Shenzhen Huaxin Information Technology Service Co., Ltd

FCC TEST REPORT

FCC ID: 2BCJQ-PT880

On Behalf of

ThinkRace Technology Co., Limited

Traxbean Tracker

Model No.: PT880,PT880N,PT882,PT850,PT860,PT400HT,TR40

Prepared for	:	ThinkRace Technology Co., Limited
Address	:	21/F Hing Lung Commercial Building 68-74 Bonham Strand East Sheung Wan Hongkong

Prepared By	:	Shenzhen Huaxin Information Technology Service Co., Ltd
Address	:	101, R & D Building, No.3 guansheng 4th Road, Luhu Community，Guanhu Street, Longhua District, Shenzhen, Guangdong, China

Report Number	:	HX230823R001
Date of Receipt	:	Jul.30th, 2023
Date of Test	:	Aug.1th, 2023- Aug.22th, 2023
Date of Report	:	Aug.24th, 2023
Version Number	:	V0

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TEST REPORT DECLARATION

Applicant	:	ThinkRace Technology Co., Limited
Address	:	21/F Hing Lung Commercial Building 68-74 Bonham Strand East Sheung Wan Hongkong
Manufacturer	:	Shenzhen Guanaixing Technology Co.,Ltd.
Address	:	201-A090,Block B,Huayuancheng Digital Building, 1079 Nanhai Avenue,Yanshan Community, Nanshan District, Shenzhen,China.
EUT Description	:	Traxbean Tracker
		(A) Model No. : PT880,PT880N,PT882,PT850,PT860,PT400HT,TR40
		(B) Trademark : Traxbean

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247,

ANSI C63.10-2013

The device described above is tested by Shenzhen Huaxin Information Technology Service Co., Ltd. to determine the maximum emission levels emanating from the device. The test results are contained in this test report and Shenzhen Huaxin Information Technology Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Huaxin Information Technology Service Co., Ltd.

Tested by (name + signature).....:	Eason Tan Project Engineer	Eason Tan
Approved by (name + signature).....:	Michael Wu Project Manager	Michael wu
Date of issue..... .....:	Aug.24th, 2023	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	Aug.24th, 2023	Initial released Issue	Eason Tan

1. Summary Of Standards And Results

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Test Item	Standards Paragraph	Result
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1)	P
Bandwidth	FCC Part 15: 15.215	P
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1)	P
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)	P
Dwell Time	FCC Part 15: 15.247(a)(1)	P
Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d)	P
Band Edge Compliance	FCC Part 15: 15.247(d)	P
Power Line Conducted Emissions	FCC Part 15: 15.207	P
Antenna requirement	FCC Part 15: 15.203	P
Note:	1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable.	

2. General Information

2.1. Description of Device (EUT)

Description/PMN	:	Traxbean Tracker
Model Number/HVIN(s)	:	PT880,PT880N,PT882,PT850,PT860,PT400HT,TR40
Diff.	:	PCB board,structure and internal of these model(s) are the same ,these different models are based on market demands and regional differences,just model names and color are different, so no additional models were tested.
Trademark	:	Traxbean
Test Voltage	:	DC 3.8V
Radio Technology	:	Bluetooth EDR
Operation frequency	:	2402MHz-2480MHz
Modulation	:	GFSK, π/4-DQPSK, 8DPSK
Channel No.	:	79 Channels
Channel Separation	:	1MHz
Antenna Type	:	Internal Antenna, max gain 0.46dBi. Antenna information is provided by applicant.
Software version	:	V1.0
Hardware version	:	V1.0

Remark:
1. The worst-case simultaneous transmission configuration was evaluated with no non-compliance found. Results in this report are only for Bluetooth EDR function, and there is no other transmitter involved.
2. This report only shows the worst data.

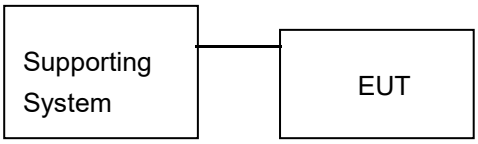
2.2. Accessories of Device (EUT)

Accessories	:	/
Manufacturer	:	/
Model	:	/
Input	:	/
Output	:	/

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1.	Notebook PC	Lenovo	ThinkPad E460	N/A	SDOC

2.4. Block Diagram of connection between EUT and simulators



2.5. Test Mode Description

The test software “RFTestTool.app” was used to control EUT work in Continuous TX mode, and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
Carrier Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
GFSK / Pi/4-DQPSK/8DPSK hopping on Tx Mode	CH0 to CH78	2402 to 2480
GFSK / Pi/4-DQPSK/8DPSK hopping off Tx Mode	CH0	2402
	CH39	2441
	CH78	2480

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	25℃
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.7. Test Facility

Shenzhen Huaxin Information Technology Service Co., Ltd

101, R & D Building, No.3 guansheng 4th Road, Luhu Community， Guanhu Street, Longhua District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 932271

Designation Number: CN1344

CAB ID ： CN0147

2.8. Measurement Uncertainty

Item	MU	Remark
Conducted Emission（9K～0.15MHz）	2.18dB	
Conducted Emission（0.15M～30MHz）	2.17dB	
Radiation Emission ,3m (30MHz～1GHz)	4.45 dB	Polarize: V
	2.76 dB	Polarize: H
Radiation Emission, 3m (1GHz～6GHz)	4.02 dB	
Radiation Emission ,3m (6GHz～18GHz)	4.30 dB	
RF output power (conducted)	0.41 dB	
Power Spectral Density (conducted)	0.39 dB	
Spurious emissions (conducted)	0.59 dB	
Occupied Channel Bandwidth (conducted)	4.22%	

2.9. Test Equipment List

Equipment	Manufacture	Model No.	Firmware version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	Mao Rui	9*6*6	N/A	N/A	2022.06.15	3Year
Spectrum analyzer	R&S	FSV40-N	V7.0-4-62-2	101795	2022.09.19	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY51280803	2023.04.15	1Year
Receiver	R&S	ESR7	5.812	102543	2022.10.20	1Year
Receiver	R&S	ESCI	N/A		2022.10.20	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	N/A	01318	2022.06.19	2Year
Horn Antenna	A.H. Systems	SAS-571	N/A	915	2022.06.17	2Year
Active Loop Antenna	Schwarzbeck	FMZB 1519B	N/A	N/A		2Year
RF Cable	/	N/J-NJ-RG58(1G) 9m	N/A	RE1	2022.09.17	1Year
RF Cable	/	N/J-NJ-RG58(1G) 10m	N/A	RE2	2022.09.17	1Year
RF Cable	/	N/J-SMAAJ-406(18G) 9m	N/A	CE1	2022.09.17	1Year
Pre-amplifier	HP	8447D	N/A	1616A02061	2023.04.15	1Year
Pre-amplifier	Agilent	8449B	N/A	3008A00551	2023.04.15	1Year
L.I.S.N.#1	R&S	ESH3-Z5	N/A	894981/024	2023.03.28	1Year
L.I.S.N.#2	R&S	ENV216	N/A	101291	2023.03.28	1 Year
Horn Antenna	A.H. Systems	SAS-571	N/A	915	2022.06.17	2 Year
power amplifier	Micotop	MPA-80-1000-250	N/A	MPA2206215	2023.04.15	1 Year
Power Meter	Keysight	E9300A	N/A	MY45105087	2023.04.15	1 Year
Power Sensor	Keysight	E9300A	N/A	MY55060025	2023.04.15	1 Year
power amplifier	Weihuang	WHTH-1000-40-880	N/A	MPA2206216	2023.04.15	1 Year
Switching Mode Power Supply	PinHong	PH-1110	N/A	20220423007	2023.04.15	1 Year
Adjustable attenuator	MWRFtest	N/A	N/A	/	/	/
10dB Attenuator	/	10dB	N/A	N/A	2022.09.17	1 Year
Temperature and humidity test chamber	Asprey	LX-150L	N/A	N/A	2023.04.2	1 Year

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EMC-I	SKET	V1.4.0.1
CE	EMC-I	SKET	V1.4.0.1
RF-CE	RF Test Software	TACHOY	V2.0

3. Maximum Peak Output Power

3.1. Limit

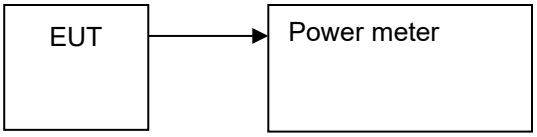
Please refer FCC part 15.247 & RSS-247..

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

The transmitter output is connected to the RF Power meter. The Power meter is set to the peak power detection.

3.3. Test Setup



3.4. Test Result

For the measurement records，refer to the appendix I.

4. Bandwidth

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in RSS-GEN, FCC Section 15.247(a)(1), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3. Test Result

For the measurement records，refer to the appendix I.

5. Carrier Frequency Separation

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

5.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

5.3. Test Result

For the measurement records，refer to the appendix I.

6. Number Of Hopping Channel

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

6.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The number of hopping channel was measured by spectrum analyzer with 100kHz RBW and 300KHz VBW.

6.3. Test Result

For the measurement records，refer to the appendix I.

7. Dwell Time

7.1. Test limit

Please refer FCC part 15.247 & RSS-247.

Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 sec- onds multiplied by the number of hopping channel employed.

7.2. Test Procedure

7.2.1. Place the EUT on the table and set it in transmitting mode.

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

7.2.3. Set center frequency of spectrum analyzer = operating frequency.

7.2.4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.

7.2.5. Repeat above procedures until all frequency measured were complete.

7.3. Test Result

For the measurement records，refer to the appendix I.

8. Emissions

8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

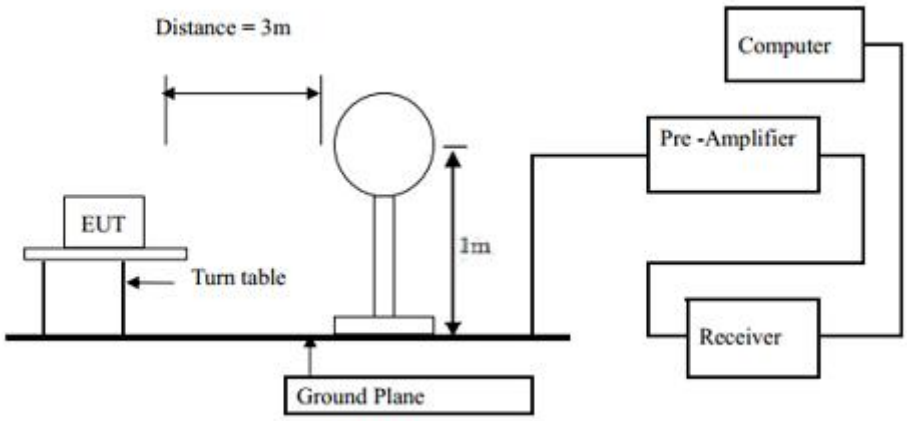
15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

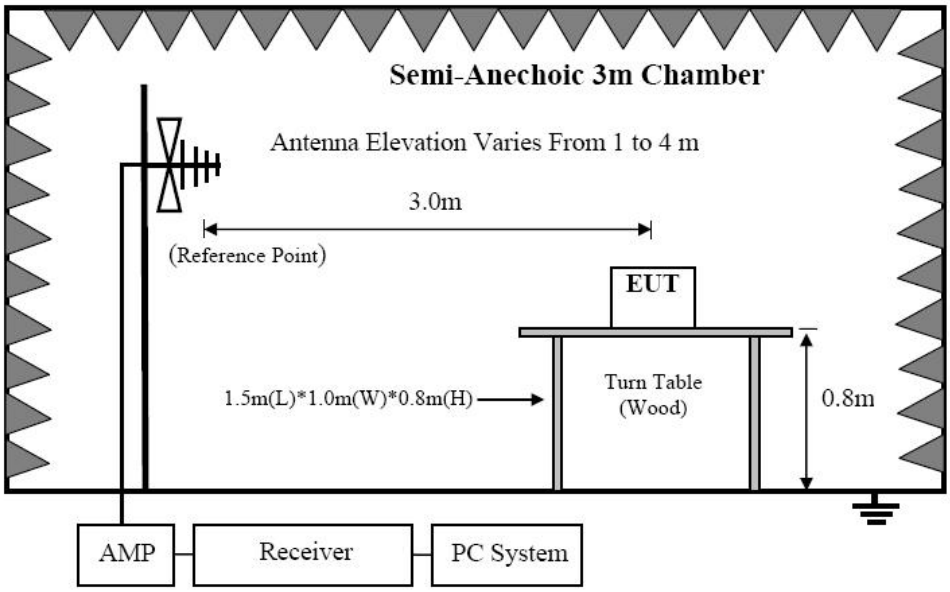
Note: The peak limit is 20 dB higher than the average limit

8.2. Block Diagram of Test setup

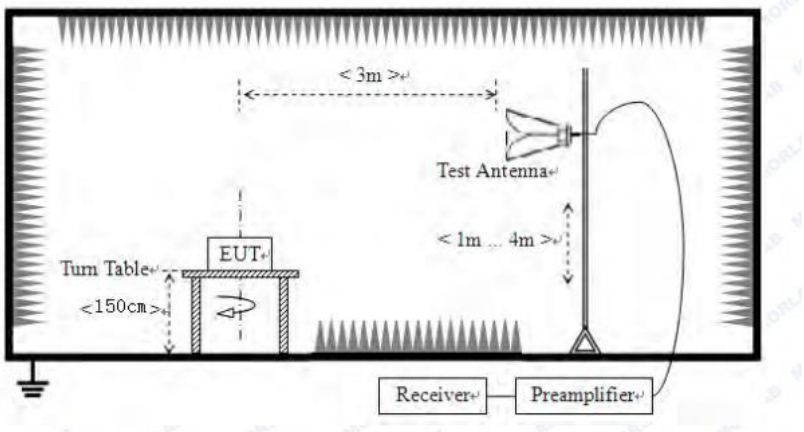
8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

8.3. Test Procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.

(2) Setup EUT and simulator

(3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

(4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated

(5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 :2013on Radiated Emission test.

(6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

8.4. Test Result

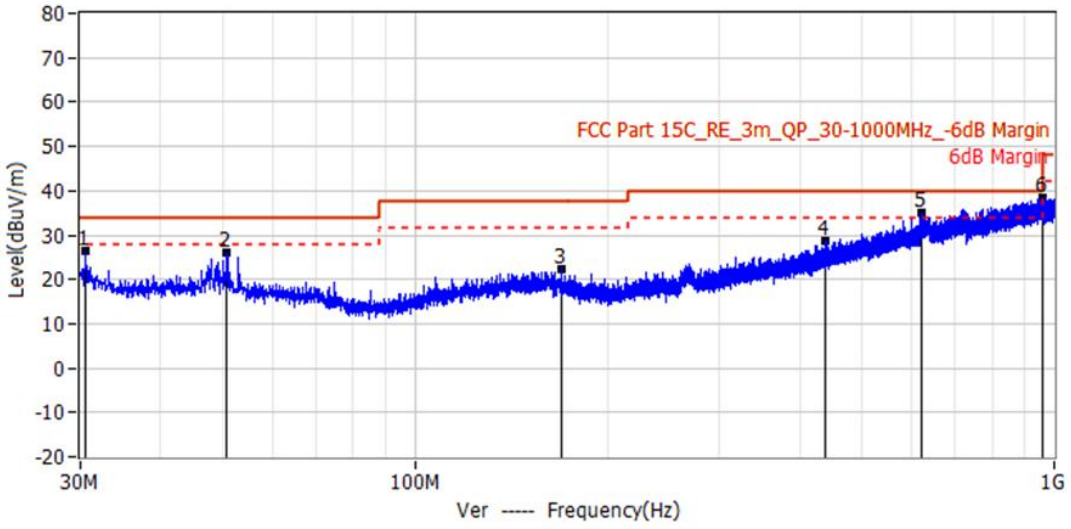
We have scanned from 9kHz to the 10th harmonic of the EUT's highest frequency.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

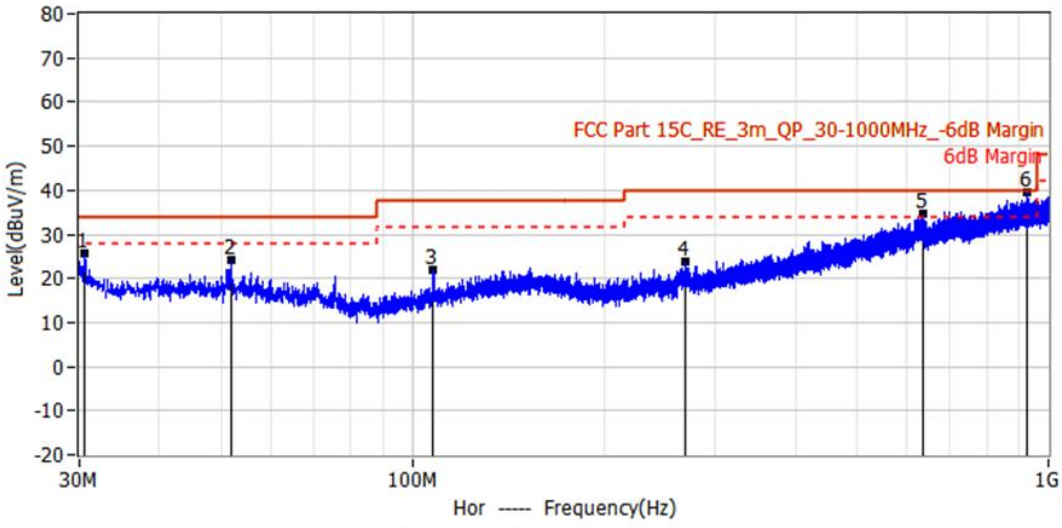
From 30MHz to 1000MHz: Conclusion: PASS

Vertical:



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar	Height cm	Angle deg
1*	30.540MHz	13.3	13.0	26.3	34.0	-7.7	QP	Ver	100.0	0.0
2*	50.880MHz	12.1	13.8	25.9	34.0	-8.1	QP	Ver	100.0	0.0
3*	169.320MHz	8.8	13.7	22.5	37.5	-15.0	QP	Ver	100.0	228.0
4*	437.580MHz	9.9	18.9	28.8	40.0	-11.2	QP	Ver	100.0	205.0
5*	619.440MHz	11.9	23.3	35.2	40.0	-4.8	QP	Ver	100.0	0.0
6*	956.400MHz	10.0	28.4	38.4	40.0	-1.6	QP	Ver	100.0	0.0

Horizontal:



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar	Height cm	Angle deg
1*	30.600MHz	12.6	13.0	25.6	34.0	-8.4	QP	Hor	100.0	121.0
2*	51.960MHz	10.5	13.8	24.3	34.0	-9.7	QP	Hor	100.0	121.0
3*	108.000MHz	10.7	11.4	22.1	37.5	-15.4	QP	Hor	100.0	49.0
4*	268.980MHz	9.3	14.5	23.8	40.0	-16.2	QP	Hor	100.0	298.0
5*	635.760MHz	10.9	23.8	34.7	40.0	-5.3	QP	Hor	100.0	248.0
6*	926.820MHz	11.3	28.1	39.4	40.0	-0.6	QP	Hor	100.0	0.0

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2441MHz was listed in this report.

From 1G-18GHz

Test Mode: GFSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	44.26	V	33.95	10.18	34.26	54.13	74	-19.87	PK
4804	36.31	V	33.95	10.18	34.26	46.18	54	-7.82	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	46.55	H	33.95	10.18	34.26	56.42	74	-17.58	PK
4804	36.91	H	33.95	10.18	34.26	46.78	54	-7.22	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX Mid									
4882	44.03	V	33.93	10.2	34.29	53.87	74	-20.13	PK
4882	35.51	V	33.93	10.2	34.29	45.35	54	-8.65	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	43.83	H	33.93	10.2	34.29	53.67	74	-20.33	PK
4882	34.49	H	33.93	10.2	34.29	44.33	54	-9.67	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX High									
4960	44.88	V	33.98	10.22	34.25	54.83	74	-19.17	PK
4960	36.15	V	33.98	10.22	34.25	46.10	54	-7.90	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	42.75	H	33.98	10.22	34.25	52.70	74	-21.30	PK
4960	32.91	H	33.98	10.22	34.25	42.86	54	-11.14	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/

Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

From 1G-18GHz

Test Mode: π/4 DQPSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	45.60	V	33.95	10.18	34.26	55.47	74	-18.53	PK
4804	35.97	V	33.95	10.18	34.26	45.84	54	-8.16	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	46.33	H	33.95	10.18	34.26	56.20	74	-17.80	PK
4804	38.15	H	33.95	10.18	34.26	48.02	54	-5.98	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX Mid									
4882	44.43	V	33.93	10.2	34.29	54.27	74	-19.73	PK
4882	36.74	V	33.93	10.2	34.29	46.58	54	-7.42	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	45.99	H	33.93	10.2	34.29	55.83	74	-18.17	PK
4882	35.68	H	33.93	10.2	34.29	45.52	54	-8.48	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX High									
4960	45.32	V	33.98	10.22	34.25	55.27	74	-18.73	PK
4960	33.52	V	33.98	10.22	34.25	43.47	54	-10.53	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	44.20	H	33.98	10.22	34.25	54.15	74	-19.85	PK
4960	33.73	H	33.98	10.22	34.25	43.68	54	-10.32	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/

Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

From 1G-18GHz

Test Mode: π/4 DQPSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	44.29	V	33.95	10.18	34.26	54.16	74	-19.84	PK
4804	36.07	V	33.95	10.18	34.26	45.94	54	-8.06	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	48.13	H	33.95	10.18	34.26	58.00	74	-16.00	PK
4804	34.52	H	33.95	10.18	34.26	44.39	54	-9.61	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX Mid									
4882	42.77	V	33.93	10.2	34.29	52.61	74	-21.39	PK
4882	35.33	V	33.93	10.2	34.29	45.17	54	-8.83	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	45.04	H	33.93	10.2	34.29	54.88	74	-19.12	PK
4882	33.74	H	33.93	10.2	34.29	43.58	54	-10.42	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX High									
4960	43.73	V	33.98	10.22	34.25	53.68	74	-20.32	PK
4960	35.71	V	33.98	10.22	34.25	45.66	54	-8.34	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	42.06	H	33.98	10.22	34.25	52.01	74	-21.99	PK
4960	35.20	H	33.98	10.22	34.25	45.15	54	-8.85	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/

Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

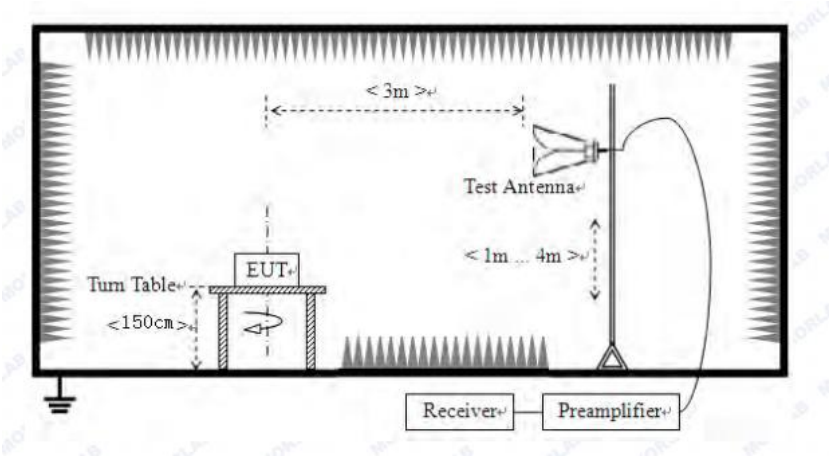
2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Conducted RF Spurious Emission

For the measurement records，refer to the appendix I.

9. Band Edge Compliance

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in FCC part 15.209 and RSS-GEN, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with FCC part 15.209 and RSS-GEN limits.

9.3. Test Procedure

Refer to ANSI C 63.10, Clause 6.10.

All restriction band and non- restriction band have been tested, only worse case is reported.

9.4. Test Result

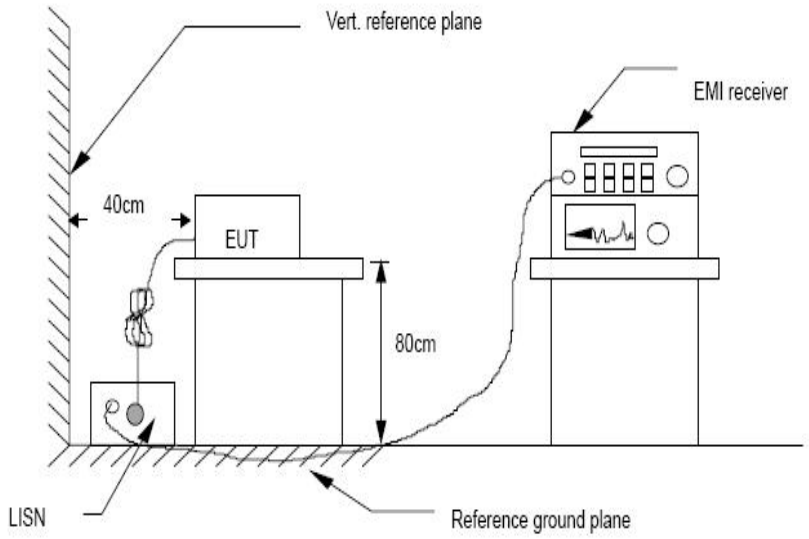
For the measurement records，refer to the appendix I.

Note: 1. *:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

10. Power Line Conducted Emissions

10.1.Block Diagram of Test Setup



10.2.Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

10.3.Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.

(2) Setup the EUT and simulator as shown in 10.1

(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013on conducted Emission test.

(4) The bandwidth of test receiver is set at 10KHz.

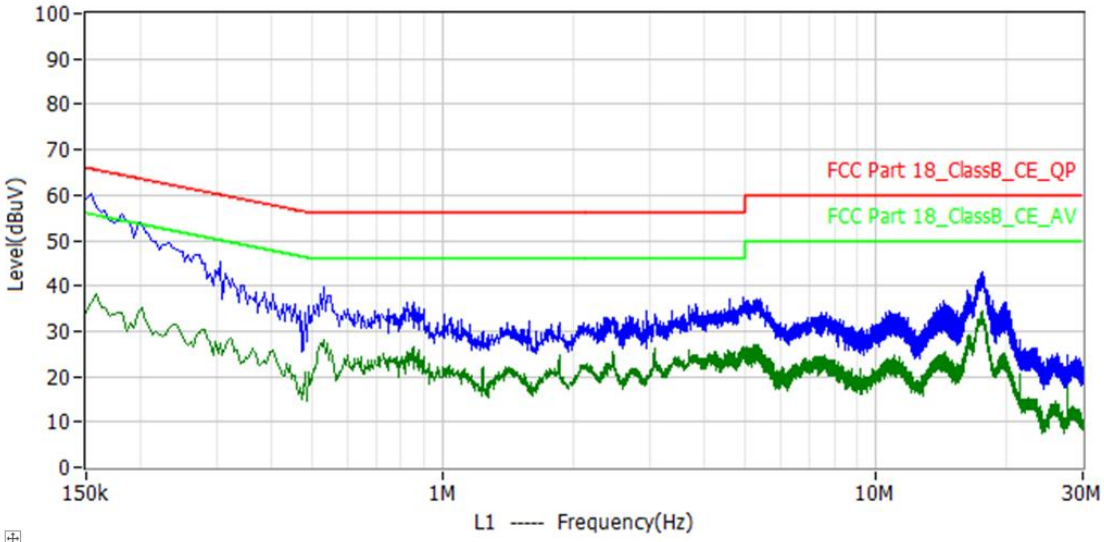
(5) The frequency range from 150 KHz to 30MHz is checked.

10.4.Test Result

PASS. (See below detailed test data)

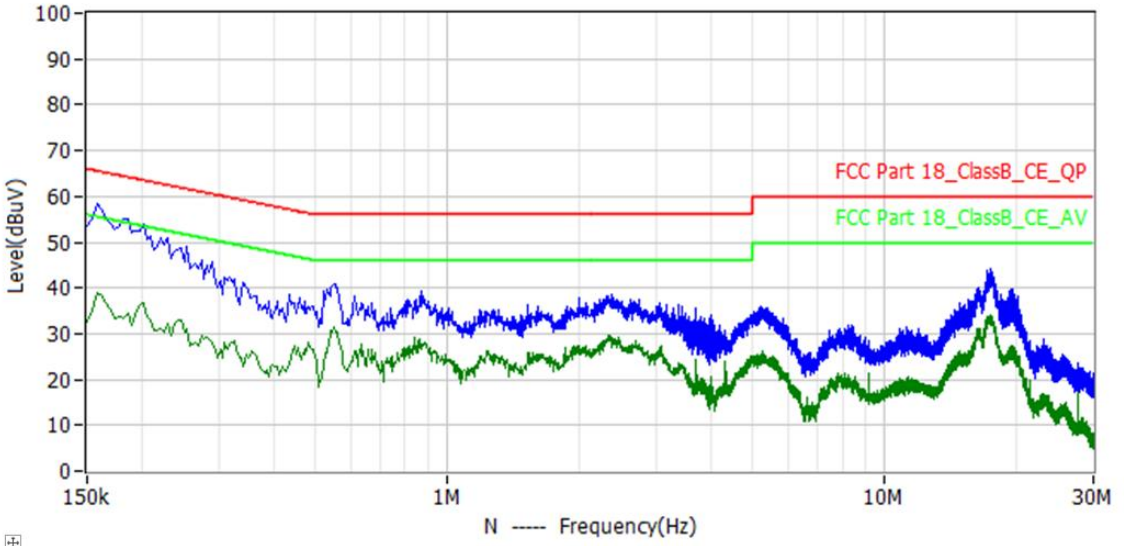
Note: If peak Result comply with AV limit, QP and AV Result is deemed to comply with AV limit

Line:



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector	Polar
1*	154.000kHz	50.58	9.57	60.15	65.78	-5.63	PK	L1
2*	306.000kHz	35.15	10.09	45.24	60.08	-14.84	PK	L1
3*	530.000kHz	30.22	9.65	39.87	56.00	-16.13	PK	L1
4*	17.594MHz	32.81	10.20	43.01	60.00	-16.99	PK	L1
5*	4.598MHz	27.27	9.80	37.07	56.00	-18.93	PK	L1
6*	1.578MHz	22.39	9.71	32.10	56.00	-23.90	PK	L1

Neutral:



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector	Polar
1*	158.000kHz	48.53	9.88	58.41	65.57	-7.16	PK	N
2*	17.486MHz	33.80	10.29	44.09	60.00	-15.91	PK	N
3*	870.000kHz	29.86	9.61	39.47	56.00	-16.53	PK	N
4*	318.000kHz	32.43	9.79	42.22	59.76	-17.54	PK	N
5*	1.994MHz	28.40	9.58	37.98	56.00	-18.02	PK	N
6*	5.206MHz	26.18	9.89	36.07	60.00	-23.93	PK	N

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2441MHz was listed in this report.

11. Antenna Requirements

11.1.Limit

For intentional device, according to FCC 47 CFR Section 15.203 and RSS-GEN, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2.Result

The EUT antenna is internal antenna. It complies with the standard requirement.

12. Test Setup Photo

Please refer to separated files for APPENDIX IV Test Setup Photos.

13. EUT Photo

For the measurement records，refer to the appendix Ⅱ and Ⅲ.

---------THE END OF REPORT-------