



VERIFICATION OF COMPLIANCE

This Verification of Compliance is hereby issued to the below named company. The test results of this report relate only to the tested sample identified in this report.

**Technical Standard: EMC DIRECTIVE 2014/30/EU
(EN55032 / EN55024)**

General Information

Applicant: EVGA Corporation
2900 Saturn Street, Suite B Brea., California 92821, USA

Product Description

EUT Description: Switching Power Supply
Model Number: 850 GQ; 1000 GQ

Measurement Standard

EN 55032: 2012 / AC: 2013

CISPR 32: 2012

AS/NZS CISPR 32: 2013

EN 61000-3-2: 2014

EN 61000-3-3: 2013

EN 55024: 2010

(IEC 61000-4-2: 2008; IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010; IEC 61000-4-4: 2012;
IEC 61000-4-5: 2014; IEC 61000-4-6: 2013; IEC 61000-4-8: 2009; IEC 61000-4-11: 2004)

Measurement Facilities

Xindian Lab.: Compliance Certification Services Inc.
No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, 23151 Taiwan.
Tel: +886-2-22170894 / Fax: +886-2-22171029

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report number: T161220D16-E

Sam Hu / Assistant Manager

Date: January 23, 2017

CE EMC TEST REPORT

for

Switching Power Supply

MODEL: 850 GQ; 1000 GQ

Test Report Number:
T161220D16-E

Issued to:

EVGA Corporation

2900 Saturn Street, Suite B Brea., California 92821, USA

Issued by:

Compliance Certification Services Inc.

Xindian Lab.

**No.163-1, Jhongsheng Rd., Xindian Dist.,
New Taipei City, 23151 Taiwan.**

TEL: 886-2-22170894

FAX: 886-2-22171029

Issued Date: January 23, 2017



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, A2LA, NVLAP, NIST or any government agencies. The test results in the report only apply to the tested sample.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 21, 2015	Initial Issue	ALL	Eva Fan
01	January 23, 2017	Standard replace: EN 55032 + EN 55024	ALL	Eva Fan

TABLE OF CONTENTS

1	TEST CERTIFICATION	4
2	TEST RESULT SUMMARY	5
3	EUT DESCRIPTION	6
4	TEST METHODOLOGY	7
4.1.	DECISION OF FINAL TEST MODE.....	7
4.2.	EUT SYSTEM OPERATION	7
5	SETUP OF EQUIPMENT UNDER TEST	8
5.1.	DESCRIPTION OF SUPPORT UNITS.....	8
5.2.	CONFIGURATION OF SYSTEM UNDER TEST	9
6	FACILITIES AND ACCREDITATIONS.....	10
6.1.	FACILITIES	10
6.2.	ACCREDITATIONS	10
6.3.	MEASUREMENT UNCERTAINTY.....	10
7	EMISSION TEST	11
7.1.	CONDUCTED EMISSION MEASUREMENT.....	11
7.2.	RADIATED EMISSION MEASUREMENT.....	18
7.3.	CONDUCTED DIFFERENTIAL VOLTAGE EMISSIONS FROM CLASS B EQUIPMENT.....	27
7.4.	HARMONICS CURRENT MEASUREMENT.....	30
7.5.	VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT	37
8	IMMUNITY TEST	40
8.1.	GENERAL DESCRIPTION	40
8.2.	GENERAL PERFORMANCE CRITERIA DESCRIPTION.....	41
8.3.	ELECTROSTATIC DISCHARGE (ESD)	42
8.4.	RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD (RS)	50
8.5.	ELECTRICAL FAST TRANSIENT (EFT)	53
8.6.	SURGE IMMUNITY TEST	56
8.7.	CONDUCTED RADIO FREQUENCY DISTURBANCES (CS).....	58
8.8.	POWER FREQUENCY MAGNETIC FIELD	61
8.9.	VOLTAGE DIPS & VOLTAGE INTERRUPTIONS	64
9	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	67
	APPENDIX 1 - PHOTOGRAPHS OF EUT	A1-1

1 TEST CERTIFICATION

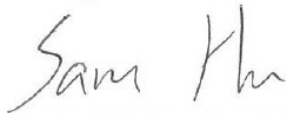
Product: Switching Power Supply**Model:** 850 GQ; 1000 GQ**Applicant:** EVGA Corporation
2900 Saturn Street, Suite B Brea., California 92821, USA**Tested:** September 20, 2015 ~ January 20, 2017

Applicable Standards:	EN 55032: 2012 / AC: 2013 Class B	EN 55024: 2010
	CISPR 32: 2012 Class B	IEC 61000-4-2: 2008
	AS/NZS CISPR 32: 2013	IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010
	EN 61000-3-2: 2014	IEC 61000-4-4: 2012
	EN 61000-3-3: 2013	IEC 61000-4-5: 2014
		IEC 61000-4-6: 2013
	IEC 61000-4-8: 2009	
	IEC 61000-4-11: 2004	

Deviation from Applicable Standard

None

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements of technical standards specified above under the EMC Directive 2014/30/EU. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:


Sam Hu
Assistant Manager

Reviewed by:


Eva Fan
Supervisor of report document dept.

2 TEST RESULT SUMMARY

EMISSION			
Standard	Item	Result	Remarks
EN 55032: 2012 / AC: 2013 CISPR 32: 2012 AS/NZS CISPR 32: 2013	Conducted (Power Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit
	Radiated emissions from FM receivers	N/A	Please see the page 26
	Conducted differential voltage emissions from Class B equipment	N/A	Please see the page 29
EN 61000-3-2: 2014	Harmonic current emissions	PASS	Meet Class D limit
EN 61000-3-3: 2013	Voltage fluctuations & flicker	PASS	Meets the requirements

IMMUNITY [EN 55024 (2010)]			
Standard	Item	Result	Remarks
IEC 61000-4-2: 2008	ESD	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010	RS	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-4: 2012	EFT	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-5: 2014	Surge	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-6: 2013	CS	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-8: 2009	PFMF	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-11: 2004	Voltage dips & voltage variations	PASS	Meets the requirements of 230Vac, 50Hz Voltage Dips: 1) >95% reduction Performance Criterion A 2) 30% reduction Performance Criterion A Voltage Interruptions: 1) >95% reduction Performance Criterion C 100Vac, 50Hz Voltage Dips: 1) >95% reduction Performance Criterion A 2) 30% reduction Performance Criterion B Voltage Interruptions: 1) >95% reduction Performance Criterion B

- Note:**
- The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
 - The information of measurement uncertainty is available upon the customer's request.

3 EUT DESCRIPTION

Product	Switching Power Supply
Model	850 GQ; 1000 GQ
Applicant	EVGA Corporation
Housing material	Metal Case
Identify Number	T150828D03
EUT Power Rating	Please see the below model differences
AC Power During Test	230VAC / 50Hz
DC Power Cable Type	Unshielded, 1.8m (Non-Detachable)

Model Differences

Model	Difference		Tested (Check)
	I/P	O/P	
850 GQ	100-240Vac, 14A, 60/50Hz	+5VSB / 3.0A; -12V / 0.5A; +5V / 24A; +3.3V / 24A; +12V / 70.8A 1. +3.3V & 5V total output not exceed 120W. 2. Total output for this subject power supply is 850W watts.	<input checked="" type="checkbox"/>
1000 GQ	100-240Vac, 16A, 60/50Hz	+5VSB / 3.0A; -12V / 0.5A; +5V / 24A; +3.3V / 24A; +12V / 83.3A 1. +3.3V & 5V total output not exceed 120W. 2. Total output for this subject power supply is 1000W watts.	<input checked="" type="checkbox"/>

I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH

Note: None.

4 TEST METHODOLOGY

4.1. DECISION OF FINAL TEST MODE

The EUT was tested together with the below additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The test configuration/ modes are as the following:

Modes:

1	850 GQ / Normal Mode
2	1000 GQ / Normal Mode

4.2. EUT SYSTEM OPERATION

1. Windows 7 boots system.
2. Run Burnin test.exe to activate all peripherals for test EUT.

Note: Test program is self-repeating throughout the test.

5 SETUP OF EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF SUPPORT UNITS

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.

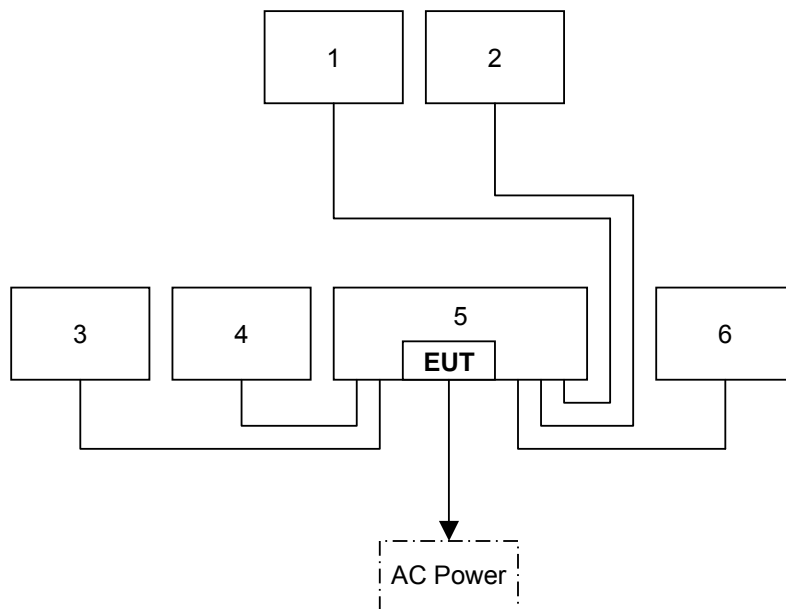
Peripherals Devices:

No.	Equipment	Model No.	Serial No.	FCC ID / BSMI ID	Brand Name	Data Cable	Power Cord
1	USB Mouse	M-U0026	810-002181	DOC BSMI: T41126	Logitech	Shielded, 1.8m	N/A
2	USB Keyboard	Y-U0011	N/A	DOC BSMI: T51160	Logitech	Shielded, 1.6m	N/A
3	Modem	AL-56ERM	N/A	DOC	GALILEO	Shielded, 1.8m	Unshielded, 1.8m with a core
4	Printer	C60	N/A	BSMI ID: 3902E006	EPSON	Shielded, 1.8m	Unshielded, 1.8m
5	Host PC	Z210	N/A	DOC BSMI: R33001	HP	N/A	Unshielded, 1.8m
6	Monitor	PA248Q	N/A	DOC BSMI: R31018	ASUS	Shielded, 1.8m with two cores	Unshielded, 1.8m

Note:

- 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5.2. CONFIGURATION OF SYSTEM UNDER TEST



6 FACILITIES AND ACCREDITATIONS

6.1. FACILITIES

All measurement facilities used to collect the measurement data are located at CCSrf Taiwan Xindian Lab. at No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, 23151 Taiwan.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4 and CISPR 16-1-5.

6.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF
USA	A2LA

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Norway	Nemko
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	0.15MHz ~ 30MHz	± 1.07
Radiated emissions	30MHz ~ 1000MHz	± 4.84

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2005, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

7 EMISSION TEST

7.1. CONDUCTED EMISSION MEASUREMENT

7.1.1. LIMITS

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

7.1.2. TEST INSTRUMENTS

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
BNC CABLE	EMCI	CFD300-NL	BNC#A8	05/18/2017
EMI Test Receiver	R&S	ESCI	101201	08/19/2017
LISN	Schwarzbeck	NNLK 8129	8129-286	08/18/2017
LISN(EUT)	Schwarzbeck	NSLK 8127	8127527	08/18/2017
Pulse Limiter	R&S	ESH3Z2	C3010026-2	08/22/2017
Thermo-Hygro Meter	Wisewind	201A	No. 02	05/02/2017
Test S/W	EZ-EMC			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

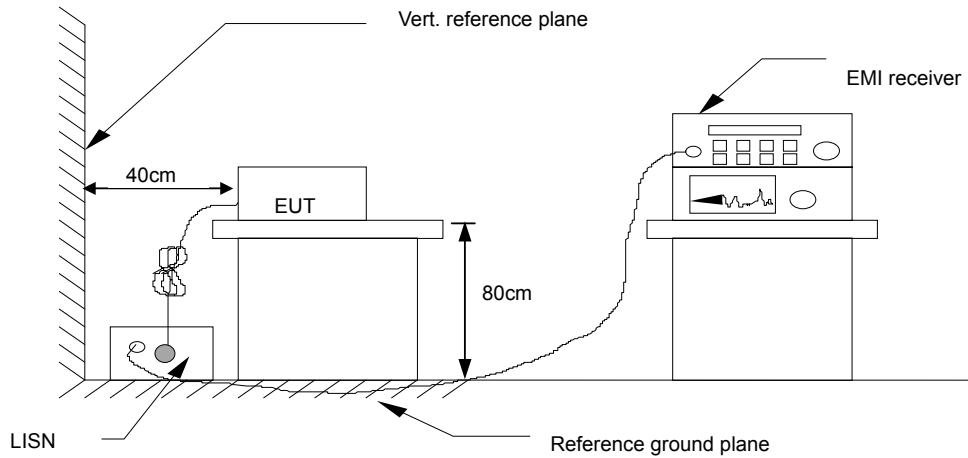
7.1.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-031 & PA-041)**Procedure of Preliminary Test**

- The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 15 cm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per EN 55032.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment power received from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 4.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 4.1 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

7.1.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.5. DATA SAMPLE

Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
x.xx	42.95	0.55	43.50	56	-12.50	Q	L1

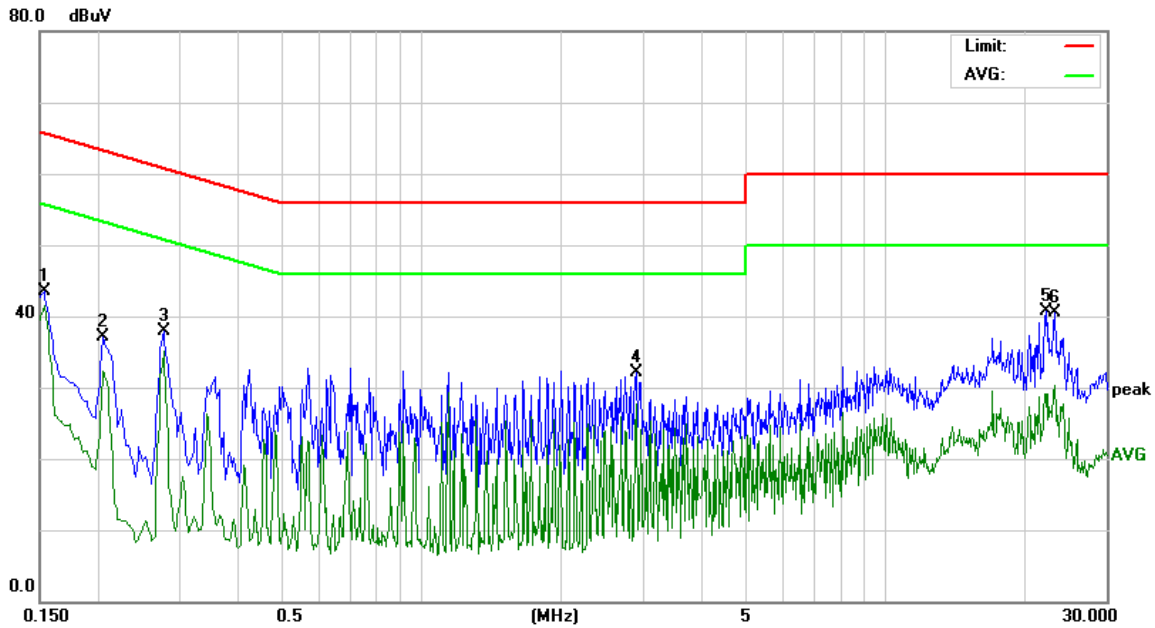
- Freq. = Emission frequency in MHz
- Reading = Uncorrected Analyzer/Receiver reading
- Factor = Insertion loss of LISN + Cable Loss + Pulse Limit
- Result = Reading + Factor
- Limit = Limit stated in standard
- Margin = Reading in reference to limit
- P = Peak Reading
- Q = Quasi-peak Reading
- A = Average Reading
- L1 = Hot side
- L2 = Neutral side

Calculation Formula

Margin (dB) = Result (dBuV) – Limit (dBuV)

7.1.6. TEST RESULTS

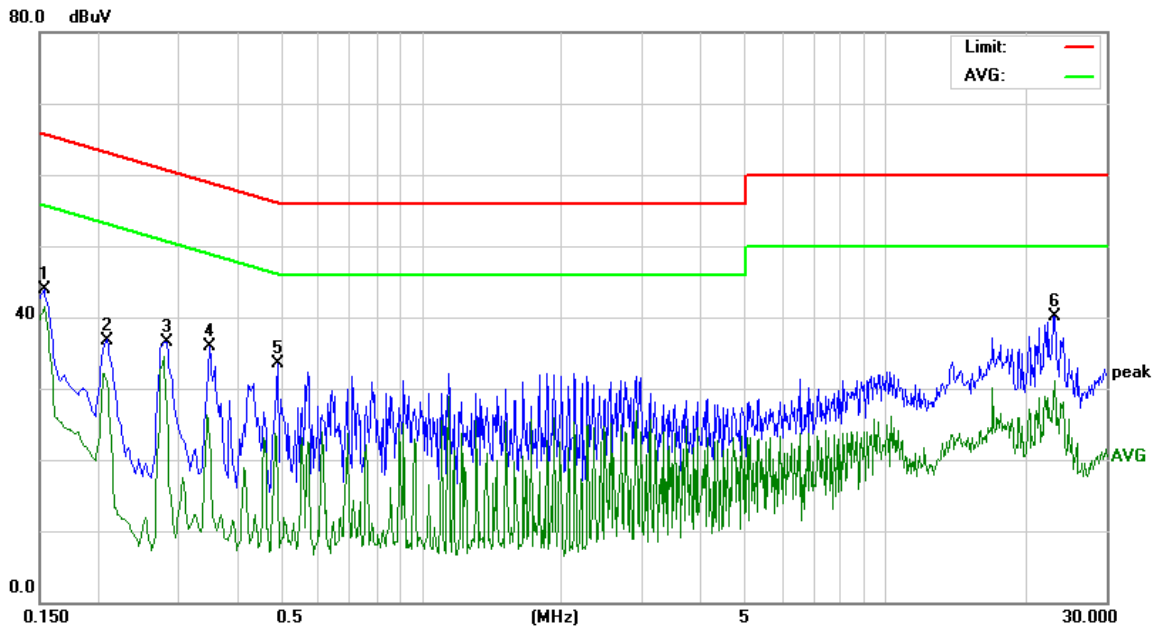
Model No.	850 GQ	6dB Bandwidth	9 kHz
Environmental Conditions	20°C, 58% RH	Test Mode	Mode 1
Tested by	Leon Yu	Phase	L1
Standard	EN 55032 CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1539	33.45	10.09	43.54	65.78	-22.24	P	L1
0.2060	26.97	10.10	37.07	63.36	-26.29	P	L1
0.2779	27.84	10.11	37.95	60.88	-22.93	P	L1
2.9020	21.80	10.33	32.13	56.00	-23.87	P	L1
22.1860	29.27	11.37	40.64	60.00	-19.36	P	L1
23.1460	29.00	11.50	40.50	60.00	-19.50	P	L1

Note: L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

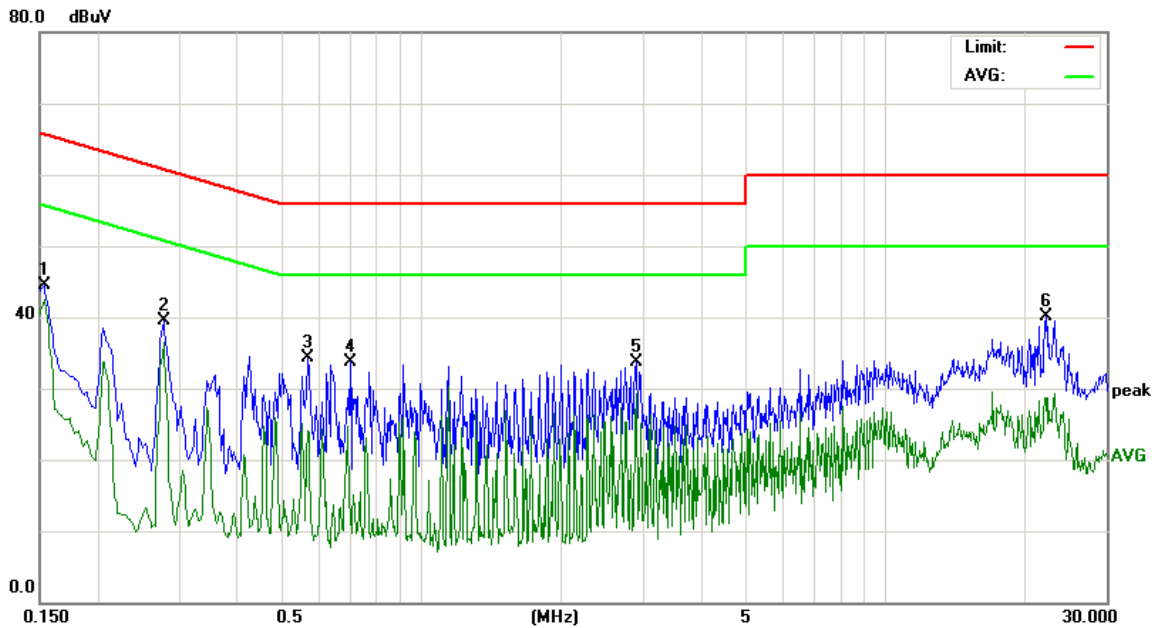
Model No.	850 GQ	6dB Bandwidth	9 kHz
Environmental Conditions	20°C, 58% RH	Test Mode	Mode 1
Tested by	Leon Yu	Phase	L2
Standard	EN 55032 CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1539	33.73	10.09	43.82	65.78	-21.96	P	L2
0.2100	26.70	10.10	36.80	63.20	-26.40	P	L2
0.2819	26.40	10.11	36.51	60.76	-24.25	P	L2
0.3500	25.72	10.10	35.82	58.96	-23.14	P	L2
0.4900	23.44	10.12	33.56	56.17	-22.61	P	L2
23.1940	28.55	11.51	40.06	60.00	-19.94	P	L2

Note: L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

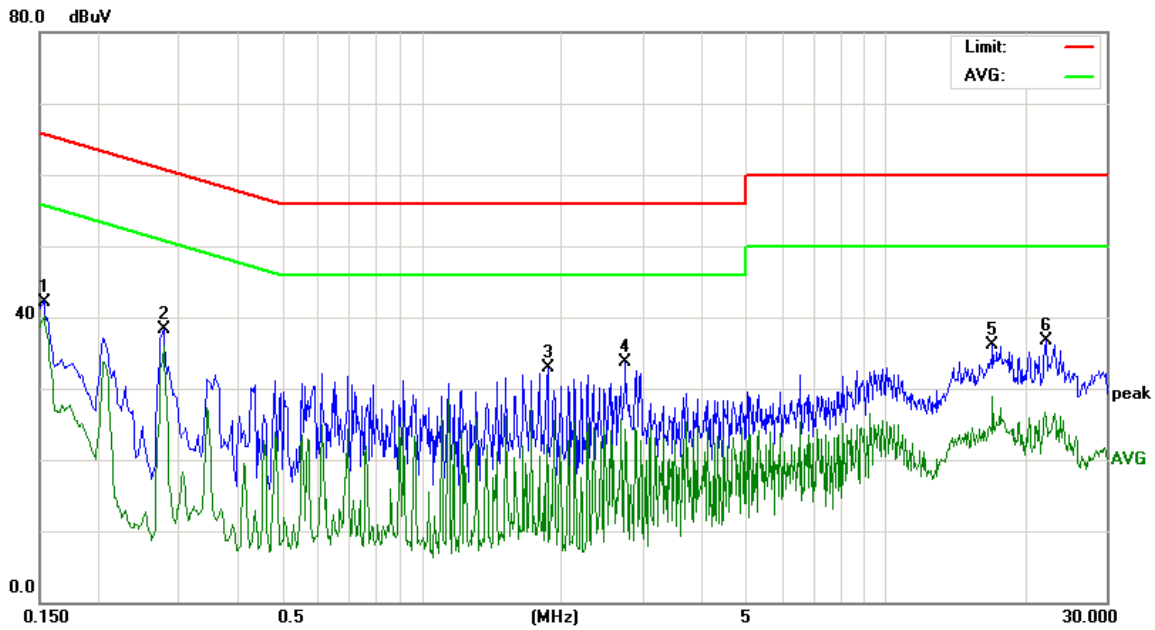
Model No.	1000 GQ	6dB Bandwidth	9 kHz
Environmental Conditions	20°C, 58% RH	Test Mode	Mode 2
Tested by	Leon Yu	Phase	L1
Standard	EN 55032 CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1539	34.45	10.09	44.54	65.78	-21.24	P	L1
0.2779	29.34	10.11	39.45	60.88	-21.43	P	L1
0.5699	24.18	10.12	34.30	56.00	-21.70	P	L1
0.7019	23.61	10.12	33.73	56.00	-22.27	P	L1
2.9020	23.30	10.33	33.63	56.00	-22.37	P	L1
22.1858	28.77	11.37	40.14	60.00	-19.86	P	L1

Note: L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Model No.	1000 GQ	6dB Bandwidth	9 kHz
Environmental Conditions	20°C, 58% RH	Test Mode	Mode 2
Tested by	Leon Yu	Phase	L2
Standard	EN 55032 CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1539	32.11	10.09	42.20	65.78	-23.58	P	L2
0.2779	28.27	10.11	38.38	60.88	-22.50	P	L2
1.8700	22.56	10.28	32.84	56.00	-23.16	P	L2
2.7620	23.38	10.32	33.70	56.00	-22.30	P	L2
17.0579	25.14	10.93	36.07	60.00	-23.93	P	L2
22.2020	25.43	11.37	36.80	60.00	-23.20	P	L2

Note: L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

7.2. RADIATED EMISSION MEASUREMENT

7.2.1. LIMITS

Below 1GHz

FREQUENCY (MHz)	dBuV/m (At 10m)		dBuV/m (At 3m)	
	Class A	Class B	Class A	Class B
30 ~ 230	40	30	50	40
230 ~ 1000	47	37	57	47

According to EN 55032: 2012 / AC: 2013 Table 1 the measurement frequency range shown in the following table:

Table 1 – Required highest frequency for radiated measurement

Highest internal frequency (F_x)	Highest internal frequency
$F_x \leq 108$ MHz	1 GHz
$108 \text{ MHz} < F_x \leq 500$ MHz	2 GHz
$500 \text{ MHz} < F_x \leq 1$ GHz	5 GHz
$F_x > 1$ GHz	$5 \times F_x$ up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, F_x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

NOTE 2 F_x is defined in 3.1.19.

Where F_x is unknown, the radiated emission measurements shall be performed up to 6 GHz.

Radiated emissions from FM receivers

Frequency range MHz	Measurement		Class B limit dB(μ V/m)	
	Distance m	Detector type / bandwidth	Fundamental	Harmonics
			OATS / SAC (see Table A.1)	OATS / SAC (see Table A.1)
30 – 230	10	Quasi peak/ 120kHz	50	42
230 – 300				42
300 – 1000				46
30 – 230	3		60	52
230 – 300				52
300 – 1000				56

These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the local oscillator. Signals at all other frequencies shall be compliant with the limits given in 7.3.1 Class B Limit

7.2.2. TEST INSTRUMENTS

Open Area Test Site # J				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Bilog Antenna	Sunol	JB1	A100209-2	05/22/2017
Cable	EMEC	CFD400NL-LW	N-Type#J9&JA	04/07/2017
EMI Test Receiver	R&S	ESCI	101054	03/24/2017
Pre-Amplifier	Schaffner	CPA9231A	3626	09/29/2017
Thermo-Hygro Meter	Wisewind	201A	No. 04	05/31/2017
Test S/W	EZ-EMC			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

7.2.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031 & PA-041)**Procedure of Preliminary Test**

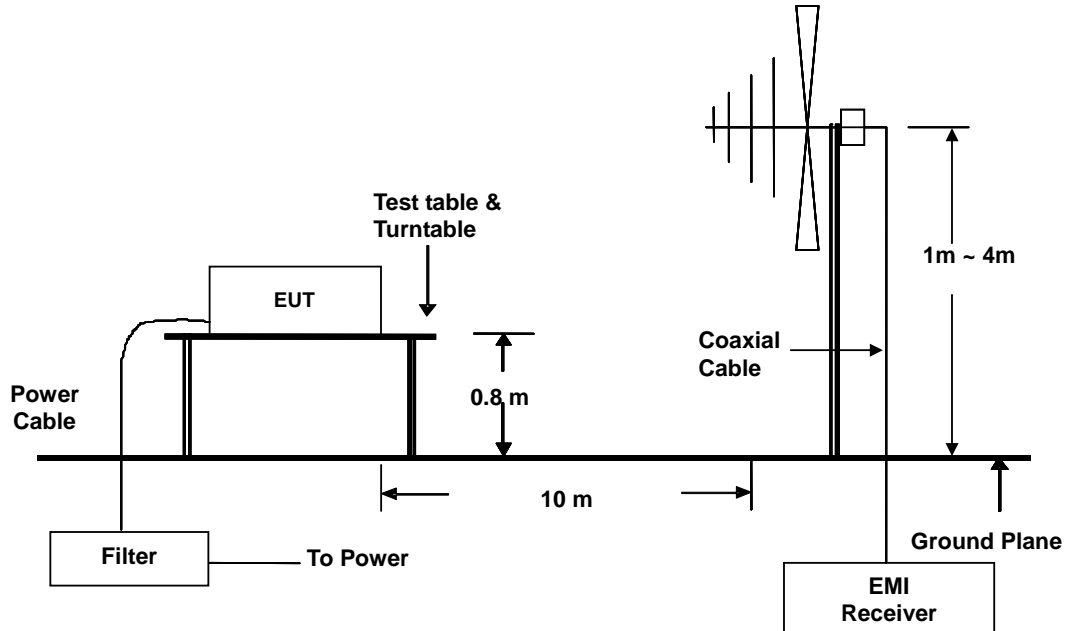
- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 15 cm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per EN 55032.
- All I/O cables were positioned to simulate typical usage as per EN 55032.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 10 meter away from the EUT as stated in EN 55032. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 4.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 4.1 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. Below 1GHz the Q.P. reading are presented.
- The test data of the worst-case condition(s) was recorded.

7.2.4. TEST SETUP

Below 1GHz



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.2.5. DATA SAMPLE

Below 1GHz

Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/Q)	Pol. (H/V)
x.xx	14.0	12.2	26.2	30	-3.8	Q	H

- Freq. = Emission frequency in MHz
- Reading = Uncorrected Analyzer/Receiver reading
- Factor = Antenna Factor + Cable Loss - Amplifier Gain
- Result = Reading + Factor
- Limit = Limit stated in standard
- Margin = Reading in reference to limit
- P = Peak Reading
- Q = Quasi-peak Reading
- H = Antenna Polarization: Horizontal
- V = Antenna Polarization: Vertical

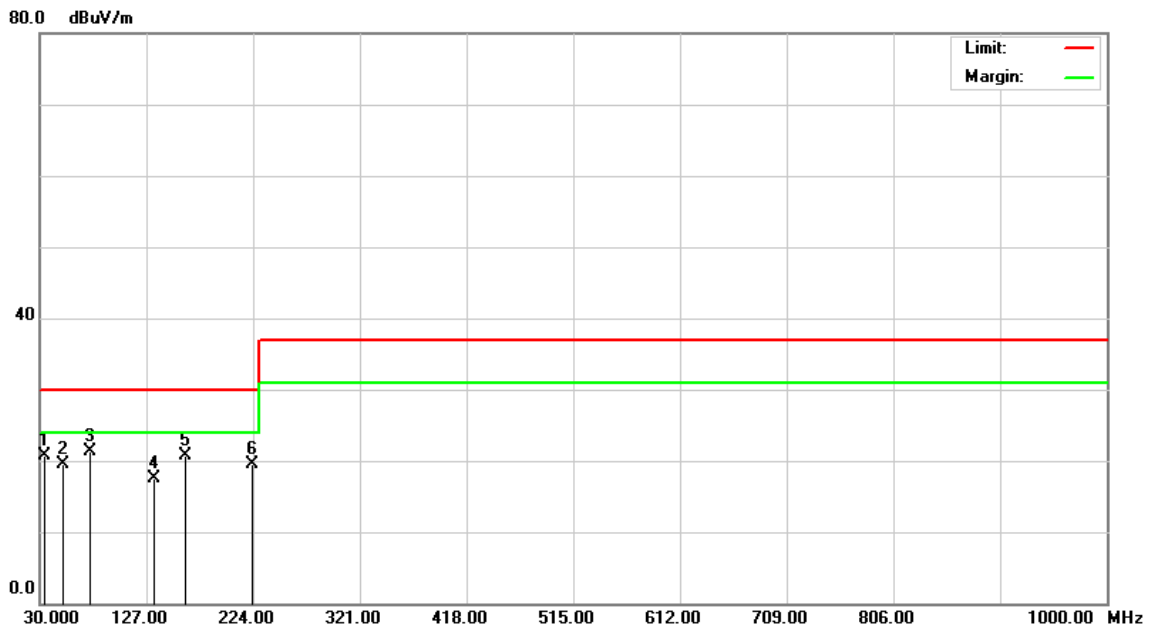
Calculation Formula

Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)

7.2.6. TEST RESULTS

Below 1GHz

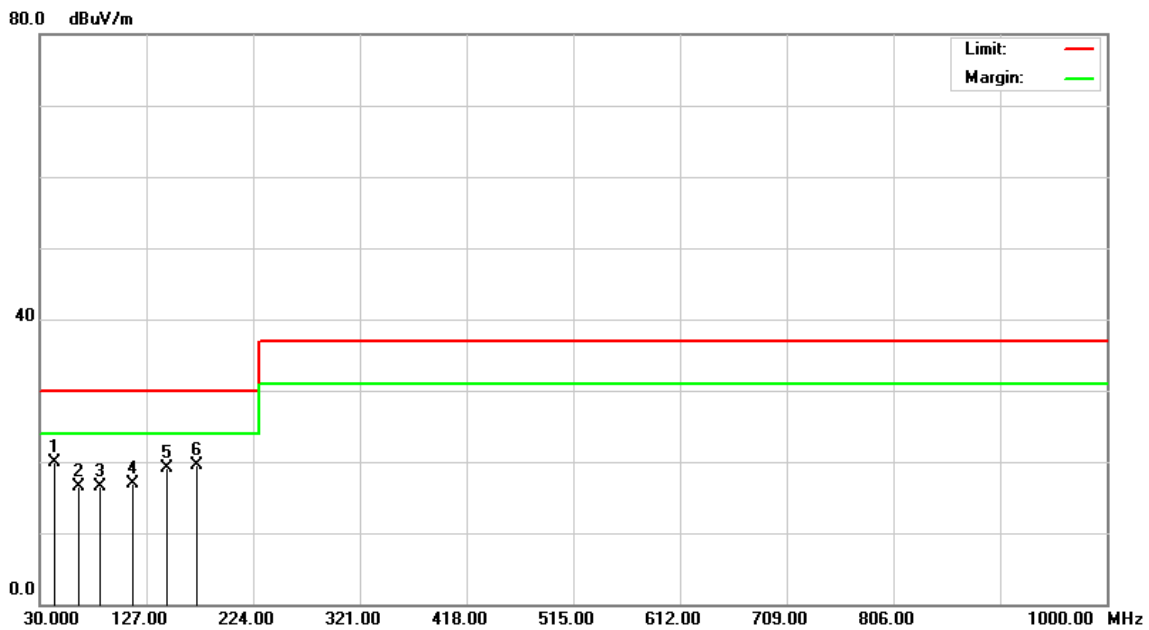
Model No.	850 GQ	Test Mode	Mode 1
Environmental Conditions	20°C, 66% RH	6dB Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Leon Yu
Standard	EN 55032 CLASS B		



Radiated Emission Readings									
Frequency Range Investigated				30 MHz to 1000 MHz at 10m					
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
34.6500	31.00	-10.22	20.78	30.00	-9.22	100	126	Q	V
51.3300	39.40	-19.92	19.48	30.00	-10.52	100	33	Q	V
76.2800	40.80	-19.42	21.38	30.00	-8.62	100	289	Q	V
134.1900	30.60	-13.02	17.58	30.00	-12.42	100	300	Q	V
162.0200	35.10	-14.38	20.72	30.00	-9.28	100	18	Q	V
223.1000	34.50	-15.03	19.47	30.00	-10.53	100	189	Q	V

Note: P= Peak Reading; Q= Quasi-peak Reading.

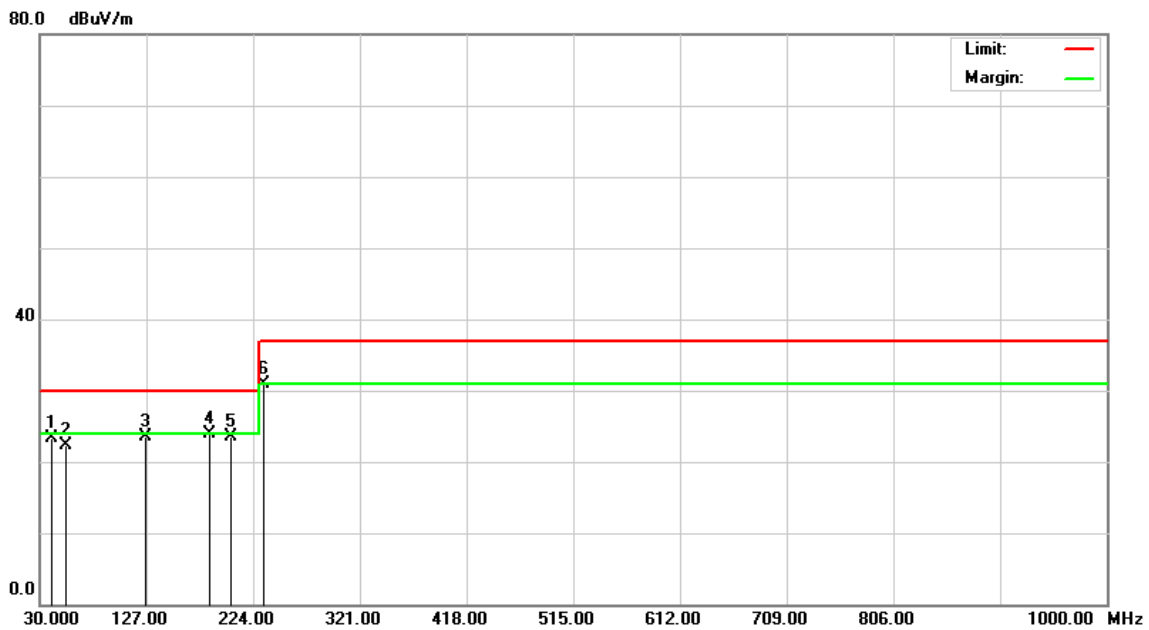
Model No.	850 GQ	Test Mode	Mode 1
Environmental Conditions	20°C, 66% RH	6dB Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Leon Yu
Standard	EN 55032 CLASS B		



Radiated Emission Readings									
Frequency Range Investigated				30 MHz to 1000 MHz at 10m					
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
43.8100	37.00	-17.11	19.89	30.00	-10.11	400	246	Q	H
65.3000	35.80	-19.36	16.44	30.00	-13.56	400	190	Q	H
84.4200	36.10	-19.56	16.54	30.00	-13.46	400	35	Q	H
114.6900	30.80	-13.89	16.91	30.00	-13.09	400	174	Q	H
145.7800	32.60	-13.43	19.17	30.00	-10.83	400	311	Q	H
173.1500	34.10	-14.62	19.48	30.00	-10.52	400	106	Q	H

Note: P= Peak Reading; Q= Quasi-peak Reading.

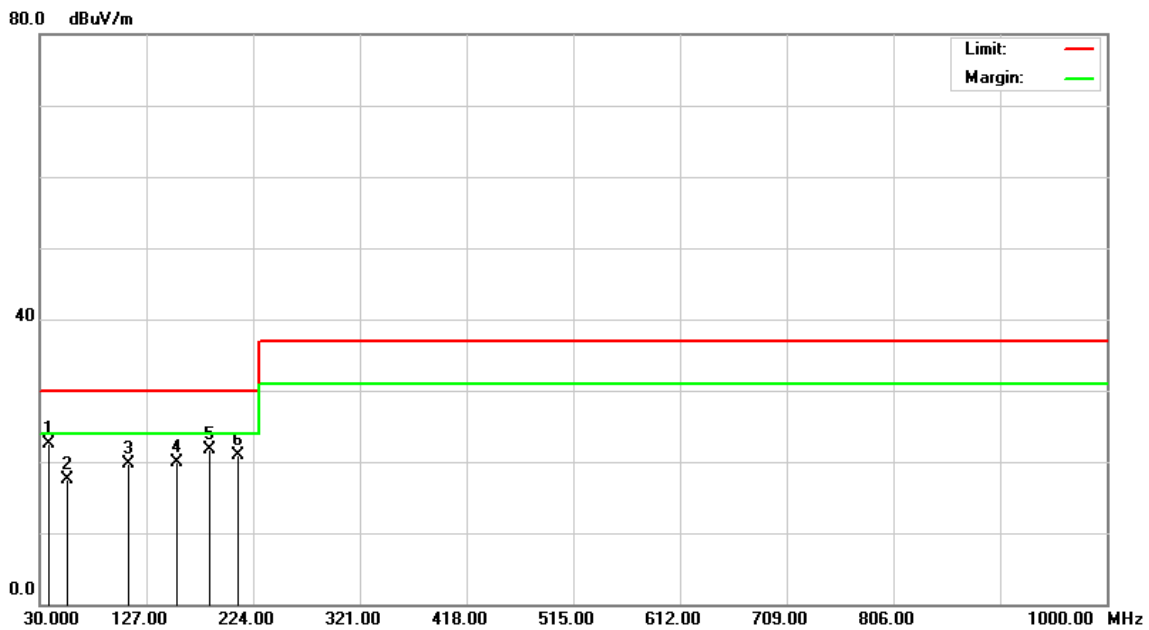
Model No.	1000 GQ	Test Mode	Mode 2
Environmental Conditions	25°C, 66% RH	6dB Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Leon Yu
Standard	EN 55032 CLASS B		



Radiated Emission Readings									
Frequency Range Investigated				30 MHz to 1000 MHz at 10m					
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
41.5299	33.60	-10.36	23.24	30.00	-6.76	100	164	Q	V
54.4585	38.20	-15.97	22.23	30.00	-7.77	100	32	Q	V
126.8422	32.10	-8.63	23.47	30.00	-6.53	100	142	Q	V
184.2635	35.00	-11.10	23.90	30.00	-6.10	100	168	Q	V
204.0036	34.20	-10.65	23.55	30.00	-6.45	100	155	Q	V
234.2263	41.60	-10.63	30.97	37.00	-6.03	100	172	Q	V

Note: P= Peak Reading; Q= Quasi-peak Reading.

Model No.	1000 GQ	Test Mode	Mode 2
Environmental Conditions	25°C, 66% RH	6dB Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Leon Yu
Standard	EN 55032 CLASS B		



Radiated Emission Readings									
Frequency Range Investigated				30 MHz to 1000 MHz at 10m					
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
38.2264	30.50	-8.04	22.46	30.00	-7.54	400	166	Q	H
55.2650	33.50	-15.99	17.51	30.00	-12.49	400	142	Q	H
110.3365	29.80	-10.04	19.76	30.00	-10.24	400	27	Q	H
155.2600	30.10	-10.20	19.90	30.00	-10.10	400	96	Q	H
184.2352	32.80	-11.10	21.70	30.00	-8.30	400	182	Q	H
210.2650	32.50	-11.53	20.97	30.00	-9.03	400	135	Q	H

Note: P= Peak Reading; Q= Quasi-peak Reading.

Radiated emissions from FM receivers

Model No.	N/A	Test Mode	N/A
Environmental Conditions	N/A	6dB Bandwidth	N/A
Antenna Pole	N/A	Antenna Distance	N/A
Detector Function	N/A	Tested by	N/A

Note: No applicable, the EUT doesn't have FM port.

7.3. CONDUCTED DIFFERENTIAL VOLTAGE EMISSIONS FROM CLASS B EQUIPMENT

Applicable to				
1. TV broadcast receiver tuner ports with an accessible connector				
2. RF modulator output ports				
3. FM broadcast receiver tuner ports with an accessible connector				
Frequency range MHz	Class B limits DB(μ V) 75			Applicability
	other	Local Oscillator Fundamental	Local Oscillator Harmonics	
30 – 950	46	46	46	See a)
950 – 2 150	46	54	54	
950 – 2 150	46	54	54	See b)
30 – 300	46	54	50	See c)
300 – 1 000			52	
30 – 300	46	66	59	See d)
300 – 1 000			52	
30 – 950	46	76	46	See e)
950 – 2 150		n/a	54	

a) Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.

b) Tuner units (not the LNB) for satellite signal reception.

c) Frequency modulation audio receivers and PC tuner cards.

d) Frequency modulation car radios.

e) Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

Testing is required at only one EUT supply voltage and frequency.

The term 'other' refers to all emissions other than the fundamental and the harmonics of the local oscillator.

The test shall be performed with the device operating at each reception channel.

The test shall cover the entire frequency range.

7.3.1. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-041)**Procedure of Preliminary Test**

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. The EUT was placed on a wooden table with a height of 0.8 meters was used that was placed on the ground plane.
- Support equipment, if needed, was placed as per EN 55032.
- All I/O cables were positioned to simulate typical usage as per EN 55032.
- The EUT received AC power source, from the outlet socket. All support equipment received power was from another socket.
- Added a 75 50 matching network, between EUT and EMI test receiver to get impedance match condition during the test.
- The output level of the auxiliary signal generator shall be set to give the value of 60 dB (μ V) for FM receiver or 70 dB (μ V) for TV and VCR to the input of the frequency-modulation or television receiver (or video recorder) respectively, on a 75 impedance. An additional amplifier should be inserted at the generator output, if necessary.
- The output level of the auxiliary signal generator shall be a standard TV color bar Move signal for TV receivers and video recorders with sound carrier that defined in Table A12 of EN 55032. An additional amplifier should be inserted at the generator output, if necessary.
- The results shall be expressed in the terms of the substitution voltage in decibels (μ V), as supplied by the standard signal generator. The specified source impedance of the receiver shall be stated with the results.
- When measurements are made at the antenna terminals of the EUT, an auxiliary signal generator shall be used to feed the equipment under test input with a standard test signal (see Table A.12 of CISPR 32/ EN 55032) at the receiver tuning frequency (30MHz to 2150MHz).
- The test mode(s) described in Item 4.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 4.1 producing the highest emission level.
- The EUT and cable configuration of the above highest emission levels were recorded for the final test.

Procedure of Final Test

- EUT and support equipment were set up on the table as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 2150MHz. recorded the value, the local frequency, amplitude, were recorded in which correction factors were used to calculate the emission level and compare reading to the applicable limit, and only Q.P reading will record in this report.
- Recorded at least the six highest emissions. Emission frequencies, amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

7.3.2. DATA SAMPLE

Freq. (MHz)	Matching Factor (dB)	Spectrum Reading (dBuV)	SG Level (dBuV)	Emission (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Note (F/H/O)
x.xx	12.2	14.0	38.4	26.2	46	-19.8	F

Freq. = Emission frequency in MHz
 Matching Factor = Matching network(50/75) attenuation
 Spectrum Reading=Spectrum analyzer reading
 S.G. Level = Standard S.G. output level
 Emission = SG Level - Matching Factor
 Limit Line = Limit stated in standard
 Over Limit = Reading in reference to limit
 F = Fundamental
 H = Harmonics
 O = Other

Calculation Formula

Over Limit (dB) = Emission (dB μ V) – Limit Line (dB μ V)

7.3.3. TEST RESULTS

Model No.	N/A	6dB Bandwidth	N/A
Environmental Conditions	N/A	Test Mode	N/A
Tested by	N/A		

Note: No applicable, the EUT doesn't have tuner port.

7.4. HARMONICS CURRENT MEASUREMENT

7.4.1. LIMITS OF HARMONICS CURRENT MEASUREMENT

Limits for Class A equipment		Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current A	Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
15<=n<=39	0.15x15/n	15<=n<=39	3.85/n	0.15x15/n
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
8<=n<=40	0.23x8/n			

NOTE: 1. Class A and Class D are classified according to item 7.3.3.

2. According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

7.4.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
H/F Measurement System	EMC Partner	HAR1000-1P	189	08/12/2016
5KVA Power Source	Teseq	5001IX-208-TSQ	1207A03643	No Cal. Required
Digital Power Meter	Protronix	1201	201091	No Cal. Required
Test S/W	HARCS V4.19			

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

7.4.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-029)

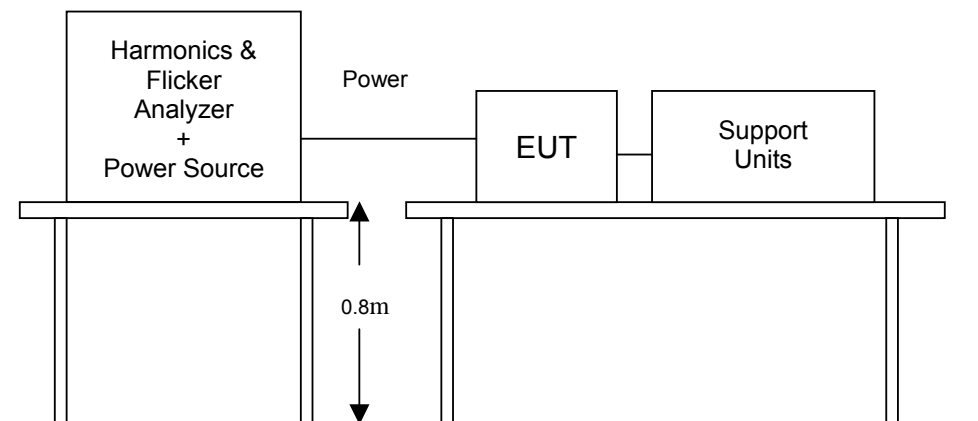
- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- The classification of EUT is according to section 5 of EN 61000-3-2.
- The EUT is classified 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; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors; television receivers and refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).
- The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

7.4.4. TEST SETUP

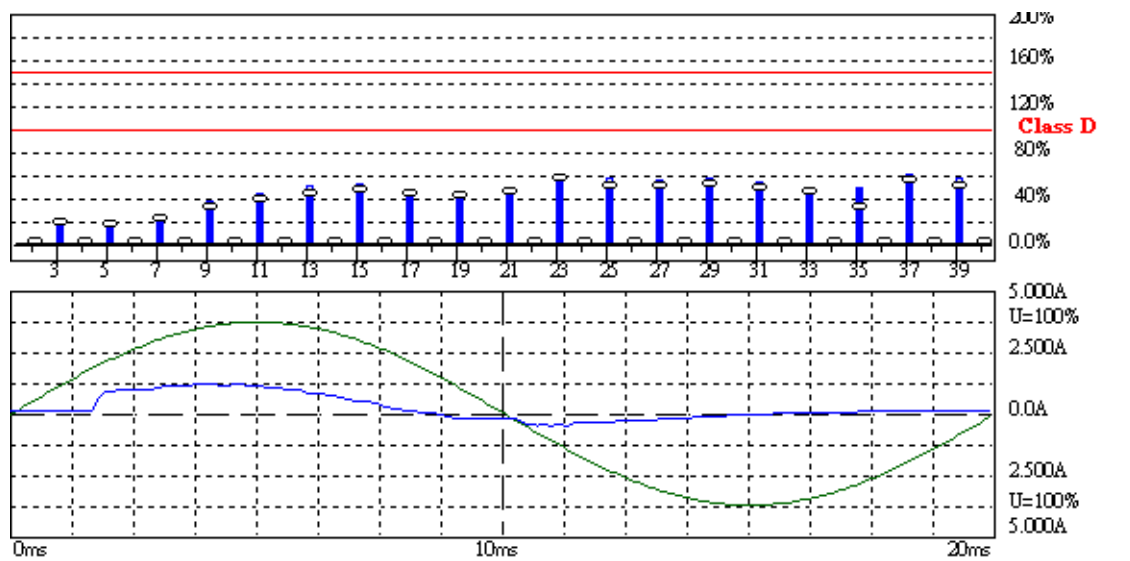
- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.4.5. TEST RESULTS

Model No.	850 GQ		
Power Consumption	93.38W	Test Mode	Mode 1
Environmental Conditions	21°C, 60% RH, 1009mbar	Tested by	Leon Yu

NOTE: 1. Limits classified according to item 7.4.1.

Test result of EN 61000-3-2



Harmonic Emission - IEC 61000-3-2, EN 61000-3-2, (EN60555-2)

2015/9/20 13:04:52 haoos.hsu

U_{rms} = 229.9 V P = 93.38 W THC = 0.253 A
I_{rms} = 0.581 A pf = 0.699 P_{max} = 100.9 W

Range: 5 A
V-nom: 230 V
TestTime: 30 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Retnet

Urms = 229.9V Freq = 50.013 Range: 5 A
 Irms = 0.581A Ipk = 1.401A cf = 2.412
 P = 93.38W S = 133.6VA pf = 0.699
 THDi = 55.8 % THDu = 0.10 % Class D

Test - Time : 30min (100 %)

Limit Reference: Pmax = 100.86W

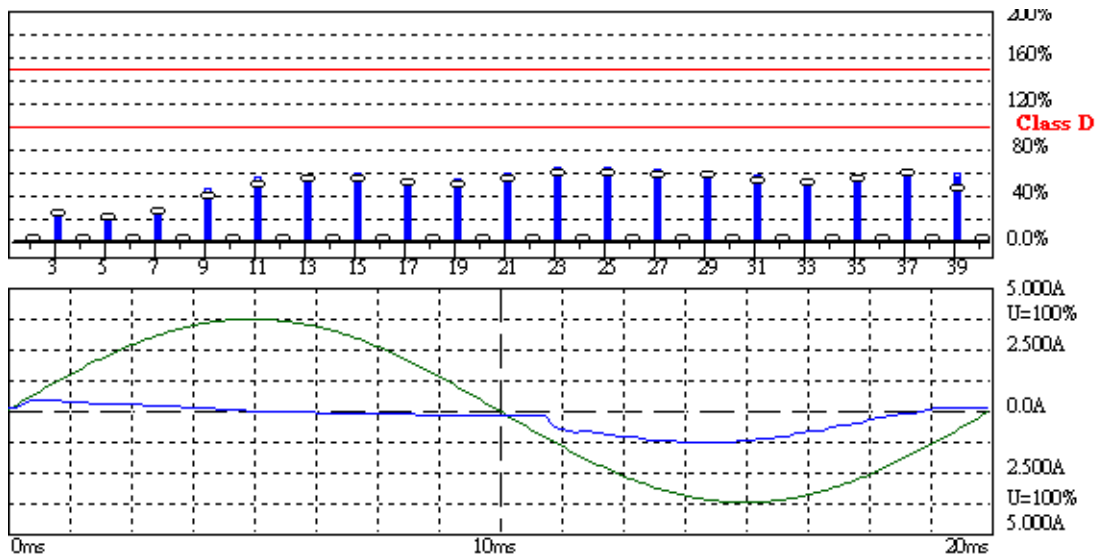
Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Irms [A]	Irms% [%]	Irms%L [%]	I _{max} [A]	I _{max} % [%]	I _{max} %L [%]	Limit [A]	Status
1	50	0.4513	0.4547	78.256		0.4681	80.567			
2	100	0.2335	0.2335	40.179		0.2368	40.756			
3	150	0.0597	0.0607	10.452	17.710	0.0662	11.397	19.312	0.3429	
4	200	0.0299	0.0308	5.3046		0.0348	5.9874			
5	250	0.0292	0.0299	5.1471	15.607	0.0323	5.5672	16.881	0.1916	
6	300	0.0238	0.0235	4.0441		0.0262	4.5168			
7	350	0.0197	0.0198	3.4139	19.668	0.0226	3.8866	22.391	0.1009	
8	400	0.0220	0.0217	3.7290		0.0232	3.9916			
9	450	0.0153	0.0162	2.7836	32.074	0.0180	3.0987	35.705	0.0504	
10	500	0.0182	0.0174	2.9937		0.0192	3.3088			
11	550	0.0129	0.0134	2.3109	38.040	0.0150	2.5735	42.362	0.0353	
12	600	0.0163	0.0162	2.7836		0.0174	2.9937			
13	650	0.0125	0.0128	2.2059	42.912	0.0146	2.5210	49.043	0.0299	
14	700	0.0132	0.0131	2.2584		0.0140	2.4160			
15	750	0.0119	0.0119	2.0483	45.978	0.0128	2.2059	49.514	0.0259	
16	800	0.0105	0.0107	1.8382		0.0116	1.9958			
17	850	0.0094	0.0095	1.6282	41.419	0.0101	1.7332	44.091	0.0228	
18	900	0.0087	0.0089	1.5231		0.0095	1.6282			
19	950	0.0083	0.0082	1.4181	40.319	0.0089	1.5231	43.305	0.0204	
20	1000	0.0085	0.0085	1.4706		0.0095	1.6282			
21	1050	0.0081	0.0079	1.3655	42.912	0.0089	1.5231	47.864	0.0185	
22	1100	0.0091	0.0095	1.6282		0.0098	1.6807			
23	1150	0.0091	0.0092	1.5756	54.230	0.0098	1.6807	57.845	0.0169	
24	1200	0.0074	0.0076	1.3130		0.0082	1.4181			
25	1250	0.0076	0.0073	1.2605	47.156	0.0085	1.4706	55.016	0.0155	
26	1300	0.0072	0.0073	1.2605		0.0085	1.4706			
27	1350	0.0072	0.0073	1.2605	50.929	0.0076	1.3130	53.051	0.0144	
28	1400	0.0086	0.0085	1.4706		0.0092	1.5756			
29	1450	0.0066	0.0067	1.1555	50.143	0.0073	1.2605	54.701	0.0134	
30	1500	0.0059	0.0061	1.0504		0.0064	1.1029			
31	1550	0.0059	0.0061	1.0504	48.728	0.0064	1.1029	51.165	0.0125	
32	1600	0.0055	0.0058	0.9979		0.0061	1.0504			
33	1650	0.0050	0.0052	0.8929	44.091	0.0055	0.9454	46.685	0.0118	
34	1700	0.0052	0.0052	0.8929		0.0058	0.9979			
35	1750	0.0035	0.0049	0.8403	44.013	0.0052	0.8929	46.763	0.0111	
36	1800	0.0042	0.0049	0.8403		0.0052	0.8929			
37	1850	0.0056	0.0055	0.9454	52.344	0.0061	1.0504	58.160	0.0105	
38	1900	0.0004	0.0046	0.7878		0.0049	0.8403			
39	1950	0.0050	0.0049	0.8403	49.043	0.0055	0.9454	55.173	0.0100	
40	2000	0.0000	0.0043	0.7353		0.0046	0.7878			

Model No.	1000 GQ		
Power Consumption	87.86W	Test Mode	Mode 2
Environmental Conditions	21°C, 60% RH, 1009mbar	Tested by	Leon Yu

NOTE: 1. Limits classified according to item 7.4.1.

Test result of EN 61000-3-2



Harmonic Emission - IEC 61000-3-2, EN 61000-3-2, (EN60555-2)

2015/9/20 09:47:59 haxos.hsu

U_{rms} = 229.9 V P = 87.86 W THC = 0.254 A
I_{rms} = 0.566 A pf = 0.675 P_{max} = 92.48 W

Range: 5 A
V_{nom}: 230 V
TestTime: 30 min (100%)

Test completed, Result: PASSED

HAR-1000 RMC-Retnet

Urms = 229.9V Freq = 50.013 Range: 5 A
 Irms = 0.566A Ipk = 1.389A cf = 2.453
 P = 87.86W S = 130.2VA pf = 0.675
 THDi = 58.7 % THDu = 0.10 % Class D

Test - Time : 30min (100 %)

Limit Reference: Pmax = 92.477W

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Irms [A]	Irms% [%]	Irms%L [%]	Imax [A]	Imax% [%]	Imax%L [%]	Limit [A]	Status
1	50	0.4239	0.4315	76.185		0.4449	78.556			
2	100	0.2275	0.2277	40.194		0.2344	41.379			
3	150	0.0668	0.0647	11.422	20.577	0.0717	12.662	22.809	0.3144	
4	200	0.0375	0.0354	6.2500		0.0446	7.8664			
5	250	0.0321	0.0314	5.5496	17.890	0.0360	6.3578	20.495	0.1757	
6	300	0.0274	0.0272	4.7953		0.0299	5.2802			
7	350	0.0213	0.0201	3.5560	21.780	0.0241	4.2565	26.070	0.0925	
8	400	0.0227	0.0229	4.0409		0.0241	4.2565			
9	450	0.0175	0.0171	3.0172	36.960	0.0204	3.6099	44.220	0.0462	
10	500	0.0181	0.0177	3.1250		0.0192	3.3944			
11	550	0.0149	0.0150	2.6401	46.200	0.0171	3.0172	52.800	0.0324	
12	600	0.0162	0.0162	2.8556		0.0174	3.0711			
13	650	0.0140	0.0137	2.4246	50.143	0.0153	2.6940	55.714	0.0274	
14	700	0.0135	0.0134	2.3707		0.0146	2.5862			
15	750	0.0124	0.0119	2.1013	50.143	0.0134	2.3707	56.572	0.0237	
16	800	0.0111	0.0113	1.9935		0.0116	2.0474			
17	850	0.0101	0.0098	1.7241	46.629	0.0110	1.9397	52.457	0.0209	
18	900	0.0093	0.0095	1.6703		0.0101	1.7780			
19	950	0.0090	0.0089	1.5625	47.229	0.0098	1.7241	52.114	0.0187	
20	1000	0.0092	0.0092	1.6164		0.0101	1.7780			
21	1050	0.0089	0.0085	1.5086	50.400	0.0098	1.7241	57.600	0.0170	
22	1100	0.0089	0.0092	1.6164		0.0098	1.7241			
23	1150	0.0090	0.0092	1.6164	59.143	0.0098	1.7241	63.086	0.0155	
24	1200	0.0076	0.0073	1.2931		0.0082	1.4547			
25	1250	0.0084	0.0082	1.4547	57.857	0.0089	1.5625	62.143	0.0142	
26	1300	0.0084	0.0082	1.4547		0.0092	1.6164			
27	1350	0.0073	0.0073	1.2931	55.543	0.0079	1.4009	60.172	0.0132	
28	1400	0.0076	0.0076	1.3470		0.0085	1.5086			
29	1450	0.0066	0.0064	1.1315	52.200	0.0070	1.2392	57.172	0.0123	
30	1500	0.0059	0.0058	1.0237		0.0064	1.1315			
31	1550	0.0059	0.0058	1.0237	50.486	0.0064	1.1315	55.800	0.0115	
32	1600	0.0056	0.0055	0.9698		0.0061	1.0776			
33	1650	0.0052	0.0052	0.9159	48.086	0.0055	0.9698	50.914	0.0108	
34	1700	0.0056	0.0058	1.0237		0.0058	1.0237			
35	1750	0.0052	0.0052	0.9159	51.000	0.0055	0.9698	54.000	0.0102	
36	1800	0.0053	0.0052	0.9159		0.0058	1.0237			
37	1850	0.0054	0.0055	0.9698	57.086	0.0058	1.0237	60.257	0.0096	
38	1900	0.0019	0.0049	0.8621		0.0052	0.9159			
39	1950	0.0038	0.0049	0.8621	53.486	0.0052	0.9159	56.829	0.0091	
40	2000	0.0000	0.0043	0.7543		0.0049	0.8621			

Definitions of Abbreviations

Urms	***	Actual total Voltage in Volt RMS
Irms	***	Actual total Current in Ampere RMS
Ipk	***	Actual Peak value of the Current in Ampere
cf	***	Actual Crest Factor (Ipk/Irms)
P	***	Actual Active Power in Watt
S	***	Actual Apparent Power in VA (Urms*Irms)
pf	***	Actual Power Factor (P/S)
THDi	***	Actual Total Harmonic Current Distortion in %
THDu	***	Actual Total Harmonic Voltage Distortion in %
THC	***	Actual Total Harmonic Current in Ampere
PHC	***	Actual Partial Harmonic Current in Ampere

Individual measurements for 2nd to 40th order:

lavg		Average value of the Individual Harmonic Current in Ampere RMS
Irms	***	Actual Individual Harmonic Current in Ampere RMS
Irms%	***	Actual Individual Harmonic Current in percentage of the actual total RMS Current
Irms%L	***	Actual Individual Harmonic Current in percentage of the applicable Limit
Imax		Maximum Individual Harmonic Current in Ampere RMS
Imax%		Maximum Individual Harmonic Current in percentage of the actual total RMS Current
Imax%lim		Maximum Individual Harmonic Current in percentage of the applicable Limit
Limit Irms		Individual Limit (100%) for the selected Class in Ampere RMS

7.5. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.5.1. LIMITS OF VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

TEST ITEM	LIMIT	REMARK
P_{st}	1.0	P_{st} means short-term flicker indicator.
P_{lt}	0.65	P_{lt} means long-term flicker indicator.
T_{dt} (ms)	500	T_{dt} means maximum time that dt exceeds 3 %.
d_{max} (%)	4%	d_{max} means maximum relative voltage change.
dc (%)	3.3%	dc means relative steady-state voltage change

7.5.2. TEST INSTRUMENTS

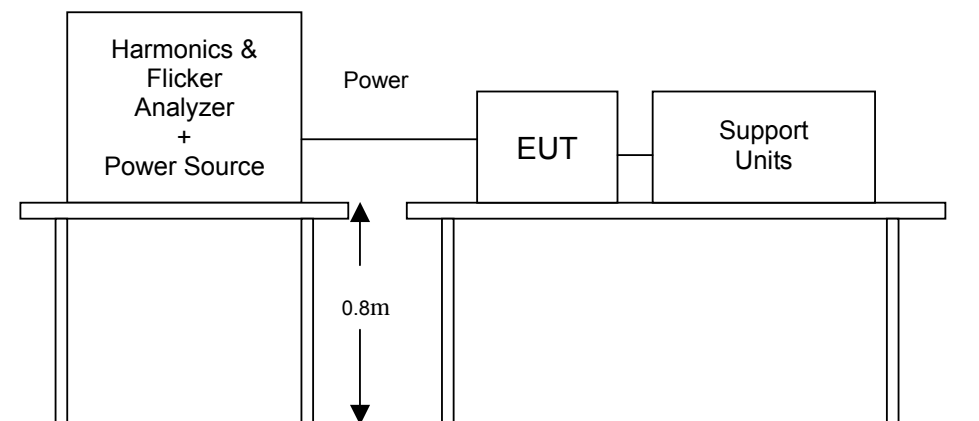
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
H/F Measurement System	EMC Partner	HAR1000-1P	189	08/12/2016
5KVA Power Source	Teseq	5001IX-208-TSQ	1207A03643	No Cal. Required
Digital Power Meter	Protronix	1201	201091	No Cal. Required
Test S/W	HARCS V4.19			

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

7.5.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-030)

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

7.5.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

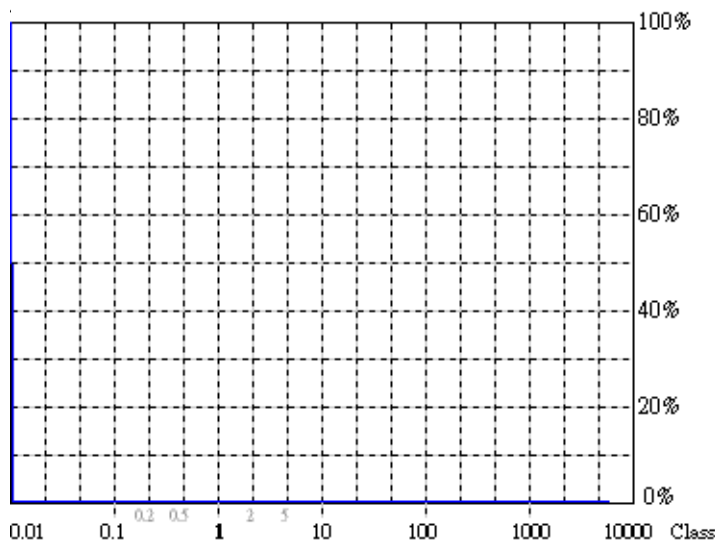
7.5.5. TEST RESULTS

Model No.	850 GQ		
Observation Period (Tp)	30mins	Test Mode	Mode 1
Environmental Conditions	21°C, 60% RH, 1009mbar	Tested by	Leon Yu

TEST PARAMETER	MEASUREMENT VALUE	LIMIT	REMARK
P _{st}	0.07	1.0	PASS
P _{lt}	0.07	0.65	PASS
T _{dt} (ms)	0	500	PASS
d _{max} (%)	0	4%	PASS
dc (%)	0.07	3.3%	PASS

Note: None.

Test result of EN 61000-3-3



Actual Flicker (Fli): 0.00
Short-term Flicker (Pst): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.07%
 Limit (dc): 3.30%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

U_{rms} = 229.9 V P = 94.61 W
 I_{rms} = 0.586 A pf = 0.702

2015/9/20 11:48:35 haoos.hsu

Range: 5 A
 V-nom: 230 V
 TestTime: 30 min (100%)

Test completed, Result: PASSED

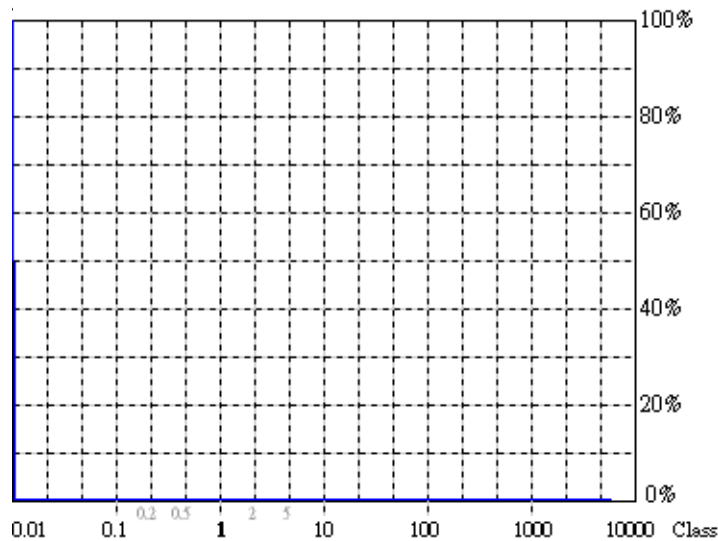
HAR-1000 EMC-Return

Model No.	1000 GQ		
Observation Period (Tp)	30mins	Test Mode	Mode 2
Environmental Conditions	21°C, 60% RH, 1009mbar	Tested by	Leon Yu

TEST PARAMETER	MEASUREMENT VALUE	LIMIT	REMARK
P _{st}	0.07	1.0	PASS
P _{lt}	0.07	0.65	PASS
T _{dt} (ms)	0	500	PASS
d _{max} (%)	0	4%	PASS
dc (%)	0.08	3.3%	PASS

Note: None.

Test result of EN 61000-3-3



Actual Flicker (Fli): 0.00
Short-term Flicker (Pst): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.08%
 Limit (dc): 3.30%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

U_{rms} = 229.9 V P = 92.65 W
 I_{rms} = 0.598 A pf = 0.679

2015/9/20 10:24:00 hawos.hsu
 Range: 5 A
 V-nom: 230 V
 TestTime: 30 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Return

8 IMMUNITY TEST

8.1. GENERAL DESCRIPTION

Product Standard	EN 55024: 2010	
	Test Type	Minimum Requirement
Basic Standard, Specification, and Performance Criterion required	IEC 61000-4-2	Electrostatic Discharge – ESD: 8kV air discharge, 4kV Contact discharge, Performance Criterion B
	IEC 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 ~1000 MHz, 3V/m, 80% AM(1kHz), Performance Criterion A
	IEC 61000-4-4	Electrical Fast Transient/Burst - EFT, AC Power Port: 1kV DC Power Port: 0.5kV Signal Ports and Telecommunication Ports: 0.5kV Performance Criterion B
	IEC 61000-4-5	Surge Immunity Test: 1.2/50 μ s Open Circuit Voltage, 8/20 μ s Short Circuit Current, AC Power Port ~ line to line: 1kV, line to earth (ground): 2kV DC Power Port ~ line to earth: 0.5kV Signal Ports and Telecommunication Ports ~ line to ground: 1kV Performance Criterion B 10/700 μ s Open Circuit Voltage Performance Criterion C
	IEC 61000-4-6	Conducted Radio Frequency Disturbances Test – CS: 0.15 ~ 80 MHz, 3Vrms, 80% AM, 1kHz, Performance Criterion A
	IEC 61000-4-8	Power frequency magnetic field immunity test 50 Hz or 60Hz, 1A/m, Performance Criterion A
	IEC 61000-4-11	Voltage Dips: i) >95% reduction for 0.5 period, Performance Criterion B ii) 30% reduction for 25 period, Performance Criterion C Voltage Interruptions: >95% reduction for 250 period Performance Criterion C

8.2. GENERAL PERFORMANCE CRITERIA DESCRIPTION

Criteria A:	The apparatus shell continues 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 apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the manufacturer does not specify the minimum performance level or the permissible performance loss, 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.
Criteria B:	<p>After test, the apparatus shell continues to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is however allowed. However, no change of operating state if stored data is allowed to persist after the test. If the manufacturer does not specify the minimum performance level or the permissible performance loss, 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.</p>
Criteria C:	<p>Temporary loss of function is allowed, provided the functions is self-recoverable or can be restored by the operation of controls by the user in accordance with the manufacturer instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>

8.3. ELECTROSTATIC DISCHARGE (ESD)

8.3.1. TEST SPECIFICATION

Basic Standard:	IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 2 ; 4 ; 8 kV (Direct) Contact Discharge: 2 ; 4 kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 10 times at each test point for each polarity Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge 1 second minimum

8.3.2. TEST INSTRUMENT

IMMUNITY SHIELDED ROOM				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESD Generator	Teseq	NSG 437	249	12/15/2015
Aneroid Barometer	Sato	7610-20	89090	10/12/2015
Thermo-Hygro meter	TECPEL	DTM-303	080269	04/19/2016

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

8.3.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-022)

The discharges shall be applied in two ways:

a) Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the **Horizontal Coupling Plane (HCP)**. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

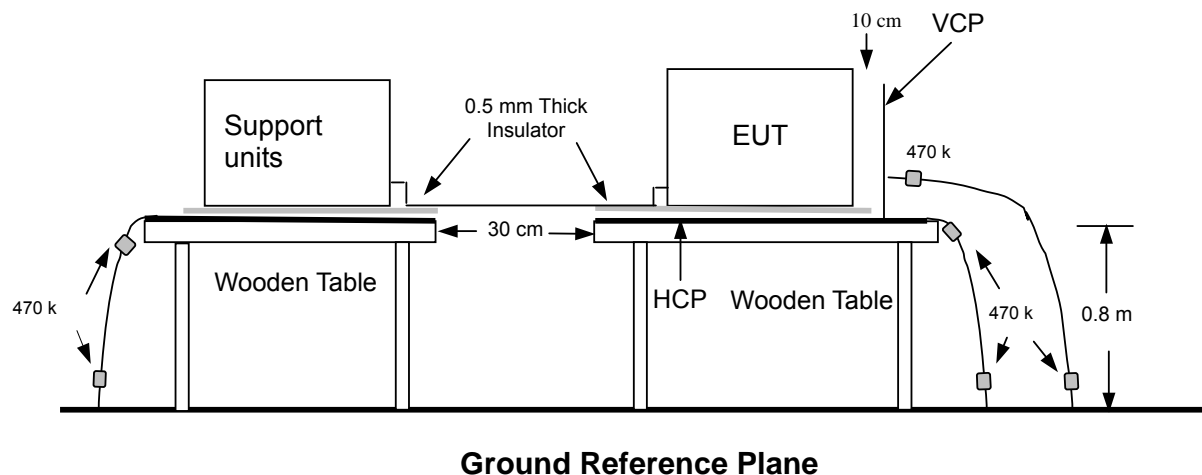
b) Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with IEC 61000-4-2:

- a) The EUT was located 0.1 m minimum from all side of the **HCP** (dimensions 1.6m x 0.8m).
- b) The support units were located another table 30 cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.
- c) The time interval between two successive single discharges was at least 1 second.
- d) Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- e) 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.
- f) At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each **HCP** opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the **HCP** and perpendicular to its front edge during the discharge.
- g) At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **Vertical Coupling Plane (VCP)** in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

8.3.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the **Ground Reference Plane**. The **GRP** consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A **Horizontal Coupling Plane** (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC 61000-4-2, and its cables were placed on the **HCP** and isolated by an insulating support of 0.5mm thickness. A distance of 1-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 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

8.3.5. TEST RESULTS

Model No.	850 GQ		
Temperature	20°C	Test Mode	Mode 1
Pressure	1010mbar	Tested By	Leon Yu
Humidity	43%RH	Required Passing Performance	Criterion B

Air Discharge							
Test Points	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Left	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Right	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Top	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2

Contact Discharge							
Test Points	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2

Discharge To Horizontal Coupling Plane							
Side of EUT	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2

Discharge To Vertical Coupling Plane							
Side of EUT	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2

NOTE: 1. There was no change compared with initial operation during the test.
2. Not applicable (Metal Case).

Model No.	1000 GQ		
Temperature	20°C	Test Mode	Mode 2
Pressure	1010mbar	Tested By	Leon Yu
Humidity	43%RH	Required Passing Performance	Criterion B

Air Discharge							
Test Points	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Left	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Right	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Top	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2
Bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input type="checkbox"/> B	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2

Contact Discharge							
Test Points	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2

Discharge To Horizontal Coupling Plane							
Side of EUT	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2

Discharge To Vertical Coupling Plane							
Side of EUT	Test Levels			Results			
	± 2 kV	± 4 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2

NOTE: 1. There was no change compared with initial operation during the test.
2. Not applicable (Metal Case).

The Photo for Discharge Points of EUT

Front



Back



Red Dot —Air Discharged
Blue Dot —Contact Discharged

Left



Right



Red Dot —Air Discharged
Blue Dot —Contact Discharged

Top



Red Dot —Air Discharged
Blue Dot —Contact Discharged

8.4. RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD (RS)

8.4.1. TEST SPECIFICATION

Basic Standard:	IEC 61000-4-3
Frequency Range:	80 MHz ~1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5m

8.4.2. TEST INSTRUMENT

844 RS Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Calibration of Field	N/A	Chamber#RS	80-1000MHz	04/01/2016
Signal Generator	Agilent	N5181A	MY47421336	12/16/2015
Electric Field Probe	AR	FL7006	0338955	06/14/2016
RF Power Meter	Boonton	4242-01-02	14357	03/15/2016
Amplifier	AR	500W1000A	320994	No Calibration Required
Direction Coupler	AR	DC6180A	312189	No Calibration Required
Broadband Antenna	AR	AT1080	311819	No Calibration Required
Thermo-Hygro meter	TFA	N/A	NO.6	11/02/2015
Software	Emcware Ver. 2.6.0.16			

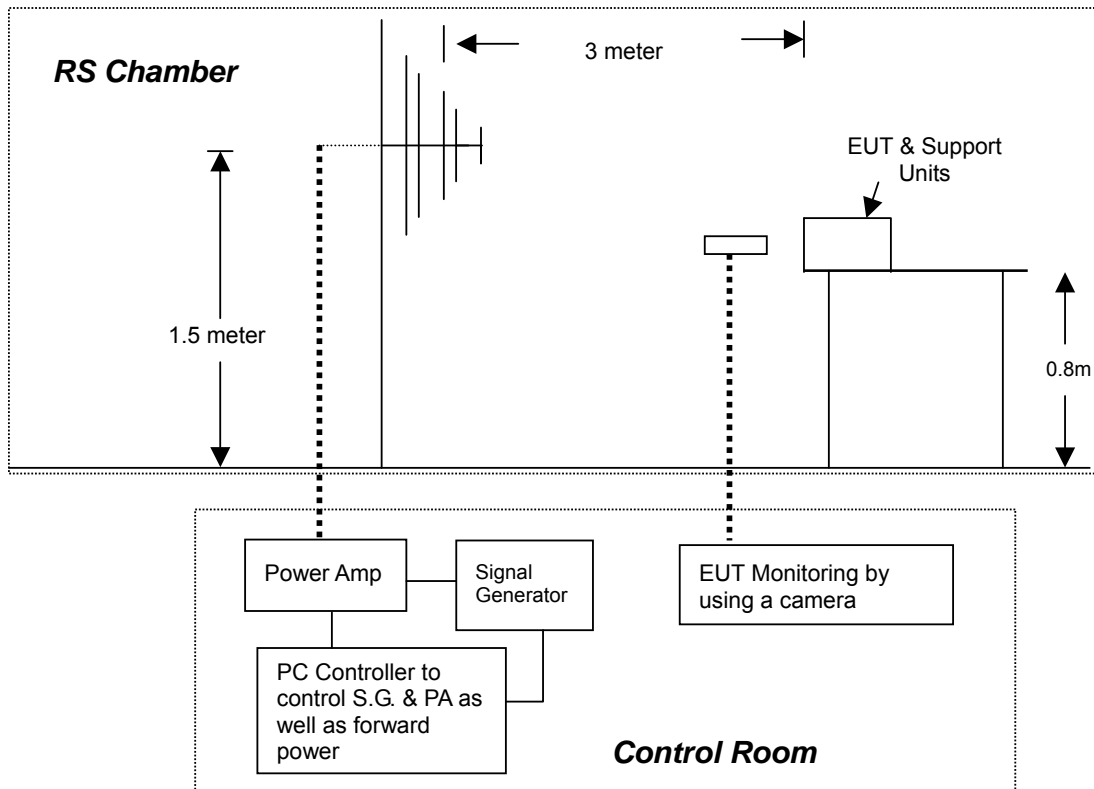
- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required.

8.4.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-023)

The test procedure was in accordance with IEC 61000-4-3

- The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine-wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s, where the frequency range is swept incrementally, the step size was 1% of preceding frequency value.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

8.4.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:TABLETOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 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 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.

8.4.5. TEST RESULTS

Model No.	850 GQ	Test Mode	Mode 1
Temperature	23°C	Tested By	Leon Yu
Pressure	1010mbar	Required Passing Performance	Criterion A
Humidity	60% RH	Dwell Time	3 sec.

Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Performance Criterion	Observation	Result
80 ~ 1000	V&H	0	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
80 ~ 1000	V&H	90	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
80 ~ 1000	V&H	180	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
80 ~ 1000	V&H	270	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with the initial operation during the test.

Model No.	1000 GQ	Test Mode	Mode 2
Temperature	23°C	Tested By	Leon Yu
Pressure	1010mbar	Required Passing Performance	Criterion A
Humidity	60% RH	Dwell Time	3 sec.

Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Performance Criterion	Observation	Result
80 ~ 1000	V&H	0	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
80 ~ 1000	V&H	90	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
80 ~ 1000	V&H	180	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
80 ~ 1000	V&H	270	3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with the initial operation during the test.

8.5. ELECTRICAL FAST TRANSIENT (EFT)

8.5.1. TEST SPECIFICATION

Basic Standard:	IEC 61000-4-4
Test Voltage:	AC Power Port: 1kV
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.

8.5.2. TEST INSTRUMENT

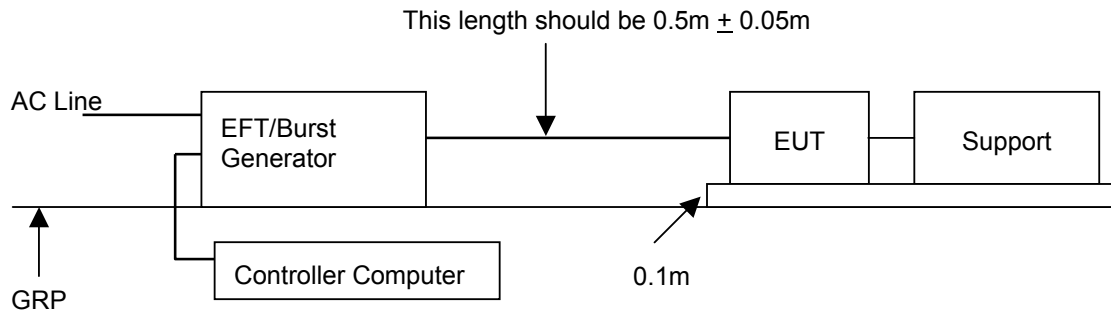
Immunity Shield Room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMC Immunity Tester	EMC Partner	TRANSIENT 2000	1117	03/03/2016
Capacitive Clamp	EMC-Partner	CN-EFT1000	589	07/21/2016
Software	Genecs Ver. 3.27			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required.

8.5.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-024)

- All types of cables, including their length, and the interface port of the EUT to which they were connected.
- Both positive and negative polarity discharges were applied.
- The length of the “ hot wire ” from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 0.5 meter.
- The duration time of each test sequential was 1 minute.
- The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

8.5.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLETOP EQUIPMENT

The configuration consisted of a wooden table (0.1m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR STANDING EQUIPMENT

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

8.5.5. TEST RESULTS

Model No.	850 GQ		
Temperature	20°C	Test Mode	Mode 1
Pressure	1010mbar	Tested By	Leon Yu
Humidity	50%RH	Required Passing Performance	Criterion B

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
N	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - N	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
N - PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - N - PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with initial operation during the test.

Model No.	1000 GQ		
Temperature	20°C	Test Mode	Mode 2
Pressure	1010mbar	Tested By	Leon Yu
Humidity	50%RH	Required Passing Performance	Criterion B

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
N	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - N	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
N - PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - N - PE	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with initial operation during the test.

8.6. SURGE IMMUNITY TEST

8.6.1. TEST SPECIFICATION

Basic Standard:	IEC 61000-4-5
Wave-Shape:	Combination Wave 1.2/50 μ s Open Circuit Voltage 8/20 μ s Short Circuit Current
Test Voltage:	AC Power Port~ line to line: 1kV, line to ground: 2kV
Surge Input/Output:	AC Power Line: L-N / L-PE / N-PE
Generator Source Impedance:	2 ohm between networks 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

8.6.2. TEST INSTRUMENT

Immunity Shield Room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMC Immunity Tester	EMC Partner	TRANSIENT 2000	1117	03/03/2016
CDN	EMC Partner	CDN-UTP8	CDN-UTP8-1505	03/03/2016
Software	Genecs Ver. 3.27			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required.

8.6.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-025)

a) For EUT power supply:

The surge is 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 was shorter than 2 meters in length.

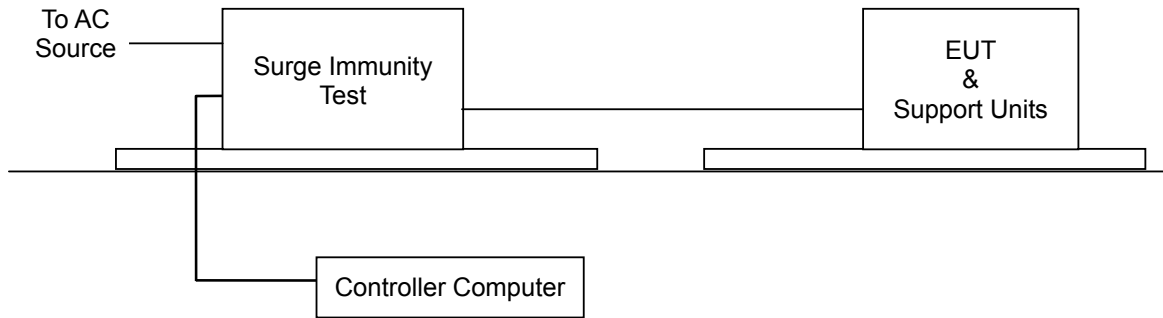
b) For test applied to unshielded un-symmetrically operated interconnection lines of EUT:

The surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

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

The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

8.6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

8.6.5. TEST RESULTS

Model No.	850 GQ		
Temperature	20°C	Test Mode	Mode 1
Pressure	1010mbar	Tested By	Leon Yu
Humidity	50%RH	Required Passing Performance	Criterion B

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L - N	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - PE	+/-	2	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
N - PE	+/-	2	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with initial operation during the test.

Model No.	1000 GQ		
Temperature	20°C	Test Mode	Mode 2
Pressure	1010mbar	Tested By	Leon Yu
Humidity	50%RH	Required Passing Performance	Criterion B

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L - N	+/-	1	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
L - PE	+/-	2	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS
N - PE	+/-	2	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with initial operation during the test.

8.7. CONDUCTED RADIO FREQUENCY DISTURBANCES (CS)

8.7.1. TEST SPECIFICATION

Basic Standard:	IEC 61000-4-6
Frequency Range:	0.15 MHz ~ 80 MHz
Field Strength:	3 Vrms
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Coupled cable:	Power Mains, Unshielded
Coupling device:	CDN-M3 (3 wires)

8.7.2. TEST INSTRUMENT

CS Room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
CWS Generator	EM Test	CWS 500N1.4	P1446143188	03/02/2016
CDN (EUT)	Teseq	CDN M016	35820	06/15/2016
CDN	Teseq	CDN M016	35821	06/08/2016
Attenuator	EMCI	SA3NL	10006F	No Calibration Required
Software	icd.control Ver. 5.1.9			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required.

8.7.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-026)

The EUT shall be tested within its intended operating and climatic conditions.

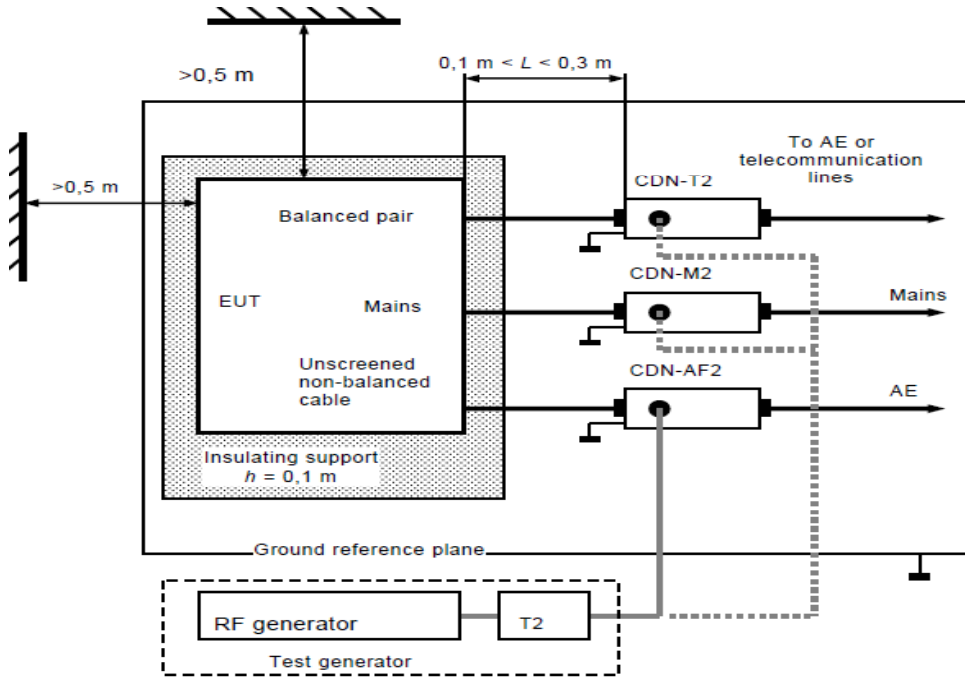
The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

The frequency range was swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal was modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate was 1.5×10^{-3} decades/s. Where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value from 150 kHz to 80 MHz.

The dwell time at each frequency was less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, was analyzed separately.

Attempts were made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

8.7.4. TEST SETUP



Note: 1. The CDNs and / or EM clamp used for real test depends on ports and cables configuration of EUT.
2. The EUT clearance from any metallic obstacles shall be at least 0.5m

- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:
TABLE-TOP AND 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.

8.7.5. TEST RESULTS

Model No.	850 GQ	Test Mode	Mode 1
Temperature	21°C	Tested By	Leon Yu
Pressure	1009mbar	Required Passing Performance	Criterion A
Humidity	60% RH	Dwell Time	3 sec.

Frequency Band (MHz)	Field Strength (Vrms)	Cable	Injection Method	Performance Criterion	Observation	Result
0.15 ~ 80	3	AC Power Line (0.3m)	CDN-M3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with initial operation during the test.

Model No.	1000 GQ	Test Mode	Mode 2
Temperature	21°C	Tested By	Leon Yu
Pressure	1009mbar	Required Passing Performance	Criterion A
Humidity	60% RH	Dwell Time	3 sec.

Frequency Band (MHz)	Field Strength (Vrms)	Cable	Injection Method	Performance Criterion	Observation	Result
0.15 ~ 80	3	AC Power Line (0.3m)	CDN-M3	<input checked="" type="checkbox"/> A <input type="checkbox"/> B	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	PASS

NOTE: 1. There was no change compared with initial operation during the test.

8.8. POWER FREQUENCY MAGNETIC FIELD

8.8.1. TEST SPECIFICATION

Basic Standard:	IEC 61000-4-8
Frequency Range:	50 Hz
Field Strength:	1 A/m
Observation Time:	1 minute
Inductance Coil:	Rectangular type, 1mx1m

8.8.2. TEST INSTRUMENT

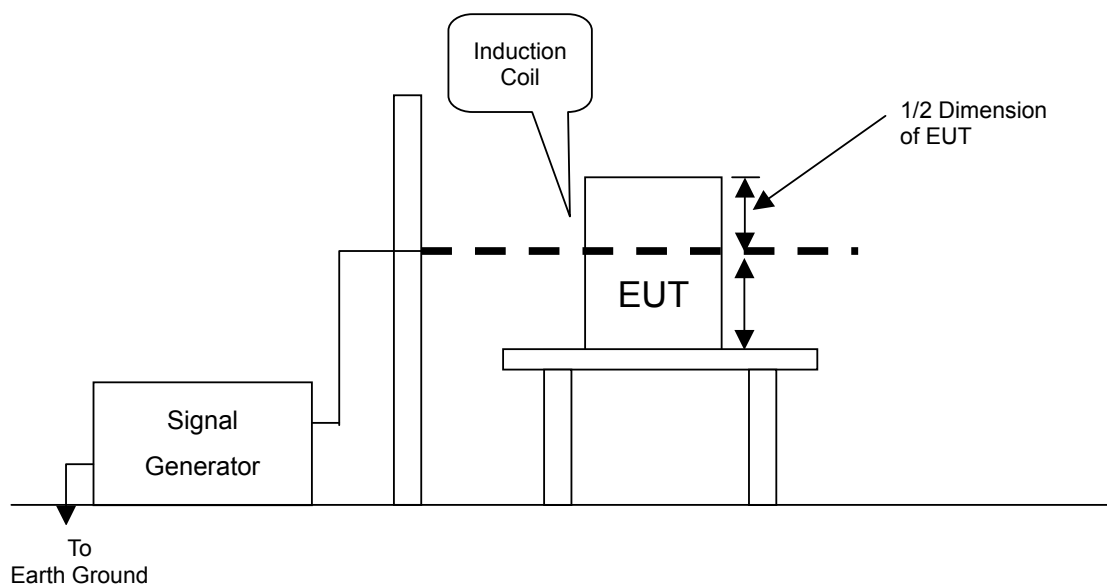
Immunity Shield Room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Induction Coil Interface	Schaffner	INA 2141	6009	No Calibration Required
5KVA Power Source	Teseq	5001IX-208-TSQ	1207A03643	No Calibration Required
AC/DC Clamp Meter	Lutron	CM-9930R	I.200121	05/26/2016
Magnetic Field Meter	Sypris	4080	0247	03/30/2016

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required.

8.8.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-027)

- The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.
- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

8.8.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:**TABLETOP EQUIPMENT**

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

8.8.5. TEST RESULTS

Model No.	850 GQ		
Temperature	18°C	Test Mode	Mode 1
Pressure	1009mbar	Tested By	Leon Yu
Humidity	48%RH	Required Passing Performance	Criterion A

DIRECTION	Field Strength (A/m)	Performance Criterion	OBSERVATION	RESULTS
X	1	A	Note	PASS
Y	1	A	Note	PASS
Z	1	A	Note	PASS

NOTE: There was no change compared with the initial operation during the test.

Model No.	1000 GQ		
Temperature	18°C	Test Mode	Mode 2
Pressure	1009mbar	Tested By	Leon Yu
Humidity	48%RH	Required Passing Performance	Criterion A

DIRECTION	Field Strength (A/m)	Performance Criterion	OBSERVATION	RESULTS
X	1	A	Note	PASS
Y	1	A	Note	PASS
Z	1	A	Note	PASS

NOTE: There was no change compared with the initial operation during the test.

8.9. VOLTAGE DIPS & VOLTAGE INTERRUPTIONS

8.9.1. TEST SPECIFICATION

Basic Standard: IEC 61000-4-11

Test duration time: Minimum three test events in sequence

Interval between event: Minimum 10 seconds

Phase Angle: 0° / 180°

Test cycle: 3 times

8.9.2. TEST INSTRUMENT

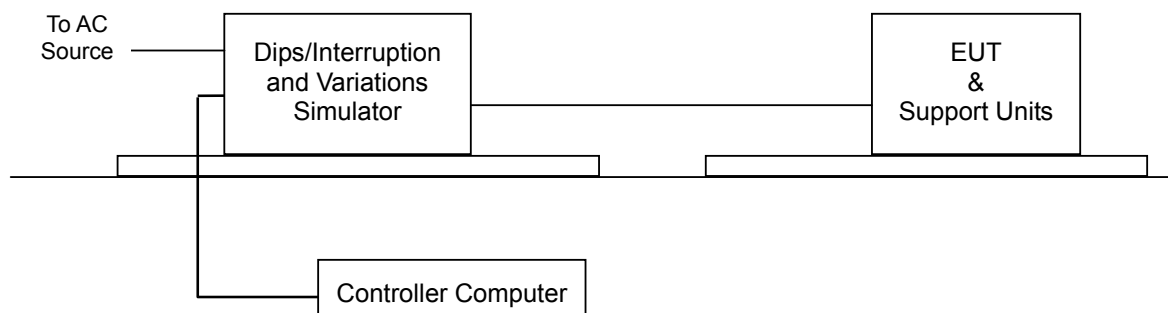
Immunity shielded room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMC Immunity Tester	EMC Partner	TRANSIENT 2000	1117	03/03/2016
AC/DC Clamp Meter	Lutron	CM-9930R	1.200121	05/26/2016
Software	Genecs Ver. 3.27			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required.

8.9.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-028)

1. The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
2. Setting the parameter of tests and then perform the test software of test simulator.
3. Conditions changes to occur at 0 degree crossover point of the voltage waveform.
4. Recording the test result in test record form.

8.9.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

8.9.5. TEST RESULTS

Model No.	850 GQ		
Temperature	20°C	Test Mode	Mode 1
Pressure	1010mbar	Tested By	Leon Yu
Humidity	59%RH	Input Power	230Vac, 50Hz & 100Vac, 50Hz
Required Passing Performance	Criterion B: >95% reduction 0.5 period Criterion C: 30% reduction 25 period & >95% reduction 250 period		

Input power for testing: 230Vac, 50Hz				
Voltage (% Reduction)	Duration (Period)	Performance Criterion	Observation	Test Result
>95	0.5	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
30	25	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
>95	250	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C	Note <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	PASS

Input power for testing: 100Vac, 50Hz				
Voltage (% Reduction)	Duration (Period)	Performance Criterion	Observation	Test Result
>95	0.5	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
30	25	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
>95	250	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PASS

NOTE: 1. There was no change compared with initial operation during and after the test. No unintentional response was found during the test.

2. EUT shut down, but it could recover automatically afterwards.

3. EUT shut down, it could not become normal except reinstalled by operator.

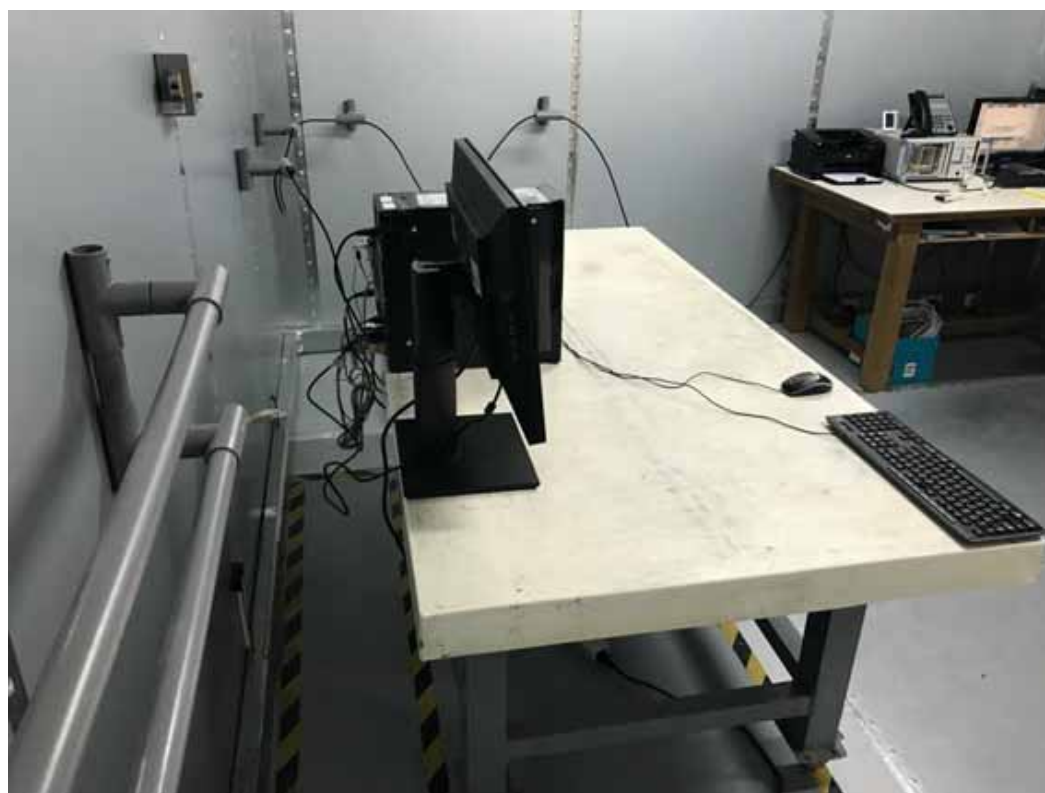
Model No.	1000 GQ		
Temperature	20°C	Test Mode	Mode 2
Pressure	1010mbar	Tested By	Leon Yu
Humidity	59%RH	Input Power	230Vac, 50Hz & 100Vac, 50Hz
Required Passing Performance	Criterion B: >95% reduction 0.5 period Criterion C: 30% reduction 25 period & >95% reduction 250 period		

Input power for testing: 230Vac, 50Hz				
Voltage (% Reduction)	Duration (Period)	Performance Criterion	Observation	Test Result
>95	0.5	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
30	25	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
>95	250	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C	Note <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	PASS

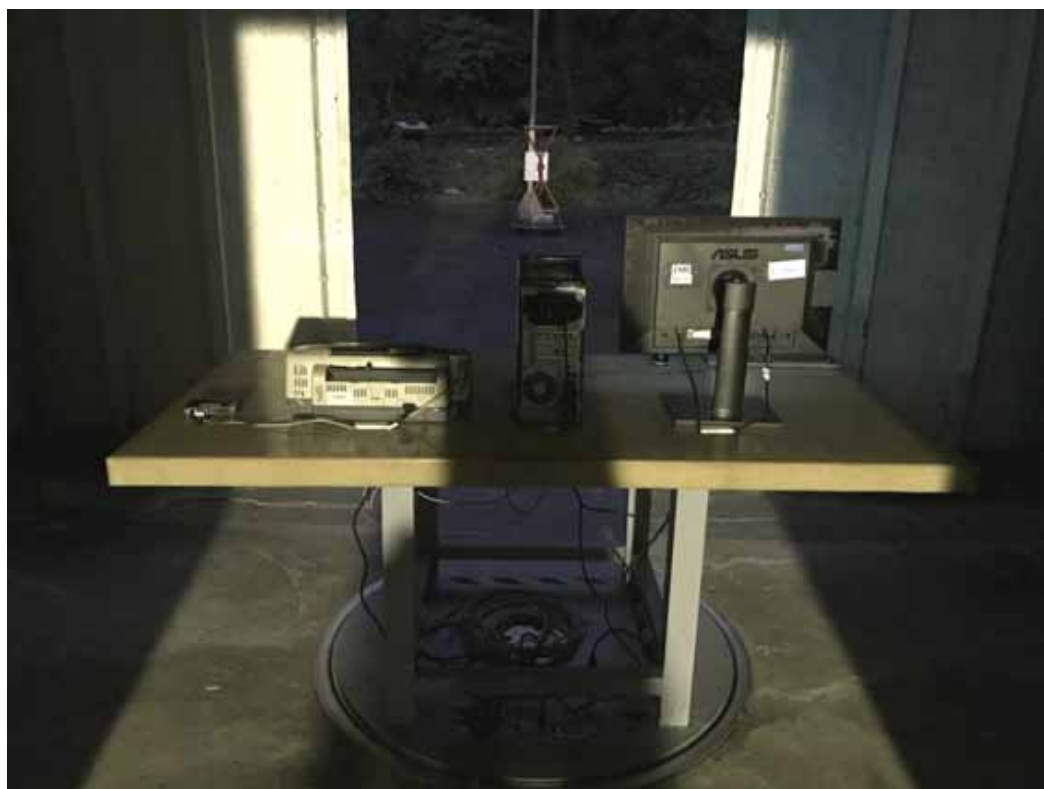
Input power for testing: 100Vac, 50Hz				
Voltage (% Reduction)	Duration (Period)	Performance Criterion	Observation	Test Result
>95	0.5	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	Note <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
30	25	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PASS
>95	250	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C	Note <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PASS

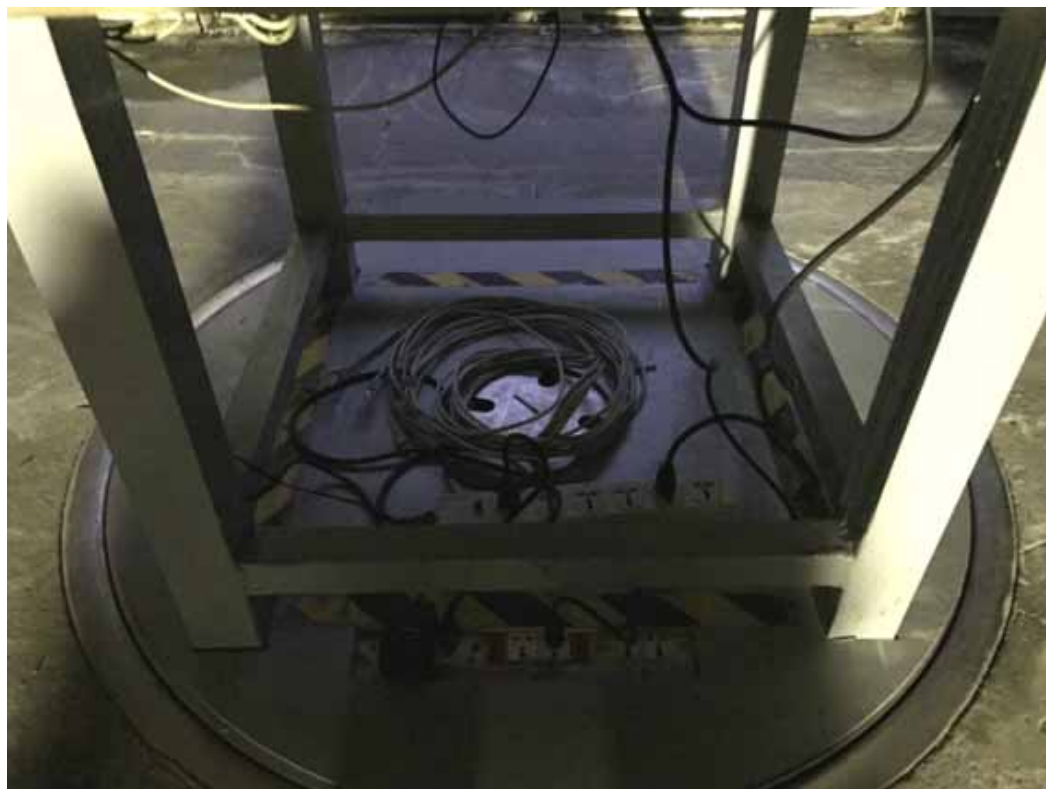
- NOTE:** 1. There was no change compared with initial operation during and after the test. No unintentional response was found during the test.
2. EUT shut down, but it could recover automatically afterwards.
3. EUT shut down, it could not become normal except reinstalled by operator.

9 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





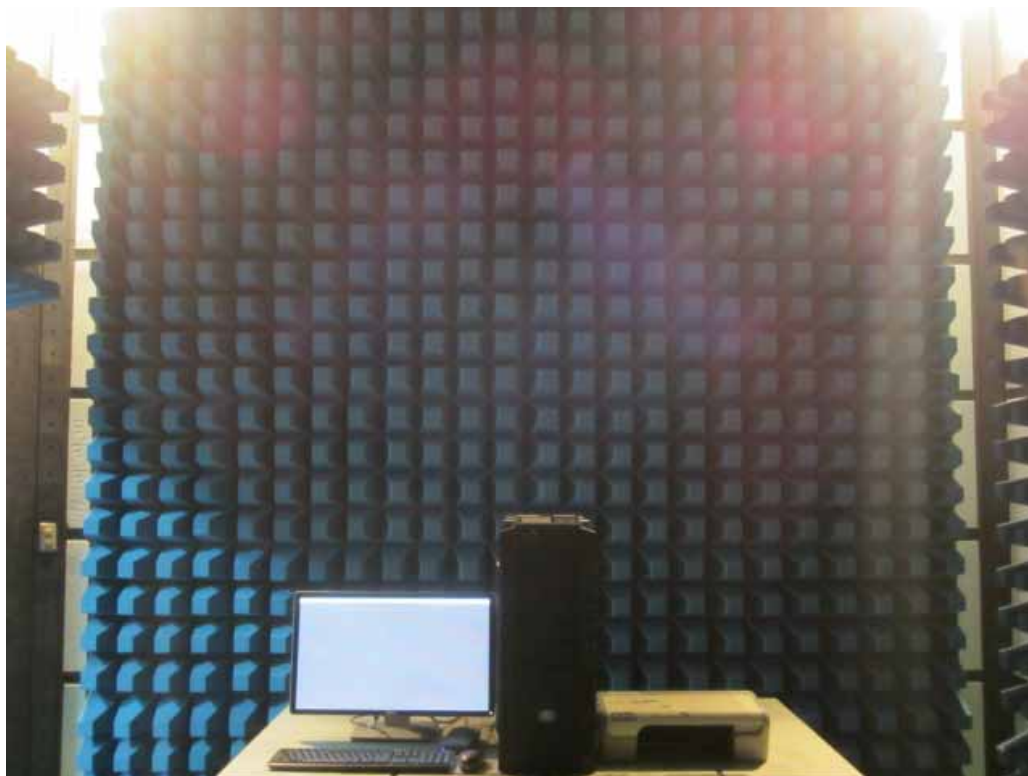
Harmonic & Flicker Test



ESD Test



RS Test



EFT Test



Surge Test



CS Test



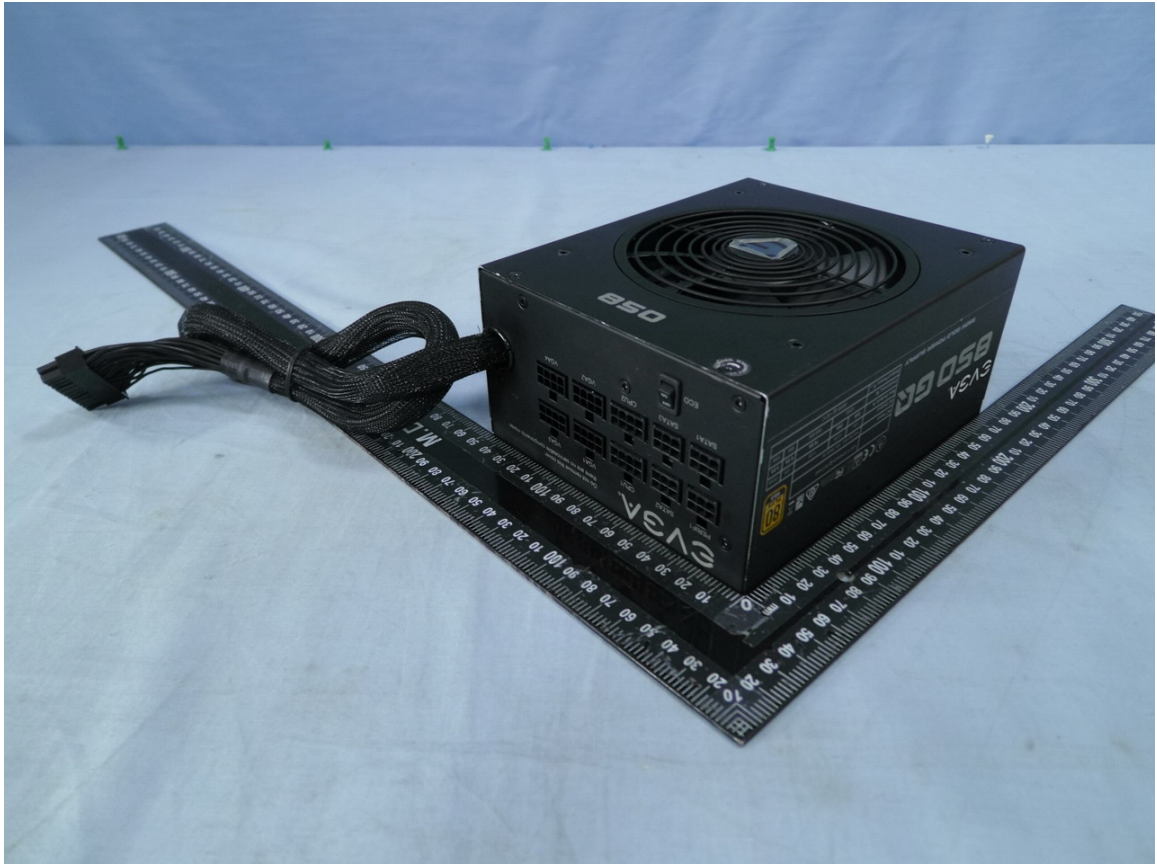
PFMF Test



Voltage Dips / Interruptions Test



APPENDIX 1 - PHOTOGRAPHS OF EUT



A1-1