



**FCC 47 CFR PART 15 SUBPART B AND ANSI C63.4:2003
IC ICES-003 Issue 4
TEST REPORT**

For

Cable Wireless Router

Model : SMC8014WN2XXXX

(Where XXXX = any alpha character "a" - "z", "A" - "Z", or numeric character "0" - "9", or combination of alpha and numeric characters.)

Trade Name : SMC

Issued for

SMC Networks Inc.

20 Mason, Irvine, CA 92618 United States

Issued by

**Compliance Certification Services Inc.
Hsinchu Lab.**

**NO. 989-1 Wen Shan Rd., Shang Shan Village,
Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C**

TEL: +886-3-5921698

FAX: +886-3-5921108

<http://www.ccsrf.com>

E-Mail : service@ccsrf.com

Issued Date: March 01, 2012



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF or any government agencies. The test results of this report relate only to the tested sample identified in this report.



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	03/01/2012	Initial Issue	All Page 19	Cindy Pon



TABLE OF CONTENTS

TITLE	PAGE NO.
1. TEST REPORT CERTIFICATION	4
2. EUT DESCRIPTION	5
3. DESCRIPTION OF TEST MODES	5
4. TEST METHODOLOGY	6
5. FACILITIES AND ACCREDITATION	6
5.1 FACILITIES	6
5.2 ACCREDITATIONS.....	6
5.3 MEASUREMENT UNCERTAINTY	7
6. SETUP OF EQUIPMENT UNDER TEST.....	8
7. EMISSION TEST	9
7.1 RADIATED EMISSION.....	9-13
7.2 CONDUCTED EMISSION.....	14-17
APPENDIX SETUP PHOTOS	18-19



1. TEST REPORT CERTIFICATION

Applicant : SMC Networks Inc.
Address : 20 Mason, Irvine, CA 92618 United States
Equipment Under Test : Cable Wireless Router
Model : SMC8014WN2XXXX
 (Where XXXX = any alpha character "a" - "z", "A" - "Z", or numeric character "0" - "9", or combination of alpha and numeric characters.)
Trade Name : SMC
Tested Date : February 08 ~ 29, 2012

APPLICABLE STANDARD		
Standard	Item	Test Result
FCC Part 15 Subpart B, CLASS B AND ANSI C63.4:2003 IC ICES-003 Issue 4	Radiated Emission	PASS
	Conducted Emission	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Sb. Lu
Sr. Engineer

Reviewed by:

Gundam Lin
Sr. Engineer



2. EUT DESCRIPTION

Product Name	Cable Wireless Router
Model Number	SMC8014WN2XXXX (Where XXXX = any alpha character "a" - "z", "A" - "Z", or numeric character "0" - "9", or combination of alpha and numeric characters.)
Identify Number	T120208S01
Received Date	February 08, 2012
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
AC Power Cord Type	Non-shielded cable 1.8m (Non-detachable)
DC Power Cable Type	Non-shielded cable 1.8m (Non-detachable)
I/O Port	RJ-45 Port x 4, (Coaxial cable) RF Port x 1, Power Port x 1

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	LEI	NT15-Y120125-A1	120Vac, 60Hz, 0.5A	12Vdc, 1.25A

Remark : 1. For more details, please refer to the User's manual of the EUT.

2. Client consigns only one sample to test (model number: SMC8014WN20208). Therefore, the testing Lab. just guarantees the unit, which has been tested.

3. DESCRIPTION OF TEST MODES

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test Mode
1	Normal Operating

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Radiated Emission	Normal Operating
	Conducted Emission	Normal Operating

Remark : Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.



4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2003 and FCC CFR 47 Part 15 Subpart B, IC ICES-003 Issue 4.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

NO. 989-1 Wen Shan Rd., Shang Shan Village,
Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C

The sites are constructed in conformance with the requirements of ANSI C63.4:2003 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

5.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

Taiwan	TAF
---------------	-----

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>



5.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.5189
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 2.5164
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 2.4967
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 2.7655
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 1.5923

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.



6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	DELL	Latitude D610	CN-0C4708-48643-6 25-5565	DoC
2	Notebook PC	HP	ProBook 4421s	CNF03242PJ	DoC
3	CMTS	ARRIS	C3 CMTS DOCSIS2. OS/N 5157 5186	-----	-----

No.	Signal Cable Description
1	Non-shielded RJ-45 cable, 12m x 1
2	Non-shielded RJ-45 cable, 1.2m x 3
3	Shielded coaxial cable, 10m x 1

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.

EUT OPERATING CONDITION

1. Setup whole system for test as shown on diagram.
2. Power on all equipments.
3. Coaxial Cable link Headend-CMTS.
CMTS set DOWN STREAM : -10 dBmV, UP STREAM: + 40 dBmV
4. Notebook (2) ping to Notebook (1).
5. Notebook (1) ping to Notebook (2).
6. LAN 2~4 port witch load.
7. Start test.



7. EMISSION TEST

7.1 RADIATED EMISSION

LIMITS

(1) For Frequency Below 1GHz

47 CFR Part 15 Subpart B Section 15.109 (a) (b)

Frequency (MHz)	Class A			Class B		
	Field Strength (µV/m)	Field Strength (dBµV/m)	Distance (meters)	Field Strength (µV/m)	Field Strength (dBµV/m)	Distance (meters)
30 - 88	90	39.0	10	100	40.0	3
88 - 216	150	43.5	10	150	43.5	3
216 - 960	210	46.4	10	200	46.0	3
Above 960	300	49.5	10	500	54.0	3

CISPR 22 (According to 47 CFR Part 15 Subpart B Section 15.109 (g))

Frequency (MHz)	Field Strengths (dBµV/m)		Distance (meters)
	Class A	Class B	
30 - 230	40	30	10
230 - 1000	47	37	10

(2) For Frequency Above 1GHz (According to 47 CFR Part 15 Subpart B Section 15.109)

Frequency (GHz)	Field Strength (dBµV/m)				Distance (meters)
	Class A		Class B		
	Peak	Average	Peak	Average	
Above 1GHz	80	60	74	54	3

(3) Frequency Range of Radiated Measurement (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40GHz, whichever is lower



TEST EQUIPMENT

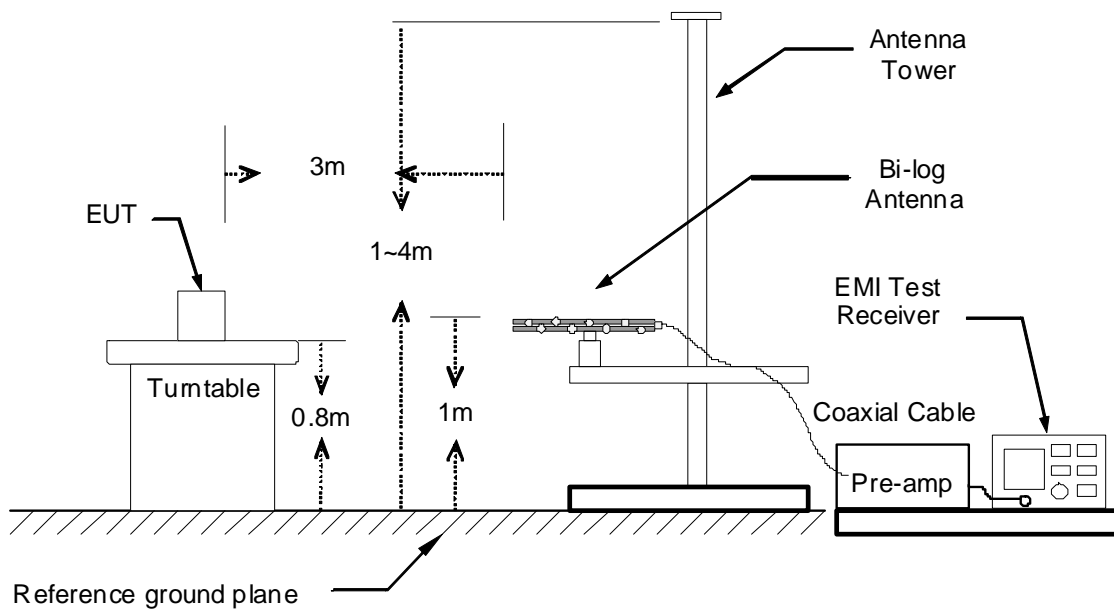
Radiated Emission / 966Chamber_B

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/19/2012
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	826547/004	10/27/2012
Broadband Hybrid Bi-Log Antenna	Sunol Sciences	JB1	A100209-4	10/05/2012
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078732	07/03/2012
Pre-Amplifier	Agilent	8447D	2944A10052	07/19/2012
Pre-Amplifier	Agilent	8449B	3008A01916	09/18/2012
Notch Filters Band Reject	Micro-Tronics	BRM05702-01	026	N.C.R

Remark: 1. Each piece of equipment is scheduled for calibration once a year.
 2. N.C.R = No Calibration Request.

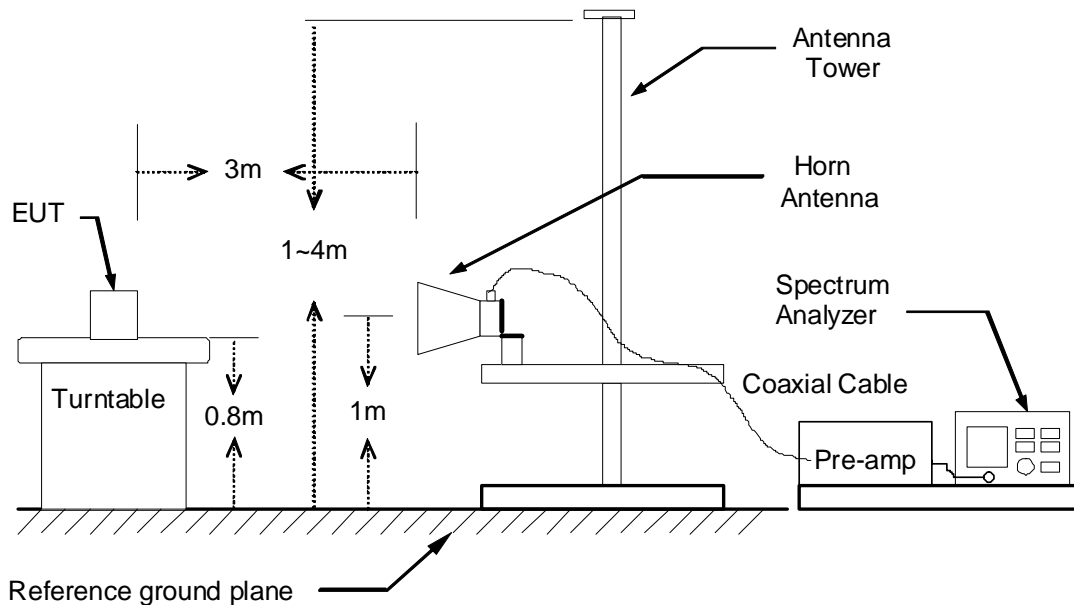
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.





The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2003.

The devices under test were placed on a rotatable table top 0.8 meter above ground. The table was rotated 360 degrees to determine the position of the highest radiation. EUT is set 3 or 10m meters from the interference receiving antenna which is mounted on the top of a variable height mast. The antenna 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.

Note :

1. The bandwidth setting on the E.M.I. meter (EMI TEST RECEIVER) is 120 KHz. The levels are Quasi-Peak value readings. The frequency spectrum from 30MHz to 1000MHz was investigated.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.



TEST RESULTS

Below 1 GHz

Product Name	Cable Wireless Router	Test By	Waternil Guan
Test Model	SMC8014WN20208	Test Date	2012/02/15
Test Mode	Normal Operating	Temp. & Humidity	23°C, 57%

966 Chamber_B at 3Meter / Horizontal								
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Height (cm)	Remark
104.69	44.89	-16.45	28.43	43.50	-15.07	75.60	300.00	Peak
138.64	42.35	-13.46	28.88	43.50	-14.62	135.00	200.00	Peak
210.42	51.98	-14.12	37.85	43.50	-5.65	217.90	100.00	Peak
250.19	57.90	-13.57	44.33	46.00	-1.67	158.90	100.00	QP
266.68	53.15	-12.81	40.34	46.00	-5.66	142.10	100.00	Peak
500.45	39.69	-8.24	31.45	46.00	-14.55	34.20	100.00	Peak
533.43	46.93	-8.03	38.90	46.00	-7.10	187.90	100.00	Peak
626.55	51.20	-6.39	44.81	46.00	-1.19	196.60	100.00	QP

966 Chamber_B at 3Meter / Vertical								
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Height (cm)	Remark
104.69	53.49	-16.45	37.03	43.50	-6.47	59.20	100.00	Peak
125.06	49.28	-13.58	35.70	43.50	-7.80	155.60	100.00	Peak
138.64	50.48	-13.46	37.01	43.50	-6.49	171.80	100.00	Peak
210.42	49.83	-14.12	35.71	43.50	-7.79	45.70	100.00	Peak
250.19	48.68	-13.57	35.11	46.00	-10.89	236.10	100.00	Peak
266.68	49.82	-12.81	37.01	46.00	-8.99	355.70	100.00	Peak
533.43	46.55	-8.03	38.52	46.00	-7.48	84.60	100.00	Peak
628.49	50.60	-6.35	44.25	46.00	-1.75	226.40	100.00	QP

Remark:

1. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.
2. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)
4. Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)
5. Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).



Above 1 GHz

Product Name	Cable Wireless Router	Test By	Waternil Guan
Test Model	SMC8014WN20208	Test Date	2012/02/15
Test Mode	Normal Operating	Temp. & Humidity	23°C, 57%

966 Chamber_B at 3Meter / Horizontal											
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Azimuth (°)	Height (cm)	Remark
1300.00	44.78	---	-2.91	41.87	---	74.00	54.00	-12.13	284.60	400.00	Peak
1992.50	47.36	---	2.15	49.51	---	74.00	54.00	-4.49	144.20	100.00	Peak
3165.00	42.85	---	5.59	48.44	---	74.00	54.00	-5.56	265.70	100.00	Peak
3780.00	41.65	---	6.54	48.19	---	74.00	54.00	-5.81	91.90	100.00	Peak
4365.00	41.14	---	8.23	49.37	---	74.00	54.00	-4.63	50.20	300.00	Peak
4915.00	59.84	33.26	9.71	69.55	42.97	74.00	54.00	-11.03	98.80	100.00	AVG

966 Chamber_B at 3Meter / Vertical											
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Azimuth (°)	Height (cm)	Remark
1175.00	44.91	---	-3.32	41.60	---	74.00	54.00	-12.40	211.00	400.00	Peak
1630.00	44.17	---	-1.10	43.07	---	74.00	54.00	-10.93	289.30	100.00	Peak
1992.50	48.71	---	2.15	50.86	---	74.00	54.00	-3.14	123.90	100.00	Peak
3262.50	50.16	40.87	5.69	55.85	46.56	74.00	54.00	-7.44	73.20	100.00	AVG
3825.00	41.97	---	6.63	48.61	---	74.00	54.00	-5.39	75.50	300.00	Peak
4915.00	59.01	33.86	9.71	68.72	43.57	74.00	54.00	-10.43	84.60	100.00	AVG

Remark:

1. Average test would be performed if the peak result were greater than the average limit.
2. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



7.2 CONDUCTED EMISSION

LIMITS

Frequency Range (MHz)	Voltage Limits (dB μ V)			
	Class A		Class B	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.50	79	66	66 - 56*	56 - 46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

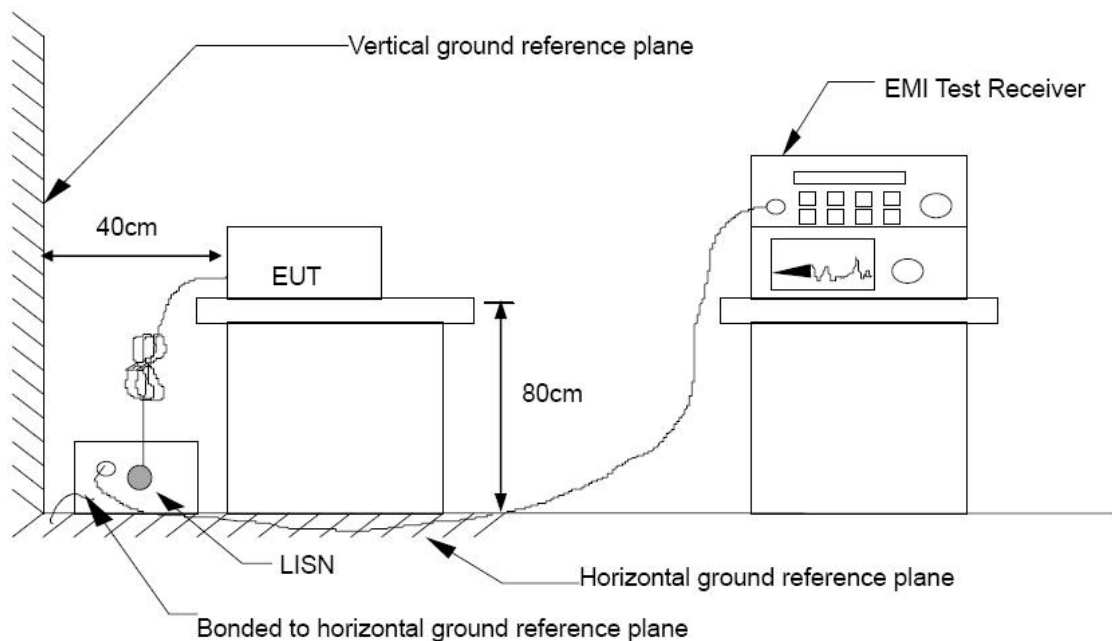
Remark: (1) The limit decreases linearly with logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
 (2) The lower limit shall apply at the transition frequency.
 (3) * Decreasing linearly with the logarithm of the frequency.

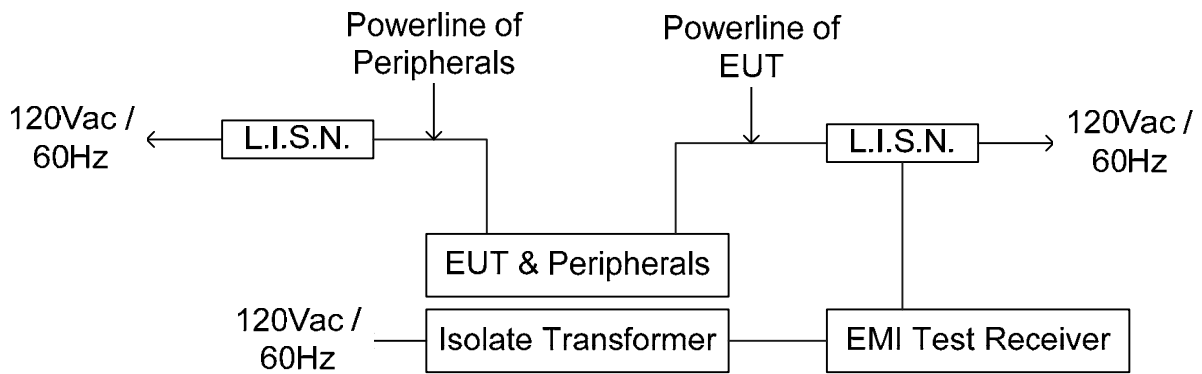
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/09/2012
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	03/14/2012
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/20/2012
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	100117	09/14/2012

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP





TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2003.

The test procedure is performed in a 4m x 3m x 2.4m (LxWxH) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) x 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.

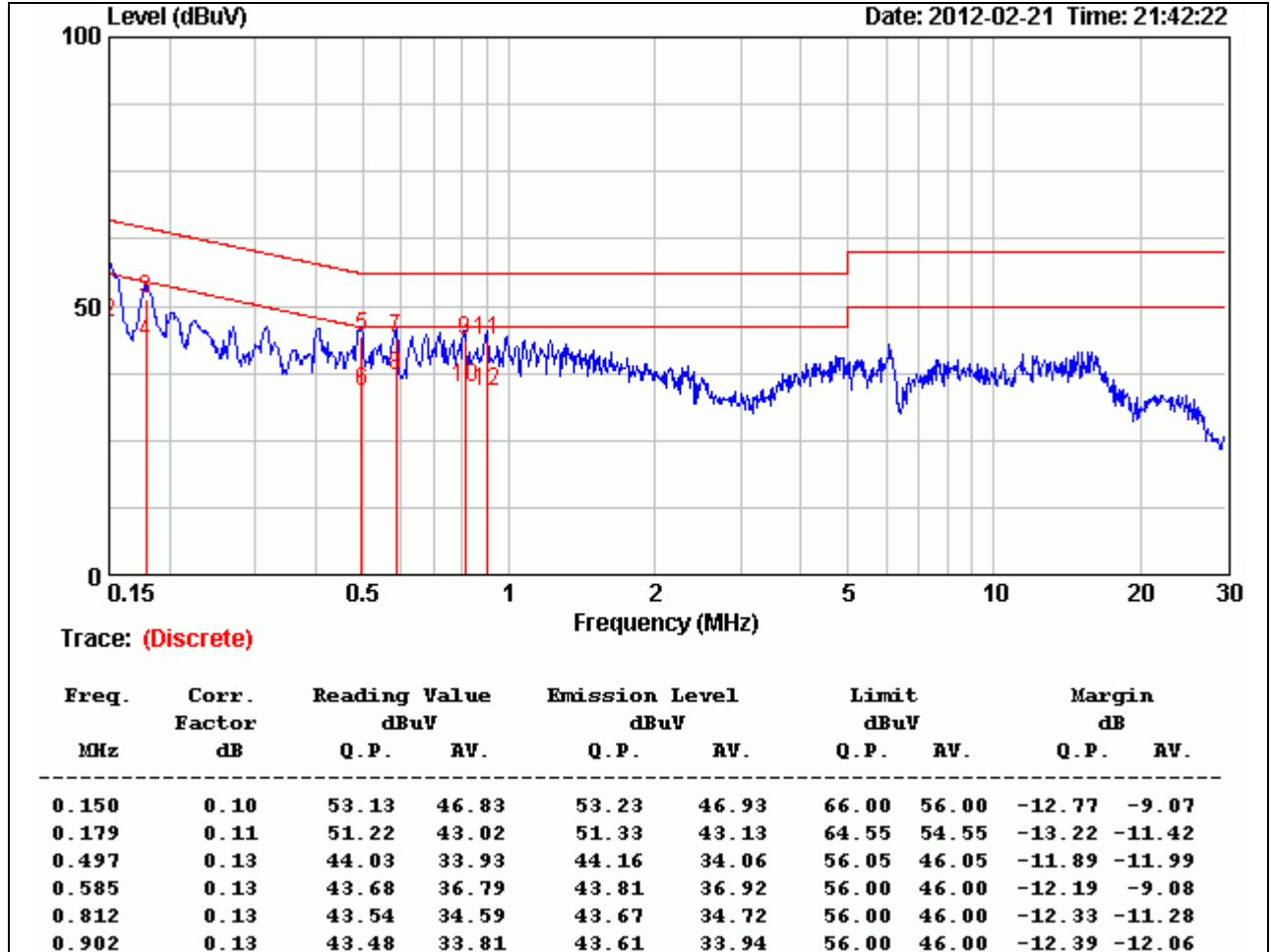
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.



TEST RESULTS

Product Name	Cable Wireless Router	Test By	Waternil Guan
Test Model	SMC8014WN20208	Test Date	2012/02/21
Test Mode	Normal Operating	Temp. & Humidity	24 °C, 62%

LINE



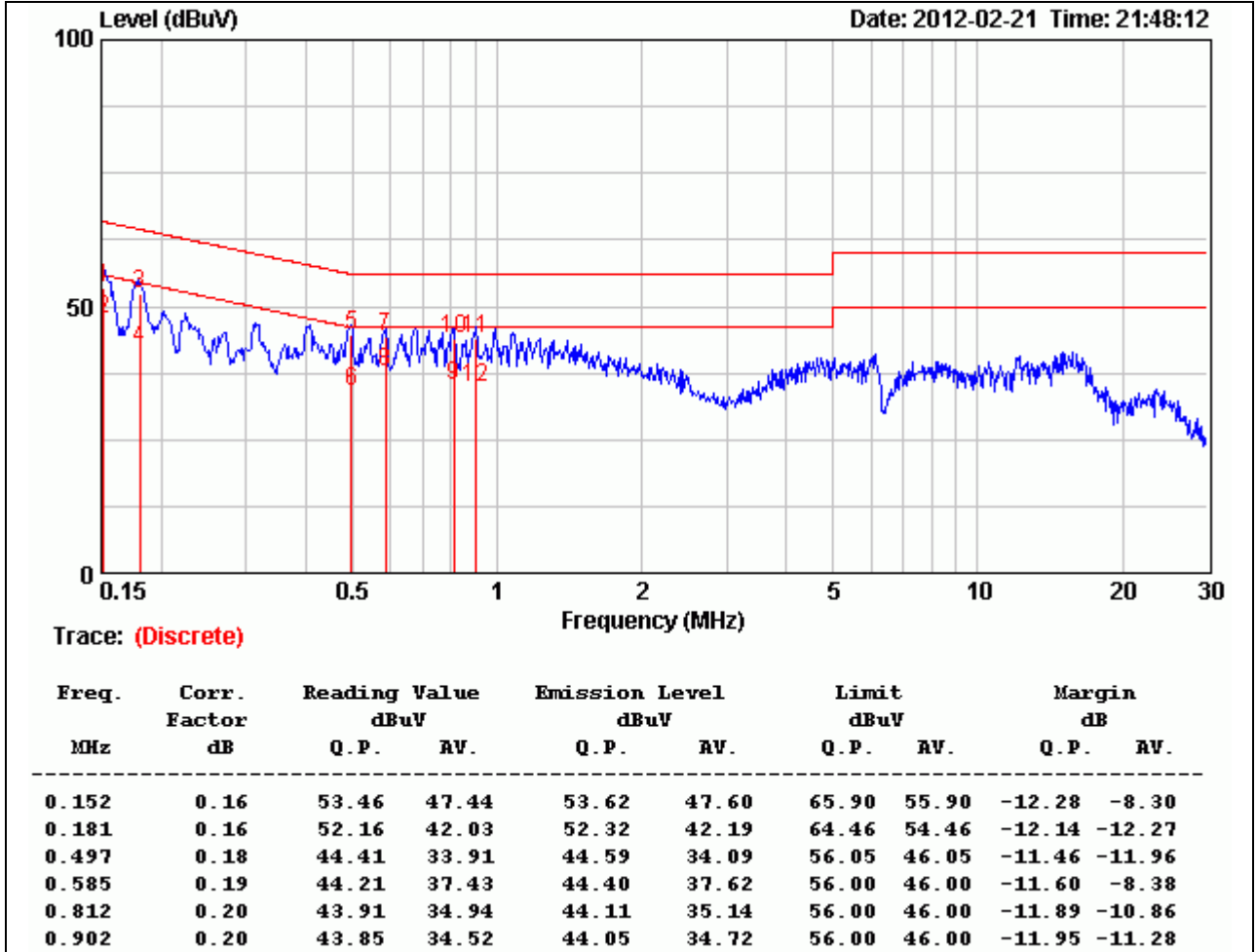
Remark:

1. Correction Factor = Insertion loss + Cable loss
2. Emission level = Reading Value + Correction factor
3. Margin value = Emission level – Limit value



Product Name	Cable Wireless Router	Test By	Waternil Guan
Test Model	SMC8014WN20208	Test Date	2012/02/21
Test Mode	Normal Operating	Temp. & Humidity	24°C, 62%

NEUTRAL



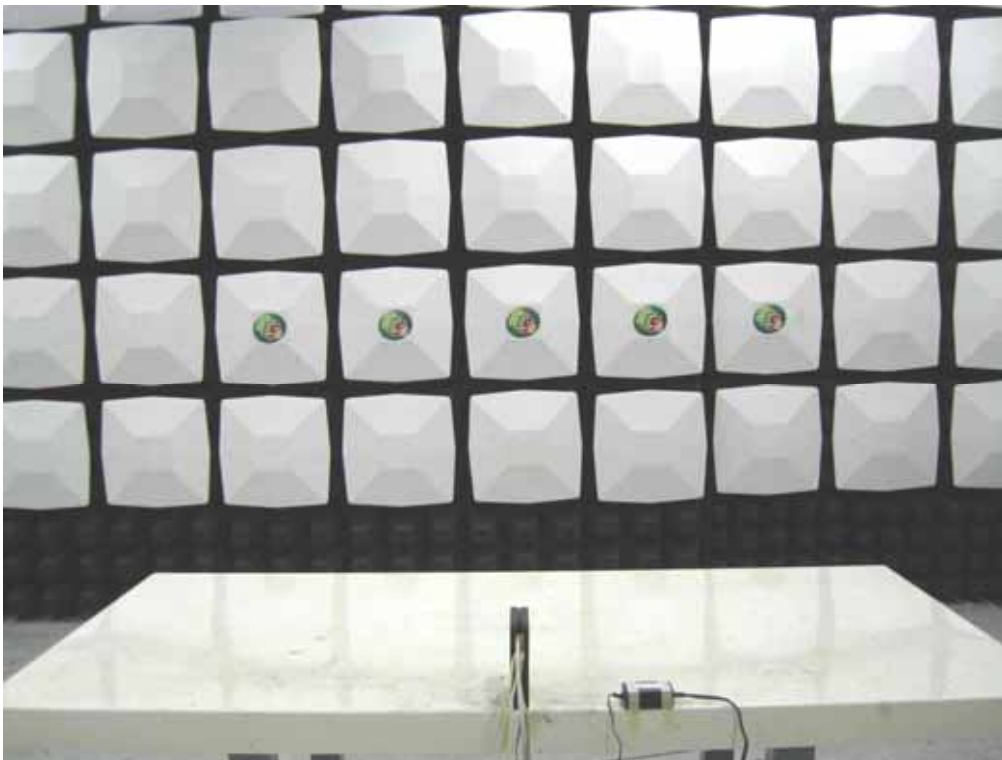
Remark:

1. Correction Factor = Insertion loss + Cable loss
2. Emission level = Reading Value + Correction factor
3. Margin value = Emission level – Limit value



APPENDIX SETUP PHOTOS

RADIATED EMISSION SETUP





CONDUCTED EMISSION SETUP

