Report No.: EH/2010/60009 Issue Date: Jun. 29, 2010

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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E CLASS II PC REPORT

For

Product Description: 3.5G Wireless PCI Express Module

Trade Name: Acer

Model Name of Host: NAV70

Model Difference of Host: NA

Model No. for WWAN

Module

FCC: F3307

FCC ID: VV7-MBMF33072-A

**Report No.:** EH/2010/60009

**Issue Date: Jun. 29, 2010** 

FCC Rule Part: 2, 22H & 24E

Prepared for: Ericsson AB

Lindholmspiren 11

SE-417 56 Gothenburg

Sweden

Prepared by: SGS Taiwan Ltd.

**Electronics & Communication Laboratory** 

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

County, Taiwan.

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# CERTIFICATION OF COMPLIANCE

Ericsson AB **Applicant:** 

> Lindholmspiren 11 SE-417 56 Gothenburg

Sweden

3.5G Wireless PCI Express Module **Product Description:** 

Trade Name of host:

VV7-MBMF33072-A FCC ID:

NAV70 Model No of the host

**Model Difference** 

NA

of Host:

Model No. for WWAN

FCC: F3307 Modular:

**File Number:** EH/2010/60009

Date of test: Jun. 10, 2010 ~ Jun. 24, 2010

**Date of EUT Received:** Jun. 09, 2010

## 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 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.

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

Test By:	Jason We	Date:	Jun. 29, 2010	
Prepared By:	Jason Chang / Asst. Supervisor	Date:	Jun. 29, 2010	
Approved By:	Alex Chen /Project Engineer  Time Vincent Su / Manager	Date:	Jun. 29, 2010	

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# Version

Version No.	Date	Description
00	Jun. 29, 2010	Initial creation of document



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## **GENERAL INFORMATION**

#### 1.1 **Description**

#### **General Information of Notebook**

WWAN Module Name:	3.5G Wireless PCI Express Module		
WWAN Module Model No.:	F3307		
Host Name:	Notebook Computer		
Brand Name of Host:	Acer		
Model Name of Host:	NAV70		
Model Difference of Host:	NA		
	11.1 Vdc I	Li-Ion battery or 19Vdc from AC/DC adapter	
Power Supply:	Battery:	Model No.:AL10B31 Supplier: SANYO	
	Adapter :	Model: ADP-40THA supplier: DELTA ELECTRONICS, INC	



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## **GSM / WCDMA / CDMA:**

h				
	GSM / GPRS 850, Class 10	824.2 MHz- 848.8 MHz	33 dBm	
	EDGE 850, Class 10	824.2 MHz- 848.8 MHz	27 dBm	
	GSM / GPRS 900, Class 10	880.2MHz – 914.8MH	33 dBm	
	EDGE 900, Class 10	880.2MHz – 914.8MH	27 dBm	
Cellular Phone Standards	GSM / GPRS 1800, Class 10	1710.2MHz-1784.8MHz	30 dBm	
Frequency Range:	EDGE 1800, Class 10	1710.2MHz-1784.8MHz	26 dBm	
	GSM / GPRS 1900, Class 10	1850.2MHz – 1909.8MHz	30 dBm	
	EDGE 1900, Class 10	1850.2MHz – 1909.8MHz	26 dBm	
	WCDMA/HSUPA/HSDPA Band I	1922.4MHz-1977.6MHz	24 dBm	
	WCDMA/HSUPA/HSDPA Band VIII	882.4MHz – 912.6MHz	24 dBm	
IMEI:	358828030027108			
Hardware Version:	R1			
Software Version:	R1K06			
WWAN module FCC ID:	VV7-MBMF33072-A			
Class II Permissive change:	Adding 3.5G Wireless PCI Express computer for the corresponding bran		notebook	
Type of Emission:	22H(GMSK): 824.2 - 848.8 MHz: 300KGXW 22H(8PSK): 824.2 - 848.8 MHz: 300KG7W 24E(GMSK): 1850.2 – 1909.8 MHz: 300KGXW 24E(8PSK): 1850.2 – 1909.8 MHz: 300KG7W			
Transmit power (Conducted Power) Listed in Test Report/Original Grant:	22H(GMSK): 824.2 - 848.8 MHz: 2.24 W/33.5dBm 22H(8PSK): 824.2 - 848.8 MHz: 2.24 W/33.5dBm 24E(GMSK): 1850.2 – 1909.8 MHz: 1.03 W/30.1dBm 24E(8PSK): 1850.2 – 1909.8 MHz: 1.02 W/30.0dBm			

This test report applies for GPRS/EDGE 850, GPRS/EDGE 1900

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

This submittal(s) (test report) is intended for FCC ID: VV7-MBMF33072-A filing to comply with Section Part 22 subpart H, Part 24 subpart E of the FCC CFR 47 Rules.

#### 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

#### **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-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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#### 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 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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# 2.4 Configuration of Tested System

Fig. 1-1 Configuration for Radiated Emission

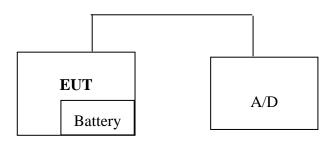
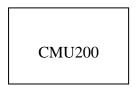


Fig. 1-2Configuration (Remote Side, on the corner)



**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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## SUMMARY OF TEST RESULTS

FCC Rules	<b>Description Of Test</b>	Result
24.232(C)	RF Power output / Maxmum	Compliant
22.913(a)(2)	power reduction measurement	Compilant
§2.1046(a)		
§22.913(a)(2)	ERP/ EIRP measurement	Compliant
§24.232(c)		
§2.1053	Field Strength of Spurious	
§22.917(a)	Radiation	Compliant
§24.238(a)		

## DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Set EUT power control "Max Power" 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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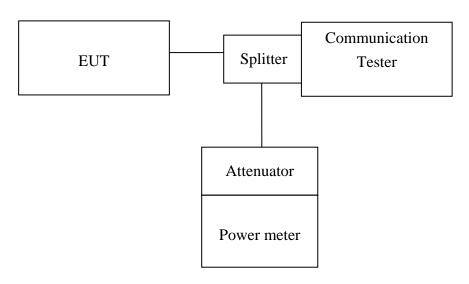
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#### RF POWER OUTPUT/ MAXMUM POWER REDUCTION MEASUREMENT

## 5.1 Standard Applicable:

FCC 24.232(C) Peak Power Measurement, 22.913(a)(2)

# 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 reaing. It was used for EUT and Base station setting.

## 5.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 5.5 Measurement Result:

GPRS850	1Dn1UP		1Dn2UP	
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 128	33.11	33.02	33.01	33.00
CH 190	33.20	32.13	33.05	33.00
CH 251	33.41	32.34	33.33	33.25

EDGE850	1Dn1UP		1Dn2UP		
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)	
CH 128	33.20	30.00	33.13	29.90	
CH 190	33.10	30.00	33.08	30.10	
CH 251	33.34	30.23	33.30	30.40	

GPRS1900	1Dn1UP		1Dn2UP		
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)	
CH 512	29.50	29.40	29.44	29.30	
CH 661	29.30	29.20	29.20	29.10	
CH 810	29.35	29.20	29.20	29.15	

EDGE1900	1Dn1UP		1Dn2UP		
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)	
CH 512	29.50	26.20	29.30	26.30	
CH 661	29.30	26.30	29.20	26.20	
CH 810	29.30	26.30	29.00	26.00	

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## 6. ERP/EIRP MEASUREMENT

# 6.1 Standard Applicable

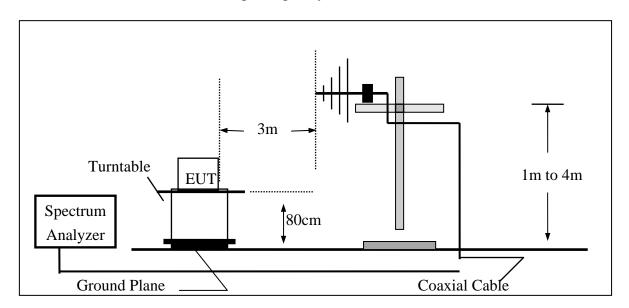
According to FCC §2.1046

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

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

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

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



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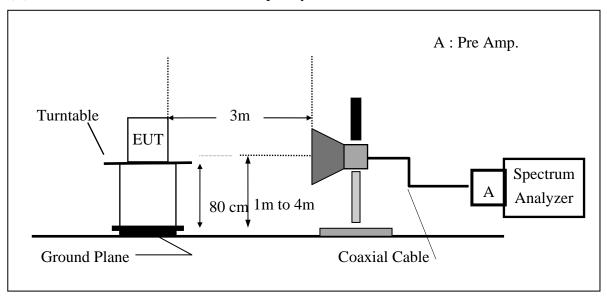
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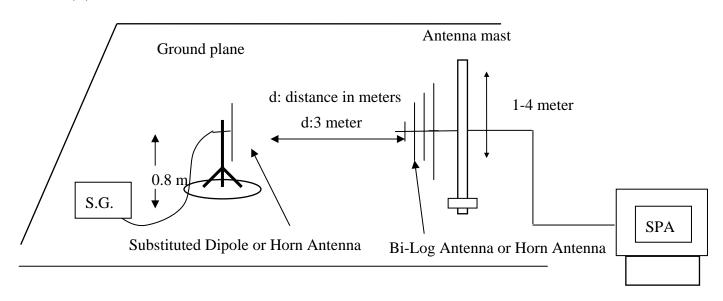
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## (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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#### **6.3** 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 <math>(dBi) - Cable Loss (dB)



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# 6.4 Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011	
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2009	11/14/2010	
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	01/22/2010	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	01/21/2011	
Signal Generator	Agilent	E4438C	MY45093613	06/11/2010	06/10/2011	
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2009	11/29/2010	
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011	
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	05/13/2010	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	01/05/2010	01/04/2011	
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011	
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2010	01/04/2011	
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2010	01/04/2011	
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010	

## 6.5 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 (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)		
	824.20	128	11	V	125.11	38.72	-7.87	3.62	27.22	38.45		
	024.20	120	Н	Н	127.63	41.36	-7.87	3.62	29.86	38.45		
GPRS 850	836.60	836.60 190 848.80 251	190	100	**	V	123.42	37.17	-7.88	3.65	25.64	38.45
GI KS 650	830.00			190 H	Н	126.09	39.86	-7.88	3.65	28.33	38.45	
	848 80			V	122.70	36.58	-7.88	3.68	25.02	38.45		
	848.80	231	Н	Н	126.09	39.90	-7.88	3.68	28.34	38.45		

#### Remark:

The RBW, VBW of SPA for frequency (1) 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	**	V	122.83	18.44	9.90	5.56	22.78	33.00
	1030.20	312	Н	Н	123.40	19.22	9.90	5.84	23.28	33.00
GPRS 1900	1880.00	661	51 H	V	120.57	16.21	9.99	5.61	20.59	33.00
GFK3 1900	1000.00	661		Н	121.92	17.78	9.99	5.61	22.15	33.00
	1909.80	1000 00 010	810 H	V	120.50	16.17	10.08	5.66	20.59	33.00
		810		Н	121.25	17.14	10.08	5.66	21.56	33.00

#### Remark:

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

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#### 7. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

# 7.1 Standard Applicable

According to FCC §2.1053,

FCC  $\S22.917(a),\S24.238(a)$  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)

## 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 frequencies (low, middle and high channels). Once spurious emission was 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.

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

EIRP = S.G. output (dBm) + Antenna Gain(dBi) – 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 Jun. 22, 2010

Fundamental Frequency : 824.20 MHz Test By: Jason **Temperature** Pol: Ver : 25°℃

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
53.28	41.57	V	-66.84	-0.55	1.11	-68.50	-13.00	-55.50
106.63	46.11	V	-55.20	-7.77	1.39	-64.35	-13.00	-51.35
327.79	42.47	V	-55.44	-7.76	2.28	-65.48	-13.00	-52.48
417.03	44.80	V	-50.17	-7.67	2.56	-60.40	-13.00	-47.40
458.74	39.84	V	-54.13	-7.70	2.68	-64.51	-13.00	-51.51
526.64	38.52	V	-54.74	-7.74	2.89	-65.37	-13.00	-52.37
824.00	79.26	V	-7.13	-7.87	3.62	-18.63	-13.00	-5.63
1648.40	51.34	V	-53.24	9.29	5.23	-49.18	-13.00	-36.18
2472.60	57.10	V	-43.91	10.08	6.53	-40.36	-13.00	-27.36
3296.80		V					-13.00	
4121.00	38.72	V	-57.40	12.61	8.86	-53.65	-13.00	-40.65
4945.20		V					-13.00	
5769.40		V					-13.00	
6593.60		V					-13.00	
7417.80		V					-13.00	
8242.00		V					-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 850 Mode

Operation Mode : TX CH Low Mode Jun. 22, 2010

Fundamental Frequency : 824.20 MHz Test By: Jason **Temperature** Pol: Hor : 25°℃

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
46.49	39.33	Н	-66.26	-1.32	1.05	-68.63	-13.00	-55.63
155.13	37.10	Н	-61.07	-7.80	1.60	-70.47	-13.00	-57.47
261.83	38.31	Н	-60.54	-7.90	2.03	-70.47	-13.00	-57.47
419.94	43.89	Н	-51.53	-7.68	2.57	-61.77	-13.00	-48.77
460.68	39.49	Н	-54.31	-7.70	2.69	-64.70	-13.00	-51.70
523.73	39.65	Н	-52.98	-7.74	2.88	-63.59	-13.00	-50.59
824.00	79.67	Н	-6.60	-7.87	3.62	-18.10	-13.00	-5.10
1648.40	58.68	Н	-45.72	9.29	5.23	-41.66	-13.00	-28.66
2472.60	54.68	Н	-46.23	10.08	6.53	-42.68	-13.00	-29.68
3296.80		Н					-13.00	
4121.00	39.17	Н	-57.08	12.61	8.86	-53.33	-13.00	-40.33
4945.20		Н					-13.00	
5769.40		Н					-13.00	
6593.60		Н					-13.00	
7417.80		Н					-13.00	
8242.00		Н					-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 850 Mode

Operation Mode : TX CH Mid Mode Test Date: Jun. 22, 2010

Fundamental Frequency : 836.60 MHz Test By: Jason Temperature :  $25^{\circ}$ C Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
53.28	42.06	V	-66.35	-0.55	1.11	-68.01	-13.00	-55.01
106.63	46.75	V	-54.56	-7.77	1.39	-63.71	-13.00	-50.71
327.79	42.09	V	-55.82	-7.76	2.28	-65.86	-13.00	-52.86
412.18	44.70	V	-50.42	-7.67	2.55	-60.63	-13.00	-47.63
458.74	40.89	V	-53.08	-7.70	2.68	-63.46	-13.00	-50.46
523.73	39.43	V	-53.93	-7.74	2.88	-64.54	-13.00	-51.54
1673.20	48.35	V	-56.21	9.36	5.27	-52.11	-13.00	-39.11
2509.80	48.47	V	-52.31	10.09	6.58	-48.81	-13.00	-35.81
3346.40		V					-13.00	
4183.00		V					-13.00	
5019.60		V					-13.00	
5856.20		V					-13.00	
6692.80		V					-13.00	
7529.40		V					-13.00	
8366.00		V					-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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Issue Date: Jun. 29, 2010

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

Operation Mode : TX CH Mid Mode Test Date: Jun. 22, 2010

Fundamental Frequency: 836.60 MHz Test By: Jason Temperature Pol: Hor : 25°℃

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
46.49	39.93	Н	-65.66	-1.32	1.05	-68.03	-13.00	-55.03
130.88	39.94	Н	-59.83	-7.78	1.50	-69.12	-13.00	-56.12
327.79	38.57	Н	-58.83	-7.76	2.28	-68.87	-13.00	-55.87
419.94	42.55	Н	-52.87	-7.68	2.57	-63.11	-13.00	-50.11
458.74	39.59	Н	-54.22	-7.70	2.68	-64.61	-13.00	-51.61
523.73	41.53	Н	-51.10	-7.74	2.88	-61.71	-13.00	-48.71
1673.20	47.11	Н	-57.27	9.36	5.27	-53.17	-13.00	-40.17
2509.80	53.95	Н	-46.75	10.09	6.58	-43.25	-13.00	-30.25
3346.40		Н					-13.00	
4183.00	37.92	Н	-58.11	12.62	8.93	-54.42	-13.00	-41.42
5019.60		Н					-13.00	
5856.20		Н					-13.00	
6692.80		Н					-13.00	
7529.40		Н					-13.00	
8366.00		Н					-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 Test Date: Jun. 22, 2010

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

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
62.98	42.26	V	-69.19	-0.64	1.10	-70.93	-13.00	-57.93
106.63	45.97	V	-55.34	-7.77	1.39	-64.49	-13.00	-51.49
327.79	40.71	V	-57.20	-7.76	2.28	-67.24	-13.00	-54.24
417.03	44.84	V	-50.13	-7.67	2.56	-60.36	-13.00	-47.36
458.74	38.32	V	-55.65	-7.70	2.68	-66.03	-13.00	-53.03
523.73	38.35	V	-55.01	-7.74	2.88	-65.62	-13.00	-52.62
849.01	76.16	V	-9.96	-7.88	3.68	-21.52	-13.00	-8.52
1697.60	51.68	V	-52.86	9.44	5.31	-48.73	-13.00	-35.73
2546.40	54.17	V	-46.47	10.20	6.63	-42.91	-13.00	-29.91
3395.20		V					-13.00	
4244.00	36.50	V	-59.16	12.63	9.00	-55.53	-13.00	-42.53
5092.80		V					-13.00	
5941.60		V					-13.00	
6790.40		V					-13.00	
7639.20		V					-13.00	
8488.00		V					-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 Test Date: Jun. 22, 2010

Fundamental Frequency :  $848.80 \, \text{MHz}$  Test By: Jason Temperature :  $25 \, ^{\circ} \text{C}$  Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
46.49	40.74	Н	-64.85	-1.32	1.05	-67.22	-13.00	-54.22
130.88	39.20	Н	-60.57	-7.78	1.50	-69.86	-13.00	-56.86
298.69	38.13	Н	-59.57	-7.92	2.17	-69.66	-13.00	-56.66
412.18	42.68	Н	-53.13	-7.67	2.55	-63.35	-13.00	-50.35
458.74	40.19	Н	-53.62	-7.70	2.68	-64.01	-13.00	-51.01
526.64	37.73	Н	-54.80	-7.74	2.89	-65.42	-13.00	-52.42
849.02	80.10	Н	-6.09	-7.88	3.68	-17.65	-13.00	-4.65
1697.60	48.61	Н	-55.74	9.44	5.31	-51.61	-13.00	-38.61
2546.40	54.40	Н	-46.20	10.20	6.63	-42.64	-13.00	-29.64
3395.20		Н					-13.00	
4244.00	37.39	Н	-58.42	12.63	9.00	-54.80	-13.00	-41.80
5092.80		Н					-13.00	
5941.60		Н					-13.00	
6790.40		Н					-13.00	
7639.20		Н					-13.00	
8488.00		Н					-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 Test Date: Jun. 22, 2010

Fundamental Frequency: 1850.20MHz Test By: Jason Temperature Pol: Ver : 25℃

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
106.63	49.06	V	-52.25	-7.77	1.39	-61.40	-13.00	-48.40
327.79	42.69	V	-55.22	-7.76	2.28	-65.26	-13.00	-52.26
412.18	45.58	V	-49.54	-7.67	2.55	-59.75	-13.00	-46.75
458.74	40.63	V	-53.34	-7.70	2.68	-63.72	-13.00	-50.72
526.64	38.90	V	-54.36	-7.74	2.89	-64.99	-13.00	-51.99
824.43	37.76	V	-48.63	-7.87	3.62	-60.12	-13.00	-47.12
1364.00	41.75	V	-63.55	8.06	3.63	-59.11	-13.00	-46.11
1850.00	76.96	V	-27.43	9.90	5.56	-23.09	-13.00	-10.09
2323.00	41.40	V	-60.63	10.16	6.30	-56.77	-13.00	-43.77
3700.40	43.39	V	-54.54	12.61	8.31	-50.24	-13.00	-37.24
5550.60	54.25	V	-36.59	13.23	10.33	-33.69	-13.00	-20.69
7400.80		V					-13.00	
9251.00		V					-13.00	
11101.20		V					-13.00	
12951.40		V					-13.00	
14801.60		V					-13.00	
16651.80		V					-13.00	
18502.00		V					-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 Test Date: Jun. 22, 2010

Fundamental Frequency: 1850.20MHz Test By: Jason Temperature Pol: Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
90.14	45.78	Н	-57.95	-7.75	1.27	-66.97	-13.00	-53.97
298.69	39.49	Н	-58.21	-7.92	2.17	-68.30	-13.00	-55.30
412.18	43.32	Н	-52.49	-7.67	2.55	-62.71	-13.00	-49.71
460.68	40.00	Н	-53.80	-7.70	2.69	-64.19	-13.00	-51.19
526.65	40.78	Н	-51.75	-7.74	2.89	-62.37	-13.00	-49.37
837.04	35.02	Н	-51.21	-7.88	3.65	-62.74	-13.00	-49.74
1364.00	42.11	Н	-63.08	8.06	3.63	-58.65	-13.00	-45.65
1849.99	76.05	Н	-28.13	9.90	5.56	-23.79	-13.00	-10.79
2323.00	40.41	Н	-61.48	10.16	6.30	-57.62	-13.00	-44.62
3700.40	45.50	Н	-52.54	12.61	8.31	-48.24	-13.00	-35.24
5550.60	46.97	Н	-44.08	13.23	10.33	-41.18	-13.00	-28.18
7400.80		Н					-13.00	
9251.00		Н					-13.00	
11101.20		Н					-13.00	
12951.40		Н					-13.00	
14801.60		Н					-13.00	
16651.80		Н					-13.00	
18502.00		Н					-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
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- 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 Jun. 22, 2010

Fundamental Frequency: 1880MHz Test By: Jason Temperature Pol: Ver : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
106.63	47.48	V	-53.83	-7.77	1.39	-62.98	-13.00	-49.98
329.73	42.37	V	-55.51	-7.75	2.28	-65.55	-13.00	-52.55
417.03	46.83	V	-48.14	-7.67	2.56	-58.37	-13.00	-45.37
458.74	40.73	V	-53.24	-7.70	2.68	-63.62	-13.00	-50.62
526.64	40.33	V	-52.93	-7.74	2.89	-63.56	-13.00	-50.56
837.04	37.93	V	-48.32	-7.88	3.65	-59.85	-13.00	-46.85
2358.00	40.69	V	-61.10	10.14	6.35	-57.31	-13.00	-44.31
3760.00	42.33	V	-55.33	12.60	8.39	-51.11	-13.00	-38.11
5640.00		V					-13.00	
7520.00		V					-13.00	
9400.00		V					-13.00	
11280.00		V					-13.00	
13160.00		V					-13.00	
15040.00		V					-13.00	
16920.00		V					-13.00	
18800.00		V					-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

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Report No.: EH/2010/60009 Issue Date: Jun. 29, 2010

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

Operation Mode : TX CH Mid Mode Jun. 22, 2010

Fundamental Frequency: 1880MHz Test By: Jason Temperature Pol: Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
90.14	44.90	Н	-58.83	-7.75	1.27	-67.85	-13.00	-54.85
261.83	39.59	Н	-59.26	-7.90	2.03	-69.19	-13.00	-56.19
412.18	44.02	Н	-51.79	-7.67	2.55	-62.01	-13.00	-49.01
458.74	41.06	Н	-52.75	-7.70	2.68	-63.14	-13.00	-50.14
523.73	40.46	Н	-52.17	-7.74	2.88	-62.78	-13.00	-49.78
824.43	36.02	Н	-50.25	-7.87	3.62	-61.75	-13.00	-48.75
1399.00	41.96	Н	-63.07	8.26	3.97	-58.79	-13.00	-45.79
2358.00	39.78	Н	-61.88	10.14	6.35	-58.09	-13.00	-45.09
3760.00	39.56	Н	-58.21	12.60	8.39	-54.00	-13.00	-41.00
5640.00	38.34	Н	-52.41	13.36	10.41	-49.46	-13.00	-36.46
7520.00		Н					-13.00	
9400.00		Н					-13.00	
11280.00		Н					-13.00	
13160.00		Н					-13.00	
15040.00		Н					-13.00	
16920.00		Н					-13.00	
18800.00		Н					-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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Report No.: EH/2010/60009 Issue Date: Jun. 29, 2010

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## Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode : TX CH High Mode Test Date: Jun. 22, 2010

Fundamental Frequency: 1909.8 MHz Test By: Jason Temperature Pol: Ver : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
106.63	48.13	V	-53.18	-7.77	1.39	-62.33	-13.00	-49.33
327.79	42.92	V	-54.99	-7.76	2.28	-65.03	-13.00	-52.03
419.94	45.42	V	-49.45	-7.68	2.57	-59.70	-13.00	-46.70
523.73	39.32	V	-54.04	-7.74	2.88	-64.65	-13.00	-51.65
827.34	37.93	V	-48.42	-7.88	3.63	-59.93	-13.00	-46.93
902.03	37.36	V	-47.38	-7.95	3.79	-59.13	-13.00	-46.13
1483.00	40.42	V	-64.38	8.74	4.81	-60.45	-13.00	-47.45
1910.01	74.21	V	-30.12	10.08	5.66	-25.70	-13.00	-12.70
2379.00	40.93	V	-60.72	10.13	6.39	-56.97	-13.00	-43.97
3819.60	40.30	V	-57.09	12.60	8.47	-52.96	-13.00	-39.96
5729.40	35.80	V	-54.52	13.49	10.50	-51.52	-13.00	-38.52
7639.20		V					-13.00	
9549.00		V					-13.00	
11458.80		V					-13.00	
13368.60		V					-13.00	
15278.40		V					-13.00	
17188.20		V					-13.00	
19098.00		V					-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 High Mode Test Date: Jun. 22, 2010

Fundamental Frequency : 1909.8 MHz Test By: Jason Temperature :  $25^{\circ}$ C Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
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261.83	40.44	Н	-58.41	-7.90	2.03	-68.34	-13.00	-55.34
419.94	43.20	Н	-52.22	-7.68	2.57	-62.46	-13.00	-49.46
458.74	40.54	Н	-53.27	-7.70	2.68	-63.66	-13.00	-50.66
526.64	40.72	Н	-51.81	-7.74	2.89	-62.43	-13.00	-49.43
827.34	35.79	Н	-50.47	-7.88	3.63	-61.97	-13.00	-48.97
1483.00	43.12	Н	-61.53	8.74	4.81	-57.60	-13.00	-44.60
1910.02	75.64	Н	-28.47	10.08	5.66	-24.05	-13.00	-11.05
2323.00	40.95	Н	-60.94	10.16	6.30	-57.08	-13.00	-44.08
3819.60	38.64	Н	-58.87	12.60	8.47	-54.73	-13.00	-41.73
5729.40	35.10	Н	-55.35	13.49	10.50	-52.36	-13.00	-39.36
7639.20		Н					-13.00	
9549.00		Н					-13.00	
11458.80		Н					-13.00	
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