

# TEST REPORT

#### **FCC PART 15.247**

Report Reference No...... CTL2411131011-WF02

Compiled by: ( position+printed name+signature)

Happy Guo (File administrators)

Tested by: ( position+printed name+signature)

Jack Wang (Test Engineer)

Approved by: ( position+printed name+signature)

Ivan Xie (Manager)



Product Name.....: Smart watch

Model/Type reference..... E41 List Model(s)..... N/A Trade Mark.....: Letsfit

Applicant's name...... HOTOEM Information Technology Company Limited

Flat 1908,19/F, Harbour Center, 25 Harbour Road, Wan Chai, Hong Address of applicant.....

Kong

Test Firm...... Shenzhen CTL Testing Technology Co., Ltd.

Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. Address of Test Firm.....

3011 Shahe West Road, Nanshan District, Shenzhen

Test specification....:

Standard..... FCC Part 15.247: Operation within the bands 902-928 MHz,

2400-2483.5 MHz and 5725-5850 MHz.

TRF Originator..... Shenzhen CTL Testing Technology Co., Ltd.

Master TRF.....: Dated 2011-01

Date of receipt of test item........: Nov. 15, 2024

Date of Test Date...... Nov. 15, 2024 - Nov. 22, 2024

Result..... Pass

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# **TEST REPORT**

Test Report No. : CTL2411131011-WF02 Nov. 26, 2024

Date of issue

Equipment under Test : Smart watch

Sample No : CTL2411131011

Model /Type : E41

Listed Models : N/A

Applicant : HOTOEM Information Technology Company

Limited

Flat 1908,19/F,Harbour Center,25 Harbour Road,Wan

Address Chai, Hong Kong

Manufacturer : Shenzhen Indell Industrial Co.,Ltd

Address : Floor 101 and 1-5, Building C, Xiawei Garden, Gushu

Community, Xixiang Street, Baoan District, Shenzhen

Test result	Pass *
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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

# \*\* Modified History \*\*

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2024-11-26	CTL2411131011-WF02	Tracy Qi
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# 1. SUMMARY

### 1.1. TEST 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

KDB 558074 D01 v05r02: KDB558074 D01 15.247 Meas Guidance v05r02

# 1.2. Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

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### 1.3. Test Facility

#### 1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co.,Ltd.

Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road, Nanshan District, Shenzhen

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10 and CISPR 32/EN 55032 requirements.

#### 1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology 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: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology 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: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

**CAB identifier: CN0041** 

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

**Designation No.: CN1216** 

Shenzhen CTL Testing Technology 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 399832, December 08, 2017.

### 1.4. 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 CTL Testing Technology 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 CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power Radiated	±2.20 dB	(1)
Radiated Emission9KHz~30MHz	±3.66dB	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
DTS Bandwidth	±1.9%	(1)
Maximum Conducted Output Power	± 1.18 dB	(1)

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Maximum Power Spectral Density Level	±0.98 dB	(1)
Band-edge	±1.21dB	(1)
Unwented Emissions In Non-restricted Erec Dands	9kHz-7GHz:±1.09dB	(1)
Unwanted Emissions In Non-restricted Freq Bands	7GHz-26.5GHz: ±3.27dB	(1)

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

# 1.5. Auxiliary test equipment information

Manufacturer	Description	Model	Serial Number
Huawei	SuperCharge	HW-100225C00	HC78E2N4121901

# 2. GENERAL INFORMATION

### 2.1. Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

# 2.2. General Description of EUT

Product Name:	Smart watch
Model/Type reference:	E41
Power supply:	DC 3.7V from battery
Bluetooth LE	
Supported type:	Bluetooth Low Energy
Modulation:	GFSK
Operation frequency:	2402MHz to 2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	Internal Antenna
Antenna gain:	1.20dBi

Note1: For more details, please refer to the user's manual of the EUT.

Note2: Antenna gain provided by the applicant.

# 2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

There are 40 channels provided to the EUT and Channel 00/19/39 were selected for BLE test.

Test Modes	BLE 1M Continuous Transmitting	BLE 2M Continuous Transmitting
1	•	

### **Operation Frequency List:**

Channel	Frequency (MHz)		
00	2402		
02	2404		
03	2406		
i i			
19	2440		
i	i :		
37	2476		
38	2478		
39	2480		

Note: The line display in grey were the channel selected for testing

# 2.4. Equipments Used during the Test

Conducted Emission							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due	
EMI	Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29	
	LISN	R&S	ESH2-Z5	860014/010	2024/04/30	2025/04/29	
	Limitator	ROHDE & SCHWARZ	ESH3-Z2	100408	2024/04/30	2025/04/29	
Softwa	re:					-	
	Name of Software: Version:			A 1			
	ES-K1			V1.71			

Radiated Emissions and E	and Edge					Bear
Test Equipment	Manufacturer	Model N	No.	Serial No.	Calibration Date	Calibration Due Date
Active Loop Antenna	Da Ze	ZN3090	00A	1	2024/04/30	2025/04/29
Double cone logarithmic antenna	VULE 9168		824	2023/02/13	2026/02/12	
Horn Antenna	Sunol Sciences Corp.	DRH-118		A062013	2021/12/23	2024/12/22
Amplifier	Agilent	8449B		3008A02306	2024/04/30	2025/04/29
Amplifier	Brief&Smart	LNA-4018		2104197	2024/05/03	2025/05/02
EMI Test Receiver	R&S	ESCI		1166.5950.03	2024/04/30	2025/04/29
Spectrum Analyzer	Keysight	N9020	Α	MY53420874	2024/05/01	2025/04/30
Test software	- 4				1	- 10
Name of So	oftware	1			Version	100
EZ_EMC(Beld	ow 1GHz)				V1.1.4.2	4 m N
EZ_EMC(Abo	ve 1GHz)				V1.1.4.2	Marie III

	Maximum Peak Output Power & 20dB Bandwidth & Frequency Separation & Number of hopping frequency & Dwell Time & Out-of-band Emissions										
Test Equipment Manufacturer Model No. Serial No. Calibration Date Calibration Due Date											
Spectrum Analyzer         Keysight         N9020A         MY53420874         2024/05/01         2025/04/30											
Temperature/Humidity											
Test Software				Marie .							
Name of Software Version											
TST-PASS V2.0											

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# 2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

# 2.6. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST CONDITIONS AND RESULTS

#### 3.1. Conducted Emissions Test

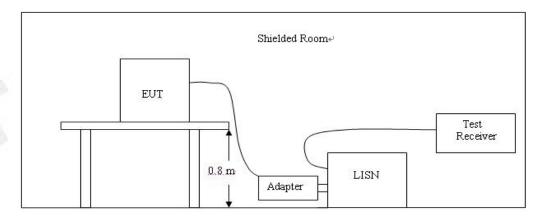
#### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

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

<sup>\*</sup> Decreases with the logarithm of the frequency.

#### **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 adapter received AC120V/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.

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#### **TEST RESULTS**

Line: L

#### Shenzhen CTL Testing Technology Co., Ltd.

#### Voltage Mains Test FCC PART 15C

EUT: E41

Manufacturer: HOTOEM Information Technology Company Limited

Operating Condition: BLE1M 2402MHz

Test Site: Operator: WSX

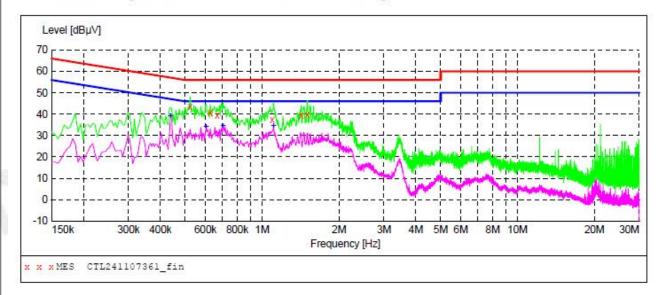
Test Specification: AC 120V/60Hz

Comment:

Start of Test: 11/19/2024 / 9:09:33AM

# SCAN TABLE: "Voltage (9K-30M) FIN" Short Description: 150K-30M

150K-30M Voltage



L1

GND

#### MEASUREMENT RESULT: "CTL241107361 fin"

11/19/2024 9:	11AM						
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.523500	43.50	10.0	56	12.5	QP	L1	GND
0.627000	40.80	10.0	56	15.2	QP	L1	GND
0.667500	39.30	10.0	56	16.7	QP	L1	GND
1.095000	37.30	10.1	56	18.7	QP	L1	GND
1.423500	39.60	10.1	56	16.4	OP	L1	GND

#### MEASUREMENT RESULT: "CTL241107361 fin2"

1.504500 39.70 10.1 56 16.3 QP

11/19/2024	9:11AM						
Frequency MHz	9 93	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.438000	38.90	10.0	47	8.2	AV	L1	GND
0.604500	34.20	10.0	46	11.8	AV	L1	GND
0.703500	34.50	10.0	46	11.5	AV	L1	GND
1.108500	34.60	10.1	46	11.4	AV	L1	GND

### Shenzhen CTL Testing Technology Co., Ltd.

#### Voltage Mains Test FCC PART 15C

EUT: E41

Manufacturer: HOTOEM Information Technology Company Limited

Operating Condition: BLE1M 2402MHz

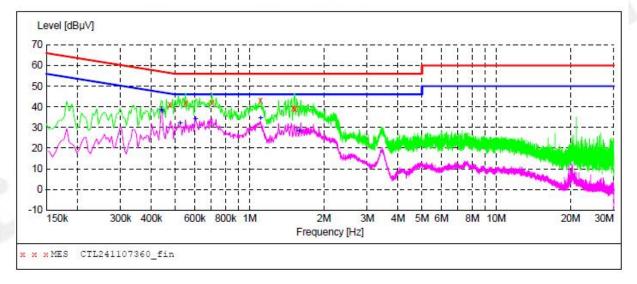
Test Site: Operator: WSX

Test Specification: AC 120V/60Hz

Comment:

Start of Test: 11/19/2024 / 9:06:30AM

SCAN TABLE: "Voltage (9K-30M) FIN"
Short Description: 150K-30M Voltage



#### MEASUREMENT RESULT: "CTL241107360 fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.474000	41.20	10.0	56	15.2	QP	N	GND
0.550500	41.90	10.0	56	14.1	QP	N	GND
0.703500	41.90	10.0	56	14.1	QP	N	GND
1.108500	43.10	10.1	56	12.9	QP	N	GND
1.504500	39.40	10.1	56	16.6	QP	N	GND
1.527000	39.20	10.1	56	16.8	QP	N	GND

#### MEASUREMENT RESULT: "CTL241107360 fin2"

11/19/2024 9:	08AM						
Frequency		Transd		Margin	Detector	Line	PE
MHz	dΒμV	dB	dΒμV	dB			
0.438000	38.60	10.0	47	8.5	AV	N	GND
0.442500	37.80	10.0	47	9.2	AV	N	GND
0.523500	31.90	10.0	46	14.1	AV	N	GND
0.604500	34.20	10.0	46	11.8	AV	N	GND
1.108500	34.30	10.1	46	11.7	AV	N	GND
1 590000	28 20	10.1	46	17 8	277	N	GND

# 3.2. Radiated Emissions and Band Edge

#### Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

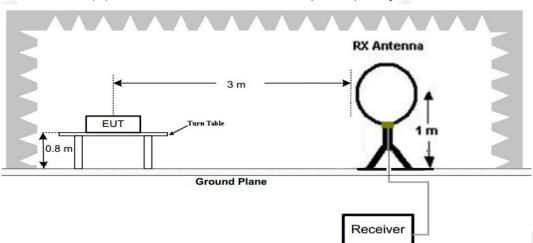
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

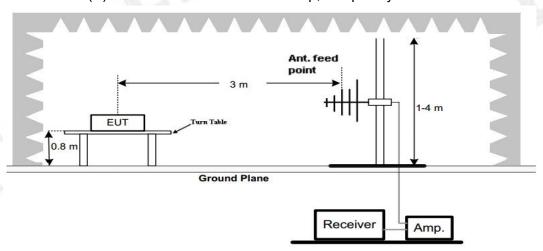
Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

#### **TEST CONFIGURATION**

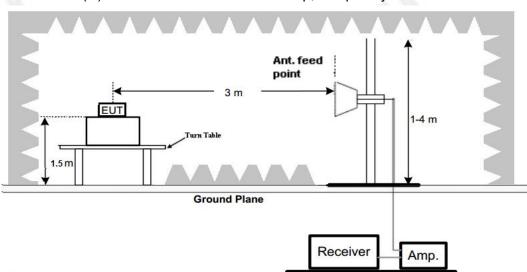
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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

#### **Test Procedure**

- 1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- 2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4. Repeat above procedures until all frequency measurements have been completed.
- 5. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

#### **TEST RESULTS**

#### Remark:

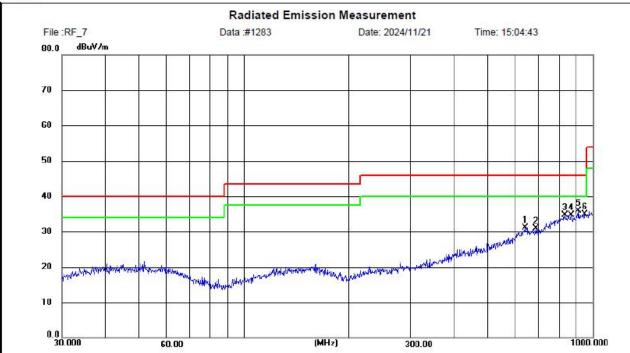
- 1. We have tested low channel, middle channel, high channel of all modes.
- 2. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, Found the emission level are attenuated 20dB below the limits from 9 kHz to 30MHz, so it does not recorded in report.

#### For 30MHz-1GHz

#### Horizontal



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2

Limit: FCC Part15 RE-Class C\_30-1000MHz

Polarization: Horizontal

Temperature:

Power:

Humidity: 50 %

25(C)

EUT:

Distance: 3m

M/N: E41

Mode: BLE1M 2402MHz

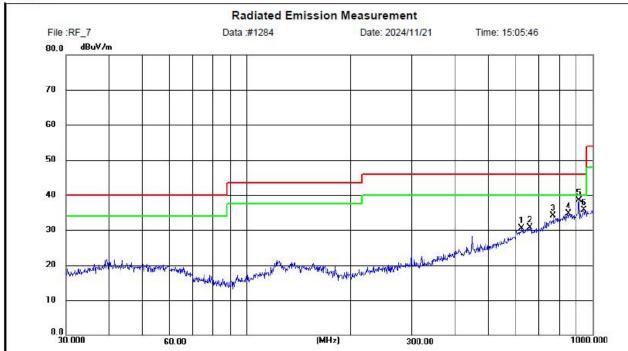
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	638.6483	7.70	23.50	31.20	46.00	14.80	peak	100	255	Р	
2	685.9470	7.36	23.47	30.83	46.00	15.17	peak	100	255	Р	
3	832.9520	7.79	26.95	34.74	46.00	11.26	peak	100	131	Р	
4	868.3686	7.60	27.07	34.67	46.00	11.33	peak	100	328	Р	
5	912.0621	7.89	27.93	35.82	46.00	10.18	peak	100	57	Р	
6	947.5142	6.47	28.35	34.82	46.00	11.18	peak	100	183	Р	

#### Report No.: CTL2411131011-WF02

#### Vertical



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Site LAB Chamber 2

Polarization: Vertical

Temperature: 25(C)

Limit: FCC Part15 RE-Class C\_30-1000MHz

Power:

Distance: 3m

Humidity: 50 %

EUT: M/N: E41

Mode: BLE1M 2402MHz

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)			Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
623.7096	7.46	23.04	30.50	46.00	15.50	peak	100	188	Р	
657.1058	7.40	23.30	30.70	46.00	15.30	peak	100	283	Р	
768.7481	8.35	25.74	34.09	46.00	11.91	peak	100	83	Р	
851.4084	7.30	27.35	34.65	46.00	11.35	peak	100	63	Р	
912.8620	10.59	27.95	38.54	46.00	7.46	peak	100	199	Р	
945.4399	7.45	28.34	35.79	46.00	10.21	peak	100	360	Р	
	(MHz) 623.7096 657.1058 768.7481 851.4084 912.8620	(MHz) (dBuV) 623.7096 7.46 657.1058 7.40 768.7481 8.35 851.4084 7.30 912.8620 10.59	(MHz)         (dBuV)         (dB/m)           623.7096         7.46         23.04           657.1058         7.40         23.30           768.7481         8.35         25.74           851.4084         7.30         27.35           912.8620         10.59         27.95	(MHz)         (dBuV)         (dB/m)         (dBuV/m)           623.7096         7.46         23.04         30.50           657.1058         7.40         23.30         30.70           768.7481         8.35         25.74         34.09           851.4084         7.30         27.35         34.65           912.8620         10.59         27.95         38.54	(MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)           623.7096         7.46         23.04         30.50         46.00           657.1058         7.40         23.30         30.70         46.00           768.7481         8.35         25.74         34.09         46.00           851.4084         7.30         27.35         34.65         46.00           912.8620         10.59         27.95         38.54         46.00	(MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)         (dBuV/m)         (dB)           623.7096         7.46         23.04         30.50         46.00         15.50           657.1058         7.40         23.30         30.70         46.00         15.30           768.7481         8.35         25.74         34.09         46.00         11.91           851.4084         7.30         27.35         34.65         46.00         11.35           912.8620         10.59         27.95         38.54         46.00         7.46	(MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)         (dB)         Detector           623.7096         7.46         23.04         30.50         46.00         15.50         peak           657.1058         7.40         23.30         30.70         46.00         15.30         peak           768.7481         8.35         25.74         34.09         46.00         11.91         peak           851.4084         7.30         27.35         34.65         46.00         11.35         peak           912.8620         10.59         27.95         38.54         46.00         7.46         peak	(MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)         (dB)         Detector (cm)           623.7096         7.46         23.04         30.50         46.00         15.50         peak         100           657.1058         7.40         23.30         30.70         46.00         15.30         peak         100           768.7481         8.35         25.74         34.09         46.00         11.91         peak         100           851.4084         7.30         27.35         34.65         46.00         11.35         peak         100           912.8620         10.59         27.95         38.54         46.00         7.46         peak         100	(MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)         (dB)         Detector (cm)         (deg.)           623.7096         7.46         23.04         30.50         46.00         15.50         peak         100         188           657.1058         7.40         23.30         30.70         46.00         15.30         peak         100         283           768.7481         8.35         25.74         34.09         46.00         11.91         peak         100         83           851.4084         7.30         27.35         34.65         46.00         11.35         peak         100         63           912.8620         10.59         27.95         38.54         46.00         7.46         peak         100         199	(MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)         (dB)         Detector         (cm)         (deg.)         P/F           623.7096         7.46         23.04         30.50         46.00         15.50         peak         100         188         P           657.1058         7.40         23.30         30.70         46.00         15.30         peak         100         283         P           768.7481         8.35         25.74         34.09         46.00         11.91         peak         100         83         P           851.4084         7.30         27.35         34.65         46.00         11.35         peak         100         63         P           912.8620         10.59         27.95         38.54         46.00         7.46         peak         100         199         P

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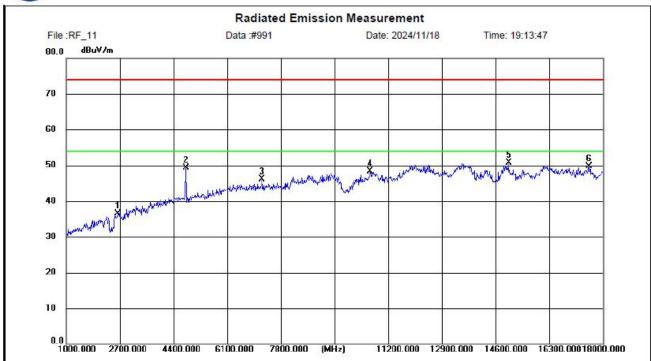
#### For 1GHz-18GHz

BLE Mode (above 1GHz)

CH00 Horizontal



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C)

Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

Mode: BLE1M 2402MHz

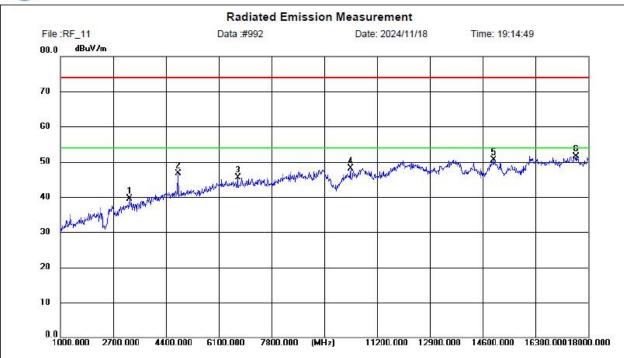
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2657.500	52.22	-15.76	36.46	74.00	37.54	peak	150	12	Р	
2	4803.750	57.45	-8.09	49.36	74.00	24.64	peak	150	64	Р	
3	7205.000	49.42	-3.29	46.13	74.00	27.87	peak	150	314	Р	
4	10624.125	48.28	0.08	48.36	74.00	25.64	peak	150	2	Р	
5	15008.000	47.27	3.35	50.62	74.00	23.38	peak	150	2	Р	
6	17570.750	40.59	9.12	49.71	74.00	24.29	peak	150	64	Р	

Vertical

CH00



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Vertical Temperature: 25(C)
Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

Mode: BLE1M 2402MHz

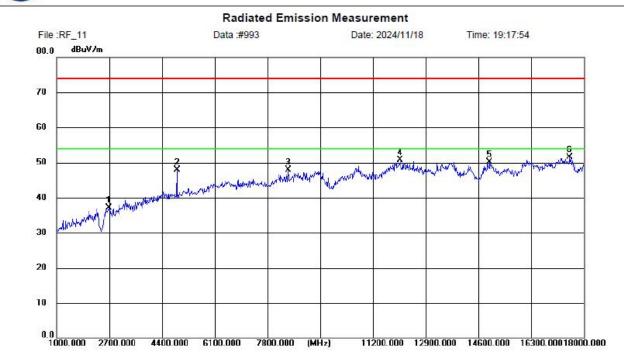
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	3233.375	52.53	-13.02	39.51	74.00	34.49	peak	150	18	Р	
2	4803.750	54.74	-8.09	46.65	74.00	27.35	peak	150	298	Р	
3	6724.750	49.74	-4.14	45.60	74.00	28.40	peak	150	298	Р	
4	10364.875	48.07	0.02	48.09	74.00	25.91	peak	150	59	Р	
5	14959.125	47.29	3.25	50.54	74.00	23.46	peak	150	287	Р	
6	17615.375	42.45	9.11	51.56	74.00	22.44	peak	150	246	Р	

Horizontal

CH19



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C)
Limit: FCC Part15 RE-Class C Above 1GHz PK Power: Humidity: 50 %

Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power:

EUT: Distance: 3m

M/N: E41

Mode: BLE1M 2440MHz

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	2683.000	52.64	-15.61	37.03	74.00	36.97	peak	150	220	Р	
2	4880.250	55.94	-7.96	47.98	74.00	26.02	peak	150	74	Р	
3	8473.625	49.65	-1.80	47.85	74.00	26.15	peak	150	240	Р	
4	12067.000	48.50	2.18	50.68	74.00	23.32	peak	150	303	Р	
5	14971.875	46.85	3.28	50.13	74.00	23.87	peak	150	157	Р	
6	17543.125	42.31	9.13	51.44	74.00	22.56	peak	150	116	Р	8



Vertical

Temperature:

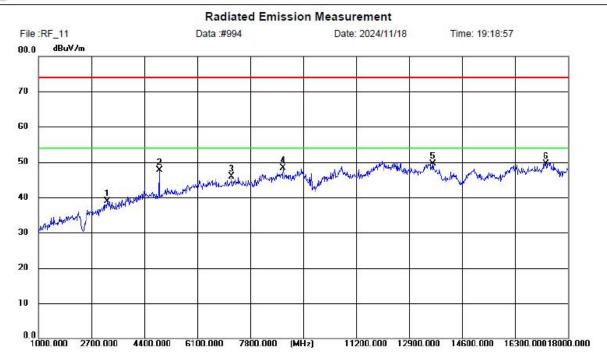
Humidity:

25(C)

50 %



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Site LAB Chamber 2 Polarization: Vertical Power:

Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK

EUT: Distance: 3m

M/N: E41

Mode: BLE1M 2440MHz

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	3220.625	51.90	-13.06	38.84	74.00	35.16	peak	150	192	Р	
2	4880.250	55.75	-7.96	47.79	74.00	26.21	peak	150	358	Р	
3	7205.000	49.23	-3.29	45.94	74.00	28.06	peak	150	328	Р	
4	8862.500	49.00	-0.63	48.37	74.00	25.63	peak	150	47	Р	
5	13669.250	45.56	3.92	49.48	74.00	24.52	peak	150	16	Р	
6	17288.125	41.43	8.10	49.53	74.00	24.47	peak	150	57	Р	

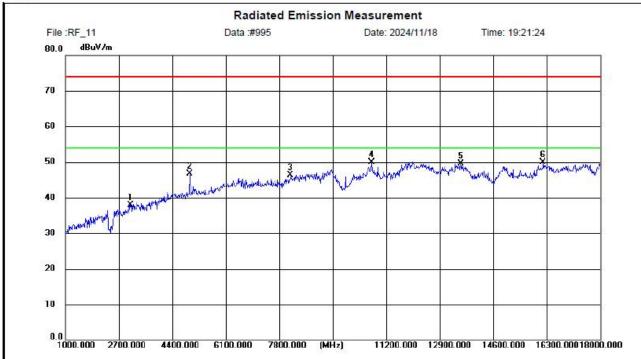
**CH39** 

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Horizontal



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Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C)
Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

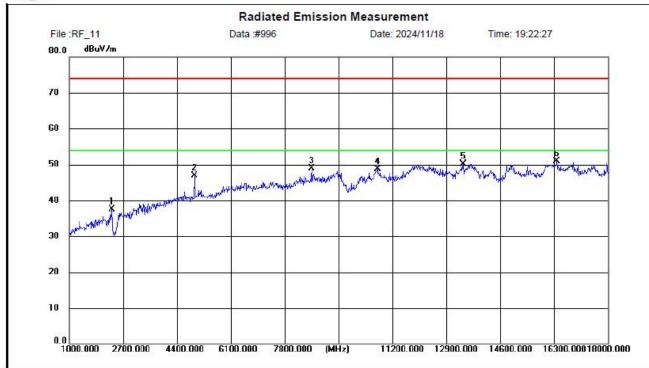
Mode: BLE1M 2480MHz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	3076.125	51.62	-13.72	37.90	74.00	36.10	peak	150	22	Р	
2	4961.000	54.65	-7.85	46.80	74.00	27.20	peak	150	210	Р	
3	8161.250	48.87	-2.55	46.32	74.00	27.68	peak	150	137	Р	
4	10741.000	49.60	0.31	49.91	74.00	24.09	peak	150	126	Р	
5	13577.875	45.54	3.96	49.50	74.00	24.50	peak	150	210	Р	
6	16187.375	44.63	5.20	49.83	74.00	24.17	peak	150	199	Р	

### CH39 Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Vertical Temperature: 25(C)

Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

Mode: BLE1M 2480MHz

Note: HOTOEM Information Technology Company Limited

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	2345.125	54.55	-17.14	37.41	74.00	36.59	peak	150	338	Р	
2	4958.875	54.79	-7.85	46.94	74.00	27.06	peak	150	68	Р	
3	8662.750	50.19	-1.33	48.86	74.00	25.14	peak	150	99	Р	
4	10736.750	48.33	0.31	48.64	74.00	25.36	peak	150	193	Р	
5	13427.000	46.53	3.62	50.15	74.00	23.85	peak	150	358	Р	
6	16393.500	45.15	5.79	50.94	74.00	23.06	peak	150	286	Р	

#### **REMARKS**:

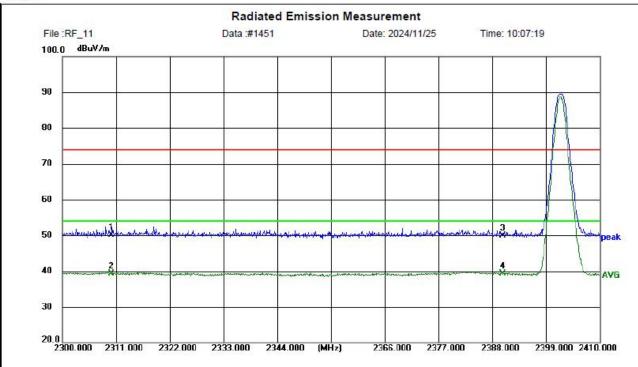
- 1.Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
- 2.Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 3.Margin value = Limit value- Emission level.
- 4.PK detector measurement value is lower than the average limit. Therefore, there is no need to test AV detector measurements.
- 5.RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value
- 6. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.
- 7.Other emissions are attenuated 20dB below the limits from 9kHz to 30MHz, so it does not recorded in report.
- 8.18GHz-26GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

### Results of Band Edges Test (Radiated)

CH00 Horizontal



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C)
Limit: FCC Part 15 C Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

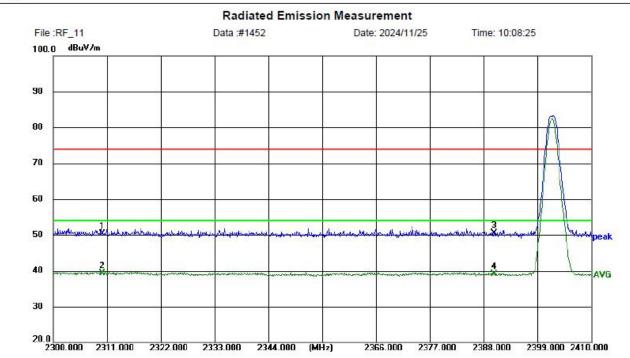
Mode: BLE1M 2402MHz

100	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
	1	2310.000	40.50	9.69	50.19	74.00	23.81	peak	150	32	Р	
	2	2310.000	29.51	9.69	39.20	54.00	14.80	AVG	150	32	Р	
	3	2390.000	40.07	9.77	49.84	74.00	24.16	peak	150	32	Р	
	4	2390.000	29.45	9.77	39.22	54.00	14.78	AVG	150	32	Р	

CH00 Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Vertical Temperature: 25(C)
Limit: FCC Part 15 C Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

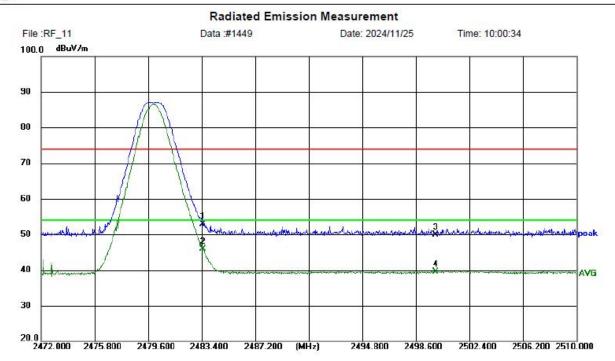
Mode: BLE1M 2402MHz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	40.64	9.69	50.33	74.00	23.67	peak	150	0	Р	
2	2310.000	29.61	9.69	39.30	54.00	14.70	AVG	150	0	Р	
3	2390.000	40.82	9.77	50.59	74.00	23.41	peak	150	219	Р	
4	2390.000	29.41	9.77	39.18	54.00	14.82	AVG	150	219	Р	

CH39 Horizontal



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C)
Limit: FCC Part 15 C Power: Humidity: 50 %

EUT: Distance: 3m

M/N: E41

Mode: BLE1M 2480MHz

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	2483.500	43.04	9.93	52.97	74.00	21.03	peak	150	32	Р	
2	2483.500	36.02	9.93	45.95	54.00	8.05	AVG	150	32	Р	
3	2500.000	39.89	10.00	49.89	74.00	24.11	peak	150	95	Р	
4	2500.000	29.46	10.00	39.46	54.00	14.54	AVG	150	95	Р	

Temperature:

Humidity:

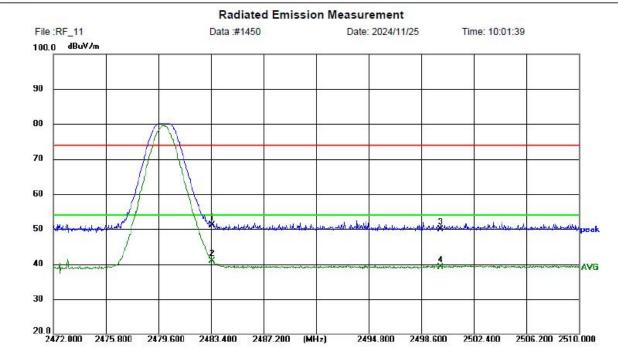
25(C)

50 %

CH39 Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2

Limit: FCC Part 15 C

EUT:

M/N: E41

Mode: BLE1M 2480MHz

Note: HOTOEM Information Technology Company Limited

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	2483.500	41.23	9.93	51.16	74.00	22.84	peak	150	358	Р	X.
2	2483.500	30.99	9.93	40.92	54.00	13.08	AVG	150	358	Р	X.
3	2500.000	39.90	10.00	49.90	74.00	24.10	peak	150	93	Р	
4	2500.000	29.01	10.00	39.01	54.00	14.99	AVG	150	93	Р	

Power:

Distance: 3m

Polarization: Vertical

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# 3.3. Maximum Conducted Output Power

#### Limit

The Maximum Peak Output Power Measurement is 30dBm.

#### **Test Procedure**

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

- a) Set the RBW≥DTS bandwidth.
- b) Set VBW ≥ [3×RBW].
- c) Set span ≥ [3×RBW].
- d) Sweep time = auto couple.
- e) Detector=peak.
- f) Trace mode=max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 2 of document No. CTL2411131011-WF02\_Appendix of BLE.

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### 3.4. Power Spectral Density

#### Limit

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 Procedure**

- 1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
- 2. Set the RBW ≥ 3 kHz.
- 3. Set the VBW  $\geq$  3× RBW.
- 4. Set the span to 1.5 times the DTS channel bandwidth.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum power level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
- 11. The resulting peak PSD level must be 8dBm.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 3 of document No. CTL2411131011-WF02\_Appendix of BLE.

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### 3.5. 6dB Bandwidth

#### Limit

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

#### **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 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

### **Test Configuration**



#### **Test Results**

Raw data reference to Section 1 of document No. CTL2411131011-WF02\_Appendix of BLE.

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#### 3.6. Out-of-band Emissions

#### Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

#### **Test Procedure**

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector, and max hold. Measurements utilizing these setting are made of the in-band reference level, bandedge and out-of-band emissions.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 4 of document No. CTL2411131011-WF02\_Appendix of BLE.

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### 3.7. Antenna Requirement

#### **Standard Applicable**

#### For intentional device, according to FCC 47 CFR Section 15.203:

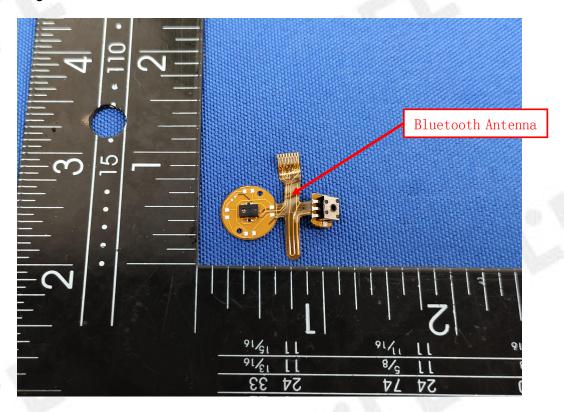
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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(b) (4):

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **Test Result:**

The maximum gain of antenna was 1.20dBi.



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# 4. Test Setup Photos of the EUT

Reference to the test report No. CTL2411131011-WF01.

# 5. Photos of the EUT

Reference to the test report No. CTL2411131011-WF01.