TEST REPORT

Product Name	:	2D Barcode Reader
Brand Name	:	SANWA
Model	:	BCR-BT2D15
Series Model	:	N/A
Applicant	:	**Sanwa Supply Inc.**
Address	:	1-10-1 Tamachi Kita-ku City: Okayama City 700-0825 Country: Japan
Manufacturer	:	**CHAMPTEK INCORPORATED**
Address	:	1F NO.4 ALLEY 2,SHIN-WEI LANE, CHUNG-CHENG RD.,XINDIAN DISTRICT NEW TAIPEI CITY 231,TAIWAN
Standard(s)	:	Article 2, paragraph 1, item 19
Date of Receipt	:	Jun 30, 2025
Date of Test	:	Jun 30, 2025~ Jul 16, 2025
Issued Date	:	Jul 16, 2025

Issued By: **Guangdong Asia Hongke Test Technology Limited**

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Reviewed by: Leon Yi
Leon.yi

Approved by: Sean She
Sean She

Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Guangdong Asia Hongke Test Technology Limited. If there is a need to alter or revise this document, the right belongs to Guangdong Asia Hongke Test Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.

Report Revise Record

Report Version	Issued Date	Notes
M1	Jul 16, 2025	Initial Release

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Contents

1 TEST SUMMARY 4

1.1 TEST STANDARDS 4
1.2 TEST SUMMARY 4
1.3 TEST FACILITY 5
1.4 MEASUREMENT UNCERTAINTY 5

2 GENGENERAL INFORMATION 6

2.1 ENVIRONMENTAL CONDITIONS 6
2.2 GENERAL DESCRIPTION OF EUT 6
2.3 DESCRIPTION OF TEST MODES AND TEST FREQUENCY 7
2.4 EQUIPMENT LIST FOR THE TEST 7
2.5 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING 8
2.6 TEST VOLTAGE 8

3 TEST CONDITIONS AND RESULTS 9

3.1 FREQUENCY ERROR 9
3.2 ANTENNA OUTPUT POWER AND OUTPUT POWER TOLERANCE 10
3.3 OCCUPIED BANDWIDTH AND SPREADING BANDWIDTH 11
3.4 DWELL TIME 12
3.5 UNWANTED EMISSION STRENGTH 13
3.6 SECONDARY RADIATED EMISSION STRENGTH 14
3.7 CONSTRUCTION PROTECTION METHOD 15
3.8 INTERFERENCE PREVENTION FUNCTION 16

4 TEST SETUP PHOTOS 17

5 PHOTOS OF THE EUT 18

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

MIC Notice No.88 Appendix No.43

1.2 Test Summary

Test Item	Result
Frequency Error	Pass
Antenna Output Power and Output Power Tolerance	Pass
Occupied Bandwidth and Spread spectrum bandwidth	Pass
Dwell time	Pass
Unwanted Emission Strength	Pass
Secondary Radiated Emission Strength	Pass
Construction protection method	Pass
Interference Prevention Function	Pass

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1.3 Test Facility

Test Laboratory:
Guangdong Asia Hongke Test Technology Limited
B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:
FCC-Registration No.: 251906 Designation Number: CN1376
Guangdong Asia Hongke Test Technology Limited 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.

IC —Registration No.: 31737 CAB identifier: CN0165
The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01
Guangdong Asia Hongke Test Technology Limited 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.

1.4 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 according 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 Guangdong Asia Hongke Test Technology Limited’s quality system according 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 Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	150KHz~30MHz ±1.20 dB	(1)
Radiated Emission	9KHz~30Hz ±3.10dB	(1)
Radiated Emission	9KHz~1GHz ±3.75dB	(1)
Radiated Emission	1GHz~18GHz ±3.88 dB	(1)
Radiated Emission	18GHz-40GHz ±3.88dB	(1)
RF power, conducted	30MHz~6GHz ±0.16dB	(1)
RF power density, conducted	±0.24dB	(1)
Spurious emissions, conducted	±0.21dB	(1)
Temperature	±1℃	(1)
Humidity	±3%	(1)
DC and low frequency voltages	±1.5%	(1)
Time	±2%	(1)
Duty cycle	±2%	(1)

The report uncertainty of measurement y ± 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%

2 GENGENERAL INFORMATION

2.1 Environmental conditions

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

Voltage	Normal Voltage	DC 3.7V
	High Voltage	DC 4.07V
	Low Voltage	DC 3.33V
Other	Normal Temperature	25°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

2.2 General Description of EUT

Product Name:	2D Barcode Reader
Model/Type reference:	BCR-BT2D15
Serial Model:	N/A
Model difference:	N/A
Power Rating:	Input: DC5V 1A DC 3.7V 2000mAh 7.4Wh Rechargeable Li-ion battery
Adapter Information:	N/A
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	AiTSZ-250630031-1(Normal sample) AiTSZ-250630031-2(Engineer sample)
Bluetooth:	
Version:	Supported BR/EDR
Modulation:	GFSK, π/4DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	PCB antenna
Antenna gain:	0.55dBi

Remark:

The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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2.3 Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)
00	**2402**
01	2403
⋮	⋮
38	2440
39	**2441**
40	2442
⋮	⋮
77	2479
78	**2480**

Note: Test performed at the lowest/middle/highest frequencies selected in the list above for EUT supported while working on specified mode.

2.4 Equipment List for the Test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	SIGNAL Analyzer	R&S	FSV40	101470	2024.09.25	2025.09.24
2	EMI Measuring Receiver	R&S	ESR	101660	2024.09.25	2025.09.24
3	Mobile phone	Samsung	GALAXY S4	R33D20 SQYNW	2024.09.25	2025.09.24
4	DC Power supply	Manson	HCS-3604	G521100129	2024.09.25	2025.09.24
5	Digital Phosphor Oscilloscope	Tektronix	TDS3012	B021220	2024.09.25	2025.09.24
6	Signal Generator	Agilent	N5182A	MY50143009	2024.09.25	2025.09.24
7	Power meter	Agilent	E4419B	MY45102079	2024.09.25	2025.09.24

Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law".
Cal. Lab: GUANGZHOULISAICALIBRATION AND TESTING CO.,LTD.

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2.5 Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	CMD Command		
Frequency	2402MHz	2441MHz	2480MHz
Bluetooth	Default	Default	Default

2.6 Test Voltage

POWER SUPPLY VOLTAGE FLUCTUATION TEST

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Power supply	DC 3.7V	DC 4.07V	DC 3.33V
Output To RF Module	DC 3.30V	DC 3.36V	DC 3.21V
Voltage Variation (%)	--	1.98%	-2.73%

Note:
Voltage Variation (%)
= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100
During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.
During the input supply voltage to the EUT from the external power source is varied by ±10%, the fluctuation of input voltage to the circuit of RF unit of test equipment is exceed ±1%. So, all measurement has been conducted by normal and limit voltage.

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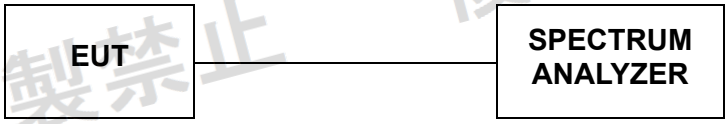
3 Test conditions and Results

3.1 Frequency Error

LIMIT

±50ppm

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: non-modulation

Spectrum Condition:

- Frequency: test frequency
- Span: 300 KHz
- RBW: 10 KHz
- VBW: 10 KHz
- Sweep time: Auto
- Detector mode: Positive peak
- Indication mode: max hold

TEST RESULTS

Raw data reference to Appendix RF test data for BT.

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3.2 Antenna Output Power and Output Power Tolerance

LIMIT

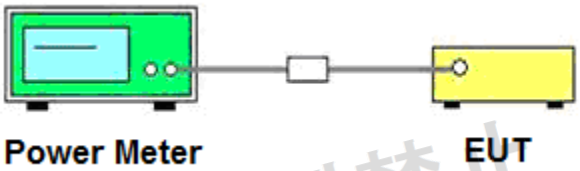
- ≤ 3 mW /MHz(FHSS from 2402-2480 MHz)
- ≤ 10 mW/MHz (OFDM, DSSS from 2400-2483.5 MHz)
- ≤ 10 mW (other from 2400-2483.5 MHz)

The Output Power Tolerance must be within +20%, -∞%.
E.i.r.p:

- ≤12.14dBm/MHz(OFDM,DS form 2400-2483.5MHz)

Note: E.I.R.P will not be applied to the transmission antenna which has a gain of 2.14dBi or less.

TEST CONFIGURATION



TEST PROCEDURE

Step 1: Connect the UUT to the spectrum analyzer as TEST CONFIGURATION and set the UUT in FHSS mode, use the following settings:

Setting of SA is following as follow:

- RBW=1MHz
- VBW=1MHz
- Sweep time: 20ms
- Sweep point:: 30001
- Detect mode: Sample
- Trace mode: Clear

Step 2: UUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth. When the trace is complete record spread bandwidth in MHz.

Step 3: Connect the UUT to the Power meter as TEST CONFIGURATION and set the UUT in FHSS mode to measure max measured power in dBm and record.

Step 4: Converting max measured power(in Step 3) from dBm to mW and divided by spread bandwidth, then record this value as antenna output power.

TEST RESULTS

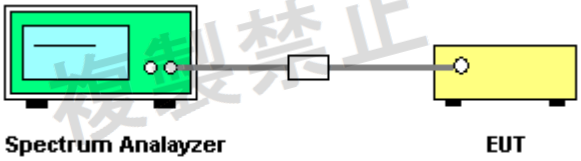
Raw data reference to Appendix RF test data for BT.

3.3 Occupied Bandwidth and Spreading Bandwidth

LIMIT

- Occupied bandwidth: FH≤83.5 MHz; OFDM≤40 MHz, DS≤26 MHz; Others≤26 MHz
- Spread Bandwidth:≥ 500 kHz(FH,DS)
- Spread factor>5.

TEST CONFIGURATION



TEST PROCEDURE

1. Setting of SA is following as fellow:
   - RBW: under 3% of OBW
   - RBW=1MHz
   - VBW=1MHz
   - Sweep time: 1ms
   - Sweep point:: 1001
   - Detect mode: Positive peak
   - Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
3. EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth.
4. Spread Factor=Spread Bandwidth/modulation rate. The modulation rate: MR=1Mbps (declare by client)

TEST RESULTS

Raw data reference to Appendix RF test data for BT.

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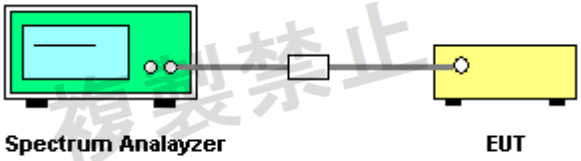
3.4 Dwell time

LIMIT

0.4 second or less

NOTE: Dwell time only applicable to FHSS system device.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

- Frequency: test channel
- RBW: 1MHz
- VBW: 1MHz
- Sweep point: 10001
- Sweep time: 20ms
- Trace:Clear
- Detector mode: Positive peak

TEST RESULTS

Raw data reference to Appendix RF test data for BT.

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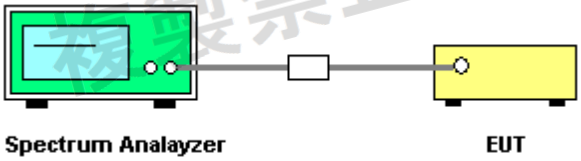
3.5 Unwanted Emission Strength

LIMIT

Below 2387 MHz: 2.5μW/MHz or less
2387 to 2400 MHz: 25μW/MHz or less
2483.5 Through 2496.5 MHz: 25μW/MHz or less
Over 2496.5 MHz: 2.5μW/MHz or less

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

- Frequency: 30MHz-12.5GHz
- RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-12.5GHz)
- VBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-12.5GHz)
- Sweep time: Auto
- Detector mode: Positive peak
- Indication mode: max hold

TEST RESULTS

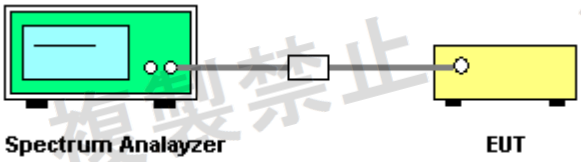
Raw data reference to Appendix RF test data for BT.

3.6 Secondary Radiated Emission Strength

LIMIT

Below 1GHz: 4.0nW or less
Above 1GHz: 20nW or less

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

- Frequency: 30MHz-12.75GHz
- RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-12.75GHz)
- VBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-12.75GHz)
- Sweep time: Auto
- Detector mode: Positive peak
- Indication mode: max hold

TEST RESULTS

Raw data reference to Appendix RF test data for BT.

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3.7 Construction protection method

Requirement

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily

Confirmation method

All high-frequency section and modulation section packet in one IC. and for the end-product the shell will bonded with high-strength glue, it cannot be easily open.

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3.8 Interference Prevention Function

Requirement

Clarify, the one automatically to transmit and to receive identification code with the wireless equipment of the wireless station used in the same premises.

Interference Prevention Function Confirm

A communication link was made where the ID code is correct (Identical).

TEST PROCEDURE

1. Connect the EUT in network
2. Open the software
3. We can get the information as follows:

TEST RESULTS

BT MAC: ff:3e:af:e0:26:5c

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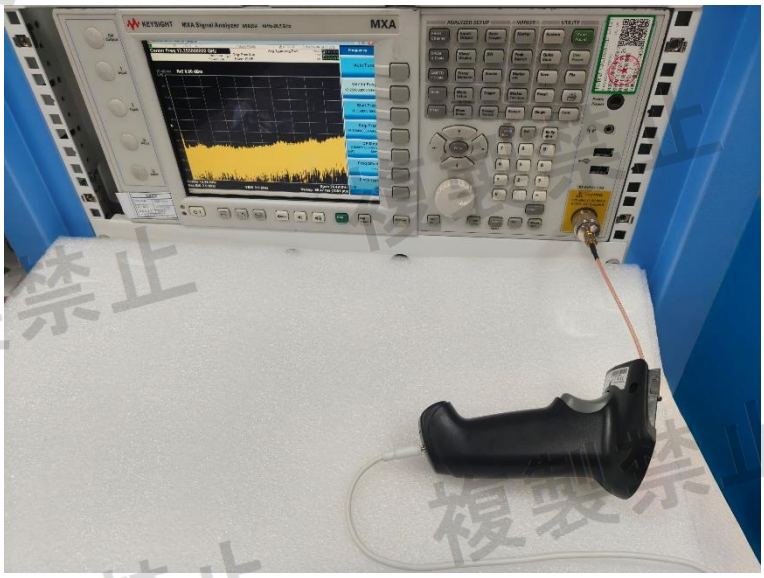
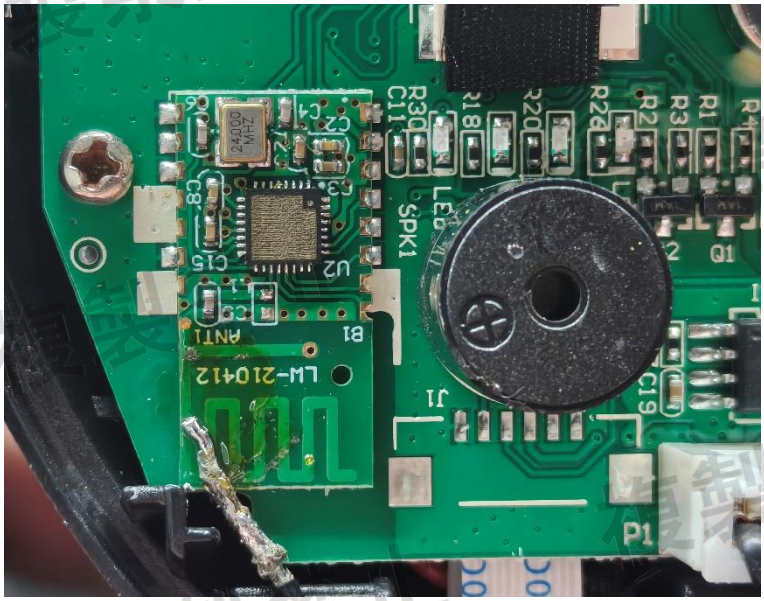
4 TEST SETUP PHOTOS





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5 PHOTOS OF THE EUT

External Photos

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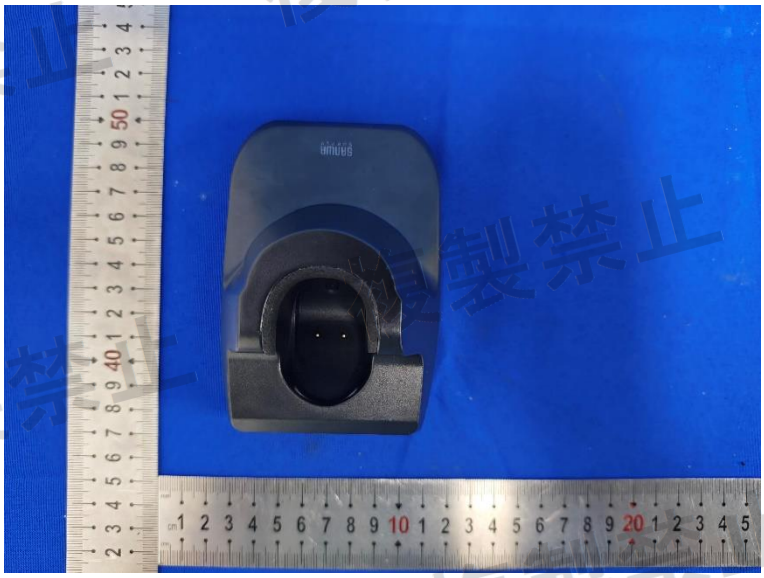

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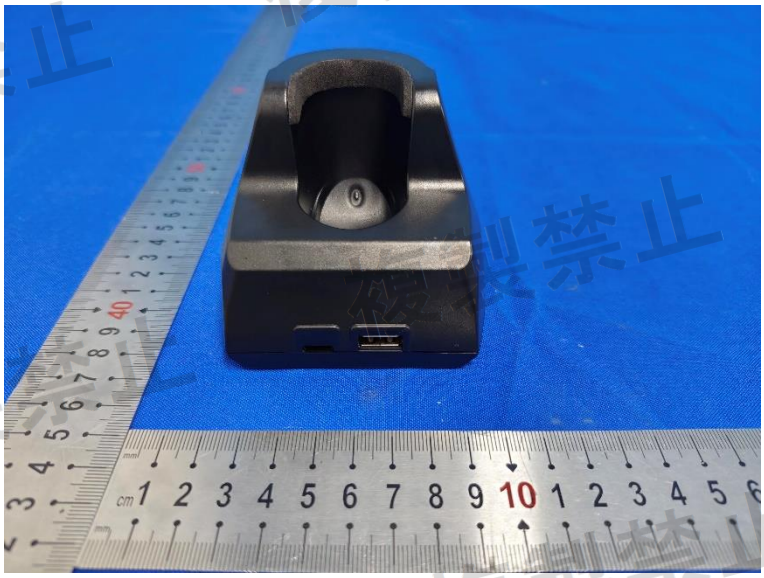

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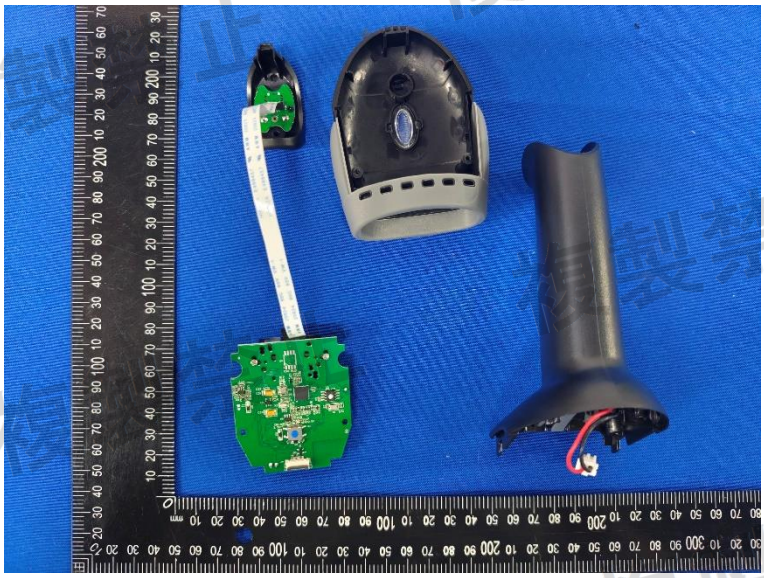
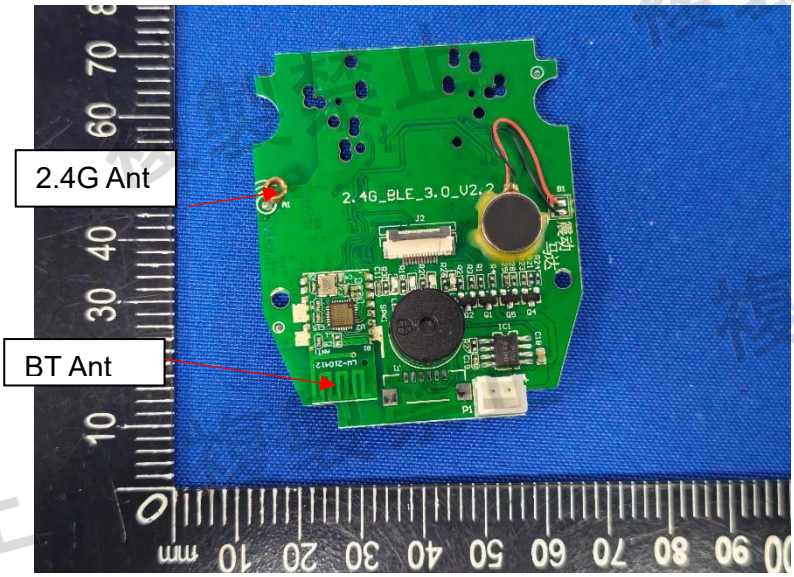
Internal photos





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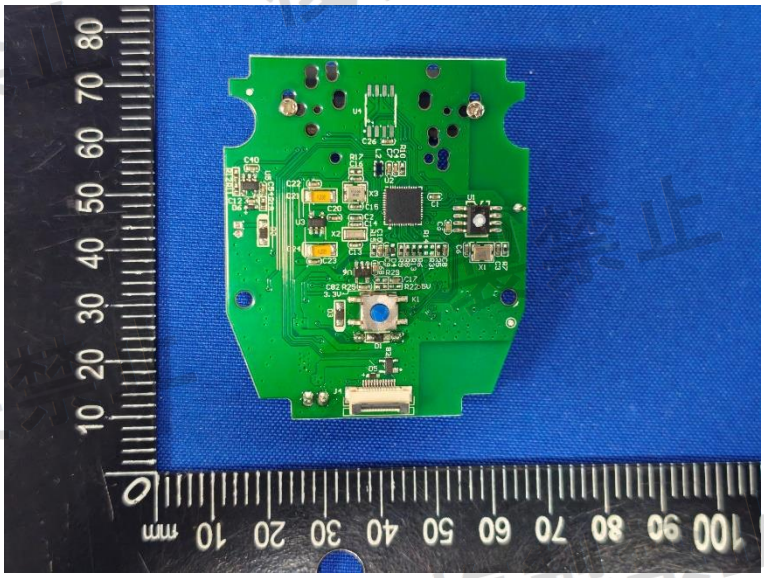

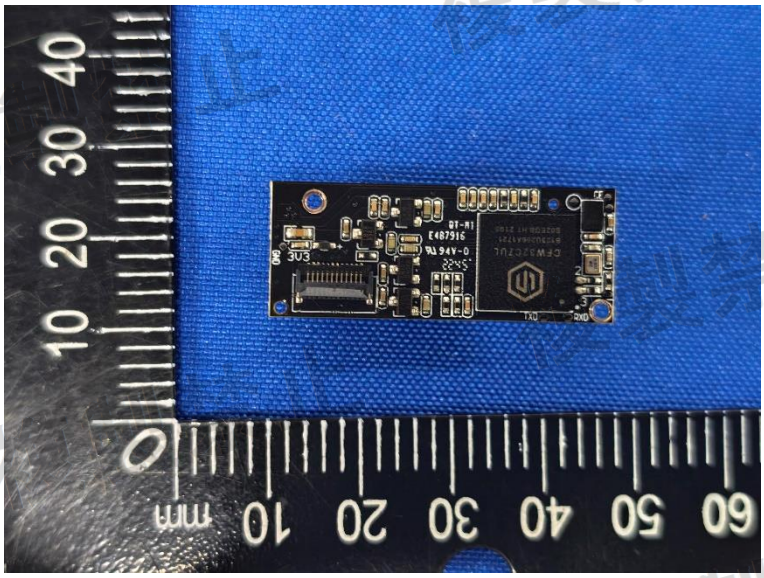

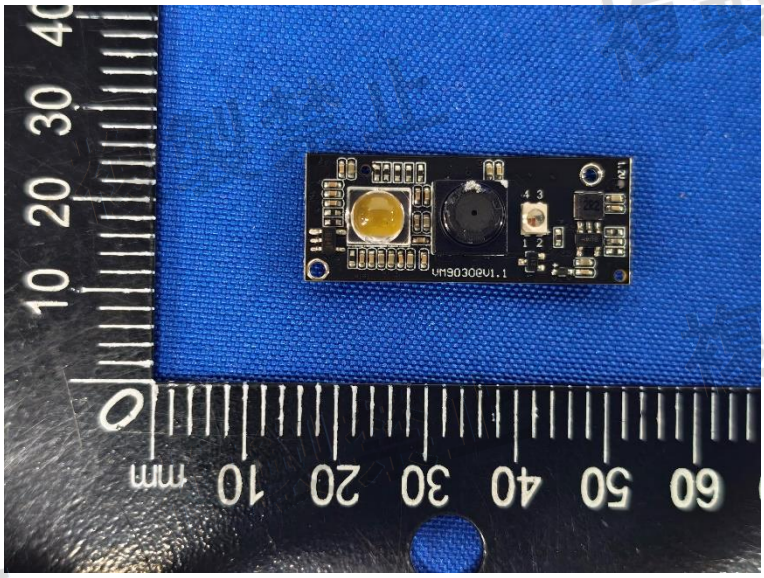

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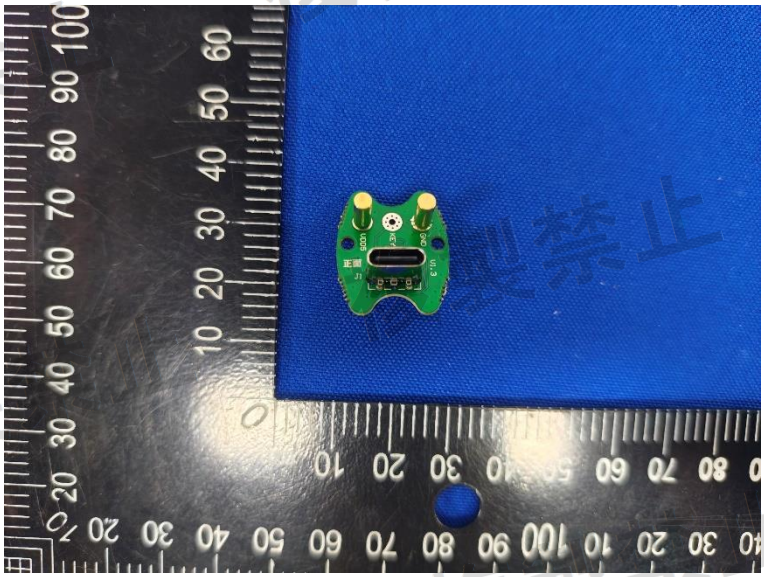

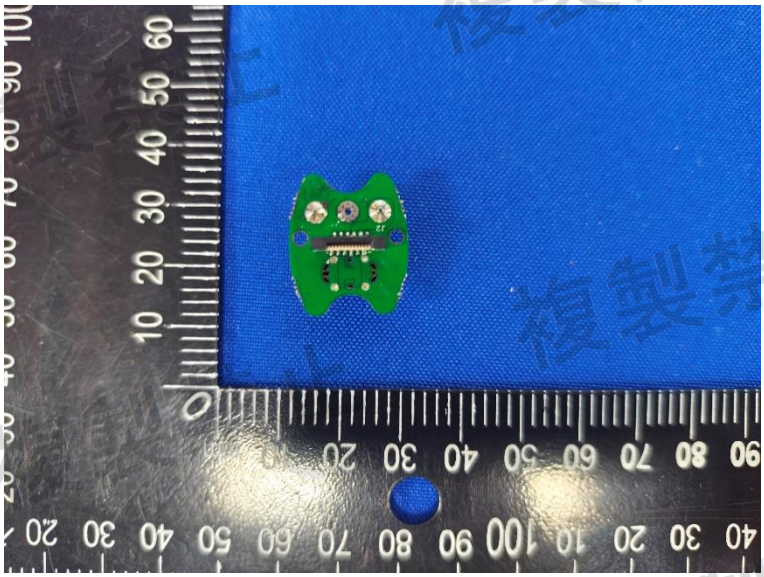

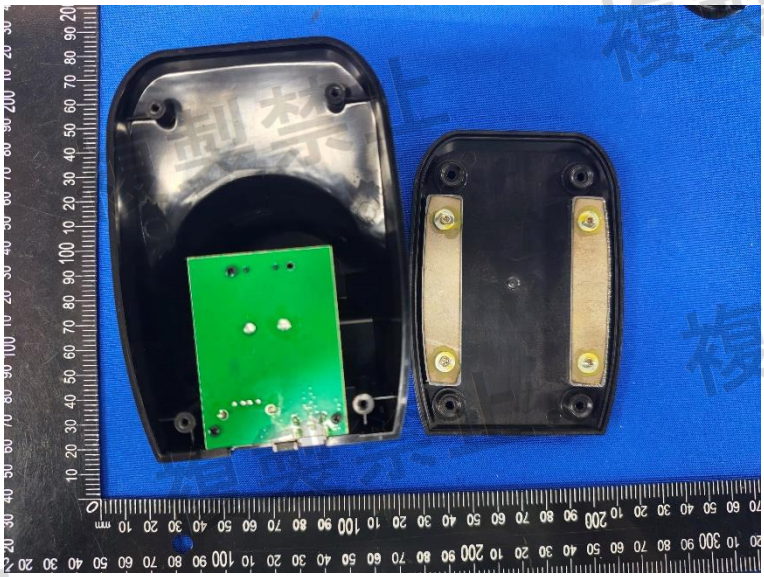

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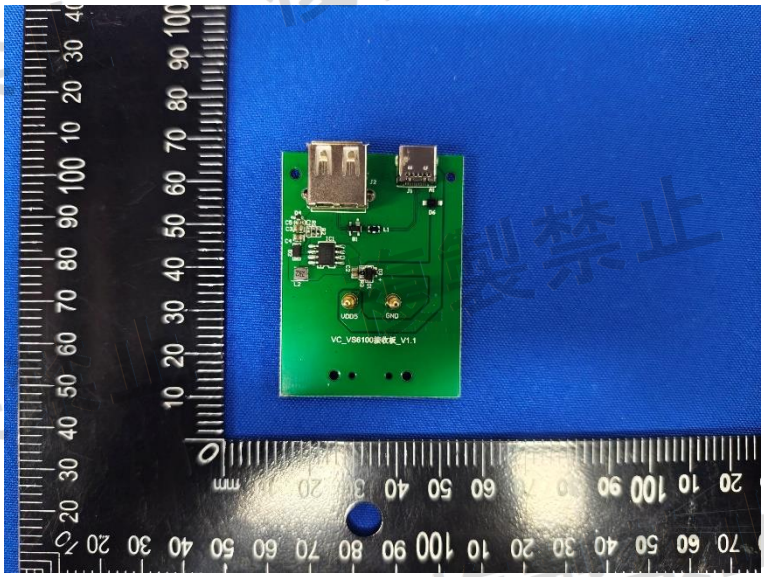

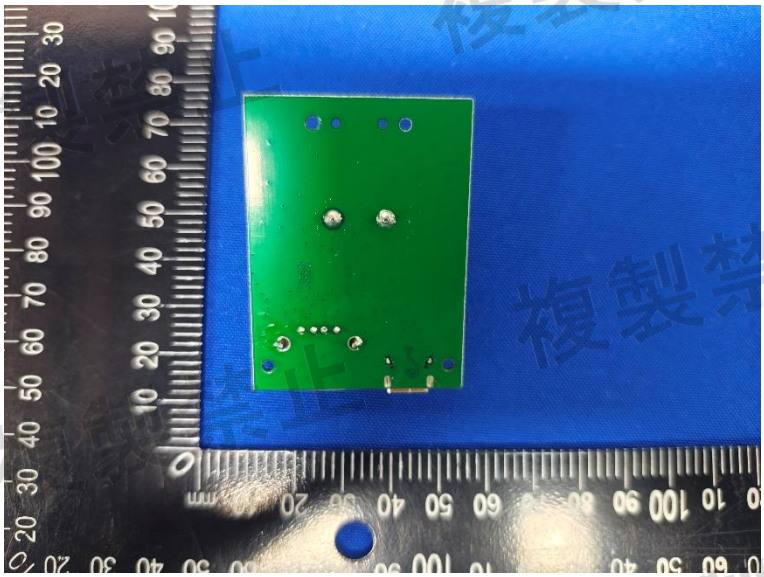

********** End of Report **********

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