FCC ID TEST REPORT

for

MK5

Model: 501

FCC ID: 2AA52MK5

Prepared for: Lab42 LLC
340 S LEMON AVE #3231
WALNUT, CA 91789
UNITED STATES

Prepared by: Shenzhen TCT Testing Technology Co., Ltd.
1F, Building 1, Yibaolai Industrial Park, Qiaotou Village, Fuyong Town, Baoan District, Shenzhen, Guangdong, China

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Report Number：TCT130821017F2-3
Date of Test： Oct. 08~ Oct. 09, 2013
Date of Issue： Oct. 09, 2013

Tested By Beryl Zhao
Beryl Zhao

Reviewed By Jack kang
Jack Kang

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1.0 General Information

1.1 Client Information

Application:	Lab42 LLC
Address of Application:	340 S LEMON AVE #3231 WALNUT, CA 91789 UNITED STATES
Manufacturer:	Lab42 LLC
Address of Manufacturer:	340 S LEMON AVE #3231 WALNUT, CA 91789 UNITED STATES

1.2 General Description of E.U.T.

Product Name:	MK5
Model No.:	501
Trade Mark:	N/A
Power Supply:	DC 9V Via Adapter
Test Accessory:	Adapter Information: Model:BX-0901500 Input: AC 100-240V, 50/60Hz Output: DC 9V, 1.5A
	Notebook Computer Trade Mark: Lenovo Model: Lenovo G485 S/N:LB00402300
Remark:	--
Model Difference:	--

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1.3 Test Facility:

Name of Test Lab:	Shenzhen Tongce Testing Lab
Address of Test Lab:	1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China
Telephone:	13410377511
Fax:	--

The test facility is recognized, certified, or accredited by the following organizations:

FCC Registration Number: 572331

Shenzhen TCT Testing Technology Co., Ltd., Shenzhen EMC Laboratory: Shenzhen Tongce Testing Lab
The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
Registration Number: 572331

Industry Canada (IC)

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing
Registration Number IC: 10668A-1

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2.0 List of Measurement Equipment					
2.1 Conducted Emission Test					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
EMI Test Receiver	R&S	ESCS30	100139	July 7, 2013	July 6, 2014
LISN	AFJ	LS16C	16010222119	July 7, 2013	July 6, 2014

2.2 Radiated Emission Test					
Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
EMI Test Receiver	ESVD	1026.5506.10	RS	July 7, 2013	July 6, 2014
Coaxial Switch	MP59B	M70585	ANRITSU	N/A	N/A
Spectrum Analyzer	8595E	3441A00893	HP	July 7, 2013	July 6, 2014
Amplifier	8447D	2727A05017	HP	July 08, 2013	July 07, 2014
Bilog Antenna	VULB9163	9163/340	Schwarebeck	July 08, 2013	July 07, 2014
Horn Antenna	BBHA 9120D	9120D-631	Schwarebeck	July 08, 2013	July 07, 2014

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3.0 Technical Details

3.1 Investigations Requested

Perform Electromagnetic Interference [EMI] tests for FCC Requirement.

3.2 Test Standards

FCC Part 15 Subpart B:2012

3.3 Measurement Uncertainty（95% confidence levels, k=2)

No.	Item	MU
1.	Temperature	±0.1℃
2.	Humidity	±1.0%
3.	Spurious emissions, conducted	±3.70dB
4.	All emissions, radiated	±4.50dB

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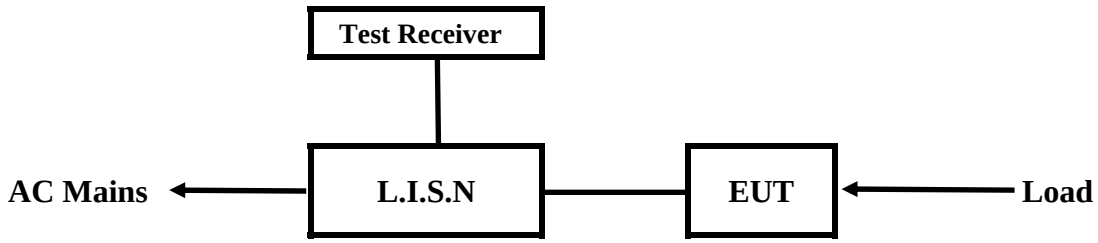
4.0 Power Line Conducted Emission Test

4.1 Schematics of the test



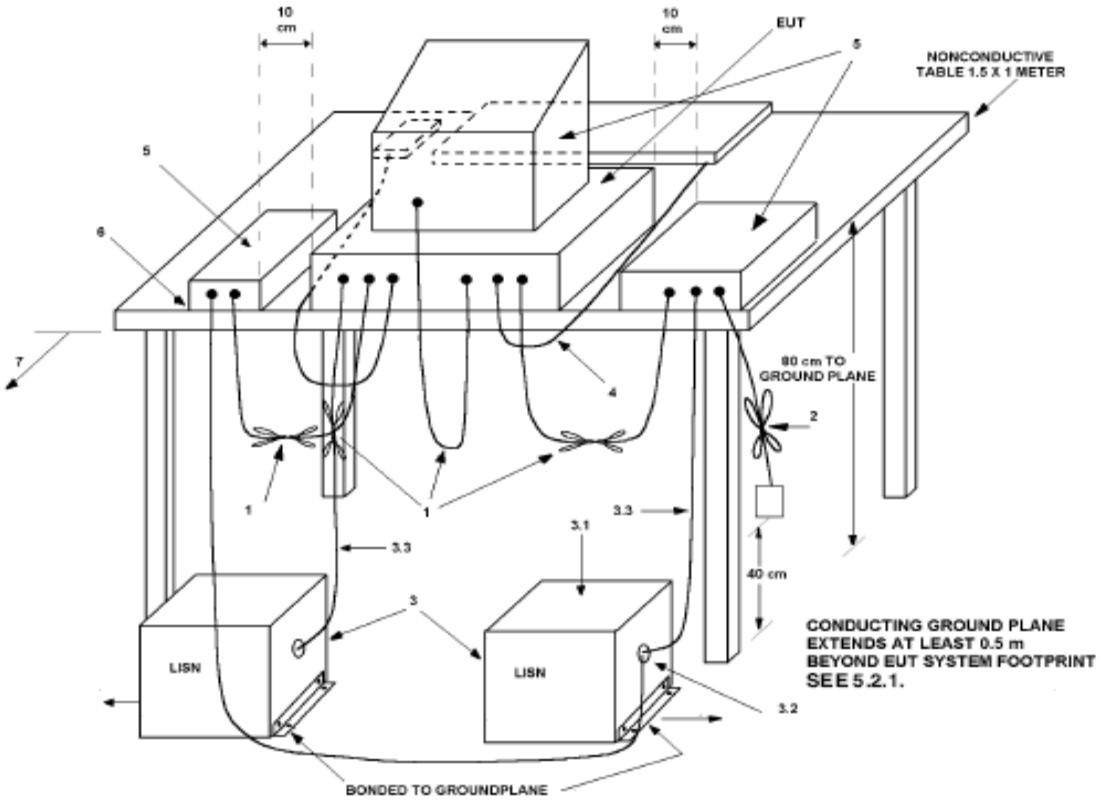
EUT: Equipment Under Test

4.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2009.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2009.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



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4.3 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2009

1) Setup the EUT and simulators as shown on the following

2) Enable AF signal and confirm EUT active to normal condition

4.4 Test Equipment

Please refer to the Section 2

4.5 Power line conducted Emission Limit

Frequency(MHz)	Class A Limits (dBμV)		Class B Limits (dBμV)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

4.6 Photo documentation of the test set-up

Please refer to the Section 7

4.7 Test specification:

Environmental conditions: Temperature: 24° C Humidity: 51% Atmospheric pressure: 103kPa

Frequency range: 0.15 MHz – 30 MHz

4.8 Test result

Min. limit margin >10dB from 0.15 MHz - 30MHz

The requirements are FULFILLED

Remarks: According to the FCC part 15 Subpart B:2012

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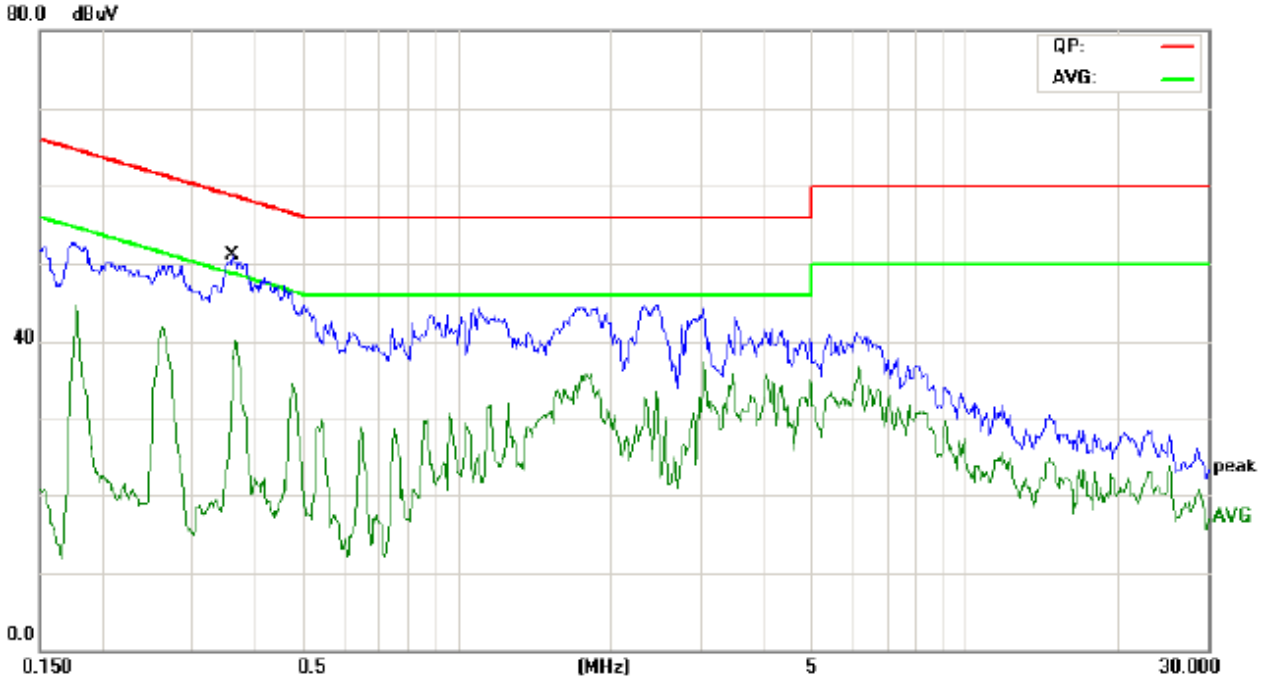
A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT Description: MK5
Operation Mode: Ethernet port mode
Tested By: Beryl Zhao
Test date: Oct. 08, 2013
Test Result: PASS

Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s



Frequency (MHz)	Reading(dBμV)				Limit (dBμV)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.3613	46.93	36.02	--	--	57.71	48.71

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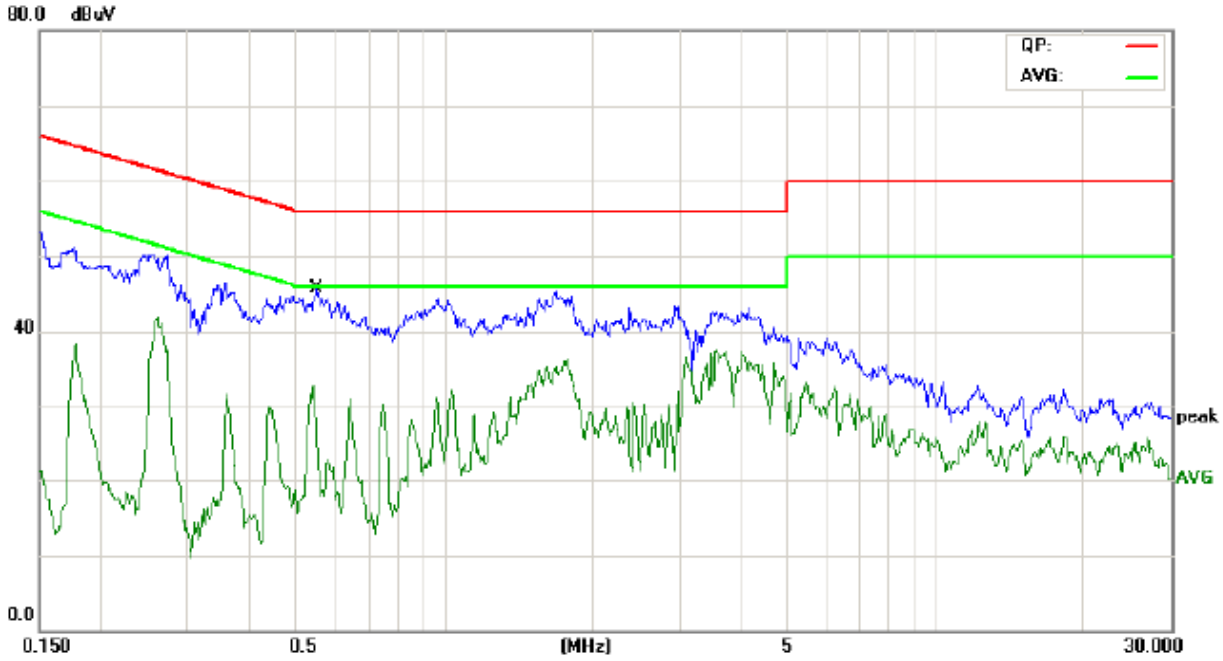
B Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

EUT Description: MK5
Operation Mode: Ethernet port mode
Tested By: Beryl Zhao
Test date: Oct. 08, 2013
Test Result: PASS

Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s



Frequency (MHz)	Reading(dBμV)				Limit (dBμV)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.5496	--	--	42.84	31.43	56.00	46.00

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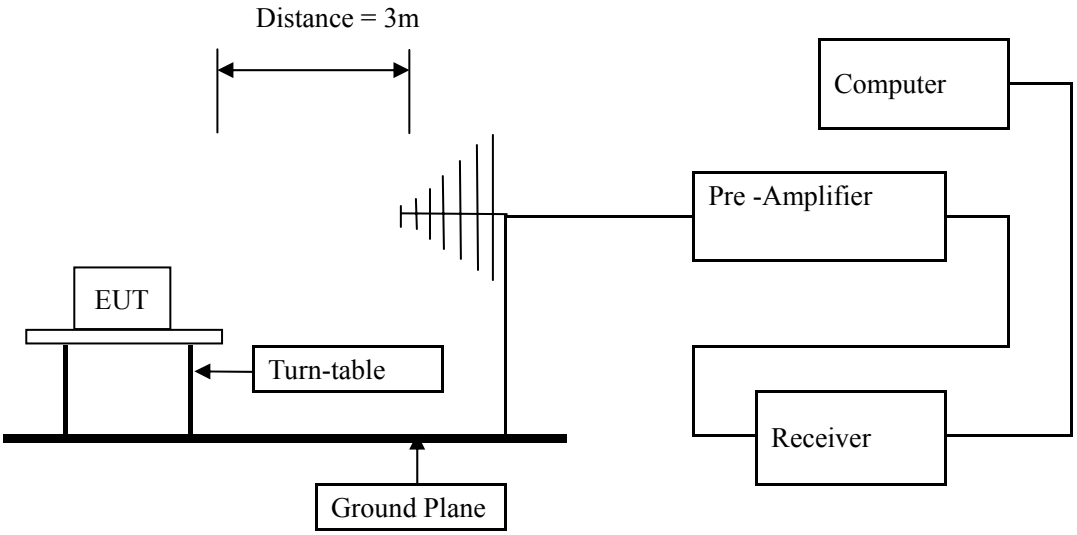
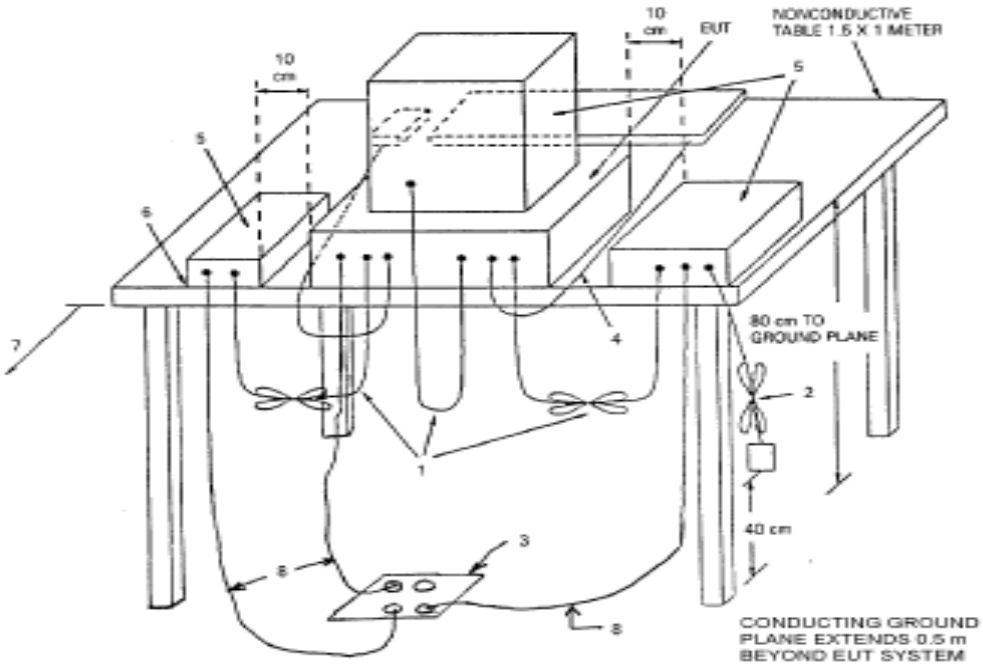
5.0 Radiated Emission Test

5.1 Test Method and test Procedure:

1) The EUT was tested according to ANSI C63.4 –2009.
2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2009.
3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
4) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup





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5.2 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2009

5.3 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequency Range (MHz)	Distance (m)	Field strength (dBμV/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1) The frequency spectrum from 30MHz to 8GHz was investigated. All reading from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120KHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK.

2) Measurements were made at 3 meters.

3) If measurement is not made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula Ld1 = Ld2 * (d2/d1)

5.4 Photo documentation of the test set-up

Please refer to the Section 7

5.5 Test Equipment:

Please refer to the Section 2

5.6 Test specification:

Environmental conditions: Temperature 26° C Humidity: 56% Atmospheric pressure: 103kPa

5.7 Test result

Min. limit margin 9.31dB at 304.0880 MHz

The requirements are FULFILLED

Remarks: According to the FCC part 15 Subpart B:2012

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A. Radiated Emission In Horizontal (30MHz----1000MHz)

EUT Description: MK5
Operation Mode: Ethernet port mode
Tested By: Beryl Zhao
Test date: Oct. 08, 2013
Test Result: PASS

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
234.1082	33.59	H	46.00
304.0880	34.16	H	46.00

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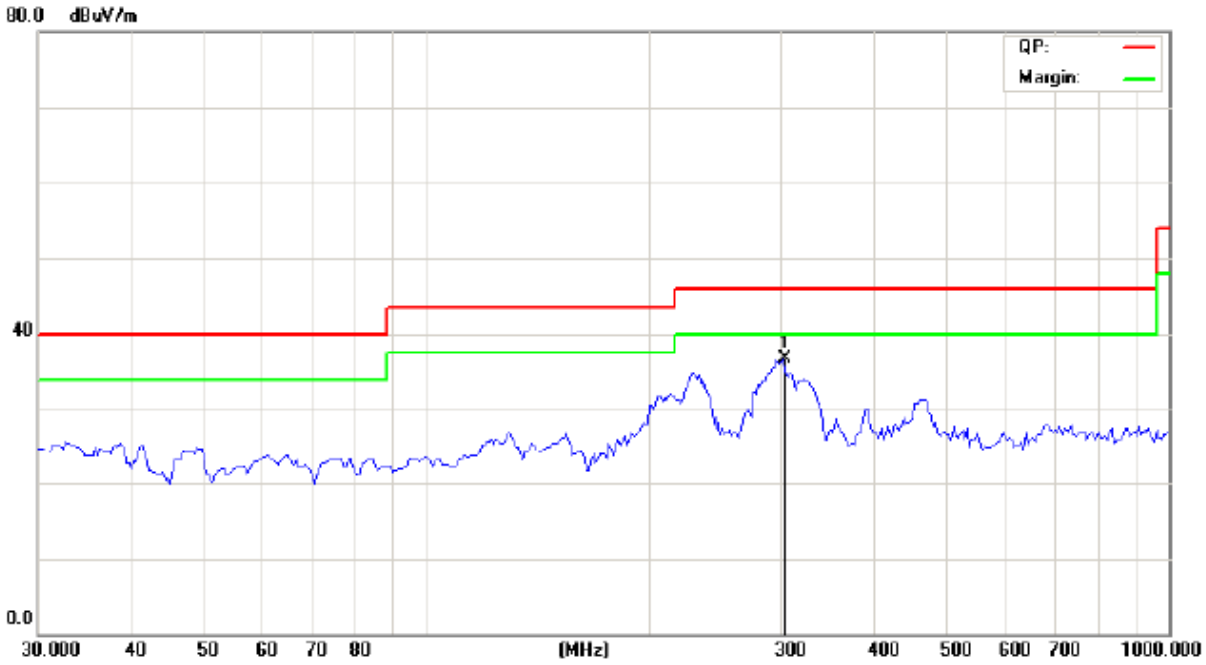
B. Radiated Emission In Vertical (30MHz----1000MHz)

EUT Description:	MK5
Operation Mode:	Ethernet port mode
Tested By:	Beryl Zhao
Test date:	Oct. 08, 2013
Test Result:	PASS



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
304.0880	36.69	V	46.00

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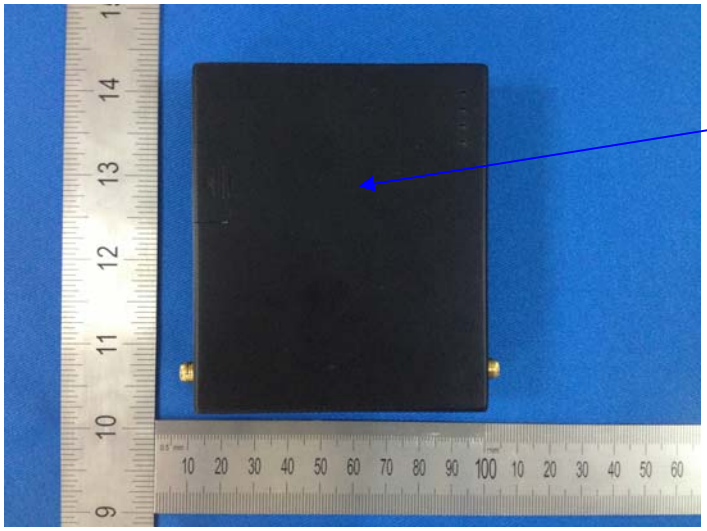
6.0 FCC Label

FCC ID: 2AA52MK5

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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