



**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E
&
INDUSTRY CANADA RSS-132 & RSS-133**

TEST REPORT

For

E5 GSM Model Pager

Trade Name: Unication

Model: E5 GSM

Issued to

**Unication Co., Ltd.
5F., No. 6, Wu-Kung 5Rd., Hsinchuang City,
Taipei, Taiwan, R. O .C.**

Issued by

**Compliance Certification Services Inc.
No.11, Wu-Gong 6th Rd., Wugu Industrial Park,
New Taipei City 248, Taiwan (R.O.C.)**

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Issued Date: December 5, 2011



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 5, 2011	Initial Issue	ALL	Jessica Ho



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1. TEST RESULT CERTIFICATION

Applicant: Unication Co., Ltd.
5F., No. 6, Wu-Kung 5Rd., Hsinchuang City,
Taipei, Taiwan, R. O .C.

Manufacturer: Unication Co., Ltd.
5F., No. 6, Wu-Kung 5Rd., Hsinchuang City,
Taipei, Taiwan, R. O .C.

Equipment Under Test: E5 GSM Model Pager

Trade Name: Unication

Model Number: E5 GSM

Date of Test: October 13 ~ November 25, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E & IC RSS-132 Issue 2: September 2005 and IC RSS-133 Issue 5: February 2009	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rule FCC PART 22 Subpart H, PART 24 Subpart E, IC RSS-132 Issue 2 and IC RSS-133 Issue 4.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Reviewed by:

Jason Lin
Section Manager
Compliance Certification Services Inc.

Gina Lo
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	E5 GSM Model Pager
Trade Name	Unication
Model Number	E5 GSM
Model Discrepancy	N/A
Received Date	September 27, 2011
Power Supply	1. Li-ion Battery Part Number: T65G1AE1S1P-R Ration: 3.7V, 0.555Wh 2. Battery: DC 5V, 1.2A
Frequency Range	GSM / GPRS / EDGE 850MHz: 824 ~ 849 MHz GSM / GPRS / EDGE: 1900MHz: 1850 ~ 1910 MHz
Modulation Technique	GSM: GMSK GPRS: GMSK
Antenna Gain	GSM / GPRS: 850MHz: -3.5dBi GSM / GPRS: 1900MHz: 0 dBi
Antenna Type	PCB Antenna

Remark: The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

Mode	ERP Power (dBm)	Type of Emission
GSM 850MHz	17.92	250GXW
GPRS 850MHz	17.42	252GXW

Mode	ERP Power (dBm)	Type of Emission
GSM 1900MHz	21.26	253GXW
GPRS 1900MHz	21.26	256GXW



3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.4: 2003, TIA/EIA-603-C: 2004 and FCC CFR 47, Part 2 and Part 22 Subpart H & Part 24 Subpart E.

The tests documented in this report were performed in accordance with IC RSS-132, SPSR503, RSS-133, SPSR510 and ANSI C63.4 and TIA/EIA-603-C.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.



3.4 DESCRIPTION OF TEST MODES

The EUT (model: E5 GSM) had been tested under operating condition.

EUT staying in continuous transmitting mode was programmed.

After verification, all tests carried out are with the worst-case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode and receiving radiated spurious emission above 1GHz, which worst case was in CH Mid mode only.

GSM / GPRS / EDGE 850MHz:

Channel Low (CH128), Channel Mid (CH190) and Channel High (CH251) were chosen for full testing.

GSM / GPRS / EDGE 1900MHz:

Channel Low (CH512), Channel Mid (CH661) and Channel High (CH810) were chosen for full testing.

Based on the above results from the different modulations, GSM850 / GSM1900 / GPRS 850 / GPRS1900 were determined to be the worst-case scenario for all tests.

The worst emission was found:

in lie-down (X axis) for GPRS 850 / GPRS 1900 mode.

in lie-down (Y axis) for GSM 1900 / GSM 850 mode.



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.



4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	11/02/2012
EMI Test Receiver	R&S	ESCI	100064	02/17/2012
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/13/2012
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/19/2012
Bilog Antenna	Sunol Sciences	JB3	A030105	10/03/2012
Bilog Antenna	Sunol Sciences	JB3	A030205	10/03/2012
Horn Antenna	EMCO	3117	00055165	01/12/2012
Horn Antenna	EMCO	3117	00055167	12/05/2012
Horn Antenna	EMCO	3116	00026370	10/12/2012
Loop Antenna	EMCO	6502	8905/2356	06/10/2013
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/26/2011
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESHS10	843743/015	05/01/2012
LISN	SCHWARZBECK	NSLK 8127	8127-541	12/18/2011
LISN	SCHAFFNER	NNB 41	03/10013	N.C.R.
Test S/W	CCS-3A1-CE			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029
- No.11, Wu-Gong 6th Rd., Wugu Industrial Park, New Taipei City 248, Taiwan (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045
- No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN,
R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4: 2003 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.




All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.



5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Universal Radio Communication Tester (Remote)	R&S	CMU200	101245	N/A	N/A	Unshielded, 1.8m

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



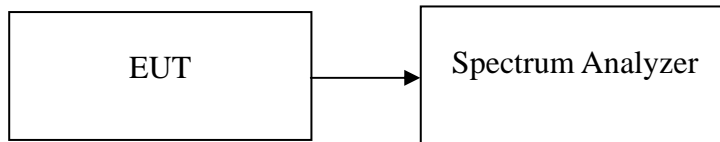
7. FCC PART 22 & 24 REQUIREMENTS & INDUSTRY CANADA RSS-132 & RSS-133

7.1 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

TEST RESULTS

No non-compliance noted.



Test Data

Test Mode	CH	Frequency (MHz)	99% Bandwidth (kHz)
GSM 850 (Class 12)	128	824.20	250.2553
	190	836.60	250.0955
	251	848.80	248.3606
GPRS 850 (Class 12)	128	824.20	252.3860
	190	836.60	249.5742
	251	848.80	251.0312
GSM 1900 (Class 12)	512	1850.21	253.8631
	661	1880.00	252.2760
	810	1910.00	250.4575
GPRS 1900 (Class 12)	512	1850.21	248.8537
	661	1880.00	248.7007
	810	1910.00	256.2817

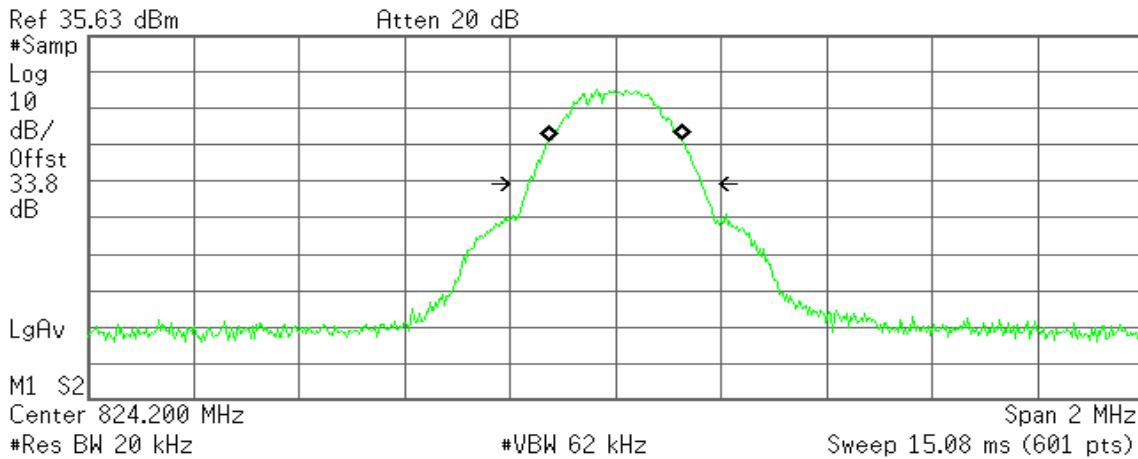


Test Plot

GSM 850 (CH Low)

Agilent 11:07:38 Oct 14, 2011

R T



Occupied Bandwidth
250.2553 kHz

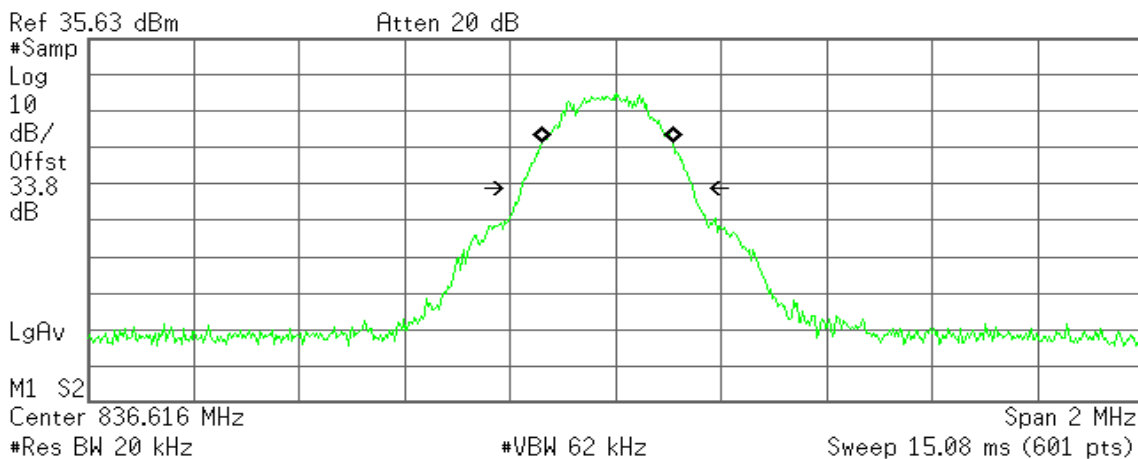
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -101.405 Hz
x dB Bandwidth 329.149 kHz*

GSM 850 (CH Mid)

Agilent 11:06:53 Oct 14, 2011

R T



Occupied Bandwidth
250.0955 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

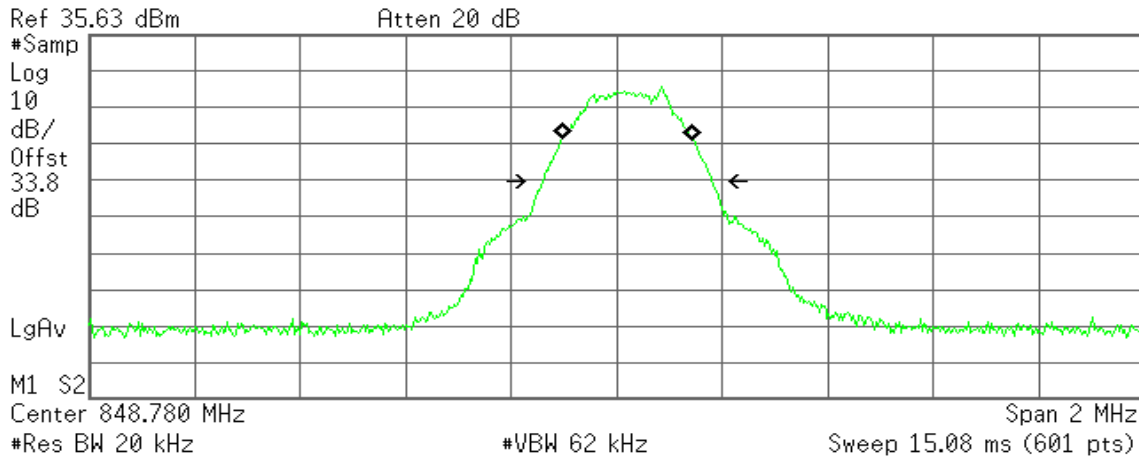
Transmit Freq Error -15.798 kHz
x dB Bandwidth 326.072 kHz*



GSM 850 (CH High)

Agilent 11:05:27 Oct 14, 2011

R T



Occupied Bandwidth
248.3606 kHz

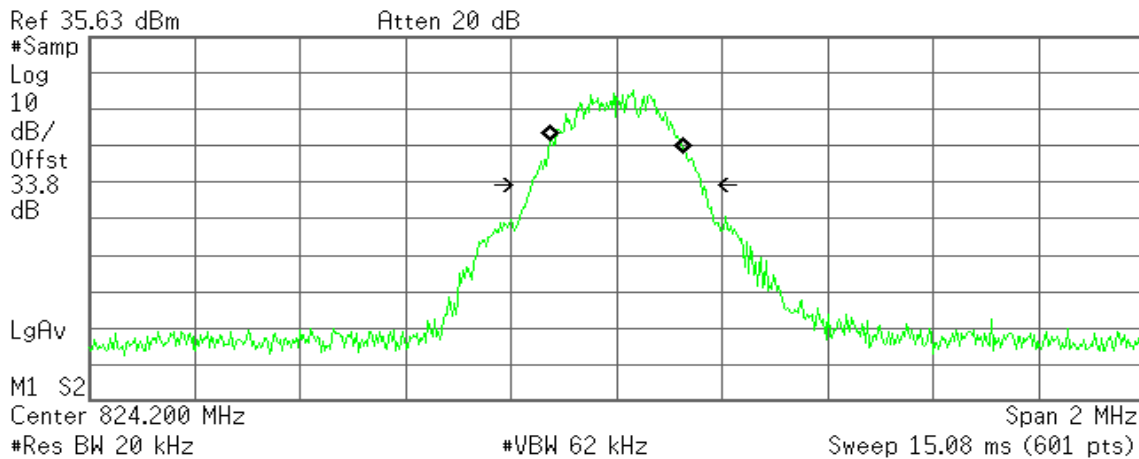
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 20.542 kHz
x dB Bandwidth 320.689 kHz*

GPRS 850 (CH Low)

Agilent 11:07:50 Oct 14, 2011

R T



Occupied Bandwidth
252.3860 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

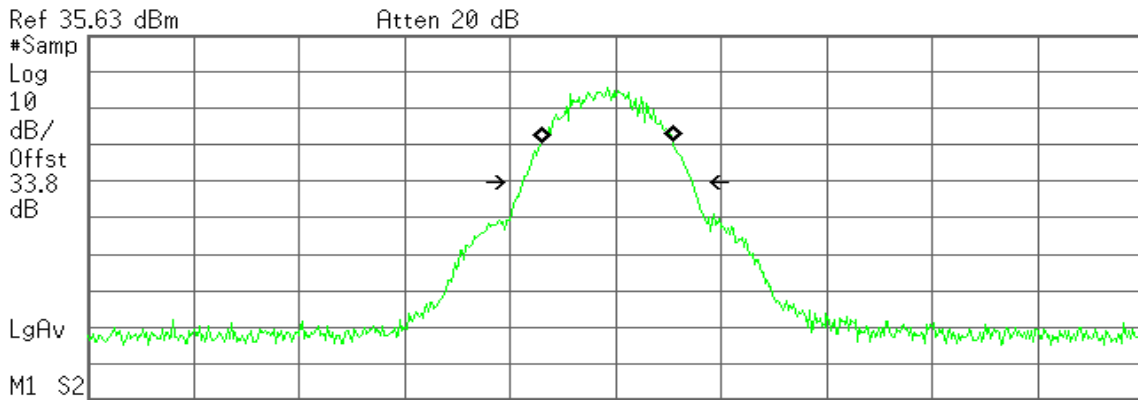
Transmit Freq Error 425.553 Hz
x dB Bandwidth 323.206 kHz*



GPRS 850 (CH Mid)

Agilent 11:06:29 Oct 14, 2011

R T



Ref 35.63 dBm Atten 20 dB
#Samp Log 10 dB/ Offst 33.8 dB
Center 836.616 MHz Span 2 MHz
#Res BW 20 kHz #VBW 62 kHz Sweep 15.08 ms (601 pts)

Occupied Bandwidth
249.5742 kHz

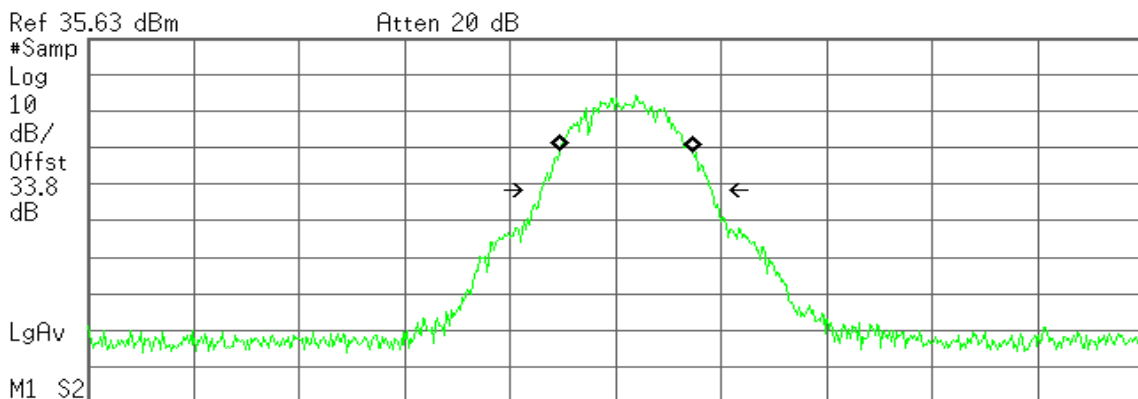
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -16.194 kHz
x dB Bandwidth 323.689 kHz*

GPRS 850(CH High)

Agilent 11:05:40 Oct 14, 2011

R T



Ref 35.63 dBm Atten 20 dB
#Samp Log 10 dB/ Offst 33.8 dB
Center 848.780 MHz Span 2 MHz
#Res BW 20 kHz #VBW 62 kHz Sweep 15.08 ms (601 pts)

Occupied Bandwidth
251.0312 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

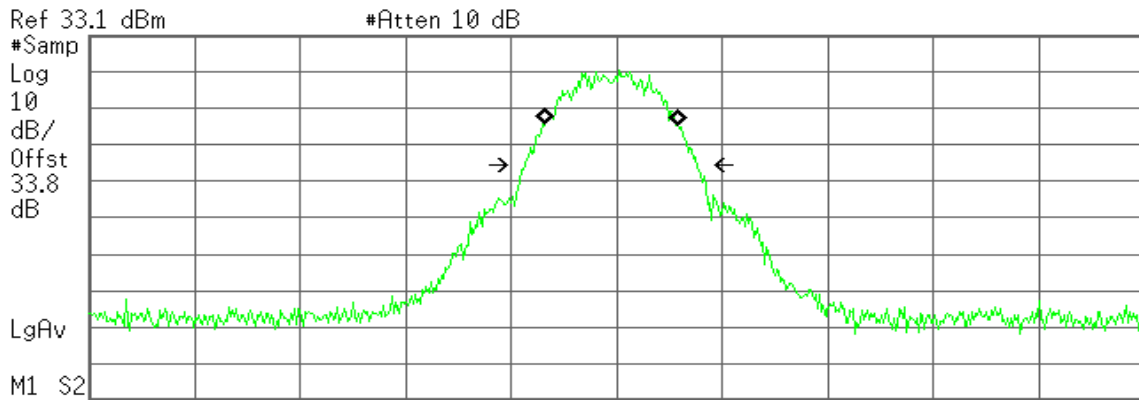
Transmit Freq Error 20.269 kHz
x dB Bandwidth 326.455 kHz*



GSM 1900 (CH Low)

Agilent 13:23:29 Oct 14, 2011

R T



Ref 33.1 dBm #Atten 10 dB
#Samp Log 10 dB/ Offst 33.8 dB
LgAv
M1 S2
Center 1.850 210 GHz Span 2 MHz
#Res BW 20 kHz #VBW 62 kHz Sweep 15.08 ms (601 pts)

Occupied Bandwidth
253.8631 kHz

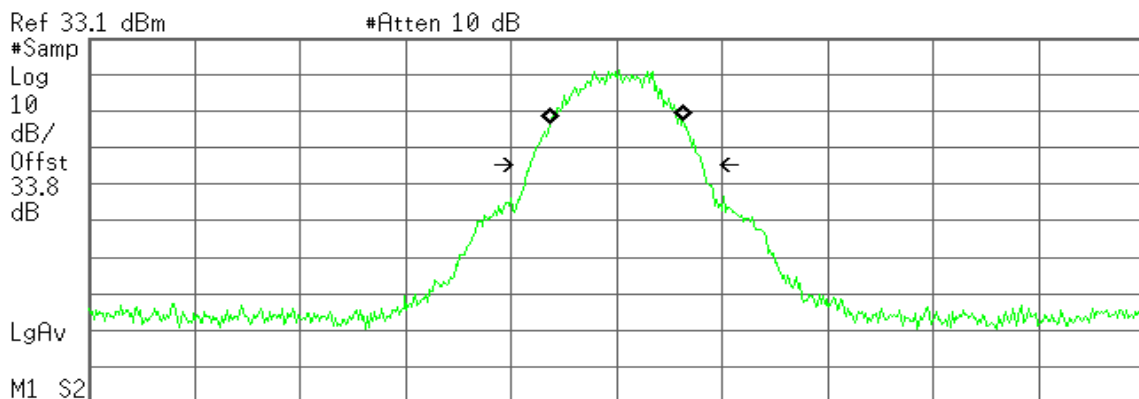
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -10.895 kHz
x dB Bandwidth 327.253 kHz*

GSM 1900 (CH Mid)

Agilent 13:22:22 Oct 14, 2011

R T



Ref 33.1 dBm #Atten 10 dB
#Samp Log 10 dB/ Offst 33.8 dB
LgAv
M1 S2
Center 1.880 000 GHz Span 2 MHz
#Res BW 20 kHz #VBW 62 kHz Sweep 15.08 ms (601 pts)

Occupied Bandwidth
252.2760 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

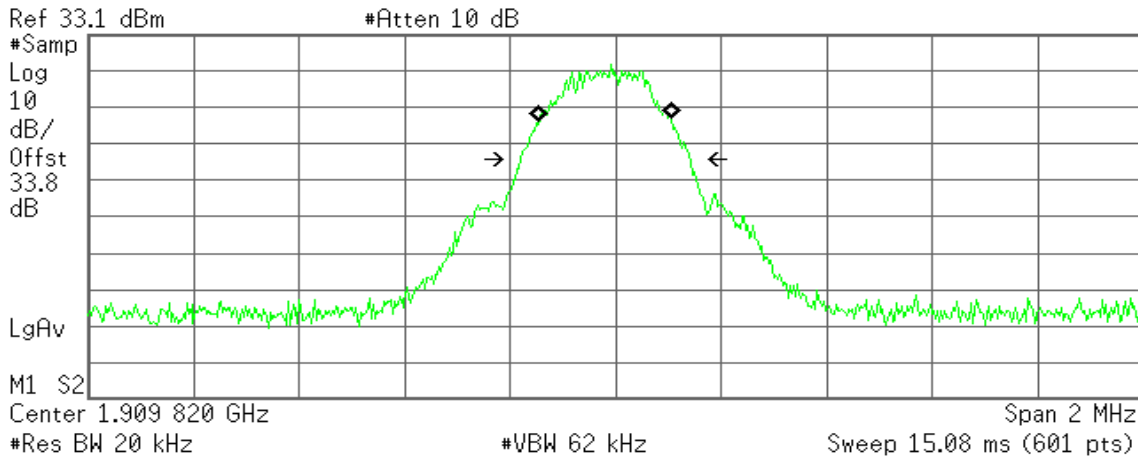
Transmit Freq Error 365.345 Hz
x dB Bandwidth 327.657 kHz*



GSM 1900 (CH High)

Agilent 13:21:44 Oct 14, 2011

R T



Occupied Bandwidth
250.4575 kHz

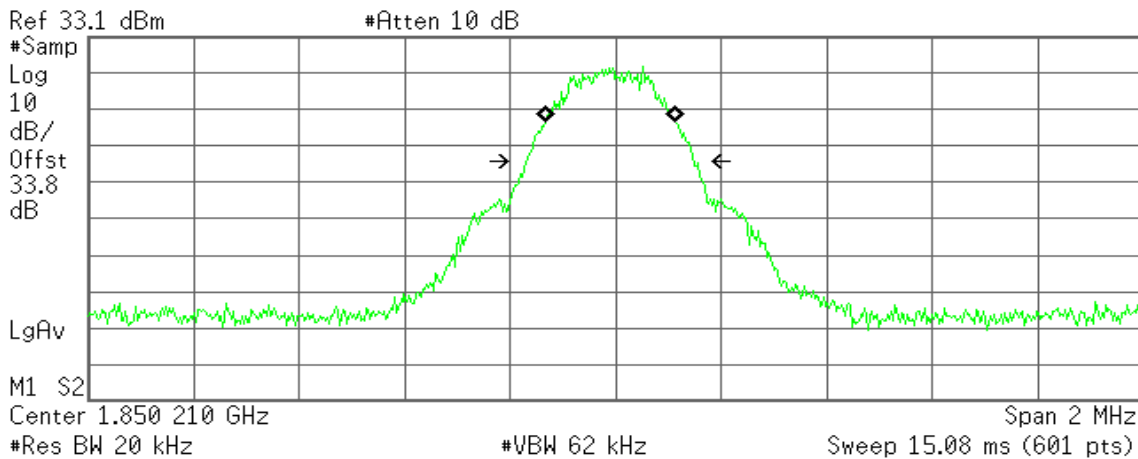
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -19.854 kHz
x dB Bandwidth 322.923 kHz*

GPRS 1900 (CH Low)

Agilent 13:23:17 Oct 14, 2011

R T



Occupied Bandwidth
248.8537 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

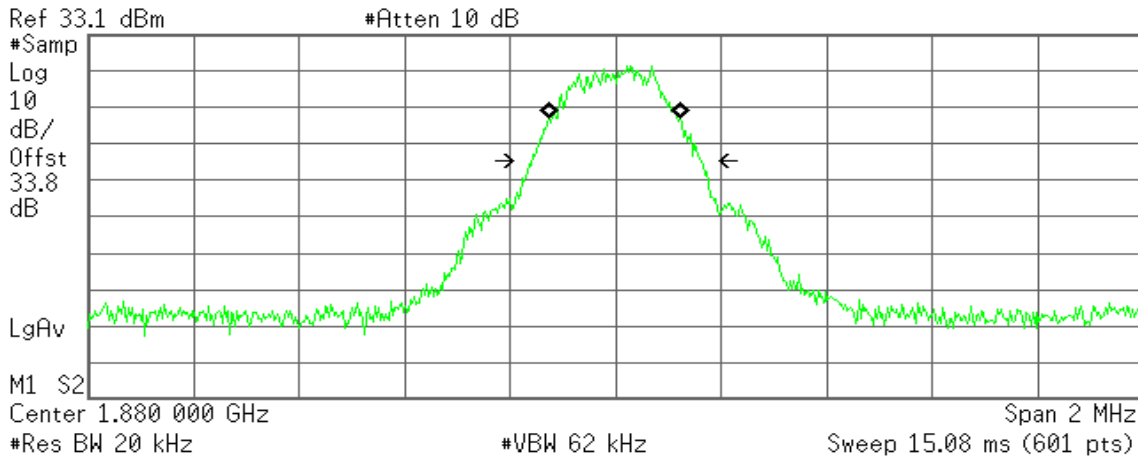
Transmit Freq Error -9.640 kHz
x dB Bandwidth 318.730 kHz*



GPRS 1900 (CH Mid)

Agilent 13:22:35 Oct 14, 2011

R T



Occupied Bandwidth
248.7007 kHz

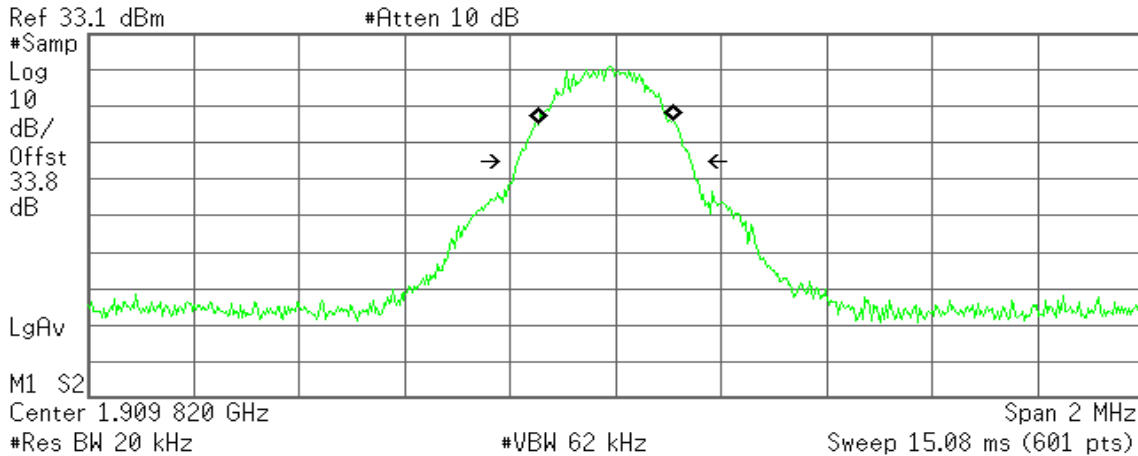
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -1.571 kHz
x dB Bandwidth 321.115 kHz*

GPRS 1900 (CH High)

Agilent 13:21:29 Oct 14, 2011

R T



Occupied Bandwidth
256.2817 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -19.797 kHz
x dB Bandwidth 328.945 kHz*

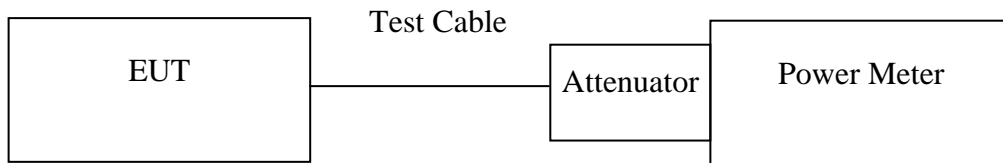


7.2 PEAK POWER

LIMIT

According to FCC §2.1046.

Test Configuration



Remark: Measurement setup for testing on Antenna connector

TEST PROCEDURE

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

TEST RESULTS

No non-compliance noted.



Test Data

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
GSM 850 (Class 12)	128	824.20	32.80
	190	836.60	32.80
	251	848.80	32.90
GPRS 850 (Class 12)	128	824.20	32.20
	190	836.60	32.70
	251	848.80	32.80

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
GSM 1900 (Class 12)	512	1850.20	30.10
	661	1880.00	30.40
	810	1910.00	30.70
GPRS 1900 (Class 12)	512	1850.20	29.80
	661	1880.00	29.90
	810	1910.00	29.90

Remark: The value of factor includes both the loss of cable and external attenuator

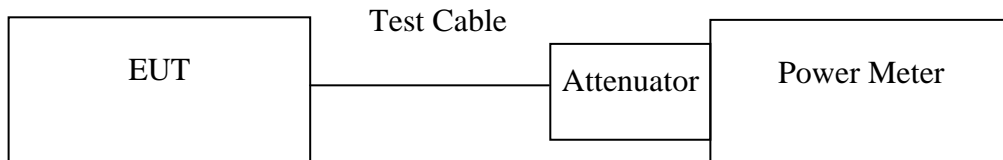


7.3 AVERAGE POWER

LIMIT

For reporting purposes only.

Test Configuration



Remark: Measurement setup for testing on Antenna connector

TEST PROCEDURE

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

TEST RESULTS

No non-compliance noted.



Test Data

Test Mode	CH	Frequency (MHz)	Average Power (dBm)
GSM 850 (Class 12)	128	824.20	32.60
	190	836.60	32.70
	251	848.80	32.80
GPRS 850 (Class 12)	128	824.20	26.18
	190	836.60	26.68
	251	848.80	26.78

Test Mode	CH	Frequency (MHz)	Average Power (dBm)
GSM 1900 (Class 12)	512	1850.20	29.90
	661	1880.00	30.10
	810	1909.80	30.50
GPRS 1900 (Class 12)	512	1850.20	23.78
	661	1880.00	23.88
	810	1909.80	23.88

Remark: The value of factor includes both the loss of cable and external attenuator



7.4 ERP & EIRP MEASUREMENT

LIMIT

According to FCC §2.1046

FCC 22.913(b): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

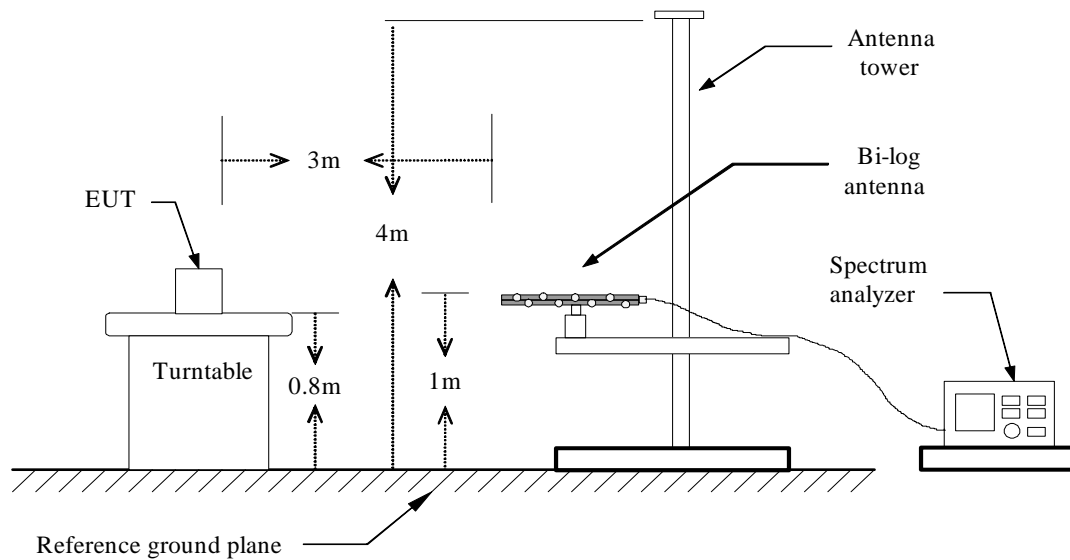
RSS-132 § 4.4 The maximum (ERP) shall be 6.3 Watts for mobile stations.

FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

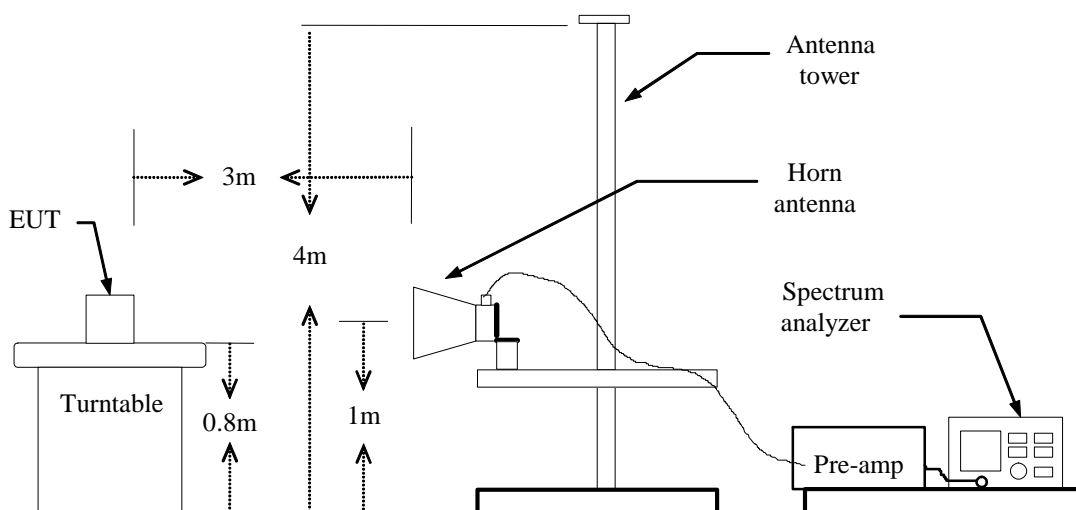
RSS133 § 6.4: Mobile stations and hand-held portables are limited to 2 watts maximum (EIRP).

Test Configuration

Below 1 GHz

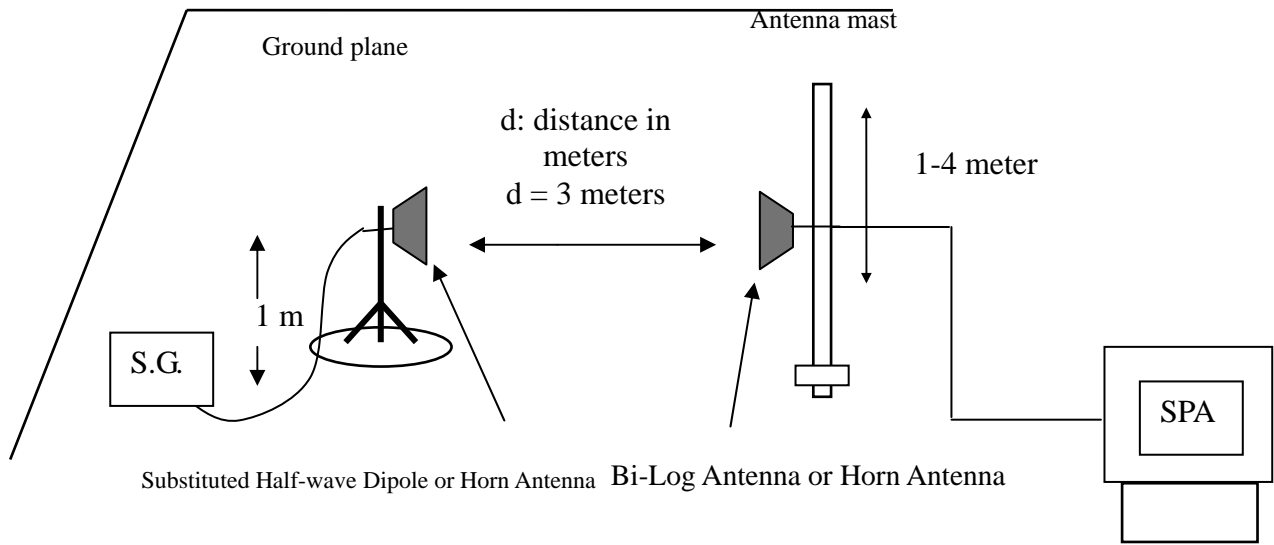


Above 1 GHz





For Substituted Method Test Set-UP



TEST PROCEDURE

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

TEST RESULTS

No non-compliance noted.



GSM 850 TEST DATA

EUT Pol.	Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
X	128	824.20	V	1.78	3.39	6.24	4.63	38.45	-33.82
		824.20	H	15.07	3.39	6.24	*17.92	38.45	-20.53
	190	836.60	V	1.61	3.4	6.36	4.57	38.45	-33.88
		836.60	H	13.2	3.4	6.37	16.17	38.45	-22.28
	251	848.80	V	2.05	3.4	6.4	5.05	38.45	-33.40
		848.80	H	12.03	3.4	6.4	15.03	38.45	-23.42
Y	128	824.20	V	2.09	3.39	6.24	4.94	38.45	-33.51
		824.20	H	14.64	3.39	6.24	17.49	38.45	-20.96
	190	836.60	V	5	3.4	6.37	3.02	38.45	-35.43
		836.60	H	13.08	3.4	6.36	16.04	38.45	-22.41
	251	848.80	V	1.8	3.4	6.4	4.80	38.45	-33.65
		848.80	H	11.96	3.4	6.4	14.96	38.45	-23.49
Z	128	824.20	V	14.69	3.39	6.24	17.54	38.45	-20.91
		824.20	H	3.61	3.39	6.24	6.46	38.45	-31.99
	190	836.60	V	13.12	3.4	6.36	16.08	38.45	-22.37
		836.60	H	1.97	3.4	6.36	4.93	38.45	-33.52
	251	848.80	V	12.77	3.4	6.4	15.77	38.45	-22.68
		848.80	H	2.5	3.4	6.4	5.50	38.45	-32.95



GPRS 850 TEST DATA (CLASS 12)

EUT Pol.	Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
X	128	824.20	V	1.05	3.39	6.24	3.90	38.45	-34.55
		824.20	H	14.52	3.39	6.24	17.37	38.45	-21.08
	190	836.60	V	0.53	3.4	6.37	3.50	38.45	-34.95
		836.60	H	13.04	3.4	6.37	16.01	38.45	-22.44
	251	848.80	V	1.78	3.4	6.4	4.78	38.45	-33.67
		848.80	H	12.03	3.4	6.4	15.03	38.45	-23.42
Y	128	824.20	V	2.13	3.39	6.24	4.98	38.45	-33.47
		824.20	H	14.57	3.39	6.24	*17.42	38.45	-21.03
	190	836.60	V	10	3.4	6.37	3.07	38.45	-35.38
		836.60	H	13.07	3.4	6.36	16.03	38.45	-22.42
	251	848.80	V	1.75	3.4	6.4	4.75	38.45	-33.70
		848.80	H	11.92	3.4	6.4	14.92	38.45	-23.53
Z	128	824.20	V	14.45	3.39	6.24	17.30	38.45	-21.15
		824.20	H	2.08	3.39	6.24	4.93	38.45	-33.52
	190	836.60	V	13.13	3.4	6.36	16.09	38.45	-22.36
		836.60	H	1.95	3.4	6.37	4.92	38.45	-33.53
	251	848.80	V	12.8	3.4	6.4	15.80	38.45	-22.65
		848.80	H	2.35	3.4	6.4	5.35	38.45	-33.10



GSM 1900 TEST DATA

EUT Pol.	Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
X	512	1850.20	V	10.92	5.37	5.67	11.22	33.00	-21.78
		1850.20	H	17.49	5.37	5.67	17.79	33.00	-15.21
	661	1880.00	V	13.31	5.42	5.62	13.51	33.00	-19.49
		1880.00	H	19.96	5.42	5.62	20.16	33.00	-12.84
	810	1909.80	V	14.25	5.48	5.56	14.33	33.00	-18.67
		1909.80	H	21.16	5.48	5.56	21.24	33.00	-11.76
Y	512	1850.20	V	17.25	5.37	5.67	17.55	33.00	-15.45
		1850.20	H	15.55	5.37	5.67	15.85	33.00	-17.15
	661	1880.00	V	20.13	5.42	5.62	20.33	33.00	-12.67
		1880.00	H	14.88	5.42	5.62	15.08	33.00	-17.92
	810	1909.80	V	17.09	5.48	5.56	17.17	33.00	-15.83
		1909.80	H	21.18	5.48	5.56	*21.26	33.00	-11.74
Z	512	1850.20	V	9.36	5.37	5.67	9.66	33.00	-23.34
		1850.20	H	12.11	5.37	5.67	12.41	33.00	-20.59
	661	1880.00	V	11.64	5.42	5.62	11.84	33.00	-21.16
		1880.00	H	15.17	5.42	5.62	15.37	33.00	-17.63
	810	1909.80	V	13.59	5.48	5.56	13.67	33.00	-19.33
		1909.80	H	17.01	5.48	5.56	17.09	33.00	-15.91



GPRS 1900 TEST DATA (CLASS 12)

EUT Pol.	Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
X	512	1850.20	V	11.42	5.37	5.67	11.72	33.00	-21.28
		1850.20	H	17.52	5.37	5.67	17.82	33.00	-15.18
	661	1880.00	V	13.33	5.42	5.62	13.53	33.00	-19.47
		1880.00	H	19.92	5.42	5.62	20.12	33.00	-12.88
	810	1909.80	V	14.25	5.48	5.56	14.33	33.00	-18.67
		1909.80	H	21.18	5.48	5.56	*21.26	33.00	-11.74
Y	512	1850.20	V	14.87	5.37	5.67	15.17	33.00	-17.83
		1850.20	H	17.76	5.37	5.67	18.06	33.00	-14.94
	661	1880.00	V	20.12	5.42	5.62	20.32	33.00	-12.68
		1880.00	H	16.74	5.42	5.62	16.94	33.00	-16.06
	810	1909.80	V	21.17	5.48	5.56	21.25	33.00	-11.75
		1909.80	H	17.07	5.48	5.56	17.15	33.00	-15.85
Z	512	1850.20	V	9.83	5.37	5.67	10.13	33.00	-22.87
		1850.20	H	12.42	5.37	5.67	12.72	33.00	-20.28
	661	1880.00	V	11.91	5.42	5.62	12.11	33.00	-20.89
		1880.00	H	15.29	5.42	5.62	15.49	33.00	-17.51
	810	1909.80	V	13.7	5.48	5.56	13.78	33.00	-19.22
		1909.80	H	12.43	5.37	5.67	12.73	33.00	-20.27



7.5 OUT OF BAND EMISSION AT ANTENNA TERMINALS

LIMIT

According to FCC §2.1051, FCC §22.917, FCC §24.238(a). RSS-132 (4.5.2), RSS-133 (6.6).

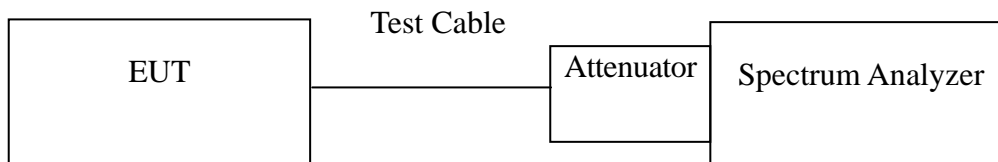
Out of Band Emissions: The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least $43 + 10 \log P$ dB.

Mobile Emissions in Base Frequency Range: The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not exceed -80 dBm at the transmit antenna connector.

Band Edge Requirements: In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the Out of band Emission

Test Configuration

Out of band emission at antenna terminals:



TEST PROCEDURE

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements (824 MHz and 849 MHz /1850MHz and 1910MHz): In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

TEST RESULTS

No non-compliance noted.

**Test Data**

Mode	CH	Location	Description
GSM 850 (Class 12)	128	Figure 7-1	Conducted spurious emissions, 30MHz - 20GHz
	190	Figure 7-2	Conducted spurious emissions, 30MHz - 20GHz
	251	Figure 7-3	Conducted spurious emissions, 30MHz - 20GHz
GPRS 850 (Class 12)	128	Figure 7-4	Conducted spurious emissions, 30MHz - 20GHz
	190	Figure 7-5	Conducted spurious emissions, 30MHz - 20GHz
	251	Figure 7-6	Conducted spurious emissions, 30MHz - 20GHz

Mode	CH	Location	Description
GSM 1900 (Class 12)	512	Figure 8-1	Conducted spurious emissions, 30MHz - 20GHz
	661	Figure 8-2	Conducted spurious emissions, 30MHz - 20GHz
	810	Figure 8-3	Conducted spurious emissions, 30MHz - 20GHz
GPRS 1900 (Class 12)	512	Figure 8-4	Conducted spurious emissions, 30MHz - 20GHz
	661	Figure 8-5	Conducted spurious emissions, 30MHz - 20GHz
	810	Figure 8-6	Conducted spurious emissions, 30MHz - 20GHz

Mode	CH	Location	Description
GSM 850 (Class 12)	128	Figure 9-1	Band Edge emissions
	251	Figure 9-2	Band Edge emissions
GPRS 850 (Class 12)	128	Figure 9-3	Band Edge emissions
	251	Figure 9-4	Band Edge emissions

Mode	CH	Location	Description
GSM 1900 (Class 12)	512	Figure 10-1	Band Edge emissions
	810	Figure 10-2	Band Edge emissions
GPRS 1900 (Class 12)	512	Figure 10-3	Band Edge emissions
	810	Figure 10-4	Band Edge emissions



Test Plot

GSM 850

Figure 7-1: Out of Band emission at antenna terminals – GSM CH Low

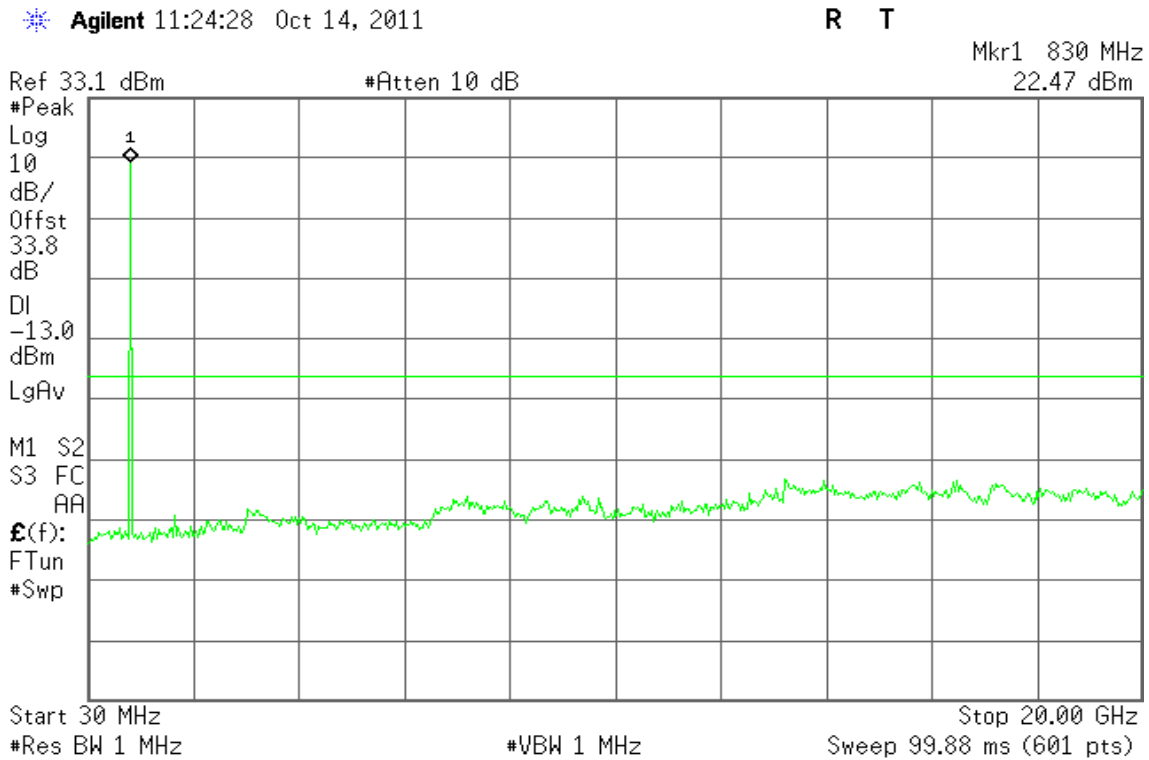


Figure 7-2: Out of Band emission at antenna terminals – GSM CH Mid

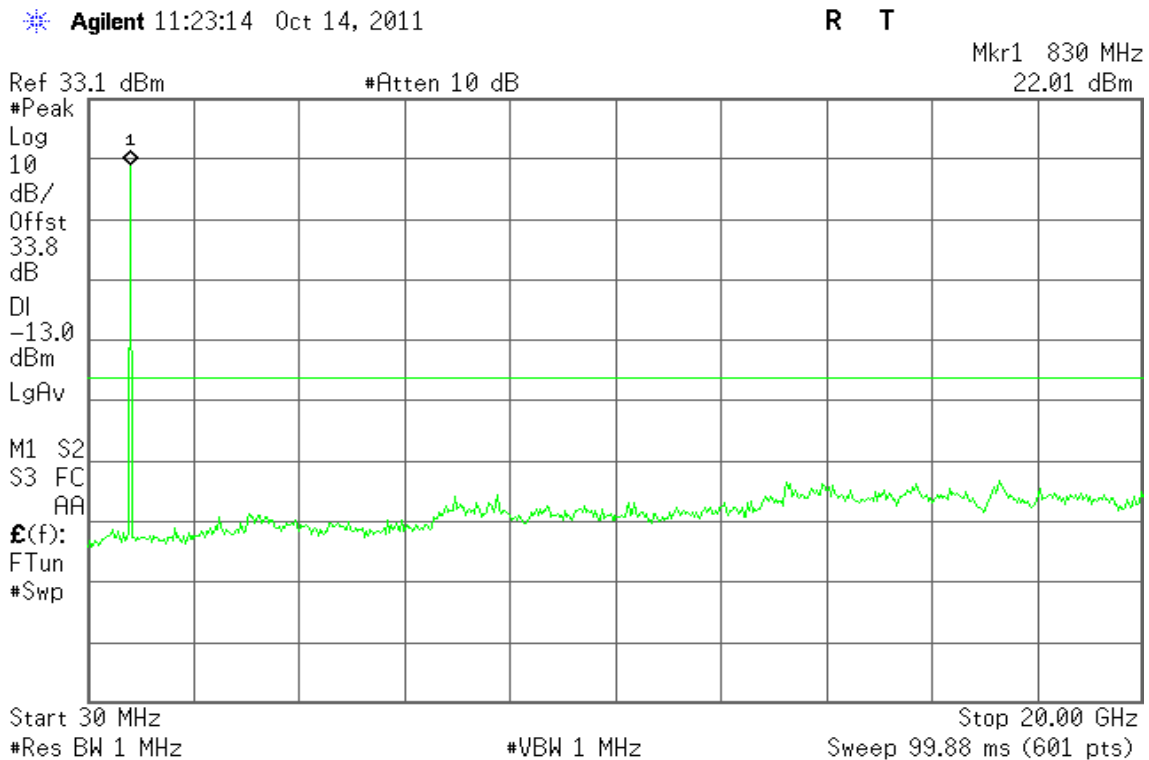
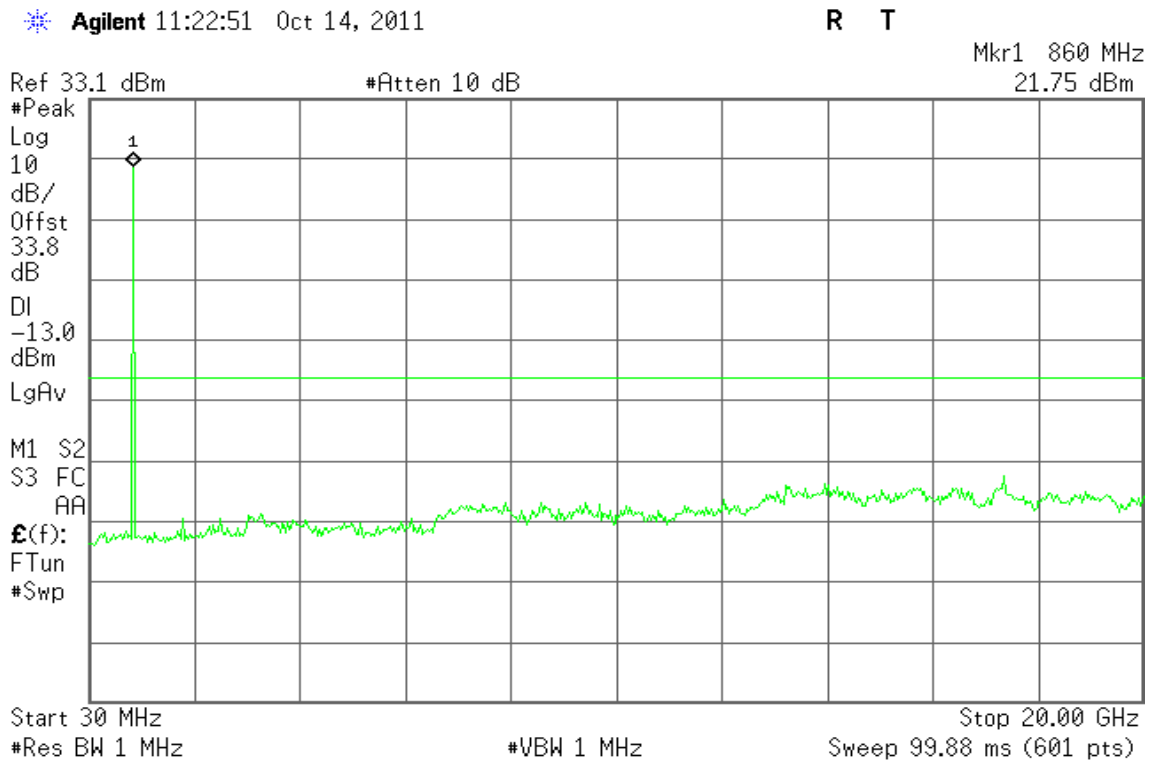




Figure 7-3: Out of Band emission at antenna terminals – GSM CH High



GPRS 850

Figure 7-4: Out of Band emission at antenna terminals – GPRS CH Low

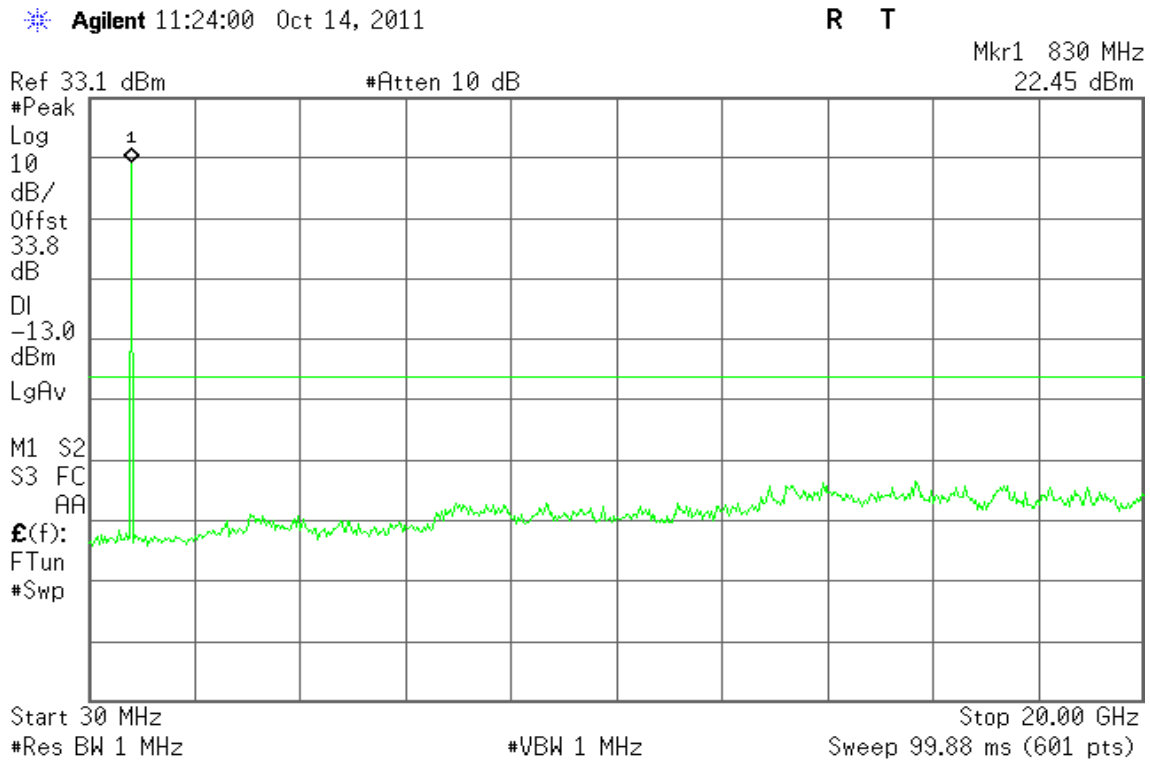




Figure 7-5: Out of Band emission at antenna terminals – GPRS CH Mid

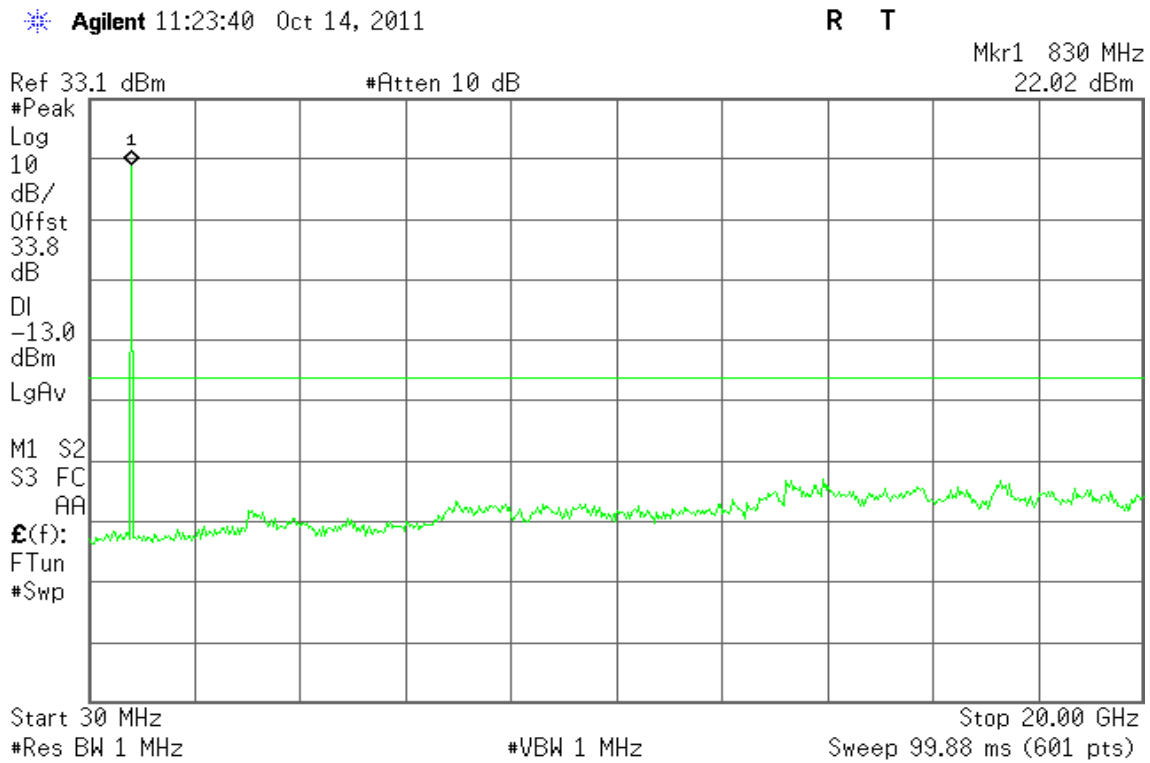
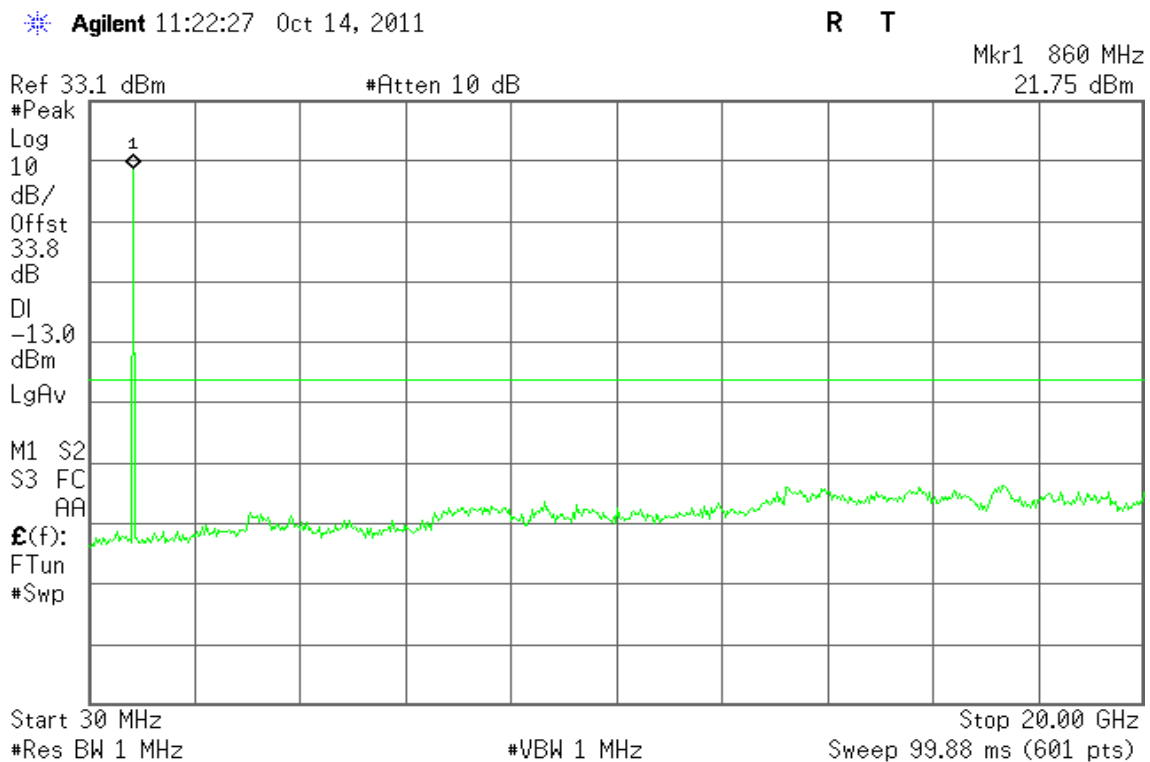


Figure 7-6: Out of Band emission at antenna terminals – GPRS CH High





GSM 1900

Figure 8-1: Out of Band emission at antenna terminals – GSM CH Low

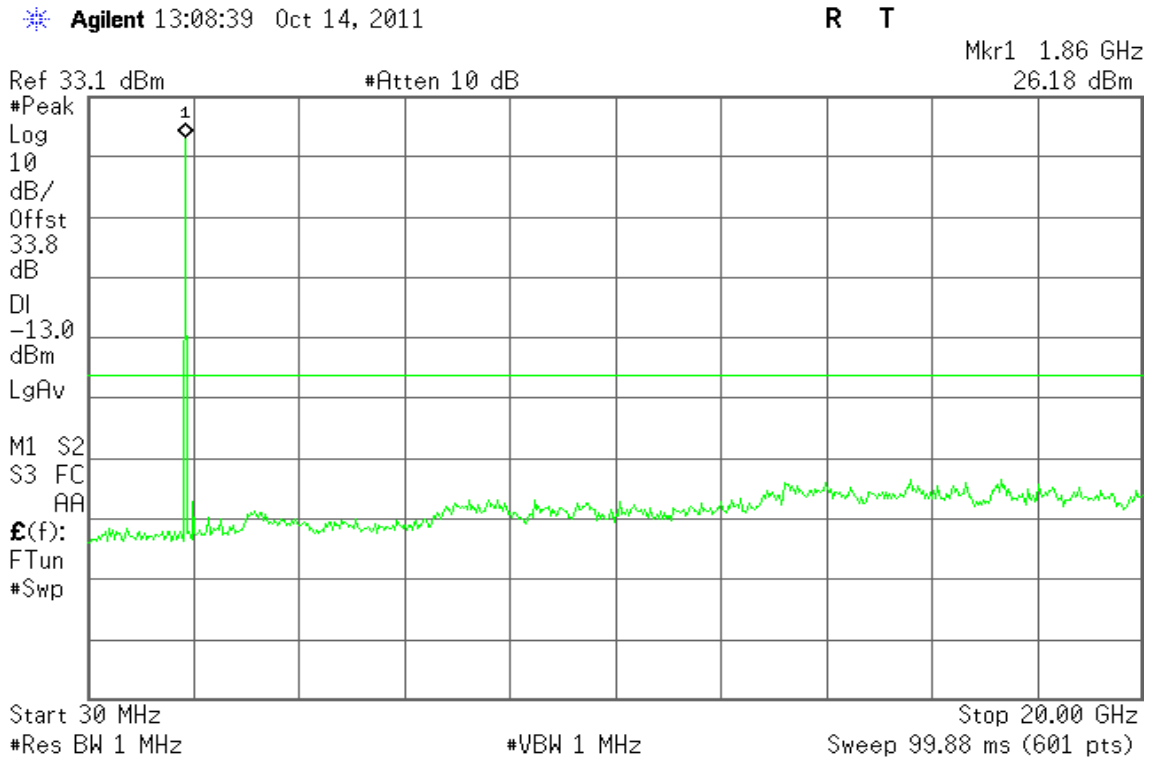


Figure 8-2: Out of Band emission at antenna terminals – GSM CH Mid

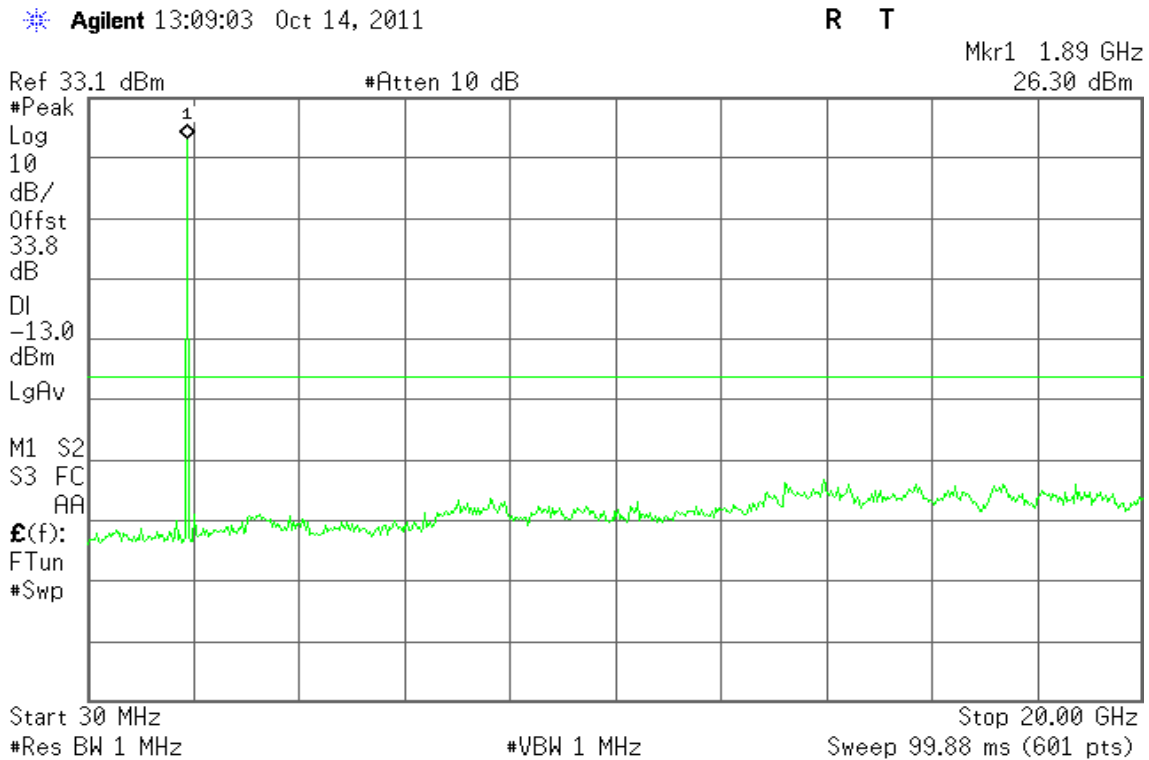
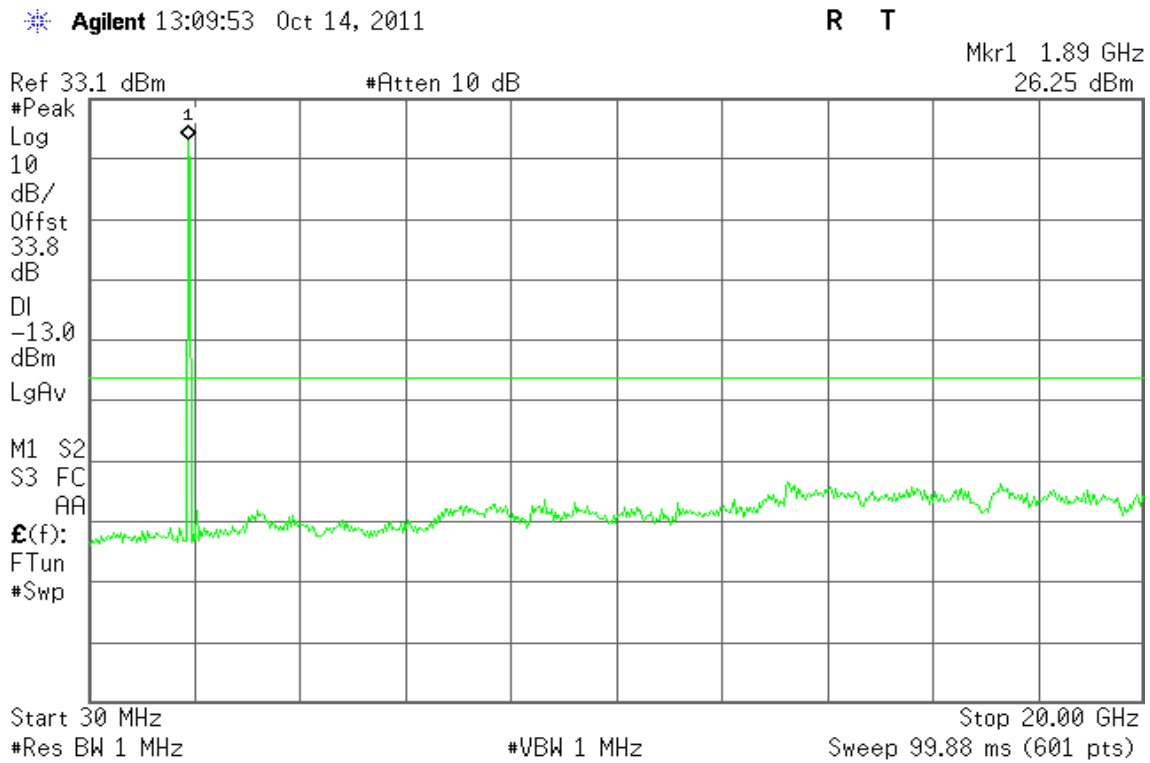




Figure 8-3: Out of Band emission at antenna terminals – GSM CH High



GPRS 1900

Figure 8-4: Out of Band emission at antenna terminals – GPRS CH Low

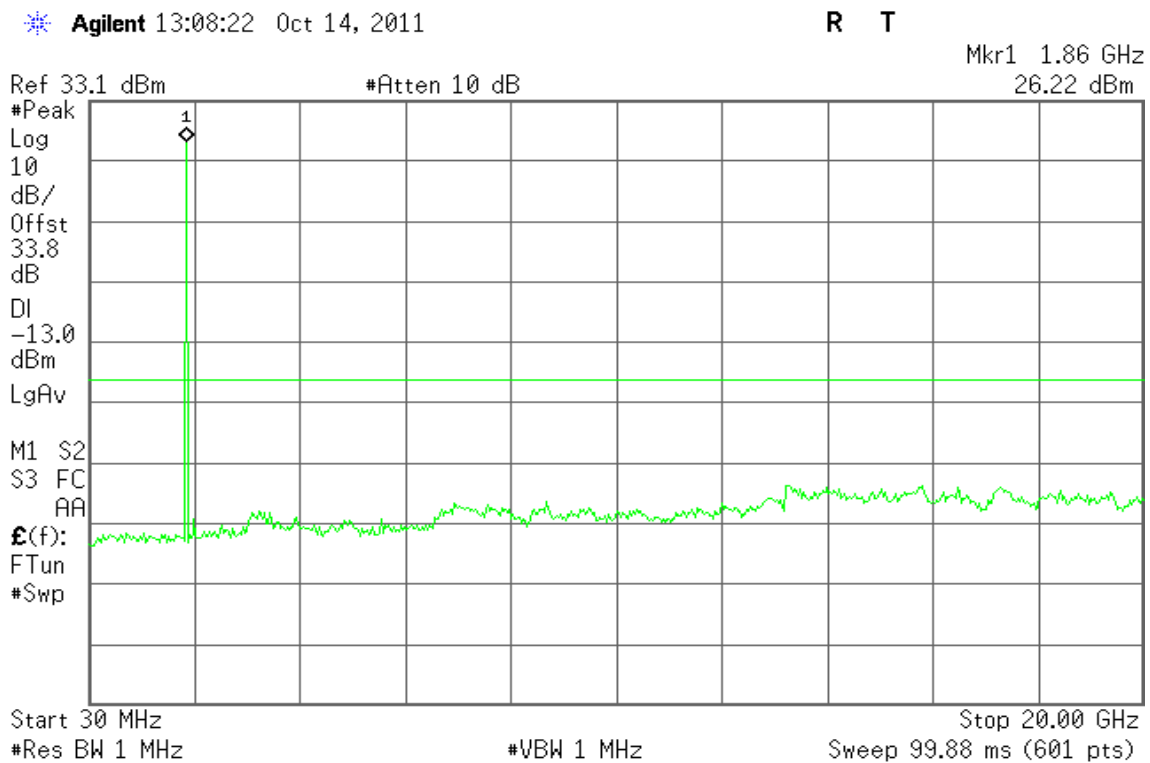




Figure 8-5: Out of Band emission at antenna terminals – GPRS CH Mid

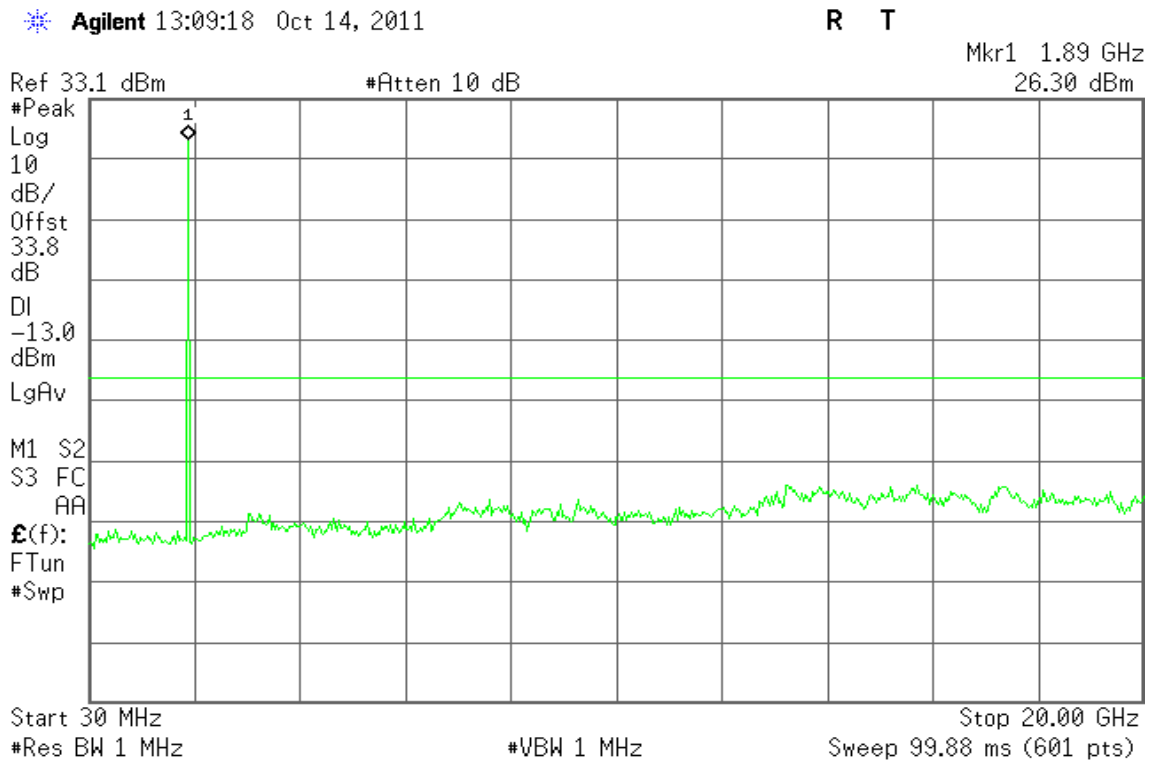
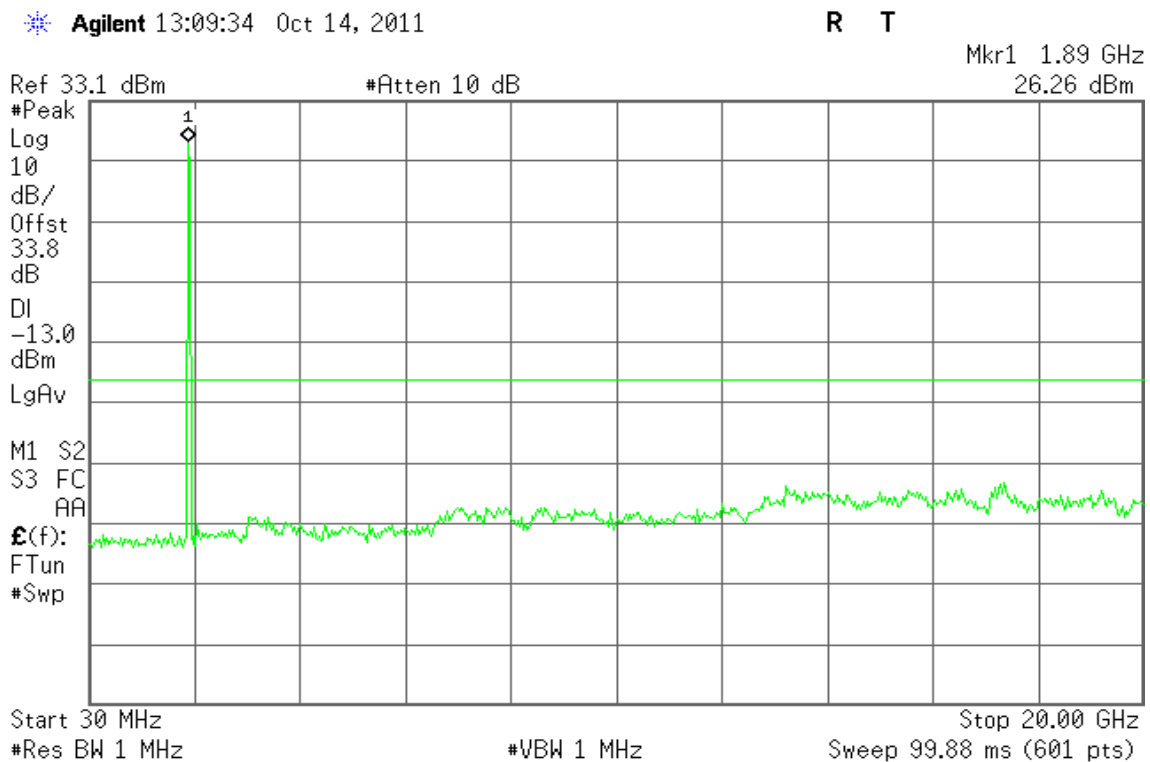


Figure 8-6: Out of Band emission at antenna terminals – GPRS CH High





GSM 850

Figure 9-1: Band Edge emissions – GSM CH Low

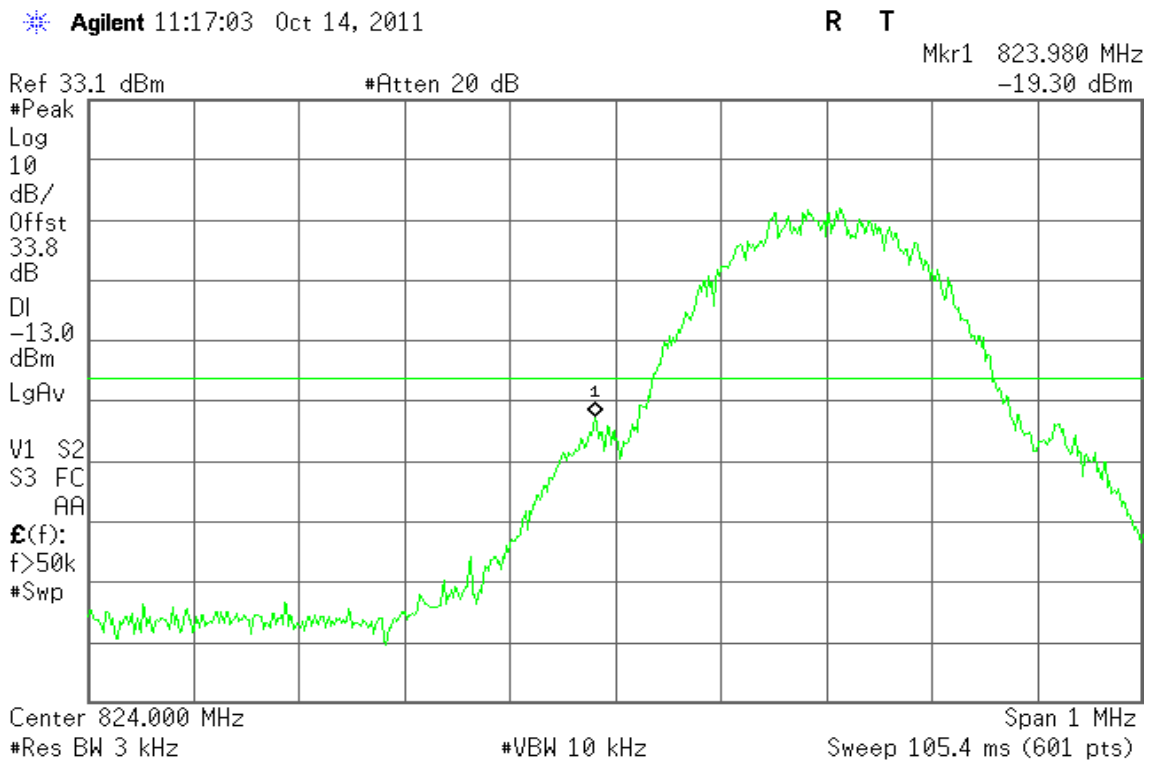
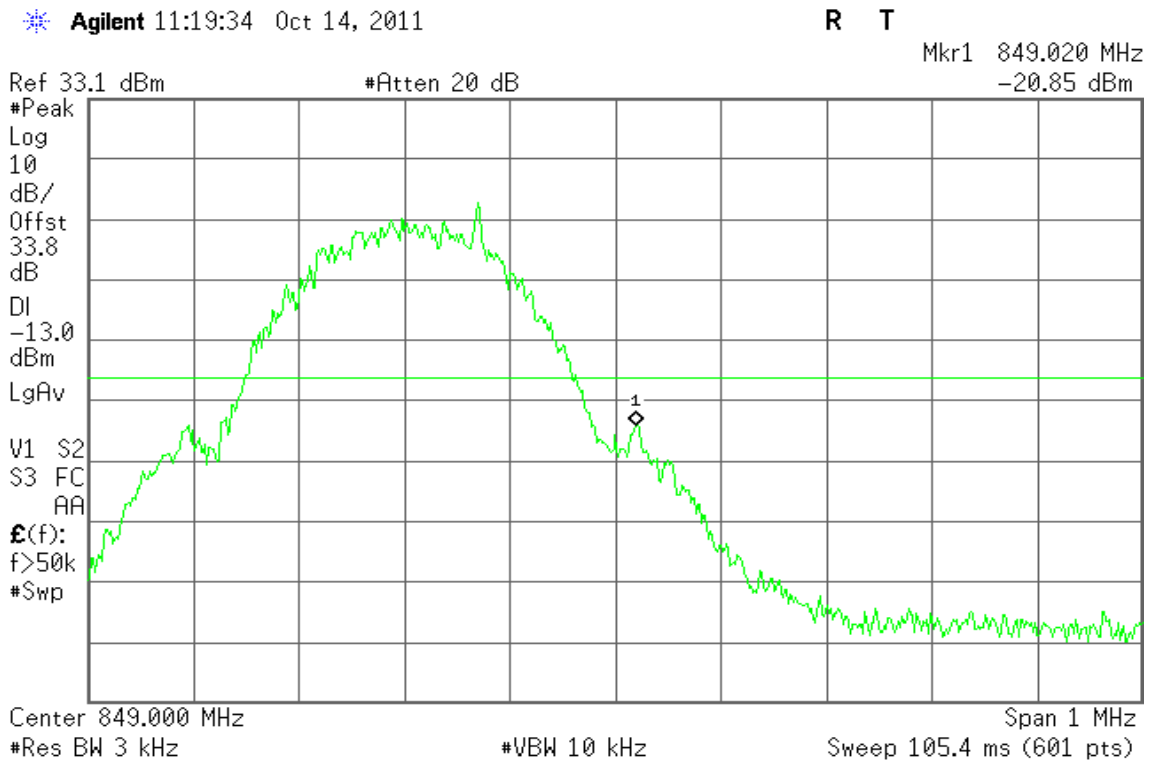


Figure 9-2: Band Edge emissions – GSM CH High





GPRS 850

Figure 9-3: Band Edge emissions – GPRS CH Low

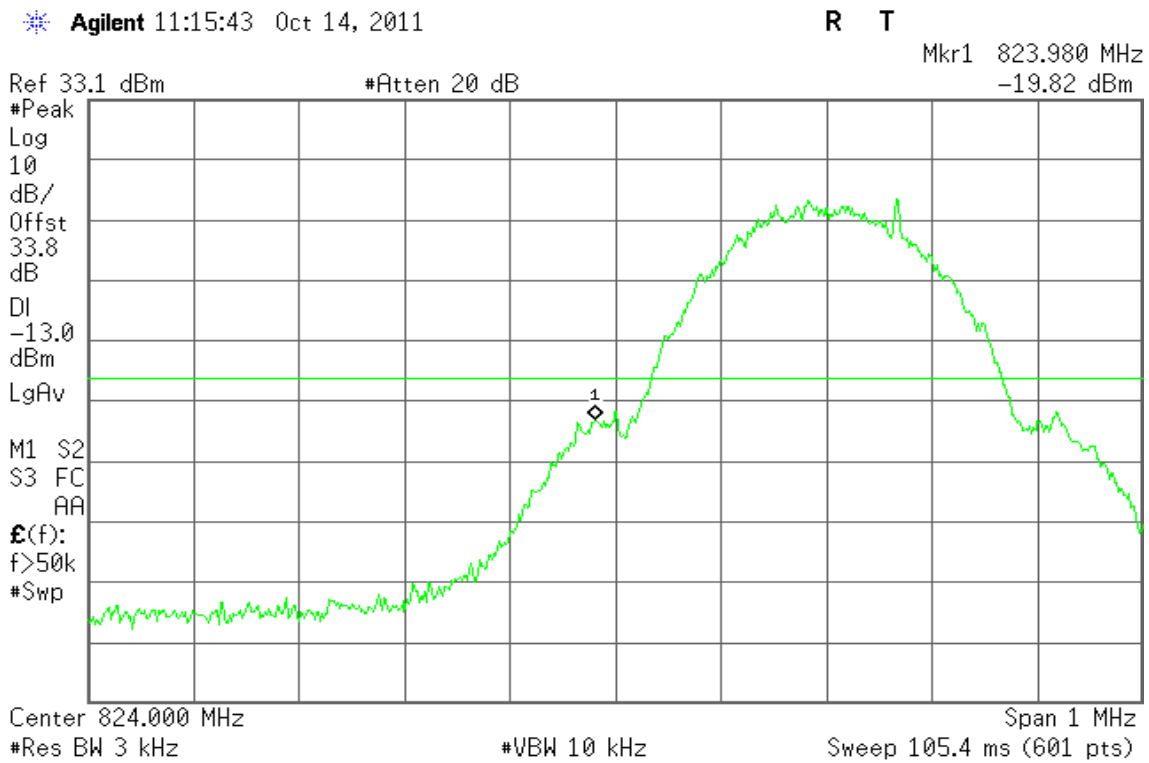
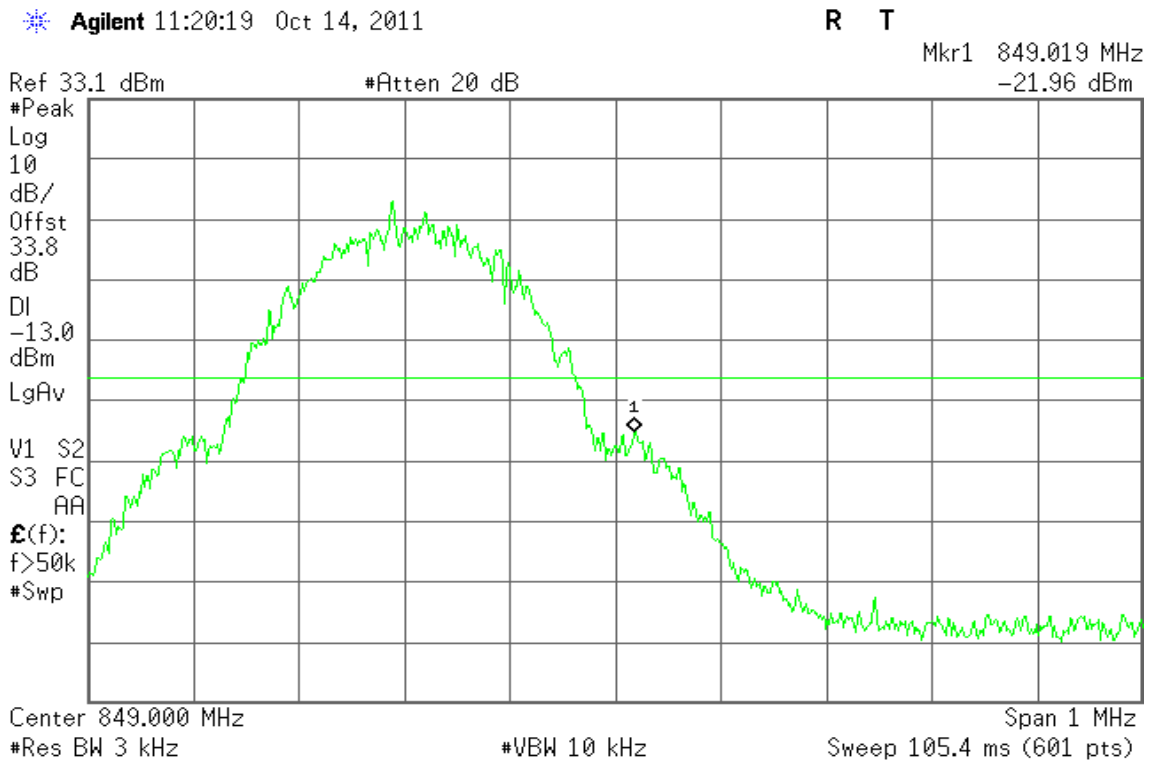


Figure 9-4: Band Edge emissions –GPRS CH High





GSM 1900

Figure 10-1: Band Edge emissions – GSM CH Low

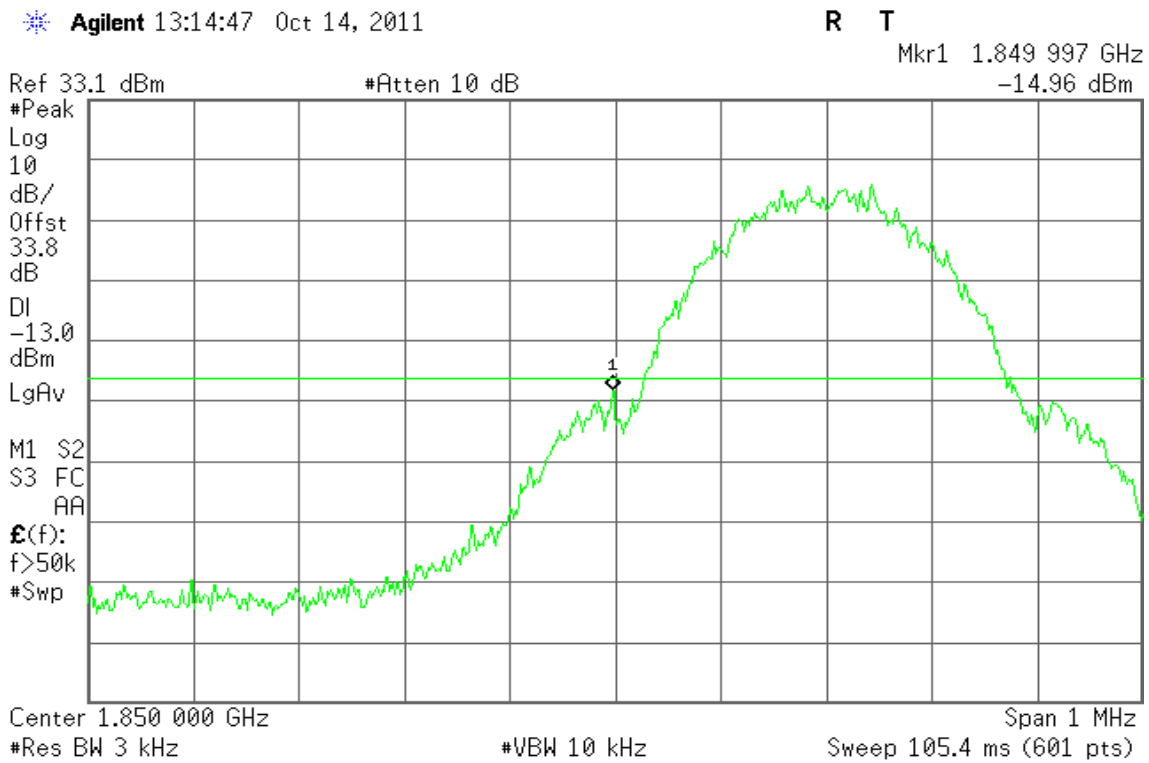
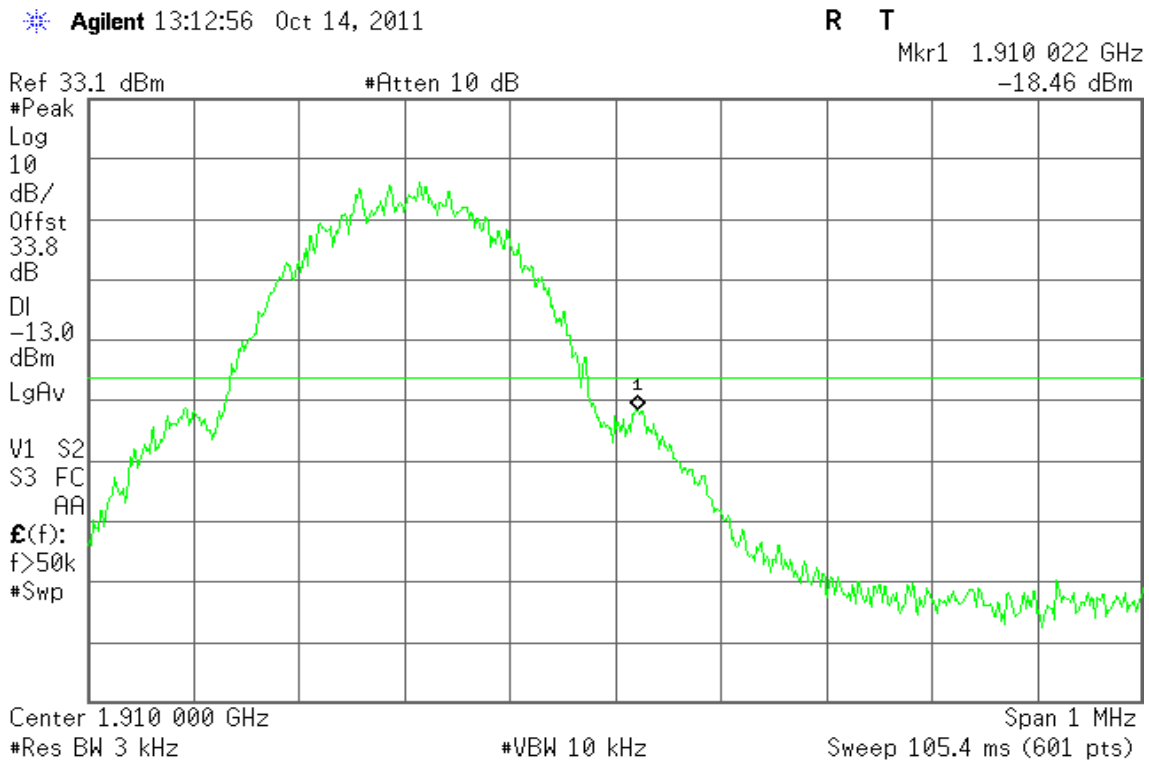


Figure 10-2: Band Edge emissions – GSM CH High





GPRS 1900

Figure 10-3: Band Edge emissions – GPRS CH Low

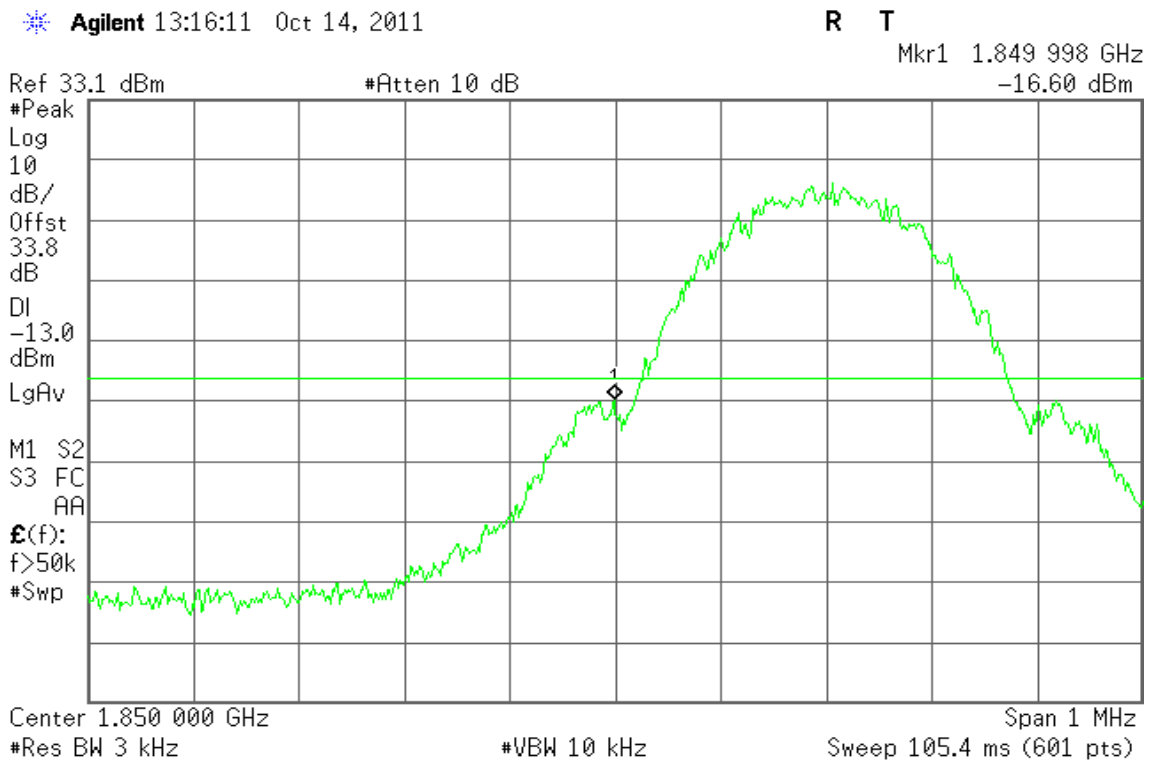
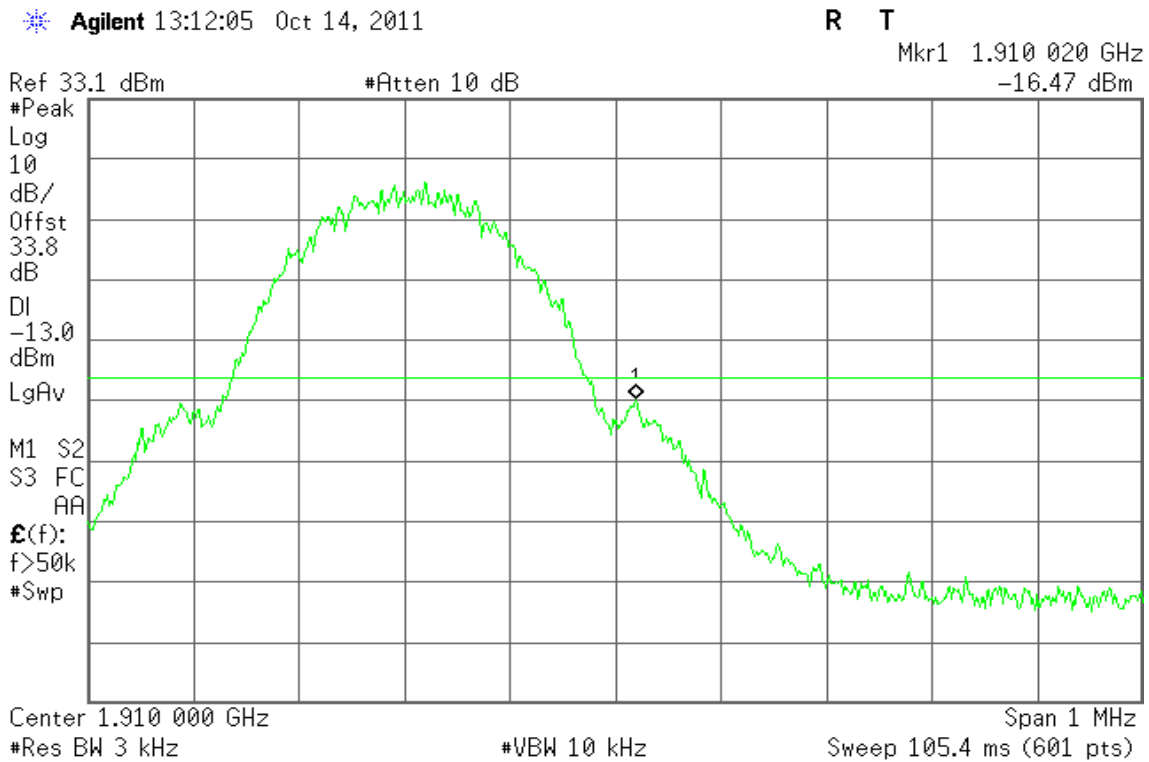


Figure 10-4: Band Edge emissions – GPRS CH High





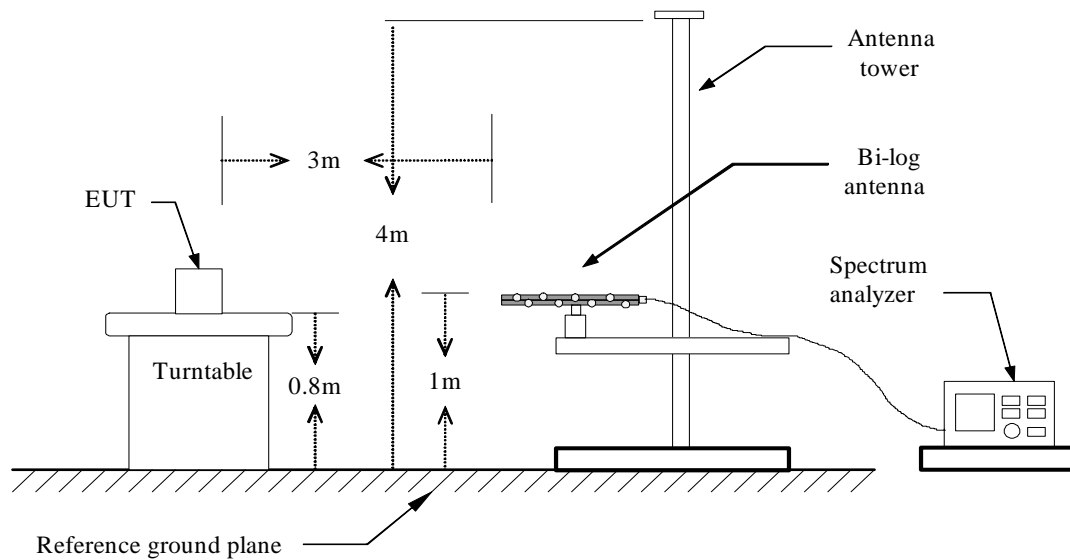
7.6 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

LIMIT

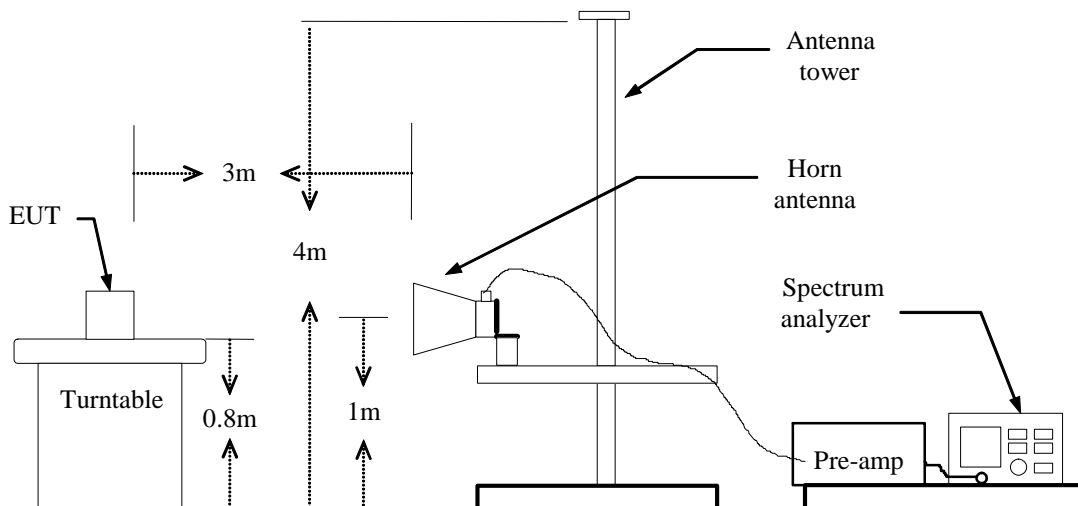
According to FCC §2.1053, RSS-132 (4.6) & RSS-133 (6.5).

Test Configuration

Below 1 GHz

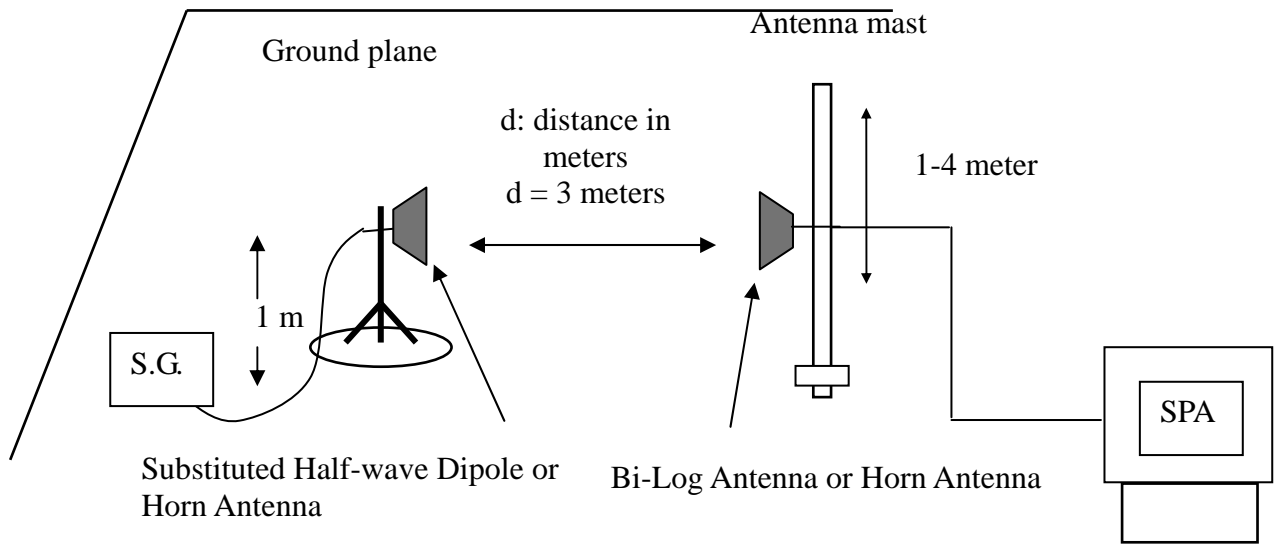


Above 1 GHz





Substituted Method Test Set-up



TEST PROCEDURE

The EUT was placed on a non-conductive, the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

TEST RESULTS

Refer to the attached tabular data sheets.

**Radiated Spurious Emission Measurement Result / Below 1GHz****Operation Mode:** GSM 850 / TX / CH 128**Test Date:** October 13, 2011**Temperature:** 26°C**Tested by:** Edward Lin**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
59.1000	-74.27	0.87	-2.23	-77.37	-13.00	-64.37	V
85.7750	-75.51	1.08	0.56	-76.03	-13.00	-63.03	V
158.5250	-82.22	1.48	1.33	-82.37	-13.00	-69.37	V
415.5750	-85.14	2.45	5.85	-81.74	-13.00	-68.74	V
544.1000	-83.8	2.79	6.23	-80.36	-13.00	-67.36	V
772.0500	-81.06	3.28	6.32	-78.02	-13.00	-65.02	V
59.1000	-67.54	0.87	-2.23	-70.64	-13.00	-57.64	H
85.7750	-67.26	1.08	0.56	-67.78	-13.00	-54.78	H
194.9000	-68.08	1.63	3.47	-66.24	-13.00	-53.24	H
284.6250	-73.83	2.01	5.35	-70.49	-13.00	-57.49	H
454.3750	-77.81	2.59	5.79	-74.61	-13.00	-61.61	H
660.5000	-73.13	3.06	6.3	-69.89	-13.00	-56.89	H

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser; with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 850 / TX / CH 190

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
54.2500	-70.52	0.83	-3.66	-75.01	-13.00	-62.01	V
85.7750	-75.77	1.08	0.56	-76.29	-13.00	-63.29	V
158.5250	-82.4	1.48	1.33	-82.55	-13.00	-69.55	V
248.2500	-86.75	1.83	5.61	-82.97	-13.00	-69.97	V
274.9250	-85.15	1.99	5.2	-81.94	-13.00	-68.94	V
645.9500	-82.87	3.02	6.21	-79.68	-13.00	-66.68	V
59.1000	-68.71	0.87	-2.23	-71.81	-13.00	-58.81	H
85.7750	-69.19	1.08	0.56	-69.71	-13.00	-56.71	H
129.4250	-70.59	1.34	-1.47	-73.40	-13.00	-60.40	H
240.9750	-81.48	1.81	5.34	-77.95	-13.00	-64.95	H
454.3750	-78.69	2.59	5.79	-75.49	-13.00	-62.49	H
670.2000	-77.08	3.07	6.3	-73.85	-13.00	-60.85	H

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 850 / TX / CH 251

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
59.1000	-75.77	0.87	-2.23	-78.87	-13.00	-65.87	V
85.7750	-75.85	1.08	0.56	-76.37	-13.00	-63.37	V
148.8250	-81.93	1.42	0.58	-82.77	-13.00	-69.77	V
221.5750	-87.45	1.77	5.34	-83.88	-13.00	-70.88	V
304.0250	-87.02	2.11	5.68	-83.45	-13.00	-70.45	V
573.2000	-83.6	2.88	6.08	-80.40	-13.00	-67.40	V
59.1000	-68.45	0.87	-2.23	-71.55	-13.00	-58.55	H
85.7750	-69.97	1.08	0.56	-70.49	-13.00	-57.49	H
129.4250	-71.56	1.34	-1.47	-74.37	-13.00	-61.37	H
219.1500	-82.44	1.76	5.32	-78.88	-13.00	-65.88	H
454.3750	-79.81	2.59	5.79	-76.61	-13.00	-63.61	H
510.1500	-80.41	2.69	6	-77.10	-13.00	-64.10	H

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GPRS 850 / TX / CH 128

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
59.1000	-77.35	0.87	-2.23	-80.45	-13.00	-67.45	V
85.7750	-76.82	1.08	0.56	-77.34	-13.00	-64.34	V
180.3500	-76.21	1.61	3.62	-74.20	-13.00	-61.20	V
483.4750	-85.22	2.65	5.59	-82.28	-13.00	-69.28	V
573.2000	-83.94	2.88	6.08	-80.74	-13.00	-67.74	V
633.8250	-83.84	2.99	6.18	-80.65	-13.00	-67.65	V
59.1000	-69.49	0.87	-2.23	-72.59	-13.00	-59.59	H
85.7750	-70.42	1.08	0.56	-70.94	-13.00	-57.94	H
129.4250	-71.49	1.34	-1.47	-74.30	-13.00	-61.30	H
190.0500	-73.09	1.62	4	-70.71	-13.00	-57.71	H
369.5000	-82.76	2.3	5.8	-79.26	-13.00	-66.26	H
660.5000	-77.73	3.06	6.3	-74.49	-13.00	-61.49	H

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Operation Mode:** GPRS 850 / TX / CH 190**Test Date:** October 13, 2011**Temperature:** 26°C**Tested by:** Edward Lin**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
59.1000	-77.17	0.87	-2.23	-80.27	-13.00	-67.27	V
85.7750	-76.09	1.08	0.56	-76.61	-13.00	-63.61	V
153.6750	-80.45	1.45	0.98	-80.92	-13.00	-67.92	V
301.6000	-86.25	2.1	5.63	-82.72	-13.00	-69.72	V
425.2750	-85.98	2.47	5.8	-82.65	-13.00	-69.65	V
573.2000	-84.01	2.88	6.08	-80.81	-13.00	-67.81	V
59.1000	-70.29	0.87	-2.23	-73.39	-13.00	-60.39	H
85.7750	-69.88	1.08	0.56	-70.40	-13.00	-57.40	H
129.4250	-70.96	1.34	-1.47	-73.77	-13.00	-60.77	H
255.5250	-77.22	1.87	5.64	-73.45	-13.00	-60.45	H
328.2750	-78.43	2.17	5.71	-74.89	-13.00	-61.89	H
454.3750	-80.7	2.59	5.79	-77.50	-13.00	-64.50	H

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 251**Test Date:** October 13, 2011**Temperature:** 26°C**Tested by:** Edward Lin**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
85.7750	-75.68	1.08	0.56	-76.20	-13.00	-63.20	V
153.6750	-72.31	1.45	0.98	-72.78	-13.00	-59.78	V
262.8000	-87.76	1.93	5.46	-84.23	-13.00	-71.23	V
403.4500	-85.89	2.41	5.96	-82.34	-13.00	-69.34	V
556.2250	-84.96	2.83	6.09	-81.70	-13.00	-68.70	V
679.9000	-83.21	3.09	6.5	-79.80	-13.00	-66.80	V
59.1000	-70.1	0.87	-2.23	-73.20	-13.00	-60.20	H
85.7750	-69.11	1.08	0.56	-69.63	-13.00	-56.63	H
163.3750	-66.85	1.51	1.77	-66.59	-13.00	-53.59	H
197.3250	-73.85	1.63	3.21	-72.27	-13.00	-59.27	H
265.2250	-74.53	1.95	5.34	-71.14	-13.00	-58.14	H
313.7250	-79.54	2.15	5.75	-75.94	-13.00	-62.94	H

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 1900 / TX / CH 512

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
85.7750	-77.6	1.08	0.56	-78.12	-13.00	-65.12	V
173.0750	-79.56	1.58	2.85	-78.29	-13.00	-65.29	V
267.6500	-81.18	1.96	5.22	-77.92	-13.00	-64.92	V
456.8000	-85.79	2.6	5.84	-82.55	-13.00	-69.55	V
645.9500	-83.15	3.02	6.21	-79.96	-13.00	-66.96	V
769.6250	-81.62	3.27	6.39	-78.50	-13.00	-65.50	V
59.1000	-72.31	0.87	-2.23	-75.41	-13.00	-62.41	H
85.7750	-72.64	1.08	0.56	-73.16	-13.00	-60.16	H
129.4250	-71.42	1.34	-1.47	-74.23	-13.00	-61.23	H
197.3250	-74.59	1.63	3.21	-73.01	-13.00	-60.01	H
260.3750	-80.31	1.91	5.58	-76.64	-13.00	-63.64	H
401.0250	-78.76	2.4	5.98	-75.18	-13.00	-62.18	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 1900 / TX / CH 661

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
85.7750	-76.43	1.08	0.56	-76.95	-13.00	-63.95	V
156.1000	-73.38	1.46	1.15	-73.69	-13.00	-60.69	V
199.7500	-77.28	1.63	2.94	-75.97	-13.00	-62.97	V
267.6500	-85.2	1.96	5.22	-81.94	-13.00	-68.94	V
488.3250	-85.29	2.66	5.73	-82.22	-13.00	-69.22	V
607.1500	-83.11	2.93	6.33	-79.71	-13.00	-66.71	V
59.1000	-72.25	0.87	-2.23	-75.35	-13.00	-62.35	H
85.7750	-72.18	1.08	0.56	-72.70	-13.00	-59.70	H
129.4250	-71.07	1.34	-1.47	-73.88	-13.00	-60.88	H
245.8250	-80.07	1.82	5.52	-76.37	-13.00	-63.37	H
410.7250	-81.29	2.45	5.9	-77.84	-13.00	-64.84	H
670.2000	-78.43	3.07	6.3	-75.20	-13.00	-62.20	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 1900 / TX / CH 810

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
85.7750	-78.03	1.08	0.56	-78.55	-13.00	-65.55	V
122.1500	-78.28	1.29	-1.93	-81.50	-13.00	-68.50	V
192.4750	-84.49	1.62	3.74	-82.37	-13.00	-69.37	V
270.0750	-79.8	1.98	5.1	-76.68	-13.00	-63.68	V
553.8000	-84.69	2.82	6.13	-81.38	-13.00	-68.38	V
658.0750	-83.4	3.05	6.3	-80.15	-13.00	-67.15	V
44.5500	-66.57	0.76	-8.84	-76.17	-13.00	-63.17	H
85.7750	-73.22	1.08	0.56	-73.74	-13.00	-60.74	H
151.2500	-74.17	1.43	0.8	-74.80	-13.00	-61.80	H
202.1750	-66.38	1.64	3.57	-64.45	-13.00	-51.45	H
340.4000	-79.98	2.17	5.8	-76.35	-13.00	-63.35	H
769.6250	-77.83	3.27	6.39	-74.71	-13.00	-61.71	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GPRS 1900 / TX / CH 512

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
66.3750	-78.76	0.93	-1.91	-81.60	-13.00	-68.60	V
143.9750	-75.23	1.41	0.13	-76.51	-13.00	-63.51	V
185.2000	-78.83	1.61	3.81	-76.63	-13.00	-63.63	V
272.5000	-85.77	1.99	5.15	-82.61	-13.00	-69.61	V
548.9500	-84.39	2.8	6.19	-81.00	-13.00	-68.00	V
978.1750	-78.59	3.68	6.29	-75.98	-13.00	-62.98	V
42.1250	-64.53	0.74	-10.72	-75.99	-13.00	-62.99	H
136.7000	-69.62	1.38	-0.61	-71.61	-13.00	-58.61	H
175.5000	-70.67	1.59	3.1	-69.16	-13.00	-56.16	H
211.8750	-76.95	1.7	5.42	-73.23	-13.00	-60.23	H
405.8750	-79.04	2.42	5.94	-75.52	-13.00	-62.52	H
844.8000	-77.4	3.41	6.4	-74.41	-13.00	-61.41	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GPRS 1900 / TX / CH 661

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
85.7750	-77.62	1.08	0.56	-78.14	-13.00	-65.14	V
190.0500	-83.47	1.62	4	-81.09	-13.00	-68.09	V
379.2000	-87.08	2.31	5.98	-83.41	-13.00	-70.41	V
548.9500	-84.33	2.8	6.19	-80.94	-13.00	-67.94	V
633.8250	-83.55	2.99	6.18	-80.36	-13.00	-67.36	V
762.3500	-81.95	3.23	6.32	-78.86	-13.00	-65.86	V
42.1250	-64.38	0.74	-10.72	-75.84	-13.00	-62.84	H
85.7750	-70.29	1.08	0.56	-70.81	-13.00	-57.81	H
129.4250	-70.99	1.34	-1.47	-73.80	-13.00	-60.80	H
255.5250	-77.68	1.87	5.64	-73.91	-13.00	-60.91	H
301.6000	-80.83	2.1	5.63	-77.30	-13.00	-64.30	H
454.3750	-80.14	2.59	5.79	-76.94	-13.00	-63.94	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GPRS 1900 / TX / CH 810

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
37.2750	-65.81	0.7	-15.05	-81.56	-13.00	-68.56	V
85.7750	-76.68	1.08	0.56	-77.20	-13.00	-64.20	V
160.9500	-82.75	1.49	1.5	-82.74	-13.00	-69.74	V
221.5750	-87.77	1.77	5.34	-84.20	-13.00	-71.20	V
570.7750	-84.49	2.87	6.1	-81.26	-13.00	-68.26	V
728.4000	-82.8	3.18	6.41	-79.57	-13.00	-66.57	V
44.5500	-66.41	0.76	-8.84	-76.01	-13.00	-63.01	H
85.7750	-70.18	1.08	0.56	-70.70	-13.00	-57.70	H
129.4250	-72.25	1.34	-1.47	-75.06	-13.00	-62.06	H
192.4750	-81.21	1.62	3.74	-79.09	-13.00	-66.09	H
471.3500	-76.48	2.62	5.74	-73.36	-13.00	-60.36	H
636.2500	-78.96	3	6.16	-75.80	-13.00	-62.80	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Above 1GHz

Operation Mode: GSM 850 / TX / CH 128

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1647.500	-54.95	5.04	6.03	-53.96	-13.00	-40.96	V
2470.000	-53.94	6.3	6.06	-54.18	-13.00	-41.18	V
N/A							
1647.500	-48.24	5.04	6.03	-47.25	-13.00	-34.25	H
2470.000	-55.26	6.3	6.06	-55.50	-13.00	-42.50	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 850 / TX / CH 190

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1682.500	-53.31	5.09	5.97	-52.43	-13.00	-39.43	V
2522.500	-52.4	6.38	6.16	-52.62	-13.00	-39.62	V
N/A							
1682.500	-49.25	5.09	5.97	-48.37	-13.00	-35.37	H
2522.500	-54.69	6.38	6.16	-54.91	-13.00	-41.91	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GSM 850 / TX / CH 251

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1700.000	-51.53	5.11	5.94	-50.70	-13.00	-37.70	V
2557.500	-50.12	6.43	6.25	-50.30	-13.00	-37.30	V
5952.500	-50.73	10.63	10.89	-50.47	-13.00	-37.47	V
N/A							
1700.000	-48.98	5.11	5.94	-48.15	-13.00	-35.15	H
2557.500	-48.85	6.43	6.25	-49.03	-13.00	-36.03	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GPRS 850 / TX / CH 128

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1647.500	-56.61	5.04	6.03	-55.62	-13.00	-42.62	V
2470.000	-55.47	6.3	6.06	-55.71	-13.00	-42.71	V
4465.000	-54.64	8.82	9.77	-53.69	-13.00	-40.69	V
N/A							
1647.500	-51.25	5.04	6.03	-50.26	-13.00	-37.26	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GPRS 850 / TX / CH 190

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1682.500	-56.75	5.09	5.97	-55.87	-13.00	-42.87	V
2522.500	-56.21	6.38	6.16	-56.43	-13.00	-43.43	V
5865.000	-51.55	10.41	10.87	-51.09	-13.00	-38.09	V
N/A							
1682.500	-52.12	5.09	5.97	-51.24	-13.00	-38.24	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GPRS 850 / TX / CH 251

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1700.000	-54.96	5.11	5.94	-54.13	-13.00	-41.13	V
2557.500	-56.5	6.43	6.25	-56.68	-13.00	-43.68	V
5952.500	-47.56	10.63	10.89	-47.30	-13.00	-34.30	V
N/A							
1700.000	-52.89	5.11	5.94	-52.06	-13.00	-39.06	H
2557.500	-55.65	6.43	6.25	-55.83	-13.00	-42.83	H
5952.500	-51.86	10.63	10.89	-51.60	-13.00	-38.60	H
N/A							

Remark:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: GSM 1900 / TX / CH 512

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3712.500	-47.3	8.21	9.11	-46.40	-13.00	-33.40	V
5550.000	-49.07	10.06	10.81	-48.32	-13.00	-35.32	V
7405.000	-41.52	12.1	12.55	-41.07	-13.00	-28.07	V
N/A							
3712.500	-47.64	8.21	9.11	-46.74	-13.00	-33.74	H
5550.000	-49.39	10.06	10.81	-48.64	-13.00	-35.64	H
7405.000	-44.41	12.1	12.55	-43.96	-13.00	-30.96	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GSM 1900 / TX / CH 661

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3765.000	-50.04	8.24	9.16	-49.12	-13.00	-36.12	V
5637.500	-49.14	10.18	10.83	-48.49	-13.00	-35.49	V
7527.500	-42.58	12.23	12.73	-42.08	-13.00	-29.08	V
N/A							
3765.000	-49.24	8.24	9.16	-48.32	-13.00	-35.32	H
5637.500	-48.61	10.18	10.83	-47.96	-13.00	-34.96	H
7527.500	-44.91	12.23	12.73	-44.41	-13.00	-31.41	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GSM 1900 / TX / CH 810

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3817.500	-48.21	8.28	9.22	-47.27	-13.00	-34.27	V
5742.500	-49.32	10.27	10.85	-48.74	-13.00	-35.74	V
7650.000	-42.83	12.29	12.85	-42.27	-13.00	-29.27	V
N/A							
3817.500	-51.93	8.28	9.22	-50.99	-13.00	-37.99	H
5742.500	-50.97	10.27	10.85	-50.39	-13.00	-37.39	H
7650.000	-45.05	12.29	12.85	-44.49	-13.00	-31.49	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GPRS 1900 / TX / CH 512

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3712.500	-56.22	8.21	9.11	-55.32	-13.00	-42.32	V
5550.000	-51.45	10.06	10.81	-50.70	-13.00	-37.70	V
7405.000	-45.56	12.1	12.55	-45.11	-13.00	-32.11	V
N/A							
3712.500	-53.34	8.21	9.11	-52.44	-13.00	-39.44	H
5550.000	-51.13	10.06	10.81	-50.38	-13.00	-37.38	H
7405.000	-43.42	12.1	12.55	-42.97	-13.00	-29.97	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GPRS 1900 / TX / CH 661

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3765.000	-55.59	8.24	9.16	-54.67	-13.00	-41.67	V
5637.500	-49.58	10.18	10.83	-48.93	-13.00	-35.93	V
7527.500	-44.62	12.23	12.73	-44.12	-13.00	-31.12	V
N/A							
3765.000	-53.74	8.24	9.16	-52.82	-13.00	-39.82	H
5637.500	-49.08	10.18	10.83	-48.43	-13.00	-35.43	H
7527.500	-45.16	12.23	12.73	-44.66	-13.00	-31.66	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: GPRS 1900 / TX / CH 810

Test Date: October 13, 2011

Temperature: 26°C

Tested by: Edward Lin

Humidity: 45 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3817.500	-55.43	8.28	9.22	-54.49	-13.00	-41.49	V
5742.500	-50.55	10.27	10.85	-49.97	-13.00	-36.97	V
7650.000	-43.23	12.29	12.85	-42.67	-13.00	-29.67	V
N/A							
3817.500	-52.34	8.28	9.22	-51.40	-13.00	-38.40	H
5742.500	-50.33	10.27	10.85	-49.75	-13.00	-36.75	H
7650.000	-45.21	12.29	12.85	-44.65	-13.00	-31.65	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



7.7 RADIATED RECEIVER SPURIOUS EMISSIONS

LIMIT

According to RSS-132 (4.6) & RSS-133 (6.7).

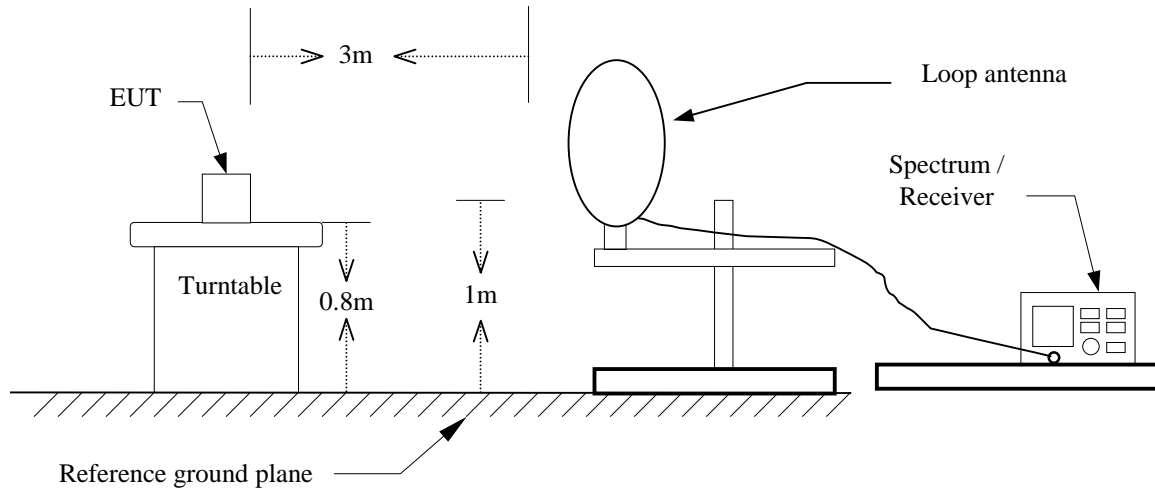
If a radiated measurement is made, all spurious emissions shall comply with the limits of Table below. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emissions measurements below 1.0 GHz, and 1.0 MHz for measurements above 1.0 GHz.

Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

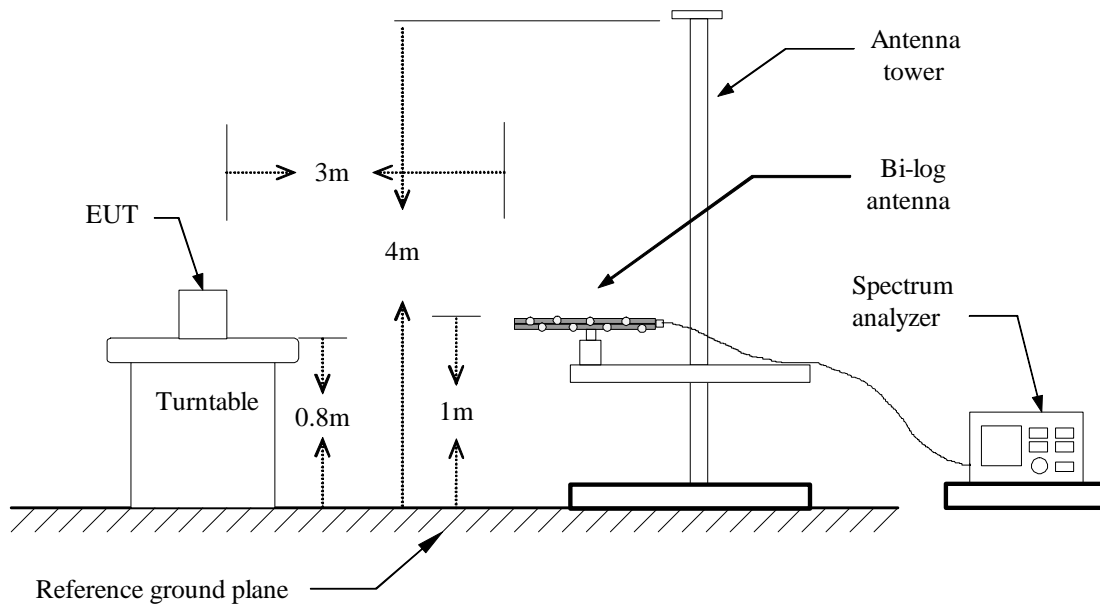


Test Configuration

9kHz ~ 30MHz

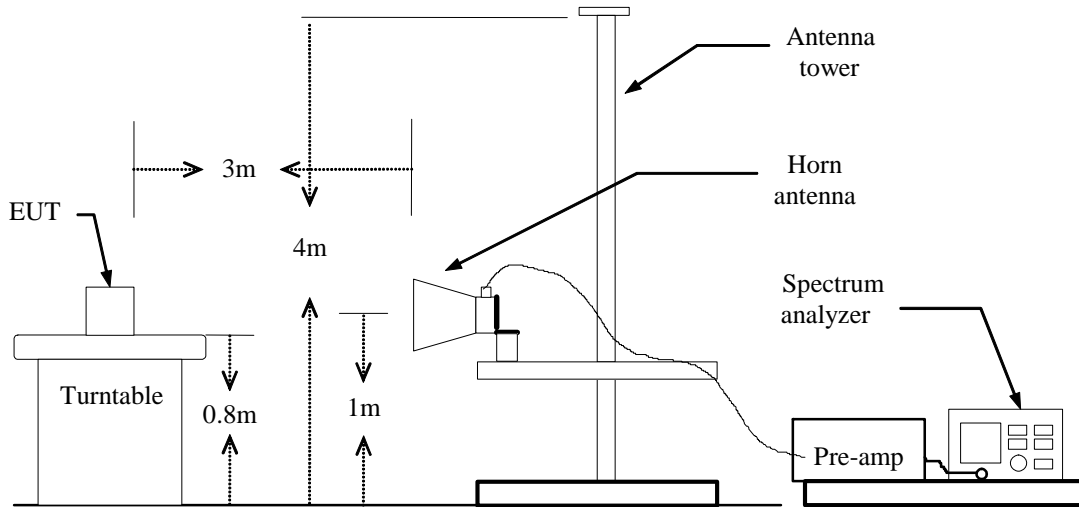


30MHz ~ 1GHz





Above 1 GHz



TEST PROCEDURE

The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

TEST RESULTS

No non-compliance noted.

**Receiver Spurious Emission Measurement Result****Below 1GHz****Operation Mode:** GSM 850 / RX / CH 190**Test Date:** November 5, 2011**Temperature:** 25°C**Tested by:** Sehni Hu**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
131.85	35.25	-11.84	23.41	43.50	-20.09	V
144.78	30.74	-12.28	18.46	43.50	-25.04	V
190.05	31.89	-12.83	19.06	43.50	-24.44	V
219.15	32.02	-13.43	18.58	46.00	-27.42	V
266.03	29.62	-11.73	17.90	46.00	-28.10	V
448.72	31.89	-8.61	23.28	46.00	-22.72	V
30.00	27.60	-4.56	23.04	40.00	-16.96	H
154.48	28.28	-12.59	15.69	43.50	-27.81	H
422.85	28.27	-8.99	19.28	46.00	-26.72	H
529.55	28.78	-7.67	21.11	46.00	-24.89	H
658.88	28.18	-5.70	22.47	46.00	-23.53	H
759.12	27.94	-4.22	23.72	46.00	-22.28	H

Remark:

- 1. The emission behaviour belongs to narrowband spurious emission.*
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Above 1GHz

Operation Mode: GSM 850 / RX / CH 190

Test Date: November 5, 2011

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1953.33	49.57	---	-5.94	43.63	---	74.00	54.00	-10.37	Peak	V
N/A										
2456.67	50.98	---	-4.05	46.93	---	74.00	54.00	-7.07	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



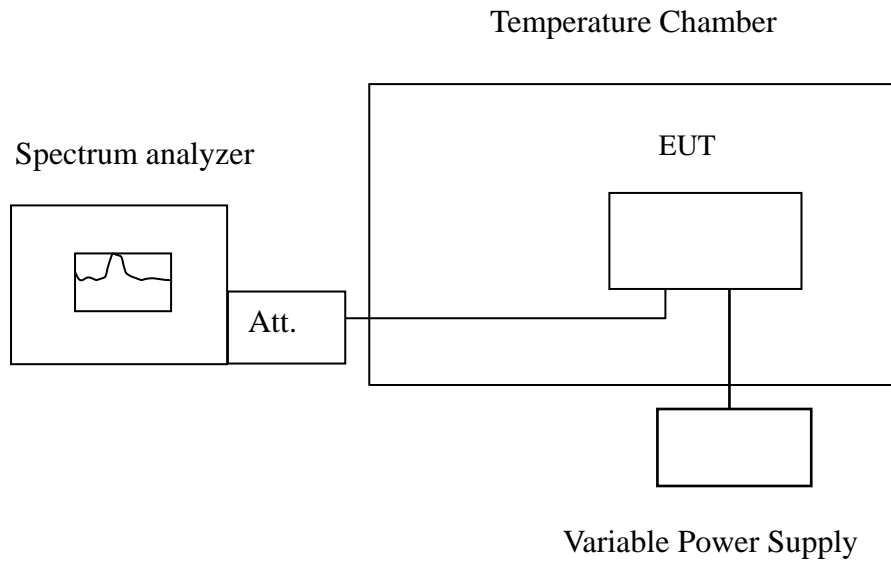
7.8 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §24.235, RSS-132 (4.3) & RSS-133 (6.3).

Frequency Tolerance: 2.5 ppm

Test Configuration



Remark: Measurement setup for testing on Antenna connector.



TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST RESULTS

No non-compliance noted.

Reference Frequency: GSM Mid Channel 836.6 MHz @ 20°C				
Limit: +/- 2.5 ppm = 2090 Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.2	50	836600010	18	2090
	40	836600009	17	
	30	836600001	9	
	20	836599992	0	
	10	836600010	18	
	0	836600011	19	
	-10	836600003	11	
	-20	836600001	9	
	-30	836600000	8	

Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.2	50	1879999999	-2	4700
	40	1880000000	-1	
	30	1879999999	-2	
	20	1880000001	0	
	10	1879999995	-6	
	0	1880000009	8	
	-10	1880000008	7	
	-20	1880000002	1	
	-30	1880000003	2	



Reference Frequency: GPRS Mid Channel 836.6 MHz @ 20°C				
Limit: +/- 2.5 ppm = 2090 Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.2	50	836600009	55	2090
	40	836600008	54	
	30	836600001	47	
	20	836599954	0	
	10	836600003	49	
	0	836600007	53	
	-10	836600013	59	
	-20	836600026	72	
	-30	836600011	57	

Reference Frequency: GPRS Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.2	50	1880000003	0	4700
	40	1880000004	1	
	30	1879999995	-8	
	20	1880000003	0	
	10	1879999996	-7	
	0	1880000008	5	
	-10	1879999997	-6	
	-20	1880000004	1	
	-30	1879999998	-5	



7.9 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

LIMIT

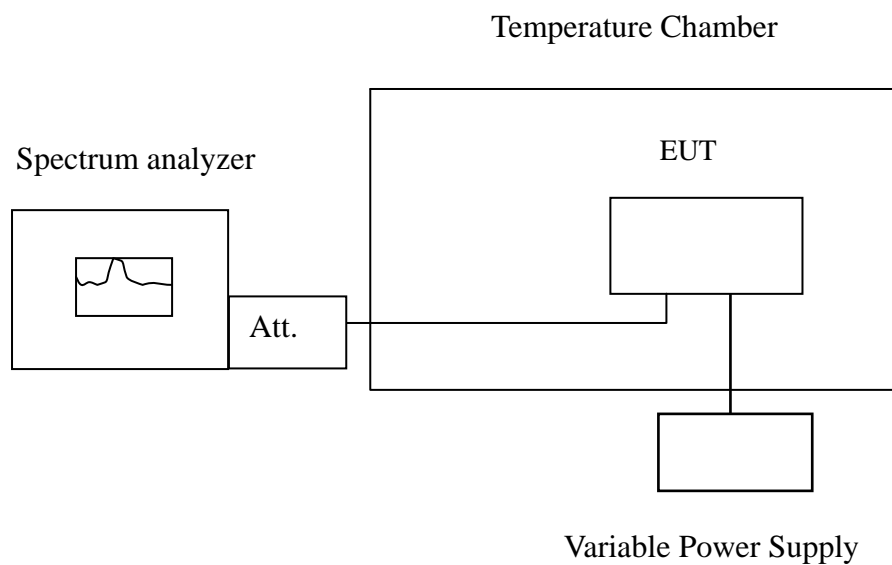
According to FCC §2.1055, FCC §24.235,

Frequency Tolerance: 2.5 ppm.

According to RSS-132 (4.3) & RSS-133 (6.3).

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

Test Configuration



Remark: Measurement setup for testing on Antenna connector.



TEST PROCEDURE

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (± 15%) and endpoint, record the maximum frequency change.

TEST RESULTS

No non-compliance noted.

Reference Frequency: GSM Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2090Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.38	20	836599991	-1	2090
1.2		836599992	0	
1.02		836599994	2	
0.5END		836599902	-90	

Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.38	20	1879999990	-11	4700
1.2		1880000001	0	
1.02		1880000003	2	
0.5END		1880000076	75	



Reference Frequency: GPRS Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2090Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.38	20	836599997	43	2090
1.2		836599954	0	
1.02		836599999	45	
0.5END		836599906	-48	

Reference Frequency: GPRS Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
1.38	20	1880000001	-2	4700
1.2		1880000003	0	
1.02		1879999996	-7	
0.5END		1879999924	-79	



7.10 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a) & RSS-Gen §7.2.2, except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

**TEST RESULTS**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Operation Mode: Normal Link

Test Date: November 25, 2011

Temperature: 26°C

Tested by: Eason Liu

Humidity: 60% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.3377	39.13	34.09	0.16	39.29	34.25	59.26	49.26	-19.97	-15.01	L1
0.8266	28.76	23.81	0.17	28.93	23.98	56.00	46.00	-27.07	-22.02	L1
1.4640	25.91	21.83	0.18	26.09	22.01	56.00	46.00	-29.91	-23.99	L1
3.6458	20.23	12.74	0.26	20.49	13.00	56.00	46.00	-35.51	-33.00	L1
6.7873	18.17	10.28	0.37	18.54	10.65	60.00	50.00	-41.46	-39.35	L1
20.8687	19.27	8.95	0.68	19.95	9.63	60.00	50.00	-40.05	-40.37	L1
0.1746	30.69	17.19	0.26	30.95	17.45	64.74	54.74	-33.79	-37.29	L2
0.3385	36.81	25.29	0.25	37.06	25.54	59.24	49.24	-22.18	-23.70	L2
0.8210	27.47	15.31	0.26	27.73	15.57	56.00	46.00	-28.27	-30.43	L2
2.3380	21.66	8.55	0.28	21.94	8.83	56.00	46.00	-34.06	-37.17	L2
6.9883	13.56	1.18	0.38	13.94	1.56	60.00	50.00	-46.06	-48.44	L2
20.8854	21.26	4.93	0.65	21.91	5.58	60.00	50.00	-38.09	-44.42	L2

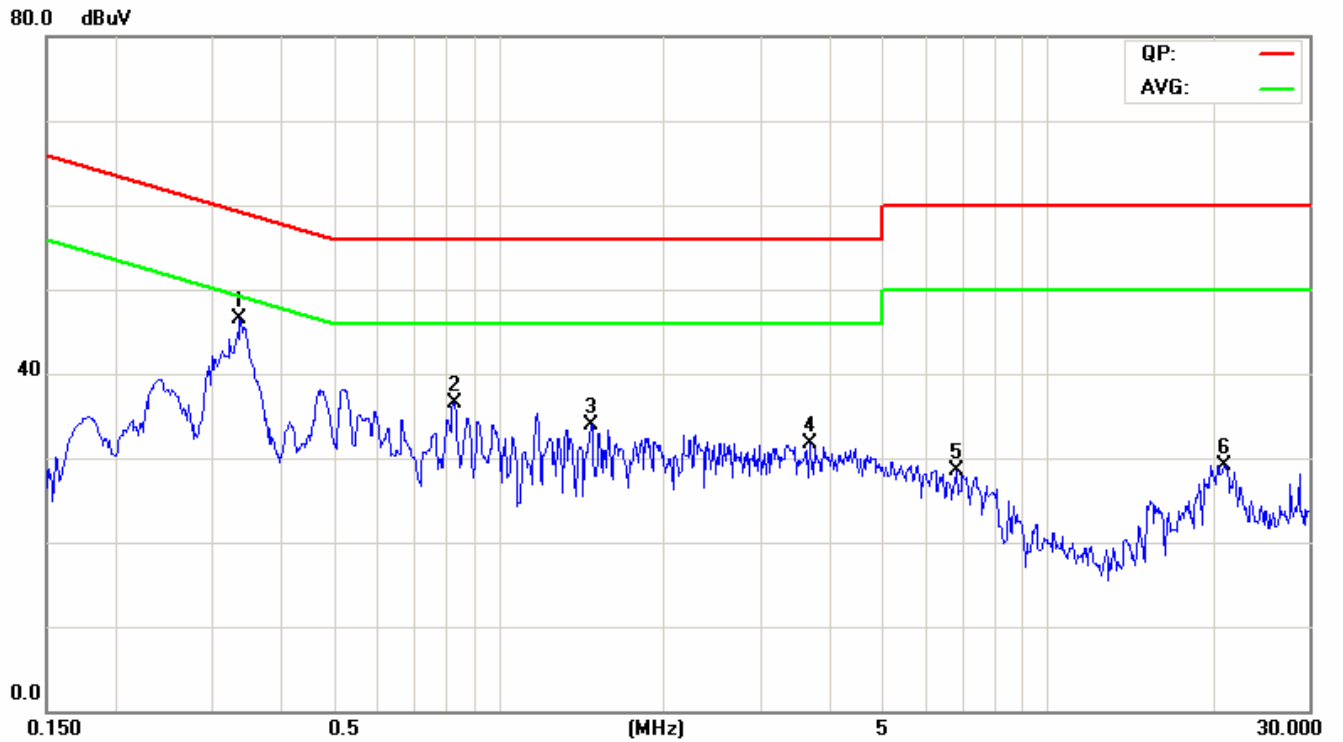
Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

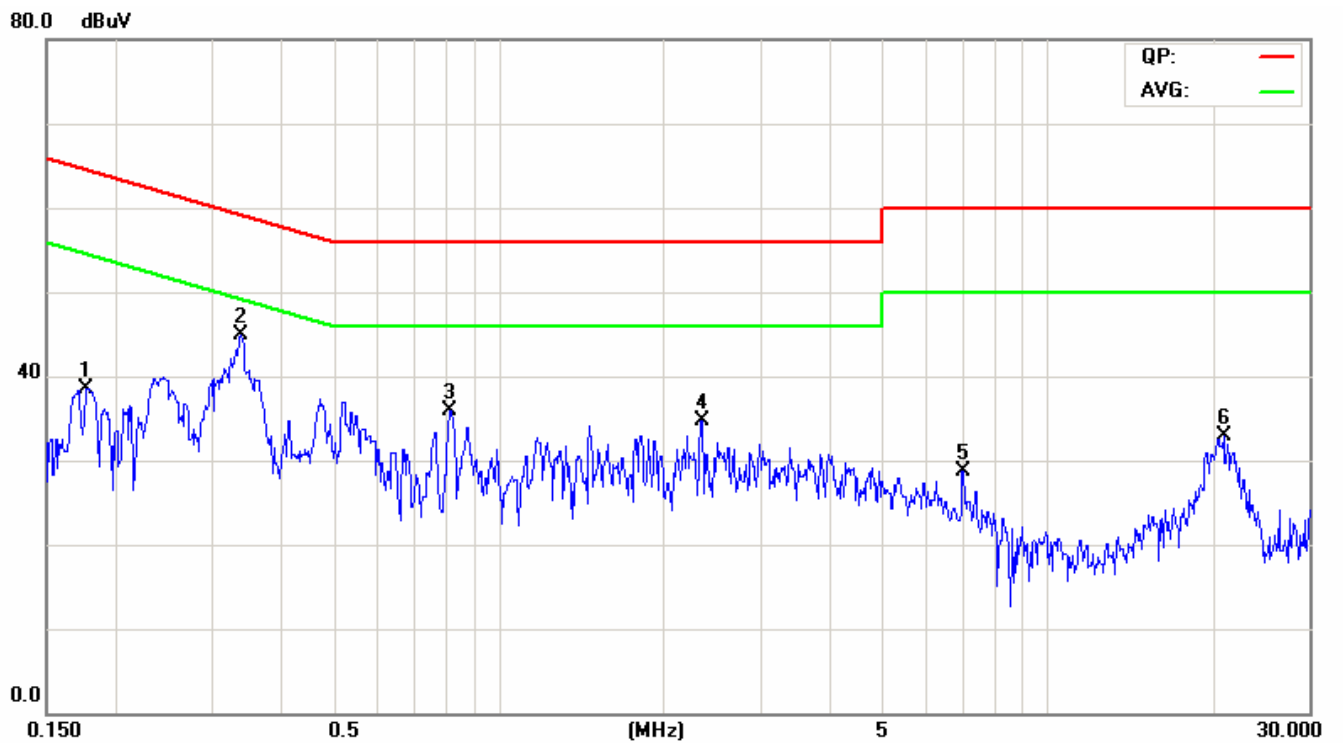


Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)





APPENDIX I RADIO FREQUENCY EXPOSURE

LIMIT

EUT Specification

EUT	E5 GSM Model Pager
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others: GSM / GPRS 850MHz: 824 ~ 849 MHz
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	ERP: 17.92 dBm (61.94 mW)
Antenna gain (Max)	-3.5 dBi (Numeric gain: 0.44)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input checked="" type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A
Remark: The maximum output power is <u>17.92 dBm (61.94 mW)</u> at <u>824.20MHz</u> (with <u>0.44 numeric antenna gain.</u>)	

TEST RESULTS

No non-compliance noted.

Remark: Please refer to the separated SAR report.

**LIMIT****EUT Specification**

EUT	E5 GSM Model Pager
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others: GSM / GPRS 1900MHz: 1850 ~ 1910 MHz
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <ul style="list-style-type: none"> <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	ERP: 21.26 dBm (133.65 mW)
Antenna gain (Max)	0 dBi (Numeric gain: 1)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input checked="" type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

Remark:

1. The maximum output power is 21.26 dBm (133.65 mW) at 1909.80 MHz (with 1 numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.

TEST RESULTS

No non-compliance noted.

Remark: Please refer to the separated SAR report.