EMC TEST REPORT

Applicant:	Guangzhou Zonerich Business Machine Co.,Ltd
Address of Applicant:	North Gate, No.17 YunJun RD., LuoGang District, GuangZhou City, GuangDong, 510530, P.R.China
Manufacturer:	Guangzhou Zonerich Business Machine Co.,Ltd
Address of Manufacturer:	North Gate, No.17 YunJun RD., LuoGang District, GuangZhou City, GuangDong, 510530, P.R.China
Product name:	Automatic Sanitizer Dispenser
Model:	ZQ-SD10, ZQ-SD20, ZQ-SD30, ZQ-SD50, ZQ-SD60
Rating(s):	DC 6V 1A
Trademark:	/
Standards:	EN 61000-6-3:2007+A1:2011+AC:2012 EN 61000-6-1:2017
Date of Receipt:	2020-04-10
Date of Test:	2020-04-10~2020-04-15
Date of Issue:	2020-04-15
Test Result	**Pass***

* In the configuration tested, the test item complied with the standards specified above.

Authorized for issue by:

Test by:			***Reviewed by:***		
Apr 15, 2020	Shaeffer Yang Project Engineer	Shaeffer Yang	Apr 15, 2020	Pauler Li Project Manager	Pauler Li
Date	*Name/Position*	*Signature*	*Date*	*Name/Position*	*Signature*

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Testing Laboratory information:	
Testing Laboratory Name ..... :	GuangZhou ITL Co., Ltd
Address ..... :	1-2/F., South Block, Building A2, No.3, Keyan Road, Science City, Guangzhou High-Tech Industrial Development Zone, Guangdong, China
Testing location ..... :	Same as above
Tel..... :	0086-20-32209330
Fax ..... :	0086-20-62824387
E-mail ..... :	itl@i-testlab.com

Possible test case verdicts:

- test case does not apply to the test object.. : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement . : F (Fail)

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report would be invalid test report without all the signatures of testing technician and approver.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

General product information:

All models are identical to each other except for the model name, all tests were performed on the model ZQ-SD10 as representative.

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Test Summary:

The following standards have been applied to ensure the product conforms with the protection requirements of the council directive 2014/30/EU.

Electromagnetic Interference (EMI)				
Test Item	**Test Standard**	**Test Method**		**Result**
Radiated Emission (30MHz to 1000MHz)	EN 61000-6-3:2007+A1:2011+ AC:2012	EN 61000-6-3:2007+A1:2011+AC:2012		PASS
Electromagnetic Immunity (EMS)				
Test Item	**Test Standard**	**Test Method**	**Test Level**	**Result**
Electrostatic Discharge Immunity (ESD)	EN 61000-6-1:2017	EN 61000-4-2:2009	Contact ±4 kV Air ±8 kV	PASS
Radiated Immunity, (80MHz to 1 GHz, 1.4GHz to 6.0GHz)	EN 61000-6-1:2017	EN 61000-4-3:2006 +A1: 2008+A2:2010	3V/m (un-modulated) for 80-1000MHz and 1.4-6GHz; 80% 1kHz AM	PASS**

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Test Location

All the tests were performed in GuangZhou ITL Co., Ltd. Which is located at 1-2/F., South Block, Building A2, No.3, Keyan Road, Science City, High-Tech Industrial Development Zone, Guangzhou, Guangdong, China

Tel: 0086-20-32209330, Fax: 0086-20-62824387

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Section 1 General Information and Equipment Used

1.1 Client Information

Applicant:	Guangzhou Zonerich Business Machine Co.,Ltd
Address of Applicant:	North Gate, No.17 YunJun RD., LuoGang District, GuangZhou City, GuangDong, 510530, P.R.China

1.2 EUT General and Technical Descriptions

EUT Name:	Automatic Sanitizer Dispenser
EUT Model:	ZQ-SD10
EUT Trademark:	/
Input Voltage:	DC 6V
Frequency:	/
Input Power/Current:	1A
Output rated:	/
Power Cable Description:	/
Other Cables Description:	/
I/O Ports:	/
Function(s) Description:	/
Accessories information:	/

1.3 Support Equipment(s) and Test Configuration

1.3.1 Details of Support Equipment(s)

Description	Manufacturer	Model No.	Connection	Working state

1.3.2 Working State of EUT

Power Supply of EUT:	DC 6V
EUT Status:	Normal working.

1.3.3 Block Diagram of Test Configuration

/

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1.4 Equipment Used during Test

Radiated Emission						
No.	**Test Equipment**	**Manufacturer**	**Model**	**Serial No.**	**Last Cal.**	**Cal. Due**
ITL-100	Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	CT09015	2019/10/16	2022/10/15
ITL-154	EMI test receiver 9kHz to 26.5GHz	R&S	ESR26	101257	2020/01/15	2021/01/14
ITL-164	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-0844	2019/11/14	2021/11/13
ITL-116	Pre Amplifier	HP	8447F	3113A05905	2020/01/15	2021/01/14

Electrostatic Discharge						
No.	**Test Equipment**	**Manufacturer**	**Model**	**Serial No.**	**Last Cal.**	**Cal. Due**
ITL-112	Electrostatic Discharge Generator	3ctest	ESD-30G	EC0281035	2019/06/19	2020/06/18

Radiated Immunity						
No.	**Test Equipment**	**Manufacturer**	**Model**	**Serial No.**	**Last Cal.**	**Cal. Due**
ITL-135	Signal generator	R&S	SML01	100252	2020/01/15	2021/01/14
ITL-144	RF power Amplifier(80-1000 MHz)	rflight	NTWPA-0 0810150E	13113217	2020/01/15	2021/01/14
ITL-105	Biconilog Antenna	ETS•Lindgren	3142D	00108096	2018/10/25	2021/10/24
ITL-100	Full Anechoic Chamber	ETS•Lindgren	FACT3 2.0	CT09015	2019/10/16	2022/10/15
ITl-145	RF power Amplifiler(700-6 000MHz)	AR	60S1G6M 3	3036585	2020/01/15	2021/01/14
ITl-147	Signal generator	R&S	SMT06	100871	2019/06/08	2020/06/07
ITl-165	Power meter	R&S	NRVS	838246	2019/09/26	2020/09/25

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Section 2 Emission Test Results

2.1 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	EN 61000-6-3:2007+A1:2011+AC:2012
Test Method:	EN 61000-6-3:2007+A1:2011+AC:2012
Test Voltage:	DC 6V
Test Date:	2020-04-13
Frequency Range:	30MHz to 1GHz
Measurement Distance	3m
Detector:	Peak for pre-scan
	Quasi-Peak if maximised peak within 6dB of limit (120 kHz resolution bandwidth)
Uncertainty:	2Uc（V）= 3.35dB
Class / Limit:	Class B

Frequency range MHz	**Quasi-peak limits** dB (μV/m)
30 to 230	40
230 to 1000	47
At transitional frequencies the lower limit applies	

2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 49 % RH Atmospheric Pressure: 101 kPa

EUT Operation: Normal working.

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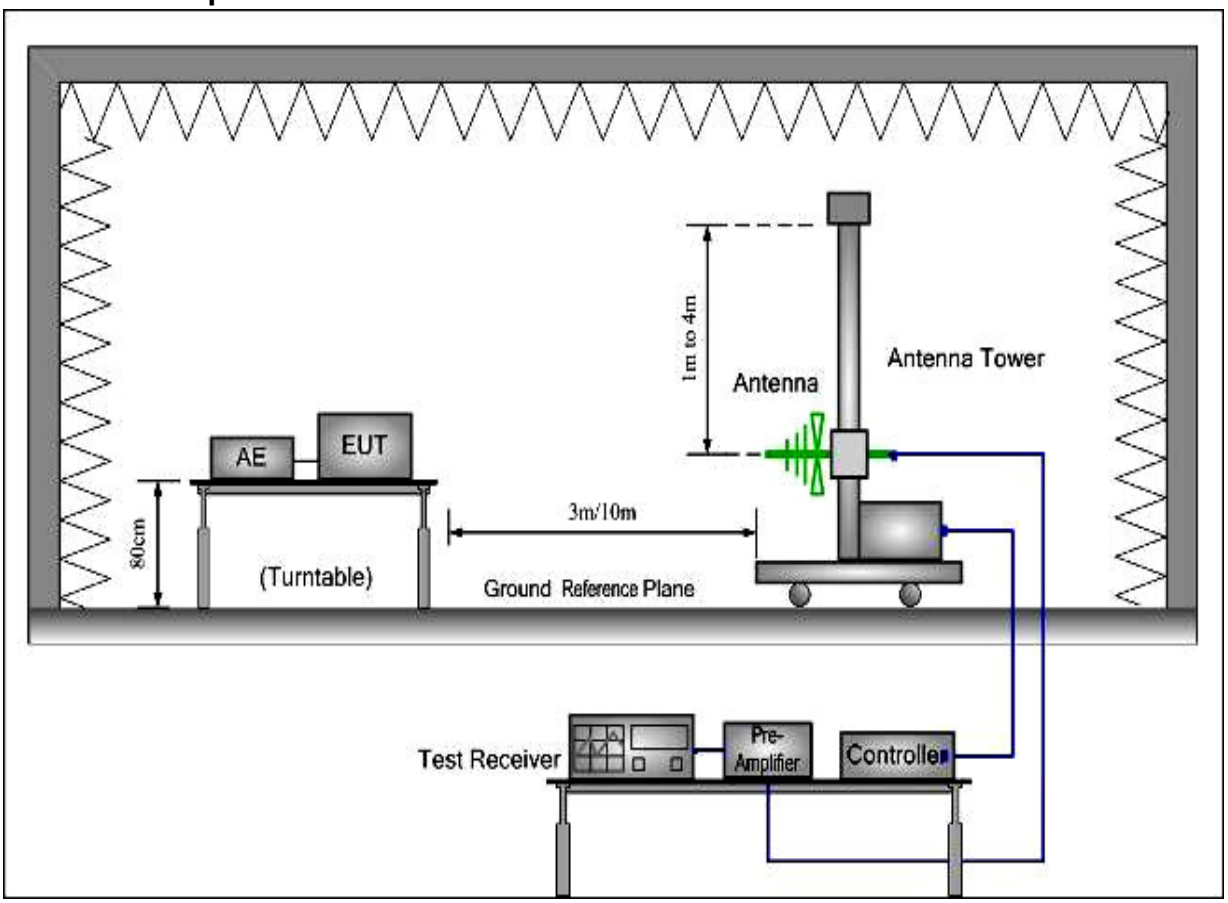
2.1.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. Biconical and log periodic antenna was used for the frequency range from 30MHz to 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

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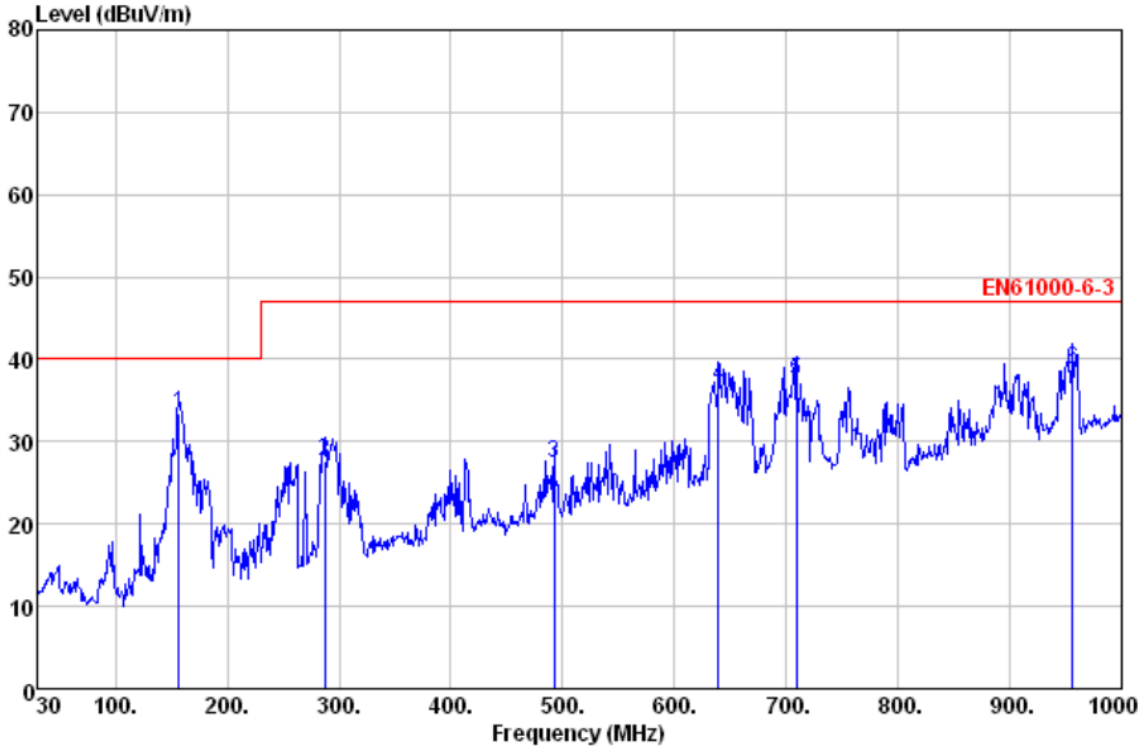
2.1.3 Measurement Data

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB		
1	157.070	43.09	17.14	1.50	28.24	33.49	40.00	-6.51	HORIZONTAL	QP
2	287.050	35.25	17.78	2.07	27.56	27.54	47.00	-19.46	HORIZONTAL	QP
3	492.690	30.39	22.91	2.76	28.69	27.37	47.00	-19.63	HORIZONTAL	QP
4	639.160	35.72	26.23	3.17	28.43	36.69	47.00	-10.31	HORIZONTAL	QP
5	709.000	35.10	27.09	3.35	28.17	37.37	47.00	-9.63	HORIZONTAL	QP
6	956.350	31.26	30.75	3.92	27.12	38.81	47.00	-8.19	HORIZONTAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

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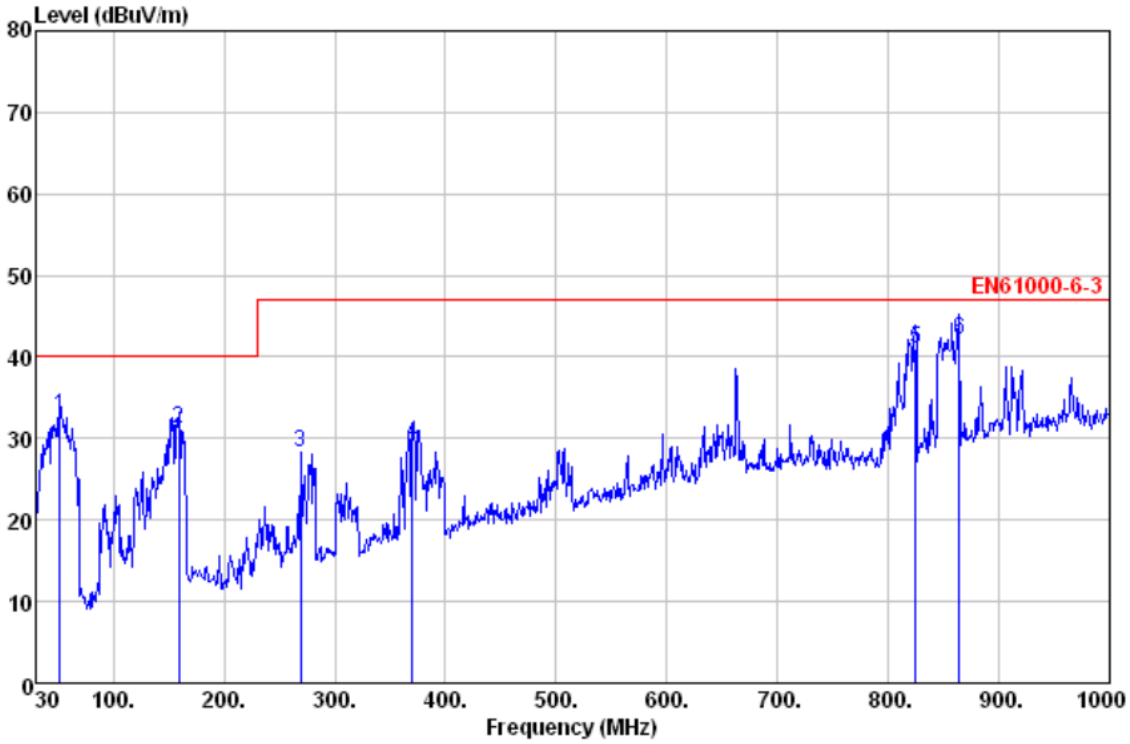
Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/ Phase	Remark
1	51.340	43.72	16.67	0.82	28.54	32.67	40.00	-7.33	VERTICAL	QP
2	159.010	40.60	17.19	1.51	28.15	31.15	40.00	-8.85	VERTICAL	QP
3	269.590	36.32	17.14	2.01	27.22	28.25	47.00	-18.75	VERTICAL	QP
4	370.470	35.36	19.94	2.34	28.21	29.43	47.00	-17.57	VERTICAL	QP
5	824.430	37.18	27.63	3.63	27.50	40.94	47.00	-6.06	VERTICAL	QP
6	864.200	36.84	29.03	3.71	27.37	42.21	47.00	-4.79	VERTICAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

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Section 3 Immunity Test Results

3.1 Performance Criteria Description in Clause 6 of EN 61000-6-1

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.
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. 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:	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.

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3.2 ESD

Test Requirement:	EN 61000-6-1	
Test Method:	EN 61000-4-2	
Test Voltage:	DC 6V	
Test Date:	2020-04-14	
Criterion Required:	B	
Discharge Impedance:	330Ω/ 150 pF	
Discharge Voltage:	Air Discharge:	2, 4, 8kV
	VCP, HCP:	4 kV
	Contact Discharge:	4 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 10 times at each test point	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	

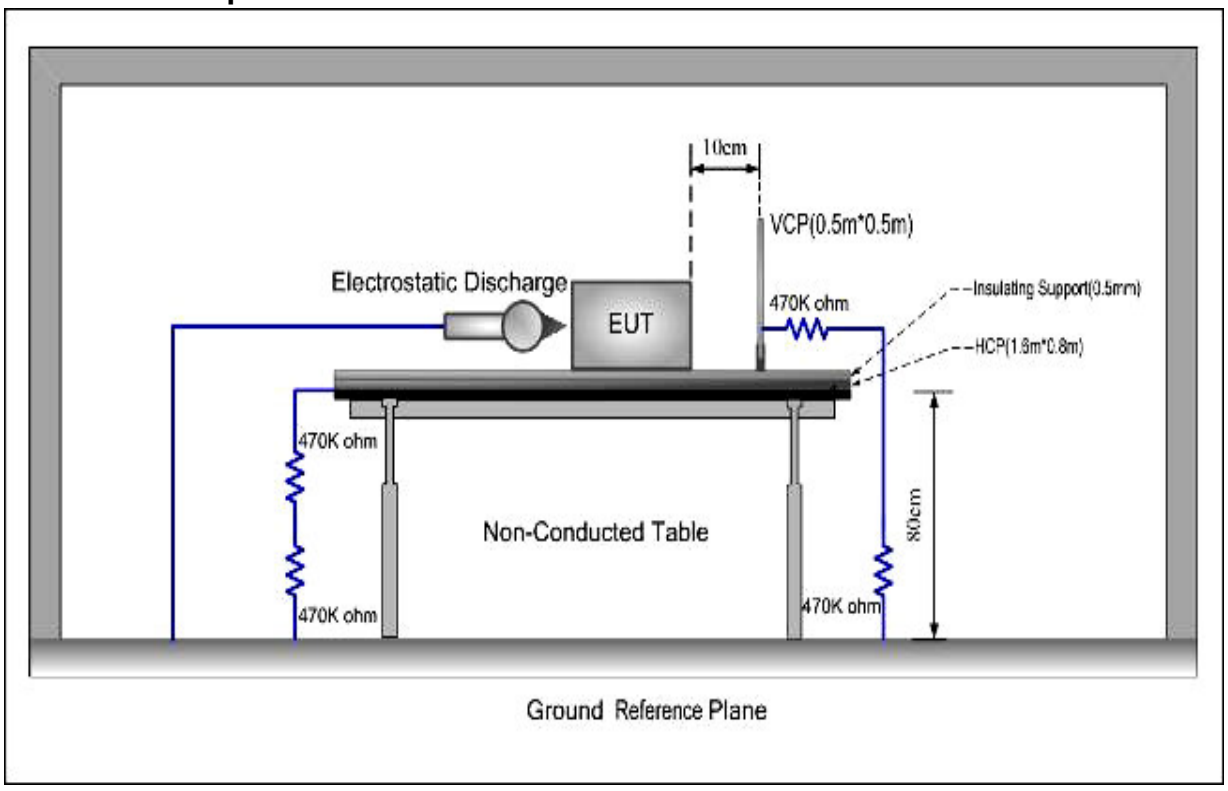
3.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 49 % RH Atmospheric Pressure: 101 kPa

EUT Operation: Normal working.

3.2.2 Test Setup and Procedure



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1. Contact discharges to the conductive surfaces and to coupling planes:
   The EUT was exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points was subjected to at least 50 indirect discharges (contact) to the centre of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points were available, then at least 200 indirect discharges were applied in the indirect mode. Tests were performed at a maximum repetition rate of one discharge per second.
   Air discharge at slots and apertures, and insulating surfaces:
   On those parts of the EUT where it was not possible to perform contact discharge testing, the equipment was investigated to identify user accessible points where breakdown may occur. This investigation was restricted to those areas normally handled by the user. A minimum of 10 single air discharges were applied to the selected test point for each such area.
   The application of electrostatic discharges to the contacts of open connectors was not required by this standard.
2. The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
3. A horizontal coupling plane (HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size while HCP were constructed from the same material type and thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 1m.
4. During the contact discharges, the tip of the discharge electrode was touched the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.
5. After each discharge, the ESD generator was removed from the EUT, the generator was then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

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3.2.3 Test Results

- **Direct Application Test Results**

Observations: Test Point: 1. All insulated enclosure & seams.
2. All accessible metal parts of the enclosure with discharge resistor used.

Direct Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Contact Discharge**	**Air Discharge**
2, 4, 8	+/-	1	N/A	A
4	+/-	2	A	N/A

- **Indirect Application Test Results**

Observations: Test Point: 1. All sides.

Indirect Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Horizontal Coupling**	**Vertical Coupling**
4	+/-	1	A	A

Remarks:

A: No degradation in the performance of the EUT was observed.

The EUT does meet the Electric-Static Discharge requirements of Standard.

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3.3 Radiated Immunity

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-4-3
Test Voltage:	DC 6V
Test Date:	2020-04-15
Criterion Required:	A
Uniform field area(UFA)	1.5m x 1.5m, 16 points with a minimum UFA size 0.5m x 0.5m, 75% of calibration points within specification if UFA is larger than 0.5m x 0.5m. 100%(all 4 points) in the specification for 0.5 x 0.5m UFA
Frequency Range:	80MHz to 1000MHz, 1.4 to 6GHz
Antenna Polarization:	Horizontal & Vertical
Level:	3V/m(un-modulated) for 80-1000MHz, 1.4-6GHz

3.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 49 % RH Atmospheric Pressure: 101 kPa

EUT Operation: Normal working.

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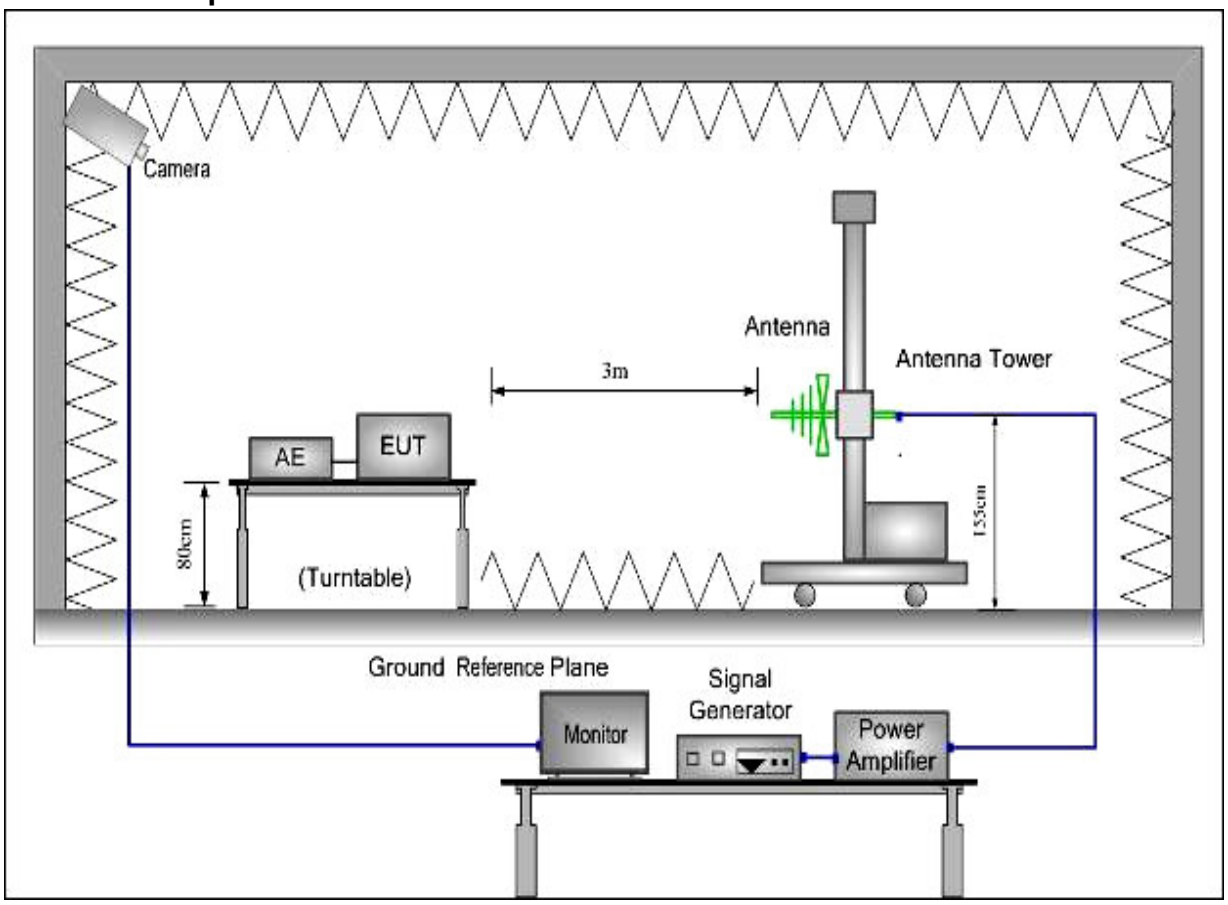
3.3.2 Test Setup and Procedure



1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.
2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).
4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Here the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value.
5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.
6. The test normally was performed with the generating antenna facing each side of the EUT.
7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.

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3.3.3 Test Results

Frequency	Antenna Polarization	EUT Face	Result / Observations
80 MHz-1 GHz 1.4GHz-6.0GHz	V	Front	A
	H		A
	V	Rear	A
	H		A
	V	Left	A
	H		A
	V	Right	A
	H		A
	V	Top	A
	H		A
	V	Bottom	A
	H		A

Remarks:

Front: the front of the EUT faces to transmitting antenna (refer to Radiated Immunity test setup photo)

A: No degradation in the performance of the E.U.T. was observed.

The EUT does meet the Radiated Immunity requirements of Standard.

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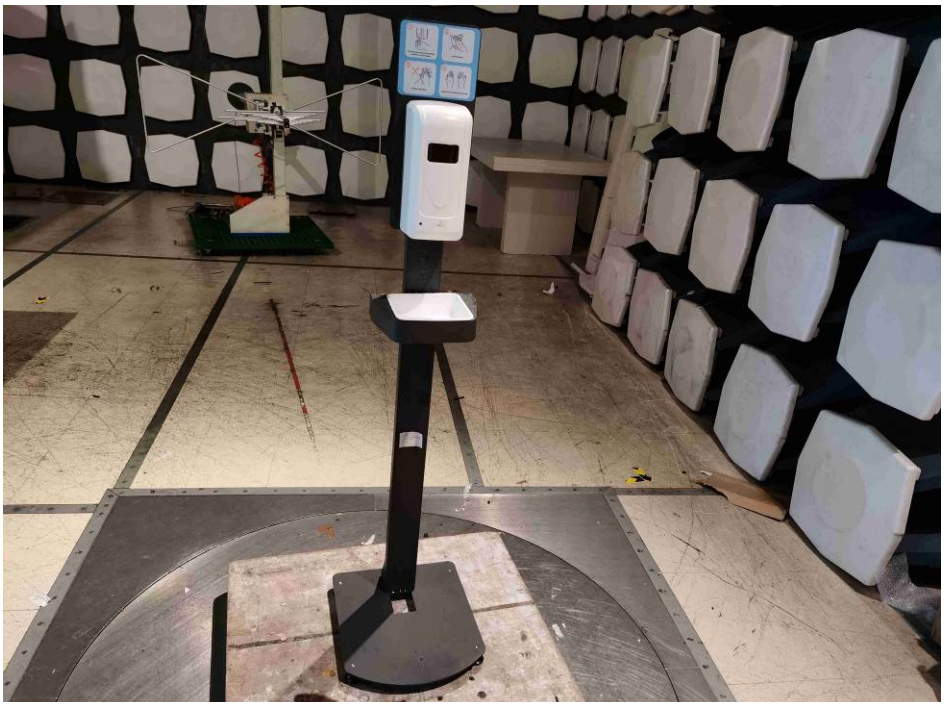
Section 4 Photographs

4.1 Radiated Emissions, 30MHz to 1GHz Test Setup



4.2 ESD Test Setup

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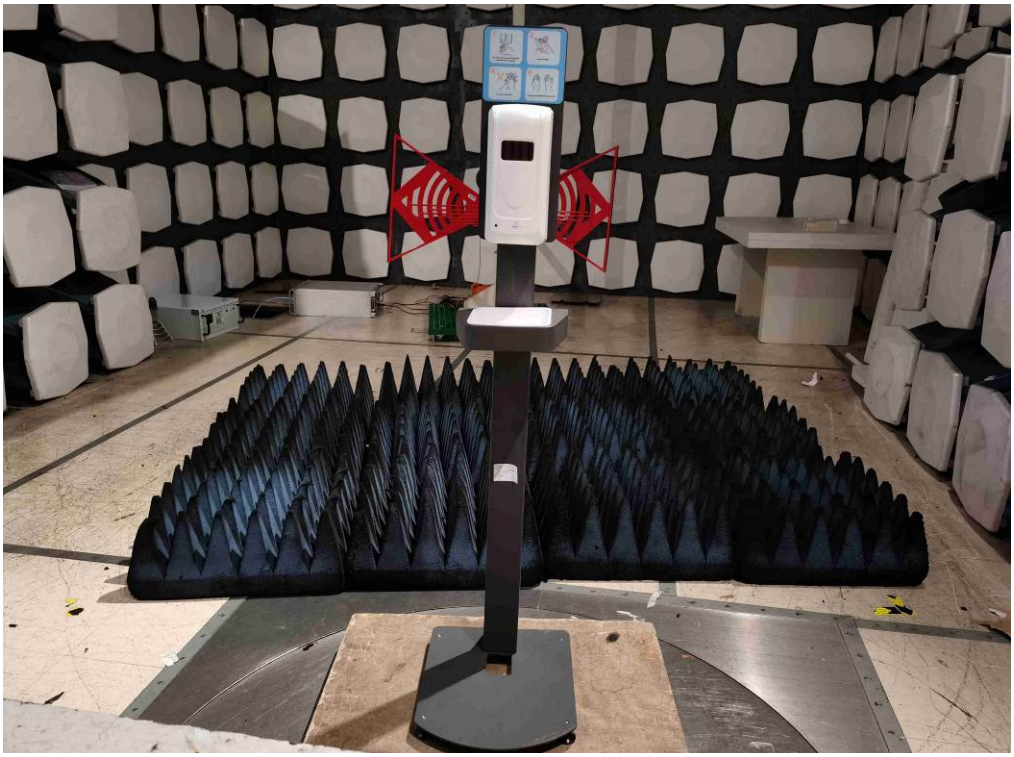
4.3 RS Test Setup



4.4 EUT Constructional Details

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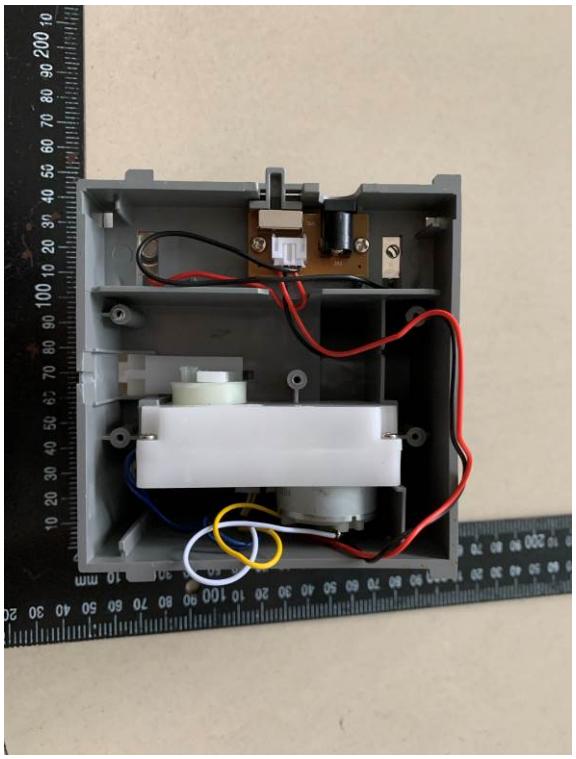

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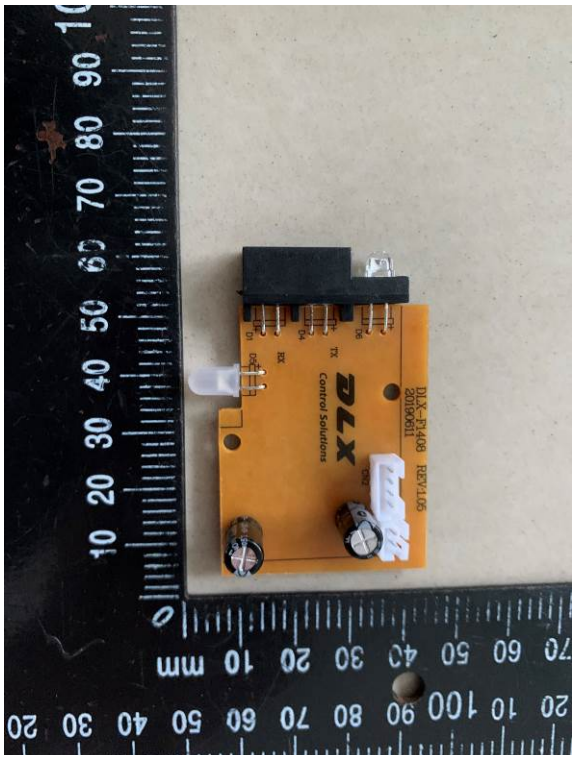

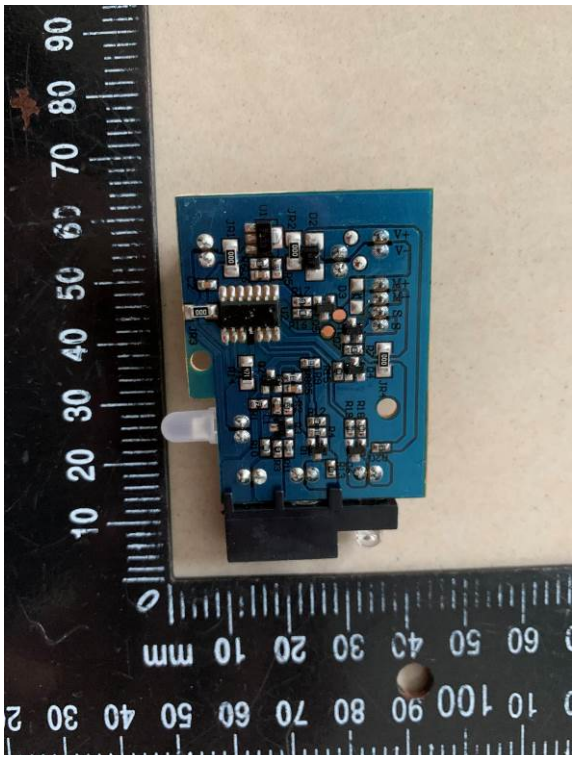

END OF THE TEST REPORT

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