Huaxun testing (Shenzhen) Group Co., Ltd

Report No: E07190013-SMT

EMC TEST REPORT

Applicant:	Dezhou Summit Power CO., LTD
Address:	NO.7, Geruide Road, Decheng District, Dezhou City, ShandongProvince, China
Manufacturer:	Dezhou Summit Power CO., LTD
Address:	NO.7, Geruide Road, Decheng District, Dezhou City, ShandongProvince, China
Product name:	Battery Charger
Model:	SMCZ7
Serial model:	SMCZ7-1210A, SMCZ7-1215A, SMCZ7-2410A, SMCZ7-2412A, SMCZ7-2415A, SMCZ7-3610A, SMCZ7- 3615A, SMCZ7-4810A, SMCZ7-4812A, SMCZ7-4815A, SMCZ7-6007A, SMCZ7-6010A, SMCZ7-6012A, SMCZ7-7207A, SMCZ7-7210A
Brand Name ：	萨美特
Sample Received Date:	July 13,2022
Testing Period:	July 13,2022~July 19,2022
TEST FACTORY:	Huaxun testing (Shenzhen) Group Co., Ltd
	Goldman Sachs building, No. 18, Shaqi Community Center Road, Xinqiao street, Bao'an District, Shenzhen, Guangdong, China

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TEST RESULT CERTIFICATION

Applicant..... :	Dezhou Summit Power CO., LTD
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Manufacturer.....:	Dezhou Summit Power CO., LTD
Address..... :	NO.7, Geruide Road, Decheng District, Dezhou City, ShandongProvince, China

Product description

Product Name..... :	Battery Charger
Brand Name .....:	萨美特
Model Name ..... :	SMCZ7
Test Methods.....:	EN55014-1:2017/A11:2020 EN IEC 61000-3-2:2019 EN 61000-3-3:2013/A1:2019 EN 55014-2:2015

This device described above has been tested by Huaxun testing (Shenzhen) Group Co., Ltd, and the test results show that the equipment under test (EUT) is in compliance with the EMC Directive 2014/30/EU requirements. And it is applicable only to the tested sample identified in the report. This report shall not be reproduced except in full, without the written approval of HX, this document may be altered or revised by Huaxun testing (Shenzhen) Group Co., Ltd, personnel only, and shall be noted in the revision of the document.

Prepared by: Rite

Reviewer: Heidi

Approved & Authorized Signer: Spike

Huaxun testing (Shenzhen) Group Co., Ltd APPROVED

Table of Contents Page

1 TEST SUMMARY

1.1 TEST RESULTS

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55014-1:2017/ A11:2020	Conducted Emission	Class B	PASS	
	Disturbance Power(30-300MHz)	——	PASS	
	Radiated Emission 30MHz to 1000MHz	Class B	PASS	
EN IEC 61000-3-2:2019	Harmonic Current Emission	Class A	PASS	
EN 61000-3-3:2013/ A1:2019	Voltage Fluctuations & Flicker	——	PASS	
EMC Immunity				
Section EN 55014-2:2015	Test Item	Performan ce Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006 +A1:2008+A2:2010	RF Electromagnetic Fie29.2V20A	A	PASS	
EN 61000-4-4:2012	Fast Transients	B	PASS	
EN 61000-4-5:2014 /A1:2017	Surges	B	PASS	
EN 61000-4-6:2014 /AC:2015	Injected Current	A	PASS	
EN IEC 61000-4-11:2020	Volt. Dips	C / C / C	PASS	NOTE (1)

Note:
(1) Voltage Dip: 100% reduction – Performance Criteria C
Voltage Dip: 30% reduction – Performance Criteria C
Voltage Dip: 60% reduction – Performance Criteria C
(2) For client's request and manual description, the test will not be executed.
(3) "N/A" denotes test is not applicable in this Test Report

1.2 TEST FACTORY

Test Firm : Huaxun testing (Shenzhen) Group Co., Ltd

Address : Goldman Sachs building, No. 18, Shaqi Community Center Road, Xinqiao street, Bao'an District, Shenzhen, Guangdong, China

1.3 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
HX	ANSI	9kHz ~ 150kHz	2.96	
		150kHz ~ 30MHz	2.44	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
HX	ANSI	9kHz ~ 30MHz	2.50	
		30MHz ~ 1000MHz	4.80	
		1000MHz ~ 6000MHz	4.13	

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Battery Charger
Brand Name :	萨美特
Main Model:	SMCZ7
Additional Model:	SMCZ7-1210A, SMCZ7-1215A, SMCZ7-2410A, SMCZ7-2412A, SMCZ7-2415A, SMCZ7-3610A, SMCZ7- 3615A, SMCZ7-4810A, SMCZ7-4812A, SMCZ7-4815A, SMCZ7-6007A,SMCZ7-6010A, SMCZ7-6012A, SMCZ7-7207A, SMCZ7-7210A
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different.
Product Description:	The EUT is an Battery Charger. Based on the application, features, or specification exhibited in User's Manual, more details of EUT technical specification, please refer to the User's Manual.

2.2 DESCRIPTION OF THE 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

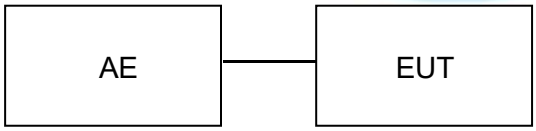
For Conducted Test	
Pretest Mode	Description
Mode 1	Running

For Radiated Test	
Pretest Mode	Description
Mode 1	Running

For EMS Test	
Pretest Mode	Description
Mode 1	Running

Note: The test modes were carried out for all operation modes (include link and idle).

2.3 DESCRIPTION OF TEST SETUP



Note: The EUT tested system was configured as upper figure, unless otherwise a special operating condition is specified in the following during the testing.

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.	Note
E-1	Battery Charger	萨美特	SMCZ7	EUT

Item	Shielded Type	Ferrite Core	Length	Note

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.
3. “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core

2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Conduction Emissions Measurement					
1	Conducted Emission Test Software	EZ-EMC	Ver.CCS-3A1-CE	N/A	N/A
2	AMN	Schwarzbeck	NNLK8121	8121370	2022.10.15
3	AMN	ETS	3810/2	00020199	2022.10.15
4	AAN	TESEQ	T8-Cat6	38888	2022.10.15
5	Pulse Limiter	CYBRTEK	EM5010	E115010056	2022.12.20
6	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2022.10.15
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2022.10.18
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2023.03.01
4	PREAMP	HP	8449B	3008A00160	2022.10.21
5	PREAMP	HP	8447D	2944A07999	2023.05.20
6	EMI Test Receiver	Rohde&Schwarz	ESR3	101891	2022.10.15
7	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2022.10.15
8	Active Loop Antenna	Com-Power	AL-310R	10160009	2023.05.20
9	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2023.05.20
10	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2022.10.23
11	Loop Antenna	Beijing daze Technology	ZN30401	13015	2022.10.15
12	EM Clamp	Schwarzbeck	MDS21	03350	2022.10.20
Harmonic / Flicker Measurement					
1	Power Analyzer	California Instrumnets	PACS-1	X71719	2022.10.15
2	AC Power Source	California Instrumnets	5001ix	HK53570	2022.10.15
Electrostatic Discharge Test					
1	ESD Generator	EVERFINE	EMS61000-2A	P185811CA837112 1	2022.10.17
RS Test					
1	Power Meter	Agilent	E4419B	QB4331226	2022.10.10
2	Power Sensor	Agilent	8481A	MY41092622	2022.10.10
3	Power Sensor	Agilent	8481A	US37296783	2022.10.10
4	Signal Generator	Agilent	N5182A	MY46240556	2022.10.10
5	Power Amplifier	MICOTOP	MPA-80-1000-250	1711489	2022.10.10

6	Power Amplifier	MICOTOP	MPA-1000-3000-75	1711488	2022.10.10
7	Power Amplifier	MICOTOP	MPA-3000-6000-50	MPA1706275	2022.10.10
8	Bilog Antenna	TESEQ	CBL6111D	34678	2022.10.10
9	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2023.05.20

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Electrical Fast Transient / Burst Immunity Test					
1	EMS Test Control System	Shanghai Lioncel	SCU-614AS	SCU614S0160601	N/A
2	EFT/B Generator	Shanghai Lioncel	EFT-404S	EFT404S0160601	2022.10.15
Surge Test					
1	EMS Test Control System	Shanghai Lioncel	SCU-614AS	SCU614S0160601	N/A
2	Surge Generator	Shanghai Lioncel	LSG-506S	LSG506S0160601	2022.10.15
3	CDN	Shanghai Lioncel	CDN-532S	CDN532S0160601	2022.10.15
CS Test					
1	CS	SCHLODER	CDG-6000-25	126A1280/2014	2022.10.10
2	CDN	SCHLODER	CDN-M2+3	A2210275/2014	2022.10.10
3	EM Clamp	SCHLODER	EMCL-20	132A1283	2022.10.10
4	Attenuator	Nemtest	ATT-6DB-100	A100W224	2022.10.10
5	Audio Analyzer	R&S	UPL	100419	2022.10.10
6	Universal Radio Communication Tester	R&S	CMW500	117239	2022.10.10
7	Universal Radio Communication Tester	R&S	CMU200	111764	2022.10.10
8	Audio Analyzer	R&S	UPL	100689	2022.10.10
9	Audio Breakthrough Shie29.2V20Aing Box	SKET	SB_ABT/C35	N/A	2022.10.10
10	Ear Simulator	SKET	AE_ABT/C35	N/A	2022.10.10
11	Mouth Simulator	SKET	AM_ABT/C35	N/A	2022.10.10
12	1KHz Standard Source	SKET	MSC_ABT/C35	N/A	2022.10.10
Power-frequency magnetic fie29.2V20As Test					
1	Magnetic Fie29.2V20A Test System	Shanghai Lioncel	PMF801C-T	PMF801C-T016070 1	2023.05.20
Voltage dips and interruptions Test					
1	Voltage SAG Simulator	Shanghai Lioncel	VDS-1101	VD29.2V20A10101 60601	2022.10.15
2	Adjustable Power Supply	Shanghai Lioncel	RGL-210	RGL2100151001	N/A

3 CONDUCTED EMISSIONS MEASUREMENT

3.1 CONDUCTED EMISSION LIMIT

3.1.1 POWER LINE CONDUCTED EMISSION

Frequency (MHz)	At mains terminals(dB V)		At load terminals and additional terminals(dB V)	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	66~56*	56~46*	80	70
0.50~5.00	56	46	74	64
5.00~30.0	60	50	74	64

3.1.2 MAINS TERMINALS OF TOOLS

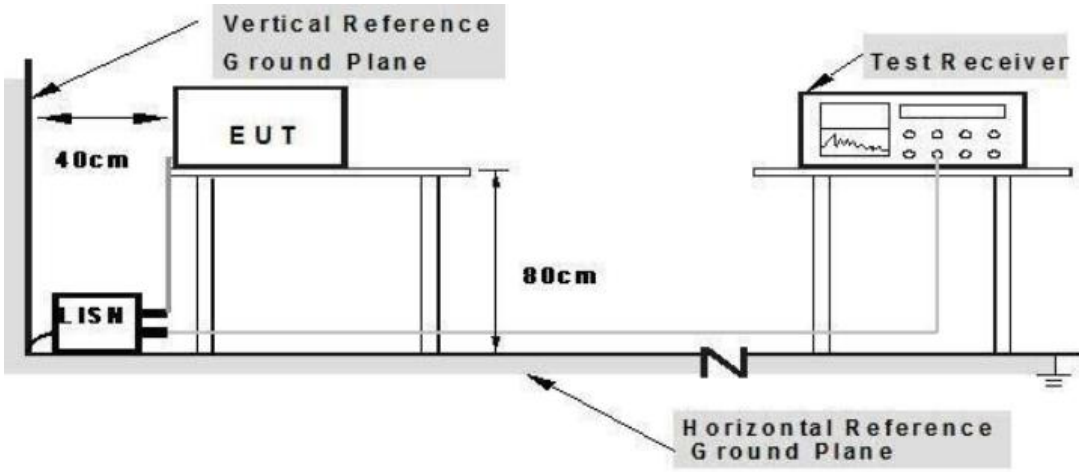
Frequency (MHz)	Rated motor power not exceeding 700W dB(uV)		Rated motor power above 700W and not exceeding 1000W dB(uV)		Rated motor power above 1000W dB(uV)	
	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	66~59*	59~49*	70~63*	63~53*	76~69*	69~59*
0.50~5.00	59	49	63	53	69	59
5.00~30.0	64	54	68	58	74	64

Note:
1. The tighter limit applies at the band edges.
2. The limit of " * " marked band means the limitation decreases linearly with thelogarithm of the frequency in the range.

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

3.2 TEST SETUP



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

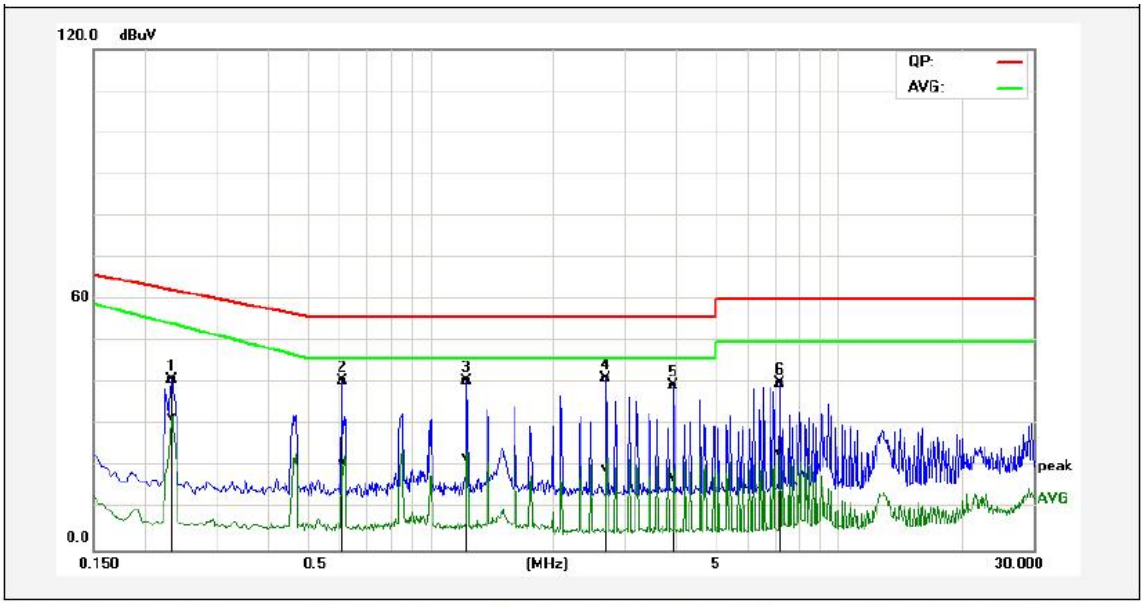
3.3 TEST PROCEDURE

1. The EUT was placed 0.4 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.
2. 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.
3. 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.
4. LISN at least 80 cm from nearest part of EUT chassis.
5. For the actual test configuration, please refer to the related Item EUT Test Photos.

3.4 TEST RESULT

PASS

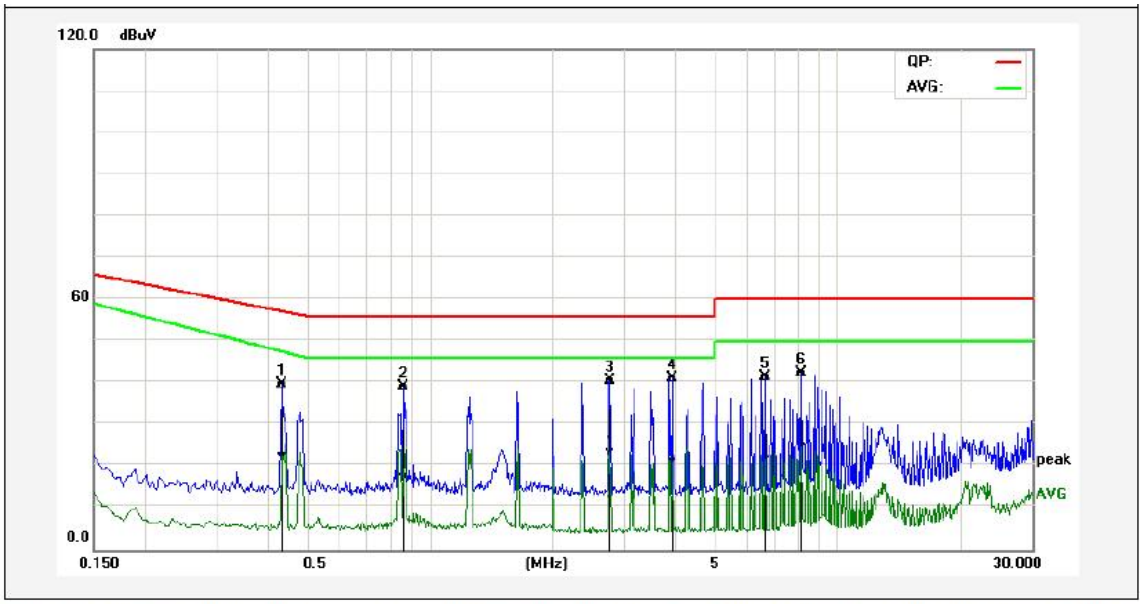
Temperature:	24℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa
Phase:	Line		



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
1P	0.2340	31.34	22.40	9.66	41.00	32.06	62.30	54.20	-21.30	-22.14	Pass
2P	0.6100	31.05	11.31	9.69	40.74	21.00	56.00	46.00	-15.26	-25.00	Pass
3P	1.2340	30.77	12.48	9.74	40.51	22.22	56.00	46.00	-15.49	-23.78	Pass
4*	2.7020	31.36	9.76	9.82	41.18	19.58	56.00	46.00	-14.82	-26.42	Pass
5P	3.9620	29.55	7.68	9.83	39.38	17.51	56.00	46.00	-16.62	-28.49	Pass
6P	7.1940	30.22	13.35	9.82	40.04	23.17	60.00	50.00	-19.96	-26.83	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

Temperature:	24℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa
Phase:	Neutral		



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
1P	0.4340	30.11	12.92	9.70	39.81	22.62	57.18	47.53	-17.37	-24.91	Pass
2P	0.8660	29.54	7.71	9.74	39.28	17.45	56.00	46.00	-16.72	-28.55	Pass
3P	2.7780	30.84	13.58	9.83	40.67	23.41	56.00	46.00	-15.33	-22.59	Pass
4*	3.9420	31.40	11.38	9.82	41.22	21.20	56.00	46.00	-14.78	-24.80	Pass
5P	6.6460	31.77	11.93	9.84	41.61	21.77	60.00	50.00	-18.39	-28.23	Pass
6P	8.1700	32.57	14.79	9.84	42.41	24.63	60.00	50.00	-17.59	-25.37	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

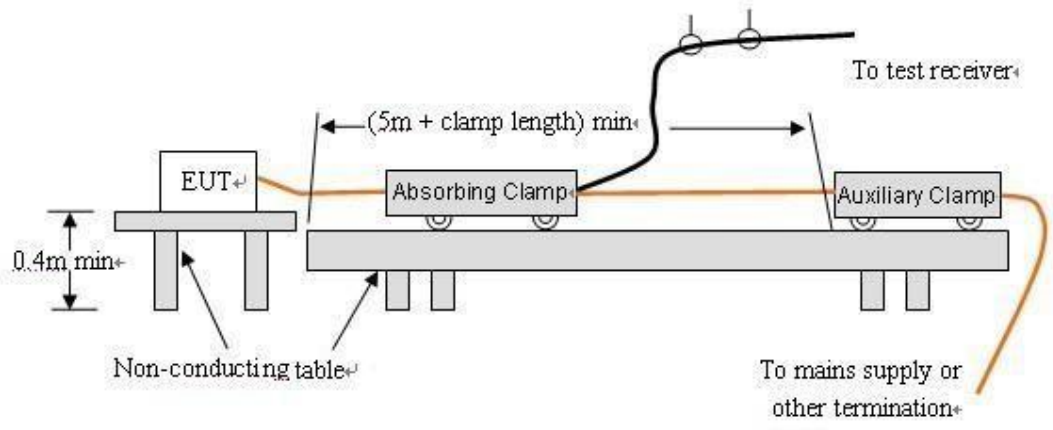
4 DISTURBANCE POWER MEASUREMENT

4.1 DISTURBANCE POWER LIMIT

Frequency (MHz)	Household appliances and similar appliances dB(pW)		Tools					
			Rated motor power not exceeding 700W dB(pW)		Rated motor power above 700W and not exceeding 1000W dB(pW)		Rated motor power above 1000W dB(pW)	
	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
30~300	44-55	35-45	44-55	35-45	49-59	39-49	55-65	45-55

Note:
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).

4.2 TEST SETUP



4.3 TEST PROCEDURE

1. The EUT is place 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 (if main lead is shorter than 6 m it should be extended).
2. 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.
3. The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
4. The EUT test program was started. Emissions were scanned and measured using a receiver connected to the absorbing clamp.
5. 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.
6. For the actual test configuration, please refer to the related Item EUT Test Photos.

4.4 TEST RESULT

PASS

Temperature:	24℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

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)	(dBpW)	(dBpW)	(dBpW)	(dBpW)	(dB)	(dB)	
1*	39.7599	16.99	-5.97	19.41	36.40	13.44	45.36	35.36	-8.96	-21.92	Pass
2P	52.0400	15.91	-5.29	17.96	33.87	12.67	45.82	35.82	-11.95	-23.15	Pass
3P	226.7200	12.11	-2.72	20.40	32.51	17.68	52.29	42.29	-19.78	-24.61	Pass
4P	260.4800	13.27	0.12	19.58	32.85	19.70	53.54	43.54	-20.69	-23.84	Pass
5P	247.6400	12.42	-1.28	19.33	31.75	18.05	53.06	43.06	-21.31	-25.01	Pass
6P	31.3200	14.47	-6.34	21.36	35.83	15.02	45.05	35.05	-9.22	-20.03	Pass

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit

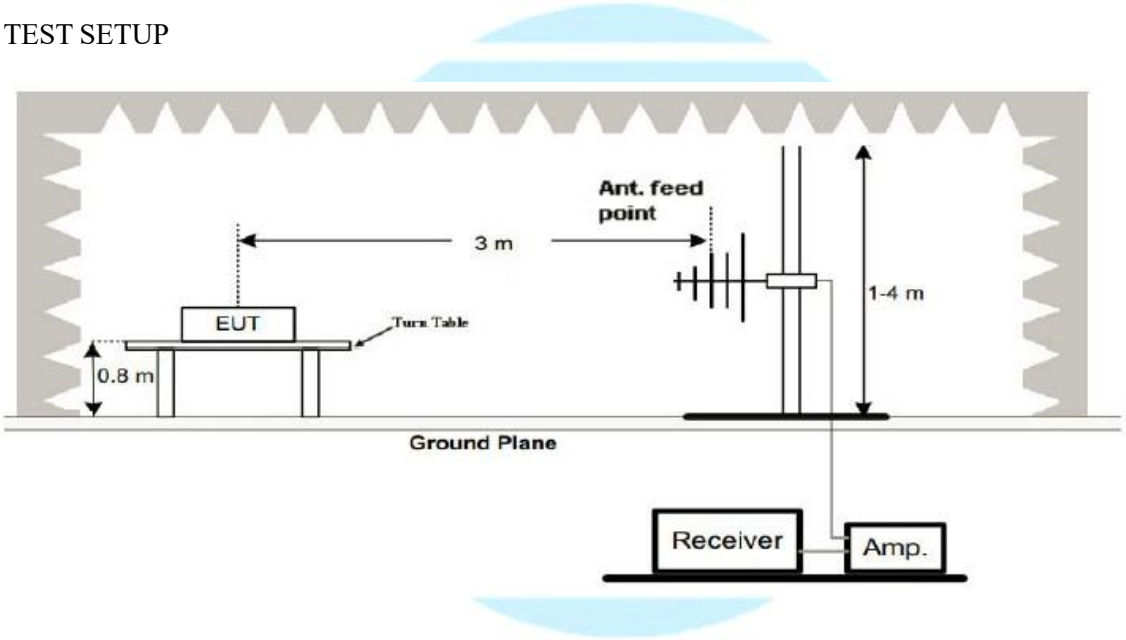
5 RADIATED EMISSIONS MEASUREMENT

5.1 RADIATED EMISSION LIMIT

Frequency (MHz)	10m	3m
	dBuV/m	dBuV/m
30~230	30	40
230~1000	37	47

Note:
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).

5.2 TEST SETUP



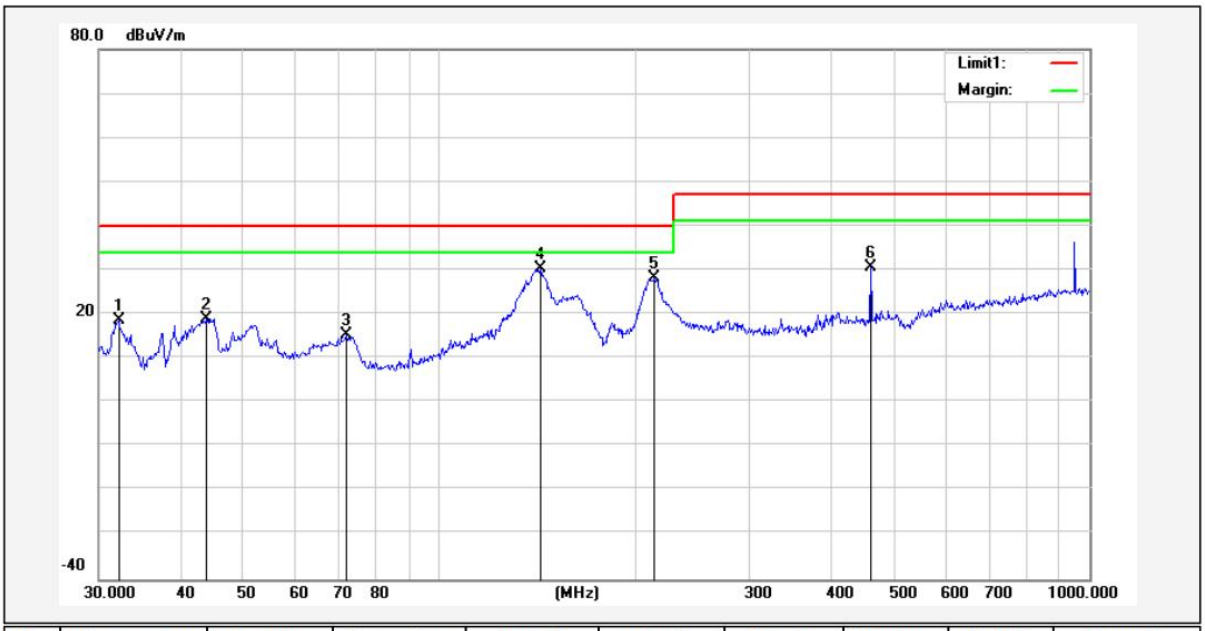
5.3 TEST PROCEDURE

1. The measuring distance of at 3 m shall be used for measurements at frequencyup to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
2. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
3. 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.
4. 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.
5. 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.
6. For the actual test configuration, please refer to the related Item EUT Test Photos.

5.4 TEST RESULT

PASS

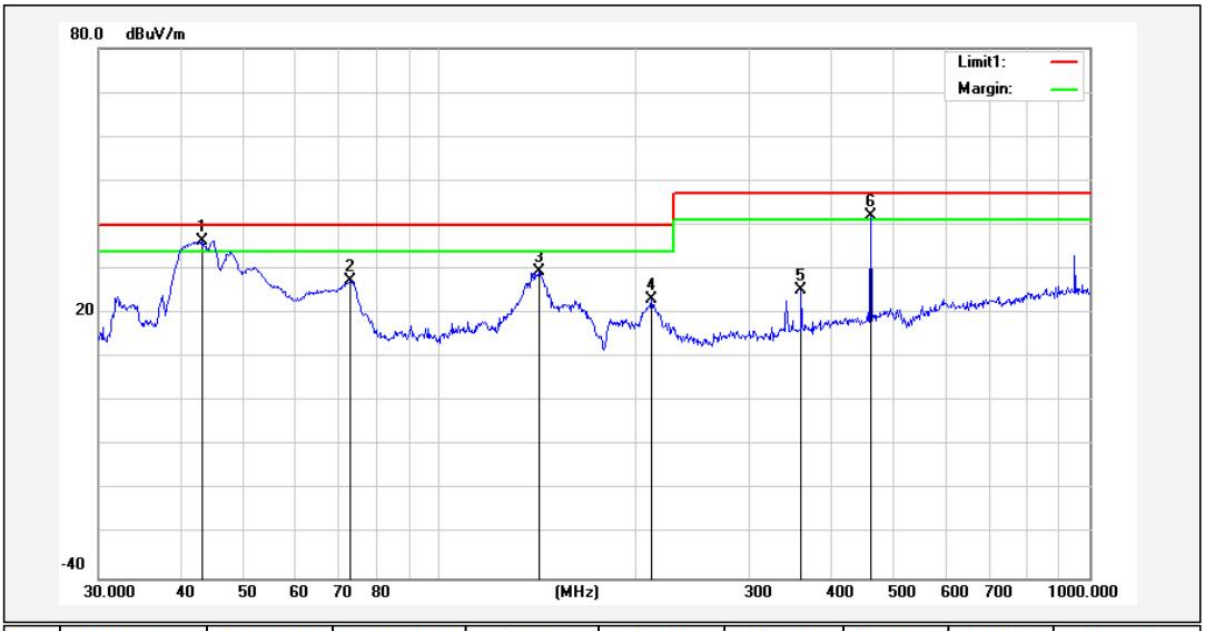
Temperature:	24℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa
Polarization:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	32.1795	30.06	-11.40	18.66	40.00	-21.34			peak
2	43.8119	36.46	-17.52	18.94	40.00	-21.06			peak
3	72.0843	35.73	-20.49	15.24	40.00	-24.76			peak
4*	143.3261	45.89	-15.60	30.29	40.00	-9.71			peak
5	214.5143	44.63	-16.34	28.29	40.00	-11.71			peak
6	460.7271	40.38	-9.59	30.79	47.00	-16.21			peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	24℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa
Polarization:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	43.3534	53.62	-17.19	36.43	40.00	-3.57			peak
2	73.1025	47.76	-20.52	27.24	40.00	-12.76			peak
3	142.3244	45.01	-15.52	29.49	40.00	-10.51			peak
4	212.2695	39.24	-16.23	23.01	40.00	-16.99			peak
5	360.4477	37.18	-12.00	25.18	47.00	-21.82			peak
6!	460.7271	51.67	-9.59	42.08	47.00	-4.92			peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

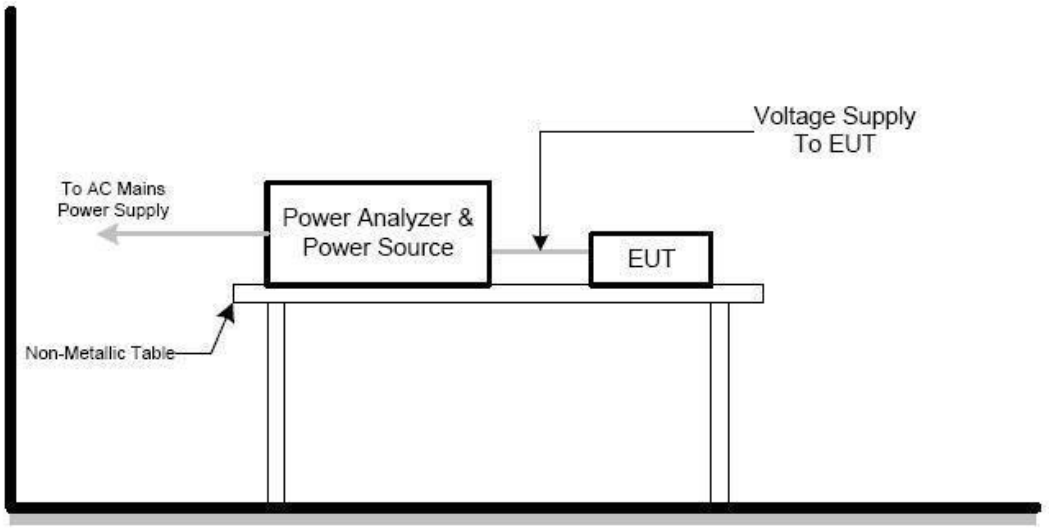
6 HARMONICS CURRENT

6.1 HARMONICS CURRENT LIMIT

IEC 555-2					
Talbe-I			Talbe-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		
	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				
	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 Ampers)	
Class A	Same as Limits Specified in 4-2.1,Table-1, 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	0.85/n
			only odd harmonics required		

6.2 TEST SETUP



6.3 TEST PROCEDURE

1. The EUT was placed on the top of a wooden table 0.8 meters above the groundand operated to produce the maximum harmonic components under normal operating conditions.
2. The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows: Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D,Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes. Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment. Class C: Lighting equipment.
   Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.
3. The correspondent test program of test instrument to measure the current harmonics emanated fromEUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

6.4 TEST RESULT

Temperature:	24℃	Relative Humidity:	48%
Test Voltage:	AC 220V	Pressure:	1010hPa
Test Mode:	Running		

E. U. T. Result

Harmonic(s) > 200%:	
Order (n):	None
Harmonic(s) with average > 90%:	
Order (n):	None
Harmonic(s) between 150% and 200% during more than 10% of the test time or max. 10min:	
Order (n):	None

Power Source Result

First dataset out of limit:	
DS (time):	None
Harmonic(s) out of limit:	
Order (n):	None

Average harmonic current results				
Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	32.497E-3	100.000		
2	1.299E-3	3.998	972.00E-3	PASS
3	30.692E-3	94.445	2.07	PASS
4	1.816E-3	5.588	387.00E-3	PASS
5	29.329E-3	90.253	1.03	PASS
6	1.292E-3	3.977	270.00E-3	PASS
7	27.576E-3	84.858	693.00E-3	PASS
8	952.234E-6	2.930	207.00E-3	PASS
9	25.431E-3	78.258	360.00E-3	PASS
10	896.645E-6	2.759	165.60E-3	PASS
11	22.984E-3	70.728	297.00E-3	PASS
12	936.627E-6	2.882	138.00E-3	PASS
13	20.328E-3	62.555	189.00E-3	PASS
14	811.926E-6	2.498	118.29E-3	PASS
15	17.540E-3	53.975	135.00E-3	PASS
16	726.776E-6	2.236	103.50E-3	PASS
17	14.732E-3	45.335	119.11E-3	PASS
18	1.012E-3	3.114	92.00E-3	PASS
19	12.030E-3	37.019	106.58E-3	PASS
20	705.497E-6	2.171	82.80E-3	PASS
21	9.547E-3	29.379	96.43E-3	PASS
22	909.232E-6	2.798	75.28E-3	PASS
23	7.371E-3	22.682	88.05E-3	PASS
24	643.431E-6	1.980	68.99E-3	PASS
25	5.613E-3	17.273	81.00E-3	PASS
26	621.366E-6	1.912	63.69E-3	PASS
27	4.388E-3	13.504	75.00E-3	PASS
28	604.813E-6	1.861	59.14E-3	PASS
29	3.655E-3	11.249	69.83E-3	PASS
30	599.997E-6	1.846	55.20E-3	PASS
31	3.365E-3	10.356	65.32E-3	PASS
32	584.959E-6	1.800	51.75E-3	PASS
33	3.240E-3	9.969	61.36E-3	PASS
34	589.753E-6	1.815	48.71E-3	PASS
35	3.154E-3	9.706	57.86E-3	PASS
36	745.584E-6	2.294	46.00E-3	PASS
37	3.004E-3	9.245	54.73E-3	PASS
38	602.293E-6	1.853	43.58E-3	PASS
39	2.738E-3	8.426	51.92E-3	PASS
40	712.286E-6	2.192	41.40E-3	PASS

Maximum harmonic current results				
Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	32.829E-3	100.000		
2	2.053E-3	6.254	2.16	PASS
3	31.136E-3	94.843	4.60	PASS
4	3.390E-3	10.327	860.00E-3	PASS
5	30.083E-3	91.635	2.28	PASS
6	1.778E-3	5.417	600.00E-3	PASS
7	28.240E-3	86.020	1.54	PASS
8	1.451E-3	4.420	460.00E-3	PASS
9	26.091E-3	79.475	800.00E-3	PASS
10	1.393E-3	4.243	368.00E-3	PASS
11	23.548E-3	71.730	660.00E-3	PASS
12	1.215E-3	3.700	306.66E-3	PASS
13	20.749E-3	63.203	420.00E-3	PASS
14	1.094E-3	3.331	262.86E-3	PASS
15	17.851E-3	54.375	300.00E-3	PASS
16	1.036E-3	3.155	230.00E-3	PASS
17	14.934E-3	45.489	264.70E-3	PASS
18	1.292E-3	3.937	204.44E-3	PASS
19	12.201E-3	37.165	236.84E-3	PASS
20	967.940E-6	2.948	184.00E-3	PASS
21	9.662E-3	29.430	214.28E-3	PASS
22	1.174E-3	3.576	167.28E-3	PASS
23	7.515E-3	22.891	195.66E-3	PASS
24	884.520E-6	2.694	153.32E-3	PASS
25	5.762E-3	17.550	180.00E-3	PASS
26	844.765E-6	2.573	141.54E-3	PASS
27	4.499E-3	13.705	166.66E-3	PASS
28	782.868E-6	2.385	131.42E-3	PASS
29	3.756E-3	11.440	155.18E-3	PASS
30	750.699E-6	2.287	122.66E-3	PASS
31	3.476E-3	10.588	145.16E-3	PASS
32	759.436E-6	2.313	115.00E-3	PASS
33	3.429E-3	10.446	136.36E-3	PASS
34	766.301E-6	2.334	108.24E-3	PASS
35	3.396E-3	10.345	128.58E-3	PASS
36	980.017E-6	2.985	102.22E-3	PASS
37	3.248E-3	9.893	121.62E-3	PASS
38	796.979E-6	2.428	96.84E-3	PASS
39	2.981E-3	9.081	115.38E-3	PASS
40	957.699E-6	2.917	92.00E-3	PASS

Maximum harmonic voltage results				
Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.38	100.599		
2	73.71E-3	0.032	0.2	PASS
3	118.14E-3	0.051	0.9	PASS
4	17.60E-3	0.008	0.2	PASS
5	39.89E-3	0.017	0.4	PASS
6	15.11E-3	0.007	0.2	PASS
7	46.20E-3	0.020	0.3	PASS
8	14.51E-3	0.006	0.2	PASS
9	41.06E-3	0.018	0.2	PASS
10	11.32E-3	0.005	0.2	PASS
11	44.90E-3	0.020	0.1	PASS
12	10.67E-3	0.005	0.1	PASS
13	40.80E-3	0.018	0.1	PASS
14	9.95E-3	0.004	0.1	PASS
15	37.21E-3	0.016	0.1	PASS
16	10.53E-3	0.005	0.1	PASS
17	34.50E-3	0.015	0.1	PASS
18	10.00E-3	0.004	0.1	PASS
19	21.94E-3	0.010	0.1	PASS
20	11.21E-3	0.005	0.1	PASS
21	45.11E-3	0.020	0.1	PASS
22	9.99E-3	0.004	0.1	PASS
23	20.80E-3	0.009	0.1	PASS
24	14.25E-3	0.006	0.1	PASS
25	18.43E-3	0.008	0.1	PASS
26	10.98E-3	0.005	0.1	PASS
27	21.66E-3	0.009	0.1	PASS
28	11.93E-3	0.005	0.1	PASS
29	40.50E-3	0.018	0.1	PASS
30	10.68E-3	0.005	0.1	PASS
31	19.94E-3	0.009	0.1	PASS
32	10.30E-3	0.004	0.1	PASS
33	17.33E-3	0.008	0.1	PASS
34	10.45E-3	0.005	0.1	PASS
35	18.79E-3	0.008	0.1	PASS
36	10.45E-3	0.005	0.1	PASS
37	28.09E-3	0.012	0.1	PASS
38	9.74E-3	0.004	0.1	PASS
39	24.44E-3	0.011	0.1	PASS
40	12.46E-3	0.005	0.1	PASS

Harmonic current results - DS: 22				
Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	32.561E-3	100.000		
2	1.407E-3	4.323	1.08	PASS
3	30.902E-3	94.905	2.30	PASS
4	2.826E-3	8.680	430.00E-3	PASS
5	30.071E-3	92.353	1.14	PASS
6	1.277E-3	3.922	300.00E-3	PASS
7	28.178E-3	86.539	770.00E-3	PASS
8	1.004E-3	3.082	230.00E-3	PASS
9	26.049E-3	80.001	400.00E-3	PASS
10	900.316E-6	2.765	184.00E-3	PASS
11	23.490E-3	72.140	330.00E-3	PASS
12	915.808E-6	2.813	153.33E-3	PASS
13	20.748E-3	63.720	210.00E-3	PASS
14	793.970E-6	2.438	131.43E-3	PASS
15	17.851E-3	54.822	150.00E-3	PASS
16	745.497E-6	2.290	115.00E-3	PASS
17	14.902E-3	45.765	132.35E-3	PASS
18	1.193E-3	3.663	102.22E-3	PASS
19	12.094E-3	37.143	118.42E-3	PASS
20	693.706E-6	2.130	92.00E-3	PASS
21	9.510E-3	29.206	107.14E-3	PASS
22	1.132E-3	3.477	83.64E-3	PASS
23	7.315E-3	22.465	97.83E-3	PASS
24	668.640E-6	2.053	76.66E-3	PASS
25	5.512E-3	16.928	90.00E-3	PASS
26	662.294E-6	2.034	70.77E-3	PASS
27	4.305E-3	13.222	83.33E-3	PASS
28	649.062E-6	1.993	65.71E-3	PASS
29	3.618E-3	11.112	77.59E-3	PASS
30	632.252E-6	1.942	61.33E-3	PASS
31	3.444E-3	10.577	72.58E-3	PASS
32	608.284E-6	1.868	57.50E-3	PASS
33	3.323E-3	10.206	68.18E-3	PASS
34	573.288E-6	1.761	54.12E-3	PASS
35	3.273E-3	10.052	64.29E-3	PASS
36	928.190E-6	2.851	51.11E-3	PASS
37	3.171E-3	9.738	60.81E-3	PASS
38	606.135E-6	1.862	48.42E-3	PASS
39	2.797E-3	8.589	57.69E-3	PASS
40	916.792E-6	2.816	46.00E-3	PASS

Caution: Results related to the 100% limit values

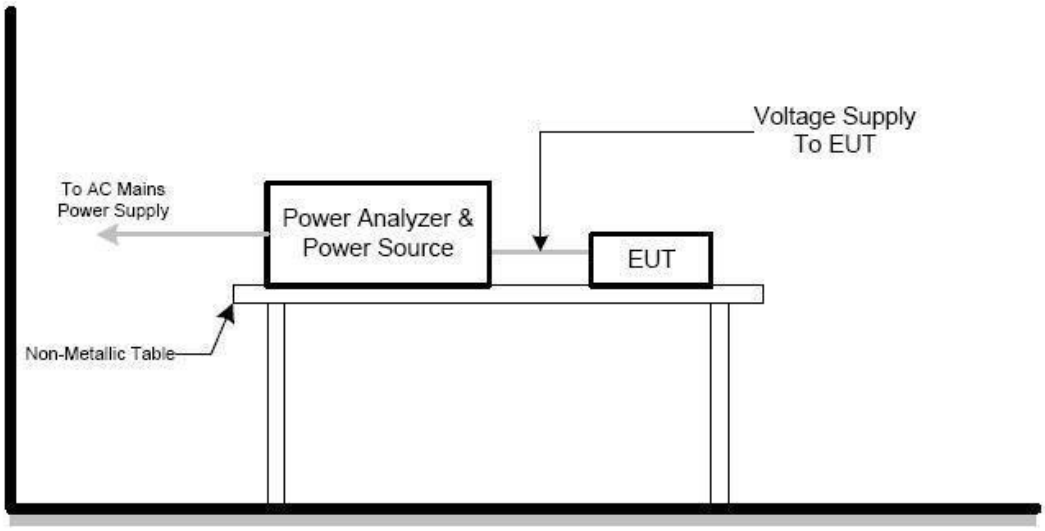
Harmonic voltage results - DS: 22				
Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.37	100.594		
2	56.61E-3	0.025	0.2	PASS
3	98.20E-3	0.043	0.9	PASS
4	6.66E-3	0.003	0.2	PASS
5	35.37E-3	0.015	0.4	PASS
6	6.01E-3	0.003	0.2	PASS
7	38.57E-3	0.017	0.3	PASS
8	599.76E-6	0.000	0.2	PASS
9	32.03E-3	0.014	0.2	PASS
10	9.29E-3	0.004	0.2	PASS
11	30.48E-3	0.013	0.1	PASS
12	4.31E-3	0.002	0.1	PASS
13	34.38E-3	0.015	0.1	PASS
14	3.40E-3	0.001	0.1	PASS
15	30.32E-3	0.013	0.1	PASS
16	2.68E-3	0.001	0.1	PASS
17	30.97E-3	0.013	0.1	PASS
18	5.19E-3	0.002	0.1	PASS
19	11.73E-3	0.005	0.1	PASS
20	8.01E-3	0.003	0.1	PASS
21	41.84E-3	0.018	0.1	PASS
22	3.10E-3	0.001	0.1	PASS
23	11.97E-3	0.005	0.1	PASS
24	2.73E-3	0.001	0.1	PASS
25	13.32E-3	0.006	0.1	PASS
26	4.32E-3	0.002	0.1	PASS
27	10.01E-3	0.004	0.1	PASS
28	4.48E-3	0.002	0.1	PASS
29	33.31E-3	0.014	0.1	PASS
30	2.35E-3	0.001	0.1	PASS
31	13.06E-3	0.006	0.1	PASS
32	5.47E-3	0.002	0.1	PASS
33	16.34E-3	0.007	0.1	PASS
34	2.67E-3	0.001	0.1	PASS
35	16.24E-3	0.007	0.1	PASS
36	1.18E-3	0.001	0.1	PASS
37	22.01E-3	0.010	0.1	PASS
38	4.85E-3	0.002	0.1	PASS
39	14.27E-3	0.006	0.1	PASS
40	4.35E-3	0.002	0.1	PASS

7 VOLTAGE FLUCTUATION AND FLICKERS

7.1 VOLTAGE FLUCTUATION AND FLICKERS LIMIT

Tests	Measurement Value	Limit	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
Tdt(s)	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax(%)	≤ 4%	≤ 4%	Maximum Relative V-Chang
dc(%)	N/A	≤ 3.3% for > 500 ms	Relative V-change Characteristic

7.2 TEST SETUP



7.3 TEST PROCEDURE

1. 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.
2. All types of voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

7.4 TEST RESULT

Temperature:	22℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

Test Parameter	Measurement Value	Limit	Result
Pst	0.028	1.00	Pass
Plt	0.028	0.65	Pass
dc [%]	0.004	3.30	Pass
dmax [%]	0.170	7.00	Pass
dt [s]	0.000	0.50	Pass

8 EMC IMMUNITY TEST

8.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform Criteria
ESD IEC/EN 61000-4-2	8kV air discharge 4kV contact discharge	Direct Mode	B
	4kV HCP discharge 4kV VCP discharge	Indirect Mode	B
RS IEC/EN 61000-4-3	80 MHz to 1000 MHz, 1000Hz, 80%, AM modulated	Enclosure	A
EFT/Burst IEC/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
Surges IEC/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
Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz, 1000Hz 80%, AM Modulated 150 source impedance	CTL/Signal Port	A
	0.15 MHz to 80 MHz, 1000Hz 80%, AM Modulated 150 source impedance	AC Power Port	A
	0.15 MHz to 80 MHz, 1000Hz 80%, AM Modulated 150 source impedance	DC Power Port	A
Power Frequency Magnetic Fie29.2V20A IEC/EN 61000-4-8	50 Hz	Enclosure	A
Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip 0% Voltage dip 30% Interruption 60%	AC Power Port	C C C

8.2 GENERAL PERFORMANCE CRITERIA

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

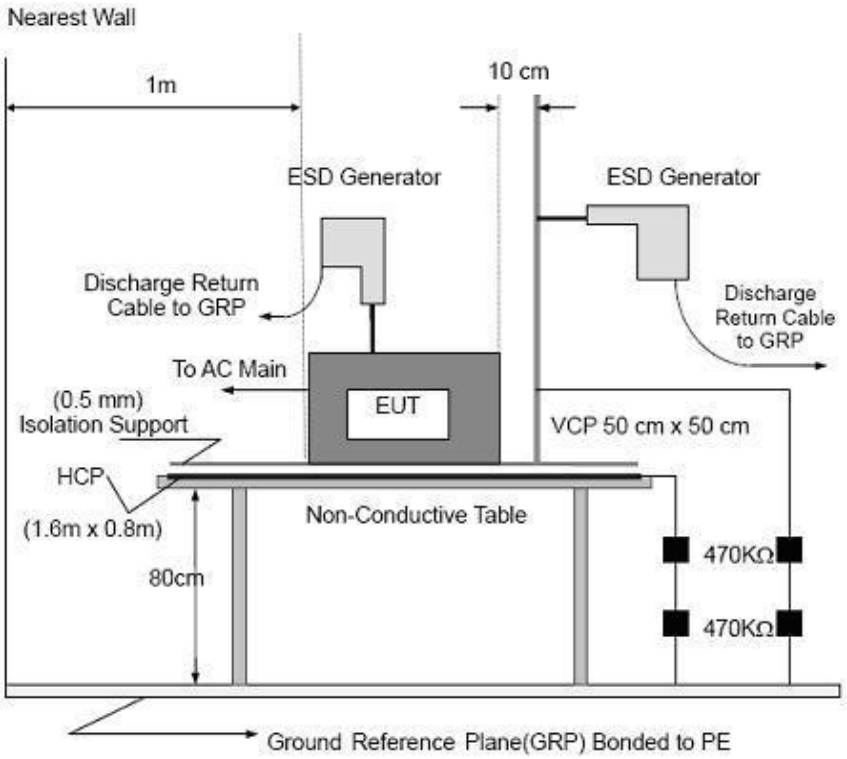
Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level 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	During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, 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), or recovery time, 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 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. A reboot or re-start operation is allowed.Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

9 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

9.1 TEST SPECIFICATION

Basic Standard:	IEC/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 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

9.2 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. 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
of0.8-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 was consisted of a sheet of aluminum that is at least 0.25mm thick, and extended at least
0.5 meters from the EUT on all sides.

9.3 TEST PROCEDURE

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

1. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
   The time interval between two successive single discharges was at least 1 second.
   The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
   Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
   Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
   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.
2. Air discharges at insulation surfaces of the EUT.
   It was at least ten single discharges with positive and negative at the same selected point.

9.4 TEST RESULT

Temperature:	22℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

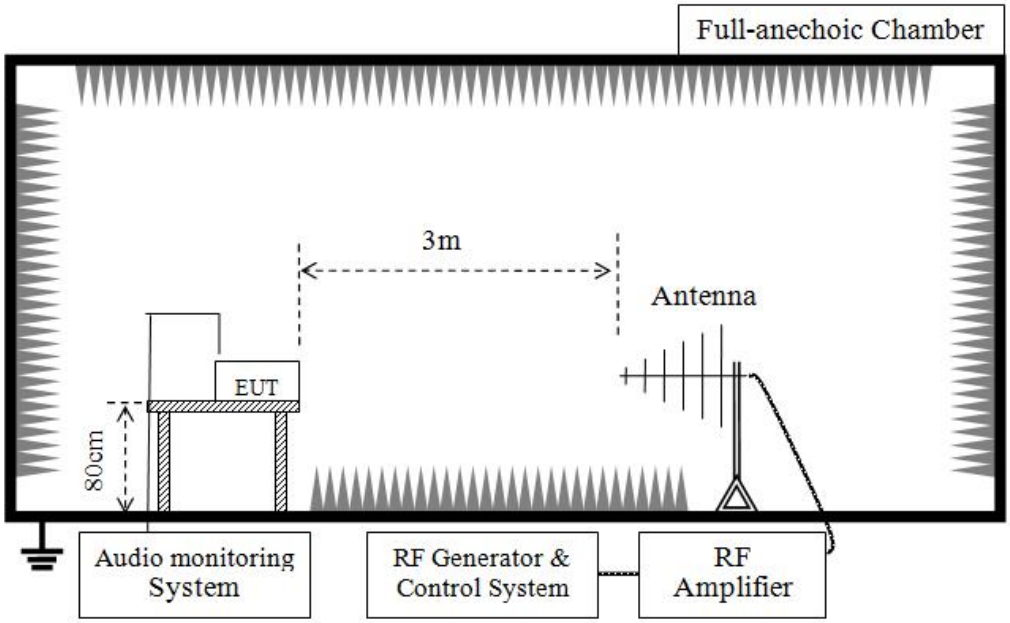
Mode	Air Discharge								Contact Discharge								Perform Criteria	Result
Test level (kV)	4		8		10		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
HCP									A	A	A	A					B	PASS
VCP									A	A	A	A						PASS
Slots	A	A	A	A														PASS
Surface	A	A	A	A														PASS

10 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

10.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance:	A
Frequency Range:	80~1000MHz
Fie29.2V20A 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

10.2 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.

10.3 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 need as following manners:

1. 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 1.5x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
2. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
3. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

10.4 TEST RESULT

Temperature:	22℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

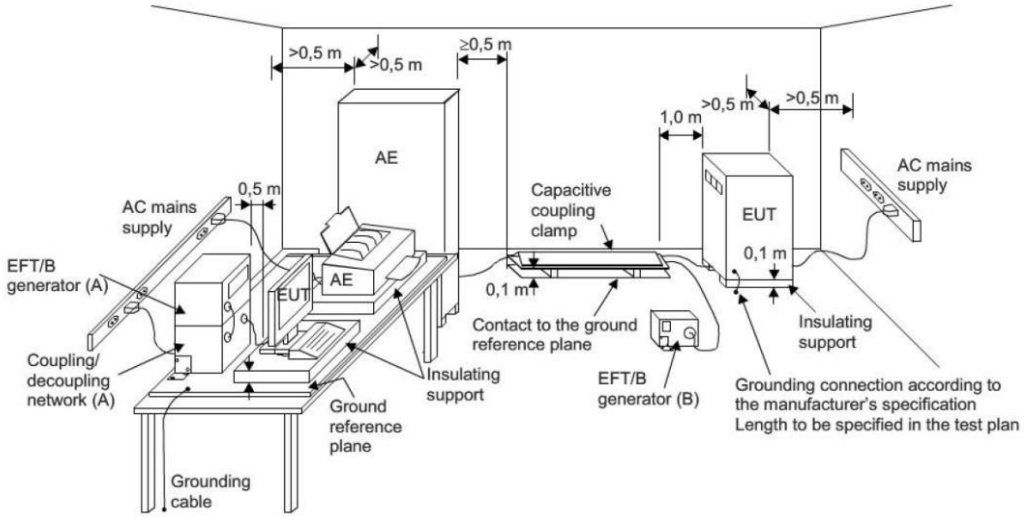
Frequency Range (MHz)	RF Fie29.2V 20A Position	R.F. Fie29.2V20A Strength	Azimuth	Perform Criteria	Result
80~1000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	A	PASS
			Rear		
			Left		
			Right		

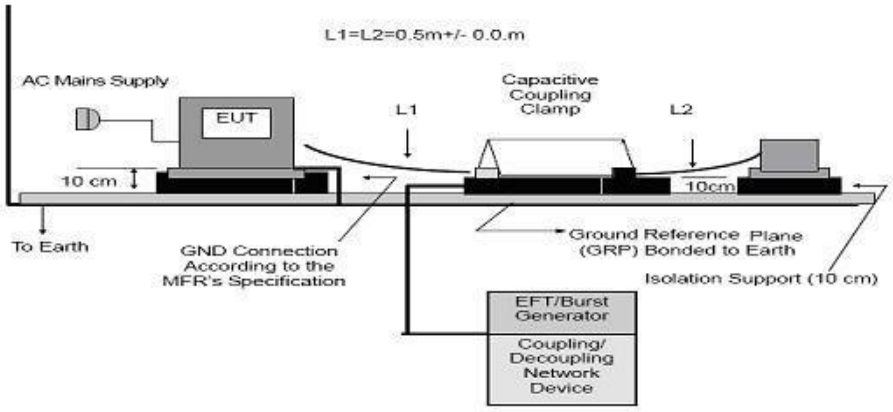
11 ELECTRICAL FAST TRANSIENT IMMUNITY TEST (EFT)

11.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance:	B
Test Voltage:	Power Line: 1kV Signal/Control Line: 0.5kV
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.

11.2 TEST SETUP





Note:

TABLE-TOP EQUIPMENT

Table-top equipment and equipment normally mounted on ceilings or walls as well as built-in equipment shall be tested with the EUT located (0.1±0.01) m above the ground reference plane.
Testing of large table-top equipment or multiple systems can be performed on the floor; maintaining the same distances as for the test setup of table-top equipment.
The test generator and the coupling/decoupling network shall be bonded to the ground reference plane.
The ground reference plane shall be a metallic sheet (copper or aluminium) of 0. 25 mm minimum thickness; other metallic materials may be used , but they shall have at least 0.65 mm minimum thickness.
The minimum size of the ground reference plane is 0.8 m x 1 m The actual size depends on the dimensions of the EUT. The ground reference plane shall project beyond the EUT by at least 0.1 m on all sides. The ground reference plane shall be connected to prolective earth (PE) for safety reasons.
The EUT shall be arranged and connected to satisfy its functional requirements, according to the equipment installation specifications.
The minimum distance between the EUT and all other conductive structures (including the generator, AE and the walls of a shielded room), except the ground reference plane , shall be more than 0.5 m.
AII cables to The EUT shall be placed on The insulation support 0.1 m above The ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.
The EUT shall be connected to the earthing system in accordance with the manufacturer's installation specifications; no additional earthing connections are allowed.
The connection impedance of the coupling/decoupling network earth cables to the ground reference plane and all bondings shall provide a low inductance.
Either a direct coupling network or a capacitive clamp shall be used for the application of the test voltages . The test voltages shall be coupled to all of the EUT porls in turn including those between two units of equipment involved in the test, unless the length of the interconnecting cable makes it impossible to test.

FLOOR-STANDING EQUIPMENT

When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces (including the generator), except the ground reference plane beneath the coupling clamp and beneath the EUT , shall be at least 0.5m.
The distance between any coupling devices and the EUT shall be (0.5 - 0/+0.1) m for tabletop equipment testing, and (1.0±0.1) m for floor standing equipment, unless otherwise specified in product standards. When it is not physically possible to apply the distances mentioned above, other distances can be used and shall be recorded in the lest report.
The cable between the EUT and the coupling device, if detachable, shall be as short as possible to comply with the requirements of this clause. lf the manufacturer provides a cable exceeding the distance between the coupling device and the point of early of the EUT, the excess length of this cable shall be bundled and situated at a distance of 0,1 m above the ground reference plane. When a capacitive clamp is used as a coupling device, the excess cable length shall be bundled at the AE side.
Parts of the EUT with interconnecting cables of a length less than 3 m, which are not tested, shall be placed on the insulating support. The parts of the EUT shall have a distance of 0.5 m between them. Excess cable length shall be bundled.

11.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter&0.1 meter above a metal ground plane measured 1m*1m min.
The ground reference plane shall be a metallic sheet (copper or aluminium) of 0. 25 mm minimum thickness; other metallic materials may be used , but they shall have at least 0.65 mm minimum thickness.
The other condition need as following manners:

1. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
2. Both positive and negative polarity discharges were applied.
3. The duration time of each test sequential was 2 minute.

11.4 TEST RESULT

Temperature:	22℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

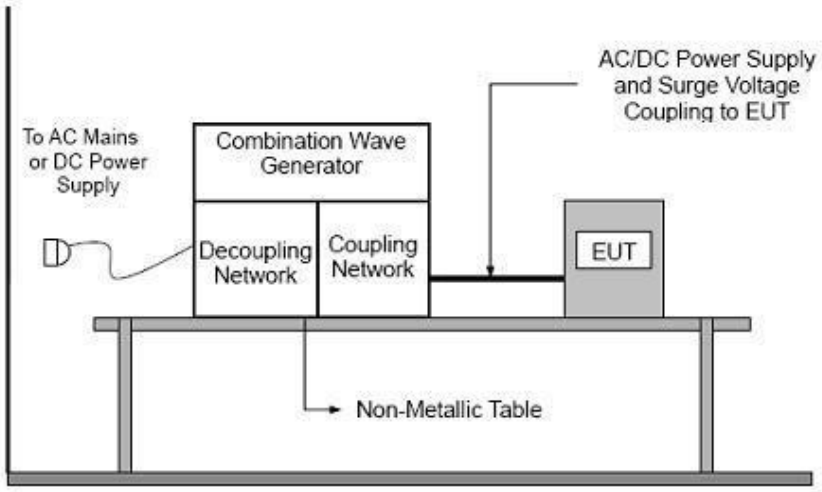
Coupling Line		Test level (kV)								Perform Criteria	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	A	A	A	A					B	PASS
	N	A	A	A	A						PASS
	PE										
	L+N	A	A	A	A						PASS
	L+PE										
	N+PE										
	L+N+PE										
DC Line											
Signal Line											

12 SURGE IMMUNITY TEST (SURGE)

12.1 TEST SPECIFICATION

Basic Standard:	IEC/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

12.2 TEST SETUP



12.3 TEST PROCEDURE

1. 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).
2. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
3. 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).

12.4 TEST RESULT

Temperature:	22℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

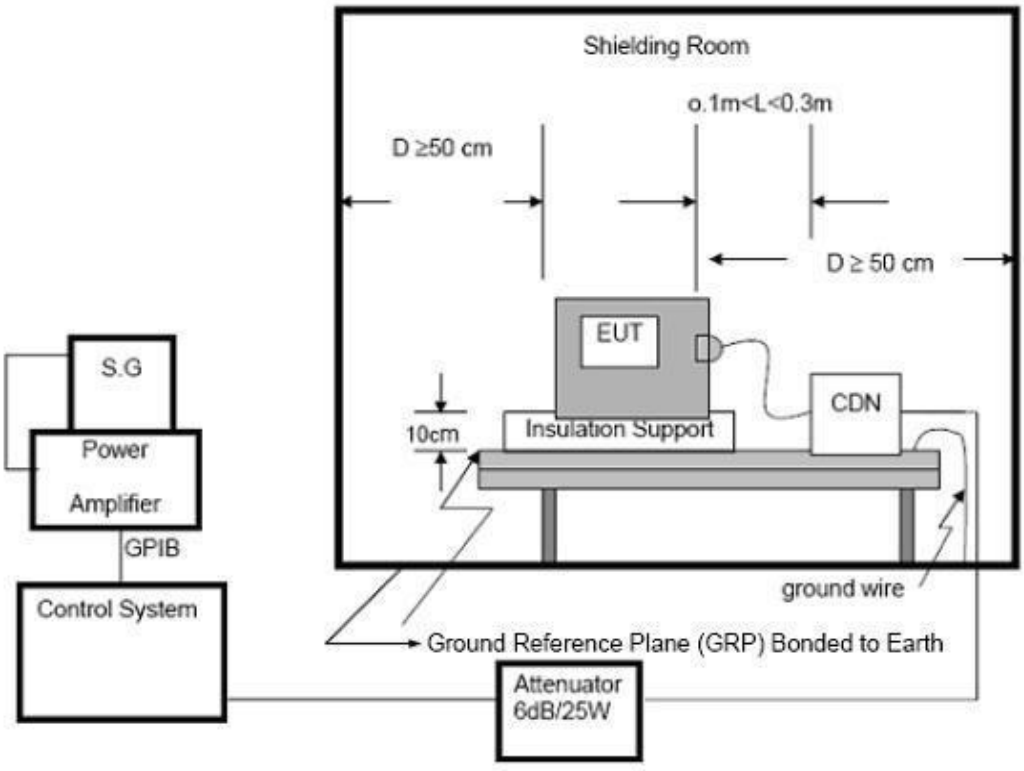
Coupling Line			Test level								Perform Criteria	Result
			0.5 kV		1 kV		2 kV		4 kV			
			+	-	+	-	+	-	+	-		
AC line	L-N	0°	A	A	A	A					B	PASS
		90°	A	A	A	A						
		180°	A	A	A	A						
		270°	A	A	A	A						
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC Line												
Signal Line												

13 CONDUCTED RADIO FREQUENCY DISTURBANCES IMMUNITY TEST (CS)

13.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance:	A
Frequency Range:	0.15~80MHz
Fie29.2V20A Strength:	3V(rms)
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

13.2 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.

13.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter&0.1 meter above a metal ground plane measured 1m*1m min.
The other condition need as following manners:

1. The EUT shall be tested within its intended operating and climatic conditions.
2. An artificial hand was placed on the hand-held accessory and connected to the ground reference plane.
3. One of the CDNs not used for injection was terminated with 50Ω, providing only one return path. All other CDNs were coupled as decoupling networks.
4. The frequency range is swept 0.15-80MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. Where the frequency is swept incrementally, the step size shall not exceed 1% of the preceding frequency value.
5. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s. The sensitive frequencies (e.g. clock frequencies) shall be analyzed separately.
6. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

13.4 TEST RESULT

Temperature:	22°C	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

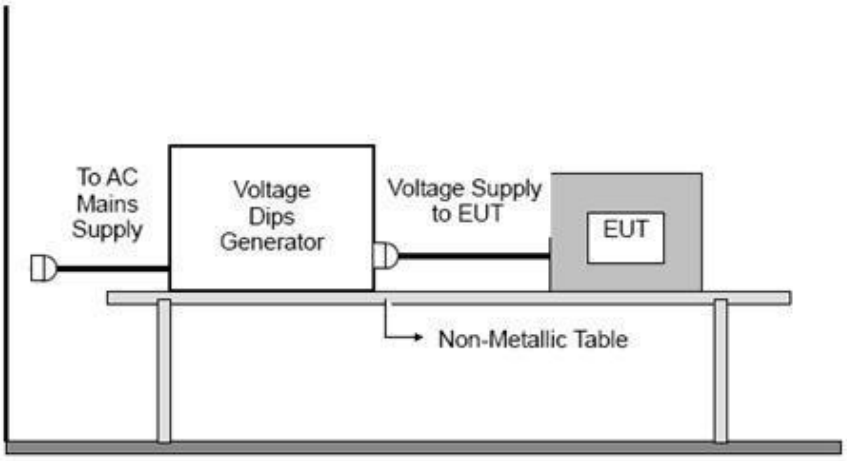
Test Ports (Mode)	Freq. Range (MHz)	Fie29.2V20A Strength	Perform Criteria	Result
Input/Output AC. Power Port	0.15~80	3V(rms) AM Modulated 1000Hz, 80%	A	PASS
Input/Output DC. Power Port	0.15~80		N/A	N/A
Signal Line	0.15~80		N/A	N/A

14 VOLTAGE INTERRUPTION/DIPS IMMUNITY TEST (DIPS)

14.1 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

14.2 TEST SETUP



14.3 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.

14.4 TEST RESULT

Temperature:	22℃	Relative Humidity:	48%
Test Mode:	Running	Pressure:	1010hPa

Voltage Reduction	Duration (cycle)	Perform Criteria	Result
Voltage dip 100%	0.5	C	PASS
Voltage dip 30%	10	C	PASS
Voltage interruptions	50	C	PASS

15 PHOTO OF EUT

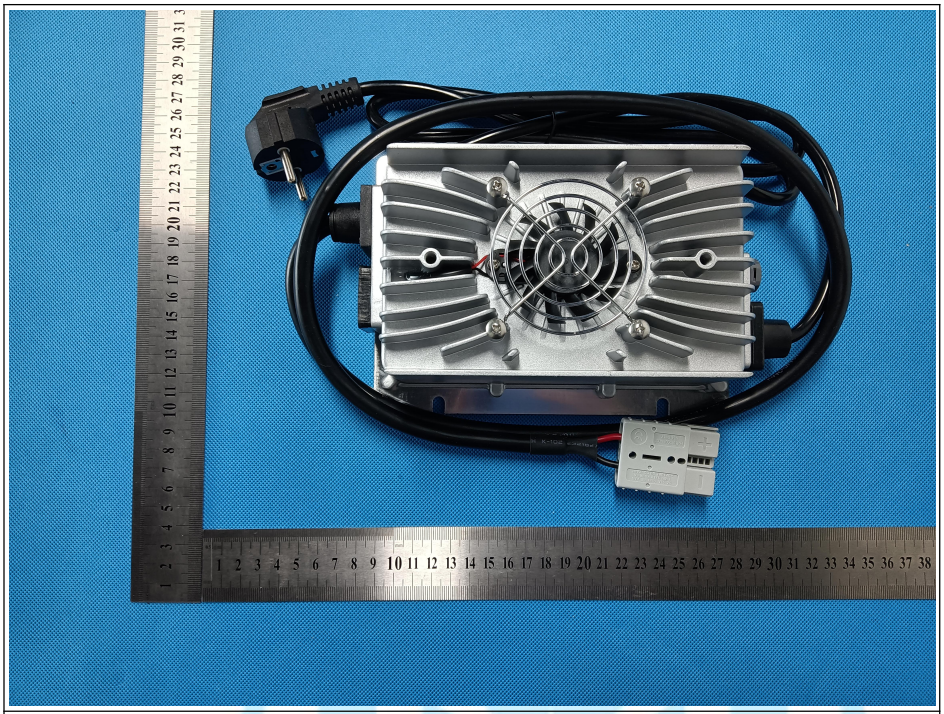


PHOTO 01

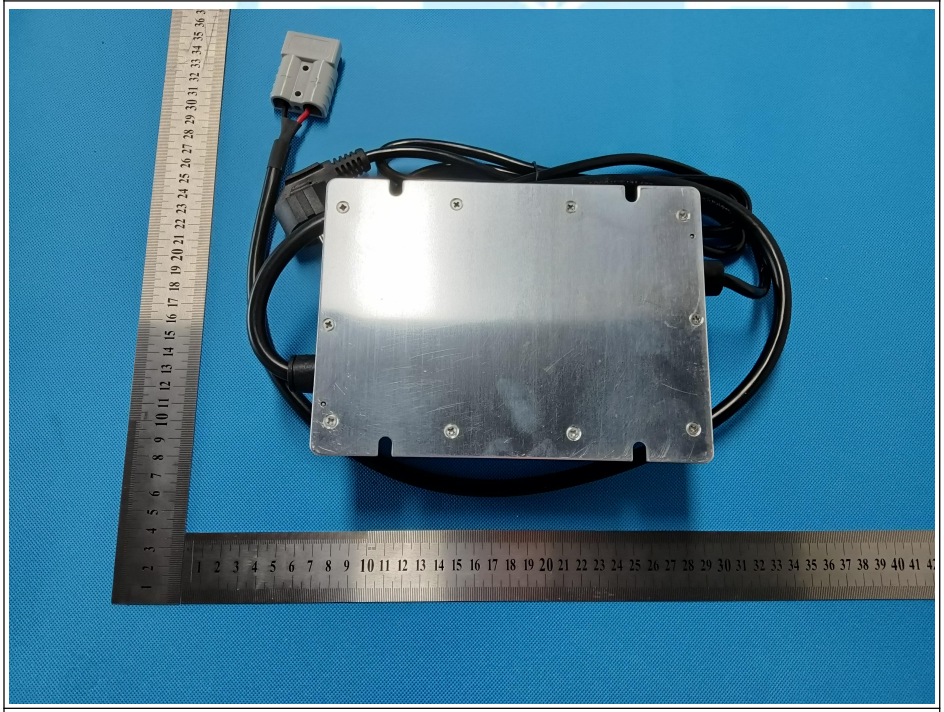


PHOTO 02

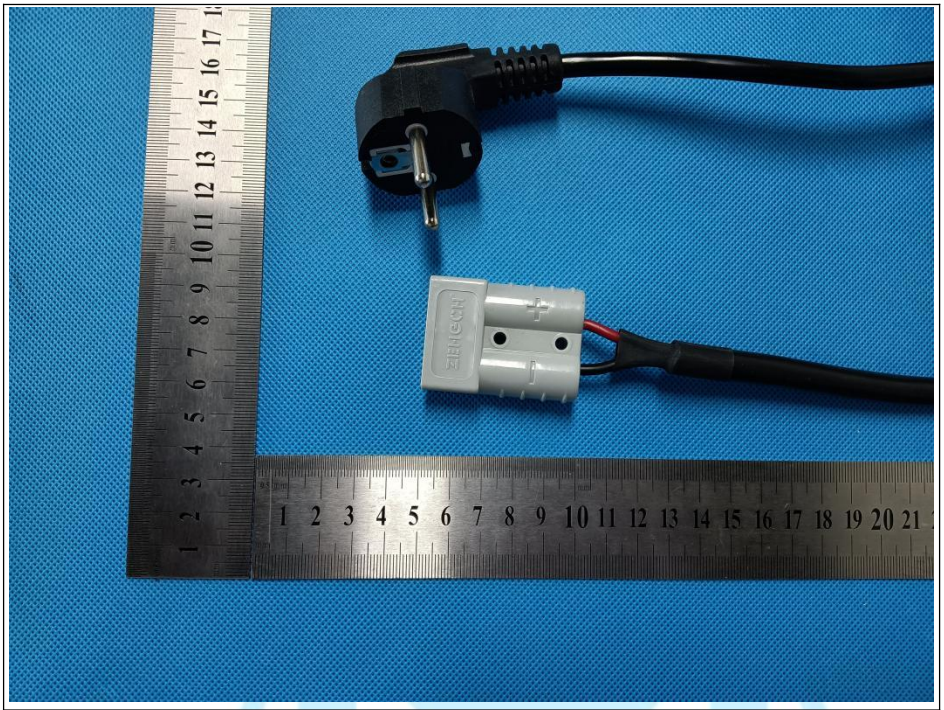


PHOTO 03

End of Report