



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

TEST REPORT

47 CFR Part 15, Subpart C 15.247

Report Reference No.: CTL2604174031-WF

Compiled by:
(printed name+signature)

Gary Gao

Reviewed by:
(printed name+signature)

Happy Guo

Approved by:
(printed name+signature)

Ivan Xie



Product Name: Smart Ring

Model/Type reference: R02S

List Model(s): R12

Trade Mark: N/A

FCC ID: 2BSEJ-R02SRING

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 specification:

Standard: 47 CFR Part 15, Subpart C 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: Apr 28 , 2026

Date of Test Date: Apr 28 , 2026-May 12, 2026

Date of Issue: May 12, 2026

Result: Pass

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TEST REPORT

Test Report No. : CTL2604174031-WF	May 12, 2026 Date of issue
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Equipment under Test : Smart Ring

Sample No : CTL260417403001, CTL260417403002

Model /Type : R02S

Listed Models : R12

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 *
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* In the configuration tested, the EUT complied with the standards specified page 5.

This device (product name: Smart Ring) model name: R02S, R12 have same electrical, PCB and BOM, only the colour and model' s names are different, which does not affect the test results.

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 ****

[illegible]

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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

[47 CFR Part 15, Subpart C 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 c63.10-2020+cor1-2023](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB 558074 D01 v05r02](#): KDB558074 D01 15.247 Meas Guidance v05r02

1.2. Test Description

47 CFR Part 15, Subpart C 15.247		
47 CFR Part 15, Subpart C 15.207	AC Power Conducted Emission	PASS
47 CFR Part 15, Subpart C 15.247(a)(2)	6dB Bandwidth	PASS
47 CFR Part 15, Subpart C 15.247(d)	Spurious RF Conducted Emission	PASS
47 CFR Part 15, Subpart C 15.247(b)	Maximum Conducted Output Power	PASS
47 CFR Part 15, Subpart C 15.247(e)	Power Spectral Density	PASS
47 CFR Part 15, Subpart C 15.109/15.205/15.209	Radiated Emissions	PASS
47 CFR Part 15, Subpart C 15.247(d)	Band Edge	PASS
47 CFR Part 15, Subpart C 15.203/15.247 (b)	Antenna Requirement	PASS

Note: N/A= not applicable

1.3. Test Facility

1.3.1 Test laboratory

Company Name:	Shenzhen CTL Testing Technology Co., Ltd.
Address 1:	Zone A.1/F..Warehouse 2.Baisha Technology Park, No.3011,Shahexi Road, Nanshan District,Shenzhen.518055,P.R.C.
Address 2:	Fl.A1, Bldg.A3, No.2533 GuanGuang Road, Fenghuang Community Fenghuang Street, Guangming District, Shenzhen, Guangdong, PR.C

1.3.2 Test location

All tests were performed at:

Company Name:	Shenzhen CTL Testing Technology Co., Ltd.
☐ Main location	Zone A.1/F..Warehouse 2.Baisha Technology Park, No.3011,Shahexi Road, Nanshan District,Shenzhen.518055,P.R.C.
☒ Satellite location	Fl.A1, Bldg.A3, No.2533 GuanGuang Road, Fenghuang Community Fenghuang Street, Guangming District, Shenzhen, Guangdong, PR.C

1.3.3 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 CAB identifier: CN0041

Main Company Number :9618B

Satellite Company Number:35187

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 Main Company Number:9618B and Satellite Company Number:35187.

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. Designation No.: CN1216. Test Firm 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	$\pm 3.11\text{dB}$	(1)
Radiated Emission 9kHz~30MHz	$\pm 3.66\text{dB}$	(1)
Radiated Emission 30~1000MHz	$\pm 4.5\text{dB}$	(1)
Radiated Emission Above 1GHz	$\pm 5.08\text{dB}$	(1)
DTS Bandwidth	$\pm 1.9\%$	(1)
Maximum Conducted Output Power	$\pm 1.18\text{ dB}$	(1)
Maximum Power Spectral Density Level	$\pm 0.98\text{ dB}$	(1)
Band-edge	$\pm 1.21\text{dB}$	(1)
Unwanted Emissions In Non-restricted Freq Bands	9kHz-7GHz: $\pm 1.09\text{dB}$ 7GHz-26.5GHz: $\pm 3.27\text{dB}$	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.
- (2) Decision rule for Statement of Conformity: The measurement uncertainty is not taken into account but only measured result.

2. GENERAL INFORMATION

2.1. Environmental conditions

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

Normal Temperature:	18°C-28°C
Relative Humidity:	30%-60%
Air Pressure:	965Pa-1030Pa

2.2. General Description of EUT

Product Name:	Smart Ring
Model/Type reference:	R02S
EUT Rated Voltage:	DC 3.7V from battery or charging by AC-DC adapter
Test Voltage:	DC 3.7V
Bluetooth Low Energy	
Supported type:	Bluetooth Low Energy
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	FPC Antenna
Antenna gain:	-4.22dBi provided by ☒ Applicant ☐ Manufacturer

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

2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

There are 40 channels provided to the EUT and Channel 00/19/39 were selected for Bluetooth Low Energy 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

RF Cable List and Details

RF Cable	RF Cable loss	RF Cable loss provided by
RF1.13	0.5dB	☒ Applicant ☐ Manufacturer ☐ Testing Laboratory(CTL)

Software Version: RF_Test	
Test Mode	Power level
BLE 1M	3

2.4. Equipments Used during the Test

Conducted Emission					
Test Equipment	Manufacturer	Model No.	Serial No.	Last calibration	Calibration Due
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2026/01/05	2027/01/04
LISN	ROHDE & SCHWARZ	ESH2-Z5	860014/010	2026/01/05	2027/01/04
Limitator	ROHDE & SCHWARZ	ESH3-Z2	100408	2026/01/05	2027/01/04
Software:					
Name of Software:			Version:		
ES-K1			V1.71		

Radiated Emission					
Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
Active Loop Antenna	Da Ze	ZN30900A	/	2025/07/02	2026/07/01
ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2025/07/02	2026/07/01
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2026/01/05	2027/01/04
Horn Antenna	Ocean Microwave	OBH100400	26999002	2025/07/03	2026/07/02
Amplifier	Brief&Smart	LNA-4018	2104197	2025/07/03	2026/07/02
EMI Test Receiver	ROHDE & SCHWARZ	ESPI	100434	2025/07/02	2026/07/01
Spectrum Analyzer	RS	FSP	1164.4391.38	2025/07/03	2026/07/02
Software:					
Name of Software:			Version:		
EZ_EMG(Below 1GHz)			V1.1.4.2		
EZ_EMG(Above 1GHz)			V1.1.4.2		

RF Conducted					
Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
Spectrum Analyzer	Keysight	N9020A	MY53420874	2025/07/03	2026/07/02
Temperature/Humidity Meter	Ji Yu	MC501	/	2025/07/03	2026/07/02
Software:					
Name of Software:			Version:		
TST-PASS			V2.0.2		

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

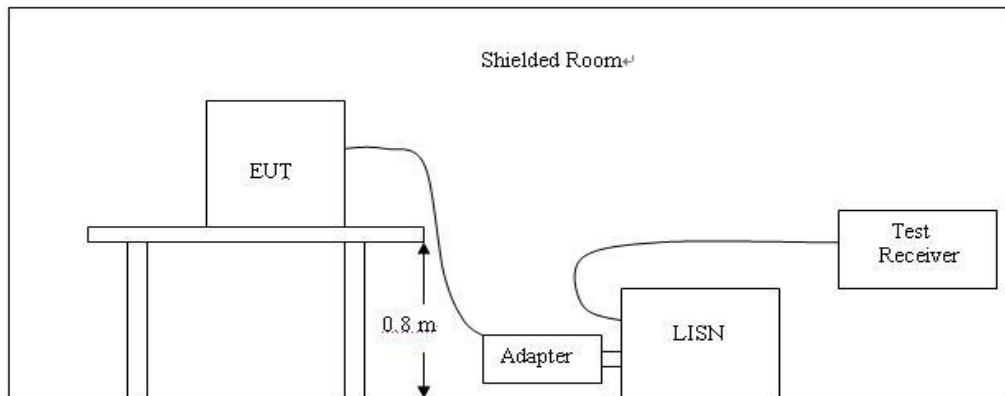
LIMIT

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 tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI c63.10-2020+cor1-2023.
2. Support equipment, if needed, was placed as per ANSI c63.10-2020+cor1-2023.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI c63.10-2020+cor1-2023.
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:

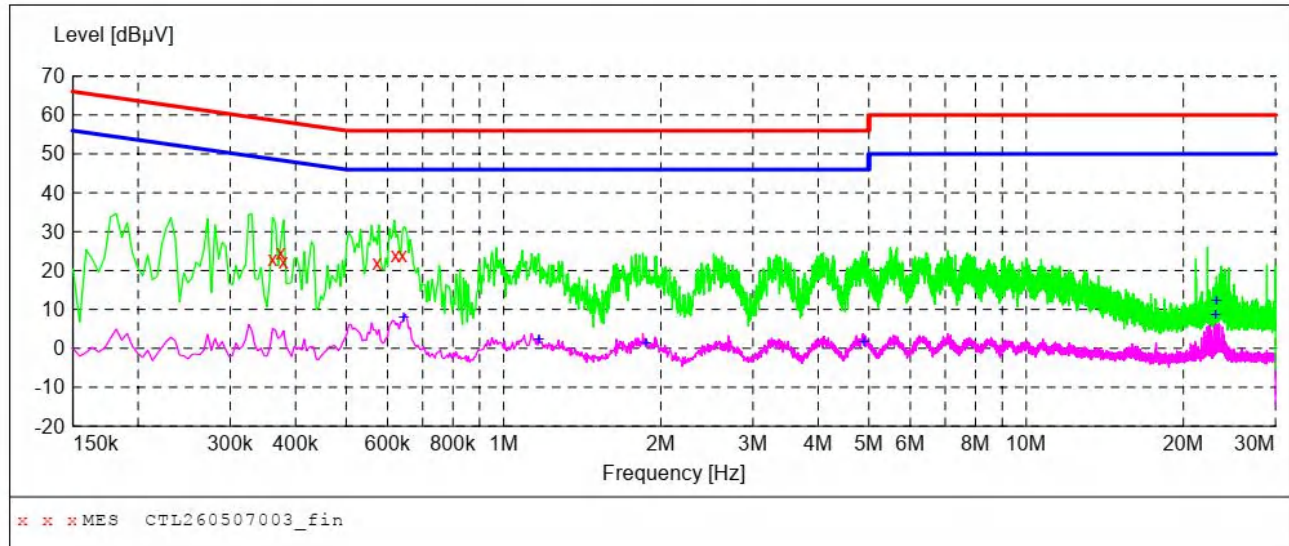
1. All low, middle and high channel were tested; only the worst result of low channel was reported as below:

Line:

L

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

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL260507003_fin"**

5/7/2026 8:56AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.361500	23.00	10.3	59	35.7	QP	L1	GND
0.375000	24.50	10.3	58	33.9	QP	L1	GND
0.379500	22.40	10.3	58	35.9	QP	L1	GND
0.573000	22.00	10.4	56	34.0	QP	L1	GND
0.622500	24.00	10.5	56	32.0	QP	L1	GND
0.640500	24.00	10.5	56	32.0	QP	L1	GND

MEASUREMENT RESULT: "CTL260507003_fin2"

5/7/2026 8:56AM

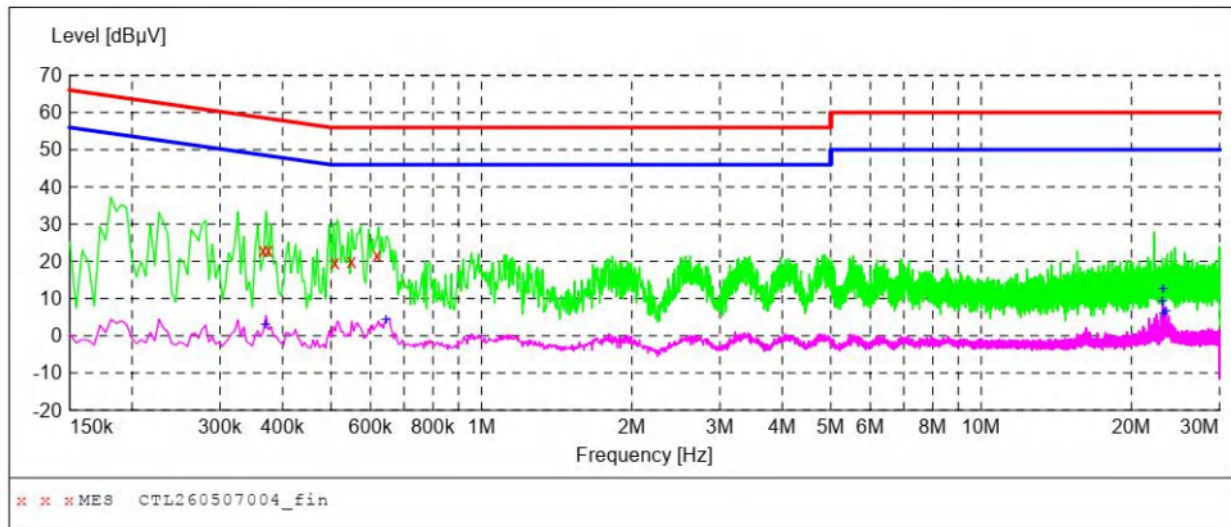
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.645000	8.00	10.5	46	38.0	AV	L1	GND
1.171500	2.40	10.7	46	43.6	AV	L1	GND
1.878000	1.30	10.7	46	44.7	AV	L1	GND
4.897500	1.90	11.0	46	44.1	AV	L1	GND
23.068500	8.80	11.5	50	41.2	AV	L1	GND
23.127000	12.30	11.5	50	37.7	AV	L1	GND

Line:

N

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

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL260507004_fin"**

5/7/2026 8:59AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.366000	22.80	10.3	59	35.8	QP	N	GND
0.375000	23.10	10.3	58	35.3	QP	N	GND
0.510000	19.60	10.4	56	36.4	QP	N	GND
0.550500	19.90	10.4	56	36.1	QP	N	GND
0.618000	21.50	10.5	56	34.5	QP	N	GND

MEASUREMENT RESULT: "CTL260507004_fin2"

5/7/2026 8:59AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.370500	3.10	10.3	49	45.4	AV	N	GND
0.645000	4.50	10.5	46	41.5	AV	N	GND
23.068500	9.20	11.5	50	40.8	AV	N	GND
23.127000	12.60	11.5	50	37.4	AV	N	GND
23.190000	6.00	11.5	50	44.0	AV	N	GND
23.433000	6.80	11.5	50	43.2	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.

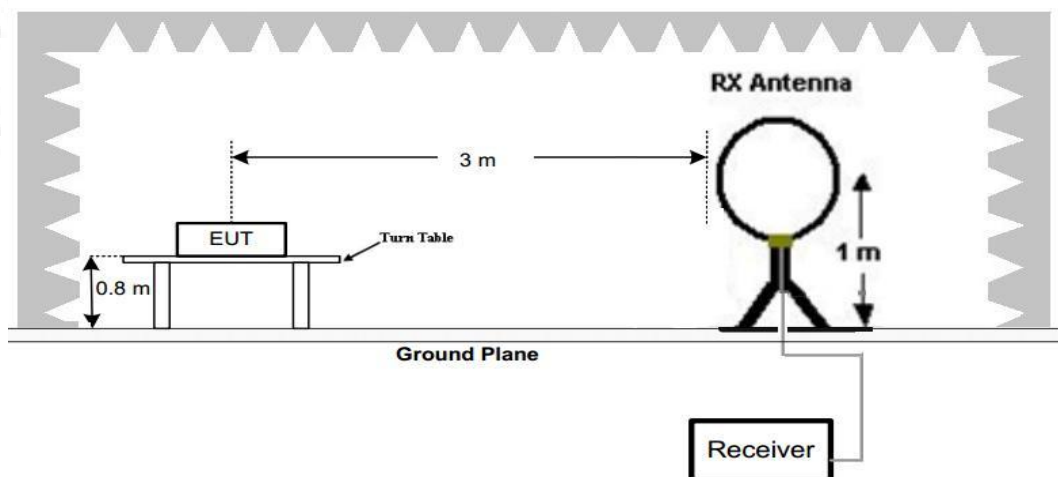
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

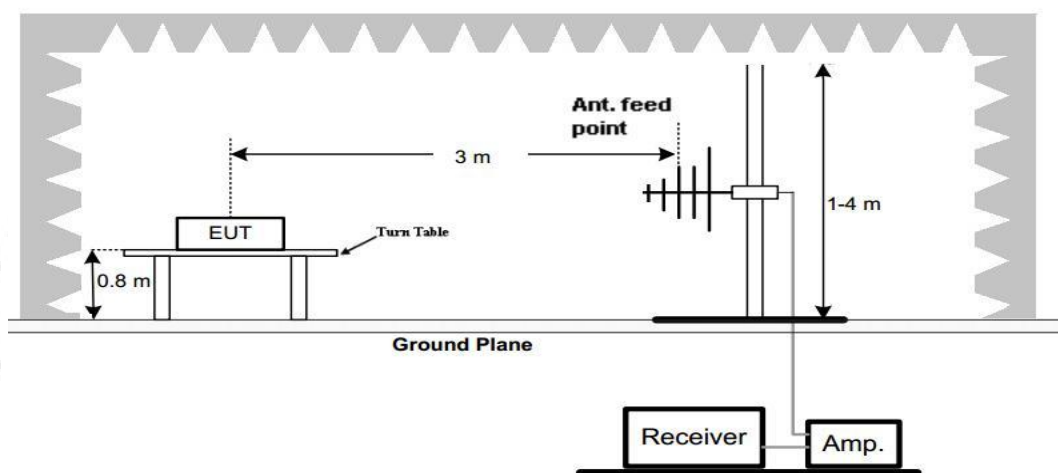
Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
0.009-0.49	3	$20\log(2400/F(\text{kHz}))+40\log(300/3)$	$2400/F(\text{kHz})$
0.49-1.705	3	$20\log(24000/F(\text{kHz}))+40\log(30/3)$	$24000/F(\text{kHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

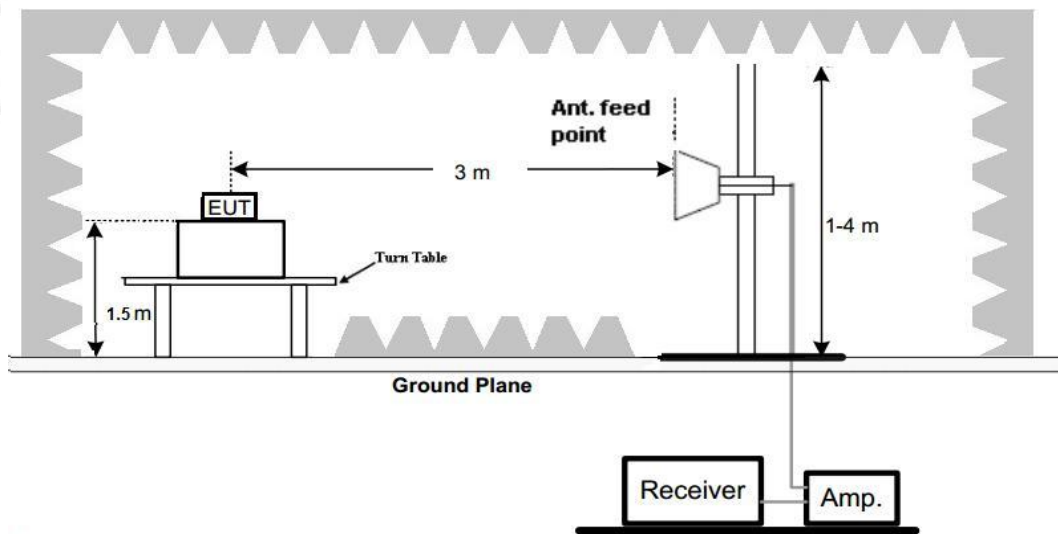
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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

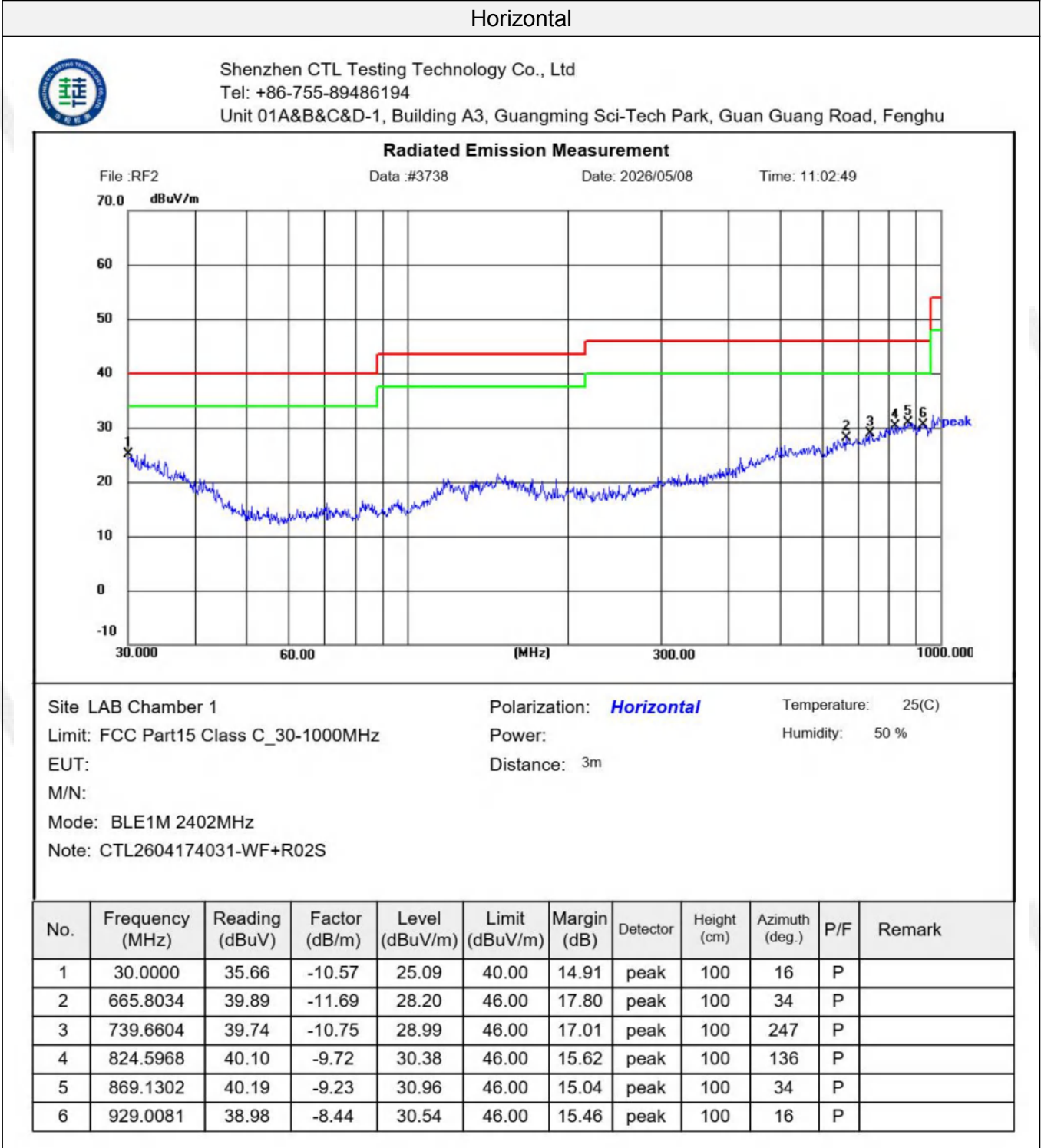
**Test Procedure**

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 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. For below 1GHz testing recorded worst at Bluetooth Low Energy 1M low channel.
2. For above 1GHz testing recorded worst at Bluetooth Low Energy 1M low channel.
3. 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

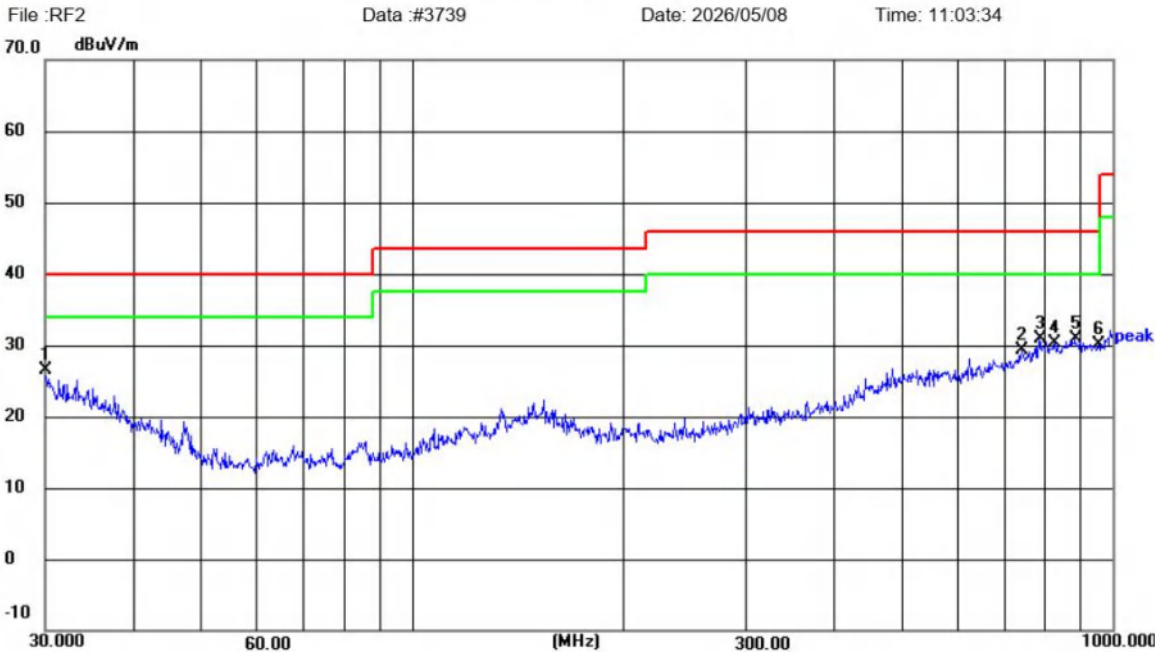


Vertical



Shenzhen CTL Testing Technology Co., Ltd
Tel: +86-755-89486194
Unit 01A&B&C&D-1, Building A3, Guangming Sci-Tech Park, Guan Guang Road, Fenghu

Radiated Emission Measurement



Site LAB Chamber 1 Polarization: **Vertical** Temperature: 25(C)
Limit: FCC Part15 Class C_30-1000MHz Power: Humidity: 50 %
EUT: Distance: 3m
M/N:
Mode: BLE1M 2402MHz
Note: CTL2604174031-WF+R02S

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	30.0000	37.06	-10.57	26.49	40.00	13.51	peak	100	234	P	
2	742.2587	39.99	-10.69	29.30	46.00	16.70	peak	100	335	P	
3	785.0935	41.06	-10.10	30.96	46.00	15.04	peak	100	85	P	
4	827.4934	39.96	-9.70	30.26	46.00	15.74	peak	100	252	P	
5	884.5029	39.90	-9.02	30.88	46.00	15.12	peak	100	187	P	
6	955.4381	38.49	-8.37	30.12	46.00	15.88	peak	100	11	P	



Shenzhen CTL Testing Technology Co., Ltd

Tel: +86-755-89486194

Unit 01A&B&C&D-1, Building A3, Guangming Sci-Tech Park, Guan Guang Road, Fenghu

Radiated Emission Measurement

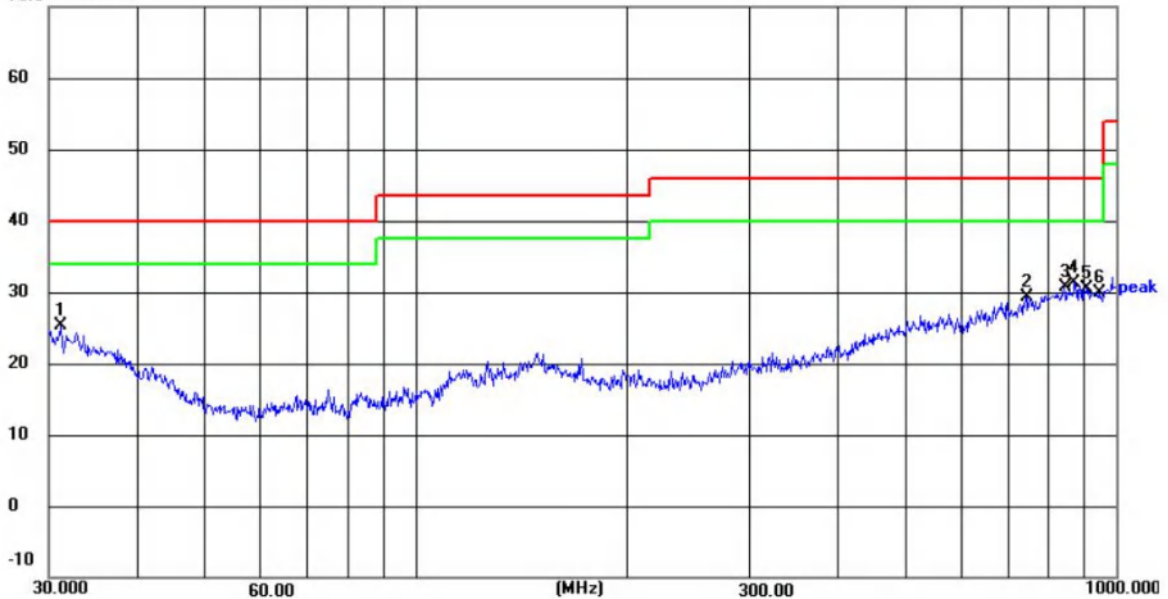
File :RF2

Data :#5894

Date: 2026/06/01

Time: 16:05:25

70.0 dBuV/m



Site LAB Chamber 1

Polarization: **Horizontal**

Temperature: 25(C)

Limit: FCC Part15 Class C_30-1000MHz

Power:

Humidity: 50 %

EUT:

Distance: 3m

M/N:

Mode: BLE1M 2402MHz

Note: CTL2604174031-WF+R12

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	31.1797	36.95	-11.63	25.32	40.00	14.68	peak	100	63	P	
2	744.8660	39.90	-10.63	29.27	46.00	16.73	peak	100	257	P	
3	842.1296	40.46	-9.68	30.78	46.00	15.22	peak	100	146	P	
4	872.1832	40.45	-9.19	31.26	46.00	14.74	peak	100	275	P	
5	909.6666	39.34	-8.74	30.60	46.00	15.40	peak	100	173	P	
6	945.4400	38.27	-8.43	29.84	46.00	16.16	peak	100	229	P	



Shenzhen CTL Testing Technology Co., Ltd

Tel: +86-755-89486194

Unit 01A&B&C&D-1, Building A3, Guangming Sci-Tech Park, Guan Guang Road, Fenghu

Radiated Emission Measurement

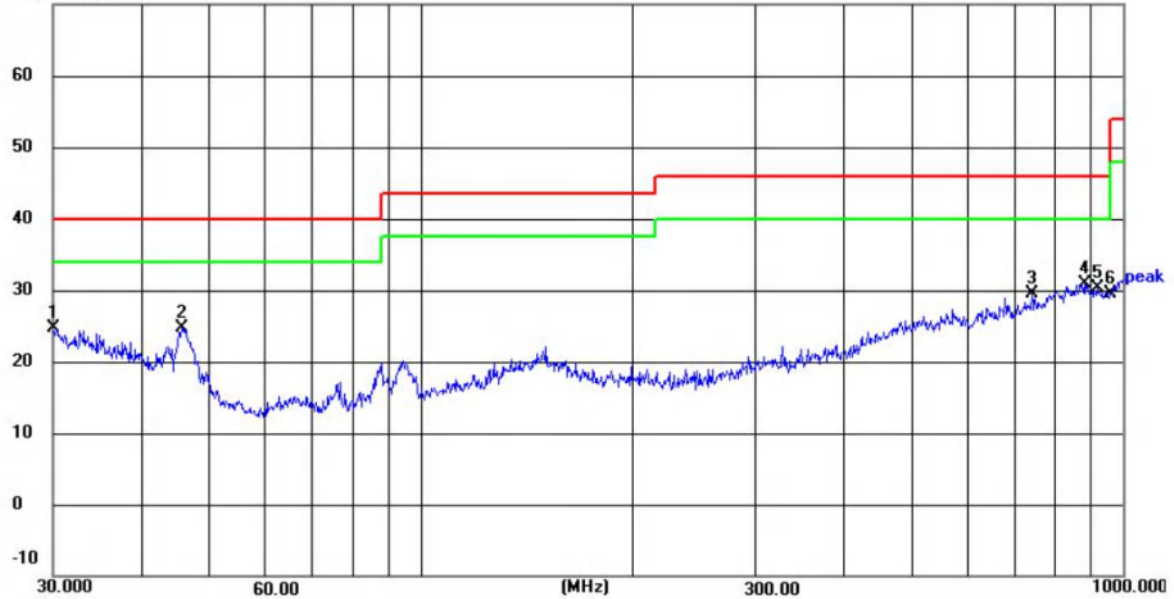
File :RF2

Data :#5895

Date: 2026/06/01

Time: 16:06:11

70.0 dBuV/m



Site LAB Chamber 1

Limit: FCC Part15 Class C_30-1000MHz

EUT:

M/N:

Mode: BLE1M 2402MHz

Note: CTL2604174031-WF+R12

Polarization: **Vertical**

Power:

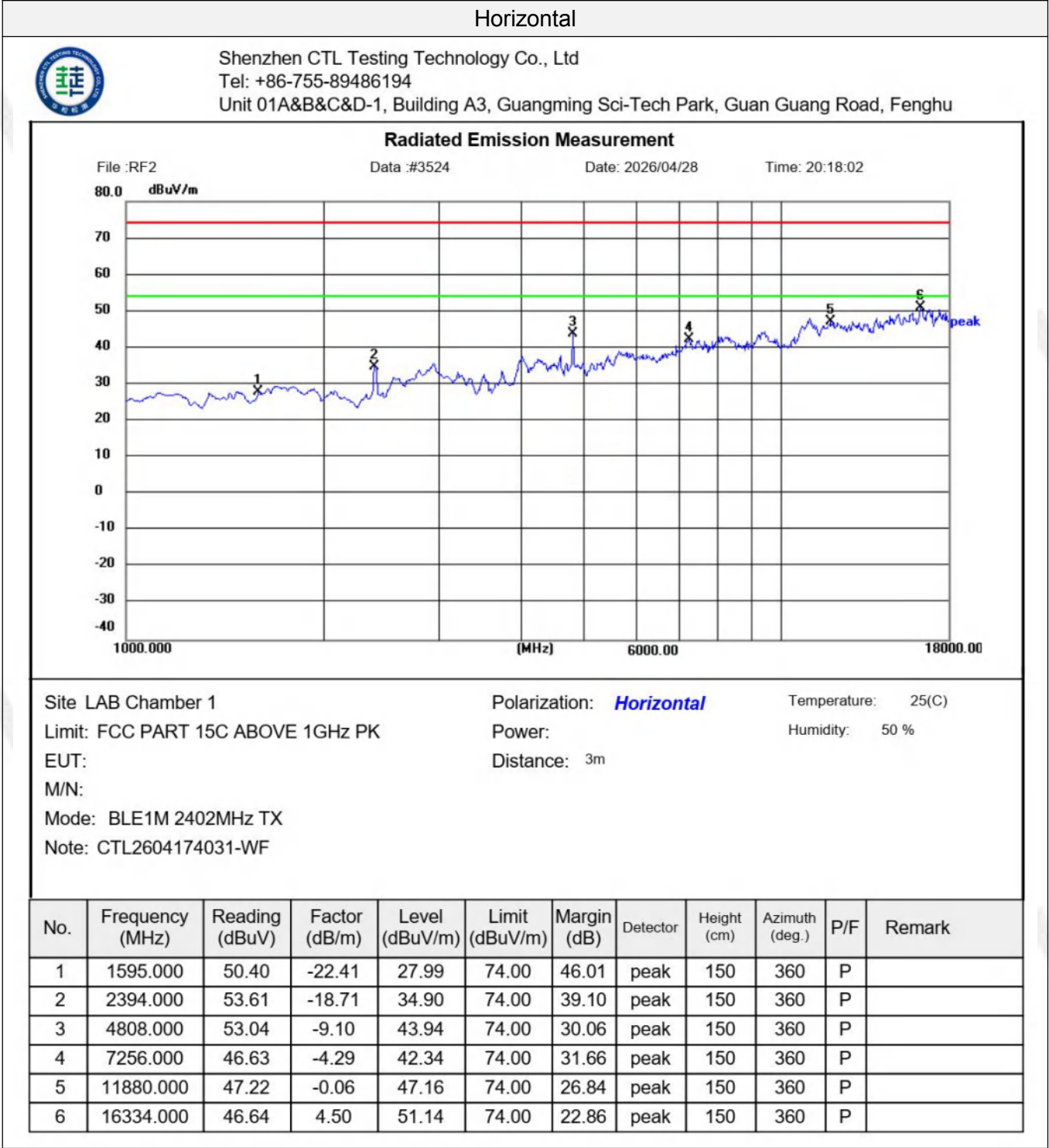
Distance: 3m

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	30.0000	35.27	-10.57	24.70	40.00	15.30	peak	100	344	P	
2	45.8553	45.32	-20.55	24.77	40.00	15.23	peak	100	187	P	
3	742.2587	40.15	-10.69	29.46	46.00	16.54	peak	100	76	P	
4	881.4067	40.03	-9.08	30.95	46.00	15.05	peak	100	297	P	
5	919.2866	38.91	-8.52	30.39	46.00	15.61	peak	100	288	P	
6	958.7943	37.75	-8.16	29.59	46.00	16.41	peak	100	233	P	

For 1GHz to 25GHz



Vertical



Shenzhen CTL Testing Technology Co., Ltd

Tel: +86-755-89486194

Unit 01A&B&C&D-1, Building A3, Guangming Sci-Tech Park, Guan Guang Road, Fenghu

Radiated Emission Measurement

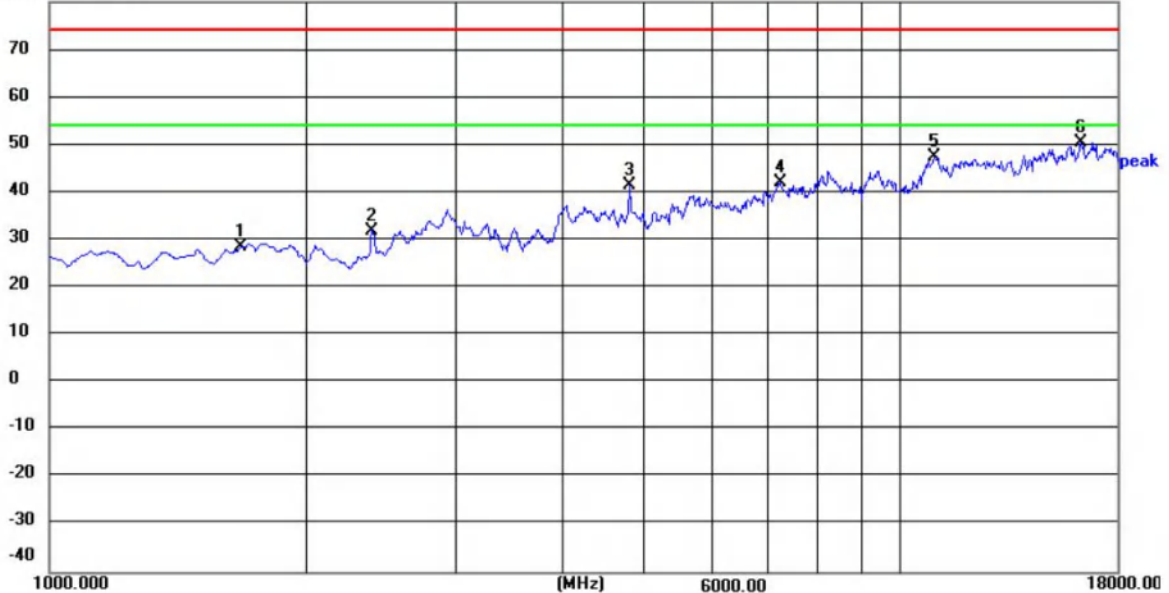
File :RF2

Data :#3525

Date: 2026/04/28

Time: 20:18:47

80.0 dBuV/m



Site LAB Chamber 1

Limit: FCC PART 15C ABOVE 1GHz PK

EUT:

M/N:

Mode: BLE1M 2402MHz TX

Note: CTL2604174031-WF

Polarization: **Vertical**

Power:

Distance: 3m

Temperature: 25(C)

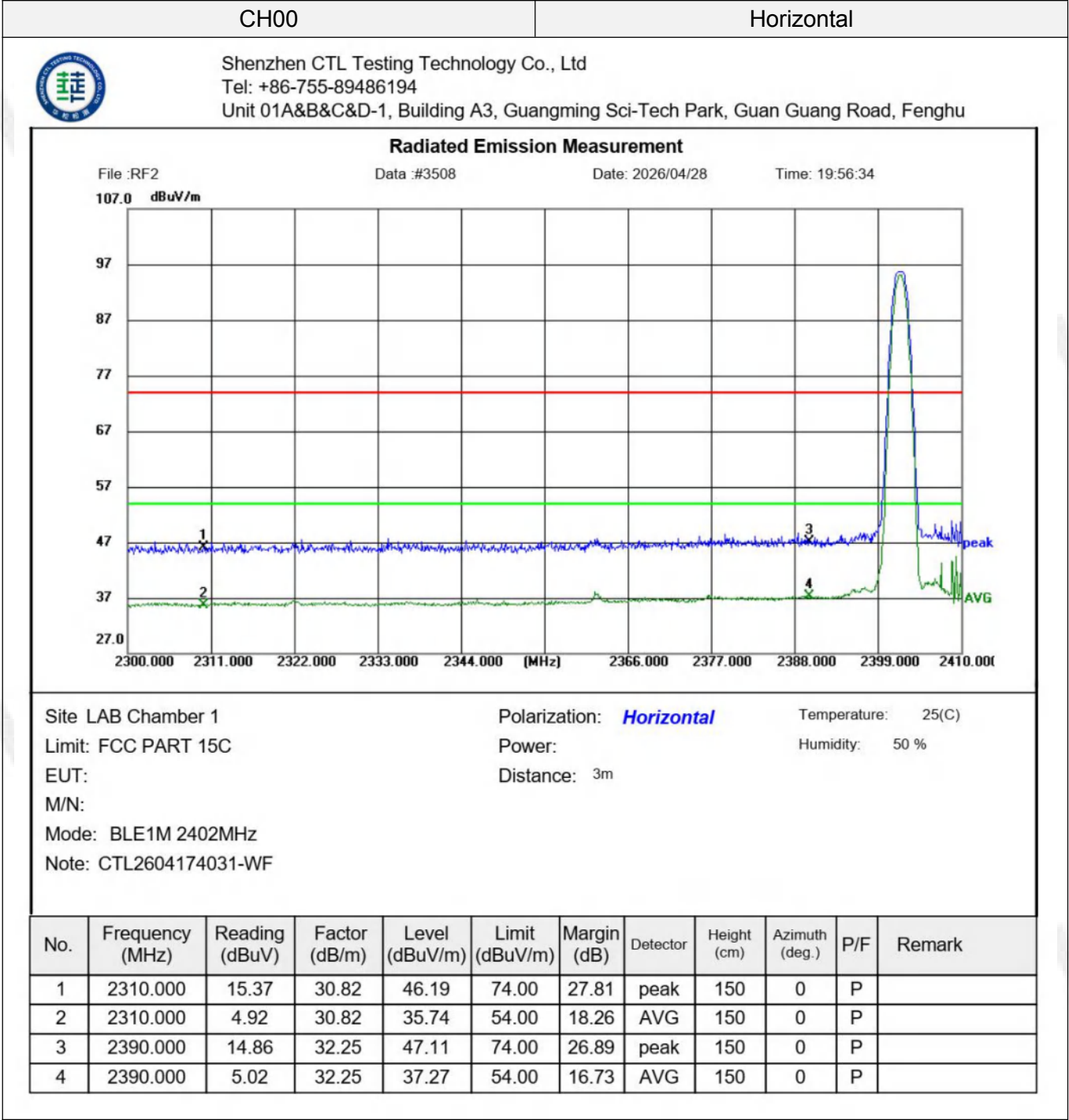
Humidity: 50 %

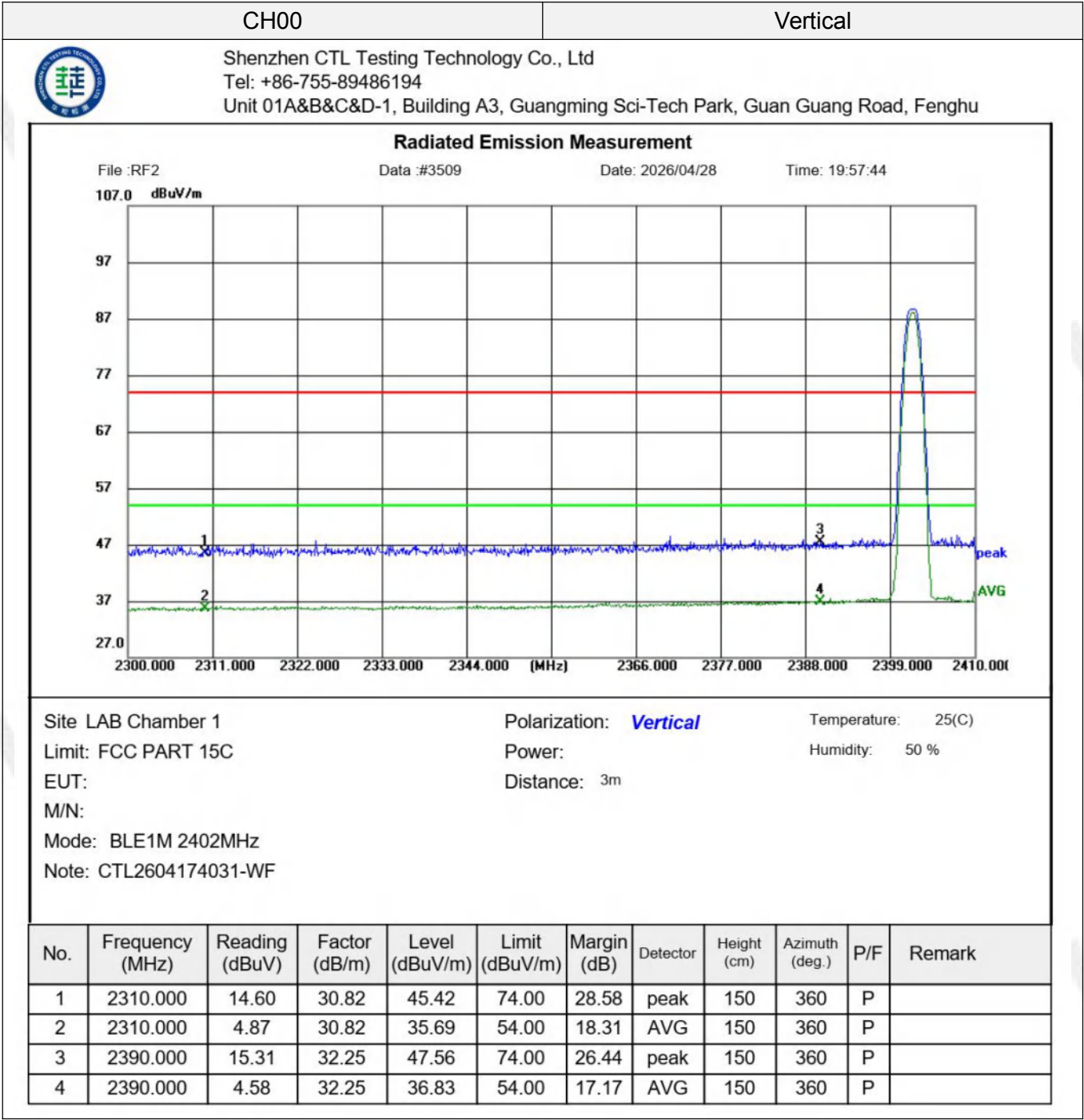
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1680.000	50.51	-22.08	28.43	74.00	45.57	peak	150	0	P	
2	2394.000	50.71	-18.71	32.00	74.00	42.00	peak	150	0	P	
3	4808.000	50.52	-9.10	41.42	74.00	32.58	peak	150	0	P	
4	7222.000	46.20	-4.09	42.11	74.00	31.89	peak	150	0	P	
5	10996.000	46.34	1.07	47.41	74.00	26.59	peak	150	0	P	
6	16334.000	45.92	4.50	50.42	74.00	23.58	peak	150	0	P	

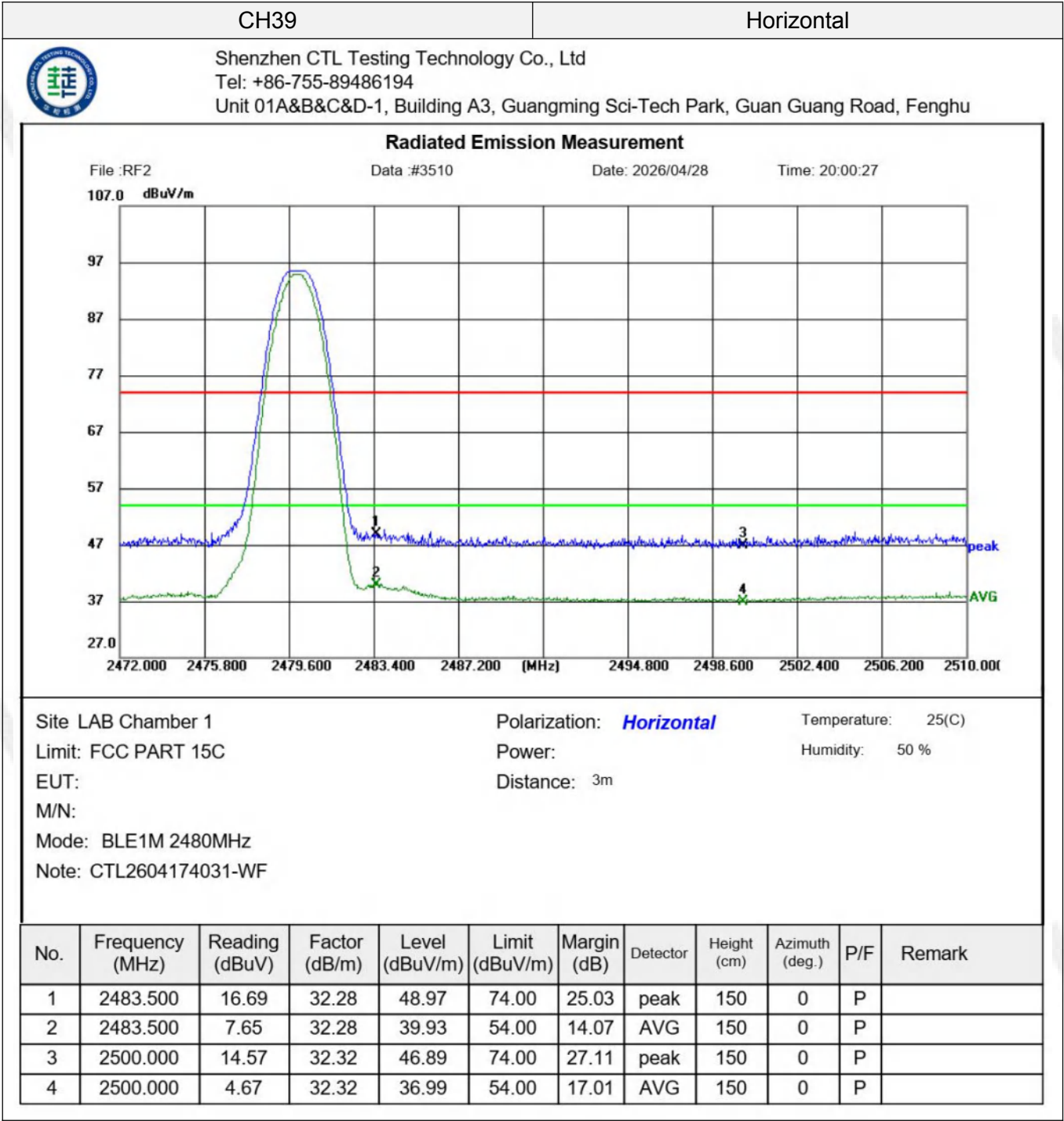
REMARKS:

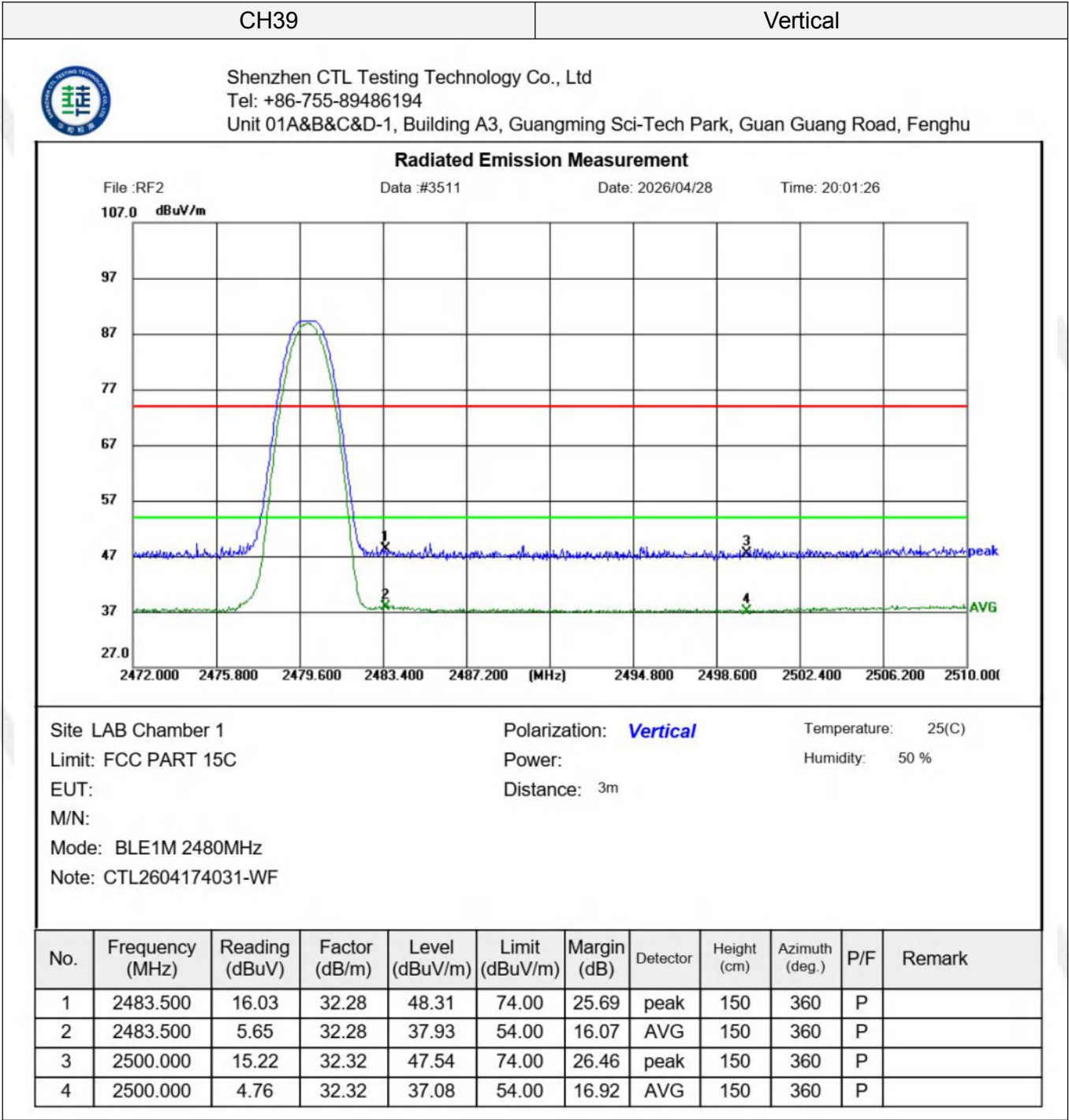
- 18GHz-26GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.
- PK detector measurement value is lower than the average limit. Therefore, there is no need to test AV detector measurements.

Results of Band Edges Test (Radiated)









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 $RBW \geq DTS$ bandwidth.
- b) Set $VBW \geq [3 \times RBW]$.
- c) Set $span \geq [3 \times RBW]$.
- 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 3 of document No. CTL2604174031-WF_Bluetooth Low Energy_Appendix.

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 $\geq 3 \times$ 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 4 of document No. CTL2604174031-WF_Bluetooth Low Energy_Appendix.

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 2 of document No. CTL2604174031-WF_Bluetooth Low Energy_Appendix.

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 conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies 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 5 of document No. CTL2604174031-WF_Bluetooth Low Energy_Appendix.

3.7. Antenna Requirement

Standard Applicable

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

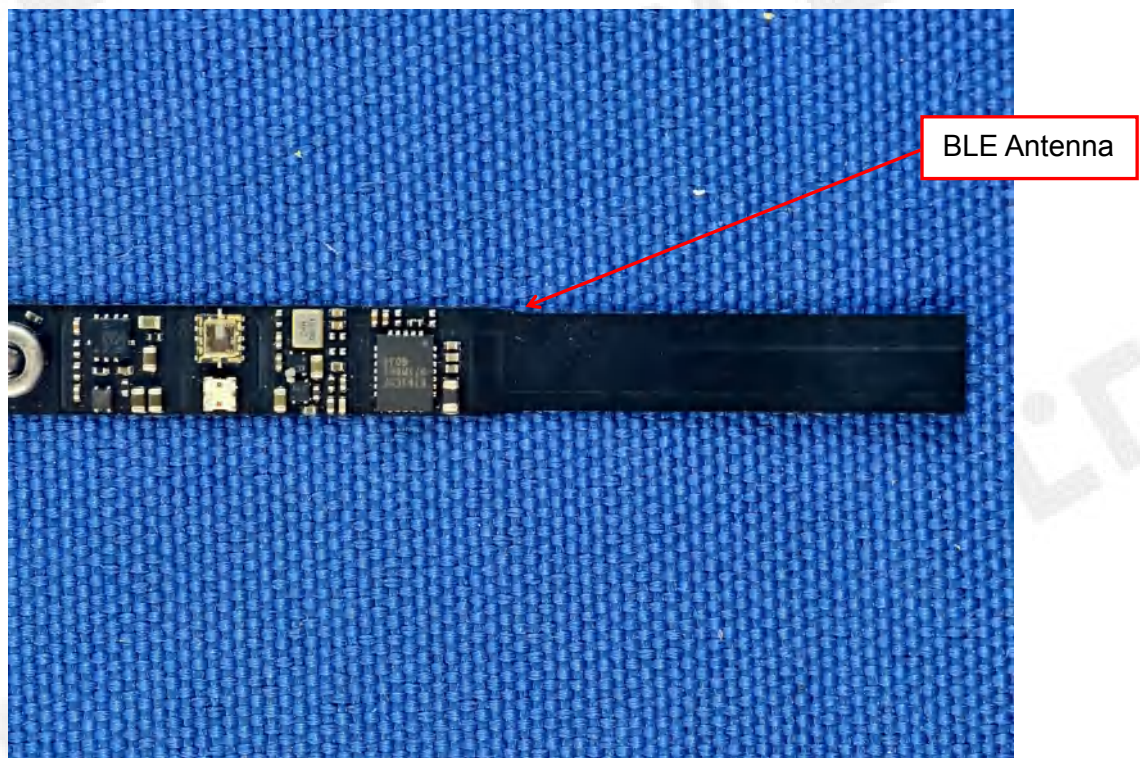
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

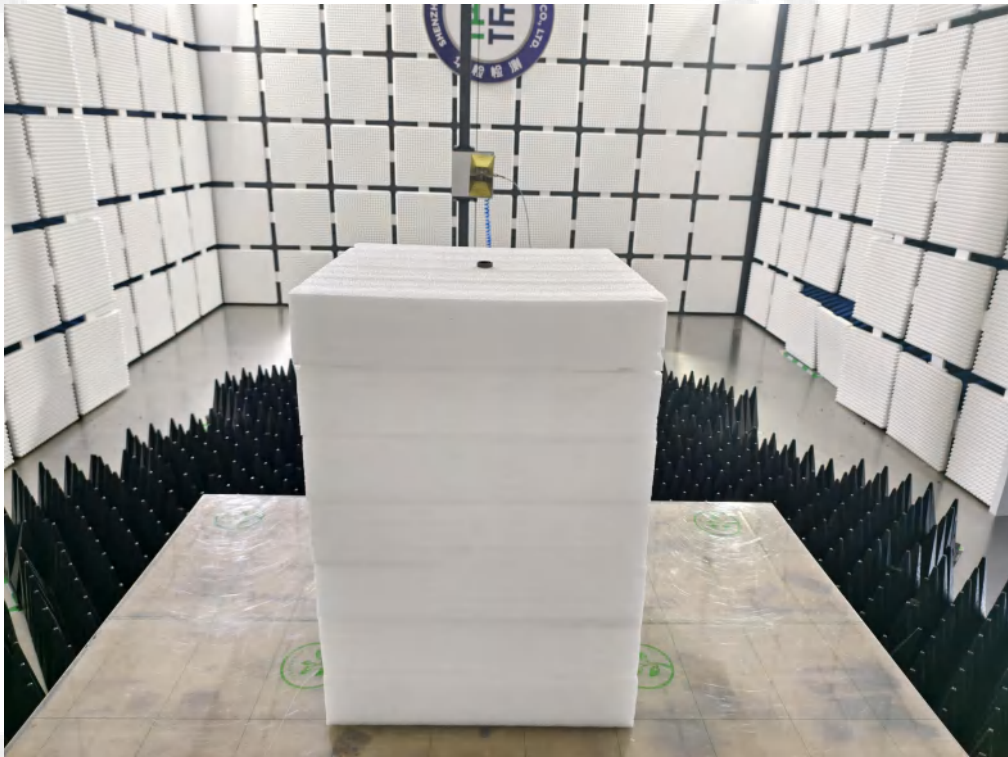
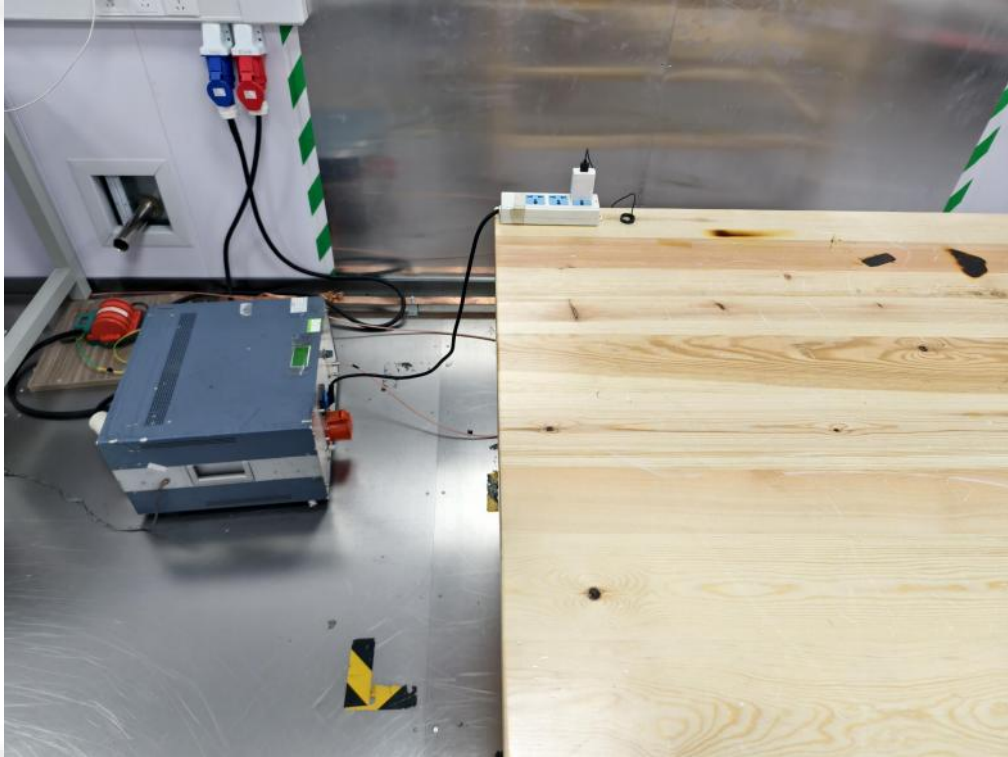
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output 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.

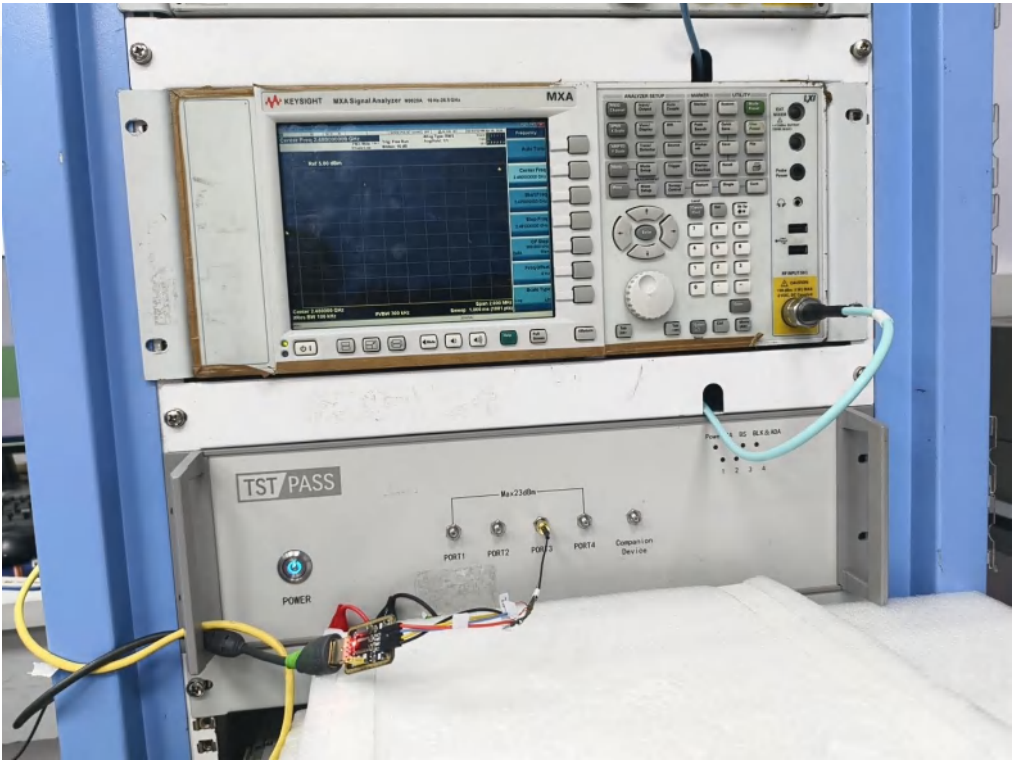
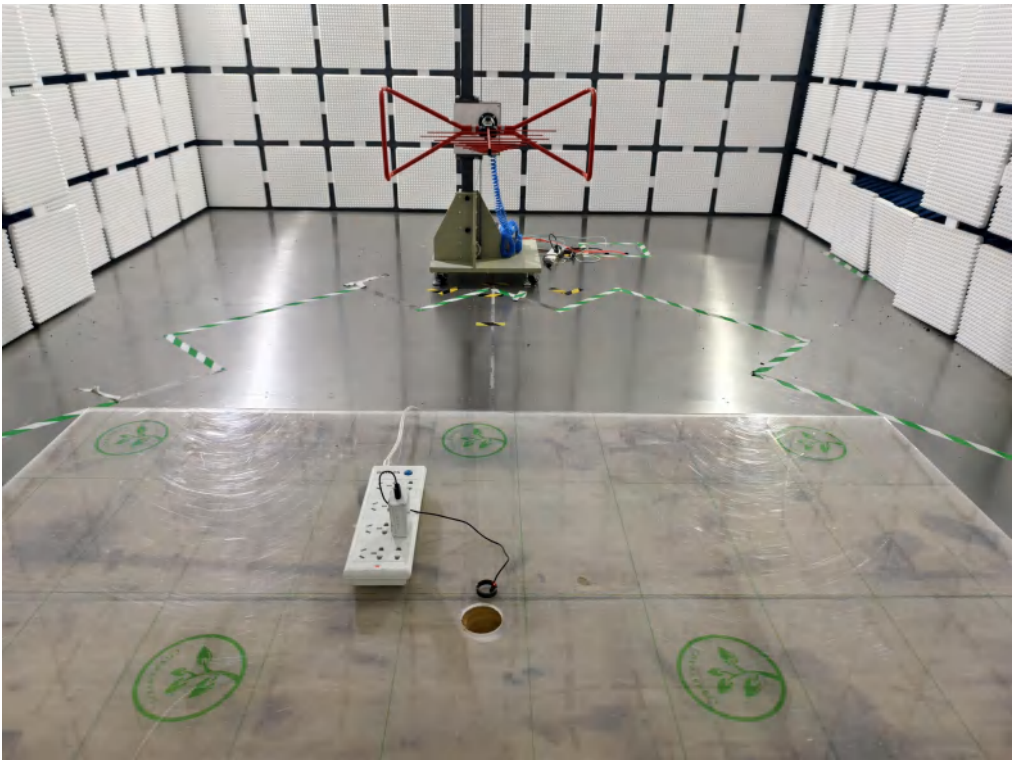
Test Result:

The maximum gain of antenna was -4.22dBi.



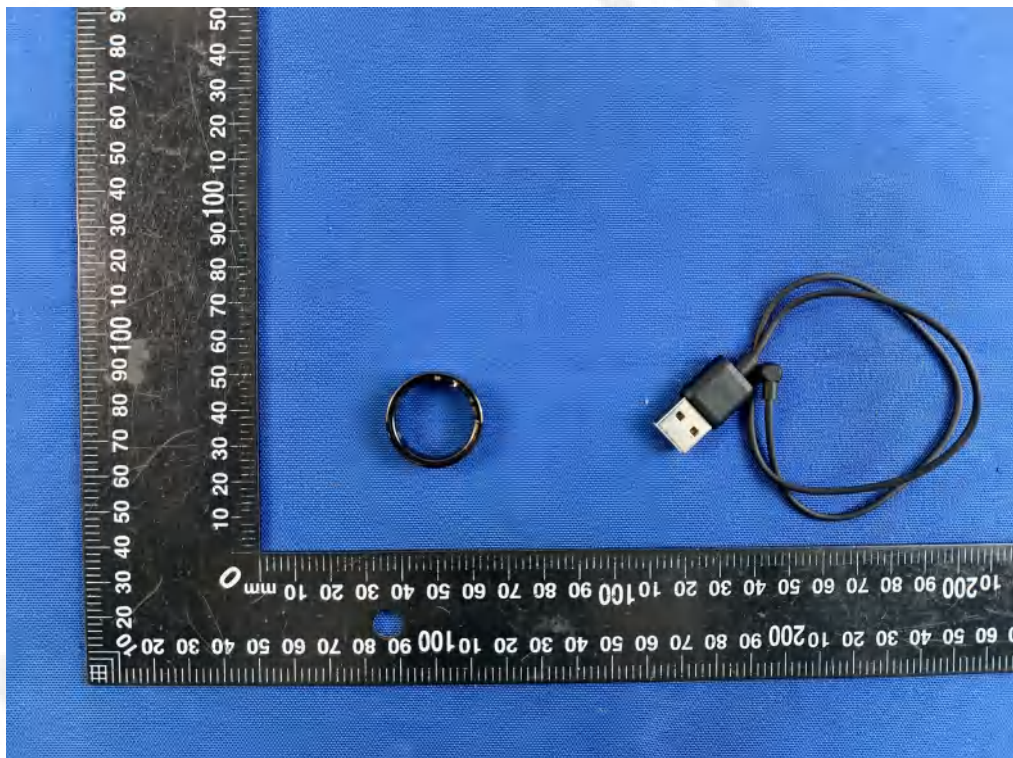
4. Test Setup Photos of the EUT

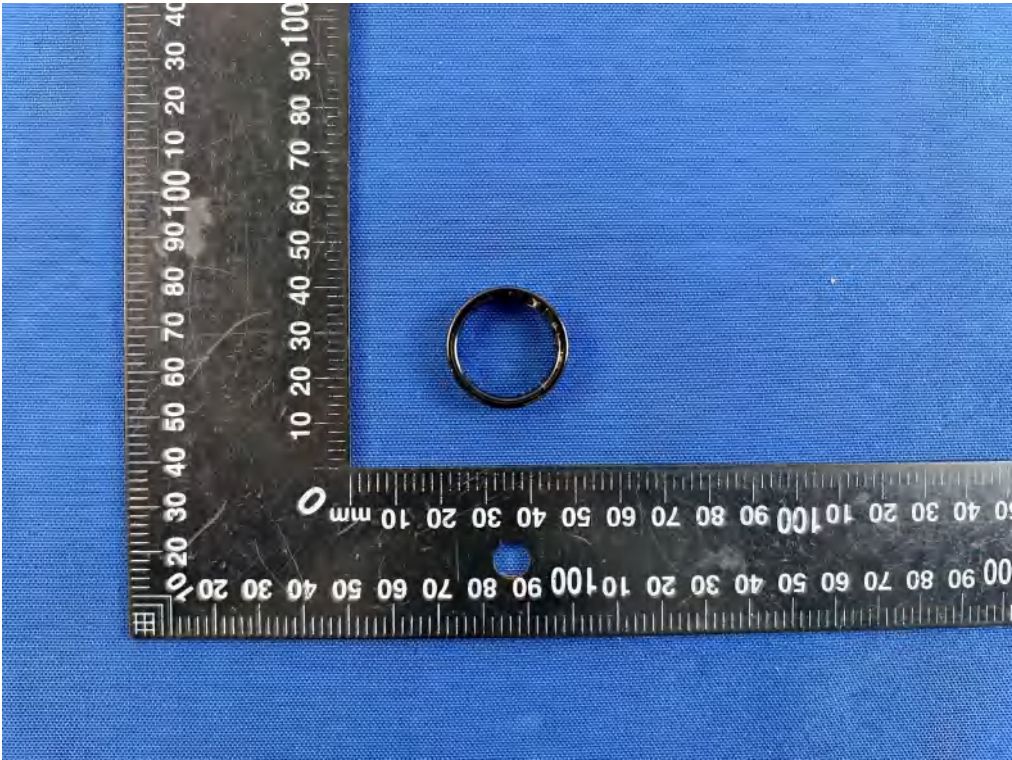
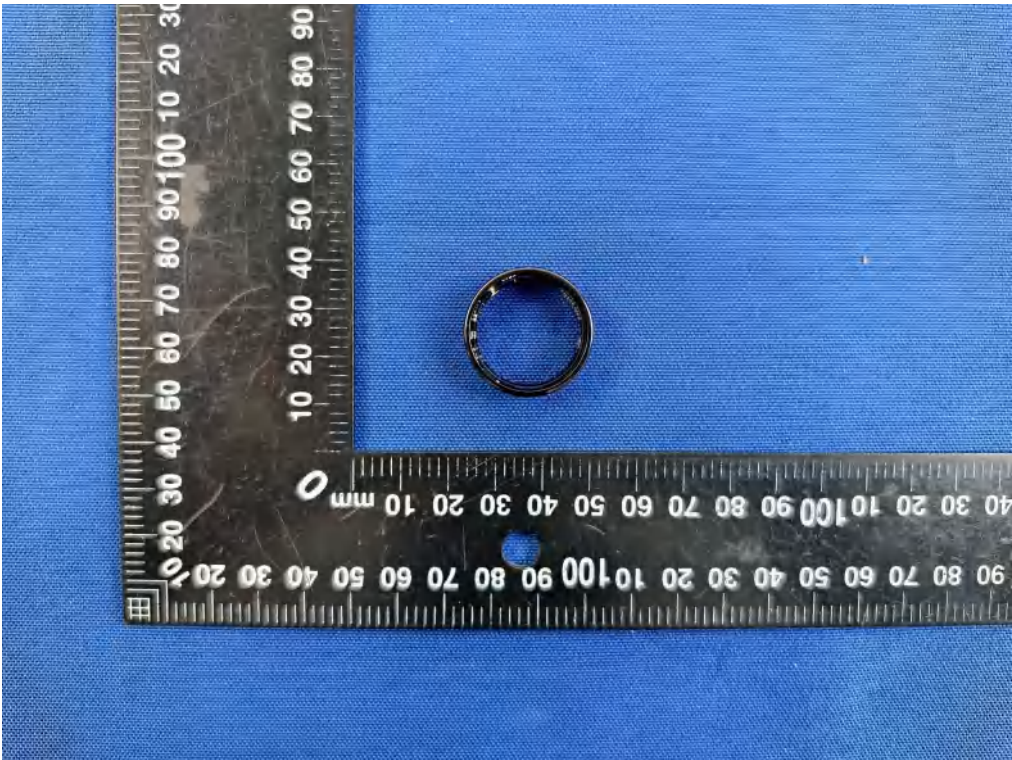




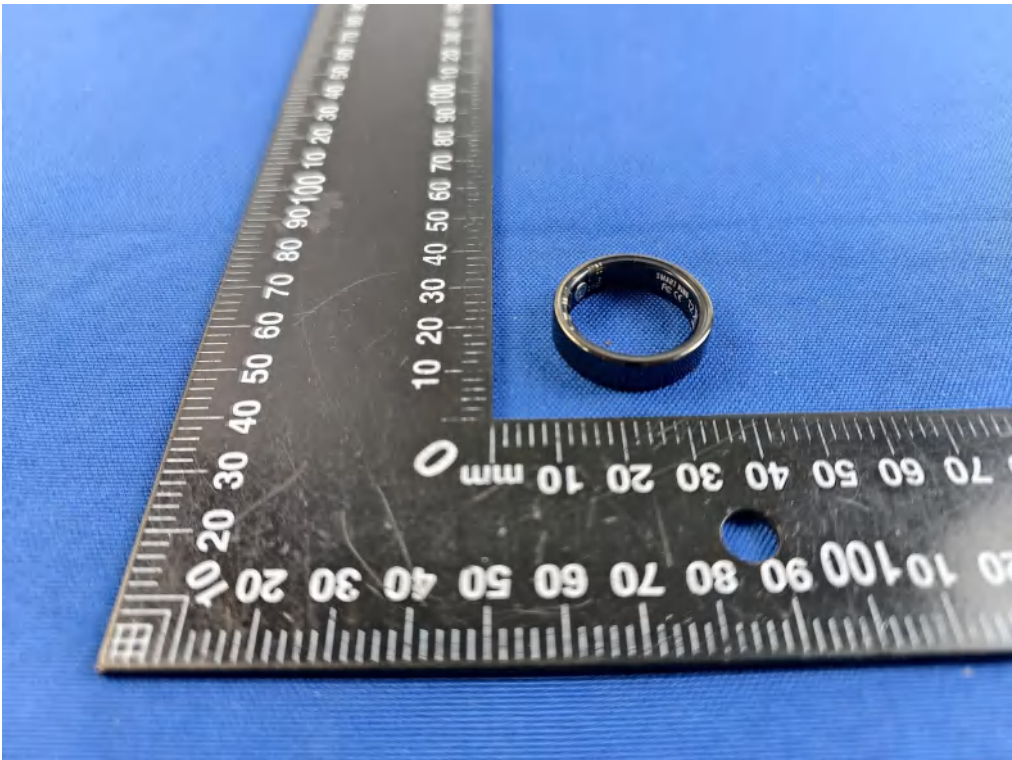
5. Photos of the EUT

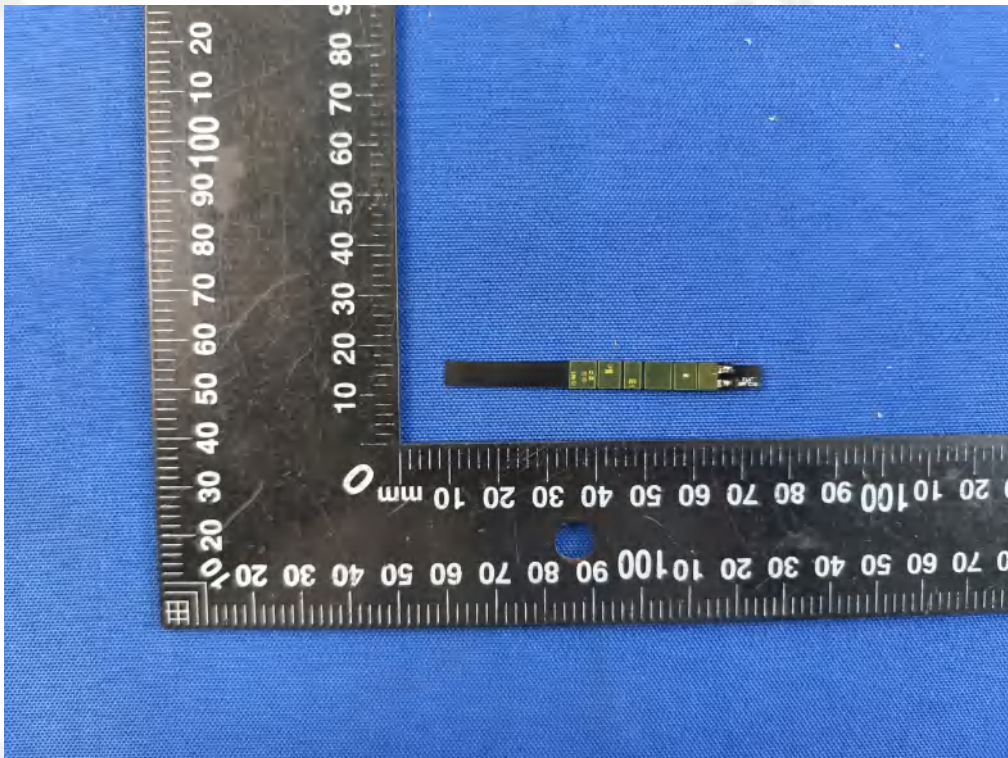
External Photos of EUT

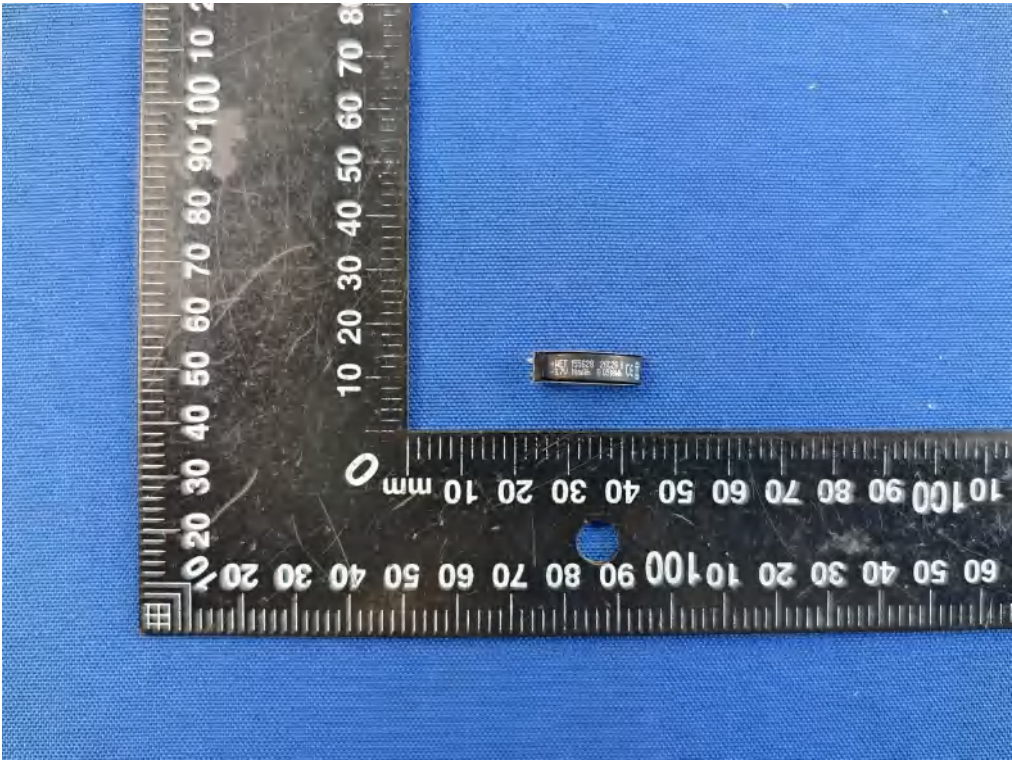
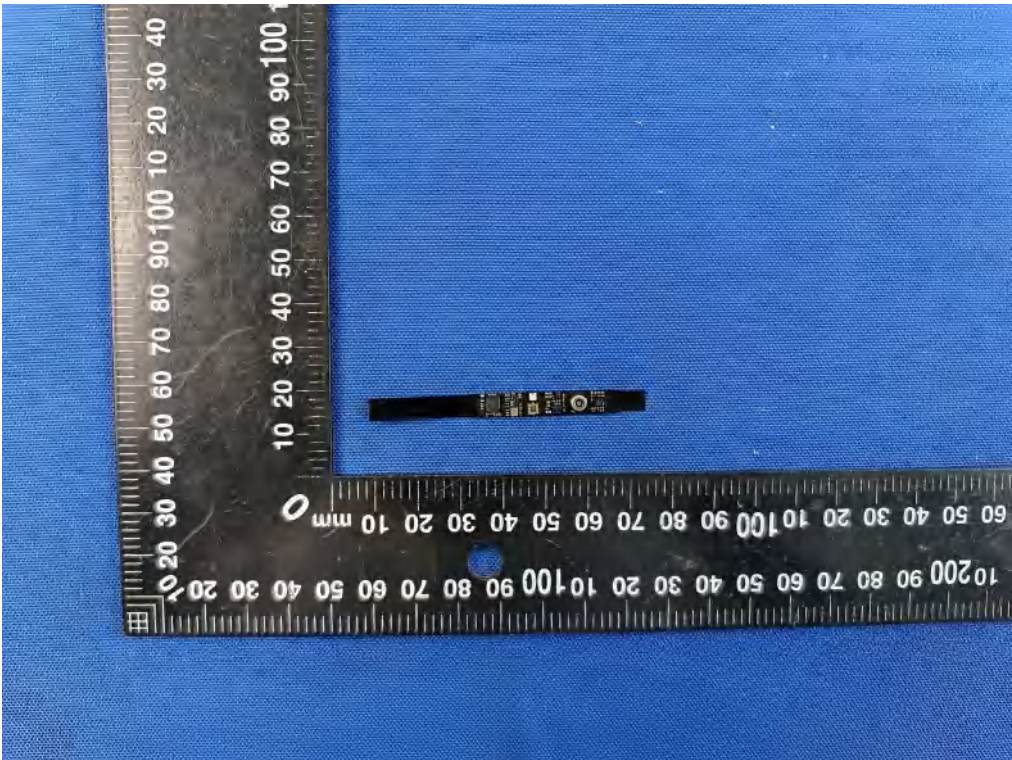


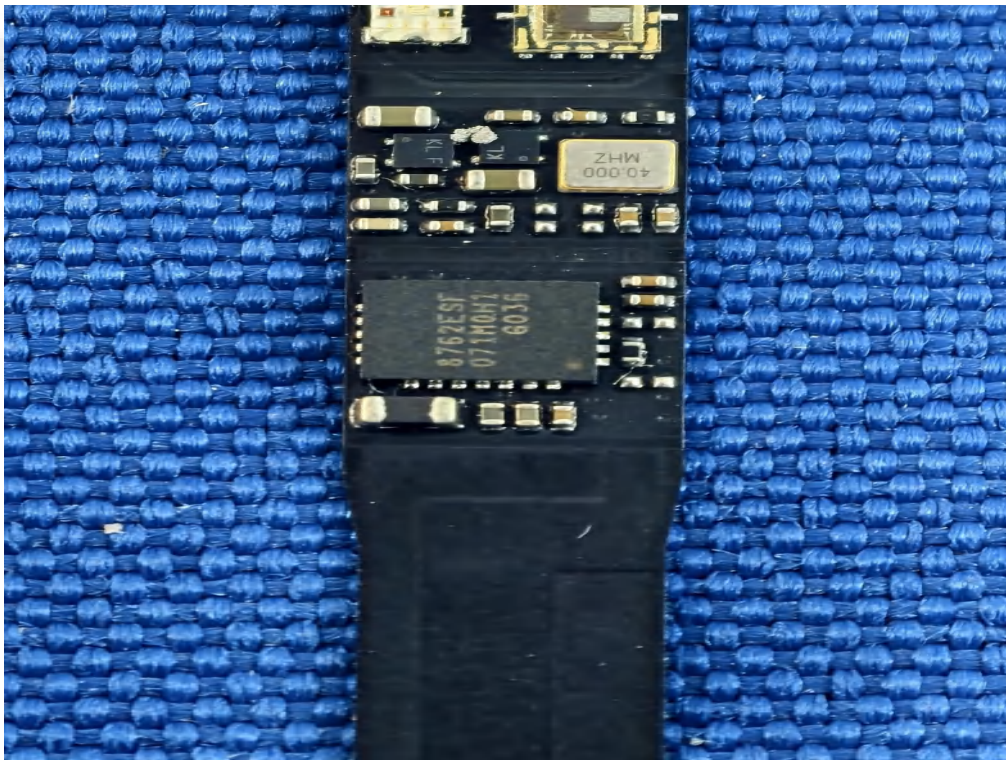
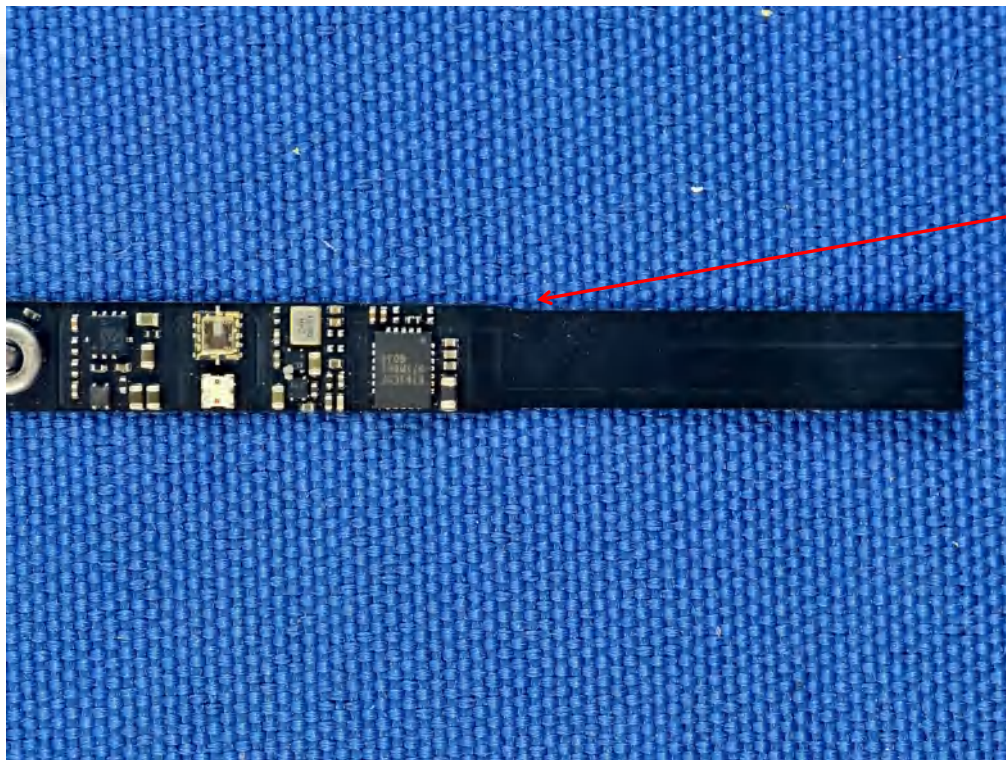






Internal Photos of EUT





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