Testing Report

Equipment Under Test：	KVM Switch
Model Number：	MPC2100Li
Serial No.：	MPC2100i
Applicant：	POWER COMMUNICATION TECH. CO., LTD.
Address of Applicant：	9F-3, No.716, Chung Cheng Rd.,Chung Ho City, Taipei Hsien, Taiwan

Matrix Test Laboratory
2F, No.146, Jian Yi Rd, Chung-Ho City,
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Contents

Verification

Applicant:	POWER COMMUNICATION TECH. CO., LTD.
Manufacturer:	POWER COMMUNICATION TECH. CO., LTD.
EUT Description:	KVM Switch
Model No.:	MPC2100Li
Serial No.:	MPC2100i
Date of Final Test:	2005/3/18
Test of Standards :	☒ ANSI C63.4 & Part 15 class B and CISPR 22

This report details the results of the testing carried out on one sample. The test results are contained in this test report and Matrix Test Laboratory assumes full responsibility for the accuracy and completeness of these Tests. This report shows the EUT is technically compliant with the ANSI C63.4 & Part 15 class B and CISPR 22 official requirements. This report applies to the above sample only and shall not be reproduced in part without written approval of Matrix Test Laboratory.

Documented: Jody Peng **Date:** 2005-03-22

Jody Peng

Test Engineer: Adam Yang **Date:** 2005-03-18

Adam Yang

Approved: Peter Chin **Date:** 2005-03-22

Peter Chin

1 General Description

1.1 Description of EUT

Equipment Under Test	:	KVM Switch
Model Number	:	MPC2100Li
Serial Number	:	MPC2100i
Applicant **Address of Applicant**	:	POWER COMMUNICATION TECH. CO., LTD. 9F-3, No.716, Chung Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan
Manufacturer **Address of Manufacturer**	:	POWER COMMUNICATION TECH. CO., LTD. 9F-3, No.716, Chung Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan
Power Supply	:	AC 110V, 50Hz Power cord: ☐Shielded ☒Non-Shielded ☒Detachable ,1.8m ☐Un-detachable ☒w/o ferrite core
Data Cable	:	☒VGA Cable ☒Shielded ☐Non-Shielded ☐Detachable ☒Un-detachable, 1.8m ☒w/o ferrite core
Description of E.U.T.	:	The main test model, MPC2100Li, has one more set of USB cable than the serial product, MPC2100i. With this USB cable, MPC2100Li could support data-link function. The manufacturer declares that both products share the identical circuit design. Matrix only holds the responsibility on the main test sample.

1.2 Tested Supporting Units

1.2.1 Personal Computer

PC01

Model Number	**:**	HP Pavilion 743
Serial Number	**:**	TW25121617
EMC Approved	**:**	R33001
Manufacturer	**:**	HP
Switching Power Supply	**:**	BESTEC M/N :ATX-1956A S/N :BST ATX-1956A P1 EMC Approved :4902A033
3.5” Floppy Driver	**:**	MITSUMI M/N :D359M3D S/N :D359M3D4102002G17BY569 EMC Approved :62001002
Hard Disk Driver	**:**	SAMSONG M/N :SV4002H S/N :0412J1FTB55615 EMC Approved :D33020
CD-Rom	**:**	HP M/N :DVD WRITER 2000I S/N :N/A EMC Approved :N/A
Serial/Parallel Card	**:**	Within Mother Boar
Video Card	**:**	Within Mother Boar
Power Cord	**:**	Non-shielded, Detachable, 1.5m

PC02

Model Number	**:**	HP Pavilion 222
Serial Number	**:**	TWL33100KD
EMC Approved	**:**	R33001
Manufacturer	**:**	HP
Switching Power Supply	**:**	HIPRO M/N:HP-D2537F3H S/N:5187-1100 EMC Approved: D33036
3.5” Floppy Driver	**:**	N/A
Hard Disk Driver	**:**	Western Digital M/N: WD80BB-00DKAO S/N:WMAHL2771668 EMC Approved: D33015
CD-Rom	**:**	HP M/N:DVD WRITER 2000I S/N: N/A EMC Approved : N/A
VGA Card	**:**	M/N: A180DDR 64M S/N:L3090152690 L3090149683 EMC Approved: D33004
Serial/Parallel Card	**:**	Within Mother Boar
Video Card	**:**	Within Mother Boar

1.2.2 Monitor

MT01

Model Number	**:**	GC577
Serial Number	**:**	313FWNL2000031
EMC Approved	**:**	3902A178
Manufacturer	**:**	GENUINE
Data Cable	**:**	VGA CABLE Shielded, Un-detachable, 1.5m

1.2.3 PS2 Keyboard

Model Number	**:**	5181
Serial Number	**:**	BL24613476
EMC Approved	**:**	3892C981
Manufacturer	**:**	HP
Model Number	**:**	5181

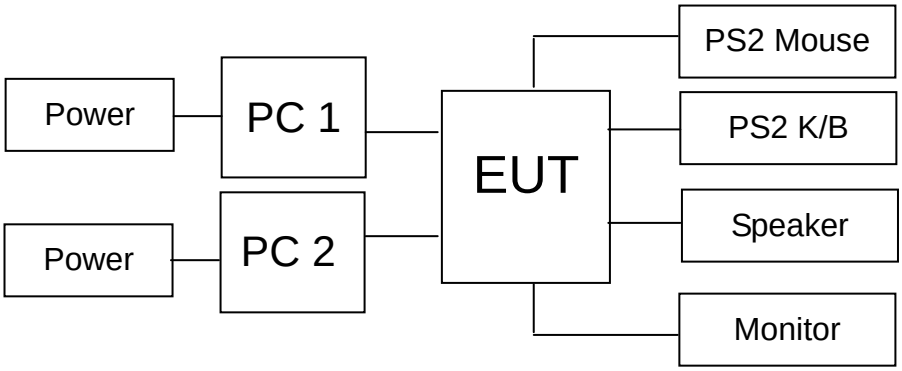
1.2.4 PS2 Mouse

Model Number	**:**	MO42KOA
Serial Number	**:**	0306052598
EMC Approved	**:**	R41108
Manufacturer	**:**	HP
Model Number	**:**	MO42KOA

1.2.5 Speaker

Model Number	**:**	GS-2160
Serial Number	**:**	9000056171
EMC Approved	**:**	BSMI:6081337
Manufacturer	**:**	Genuine
Data Cable	**:**	Audio cable Non-shielded, Un-detachable, 1.5m

1.3 Block Diagram



1.4 Test Facility

Site Description	**:**	All tests are completed by Matrix Test Laboratory. Radiated emission is performed at HongAn's open-site.
Name of Firm	**:**	Matrix Test Laboratory
Site Location	**:**	2F, No 146, Jian Yi Rd, Chung-Ho City,Taipei Hsien, Taiwan, R.O.C.

1.4.1 Test Methodology

Both conducted and Radiated Emission Test were performed according to the procedures in ANSI C63.4-1992 & FCC PART 15 B and CISPR 22: 1997 / A1: 2000. Radiated Emission Test was performed at 10 meters distance from antenna to EUT.

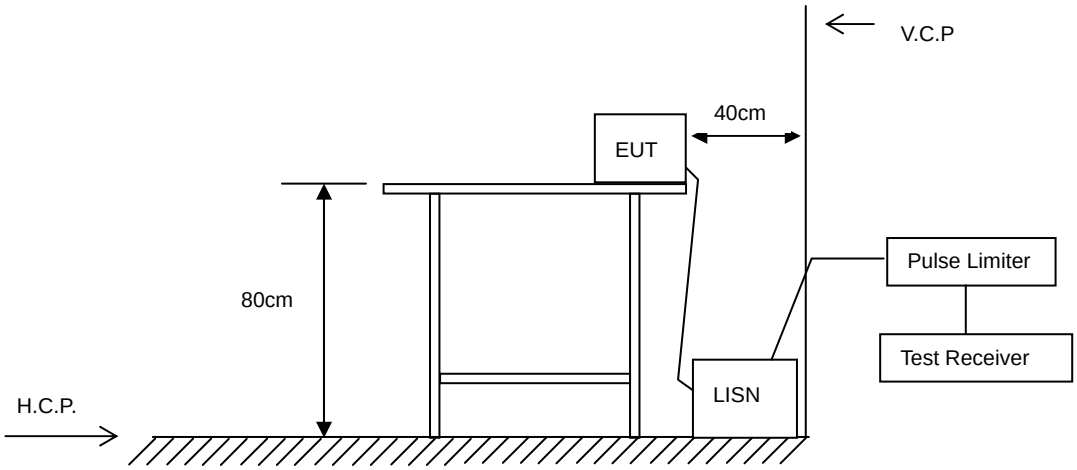
2 Conducted Emission Test

2.1 Test Instruments

Instrument	Manufacturer	Model	Serial No.	Date of Calibration
SPECTRUM ANALYZER	HP	8591EM	N/A	06/03/2004
L.I.S.N.	MessTec	NNB-2/16Z	N/A	27/03/2004
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	04/01/2005
RF Cable	IETC	CBL04	N/.A	02/05/2004

Note: All Test Instruments upon which need to be calibrated are within calibration period of 1 year.

2.2 Configuration of Instrument Setup



2.3 Conducted Limit

☒ CISPR 22 / FCC Part 15

Frequency (MHz)	☐ Class A		☒ Class B	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	79	66	66 to 56	56 to 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30	73	60	60	50

2.4 Set of Instrument

2.4.1 The EMI test receiver frequency range set from 150 KHz to 30 MHz.

2.4.2 The EMI test receiver bandwidth set at 9kHz.

2.4.3 The EMI test receiver detector set as Quasi-Peak (Q.P.) and Average (AV).

2.5 Test Mode

2.5.1 The test mode for preliminary test is as following:

- Mode : Run winfcc mode (800X600)

2.6 Test Configuration

2.6.1 The EUT was placed on a non-conductive table whose total height equaled 80cm and vertical conducting plane located 40cm to the rear of the EUT.

2.6.2 The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm/50μH coupling impedance for the measuring equipment. The auxiliary equipment was also connected to the main power through a LISN that provided a 50ohm/50μH coupling impedance with 50ohm termination. (Refer to the block diagram of the test setup and photographs.)

2.6.3 The conducted disturbance was measured between the phase lead and the reference ground, and between the neutral lead and reference ground. The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

2.6.4 The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

2.7 Configuration of EUT

2.7.1 Setup the EUT and peripheral as shown in section 1.3.

2.7.2 Turn on the power of all equipment.

2.7.3 Activate the winfcc mode (800X600) & play music.

2.7.4 Measure the Line phase and record value.

2.7.5 Change into Neutral phase then measure and record value.

2.8 Test Result

PASS.

The final tests data are shown on following pages. The test waveforms are shown on Appendix 1.

Power Line Conducted Test Data

Date of Tested	:	2005-03-18	Power Line	:	Line
Temperature	:	28℃	Humidity	:	37%
Test Mode	:	Run winfcc mode (800X600)			

Frequency	Factor	Reading (dBuV)		Measurement (dBuV)		Limits (dBuV)		Margin (dB)	
(MHz)	(dB)	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.660	0.10	33.12	30.65	33.22	30.75	56.00	46.00	-22.78	-15.25
16.560	0.37	32.81	29.01	33.18	29.38	60.00	50.00	-26.82	-20.62
17.070	0.42	32.53	30.78	32.95	31.20	60.00	50.00	-27.05	-18.80
17.590	0.40	32.19	25.09	32.59	25.49	60.00	50.00	-27.41	-24.51
19.070	0.38	32.33	28.09	32.71	28.47	60.00	50.00	-27.29	-21.53
19.220	0.39	32.26	28.71	32.65	29.10	60.00	50.00	-27.35	-20.90

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss
3. "*" Means emission level un-detectable.
4. "--" Means do not need detect.

Power Line Conducted Test Data

Date of Tested	:	2005-03-18	Power Line	:	Neutral
Temperature	:	28℃	Humidity	:	37%
Test Mode	:	Run winfcc mode (800X600)			

Frequency	Factor	Reading (dBuV)		Measurement (dBuV)		Limits (dBuV)		Margin (dB)	
(MHz)	(dB)	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.200	0.07	32.58	31.65	32.65	31.72	63.61	53.61	-30.96	-21.89
0.660	0.10	33.30	30.37	33.40	30.47	56.00	46.00	-22.60	-15.53
16.690	0.38	34.44	30.71	34.82	31.09	60.00	50.00	-25.18	-18.91
16.770	0.39	34.58	26.81	34.97	27.20	60.00	50.00	-25.03	-22.80
18.630	0.38	32.37	23.11	32.75	23.49	60.00	50.00	-27.25	-26.51
19.370	0.40	31.26	21.50	31.66	21.90	60.00	50.00	-28.34	-28.10

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss
3. "*" Means emission level un-detectable.
4. "--" Means do not need detect.

3 Radiated Emission Test

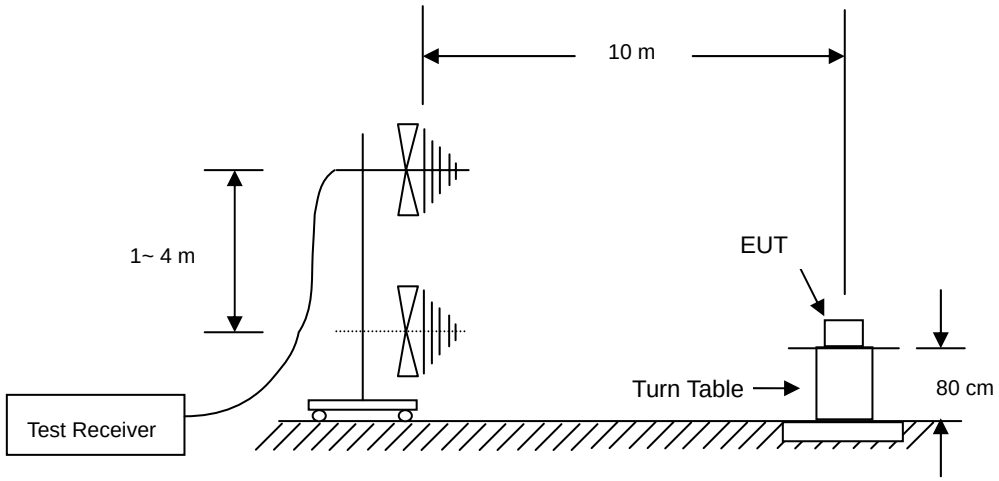
3.1 Test Instruments

☒OATS

Instrument	Manufacturer	Model	Serial No.	Date of Calibration
EMI Test Receiver	Rohde & Schwarz	ESI 07	N/A	17/10/2003
Antenna	Schaffner	CBL6112B	N/A	26/03/2004
Pre-Amplifier	Schaffner	CPA9231A	N/A	15/04/2004
RF Cable	IETC	CBL01	N/A	30/04/2004

Note: All Test Instruments upon which need to be calibrated are within calibration period of 1 year.

3.2 Configuration of Testing Setup



3.3 Radiated Limit

☐ FCC Part 15

	☐ Class A (10m)		☐ Class B (3m)	
Frequency (MHz)	Field Strength (uV)	Quasi-Peak (dBuV)	Field Strength (uV)	Quasi-Peak (dBuV)
30 ~ 88	90	39.08	100	40.00
88 ~ 216	150	43.52	150	43.52
216 ~ 960	210	46.44	200	46.02
960 above	300	49.54	500	53.98

☒ CISPR 22

	☐ Class A	☒ Class B
Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak (dBuV)
30 ~ 230	40.0	30.0
230 ~ 1000	47.0	37.0

3.4 Set of Instrument

3.4.1 The EMI test receiver frequency range set from 30 MHz to 1000 MHz.

3.4.2 The EMI test receiver bandwidth set at 120 kHz.

3.4.3 The EMI test receiver detector set as Quasi-Peak (Q.P.).

3.5 Test Mode

3.5.1 The test mode for preliminary test is as following:

- Mode : Run winfcc mode (800X600)

3.6 Test Configuration

3.6.1 The EUT was placed on a non-conductive table whose total height equaled 80cm. The turntable can rotate 360 degree to determine the position of the maximum emission level.

3.6.2 The EUT was set 10 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

3.6.3 The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

3.6.4 The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

3.7 Configuration of EUT

3.7.1 Setup the EUT and peripheral as shown in section 1.3.

3.7.2 Turn on the power of all equipment.

3.7.3 Activate the winfcc mode (800X600) & play music.

3.7.4 Measure the horizontal polarization and record the value.

3.7.5 Change into vertical polarization measure and record the value.

3.8 Test Result

PASS.

The final tests data are shown on following pages.

Radiated Emission Test Data

Date of Tested	:	2005-03-16	Polarization	:	Horizontal
Temperature	:	27℃	Humidity	:	41%
Test Mode	:	Run winfcc mode (800X600)			

Frequency (MHz)	Factor (dB)	Meter Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV/m)	Margin (dB)
32.4	27.92	-9.02	18.9	30	-11.1
211.42	13.57	14.83	28.4	30	-1.6
482.34	16.46	20.54	37	37	0
243.4	12.11	17.29	29.4	37	-7.6
403.5	15.92	13.08	29	37	-8
535.56	18.17	13.63	31.8	37	-5.2

Remark:

1. All readings are Quasi-Peak values.
2. The worst emission was detected at 482.34 MHz with corrected signal level of 37 dBuV (limit is 37 dBuV) when the antenna was at horizontal polarization and was at 1 m high and the turntable was at 218°.

Radiated Emission Test Data

Date of Tested	:	2005-03-16	Polarization	:	Vertical
Temperature	:	27℃	Humidity	:	41%
Test Mode	:	Run winfcc mode (800X600)			

Frequency (MHz)	Factor (dB)	Meter Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV/m)	Margin (dB)
71.2	9.92	12.58	22.5	30	-7.5
403.5	15.92	10.28	26.2	37	-10.8
813.74	22.2	10.2	32.4	37	-4.6
670.2	19.66	7.04	26.7	37	-10.3
849.6	22.46	7.94	30.4	37	-6.6
859.3	22.7	8.1	30.8	37	-6.2

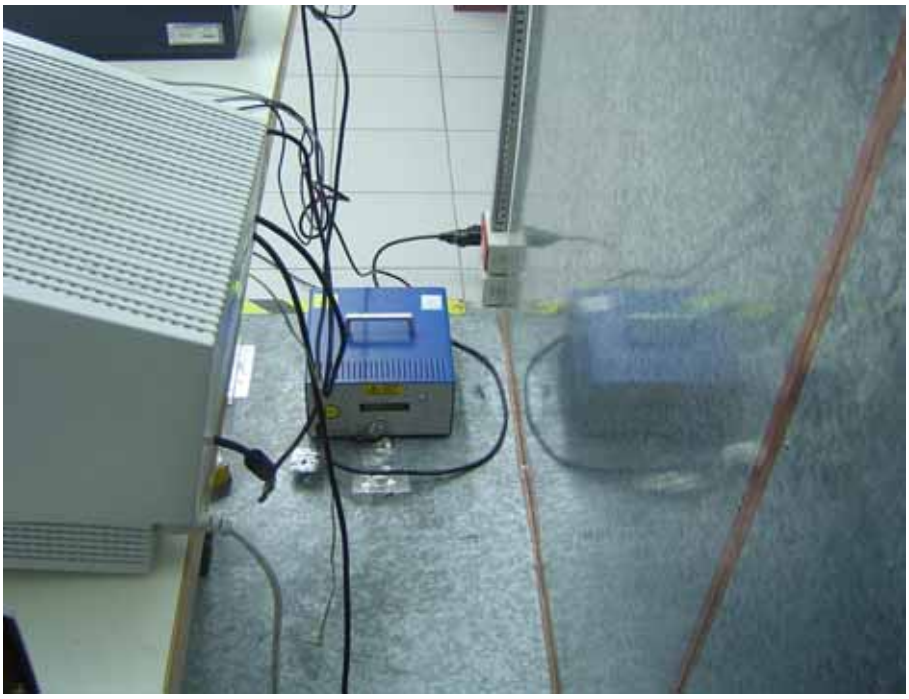
Remark:

1. All readings are Quasi-Peak values.
2. The worst emission was detected at 813.74 MHz with corrected signal level of 32.4 dBuV (limit is 37 dBuV) when the antenna was at vertical polarization and was at 3 m high and the turntable was at 352°.

4 Photographs of Test

4.1 Conducted Emission Test

Front View



Rear View

4.2 Radiated Emission Test

Front View

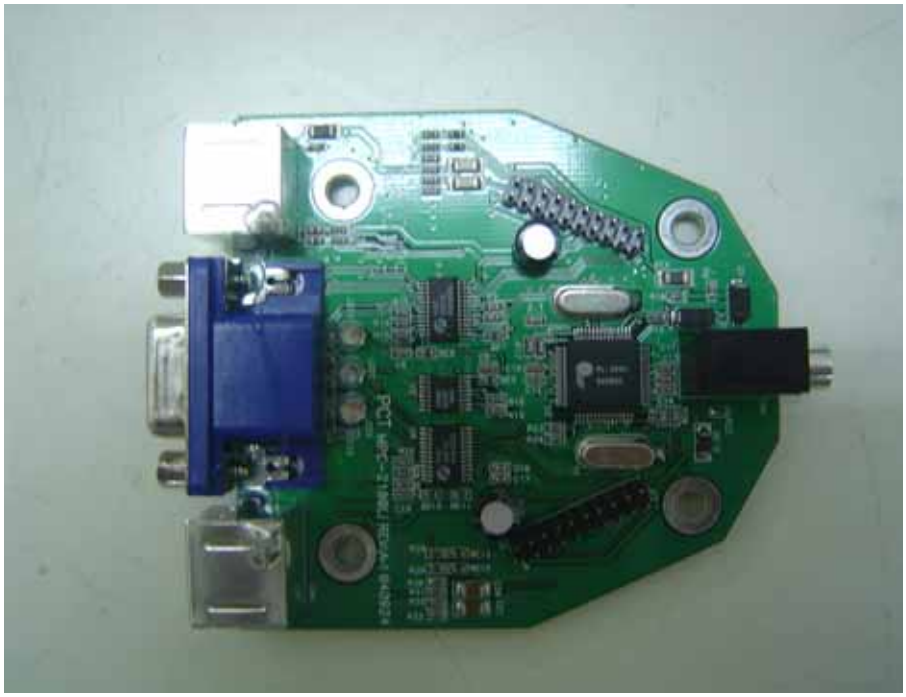
Rear View

5 Photographs of EUT

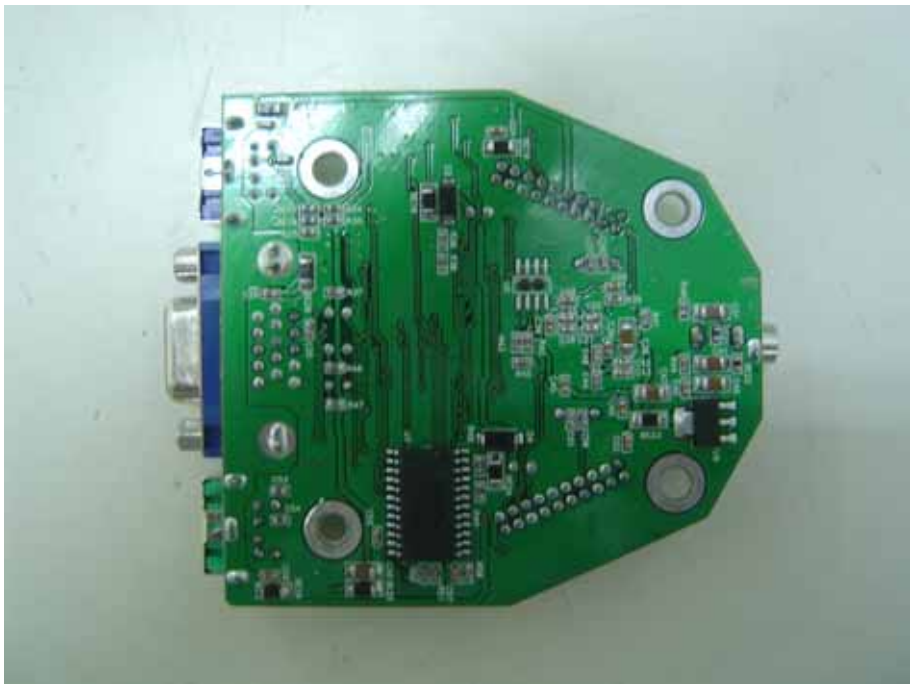
Front View of EUT

Rear View of EUT

Inside view of EUT



Front view of EUT’s PCB



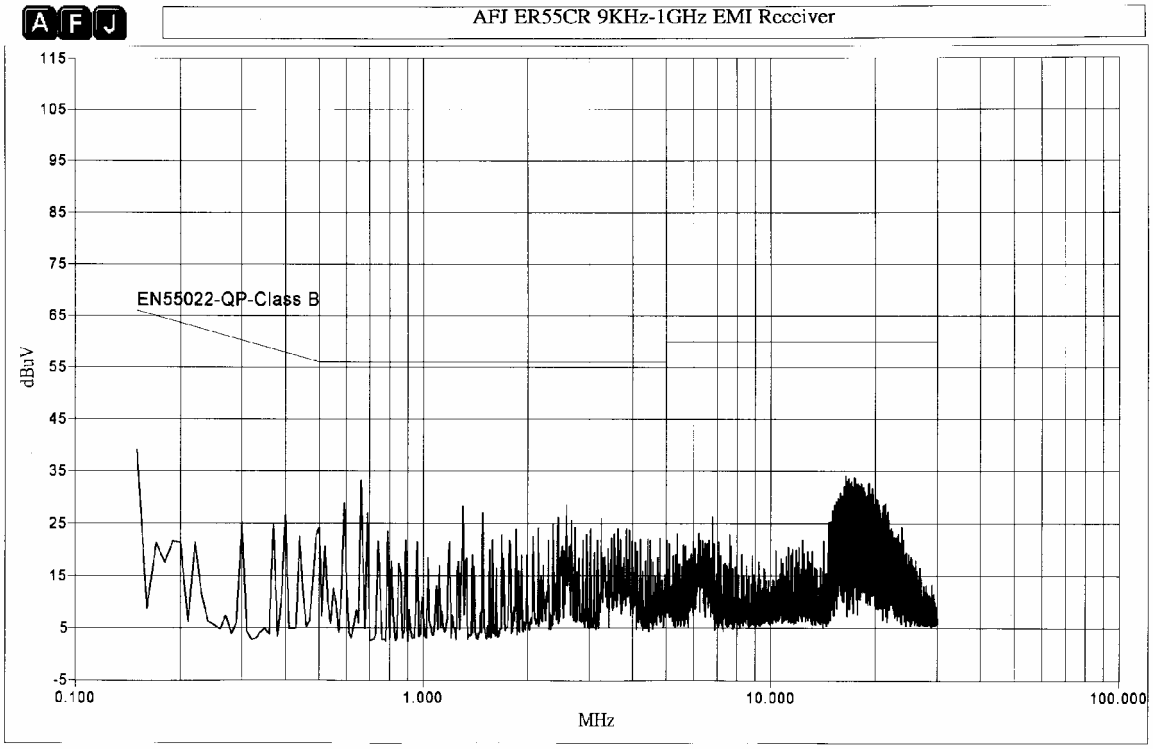
Rear view of EUT’s PCB

View of EUT’s Cable

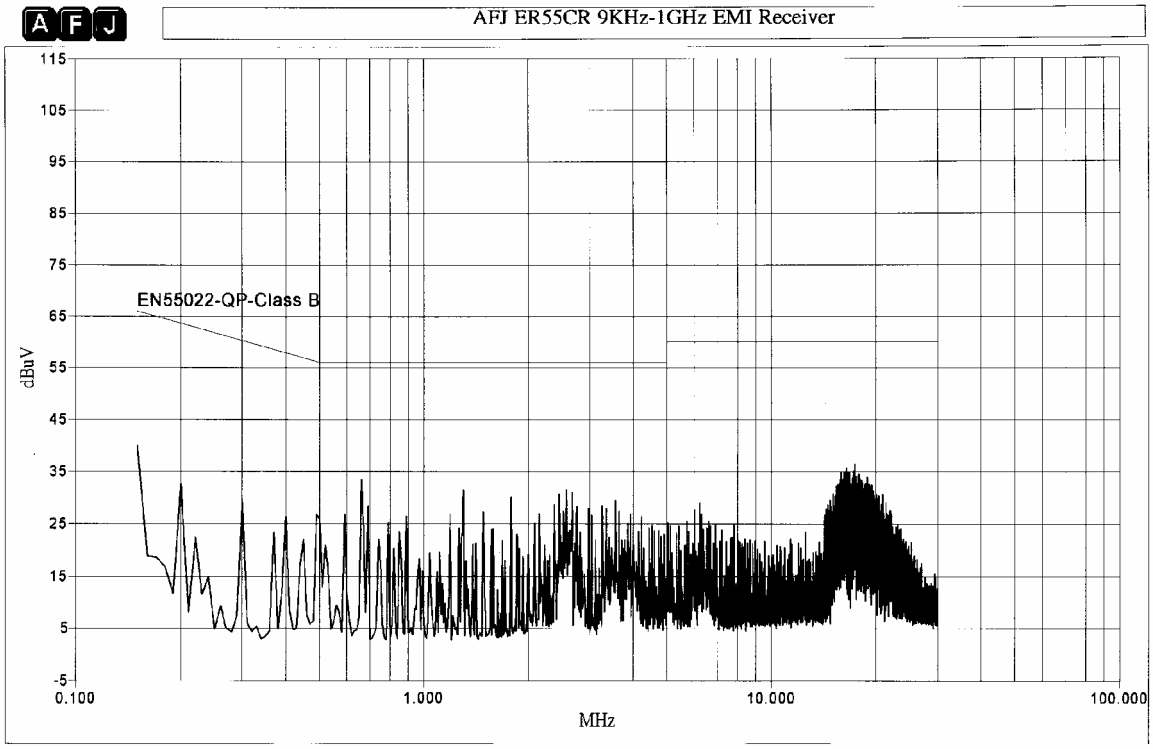
6 Photographs of Serial

7 Appendix 1 – Conducted Emission Test Waveform

A1.1 Mode : Run winfcc mode (800X600)



Line



Neutral