MOTOROLA

ACCREDITED
TESTING CERT # 2518.01

FCC ID: PHX-PCE25100
DECLARATION OF COMPLIANCE MPE ASSESSMENT

Government & Public Safety **EME Test Laboratory** **8000 West Sunrise Blvd** **Fort Lauderdale, FL. 33322**	**Date of Report:** 2/13/2008 **Report Revision:** O **Report ID:** PCEx25100_Rev O_080213 SR5738

Responsible Engineer: Stephen C. Whalen (EME Sr. Staff Eng.)
Date/s Tested: NA – MPE Numerical Assessment
Manufacturer/Location: Sanmina SCI, Penang, Malaysia
Sector/Group/Div.:   Connected Home
Date submitted for test: 1/4/2008
DUT Description: Laptop Express Card slot device. Utilizes Expedience protocol.
This device contains an internal fold down antenna and
an RF port for an optional accessory antenna.
Test TX mode(s):   NA – MPE Numerical Assessment
Max. Power output: Internal Antenna: 31.2 dBm (1.32 W); External Port: 32.2 dBm (1.67 W)
conducted, pulse average.
Nominal Power: Internal Antenna: 30.5 dBm (1.12 W); External Antenna: 31.5 dBm (1.41 W)
conducted, pulse average.
Tx Frequency Bands: 2496 - 2690 MHz
Signaling type: Motorola proprietary Expedience protocol (has been referred to in the media
as pre-WiMax). This signaling makes use of an OFDM signal structure that is
comprised of a TDMA frame made up of 1024 sub-carriers containing QPSK
information.
Model(s) Tested: NA – MPE Numerical Assessment
Model(s) Certified: PCEx25100
Serial Number(s):   NA
Classification: General Population/Uncontrolled
Rule Part(s):   27

Approved Accessories:
Antenna(s):
501-0512-0000 External Single Patch (2496 - 2690MHz 1/2 wave antenna, 7.0dBi)

Other(s):

DUT Photo
(Refer to Temporary
Confidentiality Exhibit)

Final RF Exposure Results:
Highest calculated power density = 0.45mW/cm²

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 4.0 of this report.
This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.
I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements.
This reporting format is consistent with the suggested guidelines of the TIA TSB-159 April 2006
The results and statements contained in this report pertain only to the device(s) evaluated herein.

Signature on file **Deanna Zakharia G&PS EME Lab Senior Resource Manager,** **Laboratory Director,** **Approval Date:** 2/13/08	**Certification Date: 2/13/08** **Certification No.: L108021P**

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REVISION HISTORY

Date	Revision	Comments
2/13/08	O	Original release

1.0   Product and System Description

FCC ID: PHX-PCE25100 is a Laptop Express Card slot device which utilizes Expedience protocol. The transmission is Orthogonal Frequency Division Multiplexing (OFDM) and Time Division Duplex TDD. For TDD this device supports a maximum transmitter duty cycle of 9.09% for a 6 MHz channel and 10.53% for a 5.5 MHz channel. The OFDM signal structure is comprised of a TDMA frame made up of 1024 sub-carriers containing QPSK information.

The PCE25100 is capable of operating in the 2496-2690MHz band. The rated conducted power at the external port is 1.41W. The maximum conducted output power at the external port is 1.67W (w/ 7.0dBi gain antenna)

2.0   Evaluation methods
MPE numerical assessment is used to evaluate the RF exposure of this 9000SMC is based on a maximum antenna gain of 7.0dBi for the 5 External antenna (501-0512-0000).

According to OET Bulletin 65 Edition 97-01 Section 2, calculations can be made to predict RF field strength and power density levels around typical RF sources. For example, in the case of a single radiating antenna, a prediction for power density in the far-field of the antenna can be made by use of the general Equations (1) or below. These equations are generally accurate in the far-field of an antenna but will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction.

$$S = P\,G\,/\,4\,\pi\,r^2 = EIRP\,/\,4\,\pi\,r^2 \quad (1)$$

Where: S = power density (mW/cm^2)
           P = Power input into antenna (mW)
           G = numeric gain of antenna (dBi).
           r = distance to centre of radiation (cm)
           EIRP = Effective (isotropic) radiated power

Or

$$S = \frac{P_t G_t}{4\pi d^2 L} F = \frac{c P_m G_t}{4\pi d^2 L} F$$

To include the maximum duty cycle of the signal, and the factor, F, to provide a worst-case prediction of power density according to the FCC.

Where: S = power density (mW/cm^2)
           P_t = Total output power (W) = maximum output power, P_m, scaled by the maximum duty cycle of the signal, c.
           G_t = power gain of the antenna in the direction of interest relative to an isotropic radiator (dBi).
           L = cable loss (dB)
           d = distance from the antenna (cm)
           F = 2.56

3.0   MPE Analysis

Tx Frequency (MHz)	Env./ User Category	MPE Spec Limit (mW/cm^2)		Duty cycle (%)	Max Power (W)	Antenna #	Ant Gain (dBi)	Cable loss, L (dB)	Dist. d (cm)	MPE Calc. (mW/cm^2)
		FCC	ICNIRP							
2496	Uncontrolled	1.00	1.00	10.53 %	1.67	501-0512-0000	7.0	0	20	0.45
2593	Uncontrolled	1.00	1.00	10.53 %	1.67	501-0512-0000	7.0	0	20	0.45
2690	Uncontrolled	1.00	1.00	10.53 %	1.67	501-0512-0000	7.0	0	20	0.45

Note: a conservative 0dB cable loss was used for the MPE compliance calculation.

4.0   Conclusion:

The MPE results per the assessment above are compliant to the FCC General population/Uncontrolled exposure limits of 1.00 mW/cm^2 for the frequency ranges of 2496-2690 MHz, per 47 CFR §1.1310 titled "Radio frequency radiation exposure limits".

The MPE results are also compliant to the ICNIRP General population/Uncontrolled exposure limits of 1.00 mW/cm^2 for the frequency range of 2496-2690 MHz, per ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300GHz).