



**FCC CFR47 PART 22 SUBPART H  
AND PART 24 SUBPART E  
CERTIFICATION TEST REPORT**

**FOR**

**CDMA CELL-PCS MODULE**

**MODEL NUMBER: PA3547E-1HSD**

**FCC ID: CJ6UPA3547G3**

**REPORT NUMBER: 07U11140-1, REVISION B1**

**ISSUE DATE: JULY 13, 2007**

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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
---	07/03/07	Initial Issue	T. Chan
B	07/11/07	Corrected Applicant Address	T. Hong
B1	07/13/07	Corrected typos	T. Hong

## 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. MEASURING INSTRUMENT CALIBRATION.....	5
4.2. MEASUREMENT UNCERTAINTY.....	5
<b>5. EQUIPMENT UNDER TEST.....</b>	<b>6</b>
5.1. DESCRIPTION OF EUT .....	6
5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE.....	6
5.3. MAXIMUM OUTPUT POWER .....	6
5.4. DESCRIPTION OF AVAILABLE ANTENNAS.....	6
5.5. SOFTWARE AND FIRMWARE .....	7
5.6. WORST-CASE CONFIGURATION AND MODE.....	9
5.7. DESCRIPTION OF TEST SETUP .....	10
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>12</b>
<b>7. LIMITS AND RESULTS .....</b>	<b>13</b>
7.1. RF POWER OUTPUT.....	13
7.2. MAXIMUM PERMISSIBLE EXPOSURE .....	24
7.3. FIELD STRENGTH OF SPURIOUS RADIATION.....	27
<b>8. SETUP PHOTOS .....</b>	<b>36</b>

## 1. ATTESTATION OF TEST RESULTS

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

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

**MODEL:** PA3547E-1HSD

**SERIAL NUMBER:** 47012791J

**DATE TESTED:** JUNE 19-20 2007

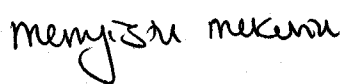
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
FCC PART 24 SUBPART E	NO NON-COMPLIANCE NOTED

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:

Tested By:



THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

MENGISTU MEKURIA  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 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 22H and 24E.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, 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
Radiated Emission, Above 2000 MHz	+/- 4.3 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 CDMA Cell-PCS Module installed in Toshiba Portege R500 Laptop

The module supports GSM, GPRS, EGPRS, WCDMA, and WCDMA+HSPDA. Device capabilities are documented in the theory of operation.

The radio module is manufactured by Toshiba Corporation.

### 5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change under this application is: added new higher antenna gain-TMZ007.

### 5.3. MAXIMUM OUTPUT POWER

The transmitter has a 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)
824.2 - 848.8	GPRS	30.60	1148.15
824.2 - 848.8	EGPRS	28.90	776.25
826.4 - 846.6	WCDMA+HSPDA	26.40	436.52

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
1850.2 - 1909.8	GPRS	29.40	870.96
1850.2 - 1909.8	EGPRS	27.30	537.03
1852.4 - 1907.6	WCDMA+HSPDA	26.20	416.87

### 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes 2xDipole antennas, with a maximum gain of 1.40dBi.for Cell band and 0.47dBi for PCS band.

## 5.5. SOFTWARE AND FIRMWARE

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

### GPRS Mode

- Call Setup > Shift & Preset
- Active Cell > Active Cell (GPRS)
- Connection Type > ETSI Type A
- BCH Parameters > Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Traffic Band > PCS or GSM850 (US band)
  - > MS TX Level > 3 (33dBm for Cell band); 3 (30dBm for PCS band)
- PDTCH > Multislot Config > 1 Down, 4 Up
  - > MS TX Level > 3 (33dBm Cell band); 3 (30dBm PCS band)
  - > Coding Scheme > CS-4
- Press "Start Data Connection"

### EGPRS Mode

- Call Setup > Shift & Preset
- Active Cell > Active Cell (EGPRS)
- Connection Type > ETSI Type A
- BCH Parameters > Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Traffic Band > PCS or GSM850 (US band)
  - > MS TX Level > 6 (27dBm Cell band); 5 (26dBm PCS band)
- PDTCH > Multislot Config > 1 Down, 4 Up
  - > MS TX Level > 6 (27dBm Cell band); 5 (26dBm PCS band)
  - > Modulation Coding Scheme > Downlink > As Uplink
    - > Uplink > MSC-5 (8PSK)
- Press "Start Data Connection" and you will see "Transferring"

### UMTS

- Call Setup > Shift & Preset
- Cell Parameters: PS Domain Information > Present
  - ATT (IMSI Attach) Flag State > Set
- Security Parameter - System Operations > None
- Channel Type:
  - RMC: 12.2k, 64k, 144k, or 384k
  - AMC: 12.2 UL / 64/ DL AM RMC, 12.2 UL / 144/ DL AM RMC, or 12.2 UL / 384/ DL AM RMC,
- Paging Service: RB Test Mode
- Channel (UARFCN) Parms:

	<u>PCS band</u>	<u>Cell band</u>
▪ DL Channel:	9662 / 9800 / 9938	4357 / 4407 / 4458
▪ UL Channel:	9262 / 9400 / 9538	4132 / 4182 / 4233
- DL DTCH Data: All Ones
- RLC Reestablish: Off
- Call Limit State: Off
- Call Drop Timer: Off
- SRB Config.: 13.6k DCCH
- UE Target Power: 25 dBm
- UL CL Power Ctrl Parameters
  - UL CL Power Ctrl Mode: All Up Bits

### HSPDA

- Uplink Parameter:
  - UPLINK DPCH Bc / Bd Control: Manual
  - Manual Uplink DPCH Bc: 9
  - Manual Uplink DPCH Bd: 15
- Channel Type: 12.2k+HSPDA
- HSPDA Parameters:
  - HSPDA RB Test Mode Setup
    - HS-DSCH Configuration Type: FRC
    - FRC Type: **H-Set 3**
    - CN Domain: CS Domain
    - Uplink 64k DTCH for HSPDA Loopback State: On
    - HS-DSCH Data Pattern: All Ones
    - RLC Header on HS-DSCH: Present
  - HSPDA Uplink Parameters
    - DeltaACK: 5
    - DeltaNACK: 5
    - DeltaCQI: 2



## **5.6. WORST-CASE CONFIGURATION AND MODE**

Based on the above results from the different modulations, GSM850, GPRS, WCDMA, and WCDMA+HSPDA modulations are to be the worst-case scenario for all measurements.

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at high channel for GSM cell band and Low channel for GSM1900 band. For WCDMA+HSPDA modulation, the highest power was at high channel for Cellular band and low channel for PCS band.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Toshiba	PPR50E-AAA15	47012791J	DoC
AC Adapter	Toshiba	PA32P2U-2ACA	G71CU02SC10	DoC
Wireless Communications Test Set	Agilent	E5515C	US41070176	DoC

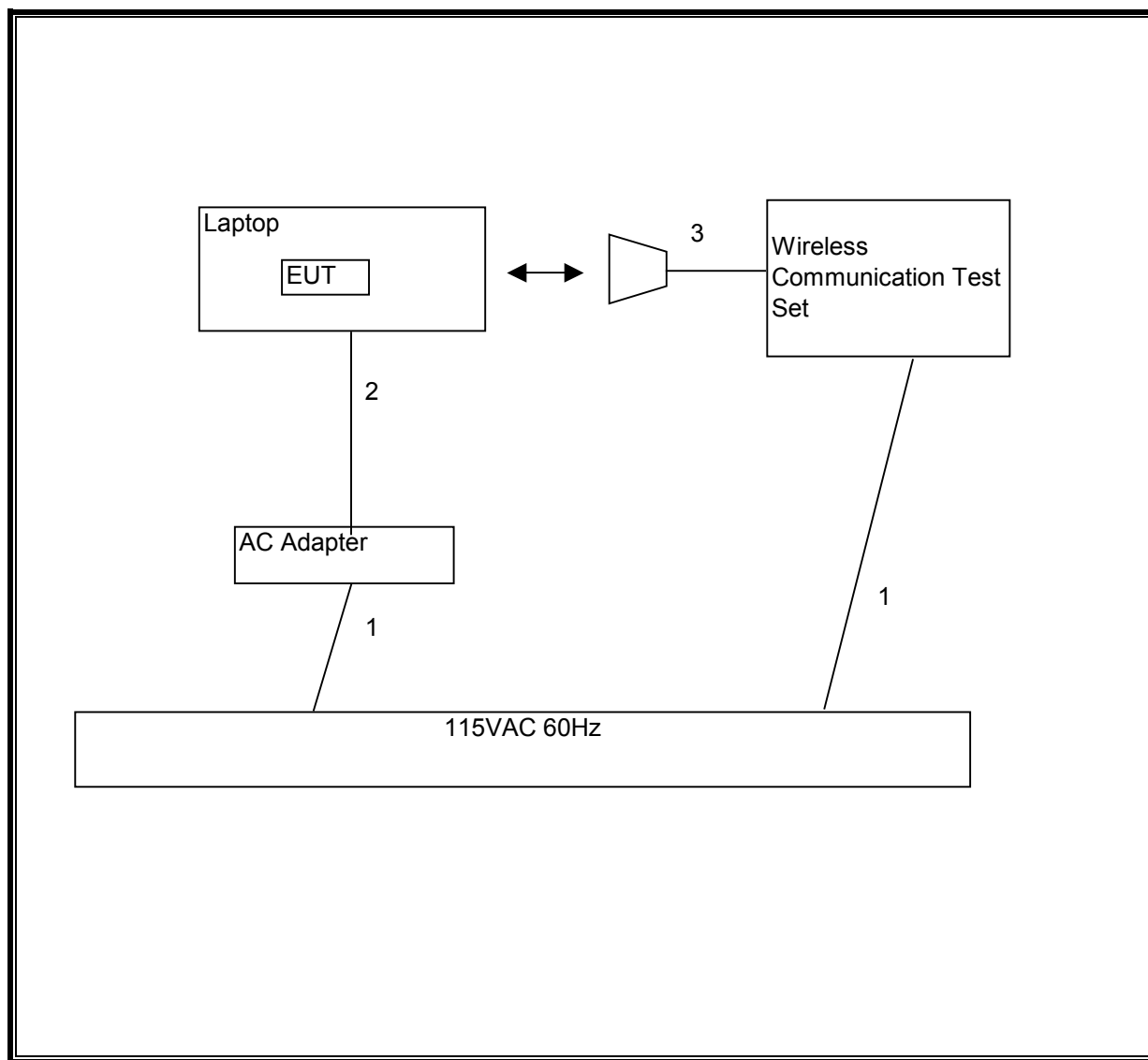
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US 115V	Un-shielded	2m	NA
2	DC	1	D C	Un-shielded	2m	NA
3	RF In/Out	1	N-Type	Un-shielded	2m	To link EUT

### TEST SETUP

The EUT is installed in Toshiba Tablet laptop during the tests. The Wireless Communication test set exercised the EUT.

**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	Serial Number	Cal Due
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY45300064	03/18/08
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/15/08
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00931	08/01/07
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A0022704	08/13/07
Communications Test Set	Agilent	E5515C	US41070176	10/19/07
2.7GHz HPF	MicroTronic	HPM13194	2	CNR
1.5GHz HPF	MicroTronic	HPM13195	1	CNR
Signal Generator 2 -40 GHz	R & S	SMP04	DE 34210	06/02/08
Signal Generator 1024 MHz	R & S	SMY01	DE 12311	05/10/08
Dipole	EMCO	3121C-DB2	22435	03/20/08

## 7. LIMITS AND RESULTS

### 7.1. 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 603 Clause 2.2.17

#### RESULTS

No non-compliance noted.

#### GSM850 CELL GPRS Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	29.70	933.25
Middle	837.0	30.00	1000.00
High	848.8	30.60	1148.15

#### GSM850 CELL EGPRS Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	27.90	616.60
Middle	837.0	28.30	676.08
High	848.8	28.90	776.25

1900MHz GPRS PCS Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.20	29.40	870.96
Middle	1880.00	28.40	691.83
High	1909.80	28.90	776.25

1900MHz EGPRS PCS Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.20	27.30	537.03
Middle	1880.00	26.40	436.52
High	1909.80	27.20	524.81

WCDMA CELL CDMA Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	826.4	25.20	331.13
Middle	836.4	25.00	316.23
High	848.6	25.30	338.84

WCDMA PCS CDMA Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1852.40	26.10	407.38
Middle	1880.00	25.60	363.08
High	1907.60	25.20	331.13

WCDMA+HSPDA CELL CDMA Modulation

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>ERP Peak Power (dBm)</b>	<b>ERP Peak Power (mW)</b>
Low	826.4	25.90	389.05
Middle	836.4	25.80	380.19
High	848.6	26.40	436.52

WCDMA+HSPDA PCS CDMA Modulation

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>EIRP Peak Power (dBm)</b>	<b>EIRP Peak Power (mW)</b>
Low	1852.40	26.20	416.87
Middle	1880.00	25.70	371.54
High	1907.60	26.00	398.11

**GSM850 GPRS Output Power (ERP)**

<b>High Frequency Substitution Measurement</b> <b>Compliance Certification Services, Fremont 5m Chamber Site</b>									
Company: TOSHIBA									
Project #: 07U11140									
Date: 6/19/2007									
Test Engineer: MENGISTU MEKURIA									
Configuration: EUT inside the Laptop									
Mode: TX 850MHz, GPRS MODE									
<b>Test Equipment:</b>									
Receiving: Smol 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
824.20	103.8	V	30.2	0.5	0.0	29.7	38.5	-8.7	
824.20	103.1	H	27.8	0.5	0.0	27.3	38.5	-11.2	
837.00	103.6	V	30.6	0.6	0.0	30.0	38.5	-8.5	
837.00	104.8	H	29.7	0.6	0.0	29.1	38.5	-9.4	
848.80	104.5	V	31.3	0.7	0.0	30.6	38.5	-7.8	
848.80	104.2	H	28.7	0.7	0.0	28.0	38.5	-10.4	
Rev. 1.24.7									





**Cell Band WCDMA Output Power (ERP)**

<p align="center"><b>High Frequency Substitution Measurement</b>  <b>Compliance Certification Services, Fremont 5m Chamber Site</b></p> <p>Company: TOSHIBA  Project #: 07U11140  Date: 6/19/2007  Test Engineer: MENGISTU MEKURIA  Configuration: EUT Inside the Laptop  Mode: TX 850MHz, WCDMA MODE</p> <p><u>Test Equipment:</u>  Receiving: Smol 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</p>									
f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	99.3	V	25.7	0.5	0.0	25.2	38.5	-13.2	
826.40	97.6	H	22.3	0.5	0.0	21.8	38.5	-16.6	
837.00	98.6	V	25.6	0.6	0.0	25.0	38.5	-13.4	
837.00	96.7	H	21.6	0.6	0.0	21.0	38.5	-17.4	
846.60	99.2	V	26.0	0.7	0.0	25.3	38.5	-13.1	
846.60	97.7	H	22.2	0.7	0.0	21.5	38.5	-16.9	
Rev. 1.24.7									

**Cell Band WCDMA+HSPDA Output Power (ERP)**

High Frequency Substitution Measurement									
Compliance Certification Services, Fremont 5m Chamber Site									
Company:	TOSHIBA								
Project #:	07U11140								
Date:	6/19/2007								
Test Engineer:	MENGISTU MEKURIA								
Configuration:	EUT Inside the Laptop								
Mode:	TX 850MHz, HSDPA MODE								
<b>Test Equipment:</b>									
Receiving: Smaol 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
826.40	100.0	V	26.4	0.5	0.0	25.9	38.5	-12.5	
826.40	98.3	H	23.0	0.5	0.0	22.5	38.5	-15.9	
837.00	99.4	V	26.4	0.6	0.0	25.8	38.5	-12.6	
837.00	97.8	H	22.7	0.6	0.0	22.1	38.5	-16.3	
846.60	100.3	V	27.1	0.7	0.0	26.4	38.5	-12.0	
846.60	98.6	H	23.1	0.7	0.0	22.4	38.5	-16.0	
Rev. 1.24.7									

**GSM1900 Band GPRS Output Power (EIRP)**

**High Frequency Fundamental Measurement**  
**Compliance Certification Services, Fremont 5m Chamber Site**

Company: TOSHIBA  
Project #: 07U11140  
Date: 6/19/2007  
Test Engineer: MENGISTU MEKURIA  
Configuration: EUT Inside the Laptop  
Mode: TX 1900MHz, GPRS MODE

**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
1.850	95.4	V	22.0	0.9	8.3	29.4	33.0	-3.6	
1.850	91.0	H	17.1	0.9	8.3	24.5	33.0	-8.5	
1.880	95.3	V	21.0	0.9	8.3	28.4	33.0	-4.6	
1.880	90.3	H	15.5	0.9	8.3	22.9	33.0	-10.1	
1.910	94.7	V	21.4	0.9	8.4	28.9	33.0	-4.1	
1.910	89.6	H	16.8	0.9	8.4	24.3	33.0	-8.8	

Rev. 1.24.7

**GSM1900 Band EGPRS Output Power (EIRP)**

**High Frequency Fundamental Measurement**  
**Compliance Certification Services, Fremont 5m Chamber Site**

Company: TOSHIBA  
Project #: 07U11140  
Date: 6/19/2007  
Test Engineer: MENGISTU MEKURIA  
Configuration: EUT inside the Laptop  
Mode: TX 1900MHz, EGPRS MODE

**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
1.850	93.3	V	19.9	0.9	8.3	27.3	33.0	-5.7	
1.850	88.8	H	14.9	0.9	8.3	22.3	33.0	-10.7	
1.880	93.3	V	19.0	0.9	8.3	26.4	33.0	-6.6	
1.880	88.4	H	13.6	0.9	8.3	21.0	33.0	-12.0	
1.910	93.0	V	19.7	0.9	8.4	27.2	33.0	-5.8	
1.910	87.7	H	14.9	0.9	8.4	22.4	33.0	-10.7	

Rev. 1.24.7

**PCS Band WCDMA Output Power (EIRP)**

**High Frequency Fundamental Measurement**  
**Compliance Certification Services, Fremont 5m Chamber Site**

Company: TOSHIBA  
Project #: 07U11140  
Date: 6/19/2007  
Test Engineer: MENGISTU MEKURIA  
Configuration: EUT Inside the Laptop  
Mode: TX 1900MHz, WCDMA MODE

**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
1.852	92.1	V	18.7	0.9	8.3	26.1	33.0	-6.9	
1.852	87.7	H	13.8	0.9	8.3	21.2	33.0	-11.8	
1.880	92.5	V	18.2	0.9	8.3	25.6	33.0	-7.4	
1.880	87.1	H	12.3	0.9	8.3	19.7	33.0	-13.3	
1.908	91.0	V	17.7	0.9	8.4	25.2	33.0	-7.8	
1.908	85.9	H	13.1	0.9	8.4	20.6	33.0	-12.5	

Rev. 1.24.7

**PCS Band WCDMA + HSPDA Output Power (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services, Fremont 5m Chamber Site									
Company:		TOSHIBA							
Project #:		07U11140							
Date:		6/19/2007							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT Inside the Laptop							
Mode:		TX 1900MHz, HSDPA MODE							
<b>Test Equipment:</b>									
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
1.852	92.2	V	18.8	0.9	8.3	26.2	33.0	-6.8	
1.852	86.1	H	12.2	0.9	8.3	19.6	33.0	-13.4	
1.880	92.6	V	18.3	0.9	8.3	25.7	33.0	-7.3	
1.880	85.4	H	10.6	0.9	8.3	18.0	33.0	-15.0	
1.908	91.8	V	18.5	0.9	8.4	26.0	33.0	-7.0	
1.908	87.3	H	14.5	0.9	8.4	22.0	33.0	-11.1	
Rev. 1.24.7									

## 7.2. MAXIMUM PERMISSIBLE EXPOSURE

### LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.



## **CALCULATIONS**

Given

$$E = \sqrt{(30 * P * G) / d}$$

and

$$S = E^2 / 3770$$

where

E = Field Strength in Volts/meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$$d = \sqrt{((30 * P * G) / (3770 * S))}$$

Changing to units of Power to mW and Distance to cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

yields

$$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$$

$$d = 0.282 * \sqrt{(P * G / S)}$$

where

d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW/cm<sup>2</sup>

Substituting the logarithmic form of power and gain using:

$$P \text{ (mW)} = 10^{(P \text{ (dBm)} / 10)} \text{ and}$$

$$G \text{ (numeric)} = 10^{(G \text{ (dBi)} / 10)}$$

yields

$$d = 0.282 * 10^{((P + G) / 20)} / \sqrt{S} \quad \text{Equation (1)}$$

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm<sup>2</sup>

Equation (1) and the measured peak power is used to calculate the MPE distance.

## **LIMITS**

From §1.1310 Table 1 (B),  $S = 1.0 \text{ mW/cm}^2$

## **RESULTS**

No non-compliance noted: (MPE distance equals 20 cm)

<b>Mode</b>	<b>MPE Distance (cm)</b>	<b>Output Power (dBm)</b>	<b>Antenna Gain (dBi)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>
GSM850MHz Celllar	20.0	30.60	1.40	0.31
GSM1900 MHz PCS	20.0	29.40	0.47	0.19
WCDMA+HSPDA Celllar	20.0	26.40	1.40	0.12
WCDMA+HSPDA PCS	20.0	26.20	0.47	0.09

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

### **7.3. FIELD STRENGTH OF SPURIOUS RADIATION**

#### **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.

# **GSM850 GPRS Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGHSTU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 850MHz, GPRS MODE								
<b>Test Equipment:</b>										
EMCO Horn 1-18 GHz		Horn > 18GHz		Limit		<input checked="" type="checkbox"/> High Pass Filter				
T60; S/N: 2238 @3m				FCC 22						
Hi Frequency Cables										
<input type="checkbox"/> (2 ft)		<input type="checkbox"/> (2 ~ 3 ft)		<input type="checkbox"/> (4 ~ 6 ft)		<input checked="" type="checkbox"/> (12 ft)				
		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz						
		T145 Agilent 3008A								
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low CH</b>										
1.961	76.5	V	-26.9	4.2	8.2	6.0	-25.2	-13.0	-12.2	
2.451	58.3	V	-43.7	4.9	9.3	7.1	-41.4	-13.0	-28.4	
2.473	49.7	V	-52.2	4.9	9.3	7.1	-49.9	-13.0	-36.9	
3.297	48.0	V	-50.4	5.6	9.4	7.3	-48.7	-13.0	-35.7	
1.465	53.5	H	-50.4	3.6	6.4	4.3	-49.7	-13.0	-36.7	
1.961	80.9	H	-21.8	4.2	8.2	6.0	-20.0	-13.0	-7.0	
2.473	48.4	H	-53.3	4.9	9.3	7.1	-51.1	-13.0	-38.1	
3.297	45.1	H	-53.1	5.6	9.4	7.3	-51.4	-13.0	-38.4	
<b>Mid Ch</b>										
1.674	61.3	V	-42.8	3.9	7.2	5.0	-41.7	-13.0	-28.7	
1.961	77.0	V	-26.4	4.2	8.2	6.0	-24.7	-13.0	-11.7	
2.511	53.5	V	-48.2	4.9	9.3	7.1	-46.0	-13.0	-33.0	
3.348	47.6	V	-50.6	5.6	9.5	7.3	-48.9	-13.0	-35.9	
1.961	80.5	H	-22.2	4.2	8.2	6.0	-20.5	-13.0	-7.5	
2.511	52.6	H	-48.9	4.9	9.3	7.1	-46.7	-13.0	-33.7	
3.348	44.7	H	-53.4	5.6	9.5	7.3	-51.7	-13.0	-38.7	
		H						-13.0		
<b>High Ch</b>										
1.698	61.2	V	-42.8	3.9	7.2	5.1	-41.6	-13.0	-28.6	
1.961	76.8	V	-26.7	4.2	8.2	6.0	-24.9	-13.0	-11.9	
2.546	52.6	V	-49.0	4.9	9.3	7.1	-46.8	-13.0	-33.8	
3.395	45.4	V	-52.6	5.7	9.5	7.3	-50.9	-13.0	-37.9	
1.698	58.7	H	-44.6	3.9	7.2	5.1	-43.4	-13.0	-30.4	
1.961	81.0	H	-21.7	4.2	8.2	6.0	-19.9	-13.0	-6.9	
2.546	51.3	H	-50.0	4.9	9.3	7.1	-47.9	-13.0	-34.9	
3.395	46.0	H	-51.9	5.7	9.5	7.3	-50.2	-13.0	-37.2	
Rev. 412.7										
Note: No other emissions were detected above the system.										

# **GSM850 EGPRS Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGISU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 850MHz, EGPRS MODE								
<b>Test Equipment:</b>										
EMCO Horn 1-18 GHz		Horn > 18GHz			Limit		<input checked="" type="checkbox"/> High Pass Filter			
T60; S/N: 2238 @3m					FCC 22					
Hi Frequency Cables					Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz			
<input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)					T145 Agilent 3008A					
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low CH</b>										
1.648	49.1	V	-55.1	3.8	7.1	4.9	-54.0	-13.0	-41.0	
1.961	76.6	V	-26.8	4.2	8.2	6.0	-25.1	-13.0	-12.1	
2.473	45.3	V	-56.6	4.9	9.3	7.1	-54.4	-13.0	-41.4	
1.648	47.9	H	-55.6	3.8	7.1	4.9	-54.5	-13.0	-41.5	
1.961	81.7	H	-21.0	4.2	8.2	6.0	-19.3	-13.0	-6.3	
2.473	45.4	H	-56.3	4.9	9.3	7.1	-54.1	-13.0	-41.1	
<b>Mid Ch</b>										
1.674	54.4	V	-49.7	3.9	7.2	5.0	-48.6	-13.0	-35.6	
1.961	77.8	V	-25.6	4.2	8.2	6.0	-23.9	-13.0	-10.9	
2.511	47.5	V	-54.2	4.9	9.3	7.1	-52.0	-13.0	-39.0	
3.348	45.6	V	-52.6	5.6	9.5	7.3	-50.9	-13.0	-37.9	
1.961	80.9	H	-21.8	4.2	8.2	6.0	-20.0	-13.0	-7.0	
2.511	46.6	H	-54.9	4.9	9.3	7.1	-52.7	-13.0	-39.7	
3.348	45.4	H	-52.7	5.6	9.5	7.3	-51.0	-13.0	-38.0	
<b>High Ch</b>										
1.698	57.7	V	-46.4	3.9	7.2	5.1	-45.2	-13.0	-32.2	
1.961	78.3	V	-25.2	4.2	8.2	6.0	-23.4	-13.0	-10.4	
2.546	48.2	V	-53.4	4.9	9.3	7.1	-51.2	-13.0	-38.2	
3.395	45.2	V	-52.8	5.7	9.5	7.3	-51.1	-13.0	-38.1	
1.698	55.4	H	-48.0	3.9	7.2	5.1	-46.8	-13.0	-33.8	
1.961	81.2	H	-21.5	4.2	8.2	6.0	-19.7	-13.0	-6.7	
2.546	46.4	H	-55.0	4.9	9.3	7.1	-52.8	-13.0	-39.8	
3.395	44.3	H	-53.6	5.7	9.5	7.3	-52.0	-13.0	-39.0	
Rev. 412.7										
Note: No other emissions were detected above the system noise floor.										

**CELL Band WCDMA Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGHISTU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 850MHz, WCDMA MODE								
Test Equipment:										
EMCO Horn 1-18GHz		Horn > 18GHz			Limit		<input checked="" type="checkbox"/> High Pass Filter			
T60; S/N: 2238 @3m					FCC 22					
Hi Frequency Cables										
<input type="checkbox"/> (2 ft)		<input type="checkbox"/> (2 ~ 3 ft)		<input type="checkbox"/> (4 ~ 6 ft)		<input checked="" type="checkbox"/> (12 ft)				
Pre-amplifier 1-26GHz					Pre-amplifier 26-40GHz					
T145 Agilent 3008A										
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low CH</b>										
1.599	48.2	V	-56.1	3.8	6.9	4.7	-55.1	-13.0	-42.1	
1.653	47.5	V	-56.7	3.8	7.1	4.9	-55.6	-13.0	-42.6	
2.479	44.0	V	-57.8	4.9	9.3	7.1	-55.6	-13.0	-42.6	
1.599	47.9	H	-55.7	3.8	6.9	4.7	-54.7	-13.0	-41.7	
1.653	46.5	H	-56.9	3.8	7.1	4.9	-55.8	-13.0	-42.8	
2.479	44.1	H	-57.6	4.9	9.3	7.1	-55.4	-13.0	-42.4	
<b>Mid Ch</b>										
1.673	48.3	V	-55.8	3.9	7.2	5.0	-54.7	-13.0	-41.7	
2.509	45.9	V	-55.9	4.9	9.3	7.1	-53.6	-13.0	-40.6	
3.104	48.1	V	-51.0	5.4	9.3	7.2	-49.2	-13.0	-36.2	
1.673	46.8	H	-56.6	3.9	7.2	5.0	-55.5	-13.0	-42.5	
2.124	46.6	H	-56.1	4.5	8.6	6.4	-54.1	-13.0	-41.1	
2.509	44.7	H	-56.8	4.9	9.3	7.1	-54.6	-13.0	-41.6	
<b>High Ch</b>										
1.593	50.0	V	-54.3	3.8	6.9	4.7	-53.3	-13.0	-40.3	
1.693	47.8	V	-56.3	3.9	7.2	5.1	-55.1	-13.0	-42.1	
2.540	44.6	V	-56.9	4.9	9.3	7.1	-54.7	-13.0	-41.7	
1.593	49.0	H	-54.6	3.8	6.9	4.7	-53.7	-13.0	-40.7	
1.693	46.0	H	-57.3	3.9	7.2	5.1	-56.2	-13.0	-43.2	
2.540	43.9	H	-57.4	4.9	9.3	7.1	-55.2	-13.0	-42.2	
Rev. 412.7										
Note: No other emissions were detected above the system noise floor.										

**CELL Band WCDMA+HSPDA Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGI STU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 850MHz, HSDPA MODE								
Test Equipment:										
EMCO Horn 1-18GHz		Horn > 18GHz			Limit		High Pass Filter			
T60; S/N: 2238 @3m					FCC 22					
Hi Frequency Cables					Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz			
<input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)					T145 Agilent 3008A					
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low CH</b>										
1.653	46.3	V	-57.9	3.8	7.1	4.9	-56.8	-13.0	-43.8	
1.862	47.3	V	-56.4	4.1	7.8	5.7	-54.8	-13.0	-41.8	
1.593	46.5	H	-57.1	3.8	6.9	4.7	-56.2	-13.0	-43.2	
1.653	45.3	H	-58.2	3.8	7.1	4.9	-57.1	-13.0	-44.1	
1.862	45.0	H	-57.9	4.1	7.8	5.7	-56.4	-13.0	-43.4	
<b>Mid Ch</b>										
1.593	49.2	V	-55.1	3.8	6.9	4.7	-54.1	-13.0	-41.1	
1.673	47.6	V	-56.5	3.9	7.2	5.0	-55.3	-13.0	-42.3	
1.862	47.8	V	-55.8	4.1	7.8	5.7	-54.3	-13.0	-41.3	
2.509	45.5	V	-56.3	4.9	9.3	7.1	-54.1	-13.0	-41.1	
1.599	47.3	H	-56.3	3.8	6.9	4.7	-55.4	-13.0	-42.4	
1.673	46.2	H	-57.2	3.9	7.2	5.0	-56.0	-13.0	-43.0	
1.862	47.1	H	-55.9	4.1	7.8	5.7	-54.3	-13.0	-41.3	
2.509	43.1	H	-58.4	4.9	9.3	7.1	-56.2	-13.0	-43.2	
<b>High Ch</b>										
1.593	48.4	V	-55.9	3.8	6.9	4.7	-54.9	-13.0	-41.9	
1.693	48.6	V	-55.4	3.9	7.2	5.1	-54.3	-13.0	-41.3	
1.868	48.7	V	-54.9	4.1	7.8	5.7	-53.4	-13.0	-40.4	
1.593	46.2	H	-57.4	3.8	6.9	4.7	-56.5	-13.0	-43.5	
1.693	46.5	H	-56.8	3.9	7.2	5.1	-55.7	-13.0	-42.7	
2.124	46.9	H	-55.9	4.5	8.6	6.4	-53.9	-13.0	-40.9	
Rev. 412.7										
Note: No other emissions were detected above the system noise floor.										

High Frequency Substitution Measurement											
Compliance Certification Services, Fremont 5m B-Chamber											
<b>Company:</b>		TOSHIBA									
<b>Project #:</b>		07U11140									
<b>Date:</b>		6/20/2007									
<b>Test Engineer:</b>		MENGISTU MEKURIA									
<b>Configuration:</b>		EUT inside the Laptop									
<b>Mode:</b>		TX 1900MHz, GPRS MODE									
<b>Test Equipment:</b> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 20%;"> <p style="background-color: #e0f0ff; padding: 2px; text-align: center;">EMCO Horn 1-18 GHz</p> <p>T60; S/N: 2238 @3m ▾</p> </div> <div style="border: 1px solid black; padding: 5px; width: 20%;"> <p style="background-color: #e0f0ff; padding: 2px; text-align: center;">Horn &gt; 18GHz</p> <p>▾</p> </div> <div style="border: 1px solid black; padding: 5px; width: 20%;"> <p style="background-color: #e0f0ff; padding: 2px; text-align: center;">Limit</p> <p>FCC 24 ▾</p> </div> <div style="border: 1px solid black; padding: 5px; width: 20%;"> <p style="background-color: #e0f0ff; padding: 2px; text-align: center;">✓ High Pass Filter</p> </div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-right: 10px;">             HI Frequency Cables  <input type="checkbox"/> (2 ft)                <input type="checkbox"/> (2 ~ 3 ft)                <input type="checkbox"/> (4 ~ 6 ft)                <input checked="" type="checkbox"/> (12 ft)           </div> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-right: 10px;"> <p style="background-color: #e0f0ff; padding: 2px; text-align: center;">Pre-amplifier 1-26GHz</p> <p>T144 Miteq 3008A01 ▾</p> </div> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="background-color: #e0f0ff; padding: 2px; text-align: center;">Pre-amplifier 26-40GHz</p> <p>▾</p> </div> </div>											
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>Low CH</b>											
3.700	45.1	V	-53.8	5.9	9.7	7.5	-50.1	-13.0	-37.1		
5.551	42.8	V	-50.5	7.4	11.0	8.9	-46.9	-13.0	-33.9		
3.700	45.4	H	-53.4	5.9	9.7	7.5	-49.7	-13.0	-36.7		
5.551	43.6	H	-48.8	7.4	11.0	8.9	-45.2	-13.0	-32.2		
<b>Mid Ch</b>											
3.760	45.1	V	-53.5	6.0	9.7	7.5	-49.8	-13.0	-36.8		
5.640	42.9	V	-50.6	7.4	11.2	9.0	-46.9	-13.0	-33.9		
3.760	45.8	H	-52.7	6.0	9.7	7.5	-49.0	-13.0	-36.0		
5.640	42.7	H	-49.7	7.4	11.2	9.0	-46.0	-13.0	-33.0		
<b>High Ch</b>											
3.820	45.1	V	-53.3	6.0	9.7	7.6	-49.7	-13.0	-36.7		
5.729	42.8	V	-50.8	7.5	11.3	9.2	-46.9	-13.0	-33.9		
3.820	46.5	H	-51.9	6.0	9.7	7.6	-48.2	-13.0	-35.2		
5.729	43.0	H	-49.6	7.5	11.3	9.2	-45.8	-13.0	-32.8		

Rev. 412.7  
**Note: No other emissions were detected above the system noise floor.**



**GSM1900 Band EGPRS Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGHSTU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 1900MHz, EGPRS MODE								
Test Equipment:										
EMCO Horn 1-18GHz		Horn > 18GHz			Limit		<input checked="" type="checkbox"/> High Pass Filter			
T60; S/N: 2238 @3m					FCC 24					
<div style="display: flex; justify-content: space-between;"> <div>             Hi Frequency Cables  <input type="checkbox"/> (2 ft)                <input type="checkbox"/> (2 ~ 3 ft)                <input type="checkbox"/> (4 ~ 6 ft)                <input checked="" type="checkbox"/> (12 ft)           </div> <div>             Pre-amplifier 1-26GHz              T145 Agilent 3008A           </div> <div>             Pre-amplifier 26-40GHz              _____           </div> </div>										
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>Low CH</b>										
3.700	45.3	V	-51.6	5.9	9.7	7.5	-47.9	-13.0	-34.9	
5.551	42.8	V	-49.1	7.4	11.0	8.9	-45.5	-13.0	-32.5	
3.700	44.2	H	-52.7	5.9	9.7	7.5	-48.9	-13.0	-35.9	
5.551	42.8	H	-48.2	7.4	11.0	8.9	-44.6	-13.0	-31.6	
<b>Mid Ch</b>										
3.760	45.2	V	-51.5	6.0	9.7	7.5	-47.8	-13.0	-34.8	
5.640	42.7	V	-49.4	7.4	11.2	9.0	-45.7	-13.0	-32.7	
3.760	44.1	H	-52.5	6.0	9.7	7.5	-48.8	-13.0	-35.8	
5.640	42.7	H	-48.4	7.4	11.2	9.0	-44.6	-13.0	-31.6	
<b>High Ch</b>										
3.820	45.6	V	-50.9	6.0	9.7	7.6	-47.3	-13.0	-34.3	
5.729	42.0	V	-50.2	7.5	11.3	9.2	-46.4	-13.0	-33.4	
3.820	44.5	H	-51.9	6.0	9.7	7.6	-48.2	-13.0	-35.2	
5.729	42.5	H	-48.7	7.5	11.3	9.2	-44.9	-13.0	-31.9	
Rev. 412.7										
Note: No other emissions were detected above the system noise floor.										

**PCS Band WCDMA Spurious & Harmonic (EIRP)**

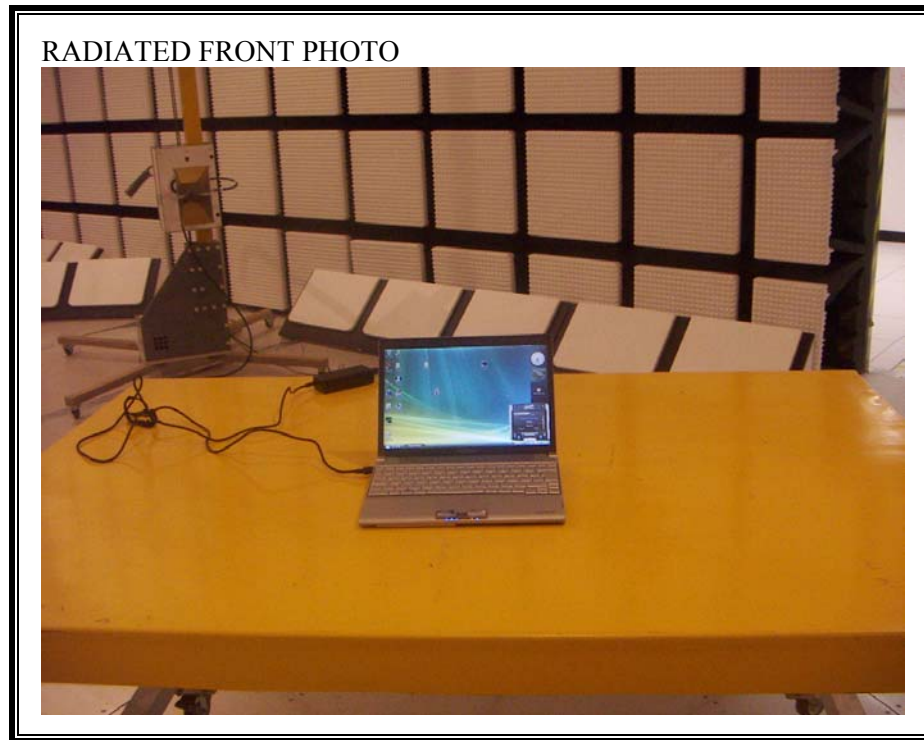
High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGI STU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 1900MHz WCDMA MODE								
<b>Test Equipment:</b>										
EMCO Horn 1-18 GHz		Horn > 18GHz			Limit		<input checked="" type="checkbox"/> High Pass Filter			
T60; S/N: 2238 @3m					FCC 24					
<b>Hi Frequency Cables</b>										
<input type="checkbox"/> (2 ft)		<input type="checkbox"/> (2 ~ 3 ft)		<input type="checkbox"/> (4 ~ 6 ft)		<input checked="" type="checkbox"/> (12 ft)				
Pre-amplifier 1-26GHz					Pre-amplifier 26-40GHz					
T145 Agilent 3008A										
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>Low CH</b>										
3.705	45.2	V	-51.7	5.9	9.7	7.5	-48.0	-13.0	-35.0	
3.705	45.3	H	-51.5	5.9	9.7	7.5	-47.8	-13.0	-34.8	
<b>Mid Ch</b>										
3.760	44.9	V	-51.8	6.0	9.7	7.5	-48.1	-13.0	-35.1	
3.760	45.1	H	-51.5	6.0	9.7	7.5	-47.8	-13.0	-34.8	
<b>High Ch</b>										
3.815	48.6	V	-48.0	6.0	9.7	7.6	-44.3	-13.0	-31.3	
3.815	48.6	H	-47.8	6.0	9.7	7.6	-44.2	-13.0	-31.2	
Rev. 412.7										
Note: No other emissions were detected above the system noise floor.										

**PCS Band WCDMA+HSPDA Spurious & Harmonic (EIRP)**

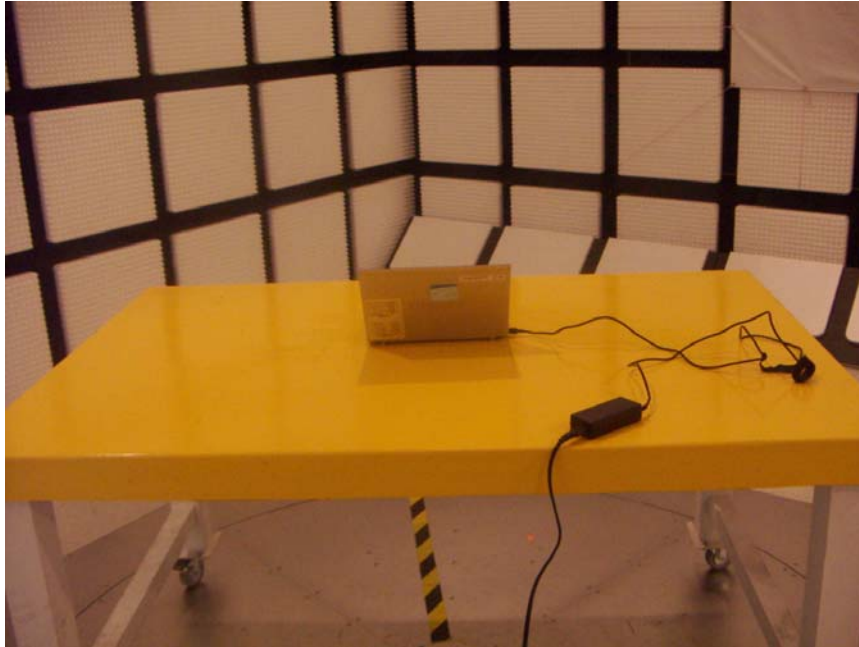
High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company:		TOSHIBA								
Project #:		07U11140								
Date:		6/20/2007								
Test Engineer:		MENGISTU MEKURIA								
Configuration:		EUT Inside the Laptop								
Mode:		TX 1900MHz HSDPA MODE								
<b>Test Equipment:</b>										
EMCO Horn 1-18 GHz		Horn > 18GHz			Limit		<input checked="" type="checkbox"/> High Pass Filter			
T60; S/N: 2238 @3m					FCC 24					
Hi Frequency Cables					Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz			
<input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)					T145 Agilent 3008A					
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>Low CH</b>										
3.705	44.8	V	-52.1	5.9	9.7	7.5	-48.4	-13.0	-35.4	
3.705	45.0	H	-51.8	5.9	9.7	7.5	-48.1	-13.0	-35.1	
<b>Mid Ch</b>										
3.760	44.9	V	-51.8	6.0	9.7	7.5	-48.1	-13.0	-35.1	
3.760	44.1	H	-52.5	6.0	9.7	7.5	-48.8	-13.0	-35.8	
<b>High Ch</b>										
3.815	45.0	V	-51.6	6.0	9.7	7.6	-47.9	-13.0	-34.9	
3.815	44.5	H	-51.9	6.0	9.7	7.6	-48.2	-13.0	-35.2	
Rev. 412.7										
Note: No other emissions were detected above the system noise floor.										

## 8. SETUP PHOTOS

### RADIATED RF MEASUREMENT SETUP FOR MOBILE CONFIGURATION



RADIATED BACK PHOTO



**END OF REPORT**