



World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

FCC Report

FCC ID: 2A59Q-HC-815WB

Product: Barcode scanning equipment

Model No.: HC-815WB

Additional Model No.: HC-101C, HC-101D, HC-Z01, HC-Z02, HC-Z03, HC-Z05
HC-Z06, HC-202C, HC-202H HC-202D, HC-203D, HC-205C, HC-205D, HC-206C
HC-206D, HC-655HW, HC-655HWB, HC-655W, HC-655WB, HC-815W, HC-815CW
HC-825W, HC-825WZ, HC-825PM, HC-835CW, HC-835W, HC-835WB, HC-855CW
HC-855W, HC-855WB, HC-620W, HC-620WB, HC-660W HC-660WB, HC-650CW
HC-650W, HC-650WB, CT-981W CT-981WB, HC-T25, HC-T25B, HC-T27, HC-T28

Trade Mark:  洁锐恒通

Report No.: WSCT-A2LA-R&E211200012A-2.4G

Issued Date: 22 February 2022

Issued for:

ShenZhen JingRui HengTong Electronics Co.Ltd.

Room 706, floor 7, Jinzheng technology building, No. 9, Gaoxin fifth road, Science
Park, Nanshan District, Shenzhen

Issued By:

WORLD STANDARDIZATION CERTIFICATION & TESTING GROUP
(SHENZHEN) CO., LTD.

Building A-B, Baoshi Road, Baoshi Science & Technology Park, Bao'an District,
Shenzhen, Guangdong, People's Republic of China

TEL: + (86) 13924678855

FAX: +86-755-86376605

Note: In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the laboratory's compliance with A2LA's ENERGY STAR ® Accreditation Program requirements 1) accreditation is granted to this laboratory to perform the following tests: EMC, electromagnetic compatibility, telecommunications and Energy Star.



ADD: Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL: 86-755-26996192 26992306 FAX: 86-755-86376605 E-mail: Fengbing.Wang@wsct-cert.com Http://www.wsct-cert.com

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

Member of the WSCT INC.



	Page
1. GENERAL INFORMATION	3
1.1 GENERAL DESCRIPTION OF EUT:	4
1.2. FACILITIES AND ACCREDITATIONS	5
1.3. ACCREDITATIONS	5
2. TEST DESCRIPTION	6
2.1 MEASUREMENT UNCERTAINTY	6
2.2 DESCRIPTION OF TEST MODES	7
2.3 CONFIGURATION OF SYSTEM UNDER TEST	9
2.4 DESCRIPTION OF SUPPORT UNITS	9
3. SUMMARY OF TEST RESULTS	10
4. MEASUREMENT INSTRUMENTS	11
5. ANTENNA REQUIREMENTS	12
6. CONDUCTED EMISSIONS MEASUREMENT	13
6.1 POWER LINE CONDUCTED EMISSION LIMITS	13
6.2 TEST PROCEDURE	14
6.3 TEST SETUP	14
6.4 ENVIRONMENTAL CONDITIONS	14
6.5 TEST RESULTS	14
7. RADIATED EMISSION MEASUREMENT	15
7.1 APPLIED PROCEDURES / LIMIT	15
7.1 RADIATED EMISSION LIMITS	15
7.2 TEST EQUIPMENT SETUP	16
7.3 TEST PROCEDURE	16
7.4 TEST SETUP	17
7.5 ENVIRONMENTAL CONDITIONS	18
7.6 TEST RESULTS	19
8. 20DB OCCUPIED BANDWIDTH	28
8.1 STANDARD APPLICABLE	28
8.2 TEST PROCEDURE	28
8.3 TEST SETUP	28
8.4 ENVIRONMENTAL CONDITIONS	28
8.5 TEST RESULTS	29
9. EUT TEST PHOTO	31
10. PHOTOGRAPHS OF EUT	32

For Question,
Please Contact with WSCT
www.wsct-cert.com





1. GENERAL INFORMATION

Product:	Barcode scanning equipment
Model No.:	HC-815WB
Additional Model:	HC-101C, HC-101D, HC-Z01, HC-Z02, HC-Z03, HC-Z05 HC-Z06, HC-202C, HC-202H HC-202D, HC-203D, HC-205C, HC-205D, HC-206C HC-206D, HC-655HW, HC-655HWB, HC-655W, HC-655WB, HC-815W, HC-815CW HC-825W, HC-825WZ, HC-825PM, HC-835CW, HC-835W, HC-835WB, HC-855CW HC-855W, HC-855WB, HC-620W, HC-620WB, HC-660W HC-660WB, HC-650CW HC-650W, HC-650WB, CT-981W CT-981WB, HC-T25, HC-T25B, HC-T27, HC-T28
Applicant:	ShenZhen JingRui HengTong Electronics Co.Ltd.
Address:	Room 706, floor 7, Jinzheng technology building, No. 9, Gaoxin fifth road, Science Park, Nanshan District, Shenzhen
Manufacturer:	DongGuanChiTeng Electronics Co.Ltd.
Address:	Room 202, building 5, No. 6, South Yiheng Road, Tangxia Town, Dongguan City, Guangdong Province
Data of receipt:	09 December 2021
Date of Test:	09 December 2021 to 29 December 2021
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249

The above equipment has been tested by World Standardization Certification & Testing Group Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

Wang Xiang

(Wang Xiang)

Check By:

Pu Shixi

(Pu Shixi)

Approved By:

Wang Fengbing

(Wang Fengbing)

Date:

22 February 2022





Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

1.1 GENERAL DESCRIPTION OF EUT:

Product	Barcode scanning equipment
Model No.	HC-815WB
Brand Name	HC-101C, HC-101D, HC-Z01, HC-Z02, HC-Z03, HC-Z05 HC-Z06, HC-202C, HC-202H HC-202D, HC-203D, HC-205C, HC-205D, HC-206C HC-206D, HC-655HW, HC-655HWB, HC-655W, HC-655WB, HC-815W, HC-815CW HC-825W, HC-825WZ, HC-825PM, HC-835CW, HC-835W, HC-835WB, HC-855CW HC-855W, HC-855WB, HC-620W, HC-620WB, HC-660W HC-660WB, HC-650CW HC-650W, HC-650WB, CT-981W CT-981WB, HC-T25, HC-T25B, HC-T27, HC-T28
Hardware version:	N/A
Software version:	N/A
Extreme Temp. Tolerance	-10°C to +65°C
Battery information:	Li-ion Battery :18650 Rated Voltage: 3.6V Rated Capacity:2000mAh Limited Charge Voltage: 4.2 V
Operating Frequency	2410-2470MHz
Channels	60
Channel Spacing	1MHz
Modulation Type	GFSK
Antenna Type:	Integral Antenna
Antenna gain:	0.56dBi
Deviation	None
Condition of Test Sample	Normal

Model difference: HC-815WB, HC-101C, HC-101D, HC-Z01, HC-Z02, HC-Z03, HC-Z05 HC-Z06, HC-202C, HC-202H HC-202D, HC-203D, HC-205C, HC-205D, HC-206C HC-206D, HC-655HW, HC-655HWB, HC-655W, HC-655WB, HC-815W, HC-815CW, HC-825W, HC-825WZ, HC-825PM, HC-835CW, HC-835W, HC-835WB, HC-855CW HC-855W, HC-855WB, HC-620W, HC-620WB, HC-660W HC-660WB, HC-650CW HC-650W, HC-650WB, CT-981W, CT-981WB, HC-T25, HC-T25B, HC-T27, HC-T28 is only the model name difference, the main test model HC-815WB .



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

Member of the WSCT INC.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

1.2. FACILITIES AND ACCREDITATIONS

All measurement facilities used to collect the measurement data are located at Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the WORLD STANDARDIZATION CERTIFICATION & TESTING GROUP (SHENZHEN) CO., LTD.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.10-2014. The sample tested as described in this report is in compliance with the FCC Rules Part15 Subpart C.

ALL the testing were referenced KDB NO.453039

The test results of this report relate only to the tested sample identified in this report.

1.3. ACCREDITATIONS

China National Accreditation Service for Conformity Assessment (CNAS)

Registration number NO: L3732

American Association for Laboratory Accreditation(A2LA)

Registration NO: 5768.01

Copies of granted accreditation certificates are available for downloading from our web site,

<http://www.wsct-cert.com>



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

Member of the WSCT INC.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

2. TEST DESCRIPTION

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$ · where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$ · providing a level of confidence of approximately 95 % ·

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 3.2\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.7\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.7\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$



世标检测认证股份

ADD: Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL: 86-755-26996192 26992306 FAX: 86-755-86376605 E-mail: Fengbing.Wang@wsct-cert.com Http://www.wsct-cert.com

World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

2.2 DESCRIPTION OF TEST MODES

The system was configured for testing in engineering mode, which was provided by the manufacturer. The engineering mode was configured under maximum power output and switched the channels by keys.

27 channels were provided by the manufacturer.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2410	21	2431	41	2451
02	2411	22	2432	42	2452
03	2412	23	2433	43	2453
04	2413	24	2434	44	2454
05	2414	25	2435	45	2455
06	2415	26	2436	46	2456
07	2416	27	2437	47	2457
08	2417	28	2438	48	2458
09	2418	29	2439	49	2459
10	2419	30	2440	50	2460
11	2420	31	2441	51	2461
12	2421	32	2442	52	2462
13	2422	33	2443	53	2463
14	2423	34	2444	54	2464
15	2424	35	2445	40	2465
16	2425	36	2446	56	2466
17	2426	37	2447	57	2467
18	2427	38	2448	58	2468
19	2428	39	2449	59	2469
20	2429	40	2450	60	2470



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

Member of the WSCT INC.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com**Test Mode List**

Test Mode	Description	Remark	
TM1	Low Channel	2410MHz	
TM2	Middle Channel	2440MHz	
TM3	High Channel	2470MHz	

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Record the worst case of each test item in this report.



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



2.3 CONFIGURATION OF SYSTEM UNDER TEST

EUT

(EUT: Barcode scanning equipment)

2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model No.	ID or Specification	Remark
1	/	/	/	/

Note:

- (1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- (2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.





3. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.249) , Subpart C			
Standard Section	Test Item	Judgment	Remark
§15.203	Antenna Requirement	PASS	
§15.207	Conducted Emission	N/A	
15.209(a),15.249(a),15.249(c),15.205(a)	Fundamental & Radiated Spurious Emission Measurement	PASS	
§15.249 (d)/ §15.205	Band Edge	PASS	
§15.215 (c)	20dB Occupied Bandwidth	PASS	

Note:

1. Pass: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.





For Question,
Please Contact with WSCT
www.wsct-cert.com

4. MEASUREMENT INSTRUMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibrated	Calibrated until
EMI Test Receiver	R&S	ESCI	100005	2021-11-05	2022-11-04
LISN	Mestec	AN3016	04/10040	2021-11-05	2022-11-04
Coaxial cable	Megalon	LMR400	C001	2021-11-05	2022-11-04
System Controller	CT	SC100	011208	2021-11-05	2022-11-04
Bi-log Antenna	SUNOL Sciences	JB3	A021907	2021-11-05	2022-11-04
Spectrum Analyzer	R&S	FSU	100114	2021-11-05	2022-11-04
Horn Antenna	SCHWARZBECK	9120D	1141	2021-11-05	2022-11-04
Loop Antenna	EMCO	6502	00042960	2021-11-05	2022-11-04
Pre Amplifier	H.P.	HP8447E	2945A02715	2021-11-05	2022-11-04
Pre-Amplifier	CDSI	PAP-1G18-38	7621	2021-11-05	2022-11-04
9*6*6 Anechoic	SAEMC	L×W×H 9×6×6	A002	2021-11-05	2022-11-04
RF cable	H+S	SUCOFLEX 102	R002	2021-11-05	2022-11-04
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	2021-11-05	2022-11-04



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

5. ANTENNA REQUIREMENTS

5.1

According to FCC Part 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 shall be considered sufficient to comply with the provisions of this section.

5.2 Test Result

This product has an PCB antenna, fulfill the requirement of this section.



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

6. CONDUCTED EMISSIONS MEASUREMENT

6.1 POWER LINE CONDUCTED EMISSION LIMITS

(Frequency Range 150KHz-30MHz)

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

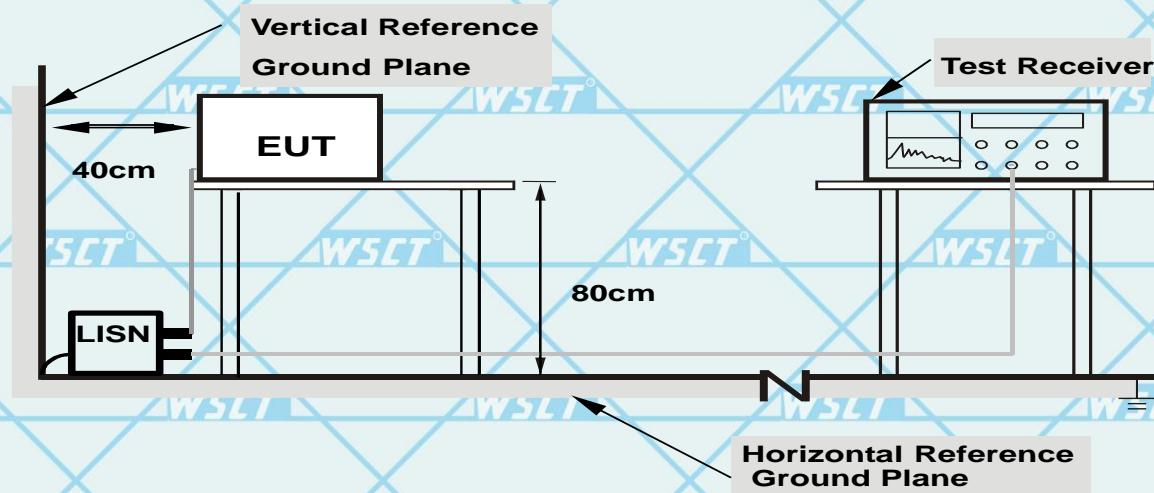
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



6.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

6.3 TEST SETUP



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

6.4 ENVIRONMENTAL CONDITIONS

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

6.5 TEST RESULTS

The EUT is supplied by button cell, so Conducted Emission is not applicable.





7. RADIATED EMISSION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

7.1 RADIATED EMISSION LIMITS

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of Harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.



7.2 TEST EQUIPMENT SETUP

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

7.3 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

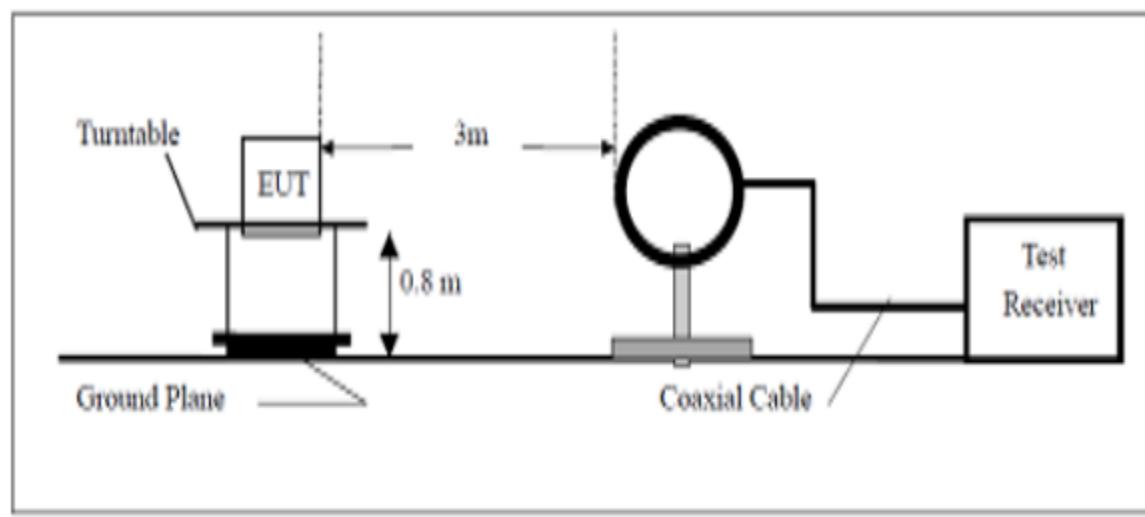




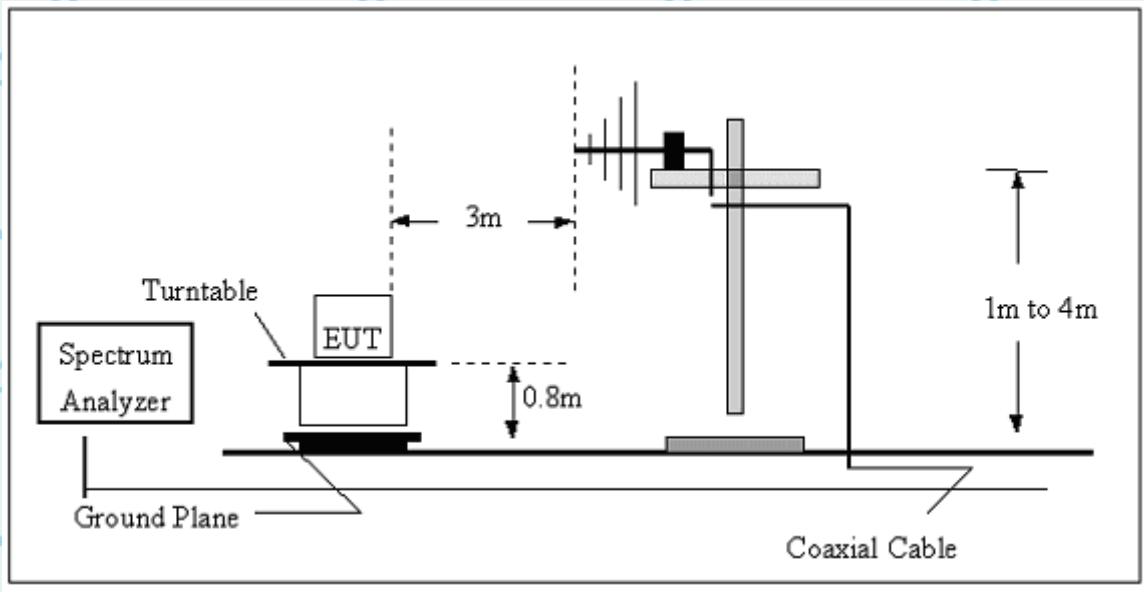
For Question,
Please Contact with WSCT
w.wsct-cert.com

7.4 TEST SETUP

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



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



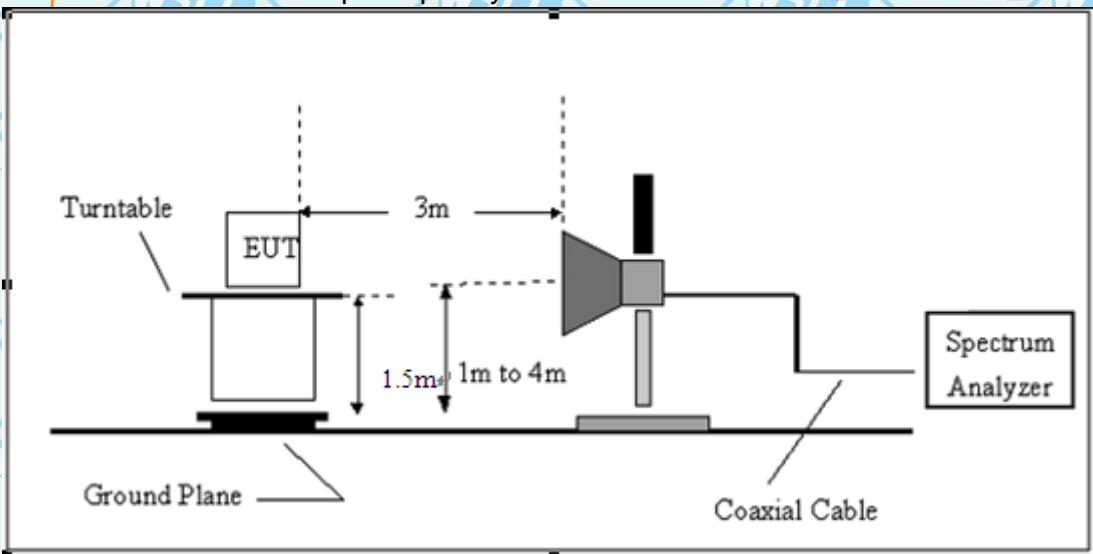
世标检测认证股份
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com Http://www.wsct-cert.com

Member of the WSCT INC.



(C) Radiated Emission Test-Up Frequency Above 1GHz



For Question,
please Contact with WSCT
www.wsct-cert.com

7.5 ENVIRONMENTAL CONDITIONS

Temperature:	25°C
Relative Humidity:	57%
ATM Pressure:	1012 mbar



世标检测认证股份

ADD: Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL: 86-755-26996192 26992306 FAX: 86-755-86376605 E-mail: Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.



7.6 TEST RESULTS

Field Strength of Fundamental

For Question,
Please Contact with WSCT
www.wsct-cert.com

Frequency (MHz)	Reading (dBuV/m)	Correct Factor dB/m	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
2410	90.62	-8.63	81.99	114	-32.01	H	PK
2410	92.70	-8.63	84.07	94	-9.93	H	AV
2440	93.42	-8.4	85.02	114	-28.98	H	PK
2440	92.10	-8.4	83.70	94	-10.30	H	AV
2470	90.82	-8.27	82.55	114	-31.45	H	PK
2470	90.66	-8.27	82.39	94	-11.61	H	AV
2410	90.56	-8.63	81.93	114	-32.07	V	PK
2410	91.21	-8.63	82.58	94	-11.42	V	AV
2440	91.96	-8.4	83.56	114	-30.44	V	PK
2440	91.37	-8.4	82.97	94	-11.03	V	AV
2470	92.98	-8.27	84.71	114	-29.29	V	PK
2470	93.53	-8.27	85.26	94	-8.74	V	AV

Note:

Correction Factor= Antenna Factor + Cable loss–Pre-amplifier; Emission Level=Peak Reading + Correction Factor; Margin=Emission Level–Limit.





Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

Spurious Emissions
Frequency Range (9 kHz-30MHz)

Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	P
--	--	--	--	P

Note:

1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor
2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

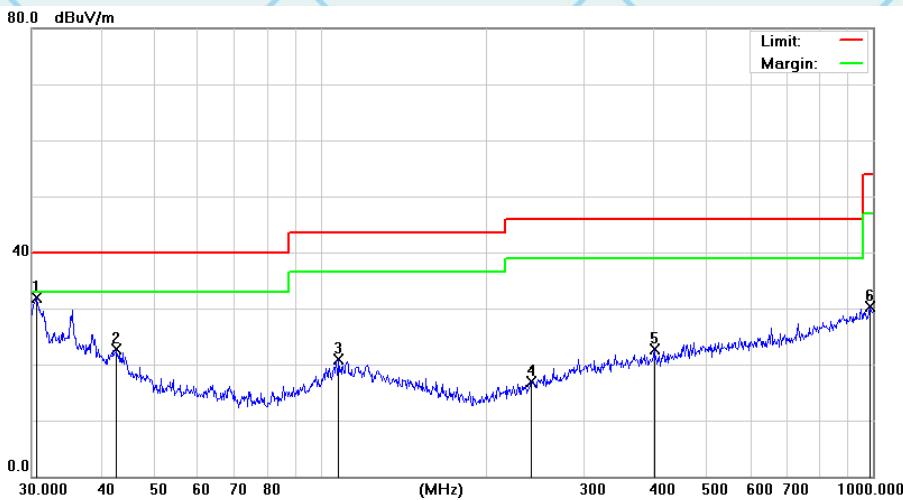


Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

Frequency Range (30MHz-1000MHz)

Horizontal:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	30.6379	27.36	4.54	31.90	40.00	-8.10	QP
2		42.7496	23.80	-1.15	22.65	40.00	-17.35	QP
3		107.8877	23.14	-2.28	20.86	43.50	-22.64	QP
4		240.8304	22.07	-5.15	16.92	46.00	-29.08	QP
5		401.8385	23.67	-1.01	22.66	46.00	-23.34	QP
6		986.0717	23.30	7.07	30.37	54.00	-23.63	QP



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

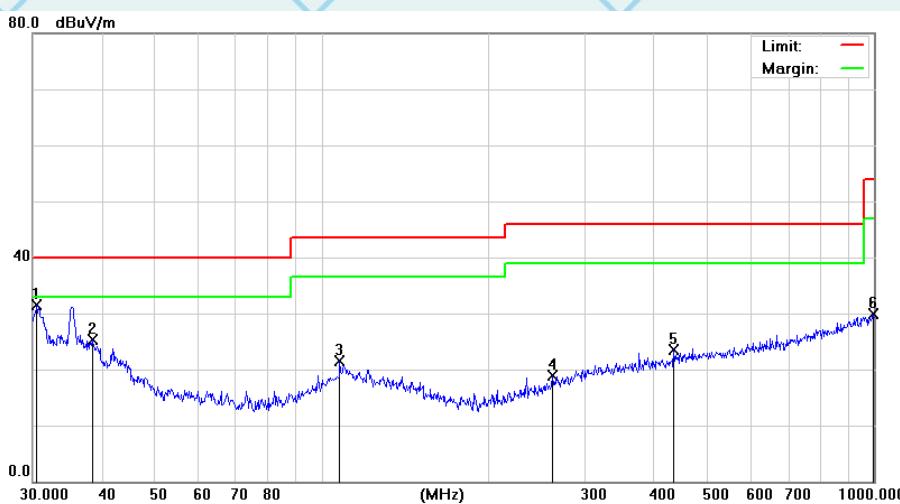
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



Certificate Number 5768.01

For Question,
Please
Contact with WSCT
wsct-cert.com

Vertical:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	WSCT
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB		
1	*	30.5306	26.84	4.59	31.43	40.00	-8.57	QP
2		38.4809	24.52	0.82	25.34	40.00	-14.66	QP
3		107.8877	23.87	-2.28	21.59	43.50	-21.91	QP
4		261.9753	23.01	-4.12	18.89	46.00	-27.11	QP
5		434.0651	23.87	-0.43	23.44	46.00	-22.56	QP
6		996.4996	22.62	7.25	29.87	54.00	-24.13	QP

Note:

Measurements were conducted in all channels (high, middle, low), and the worst case (low channel) was submitted only.



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com Http://www.wsct-cert.com

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



Frequency Range (Above 1G)

Frequency (MHz)	Reading (dBuV/m)	Correct Factor dB/m	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2410MHz							
4820	56.62	-1.29	55.33	74	-18.67	H	PK
4820	44.62	-1.29	43.33	54	-10.67	H	AV
7230	47.74	6.51	54.25	74	-19.75	H	PK
7230	34.64	6.51	41.15	54	-12.85	H	AV
4820	57.93	-1.29	56.64	74	-17.36	V	PK
4820	39.48	-1.29	38.19	54	-15.81	V	AV
7230	43.42	6.51	49.93	74	-24.07	V	PK
7230	33.32	6.51	39.83	54	-14.17	V	AV
Middle Channel-2440MHz							
4880	59.20	-0.98	58.22	74	-15.78	H	PK
4880	48.00	-0.98	47.02	54	-6.98	H	AV
7320	44.44	6.83	51.27	74	-22.73	H	PK
7320	33.11	6.83	39.94	54	-14.06	H	AV
4880	57.99	-0.98	57.01	74	-16.99	V	PK
4880	45.00	-0.98	44.02	54	-9.98	V	AV
7320	43.08	6.83	49.91	74	-24.09	V	PK
7320	30.38	6.83	37.21	54	-16.79	V	AV
High Channel-2470MHz							
4940	58.43	-0.8	57.63	74	-16.37	H	PK
4940	40.76	-0.8	39.96	54	-14.04	H	AV
7410	46.62	6.94	53.56	74	-20.44	H	PK
7410	29.37	6.94	36.31	54	-17.69	H	AV
4940	59.43	-0.8	58.63	74	-15.37	V	PK
4940	44.54	-0.8	43.74	54	-10.26	V	AV
7410	46.85	6.94	53.79	74	-20.21	V	PK
7410	33.36	6.94	40.30	54	-13.70	V	AV

Note:

1. Correction Factor= Antenna Factor + Cable loss–Pre-amplifier; Emission Level=Peak Reading + Correction Factor; Margin=Emission Level–Limit.

The emission levels of other frequencies are very lower than the limit and not show in test report.

3. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.



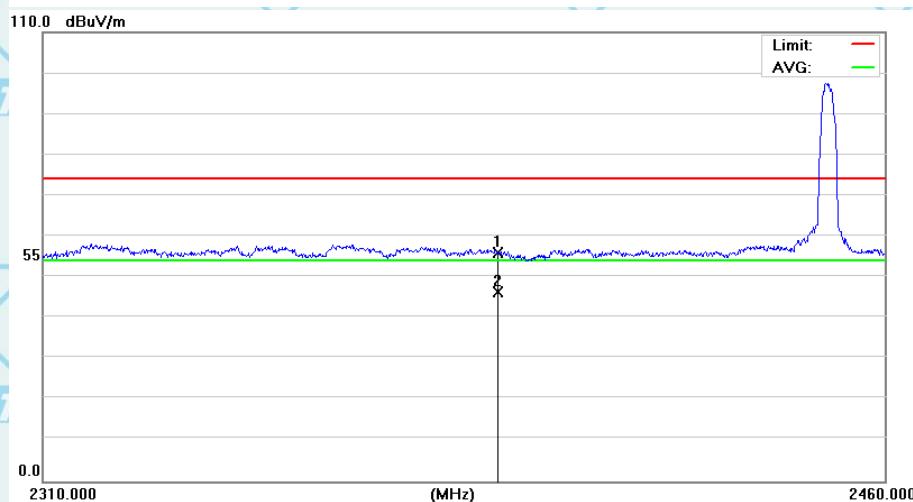


Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

OUT OF BAND EMISSION

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB	dBuV/m	dB	Detector
1		2390.000	47.93	8.10	56.03	74.00	-17.97 peak
2	*	2390.000	38.11	8.10	46.21	54.00	-7.79 AVG



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

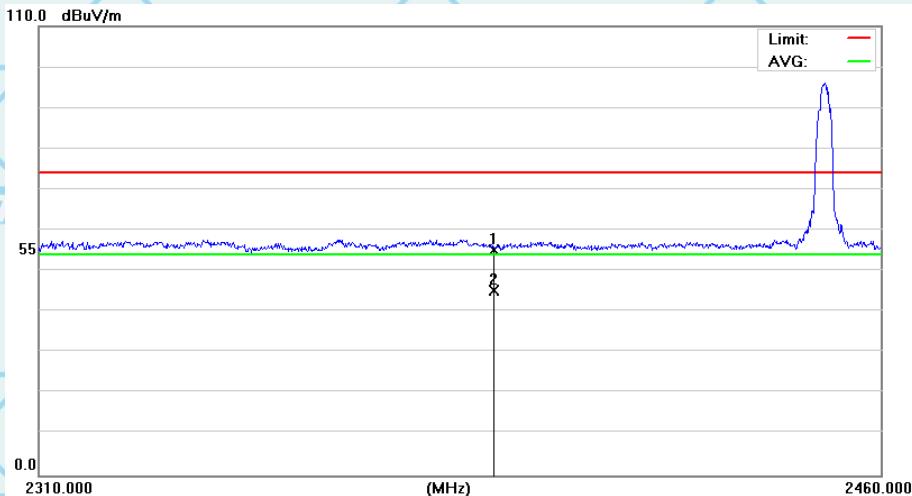
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2390.000	46.93	8.10	55.03	74.00	-18.97	peak
2	*	2390.000	37.11	8.10	45.21	54.00	-8.79	AVG



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com Http://www.wsct-cert.com

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

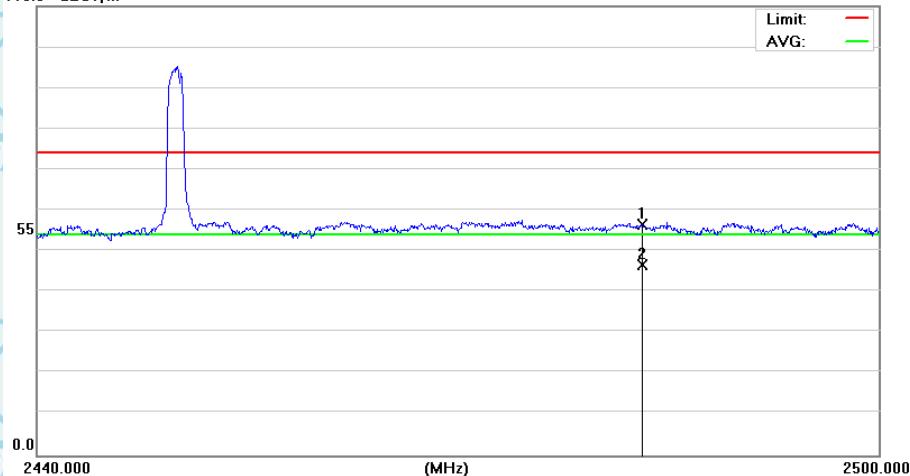


Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

Horizontal:

110.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over
		MHz	dBuV	dB	dBuV/m	dB	Detector
1		2483.000	48.31	8.13	56.44	74.00	-17.56 peak
2	*	2483.000	38.38	8.13	46.51	54.00	-7.49 AVG



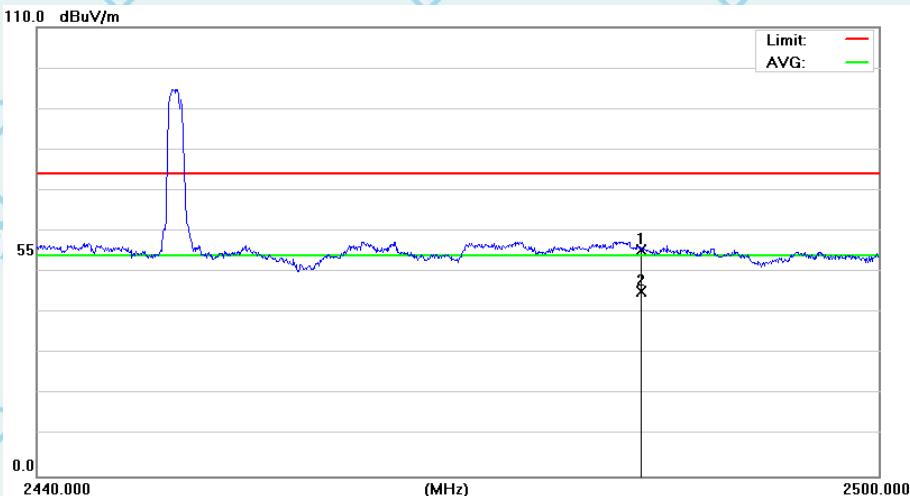
世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

Vertical:



For Question,
Please Contact with WSCT
www.wsct-cert.com

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2483.000	47.31	8.13	55.44	74.00	-18.56	peak
2	*	2483.000	37.05	8.13	45.18	54.00	-8.82	AVG



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



8. 20DB OCCUPIED BANDWIDTH

8.1 STANDARD APPLICABLE

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

8.2 TEST PROCEDURE

1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
RBW $\geq 1\%$ of the 20dB bandwidth; VBW \geq RBW; Sweep = auto; Detector function =peak; Trace = max hold.
4. Measure and record the results in the test report.

8.3 TEST SETUP



8.4 ENVIRONMENTAL CONDITIONS

Temperature:	22°C
Relative Humidity:	58%
ATM Pressure:	1012 mbar



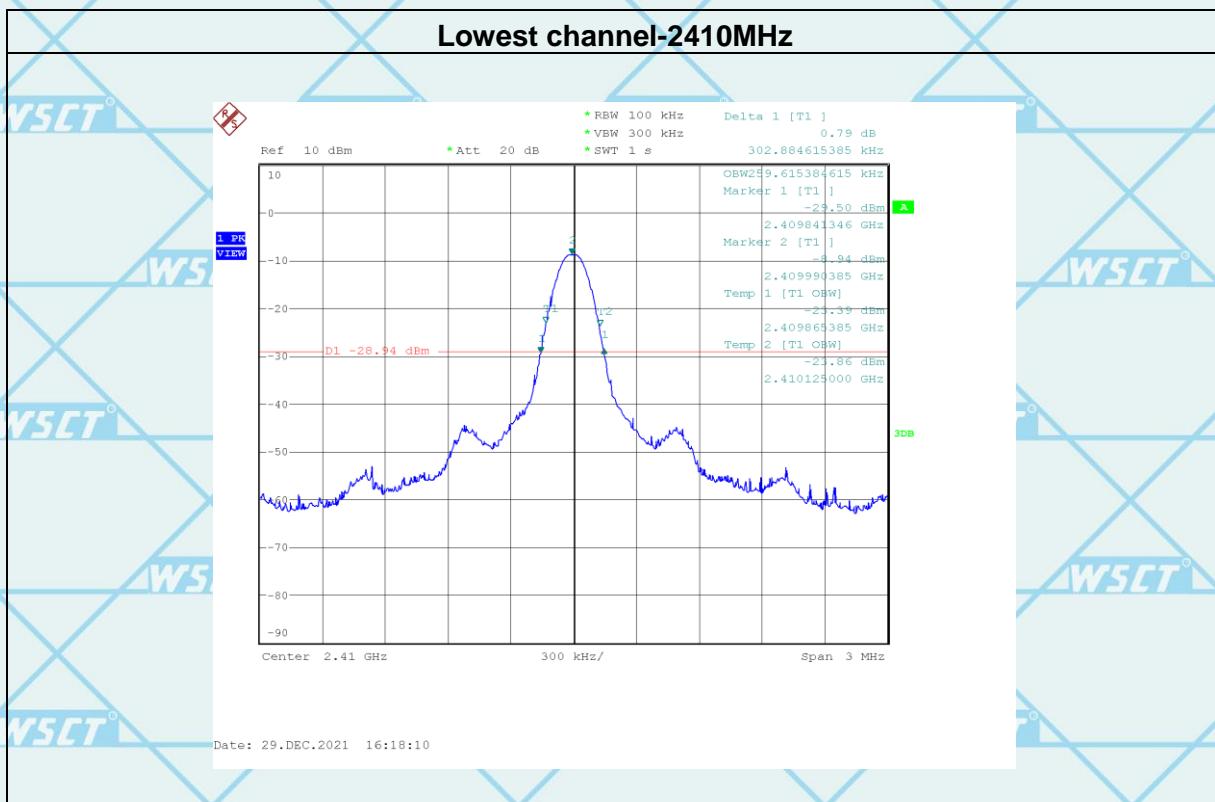


Certificate Number 5768.01

8.5 TEST RESULTS

For Question,
Please Contact with WSCT
www.wsct-cert.com

Frequency	20dB Bandwidth (kHz)	Result
2410 MHz	302.88	PASS
2440MHz	298.08	PASS
2470 MHz	298.08	PASS



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

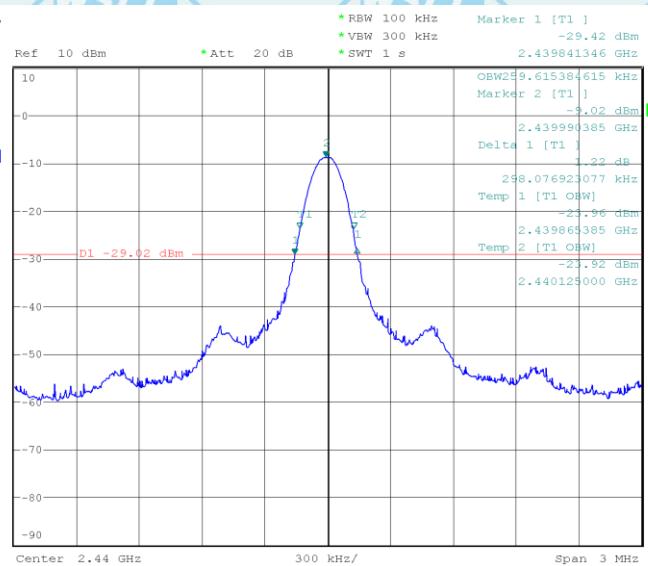
World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.



Certificate Number 5768.01

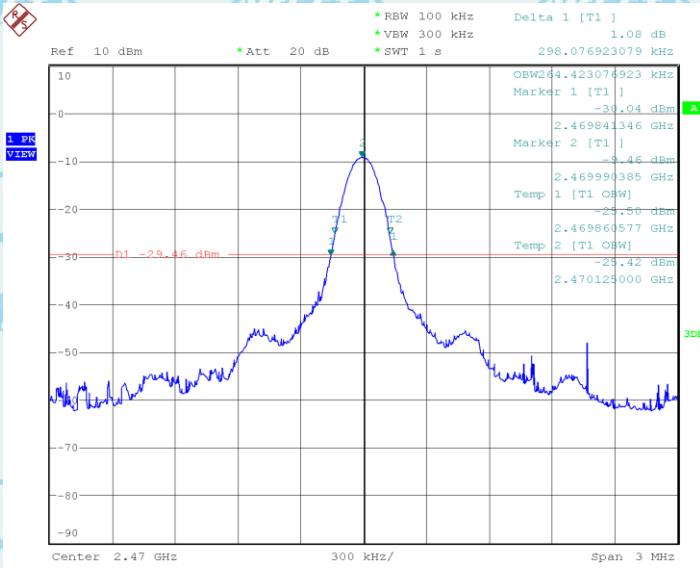
For Question,
Please Contact with WSCT
www.wsct-cert.com

Middle channel-2440MHz



Date: 29.DEC.2021 16:19:39

Highest channel-2470MHz



Date: 29.DEC.2021 16:21:37



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com Http://www.wsct-cert.com

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

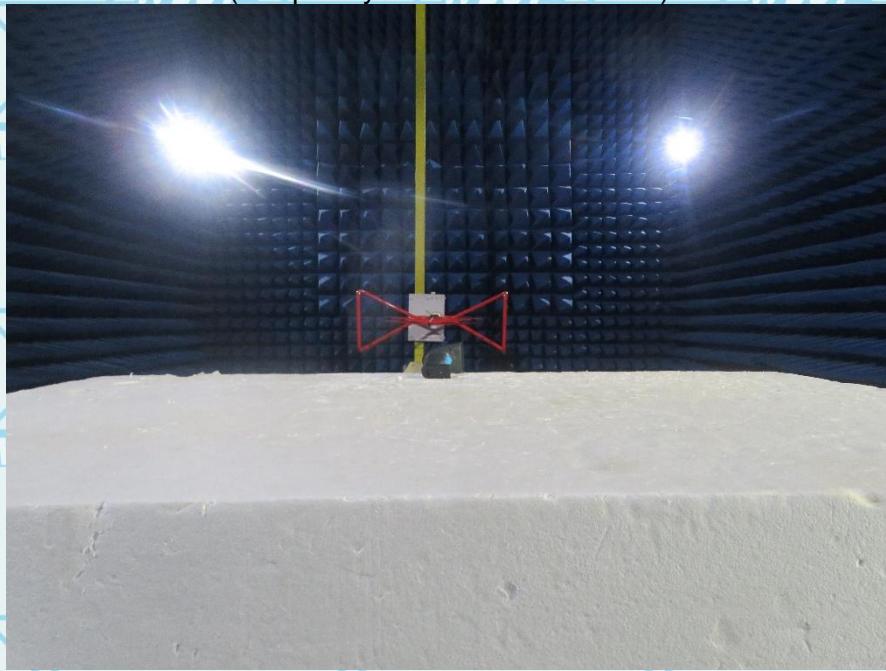


Certificate Number 5768.01

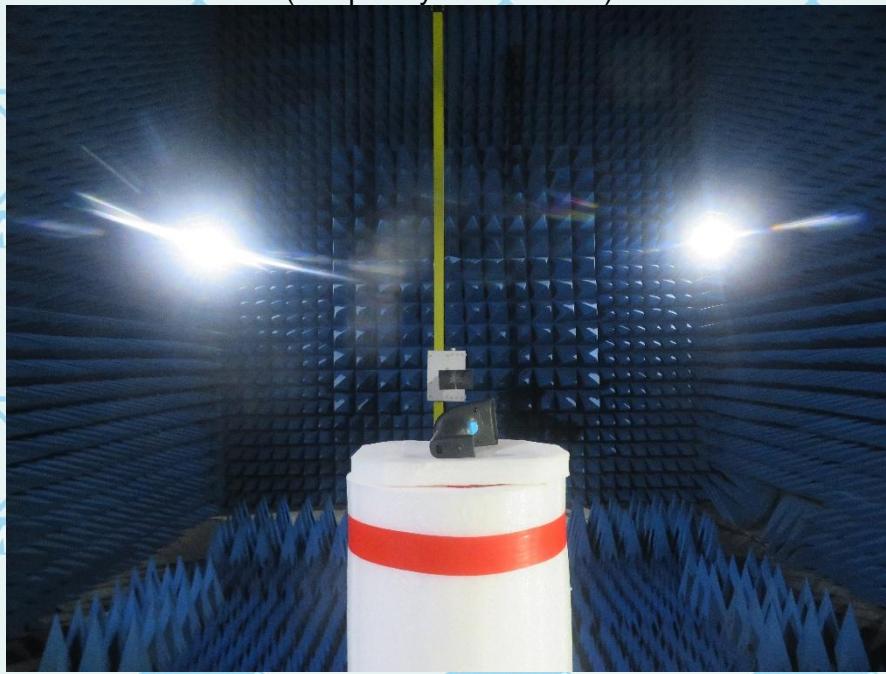
For Question,
Please Contact with WSCT
www.wsct-cert.com

9. EUT TEST PHOTO

RADIATED EMISSION TEST
(Frequency from 30MHz to 1GHz)



RADIATED EMISSION TEST
(Frequency above 1GHz)



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.



For Question,
Please Contact with WSCT
www.wsct-cert.com

10. PHOTOGRAPHS OF EUT

Appearance photograph of EUT



Appearance photograph of EUT



世标检测认证股份

World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.

ADD: Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL: 86-755-26996192 26992306 FAX: 86-755-86376605 E-mail: Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)



World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



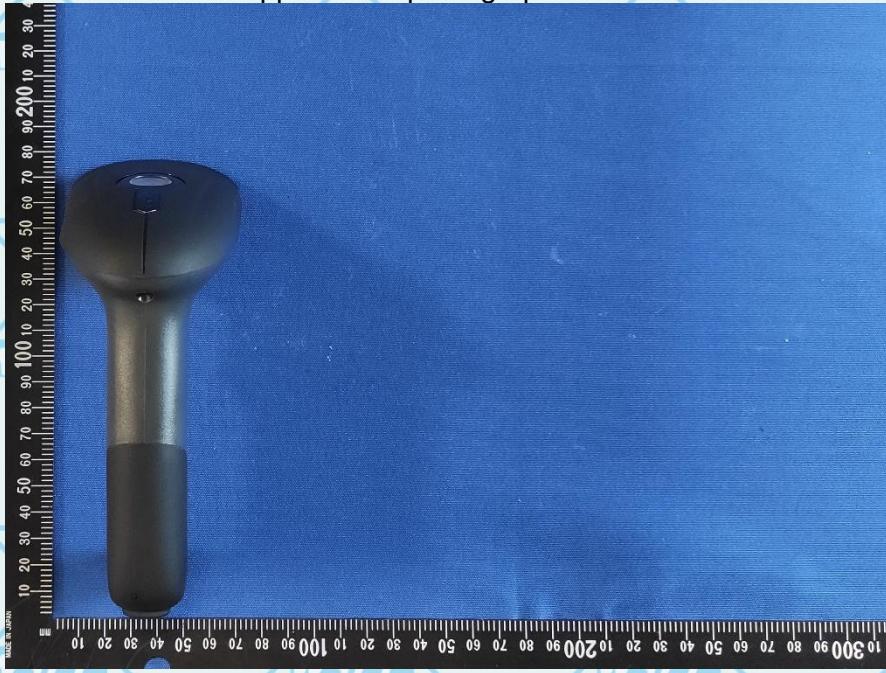
Appearance photograph of EUT

Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com



Appearance photograph of EUT



世标检测认证股份
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

Member of the WSCT INC.



World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



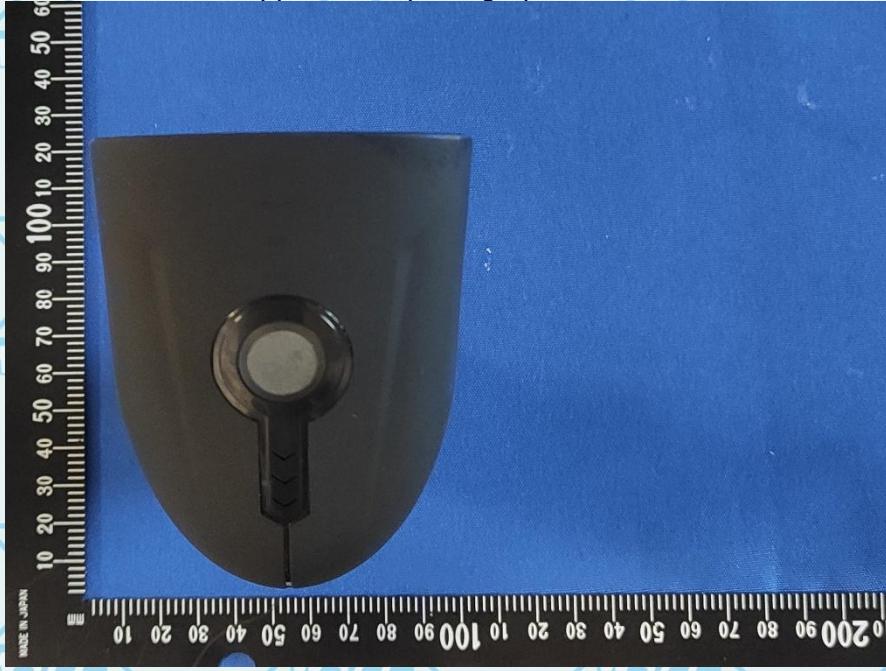
Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

Appearance photograph of EUT



Appearance photograph of EUT



世标检测认证股份
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

Member of the WSCT INC.



Certificate Number 5768.01

For Question,
Please Contact with WSCT
www.wsct-cert.com

Appearance photograph of EUT



Internal photograph of EUT



世标检测认证股份

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

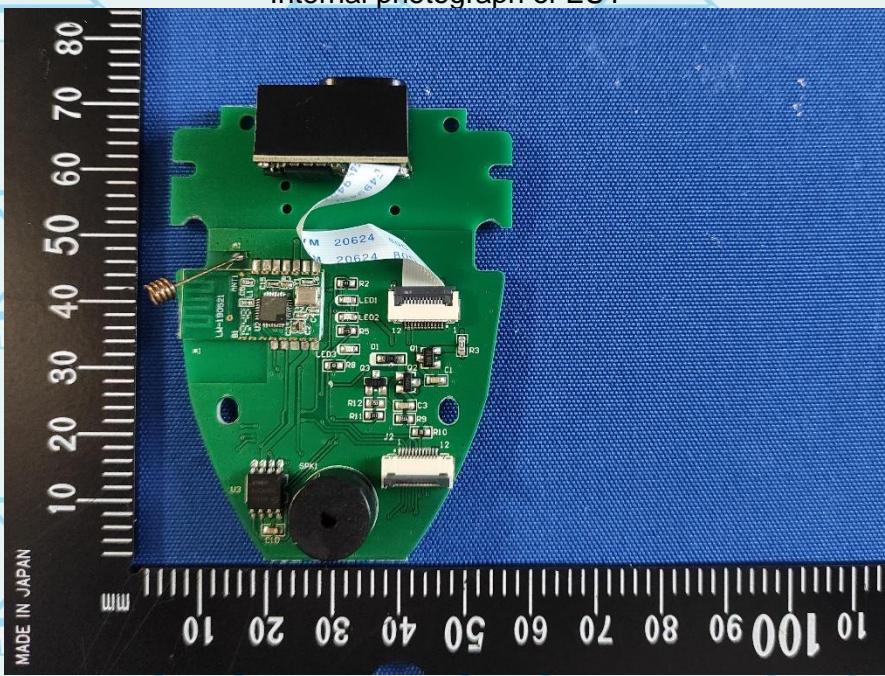


For Question,
Please Contact with WSCT
www.wsct-cert.com

Internal photograph of EUT



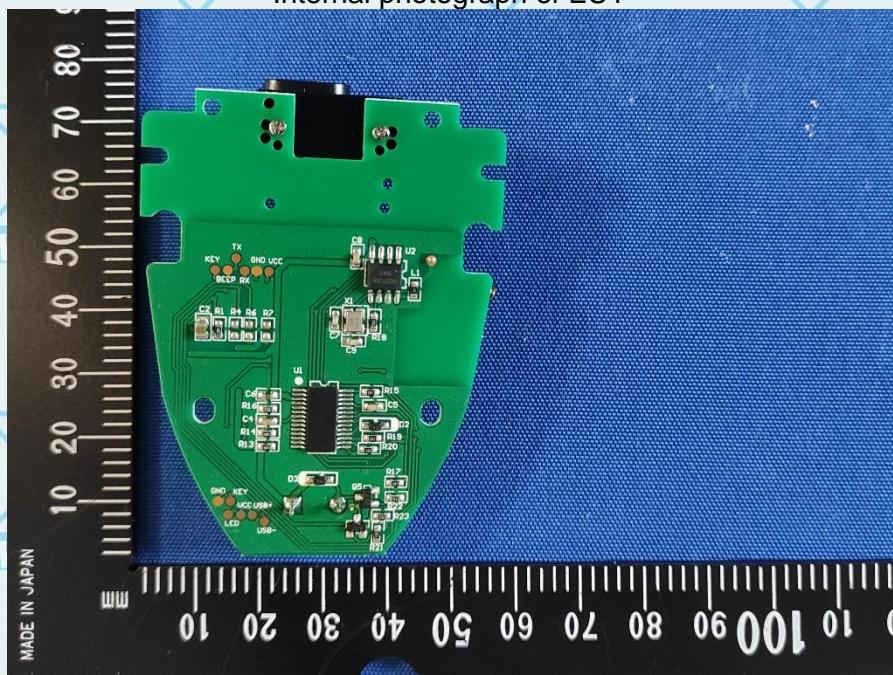
Internal photograph of EUT



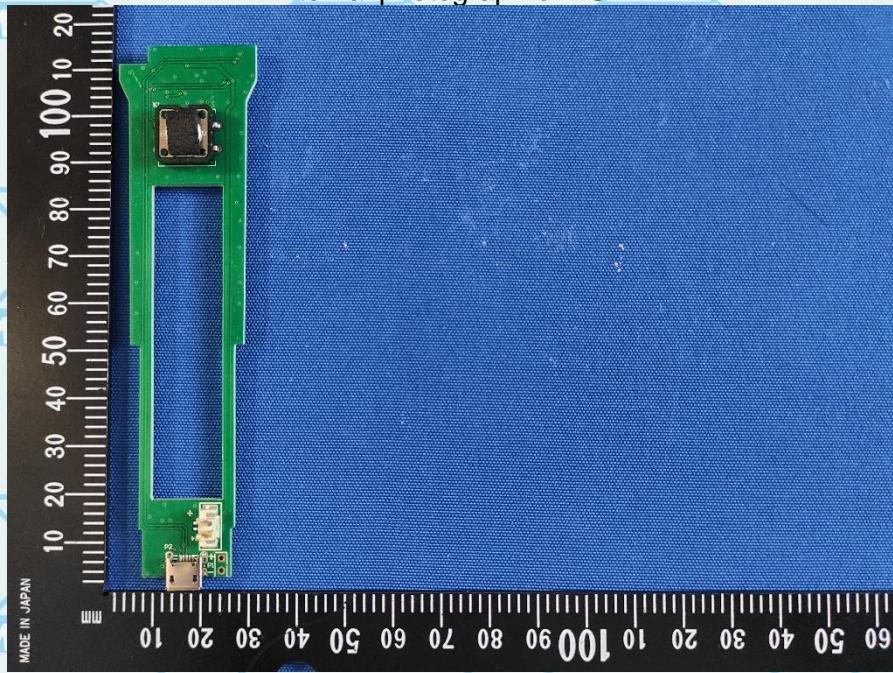


For Question,
Please Contact with WSCT
www.wsct-cert.com

Internal photograph of EUT



Internal photograph of EUT



世标检测认证股份

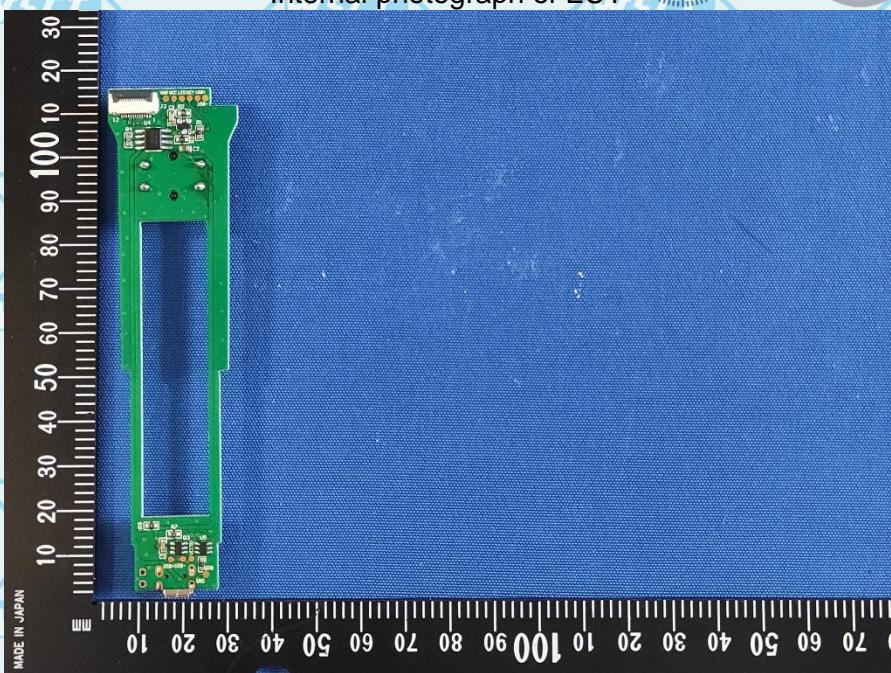
World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

Member of the WSCT INC.

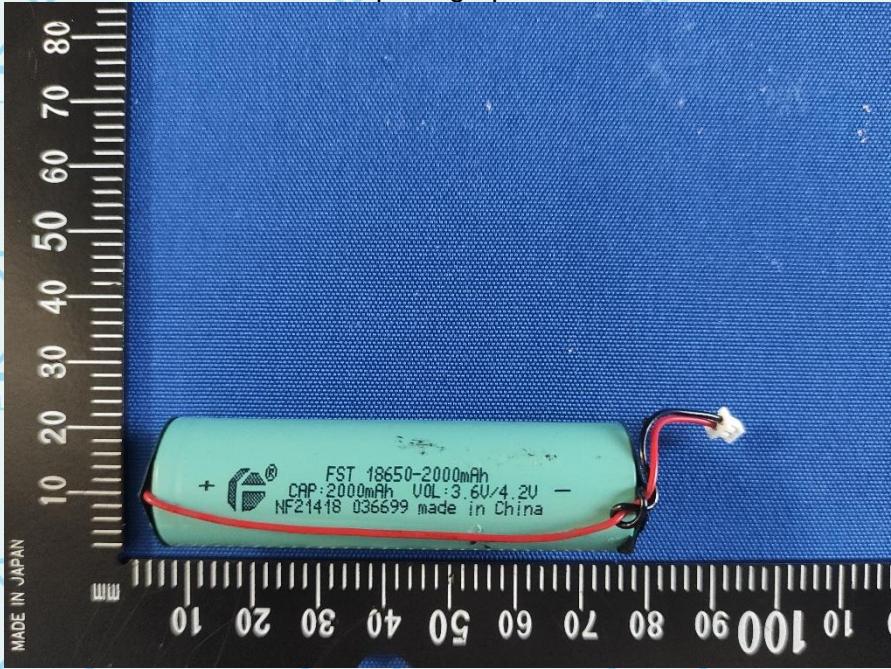


Internal photograph of EUT



For Question,
Please Contact with WSCT
www.wsct-cert.com

Internal photograph of EUT

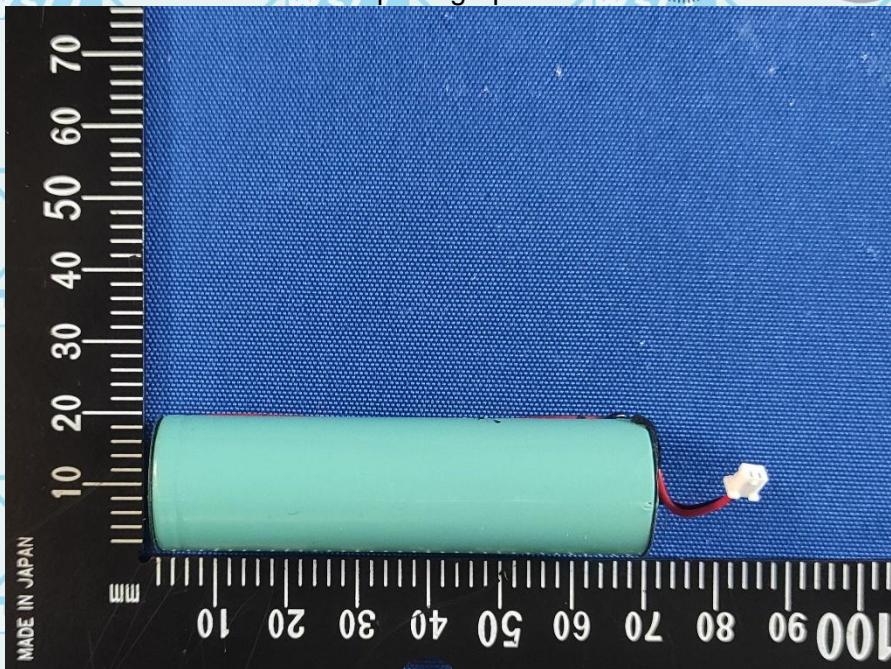




World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.



Internal photograph of EUT



For Question,
Please Contact with WSCT
www.wsct-cert.com

---END OF REPORT---



世标检测认证股份

World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd.

ADD:Building A-B Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China

TEL:86-755-26996192 26992306 FAX:86-755-86376605 E-mail:Fengbing.Wang@wsct-cert.com [Http://www.wsct-cert.com](http://www.wsct-cert.com)

Member of the WSCT INC.