

5LINX ENTERPRISES, INC.

5LINXGLOBAL WiFi Cellphone

Model: GM100N WM680

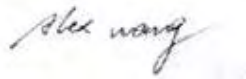
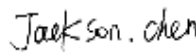
Jun 28 2010

Report No.: 1005007-01
(This report supersedes NONE)



Modifications made to the product : None

This Test Report is Issued Under the Authority of:

	
Alex Wang Compliance Engineer	Jackson Chen Technical Manager

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Test result presented in this test report is applicable to the representative sample only.

RF Test Report

FCC PART 2,PART22 ,PART 24

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Laboratory Introduction

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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
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Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
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Accreditations for Product Certifications

Country	Accreditation Body	Scope
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Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom



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1 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the 5LINX Enterprises, Inc., 5LINXGLOBAL WiFi Cellphone, and model: GM100N WM680 against the current Stipulated Standards. The 5LINXGLOBAL WiFi Cellphone has demonstrated compliance with the FCC PART 2,PART22,PART24.

EUT Information

EUT	Dual-mode GSM/WiFi cellular phone
Description	
Model No	GM100N WM680
Input Power	DC 3.7V(Li-ion Battery)
Classification	
Per Stipulated	GSM cellular phone per FCC PART 2,PART22,PART24
Test Standard	

2 TECHNICAL DETAILS

Purpose	Compliance testing of WIFI Module with stipulated standard
Applicant / Client	5LINX Enterprises, Inc. 275 Kenneth Drive, Rochester, NY, 14623, U.S.A.
Manufacturer	W&M Telecommunication Co.,Ltd B-10F,Xinghua Building,Shennan Rd east, Futian district,Shenzhen,China
Laboratory performing the tests	SIEMIC Nanjing (China) Laboratories NO.2-1,Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com
Test report reference number	1005007-01
Date EUT received	Jun 08 2010
Standard applied	FCC PART 2,PART22,PART24
Dates of test (from – to)	Jun 10~28 2010
No of Units:	#2
Equipment Category:	PCE
Model :	GM100N WM680
RF Operating Frequency (ies)	GSM 850 Tx:824.2-848.8MHz Rx:869.2-893.8MHz GSM 1900 Tx:1850.2-1909.8MHz Rx:1930.2-1989.8MHz
Modulation :	GMSK
Output Power	GSM 850: 32.67dBm GSM 1900:29.66dBm
FCC ID Number	YKMGM100N



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3 MODIFICATION

NONE

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4 TEST SUMMARY

The product was tested in accordance with the following specifications. All Testing has been performed according to below product classification:

Test Standard	Description	Pass / Fail
CFR 47 Part 2,part 22,part 24		
2.1046	Conducted Output Power	Pass
22.913(a)(2)	Effective Radiated Power	Pass
24.232(c)	Equivalent Isotropic Radiated Power	Pass
2.1049,22.917(a),24.238(a)	Occupied Bandwidth	Pass
2.1051,22.917(a),24.238(a)	Band Edge Measurement	Pass
2.1051, 22.917(a),24.238(a)	Conducted Emission	Pass
2.1051, 22.917(a),24.238(a)	Field Strength of Spurious Emission	Pass
2.1055,22.355,24.235	Frequency Stability For temperature &Voltage	Pass

ANSI C63.4: 2003

PS: All measurement uncertainties are not taken into consideration for all presented test result.

Preliminary radiated emissions testing has been performed on all models, only worst case test result is presented in this test report.



5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Conducted Output Power Measurement

1. EUT was working normal during the test
2. Environmental Conditions
Temperature 23°C
Relative Humidity 50%
Atmospheric Pressure 1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
Tested By : Alex Wang

Standard Requirement(s): Part 2.1046

Procedures:

- 1.Connect the transmitter port to the base station
- 2.Set EUT at maximum power through base station
- 3.Selet low, middle and high channels for each band and different modulation

Test result: Pass

Cellular Band				
Modes	Channel	Frequency (MHz)	Conducted power (dBm)	Conducted power (Watts)
GSM850(GSM)	Low	824.2	32.66	1.85
	Mid	836.4	32.60	1.82
	High	848.8	32.67	1.85

PCS Band				
Modes	Channel	Frequency (MHz)	Conducted power (dBm)	Conducted power (Watts)
GSM1900(GSM)	Low	1850.2	29.57	0.91
	Mid	1880.2	29.57	0.91
	High	1909.8	29.66	0.92



5.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

1. EUT was working normal during the test
2. Environmental Conditions Temperature 23°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
 Tested By : Alex Wang

Requirement(s): Part 22.913(a)(2) , 24.232(c)

The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

Procedures:

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

Test result: Pass

**GSM850(GSM) Radiated Power ERP**

Horizontal						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBm)	ERP (dBm)	ERP (w)
824.20	-19.53	-48.12	0	-1.08	27.51	0.56
836.40	-18.55	-48.28	0	-0.93	28.80	0.76
848.80	-17.90	-48.35	0	-0.76	29.69	0.93
Vertical						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBm)	ERP (dBm)	ERP (w)
824.20	-33.01	-47.97	0	-1.08	13.88	0.02
836.40	-31.59	-48.01	0	-0.93	15.49	0.04
848.80	-30.70	-48.05	0	-0.76	16.59	0.05

GSM1900(GSM) Radiated Power ERP

Horizontal						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBm)	EIRP (dBm)	EIRP (w)
1850.20	-24.17	-51.88	0	1.96	29.67	0.93
1880.00	-24.20	-52.99	0	2.00	30.79	1.20
1909.80	-24.49	-54.28	0	1.98	31.77	1.50
Vertical						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBm)	EIRP (dBm)	EIRP (w)
1850.20	27.14	52.13	0	1.96	26.95	0.50
1880.00	27.23	53.17	0	2.00	27.94	0.62
1909.80	27.13	54.13	0	1.98	28.98	0.79



5.3 Occupied Bandwidth

1. EUT was working normal during the test
2. Environmental Conditions Temperature 23°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
 Tested By : Alex Wang

Requirement(s):Part 2.1049, 22.917(a), 24.238(a)

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.

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.

Test result: Pass



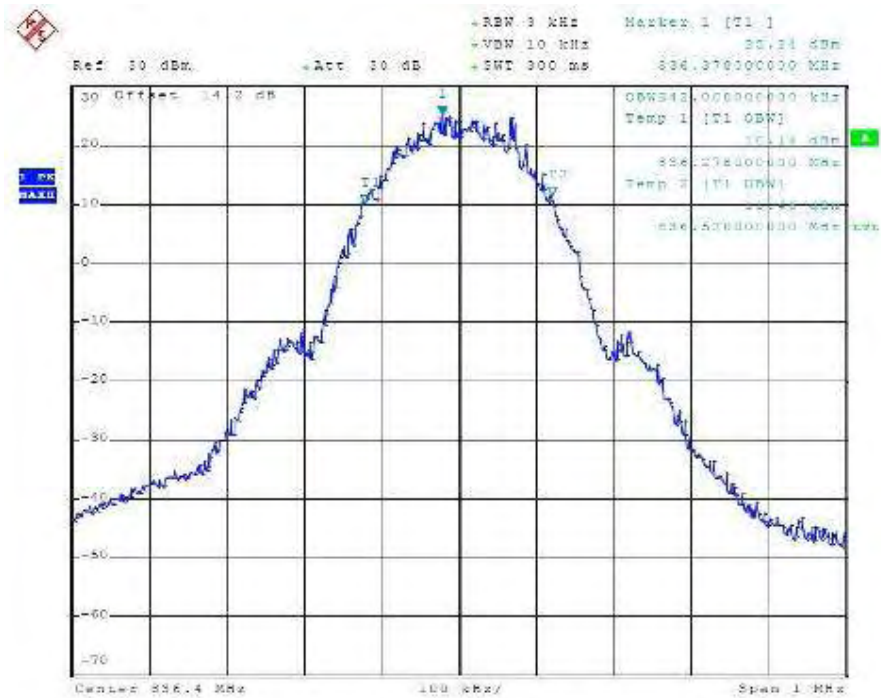
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99% Occupied Bandwidth Plot on Channel 189



26dB Bandwidth Plot on Channel 189

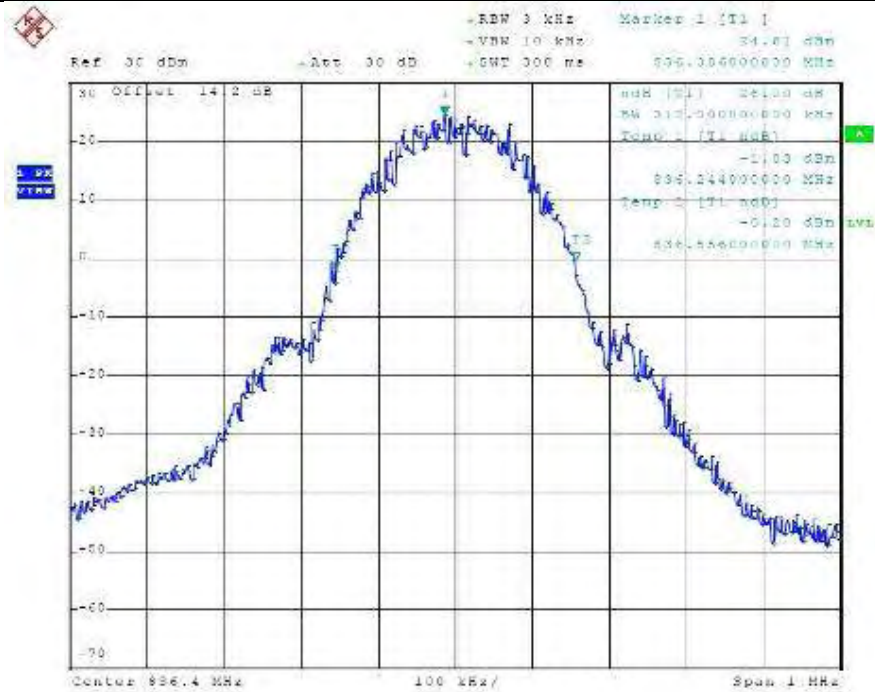


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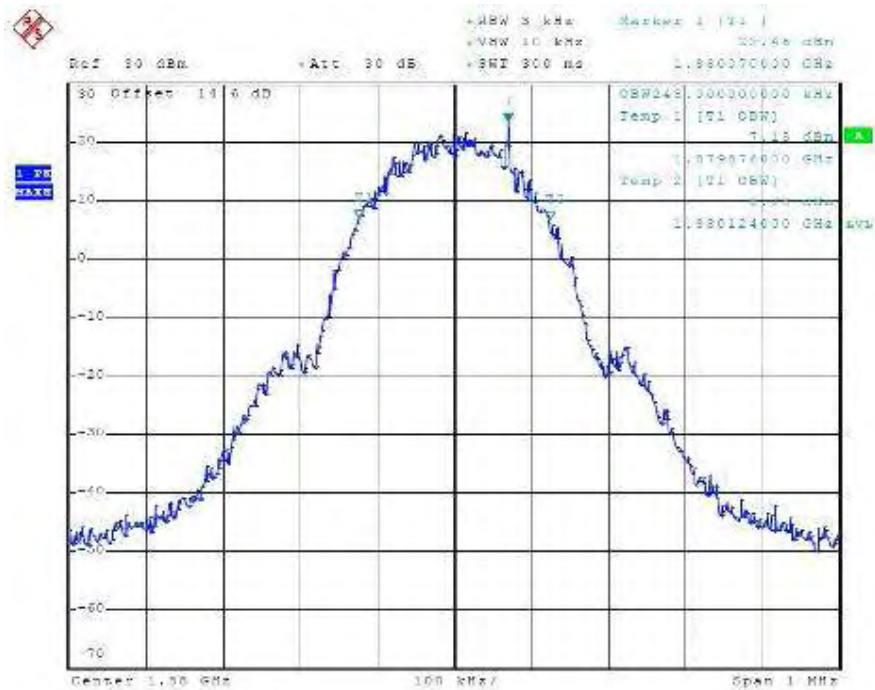
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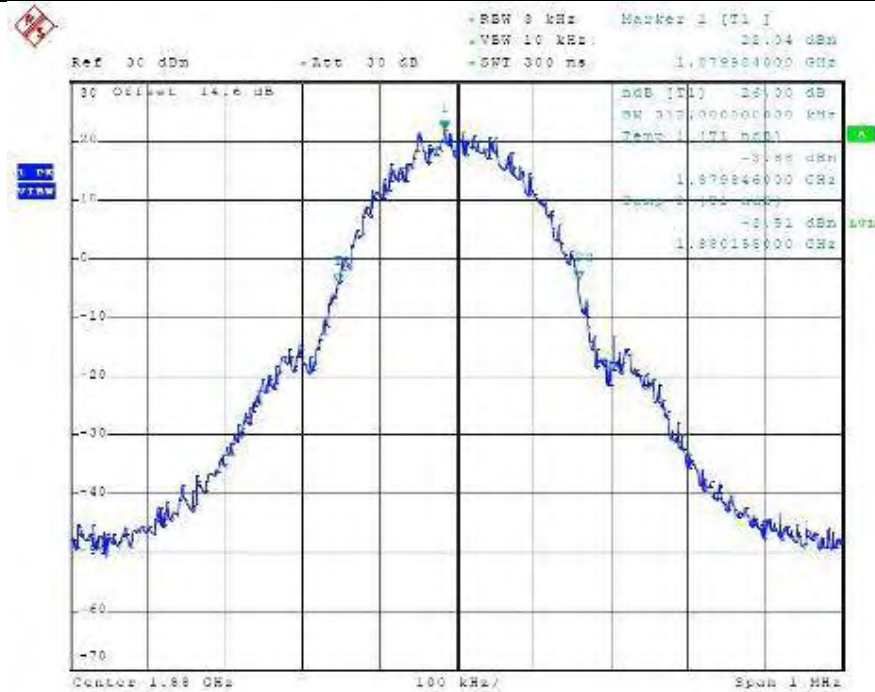
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99% Occupied Bandwidth Plot on Channel 661



26dB Bandwidth Plot on Channel 661



5.4 Band Edge

1. EUT was working normal during the test
2. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
Tested By : Alex Wang

Requirement(s):Part2.1051, 22.917(a), 24.238(a)

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.

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.

Test result: Pass



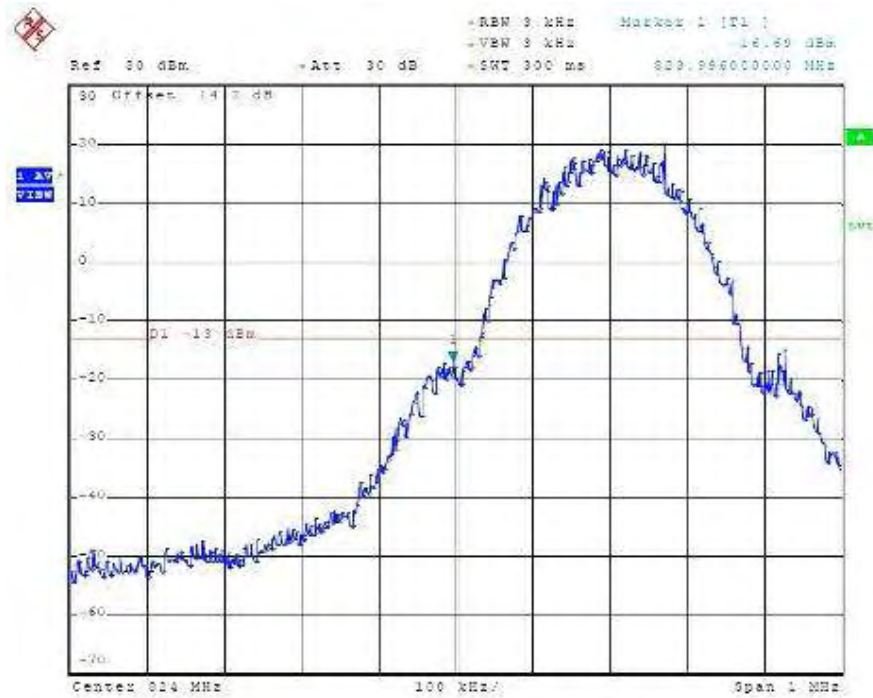
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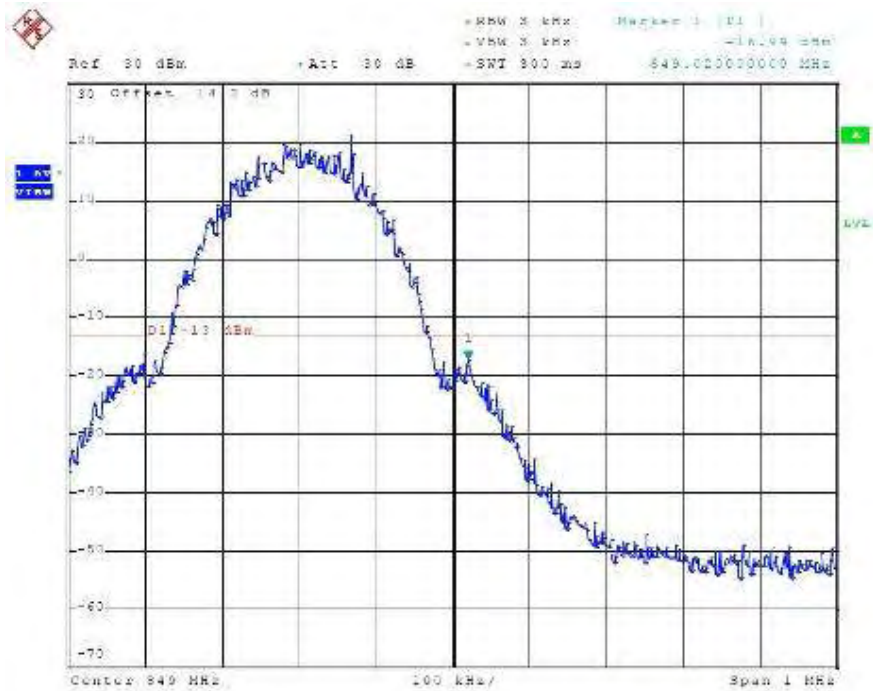
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Lower Band Edge Plot on Channel 128



Higher Band Edge Plot on Channel 251





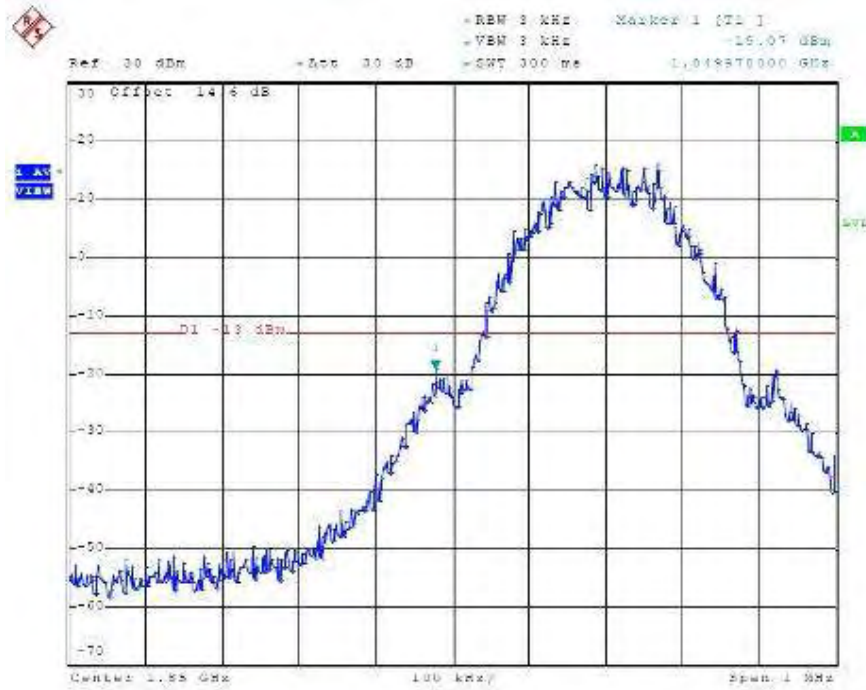
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Lower Band Edge Plot on Channel 512



Higher Band Edge Plot on Channel 810



5.5 Transmitter-Output RF spectrum

1. EUT was working normal during the test
2. Environmental Conditions Temperature 23°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
 Tested By : Alex Wang

Requirement: Part2.1051, 22.917(a), 24.238(a)

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.

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.

Test Result: Pass



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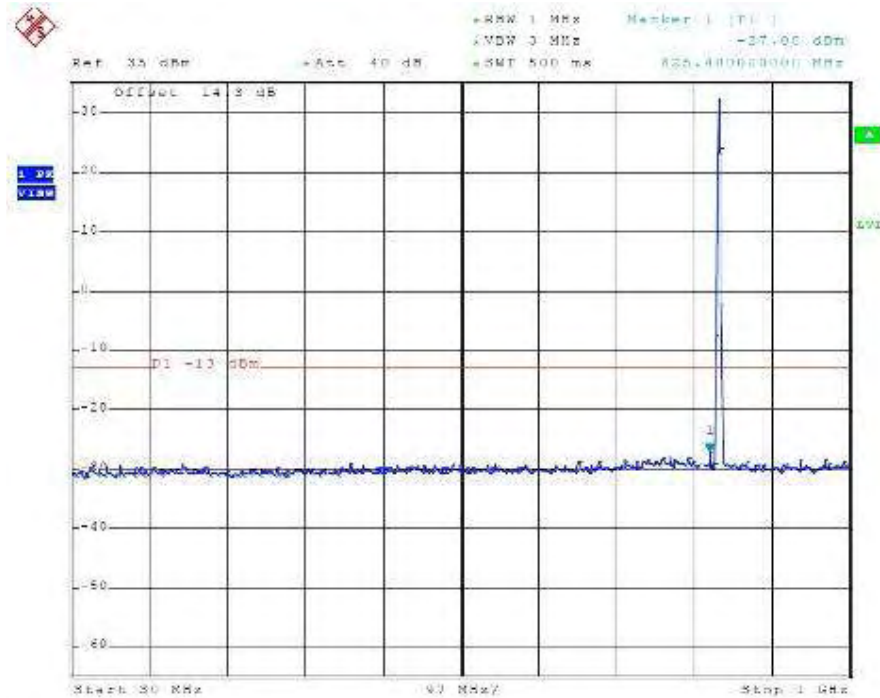
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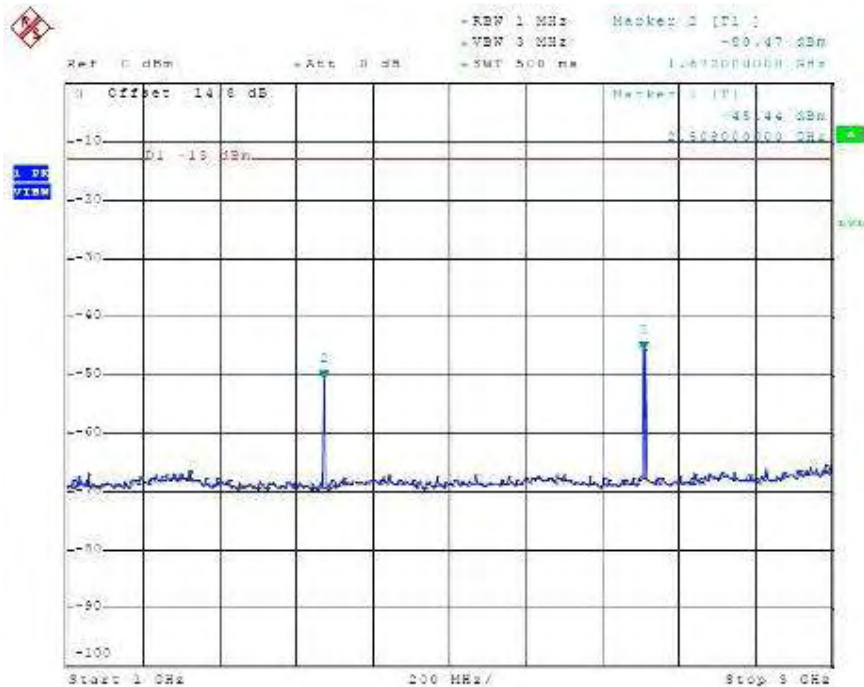
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Band	GSM850	Channel	CH189
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Conducted Emission Plot between 30MHz ~ 1GHz



Conducted Emission Plot between 1GHz ~ 3GHz



Conducted Emission Plot between 3GHz ~ 7GHz

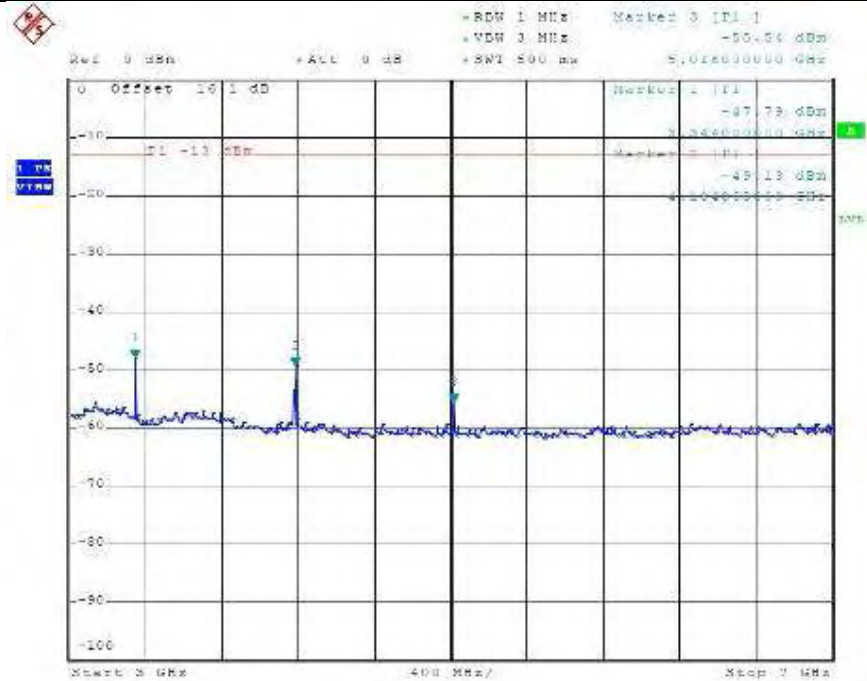


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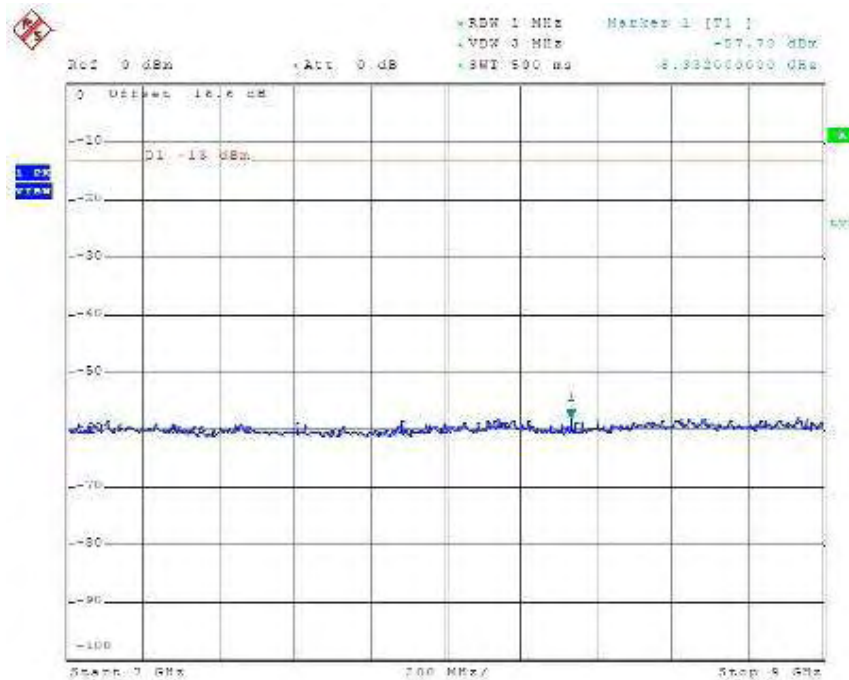
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Conducted Emission Plot between 7GHz ~ 9GHz





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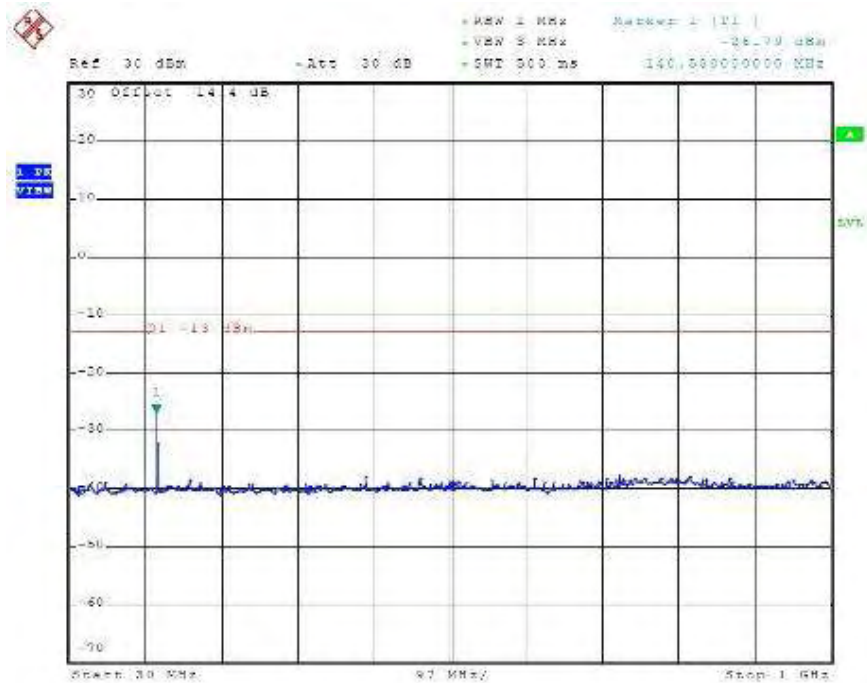
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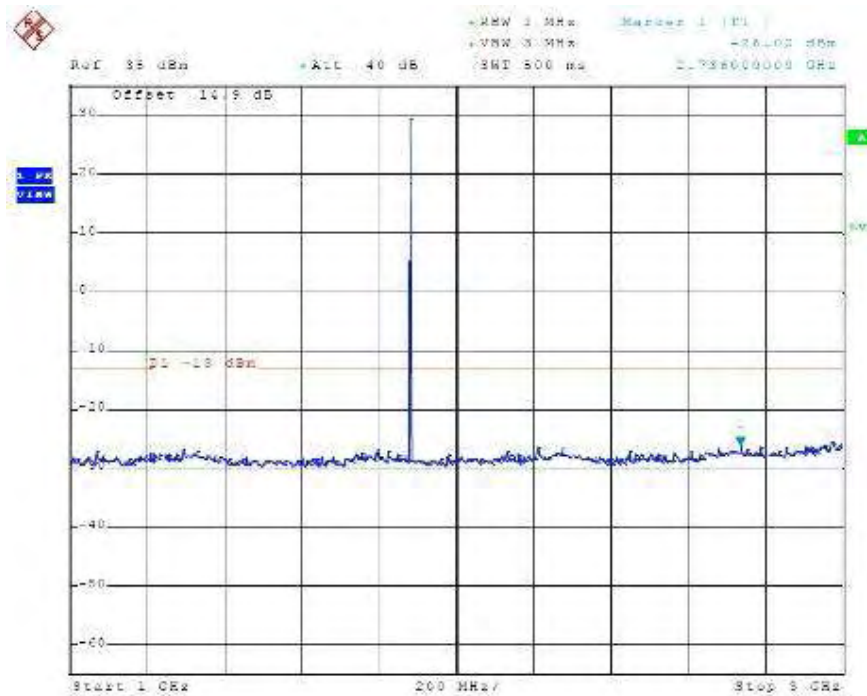
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Band	GSM1900	Channel	CH661
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Conducted Emission Plot between 30MHz ~ 1GHz



Conducted Emission Plot between 1GHz ~ 3GHz





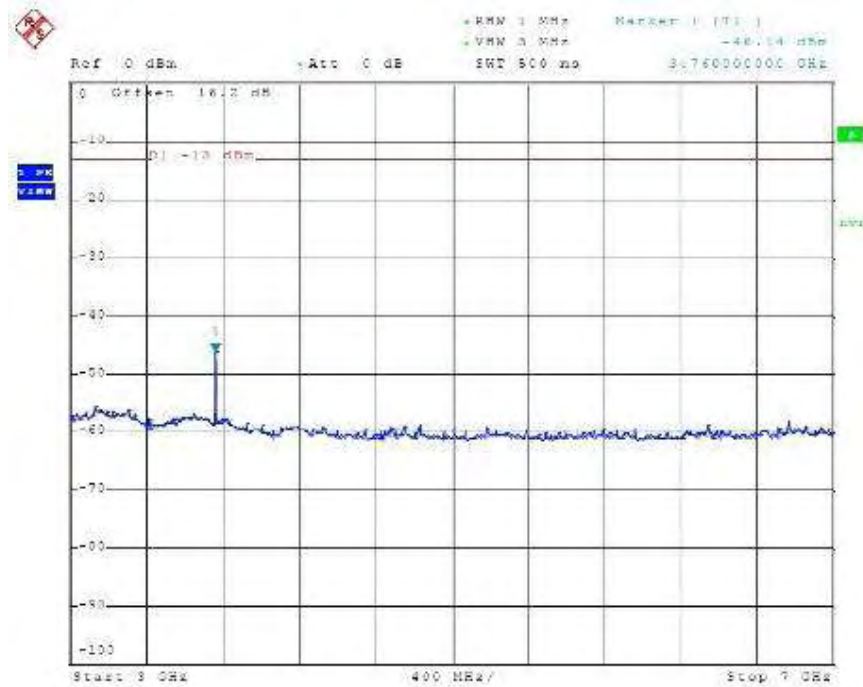
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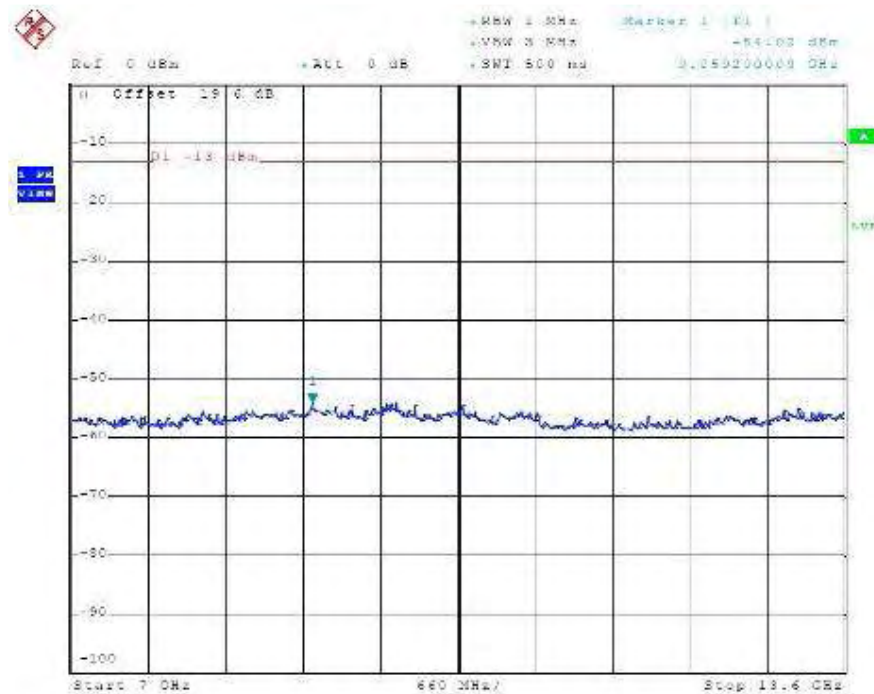
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Conducted Emission Plot between 3GHz ~ 7GHz



Conducted Emission Plot between 7GHz ~ 13.6GHz





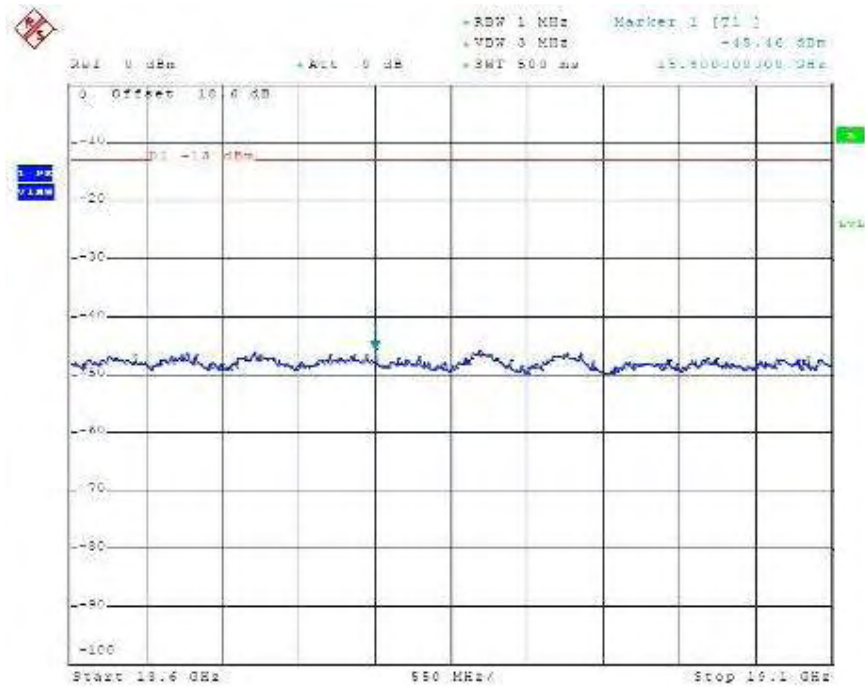
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Conducted Emission Plot between 13.6GHz ~ 19.1GHz



5.6 Field Strength of Spurious Radiation Measurement

1. EUT was working normal during the test
2. Environmental Conditions Temperature 23°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
 Tested By : Alex Wang

Requirement: Part2.1051, 22.917(a), 24.238(a)

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.

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. $ERP (dBm) = EIRP - 2.15$

Test Result: Pass

GSM 850
Low Channel :824.2MHz

Frequency (MHz)	ERP/EIRP (dBm)	Azimuth	Polarity(H /V)	Height (cm)	Limit (dBm)	Margin (dB)	Result
1648.40	-50.38	187.80	H	100.00	-13	-37.38	Pass
1648.40	-49.52	328.10	V	100.00	-13	-36.52	Pass
2472.60	-50.91	8.30	H	100.00	-13	-37.91	Pass
2472.60	-50.33	119.80	V	100.00	-13	-37.33	Pass
3296.80	-32.45	229.20	H	200.00	-13	-19.45	Pass
3296.80	-34.23	141.40	V	100.00	-13	-21.23	Pass

Middle Channel :836.60MHz

Frequency (MHz)	ERP/EIRP (dBm)	Azimuth	Polarity(H /V)	Height (cm)	Limit (dBm)	Margin (dB)	Result
1673.20	-50.78	127.80	H	100.00	-13	-37.78	Pass
1673.20	-48.69	318.20	V	200.00	-13	-35.69	Pass
2509.80	-49.72	28.30	H	200.00	-13	-36.72	Pass
2509.80	-49.36	139.80	V	100.00	-13	-36.36	Pass
3346.40	-33.41	219.20	H	200.00	-13	-20.41	Pass
3346.40	-34.02	145.40	V	100.00	-13	-21.02	Pass

High Channel :848.80MHz

Frequency (MHz)	ERP/EIRP (dBm)	Azimuth	Polarity(H /V)	Height (cm)	Limit (dBm)	Margin (dB)	Result
1697.60	-49.78	144.80	H	200.00	-13	-36.78	Pass
1697.60	-49.66	221.10	V	200.00	-13	-36.66	Pass
2546.40	-50.32	118.30	H	200.00	-13	-37.32	Pass
2546.40	-49.34	159.80	V	100.00	-13	-36.34	Pass
3395.20	-35.21	239.20	H	200.00	-13	-22.21	Pass
3395.20	-33.48	111.40	V	100.00	-13	-20.48	Pass

GSM 1900
Low Channel :1850.2MHz

Frequency (MHz)	ERP/EIRP (dBm)	Azimuth	Polarity(H /V)	Height (cm)	Limit (dBm)	Margin (dB)	Result
3700.40	-46.14	152.80	H	100.00	-13	-33.14	Pass
3700.40	-36.64	234.10	V	100.00	-13	-23.64	Pass
5550.60	-47.54	111.30	H	200.00	-13	-34.54	Pass
5550.60	-45.36	234.80	V	100.00	-13	-32.36	Pass
7400.80	-52.01	222.20	H	200.00	-13	-37.21	Pass
7400.80	-51.33	119.40	V	100.00	-13	-38.33	Pass

Middle Channel :1880.0MHz

Frequency (MHz)	ERP/EIRP (dBm)	Azimuth	Polarity(H /V)	Height (cm)	Limit (dBm)	Margin (dB)	Result
3760.00	-45.13	117.80	H	100.00	-13	-32.31	Pass
3760.00	-38.29	308.10	V	100.00	-13	-25.29	Pass
5640.00	-47.54	328.30	H	100.00	-13	-34.54	Pass
5640.00	-47.06	179.80	V	100.00	-13	-34.06	Pass
7520.00	-52.46	259.20	H	100.00	-13	-39.46	Pass
7520.00	-51.13	151.40	V	100.00	-13	-38.13	Pass

High Channel :1909.8MHz

Frequency (MHz)	ERP/EIRP (dBm)	Azimuth	Polarity(H /V)	Height (cm)	Limit (dBm)	Margin (dB)	Result
3819.60	-46.72	117.20	H	100.00	-13	-33.72	Pass
3819.60	-37.61	218.90	V	200.00	-13	-24.61	Pass
5729.80	-43.68	218.50	H	200.00	-13	-30.68	Pass
5729.80	-46.34	159.20	V	200.00	-13	-33.34	Pass
7639.20	-50.73	221.40	H	200.00	-13	-37.73	Pass
7639.20	-51.36	15170	V	200.00	-13	-38.36	Pass

5.7 Frequency Stability

1. EUT was working normal during the test
2. Environmental Conditions Temperature 23°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
3. All required parameter have been checked and adjusted
4. Test date : Jun 10~28 2010
Tested By : Alex Wang

Requirement: Part2.1055,22.355,24.235

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.

Procedures:

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

Test Result: Pass



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Title: RF Test Report for 5LINXGLOBAL WiFi Cellphone
Model: GM100N WM680
To: FCC PART 2,PART22,PART24

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Band	GSM 850		Channel	189	
Temperature (°C)	Voltage	Freq.Dev(Hz)	Deviation(ppm)	Limit(ppm)	Result
-30	New Battery	15	0.02	2.5	PASS
-20	New Battery	13	0.02	2.5	
-10	New Battery	17	0.02	2.5	
0	New Battery	16	0.02	2.5	
10	New Battery	18	0.02	2.5	
20	New Battery	17	0.02	2.5	
30	New Battery	15	0.02	2.5	
40	New Battery	14	0.02	2.5	
50	New Battery	15	0.02	2.5	

Band	GSM 1900		Channel	661	
Temperature (°C)	Voltage	Freq.Dev(Hz)	Deviation(ppm)	Limit(ppm)	Result
-30	New Battery	66	0.03	2.5	PASS
-20	New Battery	60	0.03	2.5	
-10	New Battery	60	0.03	2.5	
0	New Battery	64	0.03	2.5	
10	New Battery	62	0.03	2.5	
20	New Battery	57	0.03	2.5	
30	New Battery	57	0.03	2.5	
40	New Battery	52	0.03	2.5	
50	New Battery	58	0.03	2.5	

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Band	GSM 850		Channel	189	
Temperature(°C)	Voltage	Freq.Dev(Hz)	Deviation(ppm)	Limit(ppm)	Result
Normal	3.8	13	0.02	2.5	PASS
	3.6	13	0.02	2.5	
	4.2	12	0.01	2.5	

Band	GSM 1900		Channel	661	
Temperature(°C)	Voltage	Freq.Dev(Hz)	Deviation(ppm)	Limit(ppm)	Result
Normal	3.8	42	0.02	2.5	PASS
	3.6	40	0.02	2.5	
	4.2	41	0.01	2.5	

Annex A. TEST INSTRUMENT

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8564 E	2011.04.26
EMI Receiver	Rohde & Schwarz	ES140	2011.02.19
Antenna (30MHz~2GHz)	Sunol Sciences	JB1	2010.10.04
Horn Antenna (1~18GHz)	A-INFOMW	JXTXLB-10180	2010.11.18
Horn Antenna (1~18GHz)	N/A	N/A	2010.10.04
Pre-Amplifier(0.01 ~ 1.3GHz)	HP	8447F	2011.04.24
Pre-Amplifier(0.1 ~ 18GHz)	MITEQ	AMF-7D-00101800-30- 10P	2011.03.05
Horn Antenna (18~40GHz)	Com Power	AH-840	2011.05.21
Microwave Pre-Amp (18~40GHz)	Com Power	PA-840	2011.05.21
Communication Tester	Agilent	E5515C	2011.6.28
Communication Tester	Rohde & Schwarz	CMU200	2011.6.28
Power Meter	Agilent	E44198B	2010.12.23
Power Sensor	Agilent	E9304A	2010.12.23
Fading simulator	Rohde & Schwarz	ABFS	2010.12.23

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Annex B.i. Photograph : EUT Photo

Please see separate attachment

Annex B.ii Photograph 4: Test Setup Photo

Please see separate attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

Annex C.i EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions	EUT is working normally.

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. SIEMIC ACCREDITATION CERTIFICATES

SIEMIC ACCREDITATION DETAILS: FCC Registration NO:986914

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

April 25, 2008

Registration Number: 986914

SIEMIC Nanjing (China) Laboratories
2-1 Longcang Avenue,
Yuhua Economic and Technology Development Park,
Nanjing, 210039
China

Attention: Leslie Bai

Re: Measurement facility located at 2-1 Longcang Avenue, Nanjing, China
Anechoic chamber (3 meters) and 3&10 meter OATS
Date of Listing: April 25, 2008

Dear Sir or Madam:

Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Katie Hawkins
Electronics Engineer