

LUX LED LIGHTS

RF TEST REPORT

Report Type:

FCC Part 15C RF report

Model:

77120, 77121

REPORT NUMBER:

220201823SHA-001

ISSUE DATE:

August 26, 2022

DOCUMENT CONTROL NUMBER:

TTRFFCCPART15C_V1 © 2018 Intertek



Applicant : LUX LED LIGHTS
5540 Ekwil St Suite 130, SANTA BARBARA CA 93111

Manufacturer : Dongguan Checkson Enterprise Co.,Ltd
KongYang Ind.Gentre, Zhangmutou Town, Dongguan City, Guangdong
Province, China

FCC ID : 2ARP2-LUX-AURA01

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2020): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

PREPARED BY:**REVIEWED BY:**

Project Engineer
Erick Liu

Reviewer
Wakeyou Wang

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TEST REPORT

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Revision History

Report No.	Version	Description	Issued Date
220201823SHA-001	Rev. 01	Initial issue of report	August 26, 2022

Measurement result summary

TEST ITEM	FCC REFERENCE	RESULT
Radiated emissions	15.209	Pass
Conducted emissions	15.207	Pass

Notes: 1: NA =Not Applicable

2: Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

3: Additions, Deviations and Exclusions from Standards: None.

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1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	LUX Brooklyn Aura Desk Light
Type/Model:	77120, 77121
Description of EUT:	EUT is a desk light with wireless charging function, all models are same except the model names. After evaluation, we choose 77120 for all tests.
Rating:	12Vdc (Powered by Adaptor); total Max. 48W; USB Output 1: 5 Vdc; 1 A; USB Output 2: 5 Vdc; 1 A; Wireless Output Max. 15 W
Category of EUT:	Class B
EUT type:	<input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing
Software Version:	/
Hardware Version:	/
Sample received date:	May 23, 2022
Date of test:	May 23, 2022 – June 15, 2022

1.2 Technical Specification

Frequency Range:	111-205KHz
Modulation:	ASK
Antenna:	Coil Antenna, 0dBi

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1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road (North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0051
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

The tests were subcontracted to the following laboratories:

Name:	Shenzhen NTEK Testing Technology Co., Ltd.
Address:	Add.: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen 518126 P.R. China
Telephone:	0755-2320 0050/2320 0090

The test facility is recognized, certified, or accredited by these organizations:	CNAS-Lab The Certificate Registration Number is L5516
	IC-Registration The Certificate Registration Number is CN0074
	FCC- Accredited Test Firm Registration Number: 463705 Designation Number: CN1184
	A2LA-Lab The Certificate Registration Number is 4298.01

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2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2020)
ANSI C63.10 (2014)

2.2 Mode of operation during the test

Within this test report, EUT was tested under its rating voltage and frequency (120V, 60Hz).
The 0%/50%/100% battery capacity was tested and the 50% battery capacity was worst case.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Wireless Load	FOD	5W,10W,15W
2	iphone 8	Apple	-

2.5 Test environment condition:

Test items	Temperature	Humidity
Radiated emission	25°C	54% RH
Power line conducted emission	24°C	54% RH

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2.6 Instrument list

CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29	1 year
2	LISN	R&S	ENV216	101242	2021.09.30	2022.09.29	1 year
3	LISN	EMCO	3810/2NM	23625	2021.09.30	2022.09.29	1 year
4	Signal Analyzer	Agilent	N9020A	MY51110105	2022.03.01	2023.02.28	1 year
5	Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08	1 year

RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29	1 year
2	Signal Analyzer	R&S	FSV 40-N	101823	2021.09.30	2022.09.29	1 year
3	Active loop Antenna	ZHINAN	ZN30900C	16035	2021.04.11	2023.04.10	2 years
4	Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11	2 years
5	Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2021.10.08	2022.10.07	1 year
6	Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08	1 year

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2.7 Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

Test Item	Measurement Frequency Range	K	U(dB)
99% Bandwidth	/	/	2.3%
Conducted Emission	0.15MHz ~ 30MHz	2	2.80
Radiated Emission	30MHz ~ 1000MHz	2	2.64
Radiated Emission	1000MHz ~ 6000MHz	2	2.40
Radiated Emission	0.009MHz ~ 30MHz	2	6.00
Temperature	/	/	0.5 ° C
Humidity	/	/	2%

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3 Radiated emissions

Test result: Pass

3.1 Limit

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

3.2 Measurement Procedure

For Radiated emission below 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. 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.
- Both X and Y axes of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meters chamber room for test. 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 height of antenna 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.

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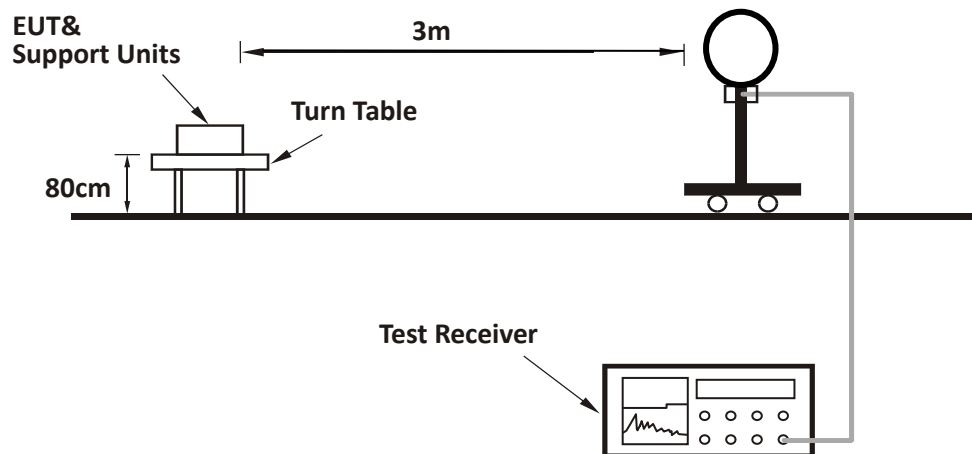
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

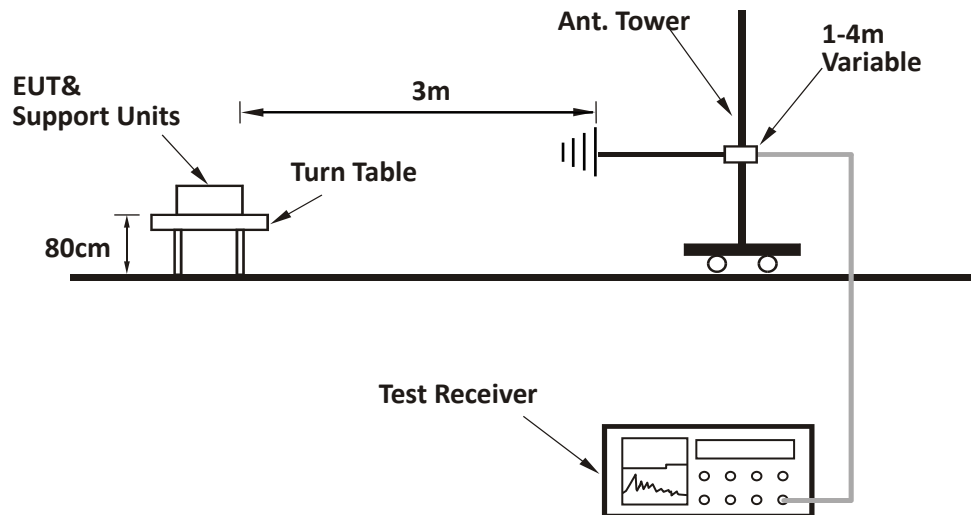
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. All modes of operation were evaluated and the worst-case emissions were reported

3.3 Test Configuration

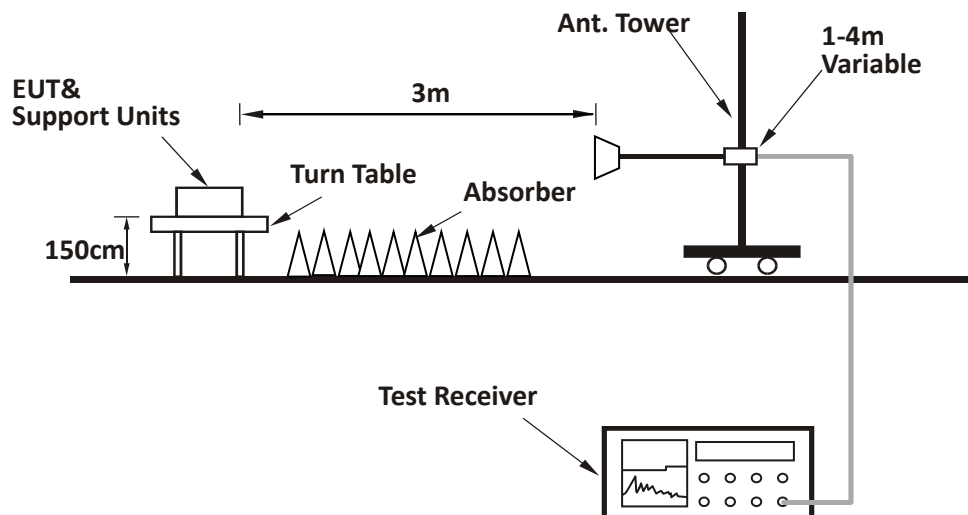
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:

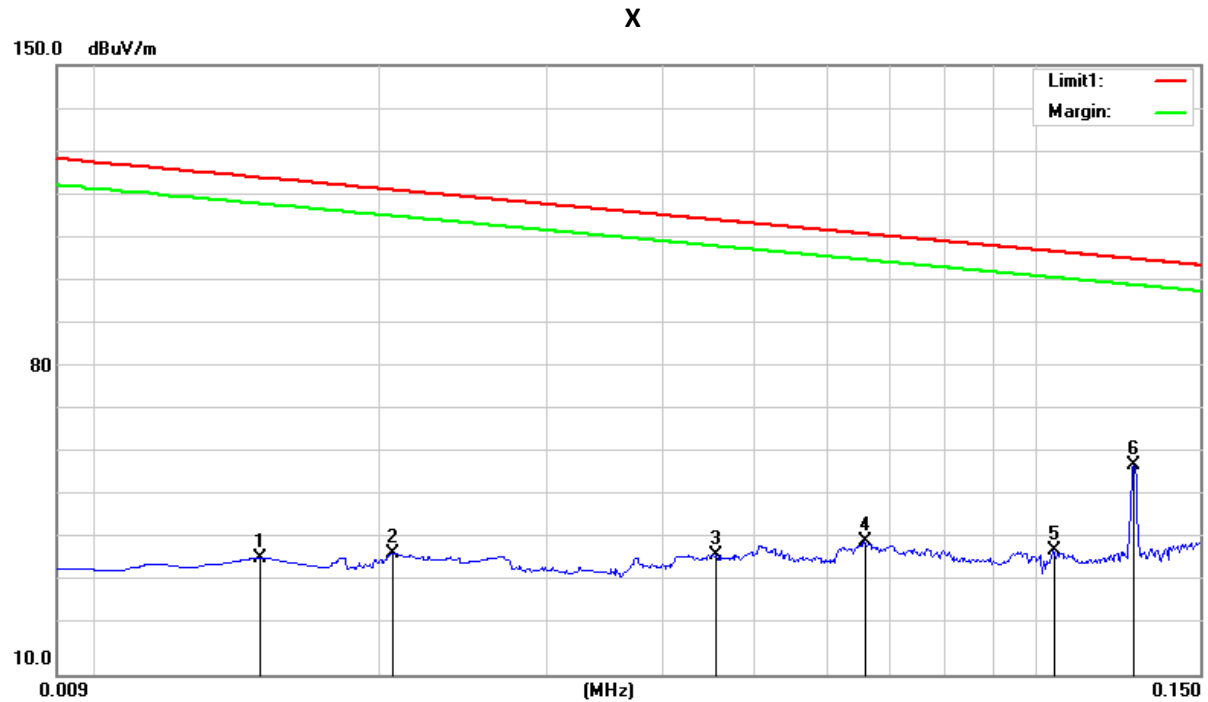


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3.4 Test Results of Radiated Emissions

EUT was tested with empty load, half load and full load, the full load is the worst case and we listed the results in the report.

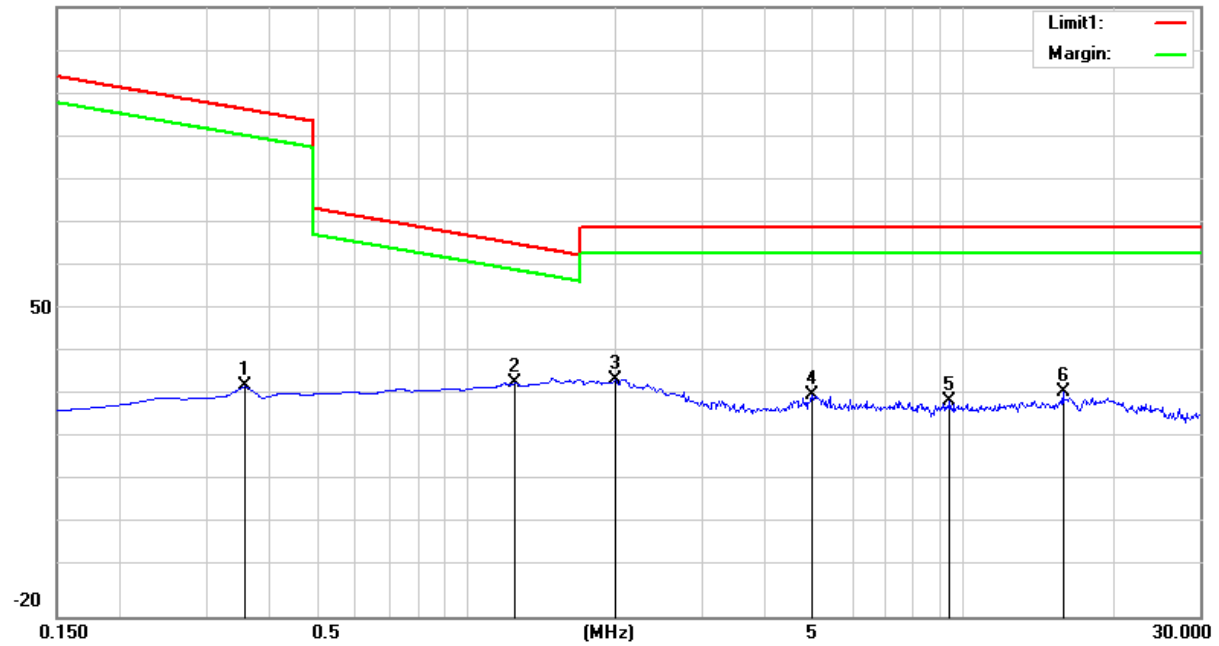
Test data below 30MHz:



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0150	17.17	19.74	36.91	124.08	-87.17	peak
2	0.0206	17.86	20.09	37.95	121.33	-83.38	peak
3	0.0457	17.85	19.59	37.44	114.41	-76.97	peak
4	0.0657	21.53	19.06	40.59	111.25	-70.66	peak
5	0.1045	20.84	17.59	38.43	107.22	-68.79	peak
6	0.1276	40.50	17.54	58.04	105.49	-47.45	peak

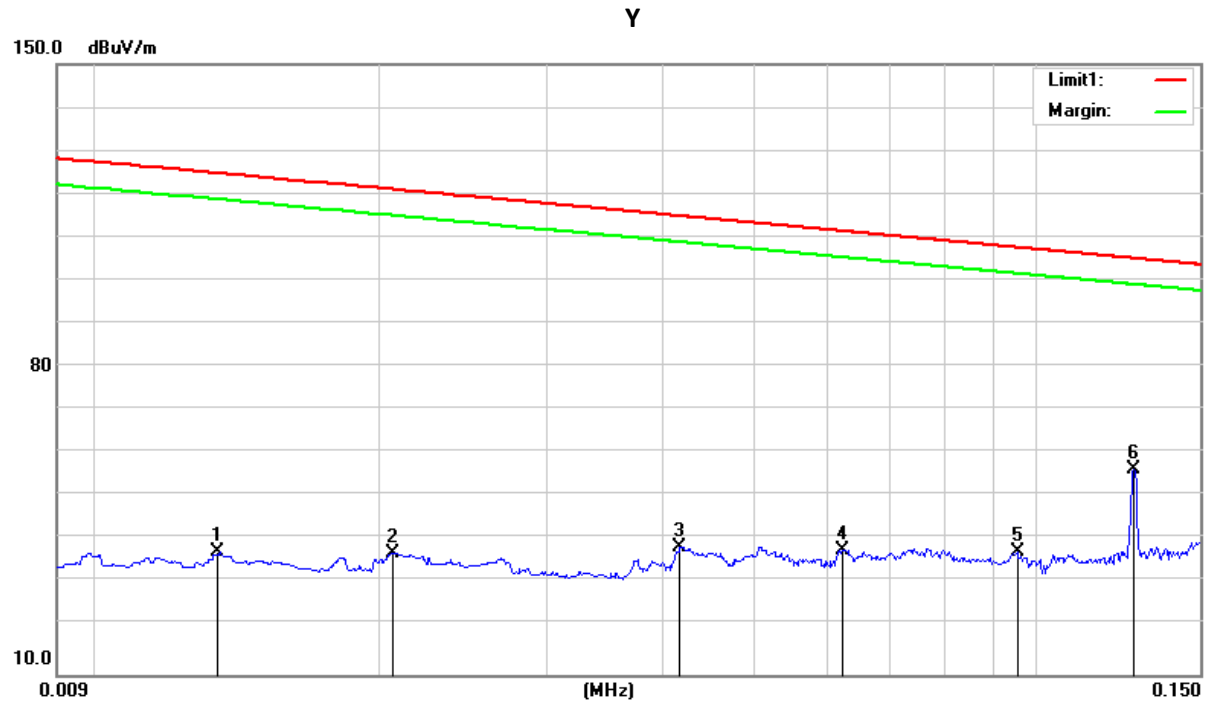
TEST REPORT

120.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.3589	12.85	20.14	32.99	96.50	-63.51	peak
2	1.2545	13.52	20.25	33.77	65.63	-31.86	peak
3	2.0007	14.10	20.40	34.50	69.50	-35.00	peak
4	4.9558	10.56	20.50	31.06	69.50	-38.44	peak
5	9.4035	9.18	20.24	29.42	69.50	-40.08	peak
6	15.9406	9.98	21.53	31.51	69.50	-37.99	peak

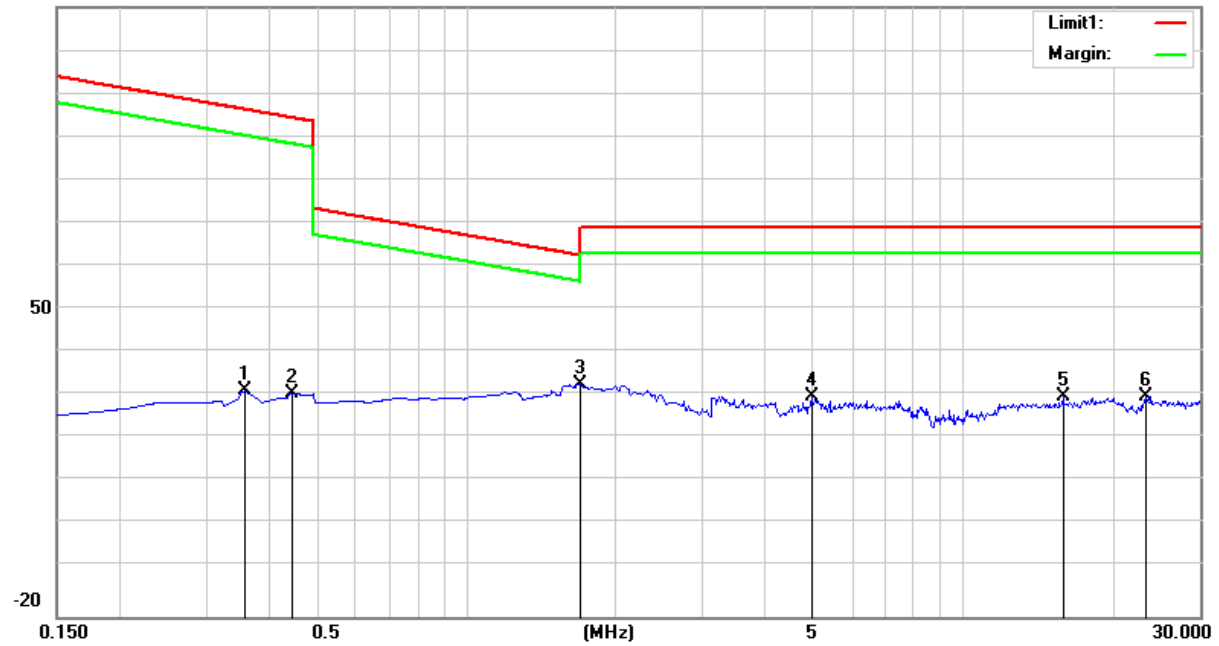
TEST REPORT



No.	Frequency (KHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0134	18.42	19.62	38.04	125.06	-87.02	peak
2	0.0206	17.86	20.09	37.95	121.33	-83.38	peak
3	0.0417	19.55	19.67	39.22	115.20	-75.98	peak
4	0.0623	19.53	19.16	38.69	111.71	-73.02	peak
5	0.0956	20.30	17.81	38.11	108.00	-69.89	peak
6	0.1275	39.49	17.55	57.04	105.49	-48.45	peak

TEST REPORT

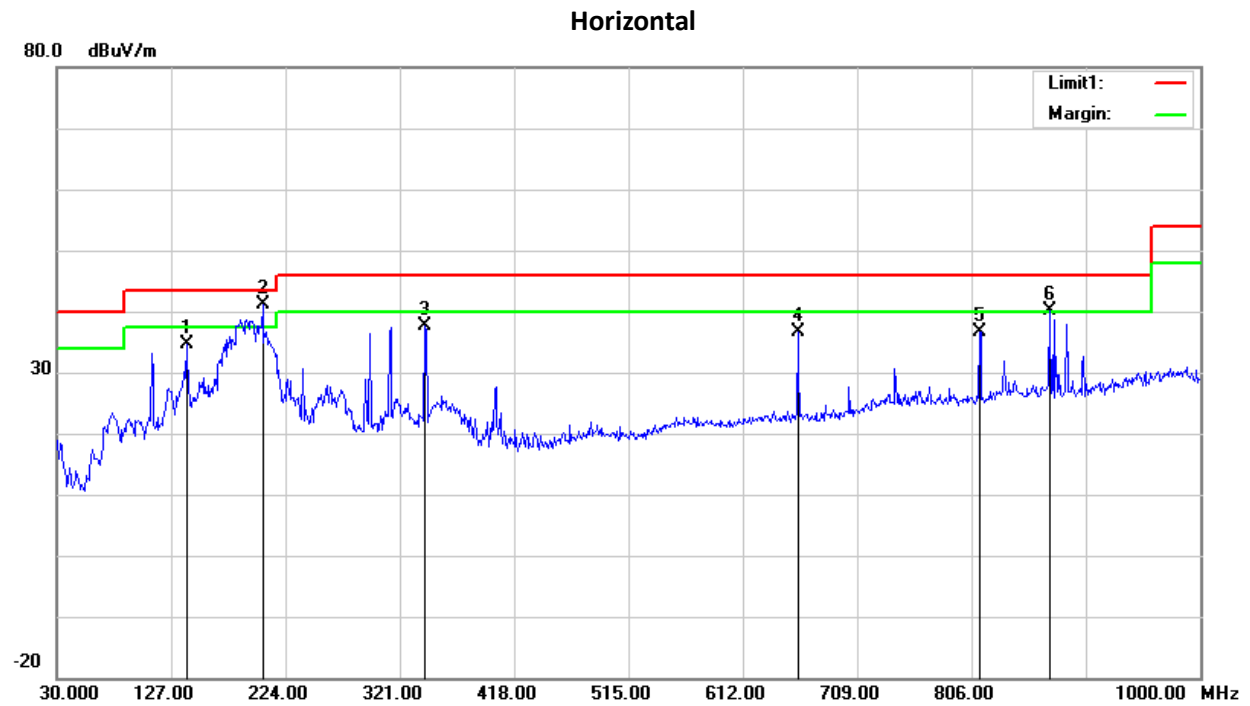
120.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.3588	11.85	20.14	31.99	96.51	-64.52	peak
2	0.4485	11.07	20.18	31.25	94.57	-63.32	peak
3	1.7020	12.99	20.34	33.33	62.99	-29.66	peak
4	4.9557	10.06	20.50	30.56	69.50	-38.94	peak
5	15.9405	8.98	21.53	30.51	69.50	-38.99	peak
6	23.3432	9.43	21.23	30.66	69.50	-38.84	peak

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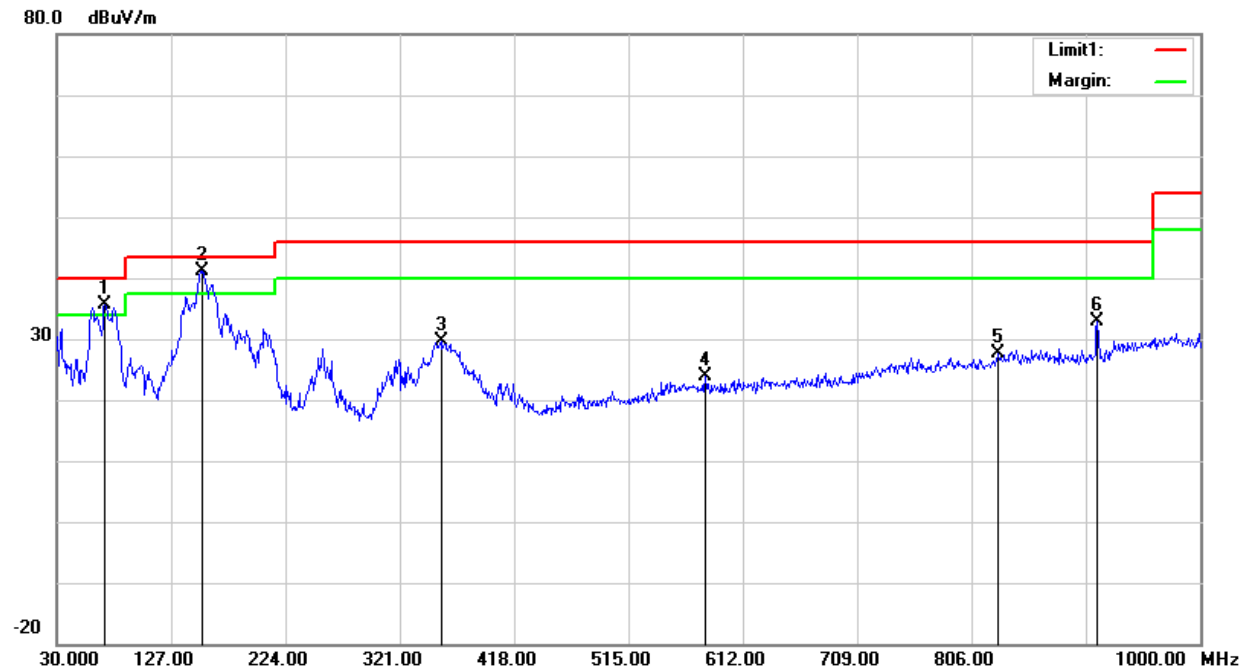
Test data from 30MHz to 1000MHz:



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	140.5800	52.71	-18.05	34.66	43.50	-8.84	peak
2	204.6000	61.98	-20.80	41.18	43.50	-2.32	peak
3	342.3400	50.92	-13.33	37.59	46.00	-8.41	peak
4	658.5600	41.51	-4.82	36.69	46.00	-9.31	peak
5	812.7900	38.66	-1.99	36.67	46.00	-9.33	peak
6	871.9600	40.65	-0.55	40.10	46.00	-5.90	peak

TEST REPORT

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	70.7400	60.44	-24.73	35.71	40.00	-4.29	peak
2	153.1900	59.77	-18.58	41.19	43.50	-2.31	peak
3	355.9200	42.57	-12.95	29.62	46.00	-16.38	peak
4	579.9900	29.55	-5.76	23.79	46.00	-22.21	peak
5	828.3100	28.59	-0.95	27.64	46.00	-18.36	peak
6	912.7000	32.98	-0.14	32.84	46.00	-13.16	peak

Remark: 1. Correct Factor = Correct Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.

2. Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Reading

4. If the PK Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Correct Factor = 30.20dB/m, Cable Loss = 2.00dB,
 Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,
 Limit = 40.00dBuV/m.
 Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
 Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m;
 Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

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4 Conducted emissions

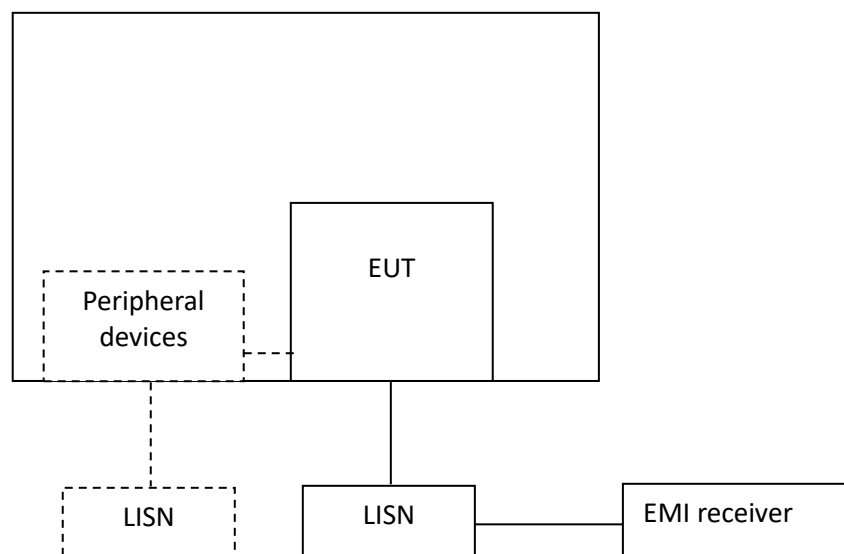
Test result: Pass

4.1 Limit

Frequency of Emission (MHz)	Conducted Emissions Limit (dBuV)	
	QP	AV
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.

4.2 Test Configuration



TEST REPORT**4.3 Measurement Procedure**

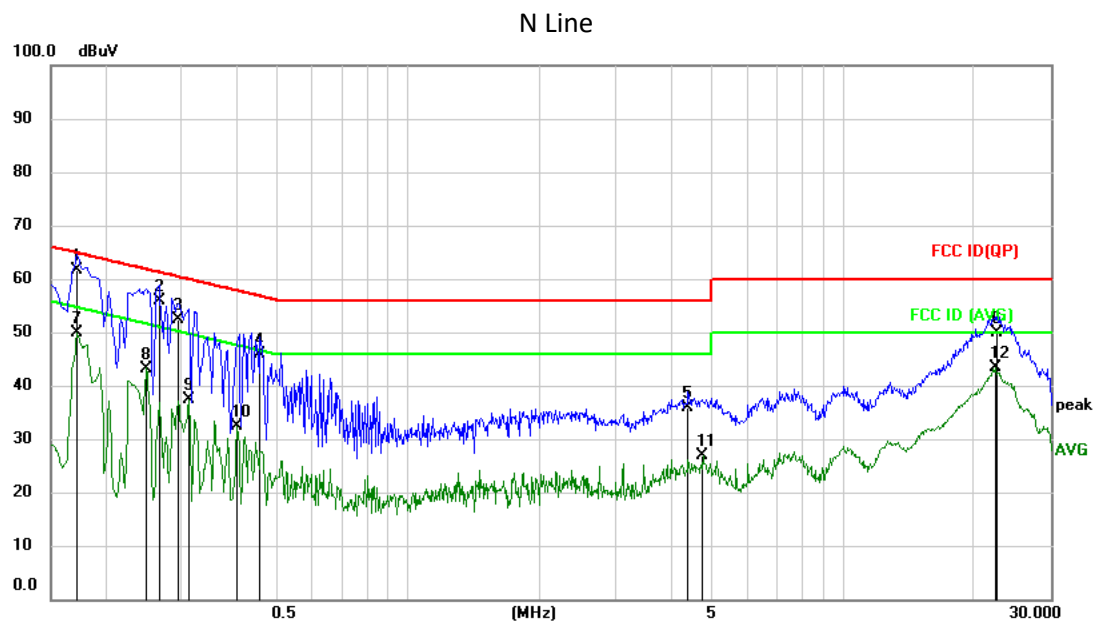
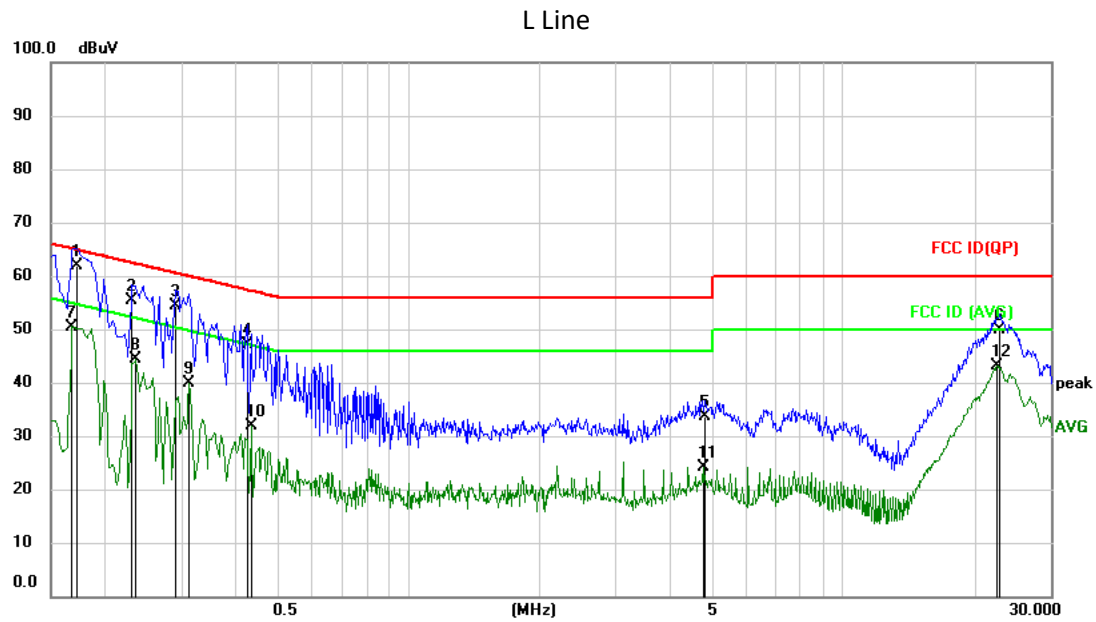
Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

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4.4 Test Results of Conducted Emissions



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L Line

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector
1	0.17	64.84	61.80	-3.04	51.87	9.93	QP
2	0.23	62.41	55.31	-7.10	45.41	9.90	QP
3	0.29	60.54	54.35	-6.19	44.43	9.92	QP
4	0.42	57.36	47.22	-10.14	37.30	9.92	QP
5	4.82	56.00	33.70	-22.30	23.44	10.26	QP
6	23.01	60.00	49.98	-10.02	37.03	12.95	QP
7	0.17	55.06	50.50	-4.56	40.57	9.93	AVG
8	0.24	52.26	44.45	-7.81	34.55	9.90	AVG
9	0.31	49.92	39.92	-10.00	30.00	9.92	AVG
10	0.43	47.19	31.85	-15.34	21.93	9.92	AVG
11	4.76	46.00	24.17	-21.83	13.92	10.25	AVG
12	22.63	50.00	43.24	-6.76	30.26	12.98	AVG

N Line

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector
1	0.17	64.84	61.60	-3.24	51.67	9.93	QP
2	0.27	61.21	55.88	-5.33	45.97	9.91	QP
3	0.29	60.41	52.40	-8.01	42.48	9.92	QP
4	0.46	56.77	46.00	-10.77	36.06	9.94	QP
5	4.39	56.00	35.90	-20.10	25.68	10.22	QP
6	22.59	60.00	49.85	-10.15	37.15	12.70	QP
7	0.17	54.84	49.77	-5.07	39.84	9.93	AVG
8	0.25	51.79	43.25	-8.54	33.35	9.90	AVG
9	0.31	49.92	37.41	-12.51	27.49	9.92	AVG
10	0.40	47.81	32.32	-15.49	22.39	9.93	AVG
11	4.75	46.00	26.76	-19.24	16.51	10.25	AVG
12	22.39	50.00	43.31	-6.69	30.61	12.70	AVG

Remark: 1. Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Level = Original Receiver Reading + Factor

3. Delta= Level - Limit

4. If the PK Level is lower than AV limit, the AV test can be elided.

Example: Assuming LISN Factor = 10.00dB, Cable Loss = 2.00dB,
Original Receiver Reading = 10.00dBuV, Limit = 66.00dBuV.
Then Factor = 10.00 + 2.00 = 12.00dB;
Level = 10dBuV + 12.00dB = 22.00dBuV;
Delta = 22.00dBuV - 66.00dBuV = -44.00dB.

***** END *****