



**FCC CFR47 PART 22H AND 24E  
CLASS II PERMISSIVE CHANGE  
CERTIFICATION TEST REPORT  
FOR**

**CDMA CELL-PCS MODULE**

**MODEL NUMBER: PA3490U-1EVD**

**FCC ID: CJ6UPA3490G3**

**REPORT NUMBER: 06U10102**

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## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>4</b>
<b>2. TEST METHODOLOGY .....</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION .....</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY.....</b>	<b>5</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	<i>5</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
<b>5. EQUIPMENT UNDER TEST.....</b>	<b>6</b>
5.1. <i>DESCRIPTION OF EUT .....</i>	<i>6</i>
5.2. <i>CLASS II PERMISSIVE CHANGE DESCRIPTION .....</i>	<i>6</i>
5.3. <i>MAXIMUM OUTPUT POWER .....</i>	<i>6</i>
5.4. <i>SOFTWARE AND FIRMWARE .....</i>	<i>7</i>
5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>7</i>
5.6. <i>DESCRIPTION OF TEST SETUP .....</i>	<i>7</i>
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>9</b>
<b>7. LIMITS AND RESULTS .....</b>	<b>10</b>
7.1. <i>RADIATED RF POWER OUTPUT.....</i>	<i>10</i>
7.2. <i>FIELD STRENGTH OF SPURIOUS EMISSION .....</i>	<i>13</i>
<b>8. SETUP PHOTOS .....</b>	<b>16</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** TOSHIBA CORPORATION  
DIGITAL MEDIA NETWORK COMPANY  
2-9 SUEHIRO-CHO, OME  
TOKYO, 198-8710, JAPAN

**EUT DESCRIPTION:** CDMA CELL-PCS Module

**MODEL:** PA3490U-1EVD

**SERIAL NUMBER:** PCN1803CC801

**DATE TESTED:** FEBRUARY 22-23, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
FCC PART 24 SUBPART E	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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:



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THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



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EMC ENGINEER  
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## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 22H and 24E.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a dual band 800 / 1900MHz Express Mini-PCI USB Wireless CDMA Modem Module, and manufactured by Sierra Wireless, Inc.

### 5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

The major changes filed under this application include:

Change #1: The EUT module is being used in a different host;  
Change #2: use of an alternative antenna;  
Change #3: Collocation with Bluetooth module;  
Change #4: Collocation with Wireless LAN module.

The maximum output power for RF antenna port is 24.5dBm based on the original grant.

### 5.3. MAXIMUM OUTPUT POWER

The transmitter has maximum ERP and EIRP output powers as follows:

#### Part 22 (824 - 849MHz) & Part 24 (1850 - 1910MHz) Authorized Band:

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
824.7 - 848.3	CDMA	27.20	524.81

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
1851.25 - 1908.75	CDMA	28.60	724.44

NOTE: RBW=VBW=3MHz

## 5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was NWtools.exe Rev. E, 12/19/2005.

## 5.5. WORST-CASE CONFIGURATION AND MODE

The Mobile position and portable X, Y and Z positions have been investigated, the portable X position for Cellular and the portable Z position for PCS were determined as the worst-case position. The highest measured output power was at 836.4 MHz and 1880.00 MHz.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	TOSHIBA	PA3283U-3ACA	G71C00043310	NA
Laptop	TOSHIBA	PORTEGE	PPM40U-AAAAA4	DoC

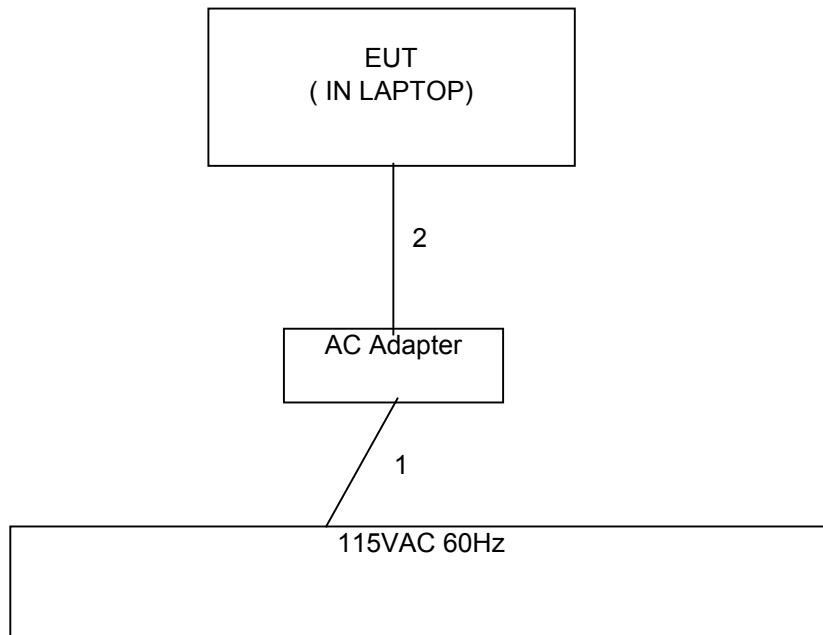
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	0.5m	NA

### TEST SETUP

The EUT is installed as a stand-alone device during the tests. The EUT is in Laptop.

**RADIATED TEST SETUP DIAGRAM**



## 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	Serial Number	Cal Due
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	3/3/06
Preamplifier, 1300 MHz	HP	8447D	1937A02062	1/7/07
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	7/26/06
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/06
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/06
Preamplifier, 1 ~ 26.5 GHz	HP	8449B	3008A00369	8/17/06
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	7/6/06
Dipole	EMCO	3121C-DB2	22435	3/25/06
Signal Generator, 1024 MHz	R & S	SMY01	DE 12311	04/11/06
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42510266	10/19/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	04/22/06

## 7. LIMITS AND RESULTS

Note: all the conducted tests were waived under this project because the EUT has been tested on the conducted testing items under previous certification process. Only radiated emission tests were performed.

### 7.1. RADIATED RF POWER OUTPUT

#### LIMIT

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

#### TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

The transmitter output is connected to the spectrum analyzer.

#### RESULTS

No non-compliance noted.

##### 800 MHz CELL CDMA Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.7	24.70	295.12
Middle	836.4	27.20	524.81
High	848.3	26.00	398.11

##### 1900 MHz PCS CDMA Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1851.25	28.40	691.83
Middle	1880.00	28.60	724.44
High	1908.75	27.10	512.86

NOTE: RBW=VBW=3MHz.

**CDMA Cellular Band Output Power (ERP)**

02/22/06      **High Frequency Substitution Measurement**  
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: William Zhuang  
Project #: 06U10102  
Company: TOSHIBA AMERICA INFORMATION SYSTEM, INC.  
EUT Descrip.: CDMA (800/1900) Cell-PCS Module  
EUT M/N: PA3490U-1EVD  
Test Target: FCC Part 22  
Mode Oper: Fundamental at worst X portable position

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)  
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.70	93.6	V	16.7	0.5	0.0	16.2	38.5	-22.3	
824.70	103.5	H	25.2	0.5	0.0	24.7	38.5	-13.8	
836.40	102.1	V	26.1	0.6	0.0	25.5	38.5	-12.9	
836.40	106.0	H	27.8	0.6	0.0	27.2	38.5	-11.2	
848.30	100.2	V	24.8	0.7	0.0	24.1	38.5	-14.3	
848.30	104.8	H	26.7	0.7	0.0	26.0	38.5	-12.4	

NOTE: RBW=VBW=3MHz

**PCS Output Power (EIRP)**

02/22/06 High Frequency Fundamental Measurement  
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: William Zhuang  
Project #: 06U10102  
Company: TOSHIBA AMERICA INFORMATION SYSTEM, INC.  
EUT Descrip.: CDMA (800/1900) Cell-PCS Module  
EUT M/N: PA3490U-1EVD  
Test Target: FCC Part 24  
Mode Oper: Fundamental at worst Z portable position

**Test Equipment:**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)  
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
1.851	93.8	H	16.5	0.9	8.3	23.9	33.0	-9.1	
1.851	98.4	V	21.0	0.9	8.3	28.4	33.0	-4.6	
1.880	93.1	H	16.2	0.9	8.3	23.7	33.0	-9.4	
1.880	98.8	V	21.1	0.9	8.3	28.6	33.0	-4.5	
1.909	89.4	H	12.9	0.9	8.4	20.4	33.0	-12.7	
1.909	96.7	V	19.7	0.9	8.4	27.1	33.0	-5.9	

NOTE: RBW=VBW=3MHz

## 7.2. FIELD STRENGTH OF SPURIOUS EMISSION

### LIMIT

§22.917 (e) and §24.238 (a) 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 603C Clause 2.2.12, FCC 22.917 (h), & FCC 24.238 (b)

### RESULTS

No non-compliance noted.

Note: No emissions were found within 30-1000MHz of 20dB below the system noise.

**800MHz Band CDMA Spurious & Harmonic (ERP)**

02/22/06 High Frequency Substitution Measurement  
 Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: William Zhuang  
 Project #: 06U10102  
 Company: TOSHIBA AMERICA INFORMATION SYSTEM, INC.  
 EUT Descrip.: CDMA (800/1900) Cell-PCS Module  
 EUT M/N:PA3490U-1EVD  
 Test Target: FCC Part 22  
 Mode Oper: Tx On at worst X portable position

**Test Equipment:**

EMCO Horn 1-18 GHz	Horn > 18GHz	Limit	<input checked="" type="checkbox"/> High Pass Filter							
T73; S/N: 6717 @3m		FCC 22								
Hi Frequency Cables										
<input checked="" type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gam (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Cellular CDMA Mode, Low Channel</b>										
1.649	69.2	V	-50.7	1.6	8.1	5.9	-46.3	-13.0	-33.3	
2.472	59.7	V	-58.3	1.9	9.6	7.4	-52.8	-13.0	-39.8	
3.295	51.2	V	-63.2	2.3	9.5	7.4	-58.1	-13.0	-45.1	
1.649	62.5	H	-56.6	1.6	8.1	5.9	-52.3	-13.0	-39.3	
2.472	60.3	H	-57.5	1.9	9.6	7.4	-52.0	-13.0	-39.0	
3.295	50.3	H	-64.0	2.3	9.5	7.4	-58.9	-13.0	-45.9	
<b>Cellular CDMA Mode, Mid Channel</b>										
1.672	67.1	V	-52.7	1.6	8.1	6.0	-48.4	-13.0	-35.4	
2.509	60.8	V	-57.0	1.9	9.6	7.4	-51.5	-13.0	-38.5	
3.346	52.1	V	-62.2	2.3	9.5	7.4	-57.1	-13.0	-44.1	
1.672	56.8	H	-62.3	1.6	8.1	6.0	-57.9	-13.0	-44.9	
2.509	56.8	H	-60.8	1.9	9.6	7.4	-55.3	-13.0	-42.3	
3.346	50.1	H	-64.1	2.3	9.5	7.4	-59.0	-13.0	-46.0	
<b>Cellular CDMA Mode, High Channel</b>										
1.697	66.2	V	-53.6	1.6	8.2	6.0	-49.2	-13.0	-36.2	
2.547	56.8	V	-60.8	2.0	9.6	7.4	-55.3	-13.0	-42.3	
3.396	50.0	V	-64.1	2.3	9.5	7.4	-59.1	-13.0	-46.1	
1.697	60.7	H	-58.4	1.6	8.2	6.0	-54.0	-13.0	-41.0	
2.547	57.0	H	-60.4	2.0	9.6	7.4	-55.0	-13.0	-42.0	
3.396	50.6	H	-63.4	2.3	9.5	7.4	-58.4	-13.0	-45.4	

PCS Spurious & Harmonic (EIRP):

02/22/06    High Frequency Substitution Measurement  
 Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: William Zhuang  
 Project # 06U10102  
 Company: TOSHIBA AMERICA INFORMATION SYSTEM, INC.  
 EUT Descrip.: CDMA (800/1900) Cell-PCS Module  
 EUT M/N:PA3490U-1EVD  
 Test Target: FCC Part 24  
 Mode Oper: Tx On at worst Z portable position

Test Equipment:



f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>PCS CDMA Mode, Low Channel</b>										
3.703	53.4	V	-60.0	2.5	9.5	7.3	-52.9	-13.0	-39.9	
5.554	52.6	V	-57.6	3.3	10.7	8.6	-50.2	-13.0	-37.2	
3.703	54.1	H	-59.1	2.5	9.5	7.3	-52.1	-13.0	-39.1	
5.554	52.7	H	-56.5	3.3	10.7	8.6	-49.0	-13.0	-36.0	
<b>PCS CDMA Mode, Mid Channel</b>										
3.760	54.1	V	-59.0	2.5	9.5	7.3	-52.1	-13.0	-39.1	
5.640	52.6	V	-57.7	3.3	10.9	8.7	-50.2	-13.0	-37.2	
3.760	53.9	H	-59.1	2.5	9.5	7.3	-52.1	-13.0	-39.1	
5.640	52.8	H	-56.5	3.3	10.9	8.7	-48.9	-13.0	-35.9	
<b>PCS CDMA Mode, High Channel</b>										
3.818	56.4	V	-56.6	2.5	9.5	7.3	-49.7	-13.0	-36.7	
5.726	52.5	V	-57.9	3.4	11.1	8.9	-50.2	-13.0	-37.2	
3.818	57.9	H	-55.0	2.5	9.5	7.3	-48.1	-13.0	-35.1	
5.726	52.3	H	-57.1	3.4	11.1	8.9	-49.4	-13.0	-36.4	