



**FCC PART 22H, 24E  
TEST AND MEASUREMENT REPORT**



For

**Motion Computing Incorporated**

8601 Ranch Road 2222, Building 2,

Austin, TX 78730, USA

**FCC ID: Q3QHSWG0BI2000**

<b>Report Type:</b> Class II Permissive Change	<b>Product Type:</b> Tablet PC with WWAN Module
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<b>Report Number:</b> R1003221-2224	
<b>Report Date:</b> 2010-5-27	
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\* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "\*" ...

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## 1 GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

The product, FCC ID: Q3QHSWG0BI2000 is WWAN module embedded to tablet PC (model J3400 (T008)), the module has features of CDMA2000/1xEVDO data at 850 MHz and 1900 MHz bands, WCDMA/HSDPA/HSUPA data at 800MHz, 850 MHz, 900 MHz, 1800MHz, and 2100 MHz bands, GSM/GPRS/EDGE data at 850 MHz, 900 MHz, 1800 MHz and 1900 MHz bands.

Technologies and bands Supported:

Operating Band	Transmit (TX) Frequency Range	Receive (RX) Frequency Range
<b>CDMA(1x/1xEVDO Rev 0, Rev A)</b> Cell (band class 0) – used in US/CA PCS (band class 1) – used in US/CA	824~849 MHz 1850~1910 MHz	869~894 MHz 1930~1990 MHz
<b>UMTS (WCDMA/HSDPA/HSUPA)</b> Cell (band V) – used in US/CA PCS (band II) – used in US/CA Japan 800 (band VI) – used in Japan GSM (band VIII) – used in EU IMT (band I) – used in EU	824~849 MHz 1850~1910 MHz 830~840 MHz 880~915 MHz 1920~1980 MHz	869~894 MHz 1930~1990 MHz 875~885 MHz 925~960 MHz 2110~2170 MHz
<b>GSM Band</b> GPRS/EDGE 850 – used in US/CA GPRS/EGPRS 900 – used in EU GPRS/EGPRS 1800 – used in EU GPRS/EDGE 1900 – used in US/CA	824~849 MHz 880~915 MHz 1710~1785 MHz 1850~1910 MHz	869~894 MHz 925~960 MHz 1805~1880 MHz 1930~1990 MHz

### 1.2 Mechanical Description

The WWAN Module measures approximately 5cm (L) × 3cm (W) × 0.5cm (H), weight 11.5g.

\* The test data gathered are from typical production sample, IMEI: 980030000193194 provided by manufacturer.

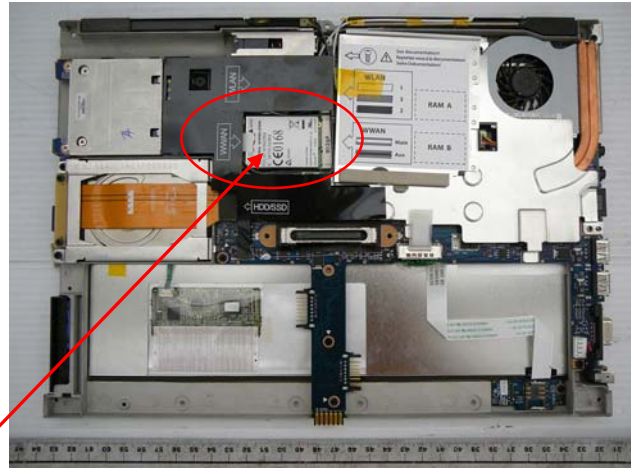
The tablet PC measures approximately 32.4cm (L) × 23.2cm (W) × 2.54cm (H), weight 1500g (without standard battery), 1723.65g (with one standard battery) and 1859.73g (with two standard batteries).

\* The test data gathered are from typical production sample, serial number: 2311219800005, sample id: DVT1005 both are provided by manufacturer.

### 1.3 EUT Photo



WWAN  
Module



WWAN Module  
built into tablet PC

*Additional Photos in Exhibit C*

### 1.4 Objective

This verification report is prepared on behalf of *Motion Computing Incorporated* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power (conducted and ERP, EIRP), field strength of spurious radiation.

This measurement and test report only pertains to the GSM/CDMA/WCDMA portion of the EUT with New chassis (T008) and antenna.

### 1.5 Related Submittal(s)/Grant(s)

BACL report, report number: R1001201-2224. FCC Identifier: Q3QHSWGOBI2000

### 1.6 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Cellular Radiotelephone Service  
Part 24 Subpart E – Broadband PCS

Applicable Standards: TIA/EIA603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## 1.7 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values ranging from  $\pm 2.0$  dB for Conducted Emissions tests and  $\pm 4.0$  dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

## 1.8 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

## 2 SYSTEM TEST CONFIGURATION

### 2.1 Justification

The EUT was configured for testing according to TIA/EIA 603-C.

The final qualification test was performed with the EUT operating at normal mode.

### 2.2 EUT Exercise Software

Agilent 8960 Wireless Communication test set was used to activate the EUT.

Modulation: GPRS – GMSK; EDGE – 8PSK  
CDMA 1X – BPSK; WCDMA Release 99 – BPSK

### 2.3 Special Accessories

N/A

### 2.4 Equipment Modifications

No modifications were made to the EUT

### 2.5 Remote Support Equipment

N/A

### 2.6 Local Support Equipment

Manufacturers	Descriptions	Models	Serial Numbers
Motion Computing Inc	Keyboard	MKB005	2135644300026
Dell	Monitor	E173Fpf	CN-0D5428-72872-56F-7TUS
Logitech	USB keyboard	-	-
Polk Audio	Speaker	-	-
COBY	Speaker	-	-
Dell	USB Mouse	-	-

**2.7 EUT Internal Configuration Details**

Manufacturers	Descriptions	Models	Serial Numbers
Motion Computing	Tablet PC	T008	2311219800005
Samaung RAM	2GB 2R*8 PC3-8500S	2G*2	-
Intel Core i7 CPU	U640Processor	1.2GHz	-
Toshiba	MK1633GSG HDD	160G	20IRW00UM
-	Bluetooth Module	-	-
Intel WiFi	WiFi Module	633ANHMW	MAC: 0024D7028EFC
Sierra Wireless	GSM/CDMA/WCDMA Module	GOBI2	IMEI: 980030000193194

**2.8 Power Supply and Line Filters**

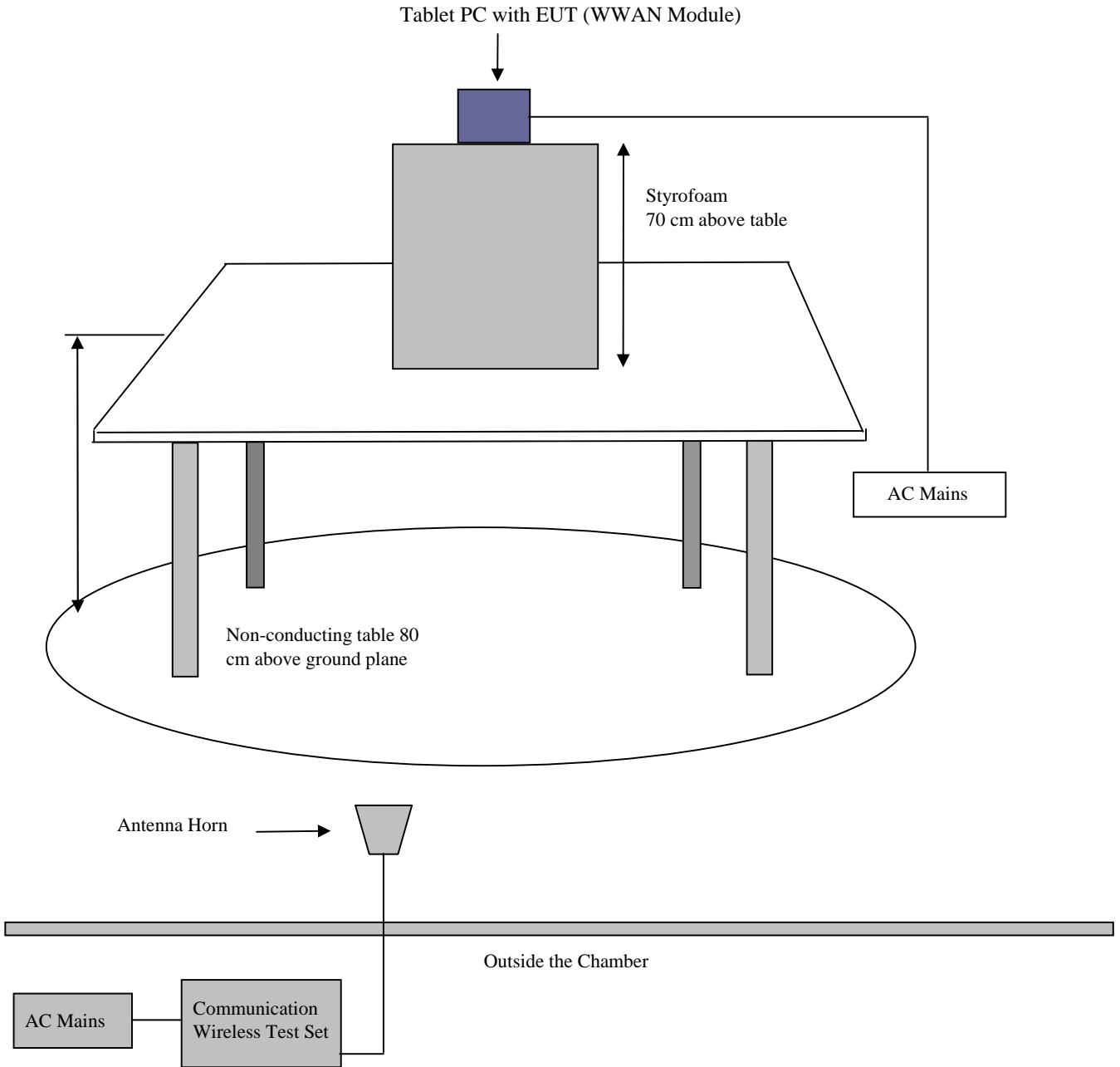
Manufacturer	Description	Model	Serial Number
Delta Electronics Inc	AC/DC Adapter	SADP-65NB	67LW038102X
Asia Power Device Inc	AC/DC Adapter	NB-65B19 RevX00	PK10000FK10-A01- 104S-00096

**2.9 External I/O Cabling List and Details**

Cable Descriptions	Length (m)	From	To
-	-	-	-



### 2.10 Test Setup Block Diagram for Radiated Emissions Tests



### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1046 §22.913; §24.232	RF Output Power	Compliant
§2.1047	Modulation Characteristics	N/A*
§2.1049 §22.917; §24.238	Out of Band Emissions, Occupied Bandwidth	N/A*
§2.1051, §22.917; §24.238 (a)	Spurious Emissions at Antenna Terminals	N/A*
§2.1053 §22.917(a); §24.238 (a)	Field Strength of Spurious Radiation	Compliant
§22.917; §24.238	Band Edge	N/A*
§ 2.1055 §22.355; §24.235	Frequency stability vs. temperature Frequency stability vs. voltage	N/A*
§2.1093	RF Exposure	Compliant **

Note: \*Please refer to the original FCC ID: Q3QHSWGObI2000, test report number: R1001201-2224.

\*\*Please See SAR report R1003221-SAR

## 4 FCC §2.1046, §22.913(a) & §24.232 – RF OUTPUT POWER

### 4.1 Applicable Standard

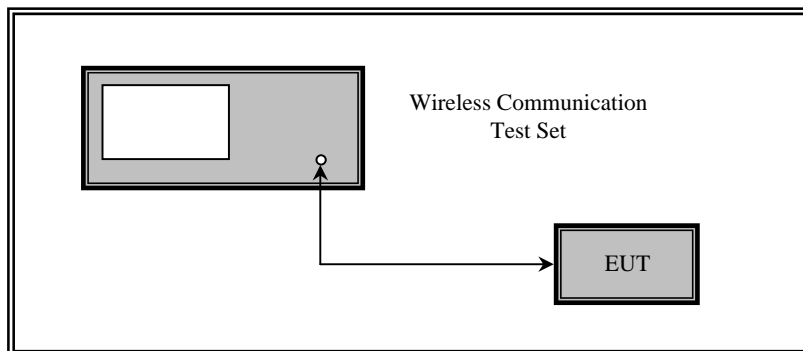
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (a), in no case may the peak output power of a base station transmitter exceed 2 watt.

### 4.2 Test Procedure

Conducted:

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.



Radiated (ERP and EIRP):

TIA-603-C §2.2.17

### 4.3 Base Station Simulator Settings

#### 1) FOR CDMA 2000 1xEV-DO

Measure the power at Channels 1013, 384 and 777 for US Cellular band; Channels 25, 600 and 1175 for US PCS band.

##### ***1xEV-DO***

Use CDMA2000 Rev 6 protocol in the Agilent 8960.

Method of measurement is according to TIA/EIA-98-F section 4.4.5.2

##### ***1xEV-DO***

- 1) Use 1xEV-DO Rel 0 Protocol in the Agilent 8960 with the following settings:
  - a. FTAP
    - FTAP Rate = 307.2 kbps (2 Slot, QPSK)
  - b. RTAP
    - RTAP Rate = 9.6 kbps, 19.2 kbps, 38.4 kbps, 76.8 kbps and 153.6 kbps
- 2) Use 1xEV-DO Rev A protocol in the Agilent 8960 with the following settings:
  - a. FETAP
    - FETAP Rate to 307.2 kbps (2 Slot, QPSK)
  - b. RETAP
    - RTAP Rate = 153.6 kbps (Subtype 0)  
= 409.6 kbps (Subtype 2)

#### 2) For WCDMA/HSDPA/HSUPA

Configure the Agilent 8960 to support all WCDMA tests with respect to the 3GPP TS 34.121. Measure the Maximum Output Power at Channels 4132, 4182 and 4233 for US cellular band; Channels 9262, 9400 and 9538 for US PCS band.

##### ***Release 99***

Method of measurements is according to 3GPP TS 34.121 sections 5.2.4

##### ***HSDPA Release 6***

Method of measurements is according to 3GPP TS 34.121 section 5.2AA.4

##### ***HSUPA Release 6***

Method of measurement is according to 3GPP TS 34.121 section 5.2B.4

#### 3) For GSM/GPRS/EDGE

Configure the Agilent 8960 to support GMSK and 8PSK call respectively, and set one timeslot transmission for GMSK GPRS and 8PSK EDGE. Measure and record power outputs for both modulations at Channels 128, 190 and 251 for GSM 850 band; Channels 512, 661 and 810 for US PCS 1900 band.

#### 4.4 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Number	Calibration Dates
Agilent	Analyzer, Communications Test Set	E5515C	GB44051221	2009-04-23
A.H Systems	Antenna, Horn	SAS-200/571	261	2009-09-23
Hewlett Packard	Pre amplifier	8447D	2944A06639	2009-06-05
Sunol Science Corp	Combination Antenna	JB3	A0020106-2	2009-08-20
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2010-03-24
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
Agilent	PSA Series Spectrum Analyzer	E4440A	US45303156	2009-07-23
HP	Pre Amplifier	8449B	3147A00400	2010-02-01

*Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.*

#### 4.5 Test Environmental Conditions

<b>Temperature:</b>	13~24° C
<b>Relative Humidity:</b>	35~63%
<b>ATM Pressure:</b>	100.2~103.3kPa

*Testing was performed by Jack Liu on 2010-04-20 ~ 2010-05-17 at RF site.*

## 4.6 Test Results

### 1) CDMA 1xRTT, 1xEV-DO Rev 0 and 1xEV-DO Rev A

Mode	Radio Configuration		Cellular Channels			PCS Channels		
			CH 1013 (dBm)	CH 384 (dBm)	CH 777 (dBm)	CH 25 (dBm)	CH 600 (dBm)	CH 1175 (dBm)
1xRTT	RC1	S02	24.42	24.45	24.43	24.47	24.49	24.33
	RC1	S055	24.53	24.43	24.45	24.43	24.48	24.35
	RC2	S09	24.52	24.47	24.50	24.45	24.43	24.34
	RC2	S055	24.55	24.49	24.49	24.40	24.47	24.32
	RC3	S02	24.54	24.49	24.48	24.37	24.52	24.37
	RC3	S055	<b>24.56</b>	<b>24.55</b>	<b>24.51</b>	<b>24.54</b>	<b>24.53</b>	<b>24.48</b>
	RC4	S02	24.54	24.46	24.49	24.38	24.50	24.41
	RC4	S055	24.52	24.48	24.50	24.40	24.52	24.30
	RC5	S09	24.48	24.47	24.40	24.41	24.51	24.33
	RC5	S055	24.50	24.45	24.50	24.43	24.52	24.44
1xEV-DO Rev 0	FTAP Rate = 307.2 kbps (2 slot QPSK)	RTAP Rate = 9.6 kbps	24.36	24.25	24.32	24.29	24.33	24.22
		RTAP Rate = 19.2 kbps	24.44	24.34	24.33	24.31	24.31	24.26
		RTAP Rate = 38.4 kbps	24.39	24.33	24.34	24.20	24.32	24.31
		RTAP Rate = 76.8 kbps	24.53	24.45	24.33	24.29	24.38	24.41
		RTAP Rate = 153.6 kbps	<b>24.55</b>	<b>24.46</b>	<b>24.36</b>	<b>24.33</b>	<b>24.39</b>	<b>24.42</b>
1xEV-DO Rev A	FETAP Rate = 307.2 kbps (2 slot, ACK Channel is Transmitted at all the slots)	Subtype 0: RETAP payload size=1536 bits	24.44	24.38	24.33	24.14	24.23	24.15
		Subtype 2: RETAP payload size=4096 bits	<b>24.49</b>	<b>24.47</b>	<b>24.36</b>	<b>24.19</b>	<b>24.26</b>	<b>24.23</b>

**Note:** SAR is not required for 1xRTT since the maximum average output power of each RF channel is less than ¼ dB higher than that measured in Subtype 0 Physical Layer configurations for Rev 0.

## 2) WCDMA/HSDPA/HSUPA

Mode	3GPP Sub test	Band V Channels			Band II Channels			MPR
		CH 4132 (dBm)	CH 4182 (dBm)	CH 4233 (dBm)	CH 9262 (dBm)	CH 9400 (dBm)	CH 9538 (dBm)	
Rel 99	1	24.13	24.09	24.14	24.13	24.14	24.08	
Rel 6 HSDPA	1	23.97	23.79	23.90	24.01	23.83	23.80	0
	2	23.49	23.42	23.46	23.45	23.24	23.31	0
	3	23.32	23.08	23.41	23.40	23.21	23.20	0.5
	4	23.06	22.77	22.99	23.11	23.00	23.11	0.5
Rel 6 HSUPA	1	23.55	23.50	23.40	23.54	23.39	23.53	0
	2	21.97	21.53	21.93	21.59	21.45	21.37	2
	3	22.34	22.38	22.30	22.30	22.53	22.81	1
	4	22.10	21.90	22.15	21.80	21.80	21.93	2
	5	23.55	23.20	23.30	23.70	23.65	23.60	0

**Note:** HSPA Body SAR is not required for this device since the maximum average output power of each RF channel with HSPA active is lower than that measured without HSPA (Release 99)+ ¼ dB

## 3) GPRS/EDGE

Mode	Modulation	Cellular Channels			PCS Channels		
		CH 128 (dBm)	CH 190 (dBm)	CH 251 (dBm)	CH 512 (dBm)	CH 661 (dBm)	CH 810 (dBm)
GPRS	GMSK	32.28	32.29	32.35	28.97	29.31	29.33
EDGE	8PSK	27.40	27.46	27.50	25.45	25.46	25.61

**Radiated Power (ERP or EIRP)**

GPRS (850 MHz Band) Part 22H:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)			
824.2	103.26	84	227	V	824.2	30.24	0	0.5	29.74	38.45	-8.71
824.2	104.94	141	124	H	824.2	30.06	0	0.5	29.56	38.45	-8.89
836.6	102.93	84	227	V	836.6	30.16	0	0.5	29.66	38.45	-8.79
836.6	104.97	141	124	H	836.6	29.27	0	0.5	28.77	38.45	-9.68
848.8	102.83	84	227	V	848.8	30.04	0	0.5	29.54	38.45	-8.91
848.8	105.55	141	124	H	848.8	29.22	0	0.5	28.72	38.45	-9.73

EDGE (850 MHz Band) Part 22H:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)			
824.2	99.02	84	227	V	824.2	26	0	0.5	25.5	38.45	-12.95
824.2	100.85	141	124	H	824.2	25.97	0	0.5	25.47	38.45	-12.98
836.6	98.27	84	227	V	836.6	25.5	0	0.5	25	38.45	-13.45
836.6	100.7	141	124	H	836.6	25	0	0.5	24.5	38.45	-13.95
848.8	97.81	84	227	V	848.8	25.02	0	0.5	24.52	38.45	-13.93
848.8	101.2	141	124	H	848.8	24.87	0	0.5	24.37	38.45	-14.08

CDMA 1X (850 MHz Band) Part 22H:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)			
824.7	95.37	247	138	V	824.7	22.35	0	0.5	21.85	38.45	-16.6
824.7	97.33	42	171	H	824.7	22.45	0	0.5	21.95	38.45	-16.5
836.52	93.71	247	138	V	836.52	20.94	0	0.5	20.44	38.45	-18.01
836.52	95.31	42	171	H	836.52	19.61	0	0.5	19.11	38.45	-19.34
848.31	92.21	247	138	V	848.31	19.42	0	0.5	18.92	38.45	-19.53
848.31	96.04	42	171	H	848.31	19.71	0	0.5	19.21	38.45	-19.24



## WCDMA Release 99 (850 MHz Band) Part 22H:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)			
826.4	92.55	90	218	V	826.4	19.53	0	0.5	19.03	38.45	-19.42
826.4	92.3	325	174	H	826.4	17.42	0	0.5	16.92	38.45	-21.53
836.4	92.9	90	218	V	836.4	20.13	0	0.5	19.63	38.45	-18.82
836.4	93.19	325	174	H	836.4	17.49	0	0.5	16.99	38.45	-21.46
846.6	93.02	90	218	V	846.6	20.23	0	0.5	19.73	38.45	-18.72
846.6	93.71	325	174	H	846.6	17.38	0	0.5	16.88	38.45	-21.57

## GPRS (1900 MHz Band) Part 24E:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dBi)	Cable Loss (dB)			
1850.2	94.08	73	200	V	1850.2	21.97	9.4	1.66	29.71	33	-3.29
1850.2	95.29	57	177	H	1850.2	23.18	9.4	1.66	30.92	33	-2.08
1880	91.48	73	200	V	1880	19.12	9.4	1.66	26.86	33	-6.14
1880	93.87	57	177	H	1880	21.51	9.4	1.66	29.25	33	-3.75
1909.8	90.27	73	200	V	1909.8	18.9	9.4	1.66	26.64	33	-6.36
1909.8	92.37	57	177	H	1909.8	21	9.4	1.66	28.74	33	-4.26

## EDGE (1900 MHz Band) Part 24E:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dBi)	Cable Loss (dB)			
1850.2	90.64	73	200	V	1850.2	18.53	9.4	1.66	26.27	33	-6.73
1850.2	91.93	57	177	H	1850.2	19.82	9.4	1.66	27.56	33	-5.44
1880	89.07	73	200	V	1880	16.71	9.4	1.66	24.45	33	-8.55
1880	90.66	57	177	H	1880	18.3	9.4	1.66	26.04	33	-6.96
1909.8	87.61	73	200	V	1909.8	16.24	9.4	1.66	23.98	33	-9.02
1909.8	89.35	57	177	H	1909.8	17.98	9.4	1.66	25.72	33	-7.28

## CDMA 1X (1900 MHz Band) Part 24E:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dBi)	Cable Loss (dB)			
1851.25	91.12	73	200	V	1851.25	19.01	9.4	1.66	26.75	33	-6.25
1851.25	91.72	56	181	H	1851.25	19.61	9.4	1.66	27.35	33	-5.65
1880	89.6	73	200	V	1880	17.24	9.4	1.66	24.98	33	-8.02
1880	91.64	56	181	H	1880	19.28	9.4	1.66	27.02	33	-5.98
1908.75	89.36	73	200	V	1908.75	17.99	9.4	1.66	25.73	33	-7.27
1908.75	91.03	56	181	H	1908.75	19.66	9.4	1.66	27.4	33	-5.6

## WCDMA Release 99 (1900 MHz Band) Part 24E:

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Cord. (dBi)	Cable Loss (dB)			
1852.4	90.38	77	200	V	1852.4	18.27	9.4	1.66	26.01	33	-6.99
1852.4	90.89	63	179	H	1852.4	18.78	9.4	1.66	26.52	33	-6.48
1880	89.35	77	200	V	1880	16.99	9.4	1.66	24.73	33	-8.27
1880	90.84	63	179	H	1880	18.48	9.4	1.66	26.22	33	-6.78
1907.5	88.65	77	200	V	1907.5	17.28	9.4	1.66	25.02	33	-7.98
1907.5	89.82	63	179	H	1907.5	18.45	9.4	1.66	26.19	33	-6.81

## 5 FCC §2.1053, §22.917 & §24.238 - RADIATED SPURIOUS EMISSIONS

### 5.1 Applicable Standard

Requirements: FCC §2.1053, §22.917, §24.238.

### 5.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 log (TX Power in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log<sub>10</sub> (power out in Watts)

### 5.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Number	Calibration Due Dates
Agilent	Analyzer, Communications Test Set	E5515C	GB44051221	2009-04-23
A.H Systems	Antenna, Horn	SAS-200/571	261	2009-09-23
Hewlett Packard	Pre amplifier	8447D	2944A06639	2009-06-05
Sunol Science Corp	Combination Antenna	JB3	A0020106-2	2009-08-20
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2010-03-24
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
Agilent	PSA Series Spectrum Analyzer	E4440A	US45303156	2009-07-23
HP	Pre Amplifier	8449B	3147A00400	2010-02-01

**Statement of Traceability:** *BACL Corp.* attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

## 5.4 Test Environmental Conditions

<b>Temperature:</b>	13~24° C
<b>Relative Humidity:</b>	35~63%
<b>ATM Pressure:</b>	100.2~103.3kPa

Testing was performed by Jack Liu on 2010-04-20 ~ 2010-05-17 in 5 meter chamber #3.

## 5.5 Test Results

Worst case reading as follows:

Mode: Transmitting		
Margin (dB)	Frequency (MHz)	Antenna Polarization (Horizontal/Vertical)
-18.36	1649.4	Horizontal

1) GPRS 850 MHz Band at High Channel (848.8 MHz)

30 MHz -10 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
1697.6	71.04	181	162	V	1697.6	-39.11	9.4	1.66	-31.37	-13	-18.37
1697.6	69.84	133	150	H	1697.6	-40.31	9.4	1.66	-32.57	-13	-19.57
3395.2	58.43	186	185	V	3395.2	-43.47	9.9	2	-35.57	-13	-22.57
2546.4	61.71	19	205	V	2546.4	-43.65	9.5	1.84	-35.99	-13	-22.99
3395.2	57.32	307	118	H	3395.2	-44.59	9.9	2	-36.69	-13	-23.69
2546.4	59.68	242	183	H	2546.4	-45.68	9.5	1.84	-38.02	-13	-25.02
2400	52.49	29	143	V	2400	-53.86	9.6	1.84	-46.1	-13	-33.1
2400	49.56	54	187	H	2400	-57.37	9.6	1.84	-49.61	-13	-36.61

## 2) EDGE 850 MHz Band at High Channel (848.8 MHz)

30 MHz -10 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
1697.6	68.41	180	160	V	1697.6	-41.74	9.4	1.66	-34	-13	-21
1697.6	67.16	133	158	H	1697.6	-42.99	9.4	1.66	-35.25	-13	-22.25
2546.4	60.48	308	166	H	2546.4	-44.88	9.5	1.84	-37.22	-13	-24.22
3395.2	56.3	186	185	V	3395.2	-45.6	9.9	2	-37.7	-13	-24.7
3395.2	54.65	305	118	H	3395.2	-47.26	9.9	2	-39.36	-13	-26.36
2546.4	56.04	165	114	V	2546.4	-49.32	9.5	1.84	-41.66	-13	-28.66
2400	52.48	29	143	V	2400	-53.87	9.6	1.84	-46.11	-13	-33.11
2400	49.55	54	187	H	2400	-57.38	9.6	1.84	-49.62	-13	-36.62

## 3) CDMA 1X 850 MHz Band at Low Channel (824.7 MHz)

30 MHz -10 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
1649.4	71.01	130	159	H	1649.4	-39.1	9.4	1.66	-31.36	-13	-18.36
1649.4	70.51	151	212	V	1649.4	-39.59	9.4	1.66	-31.85	-13	-18.85
2474.1	64.41	297	201	H	2474.1	-41.09	9.5	1.84	-33.43	-13	-20.43
2474.1	62.08	274	191	V	2474.1	-43.42	9.5	1.84	-35.76	-13	-22.76
3298.8	57.55	39	175	H	3298.8	-45.04	9.6	1.83	-37.27	-13	-24.27
3298.8	55.68	4	153	V	3298.8	-46.91	9.6	1.83	-39.14	-13	-26.14
2400	51.4	29	143	V	2400	-54.95	9.6	1.84	-47.19	-13	-34.19
2400	46.65	54	187	H	2400	-60.28	9.6	1.84	-52.52	-13	-39.52

## 4) WCDMA Release 99 850 MHz Band at High Channel (846.6 MHz)

30 MHz -10 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
1693.2	65.96	177	162	V	1693.2	-44.14	9.4	1.66	-36.4	-13	-23.4
1693.2	63.76	103	175	H	1693.2	-46.35	9.4	1.66	-38.61	-13	-25.61
2539.8	58.64	299	152	H	2539.8	-46.9	9.5	1.84	-39.24	-13	-26.24
2539.8	57.6	261	175	V	2539.8	-47.94	9.5	1.84	-40.28	-13	-27.28
3386.4	52.57	184	184	V	3386.4	-49.62	9.9	2.0	-41.72	-13	-28.72
3386.4	51.31	212	164	H	3386.4	-50.72	9.9	2.0	-42.82	-13	-29.82
2400	51.29	29	143	V	2400	-55.06	9.6	1.84	-47.3	-13	-34.3
2400	48.73	54	187	H	2400	-58.2	9.6	1.84	-50.44	-13	-37.44

## 5) GPRS 1900 MHz Band at High Channel (1909.8 MHz)

30 MHz -20 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
2400	52.58	29	143	V	2400	-53.77	9.6	1.84	-46.01	-13	-33.01
2400	49.66	54	187	H	2400	-57.27	9.6	1.84	-49.51	-13	-36.51

## 6) EDGE 1900 MHz Band at High Channel (1909.8 MHz)

30 MHz -20 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
2400	51.36	29	143	V	2400	-54.99	9.6	1.84	-47.23	-13	-34.23
2400	48.54	54	187	H	2400	-58.39	9.6	1.84	-50.63	-13	-37.63

## 7) CDMA 1X 1900 MHz Band at High Channel (1908.75 MHz)

30 MHz -20 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
3817.5	58.13	305	160	H	3817.5	-42.57	10.9	2.16	-33.83	-13	-20.83
3817.5	55	24	156	V	3817.5	-45.95	10.9	2.16	-37.21	-13	-24.21
2400	51.68	29	143	V	2400	-54.67	9.6	1.84	-46.91	-13	-33.91
2400	49.84	54	187	H	2400	-57.09	9.6	1.84	-49.33	-13	-36.33

## 8) WCDMA Release 99 1900 MHz Band Middle Channel (1880 MHz)

30 MHz -20 GHz Radiated Spurious Emission measured at 3-meter

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
3760	57.66	308	176	H	3760	-42.68	10.9	2.16	-33.94	-13	-20.94
3760	54.79	142	142	V	3760	-45.65	10.9	2.16	-36.91	-13	-23.91
2400	51.44	29	143	V	2400	-54.91	9.6	1.84	-47.15	-13	-34.15
2400	48.62	54	187	H	2400	-58.31	9.6	1.84	-50.55	-13	-37.55

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## **6 FCC §1.1307(b) & §2.1093 - RF EXPOSURE**

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### **6.1 Applicable Standard**

FCC §1.1307 (b) and §2.1093.

### **6.2 Test Result**

**Compliant:** The EUT is the portable device and thus requires SAR evaluation; please see BACL SAR Report R1003221-SAR for measurement and testing in details.