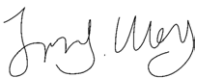
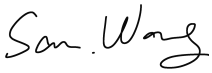
Shenzhen GUOREN Certification Technology Service Co., Ltd.

101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.249

Report Reference No..... :	**GRCTR220902005-01**	
FCC ID..... :	**2A8SK-MJ2840**	
Compiled by (position+printed name+signature).. :	File administrators Jimmy Wang	
Supervised by (position+printed name+signature).. :	Test Engineer Kelley Zhang	
Approved by (position+printed name+signature).. :	Manager Sam Wang	
Date of issue..... :	Sep. 24, 2022	
Testing Laboratory Name..... :	**Shenzhen GUOREN Certification Technology Service Co., Ltd.**	
Address..... :	101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China	
Applicant's name..... :	**HuiZhou Minjie Technology Co.,Ltd**	
Address..... :	Yong Jun Road, Chenjiang Street, Zhongkai High-Tech District, Huizhou 516029, China	
Test specification..... **:**		
Standard..... :	**FCC Part 15.249: Operation within the bands 902-928 MHz, 2400-2483.5 MHz ,5725-5850 MHz,and 24.0-24.25 GHz**	

Test item description.....:	Barcode Scanner
Trade Mark..... :	/
Manufacturer..... :	**HuiZhou Minjie Technology Co.,Ltd**
Model/Type reference..... :	MJ2840
Listed Models ..... :	MJ2810, MJ2820, MJ2830, MJ2850, MJ2860, MJ2870, MJ2880, MJ2890, MJ3650, MJ3660
Modulation Type..... :	GFSK
Operation Frequency..... :	2402MHz-2480MHz
EUT Type..... :	Production Unit
Rating..... :	DC 3.7V From Battery and USB 5V from computer
Result..... :	**PASS**

T E S T R E P O R T

Equipment under Test	:	Barcode Scanner
Model /Type	:	MJ2840
Listed Models	:	MJ2810, MJ2820, MJ2830, MJ2850, MJ2860, MJ2870, MJ2880, MJ2890, MJ3650, MJ3660
Applicant	:	**HuiZhou Minjie Technology Co.,Ltd**
Address	:	Yong Jun Road, Chenjiang Street, Zhongkai High-Tech District, Huizhou 516029, China
Manufacturer	:	**HuiZhou Minjie Technology Co.,Ltd**
Address	:	Yong Jun Road, Chenjiang Street, Zhongkai High-Tech District, Huizhou 516029, China

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

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Sep. 05, 2022
Testing commenced on	:	Sep. 05, 2022
Testing concluded on	:	Sep. 24, 2022

2.2. Product Description

Product Description:	Barcode Scanner
Model/Type reference:	MJ2840
Listed Models:	MJ2810, MJ2820, MJ2830, MJ2850, MJ2860, MJ2870, MJ2880, MJ2890, MJ3650, MJ3660(The products are identical in interior structure, electrical circuits and components, just model names and color are different.)
Power supply:	DC 3.7V From Battery and USB 5V from computer
Testing sample ID:	GRCTR220902005-01-1# (Engineer sample), GRCTR220902005-01-2# (Normal sample)
Firmware Version:	V1.0
Hardware Version:	V1.0
Modulation:	GFSK
Operation frequency:	2402MHz to 2480MHz
Channel number:	40
Antenna type:	Spring antenna
Antenna gain*（Supplied by the customer）:	2.52 dBi
Remark:*When the information provided by the customer was used to calculate test results, if the information provided by the customer is not accurate, shenzhen GUOREN Certification Technology Service Co., Ltd. does not assume any responsibility.	

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

This is a Barcode Scanner.

For more details, refer to the user's manual of the EUT.

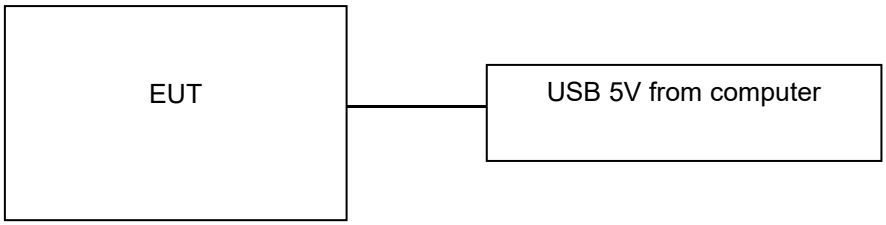
2.4. EUT operation mode

Operation Frequency：

Channel	Frequency (MHz)
00	**2402**
01	2404
02	2406
⋮	⋮
19	**2440**
⋮	⋮

37	2476
38	2478
39	**2480**

2.5. Block Diagram of Test Setup



2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - Supplied by the lab

○	Notebook	M/N:	Pro 14
		Manufacturer:	Xiao Mi

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen GUOREN Certification Technology Service Co., Ltd.
101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China

3.2. Test Facility

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

FCC-Registration No.: 920798 Designation Number: CN1304

Shenzhen GUOREN Certification Technology Service 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.: 6202.01

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

ISED#: 27264 CAB identifier: CN0115
Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed by Innovation, Science and Economic Development Canada 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:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

FCC PART 15.249		
FCC Part 15.249(a)	Field Strength of Fundamental	PASS
FCC Part 15.249 (a) (d)/15.209	Spurious Emission	PASS
FCC Part 15.249 (d)/15.205	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

Remark:
1. The measurement uncertainty is not included in the test result.
2. N/A = Not Applicable; N/P = Not Performed

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen GUOREN Certification Technology Service Co., Ltd.quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GUOREN Certification Technology Service Co., Ltd.:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.06 dB	(1)
Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

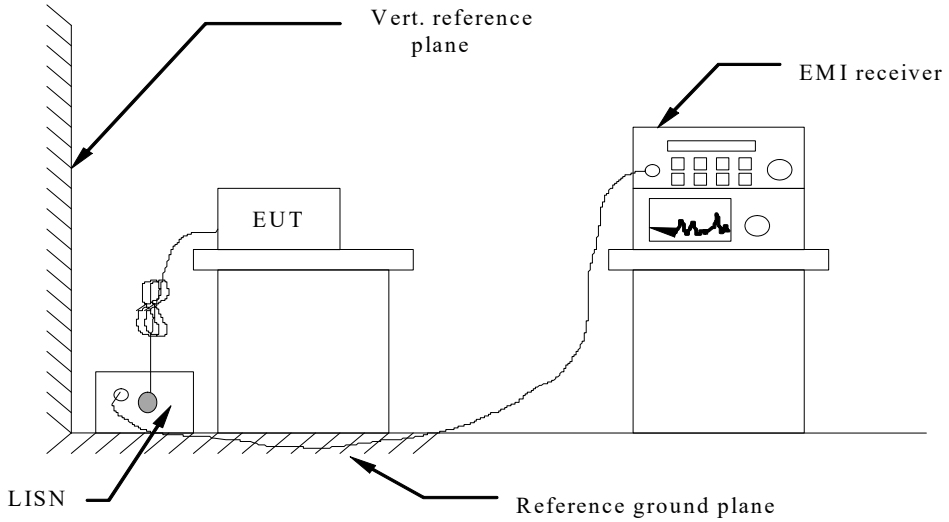
3.6. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	GRCTEE009	2021/10/30	2022/10/29
LISN	R&S	ENV216	GRCTEE010	2021/10/30	2022/10/29
EMI Test Receiver	R&S	ESPI	GRCTEE017	2021/10/30	2022/10/29
EMI Test Receiver	R&S	ESCI	GRCTEE008	2021/10/30	2022/10/29
Spectrum Analyzer	Agilent	N9020A	GRCTEE002	2021/10/30	2022/10/29
Spectrum Analyzer	R&S	FSP	GRCTEE003	2021/10/20	2022/10/19
Vector Signal generator	Agilent	N5181A	GRCTEE007	2021/10/30	2022/10/29
Analog Signal Generator	R&S	SML03	GRCTEE006	2021/10/30	2022/10/29
Climate Chamber	QIYA	LCD-9530	GRCTES016	2021/10/30	2022/10/29
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	GRCTEE018	2020/10/25	2023/10/24
Horn Antenna	Schwarzbeck	BBHA 9120D	GRCTEE019	2020/10/25	2023/10/24
Loop Antenna	Zhinan	ZN30900C	GRCTEE020	2020/10/25	2023/10/24
Horn Antenna	Beijing Hangwei Dayang	OBH100400	GRCTEE049	2021/1/18	2024/1/17
Amplifier	Schwarzbeck	BBV 9745	GRCTEE021	2021/10/30	2022/10/29
Amplifier	Taiwan chengyi	EMC051845B	GRCTEE022	2021/10/30	2022/10/29
Temperature/Humidity Meter	Huaguan	HG-308	GRCTES037	2021/10/30	2022/10/29
Directional coupler	NARDA	4226-10	GRCTEE004	2021/10/30	2022/10/29
High-Pass Filter	XingBo	XBLBQ-GTA18	GRCTEE053	2021/10/30	2022/10/29
High-Pass Filter	XingBo	XBLBQ-GTA27	GRCTEE054	2021/10/30	2022/10/29
Automated filter bank	Tonscend	JS0806-F	GRCTEE055	2021/10/30	2022/10/29
Power Sensor	Agilent	U2021XA	GRCTEE070	2021/10/30	2022/10/29
EMI Test Software	ROHDE & SCHWARZ	ESK1-V1.71	GRCTEE060	N/A	N/A
EMI Test Software	Fera	EZ-EMC	GRCTEE061	N/A	N/A

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 C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013.
4 The EUT received power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz 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.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

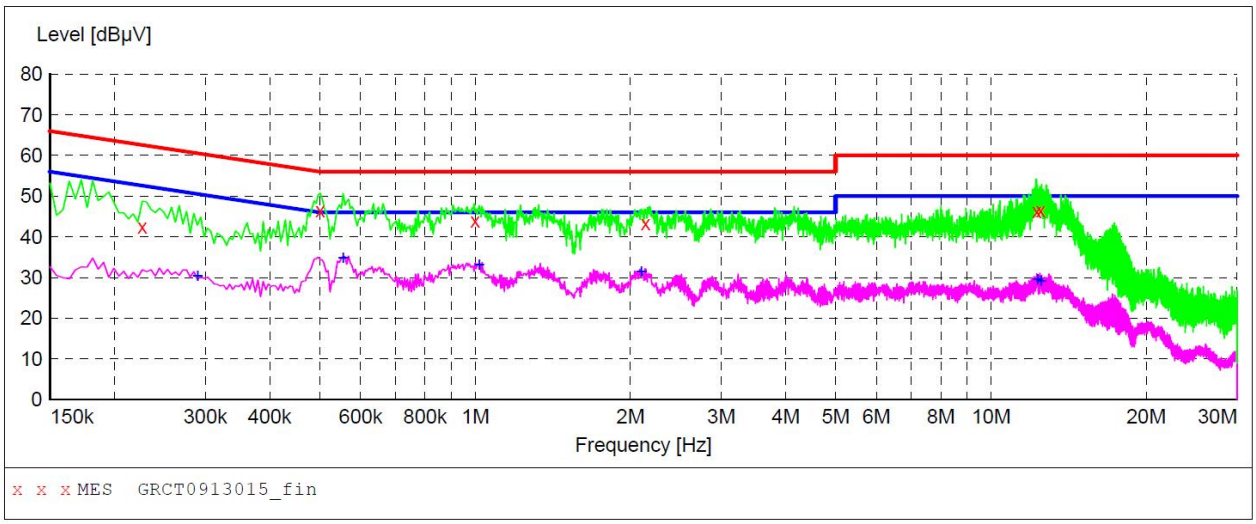
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following:

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.EUT was tested at Low, Middle, and High channel, only the worst result CH19 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:

Power supply:	USB 5V from computer	Polarization	L



MEASUREMENT RESULT: "GRCT0913015_fin"

9/13/2022 11:00AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.226500	42.40	9.7	63	20.2	QP	L1	GND
0.501000	46.50	9.7	56	9.5	QP	L1	GND
1.000500	43.90	9.9	56	12.1	QP	L1	GND
2.139000	43.40	9.9	56	12.6	QP	L1	GND
12.277500	46.20	10.1	60	13.8	QP	L1	GND
12.498000	46.40	10.2	60	13.6	QP	L1	GND

MEASUREMENT RESULT: "GRCT0913015_fin2"

9/13/2022 11:00AM

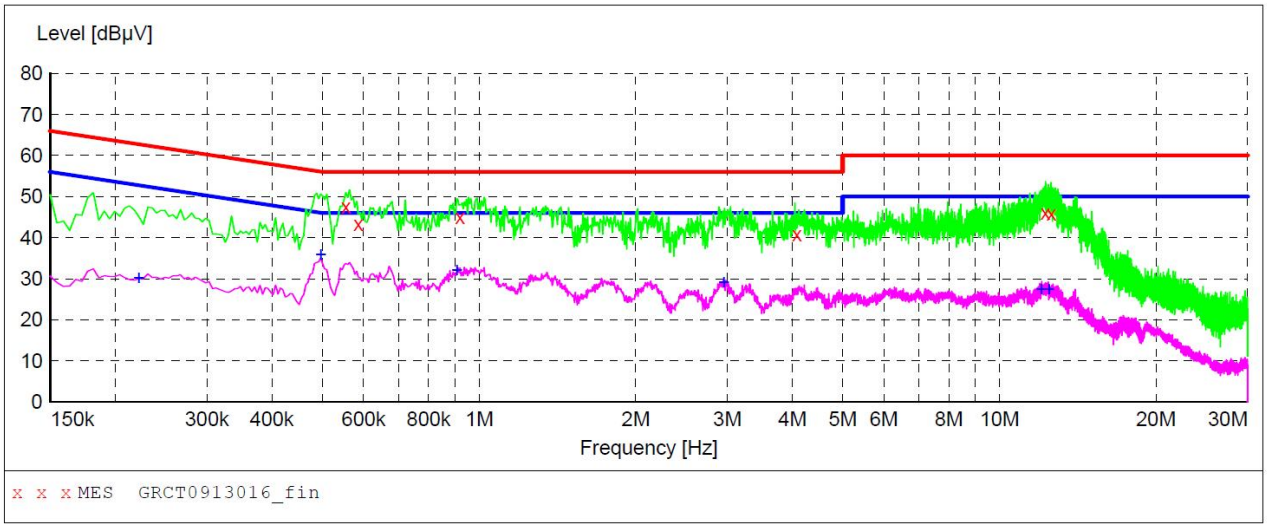
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.289500	30.50	9.7	51	20.0	AV	L1	GND
0.555000	35.00	9.7	46	11.0	AV	L1	GND
1.018500	33.20	9.9	46	12.8	AV	L1	GND
2.098500	31.50	9.9	46	14.5	AV	L1	GND
12.295500	29.70	10.1	50	20.3	AV	L1	GND
12.484500	29.20	10.2	50	20.8	AV	L1	GND

Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). Margin(dB) = Limit (dBµV) - Level (dBµV)

Power supply:	USB 5V from computer	Polarization	N



MEASUREMENT RESULT: "GRCT0913016_fin"

9/13/2022 11:02AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.555000	47.60	9.7	56	8.4	QP	N	GND
0.586500	43.30	9.7	56	12.7	QP	N	GND
0.919500	45.00	9.8	56	11.0	QP	N	GND
4.083000	40.80	10.0	56	15.2	QP	N	GND
12.268500	46.10	10.1	60	13.9	QP	N	GND
12.592500	45.80	10.2	60	14.2	QP	N	GND

MEASUREMENT RESULT: "GRCT0913016_fin2"

9/13/2022 11:02AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.222000	30.30	9.7	53	22.4	AV	N	GND
0.496500	36.00	9.7	46	10.1	AV	N	GND
0.906000	32.20	9.8	46	13.8	AV	N	GND
2.953500	29.10	9.9	46	16.9	AV	N	GND
12.021000	27.50	10.1	50	22.5	AV	N	GND
12.439500	27.50	10.2	50	22.5	AV	N	GND

Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

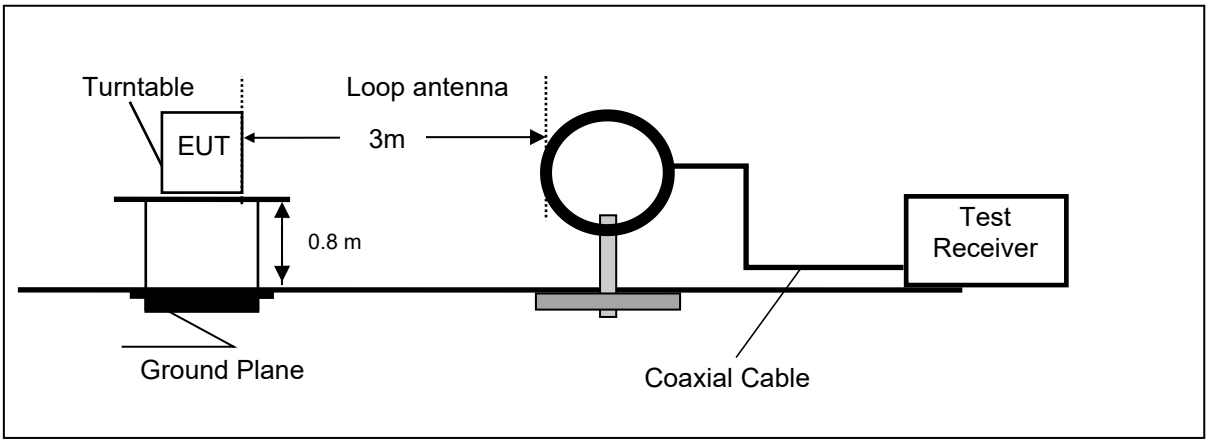
2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). Margin(dB) = Limit (dBµV) - Level (dBµV)

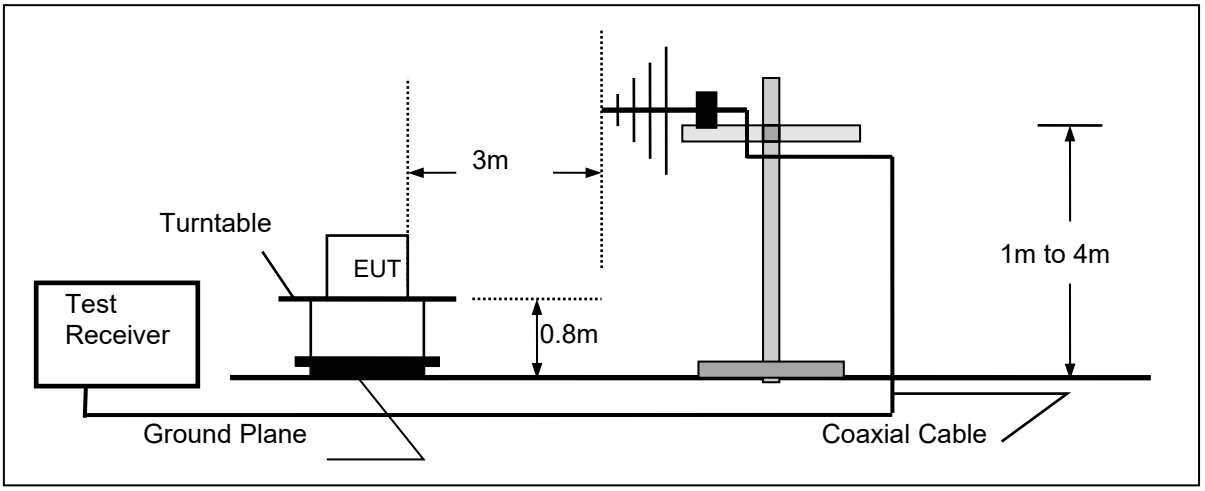
4.2. Radiated Emissions and Band Edge

TEST CONFIGURATION

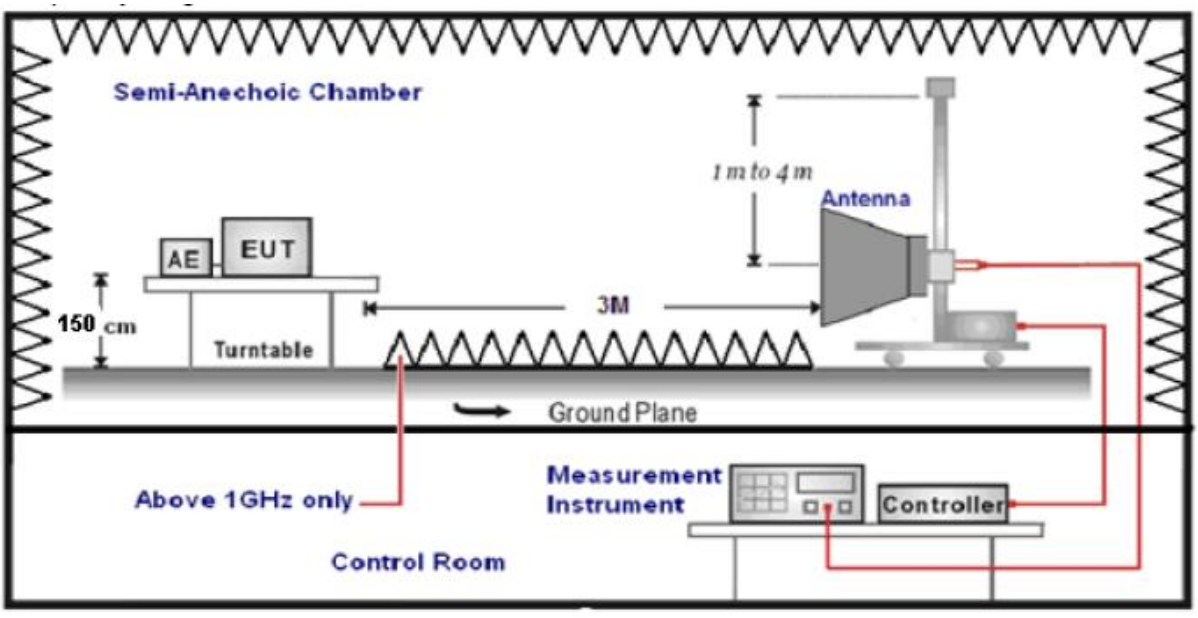
Frequency range 9 KHz – 30MHz



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 –1GHz; the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 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 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

6. 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

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

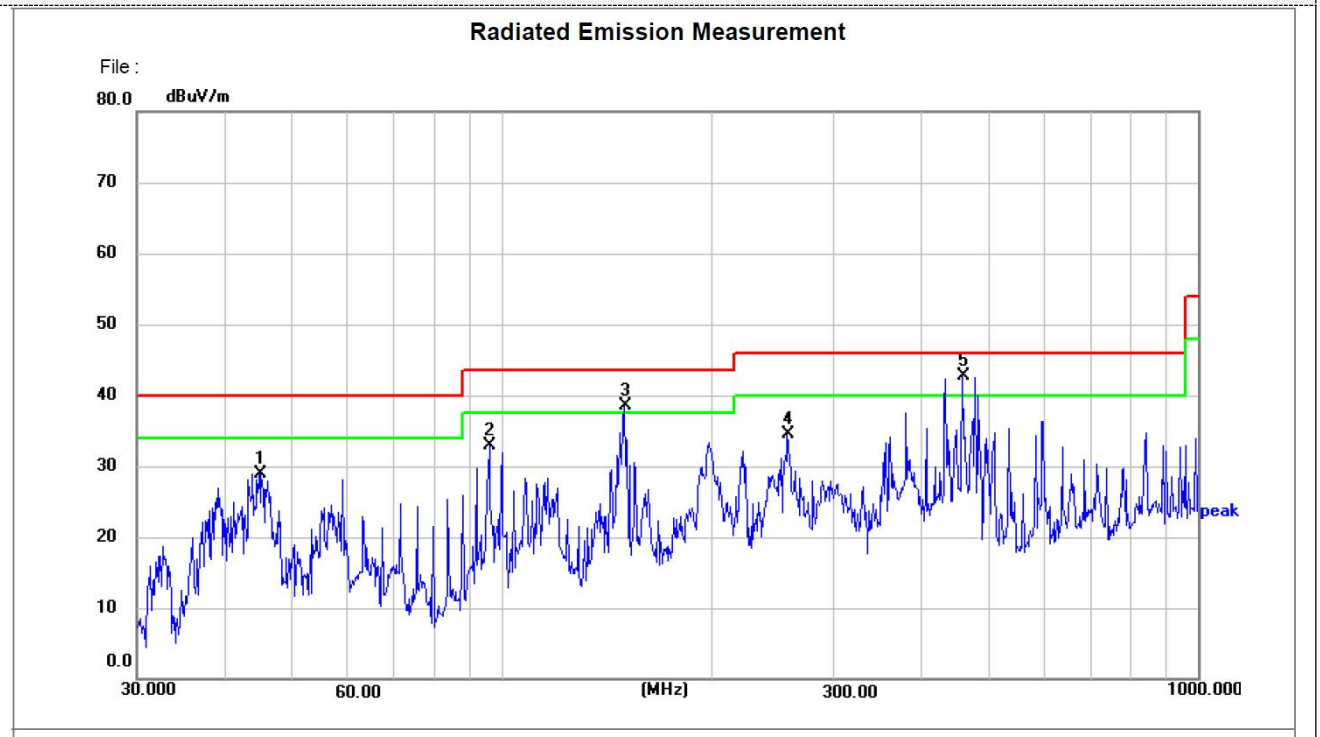
TEST RESULTS

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. EUT was tested at Low, Middle, and High channel, only the worst result of Middle Channel was reported for below 1GHz.
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 to 1000MHz

Horizontal



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT:
M/N:
Mode:
Note:

Polarization: *Horizontal*
Power: AC120V/60Hz
Distance: 3m

Temperature: 25(C)
Humidity: 53 %

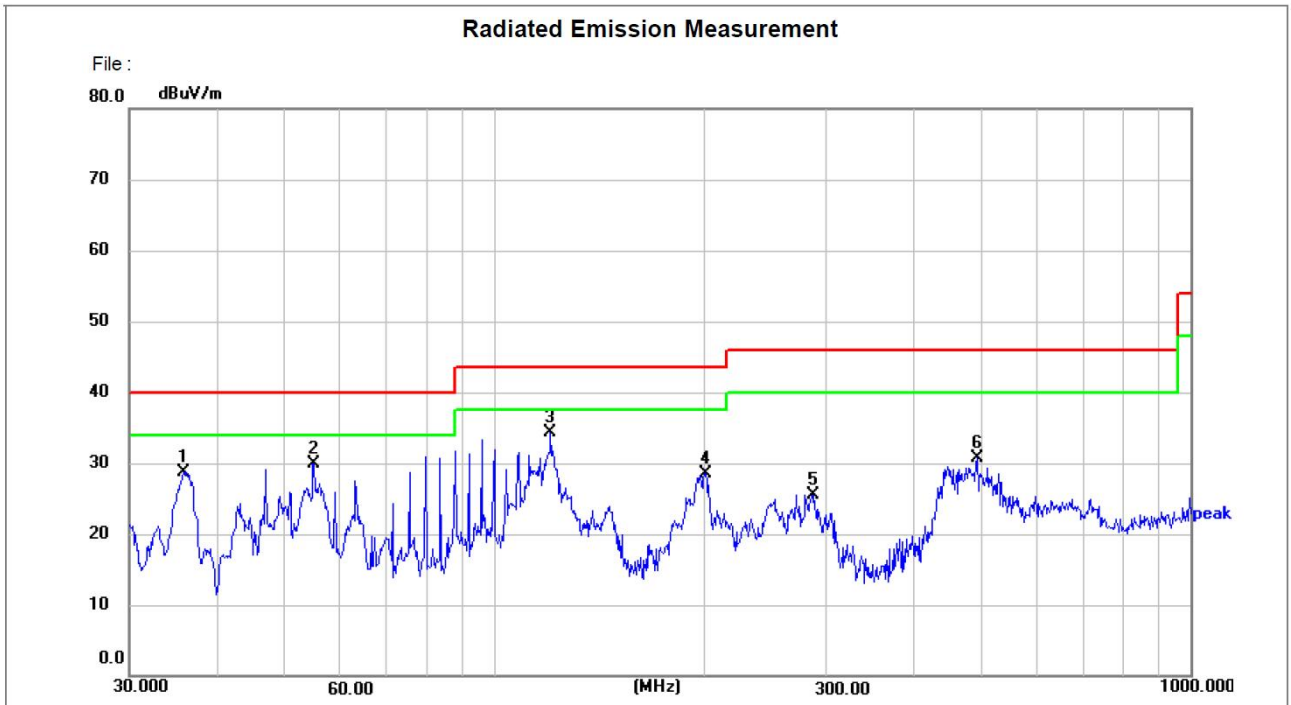
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	44.9006	46.90	-17.90	29.00	40.00	-11.00	peak	100	192	P	
2	96.0986	52.55	-19.65	32.90	43.50	-10.60	peak	100	282	P	
3 !	150.0108	60.00	-21.56	38.44	43.50	-5.06	peak	100	115	P	
4	257.4222	52.52	-18.08	34.44	46.00	-11.56	peak	100	86	P	
5 *	459.1144	57.24	-14.45	42.79	46.00	-3.21	peak	200	174	P	

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



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT:
M/N:
Mode:
Note:

Polarization: *Vertical*
Power: AC120V/60Hz
Distance: 3m

Temperature: 25(C)
Humidity: 53 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	35.8746	48.23	-19.57	28.66	40.00	-11.34	peak	100	9	P	
2	55.2207	48.09	-18.15	29.94	40.00	-10.06	peak	100	331	P	
3 *	120.6991	54.49	-20.14	34.35	43.50	-9.15	peak	100	9	P	
4	201.3930	47.42	-18.94	28.48	43.50	-15.02	peak	100	9	P	
5	286.9823	42.83	-17.32	25.51	46.00	-20.49	peak	100	9	P	
6	494.1984	44.42	-13.74	30.68	46.00	-15.32	peak	100	359	P	

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

Frequency(MHz):			2402		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2402.00	97.45	PK	114	16.55	122.66	25.74	4.35	54.72	-25.21
2402.00	74.83	AV	94	19.17	100.04	25.74	4.35	54.72	-25.21
4804.00	50.48	PK	74	23.52	71.64	28.42	5.14	54.72	-21.16
4804.00	39.11	AV	54	14.89	60.27	28.42	5.14	54.72	-21.16
7206.00	49.43	PK	74	24.57	63.85	34.15	6.46	55.03	-14.42
7206.00	37.64	AV	54	16.36	52.06	34.15	6.46	55.03	-14.42

Frequency(MHz):			2402		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2402.00	98.64	PK	114	15.36	123.85	25.74	4.35	54.72	-25.21
2402.00	75.76	AV	94	18.24	100.97	25.74	4.35	54.72	-25.21
4804.00	50.26	PK	74	23.74	71.42	28.42	5.14	54.72	-21.16
4804.00	39.71	AV	54	14.29	60.87	28.42	5.14	54.72	-21.16
7206.00	49.29	PK	74	24.71	63.71	34.15	6.46	55.03	-14.42
7206.00	37.22	AV	54	16.78	51.64	34.15	6.46	55.03	-14.42

Frequency(MHz):			2441		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2441.00	98.73	PK	114	15.27	123.27	25.75	4.39	54.68	-24.54
2441.00	75.06	AV	94	18.94	99.60	25.75	4.39	54.68	-24.54
4882.00	51.35	PK	74	22.65	71.59	28.76	5.34	54.34	-20.24
4882.00	39.89	AV	54	14.11	60.13	28.76	5.34	54.34	-20.24
7323.00	49.93	PK	74	24.07	63.56	34.41	6.83	54.87	-13.63
7323.00	38.09	AV	54	15.91	51.72	34.41	6.83	54.87	-13.63

Frequency(MHz):			2441		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2441.00	98.47	PK	114	15.53	123.01	25.75	4.39	54.68	-24.54
2441.00	75.15	AV	94	18.85	99.69	25.75	4.39	54.68	-24.54
4882.00	51.22	PK	74	22.78	71.46	28.76	5.34	54.34	-20.24
4882.00	39.94	AV	54	14.06	60.18	28.76	5.34	54.34	-20.24
7323.00	49.94	PK	74	24.06	63.57	34.41	6.83	54.87	-13.63
7323.00	37.76	PK	54	16.24	51.39	34.41	6.83	54.87	-13.63

Frequency(MHz):			2480		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2480.00	97.49	PK	114	16.51	121.70	25.77	4.40	54.81	-24.21
2480.00	74.83	AV	94	19.17	99.04	25.77	4.40	54.81	-24.21
4960.00	51.25	PK	74	22.75	71.56	29.52	5.63	54.68	-19.53
4960.00	40.12	AV	54	13.88	60.43	29.52	5.63	54.68	-19.53
7440.00	49.58	PK	74	24.42	63.24	34.49	7.23	54.92	-13.2
7440.00	37.22	PK	54	16.78	50.88	34.49	7.23	54.92	-13.2

Frequency(MHz):			2480		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2480.00	97.38	PK	114	16.62	121.59	25.77	4.40	54.81	-24.21
2480.00	74.67	AV	94	19.33	98.88	25.77	4.40	54.81	-24.21
4960.00	50.15	PK	74	23.85	70.46	29.52	5.63	54.68	-19.53
4960.00	39.27	AV	54	14.73	59.58	29.52	5.63	54.68	-19.53
7440.00	49.68	PK	74	24.32	63.34	34.49	7.23	54.92	-13.2
7440.00	38.31	PK	54	15.69	51.97	34.49	7.23	54.92	-13.2

REMARKS:
1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)- Pre-amplifier
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

Results of Band Edges Test (Radiated)

Frequency(MHz):			2402		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	55.63	PK	74	18.37	80.35	25.72	4.32	54.76	-24.72
2390.00	45.02	AV	54	8.98	69.74	25.72	4.32	54.76	-24.72
Frequency(MHz):			**2402**		**Polarity:**		**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	55.55	PK	74	18.45	80.27	25.72	4.32	54.76	-24.72
2390.00	45.09	AV	54	8.91	69.81	25.72	4.32	54.76	-24.72
Frequency(MHz):			**2480**		**Polarity:**		**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	56.29	PK	74	17.71	80.86	25.78	4.48	54.83	-24.57
2483.50	45.48	AV	54	8.52	70.05	25.78	4.48	54.83	-24.57
Frequency(MHz):			**2480**		**Polarity:**		**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	56.16	PK	74	17.84	80.73	25.78	4.48	54.83	-24.57
2483.50	45.27	AV	54	8.73	69.84	25.78	4.48	54.83	-24.57

REMARKS:
1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)- Pre-amplifier
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the 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 100KHz VBW.

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

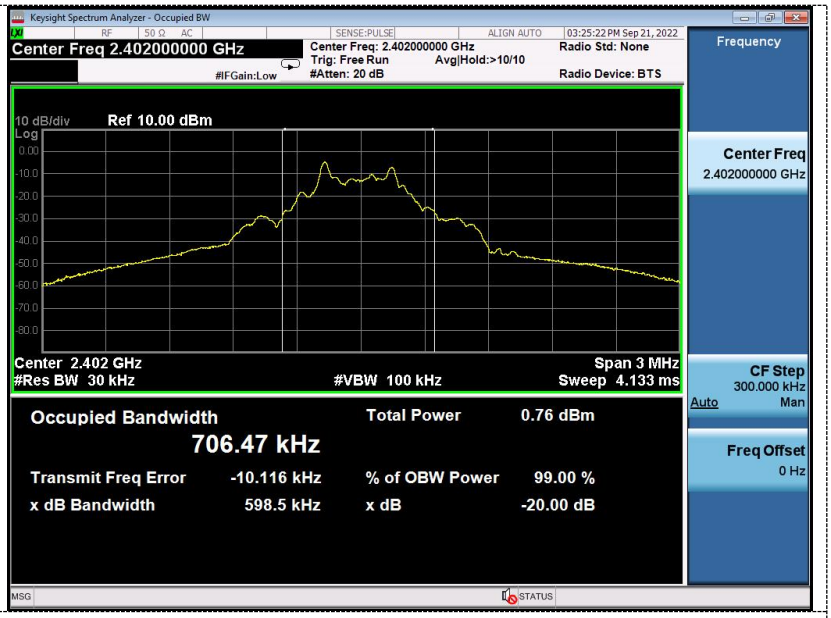
LIMIT

N/A

TEST RESULTS

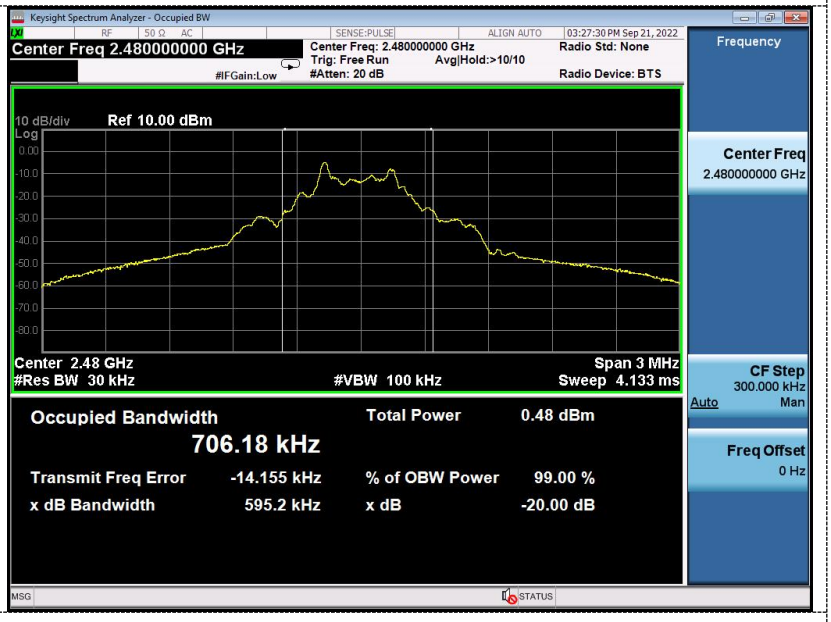
Type	Channel	20dB bandwidth (MHz)	Result
GFSK	00	0.5985	Pass
	19	0.5973	
	39	0.5952	

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



2402MHz

2441MHz



2480MHz

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. 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

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1) (I):

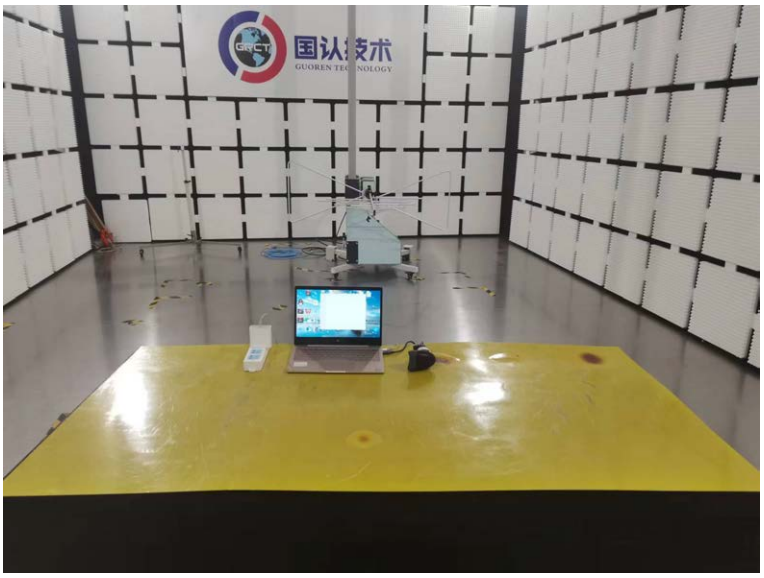
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

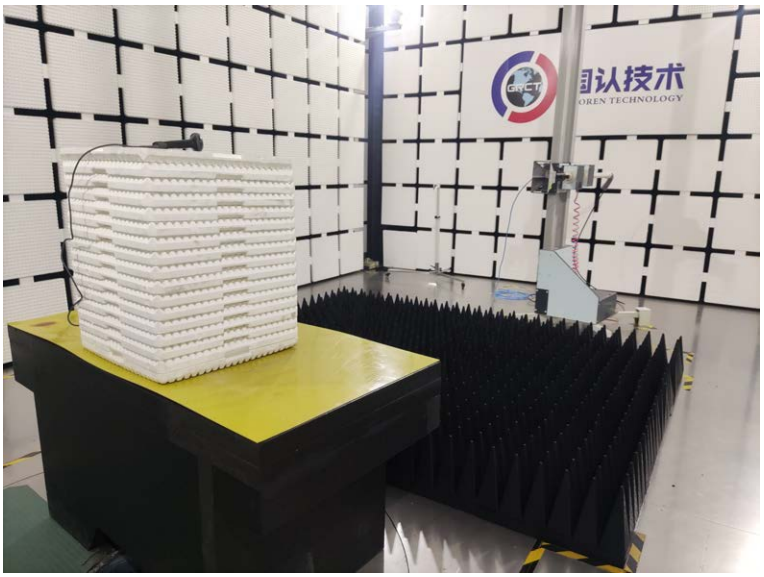
Antenna Connected Construction

The maximum gain of antenna was 2.52 dBi.

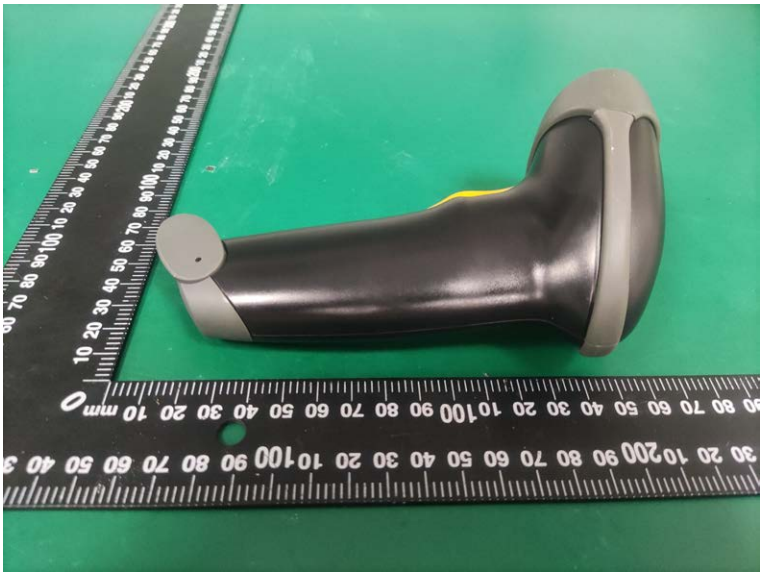
Remark:The antenna gain is provided by the customer , if the data provided by the customer is not accurate, Shenzhen GUOREN Certification Technology Service Co., Ltd. does not assume any responsibility.

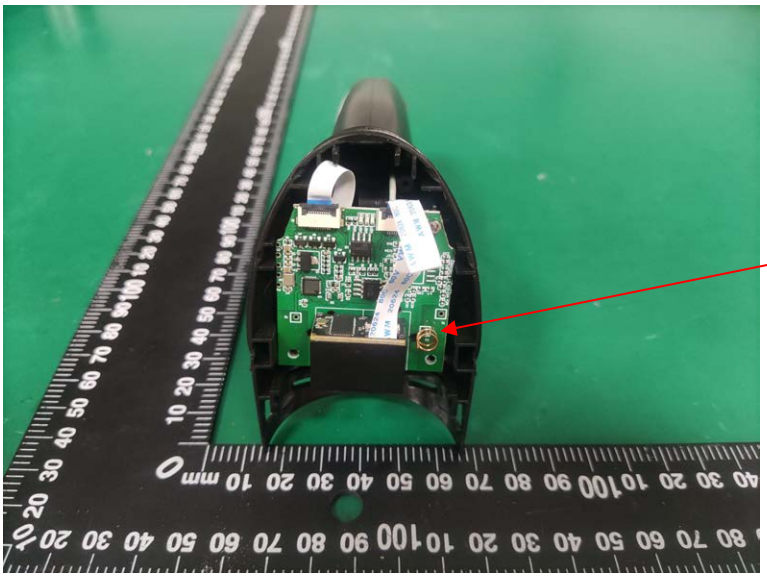
5. Test Setup Photos of the EUT

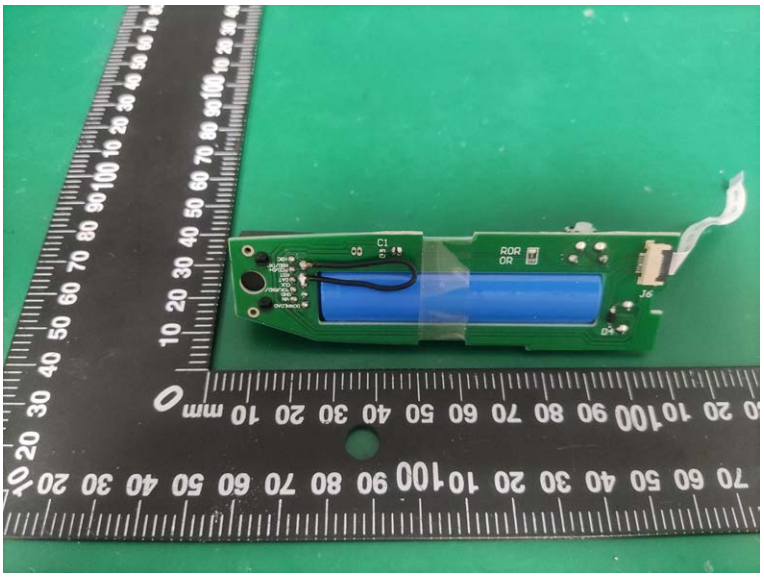


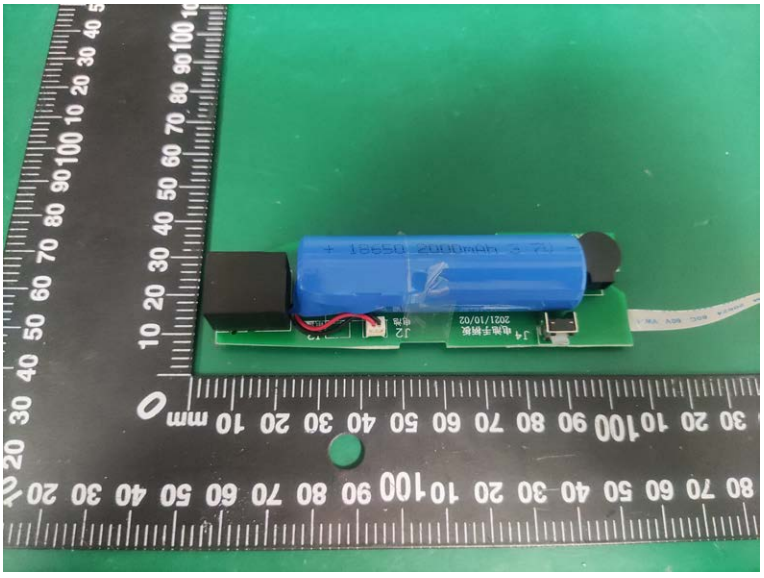


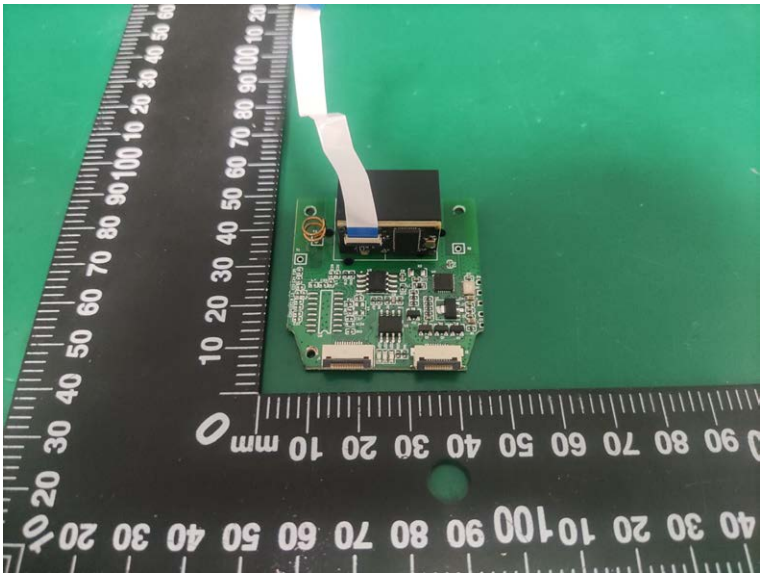
6. Photos of the EUT

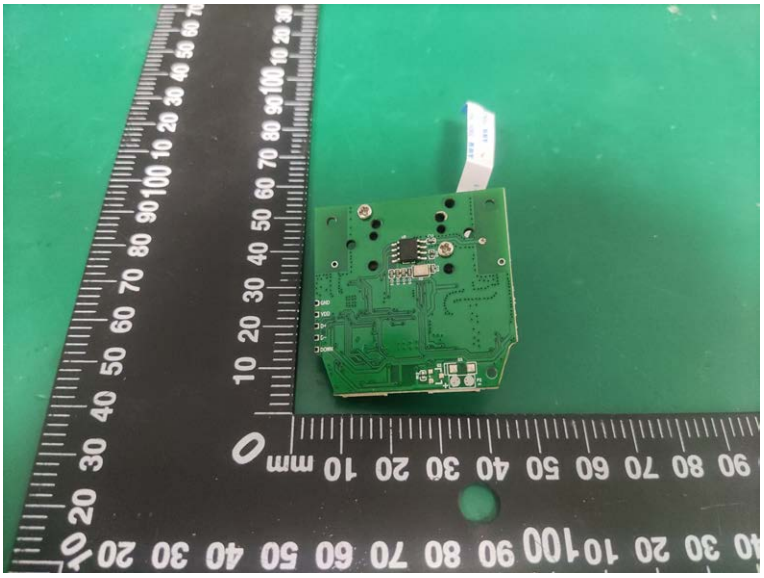



Antenna









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