CE EMC TEST REPORT

REPORT NO.: CE990301L25A

MODEL NO.: 25243 (refer to item 3.1 for more details)

RECEIVED: Mar. 01, 2010

TESTED: Mar. 09 ~ Mar. 16, 2010

ISSUED: Dec. 10, 2012

APPLICANT: LSI CORP

ADDRESS: 6145-D NORTHBELT PKY, NOR CROSS, GA 30071, USA

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

LAB ADDRESS: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
CE990301L25A	Original release	Dec. 10, 2012

1 CERTIFICATION

PRODUCT:	PCI-E SAS HBA Card
BRAND:	LSI
MODEL NO.:	25243 (refer to item 3.1 for more details)
APPLICANT:	LSI CORP
TESTED:	Mar. 09 ~ Mar. 16, 2010
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARD:	**EN 55022:2010 +AC:2011, Class B**
	EN 61000-3-2:2006 +A1:2009 +A2:2009, Class D
	EN 61000-3-3:2008
	EN 55024:2010
	IEC 61000-4-2:2008 ED. 2.0 / EN 61000-4-2:2009
	IEC 61000-4-3:2010 ED. 3.2 / EN 61000-4-3:2006 +A1:2008 +A2:2010
	IEC 61000-4-4:2012 ED.3.0 / EN 61000-4-4:2004 +A1:2010
	IEC 61000-4-5:2005 ED. 2.0 / EN 61000-4-5:2006
	IEC 61000-4-6:2008 ED. 3.0 / EN 61000-4-6:2009
	IEC 61000-4-8:2009 ED. 2.0 / EN 61000-4-8:2010
	IEC 61000-4-11:2004 ED. 2.0 / EN 61000-4-11:2004

The above equipment (model: L3-25243-03A is worst case) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. 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 : Polly Chien / Specialist , **DATE :** Dec. 10, 2012

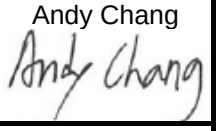
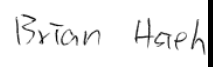
APPROVED BY : David Liu / Senior Engineer , **DATE :** Dec. 10, 2012

2 SUMMARY OF TEST RESULTS

After estimating all the combination of every test mode, the result shown as below is the worst case.

The EUT has been tested according to the following specifications.

EMISSION				
Standard	**Test Type**	**Result**	**Remarks**	**Tested By**
EN 55022:2010 +AC:2011, Class B	Conducted emission test	PASS	Worst emission frequency is 0.662 MHz at Line 2 And minimum passing margin is -10.64 dB, Average	Whisky Chang
	Radiated emission test (30MHz~6GHz)	PASS	Worst emission frequency is 375.00 MHz at Horizontal And minimum passing margin is -3.09 dB, High of antenna is 2.5 m Angle of turntable is 79 deg	Peter Lin
				Eason Chen
EN 61000-3-2:2006 +A1:2009 +A2:2009, Class D	Harmonic current emission test	PASS	Meets the requirements.	Vison Tseng
EN 61000-3-3:2008	Voltage fluctuations & flicker tests	PASS	Meets the requirements.	Vison Tseng

IMMUNITY (EN 55024:2010)				
Standard	**Test Type**	**Result**	**Remarks**	**Tested By**
IEC 61000-4-2:2008 ED. 2.0 / EN 61000-4-2:2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion A	Andy Chang 
IEC 61000-4-3:2010 ED. 3.2 / EN 61000-4-3:2006 +A1:2008 +A2:2010	Radiated, radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A	Brian Hsieh 
IEC 61000-4-4:2012 ED.3.0 / EN 61000-4-4:2004 +A1:2010	Electrical fast transient / burst immunity test	PASS	Meets the requirements of Performance Criterion A	Match Tsui 
IEC 61000-4-5:2005 ED. 2.0 / EN 61000-4-5:2006	Surge immunity test	PASS	Meets the requirements of Performance Criterion A	Match Tsui 
IEC 61000-4-6:2008 ED. 3.0 / EN 61000-4-6:2009	Immunity to conducted disturbances, induced by radio-frequency fields	PASS	Meets the requirements of Performance Criterion A	Skys Huang 
IEC 61000-4-8:2009 ED. 2.0 / EN 61000-4-8:2010	Power frequency magnetic field immunity test.	PASS	Meets the requirements of Performance Criterion A	Match Tsui 
IEC 61000-4-11:2004 ED. 2.0 / EN 61000-4-11:2004	Voltage dips, short interruptions and voltage variations immunity tests	PASS	Meets the requirements of Voltage Dips: 1. >95% reduction - Performance Criterion A 2. 30% reduction – Performance Criterion A Voltage Interruptions: 1. >95% reduction – Performance Criterion C	Match Tsui 

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 emission	150kHz ~ 30MHz	2.44dB
Radiated emissions	30MHz ~ 1GHz	3.84dB
	Above 1GHz	2.26dB

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	PCI-E SAS HBA Card
MODEL NO.	25243 (refer to item NOTE for more details)
POWER SUPPLY	5Vdc from host equipment
DATA CABLE	NA
ACCESSORY DEVICE	NA

NOTE:

1. This report is issued as a duplicate report to the original BVADT report no.: CE990301L25. The difference compared with original report is updating all standards to the latest version. Due to no affect any test item, we did not re-test.
2. The following models are provided to this EUT.

MODEL	PRODUCT NUMBER	DIFFERENCE
25243	-	-
L3-25243-03A	9280-24I4E	Twenty four SAS 2.5" HDDs External storage
L3-25243-04A	9260-I6I	Sixteen SAS 2.5" HDDs External storage
L3-25243-06A	9280-I6I4E	Sixteen SAS 2.5" HDDs only

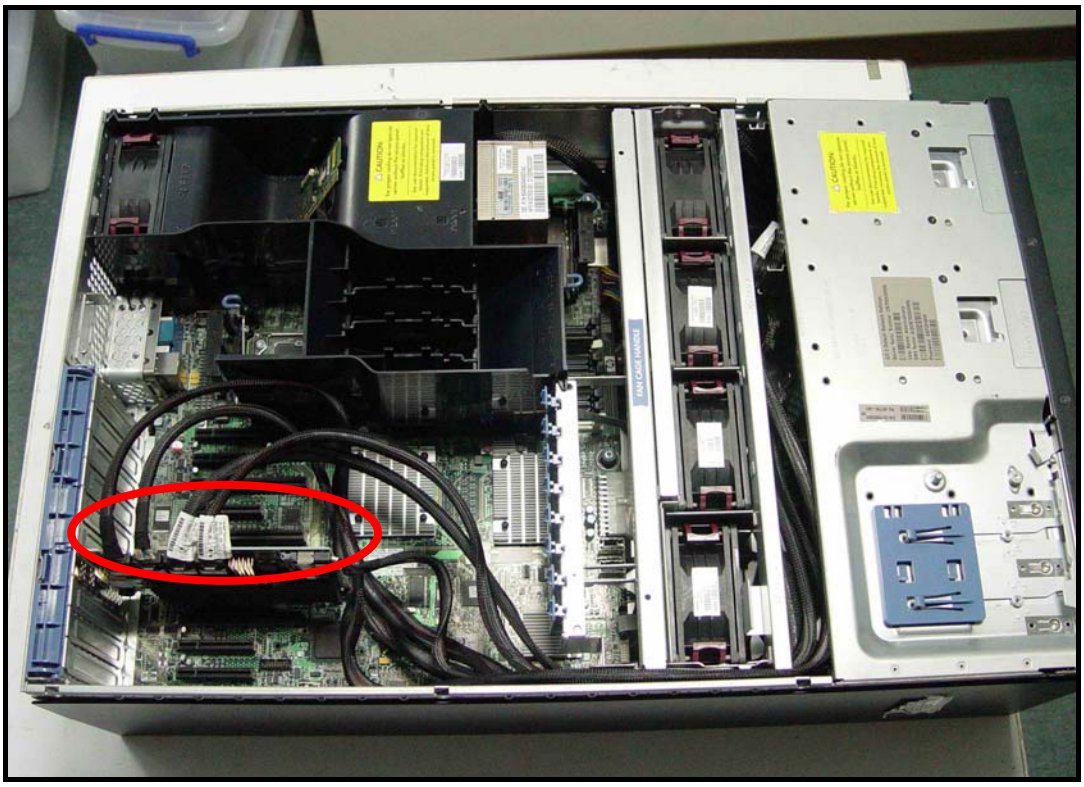
*After pre-testing, model: L3-25243-03A is found to be the worst case for the final test.

3. The EUT is a PCI-E SAS HBA Card and its features are listed as below:

FEATURE DESCRIPTION OF THE EUT
* Operation with SAS and SATA drives. * PCIe 2.0 compliant for x8 lane slots. * Six internal mini SAS4i connectors and one external mini SAS4x connector. * 512MB on-board DDR2-800 cache. * PCIe 2.0 Full Height MD2 form factor complaint. * Connection to remote iBBU (intelligent Battery Backup unit)

4. The highest working frequency is 2.5GHz.
5. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

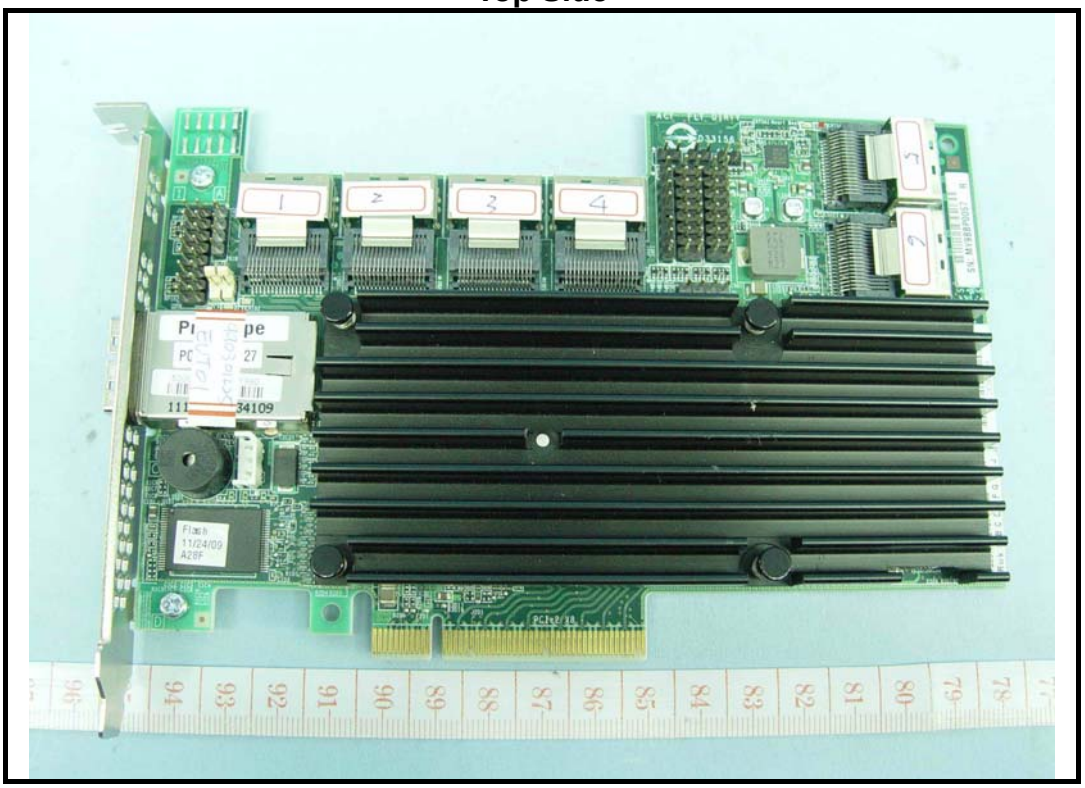
3.1.1 THE PHOTO OF LOCATION OF EUT IN HOST



3.1.2 THE PHOTO OF TOP AND BOTTOM SIDE OF EUT

<For Model: L3-25243-03A >

<Top Side>



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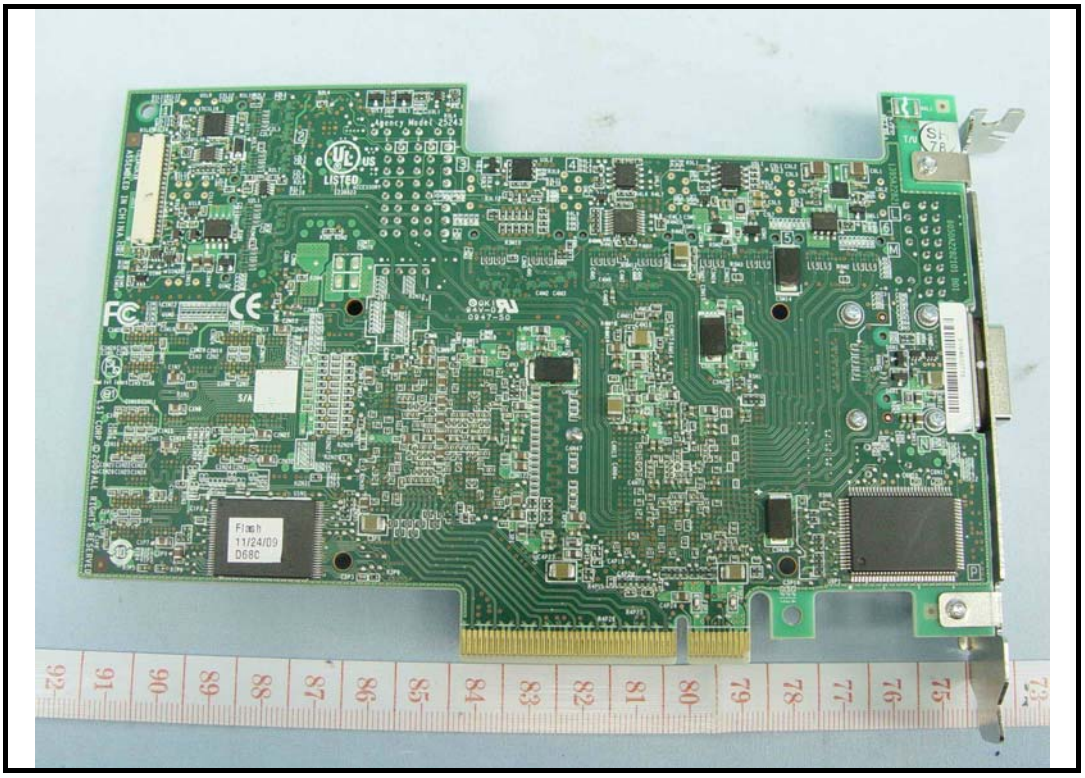

<For Model: L3-25243-04A >

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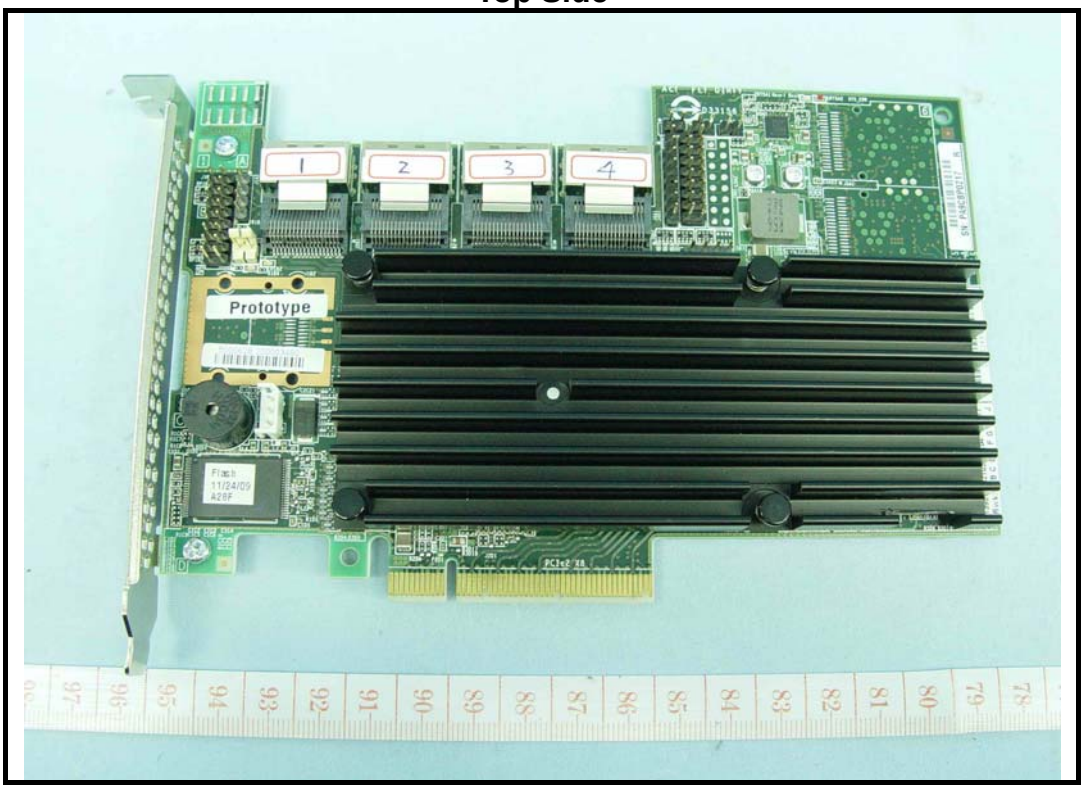

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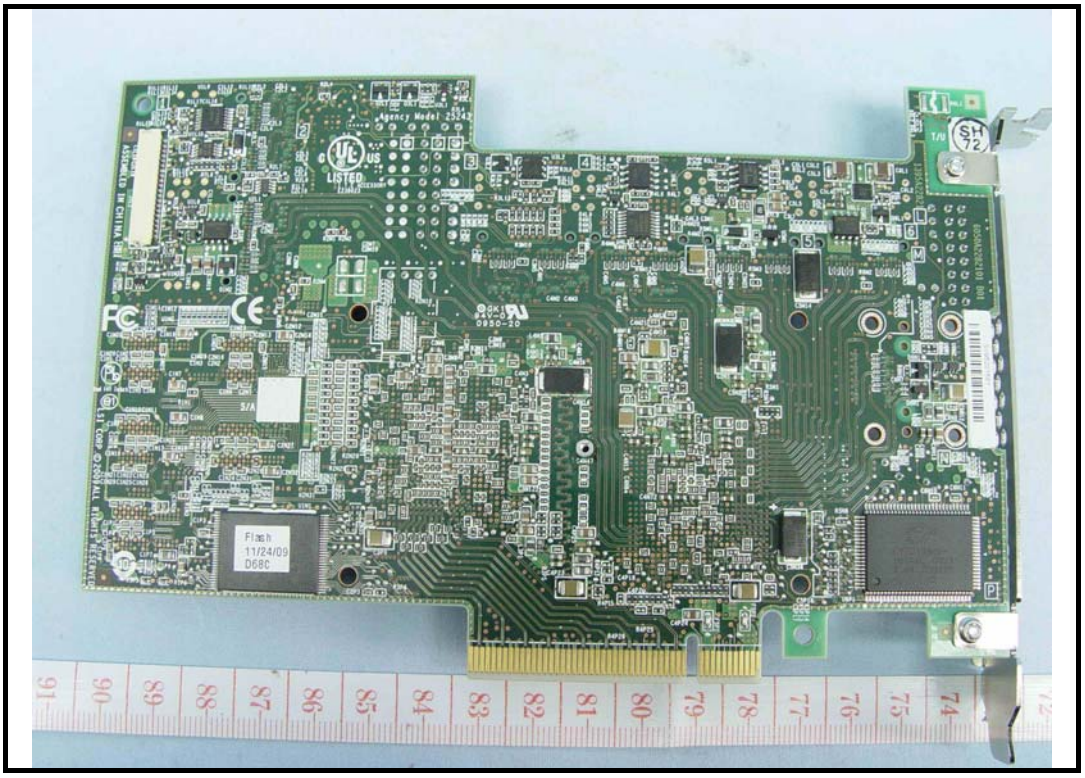

<For Model: L3-25243-06A >

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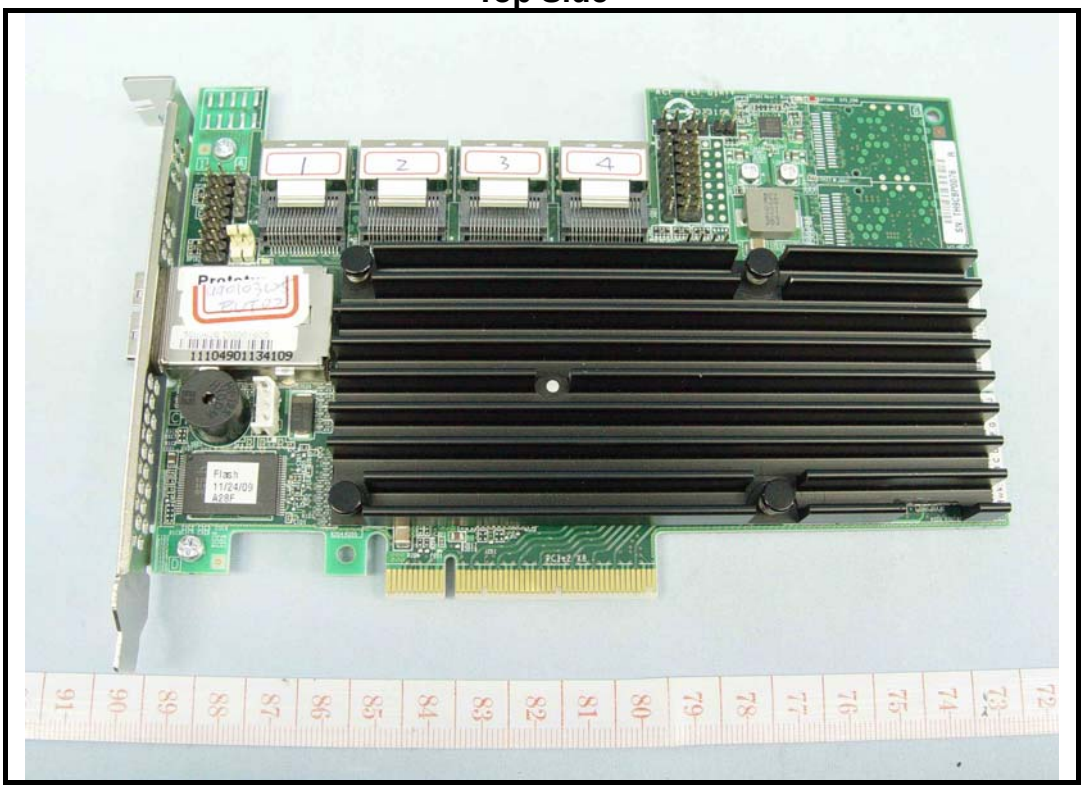

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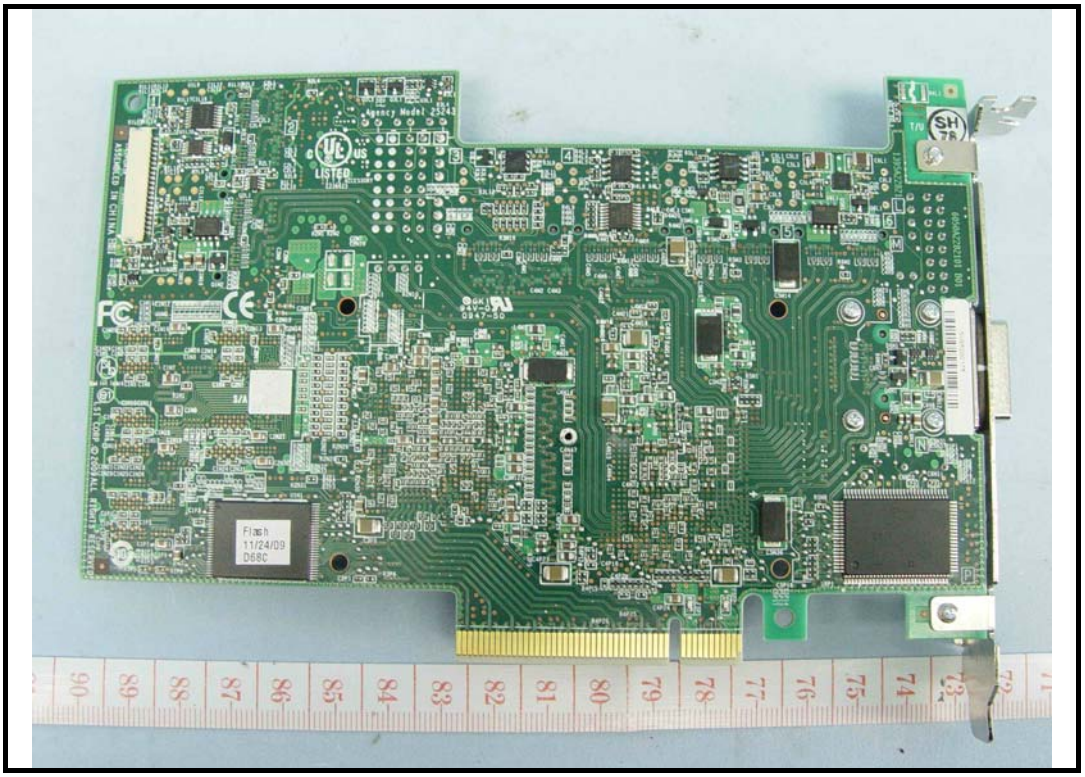
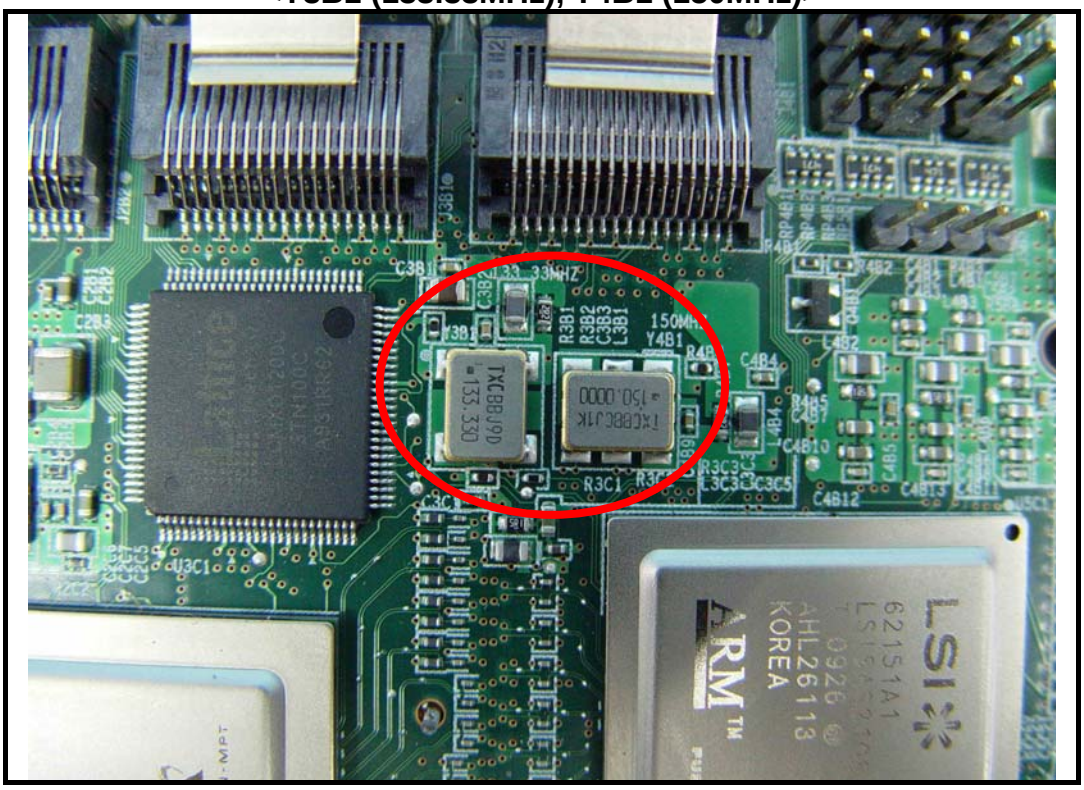


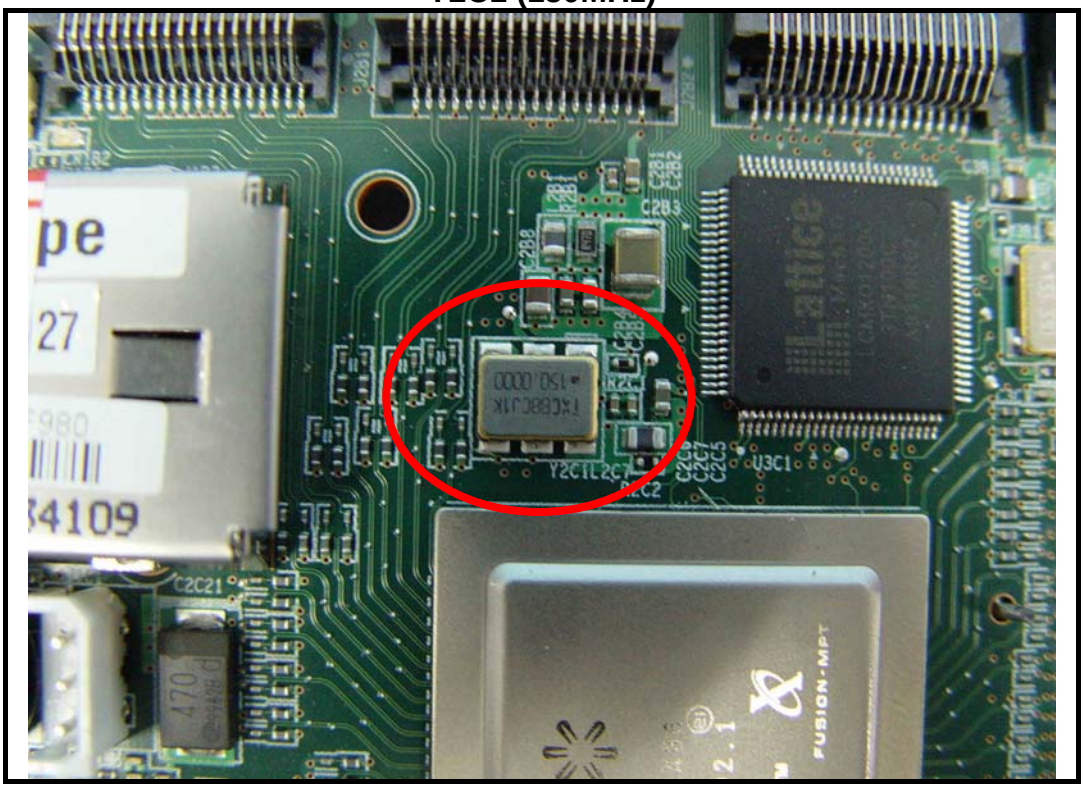
3.1.3 THE PHOTO OF NOISE SOURCES OF EUT

<For Model: L3-25243-03A >

<Y3B1 (133.33MHz), Y4B1 (150MHz)>

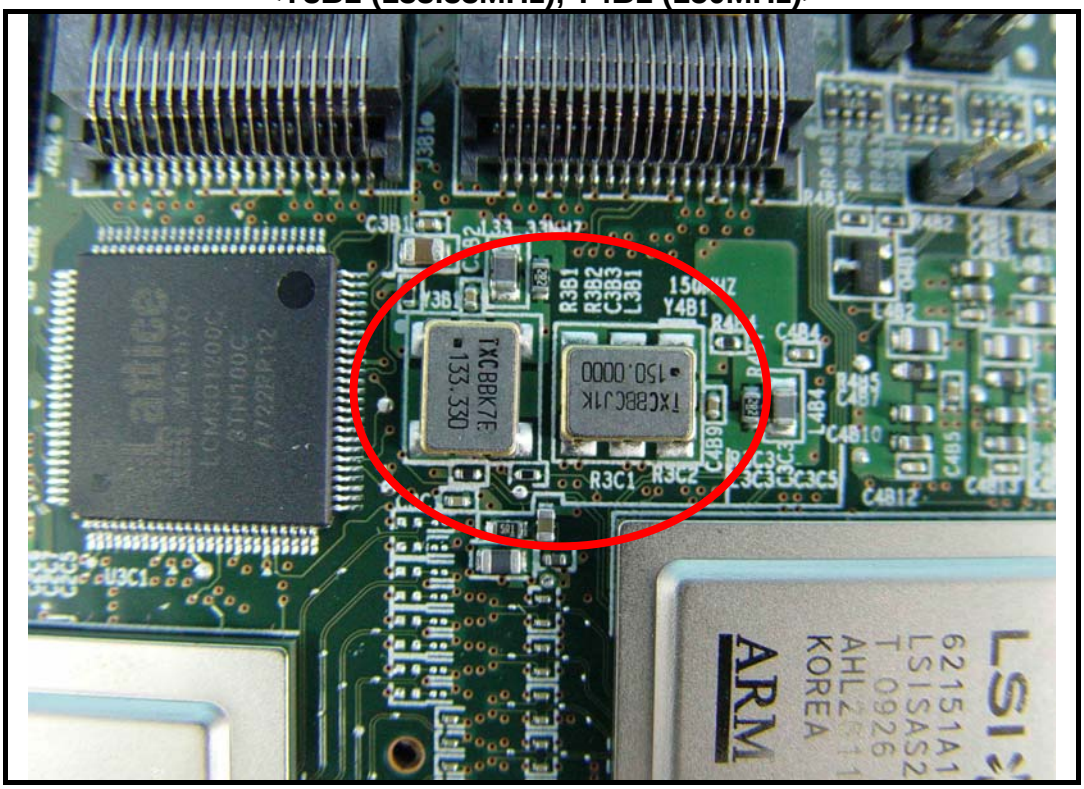


<Y2C1 (150MHz)>

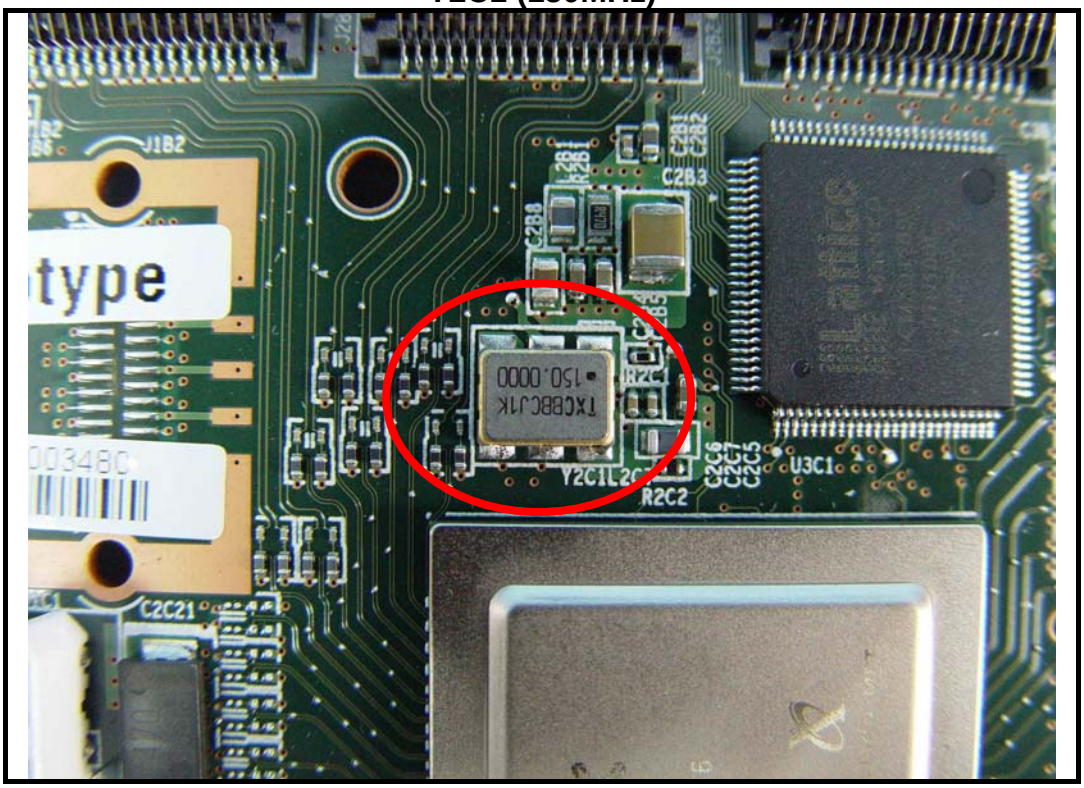


<For Model: L3-25243-04A >

<Y3B1 (133.33MHz), Y4B1 (150MHz)>



<Y2C1 (150MHz)>



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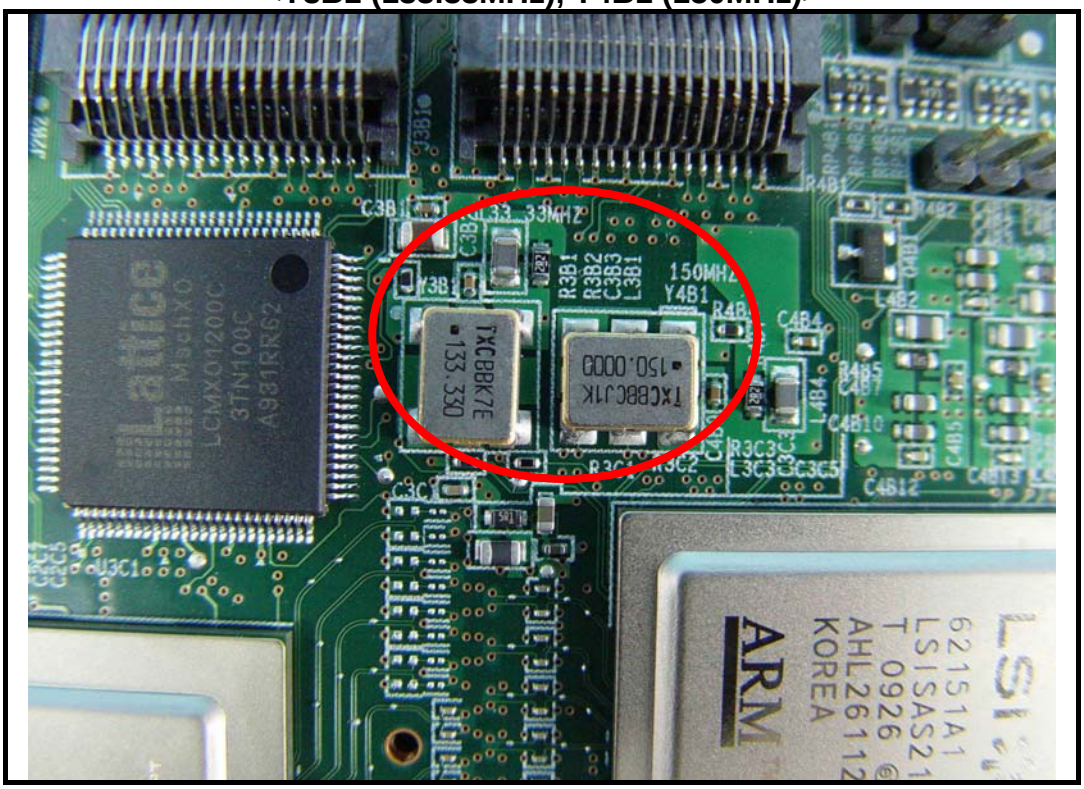
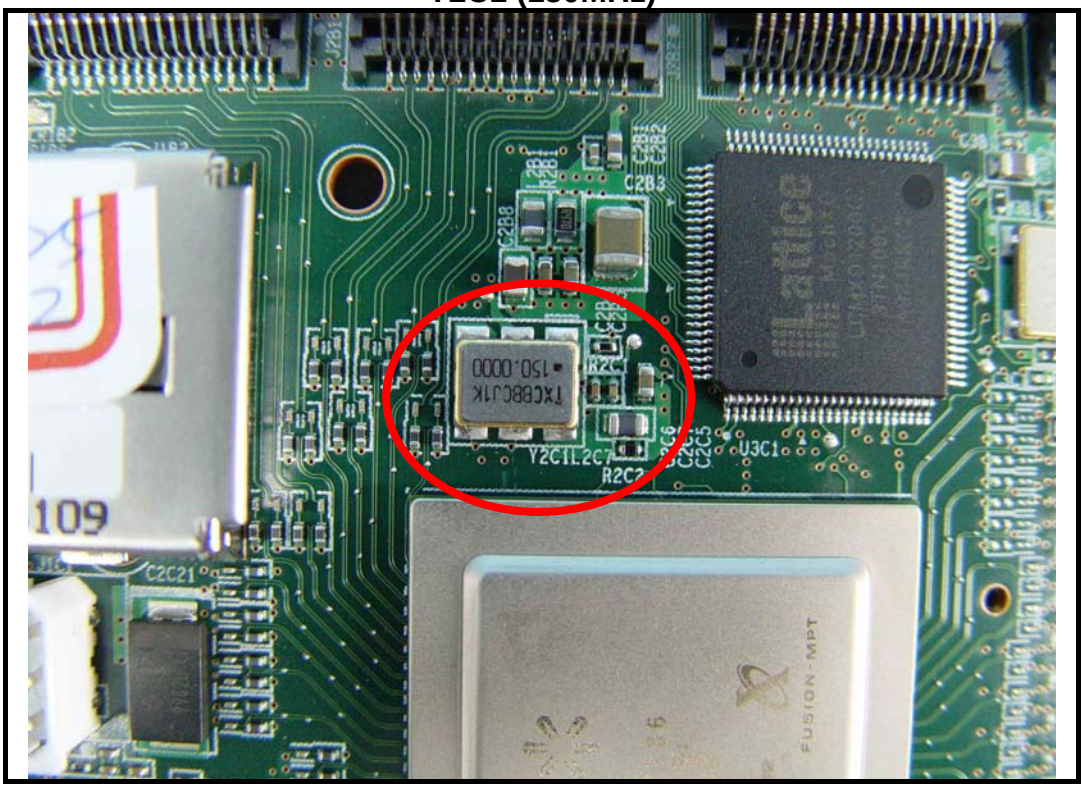
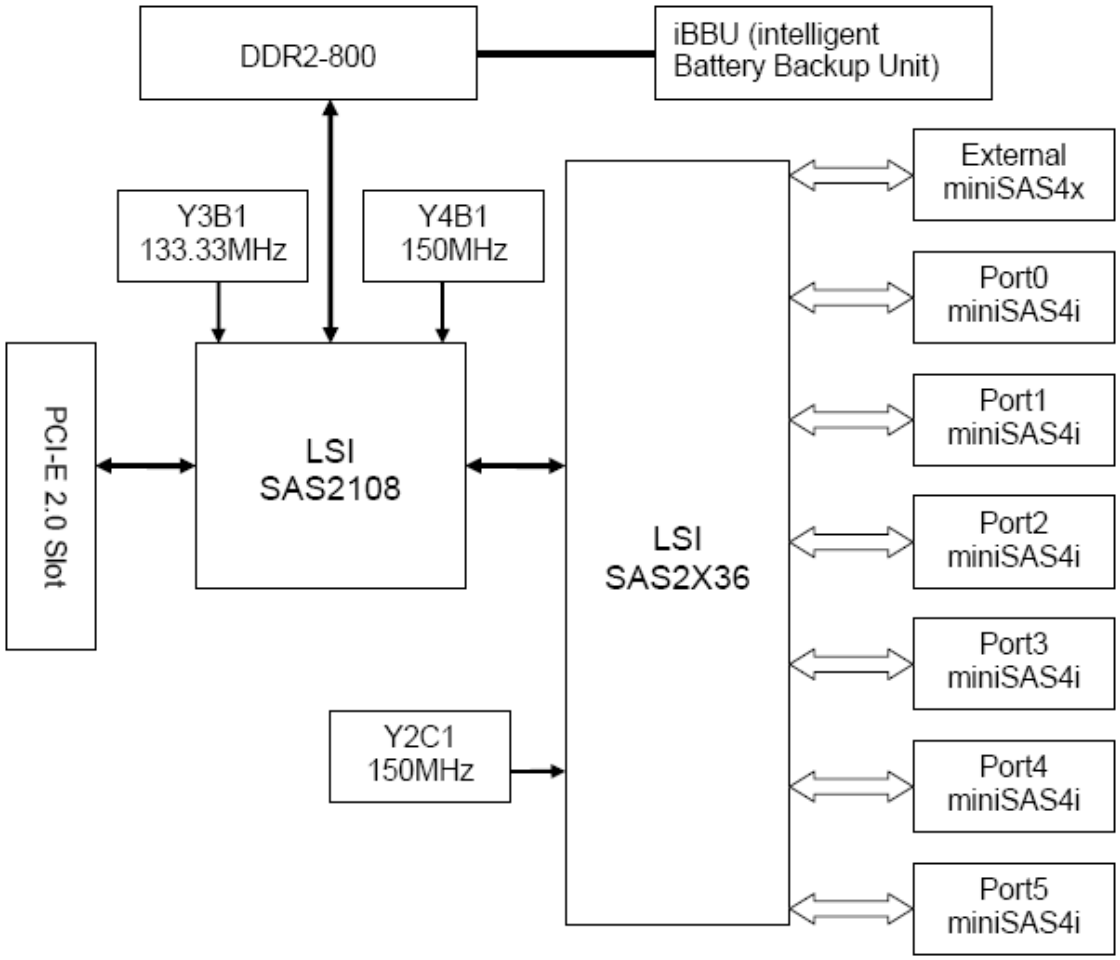
<Y3B1 (133.33MHz), Y4B1 (150MHz)>



<Y2C1 (150MHz)>



3.1.4 THE CIRCUIT BLOCK DIAGRAM OF EUT



3.1.5 ID LABEL SPECIFICATION

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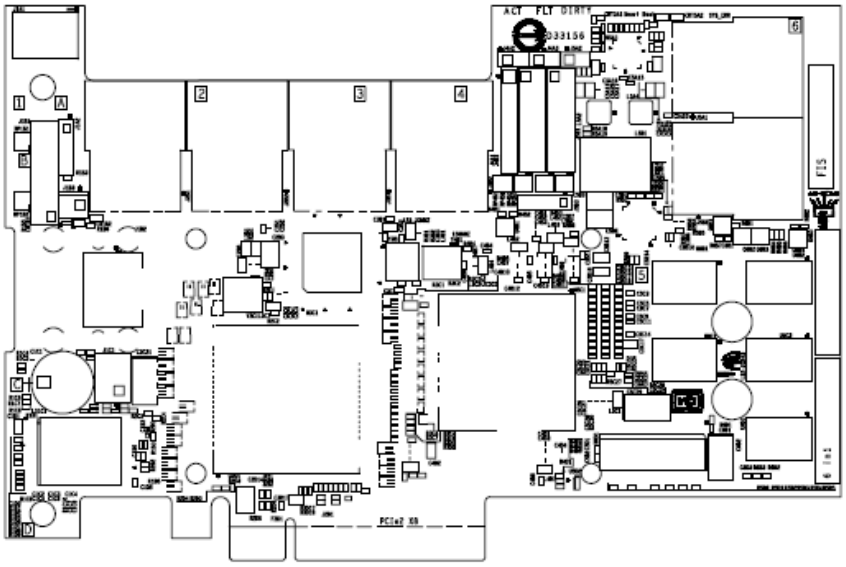

SS1 6050A2282101 B01

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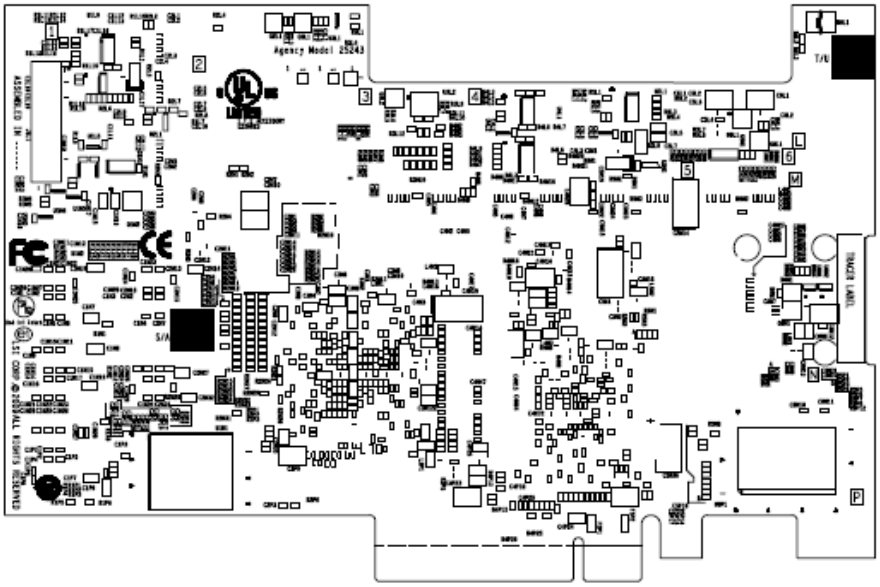


SS2 6050A2282101 B01

3.2 DESCRIPTION OF TEST MODES

The EUT is designed for power from host with AC power supply of rating 100-240V, 50/60Hz.

For radiated emission evaluation, 240Vac/50Hz (for AS/NZS CISPR 22), 230Vac/50Hz (for EN 55022), 120Vac/60Hz (for FCC Part 15), 110Vac/60Hz (for BSMI) and 100Vac/50Hz (for VCCI) had been covered during the pre-test. The worst radiated emission data was found at **110Vac/60Hz** and recorded in the applied test report.

The EUT was pre-tested under following modes, and test mode 1 was the worst case for final test.

TEST MODE	MODEL	TEST CONDITION
1	L3-25243-03A	110Vac/60Hz, Full system
2	L3-25243-04A	
3	L3-25243-06A	
4	L3-25243-04A	100Vac/50Hz, Full system
5		120Vac/60Hz, Full system
6		230Vac/50Hz, Full system
7		240Vac/50Hz, Full system

3.3 GENERAL DESCRIPTION OF THE APPLIED STANDARD

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 55022:2010 +AC:2011, Class B
EN 61000-3-2:2006 +A1:2009 +A2:2009, Class D
EN 61000-3-3:2008
EN 55024:2010
IEC 61000-4-2:2008 ED. 2.0 / EN 61000-4-2:2009
IEC 61000-4-3:2010 ED. 3.2 / EN 61000-4-3:2006 +A1:2008 +A2:2010
IEC 61000-4-4:2012 ED.3.0 / EN 61000-4-4:2004 +A1:2010
IEC 61000-4-5:2005 ED. 2.0 / EN 61000-4-5:2006
IEC 61000-4-6:2008 ED. 3.0 / EN 61000-4-6:2009
IEC 61000-4-8:2009 ED. 2.0 / EN 61000-4-8:2010
IEC 61000-4-11:2004 ED. 2.0 / EN 61000-4-11:2004

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 AND RADIATED EMISSION TESTS >

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	LCD MONITOR	DELL	2408WFPb	CN-0FC255-46633-665-07US	FCC DoC Approved
2	MODEM	ACEEX	1414V/3	0401008271	IFAXDM1414
3	EXTERNAL HARD DISK	DELL	RD1000	HK-0XM763-72953-77J-0032	NA
4	EXTERNAL HARD DISK	DELL	RD1000	CN-0F088R-70561-96D-0005-A00	NA
5	EXTERNAL HARD DISK	DELL	RD1000	HK-0XM763-72953-77Q-001C	NA
6	EXTERNAL HARD DISK	DELL	RD1000	CN-0F088R-70561-96D-002F-A00	NA
7	KEYBOARD	DELL	SK-8110	MY-05N456-71619-3C1-1801	FCC DoC Approved
8	MOUSE	DELL	M071KC	504008965	FCC DoC Approved
9	SERVER	HP	HSTNS-2123	NA	NA
10	HDD Storage	LSI	0834	NA	NA

SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS				
NO.	Length / core	Shielded / non-shielded	Manufacturer	Model Number or Part Number
1	1.8 m VGA cable, with two cores	Braid shielded	NA	NA
2	1.2 m cable, DB25 & DB9 connector, w/o core.	Braid shielded	NA	NA
3	2.0 m USB cable, with two cores.	Shielded	NA	NA
4	2.0 m USB cable, with two cores.	Shielded	NA	NA
5	2.0 m USB cable, with two cores.	Shielded	NA	NA
6	2.0 m USB cable, with two cores.	Shielded	NA	NA
7	2.0 m PS/2 cable, w/o core.	Foil shielded	NA	NA
8	2.0 m PS/2 cable, w/o core.	Foil shielded	NA	NA
9	NA	NA	NA	NA
10	6.0 m mini SAS cable, w/o core.	Shielded	MOLEX	74547-0306

NOTE: 1. All power cords of the above support units are non-shielded (1.8 m).
2. Items 9~10 and mini SAS cable are provided by the client.

< FOR HARMONICS, FLICKER AND IMMUNITY TESTS >

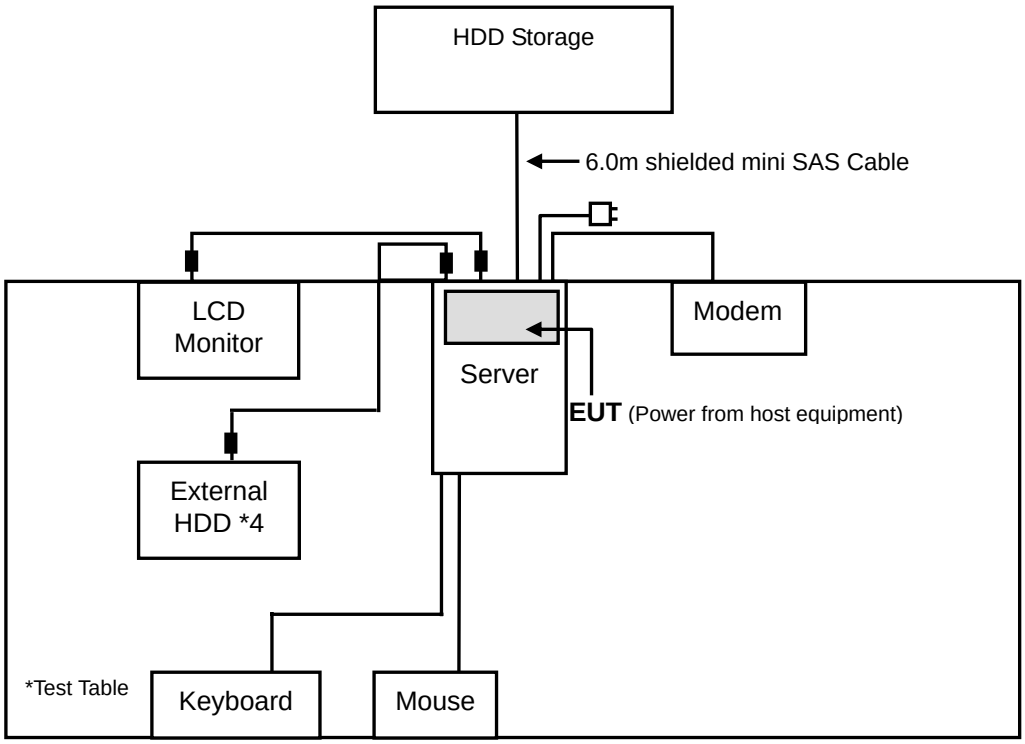
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	LCD MONITOR	DELL	2407WFPb	CN-0YY528-46633-76I-1E7S	FCC DoC Approved
2	MODEM	ACEEX	1414V/3	0401008249	IFAXDM1414
3	3.5" USB+ESATA HDD	Sarotech	FHD-354US	E80P048380735	PBCFHD-354-SRT-FHD-354(B)
4	3.5" USB+ESATA HDD	Sarotech	FHD-354US	E80P048380918	PBCFHD-354-SRT-FHD-354(B)
5	3.5" USB+ESATA HDD	Sarotech	FHD-354US	E80P048380644	PBCFHD-354-SRT-FHD-354(B)
6	3.5" USB+ESATA HDD	Sarotech	FHD-354US	E80P048380919	PBCFHD-354-SRT-FHD-354(B)
7	KEYBOARD	HP	EVT Sample	00029	FCC DoC Approved
8	MOUSE	LOGITECH	M-CAA43	HCA35000024	FCC DoC Approved
9	SERVER	HP	HSTNS-2123	NA	NA

SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS				
NO.	Length / core	Shielded / non-shielded	Manufacturer	Model Number or Part Number
1	1.8 m VGA cable, with two cores.	Braid shielded	NA	NA
2	1.2 m cable, DB25 & DB9 connector, w/o core.	Braid shielded	NA	NA
3	1.0 m USB cable, w/o core.	Shielded	NA	NA
4	1.0 m USB cable, w/o core.	Shielded	NA	NA
5	1.0 m USB cable, w/o core.	Shielded	NA	NA
6	1.0 m USB cable, w/o core.	Shielded	NA	NA
7	2.0 m PS/2 cable, w/o core.	Foil shielded	NA	NA
8	1.8 m PS/2 cable, w/o core.	Foil shielded	NA	NA
9	6.0 m mini SAS cable, w/o core.	Shielded	MOLEX	74547-0306

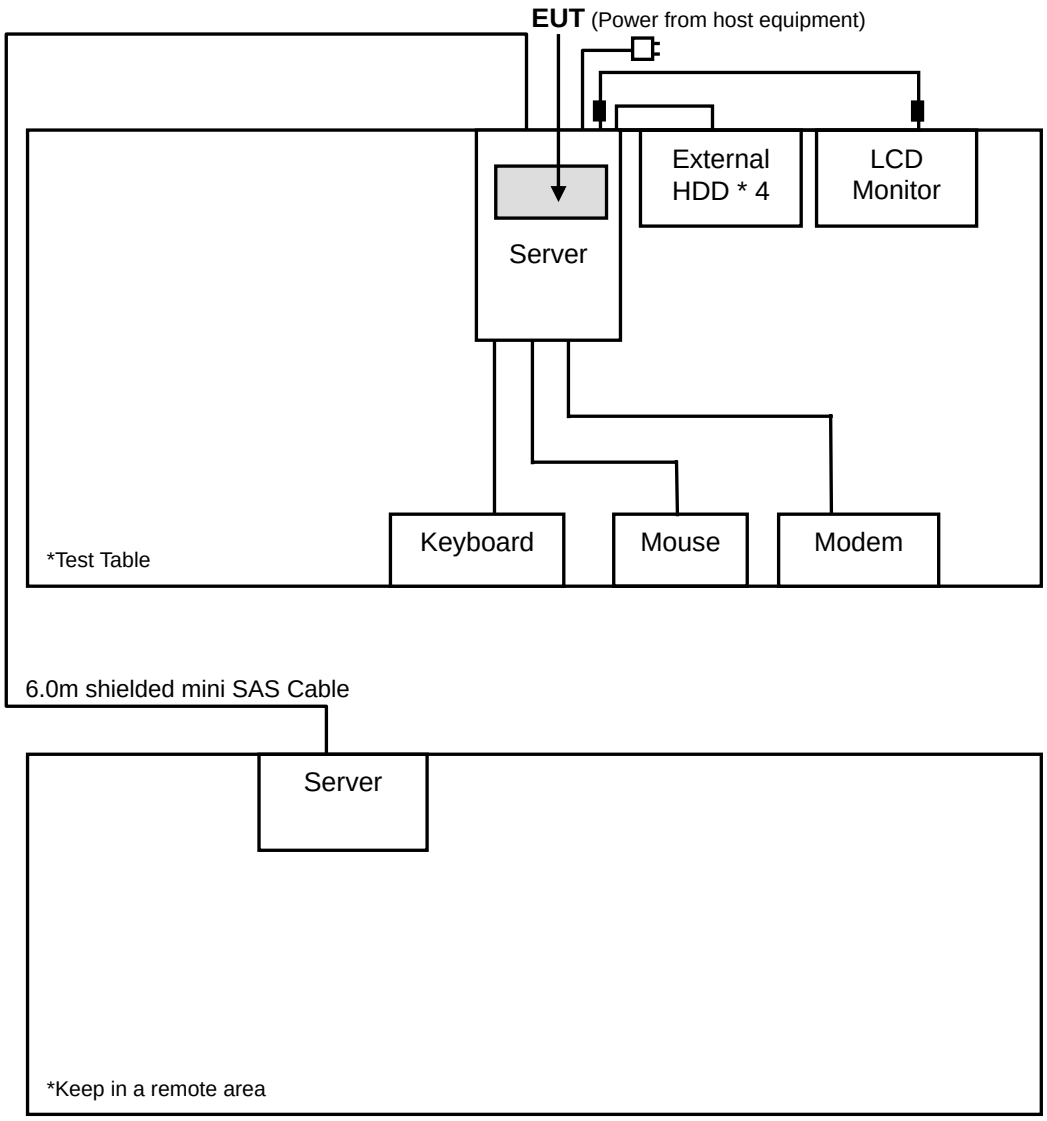
NOTE: 1. All power cords of the above support units are non-shielded (1.8m).
2. Item 9 act as a communication partner to transfer data.
3. Item 9 and mini SAS cable are provided by the client.

3.5 CONFIGURATION OF SYSTEM UNDER TEST

< FOR CONDUCTED AND RADIATED EMISSION TESTS >



< FOR HARMONICS, FLICKER AND IMMUNITY TESTS >



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
0.5-5	73	60	56	46
5-30	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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Dec. 16, 2009	Dec. 15, 2010
RF signal cable Woken	5D-FB	Cable-HYC01-01	Nov. 12, 2009	Nov. 11, 2010
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 18, 2009	Jun. 17, 2010
LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jun. 03, 2009	Jun. 02, 2010
Software ADT	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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

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.

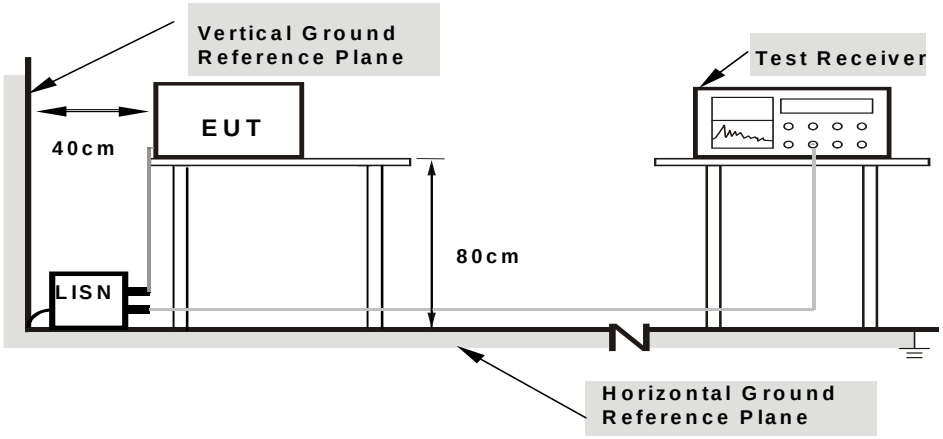
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

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. The EUT was installed into server.

b. The server ran a test program (smasher.exe) to enable all functions.

c. This program is used to exercise the EUT with providing data access as well as writing and reading data to all of disk drives.

d. Run the program “H” pattern on server. This program is used to exercise the EUT writing and reading data to all of disk drives.

e. The server sent “H” patterns to LCD monitor, and it displayed them.

f. The server sent “H” patterns to modem.

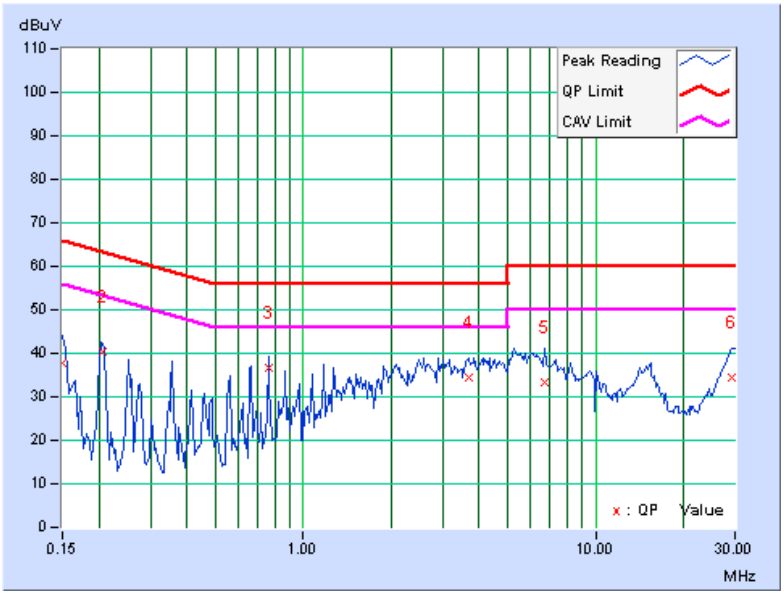
g. Steps d~f were repeated.

4.1.7 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	TEST DATE	Mar. 09, 2010
6dB BANDWIDTH	9 kHz	PHASE	Line 1
ENVIRONMENTAL CONDITIONS	23 deg. C, 69% RH, 1012 hPa	TESTED BY	Whisky Chang

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	0.10	37.78	33.36	37.88	33.46	66.00	56.00	-28.12	-22.54
2	0.206	0.10	40.29	35.74	40.39	35.84	63.37	53.37	-22.98	-17.53
3	0.763	0.15	36.61	32.61	36.76	32.76	56.00	46.00	-19.24	-13.24
4	3.664	0.32	34.22	27.76	34.54	28.08	56.00	46.00	-21.46	-17.92
5	6.668	0.44	32.78	27.25	33.22	27.69	60.00	50.00	-26.78	-22.31
6	29.270	1.32	33.17	26.71	34.49	28.03	60.00	50.00	-25.51	-21.97

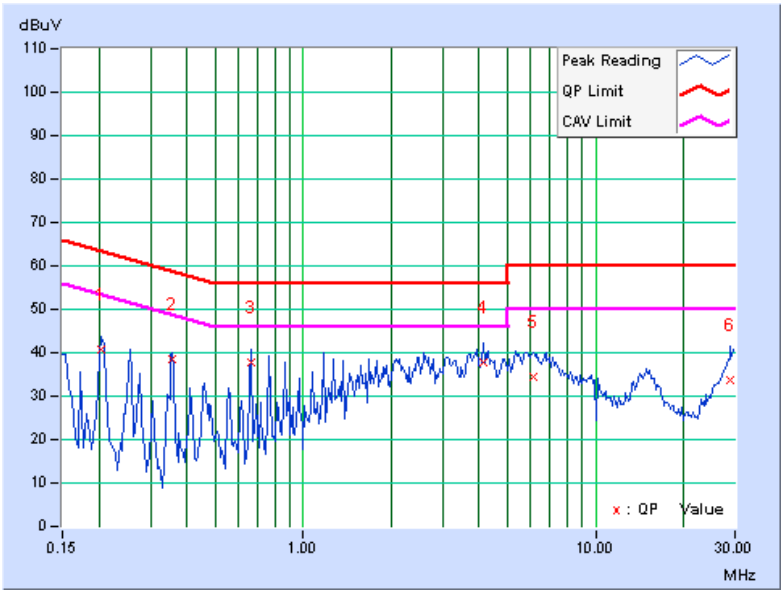
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 09, 2010
6dB BANDWIDTH	9 kHz	**PHASE**	Line 2
ENVIRONMENTAL CONDITIONS	23 deg. C, 69% RH, 1012 hPa	**TESTED BY**	Whisky Chang

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	0.205	0.12	40.59	35.74	40.71	35.86	63.42	53.42	-22.71	-17.56
2	0.357	0.14	38.35	36.16	38.49	36.30	58.80	48.80	-20.31	-12.50
3	**0.662**	**0.16**	**37.68**	**35.20**	**37.84**	**35.36**	**56.00**	**46.00**	**-18.16**	**-10.64**
4	4.125	0.33	37.29	32.23	37.62	32.56	56.00	46.00	-18.38	-13.44
5	6.160	0.38	34.04	28.57	34.42	28.95	60.00	50.00	-25.58	-21.05
6	28.949	0.96	32.83	27.46	33.79	28.42	60.00	50.00	-26.21	-21.58

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 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: EN 55022
FOR FREQUENCY BELOW 1000MHz

Frequency (MHz)	Class A (at 10m)	Class B (at 10m)
	Quasi-peak (dBuV/m)	Quasi-peak (dBuV/m)
30-230	40	30
230-1000	47	37

TEST STANDARD: EN 55022
FOR FREQUENCY ABOVE 1000MHz

Frequency (MHz)	Class A (at 3m)		Class B (at 3m)	
	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)
1000-3000	76	56	70	50
3000-6000	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 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.

FREQUENCY RANGE OF RADIATED MEASUREMENT

Highest frequency generated or used within the EUT or on which the EUT operates or tunes (MHz)	Upper frequency of measurement 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

4.2.2 TEST INSTRUMENTS

For frequency below 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100186	Dec. 11, 2009	Dec. 10, 2010
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Sep. 18, 2009	Sep. 17, 2010
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100076	May 26, 2009	May 25, 2010
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Apr. 28, 2009	Apr. 27, 2010
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Apr. 28, 2009	Apr. 27, 2010
Preamplifier Agilent	8447D	2944A10636	Dec. 10, 2009	Dec. 09, 2010
Preamplifier Agilent	8447D	2944A10637	Dec. 10, 2009	Dec. 09, 2010
RF signal cable Woken	8D-FB	Cable-Hych1-01	Oct. 24, 2009	Oct. 23, 2010
RF signal cable Woken	8D-FB	Cable-Hych1-02	Oct. 24, 2009	Oct. 23, 2010
Software ADT	ADT_Radiated_ V 7.7.03.6	NA	NA	NA
Antenna Tower(V)	MFA-440	9707	NA	NA
Antenna Tower(H)	MFA-440	970705	NA	NA
Turn Table	DS430	50303	NA	NA
Controller	MF7802	074	NA	NA
Controller	MF7802	08093	NA	NA
RF signal cable EAST COST Microwave	HP 160S-29	NA	Feb. 12, 2010	Feb. 11, 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 HwaYa Chamber 1.

3. The FCC Site Registration No. is 477732.

4. The IC Site Registration No. is IC 7450F-1.

5. The VCCI Site Registration No. is R-1893.

For frequency above 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	May 25, 2009	May 24, 2010
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100076	May 26, 2009	May 25, 2010
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Apr. 28, 2009	Apr. 27, 2010
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-405	Feb. 03, 2010	Feb. 02, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170148	Jul. 06, 2009	Jul. 05, 2010
Preamplifier Agilent	8447D	2944A10629	Nov. 04, 2009	Nov. 03, 2010
Preamplifier Agilent	8449B	3008A01959	Dec. 10, 2009	Dec. 09, 2010
RF signal cable HUBER+SUHNER	SUCOFLEX 104	23636/6	Aug. 28, 2009	Aug. 27, 2010
RF signal cable HUBER+SUHNER	SUCOFLEX 104	283402/4	Aug. 28, 2009	Aug. 27, 2010
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA	NA
Turn Table ADT.	TT100.	TT93021702	NA	NA
Controller ADT.	SC100.	SC93021702	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 HwaYa Chamber 2.

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

4. The FCC Site Registration No. is 686814.

5. The IC Site Registration No. is IC 7450F-2.

6. The VCCI Site Registration No. is G-18.

4.2.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. **<Frequency Range below 1GHz>**

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. **<Frequency Range above 1GHz>**

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 rotatable 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 1 GHz.

NOTE:

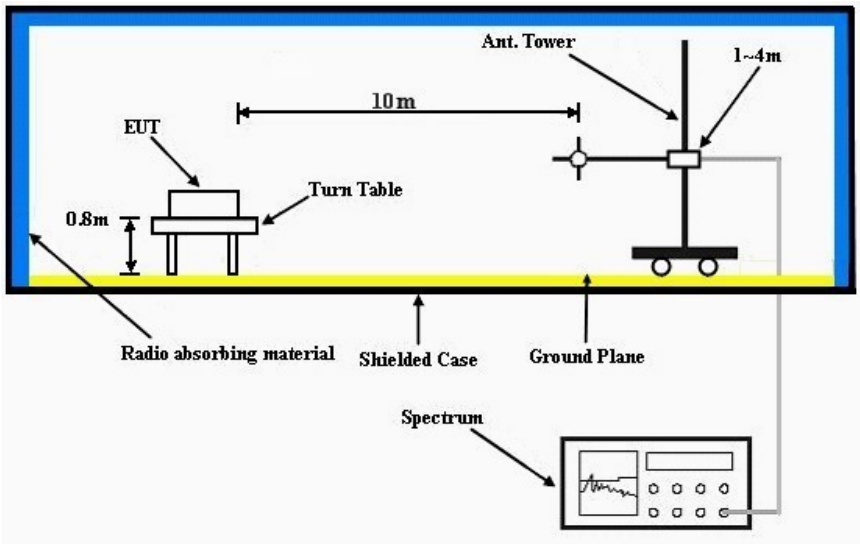
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test 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 receiver antenna.

4.2.4 DEVIATION FROM TEST STANDARD

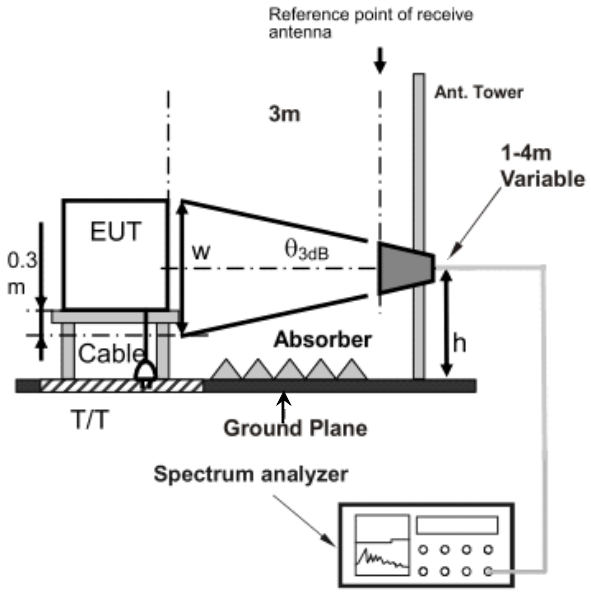
No deviation.

4.2.5 TEST SETUP

For frequency below 1 GHz



For frequency above 1 GHz



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

4.2.6 EUT OPERATING CONDITIONS

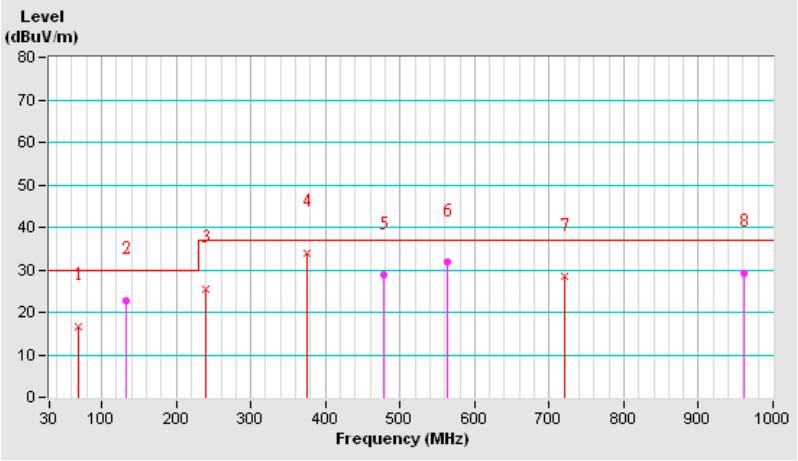
Same as item 4.1.6.

4.2.7 TEST RESULTS

FREQUENCY RANGE	30-1000 MHz	TEST DATE	Mar. 10, 2010
ENVIRONMENTAL CONDITIONS	21 deg. C, 68% RH, 1019 hPa	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Peter 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	68.80	16.59 QP	30.00	-13.41	2.00 H	192	4.88	11.71
2	133.03	22.84 QP	30.00	-7.16	3.00 H	51	10.02	12.82
3	239.99	25.52 QP	37.00	-11.48	2.00 H	158	12.95	12.57
4	**375.00**	**33.91 QP**	**37.00**	**-3.09**	**2.50 H**	**79**	**17.12**	**16.78**
5	479.04	28.71 QP	37.00	-8.29	3.50 H	97	9.59	19.12
6	562.63	31.73 QP	37.00	-5.27	2.00 H	15	10.57	21.16
7	719.97	28.34 QP	37.00	-8.66	4.00 H	85	4.60	23.74
8	961.12	29.17 QP	37.00	-7.83	2.50 H	214	2.43	26.74

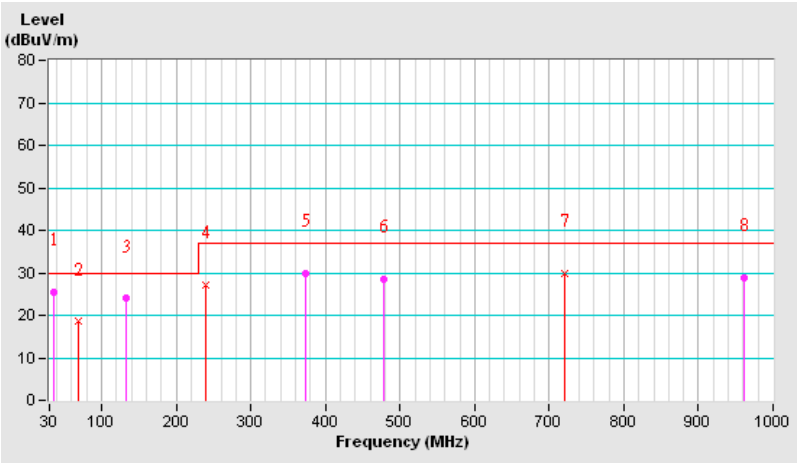
REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



FREQUENCY RANGE	30-1000 MHz	**TEST DATE**	Mar. 10, 2010
ENVIRONMENTAL CONDITIONS	21 deg. C, 68% RH, 1019 hPa	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120 kHz
TESTED BY	Peter 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	35.83	25.34 QP	30.00	-4.66	1.50 V	273	11.57	13.77
2	67.87	18.51 QP	30.00	-11.49	2.50 V	100	6.26	12.25
3	133.03	23.97 QP	30.00	-6.03	1.00 V	285	10.74	13.23
4	240.00	27.07 QP	37.00	-9.93	1.00 V	312	13.92	13.15
5	374.07	29.96 QP	37.00	-7.04	1.00 V	346	12.62	17.34
6	479.04	28.47 QP	37.00	-8.53	1.00 V	186	8.65	19.82
7	720.00	29.93 QP	37.00	-7.07	4.00 V	306	5.50	24.43
8	961.12	28.93 QP	37.00	-8.07	1.00 V	168	1.04	27.89

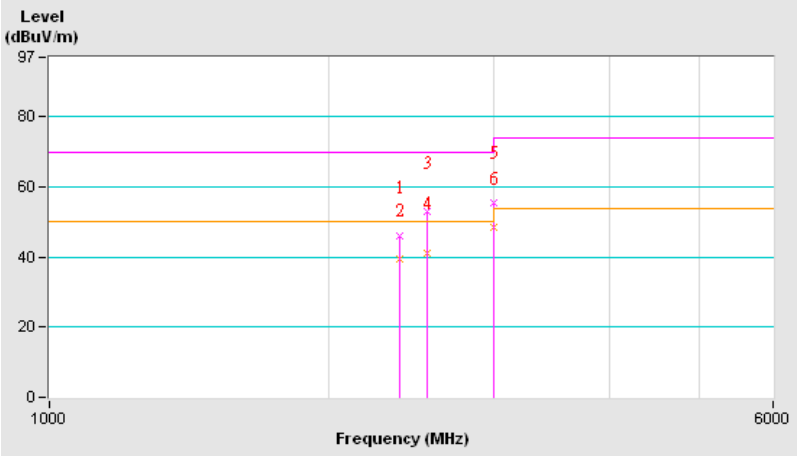
REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 09, 2010
FREQUENCY RANGE	1-6 GHz	**DETECTOR FUNCTION & BANDWIDTH**	Peak/Average, 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 75% RH, 1018 hPa	**TESTED BY**	Eason Chen

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	2383.78	46.04 PK	70.00	-23.96	1.50 H	166	13.73	32.31
2	2383.78	39.38 AV	50.00	-10.62	1.50 H	166	7.07	32.31
3	2551.29	52.84 PK	70.00	-17.16	1.00 H	188	19.92	32.92
4	2551.29	41.24 AV	50.00	-8.76	1.00 H	188	8.32	32.92
5	3000.52	55.63 PK	74.00	-18.37	1.00 H	183	21.29	34.34
6	3000.52	48.47 AV	54.00	-5.53	1.00 H	183	14.13	34.34

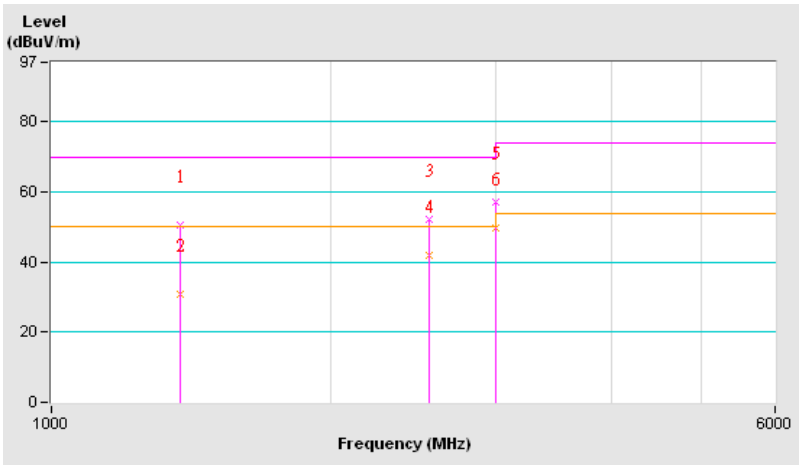
REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 09, 2010
FREQUENCY RANGE	1-6 GHz	**DETECTOR FUNCTION & BANDWIDTH**	Peak/Average, 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 75% RH, 1018 hPa	**TESTED BY**	Eason Chen

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	1375.29	50.60 PK	70.00	-19.40	1.00 V	280	21.61	28.99
2	1375.29	30.79 AV	50.00	-19.21	1.00 V	280	1.80	28.99
3	2551.38	52.05 PK	70.00	-17.95	1.06 V	184	19.13	32.92
4	2551.38	42.01 AV	50.00	-7.99	1.06 V	184	9.09	32.92
5	3000.83	56.99 PK	74.00	-17.01	1.00 V	177	22.65	34.34
6	3000.83	49.69 AV	54.00	-4.31	1.00 V	177	15.35	34.34

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.



4.3 HARMONICS CURRENT MEASUREMENT

4.3.1 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 item section 5 of EN 61000-3-2.

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

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Schaffner AC Power Source	NSG1007	55616	Nov. 12, 2009	Nov. 11, 2010
Schaffner Signal Conditioning Unit- Lumped Impedance	CCN1000-1-LR1	72224	Nov. 12, 2009	Nov. 11, 2010
Software	Schaffner Win 2100V3	NA	NA	NA

NOTE: 1. The test was performed in Hwa Ya EMS Room.

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

4.3.3 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.

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.

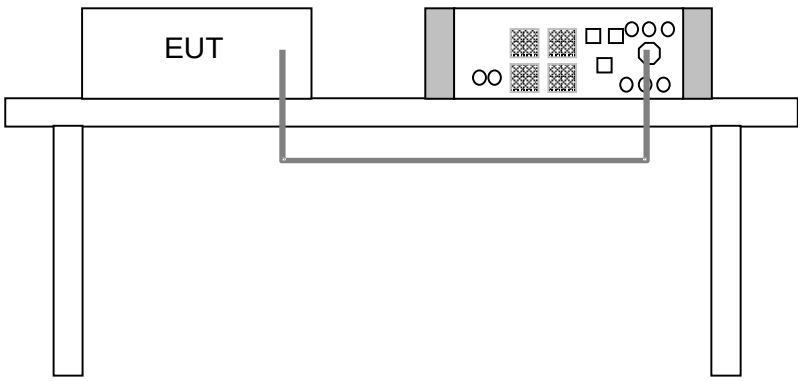
Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers, personal computer monitors and TV receivers.

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.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



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

4.3.6 EUT OPERATING CONDITIONS

a. The EUT was installed into server.

b. The server ran a test program (smasher.exe) to enable all functions.

c. This program is used to exercise the EUT with providing data access as well as writing and reading data to all of disk drives.

d. Prepared a server to act as a communication partner and placed them outside of testing area.

e. Run the program “H” pattern on server. This program is used to exercise the EUT writing and reading data to all of disk drives.

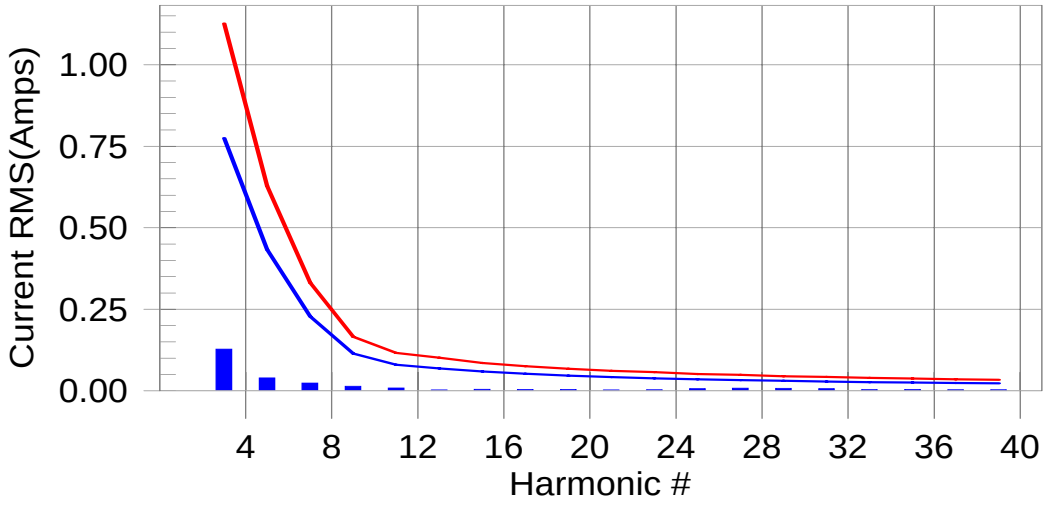
f. The server sent “H” patterns to LCD monitor, and it displayed them.

g. The server sent “H” patterns to modem.

h. Steps e~g were repeated.

4.3.7 TEST RESULTS

FUNDAMENTAL VOLTAGE/AMPERE	230.10 Vrms 0.991 Amps	**TEST DATE**	Mar. 12, 2010
RATED POWER CONSUMPTION	227.9 W	**POWER FREQUENCY**	50.00 Hz
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH, 1016 hPa	**POWER FACTOR**	0.975
TEST DURATION (min)	3	**TESTED BY**	Vison Tseng



Harm #	Harms (avg) (A)	100% Limit (A)	Harms (max) (A)	150% Limit (A)	Test Result
3	0.126	0.775	0.128	1.126	Pass
5	0.039	0.433	0.040	0.628	Pass
7	0.023	0.228	0.023	0.331	Pass
9	0.013	0.114	0.014	0.166	Pass
11	0.009	0.080	0.009	0.116	Pass
13	0.002	0.068	0.003	0.101	Pass
15	0.004	0.059	0.005	0.085	Pass
17	0.004	0.052	0.004	0.075	Pass
19	0.004	0.046	0.004	0.067	Pass
21	0.002	0.042	0.002	0.061	Pass
23	0.003	0.038	0.003	0.057	Pass
25	0.006	0.035	0.006	0.051	Pass
27	0.007	0.033	0.008	0.049	Pass
29	0.007	0.030	0.007	0.044	Pass
31	0.006	0.028	0.006	0.042	Pass
33	0.003	0.026	0.003	0.039	Pass
35	0.003	0.025	0.004	0.038	Pass
37	0.003	0.024	0.003	0.035	Pass
39	0.002	0.023	0.003	0.034	Pass

NOTE: Current inter-harmonics have to be evaluation in addition to the harmonics.

4.4 VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

4.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

TEST STANDARD: EN 61000-3-3

Test Item	Limit	Note
Pst	1.0	Pst means short-term flicker indicator.
Plt	0.65	Plt means long-term flicker indicator.
Tdt (ms)	500	Tdt means maximum time that dt exceeds 3.3 %.
dmax (%)	4%	dmax means maximum relative voltage change.
dc (%)	3.3%	dc means relative steady-state voltage change

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Schaffner AC Power Source	NSG1007	55616	Nov. 12, 2009	Nov. 11, 2010
Schaffner Signal Conditioning Unit- Lumped Impedance	CCN1000-1-LR1	72224	Nov. 12, 2009	Nov. 11, 2010
Software	Schaffner Win 2100V3	NA	NA	NA

NOTE: 1. The test was performed in Hwa Ya EMS Room.

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

4.4.3 TEST PROCEDURE

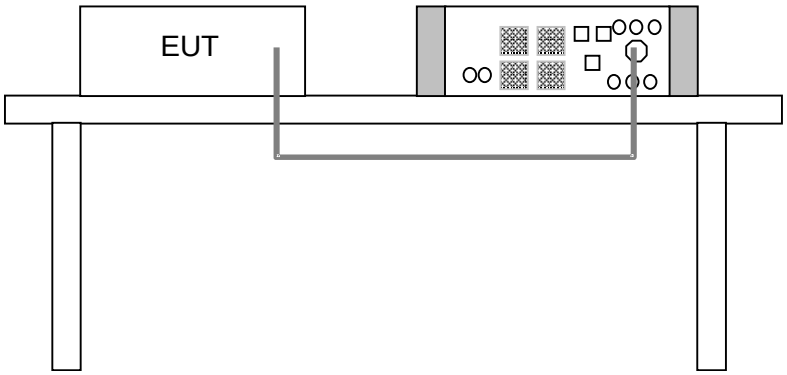
a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

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 120 minutes.

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

Same as item 4.3.6.

4.4.7 TEST RESULTS

FUNDAMENTAL VOLTAGE/AMPERE	229.67 Vrms 0.991 Amps	**TEST DATE**	Mar. 12, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH, 1016 hPa	**POWER FREQUENCY**	50.00 Hz
OBSERVATION PERIOD (Tp)	120 mins	**POWER FACTOR**	0.975
TESTED BY	Vison Tseng		

TEST PARAMETER	MEASUREMENT VALUE	LIMIT	REMARK
P_{st}	0.064	1.0	PASS
P_{lt}	0.064	0.65	PASS
T_{dt} (ms)	0	500	PASS
d_{max} (%)	-0.10	4%	PASS
dc (%)	0	3.3%	PASS

NOTE: 1. P_{st} means short-term flicker indicator.
2. P_{lt} means long-term flicker indicator.
3. T_{dt} means maximum time that dt 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**	
Basic Standard, specification requirement, and Performance Criteria	EN 61000-4-2	Electrostatic Discharge – ESD: 8 kV air discharge, 4 kV contact discharge, Performance Criterion B
	EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80-1000 MHz, 3 V/m, 80% AM (1 kHz), Performance Criterion A
	EN 61000-4-4	Electrical Fast Transient/Burst - EFT AC power line: 1 kV, DC power line: 0.5 kV, Signal line: 0.5 kV Performance Criterion B
	EN 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 2 kV, DC power line: line to earth 0.5 kV, Signal line: 1 kV Performance Criterion B
	EN 61000-4-6	Conducted Radio Frequency Disturbances Test – CS: 0.15-80 MHz, 3 Vrms, 80% AM, 1 kHz, Performance Criterion A
	EN 61000-4-8	Power Frequency Magnetic Field Test, 50 Hz, 1 A/m, Performance Criterion A
	EN 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 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 PARTICULAR PERFORMANCE CRITERIA DESCRIPTION FOR LAN FUNCTION

Criterion A	During and after the test, the EUT shall operate without: - error rate beyond the figure defined by the manufacturer; - requests for retry beyond the figure defined by the manufacturer; - speed of data transmission rate beyond the figure defined by the manufacturer; - protocol failure; - loss of link.
Criterion B	Error rate, request for retry and speed of data transmission rate may be degraded during the application of the test. Degradation of the performance as described in criterion A is permitted provided that the normal operation of the EUT is self-recoverable to the condition immediately before the application of the test. In these cases, operator response is permitted to re-initiate an operation.
Criterion C	Degradation of the performance as described in criteria A and B is permitted provided that the normal operation of the EUT is self-recoverable to the condition immediately before the application of the test or can be restored after the test by the operator.

5.4 EUT OPERATING CONDITION

Same as item 4.3.6.

5.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

5.5.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 2, 4, 6, 8 kV (Direct)
	Contact Discharge: 2, 4, 6 kV (Direct / Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: min. 50 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
ELECTROSTATIC DISCHARGE (EMTEST)	Dito//DM-150/330//DM-150/330-rfci	V0701102114//0793//0795	Nov. 23, 2009	Nov. 22, 2010

NOTE: 1. The test was performed in Hwa Ya ESD 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.

5.5.3 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 EN 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.

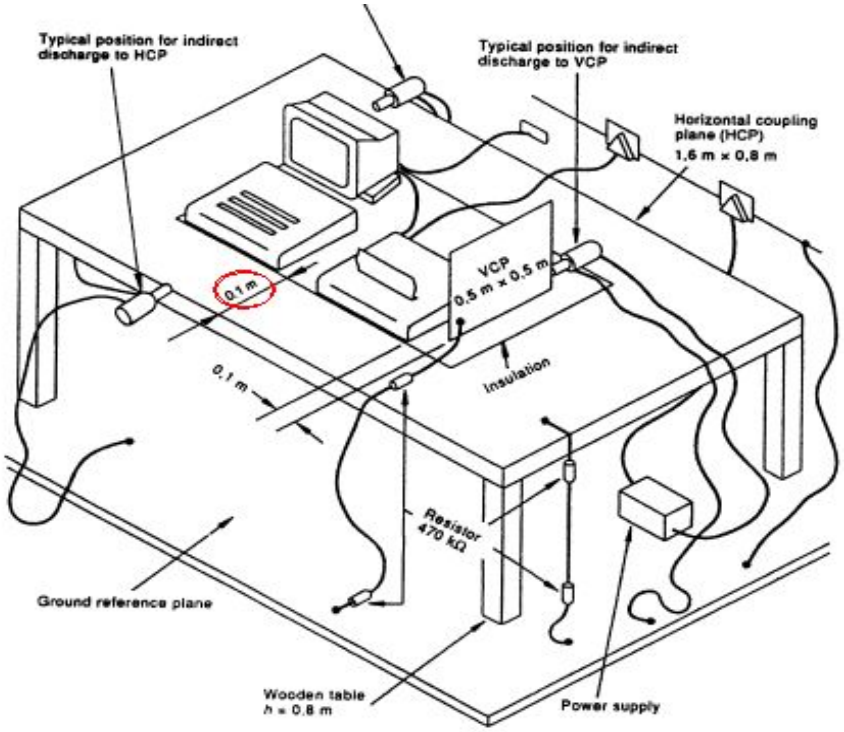
g. At least ten single discharges (in the most sensitive polarity) were applied to the **H**orizontal **C**oupling **P**lane at points on each side of the EUT. The ESD generator was positioned horizontally at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP.**

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.

5.5.4 DEVIATION FROM TEST STANDARD

The requirement followed by the client's specification.

5.5.5 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 EN 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 EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP 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.

5.5.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 44% RH 1016 hPa	**TESTED BY**	Andy Chang

TEST RESULTS OF DIRECT APPLICATION					
Discharge Level (kV)	**Polarity**	**Test Point**	**Contact Discharge**	**Air Discharge**	**Performance Criterion**
2, 4, 6	+/-	1, 2, 3, 5, 6	NOTE	NA	A
2, 4, 8	+/-	4, 7	NA	NOTE	A

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

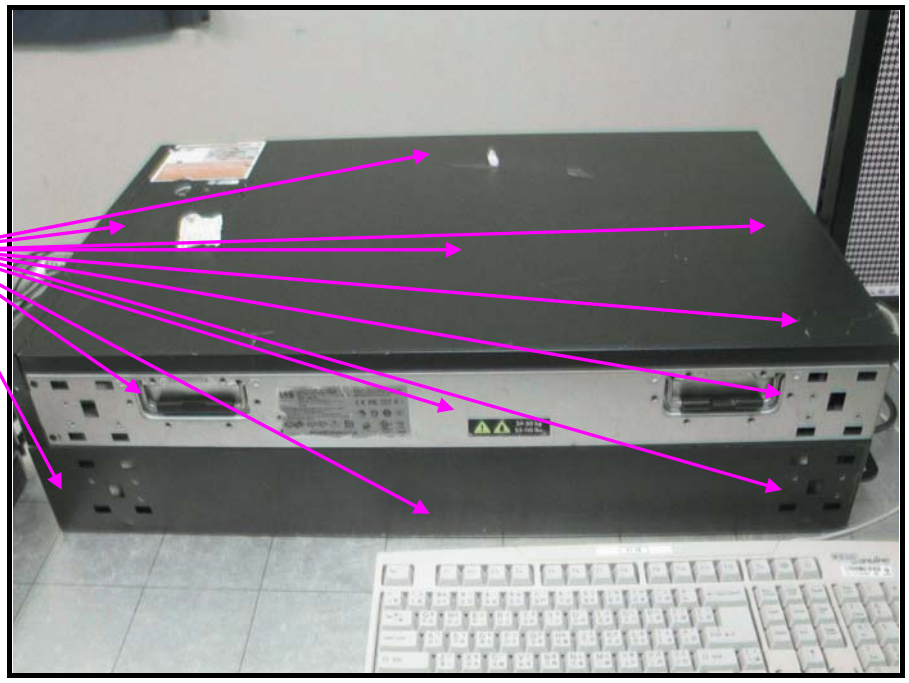
TEST RESULTS OF INDIRECT APPLICATION					
Discharge Level (kV)	**Polarity**	**Test Point**	**Horizontal Coupling Plane**	**Vertical Coupling Plane**	**Performance Criterion**
2, 4, 6	+/-	4 sides	NOTE	NOTE	A

Description of test point:

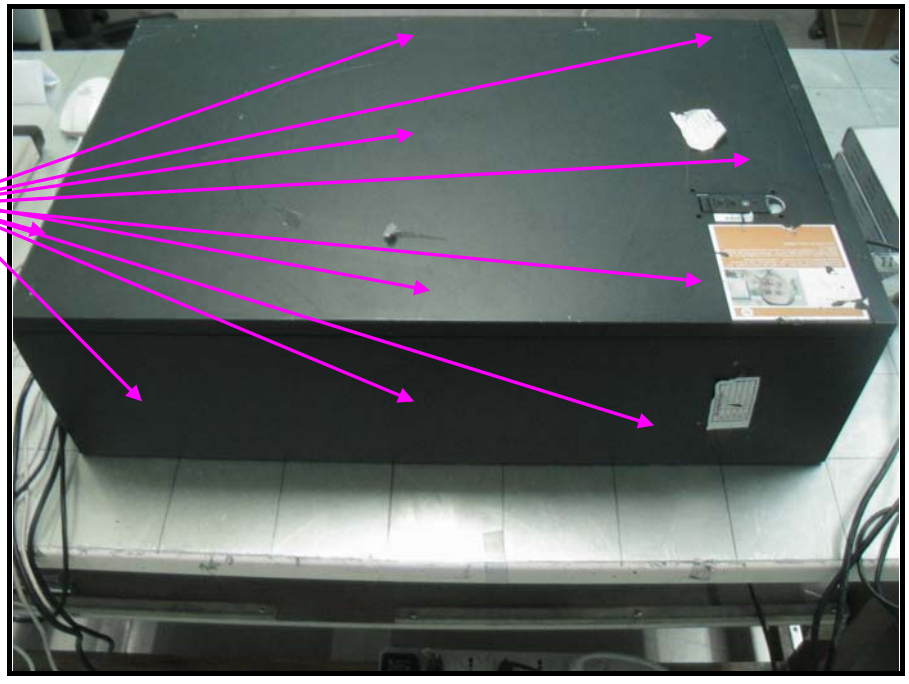
1. Front side 2. Rear side 3. Right side 4. Left side

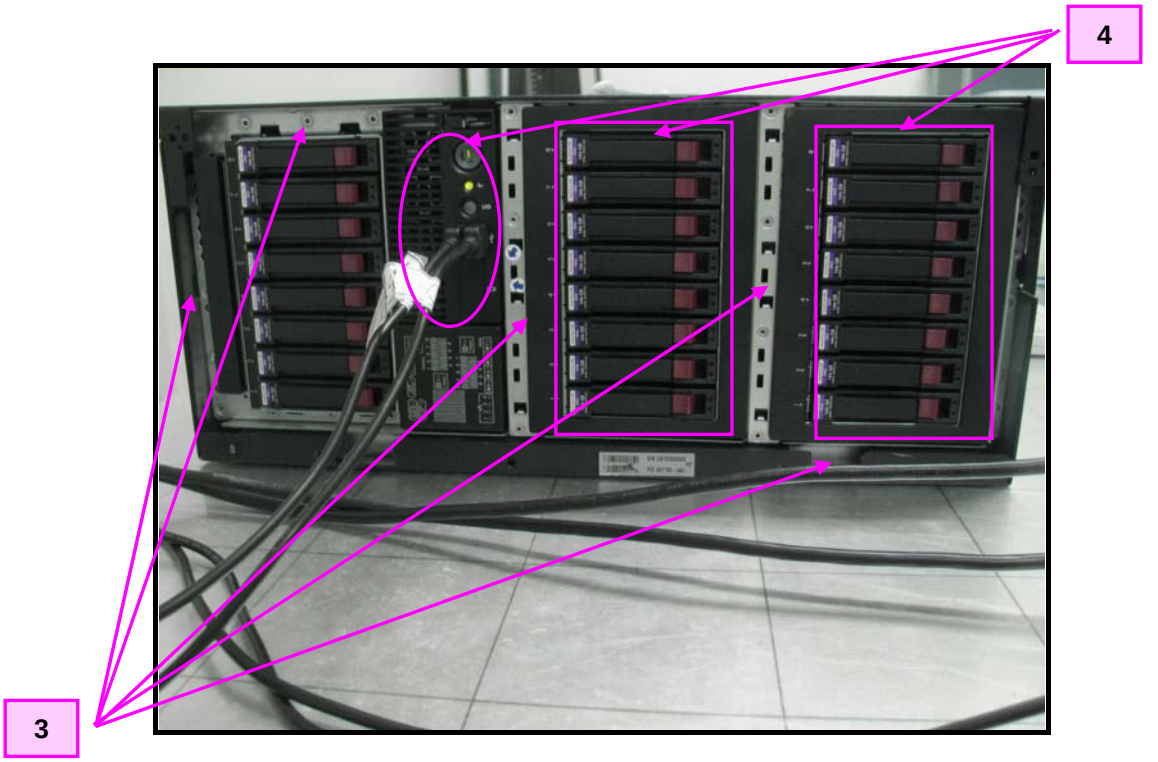
NOTE: There was no change compared with initial operation during and after the test.

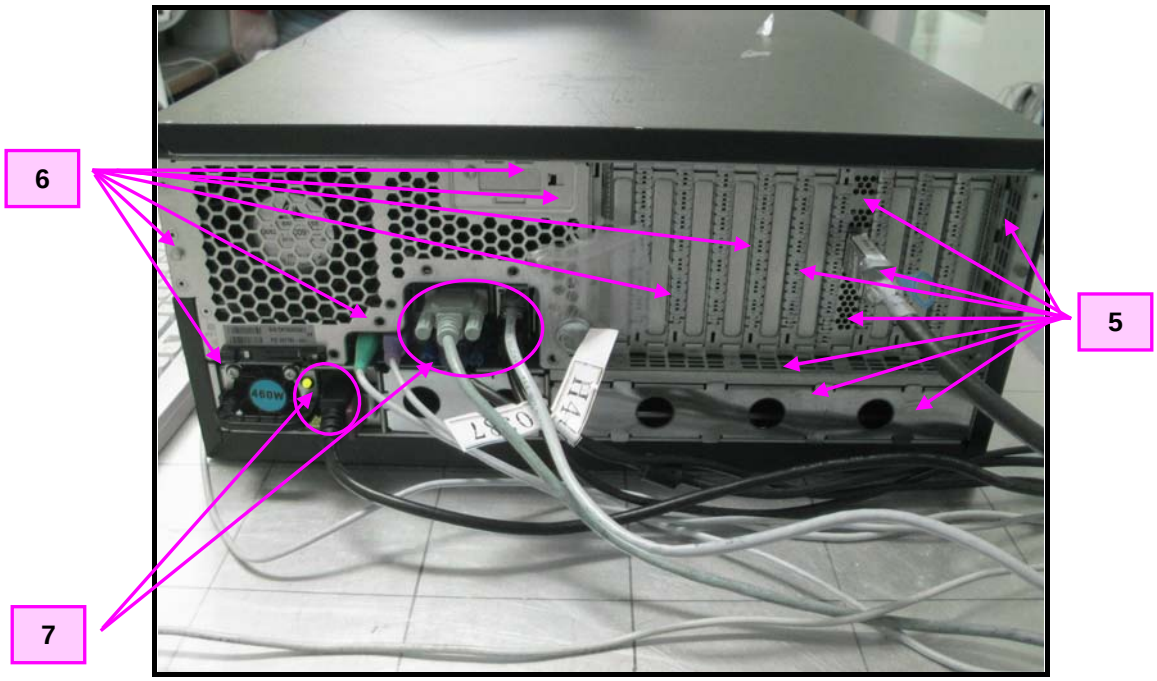
1



2




4
3


6
5
7

5.6 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMNITY TEST (RS)

5.6.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-3
Frequency Range:	80 MHz ~ 1000 MHz, 100 MHz, 133.33 MHz, 150 MHz, 200 MHz, 533 MHz, 800 MHz
Field Strength:	3 V/m
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5 m
Dwell Time:	3 seconds, 60 seconds

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Boonton RF Power Meter	4232A-01-02	107402	Apr. 23, 2009	Apr. 22, 2010
R&S Signal Generator	SML03	102843	Aug. 31, 2009	Aug. 30, 2010
LOG ANTENNA	AT5080ANT	303730	NA	NA
Amplifier	60S1G3M1	308049	NA	NA
Amplifier RF TEST SYSCTRLR	SC1000M1	308057	NA	NA
Amplifier	150W1000	322011	NA	NA
Amplifier	DC7144A	307880	NA	NA
POWER SENSOR	51011-EMC	33105	Apr. 23, 2009	Apr. 22, 2010
POWER SENSOR	51011-EMC	33107	Apr. 23, 2009	Apr. 22, 2010
Software	ADT_RS_V450	NA	NA	NA

NOTE: 1. The test was performed in Hwa Ya RS Room 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 2.0 meters from the EUT. (For frequency range 80MHz ~ 1GHz).

5.6.3 TEST PROCEDURE

The test procedure was in accordance with EN 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, 100 MHz, 133.33 MHz, 150 MHz, 200 MHz, 533 MHz and 800 MHz, with the signal 80% amplitude modulated with a 1 kHz sinewave.

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.

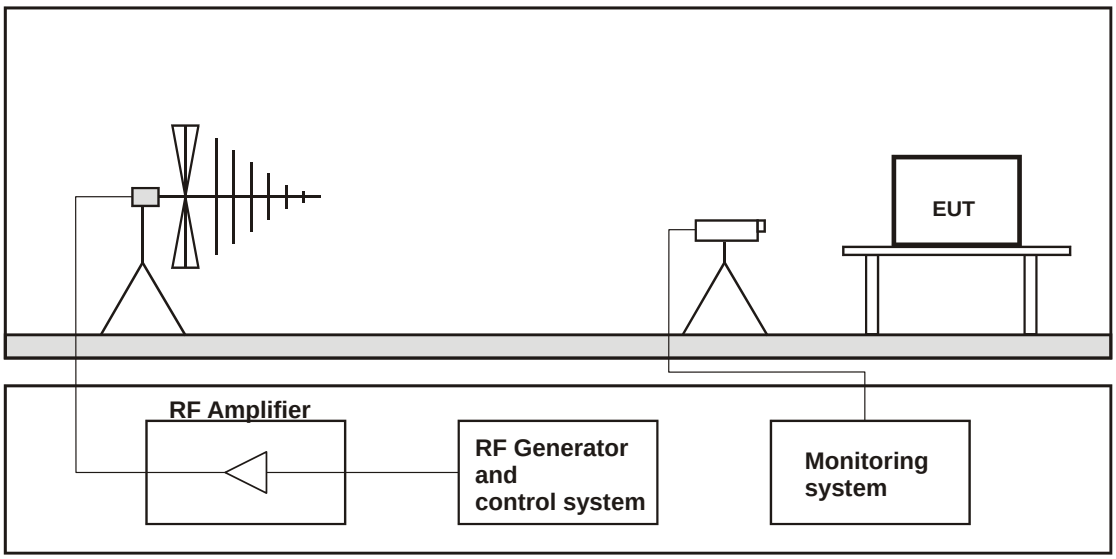
d. The field strength level was 3 V/m.

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

5.6.4 DEVIATION FROM TEST STANDARD

The requirement followed by the client's specification.

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 EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR STANDING EQUIPMENT
The EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

5.6.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	TEST DATE	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH 1016 hPa	TESTED BY	Brian Hsieh

Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Observation	Performance Criterion
80-1000	V&H	0, 90, 180, 270	3	NOTE	A
100	V&H	0, 90, 180, 270	3	NOTE	A
133.33	V&H	0, 90, 180, 270	3	NOTE	A
150	V&H	0, 90, 180, 270	3	NOTE	A
200	V&H	0, 90, 180, 270	3	NOTE	A
533	V&H	0, 90, 180, 270	3	NOTE	A
800	V&H	0, 90, 180, 270	3	NOTE	A

NOTE:
1. There was no change compared with initial operation during and after the test.
2. As client's request, the addition of 6 sensitive frequencies: 100MHz, 133.33MHz, 150MHz, 200MHz, 533MHz, 800MHz were tested in dwell time of 60 seconds.

5.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

5.7.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-4
Test Voltage:	Power line: 1 kV
	Signal line: 0.5 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Waveshape:	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 min.

5.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMC-Partner EFT Generator	TRA2000EFT-C1	623	Sep. 10, 2009	Sep. 09, 2010
EMC-Partner Capacitive Coupling clamp	CN-EFT1000	364	NA	NA
EFT Adapter WONPRO	WA	EF1Ada-001	NA	NA
Software	EMC-Partner GENECS	NA	NA	NA

NOTE: 1. The test was performed in Hwa Ya 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.

5.7.3 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 was 0.5 m.

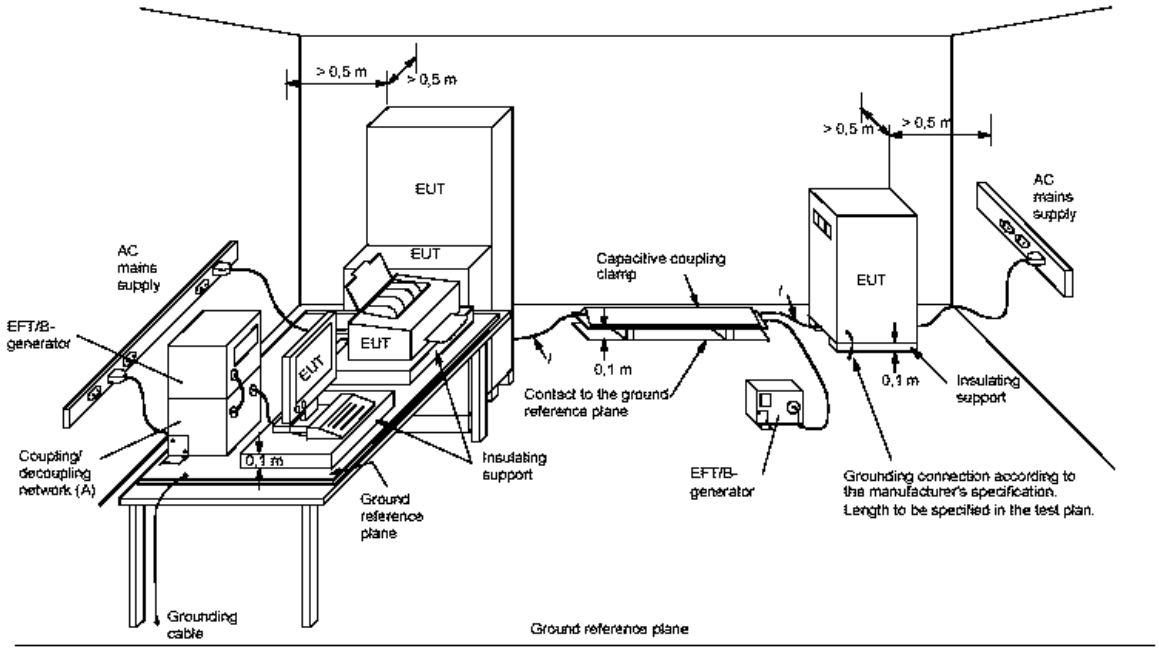
c. The duration time of each test sequential was 1 minute.

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

5.7.4 DEVIATION FROM TEST STANDARD

No deviation.

5.7.5 TEST SETUP



NOTE:
/ length between clamp and the EUT to be tested (should be 0.5 m ± 0.05 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 m ± 0.01 m thick. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

5.7.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	TEST DATE	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH 1016 hPa	TESTED BY	Match Tsui

Test Point	Polarity	Test Level (kV)	Observation	Performance Criterion
L1	+/-	1	NOTE	A
L2	+/-	1	NOTE	A
PE	+/-	1	NOTE	A
L1-L2-PE	+/-	1	NOTE	A
Mini SAS cable	+/-	0.5	NOTE	A

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

5.8 SURGE IMMUNITY TEST

5.8.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-5
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power port: 0.5, 1, 2 kV
Surge Input/Output:	L1-L2, L1-PE, L2-PE
Generator Source Impedance:	2 ohm between networks 12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0°/90°/180°/270°
Pulse Repetition Rate:	60 sec.
Number of Tests:	5 positive and 5 negative at selected points

5.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Modular Impulse Generator EMC-Partner Modular	MIG0603IN3	352	Aug. 28, 2009	Aug. 27, 2010
EMC-Partner	CDN UTP8	011	Apr. 20, 2009	Apr. 19, 2010
Surge Adapter WONPRO	WA	SU1 Ada-001	NA	NA

NOTE: 1. The test was performed in Hwa Ya 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.

5.8.3 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).

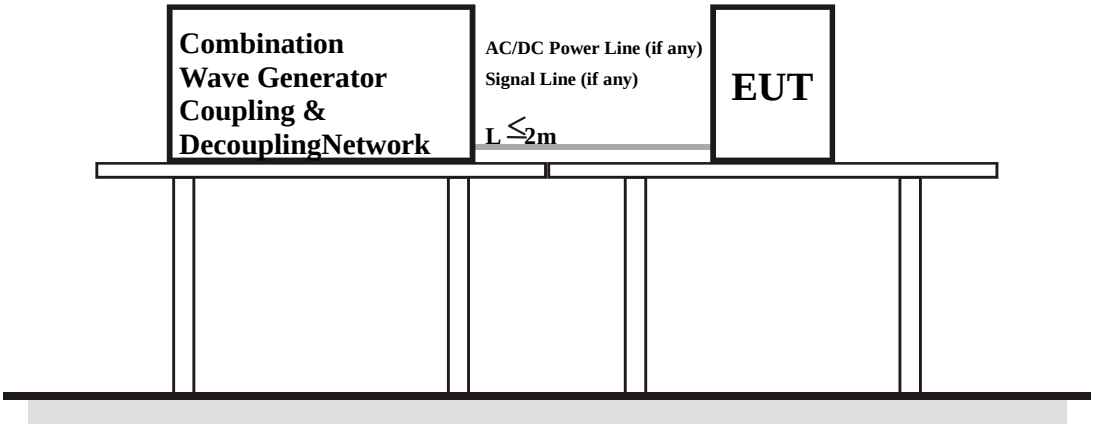
c. For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:

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).

5.8.4 DEVIATION FROM TEST STANDARD

No deviation.

5.8.5 TEST SETUP



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

5.8.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	TEST DATE	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH 1016 hPa	TESTED BY	Match Tsui

AC/DC power port

Voltage (kV)	Test Point	Polarity	Observation				Performance Criterion
			0°	90°	180°	270°	
0.5, 1	L1-L2	+/-	NOTE	NOTE	NOTE	NOTE	A
0.5, 1, 2	L1-PE	+/-	NOTE	NOTE	NOTE	NOTE	A
0.5, 1, 2	L2-PE	+/-	NOTE	NOTE	NOTE	NOTE	A

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

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

5.9.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-6
Frequency Range:	0.15 MHz ~ 80 MHz
Field Strength:	3 $V_{r.m.s.}$
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Coupled Cable:	Power Mains, Unshielded
Coupling Device:	CDN-M3 (3 wires), EM-Clamp

5.9.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
FCC POWER LINE COUPLING DECOUPLING NETWORK	M/N:FCC-801 -M1-25A	03030	Nov. 08, 2009	Nov. 07, 2010
FCC POWER LINE COUPLING DECOUPLING NETWORK	M/N:FCC-801 -M2-25A	03049	Nov. 08, 2009	Nov. 07, 2010
FCC POWER LINE COUPLING DECOUPLING NETWORK	M/N:FCC-801 -M2-25A	03050	Nov. 08, 2009	Nov. 07, 2010
FCC POWER LINE COUPLING DECOUPLING NETWORK	M/N:FCC-801 -M3-25A	03056	Nov. 08, 2009	Nov. 07, 2010
FCC POWER LINE COUPLING DECOUPLING NETWORK	M/N:FCC-801 -M3-25A	03057	Nov. 08, 2009	Nov. 07, 2010
FCC SIGNAL LINE POWER LINE COUPLING DECOUPLING NETWORK	P/N:FCC-801-T2	03030	Nov. 08, 2009	Nov. 07, 2010
FCC SIGNAL LINE POWER LINE COUPLING DECOUPLING NETWORK	P/N:FCC-801-T4	03031	Nov. 08, 2009	Nov. 07, 2010
FCC SIGNAL LINE POWER LINE COUPLING DECOUPLING NETWORK	P/N:FCC-801-T8	03032	Nov. 08, 2009	Nov. 07, 2010
EMI Injection Clamp	P/N:F-203I -23MM	434	Nov. 08, 2009	Nov. 07, 2010
BOONTON 4232ARF POWER METER	4232A-01-02	104302	Nov. 10, 2009	Nov. 09, 2010
R&S Signal generator	SML 03	102843	Aug. 31, 2009	Aug. 30, 2010
Software	ADT_CS_V37	NA	NA	NA
POWER SENSOR	51011-EMC	30028	Nov. 10, 2009	Nov. 09, 2010
POWER SENSOR	51011-EMC	33029	Nov. 10, 2009	Nov. 09, 2010

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

5.9.3 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. The sweep rate shall not exceed 1.5×10^{-3} decades/s. The step size shall not exceed 1 % of the start and thereafter 1 % of preceding frequency value where the frequency is swept incrementally.

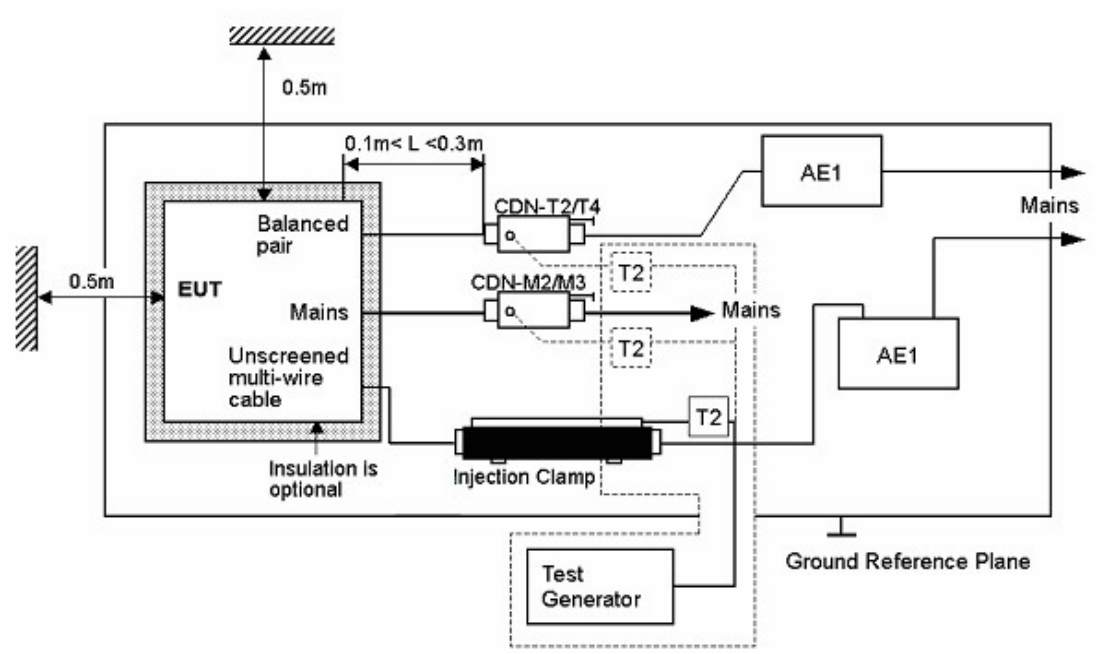
d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, shall be analyzed separately.

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

5.9.4 DEVIATION FROM TEST STANDARD

No deviation.

5.9.5 TEST SETUP



Note: 1. The EUT is setup 0.1 m above Ground Reference Plane
2. 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.

5.9.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH 1016 hPa	**TESTED BY**	Skys Huang

Frequency Band (MHz)	Applied Voltage (Vrms)	Tested Line	Injection Method	Observation	Performance Criterion
0.15-80	3	Power Line	CDN-M3	NOTE	A
0.15-80	3	Mini SAS cable	EM-Clamp	NOTE	A

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

5.10 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

5.10.1 TEST SPECIFICATION

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

5.10.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Schaffner Induction Coil Interface	INA2141	6015	NA	NA
Schaffner AC Power Source	NSG1007	55616	Nov. 12, 2009	Nov. 11, 2010
Schaffner INA702 Coil	INA702	111	NA	NA
Software	Schaffner Win 2120V3	NA	NA	NA

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

5.10.3 TEST PROCEDURE

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

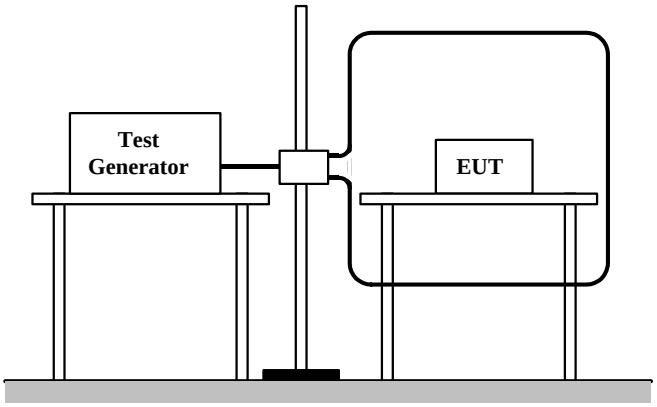
b. The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.

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.

5.10.4 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.

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.

5.10.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH 1016 hPa	**TESTED BY**	Match Tsui

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.

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

5.11.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-11
Test levels:	Voltage Dips: i) >95% reduction voltage for 0.5 period ii)30% reduction voltage for 25 period Voltage Interruptions: i) >95% reduction voltage for 250 period
Interval between Event:	10 seconds
Phase Angle:	0°/180°
Test Cycle:	3 times

5.11.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Schaffner AC Power Source	NSG1007	55616	Nov. 12, 2009	Nov. 11, 2010
Schaffner Signal Conditioning Unit- Lumped Impedance	CCN1000-1-LR1	72224	Nov. 12, 2009	Nov. 11, 2010
Software	Schaffner Win 2100V3	NA	NA	NA

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

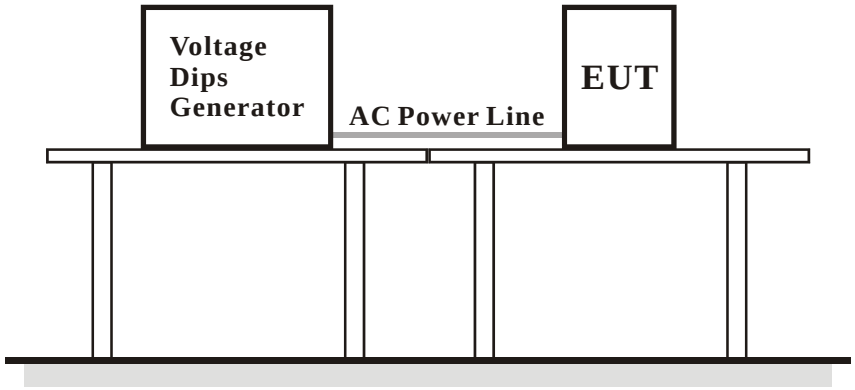
5.11.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of 3 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.

5.11.4 DEVIATION FROM TEST STANDARD

No deviation.

5.11.5 TEST SETUP



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

5.11.6 TEST RESULTS

INPUT POWER (SYSTEM)	230 Vac, 50 Hz	**TEST DATE**	Mar. 15, 2010
ENVIRONMENTAL CONDITIONS	23 deg. C, 54% RH 1016 hPa	**TESTED BY**	Match Tsui

Ut: 230Vac, 50Hz				
Voltage Dips (% Reduction)	**Duration (Period)**	**Total Events (time)**	**Observation**	**Performance Criterion**
>95	0.5	3	NOTE 1	A
30	25	3	NOTE 1	A
>95	250	3	NOTE 2	C

Ut: 240Vac, 50Hz				
Voltage Dips (% Reduction)	**Duration (Period)**	**Total Events (time)**	**Observation**	**Performance Criterion**
>95	0.5	3	NOTE 1	A
30	25	3	NOTE 1	A
>95	250	3	NOTE 2	C

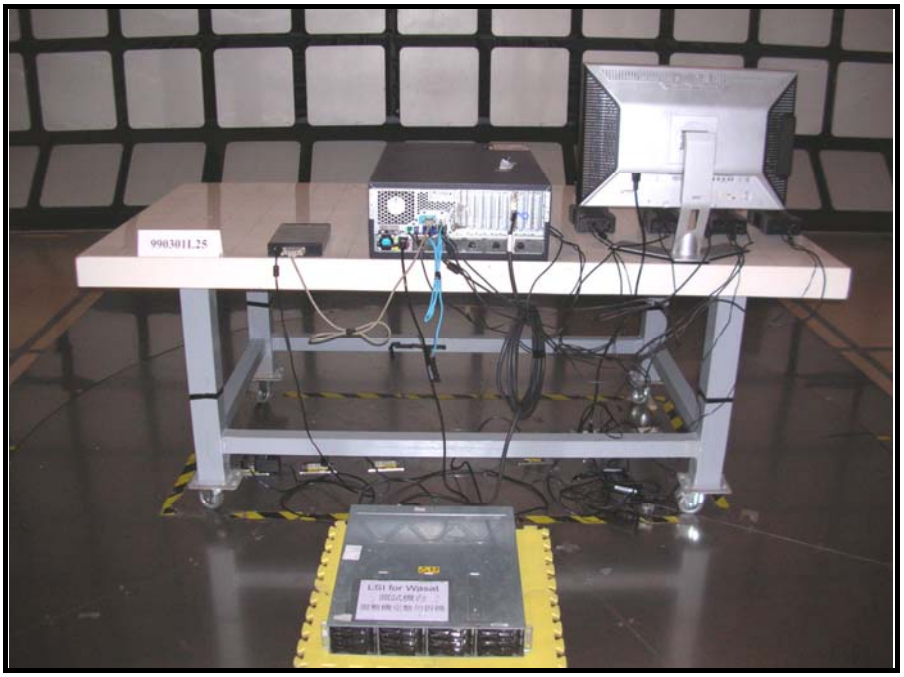
Ut: 100Vac, 50Hz				
Voltage Dips (% Reduction)	**Duration (Period)**	**Total Events (time)**	**Observation**	**Performance Criterion**
>95	0.5	3	NOTE 1	A
30	25	3	NOTE 1	A
>95	250	3	NOTE 2	C

NOTE:
1. There was no change compared with the initial operation during the test.
2. The power lost power during the test, and must be recovered manually.

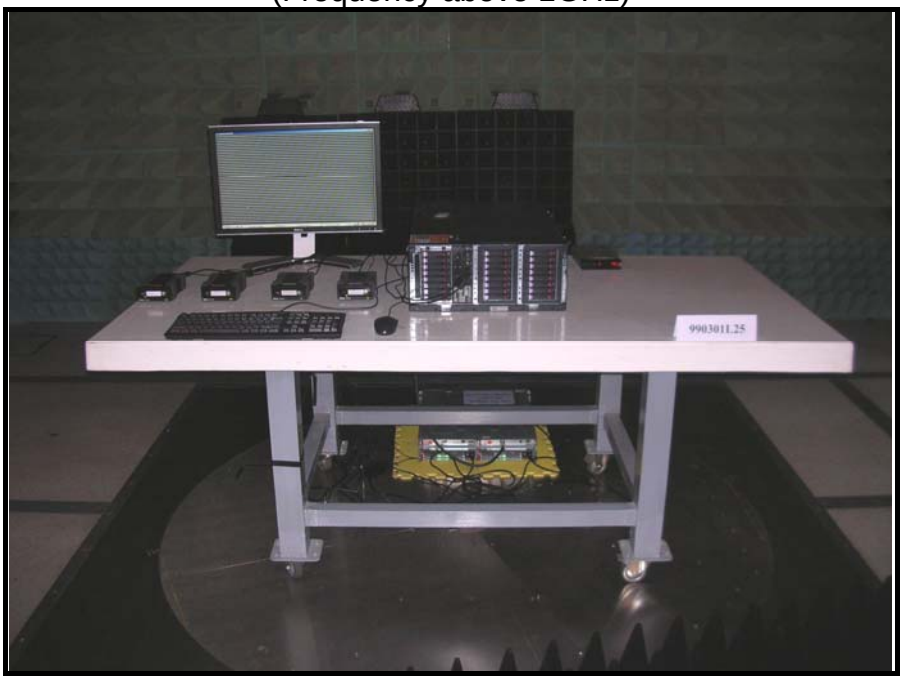
6 PHOTOGRAPHS OF THE TEST CONFIGURATION

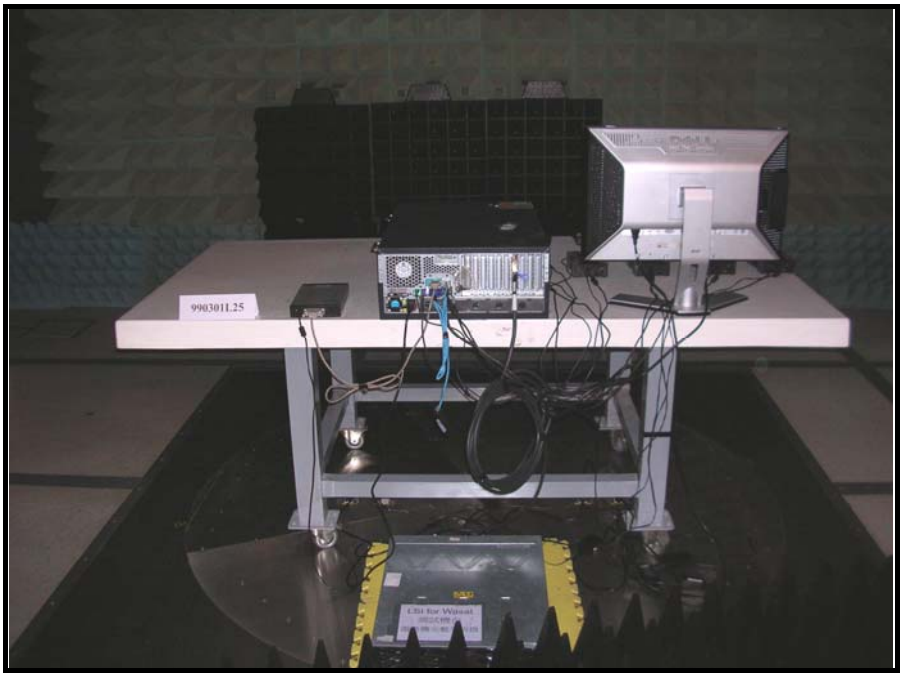
Conducted Emission Test

Radiated Emission Test
(Frequency below 1GHz)

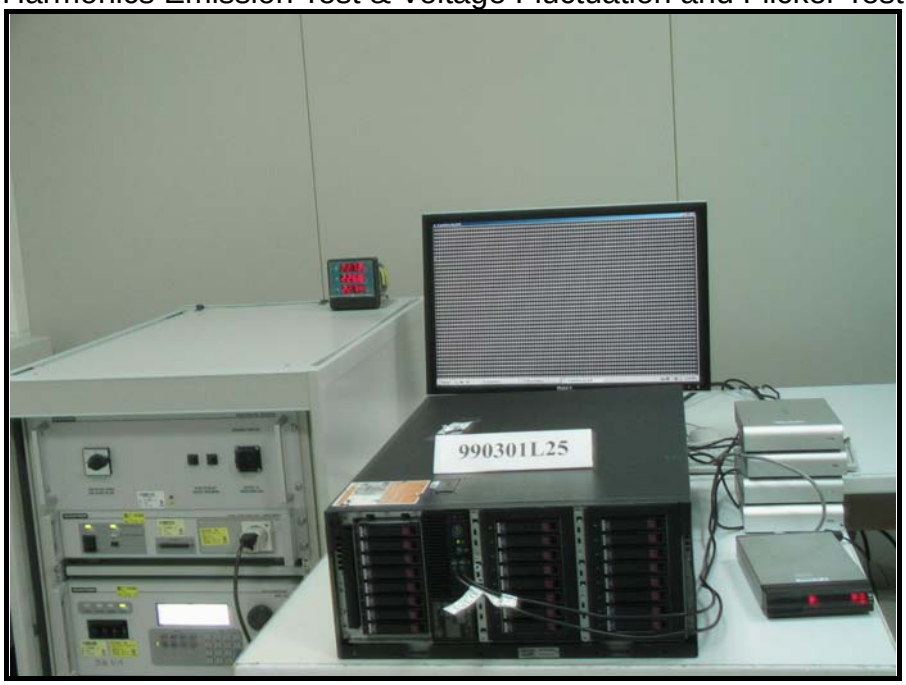


Radiated Emission Test
(Frequency above 1GHz)



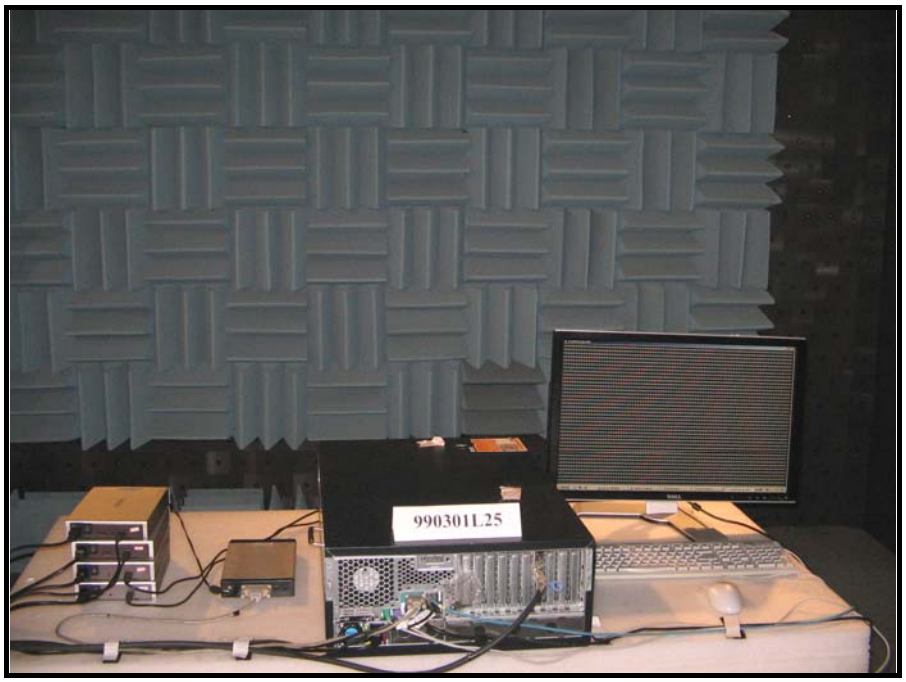


Harmonics Emission Test & Voltage Fluctuation and Flicker Test



ESD Test

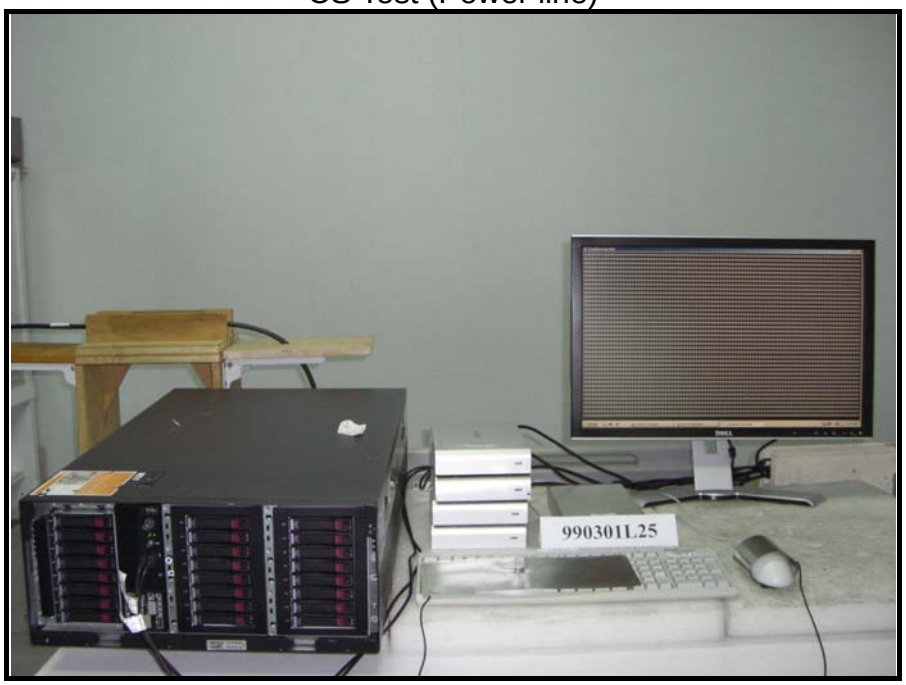
RS Test



EFT Test

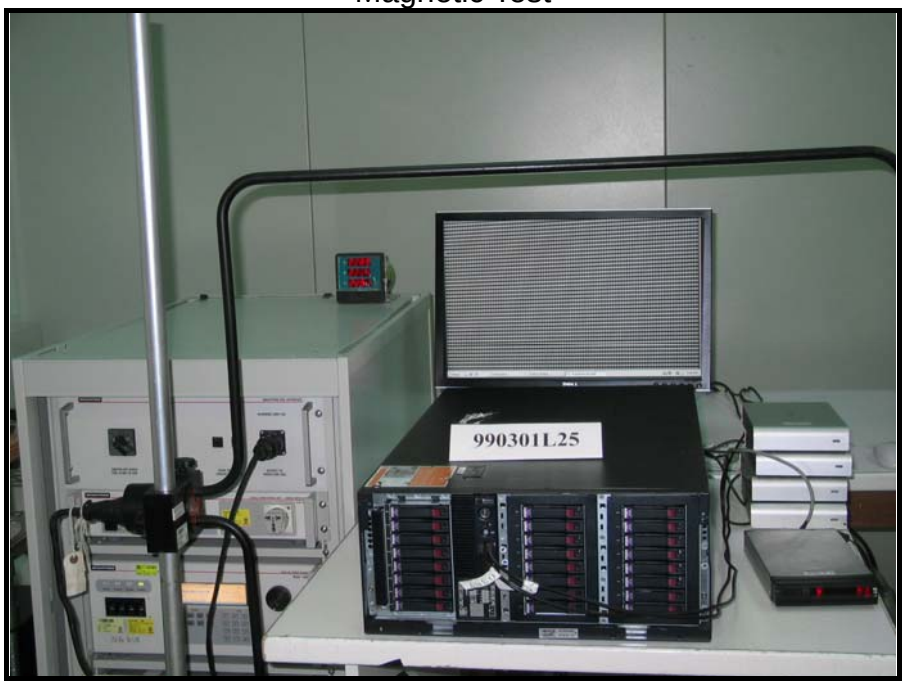
Surge Test

CS Test (Power line)

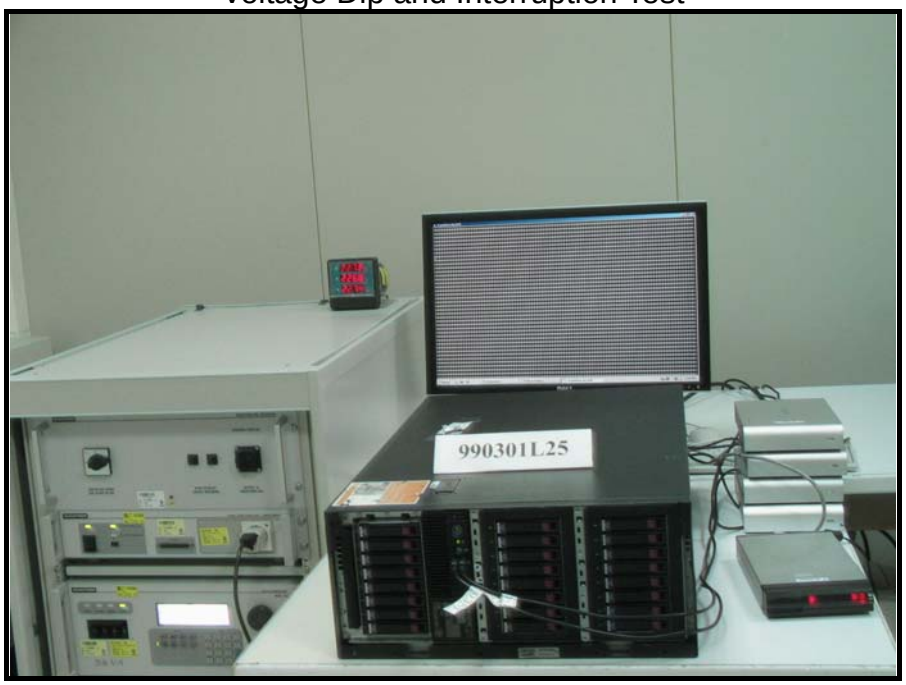


CS Test (Mini SAS cable)

Magnetic Test



Voltage Dip and Interruption Test



7 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.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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