EMC TEST REPORT

On Behalf of

Prepared For :	**Dongguan Haiwei Technology Co., Ltd** Room 410, Unit 2, No.1, Pailou Ji Industrial Road, Wanjiang Street, Dongguan City, Guangdong Province
Trade Mark :	
Product Name :	**Temperature and humidity sensor**
Model(s) :	**HW-TH200**
Prepared By:	**Shenzhen BYS Testing Co., Ltd.** Floor 4, Building 2, No.38 Guangda Road, Yuanshan Street,Longgang district, Shenzhen, China
Test Date:	**Mar. 15, 2022- Mar. 21, 2022**
Date of Report:	**Mar. 21, 2022**
Report No. :	**BYS2203150157ER**

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen BYS Testing Co., Ltd .

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Test Report Description Page

TEST REPORT DECLARATION

Applicant	:	**Dongguan Haiwei Technology Co., Ltd**
Address :	:	Room 410, Unit 2, No.1, Pailou Ji Industrial Road, Wanjiang Street, Dongguan City, Guangdong Province
Manufacturer:	:	**Dongguan Haiwei Technology Co., Ltd**
Address :	:	Room 410, Unit 2, No.1, Pailou Ji Industrial Road, Wanjiang Street, Dongguan City, Guangdong Province
EUT Description	:	**Temperature and humidity sensor**
Model Number	:	**HW-TH200**

Test Standards:

EN55032: 2015+A1:2020
EN 55035:2017+A11:2020

The EUT described above is tested by Shenzhen BYS Testing Co., Ltd EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. Shenzhen BYS Testing Co., Ltd . is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the2014/30/EU directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Date of Test: **Mar. 15, 2022- Mar. 21, 2022**

Prepared by (Engineer) :

Reviewer by (Quality Manager) :

Approved by (Manager) :

1. GENERAL INFORMATION

Description of Device (EUT)

EUT	:	Temperature and humidity sensor
Trademark	:	
Model	:	HW-TH200
Supplementary Model	:	/
Test Voltage	:	DC 9-30V
Applicant	:	**Dongguan Haiwei Technology Co., Ltd**
Address	:	Room 410, Unit 2, No.1, Pailou Ji Industrial Road, Wanjiang Street, Dongguan City, Guangdong Province
Manufacturer	:	**Dongguan Haiwei Technology Co., Ltd**
Address	:	Room 410, Unit 2, No.1, Pailou Ji Industrial Road, Wanjiang Street, Dongguan City, Guangdong Province

Test Standards

Test Standards	
EN55032: 2015+A11:2020	Electromagnetic compatibility of multimedia equipment - Emission requirements
EN55024: 2010+A1:2015	Information technology equipment- Immunity characteristics - Limits and methods of measurement

Test Summary

For the EUT described above.

Table 1: Tests Carried Out Under EN55032: 2015+A11:2020

Standard	Test Items	Status
EN55032: 2015+A11:2020	Disturbance Voltage at The Mains Terminals (150KHz To 30MHz)	×
	Radiated Disturbances (30MHz To 1000MHz)	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Table 2: Tests Carried Out Under EN 55035:2017+A11:2020

Standard	Test Items	Status
EN61000-4-2:2009	Electrostatic discharge Immunity	√
EN61000-4-3:2006 +A1:2008+A2:2010	Radiated Susceptibility (80MHz to 1GHz)	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Test Methodology

All measurements contained in this report were conducted with CISPR 16-1, radio disturbance and immunity measuring apparatus, and CISPR16-2, Method of measurement of disturbances and immunity. All measurement required was performed at laboratory of Shenzhen BYS Testing Co., Ltd.,

Test Facility

The test facility is recognized, certified, or accredited by the following organizations:
The facility also complies with the radiated and AC line conducted test site criteria set forth in CISPR 16-1, CISPR16-2.

Measurement Uncertainty

Radiation Uncertainty : Ur = ± 3.84 dB

Conduction Uncertainty : Uc = ± 2.72 dB

2. MEASURING DEVICE AND TEST EQUIPMENT

For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Nov. 20, 2021	1 Year
2.	Test Receiver	Rohde& Schwarz	ESCS30	828985/018	Nov. 20, 2021	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	Nov. 20, 2021	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	Nov. 20, 2021	1 Year
5.	EMI Power Line Filter	DUOJI EME	FNF 201 B16	N/A	Nov. 20, 2021	1 Year
6.	EMI Power Line Filter	JIANLI	DL-40C	N/A	Nov. 20, 2021	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	Nov. 20, 2021	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	Nov. 20, 2021	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	Nov. 20, 2021	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	Nov. 20, 2021	1 Year
11.	Signal Generator	HP	8648A	3625U00573	Nov. 20, 2021	1 Year

2.3. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1600	H708159	Nov. 20, 2021	1 Year

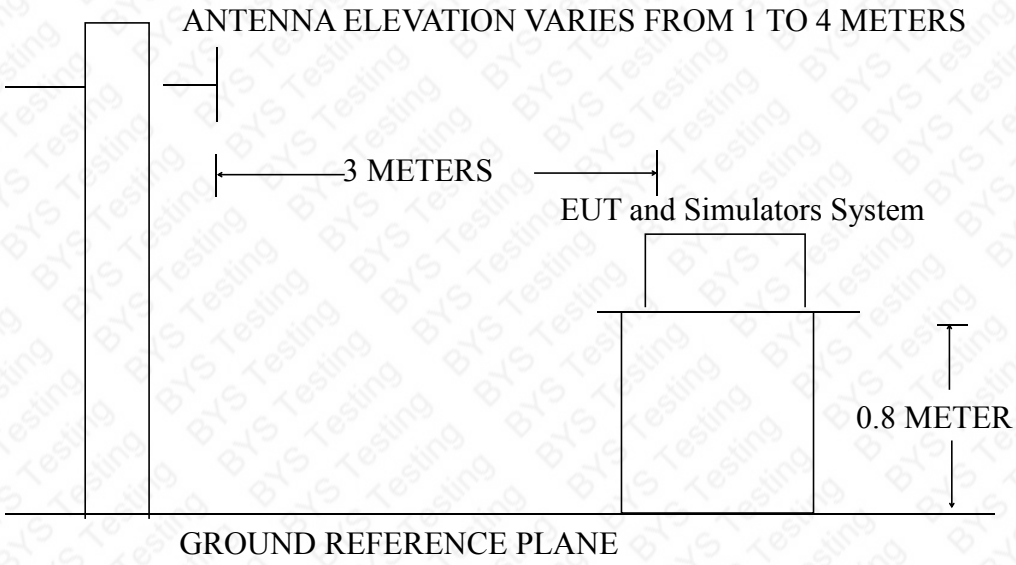
2.4. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3625U00573	Nov. 20, 2021	1 Year
2.	Amplifier	AR	500A100	17034	NCR	NCR
3.	Amplifier	AR	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	AR	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	AR	FP2000	16755	Nov. 20, 2021	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	AR	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

3.RADIATED EMISSION MEASUREMENT

Block Diagram of Test

Block diagram of test setup (In chamber)



(EUT: Temperature and humidity sensor)

Measuring Standard

EN55032: 2012+A1:2013

Radiated Emission Limits

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

EUT Configuration on Test

The EN55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

Operating Condition of EUT

Turn on the power.

After that, let the EUT work in test mode (Normal) and measure it.

Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the Receiver (ESCS30) is set at 120kHz.
The frequency range from 30MHz to 1000MHz is investigated.

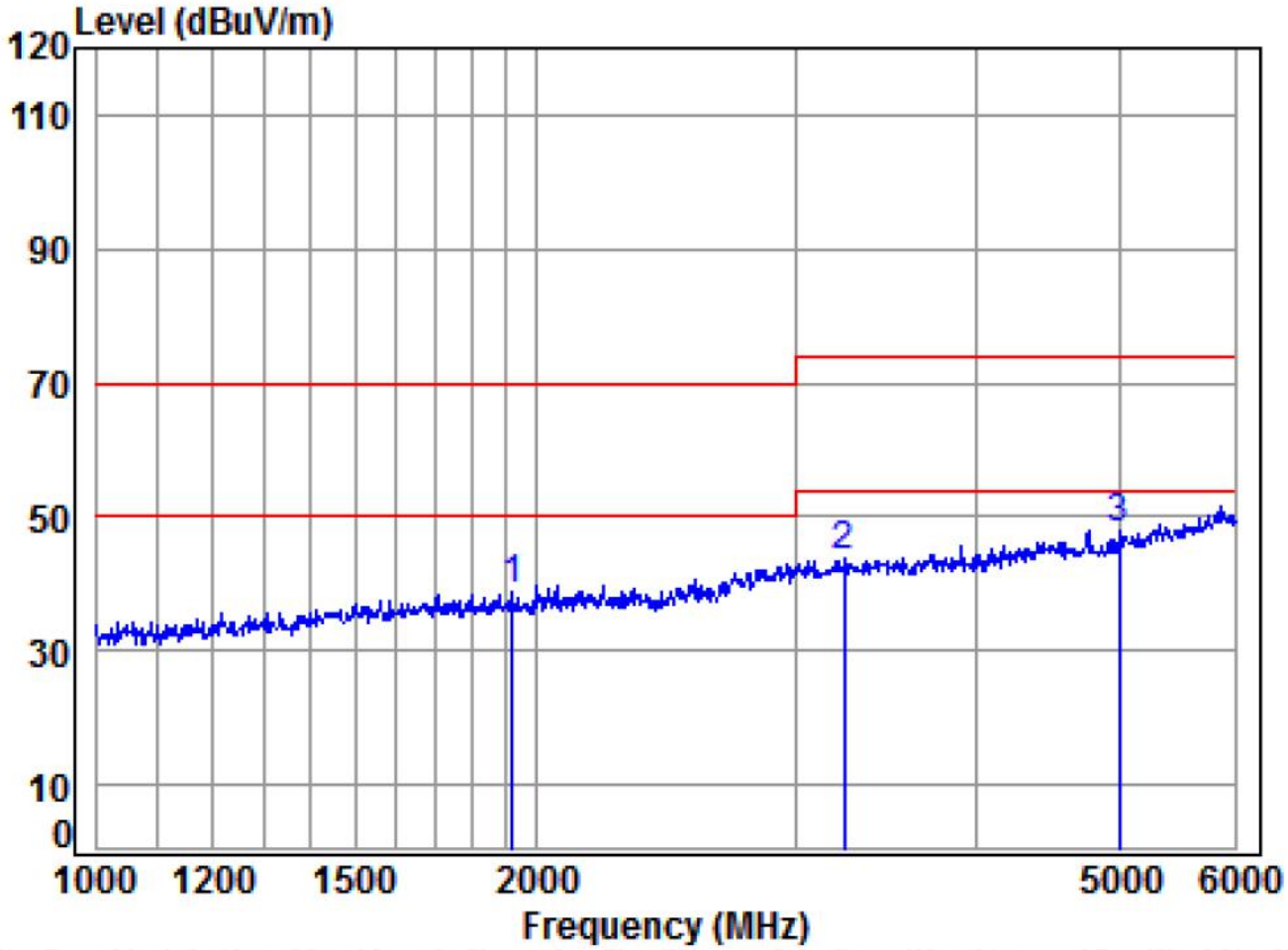
Measuring Results

PASS.

Please reference to the following pages

Radiated Emission Test Data

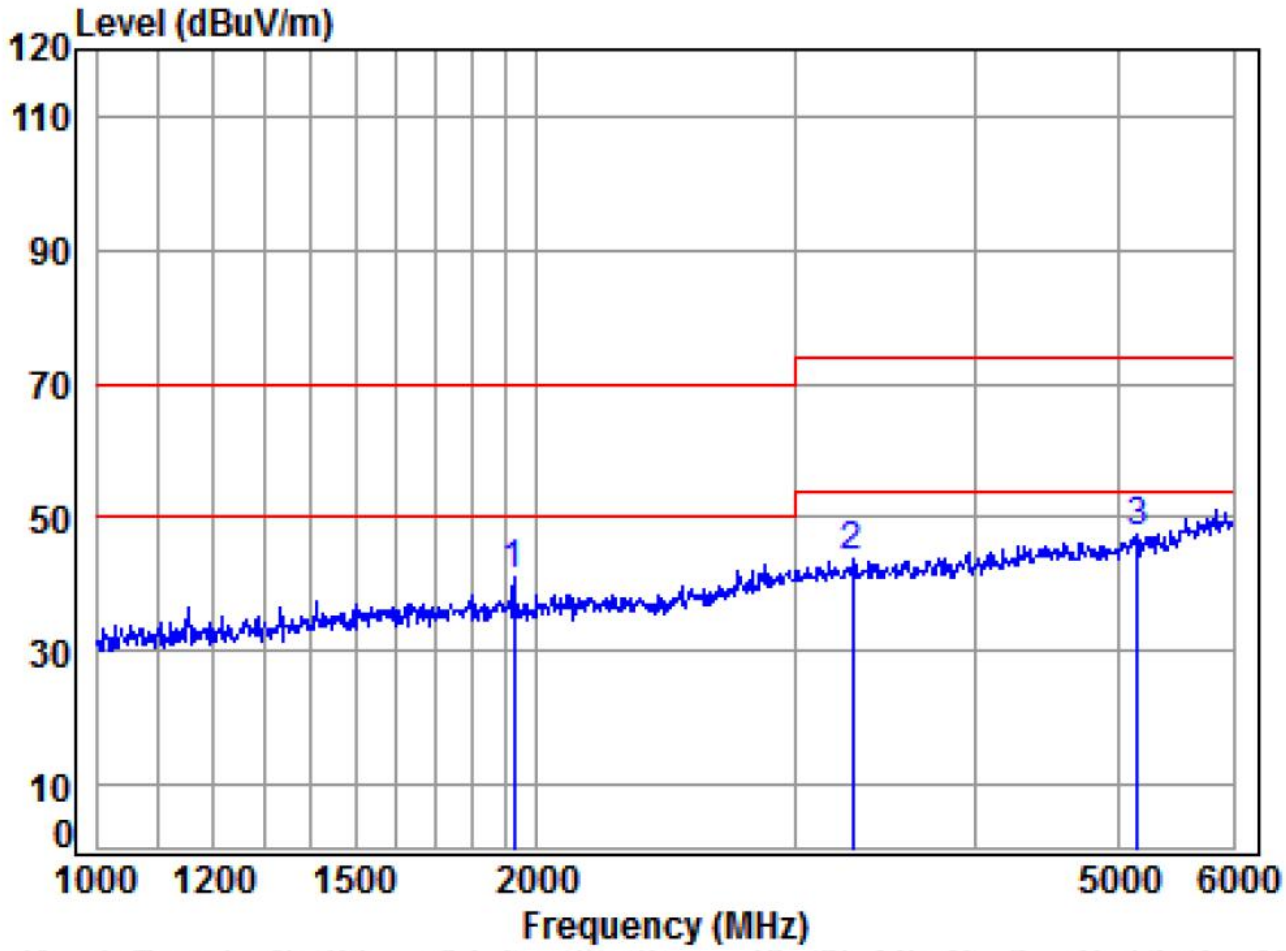
Standard:	EN55032 Class B RE	Polarization:	Horizontal
Test item:	Radiation Test	Date:	2022-03-21
EUT:	Temperature and humidity sensor	Test By:	Mark
Model:	HW-TH200	Distance:	3m
Note:			



	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1923.203	4.98	27.53	40.95	47.42	38.98	70.00	-31.02	Peak
2	3245.229	6.22	31.31	41.77	48.07	43.83	74.00	-30.17	Peak
3	4997.811	8.09	34.20	43.80	49.28	47.77	74.00	-26.23	Peak

Radiated Emission Test Data

Standard:	EN55032 Class B RE	Polarization:	Vertical
Test item:	Radiation Test	Date:	2022-03-21
EUT:	Temperature and humidity sensor	Test By:	Mark
Model:	HW-TH200	Distance:	3m
Note:			

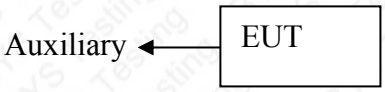


	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1926.652	4.98	27.54	40.96	49.43	40.99	70.00	-29.01	Peak
2	3286.188	6.26	31.37	41.83	48.04	43.84	74.00	-30.16	Peak
3	5161.626	8.34	34.33	43.63	48.24	47.28	74.00	-26.72	Peak

4. ELECTROSTATIC DISCHARGE IMMUNITY TEST

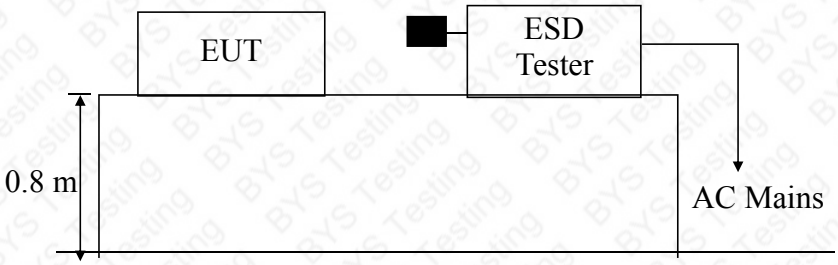
4.1 Block Diagram of Test Setup

4.1.1 Block Diagram of the EUT and the simulators



(EUT: Temperature and humidity sensor)

4.1.2 Block diagram of ESD test setup



(EUT: Temperature and humidity sensor)

4.2 Test Standard

EN 55024: 2010 (Severity Level: 3 / Air Discharge: ±8KV Level: 2 / Contact Discharge: ±4KV)

4.3 Severity Levels and Performance Criterion

4.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

4.3.2Performance criterion: B

4.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

4.5 Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.4. Except the test set up replaced by Section 7.1.

4.6 Test Procedure

4.6.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

4.6.2Contact Discharge:

All the procedure shall be same as Section 7.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

4.6.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

4.6.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

4.7 Test Results

PASS

Please refer to the following page

Electrostatic Discharge Test Result

Shenzhen BYS Testing Co., Ltd

Applicant	:	**Hangzhou Kangyun Electronic Technology Co., Ltd**	Test Date	:	2022-03-21
EUT	:	Temperature and humidity sensor	Temperature	:	22℃
M/N	:	HW-TH200	Humidity	:	50%
Power Supply	:	/	Test Mode	:	Normal
Air discharge	:	±2.0KV, ±4.0KV, ±6.0KV, ±8.0KV	Criterion	:	B
Contact discharge:		±2.0KV, ±4.0KV	Test Engineer	:	Mark

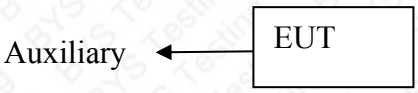
Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Gap 10 points	A	PASS
Port 10 points	A	PASS
HCP 4 points	C	PASS
VCP 4 points	C	PASS

Test Equipment: ESD Simulator (HAEFELY, PESD1600)

5. RF FIELD STRENGTH SUSCEPTIBILITY TEST

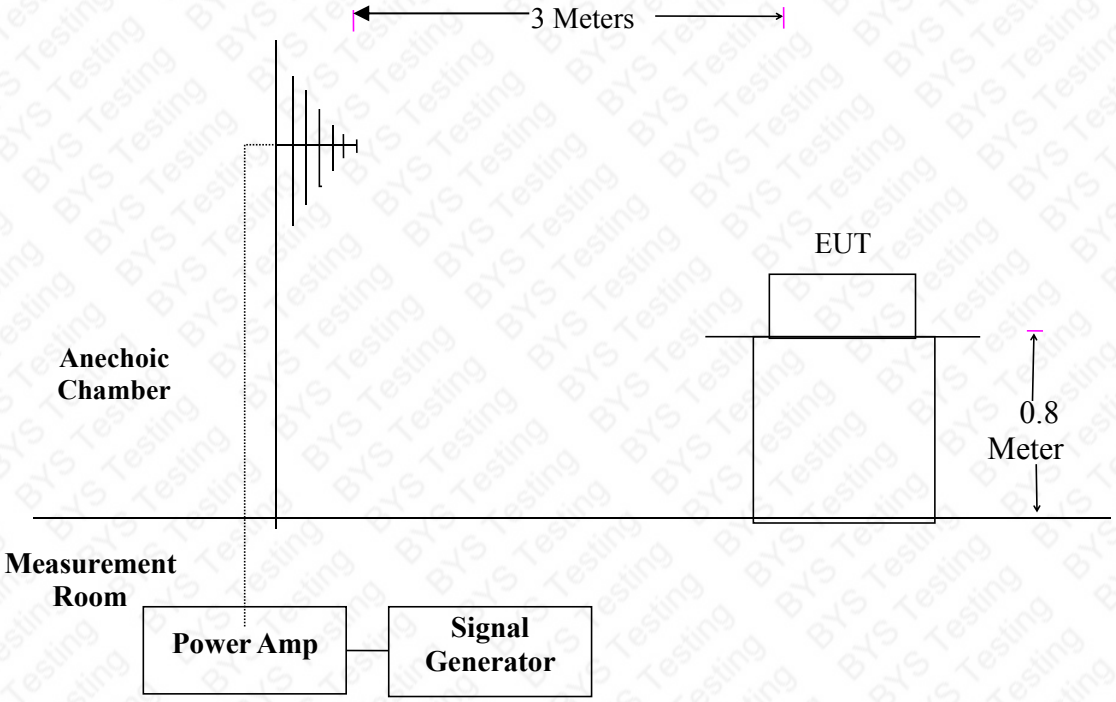
5.1 Block Diagram of Test

5.1.1Block diagram of connection between the EUT and Load



(EUT: Temperature and humidity sensor)

5.1.2 Block diagram of RS test setup



(EUT: Temperature and humidity sensor)

5.2 Test Standard

EN55024: 2010+A1:2015 (EN61000-4-3:2006+A1:2008+A2:2010 (Severity Level: 2, 5V 1A/m))

5.3 Severity Levels and Performance Criterion

5.3.1Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

5.3.2Performance Criterion : **A**

5.4 EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

5.5 Operating Condition of EUT

Same as radiated emission measurement which is listed in Section 3.4, except the test setup replaced as Section 8.1.

5.6 Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor its screen. All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	5V 1A/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80-1000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

5.7 Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Shenzhen BYS Testing Co., Ltd

Applicant	: Hangzhou Kangyun Electronic Technology Co., Ltd	Test Date :	2022-03-21
EUT	: Temperature and humidity sensor	Temperature:	22℃
M/N	: HW-TH200	Humidity:	50 %
Field Strength	: 3 V/m	Criterion:	A
Power Supply	: /	Test Mode :	Normal
Test Engineer:	Mark	Frequency Range:	100 M to1000 M

Modulation: ☐None ☐ Pulse ☑AM 1KHz 80%

	Frequency Rang 1: 80~ 1000MHz		Frequency Rang 2:	
Steps	1 / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical
Front	PASS	PASS		
Right	PASS	PASS		
Rear	PASS	PASS		
Left	PASS	PASS		

Test Equipment **:**
1. Signal Generator : 2031 (MARCONI)
2. Power Amplifier : 500A100 & 100W/1000M1 (A&R)
3. Power Antenna : 3108 (EMCO) & AT1080 (A&R)
4. Field Monitor : FM2000 (A&R)

Note:

APPENDIX I
(Photos of EUT)

FIGURE
GENERAL APPEARANCE OF EUT

Photo 1

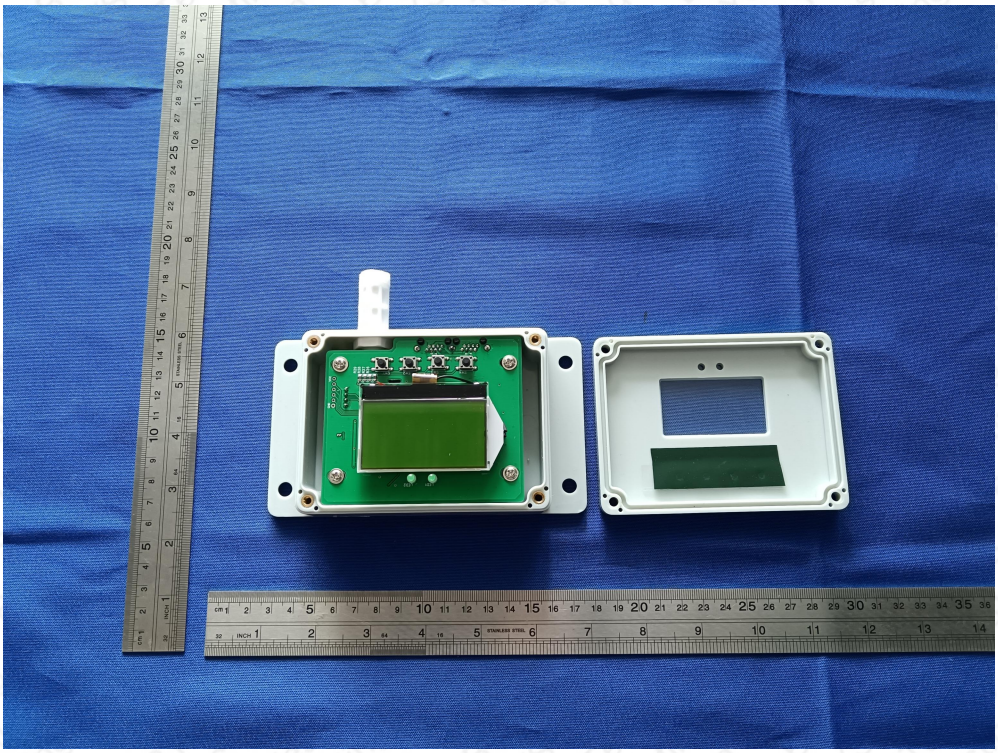
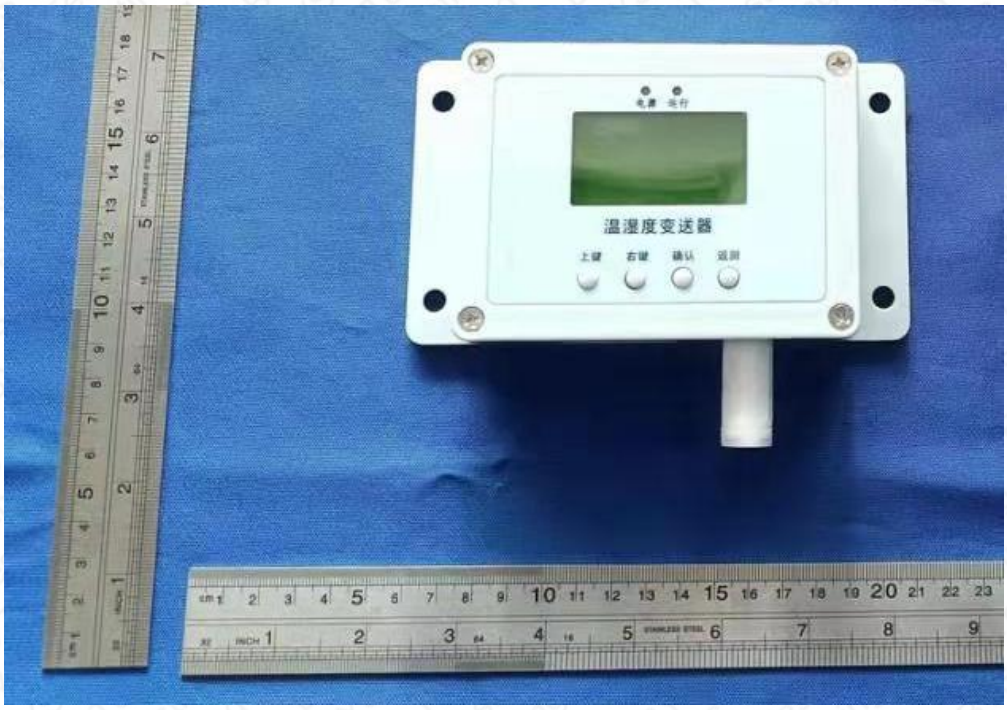


Photo 2



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