# FCC RF Test Report

APPLICANT : Sagemcom SAS

**EQUIPMENT**: Quad-Band GSM/GPRS/EDGE and Tri-Band

WCDMA/HSDPA MODULE

BRAND NAME : Sagemcom MODEL NAME : HiLo3G

FCC ID : VW3HILO3G

STANDARD : FCC 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

WCDMA Band II : 1852.4 ~ 1907.6 MHz /

1932.4 ~ 1987.6 MHz

Report No.: FG071404

MAX. ERP/EIRP POWER : <Sample 1>

GSM850 (GPRS 8): 0.08 W GSM850 (EDGE 8): 0.02 W GSM1900 (GPRS 8): 0.10 W GSM1900 (EDGE 8): 0.05 W

WCDMA Band II (RMC 12.2Kbps): 0.01 W

<Sample 2>

GSM850 (GPRS 8): 0.11 W GSM850 (EDGE 8): 0.03 W GSM1900 (GPRS 8): 0.12 W GSM1900 (EDGE 8): 0.06 W

WCDMA Band II (RMC 12.2Kbps): 0.01 W

EMISSION DESIGNATOR : GMSK : 246KGXW

8PSK: 248KG7W QPSK: 4M16F9W

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The product was received on Jul. 14, 2010 and completely tested on Jan. 25, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 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:

**Anderson Chiu / Deputy Manager** 





Report No.: FG071404

#### SPORTON INTERNATIONAL INC.

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

SPORTON INTERNATIONAL INC.

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**REVISION HISTORY** 

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG071404	Rev. 01	Initial issue of report	Jan. 27, 2011

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**SUMMARY OF TEST RESULT** 

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	-
3.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.3	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS	-
3.4	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Emission	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.6	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< 43+10log <sub>10</sub> (P[Watts])	PASS	Under limit 7.28 dB at 2509 MHz
3.7	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

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# 1 General Description

# 1.1 Applicant

#### Sagemcom SAS

250 Route de l'Empereur, 92848 Rueil Malmaison Cedex France

### 1.2 Manufacturer

### **Wistron NeWeb Corporation**

20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

# 1.3 Feature of Equipment Under Test

Produ	Product Feature & Specification					
Equipment	Quad-Band GSM/GPRS/EDGE and Tri-Band WCDMA/HSDPA MODULE					
Brand Name	Sagemcom					
Model Name	HiLo3G					
FCC ID	VW3HILO3G					
EUT Configuration	Sample 1: IPEX transfer to SMA interface Sample 2: Antenna Pad transfer to SMA interface Note: These two RF interfaces won't work at the same time; we seal the Antenna PAD with low loss RF cable which has SMA connector for this time's test.					
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz					
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz					
Maximum Output Power to Antenna	<sample 1="">     GSM850: 32.67 dBm     GSM1900: 29.48 dBm     WCDMA Band II: 22.55 dBm <sample 2="">     GSM850: 32.28 dBm     GSM1900: 29.44 dBm     WCDMA Band II: 22.33 dBm</sample></sample>					

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Product Feature & Specification				
	<sample 1=""></sample>			
	GSM850 (GPRS 8): 0.08 W (18.87 dBm)			
	GSM850 (EDGE 8): 0.02 W (13.94 dBm)			
	GSM1900 (GPRS 8): 0.10 W (19.82 dBm)			
	GSM1900 (EDGE 8): 0.05 W (16.73 dBm)			
Maximum ERP/EIRP	WCDMA Band II (RMC 12.2Kbps): 0.01 W (10.23 dBm)			
Maximum ERP/EIRP	<sample 2=""></sample>			
	GSM850 (GPRS 8): 0.11 W (20.22 dBm)			
	GSM850 (EDGE 8): 0.03 W (15.35 dBm)			
	GSM1900 (GPRS 8): 0.12 W (20.87 dBm)			
	GSM1900 (EDGE 8): 0.06 W (17.64 dBm)			
	WCDMA Band II (RMC 12.2Kbps) : 0.01 W (10.87 dBm)			
Antenna Type	Fixed External Antenna			
HW Version	48.UMCMS.SCM			
SW Version	HI3GC_A_000_34_GENERIC_V01			
	GSM / GPRS : GMSK			
Type of Modulation	EDGE: 8PSK			
Type of Modulation	WCDMA: QPSK			
	HSDPA: QPSK / 16QAM			
Type of Emission	GMSK: 246KGXW			
Type of Emission	8PSK : 248KG7W			
	QPSK : 4M16F9W			
EUT Stage	Identical Prototype			
EUT Stage	Identical Prototype			

#### Remark:

- 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.

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# 1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.				
	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,				
Test Site Location	Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.				
lest Site Location	TEL: +886-3-327-3456				
	FAX: +886-3-328-4978				
Took Site No.	Sporton Site No.		FCC/IC Registration No.		
Test Site No.	TH02-HY	03CH06-HY	722060/4086B-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:

- 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 (DoC), 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	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Dipole Antenna	N/A	N/A	N/A	N/A	N/A
3.	DC Power Supply	GW	GPC-60300	N/A	N/A	Unshielded, 1.8 m

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# 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. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes							
Band	Radiated TCs	Conducted TCs					
	■ GPRS 8 Link for Sample 1	■ GPRS 8 Link					
GSM 850	■ EDGE 8 Link for Sample 1	■ EDGE 8 Link					
	■ EDGE 8 Link for Sample 2						
	■ GPRS 8 Link for Sample 1	■ GPRS 8 Link					
GSM 1900	■ EDGE 8 Link for Sample 1	■ EDGE 8 Link					
	■ EDGE 8 Link for Sample 2						
WCDMA Band II	■ RMC 12.2Kbps Link for Sample 1	■ RMC 12.2Kbps Link					

**Note:** The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

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### The conducted power tables are as follows:

### <Sample 1>

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	32.41	32.61	32.56	29.15	29.39	29.28
GPRS 8	32.43	<b>32.67</b>	32.63	29.30	<mark>29.48</mark>	29.31
GPRS 10	32.18	32.59	32.56	29.18	29.40	29.26
GPRS 12	31.34	31.95	31.63	28.10	28.36	28.56
EGPRS 8	<mark>27.35</mark>	27.27	26.91	25.37	25.61	<mark>25.80</mark>
EGPRS 10	27.31	27.25	26.95	25.28	25.53	25.70
EGPRS 12	26.47	26.56	26.26	24.74	24.97	25.15

Conducted Power (*Unit: dBm)							
Band		WCDMA Band II					
Channel	9262	9400	9538				
Frequency	1852.4	1852.4 1880.0 1907.6					
RMC 12.2K	22.41	<mark>22.55</mark>	22.11				
HSDPA Subtest-1	22.32	22.39	22.06				
HSDPA Subtest-2	22.17	22.17 22.30 21.85					
HSDPA Subtest-3	22.11	22.30	21.85				
HSDPA Subtest-4	21.22	21.40	21.08				

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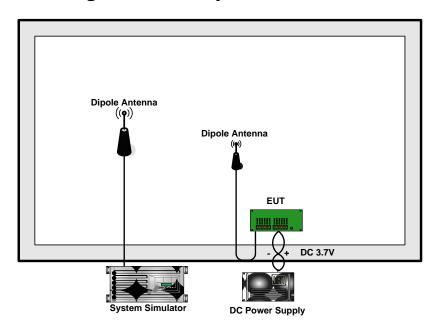


<Sample 2>

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	32.07	32.17	32.17	29.43	29.26	29.05
GPRS 8	32.19	<mark>32.28</mark>	32.27	<mark>29.44</mark>	29.31	29.17
GPRS 10	32.12	32.22	32.21	29.35	29.22	29.13
GPRS 12	31.18	31.21	31.09	28.23	28.11	27.94
EGPRS 8	26.56	<mark>26.57</mark>	26.45	<mark>25.48</mark>	25.35	25.22
EGPRS 10	26.47	26.50	26.41	25.38	25.27	25.15
EGPRS 12	25.85	25.90	25.85	24.84	24.72	24.63

Conducted Power (*Unit: dBm)							
Band		WCDMA Band II					
Channel	9262	9400	9538				
Frequency	1852.4	1852.4 1880.0 1907.6					
RMC 12.2K	22.14	<mark>22.33</mark>	21.87				
HSDPA Subtest-1	22.03	22.30	21.82				
HSDPA Subtest-2	22.11	22.11 22.08 21.61					
HSDPA Subtest-3	21.98	22.08	21.42				
HSDPA Subtest-4	21.88	21.40	21.40				

# 2.2 Connection Diagram of Test System



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### 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.

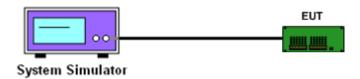
#### 3.1.2 Measuring Instruments

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



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## 3.1.5 Test Result of Conducted Output Power

Cellular Band				
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
GSM850 (GPRS 8)	128 (Low)	824.2	32.43	1.75
	189 (Mid)	836.4	32.67	1.85
	251 (High)	848.8	32.63	1.83
GSM850 (EDGE 8)	128 (Low)	824.2	27.35	0.54
	189 (Mid)	836.4	27.27	0.53
	251 (High)	848.8	26.91	0.49

PCS Band				
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
	512 (Low)	1850.2	29.30	0.85
GSM1900 (GPRS 8)	661 (Mid)	1880.0	29.48	0.89
	810 (High)	1909.8	29.31	0.85
	512 (Low)	1850.2	25.37	0.34
GSM1900 (EDGE 8)	661 (Mid)	1880.0	25.61	0.36
	810 (High)	1909.8	25.80	0.38
WCDMA Band II (RMC 12.2Kbps)	9262 (Low)	1852.4	22.41	0.17
	9400 (Mid)	1880.0	22.55	0.18
	9538 (High)	1907.6	22.11	0.16

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### 3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

### 3.2.1 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.

### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

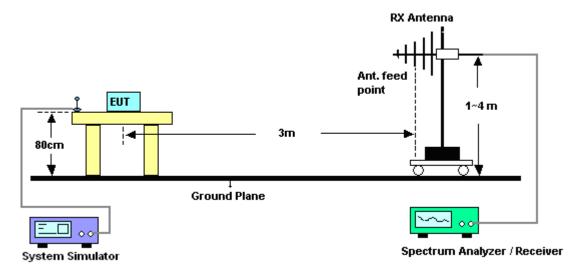
#### 3.2.3 Test Procedures

- The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz, and peak detector settings.
- 2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
- 3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. Tx Cable loss + Substitution antenna gain Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP 2.15.

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### 3.2.4 Test Setup



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#### 3.2.5 Test Result of ERP

### <Sample 1>

	GSM850 (GPRS 8) Radiated Power ERP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	ERP	ERP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
824.2	-17.10	28.19	8.94	0.01	
836.4	-13.46	28.22	12.61	0.02	
848.8	-15.83	28.38	10.40	0.01	
		Vertical Polarization			
Frequency	LVL	Correction Factor	ERP	ERP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
824.2	-12.85	31.46	16.46	0.04	
836.4	-10.88	31.5	18.47	0.07	
848.8	-10.41	31.43	18.87	0.08	

<sup>\*</sup> ERP = LVL (dBm) + Correction Factor (dB) - 2.15

	GSM850	(EDGE 8) Radiated Por	wer ERP	
		Horizontal Polarization		
Frequency	LVL	Correction Factor	ERP	ERP
(MHz)	(dBm)	(dB)	(dBm)	(W)
824.2	-21.03	28.19	5.01	0.00
836.4	-17.93	28.22	8.14	0.01
848.8	-20.33	28.38	5.90	0.00
		Vertical Polarization		
Frequency	LVL	Correction Factor	ERP	ERP
(MHz)	(dBm)	(dB)	(dBm)	(W)
824.2	-17.51	31.46	11.80	0.02
836.4	-15.78	31.5	13.57	0.02
848.8	-15.34	31.43	13.94	0.02

<sup>\*</sup> ERP = LVL (dBm) + Correction Factor (dB) -2.15

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<Sample 2>

	GSM850 (GPRS 8) Radiated Power ERP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	ERP	ERP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
824.2	-17.75	28.19	8.29	0.01	
836.4	-17.12	28.22	8.95	0.01	
848.8	-16.61	28.38	9.62	0.01	
		Vertical Polarization			
Frequency	LVL	Correction Factor	ERP	ERP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
824.2	-11.58	31.46	17.73	0.06	
836.4	-10.30	31.5	19.05	0.08	
848.8	-9.06	31.43	20.22	0.11	

<sup>\*</sup> ERP = LVL (dBm) + Correction Factor (dB) - 2.15

	GSM850 (EDGE 8) Radiated Power ERP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	ERP	ERP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
824.2	-23.16	28.19	2.88	0.00	
836.4	-21.94	28.22	4.13	0.00	
848.8	-21.44	28.38	4.79	0.00	
		Vertical Polarization			
Frequency	LVL	Correction Factor	ERP	ERP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
824.2	-16.41	31.46	12.90	0.02	
836.4	-14.81	31.5	14.54	0.03	
848.8	-13.93	31.43	15.35	0.03	

<sup>\*</sup> ERP = LVL (dBm) + Correction Factor (dB) - 2.15

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3.2.6 Test Result of EIRP

### <Sample 1>

	GSM1900 (GPRS 8) Radiated Power EIRP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1850.2	-28.60	41.93	13.33	0.02	
1880.0	-28.34	42.33	13.99	0.03	
1909.8	-26.52	42.04	15.52	0.04	
		Vertical Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1850.2	-23.46	41.18	17.72	0.06	
1880.0	-23.62	42.59	18.97	0.08	
1909.8	-22.10	41.92	19.82	0.10	

<sup>\*</sup> EIRP = LVL (dBm) + Correction Factor (dB)

	GSM1900 (EDGE 8) Radiated Power EIRP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1850.2	-31.54	41.93	10.39	0.01	
1880.0	-31.69	42.33	10.64	0.01	
1909.8	-29.74	42.04	12.30	0.02	
		Vertical Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1850.2	-26.64	41.18	14.54	0.03	
1880.0	-26.69	42.59	15.90	0.04	
1909.8	-25.19	41.92	16.73	0.05	

<sup>\*</sup> EIRP = LVL (dBm) + Correction Factor (dB)

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WCDM	WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1852.40	-38.13	41.93	3.80	0.00	
1880.00	-36.89	42.33	5.44	0.00	
1907.60	-36.78	42.04	5.26	0.00	
		Vertical Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1852.40	-33.60	41.18	7.58	0.01	
1880.00	-32.50	42.59	10.09	0.01	
1907.60	-31.69	41.92	10.23	0.01	

<sup>\*</sup> EIRP = LVL (dBm) + Correction Factor (dB)

#### <Sample 2>

	GSM1900 (GPRS 8) Radiated Power EIRP					
		, ,				
		Horizontal Polarization				
Frequency	LVL	Correction Factor	EIRP	EIRP		
(MHz)	(dBm)	(dB)	(dBm)	(W)		
1850.2	-26.88	41.93	15.05	0.03		
1880.0	-26.60	42.33	15.73	0.04		
1909.8	-25.02	42.04	17.02	0.05		
		Vertical Polarization				
Frequency	LVL	Correction Factor	EIRP	EIRP		
(MHz)	(dBm)	(dB)	(dBm)	(W)		
1850.2	-24.84	41.18	16.34	0.04		
1880.0	-22.99	42.59	19.60	0.09		
1909.8	-21.05	41.92	20.87	0.12		

<sup>\*</sup> EIRP = LVL (dBm) + Correction Factor (dB)

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	GSM1900 (EDGE 8) Radiated Power EIRP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1850.2	-30.01	41.93	11.92	0.02	
1880.0	-29.60	42.33	12.73	0.02	
1909.8	-28.36	42.04	13.68	0.02	
		Vertical Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1850.2	-28.91	41.18	12.27	0.02	
1880.0	-26.31	42.59	16.28	0.04	
1909.8	-24.28	41.92	17.64	0.06	

<sup>\*</sup> EIRP = LVL (dBm) + Correction Factor (dB)

WCDM	WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP				
		Horizontal Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1852.40	-37.42	41.93	4.51	0.00	
1880.00	-37.24	42.33	5.09	0.00	
1907.60	-35.97	42.04	6.07	0.00	
		Vertical Polarization			
Frequency	LVL	Correction Factor	EIRP	EIRP	
(MHz)	(dBm)	(dB)	(dBm)	(W)	
1852.40	-34.02	41.18	7.16	0.01	
1880.00	-33.12	42.59	9.47	0.01	
1907.60	-31.05	41.92	10.87	0.01	

<sup>\*</sup> EIRP = LVL (dBm) + Correction Factor (dB)

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### 3.3 Occupied Bandwidth Measurement

#### 3.3.1 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.

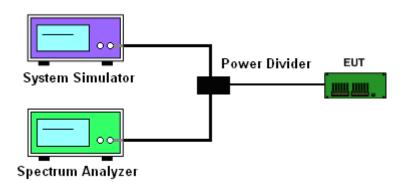
#### 3.3.2 Measuring Instruments

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 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

#### 3.3.4 Test Setup



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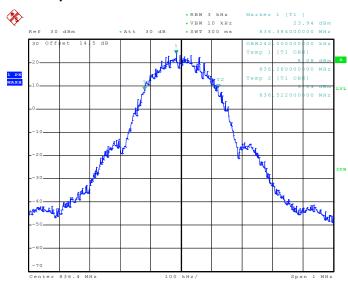
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 21 of 78 Report Issued Date: Jan. 27, 2011 Report Version : Rev. 01



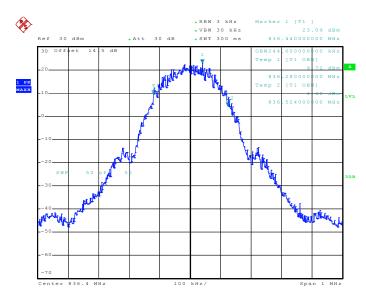
### 3.3.5 Test Result (Plots) of Occupied Bandwidth

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

#### 99% Occupied Bandwidth Plot on Channel 189



Date: 11.NOV.2010 14:07:33

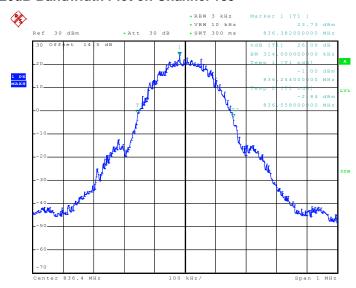


Date: 11.NOV.2010 14:08:47

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#### 26dB Bandwidth Plot on Channel 189



Date: 11.NOV.2010 14:06:07

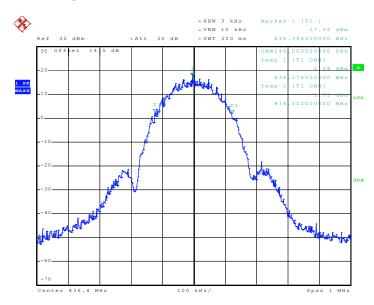
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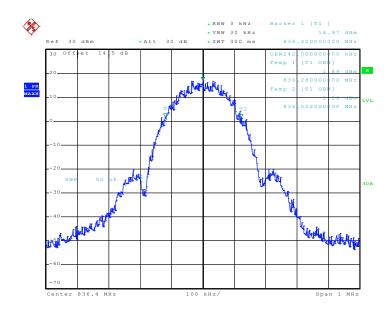
Band: GSM 850 Power Stage: High

Test Mode: EDGE 8 Link

#### 99% Occupied Bandwidth Plot on Channel 189



Date: 11.NOV.2010 13:53:09



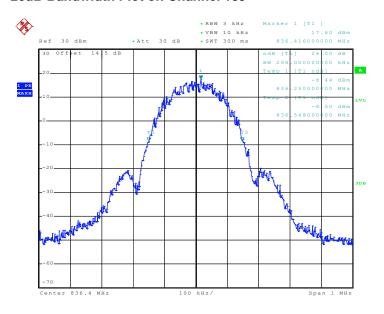
Date: 11.NOV.2010 15:47:23

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#### 26dB Bandwidth Plot on Channel 189



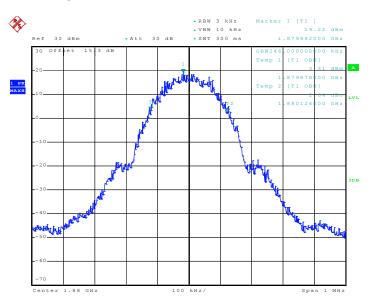
Date: 11.NOV.2010 13:51:42

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 25 of 78
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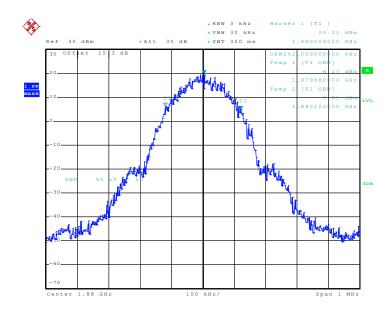


Band :	GSM 1900	Power Stage :	High
Test Mode :	GPRS 8 Link		

#### 99% Occupied Bandwidth Plot on Channel 661



Date: 11.NOV.2010 15:21:46

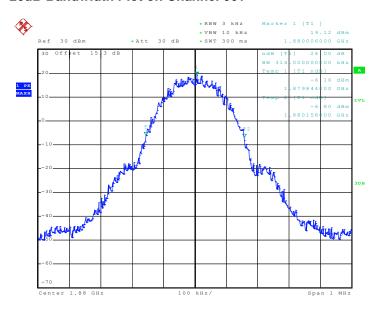


Date: 11.NOV.2010 15:26:33

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 26 of 78
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#### 26dB Bandwidth Plot on Channel 661



Date: 11.NOV.2010 15:20:19

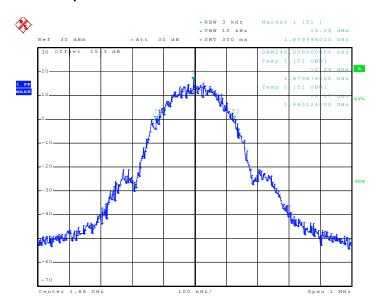
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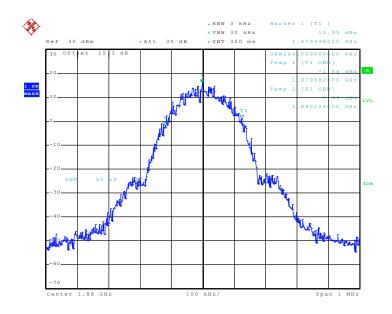
Band: GSM 1900 Power Stage: High

Test Mode: EDGE 8 Link

#### 99% Occupied Bandwidth Plot on Channel 661



Date: 11.NOV.2010 14:56:48



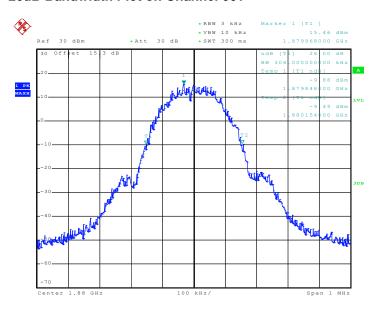
Date: 11.NOV.2010 14:58:02

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#### 26dB Bandwidth Plot on Channel 661



Date: 11.NOV.2010 14:55:22

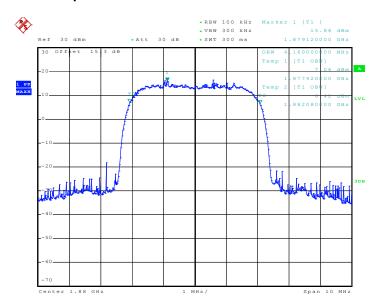
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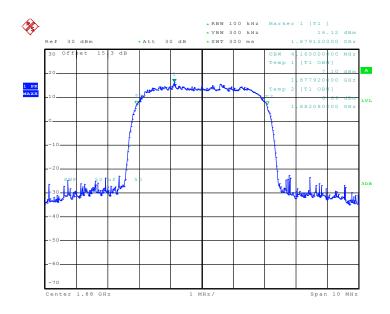
Band: WCDMA Band II Power Stage: High

Test Mode: RMC 12.2Kbps Link

#### 99% Occupied Bandwidth Plot on Channel 9400



Date: 10.NOV.2010 09:30:32

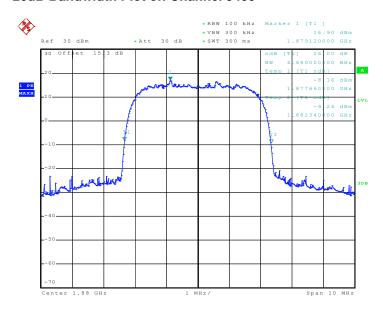


Date: 10.NOV.2010 09:31:48

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 30 of 78
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#### 26dB Bandwidth Plot on Channel 9400



Date: 10.NOV.2010 09:29:06

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## 3.4 Band Edge Measurement

#### 3.4.1 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.

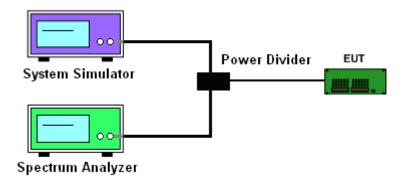
#### 3.4.2 Measuring Instruments

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 band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

#### 3.4.4 Test Setup



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Report No.: FG071404

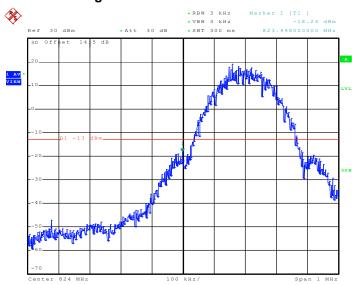
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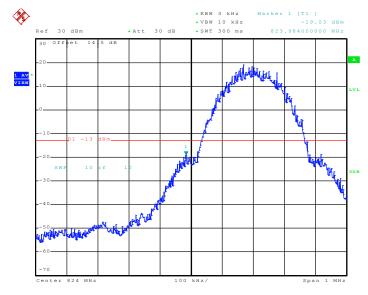
### 3.4.5 Test Result (Plots) of Conducted Band Edge

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

#### **Lower Band Edge Plot on Channel 128**



Date: 11.NOV.2010 14:09:39

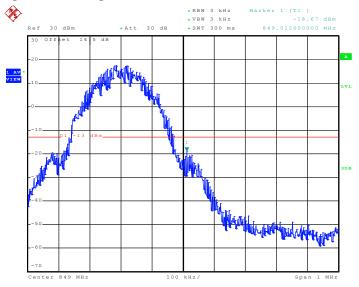


Date: 11.NOV.2010 14:10:41

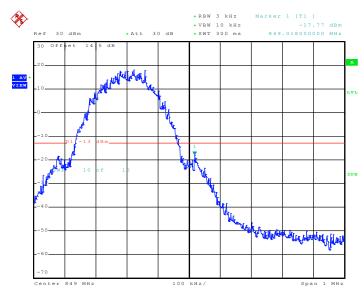
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 33 of 78
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#### **Higher Band Edge Plot on Channel 251**



Date: 11.NOV.2010 14:10:08



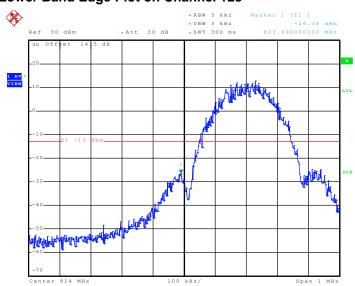
Date: 11.NOV.2010 14:11:13

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 34 of 78
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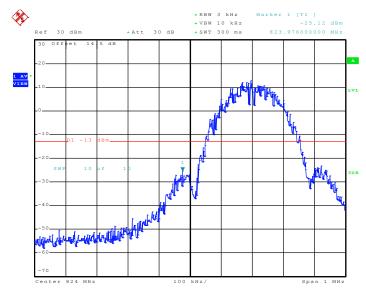


Band :	GSM850	Power Stage :	High
Test Mode :	EDGE 8 Link		

#### **Lower Band Edge Plot on Channel 128**



Date: 11.NOV.2010 13:55:15

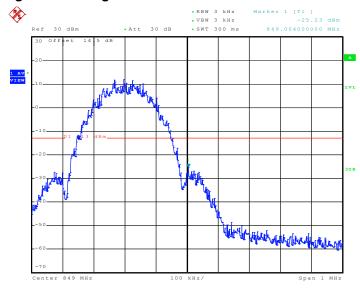


Date: 11.NOV.2010 15:48:18

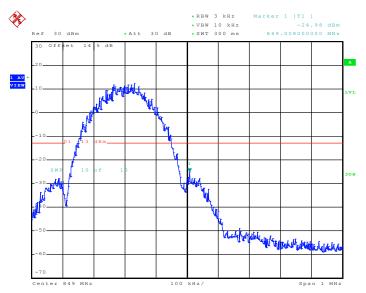
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 35 of 78
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#### **Higher Band Edge Plot on Channel 251**



Date: 11.NOV.2010 13:55:44



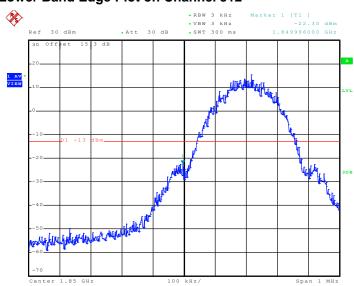
Date: 11.NOV.2010 15:48:50

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G

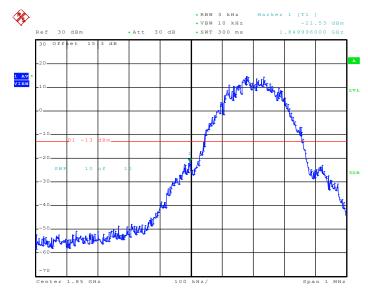


Band: GSM1900 Power Stage: High
Test Mode: GPRS 8 Link

#### **Lower Band Edge Plot on Channel 512**



Date: 11.NOV.2010 15:38:29

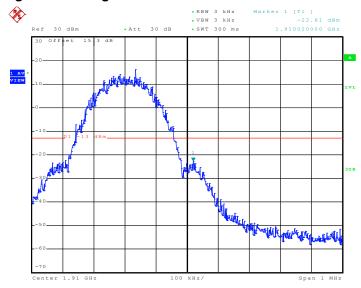


Date: 11.NOV.2010 15:28:27

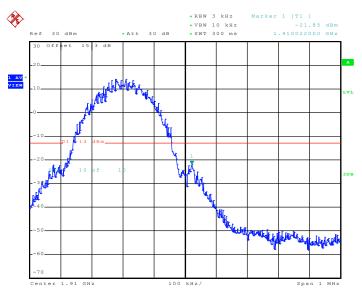
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 37 of 78
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#### **Higher Band Edge Plot on Channel 810**



Date: 11.NOV.2010 15:38:58



Date: 11.NOV.2010 15:28:58

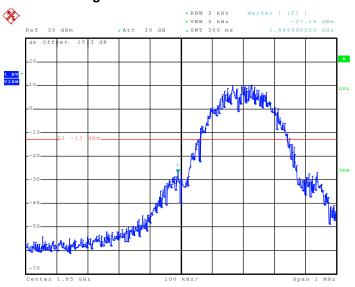
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 38 of 78 Report Issued Date: Jan. 27, 2011

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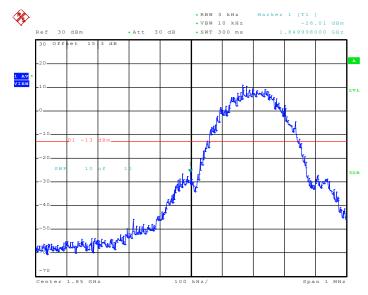


Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE 8 Link		

## **Lower Band Edge Plot on Channel 512**



Date: 11.NOV.2010 14:58:53

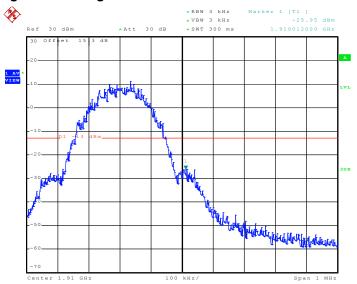


Date: 11.NOV.2010 14:59:55

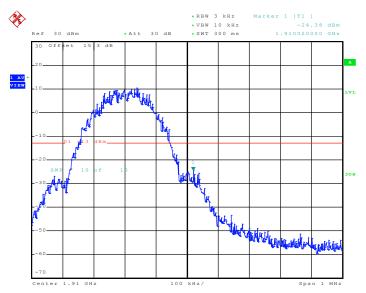
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 39 of 78
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#### **Higher Band Edge Plot on Channel 810**



Date: 11.NOV.2010 14:59:23



Date: 11.NOV.2010 15:00:27

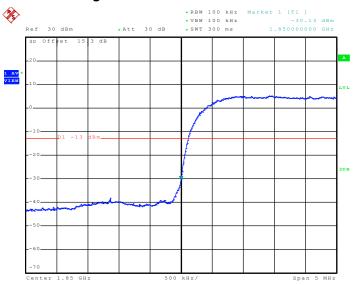
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 40 of 78
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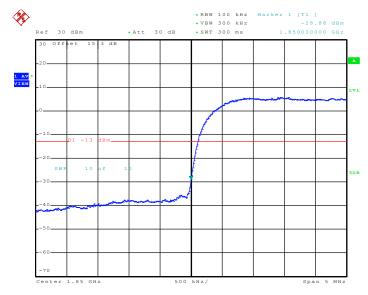
Band: WCDMA Band II Power Stage: High

Test Mode: RMC 12.2Kbps Link

#### **Lower Band Edge Plot on Channel 9262**



Date: 10.NOV.2010 09:32:40

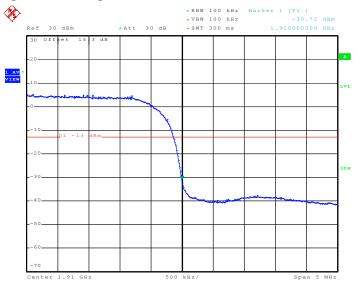


Date: 10.NOV.2010 09:33:42

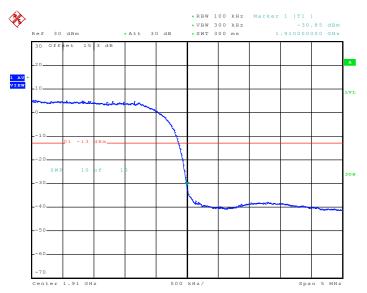
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 41 of 78
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#### **Higher Band Edge Plot on Channel 9538**



Date: 10.NOV.2010 09:33:09



Date: 10.NOV.2010 09:34:14

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 42 of 78
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#### 3.5 Conducted Emission Measurement

### 3.5.1 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 10<sup>th</sup> harmonic.

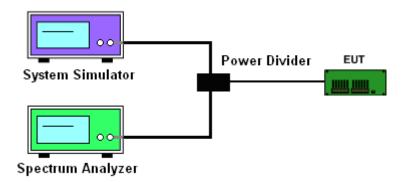
### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.5.3 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.

### 3.5.4 Test Setup



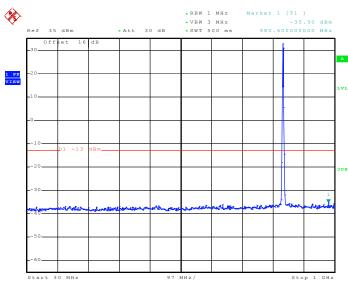
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 43 of 78
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3.5.5 Test Result (Plots) of Conducted Emission

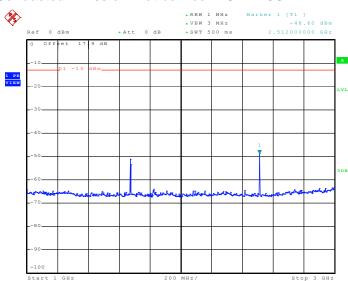
Band :	GSM850	Channel:	CH189
Test Mode :	GPRS 8 Link		

#### Conducted Emission Plot between 30MHz ~ 1GHz



Date: 11.NOV.2010 14:03:59

#### Conducted Emission Plot between 1GHz ~ 3GHz



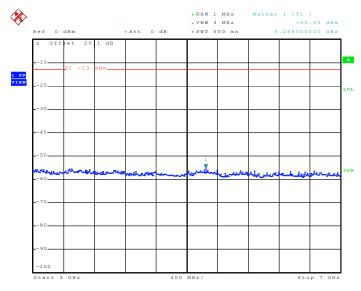
Date: 11.NOV.2010 14:04:17

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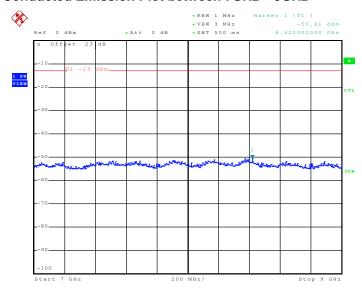






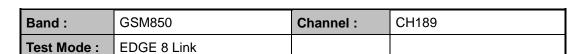
Date: 11.NOV.2010 14:04:32

#### Conducted Emission Plot between 7GHz ~ 9GHz

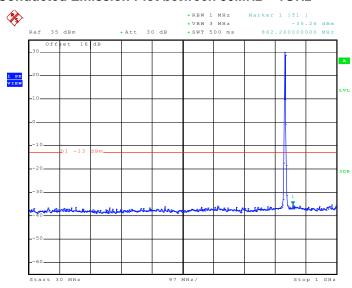


Date: 11.NOV.2010 14:04:47

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 45 of 78
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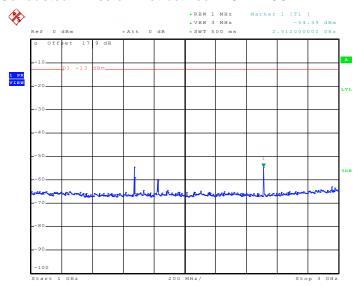


#### Conducted Emission Plot between 30MHz ~ 1GHz



Date: 11.NOV.2010 14:00:45

#### Conducted Emission Plot between 1GHz ~ 3GHz



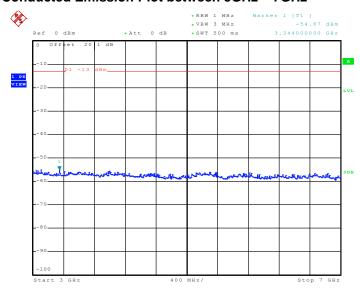
Date: 11.NOV.2010 14:01:07

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 46 of 78
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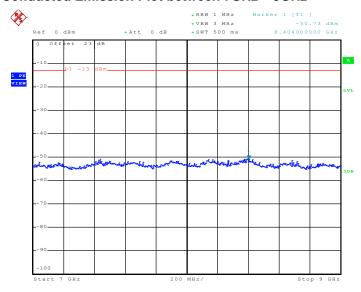


#### Conducted Emission Plot between 3GHz ~ 7GHz



Date: 11.NOV.2010 14:01:22

#### Conducted Emission Plot between 7GHz ~ 9GHz



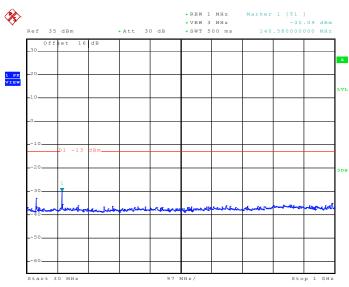
Date: 11.NOV.2010 14:01:37

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 47 of 78
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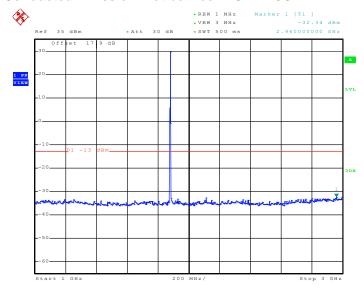
Band :	GSM1900	Channel:	CH661
Test Mode :	GPRS 8 Link		

#### Conducted Emission Plot between 30MHz ~ 1GHz



Date: 11.NOV.2010 15:08:59

#### Conducted Emission Plot between 1GHz ~ 3GHz



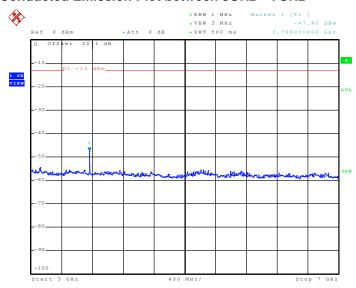
Date: 11.NOV.2010 15:09:14

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 48 of 78
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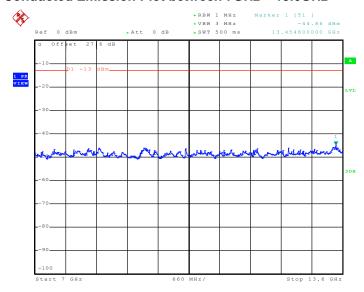


#### Conducted Emission Plot between 3GHz ~ 7GHz



Date: 11.NOV.2010 15:09:33

#### Conducted Emission Plot between 7GHz ~ 13.6GHz



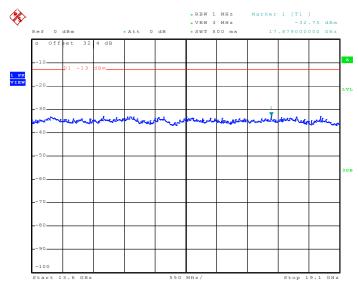
Date: 11.NOV.2010 15:09:48

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 49 of 78
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#### Conducted Emission Plot between 13.6GHz ~ 19.1GHz

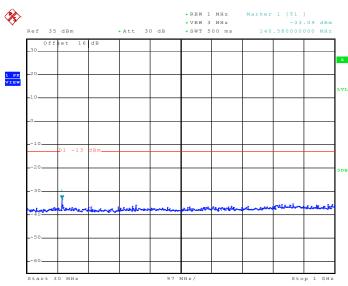


Date: 11.NOV.2010 15:10:03

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 50 of 78
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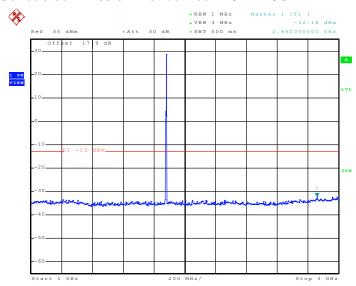
Band :	GSM1900	Channel:	CH661
Test Mode :	EDGE 8 Link		

#### Conducted Emission Plot between 30MHz ~ 1GHz



Date: 11.NOV.2010 14:53:07

#### Conducted Emission Plot between 1GHz ~ 3GHz



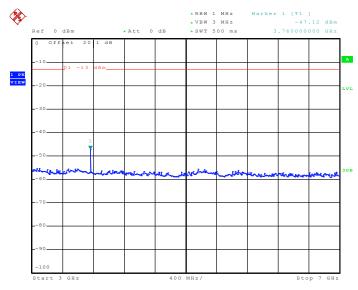
Date: 11.NOV.2010 14:53:22

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 51 of 78
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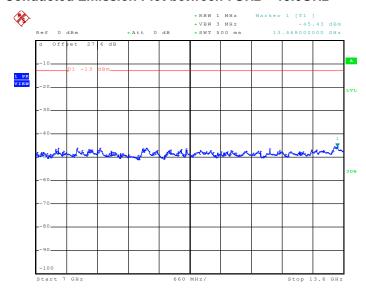


#### Conducted Emission Plot between 3GHz ~ 7GHz



Date: 11.NOV.2010 14:53:41

#### Conducted Emission Plot between 7GHz ~ 13.6GHz

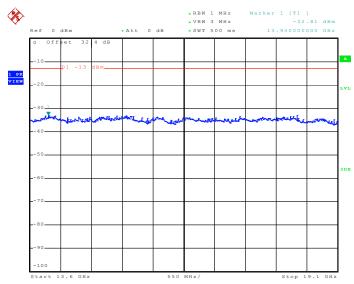


Date: 11.NOV.2010 14:53:56

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 52 of 78
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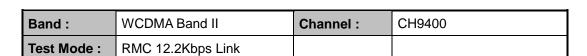


#### Conducted Emission Plot between 13.6GHz ~ 19.1GHz

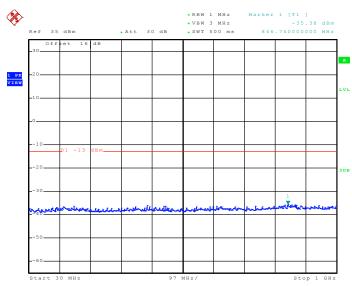


Date: 11.NOV.2010 14:54:11

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 53 of 78
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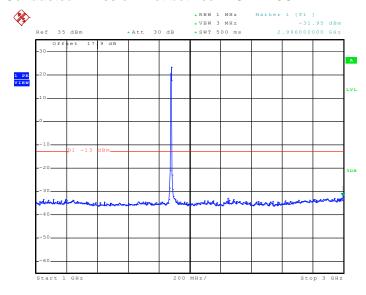


### Conducted Emission Plot between 30MHz ~ 1GHz



Date: 10.NOV.2010 09:37:37

#### Conducted Emission Plot between 1GHz ~ 3GHz



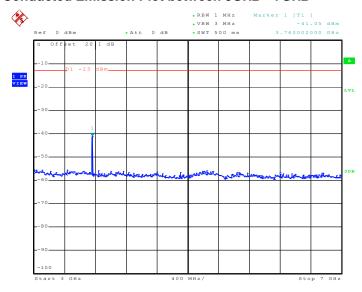
Date: 10.NOV.2010 09:37:52

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 54 of 78
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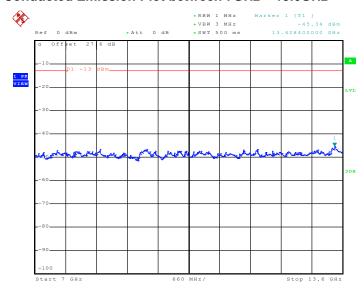


#### Conducted Emission Plot between 3GHz ~ 7GHz



Date: 10.NOV.2010 09:38:10

#### Conducted Emission Plot between 7GHz ~ 13.6GHz

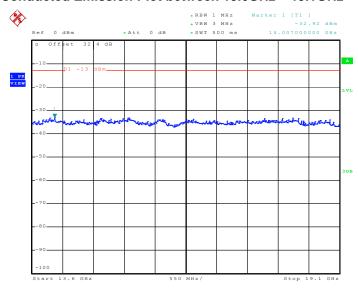


Date: 10.NOV.2010 09:38:25

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 55 of 78
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#### Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 10.NOV.2010 09:38:40

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G Page Number : 56 of 78
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## 3.6 Field Strength of Spurious Radiation Measurement

### 3.6.1 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.

### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

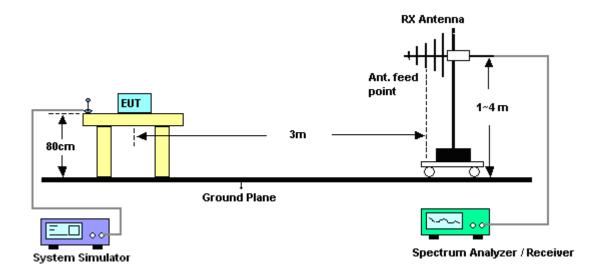
#### 3.6.3 Test Procedures

- 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. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, 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. EIRP (dBm) = S.G. Power Tx Cable Loss + Tx Antenna Gain
- 11. ERP (dBm) = EIRP 2.15

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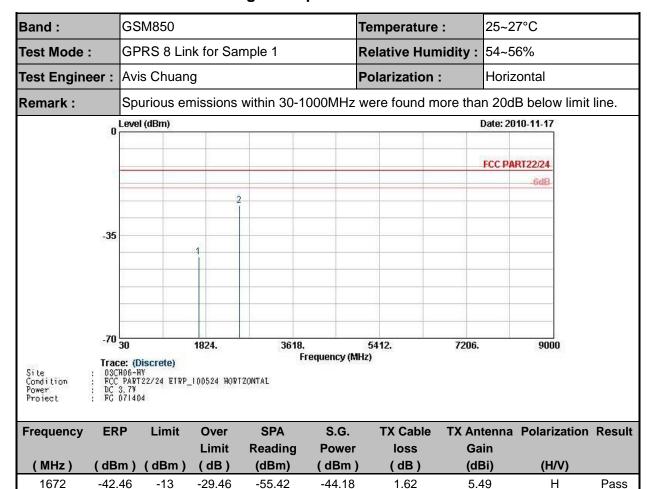


## 3.6.4 Test Setup



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### 3.6.5 Test Result of Field Strength of Spurious Radiated



-26.94

2.1

6.22

Н

**Pass** 

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G

2509

-24.97

-13

-11.97

-39.93

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Re	port	No.	:	FG(	)71	404

Band :		GSM	1850				Temperature	:	25~27°C 54~56%		
Test Mode	:	GPR	S 8 Lin	k for Saı	mple 1		Relative Hun	nidity :			
Test Engine	eer:	Avis	Chuan	3			Polarization	:	Vertic	al	
Remark :		Spur	ious en	nissions	1 20dE	B below limit	line.				
	0 1	_evel (d	IBm)		)ate: 201	10-11-17					
									FCC PAF	RT22/24	
				2						-6dB	
				10							
	-35										
				1							
	-70	20		1824.	3618.		5412.	7206.		9000	
Site Condition Power Project	Trac : 03CH : FCC : DC 3	e: (Disc 106-HY PART22	crete)	1 <b>824.</b> 100524 YERT	Fi	requency (M		7200.		9000	
Frequency	ER	P	Limit	Over	SPA	S.G.	TX Cable	TX Ant	enna	Polarization	Result
(MHz)	( dBı	n) (	dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss (dB)	Ga (dE		(H/V)	
1672	-40.		-13	-27.53	-53.49	-42.25	1.62	5.4	•	V	Pass
2509	-22.	50	-13	-9.50	-37.46	-24.47	2.1	6.2	2	V	Pass

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Band :	G	SM850				Temperature :		25~27°C			
Test Mode :	E	OGE 8 Lin	k for Sa	mple 1		Relative Hum	nidity:	54~56%			
Test Engineer	: Av	is Chuan	g			Polarization	:	Horiz	ontal		
Remark :	Sp	purious emissions within 30-1000MHz were found more than 20dB below limit									
	35 Lew	el (dBm)	1					Pate: 201	10-11-17 RT22/24 6dB		
Site Condition Power Project Frequency	030006-	Discrete) HY T22/24 ETRP_ 04  Limit	1824. 100524 HORT	SPA Reading	S.G. Power	TX Cable loss	7206.		9000 Polarization	Result	
, , ,	dBm)	(dBm)	(dB)	(dBm)	(dBm)	• •	(dE	-	(H/V)		
1672 -4	45.39	-13	-32.39	-57.78	-47.11	1.62	5.4	19	Н	Pass	

-27.06

2.1

6.22

Н

Pass

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G

2509

-25.09

-13

-12.09

-39.69

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Report	No.	: FG	071404
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Band :	GSM850			Temperature	:	25~27°C			
Test Mode :	EDGE 8 Li	nk for Sam	nple 1	Relative Hum	Relative Humidity :				
Test Engineer :	Avis Chua	ng		Polarization		Vertical			
Remark :	Spurious e	Spurious emissions within 30-1000MHz were found more than 20dB below limit line							
0	Level (dBm)					Date: 2010-11-17			
						FCC PART22/24			
		2				-6dB			
-35									
		1							
.70									
Site : 03C Condition : FCC	<b>30</b> : <b>e: (Discrete)</b> H06-HY PART22/24 EIRI 3.7 <b>Y</b> 071404	<b>1824.</b> P_100524 YERTI	=2.45 100401.0050	5412. ncy (MHz)	7206.	9000			

ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
		Limit	Reading	Power	loss	Gain		
(dBm)	(dBm)	(dB)	(dBm)	(dBm)	( dB )	(dBi)	(H/V)	
-42.93	-13	-29.93	-55.32	-44.65	1.62	5.49	V	Pass
-20.28	-13	-7.28	-34.88	-22.25	2.1	6.22	V	Pass
	(dBm) -42.93	(dBm) (dBm) -42.93 -13	Limit (dBm) (dBm) (dB) -42.93 -13 -29.93	Limit Reading (dBm) (dBm) (dBm) (dBm) (dBm) -42.93 -13 -29.93 -55.32	Limit (dBm) (dBm) (dBm) (dB)         Reading (dBm) (dBm)         Power (dBm)           -42.93         -13         -29.93         -55.32         -44.65	Limit (dBm) (dBm) (dB)         Reading (dBm) (dBm) (dBm)         Power (dBm) (dB)           -42.93         -13         -29.93         -55.32         -44.65         1.62	Limit (dBm) (dBm) (dBm)         Reading (dBm) (dBm)         Power (dBm) (dB)         Ioss (dBi)           -42.93         -13         -29.93         -55.32         -44.65         1.62         5.49	Limit (dBm) (dBm) (dBm)         Reading (dBm) (dBm)         Power (dBm) (dB)         Gain (dBi)           -42.93         -13         -29.93         -55.32         -44.65         1.62         5.49         V

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Report	Nο	·F	G07'	1404

Band :		GSI	M850				Temperature	:	25~27°C		
Test Mode	:	ED	GE 8 Lin	k for Sa	mple 2		Relative Hun	nidity :	54~56%		
Test Engin	eer :	Avis	S Chuan	g			Polarization	:	Horiz	ontal	
Remark :		Spu	ırious en	nissions	within 30-1	ore tha	n 20d	B below limit	line.		
	0	Level	(dBm)					ı	)ate: 20	10-11-17	
									FCC PA	RT22/24	
										-6dB	
				2							
	-35			ARUS -							
				1							
	-70										
Site Condition Power Project	Trac	e: (Di	i <b>screte)</b> ( 22/24 ETRP_	<b>1824.</b> 100524 HORT		requency (MI	5412. Hz)	7206.		9000	
Frequency	ER	Р	Limit	Over	SPA	S.G.	TX Cable			Polarization	Result
(MHz)	(dB	m \	(dBm)	Limit ( dB )	Reading (dBm)	Power (dBm)	loss ( dB )	Ga (dE		(H/V)	
1672	-44.		-13	-31.05	-56.27	-45.77	1.62	5.4		H	Pass
2509	-23.		-13	-10.94	-38.09	-25.91	2.1	6.2	-	Н	Pass

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Test Mode :	EDGE 8 L	ink for Samp	ole 2	Relative H	lumidity :	54~56%			
Test Engineer :	Avis Chua	ng		Polarization	Vertical				
Remark :	Spurious e	missions wi	ithin 30-1000M	IHz were found	z were found more than 20dB below lim				
0	Level (dBm)					Date: 2010-11-17			
						FCC PART22/24			
						-6dB			
		2							
-35									
		1							
-70		1001	2000	Tevro.	7000				
	30	1824.	3618. Frequen	5412.	7206.	9000			

ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
		Limit	Reading	Power	loss	Gain		
(dBm)	(dBm)	(dB)	(dBm)	(dBm)	( dB )	(dBi)	(H/V)	
-47.86	-13	-34.86	-60.08	-49.58	1.62	5.49	V	Pass
-23.65	-13	-10.65	-37.8	-25.62	2.1	6.22	V	Pass
	(dBm) -47.86	(dBm) (dBm) -47.86 -13	Limit (dBm) (dBm) (dB) -47.86 -13 -34.86	Limit Reading (dBm) (dBm) (dBm) (dBm) (dBm) -34.86 -60.08	Limit (dBm) (dBm) (dBm) (dB) (dBm)         Reading (dBm) (dBm)         Power (dBm)           -47.86 -13 -34.86 -60.08 -49.58	Limit         Reading         Power         loss           (dBm) (dBm) (dB) (dBm) (dBm)         (dBm) (dBm)         (dB)           -47.86 -13 -34.86 -60.08 -49.58         1.62	Limit (dBm) (dBm) (dBm)         Reading (dBm) (dBm)         Power (dBm) (dB)         Item (dBm) (dBm) (dBm)           -47.86         -13         -34.86         -60.08         -49.58         1.62         5.49	Limit (dBm) (dBm) (dBm)         Reading (dBm) (dBm)         Power (dBm) (dB)         Gain (dBi)           -47.86         -13         -34.86         -60.08         -49.58         1.62         5.49         V

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Band :	GSM1900	<u>'</u>					
Test Mode :	GPRS 8 L	PRS 8 Link for Sample 1 Relative Humidity: 54~56%					
Test Engineer :	Avis Chua	ng		Polarizatio	on :	Horizontal	
Remark :	Spurious 6	emissions wi	thin 30-1000N	1Hz were found	more tha	n 20dB belov	v limit lii
0	Level (dBm)					Date: 2010-11-17	
						FCC PART22/24	
						-6dB	
		2					
-35		1					
-70	30	3824.	7618.	11412.	15206.	1900	ı
Site : 03C Condition : FCC	ce: (Discrete)	<b>3824.</b> P_100524 HORTZON	52.55 (CO. 650 BS) 0	11412. cy (MHz)	15206.	19000	1

Frequency	EIRP	Limit	Over Limit	SPA Reading	S.G. Power	TX Cable loss	TX Antenna Gain	Polarization	Result
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	( dB )	(dBi)	(H/V)	
3760	-39.08	-13	-26.08	-58.86	-45.33	2.56	8.81	Н	Pass
5636	-32.43	-13	-19.43	-57.45	-40.17	2.96	10.70	Н	Pass

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Report	No.	:	FG071404

Band :		GSI	M1900				Temperature	):	25~27	7°C	
Test Mode :		GPF	RS 8 Lin	k for Sa	mple 1		Relative Hur	nidity:	54~56	6%	
Test Engine	er:	Avis	Chuan	g			Polarization	:	Vertic	al	
Remark :		Spu	rious en	nissions	within 30	-1000MHz	were found m	nore tha	n 20dl	B below limit	line.
	0	Level	(dBm)					10-11-17			
									FCC PAF	RT22/24	
										-6dB	
					2						
	-35			1							
	-70 Trac		screte)	3824.	76	18. Frequency (M	11412. IHz)	15206.		19000	
Site Condition Power Project	: 03C : FCC : DC	нов-ну	2/24 ETRP_	100524 YERT	TCAL						
Frequency	EIR	RP	Limit	Over	SPA	S.G.	TX Cable			Polarization	Result
(MHz)	( dB	m)	(dBm)	Limit ( dB )	Reading (dBm)	Power ( dBm )		Ga (dE		(H/V)	
3760	-38.		-13	-25.20	-57.98	-44.45	2.56	8.8		V	Pass
5636	-32.	.07	-13	-19.07	-57.09	-39.81	2.96	10.	70	V	Pass

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Report	No.	: FG	071404
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Band :		GSI	M1900				Temperature	:	25~27°C		
Test Mode	:	ED	GE 8 Lin	k for Sa	mple 1		Relative Hun	nidity :	54~56%		
Test Engin	eer :	Avis	S Chuan	g			Polarization	:	Horiz	ontal	
Remark :		Spu	ırious en	nissions	within 30-1	000MHz	z were found more than 20dB belo				line.
	0	Level	(dBm)					į	Date: 20	10-11-17	
									FCC PA	RT22/24	
										-6dB	
						1					
					2						
	-35			1							
						1					
						1					
Site Condition Power Project	: 03C	e: (Di	22/24 FIRE	<b>3824.</b> 100524 HOR		requency (M	11412. Hz)	15206.		19000	
Frequency	EIR	P	Limit	Over	SPA	S.G.	TX Cable	TX An	tenna	Polarization	Result
(MHz)	( dB	m \	(dBm)	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss (dB)	Ga (dE		(H/V)	
3760	-40.		-13	-27.68	-60.57	-46.93	2.56	8.8		H	Pass
5636	-30.		-13	-17.87	-56.13	-38.61	2.96	10.		Н	Pass

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Re	port	No.	:	FG	071	404

Band :		GSN	11900				Temperature	<b>:</b>	25~27	7°C		
Test Mode :		EDG	E 8 Lin	k for Saı	mple 1		Relative Humidity:			54~56%		
Test Engine	er:	Avis	Chuanç	3			Polarization	:	Vertic	al		
Remark :		Spur	ious en	nissions	within 30-	1000MHz	were found n	nore tha	n 20dl	3 below limit	line.	
	0	Level (	dBm)					Į	)ate: 201	10-11-17		
	U									12		
									FCC PAF	RT22/24		
									I CC FMI	-6dB		
										-000		
				29	2							
	-35											
	-70	30		3824.	761	8.	11412.	15206.		19000		
Site Condition Power Project	Trac : 03C : FCC : DC	e: (Dis	crete)	100524 VERT		Frequency (M						
Frequency	EIR	RP	Limit	Over	SPA	S.G.	TX Cable			Polarization	Result	
				Limit	Reading		loss	Ga				
(MHz)	(dB	m) (	dBm)	(dB)	(dBm)	( dBm )	( dB )	(dE	Bi)	(H/V)		
3760	-36.	98	-13	-23.98	-56.87	-43.23	2.56	8.8	31	V	Pass	
5636	-33.	70	-13	-20.70	-58.96	-41.44	2.96	10.	70	V	Pass	

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GE 8 Link for Samp Chuang	ole 2	Relative H		54~56%				
<u>-</u>		Polarizati						
	uang Polarization: Horizontal s emissions within 30-1000MHz were found more than 20dB below							
rious emissions wi	thin 30-1000N	/IHz were found	d more tha	n 20dB below lin				
(dBm)	Date: 2010-11-17							
				FCC PART22/24				
				-6dB				
2								
3824.	7618.	11412.	15206.	19000				
	3824.	3824. 7618. Frequen	3824. 7618. 11412. Frequency (MHz)	3824. 7618. 11412. 15206. Frequency (MHz)				

Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	( dB )	(dBi)	(H/V)	
3760	-42.87	-13	-29.87	-62.61	-49.12	2.56	8.81	Н	Pass
5636	-29.72	-13	-16.72	-54.67	-37.46	2.96	10.70	Н	Pass

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Band :		GSM1900					Temperature :		25~27°C			
Test Mode	:	ED	GE 8 Lin	ink for Sample 2			Relative Humidity :		54~56%			
Test Engine	eer :	Avi	s Chuan	g		Polarization :		Vertic	Vertical			
Remark:		Spi	urious en	nissions	within 30-1	000MHz	were found m	ore tha	n 20dl	B below limit	line.	
	0	Level (dBm) Date: 2010-11-17										
	u									107		
									FCC PAI	RT22/24		
										-6dB		
	-35				2							
				-1								
				(II)								
	-70			2004	7040		44440	45000		40000		
		Fraguency (MHz)										
Site Condition Power Project	: 03C	H06-H	22/24 EIRP	100524 YER	TTCAL	- TOP-015-028-04-18						
Frequency	EIR	P	Limit	Over	SPA	S.G.	TX Cable	TX An	tenna	Polarization	Result	
				Limit	Reading	Power	loss	Ga	in			
(MHz)	(dB	m)	(dBm)	( dB )	(dBm)	(dBm)	( dB )	(dE	3i)	(H/V)		
3760	-42.	81	-13	-29.81	-62.55	-49.06	2.56	8.8	31	V	Pass	

-41.01

2.96

10.70

Pass

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5636

-33.27

-13

-20.27

-58.22

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Band :		WCDMA B	and II			Temperature	:	25~27°C					
Test Mode	:	RMC 12.2	Kbps Link	for Sample	e 1	Relative Humidity :		54~56%					
Test Engine	eer :	Avis Chuar	ng			Polarization	:	Horizontal					
Remark :		Spurious e	missions	within 30-1	000MHz	were found m	ore tha	n 20dB below limi	it line.				
	n l	Level (dBm) Date: 2010-11-17											
	0												
								FCC PART22/24					
								6dB					
	-35												
			4										
			9										
	70												
	-70	30	3824.	7618.		11412.	15206.	19000					
Site Condition Power Project	: 03CF : FCC : DC 3	e: (Discrete) 106-HY PART22/24 EIRP 3,7V 171404	_100524 HOR		requency (M	HZ)							
Frequency	EIR	P Limit	Over	SPA	S.G.	TX Cable	TX An	tenna Polarization	n Result				
			Limit	Reading	Power	loss	Ga	in					
(MHz)	(dBr	m) (dBm)	( dB )	(dBm)	(dBm)	( dB )	(dE	Bi) (H/V)					
3760	-46.	12 -13	-33.12	-66.10	-52.37	2.56	8.8	31 H	Pass				

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Band :	W	CDMA Ba	ınd II		Temperature :		25~27°C			
Test Mode :	RI	MC 12.2K	bps Link	for Sample	e 1	Relative Hum	nidity:	54~56%		
Test Enginee	r: A	is Chuan	g			Polarization : Vertical			cal	
Remark :	Sp	ourious en	nissions	within 30-1	000MHz	were found m	ore tha	n 20d	B below limit	line.
	0 Lev	el (dBm)							10-11-17 RT22/24	
ŧ	-35		*1						-6dB	
	03CH06-	T22/24 EIRP	<b>3824.</b>		requency (M	11412. Hz)	15206.		19000	
. ,	EIRP dBm )	Limit	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss (dB)	TX Ant Ga (dE	in	Polarization (H/V)	Result
, , ,	45.67	-13	-32.67	-65.65	-51.92	2.56	8.8	-	V	Pass

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## 3.7 Frequency Stability Measurement

#### 3.7.1 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 ±0.00025% (±2.5ppm) of the center frequency.

### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

## 3.7.3 Test Procedures for Temperature Variation

- 1. The EUT was set up in the thermal chamber and connected with the base station.
- 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.

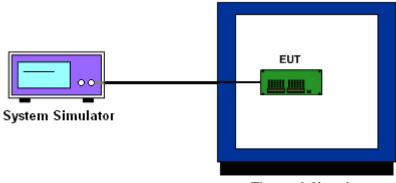
### 3.7.4 Test Procedures for Voltage Variation

- 1. The EUT was placed in a temperature chamber at 25±5° 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.

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3.7.5 Test Setup



Thermal Chamber

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# 3.7.6 Test Result of Temperature Variation

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

	GPF	RS 8	EDO	SE 8	
Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	N/A	N/A	N/A	N/A	
-20	23	0.03	27	0.03	
-10	18	0.02	36	0.04	
0	17	0.02	38	0.04	
10	16	0.02	29	0.03	PASS
20	-16	-0.02	-15	-0.02	
30	25	0.03	-19	-0.02	
40	31	0.04	21	0.02	
50	-33	-0.04	-33	-0.04	

#### Note:

- 1. The EUT stops transmitting at temperatures -30°C.
- 2. The manufacturer declared that the EUT could work properly between temperatures -20°C~55°C.

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## FCC RF Test Report

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

	GPF	GPRS 8		EDGE 8	
Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	N/A	N/A	N/A	N/A	
-20	-28	-0.01	-45	-0.02	
-10	-16	-0.01	39	0.02	
0	-15	-0.01	-40	-0.02	
10	22	0.01	-12	-0.01	PASS
20	38	0.02	-13	-0.01	
30	-21	-0.01	18	0.01	
40	-17	-0.01	-27	-0.01	
50	33	0.02	36	0.02	

#### Note:

- 1. The EUT stops transmitting at temperatures -30°C.
- 2. The manufacturer declared that the EUT could work properly between temperatures -20°C~55°C.

Band :	WCDMA Band II	Channel:	9400
Limit (ppm):	2.5		

	RMC 12		
Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	NA	NA	
-20	-33	-0.02	
-10	27	0.01	
0	-36	-0.02	
10	-42	-0.02	PASS
20	28	0.01	
30	17	0.01	
40	-16	-0.01	
50	12	0.01	

#### Note:

- 1. The EUT stops transmitting at temperatures -30°C.
- 2. The manufacturer declared that the EUT could work properly between temperatures -20°C~55°C.

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## 3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
		3.7	18	0.02		
	GPRS 8	3.2	23	0.03		
GSM 850		4.2	14	0.02		
CH189		3.7	40	0.05		
	EDGE 8	3.2	50	0.06	2.5	
		4.2	41	0.05		
	GPRS 8	3.7	-29	-0.02		
		3.2	-27	-0.01		PASS
GSM 1900		4.2	-49	-0.03		
CH661	EDGE 8	3.7	-47	-0.02		
		3.2	-70	-0.04		
		4.2	-28	-0.01		
WCDMA Band II CH9400	2110	3.7	60	0.03		
	RMC 12.2Kbps	3.2	52	0.03		
	12.210093	4.2	62	0.03		

**Note:** Normal Voltage = 3.7V.

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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)
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 2011	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30,2010	Jul. 29, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 25, 2010	Oct. 24, 2011	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2010	Apr. 27, 2011	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2010	Oct. 31, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 02, 2010	Aug. 01, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Oct. 20, 2010	Oct. 19, 2011	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	Radiation (03CH06-HY)

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# 5 Uncertainty of Evaluation

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

	Uncerta	inty of X <sub>i</sub>		
Contribution	dB	Probability Distribution	u(X <sub>i</sub> )	
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	
Combined Standard Uncertainty Uc(y)	1.27			
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54			

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

	Uncertai	nty of X <sub>i</sub>			
Contribution	dB	Probability Distribution	u(X <sub>i</sub> )	C <sub>i</sub>	C <sub>i</sub> * u(X <sub>i</sub> )
Receiver Reading	±0.10	Normal (k=2)	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-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	2.36				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))		4.7	72		

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# Appendix A. Photographs of EUT

Please refer to Sporton report number EP071404 as below.

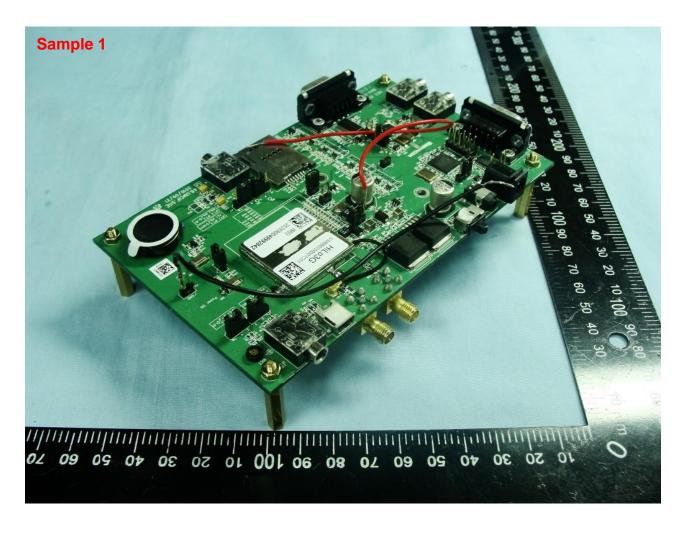
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# 1. External Photograph of EUT

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Report No.: EP071404

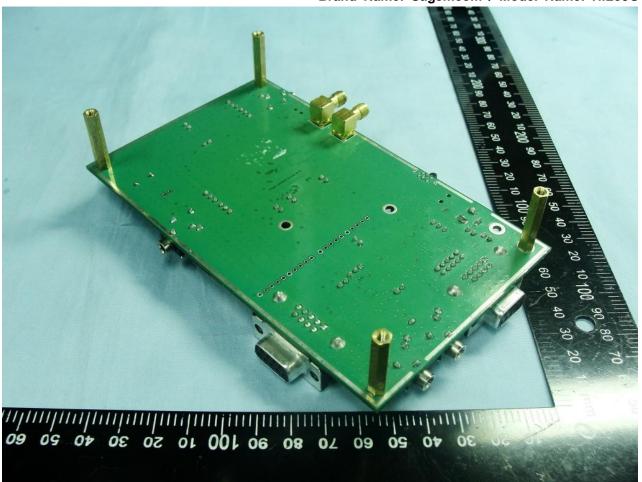


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Brand Name: Sagemcom / Model Name: HiLo3G

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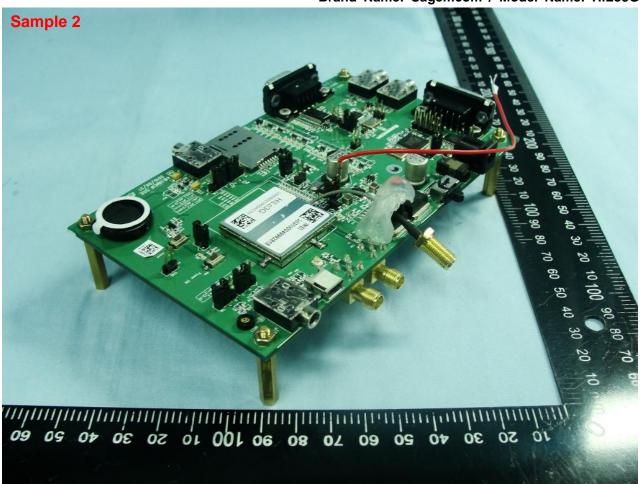


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Brand Name: Sagemcom / Model Name: HiLo3G

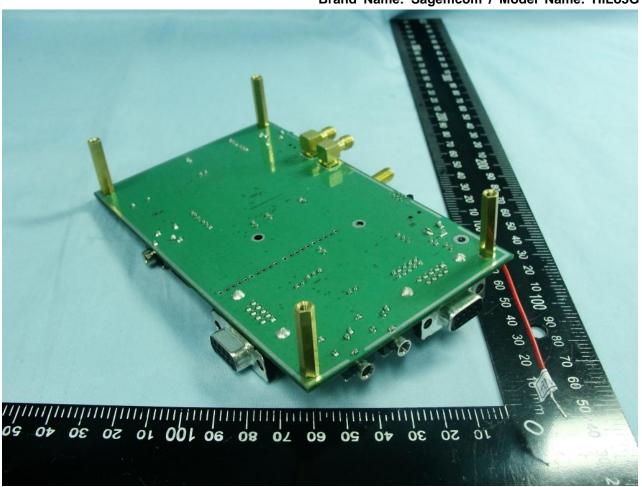
Report No.: EP071404



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# 2. Internal Photograph of EUT

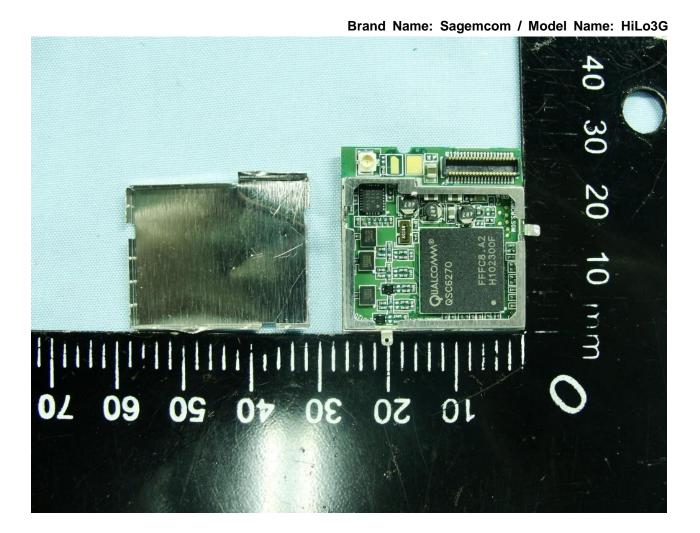
Brand Name: Sagemcom / Model Name: HiLo3G

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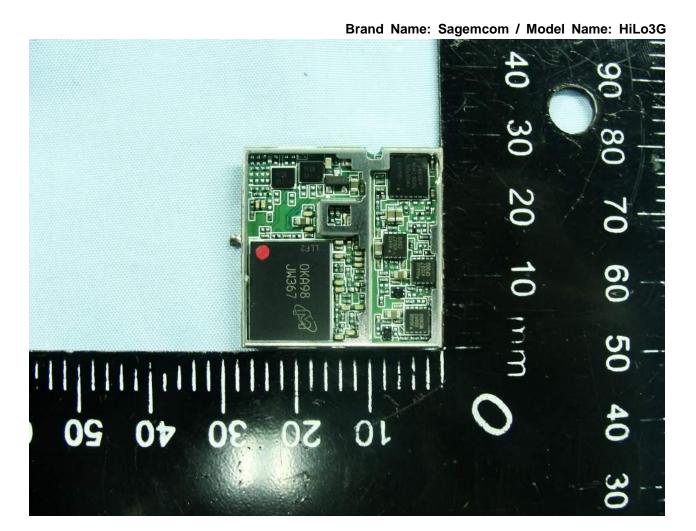


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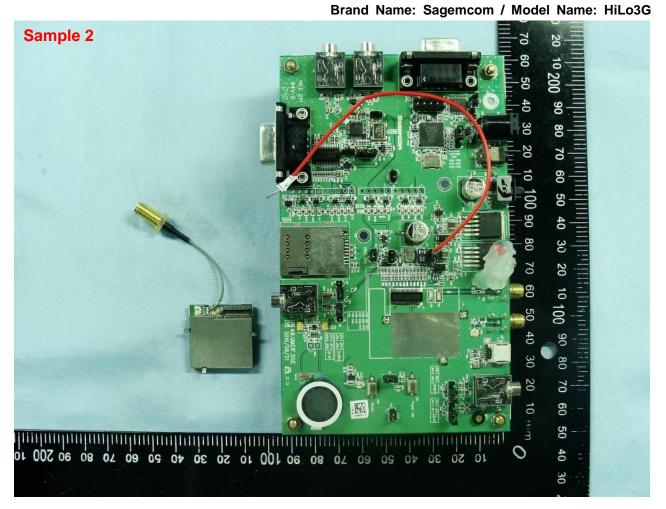
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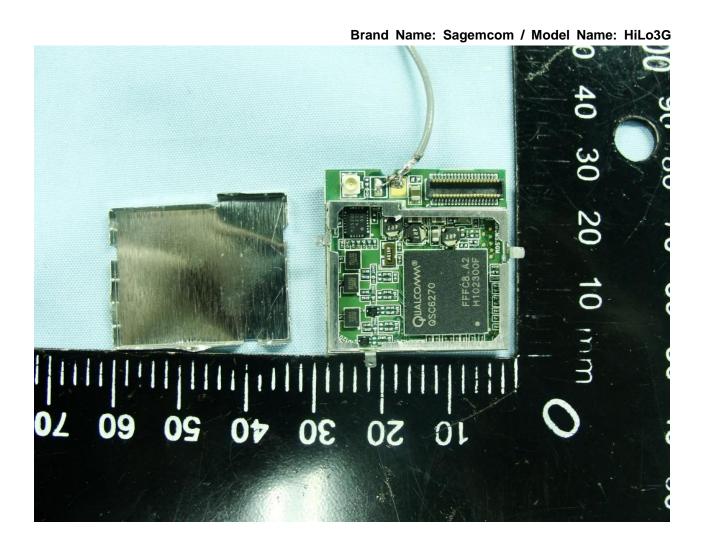
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Brand Name: Sagemcom / Model Name: HiLo3G

40 30 20 10 70 60 50

90 05 07 08 0Z 01

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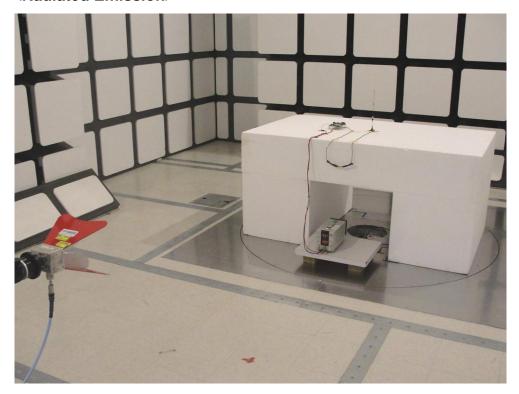
TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: VW3HILO3G IC: 9140A-HILO3G Page Number : 10 of 10
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# Appendix B. Setup Photographs

# <Radiated Emission>



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