



# FCC PART 15 SUBPART B REPORT

According to

**47 CFR, Part 2, Part 15, ICES-003:2012 Issue 5, CISPR PUB. 22**

Applicant : Hillstone Networks Corp.

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Address : 292 Gibraltar Drive, Suite 105 Sunnyvale, CA 94089

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Equipment : Firewall Appliance

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Model No. : SG-6000-E1100G3w

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Trademark : 

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FCC ID : 2AD6IE1100G3W

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- The test result refers exclusively to the test presented test model / sample.
- Without written approval of **CerpPASS Technology Corp.** the test report shall not be reproduced except in full.



## Contents

<b>1. Summary of Test Procedure and Test Result.....</b>	<b>5</b>
<b>2. Test Configuration of Equipment under Test.....</b>	<b>6</b>
2.1. Factory .....	6
2.2. Feature of Equipment under Test.....	6
2.3. Test Manner .....	7
2.4. Description of Test System.....	8
2.5. General Information of Test.....	9
2.6. Measurement Uncertainty .....	9
<b>3. Test of Conducted Emission.....</b>	<b>10</b>
3.1. Test Limit .....	10
3.2. Test Procedures .....	10
3.3. Typical test Setup.....	11
3.4. Measurement Equipment.....	11
3.5. Test Result and Data.....	12
3.6. Test Photographs .....	14
<b>4. Test of Radiated Emission .....</b>	<b>14</b>
4.1. Test Limit .....	14
4.2. Test Procedures .....	14
4.3. Typical test Setup.....	15
4.4. Measurement Equipment.....	16
4.5. Test Result and Data (30MHz ~ 1000MHz) .....	17
4.6. Test Result and Data (1000MHz ~ 18000MHz) .....	19



### History of this test report

Original

Additional attachment as following record:

Attachment No.	Issue Date	Description



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Equipment : Firewall Appliance

Model No. : SG-6000-E1100G3w

Trademark : 

FCC ID : 2AD6IE1100G3W

## I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2009** and the energy emitted by this equipment was **passed CISPR PUB. 22 FCC Part 15, ICES-003:2012 Issue 5** in both radiated and conducted emission Class B limits.

The Testing was carried out on Dec.01~08, 2014 at CerpPASS Technology (Suzhou) Co., Ltd.

Signature



Miro Chueh/ Technical director



## 1. Summary of Test Procedure and Test Result

Test Item	Normative References	Test Result
Conducted Emission	ANSI C63.4-2009 FCC Part 15 Subpart B ICES-003:2012 Issue 5	PASS
Radiated Emission	A ANSI C63.4-2009 FCC Part 15 Subpart B ICES-003:2012 Issue 5	PASS



## 2. Test Configuration of Equipment under Test

### 2.1. Factory

<b>Factory 1</b>
<b>Sanmina-SCI Systems (Kunshan) Co., Ltd.</b> 312 Qing Yang South RoadKunshan, Jiangsu Province 215335
<b>Factory 2</b>
<b>INFO-TEK ELECTRONIC(SUZHOU)CO.,LTD</b> #183,Jinfeng, Hi-tech Development Zone Suzhou Jiangsu 2015011,P.R.China

### 2.2. Feature of Equipment under Test

Equipment	Firewall Appliance
Model No:	SG-6000-E1100G3w,
Power Rating	12VDC,3.0A



### 2.3. Test Manner

a	During testing, the interface cables and equipment positions were varied according to Europe Standard.
b	The complete test system included auxiliary equipment and EUT for EMI test.
c	And then test.
<b>The pre-test modes</b>	
<b>Conducted Emission</b>	
	Test Mode 1: Full load with broadcast storm (SG-6000-E1100G3w) for 110V
<b>Radiated Emission</b>	
	Test Mode 1: Full load with broadcast storm (SG-6000-E1100G3w) for 110V
<b>The worse case was selected as the final test mode and record in the report</b>	
<b>Conducted Emission</b>	Test Mode 1: Full load with broadcast storm (SG-6000-E1100G3w) for 110V
<b>Radiated Emission</b>	Test Mode 1: Full load with broadcast storm (SG-6000-E1100G3w) for 110V

**2.4. Description of Test System**

No	Device	Manufacturer	Model No.	Description
1	PC	HP	HP Compaq Elite 8200 MTPC	Non-Shielded ,1.8m
2	USB Keyboard	DELL	SK-8115	N/A
3	USB Mouse	DELL	B889	N/A
4	Modem	Kingnet	KN-JT560	N/A
5	Printer	LENOVO	4126-LV7	N/A
6	LCD Monitor	DELL	SE198WFPt	Non-Shielded ,1.8m (R43346)
7	Notebook	SONY	PCG-71811P	Non-Shielded ,1.5m (R33021)
8	USB DISK	SANDISK	N/A	N/A



**2.5. General Information of Test**

Test Site:	CerpPASS Technology (Suzhou) Co., Ltd.
Test Site Location :	No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China
NVLAP LAB Code :	200814-0
FCC Registration Number :	916572, 331395
IC Registration Number :	7290A-1, 7290A-2
VCCI Registration Number :	T-1945 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test below 1GHz G-227 for Radiated emission test above 1GHz
Frequency Range Investigated :	Conducted Emission Test: from 150kHz to 30 MHz Radiated Emission Test: from 30 MHz to 1,000 MHz Radiated Emission Test: from 1GHz to 6GHz
Test Distance :	The test distance of radiated emission below 1GHz from antenna to EUT is 10 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.

**2.6. Measurement Uncertainty**

Conducted Emission		
The measurement uncertainty is evaluated as $\pm 2.71$ dB.		
Radiated Emission		
(30MHz -1000MHz)	Horizontal	The measurement uncertainty is evaluated as $\pm 3.59$ dB.
	Vertical	The measurement uncertainty is evaluated as $\pm 3.89$ dB
(1G-6GHz)	Horizontal	The measurement uncertainty is evaluated as $\pm 2.31$ dB.
	Vertical	The measurement uncertainty is evaluated as $\pm 2.15$ dB.



### 3. Test of Conducted Emission

#### 3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2009 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

#### Conducted Emission Limits:

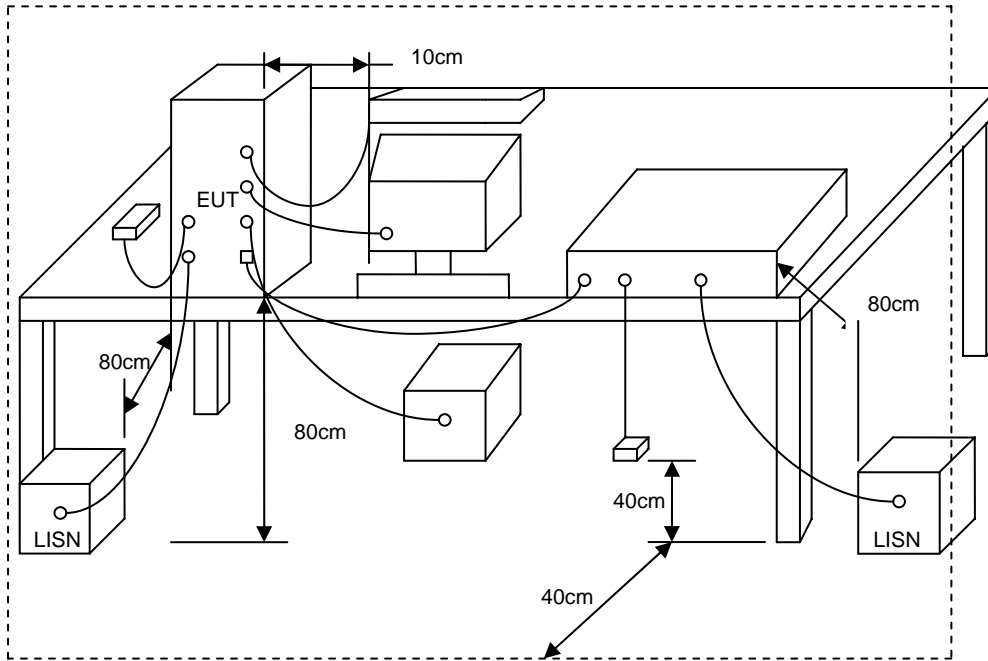
Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Average (dB $\mu$ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

#### 3.2. Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



### 3.3. Typical test Setup



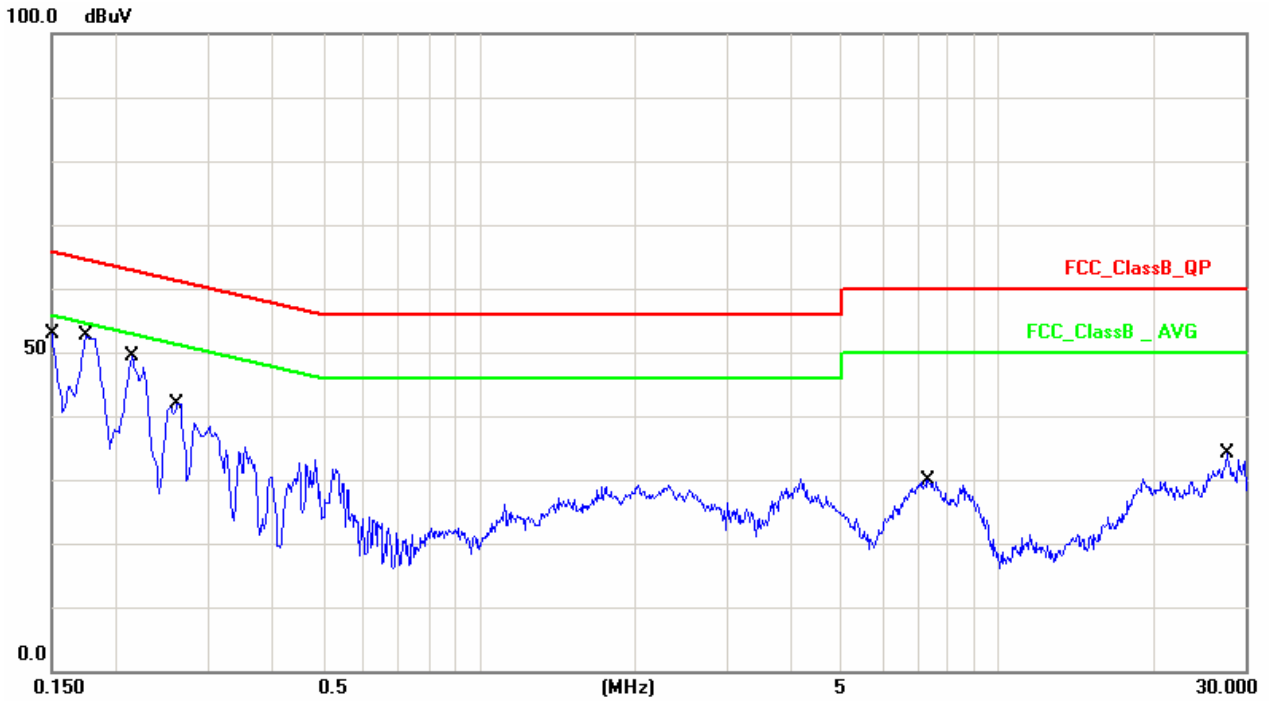
### 3.4. Measurement Equipment

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100565	2014.03.24	2015.03.23
AMN	R&S	ESH2-Z5	100182	2014.09.04	2015.09.03
Two-Line V-Network	R&S	ENV216	100325	2014.12.04	2015.12.03
ISN	FCC	FCC-TLISN-T2-02	20379	2014.03.24	2015.03.23
ISN	FCC	FCC-TLISN-T4-02	20380	2014.03.24	2015.03.23
ISN	FCC	FCC-TLISN-T8-02	20381	2014.03.24	2015.03.23
ISN	TESEQ	ISN ST08	30175	2014.03.24	2015.03.23
Current Probe	R&S	EZ-17	100303	2014.04.04	2015.04.03
Passive Voltage Probe	R&S	ESH2-Z3	100026	2014.03.24	2015.03.23
Pulse Limiter	R&S	ESH3-Z2	100529	2014.03.24	2015.03.23
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-004	2014.03.31	2015.03.30



3.5. Test Result and Data

Test Mode 1:	Full load with broadcast storm (SG-6000-E1100G3w) for 110V		
AC Power :	AC 120V/60Hz	Phase :	LINE
Temperature :	22°C	Humidity :	50%
Pressure(mbar) :	1002	Date:	2014/12/08

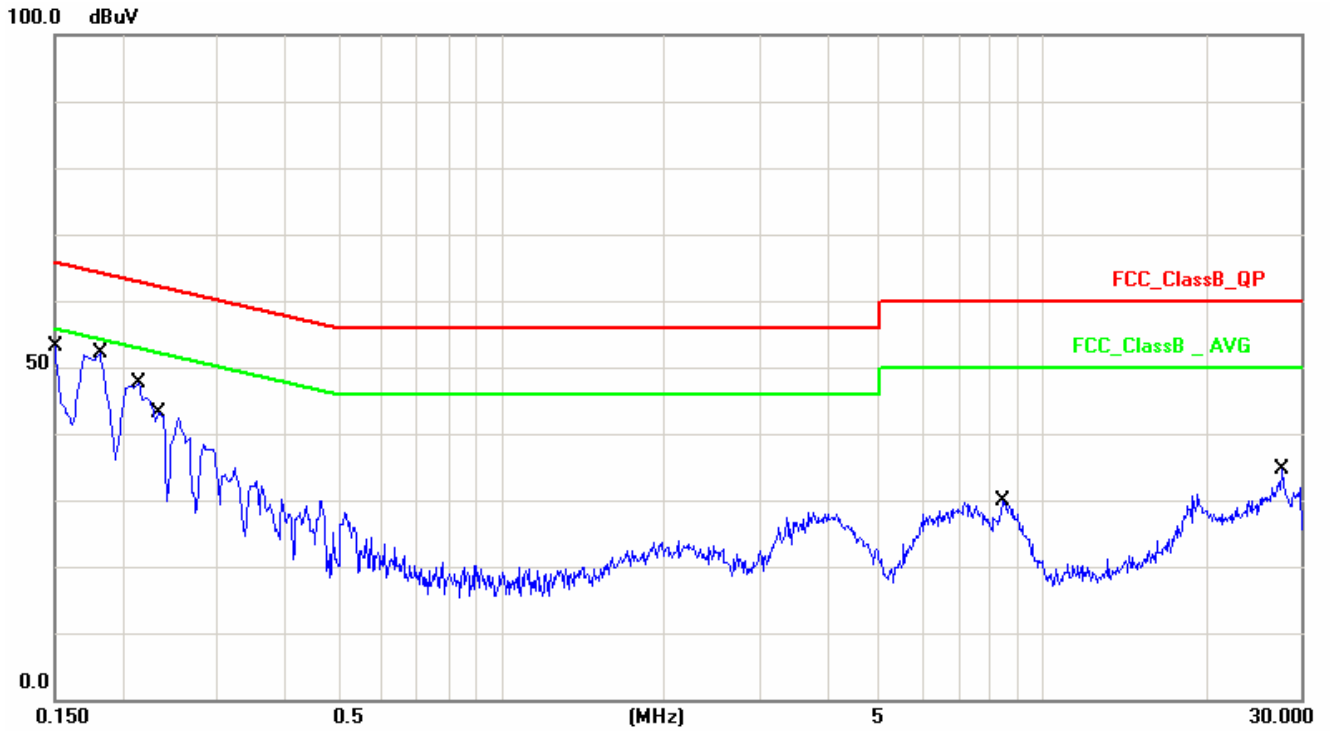


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	10.13	26.94	37.07	65.99	-28.92	QP
2	0.1500	10.13	5.58	15.71	55.99	-40.28	AVG
3	0.1740	10.13	42.19	52.32	64.76	-12.44	QP
4	0.1740	10.13	28.29	38.42	54.76	-16.34	AVG
5	0.2140	10.12	35.61	45.73	63.04	-17.31	QP
6	0.2140	10.12	19.36	29.48	53.04	-23.56	AVG
7	0.2620	10.13	29.90	40.03	61.36	-21.33	QP
8	0.2620	10.13	14.61	24.74	51.36	-26.62	AVG
9	7.3540	10.26	16.56	26.82	60.00	-33.18	QP
10	7.3540	10.26	9.40	19.66	50.00	-30.34	AVG
11	27.6620	10.44	16.24	26.68	60.00	-33.32	QP
12	27.6620	10.44	10.31	20.75	50.00	-29.25	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator



Test Mode 1:	Full load with broadcast storm (SG-6000-E1100G3w) for 110V		
AC Power :	AC 120V/60Hz	Phase :	NEUTRAL
Temperature :	22°C	Humidity :	50%
Pressure(mbar) :	1002	Date:	2014/12/08



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	10.13	41.59	51.72	65.99	-14.27	QP
2	0.1500	10.13	23.69	33.82	55.99	-22.17	AVG
3	0.1819	10.12	39.83	49.95	64.39	-14.44	QP
4	0.1819	10.12	24.57	34.69	54.39	-19.70	AVG
5	0.2140	10.12	34.90	45.02	63.04	-18.02	QP
6	0.2140	10.12	18.60	28.72	53.04	-24.32	AVG
7	0.2340	10.12	22.06	32.18	62.30	-30.12	QP
8	0.2340	10.12	0.63	10.75	52.30	-41.55	AVG
9	8.4700	10.26	14.21	24.47	60.00	-35.53	QP
10	8.4700	10.26	7.77	18.03	50.00	-31.97	AVG
11	27.8260	10.44	17.04	27.48	60.00	-32.52	QP
12	27.8260	10.44	10.55	20.99	50.00	-29.01	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator

Test engineer: Moses



### 3.6. Test Photographs

## 4. Test of Radiated Emission

### 4.1. Test Limit

Radiated emissions from 30 MHz to 15,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-2009. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 3.2. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

For unintentional device, according to § 15.109(a), except for Class B digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters	Radiated ( $\mu V / M$ )	Radiated (dB $\mu V / M$ )
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

Frequency (MHz)	Distance Meters	Radiated (dB $\mu V / M$ )
30-230	10	30
230-1000	10	37

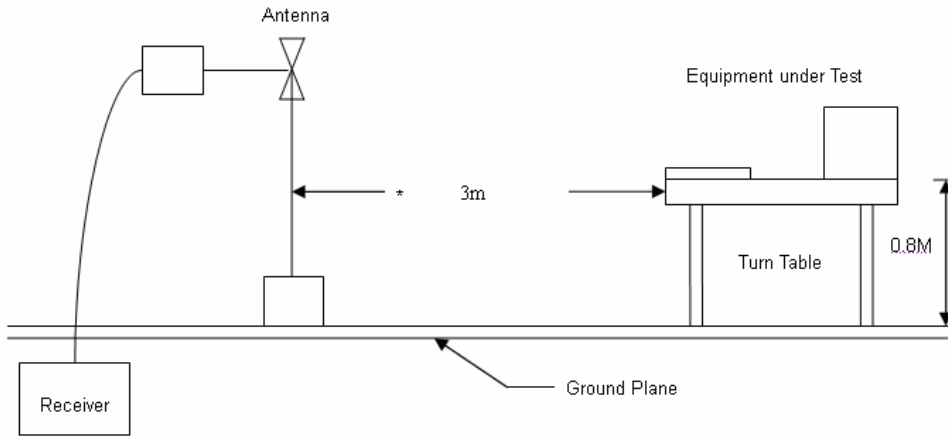
### 4.2. Test Procedures

- a. The EUT was placed on a Rota table top 0.8 meter above ground.
- b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

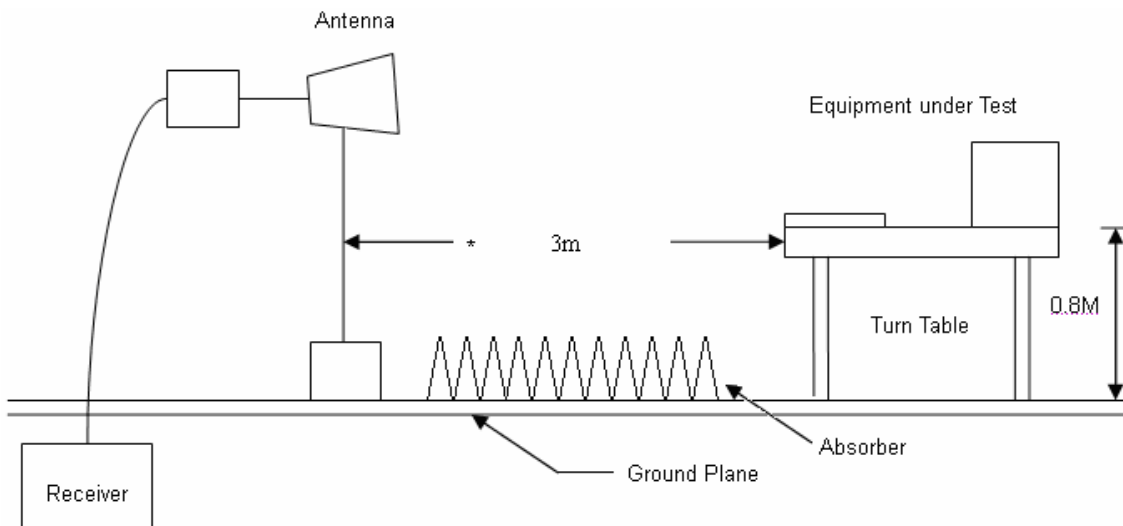


### 4.3. Typical test Setup

#### Below 1GHz Test Setup



#### Above 1GHz Test Setup



**4.4. Measurement Equipment**

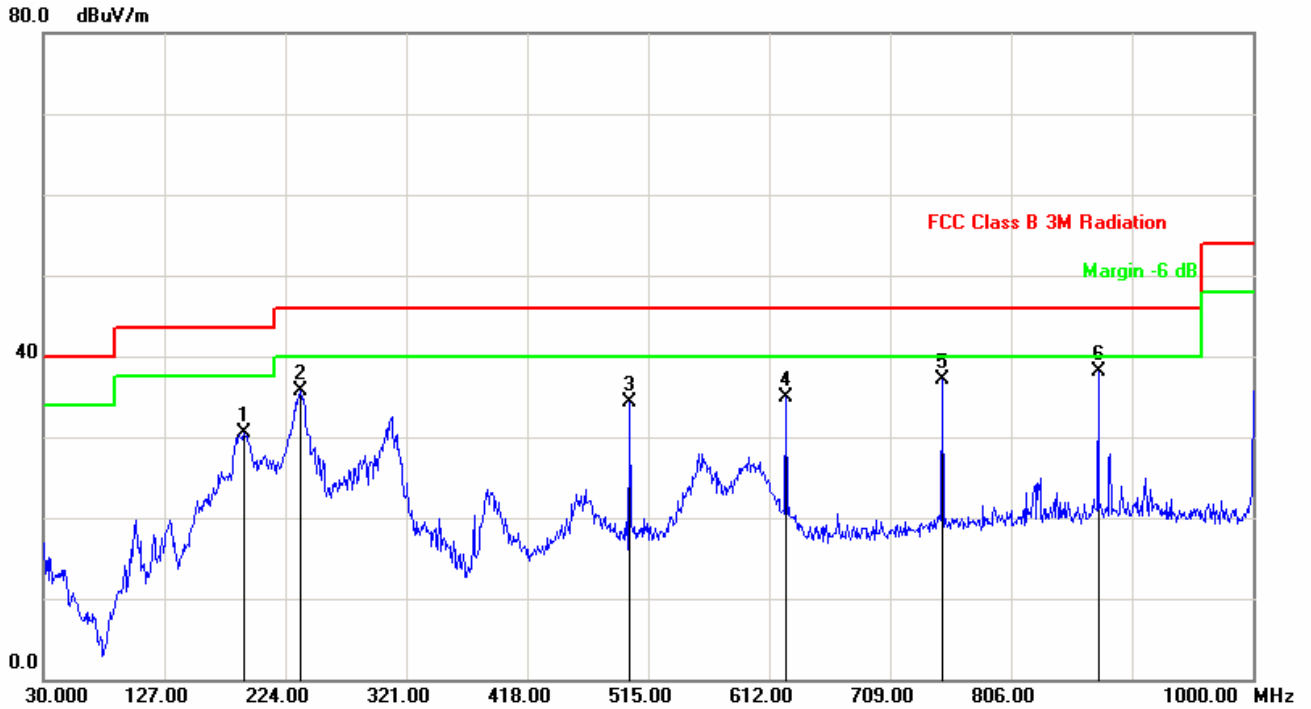
Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
EMI Test Receiver	R&S	ESCI	100563	2014.02.10	2015.02.09
H64 Preamplifier	HP	8447F	3113A05582	2014.03.24	2015.03.23
Preamplifier	Agilent	8449B	3008A02342	2014.03.24	2015.03.23
Bilog Antenna	Sunol Science	JB1	A072414-2	2014.08.05	2015.08.04
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-619	2014.05.24	2015.05.23
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	9170-348	2014.11.04	2015.11.03
Spectrum Analyzer	R&S	FSP40	100324	2014.03.23	2015.03.24
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2014.03.31	2015.03.30





4.5. Test Result and Data (30MHz ~ 1000MHz)

Test Mode 1:	Full load with broadcast storm (SG-6000-E1100G3w) for 110V		
AC Power :	AC 120/ 60Hz	Ant. Polarization:	Horizontal
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2014/12/02

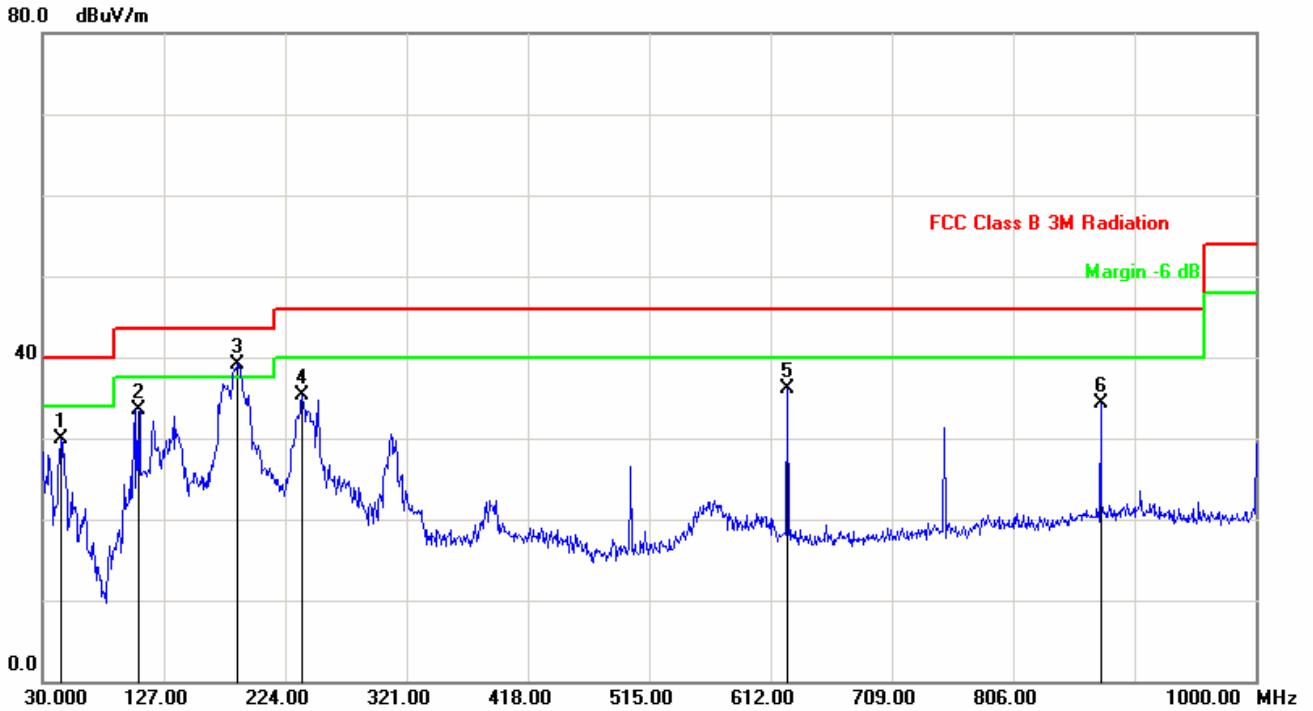


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	191.0200	-17.97	48.49	30.52	43.50	-12.98	peak	200	157
2	235.6400	-18.57	54.27	35.70	46.00	-10.30	peak	100	4
3	500.4500	-12.38	46.59	34.21	46.00	-11.79	peak	200	115
4	625.5800	-10.19	45.13	34.94	46.00	-11.06	peak	100	8
5	750.7100	-10.03	47.12	37.09	46.00	-8.91	peak	100	226
6	875.8400	-6.86	44.93	38.07	46.00	-7.93	peak	200	360

Note: Measurement Level = Reading Level + Correct Factor



Test Mode 1:	Full load with broadcast storm (SG-6000-E1100G3w) for 110V		
AC Power :	AC 120/ 60Hz	Ant. Polarization:	Vertical
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2014/12/02



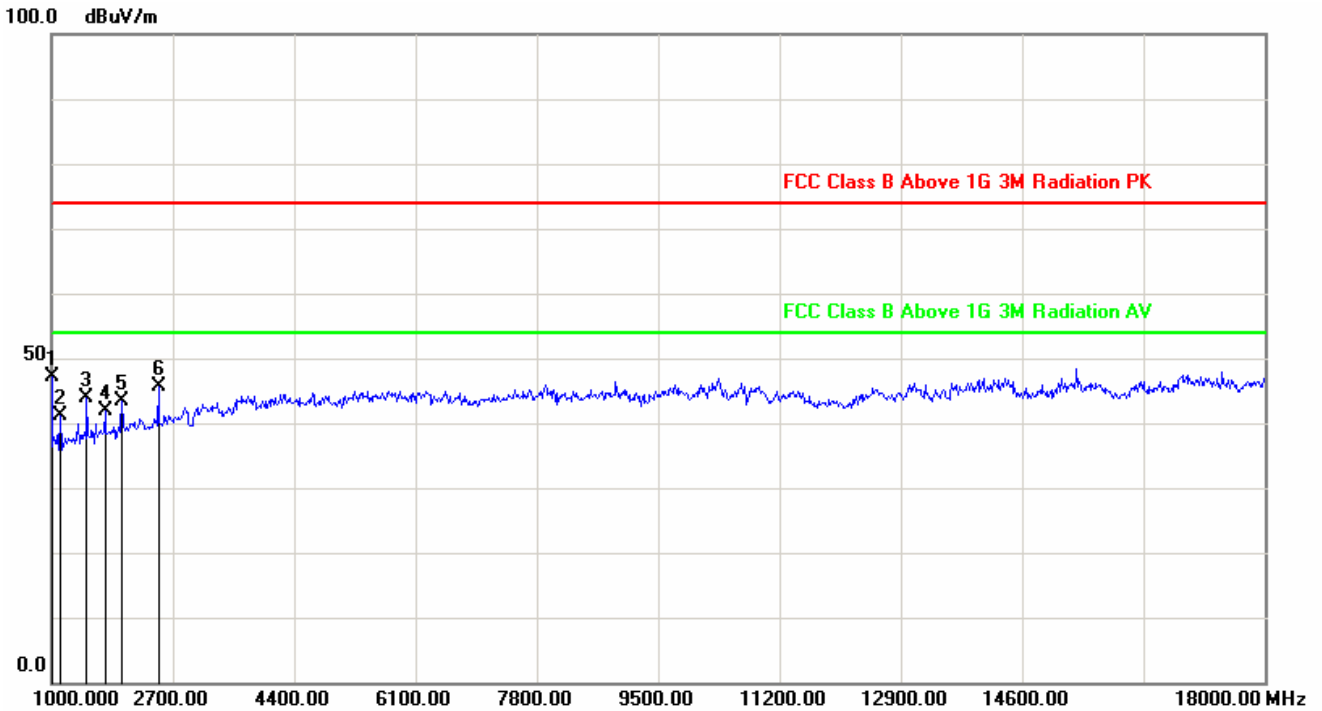
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	44.5500	-17.03	46.98	29.95	40.00	-10.05	peak	100	157
2	107.5999	-19.04	52.59	33.55	43.50	-9.95	peak	100	60
3	186.1699	-18.36	57.46	39.10	43.50	-4.40	QP	200	221
4	237.5800	-18.30	53.52	35.22	46.00	-10.78	peak	200	15
5	625.5800	-10.52	46.63	36.11	46.00	-9.89	peak	100	1
6	875.8400	-6.85	41.16	34.31	46.00	-11.69	peak	200	196

Note: Measurement Level = Reading Level + Correct Factor



4.6. Test Result and Data (1000MHz ~ 18000MHz)

Test Mode 1:	Full load with broadcast storm (SG-6000-E1100G3w) for 110V		
AC Power :	AC 120/ 60Hz	Ant. Polarization:	Horizontal
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2014/12/08

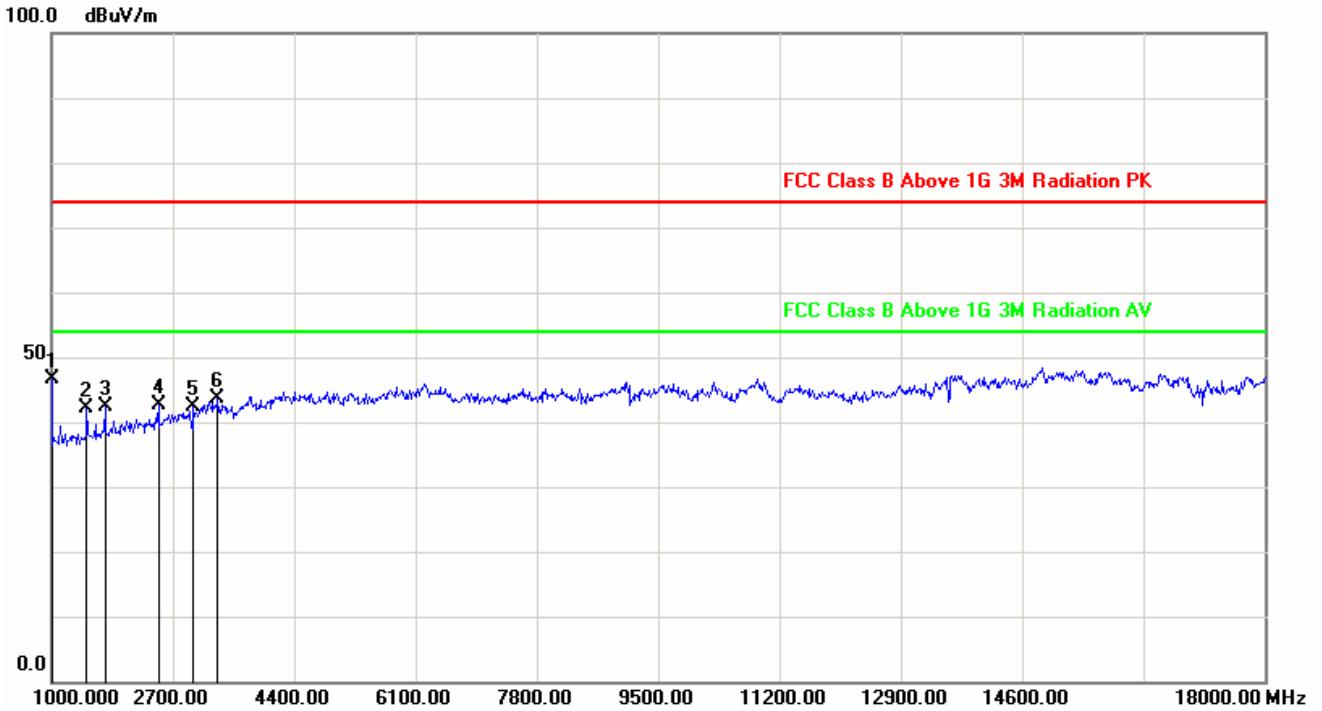


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1000.0000	-6.87	53.98	47.11	74.00	-26.89	peak	100	143
2	1119.000	-6.37	47.62	41.25	74.00	-32.75	peak	100	93
3	1493.000	-4.81	48.80	43.99	74.00	-30.01	peak	100	187
4	1748.000	-3.75	45.74	41.99	74.00	-32.01	peak	200	119
5	1986.000	-2.76	46.12	43.36	74.00	-30.64	peak	100	213
6	2496.000	-1.04	46.58	45.54	74.00	-28.46	peak	100	209
7	1000.0000	-6.87	53.98	47.11	74.00	-26.89	peak	100	143

Note: Measurement Level = Reading Level + Correct Factor



Test Mode 1:	Full load with broadcast storm (SG-6000-E1100G3w) for 110V		
AC Power :	AC 120/ 60Hz	Ant. Polarization:	Vertical
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2014/12/08



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1000.0000	-6.87	53.41	46.54	74.00	-27.46	peak	200	159
2	1493.000	-4.81	46.89	42.08	74.00	-31.92	peak	100	191
3	1748.000	-3.75	46.13	42.38	74.00	-31.62	peak	200	181
4	2496.000	-1.04	43.63	42.59	74.00	-31.41	peak	200	192
5	2989.000	0.61	41.89	42.50	74.00	-31.50	peak	200	43
6	3329.000	1.87	41.83	43.70	74.00	-30.30	peak	200	224

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Moses