

Report No.: EH/2009/90054 **Issue Date: Oct. 12, 2009** 

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# **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:** Annika

Trade Name: N/A

**Model Name: HSTNN-Q46C** 

**Model Difference:** N/A

FCC ID: J9CGOBI2000-H

IC: 2723A-GOBI2000

**Report No.:** EH/2009/80054

**Issue Date:** Oct. 12, 2009

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

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

**Prepared for: Qualcomm Incorporated** 

5775 Morehouse Dr,San Diego,CA 92121,U.S.A

SGS Taiwan Ltd. Prepared by:

**Electronics & Communication Laboratory** 

No. 134, Wu Kung Rd., Wuku Industrial Zone,

Taipei County, Taiwan.

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# CERTIFICATION OF COMPLIANCE

**Applicant:** Qualcomm Incorporated

5775 Morehouse Dr, San Diego, CA 92121, U.S.A

**Product Description:** Annika

N/A **Trade Name:** 

FCC ID: J9CGOBI2000-H

IC: 2723A-GOBI2000

Model No.: HSTNN-Q46C

**Model Difference:** N/A

File Number: EH/2009/80054

Date of test: Sep. 29, 2009 ~ Oct. 09, 2009

**Date of EUT Received:** Sep. 29, 2009

# 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 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:	Oct. 12, 2009	
ag	Jazz Huang / Engineer		ars)	
Prepared By:	Alex Hsieh / Sr. Engineer	Date:	Oct. 12, 2009	_
Approved By:	Timent Su	Date:	Oct. 12, 2009	
	Vincent Su / Manager			

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# Version

Version No.	Date	Description
00	Oct. 12, 2009	Initial creation of document



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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號



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# **GENERAL INFORMATION**

### **Product Description** 1.1

### General:

Type Name:	Annika
Brand Name:	N/A
Model Name:	HSTNN-Q46C
Model Difference:	N/A
Power Supply:	10.8 Vdc re-chargeable battery or 19.5Vdc by AC/DC power adapter, model: Series HSTNN-DA18

### GSM / WCDMA / CDMA:

GDIVIT WEDIVITATE CONTACT						
	GPRS 850	824.2 - 848.8 MHz				
	EDGE 850	824.2 - 848.8 MHz				
PROP	GPRS 1900	1850.2 – 1909.8 MHz				
Cellular Phone Standards	EDGE 1900	1850.2 – 1909.8 MHz				
Frequency Range	WCDMA/HSUPA/HSDPA Band II	1852.4 – 1907.6 MHz				
	WCDMA/HSUPA/HSDPA Band V	826.4 - 846.6 MHz				
	CDMA2000 Cellular	824.7 MHz – 848.31MHz				
	CDMA2000 PCS	1851.25 MHz – 1908.75MHz				
IMEI	35988102 0115572					
Hardware Version	P3, RevD					
Software Version	3574					
WWAN module FCC ID	Ј9CGOBI2000-Н					
Class II Pemissive change	Adding an HP HSTNN-Q46C series laptop.					

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	22H(GMSK): 824.2 - 848.8 MHz: 248KGXW
	24E(GMSK): 1850.2 – 1909.8 MHz: 250KGXW
	22H(8PSK): 824.2 - 848.8 MHz: 248KG7W
Type of Emission	24E(8PSK): 1850.2 – 1909.8 MHz: 250KG7W
Type of Emission	22H(WCDMA): 826.4 - 846.6 MHz: 4M18F9W
	24E(WCDMA): 1852.4 – 1907.5 MHz: 4M19F9W
	22H(CDMA) 824.7 - 848.31 MHz: 1M28F9W
	24E(CDMA): 1851.25 – 1908.75 MHz: 1M28F9W
	22H(GMSK): 824.2 - 848.8 MHz: 1.919W /32.831dBm
	24E(GMSK): 1850.2 – 1909.8 MHz: 0.874W /29.415dBm
Transmit power	22H(8PSK): 824.2 - 848.8 MHz: 0.555W /27.443dBm
(Conducted Power) Listed	24E(8PSK): 1850.2 – 1909.8 MHz: 0.396W /25.977dBm
in Test Report/Original	22H(WCDMA): 826.4 - 846.6 MHz: 0.262W /24.183dBm
Grant	24E(WCDMA): 1852.4 – 1907.5 MHz: 0.256W /24.082dBm
	22H(CDMA) 824.7 - 848.31 MHz: 0.29W /24.6dBm
	24E(CDMA): 1851.25 – 1908.75 MHz: 0.291W /24.639dBm

This test report applies for GPRS/EDGE 850, GPRS/EDGE 1900, WCDMA/HSUPA/HSDPA Band II, Band V bands, CDMA2000 Cellular and PCS bands.

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

This submittal(s) (test report) is intended for FCC ID: J9CGOBI2000-H filing to comply with Section Part 22 subpart H, Part 24 subpart E of the FCC CFR 47 Rules. And IC: 2723A-GOBI2000 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 5 of RSS-133 and Issue 2 of RSS-Gen.

### **Test Facility** 1.4

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-1

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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# 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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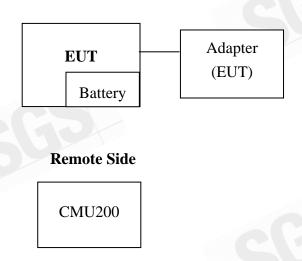


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# **Configuration of Tested System**

Fig. 1-1 Configuration for Radiated Emission



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

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

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### SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	<b>Description Of Test</b>	Result
\$2.1046(a) \$22.913(a)(2) \$24.232(c) \$27.50(d)(2)	§4.8 (RSS-Gen) §4.4 (RSS-132) §6.4 (RSS-133)	ERP/ EIRP measurement	Compliant
\$2.1053 \$22.917(a) \$24.238(a) \$27.53(g)	§4.9 (RSS-Gen) §4.5 (RSS-132) §6.5 (RSS-133)	Field Strength of Spurious Radiation (TX)	Compliant

# **DESCRIPTION OF TEST MODES**

The EUT has been tested under operating condition.

Set EUT power control "all up bits" 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 both GPRS 850 and 1900 bands were reported which has worst data.

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# **ERP/EIRP MEASUREMENT**

# 5.1 Standard Applicable

According to FCC §2.1046

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

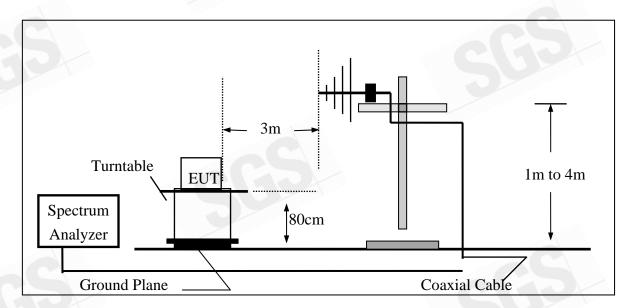
FCC 24.232(c) Mobile station are limited to 2W EIRP.

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.

# **5.2** Test SET-UP (Block Diagram of Configuration)

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



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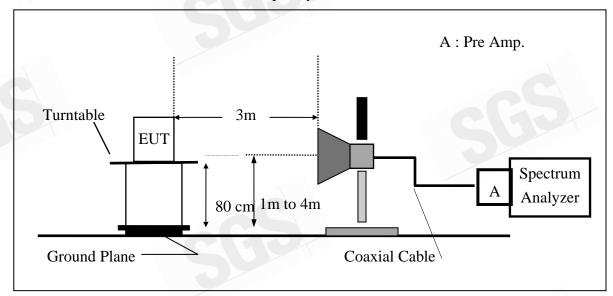


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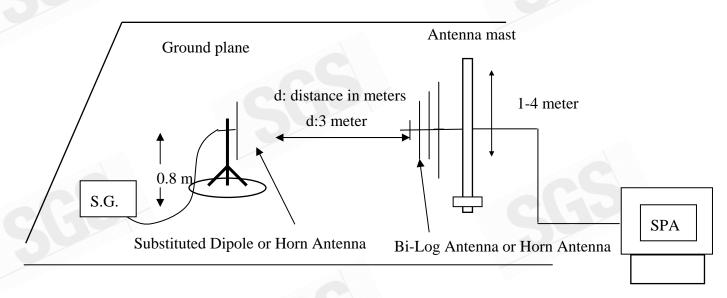
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# (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## Substituted Method Test Set-UP



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## 5.3 Measurement Procedure

The EUT was placed on an 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 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 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:

ERP = S.G. output (dBm) + Antenna Gain (dBd) - Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)

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# 5.4 Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010				
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009				
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2008	07/09/2010				
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2008	07/09/2010				
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2008	01/21/2010				
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010				
Signal Generator	R&S	SMR40	100210	01/22/2008	01/21/2010				
Signal Generator	Agilent	E4438C	MY45093613	06/11/2009	06/10/2010				
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009				
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010				
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010				
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010				
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010				
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010				
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	01/05/2009	01/04/2010				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010				
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2009	01/04/2010				
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2009	01/04/2010				
3m Site	SGS	966 chamber	N/A	11/08/2008	11/09/2009				

### **5.5** Measurement Result

Refer to following pages for detail.

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# **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)								
	924.20	128 190	Н	V	127.74	41.35	-7.87	3.62	29.85	38.45								
	824.20		п	Н	124.42	38.15	-7.87	3.62	26.65	38.45								
GPRS 850	836.60		100	100	100	100	100	100	100	100	Н	V	128.14	41.89	-7.88	3.65	30.36	38.45
GFK3 630	830.00		П	Н	124.96	38.73	-7.88	3.65	27.20	38.45								
848.	848 80	251	Н	V	128.35	42.23	-7.88	3.68	30.67	38.45								
	040.00			Н	125.23	39.04	-7.88	3.68	27.48	38.45								

### Remark:

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

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)		
	1850.20	512	510	510	11	V	124.80	20.41	9.90	5.56	24.75	33.00
	1830.20		Н	Н	125.79	21.61	9.90	5.56	25.95	33.00		
CDDC 1000	1880.00	661	1 H	V	124.98	20.62	9.99	5.61	25.00	33.00		
GPRS 1900				Н	126.87	22.73	9.99	5.61	27.10	33.00		
	1909.80	810	Н	V	125.86	21.53	10.08	5.66	25.95	33.00		
				Н	127.96	23.85	10.08	5.66	28.27	33.00		

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW=1MHz, VBW=1MHz

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# FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT(TX)

### 6.1 **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-133 §6.5

6.5.1 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).

6.5.2 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.

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

Refer to section 5.2 for details

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## **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.

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

ERP = S.G. output (dBm) + Antenna Gain(dBd) - Cable Loss <math>(dB)

EIRP = S.G. output (dBm) + Antenna Gain(dBi) - Cable Loss <math>(dB)

### **Measurement Equipment Used:** 6.4

Refer to section 5.4 for details

#### 6.5 **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: Oct. 07, 2009

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)
36.79	48.56	V	-54.17	-4.16	0.91	-59.24	-13.00	-46.24
92.08	52.04	V	-50.89	-7.75	1.29	-59.93	-13.00	-46.93
96.93	49.39	V	-52.92	-7.76	1.33	-62.01	-13.00	-49.01
177.44	43.14	V	-56.61	-7.82	1.66	-66.09	-13.00	-53.09
823.98	80.49	V	-5.90	-7.87	3.62	-17.40	-13.00	-4.40
1648.40	42.88	V	-61.70	9.29	5.23	-57.64	-13.00	-44.64
2472.60	64.27	V	-36.74	10.08	6.53	-33.19	-13.00	-20.19
3296.80	38.34	V	-60.53	12.17	7.71	-56.08	-13.00	-43.08
4121.00	43.98	V	-52.14	12.61	8.86	-48.39	-13.00	-35.39
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	704	11.48	12.71		-13.00	

	30MHz - 80MHz: 5.04dB						
Measurement uncertainty	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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# Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode : TX CH Low Mode Test Date: Oct. 07, 2009

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)
39.73	47.47	Н	-55.41	-2.78	0.89	-59.08	-13.00	-46.08
56.19	41.79	Н	-67.85	-0.51	1.09	-69.45	-13.00	-56.45
87.23	50.95	Н	-52.75	-7.75	0.91	-61.41	-13.00	-48.41
96.93	45.04	Н	-58.19	-7.76	1.33	-67.28	-13.00	-54.28
230.79	41.60	Н	-58.55	-7.87	1.88	-68.31	-13.00	-55.31
823.98	79.50	Н	-6.77	-7.87	3.62	-18.27	-13.00	-5.27
1648.40	43.22	Н	-61.18	9.29	5.23	-57.12	-13.00	-44.12
2472.60	54.19	Н	-46.72	10.08	6.53	-43.17	-13.00	-30.17
3296.80	34.99	Н	-64.11	12.17	7.71	-59.65	-13.00	-46.65
4121.00	42.19	Н	-54.06	12.61	8.86	-50.31	-13.00	-37.31
4945.20		Н		12.65	9.74		-13.00	
5769.40		Н		13.55	10.54		-13.00	
6593.60		Н		12.05	11.30		-13.00	
7417.80		Н	700	11.49	12.10		-13.00	
8242.00		Н		11.48	12.71		-13.00	

	30MHz - 80MHz: 5.04dB					
Measurement uncertainty	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:
- $4 \text{ ERP/EIRP } (dBm) = SG \text{ Setting}(dBm) + Antenna Gain } (dB/dBi) Cable loss } (dB)$

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台灣檢驗科技股份有限公司



Report No.: EH/2009/90054

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# Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode : TX CH Mid Mode Oct. 07, 2009 Test Date:

Fundamental Frequency: 836.60 MHz Test By: **Jazz** Temperature Pol: Ver : 25°C

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)
38.13	46.70	V	-55.64	-3.53	0.90	-60.07	-13.00	-47.07
92.08	50.77	V	-52.16	-7.75	1.29	-61.20	-13.00	-48.20
96.93	48.08	V	-54.23	-7.76	1.33	-63.32	-13.00	-50.32
1673.20	45.50	V	-59.06	9.36	5.27	-54.96	-13.00	-41.96
2509.80	64.05	V	-36.73	10.09	6.58	-33.23	-13.00	-20.23
3346.40	38.68	V	-60.18	12.28	7.79	-55.70	-13.00	-42.70
4183.00	42.83	V	-53.06	12.62	8.93	-49.37	-13.00	-36.37
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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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台灣檢驗科技股份有限公司



Report No.: EH/2009/90054 **Issue Date: Oct. 12, 2009** 

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# Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode : TX CH Mid Mode Oct. 07, 2009 Test Date:

Fundamental Frequency: 836.60 MHz Test By: Jazz Temperature Pol: : 25°C 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)
39.70	46.12	Н	-56.77	-2.79	0.89	-60.46	-13.00	-47.46
82.38	49.49	Н	-54.13	-7.75	0.29	-62.18	-13.00	-49.18
99.84	46.03	Н	-56.98	-7.76	1.36	-66.10	-13.00	-53.10
174.53	37.76	Н	-61.91	-7.82	1.65	-71.38	-13.00	-58.38
230.79	41.40	Н	-58.75	-7.87	1.88	-68.51	-13.00	-55.51
1673.20	48.68	Н	-55.70	9.36	5.27	-51.60	-13.00	-38.60
2509.80	58.68	Н	-42.02	10.09	6.58	-38.52	-13.00	-25.52
3346.40	34.64	Н	-64.42	12.28	7.79	-59.94	-13.00	-46.94
4183.00	41.51	Н	-54.52	12.62	8.93	-50.83	-13.00	-37.83
5019.60		Н		12.67	9.81		-13.00	
5856.20		Н		13.68	10.62		-13.00	
6692.80		Н		11.95	11.39		-13.00	
7529.40		Н		11.45	12.20		-13.00	
8366.00		Н		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB					
Measurement uncertainty	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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# Radiated Spurious Emission Measurement Result: GPRS 850 Mode

: TX CH High Mode Oct. 07, 2009 Operation Mode Test Date:

Fundamental Frequency: 848.80 MHz Test By: Jazz Temperature Pol: Ver : 25°C

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)
36.79	47.63	V	-55.10	-4.16	0.91	-60.17	-13.00	-47.17
92.08	51.30	V	-51.63	-7.75	1.29	-60.67	-13.00	-47.67
96.93	46.84	V	-55.47	-7.76	1.33	-64.56	-13.00	-51.56
184.23	42.29	V	-58.07	-7.83	1.67	-67.57	-13.00	-54.57
230.79	40.34	V	-60.28	-7.87	1.88	-70.03	-13.00	-57.03
849.03	80.91	V	-5.21	-7.88	3.68	-16.77	-13.00	-3.77
1697.60	52.81	V	-51.73	9.44	5.31	-47.60	-13.00	-34.60
2546.40	60.76	V	-39.88	10.20	6.63	-36.32	-13.00	-23.32
3395.20	35.60	V	-63.25	12.38	7.87	-58.74	-13.00	-45.74
4244.00	36.38	V	-59.28	12.63	9.00	-55.65	-13.00	-42.65
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	9	11.70	12.91		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	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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# Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode : TX CH High Mode Oct. 07, 2009 Test Date:

Fundamental Frequency: 848.80 MHz Test By: Jazz Temperature Pol: : 25°C 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)
38.73	47.46	Н	-55.73	-3.25	0.90	-59.88	-13.00	-46.88
80.44	49.35	Н	-54.25	-7.75	0.04	-62.04	-13.00	-49.04
92.08	48.48	Н	-55.11	-7.75	1.29	-64.15	-13.00	-51.15
96.93	45.63	Н	-57.60	-7.76	1.33	-66.69	-13.00	-53.69
849.00	77.82	Н	-8.37	-7.88	3.68	-19.93	-13.00	-6.93
1697.60	52.29	Н	-52.06	9.44	5.31	-47.93	-13.00	-34.93
2540.50	60.33	Н	-40.28	10.18	6.63	-36.73	-13.00	-23.73
3395.20	35.38	Н	-63.65	12.38	7.87	-59.13	-13.00	-46.13
4244.00	37.86	Н	-57.95	12.63	9.00	-54.33	-13.00	-41.33
5092.80		Н		12.74	9.88		-13.00	
5941.60		Н		13.81	10.70		-13.00	
6790.40		Н		11.86	11.48		-13.00	
7639.20		Н		11.40	12.27		-13.00	
8488.00		Н		11.70	12.91		-13.00	

	30MHz - 80MHz: 5.04dB					
Measurement uncertainty	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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# Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode : TX CH Low Mode Oct. 07, 2009 Test Date:

Fundamental Frequency: 1850.20MHz Test By: Jazz Temperature Pol: Ver : 25°C

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)
36.79	48.09	V	-54.64	-4.16	0.91	-59.71	-13.00	-46.71
92.08	37.75	V	-65.18	-7.75	1.29	-74.22	-13.00	-61.22
96.93	37.07	V	-65.24	-7.76	1.33	-74.33	-13.00	-61.33
230.79	42.23	V	-58.39	-7.87	1.88	-68.14	-13.00	-55.14
1850.00	78.35	V	-26.04	9.90	5.56	-21.70	-13.00	-8.70
3700.40	36.79	V	-61.14	12.61	8.31	-56.84	-13.00	-43.84
5550.60	40.98	V	-49.86	13.23	10.33	-46.96	-13.00	-33.96
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號 f (886-2) 2298-0488



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# Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode : TX CH Low Mode Oct. 07, 2009 Test Date:

Fundamental Frequency: 1850.20MHz Test By: Jazz Temperature Pol: : 25°C 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)
39.70	46.33	Н	-56.56	-2.79	0.89	-60.25	-13.00	-47.25
82.38	49.72	Н	-53.90	-7.75	0.29	-61.95	-13.00	-48.95
92.08	48.82	Н	-54.77	-7.75	1.29	-63.81	-13.00	-50.81
1850.00	77.40	Н	-26.99	9.90	5.56	-22.65	-13.00	-9.65
3700.40	40.61	Н	-57.43	12.61	8.31	-53.13	-13.00	-40.13
5550.60	41.23	Н	-49.82	13.23	10.33	-46.92	-13.00	-33.92
7400.80		Н		11.50	12.08		-13.00	
9251.00		Н		11.92	13.50		-13.00	
11101.20		Н		11.66	15.11		-13.00	
12951.40		Н		13.63	16.60		-13.00	
14801.60		Н		12.76	17.95		-13.00	
16651.80		Н		15.92	19.14		-13.00	
18502.00		Н		18.75	10.40		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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:
- $4 \text{ ERP/EIRP } (dBm) = SG \text{ Setting}(dBm) + Antenna Gain } (dB/dBi) Cable loss } (dB)$

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## Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode : TX CH Mid Mode Test Date: Oct. 07, 2009

Fundamental Frequency: 1880MHz Test By: Jazz Temperature Pol: Ver : 25℃

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)
36.79	47.38	V	-55.35	-4.16	0.91	-60.42	-13.00	-47.42
92.08	50.37	V	-52.56	-7.75	1.29	-61.60	-13.00	-48.60
97.90	45.99	V	-56.20	-7.76	1.34	-65.30	-13.00	-52.30
104.69	43.47	V	-58.02	-7.76	1.38	-67.16	-13.00	-54.16
3760.00	33.98	V	-63.68	12.60	8.39	-59.46	-13.00	-46.46
5640.00	40.28	V	-50.30	13.36	10.41	-47.35	-13.00	-34.35
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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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## Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode : TX CH Mid Mode Test Date: Oct. 07, 2009

Fundamental Frequency: 1880MHz Test By: Jazz Temperature Pol: Hor : 25℃

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)
38.73	47.25	Н	-55.94	-3.25	0.90	-60.09	-13.00	-47.09
82.38	50.34	Н	-53.28	-7.75	0.29	-61.33	-13.00	-48.33
92.08	49.63	Н	-53.96	-7.75	1.29	-63.00	-13.00	-50.00
3760.00	36.54	Н	-61.23	12.60	8.39	-57.02	-13.00	-44.02
5640.00	38.88	Н	-51.87	13.36	10.41	-48.92	-13.00	-35.92
7520.00		Н		11.45	12.19		-13.00	
9400.00		Н		11.93	13.61		-13.00	
11280.00		Н		11.92	15.27		-13.00	
13160.00		Н		13.33	16.71		-13.00	
15040.00		Н		13.76	18.15		-13.00	
16920.00		Н		15.27	19.32		-13.00	
18800.00		Н		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號.



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

Operation Mode : TX CH High Mode Oct. 07, 2009

Fundamental Frequency: 1909.8 MHz Test By: Jazz Temperature Pol: Ver : 25℃

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)
36.79	47.11	V	-55.62	-4.16	0.91	-60.69	-13.00	-47.69
92.08	50.34	V	-52.59	-7.75	1.29	-61.63	-13.00	-48.63
96.93	47.02	V	-55.29	-7.76	1.33	-64.38	-13.00	-51.38
104.69	43.53	V	-57.96	-7.76	1.38	-67.10	-13.00	-54.10
1910.00	79.12	V	-25.21	10.08	5.66	-20.79	-13.00	-7.79
3819.60	41.34	V	-56.05	12.60	8.47	-51.92	-13.00	-38.92
5729.40	46.47	V	-43.85	13.49	10.50	-40.85	-13.00	-27.85
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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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### Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode : TX CH High Mode Oct. 07, 2009

Fundamental Frequency: 1909.8 MHz Test By: Jazz Temperature Pol: Hor : 25℃

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)
38.73	46.58	Н	-56.61	-3.25	0.90	-60.76	-13.00	-47.76
80.44	49.18	Н	-54.42	-7.75	0.04	-62.21	-13.00	-49.21
92.08	46.88	Н	-56.71	-7.75	1.29	-65.75	-13.00	-52.75
96.93	43.80	Н	-59.43	-7.76	1.33	-68.52	-13.00	-55.52
1910.00	81.34	Н	-22.77	10.08	5.66	-18.35	-13.00	-5.35
3819.60	41.56	Н	-55.95	12.60	8.47	-51.81	-13.00	-38.81
5729.40	41.26	Н	-49.19	13.49	10.50	-46.20	-13.00	-33.20
7639.20		Н		11.40	12.27		-13.00	
9549.00		Н		11.95	13.74		-13.00	
11458.80		Н		12.17	15.43		-13.00	
13368.60		Н		12.97	16.82		-13.00	
15278.40		Н		15.00	18.29		-13.00	
17188.20		Н		14.47	19.52		-13.00	
19098.00		Н		18.66	20.78		-13.00	

	30MHz - 80MHz: 5.04dB
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### Remark:

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