

EMC TEST REPORT

Product Name CO2 Meter
 Trade mark /
 Model No. T03, T02, T05, T06, T07, T08, T09, T10, T12, T16, T18, T3
 Report No. CTB211213003EX
 Applicant Shenzhen Dazhi Technology Co.,Ltd.
 21H, Unit 1, Times Center, No. 102, Shangxing Community Center
 Road, Xinqiao Street, Baoan District, Shenzhen
 Manufacturer Shenzhen Dazhi Technology Co.,Ltd.
 21H, Unit 1, Times Center, No. 102, Shangxing Community Center
 Road, Xinqiao Street, Baoan District, Shenzhen
 Prepared by Shenzhen CTB Testing Technology Co., Ltd.
 Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan
 District, Shenzhen, China
 Date of Receipt 2021-12-09
 Date of Test(s) 2021-12-09~ 2021-12-13
 Date of Issue 2021-12-16
 Test Standard(s) EN 55014-1:2017/A11:2020, EN IEC 55014-2:2021
 EN IEC 61000-3-2:2019, EN 61000-3-3:2013/A1:2019
 Test Result: Pass

In the configuration tested, the EUT complied with the standards specified above.

Compiled by:

Du Fei

Du Fei

Reviewed by:

Zack Zhu

Zack Zhu

Approved by:



Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of CTB. This document may be altered or revised by CTB, personnel only, and shall be noted in the revision of the document.

Table of Contents

1.	Description of version	3
2.	Test summary	4
3.	Measurement uncertainty	5
4.	General information	6
4.1.	Description of EUT	6
4.2.	Description of Accessory Device	6
4.3.	Test conditions	6
4.4.	Block diagram of EUT configuration	6
4.5.	Operating condition of EUT	6
5.	List of test and measurement instruments	7
6.	Emission	9
6.1.	Continuous disturbance	9
6.5.	Radiated emission	13
7.	Immunity	17
7.1.	Performance criterion	17
7.2.	Electrostatic discharges	18
7.3.	Radio frequency electromagnetic fields	20
8.	Photographs of test setup	22
9.	Photographs of EUT	24

1. Description of version

Report No.	Issue Date	Description	Approved
CTB211213003EX	2021-12-16	Original	Valid

2. Test summary

Emission		
Test item	Test Method	Result
Continuous disturbance	EN 55014-1	PASS
Discontinuous disturbance		N/A ²
Magnetic field strength		N/A ³
Disturbance power		N/A
Radiated emission		PASS
Harmonic current emissions	EN IEC 61000-3-2	N/A ¹
voltage changes, voltage fluctuations and flicker	EN 61000-3-3	N/A ¹
Immunity(EN IEC 55014-2)		
Test item	Test Method	Result
Electrostatic discharges	IEC 61000-4-2	PASS
Fast transients	IEC 61000-4-4	N/A ¹
Injected currents	IEC 61000-4-6	N/A ¹
Radio frequency electromagnetic field	IEC 61000-4-3	PASS
Surges	IEC 61000-4-5	N/A ¹
Voltage dips	IEC 61000-4-11	N/A ¹

Note: N/A is abbreviation for Not Applicable.

1. The Product is powered by DC power, this test items is not applicable.
2. The Product has no switching operations, automatic programme or other electrically controlled or operated functions
3. It only apply to induction cooking appliances.

3. Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard

Test item	Frequency	Expanded Uncertainty (U_{Lab})
Conducted Emission	150 kHz to 30 MHz	± 3.2 dB
Disturbance power	30 MHz to 300 MHz	± 3.7 dB
Radiated Emission	30 MHz to 1000 MHz	± 4.8 dB
Radiated Emission	1000 MHz to 6000 MHz	± 4.9 dB

uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %

4. General information

4.1. Description of EUT

Product name	CO2 Meter
Trade Mark	/
Model	T03
Serial No.	T02, T05, T06, T07, T08, T09, T10, T12, T16, T18, T3
Model Difference	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model:T03.
Rated Power	1W
Normal Testing Voltage	AC230V/50Hz
Category	<input type="checkbox"/> I <input checked="" type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV
Configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor-standing
Adapter Information:	/

Note: The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

4.2. Description of Accessory Device

No.	Device Type	Brand	Model	Specification	Note
1.	ADAPTER	JIYIN	JY-05100C	/	/

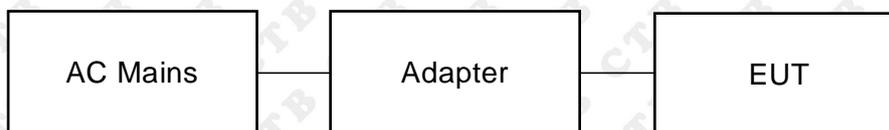
4.3. Test conditions

Temperature: 15-25°C

Relative Humidity: 30-60 %

Atmospheric pressure: 800hPa-1060hPa

4.4. Block diagram of EUT configuration



4.5. Operating condition of EUT

Operating condition	Mode 1*	Charging+Working	Test Voltage	AC 230V/50Hz
	Mode 2*	Working	Mode 1*	DC 4.5V

Note: This test covers all possible operating modes of the device, only the worst data are list in report. The worst data are shows (*) is the nearest standard limit which were recorded in this report.

5. List of test and measurement instruments

Continuous disturbance					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	AMN	ROHDE&SCHWARZ	ESH3-Z5	831551852	2022.08.05
2	Pulse limiter	ROHDE&SCHWARZ	ESH3Z2	357881052	2022.08.05
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCS30	834115/006	2022.08.05
4	Coaxial cable	ZDECL	Z302S	18091904	2022.08.05
5	AAN	Schwarzbeck	NTFM8158	6114	2022.08.05
6	EZ-EMC	Frad	EMC-con3A1.1	/	/

Radiated emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	1911	2022.08.07
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	869	2022.08.07
3	Amplifier	Agilent	8449B	3008A01838	2022.08.05
4	Amplifier	HP	8447E	2945A02747	2022.08.05
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESPI7	100362	2022.08.05
6	Coaxial cable	ETS	RFC-SNS-100 -NMS-80 NI	/	2022.08.05
7	Coaxial cable	ETS	RFC-SNS-100 -NMS-20 NI	/	2022.08.05
8	Coaxial cable	ETS	RFC-SNS-100 -SMS-20 NI	/	2022.08.05
9	Coaxial cable	ETS	RFC-NNS-10 0-NMS-300 NI	/	2022.08.05
10	EZ-EMC	Frad	EMC-con3A1. 1	/	/

Electrostatic discharges					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	TESTQ	NSG437	329	2022.08.07

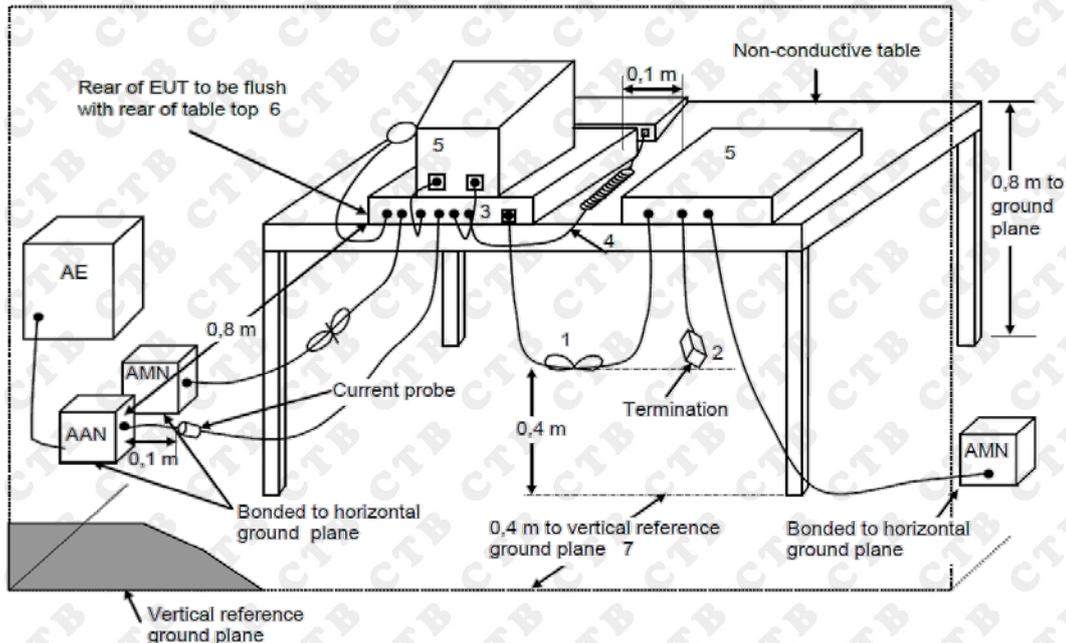
Radio frequency electromagnetic field					
No.	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	Agilent	N5181A	2106070101	2022.08.16
2	Stacked Double Log.-Per. Antenna	SKET	STLP 9129 Plus	2106070106	2022.08.16
3	Switch Controller	SKET	RFSU-DC18 G-4C	2106070105	2022.08.16
4	RF Power Meter	Agilent	U2001	2106070102	2022.08.16
5	E-Field Probe	Narda	EP-601	2106070107	2022.08.16
6	Power Amplifier	SKET	HAP-80M01G -250W	2106070103	2022.08.16
7	Power Amplifier	SKET	HAP-01G 06G-75W	2106070104	2022.08.16
8	Audio Analysis	R&S	UPV	2106070116	2022.08.16
9	Audio Output Matching Network	SKET	RCO Network	2106070117	2022.08.16
10	EMC-S Test software	SKET	V2.0.0.19	/	/

6. Emission

6.1. Continuous disturbance

6.1.1. Block diagram of test setup

For table-top equipment



6.1.2. Limit

General limits						
Frequency range	Mains ports		Associated ports			
	Disturbance voltage		Disturbance voltage		Disturbance current	
MHz	Quasi-peak dB μ V	Average dB μ V	Quasi-peak dB μ V	Average dB μ V	Quasi-peak dB μ A	Average dB μ A
0,15 to 0,50	Decreasing linearly with the logarithm of the frequency from:		80	70	Decreasing linearly with the logarithm of the frequency from:	
	66 to 56	59 to 46			40 to 30	30 to 20
0,50 to 5	56	46	74	64	30	20
5 to 30	60	50	74	64		

The lower limit applies at the transition frequencies.
The test report shall state which test method was used and which limits were applied.

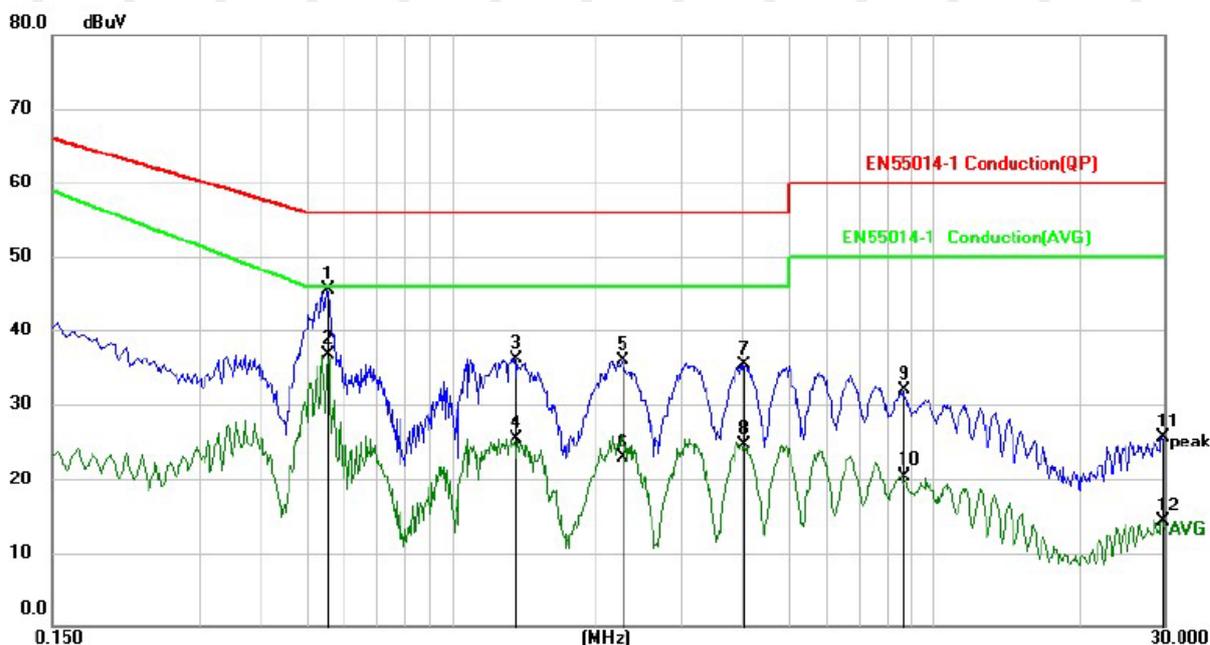
Limits for mains port of tools						
Frequency range	$P \leq 700 \text{ W}$		$700 \text{ W} < P \leq 1\,000 \text{ W}$		$P > 1\,000 \text{ W}$	
MHz	Quasi-peak dB μ V	Average dB μ V	Quasi-peak dB μ V	Average dB μ V	Quasi-peak dB μ V	Average dB μ V
	Decreasing linearly with the logarithm of the frequency from:					
0,15 to 0,35	66 to 59	59 to 49	70 to 63	63 to 53	76 to 69	69 to 59
0,35 to 5	59	49	63	53	69	59
5 to 30	64	54	68	58	74	64
The lower limit applies at the transition frequencies. P = rated power of the motor only.						

6.1.3. Test procedure

1. The AMN placed 0,8m from the boundary of the unit under test and bonded to a round reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.
2. Both sides of AC line are checked to find out the maximum conducted emission according to the EN 55014-1 regulations during conducted emission test. And the voltage probe had been used for the load terminals test according to the EN 55014-1 standard.
3. The bandwidth of the test receiver (R&S ESCS30) is set at 9 kHz in 150 kHz~30 MHz.
4. The frequency range from 150 kHz to 30MHz is checked.

6.1.4. Test results

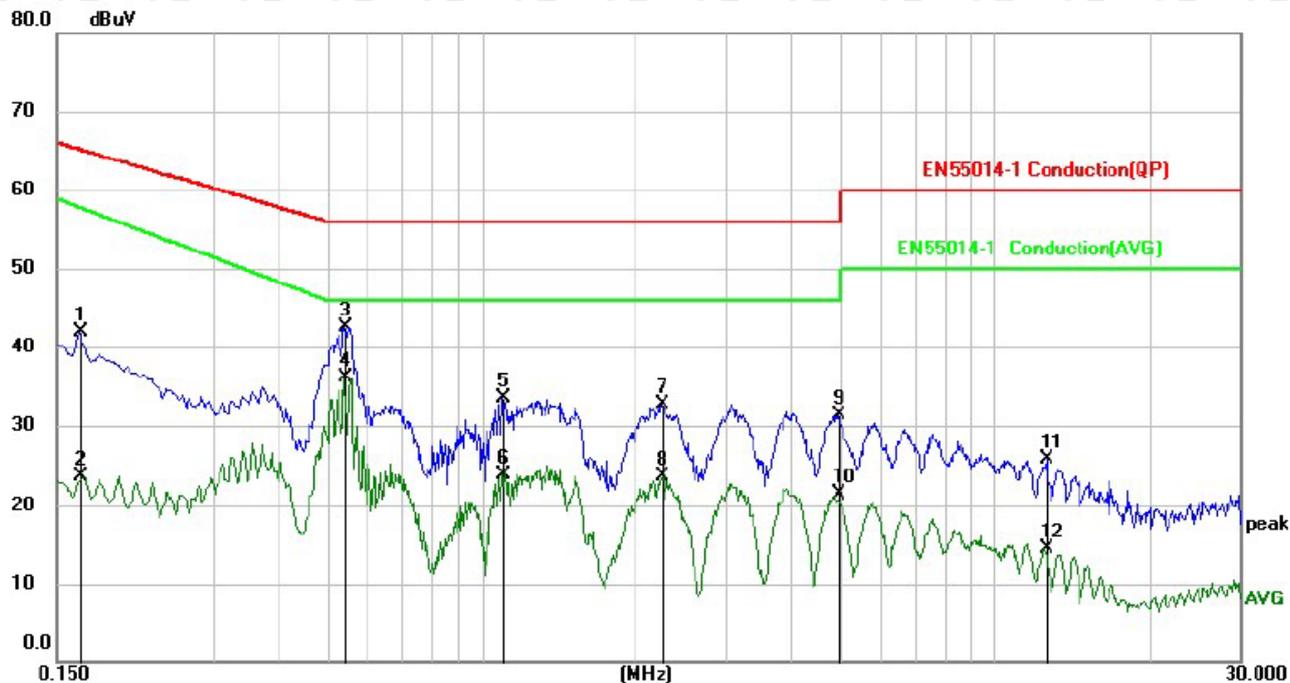
Temperature:	23°C	Relative Humidity:	54 %
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 230V/50Hz	Test Mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.5540	35.53	9.96	45.49	56.00	-10.51	QP
2	*	0.5540	26.72	9.96	36.68	46.00	-9.32	AVG
3		1.3580	26.17	9.98	36.15	56.00	-19.85	QP
4		1.3580	15.38	9.98	25.36	46.00	-20.64	AVG
5		2.2700	25.80	10.03	35.83	56.00	-20.17	QP
6		2.2700	12.69	10.03	22.72	46.00	-23.28	AVG
7		4.0460	25.18	10.12	35.30	56.00	-20.70	QP
8		4.0460	14.41	10.12	24.53	46.00	-21.47	AVG
9		8.6500	21.34	10.63	31.97	60.00	-28.03	QP
10		8.6500	9.76	10.63	20.39	50.00	-29.61	AVG
11		29.7660	14.29	11.30	25.59	60.00	-34.41	QP
12		29.7660	3.03	11.30	14.33	50.00	-35.67	AVG

Note: Result=Reading + Factor
Over Limit=Result - Limit

Temperature:	23°C	Relative Humidity:	54 %
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 230V/50Hz	Test Mode:	Mode 1



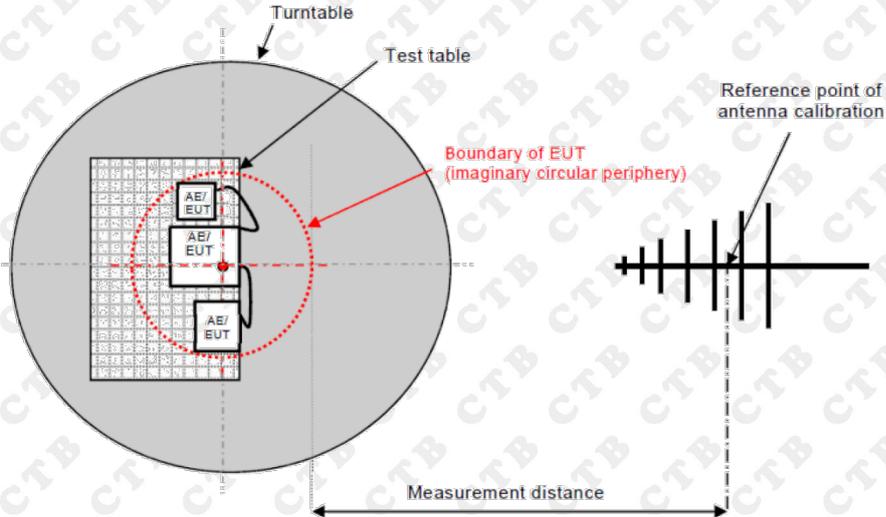
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.1660	31.99	9.96	41.95	65.16	-23.21	QP
2		0.1660	13.47	9.96	23.43	57.91	-34.48	AVG
3		0.5420	32.50	9.96	42.46	56.00	-13.54	QP
4	*	0.5420	26.21	9.96	36.17	46.00	-9.83	AVG
5		1.0940	23.63	9.96	33.59	56.00	-22.41	QP
6		1.0940	13.69	9.96	23.65	46.00	-22.35	AVG
7		2.2380	22.62	10.02	32.64	56.00	-23.36	QP
8		2.2380	13.41	10.02	23.43	46.00	-22.57	AVG
9		4.9300	21.10	10.17	31.27	56.00	-24.73	QP
10		4.9300	11.16	10.17	21.33	46.00	-24.67	AVG
11		12.5940	14.81	10.89	25.70	60.00	-34.30	QP
12		12.5940	3.60	10.89	14.49	50.00	-35.51	AVG

Note: Result=Reading + Factor
Over Limit=Result - Limit

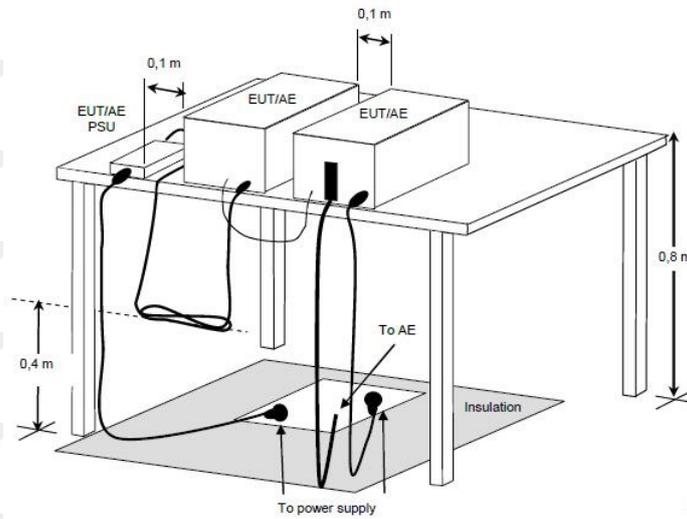
6.5. Radiated emission

6.5.1. Block diagram of test setup

Measurement distance



For table-top equipment



6.5.2. Limit

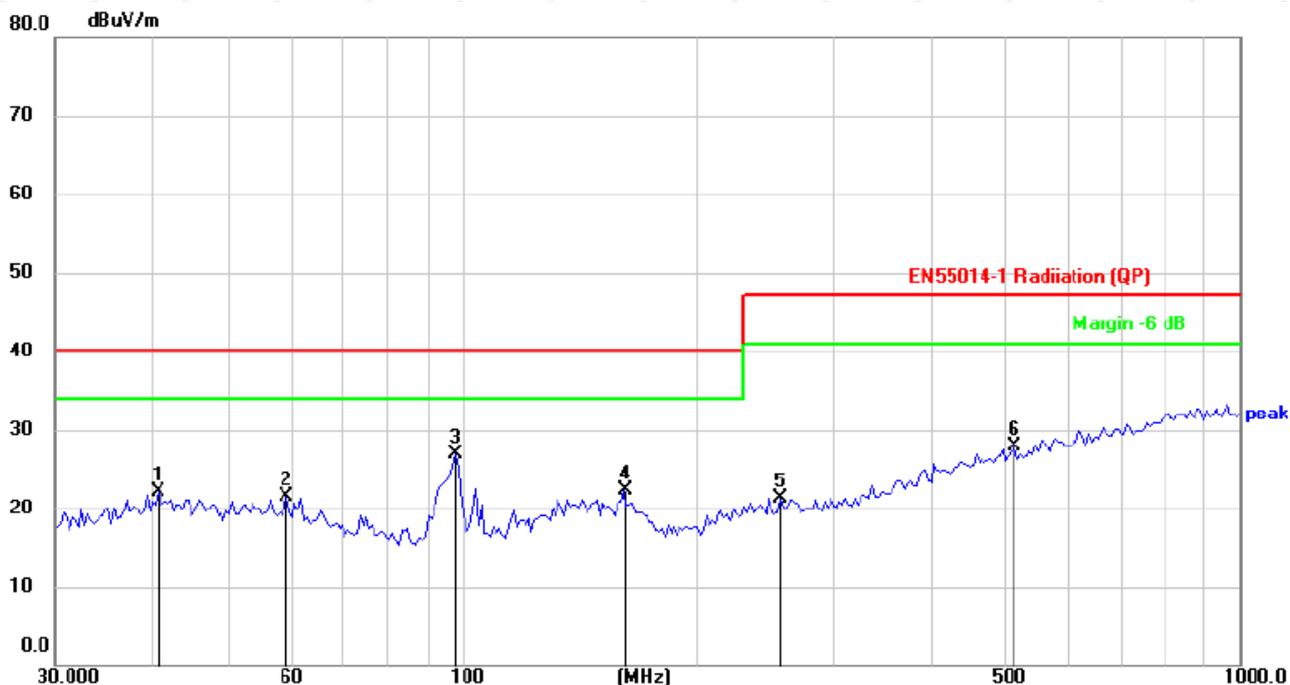
Frequency range MHz	Measurement			Limits dB(μ V/m)
	Facility	Distance m	Detector type / bandwidth	
30 to 230	SAC	3	Quasi Peak / 120 kHz	40
230 to 1 000				47

6.5.3. Test procedure

1. The EUT is placed on a turn table which is 0,8m meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The Boundary of EUT (imaginary circular periphery) is set 3 meters away from the receiving antenna (Reference point of antenna calibration) which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antennas (calibrated by dipole antenna) are used as a receiving antenna.
2. Both horizontal and vertical polarizations of the antenna are set on test.
3. The bandwidth setting on the test receiver (R&S ESPI) reference 5.3.2.
4. The EUT is tested in Semi-Anechoic Chamber.
5. The Test results are listed in Section 5.3.4.

6.5.4. Test results

Temperature:	23°C	Relative Humidity:	54 %
Pressure:	101kPa	Polarization :	Horizontal
Test Voltage :	AC 230V/50Hz	Test Mode:	Mode 1



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dB/m	dB	
1		40.7730	27.32	-5.30	22.02	40.00	-17.98	QP
2		59.4405	27.65	-6.14	21.51	40.00	-18.49	QP
3	*	97.9699	35.81	-8.86	26.95	40.00	-13.05	QP
4		161.4742	27.94	-5.66	22.28	40.00	-17.72	QP
5		256.9712	27.01	-5.63	21.38	47.00	-25.62	QP
6		513.6331	26.86	0.96	27.82	47.00	-19.18	QP

Note: Result=Reading + Factor
Over Limit=Result - Limit

Temperature:	23°C	Relative Humidity:	54 %
Pressure:	101kPa	Polarization :	Vertical
Test Voltage :	AC 230V/50Hz	Test Mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		40.0644	27.34	-5.27	22.07	40.00	-17.93	QP
2		70.2132	29.33	-7.97	21.36	40.00	-18.64	QP
3	*	97.1148	43.07	-8.96	34.11	40.00	-5.89	QP
4		213.7634	29.16	-7.18	21.98	40.00	-18.02	QP
5		405.3766	27.55	-1.55	26.00	47.00	-21.00	QP
6		633.9073	32.56	3.04	35.60	47.00	-11.40	QP

Note: Result=Reading + Factor
Over Limit=Result - Limit

7. Immunity

7.1. Performance criterion

Performance criterion A: 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.

Performance criterion B: 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 to persist after the test. 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.

Performance criterion C: 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.

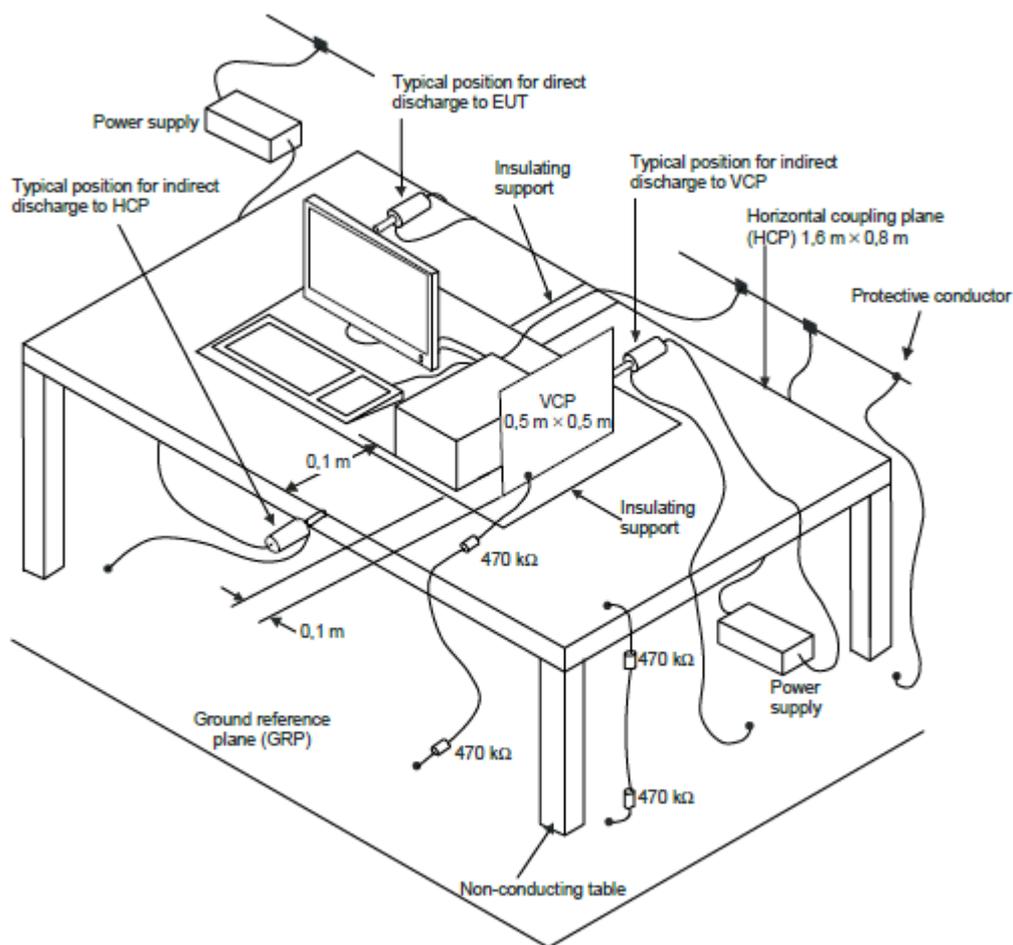
7.2. Electrostatic discharges

7.2.1. Test standard and Levels

Environmental phenomenon	Test specifications	Basic Standard
Electrostatic discharge	8 kV air discharge	IEC 61000-4-2
	4 kV contact discharge	

7.2.2. Block diagram of test setup

For table-top equipment



7.2.3. Test procedure

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.

2. Contact discharge:

All the procedure shall be same as Section 1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

4. Indirect discharge for vertical coupling plane

At least 20 single discharge 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.

7.2.4. Test results

Discharge Method	Discharge Position	Voltage (\pm kV)	Min. No. of Discharge per polarity (Each Point)	Required Criterion	Performance Criterion
Contact Discharge	Conductive Surfaces	4	10	B	A
	Indirect Discharge HCP	4	10	B	A
	Indirect Discharge VCP	4	10	B	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	B	A
Note: /					

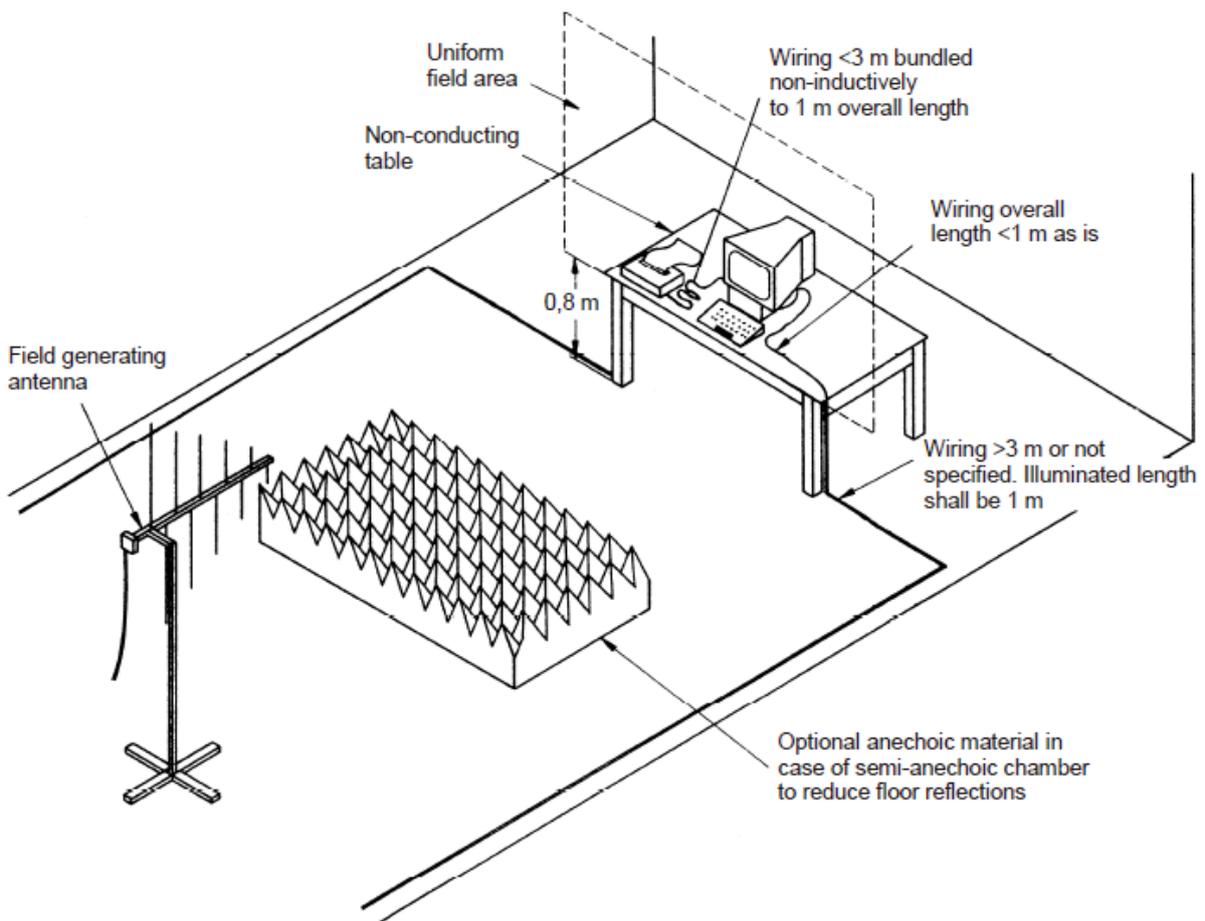
7.3. Radio frequency electromagnetic fields

7.3.1. Test standard and Levels and Performance Criterion

Enclosure port		
Environmental phenomenon	Test specifications	Basic Standard
Radio-frequency electromagnetic field, 1 kHz, 80% AM	80 MHz to 1 000 MHz	IEC 61000-4-3
	3 V /m	

7.3.2. Block diagram of test setup

For table-top equipment



7.3.3. Test procedure

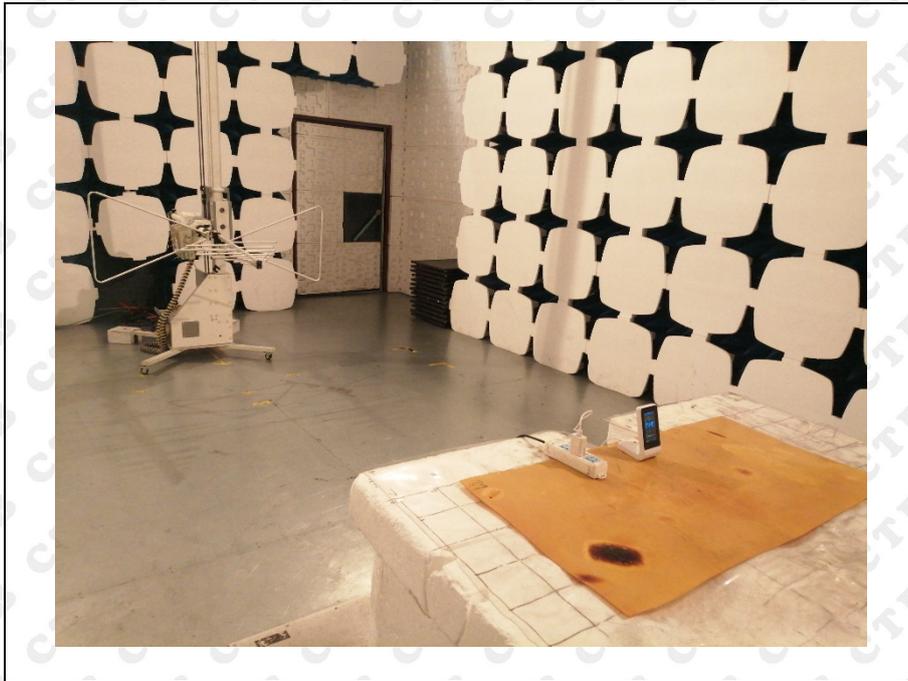
1. The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test.
2. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.
3. In order to determine the performance of EUT, a CCD camera is used to monitor the EUT.

7.3.4. Test results

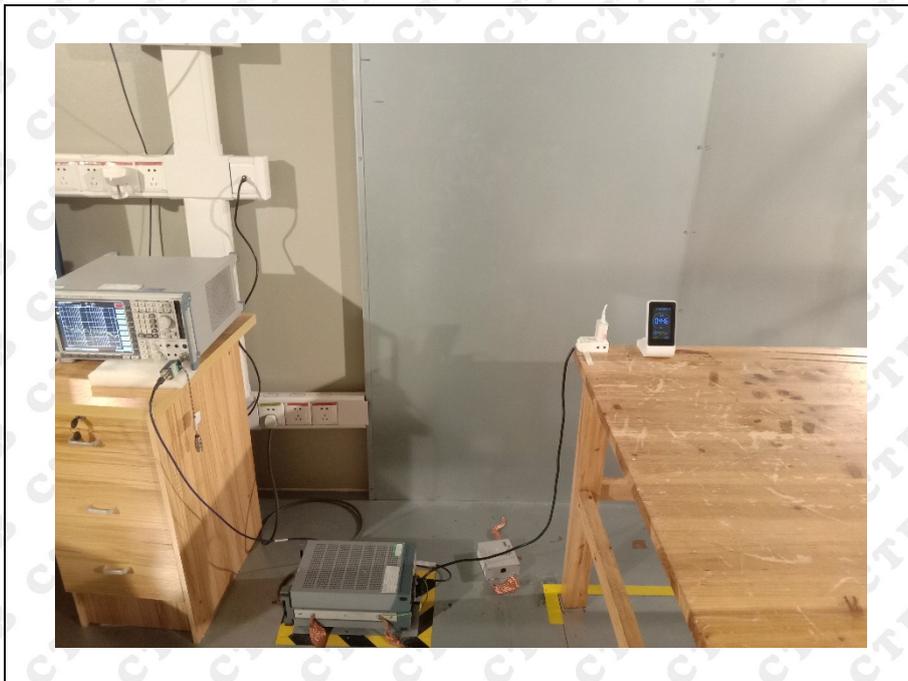
Frequency range [MHz]	Test Level [V/m]	Polarization	EUT Face	Required Criterion	Performance Criterion	Results
80 to 1000	3	Horizontal & Vertical	Front/ Rear	A	A	PASS
			Right/ Left	A	A	PASS
			Top/ Underside	A	A	PASS
Note: /						

8. Photographs of test setup

RE



CE



ESD



RS

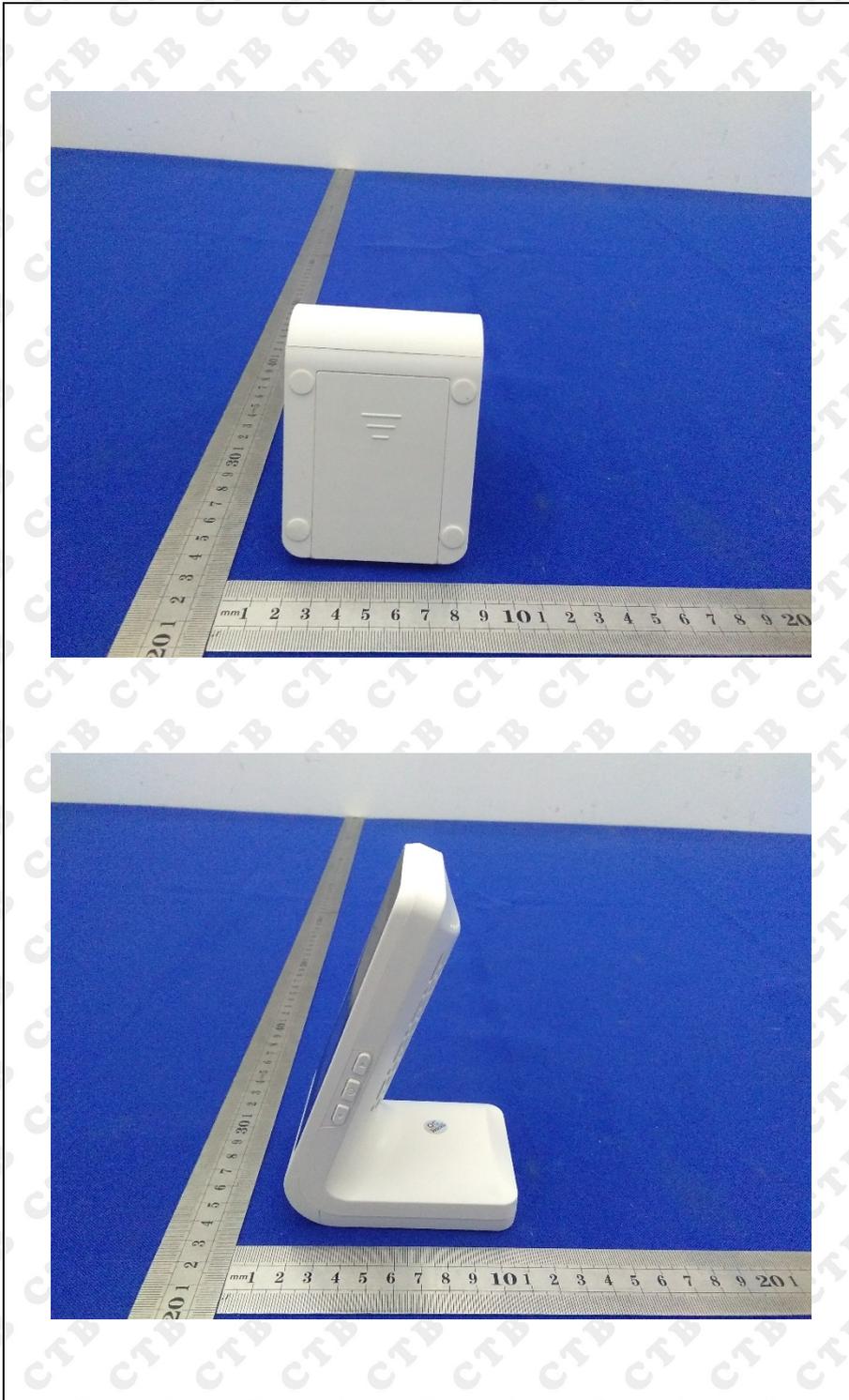


9. Photographs of EUT

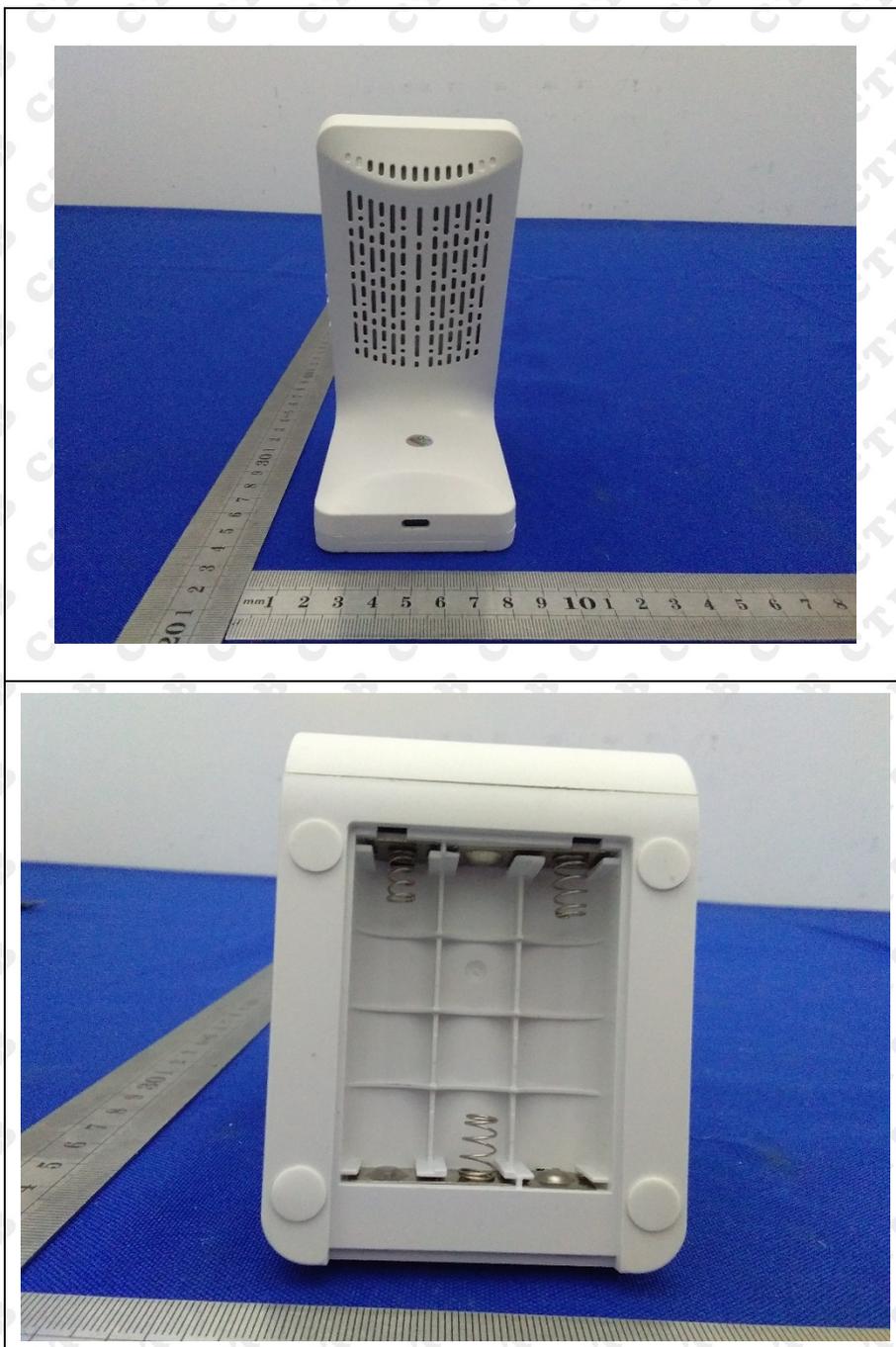
EUT photo 1



EUT photo 2



EUT photo 3



End of report