

CE EMC TEST REPORT

REPORT NO. : CE980511H06

MODEL NO. : L008KU

RECEIVED : May 11, 2009

TESTED : May 11 to June 11, 2009 & Sep. 02, 2009

ISSUED : Sep. 04, 2009

APPLICANT : Coretronic Display Solution Corporation

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

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A D T

1 CERTIFICATION

PRODUCT: MEDIA PLAYER
BRAND NAME: NEC
MODEL NO.: L008KU
TESTED: May 11 to June 11, 2009 &
Sep. 02, 2009 (for above 1GHz - radiated emission test)
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Coretronic Display Solution Corporation
STANDARDS: EN 55022:2006+A1:2007, Class A EN 55024:1998+A1:2001
AS/NZS CISPR 22:2006, Class A +A2:2003
EN 61000-3-2: 2006 IEC 61000-4-2:2001 ED.1.2
(Not Applicable) IEC 61000-4-3:2006+A1:2007
EN 61000-3-3: 1995+A1:2001 ED.3.0
+A2:2005 (Not Applicable) IEC 61000-4-4: 2004 ED.2.0
IEC 61000-4-5: 2005 ED.2.0
(Not Applicable)
IEC 61000-4-6: 2006 ED.2.2
IEC 61000-4-8: 2001 ED.1.1
IEC 61000-4-11:2004 ED.2.0
(Not Applicable)

The above equipment (Model: L008KU) 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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A D T

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 : Sunny Wen, **DATE:** Sep. 04, 2009
(Sunny Wen, Specialist)

TECHNICAL ACCEPTANCE : Mike Hsieh, **DATE:** Sep. 04, 2009
Responsible for EMI (Mike Hsieh, Supervisor)

TECHNICAL ACCEPTANCE : Ray Yeh, **DATE:** Sep. 04, 2009
Responsible for EMS (Ray Yeh, Supervisor)

APPROVED BY : May Chen, **DATE:** Sep. 04, 2009
(May Chen, Deputy Manager)

Revision Note:

Revision No.	Revised Date	Revised Pages	Comment
Rev.1.0	Sep. 04, 2009	6, 7, 26 ~ 28, 31, 32	Add test data of above 1GHz - radiated emission test.

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 -34.49 dB at 0.154 MHz
	Telecom port conducted emission test	PASS	Meets Class A Limit Minimum passing margin is -28.07 dB at 18.243 MHz
	Radiated Test	PASS	Meets Class A Limit Minimum passing margin is -6.00 dB at 1485.00 MHz
EN61000-3-2: 2006	Harmonic current emissions	NA	Not Applicable
EN61000-3-3: 1995 +A1:2001+A2:2005	Voltage fluctuations & flicker	NA	Not Applicable

IMMUNITY (EN 55024:1998+A1:2001+A2:2003)			
Standard	Test Type	Result	Remarks
IEC 61000-4-2: 2001 ED.1.2	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B
IEC 61000-4-3: 2006 ED.3.0	Radiated, radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-4: 2004 ED.2.0	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	NA	Not Applicable
IEC 61000-4-6: 2006 ED.2.2	Immunity to conducted disturbances, induced by radio-frequency fields	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-8: 2001 ED. 1.1	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	NA	Not Applicable

Rev.1.0 dated Sep. 04, 2009

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	Value
Conducted emissions	2.45 dB
Telecom port conducted emission test (T8-02)	3.694 dB
Radiated emissions (30MHz-1GHz)	3.98 dB
Radiated emissions (1GHz -18GHz)	2.44 dB

Rev.1.0 dated Sep. 04, 2009

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	MEDIA PLAYER
MODEL NO.	L008KU
POWER SUPPLY	DC 16V from host equipment
POWER CORD	NA
DATA CABLE SUPPLIED	S-Video cable (unshielded, 0.2m) USB cable (shielded, 1.0m)
I/O PORT	DVI port x 1 USB port x 1 LAN port x 1 S-Video port x 1 IR port x 1 Audio in port x 1
ASSOCIATED DEVICES	Remote controller (SMK High-Tech Taiwan Trading Co., Ltd. / RU-M111)

NOTE:

1. The EUT was pre-tested under the following modes:

Radiated test	
Pre-test Mode	Description
Mode A	1920 x 1080 / 60 Hz with Digital + LAN : 100Mbps
Mode B	1360 x 768 / 60 Hz with Digital + LAN : 100Mbps
Mode C	1360 x 768 / 60 Hz with Digital + LAN : 10Mbps
Mode D	1024 x 768 / 60 Hz with Digital + LAN : 100Mbps
Telecom port conducted emission test	
Pre-test Mode	Communication speed
Mode E	LAN : 10Mbps
Mode F	LAN : 100Mbps

The worst radiated emission was found in **Mode A**. The worst telecom port conducted emission was found in **Mode F**. Therefore only the test data of the modes were recorded in this report individually.

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

3.2 GENERAL DESCRIPTION OF TEST MODE

The EUT were tested under following test mode:

Conducted test	
Test Mode	Description
Mode 1	1920 x 1080 / 60 Hz with Digital + LAN : 100Mbps
Telecom port conducted emission test	
Test Mode	Communication speed
Mode 1	LAN : 100Mbps
Radiated test	
Test Mode	Description
Mode 1	1920 x 1080 / 60 Hz with Digital + LAN : 100Mbps
Immunity test	
Test Mode	Description
Mode 1	1920 x 1080 / 60 Hz with Digital + LAN : 100Mbps

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of IT 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	EN 55024:1998+A1:2001
AS/NZS CISPR 22:2006, Class A	+A2:2003
EN 61000-3-2: 2006 (Not Applicable)	IEC 61000-4-2: 2001 ED.1.2
EN 61000-3-3: 1995+A1:2001	IEC 61000-4-3: 2006+A1:2007 ED.3.0
+ A2:2005 (Not Applicable)	IEC 61000-4-4: 2004 ED.2.0
	IEC 61000-4-5: 2005 ED.2.0
	(Not Applicable)
	IEC 61000-4-6: 2006 ED.2.2
	IEC 61000-4-8: 2001 ED.1.1
	IEC 61000-4-11: 2004 ED.2.0
	(Not Applicable)

All tests have been performed and recorded as per the above standards.

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.

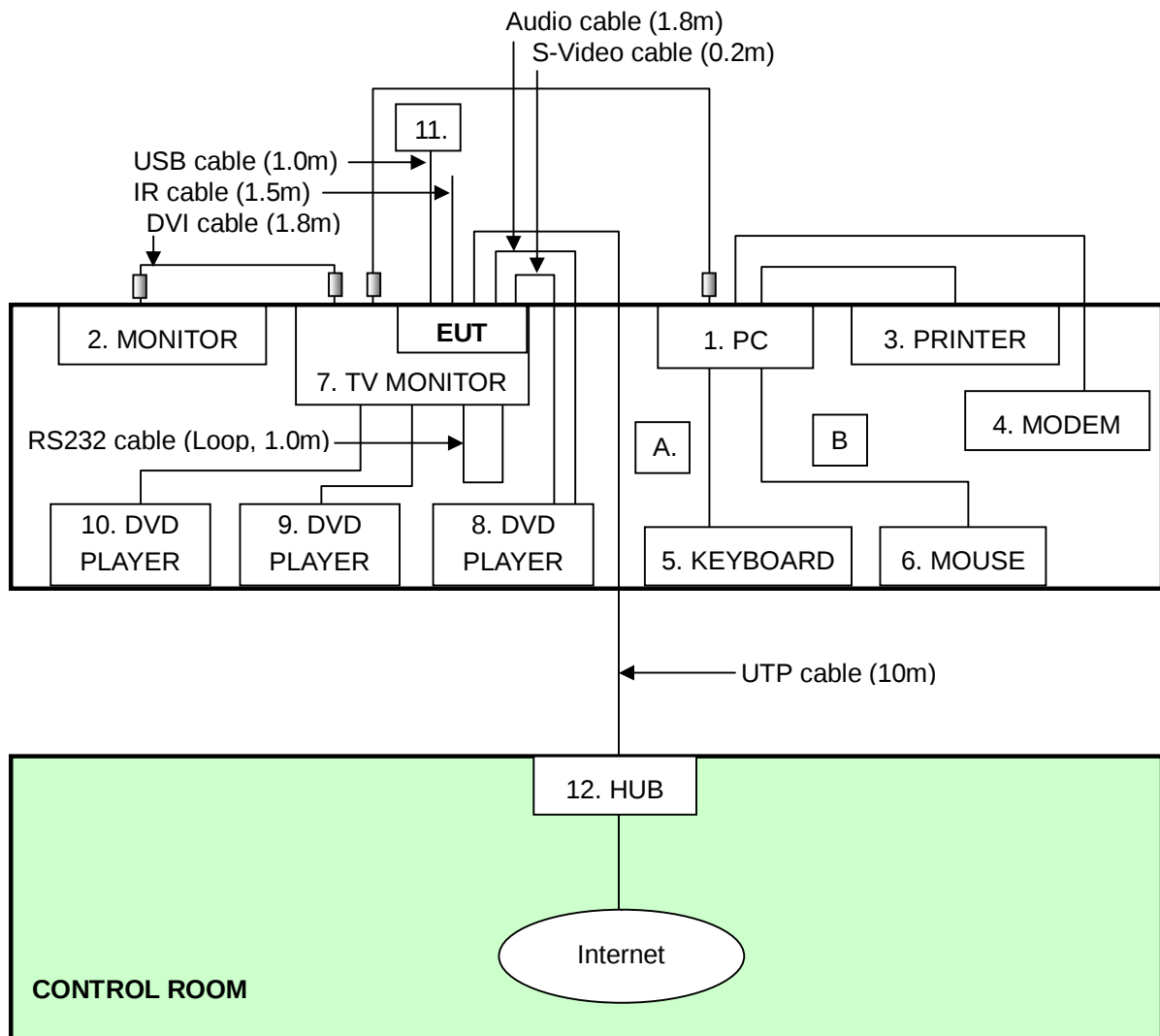
For Conducted / Telecom port conducted emission test / Radiated test					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	DELL	DCSM	394QL1S	DoC
2	MONITOR	DELL	E228WFPc	CN-OX765G-64180-86Q-OJTL-AOO	DoC
3	PRINTER	EPSON	LQ-300+	DCGY017079	DoC
4	MODEN	ACEEX	1414	0206026774	IFAXDM1414
5	KEYBOARD	DELL	SK-8115	MY-0J4635-71619-67V-0349	DoC
6	MOUSE	DELL	M056UOA	FOROOSMZ	DoC
7	TV MONITOR	NEC	NEC M40	NA	DoC
8	DVD PLAYER	SONY	DVP-NS305	1001616	NA
9	DVD PLAYER	PIONEER	DV-600AV	GIKD005965LS	DoC
10	DVD PLAYER	PIONEER	DV-600AV	GIKD005519LS	DoC
11	USB Flash Drive	SanDisk	SDCZ2-512-A10	5597844849	DoC
12	HUB	PCI	FX-05EA	NA	NA
For Immunity test					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTERBOOK COMPUTER	DELL	PP18L	4799903248	DoC
2	MONITOR	DELL	2001FP	CN-0C0647-46633-58R-2W4L	DoC
3	TV MONITOR	NEC	NEC M40	NA	DoC
4	USB Flash Drive	SanDisk	SDCZ2-512-A10	5485439362	DoC
5	DVD PLAYER	PIONEER	DV-600AV	GIKD005965LS	DoC

For Conducted / Telecom port conducted emission test / Radiated test	
No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, VGA connector, with two cores.
3	1.9 m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.8 m foil shielded wire, USB Connector, w/o core.
6	1.8 m foil shielded wire, USB Connector, w/o core.
7	1.8 m braid shielded wire, VGA connector, with two cores.
8	NA
9	NA
10	NA
11	1.0 m foil shielded wire, USB Connector, w/o core.
12	NA
For Immunity test	
No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, DVI connector, with two cores.
3	NA
4	1.0 m foil shielded wire, USB Connector, w/o core.
5	NA

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST

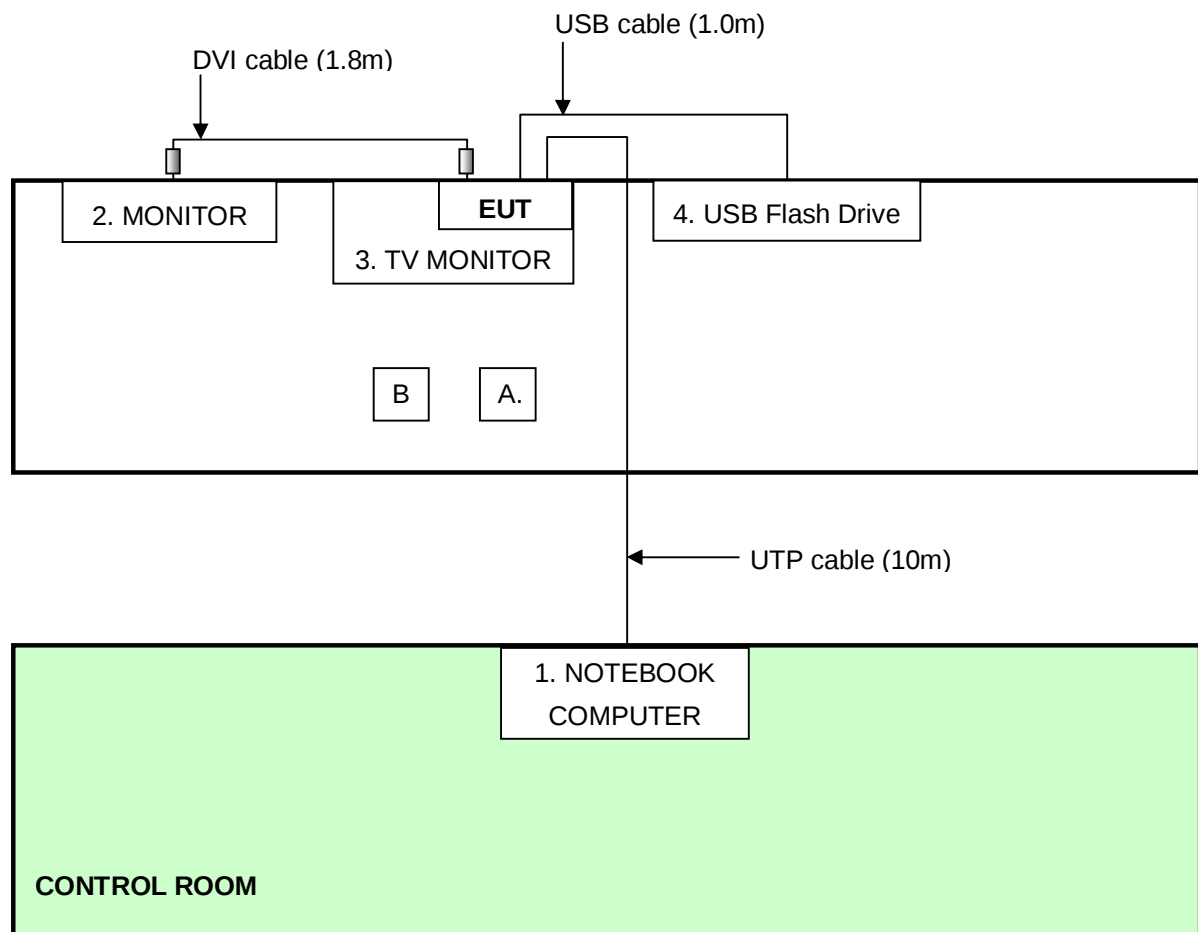
For Conducted / Telecom port conducted emission test / Radiated test



NOTE: 1. Item A is the remote controller of the EUT.

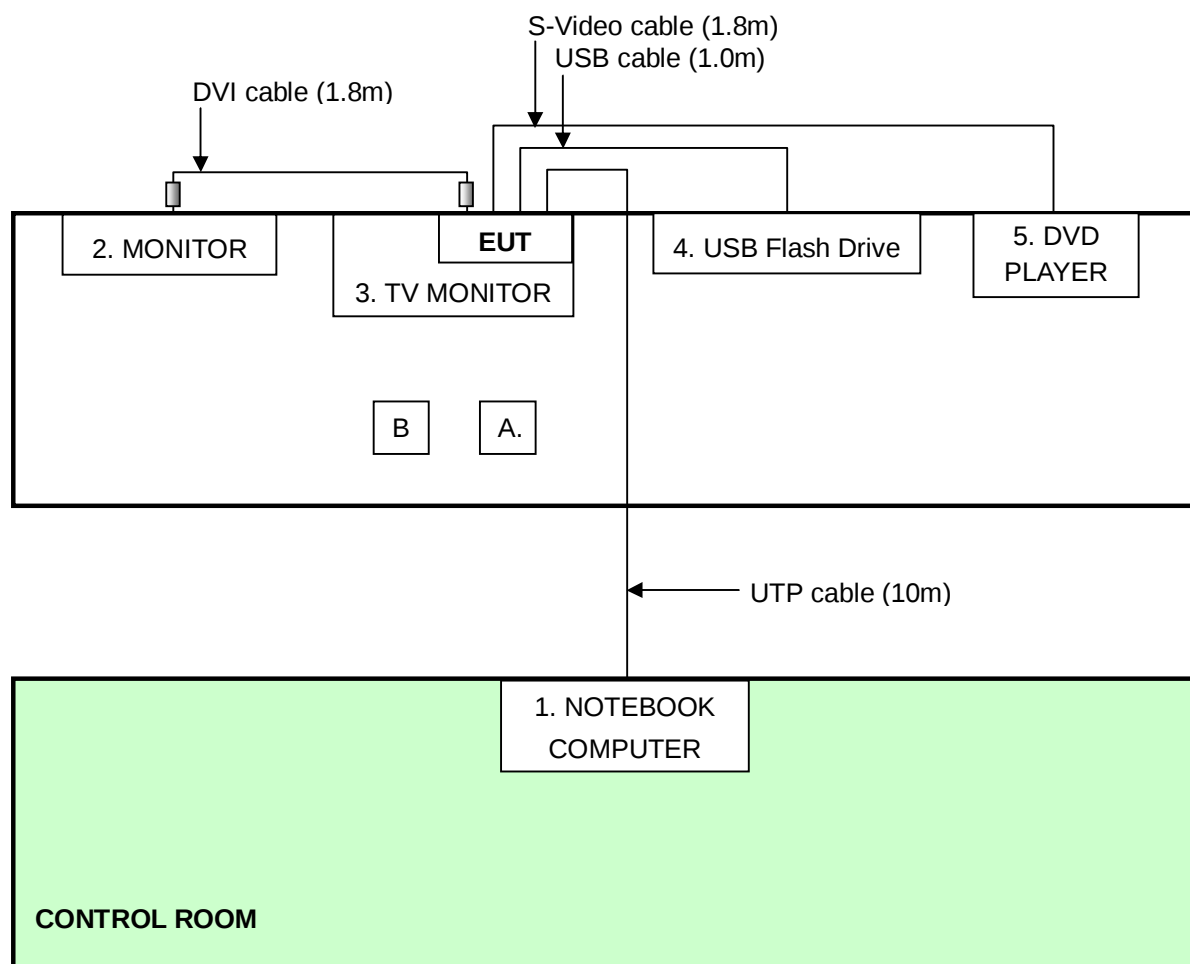
2. Item B is the remote controller of the TV Monitor.

For Immunity (except ESD, RS) test :



NOTE: 1. Item A is the remote controller of the EUT.
2. Item B is the remote controller of the TV Monitor.

For Immunity - ESD, RS test :



NOTE: 1. Item A is the remote controller of the EUT.
2. Item B is the remote controller of the TV Monitor.

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	100287	Mar. 05, 2009	Mar. 04, 2010
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 13, 2008	June 12, 2009
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec 15, 2008	Dec 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

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. A.
3. The VCCI Con A Registration No. is C-817.

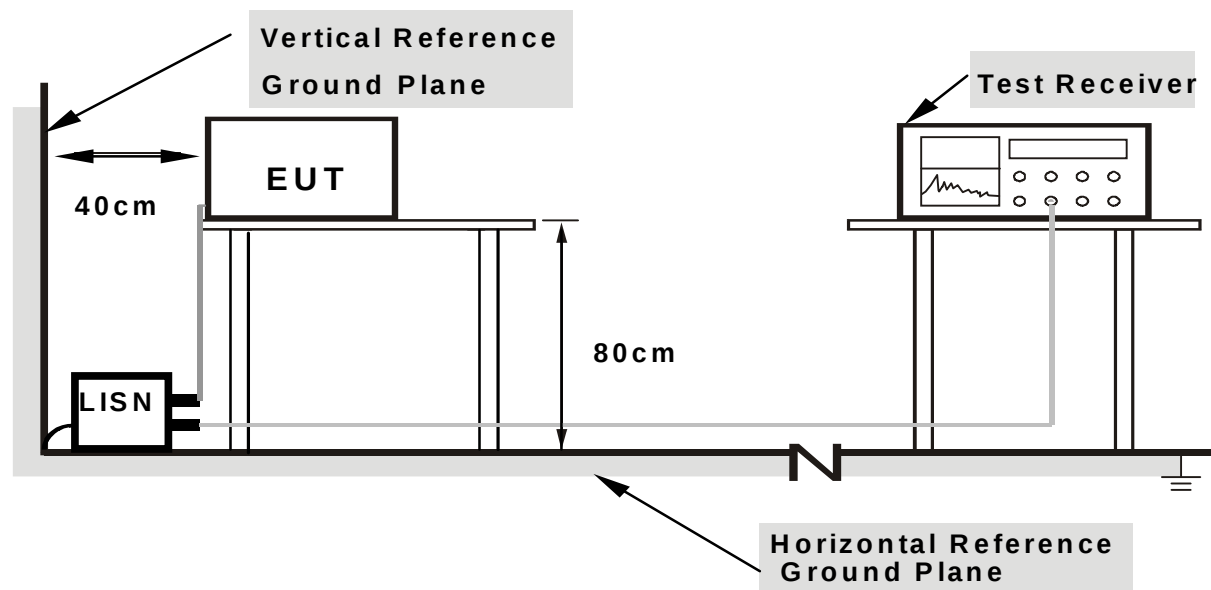
4.1.3 TEST PROCEDURE

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



- Note:**
- Support units were connected to second LISN.
 - Both of LISNs (AMN) are 80 cm from EUT and at least 80 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

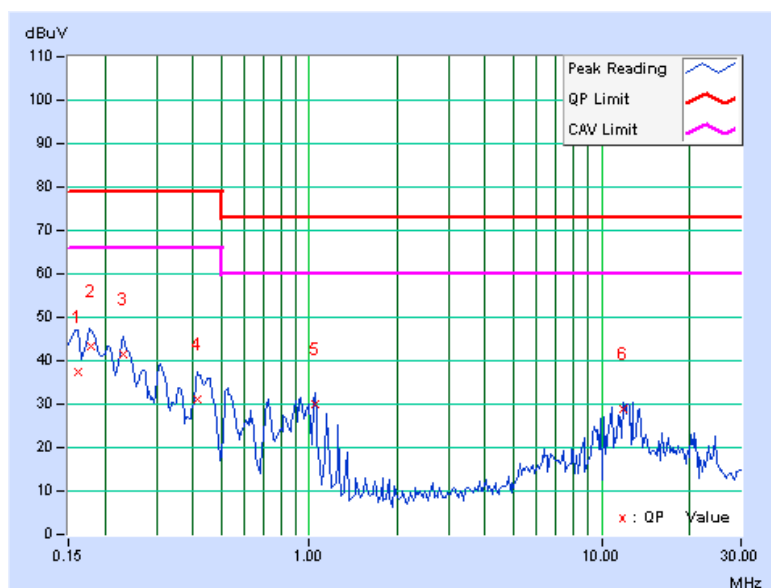
1. Turn on the power of all equipment.
2. The support unit 8 (DVD player) and support unit 11 (USB Flash Drive) sends video messages to EUT. EUT under transmission condition continuously. And support unit 2 (Monitor) and support unit 7 (TV Monitor) display on its screen.
3. The EUT communicate with Internet via support unit 12 (Hub) by Ethernet. And support unit 2 (Monitor) and support unit 7 (TV Monitor) display messages on its screen.
4. Repeat steps 2-3.

4.1.7 TEST RESULTS

TEST MODE	Mode 1	PHASE	Line (L)
INPUT POWER (SYSTEM)	230Vac, 50 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 66 % RH, 960 hPa	TESTED BY	Andy Ho

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.59	36.82	-	37.41	-	79.00	66.00	-41.59	-
2	0.179	0.55	42.90	-	43.45	-	79.00	66.00	-35.55	-
3	0.232	0.49	40.83	-	41.32	-	79.00	66.00	-37.68	-
4	0.416	0.41	30.73	-	31.14	-	79.00	66.00	-47.86	-
5	1.047	0.39	29.56	-	29.95	-	73.00	60.00	-43.05	-
6	11.895	0.56	28.39	-	28.95	-	73.00	60.00	-44.05	-

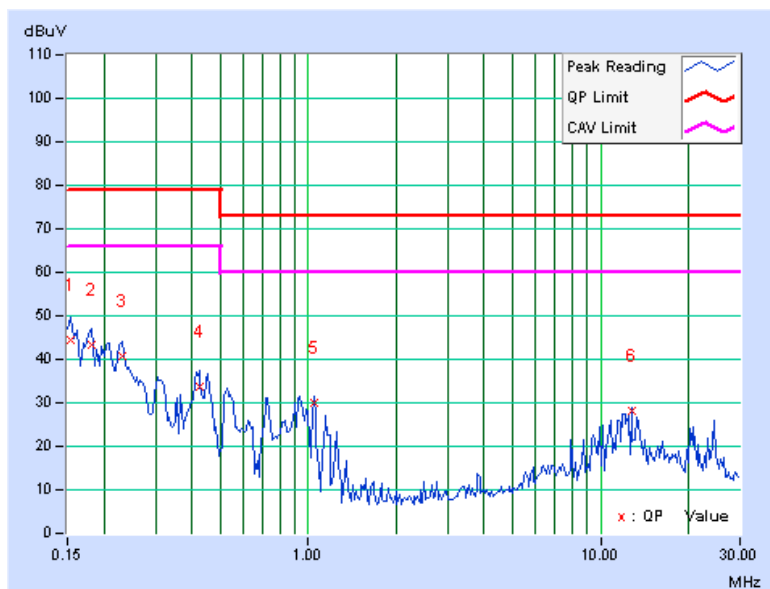
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



TEST MODE	Mode 1	PHASE	Neutral (N)
INPUT POWER (SYSTEM)	230Vac, 50 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 66 % RH, 960 hPa	TESTED BY	Andy Ho

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.36	44.15	-	44.51	-	79.00	66.00	-34.49	-
2	0.181	0.30	43.02	-	43.32	-	79.00	66.00	-35.68	-
3	0.232	0.25	40.43	-	40.68	-	79.00	66.00	-38.32	-
4	0.423	0.18	33.41	-	33.59	-	79.00	66.00	-45.41	-
5	1.047	0.15	29.70	-	29.85	-	73.00	60.00	-43.15	-
6	12.810	0.38	27.78	-	28.16	-	73.00	60.00	-44.84	-

- 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

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	100287	Mar. 05, 2009	Mar. 04, 2010
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 13, 2008	June 12, 2009
FCC ISN (FCC-TLISN-T4-02)	FCC-TLISN-T4-02	20172	Oct. 07, 2008	Oct. 06, 2009
FCC ISN (FCC-TLISN-T2-02)	FCC-TLISN-T2-02	20171	Oct. 07, 2008	Oct. 06, 2009
FCC ISN (FCC-TLISN-T8-02)	FCC-TLISN-T8-02	20173	Oct. 07, 2008	Oct. 06, 2009
FCC ISN (FCC-TLISN-S8-RJ45)	FCC-TLISN-S8-RJ45	20610	July. 15, 2008	July. 14, 2009
FCC ISN (FCC-TLISN-C1-BNC-50)	FCC-TLISN-C1-BNC-50	20609	July. 15, 2008	July. 14, 2009
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec.15, 2008	Dec. 14, 2009
CURRENT PROBE	SMZ 11	18001	Aug. 19, 2008	Aug. 18, 2009
Capacitive Voltage Probe	CVP 2200	18312	Aug. 19, 2008	Aug. 18, 2009
RF Current Probe	F-35	455	July 23, 2008	July 22, 2009
RF- ABSORBING CLAMP	KEMA 801	16617	NA	NA

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. A.
3. The VCCI Con A Registration No. is C-817.

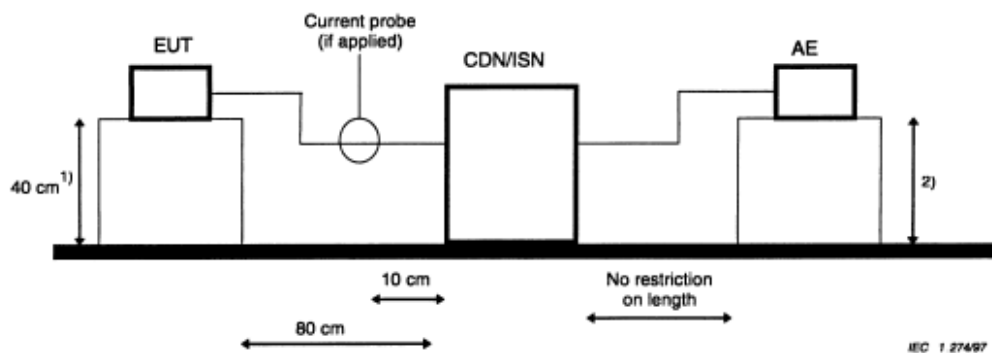
4.2.3 TEST PROCEDURE

- 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.
- The measurement at telecommunication ports of EN 55022, clause 9.6.3, was apply.
- 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



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.

NOTE:

1. The methods of conformance testing were selected according to the EN 55022, section: 9.6.1 of measurement method using an ISN with a longitudinal conversion loss (LCL) as defined in rule.
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

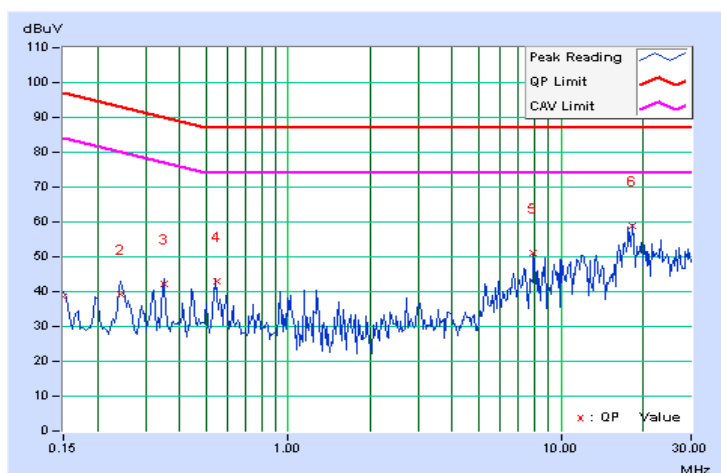
Same as 4.1.6

4.2.7 TEST RESULTS

TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50 Hz
TELECOM PORT	100Mbps	6DB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 66 % RH, 960 hPa	TESTED BY	Andy Ho

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	A.V.	Q.P.	A.V.
1	0.150	9.87	28.50	-	38.37	-	97.00	84.00	-58.63	-
2	0.244	9.86	29.51	-	39.37	-	92.97	79.97	-53.60	-
3	0.349	9.85	32.47	-	42.32	-	89.98	76.98	-47.66	-
4	0.546	9.83	33.09	-	42.92	-	87.00	74.00	-44.08	-
5	7.925	9.87	41.14	-	51.01	-	87.00	74.00	-35.99	-
6	18.243	9.90	49.03	-	58.93	-	87.00	74.00	-28.07	-

- 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)	Class B (at 10m)
	dBuV/m	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

**A D T**

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	U3751	170100022	Nov. 17, 2008	Nov. 16, 2009
ADVANTEST Spectrum Analyzer	U3772	160100280	July 26, 2009	July 25, 2010
HP Pre_Amplifier	8449B	3008A01922	Sep. 25, 2008	Sep. 24, 2009
ROHDE & SCHWARZ Test Receiver	ESCS 30	100027	May 05, 2009	May 04, 2010
SCHWARZBECK Broadband Antenna	VULB-9168	263	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D123	Sep. 30, 2008	Sep. 29, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 23, 2009	Jan. 22, 2010
RF Switches	EM-H-01-1	1009	Aug. 10, 2009	Aug. 09, 2010
RF Cable	8DFB	STACAB-30M-1GHz-091	Feb. 19, 2009	Feb. 18, 2010
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	TT100	ADT01	NA	NA
CORCOM AC Filter	MRI2030	107/108	NA	NA

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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: U3772) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in Open Site No. A.

4. The VCCI Site Registration No. is R-782.

5. The FCC Site Registration No. is 91097.

6. The CANADA Site Registration No. is IC 7450G-1.

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4.3.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10-meter open field site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters (3 meters -above 1GHz) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization 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.
- f. 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 1GHz.

NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. 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.
3. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the interference antenna.

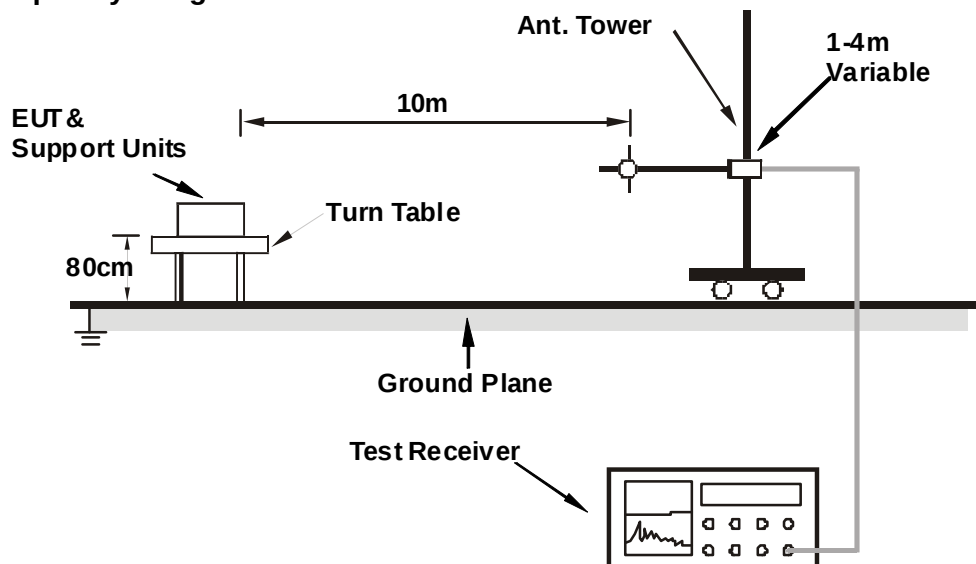
4.3.4 DEVIATION FROM TEST STANDARD

No deviation

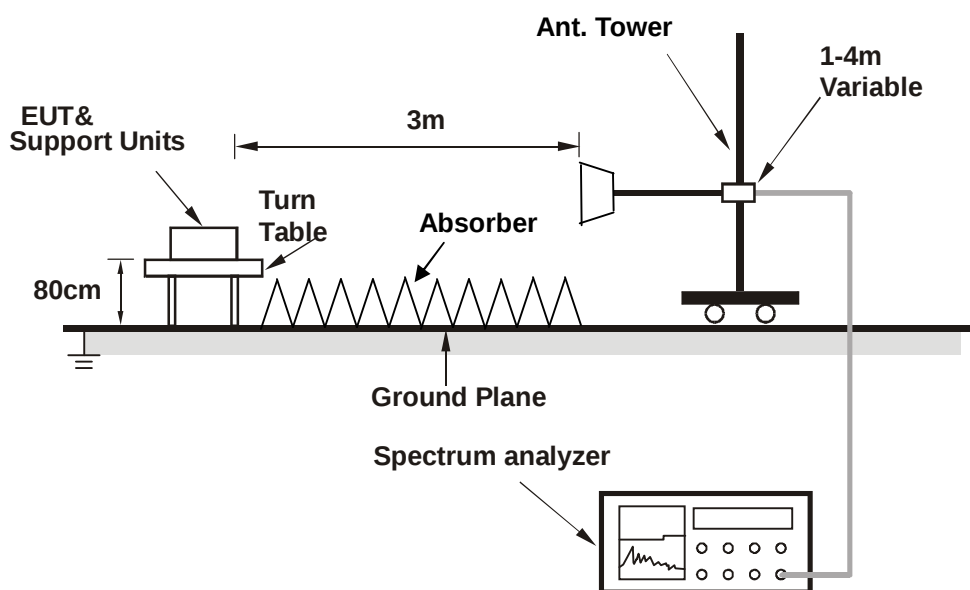
Rev.1.0 dated Sep. 04, 2009

4.3.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.3.6 EUT OPERATING CONDITIONS

Same as 4.1.6

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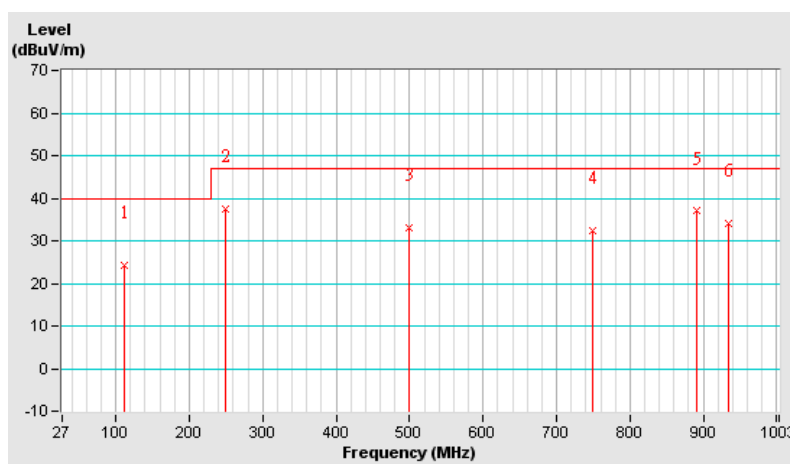
4.3.7 TEST RESULTS

TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50Hz
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 960 hPa	TESTED BY	Hat Chang

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	112.20	24.41 QP	40.00	-15.59	1.00 H	266	12.09	12.32
2	250.02	37.52 QP	47.00	-9.48	1.00 H	143	22.58	14.94
3	500.01	33.20 QP	47.00	-13.80	1.00 H	161	11.19	22.01
4	750.02	32.41 QP	47.00	-14.59	2.63 H	241	7.57	24.84
5	890.99	37.03 QP	47.00	-9.97	2.16 H	33	7.65	29.38
6	933.33	34.06 QP	47.00	-12.94	1.82 H	287	4.30	29.76

- 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.

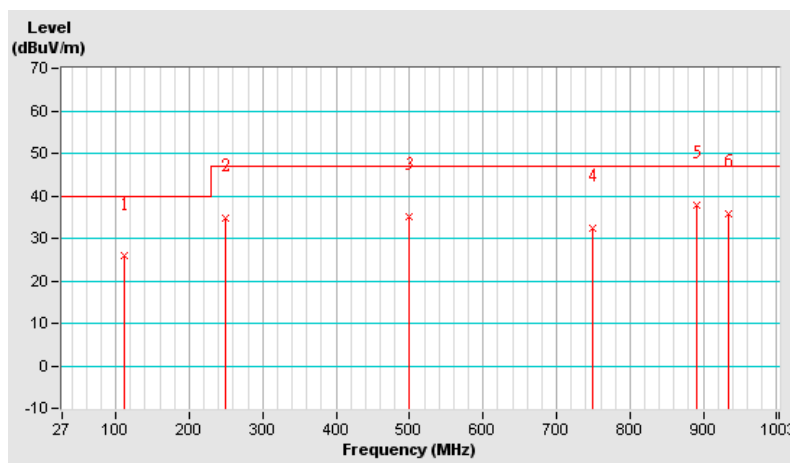


TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50Hz
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 960 hPa	TESTED BY	Hat Chang

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	112.20	25.84 QP	40.00	-14.16	1.00 V	132	13.52	12.32
2	250.02	34.91 QP	47.00	-12.09	1.00 V	135	19.97	14.94
3	500.01	35.09 QP	47.00	-11.91	1.00 V	298	13.08	22.01
4	750.01	32.37 QP	47.00	-14.63	2.81 V	166	7.53	24.84
5	890.99	37.82 QP	47.00	-9.18	2.24 V	10	8.44	29.38
6	933.33	35.88 QP	47.00	-11.12	1.98 V	231	6.12	29.76

- 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.





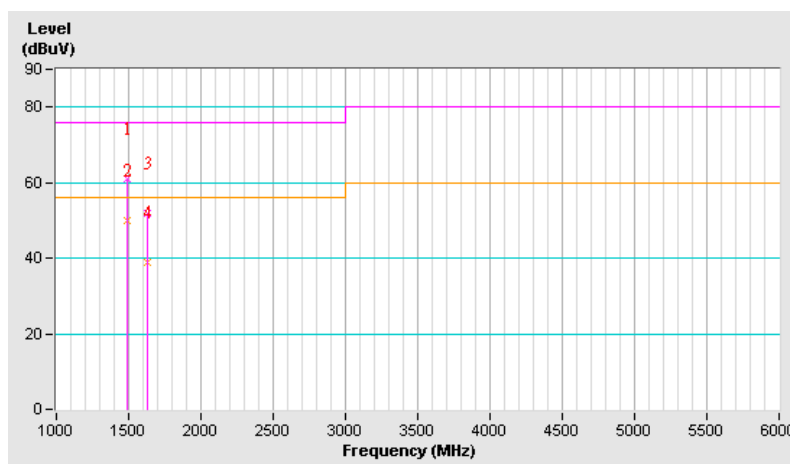
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TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50Hz
FREQUENCY RANGE	1000-2000 MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) / Average (AV), 1MHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 952 hPa	TESTED BY	Timmy Hu

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	1485.00	60.94 PK	76.00	-15.06	1.00 H	22	33.05	27.89
2	1485.00	50.00 AV	56.00	-6.00	1.00 H	22	22.11	27.89
3	1633.00	51.72 PK	76.00	-24.28	1.00 H	12	23.63	28.09
4	1633.00	39.02 AV	56.00	-16.98	1.00 H	12	10.93	28.09

- 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.



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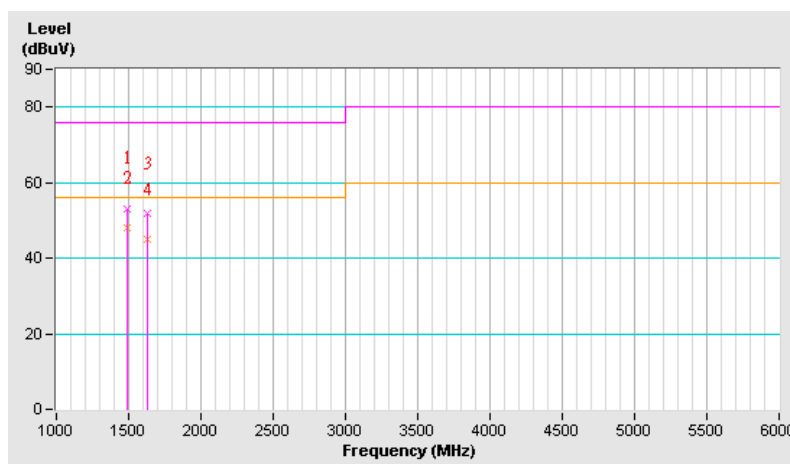
A D T

TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50Hz
FREQUENCY RANGE	1000-2000 MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) / Average (AV), 1MHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 952 hPa	TESTED BY	Timmy Hu

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	1485.00	53.18 PK	76.00	-22.82	1.00 V	135	25.29	27.89
2	1485.00	48.06 AV	56.00	-7.94	1.00 V	135	20.17	27.89
3	1633.00	51.72 PK	76.00	-24.28	1.00 V	12	23.63	28.09
4	1633.00	45.02 AV	56.00	-10.98	1.00 V	12	16.93	28.09

- 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.



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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, Power line: 1kV, 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, 3V, 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 Criteria 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 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

ESD & RS test mode :

1. Turn on the power of all equipment.
2. The support unit 4 (USB Flash Drive) and support unit 5 (DVD player) sends video messages to EUT. EUT under transmission condition continuously. And support unit 2 (Monitor) and support unit 3 (TV Monitor) display on its screen.
3. Support unit 1 (Notebook Computer) run "Ping.exe" program to enable LAN function of EUT via one UTP cable. And support unit 2 (Monitor) and support unit 7 (TV Monitor) display messages on its screen.
4. Repeat steps 2-3.

Other test mode :

1. Turn on the power of all equipment.
2. The support unit 4 (USB Flash Drive) sends video messages to EUT. EUT under transmission condition continuously. And support unit 2 (Monitor) and support unit 3 (TV Monitor) display on its screen.
3. Support unit 1 (Notebook Computer) run "Ping.exe" program to enable LAN function of EUT via one UTP cable. And support unit 2 (Monitor) and support unit 7 (TV Monitor) display messages on its screen.
4. Repeat steps 2-3.

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, 4, 8kV (Direct) Contact Discharge – 2, 4 kV (Direct / Indirect)
Polarity:	Positive / Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 50 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1-second minimum

5.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
NoiseKen, ESD Simulator	ESS-100L(A)	0189C01491	July 21, 2008	July 20, 2009
Key Tek, ESD Simulator	MZ-15/EC	9906323	June 06, 2008	June 05, 2009
NoiseKen, ESD Simulator	ESS-2002	ESS062521 2/244	May 11, 2009	May 10, 2010

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 ESD room A.

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.

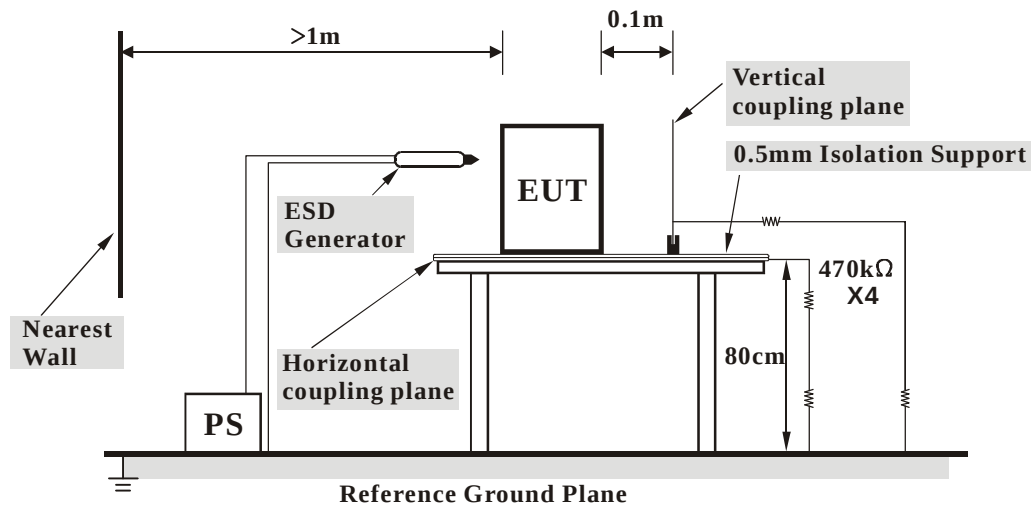
The basic test procedure was in accordance with IEC 61000-4-2:

- 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 **Horizontal Coupling Plane** at points on each side of the EUT. The ESD generator was positioned 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 **Vertical Coupling Plane** 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

NA

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 **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 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	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	25 deg. C, 56 % RH, 960 hPa	TESTED BY	Anderson Chen

TEST RESULTS OF DIRECT APPLICATION					
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge	Performance Criterion
2	+/-	1, 2	Note (1)	NA	A
4	+/-	1, 2	Note (2)	NA	B
2, 4	+/-	3, 8	NA	Note (1)	A
8	+/-	3, 8	NA	Note (2)	B
2, 4, 8	+/-	4 ~ 7	NA	Note (1)	A

Description of test point: Please refer to following page for representative mark only.

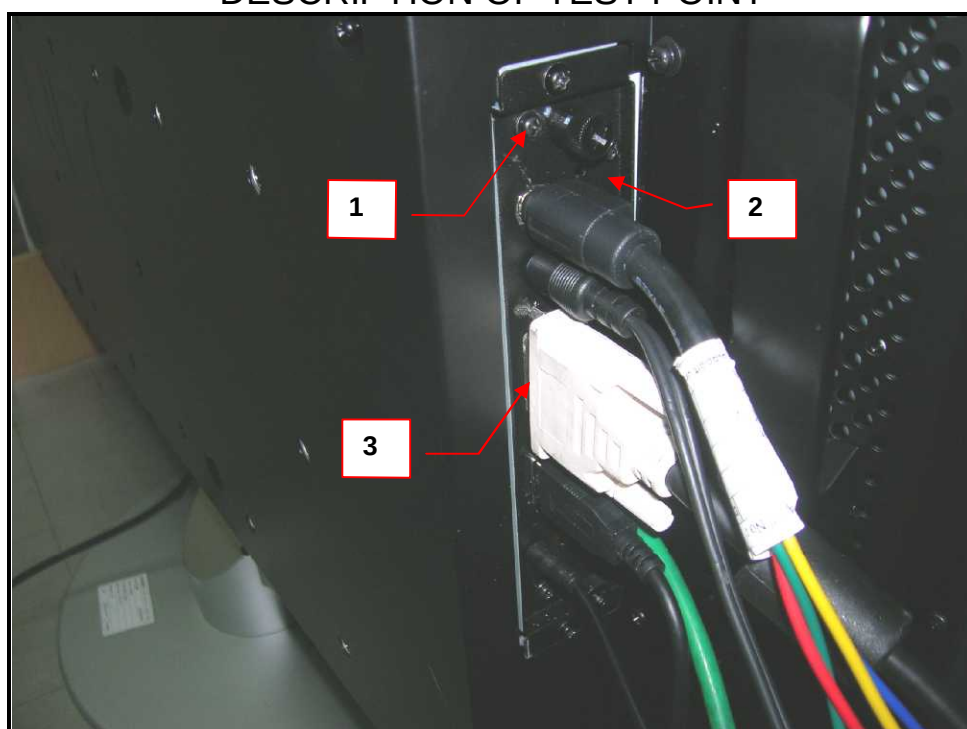
TEST RESULTS OF INDIRECT APPLICATION					
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling Plane	Vertical Coupling Plane	Performance Criterion
2, 4	+/-	1 ~ 4	Note (1)	Note (1)	A

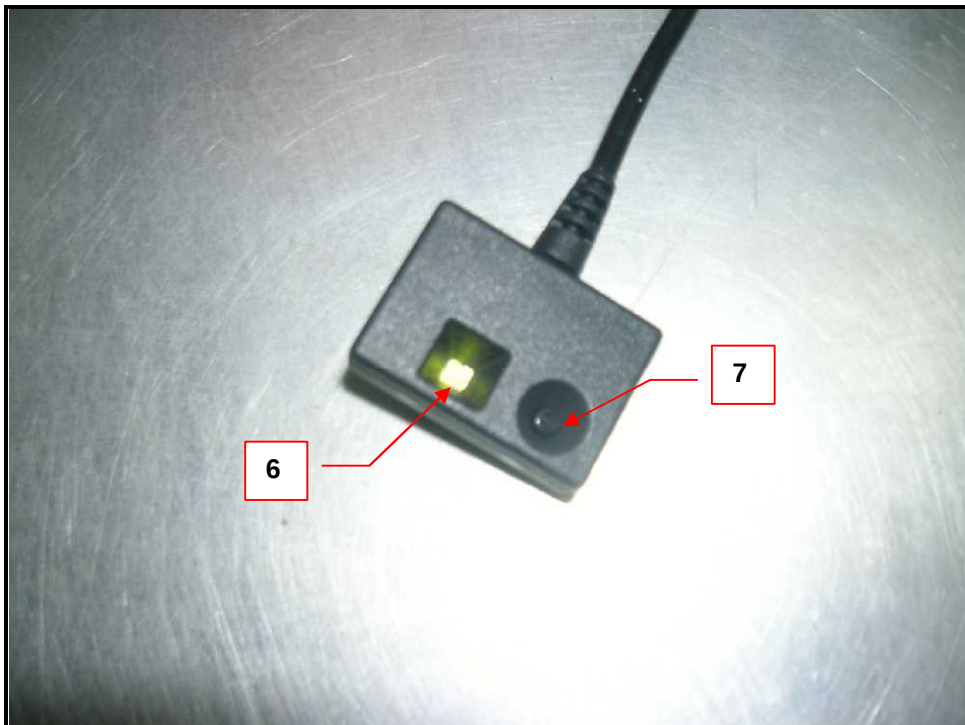
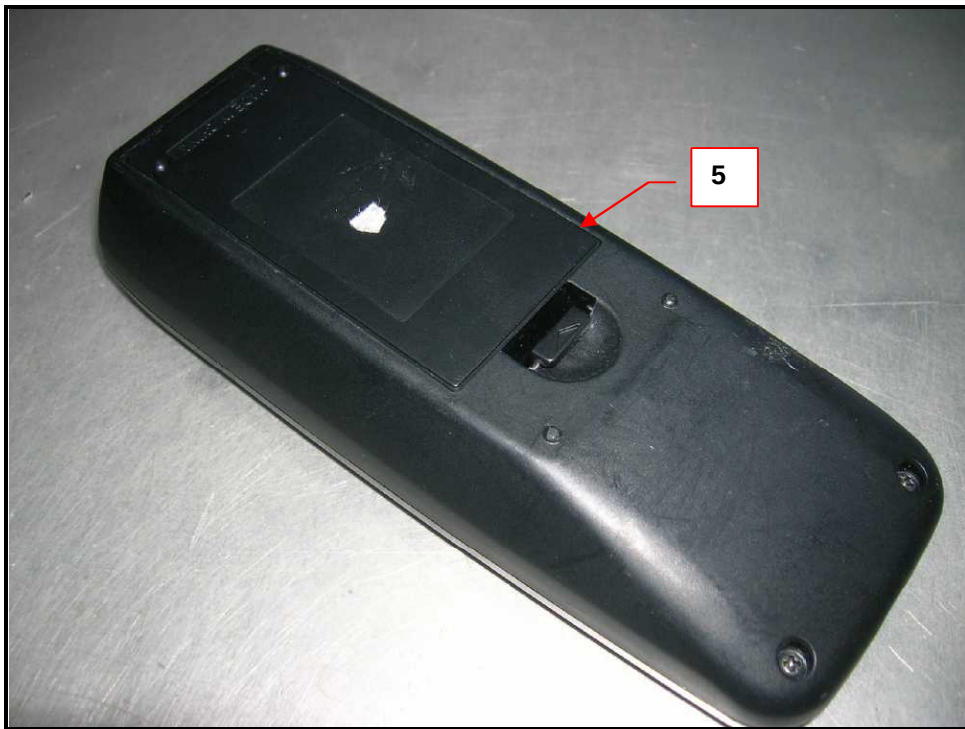
Description of test point:

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

NOTE: (1) There was no change compared with initial operation during the test.
(2) The LAN function of EUT was request time out during the test but could be self-recoverable after the test.

DESCRIPTION OF TEST POINT







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:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5m
Dwell Time:	3 seconds

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
AR Power Amplifier	150W1000M3	311567	NA	NA
AR Power Amplifier	60S1G3M1	306171	NA	NA
AR LOG ANTENNA	AT5080ANT	309740	NA	NA
BOONTON RF Voltage Meter	4232A	93801	Dec. 26, 2008	Dec. 25, 2009
R&S Signal Generator	SML03	101159	Jan. 09, 2009	Jan. 08, 2010
Electric Field Probe	FP6001	308178	Oct. 26, 2008	Oct. 25, 2009
ADT RS Test Workbench(Software)	ADT_RS_V7.5	NA	NA	NA

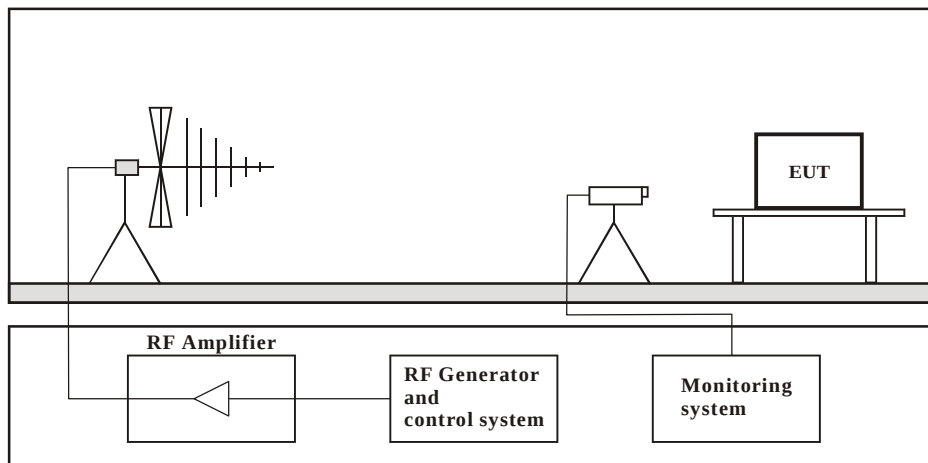
- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chamber Room No. B.
3. The transmit antenna was located at a distance of 2.0 meters from the EUT.

5.5.3 TEST PROCEDURE

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

- The testing was performed in a fully-anechoic chamber.
- The frequency range is swept from 80 MHz to 1000 MHz with the signal 80% amplitude modulated with a 1kHz sine wave.
- 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.
- The field strength level was 3V/m.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

5.5.4 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.



5.5.5 TEST RESULTS

TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	22 deg. C, 56 % RH, 960 hPa	TESTED BY	Jason Huang

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

NOTE: There was no change compared with the 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 – Not Applicable Signal/Control Line –0.5kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 min.

5.6.2 TEST INSTRUMENTS

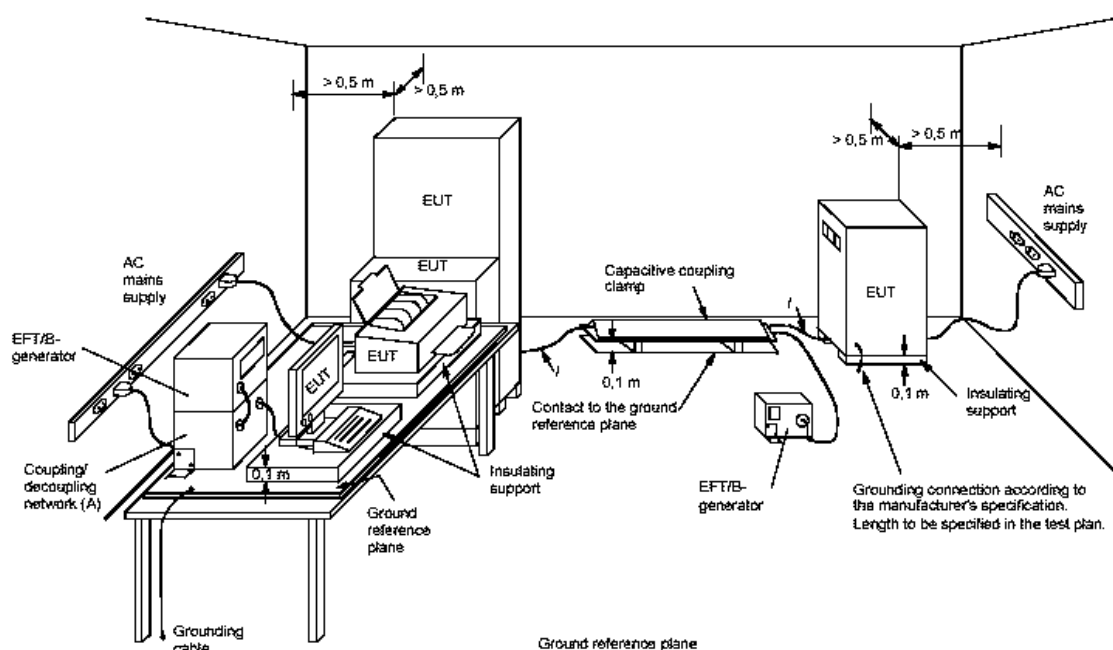
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
EMC PARTNER, TRANSIENT	TRA1Z332N	683	April 21, 2009	April 20, 2010
EMC PARTNER, CN-EFT100	CN-EFT1000	352	NA	NA
Adapter (EMC Partner)	NA	SU1ADA-002	NA	NA
EMC Partner(Software)	Test Manger_V1.53	NA	NA	NA

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 EMS room B.

5.6.3 TEST PROCEDURE

- 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 be $0.5\text{m} \pm 0.05\text{m}$.
- The duration time of each test sequential was 1 minute.
- The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

5.6.4 TEST SETUP



NOTE:

- / length between clamp and the EUT to be tested (should be $0.5 \pm 0.05\text{m}$)
- (A) location for supply line coupling
- (B) location for signal lines coupling

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

NOTE:

EUTs, whether stationary floor-mounted or table top, and equipment designed to be mounted in other configurations, shall be placed on a ground reference plane and shall be insulated from it by an insulating support $0.1\text{ m} \pm 0.01\text{ m}$ thick. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.



5.6.5 TEST RESULTS

TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50Hz
ENVIRONMENTAL CONDITIONS	24 deg. C, 50 % RH, 960 hPa	TESTED BY	Jason Huang

I. SIGNAL PORTS AND CONTROL PORTS

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

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

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

5.7.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-6
Frequency Range:	0.15 MHz - 80 MHz
Voltage Level:	3 V _{r.m.s.}
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Coupled Cable:	Power Mains, Unshielded Signal / Control Line
Coupling Device:	Clamp
Dwell Time	3 seconds

5.7.2 TEST INSTRUMENTS

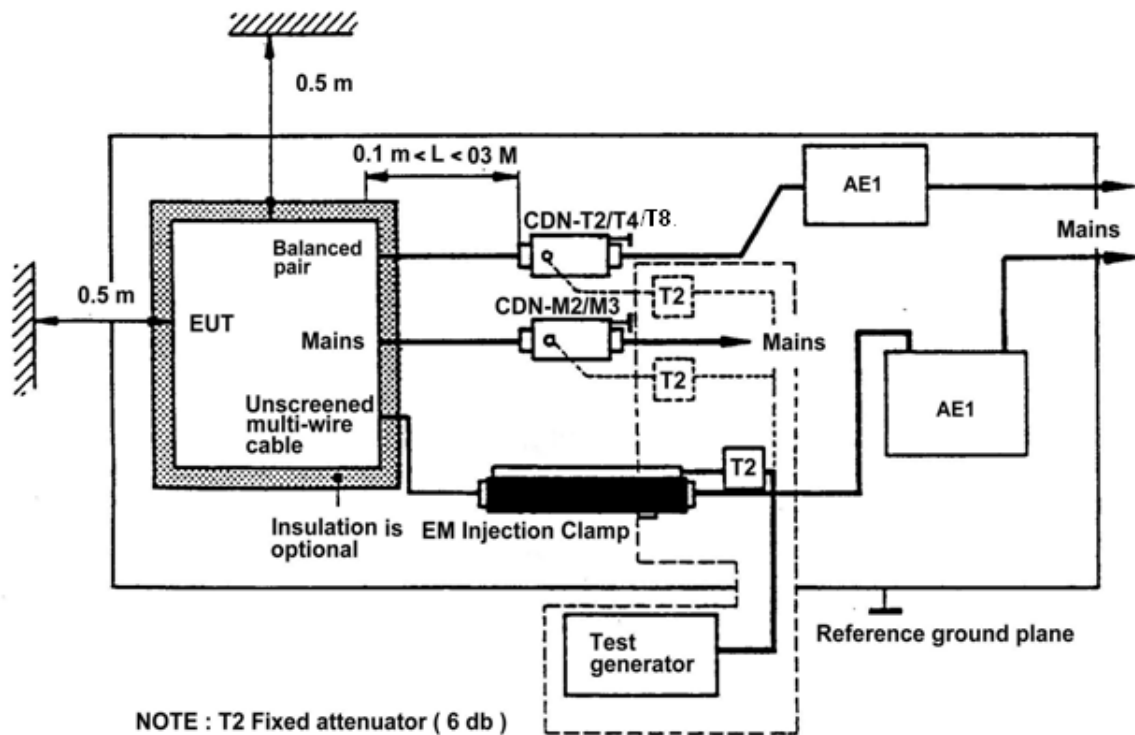
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATE D UNTIL
R&S Signal Generator	SML 01	102731	Dec. 23, 2008	Dec. 22, 2009
AR Amplifier	75A250AM2	307297	NA	NA
BOONTON RF Voltage Meter	4232A	93801	Dec. 26, 2008	Dec. 25, 2009
LUTHIE EM Injection Clamp	EM-101	35453	May 07, 2009	May 06, 2010
FCC CDN M2	FCC-801-M2-16A	03048	Jan. 12, 2009	Jan. 11, 2010
FCC CDN M3	FCC-801-M3-16A	03055	Jan. 12, 2009	Jan. 11, 2010
Fischer Custom Communications Inc Coupling Decoupling Network	FCC-801-T2	02025	Oct. 28, 2008	Oct. 27, 2009
Fischer Custom Communications Inc Coupling Decoupling Network	FCC-801-T4	02030	Oct. 28, 2008	Oct. 27, 2009
Fischer Custom Communications Inc Coupling Decoupling Network	FCC-801-T8	02036	Oct. 28, 2008	Oct. 27, 2009
ADT CS Test Workbench(Software)	ADT_CS_V7.4.2	NA	NA	NA

- 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 Room No. B.

5.7.3 TEST PROCEDURE

- a. The EUT shall be tested within its intended operating and climatic conditions.
- b. 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.
- c. 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.
- d. 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.
- e. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

5.7.4 TEST SETUP



- NOTE: 1. The EUT clearance from any metallic obstacles shall be at least 0.5m.
 2. All non-excited input ports of the CDNs shall be terminated by 50Ω loads.
 3. The EUT is setup 0.1m above Reference Ground Plane
 4. The CDNs and / or EM clamp used for real test depends on ports and cables configuration of EUT.

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

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.



A D T

5.7.5 TEST RESULTS

TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	22 deg. C, 56 % RH, 960 hPa	TESTED BY	Jason Huang

FOR SIGNAL / CONTROL LINE:

Frequency (MHz)	Voltage Level (Vr.m.s.)	Cable	Injection Method	Observation	Performance Criterion
0.15 – 80	3	RJ-45	Clamp	Note (1)	A

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

5.8 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

5.8.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-8
Frequency Range:	50Hz
Field Strength:	1 A/m
Observation Time:	1 minute
Inductance Coil:	Helmholtz coil, diameter 1.5m

5.8.2 TEST INSTRUMENTS

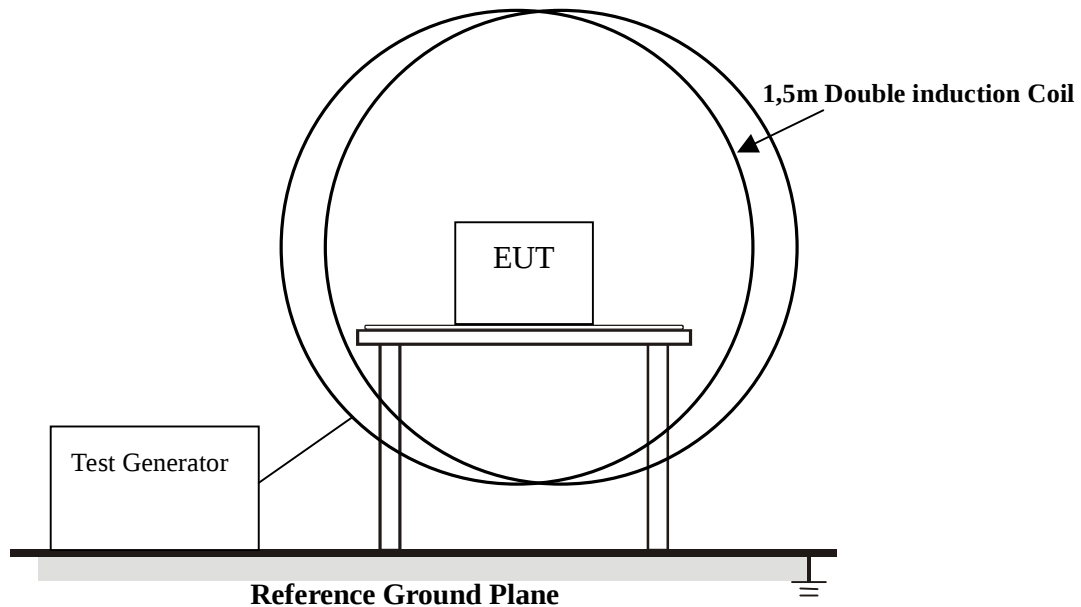
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
BELL, Triaxial Elf Magnetic Field Meter	4090	NA	Jan. 28, 2009	Jan. 27, 2010
MONTENA, Helmholtz Coil	HC150-360	NA	NA	NA

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 EMS room.

5.8.3 TEST PROCEDURE

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

5.8.4 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 (diameter 1.5m). The EUT placement shall then be rotated by 90 degrees in order to expose to the test field with different orientations.



5.8.5 TEST RESULTS

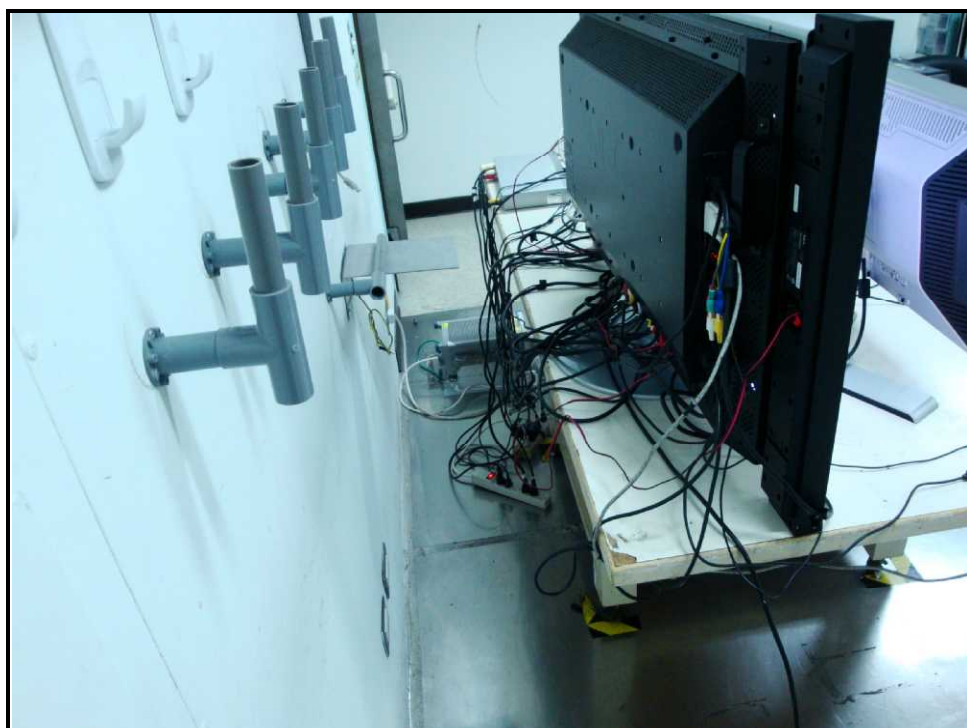
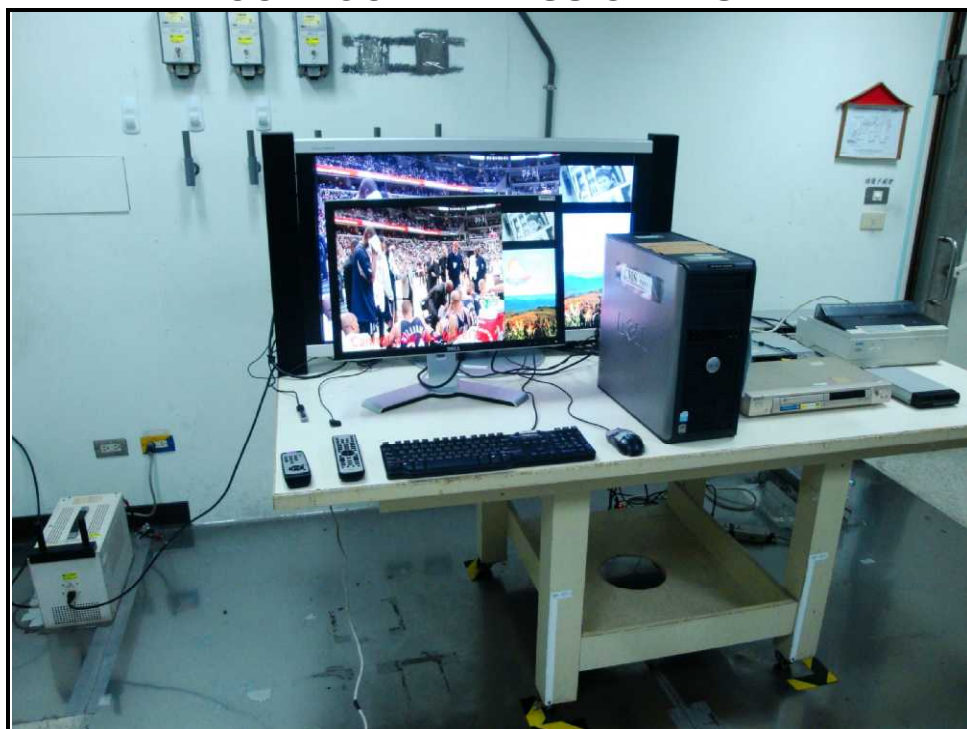
TEST MODE	Mode 1	INPUT POWER (SYSTEM)	230Vac, 50 Hz
ENVIRONMENTAL CONDITIONS	22 deg. C, 56 % RH, 960 hPa	TESTED BY	Barry Lee

DIRECTION	RESULTS	OBSERVATION	PERFORMANCE CRITERION
X	PASS	Note	A
Y	PASS	Note	A
Z	PASS	Note	A

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

6 PHOTOGRAPHS OF THE TEST CONFIGURATION

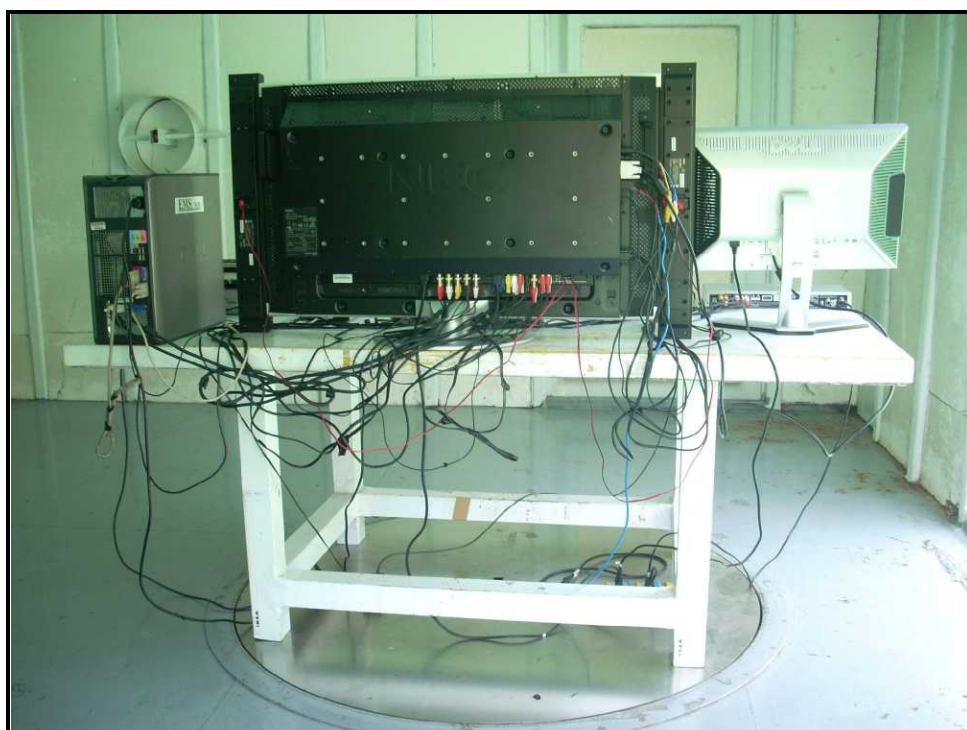
CONDUCTED EMISSION TEST



TELECOMMUNICATION PORT (RJ45) OF CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



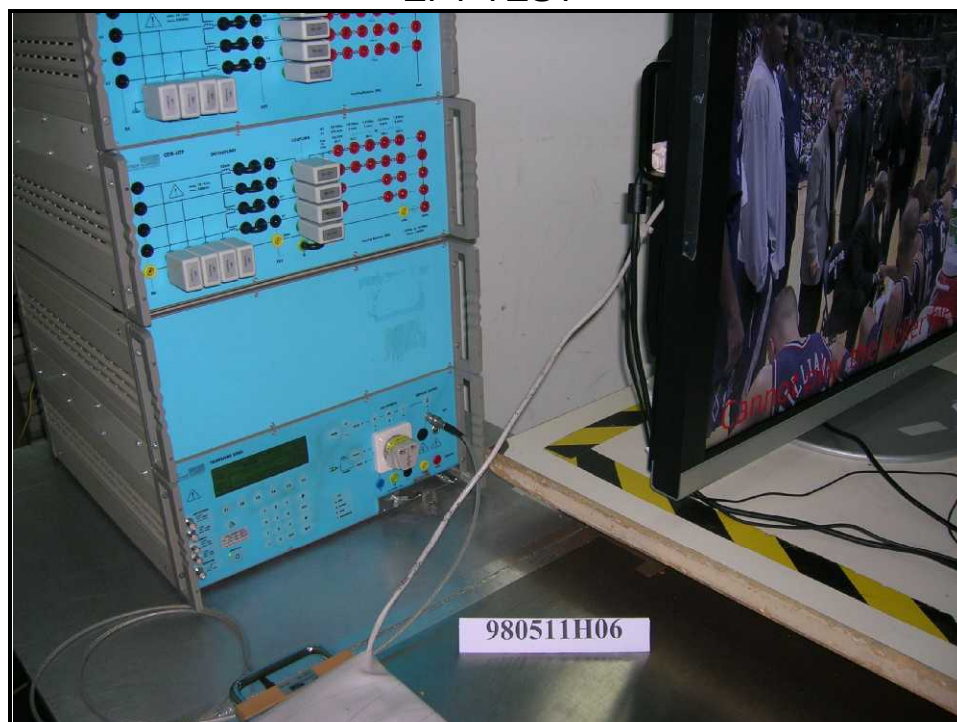
ESD TEST



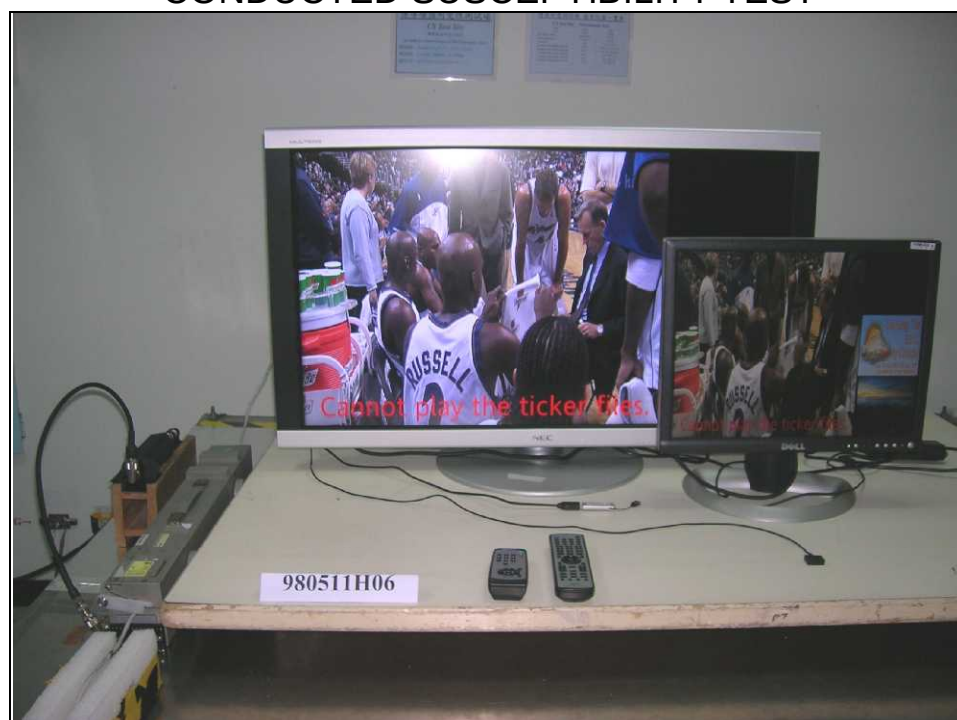
RS TEST



EFT TEST



CONDUCTED SUSCEPTIBILITY TEST



POWER-FREQUENCY MAGNETIC FIELDS 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 by the following approval agencies according to ISO/IEC 17025.

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	GOST-ASIA (MOU)
Russia	CERTIS (MOU)

Copies of accreditation 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: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

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Email: service@adt.com.tw

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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