



FCC Test Report

APPLICANT : AMOD Technology Co., Ltd.
EQUIPMENT : GSM/GPRS Module
BRAND NAME : AMOD
MODEL NAME : ACM8066
FCC ID : TLTACM8066
STANDARD : 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
Tx/Rx FREQUENCY RANGE : GSM850 : 824.2 ~ 848.8 MHz /
869.2 ~ 893.8 MHz
GSM1900 : 1850.2 ~ 1909.8 MHz /
1930.2 ~ 1989.8 MHz
MAX. CONDUCTED POWER : GSM850 (GPRS 8) : 2.13 W
GSM1900 (GPRS 8) : 0.98 W
EMISSION DESIGNATOR : 248KGXW

The product sample received on May 18, 2009 and completely tested on May 25, 2009. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Roy Wu / Manager



SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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.....	5
1.4 Testing Site.....	6
1.5 Applied Standards	6
1.6 Ancillary Equipment List.....	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST.....	7
2.1 Test Mode.....	7
2.2 Connection Diagram of Test System	7
3 TEST RESULT.....	8
3.1 Conducted Output Power Measurement.....	8
3.2 Occupied Bandwidth Measurement	9
3.3 Band Edge Measurement.....	12
3.4 Conducted Emission Measurement	15
3.5 Field Strength of Spurious Radiation Measurement	21
3.6 Frequency Stability Measurement.....	27
4 LIST OF MEASURING EQUIPMENT	30
5 UNCERTAINTY OF EVALUATION.....	31
6 CERTIFICATION OF TAF ACCREDITATION	32

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS



REVISION HISTORY



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result
3.1	§2.1046	N/A	Conducted Output Power	N/A	PASS
3.2	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS
3.3	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	$< 43+10\log_{10}(P[\text{Watts}])$	PASS
3.4	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Emission	$< 43+10\log_{10}(P[\text{Watts}])$	PASS
3.5	§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
3.6	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS



1 General Description

1.1 Applicant

AMOD Technology Co., Ltd.

8F., No. 46 Lane 10, Jihu Road, Neihu, Taipei 11492, Taiwan, R.O.C.

1.2 Manufacturer

AMOD Technology Co., Ltd.

8F., No. 46 Lane 10, Jihu Road, Neihu, Taipei 11492, Taiwan, R.O.C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	GSM/GPRS Module
Brand Name	AMOD
Model Name	ACM8066
FCC ID	TLTACM8066
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 33.29 dBm (2.13 W) GSM1900 : 29.93 dBm (0.98 W)
Antenna Type	Dipole Antenna
HW Version	V.1.0
SW Version	0105F001 00290000
Type of Modulation	GMSK
Type of Emission	248KGXW
EUT Stage	Identical Prototype

Remark:

1. This test report recorded only product characteristics and test results of PCS Licensed Transmitter (PCB).
2. 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

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st 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		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	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:

- ♦ 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI C63.4-2003
- ♦ 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.	DC Power Supply	GW	GPC-60300	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. Frequency range investigated for radiated emission is as follows:

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

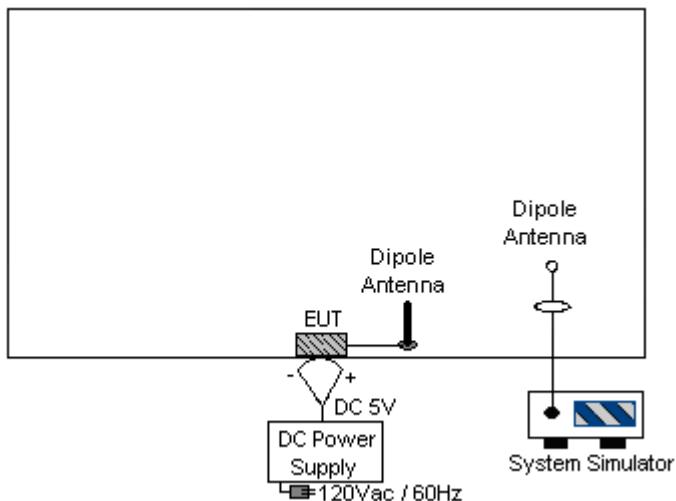
Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GPRS 8 Link	■ GPRS 8 Link
GSM 1900	■ GPRS 8 Link	■ GPRS 8 Link

Note: The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, only this mode was used for all tests. The power tables are listed as follows:

Conducted Power						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880.0	1909.8
GPRS 8	33.29	33.08	32.81	29.93	29.25	29.33
GPRS 10	33.26	33.06	32.80	29.87	29.19	29.28

(*Unit: dBm)

2.2 Connection Diagram of Test System





3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

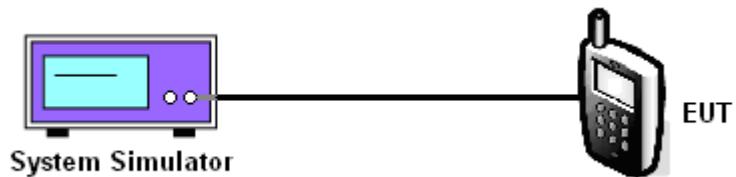
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band			
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)
GPRS 8	128 (Low)	824.2	33.29
	189 (Mid)	836.4	33.08
	251 (High)	848.8	32.81
PCS Band			
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)
GPRS 8	512 (Low)	1850.2	29.93
	661 (Mid)	1880.0	29.25
	810 (High)	1909.8	29.33

3.2 Occupied Bandwidth Measurement

3.2.1 Description of Occupied Bandwidth Measurement

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

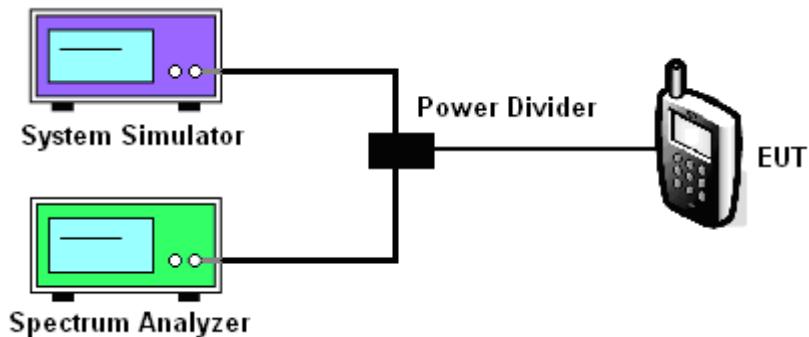
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.
3. The RBW was replaced by 10 kHz, due to the spectrum analyzer IF-Filter including an excess of the limit. A worst case correction factor of $10 \log (1\% \text{ BW}/\text{measurement RBW})$ was implemented.

3.2.4 Test Setup

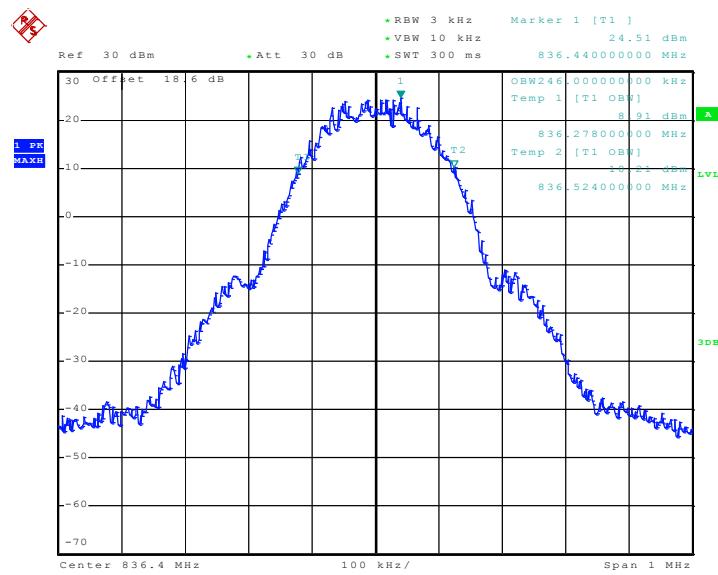




3.2.5 Test Result (Plots) of Occupied Bandwidth

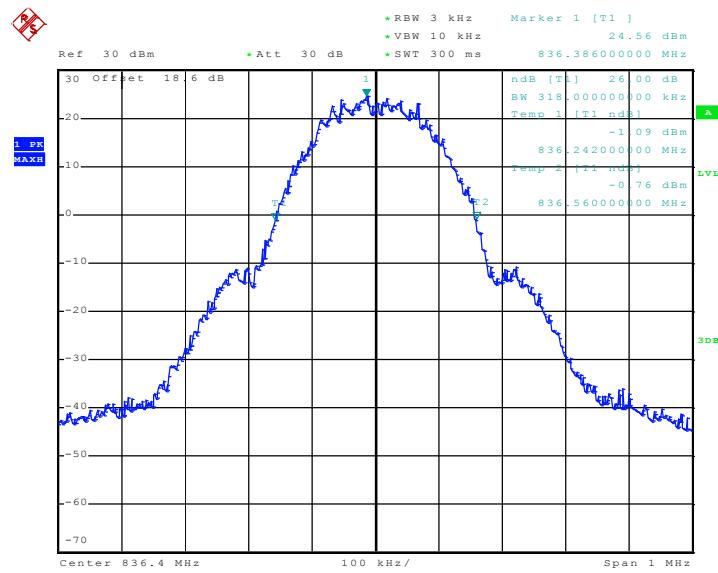
Band :	GSM 850	Power Stage :	High
Test Mode :	GPRS 8 Link		

99% Occupied Bandwidth Plot on Channel 189



Date: 18.MAY.2009 09:48:47

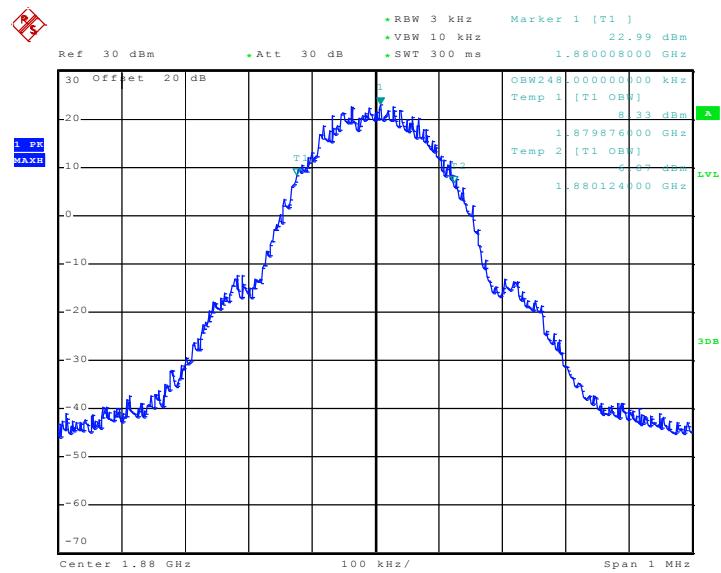
26dB Bandwidth Plot on Channel 189



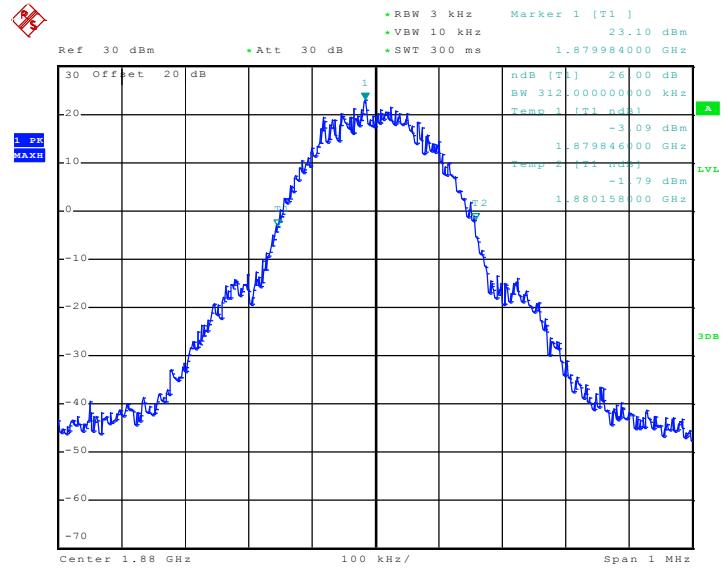
Date: 18.MAY.2009 09:43:21



Band :	GSM 1900	Power Stage :	High
Test Mode :	GPRS 8 Link		

99% Occupied Bandwidth Plot on Channel 661

Date: 18.MAY.2009 11:06:28

26dB Bandwidth Plot on Channel 661

Date: 18.MAY.2009 11:02:56

3.3 Band Edge Measurement

3.3.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

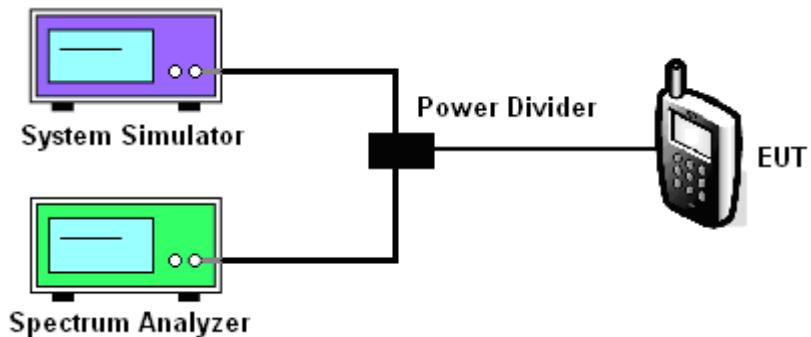
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

3.3.4 Test Setup

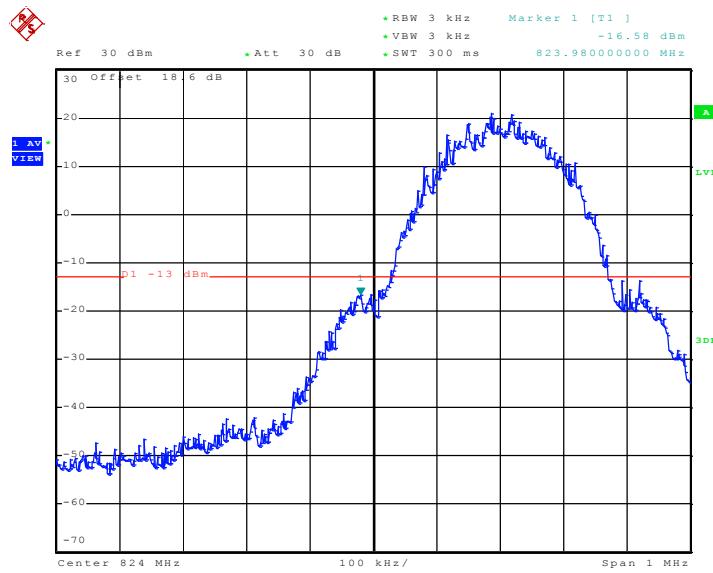




3.3.5 Test Result (Plots) of Conducted Band Edge

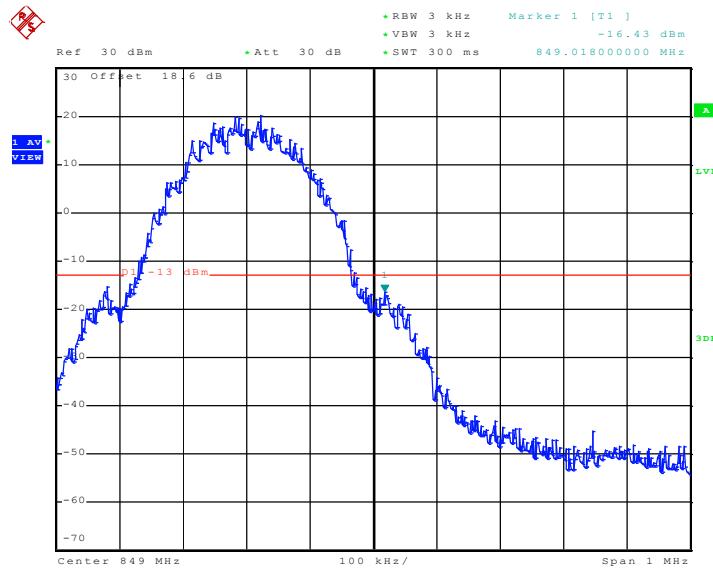
Band :	GSM850	Power Stage :	High
Test Mode :	GPRS 8 Link		

Lower Band Edge Plot on Channel 128



Date: 18.MAY.2009 09:54:35

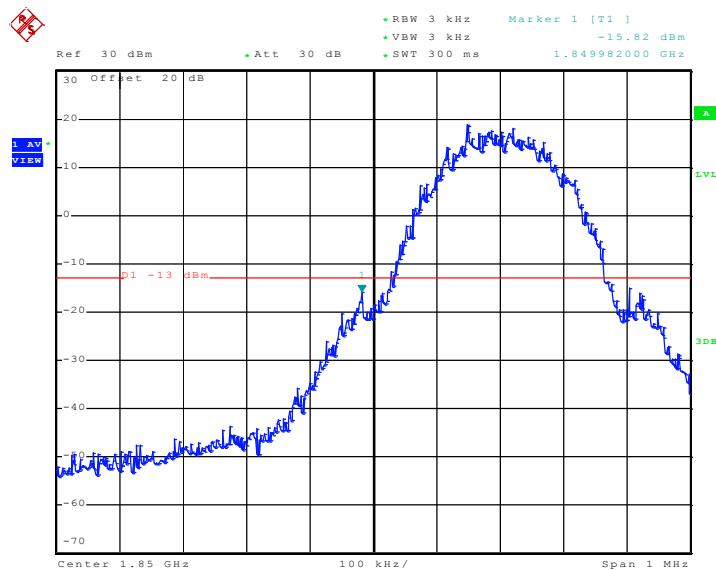
Higher Band Edge Plot on Channel 251



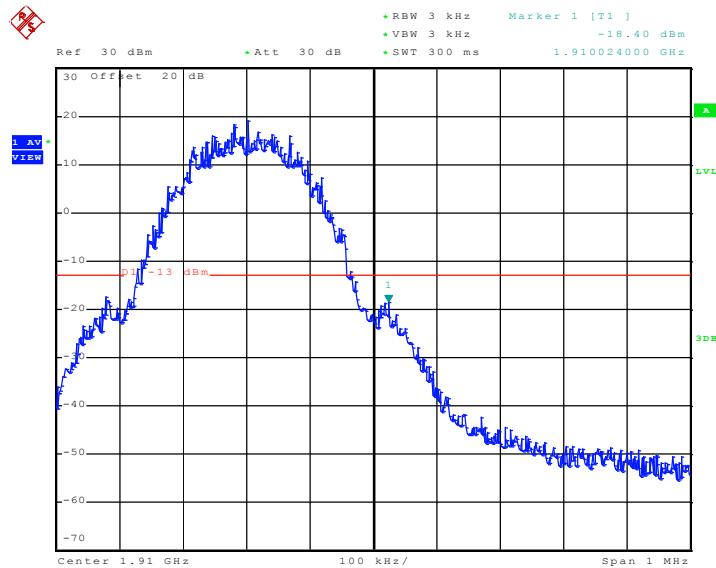
Date: 18.MAY.2009 10:07:16



Band :	GSM1900	Power Stage :	High
Test Mode :	GPRS 8 Link		

Lower Band Edge Plot on Channel 512

Date: 18.MAY.2009 11:10:54

Higher Band Edge Plot on Channel 810

Date: 18.MAY.2009 11:14:11

3.4 Conducted Emission Measurement

3.4.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

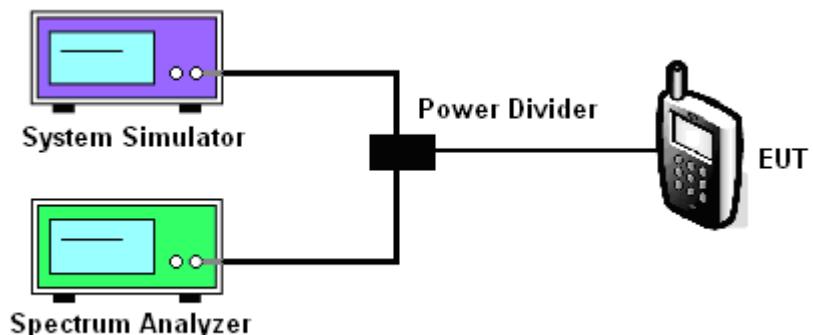
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

3.4.4 Test Setup

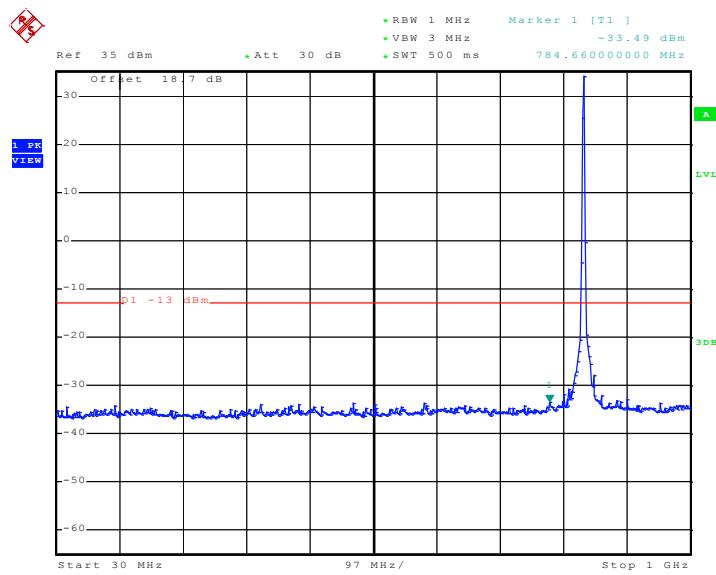




3.4.5 Test Result (Plots) of Conducted Emission

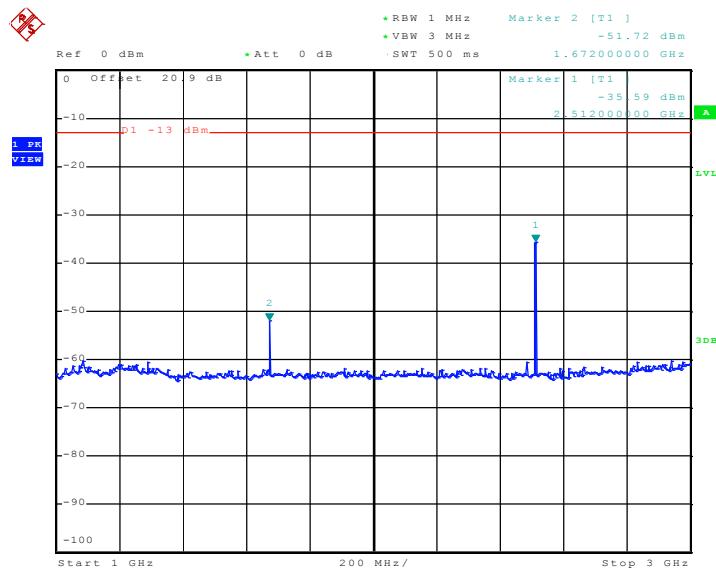
Band :	GSM850	Channel :	CH189
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 18.MAY.2009 10:16:55

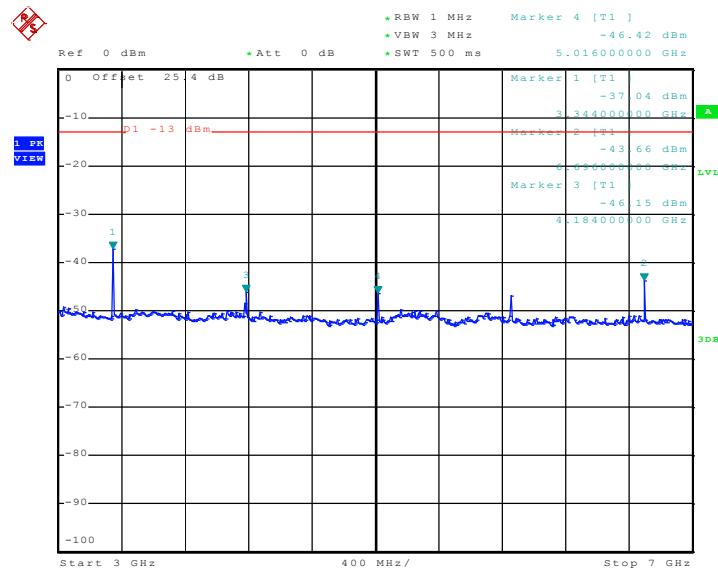
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 18.MAY.2009 10:18:49

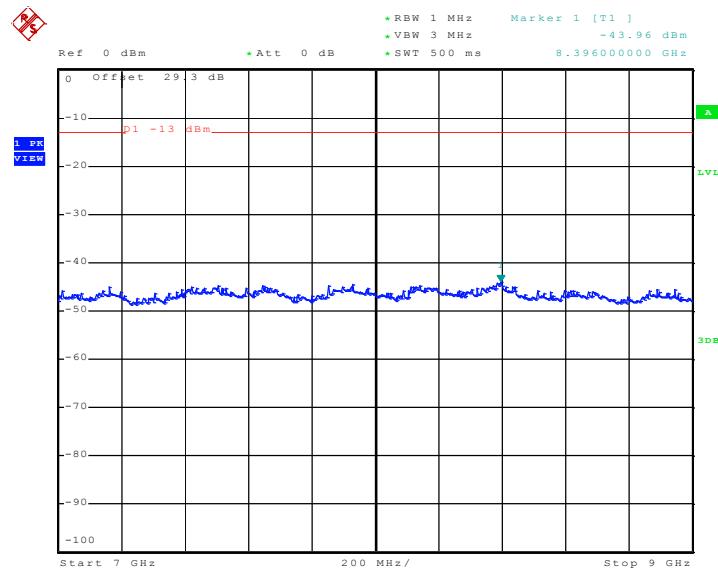


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 18.MAY.2009 10:20:05

Conducted Emission Plot between 7GHz ~ 9GHz

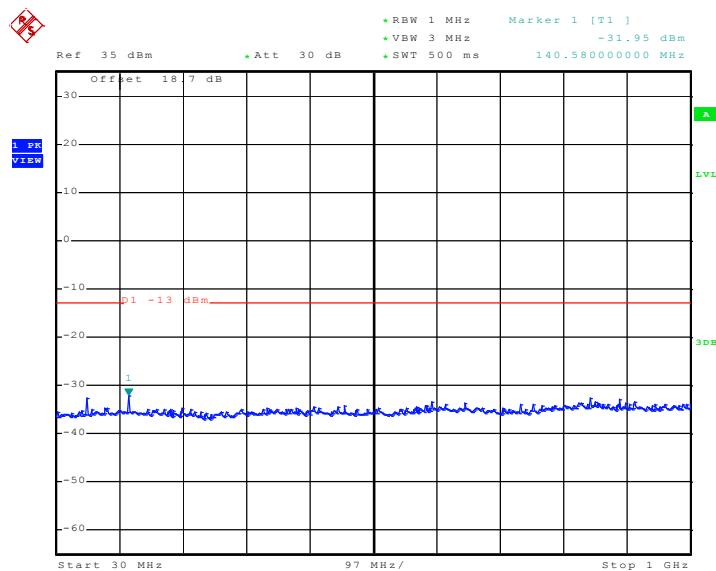


Date: 18.MAY.2009 10:26:23



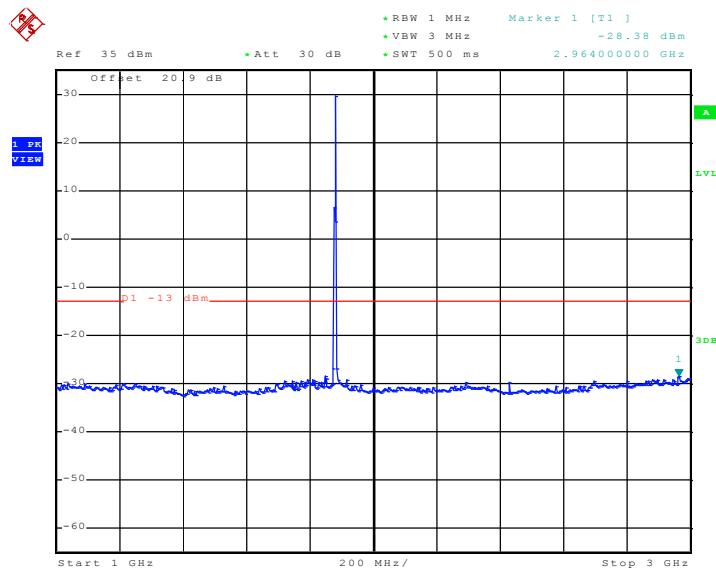
Band :	GSM1900	Channel :	CH661
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 18.MAY.2009 10:35:53

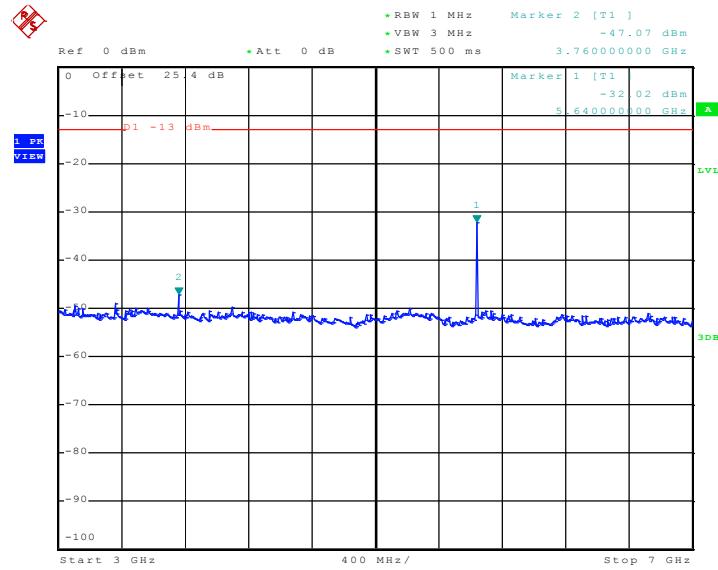
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 18.MAY.2009 10:34:58

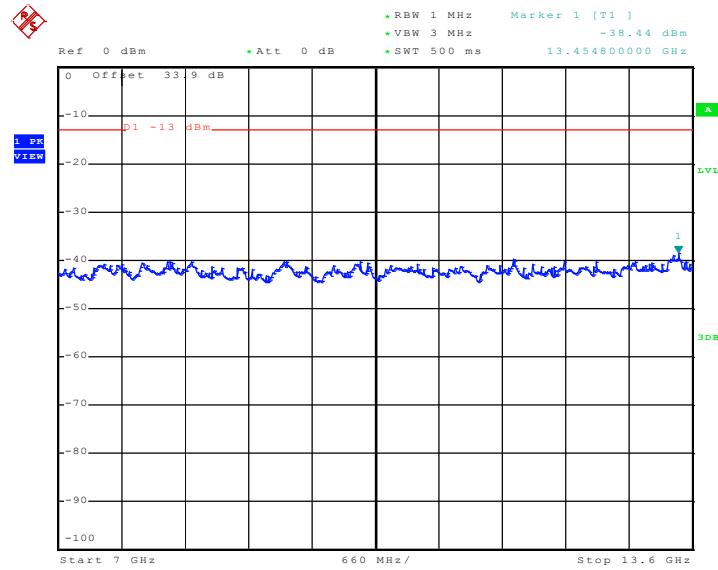


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 18.MAY.2009 10:29:39

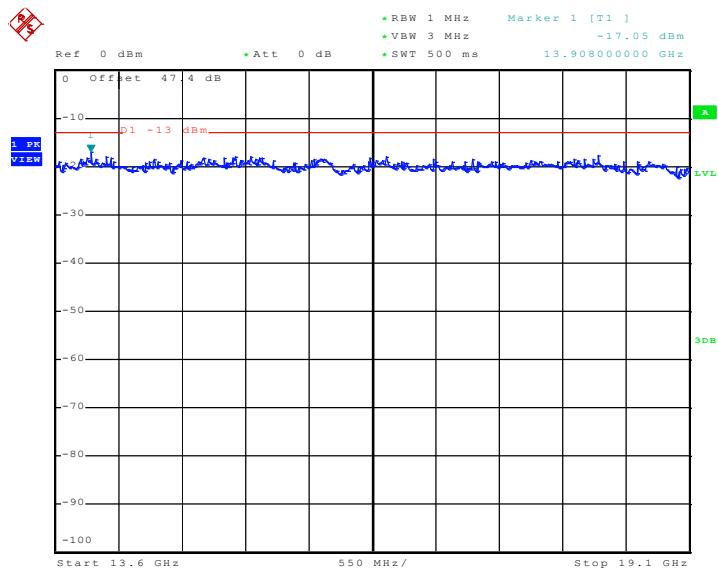
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 18.MAY.2009 10:28:54



Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 18.MAY.2009 10:28:08



3.5 Field Strength of Spurious Radiation Measurement

3.5.1 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.

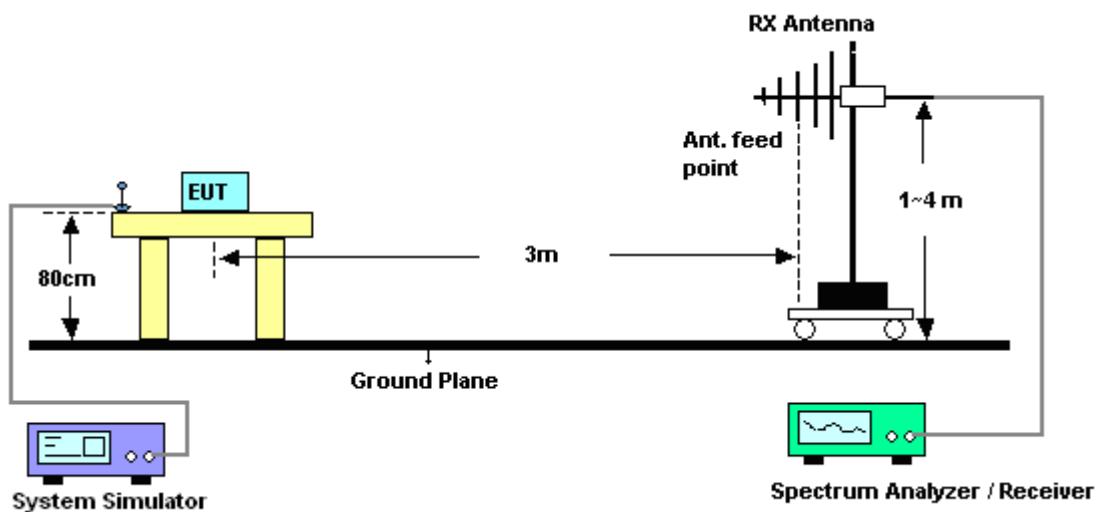
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 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 spurious emission.
4. 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.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Emission level (dBm) = output power + substitution Gain.

3.5.4 Test Setup





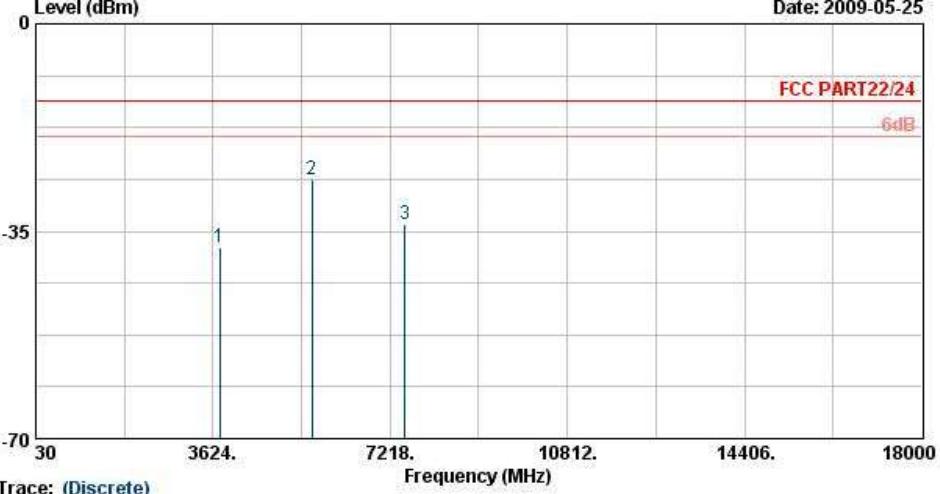
3.5.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	24.9~26.9°C						
Test Mode :	GPRS 8 Link	Relative Humidity :	37~39%						
Test Engineer :	Nadir	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
			Date: 2009-05-25						
Trace: (Discrete) Site : 03CH07-HY Condition : FCC PART22/24 HF-EIRP(080306) HORIZONTAL Power : DC 5V Project : FG 951803 Mode : Mode 1									
Frequency	ERP	Limit	Over Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
1669	-41.26	-13	-28.26	-49.81	-41.11	3.39	5.39	H	Pass
2509	-47.76	-13	-34.76	-57.9	-48.02	3.71	6.12	H	Pass
3346	-49.30	-13	-36.30	-60.25	-52.02	3.13	8.00	H	Pass



Band :	GSM850	Temperature :	24.9~26.9°C																																								
Test Mode :	GPRS 8 Link	Relative Humidity :	37~39%																																								
Test Engineer :	Nadir	Polarization :	Vertical																																								
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.																																										
<p>Level (dBm)</p> <p>Date: 2009-05-25</p> <p>FCC PART22/24</p> <p>6dB</p> <p>Trace: (Discrete)</p> <p>Site : 03CH07-HY Condition : FCC PART22/24 HF-EIRP(080306) VERTICAL Power : DC 5V Project : FG 951803 Mode : Mode 1</p>																																											
<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Over Limit (dB)</th> <th>SPA (dBm)</th> <th>S.G. (dBm)</th> <th>TX Cable loss (dB)</th> <th>TX Antenna Gain (dBi)</th> <th>Polarization (H/V)</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>1669</td> <td>-47.06</td> <td>-13</td> <td>-34.06</td> <td>-54.98</td> <td>-46.91</td> <td>3.39</td> <td>5.39</td> <td>V</td> <td>Pass</td> </tr> <tr> <td>2509</td> <td>-36.38</td> <td>-13</td> <td>-23.38</td> <td>-49.11</td> <td>-36.64</td> <td>3.71</td> <td>6.12</td> <td>V</td> <td>Pass</td> </tr> <tr> <td>3346</td> <td>-42.46</td> <td>-13</td> <td>-29.46</td> <td>-54.19</td> <td>-45.18</td> <td>3.13</td> <td>8.00</td> <td>V</td> <td>Pass</td> </tr> </tbody> </table>				Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result	1669	-47.06	-13	-34.06	-54.98	-46.91	3.39	5.39	V	Pass	2509	-36.38	-13	-23.38	-49.11	-36.64	3.71	6.12	V	Pass	3346	-42.46	-13	-29.46	-54.19	-45.18	3.13	8.00	V	Pass
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result																																		
1669	-47.06	-13	-34.06	-54.98	-46.91	3.39	5.39	V	Pass																																		
2509	-36.38	-13	-23.38	-49.11	-36.64	3.71	6.12	V	Pass																																		
3346	-42.46	-13	-29.46	-54.19	-45.18	3.13	8.00	V	Pass																																		



Band :	GSM1900	Temperature :	24.9~26.9°C						
Test Mode :	GPRS 8 Link	Relative Humidity :	37~39%						
Test Engineer :	Nadir	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
 <p>Level (dBm)</p> <p>Date: 2009-05-25</p> <p>FCC PART22/24</p> <p>6dB</p> <p>Trace: (Discrete)</p> <p>Site : 03CH07-HY Condition : FCC PART22/24 HF-EIRP(080306) HORIZONTAL Power : DC 5V Project : FG 951803 Mode : Mode 1</p>									
Frequency	EIRP	Limit	Over Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	Power	loss	Gain		
3760	-37.75	-13	-24.75	-52.47	-40.27	4.88	7.40	H	Pass
5636	-26.38	-13	-13.38	-47.15	-29.64	5.55	8.81	H	Pass
7520	-33.81	-13	-20.81	-56.55	-36.88	6.64	9.71	H	Pass



Band :	GSM1900	Temperature :	24.9~26.9°C						
Test Mode :	GPRS 8 Link	Relative Humidity :	37~39%						
Test Engineer :	Nadir	Polarization :	Vertical						
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
<p>Level (dBm)</p> <p>Date: 2009-05-25</p> <p>FCC PART22/24</p> <p>0dB</p> <p>Trace: (Discrete)</p> <p>Site : 03CH07-HY Condition : FCC PART22/24 HF-EIRP(080306) VERTICAL Power : DC 5V Project : FG 951803 Mode : Mode 1</p>									
Frequency	EIRP	Limit	Over Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3760	-37.55	-13	-24.55	-54.52	-40.58	4.88	7.91	V	Pass
5636	-22.79	-13	-9.79	-44.67	-27.01	5.55	9.77	V	Pass
7520	-29.92	-13	-16.92	-53.21	-34.09	6.64	10.81	V	Pass



3.6 Frequency Stability Measurement

3.6.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

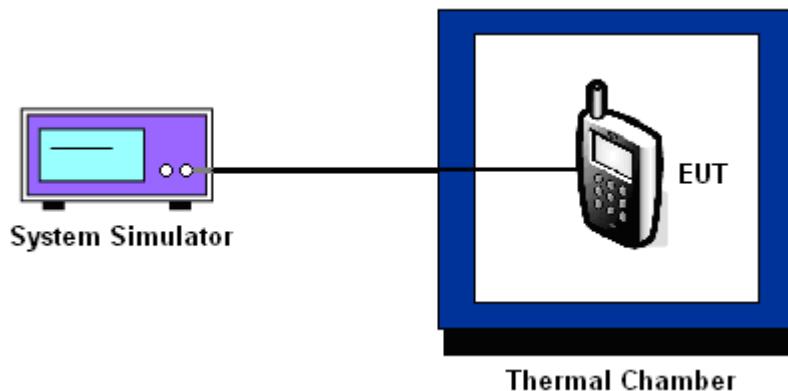
3.6.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.6.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at $25\pm 5^\circ\text{C}$ and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.6.5 Test Setup





3.6.6 Test Result of Temperature Variation

Band :	GSM 850	Channel :	189
Limit (ppm) :	2.5		

Temperature (°C)	GPRS 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	51	0.06	PASS
-20	-22	-0.03	
-10	10	0.01	
0	-26	-0.03	
10	-14	-0.02	
20	-17	-0.02	
30	-35	-0.04	
40	-53	-0.06	
50	-25	-0.03	

Band :	GSM 1900	Channel :	661
Limit (ppm) :	2.5		

Temperature (°C)	GPRS 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-28	-0.01	PASS
-20	-85	-0.04	
-10	-42	-0.02	
0	18	0.01	
10	5	0.00	
20	-23	-0.01	
30	-66	-0.03	
40	-72	-0.04	
50	-51	-0.03	



3.6.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GPRS 8	5.0	-7	-0.01	2.5	PASS
		BEP	-25	-0.03		
		5.8	-61	-0.07		
GSM 1900 CH661	GPRS 8	5.0	-18	-0.01		
		BEP	-30	-0.02		
		5.8	-25	-0.01		

Note:

1. Normal Voltage = 5.0V.
2. Battery End Point (BEP) = 4.3 V.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	116456	N/A	Jun. 05, 2008	Jun. 04, 2009	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 26, 2008	Jun. 25, 2009	Conducted (TH02-HY)
Thermal Chamber	TEN BILLION	TTH-D35P	TBN-930701	N/A	Aug. 01, 2008	Jul. 31, 2009	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz~1GHz	Nov. 20, 2008	Nov. 19, 2009	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9kHz~30GHz	Dec. 02, 2008	Dec. 01, 2009	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1G~18GHz	Aug. 18, 2008	Aug. 17, 2009	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1G~26.5GHz	Dec. 17, 2008	Dec. 16, 2009	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10~1000MHz. 32dB.GAIN	Mar. 27, 2009	Mar. 26, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00066584	1G~18GHz	Aug. 06, 2008	Aug. 05. 2009	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	May 22, 2008	May 21, 2010	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 23, 2008	Oct. 22, 2010	Radiation (03CH07-HY)



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-shaped	0.28
Combined standard uncertainty $U_c(y)$	1.27		
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	2.54		

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

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma 1 = 0.197$ Antenna VSWR $\Gamma 2 = 0.194$ Uncertainty=20log(1- $\Gamma 1 * \Gamma 2$)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	4.72				



6 Certification of TAF Accreditation



Certificate No. : L1190-090417

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sportun International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria : ISO/IEC 17025:2005
Accreditation Number : 1190
Originally Accredited : December 15, 2003
Effective Period : January 10, 2007 to January 09, 2010
Accredited Scope : Testing Field, see described in the Appendix
Specific Accreditation Program : Accreditation Program for Designated Testing Laboratory
for Commodities Inspection
Accreditation Program for Telecommunication Equipment
Testing Laboratory
Accreditation Program for BSMI Mutual Recognition
Arrangement with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : April 17, 2009

P1, total 20 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix



Appendix A. Photographs of EUT

Please refer to Sporton report number EP951803 as below.