

# Test Report

Report No.: MTi181024E086

Date of issue: July 17, 2019

Sample Description:	Portable Deep UV Sterillzer
Model(s):	D01BFG001
Applicant:	Cleantrust Environmental Protection Advanced Material Technology (Shenzhen) CO., LTD
Address:	6th Floor, Building B, Block 70, WanFu Road, PingHu Tow, LongGang District, ShenZhen, China
Date of Test:	Oct. 16, 2018 to Nov. 07, 2018

Shenzhen Microtest Co., Ltd.  
<http://www.mtitest.com>



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## Test Result Certification

Applicant's name: Cleantrust Environmental Protection Advanced Material  
Technology (Shenzhen) CO., LTD

Address: 6th Floor, Building B, Block 70, WanFu Road, PingHu Tow,  
LongGang District, ShenZhen, China

Manufacture's Name: Shenzhen Rongjin Technology Co., Ltd.

Address: 202, building 3, No.3 industrial park, bantian street, Longgang  
district, Shenzhen city, Guangdong province

Product name: Portable Deep UV Sterillzer

Model name: D01BFG001

Trademark: CleanTrust

Standards: EN 55014-1:2006/A2:2011  
EN 55014-2:1997/A2:2008  
EN 61000-3-2:2014  
EN 61000-3-3:2013

*This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.*

Tested by:

*Aile An*

Aile An

Nov. 07, 2018

Reviewed by:

*Blue Zheng*

Blue Zheng

July 17, 2019

Approved by:

*Smith Chen*

Smith Chen

July 17, 2019

## 1 General description

### 1.1 Feature of equipment under test (EUT)

Product name:	Portable Deep UV Sterillzer
Model name:	D01BFG001
Series Model	N/A
Different of series model:	N/A
Power supply:	DC 5V from adapter by AC 230V/50Hz or DC 3.7V from battery
Adapter information:	N/A

### 1.2 Test mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test mode	Description
Mode 1	Charging
Mode 2	Normal Working
<i>Note: The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data is showed.</i>	

### 1.3 EUT test setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

### 1.4 Ancillary equipment

Equipment	Model	S/N	Manufacturer
Adapter	QC5800-EU	/	/

## 2 Summary of test result

No.	Test Standard	Description of Test	Result	Remark
Emission				
1	EN 55014-1	Conducted disturbance	Pass	
2		Disturbance power	Pass	
3		Radiated disturbance	Pass	
Immunity				
1	EN 55014-2	Electrostatic discharge (ESD)	Pass	
2		Fast transients (EFT)	Pass	
3		Injected currents (CS)	Pass	
4		Radio frequency electromagnetic fields (RS)	Pass	
5		Surges	Pass	
6		Voltage interruptions voltage Dips	Pass	
8	EN 61000-3-2:2014	Harmonic current emission	N/A	
9	EN 61000-3-3:2013	Voltage fluctuations & flicker	Pass	
N/A: Mean not applicable.				

### 3 Test facilities and accreditations

#### 3.1 Test laboratory

Test Site	Shenzhen Microtest Co., Ltd.
Test Site Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868

#### 3.2 Environmental conditions

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

Temperature:	20°C~30°C
Humidity	30%~70% (30%~60% for ESD)
Atmospheric pressure	98kPa~101kPa

#### 3.3 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %,  $U=2 \times U_c(y)$

Conducted emission(150kHz~30MHz)	$\pm 2.5$ dB
Radiated emission(30MHz~1GHz)	$\pm 4.2$ dB
Radiated emission (above 1GHz)	$\pm 4.3$ dB
Temperature	$\pm 1$ degree
Humidity	$\pm 5$ %

#### 3.4 Test software

Software name	Manufacturer	Model	Version
EMI Measurement Software	Farad	EZ-EMC	V1.1.4.2
Conducted immunity test system	Scholder	EN61000-4-6.exe	V1.3.0
Harmonics and flicker test system	TTI	HA-PC Link	V2.02
DIPS Test Firmware	Prima	DRP61011AG	V4.1.2
EFT Test Firmware	HTEC	HCOMPACT	V1.0.1
Surge Test Firmware	HTEC+	HCOMPACT	V1.0.1

## 4 List of test equipment

Radiation emission							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	MTI-E004	Rohde&schwarz	ESPI	1000314	2018/10/08	2019/10/07
2	Broadband antenna	MTI-E006	schwarabeck	VULB9163	872	2018/10/08	2019/10/07
3	Horn antenna	MTI-E007	schwarabeck	BBHA9120D	1201	2018/10/08	2019/10/07
4	amplifier	MTI-E014	America	8447D	3113A06150	2018/10/08	2019/10/07
5	amplifier	MTI-E034	Agilent	8449B	3008A02400	2018/10/08	2019/10/07
6	18-40GHz amplifier	MTI-E052	Chengdu step Micro Technology	ZLNA-18-40G-21	1608001	2018/10/08	2019/10/07
7	spectrum analyzer	MTI-E049	Rohde&schwarz	FSP-38	100019	2018/10/08	2019/10/07
8	15-40G Antenna	MTI-E053	Schwarzbeck	BBHA9170	BBHA9170582	2018/10/08	2019/10/07
9	Active Loop Antenna 9kHz - 30MHz	MTI-E051	Schwarzbeck	FMZB 1519 B	00044	2018/02/26	2019/02/25

Conduction emission							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Artificial power network	MTI-E037	Schwarzbeck	NSLK8127	NSLK8127#841	2018/10/08	2019/10/07
2	EMI Test Receiver	MTI-E003	Rohde&schwarz	ESCI	101368	2018/10/08	2019/10/07
3	Artificial power network	MTI-E058	Schwarzbeck	NSLK8127	NSLK8127#841	2018/10/08	2019/10/07

Conduction immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Conduction Immunity Signal Generator	MTI-E015	Schloder	CDG6000	126A1343/2015	2018/10/08	2019/10/07
2	Coupled decoupling network	MTI-E016	Schloder	CDA M2/M3	A2210332/2015	2018/10/08	2019/10/07



Voltage dips, short interruptions and voltage variations immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Drop generator	MTI-E025	Prima/China	DRP61011AG	PR15056303	2018/10/08	2019/10/07

Working frequency magnetic field immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	power frequency magnetic field generator	MTI-E011	china HTEC	HPFMF 100	153703	2018/10/08	2019/10/07

Electrostatic discharge immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	ESD Simulator	MTI-E008	Schloder	SESD 30000	509325	2018/10/08	2019/10/07

Surge immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Surge Generator	MTI-E010	china HTEC	HCWG 51	153702	2018/10/08	2019/10/07

Harmonic & flicker emissions							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	AC power source	MTI-E023	shenzhen tongyuan	TY-8205	20150916809	2018/10/08	2019/10/07
2	Harmonic scintillation Analyzer	MTI-E013	Laplace	AC2000A	311216	2018/10/08	2019/10/07

Radiated electromagnetic field immunity						
Equipment	Manufacturer	Model	Serial No.	Calibration date	Due date	
Signal Generator	R&S	SMB100A	106148	2018/09/10	2019/09/09	
RF Power Amplifier	BONN Elektronik	STLP9128D	128740	2018/09/10	2019/09/09	
Gestockte Breitband (S tacked ) Log.-per.Antenna	SCHWARZBECK	STLP9128D	043	2018/09/10	2019/09/09	
Power Meter	R&S	NRP2	102031	2018/09/10	2019/09/09	
Amplifier	NJNT	NTWPAS-2560 025	2560025	2018/04/14	2019/04/13	
Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120D-667	2018/04/06	2019/04/05	

Electrical Fast Transient/Burst immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Electrical Fast Transient Generator	MTI-E009	HTEC	HEFT 51	153701	2018/10/08	2019/10/07

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

## 5 Emission test

### 5.1 Conducted disturbance

#### 5.1.1 Limits

Frequency (MHz)	At mains terminals (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	59 to 46
0.5 – 5	56	46
5 - 30	60	50

Note 1: Decreasing linearly with the logarithm of the frequency from 0.15MHz to 0.5MHz

Note 2: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

#### 5.1.2 Test procedures

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

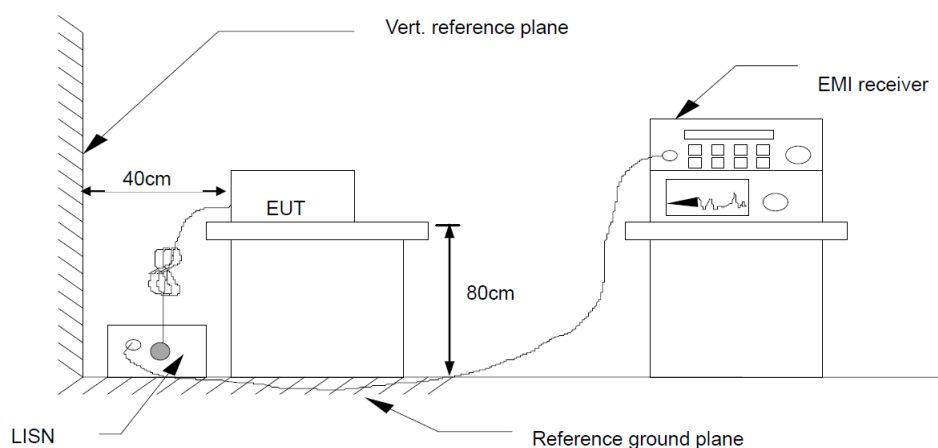
Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN is at least 80 cm from nearest part of EUT chassis.

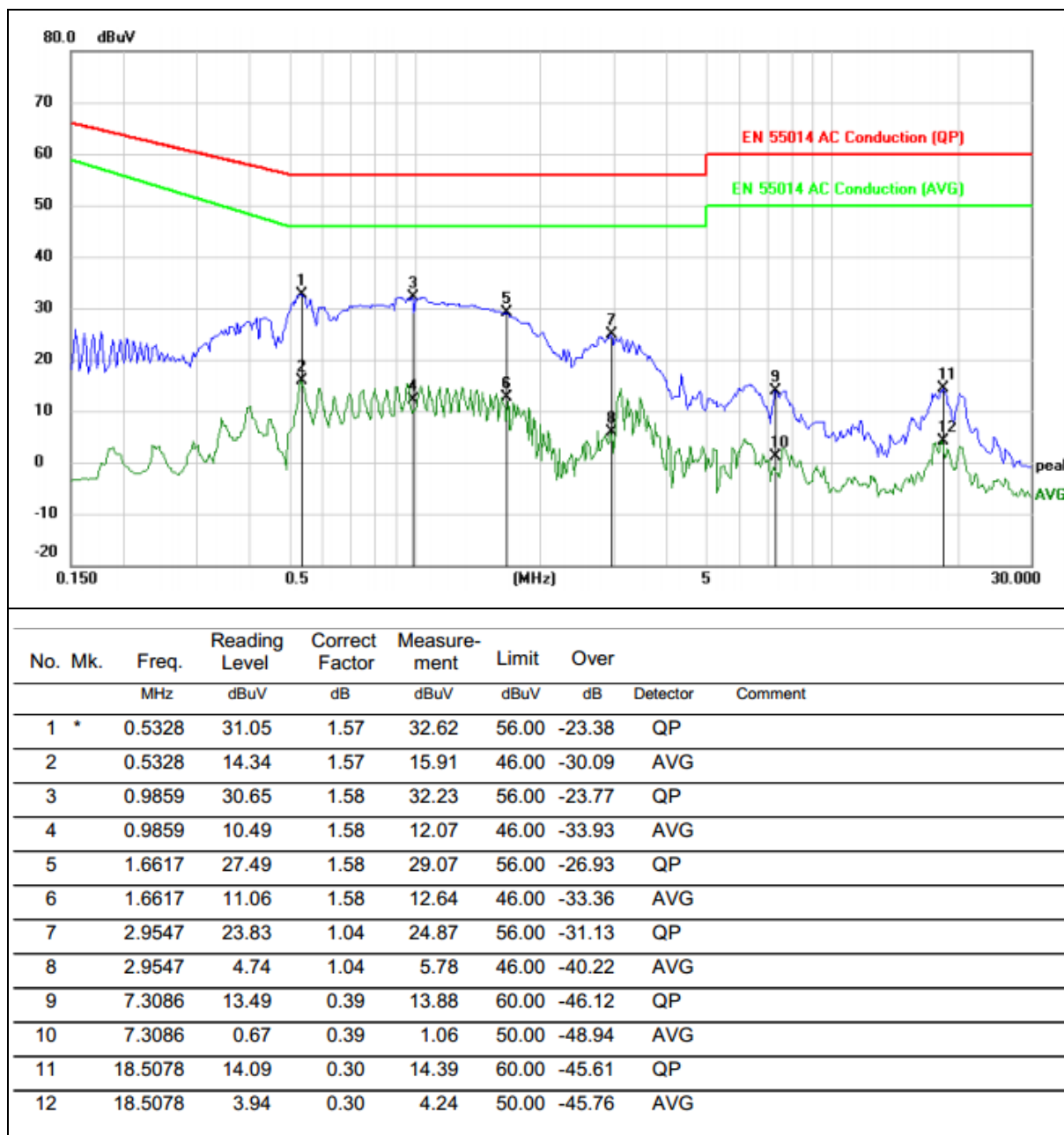
For the actual test configuration, please refer to the related Item – photographs of the test setup.

#### 5.1.3 Test setup

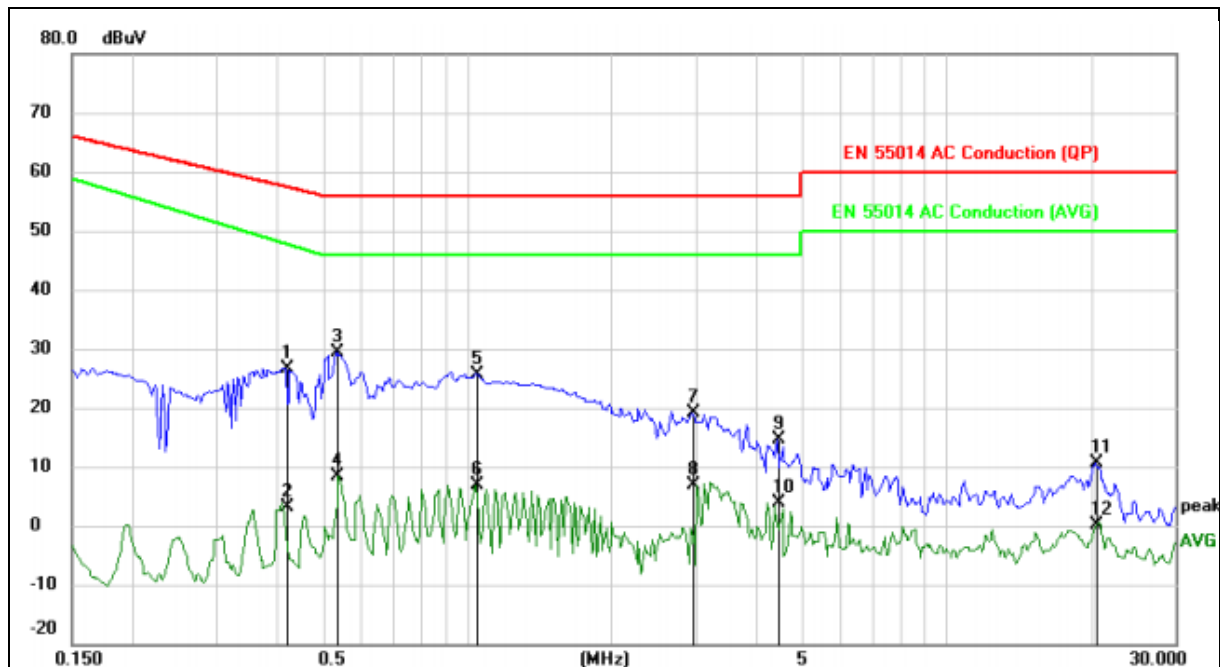


### 5.1.4 Test result

Temperature:	24°C	Relative Humidity:	48%
Pressure:	101kPa	Phase:	L
Test voltage:	DC 5V from adapter by AC 230V/50Hz	Test mode:	Mode 1



Temperature:	24°C	Relative Humidity:	48%
Pressure:	101kPa	Phase:	N
Test voltage:	DC 5V from adapter by AC 230V/50Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.4195	25.09	1.57	26.66	57.46	-30.80	QP	
2		0.4195	1.66	1.57	3.23	47.90	-44.67	AVG	
3	*	0.5328	27.91	1.57	29.48	56.00	-26.52	QP	
4		0.5328	6.87	1.57	8.44	46.00	-37.56	AVG	
5		1.0485	24.14	1.58	25.72	56.00	-30.28	QP	
6		1.0485	5.35	1.58	6.93	46.00	-39.07	AVG	
7		2.9547	17.99	1.04	19.03	56.00	-36.97	QP	
8		2.9547	5.72	1.04	6.76	46.00	-39.24	AVG	
9		4.4492	13.87	0.64	14.51	56.00	-41.49	QP	
10		4.4492	3.22	0.64	3.86	46.00	-42.14	AVG	
11		20.3828	10.25	0.30	10.55	60.00	-49.45	QP	
12		20.3828	-0.21	0.30	0.09	50.00	-49.91	AVG	

## 5.2 Disturbance power

### 5.2.1 Limits

Frequency (MHz)	Quasi-peak (dBpW)	Average (dBpW)
30 to 300	45 to 55	35 to 45

Note 1: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

### 5.2.2 Test procedures

The EUT is placed on a 0.8 meters height wooden table above the ground plane and kept at least 0.8 m from other metallic object. The straight portion of main lead would put on 6 m long testing bench.

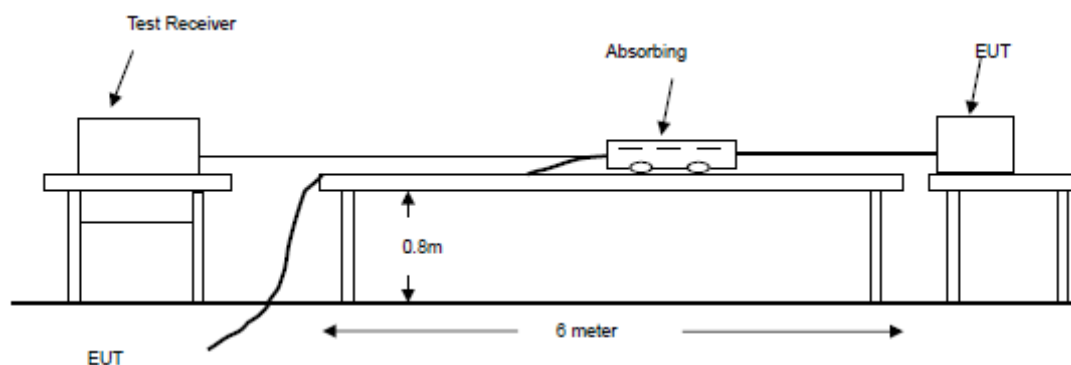
Any lead connecting the main appliance to an auxiliary apparatus is disconnected if this does not affect the operation of the appliance or is isolated by means of ferrite rings (or an absorbing clamp) close to the appliance.

Emissions were scanned and measured using a receiver connected to the absorbing clamp.

The absorbing clamp is positioned for maximum indication at each test frequency (30MHz to 300MHz), that means is clamp moved along the main lead until the maximum emission value is found.

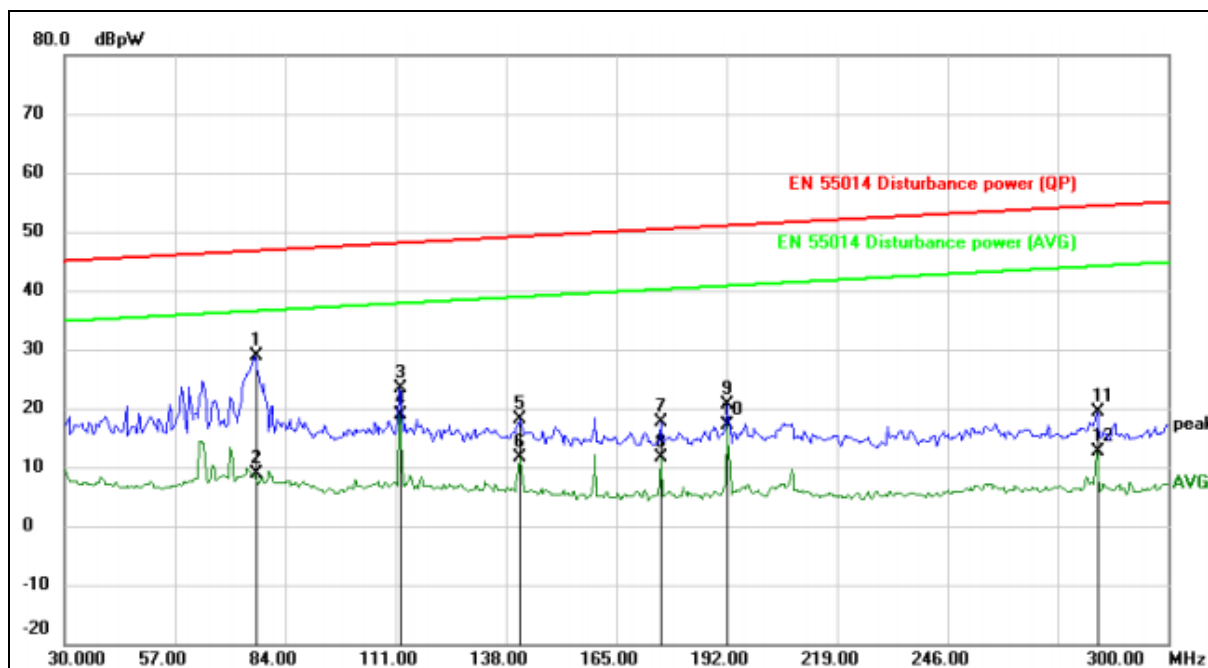
For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 5.2.3 Test setup



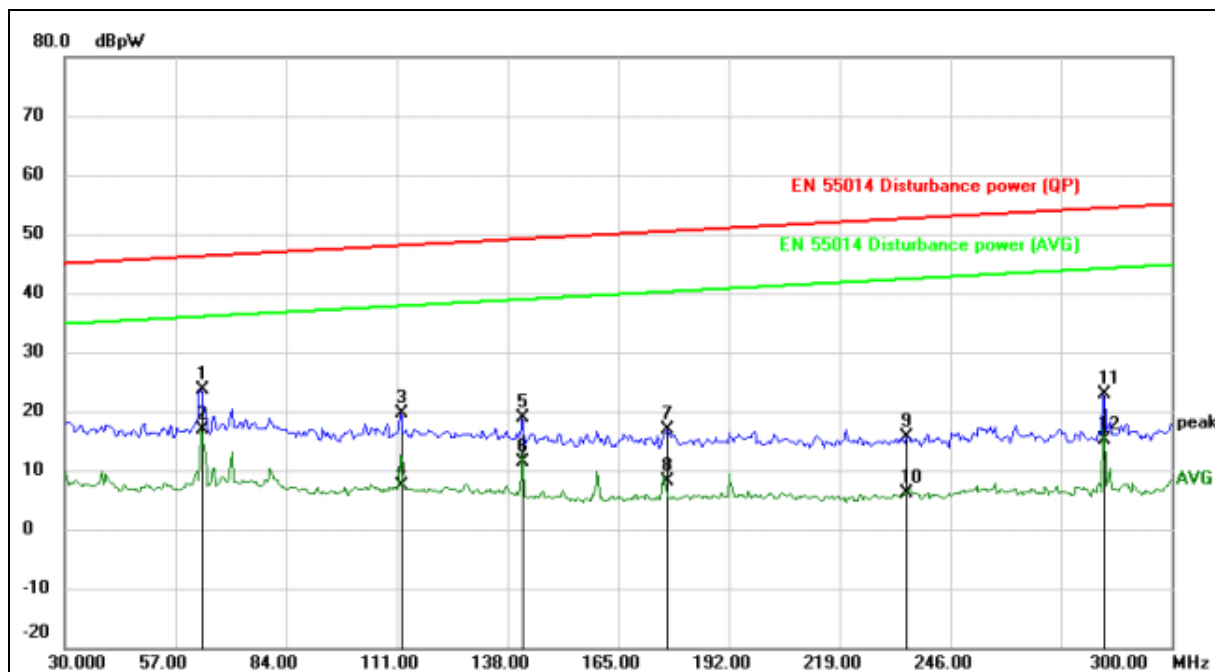
## 5.2.4 Test result

Temperature:	24°C	Relative Humidity:	48%
Pressure:	101kPa	Test Line:	AC Line
Test voltage:	DC 5V from adapter by AC 230V/50Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBpW	Correct Factor dB	Measure- ment dBpW	Limit dBpW	Over dB	Detector	Position cm	Comment
1	*	76.7500	21.11	7.78	28.89	46.73	-17.84	QP		
2		76.7500	1.22	7.78	9.00	36.73	-27.73	AVG		
3		112.0000	16.52	6.82	23.34	48.04	-24.70	QP		
4		112.0000	11.97	6.82	18.79	38.04	-19.25	AVG		
5		141.4375	12.01	6.04	18.05	49.13	-31.08	QP		
6		141.4375	5.70	6.04	11.74	39.13	-27.39	AVG		
7		176.0000	12.62	5.08	17.70	50.41	-32.71	QP		
8		176.0000	6.64	5.08	11.72	40.41	-28.69	AVG		
9		192.0625	15.47	5.18	20.65	51.00	-30.35	QP		
10		192.0625	11.94	5.18	17.12	41.00	-23.88	AVG		
11		282.5625	13.61	5.81	19.42	54.35	-34.93	QP		
12		282.5625	6.83	5.81	12.64	44.35	-31.71	AVG		

Temperature:	24°C	Relative Humidity:	48%
Pressure:	101kPa	Test Line:	DC Line
Test voltage:	DC 5V from adapter by AC 230V/50Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBpW	Correct Factor dB	Measure- ment dBpW	Limit dBpW	Over dB	Detector	Position cm	Comment
1		63.3750	16.09	7.46	23.55	46.24	-22.69	QP		
2	*	63.3750	9.43	7.46	16.89	36.24	-19.35	AVG		
3		112.0000	12.79	6.82	19.61	48.04	-28.43	QP		
4		112.0000	0.66	6.82	7.48	38.04	-30.56	AVG		
5		141.6875	12.91	6.01	18.92	49.14	-30.22	QP		
6		141.7800	5.49	6.00	11.49	39.14	-27.65	AVG		
7		177.0625	11.79	5.09	16.88	50.45	-33.57	QP		
8		177.0625	3.14	5.09	8.23	40.45	-32.22	AVG		
9		235.3750	10.59	5.11	15.70	52.61	-36.91	QP		
10		235.3750	0.91	5.11	6.02	42.61	-36.59	AVG		
11		283.3750	16.95	5.85	22.80	54.38	-31.58	QP		
12		283.3750	9.35	5.85	15.20	44.38	-29.18	AVG		



## 5.3 Radiated disturbance

### 5.3.1 Limits

Limits of radiated emission measurement:

Frequency (MHz)	Measurement distance 3m
	QP (dB $\mu$ V/m)
30-230	40
230 – 300	47
230-1000	47

### 5.3.2 Test procedures

The radiated emission tests were performed in the 3 meters.

The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.

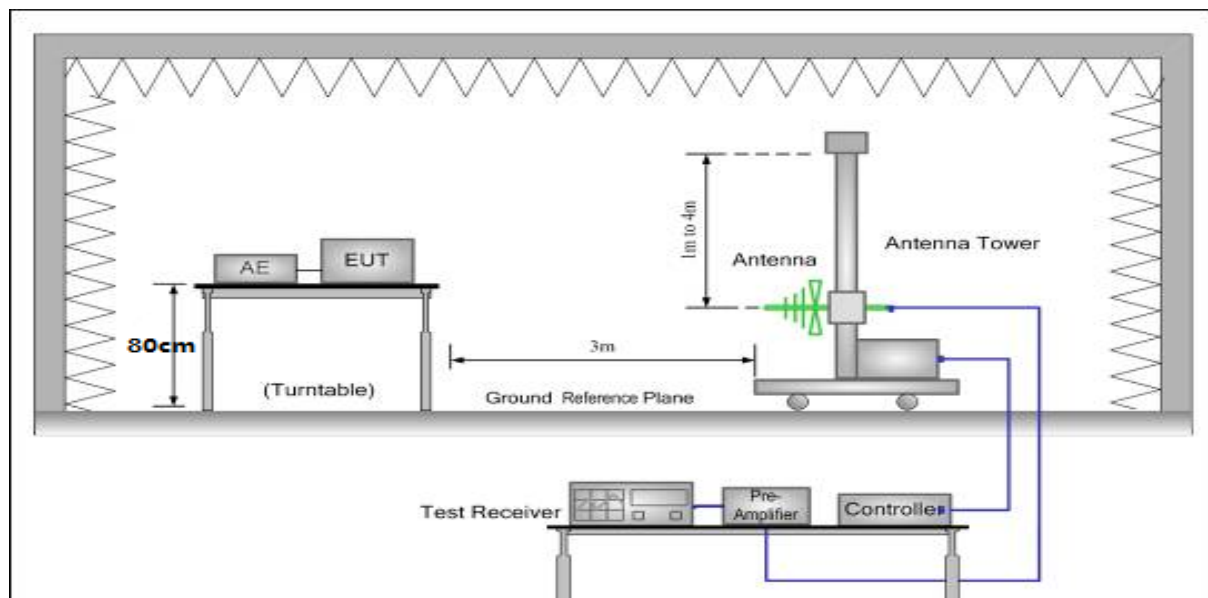
The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.

If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

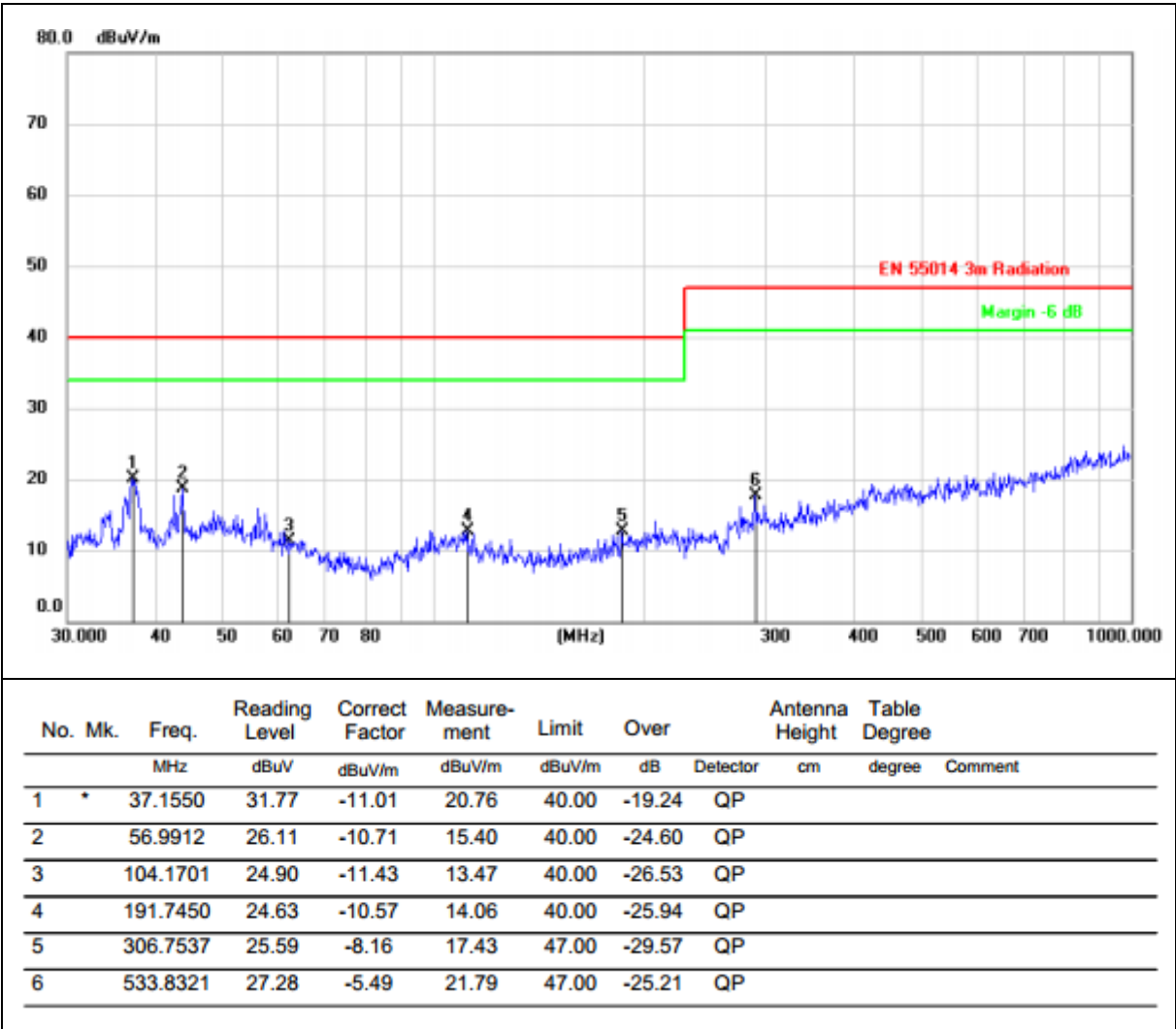
For the actual test configuration, please refer to the related item – EUT test photos.

### 5.3.3 Test setup

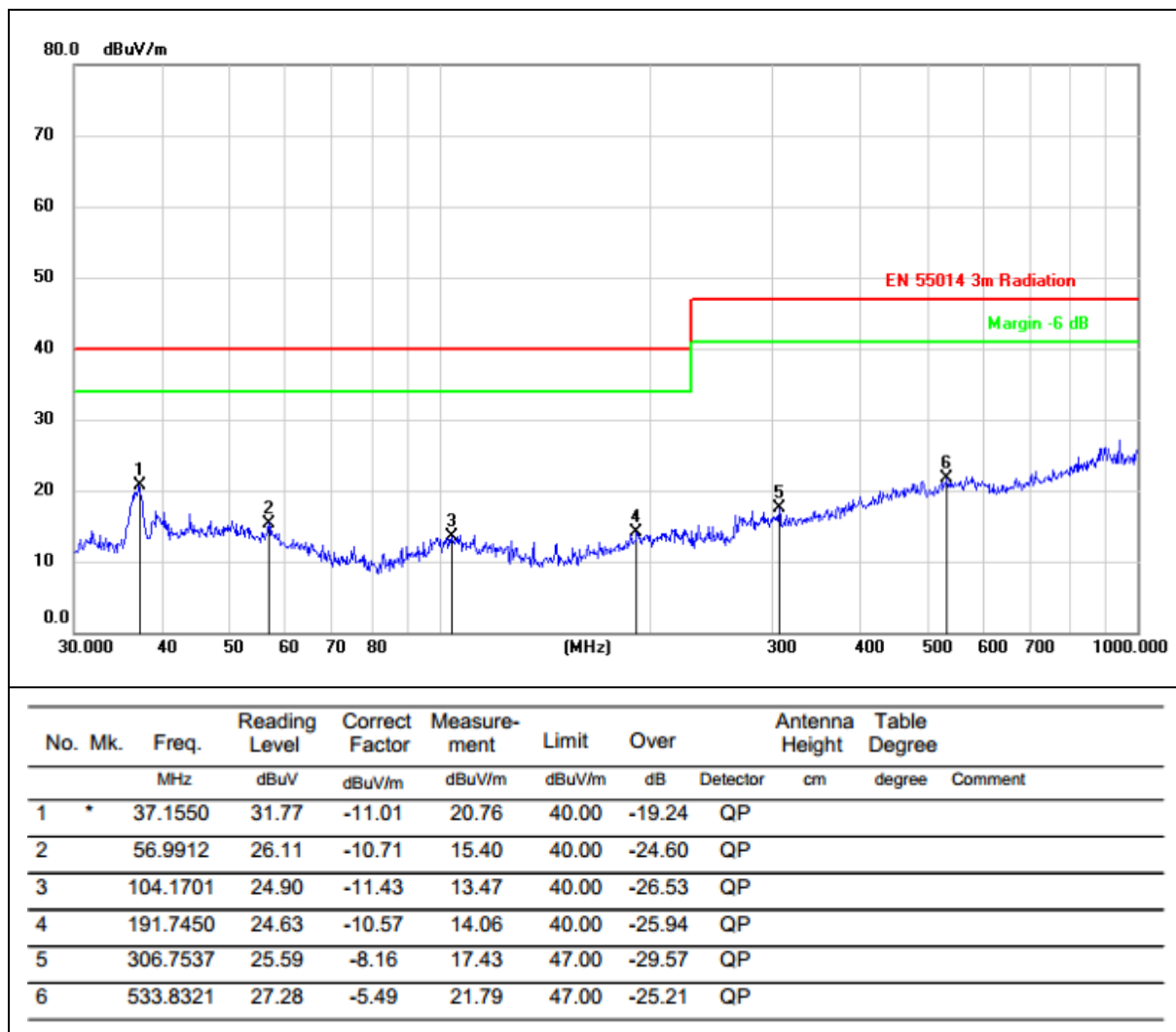


### 5.3.4 Test result

Temperature:	23°C	Relative Humidity:	59%
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	DC 3.7V from battery	Test mode:	Mode 2



Temperature:	23°C	Relative Humidity:	59%
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	DC 3.7V from battery	Test mode:	Mode 2



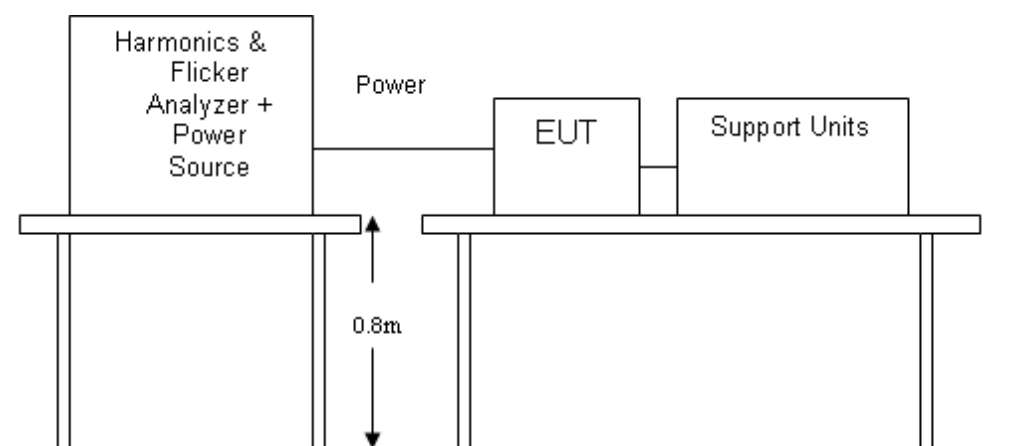
## 5.4 Harmonic current emission / Voltage fluctuations & flicker

### 5.4.1 Test procedures

The EUT was installed and placed on a non-conductive table and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The correspondent test program of test instrument to measure the current harmonics / voltage fluctuations & flicker emanated from EUT. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 5.4.2 Test setup



### 5.4.3 Test result

Temperature:	25°C	Relative Humidity:	49%
Pressure:	101kPa	Test mode:	Mode 1

#### Harmonic current emission:

N/A.

The rated power is below 75W.

#### Voltage fluctuations & flicker:

	Pst	dc (%)	dmax (%)	d(t) > 3.3% (ms)
Limit	1.000	3.300	4.000	500
Reading	0.12	0.20	0.21	0

## 6 Immunity test

### 6.1 Performance criteria

Performance criteria	
Performance criterion	Description
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.
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, the neither 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.
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 the following Table 14 serves as a guide to formulate the permissible degradation of the equipment under test (EUT) caused by electromagnetic stress. Not all functions of the apparatus need to be tested. The selection, the specification of functions and the permissible degradation is left to the responsibility of the manufacturer.
<p>Particular performance criteria:</p> <p>The particular performance criteria which are specified in the normative annexes take precedence over the corresponding parts of the general performance criteria. Where particular performance criteria for specific functions are not given, then the general performance criteria shall apply</p>	

## 6.2 Electrostatic discharge (ESD)

### 6.2.1 Test procedures

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

Contact discharge was applied to conductive surfaces and coupling planes of the EUT. During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second.

Vertical Coupling Plane (VCP):

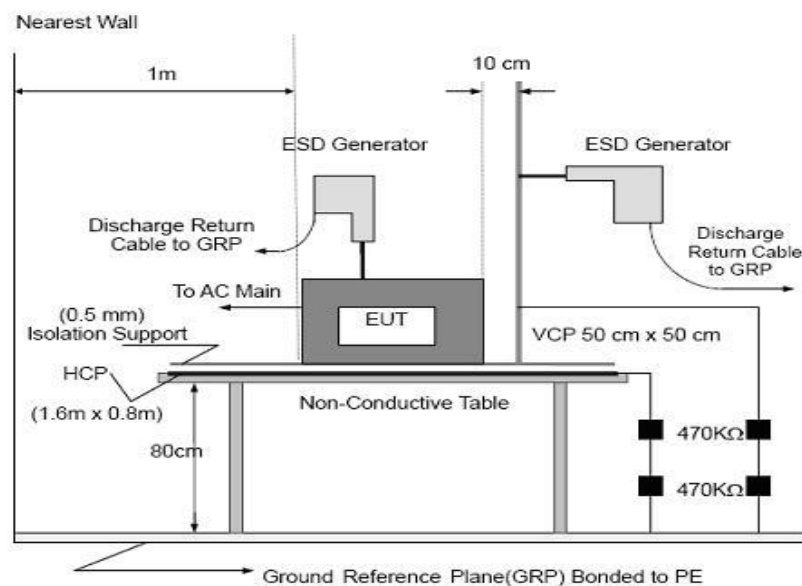
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

Air discharges at insulation surfaces of the EUT. It was at least ten single discharges with positive and negative at the same selected point. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 6.2.2 Test setup



### 6.2.3 Test result

Temperature:	25℃	Relative Humidity:	49%
Pressure:	101kPa	Test mode:	Mode 1

#### Indirect discharge

Test Point	Contact discharge level (kV)	Number and polarity	Criterion met	Criterion Required
1. VCP-Front side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	B
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
2.VCP-Rear side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
3.VCP-Left side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
4. VCP-Right side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
5. HCP	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	

**Result: Compliance.**

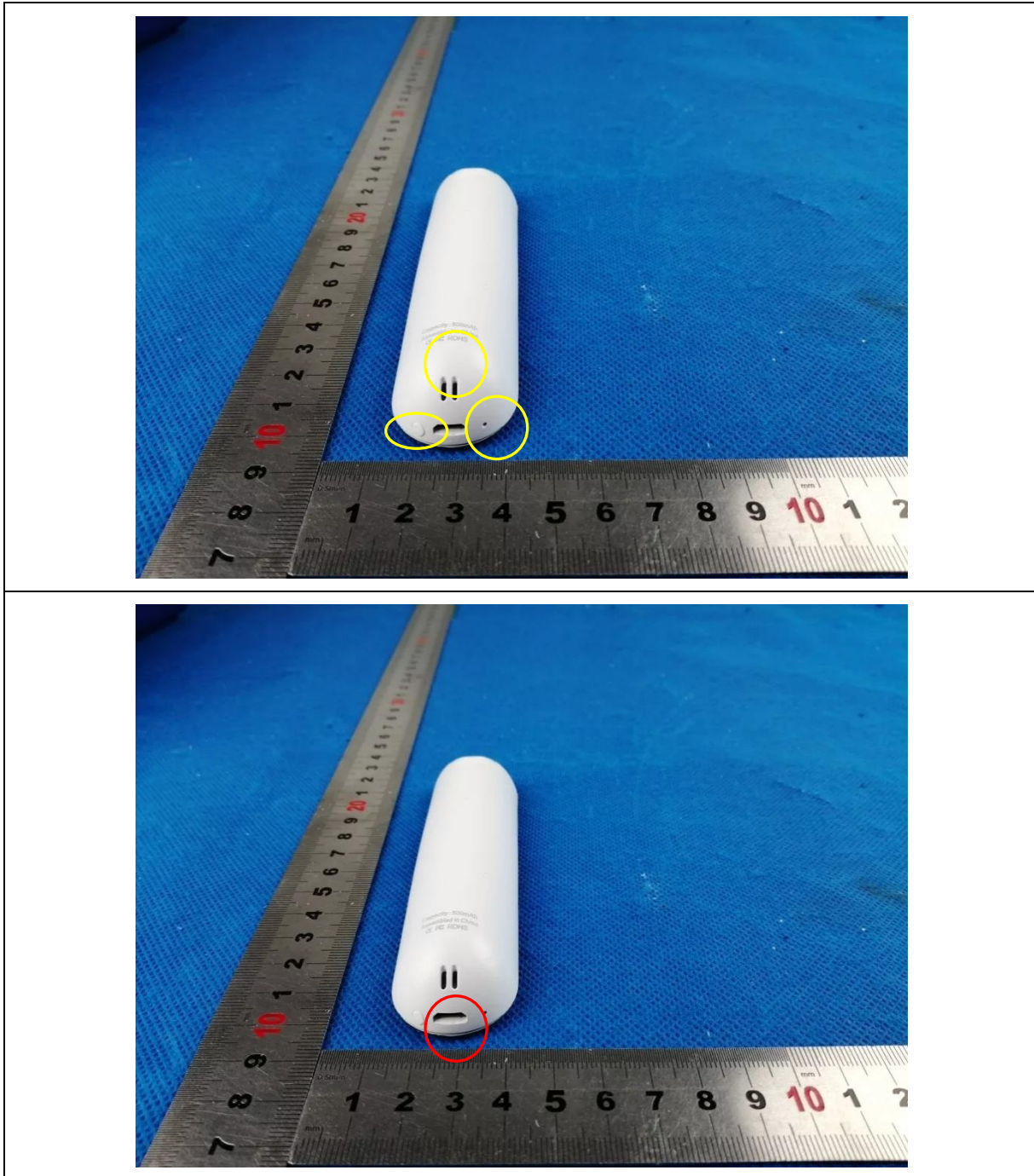
#### Direct discharge

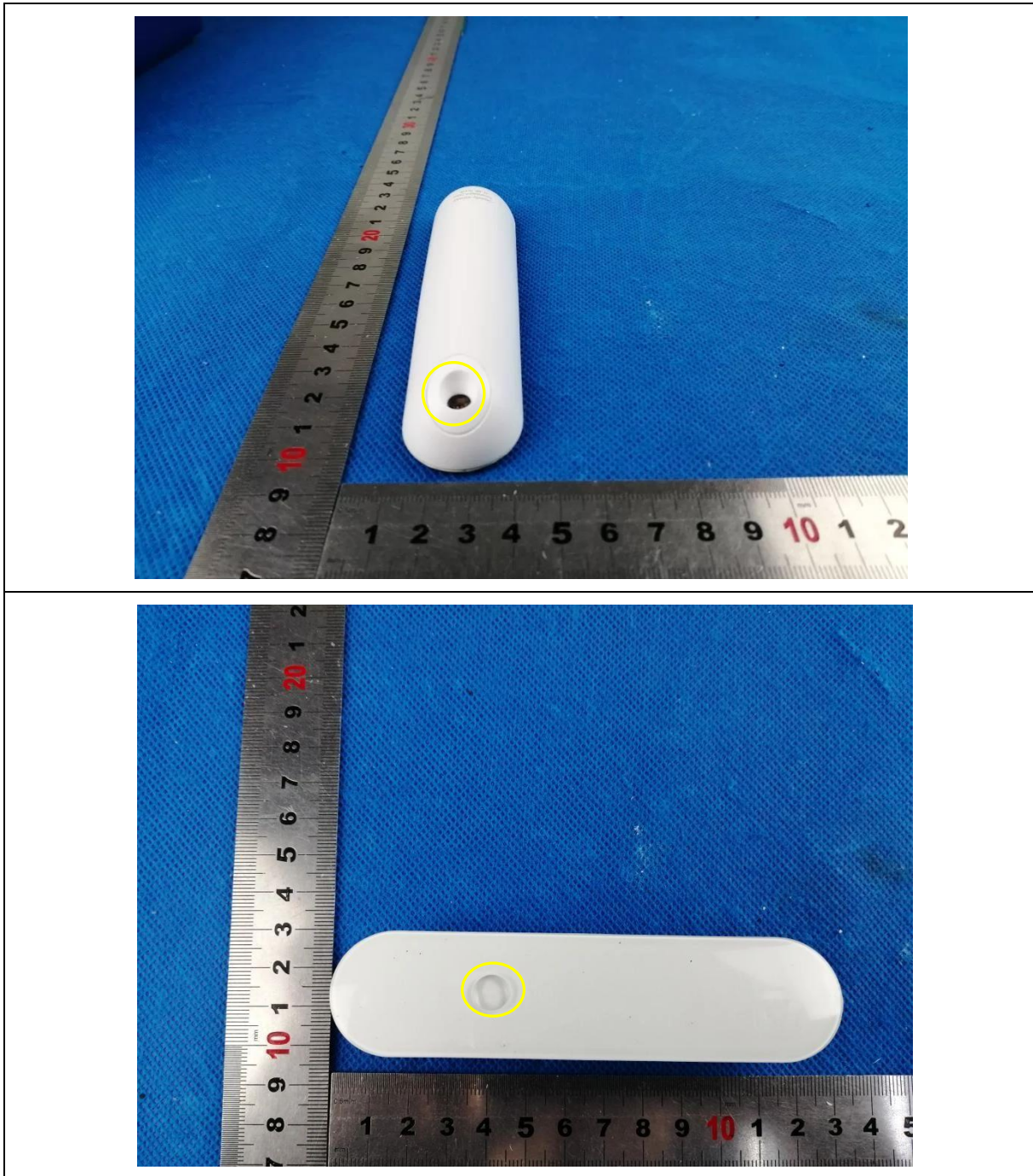
Test Point	Contact discharge level (kV)	Air discharge level (kV)	Number and polarity	Criterion met	Criterion Required
1. Each non-conductive location touchable by hand	<input type="checkbox"/> ..2 <input type="checkbox"/> ..4	<input type="checkbox"/> ..2 <input type="checkbox"/> ..4	10 (+)	A	B
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	<input type="checkbox"/> ..6 <input checked="" type="checkbox"/> ..8	10 (-)	A	
2. Each conductive location touchable by hand	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	<input type="checkbox"/> ..2 <input type="checkbox"/> ..4	10 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	10 (-)	A	

**Result: compliance.**



## Test location





Note: Yellow circle for Air Discharge; Red circle for Contact Discharge.

## 6.3 Fast transients (EFT)

### 6.3.1 Test procedures

The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m\*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

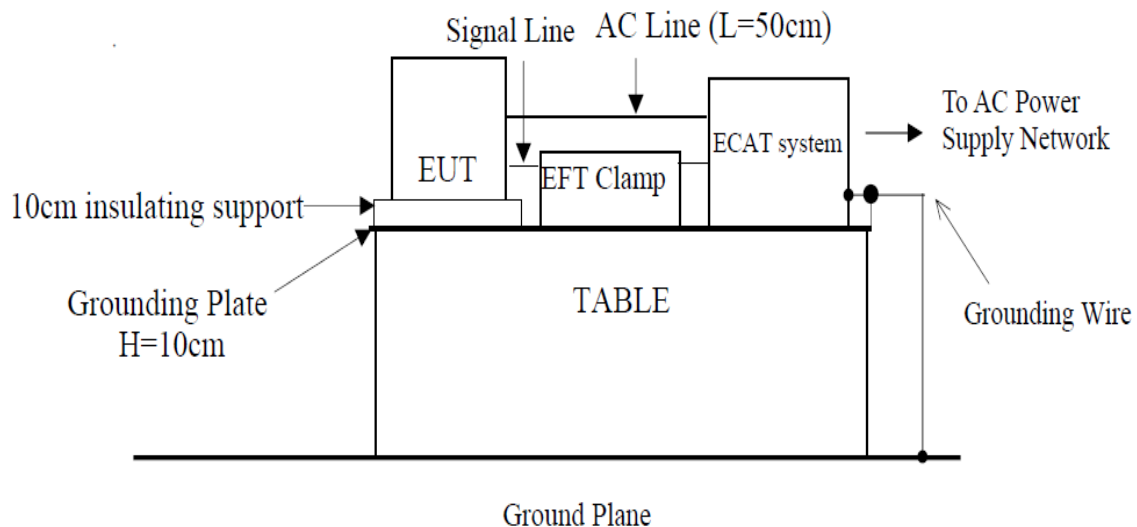
For input and AC power ports:

The EUT was connected to the power mains by using a coupling device that couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage were applied during compliance test and the duration of the test can't less than 1min.

For signal lines and control lines ports:

Ports which are intended to be connected to telecommunication networks (e.g. public switched telecommunication networks, integrated services digital networks, local area networks and similar networks.)

### 6.3.2 Test setup



### 6.3.3 Test result

Temperature:	25°C	Relative Humidity:	49%
Pressure:	101kPa	Test mode:	Mode 1

Port Type	Injected Line	Test Voltage	Criterion met	Criterion Required
AC Mains	L	±1kV	A	B
	N	±1kV	A	
	L+N	±1kV	A	
	PE	±1kV	N/A	
	L+PE	±1kV	N/A	
	N+PE	±1kV	N/A	
	L+N+PE	±1kV	N/A	



6.4 Surges

6.4.1 Test procedures

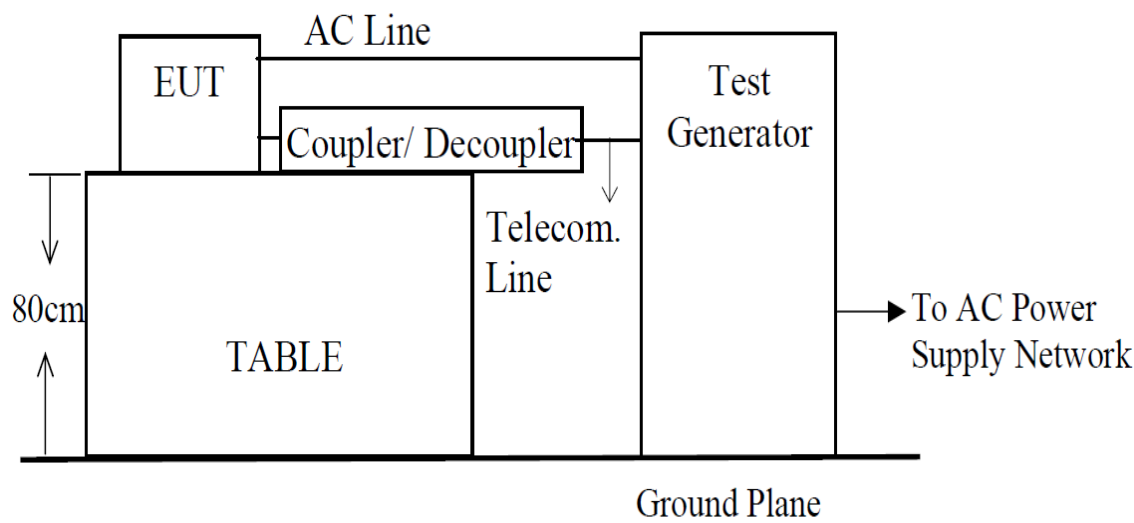
For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV.

At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.

Different phase angles are done individually.

Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

6.4.2 Test setup



6.4.3 Test result

Temperature:	25℃	Relative Humidity:	49%
Pressure:	101kPa	Test mode:	Mode 1

Port Type	Injected Line	Test Voltage	Criterion met	Criterion Required
AC Mains	L – N	±1kV	A	B
	L – PE	±2kV	N/A	
	N – PE	±2kV	N/A	
	L+N – PE	±2kV	N/A	

## 6.5 Radiated immunity (RS)

### 6.5.1 Test procedures

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

The field strength level was 3V/m.

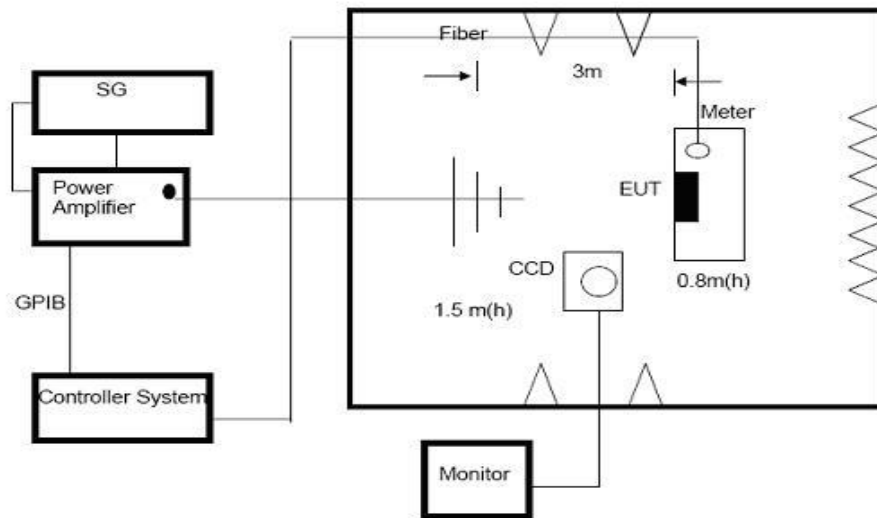
The frequency range is swept from 80 MHz to 1000 MHz with the signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 6.5.2 Test setup



### 6.5.3 Test result

Temperature:	25°C	Relative Humidity:	48%
Pressure:	101kPa	Test mode:	Mode 1

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80~1000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	A	A	Pass
			Rear			
			Left			
			Right			

## 6.6 Injected current (CS)

### 6.6.1 Test procedures

The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

The disturbance signal described below is injected to EUT through CDN.

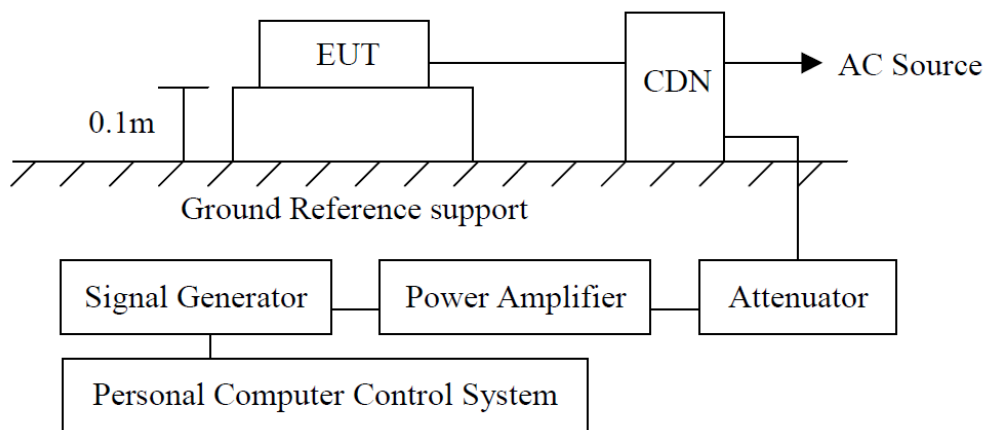
The EUT operates within its operational mode(s) under intended climatic conditions after power on.

The frequency range is swept from 0.150MHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.

The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 6.6.2 Test setup



### 6.6.3 Test result

Temperature:	25°C	Relative Humidity:	49%
Pressure:	101kPa	Test mode:	Mode 1

Port Type	Frequency (MHz)	Test Voltage	Criterion met	Criterion Required
AC Mains	0.15 to 80	3 V (rms) AM Modulated 1000Hz, 80%	A	A



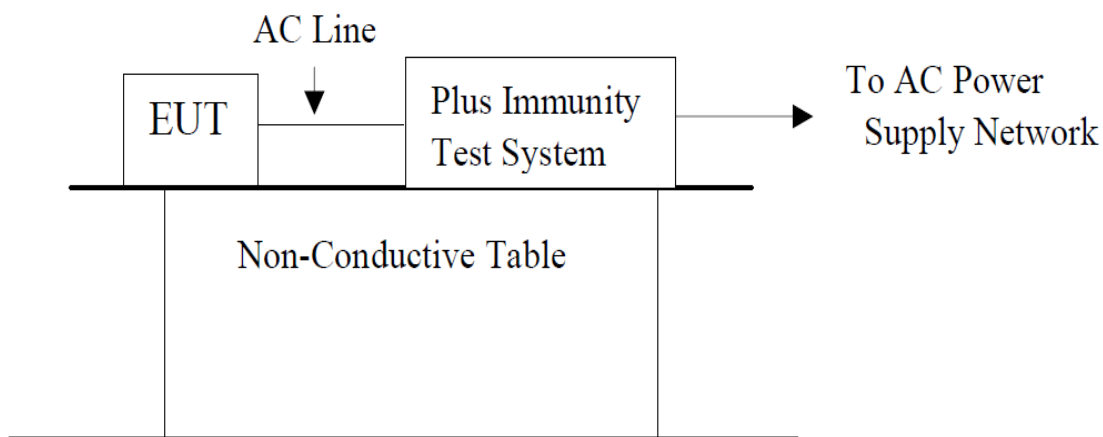
## 6.7 Voltage interruptions voltage Dips

### 6.7.1 Test procedures

The interruptions are introduced at selected phase angles with specified duration.

Record any degradation of performance

### 6.7.2 Test setup



### 6.7.3 Severity level

Voltage dip and short interruptions %UT	Performance Criterion	Duration(in period)
100	C	0.5
60	C	10
30	C	25

### 6.7.4 Test result

Voltage dip and short interruptions %UT	Period	Criterion	Result
100	0.5	C	A
60	10	C	B
30	25	C	B

## Photographs of the Test Setup

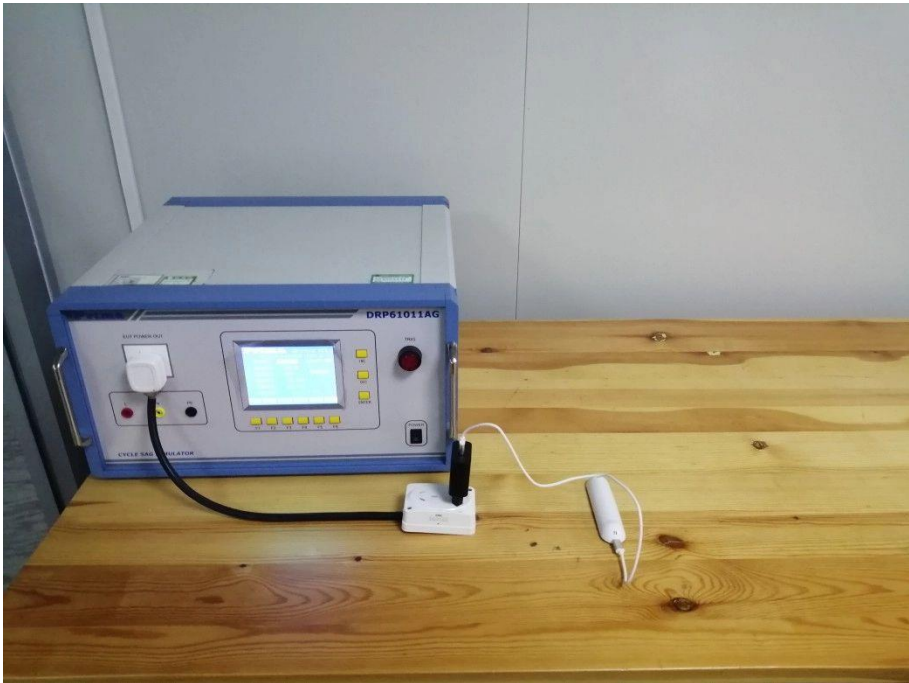
Conducted emission



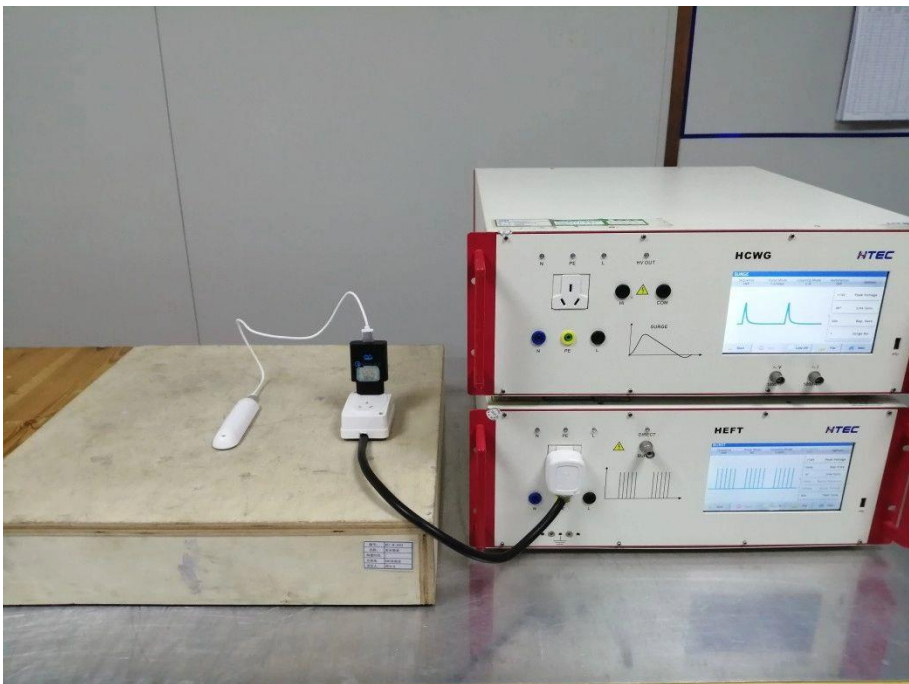
Disturbance power



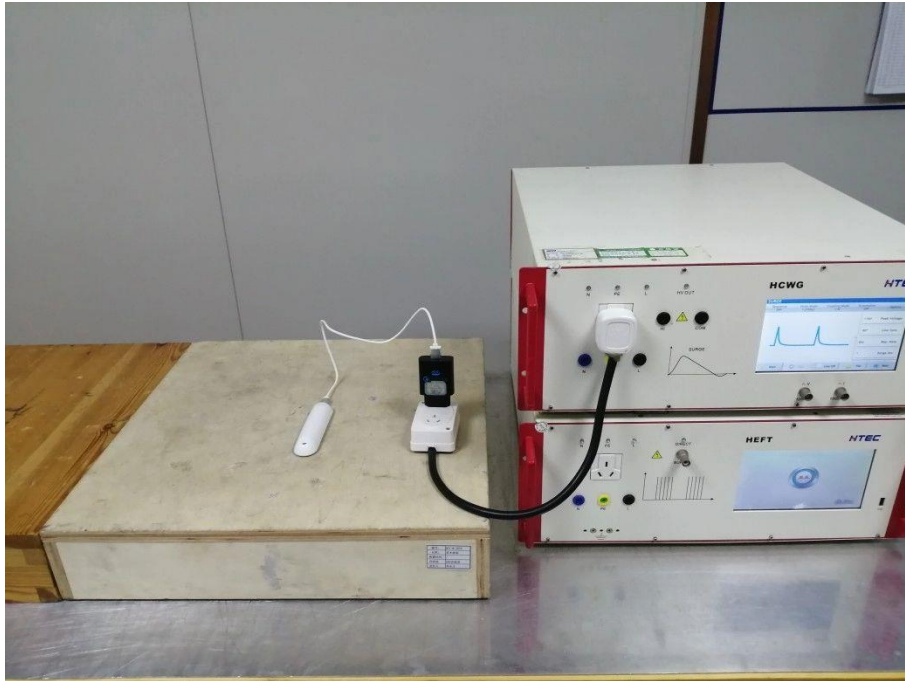
DIPS



EFT



Surge

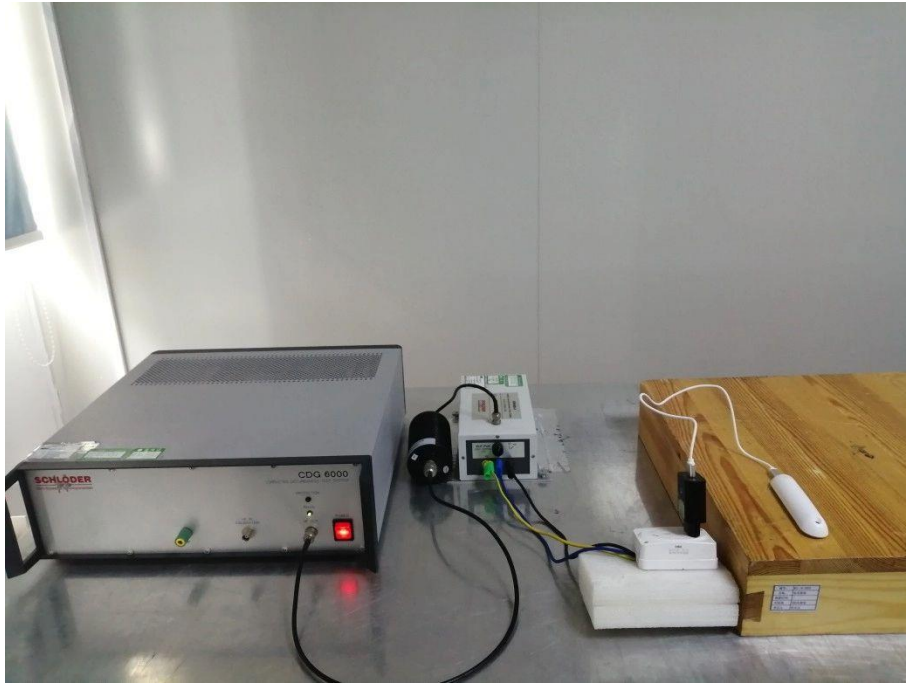


Harmonic & Flicker





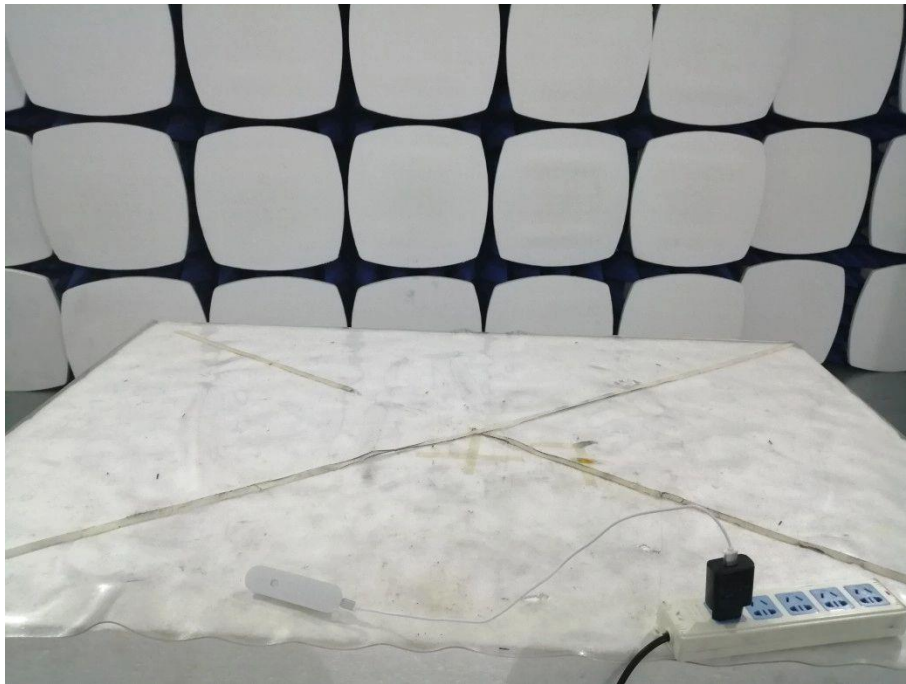
CS



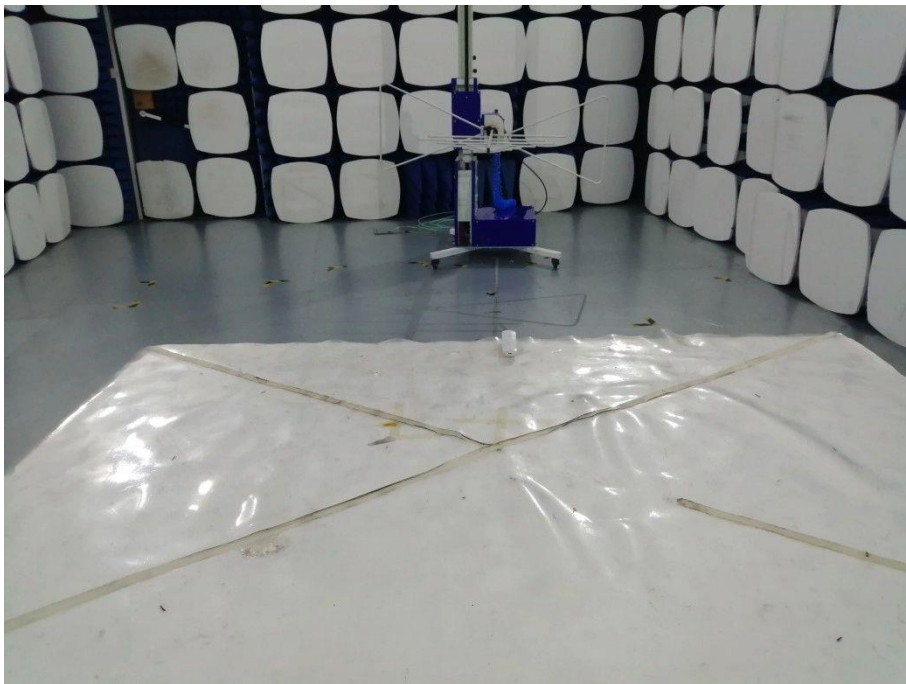
ESD



RS



Radiated disturbance



## **Photographs of the EUT**

See the APPENDIX 1: EUT PHOTO in the report No.: MTi181024E086-1

**----End of Report----**