

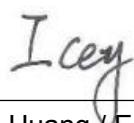
EMC TEST REPORT

The device described below is tested by Shenzhen Nore Testing Center Co.,Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results are contained in this test report. Shenzhen NTC Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Applicant / Manufacturer : Foshan Unipower Electronic Co.,Ltd
Address : Block7, No.115, 1st ZhangCha Road, Foshan, Guangdong Province, P.R.China
Factory : Foshan Unipower Electronic Co.,Ltd
Address : Block7, No.115, 1st ZhangCha Road, Foshan, Guangdong Province, P.R.China
E.U.T. : UPS
Brand Name : N/A
Model No. : S600, S800, S1000
Measurement Standard : EN 62040-2: 2006+AC: 2006
EN 61000-3-2: 2014
(EN 61000-4-2: 2009, EN 61000-4-3: 2006+A2: 2010,
EN 61000-4-4: 2012, EN 61000-4-5: 2014+A1:2017, EN 61000-4-6: 2014,
EN 61000-4-8: 2010, EN 61000-2-2: 2002)
Date of Receiver : December 09, 2019
Date of Test : December 09, 2019 to December 12, 2019
Date of Report : December 14, 2019

This Test Report is Issued Under the Authority of :

Prepared by



Icey Huang / Engineer

Approved & Authorized Signer



Han Song / Authorized Signatory

This report shows that the E.U.T. is technically compliant with the EN 62040-2 and EN 61000-3-2. This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Nore Testing Center Co.,Ltd.

TABLE OF CONTENTS

1. SUMMARY OF TEST RESULTS.....	5
2. GENERAL INFORMATION.....	6
2.1 Details of E.U.T.....	6
2.2 Description of Support Device.....	7
2.3 Block Diagram of Test Setup.....	7
2.4 Test Facility.....	7
2.5 Abnormalities from Standard Conditions.....	7
3. MEASURING DEVICES AND TEST EQUIPMENT.....	8
3.1 For Mains terminals Disturbance voltage Test.....	8
3.2 For Radiated Emission Measurement.....	8
3.3 For Harmonic Measurement.....	8
3.4 For Electrostatic Discharge Immunity Test.....	9
3.5 For RF Electromagnetic Field Immunity Test.....	9
3.6 For Electrical Fast Transient /Burst Immunity Test.....	9
3.7 For Surge Immunity Test.....	9
3.8 For Injected Currents Immunity Measurement.....	10
3.9 For Magnetic Field Immunity Measurement.....	10
3.10 For Low Frequency Signal Immunity Test.....	10
4. MAINS TERMINAL DISTURBANCE VOLTAGE MEASUREMENT.....	11
4.1 Block Diagram of Test Setup.....	11
4.2 Limit of Mains Terminal Disturbance voltage measurement.....	11
4.3 Test Procedure.....	12
4.4 Operating Condition of E.U.T.....	12
4.5 Mains Terminal Disturbance Voltage Test Results.....	12
5. RADIATED EMISSION MEASUREMENT.....	25
5.1 Block Diagram of Test.....	25
5.2 Limit of Radiated Emission Measurement.....	25
5.3 Test Procedure.....	26
5.4 Operating Condition of E.U.T.....	26
5.5 Radiated Emission Measurement Result.....	26
6. HARMONIC CURRENT EMISSION TEST.....	39
6.1 Block Diagram of Test Setup.....	39
6.2 Limits of Harmonics current measurement.....	39
6.3 Test Procedure.....	40
6.4 Operating Condition of E.U.T.....	40
6.5 Harmonics Current Measurement Result.....	40
7. PERFORMANCE CRITERIA FOR IMMUNITY.....	44
8. LOW FREQUENCY SIGNALS TEST.....	45
8.1 Block Diagram of Test Setup.....	45
8.2 Test Standard and Performance Criterion.....	45
8.3 Operating Condition of E.U.T.....	45
8.4 Test Results.....	45
9. ELECTROSTATIC DISCHARGE TEST.....	47
9.1 Block Diagram of Test Setup.....	47

9.2 Test Standard and Severity Levels.....	47
9.3 Test Procedure.....	48
9.4 Test Results.....	48
10. RF FIELD STRENGTH SUSCEPTIBILITY TEST.....	50
10.1 Block Diagram of Test Setup.....	50
10.2 Test Standard and Severity Levels.....	50
10.3 Test Procedure.....	51
10.4 Test Results.....	51
11. ELECTRICAL FAST TRANSIENT/BURST TEST.....	53
11.1 Block Diagram of Test Setup.....	53
11.2 Test Standard and Severity Levels.....	53
11.3 Test Procedure.....	54
11.4 Test Result.....	54
12. SURGE IMMUNITY TEST.....	56
12.1 Block Diagram of Test Setup.....	56
12.2 Test Standard and Severity Levels.....	56
12.3 Test Procedure.....	56
12.4 Test Result.....	57
13. INJECTED CURRENTS SUSCEPTIBILITY TEST.....	59
13.1 Block Diagram of Test Setup.....	59
13.2 Test Standard and Severity Levels.....	59
13.3 Test Procedure.....	60
13.4 Test Result.....	60
14. MAGNETIC FIELD IMMUNITY TEST.....	62
14.1 Block Diagram of Test Setup.....	62
14.2 Test Standard and Severity Levels.....	62
14.3 Test Procedure.....	62
14.4 Test Result.....	63
15. PHOTOGRAPH.....	65
15.1 Photo of Conducted Emission Measurement.....	65
15.2 Photo of Radiation Emission Measurement.....	65
15.3 Photo of Harmonic Measurement.....	66
15.4 Photo of Electrostatic Discharge Test.....	66
15.4 RF Field Strength Susceptibility Test.....	67
15.5 Photo of Electrical Fast Transient /Surge Test.....	67
APPENDIX I.....	68
(PHOTOS OF E.U.T.).....	68

Revision History of This Test Report

1. SUMMARY OF TEST RESULTS

The E.U.T. has been tested according to the following specifications:

EMISSION			
Standard	Test Type	Result	Remarks
EN 62040-2: 2006+AC: 2006	Mains Terminal Disturbance Voltage Test	PASS	Uncertainty: 2.7dB
	Radiated Emission Test	PASS	Uncertainty: 3.4dB
EN 61000-3-2: 2014	Harmonic current emission	PASS	Meets the requirements.

IMMUNITY(EN 62040-2: 2006+AC: 2006)			
Standard	Test Type	Result	Remarks
EN 61000-2-2: 2002	Low frequency signals test	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-2: 2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-3: 2006+A2: 2010	Radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-4: 2012	Electrical fast transient/ burst immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-5: 2014+A1:2017	Surge immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-6: 2014	Injected Currents immunity test	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-8: 2010	Magnetic Field Immunity Test	PASS	Meets the requirements of Performance Criterion B

2. GENERAL INFORMATION

2.1 Details of E.U.T.

E.U.T.	: UPS
Model No.	: S600
Series Model	: S800, S1000
WARNING	: This is a category C2 Uninterruptible Power Supply product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.
Brand Name	: N/A
Rating	: Model: S600 Input: AC 220-240V, 50/60Hz, 4A Output: AC 220-240V, 50/60Hz, 600VA, 360W
	Model: S800 Input: AC 220-240V, 50/60Hz, 5A Output: AC 220-240V, 50/60Hz, 800VA, 480W
	Model: S1000 Input: AC 220-240V, 50/60Hz, 6.3A Output: AC 220-240V, 50/60Hz, 1000VA, 680W
Test Voltage	: AC 230V/ 50Hz, DC12V (Internal Barrery)
Cable	: None
Description of model	: These samples are the same except the power difference
Remark	: None

2.2 Description of Support Device

None

2.3 Block Diagram of Test Setup



2.4 Test Facility

Site Description

EMC Lab : Listed by CNAS, May 18, 2018
The certificate is valid until May 17, 2024
The Laboratory has been assessed and proved to
be in compliance with CNAS/CL01
The Certificate Registration Number is L11038.

Listed by FCC, July 03, 2014
The Certificate Number is 665078.

Listed by Industry Canada, June 08, 2017
The Certificate Registration Number. Is 46405-9743

Name of Firm 1 : Shenzhen Nore Testing Center Co.,Ltd.
Site Location 1 : South, No. 1, Building 10, Maqueling Industrial
Zone, Nanshan Shenzhen, Guangdong, 518057,
China
Name of Firm 2 : Dongguan Nore Testing Center Co., Ltd.
(Dongguan NTC Co., Ltd.)
Site Location 2 : Building D, Gaosheng Science&Technology Park,
Zhouxi Longxi Road, Nancheng District,
Dongguan City, Guangdong, China

2.5 Abnormalities from Standard Conditions

None

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1 For Mains terminals Disturbance voltage Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI-3	100120	Mar. 04, 2019	1 Year
2.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	893606-014	May 06, 2019	1 Year
3.	L.I.S.N	SCHWARZBECK	NNLK8129	8129-212	May 06, 2019	1 Year
4.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	RSUM2009	May 06, 2019	1 Year
5.	Cable	N/A	1M	N/A	May 24, 2019	1 Year
6.	Cable	N/A	2M	N/A	May 24, 2019	1 Year
7.	Test Software	EZ	EZ-EMC (Ver. CT3A11)	N/A	N/A	N/A

3.2 For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESPI-7	100006	Mar. 04, 2019	1 Year
2.	Composite logarithmic antenna	SCHAFFNER	CBL6112B	2625	May 25, 2018	2 Year
3.	Horn Antenna	SCHWARZBECKI	BBHA 9120 D	01884	Jun. 03, 2019	1 Year
4.	Power Amplifier	HP	HP 8447F	2443A01735	Mar. 27, 2019	1 Year
5.	Power Amplifier	KSYET	PAM-118	443007	Mar. 27, 2019	1 Year
6.	Cable	N/A	1M	N/A	May 24, 2019	1 Year
7.	Cable	N/A	5M	N/A	May 24, 2019	1 Year
8.	Cable	N/A	9M	N/A	May 24, 2019	1 Year
9.	Test Software	EZ	EZ-EMC (Ver. CT3A11)	N/A	N/A	N/A

3.3 For Harmonic Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	LAPLACE INSTRUMENTS LTD	AS 2000A	N/A	May 05, 2019	1 Year
2.	Software	Thurlby Thandar Instruments Ltd	HA-PC Link Plus v 3.01	N/A	N/A	N/A

3.4 For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	ONYX16	1811981	Mar. 23, 2019	1 Year
2.	ESD Gun-1	HAEFELY	N/A	4700500/01	Mar. 23, 2019	1 Year
3.	ESD Gun-2	HAEFELY	N/A	4700525/00	Mar. 23, 2019	1 Year

3.5 For RF Electromagnetic Field Immunity Test

(Dongguan Nore Testing Center Co., Ltd.)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY47070160	Apr. 24, 2019	1 Year
2.	RF Switch	SKET	N/A	N/A	N/A	N/A
3.	Power Amplifier	SKET	HAP801000 M_250W	201804008	N/A	N/A
4.	Power Amplifier	SKET	HAP0103G_75W	201804009	N/A	N/A
5.	Power Amplifier	SKET	HAP0306G_50W	201804010	N/A	N/A
6.	Power Meter	Agilent	E4419B	GB40201469	Apr. 24, 2019	1 Year
7.	Power Sensor	Agilent	E9300A	MY41498919	Apr. 24, 2019	1 Year
8.	Power Sensor	Agilent	E9300A	US39211259	Apr. 24, 2019	1 Year
9.	E-Field Probe	Narda	EP-601	N/A	Apr. 24, 2019	1 Year
10.	Antenna	Schwarzbeck	STLP 9129	9129071	Apr. 24, 2018	2 Year
11.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 23, 2019	1 Year
12.	Chamber	Chengyu	7*5*3.5m	N/A	Mar. 26, 2018	2 Year
13.	Test Software	SKET	EMC-S V1.4.0.4	N/A	N/A	N/A

3.6 For Electrical Fast Transient /Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	AXOS5	177723	Mar. 23, 2019	1 Year
2.	Coupling Clamp	HAEFELY	N/A	N/A	May 05, 2019	1 Year
3.	Test Soft	VNC	VNC Viewer 5.0.5	N/A	N/A	N/A

3.7 For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	AXOS5	177723	Mar. 23, 2019	1 Year
2.	Test Soft	VNC	VNC Viewer 5.0.5	N/A	N/A	N/A

3.8 For Injected Currents Immunity Measurement

(Dongguan Nore Testing Center Co., Ltd.)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2023A	N/A	Mar. 13, 2019	1 Year
2.	Power Amplifier	SCHAFFNER	CBA9425	1022	Mar. 13, 2019	1 Year
3.	6dB 50Watt Attenuator	SCHAFFNER	ATN6025	N/A	Mar. 13, 2019	1 Year
4.	CDN	Lioncel	CDN-M3-16	0170708	Mar. 13, 2019	1 Year
5.	CDN	Lioncel	CDN-M2-16	0170723	Mar. 13, 2019	1 Year
6.	CDN	CDSI	ADN-M5/AF5	N/A	Mar. 13, 2019	1 Year
7.	EM Clamp	CDSI	EMCL-22	N/A	Mar. 13, 2019	1 Year
8.	Directional Coupler	SCHAFFNER	255	19184	Mar. 13, 2019	1 Year
9.	Dips Modulator	EM TEST	V4780S2	0111-11	Mar. 13, 2019	1 Year
10.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 22, 2019	1 Year
11.	Test Software	EZ	EZ_CS	N/A	N/A	N/A

3.9 For Magnetic Field Immunity Measurement

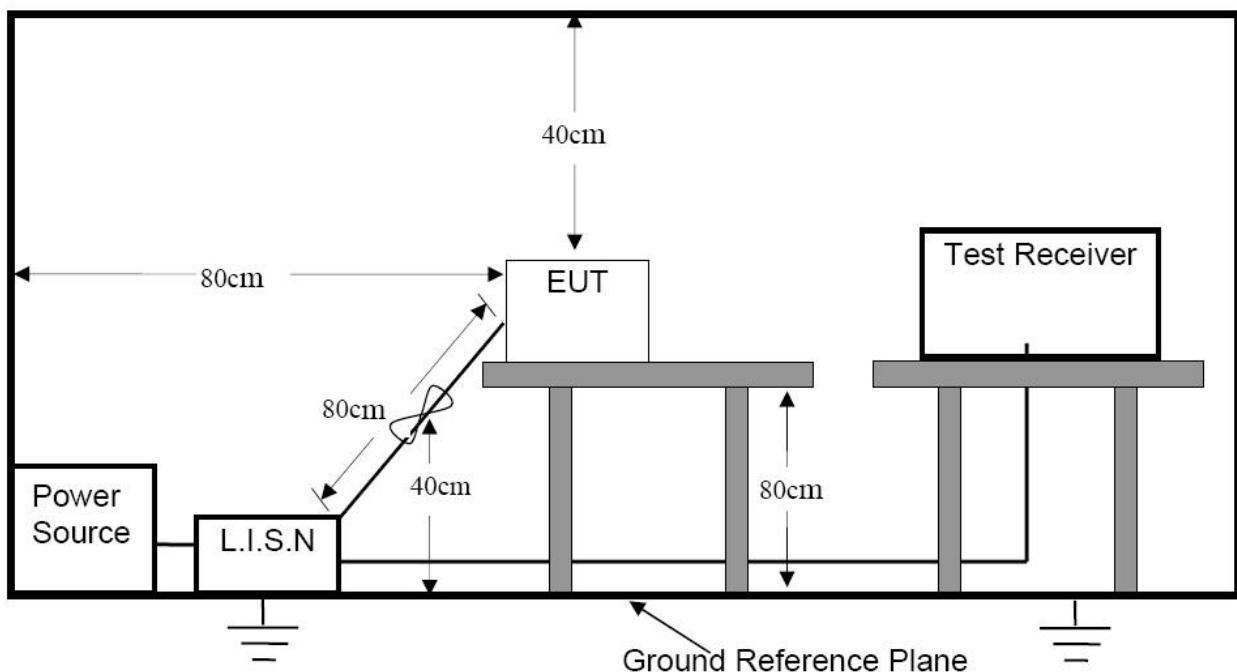
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	N/A	MS-8000	N/A	Mar. 24, 2019	1 Year
2.	Test Software	N/A	N/A	N/A	N/A	N/A

3.10 For Low Frequency Signal Immunity Test

Item	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Programmable AC Source	N/A	HHF 5010	Mar. 24, 2019	1 Year

4. MAINS TERMINAL DISTURBANCE VOLTAGE MEASUREMENT

4.1 Block Diagram of Test Setup



4.2 Limit of Mains Terminal Disturbance voltage measurement

Test Standard: EN 62040-2 Category C2

Limits of mains terminal interference voltage frequency range 0.15 MHz to 30 MHz for Category C2 Uninterruptible Power Supply equipment.

Frequency range MHz	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50 ^a	79	66
0.50 to 5 ^b	73	60
5 to 30	73	60

^a The limit decreases linearly with the logarithm of the frequency.
^b The lower limit shall apply at the transition frequency.

4.3 Test Procedure

The E.U.T. is put on the 0.8 m high table and connected to the AC mains through a Artificial Mains Network (AMN). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the EN 62040-2 regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCI) is set at 9 KHz.

4.4 Operating Condition of E.U.T.

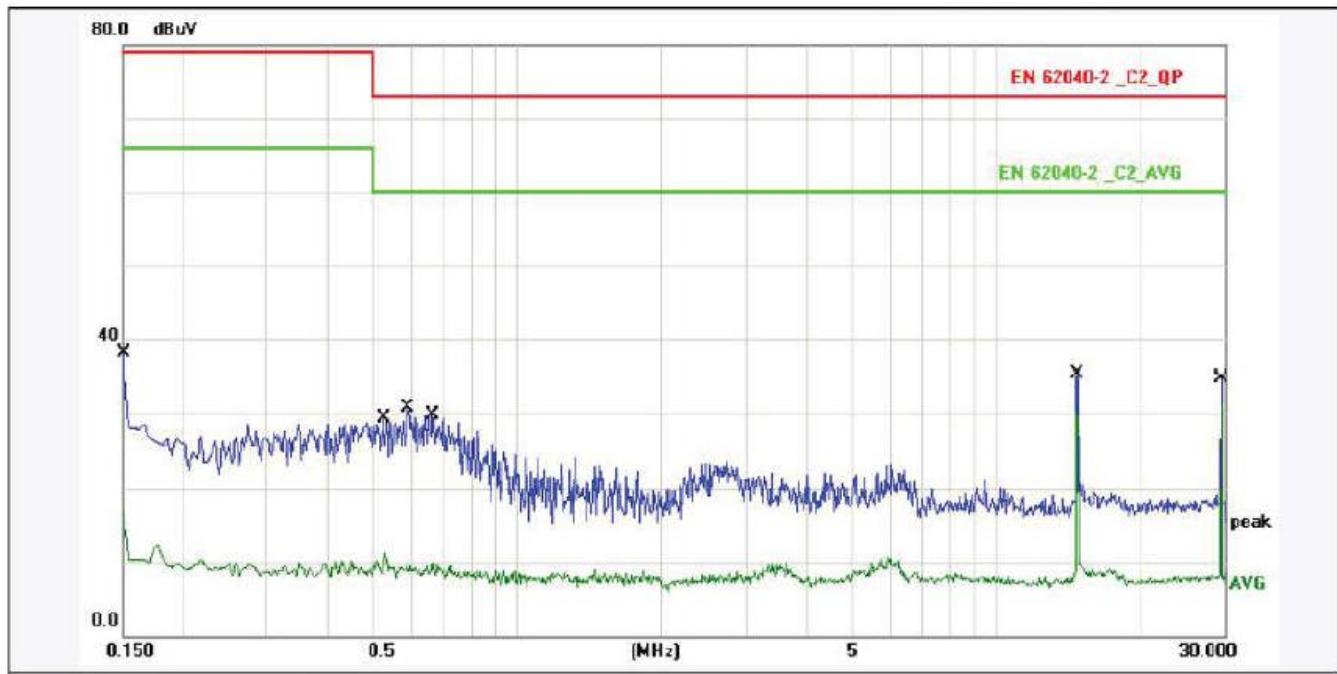
- 4.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.
- 4.4.2 Turn on the power of all equipments.
- 4.4.3 Let the E.U.T. work in test modes (Normal Mode, Stored Energy Mode) and test it.

4.5 Mains Terminal Disturbance Voltage Test Results

PASS.

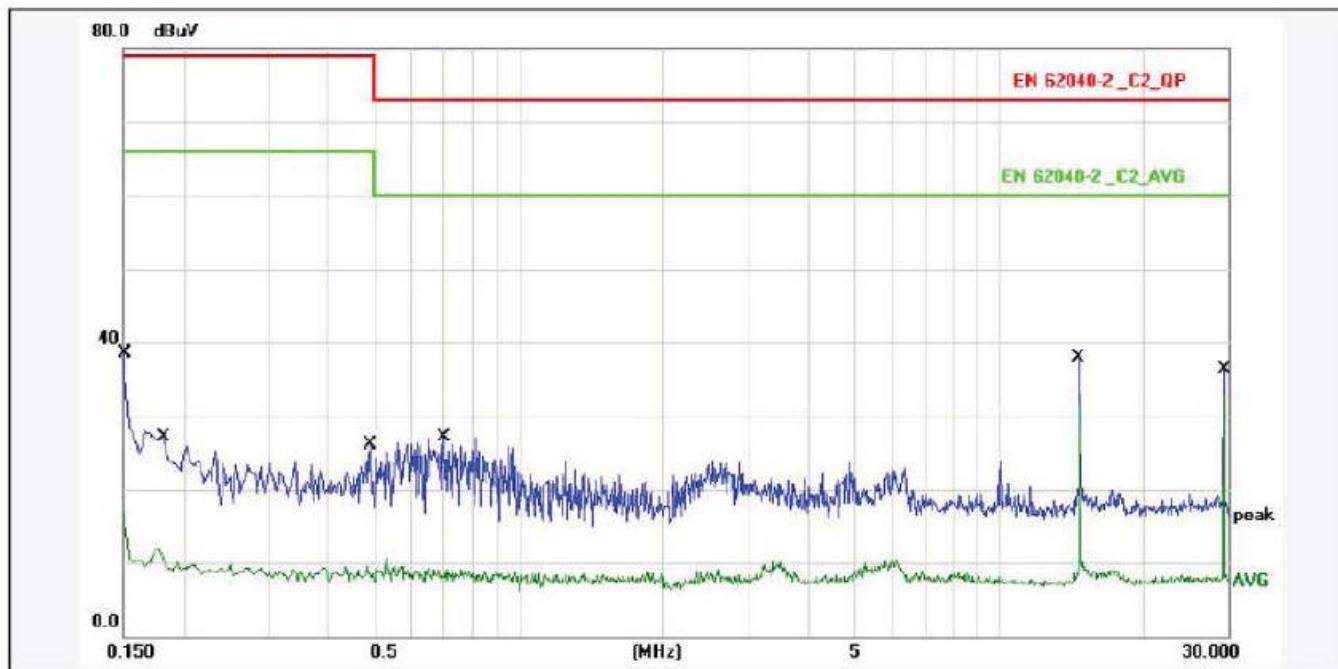
Please refer to the following pages.

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Phase:	Line



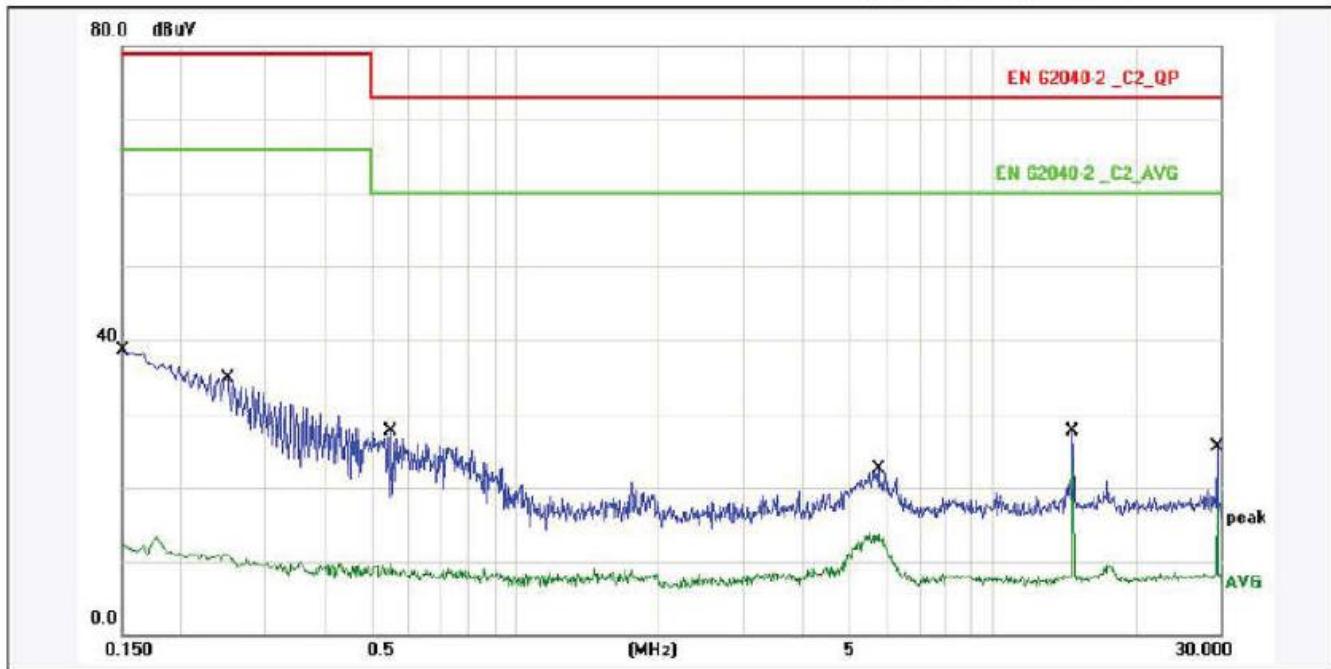
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	26.01	36.01	79.00	-40.99	QP	P	
2	0.1500	12.00	4.63	16.63	66.00	-49.37	AVG	P	
3	0.5260	12.00	17.34	29.34	73.00	-43.66	QP	P	
4	0.5260	12.00	-0.79	11.21	60.00	-48.79	AVG	P	
5	0.5899	12.00	18.61	30.61	73.00	-42.39	QP	P	
6	0.5899	12.00	-2.36	9.64	60.00	-50.36	AVG	P	
7	0.6660	12.00	17.72	29.72	73.00	-43.28	QP	P	
8	0.6660	12.00	-2.08	9.92	60.00	-50.08	AVG	P	
9	14.7490	12.00	18.06	30.06	60.00	-29.94	AVG	P	
10	14.7499	12.00	23.26	35.26	73.00	-37.74	QP	P	
11	29.4940	12.00	22.70	34.70	73.00	-38.30	QP	P	
12	29.4940	12.00	19.05	31.05	60.00	-28.95	AVG	P	

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Phase:	Neutral



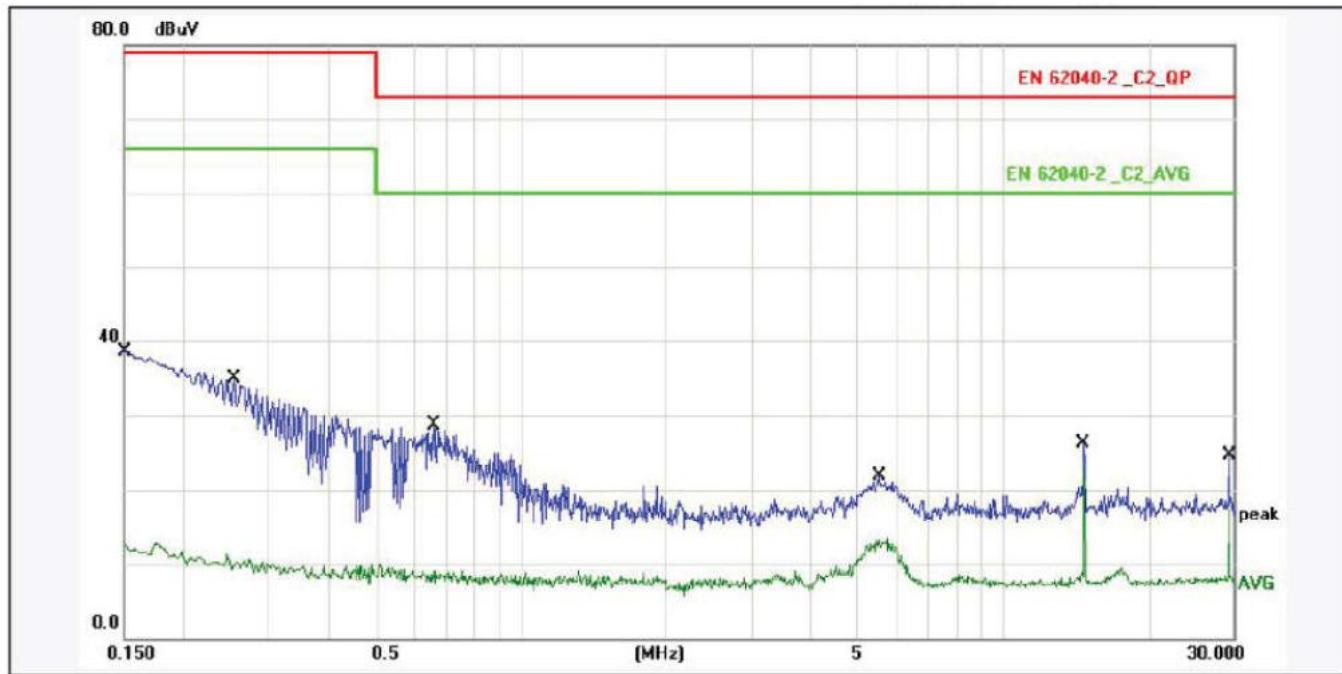
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	26.47	38.47	79.00	-40.53	QP	P	
2	0.1500	12.00	4.85	16.85	66.00	-49.15	AVG	P	
3	0.1819	12.00	15.08	27.08	79.00	-51.92	QP	P	
4	0.1819	12.00	-0.04	11.96	66.00	-54.04	AVG	P	
5	0.4900	12.00	14.20	26.20	79.00	-52.80	QP	P	
6	0.4900	12.00	-2.52	9.48	66.00	-56.52	AVG	P	
7	0.6980	12.00	15.09	27.09	73.00	-45.91	QP	P	
8	0.6980	12.00	-2.87	9.13	60.00	-50.87	AVG	P	
9	14.7460	12.00	25.83	37.83	73.00	-35.17	QP	P	
10	14.7460	12.00	19.62	31.62	60.00	-28.38	AVG	P	
11	29.4940	12.00	24.28	36.28	73.00	-36.72	QP	P	
12	29.4940	12.00	20.95	32.95	60.00	-27.05	AVG	P	

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Phase:	Line



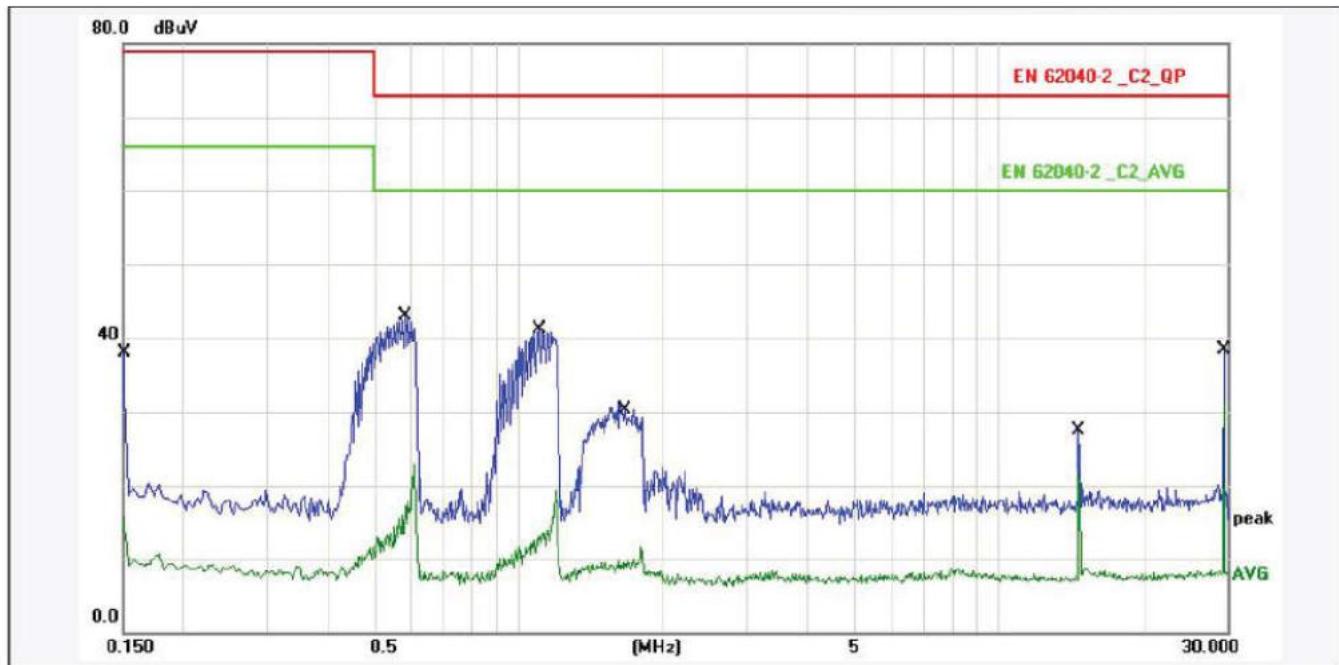
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	26.59	38.59	79.00	-40.41	QP	P	
2	0.1500	12.00	0.22	12.22	66.00	-53.78	AVG	P	
3	0.2500	12.00	22.66	34.66	79.00	-44.34	QP	P	
4	0.2500	12.00	-1.00	11.00	66.00	-55.00	AVG	P	
5	0.5500	12.00	15.63	27.63	73.00	-45.37	QP	P	
6	0.5500	12.00	-2.38	9.62	60.00	-50.38	AVG	P	
7	5.7580	12.00	10.48	22.48	73.00	-50.52	QP	P	
8	5.7580	12.00	1.76	13.76	60.00	-46.24	AVG	P	
9	14.7460	12.00	15.69	27.69	73.00	-45.31	QP	P	
10	14.7460	12.00	12.31	24.31	60.00	-35.69	AVG	P	
11	29.4940	12.00	13.53	25.53	73.00	-47.47	QP	P	
12	29.4940	12.00	6.60	18.60	60.00	-41.40	AVG	P	

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Phase:	Neutral



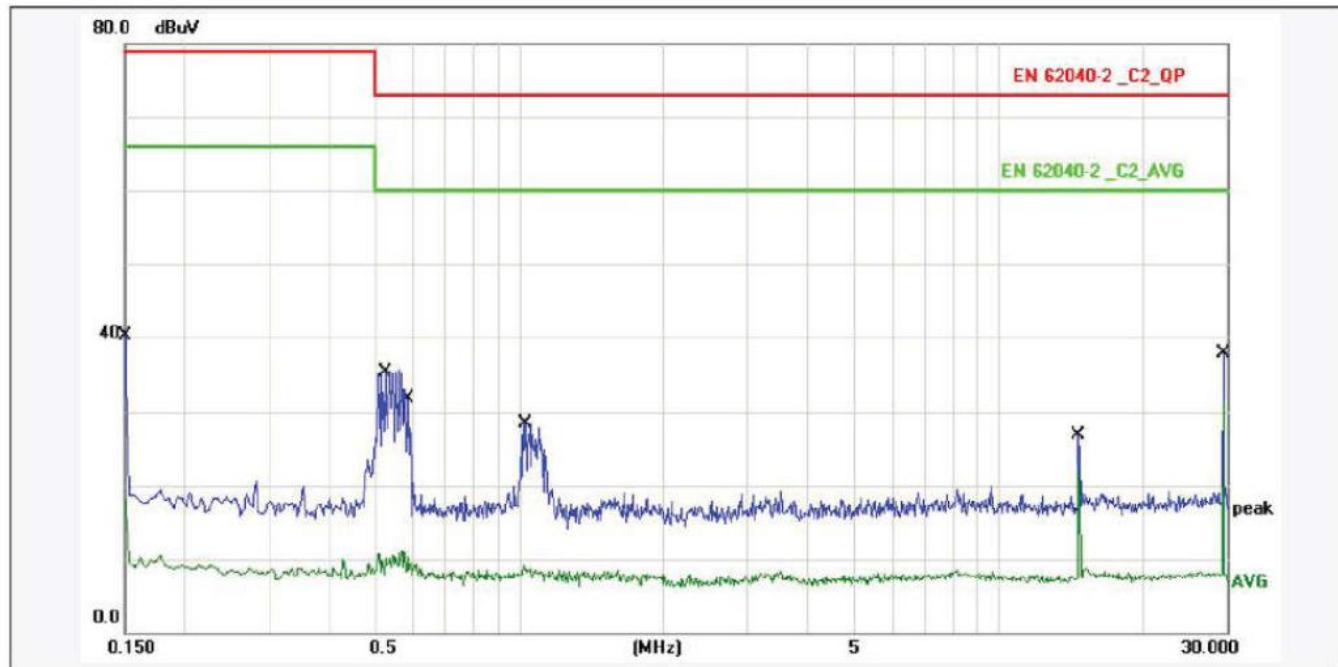
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	26.60	38.60	79.00	-40.40	QP	P	
2	0.1500	12.00	0.95	12.95	66.00	-53.05	AVG	P	
3	0.2540	12.00	22.91	34.91	79.00	-44.09	QP	P	
4	0.2540	12.00	-0.67	11.33	66.00	-54.67	AVG	P	
5	0.6580	12.00	16.70	28.70	73.00	-44.30	QP	P	
6	0.6580	12.00	-2.93	9.07	60.00	-50.93	AVG	P	
7	5.5220	12.00	9.95	21.95	73.00	-51.05	QP	P	
8	5.5220	12.00	1.47	13.47	60.00	-46.53	AVG	P	
9	14.7460	12.00	14.37	26.37	73.00	-46.63	QP	P	
10	14.7460	12.00	11.66	23.66	60.00	-36.34	AVG	P	
11	29.4940	12.00	12.67	24.67	73.00	-48.33	QP	P	
12	29.4940	12.00	5.26	17.26	60.00	-42.74	AVG	P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Phase:	Line



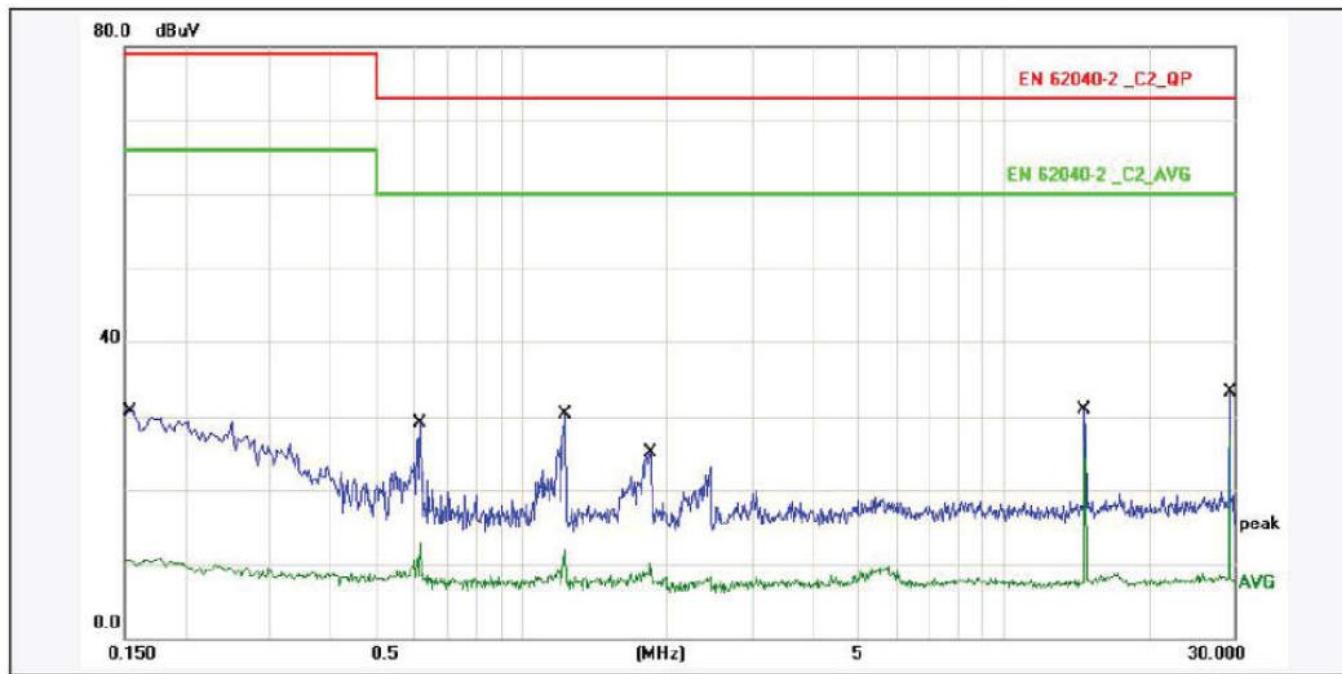
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	25.99	37.99	79.00	-41.01	QP	P	
2	0.1500	12.00	3.69	15.69	66.00	-50.31	AVG	P	
3	0.5820	12.00	30.80	42.80	73.00	-30.20	QP	P	
4	0.5820	12.00	10.93	22.93	60.00	-37.07	AVG	P	
5	1.1100	12.00	29.19	41.19	73.00	-31.81	QP	P	
6	1.1100	12.00	7.33	19.33	60.00	-40.67	AVG	P	
7	1.6700	12.00	18.38	30.38	73.00	-42.62	QP	P	
8	1.6700	12.00	-0.37	11.63	60.00	-48.37	AVG	P	
9	14.7460	12.00	15.57	27.57	73.00	-45.43	QP	P	
10	14.7460	12.00	10.13	22.13	60.00	-37.87	AVG	P	
11	29.4900	12.00	26.36	38.36	73.00	-34.64	QP	P	
12	29.4900	12.00	19.21	31.21	60.00	-28.79	AVG	P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Phase:	Neutral



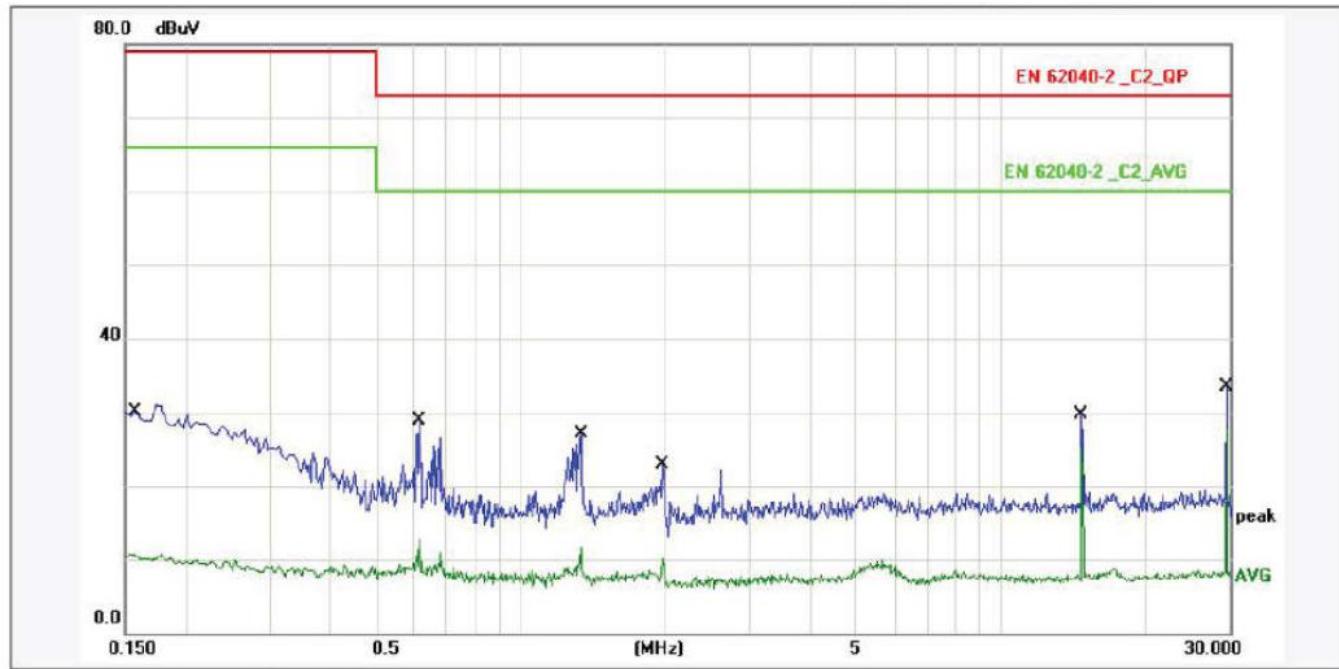
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	28.19	40.19	79.00	-38.81	QP	P	
2	0.1500	12.00	6.20	18.20	66.00	-47.80	AVG	P	
3	0.5260	12.00	23.02	35.02	73.00	-37.98	QP	P	
4	0.5260	12.00	-1.21	10.79	60.00	-49.21	AVG	P	
5	0.5940	12.00	15.34	27.34	73.00	-45.66	QP	P	
6	0.5940	12.00	-0.92	11.08	60.00	-48.92	AVG	P	
7	1.0300	12.00	16.49	28.49	73.00	-44.51	QP	P	
8	1.0300	12.00	-2.82	9.18	60.00	-50.82	AVG	P	
9	14.7460	12.00	14.95	26.95	73.00	-46.05	QP	P	
10	14.7460	12.00	10.61	22.61	60.00	-37.39	AVG	P	
11	29.4940	12.00	25.68	37.68	73.00	-35.32	QP	P	
12	29.4940	12.00	19.57	31.57	60.00	-28.43	AVG	P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Phase:	Line



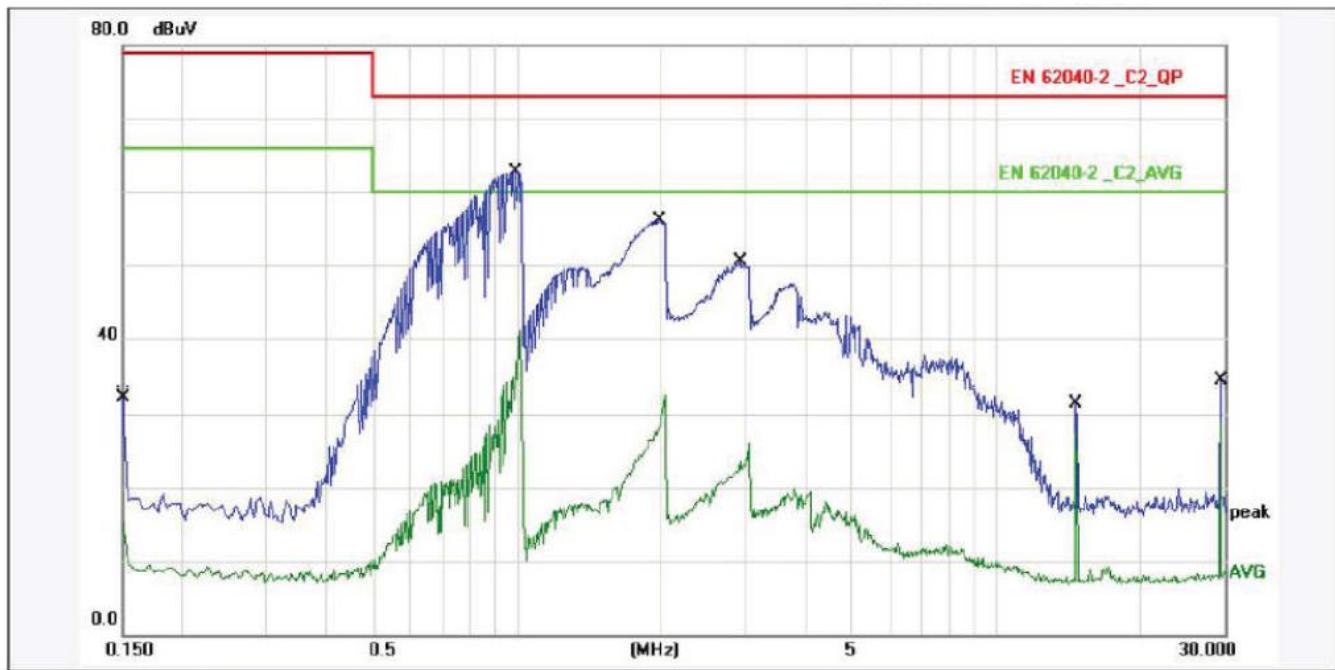
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	12.00	18.76	30.76	79.00	-48.24	QP	P	
2	0.1539	12.00	-1.44	10.56	66.00	-55.44	AVG	P	
3	0.6140	12.00	17.10	29.10	73.00	-43.90	QP	P	
4	0.6140	12.00	0.84	12.84	60.00	-47.16	AVG	P	
5	1.2340	12.00	18.23	30.23	73.00	-42.77	QP	P	
6	1.2340	12.00	-0.17	11.83	60.00	-48.17	AVG	P	
7	1.8500	12.00	13.02	25.02	73.00	-47.98	QP	P	
8	1.8500	12.00	-1.83	10.17	60.00	-49.83	AVG	P	
9	14.7460	12.00	18.92	30.92	73.00	-42.08	QP	P	
10	14.7460	12.00	14.46	26.46	60.00	-33.54	AVG	P	
11	29.4940	12.00	21.28	33.28	73.00	-39.72	QP	P	
12	29.4940	12.00	15.55	27.55	60.00	-32.45	AVG	P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Phase:	Neutral



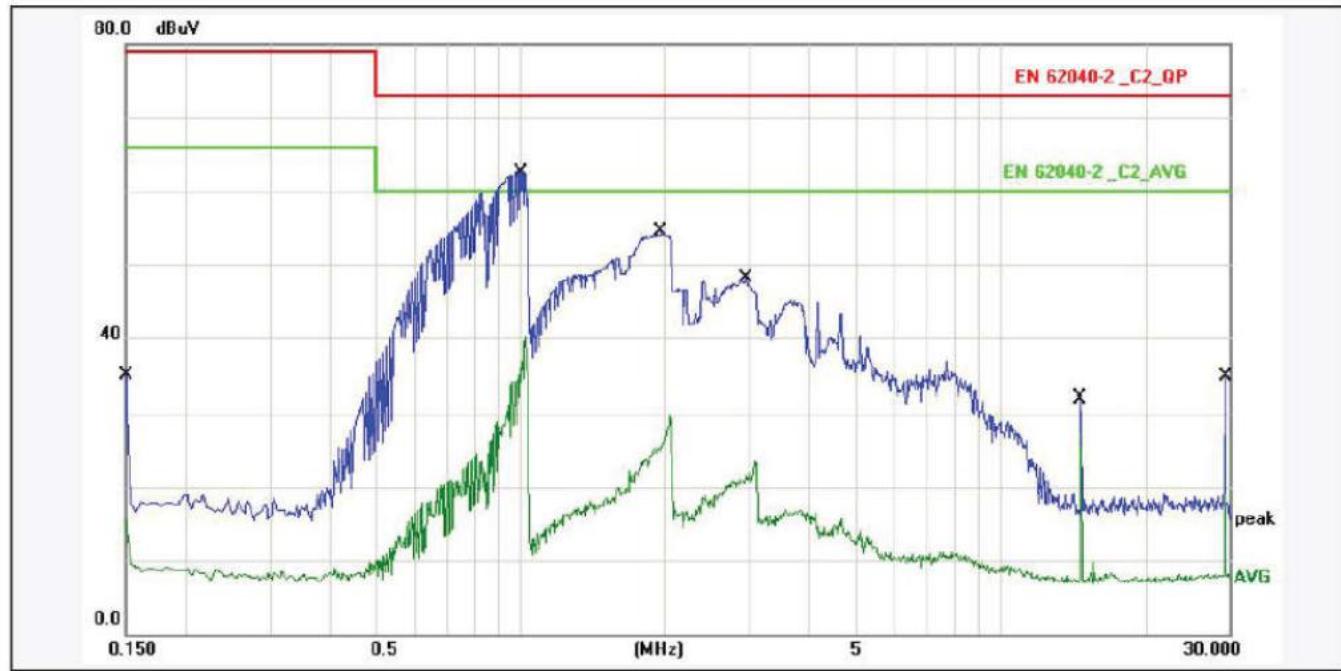
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1580	12.00	18.11	30.11	79.00	-48.89	QP	P	
2	0.1580	12.00	-1.31	10.69	66.00	-55.31	AVG	P	
3	0.6140	12.00	16.90	28.90	73.00	-44.10	QP	P	
4	0.6140	12.00	0.79	12.79	60.00	-47.21	AVG	P	
5	1.3340	12.00	15.17	27.17	73.00	-45.83	QP	P	
6	1.3340	12.00	-0.37	11.63	60.00	-48.37	AVG	P	
7	1.9780	12.00	11.00	23.00	73.00	-50.00	QP	P	
8	1.9780	12.00	-1.97	10.03	60.00	-49.97	AVG	P	
9	14.7459	12.00	17.66	29.66	73.00	-43.34	QP	P	
10	14.7459	12.00	13.28	25.28	60.00	-34.72	AVG	P	
11	29.4940	12.00	21.54	33.54	73.00	-39.46	QP	P	
12	29.4940	12.00	15.77	27.77	60.00	-32.23	AVG	P	

E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Phase:	Line



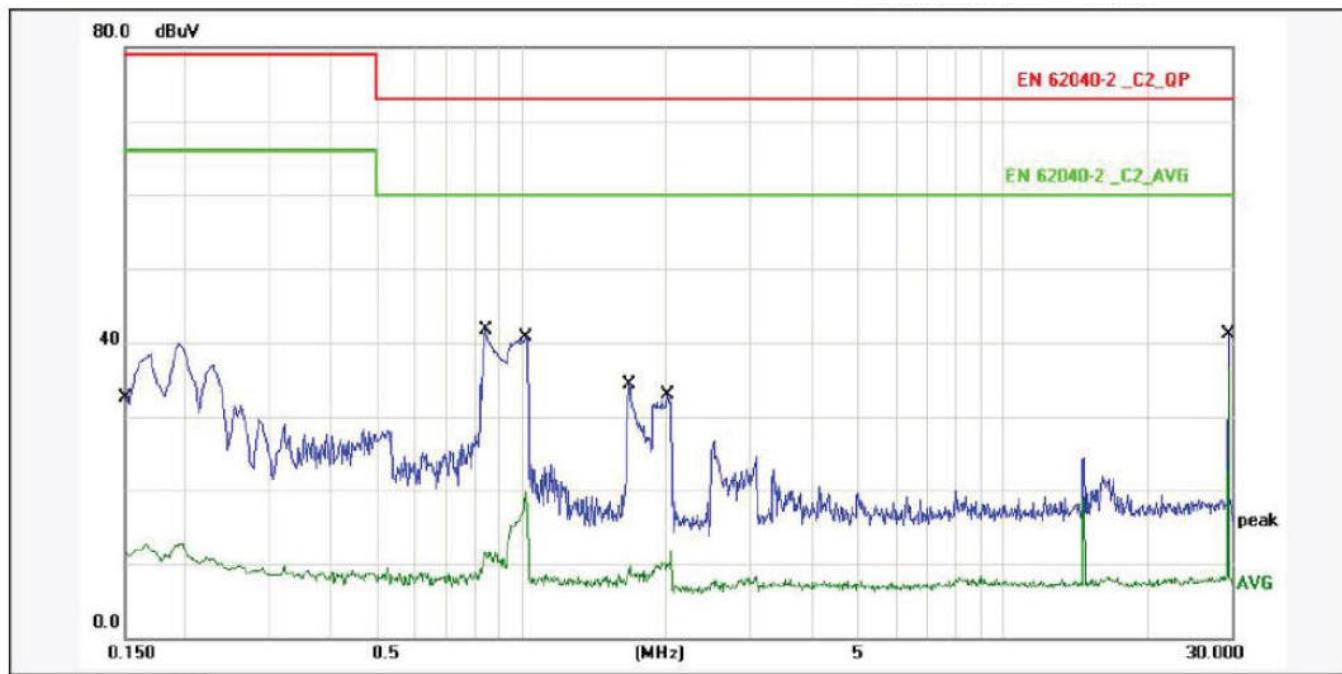
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	20.29	32.29	79.00	-46.71	QP	P	
2	0.1500	12.00	3.39	15.39	66.00	-50.61	AVG	P	
3	0.9980	12.00	50.61	62.61	73.00	-10.39	QP	P	
4	0.9980	12.00	29.00	41.00	60.00	-19.00	AVG	P	
5	1.9860	12.00	44.10	56.10	73.00	-16.90	QP	P	
6	1.9860	12.00	20.62	32.62	60.00	-27.38	AVG	P	
7	2.9219	12.00	38.44	50.44	73.00	-22.56	QP	P	
8	2.9219	12.00	14.07	26.07	60.00	-33.93	AVG	P	
9	14.7459	12.00	19.41	31.41	73.00	-41.59	QP	P	
10	14.7459	12.00	15.59	27.59	60.00	-32.41	AVG	P	
11	29.4940	12.00	22.29	34.29	73.00	-38.71	QP	P	
12	29.4940	12.00	17.12	29.12	60.00	-30.88	AVG	P	

E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Phase:	Neutral



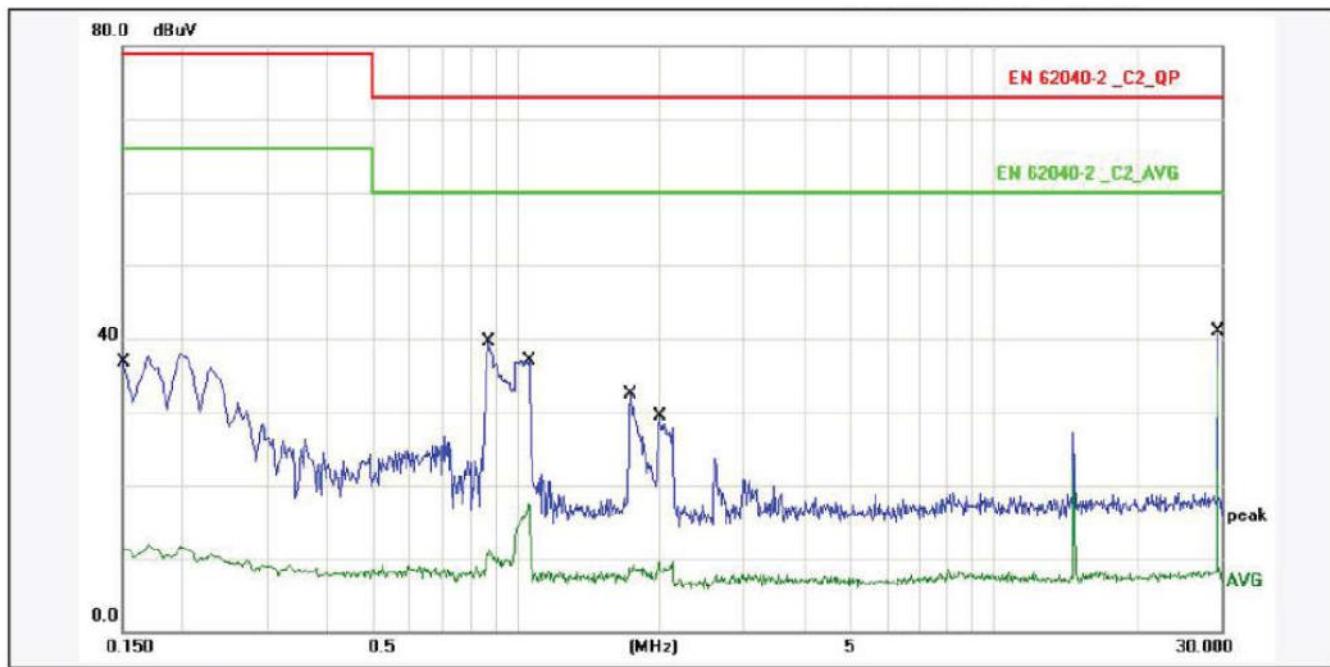
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	22.85	34.85	79.00	-44.15	QP	P	
2	0.1500	12.00	3.59	15.59	66.00	-50.41	AVG	P	
3	1.0020	12.00	50.56	62.56	73.00	-10.44	QP	P	
4	1.0020	12.00	28.03	40.03	60.00	-19.97	AVG	P	
5	1.9620	12.00	42.49	54.49	73.00	-18.51	QP	P	
6	1.9620	12.00	17.67	29.67	60.00	-30.33	AVG	P	
7	2.9580	12.00	36.17	48.17	73.00	-24.83	QP	P	
8	2.9580	12.00	11.54	23.54	60.00	-36.46	AVG	P	
9	14.7459	12.00	19.97	31.97	73.00	-41.03	QP	P	
10	14.7459	12.00	15.41	27.41	60.00	-32.59	AVG	P	
11	29.4940	12.00	22.64	34.64	73.00	-38.36	QP	P	
12	29.4940	12.00	15.10	27.10	60.00	-32.90	AVG	P	

E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Phase:	Line



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	20.53	32.53	79.00	-46.47	QP	P	
2	0.1500	12.00	-0.49	11.51	66.00	-54.49	AVG	P	
3	0.8460	12.00	29.71	41.71	73.00	-31.29	QP	P	
4	0.8460	12.00	-0.46	11.54	60.00	-48.46	AVG	P	
5	1.0260	12.00	28.78	40.78	73.00	-32.22	QP	P	
6	1.0260	12.00	7.78	19.78	60.00	-40.22	AVG	P	
7	1.6740	12.00	22.30	34.30	73.00	-38.70	QP	P	
8	1.6740	12.00	-2.26	9.74	60.00	-50.26	AVG	P	
9	2.0220	12.00	20.80	32.80	73.00	-40.20	QP	P	
10	2.0220	12.00	-0.37	11.63	60.00	-48.37	AVG	P	
11	29.4940	12.00	29.07	41.07	73.00	-31.93	QP	P	
12	29.4940	12.00	24.68	36.68	60.00	-23.32	AVG	P	

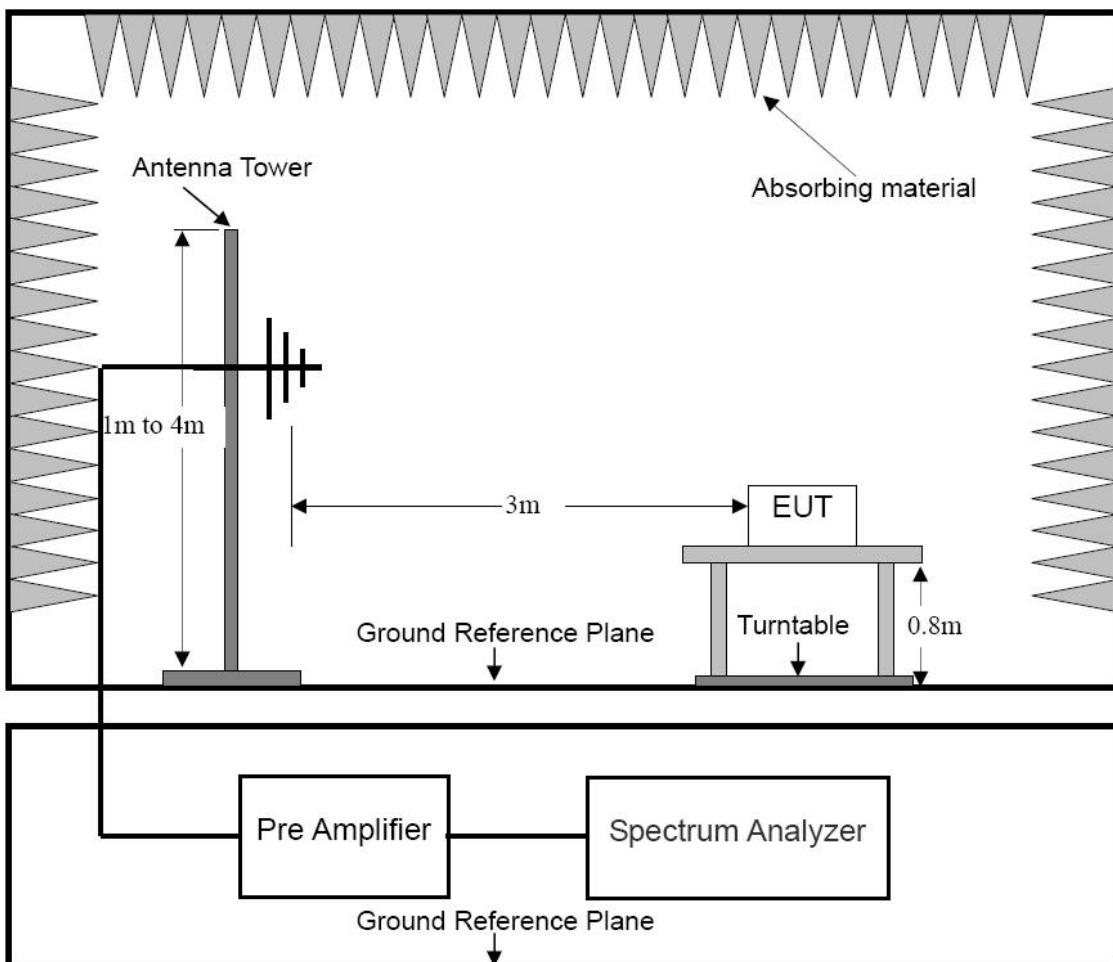
E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Phase:	Neutral



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	12.00	24.85	36.85	79.00	-42.15	QP	P	
2	0.1500	12.00	-0.67	11.33	66.00	-54.67	AVG	P	
3	0.8740	12.00	27.58	39.58	73.00	-33.42	QP	P	
4	0.8740	12.00	-0.96	11.04	60.00	-48.96	AVG	P	
5	1.0660	12.00	25.20	37.20	73.00	-35.80	QP	P	
6	1.0660	12.00	5.43	17.43	60.00	-42.57	AVG	P	
7	1.7420	12.00	20.41	32.41	73.00	-40.59	QP	P	
8	1.7420	12.00	-2.90	9.10	60.00	-50.90	AVG	P	
9	1.9980	12.00	17.44	29.44	73.00	-43.56	QP	P	
10	1.9980	12.00	-2.41	9.59	60.00	-50.41	AVG	P	
11	29.4940	12.00	28.90	40.90	73.00	-32.10	QP	P	
12	29.4940	12.00	24.21	36.21	60.00	-23.79	AVG	P	

5. RADIATED EMISSION MEASUREMENT

5.1 Block Diagram of Test



5.2 Limit of Radiated Emission Measurement

Test Standard: EN 62040-2 Category C2

Limits for radiated disturbance at a measuring distance of 3m

Frequency range MHz	Quasi-peak limits dB(uV/m)		
	Category C1	Category C2	Category C3
30 to 230	40	50	60
230 to 1000	47	57	70

Note: The lower limit shall apply at the transition frequency.

5.3 Test Procedure

E.U.T. and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. E.U.T. is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4.0 meter to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to EN 62040-2 on radiated emission measurement.

The bandwidth of the EMI test receiver (R&S ESCI7) is set at 120 KHz. The frequency range from 30 MHz to 1000 MHz is checked.

5.4 Operating Condition of E.U.T.

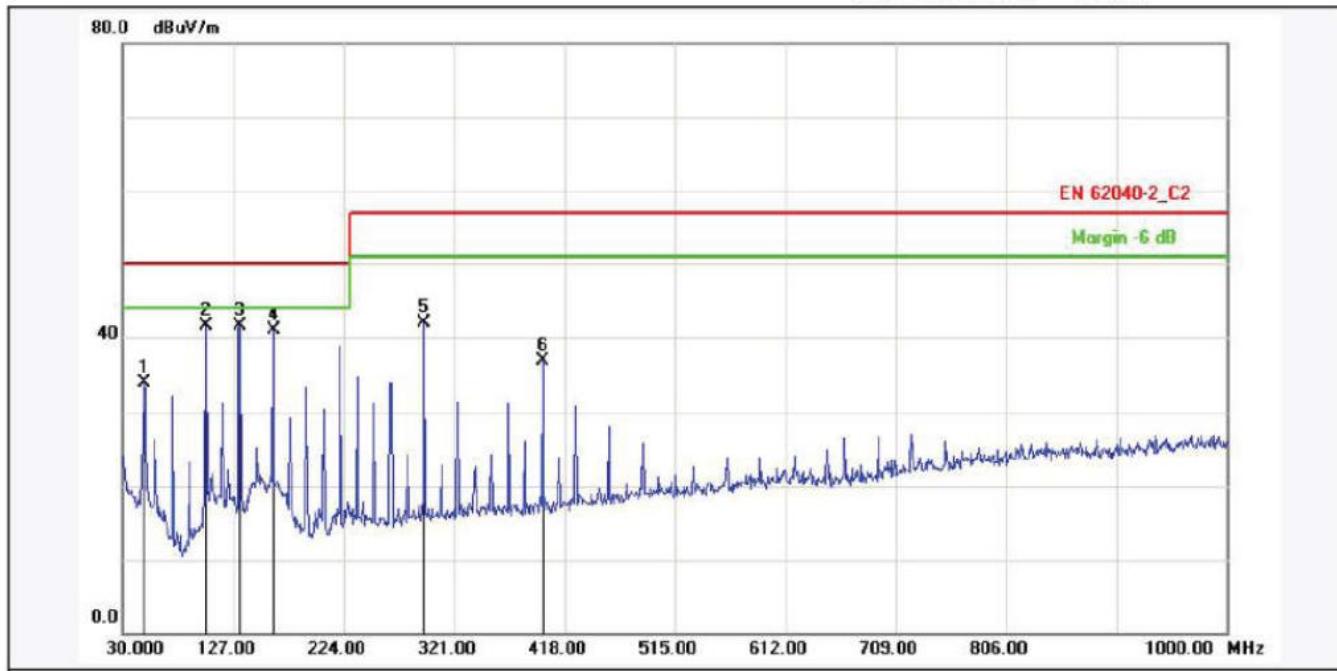
- 5.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.
- 5.4.2 Turn on the power of all equipments.
- 5.4.3 Let the E.U.T. work in test modes (Normal Mode/Stored Energy Mode) and test it.

5.5 Radiated Emission Measurement Result

PASS.

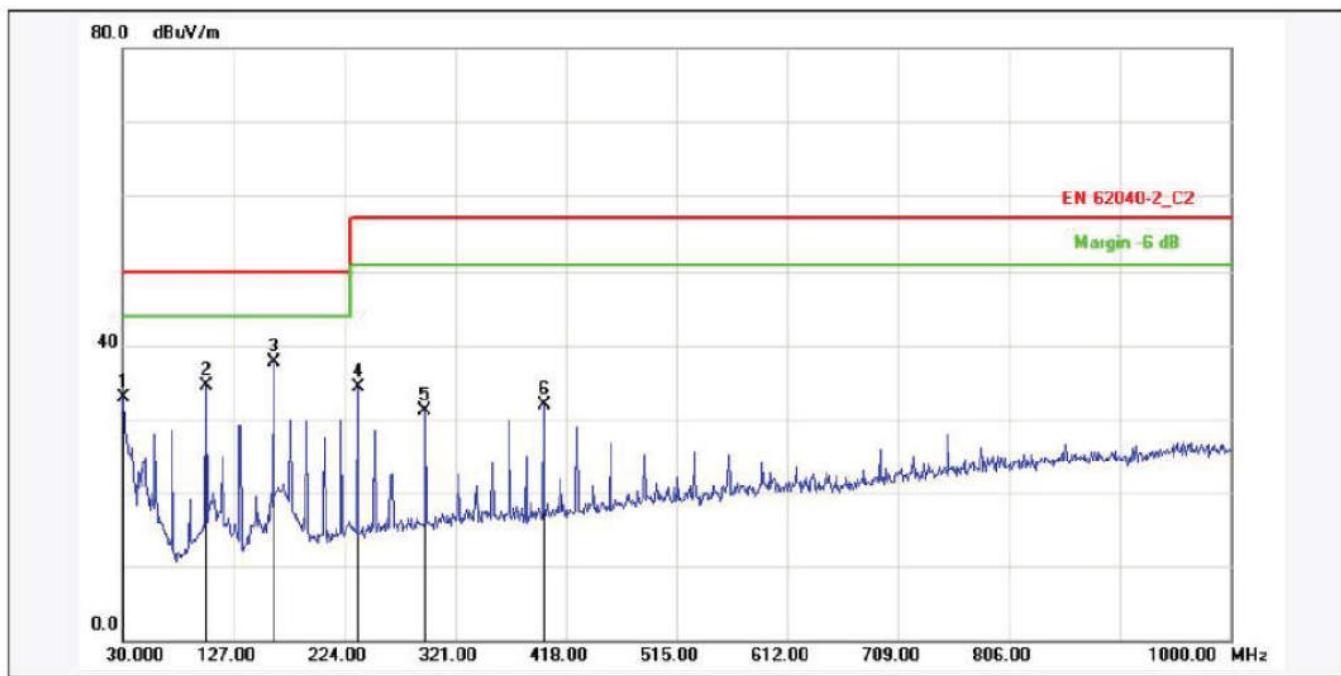
Please refer to the following pages.

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Polarization:	Horizontal



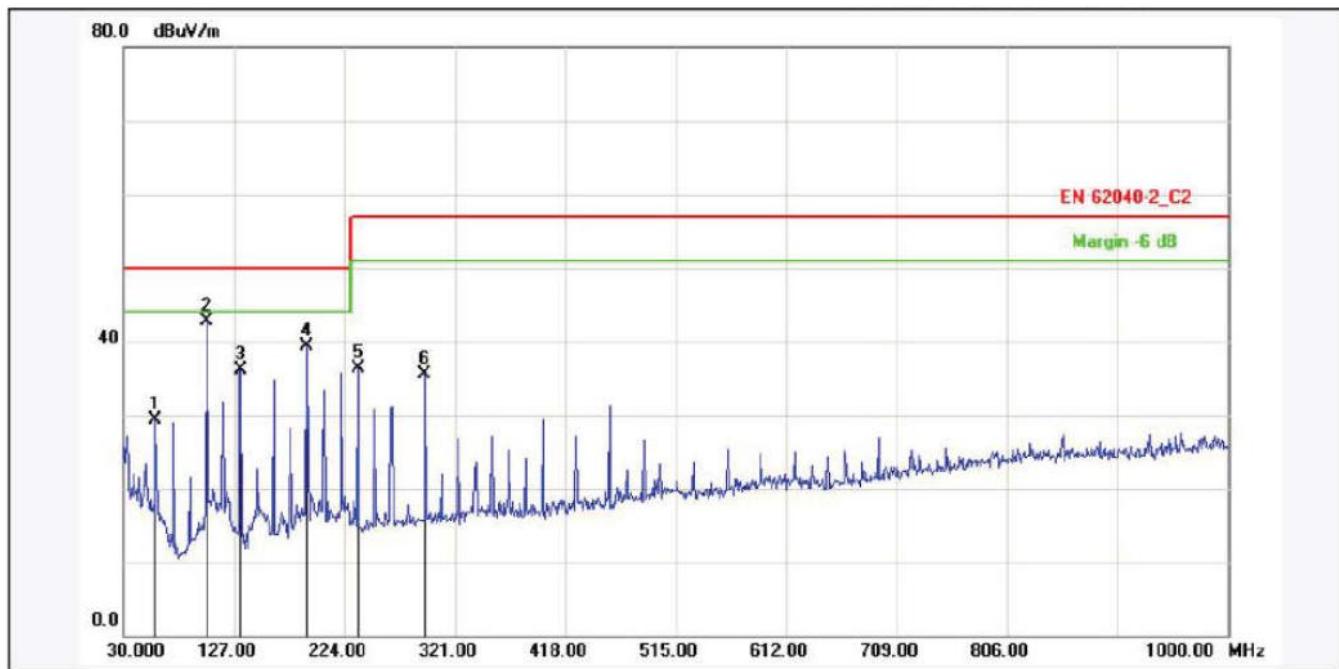
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	48.4300	-9.42	43.16	33.74	50.00	-16.26	QP			P	
2	102.7500	-12.03	53.55	41.52	50.00	-8.48	QP			P	
3	132.8200	-15.28	56.72	41.44	50.00	-8.56	QP			P	
4	161.9200	-15.08	55.97	40.89	50.00	-9.11	QP			P	
5	294.8100	-10.61	52.47	41.86	57.00	-15.14	QP			P	
6	398.6000	-9.11	45.91	36.80	57.00	-20.20	QP			P	

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Polarization:	Vertical



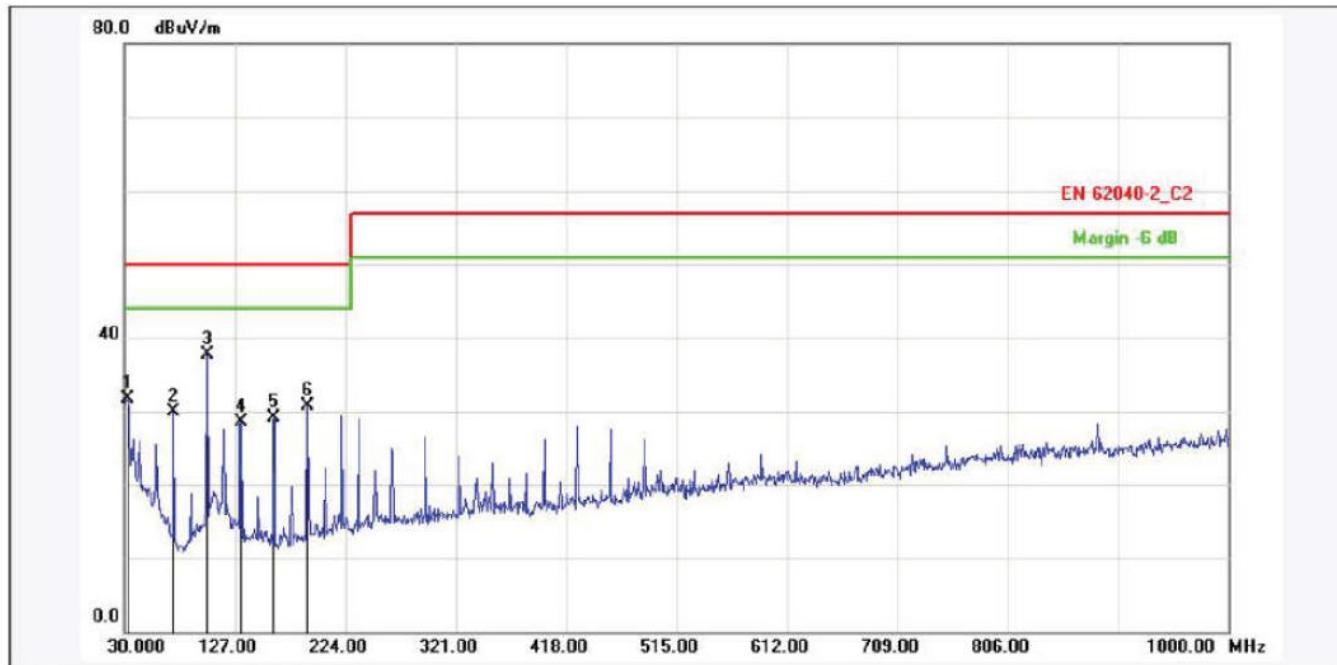
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	30.9700	-12.83	45.78	32.95	50.00	-17.05	QP			P	
2	102.7500	-12.03	46.55	34.52	50.00	-15.48	QP			P	
3	161.9200	-15.08	52.70	37.62	50.00	-12.38	QP			P	
4	235.6400	-12.22	46.46	34.24	57.00	-22.76	QP			P	
5	294.8100	-10.61	41.76	31.15	57.00	-25.85	QP			P	
6	398.6000	-9.11	41.10	31.99	57.00	-25.01	QP			P	

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Polarization:	Horizontal



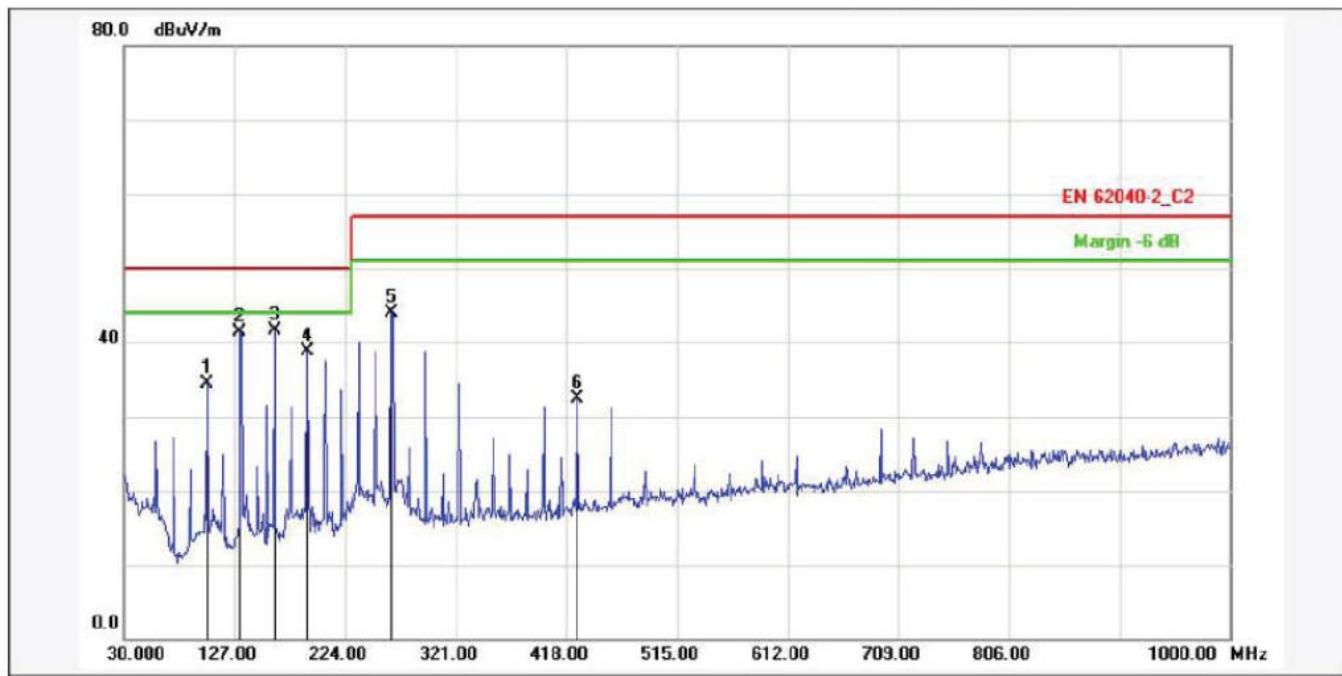
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	58.1300	-10.38	39.63	29.25	50.00	-20.75	QP			P	
2	102.7500	-12.03	54.64	42.61	50.00	-7.39	QP			P	
3	132.8200	-15.28	51.46	36.18	50.00	-13.82	QP			P	
4	191.0200	-13.53	52.92	39.39	50.00	-10.61	QP			P	
5	235.6400	-12.22	48.56	36.34	57.00	-20.66	QP			P	
6	294.8100	-10.61	46.20	35.59	57.00	-21.41	QP			P	

E.U.T :	UPS	Model Name :	S1000
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Polarization:	Vertical



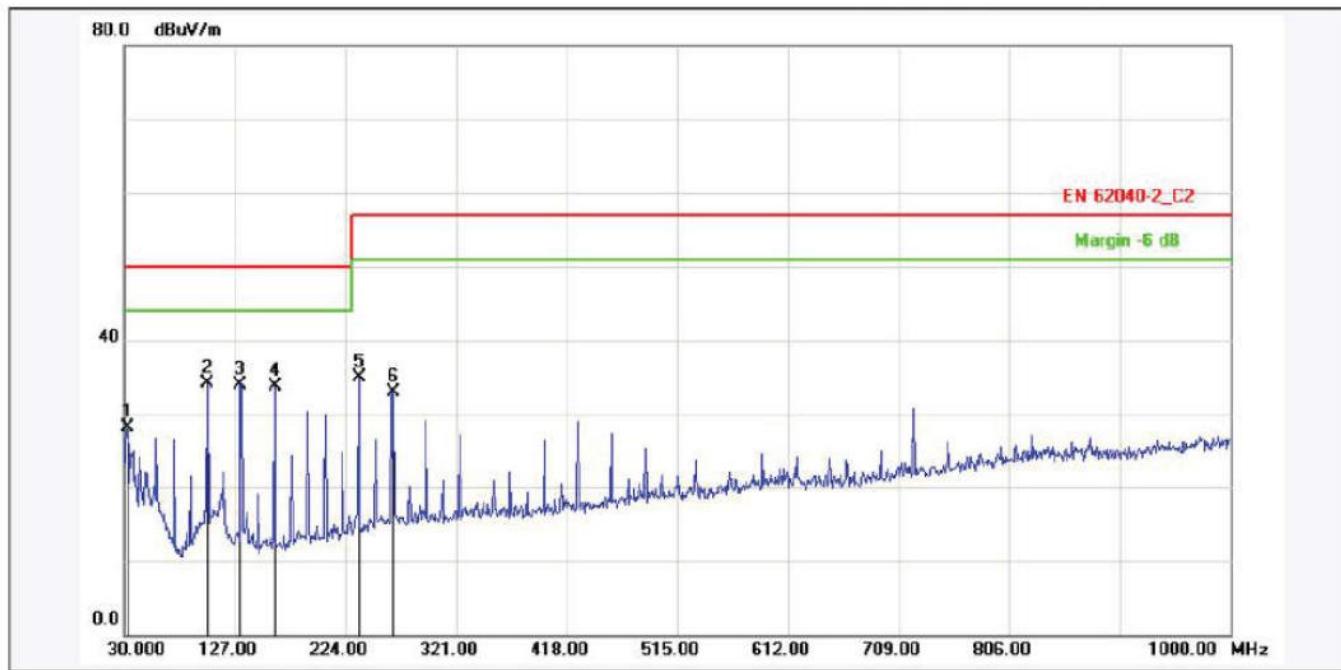
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	32.9099	-12.67	44.44	31.77	50.00	-18.23	QP			P	
2	73.6500	-15.37	45.22	29.85	50.00	-20.15	QP			P	
3	102.7500	-12.03	49.76	37.73	50.00	-12.27	QP			P	
4	132.8199	-15.28	43.74	28.46	50.00	-21.54	QP			P	
5	161.9199	-15.08	44.21	29.13	50.00	-20.87	QP			P	
6	191.0200	-13.53	44.22	30.69	50.00	-19.31	QP			P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Polarization:	Horizontal



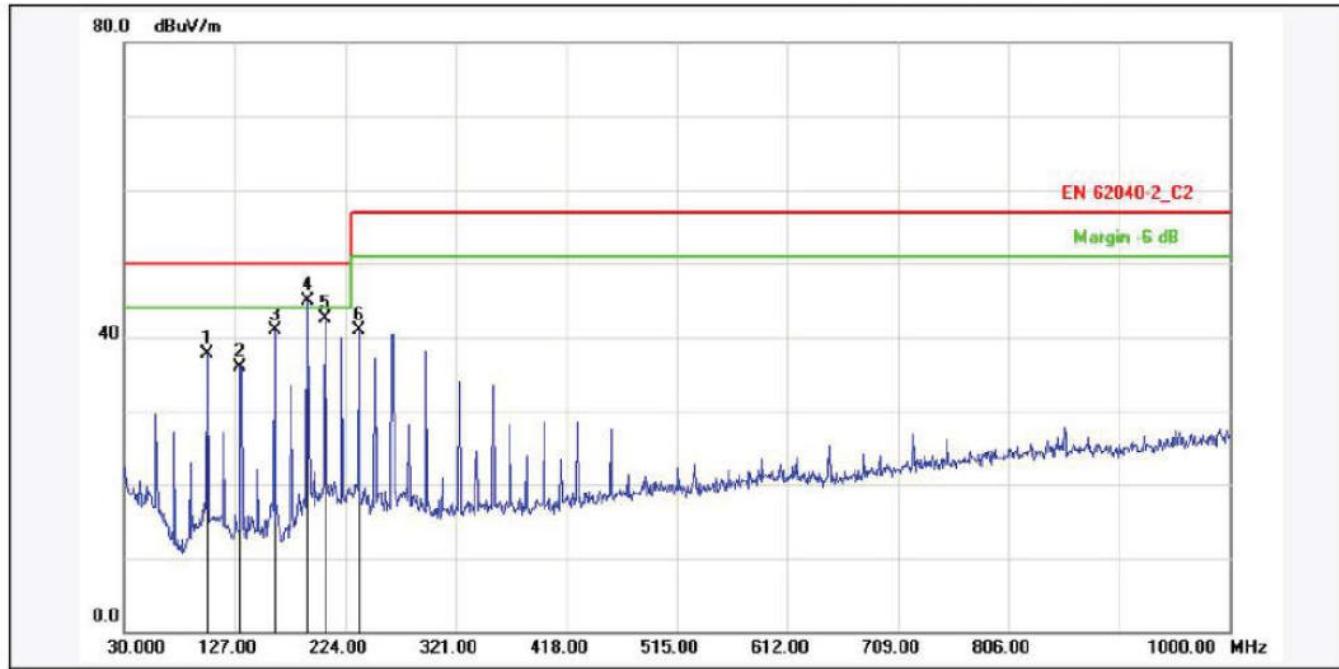
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	102.7500	-12.03	46.50	34.47	50.00	-15.53	QP			P	
2	131.8500	-15.24	56.48	41.24	50.00	-8.76	QP			P	
3	161.9200	-15.08	56.53	41.45	50.00	-8.55	QP			P	
4	191.0200	-13.53	52.15	38.62	50.00	-11.38	QP			P	
5	264.7400	-11.31	55.22	43.91	57.00	-13.09	QP			P	
6	427.7000	-8.48	40.98	32.50	57.00	-24.50	QP			P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Polarization:	Vertical



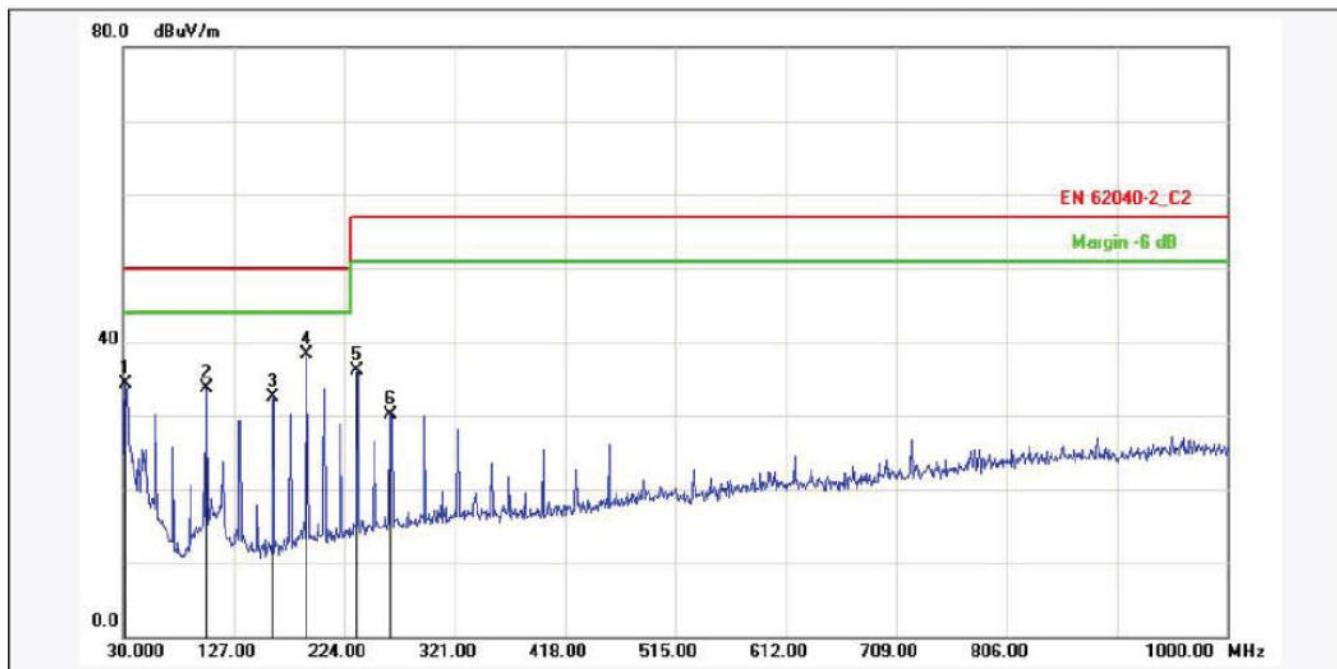
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	32.9100	-12.67	40.85	28.18	50.00	-21.82	QP			P	
2	102.7500	-12.03	46.05	34.02	50.00	-15.98	QP			P	
3	131.8500	-15.24	49.24	34.00	50.00	-16.00	QP			P	
4	161.9200	-15.08	48.75	33.67	50.00	-16.33	QP			P	
5	235.6400	-12.22	47.11	34.89	57.00	-22.11	QP			P	
6	265.7100	-11.29	44.20	32.91	57.00	-24.09	QP			P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Polarization:	Horizontal



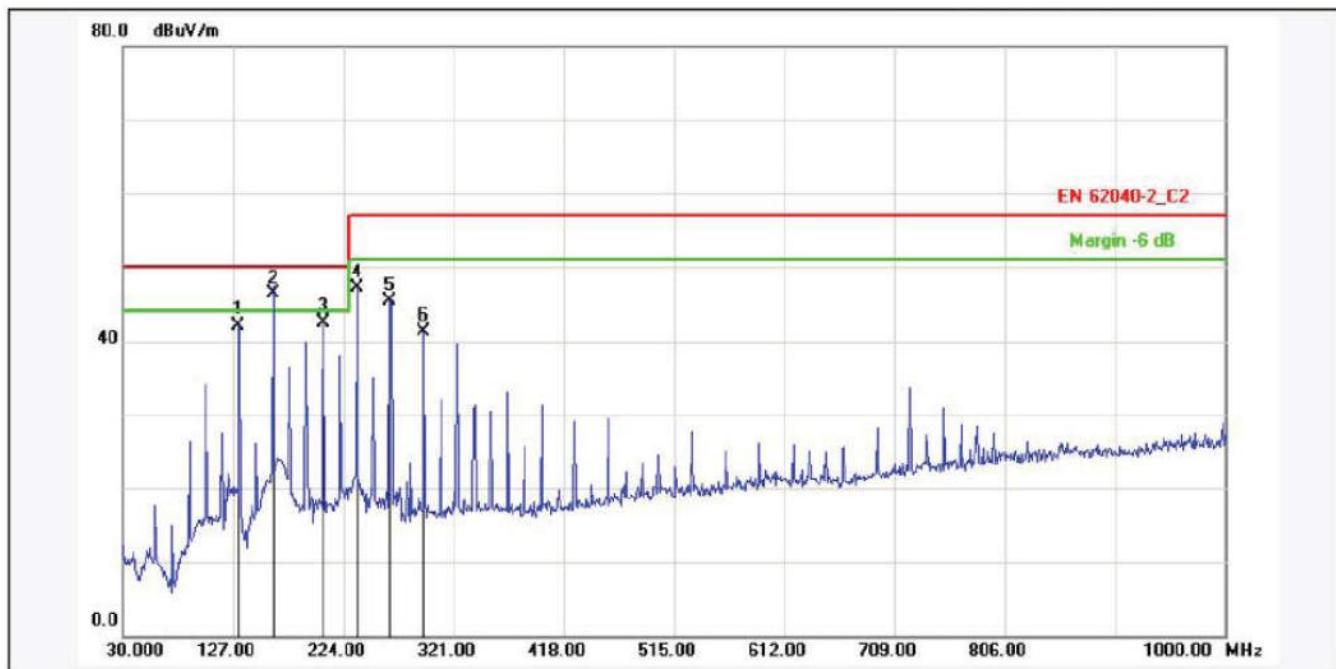
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	102.7500	-12.03	49.75	37.72	50.00	-12.28	QP			P	
2	131.8500	-15.24	51.23	35.99	50.00	-14.01	QP			P	
3	161.9200	-15.08	56.05	40.97	50.00	-9.03	QP			P	
4	191.0200	-13.53	58.36	44.83	50.00	-5.17	QP			P	
5	206.5400	-13.32	55.89	42.57	50.00	-7.43	QP			P	
6	235.6400	-12.22	53.17	40.95	57.00	-16.05	QP			P	

E.U.T :	UPS	Model Name :	S600
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Polarization:	Vertical



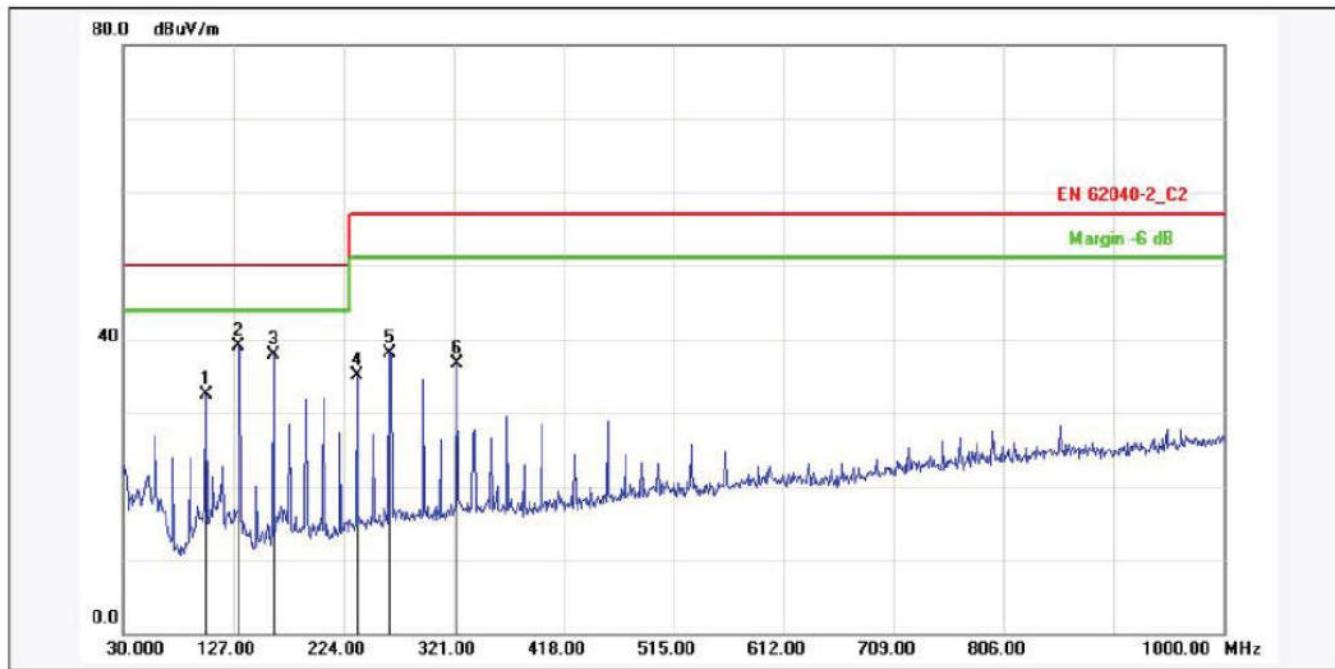
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	31.9400	-12.77	47.06	34.29	50.00	-15.71	QP			P	
2	102.7500	-12.03	45.66	33.63	50.00	-16.37	QP			P	
3	161.9199	-15.08	47.64	32.56	50.00	-17.44	QP			P	
4	191.0200	-13.53	51.86	38.33	50.00	-11.67	QP			P	
5	235.6399	-12.22	48.30	36.08	57.00	-20.92	QP			P	
6	264.7400	-11.31	41.49	30.18	57.00	-26.82	QP			P	

E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Polarization:	Horizontal



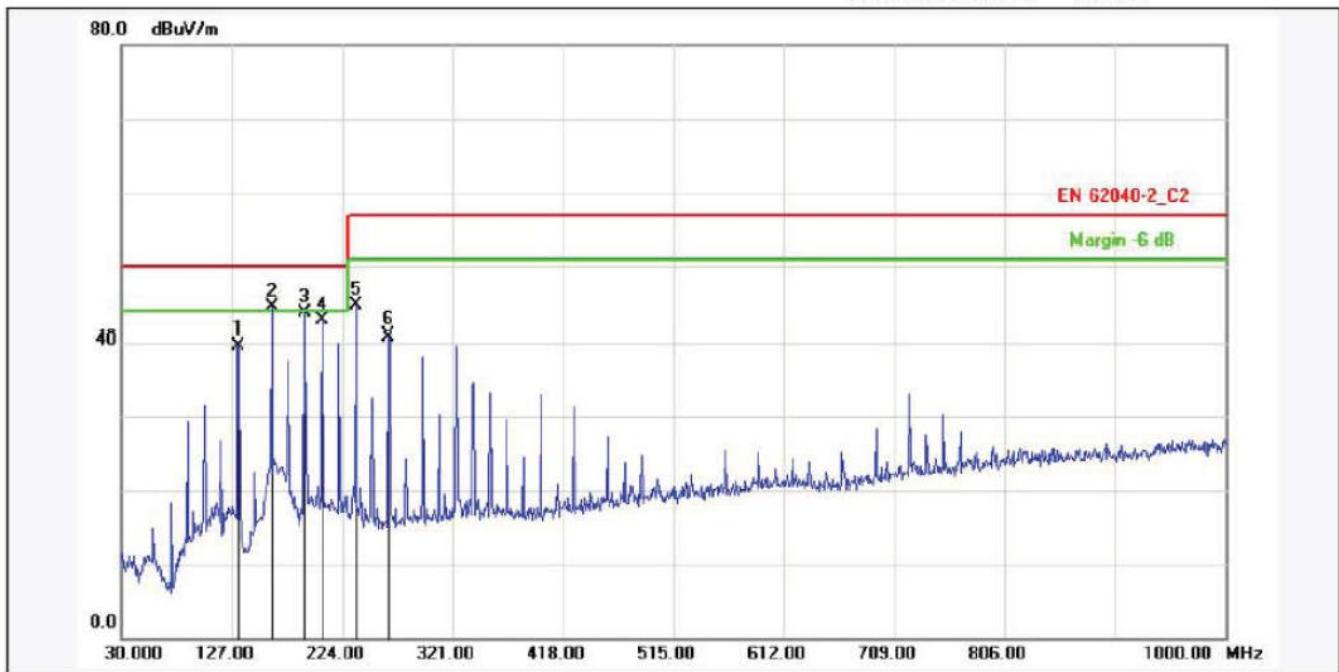
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	131.8500	-15.24	57.36	42.12	50.00	-7.88	QP			P	
2	161.9200	-15.08	61.35	46.27	50.00	-3.73	QP			P	
3	206.5399	-13.32	55.75	42.43	50.00	-7.57	QP			P	
4	235.6400	-12.22	59.28	47.06	57.00	-9.94	QP			P	
5	264.7400	-11.31	56.56	45.25	57.00	-11.75	QP			P	
6	294.8100	-10.61	51.99	41.38	57.00	-15.62	QP			P	

E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	Normal Mode	Polarization:	Vertical



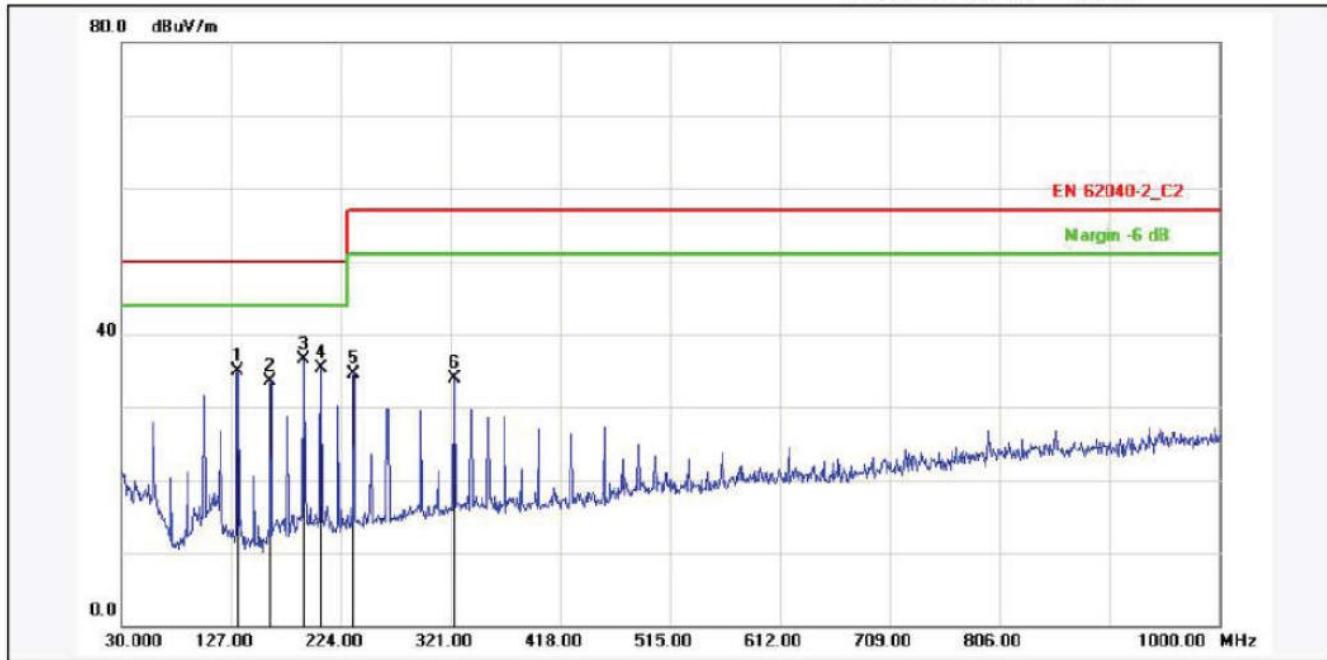
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	102.7500	-12.03	44.50	32.47	50.00	-17.53	QP			P	
2	131.8500	-15.24	54.27	39.03	50.00	-10.97	QP			P	
3	161.9200	-15.08	53.02	37.94	50.00	-12.06	QP			P	
4	235.6400	-12.22	47.36	35.14	57.00	-21.86	QP			P	
5	264.7400	-11.31	49.50	38.19	57.00	-18.81	QP			P	
6	323.9100	-9.81	46.45	36.64	57.00	-20.36	QP			P	

E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Polarization:	Horizontal



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	132.8200	-15.28	54.83	39.55	50.00	-10.45	QP			P	
2	161.9200	-15.08	59.55	44.47	50.00	-5.53	QP			P	
3	191.0200	-13.53	57.25	43.72	50.00	-6.28	QP			P	
4	206.5399	-13.32	56.00	42.68	50.00	-7.32	QP			P	
5	235.6400	-12.22	56.85	44.63	57.00	-12.37	QP			P	
6	264.7400	-11.31	52.06	40.75	57.00	-16.25	QP			P	

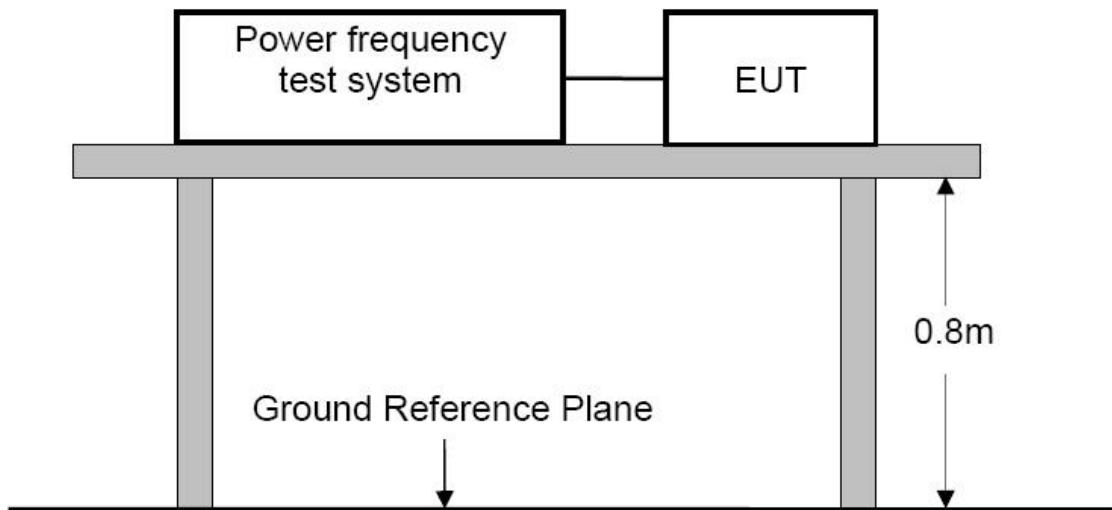
E.U.T :	UPS	Model Name :	S800
Temperature :	26°C	Relative Humidity :	60 %
Pressure :	1006 hPa	Test Voltage :	DC 12V
Test Mode :	Stored Energy Mode	Polarization:	Vertical



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ()	P/F	Remark
1	132.8199	-15.28	50.12	34.84	50.00	-15.16	QP			P	
2	161.9199	-15.08	48.49	33.41	50.00	-16.59	QP			P	
3	191.0200	-13.53	50.00	36.47	50.00	-13.53	QP			P	
4	206.5399	-13.32	48.70	35.38	50.00	-14.62	QP			P	
5	235.6399	-12.22	46.70	34.48	57.00	-22.52	QP			P	
6	323.9100	-9.81	43.65	33.84	57.00	-23.16	QP			P	

6. HARMONIC CURRENT EMISSION TEST

6.1 Block Diagram of Test Setup



6.2 Limits of Harmonics current measurement

Test Standard: EN 61000-3-2: 2014

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \times 8/n$

Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
$15 \leq n \leq 39$	$3.85/n$	$0.15 \times 15/n$

For the following categories of equipment limits are not specified in this edition of the standard.

Note 1: Equipment with a rated power of 75W or less, other than lighting equipment.

6.3 Test Procedure

The E.U.T. was put on the top of a wooden table 0.8m above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The E.U.T. 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; 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.

6.4 Operating Condition of E.U.T.

6.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

6.4.2 Turn on the power of all equipments.

6.4.3 Let the E.U.T. work in test mode (Normal Mode) and test it.

6.5 Harmonics Current Measurement Result

Pass

Harmonics – Class-A per Ed. 4.0 (2014)(Run time)

Test duration (min): 2.5

Data file name: H-000025.cts_data

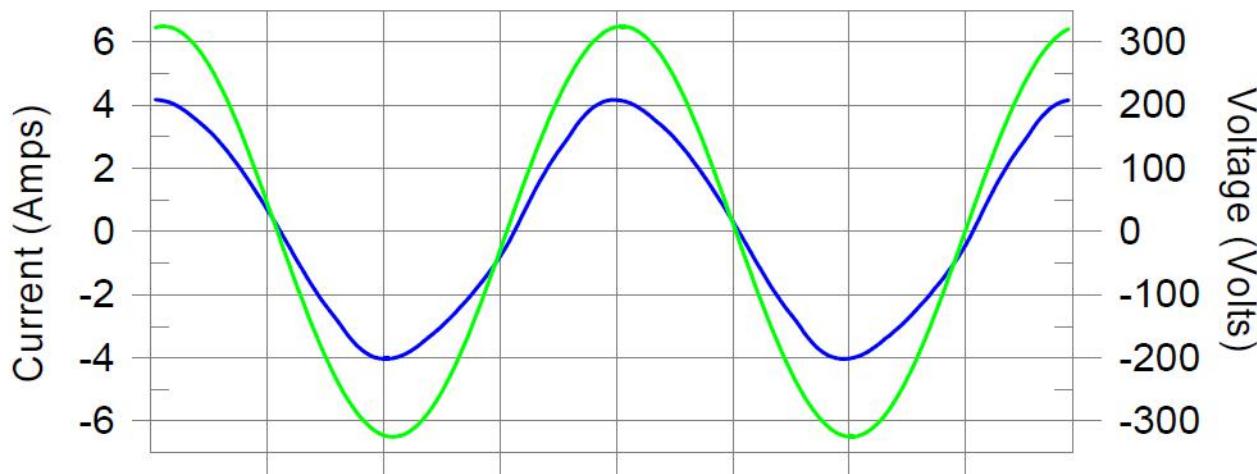
Comment: S1000

Customer: Foshan Unipower Electronic Co., Ltd.

Test Result: Pass

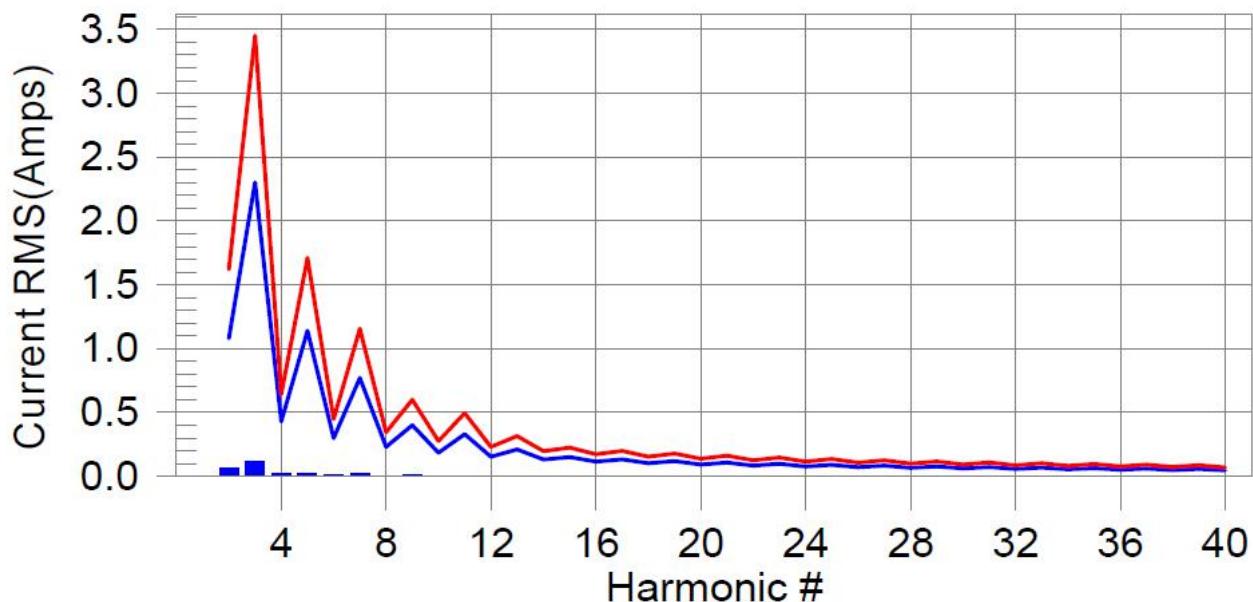
Source qualification: Normal Mode

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass

Worst harmonic was #2 with 5.83% of the limit.

Current Test Result Summary (Run time)

Test duration (min): 2.5 Data file name: H-000025.cts_data

Comment: S1000

Customer: Foshan Unipower Electronic Co., Ltd.

Test Result: Pass Source qualification: Normal Mode
THC(A): 0.14 I-THD(%): 4.88 POHC(A): 0.000 POHC Limit(A): 0.320

Highest parameter values during test:

V_RMS (Volts): 229.95 Frequency(Hz): 50.00
I_Peak (Amps): 4.178 I_RMS (Amps): 2.846
I_Fund (Amps): 2.841 Crest Factor: 1.469
Power (Watts): 652.9 Power Factor: 0.998

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.063	1.080	5.8	0.064	1.620	3.95	Pass
3	0.118	2.300	5.1	0.120	3.450	3.47	Pass
4	0.025	0.430	5.8	0.026	0.645	4.00	Pass
5	0.020	1.140	1.8	0.021	1.710	1.25	Pass
6	0.008	0.300	0.0	0.008	0.450	1.82	Pass
7	0.017	0.770	2.3	0.018	1.155	1.55	Pass
8	0.003	0.230	0.0	0.003	0.345	1.00	Pass
9	0.010	0.400	0.0	0.010	0.600	1.68	Pass
10	0.001	0.184	0.0	0.002	0.276	0.56	Pass
11	0.005	0.330	0.0	0.005	0.495	1.00	Pass
12	0.001	0.153	0.0	0.001	0.230	0.29	Pass
13	0.001	0.210	0.0	0.002	0.315	0.55	Pass
14	0.000	0.131	0.0	0.000	0.197	0.25	Pass
15	0.003	0.150	0.0	0.003	0.225	1.22	Pass
16	0.000	0.115	0.0	0.000	0.173	0.20	Pass
17	0.002	0.132	0.0	0.002	0.199	0.97	Pass
18	0.000	0.102	0.0	0.000	0.153	0.16	Pass
19	0.001	0.118	0.0	0.001	0.178	0.64	Pass
20	0.000	0.092	0.0	0.000	0.138	0.26	Pass
21	0.001	0.107	0.0	0.001	0.161	0.71	Pass
22	0.000	0.084	0.0	0.000	0.125	0.15	Pass
23	0.001	0.098	0.0	0.001	0.147	0.53	Pass
24	0.000	0.077	0.0	0.000	0.115	0.05	Pass
25	0.001	0.090	0.0	0.001	0.135	0.56	Pass
26	0.000	0.071	0.0	0.000	0.106	0.10	Pass
27	0.001	0.083	0.0	0.001	0.125	0.56	Pass
28	0.000	0.066	0.0	0.000	0.099	0.22	Pass
29	0.000	0.078	0.0	0.000	0.116	0.28	Pass
30	0.000	0.061	0.0	0.000	0.092	0.17	Pass
31	0.000	0.073	0.0	0.000	0.109	0.44	Pass
32	0.000	0.058	0.0	0.000	0.086	0.26	Pass
33	0.000	0.068	0.0	0.000	0.102	0.33	Pass
34	0.000	0.054	0.0	0.000	0.081	0.15	Pass
35	0.000	0.064	0.0	0.000	0.096	0.20	Pass
36	0.000	0.051	0.0	0.000	0.077	0.10	Pass
37	0.000	0.061	0.0	0.000	0.091	0.33	Pass
38	0.000	0.048	0.0	0.000	0.073	0.12	Pass
39	0.000	0.058	0.0	0.000	0.087	0.15	Pass
40	0.000	0.046	0.0	0.000	0.069	0.24	Pass

Voltage Source Verification Data (Run time)

Test duration (min): 2.5 Data file name: H-000025.cts_data
Comment: S1000
Customer: Foshan Unipower Electronic Co., Ltd.

Test Result: Pass Source qualification: Normal Mode

Highest parameter values during test:

Voltage (Vrms):	229.95	Frequency(Hz):	50.00
I_Peak (Amps):	4.178	I_RMS (Amps):	2.846
I_Fund (Amps):	2.841	Crest Factor:	1.469
Power (Watts):	652.9	Power Factor:	0.998

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.080	0.460	17.40	OK
3	0.628	2.069	30.35	OK
4	0.090	0.460	19.49	OK
5	0.071	0.920	7.76	OK
6	0.048	0.460	10.34	OK
7	0.029	0.690	4.15	OK
8	0.021	0.460	4.52	OK
9	0.049	0.460	10.75	OK
10	0.014	0.460	3.07	OK
11	0.019	0.230	8.46	OK
12	0.013	0.230	5.84	OK
13	0.010	0.230	4.39	OK
14	0.008	0.230	3.40	OK
15	0.015	0.230	6.37	OK
16	0.012	0.230	5.32	OK
17	0.007	0.230	3.09	OK
18	0.010	0.230	4.37	OK
19	0.009	0.230	3.75	OK
20	0.023	0.230	9.94	OK
21	0.010	0.230	4.14	OK
22	0.007	0.230	2.99	OK
23	0.006	0.230	2.47	OK
24	0.004	0.230	1.66	OK
25	0.005	0.230	2.36	OK
26	0.003	0.230	1.34	OK
27	0.007	0.230	3.04	OK
28	0.003	0.230	1.26	OK
29	0.006	0.230	2.70	OK
30	0.005	0.230	2.27	OK
31	0.004	0.230	1.83	OK
32	0.004	0.230	1.68	OK
33	0.003	0.230	1.52	OK
34	0.003	0.230	1.16	OK
35	0.003	0.230	1.26	OK
36	0.002	0.230	0.93	OK
37	0.003	0.230	1.35	OK
38	0.004	0.230	1.57	OK
39	0.005	0.230	1.99	OK
40	0.011	0.230	4.76	OK

7. PERFORMANCE CRITERIA FOR IMMUNITY

The performance criteria are referred to the test standard: EN 62040-2

Performance criteria for immunity tests

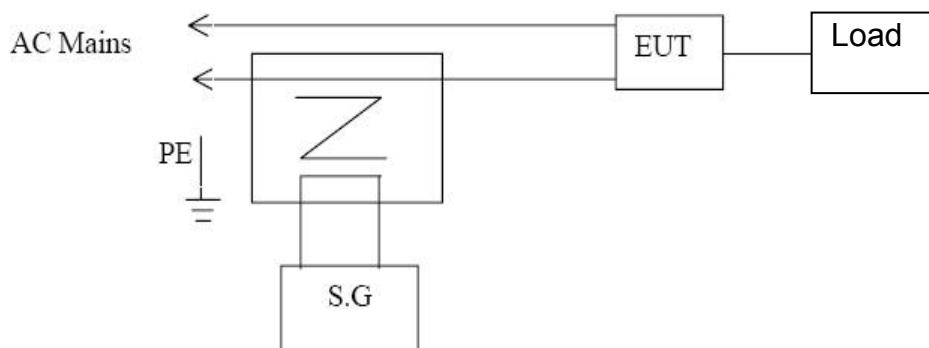
	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable(100m sec limits in Figures 1,2 or 3 of IEC62040-3)	Voltage permitted to vary within the inverse time characteristics applicable (<100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)
External and internal indications and metering	Change only during test	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual Uninterruptible Power Supply mode of operation
Mode of operation	No change	Change only temporarily

The tests shall be made with the Uninterruptible Power Supply in the following conditions:

- rated input voltage;
- normal mode of operation;
- linear load at rated active output power or at light load according to IEC62040-3.

8. LOW FREQUENCY SIGNALS TEST

8.1 Block Diagram of Test Setup



8.2 Test Standard and Performance Criterion

EN 62040-2: 2006+AC: 2006 Category C2
(EN 61000-2-2: 2002)

Performance criterion: **A**

8.3 Operating Condition of E.U.T.

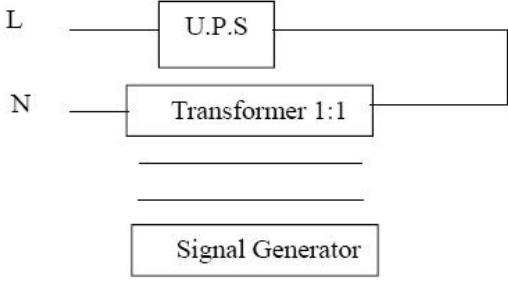
- 8.3.1 Setup the E.U.T. and simulators as shown in Section 2.3.
- 8.3.2 Turn on the power of all equipments.
- 8.3.3 Let the E.U.T. work in test mode (Normal Mode) and test it.

8.4 Test Results

PASS.

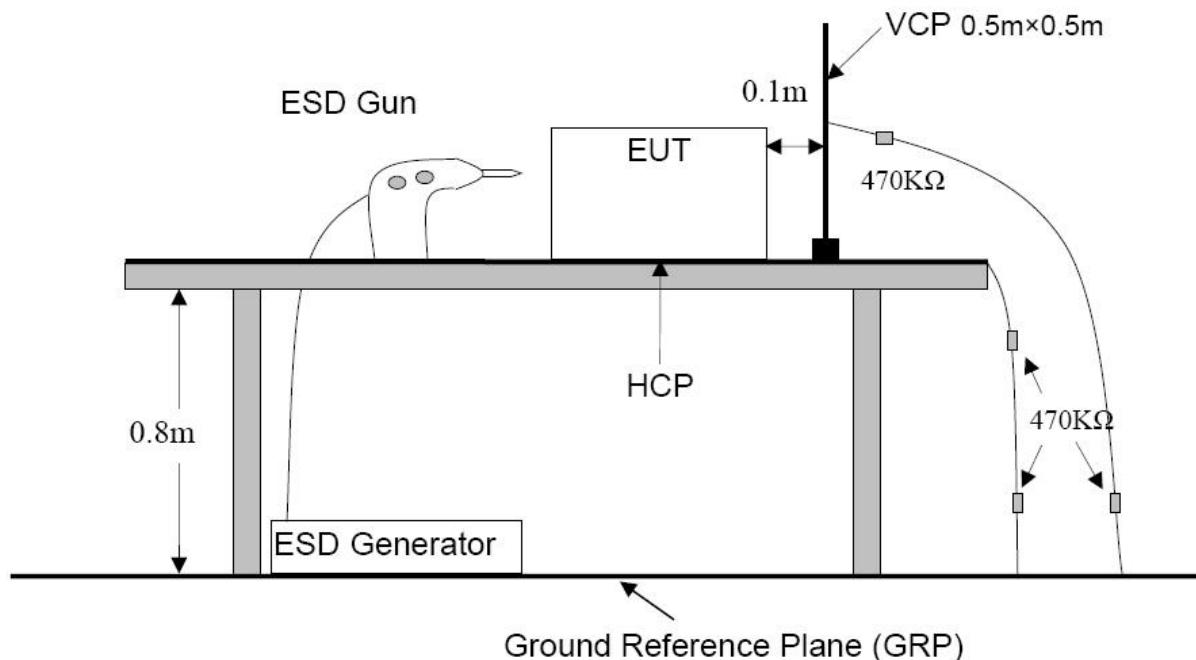
Please refer to following page.

Low Frequency Signals Test Result

Ambient Condition:	Temp.: 22 °C	R.H.: 58 %	Air Pressure: 101 kPa
Power Supply:	AC230V/50Hz	Required Performance Criterion:	A
Tested mode:	Normal Mode		
Frequency Range (Hz)	Position	Strength	Result (Performance Criterion)
140	See Fig.1	10V(rms) Sinusoidal	A
160			A
200			A
240			A
280			A
320			A
360			A
		Test Engineer : James	
Note:			

9. ELECTROSTATIC DISCHARGE TEST

9.1 Block Diagram of Test Setup



9.2 Test Standard and Severity Levels

9.2.1 Test Standard:

EN 62040-2: 2006+AC: 2006 Category C2
(EN 61000-4-2 Air Discharge: Severity Level: 3, $\pm 8KV$;
Contact Discharge: Level: 2, $\pm 4KV$)

9.2.2 Severity Levels:

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

9.3 Test Procedure

9.3.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the E.U.T.. After each discharge, the discharge electrode shall be removed from the E.U.T.. The generator is then re-triggered for a new single discharge and repeated 25 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

9.3.2 Contact Discharge:

All the procedure shall be same as Section 9.3.1. except that the tip of the discharge electrode shall touch the E.U.T..

9.3.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges(in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit(if applicable) of the E.U.T. and 0.1m from the front of the E.U.T.. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

9.3.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the E.U.T.. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the E.U.T. are completely illuminated.

9.4 Test Results

PASS.

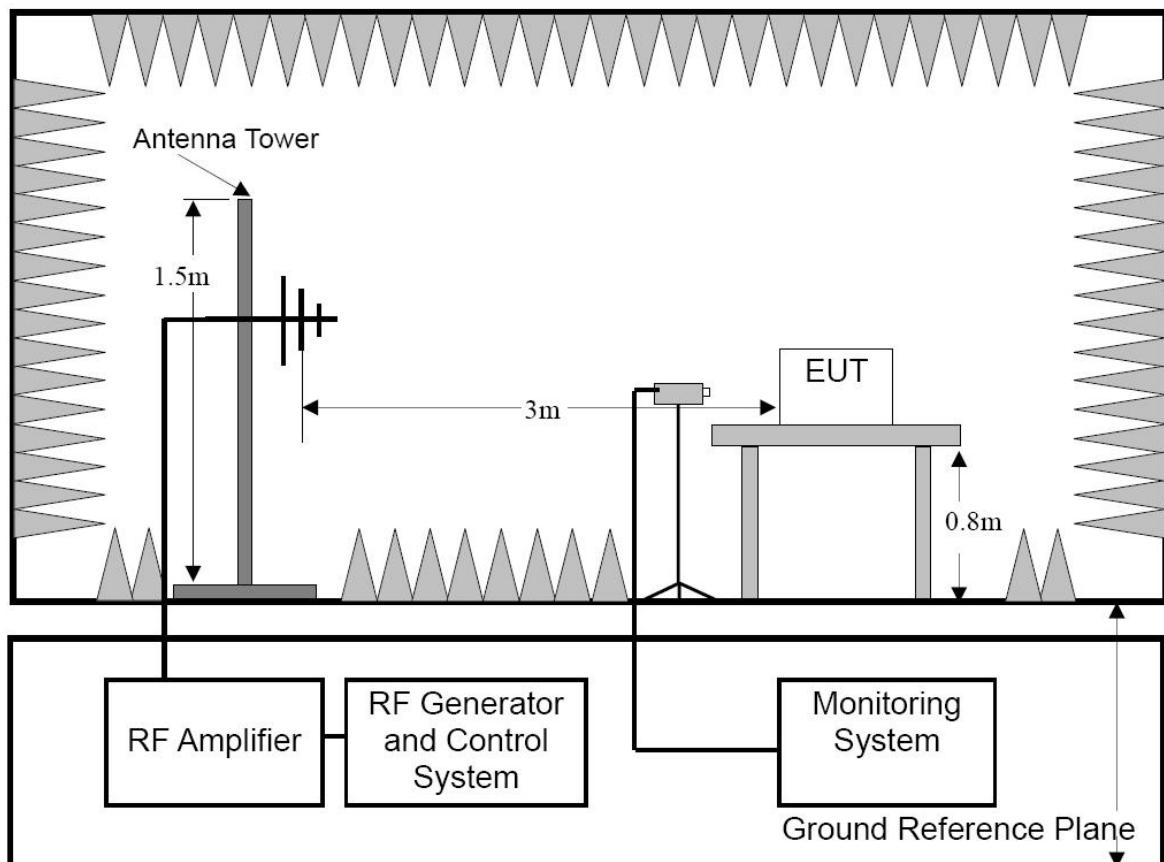
Please refer to the following page.

Electrostatic Discharge Test Results

Ambient Condition:	Temp.: 27 °C R.H.: 57 %	Air Pressure: 101 kPa
Power Supply:	AC 230V/50Hz	Required Performance Criterion: B
Test Specifications:	<p>±2, 4 KV Contact Discharge; ±2, 4, 8 KV Air Discharge For each point positive 10 times and negative 10 times</p>	
Tested mode:	Normal Mode/Stored Energy Mode	
Test Point	Kind A-Air Discharge C-Contact Discharge	Result (Performance Criterion)
Screen	A	A
Metal	C	A
Indirect Discharge (HCP)	C	A
Indirect Discharge (VCP)	C	A
Note:		
Test Engineer : James		

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1 Block Diagram of Test Setup



10.2 Test Standard and Severity Levels

10.2.1 Test Standard

EN 62040-2: 2006+AC: 2006 Category C2
(EN 61000-4-3, Severity Level: 3, 10V / m)

10.2.2 Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

10.3 Test Procedure

The E.U.T. and its simulators are placed on a turn table which is 0.8 meter above ground. E.U.T. is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of E.U.T. must be faced this transmitting antenna and measured individually.

All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	10 V/m (Severity Level 3)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

10.4 Test Results

PASS.

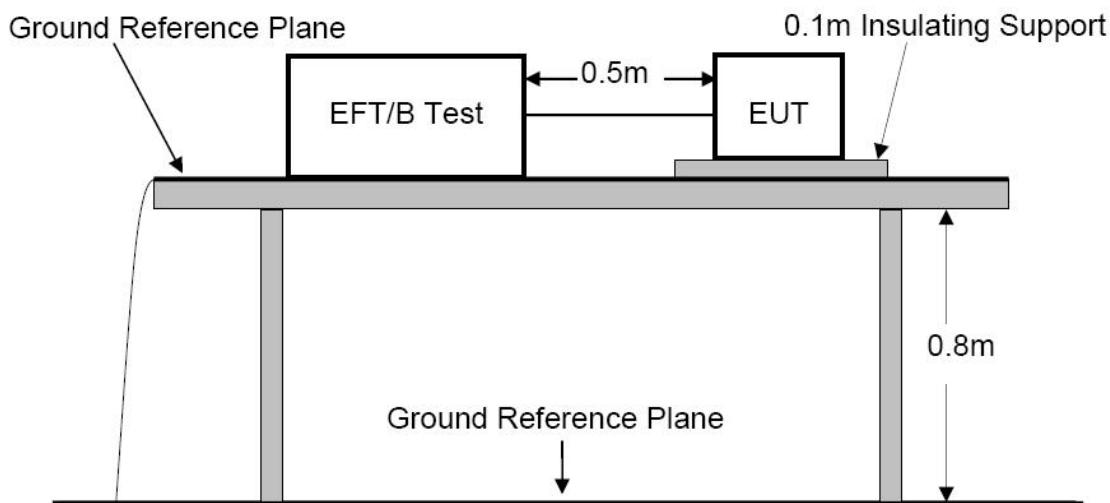
Please refer to the following page.

RF Field Strength Susceptibility Test Results

Ambient Condition:	Temp.: 22 °C	R.H.: 50 %	Air Pressure: 101 kPa			
Power Supply:	AC 230V/50Hz	Required Performance Criterion: A				
Test Specifications:	Modulation: 1kHz, 80%AM; Step Size: 1%; Dwell Time: 1s					
Tested mode:	Normal Mode/Stored Energy Mode					
Frequency (MHz)	Level (V/m)	Antenna polarity	Side	Result (Performance Criterion)		
80-1000	10	Horizontal	Front	A		
			Left	A		
			Right	A		
			Back	A		
	10	Vertical	Front	A		
			Left	A		
			Right	A		
			Back	A		
Note:						
Test Engineer :						

11.ELECTRICAL FAST TRANSIENT/BURST TEST

11.1 Block Diagram of Test Setup



11.2 Test Standard and Severity Levels

11.2.1 Test Standard

EN 62040-2: 2006+AC: 2006 Category C2
(EN 61000-4-4, Severity Level, Level 3: 2KV)

11.2.2 Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5	5 or 100	0.25	5 or 100
2.	1.0	5 or 100	0.5	5 or 100
3.	2.0	5 or 100	1.0	5 or 100
4.	4.0	5 or 100	2.0	5 or 100
X	Special	Special	Special	Special

Note 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.

Note 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.

Note 3 "X" is an open level. The level has to be specified in the dedicated equipment specification.

11.3 Test Procedure

The E.U.T. is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the E.U.T. by at least 0.1m on all sides and the minimum distance between E.U.T. and all other conductive structure, except the ground plane beneath the E.U.T., shall be more than 0.5m.

11.3.1 For input and output AC power ports:

The E.U.T. is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minutes.

11.3.2 For signal lines ports:

It's unnecessary to test.

11.3.3 For DC ports:

It's unnecessary to test.

11.4 Test Result

PASS.

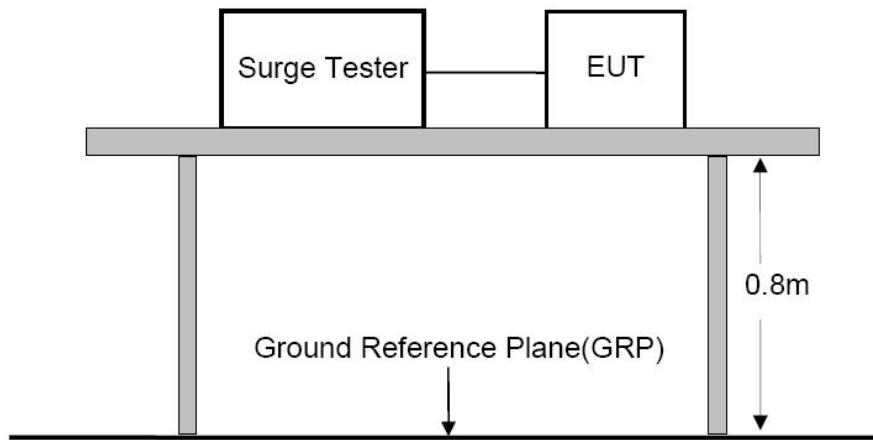
Please refer to the following page.

Electrical Fast Transient/Burst Test Results

Ambient Condition:	Temp.: 27 °C	R.H.: 55 %	Air Pressure: 101 kPa		
Power Supply:	AC 230V 50Hz	Required Performance Criterion: B			
Test Specifications:	Repetition Frequency: 5kHz; Duration: 15ms; Period: 300ms Transient/burst wave form: 5/50ns				
Test mode:	Normal Mode				
Line : <input checked="" type="checkbox"/> AC Mains	<input type="checkbox"/> Signal line	<input type="checkbox"/> DC line			
Coupling : <input checked="" type="checkbox"/> Direct	<input type="checkbox"/> Capacitive				
Line	Test Voltage	Result (Performance Criterion)			
L	±2KV	A			
N	±2KV	A			
PE	±2KV	A			
L、N	±2KV	A			
L、PE	±2KV	A			
N、PE	±2KV	A			
L、N、PE	±2KV	A			
Signal line					
DC line					
Note :					
Test Engineer : James					

12. SURGE IMMUNITY TEST

12.1 Block Diagram of Test Setup



12.2 Test Standard and Severity Levels

12.2.1 Test Standard

EN 62040-2: 2006+AC: 2006 Category C2

(EN 61000-4-5, Severity Level: Line To Line, Level 2: 1.0KV; Line To Earth, Level 3: 2.0KV)

12.2.2 Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.3 Test Procedure

1. Set up the E.U.T. and test generator as shown on Section 12.1.
2. For line to line coupling mode, provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to E.U.T. selected points.
3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
4. Different phase angles are done individually.
5. Record the E.U.T. operating situation during compliance test and decide the E.U.T. immunity criterion for above each test.

12.4 Test Result

PASS.

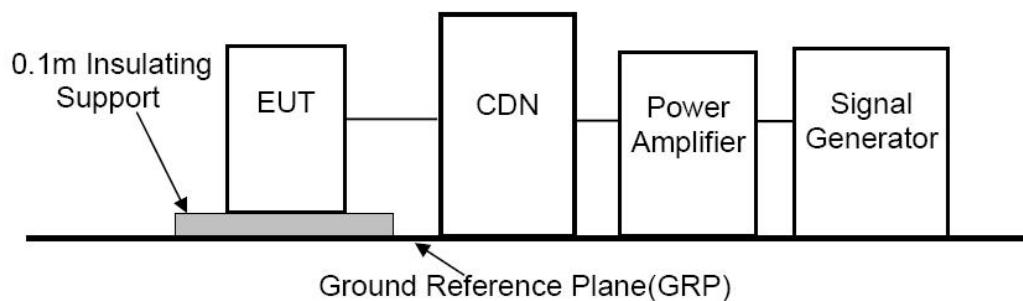
Please refer to the following page.

Surge Immunity Test Results

Ambient Condition:	Temp.: 27 °C	R.H.: 57 %	Air Pressure: 101 kPa		
Power Supply:	AC 230V 50Hz	Required Performance Criterion: B			
Test Specifications:	Voltage surge 1.2/50 us ; Current surge 8/20 us ; Five positive and five negative pulses each at 0°, 90°, 180° and 270°.				
Test mode:	Normal Mode				
Line (Input)	Phase Angle	Test Voltage	Result (Performance Criterion)		
L-N	0°, 90°, 180°, 270°	±1KV	A		
L-PE	0°, 90°, 180°, 270°	±2KV	A		
N-PE	0°, 90°, 180°, 270°	±2KV	A		
Signal line					
DC line					
Line (Output)	Phase Angle	Test Voltage	Result (Performance Criterion)		
L-N	0°, 90°, 180°, 270°	±1KV	A		
L-PE	0°, 90°, 180°, 270°	±2KV	A		
N-PE	0°, 90°, 180°, 270°	±2KV	A		
Signal line					
DC line					
Note :					
Test Engineer : James					

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1 Block Diagram of Test Setup



13.2 Test Standard and Severity Levels

13.2.1 Test Standard

EN 62040-2: 2006+AC: 2006 Category C2
(EN 61000-4-6, Severity Level 3: 10V (rms), 0.15MHz ~ 80MHz)

13.2.2 Severity level

Level	Field Strength V
1.	1
2.	3
3.	10
X	Special

13.3 Test Procedure

1. Set up the E.U.T., CDN and test generators as shown on Section 11.1.
2. Let the E.U.T. work in test mode and measure it.
3. The E.U.T. 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 E.U.T.. Cables between CDN and E.U.T. are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
4. The disturbance signal described below is injected to E.U.T. through CDN.
5. The E.U.T. operates within its operational mode(s) under intended climatic conditions after power on.
6. The frequency range is swept from 150 KHz to 80 MHz using 10V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
7. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
8. Recording the E.U.T. operating situation during compliance testing and decide the E.U.T. immunity criterion.

13.4 Test Result

PASS.

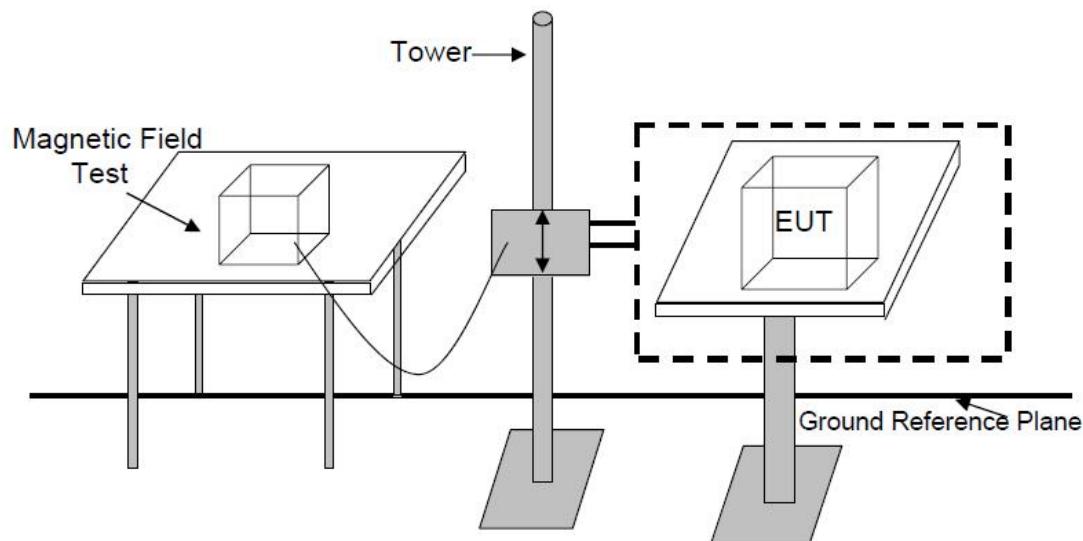
Please refer to the following page.

Injected Currents Susceptibility Test Results

Ambient Condition:	Temp.: 22°C	R.H.: 50%	Air Pressure: 101 kPa		
Power Supply:	AC 230V 50Hz	Required Performance Criterion: A			
Test Specifications:	Modulation : 1KHz, 80%AM, Step Size : 1%, Dwell Time : 1s				
Test mode:	Normal Mode				
Test Port	Frequency (MHz)	Level(V)	Result (Performance Criterion)		
AC Mains	0.15~80	10	A		
Note :					
Test Engineer :					

14. MAGNETIC FIELD IMMUNITY TEST

14.1 Block Diagram of Test Setup



14.2 Test Standard and Severity Levels

14.2.1 Test Standard

EN 62040-2: 2006+AC: 2006 Category C2
(EN 61000-4-8: 2010, Severity level 4: 30A/m)

14.2.2 Severity level

Level	Magnetic Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

14.3 Test Procedure

The E.U.T. is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8m above the ground. X, Y and Z polarization of the induction coil are set on test, so that each side of the E.U.T. is affected by the magnetic field. Also can reach the same aim by change the position of the E.U.T..

14.4 Test Result

PASS.

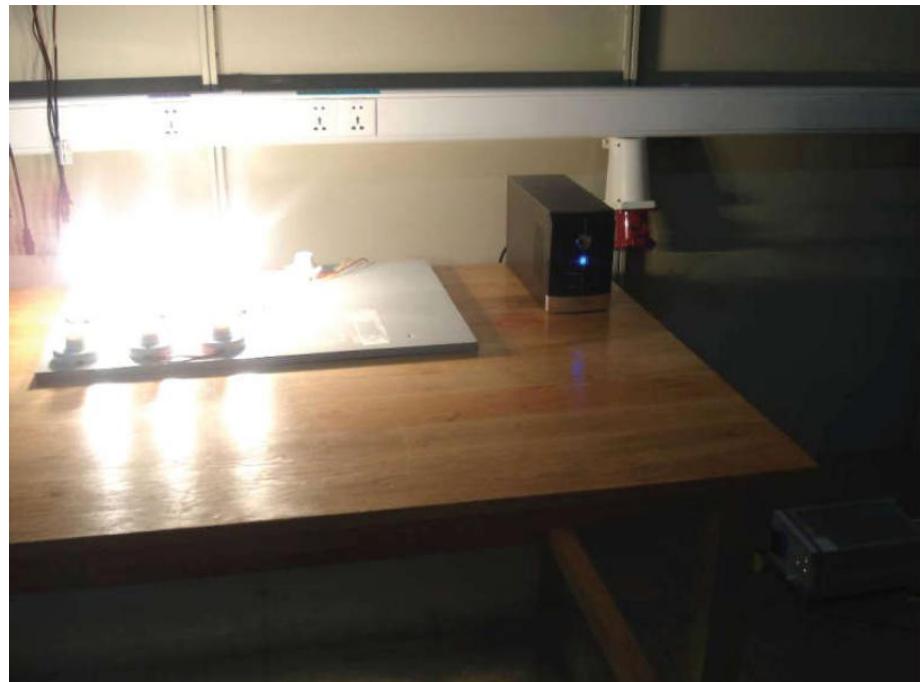
Please refer to the following page.

Magnetic Field Immunity Test Results

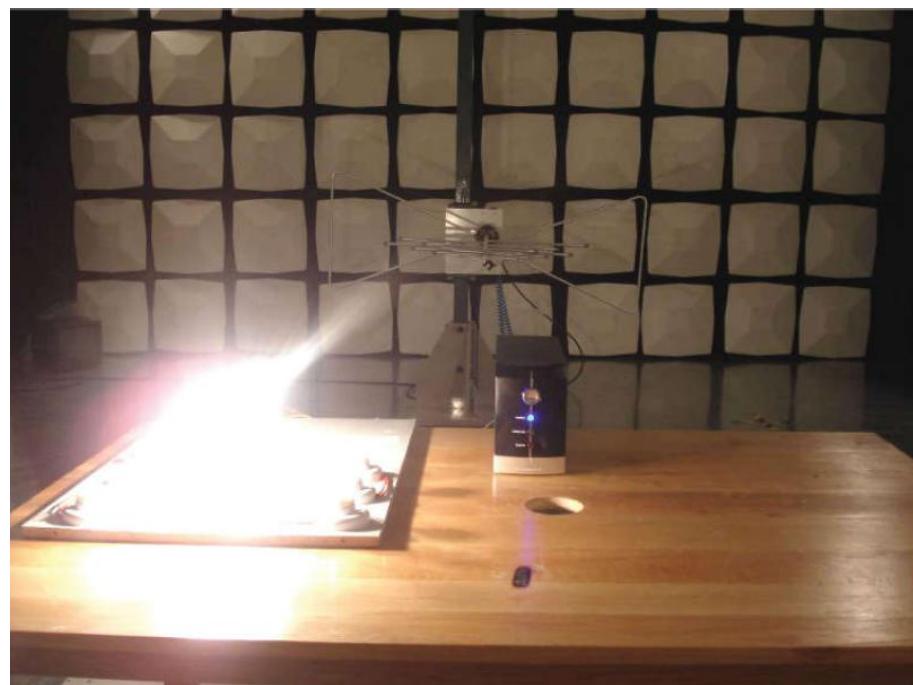
Ambient Condition:	Temp.: 22°C	R.H.: 58 %	Air Pressure: 101 kPa		
Power Supply:	AC 230V/50Hz	Required Performance Criterion: B			
Test Specifications:	30A/m				
Test mode:	Normal Mode/Stored Energy Mode				
Test Level	Testing Duration	Coil Orientation	Result (Performance Criterion)		
30A/m	5min	X	B		
30A/m	5min	Y	B		
30A/m	5min	Z	B		
Note :					
Test Engineer : James					

15.PHOTOGRAPH

15.1 Photo of Conducted Emission Measurement



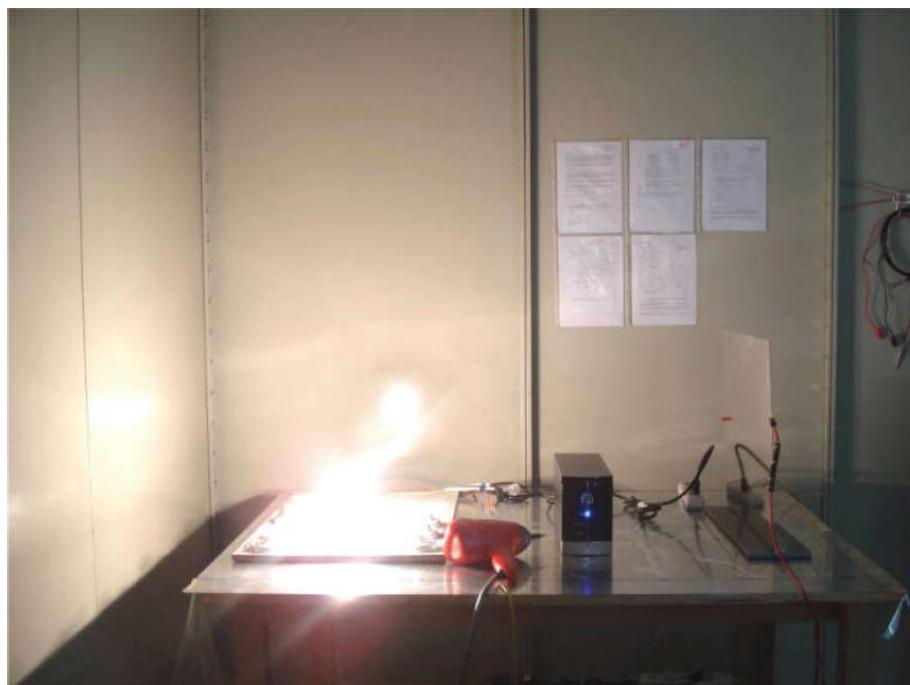
15.2 Photo of Radiation Emission Measurement



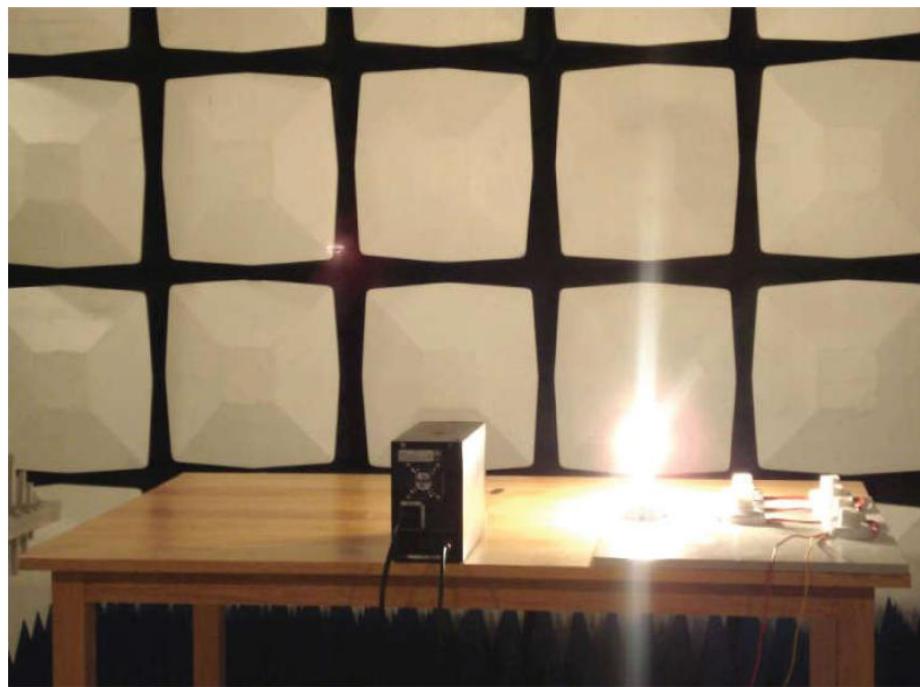
15.3 Photo of Harmonic Measurement



15.4 Photo of Electrostatic Discharge Test



15.4 RF Field Strength Susceptibility Test



15.5 Photo of Electrical Fast Transient /Surge Test



APPENDIX I

(Photos of E.U.T.)

Figure 1
General Appearance of the E.U.T.
S1000



Figure 2
General Appearance of the E.U.T.
S1000



Figure 3
General Internal of the E.U.T

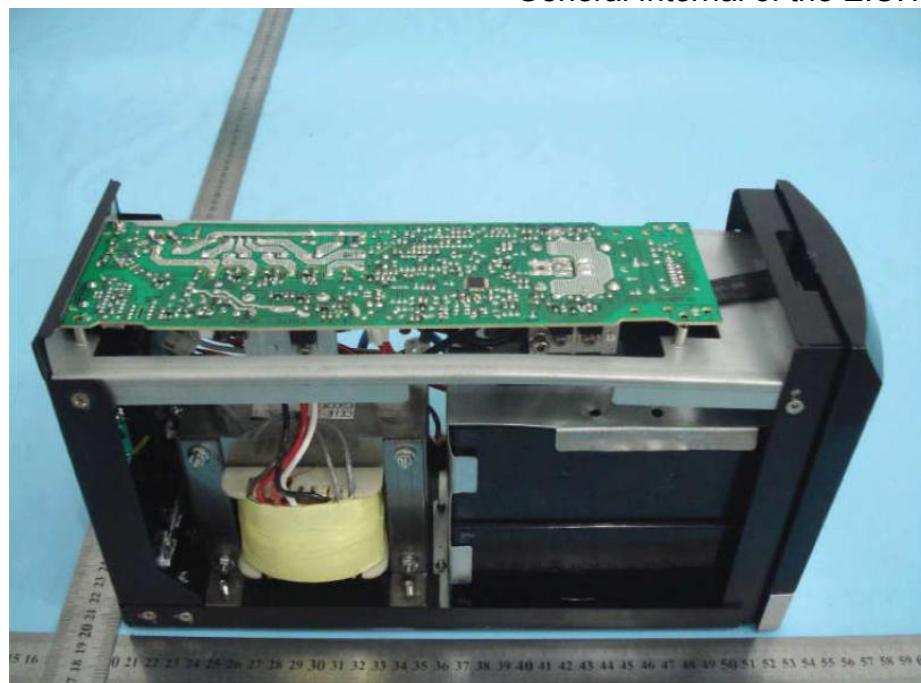


Figure4
General Appearance of the PCB

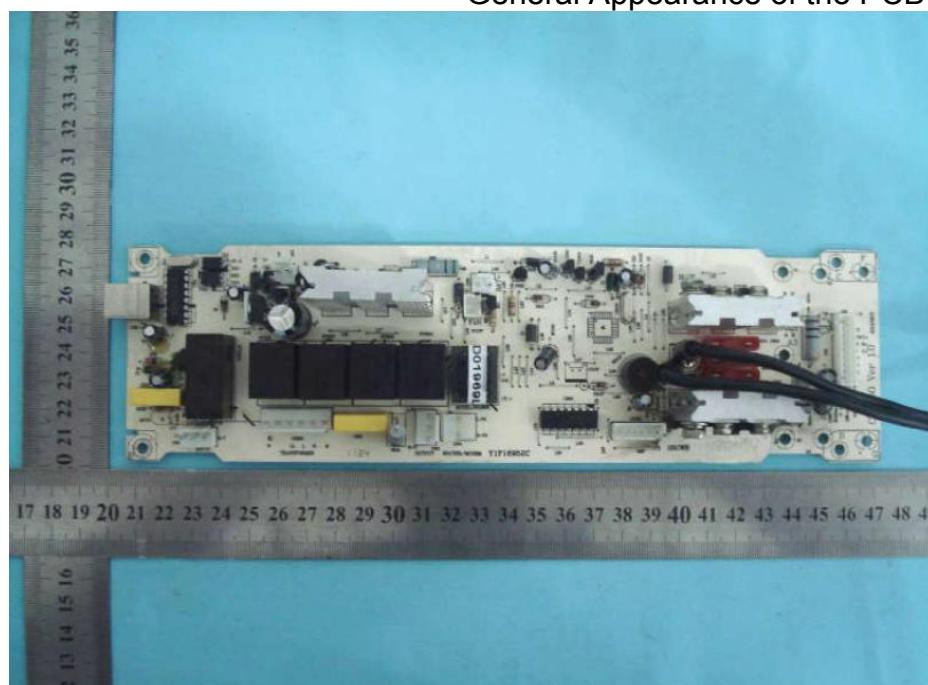
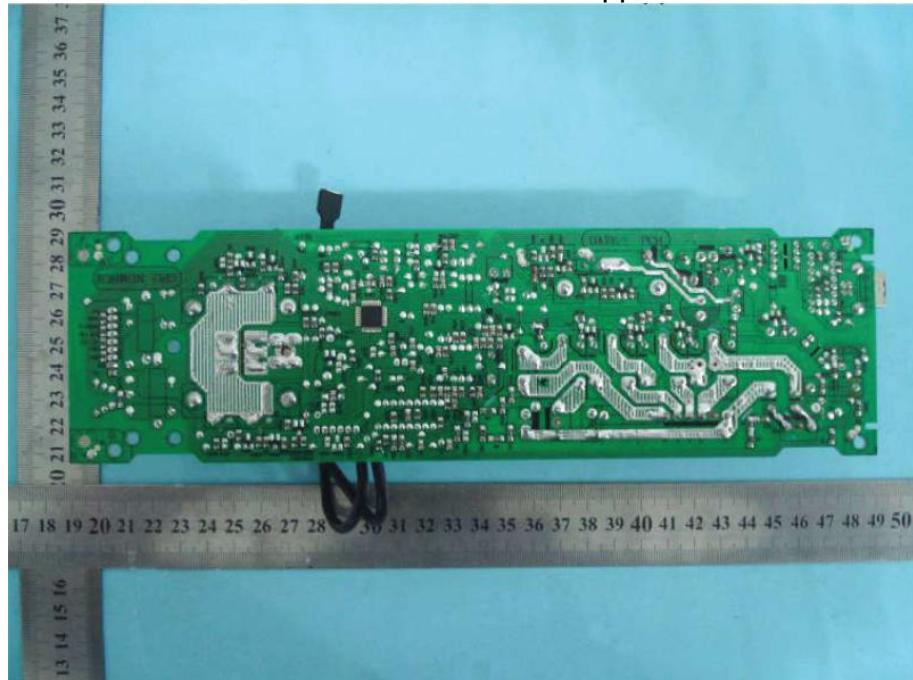


Figure 5
General Appearance of the PCB



--- End ---