



**FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
INDUSTRY CANADA RSS-132 ISSUE 2
INDUSTRY CANADA RSS-133 ISSUE 5**

CLASS II PERMISSIVE CHANGE

**TEST REPORT
FOR**

PCI EXPRESS MINI CARD (TESTED INSIDE OF DELL LATITUDE E4200-2 PC)

MODEL NUMBER: E725

**FCC ID: PKRNVWE725
IC: 3229B-E725**

REPORT NUMBER: 09U12748-1

ISSUE DATE: AUGUST 26, 2009

Prepared for

**NOVATEL WIRELESS
9645 SCRANTON ROAD, SUITE 205
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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: NOVATEL WIRELESS
9645 SCRANTON ROAD, SUITE 205
SAN DIEGO, CA 92121

EUT DESCRIPTION: PCI EXPRESS MINI CARD (TESTED INSIDE OF DELL
LATITUDE E4200-2 PC)

MODEL NUMBER: E725

SERIAL NUMBER: N/A

DATE TESTED: AUGUST 18 and 19, 2009

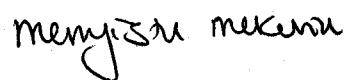
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H and 24E	PASS
IC RSS-132 ISSUE 2 and RSS-133 ISSUE 5	

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, RSS-132 Issue 2, and RSS-133 Issue 5.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a mini-PCI E card that installed inside Dell Notebook. The radio module is manufactured by Novatel Wireless.

5.2. MAXIMUM OUTPUT POWER

The test measurement passed within ± 0.5 dBm of the original output power.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding Dell mobile notebook.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two different PIFA antennas, with a maximum gain of -2.84 for Cell band and -1.92 dBi for PCS band respectively.

5.5. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent Communication Test Set.

PROCEDURE USED TO ESTABLISH TEST SIGNAL

3G-CDMA2000 1xRTT

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev. License</u>
CDMA2000 Mobil Test	B.10.11, L

1xRTT

- Call Setup > Shift & Preset
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > RC3 (Fwd3, Rvs3)
- FCH Service Option (SO) Setup > 55
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
> R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Cell Info > Cell Parameters > System ID (SID) > 2004
> Network ID (NID) > 65535

Once "Active Cell" show "Connected " then change "Rvs Power Ctrl" from "Active bits" to "**All Up bits**" to get the maximum power.

Worst-case Measurement Result @ Low, Middle and High Channel

Worst-case Measurement Result for Low, Middle and High Channel under Radio Configuration RC3 and Service Option 55.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	Latitude 4200	2194409000074	DoC
AC/DC	Delta Electronics Inc.	LA65NE1-00	CN-0CM164-71615-96U-1AA4-A01	DoC

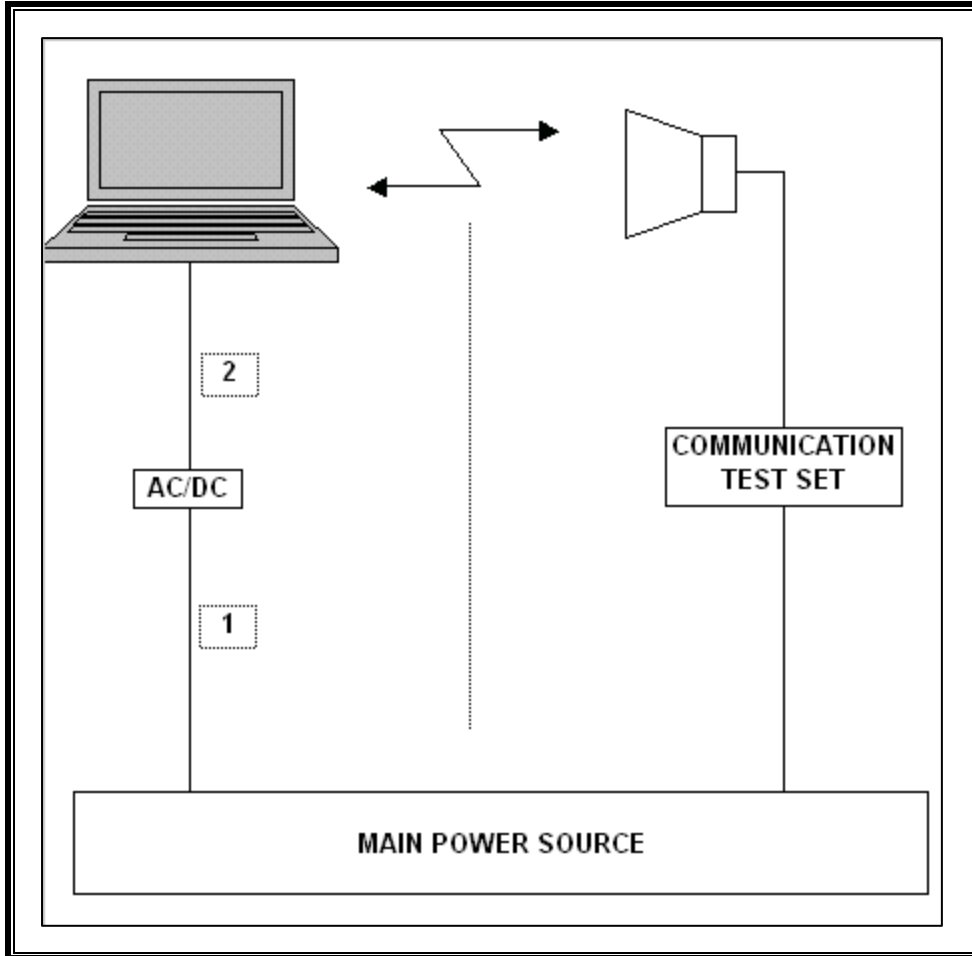
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Input	1	DC	Un-Shielded	1.0 m	N/A
2	DC Input	1	DC	Un-Shielded	2.0 m	FERRITE AT ONE END

TEST SETUP

The EUT is a CDMA PCI E Mini card that installed inside Dell Notebook Laptop. Communications Test Set is used to link the device under test.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	02/04/10
Antenna, Horn, 18 GHz	EMCO	3115	C00943	01/29/10
Antenna, Horn, 18 GHz	EMCO	3115	C00945	01/29/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Dipole	Speag	D900V2	NA	11/16/11
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Signal Generator	R & S	SMP04	C00953	02/16/11
Communications Test Set	Agilent / HP	E5515C	C01086	06/16/10
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/24/10

7. LIMITS AND RESULTS

7.1. MAXIMUM RADIATED OUTPUT POWER

The transmitter has a maximum ERP & EIRP Peak output powers as follows:

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 824.70	CDMA2000	25.9	389.0
Mid CH - 836.52		23.8	239.9
High CH - 848.31		24.1	257.0

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1851.25	CDMA2000	28.9	776.2
Mid CH - 1880.00		28.7	741.3
High CH - 1908.75		24.6	288.4

7.2. RADIATED OUTPUT POWER

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(b) & RSS133 § 6.4 Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

RSS-132 § 4.4 The maximum ERP shall be 6.3 Watts for mobile stations.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17, RSS-132, and RSS-133.

RESULTS

CELL OUTPUT POWER (ERP)

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
Company:	NOVATEL WIRELESS						
Project #:	09U12748						
Date:	8/18/2009						
Test Engineer:	MENGISTU MEKURIA						
Configuration:	EUT EMBEDDED ISNIDE DELL MINI LAPTOP COMPUTER						
Mode:	TX CELL BAND CDMA MODE						
Test Equipment:							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.70	-8.9	V	34.8	25.9	38.5	-12.6	
824.70	-6.9	H	30.5	23.6	38.5	-14.8	
836.52	-9.4	V	33.1	23.7	38.5	-14.8	
836.52	-7.3	H	31.2	23.8	38.5	-14.6	
848.31	-8.7	V	32.1	23.4	38.5	-15.0	
848.31	-7.1	H	31.2	24.1	38.5	-14.4	
Rev. 1.24.7							

PCS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
Company:	NOVATEL WIRELESS						
Project #:	09U12748						
Date:	8/18/2009						
Test Engineer:	MENGISTU MEKURIA						
Configuration:	EUT EMBEDDED ISNIDE DELL MINI LAPTOP COMPUTER						
Mode:	TX PCS BAND CDMA MODE						
Test Equipment:							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	-11.5	V	40.4	28.9	33.0	4.1	
1.850	-13.1	H	39.7	26.6	33.0	-6.4	
1.880	-11.2	V	39.9	28.7	33.0	4.3	
1.880	-12.9	H	40.1	27.2	33.0	-5.8	
1.910	-15.2	V	39.8	24.6	33.0	-8.4	
1.910	-15.5	H	40.2	24.6	33.0	-8.4	
Rev. 1.24.7							

7.3. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (e) and §24.238 (a), RSS-132 § 4.5.1, & RSS-133 § 6.5.1 (a) (i) & (b): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b), FCC 24.238 (b), & FCC 27.53 (g)(1)(2)(3), RSS-132, and RSS-133.

RESULTS

CELL SPURIOUS & HARMONIC (ERP)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:		NOVATEL WIRELESS								
Project #:		09U12748								
Date:		8/18/2009								
Test Engineer:		MENGISTU MEKURIA								
Configuration:		EUT EMBEDDED ISNIDE DELL MINI LAPTOP COMPUTER								
Mode:		TX CELL BAND CDMA MODE								
Chamber		Pre-amplifier			Filter			Limit		
3m Chamber		T34 8449B			Filter 1			FCC 22 TX		
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low CH 824.7 MHz										
1.649	-48.2	V	3.0	36.9	37.4	1.0	-47.7	-13.0	-34.7	
2.474	-51.2	V	3.0	41.6	36.4	1.0	-44.9	-13.0	-31.9	
3.299	-62.6	V	3.0	43.6	35.8	1.0	-53.7	-13.0	-40.7	
1.649	-51.9	H	3.0	36.6	37.4	1.0	-51.6	-13.0	-38.6	
2.474	-57.7	H	3.0	40.0	36.4	1.0	-53.0	-13.0	-40.0	
3.299	-64.2	H	3.0	43.4	35.8	1.0	-55.5	-13.0	-42.5	
Mid CH 836.52 MHz										
1.673	-47.3	V	3.0	37.1	37.3	1.0	-46.5	-13.0	-33.5	
2.510	-49.6	V	3.0	41.8	36.4	1.0	-43.2	-13.0	-30.2	
3.346	-60.9	V	3.0	43.8	35.8	1.0	-51.9	-13.0	-38.9	
1.673	-49.7	H	3.0	36.9	37.3	1.0	-49.1	-13.0	-36.1	
2.510	-54.5	H	3.0	40.2	36.4	1.0	-49.6	-13.0	-36.6	
3.346	-64.4	H	3.0	43.6	35.8	1.0	-55.6	-13.0	-42.6	
High CH 848.31 MHz										
1.697	-44.5	V	3.0	37.4	37.3	1.0	-43.4	-13.0	-30.4	
2.545	-47.2	V	3.0	41.9	36.3	1.0	-40.7	-13.0	-27.7	
3.393	-59.5	V	3.0	43.9	35.7	1.0	-50.2	-13.0	-37.2	
1.697	-46.7	H	3.0	37.1	37.3	1.0	-45.9	-13.0	-32.9	
2.545	-52.8	H	3.0	40.4	36.3	1.0	-47.7	-13.0	-34.7	
3.393	-68.2	H	3.0	43.7	35.7	1.0	-59.2	-13.0	-46.2	
No other emissions were found within 20dB from the limit of the system noise up to 10th harmonic										
Rev. 03.03.09										

PCS Spurious & Harmonic (EIRP)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement											
Company:		NOVATEL WIRELESS									
Project #:		09U12748									
Date:		8/18/2009									
Test Engineer:		MENGISTU MEKURIA									
Configuration:		EUT EMBEDDED ISNIDE DELL MINI LAPTOP COMPUTER									
Mode:		TX PCS BAND CDMA MODE									
Chamber		Pre-amplifier			Filter			Limit			
3m Chamber		T34 8449B			Filter 1			FCC 24 TX			
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low CH (1851.25 MHz)											
3.703	-56.6	V	3.0	44.9	35.4	1.0	-46.1	-13.0	-33.1		
5.554	-65.6	V	3.0	49.2	34.7	1.0	-50.2	-13.0	-37.2		
7.405	-65.2	V	3.0	52.1	34.9	1.0	-46.9	-13.0	-33.9		
3.703	-61.2	H	3.0	44.7	35.4	1.0	-50.9	-13.0	-37.9		
5.554	-63.3	H	3.0	49.7	34.7	1.0	-47.3	-13.0	-34.3		
7.405	-68.6	H	3.0	53.1	34.9	1.0	-49.4	-13.0	-36.4		
Mid CH (1800.00 MHz)											
3.760	-37.3	V	3.0	45.1	35.3	1.0	-26.5	-13.0	-13.5		
5.640	-61.3	V	3.0	49.3	34.7	1.0	-45.7	-13.0	-32.7		
7.520	-65.4	V	3.0	52.3	34.9	1.0	-47.1	-13.0	-34.1		
3.760	-43.9	H	3.0	44.8	35.3	1.0	-33.4	-13.0	-20.4		
5.640	-54.1	H	3.0	49.9	34.7	1.0	-37.9	-13.0	-24.9		
7.520	-68.3	H	3.0	53.3	34.9	1.0	-49.0	-13.0	-36.0		
High CH (1908.75 MHz)											
3.818	-29.3	V	3.0	45.3	35.3	1.0	-18.3	-13.0	-5.3		
5.726	-62.3	V	3.0	49.5	34.7	1.0	-46.6	-13.0	-33.6		
7.635	-66.9	V	3.0	52.4	34.9	1.0	-48.4	-13.0	-35.4		
3.818	-36.1	H	3.0	45.0	35.3	1.0	-25.4	-13.0	-12.4		
5.726	-63.4	H	3.0	50.1	34.7	1.0	-47.1	-13.0	-34.1		
7.635	-68.3	H	3.0	53.4	34.9	1.0	-48.8	-13.0	-35.8		
No other emissions were found within 20dB from the limit of the system noise up to 10th harmonic											
Rev. 03.03.09											

8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION



MOBILE POSITION BACK PHOTO



END OF REPORT