

FCC Part 15, Subpart B, Class B(sDoC)

TEST REPORT

Shenzhen Qiangwei Electronic Co., Ltd

Infrared Thermometer

Test Model: K3

Prepared for : Shenzhen Qiangwei Electronic Co., Ltd
Address : 4F, Building 3, Xialingpai Industrial Zone, Dalang
Subdistrict, Longhua District, Shenzhen, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101, 201, Building A and Room 301, Building C,
Juji Industrial Park, Yabianxueziwei, Shajing Street,
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Date of receipt of test sample : March 30, 2020
Number of tested samples : 1
Serial number : Prototype
Date of Test : March 30, 2020 ~ April 02, 2020
Date of Report : April 03, 2020



FCC TEST REPORT

FCC Part 15, Subpart B, Class B(sDoC)

Report Reference No. : LCS200327013AE

Date Of Issue : April 03, 2020

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure... : Full application of Harmonised standards ☒
 Partial application of Harmonised standards ☐
 Other standard testing method ☐

Applicant's Name..... : Shenzhen Qiangwei Electronic Co., Ltd

Address : 4F, Building 3, Xialingpai Industrial Zone, Dalang Subdistrict, Longhua District, Shenzhen, China

Test Specification

Standard : FCC Part 15, Subpart B, Class B(sDoC), ANSI C63.4 -2014

Test Report Form No...... : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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Test Item Description..... : Infrared Thermometer

Test Model : K3

Trade Mark..... : Testacy

Ratings : DC 5V

Result : Positive

Compiled by:

Rita Huang

Supervised by:

Jason Deng

Approved by:



Rita Huang/ File administrators

Jason Deng/ Technique principal

Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS200327013AE

April 03, 2020
Date of issue

Test Model : K3

EUT..... : Infrared Thermometer

Applicant..... : Shenzhen Qiangwei Electronic Co., Ltd
Address..... : 4F, Building 3, Xialingpai Industrial Zone, Dalang
Subdistrict, Longhua District, Shenzhen, China
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Manufacturer..... : Shenzhen Qiangwei Electronic Co., Ltd
Address..... : 4F, Building 3, Xialingpai Industrial Zone, Dalang
Subdistrict, Longhua District, Shenzhen, China
Telephone..... : /
Fax..... : /

Factory..... : Shenzhen Qiangwei Electronic Co., Ltd
Address..... : 4F, Building 3, Xialingpai Industrial Zone, Dalang
Subdistrict, Longhua District, Shenzhen, China
Telephone..... : /
Fax..... : /

Test Result according to the standards on page 6: **Positive**

The 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.

Revision History

Revision	Issue Date	Revisions	Revised By
000	April 03, 2020	Initial Issue	Gavin Liang

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1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC Part 15, Subpart B, Class B(sDoC), ANSI C63.4 -2014	Class B	PASS
Radiated disturbance	FCC Part 15, Subpart B, Class B(sDoC), ANSI C63.4 -2014	Class B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:

Mode 1	Normal operation	Record
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2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Infrared Thermometer

Trade Mark : Testacy

Test Model : K3

Power Supply : DC 5V

Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
$F_x > 1 \text{ GHz}$	$5 \times F_x$ up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, F_x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.
Where F_x is unknown, the radiated emission measurements shall be performed up to 6 GHz.

2.2. Description of Test Facility

Site Description

EMC Lab. : FCC Registration Number is 254912.

Industry Canada Registration Number is 9642A-1.

ESMD Registration Number is ARCB0108.

UL Registration Number is 100571-492.

TUV SUD Registration Number is SCN1081.

TUV RH Registration Number is UA 50296516-001.

NVLAP Registration Code is 600167-0.

2.3. 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 LCS 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.

2.4. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (U _{lab})	Expanded Uncertainty (U _{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	± 2.90 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB
Mains Harmonic	Voltage	$\pm 0.510\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 0.510\%$	N/A
EMF		$\pm 21.59\%$	N/A

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. TEST RESULTS

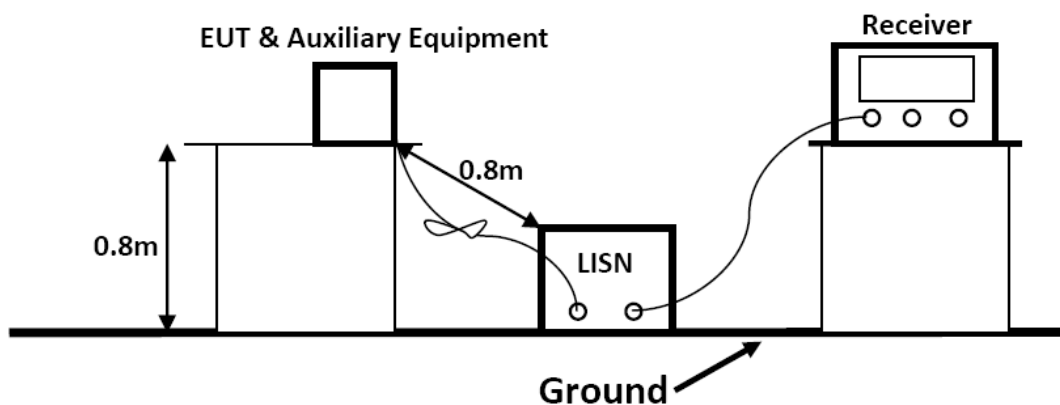
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	EZ	EZ-EMC	/	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2019-06-11
3	Artificial Mains	R&S	ENV216	101288	2019-06-12
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2019-06-11

3.1.2. Block Diagram of Test Setup



3.1.3. Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dB μ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.1.4. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

3.1.5. Operating Condition of EUT

3.1.5.1. Setup the EUT as shown on Section 3.1.2

3.1.5.2. Turn on the power of all equipments.

3.1.5.3. Let the EUT work in measuring Mode 1 and measure it.

3.1.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

PASS.

The test result please refer to the next page.

Test Model	K3	Test Mode	Mode 1
Environmental Conditions	22.8°C, 54.1% RH	Test Engineer	Jay Li
Pol	Line	Test Voltage	AC 120V/60Hz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5864	29.51	19.17	48.68	56.00	-7.32	QP
2	0.6010	15.18	19.18	34.36	46.00	-11.64	AVG
3	1.3872	27.04	19.32	46.36	56.00	-9.64	QP
4	1.3918	16.69	19.32	36.01	46.00	-9.99	AVG
5	3.9885	26.01	19.47	45.48	56.00	-10.52	QP
6	4.1144	10.78	19.47	30.25	46.00	-15.75	AVG
7	8.8754	24.46	19.66	44.12	60.00	-15.88	QP
8	9.1995	11.21	19.67	30.88	50.00	-19.12	AVG
9	11.2334	28.23	19.80	48.03	60.00	-11.97	QP
10	11.5259	13.30	19.82	33.12	50.00	-16.88	AVG
11	14.3294	28.84	20.06	48.90	60.00	-11.10	QP
12	14.6940	11.85	20.10	31.95	50.00	-18.05	AVG

Test Model	K3	Test Mode	Mode 1
Environmental Conditions	22.8°C, 54.1% RH	Test Engineer	Jay Li
Pol	Neutral	Test Voltage	AC 120V/60Hz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.6629	33.20	19.24	52.44	56.00	-3.56	QP
2	0.6719	19.45	19.25	38.70	46.00	-7.30	AVG
3	1.4100	27.79	19.32	47.11	56.00	-8.89	QP
4	1.4369	16.87	19.32	36.19	46.00	-9.81	AVG
5	4.1414	26.85	19.46	46.31	56.00	-9.69	QP
6	4.3034	10.86	19.47	30.33	46.00	-15.67	AVG
7	9.4469	25.72	19.67	45.39	60.00	-14.61	QP
8	9.6180	10.88	19.67	30.55	50.00	-19.45	AVG
9	11.0534	29.03	19.78	48.81	60.00	-11.19	QP
10	11.2289	15.96	19.80	35.76	50.00	-14.24	AVG
11	14.1225	26.26	20.05	46.31	60.00	-13.69	QP
12	14.3294	15.14	20.08	35.22	50.00	-14.78	AVG

Note: Pre-Scan all mode, Thus record worse case mode result in this report.

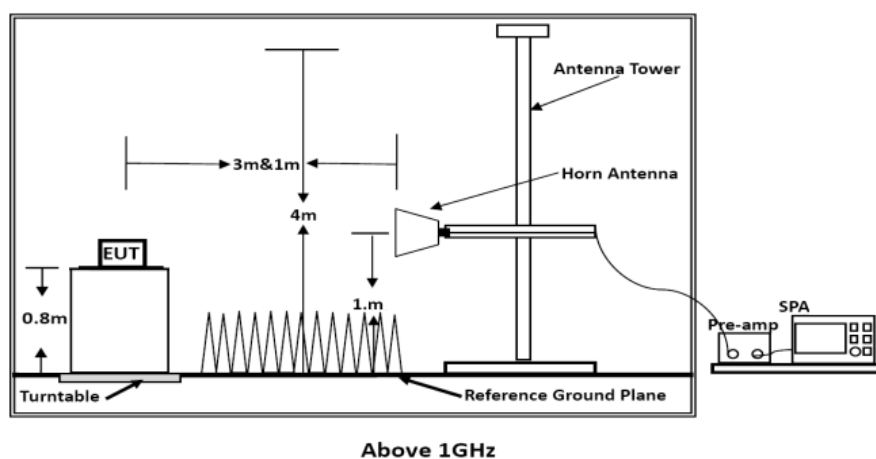
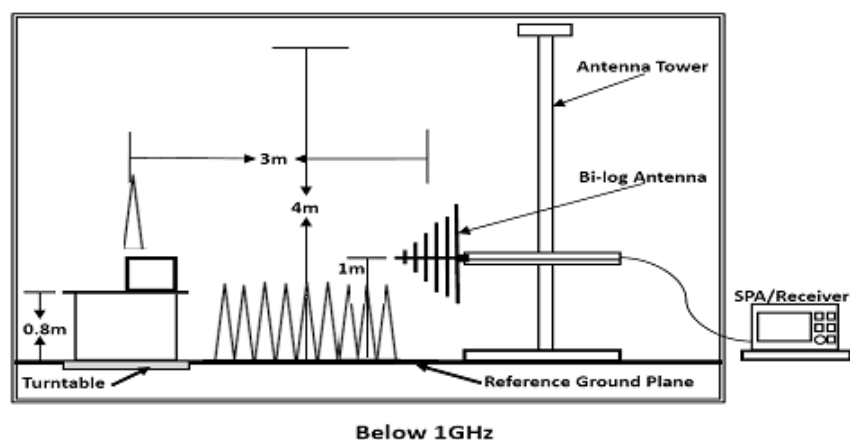
3.2. Radiated emission Measurement

3.2.1. Test Equipment

The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	EZ	EZ-EMC	/	N/A
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2019-06-12
3	Positioning Controller	MF	MF-7082	/	2019-06-12
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2019-07-25
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-192 5	2019-07-01
6	EMI Test Receiver	R&S	ESR 7	101181	2019-06-12
7	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2019-11-14
8	Broadband Preamplifier	/	BP-01M18G	P190501	2019-07-01
9	RF Cable-R03m	Jye Bao	RG142	CB021	2019-06-12
10	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2019-06-12

3.2.2. Block Diagram of Test Setup



3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54

Remark : (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 (2) The smaller limit shall apply at the cross point between two frequency bands.
 (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Limits for Radiated Emission Above 1GHz

Frequency (MHz)	Distance (Meters)	Peak Limit ($\text{dB}\mu\text{V/m}$)	Average Limit ($\text{dB}\mu\text{V/m}$)
1000 ~ 3000	3	70	42~35
3000 ~ 6000	3	74	42

***Note: The lower limit applies at the transition frequency.

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

3.2.5.1. Setup the EUT as shown in Section 3.2.2.

3.2.5.2. Let the EUT work in test Mode 1 and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver is set at 120kHz, 300kHz.

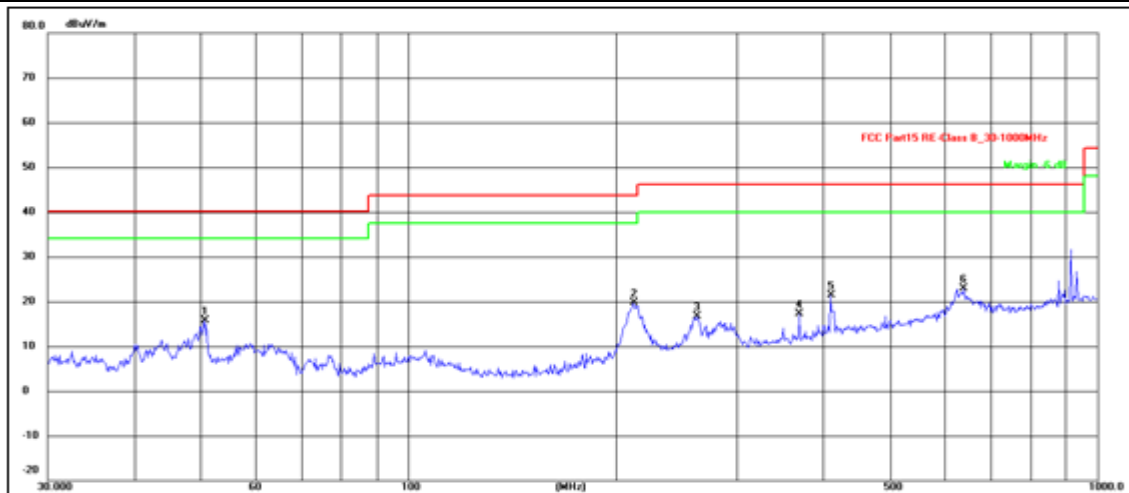
The frequency range from 30MHz to 1000MHz is checked.

3.2.7. Radiated Emission Noise Measurement Result

PASS.

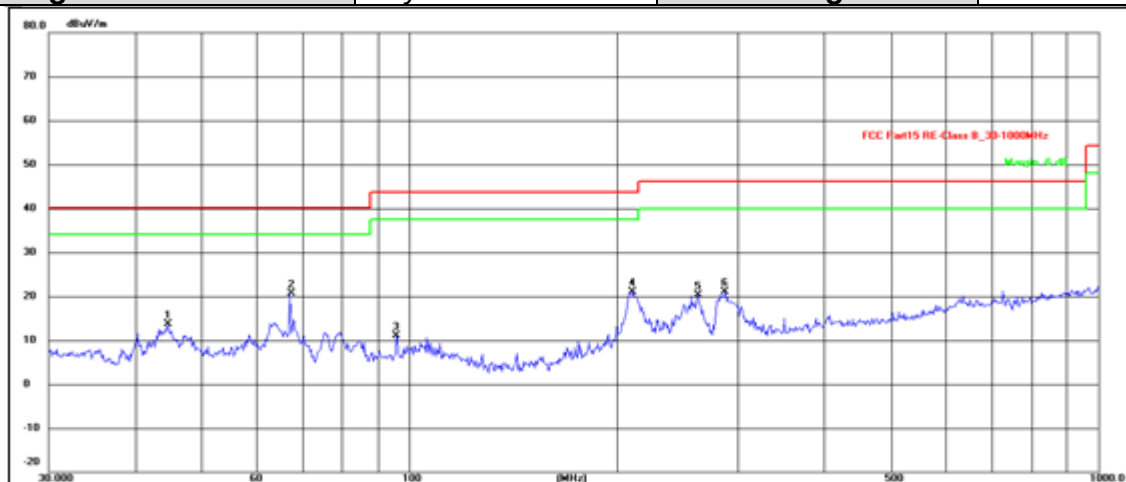
The scanning waveforms please refer to the next page.

Test Model	K3	Test Mode	Mode 2
Environmental Conditions	24.6°C, 54.1% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Jay Li	Test Voltage	DC 42V



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	50.5860	32.28	-16.48	15.80	40.00	-24.20	QP
2	212.2695	37.49	-17.84	19.65	43.50	-23.85	QP
3	262.8955	33.02	-16.37	16.65	46.00	-29.35	QP
4	369.4047	31.26	-14.01	17.25	46.00	-28.75	QP
5	410.3825	34.43	-13.07	21.36	46.00	-24.64	QP
6	640.6110	31.82	-8.84	22.98	46.00	-23.02	QP

Test Model	K3	Test Mode	Mode 2
Environmental Conditions	24.6°C, 54.1% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Jay Li	Test Voltage	DC 42V



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	44.7433	30.21	-16.50	13.71	40.00	-26.29	QP
2	67.2022	40.42	-19.78	20.64	40.00	-19.36	QP
3	95.7622	30.17	-19.04	11.13	43.50	-32.37	QP
4	210.0482	38.91	-17.89	21.02	43.50	-22.48	QP
5	262.8955	36.66	-16.37	20.29	46.00	-25.71	QP
6	286.9823	36.95	-15.94	21.01	46.00	-24.99	QP

Note: Pre-Scan all mode, Thus record worse case mode result in this report.

4. PHOTOGRAPH



Photo of Power Line Conducted Measurement

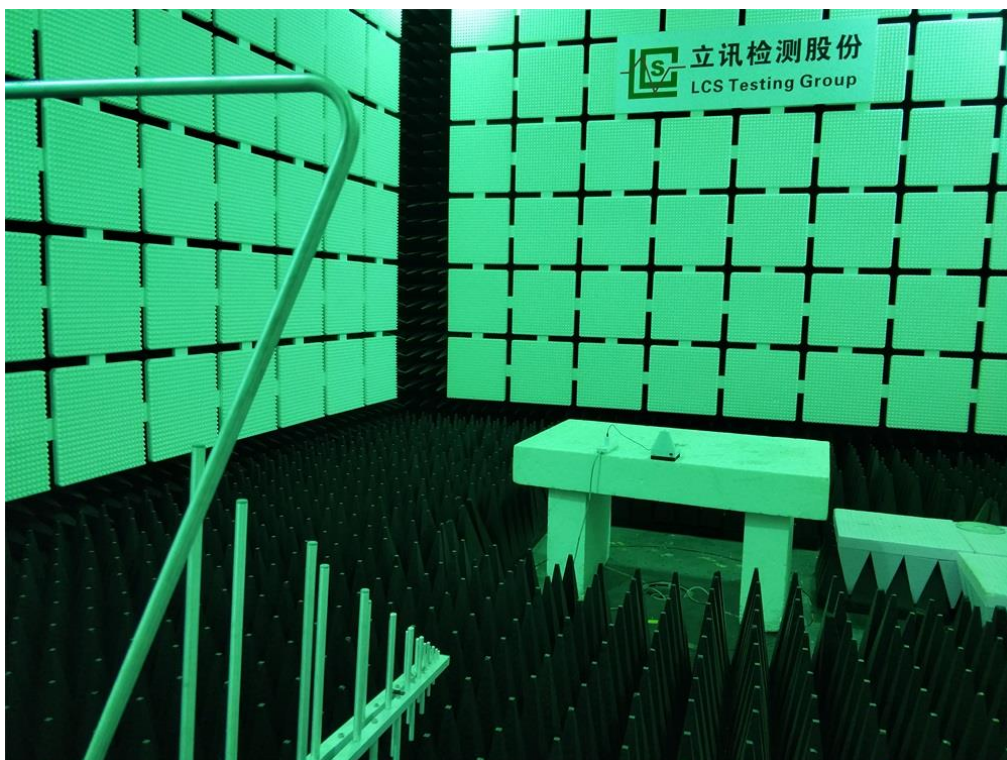


Photo of Radiated Measurement (Below 1GHz)

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1



Fig. 2



Fig. 3



Fig. 4

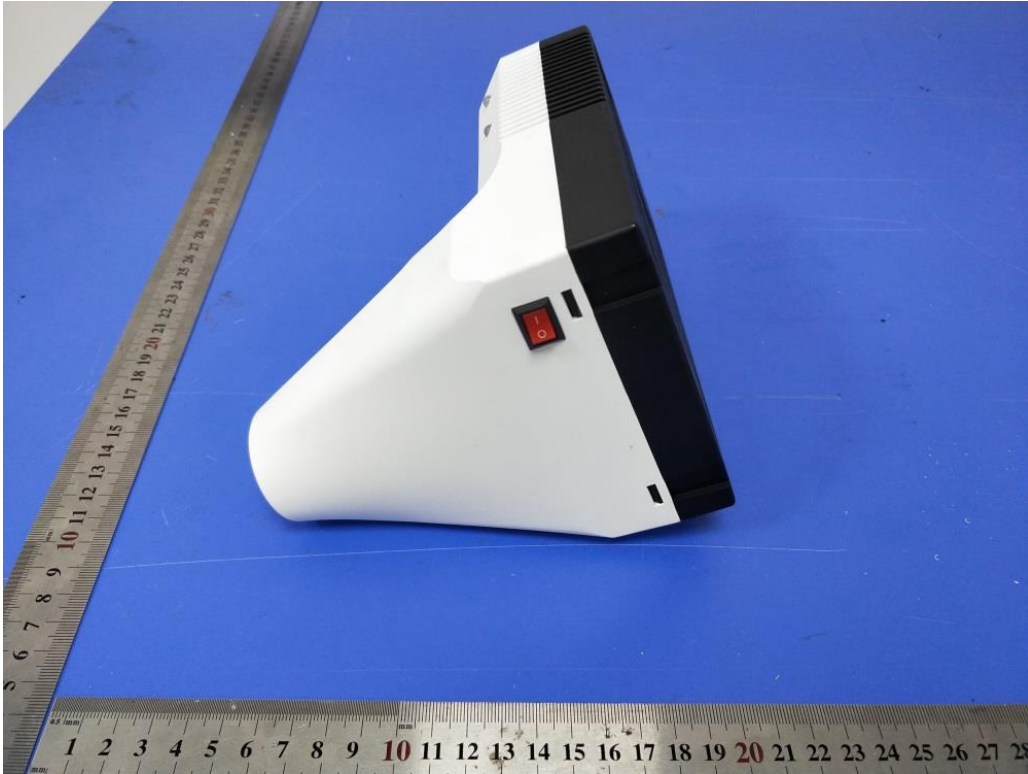


Fig. 5

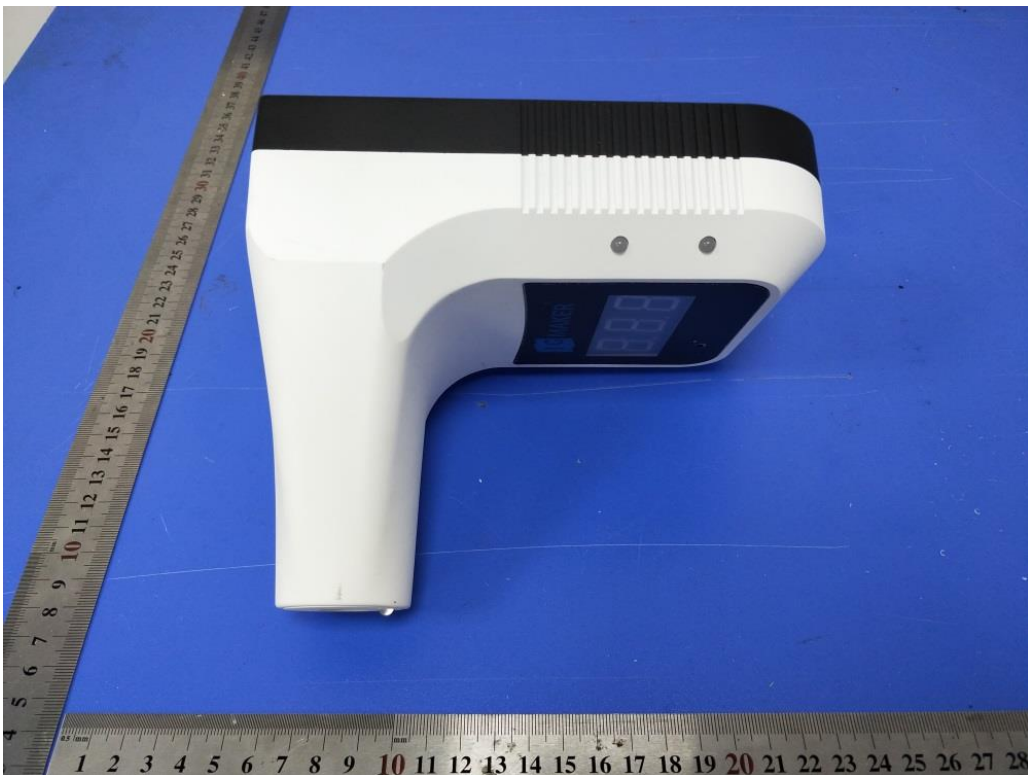


Fig. 6

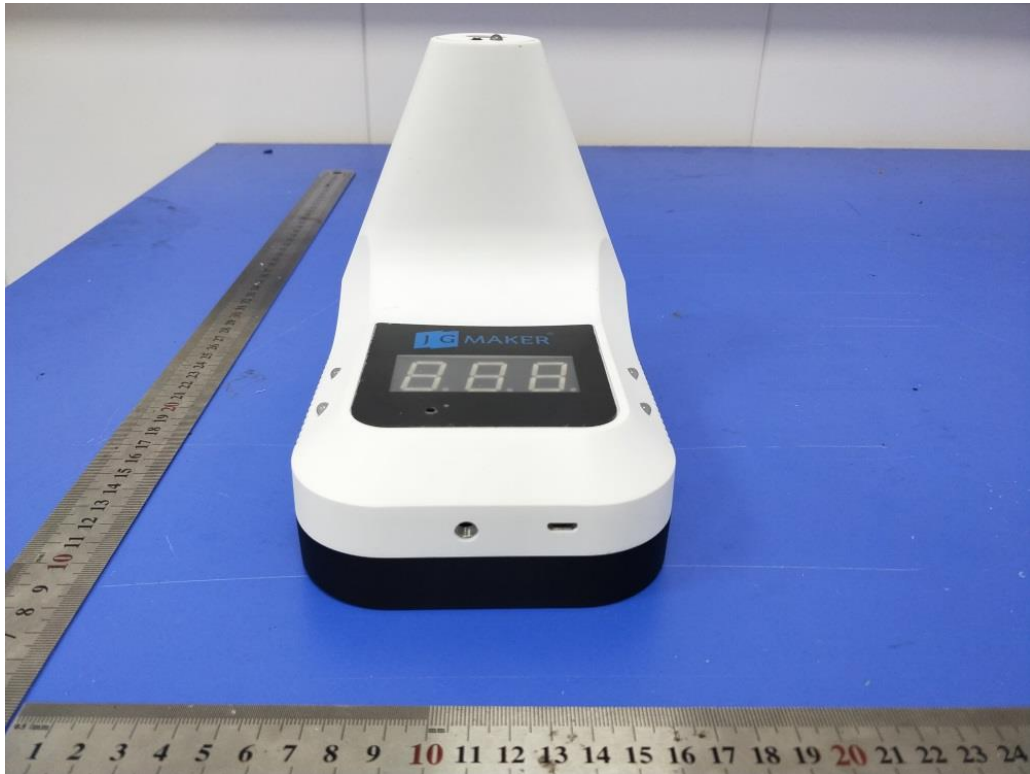


Fig. 7



Fig. 8



Fig. 9

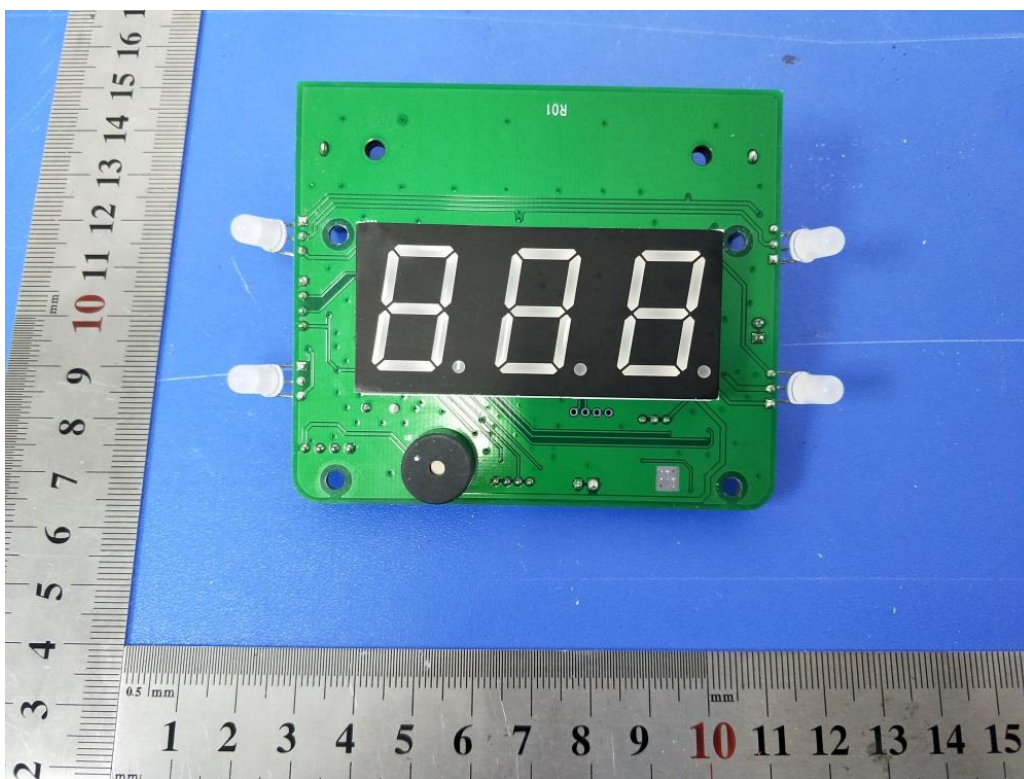


Fig. 10

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