Aibo Standard Technology (Shenzhen) Co., Ltd.
101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District, Shenzhen City, Guangdong Province, China
Tel.: +(86) 0755 85250797 E-mail: Aibonorm@aibonorm.com Website: www.Aibonorm.com

FCC&IC TEST REPORT

Report No.:	AB25060084FW01
FCC ID.:	**2AC59-OE928**
IC ID.:	**32474-OE928**
Applicant.:	SHENZHEN LOFREE CULTURE CO., LTD
Address.:	201-F4,F518 Idea Land,1065 Bao Yuan Road, Shenzhen
Manufacturer.:	SHENZHEN LOFREE CULTURE CO., LTD
Address.:	201-F4,F518 Idea Land,1065 Bao Yuan Road, Shenzhen
Product Name.:	FLOW 2-68 Triple Mode Low-Profile Mechanical Keyboard
Trade Mark.:	lofree
Test Model.:	OE928
Additional Model(s).:	N/A
Standard.:	FCC 47 CFR Part 15 Subpart C (Part 15.247) RSS-Gen Issue 5 RSS-247 Issue 3
Date of Receipt.:	2025.07.03
Date of Test Date.:	2025.07.03-2025.08.13
Date of Issue.:	2025.08.13
Test Result.:	Pass

Compiled by: (Printed Name + Signature)	Huaijie Li	Huaijie Li
Supervised by: (Printed Name + Signature)	Jay Liu	Jay Liu
Approved by: (Printed Name + Signature)	Mic Cheng	Mic Cheng

Testing Laboratory Name.:	Aibo Standard Technology (Shenzhen) Co., Ltd.
Address.:	101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District, Shenzhen City, Guangdong Province, China

FCC&IC TEST REPORT

Test Report No.: AB25060084FW01	2025.08.13 Date of issue

EUT.....	: FLOW 2-68 Triple Mode Low-Profile Mechanical Keyboard
Test Model.....	: OE928
Applicant.....	**:** SHENZHEN LOFREE CULTURE CO., LTD
Address.....	: 201-F4,F518 Idea Land,1065 Bao Yuan Road, Shenzhen
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**:** SHENZHEN LOFREE CULTURE CO., LTD
Address.....	: 201-F4,F518 Idea Land,1065 Bao Yuan Road, Shenzhen
Telephone.....	: /
Fax.....	: /
Factory.....	**:** SHENZHEN LOFREE CULTURE CO., LTD
Address.....	: 201-F4,F518 Idea Land,1065 Bao Yuan Road, Shenzhen
Telephone.....	: /
Fax.....	: /

Test Result	Positive

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

REPORT VERSION

Version No.	Issue Date	Description
01	2025.08.13	Initial Issue

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1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF EUT

Product Name:	FLOW 2-68 Triple Mode Low-Profile Mechanical Keyboard

Trade Mark:	Lofree	
Test Model:	OE928	
Additional Model(s):	/	
Model Difference:	/	
Hardware Version:	OE928-VIA-V1	
Software Version:	1	
Power Supply:	DC 3.7V by battery(3000mAh) or DC from USB Port	
EUT Supports Function: (Provided by the customer)	2.4GHz ISM Bands:	Bluetooth V5. 1
Test Sample(s) Number:	AB25060084-01 (Engineer Sample)	
Radio Specification Subject to this Report		
Bluetooth Version:	Bluetooth LE	
Frequency Range:	2402MHz~2480MHz	
Modulation Type:	GFSK	
Channel Spacing:	2MHz	
Channel Number(s):	40	
Antenna Type:	PCB Antenna	
Antenna Gain:	-0.58dBi(Max.)	

1.2. DESCRIPTION OF SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number	Supplied by
AC/DC Adapter	Xiaomi	MDY-11-EX	SA62212LA04358J	Applicant
Lenovo	Notebook	B470	WB05067151	Applicant

1.3. DESCRIPTION OF EXTERNAL I/O

I/O Port Description	Quantity	Cable
USB Type-C Interface	1	0.8m, unshielded

1.4. GENERAL DESCRIPTION OF APPLIED STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247 - Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

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

KDB 558074 D01 15.247 Meas Guidance v05r02 - Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under Section 15.247 Of the FCC Rules.

RSS-Gen Issue 5-General Requirements for Compliance of Radio Apparatus

RSS-247 Issue 3-Digital Transmission Systems (DTSs),Frequency Hopping Systems (FHSs)and Licence-Exempt Local Area Network(LE-LAN) Devices

1.5. DESCRIPTION OF TEST FACILITY

Test Lab: Aibo Standard Technology (Shenzhen) Co., Ltd.

Address: 101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District, Shenzhen City, Guangdong Province, China

Tel.: +(86) 0755 85250797

E-mail: Aibonorm@aibonorm.com

Website: www.Aibonorm.com

The test facility is recognized, certified, or accredited by the following organizations:

A2LA-Lab Certificate No.: 7514.01

Aibo Standard Technology (Shenzhen) Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.

Designation Number: CN1411

Test Firm Registration Number: 567066

ISED Wireless Device Testing Laboratories

Company Number: 33924

CAB identifier: CN0185

1.6. MEASUREMENT UNCERTAINTY

The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Items	Measurement Uncertainty
Power Line Conducted Emission (9kHz~150kHz)	±3.62dB
Power Line Conducted Emission (150kHz~30MHz)	±3.38dB
Radiated Emission (9kHz~30MHz)	±3.10dB
Radiated Emission (30MHz~1GHz)	±4.90dB
Radiated Emission (1GHz~18GHz)	±3.88dB
Radiated Emission (8GHz~40GHz)	±5.32dB
RF Conducted Power	±0.57dB
Conducted Spurious Emissions	±1.60dB
RF Frequency	$\pm 6.0 \times 10^{-7}$
Occupied Channel Bandwidth	±28.87KHz
Maximum Power Spectral Density Level	±0.59dB

Note: All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

1.7. ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	+15°C ~ +35°C
Lative Humidity	20 % ~ 75 %
Air Pressure	98KPa ~ 101KPa

1.8. DESCRIPTION OF TEST MODES

Operation Frequency List	
Channel Number	Frequency (MHz)
00	**2402**
01	2404
⋮	⋮
19	**2440**
20	2442
21	2444
⋮	⋮
38	2478
39	**2480**

For portable device, radiated emission was verified over X, Y, Z Axis, and shown the worst case in this report. The following operating modes were applied for the related test items. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data packets and antenna ports (if EUT with antenna diversity architecture), only the result of the worst case was recorded in the report.

List of Test Modes	
Test Mode(s)	Description
TM1	Keep the EUT works in continuously transmitting mode (BLE 1M)

Power setting during the test:

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Software Version	#*#*3646633#*#*		
Frequency	2402MHz	2440MHz	2480MHz
RF Power Parameter(s)	Default	Default	Default

2. SUMMARY OF TEST RESULT

Test Cases			
FCC&IC Rule	**Description of Test Item(s)**	**Result**	**Test Engineer**
Part 15.203	Antenna Requirement	Pass	Jacey Fu
Part 15.247(b)(3) RSS-247 5.4(d)	Maximum Peak Conducted Output Power	Pass	Jacey Fu
Part 15.247(a)(2) RSS-247 5.2(a) RSS-Gen 6.7	6dB Bandwidth& Occupied Bandwidth	Pass	Jacey Fu
Part 15.247(e) RSS-247 5.2(b)	Power Spectral Density	Pass	Jacey Fu
Part 15.247(d) RSS-Gen 8.9, 8.10 RSS-247 5.5	Conducted Spurious Emissions and Conducted Band Edges Measurement	Pass	Jacey Fu
Part 15.205, 15.209, 15.247(d) RSS-Gen 8.9, 8.10 RSS-247 5.5	Radiated Emissions and Radiated Band Edges Measurement	Pass	Jacey Fu
Part 15.207 RSS-Gen 8.8	Power Line Conducted Emissions	Pass	Jacey Fu

3. MEASUREMENT INSTRUMENTS LIST

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
1	Loop Antenna	Schwarzbeck	FMZB 1519	1519-025	02/19/2025	02/18/2026
2	Power Amplifier	HZEMC	HPA-9K0133	HYPA23029	02/19/2025	02/18/2026
3	Broadband Antenna	Schwarzbeck	VULB 9168	01763	02/19/2025	02/18/2026
4	Attenuator	PRM	ATT50-6-3	ATT50-6-3	01/20/2025	01/19/2026
5	Spectrum Analyzer	R&S	FSV40-N	101365	01/20/2025	01/19/2026
6	Horn Antenna	Schwarzbeck	BBHA 9120 D	02786	02/19/2025	02/18/2026
7	Horn Antenna	Schwarzbeck	ZLB7-18-40G-77	072410839	02/19/2025	02/18/2026
8	Power Amplifier	HZEMC	PA0118-43	HYPA23030	02/19/2025	02/18/2026
9	Power Amplifier	HZEMC	PA01840-45	HYPA23031	02/19/2025	02/18/2026
10	EMI Test Receiver	R&S	ESCI	101196	01/20/2025	01/19/2026
11	LISN	R&S	ENV216	102374	01/20/2025	01/19/2026
12	Pulse Limiter	Schwarzbeck	ESH3-Z2	0357.8810.54	01/20/2025	01/19/2026
13	MXA Signal Analyzer	Keysight	N9020A	MY52091389	01/20/2025	01/19/2026
14	Power Sensor	Agilent	U2021XA	MY54110007	01/31/2025	01/30/2026
15	Power Sensor	Agilent	U2021XA	MY54110009	01/31/2025	01/30/2026
16	MXG Vector Signal Generator	Agilent	N5182A	MY47070153	01/20/2025	01/19/2026
17	Analog Signal Source	Keysight	N5173B	MY60403029	01/20/2025	01/19/2026
18	Vector Signal Generator	R&S	SMCV100B	106103	01/20/2025	01/19/2026
19	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW500	118780	01/20/2025	01/19/2026
20	DC POWER SUPPLY	MAISHENG	MT-305DS	2021040016	02/28/2025	02/27/2026
21	Const Temp. & Humidity Chamber	GRT	GR-HWX-150L	GR25010601	01/20/2025	01/19/2026

Test Software		
Software name	Model	Version
Conducted Emission Measurement Software	FASLAB	V4.1
Radiated Emission Measurement Software	FASLAB	V4.1
Bluetooth and WIFI Test System	MTS 8310	V3.0.0.0

4. ANTENNA REQUIREMENT

1) Standard Requirement

15.203 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2) Conclusion

Antenna in the interior of the equipment and no consideration of replacement. The gain of the antenna is -0.58dBi (Max.). It complies with the standard requirement.

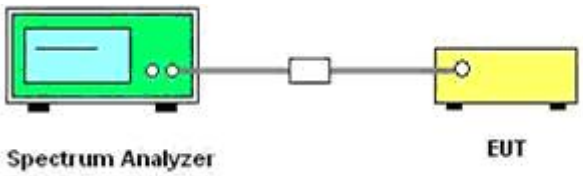
5. CONDUCTED OUTPUT POWER

5.1. LIMIT

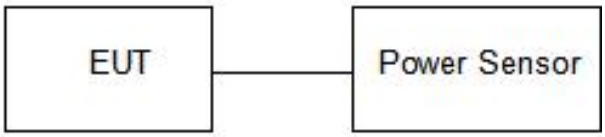
According to 15.247(b)(3) and IC RSS-247 5.4(d). For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the 1 Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

5.2. TEST SETUP

☒ **Using a Spectrum Analyzer for Testing:**



☐ **Using a Broadband Power Meter for Testing:**



5.3. TEST PROCEDURE

☒ **Using a Spectrum Analyzer for Testing:**

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

a) Use the following spectrum analyzer settings:

1) Set the RBW ≥ DTS bandwidth, centered on the test channel.

2) Set VBW ≥ 3 x RBW.

3) Set Span ≥ 3 x RBW.

4) Sweep: Auto.

5) Detector function: Peak.

6) Trace: Max hold.

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

e) A plot of the test results and setup description shall be included in the test report.

☐ **Using a Broadband Power Meter for Testing:**

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the broadband power meter.

5.4. TEST RESULT

Pass.

Please refer to the Appendix for Bluetooth LE RF Conducted Test Data.

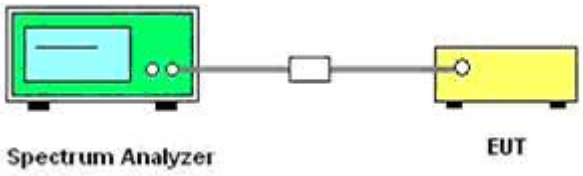
Note: The test results including the cable lose.

6. 6DB BANDWIDTH AND OCCUPIED BANDWIDTH

6.1. LIMIT

According to 15.247(a)(2) and IC RSS-247 5.2(a), Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2. TEST SETUP



6.3. TEST PROCEDURE

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

For 6dB Bandwidth Measurement:

a) Span = approximately 1.5 to 5 times the OBW, centered on the test channel.

b) RBW = 100KHz.

c) VBW ≥ 3 x RBW

d) Sweep = auto;

e) Detector function = peak

f) Trace = max hold

g) All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 6dB down bandwidth of the emission.

For 99% Occupied Bandwidth Measurement:

a) Span = approximately 1.5 to 5 times the OBW, centered on the test channel.

b) RBW = 1% to 5% of the OBW.

c) VBW ≥ 3 x RBW

d) Sweep = auto;

e) Detector function = peak

f) Trace = max hold

g) Use the 99% power bandwidth function of the instrument to measure the Occupied Bandwidth and recoded.

6.4. TEST RESULT

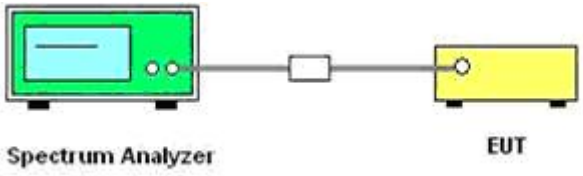
Please refer to the Appendix for Bluetooth BLE RF Conducted Test Data.

7. POWER SPECTRAL DENSITY

7.1. LIMIT

According to 15.247(e) and IC RSS-247 5.2(b), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

7.2. TEST SETUP



7.3. TEST PROCEDURE

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

a) Set analyzer center frequency to DTS channel center frequency.

b) Set the span to 1.5 times the DTS bandwidth.

c) Set the RBW to: 3KHz ≤ RBW ≤ 100KHz.

d) Set the VBW ≥ 3 x RBW.

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.4. TEST RESULT

Pass.

Please refer to the Appendix for Bluetooth LE RF Conducted Test Data.

8. RADIATED EMISSIONS AND RADIATED BAND EDGES MEASUREMENT

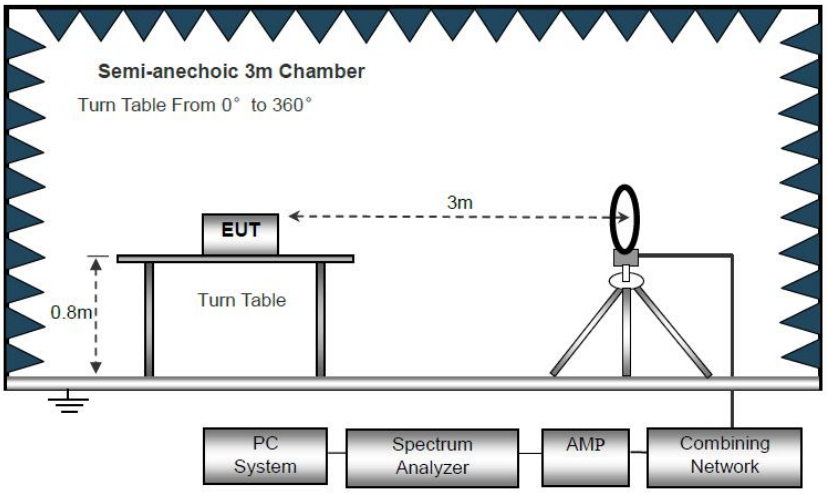
8.1. LIMIT

According to §15.247(d) and IC RSS-247, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

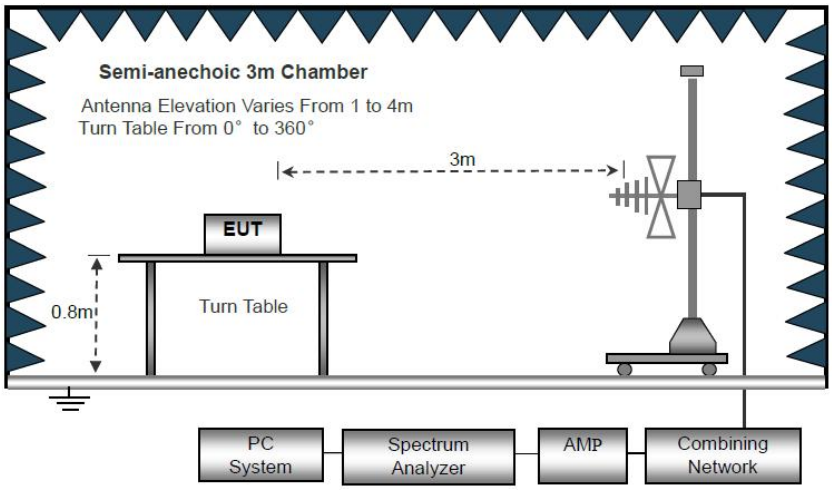
Limits of Spurious Emissions				
Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz~0.490MHz	2400/F(kHz)	---	---	300
0.490MHz~1.705MHz	24000/F(kHz)	---	---	30
1.705MHz~30MHz	30	---	---	30
30MHz~88MHz	100	40.0	Quasi-peak	3
88MHz~216MHz	150	43.5	Quasi-peak	3
216MHz~960MHz	200	46.0	Quasi-peak	3
960MHz~1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Remark:
a) The lower limit shall apply at the transition frequencies.
b) Emission level (dBuV/m) = 20*log Emission level (uV/m).
c) For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
d) Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

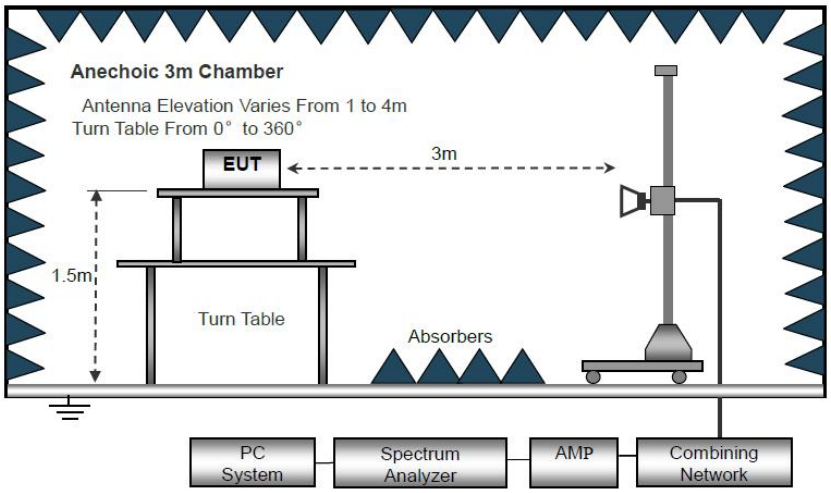
8.2. TEST SETUP



Block Diagram of Radiated Emission Below 30MHz



Block Diagram of Radiated Emission From 30MHz to 1GHz



Block Diagram of Radiated Emission Above 1GHz

8.3. TEST PROCEDURE

a) Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.

b) Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0 degree to 360 degree to acquire the highest emissions from EUT.

c) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

d) Repeat above procedures until all frequency measurements have been completed.

e) Radiated emission test frequency band from 9KHz to 25GHz.

f) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and record the worst case in this report.

g) The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz~30MHz	Active Loop Antenna	3
30MHz~1GHz	Bilog Antenna	3
1GHz~18GHz	Horn Antenna	3
18GHz~25GHz	Horn Anternna	1

h) Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz~150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz~30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz~1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP
1GHz~40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

8.4. TEST RESULT

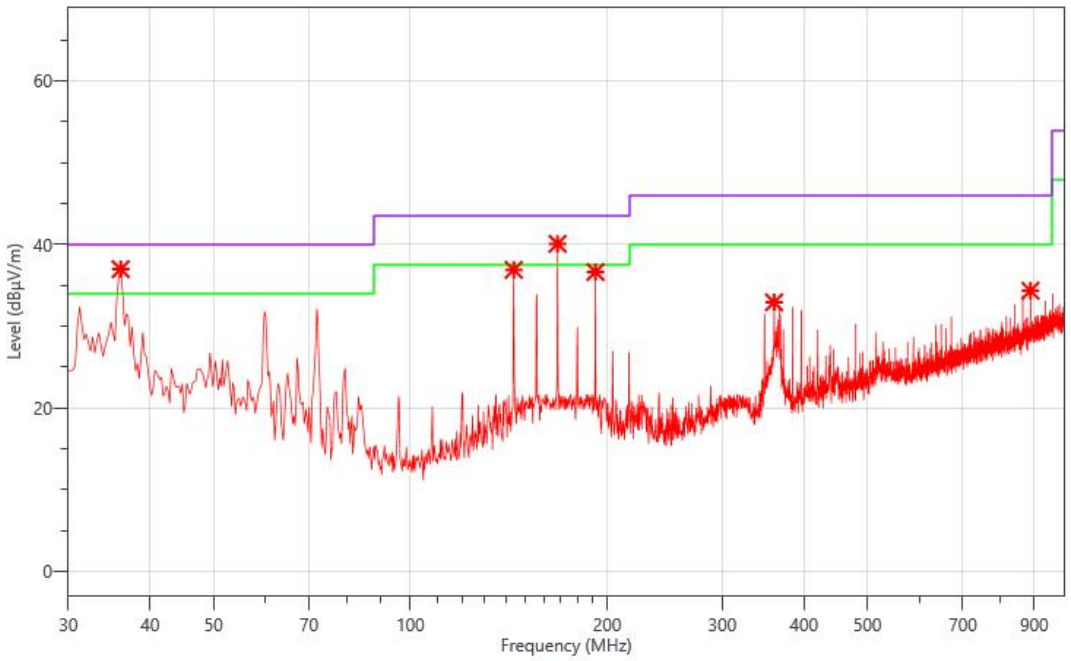
Pass.

Remark:

a) Pre-scan all modes and recorded the worst case in this report.

b) Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and the emission levels from 9kHz to 30MHz are attenuated 20dB below the limit and not recorded in report.

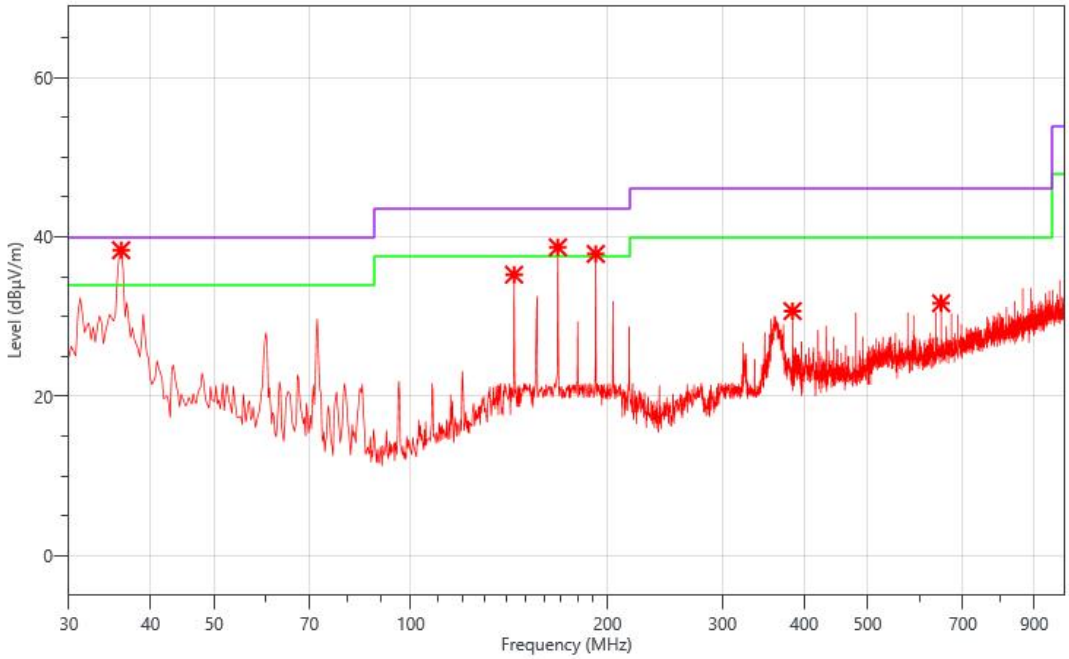
Radiated Emission Test Data (30MHz to 1GHz)			
Environmental Conditions	24.6℃, 53.4% RH	Test Engineer	Jacey Fu
Worst Test Mode:	TM1(BLE 1M)	Polarity:	Horizontal



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Pol.
1	36.063	50.43	-13.47	36.96	40.00	3.04	PK+	H
2	143.975	48.98	-12.1	36.88	43.50	6.62	PK+	H
3	167.983	52.06	-12	40.06	43.50	3.44	PK+	H
4	191.990	51.65	-15.04	36.61	43.50	6.89	PK+	H
5	360.043	42.82	-9.92	32.90	46.00	13.10	PK+	H
6	888.208	33.89	0.44	34.33	46.00	11.67	PK+	H

Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Limit. - Emission Level

Radiated Emission Test Data (30MHz to 1GHz)			
Environmental Conditions	24.6℃, 53.4% RH	Test Engineer	Jacey Fu
Worst Test Mode:	TM1(BLE 1M)	Polarity:	Vertical



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Pol.
1	36.063	51.80	-13.47	38.33	40.00	1.67	PK+	V
2	143.975	47.36	-12.1	35.26	43.50	8.24	PK+	V
3	167.983	50.69	-12	38.69	43.50	4.81	PK+	V
4	191.990	52.90	-15.04	37.86	43.50	5.64	PK+	V
5	384.050	39.91	-9.22	30.69	46.00	15.31	PK+	V
6	648.133	34.87	-3.2	31.67	46.00	14.33	PK+	V

Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Limit. - Emission Level

Radiated Emission Test Data (Above 1GHz)							
Environmental Conditions	24.6℃, 53.4% RH			Test Engineer		Jacey Fu	
Lowest Channel (Worst Case: BLE 1M_2402MHz)							
Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (PEAK/AVG)	Polar (H/V)
4804	67.24	-6.77	60.47	74	13.53	PEAK	H
4804	53.66	-6.77	46.89	54	7.11	AVG	H
7206	58.8	-4	54.8	74	19.2	PEAK	H
7206	45.77	-4	41.77	54	12.23	AVG	H
4804	52.26	-5.53	46.73	74	27.27	PEAK	V
4804	44.25	-5.53	38.72	54	15.28	AVG	V
7206	57.48	-1.96	55.52	74	18.48	PEAK	V
7206	36.76	-1.96	34.8	54	19.2	AVG	V
Middle Channel (Worst Case: BLE 1M_2440MHz)							
Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (PEAK/AVG)	Polar (H/V)
4880	66	-8.86	57.14	74	16.86	PEAK	H
4880	54.88	-8.86	46.02	54	7.98	AVG	H
7320	53.39	-1.32	52.07	74	21.93	PEAK	H
7320	48.19	-1.32	46.87	54	7.13	AVG	H
4880	55.89	-7.04	48.85	74	25.15	PEAK	V
4880	46.36	-7.04	39.32	54	14.68	AVG	V
7320	54.87	-1.5	53.37	74	20.63	PEAK	V
7320	41.16	-1.5	39.66	54	14.34	AVG	V
Highest Channel (Worst Case: BLE 1M_2480MHz)							
Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (PEAK/AVG)	Polar (H/V)
4960	63.78	-6.44	57.34	74	16.66	PEAK	H
4960	58.68	-6.44	52.24	54	1.76	AVG	H
7440	52.33	-1.46	50.87	74	23.13	PEAK	H
7440	32.03	-1.46	30.57	54	23.43	AVG	H
4960	68.42	-7.74	60.68	74	13.32	PEAK	V
4960	40.1	-7.74	32.36	54	21.64	AVG	V
7440	53.04	-1.24	51.8	74	22.2	PEAK	V
7440	40.88	-1.24	39.64	54	14.36	AVG	V

Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Limit. - Emission Level

Testing is carried out with frequency rang 9kHz to the tenth harmonics. The measurements greater than 20dB below the limit from 18GHz to 25GHz.

Radiated Band Edges Test Data							
Environmental Conditions	24.6℃, 53.4% RH			Test Engineer		Jacey Fu	
Lowest Channel (Worst Case: BLE 1M_2402MHz)							
Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (PEAK/AVG)	Polar (H/V)
2310	57.52	-13.61	44.44	74	29.56	PEAK	H
2310	43.4	-13.61	27.15	54	26.85	AVG	H
2390	59.63	-13.48	46.54	74	27.46	PEAK	H
2390	42.65	-13.48	25.75	54	28.25	AVG	H
2400	64.77	-13.4	53.57	74	20.43	PEAK	H
2400	50.83	-13.4	39.05	54	14.95	AVG	H
2310	57.1	-13.61	41.28	74	32.72	PEAK	V
2310	45.76	-13.61	31.01	54	22.99	AVG	V
2390	63.44	-13.48	46.93	74	27.07	PEAK	V
2390	38.44	-13.48	24.27	54	29.73	AVG	V
2400	60.22	-13.4	42.22	74	31.78	PEAK	V
2400	44.91	-13.4	36.26	54	17.74	AVG	V
Highest Channel (Worst Case: BLE 1M_2480MHz)							
Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (PEAK/AVG)	Polar (H/V)
2483.5	68.6	-13.36	53.65	74	20.35	PEAK	H
2483.5	46.74	-13.36	29.63	54	24.37	AVG	H
2500	59.31	-12.45	47.53	74	26.47	PEAK	H
2500	42.82	-12.45	34.29	54	19.71	AVG	H
2483.5	63.47	-13.36	49.98	74	24.02	PEAK	V
2483.5	50.29	-13.36	36.39	54	17.61	AVG	V
2500	59.18	-12.45	49.14	74	24.86	PEAK	V
2500	41.31	-12.45	25.87	54	28.13	AVG	V

Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Limit. - Emission Level

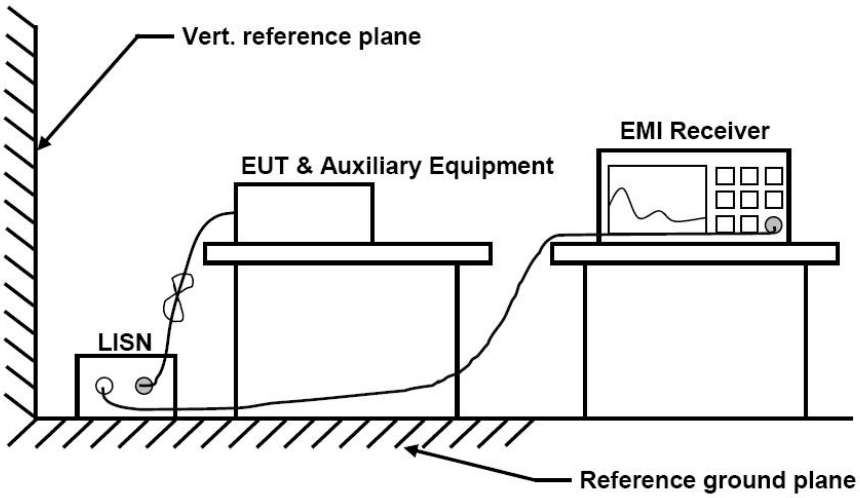
9. POWER LINE CONDUCTED EMISSIONS

9.1. LIMIT

According to the rule FCC Part 15.207 and IC RSS-Gen 8.8, Conducted emissions limit, the limit for a wireless device as below:

Frequency Range (MHz)	Conducted emissions (dBuV)	
	Quasi-peak	Average
0.15~0.5	66 to 56	56 to 46
0.5~5	56	46
5~30	60	50
Remark: a) The lower limit shall apply at the transition frequencies. b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50MHz.		

9.2. TEST SETUP



9.3. TEST PROCEDURE

Test frequency range :150KHz-30MHz

a) The mains terminal disturbance voltage test was conducted in a shielded room.

b) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

c) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

d) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This

distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

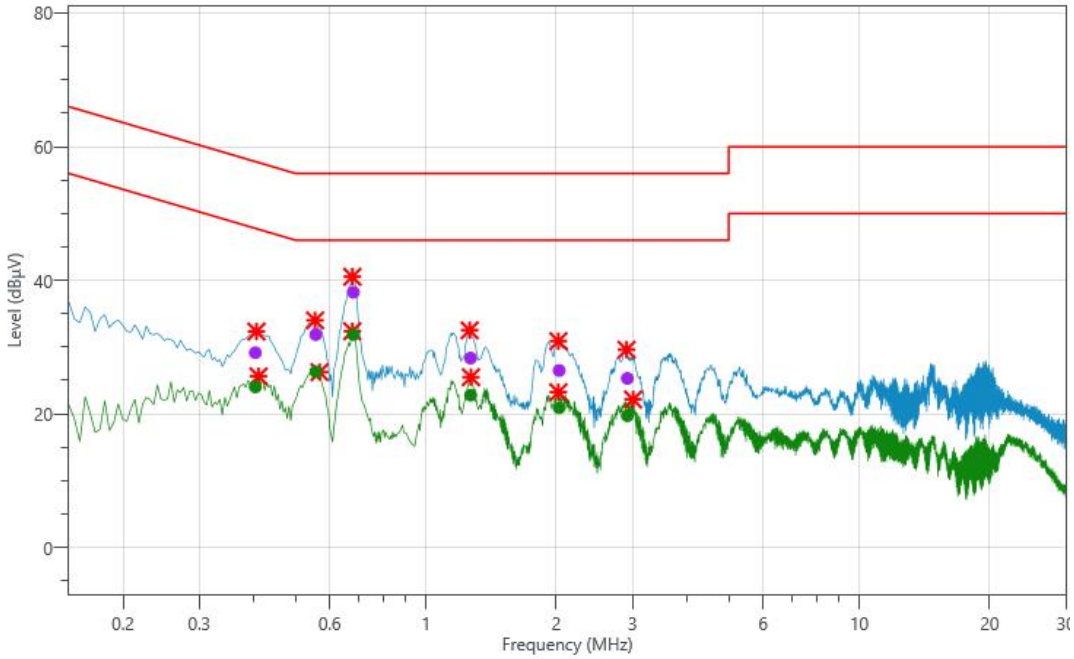
e) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

9.4. TEST RESULT

Pass.

Remark:
a) AC Power line conducted emissions pre-test both at AC 120V/60Hz and AC 240V/50Hz modes, recorded worst case.
b) Worst-case mode and channel used for 150KHz~30MHz power line conducted emissions was determined to be BLE 1M_2402MHz.

Test Plots and Data of Conducted Emissions (Worst Case: BLE 1M_2402MHz)			
Environmental Conditions	24.6℃, 53.4% RH	Test Engineer	Jacey Fu
Test Voltage:	AC 120V/60Hz	Test Power Line:	Live



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV)	Limit (dBµV)	Margin (dB)	Det.	Line	PE
1	0.404	19.16	9.99	29.15	57.77	28.62	QPK	L1	GND
2	0.404	14.06	9.99	24.05	47.77	23.72	AVG	L1	GND
3	0.557	21.88	9.99	31.87	56.00	24.13	QPK	L1	GND
4	0.557	16.32	9.99	26.31	46.00	19.69	AVG	L1	GND
5	0.680	28.21	10	38.21	56.00	17.79	QPK	L1	GND
6	0.680	21.88	10	31.88	46.00	14.12	AVG	L1	GND
7	1.268	18.35	10.01	28.36	56.00	27.64	QPK	L1	GND
8	1.268	12.79	10.01	22.80	46.00	23.20	AVG	L1	GND
9	2.030	16.48	10.02	26.50	56.00	29.50	QPK	L1	GND
10	2.030	10.89	10.02	20.91	46.00	25.09	AVG	L1	GND
11	2.916	15.27	10.04	25.31	56.00	30.69	QPK	L1	GND
12	2.916	9.69	10.04	19.73	46.00	26.27	AVG	L1	GND

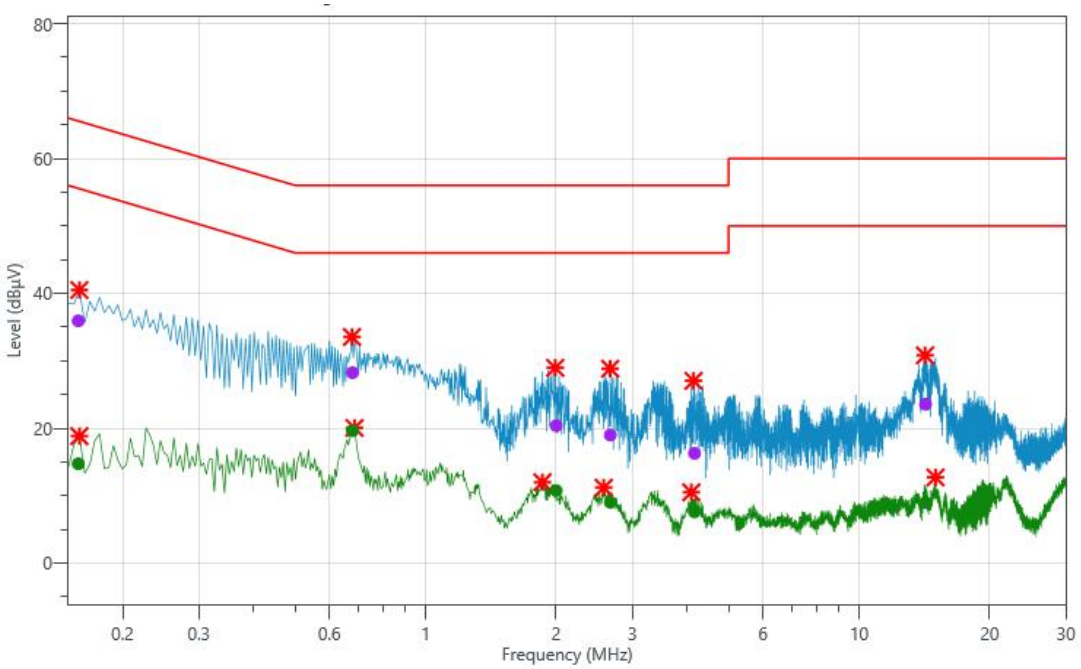
Remark:

Emission Level = Reading + Correct Factor;

Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Attenuation Factor

Margin= Emission Level - Limit.

Test Plots and Data of Conducted Emissions (Worst Case: BLE 1M_2402MHz)			
Environmental Conditions	24.6℃, 53.4% RH	Test Engineer	Jacey Fu
Test Voltage:	AC 120V/60Hz	Test Power Line:	Neutral



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV)	Limit (dBµV)	Margin (dB)	Det.	Line	PE
1	0.158	25.94	9.99	35.93	65.57	29.64	QPK	N	GND
2	0.158	4.75	9.99	14.74	55.57	40.83	AVG	N	GND
3	0.678	18.24	10	28.24	56.00	27.76	QPK	N	GND
4	0.678	9.62	10	19.62	46.00	26.38	AVG	N	GND
5	2.000	10.37	10.02	20.39	56.00	35.61	QPK	N	GND
6	2.000	0.74	10.02	10.76	46.00	35.24	AVG	N	GND
7	2.666	8.96	10.03	18.99	56.00	37.01	QPK	N	GND
8	2.666	-1.01	10.03	9.02	46.00	36.98	AVG	N	GND
9	4.170	6.22	10.06	16.28	56.00	39.72	QPK	N	GND
10	4.170	-2.47	10.06	7.59	46.00	38.41	AVG	N	GND
11	14.223	10.25	13.32	23.57	60.00	36.43	QPK	N	GND
12	14.223	-4.36	13.32	8.96	50.00	41.04	AVG	N	GND

Remark:

Emission Level = Reading + Correct Factor;

Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Attenuation Factor

Margin= Emission Level - Limit.

10. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files for Test Setup Photos of the EUT.

11. EXTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

12. INTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

**********THE END**********