Testing Laboratory
1332

FCC DOC TEST REPORT

Declaration **o**f **C**onformity

According to

47 CFR, Part 2, Part 15, CISPR PUB. 22,
Canada ICES-003

Applicant	:	SMART CABLEING & TRANSMISSION CORP.
Address	:	10F, No. 493, Chung-Cheng Rd., Hsin Tien City, Taipei 231, Taiwan, R.O.C.
Equipment	:	Keyboard Mouse CAT5 Extender
Model No.	:	KMXXXT, KMXXXR

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

Contents

History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description
TEFD1109073	Sep. 28, 2011	Original.

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47 CFR, Part 2, Part 15, CISPR PUB. 22,
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Equipment	:	Keyboard Mouse CAT5 Extender
Model No.	:	KMXXXT, KMXXXR

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, Canada ICES-003** in both radiated and conducted emission class B limits.
Testing was carried out on Sep. 19, 2011 at Cerpass Technology Corp.

Signature

Hill Chen
EMC/RF B.U. Assistant Manager

1. Summary of Test Procedure and Test Results

Test Item	Normative References	Test Result
Conducted Emission	ANSI C63.4-2009 FCC Part 15 Subpart B, Canada ICES-003	PASS
Radiated Emission	ANSI C63.4-2009 FCC Part 15 Subpart B, Canada ICES-003	PASS

2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

Please refer to the user manual.

2.2. Test Manner

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.

b. The complete test system included PC, Monitor, Keyboard, Mouse, Modem, Printer, and EUT for EMC test. The Remote workstation includes Notebook.

c. The test mode of conduction and radiation test as follow:
Test Mode 1. Link LAN Work USB Keyboard and Mouse, power from system
Test Mode 2. Link LAN Work USB Keyboard and Mouse, power from adapter
The “Test Mode 2” generated the worst test result; it was reported as final result.

d. An executive program, “WinFCC.exe” under WIN 7, which generates a complete line of continuously repeating “H” pattern was used as the test software.
The program was executed as follows:
1. Turn on the power of all equipment.
2. The EUT reads the test program from the hard disk drive and runs it.
3. The EUT sends “H” messages to the monitor, and the monitor displays “H” patterns on the screen.
4. The EUT sends “H” messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
5. The EUT sends "H" messages to the modem.
6. Repeat the steps from 2 to 5.

2.3. Description of Test System

Device	Manufacturer	Model No.	Description
PC	DELL	D02M	Power Cable, Unshielding, 1.8m
Monitor	DELL	U2410f	Power Cable, Unshielding 1.8m Data Cable, VGA Shielding 1.35 m
Keyboard	DELL	SK-8175	USB Cable, Shielding 1.85m
Mouse	DELL	M-UV83	USB Cable, Shielding 1.85m
Modem	ACEEX	DM-1414	Power Cable, Unshielding 1.8m Data Cable, RS232Shielding 1.35 m
Printer	hp	D2660	Power Cable, Unshielding, 1.8m Data Cable, USB Shielding, 1.6m

Use Cable:

Cable	Quantity	Description
RJ45	1	Unshielding, 1.8m

2.4. General Information of Test

Test Site :	Cerpass Technology Corp. 2F-11, No. 3, Yuan Qu St., (Nankang Software Park), Taipei, Taiwan 115, R.O.C.
Test Site Location (OATS2-SD) :	No.68-1, Shihbachongsi, Shihding Township, Taipei City 223, Taiwan, R.O.C.
FCC Registration Number :	TW1049, TW1061, 488071, 390316
IC Registration Number :	4934B-1, 4934D-1
VCCI Registration Number :	T-543 for Telecommunication Test C-3328 for Conducted emission test R-3013 for Radiated emission test G-97 for radiated disturbance above 1GHz
Test in Compliance with:	ANSI C63.4-2009 FCC Part 15 Subpart B Canada ICES-003
Frequency Range Investigated :	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 10,000 MHz
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.

2.5. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE / NEUTRAL	2.71dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical	3.52 dB
		Horizontal	3.39 dB
	1,000 MHz ~ 18,000 MHz	Vertical	4.39 dB
		Horizontal	5.25 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.

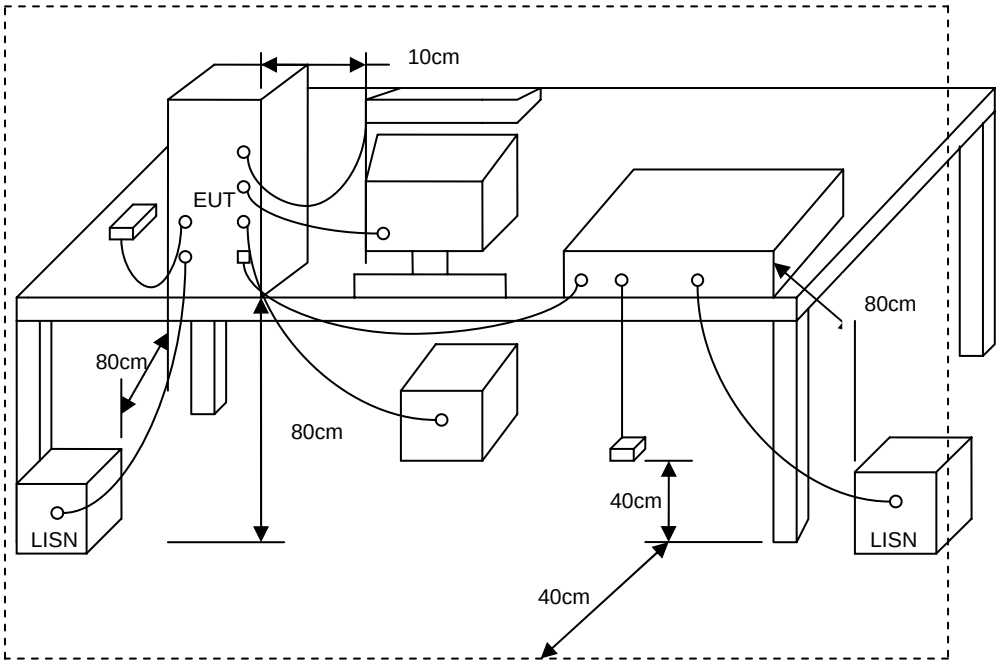
Conducted Emission Limits:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ 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

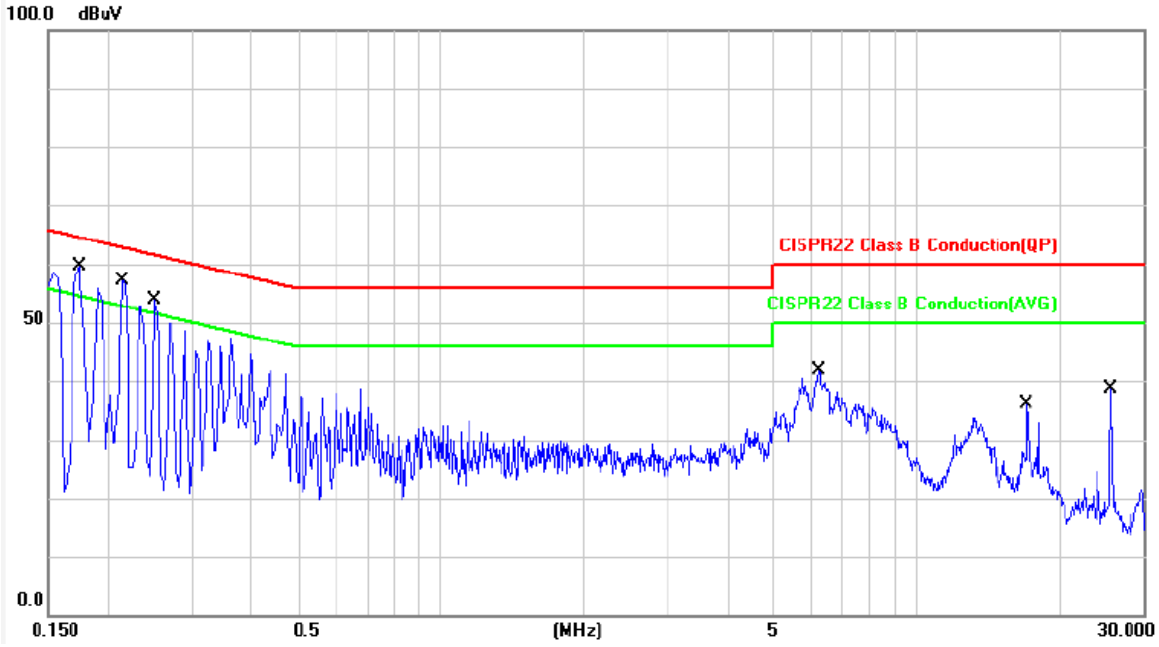


3.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI	100443	2011/02/08	2012/02/07
LISN	Schwarzbeck	NSLK 8127	8127-516	2011/05/05	2012/05/04
LISN	Schwarzbeck	NSLK 8127	8127-568	2011/08/24	2012/08/23

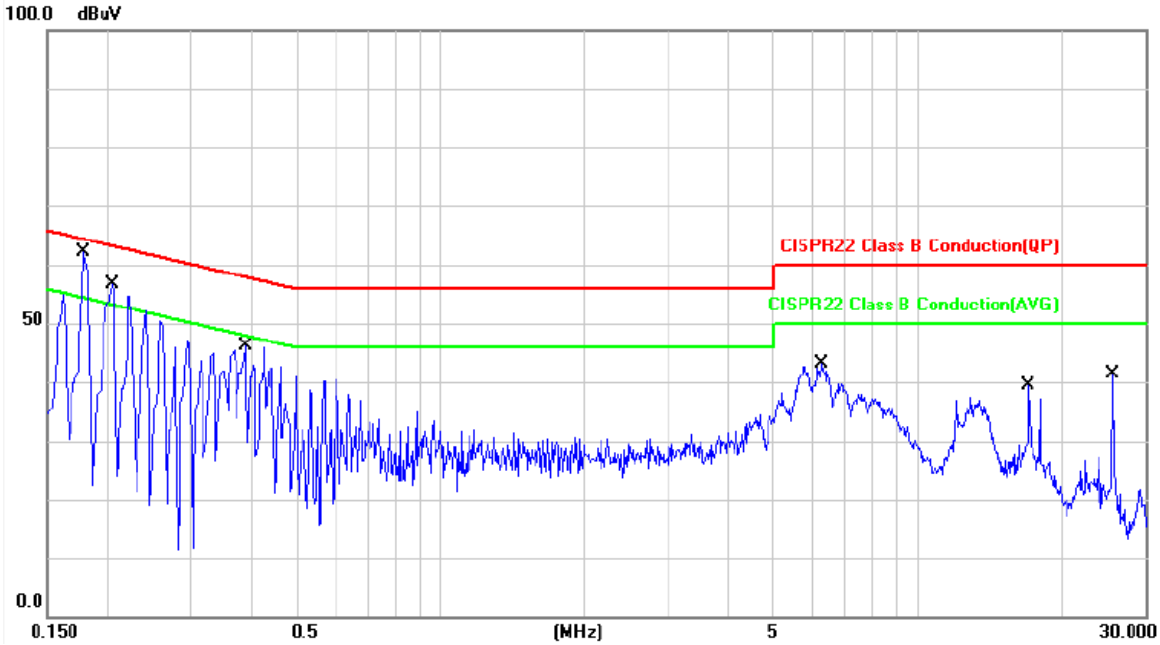
3.5. Test Result and Data

Power	:	AC 120V	Pol/Phase	:	LINE
Test Mode 2	:	Power from adapter	Temperature	:	24 °C
Test Date	:	Sep. 15, 2011	Humidity	:	58 %



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1740	0.12	57.54	57.66	64.76	-7.10	QP	P
2	0.1740	0.12	42.54	42.66	54.76	-12.10	AVG	P
3	0.2140	0.12	55.88	56.00	63.04	-7.04	QP	P
4	0.2140	0.12	37.34	37.46	53.04	-15.58	AVG	P
5	0.2500	0.12	52.01	52.13	61.75	-9.62	QP	P
6	0.2500	0.12	33.58	33.70	51.75	-18.05	AVG	P
7	6.2220	0.43	37.15	37.58	60.00	-22.42	QP	P
8	6.2220	0.43	31.20	31.63	50.00	-18.37	AVG	P
9	17.0820	0.87	35.44	36.31	60.00	-23.69	QP	P
10	17.0820	0.87	27.98	28.85	50.00	-21.15	AVG	P
11	25.6220	1.19	35.92	37.11	60.00	-22.89	QP	P
12	25.6220	1.19	28.49	29.68	50.00	-20.32	AVG	P

Power	:	AC 120V	Pol/Phase	:	NEUTRAL
Test Mode 2	:	Power from adapter	Temperature	:	24 °C
Test Date	:	Sep. 15, 2011	Humidity	:	58 %



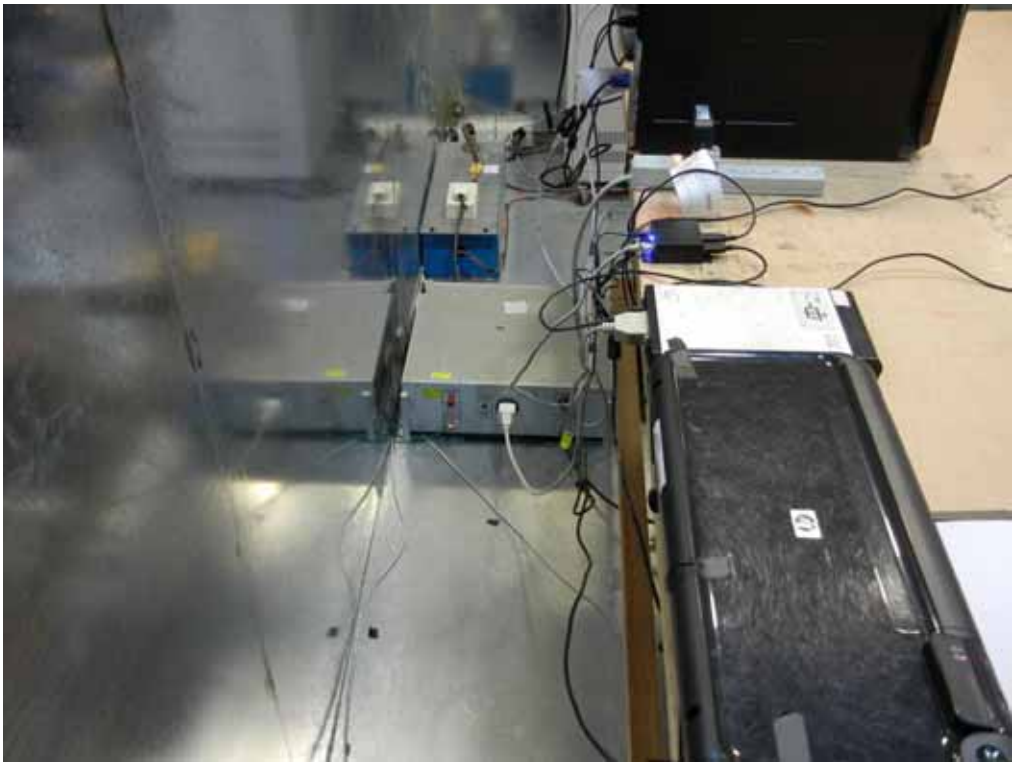
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1780	0.10	59.81	59.91	64.57	-4.66	QP	P
2	0.1780	0.10	42.93	43.03	54.57	-11.54	AVG	P
3	0.2060	0.10	54.40	54.50	63.36	-8.86	QP	P
4	0.2060	0.10	38.59	38.69	53.36	-14.67	AVG	P
5	0.3899	0.12	43.85	43.97	58.06	-14.09	QP	P
6	0.3899	0.12	35.59	35.71	48.06	-12.35	AVG	P
7	6.2540	0.40	39.07	39.47	60.00	-20.53	QP	P
8	6.2540	0.40	32.87	33.27	50.00	-16.73	AVG	P
9	17.0780	0.67	36.75	37.42	60.00	-22.58	QP	P
10	17.0780	0.67	28.96	29.63	50.00	-20.37	AVG	P
11	25.6700	0.86	40.27	41.13	60.00	-18.87	QP	P
12	25.6700	0.86	32.53	33.39	50.00	-16.61	AVG	P

Test engineer: Dian

3.6. Test Photographs

Front View

Rear View



4. Test of Radiated Emission

4.1. Test Limit

Radiated emissions from 30 MHz to 10,000 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 A 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 (μ V / M)	Radiated (dB μ 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.

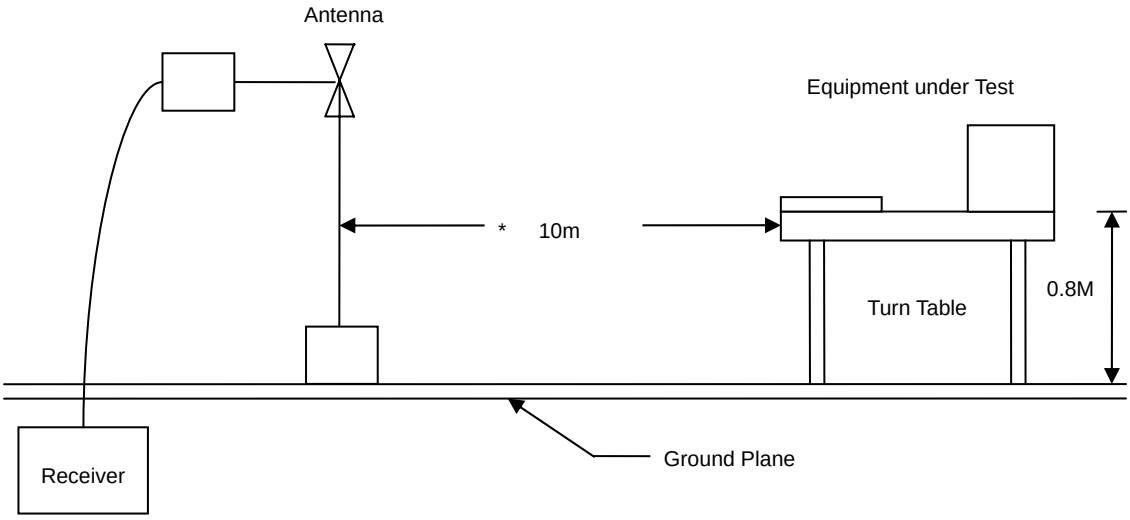
Frequency (MHz)	Distance Meters	Radiated (dB μ V/ M)
30-230	10	30
230-1000	10	37

4.2. Test Procedures

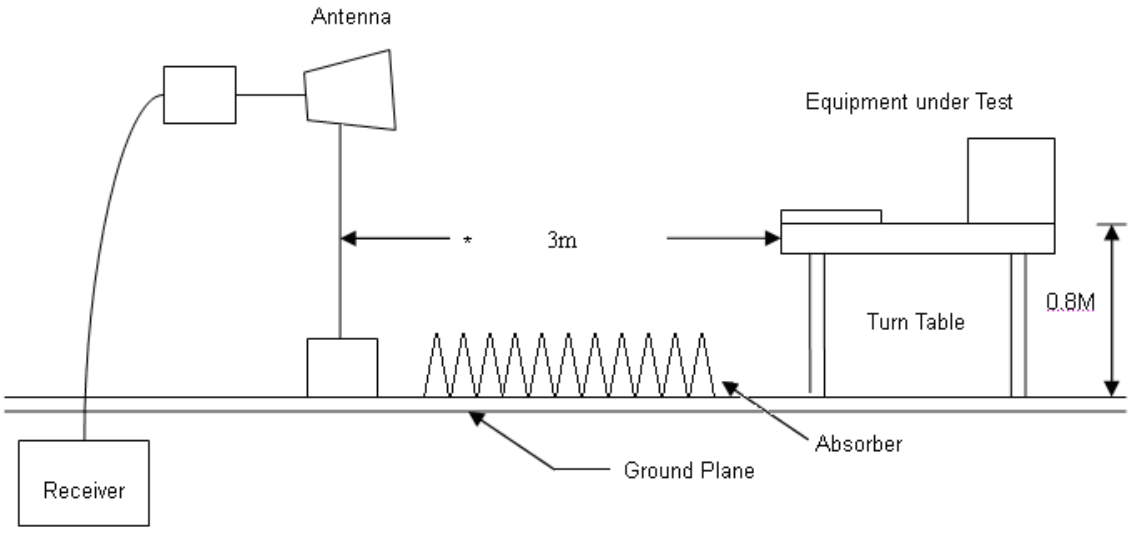
a. The EUT was placed on a Rota table top 0.8 meter above ground.
b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna 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

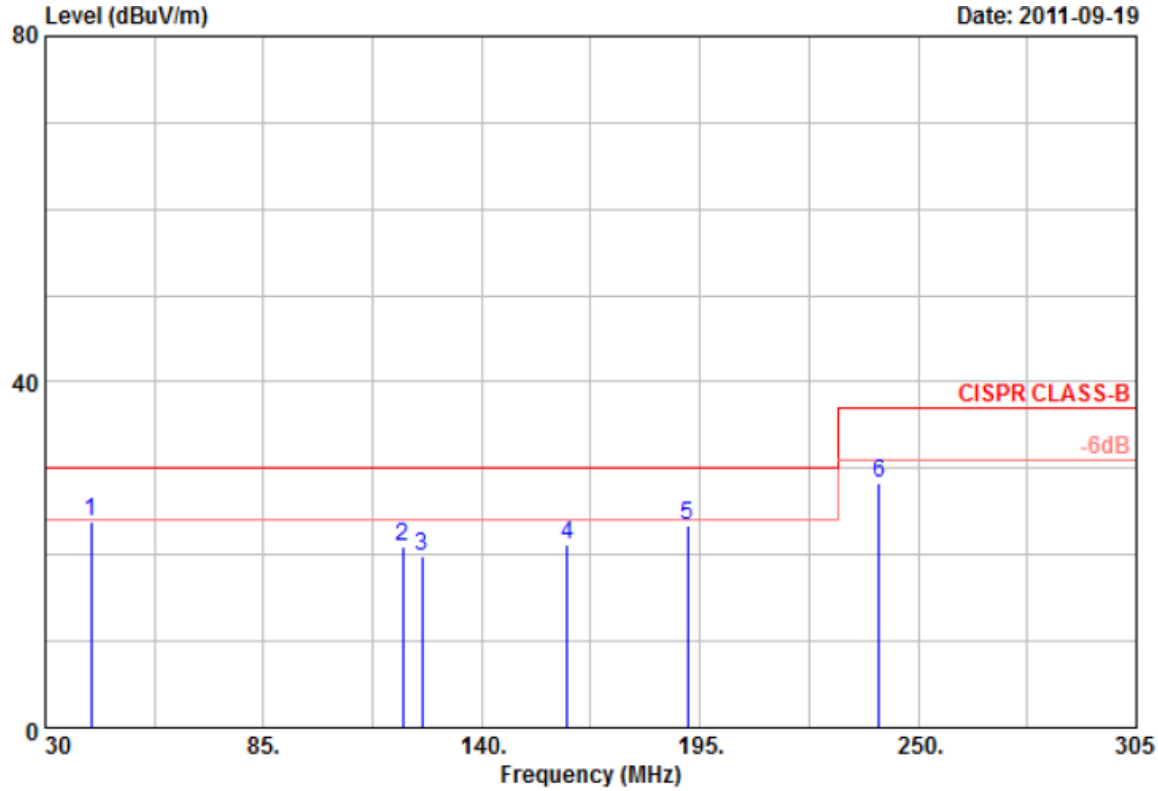


4.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Amplifier	Agilent	8447D	2944A10531	2011/01/21	2012/01/20
Bilog Antenna	Schaffner	CBL6112D	22242	2011/02/09	2012/02/08
EMI Receiver	R&S	ESCI	101200	2011/07/26	2012/07/25
SPECTRUM ANALYZER	R&S	FSP40	100219	2010/11/05	2011/11/04
HORN ANTENNA	EMCO	3115	31589	2011/05/02	2012/05/01
Preamplifier	Agilent	8449B	3008A01954	2011/03/02	2012/03/01

4.5. Test Result and Data (30MHz~1GHz)

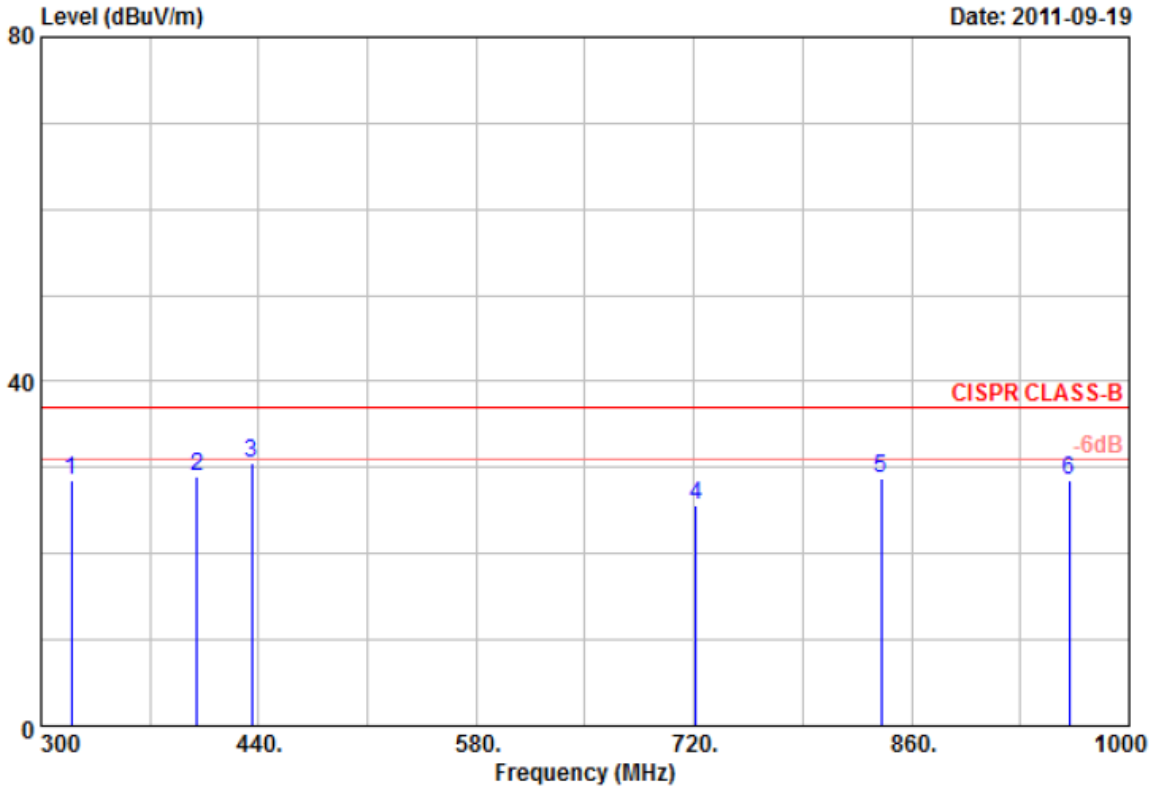
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 2	:	Power from adapter	Temperature	:	27 °C
Memo	:		Humidity	:	60 %



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	41.550	39.552	-15.802	23.750	30.000	-6.250	QP	400	0
2	120.000	33.925	-13.050	20.875	30.000	-9.125	QP	100	62
3	125.000	32.467	-12.675	19.792	30.000	-10.208	QP	400	0
4	161.450	37.867	-16.788	21.079	30.000	-8.921	QP	400	0
5	191.975	39.649	-16.298	23.351	30.000	-6.649	QP	400	0
6	240.100	42.432	-14.115	28.317	37.000	-8.683	QP	400	0

Remarks: 1. Result = Read Value + Factor
2. Factor = Antenna factor + Cable loss - Amplifier factor

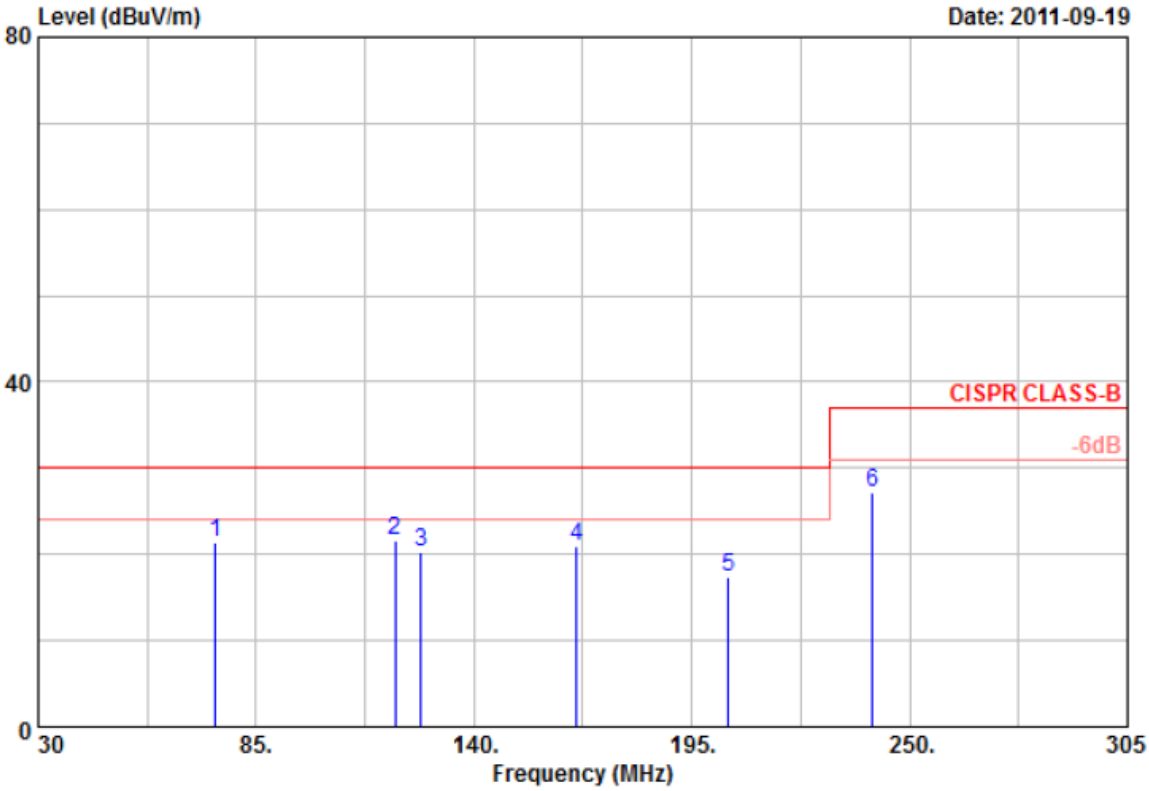
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 2	:	Power from adapter	Temperature	:	27 °C
Memo	:		Humidity	:	60 %



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	319.600	38.421	-9.807	28.614	37.000	-8.386	QP	100	0
2	400.100	37.998	-9.134	28.864	37.000	-8.136	QP	100	0
3	435.800	37.954	-7.332	30.622	37.000	-6.378	QP	100	0
4	721.400	27.471	-1.935	25.536	37.000	-11.464	QP	100	0
5	840.400	26.480	2.262	28.742	37.000	-8.258	QP	100	0
6	961.500	25.023	3.549	28.572	37.000	-8.428	QP	100	0

Remarks: 1. Result = Read Value + Factor
2. Factor = Antenna factor + Cable loss - Amplifier factor

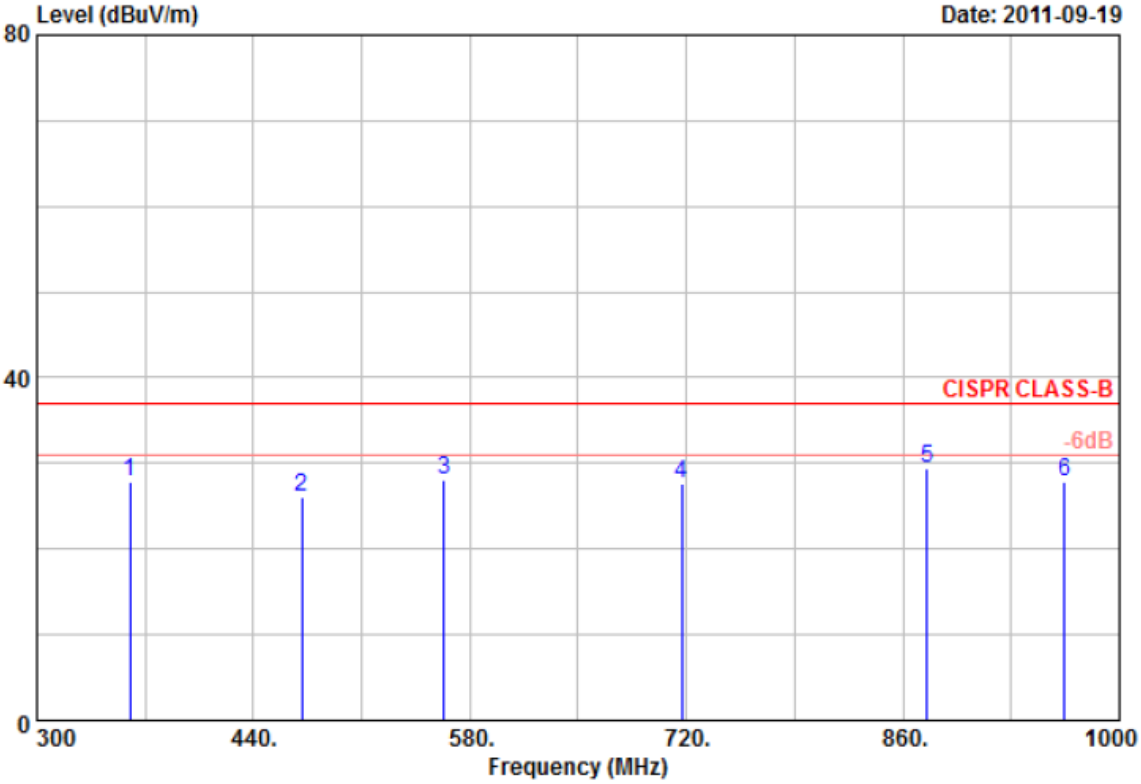
Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Power from adapter	Temperature	:	27 °C
Memo	:		Humidity	:	60 %



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	74.825	42.740	-21.288	21.452	30.000	-8.548	QP	400	0
2	120.000	35.000	-13.430	21.570	30.000	-8.430	QP	400	0
3	126.525	34.522	-14.193	20.329	30.000	-9.671	QP	400	0
4	165.850	37.374	-16.433	20.941	30.000	-9.059	QP	400	0
5	204.350	33.534	-16.215	17.319	30.000	-12.681	QP	400	0
6	240.650	41.106	-13.911	27.195	37.000	-9.805	QP	400	0

Remarks: 1. Result = Read Value + Factor
2. Factor = Antenna factor + Cable loss - Amplifier factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Power from adapter	Temperature	:	27 °C
Memo	:		Humidity	:	60 %

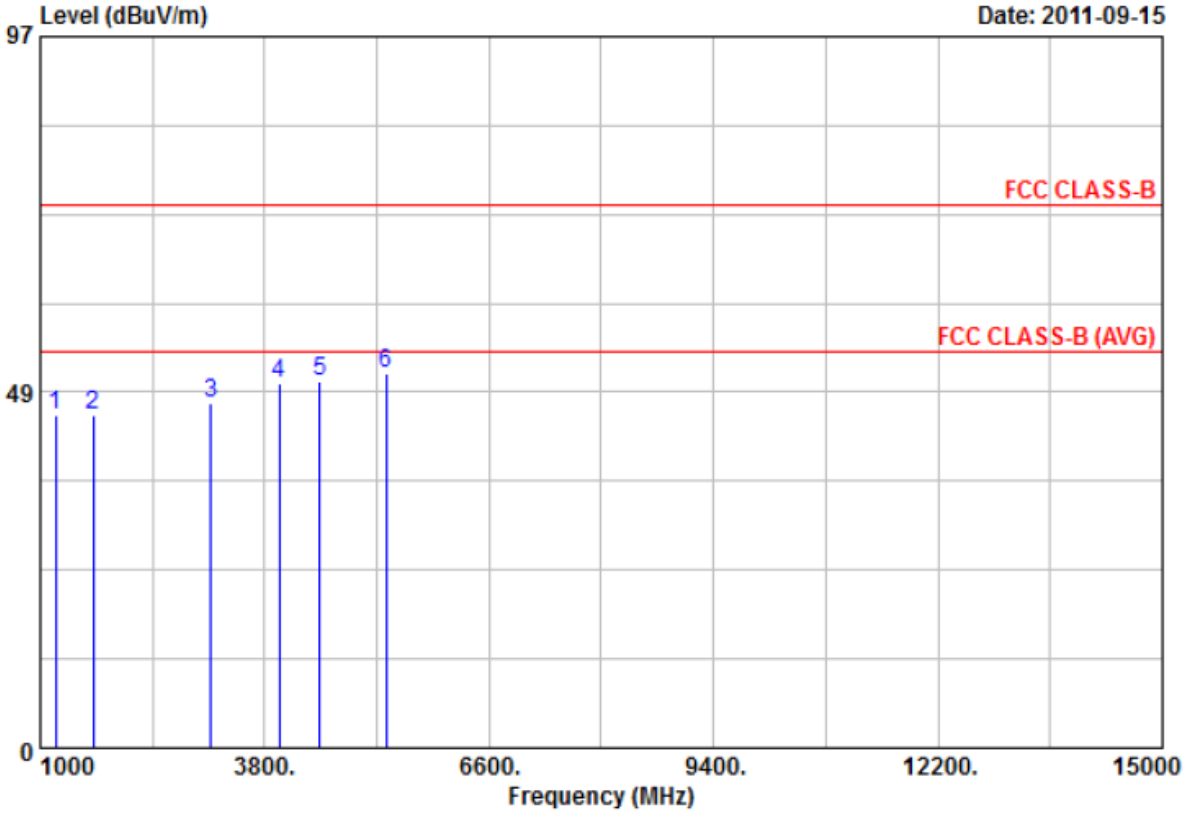


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	360.200	37.262	-9.432	27.830	37.000	-9.170	QP	100	0
2	471.500	31.932	-5.752	26.180	37.000	-10.820	QP	100	0
3	563.200	31.795	-3.682	28.113	37.000	-8.887	QP	100	0
4	717.200	29.219	-1.485	27.734	37.000	-9.266	QP	100	0
5	875.400	26.885	2.467	29.352	37.000	-7.648	QP	100	0
6	964.300	24.833	2.999	27.832	37.000	-9.168	QP	100	0

Remarks: 1. Result = Read Value + Factor
2. Factor = Antenna factor + Cable loss - Amplifier factor

4.6. Test Result and Data (1GHz~10GHz)

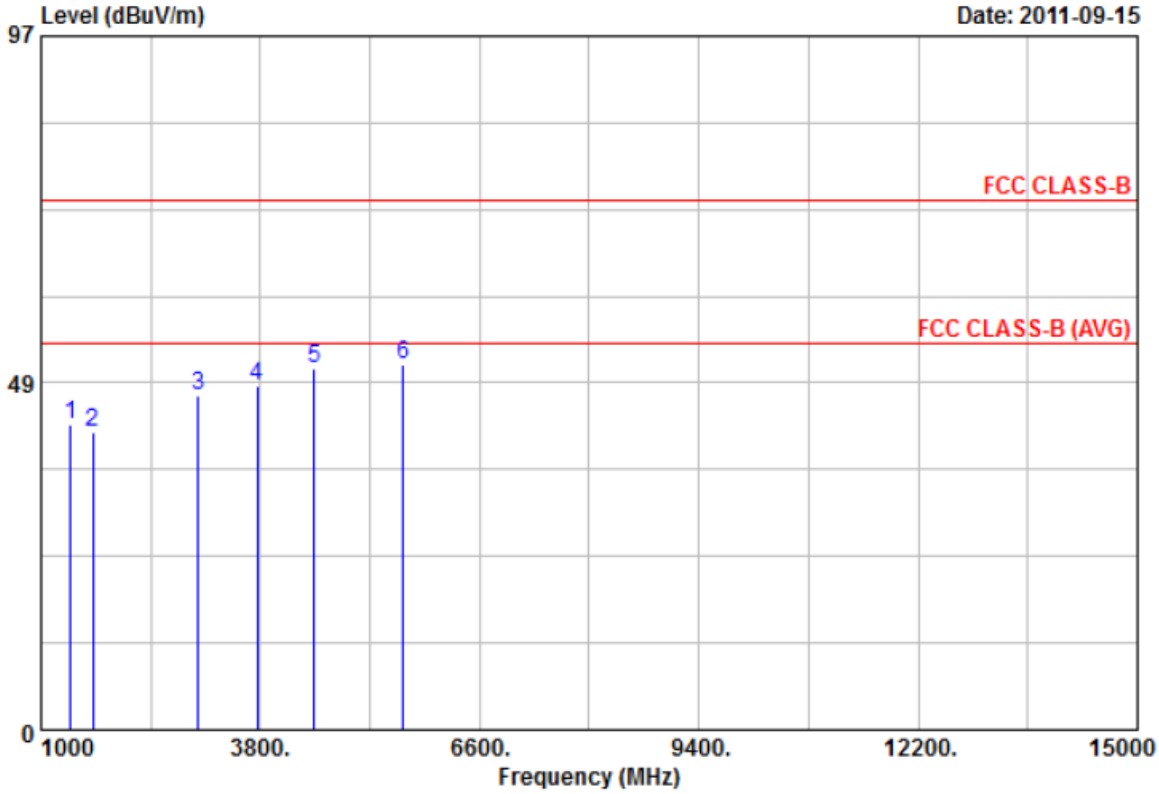
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 2	:	Power from adapter	Temperature	:	25 °C
Memo	:		Humidity	:	57 %



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBpW	dB/m	dBpW	dBpW	dB		cm	Deg
1	1196.00	63.18	-17.86	45.32	74.00	-28.68	Peak	100	0
2	1658.00	61.14	-15.86	45.28	74.00	-28.72	Peak	100	0
3	3128.00	56.75	-9.71	47.04	74.00	-26.96	Peak	100	0
4	3982.00	56.90	-7.09	49.81	74.00	-24.19	Peak	100	0
5	4486.00	56.64	-6.69	49.95	74.00	-24.05	Peak	100	0
6	5312.00	55.28	-4.26	51.02	74.00	-22.98	Peak	100	0

Remarks: 1. Result = Read Value + Factor
2. Factor = Antenna factor + Cable loss - Amplifier factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Power from adapter	Temperature	:	25 °C
Memo	:		Humidity	:	57 %



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBpW	dB/m	dBpW	dBpW	dB		cm	Deg
1	1378.00	59.94	-17.15	42.79	74.00	-31.21	Peak	200	0
2	1658.00	57.46	-15.86	41.60	74.00	-32.40	Peak	200	0
3	3002.00	56.93	-10.07	46.86	74.00	-27.14	Peak	200	0
4	3758.00	55.92	-7.84	48.08	74.00	-25.92	Peak	200	0
5	4486.00	57.13	-6.69	50.44	74.00	-23.56	Peak	200	0
6	5620.00	54.92	-3.73	51.19	74.00	-22.81	Peak	200	0

Remarks: 1. Result = Read Value + Factor
2. Factor = Antenna factor + Cable loss - Amplifier factor

Test engineer: _____

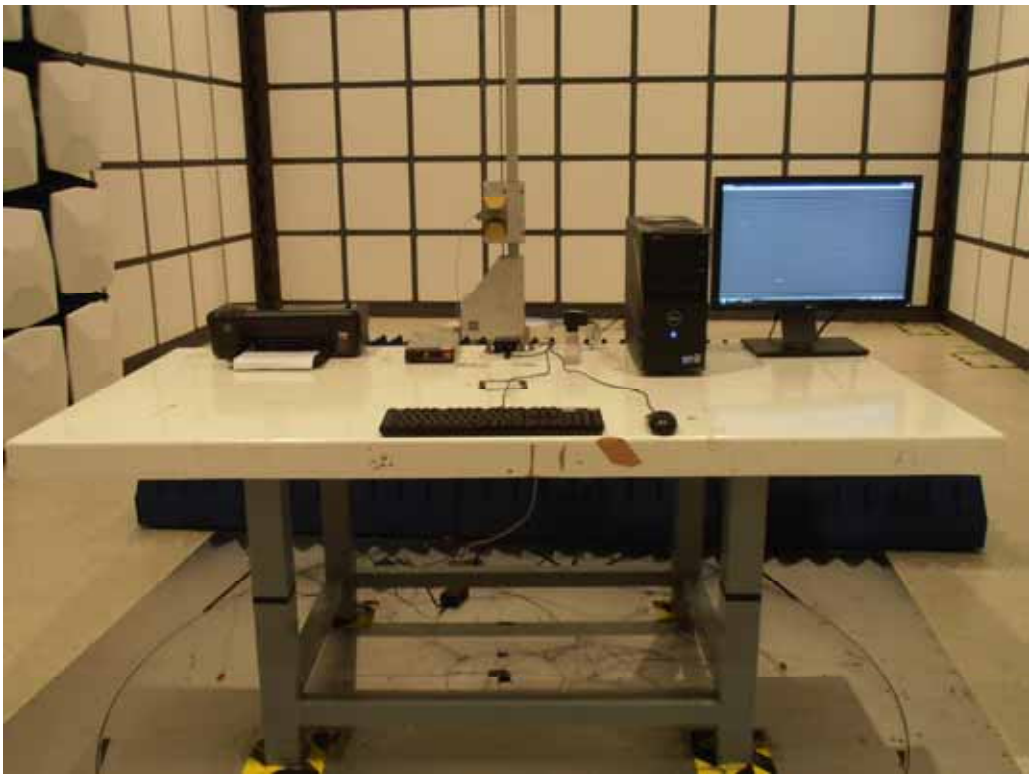
4.7. Test Photographs (30MHz~1GHz)

Front View

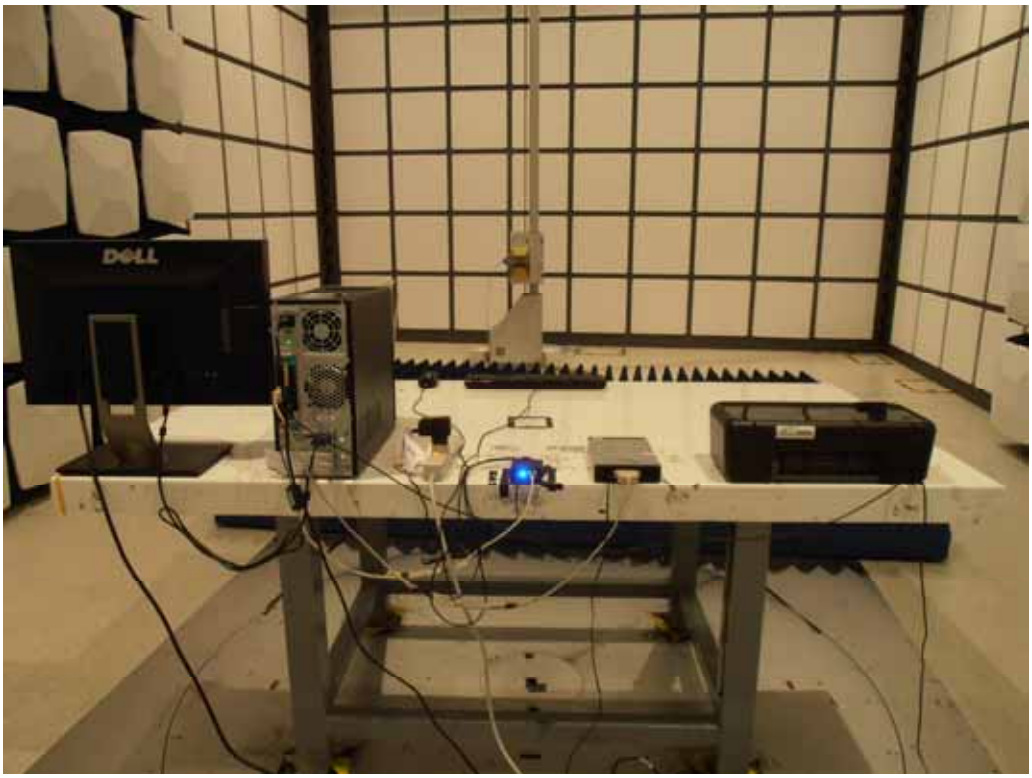
Rear View

4.8. Test Photographs (1GHz~10GHz)

Front View

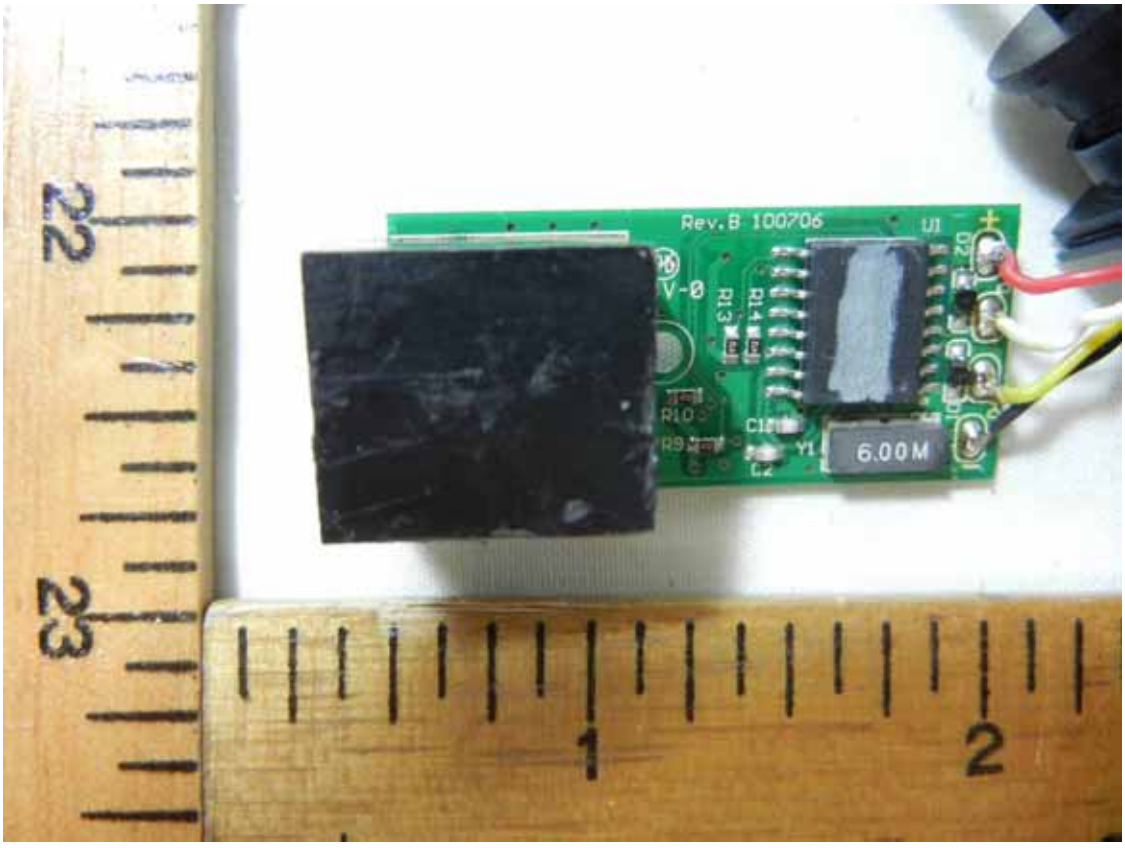


Rear View



Appendix A. Photographs of EUT


SC&T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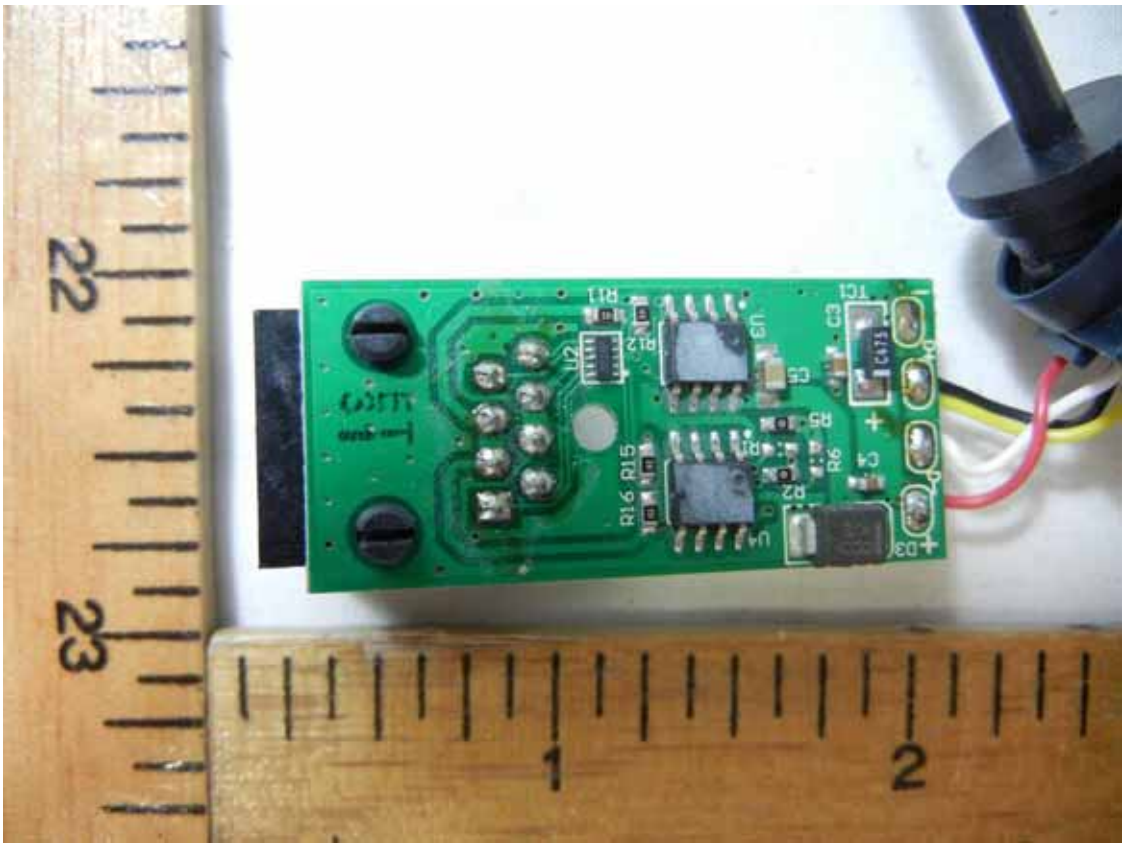
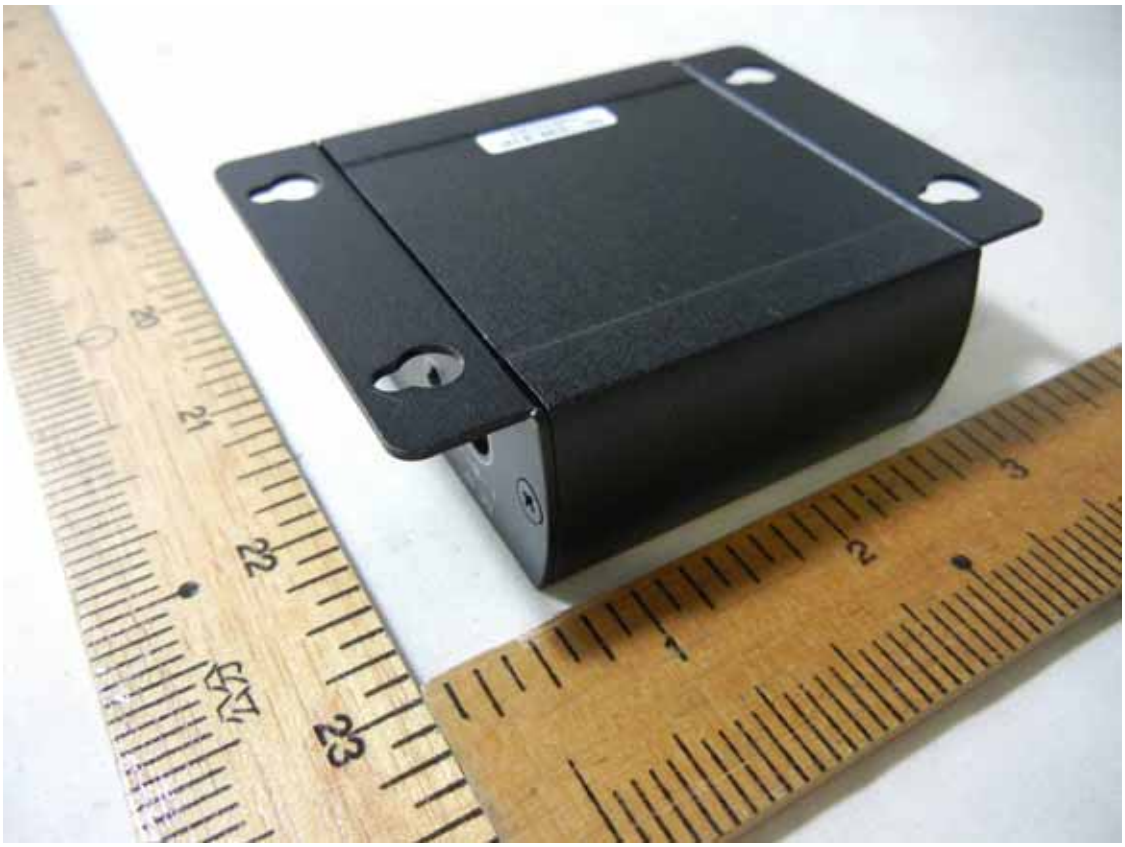



Keyboard Mouse CAT5 Extender

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Keyboard Mouse CAT5 Extender