Shanghai Sand Information Technology System Co., Ltd

EFT-POS

Model: PS400

20 October,2011

Report No.: 11050080
(This report supersedes NONE)

RF Test Report

To: FCC Part 2, 22(H), 24(E)

SIEMIC, INC.
Accessing global markets

Modifications made to the product : None

This Test Report is Issued Under the Authority of:	
Andy. wang	Peter Cai
Andy Wang Compliance Engineer	Peter Cai Technical Manager

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All Test Data Presented in this report is only applicable to presented Test sample.

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
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB, NIST	EMC,RF,Safety,Telecom

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CONTENTS

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1 Executive Summary & EUT information

The purpose of this test programmed was to demonstrate compliance of the Shanghai Sand Information Technology System Co., Ltd Model: PS400 against the current Stipulated Standards. The EFT-POS have demonstrated compliance with the FCC 22(H):2010 , FCC 24(E):2010.

The test has demonstrated that this unit complies with stipulated standards.

EUT Information

EUT Description	:	EFT-POS
Model No	:	PS400
Serial No	:	N/A
HW version	:	V3.1
Input Power	:	Powered by Power Adapter1: Trade Name: HuntKey Model No.: PS400 Input: AC100-240V,1.0A,50/60Hz Output: DC9.0V, 4.0A Powered by Power Adapter2: Trade Name: DELTA Model No.: DPS-38CB A Input: AC100-240V,2A-1A,47-63Hz Output: DC9.5V, 4A Li-ion Battery: Model No.: NL465082-2S Rating:7.4V, 2000mAh
Maximum Conducted Output Power to Antenna		GSM850: 31.78 dBm GPRS850(Multi slot Class 8) : 31.72 dBm GPRS850(Multi slot Class 10) :31.19 dBm GSM1900: 29.65 dBm GPRS1900 (Multi slot Class 8) : 29.63 dBm GPRS1900 (Multi slot Class 10) : 29.12 dBm
Maximum Radiated ERP/EIRP		GPRS850(Class 10):29.50dBm / ERP GPRS1900 (Class 10):26.90dBm / EIRP
Classification Per Stipulated Test Standard	:	Mobile Device / PCE

2 TECHNICAL DETAILS

Purpose	Compliance testing of EFT-POS model PS400 with stipulated standard
Applicant / Client	Shanghai Sand Information Technology System Co., Ltd Building 22,Germs Park,NO. 487 Tianlin Road, Shanghai China
Manufacturer	Shanghai Sand Information Technology System Co., Ltd Building 22,Germs Park,NO. 487 Tianlin Road, Shanghai 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	11050080
Date EUT received	29 September, 2011
Standard applied	See Page 9
Dates of test (from – to)	10 October,2011
No of Units:	1
Equipment Category:	Portable Radio
Trade Name:	SAND
Model Name:	PS400
RF Operating Frequency (ies)	GSM850 : 824.2 ~ 848.8 MHz(TX) / 869.2 ~ 893.8 MHz(RX) GSM1900 : 1850.2 ~ 1909.8 MHz(TX) / 1930.2 ~ 1989.8 MHz(RX) RFID: 13.110 MHz–14.010 MHz
Number of Channels:	300 (PCS1900) and 125 (GSM850) RFID:1
Modulation:	GSM / GPRS : GMSK RFID:ASK
FCC ID:	XLHPS400-1109

3 MODIFICATION

NONE

4 TEST SUMMARY

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

Mobile Device

Test Results Summary

Test Standard	Description	Pass / Fail
FCC 22(H):2010 FCC 24(E):2010		
2.1046	Conducted Output Power	Pass
22.913(a)(2)	Effective Radiated Power	Pass
24.232(c)	Equivalent Isotropic Radiated Power	Pass
22.917(a) 24.238(a)	Occupied Bandwidth	Pass
22.917(a) 24.238(a)	Band Edge Measurement	Pass
22.917(a) 24.238(a)	Conducted Spurious Emission	Pass
22.917(a) 24.238(a)	Radiated Spurious Emission	Pass
22.355 24.235	Frequency Stability	Pass
ANSI/TIA-603-C-2004 PS: All measurement uncertainties are not taken into consideration for all presented test result.		

Note: Testing was perform by configuring EUT to maximum output power status, the declared output power class for diffent

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Conducted Output Power

1. Conducted Measurement
   EUT was set for low , mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test Date : 10 October,2011
   Tested By :Andy Wang

Standard Requirement: 47 CFR §2.1046

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 test mode.

Test Result: Pass

Conducted Output Power Test Result

Test Result:

GSM Mode:

Burst Average Power (dBm)								
Band	**GSM850**				**GSM1900**			
Channel	128	190	251	Tune up Power tolerant	512	661	810	Tune up Power tolerant
Frequency (MHz)	824.2	836.4	848.8	/	1850.2	1880.0	1909.8	/
GSM Voice (1 uplink)	31.78	31.68	31.63	33±2	29.65	29.63	29.60	30±2
GPRS Multi-Slot Class 8 (1 uplink)	31.72	31.60	31.57	33±2	29.63	29.60	29.58	30±2
GPRS Multi-Slot Class 10 (2 uplink)	31.19	31.07	30.93	31±2	29.12	29.09	29.02	28±2
Remark : Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link								

5.2 Effective Radiated Power and Effective Isotropic Radiated Power

1. Conducted Measurement
   EUT was set for low , mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test Date : 10 October,2011
   Tested By :Andy Wang

Standard Requirement: 47 CFR § 22.913(a)(2), §24.232(c).

Procedures:

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. Measurement was made at a distance of 3 m.
3. The measuring antenna was set to 1 meter away from the ground plain.
4. Maximization of the emissions was carried out by rotating the EUT, and adjusting the antenna azimuth.
5. The test was done in both horizontal and vertical antenna polarizations.
6. The measurement shall be made with the transmitter set to the lowest operating frequency and with the transmitter set to the highest operating frequency.

Sample Calculation: Corrected Amplitude = Raw Amplitude (dBμV/m) + ACF(dB) + Cable Loss(dB)

Test Result: Pass

Cellular Band ERP Test Result

Test Mode / Frequency	Lower Channel Calculated EIRP (dBm)	Middle Channel Calculated EIRP (dBm)	High Channel Calculated EIRP (dBm)	Limit ERP (dBm)
GPRS850 (Class 10)	29.06	29.40	29.50	38.45

PCS Band EIRP Test Result

Test Conditions	Lower Channel Calculated EIRP (dBm)	Middle Channel Calculated EIRP (dBm)	High Channel Calculated EIRP (dBm)	Limit EIRP (dBm)
GPRS1900 (Class 10)	26.80	26.00	26.90	33.00

5.3 Occupied Bandwidth

1. Conducted Measurement
   EUT was set for low , mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions — Temperature 23°C; Relative Humidity 50%; Atmospheric Pressure 1019mbar
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test Date : 10 October,2011
   Tested By :Andy Wang

Requirement(s): 47 CFR § 22.917(a), § 24.238(a);

Procedures:

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.

2. The 99% occupied bandwidth (BW) of the low, middle and high channels for the highest RF powers

Results: Pass

Cellular Band Test Result

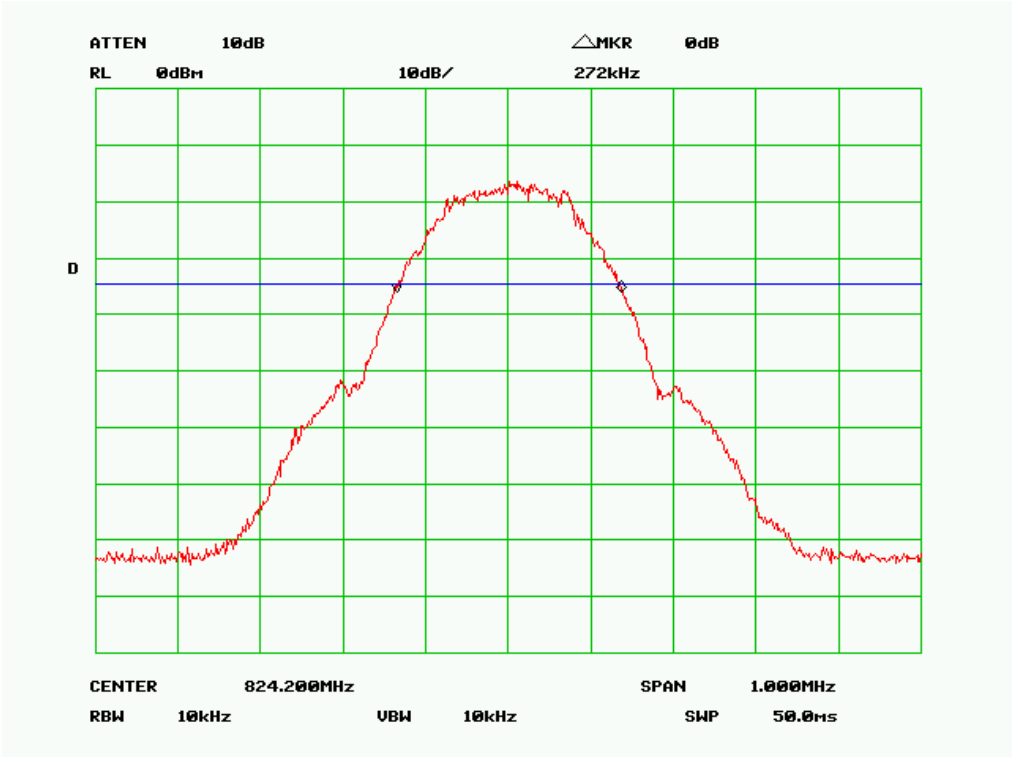
Test Mode	Channel	Occupied Bandwidth
GPRS850	Low(128)	272 kHz
GPRS850	Mid(190)	275 kHz
GPRS850	High(251)	275 kHz

PCS Band Test Result

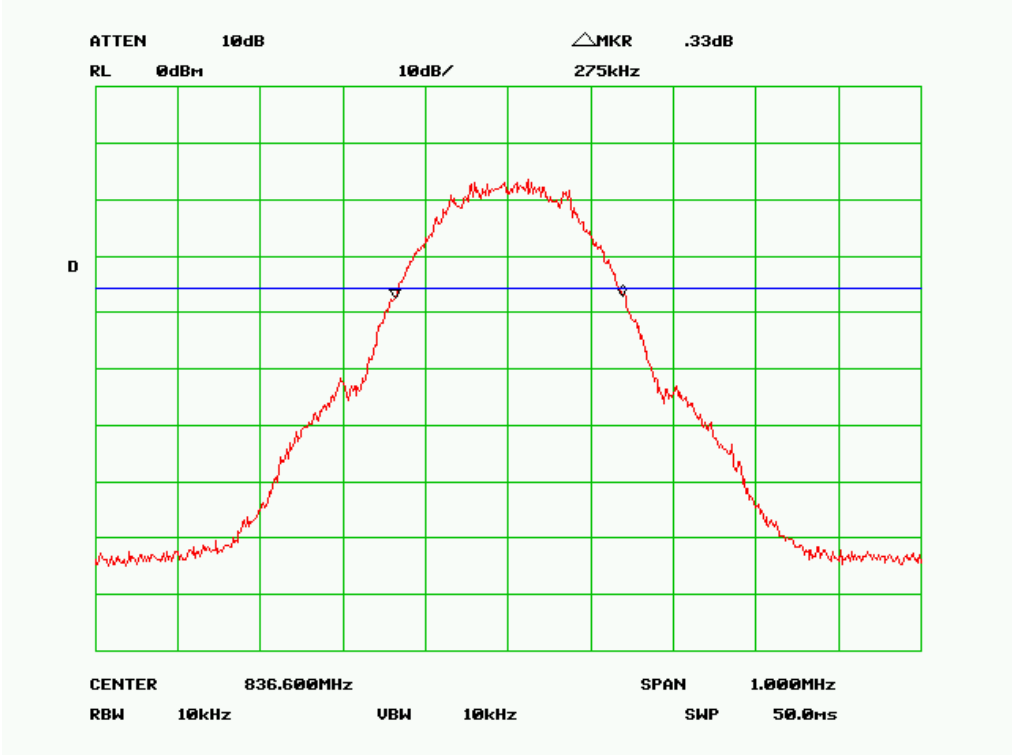
Test Mode	Channel	Occupied Bandwidth
GPRS1900	Low(512)	278 kHz
GPRS1900	Mid(661)	263 kHz
GPRS1900	High(810)	255 kHz

Refer to the attached plots

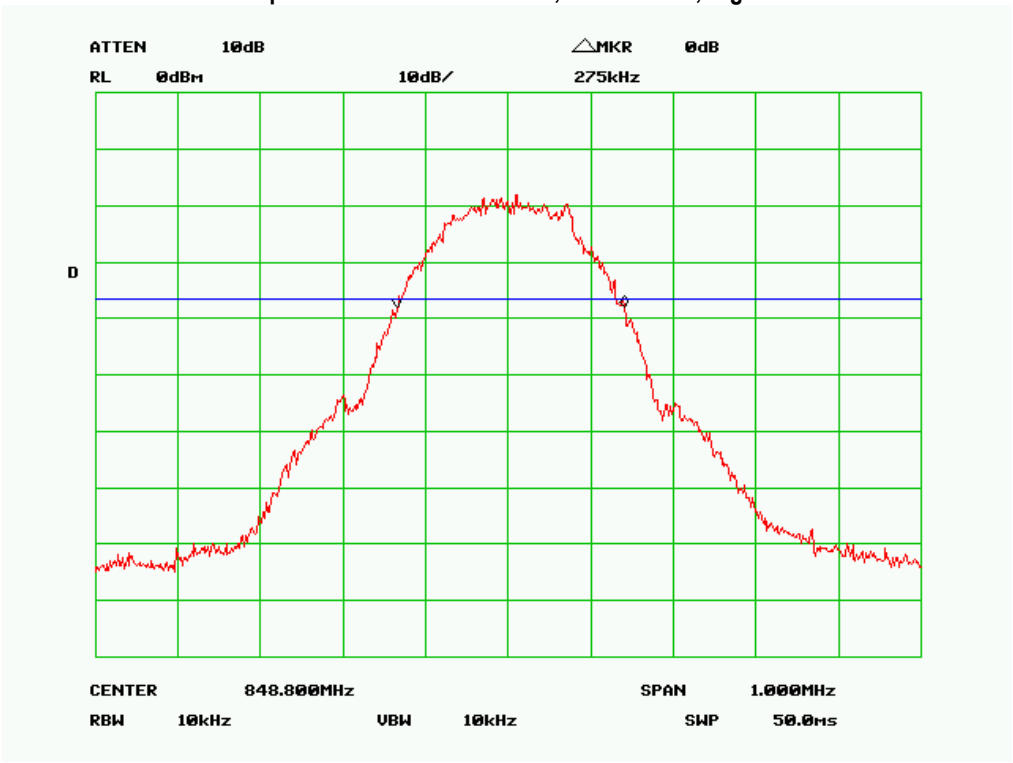
99% Occupied Bandwidth – GPRS850, Channel 128, Low Channel



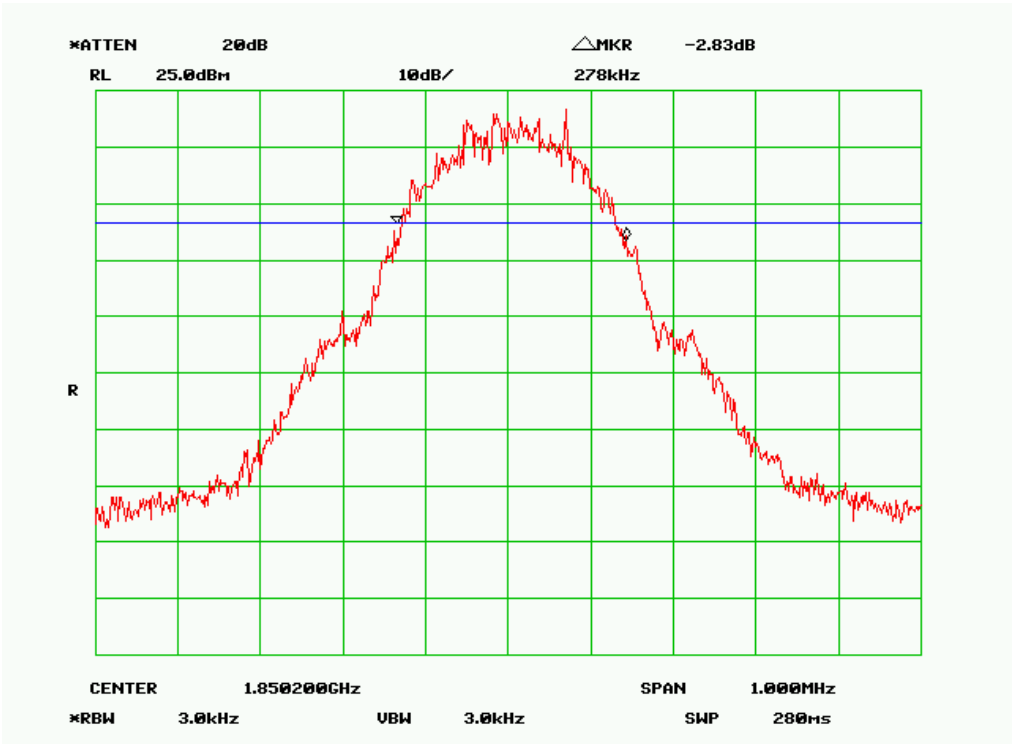
99% Occupied Bandwidth – GPRS850, Channel 190, Mid Channel



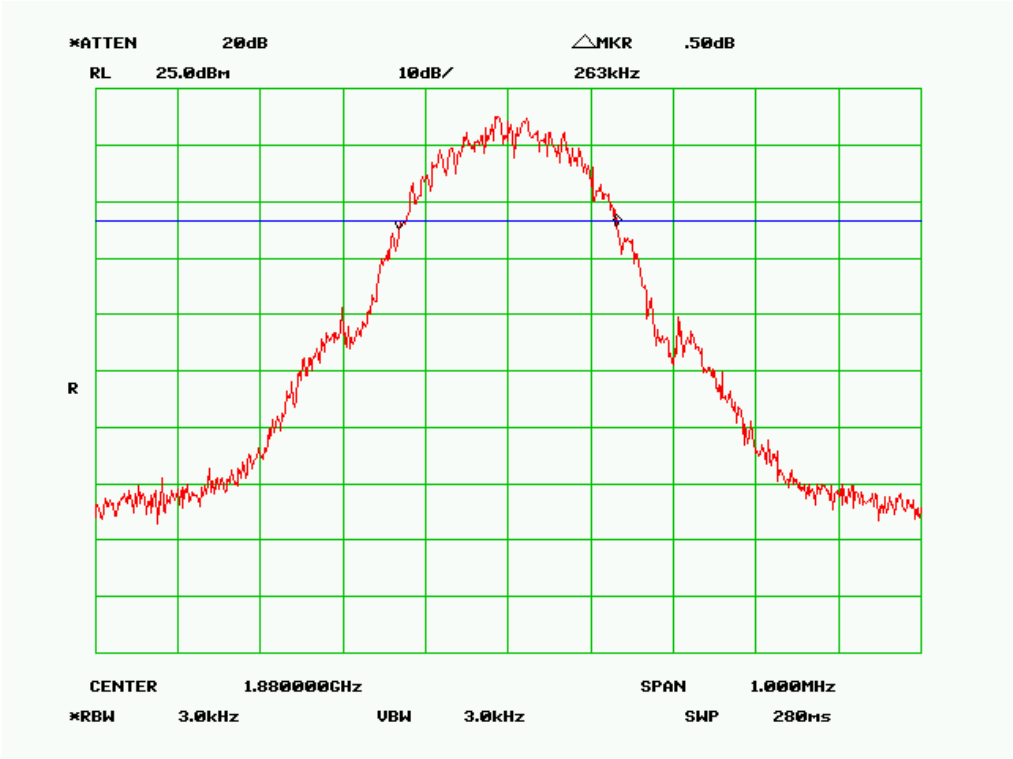
99% Occupied Bandwidth – GPRS850, Channel 251, High Channel



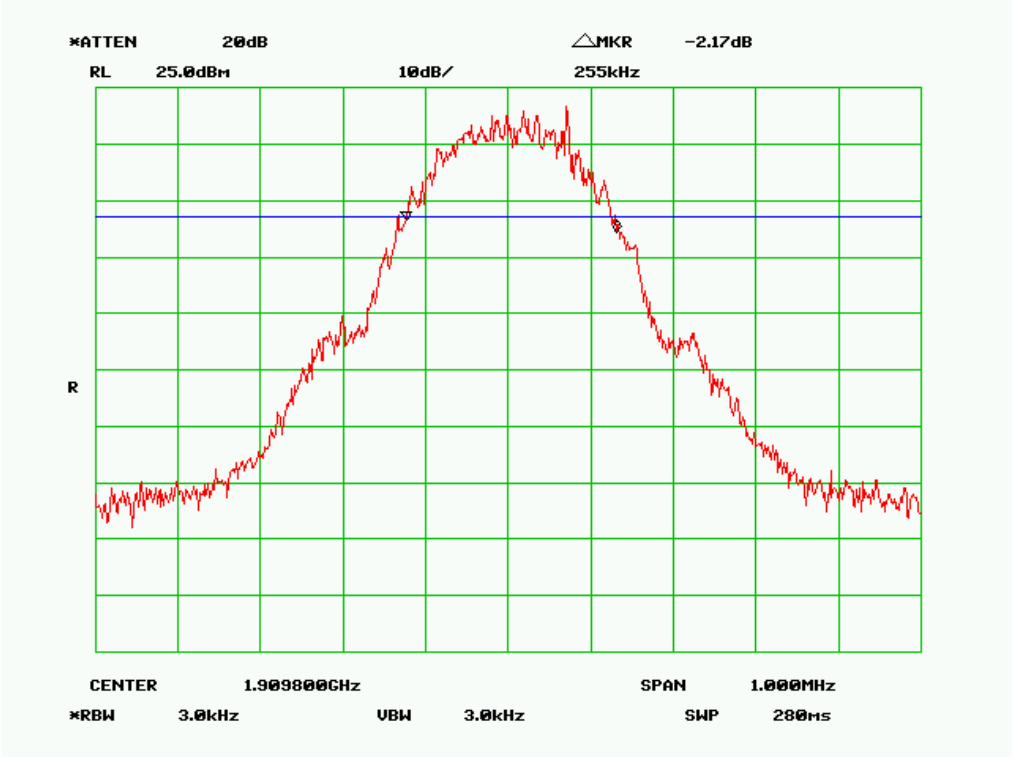
99% Occupied Bandwidth – GPRS1900, Channel 512, Low Channel



99% Occupied Bandwidth – GPRS1900, Channel 661, Mid Channel



99% Occupied Bandwidth – GPRS1900, Channel 810, High Channel



5.4 Band Edge Test Result

1. Conducted Measurement
   EUT was set for low , mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test Date :10 October,2011
   Tested By :Andy Wang

Standard Requirement: 47 CFR § 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

Refer to the attached plots.

Cellular Band (Part 22H)

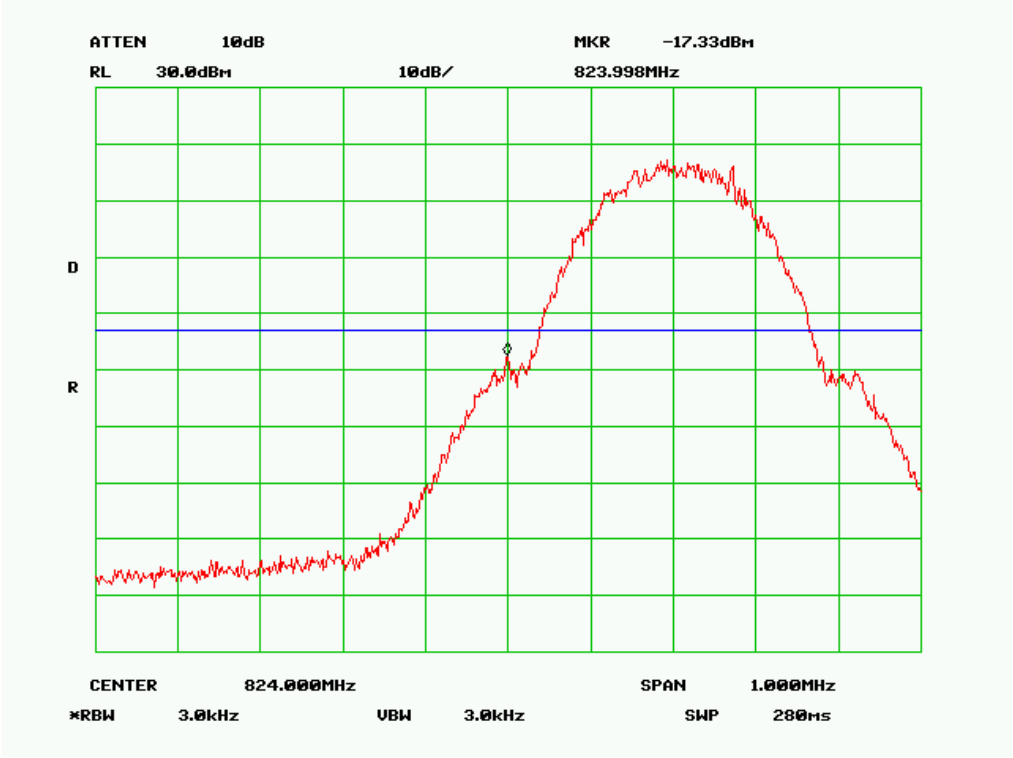
Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.998	-17.33	-13
849.023	-21.17	-13

PCS Band (Part 24E)

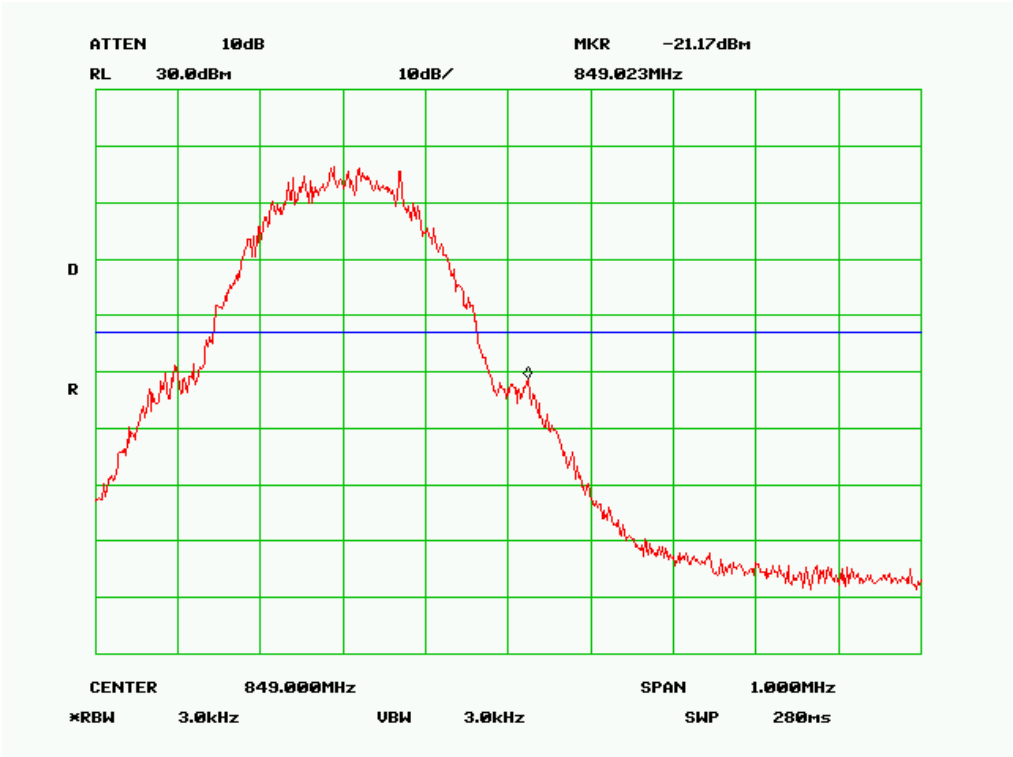
Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.998	-17.83	-13
1910.020	-17.67	-13

Please refer to the following plots.

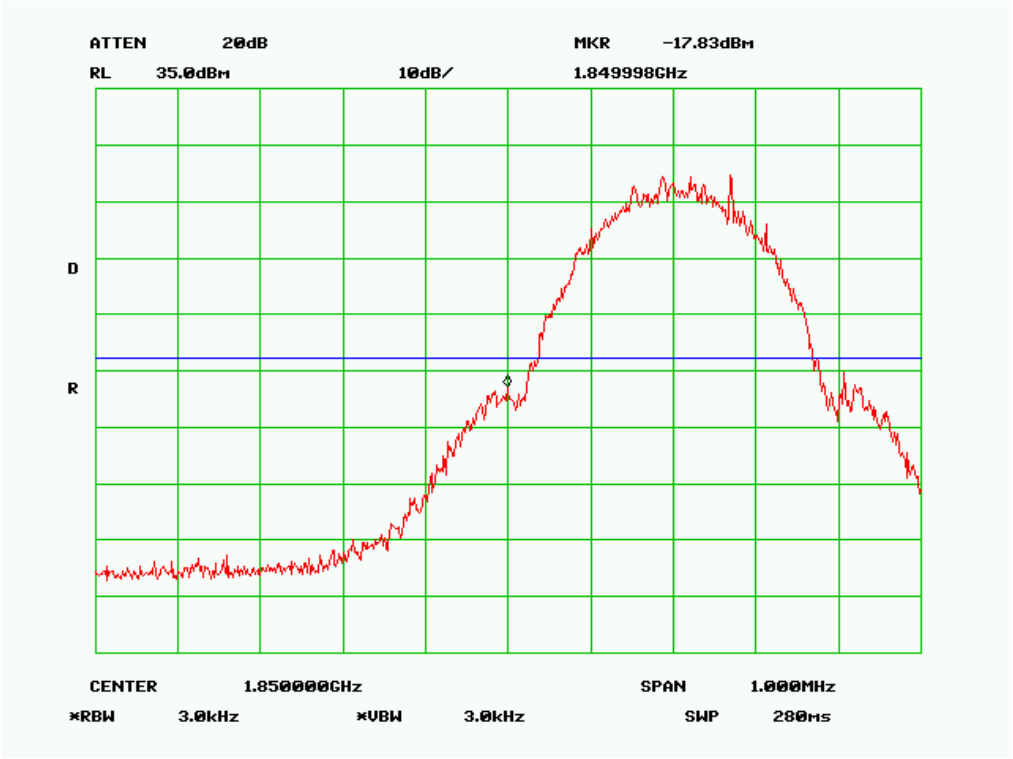
Lower Band Edge Plot – GPRS850, Channel 128, Low Channel



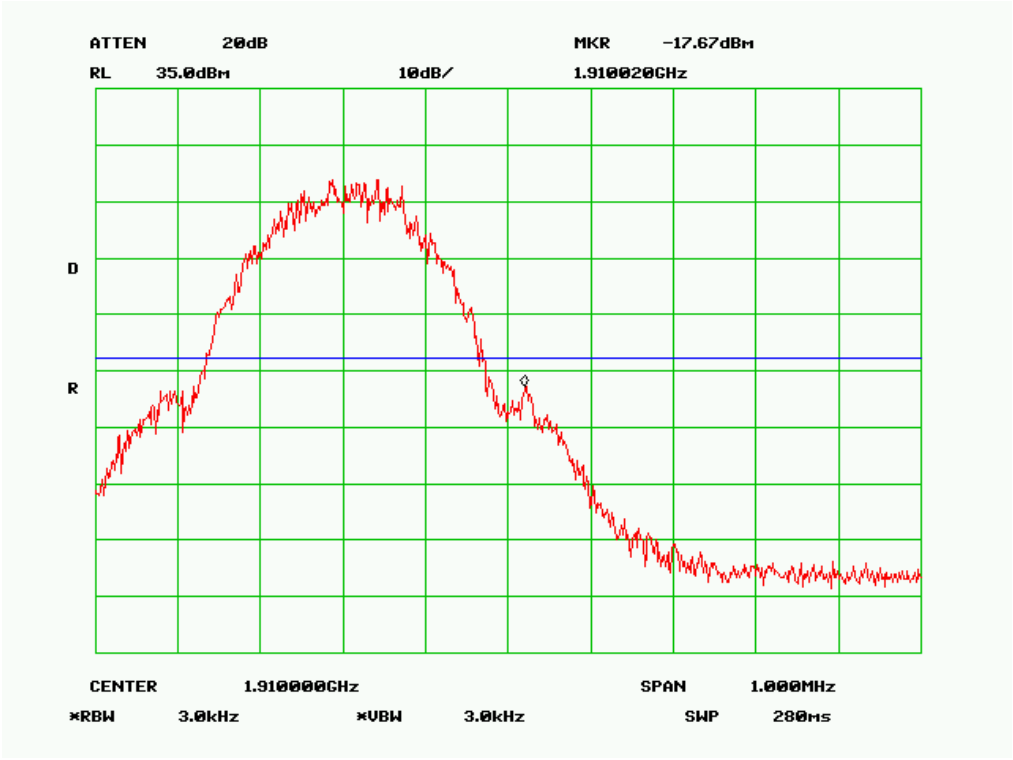
Higher Band Edge Plot – GPRS850, Channel 251, High Channel



Lower Band Edge Plot – GPRS1900, Channel 512, Low Channel



Higher Band Edge Plot – GPRS1900, Channel 810, High Channel



5.5 Antenna Port Emission

1. Conducted Measurement
EUT was set for low , mid, high channel with modulated mode and highest RF output power.
The spectrum analyzer was connected to the antenna terminal.

2 Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.

3 Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4 Test Date : 10 October,2011
Tested By :Andy Wang

Standard Requirement: 47 CFR § 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.

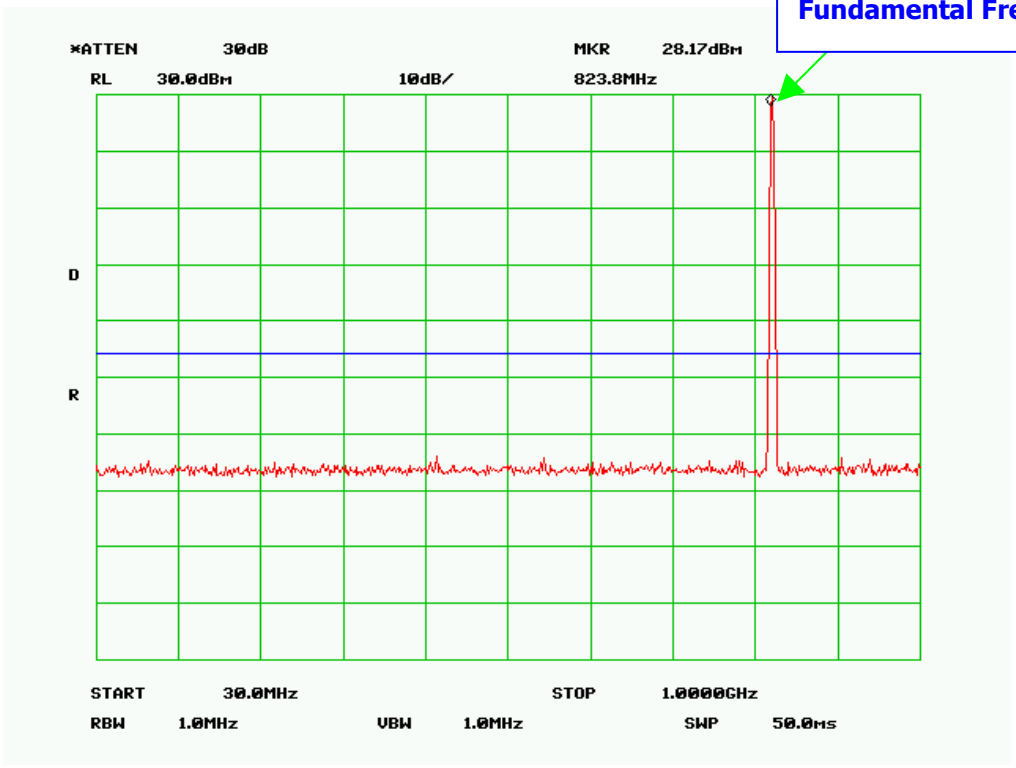
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

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.

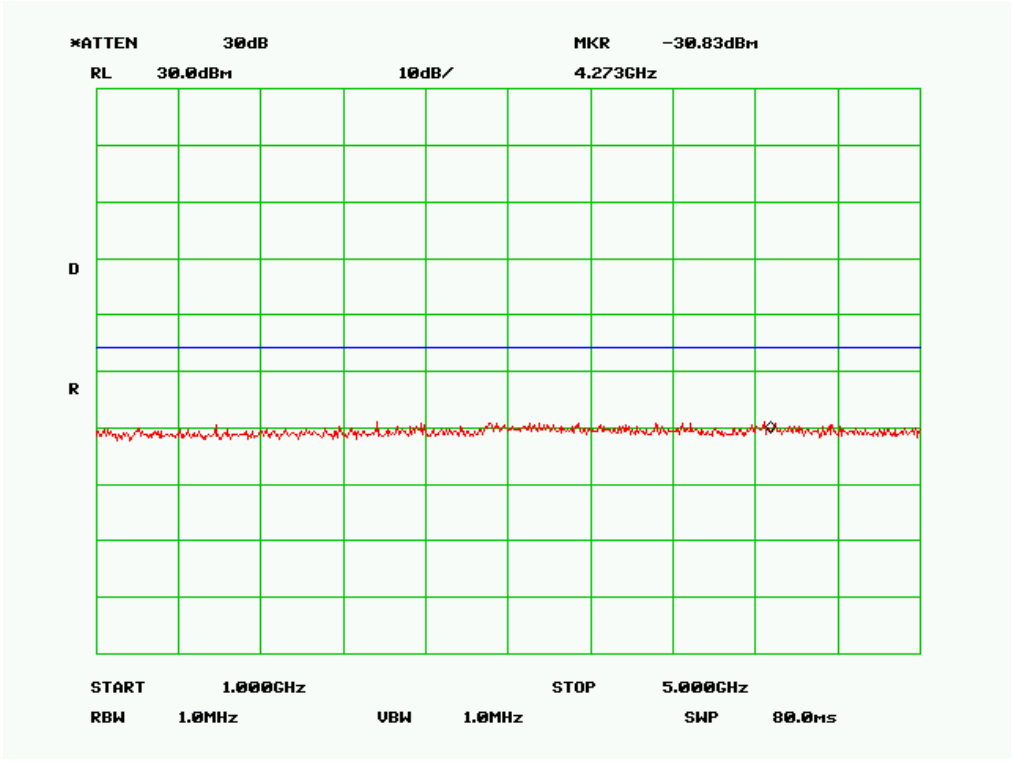
Test Result: Pass

Refer to the attached plots.

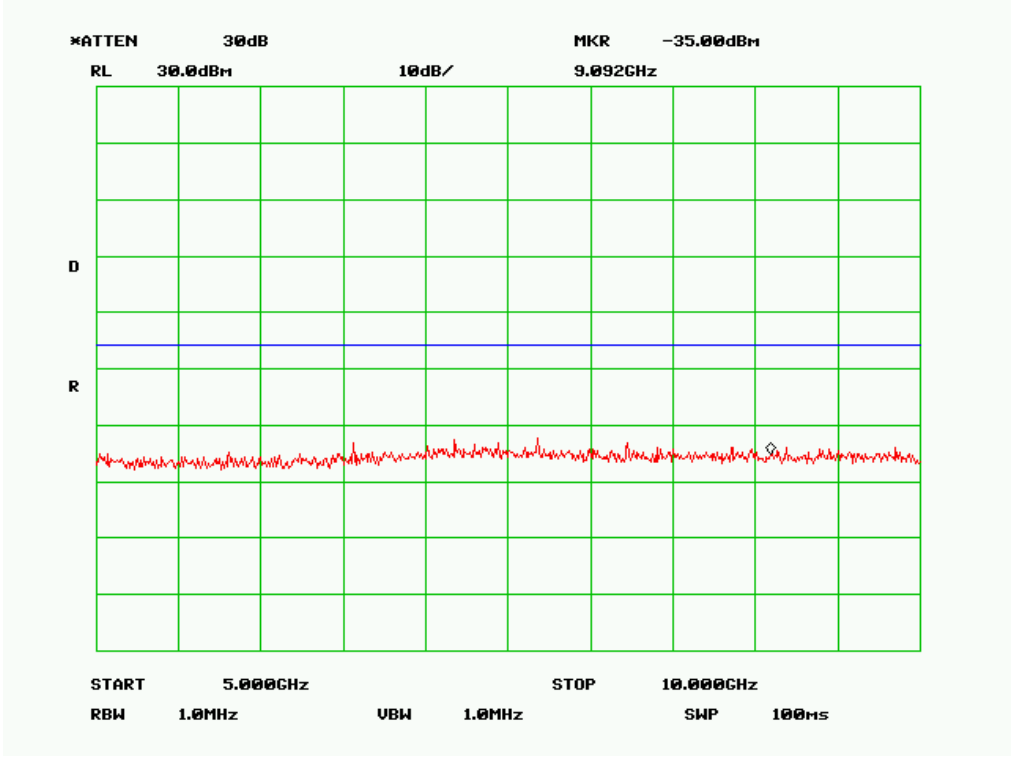
Configuration Mode: GPRS850, Channel 128, Low channel



Plot-1

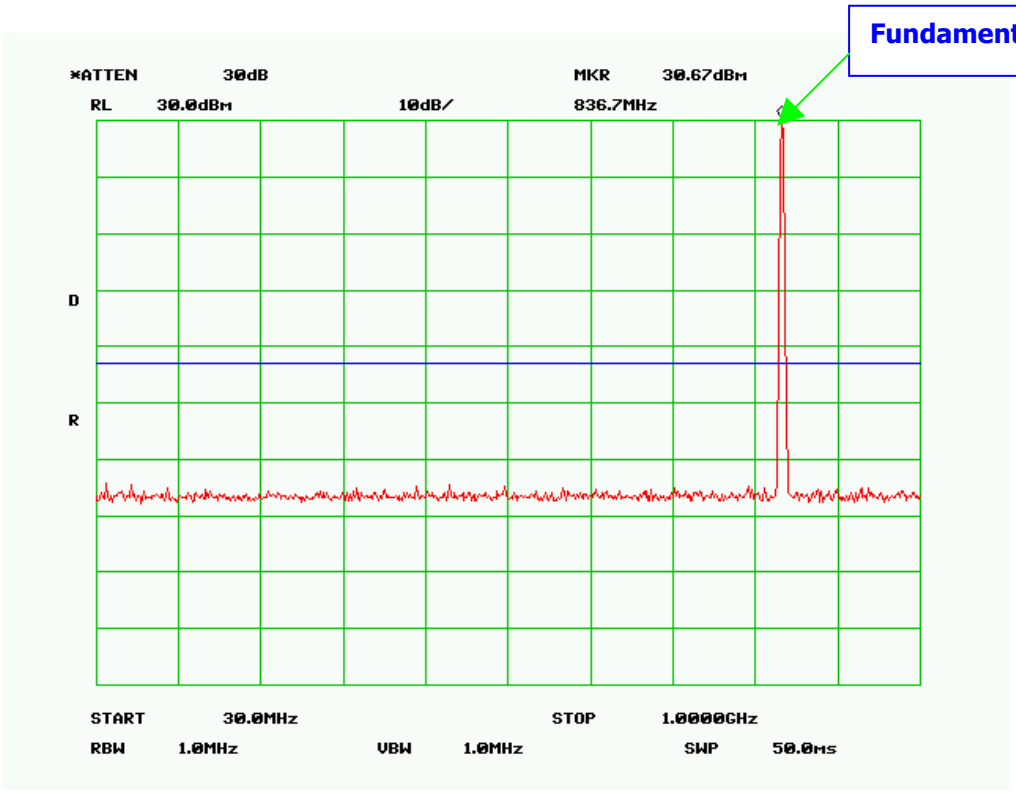


Plot-2

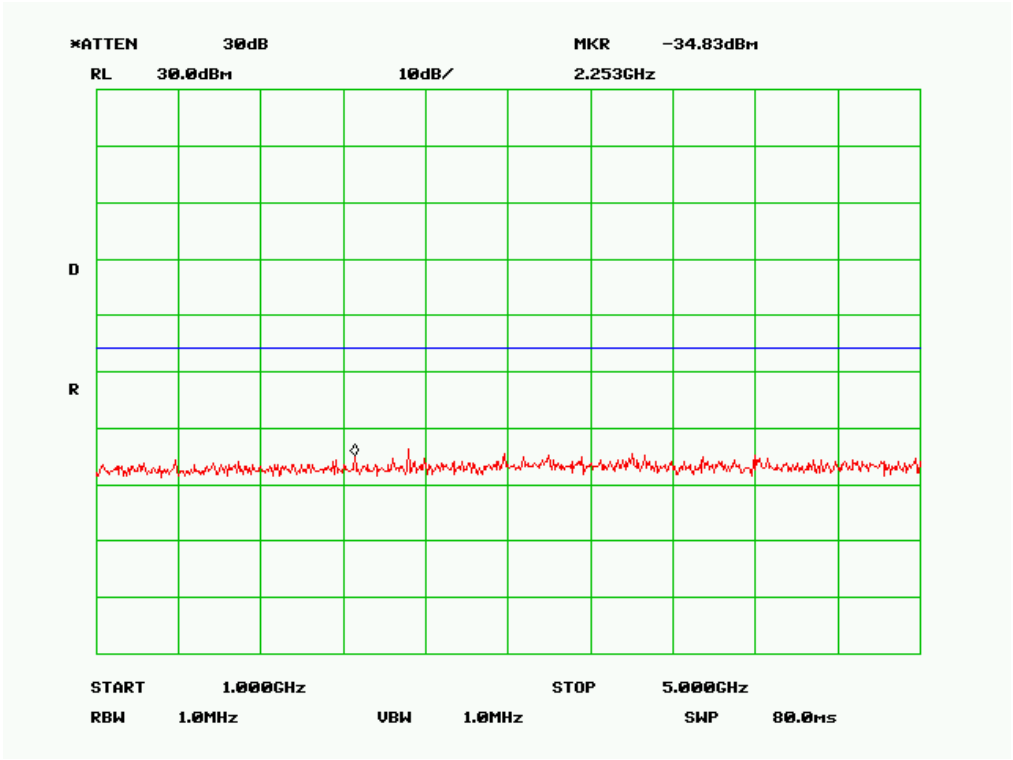

*ATTEN 30dB
MKR -35.00dBm
RL 30.0dBm
10dB/
9.092GHz
D
R
START 5.000GHz
STOP 10.000GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 100ms

Plot-3

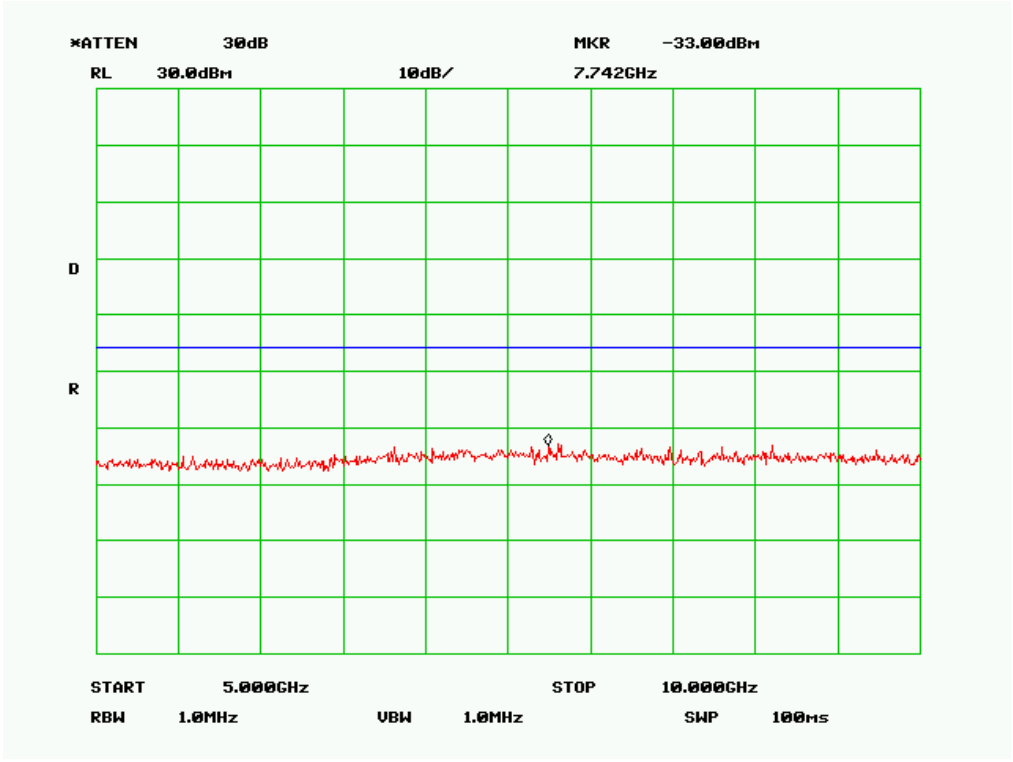
Configuration Mode: GPRS850, Channel 190, Mid channel



Plot-1

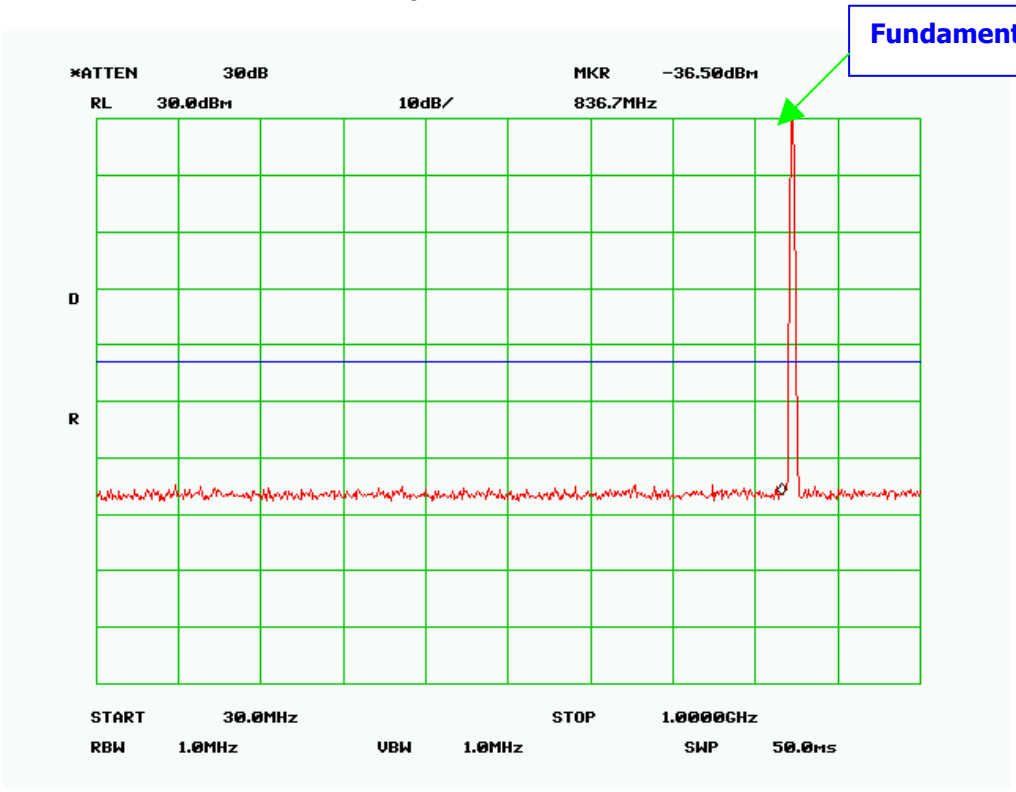


Plot-2

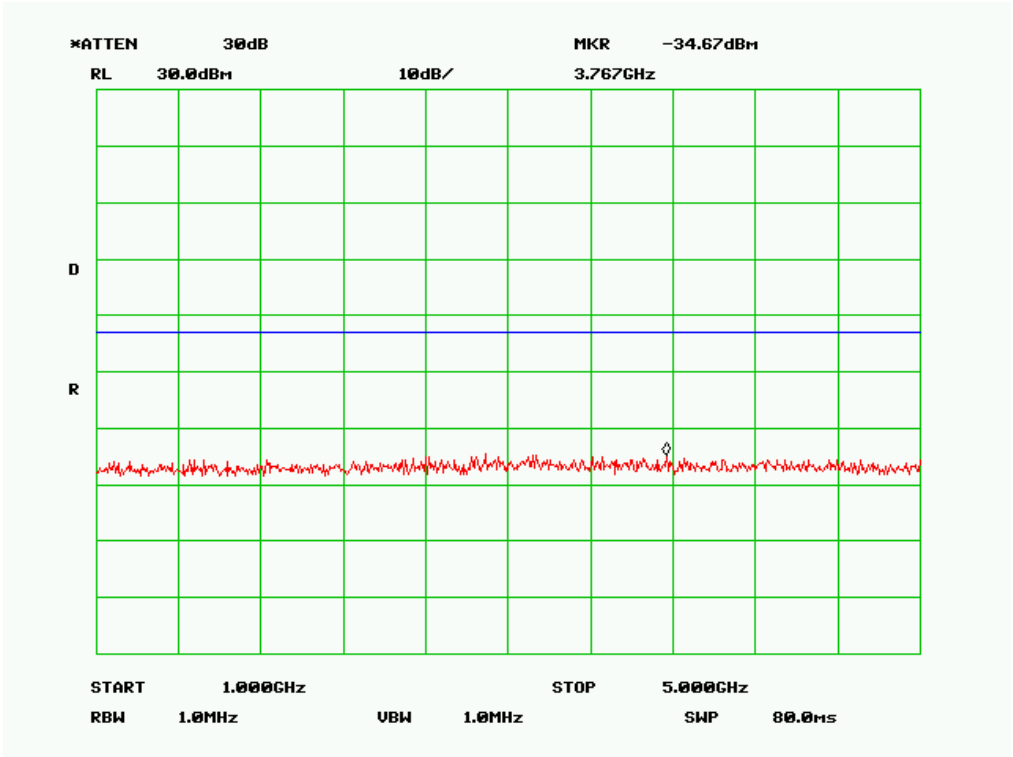

*ATTEN 30dB
MKR -33.00dBm
RL 30.0dBm
10dB/
7.742GHz
D
R
START 5.000GHz
STOP 10.000GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 100ms

Plot-3

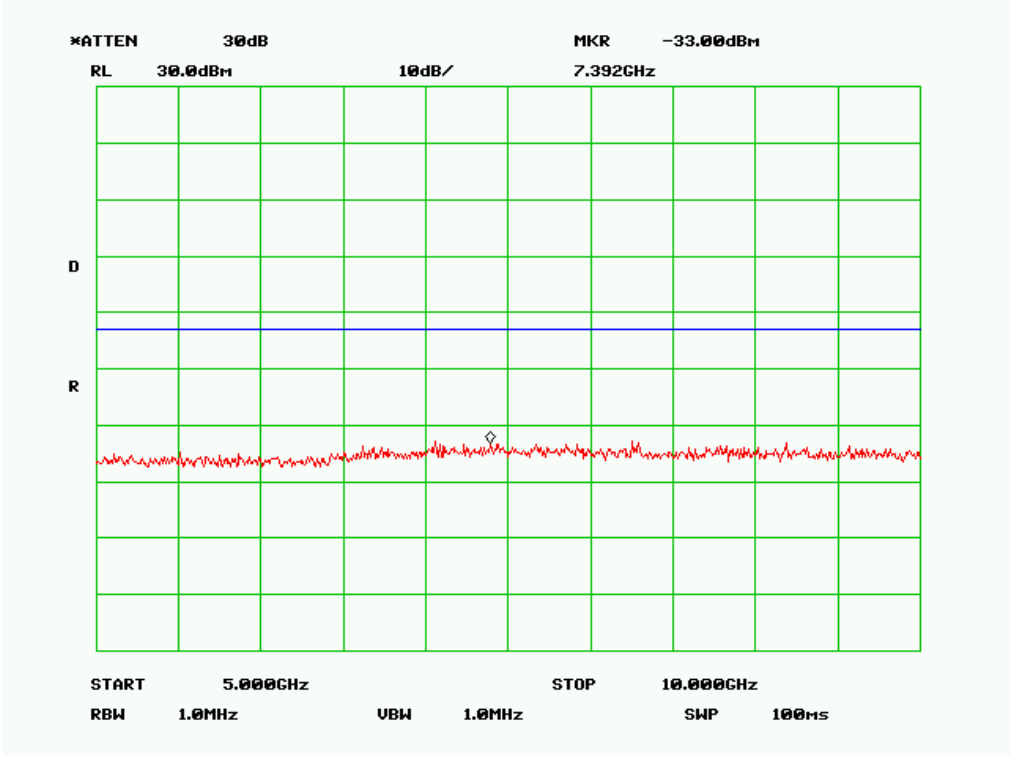
Configuration Mode: GPRS850, Channel 251, High channel



Plot-1

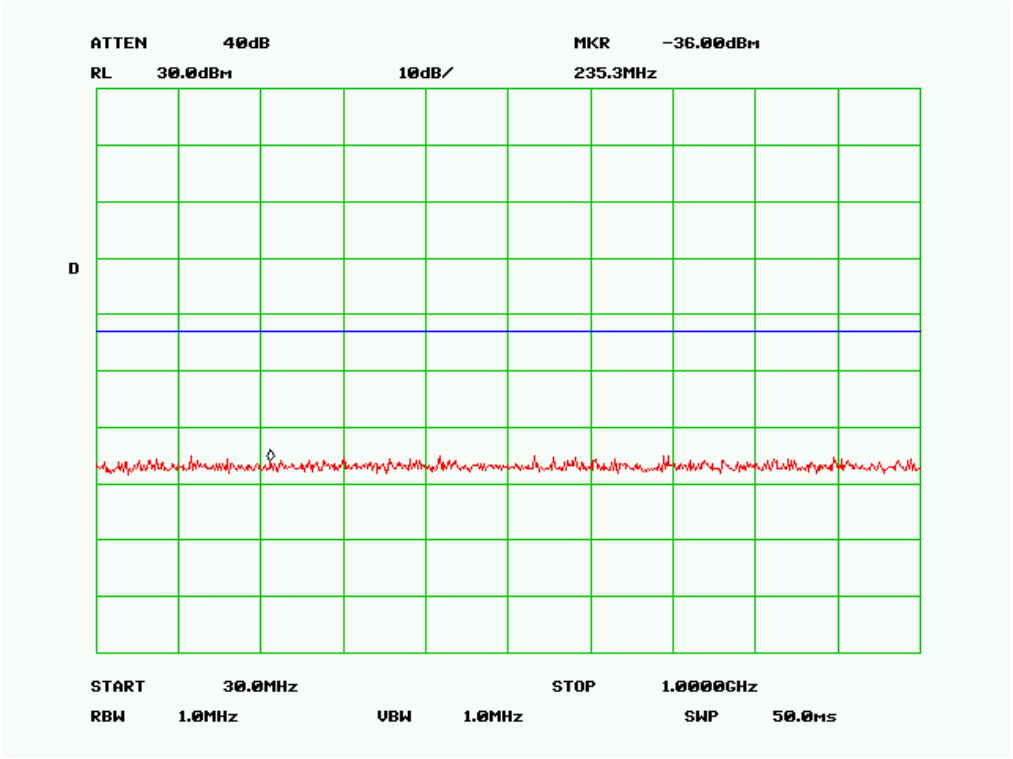


Plot-2

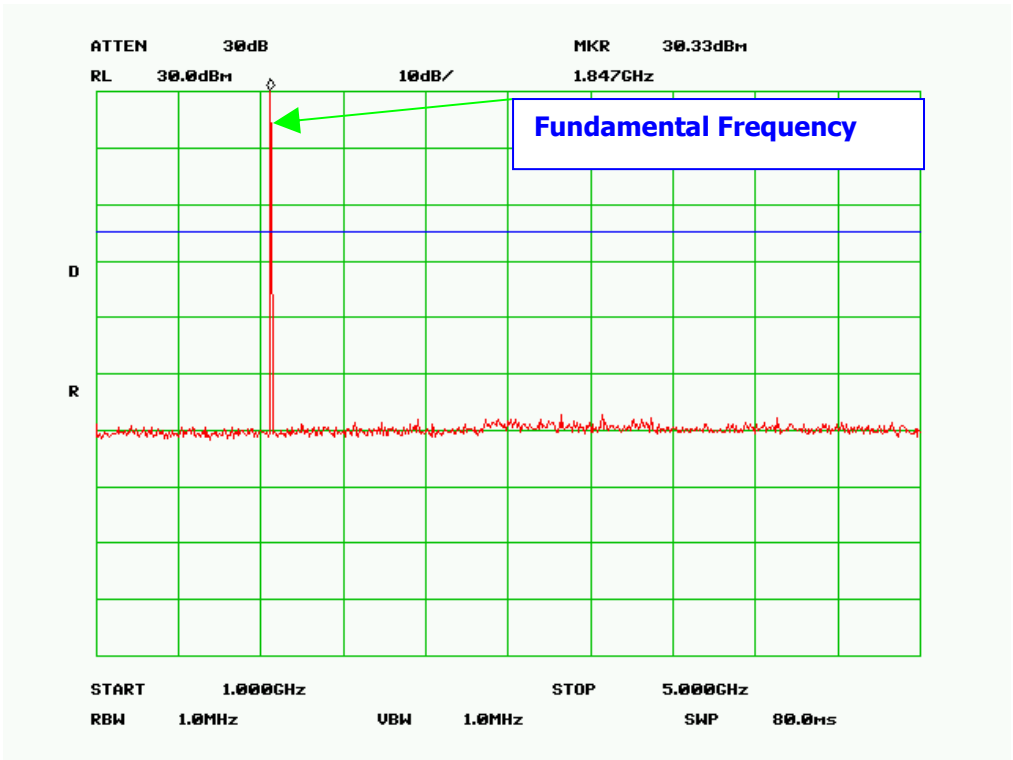

*ATTEN 30dB
MKR -33.00dBm
RL 30.0dBm
10dB/
7.392GHz
D
R
START 5.000GHz
STOP 10.000GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 100ms

Plot-3

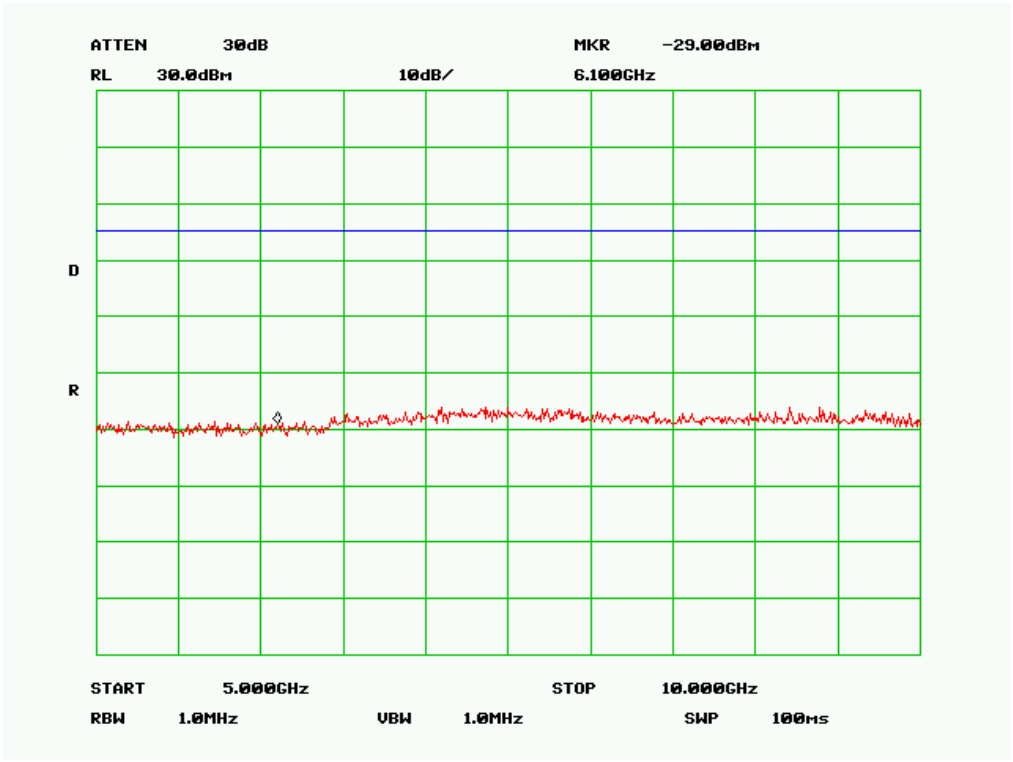
Configuration Mode: GPRS1900, Channel 512, Low channel



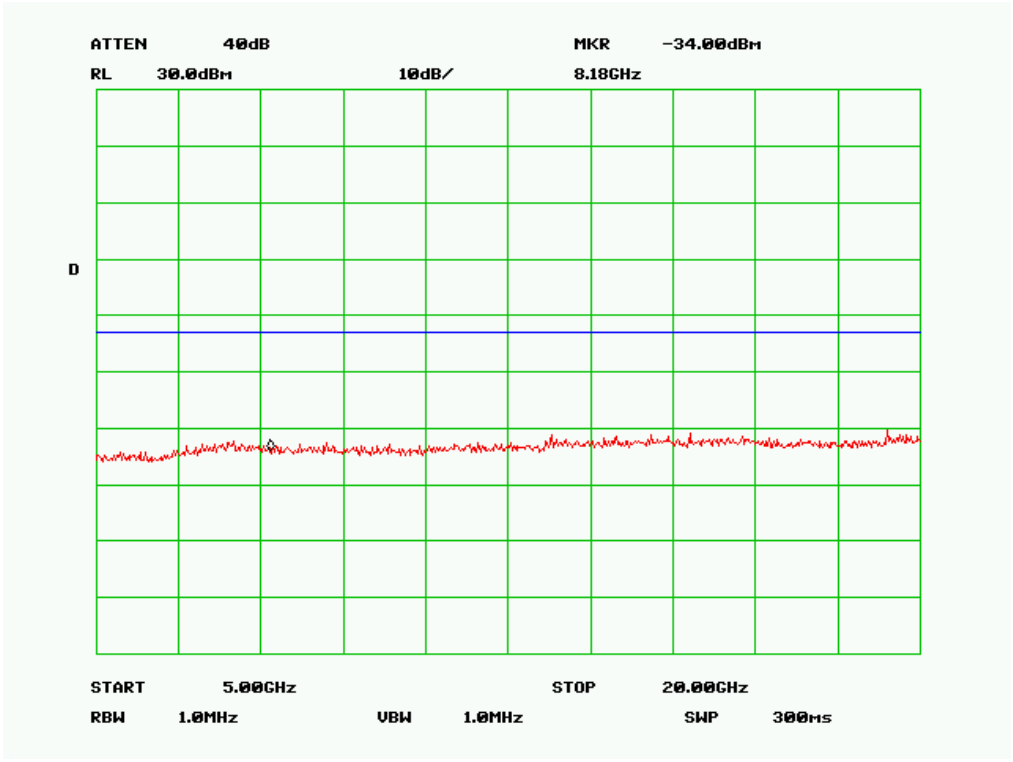
Plot-1



Plot-2

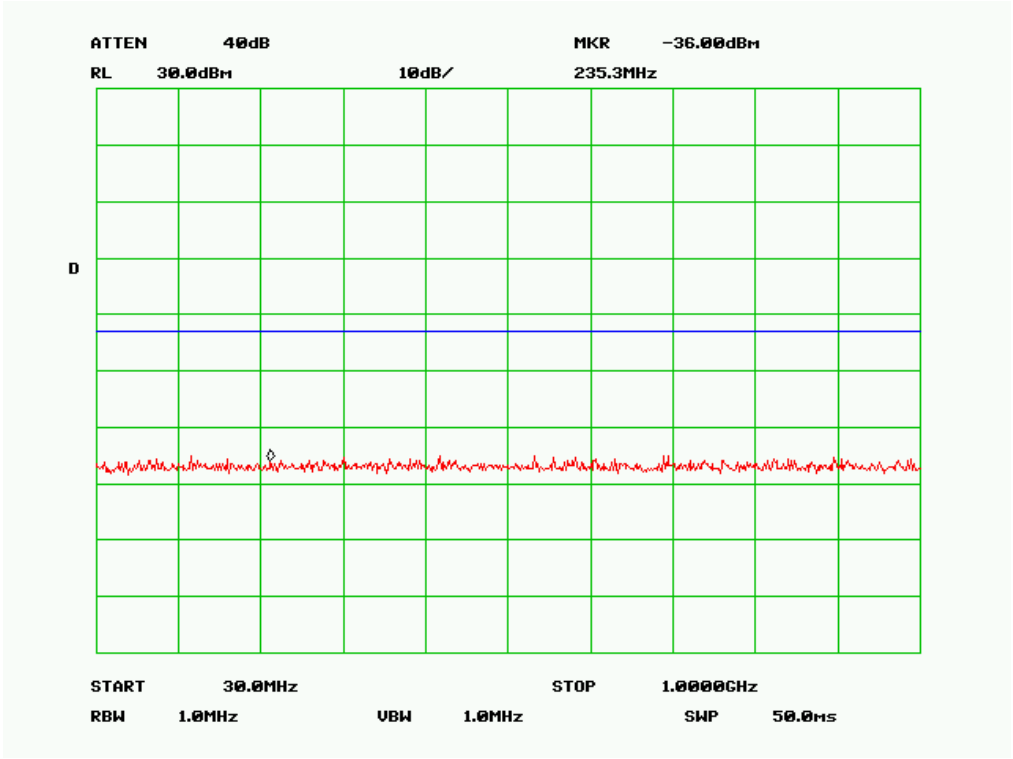

ATTEN 30dB
MKR -29.00dBm
RL 30.0dBm
10dB/
6.100GHz
D
R
START 5.000GHz
STOP 10.000GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 100ms

Plot-3

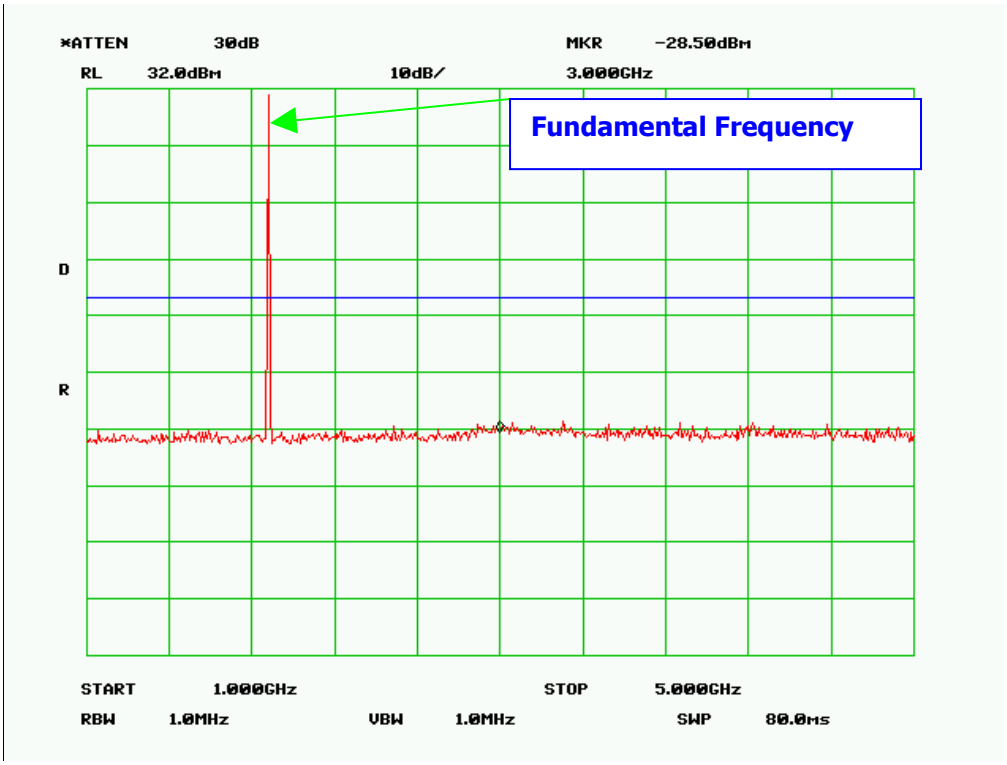

ATTEN 40dB
MKR -34.00dBm
RL 30.0dBm
10dB/
8.18GHz
D
START 5.00GHz
STOP 20.00GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 300ms

Plot-4

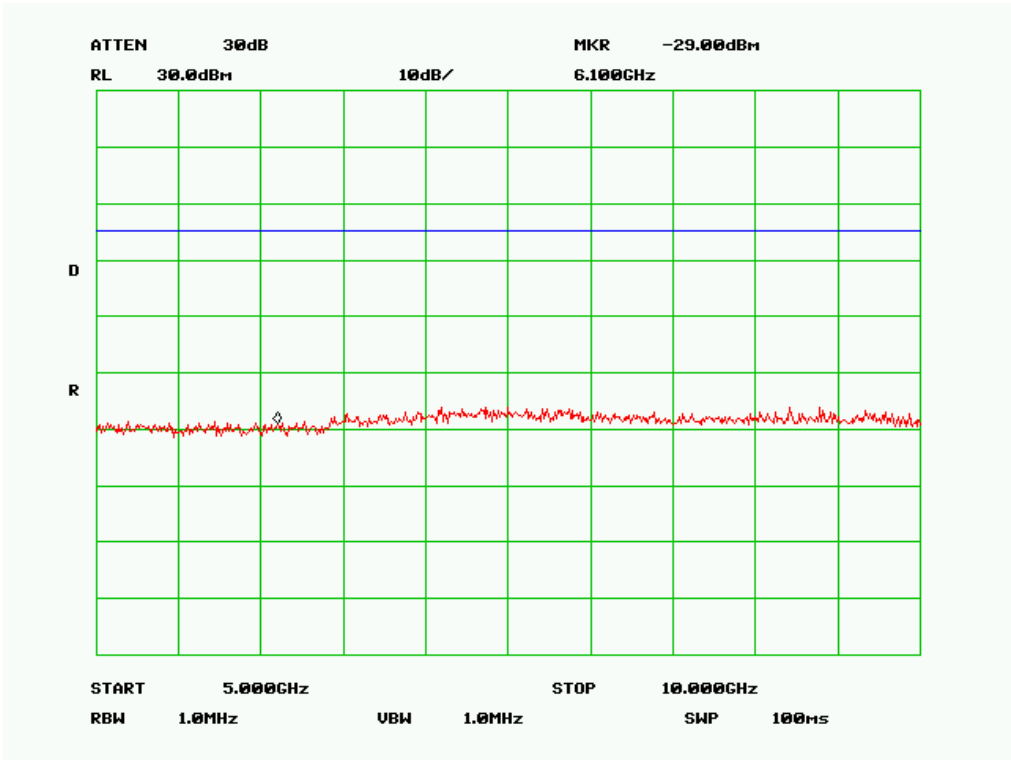
Configuration Mode: GPRS1900, Channel 661, Mid channel



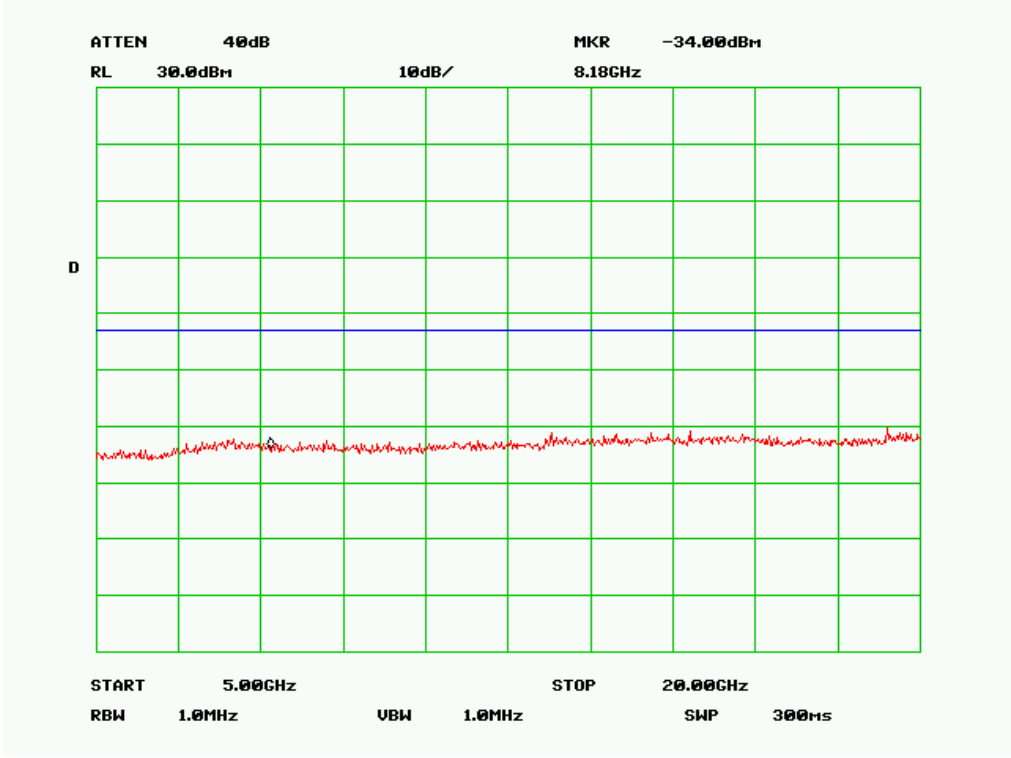
Plot-1



Plot-2

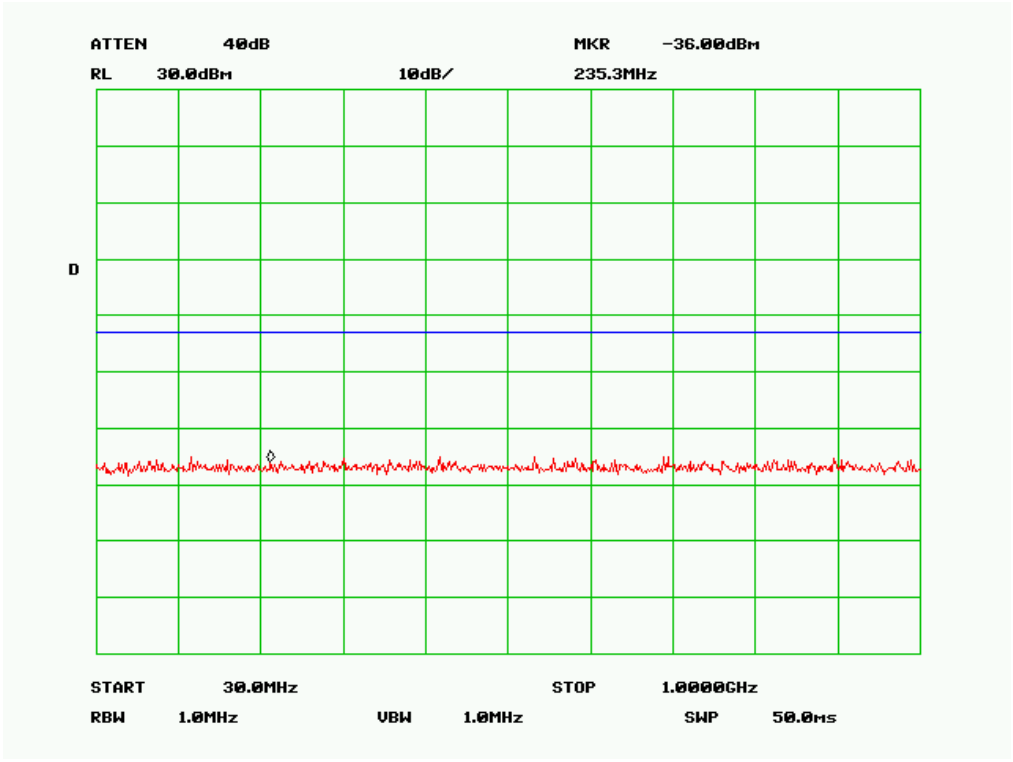

ATTEN 30dB
MKR -29.00dBm
RL 30.0dBm
10dB/
6.100GHz
D
R
START 5.000GHz
STOP 10.000GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 100ms

Plot-3

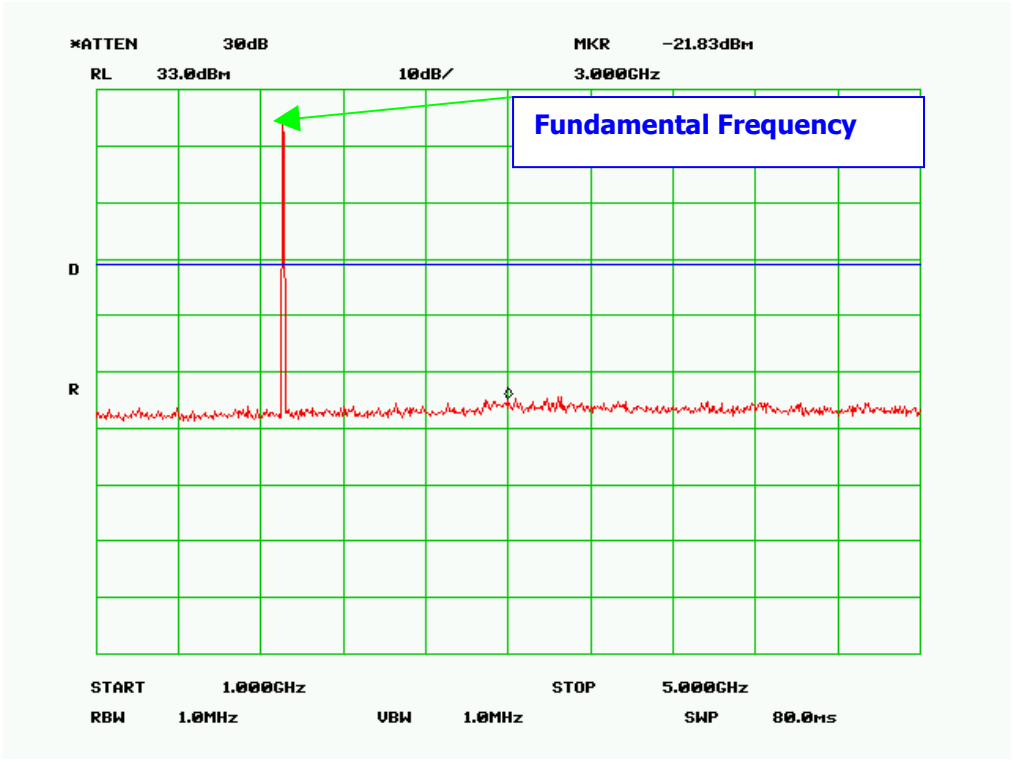

ATTEN 40dB
MKR -34.00dBm
RL 30.0dBm
10dB/
8.18GHz
D
START 5.00GHz
STOP 20.00GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 300ms

Plot-4

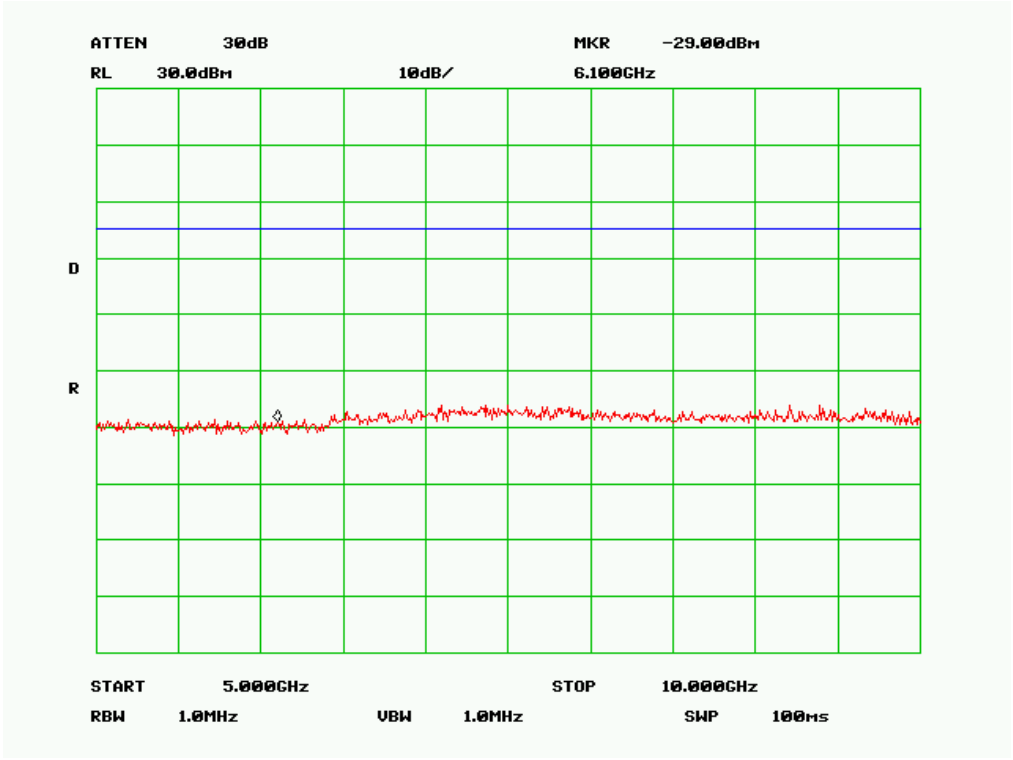
Configuration Mode: GPRS1900, Channel 810, High channel



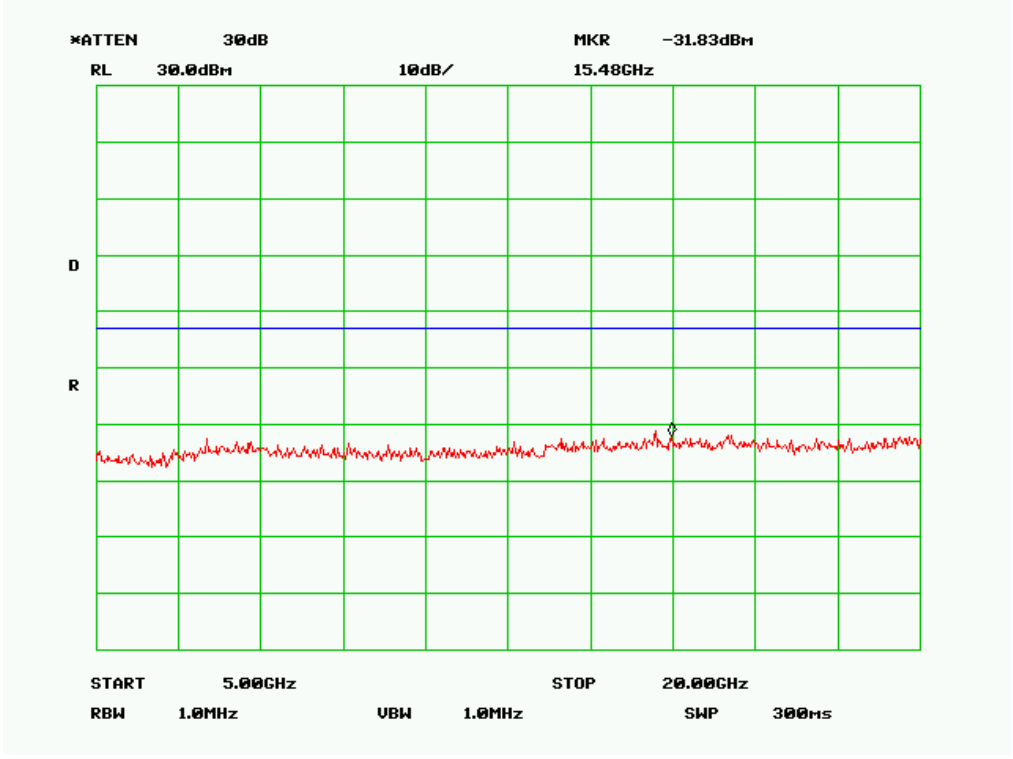
Plot-1



Plot-2


ATTEN 30dB
MKR -29.00dBm
RL 30.0dBm
10dB/
6.100GHz
D
R
START 5.000GHz
STOP 10.000GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 100ms

Plot-3


*ATTEN 30dB
MKR -31.83dBm
RL 30.0dBm
10dB/
15.48GHz
D
R
START 5.00GHz
STOP 20.00GHz
RBW 1.0MHz
VBW 1.0MHz
SWP 300ms

Plot-4

5.6 Radiated Spurious Emissions

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 1GHz – 40GH is +6.0dB (for EUTs < 0.5m X 0.5m X 0.5m).
4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date : 10 October,2011
Tested By :Andy Wang

Standard Requirement: 47 CFR § 22.917(a), § 24.238(a).

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: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz an average measurement was taken with a 10Hz video bandwidth. The EUT was tested at low, mid and high with the highest output power. An emission was scan up to 10th harmonic of the operating frequency.

Sample Calculation:

EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)

Test Result: Pass

Configuration Mode: GPRS850, Channel 128, Low channel

Frequency (GHz)	Reading (dBm)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1.283	-76.62	131	1.0	H	25.70	2.52	0	-46.34	-13	-33.34
7.653	-74.06	119	1.0	H	34.50	6.19	0	-36.37	-13	-23.37
6.311	-73.89	215	1.0	H	35.10	6.18	0	-34.69	-13	-21.69
7.802	-74.93	157	1.1	V	37.80	6.54	0	-38.63	-13	-25.63

Note: Emission was scanned up to 9GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit

Configuration Mode: GPRS850, Channel 190, Mid channel

Frequency (GHz)	Reading (dBm)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1.648	-76.62	131	1.0	H	25.70	2.52	0	-48.40	-13	-35.40
6.663	-74.06	119	1.0	H	34.50	6.19	0	-33.37	-13	-20.37
7.131	-73.89	215	1.0	H	35.10	6.18	0	-32.61	-13	-19.61
8.802	-74.93	157	1.1	V	37.80	6.54	0	-30.59	-13	-17.59

Note: Emission was scanned up to 9GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit

Configuration Mode: GPRS850, Channel 251, High channel

Frequency (GHz)	Reading (dBm)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
2.648	-76.62	131	1.0	H	25.70	2.52	0	-43.56	-13	-30.56
5.663	-74.06	119	1.0	H	34.50	6.19	0	-35.37	-13	-22.37
7.131	-73.89	215	1.0	H	35.10	6.18	0	-36.61	-13	-23.61
6.802	-74.93	157	1.1	V	37.80	6.54	0	-29.46	-13	-16.46

Note: Emission was scanned up to 9GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit

Configuration Mode: GPRS1900, Channel 512, Low channel

Frequency (GHz)	Reading (dBm)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
2.864	-76.32	169	1.0	H	25.70	2.52	0	-48.10	-13	-35.10
6.636	-73.98	215	1.0	H	34.50	6.19	0	-35.36	-13	-22.36
8.439	-73.91	78	1.0	H	36.10	7.01	0	-33.79	-13	-20.79
5.601	-77.45	180	1.1	V	32.20	4.49	0	-39.32	-13	-26.32

Note: Emission was scanned up to 20GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit

Configuration Mode: GPRS1900, Channel 661, Mid channel

Frequency (GHz)	Reading (dBm)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1.648	-76.32	169	1.0	H	25.70	2.52	0	-48.10	-13	-35.10
6.663	-73.98	215	1.0	H	34.50	6.19	0	-33.29	-13	-20.29
7.939	-73.91	78	1.0	H	36.10	7.01	0	-30.80	-13	-17.80
4.919	-77.45	180	1.1	V	32.20	4.49	0	-40.76	-13	-27.76

Note: Emission was scanned up to 20GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit

Configuration Mode: GPRS1900, Channel 810, High channel

Frequency (GHz)	Reading (dBm)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1.986	-76.32	169	1.0	H	25.70	2.52	0	-49.58	-13	-36.58
5.892	-73.98	215	1.0	H	34.50	6.19	0	-36.55	-13	-23.55
4.856	-73.91	78	1.0	H	36.10	7.01	0	-37.11	-13	-24.11
5.940	-77.45	180	1.1	V	32.20	4.49	0	-39.76	-13	-26.76

Note: Emission was scanned up to 20GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit

5.7 Frequency Stability

Requirement(s): 47 CFR §22.355, §22.235.

Procedures: A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage..

Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

Environmental Conditions	Temperature	-10 ~ 50°C
	Relative Humidity	50%
	Atmospheric Pressure	1019mbar

Test Date : 10 October,2011
Tested By : Andy Wang

Results: Pass

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within ± 0.00025% of the operating frequency over a temperature variation of -10ºC to +50ºC at normal supply voltage.

Test Result for GPRS850, Channel 190 (middle channel)

Temperature (℃)	Freq. Drift (Hz)	Freq. Deviation (Limit: ppm)	Pass/Fail
50	-6	<2.5	Pass
40	-3	<2.5	Pass
30	-3	<2.5	Pass
20	-5	<2.5	Pass
10	-3	<2.5	Pass
0	-5	<2.5	Pass
-10	-5	<2.5	Pass

Note : Manufacturer declares that operating temperature range of EUT is -10 ~ +50ºC.

Frequency Stability versus Input Voltage: The frequency tolerance of the carrier signal shall be maintained within ± 0.00025% of the operating frequency, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Measured Voltage ±15% of nominal (DC)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
6.29	-5	<2.5	Pass
7.40	-4	<2.5	Pass
8.51	-4	<2.5	Pass

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal over a temperature variation of -10ºC to +50ºC at normal supply voltage.

Test Result for GPRS1900, Channel 661 (middle channel)

Temperature (℃)	Freq. Drift (Hz)	Freq. Deviation (Limit: ppm)	Pass/Fail
50	-15	<2.5	Pass
40	-16	<2.5	Pass
30	-12	<2.5	Pass
20	-14	<2.5	Pass
10	-6	<2.5	Pass
0	-14	<2.5	Pass
-10	-18	<2.5	Pass

Note : Manufacturer declares that operating temperature range of EUT is -10 ~ +50ºC.

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Measured Voltage ±15% of nominal (DC)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
6.29	-15	<2.5	Pass
7.40	-16	<2.5	Pass
8.51	-21	<2.5	Pass

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8564 E	2012.03.21
EMI Receiver	Rohde & Schwarz	ESPI 3	2012.03.21
Antenna (30MHz~2GHz)	Sunol Sciences	JB1	2012.11.18
Horn Antenna (1~18GHz)	A-INFOMW	JXTXLB-10180	2012.11.18
Horn Antenna (1~18GHz)	N/A	N/A	2012.10.04
Pre-Amplifier(0.01 ~ 1.3GHz)	HP	8447F	2012.03.21
Pre-Amplifier(0.1 ~ 18GHz)	MITEQ	AMF-7D-00101800-30-10P	2012.03.21
Horn Antenna (18~40GHz)	Com Power	AH-840	2012.03.21
Microwave Pre-Amp (18~40GHz)	Com Power	PA-840	2012.03.21

Note: Functional Verification

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipments were powered separately from another main supply.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 KHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Sample Calculation Example

At 20 MHz limit = 250 μV = 47.96 dBμV

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dBμV
(Calibrated for system losses)

Therefore, Q-P margin = 47.96 – 40.00 = 7.96 i.e. **7.96 dB below limit**

Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 1GHz (for FCC tests, until the 5th harmonic for operating frequencies ≥ 108MHz), was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

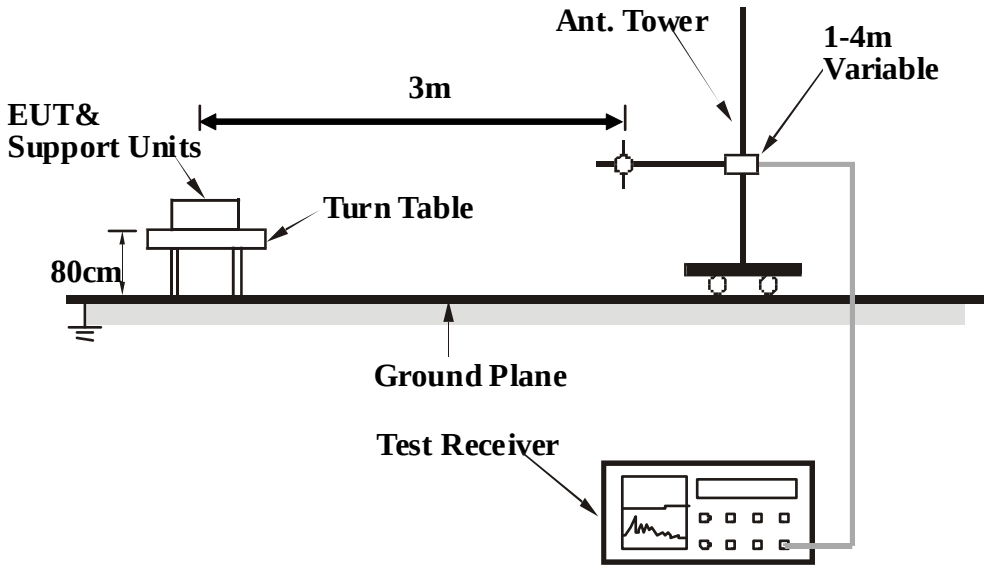
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS).

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table as shown in Annex B.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ◦ to 360 ◦ with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured were complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

Where:
Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)
And the average value is

Average = Peak Value + Duty Factor or
Set RBW = 1MHz, VBW = 10Hz.

Note:
If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B EUT AND TEST SETUP PHOTOGRAPHS

Annex B.i. Photograph1: EUT External Photo

Front View of EUT

Rear View of EUT

Top View of EUT

Bottom View of EUT

Left View of EUT

Right View of EUT

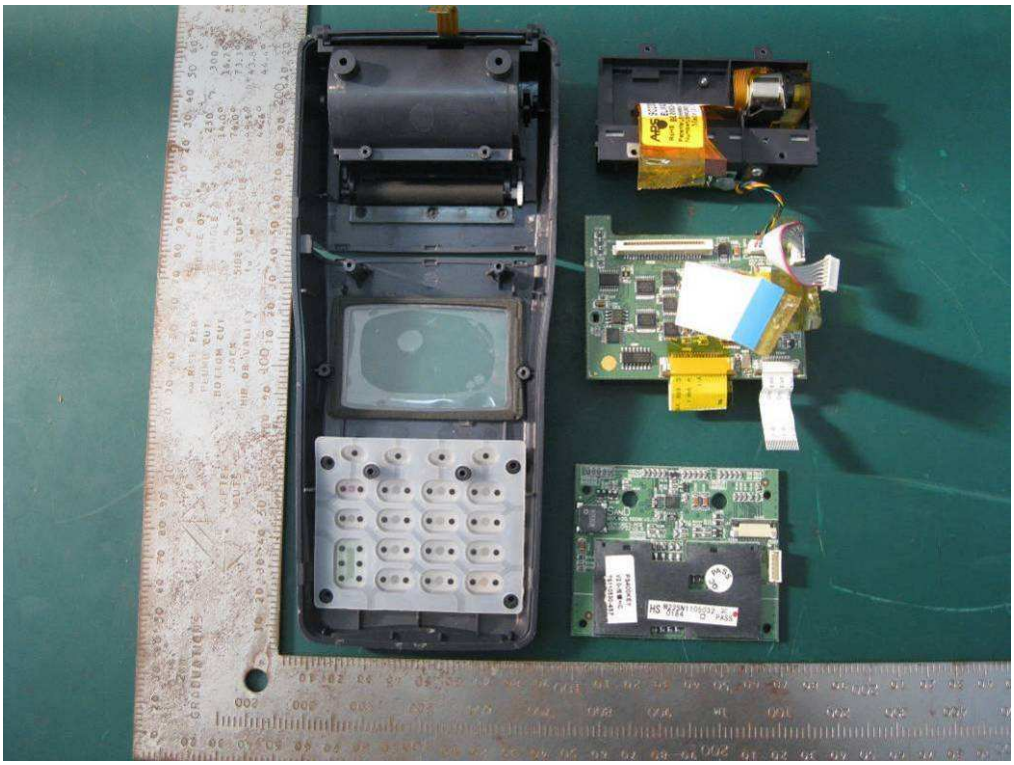
Adapter1 View of EUT

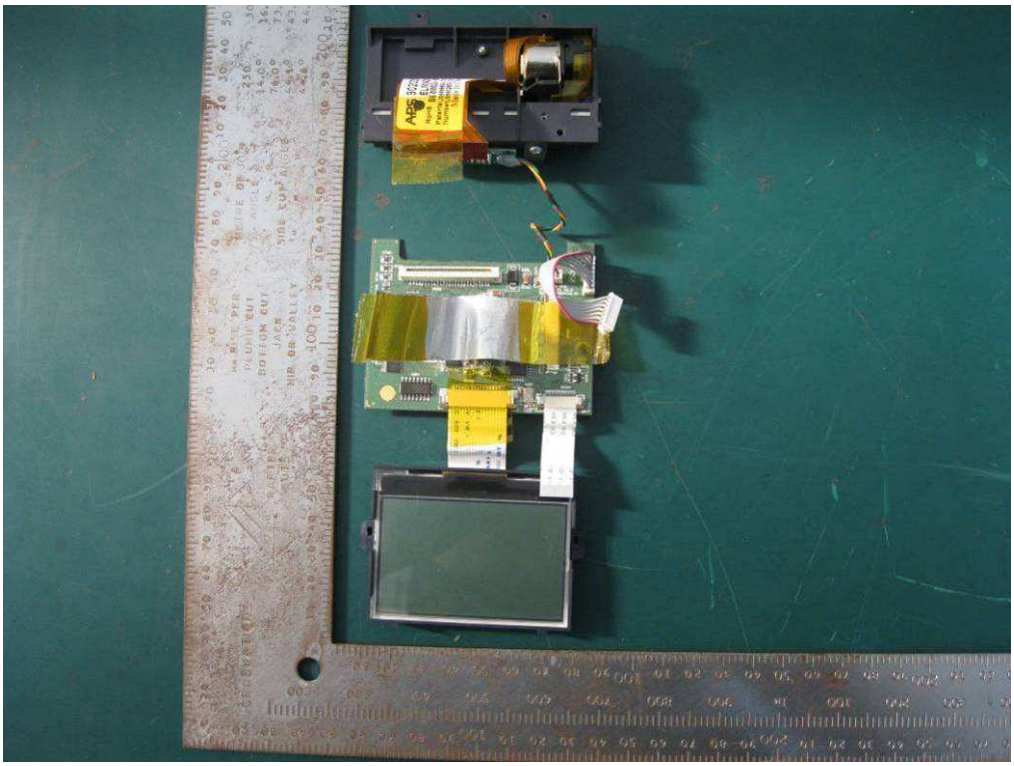
Adapter1 View of EUT

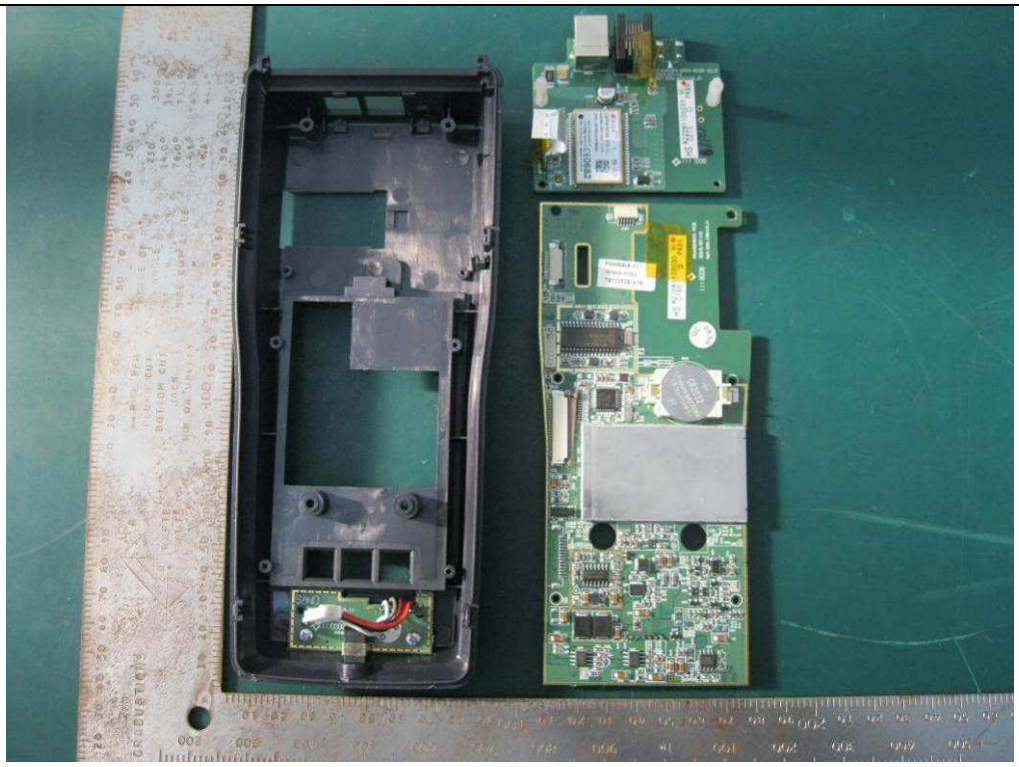
Adapter2 View of EUT

Adapter2 View of EUT

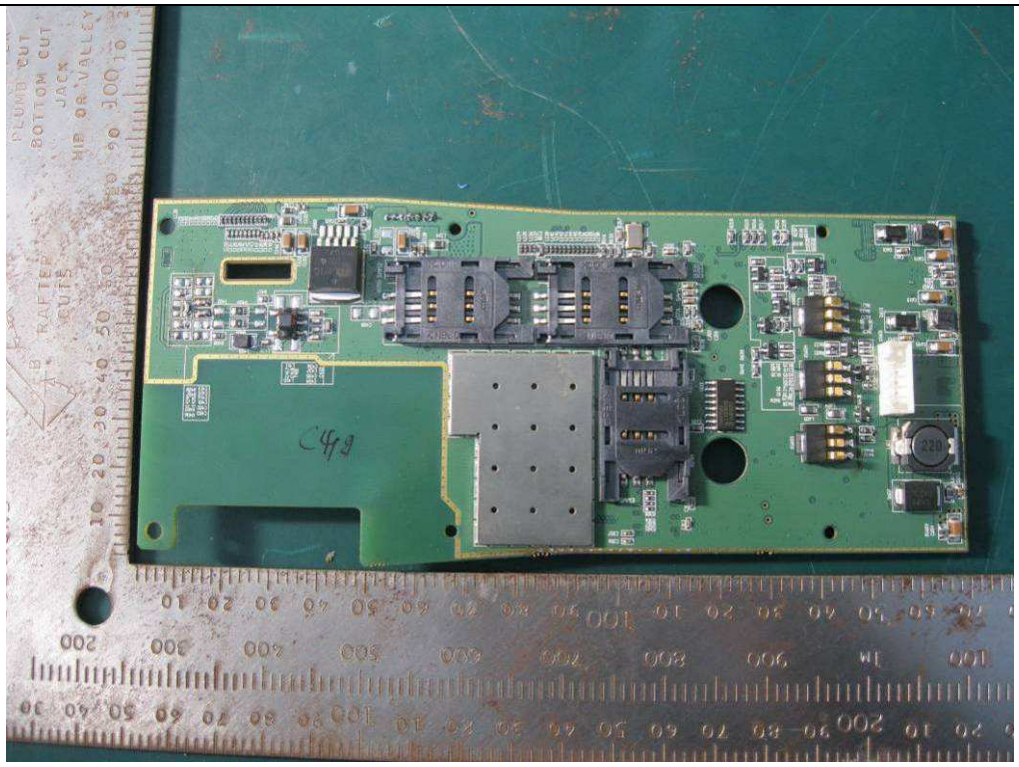
Annex B.ii. Photograph 2: EUT Internal Photo

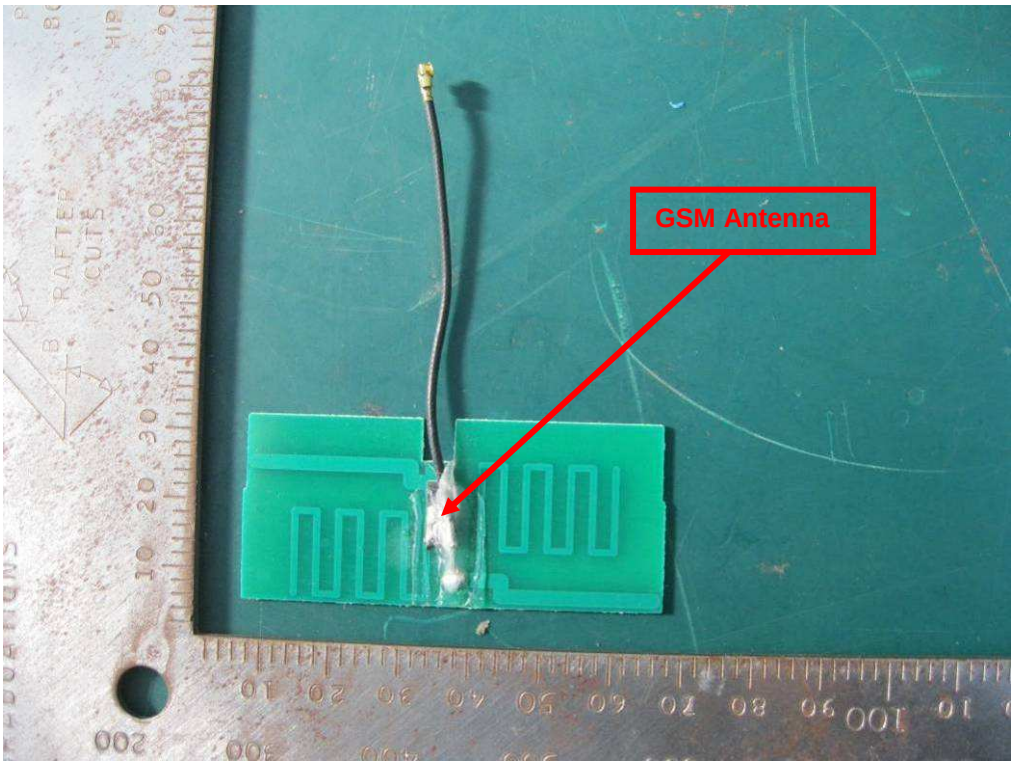




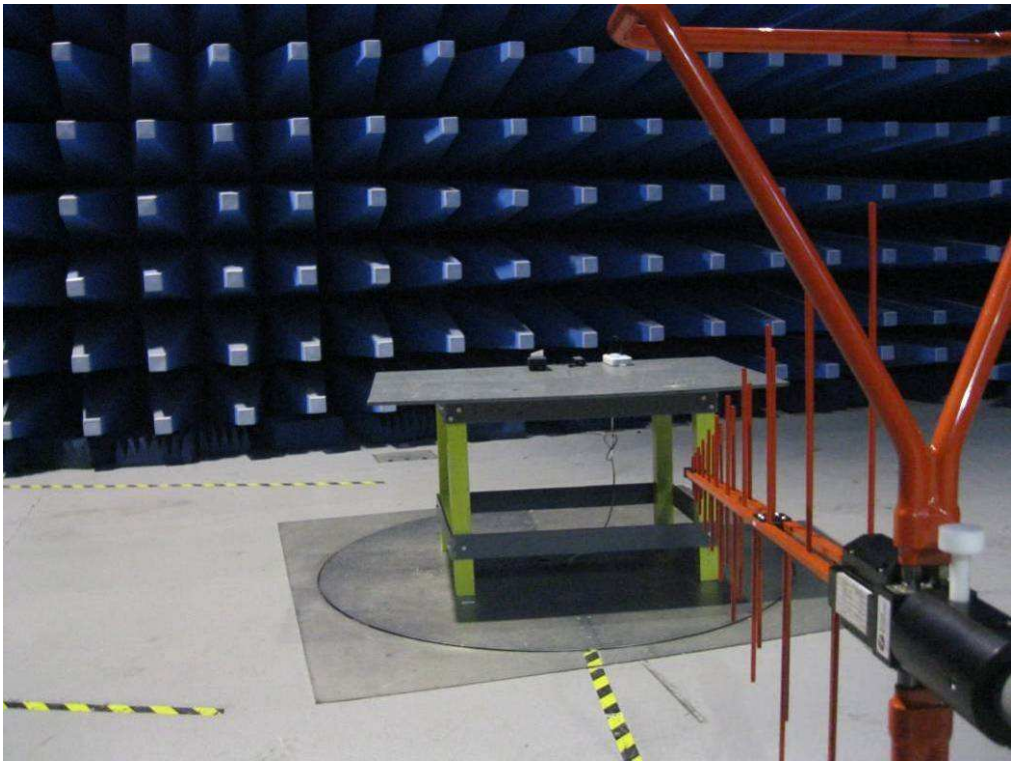



PASS
GRADUATIONS

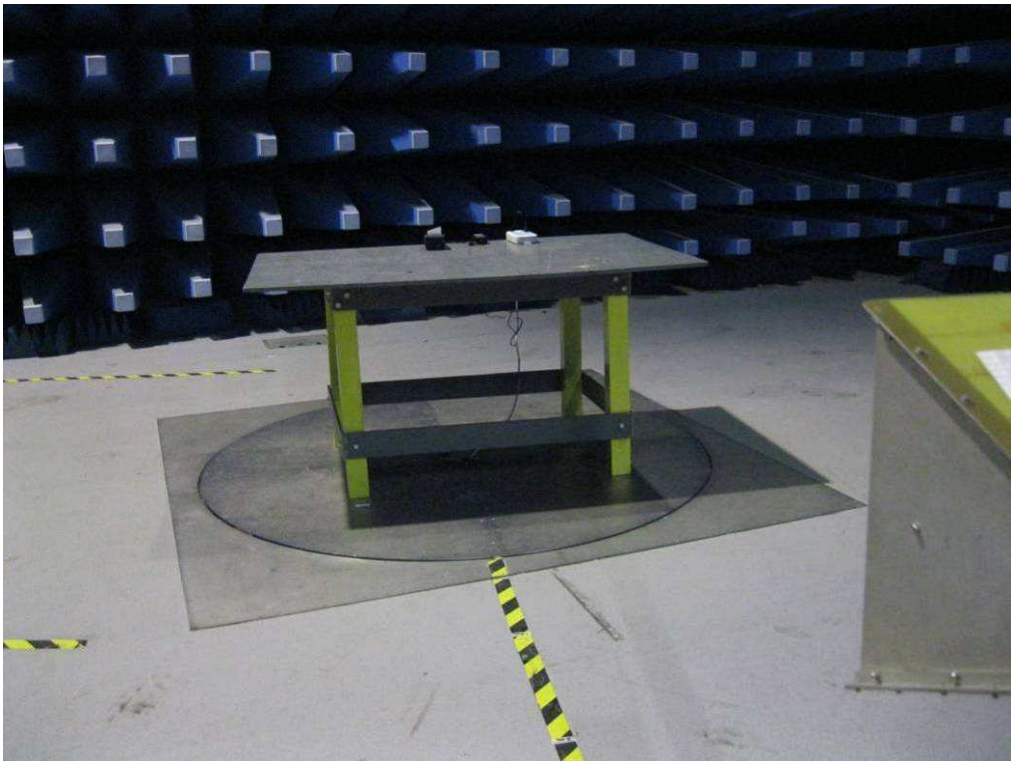



GSM Antenna

Annex B.ii. Photograph 2: Test setup Photo



Radiated Emission (30MHz - 1GHz) – Front View



Radiated Emission (> 1GHz) – Front View

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

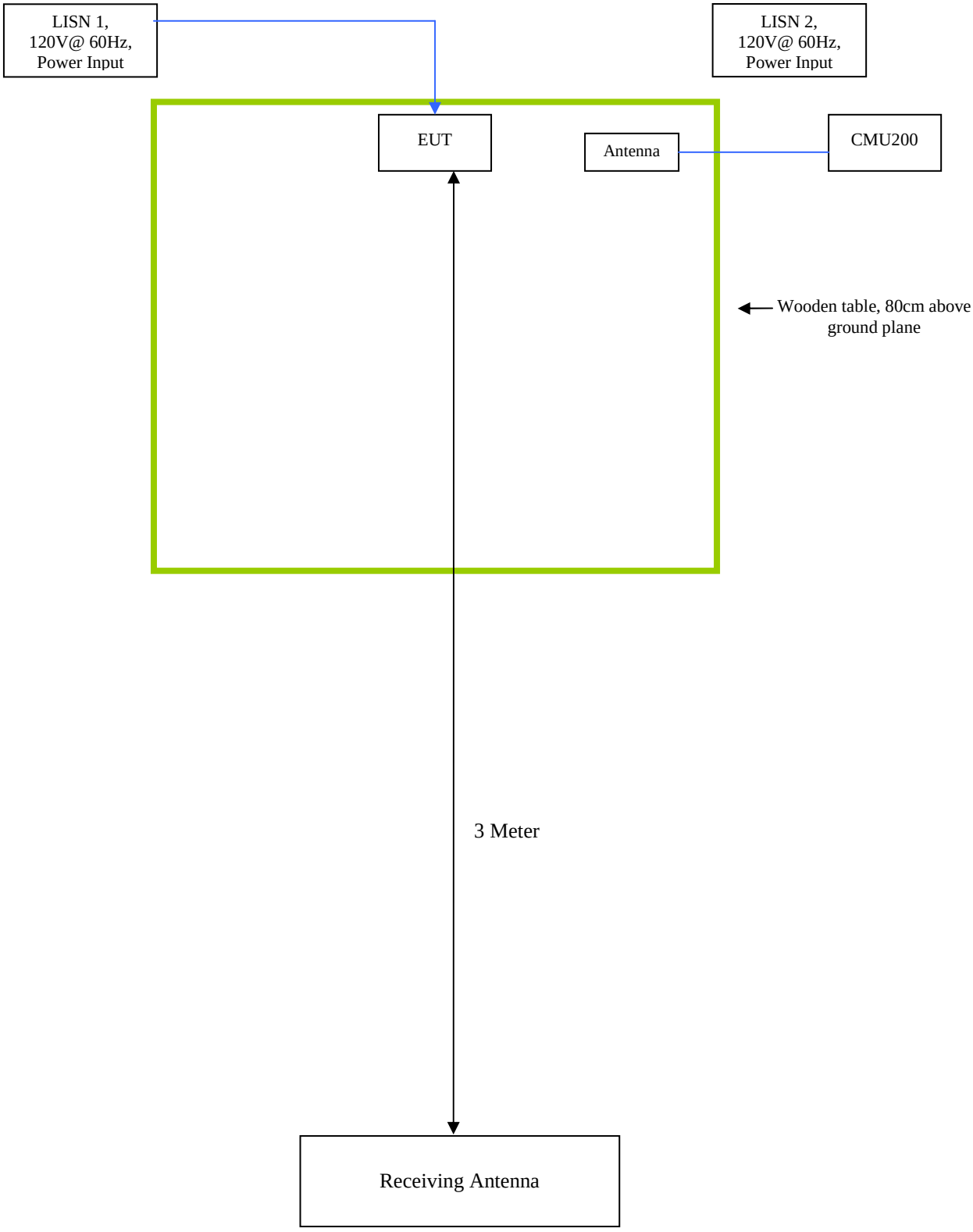
EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
N/A	N/A	N/A

Block Configuration Diagram for Radiated Emission



Annex C.ii. EUT OPERATING CONDITIONS

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

Test	Description Of Operation
Emissions Testing	The EUT was communicating with base station and set to work at maximum output power.
Others Testing	The EUT was communicating with base station and set to work at maximum output power.

Annex D User Manual, Block Diagram, Circuit Diagram

Please see attachment

Annex E. SIEMIC ACCREDITATION CERTIFICATES

SIEMIC ACREDITATION DETAILS: FCC Test Site Registration No. 986914

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

April 19, 2011

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 Renewal: April 19, 2011

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on 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,

Phyllis Parrish
Industry Analyst

SIEMIC ACREDITATION DETAILS: Industry of Canada Test Site Registration No. 4842B

Industry Canada Industrie Canada

January 25, 2011

OUR FILE: 46405-4842
Submission No: 145222

Siemic Nanjing (China) Laboratories
2-1 Longcang Avenue
Yuhua Economic & Technology Dev. Park, Nanjing
China

Attention: Leslie Bai

Dear Sir/Madame:

The Bureau has received your application for the registration of a 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought (Site# 4842B-2). Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please keep for your records the following information:

- The company address code associated to the site(s) located at the above address is: 4842B

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 or later shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 metre OATS or 3 metre chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to exceed three years. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;
http://strategis.ic.gc.ca/epic/internet/inceb-bbst.nsf/en/h_tt00032e.html.

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.ca Please reference our file and submission number above for all correspondence.

Yours sincerely,

Dalwinder Gill
For: Wireless Laboratory Manager
Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario K2H 8S2
Email: dalwinder.gill@ic.gc.ca
Tel. No. (613) 998-8363
Fax. No. (613) 990-4752