CE EMC TEST REPORT

REPORT NO.: CE991222D10 R1

MODEL NO.: VS8801, VS8401

RECEIVED: Dec. 22, 2010

TESTED: Dec. 22, 2010 ~ Oct. 23, 2011

ISSUED: Oct. 31, 2011

APPLICANT: VIVOTEK INC.

ADDRESS: 6F, No.192, Lien-Cheng Rd., Chung-Ho Sectioin, New Taipei City.

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB LOCATION: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

Testing Laboratory 2021

LAB CODE: 200836-0

Table of Contents

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
CE991222D10	N/A	Jan. 20, 2011
CE991222D10 R1	Addition EUT's signal line data for Surge test	Oct. 31, 2011

1 CERTIFICATION

PRODUCT:	Video Server
BRAND NAME:	VIVOTEK
MODEL NO.:	VS8801, VS8401
TEST ITEM:	ENGINEERING SAMPLE
APPLICANT:	VIVOTEK INC.
TESTED:	Dec. 22, 2010 ~ Oct. 23, 2011
STANDARDS:	**EN 55022: 2006+A1: 2007, Class A**
	CISPR 22: 2005+ A1:2005, Class A
	AS/NZS CISPR 22: 2006, Class A
	EN 61000-3-2: 2006 +A1: 2009+A2: 2009
	EN 61000-3-3: 2008
	EN 55024: 1998+A1: 2001+A2: 2003
	IEC 61000-4-2: 2008 ED.2.0
	IEC 61000-4-3: 2010 ED.3.2
	IEC 61000-4-4: 2011 ED.2.1
	IEC 61000-4-5: 2005 ED.2.0
	IEC 61000-4-6: 2008 ED.3.0
	IEC 61000-4-8: 2009 ED.2.0
	IEC 61000-4-11: 2004 ED.2.0

The above equipment (Model No.: VS8801) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards.

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CERTIFICATION-Continued

The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Jessica Cheng , DATE: Oct. 31, 2011
(Jessica Cheng / Specialist)

APPROVED BY : Kenny Meng , DATE: Oct. 31, 2011
(Kenny Meng / Assistant Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

EMISSION			
Standard	**Test Type**	**Result**	**Remarks**
EN 55022: 2006 +A1:2007, Class A	Conducted Test	PASS	Meets Class A Limit Minimum passing margin is –16.27 dB at 0.150 MHz
	Conducted Test (telecom port)	PASS	Meets Class A Limit Minimum passing margin is –8.86 dB at 10.000 MHz
	Radiated Test (30MHz ~ 2GHz)	PASS	Meets Class A Limit Minimum passing margin is –3.75 dB at 625.02 MHz
EN 61000-3-2: 2006 +A1: 2009+A2: 2009	Harmonic current emissions	PASS	The power consumption of EUT is less than 75W and no limits apply
EN 61000-3-3:2008	Voltage fluctuations & flicker	PASS	Meets the requirements.

Note: The EUT highest frequency generated **150MHz** and therefore the test frequency range was performed up to 2GHz for radiated emission test.

IMMUNITY (EN 55024: 1998+A1: 2001+A2: 2003)			
Standard	**Test Type**	**Result**	**Remarks**
IEC 61000-4-2 : 2008 ED.2.0	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B
IEC 61000-4-3: 2010 ED.3.2	Radiated, radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-4: 2011 ED.2.1	Electrical fast transient / burst immunity test.	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-5: 2005 ED.2.0	Surge immunity test	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-6: 2008 ED.3.0	Immunity to conducted disturbances, induced by radio-frequency fields	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-8: 2009 ED.2.0	Power frequency magnetic field immunity test.	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-11: 2004 ED.2.0	Voltage dips, short interruptions and voltage variations immunity tests	PASS	Meets the requirements of **Voltage Dips:** i) >95% reduction - Performance Criterion A ii) 30% reduction – Performance Criterion A **Voltage Interruptions:** i) >95% reduction – Performance Criterion B

2.1 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:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz ~ 30MHz	3.43 dB
Conducted emissions at telecom port	150kHz ~ 30MHz	2.6174 dB
Radiated emissions	30MHz~1GHz	3.79 dB
	Above 1GHz	2.76 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Video Server
MODEL NO.	VS8801, VS8401
POWER SUPPLY	Switching power adapter Rating: refer to Note below Power cord: AC-2 Pin. Non-shielded DC (1.8m) with one ferrite core.
DATA CABLE SUPPLIED	N/A

NOTE:

1. The EUT is a Video Server, which has several models for following differentiation:

Model No.	Difference
VS8801	Audio/Video 8 channels, 8 DI/DO
VS8401	Audio/Video 4 channels, 4 DI/DO

2. The EUT consumes power from a switching power adapter, as the following:

Brand Name	Model No.	Specification
ENG	3A-303WP12	AC I/P: 100-240V, 50-60Hz, 1.0A DC O/P: 12V, 2.5A

3. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

1. During the test, the above two models were pre-tested, and the worst emission level was found on model no.: **VS8801**, therefore only its test data were recorded in this report.
2. The EUT was pre-tested under R/W the following devices:
   - ♦ SD card Mode
   - ♦ USB Mode

   And found the worst emission was under **SD card Mode**, therefore only this mode was applied for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of ITE equipment and, according to the specifications of the manufacturers, must comply with the requirements of the following standards:

EN 55022: 2006+A1: 2007, Class A
CISPR 22: 2005+ A1:2005, Class A
AS/NZS CISPR 22: 2006, Class A
EN 61000-3-2: 2006 +A1: 2009+A2: 2009
EN 61000-3-3: 2008
EN 55024: 1998+A1: 2001+A2: 2003
IEC 61000-4-2: 2008 ED.2.0
IEC 61000-4-3: 2010 ED.3.2
IEC 61000-4-4: 2011 ED.2.1
IEC 61000-4-5: 2005 ED.2.0
IEC 61000-4-6: 2008 ED.3.0
IEC 61000-4-8: 2009 ED.2.0
IEC 61000-4-11: 2004 ED.2.0

Notes: The above IEC basic standards are applied with latest version if customer has no special requirement

3.4 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.

3.4.1 FOR EMISSION TEST

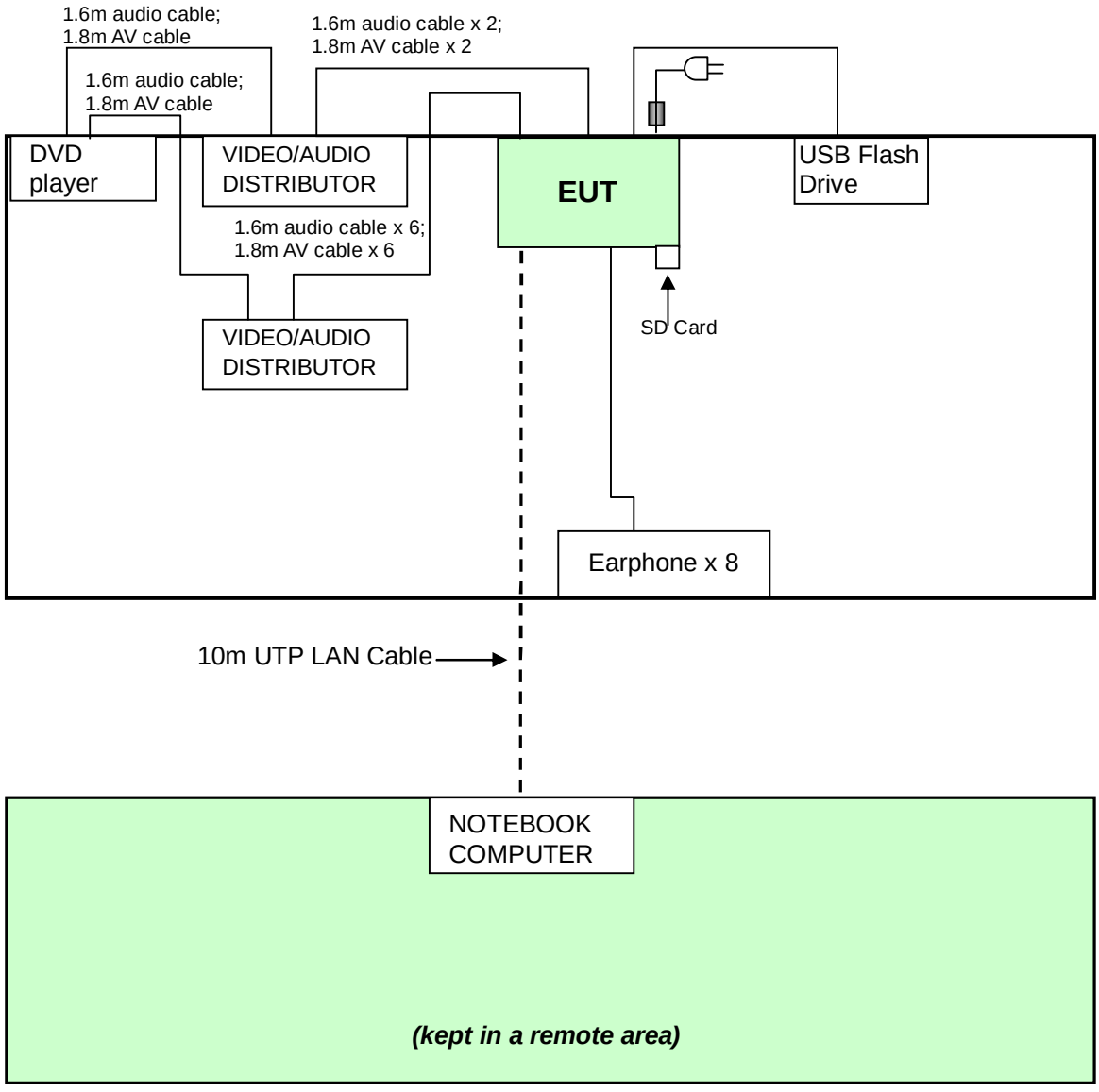
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DVD player	SONY	DVP-NS975V	2030567	VERIFICATION
2	VIDEO/AUDIO DISTRIBUTOR	Trans Electric	AV-004	V4-010027	VERIFICATION
3	VIDEO/AUDIO DISTRIBUTOR	JEBSEE	AV-486	N/A	VERIFICATION
4	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
5	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
6	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
7	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
8	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
9	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
10	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
11	EARPHONE	PHILIPS	SBC HL145	N/A	N/A
12	USB Flash Drive	SanDisk	Cruzer Micro Skin	NA	FCC DoC Approved
13	SD Card	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.6 m audio cable x 2, 1.8 m AV cable x 2
2	1.6 m audio cable x 2, 1.8 m AV cable x 2
3	1.6 m audio cable x 6, 1.8 m AV cable x 6
4	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
5	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
6	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
7	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
8	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
9	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
10	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.

11	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.
12	1.8 m USB cable
13	N/A

NOTE: All power cords of the above support units are non shielded (1.8m).

TEST CONFIGURATION



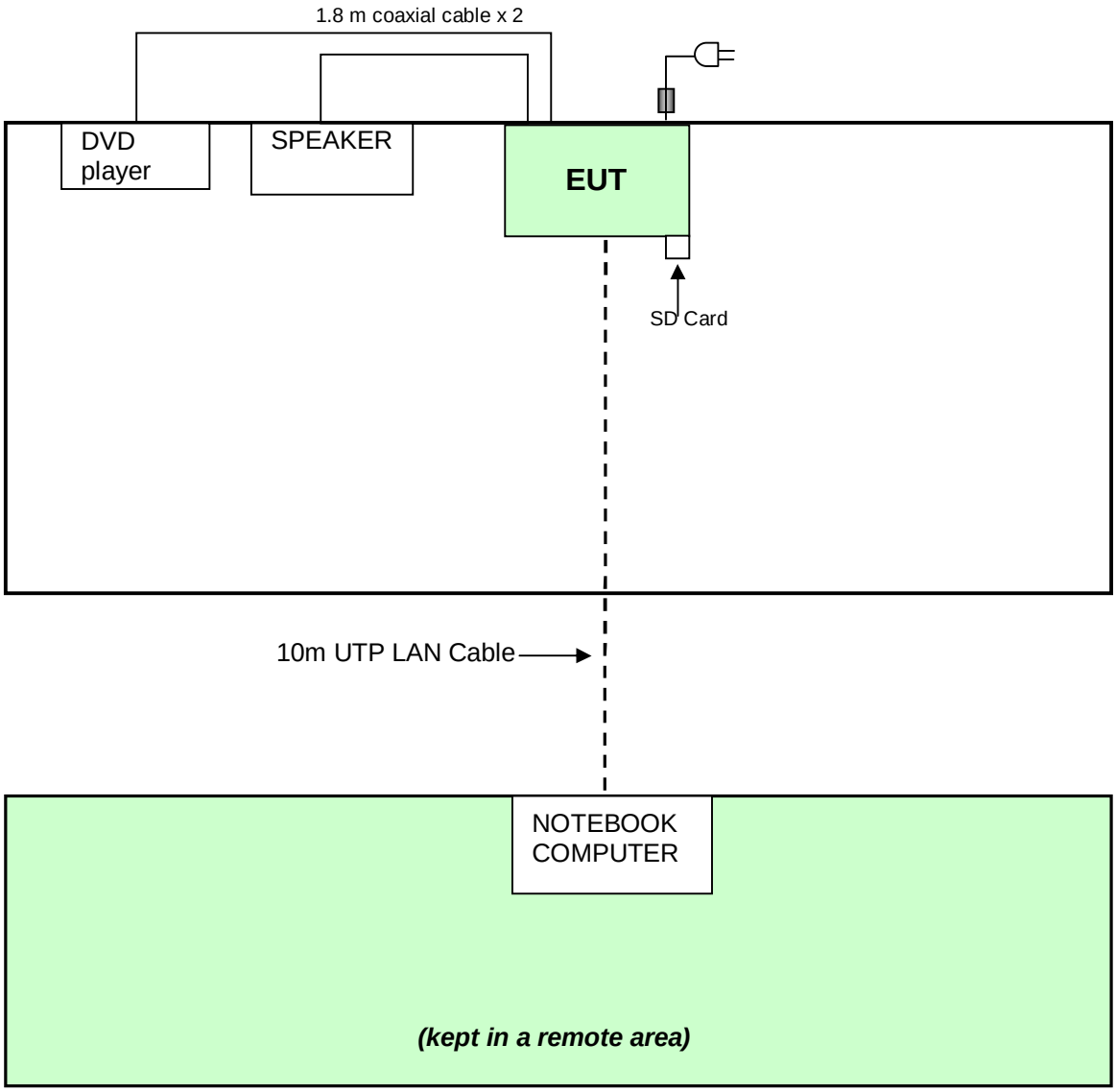
3.4.2 FOR HARMONICS / FLICKER / IMMUNITY TEST

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DVD player	SONY	DVP-NS530	1003748	Verification
2	SPEAKER	MOREX	MS-288	N/A	N/A
3	NOTEBOOK COMPUTER	DELL	PP04X	66SYW1S	FCC DoC Approved
4	SD Card	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8 m coaxial cable x 2
2	1.4 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
3	10m UTP LAN Cable
4	N/A

NOTE: All power cords of the above support units are non shielded (1.8m).

TEST CONFIGURATION



4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: EN 55022

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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100290	Dec. 21, 2010	Dec. 20, 2011
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	Sep. 09, 2010	Sep. 08, 2011
LISN With Adapter (for EUT)	AD10	C00Ada-001	Sep. 09, 2010	Sep. 08, 2011
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	May 28, 2010	May 27, 2011
Software	ADT_Cond_V7.3.7	NA	NA	NA
Software	ADT_ISN_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C02.01	Jan. 08, 2011	Jan. 07, 2012
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-298	Jan. 21, 2010	Jan. 20, 2011
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-299	Jan. 21, 2010	Jan. 20, 2011

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. The test was performed in Shielded Room No. 2.
3. The VCCI Site Registration No. C-240.

4.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

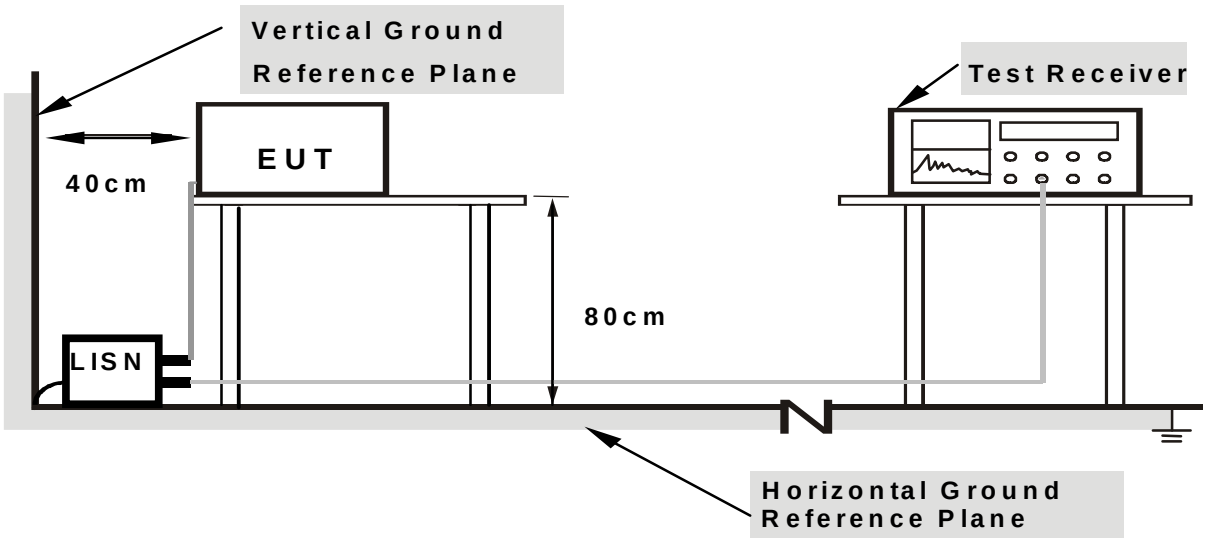
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

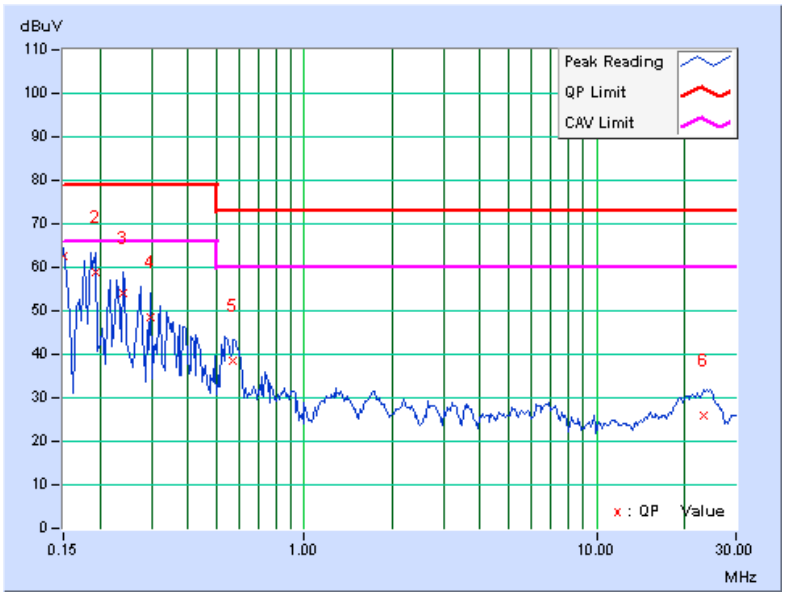
a. Turned on the power of all equipment.
b. Server PC (kept in a remote area) sent and received messages to/ from EUT via an UTP LAN cable (10m).
c. EUT ran a test program to enable all functions.
d. Server PC (kept in a remote area) read and wrote messages to/ from SD card via EUT.
e. DVD Player sent ”1 kHz audio signal” to earphones via EUT.
f. Steps d-f were repeated.

4.1.7 TEST RESULTS

TEST MODE	SD card mode	6dB BANDWIDTH	9 kHz
INPUT POWER	230Vac, 50 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	15deg. C, 60% RH	TESTED BY: Hermes Lin	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.150**	**0.34**	**62.39**	**-**	**62.73**	**-**	**79.00**	**66.00**	**-16.27**	**-**
2	0.193	0.34	58.70	-	59.04	-	79.00	66.00	-19.96	-
3	0.240	0.36	53.85	-	54.21	-	79.00	66.00	-24.79	-
4	0.298	0.40	48.16	-	48.56	-	79.00	66.00	-30.44	-
5	0.572	0.47	37.88	-	38.35	-	73.00	60.00	-34.65	-
6	23.141	2.11	23.80	-	25.91	-	73.00	60.00	-47.09	-

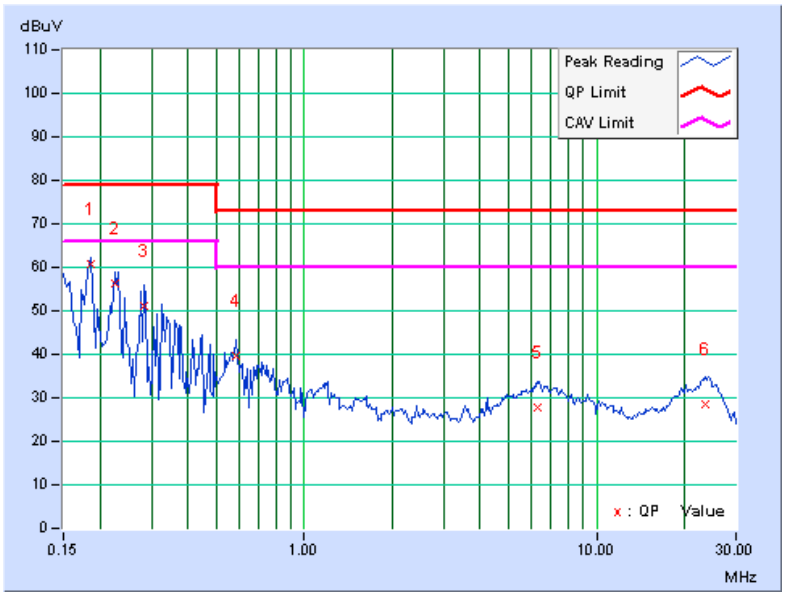
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



TEST MODE	SD card mode	**6dB BANDWIDTH**	9 kHz
INPUT POWER	230Vac, 50 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	15deg. C, 60% RH	**TESTED BY**: Hermes Lin	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.185	0.29	60.36	-	60.65	-	79.00	66.00	-18.35	-
2	0.224	0.30	56.09	-	56.39	-	79.00	66.00	-22.61	-
3	0.283	0.34	50.89	-	51.23	-	79.00	66.00	-27.77	-
4	0.588	0.42	39.22	-	39.64	-	73.00	60.00	-33.36	-
5	6.320	1.00	26.61	-	27.61	-	73.00	60.00	-45.39	-
6	23.418	1.63	26.99	-	28.62	-	73.00	60.00	-44.38	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.2 CONDUCTED EMISSION MEASUREMENT AT TELECOMMUNICATION PORTS

4.2.1 LIMIT OF CONDUCTED COMMON MODE DISTURBANCE AT TELECOMMUNICATION PORTS

TEST STANDARD: EN 55022 FOR CLASS A EQUIPMENT

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	97 – 87	84 - 74	53 – 43	40 – 30
0.5 - 30.0	87	74	43	30

FOR CLASS B EQUIPMENT

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	84 - 74	74 - 64	40 – 30	30 – 20
0.5 - 30.0	74	64	30	20

NOTE: (1) The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100290	Dec. 21, 2010	Dec. 20, 2011
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	Sep. 09, 2010	Sep. 08, 2011
LISN With Adapter (for EUT)	AD10	C00Ada-001	Sep. 09, 2010	Sep. 08, 2011
FCC ISN	FCC-TLISN-T 2-02	20117	Jul. 05, 2010	Jul. 04, 2011
FCC ISN	FCC-TLISN-T 4-02	20116	Jul. 05, 2010	Jul. 04, 2011
FCC ISN	FCC-TLISN-T 8-02	20096	Jul. 05, 2010	Jul. 04, 2011
FCC ISN Current Probe	F-33-4	56	Jul. 12, 2010	Jul. 11, 2011
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	May 28, 2010	May 27, 2011
Software	ADT_Cond_V 7.3.7	NA	NA	NA
Software	ADT_ISN_V7. 3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C02.01	Jan. 08, 2011	Jan. 07, 2012
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-298	Jan. 21, 2010	Jan. 20, 2011
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-299	Jan. 21, 2010	Jan. 20, 2011
LYNICS Terminator (For FCC ISN)	0900510	E1-011284	Sep. 10, 2010	Sep. 09, 2011
LYNICS Terminator (For FCC ISN)	0900510	E1-011285	Sep. 10, 2010	Sep. 09, 2011
LYNICS Terminator (For FCC ISN)	0900510	E1-011286	Sep. 10, 2010	Sep. 09, 2011

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. The test was performed in Shielded Room No. 2.
3. The VCCI Site Registration No. T-1650

4.2.3 TEST PROCEDURE

For ISN:

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room and connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN.

b. Voltage at the measurement port of the ISN was detected, the reading was corrected by adding the voltage division factor of the ISN, and was compared to the voltage limits.

c. The disturbance levels and the frequencies of at least six highest disturbances were recorded from each telecommunication port, which comprises the EUT.

For Current Probe:

a. Current probe shall be placed at 0.1m from the ISN.

b. Current at the measurement port of the ISN was detected, the reading was corrected by adding the current division factor of the current probe, and was compared to the current limits.

c. The disturbance levels and the frequencies of at least six highest disturbances were recorded from each telecommunication port, which comprises the EUT.

d. Break the insulation and connect a 150Ω resistor from the outside surface of the shield to ground and apply a clamp between 150Ω connection and associated equipment (For STP LAN only).

For Voltage Probe:

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room and connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN.

b. Voltage at the measurement port of the voltage probe was detected, the reading was corrected by adding the voltage division factor of the voltage probe, and was compared to the voltage limits.

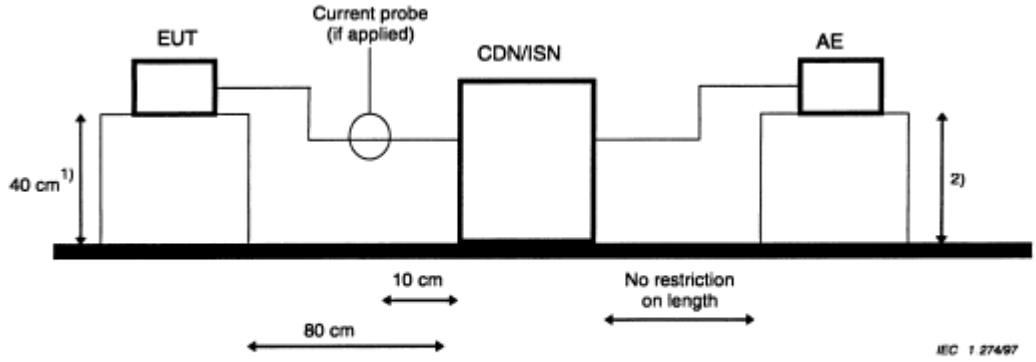
c. The disturbance levels and the frequencies of at least six highest disturbances were recorded from each telecommunication port, which comprises the EUT.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP

For ISN & Current Probe (UTP LAN cable):

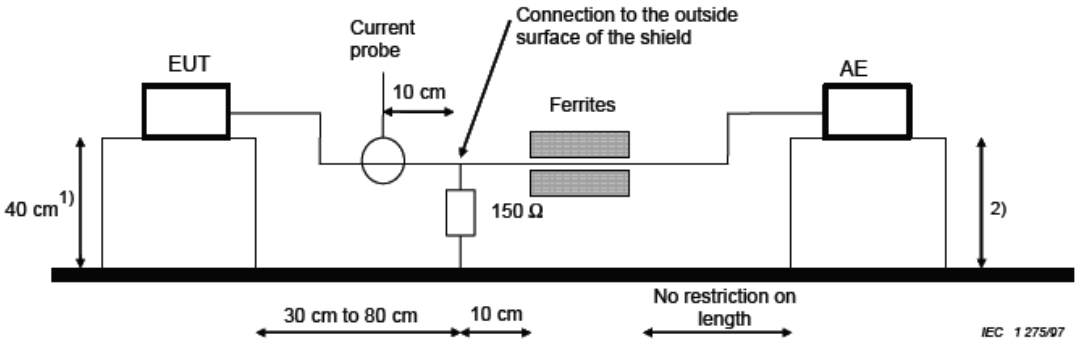


AE = Associated equipment
EUT = Equipment under test

1) Distance to the reference groundplane (vertical or horizontal).

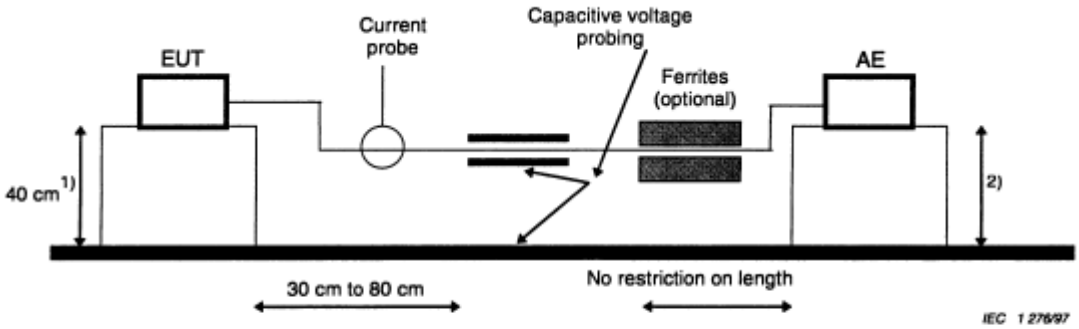
2) Distance to the reference groundplane is not critical.

For Current Probe (STP LAN cable):



AE = Associated equipment
EUT = Equipment under test

For Voltage & Current Probe:



AE = Associated equipment

EUT = Equipment under test

1) Distance to the reference groundplane (vertical or horizontal).

2) Distance to the reference groundplane is not critical.

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

NOTE:

1. The methods of conformance testing were selected according to the EN55022: 2006+A1:2007, section: 9.6.1 of measurement method using an ISN with a longitudinal conversion loss (LCL) as defined in section: 9.6.2.
2. When measurements were performed on a single unscreened balanced pair, an adequate ISN for two wires were used; when performed on unscreened cables containing two balanced pairs, an adequate ISN for four wires were used; when performed on unscreened cables containing four balanced pairs, an adequate ISN for eight wires were used.
3. The communication function of EUT was executed and ISN was connected between EUT and associated equipment and the ISN was connected directly to reference ground plane.

4.2.6 EUT OPERATING CONDITIONS

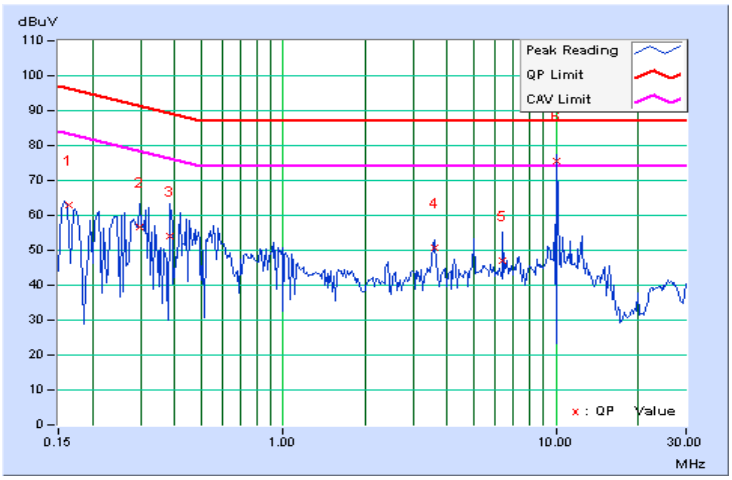
a. Turned on the power of all equipment.
b. Server PC (kept in a remote area) sent and received messages to/ from EUT via an UTP LAN cable (10m).
c. EUT ran a test program to enable all functions.
d. EUT run "TfGen.exe" (10% of transmission rate 10/100/1000Mbps) then sent/ received messages to/from Server PC (kept in a remote area) via an UTP LAN cable (10m).
e. Server PC (kept in a remote area) read and wrote messages to/ from SD card via EUT.
f. DVD Player sent "1 kHz audio signal" to earphones via EUT.
g. Steps d-g were repeated.

4.2.7 TEST RESULTS

TEST MODE	SD card mode	6dB BANDWIDTH	9 kHz
INPUT POWER	230Vac, 50 Hz	PHASE	RJ45 TELECOM PORT (10Mbps)
ENVIRONMENTAL CONDITIONS	15deg. C, 60% RH	TESTED BY: Hermes Lin	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	A.V.	Q.P.	A.V.
1	0.163	10.20	52.62	-	62.82	-	96.30	83.30	-33.48	-
2	0.298	10.23	46.31	-	56.54	-	91.29	78.29	-34.75	-
3	0.384	10.26	43.69	-	53.95	-	89.18	76.18	-35.24	-
4	3.594	10.46	40.10	-	50.56	-	87.00	74.00	-36.44	-
5	6.406	10.53	36.39	-	46.92	-	87.00	74.00	-40.08	-
6	**10.000**	**10.65**	**64.89**	**54.49**	**75.54**	**65.14**	**87.00**	**74.00**	**-11.46**	**-8.86**

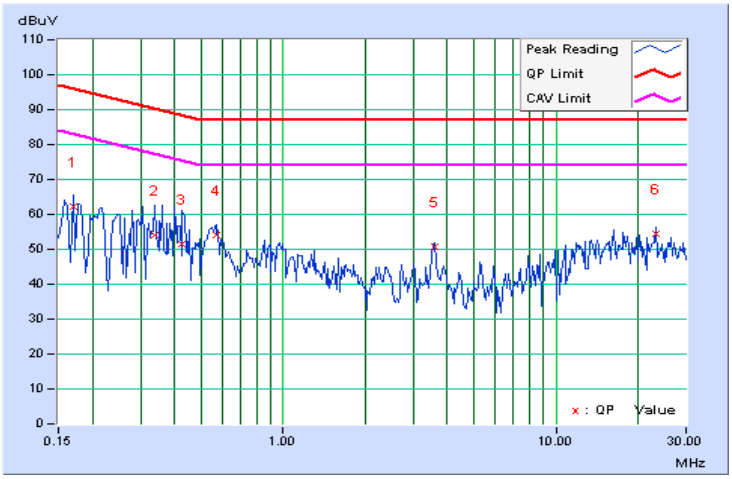
REMARKS:
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



TEST MODE	SD card mode	**6dB BANDWIDTH**	9 kHz
INPUT POWER	230Vac, 50 Hz	**PHASE**	RJ45 TELECOM PORT (100Mbps)
ENVIRONMENTAL CONDITIONS	15deg. C, 60% RH	**TESTED BY**: Hermes Lin	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	A.V.	Q.P.	A.V.
1	0.170	10.20	52.13	-	62.33	-	95.98	82.98	-33.65	-
2	0.338	10.24	43.98	-	54.22	-	90.26	77.26	-36.04	-
3	0.427	10.26	41.06	-	51.32	-	88.30	75.30	-36.98	-
4	0.568	10.25	43.98	-	54.23	-	87.00	74.00	-32.77	-
5	3.609	10.46	40.33	-	50.79	-	87.00	74.00	-36.21	-
6	23.129	11.26	43.32	-	54.58	-	87.00	74.00	-32.42	-

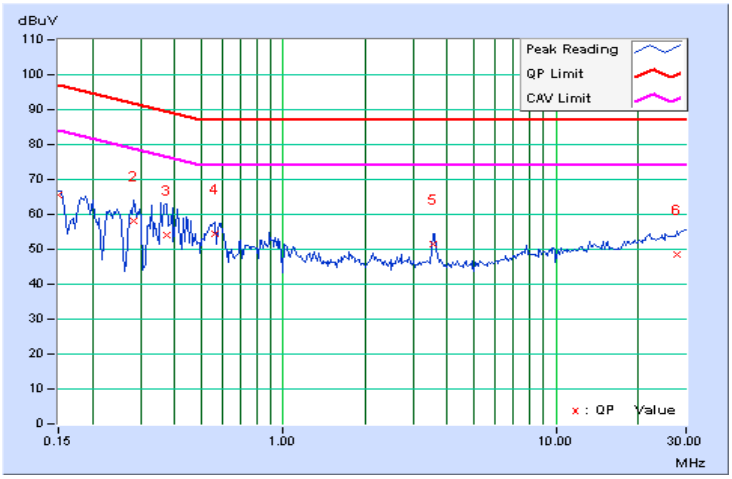
REMARKS:
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



TEST MODE	SD card mode	**6dB BANDWIDTH**	9 kHz
INPUT POWER	230Vac, 50 Hz	**PHASE**	RJ45 TELECOM PORT (1Gbps)
ENVIRONMENTAL CONDITIONS	15deg. C, 60% RH	**TESTED BY**: Hermes Lin	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	A.V.	Q.P.	A.V.
1	0.150	10.21	55.28	-	65.49	-	97.00	84.00	-31.51	-
2	0.283	10.22	48.11	-	58.33	-	91.73	78.73	-33.40	-
3	0.373	10.25	43.88	-	54.13	-	89.44	76.44	-35.31	-
4	0.560	10.25	44.08	-	54.33	-	87.00	74.00	-32.67	-
5	3.547	10.46	41.14	-	51.60	-	87.00	74.00	-35.40	-
6	27.895	11.59	36.79	-	48.38	-	87.00	74.00	-38.62	-

REMARKS:
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.3 RADIATED EMISSION MEASUREMENT

4.3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: EN 55022
FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m) dBuV/m	Class B (at 10m) dBuV/m
30 – 230	40	30
230 – 1000	47	37

FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1 to 3	76	56	70	50
3 to 6	80	60	74	54

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
(3) All emanation 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.

FREQUENCY RANGE OF RADIATED MEASUREMENT
(For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	Up to 5 times of the highest frequency or 6 GHz, whichever is less

4.3.2 TEST INSTRUMENTS

Frequency Range 30MHz-1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Receiver	ESCI	100612	Jul. 21, 2010	Jul. 20, 2011
CHASE BILOG Antenna	CBL6112B	2640	Apr. 27, 2010	Apr. 26, 2011
ADT Turn Table	TT100	0204	NA	NA
ADT Tower	AT100	0204	NA	NA
Software	ADT_Radiated _V7.6.15.9.2	NA	NA	NA
ADT RF Switches BOX	EM-H-01-1	1005	Jul. 07, 2010	Jul. 06, 2011
WOKEN RF cable	8D	CABLE-ST1-01	Jul. 07, 2010	Jul. 06, 2011

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. The test was performed in Open Site No. 1.
3. The VCCI Site Registration No. R-236.
4. The FCC Site Registration No. 90423.

Frequency Range 1GHz-40GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum	E4446A	MY46180666	Jul. 22, 2010	Jul. 21, 2011
Agilent Preamplifier	8449B	3008A01924	Jul. 14, 2010	Jul. 13, 2011
Agilent Preamplifier	8449B	3008A02367	Jul. 14, 2010	Jul. 13, 2011
MITEQ Preamplifier	AMF-6F-26040 0-33-8P	892164	Jul. 14, 2010	Jul. 13, 2011
Schwarzbeck Horn Antenna	BBHA-9170	BBHA9170190	Sep. 24, 2010	Sep. 23, 2011
Schwarzbeck Horn Antenna	BBHA-9120	D130	May 25, 2010	May 24, 2011
Max Full. Turn Table & Tower	MF7802	MF780208103	NA	NA
Software	ADT_Radiated _V8.7.03.5	NA	NA	NA
SUHNER RF cable	SF106-18	Cable-CH7	Aug. 20, 2010	Aug. 19, 2011

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. The test was performed in Chamber No. 7.
3. The Industry Canada Reference No. IC 7450E-7.
4. The FCC Site Registration No. 127748.
5. The VCCI Site Registration No. G-39

4.3.3 TEST PROCEDURE

<Frequency Range 30MHz ~ 1GHz >

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

b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.

<Frequency Range above 1GHz>

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

NOTE:

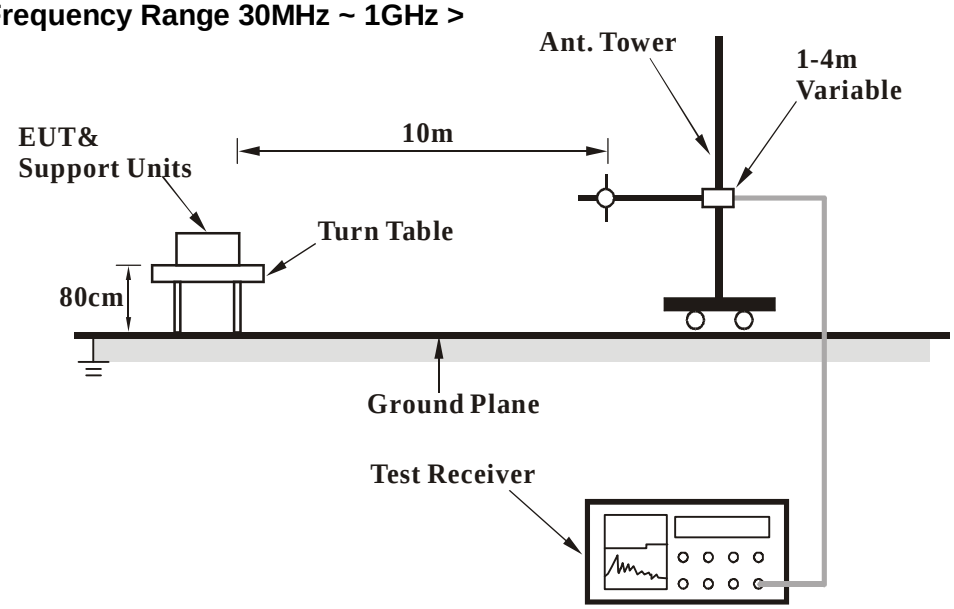
1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
2. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.

4.3.4 DEVIATION FROM TEST STANDARD

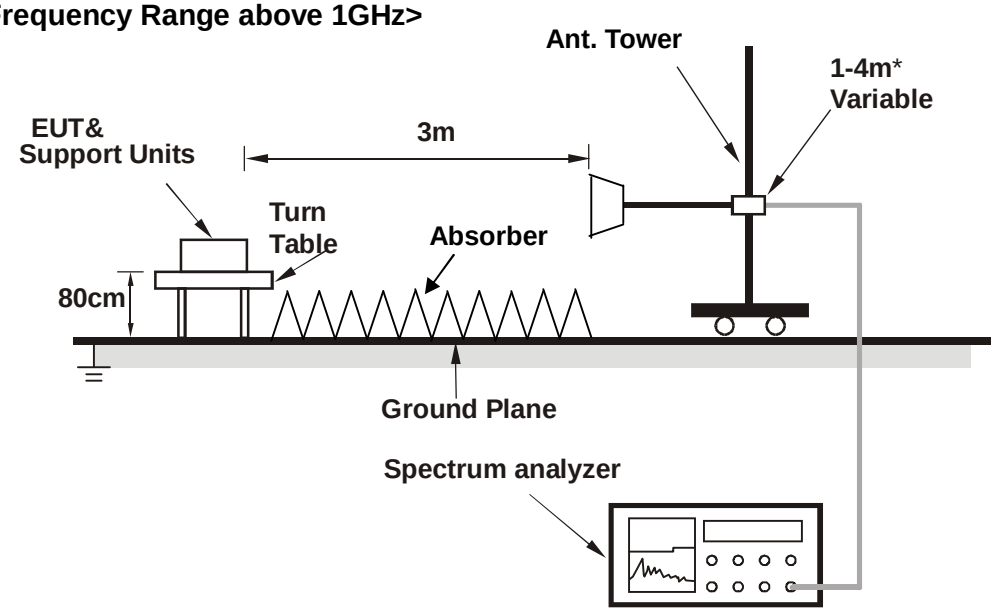
No deviation

4.3.5 TEST SETUP

<Frequency Range 30MHz ~ 1GHz >



<Frequency Range above 1GHz>



***** : depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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

4.3.6 EUT OPERATING CONDITIONS

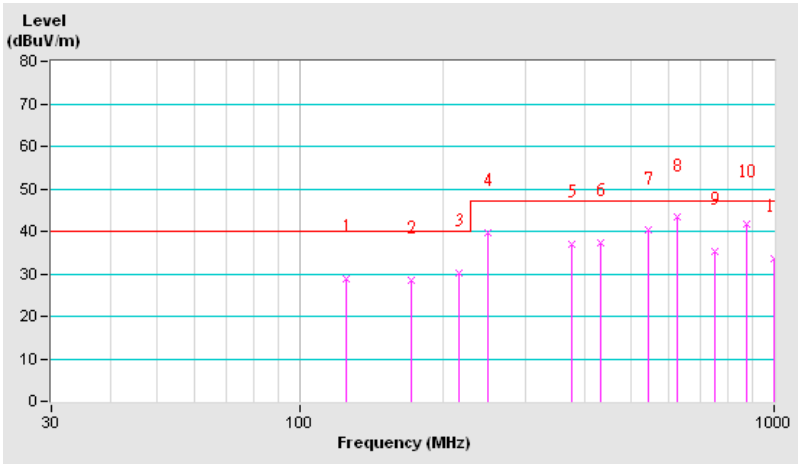
Same as item 4.1.6.

4.3.7 TEST RESULTS

TEST MODE	SD card mode	FREQUENCY RANGE	30-1000 MHz
INPUT POWER	230Vac, 50 Hz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	15deg. C, 70% RH	**TESTED BY:** Vincent Lin	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	125.01	28.83 QP	40.00	-11.17	4.00 H	231	13.82	15.01
2	171.93	28.47 QP	40.00	-11.53	4.00 H	203	16.27	12.20
3	216.04	30.28 QP	40.00	-9.72	4.00 H	237	16.59	13.69
4	250.00	39.58 QP	47.00	-7.42	3.87 H	340	23.92	15.66
5	375.02	36.99 QP	47.00	-10.01	2.35 H	20	17.48	19.51
6	432.05	37.30 QP	47.00	-9.70	1.88 H	52	16.13	21.17
7	543.30	40.25 QP	47.00	-6.75	1.88 H	0	16.71	23.54
8	**625.02**	**43.25 QP**	**47.00**	**-3.75**	**2.25 H**	**110**	**18.59**	**24.66**
9	750.03	35.17 QP	47.00	-11.83	1.00 H	296	9.24	25.93
10	875.03	41.76 QP	47.00	-5.24	1.00 H	106	14.09	27.67
11	1000.00	33.64 QP	47.00	-13.36	1.00 H	258	4.59	29.05

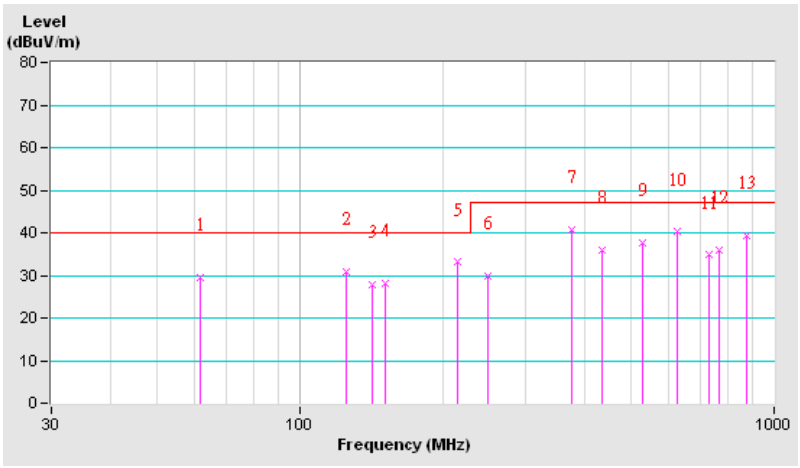
REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



TEST MODE	SD card mode	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER	230Vac, 50 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	15deg. C, 70% RH	**TESTED BY:** Vincent Lin	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	61.61	29.53 QP	40.00	-10.47	1.00 V	339	21.30	8.23
2	125.01	30.97 QP	40.00	-9.03	1.00 V	310	15.96	15.01
3	142.15	27.78 QP	40.00	-12.22	1.00 V	322	13.21	14.57
4	151.22	28.10 QP	40.00	-11.90	1.00 V	210	15.22	12.88
5	215.99	33.12 QP	40.00	-6.88	1.00 V	62	19.43	13.69
6	250.01	29.97 QP	47.00	-17.03	1.00 V	124	14.30	15.67
7	375.04	40.72 QP	47.00	-6.28	1.00 V	2	21.21	19.51
8	433.80	36.01 QP	47.00	-10.99	1.00 V	210	14.80	21.21
9	529.00	37.64 QP	47.00	-9.36	1.01 V	300	14.37	23.27
10	625.03	40.21 QP	47.00	-6.79	3.52 V	324	15.55	24.66
11	728.30	34.80 QP	47.00	-12.20	2.77 V	34	9.37	25.43
12	764.30	35.85 QP	47.00	-11.15	1.79 V	0	9.61	26.24
13	875.04	39.42 QP	47.00	-7.58	2.26 V	105	11.75	27.67

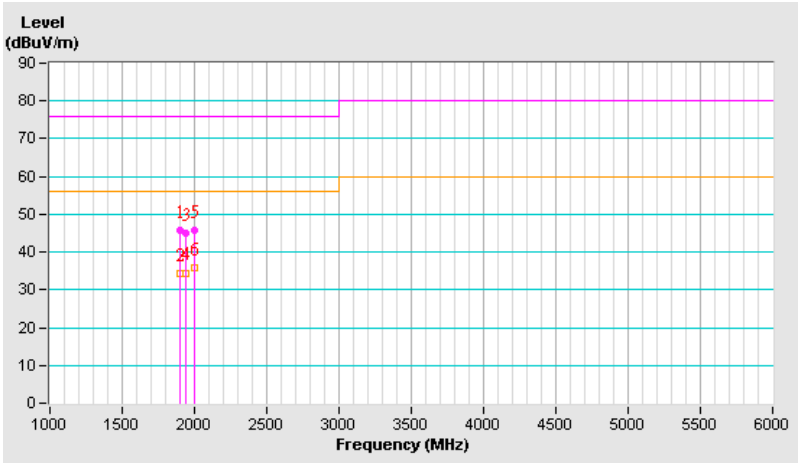
REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



TEST MODE	SD card mode	**FREQUENCY RANGE**	1-2GHz
INPUT POWER	230Vac, 50 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak/ Average , 1MHz
ENVIRONMENTAL CONDITIONS	15deg. C, 781% RH	**TESTED BY:** Kevin Liao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1896.40	45.91 PK	76.00	-30.09	1.12 H	221	11.86	34.05
2	1896.40	34.21 AV	56.00	-21.79	1.12 H	221	0.16	34.05
3	1942.78	45.06 PK	76.00	-30.94	1.87 H	20	10.64	34.42
4	1942.78	34.49 AV	56.00	-21.51	1.87 H	20	0.07	34.42
5	1996.16	45.81 PK	76.00	-30.19	1.45 H	119	10.96	34.85
6	1996.16	35.74 AV	56.00	-20.26	1.45 H	119	0.89	34.85

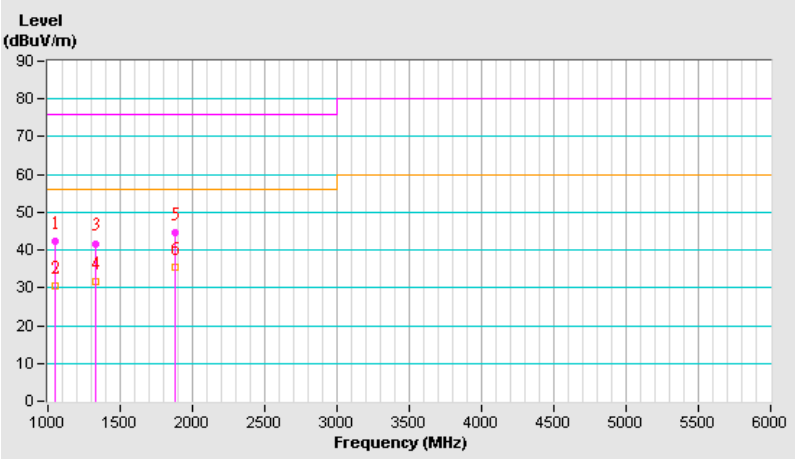
REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



TEST MODE	SD card mode	**FREQUENCY RANGE**	1-2GHz
INPUT POWER	230Vac, 50 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak/ Average , 1MHz
ENVIRONMENTAL CONDITIONS	15deg. C, 781% RH	**TESTED BY:** Kevin Liao	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1053.07	42.41 PK	76.00	-33.59	1.49 V	196	12.03	30.38
2	1053.07	30.45 AV	56.00	-25.55	1.49 V	196	0.07	30.38
3	1326.01	41.74 PK	76.00	-34.26	1.67 V	360	11.19	30.55
4	1326.01	31.48 AV	56.00	-24.52	1.67 V	360	0.93	30.55
5	1884.61	44.74 PK	76.00	-31.26	1.02 V	123	10.80	33.94
6	1884.61	35.32 AV	56.00	-20.68	1.02 V	123	1.38	33.94

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



4.4 HARMONICS CURRENT MEASUREMENT

4.4.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

TEST STANDARD: EN 61000-3-2

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23x8/n

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

NOTE: 1.Class A and Class D are classified according to section 5 of EN 61000-3-2: 2006.

2. According to section 7 of EN 61000-3-2: 2006, the above limits for all equipment except for lighting equipment are for all applications having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
EMC PARTNER EMC Emission Tester	HAR1000-1P	084	Apr. 16, 2010	Apr. 15, 2011
Software	HARCS	NA	NA	NA

NOTE: 1. The test was performed in EMS Room No. 1.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. According to IEC 61000-4-7: 2002, the time window shall be synchronized with each group of 10 or 12 cycles (200 ms)for power frequency of 50 or 60Hz.

4.4.3 TEST PROCEDURE

a. 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.

b. The classification of EUT is according to section 5 of EN 61000-3-2:2006.

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.

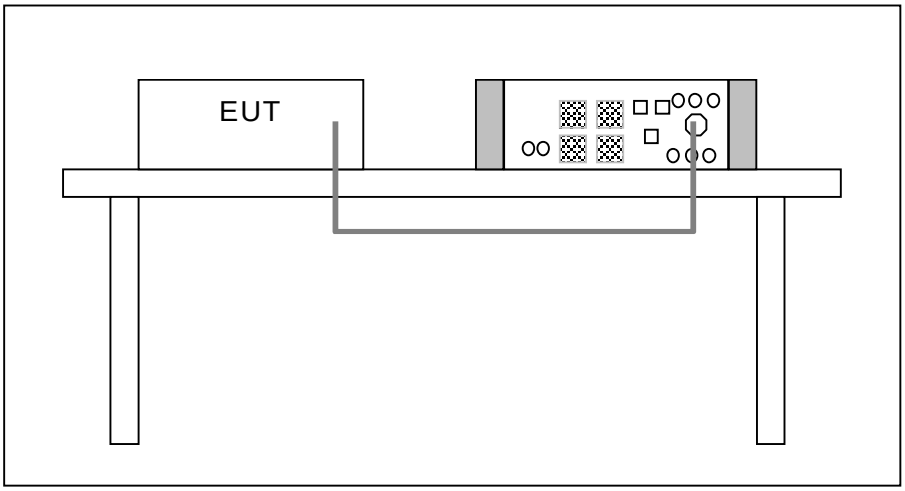
Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

c. 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.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



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

4.4.6 EUT OPERATING CONDITIONS

a. Turned on the power of all equipment.
b. EUT sent and received messages to/ from Server PC (kept in a remote area) via an UTP LAN cable (10m).
c. EUT ran a test program to enable all functions.
d. Server PC (kept in a remote area) read and wrote messages to/ from SD card via EUT.
e. DVD players sent audio and video signal to Server PC (kept in a remote area) via EUT.
f. Server PC (kept in a remote area) sent audio signal to speaker via EUT.
g. Steps d-g were repeated.

4.4.7 TEST RESULTS

TEST MODE	SD card mode		
FUNDAMENTAL VOLTAGE/AMPERE	230.3Vrms/ 0.139Arms	POWER FREQUENCY	49.987Hz
POWER CONSUMPTION	10.99W	POWER FACTOR	0.344
ENVIRONMENTAL CONDITIONS	18deg. C, 73% RH	**TESTED BY:** Evan Chang	

NOTE: Limits are not specified for equipment with a rated power of 75W or less (other than lighting equipment).

4.5 VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

4.5.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

TEST STANDARD: EN 61000-3-3

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

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
EMC PARTNER EMC Emission Tester	HAR1000-1P	084	Apr. 16, 2010	Apr. 15, 2011
Software	HARCS	NA	NA	NA

NOTE: 1. The test was performed in EMS Room No. 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

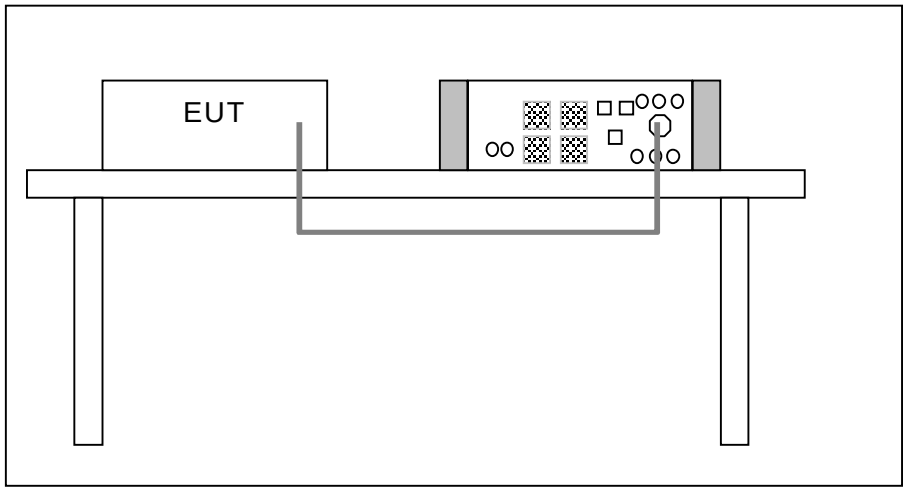
a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. 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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



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

4.5.6 EUT OPERATING CONDITIONS

Same as item 4.4.6

4.5.7 TEST RESULTS

TEST MODE	SD card mode		
FUNDAMENTAL VOLTAGE/AMPERE	230.3Vrms/ 0.139Arms	POWER FREQUENCY	49.987Hz
OBSERVATION PERIOD (Tp)	10min	POWER FACTOR	0.344
ENVIRONMENTAL CONDITIONS	18deg. C, 73% RH	**TESTED BY:** Evan Chang	

TEST PARAMETER	MEASUREMENT VALUE	LIMIT	REMARKS
P_{st}	0.072	1.0	Pass
P_{lt}	0.072	0.65	Pass
$T_{d(t)}$ (ms)	0	500	Pass
d_{max} (%)	0	4	Pass
dc (%)	0.020	3.3	Pass

NOTE: (1) P_{st} means short-term flicker indicator.
(2) P_{lt} means long-term flicker indicator.
(3) $T_{d(t)}$ means maximum time that d(t) exceeds 3.3%.
(4) d_{max} means maximum relative voltage change.
(5) dc means relative steady-state voltage change.

5 IMMUNITY TEST

5.1 GENERAL DESCRIPTION

Product Standard:	**EN 55024: 1998+A1: 2001+A2: 2003**	
Basic Standard, Specification, and Performance Criteria:	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 line: 1kV, DC Power line: 0.5kV Signal line: 0.5kV Performance Criterion B
	IEC 61000-4-5	Surge Immunity Test: 1.2/50 us Open Circuit Voltage, 8 /20 us Short Circuit Current AC Power Line: line to line 1 kV, line to earth 2kV DC Power Line: line to earth 0.5kV Signal line: 1kV Performance Criterion B
	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 Test, 50 Hz, 1A/m, Performance Criterion A
	IEC 61000-4-11	Voltage Dips: i) >95% reduction -0.5 period, Performance Criterion B ii) 30% reduction – 25 period, Performance Criterion C Voltage Interruptions: i) >95% reduction – 250 period, Performance Criterion C

5.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION

According to Clause 7.1 of EN 55024: 1998+A1: 2001+A2: 2003 standard, the following describes the general performance criteria:

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

5.3 EUT OPERATING CONDITION

Same as item 4.4.6.

5.4 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

5.4.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge : 2 kV/ 4 kV /8 kV (Direct)
	Contact Discharge : 2 kV/ 4 kV (Direct / Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point
	Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

5.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
KeyTek, ESD Simulator	MZ-15/EC	0401299	May. 03, 2010	May. 02, 2011

NOTE: 1. The test was performed in ESD Room No. 2.

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

5.4.3 TEST PROCEDURE

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. 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. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. 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.

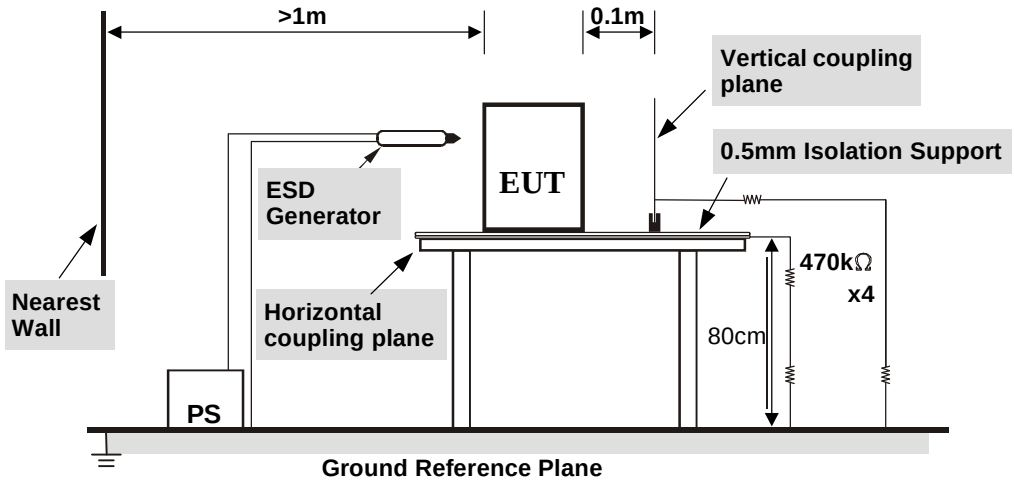
g. At least ten single discharges (in the most sensitive polarity) were applied to the **H**orizontal **C**oupling **P**lane at points on each side of the EUT. The ESD generator was positioned horizontally at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP.**

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **V**ertical **C**oupling **P**lane 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.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 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 **G**round **R**eference **P**lane. 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 **H**orizontal **C**oupling **P**lane (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ 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.

5.4.6 TEST RESULTS

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 48% RH, 1019hPa	TESTED BY: Evan Chang	

TEST RESULTS OF DIRECT APPLICATION					
Discharge Level (kV)	Polarity	Test Point	Contact Discharge	Air Discharge	Performance Criterion
2, 4	+/-	3, 6	Note(2)	N/A	B
2, 4, 8	+/-	1, 2, 4, 5	N/A	Note(2)	B

Description of test point: Please refer to ESD test photo for representative marks only.

TEST RESULTS OF INDIRECT APPLICATION					
Discharge Level (kV)	Polarity	Test Point	Horizontal Coupling Plane	Vertical Coupling Plane	Performance Criterion
2, 4	+/-	1 ~ 4	Note(1)	Note(1)	A

Description of test point:

1. Left side
2. Right side
3. Front side
4. Rear side

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

(2) The EUT reset during the test.

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

5.5.1 TEST SPECIFICATION

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

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Signal Generator	SML03	101801	Dec. 23, 2010	Dec. 22, 2011
AR RF Amplifier	60S1G3	304334	NA	NA
BOONTON RF Meter	4232A	94901	Jun. 28, 2010	Jun. 27, 2011
BOONTON Power Sensor	51011-EMC	32832	Jun. 28, 2010	Jun. 27, 2011
BOONTON Power Sensor	51011-EMC	32807	Jun. 28, 2010	Jun. 27, 2011
Radisense Electric Field Sensor	CTR1001A RadiSense 6	06D00232SNO-02 06D00232SNO39	Jan. 11, 2011	Jan. 10,2012
FRANKONIA Power Amplifier	FLH-200B	1071	NA	NA
Dell Antenna	NA	NA	NA	NA
AR Log-Periodic Antenna	AT5080	312115	NA	NA
HP-IB Extender	37204	3212U26684	NA	NA
ADVANTEST Spectrum Analyzer	R3261C	81720152	NA	NA
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	RS-001	Oct. 02, 2010	Oct. 01, 2011
Software	ADT_RS_V7.6	NA	NA	NA

NOTE: 1. The test was performed in RS Room No.1.

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

3.The transmit antenna was located at a distance of 3 meters from the EUT.

5.5.3 TEST PROCEDURE

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

a. The testing was performed in a fully-anechoic chamber.

b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave.

c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0,5s.

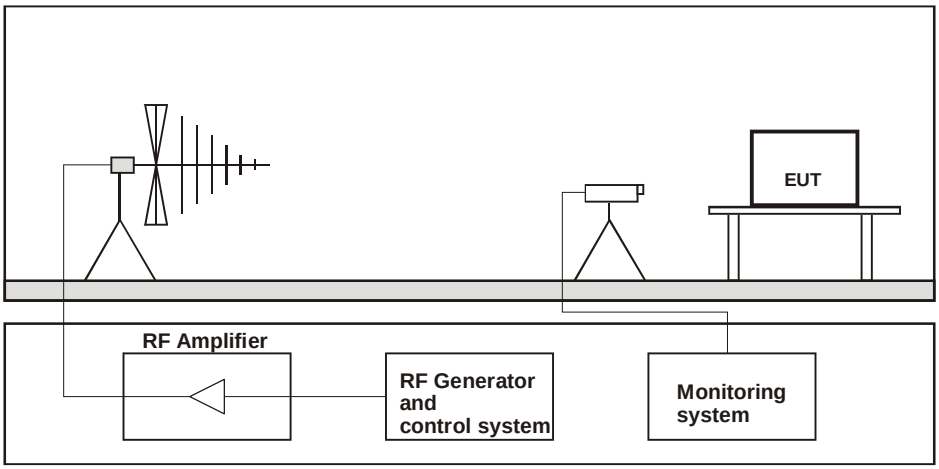
d. The field strength level was 3V/m.

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

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 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.

5.5.6 TEST RESULTS

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 56% RH	**TESTED BY:** Evan Chang	

Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Obser-vation	Performance Criterion
80 - 1000	V&H	0	3	Note	A
80 - 1000	V&H	90	3		
80 - 1000	V&H	180	3		
80 - 1000	V&H	270	3		

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

5.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

5.6.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-4
Test Voltage:	Power Line : 1kV Signal/Control Line : 0.5kV (Coaxial cable, Cat.5 Line)
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Waveshape:	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 min.

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Haefely, EFT Generator	PEFT 4010	154954	Apr. 30, 2010	Apr. 29, 2011
Haefely,Capacitive Clamp	IP4A	155173	NA	NA

NOTE: 1. The test was performed in EFT Room
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.6.3 TEST PROCEDURE

a. Both positive and negative polarity discharges were applied.

b. The length of the “hot wire” from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 0.5meter ± 0.05meter.

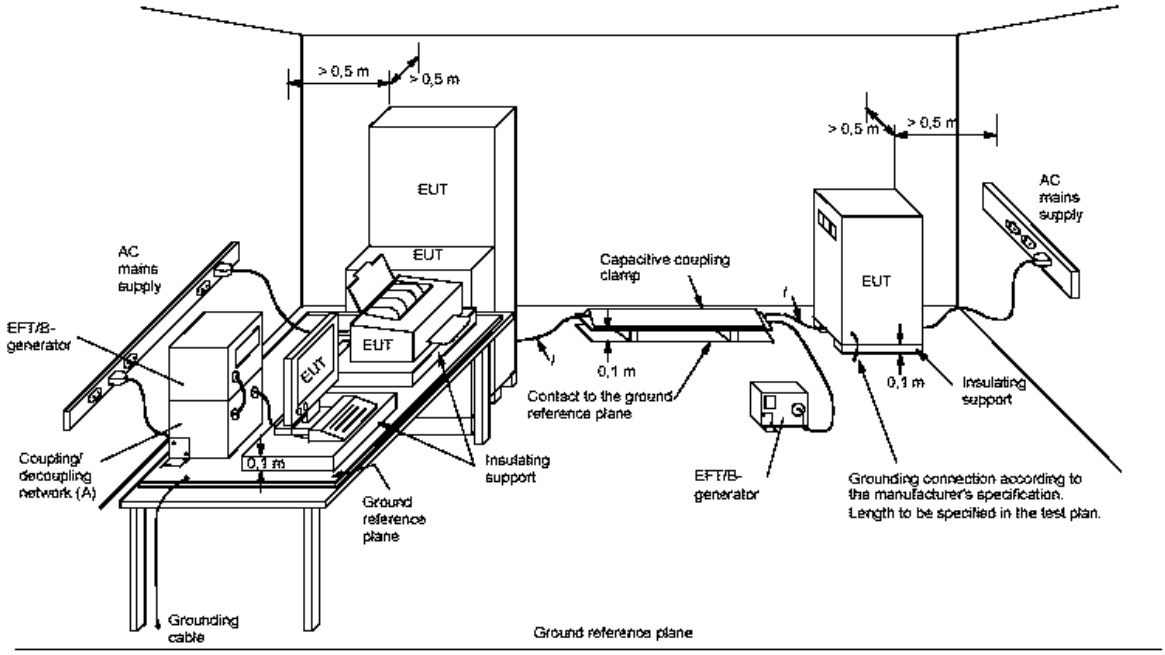
c. The duration time of each test sequential was 1 minute.

d. The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation.

5.6.5 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 standing on the Ground Reference Plane and should be located 0.1m +/- 0.01m above 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.

5.6.6 TEST RESULTS

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	18deg. C, 73% RH	**TESTED BY:** Evan Chang	

TEST POINT	POLARITY	TEST LEVEL (KV)	OBSERVATION	PERFORMANCE CRITERION
L1	+/-	1	Note	A
L2	+/-	1	Note	A
L1-L2	+/-	1	Note	A
Coaxial cable x 2	+/-	0.5	Note	A
Cat. 5 Line	+/-	0.5	Note	A

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

5.7 SURGE IMMUNITY TEST

5.7.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-5
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line : 0.5, 1 kV Signal Line : 0.5, 1 kV
Surge Input/Output:	L1-L2, LAN (L-PE), DIDO (CH1),RCA (Audio 1), BNC (Video 1), Audio Out (CH 1)
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 / 60 sec.
Number of Tests:	5 positive and 5 negative at selected points

5.7.2 TEST INSTRUMENTS

(For Power Line Test)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
KeyTek, Surge Coupler/Decoupler	E-Class Series 100	9508347	Jun. 29, 2010	Jun. 28, 2011
Coupling Decoupling Network	CDN-UTP8	028	Jul. 05, 2010	Jul. 04, 2011
KeyTek I/O Signal Line Coupler/Decoupler	CM-I/OCD	9907177	NA	NA
Surge Cable	WE-4	SU1Cab-001	NA	NA
Surge Adapter WONPRO	WA-9	SU1ADA-002	NA	NA
Software	E500	NA	NA	NA

NOTE: 1. The test was performed in Surge Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

(For Signal Line Test)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
KeyTek, Surge Coupler/Decoupler	E-Class Series 100	9508347	Jun. 30, 2011	Jun. 29, 2012
Coupling Decoupling Network	CDN-UTP8	028	Jul. 18, 2011	Jul. 17, 2012
KeyTek I/O Signal Line Coupler/Decoupler	CM-I/OCD	9907177	NA	NA
Surge Cable	WE-4	SU1Cab-001	NA	NA
Surge Adapter WONPRO	WA-9	SU1ADA-002	NA	NA
Software	E500	NA	NA	NA

NOTE: 1. The test was performed in Surge Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.7.3 TEST PROCEDURE

a. For EUT power supply:

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

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

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

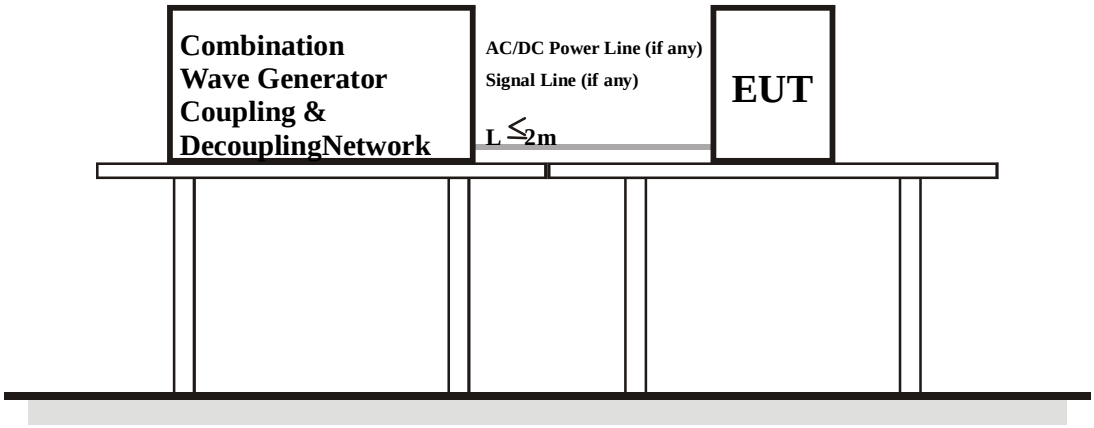
c. For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:

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

5.7.4 DEVIATION FROM TEST STANDARD

No deviation.

5.7.5 TEST SETUP



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

5.7.6 TEST RESULTS (1)

For Power Line Test

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	18deg. C, 70% RH	**TESTED BY:** Evan Chang	

VOLTAGE (kV)	TEST POINT	POLARITY	OBSERVATION	PERFORMANCE CRITERION
0.5, 1	L1-L2	+/-	Note	A

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

5.7.7 TEST RESULTS (2)

For Signal Line Test

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 67% RH	**TESTED BY:** Jiannren Hsieh	

VOLTAGE (kV)	TEST POINT	POLARITY	OBSERVATION	PERFORMANCE CRITERION
0.5, 1	LAN (L-PE)	+/-	Note	A
0.5, 1	DIDO(CH 1)	+/-	Note	A
0.5, 1	RCA (Audio 1)	+/-	Note	A
0.5, 1	BNC (Video 1)	+/-	Note	A
0.5, 1	Audio Out(CH 1)	+/-	Note	A

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

5.8 IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS (CS)

5.8.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-6
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 $V_{r.m.s.}$
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Coupled Cable:	Power Mains, Signal Cable
Coupling Device:	CDN-M2 (2 wires), CDN-T8, EM-Clamp

5.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Signal Generator	SMY01	841104/033	Nov. 23, 2010	Nov. 22, 2011
Digital Sweep Function Generator	8120	984801	NA	NA
AR Power Amplifier	75A250AM1	312196	NA	NA
FCC Coupling Decoupling Network	FCC-801-M3-25A	48	Jul. 15, 2010	Jul. 14, 2011
FCC Coupling Decoupling Network	FCC-801-M3-25A	01022	Mar. 04, 2010	Mar. 03, 2011
FCC Coupling Decoupling Network	FCC-801-M2-16A	01047	Jul. 15, 2010	Jul. 14, 2011
FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp	FCC-203I	50	NA	NA
FISCHER CUSTOM COMMUNICATIONS Current Injection Clamp	F-120-9A	361	NA	NA
EM TEST Coupling Decoupling Network	CDN M1/32A	306508	Mar. 04, 2010	Mar. 03, 2011
FCC Coupling Decoupling Network	FCC-801-T8	02038	Mar. 04, 2010	Mar. 03, 2011
FCC Coupling Decoupling Network	FCC-801-T4	02031	Mar. 04, 2010	Mar. 03, 2011
FCC Coupling Decoupling Network	FCC-801-T2	02021	Mar. 04, 2010	Mar. 03, 2011
R&S Power Sensor	NRV-Z5	837878/038	Nov. 01, 2010	Oct. 31, 2011
R&S Power Sensor	NRV-Z5	837878/039	Nov. 01, 2010	Oct. 31, 2011
R&S Power Meter	NRVD	837794/040	Nov. 01, 2010	Oct. 31, 2011
Software	ADT_CS_V7.4.2	NA	NA	NA

NOTE: 1. The test was performed in CS Room No. 1.

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

5.8.3 TEST PROCEDURE

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

b. An artificial hand was placed on the hand-held accessory and connected to the ground reference plane.

c. 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.

d. The frequency range is 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 is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value.

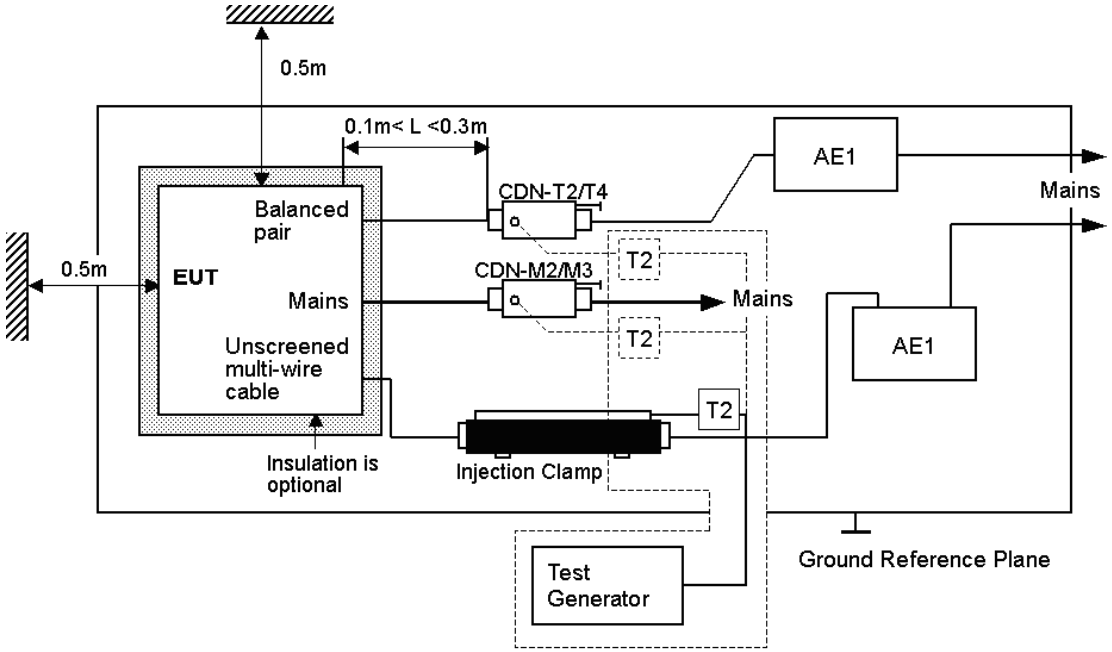
e. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0,5 s. The sensitive frequencies (e.g. clock frequencies) shall be analyzed separately.

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

5.8.4 DEVIATION FROM TEST STANDARD

No deviation

5.8.5 TEST SETUP



NOTE: The EUT clearance from any metallic obstacles shall be at least 0.5m.
All non-excited input ports of the CDNs shall be terminated by 50Ω loads.

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

NOTE:
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.

5.8.6 TEST RESULTS

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 70% RH	**TESTED BY:** Evan Chang	

FREQUENCY (MHz)	FIELD STRENGTH ($V_{r.m.s.}$)	CABLE	INJECTION METHOD	OBSER-VATION	PERFORMANCE CRITERION
0.15 – 80	3	AC power line	CDN-M2	Note	A
0.15 – 80	3	Cat. 5 Line	CDN-T8	Note	A
0.15 – 80	3	Coaxial cable X 2	EM-Clamp	Note	A

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

5.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

5.9.1 TEST SPECIFICATION

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

5.9.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	NA	NA
COMBINOVA Magnetic Field Meter	MFM10	224	Feb. 22, 2010	Feb. 21, 2011

NOTE: 1. The test was performed in EMS Room No. 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.9.3 TEST PROCEDURE

a. The equipment is configured and connected to satisfy its functional requirements.

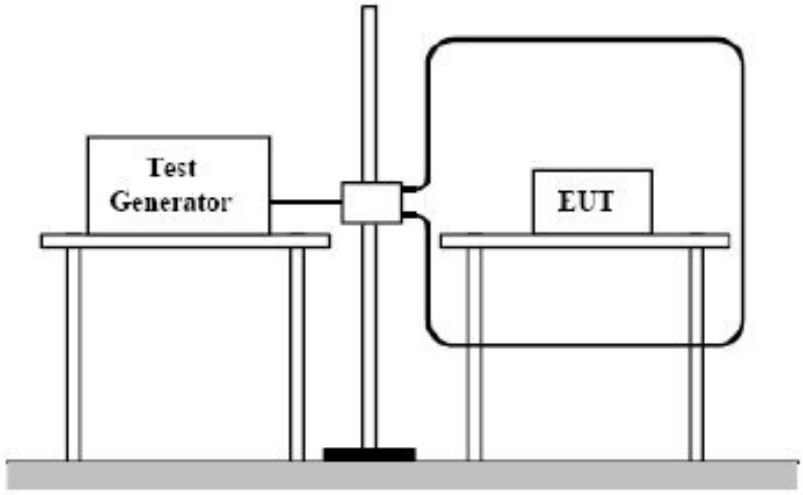
b. The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.

c. 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.

5.9.4 DEVIATION FROM TEST STANDARD

No deviation

5.9.5 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.

5.9.6 TEST RESULTS

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	18deg. C, 73% RH	**TESTED BY:** Evan Chang	

DIRECTION	Field Strength (A/m)	OBSERVATION	PERFORMANCE CRITERION
X - Axis	1	Note	A
Y - Axis	1	Note	A
Z - Axis	1	Note	A

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

5.10 VOLTAGE DIP/SHORT INTERRUPTIONS/VOLTAGE VARIATIONS (DIP) IMMUNITY TEST

5.10.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-11
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/180°
Test Cycle:	3 times

5.10.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HAEFELY Mains Interference Simulator	PLINE1610	083690-17	Jun 01, 2010	May 31, 2011

NOTE: 1. The test was performed in EMS Room No. 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

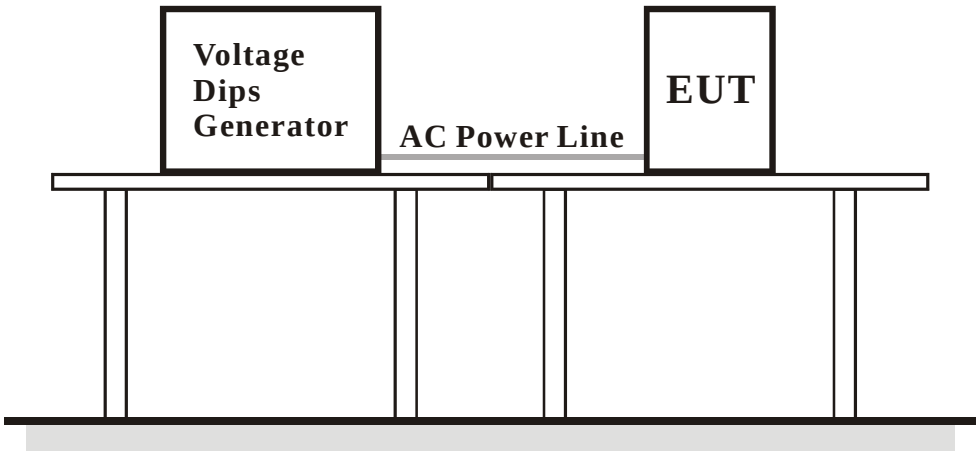
5.10.3 TEST PROCEDURE

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

5.10.4 DEVIATION FROM TEST STANDARD

No deviation.

5.10.5 TEST SETUP



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

5.10.6 TEST RESULTS

TEST MODE	SD card mode	INPUT POWER	230Vac, 50 Hz/ 100Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	18deg. C, 73% RH	**TESTED BY:** Evan Chang	

Input Power for testing: 230Vac, 50 Hz			
VOLTAGE % REDUCTION	PERIODS	OBSERVATION	PERFORMANCE CRITERION
>95	0.5	Note (1)	A
30	25	Note (1)	A
>95	250	Note (2)	B

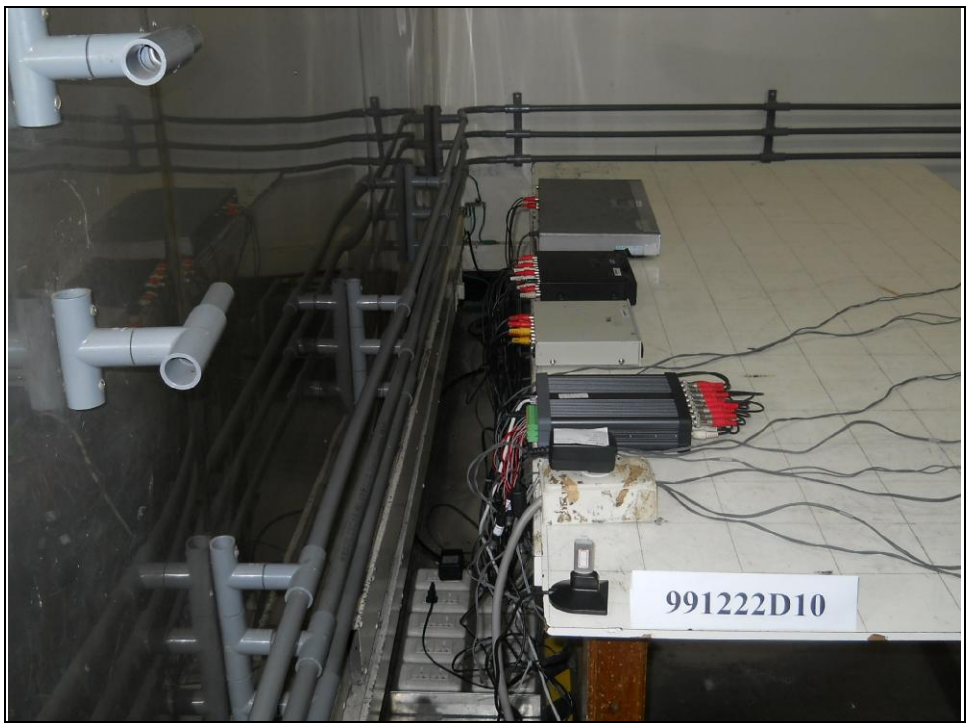
Input Power for testing: 100Vac, 50 Hz			
VOLTAGE % REDUCTION	PERIODS	OBSERVATION	PERFORMANCE CRITERION
>95	0.5	Note (1)	A
30	25	Note (1)	A
>95	250	Note (2)	B

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

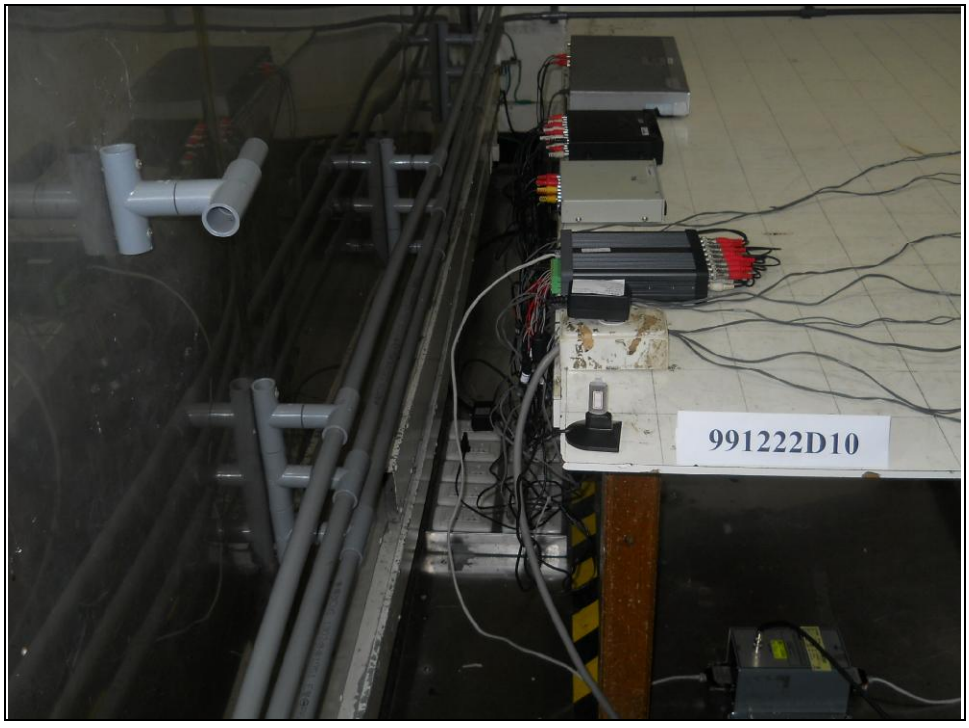
(2) The EUT reset during the test.

6 PHOTOGRAPHS OF THE TEST CONFIGURATION

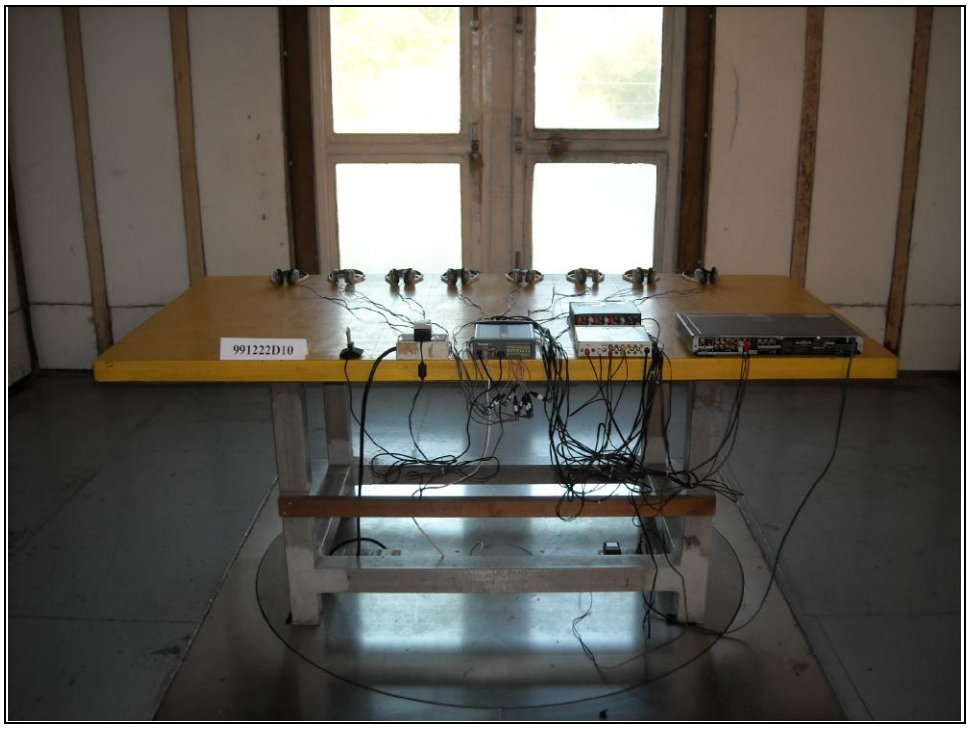
CONDUCTED EMISSION TEST



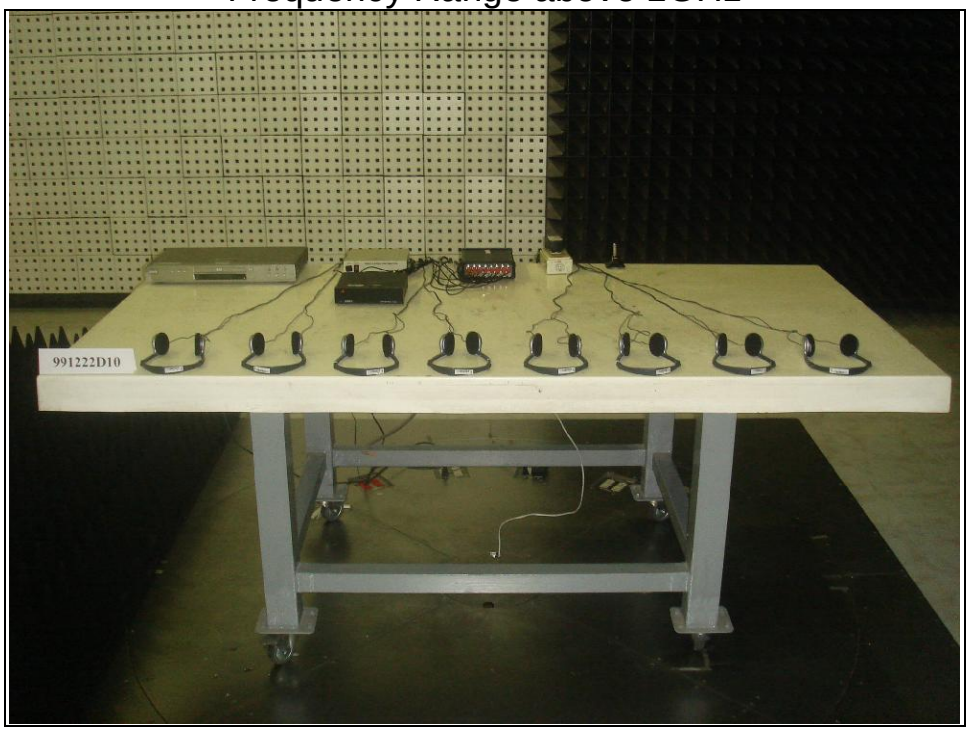
TELECOMMUNICATION PORT - RJ45
OF CONDUCTED EMISSION TEST

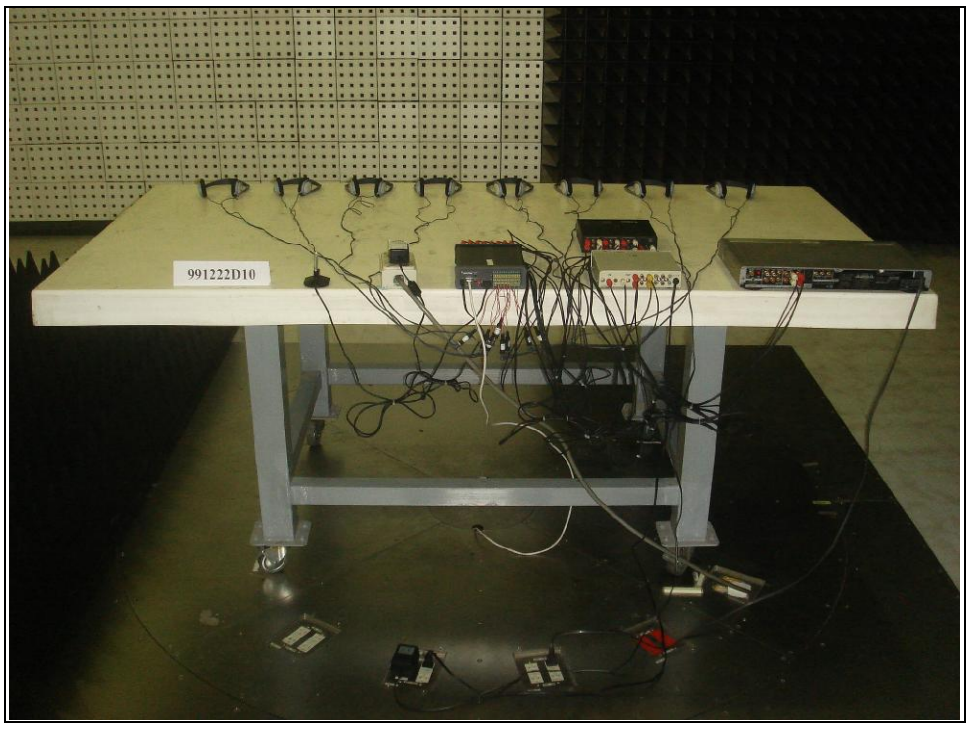


RADIATED EMISSION TEST
< Frequency Range 30MHz ~ 1GHz >

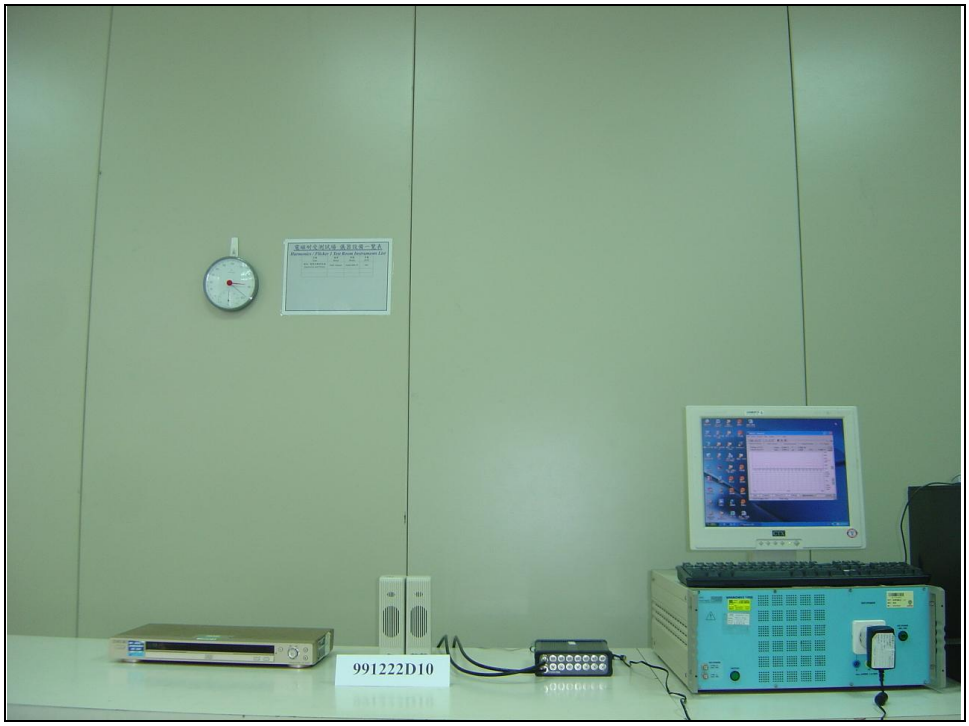


RADIATED EMISSION TEST
<Frequency Range above 1GHz>



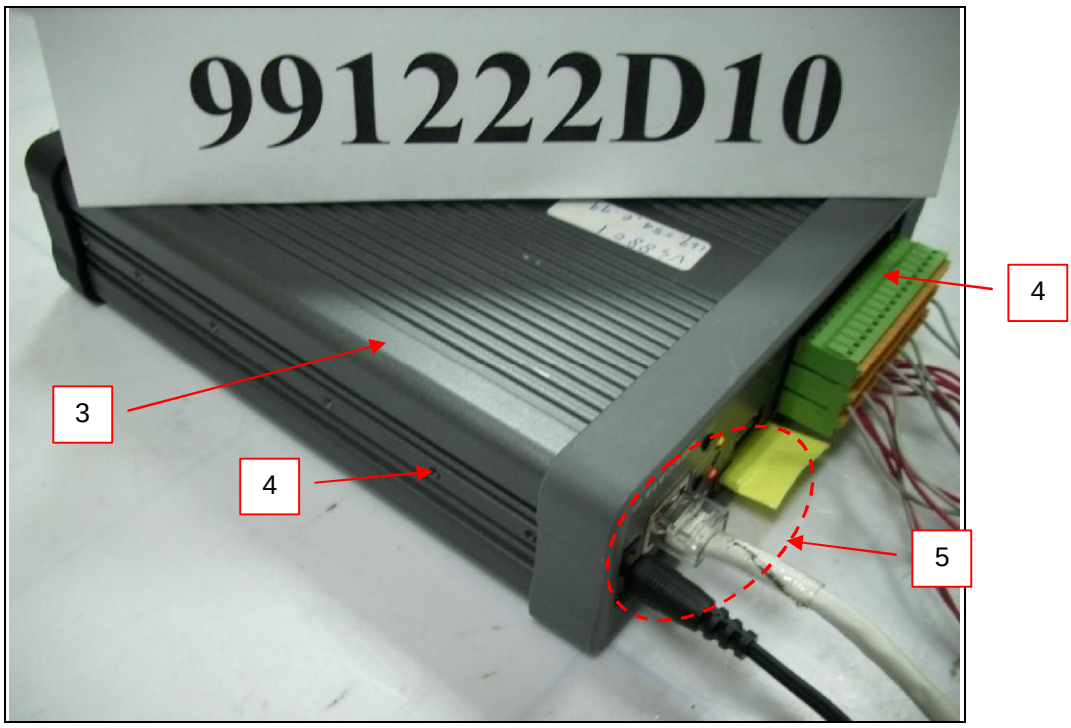


HARMONICS EMISSION TEST &
VOLTAGE FLUCTUATIONS AND FLICKER TEST

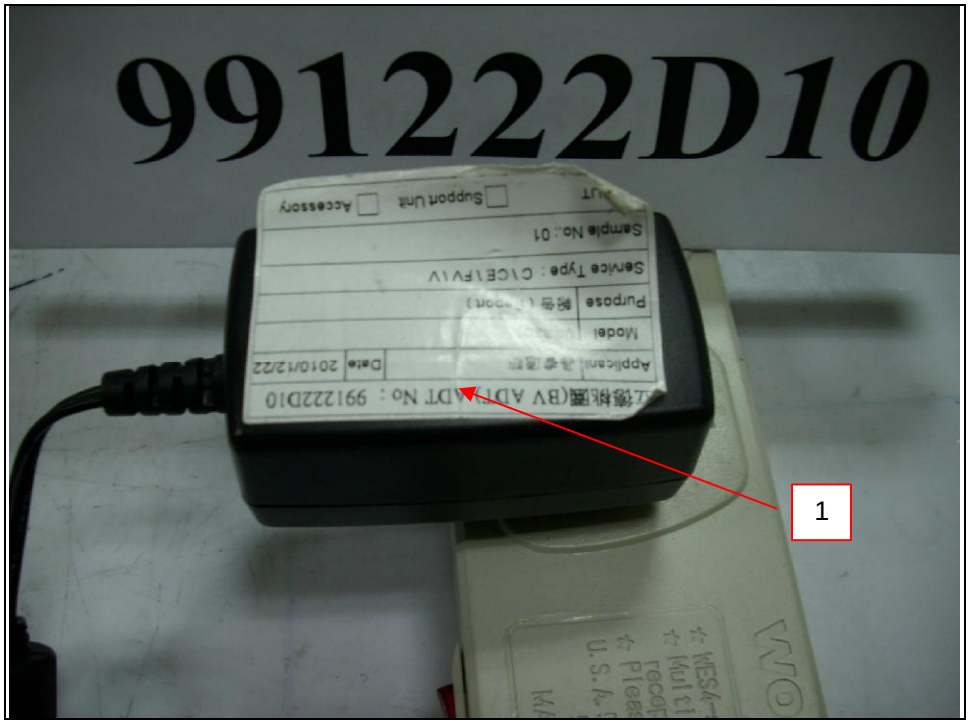


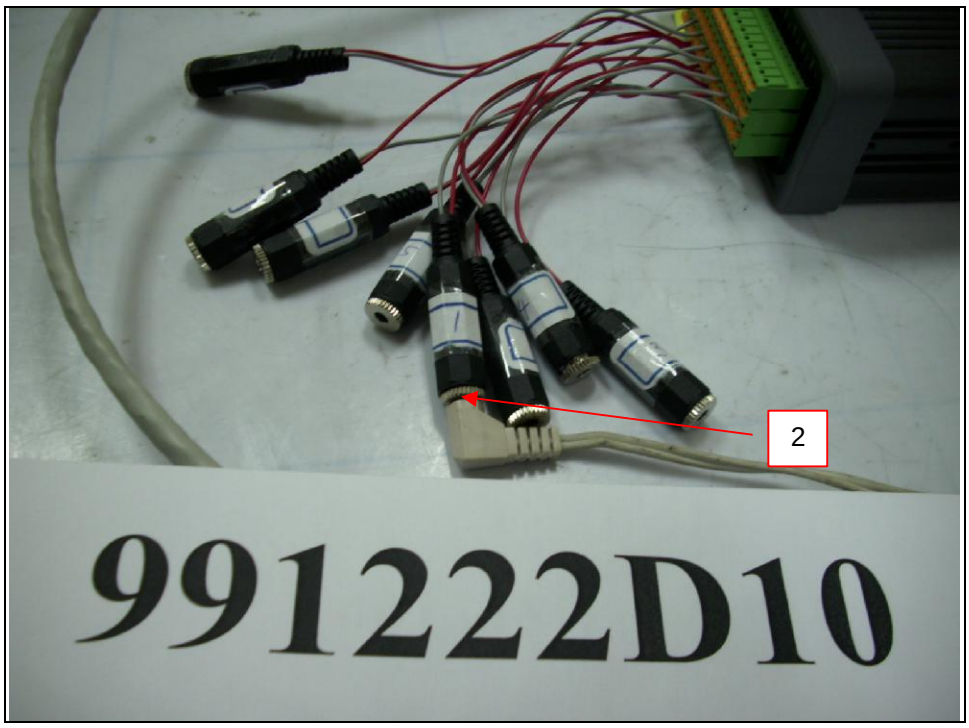
ESD TEST

ESD TEST POINT

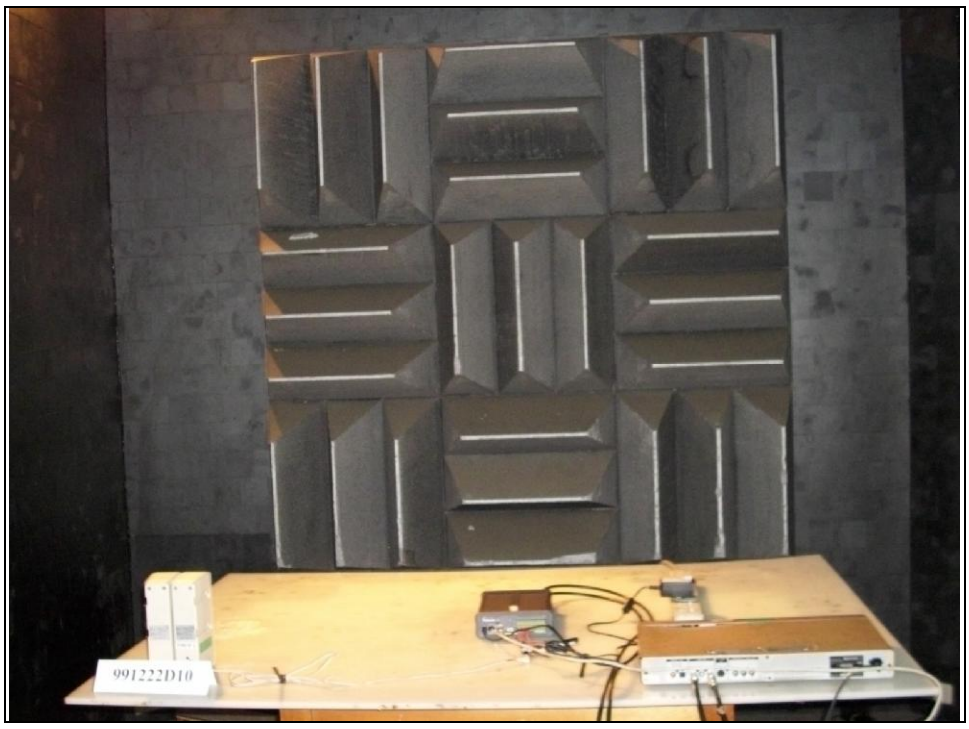


ESD TEST POINT





RS TEST



EFT TEST

EFT TEST –Cat. 5 Line

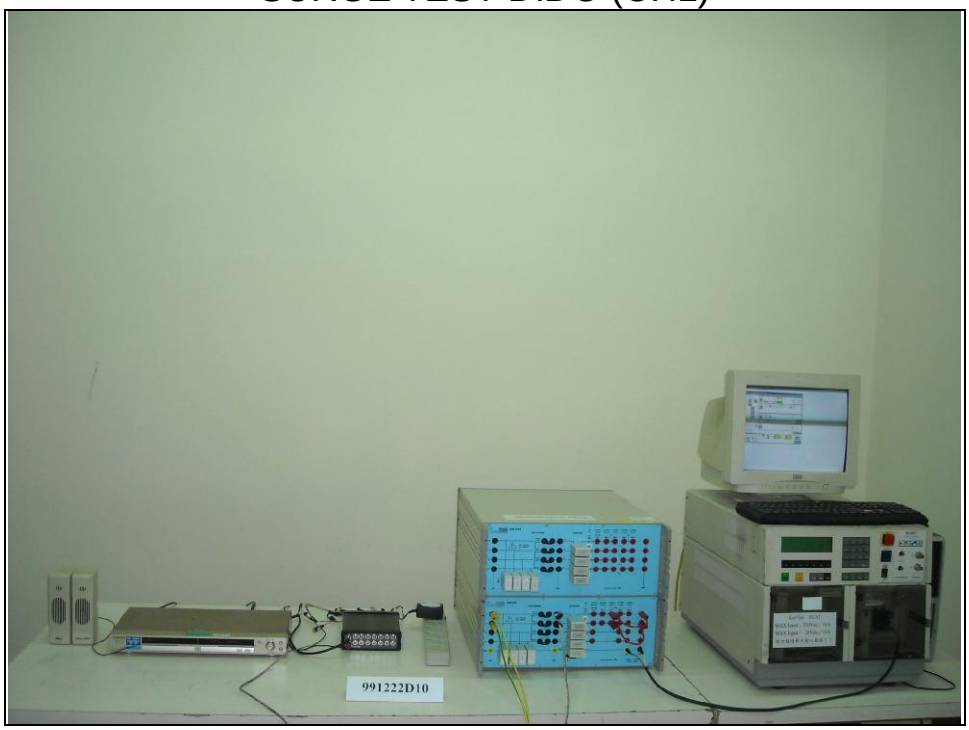
EFT TEST –Coaxial cable 1

EFT TEST –Coaxial cable 2

SURGE TEST

SURGE TEST-LAN (L-PE)

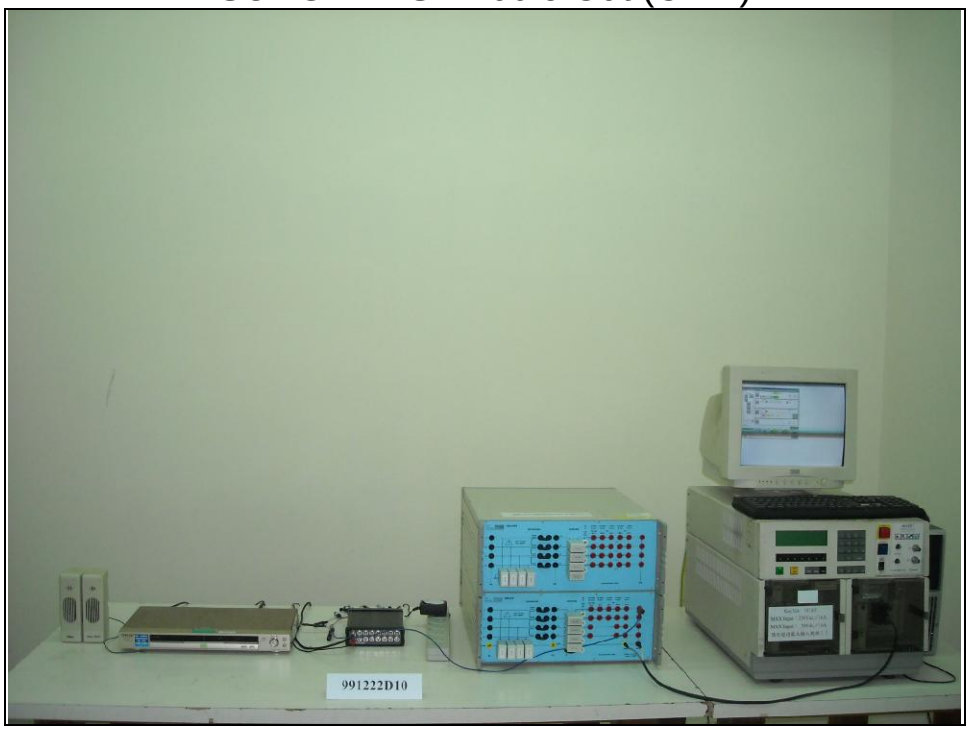
SURGE TEST-DIDO (CH1)



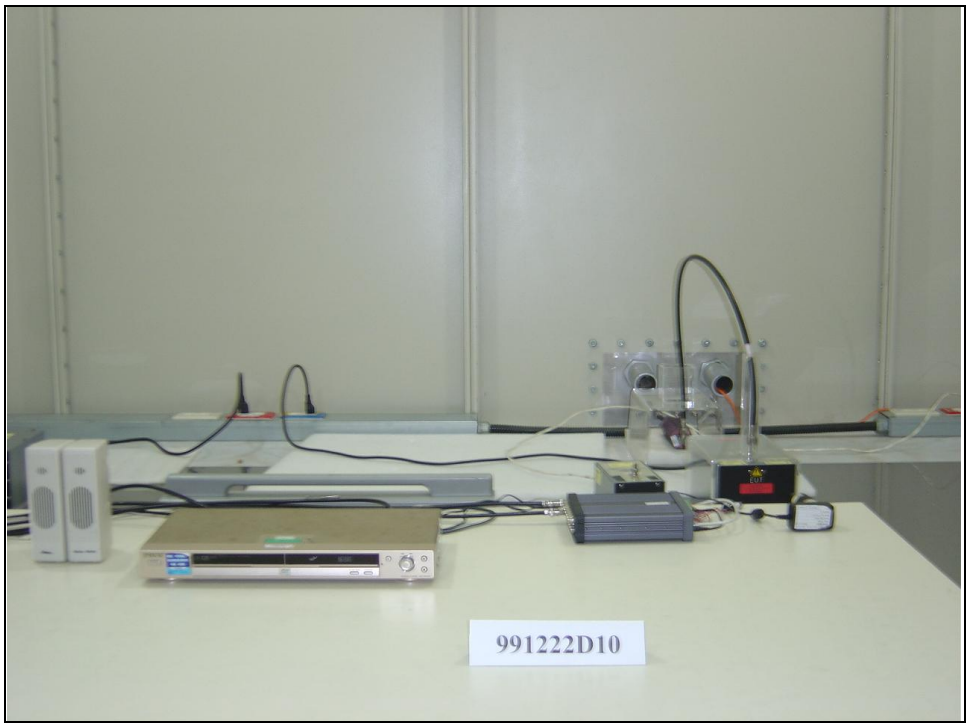
SURGE TEST-RCA (Audio 1)

SURGE TEST- BNC (Video 1)

SURGE TEST-Audio Out (CH 1)

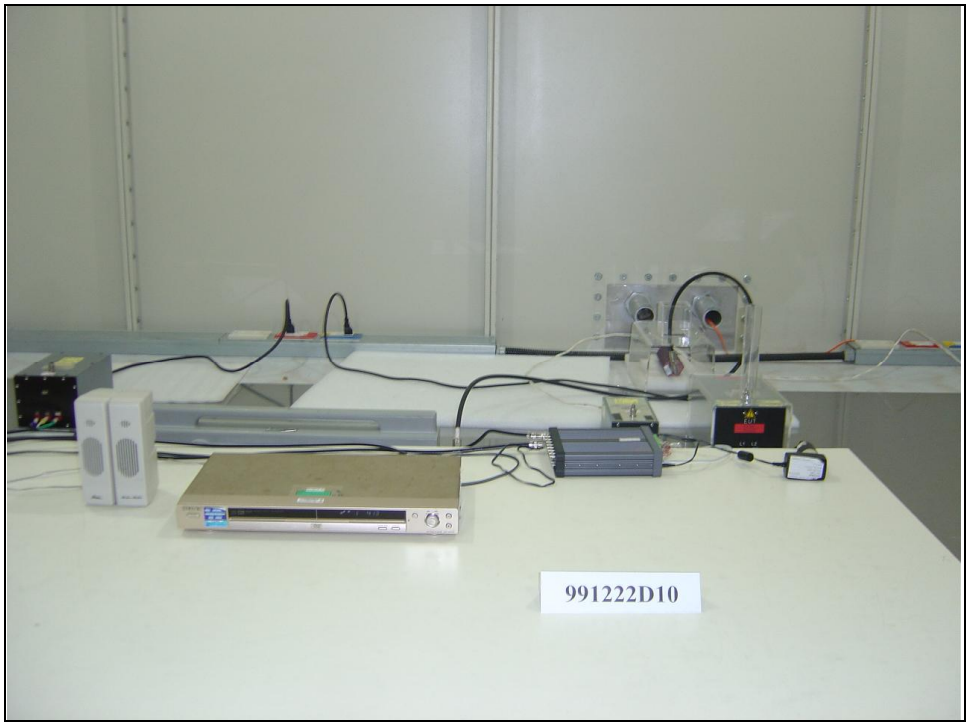


CONDUCTED SUSCEPTIBILITY TEST



CONDUCTED SUSCEPTIBILITY TEST –Cat.5 Line

CONDUCTED SUSCEPTIBILITY TEST–Coaxial cable 1



CONDUCTED SUSCEPTIBILITY TEST –Coaxial cable 2

POWER-FREQUENCY MAGNETIC FIELDS TEST

VOLTAGE DIPS AND INTERRUPTIONS TEST

7 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
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Tel: 886-3-3183232
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Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

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