

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

### INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E AND INDUSTRY CANADA RSS-132 and RSS-133 CLASS II PC REPORT

For

**Product Description:** Mini-PCIe wireless WAN (F5521gw) card  
INSTALLED IN AN HP TPN-Q101 SERIES  
LAPTOP

**Trade Name:** N/A

**Model Name:** TPN-Q101

**Model Difference:** N/A

**FCC ID:** VV7-MBMF5521GW1

**IC:** 287AG-MBMF5521GW1

**Report No.:** EH/2011/30034

**Issue Date:** Mar. 14, 2011

**FCC Rule Part:** 2, 22H & 24E

**IC Rule Part:** RSS 132 Issue 2 and RSS 133 Issue 5

**Prepared for:** Ericsson AB  
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SE-41756

**Prepared by:** SGS Taiwan Ltd.  
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## CERTIFICATION OF COMPLIANCE

**Applicant:** Ericsson AB  
 Lindholmspiren 11 Gothenburg, Sweden SE-41756

**Product Description:** Mini-PCIe wireless WAN (F5521gw) card INSTALLED IN AN HP  
 TPN-Q101 SERIES LAPTOP

**Trade Name:** N/A

**FCC ID:** VV7-MBMF5521GW1

**IC:** 287AG-MBMF5521GW1

**Model No.:** TPN-Q101

**Model Difference:** N/A

**File Number:** EH/2011/30034

**Date of test:** Mar. 09, 2011 ~ Mar. 14, 2011

**Date of EUT Received:** Mar. 09, 2011

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004, Issue 2 of RSS-Gen and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule PART 22 subpart H, PART 24 subpart E and IC standards Issue 2 of RSS-132, Issue 5 of RSS-133.

The test results of this report relate only to the tested sample identified in this report.

**Test By:**

*Jazz Huang*

**Date:**

Mar. 14, 2011

*Jazz Huang / Engineer*

**Prepared By:**

*Judy Hsu*

**Date:**

Mar. 14, 2011

*Judy Hsu / General Admin.*

**Approved By:**

*Jim Chang*

**Date:**

Mar. 14, 2011

*Jim Chang / Supervisor*

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## Version

Version No.	Date	Description
00	Mar. 14, 2011	Initial creation of document

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## 1. GENERAL INFORMATION

### 1.1 Product Description

#### General:

Notebook Applicant	Ericsson AB
Product name:	Mini-PCIe wireless WAN (F5521gw) card INSTALLED IN AN HP TPN-Q101 SERIES LAPTOP
Brand Name:	N/A
Model Name:	TPN-Q101
Model Difference:	N/A
Power Supply:	10.8 Vdc re-chargeable battery model:MT06055 19.5Vdc by AC/DC power adapter, model: Series HSTNN-LA18

#### GPRS / WCDMA:

Modular report	Testing Lab.: CETECOM ICT Services GmbH Model Number: F5521gw, type:KRD 131 18/1 Report Number: 1-2205-01-05/10-A	
WWAN module FCC ID	VV7-MBMF5521GW1	
WWAN module IC ID	287AG-MBMF5521GW1	
Hardware Version for WWAN module	R1	
Software Version for WWAN module	R1A29	
Cellular Phone Standards Frequency Range	GPRS/EDGE 850, Class 10	824.2 - 848.8 MHz
	GPRS/EDGE 900, Class 10	880.2 - 914.8 MHz
	GPRS/EDGE 1800, Class 10	1710.2 - 1784.8 MHz
	GPRS/EDGE 1900, Class 10	1850.2 - 1909.8 MHz
	WCDMA/HSUPA/HSDPA Band II	1852.4 - 1907.6 MHz
	WCDMA/HSUPA/HSDPA Band V	826.4 - 846.6 MHz
IMEI	0044017007949916	
Class II Pemiissive change	Mini-PCIe wireless WAN (F5521gw) card INSTALLED IN AN HP TPN-Q101 SERIES LAPTOP	

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FCC-Transmit power (Conducted Power) Listed in Original Grant / Type of Emission	22H(GMSK): 824.2 - 848.8 MHz: 300KGXW 24E(GMSK): 1850.2 - 1909.8 MHz: 300KGXW 22H(8PSK): 824.2 - 848.8 MHz: 300KG7W 24E(8PSK): 1850.2 - 1909.8 MHz: 300KG7W 22H(8PSK): 826.4 - 846.6 MHz: 4M20F9W 24E(GMSK): 1852.4 - 1907.6 MHz: 4M20F9W
FCC-Transmit power (Conducted Power) Listed in Test Report/Original Grant	22H(GMSK): 824.2 - 848.8 MHz: 1.77W 24E(GMSK): 1850.2 - 1909.8 MHz: 0.91W 22H(8PSK): 824.2 - 848.8 MHz: 0.46W 24E(8PSK): 1850.2 - 1909.8 MHz: 0.39W 22H(8PSK): 826.4 - 846.6 MHz: 0.25W 24E(GMSK): 1852.4 - 1907.5 MHz: 0.19W
IC-Transmit power (Con- ducted Power) Listed in Original Grant / Type of Emission	824.2 - 848.8 M: 307KG7W 824.2 - 848.8 M: 281KGXW 1.85-1.91 G: 281KG7W 824.6-846.6 M: 4M65F9W 1.852-1.908 G: 4M68F9W 1.85-1.91 G: 283KGXW
IC-Transmit power (Conducted Power) Listed in Test Report/Original Grant	824.2 - 848.8 M: 460mW 824.2 - 848.8 M: 1.77W 1.851-1.909 G: 390mW 824.6-846.6 M: 250mW 1.852-1.908 G: 190mW 1.85-1.91 G: 910mW

This test report applies for GPRS/EDGE 850, GPRS/EDGE 1900, WCDMA/HSUPA/HSDPA Band II, Band V bands.

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

This submittal(s) (test report) is intended for **FCC ID: VV7-MBMF5521GW1** filing to comply with Section Part 22 subpart H, Part 24 subpart E of the FCC CFR 47 Rules. And **IC: 287AG-MBMF5521GW1** filing to comply with RSS-132 and issue 5 of RSS-133

## 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA-603-C-2004 and FCC CFR 47 2.1046, 2.1053, Issue 2 of RSS-132, Issue 5 of RSS-133 and Issue 2 of RSS-Gen.

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## 1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

## 1.5 Special Accessories

Not available for this EUT intended for grant.

## 1.6 Equipment Modifications

Not available for this EUT intended for grant.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

#### 2.3.2 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C, issue 2 of RSS-Gen and TIA/EIA IS-98 for Mobile stations. The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements.

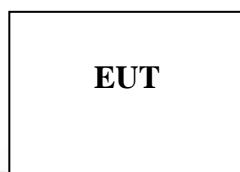
A standard antenna was used to replace the EUT and connect to the SG. Adjust the SG output level to reach the max emission level which were measured above.

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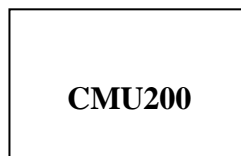
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## 2.4 Configuration of Tested System

**Fig. 1-1 Configuration for Radiated Emission**



**Fig. 1-2 Configuration (Remote Side, on the corner)**



**Table 2-1 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Universal Radio Communication Tester	R&S	CMU200	102189	Shielded	Un-shielded

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### 3. SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	Description Of Test	Result
§2.1046(a) §22.913(a)(2) §24.232(c)	§4.8 (RSS-Gen) §4.4 (RSS-132) §6.4 (RSS-133)	ERP/ EIRP measurement	Compliant
§2.1053 §22.917(a) §24.238(a)	§4.9 (RSS-Gen) §4.5 (RSS-132) §6.5 (RSS-133)	Field Strength of Spurious Radiation (TX)(RX)	Compliant

Max ERP/EIRP measurement result:

	dBm		W
GPRS 850 Band	31.63	ERP	1.455
GPRS 1900 Band	23.14	EIRP	0.206
EDGE 850 Band	29.03	ERP	0.800
EDGE 1900 Band	23.37	EIRP	0.217
WCDMA Band II	18.29	EIRP	0.067
HSUPA Band II	17.51	EIRP	0.056
WCDMA Band V	21.43	ERP	0.139
HSUPA Band V	21.33	ERP	0.136

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#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Set EUT power for maximum level for all test mode through base station.

The Channel Low, Mid and High for each type of bands with rated data rate were chosen for above testing.

The field strength of ERP/EIRP power and spurious radiation emission were measured as EUT stand up position for GPRS/EDGE 850, GPRS/EDGE 1900, WCDMA/HSUPA/HSDPA Band II, Band V bands were reported which has worst data.

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## 5. RF POWER OUTPUT MEASUREMENT

### 5.1 Standard Applicable:

According to FCC §2.1046 & RSS-132(4.4), RSS-133(6.4)

FCC 22.913(a) Mobile station are limited to 7W.

FCC 24.232(c) Peak Power Measurement

3GPP Power limitation for HSDPA and HSUPA

#### Maximum Output Powers for HSDPA

Sub-test in table C.10.1.4	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-3.7	+21	+2.7/-2.7
2	+24	+1.7/-3.7	+21	+2.7/-2.7
3	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7
4	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7

#### Maximum Output Powers for HSUPA

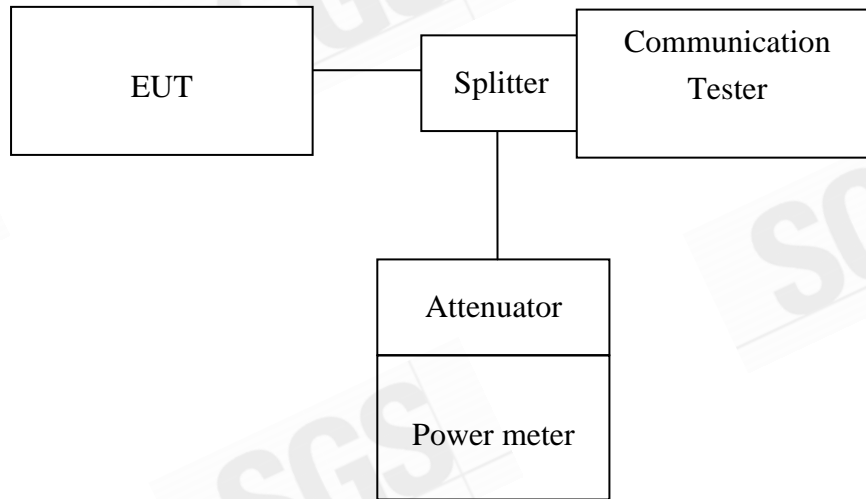
Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-6.7	+21	+2.7/-5.7
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-6.7	+21	+2.7/-5.7

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## 5.2 Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

## 5.3 Measurement Procedure:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. The Procedure of KDB941225(SAR Measurement Procedures for 3G devices, WCDMA/HSDPA) was used for EUT and Base station setting.RMC 12.2kps is used for this testing

## 5.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 5.5 Measurement Result:

### 5.5.1RF Conducted Output Power

#### 5.5.1.1.: GPRS/EDGE (GMSK; 8-PSK)

##### Result:

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
GPRS 850	824.2	128	32.50	32.50
	836.6	190	32.30	32.30
	848.8	251	32.30	32.30

EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
GPRS 850	824.2	128	32.45	32.45
	836.6	190	32.20	32.20
	848.8	251	32.25	32.25

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
EDGE 850	824.2	128	30.60	30.60
	836.6	190	30.70	30.70
	848.8	251	30.70	30.70

EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
EDGE 850	824.2	128	26.50	26.50
	836.6	190	26.50	26.50
	848.8	251	26.40	26.40

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EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
GPRS 1900	1850.2	512	29.70	29.70
	1880.0	661	29.30	29.30
	1909.8	810	29.50	29.50

EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
GPRS 1900	1850.2	512	29.51	29.51
	1880.0	661	29.21	29.21
	1909.8	810	29.40	29.40

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
EDGE 1900	1850.2	512	29.40	29.40
	1880.0	661	29.00	29.00
	1909.8	810	29.00	29.00

EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
EDGE 1900	1850.2	512	25.80	25.80
	1880.0	661	25.60	25.60
	1909.8	810	25.80	25.80

**Note: Offset 1 dB**

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**5.5.1.2: WCDMA mode**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1/-3). RMC 12.2kps is used for this testing.

**Results:**

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg Power (dBm)
WCDMA Band II	1852.4	9262	25.83	22.60
	1880.0	9400	25.93	22.59
	1907.6	9538	25.31	22.68

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg Power (dBm)
WCDMA Band V	826.40	4132	26.74	23.76
	836.60	4183	26.62	23.68
	846.60	4233	26.67	23.66

Note: The results above reflect max power with all up bits.

**Note: Offset 0.5 dB**

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### 5.5.13: HSDPA Release 6 mode

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

### HSDPA SUB-TEST Setting

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

**Note: The recommended HSDPA MPRs are implemented as per following sub-tests.**

### Results:

Mode	Sub-test	RMS Power (dBm)			Power Class 3 Limita- tion (dBm)	Comments
		9262	9400	9538		
HSDPA B2	1	22.89	22.85	22.95	20.3dBm – 25.7dBm	Pass
	2	22.48	22.45	22.53	20.3dBm – 25.7dBm	Pass
	3	22.41	22.40	22.42	19.8dBm – 25.7dBm	Pass
	4	22.48	22.41	22.54	19.8dBm – 25.7dBm	Pass

### Results:

Mode	Sub-test	RMS Power (dBm)			Power Class 3 Limita- tion (dBm)	Comments
		4132	4172	4233		
HSDPA B5	1	23.98	23.93	23.85	20.3dBm – 25.7dBm	Pass
	2	23.69	23.57	23.53	20.3dBm – 25.7dBm	Pass
	3	23.52	23.45	23.36	19.8dBm – 25.7dBm	Pass
	4	23.57	23.49	23.42	19.8dBm – 25.7dBm	Pass

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#### 5.5.1.4: HSPA (HSDPA & HSUPA) Release 6 mode

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

#### HSPA SUB-TEST Setting

Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$	$\beta_{ec}$	$\beta_{ed}$	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

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**Note: The recommended HSUPA are implemented as per following sub-tests.**

**Results:**

Mode	Sub-test	RMS Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		9262	9400	9538		
HSUPA B2	1	22.52	22.57	22.62	17.3dBm – 25.7dBm	Pass
	2	20.57	20.64	20.66	16.8dBm – 25.7dBm	Pass
	3	21.58	21.59	21.70	17.8dBm – 25.7dBm	Pass
	4	20.70	20.69	20.70	16.8dBm – 25.7dBm	Pass
	5	22.41	22.43	22.53	17.3dBm – 25.7dBm	Pass

**Results:**

Mode	Sub-test	RMS Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		4132	4172	4233		
HSUPA B5	1	23.72	23.61	23.58	17.3dBm – 25.7dBm	Pass
	2	21.78	21.69	21.62	16.8dBm – 25.7dBm	Pass
	3	22.76	22.67	22.66	17.8dBm – 25.7dBm	Pass
	4	21.83	21.75	21.70	16.8dBm – 25.7dBm	Pass
	5	23.58	23.44	23.47	17.3dBm – 25.7dBm	Pass

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### 5.5.2 Maximum Power Reduction: PCS1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.8	27.6	25.6	23.6	21.7	20	18	16	14
PCL	9	10	11	12	13	14	15		
Output power (dBm)	11.8	10	8.2	6.2	4.3	2.2	0.4		

Note: The EUT output power was controlled by simulator. Set Communication Tester CMU200 PCL as above, and get the mobile phone output power reading.

### WCDMA/HSDPA band II / V

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key "UE Power Control" and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. then record the read(see page 19 for measurement data) . The min. power was measures by a function key "minimum power" then record the read. It is -52.5dBm. The power variation can be 0.1dB step by setting.

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## 6. ERP/EIRP MEASUREMENT

### 6.1 Standard Applicable

According to FCC §2.1046

FCC 22.913(a)(2) Mobile station are limited to 7W ERP.

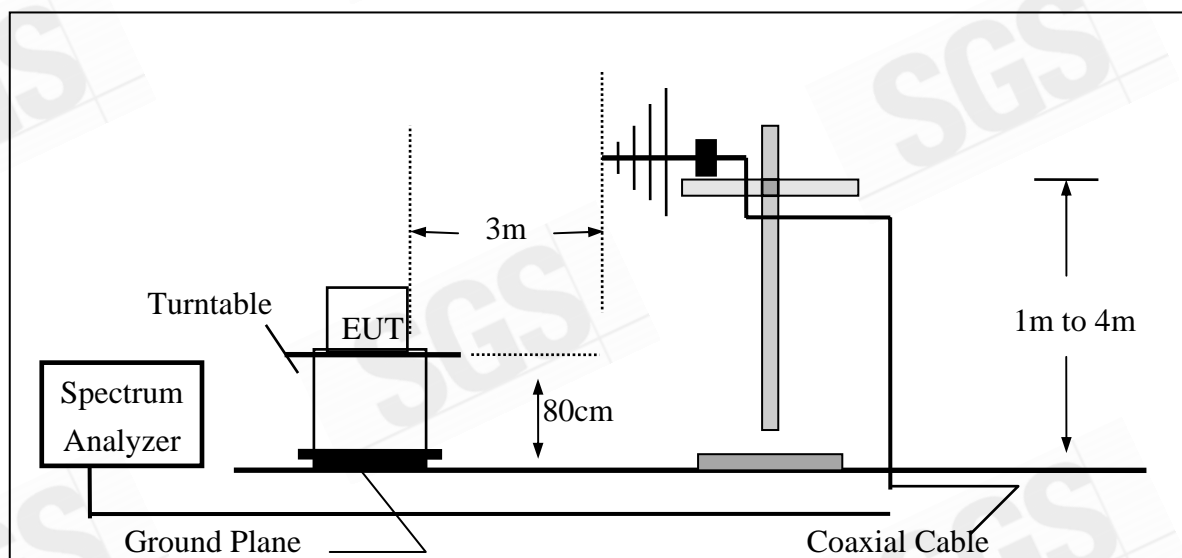
FCC 24.232(c) Mobile station are limited to 2W EIRP.

According to issue 5 of RSS-133 §6.4. The peak e.i.r.p. for transmitters operating in the band 1850-1910 MHz shall not exceed the limits given in SRSP-510.

According to issue 2 of RSS 132, section 4.4. The transmitter output power shall not exceed the limits given in SRSP-503.

### 6.2 Test SET-UP (Block Diagram of Configuration)

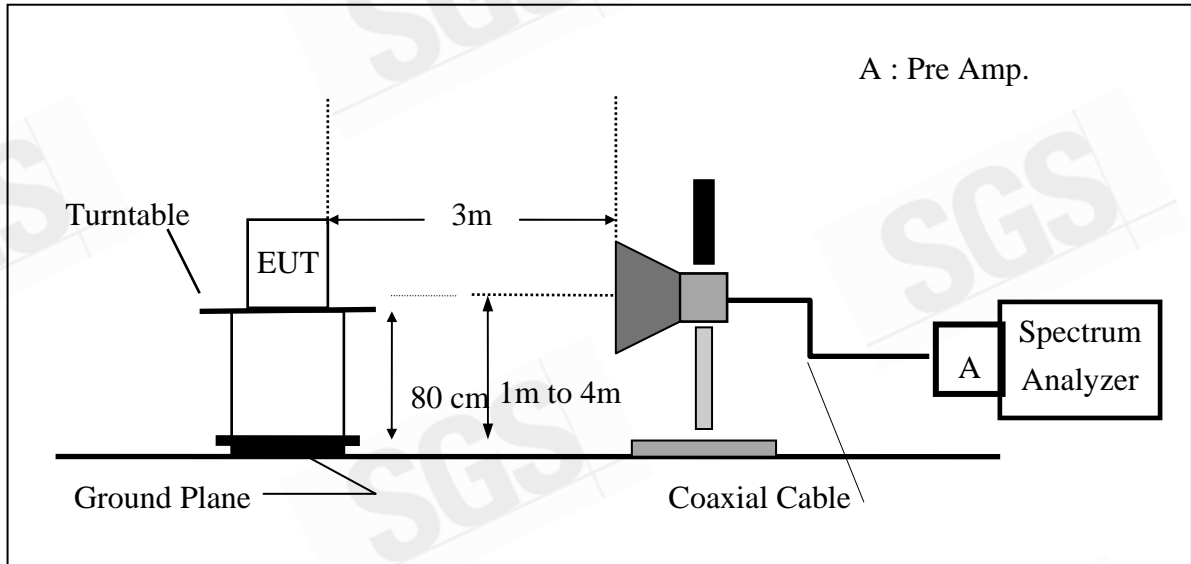
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



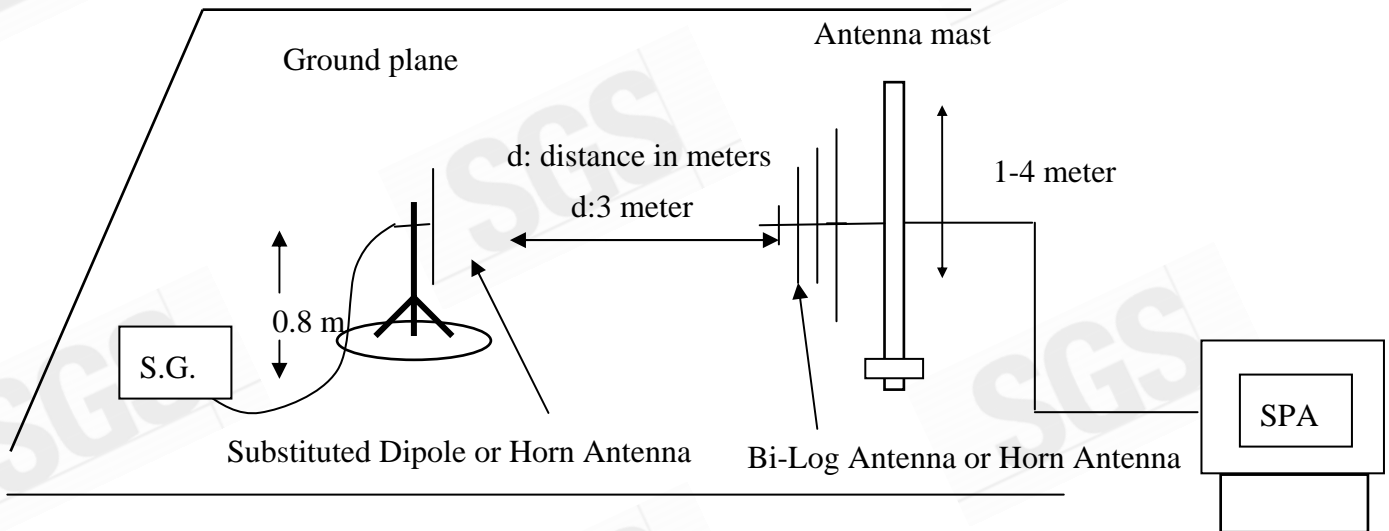
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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### 6.3 Measurement Procedure

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was in communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

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#### 6.4 Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2011	02/11/2012
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2010	11/14/2011
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2010	07/09/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2010	07/09/2012
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2010	01/21/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2010	05/08/2012
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012
Signal Generator	Agilent	E4438C	MY45093613	06/11/2010	06/10/2011
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2010	11/29/2011
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2010	07/04/2011
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2011	01/04/2012
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2011	01/04/2012
3m Site	SGS	966 chamber	N/A	11/08/2011	11/09/2012

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## 6.5 Measurement Result

Refer to following pages for detail.

### Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
GPRS 850	824.20	128	H	V	129.03	42.64	-7.87	3.62	31.14	38.45
				H	129.40	43.13	-7.87	3.62	<b>31.63</b>	38.45
	836.60	190	H	V	128.01	41.76	-7.88	3.65	30.23	38.45
				H	128.27	42.04	-7.88	3.65	30.51	38.45
	848.80	251	H	V	126.67	40.55	-7.88	3.68	28.99	38.45
				H	127.18	40.99	-7.88	3.68	29.43	38.45

#### Remark :

- (1) The RBW,VBW of SPA for frequency  
RBW=300 KHz, VBW=1MHz

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
GPRS 1900	1850.20	512	H	V	120.93	16.54	9.90	5.56	20.88	33.00
				H	121.54	17.36	9.90	5.84	21.42	33.00
	1880.00	661	H	V	119.51	15.15	9.99	5.61	19.53	33.00
				H	121.49	17.35	9.99	5.61	21.72	33.00
	1909.80	810	H	V	120.00	15.67	10.08	5.66	20.09	33.00
				H	122.83	18.72	10.08	5.66	<b>23.14</b>	33.00

#### Remark :

- (1) The RBW,VBW of SPA for frequency  
RBW=1MHz, VBW=1MHz

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
EDGE 850	824.20	128	E2	V	126.28	39.89	-7.87	3.62	28.39	38.45
				H	126.80	40.53	-7.87	3.62	<b>29.03</b>	38.45
	836.60	190	E2	V	125.28	39.03	-7.88	3.65	27.50	38.45
				H	125.59	39.36	-7.88	3.65	27.83	38.45
	848.80	251	E2	V	125.00	38.88	-7.88	3.68	27.32	38.45
				H	125.47	39.28	-7.88	3.68	27.72	38.45

**Remark :**

- (1) The RBW,VBW of SPA for frequency  
RBW=300 KHz, VBW=1MHz

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
EDGE 1900	1850.20	512	E2	V	120.35	15.96	9.90	5.56	20.30	33.00
				H	121.43	17.25	9.90	5.84	21.31	33.00
	1880.00	661	E2	V	121.61	17.25	9.99	5.61	21.63	33.00
				H	123.02	18.88	9.99	5.61	23.25	33.00
	1909.80	810	E2	V	121.27	16.94	10.08	5.66	21.36	33.00
				H	123.06	18.95	10.08	5.66	<b>23.37</b>	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency  
RBW=300 KHz, VBW=1MHz

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**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
WCDMA Band II	1852.40	9262	E2	V	116.69	12.31	9.90	5.56	16.64	33.00
				H	117.22	13.04	9.90	5.84	17.10	33.00
	1880.00	9400	E2	V	117.10	12.74	9.99	5.61	17.12	33.00
				H	118.06	13.92	9.99	5.61	<b>18.29</b>	33.00
	1907.60	9538	E2	V	116.64	12.31	10.07	5.66	16.72	33.00
				H	117.19	13.08	10.07	5.66	17.49	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
HSUPA Band II	1852.40	9262	E2	V	116.43	12.05	9.90	5.56	16.38	33.00
				H	117.21	13.03	9.90	5.84	17.09	33.00
	1880.00	9400	E2	V	116.85	12.49	9.99	5.61	16.87	33.00
				H	117.28	13.14	9.99	5.61	<b>17.51</b>	33.00
	1907.60	9538	E2	V	115.69	11.36	10.07	5.66	15.77	33.00
				H	117.09	12.98	10.07	5.66	17.39	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

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**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
WCDMA Band V	826.40	4132	E2	V	120.79	34.43	-10.02	3.63	20.78	38.45
				H	121.33	35.07	-10.02	3.63	<b>21.43</b>	38.45
	836.60	4183	E2	V	120.75	34.49	-10.02	3.65	20.82	38.45
				H	121.08	34.85	-10.02	3.65	21.18	38.45
	846.60	4233	E2	V	120.41	34.26	-10.02	3.67	20.57	38.45
				H	120.83	34.63	-10.02	3.67	20.94	38.45

**Remark :**

- (1) The RBW,VBW of SPA for frequency  
RBW= 5MHz , VBW= 8MHz

**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
HSUPA Band V	826.40	4132	E2	V	120.86	34.50	-10.02	3.63	20.85	38.45
				H	121.23	34.97	-10.02	3.63	<b>21.33</b>	38.45
	836.60	4183	E2	V	120.82	34.56	-10.02	3.65	20.89	38.45
				H	120.84	34.61	-10.02	3.65	20.94	38.45
	846.60	4233	E2	V	120.37	34.22	-10.02	3.67	20.53	38.45
				H	120.90	34.70	-10.02	3.67	21.01	38.45

**Remark :**

- (1) The RBW,VBW of SPA for frequency  
RBW= 5MHz , VBW= 8MHz

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## 7. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT(TX)

### 7.1 Standard Applicable

According to FCC §2.1053,

FCC §22.917(a),§24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

According to RSS-132 § 4.5 and RSS-133 §6.5

Out-of-Block Emissions

a. Mobile stations must comply with subsection i. below.

In the first 1.0MHz band immediately outside and adjacent to the licensee's frequency block, the power of emissions per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least  $43 + 10 \log (P)$ , dB.

b. After the first 1.0 MHz (for equipment that complies with a.i. of this subsection) or 1.5 MHz (for equipment that complies with a.ii.of this subsection), the power of emissions shall be attenuated below the transmitter output power by at least  $43 + 10 \log (P)$ , dB, per any MHz of bandwidth.

(Note: If the test result using 1% of the emission bandwidth is used, then power integration over 1.0 MHz is required; alternatively, the spectrum analyser resolution and video bandwidths can be increased to 1.0 MHz for this measurement).

Out-of-Sub-band Emissions

Outside the sub-bands 1850-1910 MHz and 1930-1990 MHz, the attenuation shall be equal to or greater than the out-of-block emission limits in Section 6.5.1.

### 7.2 EUT Setup (Block Diagram of Configuration)

Refer to section 5.2 for details

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### 7.3 Measurement Procedure

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

ERP in frequency band 824.2 –848.80MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss (dB)}$$

### 7.4 Measurement Equipment Used:

Refer to section 5.4 for details

### 7.5 Measurement Result

Refer to attach tabular data sheets.

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### Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH Low Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 824.20 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	49.93	V	-52.88	-7.75	1.30	-61.93	-13.00	-48.93
248.25	36.28	V	-63.68	-7.89	1.98	-73.54	-13.00	-60.54
325.85	38.32	V	-59.61	-7.78	2.27	-69.65	-13.00	-56.65
416.06	39.95	V	-55.05	-7.67	2.56	-65.28	-13.00	-52.28
483.96	35.68	V	-58.39	-7.71	2.76	-68.86	-13.00	-55.86
633.34	32.55	V	-56.59	-7.80	3.12	-67.51	-13.00	-54.51
824.00	82.47	V	-3.92	-7.87	3.62	-15.42	-13.00	-2.42
1650.00	46.23	V	-58.35	9.29	5.23	-54.29	-13.00	-41.29
2472.60	42.06	V	-58.95	10.08	6.53	-55.40	-13.00	-42.40
3296.80	---	V		12.17	7.71		-13.00	
4121.00	---	V		12.61	8.86		-13.00	
4945.20	---	V		12.65	9.74		-13.00	
5769.40	---	V		13.55	10.54		-13.00	
6593.60	---	V		12.05	11.30		-13.00	
7417.80	---	V		11.49	12.10		-13.00	
8242.00	---	V		11.48	12.71		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

**Remark :**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 850 Mode**

Operation Mode	: TX CH Low Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 824.20 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	49.46	H	-54.05	-7.75	1.30	-63.10	-13.00	-50.10
257.95	34.72	H	-64.25	-7.89	2.02	-74.17	-13.00	-61.17
325.85	35.23	H	-62.19	-7.78	2.27	-72.24	-13.00	-59.24
400.54	39.26	H	-57.14	-7.66	2.51	-67.31	-13.00	-54.31
483.96	36.77	H	-56.82	-7.71	2.76	-67.29	-13.00	-54.29
623.64	32.75	H	-57.49	-7.80	3.09	-68.38	-13.00	-55.38
824.00	83.45	H	-2.82	-7.87	3.62	-14.32	-13.00	-1.32
1650.00	46.24	H	-58.16	9.29	5.23	-54.10	-13.00	-41.10
2472.60	47.25	H	-53.66	10.08	6.53	-50.11	-13.00	-37.11
3296.80	---	H		12.17	7.71		-13.00	
4121.00	---	H		12.61	8.86		-13.00	
4945.20	---	H		12.65	9.74		-13.00	
5769.40	---	H		13.55	10.54		-13.00	
6593.60	---	H		12.05	11.30		-13.00	
7417.80	---	H		11.49	12.10		-13.00	
8242.00	---	H		11.48	12.71		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

**Remark :**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 850 Mode**

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 836.60 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	49.22	V	-53.59	-7.75	1.30	-62.64	-13.00	-49.64
163.86	33.60	V	-64.93	-7.81	1.62	-74.37	-13.00	-61.37
260.86	34.64	V	-64.89	-7.90	2.03	-74.82	-13.00	-61.82
325.85	37.76	V	-60.17	-7.78	2.27	-70.21	-13.00	-57.21
400.54	38.93	V	-56.55	-7.66	2.51	-66.73	-13.00	-53.73
636.25	32.11	V	-56.99	-7.80	3.12	-67.92	-13.00	-54.92
2509.80	57.62	V	-43.16	10.09	6.58	-39.66	-13.00	-26.66
3346.40	---	V		12.28	7.79		-13.00	
4183.00	---	V		12.62	8.93		-13.00	
5019.60	---	V		12.67	9.81		-13.00	
5856.20	---	V		13.68	10.62		-13.00	
6692.80	---	V		11.95	11.39		-13.00	
7529.40	---	V		11.45	12.20		-13.00	
8366.00	---	V		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 850 Mode**

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 836.60 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	49.54	H	-53.97	-7.75	1.30	-63.02	-13.00	-50.02
107.60	45.23	H	-56.98	-7.77	1.39	-66.14	-13.00	-53.14
260.86	34.36	H	-64.52	-7.90	2.03	-74.45	-13.00	-61.45
400.54	39.88	H	-56.52	-7.66	2.51	-66.69	-13.00	-53.69
485.90	35.00	H	-58.57	-7.71	2.76	-69.05	-13.00	-56.05
621.70	33.09	H	-57.18	-7.80	3.09	-68.07	-13.00	-55.07
1663.00	41.82	H	-62.57	9.33	5.25	-58.49	-13.00	-45.49
2509.80	42.53	H	-58.17	10.09	6.58	-54.67	-13.00	-41.67
3346.40	---	H		12.28	7.79		-13.00	
4183.00	---	H		12.62	8.93		-13.00	
5019.60	---	H		12.67	9.81		-13.00	
5856.20	---	H		13.68	10.62		-13.00	
6692.80	---	H		11.95	11.39		-13.00	
7529.40	---	H		11.45	12.20		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 850 Mode**

Operation Mode : TX CH High Mode      Test Date: Mar. 13, 2011  
 Fundamental Frequency : 848.80 MHz      Test By: Jazz  
 Temperature : 25°C      Pol: Ver  
 Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	44.46	V	-58.35	-7.75	1.30	-67.40	-13.00	-54.40
311.30	34.89	V	-63.22	-7.86	2.21	-73.29	-13.00	-60.29
325.85	36.89	V	-61.04	-7.78	2.27	-71.08	-13.00	-58.08
400.54	38.87	V	-56.61	-7.66	2.51	-66.79	-13.00	-53.79
551.86	34.39	V	-57.99	-7.76	2.96	-68.72	-13.00	-55.72
698.33	32.51	V	-56.91	-7.86	3.29	-68.06	-13.00	-55.06
850.00	81.66	V	-4.45	-7.88	3.68	-16.01	-13.00	-3.01
2546.40	38.72	V	-61.92	10.20	6.63	-58.36	-13.00	-45.36
3395.20	---	V		12.38	7.87		-13.00	
4244.00	---	V		12.63	9.00		-13.00	
5092.80	---	V		12.74	9.88		-13.00	
5941.60	---	V		13.81	10.70		-13.00	
6790.40	---	V		11.86	11.48		-13.00	
7639.20	---	V		11.40	12.27		-13.00	
8488.00	---	V		11.70	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 850 Mode**

Operation Mode : TX CH High Mode      Test Date: Mar. 13, 2011  
 Fundamental Frequency : 848.80 MHz      Test By: Jazz  
 Temperature : 25°C      Pol: Hor  
 Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	44.39	H	-59.12	-7.75	1.30	-68.17	-13.00	-55.17
165.80	32.26	H	-66.74	-7.81	1.63	-76.18	-13.00	-63.18
248.25	33.78	H	-65.53	-7.89	1.98	-75.39	-13.00	-62.39
325.85	34.68	H	-62.74	-7.78	2.27	-72.79	-13.00	-59.79
400.54	38.65	H	-57.75	-7.66	2.51	-67.92	-13.00	-54.92
483.96	36.66	H	-56.93	-7.71	2.76	-67.40	-13.00	-54.40
850.00	81.95	H	-4.24	-7.88	3.68	-15.80	-13.00	-2.80
2546.40	45.63	H	-54.97	10.20	6.63	-51.41	-13.00	-38.41
3395.20	---	H		12.38	7.87		-13.00	
4244.00	---	H		12.63	9.00		-13.00	
5092.80	---	H		12.74	9.88		-13.00	
5941.60	---	H		13.81	10.70		-13.00	
6790.40	---	H		11.86	11.48		-13.00	
7639.20	---	H		11.40	12.27		-13.00	
8488.00	---	H		11.70	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Mode : TX CH Low Mode  
Fundamental Frequency : 1850.20MHz  
Temperature : 25°C  
Humidity : 65%

Test Date: Mar. 13, 2011  
Test By: Jazz  
Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
248.25	36.19	V	-63.77	-7.89	1.98	-73.63	-13.00	-60.63
325.85	38.24	V	-59.69	-7.78	2.27	-69.73	-13.00	-56.73
400.54	39.05	V	-56.43	-7.66	2.51	-66.61	-13.00	-53.61
483.96	34.99	V	-59.08	-7.71	2.76	-69.55	-13.00	-56.55
553.80	34.74	V	-57.53	-7.76	2.97	-68.26	-13.00	-55.26
662.44	33.00	V	-56.05	-7.82	3.19	-67.06	-13.00	-54.06
1850.00	75.30	V	-29.09	9.90	5.56	-24.75	-13.00	-11.75
3700.40	47.99	V	-49.94	12.61	8.31	-45.64	-13.00	-32.64
5550.60	40.01	V	-50.83	13.23	10.33	-47.93	-13.00	-34.93
7400.80	---	V		11.50	12.08		-13.00	
9251.00	---	V		11.92	13.50		-13.00	
11101.20	---	V		11.66	15.11		-13.00	
12951.40	---	V		13.63	16.60		-13.00	
14801.60	---	V		12.76	17.95		-13.00	
16651.80	---	V		15.92	19.14		-13.00	
18502.00	---	V		18.75	10.40		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Mode : TX CH Low Mode  
Fundamental Frequency : 1850.20MHz  
Temperature : 25°C  
Humidity : 65%

Test Date: Mar. 13, 2011  
Test By: Jazz  
Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	38.45	H	-60.55	-7.81	1.63	-69.99	-13.00	-56.99
257.95	34.36	H	-64.61	-7.89	2.02	-74.53	-13.00	-61.53
325.85	34.91	H	-62.51	-7.78	2.27	-72.56	-13.00	-59.56
483.96	35.46	H	-58.13	-7.71	2.76	-68.60	-13.00	-55.60
621.70	33.86	H	-56.41	-7.80	3.09	-67.30	-13.00	-54.30
733.25	32.47	H	-61.38	-7.87	3.41	-72.65	-13.00	-59.65
1850.00	79.29	H	-24.89	9.90	5.56	-20.55	-13.00	-7.55
3700.40	47.38	H	-50.66	12.61	8.31	-46.36	-13.00	-33.36
5550.60	---	H		13.23	10.33		-13.00	
7400.80	---	H		11.50	12.08		-13.00	
9251.00	---	H		11.92	13.50		-13.00	
11101.20	---	H		11.66	15.11		-13.00	
12951.40	---	H		13.63	16.60		-13.00	
14801.60	---	H		12.76	17.95		-13.00	
16651.80	---	H		15.92	19.14		-13.00	
18502.00	---	H		18.75	10.40		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 1880MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
248.25	35.89	V	-64.07	-7.89	1.98	-73.93	-13.00	-60.93
325.85	38.51	V	-59.42	-7.78	2.27	-69.46	-13.00	-56.46
400.54	39.16	V	-56.32	-7.66	2.51	-66.50	-13.00	-53.50
553.80	35.44	V	-56.83	-7.76	2.97	-67.56	-13.00	-54.56
645.95	32.83	V	-56.14	-7.81	3.15	-67.10	-13.00	-54.10
757.50	32.18	V	-54.86	-7.87	3.49	-66.22	-13.00	-53.22
3760.00	40.98	V	-56.68	12.60	8.39	-52.46	-13.00	-39.46
5640.00	47.01	V	-43.57	13.36	10.41	-40.62	-13.00	-27.62
7520.00	---	V		11.45	12.19		-13.00	
9400.00	---	V		11.93	13.61		-13.00	
11280.00	---	V		11.92	15.27		-13.00	
13160.00	---	V		13.33	16.71		-13.00	
15040.00	---	V		13.76	18.15		-13.00	
16920.00	---	V		15.27	19.32		-13.00	
18800.00	---	V		18.68	16.58		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 1880MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
131.85	35.16	H	-64.51	-7.79	1.51	-73.80	-13.00	-60.80
260.86	34.64	H	-64.24	-7.90	2.03	-74.17	-13.00	-61.17
325.85	35.83	H	-61.59	-7.78	2.27	-71.64	-13.00	-58.64
483.96	34.51	H	-59.08	-7.71	2.76	-69.55	-13.00	-56.55
553.80	34.21	H	-57.43	-7.76	2.97	-68.16	-13.00	-55.16
709.00	32.77	H	-56.54	-7.86	3.32	-67.73	-13.00	-54.73
3760.00	38.88	H	-58.89	12.60	8.39	-54.68	-13.00	-41.68
5640.00	41.60	H	-49.15	13.36	10.41	-46.20	-13.00	-33.20
7520.00	---	H		11.45	12.19		-13.00	
9400.00	---	H		11.93	13.61		-13.00	
11280.00	---	H		11.92	15.27		-13.00	
13160.00	---	H		13.33	16.71		-13.00	
15040.00	---	H		13.76	18.15		-13.00	
16920.00	---	H		15.27	19.32		-13.00	
18800.00	---	H		18.68	16.58		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Mode	: TX CH High Mode	Test Date:	Mar. 13, 2011
Fundamental Frequency	: 1909.8 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBUV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	32.60	V	-64.80	-7.80	1.59	-74.20	-13.00	-61.20
253.10	35.95	V	-63.84	-7.89	2.00	-73.73	-13.00	-60.73
400.54	38.64	V	-56.84	-7.66	2.51	-67.02	-13.00	-54.02
485.90	34.12	V	-59.96	-7.71	2.76	-70.44	-13.00	-57.44
553.80	35.08	V	-57.19	-7.76	2.97	-67.92	-13.00	-54.92
726.46	32.33	V	-55.88	-7.87	3.39	-67.13	-13.00	-54.13
1910.03	75.41	V	-28.92	10.08	5.66	-24.50	-13.00	-11.50
3819.60	38.51	V	-58.88	12.60	8.47	-54.75	-13.00	-41.75
5729.40	50.30	V	-40.02	13.49	10.50	-37.02	-13.00	-24.02
7639.20	---	V		11.40	12.27		-13.00	
9549.00	---	V		11.95	13.74		-13.00	
11458.80	---	V		12.17	15.43		-13.00	
13368.60	---	V		12.97	16.82		-13.00	
15278.40	---	V		15.00	18.29		-13.00	
17188.20	---	V		14.47	19.52		-13.00	
19098.00	---	V		18.66	20.78		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

Remark :

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Mode : TX CH High Mode      Test Date: Mar. 13, 2011  
 Fundamental Frequency : 1909.8 MHz      Test By: Jazz  
 Temperature : 25°C      Pol: Hor  
 Humidity : 65%

Freq. (MHz)	SPA Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
131.85	34.83	H	-64.84	-7.79	1.51	-74.13	-13.00	-61.13
257.95	34.64	H	-64.33	-7.89	2.02	-74.25	-13.00	-61.25
325.85	36.35	H	-61.07	-7.78	2.27	-71.12	-13.00	-58.12
400.54	39.06	H	-57.34	-7.66	2.51	-67.51	-13.00	-54.51
485.90	35.78	H	-57.79	-7.71	2.76	-68.27	-13.00	-55.27
648.86	32.45	H	-57.29	-7.81	3.16	-68.26	-13.00	-55.26
1910.02	77.85	H	-26.26	10.08	5.66	-21.84	-13.00	-8.84
3819.60	39.52	H	-57.99	12.60	8.47	-53.85	-13.00	-40.85
5729.40	42.10	H	-48.35	13.49	10.50	-45.36	-13.00	-32.36
7639.20	---	H		11.40	12.27		-13.00	
9549.00	---	H		11.95	13.74		-13.00	
11458.80	---	H		12.17	15.43		-13.00	
13368.60	---	H		12.97	16.82		-13.00	
15278.40	---	H		15.00	18.29		-13.00	
17188.20	---	H		14.47	19.52		-13.00	
19098.00	---	H		18.66	20.78		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 40GHz: 4.45dB

**Remark :**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

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## 8. SPURIOUS RADIATED EMISSION TEST (RX)

### 8.1 Standard Applicable

According to RSS 132 §4.6, all spurious emissions shall comply with the limits of Table 2. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emissions measurements below 1.0 GHz, and 1.0 MHz for measurements above 1.0 GHz.

Frequency (MHz)	Field strength $\mu\text{V}/\text{m}$	Distance (m)	Field strength at 3m $\text{dB}\mu\text{V}/\text{m}$
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

According to RSS 133 §6.6, Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

### 8.2 EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the RSS-Gen.
2. The EUT was put in the front of the test table. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The spacing between the peripherals was 10 centimeters.
4. External I/O cables were draped along the edge of the test table and bundle when necessary.
5. The host was connected with 120Vac/60Hz power source.

### 8.3 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

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#### 8.4 Test SET-UP (Block Diagram of Configuration)

Refer to section 6.2 in this report

#### 8.5 Measurement Equipment Used:

Refer to section 2.4 in this report

#### 8.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

#### 8.7 Measurement Result

Refer to attach tabular data sheets.

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### Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	GPRS850 CH Low Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	824.2MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
141.55	V	Peak	33.88	-13.56	20.32	43.50	-23.18
253.10	V	Peak	35.00	-13.70	21.30	46.00	-24.70
325.85	V	Peak	39.16	-12.41	26.75	46.00	-19.25
400.54	V	Peak	40.42	-9.99	30.43	46.00	-15.57
600.36	V	Peak	32.87	-6.00	26.87	46.00	-19.13
762.35	V	Peak	33.48	-3.95	29.53	46.00	-16.47
146.40	H	Peak	35.89	-13.06	22.83	43.50	-20.67
253.10	H	Peak	34.86	-13.70	21.16	46.00	-24.84
400.54	H	Peak	41.23	-9.99	31.24	46.00	-14.76
483.96	H	Peak	34.54	-8.56	25.98	46.00	-20.02
584.84	H	Peak	35.44	-6.52	28.92	46.00	-17.08
762.35	H	Peak	33.97	-3.95	30.02	46.00	-15.98

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/AV detector mode.
- (3) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	GPRS850 CH Mid Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	836.6 MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
144.46	V	Peak	34.72	-13.21	21.51	43.50	-21.99
253.10	V	Peak	36.15	-13.70	22.45	46.00	-23.55
325.85	V	Peak	38.25	-12.41	25.84	46.00	-20.16
400.54	V	Peak	41.02	-9.99	31.03	46.00	-14.97
485.90	V	Peak	38.81	-8.57	30.24	46.00	-15.76
551.86	V	Peak	38.63	-7.59	31.04	46.00	-14.96
151.25	H	Peak	33.27	-12.89	20.38	43.50	-23.12
264.74	H	Peak	34.51	-13.59	20.92	46.00	-25.08
325.85	H	Peak	37.26	-12.41	24.85	46.00	-21.15
483.96	H	Peak	34.92	-8.56	26.36	46.00	-19.64
584.84	H	Peak	34.78	-6.52	28.26	46.00	-17.74
616.85	H	Peak	33.05	-5.68	27.37	46.00	-18.63

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/AV detector mode.
- (3) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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**Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	GPRS850 CH High Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	848.8MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
151.25	V	Peak	33.54	-12.89	20.65	43.50	-22.85
277.35	V	Peak	34.10	-13.35	20.75	46.00	-25.25
325.85	V	Peak	38.53	-12.41	26.12	46.00	-19.88
483.96	V	Peak	34.84	-8.56	26.28	46.00	-19.72
602.30	V	Peak	33.07	-5.96	27.11	46.00	-18.89
655.65	V	Peak	32.82	-4.97	27.85	46.00	-18.15
158.04	H	Peak	33.36	-13.28	20.08	43.50	-23.42
264.74	H	Peak	35.77	-13.59	22.18	46.00	-23.82
325.85	H	Peak	38.11	-12.41	25.70	46.00	-20.30
400.54	H	Peak	40.48	-9.99	30.49	46.00	-15.51
485.90	H	Peak	34.99	-8.57	26.42	46.00	-19.58
584.84	H	Peak	34.15	-6.52	27.63	46.00	-18.37

**Remark :**

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/AV detector mode.
- (3) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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**Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	GPRS1900 CH Low Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	1850.2MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
167.74	V	Peak	35.19	-13.85	21.34	43.50	-22.16
255.04	V	Peak	36.84	-13.69	23.15	46.00	-22.85
325.85	V	Peak	38.59	-12.41	26.18	46.00	-19.82
400.54	V	Peak	38.89	-9.99	28.90	46.00	-17.10
483.96	V	Peak	34.95	-8.56	26.39	46.00	-19.61
738.10	V	Peak	32.06	-4.45	27.61	46.00	-18.39
131.85	H	Peak	37.02	-14.33	22.69	43.50	-20.81
260.86	H	Peak	36.69	-13.63	23.06	46.00	-22.94
325.85	H	Peak	36.73	-12.41	24.32	46.00	-21.68
485.90	H	Peak	36.39	-8.57	27.82	46.00	-18.18
553.80	H	Peak	36.10	-7.53	28.57	46.00	-17.43
757.50	H	Peak	34.85	-4.06	30.79	46.00	-15.21

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/AV detector mode.
- (3) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	GPRS1900 CH Mid Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	1880.0MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
151.25	V	Peak	33.42	-12.89	20.53	43.50	-22.97
255.04	V	Peak	37.27	-13.69	23.58	46.00	-22.42
400.54	V	Peak	40.14	-9.99	30.15	46.00	-15.85
485.90	V	Peak	35.24	-8.57	26.67	46.00	-19.33
553.80	V	Peak	34.49	-7.53	26.96	46.00	-19.04
791.45	V	Peak	32.60	-3.23	29.37	46.00	-16.63
117.30	H	Peak	36.99	-15.64	21.35	43.50	-22.15
277.35	H	Peak	35.23	-13.35	21.88	46.00	-24.12
325.85	H	Peak	36.30	-12.41	23.89	46.00	-22.11
483.96	H	Peak	37.20	-8.56	28.64	46.00	-17.36
584.84	H	Peak	34.95	-6.52	28.43	46.00	-17.57
762.35	H	Peak	33.13	-3.95	29.18	46.00	-16.82

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/AV detector mode.
- (3) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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**Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	GPRS1900 CH High Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	1909.8MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
127.00	V	Peak	35.33	-14.71	20.62	43.50	-22.88
325.85	V	Peak	38.67	-12.41	26.26	46.00	-19.74
400.54	V	Peak	38.62	-9.99	28.63	46.00	-17.37
553.80	V	Peak	34.31	-7.53	26.78	46.00	-19.22
652.74	V	Peak	33.49	-4.96	28.53	46.00	-17.47
752.65	V	Peak	32.97	-4.24	28.73	46.00	-17.27
165.80	H	Peak	34.09	-13.73	20.36	43.50	-23.14
253.10	H	Peak	35.88	-13.70	22.18	46.00	-23.82
325.85	H	Peak	35.98	-12.41	23.57	46.00	-22.43
400.54	H	Peak	40.67	-9.99	30.68	46.00	-15.32
483.96	H	Peak	34.07	-8.56	25.51	46.00	-20.49
600.36	H	Peak	34.07	-6.00	28.07	46.00	-17.93

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/AV detector mode.
- (3) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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**Radiated Spurious Emission Measurement Result (above 1GHz)**

Operation Mode	GPRS 850 CH Low Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	824.2 MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver. / Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
1648.4	V	35.62	--	-5.22	30.40	--	74.00	54.00	-23.60
2472.6	V	--	--			--	74.00	54.00	
3296.8	V	--	--			--	74.00	54.00	
4121.0	V	--	--			--	74.00	54.00	
4945.2	V	--	--			--	74.00	54.00	
1648.4	H	35.62	--	-5.22	30.40	--	74.00	54.00	-23.60
2472.6	H	--	--			--	74.00	54.00	
3296.8	H	--	--			--	74.00	54.00	
4121.0	H	--	--			--	74.00	54.00	
4945.2	H	--	--			--	74.00	54.00	

**Remark:**

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency °
- (2) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Peak Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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**Radiated Spurious Emission Measurement Result (above 1GHz)**

Operation Mode	GPRS 850 CH Mid Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	836.6MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver. / Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
1673.2	V	35.92	--	-5.11	30.81	--	74.00	54.00	-23.19
2509.8	V	--	--			--	74.00	54.00	
3346.4	V	--	--			--	74.00	54.00	
4183.0	V	--	--			--	74.00	54.00	
5019.6	V	--	--			--	74.00	54.00	
1673.2	H	36.43	--	-5.11	31.32	--	74.00	54.00	-22.68
2509.8	H	--	--			--	74.00	54.00	
3346.4	H	--	--			--	74.00	54.00	
4183.0	H	--	--			--	74.00	54.00	
5019.6	H	--	--			--	74.00	54.00	

Remark:

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency ◦
- (2) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column ◦
- (4) Spectrum Peak Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	GPRS 850 CH High Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	848.8MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver. / Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
1697.6	V	35.72	--	-4.96	30.76	--	74.00	54.00	-23.24
2546.4	V	--	--			--	74.00	54.00	
3395.2	V	--	--			--	74.00	54.00	
4244.0	V	--	--			--	74.00	54.00	
5092.8	V	--	--			--	74.00	54.00	
1697.6	H	36.08	--	-4.96	31.12	--	74.00	54.00	-22.88
2546.4	H	--	--			--	74.00	54.00	
3395.2	H	--	--			--	74.00	54.00	
4244.0	H	--	--			--	74.00	54.00	
5092.8	H	--	--			--	74.00	54.00	

Remark:

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency °
- (2) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Peak Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

### Radiated Spurious Emission Measurement Result (above 1GHz)

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Fundamental Frequency 1850.2MHz  
Temperature 25 °C  
Humidity 65 %

Test By Jazz  
Pol Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
3700.4	V	34.63	--	2.72	37.35	--	74.00	54.00	-16.65
5550.6	V	--	--			--	74.00	54.00	
7400.8	V	--	--			--	74.00	54.00	
9251.0	V	--	--			--	74.00	54.00	
11101.2	V	--	--			--	74.00	54.00	
3700.4	H	34.43	--	2.72	37.15	--	74.00	54.00	-16.85
5550.6	H	--	--			--	74.00	54.00	
7400.8	H	--	--			--	74.00	54.00	
9251.0	H	--	--			--	74.00	54.00	
11101.2	H	--	--			--	74.00	54.00	

Remark:

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency °
- (2) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Peak Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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**Radiated Spurious Emission Measurement Result (above 1GHz)**

Operation Mode	GPRS 1900 CH Mid Mode	Test Date	Mar. 13, 2011
Fundamental Frequency	1880.0MHz	Test By	Jazz
Temperature	25 °C	Pol	Ver. / Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
3760.0	V	33.73	--	2.88	36.61	--	74.00	54.00	-17.39
5640.0	V	--	--			--	74.00	54.00	
7520.0	V	--	--			--	74.00	54.00	
9400.0	V	--	--			--	74.00	54.00	
11280.0	V	--	--			--	74.00	54.00	
3760.0	H	33.91	--	2.88	36.79	--	74.00	54.00	-17.21
5640.0	H	--	--			--	74.00	54.00	
7520.0	H	--	--			--	74.00	54.00	
9400.0	H	--	--			--	74.00	54.00	
11280.0	H	--	--			--	74.00	54.00	

Remark:

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency °
- (2) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Peak Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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**Radiated Spurious Emission Measurement Result (above 1GHz)**

Operation Mode           GPRS 1900 CH High Mode  
Fundamental Frequency   1909.8MHz  
Temperature               25 °C  
Humidity                   65 %

Test Date       Mar. 13, 2011  
Test By         Jazz  
Pol              Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
3819.6	V	34.08	--	3.09	37.17	--	74.00	54.00	-16.83
5729.4	V	--	--			--	74.00	54.00	
7639.2	V	--	--			--	74.00	54.00	
9549.0	V	--	--			--	74.00	54.00	
11458.8	V	--	--			--	74.00	54.00	
3819.6	H	34.12	--	3.09	37.21	--	74.00	54.00	-16.79
5729.4	H	--	--			--	74.00	54.00	
7639.2	H	--	--			--	74.00	54.00	
9549.0	H	--	--			--	74.00	54.00	
11458.8	H	--	--			--	74.00	54.00	

**Remark:**

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency °
- (2) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Peak Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 13GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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