# EMC TEST REPORT
for
Xiamen E-top Controls Technology Co., Ltd.

Thermostat

Model No.: WT-02, WT-08, WT-11, WT-15, WT-16, WT-18, WT-19, WT-20, HT-CS01, HT-CS06, HT-04, HT-07, HT-08, HT-09, HT-10R, R03, R06, R07, R08, E-HUB, EGW-01, TR-01

| | | |
|---|---|---|
| Prepared for | : | Xiamen E-top Controls Technology Co., Ltd. |
| Address | : | No.6 of Tong'an Industrial Park, Meixi Rd,Tong'an District, Xiamen China 361100 |
| Prepared by | : | Shenzhen Accurate Technology Co., Ltd. |
| Address | : | 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China |
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| | | |
|---|---|---|
| Report No. | : | RTZ200925003-02 |
| Date of Test | : | Sep.25-Oct.28, 2020 |
| Date of Report | : | Oct.28, 2020 |

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# Test Report Declaration

| | | |
|---|---|---|
| Applicant | : | Xiamen E-top Controls Technology Co., Ltd.<br>No.6 of Tong'an Industrial Park, Meixi Rd,Tong'an District, Xiamen China 361100 |
| Manufacturer | : | Xiamen E-top Controls Technology Co., Ltd.<br>No.6 of Tong'an Industrial Park,Meixi Rd,Tong'an District,Xiamen China 361100 |
| Product | : | Thermostat |
| Model No. | : | WT-02, WT-08, WT-11, WT-15, WT-16, WT-18, WT-19, WT-20, HT-CS01, HT-CS06, HT-04, HT-07, HT-08, HT-09, HT-10R, R03, R06, R07, R08, E-HUB, EGW-01, TR-01 |
| Trade name | : | N/A |

Measurement Procedure Used:

**EN 301 489-1 V2.2.3 [Electromagnetic compatibility(EMC) standard for radio equipment and services; Part 1: Common technical requirements]; Harmonised Standard for ElectroMagnetic Compatibility**

**EN 301 489-3 V2.1.1 [ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU]**

**EN 301 489-17 V3.2.4 [ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU]**

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 301 489-1 V2.2.3 and EN 301 489-3 V2.1.1 and EN 301 489-17 V3.2.4 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : Sep.25-Oct.28, 2020

Date of Report : Oct.28, 2020

Prepared by : (Bob Wang, Engineer)

Approved & Authorized Signer : ( Candy.Li, RF Engineer )

# 1. TEST RESULTS SUMJUNY

| Test Items | Test Standard | Test Results |
|---|---|---|
| Conducted Emission(AC mains power input/output port) | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Conducted Emission(DC mains power input/output port) | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | N/A |
| Conducted Emission (Wired network port) | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | N/A |
| Radiated Emission | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Harmonic Current Emission | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Voltage Fluctuation and Flicker Emission | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Electrostatic Discharge Immunity | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Radiated Electromagnetic Fields Immunity | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Electrical Fast Transient /Burst Immunity | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Surge Immunity | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Injected Current Susceptibility | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |
| Voltage dips and interruptions Immunity | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.1.1<br>EN 301 489-17 V3.2.4 | Pass |

Remark: “N/A” means “Not applicable”.

# 2. GENERAL INFORMATION

## 2.1.Description of Device (EUT)

The submitted sample is a Thermostat which have TX & RX 868MHz and Wi-Fi function.

| Transmitter 868MHz | | |
|---|---|---|
| Model No. | : | WT-02, WT-08, WT-11, WT-15, WT-16, WT-18, WT-19, WT-20, HT-CS01, HT-CS06, HT-04, HT-07, HT-08, HT-09, HT-10R, R03, R06, R07, R08, E-HUB, EGW-01, TR-01 |
| Range of Frequency | : | 868MHz |
| Number of Channels | : | 1 |
| Modulation Mode | : | FSK |
| Antenna Gain | : | 2.15dBi |
| Type of Antenna | : | Integral Antenna |
| Power Supply | : | DC 3V |
| Applicant | : | Xiamen E-top Controls Technology Co., Ltd. |
| Address | : | No.6 of Tong'an Industrial Park, Meixi Rd,Tong'an District, Xiamen China 361100 |
| Manufacturer | : | Xiamen E-top Controls Technology Co., Ltd. |
| Address | : | No.6 of Tong'an Industrial Park, Meixi Rd,Tong'an District, Xiamen China 361100 |
| Sample No. | : | RTZ200925003-RF-S1 |

| Receiver 868MHz | | |
|---|---|---|
| Model No. | : | WT-02, WT-08, WT-11, WT-15, WT-16, WT-18, WT-19, WT-20, HT-CS01, HT-CS06, HT-04, HT-07, HT-08, HT-09, HT-10R, R03, R06, R07, R08, E-HUB, EGW-01, TR-01 |
| Range of Frequency | : | 868MHz |
| Number of Channels | : | 1 |
| Modulation Mode | : | FSK |
| Type of Antenna | : | Integral Antenna |
| Power Supply | : | AC 230V; 50Hz |
| Sample No. | : | RTZ200925003-RF-S2 |

| Wi-Fi | | |
|---|---|---|
| Model differences | : | WT-02, WT-08, WT-11, WT-15, WT-16, WT-18, WT-19, WT-20, HT-CS01, HT-CS06, HT-04, HT-07, HT-08, HT-09, HT-10R, R03, R06, R07, R08, E-HUB, EGW-01, TR-01 |
| Frequency Range | : | 2412-2472MHz(802.11B/G/N20)<br>2422-2462MHz(802.11N40) |
| Data Rate | : | 802.11b: 11, 5.5, 2, 1 Mbps<br>802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps<br>802.11n: up to 150Mbps |
| Number of Channels | : | 13 Channels(802.11B/G/N20)<br>9 Channels(802.11N40) |
| Type of Antenna | : | PCB Antenna (The Max. gain of each antenna is 0dBi) |
| Modulation mode | : | DSSS,OFDM |
| Rating | : | AC 230V; 50Hz |
| Sample No. | : | RTZ200925003-RF-S2 |

## 2.1.Model difference declaration

WT-02, WT-08, WT-11, WT-15, WT-16, WT-18, WT-19, WT-20, HT-CS01, HT-CS06, HT-04, HT-07, HT-08, HT-09, HT-10R, R03, R06, R07, R08, E-HUB, EGW-01, TR-01 are identical in interior structure, electrical circuits and components, except model name appearance design and appearance color.

## 2.2.Accessory and Auxiliary Equipment

N/A

## 2.3.General performance criteria

**The performance criteria are:**

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

## 2.4.Performance table

**Table 1: Performance criteria**

| Criteria | During test | After test |
|---|---|---|
| A | Shall operate as intended.<br>(see note 1).<br>Shall be no loss of function.<br>Shall be no unintentional transmissions. | Shall operate as intended.<br>Shall be no degradation of performance (see note 3).<br>Shall be no loss of function.<br>Shall be no loss of stored data or user programmable functions. |
| B | May show loss of function (one or more).<br>May show degradation of performance<br>(see note 2).<br>Shall be no unintentional transmissions. | Functions shall be self-recoverable.<br>Shall operate as intended after recovering.<br>Shall be no degradation of performance (see note 3).<br>Shall be no loss of stored data or user programmable functions. |
| C | May be loss of function (one or more). | Functions shall be recoverable by the operator.<br>Shall operate as intended after recovering.<br>Shall be no degradation of performance (see note 3). |

NOTE 1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.
If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.
If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

**Performance criteria for Continuous phenomena applied to Transmitters (CT)**

The performance criteria A shall apply.
Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**Performance criteria for Transient phenomena applied to Transmitters (TT)**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.
Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**Performance criteria for Continuous phenomena applied to Receivers (CR)**

The performance criteria A shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**Performance criteria for Transient phenomena applied to Receivers (TR)**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply.
Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

## 2.5.Description of Test Facility

| | | |
|---|---|---|
| EMC Lab | : | Recognition of accreditation by Federal Communications Commission (FCC)<br>The Designation Number is CN1189<br>The Registration Number is 708358<br><br>Listed by Innovation, Science and Economic Development Canada (ISEDC)<br>The Registration Number is 5077A-2<br><br>Accredited by China National Accreditation Service for Conformity Assessment (CNAS)<br>The Registration Number is CNAS L3193<br><br>Accredited by American Association for Laboratory Accreditation (A2LA)<br>The Certificate Number is 4297.01 |
| Name of Firm | : | Shenzhen Accurate Technology Co., Ltd |
| Site Location | : | 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China |
| Subcontracted Items | : | Radiated RF Electromagnetic Fields |
| Subcontractor | : | Bay Area Compliance Labs Corp.(Shenzhen) |
| Site Location | : | 6/F, the 3rd Phase of Wan Li Industrial Bldg., Shihua Rd., FuTian Free Trade Zone, Shenzhen, China |

## 2.6.Measurement Uncertainty

| | | |
|---|---|---|
| Radiated emission expanded uncertainty (30MHz-1000MHz) | : | U=4.28dB, k=2 |
| Radiated emission expanded uncertainty (1G-18GHz) | : | U=4.98dB, k=2 |
| Radiated emission expanded uncertainty (18G-26.5GHz) | : | U=5.06dB, k=2 |
| Conduction Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz) | : | U=2.72dB, k=2 |
| Harmonic current expanded uncertainty | : | U=0.512%, k=2 |

# 3. MEASURING DEVICE AND TEST EQUIPMENT

## 3.1.For Conducted Emission Measurement

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | Rohde & Schwarz | ESCS30 | 100307 | Jan.04, 2020 | 1 Year |
| 2. | L.I.S.N. | Schwarzbeck | NLSK8126 | 8126431 | Jan.04, 2020 | 1 Year |
| 3. | Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100815 | Jan.04, 2020 | 1 Year |
| 4. | 50Ω Coaxial Switch | Anritsu Corp | MP59B | 6200283933 | Jan.04, 2020 | 1 Year |
| 5 | Conducted Emission Test Software: ES-K1 V1.71 | | | | | |

## 3.2.For Harmonic & Flicker

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | AC Power Source | California Instruments | 5001iX-400 | 55689 | Jan.04, 2020 | 1Year |
| 2. | Test analyzer | California Instruments | PACS-1 | 72254 | Jan.04, 2020 | 1Year |
| Harmonic & Flicker Test Software：CTS 4 Version 4.26.0 | | | | | | |

## 3.3.For Radiated Emission Measurement

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | E7405A | MY45115511 | Jan.04, 2020 | 1 Year |
| 2. | Test Receiver | Rohde & Schwarz | ESCS30 | 100307 | Jan.04, 2020 | 1 Year |
| 3. | Bilog Antenna | Schwarzbeck | VULB9163 | 9163-323 | Jan.05, 2020 | 1 Year |
| 4. | Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-655 | Jan.05, 2020 | 1 Year |
| 5. | 50 Coaxial Switch | Anritsu Corp | MP59B | 6200506474 | Jan.04, 2020 | 1 Year |
| 6. | Pre-Amplifier | Agilent | 8447D | 294A10619 | Jan. 04, 2020 | 1 Year |
| 7. | Pre-Amplifier | Rohde & Schwarz | CBLU1183540-01 | 3791 | Jan.04, 2020 | 1 Year |
| 8. | Radiated Emission Test Software: EZ_EMC V1.1.4.2 | | | | | |

## 3.4.For Electrostatic Discharge Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | ESD Tester | TESEQ | NSG 437 | 823 | Jan.08, 2020 | 1 Year |

## 3.5.For RF Strength Susceptibility Test

| Item | Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| 1. | HP | Signal Generator | 8665B | 3744A01692 | 2019/8/13 | 2020/8/12 |
| 2. | AR | Amplifier | 500W1000B | 0348446 | 2020/3/2 | 2021/3/1 |
| 3. | AR | Amplifier | 60S1G6 | 0348712 | 2020/3/2 | 2021/3/1 |
| 4. | AR | Antenna | ATL80M1G | 0348837 | NCR | NCR |
| 5. | AR | Antenna | ATT700M12G | 0349411 | NCR | NCR |
| 6. | BACL | Test Software | VEE PRO | V2.3 VXE | NCR | NCR |

## 3.6.For Electrical Fast Transient /Burst Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | ULTRA COMPACT SIMULATOR | EM TEST | UCS 500 N5 | V0928104968 | Jan.04, 2020 | 1Year |
| 2. | EFT Test Software：iec control V5.0.8.0 | | | | | |

## 3.7.For Voltage Dips and Interruptions Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | ULTRA COMPACT SIMULATOR | EM TEST | UCS 500 N5 | V0928104968 | Jan.04, 2020 | 1Year |
| 2. | Transformer | EM TEST | V4780S2 | 0109-44 | Jan.04, 2020 | 1Year |
| 3. | Dips Test Software：iec control V5.0.8.0 | | | | | |

## 3.8.For Injected Current Susceptibility Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Conducted Immunity Test System | FRANKONIA | CIT-10 | 126B1121 | Jan.04, 2020 | 1Year |
| 2. | CDN | FRANKONIA | CDN-M2/3 | A3027020 | Jan.04, 2020 | 1Year |
| 3. | 6dB Attenuator | Weinschel | WA59-6-33 | A329 | Jan.04, 2020 | 1Year |
| 4. | CS Test Software：IEC/EN61000-4-6 V1.1.1 | | | | | |

## 3.9.For Surge Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | ULTRA COMPACT SIMULATOR | EM TEST | UCS 500 N5 | V0928104968 | Jan.04, 2020 | 1Year |
| 2. | Surge Test Software：iec control V5.0.8.0 | | | | | |

# 4. TEST RESULTS EMISSION

## 4.1.Emission in the Frequency Range up to 30 MHz

### 4.1.1.Harmonic current emissions (AC mains input port)

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | September 25, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 8.5 |
| Basic standard | : | EN 61000-3-2: 2014 |
| Measured harmonics | : | 1-40 |
| Class | : | A |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

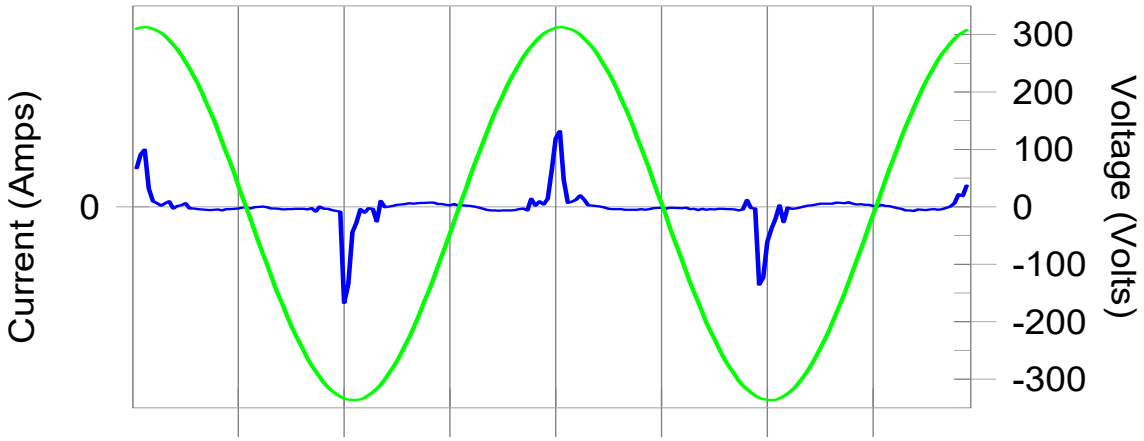
The test data are shown in the following pages
We tested 868(RX) and Wi-Fi the worst mode (Wi-Fi) test data in the report.

# Harmonics – Class-A per Ed. Ed. 5.0 (2018)(Run time)

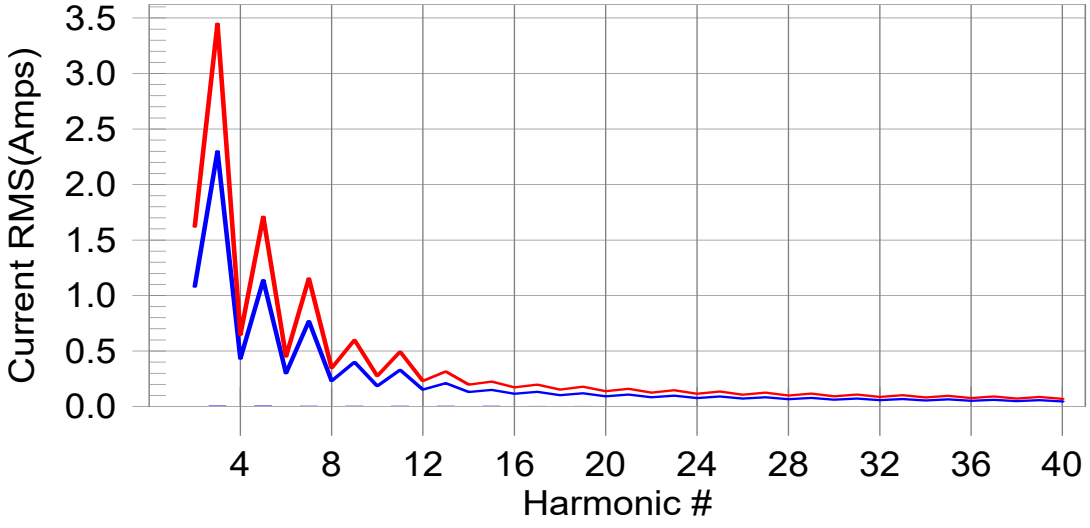
**EUT: Thermostat M/N:WT-02** **Tested by: Bob**
**Test category: Class-A per Ed. 5.0 (2018) (European limits)** **Test Margin: 100**
**Test date: 2020/10/25** **Start time: 16:59:37** **End time: 17:02:18**
**Test duration (min): 2.5** **Data file name: H-000044.cts_data**
**Comment: Wi-Fi Report NO.:RTZ200925003-02**
**Customer: Xiamen E-top Controls Technology Co., Ltd.**

**Test Result: Pass** **Source qualification: Normal**

**Current & voltage waveforms**




**Harmonics and Class A limit line** **European Limits**




**Test result: Pass** **Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit**

# Current Test Result Summary (Run time)

**EUT: Thermostat M/N:WT-02** **Tested by: Bob**
**Test category: Class-A per Ed. 5.0 (2018) (European limits)** **Test Margin: 100**
**Test date: 2020/10/25** **Start time: 16:59:37** **End time: 17:02:18**
**Test duration (min): 2.5** **Data file name: H-000044.cts_data**
**Comment: Wi-Fi Report NO.:RTZ200925003-02**
**Customer: Xiamen E-top Controls Technology Co., Ltd.**

**Test Result: Pass** **Source qualification: Normal**
**THC(A): 0.013** **I-THD(%): 208.8** **POHC(A): 0.004** **POHC Limit(A): 0.251**

**Highest parameter values during test:**

| | | | |
|---|---|---|---|
| V_RMS (Volts): | 229.97 | Frequency(Hz): | 50.00 |
| I_Peak (Amps): | 0.127 | I_RMS (Amps): | 0.017 |
| I_Fund (Amps): | 0.006 | Crest Factor: | 8.337 |
| Power (Watts): | 1.5 | Power Factor: | 0.417 |

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|---|---|---|---|---|---|---|---|
| 2 | 0.001 | 1.080 | N/A | 0.001 | 1.620 | N/A | Pass |
| 3 | 0.006 | 2.300 | 0.2 | 0.007 | 3.450 | 0.2 | Pass |
| 4 | 0.001 | 0.430 | N/A | 0.001 | 0.645 | N/A | Pass |
| 5 | 0.005 | 1.140 | 0.5 | 0.006 | 1.710 | 0.3 | Pass |
| 6 | 0.000 | 0.300 | N/A | 0.001 | 0.450 | N/A | Pass |
| 7 | 0.005 | 0.770 | N/A | 0.005 | 1.155 | N/A | Pass |
| 8 | 0.000 | 0.230 | N/A | 0.000 | 0.345 | N/A | Pass |
| 9 | 0.005 | 0.400 | N/A | 0.005 | 0.600 | N/A | Pass |
| 10 | 0.000 | 0.184 | N/A | 0.000 | 0.276 | N/A | Pass |
| 11 | 0.004 | 0.330 | N/A | 0.004 | 0.495 | N/A | Pass |
| 12 | 0.000 | 0.153 | N/A | 0.000 | 0.230 | N/A | Pass |
| 13 | 0.004 | 0.210 | N/A | 0.004 | 0.315 | N/A | Pass |
| 14 | 0.000 | 0.131 | N/A | 0.000 | 0.197 | N/A | Pass |
| 15 | 0.003 | 0.150 | N/A | 0.004 | 0.225 | N/A | Pass |
| 16 | 0.000 | 0.115 | N/A | 0.000 | 0.173 | N/A | Pass |
| 17 | 0.003 | 0.132 | N/A | 0.003 | 0.198 | N/A | Pass |
| 18 | 0.000 | 0.102 | N/A | 0.000 | 0.153 | N/A | Pass |
| 19 | 0.002 | 0.118 | N/A | 0.003 | 0.178 | N/A | Pass |
| 20 | 0.000 | 0.092 | N/A | 0.000 | 0.138 | N/A | Pass |
| 21 | 0.002 | 0.107 | N/A | 0.002 | 0.161 | N/A | Pass |
| 22 | 0.000 | 0.084 | N/A | 0.000 | 0.125 | N/A | Pass |
| 23 | 0.002 | 0.098 | N/A | 0.002 | 0.147 | N/A | Pass |
| 24 | 0.000 | 0.077 | N/A | 0.000 | 0.115 | N/A | Pass |
| 25 | 0.001 | 0.090 | N/A | 0.001 | 0.135 | N/A | Pass |
| 26 | 0.000 | 0.071 | N/A | 0.000 | 0.107 | N/A | Pass |
| 27 | 0.001 | 0.083 | N/A | 0.001 | 0.125 | N/A | Pass |
| 28 | 0.000 | 0.066 | N/A | 0.000 | 0.099 | N/A | Pass |
| 29 | 0.001 | 0.078 | N/A | 0.001 | 0.116 | N/A | Pass |
| 30 | 0.000 | 0.061 | N/A | 0.000 | 0.092 | N/A | Pass |
| 31 | 0.001 | 0.073 | N/A | 0.001 | 0.109 | N/A | Pass |
| 32 | 0.000 | 0.058 | N/A | 0.000 | 0.086 | N/A | Pass |
| 33 | 0.001 | 0.068 | N/A | 0.001 | 0.102 | N/A | Pass |
| 34 | 0.000 | 0.054 | N/A | 0.000 | 0.081 | N/A | Pass |
| 35 | 0.001 | 0.064 | N/A | 0.001 | 0.096 | N/A | Pass |
| 36 | 0.000 | 0.051 | N/A | 0.000 | 0.077 | N/A | Pass |
| 37 | 0.001 | 0.061 | N/A | 0.001 | 0.091 | N/A | Pass |
| 38 | 0.000 | 0.048 | N/A | 0.000 | 0.073 | N/A | Pass |
| 39 | 0.001 | 0.058 | N/A | 0.001 | 0.087 | N/A | Pass |
| 40 | 0.000 | 0.046 | N/A | 0.000 | 0.069 | N/A | Pass |

# Voltage Source Verification Data (Run time)

**EUT: Thermostat M/N:WT-02** **Tested by: Bob**
**Test category: Class-A per Ed. 5.0 (2018) (European limits)** **Test Margin: 100**
**Test date: 2020/10/25** **Start time: 16:59:37** **End time: 17:02:18**
**Test duration (min): 2.5** **Data file name: H-000044.cts_data**
**Comment: Wi-Fi Report NO.:RTZ200925003-02**
**Customer: Xiamen E-top Controls Technology Co., Ltd.**

**Test Result: Pass** **Source qualification: Normal**

**Highest parameter values during test:**

| | | | |
|---|---|---|---|
| **Voltage (Vrms):** | **229.97** | **Frequency(Hz):** | **50.00** |
| **I_Peak (Amps):** | **0.127** | **I_RMS (Amps):** | **0.017** |
| **I_Fund (Amps):** | **0.006** | **Crest Factor:** | **8.337** |
| **Power (Watts):** | **1.5** | **Power Factor:** | **0.417** |

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|---|---|---|---|---|
| 2 | 0.140 | 0.460 | 30.52 | OK |
| 3 | 0.562 | 2.070 | 27.18 | OK |
| 4 | 0.089 | 0.460 | 19.34 | OK |
| 5 | 0.068 | 0.920 | 7.41 | OK |
| 6 | 0.104 | 0.460 | 22.71 | OK |
| 7 | 0.043 | 0.690 | 6.28 | OK |
| 8 | 0.047 | 0.460 | 10.22 | OK |
| 9 | 0.023 | 0.460 | 5.03 | OK |
| 10 | 0.033 | 0.460 | 7.25 | OK |
| 11 | 0.025 | 0.230 | 10.99 | OK |
| 12 | 0.020 | 0.230 | 8.88 | OK |
| 13 | 0.017 | 0.230 | 7.28 | OK |
| 14 | 0.011 | 0.230 | 4.61 | OK |
| 15 | 0.013 | 0.230 | 5.86 | OK |
| 16 | 0.016 | 0.230 | 6.84 | OK |
| 17 | 0.017 | 0.230 | 7.23 | OK |
| 18 | 0.015 | 0.230 | 6.38 | OK |
| 19 | 0.011 | 0.230 | 4.85 | OK |
| 20 | 0.015 | 0.230 | 6.55 | OK |
| 21 | 0.007 | 0.230 | 2.91 | OK |
| 22 | 0.009 | 0.230 | 4.04 | OK |
| 23 | 0.009 | 0.230 | 4.04 | OK |
| 24 | 0.007 | 0.230 | 2.95 | OK |
| 25 | 0.009 | 0.230 | 3.91 | OK |
| 26 | 0.009 | 0.230 | 3.91 | OK |
| 27 | 0.008 | 0.230 | 3.32 | OK |
| 28 | 0.008 | 0.230 | 3.55 | OK |
| 29 | 0.006 | 0.230 | 2.82 | OK |
| 30 | 0.006 | 0.230 | 2.75 | OK |
| 31 | 0.006 | 0.230 | 2.58 | OK |
| 32 | 0.007 | 0.230 | 2.94 | OK |
| 33 | 0.007 | 0.230 | 3.16 | OK |
| 34 | 0.004 | 0.230 | 1.66 | OK |
| 35 | 0.004 | 0.230 | 1.71 | OK |
| 36 | 0.004 | 0.230 | 1.79 | OK |
| 37 | 0.006 | 0.230 | 2.80 | OK |
| 38 | 0.004 | 0.230 | 1.63 | OK |
| 39 | 0.004 | 0.230 | 1.84 | OK |
| 40 | 0.006 | 0.230 | 2.82 | OK |

## 4.1.2.Voltage fluctuations and flicker (AC mains input port)

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Sep.25, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 8.6 |
| Basic standard | : | EN 61000-3-3: 2013 |
| Flicker Impedance | : | Zref (IEC 60725) |
| Limits | : | EN 61000-3-3: 2013 clause 5 |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz |
| Operation Mode | : | Wi-Fi Connection |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

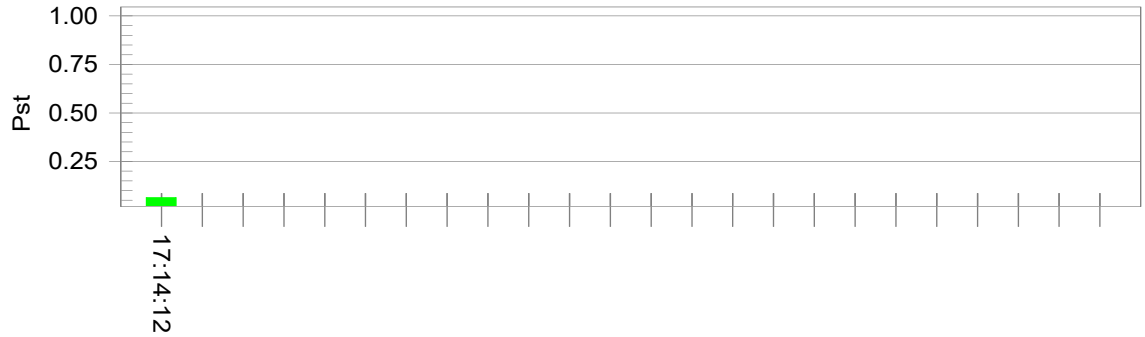
The test data are shown in the following pages
We tested 868(RX) and Wi-Fi the worst mode (Wi-Fi) test data in the report.

# Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

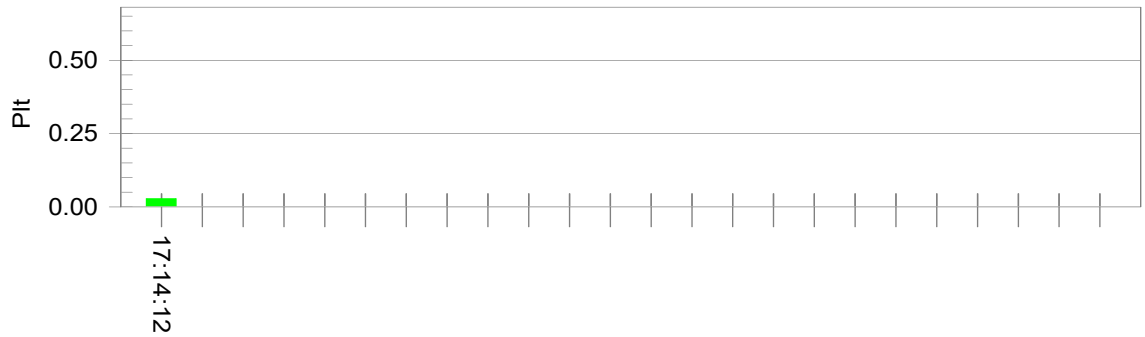
**EUT: Thermostat M/N:WT-02** **Tested by: Bob**
**Test category: All parameters (European limits)** **Test Margin: 100**
**Test date: 2020/10/25** **Start time: 17:03:51** **End time: 17:14:18**
**Test duration (min): 10** **Data file name: F-000045.cts_data**
**Comment: Wi-Fi Report NO.:RTZ200925003-02**
**Customer: Xiamen E-top Controls Technology Co., Ltd.**

**Test Result: Pass** **Status: Test Completed**

**$Pst_i$ and limit line** **European Limits**




**Plt and limit line**




**Parameter values recorded during the test:**

| | | | | |
|---|---|---|---|---|
| **Vrms at the end of test (Volt):** | **229.56** | | | |
| **T-max (mS):** | **0** | **Test limit (mS):** | **500.0** | **Pass** |
| **Highest dc (%):** | **0.00** | **Test limit (%):** | **3.30** | **Pass** |
| **Highest dmax (%):** | **0.00** | **Test limit (%):** | **4.00** | **Pass** |
| **Highest Pst (10 min. period):** | **0.064** | **Test limit:** | **1.000** | **Pass** |
| **Highest Plt (2 hr. period):** | **0.028** | **Test limit:** | **0.650** | **Pass** |

## 4.1.3.Mains Terminal Disturbance Voltage

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 8.4 |
| Basic standard | : | EN 55032 |
| Frequency range | : | 0.15-30MHz |
| Equipment class | : | Class B |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2. RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

**Table: Test Limit**

| Frequency MHz | Limits dB(μV) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 0.15 - 0.50 | 66 - 56* | 56 - 46* |
| 0.50 - 5.00 | 56 | 46 |
| 5.00 - 30.00 | 60 | 50 |

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

## Table: Conducted Disturbance Test Data

Test mode: Wi-Fi Connection

Neutral

***MEASUREMENT RESULT: "B-1009-1_fin"***

10/9/2020 2:12PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 44.70 | 10.5 | 60 | 15.0 | QP | N | GND |
| 0.390000 | 47.90 | 10.5 | 58 | 10.2 | QP | N | GND |
| 0.940000 | 40.20 | 10.6 | 56 | 15.8 | QP | N | GND |
| 2.200000 | 35.20 | 10.7 | 56 | 20.8 | QP | N | GND |
| 5.140000 | 33.80 | 10.7 | 60 | 26.2 | QP | N | GND |
| 15.385000 | 22.70 | 10.8 | 60 | 37.3 | QP | N | GND |

***MEASUREMENT RESULT: "B-1009-1_fin2"***

10/9/2020 2:12PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.340000 | 39.40 | 10.5 | 49 | 9.8 | AV | N | GND |
| 0.390000 | 42.30 | 10.5 | 48 | 5.8 | AV | N | GND |
| 0.900000 | 31.90 | 10.6 | 46 | 14.1 | AV | N | GND |
| 2.570000 | 26.40 | 10.7 | 46 | 19.6 | AV | N | GND |
| 5.140000 | 22.50 | 10.7 | 50 | 27.5 | AV | N | GND |
| 15.025000 | 14.50 | 10.8 | 50 | 35.5 | AV | N | GND |

Live

***MEASUREMENT RESULT: "B-1009-2_fin"***

10/9/2020 2:17PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.335000 | 38.80 | 10.5 | 59 | 20.5 | QP | L1 | GND |
| 0.390000 | 41.40 | 10.5 | 58 | 16.7 | QP | L1 | GND |
| 1.000000 | 33.10 | 10.6 | 56 | 22.9 | QP | L1 | GND |
| 4.770000 | 29.20 | 10.7 | 56 | 26.8 | QP | L1 | GND |
| 5.170000 | 30.50 | 10.7 | 60 | 29.5 | QP | L1 | GND |
| 15.070000 | 21.00 | 10.8 | 60 | 39.0 | QP | L1 | GND |

***MEASUREMENT RESULT: "B-1009-2_fin2"***

10/9/2020 2:17PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 27.60 | 10.5 | 50 | 22.1 | AV | L1 | GND |
| 0.390000 | 31.70 | 10.5 | 48 | 16.4 | AV | L1 | GND |
| 0.930000 | 22.80 | 10.6 | 46 | 23.2 | AV | L1 | GND |
| 4.390000 | 20.40 | 10.7 | 46 | 25.6 | AV | L1 | GND |
| 5.140000 | 20.20 | 10.7 | 50 | 29.8 | AV | L1 | GND |
| 15.715000 | 11.80 | 10.8 | 50 | 38.2 | AV | L1 | GND |

Test mode: RX 868MHz

Neutral

***MEASUREMENT RESULT: "B-1009-4_fin"***

10/9/2020 2:27PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 44.90 | 10.5 | 60 | 14.8 | QP | N | GND |
| 0.385000 | 45.80 | 10.5 | 58 | 12.4 | QP | N | GND |
| 0.935000 | 40.30 | 10.6 | 56 | 15.7 | QP | N | GND |
| 2.130000 | 37.00 | 10.6 | 56 | 19.0 | QP | N | GND |
| 5.150000 | 34.30 | 10.7 | 60 | 25.7 | QP | N | GND |
| 15.475000 | 22.50 | 10.8 | 60 | 37.5 | QP | N | GND |

***MEASUREMENT RESULT: "B-1009-4_fin2"***

10/9/2020 2:27PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 38.30 | 10.5 | 50 | 11.4 | AV | N | GND |
| 0.390000 | 41.70 | 10.5 | 48 | 6.4 | AV | N | GND |
| 0.930000 | 31.30 | 10.6 | 46 | 14.7 | AV | N | GND |
| 2.130000 | 26.60 | 10.6 | 46 | 19.4 | AV | N | GND |
| 5.150000 | 22.40 | 10.7 | 50 | 27.6 | AV | N | GND |
| 15.745000 | 14.60 | 10.8 | 50 | 35.4 | AV | N | GND |

Live

***MEASUREMENT RESULT: "B-1009-3_fin"***

10/9/2020 2:23PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 38.30 | 10.5 | 60 | 21.4 | QP | L1 | GND |
| 0.650000 | 35.10 | 10.5 | 56 | 20.9 | QP | L1 | GND |
| 1.005000 | 34.00 | 10.6 | 56 | 22.0 | QP | L1 | GND |
| 4.660000 | 29.10 | 10.7 | 56 | 26.9 | QP | L1 | GND |
| 5.270000 | 31.10 | 10.7 | 60 | 28.9 | QP | L1 | GND |
| 14.965000 | 20.90 | 10.8 | 60 | 39.1 | QP | L1 | GND |

***MEASUREMENT RESULT: "B-1009-3_fin2"***

10/9/2020 2:23PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 27.80 | 10.5 | 50 | 21.9 | AV | L1 | GND |
| 0.390000 | 31.30 | 10.5 | 48 | 16.8 | AV | L1 | GND |
| 0.945000 | 21.80 | 10.6 | 46 | 24.2 | AV | L1 | GND |
| 4.390000 | 20.40 | 10.7 | 46 | 25.6 | AV | L1 | GND |
| 5.130000 | 20.50 | 10.7 | 50 | 29.5 | AV | L1 | GND |
| 15.250000 | 11.50 | 10.8 | 50 | 38.5 | AV | L1 | GND |

Emissions attenuated more than 20 dB below the permissible value are not reported.
The test data are shown in the following pages.

***ACCURATE TECHNOLOGY CO.,LTD***

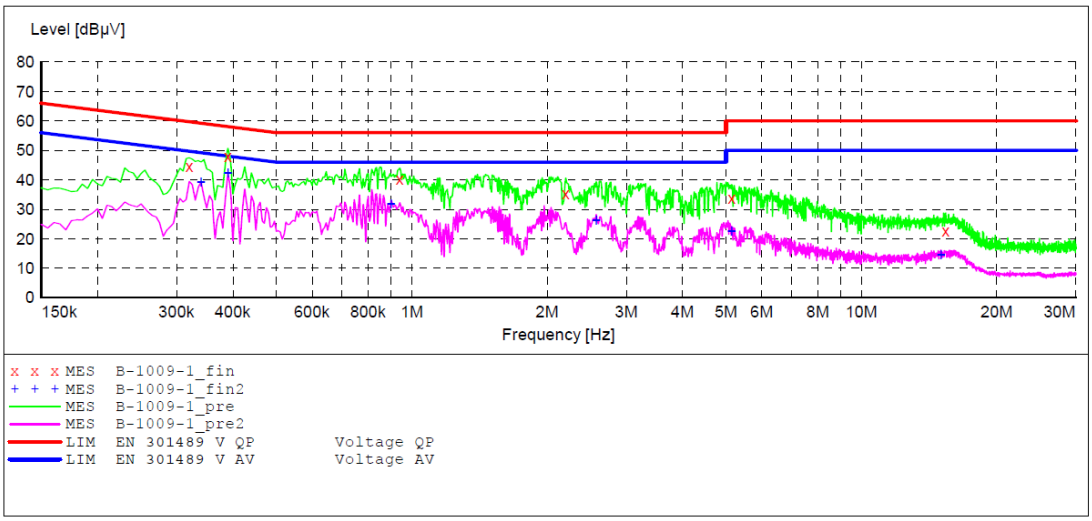
***CONDUCTED EMISSION STANDARD EN 301489***

EUT: Thermostat M/N:WT-02
Manufacturer: Xiamen E-top Controls Technology Co., Ltd.
Operating Condition: WIFI Connection
Test Site: 1#Shielding Room
Operator: Bob
Test Specification: N 230V/50Hz
Comment: Report No.RTZ200925003-02
Start of Test: 10/9/2020 / 2:09:30PM

***SCAN TABLE: "V 9K-30MHz fin"***

Short Description: _SUB_STD_VTERM2 1.70

| Start Frequency | Stop Frequency | Step Width | Detector | Meas. Time | IF Bandw. | Transducer |
|---|---|---|---|---|---|---|
| 9.0 kHz | 150.0 kHz | 100.0 Hz | QuasiPeak<br>Average | 1.0 s | 200 Hz | NSLK8126 2008 |
| 150.0 kHz | 30.0 MHz | 5.0 kHz | QuasiPeak<br>Average | 1.0 s | 9 kHz | NSLK8126 2008 |




***MEASUREMENT RESULT: "B-1009-1_fin"***

10/9/2020 2:12PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 44.70 | 10.5 | 60 | 15.0 | QP | N | GND |
| 0.390000 | 47.90 | 10.5 | 58 | 10.2 | QP | N | GND |
| 0.940000 | 40.20 | 10.6 | 56 | 15.8 | QP | N | GND |
| 2.200000 | 35.20 | 10.7 | 56 | 20.8 | QP | N | GND |
| 5.140000 | 33.80 | 10.7 | 60 | 26.2 | QP | N | GND |
| 15.385000 | 22.70 | 10.8 | 60 | 37.3 | QP | N | GND |

***MEASUREMENT RESULT: "B-1009-1_fin2"***

10/9/2020 2:12PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.340000 | 39.40 | 10.5 | 49 | 9.8 | AV | N | GND |
| 0.390000 | 42.30 | 10.5 | 48 | 5.8 | AV | N | GND |
| 0.900000 | 31.90 | 10.6 | 46 | 14.1 | AV | N | GND |
| 2.570000 | 26.40 | 10.7 | 46 | 19.6 | AV | N | GND |
| 5.140000 | 22.50 | 10.7 | 50 | 27.5 | AV | N | GND |
| 15.025000 | 14.50 | 10.8 | 50 | 35.5 | AV | N | GND |

***ACCURATE TECHNOLOGY CO.,LTD***

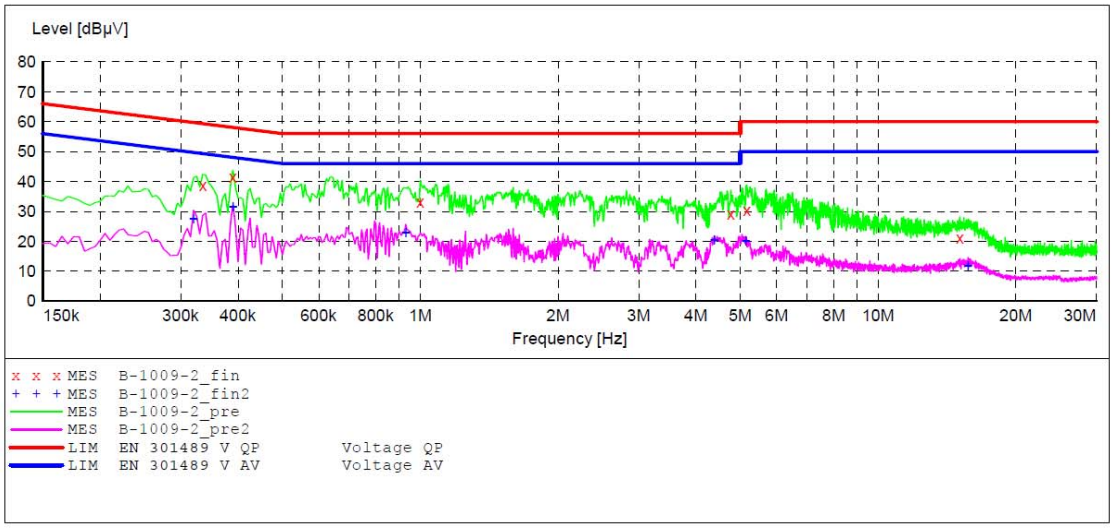
***CONDUCTED EMISSION STANDARD EN 301489***

EUT: Thermostat M/N:WT-02
Manufacturer: Xiamen E-top Controls Technology Co., Ltd.
Operating Condition: WIFI Connection
Test Site: 1#Shielding Room
Operator: Bob
Test Specification: L 230V/50Hz
Comment: Report No.RTZ200925003-02
Start of Test: 10/9/2020 / 2:14:02PM

***SCAN TABLE: "V 9K-30MHz fin"***

Short Description: _SUB_STD_VTERM2 1.70

| Start Frequency | Stop Frequency | Step Width | Detector | Meas. Time | IF Bandw. | Transducer |
|---|---|---|---|---|---|---|
| 9.0 kHz | 150.0 kHz | 100.0 Hz | QuasiPeak<br>Average | 1.0 s | 200 Hz | NSLK8126 2008 |
| 150.0 kHz | 30.0 MHz | 5.0 kHz | QuasiPeak<br>Average | 1.0 s | 9 kHz | NSLK8126 2008 |




***MEASUREMENT RESULT: "B-1009-2_fin"***

10/9/2020 2:17PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.335000 | 38.80 | 10.5 | 59 | 20.5 | QP | L1 | GND |
| 0.390000 | 41.40 | 10.5 | 58 | 16.7 | QP | L1 | GND |
| 1.000000 | 33.10 | 10.6 | 56 | 22.9 | QP | L1 | GND |
| 4.770000 | 29.20 | 10.7 | 56 | 26.8 | QP | L1 | GND |
| 5.170000 | 30.50 | 10.7 | 60 | 29.5 | QP | L1 | GND |
| 15.070000 | 21.00 | 10.8 | 60 | 39.0 | QP | L1 | GND |

***MEASUREMENT RESULT: "B-1009-2_fin2"***

10/9/2020 2:17PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 27.60 | 10.5 | 50 | 22.1 | AV | L1 | GND |
| 0.390000 | 31.70 | 10.5 | 48 | 16.4 | AV | L1 | GND |
| 0.930000 | 22.80 | 10.6 | 46 | 23.2 | AV | L1 | GND |
| 4.390000 | 20.40 | 10.7 | 46 | 25.6 | AV | L1 | GND |
| 5.140000 | 20.20 | 10.7 | 50 | 29.8 | AV | L1 | GND |
| 15.715000 | 11.80 | 10.8 | 50 | 38.2 | AV | L1 | GND |

*ACCURATE TECHNOLOGY CO.,LTD*

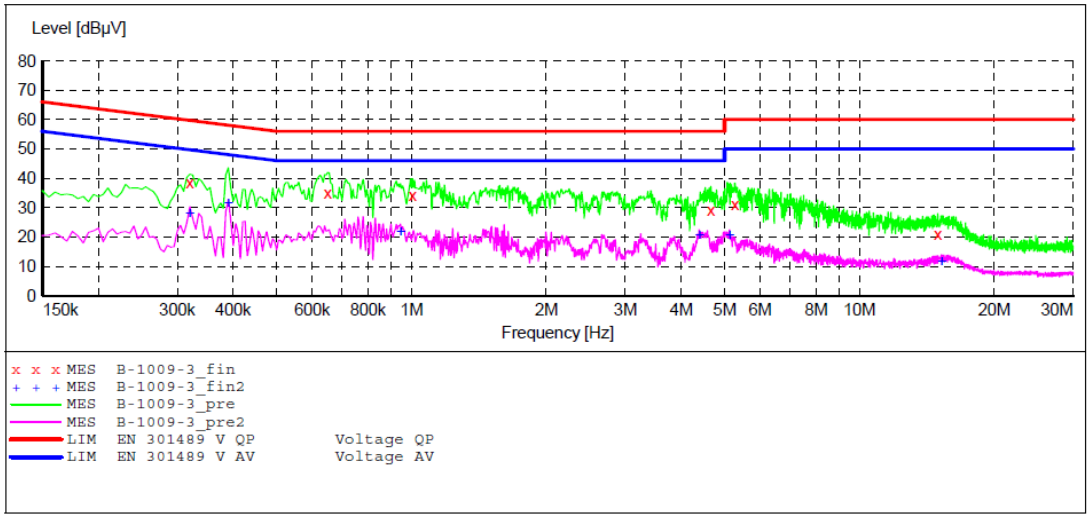
*CONDUCTED EMISSION STANDARD EN 301489*

EUT: Thermostat M/N:WT-02
Manufacturer: Xiamen E-top Controls Technology Co., Ltd.
Operating Condition: RX 868MHz
Test Site: 1#Shielding Room
Operator: Bob
Test Specification: L 230V/50Hz
Comment: Report No.RTZ200925003-02
Start of Test: 10/9/2020 / 2:20:06PM

*SCAN TABLE: "V 9K-30MHz fin"*

Short Description: _SUB_STD_VTERM2 1.70

| Start Frequency | Stop Frequency | Step Width | Detector | Meas. Time | IF Bandw. | Transducer |
|---|---|---|---|---|---|---|
| 9.0 kHz | 150.0 kHz | 100.0 Hz | QuasiPeak<br>Average | 1.0 s | 200 Hz | NSLK8126 2008 |
| 150.0 kHz | 30.0 MHz | 5.0 kHz | QuasiPeak<br>Average | 1.0 s | 9 kHz | NSLK8126 2008 |




*MEASUREMENT RESULT: "B-1009-3_fin"*

10/9/2020 2:23PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 38.30 | 10.5 | 60 | 21.4 | QP | L1 | GND |
| 0.650000 | 35.10 | 10.5 | 56 | 20.9 | QP | L1 | GND |
| 1.005000 | 34.00 | 10.6 | 56 | 22.0 | QP | L1 | GND |
| 4.660000 | 29.10 | 10.7 | 56 | 26.9 | QP | L1 | GND |
| 5.270000 | 31.10 | 10.7 | 60 | 28.9 | QP | L1 | GND |
| 14.965000 | 20.90 | 10.8 | 60 | 39.1 | QP | L1 | GND |

*MEASUREMENT RESULT: "B-1009-3_fin2"*

10/9/2020 2:23PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 27.80 | 10.5 | 50 | 21.9 | AV | L1 | GND |
| 0.390000 | 31.30 | 10.5 | 48 | 16.8 | AV | L1 | GND |
| 0.945000 | 21.80 | 10.6 | 46 | 24.2 | AV | L1 | GND |
| 4.390000 | 20.40 | 10.7 | 46 | 25.6 | AV | L1 | GND |
| 5.130000 | 20.50 | 10.7 | 50 | 29.5 | AV | L1 | GND |
| 15.250000 | 11.50 | 10.8 | 50 | 38.5 | AV | L1 | GND |

*ACCURATE TECHNOLOGY CO.,LTD*

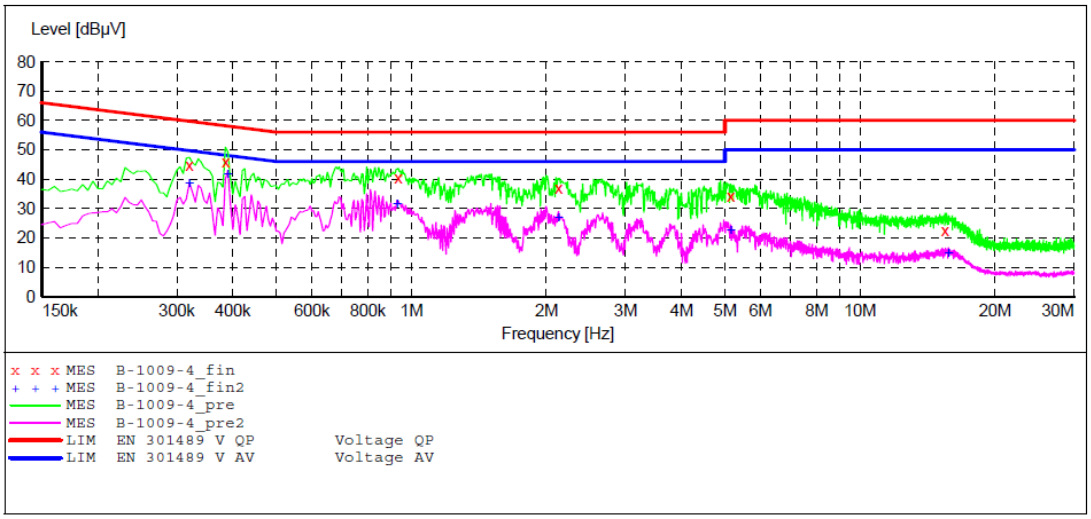
*CONDUCTED EMISSION STANDARD EN 301489*

EUT: Thermostat M/N:WT-02
Manufacturer: Xiamen E-top Controls Technology Co., Ltd.
Operating Condition: RX 868MHz
Test Site: 1#Shielding Room
Operator: Bob
Test Specification: N 230V/50Hz
Comment: Report No.RTZ200925003-02
Start of Test: 10/9/2020 / 2:24:31PM

*SCAN TABLE: "V 9K-30MHz fin"*

Short Description: _SUB_STD_VTERM2 1.70

| Start Frequency | Stop Frequency | Step Width | Detector | Meas. Time | IF Bandw. | Transducer |
|---|---|---|---|---|---|---|
| 9.0 kHz | 150.0 kHz | 100.0 Hz | QuasiPeak<br>Average | 1.0 s | 200 Hz | NSLK8126 2008 |
| 150.0 kHz | 30.0 MHz | 5.0 kHz | QuasiPeak<br>Average | 1.0 s | 9 kHz | NSLK8126 2008 |




*MEASUREMENT RESULT: "B-1009-4_fin"*

10/9/2020 2:27PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 44.90 | 10.5 | 60 | 14.8 | QP | N | GND |
| 0.385000 | 45.80 | 10.5 | 58 | 12.4 | QP | N | GND |
| 0.935000 | 40.30 | 10.6 | 56 | 15.7 | QP | N | GND |
| 2.130000 | 37.00 | 10.6 | 56 | 19.0 | QP | N | GND |
| 5.150000 | 34.30 | 10.7 | 60 | 25.7 | QP | N | GND |
| 15.475000 | 22.50 | 10.8 | 60 | 37.5 | QP | N | GND |

*MEASUREMENT RESULT: "B-1009-4_fin2"*

10/9/2020 2:27PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.320000 | 38.30 | 10.5 | 50 | 11.4 | AV | N | GND |
| 0.390000 | 41.70 | 10.5 | 48 | 6.4 | AV | N | GND |
| 0.930000 | 31.30 | 10.6 | 46 | 14.7 | AV | N | GND |
| 2.130000 | 26.60 | 10.6 | 46 | 19.4 | AV | N | GND |
| 5.150000 | 22.40 | 10.7 | 50 | 27.6 | AV | N | GND |
| 15.745000 | 14.60 | 10.8 | 50 | 35.4 | AV | N | GND |

## 4.2.Emission in the Frequency Range above 30 MHz

### 4.2.1.Radiated Emission (RE)

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 8.2 |
| Basic standard | : | EN 55032 |
| Frequency range | : | 30-6000MHz |
| Equipment class | : | Class B |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25℃ |
| Humidity | : | 50% |

**Table: Test Limit**

Limit below 1GHz

| Frequency (MHz) | Distance (Meters) | Quasi-peak Limits (dBμV/m) |
|---|---|---|
| 30 - 230 | 3 | 40 |
| 230 - 1000 | 3 | 47 |
| Note: The smaller limit shall apply at the combination point between two frequency bands. | | |

Limit above 1GHz

| Frequency (GHz) | Distance (Meters) | Average Limits (dBμV/m) | Peak Limits (dBμV/m) |
|---|---|---|---|
| 1 – 3 | 3 | 50 | 70 |
| 3 - 6 | 3 | 54 | 74 |
| Note: The lower limit applies at the transition frequency. | | | |

Emissions attenuated more than 20 dB below the permissible value are not reported.

Test Mode: Wi-Fi Connection
Below 1GHz

Polarization

Horizontal

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 76.3868 | 50.01 | -27.61 | 22.40 | 40.00 | -17.60 | QP |
| 2 | 191.7841 | 46.04 | -24.95 | 21.09 | 40.00 | -18.91 | QP |
| 3 | 246.1238 | 43.47 | -23.67 | 19.80 | 47.00 | -27.20 | QP |

Vertical

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 32.7544 | 40.13 | -20.89 | 19.24 | 40.00 | -20.76 | QP |
| 2 | 75.3208 | 55.25 | -27.68 | 27.57 | 40.00 | -12.43 | QP |
| 3 | 151.5567 | 46.51 | -27.92 | 18.59 | 40.00 | -21.41 | QP |

Test Mode: RX868 MHz

Polarization

Horizontal

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 76.3869 | 50.02 | -27.61 | 22.41 | 40.00 | -17.59 | QP |
| 2 | 198.6424 | 41.70 | -24.44 | 17.26 | 40.00 | -22.74 | QP |
| 3 | 355.9397 | 39.58 | -19.09 | 20.49 | 47.00 | -26.51 | QP |

Vertical

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 75.3208 | 53.26 | -27.68 | 25.58 | 40.00 | -14.42 | QP |
| 2 | 90.7380 | 50.15 | -27.41 | 22.74 | 40.00 | -17.26 | QP |
| 3 | 369.9659 | 43.78 | -18.77 | 25.01 | 47.00 | -21.99 | QP |

Test Mode: Wi-Fi Connection
Above 1GHz

Polarization

Horizontal

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2928.044 | 44.09 | -2.89 | 41.20 | 70.00 | -28.80 | peak |
| 2 | 2928.044 | 34.69 | -2.89 | 31.80 | 50.00 | -18.20 | AVG |

Vertical

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2886.123 | 43.03 | -3.18 | 39.85 | 70.00 | -30.15 | peak |
| 2 | 2886.123 | 34.25 | -3.18 | 31.07 | 50.00 | -18.93 | AVG |

Test Mode: RX868 MHz

Polarization

Horizontal

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2912.253 | 43.01 | -3.05 | 39.96 | 70.00 | -30.04 | peak |
| 2 | 2912.253 | 33.78 | -3.05 | 30.73 | 50.00 | -19.27 | AVG |

Vertical

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2928.044 | 43.42 | -2.89 | 40.53 | 70.00 | -29.47 | peak |
| 2 | 2928.044 | 32.87 | -2.89 | 29.98 | 50.00 | -20.02 | AVG |

The test data are shown in the following pages.

Below 1GHz

**ACCURATE TECHNOLOGY CO., LTD.**
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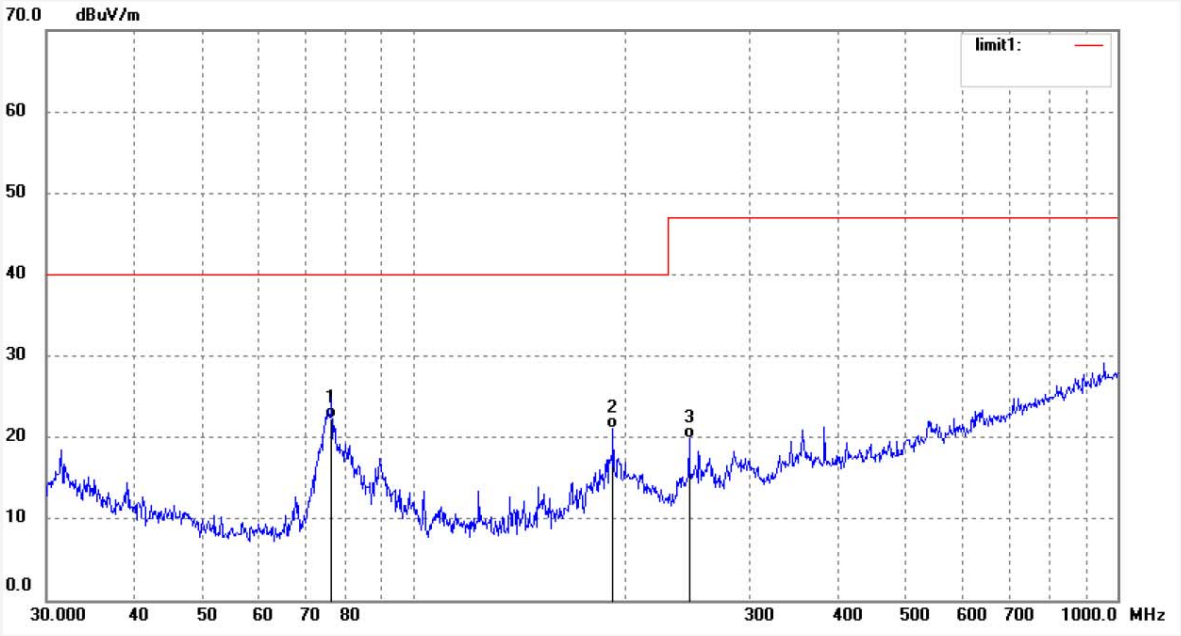
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

| | |
|---|---|
| Job No.: Bob #987 | Polarization: Horizontal |
| Standard: EN55032 CLASS B | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 02:38:25 |
| EUT: Thermostat | Engineer Signature: |
| Mode: Wifi Connection | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 76.3868 | 50.01 | -27.61 | 22.40 | 40.00 | -17.60 | QP | | | |
| 2 | 191.7841 | 46.04 | -24.95 | 21.09 | 40.00 | -18.91 | QP | | | |
| 3 | 246.1238 | 43.47 | -23.67 | 19.80 | 47.00 | -27.20 | QP | | | |

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Site: 1# Chamber
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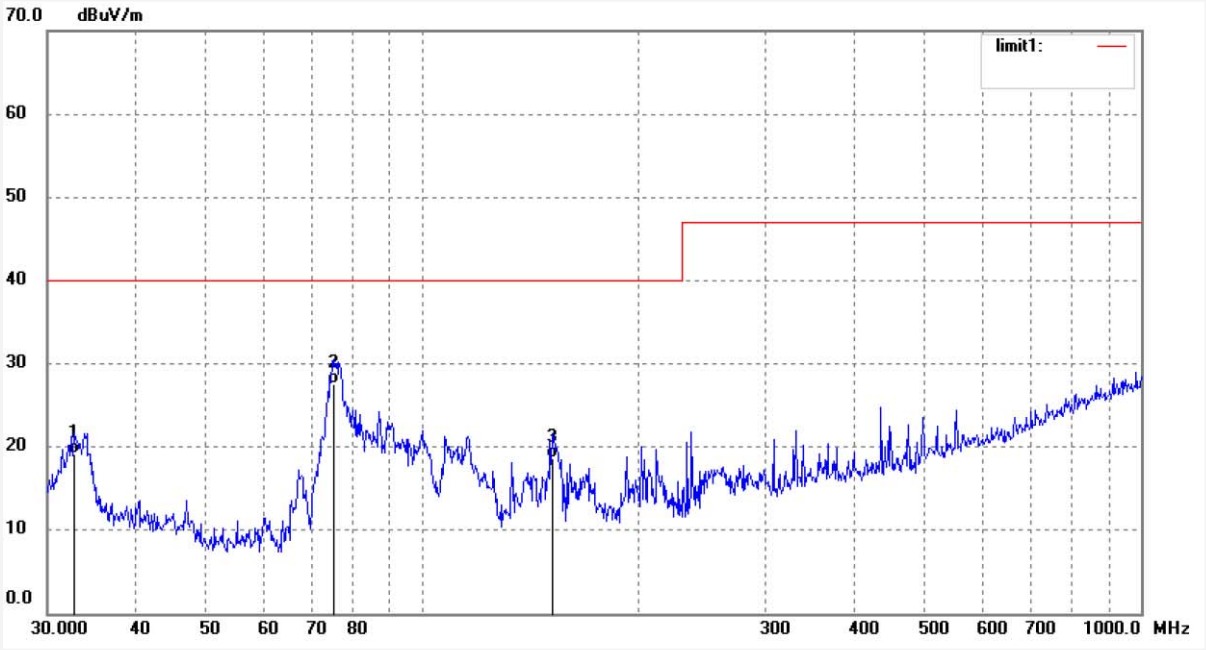
| | |
|---|---|
| Job No.: Bob #988 | Polarization: Vertical |
| Standard: EN55032 CLASS B | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 02:41:41 |
| EUT: Thermostat | Engineer Signature: |
| Mode: Wifi Connection | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 32.7544 | 40.13 | -20.89 | 19.24 | 40.00 | -20.76 | QP | | | |
| 2 | 75.3208 | 55.25 | -27.68 | 27.57 | 40.00 | -12.43 | QP | | | |
| 3 | 151.5567 | 46.51 | -27.92 | 18.59 | 40.00 | -21.41 | QP | | | |

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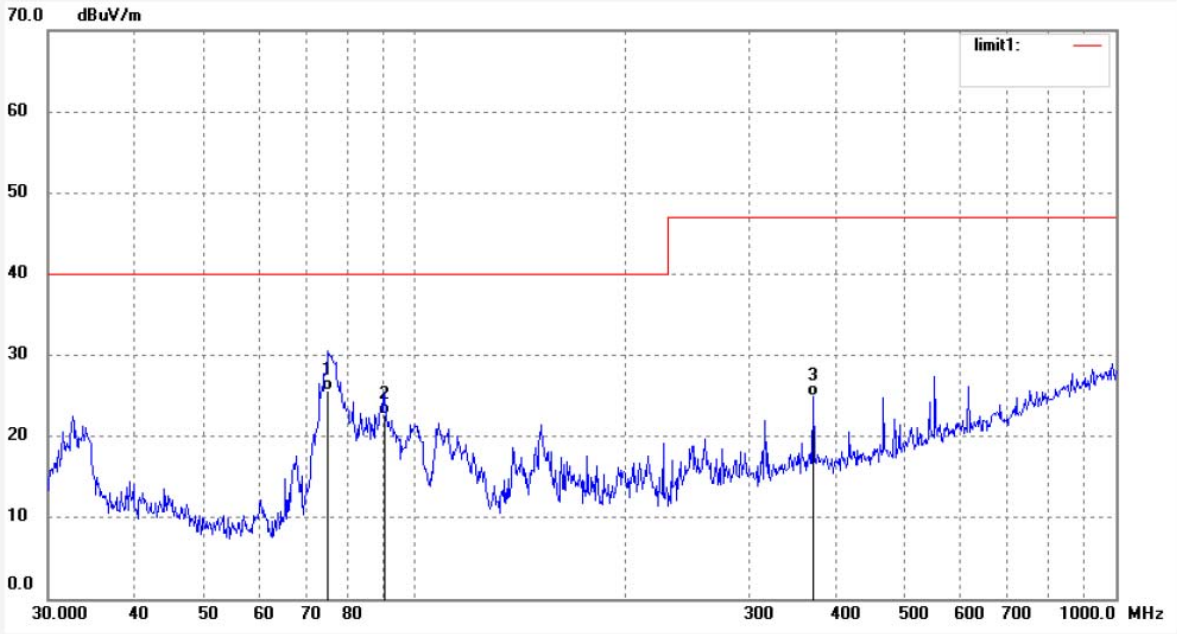
| | |
|---|---|
| Job No.: Bob #989 | Polarization: Vertical |
| Standard: EN55032 CLASS B | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 02:44:25 |
| EUT: Thermostat | Engineer Signature: |
| Mode: RX868 MHz | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 75.3208 | 53.26 | -27.68 | 25.58 | 40.00 | -14.42 | QP | | | |
| 2 | 90.7380 | 50.15 | -27.41 | 22.74 | 40.00 | -17.26 | QP | | | |
| 3 | 369.9659 | 43.78 | -18.77 | 25.01 | 47.00 | -21.99 | QP | | | |

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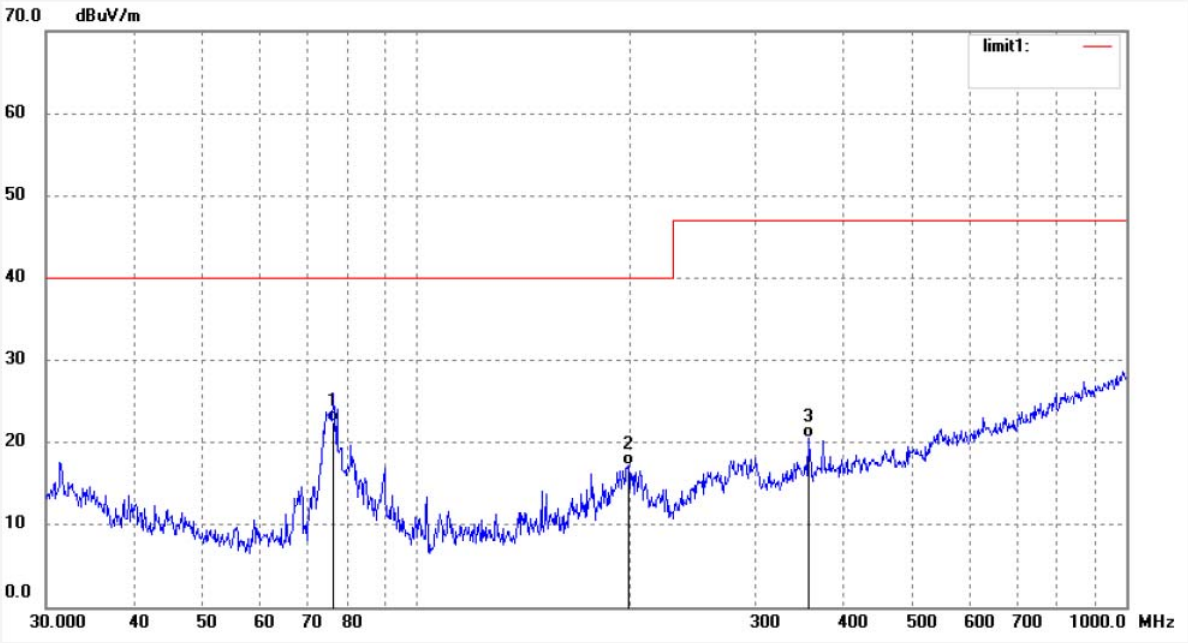
| | |
|---|---|
| Job No.: Bob #990 | Polarization: Horizontal |
| Standard: EN55032 CLASS B | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 02:46:30 |
| EUT: Thermostat | Engineer Signature: |
| Mode: RX868 MHz | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 76.3869 | 50.02 | -27.61 | 22.41 | 40.00 | -17.59 | QP | | | |
| 2 | 198.6424 | 41.70 | -24.44 | 17.26 | 40.00 | -22.74 | QP | | | |
| 3 | 355.9397 | 39.58 | -19.09 | 20.49 | 47.00 | -26.51 | QP | | | |

Above 1GHz

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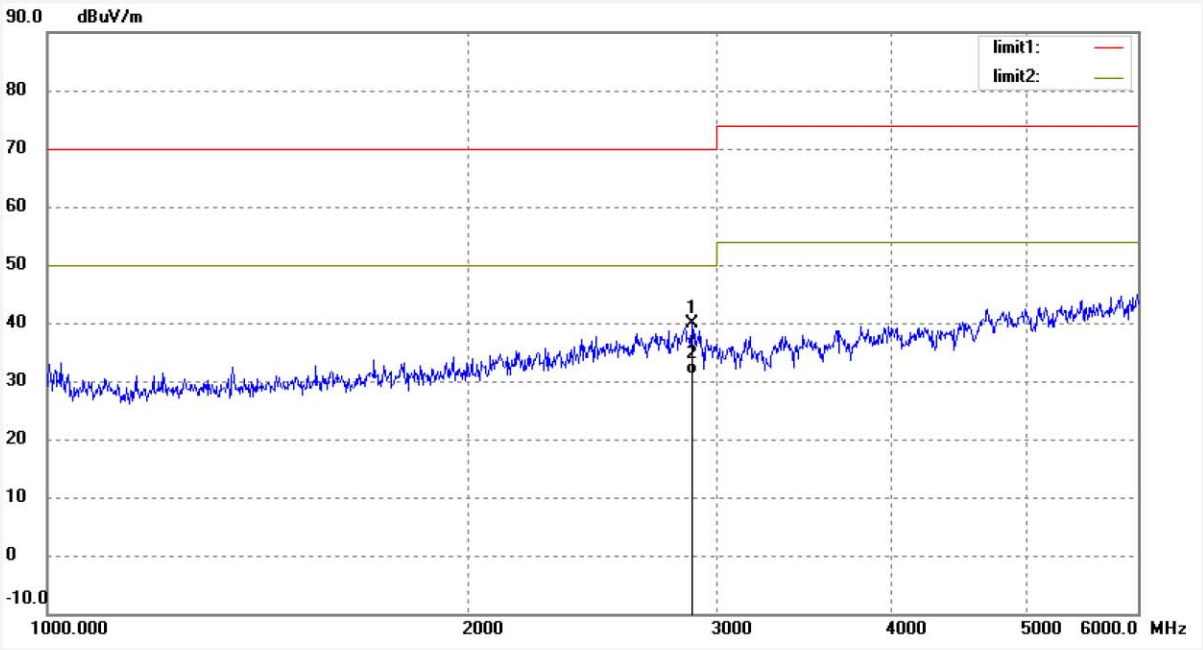
| | |
|---|---|
| Job No.: Bob #1015 | Polarization: Vertical |
| Standard: EN55032B above1GHz(PK) | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 04:48:24 |
| EUT: Thermostat | Engineer Signature: |
| Mode: Wifi Connection | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2886.123 | 43.03 | -3.18 | 39.85 | 70.00 | -30.15 | peak | | | |
| 2 | 2886.123 | 34.25 | -3.18 | 31.07 | 50.00 | -18.93 | AVG | | | |

**ACCURATE TECHNOLOGY CO., LTD.**
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Site: 1# Chamber
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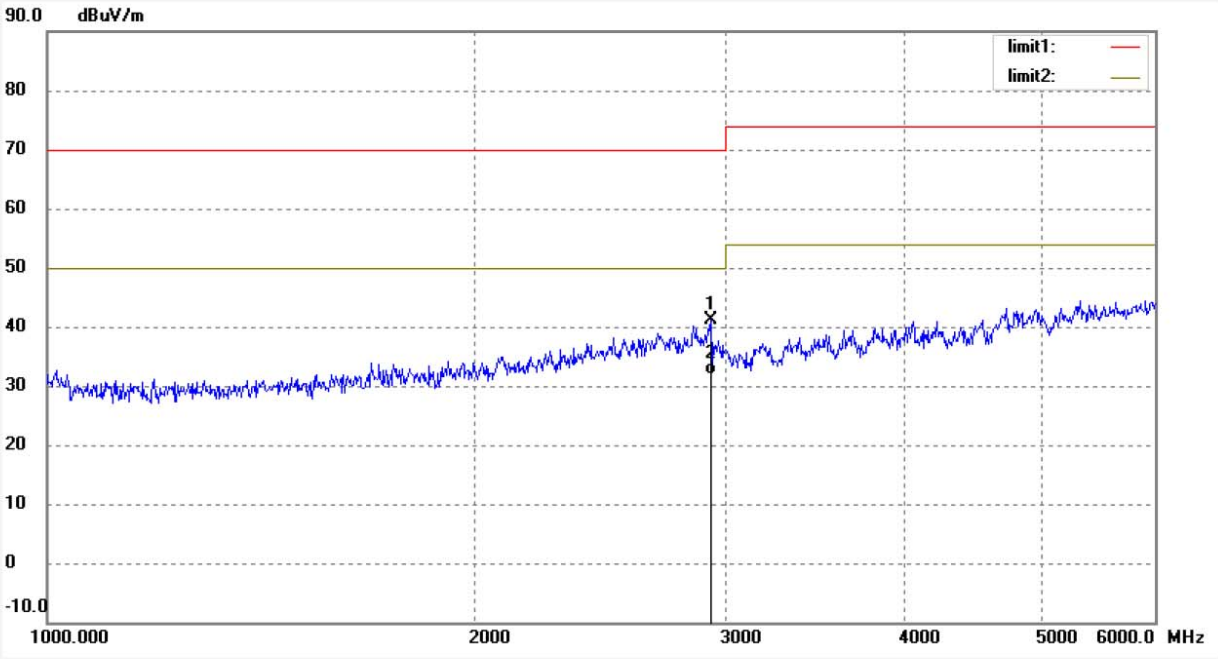
Fax:+86-0755-26503396

| | |
|---|---|
| Job No.: Bob #1016 | Polarization: Horizontal |
| Standard: EN55032B above1GHz(PK) | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 04:50:59 |
| EUT: Thermostat | Engineer Signature: |
| Mode: Wifi Connection | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2928.044 | 44.09 | -2.89 | 41.20 | 70.00 | -28.80 | peak | | | |
| 2 | 2928.044 | 34.69 | -2.89 | 31.80 | 50.00 | -18.20 | AVG | | | |

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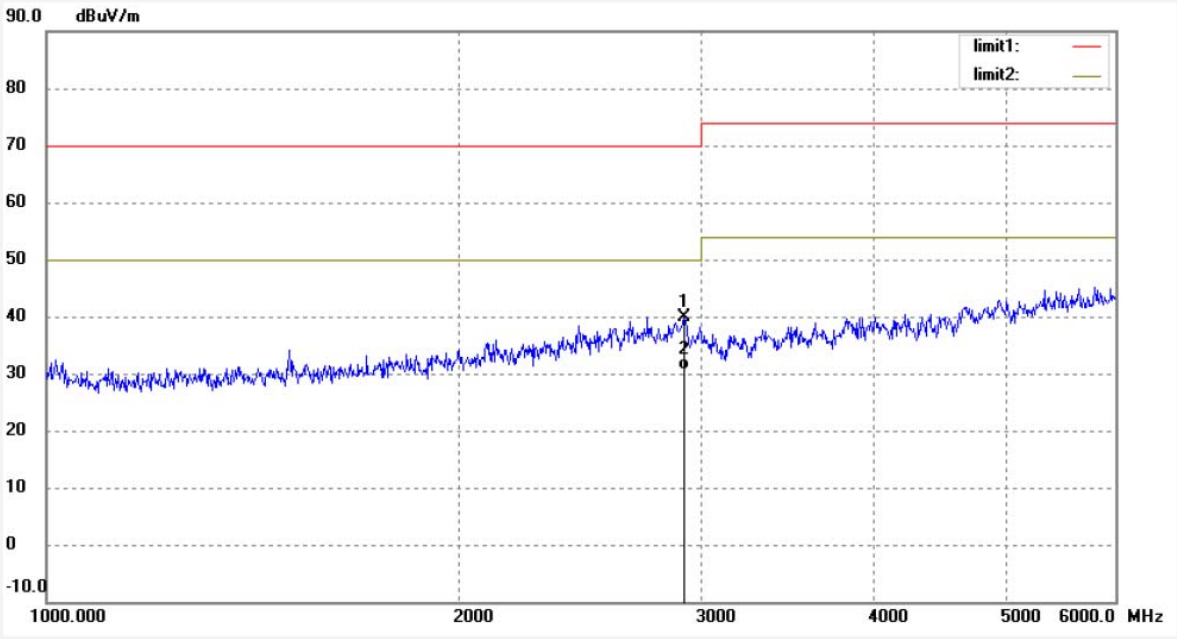
| | |
|---|---|
| Job No.: Bob #1017 | Polarization: Horizontal |
| Standard: EN55032B above1GHz(PK) | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 04:54:41 |
| EUT: Thermostat | Engineer Signature: |
| Mode: RX868 MHz | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2912.253 | 43.01 | -3.05 | 39.96 | 70.00 | -30.04 | peak | | | |
| 2 | 2912.253 | 33.78 | -3.05 | 30.73 | 50.00 | -19.27 | AVG | | | |

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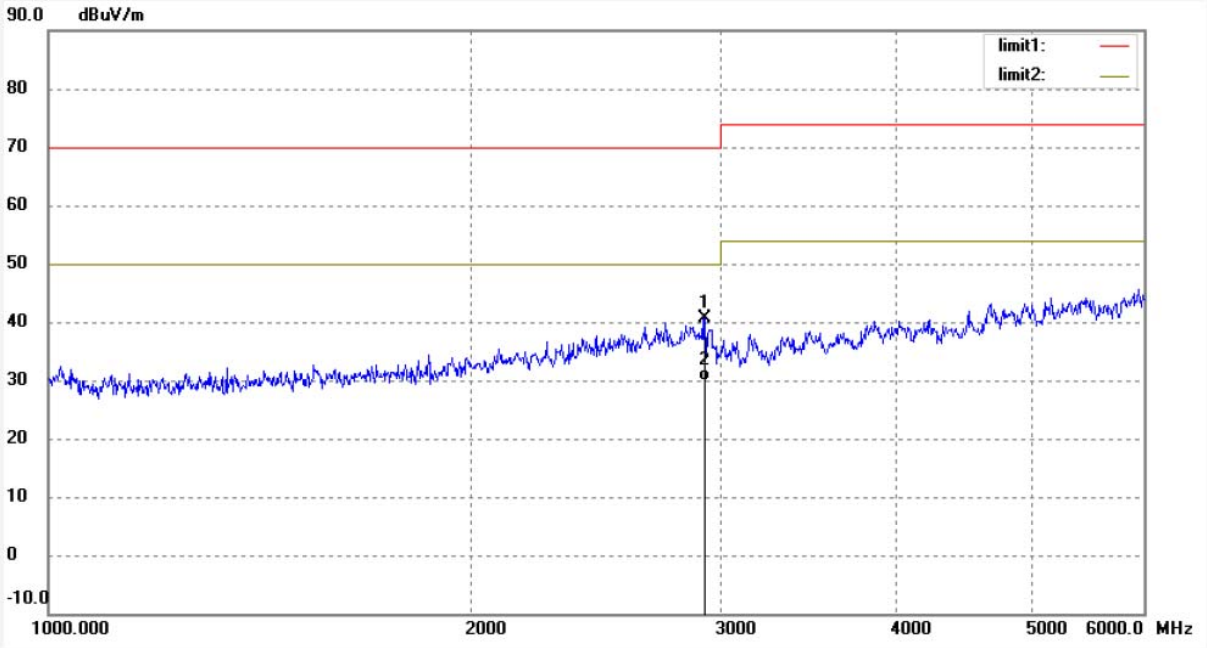
| | |
|---|---|
| Job No.: Bob #1018 | Polarization: Vertical |
| Standard: EN55032B above1GHz(PK) | Power Source: AC 230V/50Hz |
| Test item: Radiation Test | Date: 2020/10/09 |
| Temp.( C)/Hum.(%) 25 C / 55 % | Time: 04:57:47 |
| EUT: Thermostat | Engineer Signature: |
| Mode: RX868 MHz | Distance: 3m |
| Model: WT-02 | |
| Manufacturer: Xiamen E-top Controls | |

Note: Report No.:RTZ200925003-02




| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2928.044 | 43.42 | -2.89 | 40.53 | 70.00 | -29.47 | peak | | | |
| 2 | 2928.044 | 32.87 | -2.89 | 29.98 | 50.00 | -20.02 | AVG | | | |

# 5. TEST RESULTS IMMUNITY

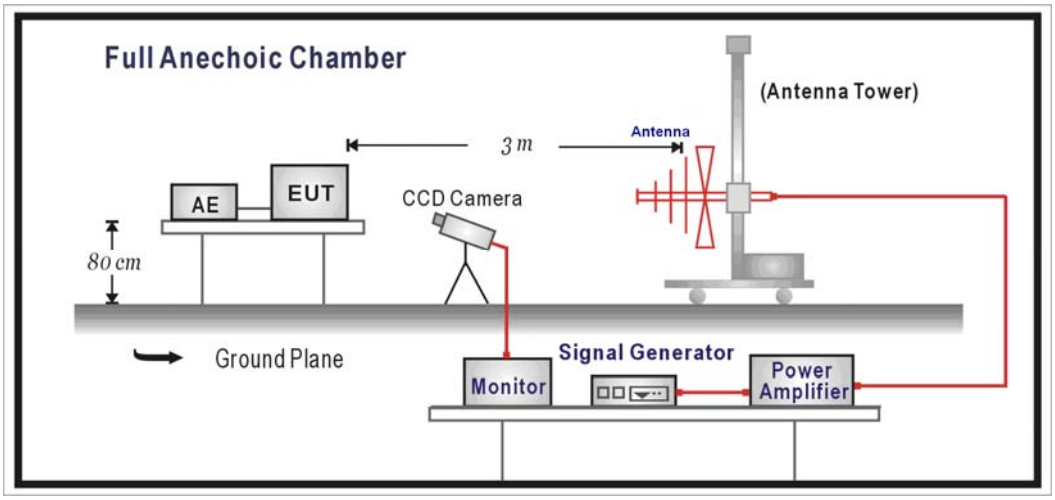
## 5.1.Continuous Disturbances

### 5.1.1. Radio frequency electromagnetic field

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 9.2 |
| Basic standard | : | EN 61000-4-3 |
| Criterion | : | CT, CR |
| Test level | : | 3V/m (unmodulated, rms.) |
| Frequency range | : | 80-6000MHz |
| Modulation | : | 1kHz sinusoidal audio signal, 80% AM |
| Sweep step | : | 1% |

**Test Setup**




| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.TX+RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

## Test Procedure

### The test procedure was in accordance with EN 61000-4-3

a) The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
b) the test level shall be 3 V/m (measured unmodulated). The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 000 Hz. If the wanted signal is modulated at 1 000 Hz, then an audio signal of 400 Hz shall be used.
c) the test shall be performed over the frequency range 80 MHz to 6 000 MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers (see clause 4), as appropriate.
d) for receivers and transmitters the stepped frequency increments shall be 1 % frequency increment of the momentary used frequency, unless specified otherwise in the relevant part of ETSI EN 301 489 series [i.13];
e) the dwell time of the test phenomena at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond.

### Table: Immunity against radiated electromagnetic fields

| Coupling port | Coupling method | Strength | Mode | Result | Criterion | Remarks |
|---|---|---|---|---|---|---|
| Horizontal Vertical | Left Right Front Rear Up Lower | 3V/m (r.m.s) | Wi-Fi Connection | Pass | A | Note |
| Horizontal Vertical | Left Right Front Rear Up Lower | 3V/m (r.m.s) | TX+RX 868MHz | Pass | A | Note |

Note: The EUT can operate as intended with no loss of user control functions or stored data, and maintain the communication link during and after test at traffic mode;

## 5.1.2. Radio frequency, common mode

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 9.5 |
| Basic standard | : | EN 61000-4-6 |
| Performance Criterion | : | CT, CR |
| Test level | : | 3V/m (unmodulated, rms.) |
| Source Standard | : | 150Ω |
| Frequency range | : | 150kHz-80MHz |
| Modulation | : | 1kHz sinusoidal audio signal, 80% AM |
| Sweep step | : | 1% |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.TX+RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

**Test Procedure**

**The test procedure was in accordance with EN 61000-4-6**

a) the test level shall be severity level 2 as given in CENELEC EN 61000-4-6 [6] corresponding to 3 V rms unmodulated. The test signal shall then be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 000 Hz. If the wanted signal is modulated at 1 000 Hz, then the test signal of 400 Hz shall be used.
b) the test shall be performed over the frequency range 150 kHz to 80 MHz with the exception of an exclusion band for transmitters, and for receivers and duplex transceivers, (see clause 4).
c) for receivers and transmitters the stepped frequency increments shall be 1 % frequency increment of the momentary frequency in the frequency range 150 kHz to 80 MHz, unless specified otherwise in the part of ETSI EN 301 489 series [i.13] dealing with the particular type of radio equipment.
d) for receivers and transmitters the stepped frequency increments shall be 1 % frequency increment of the momentary used frequency, unless specified otherwise in the relevant part of ETSI EN 301 489 series [i.13];
e) the injection method to be used shall be selected according to the basic standard CENELEC EN 61000-4-6 [6].
f) responses on receivers or receiver parts of transceivers occurring at discrete frequencies which are narrow band responses (spurious responses), are disregarded from the test, (see clause 4). the dwell time of the test phenomena at each frequency

shall not be less than the time necessary for the EUT to be exercised and to be able to respond;
g) the frequencies of the immunity test signal selected and used during the test shall be recorded in the test report

**Table: Common mode / Conducted Immunity**

☒ Results of Final Tests
Frequency Range: 0.15MHz~80MHz
Frequency Step: 1% of fundamental
Dwell time: 1 Sec.

☒ **80% A.M., 400 Hz Sine wave (Field Strength: 3 V/m)**

☒ **Coupling type:** ☒ **CDN /** ☐ **RF Current Probe/**☐ **EM CLAMP (LÜTHI)**

| Frequency Range(MHz) | Test Point | Coupling | Voltage Level | Modulation | Criterion | Results | Remark |
|---|---|---|---|---|---|---|---|
| 0.15-80 | AC Input | CDN | 3V | 80% AM | A | Pass | Note 1 |

Note: 1.The EUT can operate as intended with no loss of user control functions during and after test.

## 5.2.Transient Disturbances

### 5.2.1.Fast transients, common mode

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 9.4 |
| Basic standard | : | EN 61000-4-4 |
| Performance Criterion | : | TT, TR |
| Test level | : | 1kV (peak) for AC main |
| Test duration | : | 60sec |
| Rise time | : | 5/50ns |
| Repetition frequency | : | 5kHz |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.TX+RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

**Table: Immunity against Electrical Fast Transients**

| Test ports | Test Voltage | Result | Criterion | Remarks |
|---|---|---|---|---|
| AC Mains | ±1 kV | Pass | B | Equipment operated as intended, no degradation of function |

## 5.2.2.Electrostatic discharges

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 9.3 |
| Basic standard | : | EN 61000-4-2 |
| Charge voltage | : | ±2.0kV, ±4.0kV (contact discharge)<br>±2.0kV, ±4.0kV, ±6.0kV, ±8.0kV (air discharge) |
| Number of discharge | : | ≥10 |
| Polarity | : | Positive / Negative |
| Performance criterion | : | TT, TR |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.TX+RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

**Table: Electrostatic Discharge, both Polarities**

| Discharge points | Type of discharge | Mode | Result | Criterion | Remarks |
|---|---|---|---|---|---|
| Nonconductive Enclosure | Air Discharge | Wi-Fi Connection | Pass | B | Note |
| Conductive Enclosure | Contact Discharge | | Pass | B | |
| HCP | Indirect Contact | | Pass | B | |
| VCP | Indirect Contact | | Pass | B | |
| Nonconductive Enclosure | Air Discharge | TX+RX 868MHz | Pass | B | Note |
| Conductive Enclosure | Contact Discharge | | Pass | B | |
| HCP | Indirect Contact | | Pass | B | |
| VCP | Indirect Contact | | Pass | B | |

Note: Equipment operated as intended, no degradation of function

## 5.2.3.Surges

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 9.8 |
| Basic standard | : | EN 61000-4-5 |
| Waveform | : | 1.2/50μs |
| Test voltage | : | ±1kV |
| Coupling | : | Coupling Network for AC Mains |
| Coupling phase | : | 0, π /2,π , 3π /2 |
| Number of surges | : | 5 (for each combination of parameters) |
| Repetition rate | : | max. 1/min |
| Performance Criterion | : | TT, TR |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.TX+RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

**Table: Immunity against Surge**

| Test ports | Test Voltage | Result | Criterion | Remarks |
|---|---|---|---|---|
| AC Mains | ±1kV<br>(line to line) | Pass | B | Equipment operated as intended, no degradation of function |

## 5.3.Power Supply Alterations

### 5.3.1.Voltage dips and interruptions

**Result: Pass**

| | | |
|---|---|---|
| Date of testing | : | Oct.9, 2020 |
| Test Specification | : | EN 301 489-1 V2.2.3, clause 9.7 |
| Basic standard | : | EN 61000-4-11 |
| Performance Criterion | : | TT, TR |

**Test Setup**

| | | |
|---|---|---|
| Input Voltage | : | For Wi-Fi mode: AC 230V/50Hz<br>For 868(TX) mode: DC3V<br>For 868(RX) mode: AC 230V/50Hz |
| Operation Mode | : | 1. Wi-Fi Connection<br>2.TX+RX 868MHz |
| Earthing | : | Not Applied |
| Temperature | : | 25ºC |
| Humidity | : | 50% |

**Table: Immunity Voltage dips and interruptions**

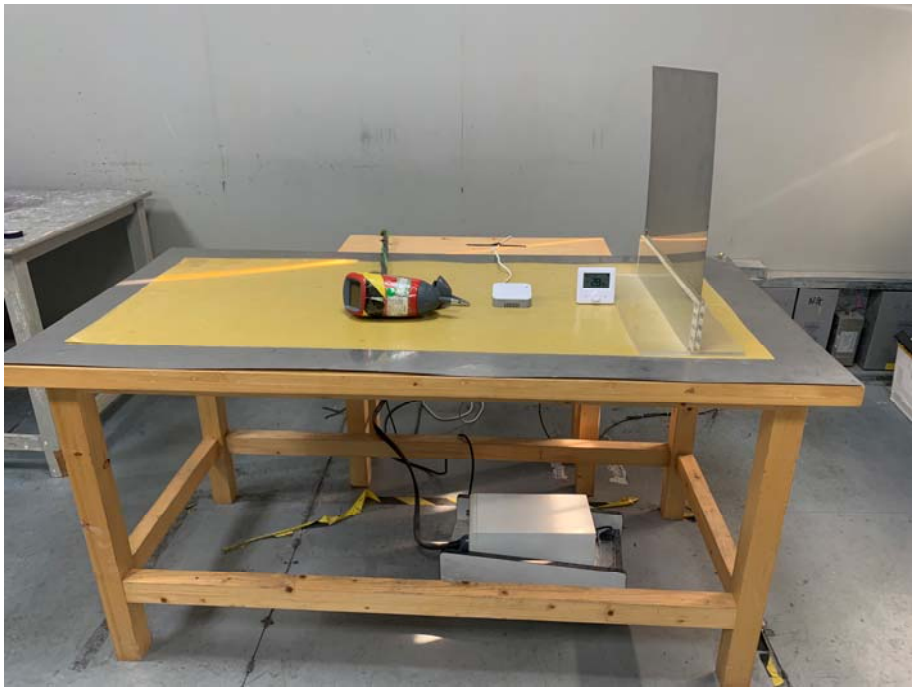
| Test Level<br>% $U_T$ | Voltage Dips & Short Interruptions<br>% $U_T$ | Duration (in periods) | Result | Criterion | Remarks |
|---|---|---|---|---|---|
| 0 | 100 | 0.5P | Pass | B | Equipment operated as intended, no degradation of function |
| 0 | 100 | 1P | Pass | B | Equipment operated as intended, no degradation of function |
| 70 | 30 | 25P | Pass | B | Equipment operated as intended, no degradation of function |
| 0 | 100 | 250P | Pass | C | Power off the equipment. Automatic restart will restore normal |

Note:
1. $U_T$ is the rated voltage for the equipment.
P = 20ms

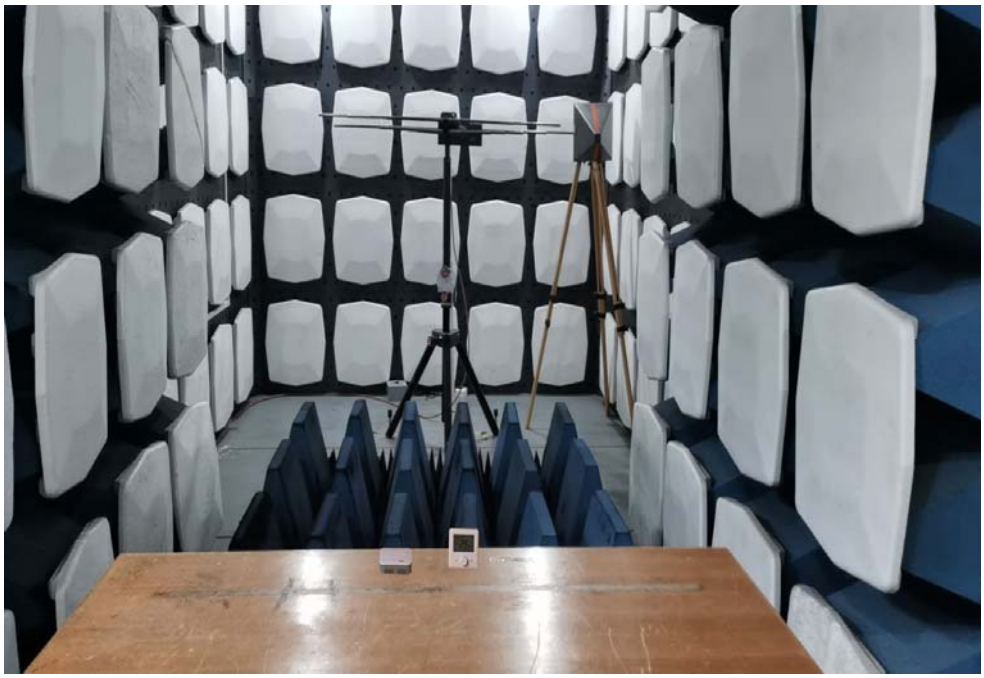
# 6. PHOTOGRAPHS

## 6.1.Photograph of set-up for Mains Terminal Disturbance Voltage

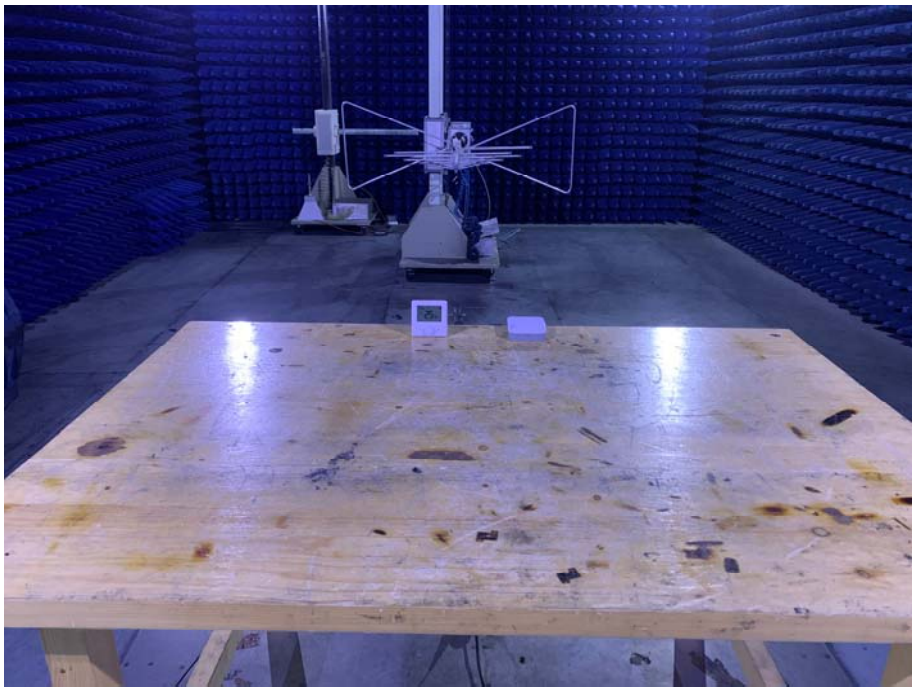
## 6.2.Photograph of set-up for Electrostatic Discharge

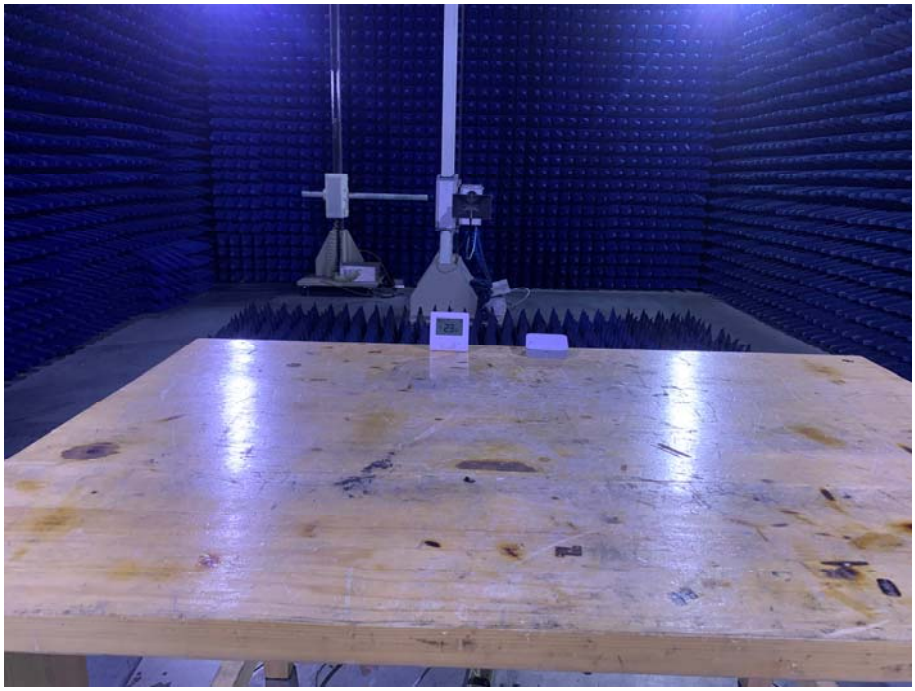


## 6.3.Photograph of set-up for Radiated susceptibility



## 6.4.Photo of Radiation Emission Measurement





## 6.5.Photograph of set-up for Fast transient, common mode

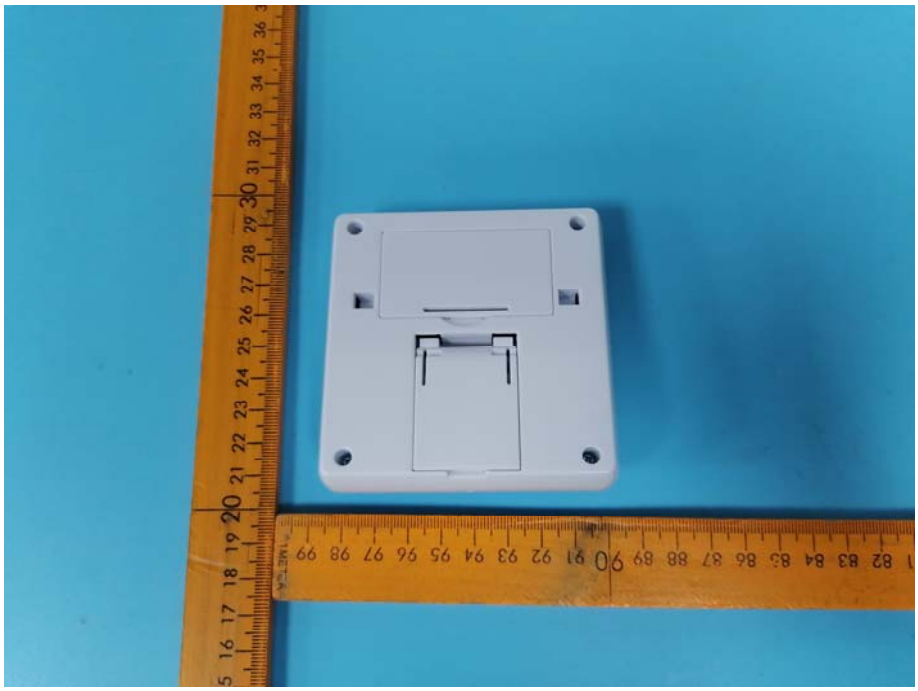
## 6.6.Photograph of set-up for Surges; Voltage dips and interruptions

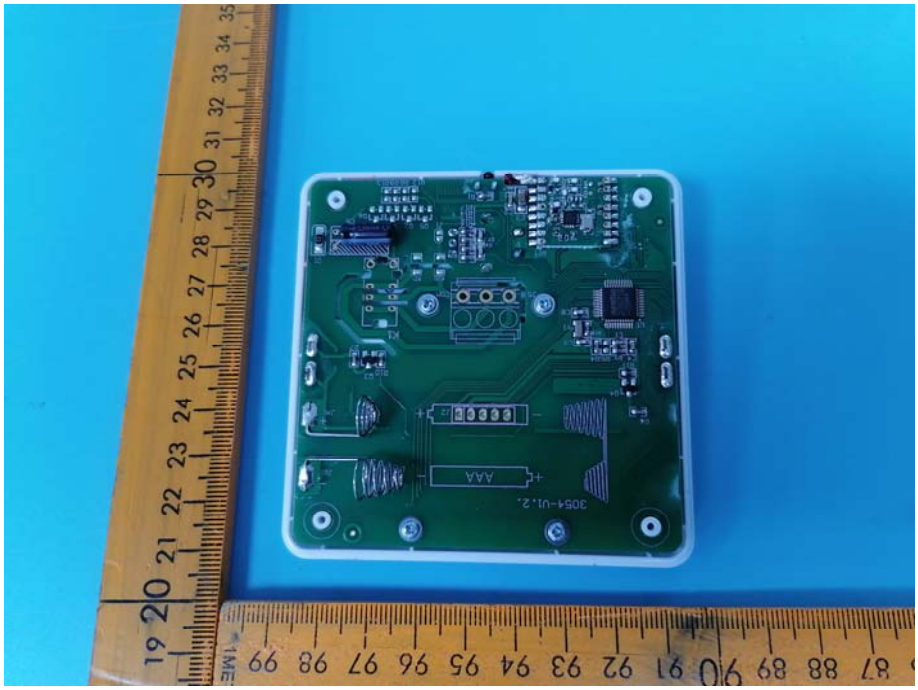
## 6.7.Photograph of set-up for Harmonic/ Flicker Test

## 6.8.Photograph of set-up for Induced RF Disturbance Test

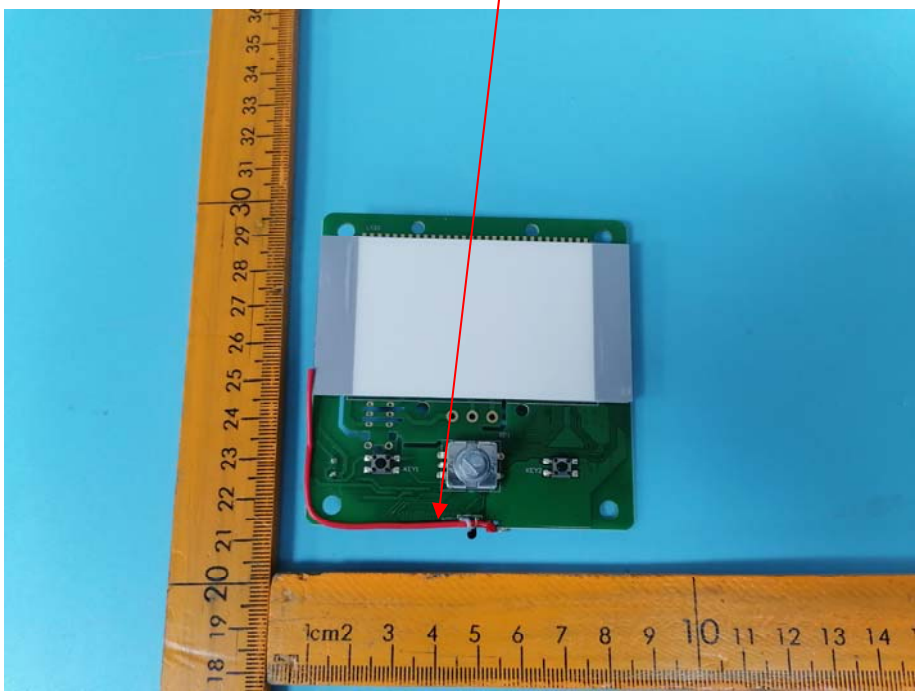
## 6.9.Photographs of the EUT

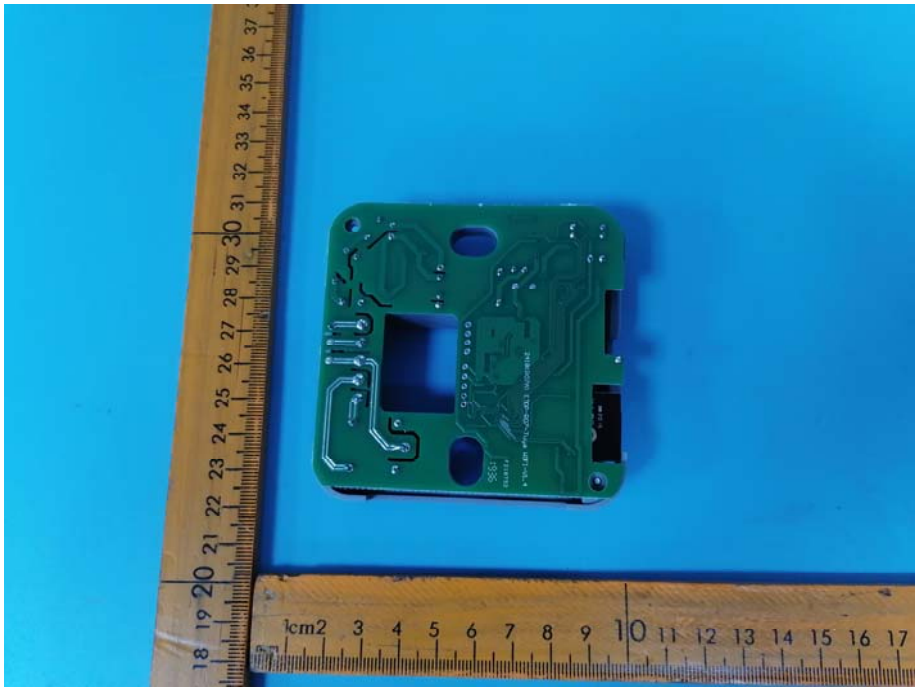

P
M



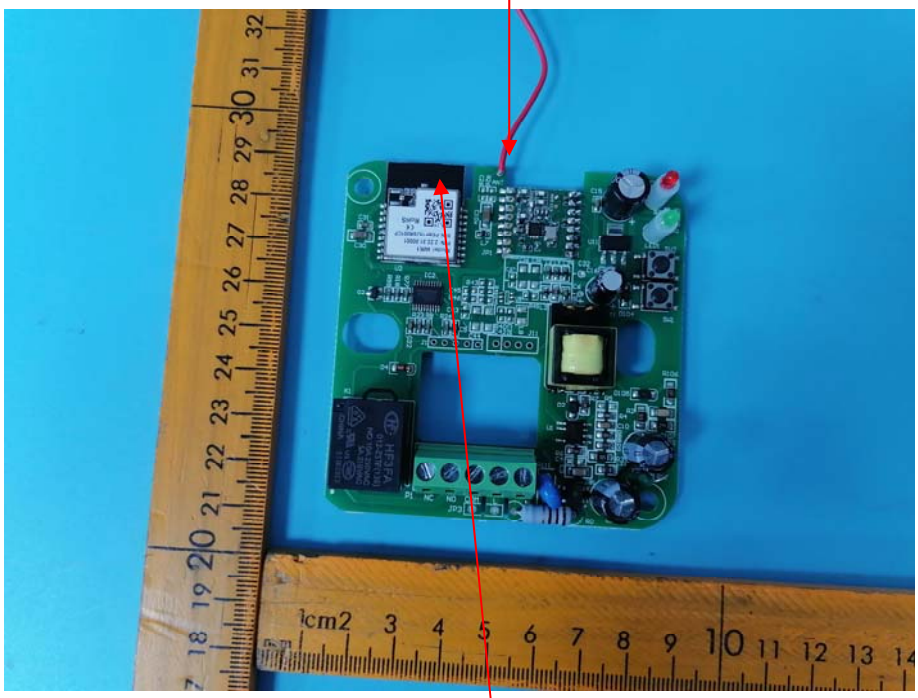


TX 868MHz Antenna

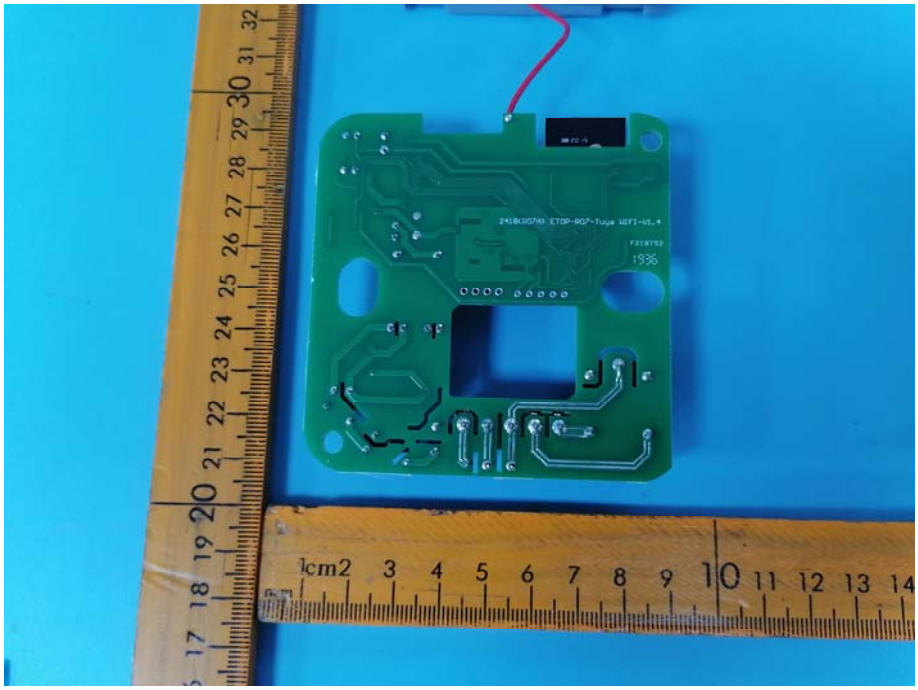




RX 868MHz Antenna



WI-FI Antenna



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