Shenzhen CTL Testing Technology Co.,Ltd.
Tel: 0755-89486194 E-Mail: ctl@ctl-lab.com

Test Report

EN 55032 Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 55035 Electromagnetic compatibility of multimedia equipment - Immunity requirements

Report Reference No.....:	**CTL1907032022-E**
Compiled by (position+printed name+signature)..:	File administrators Rambo Li
Supervised by (position+printed name+signature)..:	Technique principal Ivan Xie
Approved by (position+printed name+signature)..:	Manager Jacky Chen
Date of issue.....:	Jul. 12, 2019
Testing Laboratory Name.....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address.....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Testing location/ procedure.....:	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing methods ☐
Applicant's name.....:	**Beijing Shi'An Technology Instrument Co., Ltd**
Address.....:	Rm.623-625, Linji Industrial Park, No. 53 Shunren Road, Linhe Developing Zone, Shunyi District, Beijing, China, 101300
Test specification:	
Standard.....:	**EN 55032: 2015** **EN 55035: 2017**
Non-standard test method.....:	/
Test Report Form No.....:	
TRF Originator.....:	Shenzhen CTL Testing Technology Co., Ltd

Test item description.....:	**Carbon Monoxide Gas Detector**
Trade Mark .....:	SA
Test voltage.....:	DC 6V
Result.....:	**Pass**

EMC -- Test Report

Test Report No. :	CTL1907032022-E	Jul. 12, 2019 Date of issue

Equipment under Test : Carbon Monoxide Gas Detector

Type / Model : SA-V1000

Listed Models : SA103

Applicant : **Beijing Shi'An Technology Instrument Co., Ltd**

Address : Rm.623-625, Linji Industrial Park, No. 53 Shunren Road, Linhe Developing Zone, Shunyi District, Beijing, China, 101300

Manufacturer : **Beijing Shi'An Technology Instrument Co., Ltd**

Address : Rm.623-625, Linji Industrial Park, No. 53 Shunren Road, Linhe Developing Zone, Shunyi District, Beijing, China, 101300

Test Result	Pass

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

History of this test report

Report No.	Version	Description	Issued Date
CTL1907032022-E	V1.0	Initial Issued Report	Jul. 12, 2019

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

EN 55032: 2015 Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 55035: 2017 Electromagnetic compatibility of multimedia equipment - Immunity requirements

2. SUMMARY

2.1. General Remarks:

Date of receipt of test sample : Jul. 09, 2019

Sampling and Testing commenced on : Jul. 09, 2019

Testing concluded on : Jul. 12, 2019

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : o 230V / 50 Hz o 115V / 60Hz
o 12 V DC o 24 V DC
■ Other (specified in blank below)

DC 6V

2.3. Short description of the Equipment under Test (EUT)

The EUT is a Carbon Monoxide Gas Detector

2.4. EUT operation mode:

The equipment under test was operated during the measurement under the following conditions:

The tests are carried out with surge protective devices disconnected.

Test program (customer specific)

Emissions tests…….: According to EN55032, searching for the highest disturbance.

Immunity tests ……..: According to EN55035, searching for the highest susceptivity.

2.5. EUT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurement:

■- supplied by the manufacturer

o - supplied by the lab

2.6. Performance Criteria

Definition related to the performance level:

☒ based on the used product standard
☐ based on the declaration of the manufacturer, requestor or purchaser

Criterion A:
Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion B:
Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion C:
Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 399832

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

Certificated by A2LA, USA
Registration No.:4343.01
Date of registration: December 27, 2017

3.3. Environmental conditions

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

Temperature:	22-25 ° C
Humidity:	40-54 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

Emission Measurement		
Radiated Emission	EN 55032: 2015	PASS
Immunity Measurement		
Electrostatic Discharge	EN 55035: 2017 IEC 61000-4-2: 2008	PASS
RF Field Strength Susceptibility	EN 55035: 2017 IEC 61000-4-3: 2010	PASS
Power Frequency Magnetic Field Susceptibility Test	EN 55035: 2017 IEC 61000-4-8: 2009	PASS

Remark:
1. The test result PASS and /or FAIL has no relationship with the measurement uncertainty.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar
to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission(chamber 1)	30~1000MHz	±3.20dB	(1)
Radiated Emission(chamber 2)	30~1000MHz	±3.53dB	(1)
Radiated Emission	Above 1GHz	±4.32dB	(1)
Conducted Emission	0.15~30MHz	±2.66dB	(1)
Disturbance Power	30~300MHz	±2.90dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

Radiated Emission(chamber 1)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2018/10/08	2019/10/07
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2019/05/24	2020/05/23
3	Horn Antenna	Sunol Sciences Corp	DRH-118	A062013	2019/05/24	2020/05/23

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ESD Simulator	TESEQ AG	NSG 437	1058	2018/10/07	2019/10/06

Power Frequency Magnetic Field Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	MAGNETIC COIL	HTEC Instruments Ltd.	HPFMF	154402	2019/05/24	2020/05/23

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	SIGNAL GENERATOR	HEWLETT PACKARD	8648C	3642U01765	2018/10/08	2019/10/07
2	Power Amplifier	AR	150W1000M3	309401	2018/10/08	2019/10/07
3	Power Meter	Agilent	E4419B	GB43317877	2018/10/08	2019/10/07
4	Directional Coupler	EMtrace	DDC-0210-150W	N/A	2018/10/08	2019/10/07
5	Test Antenna-Bi-Log	Schwarzbeck	VULB 9118 E	N/A	2018/10/08	2019/10/07

4. TEST CONDITIONS AND RESULTS

4.1. Radiated Emission

For test instruments and accessories used see section 3.6.

4.1.1. Description of the test location

Test location: Chamber 1

4.1.2. Limits of disturbance

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

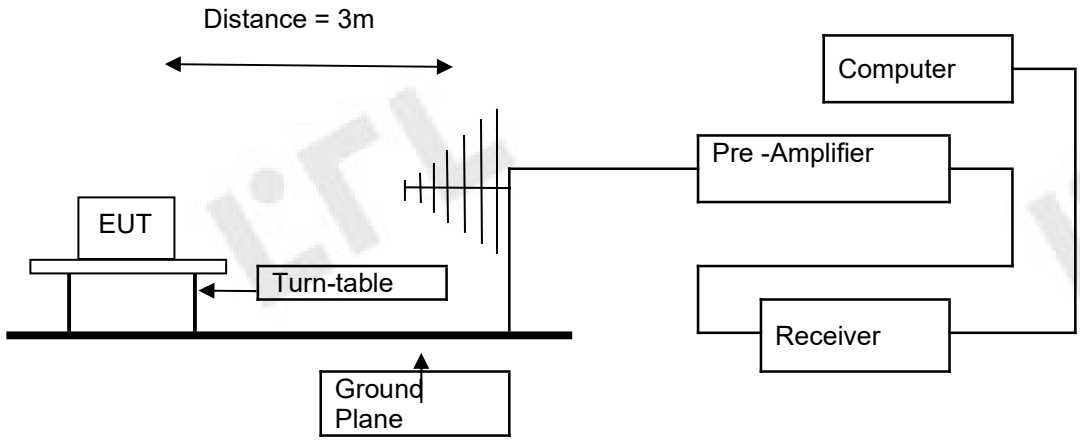
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.1.3. Description of the test set-up

4.1.3.1. Operating Condition

The EUT is set to work shall be carried out with full load mode during the test, and the maximum emanating results are recorded.

4.1.3.2. Configuration of test setup



4.1.4. Test result

The requirements are **Fulfilled**

Band Width: 120KHz

Frequency Range: 30MHz to 1000MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

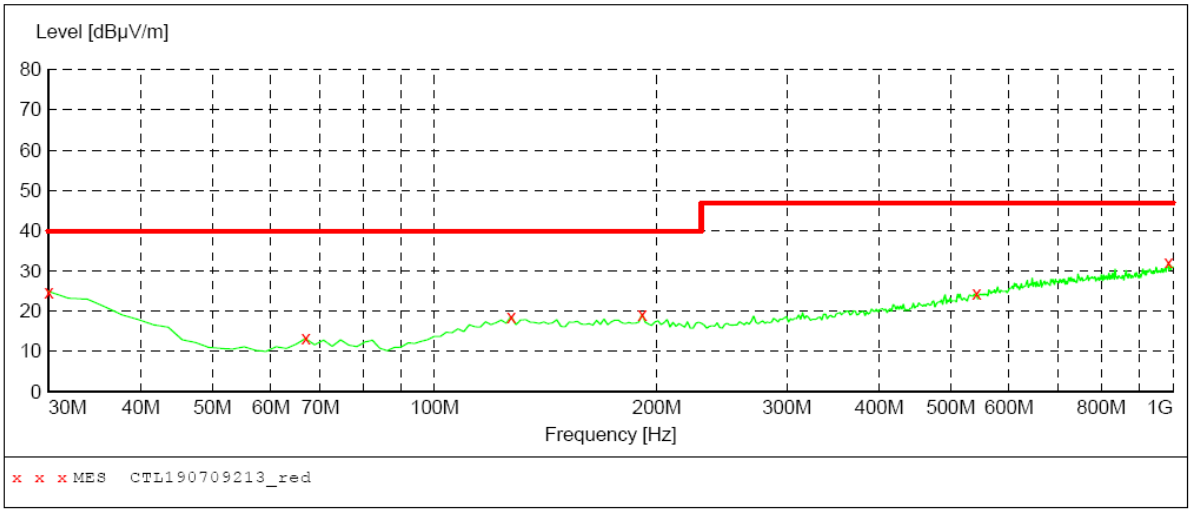
Shenzhen CTL Testing Technology Co.,Ltd

Radiation Emission Test EN 55032

```
EUT:                    SA-V1000
Manufacturer:           Beijing Shi'An Technology Instrument Co., Ltd
Operating Condition:    WORKING
Test Site:              Chamber1
Operator:               LYQ
Test Specification:     DC 6V
Comment:
Start of Test:          2019-7-9 / 20:57:24
```

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL190709213_red"

2019-7-9 20:58

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	24.80	22.2	40.0	15.2	---	0.0	0.00	VERTICAL
66.860000	13.20	8.7	40.0	26.8	---	0.0	0.00	VERTICAL
127.000000	18.60	15.3	40.0	21.4	---	0.0	0.00	VERTICAL
191.020000	19.20	14.6	40.0	20.8	---	0.0	0.00	VERTICAL
542.160000	24.30	21.7	47.0	22.7	---	0.0	0.00	VERTICAL
986.420000	32.20	28.0	47.0	14.8	---	0.0	0.00	VERTICAL

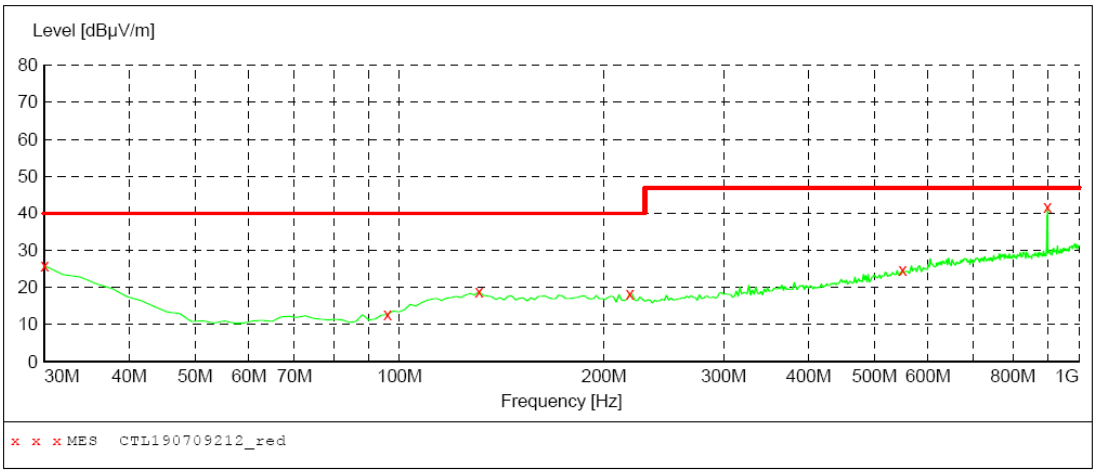
Shenzhen CTL Testing Technology Co.,Ltd

Radiation Emission Test EN 55032

```
EUT:                    SA-V1000
Manufacturer:           Beijing Shi'An Technology Instrument Co., Ltd
Operating Condition:    WORKING
Test Site:              Chamber1
Operator:               LYQ
Test Specification:     DC 6V
Comment:
Start of Test:          2019-7-9 / 20:40:22
```

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL190709212_red"

2019-7-9 20:57

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	25.80	22.2	40.0	14.2	---	0.0	0.00	HORIZONTAL
95.960000	12.70	10.3	40.0	27.3	---	0.0	0.00	HORIZONTAL
130.880000	18.80	15.3	40.0	21.2	---	0.0	0.00	HORIZONTAL
218.180000	18.20	14.4	40.0	21.8	---	0.0	0.00	HORIZONTAL
549.920000	24.60	21.9	47.0	22.4	---	0.0	0.00	HORIZONTAL
899.120000	41.90	26.3	47.0	5.1	---	0.0	0.00	HORIZONTAL

4.2. Electrostatic discharge

For test instruments and accessories used see section 3.6.

4.2.1. Description of the test location and date

Test location: 1# EMC Test Room

Date of test: Jul. 10, 2019

Operator: Li

4.2.2. Severity levels of electrostatic discharge

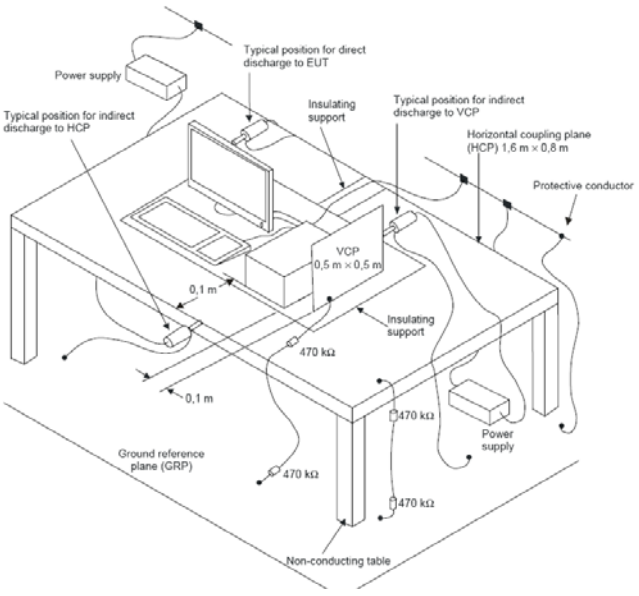
Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.2.3. Description of the test set-up

4.2.3.1. Operating Condition

The EUT is set to work shall be carried out with normal working mode during the test, and the maximum emanating results are recorded.

4.2.3.2. Configuration of test setup



4.2.4. Test specification:

Contact discharge voltage:	■ 2 kV	■ 4 kV	
Air discharge voltage:	■ 2 kV	■ 4 kV	■ 8 kV
Number of discharges:	■ ≥ 10	□ ≥ 25	
Type of discharge:	Direct discharge	■ Air discharge ■ Contact discharge	
	Indirect discharge	■ Contact discharge	
Polarity:	■ Positive	■ Negative	
Discharge location:	■ see photo documentation of the test set-up		
	■ all external locations accessible by hand		
	■ horizontal plate (HCP)		
	■ vertical coupling plate (VCP)		

4.2.5. Test result

The requirements are **Fulfilled** Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.3. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.6.

4.3.1. Description of the test location and date

Test location: Chamber 2

Date of test: Jul. 10, 2019

Operator: Li

4.3.2. Severity levels of radiated, radio-frequency, electromagnetic field

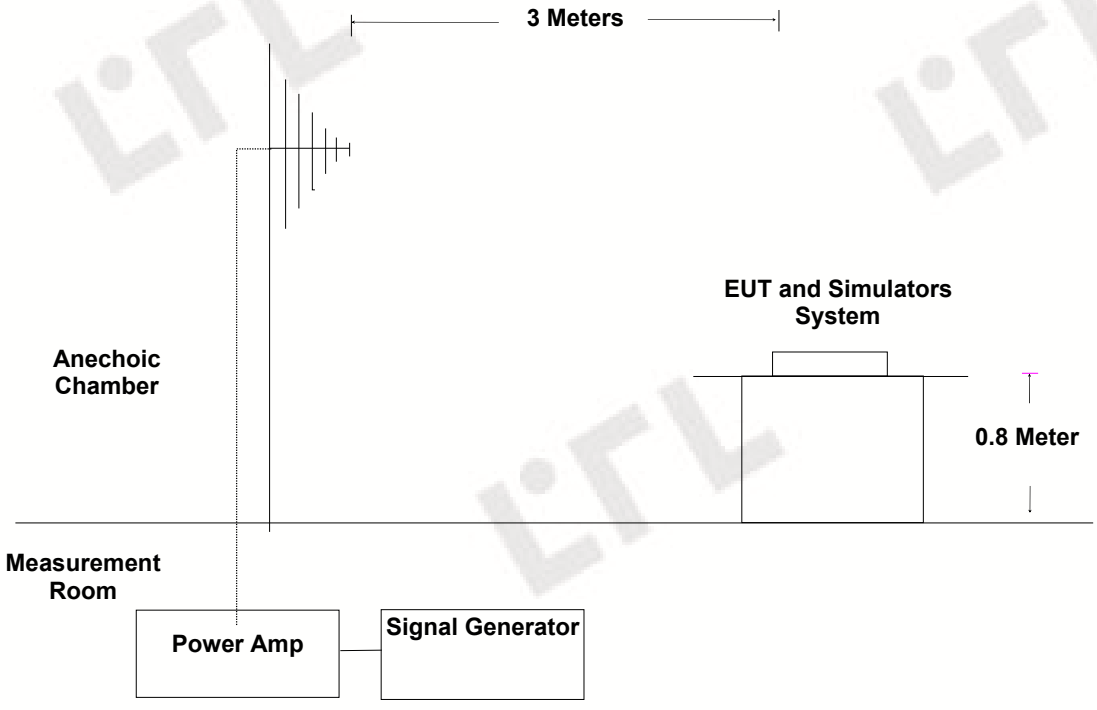
Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.3.3. Description of the test set-up

4.3.3.1. Operating Condition

The EUT is set to work shall be carried out normal working mode during the test, and the maximum emanating results are recorded.

4.3.3.2. Configuration of test setup



4.3.4. Test specification:

Frequency range:	■ 80 MHz to 1000 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical

4.3.5. Test result

The requirements are **Fulfilled** Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.4. Magnetic Field Immunity

For test instruments and accessories used see section 3.6.

4.4.1. Description of the test location

Test location: EMC Test Room

Date of test: Jul. 10, 2019

Operator: Li

4.4.2. Severity levels of magnetic field immunity

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X.	Special

4.4.3. Description of the test set-up

4.4.3.1. Operating Condition

The EUT is set to work shall be carried out normal working mode during the test, and the maximum emanating results are recorded.

4.4.4. Test specification:

Test frequency: ■ 50 Hz

Continuous field: ■ 1 A/m

Test duration: ■ 5 m

Antenna factor: 0.917 A/m

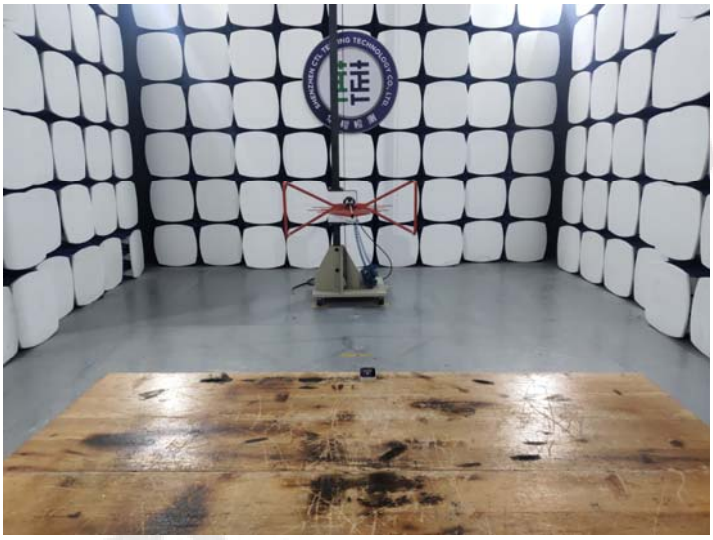
Axis: ■ x-axis ■ y-axis ■ z-axis

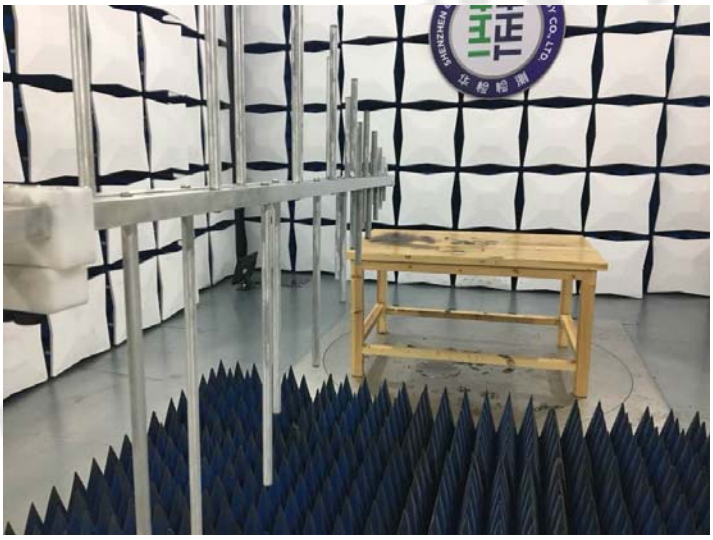
4.4.5. Test result

The requirements are **Fulfilled** Performance Criterion: **A**

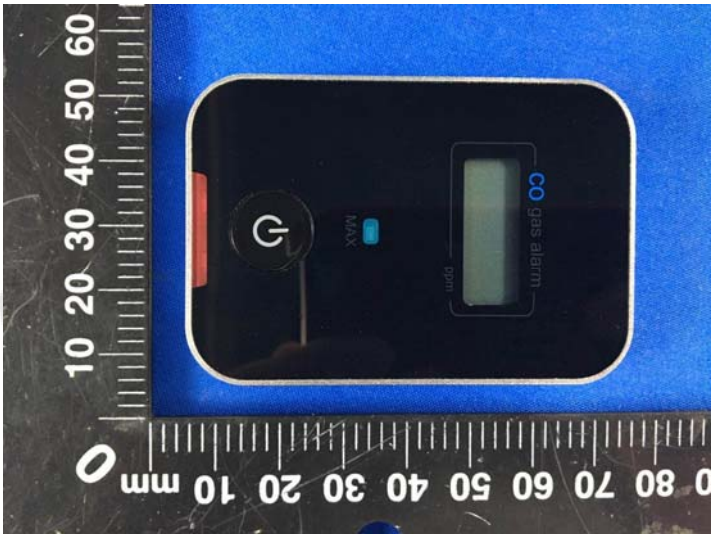
Remarks: During the test no deviation was detected to the selected operation mode(s).

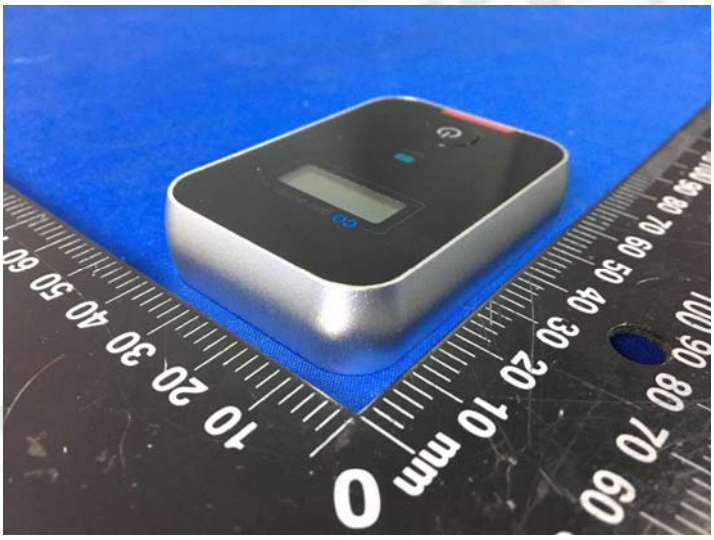
5. Test Setup Photos

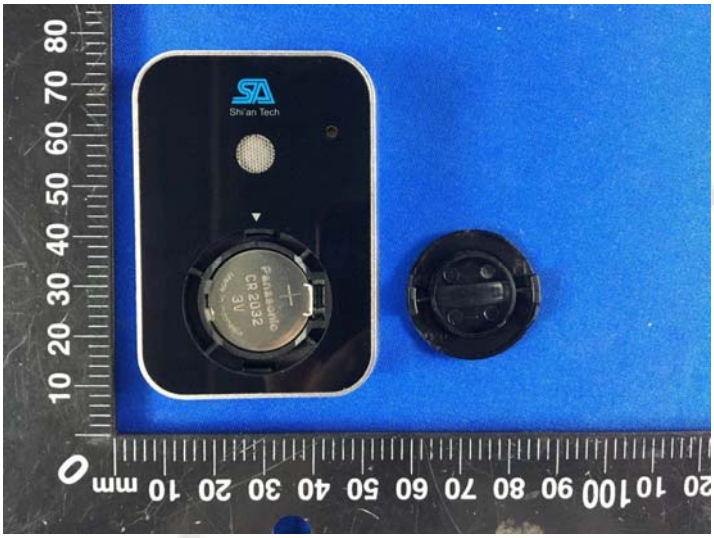


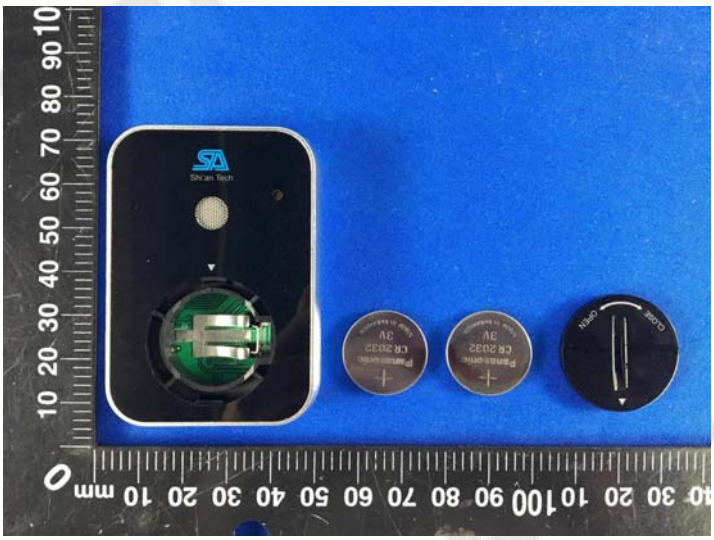


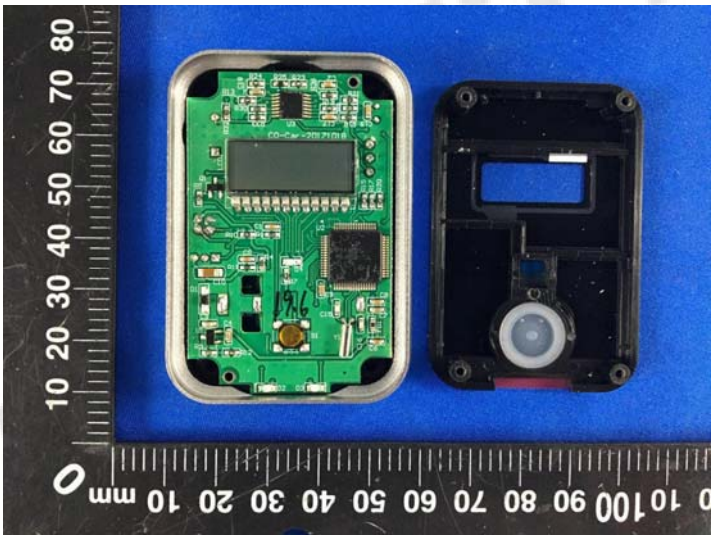
6. External and Internal Photos of the EUT

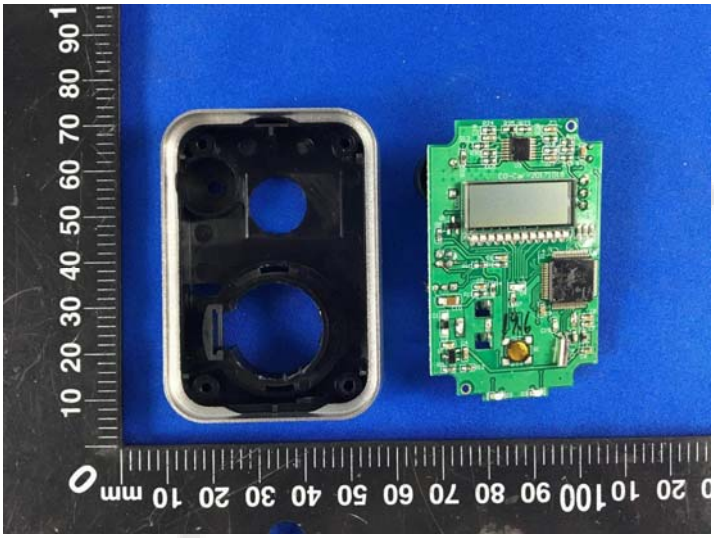


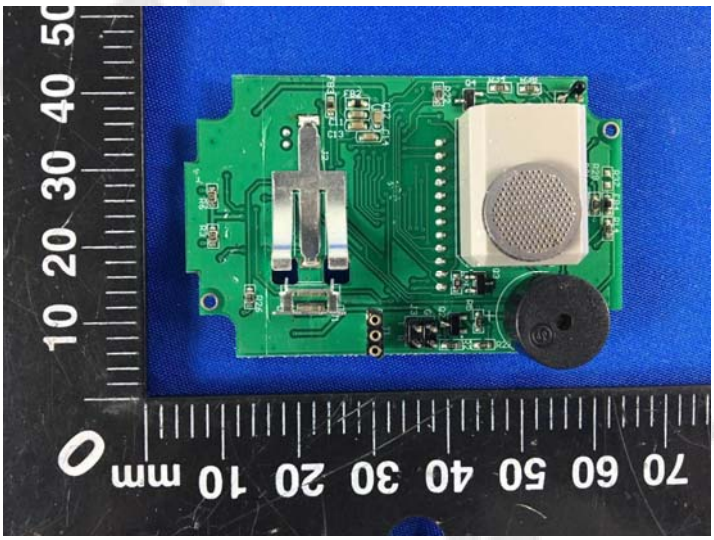


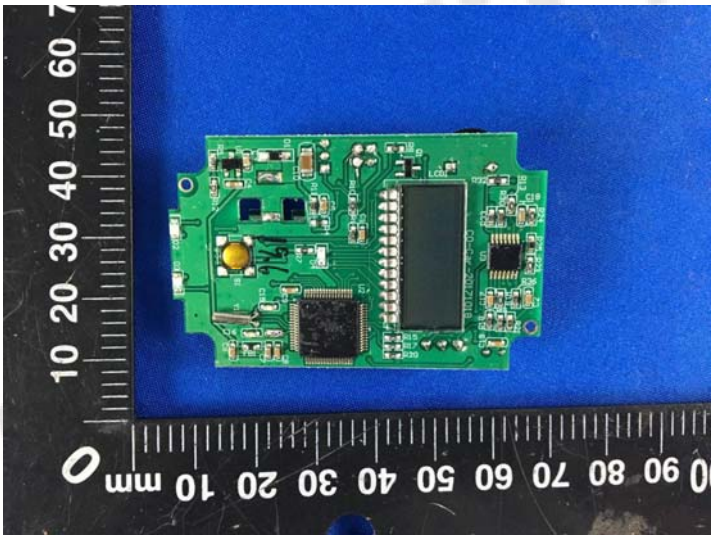

Shi'an Tech
Panasonic
CR 2032
3V


Shi'an Tech









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