FCC 47 CFR PART 15 SUBPART B

Product Type	:	Embedded Controller
Applicant	:	AAEON Technology. Inc.
Address	:	5F, No.135, Lane 235, Pao Chiao Rd, Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.
Trade Name	:	AAEON
Model Number	:	xxxxxAEC-6637-xxxxxxxx (Where x maybe is 0-9、A-Z、a-z、－、 blank)
Test Specification	:	FCC 47 CFR PART 15 SUBPART B: Oct., 2011 ANSI C63.4: 2009 CISPR 22: 1997
Receive Date	:	Aug. 23, 2012
Issue Date	:	Aug. 31, 2012

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
Taoyuan County 334, Taiwan R.O.C.
Tel：+886-3-2710188 / Fax：+886-3-2710190

Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Aug. 31, 2012	Initial Issue	

Verification of Compliance

Issued Date: 08/31/2012

Product Type	:	Embedded Controller
Applicant	:	AAEON Technology. Inc.
Address	:	5F, No.135, Lane 235, Pao Chiao Rd, Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.
Trade Name	:	AAEON
Model Number	:	xxxxxAEC-6637-xxxxxxxx (Where x maybe is 0-9、A-Z、a-z、－、 blank)
EUT Rated Voltage	:	DC 19.0V, 6.32A
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART B: Oct., 2011 ANSI C63.4: 2009 CISPR 22: 1997
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade City, Taoyuan County 334, Taiwan R.O.C. Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By	:		Reviewed By	:	
(Manager)		(Murphy Wang)	(Testing Engineer)		(Charlie Chang)

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1 General Information

1.1 Summary of Test Result

Emission			
Standard	Item	Result	Remark
FCC 47 CFR PART 15 SUBPART B ANSI C63.4	Conducted Emission	PASS	Meet Class A limit
FCC 47 CFR PART 15 SUBPART B ANSI C63.4	Radiated Emission	PASS	Meet Class A limit

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.24 dB.

Conducted Emissions (Telecommunication Ports)

The measurement uncertainty is evaluated as ± 2.24 dB.

Radiated Emission

The measurement uncertainty of 30 MHz - 1GHz is evaluated as ± 3.072dB.

The measurement uncertainty of 1GHz - 40GHz is evaluated as ± 3.072dB.

2 EUT Description

Product	Embedded Controller
Trade Name	AAEON
Model Number	xxxxxAEC-6637-xxxxxxxx (Where x maybe is 0-9、A-Z、a-z、－、 blank) * The model numbers differ from each other in selling region.
Applicant	AAEON Technology. Inc. 5F, No.135, Lane 235, Pao Chiao Rd, Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.
Manufacturer	AAEON Technology. Inc. 5F, No.135, Lane 235, Pao Chiao Rd, Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.
Component	
Power Adapter	FSP, FSP120-AAB I/P: 100-240VAC, 2A, 50-60Hz O/P: 19.0VDC, 6.32A Cable in: Non-Shielded, 1.8m, Detachable at Power Adaptor Cable out: Non-Shielded, 1.8m, Non-Detachable at Power Adaptor with one core

I/O Port Description：

I/O Port Types	Q'TY	Test Description
1). USB Port	1	Connected to Mouse
2). USB Port	1	Connected to Keyboard
3). USB 3.0 Port	2	Connected to 3.0 HDD
4). LAN Port	2	Connected to Notebook
5). COM Port	4	Connected to Modem
6). D-SUB Port	1	Connected to Monitor
7). Audio Port	1	Connected to Earphone
8). DC Power Port	1	Connected to AC Adapter

3 Test Methodology

3.1. Decision of Test Mode

3.1.1. The following test mode(s) were scanned during the preliminary test:

Pre-Test Mode
Mode 1: Normal Operation (D-SUB 1920 x 1200 / 60Hz)

3.1.2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode			
Emission	Conducted Emission		Mode 1
	Radiated Emission	Below 1GHz	Mode 1
		Above 1GHz	Mode 1

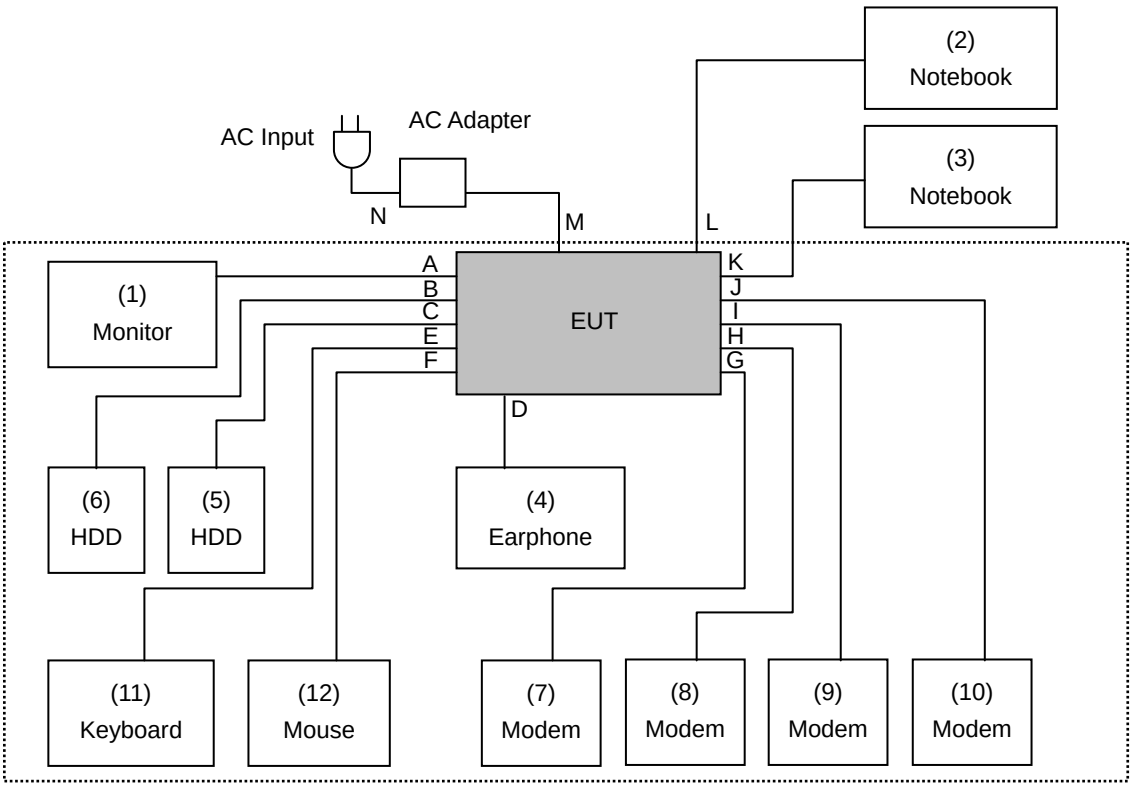
Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

3.2. EUT Exercise Software

1	Setup the EUT and simulators as shown on 3.3.
2	Turn on the power of all equipment.
3	EUT into the Windows operating system, adjust the display resolution to the test mode.
4	Data will be communicated between the Notebook through EUT that is connected to LAN port of Notebook.
5	USB connection to the HDD data transfer (read / write).
6	EUT will sends “H” pattern to monitor, the monitor will show “H” pattern on the screen.
7	Repeat the above procedure (3) to (6).

3.3. Configuration of Test System Details

Mode 1



Signal Cable Type		Signal Cable Description
A	D-SUB Cable	Shielded, 1.8m with two cores
B	USB Cable	Shielded, 2.0m
C	USB Cable	Shielded, 2.0m
D	Earphone Cable	Non-Shielded, 1.8m
E	USB Cable	Shielded, 1.8m with one core
F	USB Cable	Shielded, 1.8m
G	RS-232 Cable	Shielded, 1.8m
H	RS-232 Cable	Shielded, 1.8m
I	RS-232 Cable	Shielded, 1.8m
J	RS-232 Cable	Shielded, 1.8m
K	LAN Cable	Non-Shielded, 3.0m
L	LAN Cable	Non-Shielded, 3.0m
M	DC Power Cable	Non-Shielded, 1.8m with one core
N	AC Power Cable	Non-Shielded, 1.8m

Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
(1)	Mornitor	DELL	U2410f	CN-0J257M-72872 -08J-060L	Non-Shielded, 1.8m
(2)	Notebook	DELL	D830	CN-OHN341-48643 -88Q-1221	Non-Shielded, 2.0m
(3)	Notebook	DELL	D531	CN-OXM006-48643 -87A-3398	Non-Shielded, 2.0m
(4)	Earphone	N/A	N/A	N/A	N/A
(5)	HDD	Buffalo	HD-HXU3	15564891205705	Non-Shielded, 1.5m
(6)	HDD	Buffalo	HD-HXU3	15564891200435	Non-Shielded, 1.5m
(7)	Modem	ACEEX	DM-1414	501001580	Non-Shielded, 1.8m
(8)	Modem	SuperVoice	56000BPS	737520069	Non-Shielded, 1.8m
(9)	Modem	SuperVoice	56000BPS	737448818	Non-Shielded, 1.8m
(10)	Modem	Acer	AME-MT00	9420031N	Non-Shielded, 1.8m
(11)	Keyboard	HP	SK-2880	BC3520FJ6X40UE	Power by EUT
(12)	Mouse	DELL	MOC5U	N/A	Power by EUT

3.4. Test Site Environment

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC part 15: 15.107 Conducted Emission	15-35	26
Humidity (%RH)		25-75	60
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	FCC part 15: 15.109 Radiated Emission	15-35	26
Humidity (%RH)		25-75	60
Barometric pressure (mbar)		860-1060	950

4 Emission Test

4.1. Conducted Emission Measurement

4.1.1. Limit

A.C. Mains Conducted Interference Limit

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 0.15 to 0.50 MHz.

4.1.2. Test Instruments

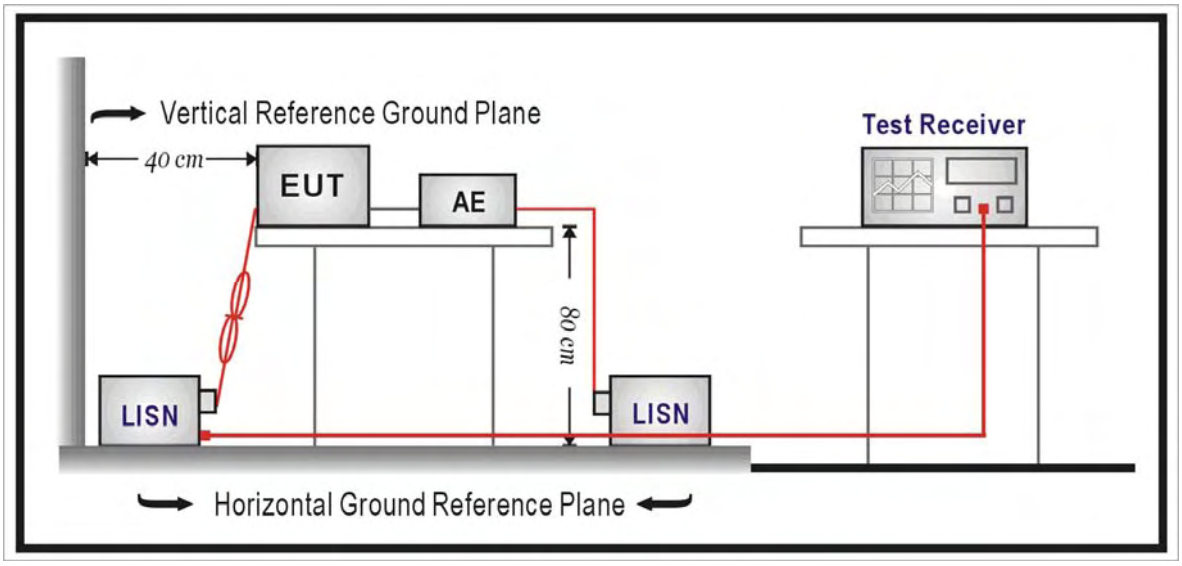
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/18/2012	(1)
LISN	R&S	ENV216	101040	03/07/2012	(1)
LISN	R&S	ENV216	101041	03/07/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

4.1.3. Test Setup

A.C. mains setup



4.1.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

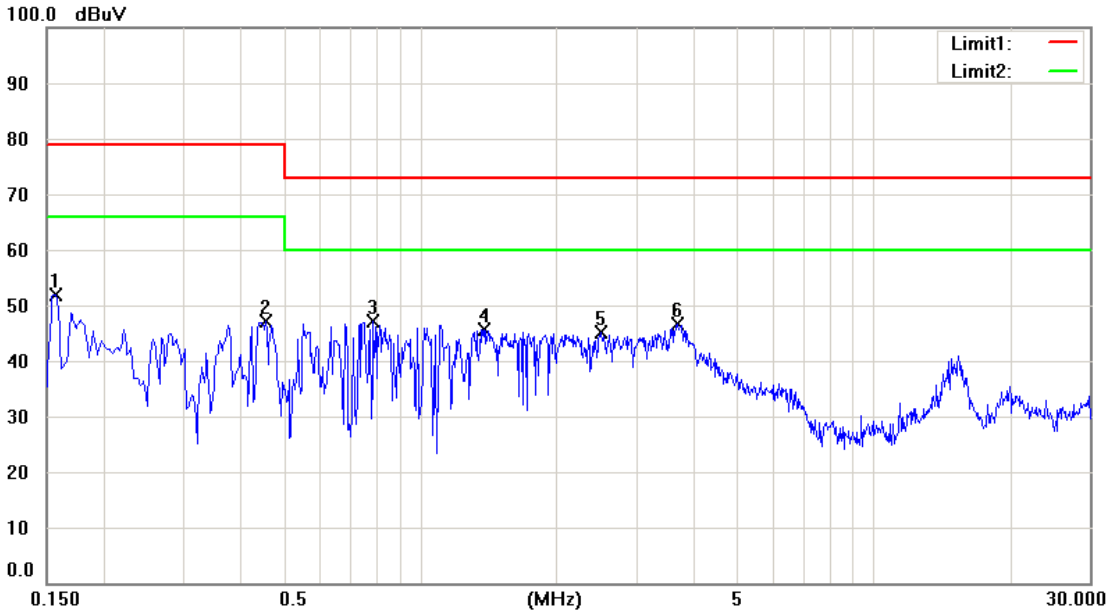
For A.C. mains conducted interference, measured both sides of A.C. lines and carried out using quasi-peak and average detector receivers of maximum conducted interference.

Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. The voltage limits shall be met. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

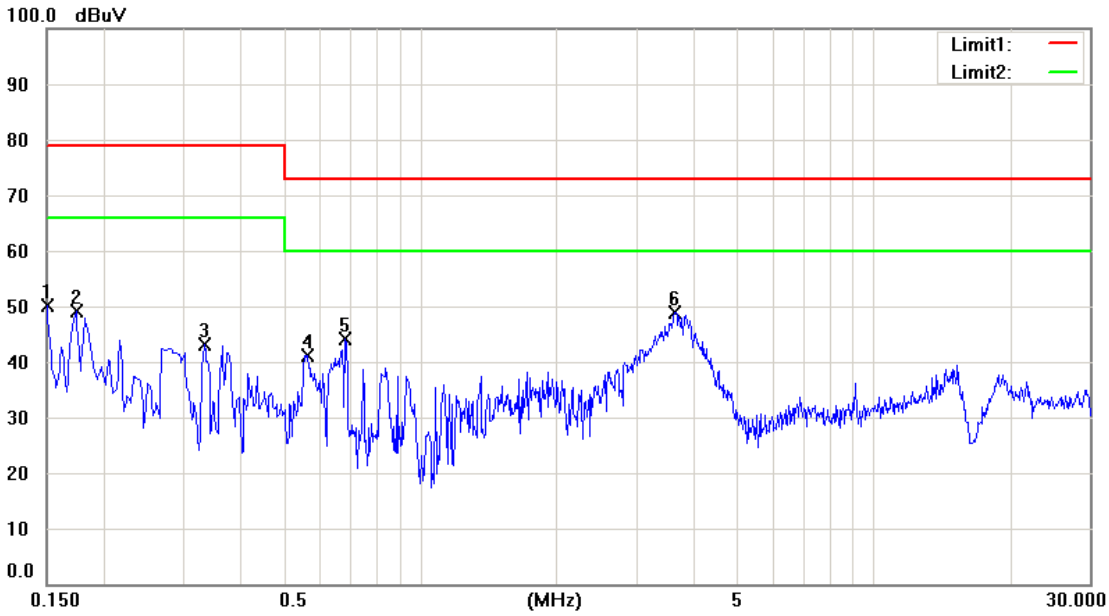
4.1.5. Test Result

Standard:	FCC Part 15B Class A	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TF-AEC-6637-A2M-1010	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	1	Date:	08/24/2012
		Test By:	Charlie Chang
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1580	39.83	24.41	9.72	49.55	34.13	79.00	66.00	-29.45	-31.87	Pass
2	0.4580	35.59	26.24	9.72	45.31	35.96	79.00	66.00	-33.69	-30.04	Pass
3	0.7900	33.39	16.94	9.73	43.12	26.67	73.00	60.00	-29.88	-33.33	Pass
4	1.3860	33.36	18.68	9.76	43.12	28.44	73.00	60.00	-29.88	-31.56	Pass
5	2.5100	30.29	15.83	9.81	40.10	25.64	73.00	60.00	-32.90	-34.36	Pass
6	3.6980	33.40	22.55	9.81	43.21	32.36	73.00	60.00	-29.79	-27.64	Pass

Standard:	FCC Part 15B Class A	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TF-AEC-6637-A2M-1010	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	1	Date:	08/24/2012
		Test By:	Charlie Chang
Description:			

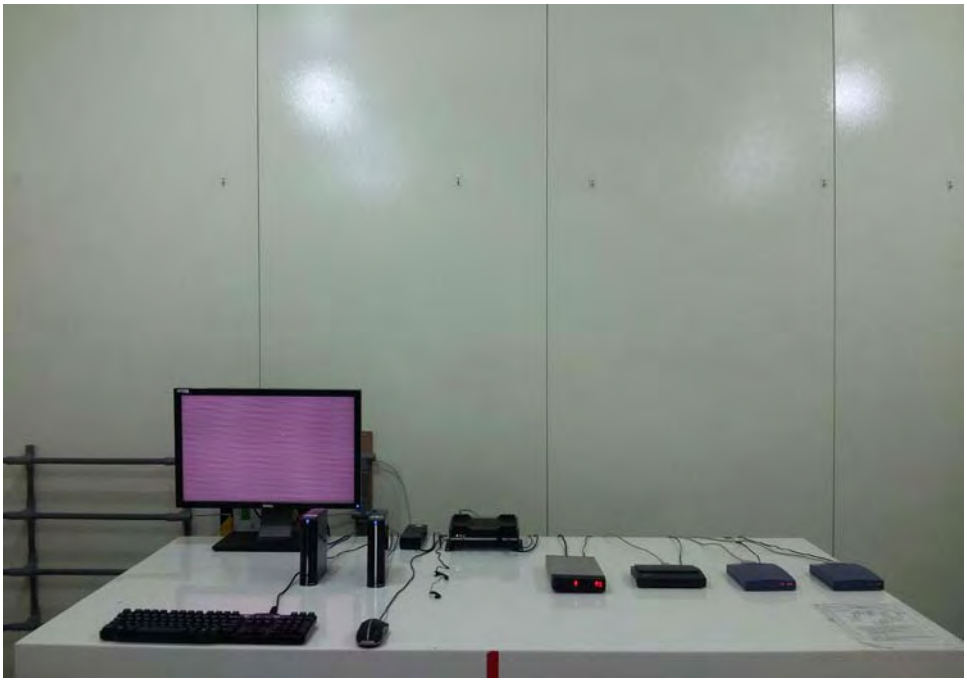


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1500	39.30	25.50	9.65	48.95	35.15	79.00	66.00	-30.05	-30.85	Pass
2	0.1740	35.42	21.46	9.65	45.07	31.11	79.00	66.00	-33.93	-34.89	Pass
3	0.3340	25.76	10.57	9.64	35.40	20.21	79.00	66.00	-43.60	-45.79	Pass
4	0.5660	29.52	23.45	9.64	39.16	33.09	73.00	60.00	-33.84	-26.91	Pass
5	0.6860	19.59	12.08	9.65	29.24	21.73	73.00	60.00	-43.76	-38.27	Pass
6	3.6540	33.70	21.03	9.74	43.44	30.77	73.00	60.00	-29.56	-29.23	Pass

4.1.6. Test Photograph

Test Mode: Mode 1

Description: Front View of Conducted Test



Test Mode: Mode 1

Description: Back View of Conducted Test

4.2. Radiated Interference Measurement

4.2.1. Limit

Under 1GHz test shall not exceed following value

FCC 47 CFR PART 15 SUBPART B				
Frequency range (MHz)	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m
30 to 88	10	39	3	40
88 to 216	10	43.5	3	43.5
216 to 960	10	46.4	3	46
Above 960	10	49.5	3	54

CISPR 22				
Frequency range (MHz)	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m
30 to 230	10	40	10	30
230 to 1000	10	47	10	37

Above 1GHz test shall not exceed following value

Frequency (MHz)	dBuV/m (Distance 3m)			
	Class A		Class B	
	Average	Peak	Average	Peak
1000 ~ 40000	60	80	54	74

Remark: 1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
4. Peak detector limit is corresponding to 20 dB above the maximum permitted average limit.

4.2.2. Test Instruments

10 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Pre Amplifier	Agilent	8447D	2944A11120	01/10/2012	(1)
Pre Amplifier	Agilent	8447D	2944A11119	01/10/2012	(1)
Test Receiver	R&S	ESCI	100722	10/18/2011	(1)
Test Receiver	R&S	ESCI	101000	12/26/2011	(1)
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3268	06/06/2012	(1)
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3273	12/27/2011	(1)
Test Site	ATL	TE06	TE06	09/05/2011	(1)

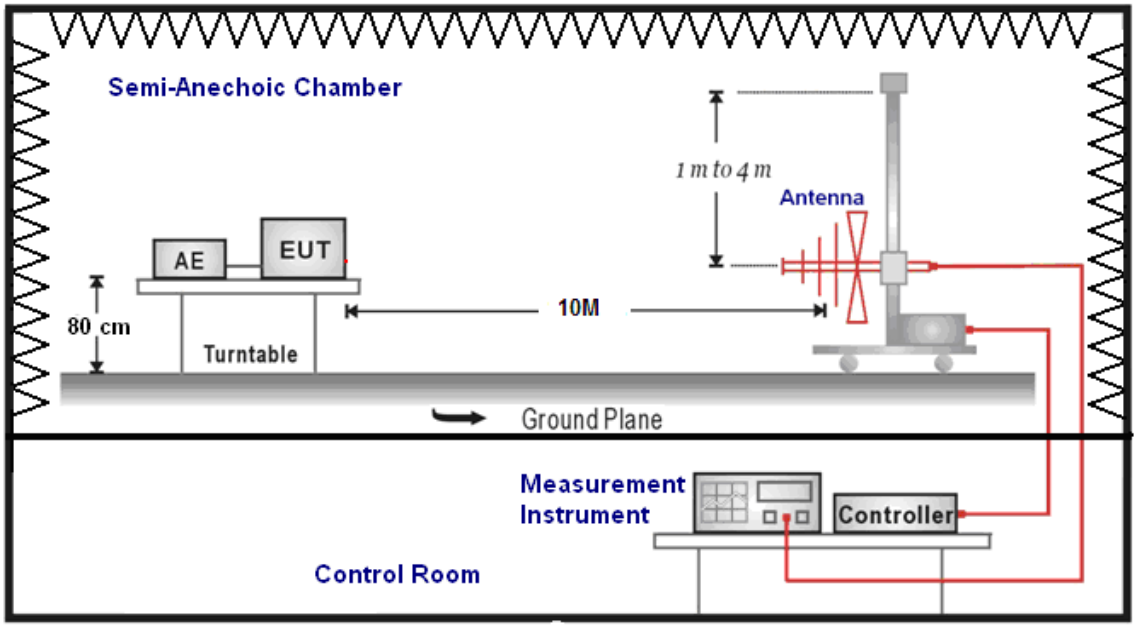
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Amplifier	Mini-Circuits	ZKL-1R5+	072010	05/29/2012	(1)
Amplifier	Mini-Circuits	ZVA-213-S+	467900926	05/29/2012	(1)
RF Pre-selector	Agilent	N9039A	MY46520255	05/10/2012	(1)
Horn Antenna (1~18GHz)	ETS-Lindgren	3117	00128055	08/09/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE09	TE09	05/11/2012	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

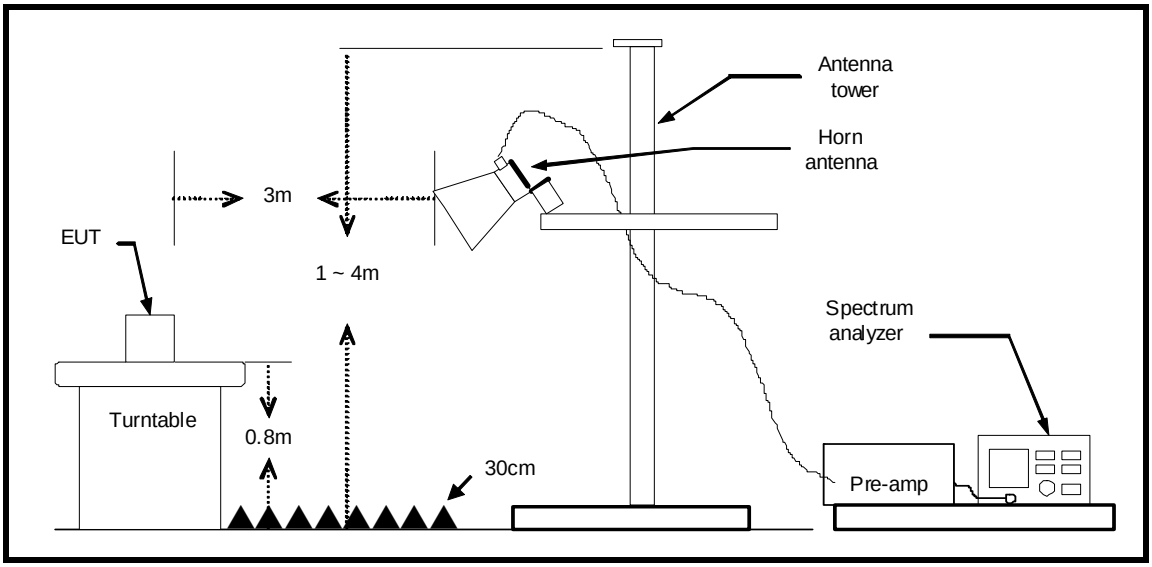
Note: N.C.R. = No Calibration Request.

4.2.3. Setup

Below 1GHz



Above 1GHz



4.2.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters for under 1GHz, and 3 meter for above 1GHz, the highest frequency performed according to internal source frequency of the EUT, the specification was below:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

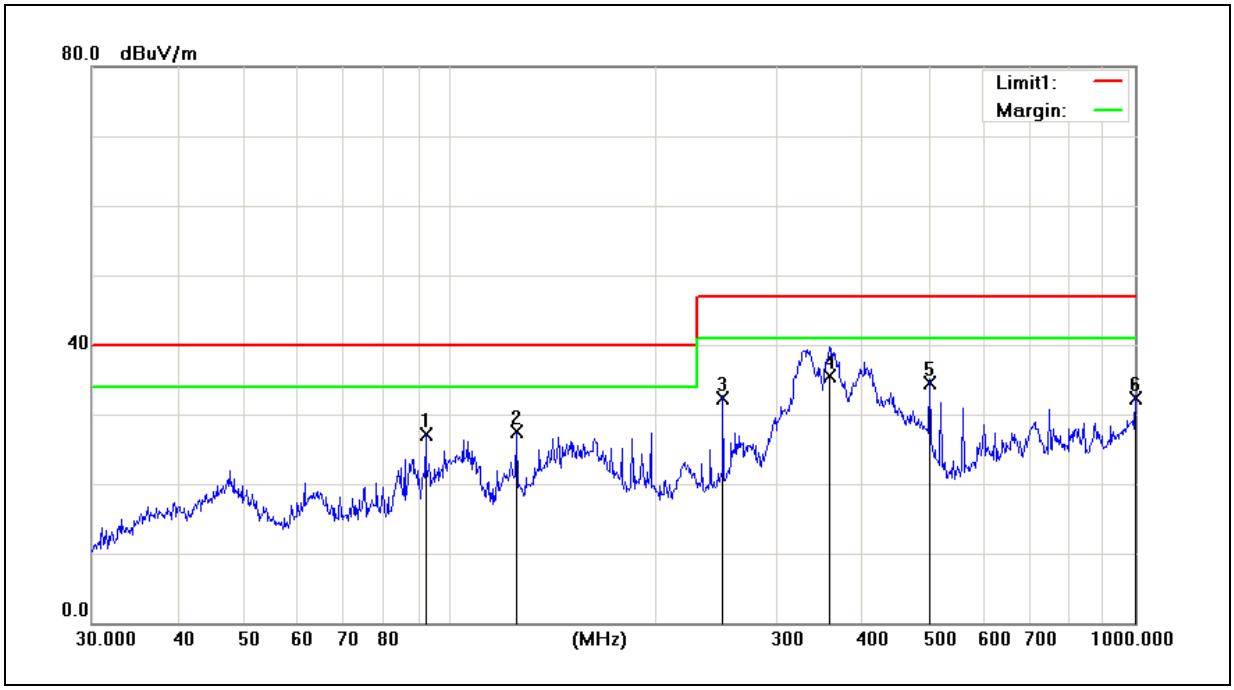
According to this standard paragraph 15.109, as an alternative to the radiated emission limits, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, “Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement”.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

Radiated emissions were invested over the frequency range from 30MHz to1GHz using a receiver bandwidth of 120 kHz. Radiated was performed at an antenna to EUT distance of 10 meters.

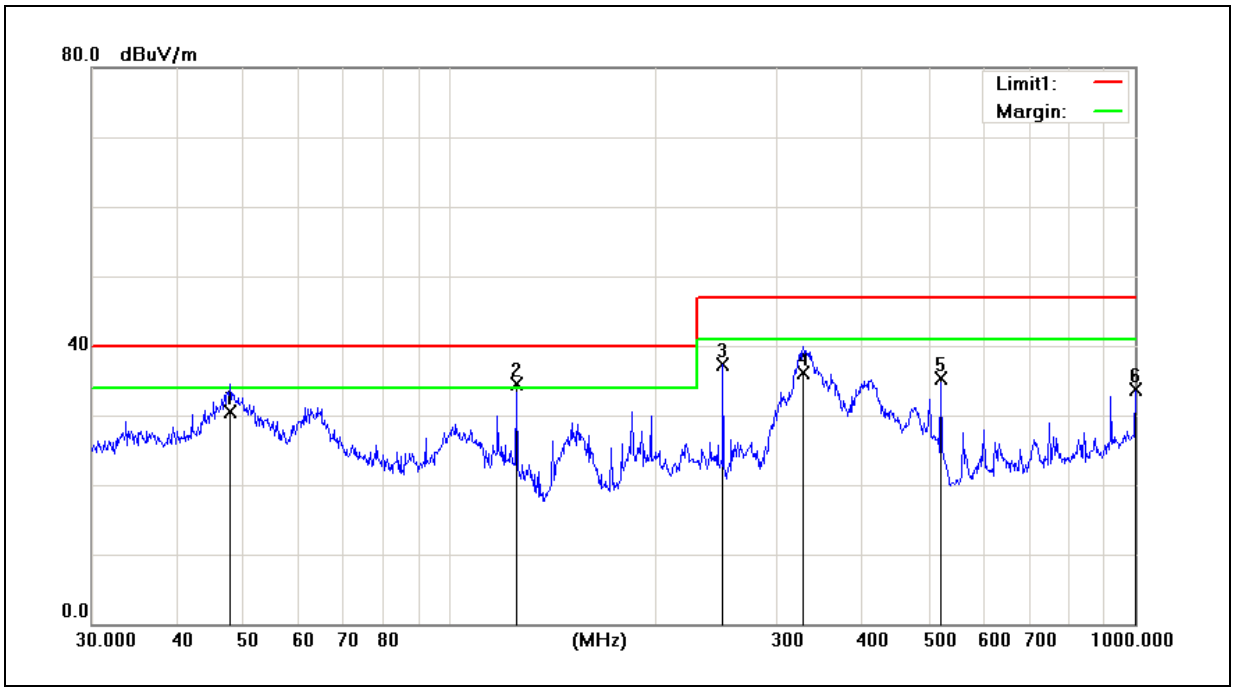
4.2.5. Test Result

Standard:	CISPR 22 Class A	Test Distance:	10m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TF-AEC-6637-A2M-1010	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	1	Date:	08/24/2012
Ant.Polar.:	Horizontal	Test By:	Charlie Chang



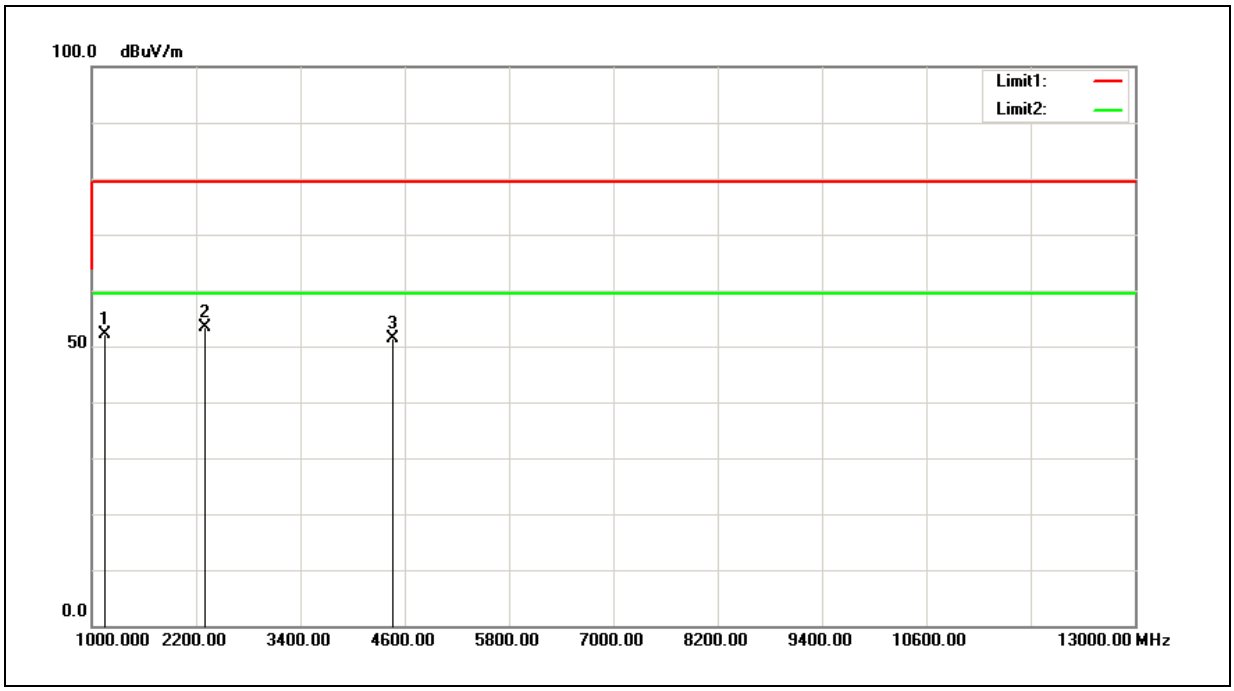
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	92.1388	45.86	-18.66	27.20	40.00	-12.80	400	284	QP
2	125.0066	41.80	-14.20	27.60	40.00	-12.40	400	304	QP
3	250.3012	45.59	-13.29	32.30	47.00	-14.70	300	250	QP
4	357.9287	46.19	-10.59	35.60	47.00	-11.40	200	257	QP
5	501.1790	42.36	-7.76	34.60	47.00	-12.40	200	31	QP
6	1000.0000	31.10	1.20	32.30	47.00	-14.70	300	35	QP

Standard:	CISPR 22 Class A	Test Distance:	10m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TF-AEC-6637-A2M-1010	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	1	Date:	08/24/2012
Ant.Polar.:	Vertical	Test By:	Charlie Chang



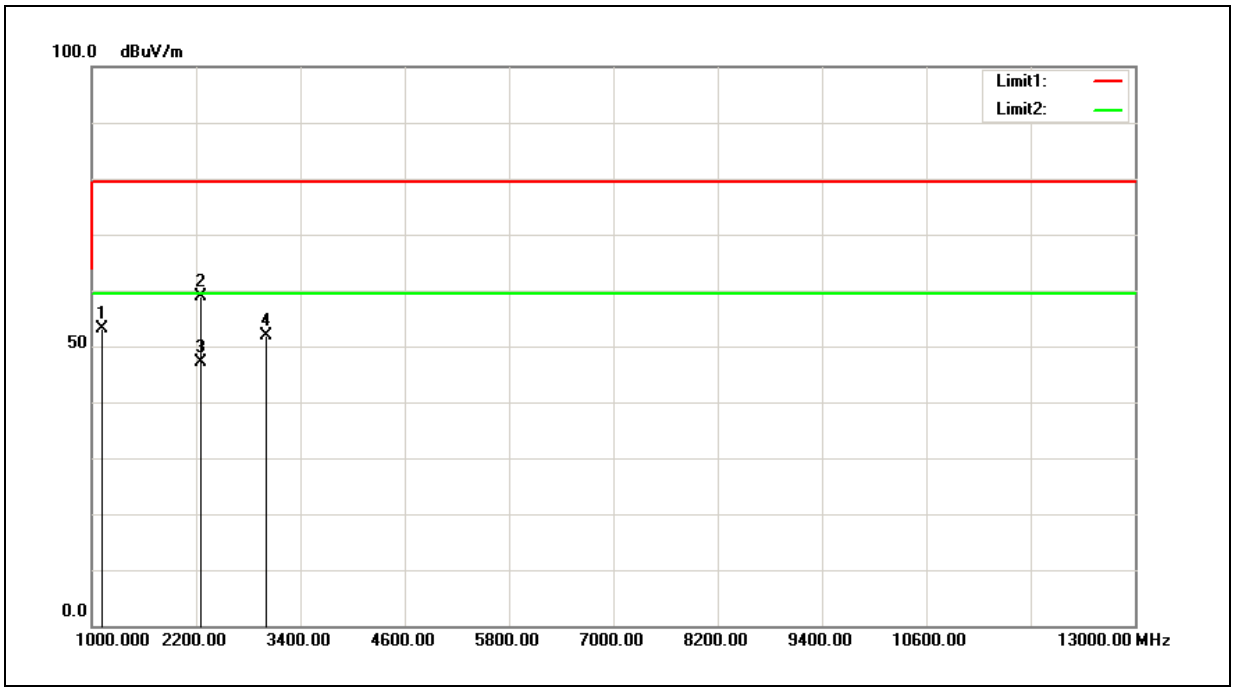
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	47.8260	44.95	-14.35	30.60	40.00	-9.40	200	288	QP
2	125.0066	48.45	-13.85	34.60	40.00	-5.40	201	0	QP
3	250.3012	49.90	-12.60	37.30	47.00	-9.70	101	360	QP
4	327.8873	46.41	-10.21	36.20	47.00	-10.80	100	0	QP
5	520.8882	41.51	-6.21	35.30	47.00	-11.70	300	98	QP
6	1000.0000	30.66	3.14	33.80	47.00	-13.20	151	360	QP

Standard:	FCC Part 15B Class A	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TF-AEC-6637-A2M-1010	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	1 (1GHz~13GHz)	Date:	08/24/2012
Ant.Polar.:	Horizontal	Test By:	Charlie Chang



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1144.000	75.85	-23.63	52.22	79.50	-27.28	peak
2	2308.000	71.88	-18.62	53.26	79.50	-26.24	peak
3	4468.000	64.69	-13.24	51.45	79.50	-28.05	peak

Standard:	FCC Part 15B Class A	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TF-AEC-6637-A2M-1010	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	1 (1GHz~13GHz)	Date:	08/24/2012
Ant.Polar.:	Vertical	Test By:	Charlie Chang



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1120.000	76.70	-23.66	53.04	79.50	-26.46	peak
2	2248.000	77.65	-18.77	58.88	79.50	-20.62	peak
3	2248.000	65.83	-18.77	47.06	59.50	-12.44	AVG
4	3004.000	68.43	-16.67	51.76	79.50	-27.74	peak

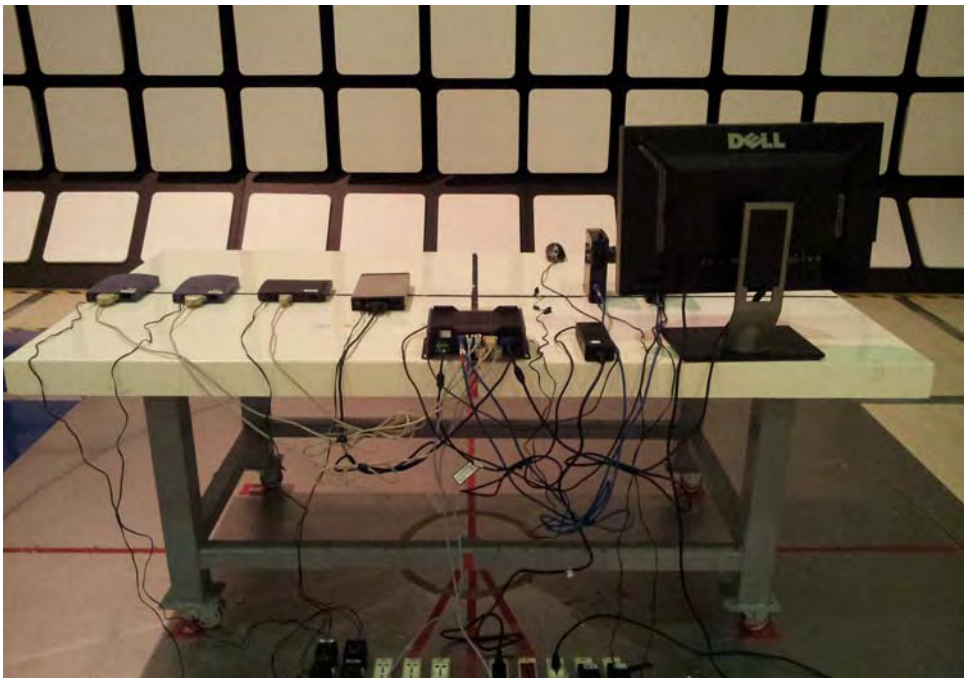
4.2.6. Test Photograph

Test Mode: Mode 1

Description: Front View of Radiated Emission Test _ Below 1GHz

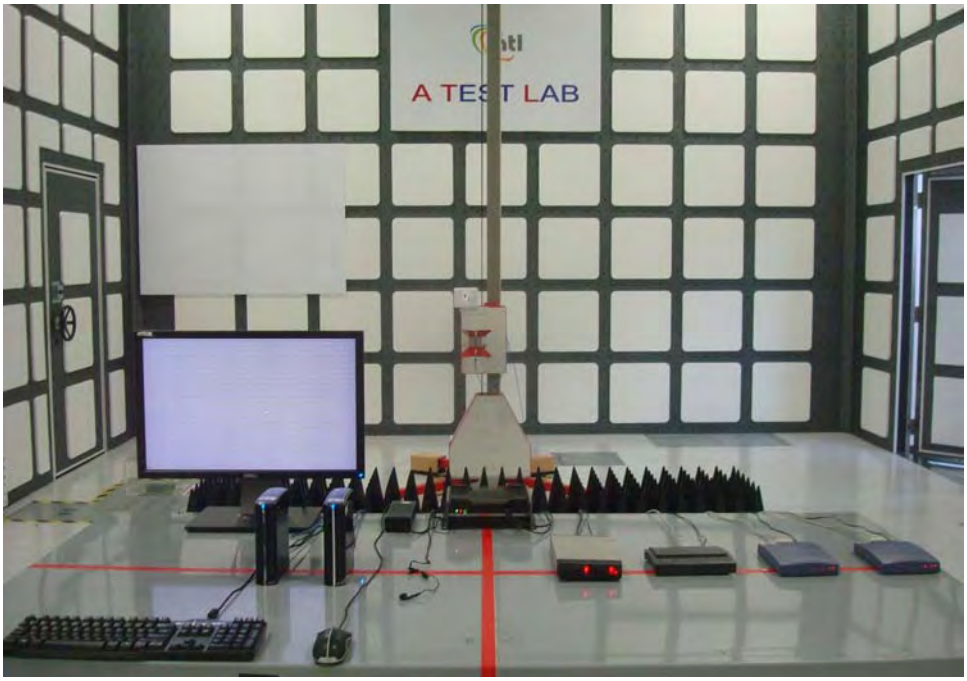
Test Mode: Mode 1

Description: Back View of Radiated Emission Test _ Below 1GHz



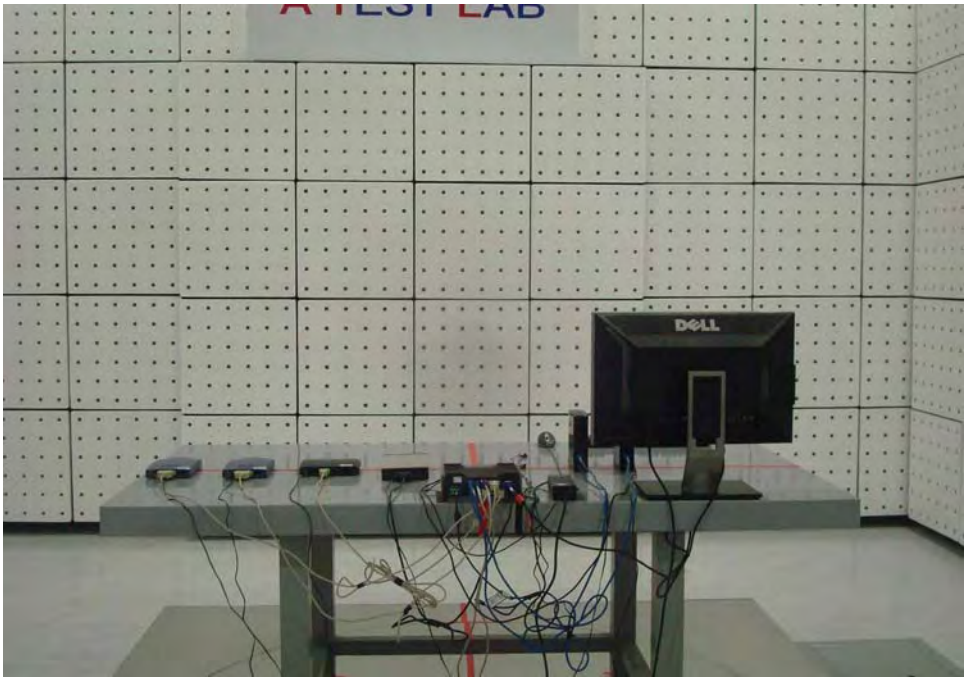
Test Mode: Mode 1

Description: Front View of Radiated Emission Test _ Above 1GHz



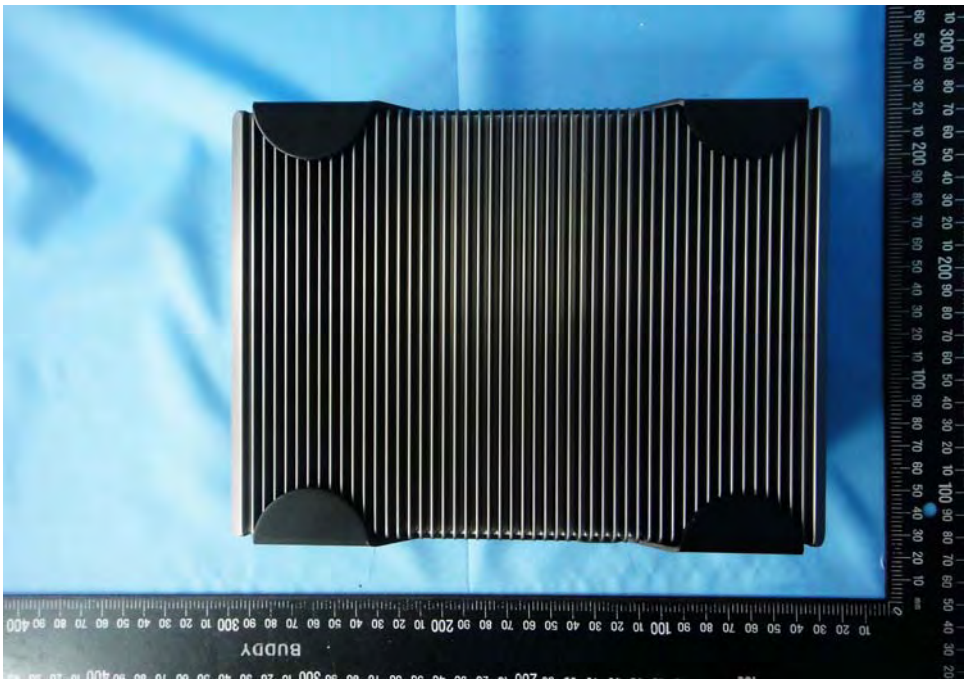
Test Mode: Mode 1

Description: Back View of Radiated Emission Test _ Above 1GHz

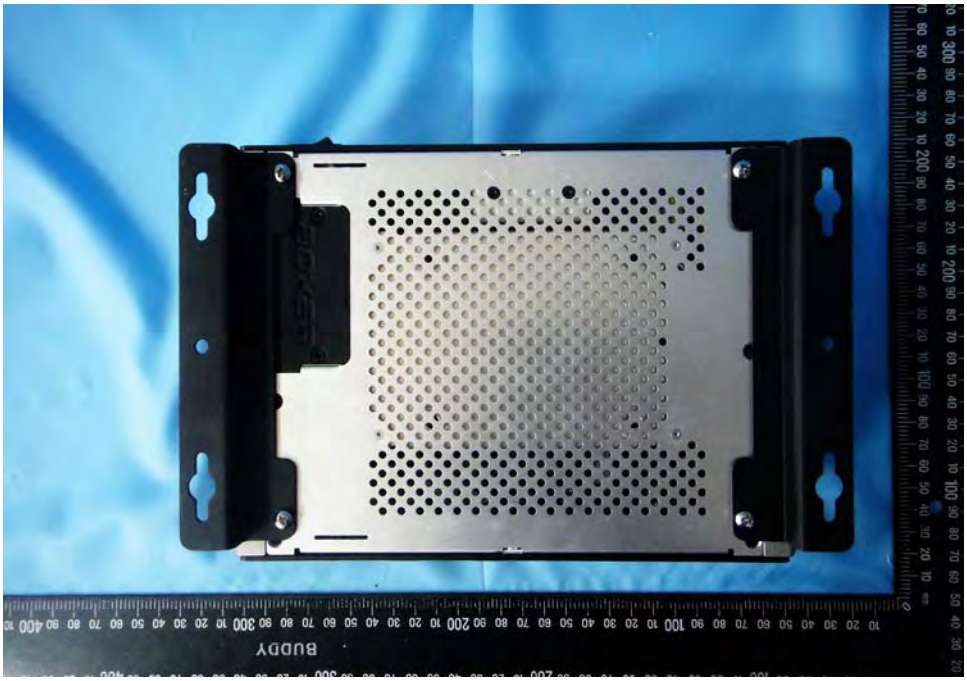


5 EUT Photograph

(1) EUT Photo



(2) EUT Photo



(3) EUT Photo

(4) EUT Photo

(5) EUT Photo

(6) EUT Photo

(7) EUT Photo

(8) EUT Photo

(9) EUT Photo

(10)EUT Photo

(11)EUT Photo

(12)EUT Photo