



TEST REPORT

Product Name: 4 channel with rf control intelligent switch

Trademark: 

Model Number: Sonoff 4CH Pro R2

Serial Model: Sonoff 4CH R2

Prepared For: Shenzhen Sonoff Technologies Co., Ltd.

Address: 301, 3F, BLDG 52, The Third Industrial Park, Bantian, Longgang Dist Shenzhen, GD, 518055 China.

Manufacturer: Shenzhen Sonoff Technologies Co., Ltd.

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Prepared By: Shenzhen BCTC Testing Co., Ltd.

Address: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

Sample Received Date: Apr. 02, 2018

Sample tested Date: Apr. 03, 2018 to Apr. 10, 2018

Issue Date: Apr. 10, 2018

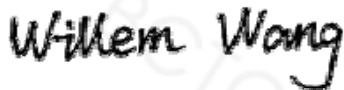
Report No.: BCTC-FY180301676-4E

Test Standards: ETSI EN 300 220-1 V3.1.1 (2017-02)
ETSI EN 300 220-2 V3.1.1 (2017-02)

Test Results: PASS

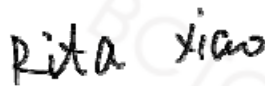
Remark: This is SRD-433MHz radio test report.

Compiled by:



Willen Wang

Reviewed by:



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Approved by:



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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
BCTC-FY180301676-4E	Apr. 10, 2018	Original	Valid



2. TEST SUMMARY

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No	Results
Receiver Parameters			
1	RX sensitivity	4.4.1	N/A
2	Clear channel assessment threshold	4.5.2	N/A
3	Polite spectrum access timing parameters	4.5.3	N/A
4	RX Blocking	4.4.2	PASS
5	Adaptive Frequency Agility	4.5.4	N/A

Note: N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device.



3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

RF frequency	1×10^{-7}
RF power, conducted	± 1.0 dB
Conducted emission of receivers	± 1 dB
Radiated emission of transmitter	± 6 dB
Radiated emission of receiver	± 6 dB
Temperature	± 1 degree
Humidity	± 5 %



4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	Sonoff 4CH Pro R2
Serial Model:	Sonoff 4CH R2
Model Description:	The product is different for model number and outlook color.
Wi-Fi Specification:	IEEE 802.11b/g/n
SRD	433.92MHz
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	WiFi: IEEE 802.11b/g/n 20: 2412-2472MHz SDR: RX 433.92MHz
Max. RF output power:	WiFi (2.4G) : 9.58dBm
Type of Modulation:	WiFi: DSSS, OFDM SRD: FSK
Antenna installation:	WiFi: Internal antenna
Antenna Gain:	WiFi (2.4G) : 1dBi
Ratings:	Input: AC 90-264V 50/60Hz DC 5-24V
Adapter:	N/A

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord

Notes:

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.

4.4 Channel List

N/A



4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Receiving	/	433.92MHz	/

4.6 Test Environment

1. Normal Test Conditions:

Humidity(%):	55
Atmospheric Pressure(hPa):	1010
Temperature(°C):	25
Test Voltage(AC):	230V/50Hz

2. Extreme Test Conditions:

For tests at extreme temperatures, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.

For tests at extreme voltages, measurements shall be made over the extremes of the power source voltage range as declared by the manufacturer.

Test Conditions	LTLV	LTHV	HTLV	HTHV
Temperature (°C)	0	0	40	40
Test Voltage (AC)	207	253	207	253



5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

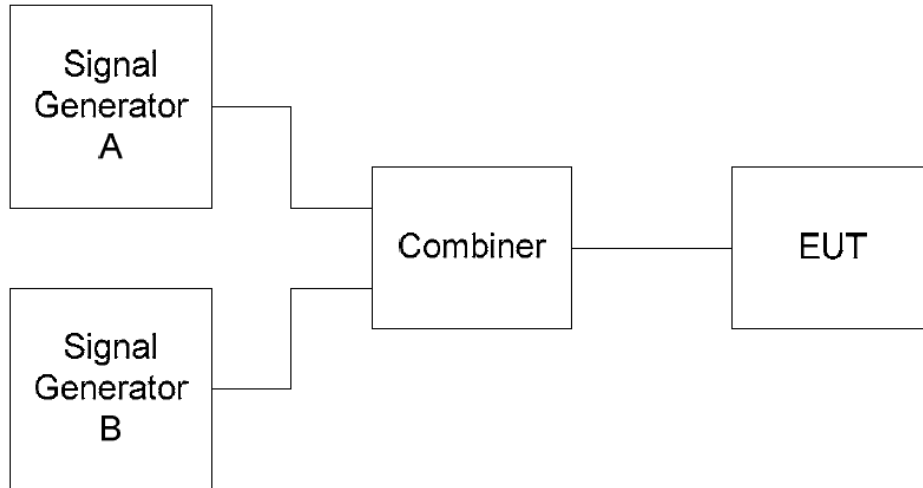
All measurement facilities used to collect the measurement data are located at BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Cal.Date	Cal.Due date
1	Spectrum Analyzer	R&S	FSP_40	100129	Aug. 25, 2017	Aug. 24, 2018
2	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Aug. 25, 2017	Aug. 24, 2018
3	Microflex Cable	United Microwave	57793	1m	Aug. 25, 2017	Aug. 24, 2018
4	Microflex Cable	United Microwave	A30A30-5006	10M	Aug. 25, 2017	Aug. 24, 2018
5	Horn Antenna	EMCO	3115	9605-4803	Aug. 25, 2017	Aug. 24, 2018
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	Aug. 25, 2017	Aug. 24, 2018
7	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	Aug. 25, 2017	Aug. 24, 2018
8	Test Cable	N/A	10M_OS02	N/A	Aug. 25, 2017	Aug. 24, 2018
9	Test Cable	N/A	OS02-1/-2/-3	N/A	Aug. 25, 2017	Aug. 24, 2018
10	Pre-Amplifier	Anritsu	MH648A	M09961	Aug. 25, 2017	Aug. 24, 2018
11	Temperature & Humidity Chamber	GIANT FORCE	GTH-056P	GF-94454-1	Aug. 25, 2017	Aug. 24, 2018
12	Signal Generator	R&S	SMT 06	832080/007	Aug. 25, 2017	Aug. 24, 2018
13	Power Metter	ANRITSU	ML2487A	6K00001568	Aug. 25, 2017	Aug. 24, 2018
14	Power Sensor (AV)	ANRITSU	ML2491A	030989	Aug. 25, 2017	Aug. 24, 2018
15	Signal Analyzer	Agilent	N9010A	MY48030494	Aug. 25, 2017	Aug. 24, 2018

6. RECEIVER BLOCKING

6.1 Block Diagram Of Test Setup



6.2 Limit

RX category 3

Requirement	Limits
	Receiver category 3
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -80 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -60 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -60 dBm

RX category 2

Requirement	Limits
	Receiver category 2
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -69 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -44 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -44 dBm

RX category 1.5

Requirement	Limits
	Receiver category 1.5
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -43 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -33 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -33 dBm

RX category 1

Requirement	Limits
	Receiver category 1
Blocking at ± 2 MHz from Centre Frequency	≥ -20 dBm
Blocking at ± 10 MHz from Centre Frequency	≥ -20 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -20 dBm



6.3 Test procedure

Signal generator A shall be set to an appropriate modulated test signal at the operating frequency of the EUT receiver.

Signal generator B shall be unmodulated.

Measurements shall be carried out at frequencies of the unwanted signal at approximately the frequency(ies) offset(s) defined in technical requirement avoiding those frequencies at which spurious responses occur. Additional

measurement points may be requested by technical requirements clause.

If several operational frequency bands are used by the equipment, at least one blocking measurement by bands has to be performed.

Step 1:

Signal generator B shall be powered off. Signal generator A shall be set to the minimum level which gives the wanted performance criterion of EUT or the reference level in Table 32, whichever is the higher. The output level of generator A shall then be increased by 3 dB unless otherwise specified in technical requirement.

Step 2:

Signal generator B is powered on and set to operate at the nominal operating frequency - offset frequency.

Signal generator B is then switched on and the signal amplitude is adjusted to the minimum level at which the wanted performance criterion is not achieved.

With signal generator B settings unchanged, the receiver shall be replaced with a suitable RF power measuring equipment. The power into the measuring equipment shall be measured and noted.

The blocking level is then the conducted power received from generator B at the EUT antenna connector.

This can either be measured on the antenna connector for conducted test or be calculated for radiated test (see clause C.5.4).

The blocking level shall be higher or equal to the blocking power level requested in the technical requirement clause.

Step 3:

The measurement in steps 1 to 3 shall be repeated with signal offsets at required frequencies.

Step 4:

The information shown in below Table shall be recorded in the test report for each measured signal level and unwanted signal offset.



Value	Notes
Operating Frequency	Nominal centre frequency of the receiver
Signal generator A	Power level of signal generator A
Blocking level	Power level of signal generator B

6.4 Test Result

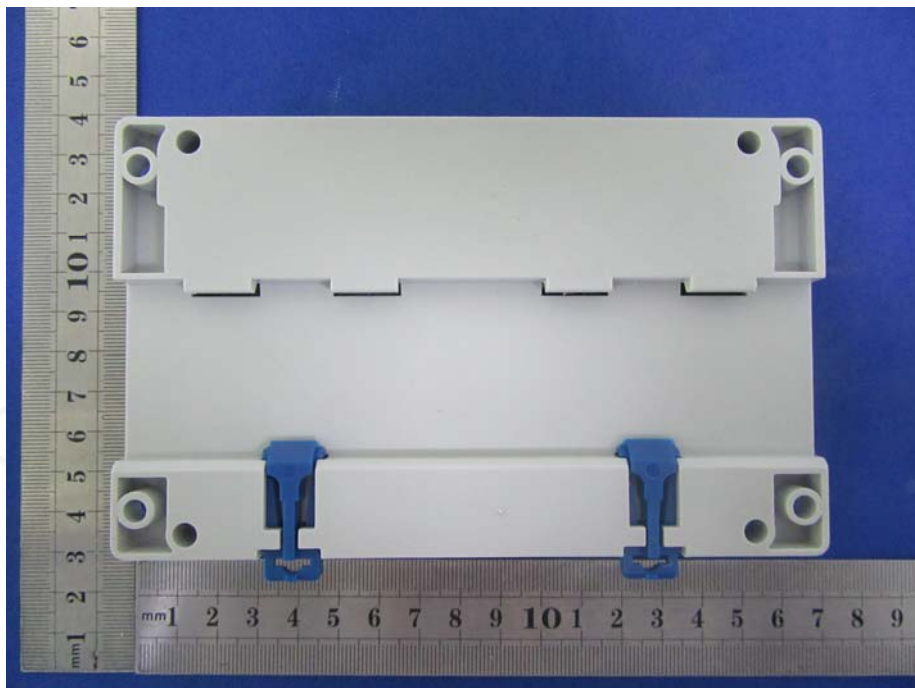
Requirement (MHz)	Result (dBm)	Limit Receiver category 2 (dBm)
Blocking at -2 MHz from OC edge f_{low}	-60	≥ -69
Blocking at +2 MHz from OC edge f_{high}	-58	≥ -69
Blocking at -10 MHz from OC edge f_{low}	-36	≥ -44 dBm
Blocking at +10 MHz from OC edge f_{high}	-35	≥ -44 dBm
Blocking at -5 % of Centre Frequency edge f_{low}	-34	≥ -44 dBm
Blocking at +5 % of Centre Frequency edge f_{high}	-35	≥ -44 dBm

7. EUT PHOTOGRAPHS

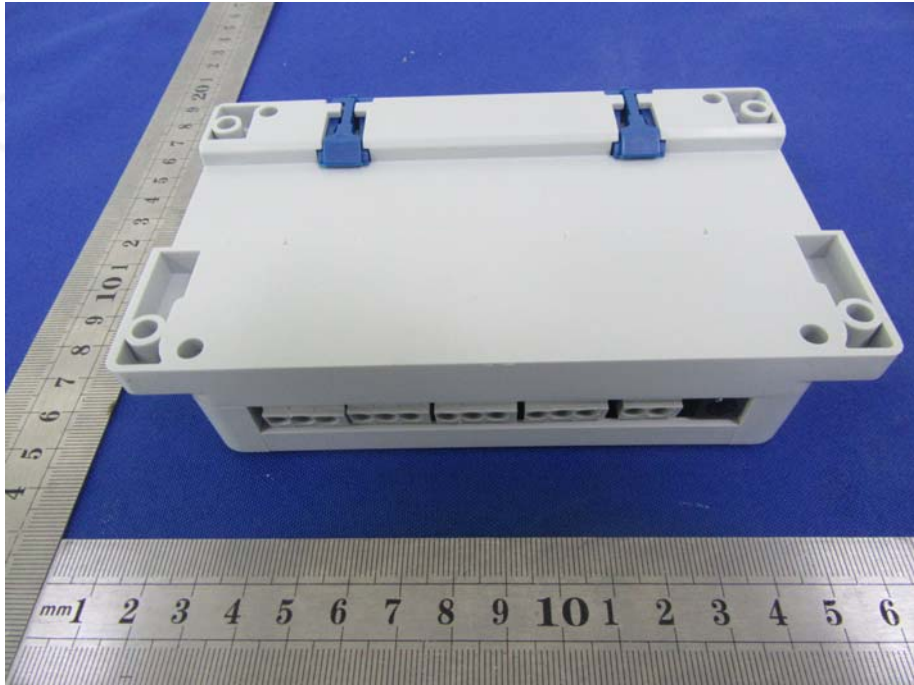
EUT Photo 1



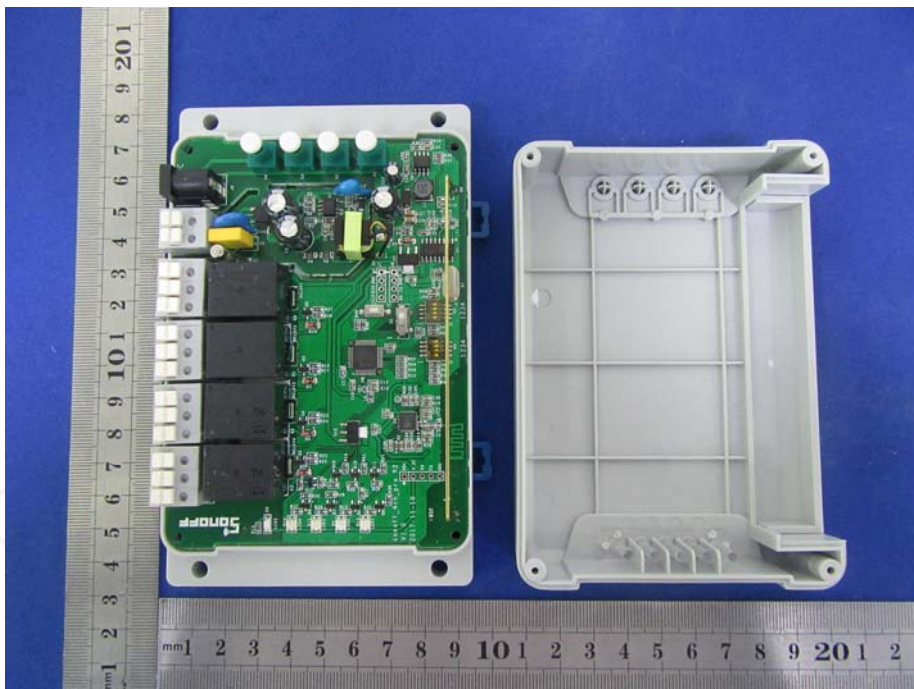
EUT Photo 2



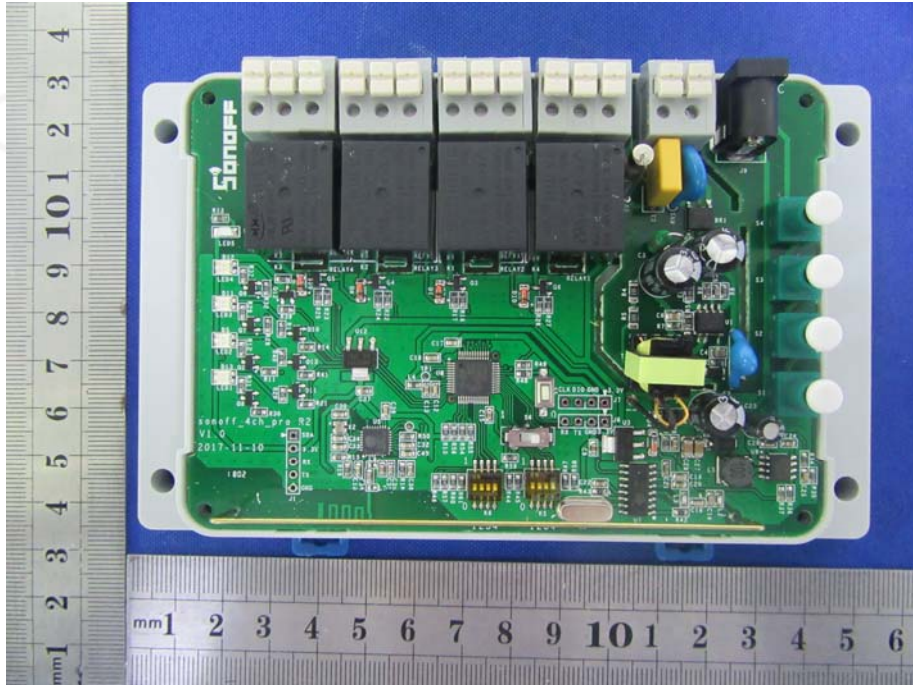
EUT Photo 3



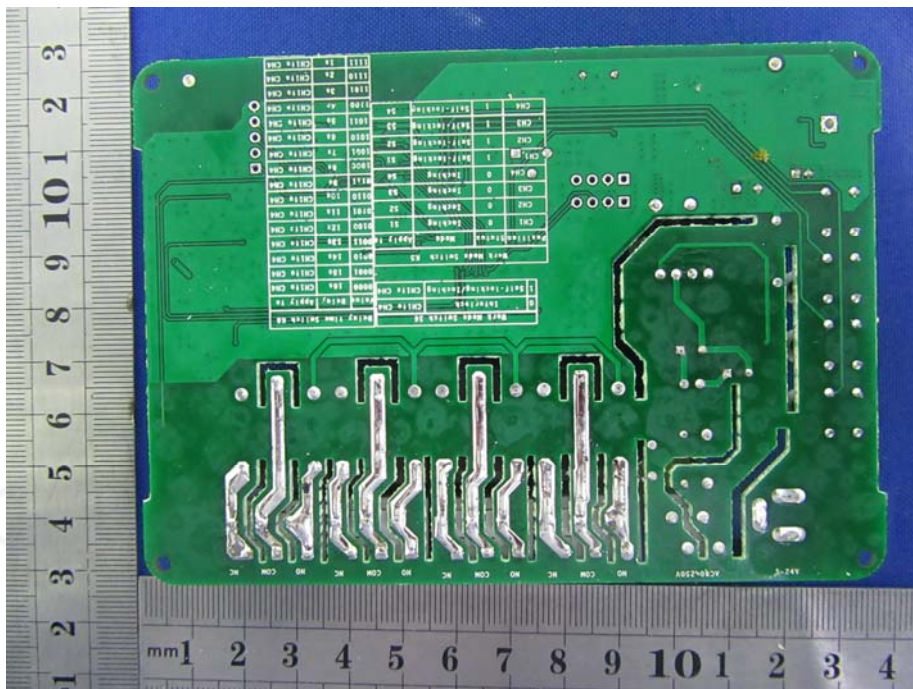
EUT Photo 4



EUT Photo 5



EUT Photo 6

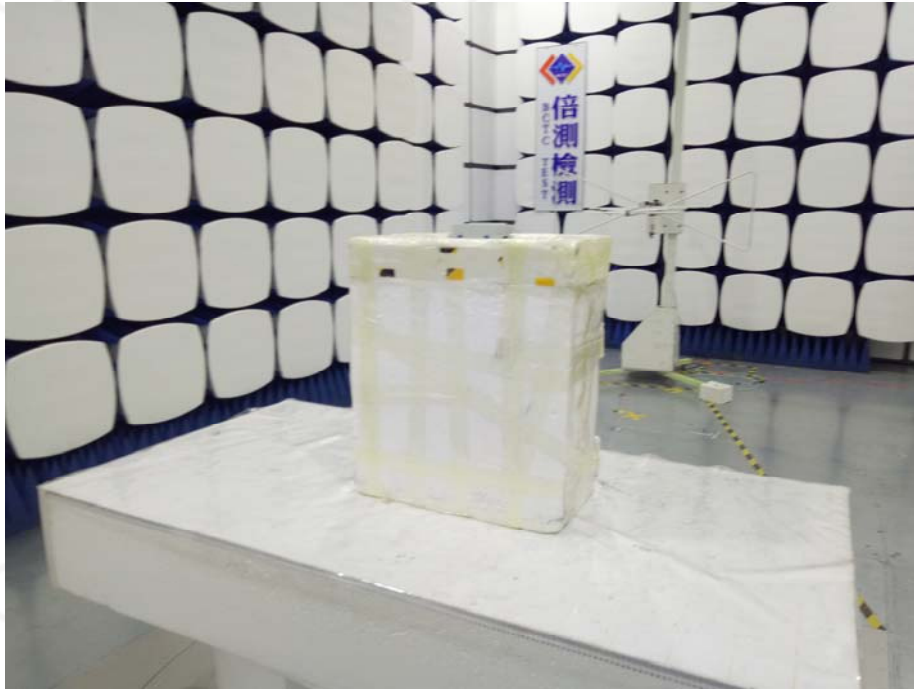


8. EUT TEST SETUP PHOTOGRAPHS

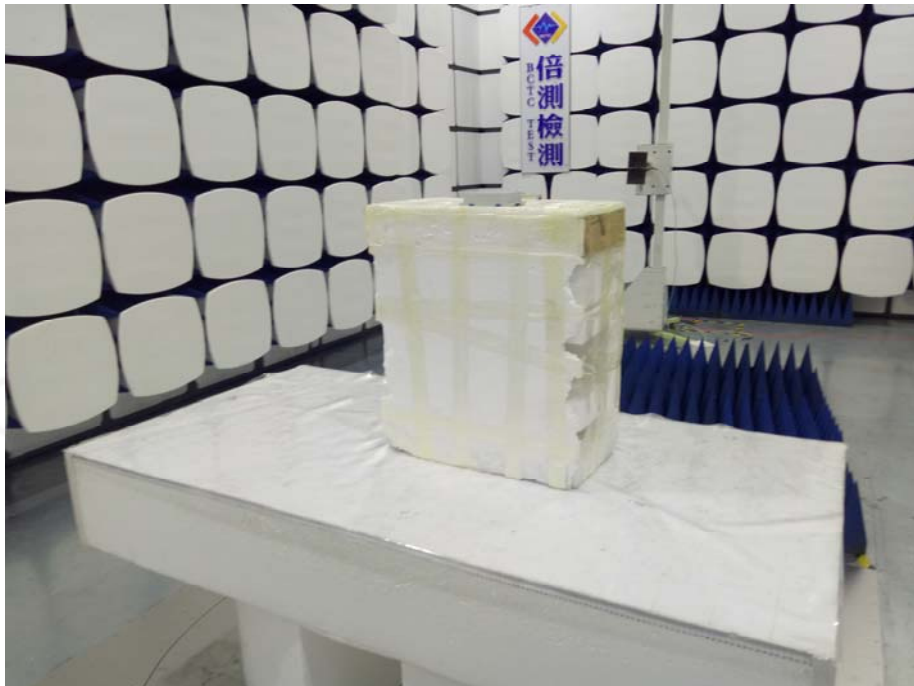
Spurious emissions

Spurious emissions

Below 1G



Above 1G



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