FCC TEST REPORT
No. 151200162SHA-001

Applicant	:	RAZOR USA LLC. P.O. Box 3610 Cerritos, CA 90703 United States
Manufacturer	:	RAZOR USA LLC. P.O. Box 3610 Cerritos, CA 90703 United States
Product Name	:	Ripstik Electic
Type/Model	:	15155040
TEST RESULT	**:**	**PASS**

SUMMARY

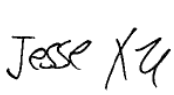
The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2014): Radio Frequency Devices (Subpart C)

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

Date of issue: Jan 14,2016

Prepared by: Reviewed by:



Jesse Xu (*Project Engineer*) Daniel Zhao (*Reviewer*)

Description of Test Facility

Name: Intertek Testing Service Limited Shanghai
Address: Building No.86, 1198 Qinzhou Road(North), Shanghai 200233, P.R. China

FCC Registration Number: 236597
IC Assigned Code: 2402B-1

Name of contact: Jonny Jing
Tel: 86 21 61278271
Fax: 86 21 54262353

Content

1 GENERAL INFORMATION

1.1 Description of Client

Applicant	:	RAZOR USA LLC. P.O. Box 3610 Cerritos, CA 90703 United States
Name of contact	:	David
Tel	:	0562-3456036
Fax	:	-
Email	:	dpang@razorchina.com
Manufacturer	:	RAZOR USA LLC. P.O. Box 3610 Cerritos, CA 90703 United States

1.2 Identification of the EUT

Product Name	:	Ripstik Electic
Type/model	:	15155040
FCC ID	:	2AGU6001

1.3 Technical Specification

Operation Frequency Band	:	2402-2480MHz
Type of Modulation	:	GFSK
Description of EUT	:	Here is one model. We tested the 2402CH , 2442CH and 2480CH and listed the worst data in this report.
Antenna Designation	:	PCB antenna. 0dBi
Rating	:	Battery 3V
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Software applied	:	Set the power to 0dBm
Sample received date	:	Nov 11, 2015
Date of test	:	Nov 18, 2015 ~Jan 06, 2016

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2014)
ANSI C63.10 (2013)

2.2 Mode of operation during the test

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

The EUT is a handheld device, so 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.

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

2.5 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESCS 30	R&S	EC 2107	2015-10-21	2016-10-20
Test Receiver	ESIB 26	R&S	EC 3045	2015-10-20	2016-10-19
A.M.N.	ESH2-Z5	R&S	EC 3119	2015-1-9	2016-1-8
A.M.N.	ENV 216	R&S	EC 3393	2015-8-9	2016-8-8
A.M.N.	ENV 216	R&S	EC 3394	2015-8-9	2016-8-8
A.M.N.	ENV4200	R&S	EC3558	2015-8-9	2016-8-8
Ultra-broadband antenna	HL 562	R&S	EC 3046-1	2015-5-16	2016-5-14
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2015-4-28	2017-4-27
Horn antenna	HF 906	R&S	EC 3049	2015-4-28	2017-4-27
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2015-4-12	2016-4-11
Semi-anechoic chamber	-	Albatross project	EC 3048	2015-5-12	2016-5-11
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2015-1-8	2016-1-7
Power sensor / Power meter	N1911A/N1921A	Agilent	EC4318	2015-04-12	2016-04-11

2.6 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	RESULT
Radiated emission	15.249 & 15.209	Pass
Assigned bandwidth (20dB bandwidth)	15.215(c)	Pass
Power line conducted emission	15.207	NA

Notes: 1: NA =Not Applicable

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3 Radiated emission

Test result: **Pass**

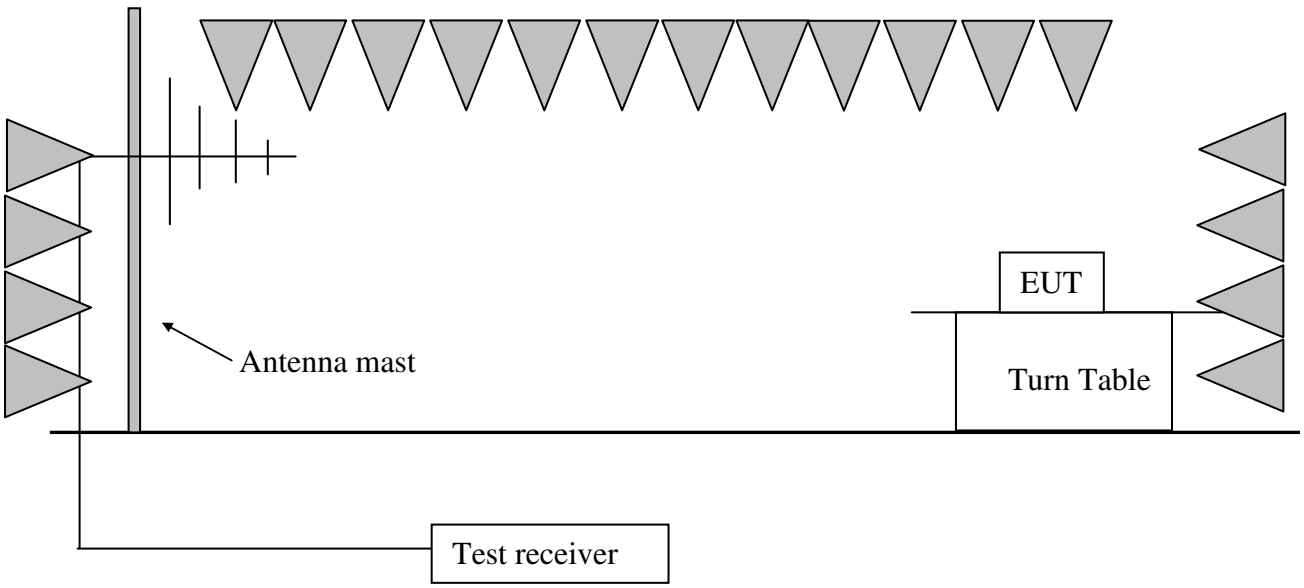
3.1 Test limit

Fundamental Frequency (MHz)	Fundamental limit (dBuV/m)	Harmonic limit (dBuV/m)
☐902 - 928	94	54
☒2400 - 2483.5	94	54
☐5725 - 5875	94	54
☐24000 - 24250	108	68

The radiated emissions which fall outside allocated band (2400-2483.5MHz), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

3.2 Test Configuration



3.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

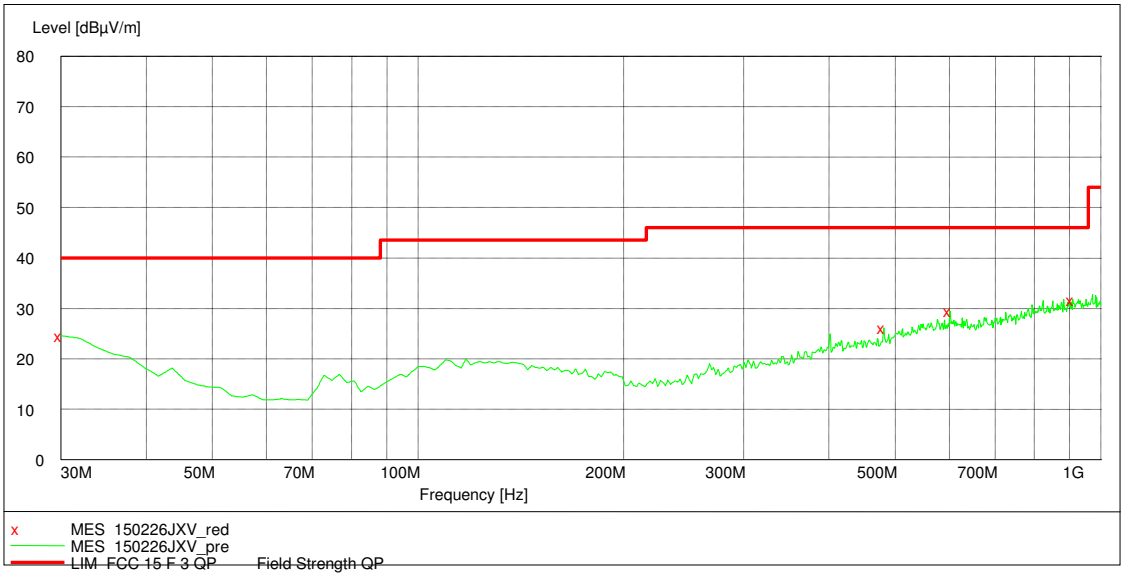
RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);
RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);
RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);
RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

3.4 Test protocol

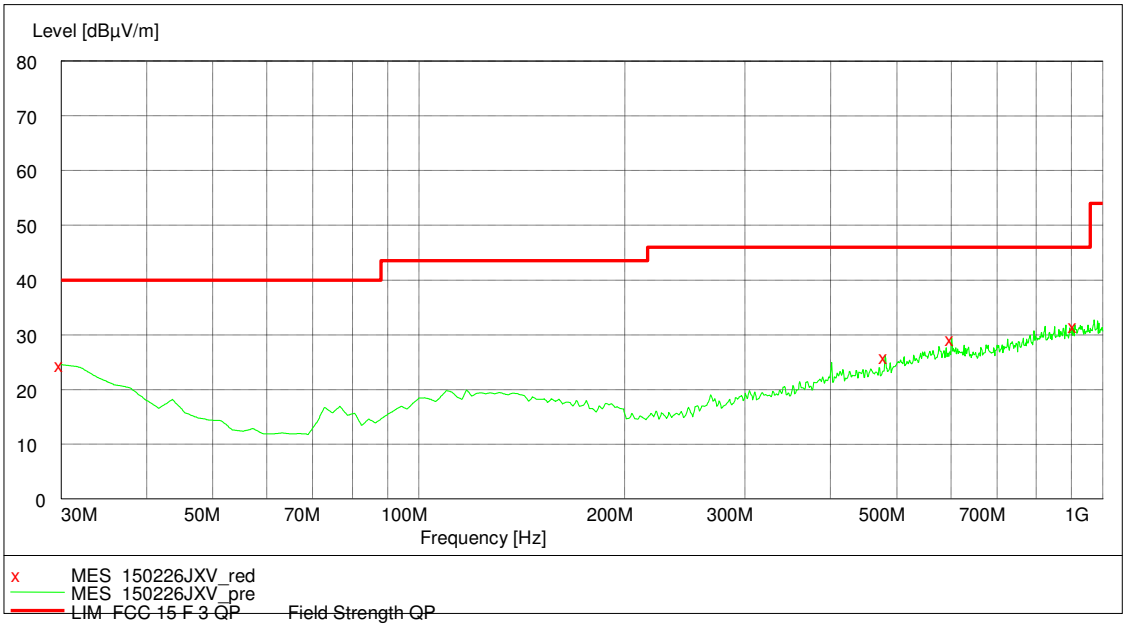
Temperature	:	23 °C
Relative Humidity	:	56 %

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.

30MHz~1GHz, Horizontal



30MHz~1GHz, Vertical



Test data at 30MHz~1GHz:

Polarization	Frequency (MHz)	Measured level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
H	30.0	25.0	40.0	15.0	PK
	133.0	25.7	43.5	17.8	PK
	401.3	30.6	46.0	15.4	PK
	669.5	30.0	46.0	16.0	PK
	893.1	35.4	46.0	10.6	PK
V	30.0	25.3	40.0	14.7	PK
	43.6	20.8	40.0	19.2	PK
	133.0	26.3	43.5	17.2	PK
	222.4	29.2	46.0	16.8	PK
	311.9	26.7	46.0	19.3	PK
	490.7	32.3	46.0	13.7	PK
	580.1	35.9	46.0	10.1	PK
	937.8	34.0	46.0	12.0	PK

Note: The worst test result (30MHz to 1GHz) of channel L (2402MHz) chosen to list in the report as representative.

Test result above 1GHz:

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.00	30.70	92.40	94.00	1.60	PK
	H	2398.00	30.30	36.50	54.00	17.50	PK
	H	4804.00	-1.50	41.30	54.00	12.70	PK
	H	7206.00	3.50	40.10	54.00	13.90	PK
	V	2402.00	30.70	87.40	94.00	6.60	PK
	V	4804.00	-1.50	40.02	54.00	13.98	PK
M	H	2442.00	30.70	89.50	94.00	4.50	PK
	H	4880.00	-1.10	43.37	54.00	10.63	PK
	H	7320.00	3.60	40.48	54.00	13.52	PK
	V	2442.00	30.70	88.00	94.00	6.00	PK
	V	4880.00	-1.10	41.05	54.00	12.95	PK
H	H	2480.00	30.70	88.20	94.00	5.80	PK
	H	2483.50	30.80	42.20	54.00	11.80	PK
	H	4960.00	-0.80	40.60	54.00	15.40	PK
	V	2480.00	30.70	87.45	94.00	6.55	PK
	V	2485.05	29.45	38.19	54.00	15.81	PK
	V	4960.00	-0.80	40.38	54.00	13.62	PK

Remark:

1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed);
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 = 10dBuV,
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m,
Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m,
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m,
Then Margin = 54 -10.20 = 43.80dBuV/m.

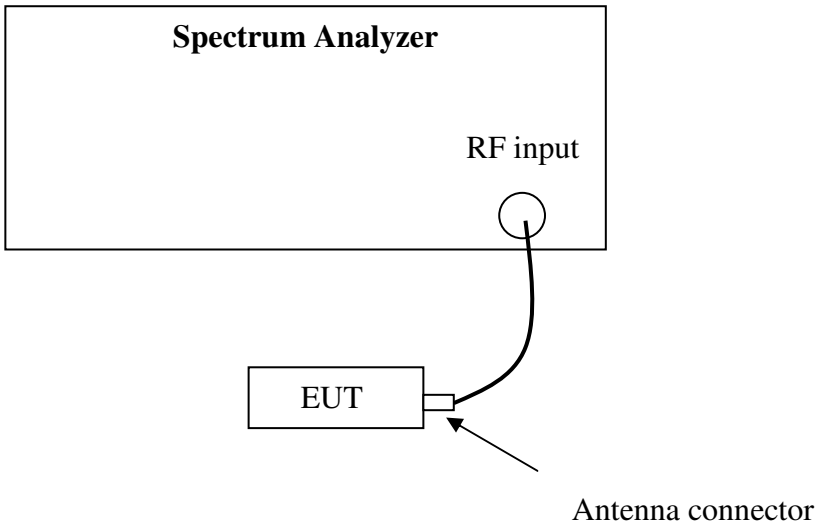
4 Assigned bandwidth (20dB bandwidth)

Test result: **Pass**

4.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band.

4.2 Test Configuration



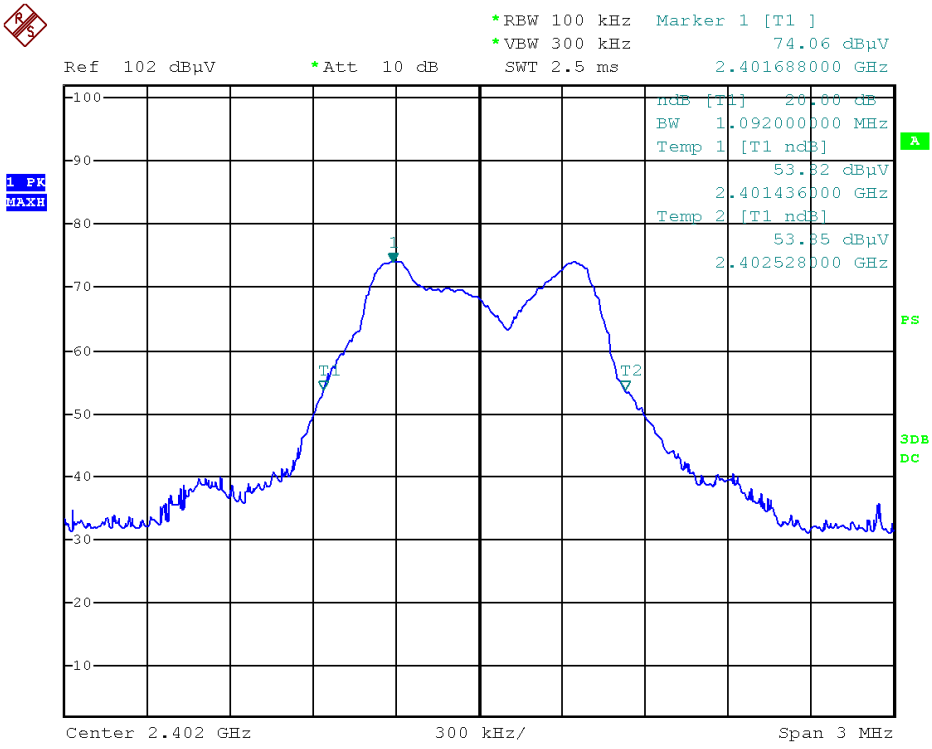
4.3 Test procedure and test setup

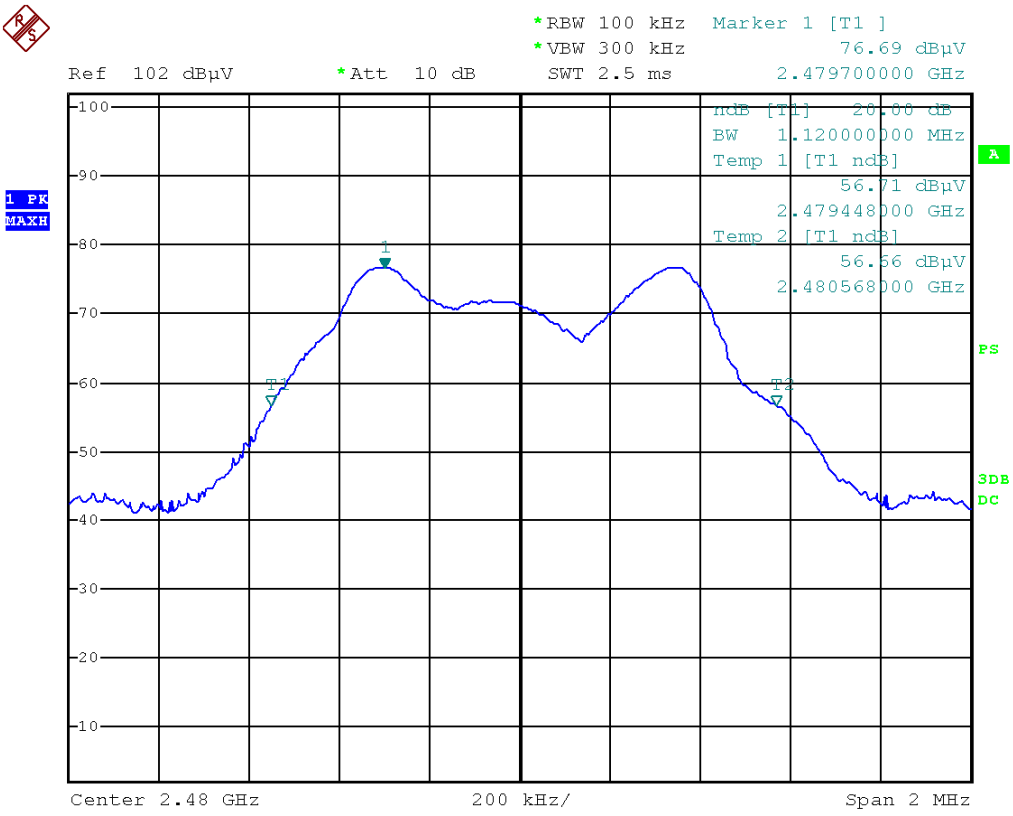
The 20dB Bandwidth per FCC § 15.215(c) is measured using the Spectrum Analyzer. Set Span = 2 to 3 times the 20 dB bandwidth, RBW = approximately 1% of the 20 dB bandwidth, VBW>RBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at 3 channels (lowest, middle and highest channel).

4.4 Test protocol

Temperature : 24 °C
Relative Humidity : 56 %

20dB bandwidth (MHz)	permitted band (MHz)	Result
2401.43 ~ 2480.56	2400 ~ 2483.5	Pass





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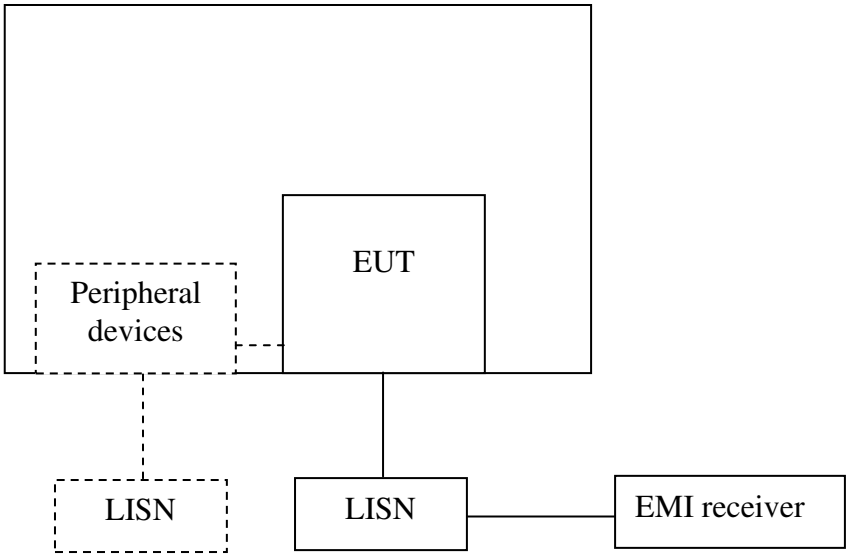
5 Power line conducted emission

Test result: **NA**

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



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.

5.3 Test procedure and test set up

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.

5.4 Test protocol

Temperature : ℃
Relative Humidity : %

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)

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)