

## FCC TEST REPORT

**Product Name** : ADSL router  
**Trade Name** :   
**Model Name** : PD1101-K5815  
**Serial Number** : Not Applicable  
**Technical Data** : AC 120V, 60Hz  
**FCC ID** : ZNL-PD1101-K5815  
**Report Number** : EESZD05310011-1  
**Date** : June 22, 2011  
**Regulations** : See below

Test Standards	Results
<input checked="" type="checkbox"/> FCC Part 15 Subpart B: 2010	PASS

Prepared for:

**TelWorx Communications, LLC**  
**239 welcome center BLVD, Lexington, North Carolina 27295,**  
**United States.**

Prepared by:

**CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION**  
**Building C, Hongwei Industrial Zone, Baoan 70 District,**  
**Shenzhen, Guangdong, China**  
**TEL: +86-755-3368 3668**  
**FAX: +86-755-3368 3385**

Check No.: 30000626

**This report shall not be reproduced, except in full, without the written approval of**  
**CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION**

## TABLE OF CONTENTS

Description	Page
<b>1. GENERAL INFORMATION .....</b>	<b>3</b>
<b>2. TEST SUMMARY .....</b>	<b>4</b>
<b>3. MEASUREMENT UNCERTAINTY .....</b>	<b>4</b>
<b>4. PRODUCT INFORMATION AND TEST SETUP .....</b>	<b>4</b>
<b>5. SYSTEM TEST CONFIGURATION.....</b>	<b>5</b>
<b>6. FACILITIES AND ACCREDITATIONS .....</b>	<b>5</b>
<b>7. CONDUCTED EMISSION TEST .....</b>	<b>7</b>
<b>8. RADIATED EMISSION TEST.....</b>	<b>10</b>
<b>APPENDIX 1 PHOTOGRAPHS OF TEST SETUP.....</b>	<b>13</b>
<b>APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT .....</b>	<b>15</b>
<b>APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT .....</b>	<b>17</b>

*(Note: N/A means not applicable)*

## 1. GENERAL INFORMATION

**Applicant:** TelWorx Communications, LLC  
239 welcome center BLVD, Lexington, North Carolina  
27295, United States.

**Manufacturer:** Not Applicable

**Equipment Authorization:** Certification

**FCC ID:** ZNL-PD1101-K5815

**Product Name:** ADSL router

**Trade Name:**  ProcurDirect  
your global sourcing partner

**Model Name:** PD1101-K5815

**Serial Number:** Not Applicable

**Report Number:** EESZD05310011-1

**Date of Test:** May 31, 2011 to June 20, 2011

The results of this test report are only valid for the mentioned equipment under test. The test report with all its sub-reports, e.g. tables, photographs and drawings, is copyrighted. Unauthorized utilization, especially without permission of the test laboratory, is not allowed and punishable. For copying parts of the test report, a written permission by the test laboratory is needed.

The test results of this report relate only to the tested sample identified in this report.

Prepared by : Gavin Song  
Gavin Song

Reviewed by : Louisa Lu  
Louisa Lu

Approved by : Jimmy Li  
Jimmy Li  
Manager



Date June 22, 2011

## 2. TEST SUMMARY

The EUT has been tested according to the following specifications:

Standard	Test Item	Test
FCC 15.107	Conducted Emission	Yes
FCC 15.109	Radiated Emission	Yes

## 3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted Emission	2.7
Radiated Emission	4.4

## 4. PRODUCT INFORMATION AND TEST SETUP

### 4.1. PRODUCT INFORMATION

Technical Data: AC 120V, 60Hz

#### Cable of EUT

No.	Cable Type	Quantity	Provider	Length (m)	Specification	Note
1	RJ45 Cable	1	Applicant	1.5	unshielded	Detachable
2	RJ11 Cable	1	Applicant	1.1	unshielded	Detachable
3	DC Cable from adaptor	1	Applicant	1.5	unshielded	Detachable and with a ferrite ring near the jack

### 4.2. TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 4.3. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	PC	IBM	8143	BD-241	N/A	Un-shielded 1.2M
2.	Monitor	IBM	9205-AB6	VK-KZ133	Un-shielded 1M	Un-shielded 1M
3.	Mouse	IBM	M028UOL	23-468157	Un-shielded 1.2M	N/A

4.	Keyboard	IBM	89P8300	02284699	Un-shielded 1.2M	N/A
----	----------	-----	---------	----------	------------------	-----

**Notes:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 5. SYSTEM TEST CONFIGURATION

### 5.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it), The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement as outlined in ANSI C63.4 (2003).

The EUT was powered by 120VAC/ 60Hz during test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The rear of unit shall be flushed with the rear of the table.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

### 5.2. EUT EXERCISING SOFTWARE

No Software was used during testing.

## 6. FACILITIES AND ACCREDITATIONS

### 6.1. TEST FACILITY

All test facilities used to collect the test data are located at Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

### 6.2. TEST EQUIPMENT LIST

**Instrumentation:** The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

### Equipment used during the tests:

<b>Shielding Room No. 1 - Conducted Emission Test</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Due Date</b>
Receiver	R&S	ESCI	100009	07/10/2011
LISN	R&S	ENV216	100098	07/10/2011
LISN	ETS-LINDGREN	3850/2	00051952	03/29/2012

<b>3M Semi-anechoic Chamber - Radiated Emission Test</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Due Date</b>
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
Spectrum Analyzer	Agilent	E4440A	MY46185649	03/29/2012
Biconilog Antenna	ETS-LINGREN	3142C	00044562	07/31/2011
Multi device Controller	ETS-LINGREN	2090	00057230	N/A

### **6.3. LABORATORY ACCREDITATIONS AND LISTINGS**

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

## 7. CONDUCTED EMISSION TEST

### 7.1. LIMITS

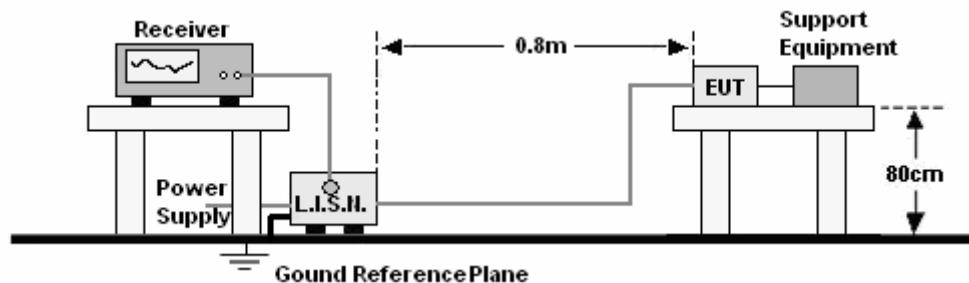
Limits for Class B digital devices

Frequency range (MHz)	Limits dB(µV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

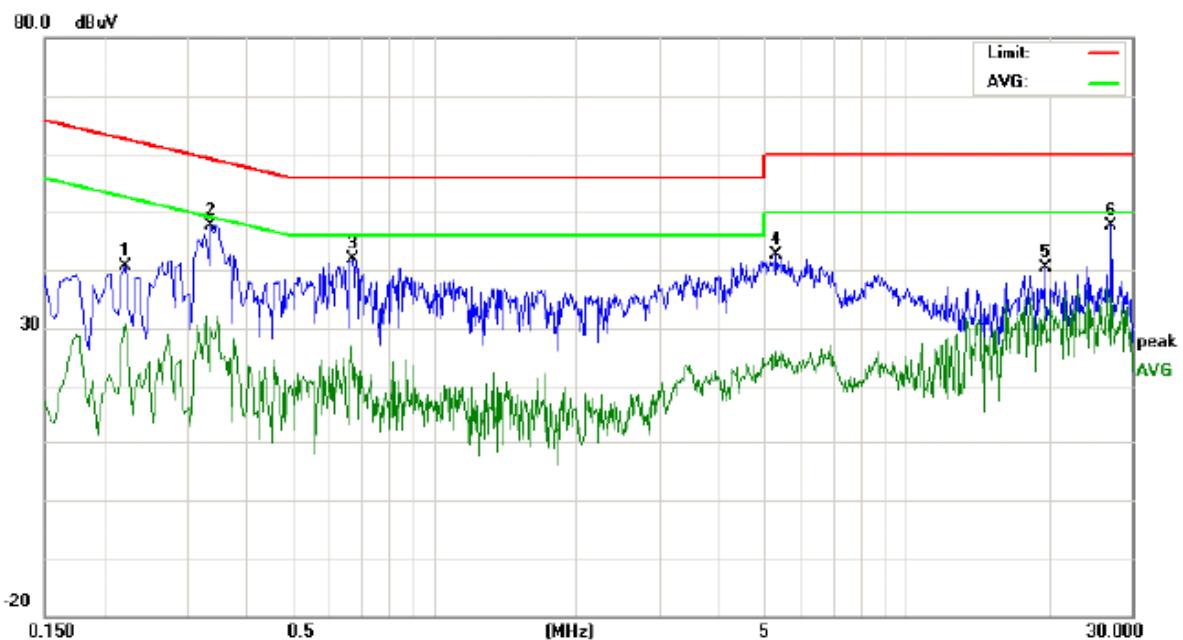
### 7.2. BLOCK DIAGRAM OF TEST SETUP



### 7.3. PROCEDURE OF CONDUCTED EMISSION TEST

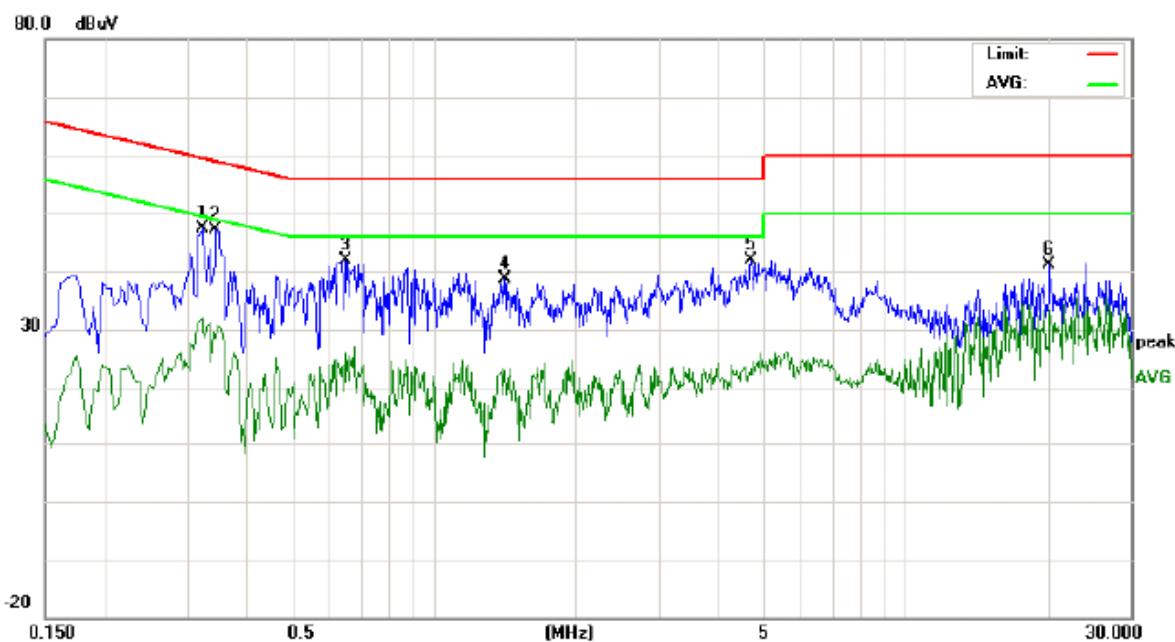
- The EUT was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N.).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from EUT in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

## 7.4. WORST CASE TEST GRAPHS AND TEST DATA



Site site #1  
 Phase: *L1* Temperature: 25  
 Limit: FCC Class B Conduction (QP) Power: AC 120V/60Hz Humidity: 54 %  
 EUT: ADSL router  
 M/N: PD1101-K5815  
 Mode: PING  
 Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG	P/F
1	0.2220	30.86	28.36	20.81	9.86	40.72	38.22	30.67	62.74	52.74	-24.52	-22.07	P
2	0.3379	37.89	37.02	20.24	9.86	47.75	46.88	30.10	59.25	49.25	-12.37	-19.15	P
3	0.6740	31.87	30.92	11.13	10.02	41.89	40.94	21.15	56.00	46.00	-15.06	-24.85	P
4	5.3140	32.52	30.76	15.84	10.06	42.58	40.82	25.90	60.00	50.00	-19.18	-24.10	P
5	19.7099	30.03	29.03	23.80	10.43	40.46	39.46	34.23	60.00	50.00	-20.54	-15.77	P
6	27.1340	37.06	35.85	24.70	10.62	47.68	46.47	35.32	60.00	50.00	-13.53	-14.68	P



Site site #1 Phase: **N** Temperature: 25

Limit: FCC Class B Conduction (QP) Power: AC 120V/60Hz Humidity: 54 %

EUT: ADSL router

M/N: PD1101-K5815

Mode: PING

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		
		MHz	Peak	QP	Avg	Peak	QP	Avg	QP	Avg	QP	Avg	P/F
1	0.3220	37.49	36.97	21.93	9.86	47.35	46.83	31.79	59.65	49.65	-12.82	-17.86	P
2	0.3460	37.24	36.06	18.66	9.86	47.10	45.92	28.52	59.06	49.06	-13.14	-20.54	P
3	0.6540	31.97	30.85	15.95	10.00	41.97	40.85	25.95	56.00	46.00	-15.15	-20.05	P
4	1.4140	28.60	27.31	12.91	9.93	38.53	37.24	22.84	56.00	46.00	-18.76	-23.16	P
5	4.7100	31.95	30.99	12.01	10.03	41.98	41.02	22.04	56.00	46.00	-14.98	-23.96	P
6	20.1980	30.68	29.83	22.83	10.46	41.14	40.29	33.29	60.00	50.00	-19.71	-16.71	P

## 8. RADIATED EMISSION TEST

### 8.1. LIMITS

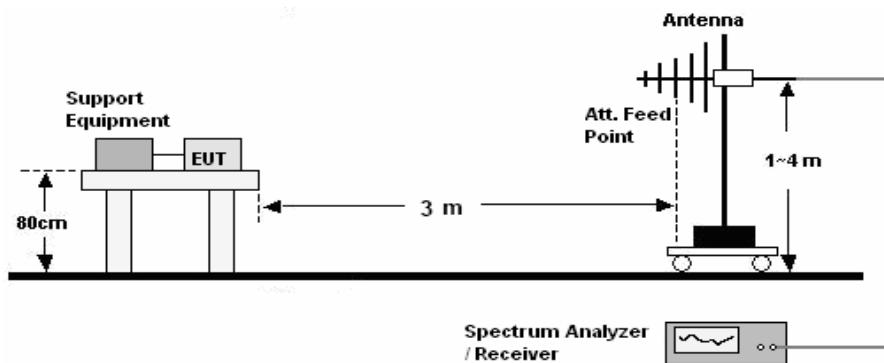
**Limits for Class B digital devices**

Frequency (MHz)	limits at 3m dB( $\mu$ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

**NOTE:** 1. The lower limit shall apply at the transition frequency.

2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

### 8.2. BLOCK DIAGRAM OF TEST SETUP

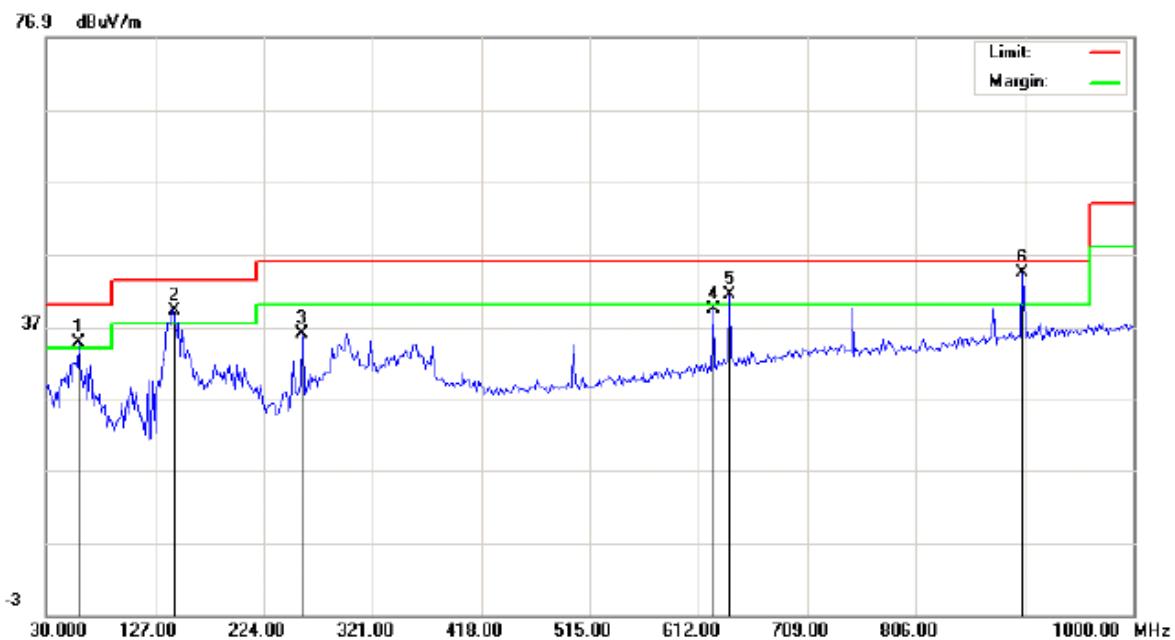


### 8.3. PROCEDURE OF RADIATED EMISSION TEST

#### 30MHz ~ 1GHz:

- a. The EUT was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

## 8.4. WORST CASE TEST GRAPHS AND TEST DATA



Site site #1

Polarization: *Horizontal*

Temperature: 25

Limit: FCC Class B 3M Radiation

Power: AC 120V/60Hz

Humidity: 56 %

### FUT: ADSL router

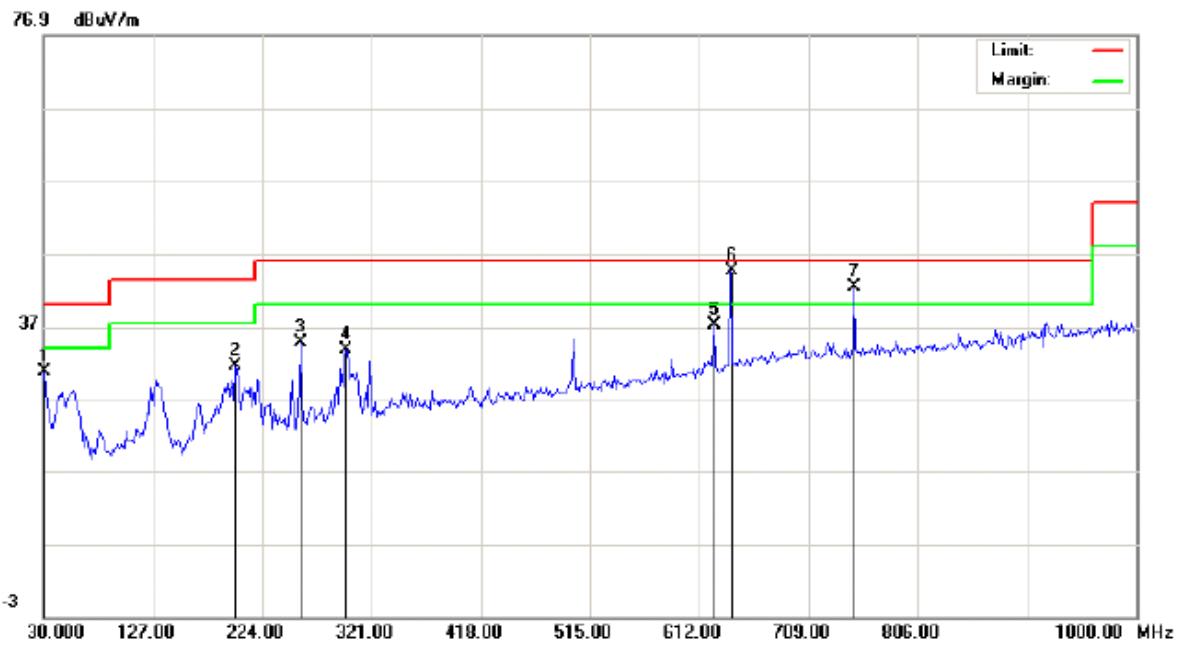
M/N: PD1101-K5815

Mode: PING

### Note:-

### Notes.

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)	
		MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	P/F
1	59.1000	26.42	24.16		8.42	34.84	32.58		40.00	-7.42		P
2	143.2850	29.15	27.12		9.97	39.12	37.09		43.50	-6.41		P
3	257.9500	21.82	20.35		14.15	35.97	34.50		46.00	-11.50		P
4	624.9333	16.61	14.36		22.83	39.44	37.19		46.00	-8.81		P
5	639.4833	18.17	17.52		23.20	41.37	40.72		46.00	-5.28		P
6	901.3833	17.75	15.68		26.67	44.42	42.35		46.00	-3.65		P



Site site #1

Polarization: **Vertical**

Temperature: 25

Limit: FCC Class B 3M Radiation

Power: AC 120V/60Hz

Humidity: 56 %

EUT: ADSL router

M/N: PD1101-K5815

Mode: PING

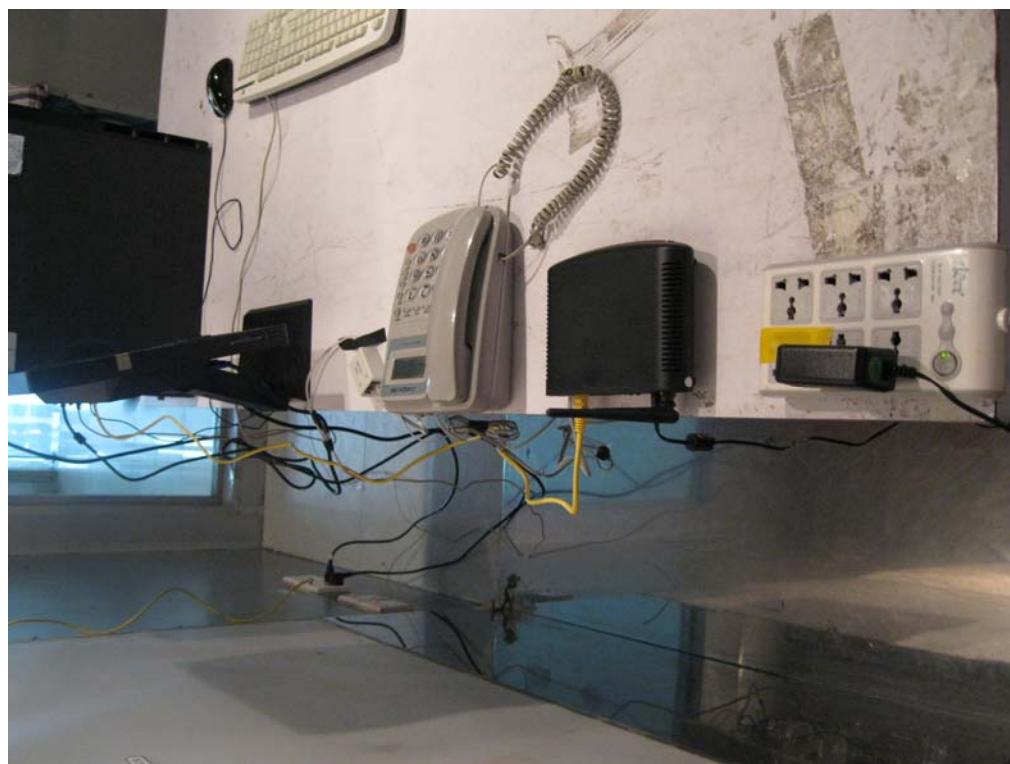
Note:

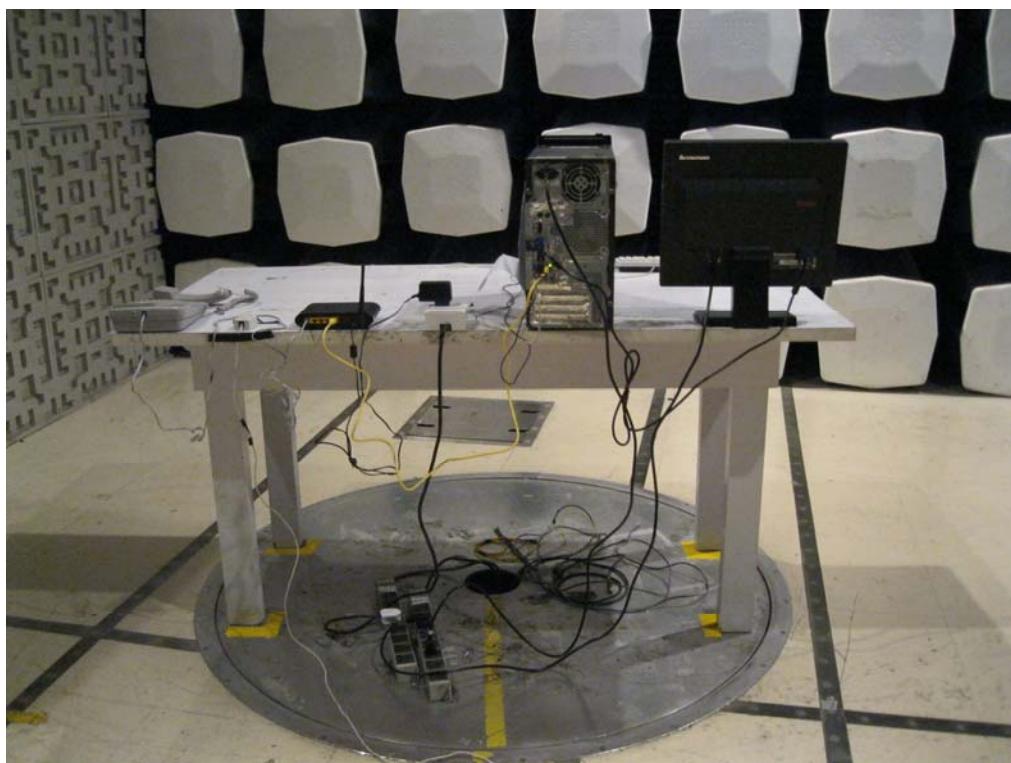
No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		
		MHz	Peak	QP	Avg	Peak	QP	Avg	QP	Avg	QP	Avg	P/F
1	30.0000	13.21	11.94		17.63	30.84	29.57		40.00		-10.43		P
2	199.7500	19.76	17.36		11.84	31.60	29.20		43.50		-14.30		P
3	257.9500	20.69	18.26		14.15	34.84	32.41		46.00		-13.59		P
4	298.3667	18.09	16.58		15.76	33.85	32.34		46.00		-13.66		P
5	624.9333	14.33	13.21		22.83	37.16	36.04		46.00		-9.96		P
6	640.0260	21.46	18.45		23.21	44.67	41.66		46.00		-4.34		P
7	749.4167	17.40	15.92		24.92	42.32	40.84		46.00		-5.16		P

**Note:** The correct factor = cable loss+ antenna factor.

Final Emission \_QP = Reading Level\_ QP+ correct factor.

For example: The cable loss of 749.4167MHz is 1.62dB and the antenna factor is 23.3dB. So, the correct factor=1.62 dB +23.3 dB =24.92 dB

**APPENDIX 1 PHOTOGRAPHS OF TEST SETUP****CONDUCTED EMISSION TEST SETUP**

**RADIATED EMISSION TEST SETUP**

**APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT**

External View of EUT-1



External View of EUT-2



External View of EUT-3



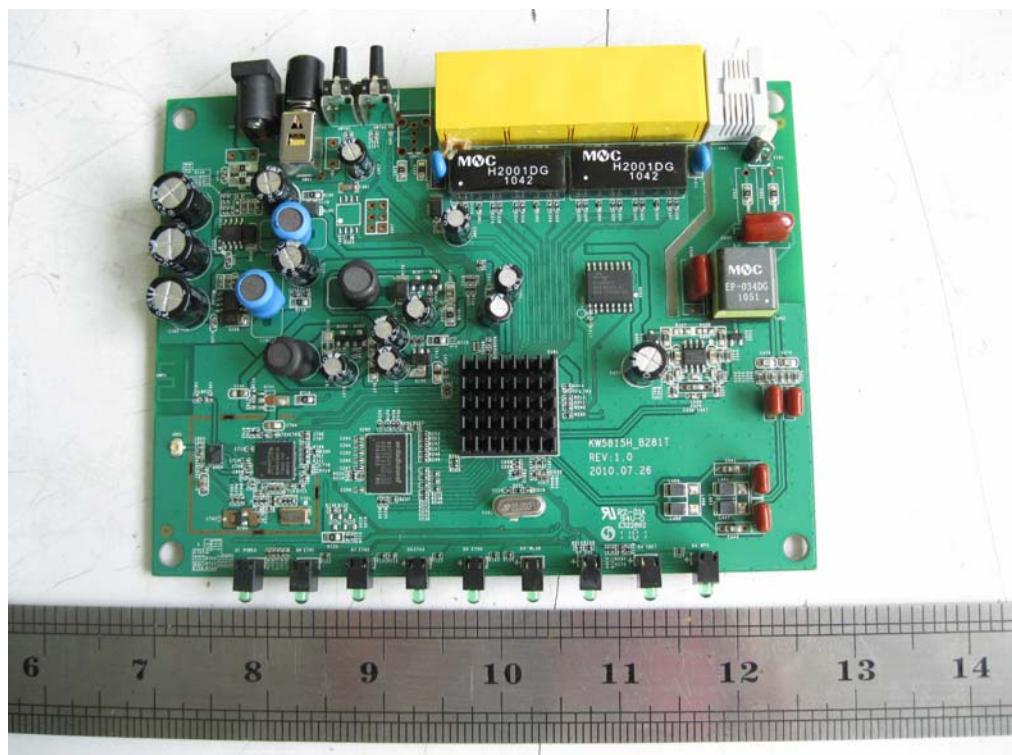
External View of EUT-4

**APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT**

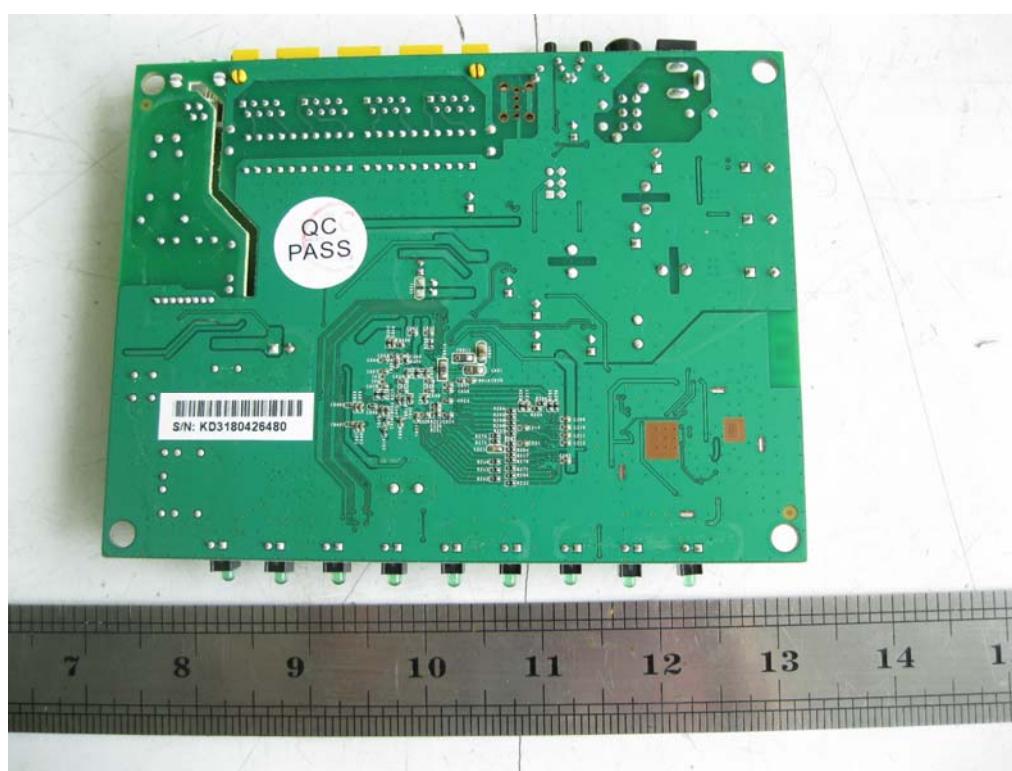
Internal View of EUT-1



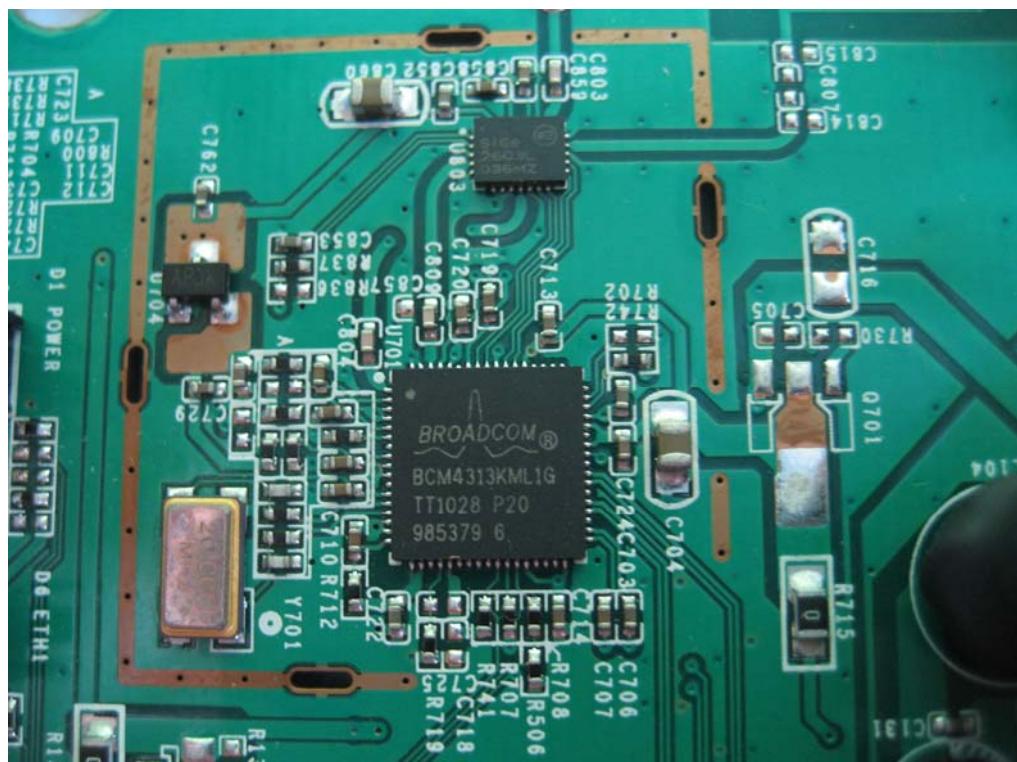
Internal View of EUT-2



Internal View of EUT-3



Internal View of EUT-4



Internal View of EUT-5

----End of the report----