TEST REPORT

FCC PART 15B

Report Reference No.....:	**TZ210302073-E**
Compiled by (position+printed name+signature)..:	File administrators Nancy Li
Name of the organization performing the tests (position+printed name+signature)..:	Technique principal Hugo Chen
Approved by (position+printed name+signature)..:	Manager Andy Zhang
Date of issue.....:	2021/4/20
Representative Laboratory Name ....:	Shenzhen Tongzhou Testing Co.,Ltd
Address.....:	1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
Applicant's name.....:	**shen zhen shi de yue dian zi you xian gong si**
Address.....:	baoanqu xixiangjiedao tiezailu gonglegongyeyuanadong7louxice shenzhenshi baoanqu guangdong 518102 China
Test specification:	
Standard .....:	**FCC Part 15B**
TRF Originator.....:	Shenzhen Tongzhou Testing Co.,Ltd
Master TRF.....:	Dated 2012-06

Test item description ..... :	Two way radio
Trade Mark .....:	Baofeng
Model/Type reference.....:	BF-F9V2N
Hardware Version.....:	SRTSA.V07
Software Version .....:	V1.0
FCC ID.....:	2AZGL-BF-F9V2N
Listed Models .....:	N/A
Operation Frequency.....:	VHF:136-174MHz(Rx only) UHF:400-480MHz(Rx only) FM: 76-108MHz(Rx only)
Power Supply.....:	DC 7.4V by adapter Adapter Information: Model: 480-10050-E.S Input: 100-240V~ 50/60Hz 0.25A Output: DC10V, 0.5A
Result.....:	**Pass**

TEST REPORT

Test Report No. :	TZ210302073-E	2021/4/20 Date of issue

Equipment under Test	:	Two way radio
Model /Type	:	BF-F9V2N
Listed Models	:	N/A
Applicant	:	**shen zhen shi de yue dian zi you xian gong si**
Address	:	baoanqu xixiangjiedao tiezailu gonglegongyeyuanadong7louxice shenzhenshi baoanqu guangdong 518102 China
Manufacturer	:	**shen zhen shi de yue dian zi you xian gong si**
Address	:	baoanqu xixiangjiedao tiezailu gonglegongyeyuanadong7louxice shenzhenshi baoanqu guangdong 518102 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 Subpart B
Unintentional Radiators

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 40 GHz

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : 2020/4/13

Testing commenced on : 2020/4/13

Testing concluded on : 2021/4/19

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	○	120V / 60 Hz	○	115V / 60Hz
	○	12 V DC	○	24 V DC
	●	Other (specified in blank below)		

DC 7.4V by adapter

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

Two way radio.

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

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

Mode(s)	Description	Conect to GRP
1	Charging + Receiving(VHF)	No
2	Charging + Receiving(UHF)	No
3	Charging + Receiving(FM)	No

Test Sample ID: TZ210302073-1#

2.5. EUT configuration

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

○ - supplied by the manufacturer

● - supplied by the lab

○	Adapter	Model :	480-10050-E.S
		Input :	100-240V~ 50/60Hz 0.25A
		Output :	DC10V, 0.5A

2.6. Related Submittal(s) / Grant (s)

This test report is intended for BF-F9V2N filing to comply with the FCC Part 15, Subpart B Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. Test Result Summary

Test Item	Test Requirement	Standard Paragrph	Result
Radiated Emission	FCC PART 15B	Section 15.109	PASS
Conducted Emission	FCC PART 15B	Section 15.107	PASS
Compliance For Scanning Receiver	FCC PART 15B	Section 15.121	PASS
Spurious Emission	FCC PART 15B	Section 15.111	PASS

3. TEST ENVIRONMENT

3.1. Description of Test Facility

FCC
Designation Number: CN1275
Test Firm Registration Number: 167722
Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA
Certificate Number: 5463.01
Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

IC
ISED#: 22033
CAB identifier: CN0099
Shenzhen Tongzhou Testing 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

3.2. Environmental conditions

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

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

3.3. 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 CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Tongzhou Testing 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 Tongzhou Testing Co.,Ltd y is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.22dB	(1)

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

3.4. Equipments Used during the Test

Conducted emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100849/003	2021/1/4	2022/1/3
2	Artificial Mains	ROHDE & SCHWARZ	ENV 216	101333-IP	2021/1/4	2022/1/3
3	EMI Test Software	ROHDE & SCHWARZ	ESK1	V1.71	N/A	N/A

Radiated emission and Spurious Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Test Receiver	R&S	ESCI-7	100849/003	2021/1/4	2022/1/3
2	wideband Antenna	schwarzbeck	VULB 9163	958	2019/11/16	2022/11/15
3	Horn Antenna	schwarzbeck	9120D-1141	1574	2019/11/16	2022/11/15
4	Amplifier	schwarzbeck	BBV 9743	209	2021/1/4	2022/1/3
5	Amplifier	Tonscend	TSAMP-0518SE	--	2021/1/4	2022/1/3
6	Postional Controller	MF	MF7802	--	--	--
7	RE test software	Tonscend	JS32-RE	V2.0.2.0	--	--
8	RF COMMUNICATION TEST SET(SG A)	HP	8921A	3430A01131	2021/1/4	2022/1/3
9	DC source	Agilent	E3646A	MY40006693	2021/1/4	2022/1/3
10	MXA Signal Analyzer	Keysight	N9020A	MY52091623	2021/1/4	2022/1/3

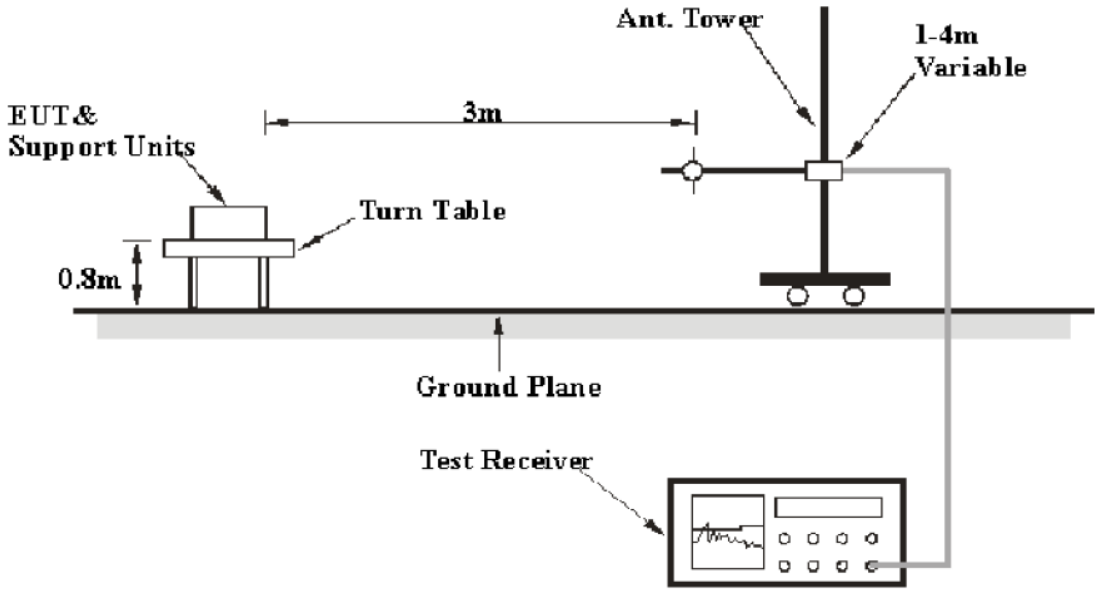
Compliance For Scanning Receiver						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	RF COMMUNICATION TEST SET(SG A)	HP	8921A	3430A01131	2021/1/4	2022/1/3
2	DC source	Agilent	E3646A	MY40006693	2021/1/4	2022/1/3

4. TEST CONDITIONS AND RESULTS

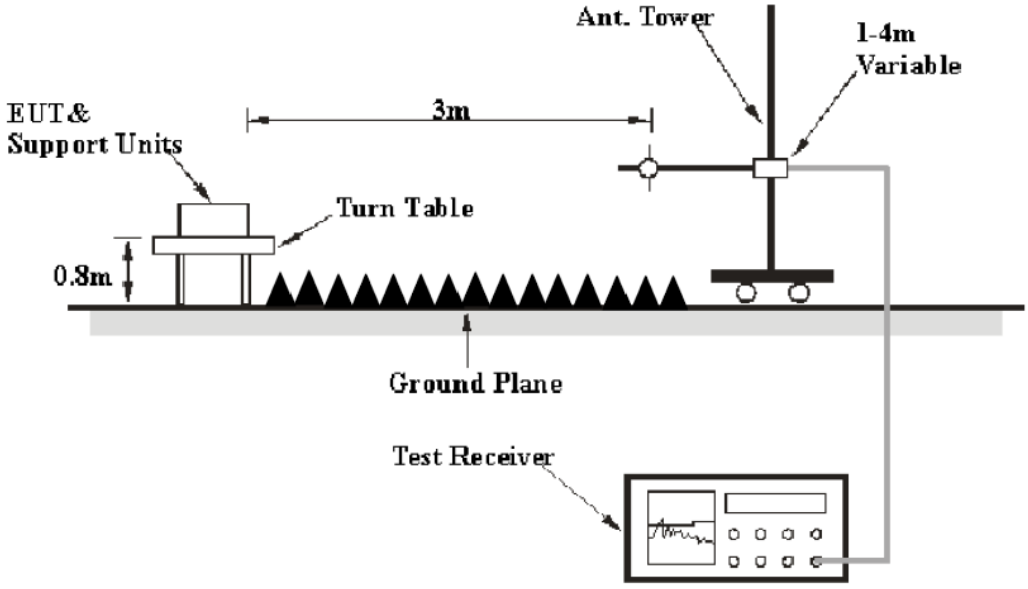
4.1. Radiated Emission Test

TEST CONFIGURATION

(a) Radiated Emission Test Set-Up, Frequency below 1000MHz



(b) Radiated Emission Test Set-Up, Frequency above 1000MHz



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	

RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

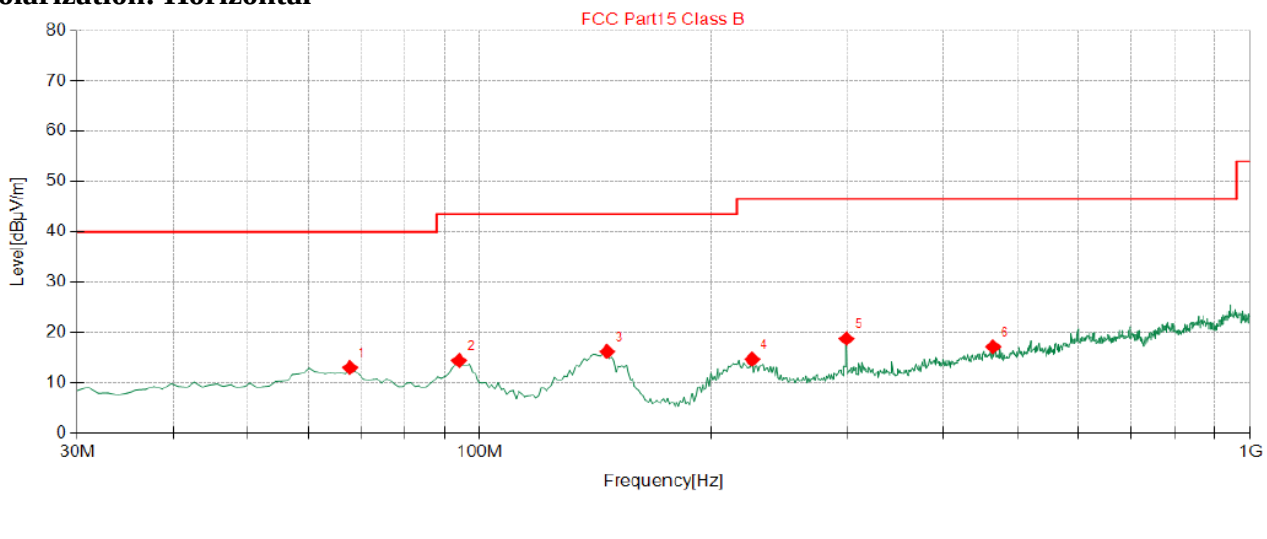
Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Radiation Test Results

Below 1000MHz(Worst Case:Mode 1)

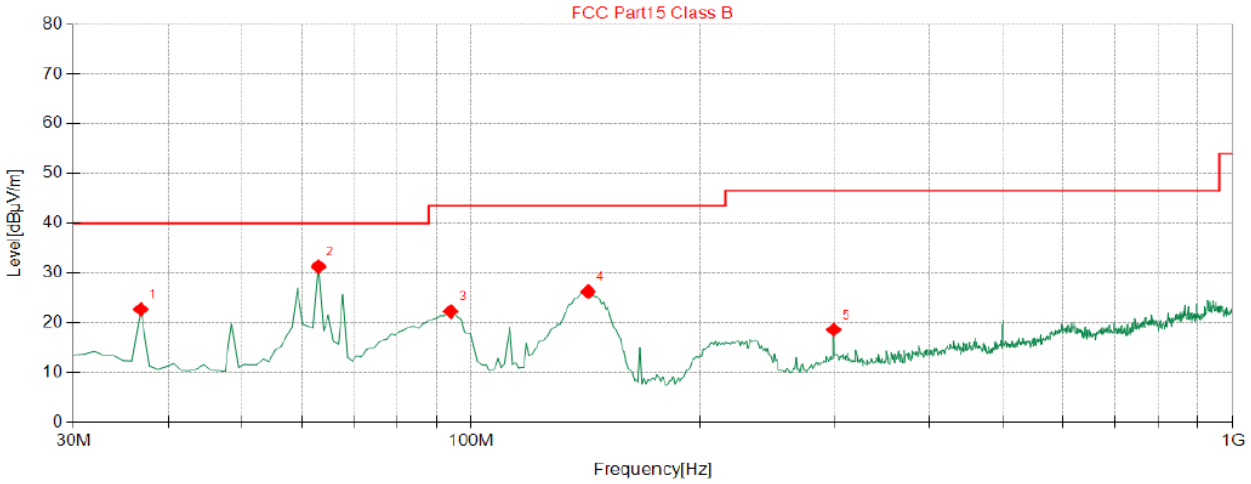
Polarization: Horizontal



Suspected Data List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	67.830	12.99	40.00	27.01	300	9	Horizontal
2	94.020	14.39	43.50	29.11	300	83	Horizontal
3	146.40	16.17	43.50	27.33	300	295	Horizontal
4	225.94	14.64	46.50	31.86	100	272	Horizontal
5	299.66	18.75	46.50	27.75	100	335	Horizontal
6	464.56	17.13	46.50	29.37	300	79	Horizontal

Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit - Level

Polarization: Vertical



Suspected Data List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.790	22.70	40.00	17.30	200	104	Vertical
2	62.980	31.28	40.00	8.72	200	106	Vertical
3	94.020	22.28	43.50	21.22	100	132	Vertical
4	142.52	26.24	43.50	17.26	100	306	Vertical
5	299.66	18.61	46.50	27.89	200	83	Vertical

Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit - Level

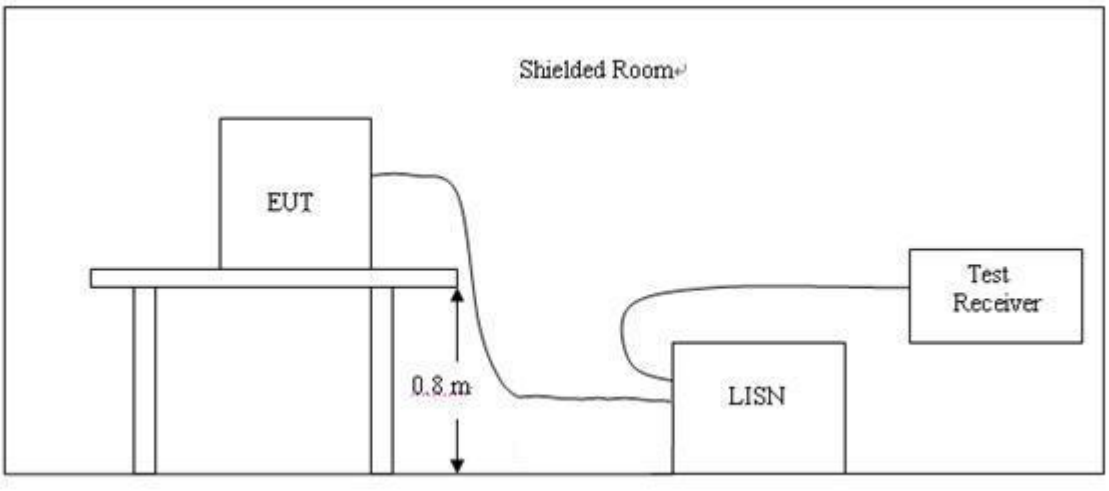
Radiated Emission from 1 GHz to 6GHz(Worst Case:Mode 1)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (KHz)	Height (cm)	Pol	Azimuth (deg)
1002.41	41.38	---	74	32.62	100	1000	100	V	48
1371.58	44.75	---	74	29.25	100	1000	100	V	135
2214.86	45.23	---	74	28.77	100	1000	100	H	191
2626.37	47.97	---	74	26.03	100	1000	100	H	278
6121.34	47.81	---	74	26.19	100	1000	100	V	10
9169.73	49.36	---	74	24.64	100	1000	100	H	45

Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit - Max Peak

4.2. Conducted Emissions Test

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 C63.4.
2 Support equipment, if needed, was placed as per ANSI C63.4.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4 The EUT 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.
8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

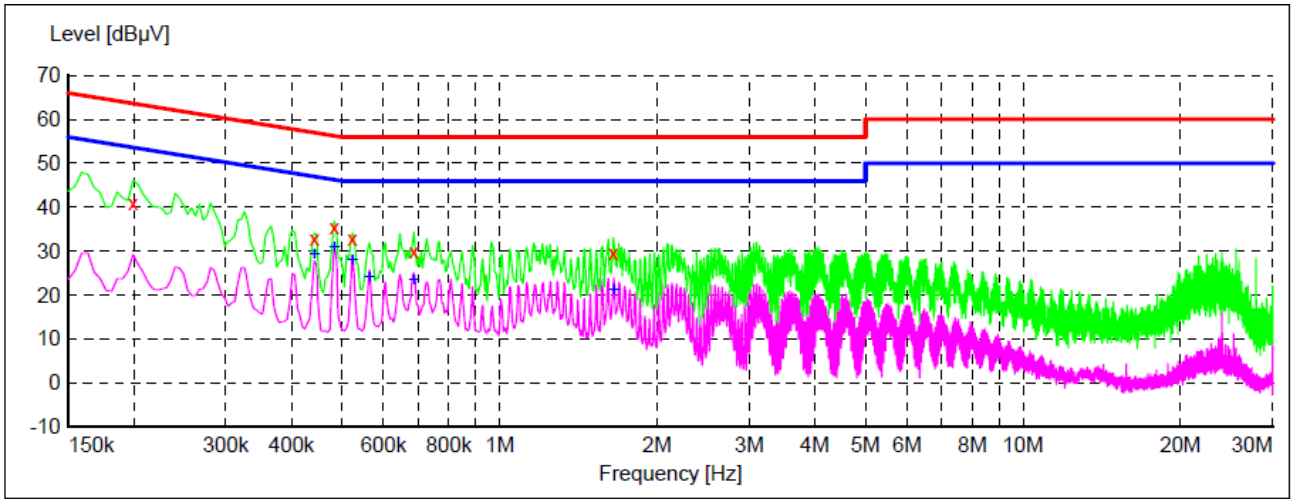
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

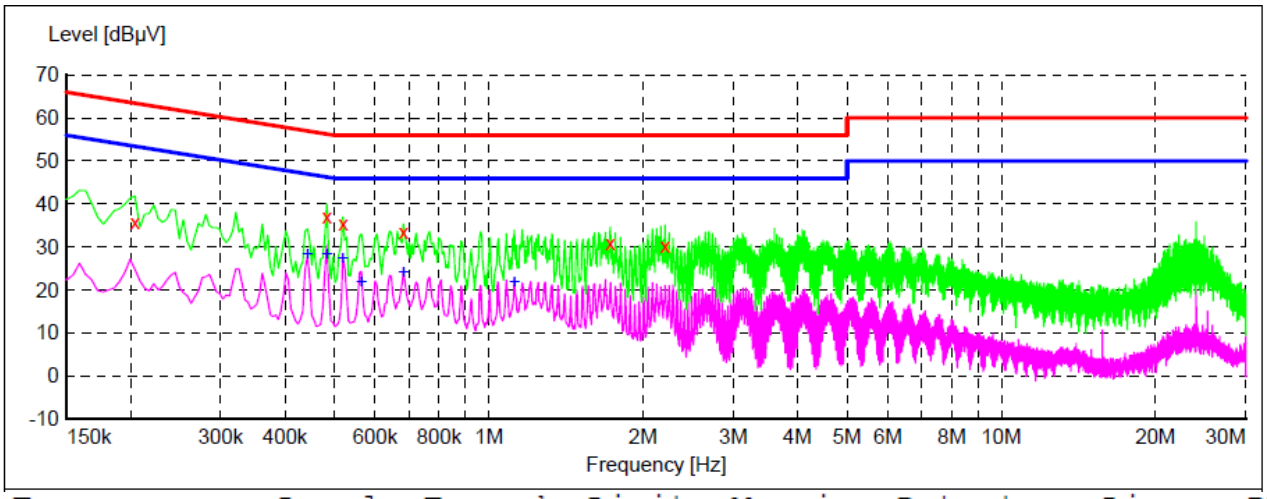
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS(Worst Case:Mode 1)



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.199500	40.90	10.6	64	22.7	QP	N	GND
0.442500	33.00	10.0	57	24.0	QP	N	GND
0.483000	35.30	10.0	56	21.0	QP	N	GND
0.523500	32.90	9.9	56	23.1	QP	N	GND
0.685500	29.90	9.9	56	26.1	QP	N	GND
1.648500	29.60	9.7	56	26.4	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.442500	29.10	10.0	47	17.9	AV	N	GND
0.483000	31.00	10.0	46	15.3	AV	N	GND
0.523500	27.90	9.9	46	18.1	AV	N	GND
0.564000	24.00	9.9	46	22.0	AV	N	GND
0.685500	23.30	9.9	46	22.7	AV	N	GND
1.653000	21.10	9.7	46	24.9	AV	N	GND



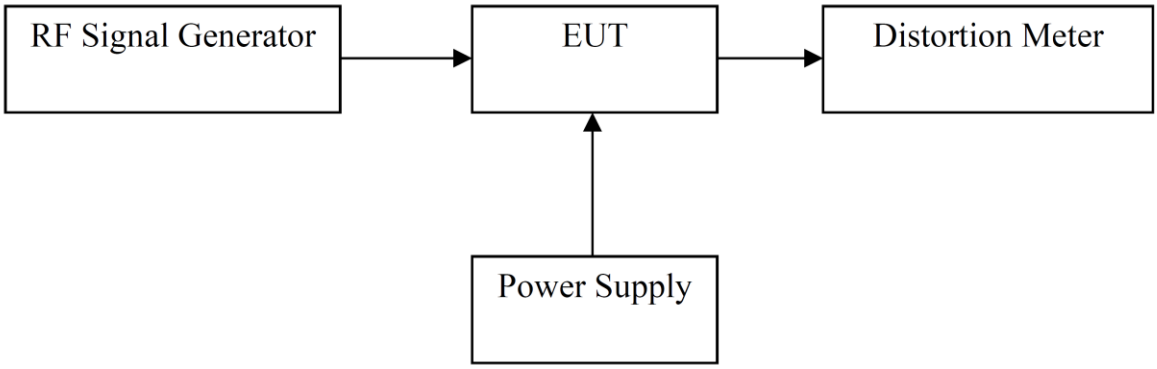
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.204000	35.80	10.6	63	27.6	QP	L1	GND
0.483000	37.10	10.0	56	19.2	QP	L1	GND
0.519000	35.30	9.9	56	20.7	QP	L1	GND
0.681000	33.50	9.9	56	22.5	QP	L1	GND
1.725000	31.00	9.7	56	25.0	QP	L1	GND
2.206500	30.20	9.7	56	25.8	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.442500	28.20	10.0	47	18.8	AV	L1	GND
0.483000	28.20	10.0	46	18.1	AV	L1	GND
0.519000	27.20	9.9	46	18.8	AV	L1	GND
0.564000	21.80	9.9	46	24.2	AV	L1	GND
0.681000	24.00	9.9	46	22.0	AV	L1	GND
1.122000	21.80	9.8	46	24.2	AV	L1	GND

4.3. Compliance For Scanning Receiver

TEST CONFIGURATION

For FCC §15.121(b) Scanning Receiver Cellular Band Rejection Test



Test Procedure

1) Connected the EUT as shown in the above block diagram.
2) Apply a RF signal to the receiver input port at lowest, middle and highest channel frequencies of receiver operation band.
3) Adjust the audio output level of the receiver to it's rated value with the distortion less than 10%.
4) Adjust the RF Signal Generator Output Power to produce 12 dB SINAD without the audio output power dropping by more than 3 dB.This output level of the RF SG at each channel frequency is the sensitivity of the receiver.
5) Select the lowest or worse-case sensitivity level for all of the bands as the reference sensitivity.
6) Adjust the RF Signal Generator output to a level of +60 dB above the reference sensitivity obtained in step 5) and its frequency to the frequency points in the cellular band.
7) Set the Receiver squelch to threshold, the signal required to open the squelch must be lower than the reference sensitivity level.
8) Set the receiver in a scanning mode and allow it to scan through it's complete receiving range.
9) If the receiver unsquelched or stopped on any frequency, receiving at this frequency, then adjust the signal generator output level until 12 dB SINAD is produced, this level is the spurious value and the difference between the reference sensitivity and the spurious value is the rejection ratio and must be at least 38dB.
10) Repeat above procedure at the frequencies 824.5, 836.0, and 848.5 MHz for the mobile band, and 869.1, 881.5, and 893.5MHz for the cellular base band.

Test Results Summary

Comply with FCC 121(a):

– Please refer to the technical informations or the attestation letter conforming compliance with this requirement.

Comply with FCC 121(b):

– Please refer to the following Scanning Receiver Cellular Band Rejection Test Result.

Comply with FCC 121(c):

– Not applicable.

Comply with FCC 121(d):

– Please refer to the User Manual.

Comply with FCC 121(e):

– This Scanning Receiver is not assembled from kits or marketed in kit form.

Comply with FCC 121(f):

– Please refer to the label of the product.

Test Data

For FCC §15.121(b) Scanning Receiver Cellular Band Rejection

EUT's Scanning Frequency Band (MHz)	Test Frequency (MHz)	Test Frequencies of Cellular Band (MHz)	Spurious Value of Cellular Frequencies for 12 dB SINAD (dBm)	Reference Sensitivity for 12 dB SINAD (dBm)	Rejection Ratio (dB)	Rejection Ratio Limit (dB)
136–174	136.025	824.5, 836.0, 848.5, 869.1, 881.5, 893.5	> -53.2	-115.8	< -62.6	< -38.0
	155		> -53.2	-115.6	< -62.4	< -38.0
	173.975		> -53.2	-115.6	< -62.4	< -38.0
400–480	400.025	824.5, 836.0, 848.5, 869.1, 881.5, 893.5	> -53.2	-115.6	< -62.4	< -38.0
	440		> -53.2	-115.7	< -62.5	< -38.0
	479.975		> -53.2	-115.6	< -62.4	< -38.0
65-108	65.1	824.5, 836.0, 848.5, 869.1, 881.5, 893.5	> -53.2	-115.8	< -62.6	< -38.0
	86.5		> -53.2	-115.8	< -62.6	< -38.0
	107.9		> -53.2	-115.6	< -62.4	< -38.0

Note: Rejection Ratio = Reference Sensitivity - Spurious Value

4.4. Spurious Emission

TEST CONFIGURATION

Same with 4.1

Test Procedure

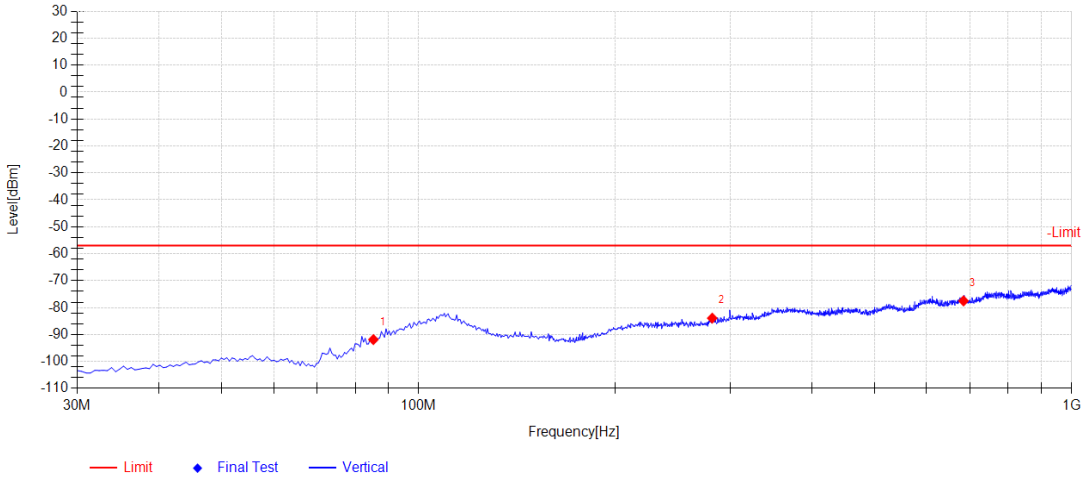
Per FCC section 15.109(f), For a receiver which employs terminals for the connection of an external receiving antenna, the receiver shall be tested to demonstrate compliance with the provisions of this section with an antenna connected to the antenna terminals unless the antenna conducted power is measured as specified in §15.111(a).

FCC section 15.111(a) states: In addition to the radiated emission limits, receivers that operate (tune) in the frequency range 30 to 960 MHz and CB receivers that provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the provisions of §15.109 with the antenna terminals shielded and terminated with a resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements specified in §15.33 shall not exceed 2.0 nanowatts.

Test Results

Pass

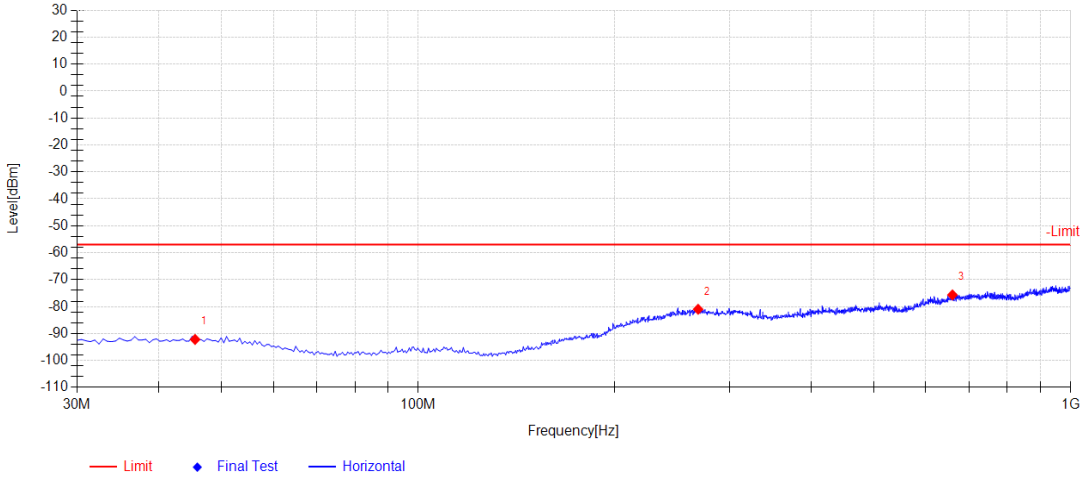
Below 1000MHz(Worst Case:Mode 1)
Polarization: Vertical



Suspected Data List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	85.2900	-83.69	-91.87	-57.00	34.87	-8.18	Vertical
2	281.7150	-83.54	-83.92	-57.00	26.92	-0.38	Vertical
3	683.2950	-84.90	-77.51	-57.00	20.51	7.39	Vertical

Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit - Level
3). Level= Reading + Factor

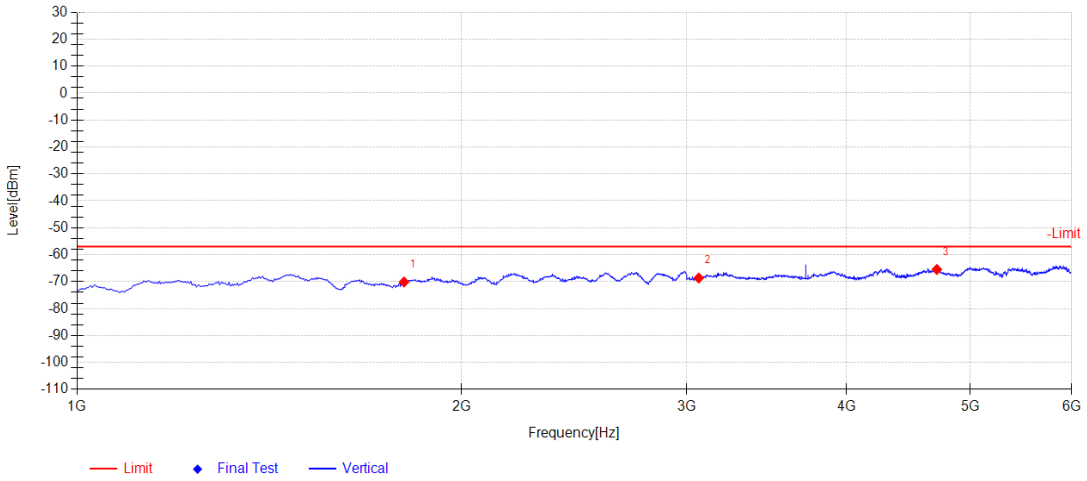
Polarization: Horizontal



Suspected Data List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	45.5200	-85.42	-92.19	-57.00	35.19	-6.77	Horizontal
2	268.6200	-84.30	-80.99	-57.00	23.99	3.31	Horizontal
3	659.0450	-83.91	-75.67	-57.00	18.67	8.24	Horizontal

Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit-Level
3). Level= Reading + Factor

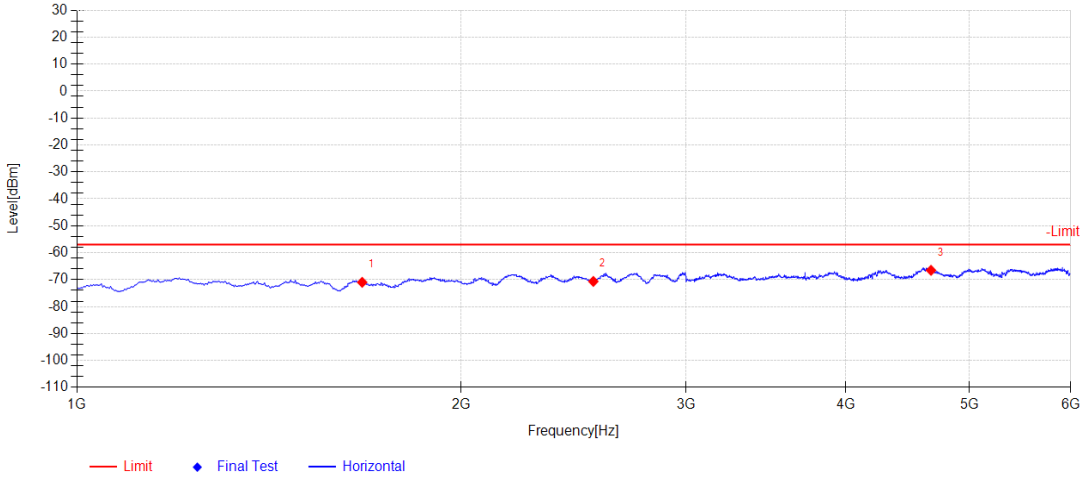
Above 1000MHz(Worst Case:Mode 1)
Polarization: Vertical



Suspected Data List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1802.500	-67.50	-70.12	-57.00	13.12	-2.62	Vertical
2	3065.000	-71.03	-68.65	-57.00	11.65	2.38	Vertical
3	4707.500	-71.61	-65.48	-57.00	8.48	6.13	Vertical

Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit - Level
3). Level= Reading + Factor

Polarization: Horizontal

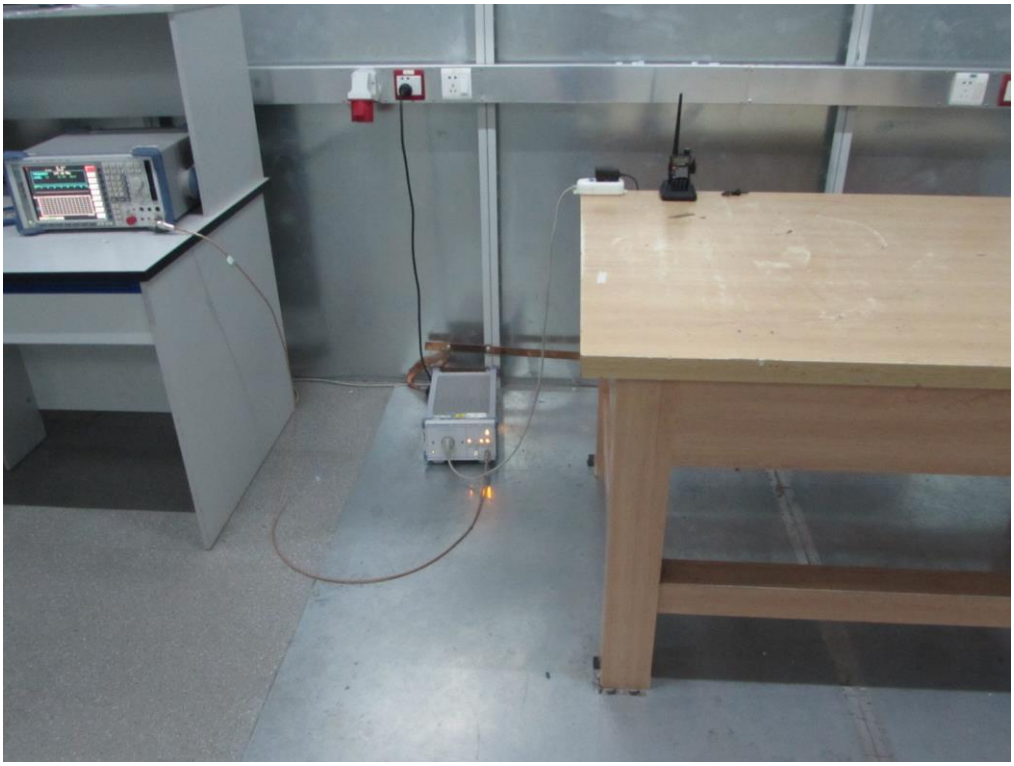


Suspected Data List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1672.500	-67.31	-70.99	-57.00	13.99	-3.68	Horizontal
2	2537.500	-70.54	-70.66	-57.00	13.66	-0.12	Horizontal
3	4665.000	-71.84	-66.53	-57.00	9.53	5.31	Horizontal

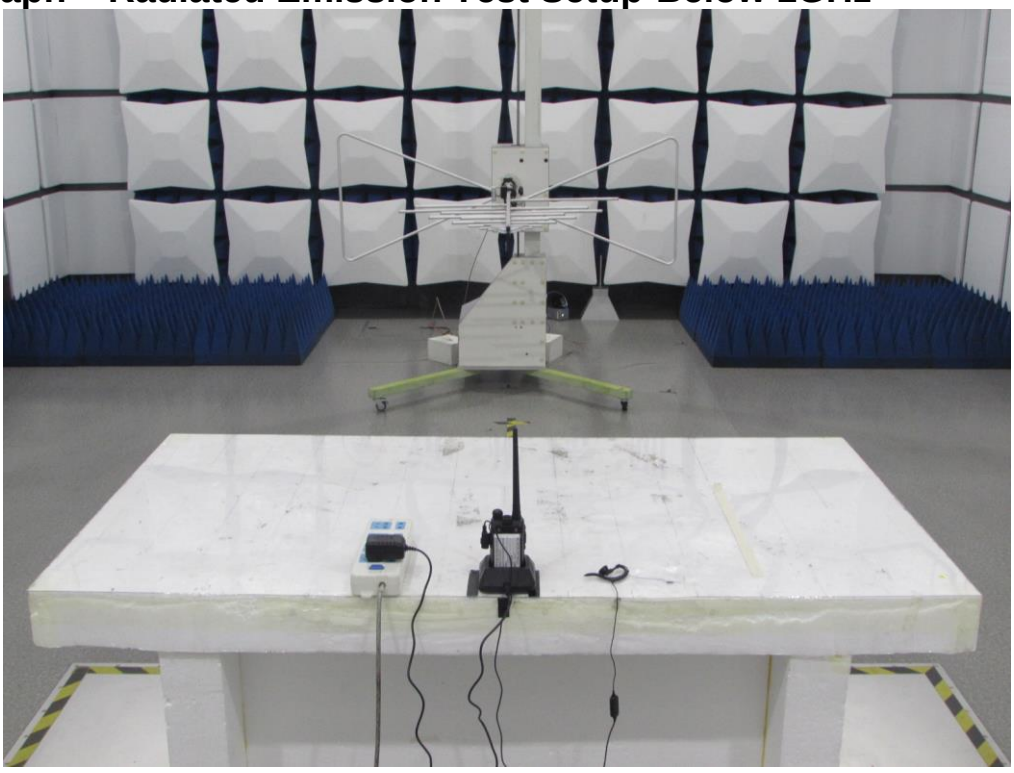
Note:
1). Pre-scan all modes and recorded the worst case results in this report
2). Margin=Limit-Level
3). Level= Reading + Factor

5. Test Setup Photos of the EUT

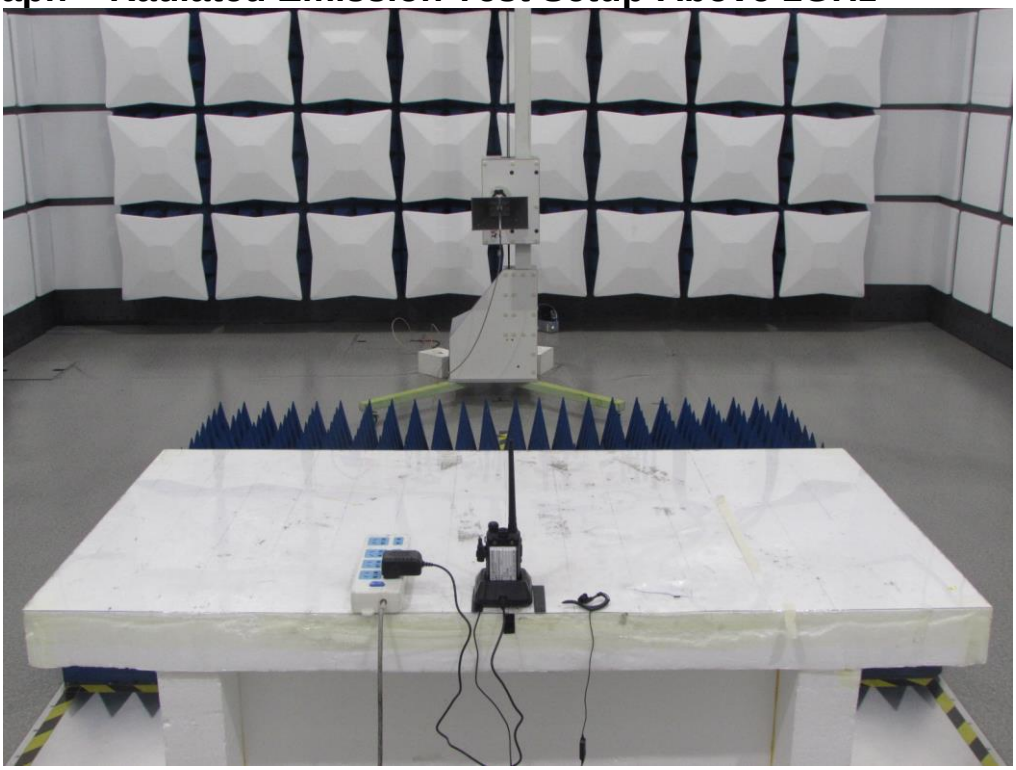
Photograph – Conducted Emission Test Setup



Photograph – Radiated Emission Test Setup-Below 1GHz



Photograph – Radiated Emission Test Setup-Above 1GHz



6. External and Internal Photos of the EUT

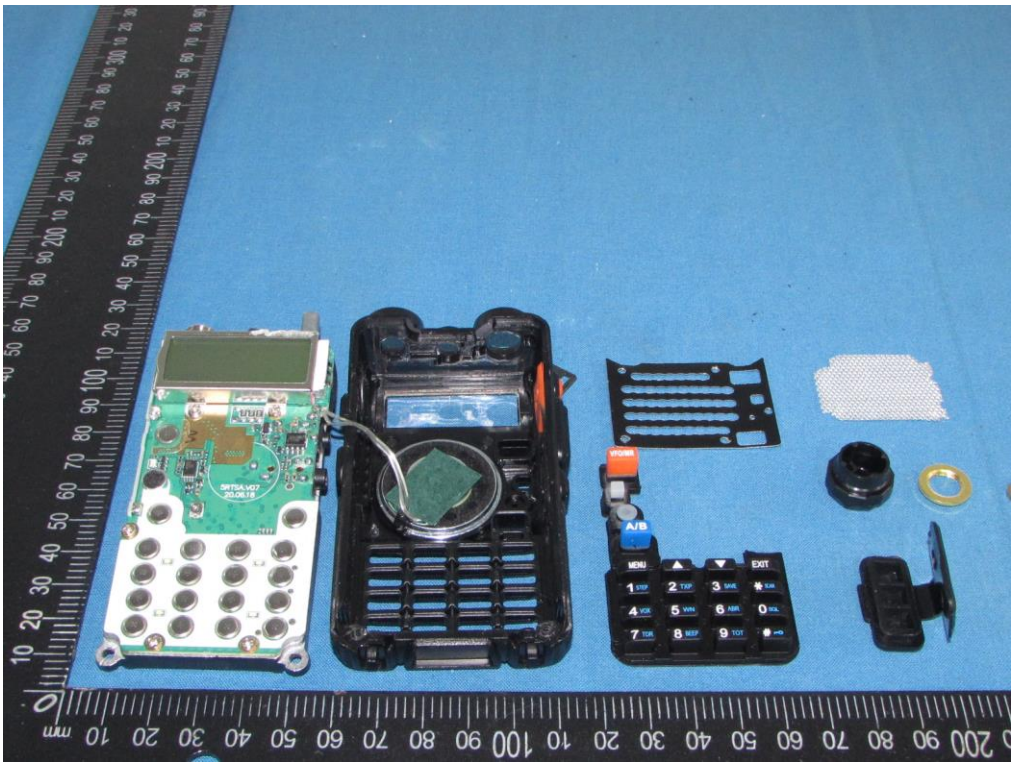
External Photos

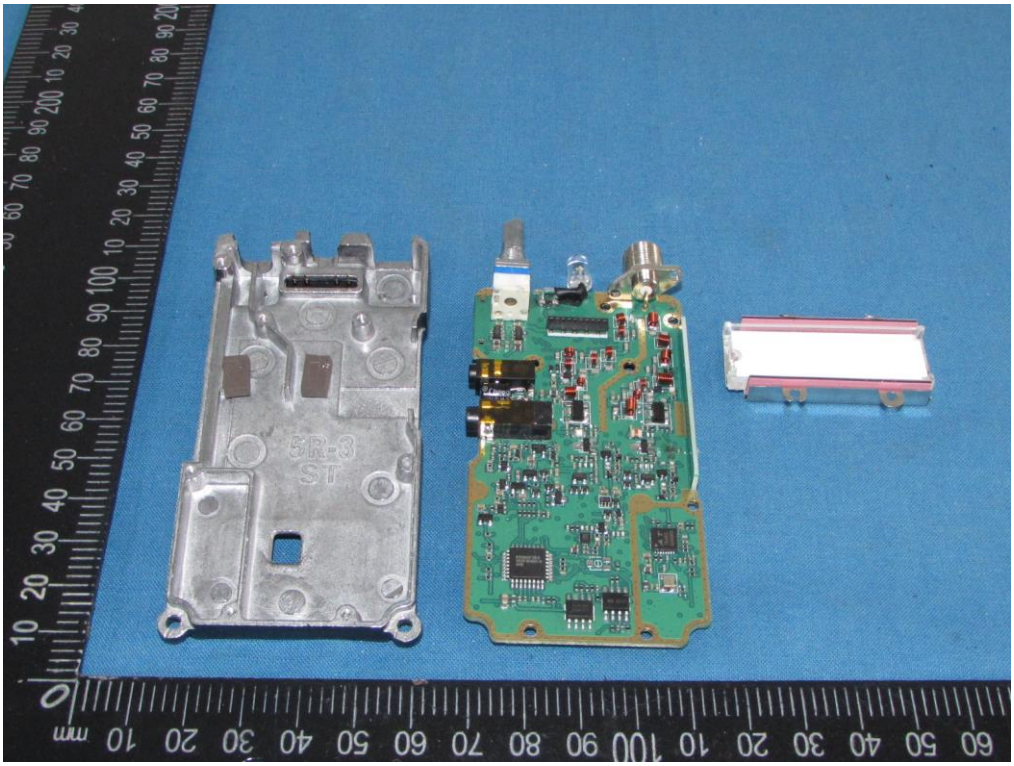

Li-ion BATTERY CHARGER
POWER

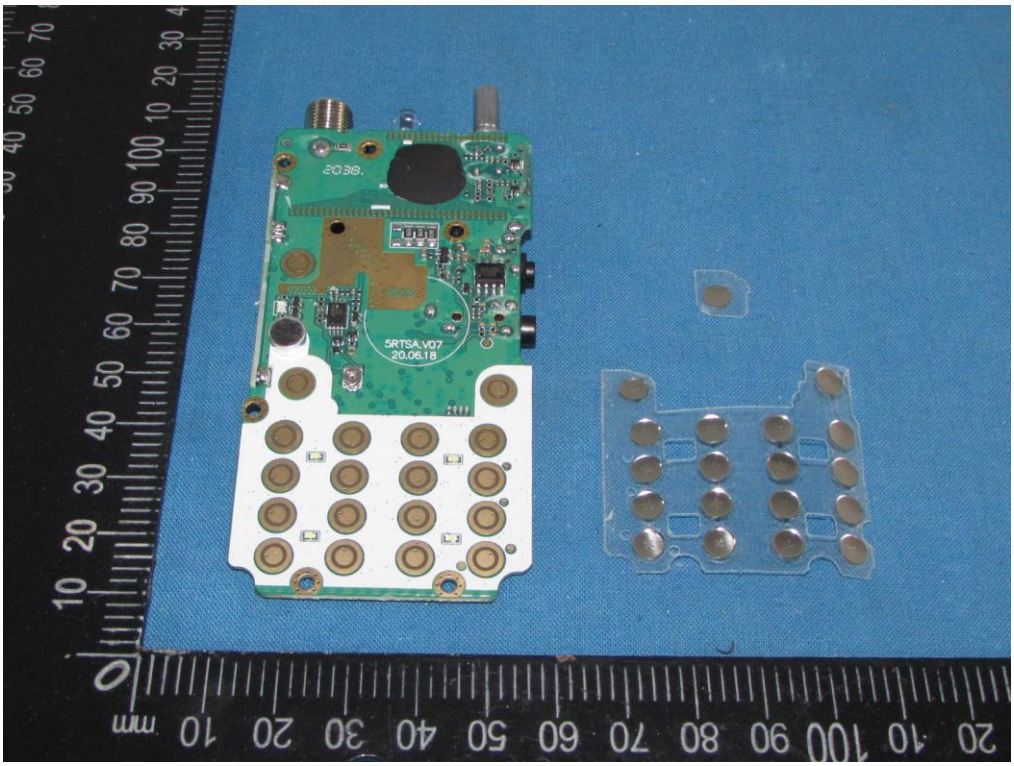

Adapter
MODEL:480-10050-E.S
INPUT:100-240V~
50/60Hz 0.25A
OUTPUT:10V 0.5A
LPS
MADE IN CHINA

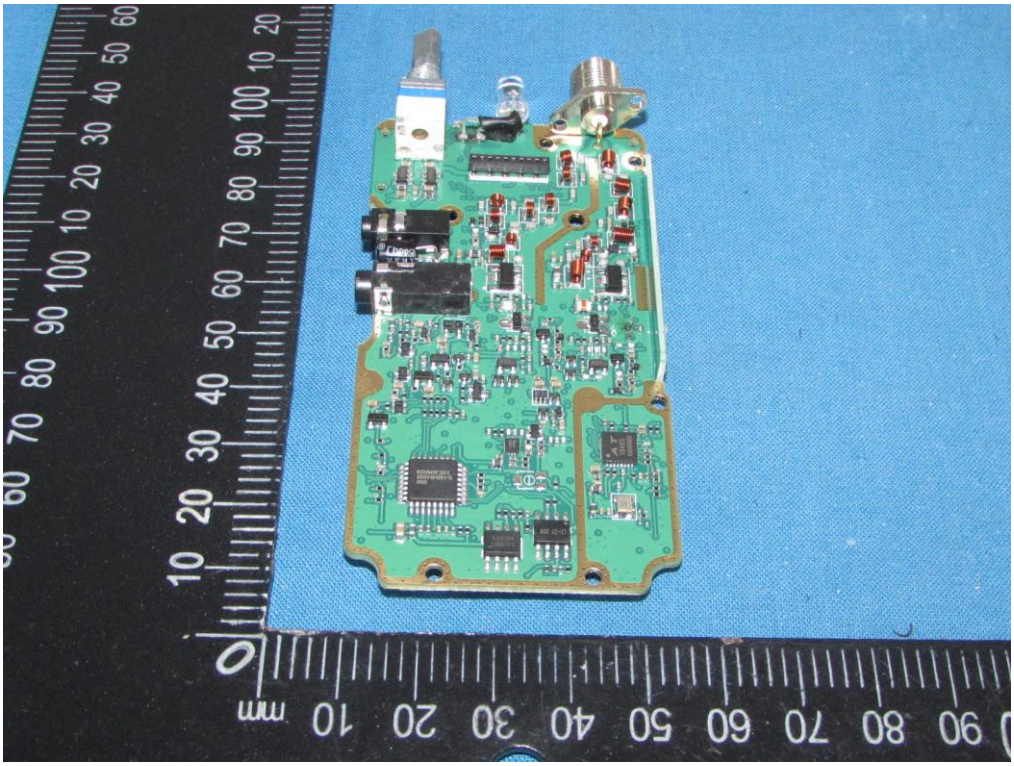
Internal Photos

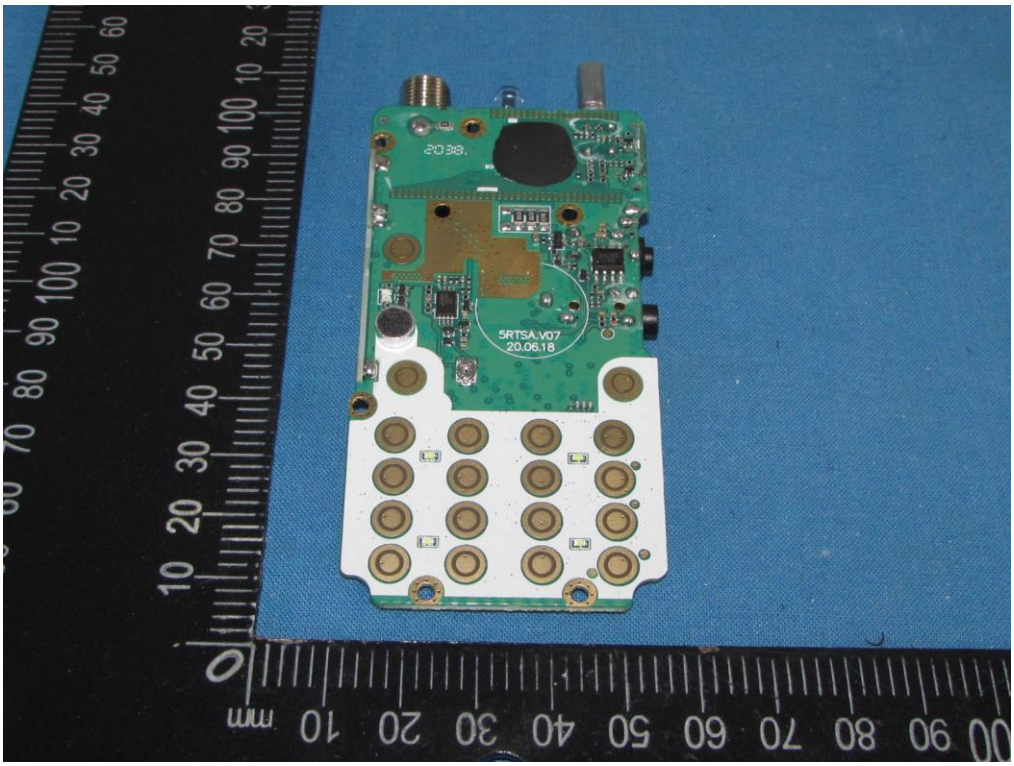

Li-ion Battery
7.4V 2100mAh
MODEL: BL-5






5RTSA.V07
20.06.18





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