



# Shenzhen HTT Technology Co., Ltd.

## TEST REPORT FCC Rules and Regulations Part PART 15.249

Report Reference No.: HTT202202092F01

FCC ID.: 2A4O4-USBRECEIVER

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: Feb .27, 2022

Testing Laboratory Name: Shenzhen HTT Technology Co.,Ltd.

1F, Building B, Huafeng International Robotics Industrial Park,

Address: Hangcheng Road, Nanchang Community, Xixiang Street, Bao'an  
District, Shenzhen, Guangdong, China

Applicant's name: Guangzhou Banda Electronics Co., Ltd

Address: Guangzhou Zengcheng District Xintang Town Nizi village Banda  
electronics factory Guangzhou China

Standard: FCC Rules and Regulations Part PART 15.249

Shenzhen HTT Technology Co.,Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the  
Shenzhen HTT Technology Co.,Ltd. is acknowledged as copyright owner and source of the material.  
Shenzhen HTT Technology Co.,Ltd. takes no responsibility for and will not assume liability for damages  
resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description: USB receiver

Trade Mark: N/A

Manufacturer: Guangzhou Banda Electronics Co., Ltd

Model/Type reference: K100

Listed Models: N/A

Modulation: GFSK

Frequency: 2402-2480MHz

Ratings: DC 5.0V From PC

Result: PASS

## TEST REPORT

Equipment under Test : USB receiver

Model /Type : K100

Listed Models : N/A

**Applicant** : **Guangzhou Banda Electronics Co., Ltd**

Address : Guangzhou Zengcheng District Xintang Town Nizi village Banda electronics factory Guangzhou China

**Manufacturer** : **Guangzhou Banda Electronics Co., Ltd**

Address : Guangzhou Zengcheng District Xintang Town Nizi village Banda electronics factory Guangzhou China

<b>Test Result:</b>	<b>PASS</b>
---------------------	-------------

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

<b><u>1. TEST STANDARDS .....</u></b>	<b>4</b>
<b><u>2. SUMMARY .....</u></b>	<b>5</b>
2.1.    General Remarks .....	5
2.2.    Product Description .....	5
2.3.    Equipment Under Test .....	5
2.4.    Short description of the Equipment under Test (EUT) .....	5
2.5.    EUT operation mode .....	5
2.6.    Block Diagram of Test Setup.....	6
2.7.    Modifications .....	6
<b><u>3. TEST ENVIRONMENT .....</u></b>	<b>7</b>
3.1.    Address of the test laboratory .....	7
3.2.    Test Facility.....	7
3.3.    Environmental conditions .....	7
3.4.    Summary of measurement results .....	8
3.5.    Statement of the measurement uncertainty .....	8
3.6.    Equipments Used during the Test .....	8
<b><u>4. TEST CONDITIONS AND RESULTS .....</u></b>	<b>10</b>
4.1.    AC Power Conducted Emission.....	10
4.2.    Radiated Emission and Band Edges .....	13
4.3.    20dB Bandwidth Measurement.....	22
4.4.    Antenna Requirement .....	24
<b><u>5. TEST SETUP PHOTOS OF THE EUT .....</u></b>	<b>25</b>
<b><u>6. TEST PHOTOS OF THE EUT.....</u></b>	<b>25</b>

## **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	:	Feb. 10, 2022
Testing commenced on	:	Feb. 10, 2022
Testing concluded on	:	Feb. 27, 2022

### 2.2. Product Description

Name of EUT	USB receiver
Model Number	K100
List Model:	N/A
Power Rating	DC 5.0V From PC
Auxiliary test PC(Supplied by testing Lab):	Model:Air 13IWL Trade:Lenovo
Sample ID:	HTT202202093-1#(Engineer sample) HTT202202093-2#(Normal sample)
Operation frequency	2402-2480MHz
Modulation	GFSK
Antenna Type	PCB antenna
Antenna Gain	0dB(Max)

### 2.3. Equipment Under Test

#### Power supply system utilised

Power supply voltage	:	<input type="radio"/>	230V / 50 Hz	<input type="radio"/>	120V / 60Hz
		<input type="radio"/>	12 V DC	<input type="radio"/>	24 V DC
		<input checked="" type="radio"/>	Other (specified in blank below)		

DC 5.0V From PC

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

This is a USB receiver

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 40 channels provided to the EUT. Channel Low, Mid and High was selected to test.

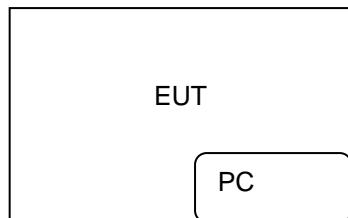
Channel	Frequency(MHz)	Channel	Frequency(MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452

6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
<b>19</b>	<b>2440</b>	<b>39</b>	<b>2480</b>

Test frequency:

Channel	Frequency (MHz)
Low	2402
Mid	2440
High	2480

## 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

#### **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

AC Main Conducted testing:

Temperature:	24 ° C
Humidity:	45 %
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	PASS
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&Schwarz	ESCI7	HTT-E022	May 21 2021	May 20 2022
4	Spectrum Analyzer	Rohde&Schwarz	FSP	HTT-E037	May 21 2021	May 20 2022
5	Coaxial Cable	ZDecl	ZT26-NJ-NJ-0.6M	HTT-E018	May 21 2021	May 20 2022
6	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-2M	HTT-E019	May 21 2021	May 20 2022
7	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-0.6M	HTT-E020	May 21 2021	May 20 2022
8	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-8.5M	HTT-E021	May 21 2021	May 20 2022
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 21 2021	May 20 2022
14	high-frequency Amplifier	HP	8449B	HTT-E014	May 21 2021	May 20 2022
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	May 21 2021	May 20 2022
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	May 21 2021	May 20 2022
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May 21 2021	May 20 2022
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May 21 2021	May 20 2022
19	Cable Line	Robinson	Z302S-NJ-BNCJ-1.5M	HTT-E001	May 21 2021	May 20 2022
20	Attenuator	Robinson	6810.17A	HTT-E007	May 21 2021	May 20 2022
21	Variable frequency power supply	Shenzhen Yanghong Electric Co., Ltd	YF-650 (5KVA)	HTT-E032	May 21 2021	May 20 2022

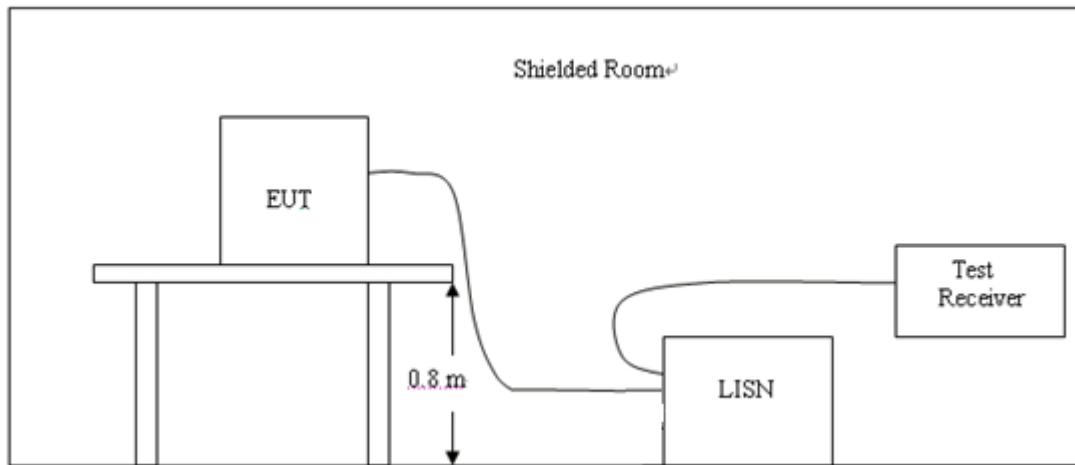
22	Control Room	Shenzhen C.R.T technology co., LTD	8*4*3.5	HTT-E029	May 21 2021	May 20 2022
23	DC power supply	Agilent	E3632A	HTT-E023	May 21 2021	May 20 2022
24	EMI Test Receiver	Agilent	N9020A	HTT-E024	May 21 2021	May 20 2022
25	Analog signal generator	Agilent	N5181A	HTT-E025	May 21 2021	May 20 2022
26	Vector signal generator	Agilent	N5182A	HTT-E026	May 21 2021	May 20 2022
27	Power sensor	Keysight	U2021XA	HTT-E027	May 21 2021	May 20 2022
28	Temperature and humidity meter	Shenzhen Anbiao Instrument Co., Ltd	TH10R	HTT-074	May 21 2021	May 20 2022
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 :

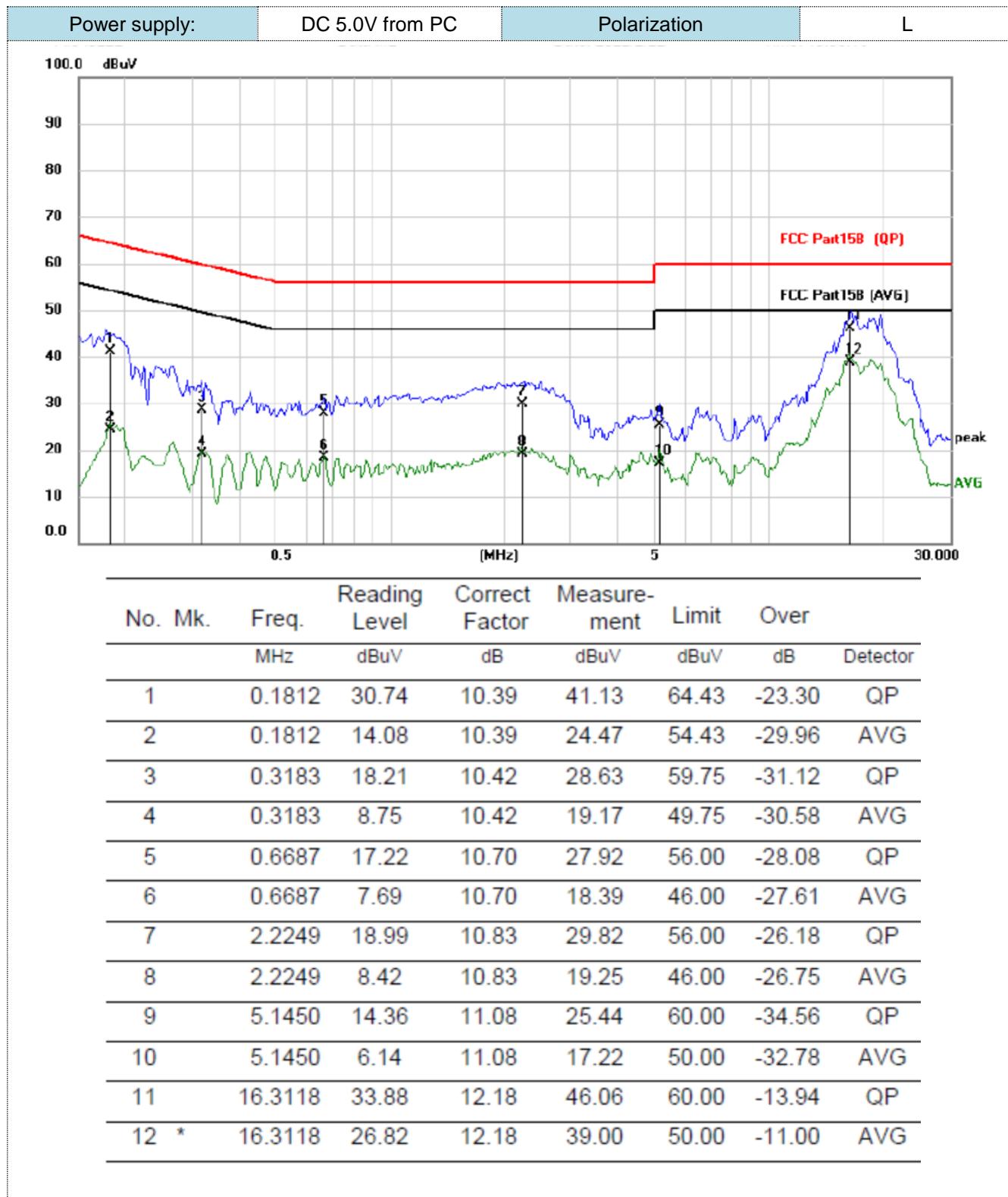
Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

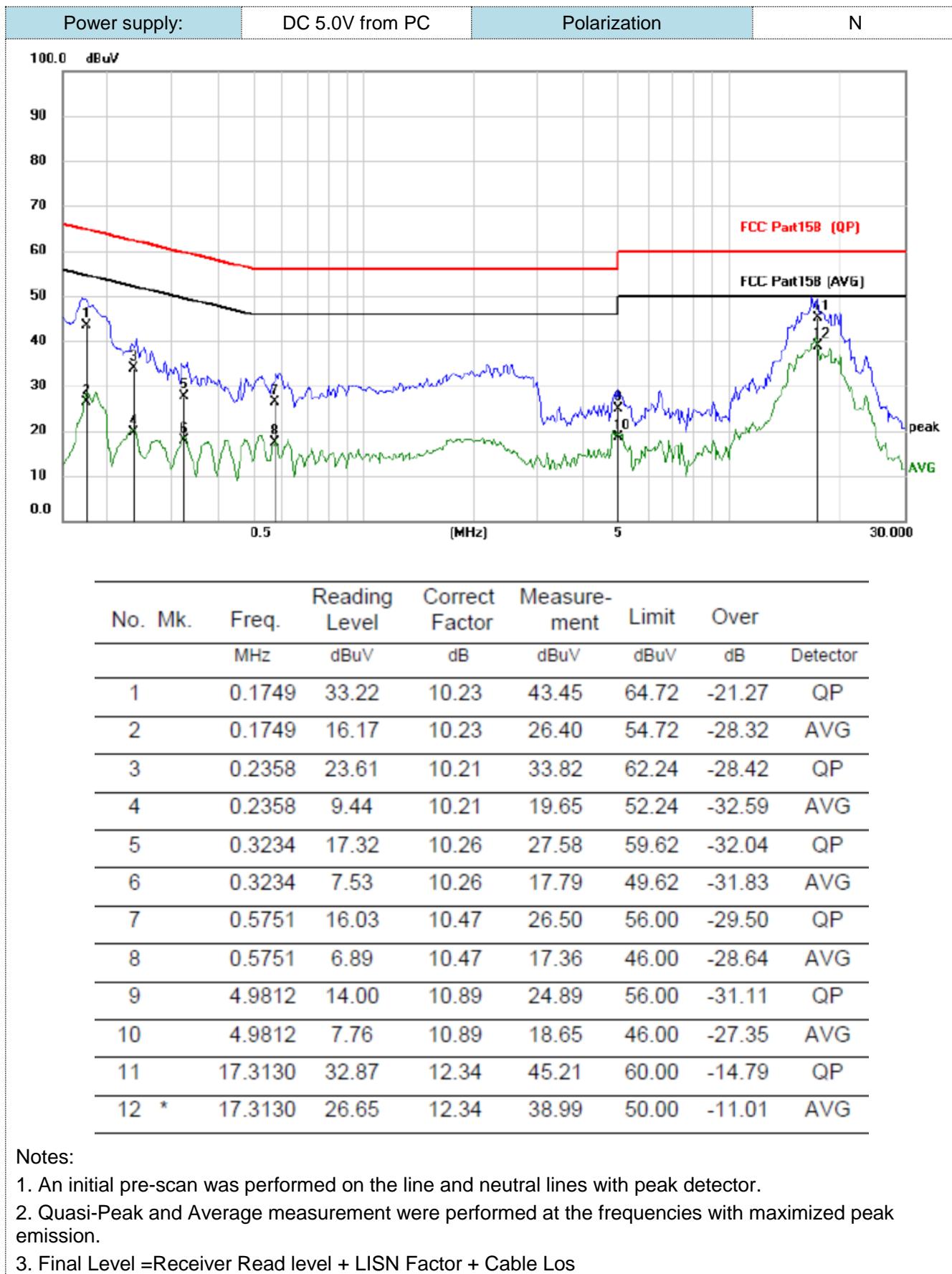
\* Decreases with the logarithm of the frequency.

#### TEST RESULTS

Remark:

1. GFSK was tested at Low, Middle, and High channel; only the worst result of GFSK High channel was reported as below:
2. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

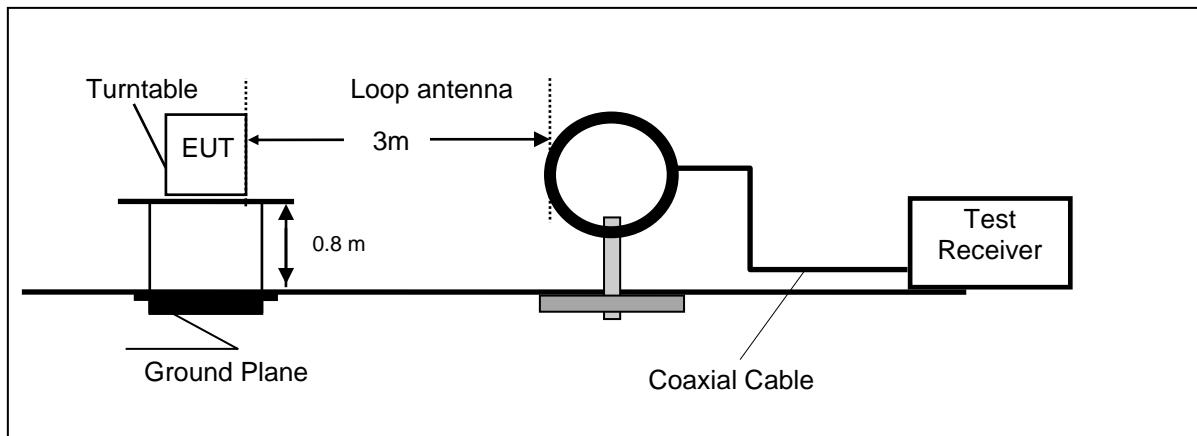




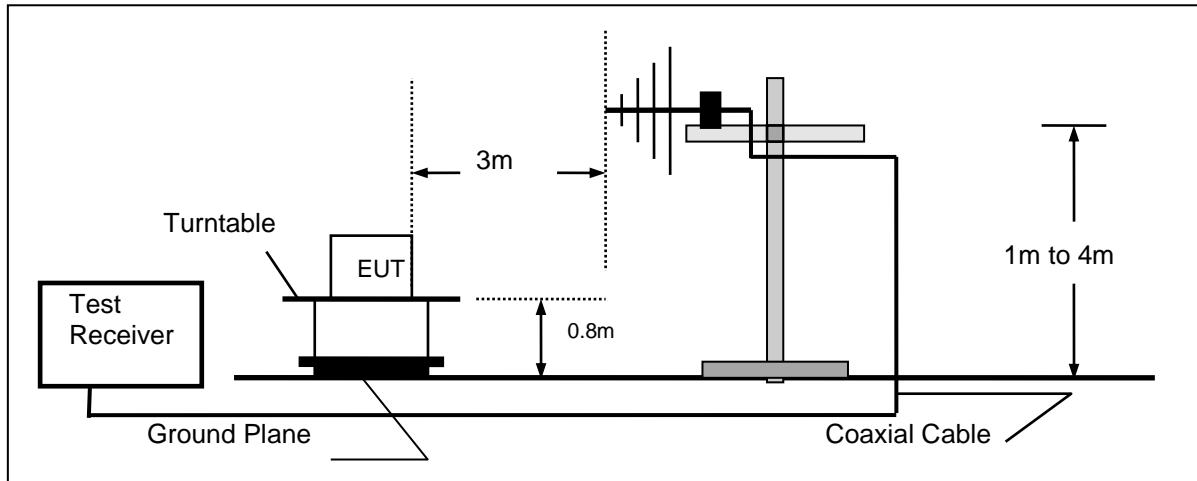
## 4.2. Radiated Emission and Band Edges

### TEST CONFIGURATION

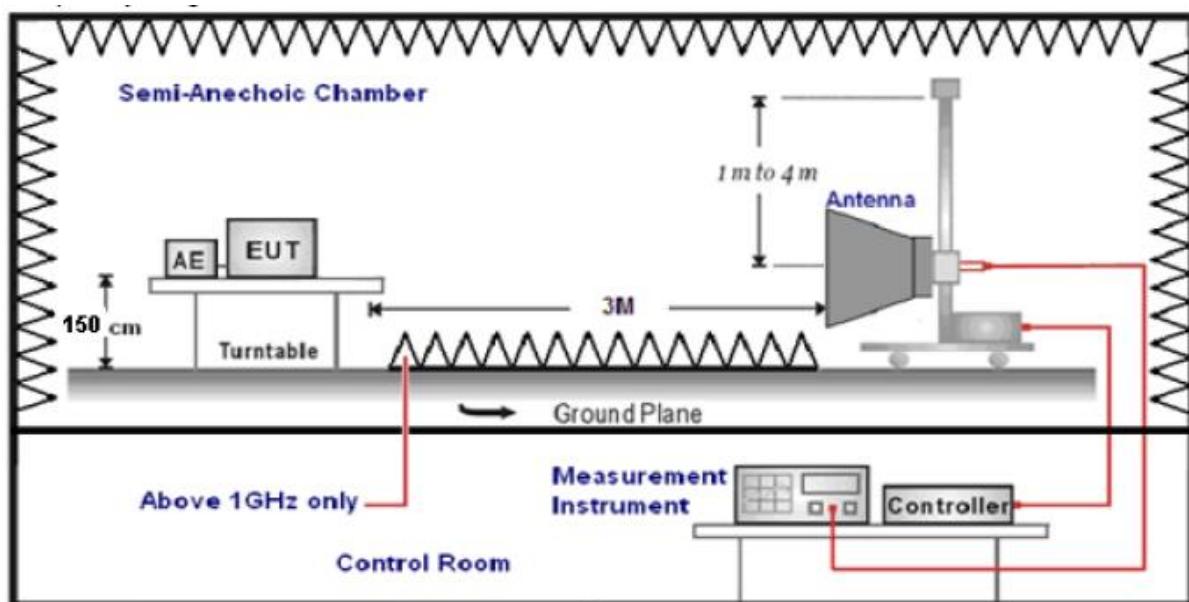
Frequency range 9 KHz – 30MHz



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°C to 360°C 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 Antenna	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 94dB $\mu$ V/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

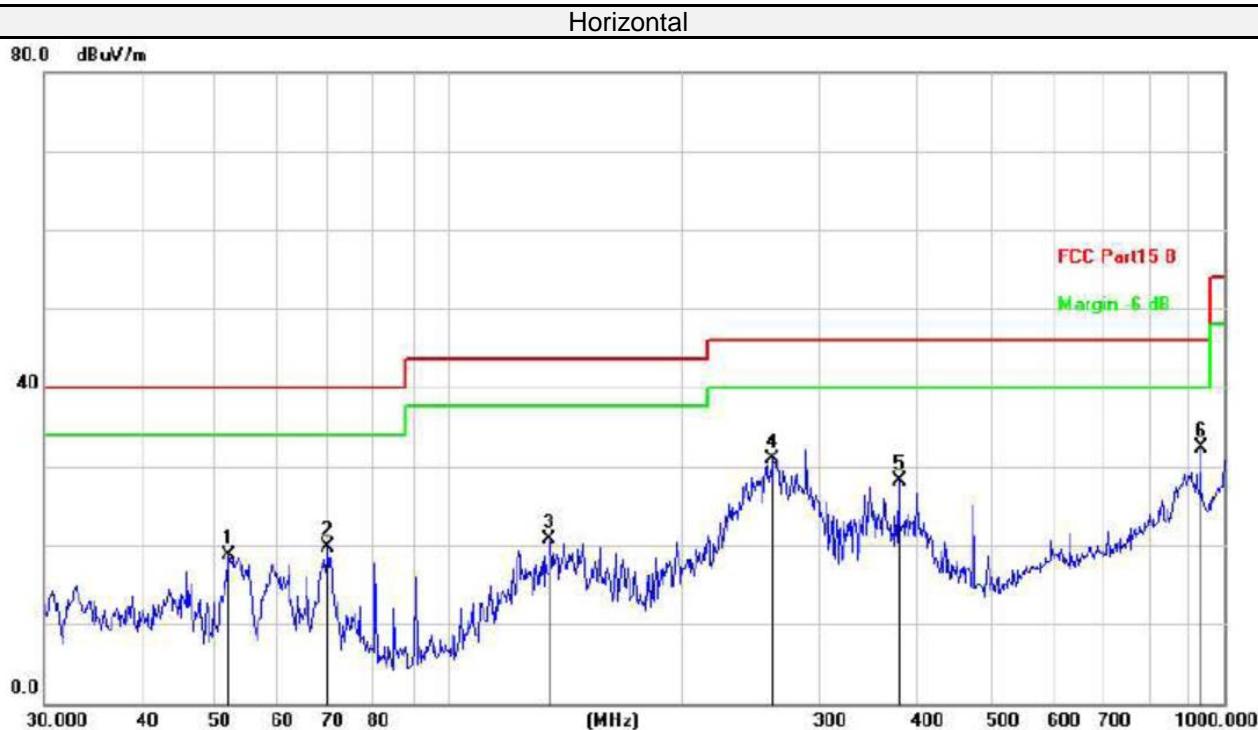
Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0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

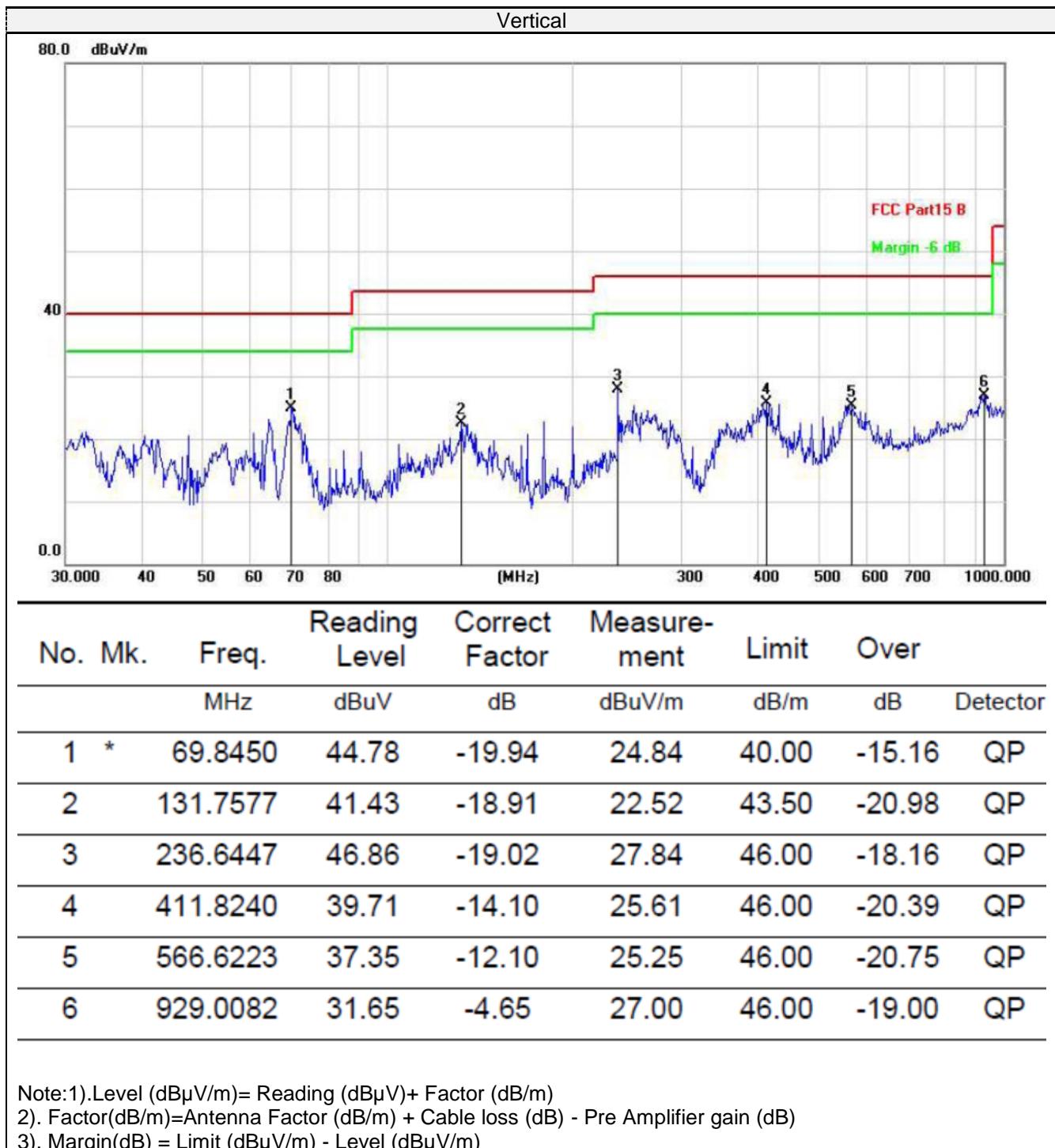


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		52.0251	36.01	-17.38	18.63	40.00	-21.37	QP
2		69.8450	39.73	-19.94	19.79	40.00	-20.21	QP
3		135.0319	39.15	-18.48	20.67	43.50	-22.83	QP
4		261.0583	49.55	-18.61	30.94	46.00	-15.06	QP
5		379.9141	45.58	-17.38	28.20	46.00	-17.80	QP
6	*	932.2715	36.98	-4.65	32.33	46.00	-13.67	QP

Note:1).Level (dB $\mu$ V/m)= Reading (dB $\mu$ V)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dB $\mu$ V/m) - Level (dB $\mu$ V/m)



## For 1GHz to 25GHz

**GFSK (above 1GHz)**

CH Low (2402MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2402	98.43	26.3	5.8	33.2	97.33	114.00	-16.67	peak
2402	79.98	26.3	5.8	33.2	78.88	98.00	-19.12	AVG
4804	51.42	31.40	8.18	32.10	58.90	74.00	-15.10	peak
4804	37.53	31.40	8.18	32.10	45.01	54.00	-8.99	AVG
7206	41.47	35.80	10.83	31.40	56.70	74.00	-17.30	peak
7206	28.06	35.80	10.83	31.40	43.29	54.00	-10.71	AVG
---	---			---	---	---	---	---
---	---			---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2402	98.84	26.3	5.8	33.2	97.74	114.00	-16.26	peak
2402	81.54	26.3	5.8	33.2	80.44	94.00	-13.56	AVG
4804	52.76	31.40	8.18	32.10	60.24	74.00	-13.76	peak
4804	36.69	31.40	8.18	32.10	44.17	54.00	-9.83	AVG
7206	44.52	35.80	10.83	31.40	59.75	74.00	-14.25	peak
7206	28.75	35.80	10.83	31.40	43.98	54.00	-10.02	AVG
---	---			---	---	---	---	---
---	---			---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

## CH Middle (2440MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2440	98.53	27.2	6.3	32.9	99.13	114	-14.87	peak
2440	80.86	27.2	6.3	33.9	80.46	94	-13.54	AVG
4880	53.28	31.40	9.17	32.10	61.75	74.00	-12.25	peak
4880	36.54	31.40	9.17	32.10	45.01	54.00	-8.99	AVG
7320	46.52	35.80	10.83	31.40	61.75	74.00	-12.25	peak
7320	28.15	35.80	10.83	31.40	43.38	54.00	-10.62	AVG
---	---			---	---	---	---	---
---	---			---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2440	98.64	27.2	6.3	32.9	99.24	114	-14.76	peak
2440	79.7	27.2	6.3	33.9	79.30	94	-14.70	AVG
4880	50.21	31.40	9.17	32.10	58.68	74.00	-15.32	peak
4880	36.53	31.40	9.17	32.10	45.00	54.00	-9.00	AVG
7320	44.97	35.80	10.83	31.40	60.20	74.00	-13.80	peak
7320	29.27	35.80	10.83	31.40	44.50	54.00	-9.50	AVG
---	---			---	---	---	---	---
---	---			---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

CH High (2480MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2480	97.57	28.5	6.9	32.6	100.37	114	-13.63	peak
2480	78.75	28.5	6.9	32.6	81.55	94	-12.45	AVG
4960	49.21	31.40	9.17	32.10	57.68	74.00	-16.32	peak
4960	37.93	31.40	9.17	32.10	46.40	54.00	-7.60	AVG
7440	45.11	35.80	10.83	31.40	60.34	74.00	-13.66	peak
7440	27.49	35.80	10.83	31.40	42.72	54.00	-11.28	AVG
---	---			---	---	---	---	---
---	---			---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2480	98.63	28.5	6.9	32.6	101.43	114.00	-12.57	peak
2480	79.17	28.5	6.9	32.6	81.97	94.00	-12.03	AVG
4960	52.53	31.40	9.17	32.10	61.00	74.00	-13.00	peak
4960	36.39	31.40	9.17	32.10	44.86	54.00	-9.14	AVG
7440	45.64	35.80	10.83	31.40	60.87	74.00	-13.13	peak
7440	27.37	35.80	10.83	31.40	42.60	54.00	-11.40	AVG
---	---			---	---	---	---	---
---	---			---	---	---	---	---

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 (2402MHz)

Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2390	56.53	-5.68	50.85	74	-23.15	peak
2390	43.79	-5.68	38.11	54	-15.89	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2390	56.69	-5.68	51.01	74	-22.99	peak
2390	43.47	-5.68	37.79	54	-16.21	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: GFSK (2480MHz)  
 Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2483.5	54.98	-5.85	49.13	74	-24.87	peak
2483.5	43.19	-5.85	37.34	54	-16.66	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

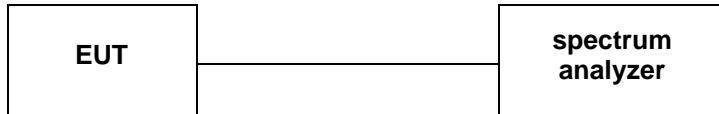
Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2483.5	55.79	-5.85	49.94	74	-24.06	peak
2483.5	43.45	-5.85	37.6	54	-16.4	AVG

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.

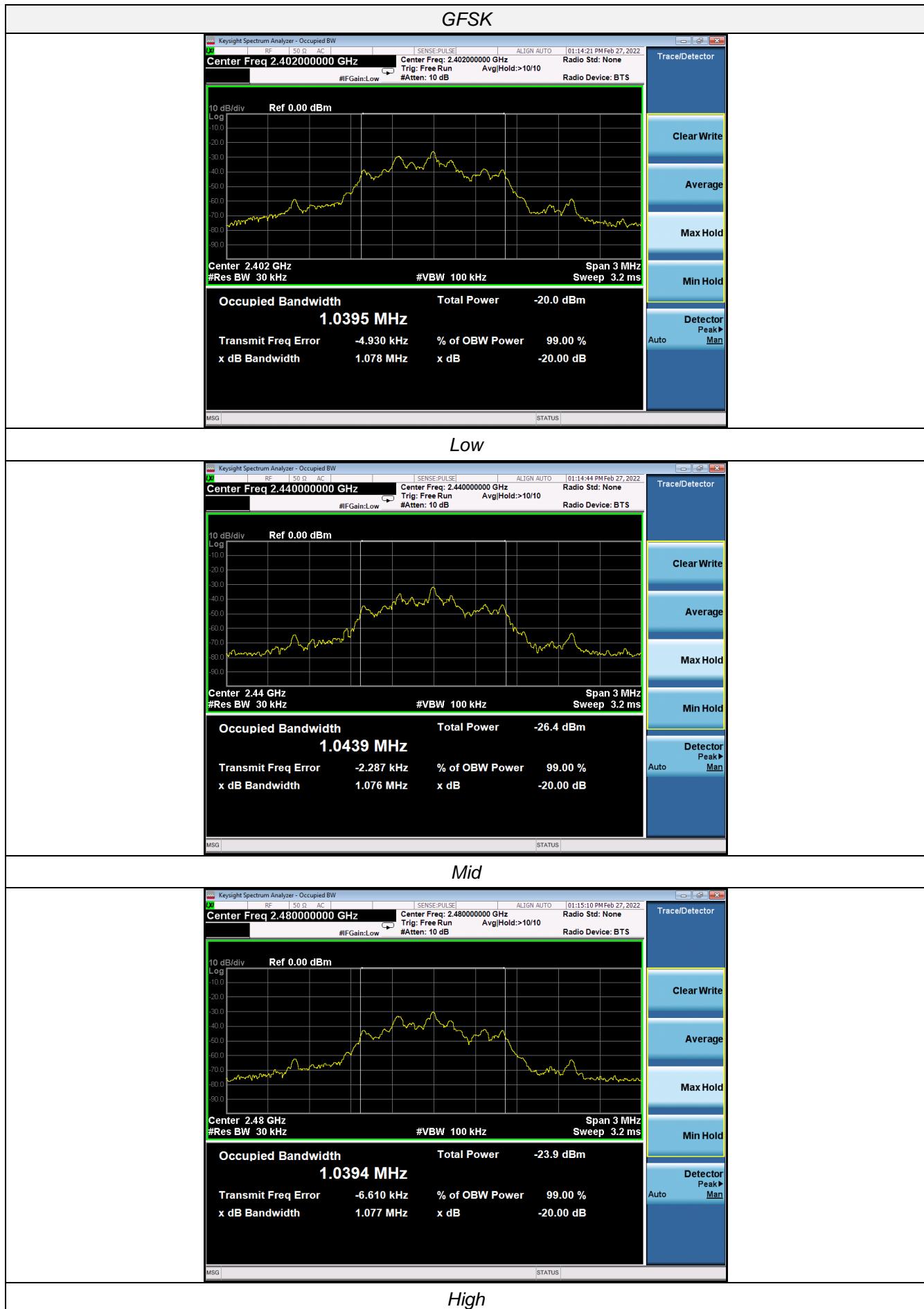
#### LIMIT

N/A

#### TEST RESULTS

Modulation	Channel	20dB bandwidth (MHz)	Result
GFSK	Low	1.078	PASS
	Mid	1.076	
	High	1.077	

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



#### 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 0.0 dBi.

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**.....