TEST REPORT

Product Name	:	Mini Moble Transceiver
Model Number	:	QB25
FCC ID	:	2AN62-DBQB25

Prepared for	:	Sain3 LLC.
Address	:	36 Berkley Drive Newark DE 19702 United States
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282

Report Number	:	ES201019008E
Date(s) of Tests	:	October 19, 2020 to December 03, 2020
Date of issue	:	December 03, 2020

TABLE OF CONTENT

TEST REPORT DESCRIPTION

Applicant	:	Sain3 LLC.
Manufacturer	:	Sain3 LLC.
Trade Mark	:	N/A
EUT	:	Mini Moble Transceiver
Model No.	:	QB25
Power Supply	:	DC 13.8V

Measurement Procedure Used:

FCC CFR Title 47, Part 15, Subpart B
ANSI C63.4-2014

The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test : October 19, 2020 to December 03, 2020

Prepared by : Kaimin Guo /Editor

Reviewer : Jessie Hu /Supervisor

Approved & Authorized Signer : Lisa Wang /Manager

Modified Information

Version	Report No.	Revision Data	Summary
Ver.1.0	ES201019008E	/	Original Version

1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission at Mains Terminals	FCC Part 15.107	N/A
Radiated Emission	FCC Part 15.109	Pass
Antenna power conduction limits for receivers	FCC Part 15.111	Pass
Scanning receivers and frequency converters used with scanning receivers	FCC Part 15.121	Pass

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Mini Moble Transceiver

Model Number : QB25

Test Voltage : DC 13.8V

Modulation : FM

RX Frequency Range : Rx: 136MHz -174MHz; Rx: 220MHz -270MHz;
Rx: 350MHz -390MHz; Rx: 400MHz -480MHz;

Applicant : Sain3 LLC.

Address : 36 Berkley Drive Newark DE 19702 United States

Manufacturer : Sain3 LLC.

Address : 36 Berkley Drive Newark DE 19702 United States

Date of Received : October 19, 2020

Date of Test : October 19, 2020 to December 03, 2020

2.2. Input / Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	--	--	None
1	ANT Port	I/O	--	--	1Port
2	Headset Port	I/O	--	--	1Port
3	RJ45	I/O	--	--	1Port

* Note: Use abbreviations:
AC= AC Power Port
DC= DC Power Port
N/E= Non-Electrical
I/O= Signal Input or Output Port (Not Involved in Process Control)
TP= Telecommunication Ports

2.3. Independent Operation Modes

A. VHF(RX 136MHz-174MHz)
B. VHF(RX 220MHz -270MHz)
C. UHF(RX 350MHz-390MHz)
D. UHF(RX 400MHz -480MHz)
E. FM(88.1MHz)
F. FM(98MHz)
G. FM(107.9MHz)

2.4. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Radiated Emission	DC 13.8V	Mode A&B&C&D&E&F&G	Mode A

2.5. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2018.07.06
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)
The Certificate Registration Number is L2291

Accredited by FCC
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by A2LA, August 25, 2020
The Certificate Registration Number is 4321.01

Accredited by Industry Canada
The Certificate Registration Number is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.
Site Location : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

2.6. Test Software

Item	Software
Conducted Emission	: EMTEK(Ver.CON-03A1)-Shenzhen
Radiated Emission	: EMTEK(Ver.RA-03A1)-Shenzhen

2.7. Description of Support Device

N/A

2.8. Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty	: 3.16dB(9k~150kHz Conduction 2#) 2.90dB(150k-30MHz Conduction 2#)
Radiated Emission Uncertainty (3m Chamber)	: 3.78dB (30M~1GHz Polarize: H) 4.27dB (30M~1GHz Polarize: V) 4.46dB (1~6GHz)

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Power Line Conducted Emission Measurement

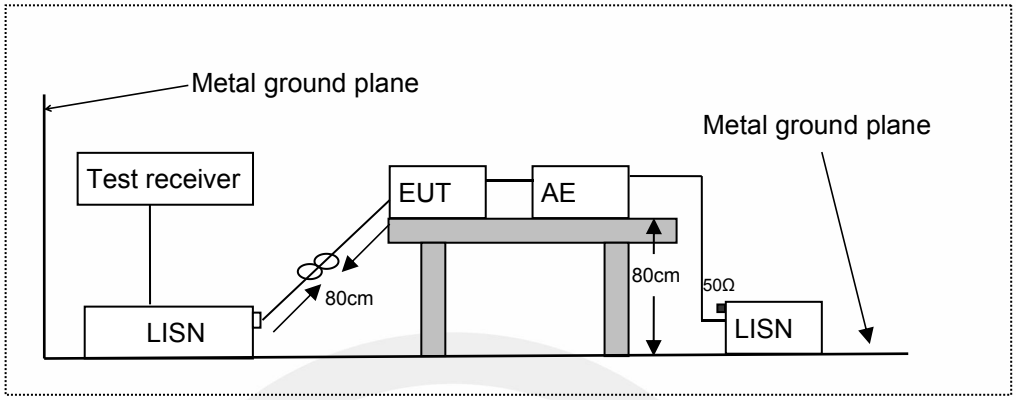
Equ.No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EE-144	EMI Test Receiver	Rohde & Schwarz	ESCI	101045	2020/5/16	1Year
EE-023-2	PULSE LIMTER	Rohde & Schwarz	ESH3-Z2	100107	2020/5/17	1Year
EE-032	AMN	Rohde & Schwarz	ESH3-Z5	100191	2020/5/16	1Year

3.2. For Radiated Emission Measurement

Equ.No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EE-040	Pre-Amplifier	HP	8447F	2944A07999	2020/5/16	1Year
EE-343	EMI Test Receiver	Rohde & Schwarz	ESCI	101414	2020/5/16	1Year
EE-245	Bilog Antenna	Schwarzbeck	VULB9163	660	2019/7/14	2 Year
EE-351	Horn antenna	Schwarzbeck	BBHA9120D	9120D-1198	2019/6/16	2 Year
EE-237	Pre-Amplifie	Lunar EM	LNA1G18-48	J1011131010001	2020/5/16	1Year
EE-230	Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	2020/5/16	1Year
EE-095	Horn antenna	Schwarzbeck	BBHA9170	9170-399	2019/6/16	2 Year
EE-157	Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2019/7/14	2 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network
AE: Associated equipment
EUT: Equipment under test

4.2. Limits

FCC Part 15, Subpart B, Class B

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

4.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a line impedance stabilization network (LISN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:
Emission Level (dBμV) = LISN Factor (dB) + Cable Loss (dB) + Reading (dBμV)
Margin (dB) = Emission Level (dBμV) - Limit (dBμV)

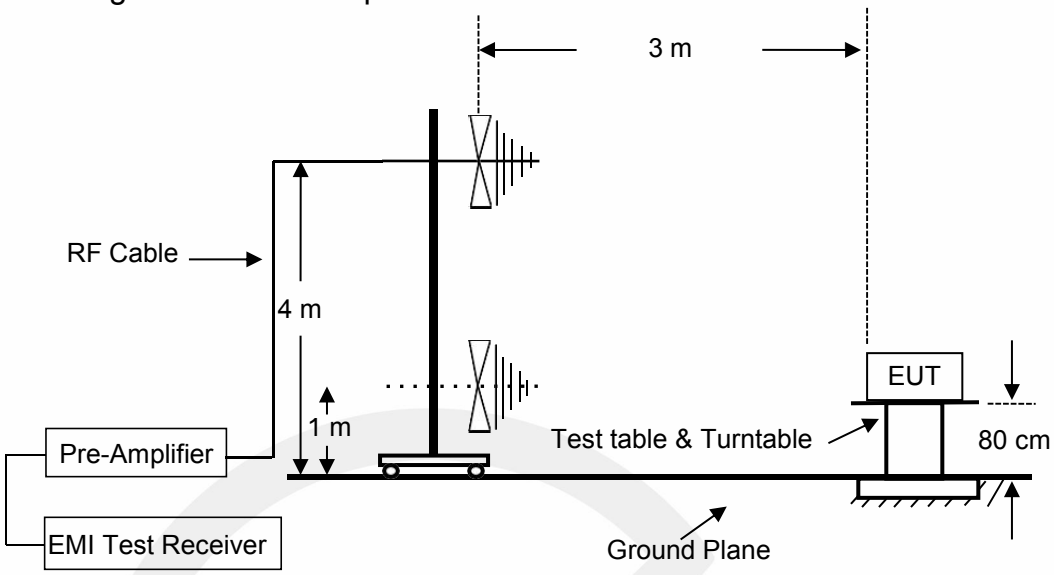
4.4. Measuring Results

N/A.

The product supplies power to DC.

5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup



5.2. Radiated Limit

FCC Part 15, Subpart B, Class B

Frequency MHz	Distance Meters	Field Strengths Limit	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

5.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

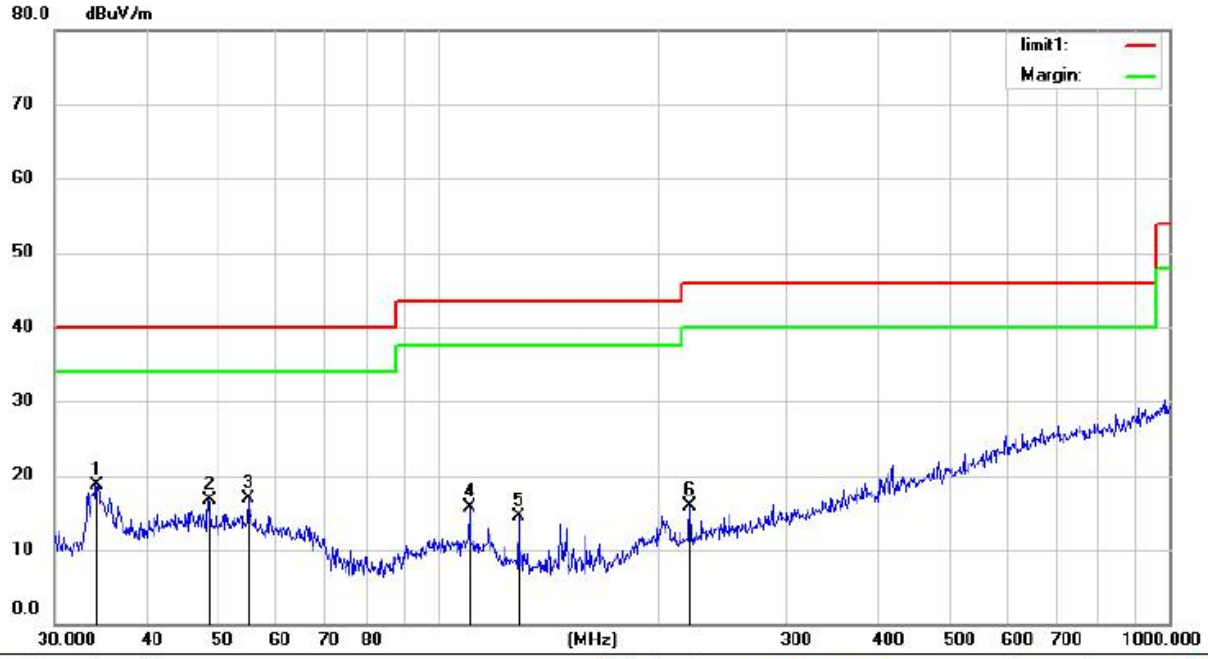
The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:
Emission level (dBμV/m) = Antenna Factor -Amp Factor +Cable Loss + Reading
Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

5.4. Measuring Results

PASS.

All modulation modes have been tested, the worst mode is (Mode A), the data is recorded on the following page, other modulation modes do not exceed this limit.



Site Chamber #1 Polarization: *Horizontal* Temperature: 24.1

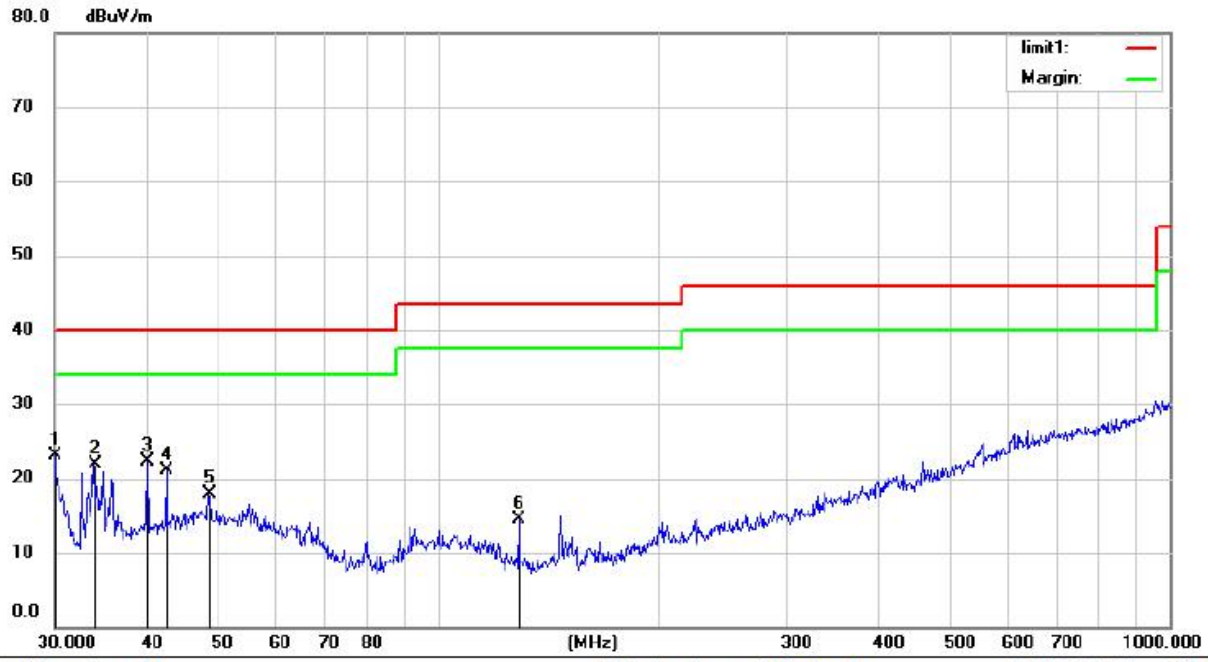
Limit: FCC PART 15 B 3m(RE) Power: DC 13.8V Humidity: 50 %

Mode: VHF Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	34.1561	37.61	-18.90	18.71	40.00	-21.29	QP			
2		48.6720	32.31	-15.65	16.66	40.00	-23.34	QP			
3		55.2207	32.78	-15.97	16.81	40.00	-23.19	QP			
4		110.5687	34.24	-18.49	15.75	43.50	-27.75	QP			
5		129.0146	35.81	-21.27	14.54	43.50	-28.96	QP			
6		221.3921	32.65	-16.71	15.94	46.00	-30.06	QP			

*:Maximum data x:Over limit !:over margin Operator: Tom



Site Chamber #1 Polarization: *Vertical* Temperature: 24.1

Limit: FCC PART 15 B 3m(RE) Power: DC 13.8V Humidity: 50 %

Mode: VHF Mode

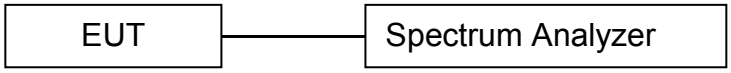
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	30.0000	41.84	-18.76	23.08	40.00	-16.92	QP			
2		33.9174	40.83	-18.95	21.88	40.00	-18.12	QP			
3		40.1347	38.97	-16.75	22.22	40.00	-17.78	QP			
4		42.6000	37.22	-16.09	21.13	40.00	-18.87	QP			
5		48.6720	33.57	-15.65	17.92	40.00	-22.08	QP			
6		129.0146	35.76	-21.27	14.49	43.50	-29.01	QP			

*:Maximum data x:Over limit !:over margin Operator: Tom

6. ANTENNA POWER CONDUCTION LIMITS FOR RECEIVERS.

6.1. Block Diagram of Test Setup



6.2. Radiated Limit

Frequency	Limit
9 KHz to 2GHz	2.0 nW (-57 dBm)

6.3. Test Procedure

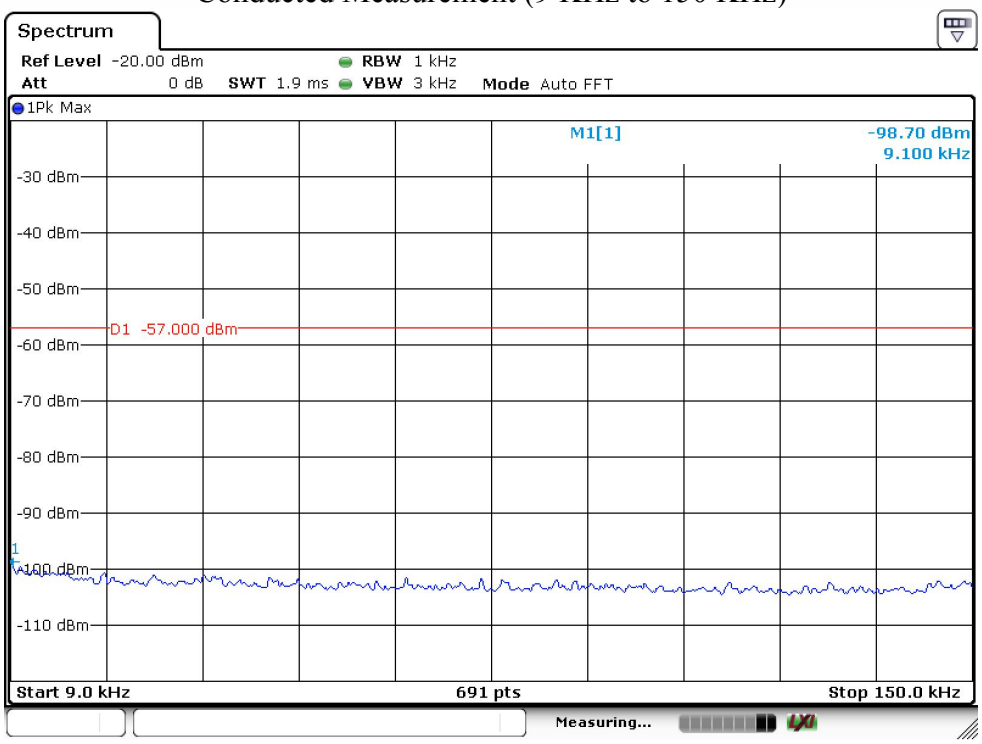
1. The receiver antenna terminal connected to a spectrum analyzer.
2. The test data of the worst case condition (mode A) was reported on the following Data page.

6.4. Measuring Results

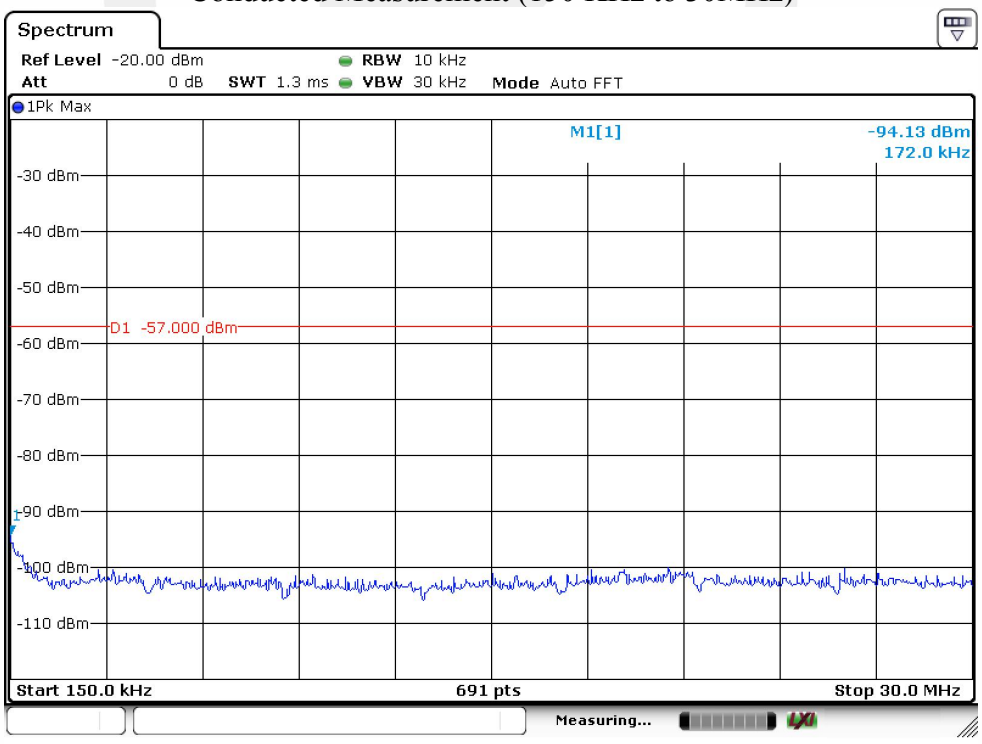
PASS.

The worst test data are attach on following pages.

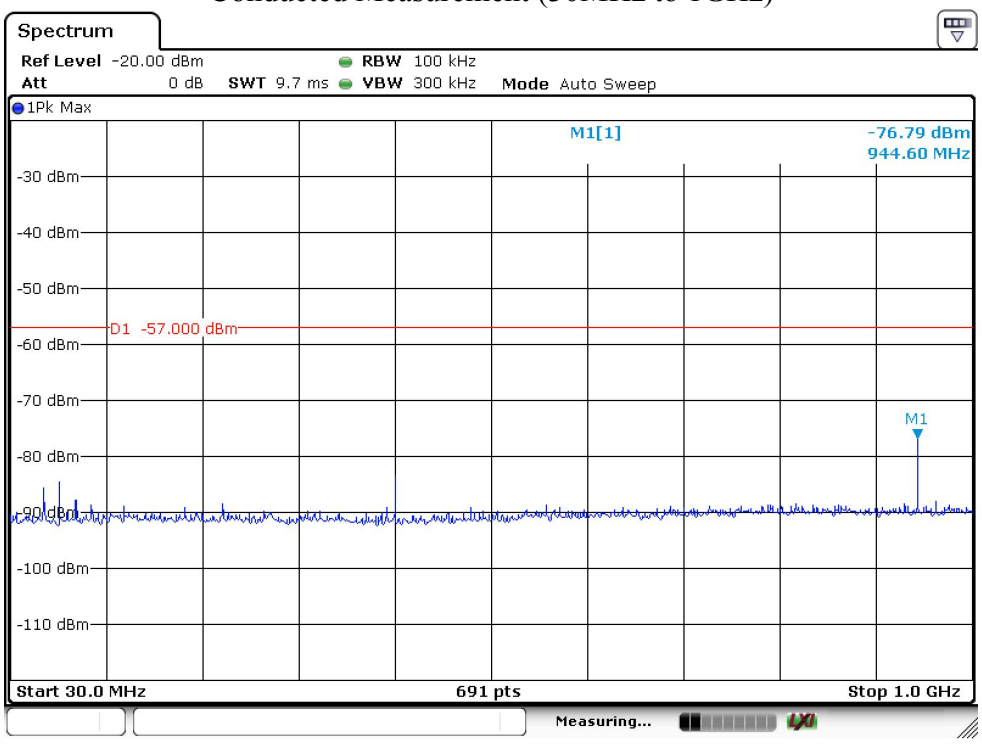
Conducted Measurement (9 KHz to 150 KHz)



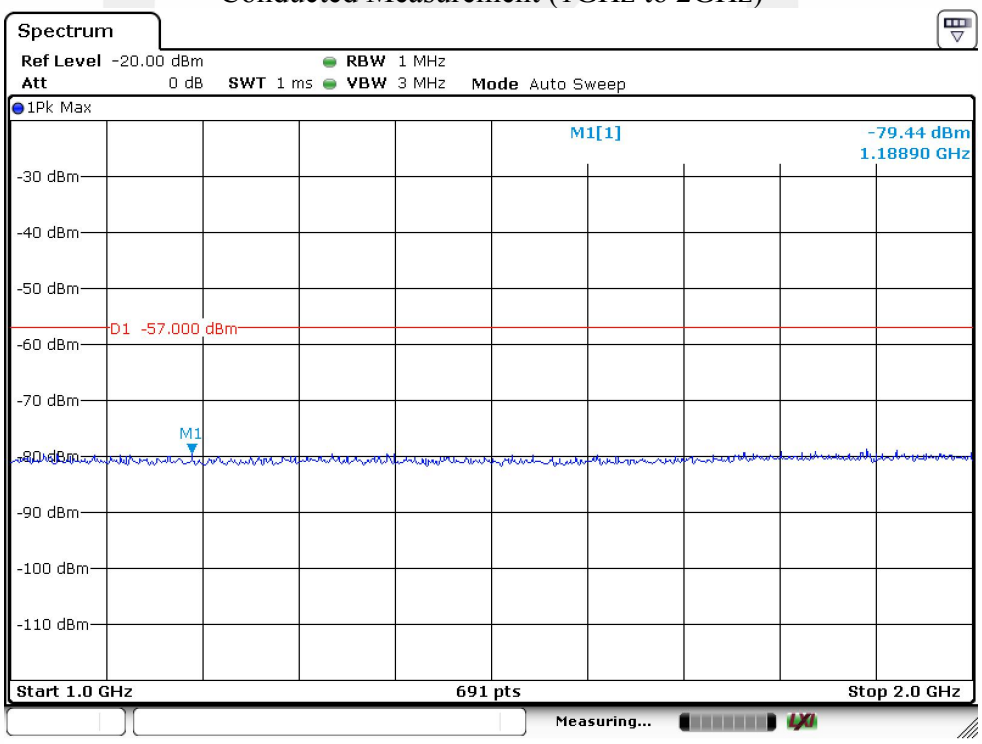
Conducted Measurement (150 KHz to 30MHz)



Conducted Measurement (30MHz to 1GHz)

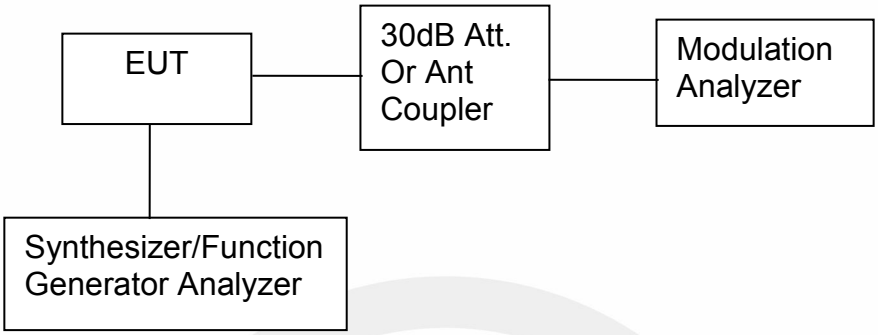


Conducted Measurement (1GHz to 2GHz)



7. SCANNING RECEIVERS AND FREQUENCY CONVERTERS USED WITH SCANNING RECEIVERS.

7.1. Block Diagram of Test Setup



7.2. Radiated Limit

Except as provided in paragraph (c) of this section, scanning receivers shall reject any signals from the Cellular Radiotelephone Service frequency bands that are 38 dB or lower based upon a 12 dB SINAD measurement, which is considered the threshold where a signal can be clearly discerned from any interference that may be present.

7.3. Test Procedure

Please review the FCC Part 15.121 b section requirements to meet the testing process.

7.4. Measuring Results

VHF:

Frequency Range(MHz)	Channel	Measurement Result (dB)	Limit(dB)	Result
136-174	L	49	＞38	Pass
136-174	M	48	＞38	Pass
136-174	H	50	＞38	Pass

Frequency Range(MHz)	Channel	Measurement Result (dB)	Limit(dB)	Result
220-270	L	52	＞38	Pass
220-270	M	49	＞38	Pass
220-270	H	51	＞38	Pass

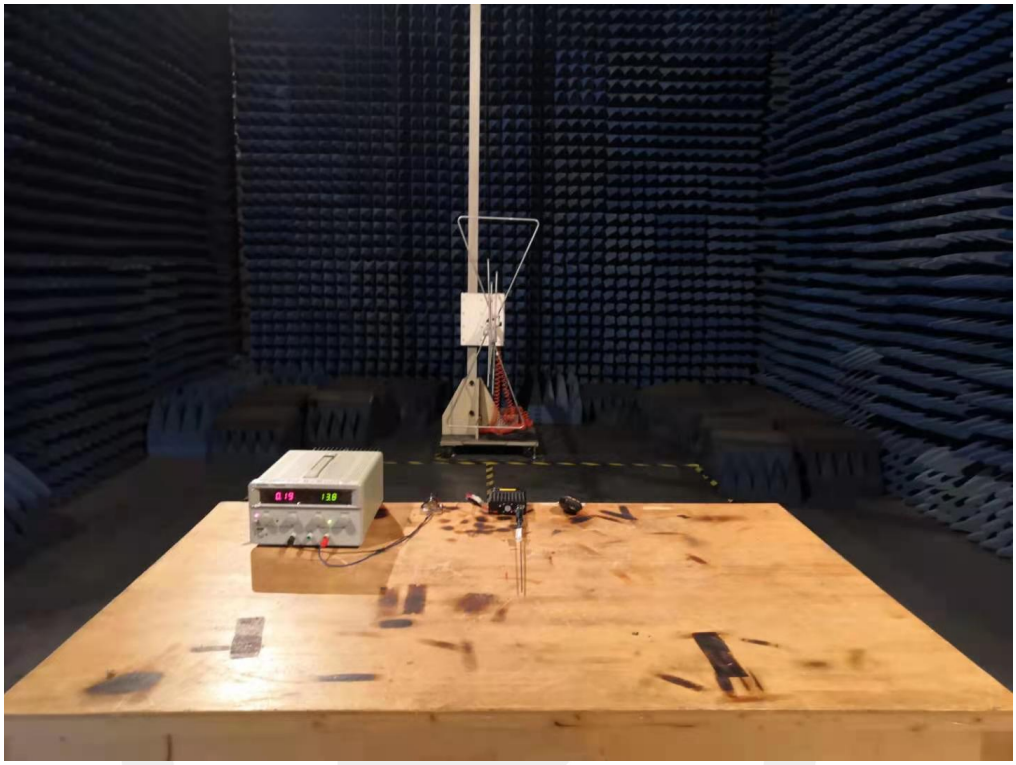
UHF:

Frequency Range(MHz)	Channel	Measurement Result (dB)	Limit(dB)	Result
350-390	L	51	＞38	Pass
350-390	M	49	＞38	Pass
350-390	H	47	＞38	Pass

Frequency Range(MHz)	Channel	Measurement Result (dB)	Limit(dB)	Result
400-480	L	48	＞38	Pass
400-480	M	51	＞38	Pass
400-480	H	50	＞38	Pass

8. PHOTOGRAPHS

8.1. Photos of Radiation Emission Measurement



APPENDIX A: Label Requirements

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under part 73 of this chapter, land mobile operation under part 90 of this chapter, etc., shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful
interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

APPENDIX B: Warning Statement

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

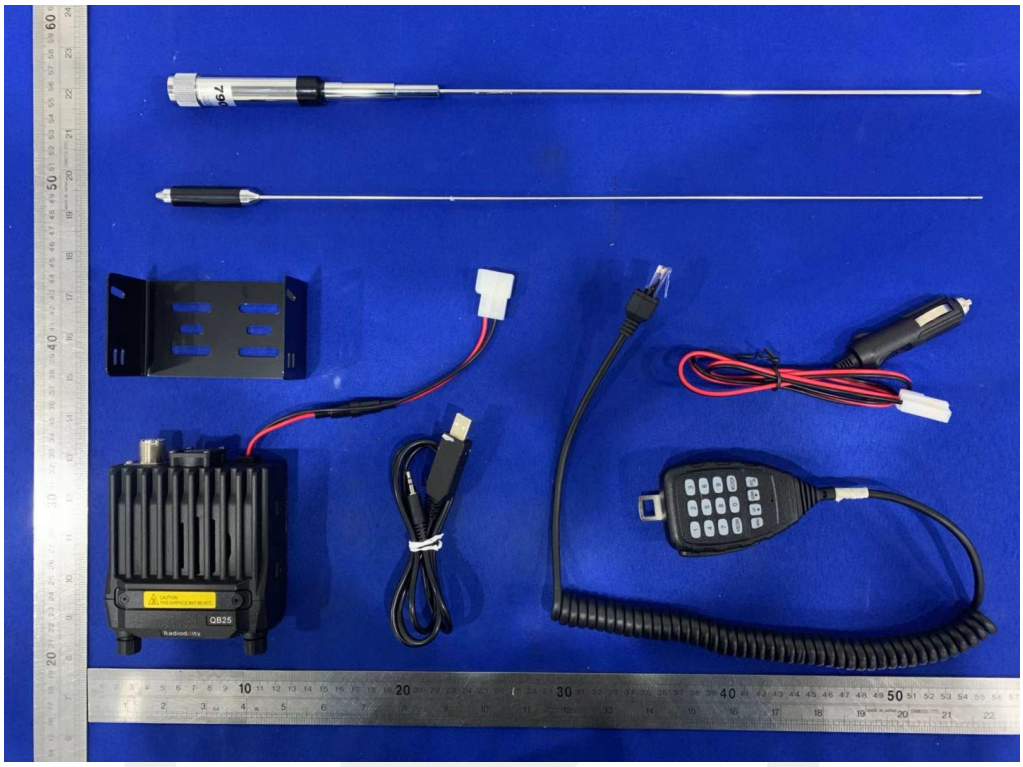
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

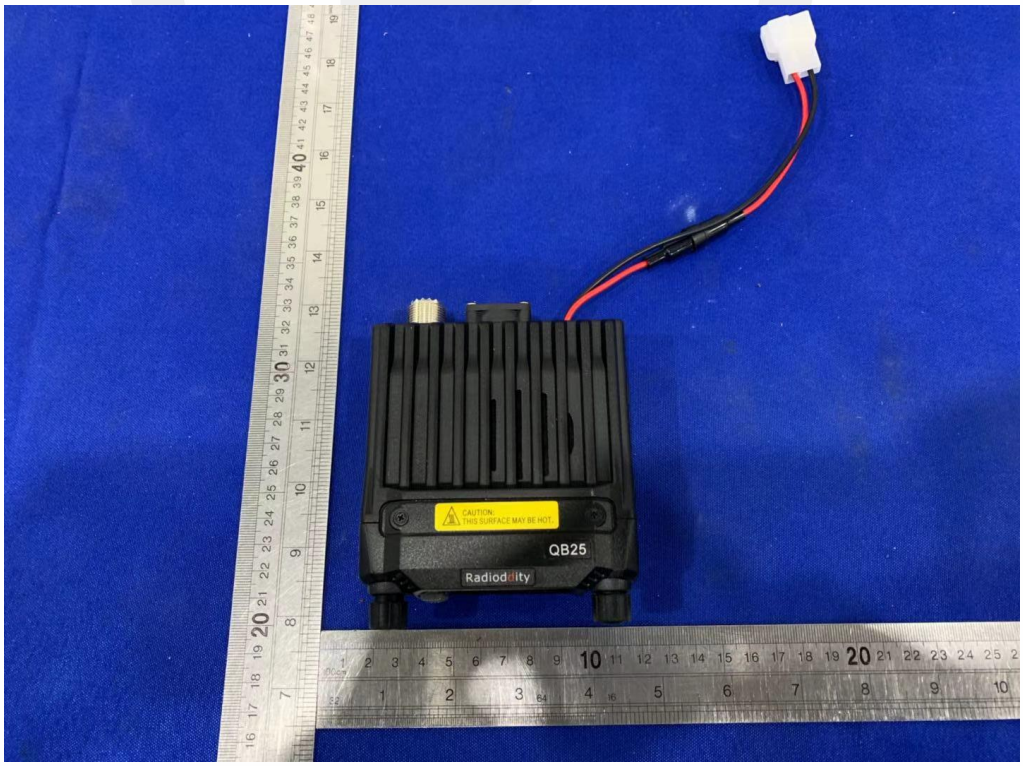
(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

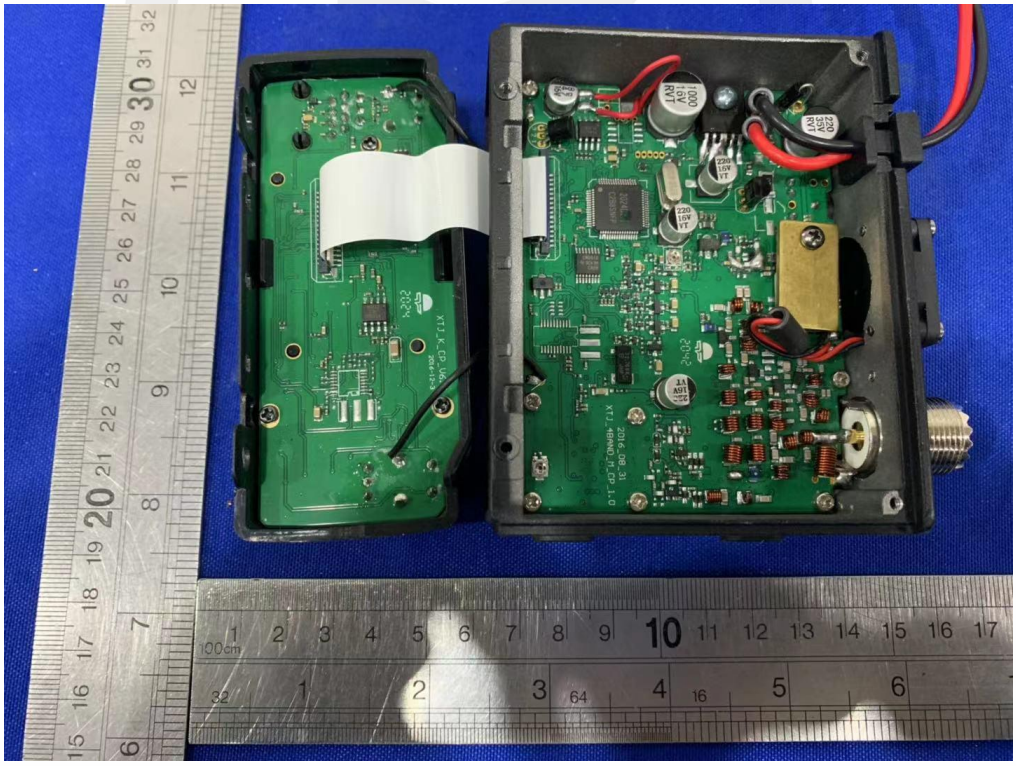
Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

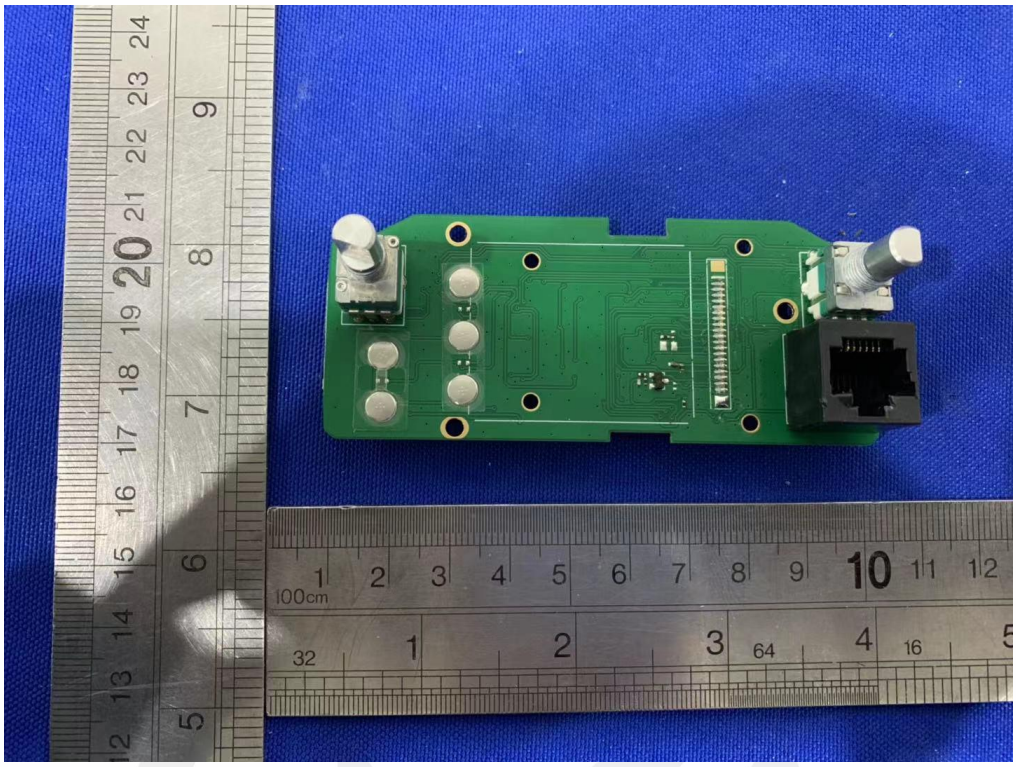
APPENDIX C: Photos of EUT

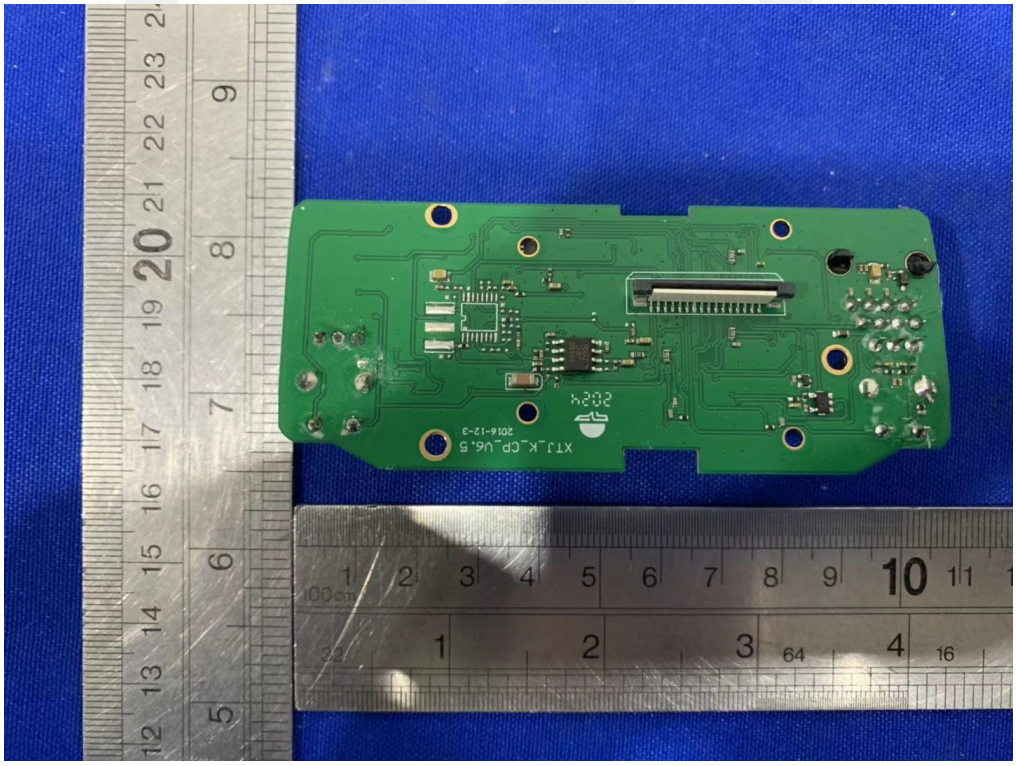


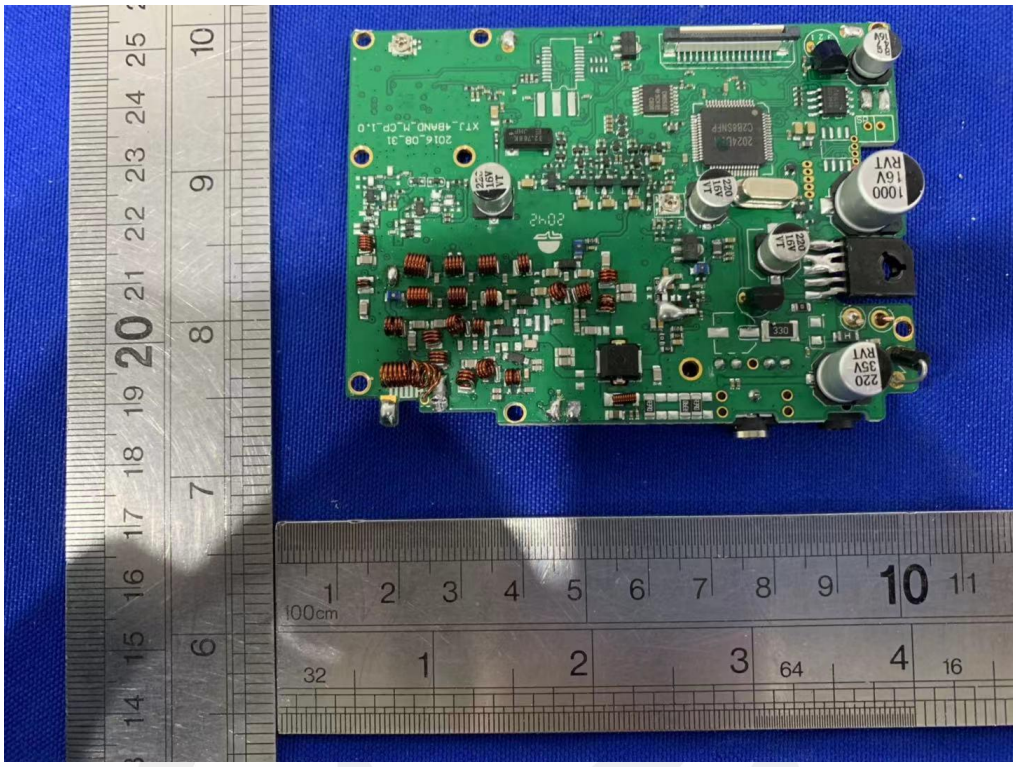


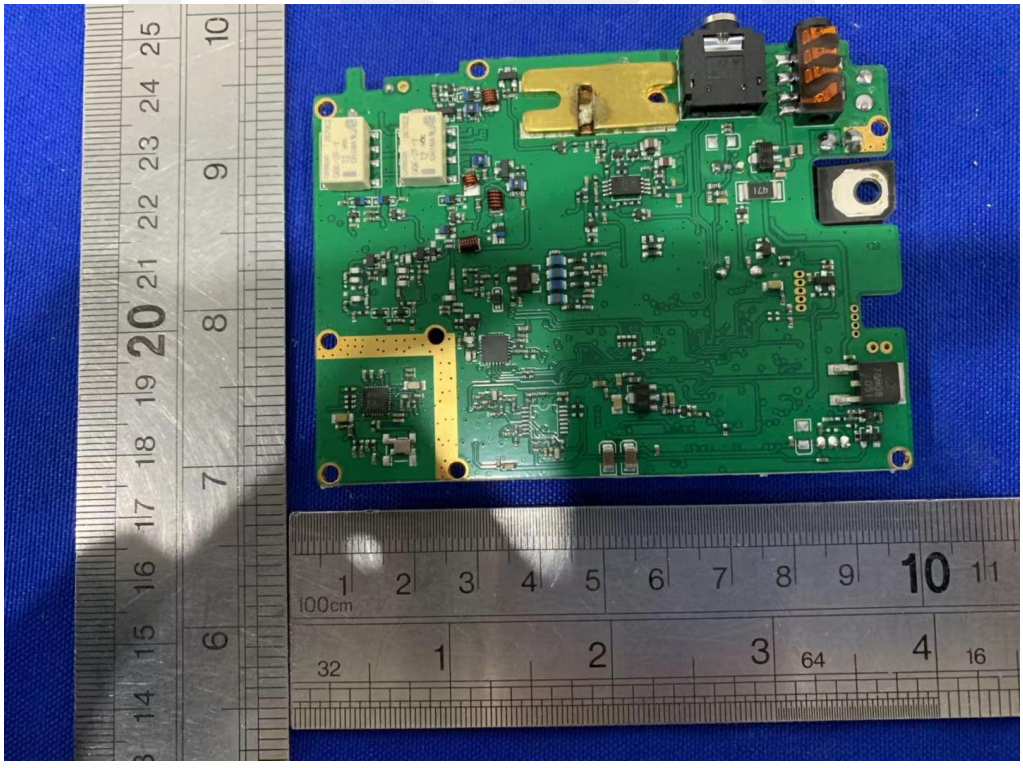

CALL
V/M
EXIT
ABCD
FM
MONI



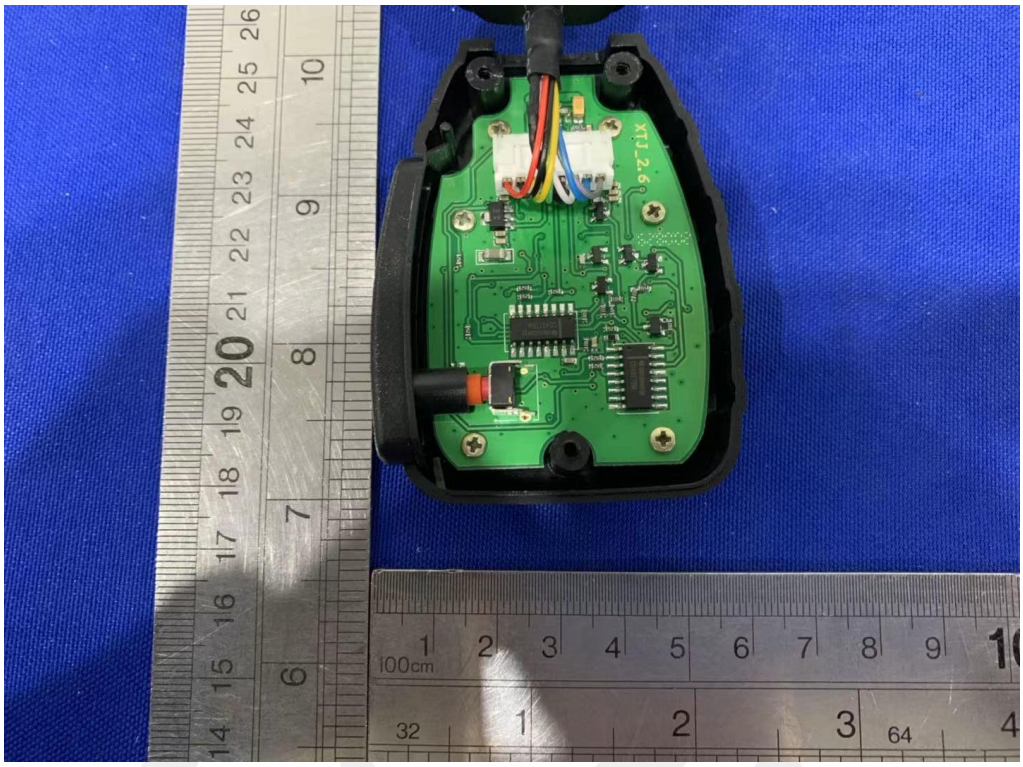


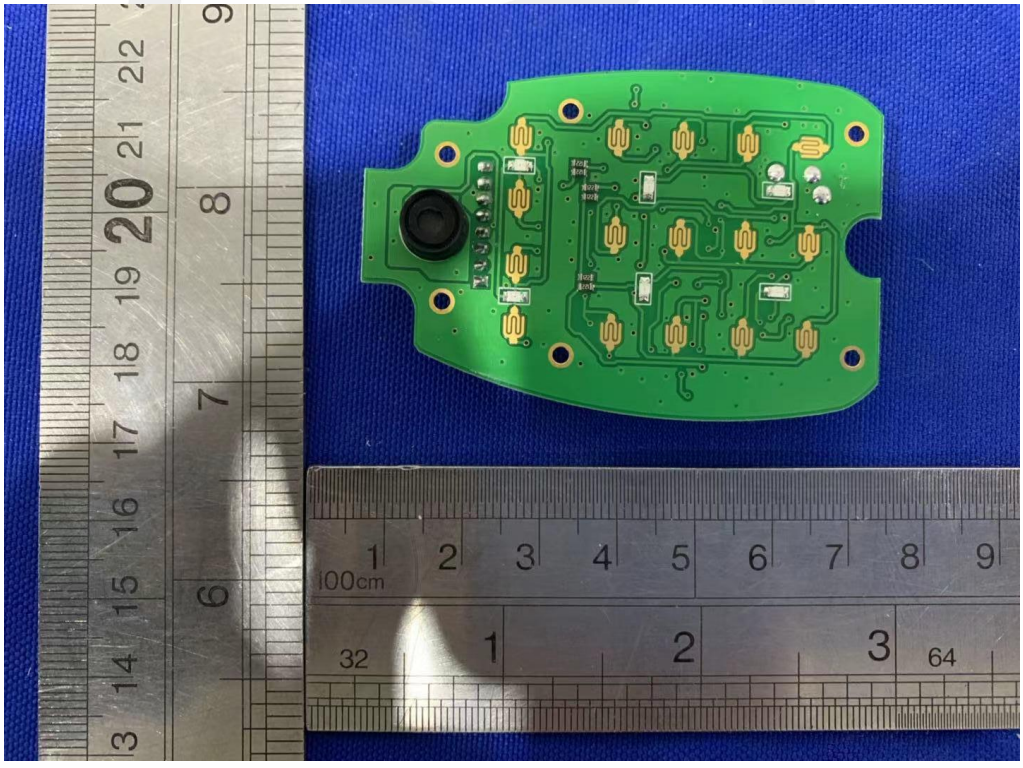


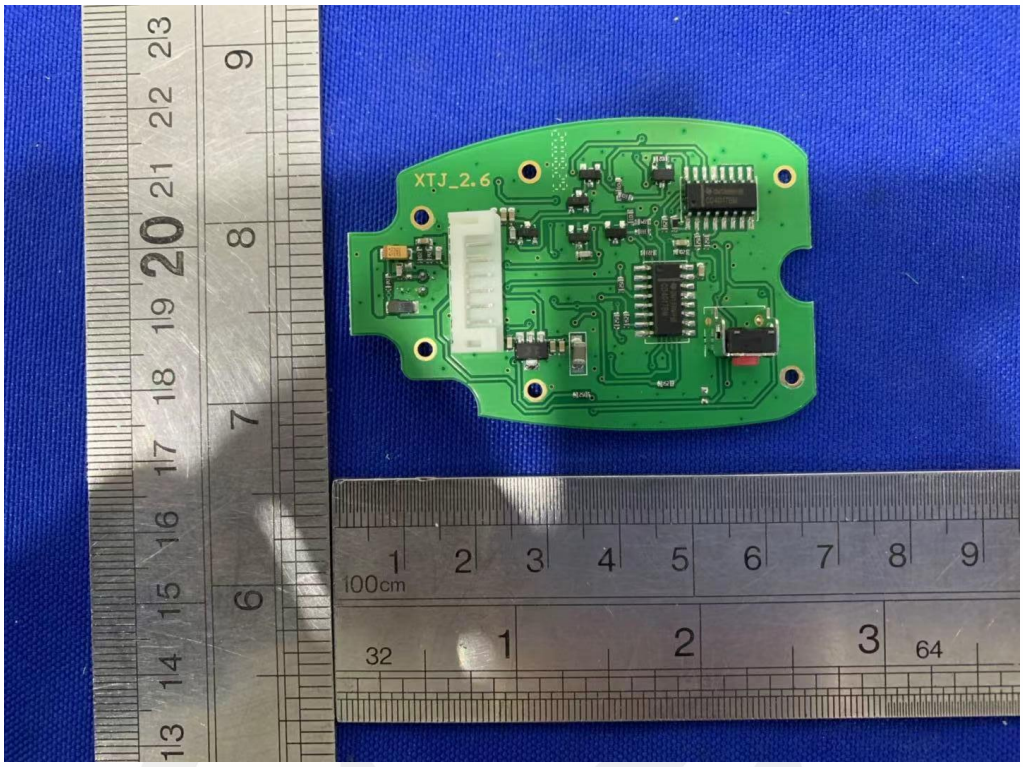





MENU
UP
DOWN
EXIT/AB
#/LOCK
0
*/SCAN
1
2
3
4
5
6
7
8
9


XTJ_2.6
100cm


100cm



*** End of Report ***

声 明

Statement

1．本报告无授权批准人签字及“检验报告专用章”无效；

This report will be void without authorized signature or special seal for testing report.

2．未经许可本报告不得部分复制；

This report shall not be copied partly without authorization.

3．本报告的检测结果仅对送测样品有效，委托方对样品的代表性和资料的真实性负责；

The test results or observations are applicable only to tested sample. Client shall be responsible for representativenes of the sample and authenticity of the material.

4．本检测报告中检测项目标注有特殊符号则该项目不在资质认定范围内，仅作为客户委托、科研、教学或内部质量控制等目的使用；

The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

5．本检测报告以实测值进行符合性判定，未考虑不确定度所带来的风险，本实验室不承担相关责任，特别约定、标准或规范中有明确规定的除外；

The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6．对本检测报告若有异议，请于收到报告之日起 20 日内提出；

Objections shall be raised within 20 days from the date receiving the report.