EMC TEST REPORT

For

MILESTONE (HAINAN) TECHNOLOGY CO.,LTD

Mirror

Model No.	:	LED mirror, Aluminium Alloy framed mirror, MDF framed mirror, Frameless mirror, Decorative Mirror, Wrought Iron framed mirror, PS framed mirror, PU framed mirror, Wooden framed mirror, Irregular mirror, Stainless steel framed mirror, Acrylic mirror, Plastic framed mirror

Prepared for	:	MILESTONE (HAINAN) TECHNOLOGY CO.,LTD
Address	:	No. 596, 4th Floor, Building A, Haikou Binhai International Technology Enterprise Incubator, Longhua District, Haikou City, Hainan Province, China
Prepared by	:	Shenzhen Huawin Testing Certification Co., Ltd.
Address	:	7F, Building A, Shenye U Center, No. 743, Zhoushi Road, Bao′ an District,Shenzhen, China

Tel: +86-755-28266382
E-mail: info@huawinlab.com

Report Number	:	HW20250804022E
Date of Test	:	July 28, 2025 to August 4, 2025
Date of Report	:	May 14, 2025

TEST RESULT CERTIFICATION

Applicant's name ..... :	MILESTONE (HAINAN) TECHNOLOGY CO.,LTD
Address..... :	No. 596, 4th Floor, Building A, Haikou Binhai International Technology Enterprise Incubator, Longhua District, Haikou City, Hainan Province, China
Manufacturer's Name..... :	MILESTONE (HAINAN) TECHNOLOGY CO.,LTD
Address..... :	No. 596, 4th Floor, Building A, Haikou Binhai International Technology Enterprise Incubator, Longhua District, Haikou City, Hainan Province, China
Product name ..... :	Mirror
Model and/or type reference .:	LED mirror, Aluminium Alloy framed mirror, MDF framed mirror, Frameless mirror, Decorative Mirror, Wrought Iron framed mirror, PS framed mirror, PU framed mirror, Wooden framed mirror, Irregular mirror, Stainless steel framed mirror, Acrylic mirror, Plastic framed mirror
Standards ..... :	EN IEC 55014-1:2021 EN IEC 61000-3-2:2019+A1:2021 EN IEC 61000-3-3:2013+A2:2021 EN IEC 55014-2:2021

This device described above has been tested by Huawin, and the test results show that the equipment under test (EUT) is in compliance with the 2014/30/EU requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test..... :	
Date (s) of performance of tests ..... :	July 28, 2025 to August 4, 2025
Date of Issue ..... :	May 14, 2025
Test Result ..... :	**Pass**

Prepared by : Doris
Assistant

Reviewer :
Supervisor

Approved & Authorized Signer : Jason

HUAWIN TESTING TECHNOLOGY CO.,LTD 华测检测技术有限公司 HUAWIN Test Report

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN IEC 55014-1:2021	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
EN IEC 61000-3-2	Harmonic Current Emission	Class A or D NOTE (2)	N/A	
EN 61000-3-3	Voltage Fluctuations & Flicker	------	N/A	
EMC Immunity				
Section EN IEC 55014-2:2021	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:	Electrostatic Discharge	B	PASS	
EN 61000-4-3	RF electromagnetic field	A	PASS	
EN 61000-4-4	Fast transients	B	PASS	
EN 61000-4-5	Surges	B	PASS	
EN 61000-4-6	Injected Current	A	PASS	
EN 61000-4-11	Volt. Interruptions Volt. Dips	C / C / C **NOTE (3)**	PASS	

NOTE:

(1)' N/A' denotes test is not applicable in this Test Report

(2) No limits apply for equipment with an active input power up to and including 75W.

(3)Voltage dip: 0% reduction – Performance Criteria **C**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage dip: 60% reduction – Performance Criteria **C**

For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen Huawin Testing Certification Co., Ltd.

7F, Building A, Shenye U Center, No. 743, Zhoushi Road, Bao′ an District, Shenzhen, China

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
PTSC01	ANSI	150 KHz ~ 30MHz	3.1	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
PTSA01	ANSI	30MHz ~ 1000MHz	4.8	
		1GHz ~6GHz	5.0	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Mirror
Model Name	LED MIRROR
Power Rating	AC 110-240V

2.2 DESCRIPTION OF TEST MODES

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.

Pretest Mode	Description
Mode 1	Running

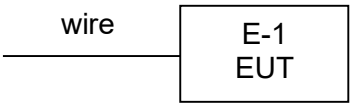
For Conducted Test	
Final Test Mode	Description
Mode 1	N/A

For Radiated Test	
Final Test Mode	Description
Mode 1	Running

For EMS Test	
Final Test Mode	Description
Mode 1	Running

2.3 DESCRIPTION OF TEST SETUP

Mode 1:



(EUT: Mirror)

2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
N/A	/	/	/	/	N/A

Item	Shielded Type	Ferrite Core	Length	Note
N/A	/	/	/	/

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	100162	May.15, 2025	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ENV216	101161	May.15, 205	1 Year
3.	50Ω Coaxial Switch	Anritsu	MP59B	6100214550	N/A	N/A
4.	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May.15, 2025	1 Year
5.	I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	May.15, 2025	1 Year

2.5.2 RADIATED TEST SITE

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May.15, 2025	1 Year
2.	Pre-Amplifier	HP	8447D	2944A07999	May.15, 2025	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	May.15, 2025	1 Year
4.	Loop Antenna	ARA	PLA-1030/B	1029	May.15, 2025	1 Year
5.	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May.15, 2025	1 Year
6.	Horn Antenna	Schwarzbeck	BBHA 9120	D143	May.15, 2025	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	May.15, 2025	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	May.15, 2025	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	May.15, 2025	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	May.15, 2025	1 Year

2.5.3 HARMONICS AND FILCK

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC Power Source	California Instruments	5001iX-CTS-400-413	72795	May.15, 2025	1 Year
2.	PC	N/A	P2L97	N/A	May.15, 2025	N/A

2.5.4 ESD

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQAG	NSG 437	000409	May.15, 2025	1 Year

2.5.5 RS

1.	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May.15, 2025	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May.15, 2025	1 Year
3.	Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 L3F	332	May.15, 2025	1 Year
4.	Power Amplifier	PRANA	AP32MT215	N/A	May.15, 2025	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	May.15, 2025	1 Year
6.	Signal Generator	AEROFLEX	2023B	N/A	May.15, 2025	1 Year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	May.15, 205	1 Year
8.	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May.15, 2025	1 Year
9.	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May.15, 2025	1 Year

2.5.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

1.	Burst Tester	HAEFELY	PEFT4010	080981-16	May.15, 2025	1 Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	May.15, 2025	1 Year
3.	Surge Controller	HAEFELY	Psurge 8000	174031	May.15, 2025	1 Year
4.	Impulse Module	HAEFELY	PIM 100	174124	May.15, 2025	1 Year
5.	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May.15, 2025	1 Year
6.	Coupling Module	HAEFELY	PCD122	174354	May.15, 2025	1 Year
7.	Surge Impulse Module	HAEFELY	PIM 120	174435	May.15, 2025	1 Year
8.	Coupling Module	HAEFELY	PCD 126A	174387	May.15, 2025	1 Year
9.	Impulse Module	HAEFELY	PIM 110	174391	May.15, 2025	1 Year
10.	Dips Tester	HAEFELY	Pline1610	083732-12	May.15, 2025	1 Year

2.5.7 INJECTION CURRENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	May.15, 2025	1 Year
2.	CDN	EMTEST	CDN-M2	5100100100	May.15, 2025	1 Year
3.	CDN	EMTEST	CDN-M3	0900-11	May.15, 2025	1 Year
4.	Injection Clamp	EMTEST	F-2031-23MM	368	May.15, 2025	1 Year
5.	Attenuator	EMTEST	ATT6	0010222A	May.15, 2025	1 Year

2.5.8 MF

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May.15, 2025	1 Year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

Frequency Range (MHz)	At mains terminals		At load terminals and additional terminals	
	Quasi-peak (dBuV)	Average (dBuV)	Quasi-peak (dBuV)	Average (dBuV)
0.15 -0.5	66 - 56 *	56 - 46 *	80.00	70.00
0.50 -5.0	56.00	46.00	74.00	64.00
5.0 -30.0	60.00	50.00	74.00	64.00

3.1.2 MAINS TERMINALS OF TOOLS

Frequency Range	Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (uV) Quasi-peak	dB (uV) Average**	dB (uV) Quasi-peak	dB (uV) Average**	dB (uV) Quasi-peak	dB (uV) Average**
0.15 -0.5	66.0 to 59.0*	59.0 to 49.0*	70.0 to 63.0*	63.0 to 53.0*	76.0 to 69.0*	69.0 to 59.0*
0.50 -5.0	59.0	49.0	63.0	53.0	69.0	59.0
5.0 -30.0	64.0	54.0	68.0	58.0	74.0	64.0

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of ' * ' marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

(3) '**' 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.

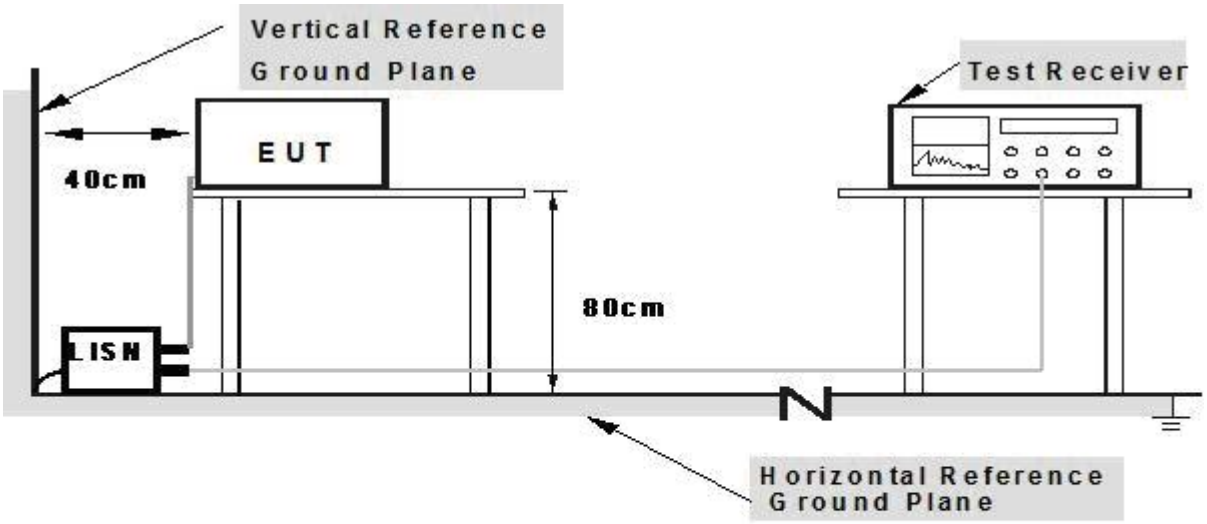
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.3 TEST PROCEDURE

a. 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.
b. 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.
c. 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.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

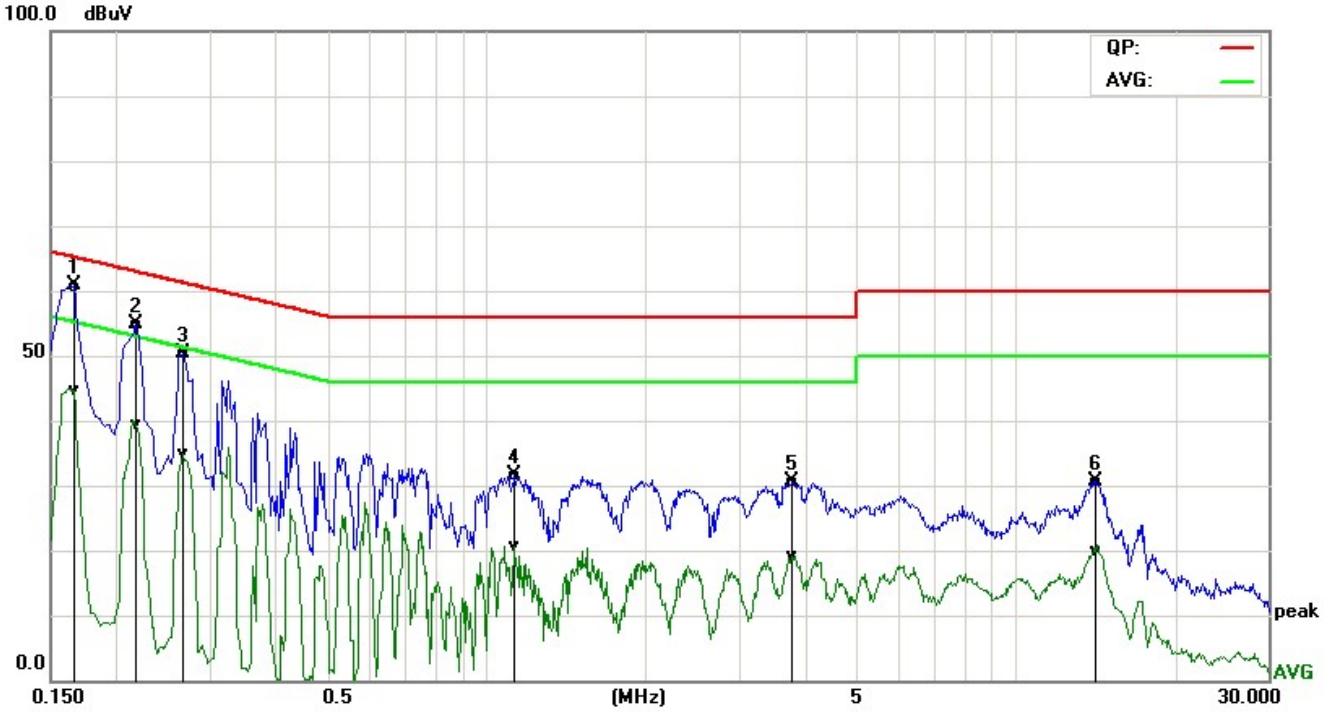
3.1.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.6 TEST RESULTS

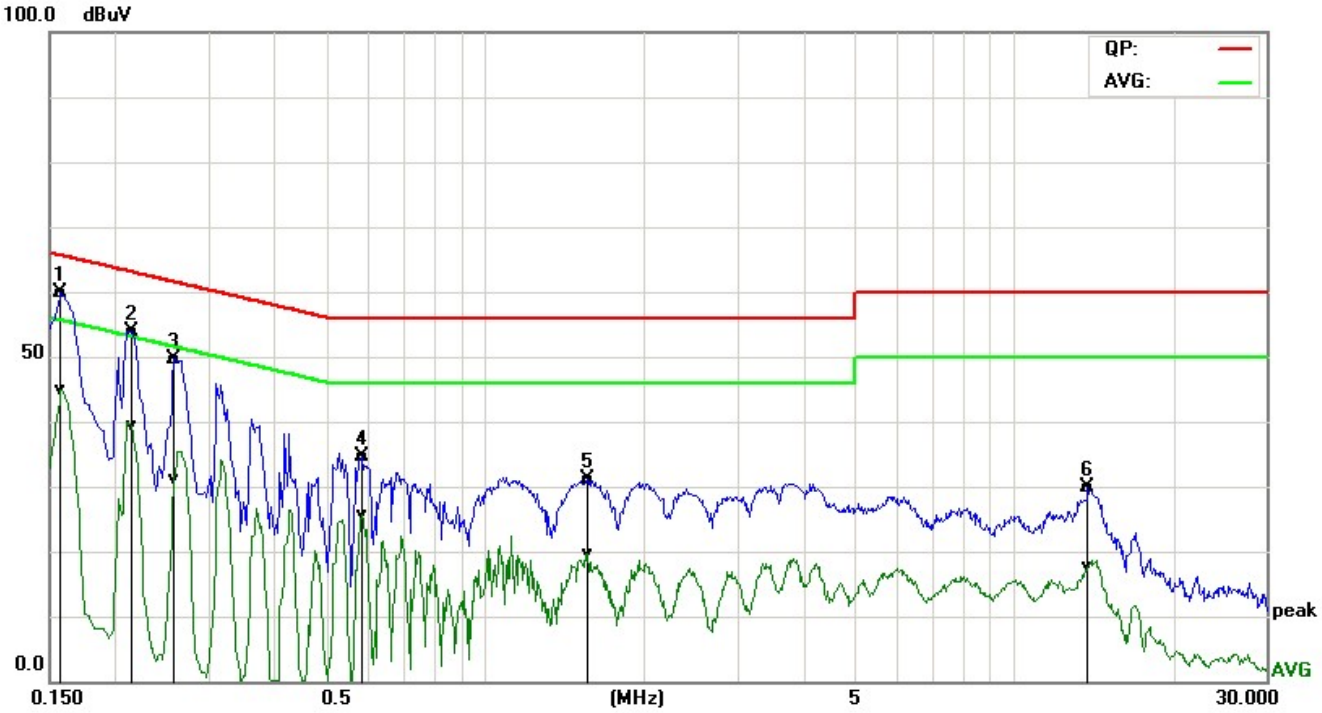
PASS

EUT:	Mirror	Model Name. :	LED MIRROR
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101hPa	Phase :	L
Test Voltage :	AC110-240V	Test Mode:	/



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1660	60.55	44.46	0.20	60.75	44.66	65.16	55.16	-4.41	-10.50	Pass
2P	0.2180	54.78	39.13	0.21	54.99	39.34	62.89	52.89	-7.90	-13.55	Pass
3P	0.2660	50.16	34.81	0.18	50.34	34.99	61.24	51.24	-10.90	-16.25	Pass
4P	1.1340	31.35	20.47	0.17	31.52	20.64	56.00	46.00	-24.48	-25.36	Pass
5P	3.7860	30.39	18.80	0.23	30.62	19.03	56.00	46.00	-25.38	-26.97	Pass
6P	14.1580	30.43	19.58	0.27	30.70	19.85	60.00	50.00	-29.30	-30.15	Pass

EUT:	Mirror	Model Name. :	LED MIRROR
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	AC 100-240V	Test Mode:	/



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1580	59.79	44.70	0.19	59.98	44.89	65.57	55.57	-5.59	-10.68	Pass
2P	0.2140	53.74	39.13	0.21	53.95	39.34	63.05	53.05	-9.10	-13.71	Pass
3P	0.2580	49.46	30.91	0.19	49.65	31.10	61.50	51.50	-11.85	-20.40	Pass
4P	0.5860	34.36	25.54	0.16	34.52	25.70	56.00	46.00	-21.48	-20.30	Pass
5P	1.5620	30.99	19.42	0.18	31.17	19.60	56.00	46.00	-24.83	-26.40	Pass
6P	13.8060	29.69	17.34	0.26	29.95	17.60	60.00	50.00	-30.05	-32.40	Pass

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	At 10m	At 3m
	dBuV/m	dBuV/m
30 – 230	30	40
230 – 1000	37	47

3.2.2 LIMITS OF DISTURBANCE POWER MEASUREMENT (Below 1000MHz)

	Household and similar appliances		Tools					
Frequency Range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (pW) Quasi-peak	dB (pW) Averag*	dB (pW) Quasi-peak	dB (pW) Averag*	dB (pW) Quasi-peak	dB (pW) Averag*	dB (pW) Quasi-peak	dB (pW) Average*
30-300	44-55	35-45	44-55	35-45	49-59	39-49	55-65	45-55
* 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.								

Notes:

(1) The limit for radiated test was performed according to as following: CISPR 14.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.3 TEST PROCEDURE

a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

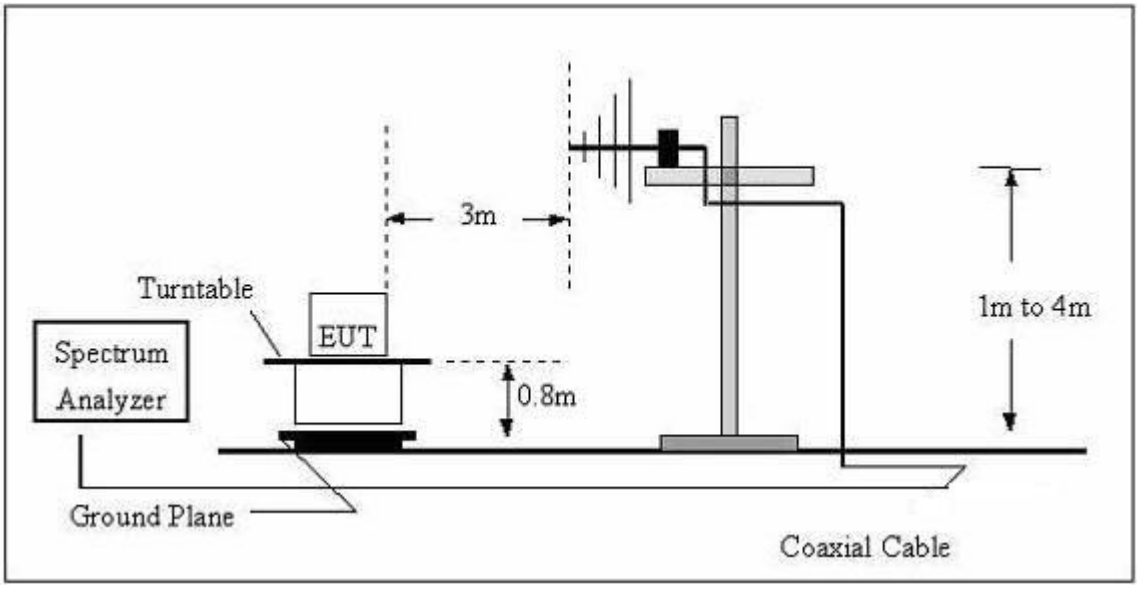
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

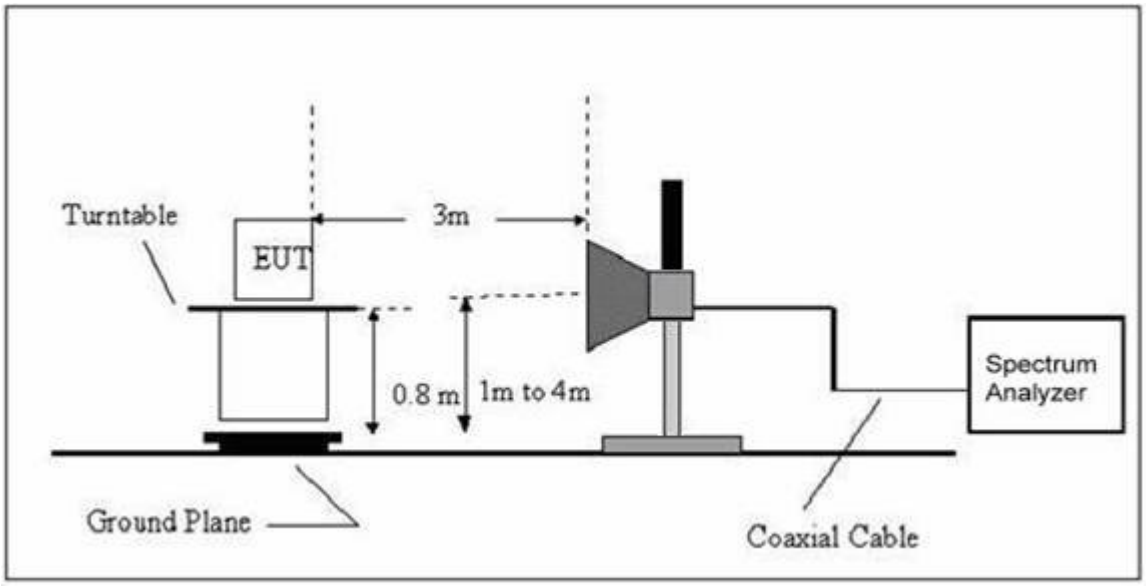
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.4 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz.



(B) Disturbance Power Test Set-UP Frequency Below 1GHz

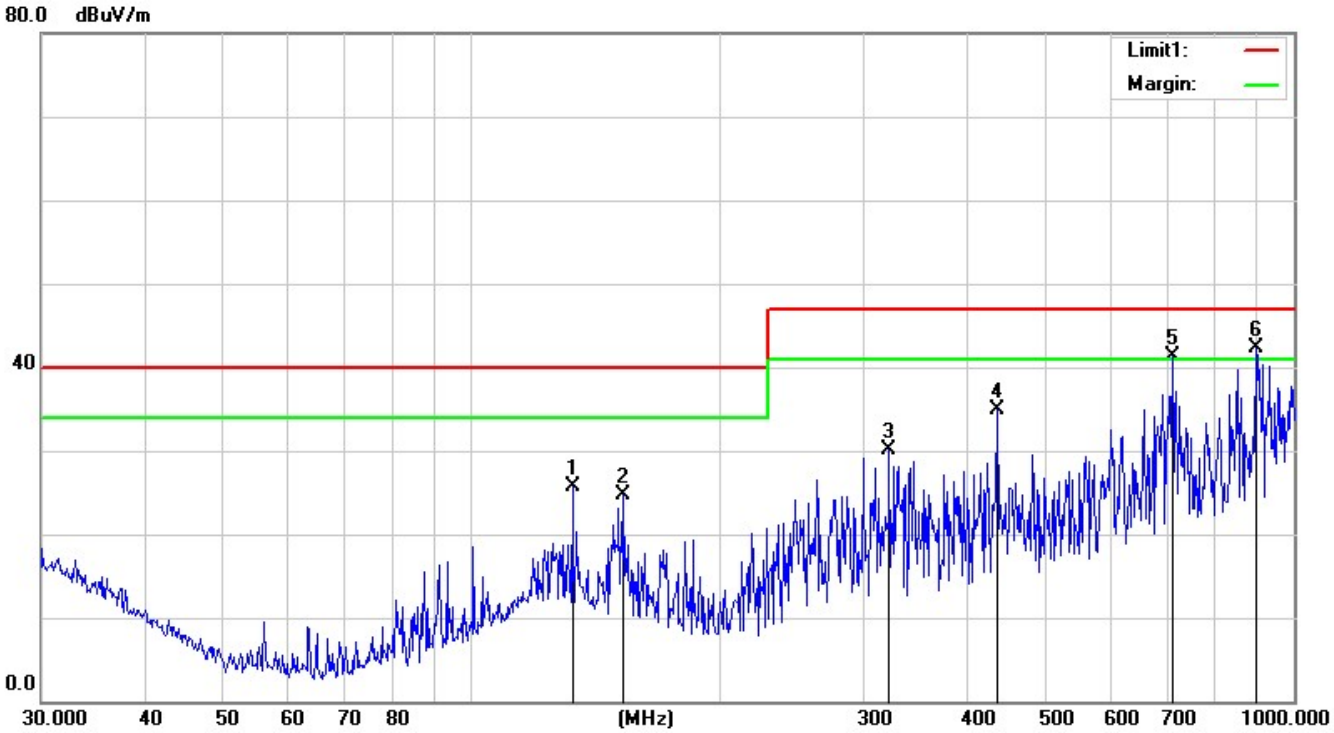


3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

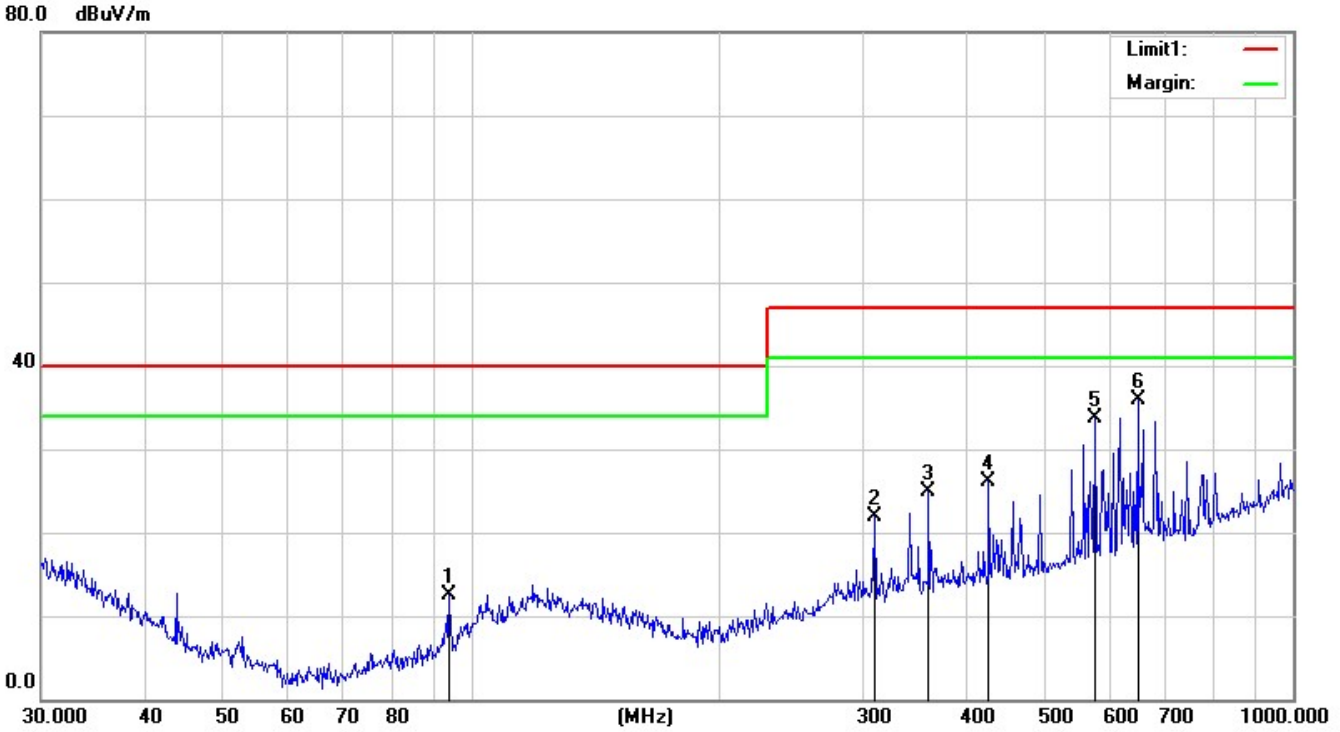
3.2.6 TEST RESULTS

EUT:	Mirror	Model Name. :	LED MIRROR
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101hPa	Phase :	Horizontal
Test Voltage :	AC 110-240V	Test Mode:	/



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	132.6850	40.25	-14.50	25.75	40.00	-14.25			peak
2	153.2004	40.39	-15.67	24.72	40.00	-15.28			peak
3	322.1886	43.11	-12.94	30.17	47.00	-16.83			peak
4	435.5898	46.33	-11.37	34.96	47.00	-12.04			peak
5I	711.6734	48.17	-6.79	41.38	47.00	-5.62			peak
6*	900.1474	45.43	-3.13	42.30	47.00	-4.70			peak

EUT:	Mirror	Model Name. :	LED MIRROR
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101hPa	Phase :	Vertical
Test Voltage :	AC 110-240V	Test Mode:	/



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	94.0979	32.00	-19.56	12.44	40.00	-27.56			peak
2	309.9977	34.86	-12.99	21.87	47.00	-25.13			peak
3	360.4477	37.46	-12.57	24.89	47.00	-22.11			peak
4	426.5210	37.61	-11.47	26.14	47.00	-20.86			peak
5	574.6258	43.06	-9.38	33.68	47.00	-13.32			peak
6*	647.3856	43.56	-7.68	35.88	47.00	-11.12			peak

3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

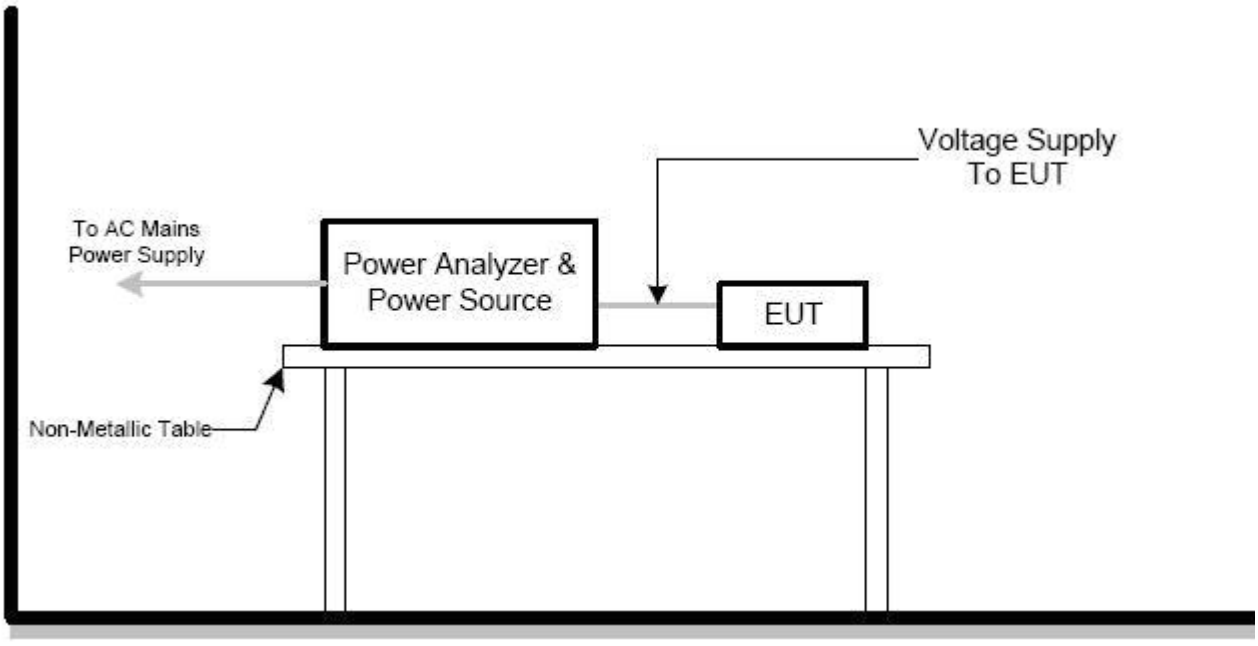
3.3.1.1TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.
b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.1.3 TEST SETUP



3.3.2 TEST RESULTS

N/A

3.3.2.1 VOLTAGE FLUCTUATION AND FLICKERS

3.3.3 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax	≤ 4%	≤ 4%	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

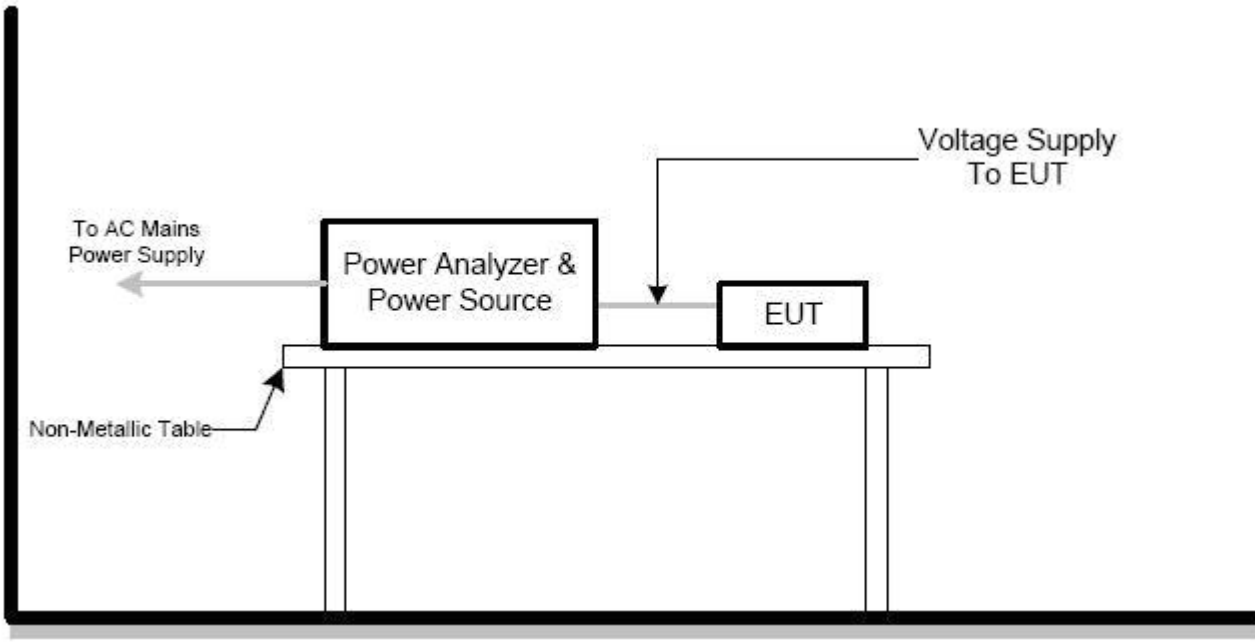
3.3.3.1TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.
b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.3.3.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.3.3 TEST SETUP



3.3.4 TEST RESULTS

N/A

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/ SERVRITY LEVEL/ CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform. Criteria
1. ESD EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B
2. RS EN 61000-4-3	80 MHz to 1000 MHz, 1000Hz, 80%, AM modulated	Enclosure	A
3. EFT/Burst EN 61000-4-4	5/50ns Tr/Th 5KHz Repetition Freq.	Power Supply Port	B
	5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B
4. Surges EN 61000-4-5	1.2/50(8/20) Tr/Th us	L-N	B
	1.2/50(8/20) Tr/Th us	L-PE N-PE	B
5 Injected Current EN 61000-4-6	0.15 MHz to 80 MHz, 1000Hz 80 % , AM Modulated 150Ω source impedance	CTL/Signal Port	A
	0.15 MHz to 80 MHz, 1000Hz 80 % , AM Modulated 150Ω source impedance	AC Power Port	A
	0.15 MHz to 80 MHz, 1000Hz 80 % , AM Modulated 150Ω source impedance	DC Power Port	A
6. Power Frequency Magnetic Field EN 61000-4-8	50 Hz,	Enclosure	A
7. Volt. Interruptions Volt. Dips EN 61000-4-11	Voltage dip 0% Voltage dip 40% Voltage dip 70%	AC Power Port	C C C

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 55014-2** standard, the general performance criteria as following:

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.
Criterion B	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge：2kV/4kV/8kV (Direct) Contact Discharge：2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

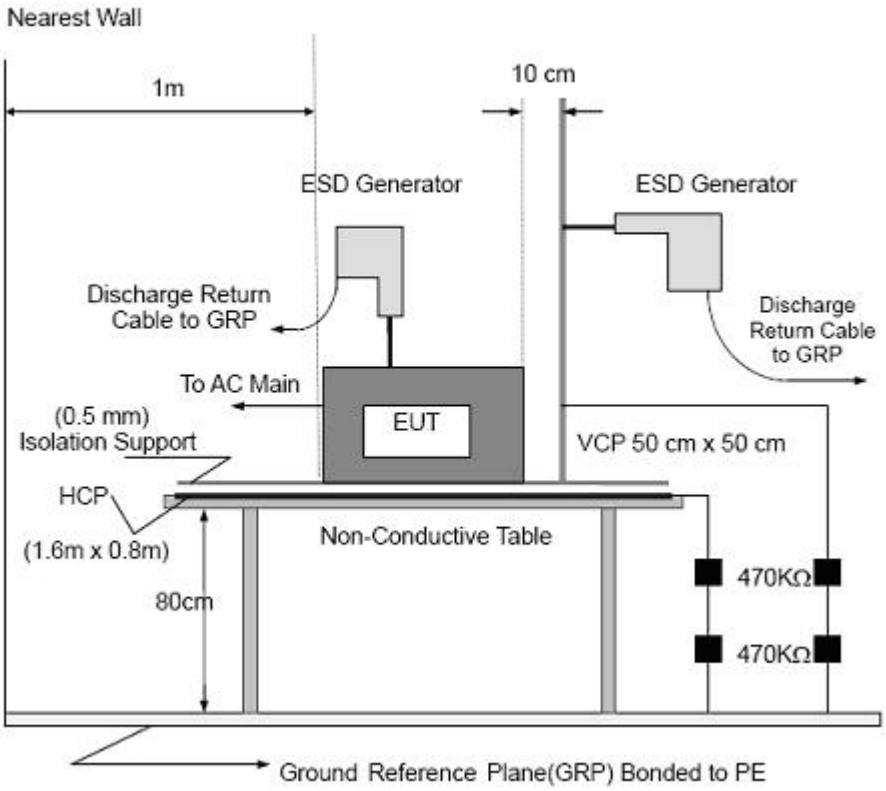
4.4.2 TEST PROCEDURE

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

a. 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. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center 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 are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per 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.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

4.4.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.4 TEST RESULTS

Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	2		4		8		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
HCP									A	A	A	A						**PASS**
VCP									A	A	A	A						**PASS**
A1	A	A	A	A	A	A												**PASS**
A2	A	A	A	A	A	A												**PASS**
A3	A	A	A	A	A	A											**B**	**PASS**
C1									A	A	A	A						**PASS**

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
   Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
4) The Indirect (HCP/VCP) discharges description of test point as following:
   1. left side 2.right side 3.front side 4.rear side.
5) N/A - denotes test is not applicable in this test report.

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

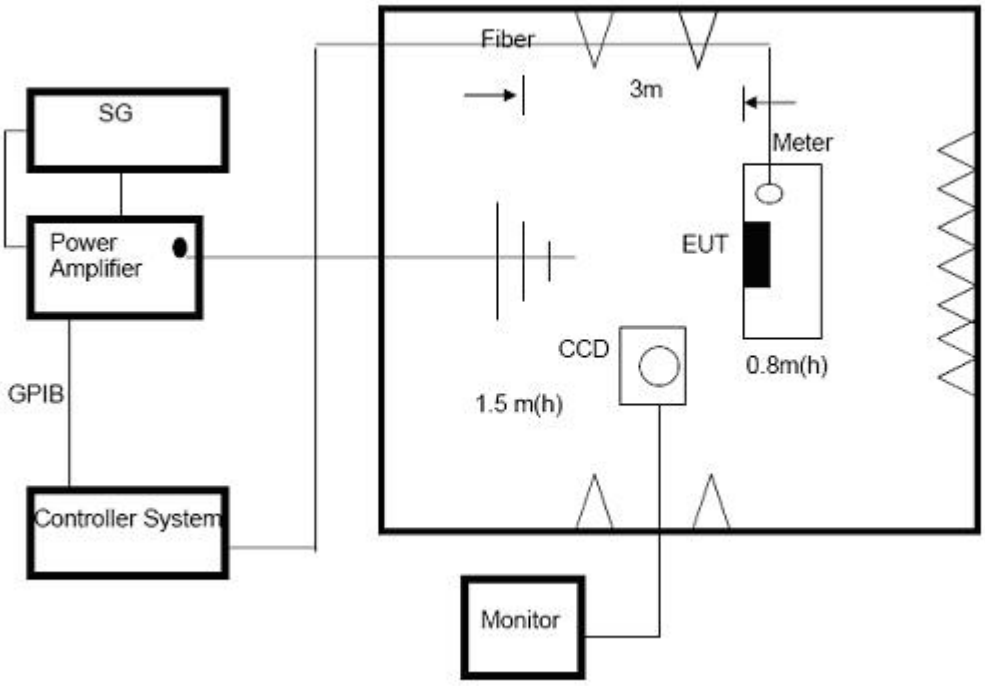
Basic Standard:	EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

4.5.2 TEST PROCEDURE

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:

a. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
b. Sweep Frequency 900 MHz, with the Duty Cycle: 1/8 and Modulation: Pulse 217 Hz(if applicable)
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.5.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.4 TEST RESULTS

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

Note:

1) N/A - denotes test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

4.6 EFT/BURST TESTING

4.6.1 TEST SPECIFICATION

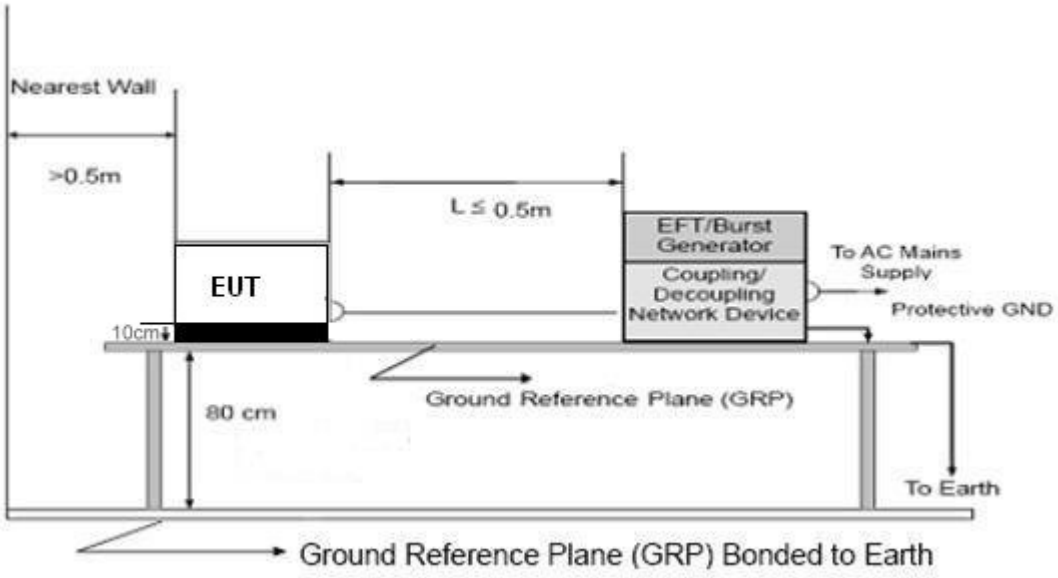
Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line：1 kV Signal/Control Line：0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

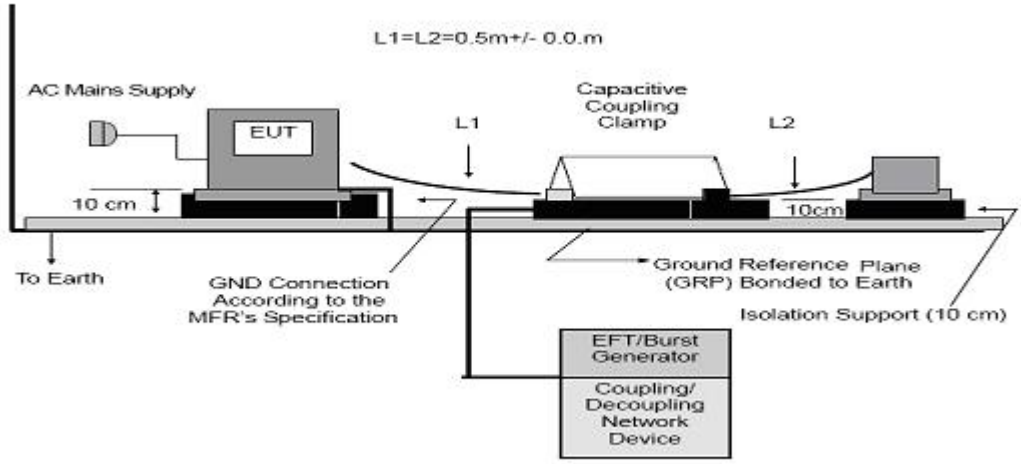
4.6.2 TEST PROCEDURE

The EUT and its simulators were placed on a 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. The other condition as following manner:

a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
b. Both positive and negative polarity discharges were applied.
c. The duration time of each test sequential was 1 minute.

4.6.3 TEST SETUP





Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.4 TEST RESULTS

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
N	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
L-N	+/-	1	☐A ☒B	Note ☐1 ☒2	N/A
PE	+/-	1	☐A ☒B	Note ☐1 ☒2	N/A
L-PE	+/-	1	☐A ☒B	Note ☐1 ☒2	N/A
N-PE	+/-	1	☐A ☒B	Note ☐1 ☒2	N/A
L-N-PE	+/-	1	☐A ☒B	Note ☐1 ☒2	N/A
RJ45 UTP cable	+/-	--	☐A ☐B	Note ☐1 ☐2	N/A

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.

2) N/A - denotes test is not applicable in this test report.

3) Criteria A: There was no change operated with initial operating during the test.

4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

5) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

4.7.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line：0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.7.2 TEST PROCEDURE

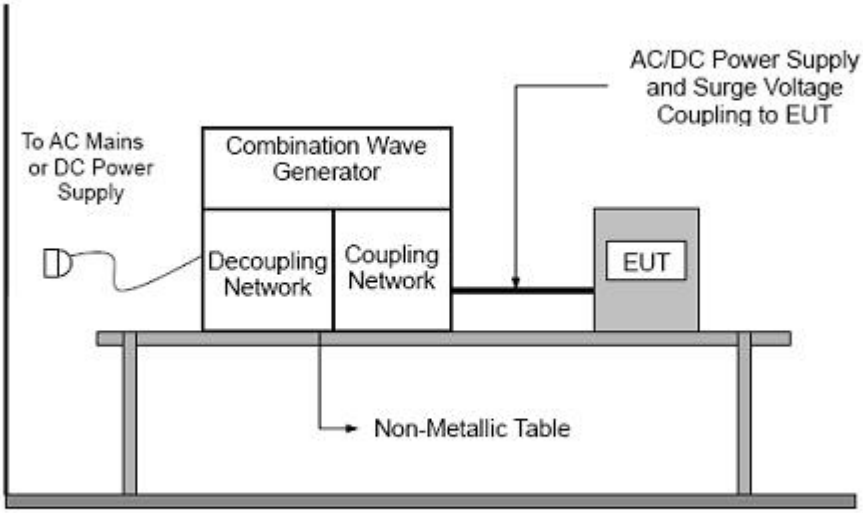
a. For EUT power supply:
The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

d. The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

4.7.3 TEST SETUP



4.7.4 TEST RESULTS

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L-N	+/-	1	B	Note ☐1 ☒2	PASS
L-PE	--	2	B	Note ☐1 ☒2	N/A
N-PE	--	2	B	Note ☐1 ☒2	N/A
R - Ground	--	--	--	Note ☐1 ☐2	N/A
T - Ground	--	--	--	Note ☐1 ☐2	N/A

Note:

1) Polarity and Numbers of Impulses：5 Pst / Ngt at each tested mode.
2) N/A - denotes test is not applicable in this Test Report.
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

4.8 INJECTION CURRENT TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

4.8.2 TEST PROCEDURE

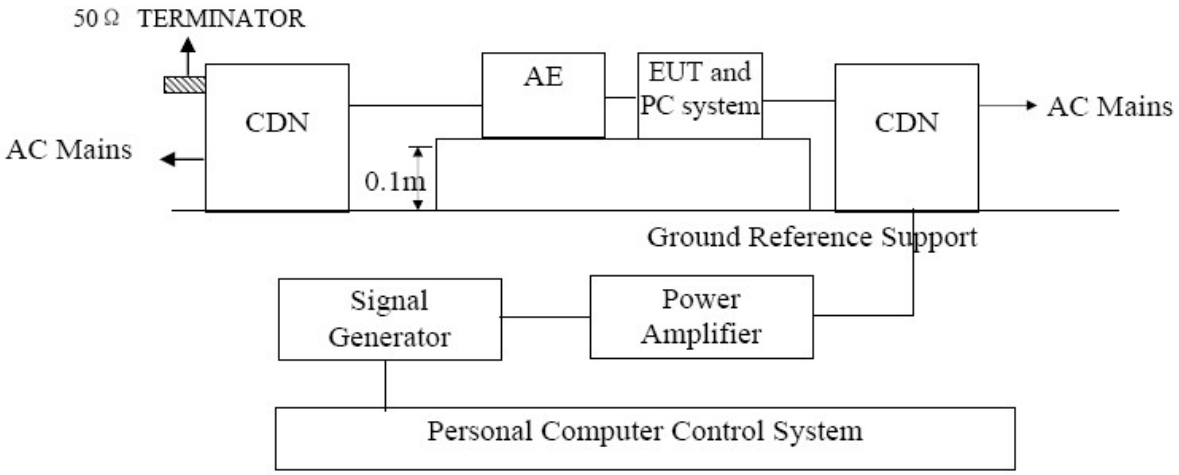
The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and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

The other condition as following manner:

a. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

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

4.8.3 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.4 TEST RESULTS

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	A	A	PASS
Input/ Output DC. Power Port	0.15 --- 80		A	N/A	N/A
Signal Line	0.15 --- 80		A	N/A	N/A

Note:

1) N/A - denotes test is not applicable in this Test Report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

4.9 VOLTAGE INTERRUPTION/DIPS TESTING

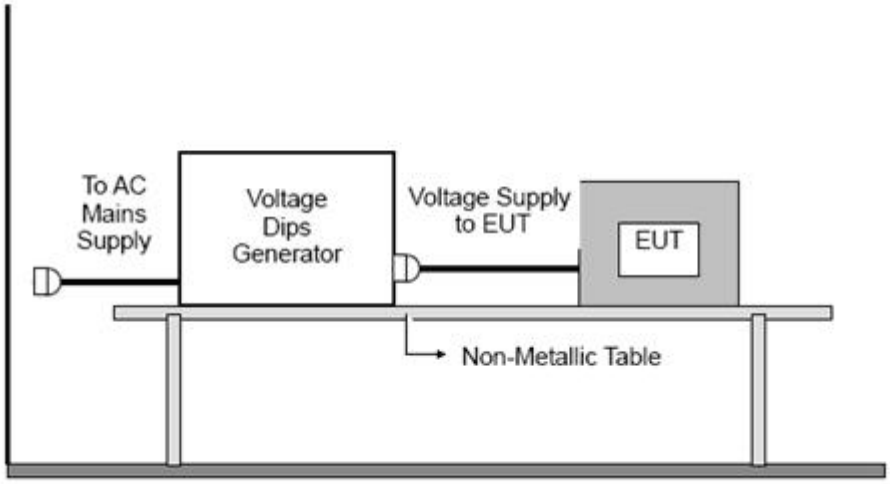
4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance:	C (For 0% Voltage Dips) C (For 30% Voltage Dips) C (For 60% Voltage Dips)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.9.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.9.3 TEST SETUP



4.9.4 TEST RESULTS

PASS

Test Power: 230Vac, 50Hz				
Voltage (% Reduction)	**Duration (Period)**	**Performance Criterion**	**Observation**	**Test Result**
100	0.5	☐A ☐B ☒C	Note ☐1 ☐2 ☐ 3	PASS
60	10	☐A ☐B ☒C	Note ☐1 ☐2 ☐3	PASS
30	25	☐A ☐B ☒C	Note ☐1 ☐2 ☐3	PASS

Note:

1). N/A - denotes test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

ATTACHMENT PHOTOGRAPHS OF EUT

*****END OF REPORT*****