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Harman International Industries, Inc.

RF TEST REPORT

Report Type:
FCC Part 15.247 & ISED RSS-247 RF report

Model:
LUXASTR01

REPORT NUMBER:
210402581SHA-001

ISSUE DATE:
May 27, 2021

DOCUMENT CONTROL NUMBER:
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TEST REPORT

Report no.: 210402581SHA-001

Applicant:	Harman International Industries, Inc.
	8500, Balboa Blvd, Northridge, CA,91329, USA
Manufacturer:	Anam Electronics Co., Ltd.
	27, Digital-ro 27ga-gil, Guro-gu, Seoul, 08375, Republic of Korea
Product Name:	WiFi Module
Type/Model:	LUXASTR01
FCC ID:	APILUXASTR01
IC:	6132A-LUXASTR01

SUMMARY:

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

47CFR Part 15 (2019): Radio Frequency Devices (Subpart C)

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

RSS-247 Issue 2 (February 2017): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

RSS-Gen Issue 5 (February 2021) Amendment 2: General Requirements for Compliance of Radio Apparatus

PREPARED BY:	**REVIEWED BY:**
Project Engineer Dylan Tang	Reviewer Daniel Zhao

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Revision History

Report No.	Version	Description	Issued Date
210401011SHA-001	Rev. 01	C2PC	May 27, 2021

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Measurement result summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-247 Issue 2 Clause 5.2	NA
Maximum conducted output power and e.i.r.p.	15.247(b)(3)	RSS-247 Issue 2 Clause 5.4	Verified
Power spectrum density	15.247(e)	RSS-247 Issue 2 Clause 5.2	NA
Emission outside the frequency band	15.247(d)	RSS-247 Issue 2 Clause 5.5	NA
Radiated Emissions in restricted frequency bands	15.247(d), 15.205&15.209	RSS-Gen Issue 5 Clause 8.9&8.10	Pass
Power line conducted emission	15.207(a)	RSS-Gen Issue 5 Clause 8.8	NA
Occupied bandwidth	-	RSS-Gen Issue 5 Clause 6.6	NA
Antenna requirement	15.203	-	Verified

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.
4. Verified= This report is based on the previous report that add three Antennas. For specific changes, need to verified power.

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	WiFi Module
Type/Model:	LUXASTR01
Description of EUT:	The EUT is a WiFi Platform Module, which supports 802.11a/b/g/n/ac , WiFi & BT mode.
Rating:	DC 5V
EUT type:	☒ Table top ☐ Floor standing
Sample number：	G212B019
Product Marketing Name:	WiFi & BT Platform Module
Hardware Version:	LUXASTR01
Sample received date:	May 6, 2021
Date of test:	April 28, 2020 ~ May 25, 2021

1.2 Technical Specification

Frequency Range:	2402-2480MHz
Support Standards:	IEEE 802.15.1
Type of Modulation:	GFSK
Channel Number:	40
Channel Separation:	2MHz
Antenna port Information:	Chip antenna: ant2 1.55dBi PCB antenna: ant2 3.19dBi Pole antenna: ant2 2.53dBi

1.3 Antenna information

No.	Antenna Type	Gain	Note
0	Chip Antenna	1.55dBi	Internal type
1	PCB Antenna	3.19dBi	Internal type
2	Pole Antenna	2.53dBi	External type

1.4 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: CN1175
	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

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2019)
ANSI C63.10 (2013)
KDB 662911 D01 (v02r01)
KDB 558074 (v05r02)
RSS-247 Issue 2 (February 2017)
RSS-Gen Issue 5 (February 2021) Amendment 2

2.2 Mode of operation during the test

Three axes (X, Y, Z) were observed while the test receiver worked as “max hold” continuously and the highest reading among the whole test procedure was recorded. Compare with the test results that X axis is the worst case.

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)				2402 ~ 2480			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	**2402**	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	**19**	**2440**	29	2460	**39**	**2480**

Data rate VS Power:
The test setting software is offered by the manufactory. The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases.

Test software and Power Setting parameter			
Test Software	SecureCRT		
Working Mode	BLE		
Supply voltage	120V/60Hz		
Test Channel	2402MHz	2440MHz	2480MHz
Power Setting	Default	Default	Default

2.3 Test software list

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

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Laptop computer	DELL 5480	-
2	RF cable	/	0.2m length; 0.8dB loss

2.5 Test environment condition:

Test items	Temperature	Humidity
Minimum 6dB Bandwidth	18°C	51%RH
Maximum conducted output power and e.i.r.p.		
Power spectrum density		
Emission outside the frequency band		
Occupied bandwidth		
Radiated Emissions in restricted frequency bands	25.2°C	52%RH
Power line conducted emission	19°C	52%RH

2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESCS 30	EC 2107	2021-07-14
☑	A.M.N.	R&S	ESH2-Z5	EC 3119	2021-11-09

Radiated Emission					
Used	Equipment	Manufacturer	Type	Serial Number	Due date
☑	3m Chamber & Accessory Equipment	ETS-LINDGREN	3m	N/A	2024-01-21
☑	Receiver	R&S	ESIB26	100114	2021-11-17
☑	Loop Antenna	ETS-LINDGREN	6502	00202525	2021-11-13
☑	Broadband Antenna	ETS-LINDGREN	3142E	00201566	2021-11-13
☑	6dB Attenuator	Talent	RA6A5-N-18	18103001	2021-11-13
☑	Preamplifier	HP	8447F	2805A02960	2021-11-09
☑	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	2022-05-28
☑	Pre-amplifier	ETS-LINDGREN	118385	00201874	2021-11-09
☑	Horn Antenna	ETS-LINDGREN	3116C	00200180	2021-06-18
☑	Pre-amplifier	ETS-LINDGREN	118384	00202652	2021-11-13
☑	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A

RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2022-03-15
☑	PXA Signal Analyzer	Keysight	N9030B	EC 6078	2022-06-09
☑	Power sensor	Agilent	U2021XA	EC 5338-1	2022-03-15
☑	Vector Signal Generator	Agilent	N5182B	EC 5175	2022-03-17
☑	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2022-03-17
☑	Test Receiver	R&S	ESCI 7	EC 4501	2021-09-16
☐	Universal Radio Communication Tester	R&S	CMW500	EC5944	2021-12-09
☑	Signal generator	Agilent	N5182A	Ec6172	2021-08-21
☑	Signal generator	Agilent	N5181A	Ec6171	2021-08-21
☑	Climate chamber	GWS	MT3065	EC 6021	2022-03-04

Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2022-03-02
☑	Pressure meter	YM3	Shanghai Mengde	EC 4620	2021-09-09

2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum peak output power	± 0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	± 4.60dB
Radiated Emissions in restricted frequency bands above 1GHz	± 4.40dB
Emission outside the frequency band	± 2.70dB
Power line conducted emission	± 3.19dB

3 Maximum conducted output power and e.i.r.p.

Test result: Pass

3.1 Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 W. (The e.i.r.p. shall not exceed 4 W)

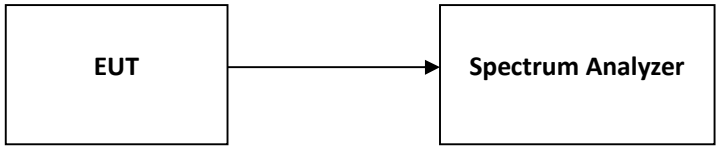
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 30dBm and 30+ (6 –antenna gain-beam forming gain).

3.2 Measurement Procedure

The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance” (clause 9.1.1) for compliance requirements.

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

3.3 Test Configuration



3.4 Test Results of Maximum conducted output power

Chip antenna

BLE Maximum Output Power					
Test Frequency (MHz)	Power (dBm)		ERIP(dBm)		Result
	1M	2M	1M	2M	
2402	3.84	3.90	5.39	5.45	Pass
2440	4.01	4.15	5.56	5.70	Pass
2480	3.71	3.95	5.26	5.50	Pass

PCB Antenna

BLE Maximum Output Power					
Test Frequency (MHz)	Power (dBm)		ERIP(dBm)		Result
	1M	2M	1M	2M	
2402	3.84	3.90	7.03	7.09	Pass
2440	4.01	4.15	7.20	7.34	Pass
2480	3.71	3.95	6.90	7.14	Pass

Pole Antenna

BLE Maximum Output Power					
Test Frequency (MHz)	Power (dBm)		ERIP(dBm)		Result
	1M	2M	1M	2M	
2402	3.84	3.90	6.37	6.43	Pass
2440	4.01	4.15	6.54	6.68	Pass
2480	3.71	3.95	6.24	6.48	Pass

4 Radiated Emissions in restricted frequency bands

Test result: **Pass**

4.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

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

4.2 Measurement Procedure

For Radiated emission below 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
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) Both X and Y axes of the antenna are set to make the measurement.
d) 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.
e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz:

a) 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 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
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 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.

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.

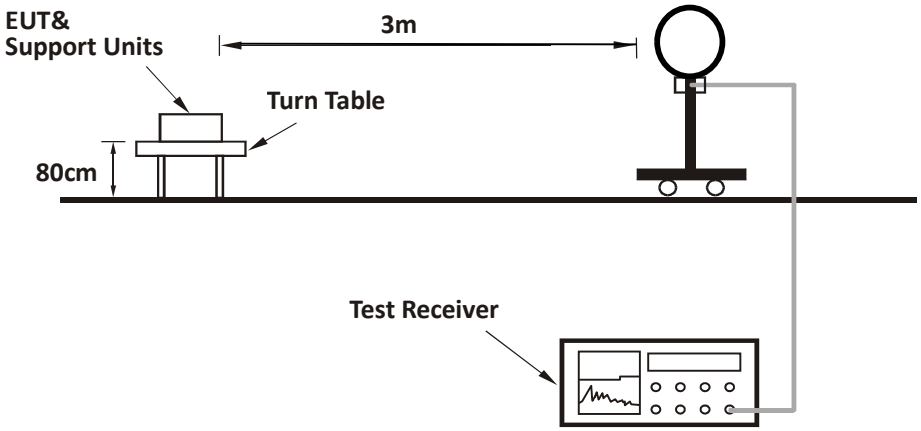
f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

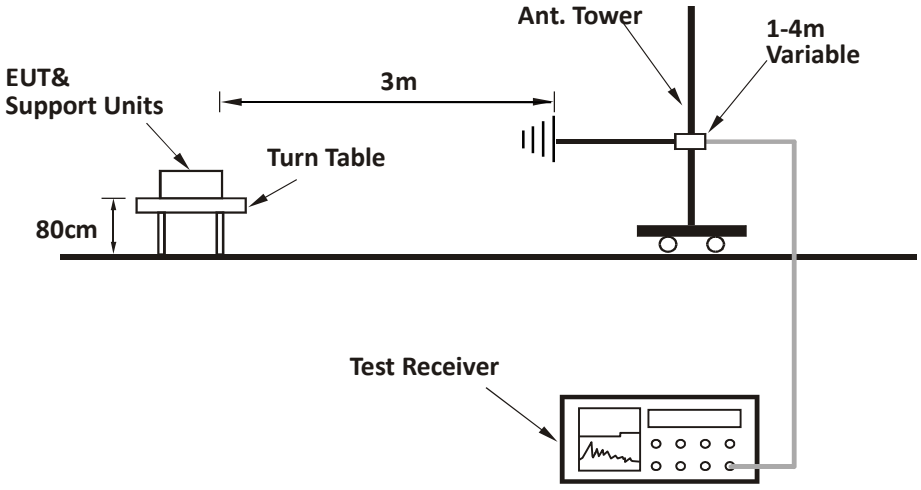
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported

4.3 Test Configuration

For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



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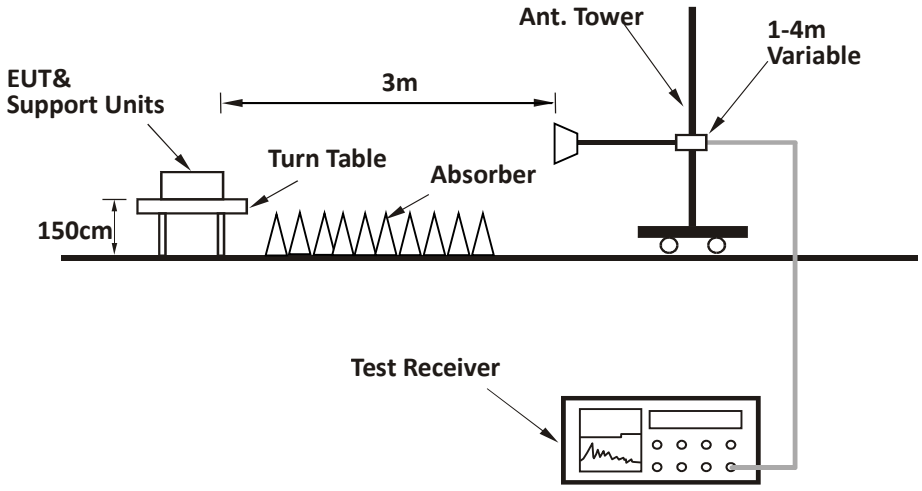
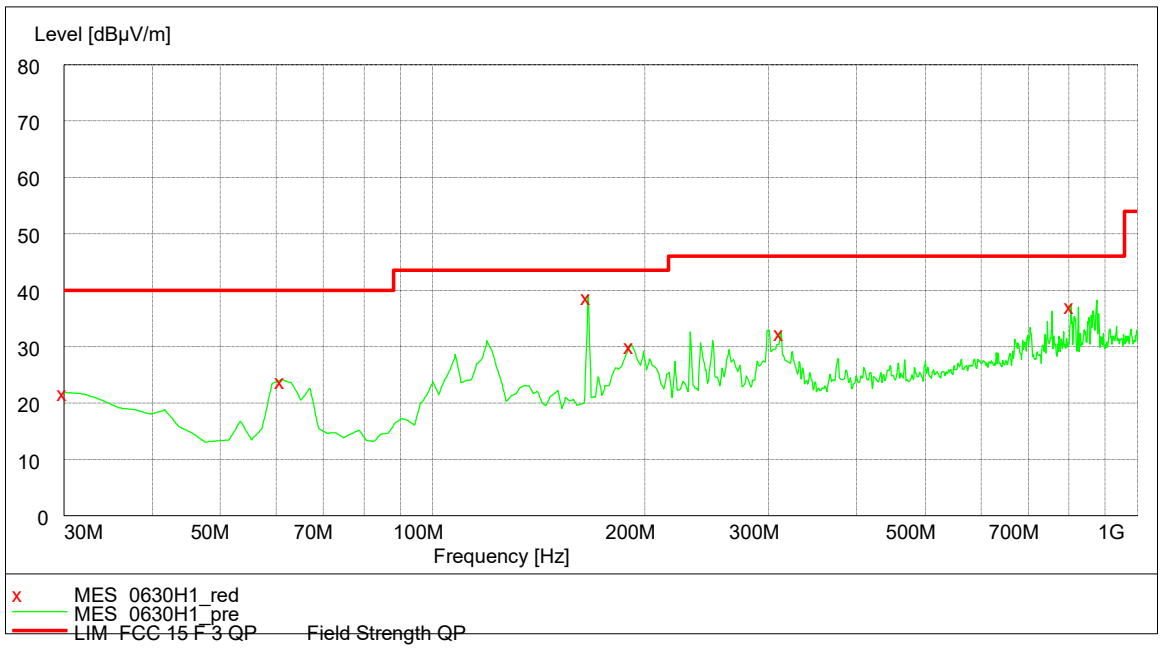
For Radiated emission above 1GHz:



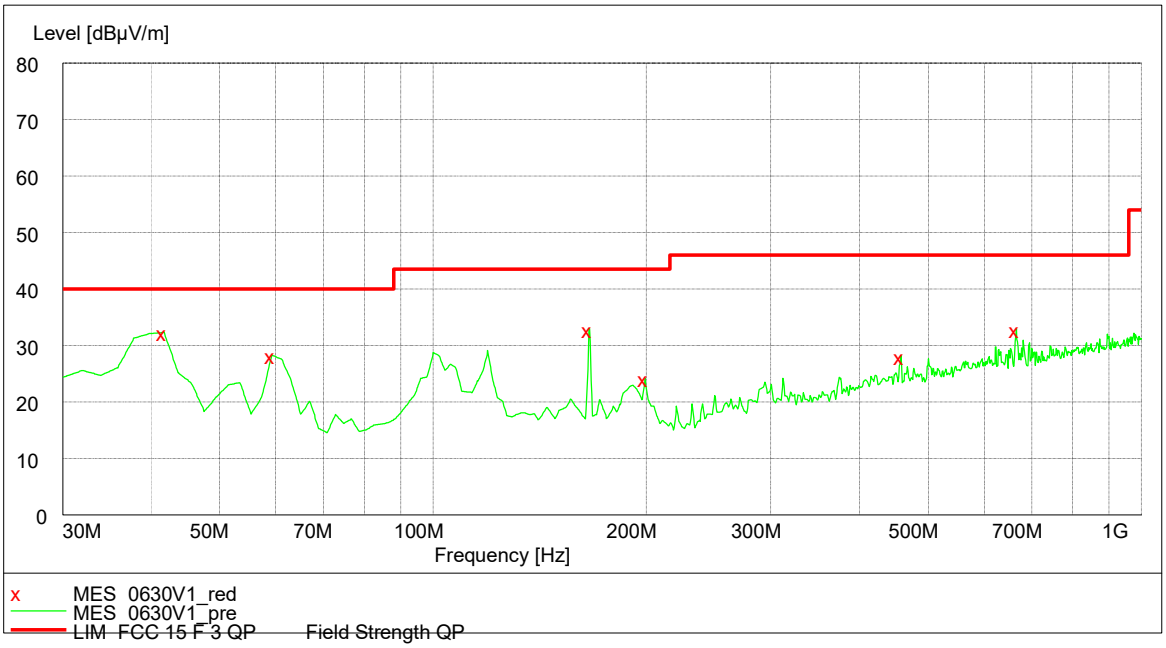
4.4 Test Results of Radiated Emissions

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.
The worst waveform from 30MHz to 1000MHz is listed as below(Chip antenna channel:2402MHz):

Horizontal



Vertical



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Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	21.90	18.8	40.00	18.1	PK
H	61.10	24.10	7.1	40.0	15.9	PK
H	166.07	39.00	11.1	43.5	4.5	PK
H	191.34	30.40	10.9	43.5	13.1	PK
H	311.86	43.90	15.3	46.00	13.3	PK
H	805.61	37.40	23.0	46.00	8.6	PK
V	41.66	35.10	19.8	40.00	4.9	PK
V	59.16	28.30	7.2	40.0	11.7	PK
V	166.07	33.00	11.1	43.50	10.5	PK
V	199.12	24.20	11.1	43.50	19.3	PK
V	457.66	28.20	18.9	46.00	17.8	PK
V	665.65	32.90	21.4	46.00	13.1	PK

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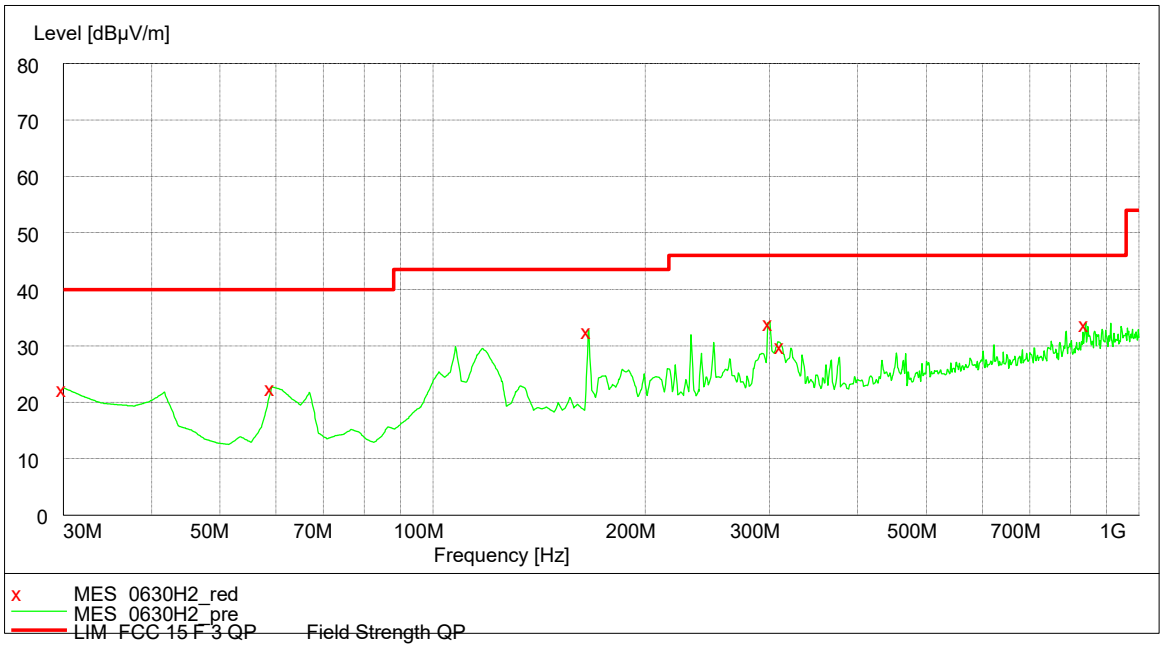
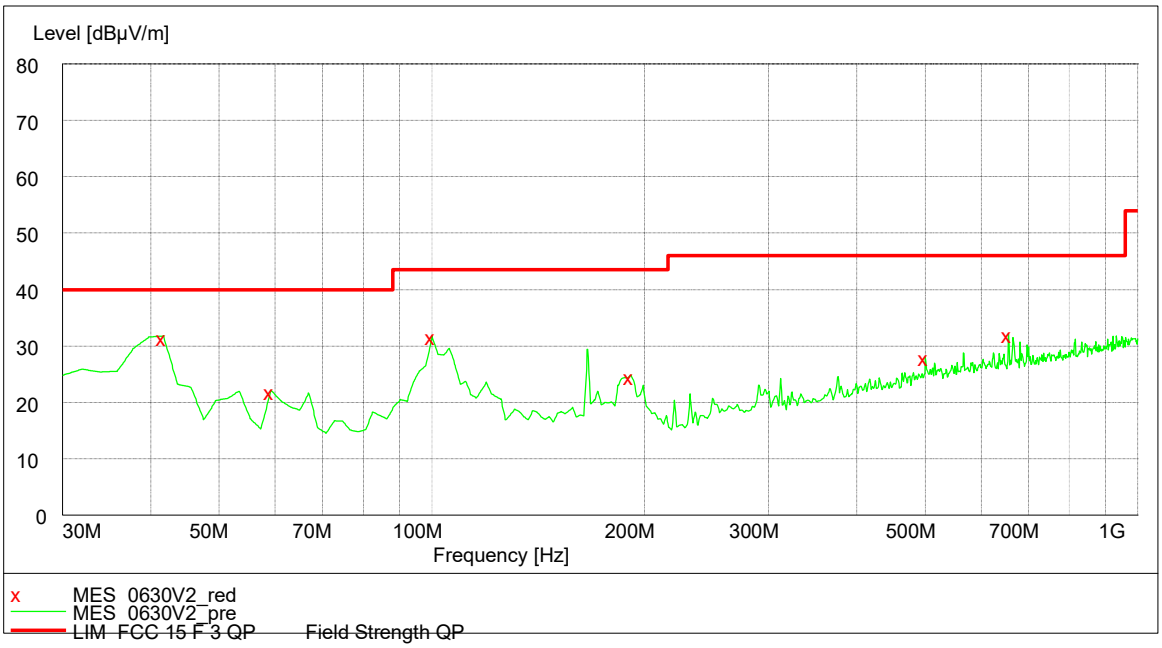
The worst waveform from 30MHz to 1000MHz is listed as below(PCB antenna channel:2402MHz):

Horizontal



Vertical



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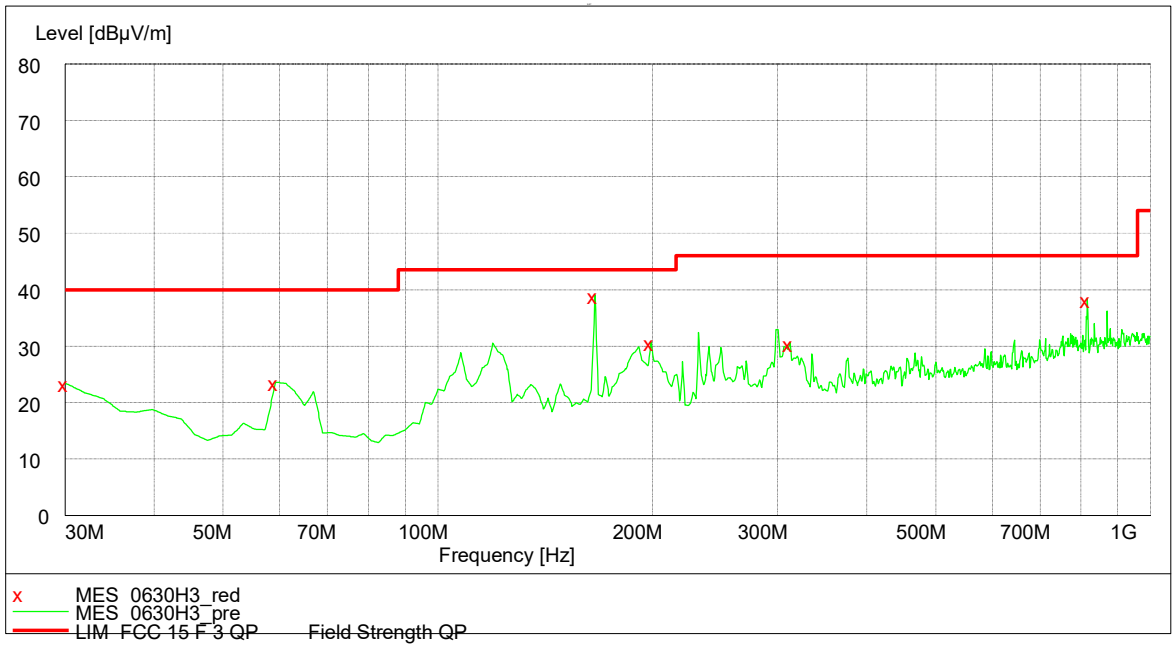
Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	22.50	18.8	40.00	17.5	PK
H	59.16	22.70	7.20	40.0	17.3	PK
H	166.07	32.80	11.1	43.5	10.7	PK
H	300.20	34.30	14.9	46.0	11.7	PK
H	311.86	30.10	15.3	46.00	15.9	PK
H	840.60	34.10	23.0	46.00	11.9	PK
V	41.66	31.70	12.6	40.00	8.3	PK
V	59.16	22.10	7.20	40.0	17.9	PK
V	99.98	31.80	12.1	43.50	11.7	PK
V	191.34	24.80	10.9	43.50	18.7	PK
V	500.42	28.00	19.7	46.00	18.0	PK
V	655.93	32.10	21.3	46.00	13.9	PK

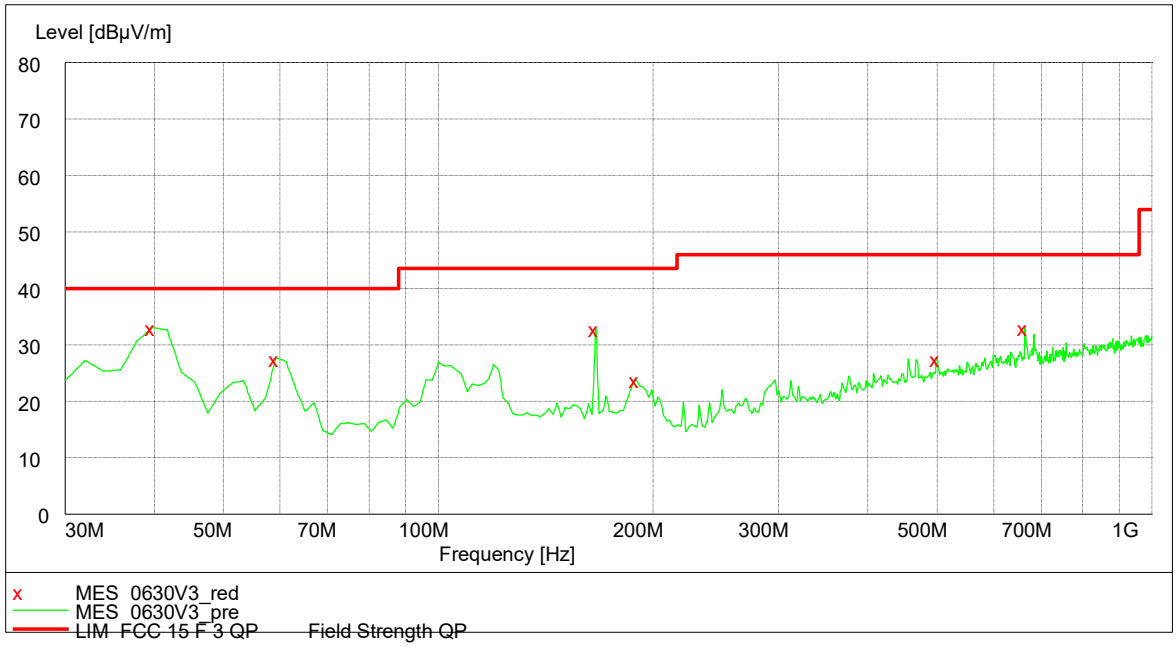
TEST REPORT

The worst waveform from 30MHz to 1000MHz is listed as below(Pole antenna channel:2402MHz):

Horizontal



Vertical



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Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	23.40	18.8	40.00	16.6	PK
H	59.16	23.60	7.20	40.00	16.4	PK
H	166.07	39.00	11.1	43.50	4.5	PK
H	199.12	30.70	11.1	43.50	12.8	PK
H	311.86	30.60	15.3	46.00	15.4	PK
H	815.33	38.30	23.0	46.00	7.7	PK
V	39.72	33.10	13.6	40.00	6.9	PK
V	59.16	27.70	7.20	40.00	12.3	PK
V	166.07	32.90	11.1	43.50	10.6	PK
V	189.40	23.90	10.9	43.50	19.6	PK
V	500.42	27.70	19.7	46.00	18.3	PK
V	663.70	33.20	21.4	46.00	12.8	PK

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Test result above 1GHz:

The emission was conducted from 1GHz to 18GHz

1)Pole antenna

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.00	36.30	101.40	Fundamental	/	PK
	V	2402.00	36.30	93.70	Fundamental	/	PK
	H	2390.00	36.30	43.80	74.00	30.2	PK
	H	2390.00	36.3	36.30	54.00	17.7	AV
	H	4804.00	-9.50	46.20	74.00	27.8	PK
	H	7206.00	-8.20	49.90	74.00	24.1	PK
	V	2390.00	36.30	44.10	74.00	29.9	PK
	V	2390.00	36.30	30.30	54.00	23.7	AV
	V	4804.00	-9.50	45.80	74.00	28.2	PK
	V	7206.00	-8.20	49.45	74.00	24.55	PK
M	H	2440.00	30.70	99.40	Fundamental	/	PK
	V	2440.00	30.70	95.40	Fundamental	/	PK
	H	4880.00	-9.80	46.56	74.00	27.44	PK
	V	4880.00	-9.80	46.02	74.00	27.98	PK
	H	7320.00	-8.50	50.98	74.00	23.02	PK
	V	7320.00	-9.80	49.85	74.00	24.15	PK
H	H	2480.00	36.30	105.70	Fundamental	/	PK
	V	2480.00	36.30	97.70	Fundamental	/	PK
	H	2483.50	36.30	50.60	74.00	23.4	PK
	V	2483.50	36.30	50.40	74.00	23.6	PK
	H	4960.00	-11.85	47.50	74.00	26.5	PK
	H	7440.00	-7.50	52.05	74.00	21.95	PK
	V	4960.00	-11.85	47.35	74.00	26.65	PK
	V	7440.00	-7.50	51.80	74.00	22.2	PK

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2) PCB Antenna

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.00	36.30	101.40	Fundamental	/	PK
	V	2402.00	36.30	93.70	Fundamental	/	PK
	H	2390.00	36.30	43.80	74.00	30.2	PK
	H	2390.00	36.3	36.30	54.00	17.7	AV
	H	4804.00	-9.50	46.20	74.00	27.8	PK
	H	7206.00	-8.20	49.90	74.00	24.1	PK
	V	2390.00	36.30	44.10	74.00	29.9	PK
	V	2390.00	36.30	30.30	54.00	23.7	AV
	V	4804.00	-9.50	45.80	74.00	28.2	PK
	V	7206.00	-8.20	49.45	74.00	24.55	PK
M	H	2440.00	30.70	99.40	Fundamental	/	PK
	V	2440.00	30.70	95.40	Fundamental	/	PK
	H	4880.00	-9.80	46.56	74.00	27.44	PK
	V	4880.00	-9.80	46.02	74.00	27.98	PK
	H	7320.00	-8.50	50.98	74.00	23.02	PK
	V	7320.00	-9.80	49.85	74.00	24.15	PK
H	H	2480.00	36.30	105.70	Fundamental	/	PK
	V	2480.00	36.30	97.70	Fundamental	/	PK
	H	2483.50	36.30	50.60	74.00	23.4	PK
	V	2483.50	36.30	50.40	74.00	23.6	PK
	H	4960.00	-11.85	47.50	74.00	26.5	PK
	H	7440.00	-7.50	52.05	74.00	21.95	PK
	V	4960.00	-11.85	47.35	74.00	26.65	PK
	V	7440.00	-7.50	51.80	74.00	22.2	PK

TEST REPORT

3) Chip antenna

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.00	36.30	101.40	Fundamental	/	PK
	V	2402.00	36.30	93.70	Fundamental	/	PK
	H	2390.00	36.30	43.80	74.00	30.2	PK
	H	2390.00	36.3	36.30	54.00	17.7	AV
	H	4804.00	-9.50	46.20	74.00	27.8	PK
	H	7206.00	-8.20	49.90	74.00	24.1	PK
	V	2390.00	36.30	44.10	74.00	29.9	PK
	V	2390.00	36.30	30.30	54.00	23.7	AV
	V	4804.00	-9.50	45.80	74.00	28.2	PK
	V	7206.00	-8.20	49.45	74.00	24.55	PK
M	H	2440.00	30.70	99.40	Fundamental	/	PK
	V	2440.00	30.70	95.40	Fundamental	/	PK
	H	4880.00	-9.80	46.56	74.00	27.44	PK
	V	4880.00	-9.80	46.02	74.00	27.98	PK
	H	7320.00	-8.50	50.98	74.00	23.02	PK
	V	7320.00	-9.80	49.85	74.00	24.15	PK
H	H	2480.00	36.30	105.70	Fundamental	/	PK
	V	2480.00	36.30	97.70	Fundamental	/	PK
	H	2483.50	36.30	50.60	74.00	23.4	PK
	V	2483.50	36.30	50.40	74.00	23.6	PK
	H	4960.00	-11.85	47.50	74.00	26.5	PK
	H	7440.00	-7.50	52.05	74.00	21.95	PK
	V	4960.00	-11.85	47.35	74.00	26.65	PK
	V	7440.00	-7.50	51.80	74.00	22.2	PK

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

2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

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

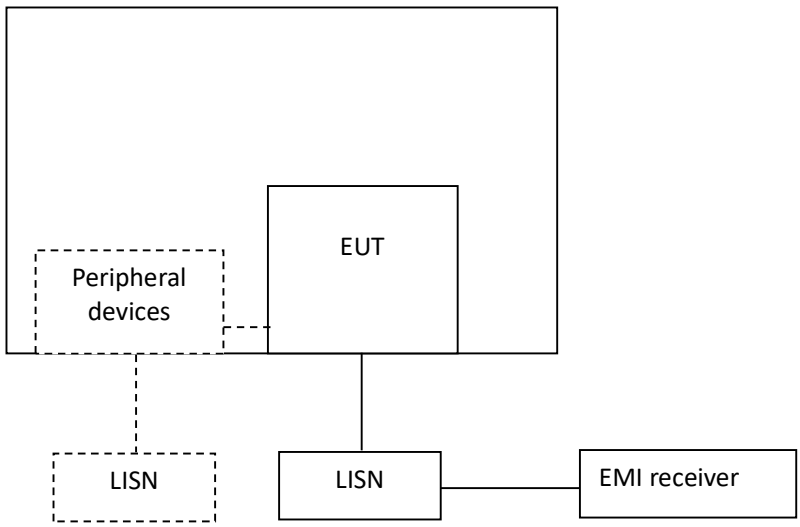
5 Power line conducted emission

Test result: **PASS**

5.1 Limit

Frequency of Emission (MHz)	Conducted 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.		

5.2 Test Configuration



5.3 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.

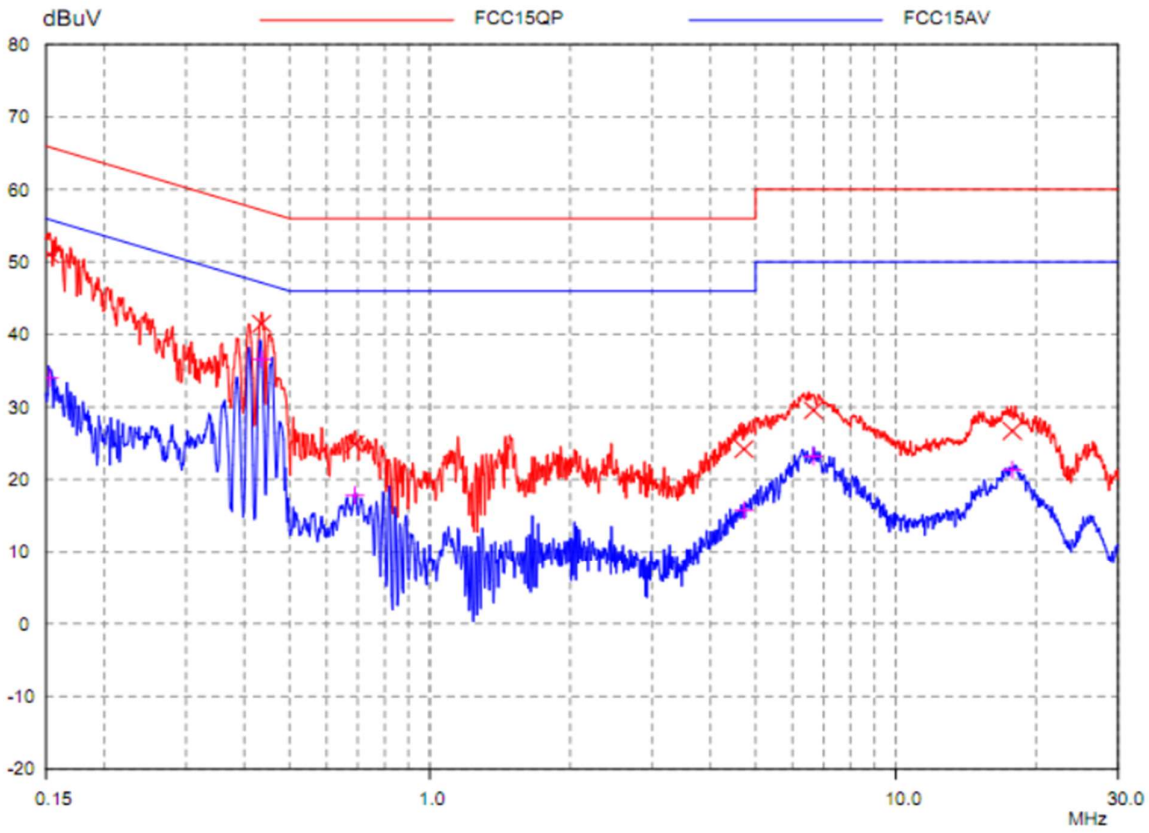
TEST REPORT

5.4 Test Results of Power line conducted emission

The worst waveform from 30MHz to 1000MHz is listed as below:

Test Curve:

L Line



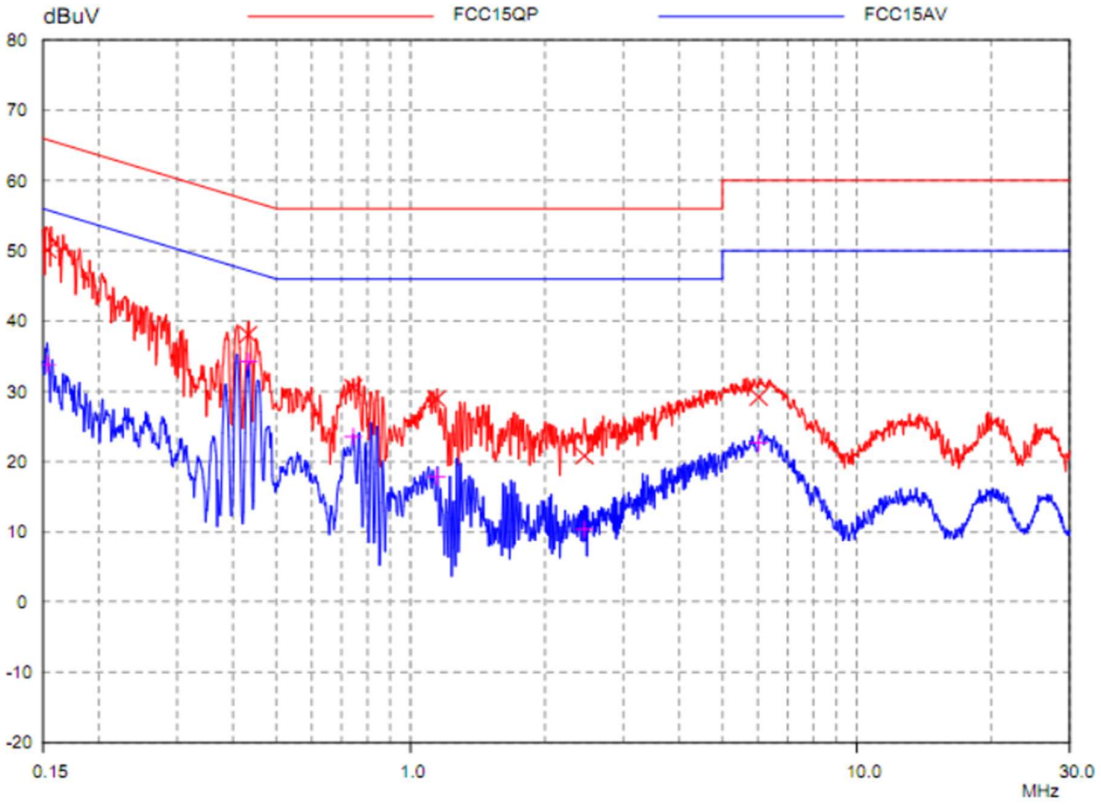
Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.1524	51.04	65.87	14.83	33.97	55.87	21.90
0.4355	41.48	57.15	15.67	36.57	47.15	10.58
0.6892	24.89	56.00	31.11	17.83	46.00	28.17
4.7208	24.18	56.00	31.82	15.75	46.00	30.25
6.6545	29.54	60.00	30.46	23.20	50.00	26.80
17.766	26.67	60.00	33.33	21.34	50.00	28.66

TEST REPORT

Test Curve:

N Line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.1536	50.12	65.80	15.68	33.88	55.80	21.92
0.4320	38.10	57.21	19.11	34.25	47.21	12.96
0.7435	30.54	56.00	25.46	23.57	46.00	22.43
1.1443	28.95	56.00	27.05	17.85	46.00	28.15
2.4529	20.84	56.00	35.16	10.38	46.00	35.62
6.0224	29.18	60.00	30.82	22.69	50.00	27.31

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

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

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

Total Quality. Assured.

TEST REPORT

6 Antenna requirement

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 shall be considered sufficient to comply with the provisions of this section.

Result:
EUT uses unique coupling to the intentional radiator, so it can comply with the provisions of this section.

********** END **********