

Complex Systems Pte Ltd

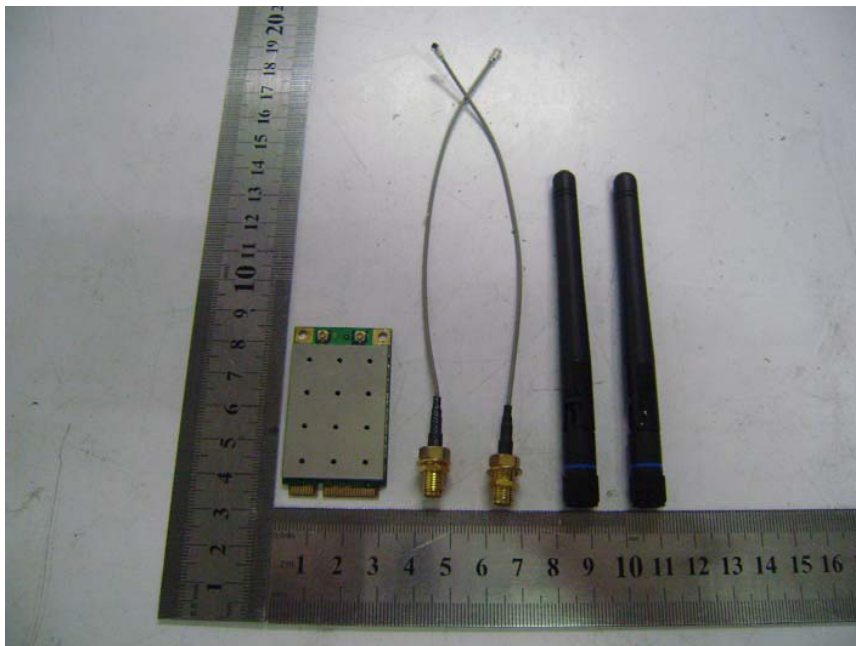
Wireless-A/B/G/N Network Mini PCIe Adapter

Model: WLE200NX

November 11, 2010

Report No.: 09U12946-3

(This report supersedes NONE)



Modifications made to the product : None

This Test Report is Issued Under the Authority of:

<i>Andy Hao</i>	<i>Jackson.chen</i>
Andy Hao Compliance Engineer	Jackson Chen Technical Manager

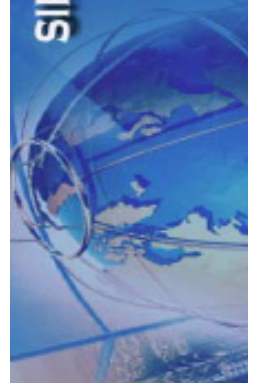
This test report may be reproduced in full only.

Test result presented in this test report is applicable to the representative sample only.

RF Test Report

TO: EN 301 489 -1 V 1.8.1, EN 301 489-17 V2.1.1

SIEMIC, INC.
Accessing global markets



Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to [testing](#) and [certification](#), SIEMIC provides initial design reviews and [compliance management](#) through out a project. Our extensive experience with [China](#), [Asia Pacific](#), [North America](#), [European](#), and [international](#) compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the [global markets](#).

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom

This page has been left blank intentionally.

CONTENTS

2	EXECUTIVE SUMMARY & EUT INFORMATION	5
3	TECHNICAL DETAILS	6
4	MODIFICATION	7

2 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the Compex Systems Pte Ltd , Wireless-A/B/G/N Network Mini PCIe Adapter, and model: WLE200NX against the current Stipulated Standards. The Wireless-A/B/G/N Network Mini PCIe Adapterhas demonstrated compliance with the EN 301 489 -1 V 1.8.1,EN 301 489-17 V2.1.1.

EUT Information

EUT	Please see attachment
Description	
Model No	WLE200NX
Input Power	DC 3.3V
Classification	
Per Stipulated	Spread Spectrum System/Device
Test Standard	

3 TECHNICAL DETAILS

Purpose	Compliance testing of WIFI Module with stipulated standard
Applicant / Client	Compex Systems Pte Ltd 135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363
Manufacturer	Compex Systems Pte Ltd 135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363
Laboratory performing the tests	SIEMIC Nanjing (China) Laboratories NO.2-1, Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel: +86(25)86730128/86730129 Fax: +86(25)86730127 Email: info@siemic.com
Test report reference number	09U12946-3
Date EUT received	September 09, 2010
Standard applied	EN 301 489 -1 V 1.8.1, EN 301 489-17 V2.1.1
Dates of test (from – to)	September 09, 2010 to November 08, 2010
No of Units:	#2
Equipment Category:	DTS
Trade Name:	COMPEX
Model :	WLE200NX
RF Operating Frequency (ies)	2412 ~ 2472 MHz, 2422~2462MHz, 5180~5240MHz, 5190 ~ 5230MHz, 5260~5320MHz, 5270 ~ 5310MHz, 5500~5700MHz, 5510 ~ 5670MHz
Modulation:	DSSS/OFDM

4 MODIFICATION

NONE

5. EQUIPMENT UNDER TEST (EUT)

5.1. DESCRIPTION OF EUT

EUT Description Wireless-A/B/G/N Network Mini PCIe Adapter compliance with IEEE 802.11a/b/g/n, communicate with other WLAN device

Model No WLE200NX

Input Power DC 3.3V

5.2. SOFTWARE AND FIRMWARE

The test utility and driver software used during testing was ART Devlib Revision 0.9 Build #15 Art_11n.

5.3. WORST-CASE MODE FOR EMISSIONS TESTS

EUT was evaluated on radiated emissions tests to find the worst case.

For radiated emissions above 1 GHz the worst-case configuration is determined to be the b-mode and channel with the highest output power.

5.4. WORST-CASE MODE FOR IMMUNITY TESTS

EUT was pinging IP address of Access Point, through the air, as the worst case.

6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
Laptop PC	Lenovo	769	L3-BA653
AC Adapter	Lenovo	92P1160	11S92P1160Z1ZBGH7CLV58
Access Point	Broadcom	BCM94704AGR	C01133
AC Adapter	CUI	KSAFD050300U-P5P-TK	2330
Laptop PC	Lenovo	769	L3-BA660
AC Adapter	Lenovo	92P1160	11S92P1160Z1ZBGH7CM9B2

I/O CABLES

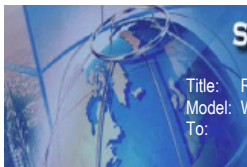
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	2-Prong	Un-Shielded	1m	N/A
2	DC	1	DC	Shielded	1.8m	N/A
3	DC	1	DC	Shielded	1.85m	N/A

TEST SETUP

- For radiated emissions test - The EUT was inserted onto an extension card, and then plugged to a Laptop PC, and running ART transmission program continuously.

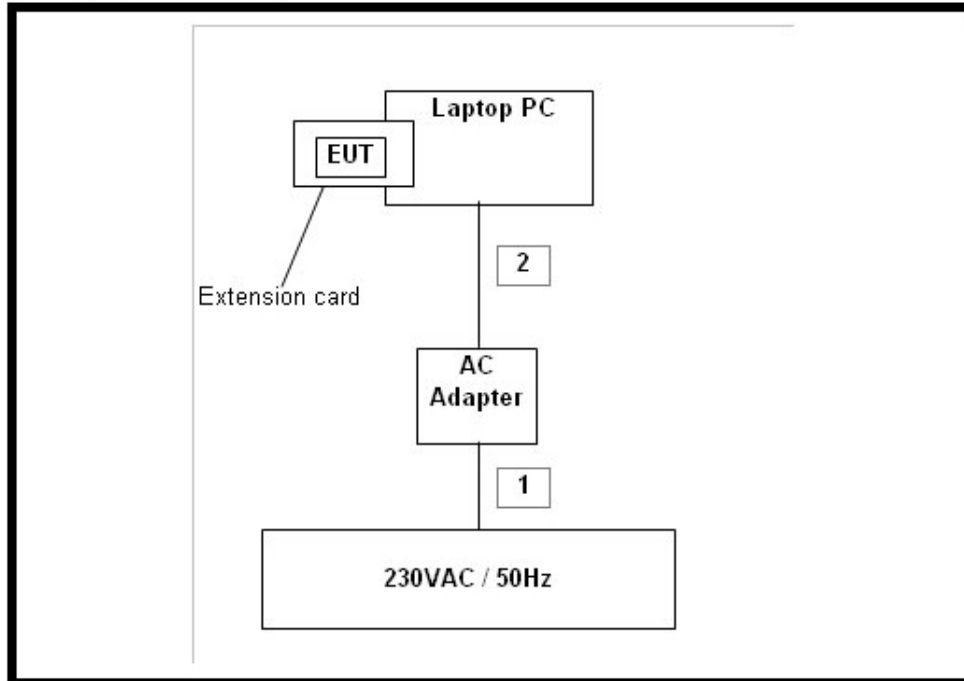
Two pieces of 50 ohm terminator were connected to the antenna ports of EUT during this test.
- For immunity test - The EUT was inserted onto an extension card, and then plugged to a Laptop PC, pinging with IP address of Access Point continuously.

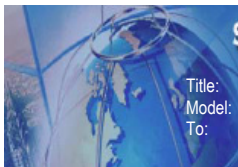
Two pieces of Antennas (EBJ Main and TDC) were connected to the antenna ports of EUT during this test.



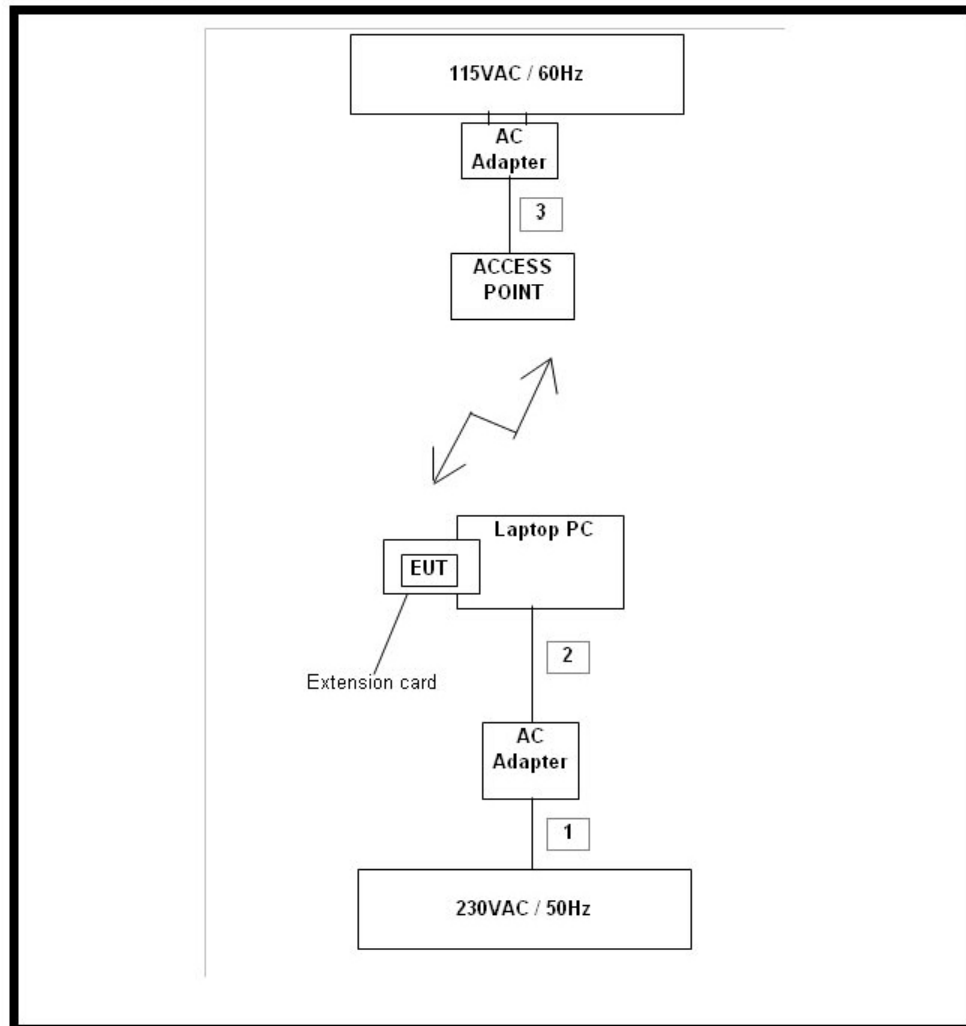
SETUP DIAGRAM FOR TESTS

FOR RADIATED EMISSION TEST





FOR IMMUNITY TEST



7. EMISSIONS LIMITS AND RESULTS

7.1. RADIATED EMISSIONS (1-6 GHz)

LIMIT

EN 301 489-1 Clause 8.2.3

The ancillary equipment shall meet the class B limits given in EN 55022 and the limits above 1 GHz shown in table 3.

**Table 6 – Limits for radiated disturbance of class B ITE
at a measuring distance of 10 m**

Frequency range MHz	Quasi-peak limits dB(μV/m)
30 to 230	30
230 to 1 000	37
NOTE 1 The lower limit shall apply at the transition frequency. NOTE 2 Additional provisions may be required for cases where interference occurs.	

Table 3: Limits for radiated disturbance above 1 GHz at a measurement distance of 3 m

Frequency range	Average Limit (dBμV/m)	Peak limit (dBμV/m)
1 000 MHz to 3 000 MHz	50	70
3 000 MHz to 6 000 MHz	54	74
NOTE: The lower limit applies at the transition frequency.		

TEST PROCEDURE

EN 55022

TEST AND MEASUREMENT EQUIPMENT

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Calibration Due
<input checked="" type="checkbox"/> Horn Antenna	EMCO	3115	6717	01/29/2011
<input checked="" type="checkbox"/> Preamplifier	HP / AGILENT	8449B	3008A00931	02/04/2011
<input checked="" type="checkbox"/> Spectrum Analyzer	HP / AGILENT	E4440A	MY48250923	08/24/2011
<input checked="" type="checkbox"/> Horn Antenna	EMCO	3115	9001-3245	01/29/2011
<input checked="" type="checkbox"/> Preamplifier	HP / AGILENT	8449B	3008A00561	02/04/2011
<input checked="" type="checkbox"/> Spectrum Analyzer	HP / AGILENT	E4440A	MY48250925	08/31/2011

RADIATED EMISSIONS 1000 TO 6000 MHz (WORST-CASE CONFIGURATION)

TABULATED DATA

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Test Equipment:

Horn 1-18GHz
 T73; S/N: 6717 @3m

Pre-amplifier 1-26GHz
 T144 Miteq 3008A00931

Pre-amplifier 26-40GHz
 T144 Miteq 3008A00931

Horn > 18GHz
 T144 Miteq 3008A00931

Limit
 EN55022 B

HI Frequency Cables
 3' cable 22807700
 3' cable 22807700

12' cable 22807600
 12' cable 22807600

20' cable 22807500
 20' cable 22807500

HPF
 R_001

Reject Filter
 R_001

Peak Measurements
 RBW=VBW=1MHz
 Average Measurements
 RBW=1MHz, VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.343	3.0	56.3	34.5	25.0	2.8	-39.0	0.0	0.0	45.0	23.2	70.0	50.0	-25.0	-26.8	V
1.874	3.0	55.1	35.2	26.8	3.3	-38.2	0.0	0.0	47.0	27.1	70.0	50.0	-23.0	-22.9	V
2.503	3.0	56.9	36.9	28.5	3.9	-37.5	0.0	0.0	51.9	31.9	70.0	50.0	-18.1	-18.1	V
1.617	3.0	52.1	32.2	25.9	3.1	-38.6	0.0	0.0	42.5	22.6	70.0	50.0	-27.5	-27.4	H
1.867	3.0	53.7	34.1	26.8	3.3	-38.3	0.0	0.0	45.5	25.9	70.0	50.0	-24.5	-24.1	H
2.508	3.0	54.3	35.3	28.5	3.9	-37.5	0.0	0.0	49.2	30.3	70.0	50.0	-20.8	-19.7	H

Note: No other emissions were detected above the system noise floor.
 Rev. 11.10.08

f Measurement Frequency
 Dist Distance to Antenna
 Read Analyzer Reading
 AF Antenna Factor
 CL Cable Loss

Amp Preamp Gain
 D Corr Distance Correct to 3 meters
 Avg Average Field Strength @ 3 m
 Peak Calculated Peak Field Strength
 HPF High Pass Filter

Avg Lim Average Field Strength Limit
 Pk Lim Peak Field Strength Limit
 Avg Mar Margin vs. Average Limit
 Pk Mar Margin vs. Peak Limit

- Note: 5GHz band was tested.

8. IMMUNITY LIMITS AND RESULTS

8.1. RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY

TEST LEVEL

EN 301 489-1 Clause 9.2.2

3 V/m with 1000 Hz Sinusoidal AM at 80 % depth
 2000 to 2700 MHz in 1 % increments

TEST PROCEDURE

EN 301 489-1 Clause 9.2.2

EN 61000-4-3

TEST AND MEASUREMENT EQUIPMENT

Test Equipment List				
Description	Manufacturer	Model	Serial Number	Calibration Due
<input checked="" type="checkbox"/> Signal Generator	Rohde & Schwarz	SME06	842829/002	6/29/2011
<input type="checkbox"/> RF Amplifier	Amplifier Research	150W1000M2	303370	C.N.R.
<input checked="" type="checkbox"/> RF Amplifier	Amplifier Research	30S1G3	303877	C.N.R.
<input type="checkbox"/> Directional Coupler	Werlatone	C6021	8576	C.N.R.
<input checked="" type="checkbox"/> Directional Coupler	Amplifier Research	DC7144A	305089	C.N.R.
<input checked="" type="checkbox"/> Power Meter	HP	438A	2822A05684	4/14/2011
<input type="checkbox"/> Power Sensor	HP	8482A	2349A08568	4/14/2011
<input type="checkbox"/> Log Periodic Antenna	Rohde & Schwarz	HL 046	358714/003	C.N.R.
<input checked="" type="checkbox"/> Horn Antenna	EMCO	3115	6739	C.N.R.
<input checked="" type="checkbox"/> Field Probe	Holaday	HI 6105	62873	3/5/2011

ENVIRONMENTAL CONDITIONS

Parameter	Value	Limits
Humidity	34 %	< 95 %

TEST INFORMATION

Project No: 09U12964-3

Tester: Oliver Su

EUT Mode of Operation: EUT was pinging with AP, through the air

RESULTS

Enclosure Port									
Frequency Range (MHz)	Antenna Polarization	Front Side		Back Side		Left Side		Right Side	
		Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
2000 to 2700	Horizontal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2000 to 2700	Vertical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Required Passing Criterion:

Actual Performance:

A ☒

A ☒

B ☐

B ☐

C ☐

C ☐

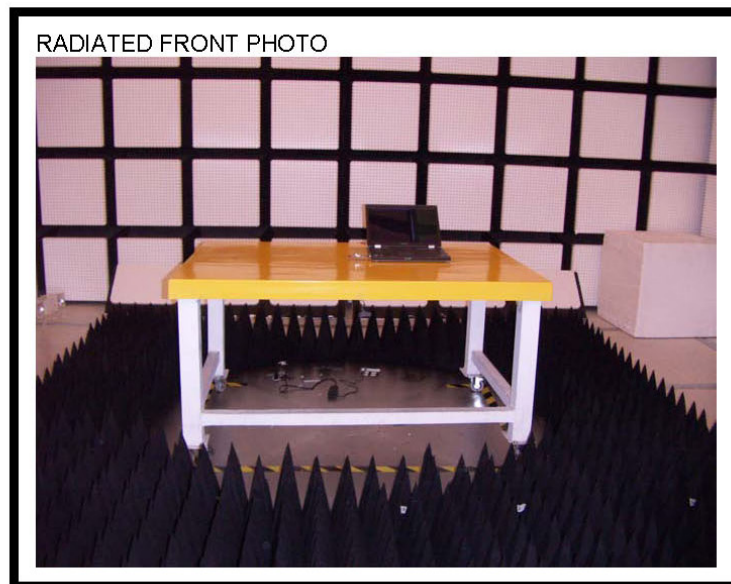
Notes:

- Test was not performed for the exclusion band of 2,280 - 2,607,675MHz.
- Both 2.4GHz band and 5GHz band were tested.

9. SETUP PHOTOS

9.1. EMISSIONS SETUP PHOTOS

RADIATED EMISSIONS





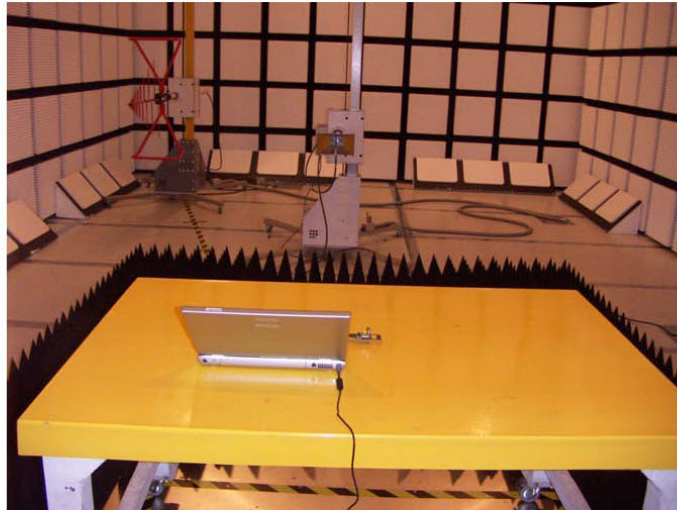
SIEMIC, Inc.

Accessing global markets

Title: RF Test Report for Wireless-A/B/G/N Network Mini PCIe Adapter
Model: WLE200NX
To: EN 301 489 -1 V 1.8.1, EN 301 489-17 V2.1.1

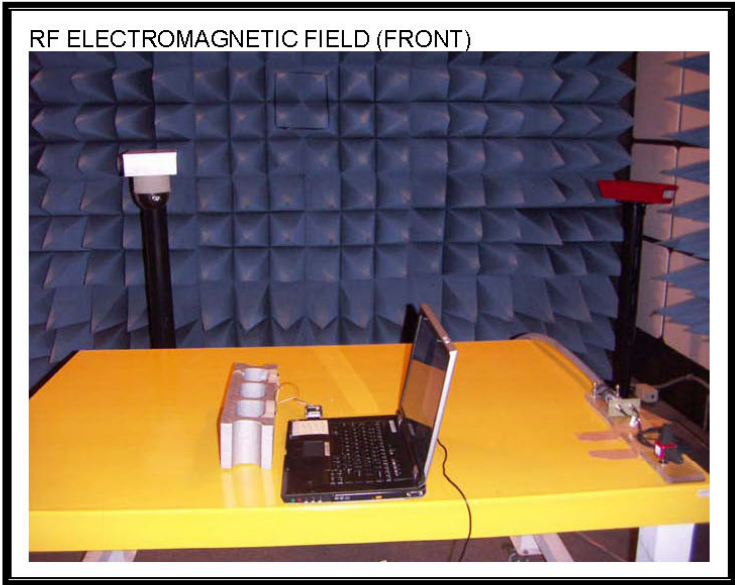
Serial#: 09U12946-3
Issue Date: November 11, 2010
Page 17 of 26
www.siemic.com.cn

RADIATED BACK PHOTO



9.2. IMMUNITY SETUP PHOTOS

RADIATED IMMUNITY



RF ELECTROMAGNETIC FIELD (BACK)



RF ELECTROMAGNETIC FIELD (LEFT)

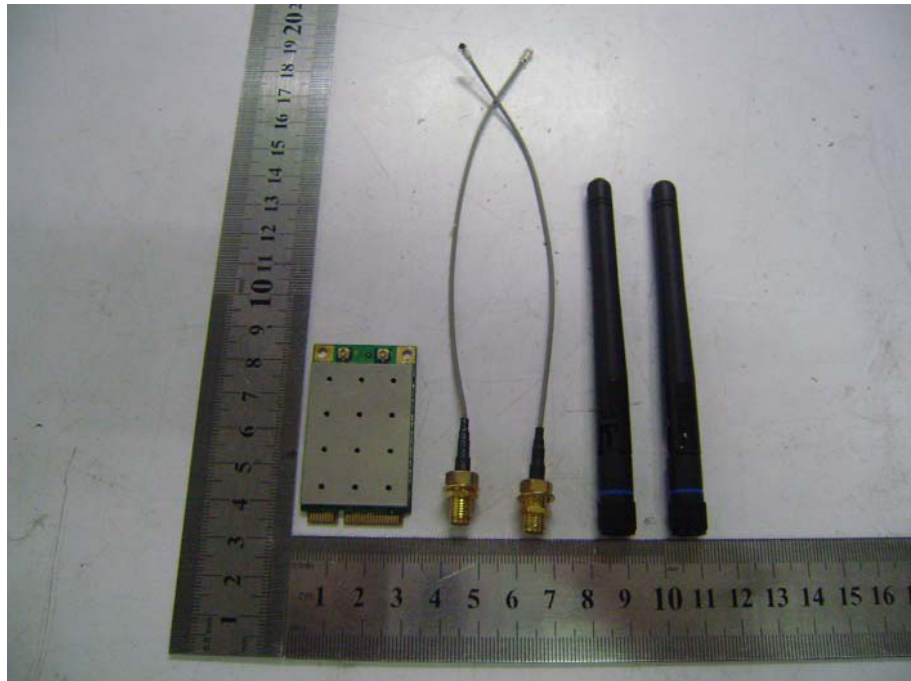


RF ELECTROMAGNETIC FIELD (RIGHT)

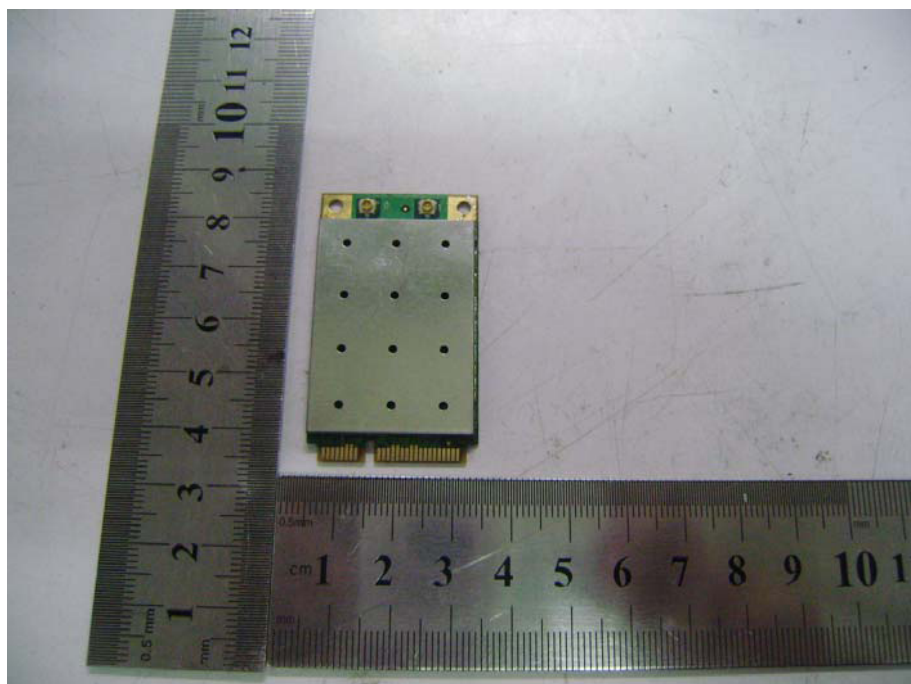


10. EUT PHOTOS

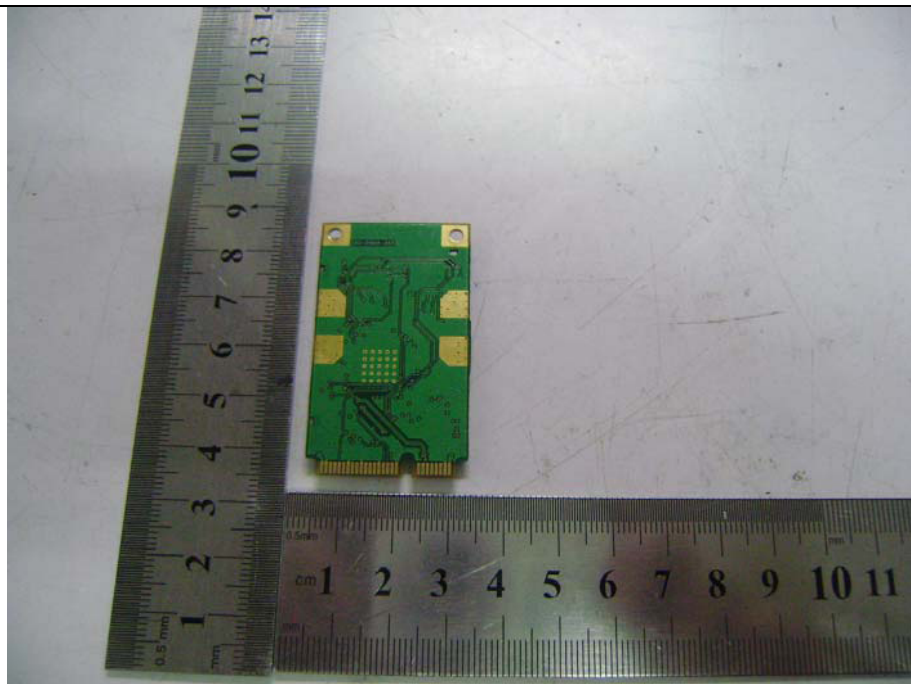
EUT View 1



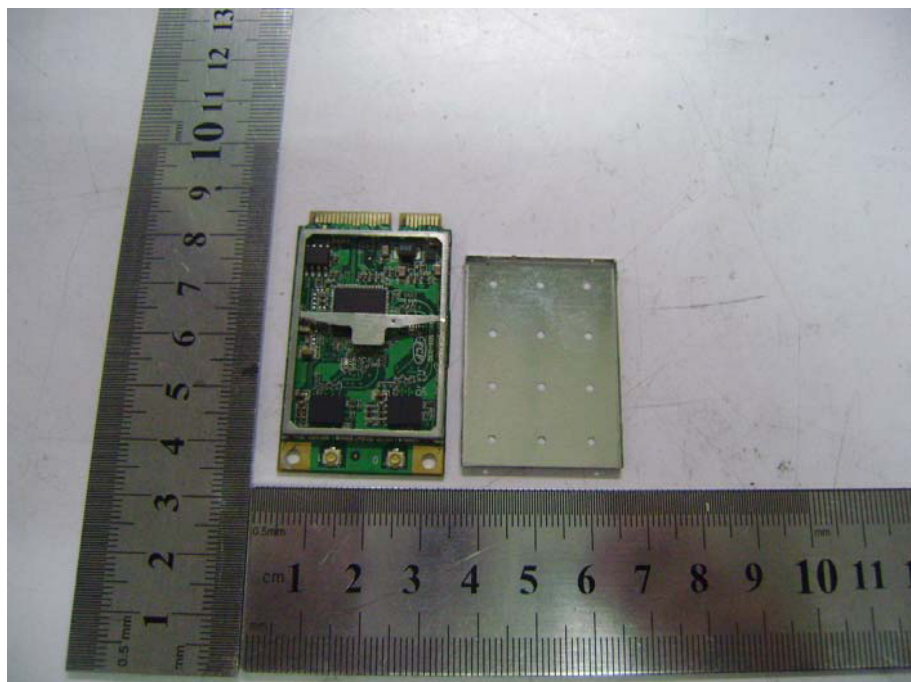
EUT View 2



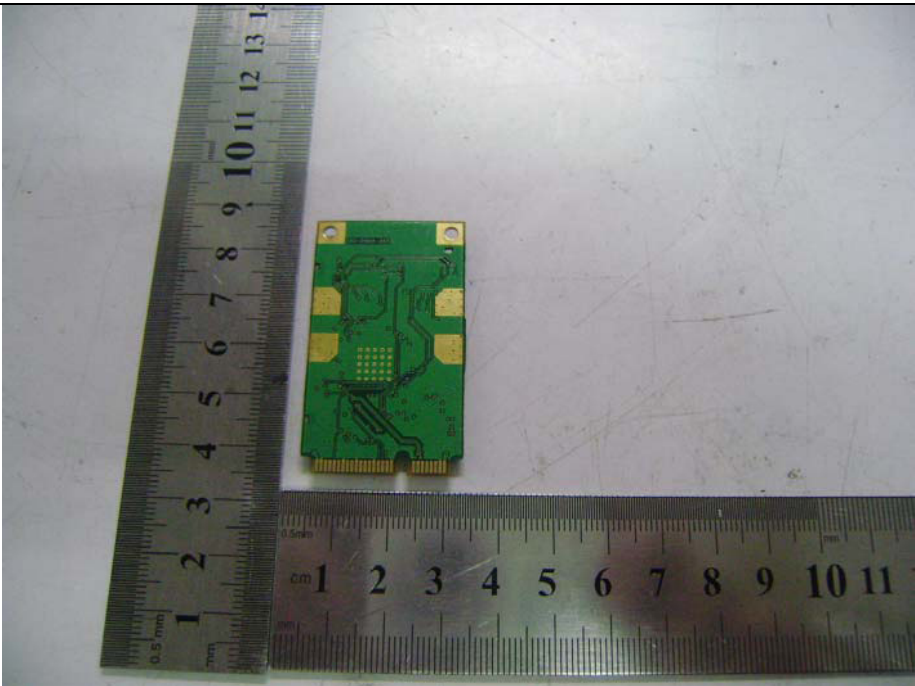
EUT View 3



Solder Board-Component View 1



Solder Board-Component View 2



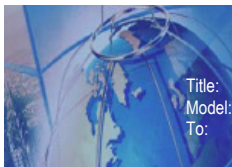
Antenna View





Antenna Connect Cable View





SIEMIC, INC.

Accessing global markets

Title: RF Test Report for Wireless-A/B/G/N Network Mini PCIe Adapter
Model: WLE200NX
To: EN 301 489 -1 V 1.8.1, EN 301 489-17 V2.1.1

Serial#: 09U12946-3
Issue Date: November 11, 2010
Page 26 of 26
www.siemic.com.cn

