





# TABLE OF CONTENTS

**REVISION HISTORY..... 3**

**SUMMARY OF TEST RESULT ..... 4**

**1 GENERAL DESCRIPTION ..... 5**

    1.1 Applicant..... 5

    1.2 Manufacturer ..... 5

    1.3 Feature of Equipment Under Test..... 6

    1.4 Testing Site..... 7

    1.5 Applied Standards ..... 7

    1.6 Ancillary Equipment List..... 7

**2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 8**

    2.1 Test Mode..... 8

    2.2 Connection Diagram of Test System ..... 9

**3 TEST RESULT..... 10**

    3.1 Effective Radiated Power and Effective Isotropic Radiated Power Measurement ..... 10

    3.2 Field Strength of Spurious Radiation Measurement ..... 16

**4 LIST OF MEASURING EQUIPMENT ..... 22**

**5 UNCERTAINTY OF EVALUATION ..... 23**

**APPENDIX A. PHOTOGRAPHS OF EUT**

**APPENDIX B. SETUP PHOTOGRAPHS**

**APPENDIX C. ORIGINAL REPORT**





### SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.1	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 23.85 dB at 2509.00 MHz



# **1 General Description**

## **1.1 Applicant**

**Trimble Navigation Ltd.**

935 Stewart Drive, Sunnyvale, CA 94088-3642 U.S.A.

## **1.2 Manufacturer**

**GOLDTEK Technology Co., Ltd.**

3F., No. 3, Ln. 768, Sec. 4, Pateh Rd., Taipei 115, Taiwan, R.O.C.



### 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	PDA
Brand Name	Trimble
Model Name	Juno SD
FCC ID	JUP66420
Integrated WWAN Module	Brand Name : CINTERION Model Name : HC25 HW Version : B2.12.1 SW Version : Revision 02.050 (SV 15)
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band V : 824 MHz ~ 849 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band V : 869 MHz ~ 894 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 31.43 dBm GSM1900 : 28.88 dBm WCDMA Band V : 21.93 dBm WCDMA Band II : 22.49 dBm
Maximum ERP/EIRP	GSM850 (GPRS 8) : 1.04 W (30.18 dBm) GSM850 (EDGE 8) : 0.37 W (25.66 dBm) GSM1900 (GPRS 8) : 1.97 W (32.95 dBm) GSM1900 (EDGE 8) : 1.25 W (30.98 dBm) WCDMA Band V (HSDPA) : 0.12 W (20.79 dBm) WCDMA Band II (HSDPA) : 0.65 W (28.12 dBm)
Antenna Type	Fixed Internal Antenna
HW Version	1.0
SW Version	1.0
Type of Modulation	GSM / GPRS : GMSK EDGE : 8PSK WCDMA : QPSK HSDPA : QPSK / 16QAM
EUT Stage	Identical Prototype

**Remark:**

1. For other wireless features of this EUT, the test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	TH02-HY	03CH07-HY	TW1022/4086B-1

## 1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850.
2. 30 MHz to 19000 MHz for GSM1900

Test Modes	
Band	Radiated TCs
GSM 850	■ GPRS 8 Link
GSM 1900	■ GPRS 8 Link

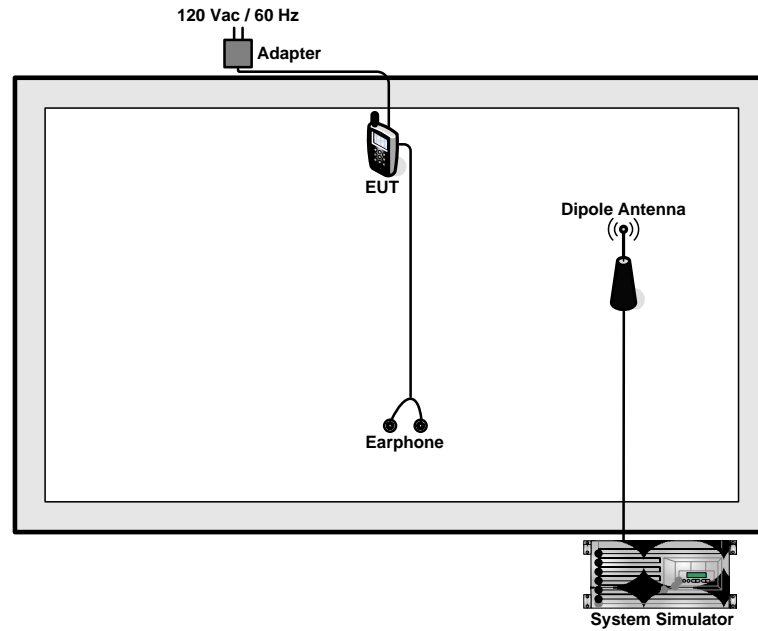
The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880.0	1909.8
GSM	31.42	31.39	31.40	28.62	28.83	28.65
GPRS 8	<b>31.43</b>	31.39	31.40	28.85	<b>28.88</b>	28.66
GPRS 10	29.87	30.04	30.11	27.22	27.30	27.11
EGPRS 8	<b>26.50</b>	26.44	26.45	25.84	<b>26.06</b>	25.99
EGPRS 10	24.47	24.47	24.42	23.78	23.99	23.96

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880.0	1907.6
RMC 12.2K	21.60	21.84	21.81	22.45	22.49	22.48
HSDPA Subtest-1	21.61	21.88	21.88	22.47	22.48	22.45
HSDPA Subtest-2	21.69	<b>21.93</b>	21.92	<b>22.49</b>	22.49	22.46
HSDPA Subtest-3	20.44	20.67	20.69	21.36	21.47	21.45
HSDPA Subtest-4	19.49	19.77	19.67	20.22	20.23	20.53



## 2.2 Connection Diagram of Test System



### 3 Test Result

#### 3.1 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

##### 3.1.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

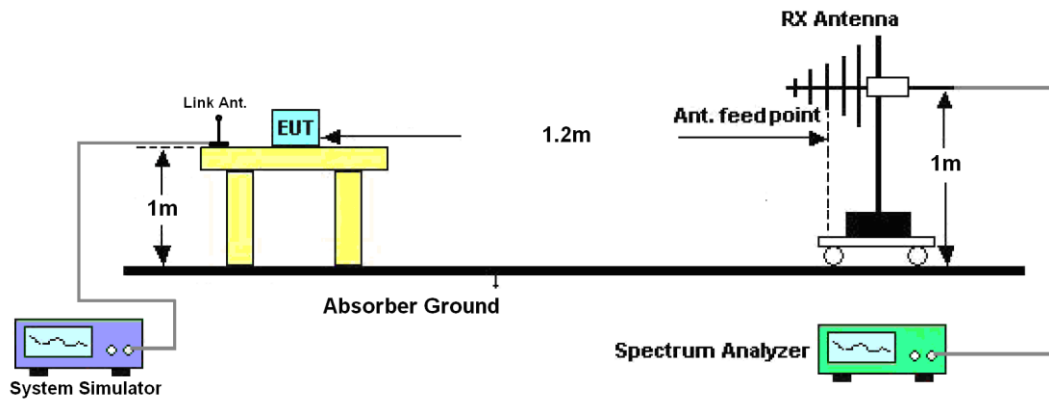
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$   
Ps (dBm) : Input power to substitution antenna.  
Gs (dBi or dBd) : Substitution antenna Gain.  
 $E_t = R_t + AF$   
 $E_s = R_s + AF$   
AF (dB/m) : Receive antenna factor  
Rt : The highest received signal in spectrum analyzer for EUT.  
Rs : The highest received signal in spectrum analyzer for substitution antenna.

### 3.1.4 Test Setup





3.1.5 Test Result of ERP

GSM850 (GPRS 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-31.17	-48.12	0.00	-1.08	15.87	0.04
836.40	-29.84	-48.28	0.00	-0.93	17.51	0.06
848.80	-28.56	-48.35	0.00	-0.76	19.03	0.08
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-19.44	-47.97	0.00	-1.08	27.45	0.56
836.40	-18.30	-48.01	0.00	-0.93	28.78	0.76
848.80	-17.11	-48.05	0.00	-0.76	30.18	1.04

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-24.28	-48.12	0.00	-1.08	22.76	0.19
836.40	-23.22	-48.28	0.00	-0.93	24.13	0.26
848.80	-21.93	-48.35	0.00	-0.76	25.66	0.37
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-35.32	-47.97	0.00	-1.08	11.57	0.01
836.40	-33.34	-48.01	0.00	-0.93	13.74	0.02
848.80	-31.51	-48.05	0.00	-0.76	15.78	0.04



WCDMA Band V (HSDPA) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-27.06	-48.12	0.00	-1.08	19.98	0.10
836.40	-26.96	-48.28	0.00	-0.93	20.39	0.11
846.60	-26.80	-48.35	0.00	-0.76	20.79	0.12
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-37.92	-47.97	0.00	-1.08	8.97	0.01
836.40	-37.11	-48.01	0.00	-0.93	9.97	0.01
846.60	-36.46	-48.05	0.00	-0.76	10.83	0.01



3.1.6 Test Result of EIRP

GSM1900 (GPRS 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-21.34	-51.88	0.00	1.96	32.50	1.78
1880.00	-22.04	-52.99	0.00	2.00	32.95	1.97
1909.80	-23.68	-54.28	0.00	1.98	32.58	1.81
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-22.18	-52.13	0.00	1.96	31.91	1.55
1880.00	-23.10	-53.17	0.00	2.00	32.07	1.61
1909.80	-24.45	-54.13	0.00	1.98	31.66	1.47

GSM1900 (EDGE 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-23.96	-51.88	0.00	1.96	29.88	0.97
1880.00	-24.01	-52.99	0.00	2.00	30.98	1.25
1909.80	-26.16	-54.28	0.00	1.98	30.10	1.02
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.94	-52.13	0.00	1.96	28.15	0.65
1880.00	-27.40	-53.17	0.00	2.00	27.77	0.60
1909.80	-29.10	-54.13	0.00	1.98	27.01	0.50



WCDMA Band II (HSDPA) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-26.26	-51.88	0.00	1.96	27.58	0.57
1880.00	-26.87	-52.99	0.00	2.00	28.12	0.65
1907.60	-29.04	-54.28	0.00	1.98	27.22	0.53
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-29.54	-52.13	0.00	1.96	24.55	0.29
1880.00	-30.37	-53.17	0.00	2.00	24.80	0.30
1907.60	-32.33	-54.13	0.00	1.98	23.78	0.24

## 3.2 Field Strength of Spurious Radiation Measurement

### 3.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 3.2.2 Measuring Instruments

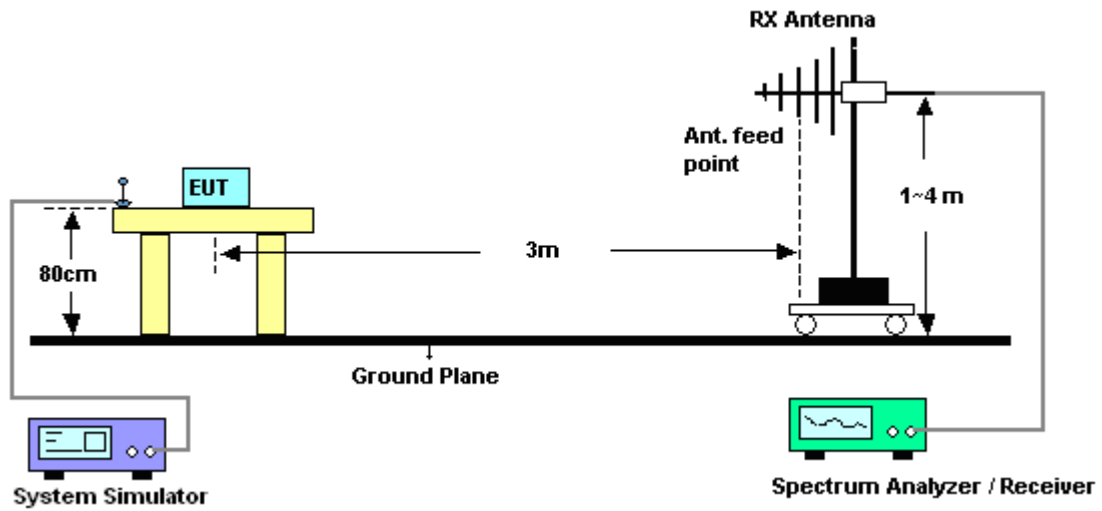
See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

10. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
11. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
12. The table was rotated 360 degrees to determine the position of the highest spurious emission.
13. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
14. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
15. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
16. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
17. Taking the record of output power at antenna port.
18. Repeat step 7 to step 8 for another polarization.
19.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
20.  $ERP \text{ (dBm)} = EIRP - 2.15$



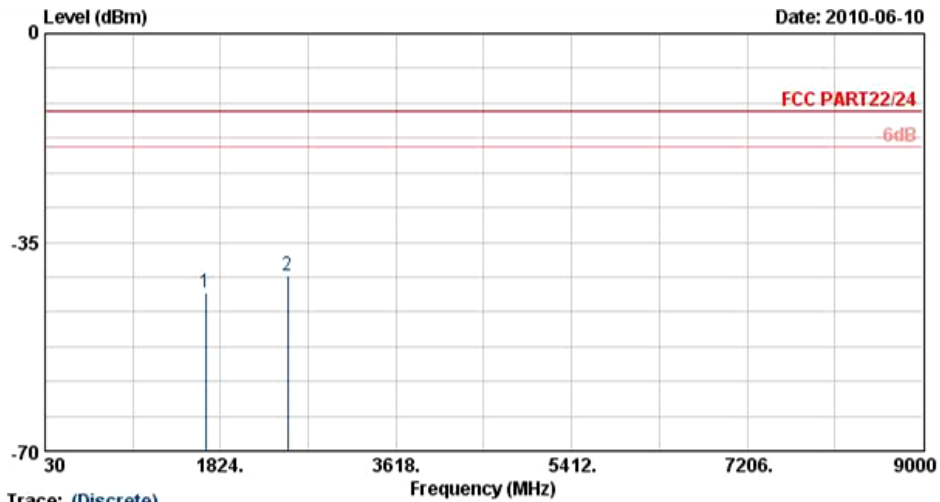
### 3.2.4 Test Setup





3.2.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	24~25°C
Test Mode :	GPRS 8 Link	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

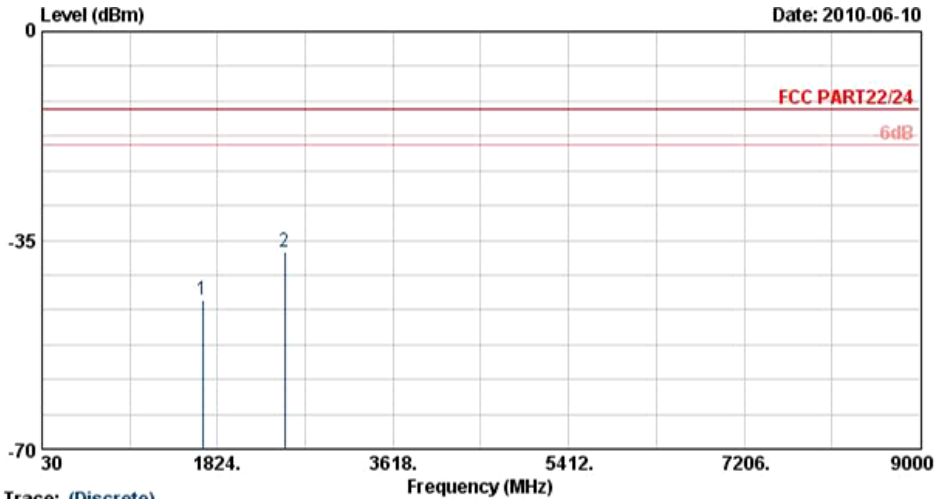


Trace: (Discrete)  
 Site : 03CH07-RY  
 Condition : FCC PART22/24 HF-ETRP(080306) HORIZONTAL  
 Project : FG 052102

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1669	-43.40	-13	-30.40	-51.89	-43.25	3.39	5.39	H	Pass
2509	-40.69	-13	-27.69	-49.11	-40.95	3.71	6.12	H	Pass



<b>Band :</b>	GSM850	<b>Temperature :</b>	24~25°C
<b>Test Mode :</b>	GPRS 8 Link	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

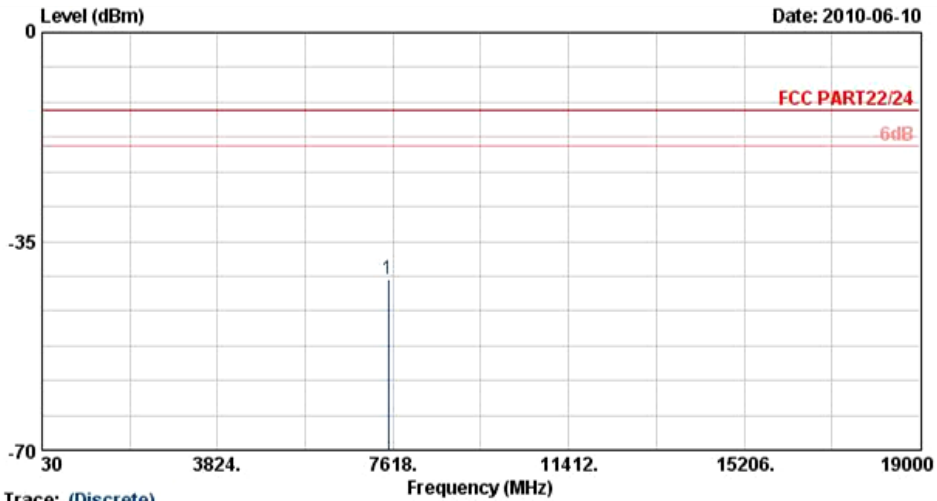


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) VERTICAL  
 Project : FG 052102

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1669	-45.10	-13	-32.10	-53.18	-44.95	3.39	5.39	V	Pass
2509	-36.85	-13	-23.85	-48.62	-37.11	3.71	6.12	V	Pass



Band :	GSM1900	Temperature :	24~25°C
Test Mode :	GPRS 8 Link	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

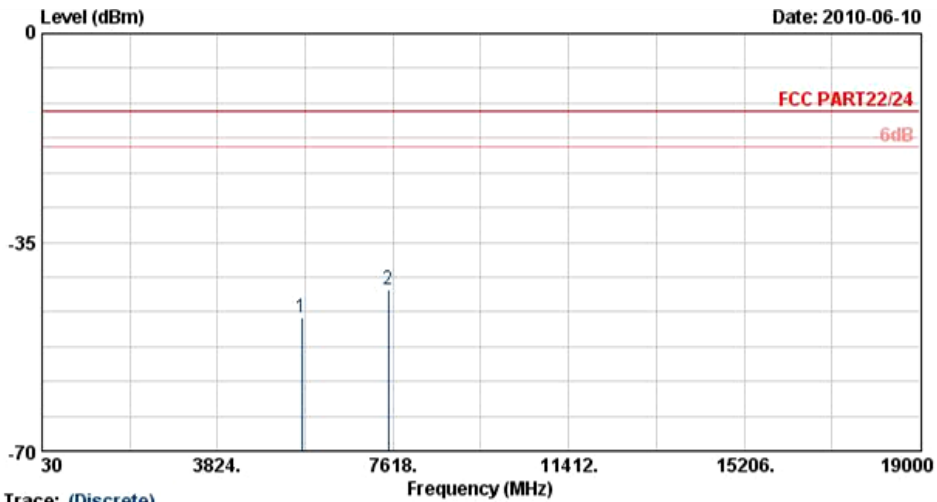


Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) HORIZONTAL  
 Project : FG 052102

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
7520	-41.36	-13	-28.36	-64.27	-44.43	6.64	9.71	H	Pass



<b>Band :</b>	GSM1900	<b>Temperature :</b>	24~25°C
<b>Test Mode :</b>	GPRS 8 Link	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Trace: (Discrete)  
 Site : 08CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) VERTICAL  
 Project : FG 052102

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
5636	-47.52	-13	-34.52	-65.57	-51.74	5.55	9.77	V	Pass
7520	-42.96	-13	-29.96	-65.06	-47.13	6.64	10.81	V	Pass



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Mar. 19, 2009	Mar. 18, 2011	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB. GAIN	Mar. 27, 2010	Mar. 26, 2011	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	-

## 5 Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of $X_i$		$u(X_i)$	$C_i$	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	$\pm 0.10$	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	$\pm 1.70$	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	$\pm 0.50$	Normal (k=2)	0.25	1	0.25
Receiver Correction	$\pm 2.00$	Rectangular	1.15	1	1.15
Antenna Factor Directional	$\pm 1.50$	Rectangular	0.87	1	0.87
Site Imperfection	$\pm 2.80$	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP052102 as below.





## **Appendix C. Original Report**

Please refer to Sporton report number FG8O0405 as below.