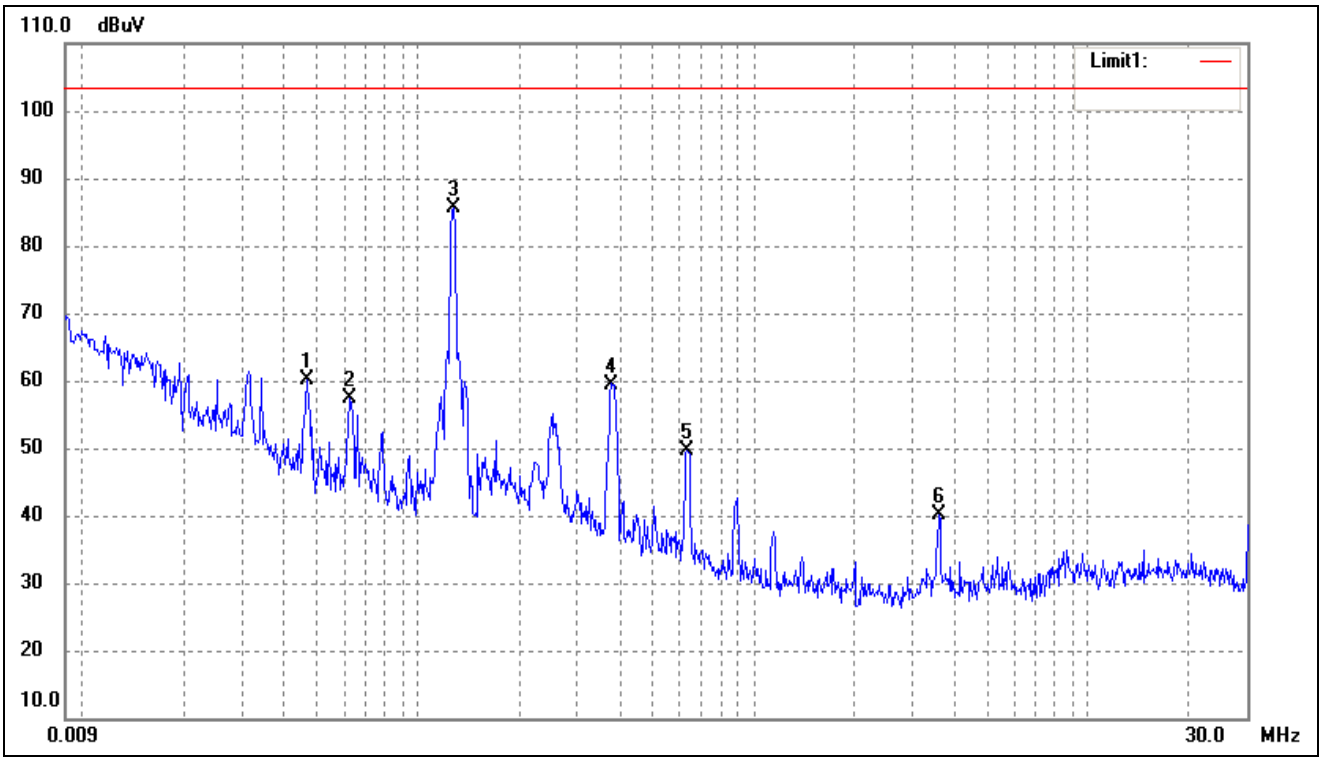
4.5 Summary of Test Results/Plots

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

-17.82 dB at **0.1271 MHz** in the **Vertical** polarization, **TM1** mode, **3Meters**

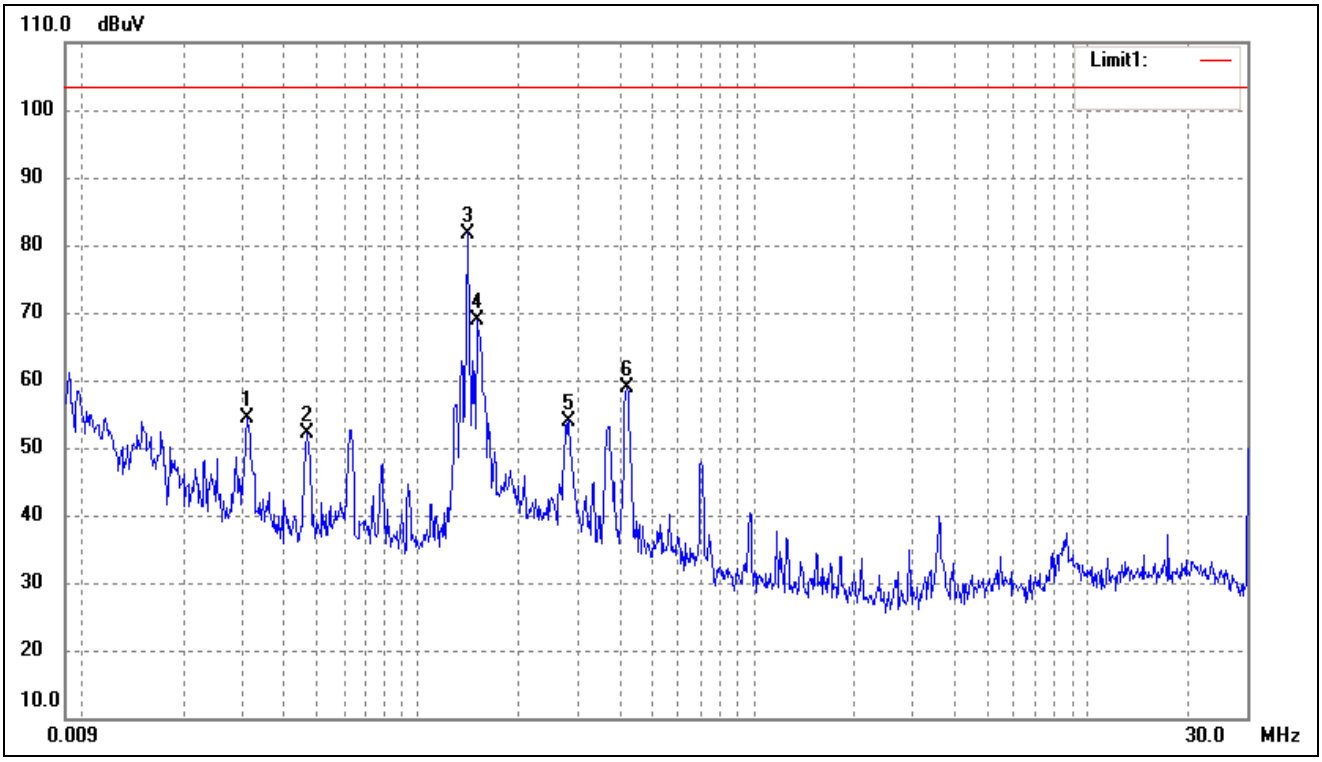
Plot of Radiated Emissions Test Data (Below 30MHz)

Test mode:	TM1	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	0.0471	64.31	-4.17	60.14	103.50	-43.36	-	-	peak
2	0.0627	61.93	-4.49	57.44	103.50	-46.06	-	-	peak
3	0.1271	90.51	-4.83	85.68	103.50	-17.82	-	-	peak
4	0.3791	65.66	-6.16	59.50	103.50	-44.00	-	-	peak
5	0.6338	56.68	-7.03	49.65	103.50	-53.85	-	-	peak
6	3.5843	47.77	-7.59	40.18	103.50	-63.32	-	-	peak

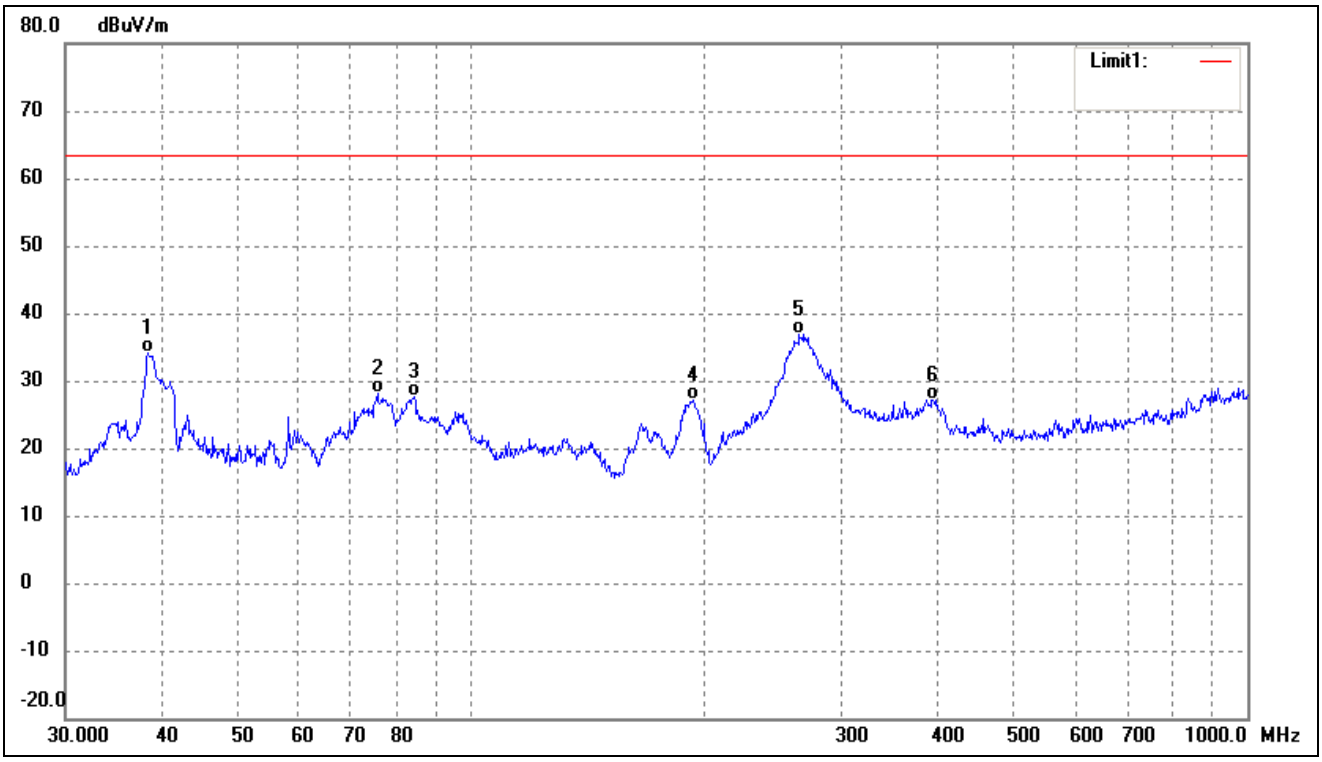
Test mode:	TM2	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	0.0309	59.37	-5.07	54.30	103.50	-49.20	-	-	peak
2	0.0469	56.42	-4.19	52.23	103.50	-51.27	-	-	peak
3	0.1409	86.47	-4.72	81.75	103.50	-21.75	-	-	peak
4	0.1500	73.41	-4.65	68.76	103.50	-34.74	-	-	peak
5	0.2818	59.74	-5.74	54.00	103.50	-49.50	-	-	peak
6	0.4193	65.21	-6.36	58.85	103.50	-44.65	-	-	peak

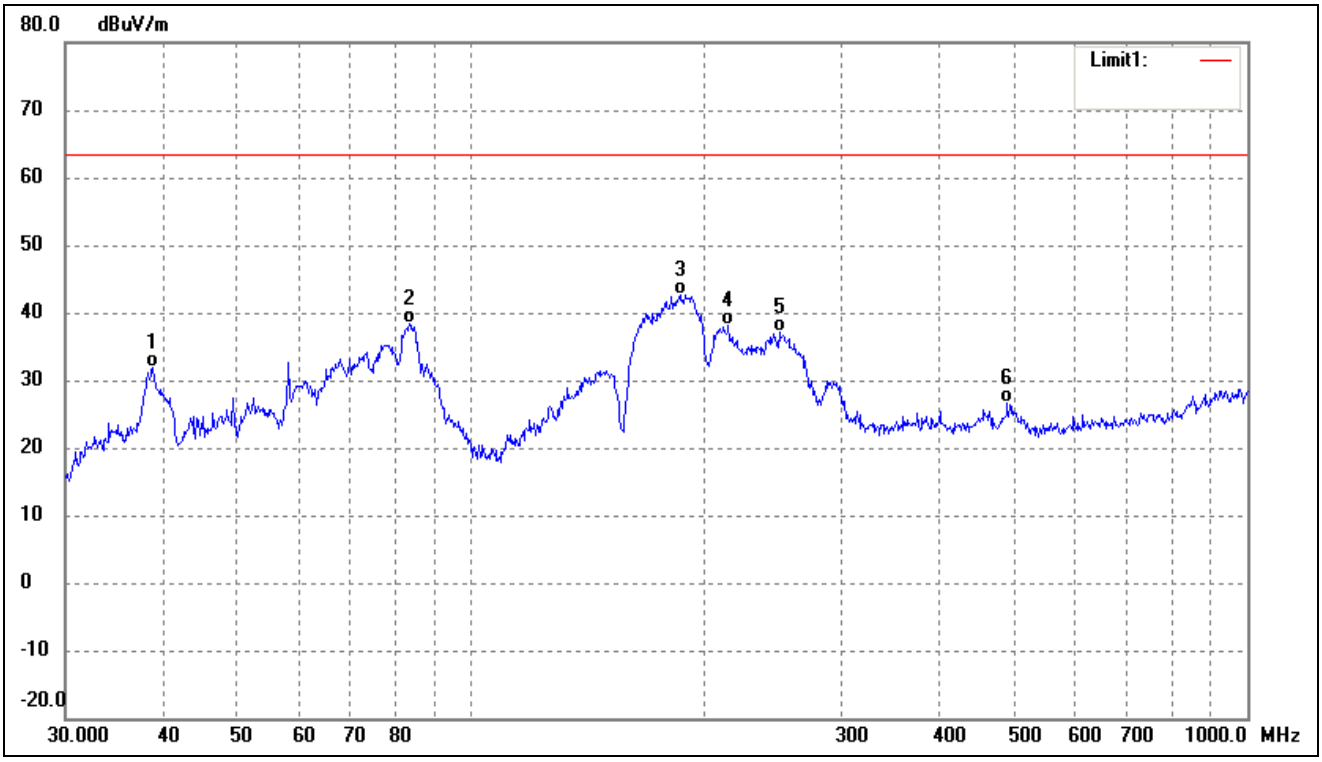
Plot of Radiated Emissions Test Data (Above 30MHz)

Test mode:	TM1	Polarity:	Horizontal



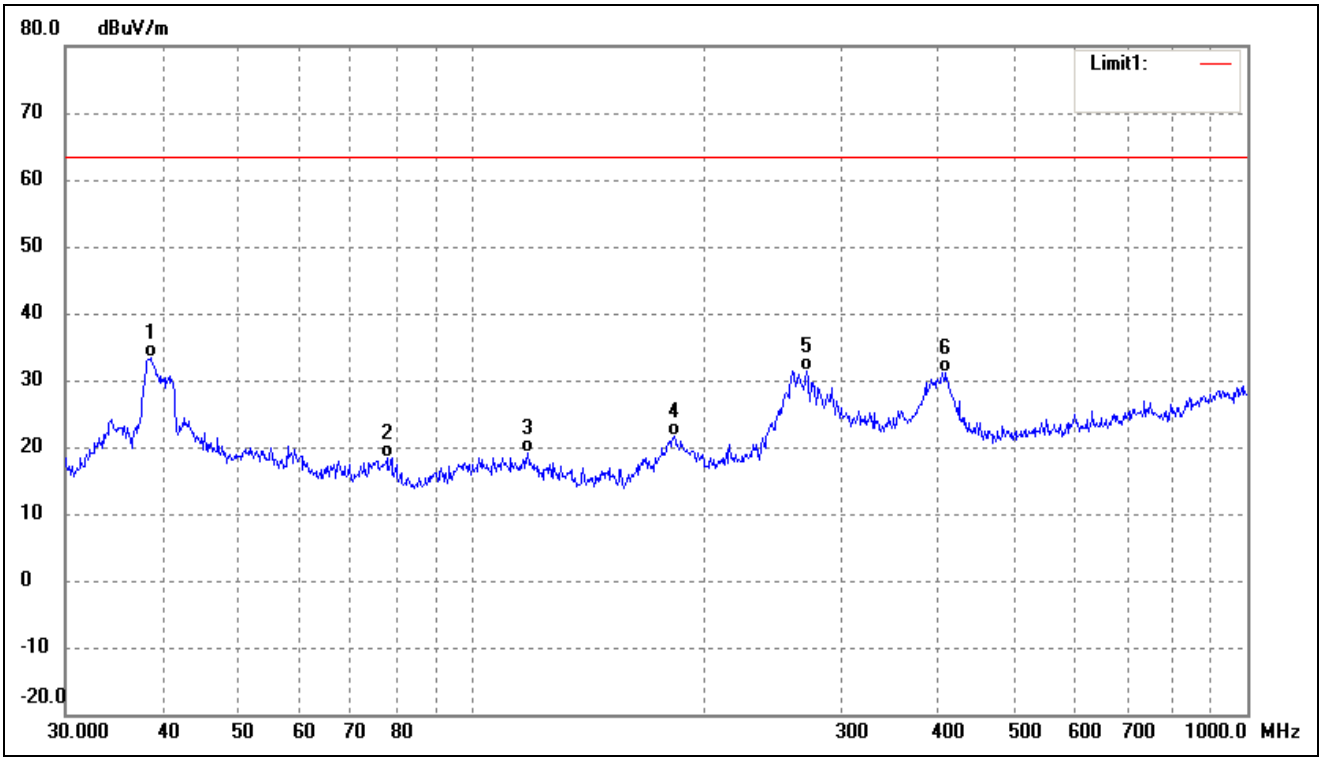
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.3462	48.86	-14.80	34.06	63.50	-29.44	-	-	QP
2	75.7114	46.58	-18.42	28.16	63.50	-35.34	-	-	QP
3	84.4054	45.89	-18.28	27.61	63.50	-35.89	-	-	QP
4	193.0945	40.45	-13.24	27.21	63.50	-36.29	-	-	QP
5	264.7457	47.14	-10.19	36.95	63.50	-26.55	-	-	QP
6	393.4723	35.09	-7.89	27.20	63.50	-36.30	-	-	QP

Test mode:	TM1	Polarity:	Vertical



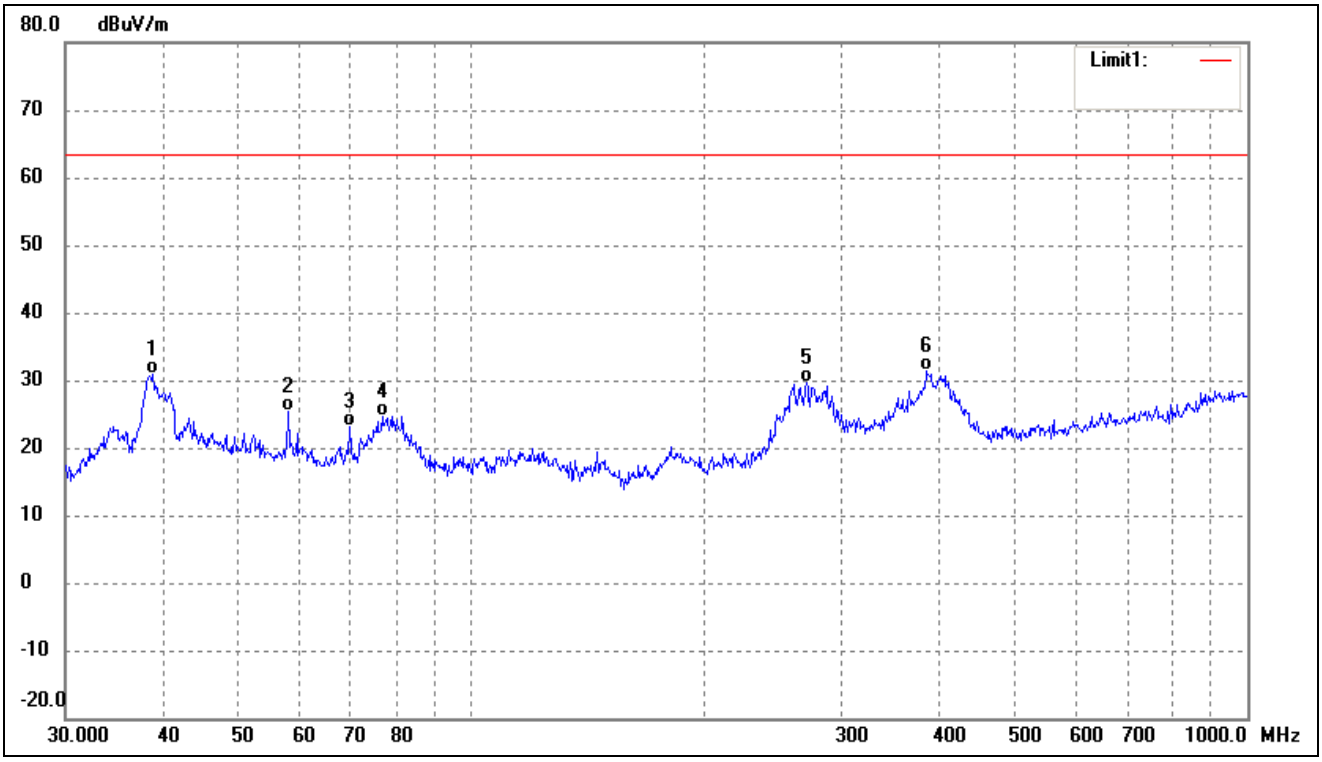
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.8879	46.57	-14.59	31.98	63.50	-31.52	-	-	QP
2	83.2298	56.77	-18.50	38.27	63.50	-25.23	-	-	QP
3	185.7882	56.64	-14.05	42.59	63.50	-20.91	-	-	QP
4	214.5143	50.34	-12.31	38.03	63.50	-25.47	-	-	QP
5	249.4250	47.62	-10.54	37.08	63.50	-26.42	-	-	QP
6	490.7447	34.56	-7.99	26.57	63.50	-36.93	-	-	QP

Test mode:	TM2	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.6161	48.13	-14.70	33.43	63.50	-30.07	-	-	QP
2	77.8654	37.04	-18.76	18.28	63.50	-45.22	-	-	QP
3	118.1862	34.61	-15.48	19.13	63.50	-44.37	-	-	QP
4	182.5592	36.07	-14.49	21.58	63.50	-41.92	-	-	QP
5	270.3748	41.51	-10.08	31.43	63.50	-32.07	-	-	QP
6	407.5145	38.99	-7.87	31.12	63.50	-32.38	-	-	QP

Test mode:	TM2	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.8879	45.55	-14.59	30.96	63.50	-32.54	-	-	QP
2	58.2030	40.41	-15.13	25.28	63.50	-38.22	-	-	QP
3	69.8450	39.87	-16.85	23.02	63.50	-40.48	-	-	QP
4	76.7808	43.32	-18.59	24.73	63.50	-38.77	-	-	QP
5	270.3748	39.80	-10.08	29.72	63.50	-33.78	-	-	QP
6	386.6338	39.27	-7.92	31.35	63.50	-32.15	-	-	QP

******* END OF REPORT *******