

# RF TEST REPORT

Test item : Handheld Terminal(Industrial PDA)  
Model No. : Smart-P300U, SM-P300U  
Order No. : DEMC1307-02124  
Date of receipt : 2013-07-09  
Test duration : 2013-08-01 ~ 2013-08-29  
Date of issue : 2013-09-24  
Use of report : FCC Original Grant

Applicant : Sammi Information Systems Co, Ltd  
11F Kolon Aston Bldg, 505-14, Gasan-dong, Guemcheon-Gu, Seoul, Korea

Test laboratory : Digital EMC Co., Ltd.  
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, 449-080, Korea

Test specification : §22(H), §24(E)  
Test environment : See appended test report  
Test result : ☒ Pass ☐ Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DIGITAL EMC CO., LTD.

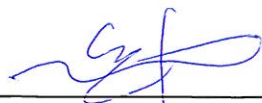
Tested by:

Witnessed by:

Reviewed by:

  
\_\_\_\_\_  
Engineer  
HyunSu Son

N/A

  
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Deputy General Manager  
HongHee Lee

## Test Report Version

Test Report No.	Date	Description
DRTFCC1309-0912	Sep. 24, 2013	Initial issue

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## 1. GENERAL INFORMATION

**Applicant Name:** Sammi Information Systems Co, Ltd

**Address:** 11F Kolon Aston Bldg, 505-14, Gasan-dong, Guemcheon-Gu, Seoul, Korea

**FCC ID** : RQK-SMART-P300U

**FCC Classification** : Licensed Portable Transmitter Held to Ear (PCE)

**EUT Type** : Handheld Terminal(Industrial PDA)

**Model Name** : Smart-P300U

**Add Model Name** : SM-P300U

**Supplying power** : Standard Battery  
- Type: Li-Polymey Battery  
- M/N: H300B-4000  
- Rating: DC 3.7V & 4000mAh

**Antenna Information** : Internal Antenna  
- Type: Built-In type

**Tx Frequency** : GSM850: 824.2 MHz ~ 848.8 MHz  
GSM1900: 1850.2 MHz ~ 1909.8 MHz  
EDGE850: 824.2 MHz ~ 848.8 MHz  
EDGE1900: 1850.2 MHz ~ 1909.8 MHz  
WCDMA850: 826.4 MHz ~ 846.6 MHz  
WCDMA1900: 1852.4 MHz ~ 1907.6 MHz  
HSUPA850: 826.4 MHz ~ 846.6 MHz  
HSUPA1900: 1852.4 MHz ~ 1907.6 MHz

**Rx Frequency** : GSM850: 869.2 MHz ~ 893.8 MHz  
GSM1900: 1930.2 MHz ~ 1989.8 MHz  
EDGE850: 869.2 MHz ~ 893.8 MHz  
EDGE1900: 1930.2 MHz ~ 1989.8 MHz  
WCDMA850: 871.4 MHz ~ 891.6 MHz  
WCDMA1900: 1932.4 MHz ~ 1987.6 MHz  
HSUPA850: 871.4 MHz ~ 891.6 MHz  
HSUPA1900: 1932.4 MHz ~ 1987.6 MHz

**Max. RF Output Power** : GSM850: 0.259 W ERP (24.13 dBm)  
GSM1900: 0.863 W EIRP (29.36 dBm)  
EDGE850: 0.086 W ERP (19.37 dBm)  
EDGE1900: 0.306 W ERP (24.86 dBm)  
WCDMA850: 0.042 W ERP (16.23 dBm)  
WCDMA1900: 0.243 W EIRP (23.85 dBm)  
HSUPA850: 0.037 W EIRP (15.71 dBm)  
HSUPA1900: 0.230 W EIRP (23.61 dBm)

**Emission Designator(s)** : GSM850: 247KGXW  
GSM1900: 245KGXW  
EDGE850: 247KG7W  
EDGE1900: 247KG7W  
WCDMA850: 4M15F9W  
WCDMA1900: 4M17F9W  
HSUPA850: 4M17F9W  
HSUPA1900: 4M17F9W

## 2. INTRODUCTION

### 2.1. EUT DESCRIPTION

The Equipment under Test(EUT) supports a GSM/GPRS/EDGE of dual band(Cellular/PCS) and a WCDMA/HSDPA/HSUPA of dual band(Cellular/PCS) with Bluetooth, WLAN and UHF.

### 2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 2.3. TEST FACILITY

The 3 & 10M test site and conducted measurement facility used to collect the radiated data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

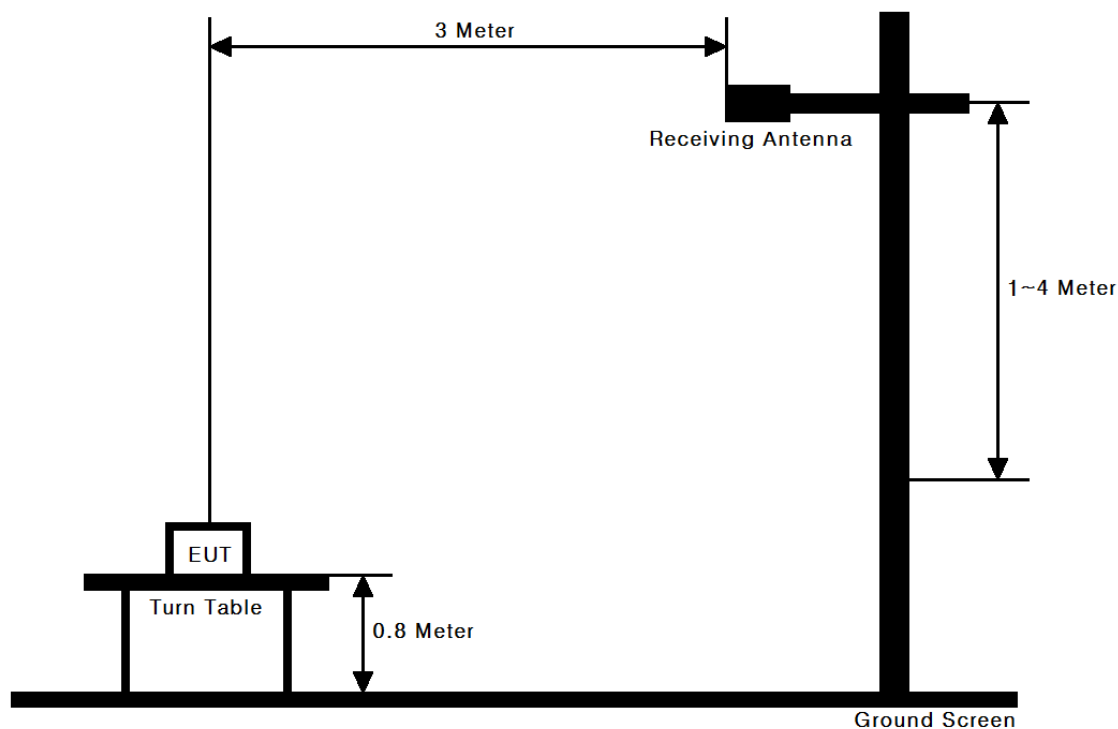
- 3&10M test site registration Number: 678747

### 3. DESCRIPTION OF TESTS

#### 3.1 ERP&EIRP

(Effective Radiated Power & Equivalent Isotropic Radiated Power)

##### *Test Set-up*



##### *Test Procedure*

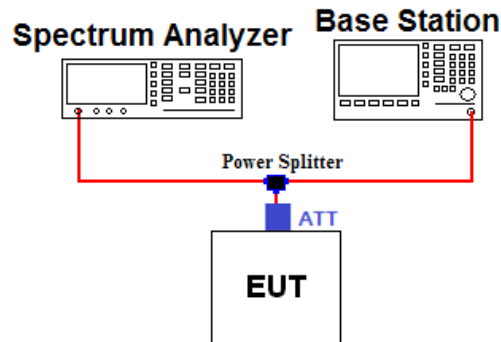
These measurements were performed at 3 & 10m test site. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading.

For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

## 3.2 PEAK TO AVERAGE RATIO

### Test set-up



### Test Procedure

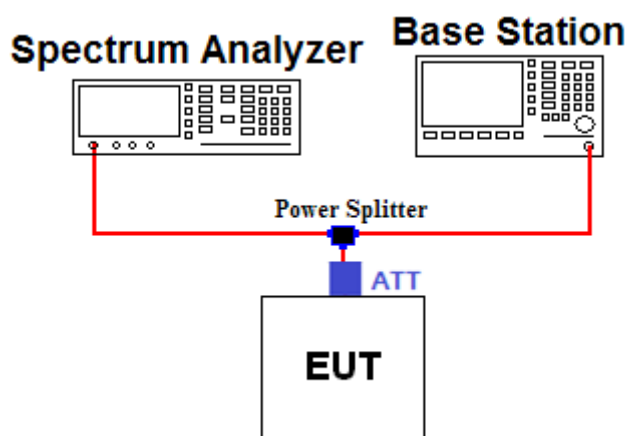
A peak to average ratio measurement is performed at the conducted port of the EUT.

The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The present of time the signal spends at or above the level defines the probability for that particular power level.

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth
2. Set the number of counts to a value that stabilizes the measured CCDF curve
3. Set the measurement interval as follows:
  - 1) For continuous transmissions, set to 1 ms
  - 2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1%

### 3.3 OCCUPIED BANDWIDTH.

#### Test set-up



#### Offset value information

Frequency (MHz)	Offset Value (dB)	Frequency (MHz)	Offset Value (dB)
-	-	-	-
-	-	-	-
-	-	-	-

Note. 1: The offset values from EUT to Spectrum analyzer were measured and used for test.

Offset value = Cable A + Splitter + ATT + Cable B

#### Test Procedure

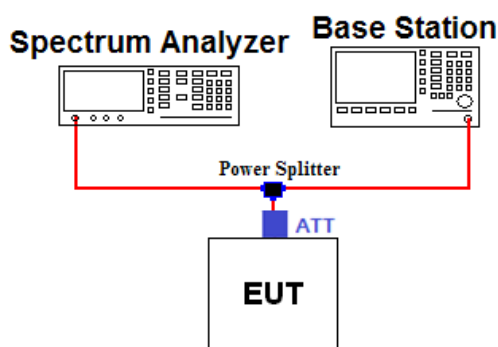
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2.  $RBW = 1 \sim 5\%$  of the expected OBW &  $VBW \geq 3 \times RBW$
3. Detector = Peak
4. Trance mode = Max hold
5. Sweep = Auto couple
6. The trace was allowed to stabilize
7. If necessary, step 2 ~ 7 were repeated after changing the RBW such that it would be within  $1 \sim 5\%$  of the 99% occupied bandwidth observed in step 7.



### 3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

#### Test set-up



#### Offset value information

Frequency (MHz)	Offset Value (dB)	Frequency (MHz)	Offset Value (dB)	Frequency (MHz)	Offset Value (dB)
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Note. 1: The offset value from EUT to Spectrum analyzer was measured and used for test.  
Offset value = Cable A + Splitter + ATT + Cable B

#### Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The EUT was setup to maximum output power at its lowest channel. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

1. RBW = 1MHz & VBW  $\geq$  3MHz
2. Detector = Positive peak
3. Trace mode = Max hold
4. Sweep time = Auto
5. The trace was allowed to stabilize

The highest, lowest and a middle channel were tested for out of band measurements.

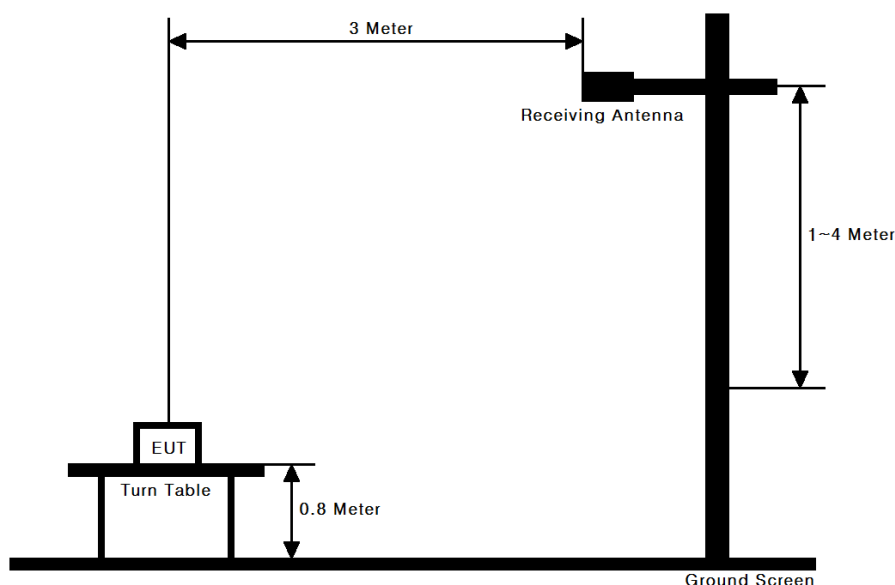
The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P[\text{Watts}])$ , where P is the transmitter power in Watts.

Note 1: In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter was employed to measure the out of band Emissions.

Note 2: Compliance with the applicable limits is based on the use of measurement instrumentation employing a RBW of 100 KHz or greater for Part 22 and 1 MHz or greater for Part24.

### 3.5 RADIATED SPURIOUS EMISSIONS

#### *Test Set-up*



#### *Test Procedure*

This measurement was performed at 3-meter test range. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 3-meters from the receive antenna.

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

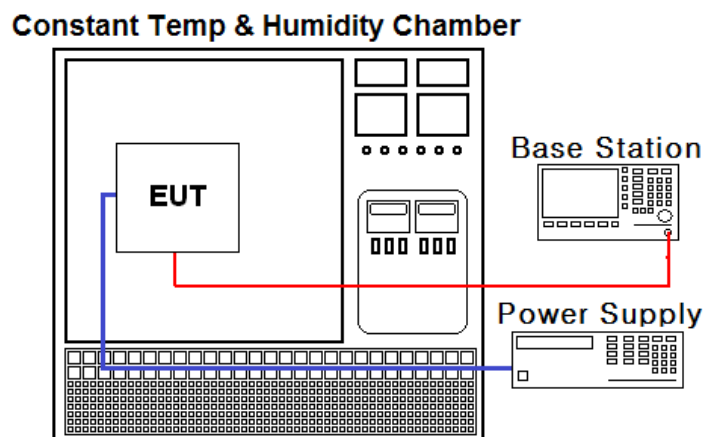
For radiated power measurements below 1GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

### 3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

#### Test Set-up



#### Test Procedure

The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification - the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.000\ 25\ \%$  ( $\pm 2.5\ \text{ppm}$ ) of the center frequency.

#### Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature. (25°C to provide a reference).
2. The equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

**NOTE: The EUT is tested down to the battery endpoint.**

#### 4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Multimeter	H.P	34401A	13/02/27	14/02/27	3146A13475
DC Power Supply	H.P	6622A	13/02/27	14/02/27	3448A03760
Power Splitter	Anritsu	K241B	12/09/17	13/09/17	020611
			13/09/12	14/09/12	
Attenuator	Aeroflex/Weinschel	56-3	12/09/17	13/09/17	Y2342
			13/09/12	14/09/12	
Attenuator	WEINSCHTEL	23-10-34	12/09/17	13/09/17	BP4386
			13/09/12	14/09/12	
Thermohygrometer	BODYCOM	BJ5478	13/01/14	14/01/14	090205-4
Dipole Antenna	Schwarzbeck	VHA9103	12/03/12	14/03/12	2116
Dipole Antenna	Schwarzbeck	VHA9103	12/03/22	14/03/22	2117
Dipole Antenna	Schwarzbeck	UHA9105	12/03/12	14/03/12	2261
Dipole Antenna	Schwarzbeck	UHA9105	12/03/22	14/03/22	2262
Bilog Antenna	SCHAFFNER	CBL6112B	12/11/06	14/11/06	2737
HORN ANT	ETS	3115	12/02/20	14/02/20	6419
HORN ANT	ETS	3115	13/02/28	15/02/28	00021097
HORN ANT	A.H.Systems	SAS-574	13/03/20	15/03/20	154
HORN ANT	A.H.Systems	SAS-574	13/05/27	15/05/27	155
Amplifier	Agilent	8447E	13/01/08	14/01/08	2945A02865
Amplifier	Agilent	8449B	13/02/27	14/02/27	3008A00370
High-pass filter	Wainwright Instruments	WHKX1.0	12/09/17	13/09/17	9
			13/09/12	14/09/12	
High-Pass Filter	Wainwright	WHNX2.1	12/09/17	13/09/17	1
			13/09/12	14/09/12	
8960 Series 10 Wireless Comms Test Set	Agilent	E5515C	13/02/28	14/02/28	GB43461134
Universal Radio Communication Tester	Rohde Schwarz	CMU200	13/02/28	14/02/28	106760
Vector Signal Generator	Rohde Schwarz	SMJ100A	13/01/08	14/01/08	100148
Signal Generator	Rohde Schwarz	SMF100A	13/07/22	14/07/22	102341
Amplifier	EMPOWER	BBS3Q7ELU	12/09/18	13/09/18	1020
			13/09/12	14/09/12	
Spectrum Analyzer	Agilent	E4440A	12/10/22	13/10/22	US45303051

**5. SUMMARY OF TEST RESULTS**

<b>FCC Part Section(s)</b>	<b>RSS Section(s)</b>	<b>Parameter</b>	<b>Status</b> Note 1
2.1046	RSS-132 (4.4) RSS-133 (4.1)	Conducted Output Power	<b>C</b>
22.913(a) 24.232(c)	RSS-132 (4.4) [SRSP-503(5.1.3)] RSS-133 (6.4) [SRSP-510(5.1.2)]	Effective Radiated Power Equivalent Isotropic Radiated Power	<b>C</b>
22.917(a) 24.238(a) 2.1049	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	<b>NA</b> Note 2
22.917(a) 24.238(a) 2.1051	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Spurious and Harmonic Emissions at Antenna Terminal	<b>NA</b> Note 2
24.232(d)	RSS-133 (6.4)	Peak to Average Ratio	<b>NA</b> Note 2
22.917(a) 24.238(a) 2.1053	RSS-132 (4.5.1) RSS-133 (6.5.1)	Radiated Spurious and Harmonic Emissions	<b>C</b>
22.355 24.235 2.1055	RSS-132 (4.3) RSS-133 (6.3)	Frequency Stability	<b>NA</b> Note 2
<p>Note 1: <b>C</b>=Comply    <b>NC</b>=Not Comply    <b>NT</b>=Not Tested    <b>NA</b>=Not Applicable</p> <p>Note 2: These test items were not performed because this device uses the granted module.(FCCID: QIPPH8) Please refer to the test report of the granted module. The module test report number:  - Part 22: MDE_CINTE_0902_FCCa(By 7 Layers AG)  - Part 24: MDE_CINTE_0902_FCCb(By 7 Layers AG)</p>			

The sample was tested according to the following specification:  
**ANSI/TIA/EIA-603-C-2004 and KDB 971168 D01 v02r01**

## 6. SAMPLE CALCULATION

### A. Emission Designator

#### GSM850 Emission Designator

Emission Designator = **247KGXW**

#### EDGE850 Emission Designator

Emission Designator = **247KG7W**

#### WCDMA850 Emission Designator

Emission Designator = **4M15F9W**

#### HSUPA850 Emission Designator

Emission Designator = **4M17F9W**

#### GSM1900 Emission Designator

Emission Designator = **245KGXW**

#### EDGE1900 Emission Designator

Emission Designator = **247KG7W**

#### WCDMA1900 Emission Designator

Emission Designator = **4M17F9W**

#### HSUPA1900 Emission Designator

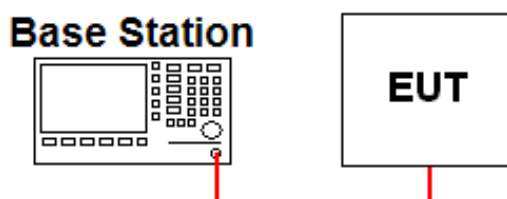
Emission Designator = **4M17F9W**

Note: Emission designators of the granted module were used.

## 7. TEST DATA

### 7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



#### ▪ GSM / GPRS / EDGE

Band	Channel	Test Result(dBm)								
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot	EDGE 1 TX Slot	EDGE 2 TX Slot	EDGE 3 TX Slot	EDGE 4 TX Slot
Cellular	128	33.0	33.0	30.0	27.9	26.5	27.0	23.9	22.1	21.2
	190	33.0	33.0	30.0	27.9	26.5	27.0	23.8	22.2	21.1
	251	32.9	32.9	29.9	27.8	26.4	27.0	23.9	22.2	21.1
PCS	512	30.0	29.9	26.8	24.5	23.5	25.5	22.5	20.5	19.1
	661	30.0	30.0	26.9	24.5	23.5	25.5	22.5	20.4	19.1
	810	30.0	30.0	26.9	24.4	23.4	25.4	22.5	20.4	19.0

The output power was measured using the Agilent E5515C

## ▪ WCDMA

3GPP Release Version	Mode		Power (dBm)			MPR	B <sub>c</sub>	β <sub>d</sub>	B <sub>c</sub> /β <sub>d</sub>	Sub-Test
	Channel		4132	4183	4233					
99	WCDMA	RMC	23.91	23.99	23.92	-	-	-	-	-
		ARM	23.88	23.95	23.91					
5	HSDPA (Cellular)		23.85	23.89	23.81	0	2/15	15/15	2/15	1
5			23.80	23.85	23.80	0	12/15	15/15	12/15	2
5			23.38	23.45	23.40	0.5	15/15	8/15	15/8	3
5			23.37	23.45	23.38	0.5	15/15	4/15	15/4	4
-	Channel		9262	9400	9538	-	-	-	-	-
99	WCDMA	RMC	23.48	23.50	23.45	-	-	-	-	-
		ARM	23.41	23.45	23.38					
5	HSDPA (PCS)		23.38	23.39	23.31	0	2/15	15/15	2/15	1
5			23.30	23.31	23.27	0	12/15	15/15	12/15	2
5			22.89	22.95	22.91	0.5	15/15	8/15	15/8	3
5			22.89	22.91	22.85	0.5	15/15	4/15	15/4	4

The output power was measured using the Agilent E5515C

## ▪ HSUPA

3GPP Release Version	Mode		Power (dBm)			MPR	B <sub>c</sub>	β <sub>d</sub>	B <sub>c</sub> /β <sub>d</sub>	Sub-Test
	Channel		4132	4183	4233					
6	HSUPA (Cellular)		23.80	23.85	23.79	0	11/15	15/15	11/15	1
6			21.75	21.77	21.70	2	6/15	15/15	6/15	2
6			22.83	22.88	22.80	1	15/15	9/15	15/9	3
6			21.71	21.75	21.65	2	2/15	15/15	2/15	4
6			23.75	23.77	23.70	0	15/15	15/15	15/15	5
-	Channel		9262	9400	9538	-	-	-	-	-
6	HSUPA (PCS)		23.35	23.35	23.29	0	11/15	15/15	11/15	1
6			21.29	21.24	21.19	2	6/15	15/15	6/15	2
6			22.34	22.39	22.36	1	15/15	9/15	15/9	3
6			21.27	21.21	21.20	2	2/15	15/15	2/15	4
6			23.31	23.34	23.25	0	15/15	15/15	15/15	5

The power was measured E5515C



**7.2 EFFECTIVE RADIATED POWER****- GSM850 data**

CH.	EUT Position (Axis)	TEST CONDITIONS(Power Step: 5)							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Power Supply	Note.
824.2 (128 CH)	X	- 10.99	H	21.72	1.20	22.92	0.196	DC 3.7V	GSM
836.6 (190 CH)	X	- 11.39	H	22.61	1.15	23.76	0.238	DC 3.7V	GSM
<b>848.8 (251 CH)</b>	<b>X</b>	<b>- 10.52</b>	<b>H</b>	<b>23.08</b>	<b>1.05</b>	<b>24.13</b>	<b>0.259</b>	<b>DC 3.7V</b>	<b>GSM</b>
836.6 (190 CH)	X	- 15.28	H	18.32	1.05	19.37	0.086	DC 3.7V	EDGE

**- WCDMA850 data**

CH.	EUT Position (Axis)	TEST CONDITIONS							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Power Supply	Note.
826.4 (4132 CH)	X	- 19.92	H	13.02	1.19	14.21	0.026	DC 3.7V	WCDMA
836.6 (4183 CH)	Z	- 20.54	H	13.72	1.15	14.87	0.031	DC 3.7V	WCDMA
<b>846.6 (4233 CH)</b>	<b>X</b>	<b>- 19.31</b>	<b>H</b>	<b>15.13</b>	<b>1.10</b>	<b>16.23</b>	<b>0.042</b>	<b>DC 3.7V</b>	<b>WCDMA</b>

**- HSUPA850 data**

CH.	EUT Position (Axis)	TEST CONDITIONS							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Power Supply	Note.
826.4 (4132 CH)	X	- 19.82	H	13.12	1.19	14.31	0.027	DC 3.7V	HSUPA
836.6 (4183 CH)	Z	- 20.13	H	14.13	1.15	15.28	0.034	DC 3.7V	HSUPA
<b>846.6 (4233 CH)</b>	<b>X</b>	<b>- 19.83</b>	<b>H</b>	<b>14.61</b>	<b>1.10</b>	<b>15.71</b>	<b>0.037</b>	<b>DC 3.7V</b>	<b>HSUPA</b>

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.

A half-wave dipole is substituted in place of the EUT. This dipole antenna is driven by a signal generator and the level of the signal generator is adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

**7.3 EQUIVALENT ISOTROPIC RADIATED POWER****- GSM1900 data**

CH.	EUT Position (Axis)	TEST CONDITIONS(Power Step: 0)							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Power Supply	Note.
1850.2 (512 CH)	Z	- 8.73	V	21.17	8.06	29.23	0.837	DC 3.7V	GSM
1880.0 (661 CH)	X	- 7.90	H	20.69	8.12	28.81	0.760	DC 3.7V	GSM
<b>1909.8 (810 CH)</b>	<b>Z</b>	<b>- 9.61</b>	<b>V</b>	<b>21.18</b>	<b>8.18</b>	<b>29.36</b>	<b>0.863</b>	<b>DC 3.7V</b>	<b>GSM</b>
1909.8 (810 CH)	Z	- 14.11	V	16.68	8.18	24.86	0.306	DC 3.7V	EDGE

**- WCDMA1900 data**

CH.	EUT Position (Axis)	TEST CONDITIONS							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Power Supply	Note.
1852.4 (9262 CH)	Z	- 14.96	V	14.83	8.06	22.89	0.194	DC 3.7V	WCDMA
1880.0 (9400 CH)	Z	- 15.47	V	14.17	8.12	22.29	0.169	DC 3.7V	WCDMA
<b>1907.6 (9538 CH)</b>	<b>X</b>	<b>- 15.87</b>	<b>V</b>	<b>15.67</b>	<b>8.18</b>	<b>23.85</b>	<b>0.243</b>	<b>DC 3.7V</b>	<b>WCDMA</b>

**- HSUPA1900 data**

CH.	EUT Position (Axis)	TEST CONDITIONS							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Power Supply	Note.
1852.4 (9262 CH)	Z	- 14.51	V	15.28	8.06	23.34	0.216	DC 3.7V	HSUPA
1880.0 (9400 CH)	Z	- 15.02	V	14.62	8.12	22.74	0.188	DC 3.7V	HSUPA
<b>1907.6 (9538 CH)</b>	<b>X</b>	<b>- 16.11</b>	<b>V</b>	<b>15.43</b>	<b>8.18</b>	<b>23.61</b>	<b>0.230</b>	<b>DC 3.7V</b>	<b>HSUPA</b>

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.

A half-wave dipole is substituted in place of the EUT. This dipole antenna is driven by a signal generator and the level of the signal generator is adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

**7.4 RADIATED SPURIOUS EMISSIONS****7.4.1 RADIATED SPURIOUS EMISSIONS (GSM850)**

Channel (ERP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
128 (0.196W)	1648.31	X	H	- 25.34	5.48	- 19.86	42.78	35.92
	2472.80	Z	V	-39.01	6.89	-32.12	55.04	
	3296.76	Z	V	-41.25	7.68	-33.57	56.49	
	-	-	-	-	-	-	-	
190 (0.238W)	1673.12	X	H	- 26.81	5.53	- 21.28	45.04	36.76
	2509.60	Z	V	-37.84	6.94	-30.90	54.66	
	3346.42	Z	V	-41.62	7.69	-33.93	57.69	
	-	-	-	-	-	-	-	
251 (0.259W)	1697.65	X	H	- 28.03	5.59	- 22.44	46.57	37.13
	2546.25	Z	V	-35.37	7.00	-28.37	52.50	
	3395.13	Z	V	-42.05	7.70	-34.35	58.48	
	-	-	-	-	-	-	-	

- Limit Calculation=  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

**7.4.2 RADIATED SPURIOUS EMISSIONS (WCDMA850)**

Channel (EIRP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
4132 (0.026W)	1650.31	X	H	- 50.59	5.49	- 45.10	59.31	27.21
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4183 (0.031W)	1675.03	X	H	- 48.47	5.54	- 42.93	57.80	27.87
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4233 (0.042W)	1690.62	X	H	- 51.81	5.57	- 46.24	62.47	29.23
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation =  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

**7.4.3 RADIATED SPURIOUS EMISSIONS (HSUPA850)**

Channel (ERP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
4132 (0.027W)	1651.24	X	H	- 51.87	5.49	- 46.38	60.69	27.31
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4183 (0.034W)	1671.86	X	H	- 51.20	5.53	- 45.67	60.95	28.28
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4233 (0.037W)	1694.50	X	H	- 53.34	5.58	- 47.76	63.47	28.71
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation =  $43 + 10 \log_{10} (ERP [W])$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

**7.4.4 RADIATED SPURIOUS EMISSIONS (GSM1900)**

Channel (EIRP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
512 (0.837W)	3700.43	Z	V	- 48.08	9.90	- 38.18	67.41	42.23
	5550.35	Z	V	- 44.30	11.35	- 32.95	62.18	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
661 (0.760W)	3760.20	Z	V	- 51.85	9.90	- 41.95	70.75	41.81
	5639.85	Z	V	- 50.76	11.42	- 39.34	68.15	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
810 (0.863W)	3819.48	Z	V	- 48.82	9.91	- 38.91	68.27	42.36
	5729.40	Z	V	- 50.10	11.48	- 38.62	67.98	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation =  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

**7.4.5 RADIATED SPURIOUS EMISSIONS (WCDMA1900)**

Channel (EIRP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
9262 (0.194W)	3702.53	X	H	- 47.07	9.90	- 37.17	60.06	35.89
	5556.68	X	H	- 47.19	11.35	- 35.84	58.72	
	-	-	-	-	-	-	-	
9400 (0.169W)	3762.45	X	H	- 50.16	9.90	- 40.26	62.54	35.29
	5642.58	X	H	- 49.71	11.42	- 38.29	60.58	
	-	-	-	-	-	-	-	
9538 (0.243W)	3816.67	X	H	- 47.38	9.91	- 37.47	61.32	36.85
	5726.42	X	H	- 51.87	11.48	- 40.39	64.24	
	-	-	-	-	-	-	-	

- Limit Calculation =  $43 + 10 \log_{10} (ERP [W])$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.



**7.4.6 RADIATED SPURIOUS EMISSIONS (HSUPA1900)**

Channel (ERP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
9262 (0.216W)	3705.75	X	H	- 49.13	9.90	- 39.23	62.57	36.34
	5557.44	X	H	- 47.34	11.35	- 35.99	59.32	
	-	-	-	-	-	-	-	
9400 (0.188W)	3760.57	X	H	- 51.47	9.90	- 41.57	64.30	35.74
	5641.31	X	H	- 50.91	11.42	- 39.49	62.23	
	-	-	-	-	-	-	-	
9538 (0.230W)	3817.45	X	H	- 49.66	9.91	- 39.75	63.36	36.61
	5723.62	X	H	- 52.64	11.48	- 41.16	64.77	
	-	-	-	-	-	-	-	

- Limit Calculation =  $43 + 10 \log_{10} (ERP [W])$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.