Shenzhen HTT Technology Co., Ltd.

TEST REPORT
FCC Rules and Regulations Part PART 15.249

Report Reference No……..:	**HTT202206164F01**	
FCC ID……..:	**2A7FX-KM9000**	
Compiled by (position+printed name+signature..	File administrators	Ervin Xu
Supervised by (position+printed name+signature..	Project Engineer	Bruce Zhu
Approved by (position+printed name+signature..	RF Manager	Kevin Yang
Date of issue.....	Jun.15,2022	

Testing Laboratory Name	**Shenzhen HTT Technology Co.,Ltd.**
Address	1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....	**Shenzhen Nipai Technology Co., Ltd.**
Address	511B, Building A, No. 51 Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen
Standard	**FCC Rules and Regulations Part PART 15.249**

**Test item description ..... **	**Wireless keyboard**
Trade Mark	Topmate
Manufacturer	Shenzhen Nipai Technology Co., Ltd.
Model/Type reference.....	KM9000
Listed Models	K21, K22, KM22, KM23, KM24, KM25, KM26, KM27, KM28
Modulation	GFSK
Frequency.....	2403.85-2479.85MHz
Ratings	DC 3.0V From Battery
Result.....	**PASS**

T E S T R E P O R T

Equipment under Test	:	Wireless keyboard
Model /Type	:	KM9000
Listed Models	:	K21, K22, KM22, KM23, KM24, KM25, KM26, KM27, KM28
Applicant	:	**Shenzhen Nipai Technology Co., Ltd.**
Address	:	511B, Building A, No. 51 Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen
Manufacturer	:	**Shenzhen Nipai Technology Co., Ltd.**
Address	:	511B, Building A, No. 51 Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen

Test Result:	**PASS**

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.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.249: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

ANSI C63.10:2013 : American National Standard for Testing Unlicensed Wireless Devices

ANSI C63.4: 2014: –American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz Range of 9 kHz to 40GHz

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Jun.07,2022
Testing commenced on	:	Jun.07,2022
Testing concluded on	:	Jun.15,2022

2.2. Product Description

Name of EUT	Wireless keyboard
Model Number	KM9000
List Model:	K21, K22, KM22, KM23, KM24, KM25, KM26, KM27, KM28
Power Rating	DC 3.0V From Battery
Sample ID:	HTT202206164-1#(Engineer sample) HTT202206164-2#(Normal sample)
Operation frequency	2403.85-2479.85MHz
Modulation	GFSK
Antenna Type	PCB antenna
Antenna Gain	-1dBi

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 3.0V From Battery

2.4. Short description of the Equipment under Test (EUT)

This is a Wireless keyboard
For more details, refer to the user's manual of the EUT.

2.5. EUT operation mode

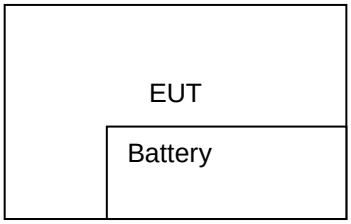
The Applicant use Key to control the EUT for staying in continuous transmitting and receiving mode for testing .There is 16 channels provided to the EUT. Channel Low,Mid and High was selected to test.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2403.85**	09	2441.85
02	2407.85	10	2445.85
03	2414.85	11	2453.85
04	2419.85	12	2459.85
05	2422.85	13	2463.85
06	2426.85	14	2466.85
07	2436.85	15	2473.85
08	**2439.85**	**16**	**2479.85**

Test frequency:

Channel	Frequency (MHz)
Low	2403.85
Mid	2439.85
High	2479.85

2.6. Block Diagram of Test Setup



2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen HTT Technology Co.,Ltd.
1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China

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3.2. Test Facility

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

FCC-Registration No.: 779513 Designation Number: CN1319
Shenzhen HTT Technology Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6435.01
Shenzhen HTT Technology Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3. Environmental conditions

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

Radiated Emission:

Temperature:	23 ° C
Humidity:	48 %
Atmospheric pressure:	950-1050mbar

Conducted testing：

Temperature:	24 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

3.4. Summary of measurement results

FCC PART 15.249		
FCC Part 15.249(a)	Field Strength of Fundamental	PASS
FCC Part 15.209	Spurious Emission	PASS
FCC Part 15.209	Band edge	PASS
FCC Part 15.215(c)	20dB bandwidth	PASS
FCC Part 15.207	Conducted Emission	N/A
FCC Part 15.203	Antenna Requirement	PASS

3.5. Statement of the measurement uncertainty

Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty(9kHz-30MHz) = 3.08dB, k=2

Radiated emission expanded uncertainty(30MHz-1000MHz) = 4.42dB, k=2

Radiated emission expanded uncertainty(Above 1GHz) = 4.06dB, k=2

3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	Shenzhen C.R.T technology co., LTD	9*6*6	HTT-E028	Aug. 10 2020	Aug. 09 2024
2	Control Room	Shenzhen C.R.T technology co., LTD	4.8*3.5*3.0	HTT-E030	Aug. 10 2020	Aug. 09 2024
3	EMI Test Receiver	Rohde&Schwar	ESCI7	HTT-E022	May 23 2022	May 22 2023
4	Spectrum Analyzer	Rohde&Schwar	FSP	HTT-E037	May 23 2022	May 22 2023
5	Coaxial Cable	ZDecl	ZT26-NJ-NJ-0.6M	HTT-E018	May 23 2022	May 22 2023
6	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-2M	HTT-E019	May 23 2022	May 22 2023
7	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-0.6M	HTT-E020	May 23 2022	May 22 2023
8	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-8.5M	HTT-E021	May 23 2022	May 22 2023
9	Composite logarithmic antenna	Schwarzbeck	VULB 9168	HTT-E017	Aug. 22 2021	Aug. 21 2022
10	Horn Antenna	Schwarzbeck	BBHA9120D	HTT-E016	Aug. 22 2021	Aug. 21 2022
11	Loop Antenna	Zhinan	ZN30900C	HTT-E039	Aug. 22 2021	Aug. 21 2022
12	Horn Antenna	Beijing Hangwei Dayang	OBH100400	HTT-E040	Aug. 22 2021	Aug. 21 2022
13	low frequency Amplifier	Sonoma Instrument	310	HTT-E015	May 23 2022	May 22 2023
14	high-frequency Amplifier	HP	8449B	HTT-E014	May 23 2022	May 22 2023
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	May 23 2022	May 22 2023
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	May 23 2022	May 22 2023
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May 23 2022	May 22 2023
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May 23 2022	May 22 2023
19	Cable Line	Robinson	Z302S-NJ-BNCJ-1.5M	HTT-E001	May 23 2022	May 22 2023
20	Attenuator	Robinson	6810.17A	HTT-E007	May 23 2022	May 22 2023
21	Variable frequency power supply	Shenzhen Yanghong Electric Co., Ltd	YF-650（5KVA）	HTT-E032	May 23 2022	May 22 2023

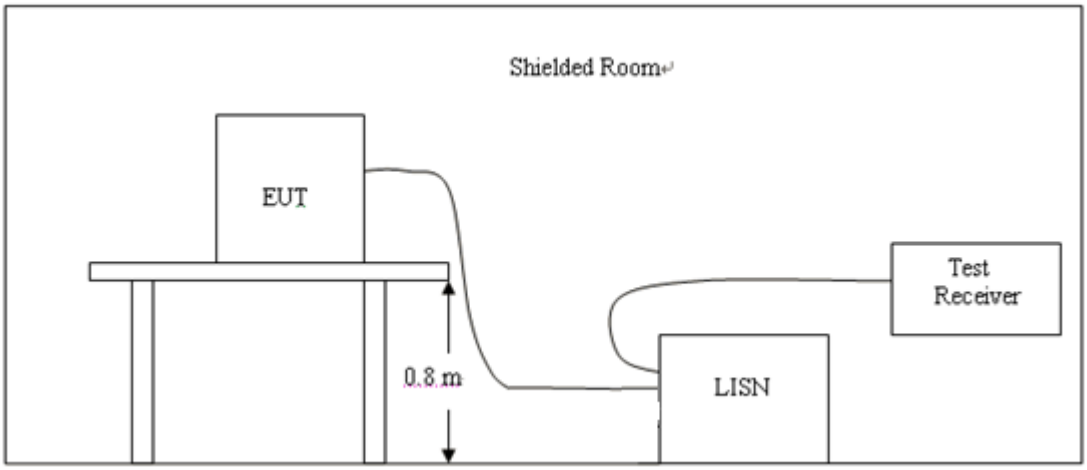
22	Control Room	Shenzhen C.R.T technology co., LTD	8*4*3.5	HTT-E029	May 23 2022	May 22 2023
23	DC power supply	Agilent	E3632A	HTT-E023	May 23 2022	May 22 2023
24	EMI Test Receiver	Agilent	N9020A	HTT-E024	May 23 2022	May 22 2023
25	Analog signal generator	Agilent	N5181A	HTT-E025	May 23 2022	May 22 2023
26	Vector signal generator	Agilent	N5182A	HTT-E026	May 23 2022	May 22 2023
27	Power sensor	Keysight	U2021XA	HTT-E027	May 23 2022	May 22 2023
28	Temperature and humidity meter	Shenzhen Anbiao Instrument Co., Ltd	TH10R	HTT-074	May 23 2022	May 22 2023
29	Radiated Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
30	Conducted Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
31	RF Test Software	panshanrf	TST	N/A	N/A	N/A

Note: The Cal.Interval was one year.

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2, Support equipment, if needed, was placed as per ANSI C63.10.
3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5, All support equipments received AC power from a second LISN, if any.
6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
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.		

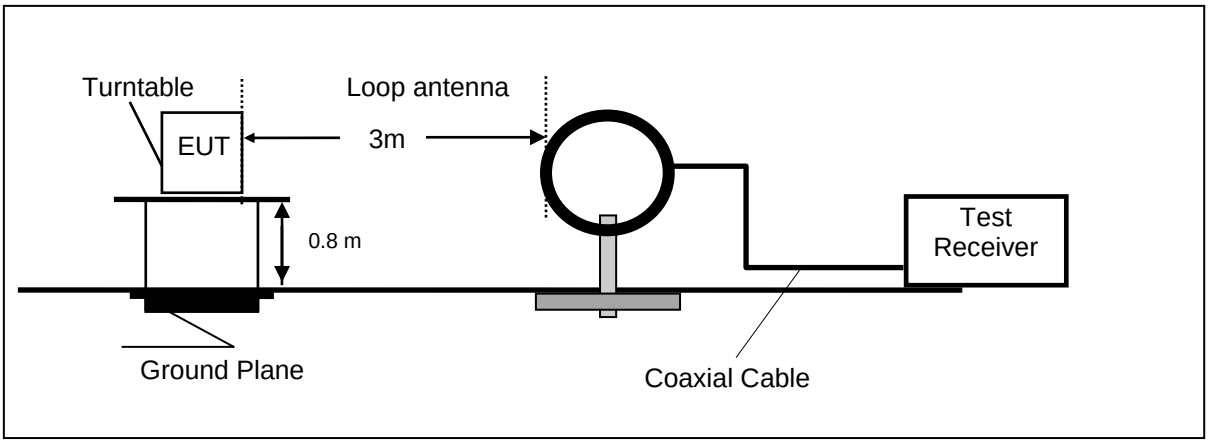
TEST RESULTS

The EUT is Powered by the Battery,So This test item is not applicable for the EUT.

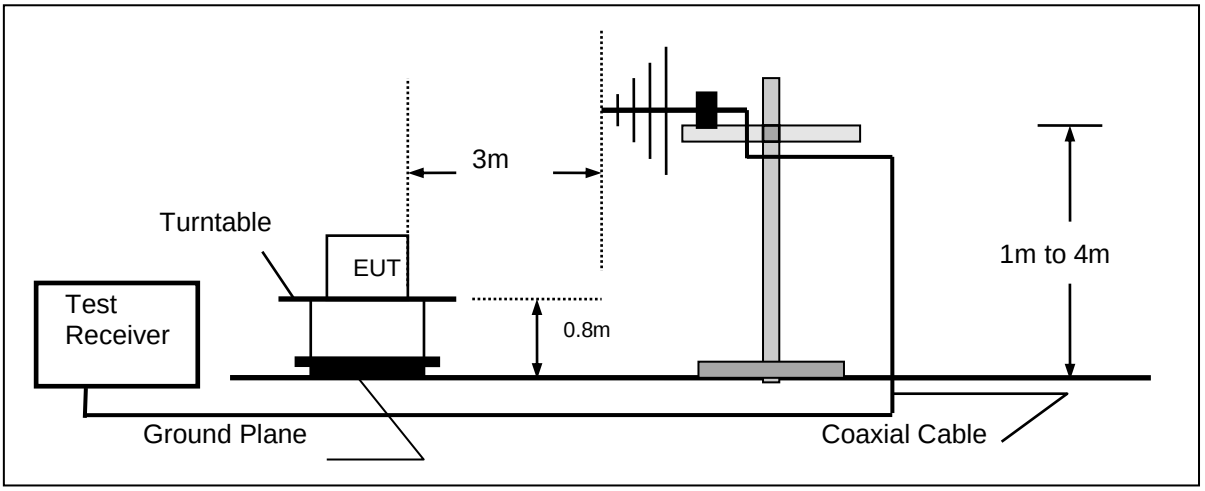
4.2. Radiated Emission and Band Edges

TEST CONFIGURATION

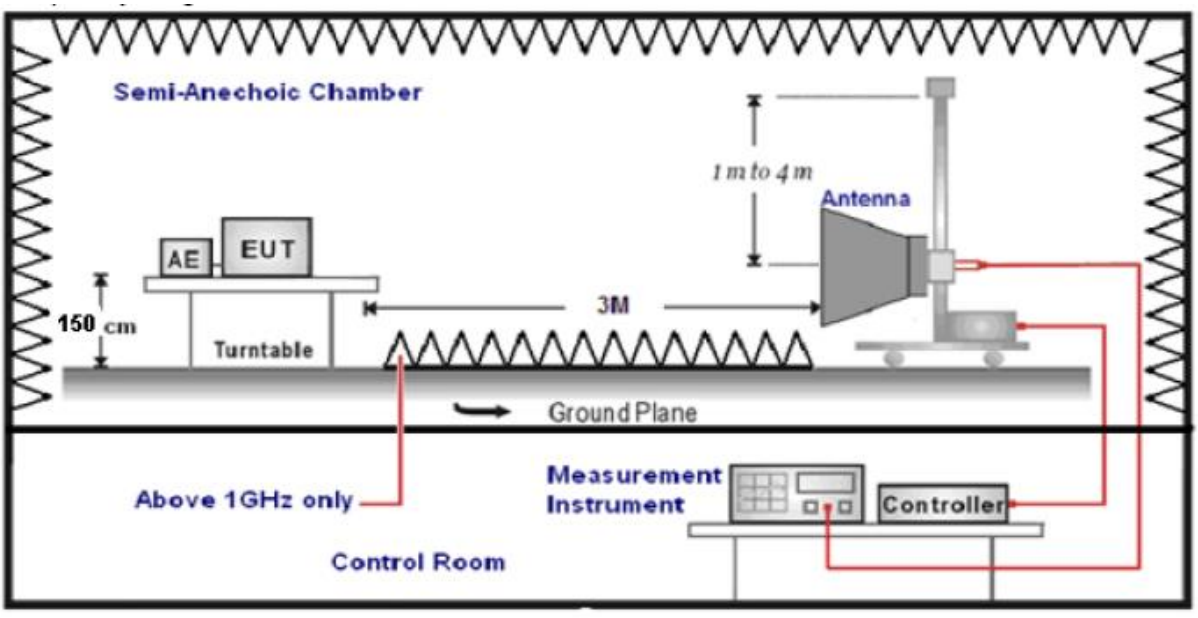
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 26MHz and maximum operation frequency was 1910MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. 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	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. 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

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Transd=AF +CL-AG

RADIATION LIMIT

According 15.249, the field strength of emissions from intentional radiators operated within 2400MHz-2483.5 MHz shall not exceed 94dBμV/m (50mV/m):

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

In addition, 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)

Radiated emission limits

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

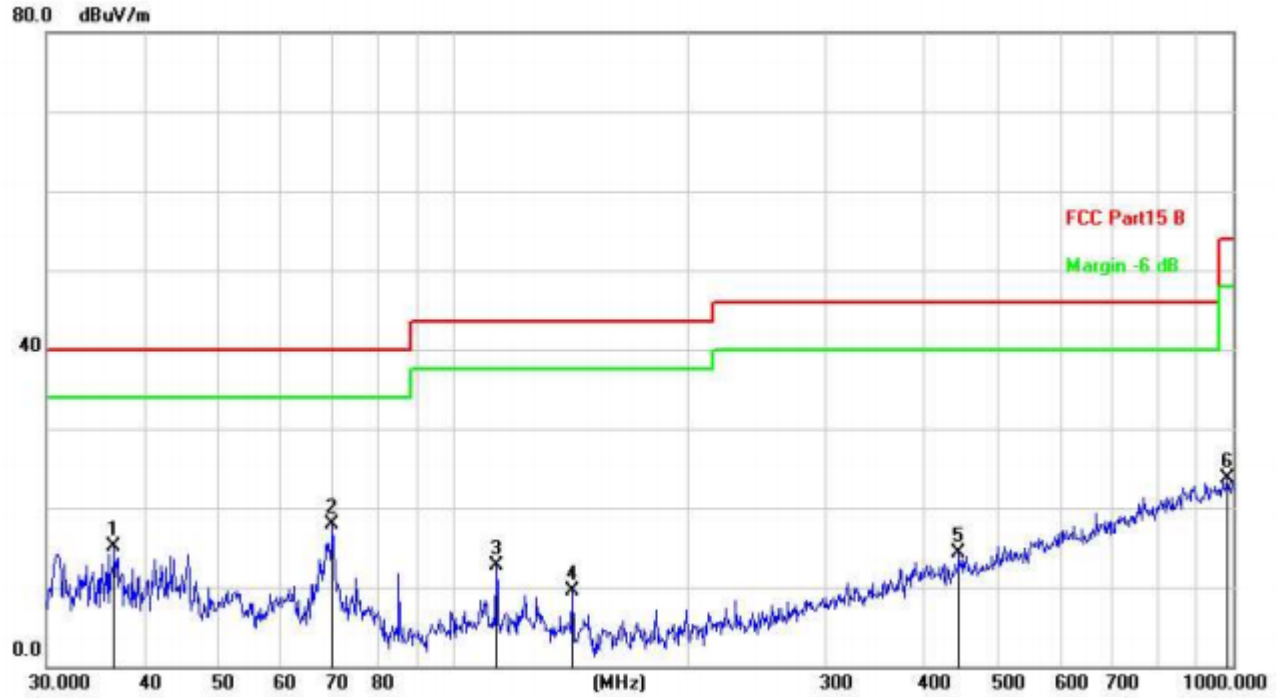
TEST RESULTS

Remark:

1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. Both modes of GFSK were tested at Low, Middle, and High channel and recorded worst mode at GFSK
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

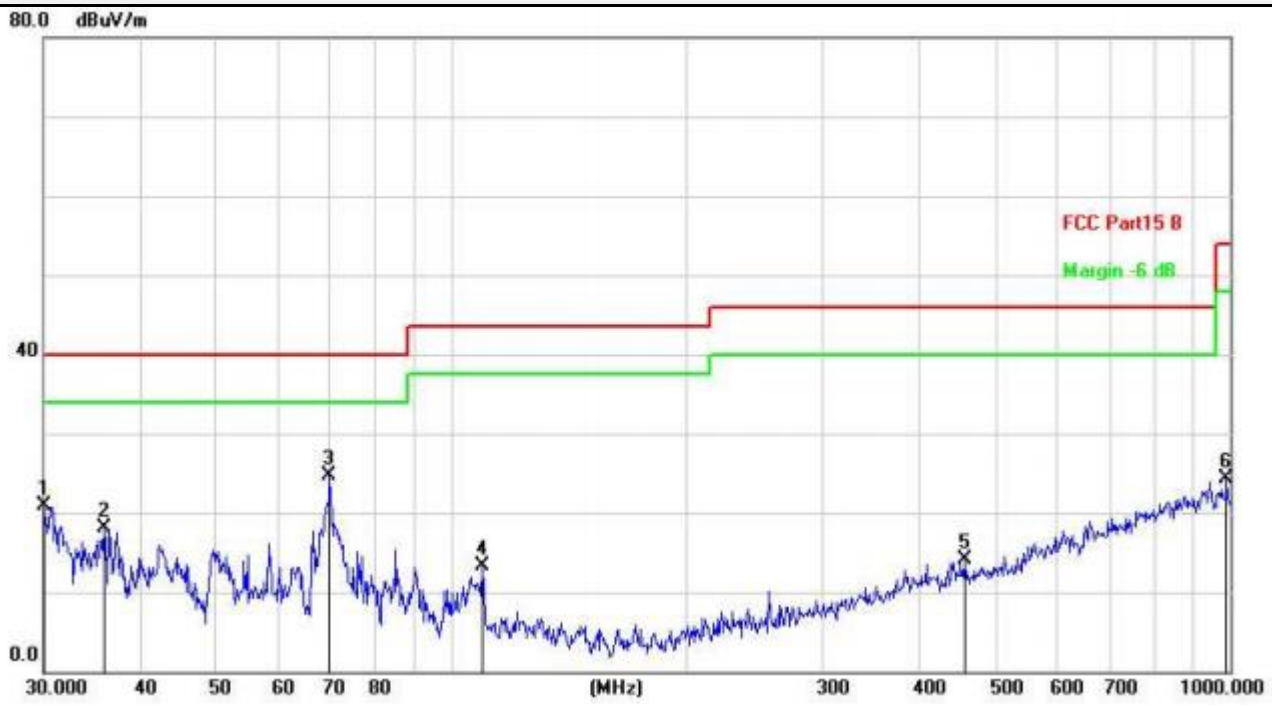
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB/m	dB	Detector
1		36.6375	32.88	-17.85	15.03	40.00	-24.97	QP
2	*	69.8450	37.92	-19.94	17.98	40.00	-22.02	QP
3		113.3163	32.82	-20.18	12.64	43.50	-30.86	QP
4		141.8262	27.41	-17.82	9.59	43.50	-33.91	QP
5		444.8514	28.30	-14.01	14.29	46.00	-31.71	QP
6		982.6200	27.69	-3.92	23.77	54.00	-30.23	QP

Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB/m	dB	Detector
1		30.0000	39.49	-18.59	20.90	40.00	-19.10	QP
2		35.8746	36.03	-17.96	18.07	40.00	-21.93	QP
3	*	69.8450	44.61	-19.94	24.67	40.00	-15.33	QP
4		109.7960	34.17	-20.89	13.28	43.50	-30.22	QP
5		455.9058	28.56	-14.44	14.12	46.00	-31.88	QP
6		989.5355	28.16	-3.86	24.30	54.00	-29.70	QP

Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

For 1GHz to 25GHz

GFSK (above 1GHz)

CH Low (2403.85MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2403.85	102.56	26.15	5.75	33.1	101.36	114.00	-12.64	peak
2403.85	87.62	26.15	5.75	33.1	86.42	94.00	-7.58	AVG
4807.7	51.34	31.25	8.15	31.95	58.79	74.00	-15.21	peak
4807.7	36.25	31.25	8.15	31.95	43.70	54.00	-10.30	AVG
7211.55	43.05	35.65	10.70	31.20	58.20	74.00	-15.80	peak
7211.55	25.97	35.65	10.70	31.20	41.12	54.00	-12.88	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2403.85	104.69	26.15	5.75	33.1	103.49	114.00	-10.51	peak
2403.85	86.59	26.15	5.75	33.1	85.39	94.00	-8.61	AVG
4807.7	55.26	31.25	8.15	31.95	62.71	74.00	-11.29	peak
4807.7	37.16	31.25	8.15	31.95	44.61	54.00	-9.39	AVG
7211.55	43.29	35.65	10.70	31.20	58.44	74.00	-15.56	peak
7211.55	28.65	35.65	10.70	31.20	43.80	54.00	-10.20	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

CH Middle (2439.85MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2439.85	104.69	27.25	6.35	32.95	105.34	114	-8.66	peak
2439.85	87.47	27.25	6.35	33.95	87.12	94	-6.88	AVG
4879.7	53.26	31.46	9.21	32.16	61.77	74.00	-12.23	peak
4879.7	36.48	31.46	9.21	32.16	44.99	54.00	-9.01	AVG
7319.55	46.05	35.82	10.86	31.45	61.28	74.00	-12.72	peak
7319.55	28.48	35.82	10.86	31.45	43.71	54.00	-10.29	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2439.85	105.68	27.25	6.35	32.95	106.33	114	-7.67	peak
2439.85	88.15	27.25	6.35	33.95	87.80	94	-6.20	AVG
4879.7	52.69	31.46	9.21	32.16	61.20	74.00	-12.80	peak
4879.7	38.45	31.46	9.21	32.16	46.96	54.00	-7.04	AVG
7319.55	46.22	35.82	10.86	31.45	61.45	74.00	-12.55	peak
7319.55	29.31	35.82	10.86	31.45	44.54	54.00	-9.46	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

CH High (2479.*85MHz)*

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2479.85	103.77	28.61	6.95	32.75	106.58	114	-7.42	peak
2479.85	82.97	28.61	6.95	32.75	85.78	94	-8.22	AVG
4959.7	52.31	31.50	9.25	32.26	60.80	74.00	-13.20	peak
4959.7	37.16	31.50	9.25	32.26	45.65	54.00	-8.35	AVG
7439.55	46.29	35.85	10.89	31.51	61.52	74.00	-12.48	peak
7439.55	26.48	35.85	10.89	31.51	41.71	54.00	-12.29	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

Vertical:

Frequency (MHz)	Meter Reading (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2479.85	103.36	28.61	6.95	32.75	106.17	114.00	-7.83	peak
2479.85	83.46	28.61	6.95	32.75	86.27	94.00	-7.73	AVG
4959.7	51.36	31.50	9.25	32.26	59.85	74.00	-14.15	peak
4959.7	35.08	31.50	9.25	32.26	43.57	54.00	-10.43	AVG
7439.55	45.16	35.85	10.89	31.51	60.39	74.00	-13.61	peak
7439.55	28.65	35.85	10.89	31.51	43.88	54.00	-10.12	AVG
---	---			---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

Remark：
(1) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(2) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed.

Results of Band Edges Test (Radiated)

Operation Mode: GFSK (2403.85MHz)

Horizontal (Worst case)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390	57.49	-5.68	51.81	74	-22.19	peak
2390	42.31	-5.68	36.63	54	-17.37	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390	56.32	-5.68	50.64	74	-23.36	peak
2390	45.69	-5.68	40.01	54	-13.99	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: GFSK (2479.85MHz)
Horizontal (Worst case)

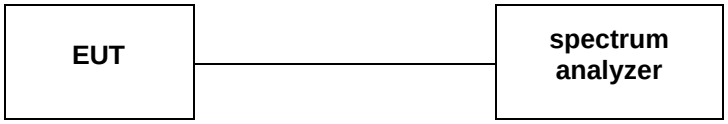
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
2483.5	55.36	-5.85	49.51	74	-24.49	peak
2483.5	44.13	-5.85	38.28	54	-15.72	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
2483.5	56.31	-5.85	50.46	74	-23.54	peak
2483.5	45.28	-5.85	39.43	54	-14.57	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

4.3. 20dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30KHz RBW and 300KHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

LIMIT

N/A

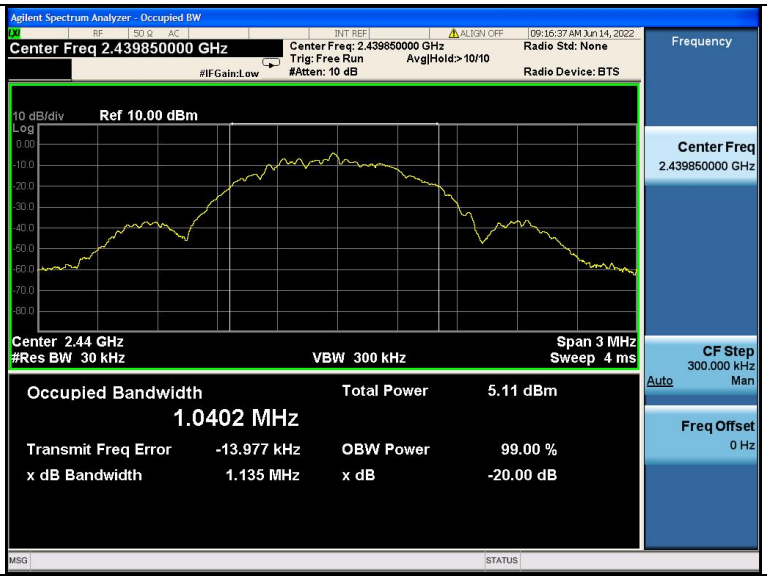
TEST RESULTS

Modulation	Channel	20dB bandwidth (MHz)	Result
GFSK	Low	1.117	PASS
	Mid	1.135	
	High	1.112	

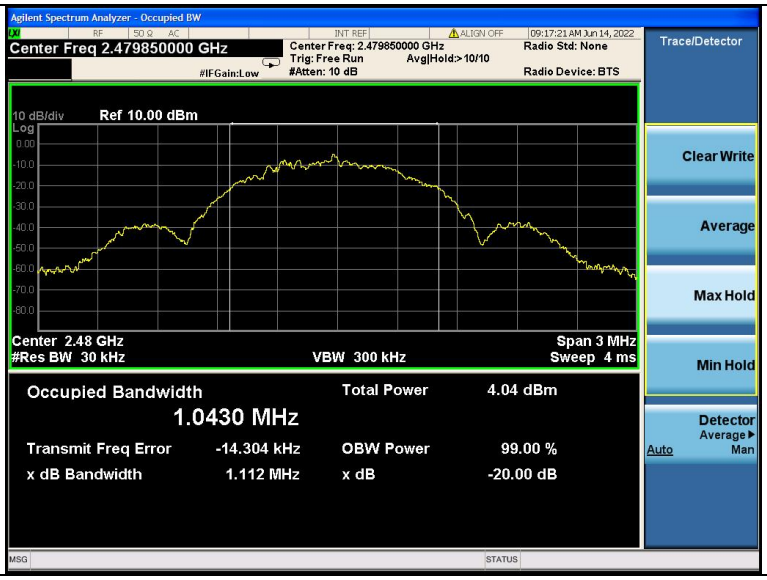
Note: 1.The test results including the cable lose.

GFSK

Low



Mid



High

4.4. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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 (c), 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.

Antenna Information

The maximum gain of antenna was -1dBi.

Remark:The antenna gain is provided by the customer , if the data provided by the customer is not accurate, Shenzhen HTT Technology Co.,Ltd. does not assume any responsibility.

5. Test Setup Photos of the EUT

Reference to the **appendix I** for details

6. Test Photos of the EUT

Reference to the **appendix II** for details.

.....End of Report.....