Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

TEST REPORT

FCC PART 15.247

Report Reference No. ..... :	**CTL2410143041-WF**
Compiled by: (position+printed name+signature)	Happy Guo (File administrators)
Tested by: (position+printed name+signature)	Wuqiang Wu (Test Engineer)
Approved by: (position+printed name+signature)	Ivan Xie (Manager)

Product Name ..... :	Smart Ring
Model/Type reference ..... :	R09
List Model(s)..... :	N/A
Trade Mark..... :	N/A
FCC ID..... :	**2AOM3-R09RING**
Applicant's name ..... :	**ShenZhen YaWell intelligent Technology Co.,Ltd.**
Address of applicant ..... :	A402, Wuhan University, Shenzhen Research Institute, No. 6 Yuexing 2nd Road, Gaoxin District Yuehai Street, Nanshan District, Shenzhen, China
Test Firm..... :	**Shenzhen CTL Testing Technology Co., Ltd.**
Address of Test Firm ..... :	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
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 ..... :	Oct. 31, 2024
Date of Test Date..... :	Oct. 31, 2024-Nov. 04, 2024
Date of Issue ..... :	Nov. 06, 2024
Result..... :	**Pass**

TEST REPORT

Test Report No. :	CTL2410143041-WF	Nov. 06, 2024 Date of issue

Equipment under Test	:	Smart Ring
Sample No	:	CTL2410143041
Model /Type	:	R09
Listed Models	:	N/A
Applicant	:	**ShenZhen YaWell intelligent Technology Co.,Ltd.**
Address	:	A402, Wuhan University, Shenzhen Research Institute, No. 6 Yuexing 2nd Road, Gaoxin District Yuehai Street, Nanshan District, Shenzhen, China
Manufacturer	:	**ShenZhen YaWell intelligent Technology Co.,Ltd.**
Address	:	A402, Wuhan University, Shenzhen Research Institute, No. 6 Yuexing 2nd Road, Gaoxin District Yuehai Street, Nanshan District, Shenzhen, China

Test result	Pass *

* 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	2024-11-07	CTL2410143041-WF	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 15.247 Meas Guidance v05R09 : Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

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

Note: N/A= not applicable

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

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.

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.

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)
Occupied Bandwidth	±0.02ppm	(1)
Radiated Emission 30~1000MHz	±4.08dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±2.96dB	(1)
20dB Emission Bandwidth	±1.9%	(1)

Carrier Frequency Separation	±1.9%	(1)
Maximum Power Spectral Density Level	±0.98 dB	(1)
Number of Hopping Channel	±1.9%	(1)
Time of Occupancy	±0.11%	(1)
Max Peak Conducted Output Power	±0.98 dB	(1)
Band-edge Spurious Emission	±1.21dB	(1)
Conducted RF Spurious Emission	9kHz-7GHz:±1.09dB 7GHz-26.5GHz: ±3.27dB	(1)

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

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 Ring
Model/Type reference:	R09
Power supply:	DC 3.7V from battery or DC 5V from adapter
Bluetooth LE	
Supported type:	Bluetooth Low Energy
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	FPC antenna
Antenna gain:	-4.22 dBi

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.

Operation Frequency List：

Channel	Frequency (MHz)
00	**2402**
02	2404
03	2406
⋮	⋮
19	**2440**
⋮	⋮
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

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
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
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	2023/02/13	2026/02/12
EMI Test Receiver	R&S	ESCI	1166.5950.03	2024/04/30	2025/04/29
Spectrum Analyzer	Agilent	N9020A	US46220290	2024/05/02	2025/05/01
Spectrum Analyzer	Keysight	N9020A	MY53420874	2024/05/02	2025/05/01
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2021/12/23	2024/12/22
Active Loop Antenna	Da Ze	ZN30900A	/	2024/04/30	2025/04/29
Amplifier	Agilent	8449B	3008A02306	2024/04/30	2025/04/29
Amplifier	Brief&Smart	LNA-4018	2104197	2024/05/03	2025/05/02
Temperature/Humidity Meter	Ji Yu	MC501	/	2024/05/04	2025/05/03
Power measurement module	TSTPASS	TSPS2023R	TSCB220016	2024/05/03	2025/05/02
Power Sensor	Agilent	U2021XA	MY53340004	2024/05/04	2025/05/03
Power Sensor	Agilent	U2021XA	MY54080012	2024/05/03	2025/05/02
Spectrum Analyzer	RS	FSP	1164.4391.38	2024/05/03	2025/05/02

Test Software	
Name of Software	Version
TST-PASS	V2.0
EZ_EMC(Below 1GHz)	V1.1.4.2
EZ_EMC(Above 1GHz)	V1.1.4.2

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

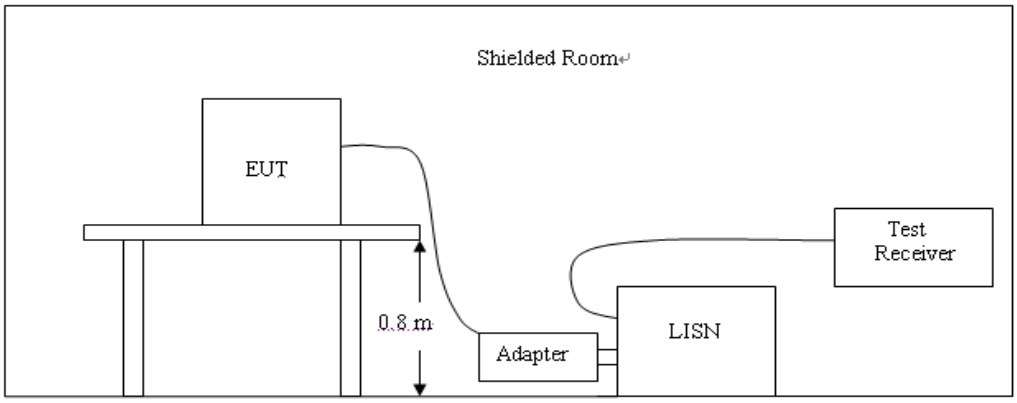
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

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 equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a Smart Watchop 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.

TEST RESULTS

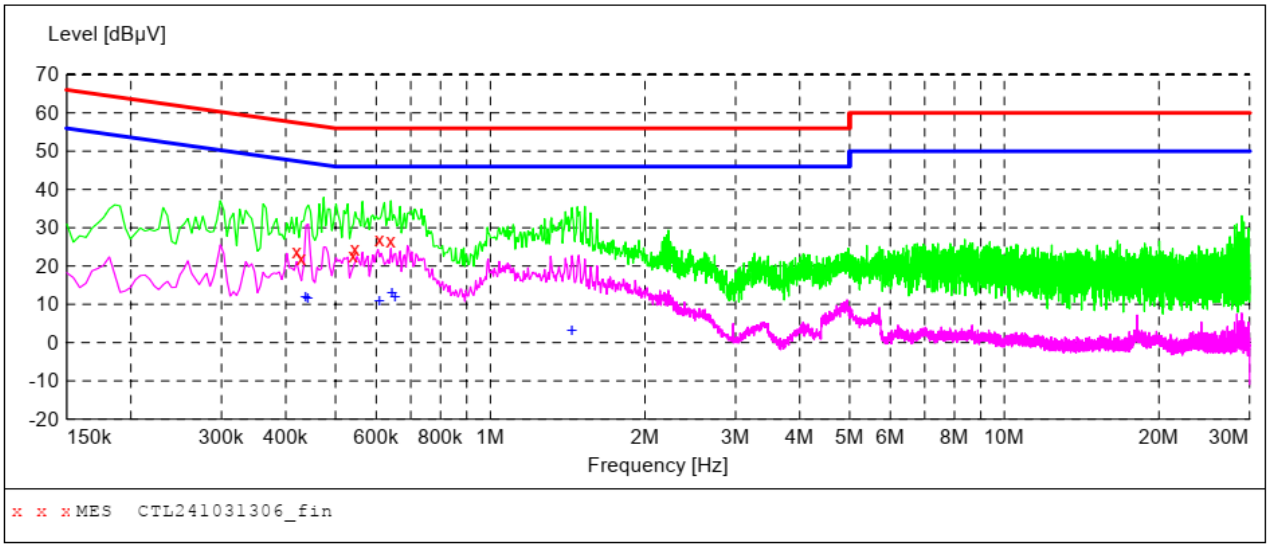
Remark:

1. All low, middle and high channel were tested; only the worst result of low channel was reported as below:

Line:	L

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL241031306_fin"

11/4/2024 10:47AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.420000	23.80	10.0	57	33.6	QP	L1	GND
0.429000	22.20	10.0	57	35.1	QP	L1	GND
0.541500	22.70	10.0	56	33.3	QP	L1	GND
0.546000	24.40	10.0	56	31.6	QP	L1	GND
0.609000	27.10	10.0	56	28.9	QP	L1	GND
0.640500	26.80	10.0	56	29.2	QP	L1	GND

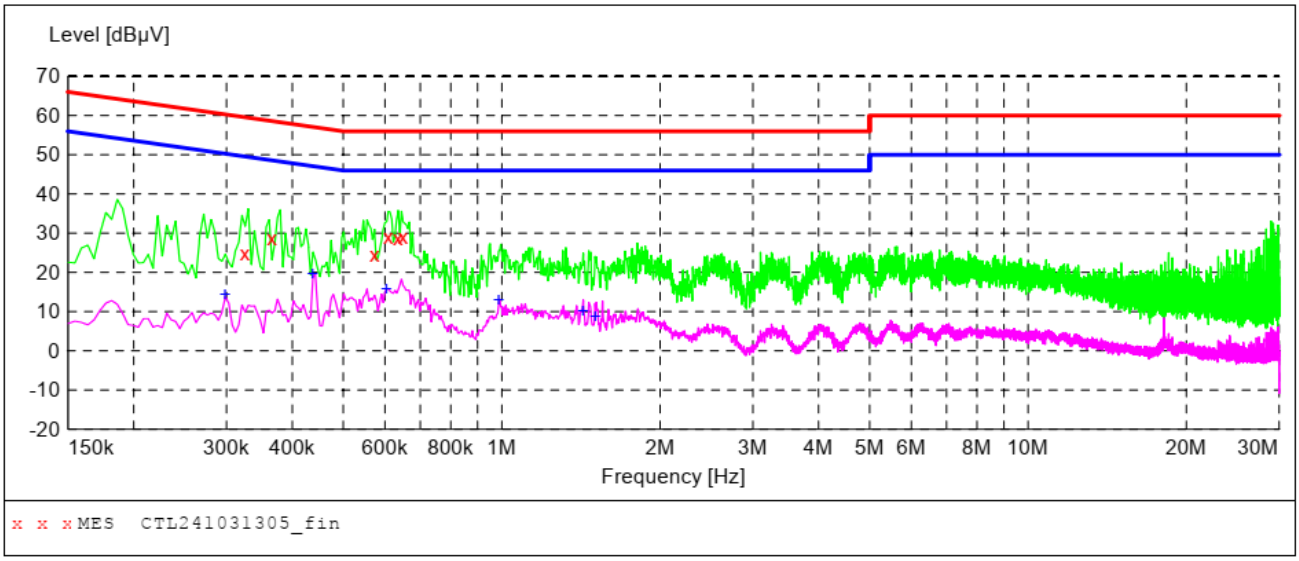
MEASUREMENT RESULT: "CTL241031306_fin2"

11/4/2024 10:47AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.438000	11.80	10.0	47	35.3	AV	L1	GND
0.442500	11.60	10.0	47	35.4	AV	L1	GND
0.609000	10.80	10.0	46	35.2	AV	L1	GND
0.645000	12.80	10.0	46	33.2	AV	L1	GND
0.654000	12.00	10.0	46	34.0	AV	L1	GND
1.441500	3.20	10.1	46	42.8	AV	L1	GND

Line:	N

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



MEASUREMENT RESULT: "CTL241031305_fin"

11/4/2024 10:44AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.325500	24.80	10.0	60	34.8	QP	N	GND
0.366000	28.70	10.0	59	29.9	QP	N	GND
0.573000	24.60	10.0	56	31.4	QP	N	GND
0.609000	28.90	10.0	56	27.1	QP	N	GND
0.636000	28.60	10.0	56	27.4	QP	N	GND
0.649500	29.10	10.0	56	26.9	QP	N	GND

MEASUREMENT RESULT: "CTL241031305_fin2"

11/4/2024 10:44AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.298500	14.30	10.0	50	36.0	AV	N	GND
0.438000	19.50	10.0	47	27.6	AV	N	GND
0.604500	15.80	10.0	46	30.2	AV	N	GND
0.987000	12.80	10.1	46	33.2	AV	N	GND
1.428000	10.10	10.1	46	35.9	AV	N	GND
1.509000	8.60	10.1	46	37.4	AV	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.

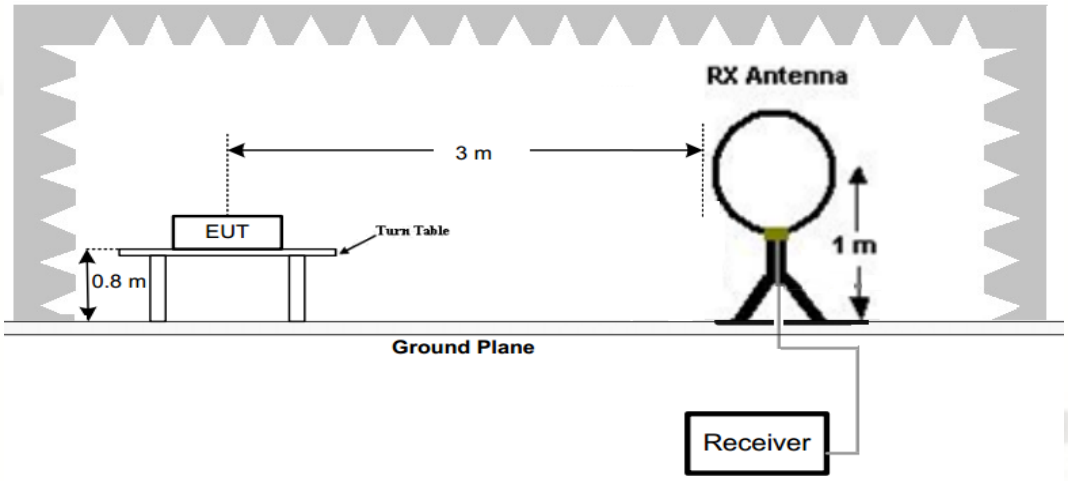
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

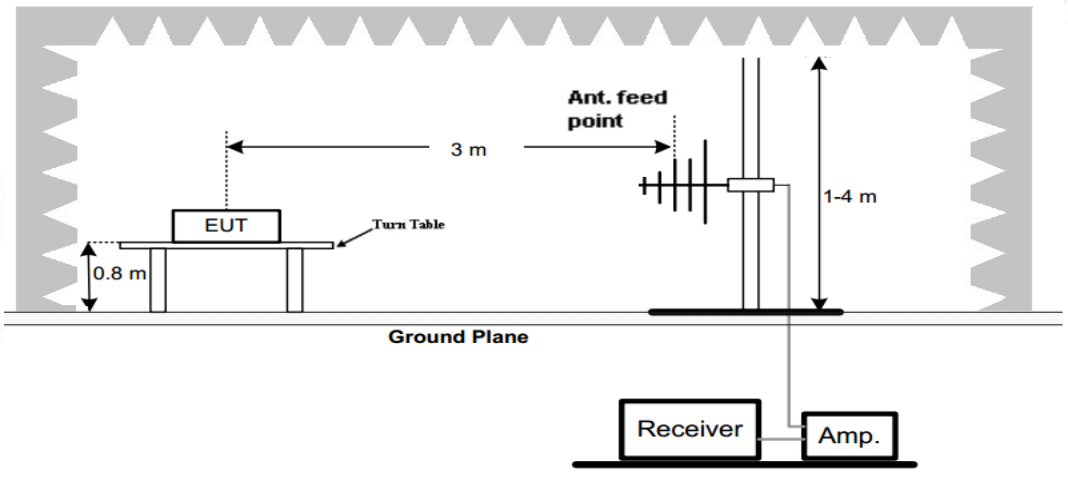
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

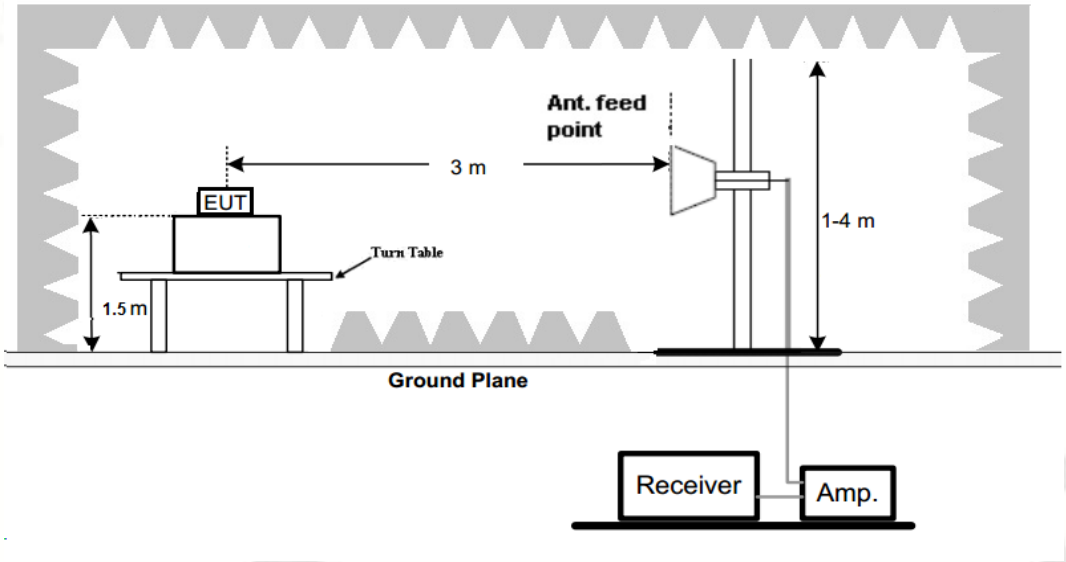
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



(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℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT was pretested with 3 orientations placed on the table for the radiated emission
6. measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were
7. shown in this report

TEST RESULTS

Remark:
1. We have tested low channel, middle channel, high channel, only recorded worst at low channel.
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

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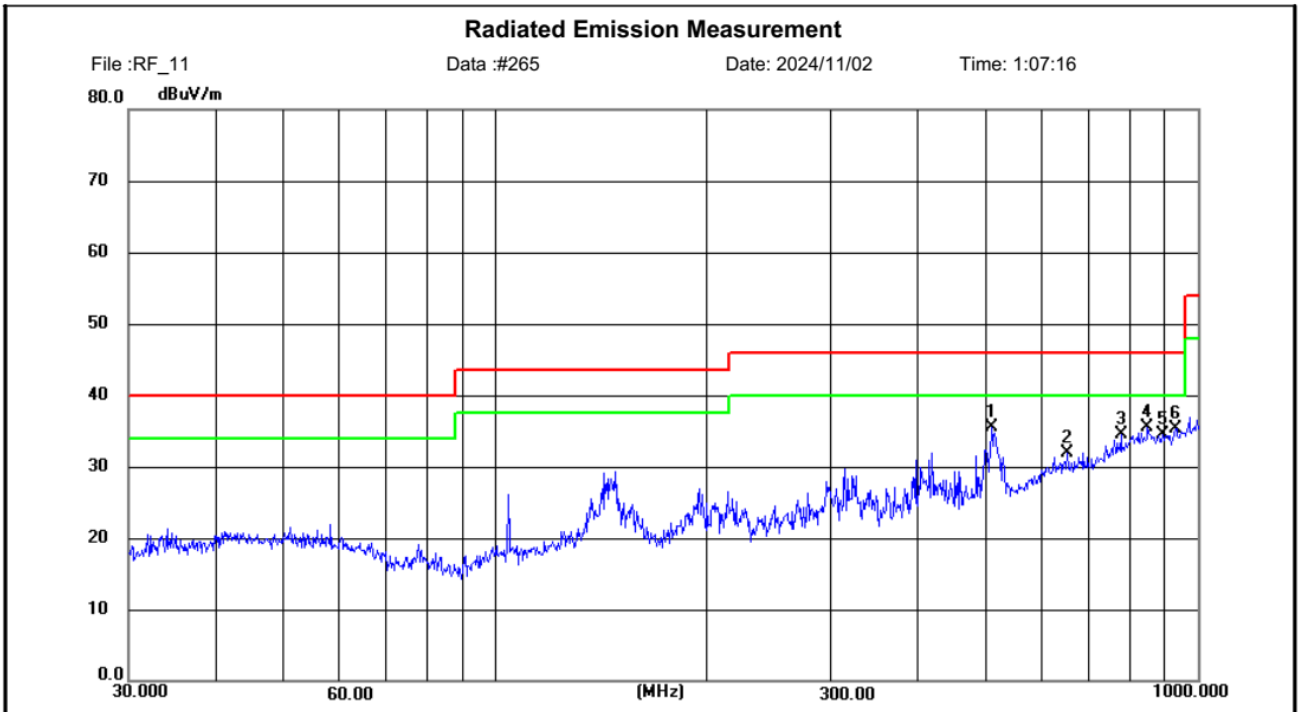

Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_30-1000MHz
EUT:
M/N: R09
Mode: BLE1M 2402MHz
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	509.5966	15.47	20.04	35.51	46.00	10.49	peak	100	308	P	
2	653.3721	8.66	23.29	31.95	46.00	14.05	peak	100	276	P	
3	778.2411	8.35	26.11	34.46	46.00	11.54	peak	100	120	P	
4	849.5445	8.17	27.31	35.48	46.00	10.52	peak	100	328	P	
5	891.5090	6.88	27.56	34.44	46.00	11.56	peak	100	26	P	
6	932.2715	7.00	28.32	35.32	46.00	10.68	peak	100	15	P	

Vertical

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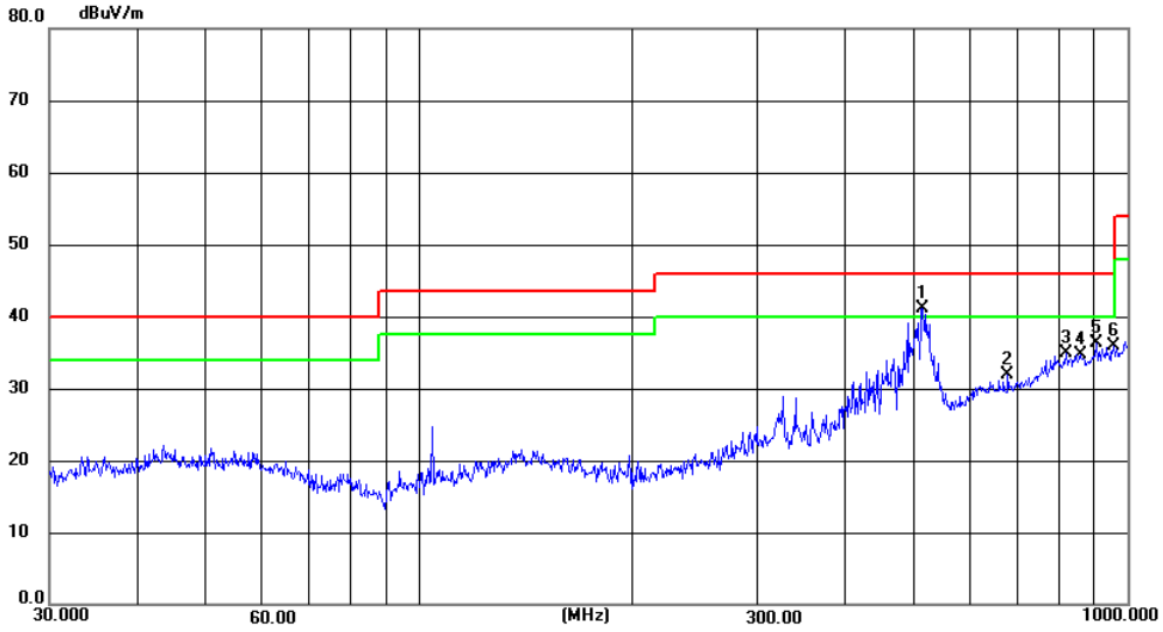
Radiated Emission Measurement

File :RF_11 Data :#266 Date: 2024/11/02 Time: 1:08:20



Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_30-1000MHz
EUT:
M/N: R09
Mode: BLE1M 2402MHz
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	514.0836	21.20	19.99	41.19	46.00	4.81	peak	100	249	P	
2	679.0664	8.53	23.43	31.96	46.00	14.04	peak	100	72	P	
3	819.5522	7.90	27.01	34.91	46.00	11.09	peak	100	41	P	
4	857.4004	7.18	27.45	34.63	46.00	11.37	peak	100	333	P	
5	904.4980	8.34	27.88	36.22	46.00	9.78	peak	100	9	P	
6	957.9542	7.48	28.39	35.87	46.00	10.13	peak	100	41	P	

For 1GHz to 18GHz

BLE Mode (above 1GHz)

CH00	Horizontal

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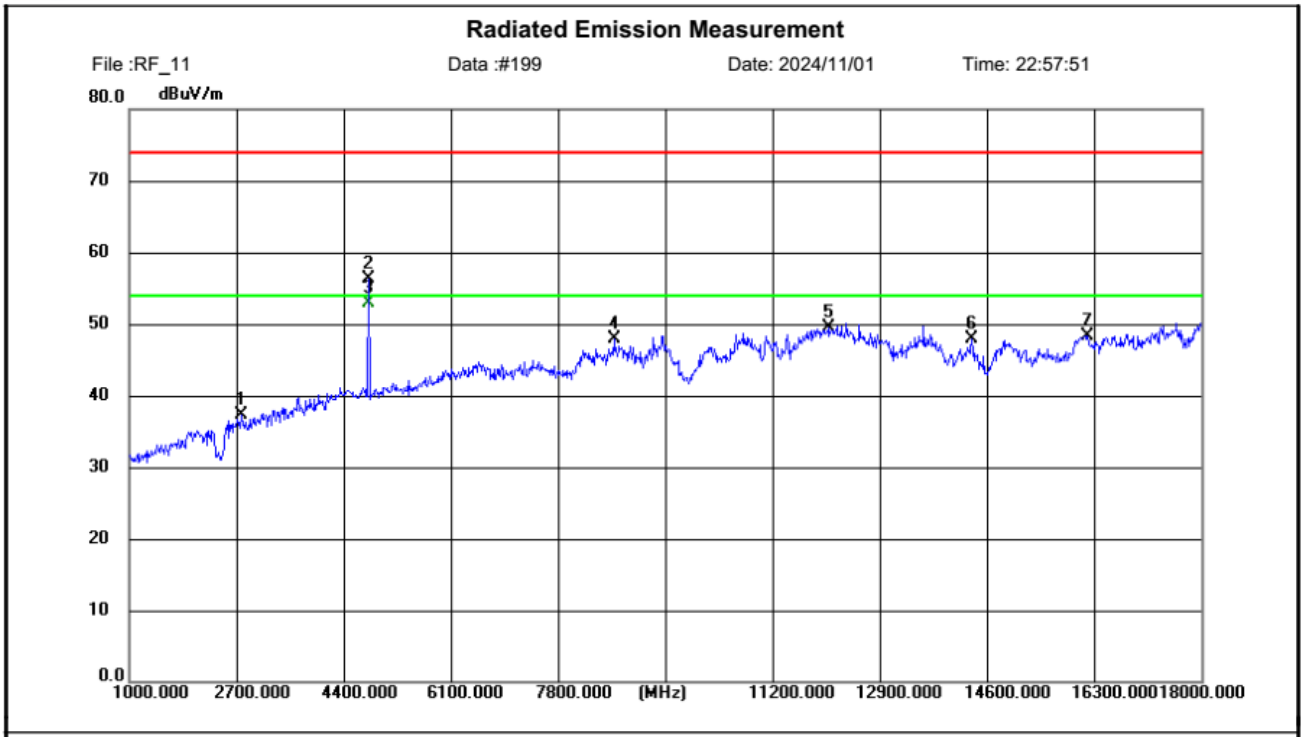

Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_Above 1GHz_PK
EUT:
M/N: R09
Mode: BLE1M 2402MHz TX
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: ***Horizontal***
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	2789.250	52.35	-15.10	37.25	74.00	36.75	peak	150	179	P	
2	4803.750	64.46	-8.09	56.37	74.00	17.63	peak	150	87	P	
3	4803.990	61.03	-8.09	52.94	54.00	1.06	AVG	150	0	P	
4	8684.000	49.26	-1.28	47.98	74.00	26.02	peak	150	158	P	
5	12094.625	47.33	2.17	49.50	74.00	24.50	peak	150	105	P	
6	14364.125	45.16	2.70	47.86	74.00	26.14	peak	150	339	P	
7	16212.875	43.10	5.27	48.37	74.00	25.63	peak	150	339	P	

CH00	Vertical

Shenzhen CTL Testing Technology Co., Ltd
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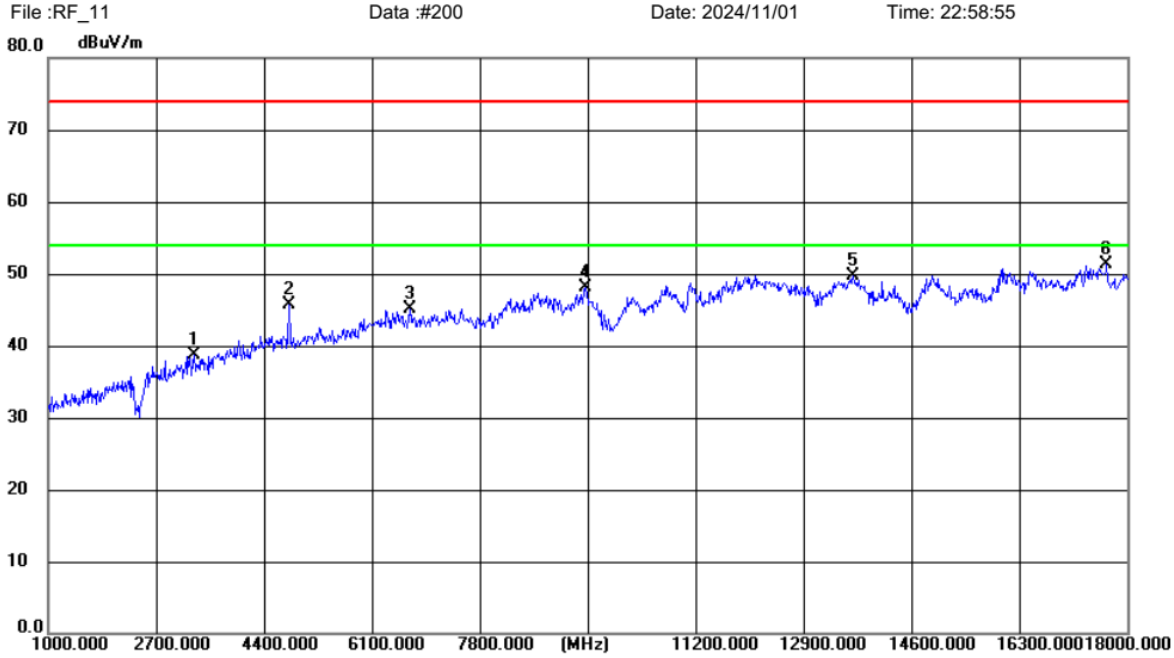
Radiated Emission Measurement



Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_Above 1GHz_PK
EUT:
M/N: R09
Mode: BLE1M 2402MHz TX
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	3297.125	51.42	-12.73	38.69	74.00	35.31	peak	150	122	P	
2	4803.750	53.70	-8.09	45.61	74.00	28.39	peak	150	28	P	
3	6709.875	49.29	-4.16	45.13	74.00	28.87	peak	150	277	P	
4	9470.250	47.76	0.28	48.04	74.00	25.96	peak	150	288	P	
5	13696.875	45.90	3.90	49.80	74.00	24.20	peak	150	0	P	
6	17677.000	42.13	9.13	51.26	74.00	22.74	peak	150	217	P	

CH19	Horizontal

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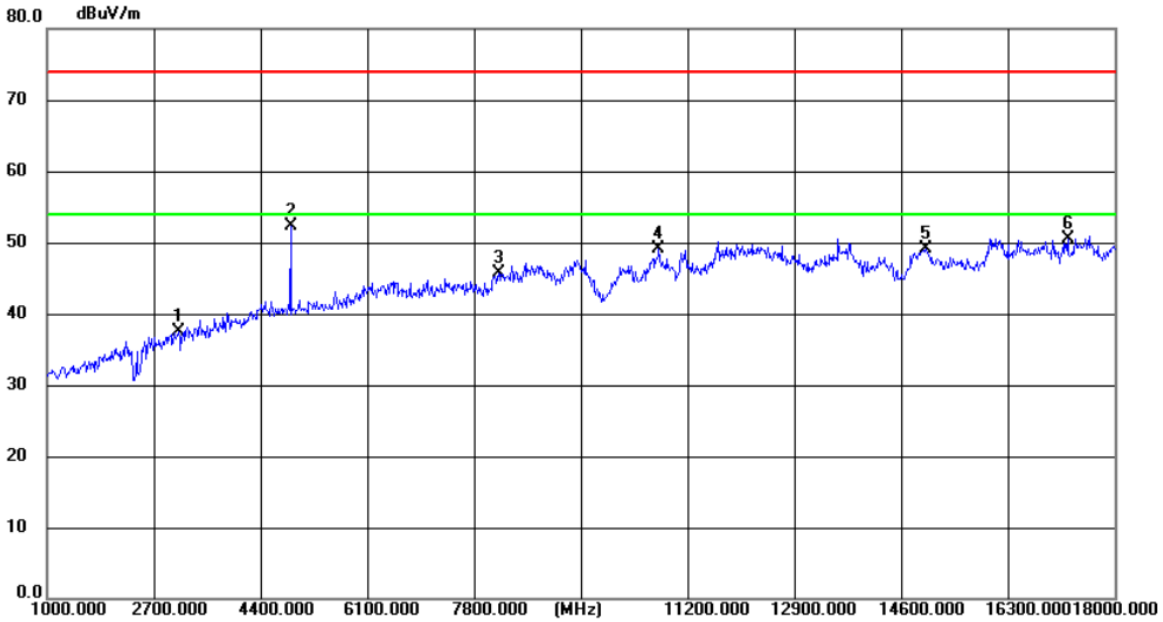
Radiated Emission Measurement

File :RF_11 Data :#201 Date: 2024/11/01 Time: 23:02:59



Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_Above 1GHz_PK
EUT:
M/N: R09
Mode: BLE1M 2440MHz TX
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	3093.125	51.06	-13.65	37.41	74.00	36.59	peak	150	356	P	
2	4878.125	60.32	-7.96	52.36	74.00	21.64	peak	150	43	P	
3	8191.000	48.23	-2.50	45.73	74.00	28.27	peak	150	251	P	
4	10753.750	48.82	0.33	49.15	74.00	24.85	peak	150	241	P	
5	15005.875	45.70	3.34	49.04	74.00	24.96	peak	150	283	P	
6	17258.375	42.56	7.95	50.51	74.00	23.49	peak	150	22	P	

CH19	Vertical

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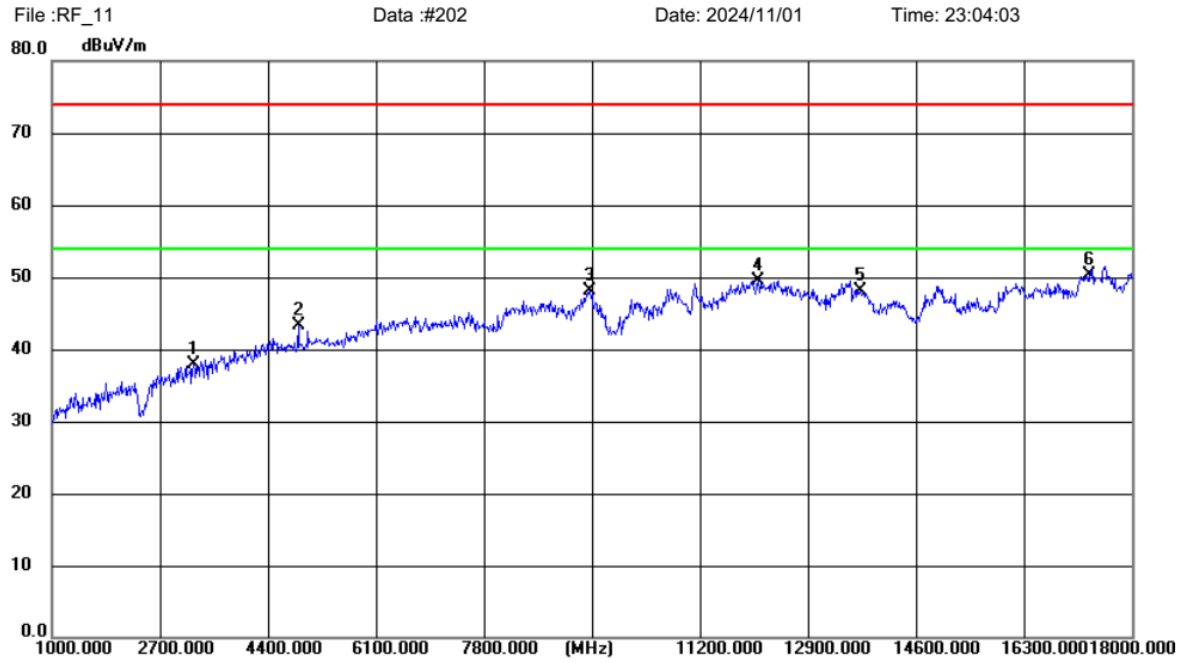
Radiated Emission Measurement



Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_Above 1GHz_PK
EUT:
M/N: R09
Mode: BLE1M 2440MHz TX
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	50.84	-13.02	37.82	74.00	36.18	peak	150	203	P	
2	4880.250	51.18	-7.96	43.22	74.00	30.78	peak	150	26	P	
3	9474.500	47.86	0.28	48.14	74.00	25.86	peak	150	265	P	
4	12126.500	47.42	2.18	49.60	74.00	24.40	peak	150	99	P	
5	13741.500	44.33	3.83	48.16	74.00	25.84	peak	150	213	P	
6	17324.250	42.00	8.30	50.30	74.00	23.70	peak	150	328	P	

CH39	Horizontal

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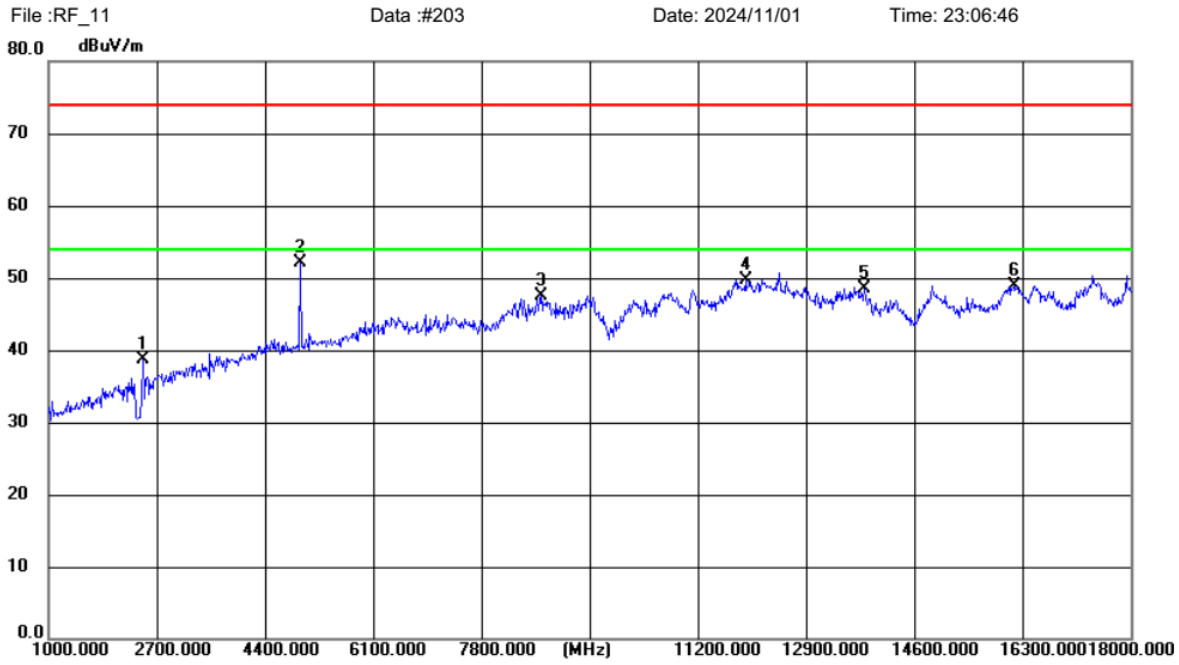
Radiated Emission Measurement



Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_Above 1GHz_PK
EUT:
M/N: R09
Mode: BLE1M 2480MHz TX
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	2479.000	55.45	-16.65	38.80	74.00	35.20	peak	150	2	P	
2	4958.875	60.01	-7.85	52.16	74.00	21.84	peak	150	54	P	
3	8749.875	48.48	-1.01	47.47	74.00	26.53	peak	150	190	P	
4	11958.625	47.68	2.07	49.75	74.00	24.25	peak	150	137	P	
5	13822.250	44.85	3.74	48.59	74.00	25.41	peak	150	263	P	
6	16168.250	43.81	5.15	48.96	74.00	25.04	peak	150	2	P	

CH39	Vertical

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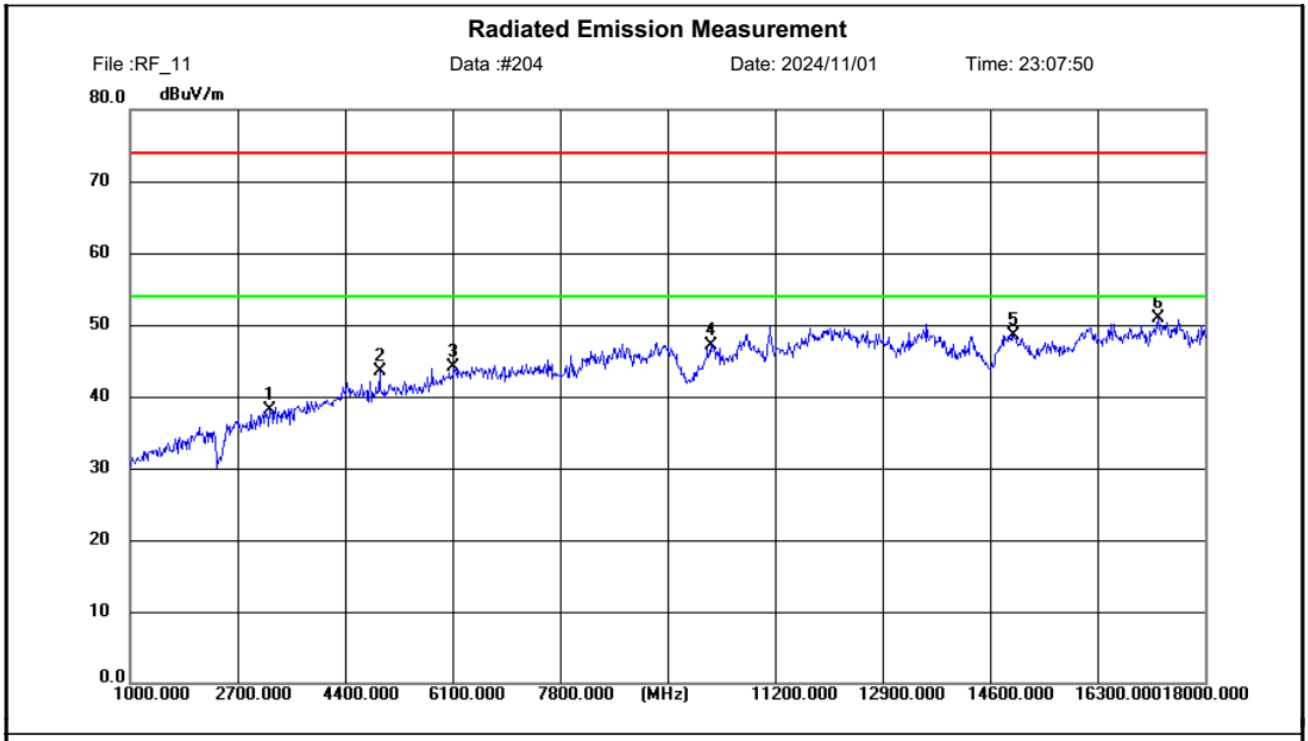

Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_Above 1GHz_PK
EUT:
M/N: R09
Mode: BLE1M 2480MHz TX
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	3214.250	51.14	-13.08	38.06	74.00	35.94	peak	150	150	P	
2	4958.875	51.37	-7.85	43.52	74.00	30.48	peak	150	24	P	
3	6117.000	49.43	-5.28	44.15	74.00	29.85	peak	150	213	P	
4	10188.500	46.84	0.36	47.20	74.00	26.80	peak	150	65	P	
5	14982.500	45.21	3.31	48.52	74.00	25.48	peak	150	0	P	
6	17273.250	42.94	8.03	50.97	74.00	23.03	peak	150	202	P	

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. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
5. Other emissions are attenuated 20dB below the limits from 9kHz to 30MHz, so it does not recorded in report.
6. 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

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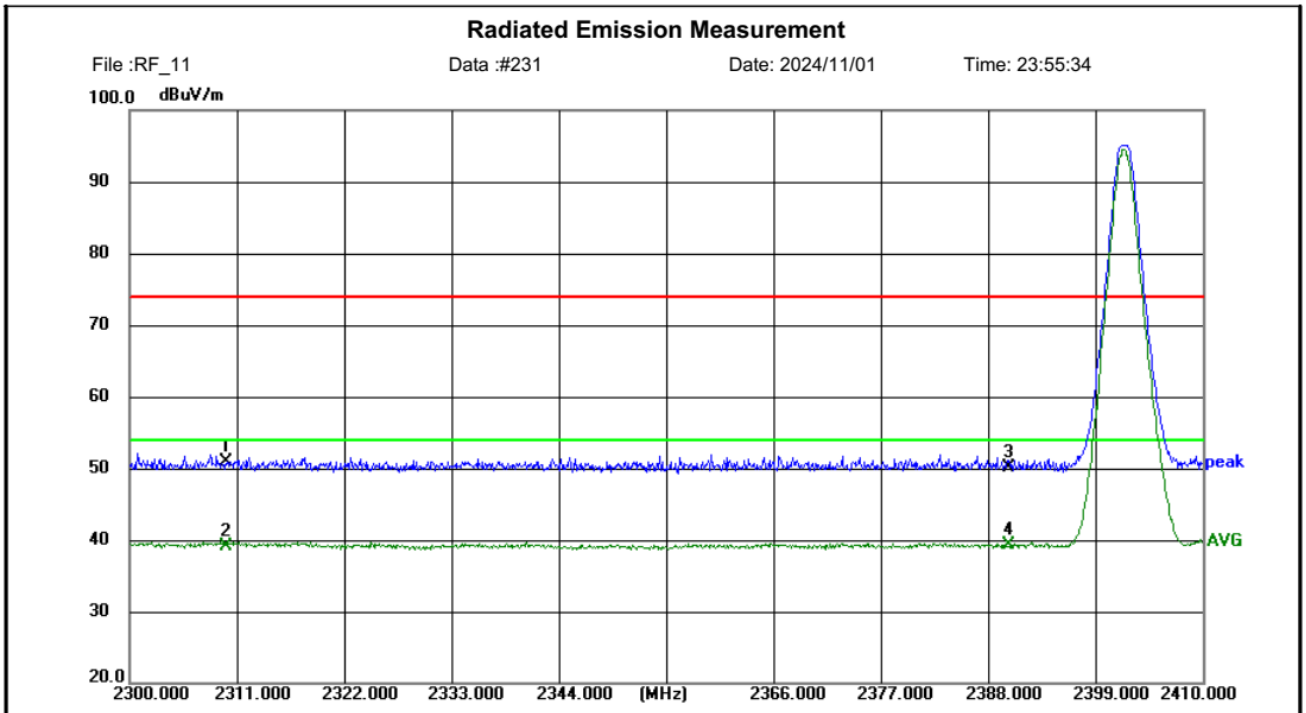

Site LAB Chamber 2
Limit: FCC Part 15 C
EUT:
M/N: R09
Mode: BLE1M 2402MHz
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: ***Horizontal***
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	2310.000	41.13	9.69	50.82	74.00	23.18	peak	150	155	P	
2	2310.000	29.45	9.69	39.14	54.00	14.86	AVG	150	155	P	
3	2390.000	40.34	9.77	50.11	74.00	23.89	peak	150	234	P	
4	2390.000	29.53	9.77	39.30	54.00	14.70	AVG	150	234	P	

CH00	Vertical

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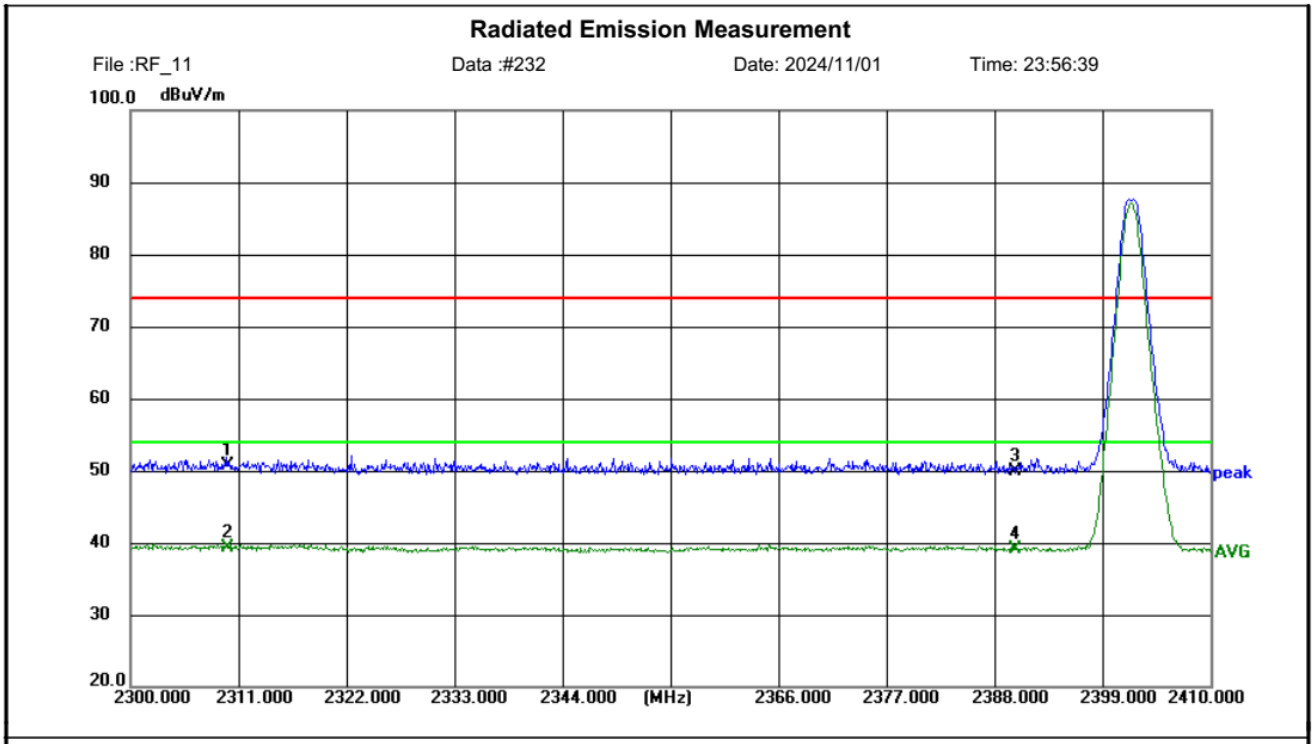

Site LAB Chamber 2
Limit: FCC Part 15 C
EUT:
M/N: R09
Mode: BLE1M 2402MHz
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	2310.000	41.02	9.69	50.71	74.00	23.29	peak	150	343	P	
2	2310.000	29.63	9.69	39.32	54.00	14.68	AVG	150	343	P	
3	2390.000	40.09	9.77	49.86	74.00	24.14	peak	150	313	P	
4	2390.000	29.34	9.77	39.11	54.00	14.89	AVG	150	313	P	

CH39	Horizontal

Shenzhen CTL Testing Technology Co., Ltd
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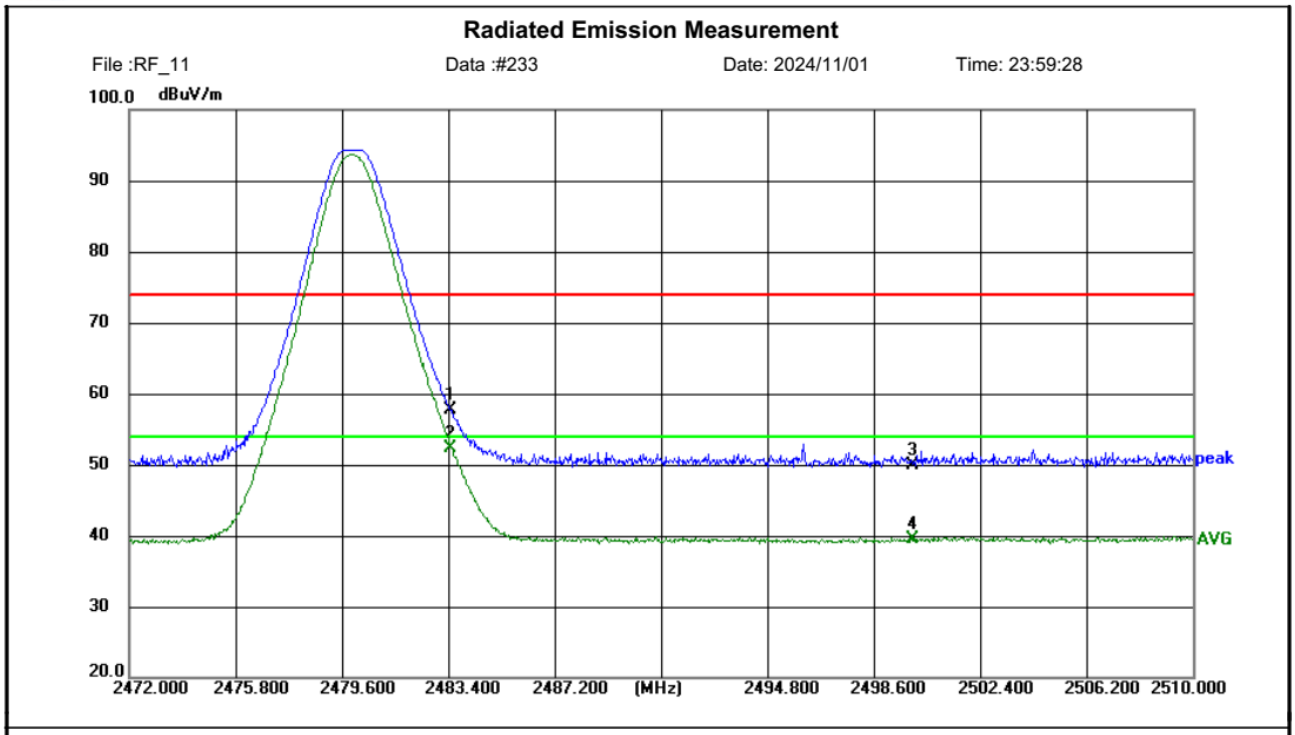

Site LAB Chamber 2
Limit: FCC Part 15 C
EUT:
M/N: R09
Mode: BLE1M 2480MHz
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	47.81	9.93	57.74	74.00	16.26	peak	150	2	P	
2	2483.500	42.40	9.93	52.33	54.00	1.67	AVG	150	2	P	
3	2500.000	39.96	10.00	49.96	74.00	24.04	peak	150	222	P	
4	2500.000	29.44	10.00	39.44	54.00	14.56	AVG	150	222	P	

CH39	Vertical

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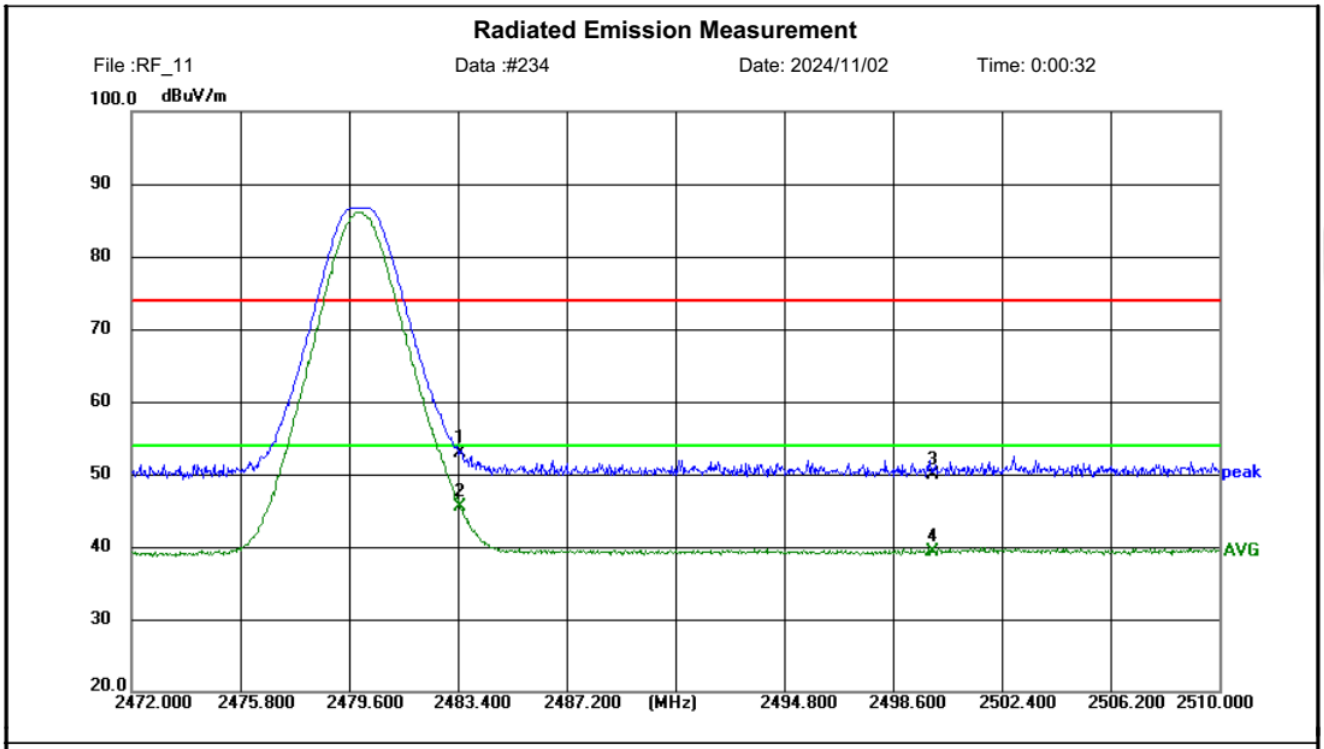


Site LAB Chamber 2
Limit: FCC Part 15 C
EUT:
M/N: R09
Mode: BLE1M 2480MHz
Note: Shenzhen Yawell Intelligent Technology Co.,Ltd

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	43.00	9.93	52.93	74.00	21.07	peak	150	218	P	
2	2483.500	35.56	9.93	45.49	54.00	8.51	AVG	150	218	P	
3	2500.000	39.88	10.00	49.88	74.00	24.12	peak	150	28	P	
4	2500.000	29.38	10.00	39.38	54.00	14.62	AVG	150	28	P	

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. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
5. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.
6. Other emissions are attenuated 20dB below the limits from 9kHz to 30MHz, so it does not recorded in report.

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.

a)Set the RBW≥DTS bandwidth.

b)Set VBW≥[3×RBW].

c) Set span≥[3×RBW].

d) Sweep time = auto couple.

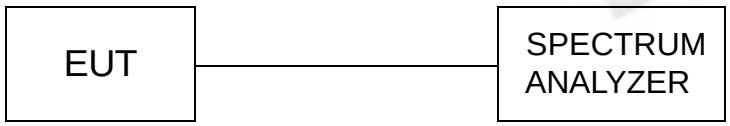
e) Detector=peak.

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 Appendix Test Data for Bluetooth LE Section 2.

3.4. Power Spectral Density

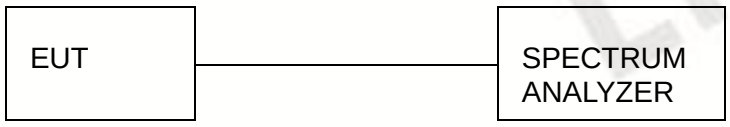
Limit

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 ≥ 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 Appendix Test Data for Bluetooth LE Section 3.

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 Appendix Test Data for Bluetooth LE Section 1.

3.6. Out-of-band Emissions

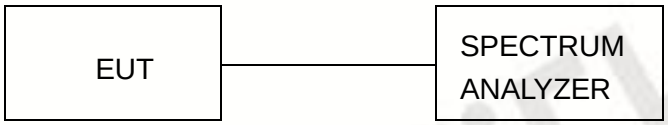
Limit

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 Appendix Test Data for Bluetooth LE Section 4.

3.7. Antenna Requirement

Standard Applicable

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

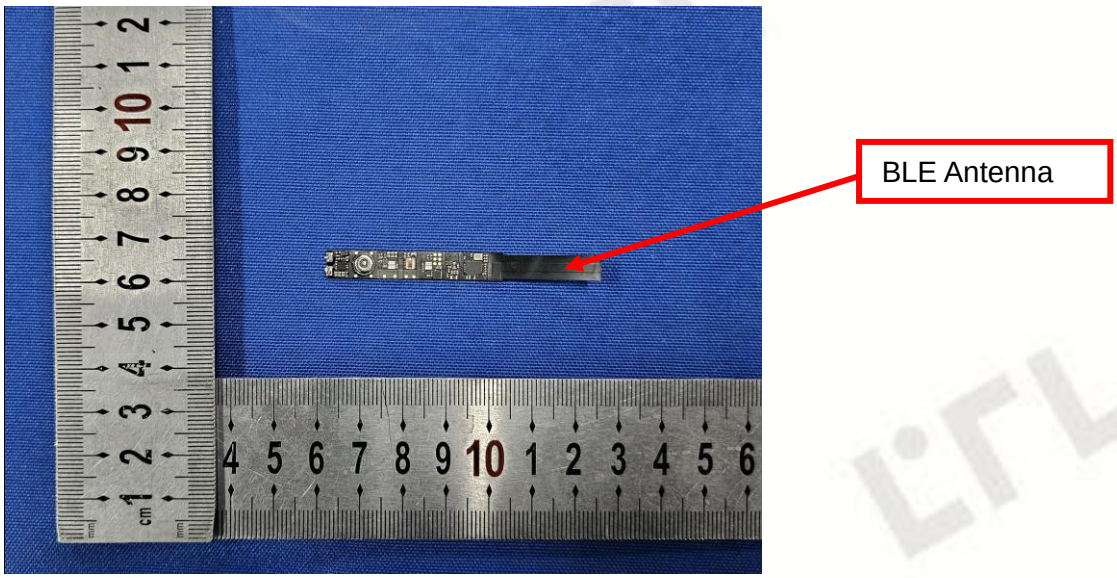
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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(c) (1) (I):

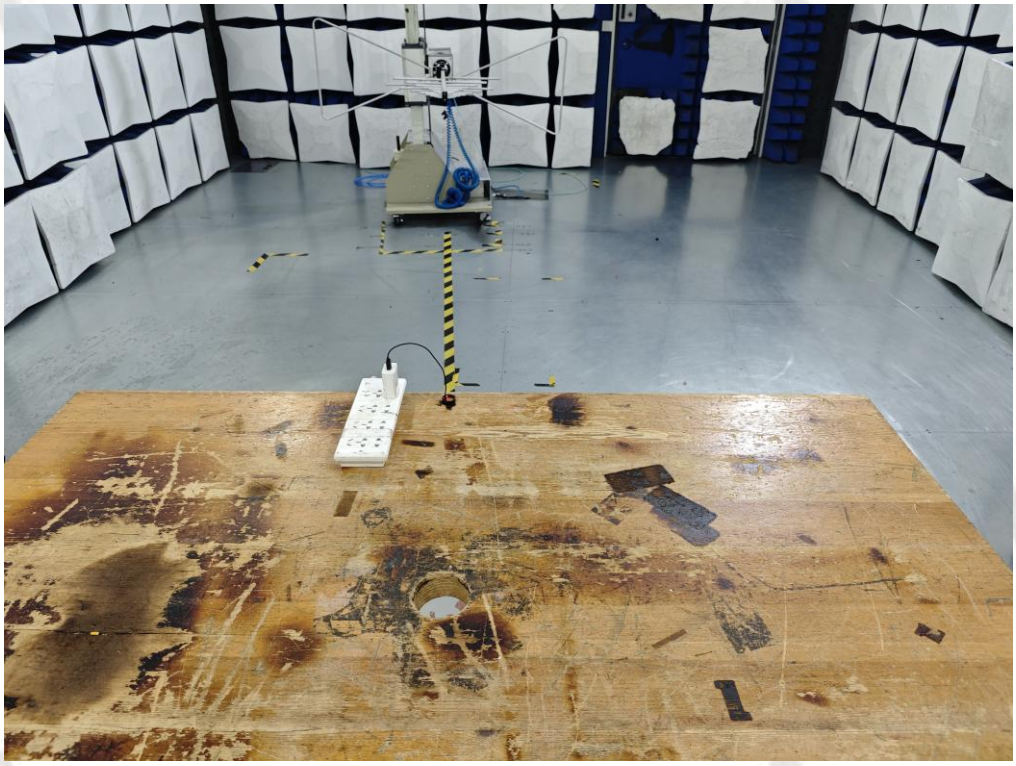
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional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

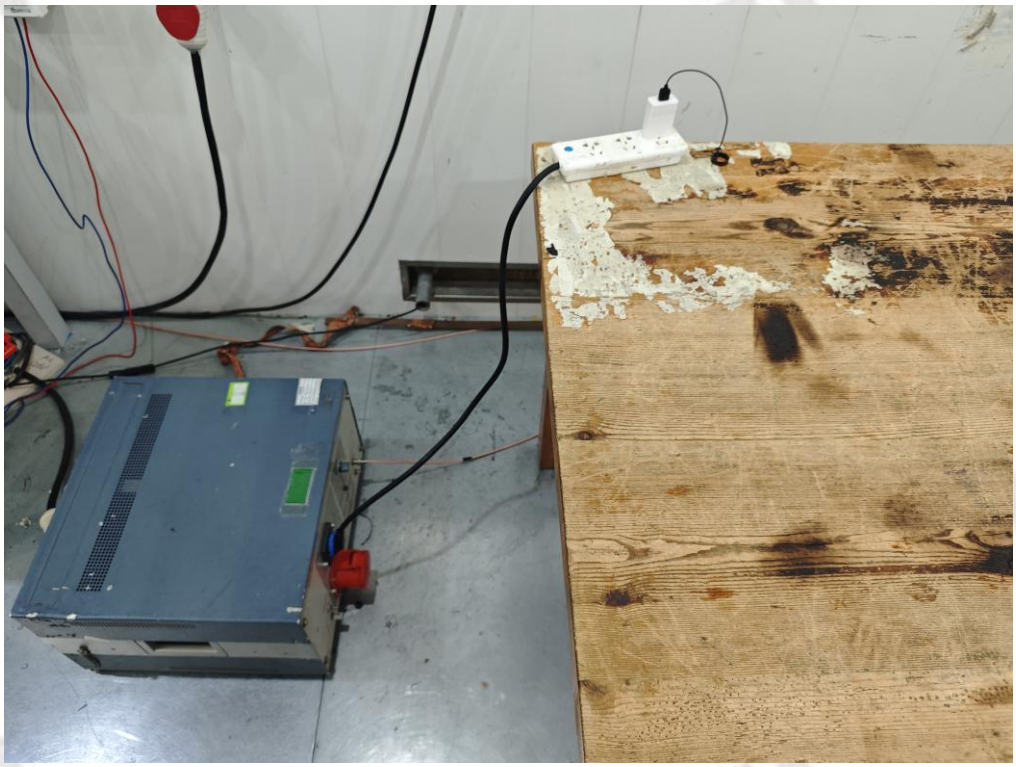
Test Result:

The maximum gain of antenna was -4.22dBi



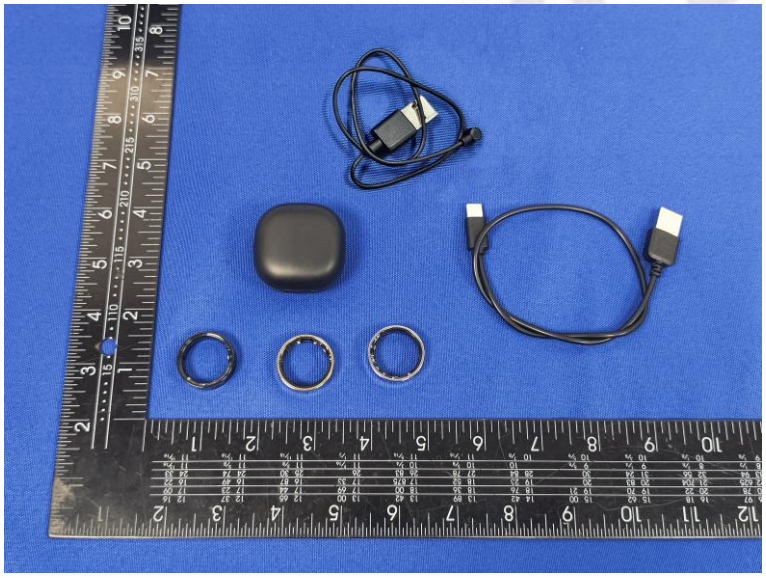
4. Test Setup Photos of the EUT

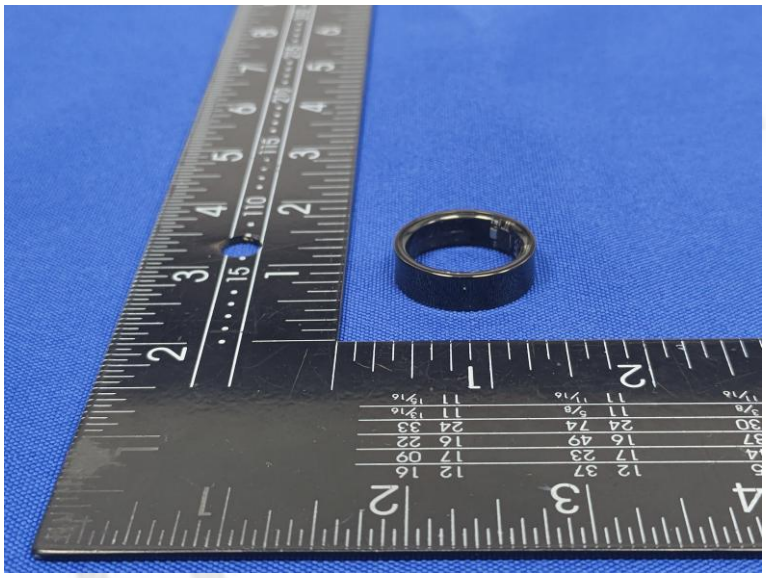


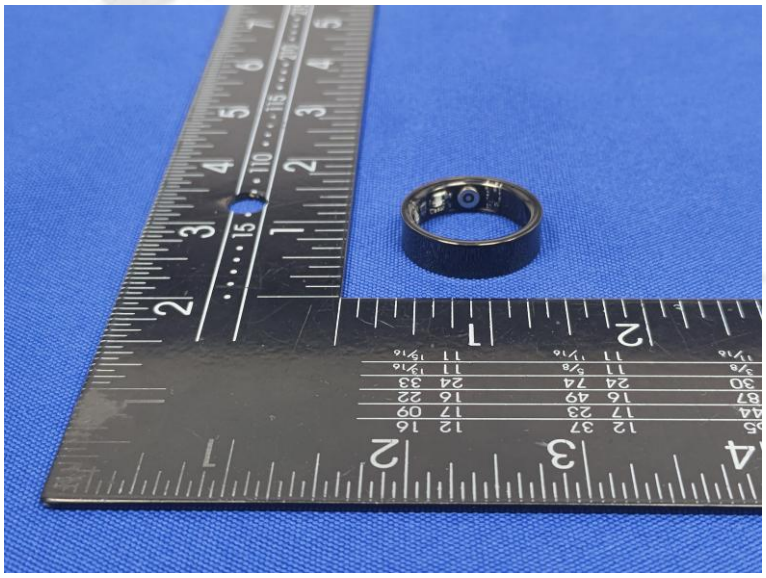


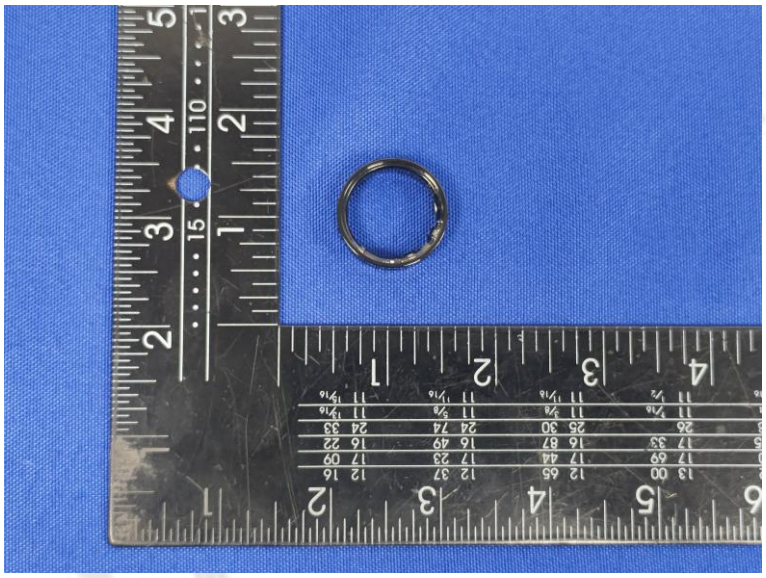
5. External and Internal Photos of the EUT

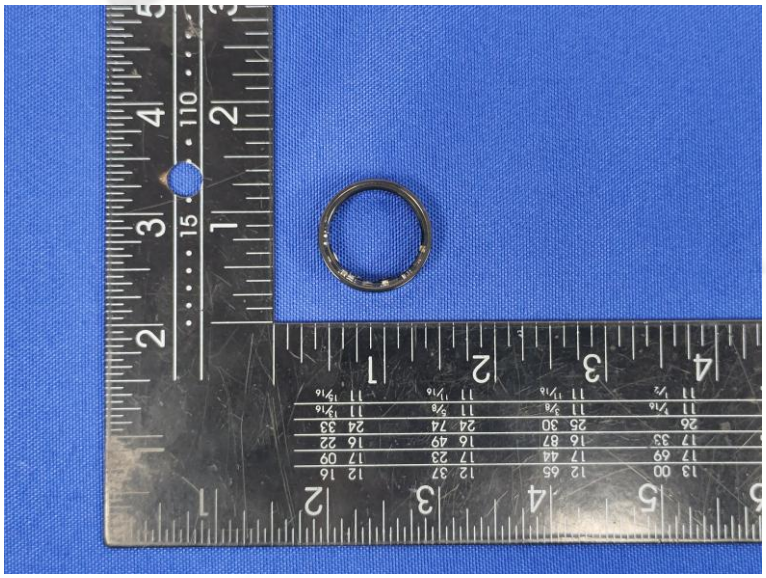
External Photos of EUT

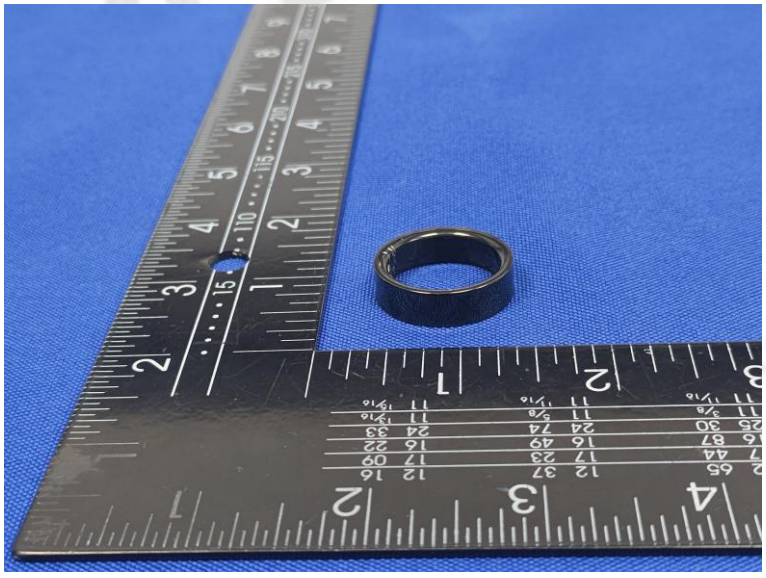




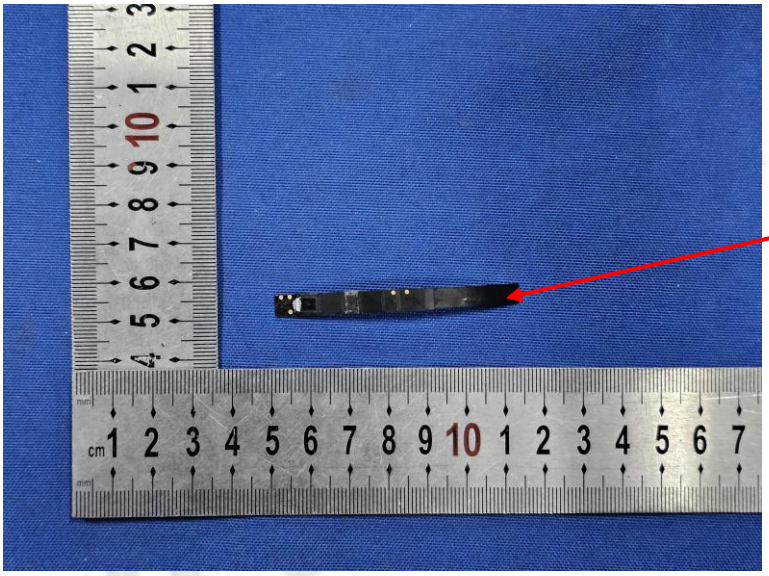


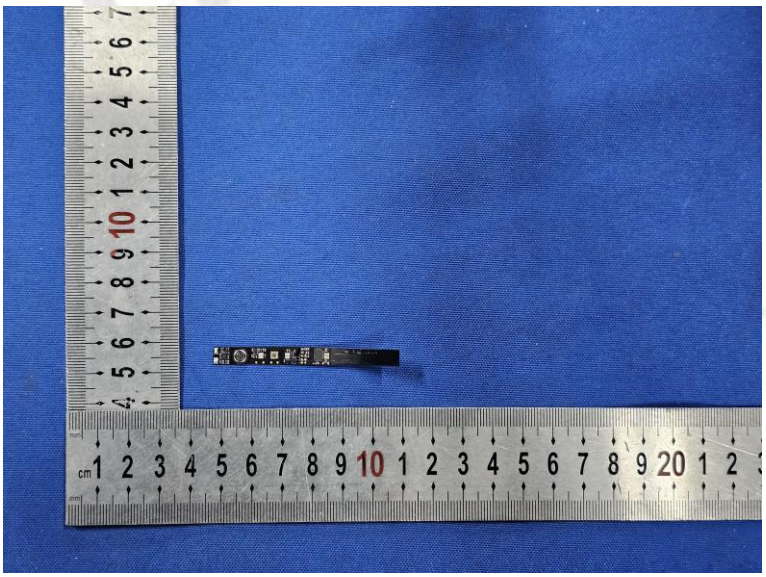


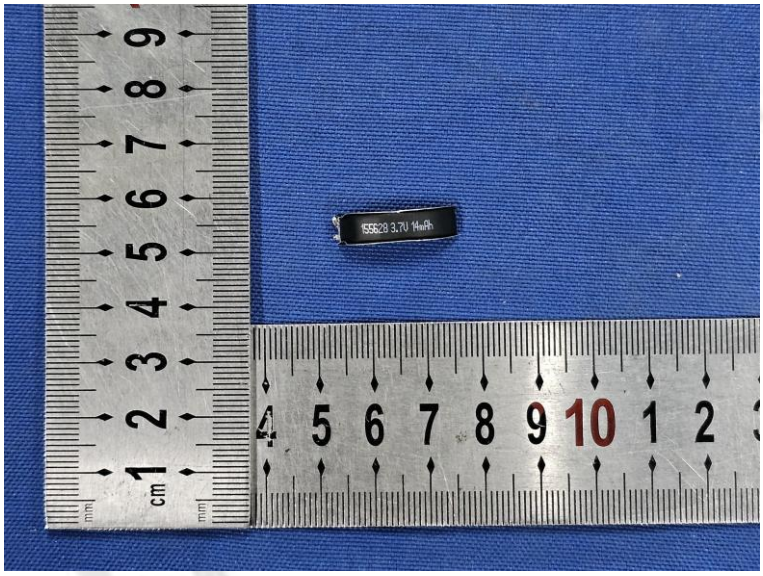


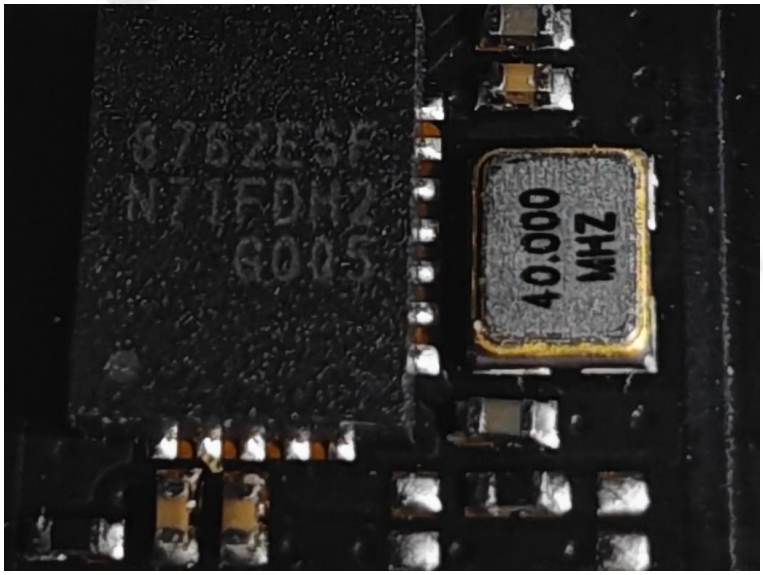


Internal Photos of EUT









********** End of Report **********