



# TEST REPORT

**Report Reference No.**..... : **TRE1705025301** R/C.....: 26030  
**FCC ID**..... : **2AMED-HW-1**  
**Applicant's name**..... : **Shenzhen Laser Medical Technology Co., Ltd.**  
**Address**..... : 7F,Block A,Bldg. 6,Baoneng industrial Park,QingXiang Rd.,Longhua Dist.,Shenzhen,China 518109  
**Manufacturer**..... : Shenzhen Laser Medical Technology Co., Ltd.  
**Address**..... : 7F,Block A,Bldg. 6,Baoneng industrial Park,QingXiang Rd.,Longhua Dist.,Shenzhen,China 518109  
**Test item description** ..... : **iBMI Chair**  
**Trade Mark** ..... : iBMI  
**Model/Type reference**..... : HW-1  
**Listed Model(s)** ..... : -  
**Standard** ..... : **FCC CFR Title 47 Part 15 Subpart C Section 15.247**  
**Date of receipt of test sample**..... : May.25, 2017  
**Date of testing**..... : May.26, 2017- Jun.15, 2017  
**Date of issue**..... : Jun.16, 2017  
**Result**..... : **PASS**

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*Hans Hu*

**Testing Laboratory Name** ..... : **Shenzhen Huatongwei International Inspection Co., Ltd.**

**Address**..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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## 1. Test standards and Report version

### 1.1. Applicable Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10:2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB558074 D01 DTS Meas Guidance v04](#): Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating under § 15.247

### 1.2. Report version

Version No.	Date of issue	Description
00	Jun.16,2017	Original

## 2. Test Description

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
Line Conducted Emissions (AC Main)	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Power Spectral Density	15.247 (e)	Pass
6dB Bandwidth	15.247 (a)(2)	Pass
Restricted band	15.247(d)/15.205	Pass
Spurious Emissions	15.247(d)/15.209	Pass

Note: The measurement uncertainty is not included in the test result.

### 3. Summary

#### 3.1. Client Information

Applicant:	Shenzhen Laser Medical Technology Co., Ltd.
Address:	7F,Block A,Bldg. 6,Baoneng industrial Park,QingXiang Rd.,Longhua Dist.,Shenzhen,China 518109
Manufacturer:	Shenzhen Laser Medical Technology Co., Ltd.
Address:	7F,Block A,Bldg. 6,Baoneng industrial Park,QingXiang Rd.,Longhua Dist.,Shenzhen,China 518109

#### 3.2. Product Description

Name of EUT	iBMI Chair
Trade Mark:	iBMI
Model No.:	HW-1
Listed Model(s):	-
Power supply:	AC 120V/60Hz
Adapter information:	Model:GSM18U05 Input:100-240VAC,50/60Hz,0.5-0.25A Output:5V,3A
Bluetooth	
Version:	Supported BT4.0+BLE
Modulation:	GFSK
Operation frequency:	2402MHz - 2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	Internal Antenna
Antenna gain:	0dBi

### 3.3. Operation state

#### ➤ Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

Channel	Frequency (MHz)
00	2402
02	2404
:	:
19	2440
:	:
38	2478
39	2480

#### ➤ Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the Bluetooth under large data rate(2 Mbit/s) transmission.
For RF test axis
EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

### 3.4. EUT configuration

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

- - supplied by the manufacturer
- - supplied by the lab

	Manufacturer :	/
	Model No. :	/
	Manufacturer :	/
	Model No. :	/

### 3.5. Modifications

No modifications were implemented to meet testing criteria.

## **4. Test Environment**

### **4.1. Address of the test laboratory**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

### **4.2. Test Facility**

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

#### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories

(identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

#### **A2LA-Lab Cert. No. 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2018.

#### **FCC-Registration No.: 317478**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

#### **IC-Registration No.: 5377B-1**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B-1 on Dec.03, 2014, valid time is until Dec.03, 2017.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

### 4.3. Equipments Used during the Test

Line Conducted Emission (AC Main)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	R&S	ESCI	101247	2016/11/13
2	Artificial Mains	Shwarzbeck	NNLK 8121	573	2016/11/13
3	Pulse Limiter	R&S	ESH3-Z2	101488	2016/11/13
4	Test Software	R&S	ES-K1	N/A	N/A
5	Test cable	ENVIROFLEX	3651	1101902	2016/11/13

Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	2016/11/13
2	Power Meter	Anritsu	ML2480B	100798	2016/11/13
3	Power Sensor	Anritsu	MA2411B	100258	2016/11/13
4	Test cable	FARPU	MCX-J	N/A	2016/11/13
5	Temporary antenna connector	D-LENP	NJ-SMAK	N/A	2016/11/13

NOTE: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	2016/11/13
2	RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
3	EMI Test Software	Rohde&Schwarz	ESK1	N/A	N/A
4	Loop Antenna	Rohde&Schwarz	HZ-9	838622\013	2016/11/13
5	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2016/11/13
6	Horn Antenna	ShwarzBeck	9120D	1011	2016/11/13
7	Broadband Horn Antenna	Shwarzbeck	BBHA9170	BBHA917047 2	2016/11/13
8	Preamplifier	Shwarzbeck	BBV9742	9742-196	2016/11/13
9	Broadband Preamplifier	Shwarzbeck	BBV 9721	9721-102	2016/11/13
10	Broadband Preamplifier	Shwarzbeck	BBV 9718	9718-247	2016/11/13
11	Turn Table	MATURO	TT2.0	/	N/A
12	Antenna Mast	MATURO	TAM-4.0-P	/	N/A
13	EMI Test Software	Audix	E3	N/A	N/A
14	Test Software	R&S	ES-K1	N/A	N/A
15	Test cable	Siva Cables Italy	RG 58A/U	W14.02	2016/11/13

The Cal.Interval was one year



#### 4.4. Environmental conditions

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

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

#### 4.5. 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 in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according 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 Huatongwei International Inspection Co., Ltd quality system according to ISO/IEC 17025. Further more, 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.

Here after the best measurement capability for Shenzhen Huatongwei is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

## 5. Test Conditions and Results

### 5.1. Antenna requirement

#### REQUIREMENT:

##### **FCC CFR Title 47 Part 15 Subpart C 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):**

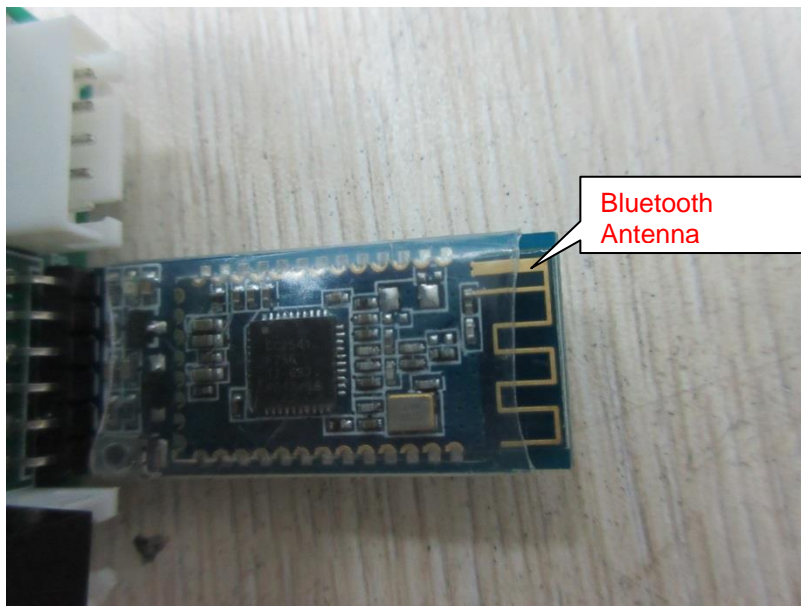
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional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

#### TEST RESULTS

☒ **Passed**      ☐ **Not Applicable**

The Antenna is PCB antenna, is not replaced by user.

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



## 5.2. Conducted Emissions (AC Main)

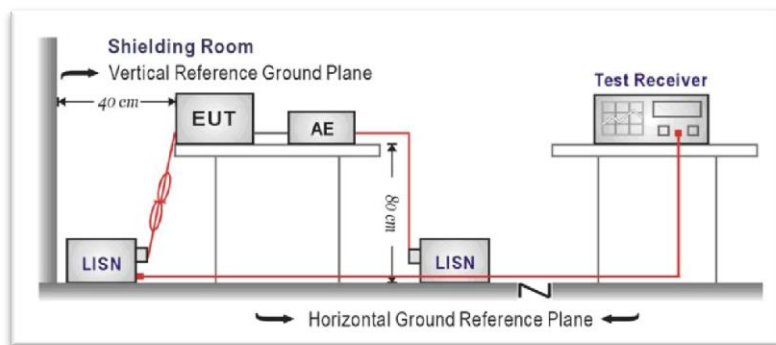
### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

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 CONFIGURATION



### TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 10 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 10 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

### TEST MODE:

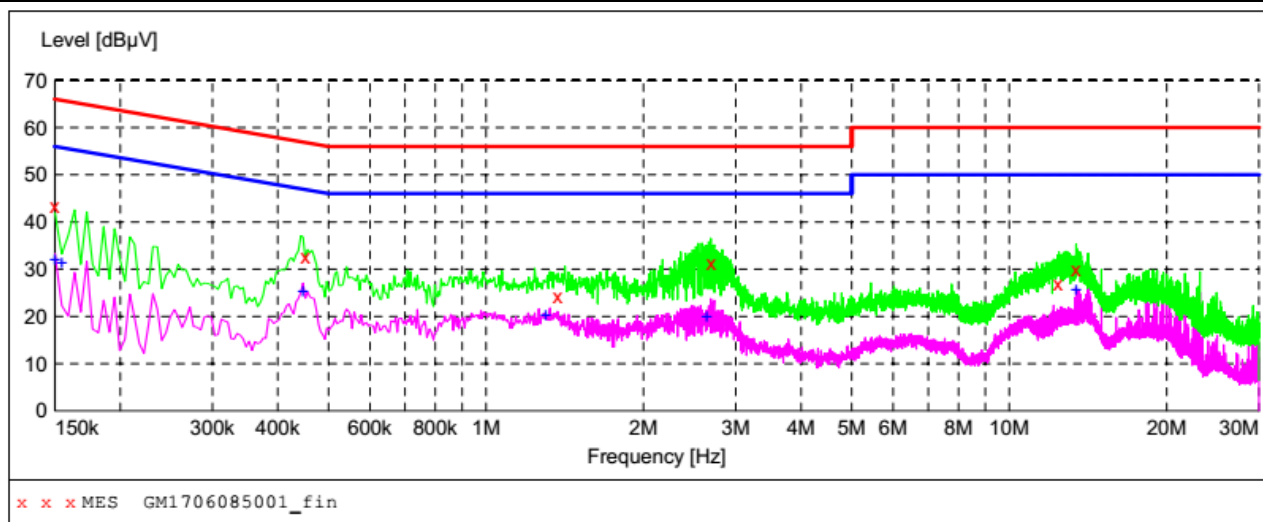
Please refer to the clause 3.3

### TEST RESULTS

☒ Passed ☐ Not Applicable

Test Line:

L

**MEASUREMENT RESULT: "GM1706085001\_fin"**

6/8/2017 8:50AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	43.40	10.4	66	22.6	QP	L1	GND
0.451500	32.70	10.2	57	24.1	QP	L1	GND
1.369500	24.20	10.2	56	31.8	QP	L1	GND
2.692500	31.20	10.2	56	24.8	QP	L1	GND
12.399000	27.00	10.5	60	33.0	QP	L1	GND
13.420500	29.90	10.5	60	30.1	QP	L1	GND

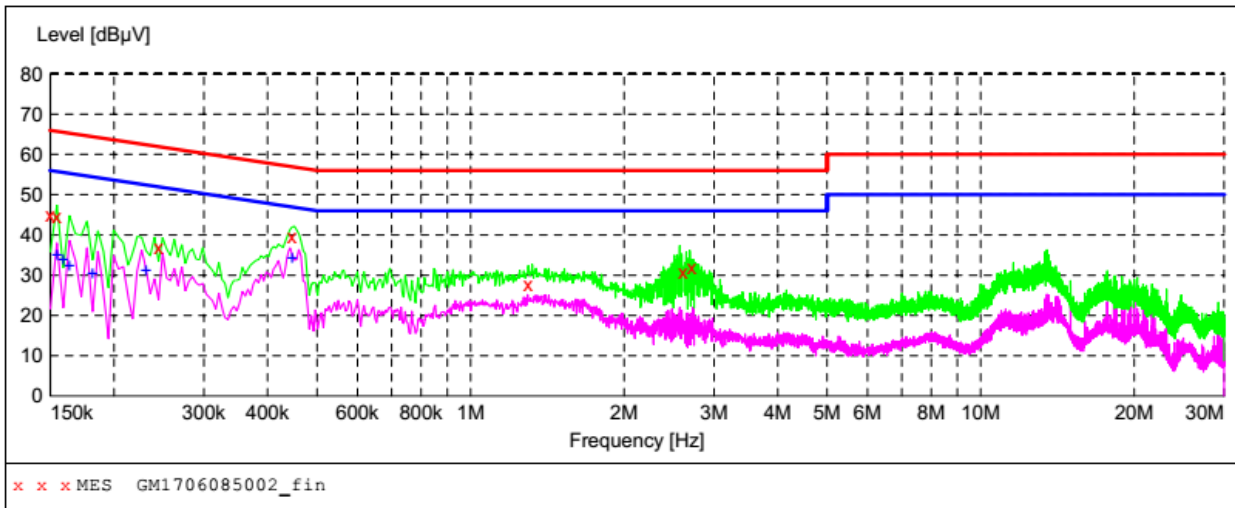
**MEASUREMENT RESULT: "GM1706085001\_fin2"**

6/8/2017 8:50AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	32.00	10.4	56	24.0	AV	L1	GND
0.154500	31.30	10.4	56	24.5	AV	L1	GND
0.447000	25.30	10.2	47	21.6	AV	L1	GND
1.302000	20.20	10.2	46	25.8	AV	L1	GND
2.643000	19.80	10.2	46	26.2	AV	L1	GND
13.416000	25.60	10.5	50	24.4	AV	L1	GND

Test Line:

N

**MEASUREMENT RESULT: "GM1706085002\_fin"**

6/8/2017 8:57AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	44.90	10.4	66	21.1	QP	N	GND
0.154500	44.40	10.4	66	21.4	QP	N	GND
0.244500	36.90	10.3	62	25.0	QP	N	GND
0.447000	39.40	10.2	57	17.5	QP	N	GND
1.297500	27.80	10.2	56	28.2	QP	N	GND
2.607000	30.80	10.2	56	25.2	QP	N	GND
2.710500	31.80	10.2	56	24.2	QP	N	GND

**MEASUREMENT RESULT: "GM1706085002\_fin2"**

6/8/2017 8:57AM

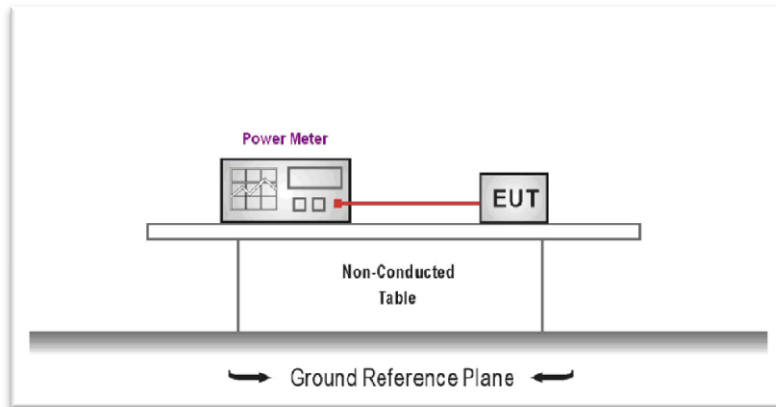
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.154500	35.00	10.4	56	20.8	AV	N	GND
0.159000	33.70	10.4	56	21.8	AV	N	GND
0.163500	32.50	10.4	55	22.8	AV	N	GND
0.181500	30.60	10.3	54	23.8	AV	N	GND
0.231000	31.10	10.3	52	21.3	AV	N	GND
0.447000	34.40	10.2	47	12.5	AV	N	GND

### 5.3. Conducted Peak Output Power

#### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): **30dBm**:

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47CFR 15.247 requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
4. Record the measurement data.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

☒ **Passed**      ☐ **Not Applicable**

Type	Channel	Output power (dBm)	Limit (dBm)	Result
BT-BLE	00	-15.95	30.00	Pass
	19	-13.03		
	39	-14.14		

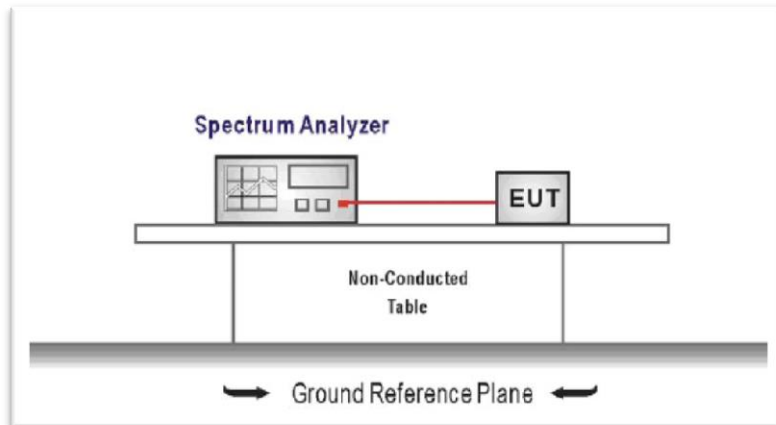
## 5.4. Power Spectral Density

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configure the spectrum analyzer as shown below:  
*Center frequency = DTS channel center frequency*  
*Span = 1.5 times the DTS bandwidth*  
 *$RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$ ,  $VBW \geq 3 \times RBW$*   
*Sweep time = auto couple*  
*Detector = peak*  
*Trace mode = max hold*
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### TEST MODE:

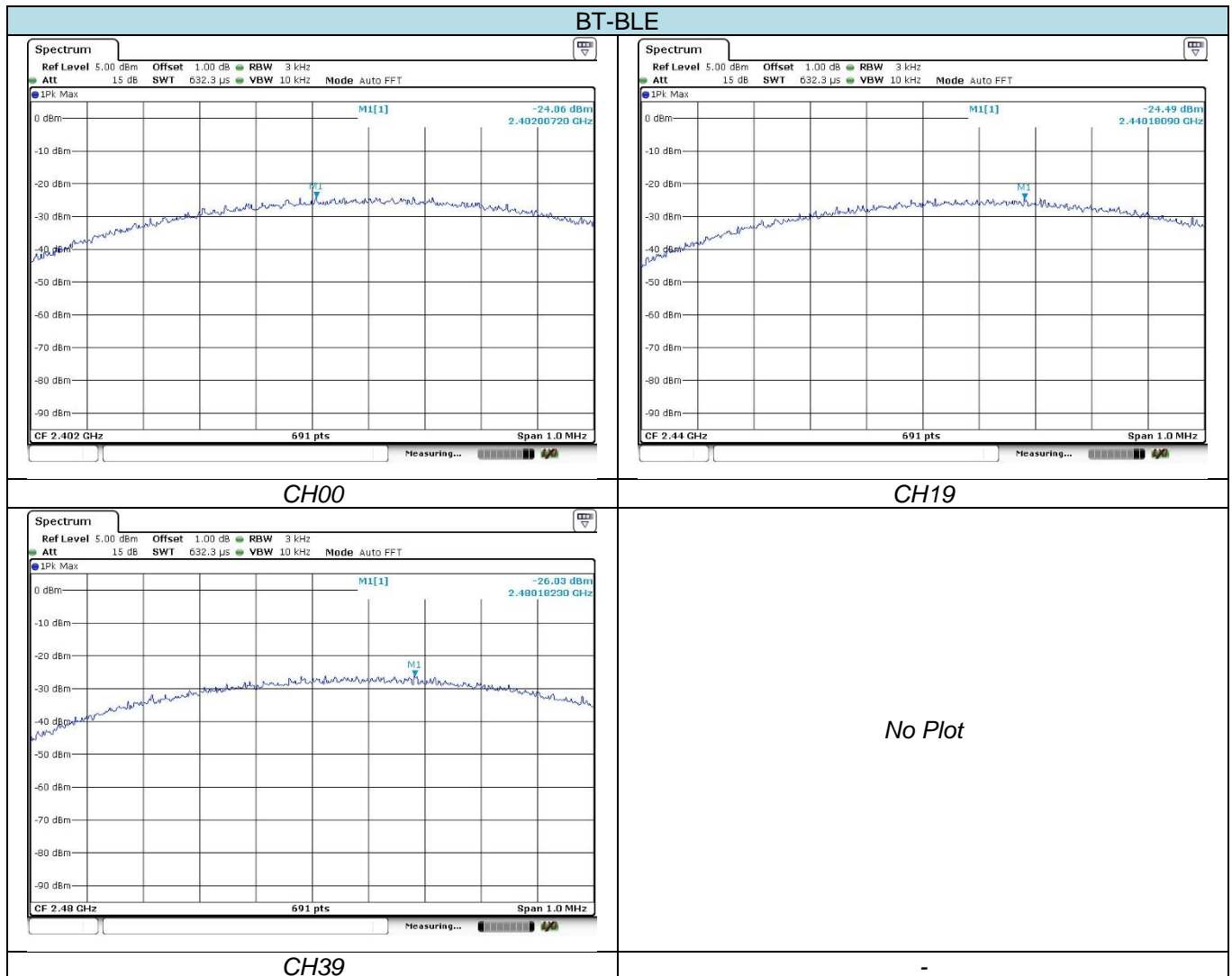
Please refer to the clause 3.3

### TEST RESULTS

☒ **Passed**      ☐ **Not Applicable**

Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
BT-BLE	00	-24.06	8.00	Pass
	19	-24.49		
	39	-26.03		

Test plot as follows:





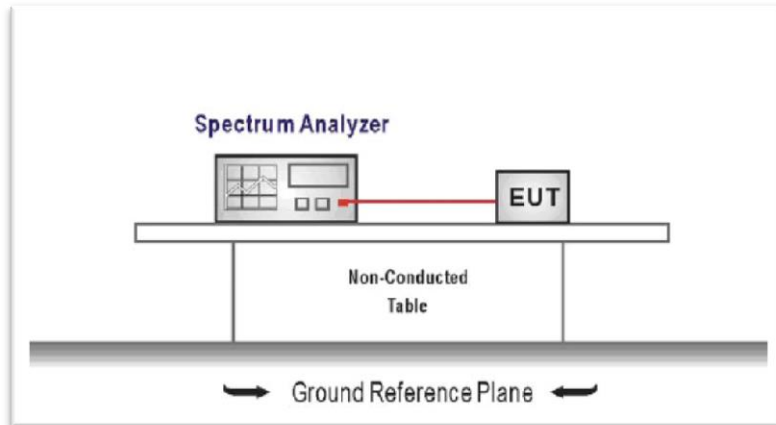
## 5.5. 6dB bandwidthand

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):**

*For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.*

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).  
Center Frequency = DTS channel center frequency  
Span = 2 x DTS bandwidth  
RBW = 100 kHz, VBW  $\geq 3 \times$  RBW  
Sweep time = auto couple  
Detector = Peak  
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

### TEST MODE:

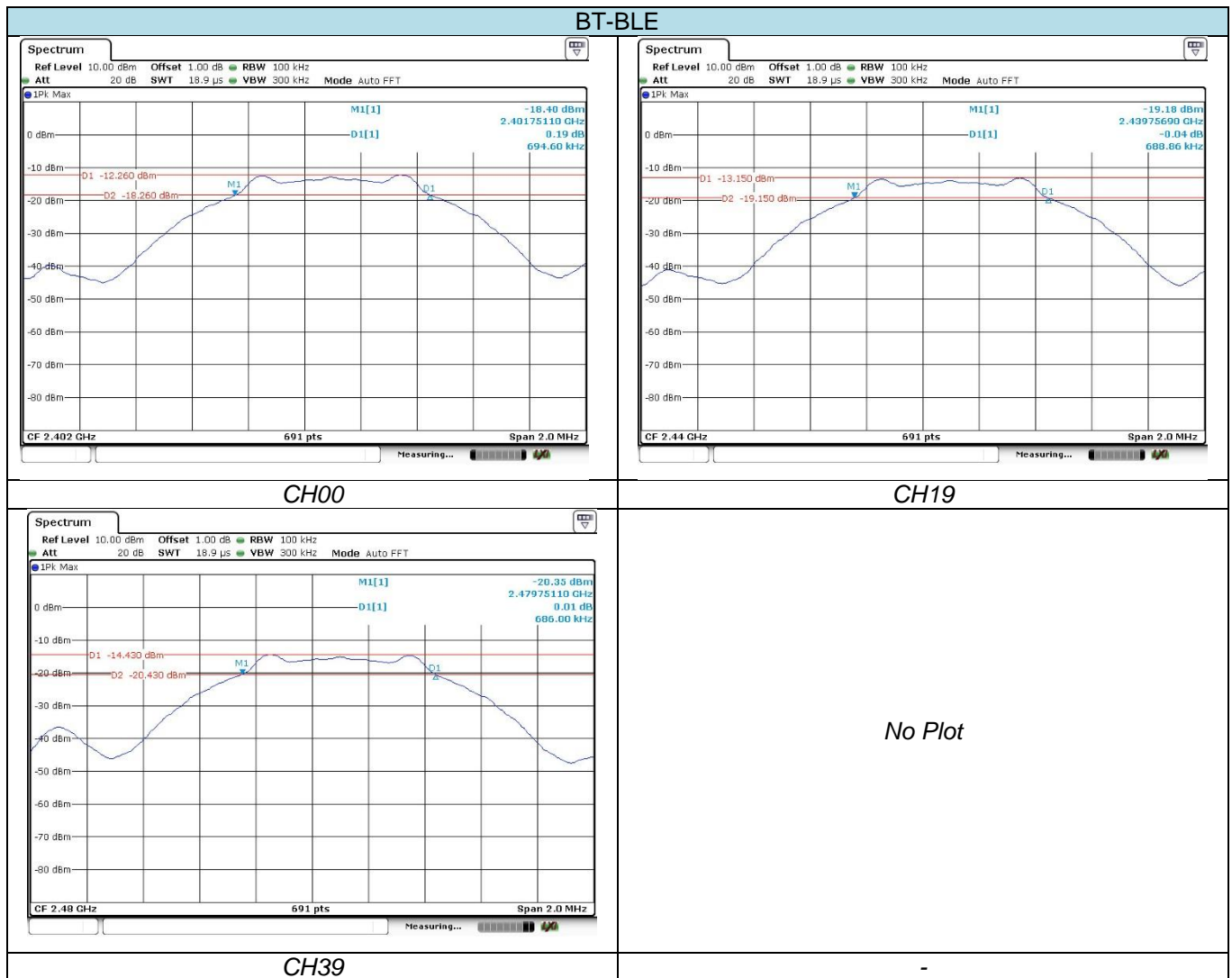
Please refer to the clause 3.3

### TEST RESULTS

☒ **Passed**      ☐ **Not Applicable**

Type	Channel	6dB Bandwidth (KHz)	Limit (KHz)	Result
BT-BLE	00	694.60	$\geq 500$	Pass
	19	688.86		
	39	686.00		

Test plot as follows:



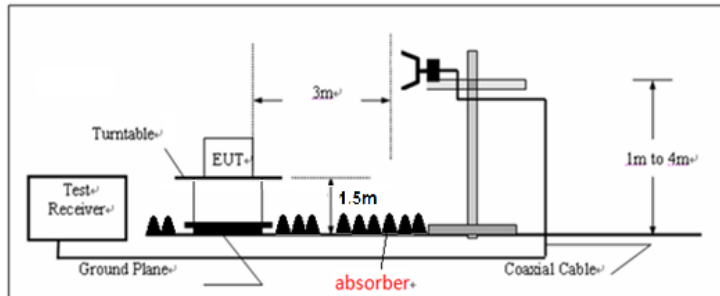
## 5.6. Restricted band

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, 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) (see §15.205(c)).

### TEST CONFIGURATION



### TEST PROCEDURE

- 1) The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2) The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3) The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5) The receiver set as follow:  
 RBW=1MHz, VBW=3MHz Peak detector for Peak value  
 RBW=1MHz, VBW=3MHz RMS detector for Average value.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

☒ **Passed**      ☐ **Not Applicable**

Note:

- 1) *Final level = Read level + Antenna Factor + Cable Loss - Preamp Factor*

BT-BLE						CH00			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2310.000	35.36	28.05	6.62	37.65	32.38	74	-41.62	Horizontal	Peak
2390.031	46.51	27.65	6.75	37.87	43.04	74	-30.96	Horizontal	Peak
2310.000	35.69	28.05	6.62	37.65	32.71	74	-41.29	Vertical	Peak
2390.031	38.72	27.65	6.75	37.87	35.25	74	-38.75	Vertical	Peak
2310.000	26.38	28.05	6.62	37.65	23.4	54	-30.6	Horizontal	Average
2389.834	36.81	27.65	6.75	37.87	33.34	54	-20.66	Horizontal	Average
2310.000	27.48	28.05	6.62	37.65	24.5	54	-29.5	Vertical	Average
2390.031	32.96	27.65	6.75	37.87	29.49	54	-24.51	Vertical	Average

BT-BLE						CH39			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2483.497	57.75	27.26	6.83	37.87	53.97	74	-20.03	Horizontal	Peak
2500.000	42.4	27.2	6.84	37.87	38.57	74	-35.43	Horizontal	Peak
2483.497	47.25	27.26	6.83	37.87	43.47	74	-30.53	Vertical	Peak
2500.000	36.3	27.2	6.84	37.87	32.47	74	-41.53	Vertical	Peak
2483.497	51.27	27.26	6.83	37.87	47.49	54	-6.51	Horizontal	Average
2500.000	32.56	27.2	6.84	37.87	28.73	54	-25.27	Horizontal	Average
2483.497	45.12	27.26	6.83	37.87	41.34	54	-12.66	Vertical	Average
2500.000	28.67	27.2	6.84	37.87	24.84	54	-29.16	Vertical	Average

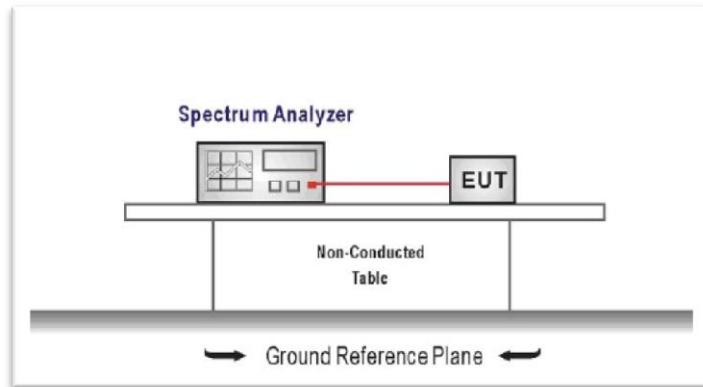
## 5.7. Band edge and Spurious Emissions (conducted)

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Establish a reference level by using the following procedure  
*Center frequency = DTS channel center frequency*  
*The span = 1.5 times the DTS bandwidth.*  
*RBW = 100 kHz, VBW ≥ 3 x RBW*  
*Detector = peak, Sweep time = auto couple, Trace mode = max hold*  
*Allow trace to fully stabilize*  
*Use the peak marker function to determine the maximum PSD level*
- Note: the channel found to contain the maximum PSD level can be used to establish the reference level.
3. Emission level measurement  
Set the center frequency and span to encompass frequency range to be measured  
*RBW = 100 kHz, VBW ≥ 3 x RBW*  
*Detector = peak, Sweep time = auto couple, Trace mode = max hold*  
Allow trace to fully stabilize  
Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emissions relative to the limit.

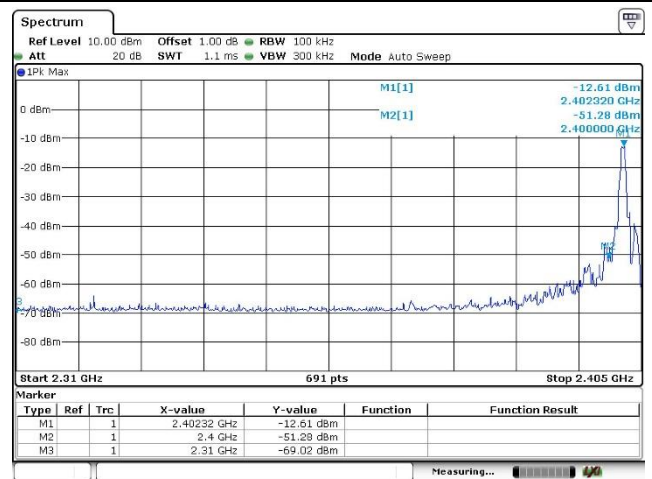
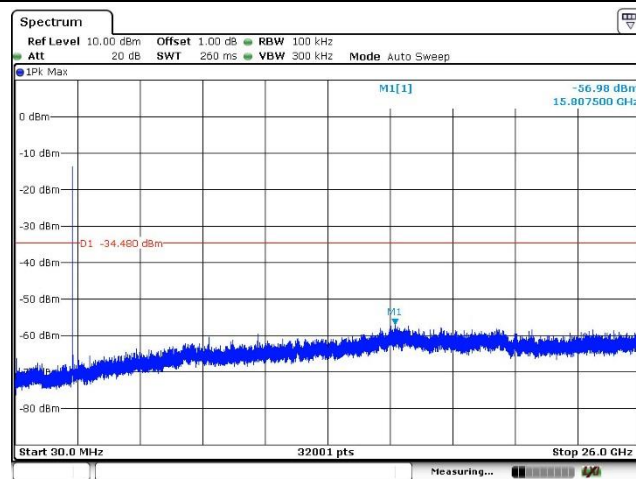
### TEST MODE:

Please refer to the clause 3.3

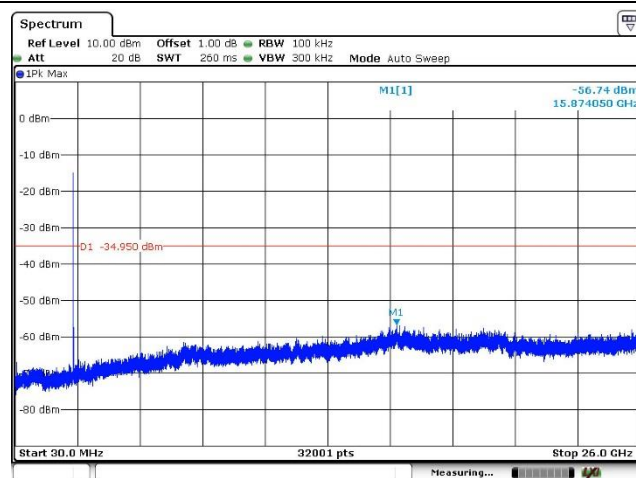
### TEST RESULTS

☒ **Passed**      ☐ **Not Applicable**

## BT-BLE



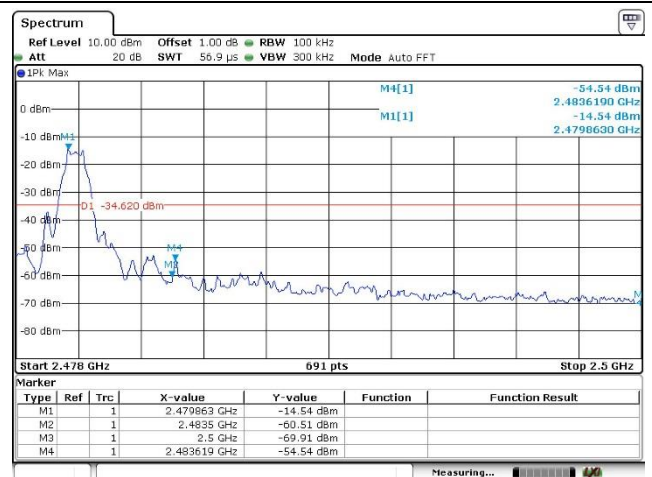
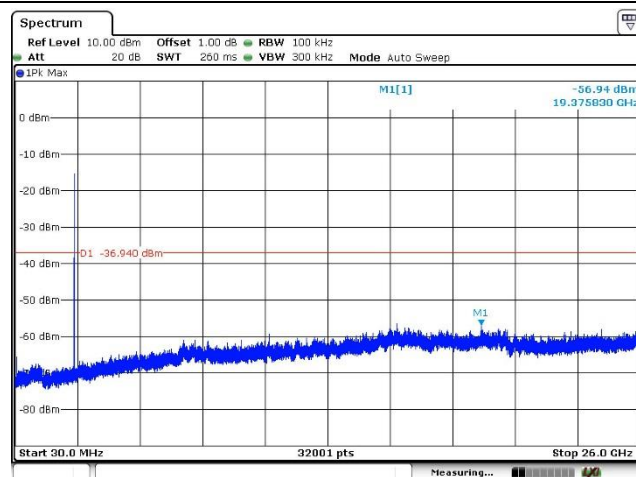
## CH00-SE



## CH00-Bandedge

No Plot

## CH19-SE



## CH39-SE

## CH39-Bandedge

## 5.8. Spurious Emissions (radiated)

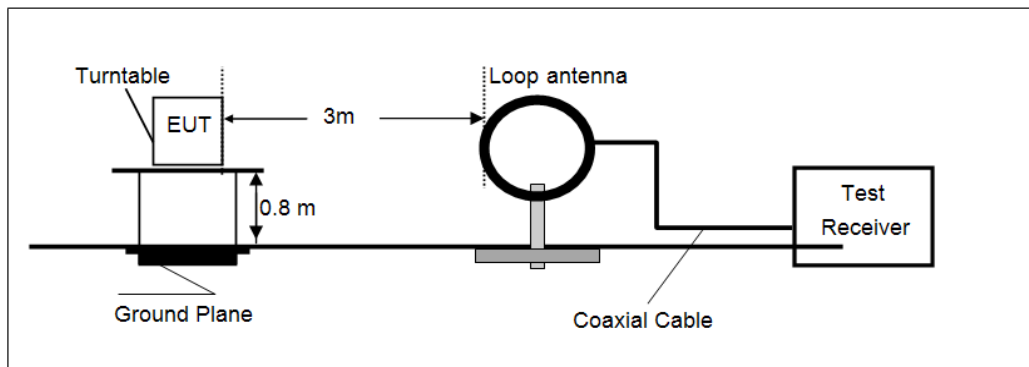
### LIMIT

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

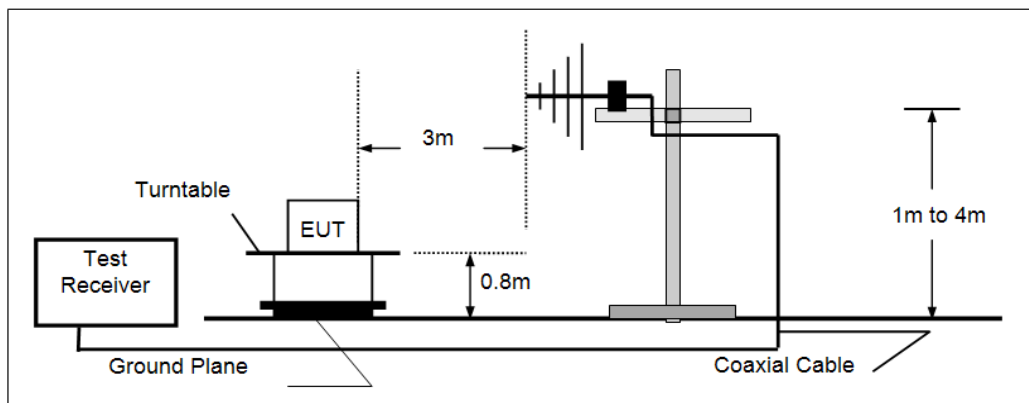
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

### TEST CONFIGURATION

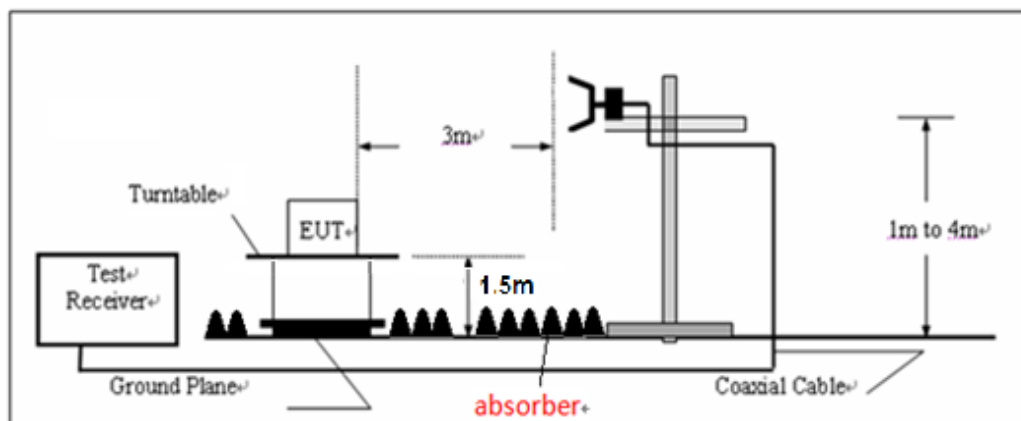
#### ➤ 9KHz ~30MHz



#### ➤ 30MHz ~ 1GHz



#### ➤ Above 1GHz



**TEST PROCEDURE**

1. The EUT was tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8/1.5 meter above ground plane. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1GHz, RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold;  
*If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.*
  - (3) Above 1GHz, RBW=1MHz, VBW=3MHz Peak detector for Peak value  
RBW=1MHz, VBW=3MHz RMS detector for Average value.

Remark: "floor-standing equipment" Where possible, the antenna(s) of the EUT shall be located at a height of 1.5 m above the floor, and the intentional radiator circuitry shall be located within the system at a height of at least 0.8 m above the floor.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed**      ☐ **Not Applicable**

Note:

- 1) *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
- 2) *"\*\*", means this data is too weak instrument of signal is unable to test.*
- 3) *The emission levels of other frequencies are very lower than the limit and not show in test report.*

➤ **9kHz ~ 30MHz**

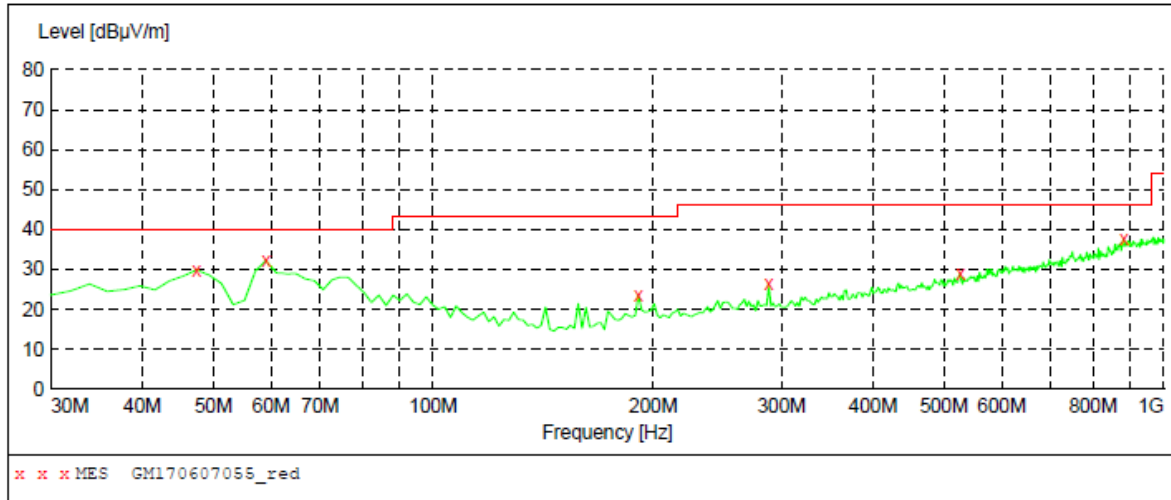
The EUT was pre-scanned the frequency band (9KHz~30MHz), found the radiated level lower than the limit (all emissions were greater than 20 dB below the limit), so don't show on the report.



## ➤ 30MHz ~ 1GHz

Polarization:

Vertical

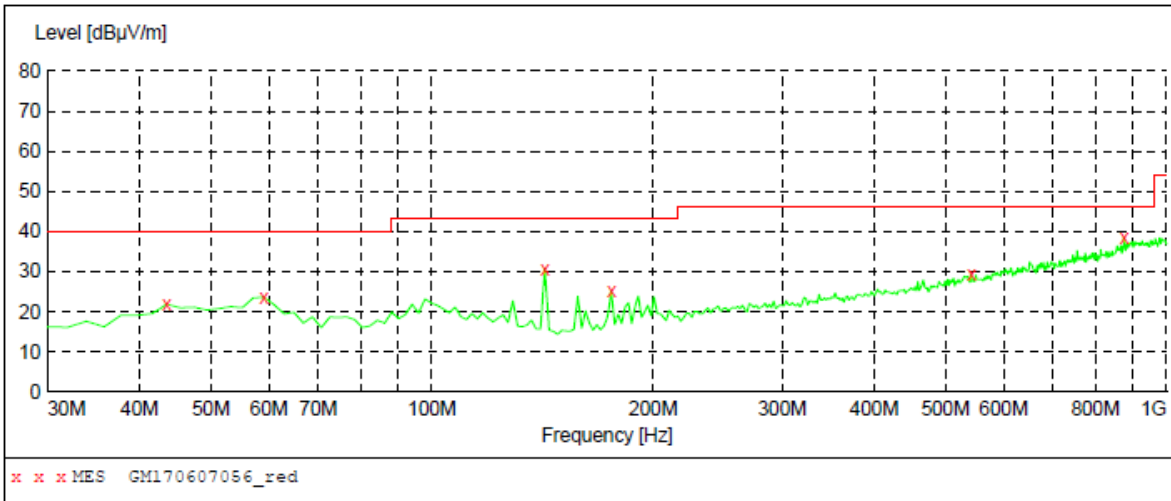
**MEASUREMENT RESULT: "GM170607055\_red"**

6/7/2017 2:36PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	29.90	-8.8	40.0	10.1	QP	100.0	328.00	VERTICAL
59.100000	32.20	-9.8	40.0	7.8	QP	100.0	353.00	VERTICAL
191.020000	23.60	-10.9	43.5	19.9	QP	100.0	194.00	VERTICAL
288.020000	26.30	-7.5	46.0	19.7	QP	100.0	166.00	VERTICAL
526.640000	28.80	-1.2	46.0	17.2	QP	100.0	143.00	VERTICAL
881.660000	37.60	6.3	46.0	8.4	QP	100.0	102.00	VERTICAL

Polarization:

Horizontal

**MEASUREMENT RESULT: "GM170607056\_red"**

6/7/2017 2:39PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
43.580000	21.90	-9.1	40.0	18.1	QP	300.0	98.00	HORIZONTAL
59.100000	23.70	-9.8	40.0	16.3	QP	300.0	207.00	HORIZONTAL
142.520000	30.80	-13.9	43.5	12.7	QP	100.0	278.00	HORIZONTAL
175.500000	25.10	-12.7	43.5	18.4	QP	100.0	171.00	HORIZONTAL
542.160000	29.30	-0.9	46.0	16.7	QP	100.0	171.00	HORIZONTAL
875.840000	38.50	6.2	46.0	7.5	QP	300.0	359.00	HORIZONTAL

➤ **Above 1GHz**

BT-BLE					CH00				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1487.509	46.8	25.81	5.25	36.57	41.29	74	-32.71	Vertical	Peak
1672.296	52.78	25.12	5.71	36.87	46.74	74	-27.26	Vertical	
3184.25	40.43	28.8	7.7	38.2	38.73	74	-35.27	Vertical	
4809.499	40.87	31.58	9.55	36.93	45.07	74	-28.93	Vertical	
1589.289	49.94	24.99	5.54	36.71	43.76	74	-30.24	Horizontal	
2118.973	44.06	26.85	6.37	37.32	39.96	74	-34.04	Horizontal	
3184.25	39.49	28.8	7.7	38.2	37.79	74	-36.21	Horizontal	
4809.499	42.72	31.58	9.55	36.93	46.92	74	-27.08	Horizontal	

BT-BLE					CH19				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1589.419	49.29	24.99	5.54	36.71	43.11	74	-30.89	Vertical	Peak
2129.938	45.4	26.94	6.38	37.33	41.39	74	-32.61	Vertical	
3184.423	39.01	28.8	7.7	38.2	37.31	74	-36.69	Vertical	
4883.703	39.48	31.43	9.59	36.73	43.77	74	-30.23	Vertical	
1589.419	42.03	24.99	5.54	36.71	35.85	74	-38.15	Horizontal	
2129.938	41.33	26.94	6.38	37.33	37.32	74	-36.68	Horizontal	
4858.904	44.59	31.48	9.58	36.8	48.85	74	-25.15	Horizontal	
6628.347	34.42	34.2	11.39	35.31	44.7	74	-29.3	Horizontal	

BT-BLE					CH39				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1597.531	51.49	24.92	5.56	36.72	45.25	74	-28.75	Vertical	Peak
3184.423	39.25	28.8	7.7	38.2	37.55	74	-36.45	Vertical	
4958.862	38.2	31.46	9.64	36.52	42.78	74	-31.22	Vertical	
8146.068	32.48	36.86	12.64	34.54	47.44	74	-26.56	Vertical	
1597.531	51.49	24.92	5.56	36.72	45.25	74	-28.75	Horizontal	
3184.423	39.25	28.8	7.7	38.2	37.55	74	-36.45	Horizontal	
4958.862	38.2	31.46	9.64	36.52	42.78	74	-31.22	Horizontal	
6992.3	34.2	35.25	11.84	34.8	46.49	74	-27.51	Horizontal	

Remark:

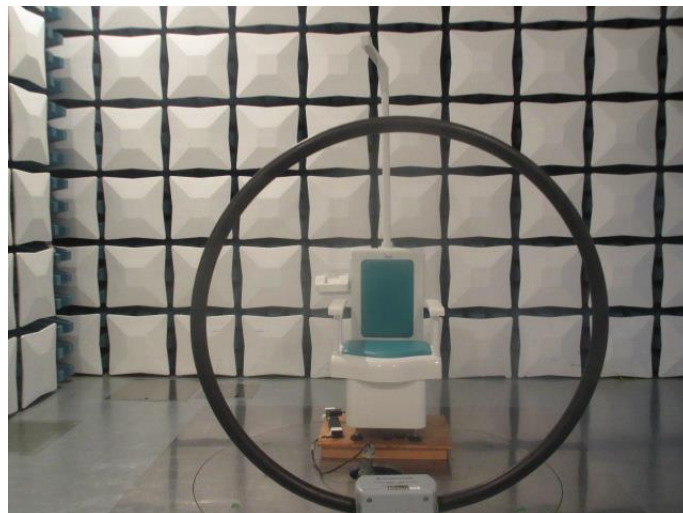
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit (54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

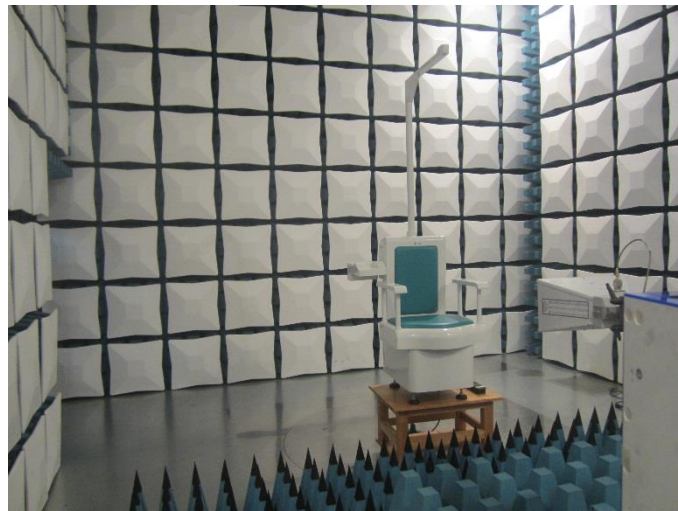
## 6. Test Setup Photos of the EUT

### Conducted Emission(AC Mains)



### Radiated Emission





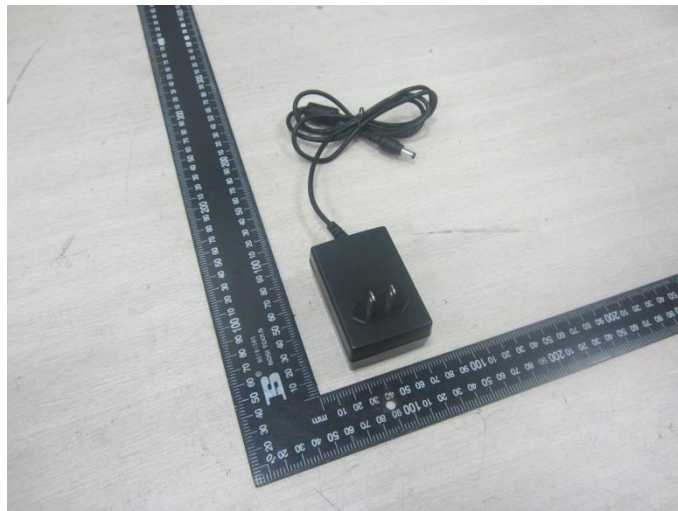
## 7. External and Internal Photos of the EUT

### External Photos







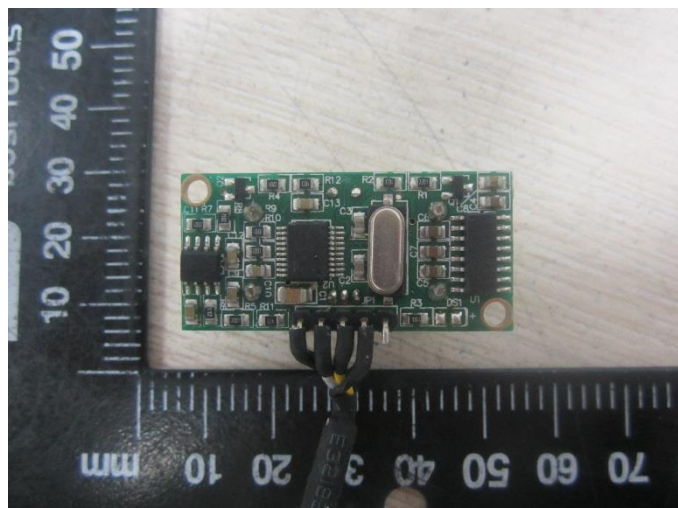
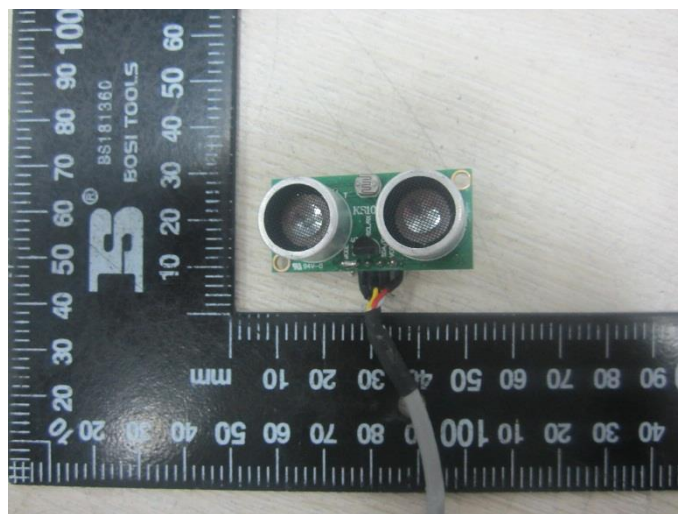
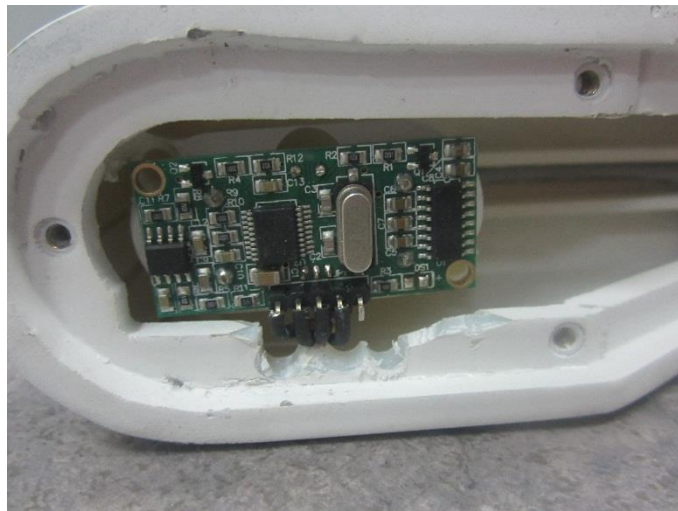


**Internal Photos**



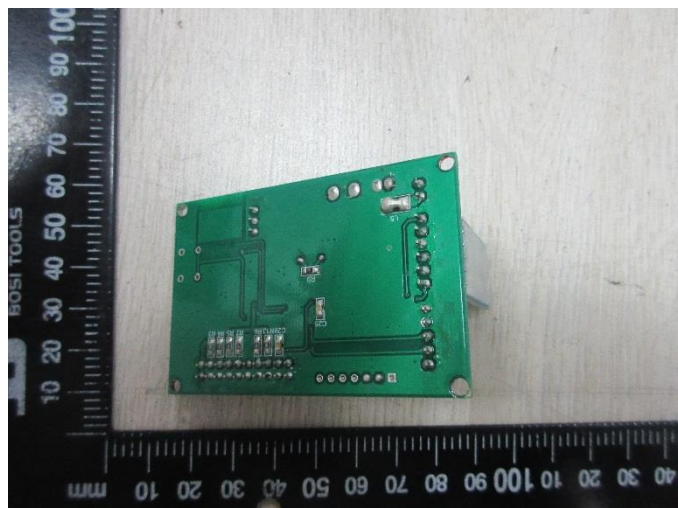
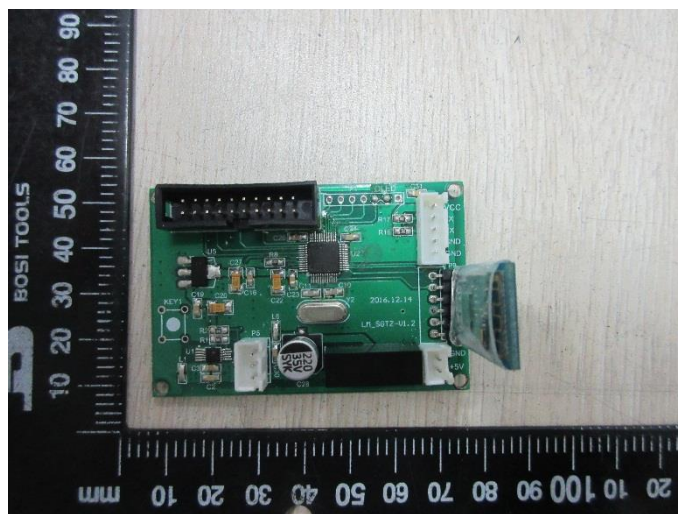




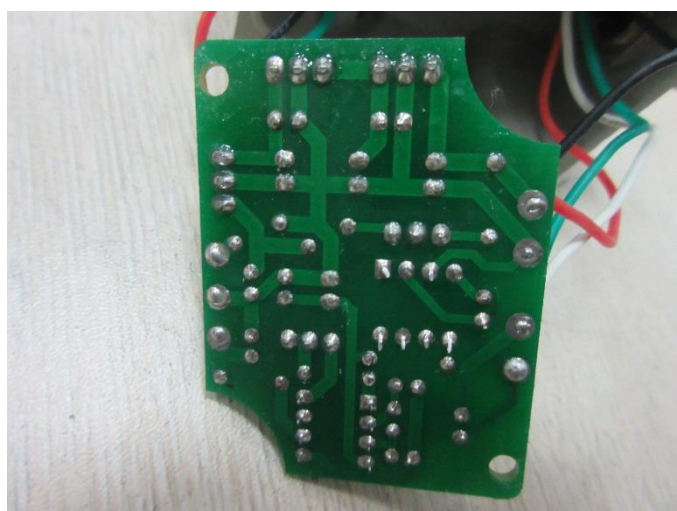
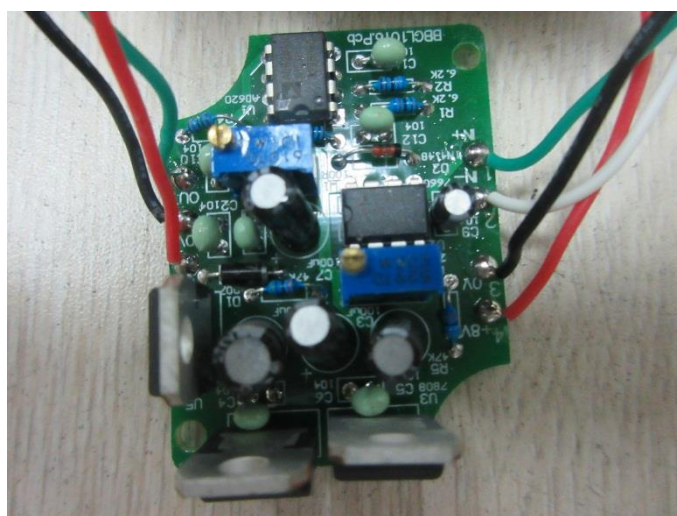
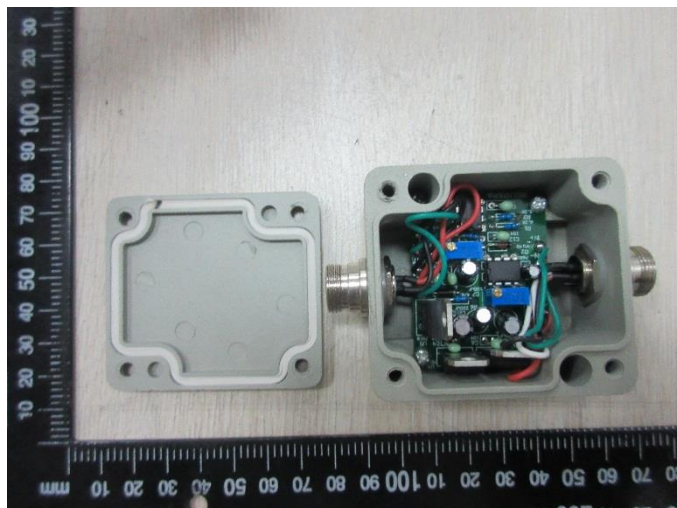












.....End of Report.....