



FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E TEST REPORT

For

Product Name: Mobile Phone

Brand Name: TOCH Mobile

Model No.: Angel

Series Model: N/A

**Test Report Number:
KS121016A03-RP1**

Issued for

TOCH MOBILE INTERNACIONAL S.A.

RES. LA LILLIANA 2 ETAPA, # 88,SAN FCO.,HEREDIA,Costa Rica

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

**No.10 Weiye Rd., Innovation park, Eco&Tec,
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TESTING CERT #2541.01

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 20, 2012	Initial Issue	ALL	Hadiif Hoo



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1 TEST RESULT CERTIFICATION

Product Name:	Mobile Phone
Trade Name:	TOCH Mobile
Model Name.:	Angel
Series Model:	N/A
Applicant Discrepancy:	Initial
Devices supporting GPRS:	Class B
GPRS /EDGE Level:	Multi-Class 12
Multi-slot Class:	4 Uplink +1 Downlink
Device Category:	PORTABLE DEVICES
Exposure Category:	GENERAL POPULATION/UNCONTROLLED EXPOSURE
Date of Test:	October 19, 2012
Applicant:	TOCH MOBILE INTERNACIONAL S.A. RES. LA LILLIANA 2 ETAPA, # 88,SAN FCO.,HEREDIA,Costa Rica
Manufacturer:	APS DIGITECH HOLDINGS LTD 803, Block A, Jialinhaoting, No.2001,Shennan Rd, Futian District, Shenzhen, China
Application Type:	Certification

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 22 Subpart H & Part 24 Subpart E	No non-compliance noted

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 ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E.

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

Approved by:

Hadiif Hoo
RF Manager
Compliance Certification Service Inc.

Tested by:

Sean.Yu
Test Engineer
Compliance Certification Service Inc.



2 EUT DESCRIPTION

Product Name:	Mobile Phone
Brand Name:	TOCH Mobile
Model Name:	Angel
Series Model:	N/A
Model Discrepancy:	N/A
Power Adapter Power Rating :	Power supply and ADP (rating): Brand: TOCH Mobile Model: XT-003Y-5060 INPUT:100~240V---50/60Hz 150mA OUTPUT:5.0V --- 550mA Battery (rating): Brand: TOCH Mobile Model:TB-2 Capacitance: 3.7V 1000mAh
Frequency Range:	GSM/GPRS/850: 824.20 ~ 848.80 MHz GSM/GPRS/1900: 1850.20 ~ 1909.80 MHz
Transmit Power (ERP & EIRP Power):	GSM 850: 30.27 dBm GSM 1900: 28.99 dBm GPRS 850: 29.07 dBm GPRS 1900: 25.79 dBm
Modulation Technique:	GSM/GPRS: GMSK
Antenna Gain:	GSM: 1 dBi
Antenna Type:	GSM: PIFA Antenna

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: PPATOCHANGEL** filing to comply with Part 22 and Part 24 of the FCC 47 CFR Rules.



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, PART 22 SUBPART H AND PART 24 SUBPART E

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: Gobi2) had been tested under operating condition.

After verification, all tests were carried out 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 only.

EUT staying in continuous transmitting mode was programmed.

GSM/GPRS / 850:

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

GSM/GPRS / 1900:

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



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

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2013-5-12
DETECTOR NEGATIVE	Agilent	8473B	MY42240176	2013-5-12
OSCILLOSCOPE	Agilent	DSO6104A	MY44002585	2013-3-25
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	2013-3-25
EPM-P Series Power Meter	Agilent	E4416A	GB41292714	2013-5-12
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	2013-5-12
DC POWER SUPPLY	GW instek	GPS-3303C	E903131	2013-5-12
Temp. / Humidity Chamber	Kingson	THS-M1	242	2013-3-13
Test Software	EZ-EMC			

977 Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2013-5-12
EMI Test Receiver	R&S	ESPI3	101026	2013-3-16
Pre-Amplifier	MINI	ZFL-1000VH2	d041703	2013-6-30
Pre-Amplifier	Miteq	NSP4000-NF	870629	2013-6-30
Bilog Antenna	Sunol	JB1	A110204-2	2013-6-24
Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	2013-5-12
Turn Table	CT	CT123	4165	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R
Controller	CT	CT100	95637	N.C.R
Test Software	EZ-EMC			



Conducted Emission				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER	R&S	ESCI3	100781	2013-3-16
V (V-LISN)	Schwarzbeck	NNLK 8129	8129-143	2013-3-16
LISN (EUT)	FCC	FCC-LISN-50/250-50-2-02	SN:05012	2013-3-16
TRANSIENT LIMITER	SCHAFFNER	CFL9206	1710	2013-4-9
Test Software	EZ-EMC			

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency		Uncertainty
Conducted emissions	0.15MHz~30MHz		± 3.43 dB
Measurement	Polarity	Frequency	Uncertainty
Radiated emissions (below 1GHz)	H	30MHz ~ 200MHz	+/- 4.72dB
		200MHz ~1000MHz	+/- 4.72dB
	V	30MHz ~ 200MHz	+/- 4.83dB
		200MHz ~1000MHz	+/- 4.70dB
Radiated emissions (above 1GHz)	H	1000MHz ~5000MHz	+/- 3.94dB
		5000MHz ~6000MHz	+/- 3.94dB
	V	1000MHz ~5000MHz	+/- 3.94dB
		5000MHz ~6000MHz	+/- 3.94dB

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

☒ No.10Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

The sites are constructed in conformance with the requirements of ANSI C63.4 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. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>



6 SETUP OF EQUIPMENT UNDER TEST

6.1. SETUP CONFIGURATION OF EUT

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

6.2. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
N/A							

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.



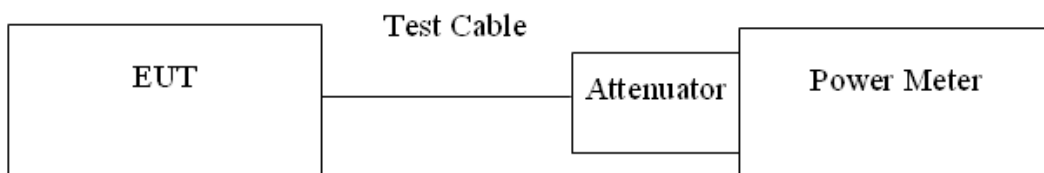
7 FCC PART 22 & 24 REQUIREMENTS

7.1. 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	128	824.20	31.38
	190	836.40	30.77
	251	848.80	30.66
GPRS 850 (Class 12)	128	824.20	29.64
	190	836.40	29.45
	251	848.80	29.17

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
GSM 1900	512	1850.20	27.24
	661	1880.00	27.09
	810	1909.80	26.70
GPRS 1900 (Class 12)	512	1850.20	24.63
	661	1880.00	24.43
	810	1909.80	24.01

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



7.2. ERP & EIRP MEASUREMENT

LIMIT

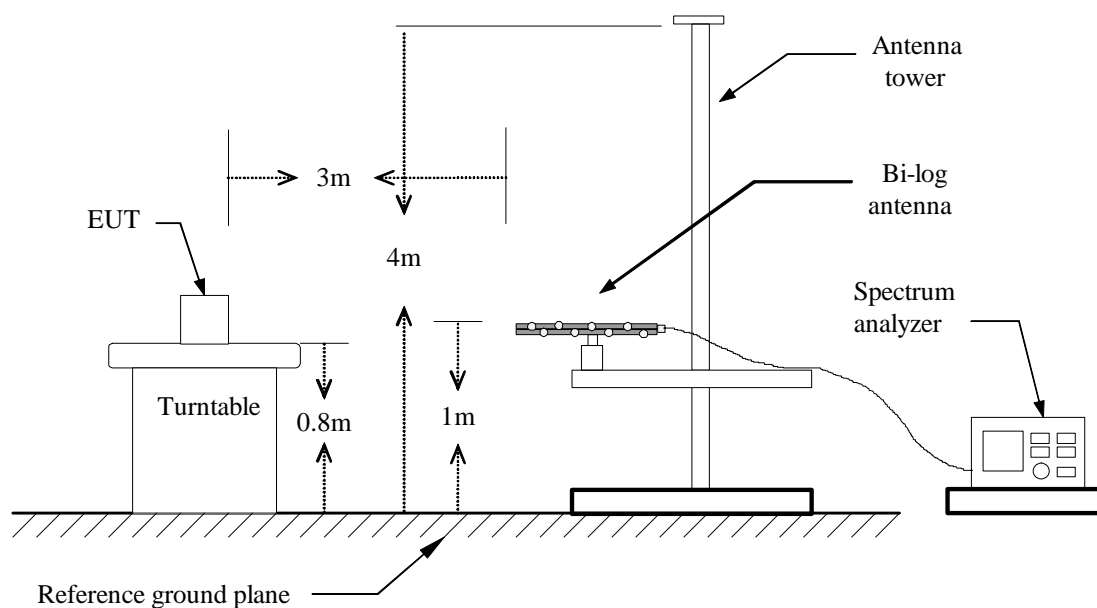
According to FCC §2.1046

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

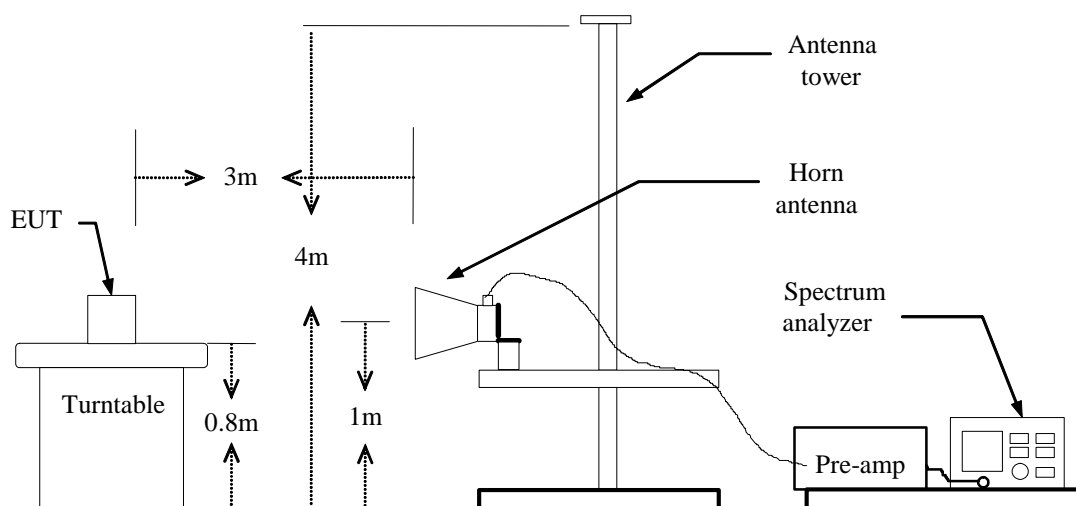
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

TEST CONFIGURATION

Below 1 GHz

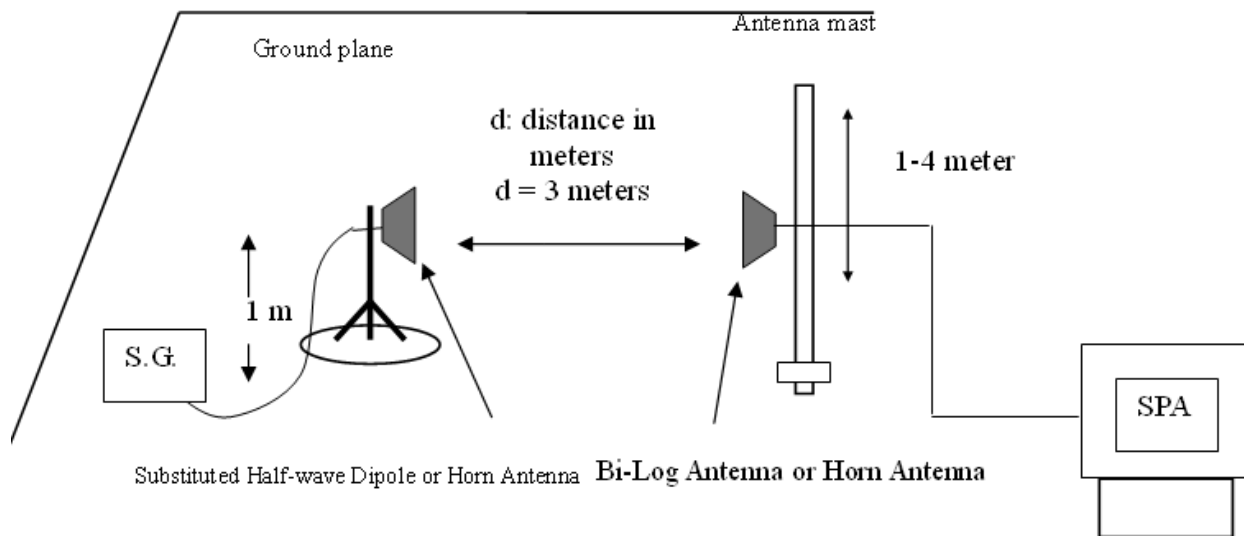


Above 1 GHz





FOR SUBSTITUTED METHOD TEST SET-UP



TEST PROCEDURE

The EUT was placed on an 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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

GSM 850 TEST DATA

Channel	Frequency (MHz)	Antenna Pol.	Reading level (dB)	rection Fa (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
128	824.18	V	-5.68	34.61	28.93	38.5	-9.57
	824.3	H	-3.99	34.26	30.27	38.5	-8.23
190	836.66	V	-6.39	34.45	28.06	38.5	-10.44
	836.78	H	-4.63	34.26	29.63	38.5	-8.87
251	848.84	V	-6.67	34.64	27.97	38.5	-10.53
	848.84	H	-5.62	34.44	28.82	38.5	-9.68

GSM 1900 TEST DATA

Channel	Frequency (MHz)	Antenna Pol.	Reading level (dB)	rection Fa (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
512	1850.1	V	-12.69	41.19	28.5	33	-4.5
	1850	H	-15.26	40.29	25.03	33	-7.97
661	1880	V	-17.36	41.19	23.83	33	-9.17
	1879.8	H	-16.66	41.75	25.09	33	-7.91
810	1909.9	V	-12.36	41.35	28.99	33	-4.01
	1909.9	H	-15.36	41.16	25.8	33	-7.2

GPRS 850 TEST DATA

Channel	Frequency (MHz)	Antenna Pol.	Reading level (dB)	rection Fa (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
128	824.18	V	-10.36	34.61	24.25	38.5	-14.25
	824.18	H	-5.69	34.26	28.57	38.5	-9.93
190	836.54	V	-8.25	34.45	26.2	38.5	-12.3
	836.54	H	-5.19	34.26	29.07	38.5	-9.43
251	848.78	V	-15.62	34.64	19.02	38.5	-19.48
	849.08	H	-9.68	34.44	24.76	38.5	-13.74



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GPRS 1900 TEST DATA

Channel	Frequency (MHz)	Antenna Pol.	Reading level (dB)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
512	1850.2	V	-15.38	41.17	25.79	33	-7.21
	1850.2	H	-16.58	40.79	24.21	33	-8.79
661	1879.8	V	-16.99	41.23	24.24	33	-8.76
	1879.8	H	-15.84	41.14	25.3	33	-7.7
810	1909.7	V	-16.39	41.3	24.91	33	-8.09
	1909.7	H	-16.39	41.38	24.99	33	-8.01

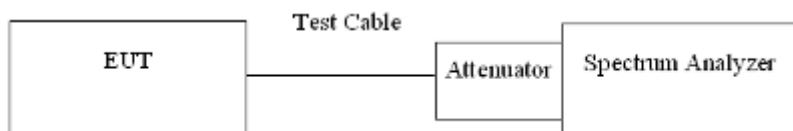


7.3. OCCUPIED BANDWIDTH MEASUREMENT

LIMIT

According to §FCC 2.1049.

TEST CONFIGURATION



Remark: Measurement setup for testing on Antenna connector

TEST PROCEDURE

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW is set to 3 times the RBW, -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

No non-compliance noted

Test Data

Test Mode	CH	Frequency (MHz)	99% Bandwidth (kHz)	26dB Bandwidth KHz
GSM 850	128	824.20	245.6616	316.271
	190	836.40	245.9843	311.964
	251	848.80	244.7596	314.980
GPRS 850	128	824.20	241.7738	321.719
	190	836.40	242.4498	317.264
	251	848.80	240.7786	315.668

Test Mode	CH	Frequency (MHz)	99% Bandwidth (kHz)	26dB Bandwidth KHz
GSM 1900	512	1850.20	242.4992	310.524
	661	1880.00	243.8242	309.308
	810	1909.80	248.6657	314.096
GPRS 1900	512	1850.20	246.0178	319.324
	661	1880.00	242.7669	318.824
	810	1909.80	244.3740	309.203



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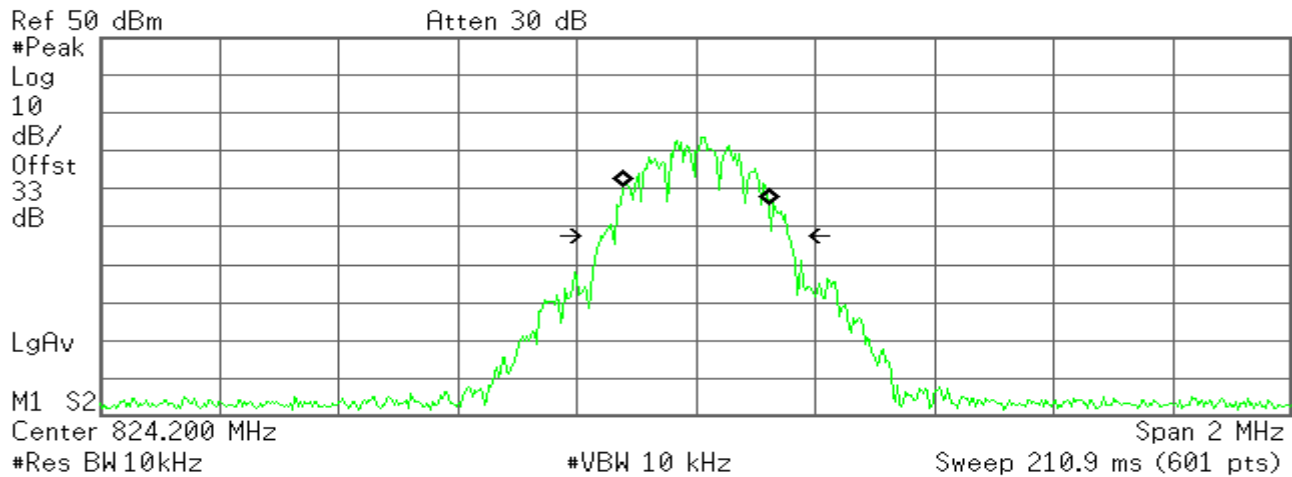
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Test Plot

GSM 850 (CH Low)

Agilent

R T



Occupied Bandwidth
245.6616 kHz

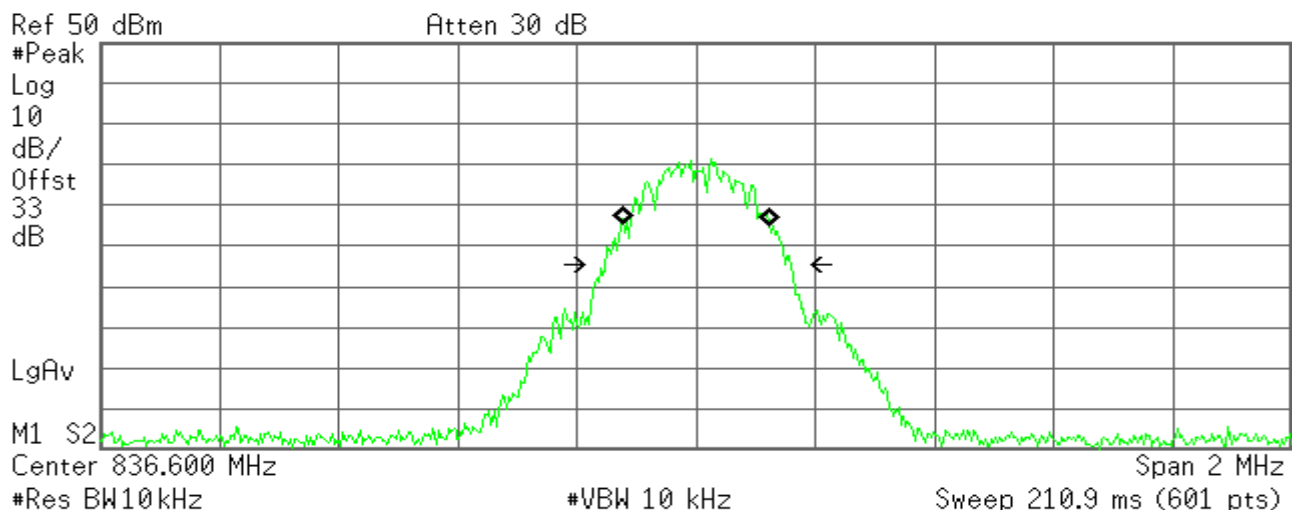
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -394.819 Hz
x dB Bandwidth 316.271 kHz

GSM 850 (CH Mid)

Agilent

R T



Occupied Bandwidth
245.9843 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 1.004 kHz
x dB Bandwidth 311.964 kHz



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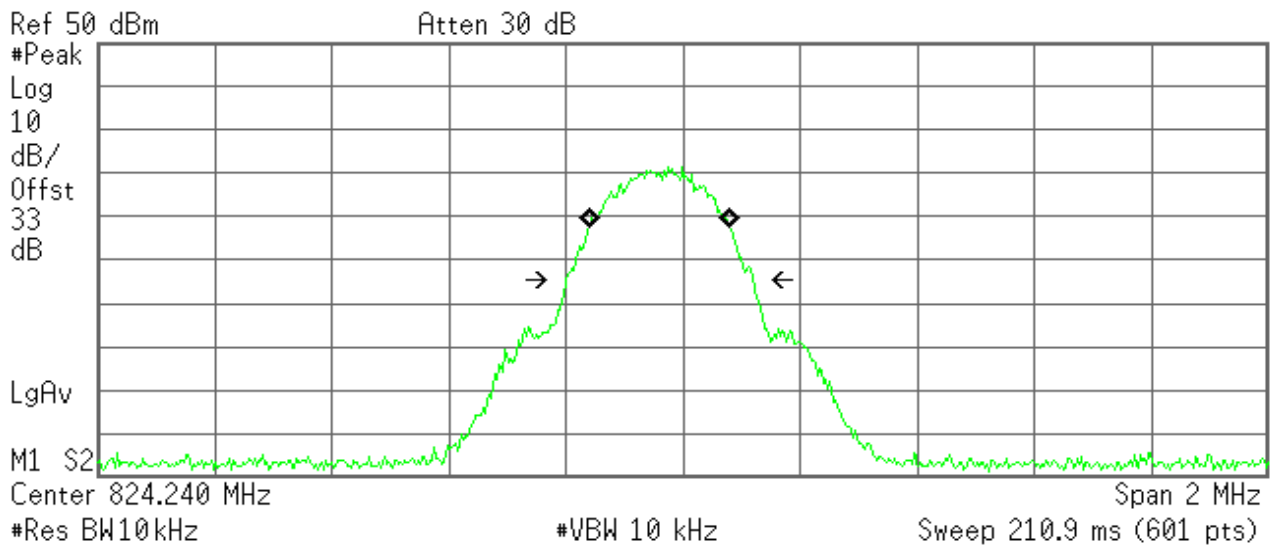
FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

GSM 850(CH High)

Agilent

R T



Occupied Bandwidth
241.7738 kHz

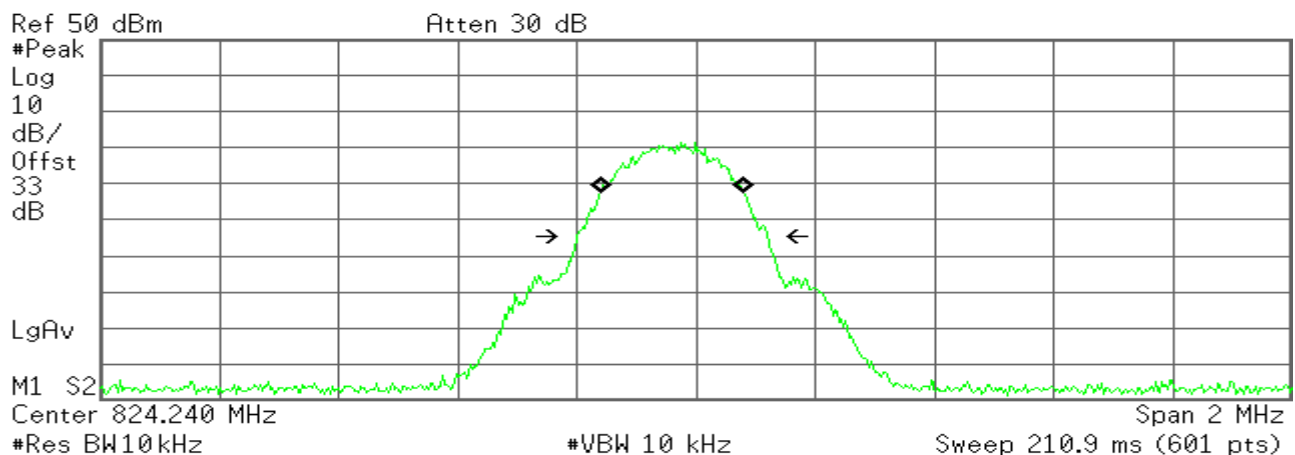
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -39.909 kHz
x dB Bandwidth 321.719 kHz

GPRS 850 (CH Low)

Agilent

R T



Occupied Bandwidth
241.7738 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

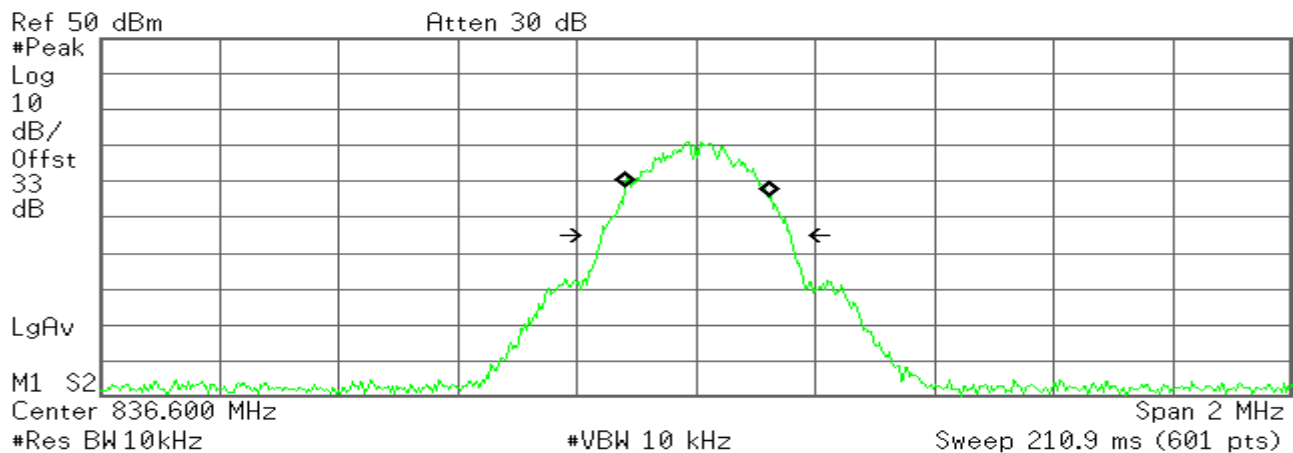
Transmit Freq Error -39.909 kHz
x dB Bandwidth 321.719 kHz



GPRS 850 (CH Mid)

Agilent

R T



Occupied Bandwidth
242.4498 kHz

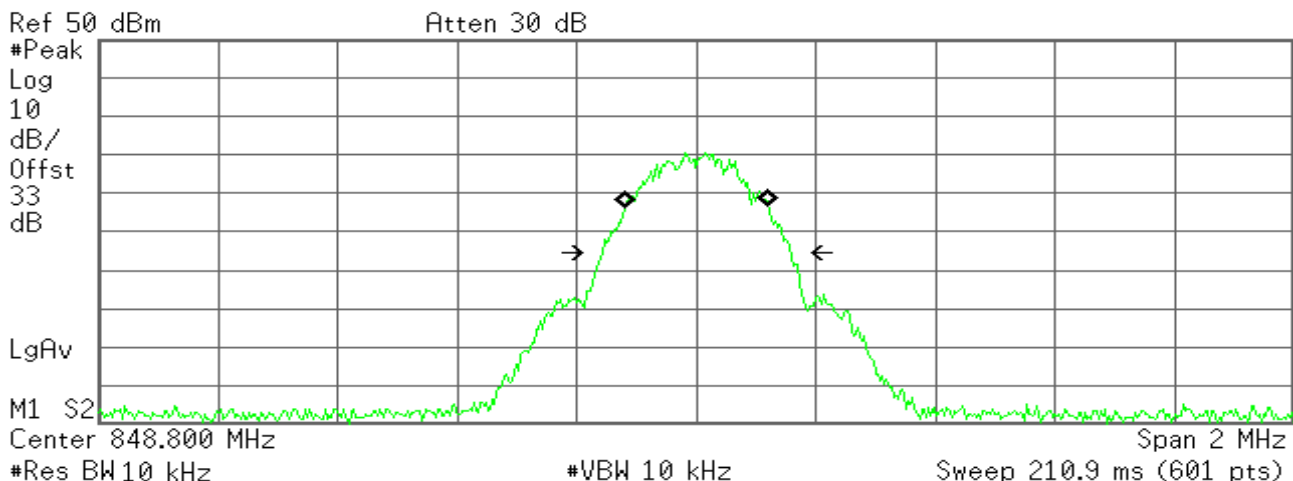
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 925.518 Hz
x dB Bandwidth 317.264 kHz

GPRS 850(CH High)

Agilent

R T



Occupied Bandwidth
240.7786 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

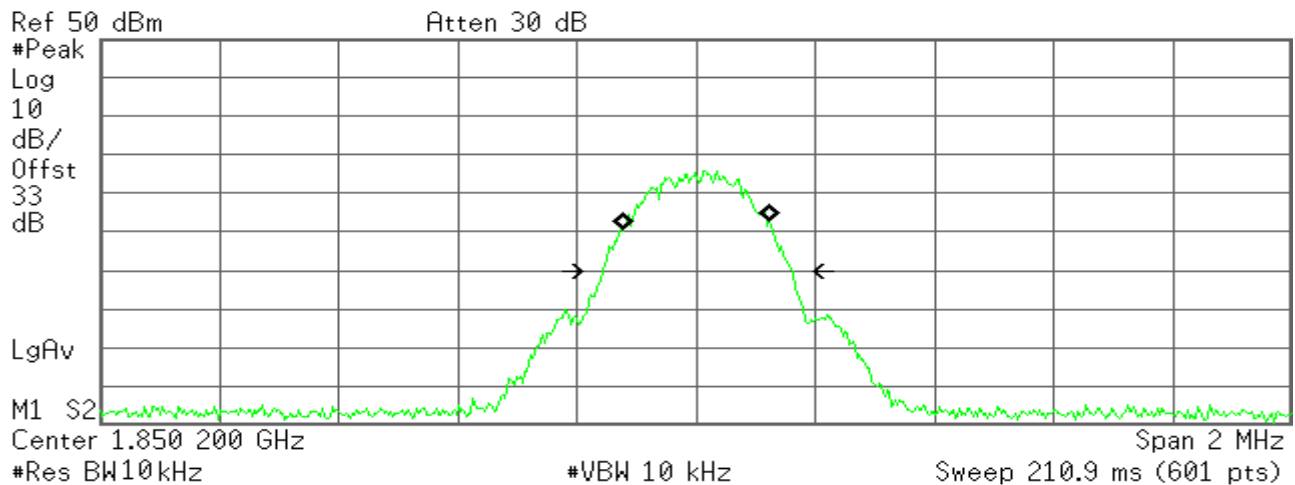
Transmit Freq Error 1.098 kHz
x dB Bandwidth 315.668 kHz



GPRS 1900 (CH Low)

Agilent

R T



Occupied Bandwidth
246.0178 kHz

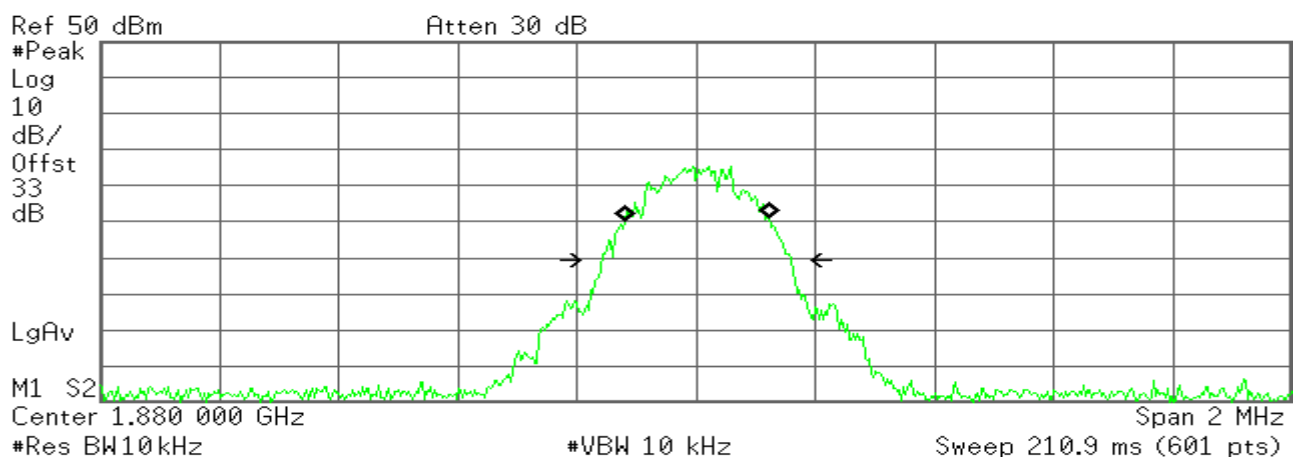
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 515.643 Hz
x dB Bandwidth 319.324 kHz

GPRS 1900 (CH Mid)

Agilent

R T



Occupied Bandwidth
242.7669 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

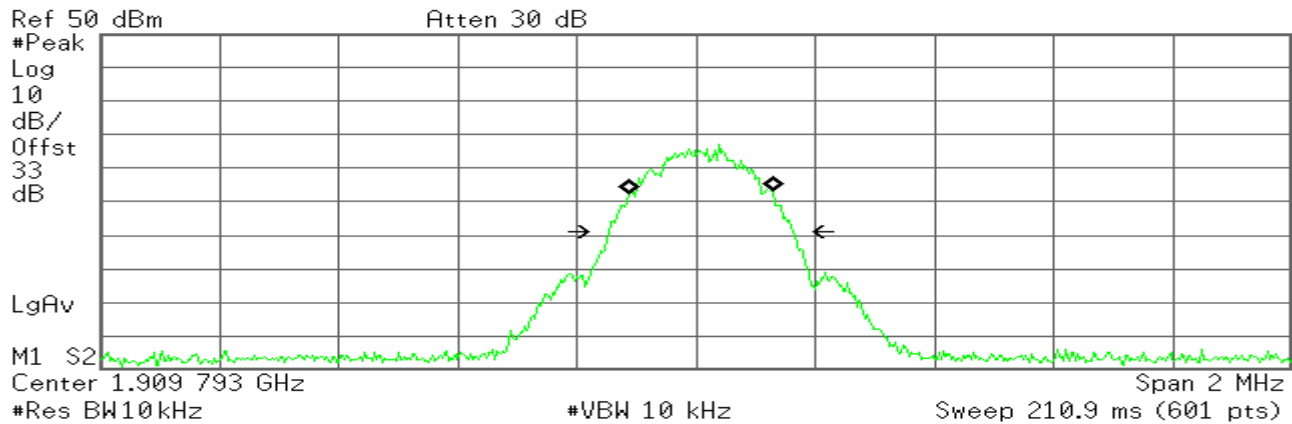
Transmit Freq Error 1.130 kHz
x dB Bandwidth 318.824 kHz



GPRS 1900 (CH High)

* Agilent

R T



Occupied Bandwidth
244.3740 kHz

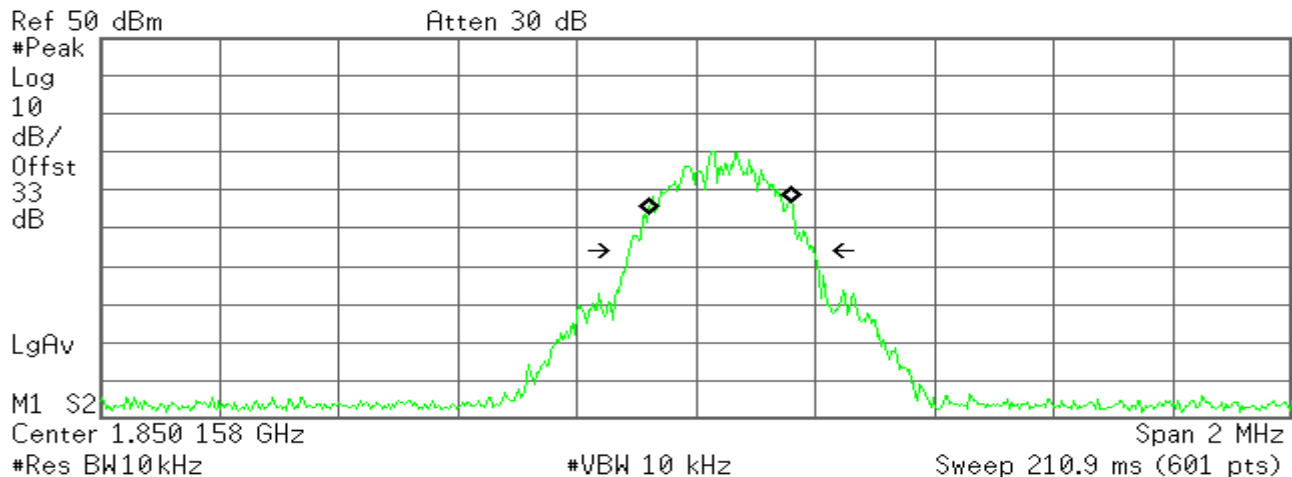
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 8.169 kHz
x dB Bandwidth 309.203 kHz

GSM 1900 (CH Low)

* Agilent

R T



Occupied Bandwidth
242.4992 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

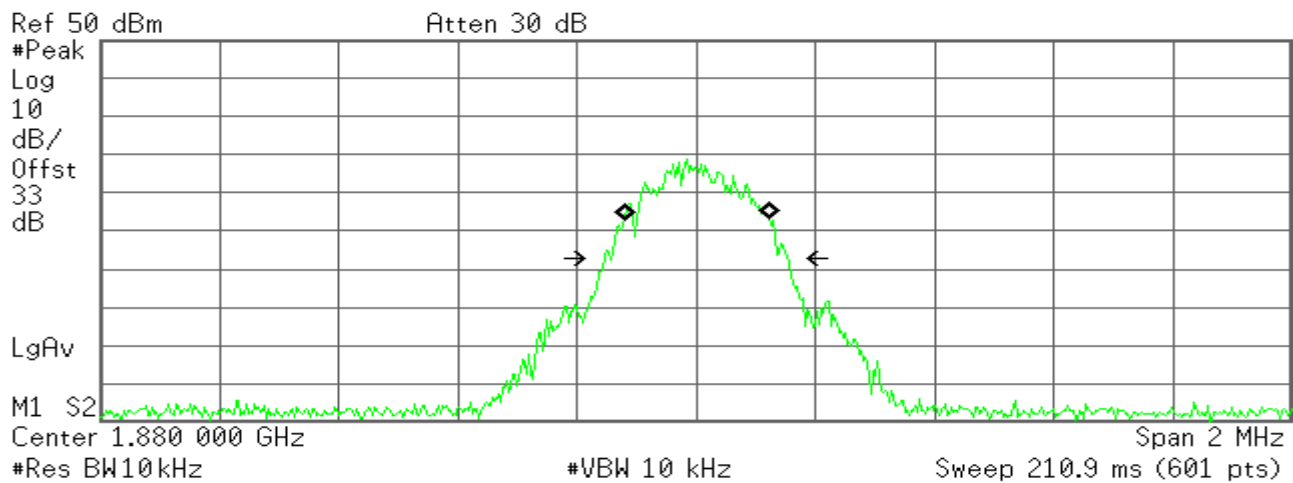
Transmit Freq Error 39.778 kHz
x dB Bandwidth 310.524 kHz



GSM 1900 (CH Mid)

* Agilent

R T



Occupied Bandwidth
243.8242 kHz

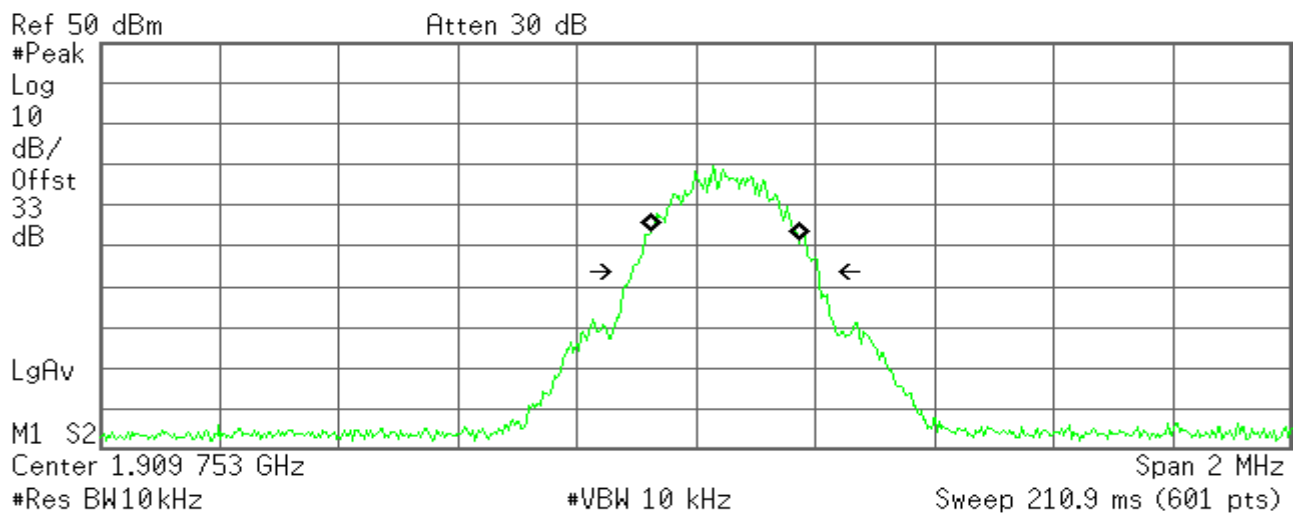
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 468.397 Hz
x dB Bandwidth 309.308 kHz

GSM 1900 (CH High)

* Agilent

R T



Occupied Bandwidth
248.6657 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 47.609 kHz
x dB Bandwidth 314.096 kHz



7.4. OUT OF BAND EMISSION AT ANTENNA TERMINALS

LIMIT

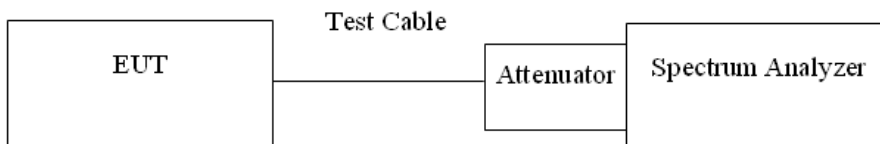
According to FCC §2.1051, FCC §22.917, FCC §24.238(a).

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



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	128	Figure 3-1	Band Edge emissions
	251	Figure 3-2	Band Edge emissions

Mode	CH	Location	Description
GSM 1900	512	Figure 4-1	Band Edge emissions
	810	Figure 4-2	Band Edge emissions

Mode	CH	Location	Description
GSM 850	128	Figure 5-1	Conducted spurious emissions, 30MHz - 20GHz
	190	Figure 5-2	Conducted spurious emissions, 30MHz - 20GHz
	251	Figure 5-3	Conducted spurious emissions, 30MHz - 20GHz

Mode	CH	Location	Description
GSM 1900	512	Figure 6-1	Conducted spurious emissions, 30MHz - 20GHz
	661	Figure 6-2	Conducted spurious emissions, 30MHz - 20GHz
	810	Figure 6-3	Conducted spurious emissions, 30MHz - 20GHz

Mode	CH	Location	Description
GPRS 850	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

Mode	CH	Location	Description
GPRS 1900	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



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Mode	CH	Location	Description
GPRS 850	128	Figure 9-1	Band Edge emissions
	251	Figure 9-2	Band Edge emissions

Mode	CH	Location	Description
GPRS 1900	512	Figure 10-1	Band Edge emissions
	810	Figure 10-2	Band Edge emissions



Test Plot

GSM 850

Figure 5-1: Out of Band emission at antenna terminals – GSM CH Low

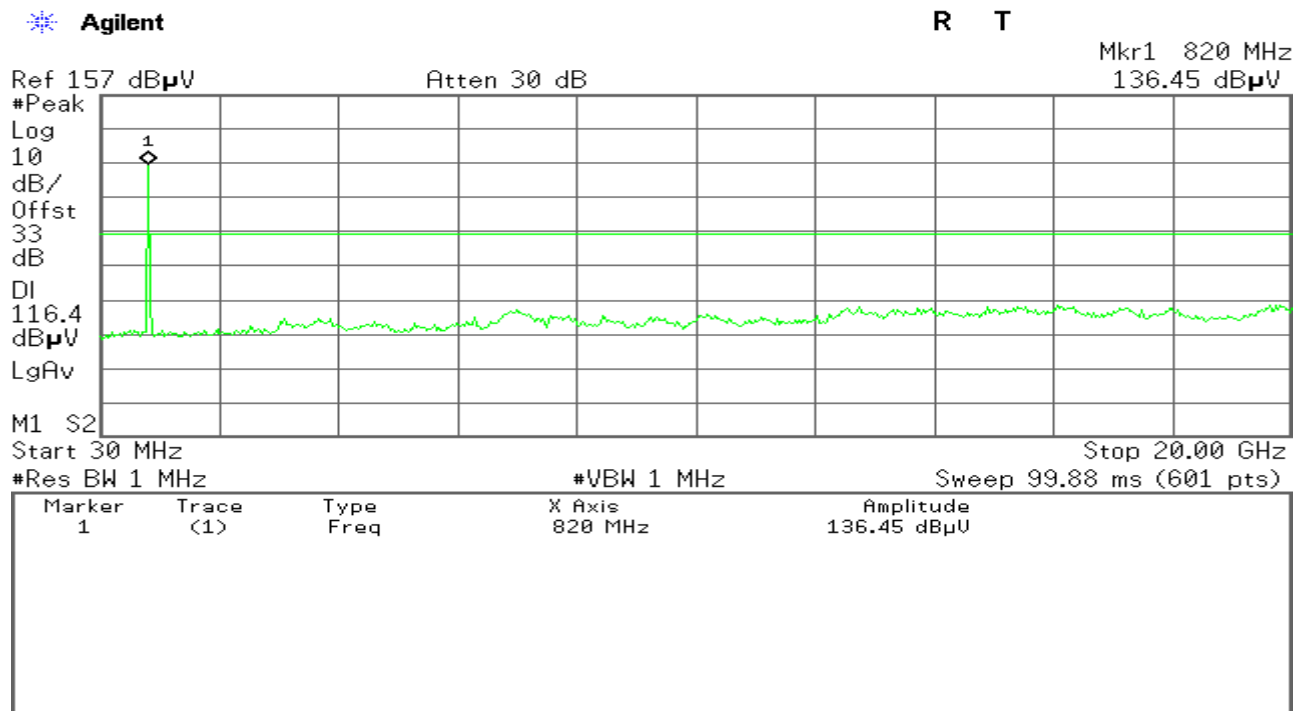


Figure 5-2: Out of Band emission at antenna terminals – GSM CH Mid

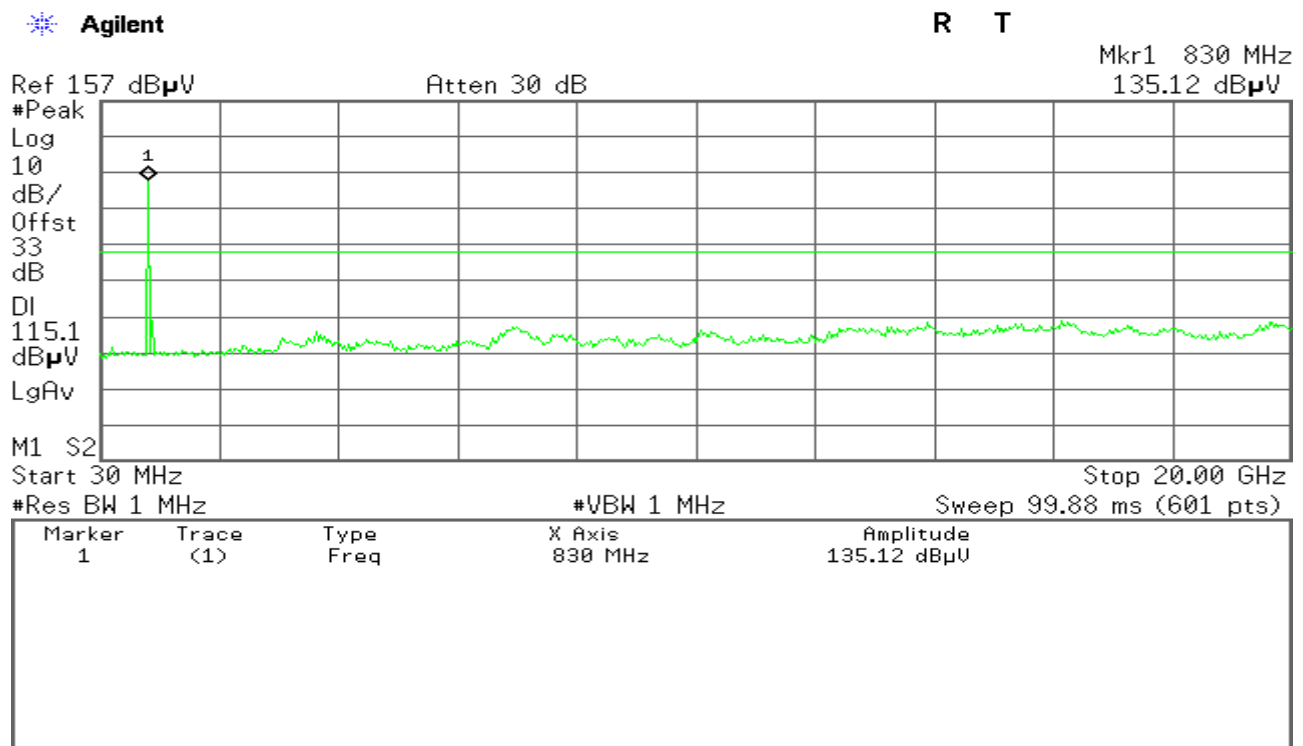
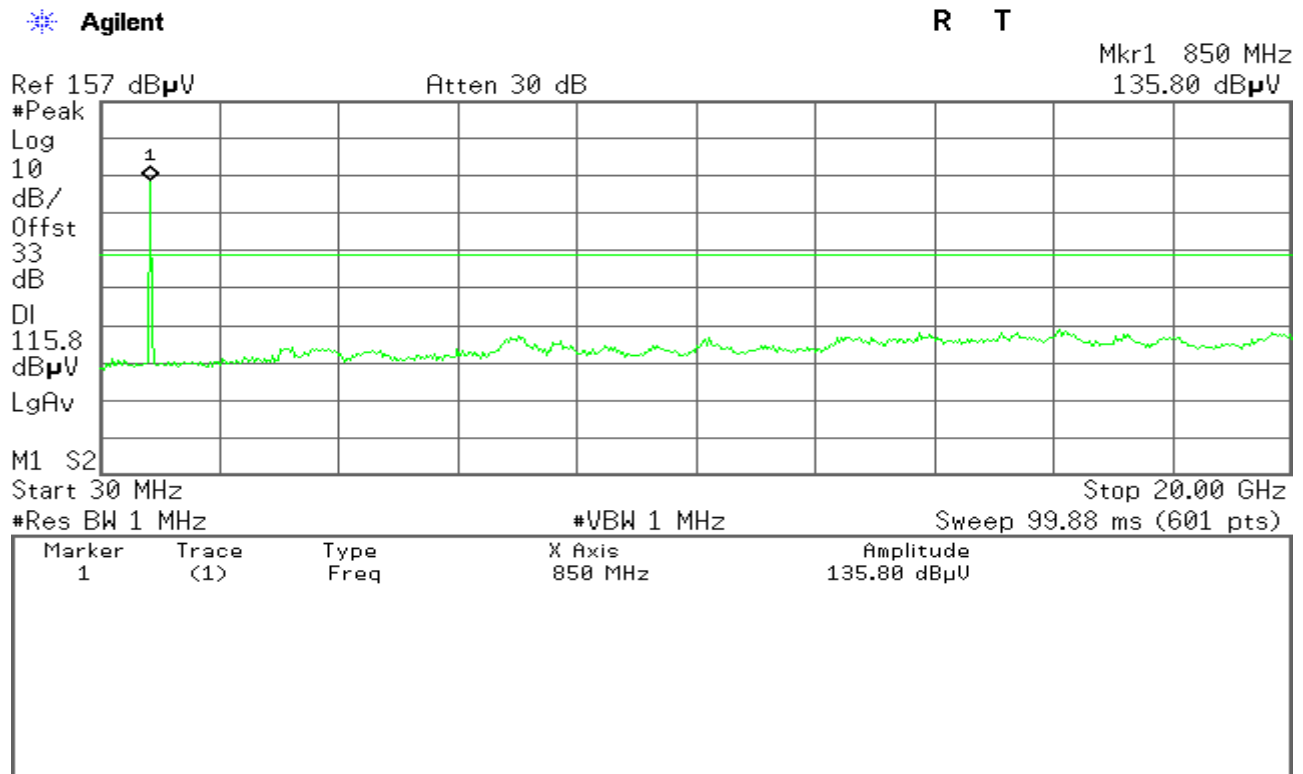




Figure 5-3: Out of Band emission at antenna terminals – GSM CH High



GSM 1900

Figure 6-1: Out of Band emission at antenna terminals – GSM CH Low

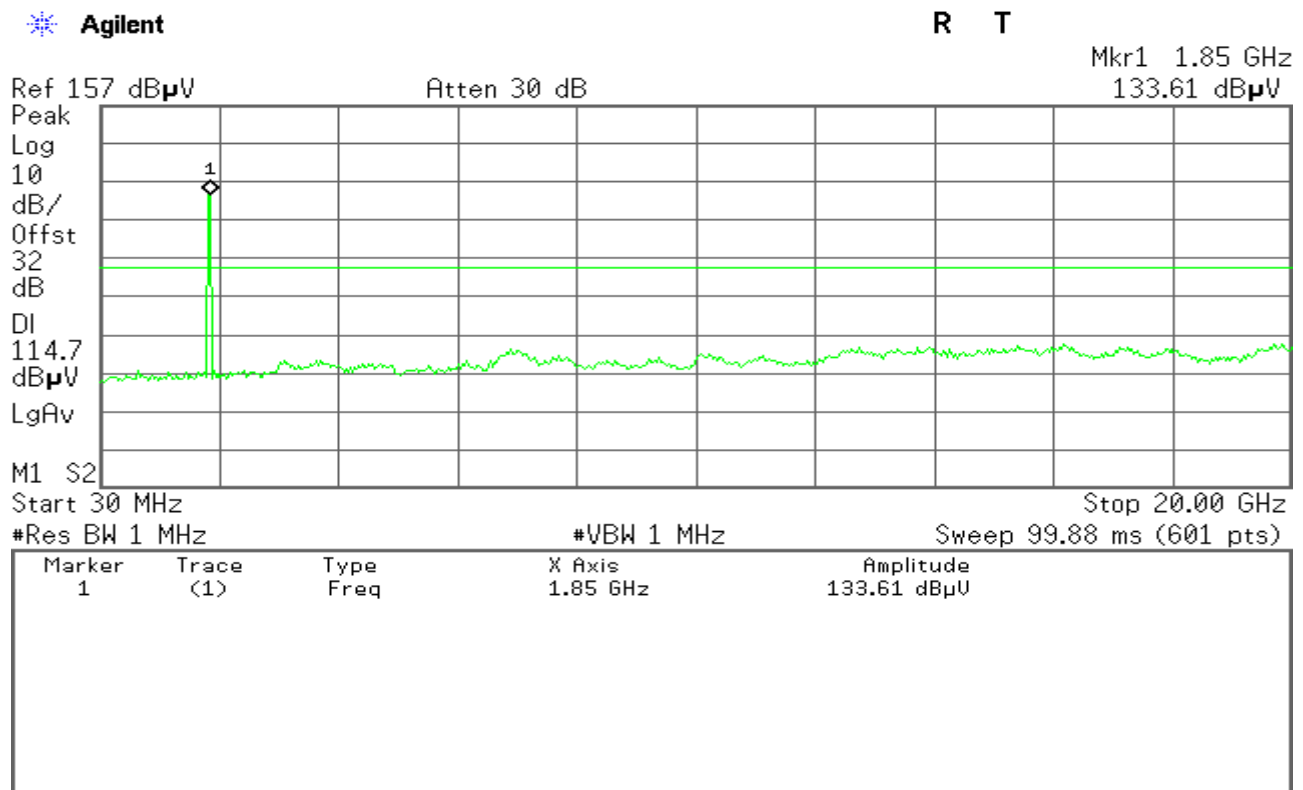




Figure 6-2: Out of Band emission at antenna terminals – GSM CH Mid

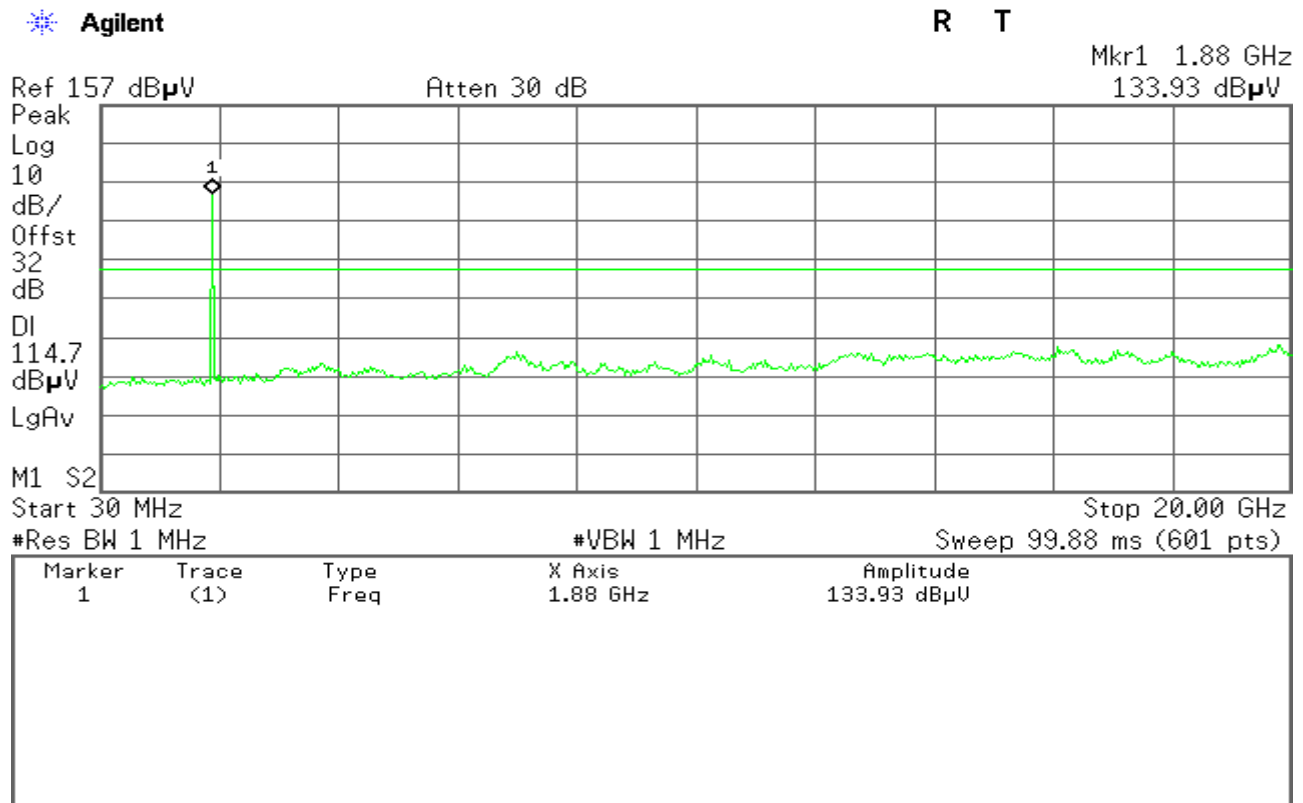
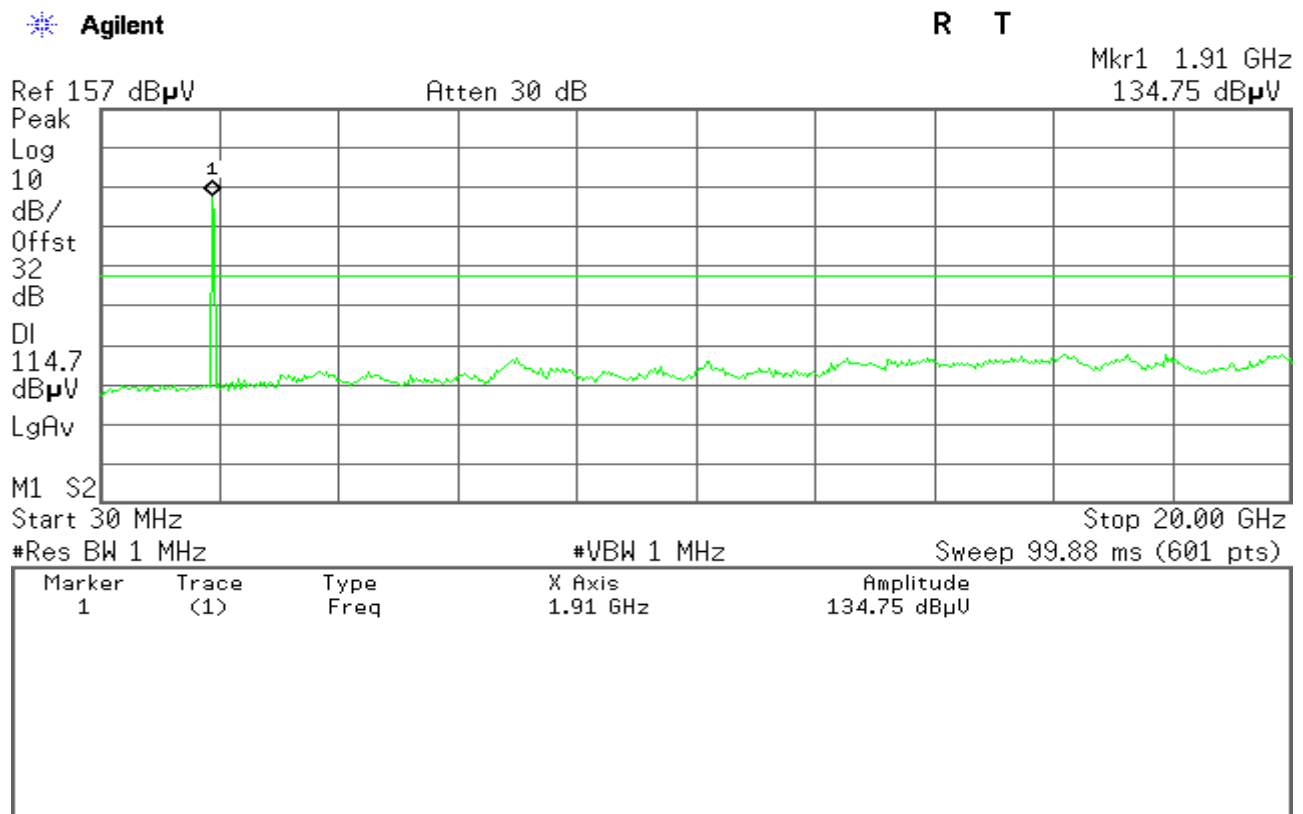


Figure 6-3: Out of Band emission at antenna terminals – GSM CH High





GSM 850

Figure 3-1: Band Edge emissions – GSM CH Low

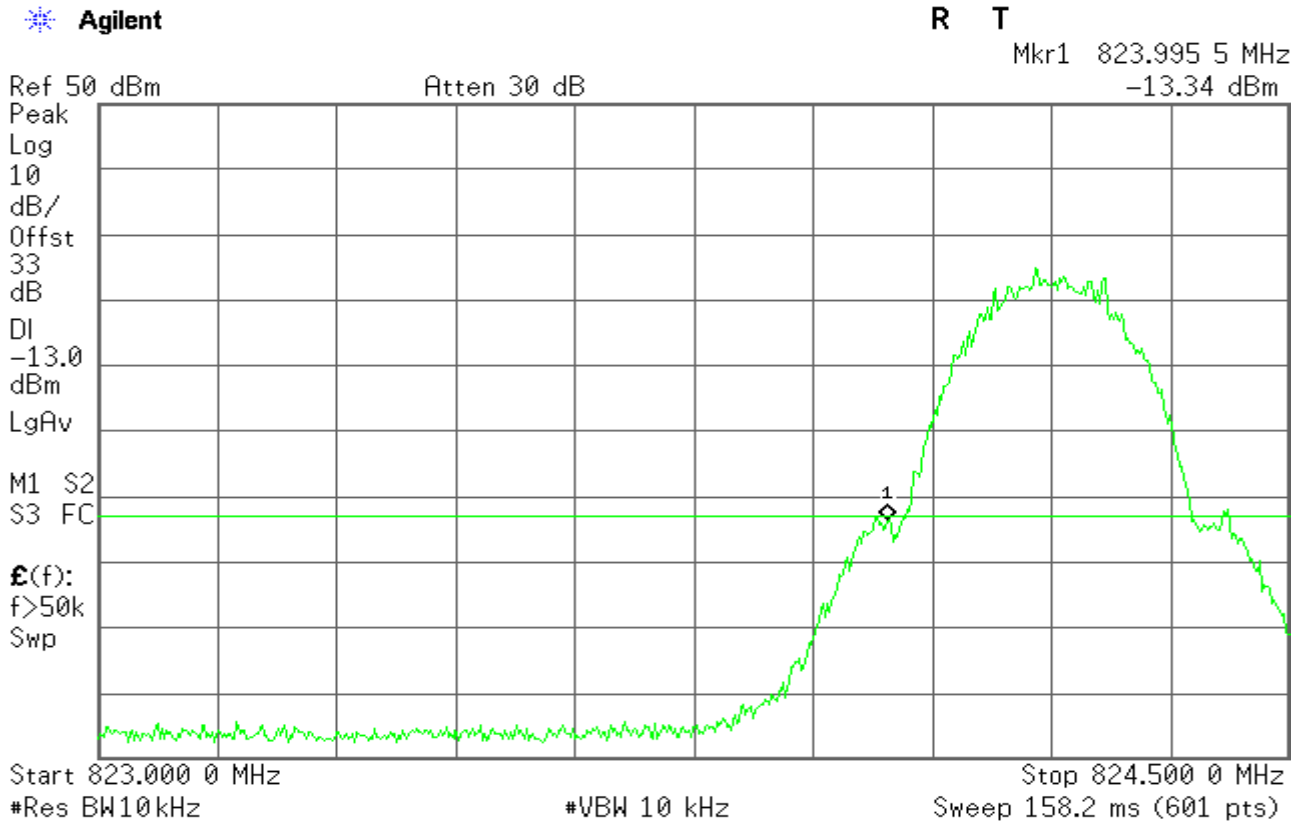
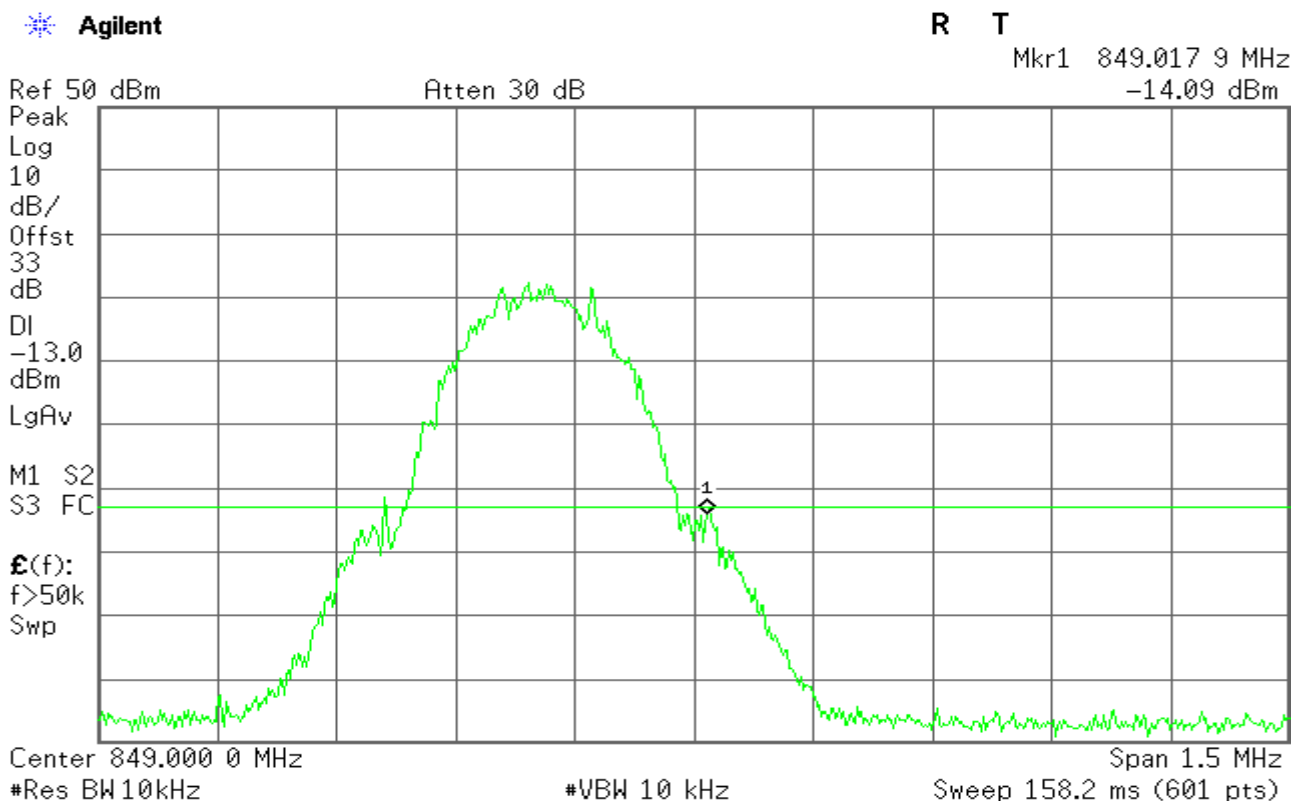


Figure 3-2: Band Edge emissions –GSM CH High





GSM 1900

Figure 4-1: Band Edge emissions – GSM CH Low

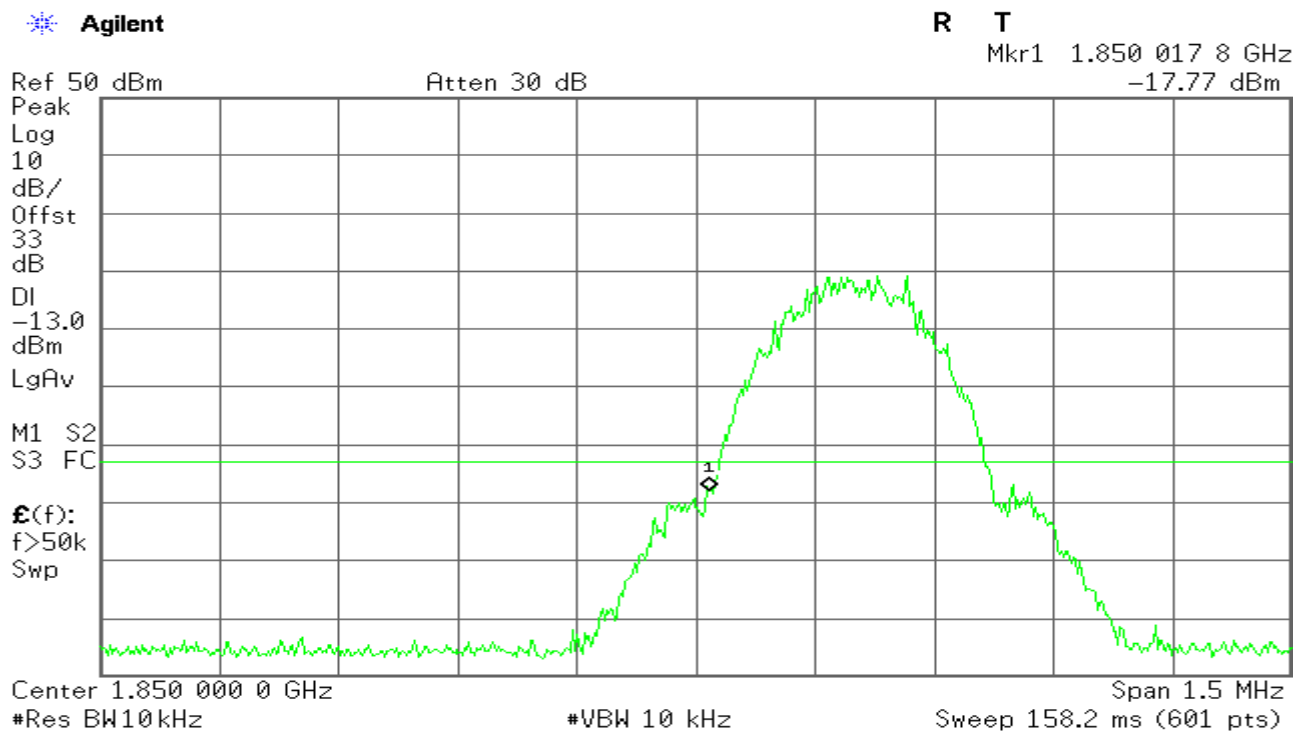
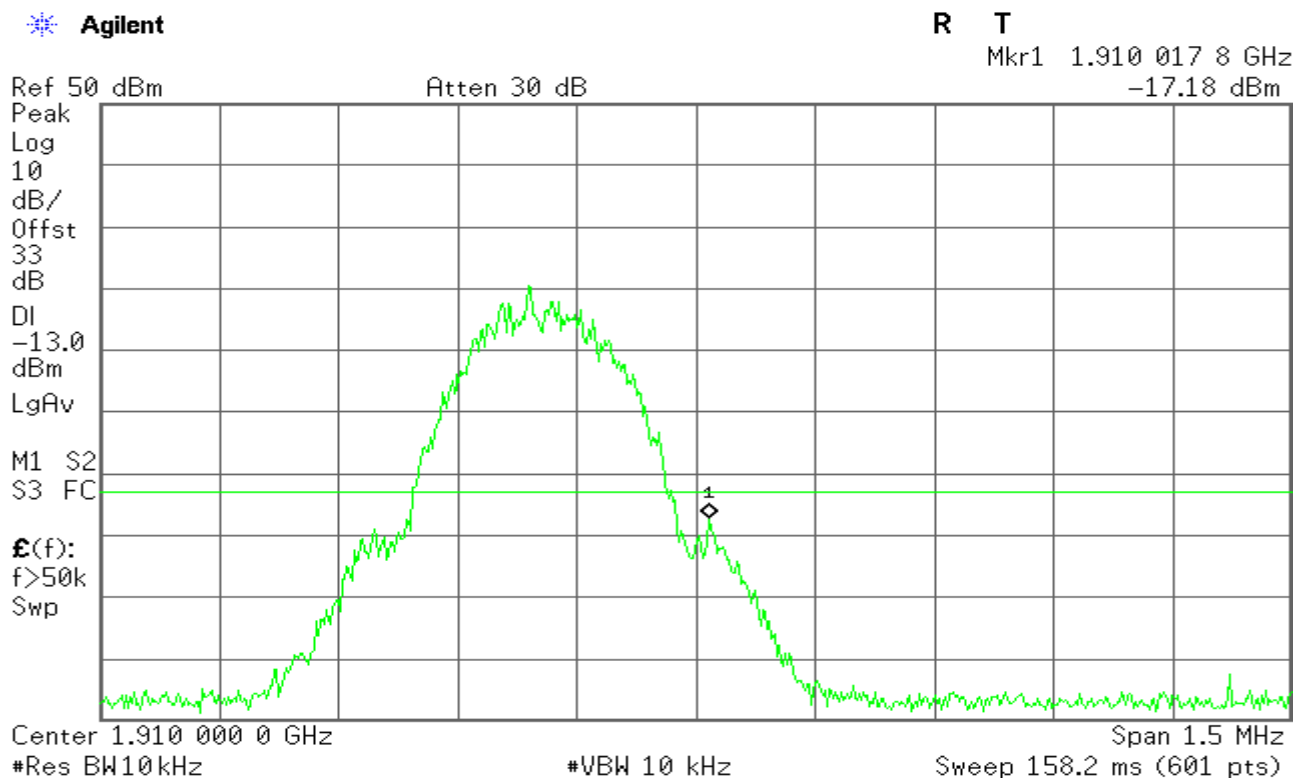


Figure 4-2: Band Edge emissions – GSM CH High





GPRS 850

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

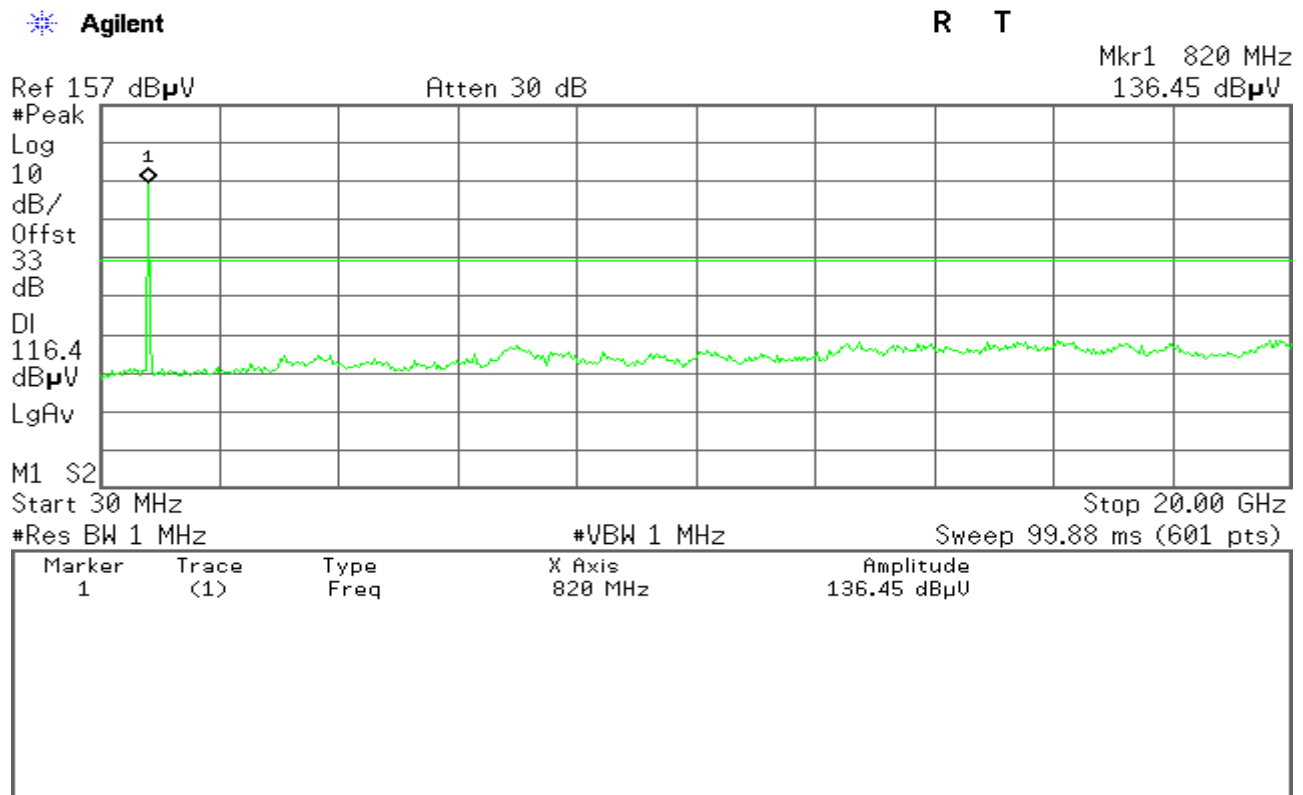


Figure 7-2: Out of Band emission at antenna terminals – GPRS CH Mid

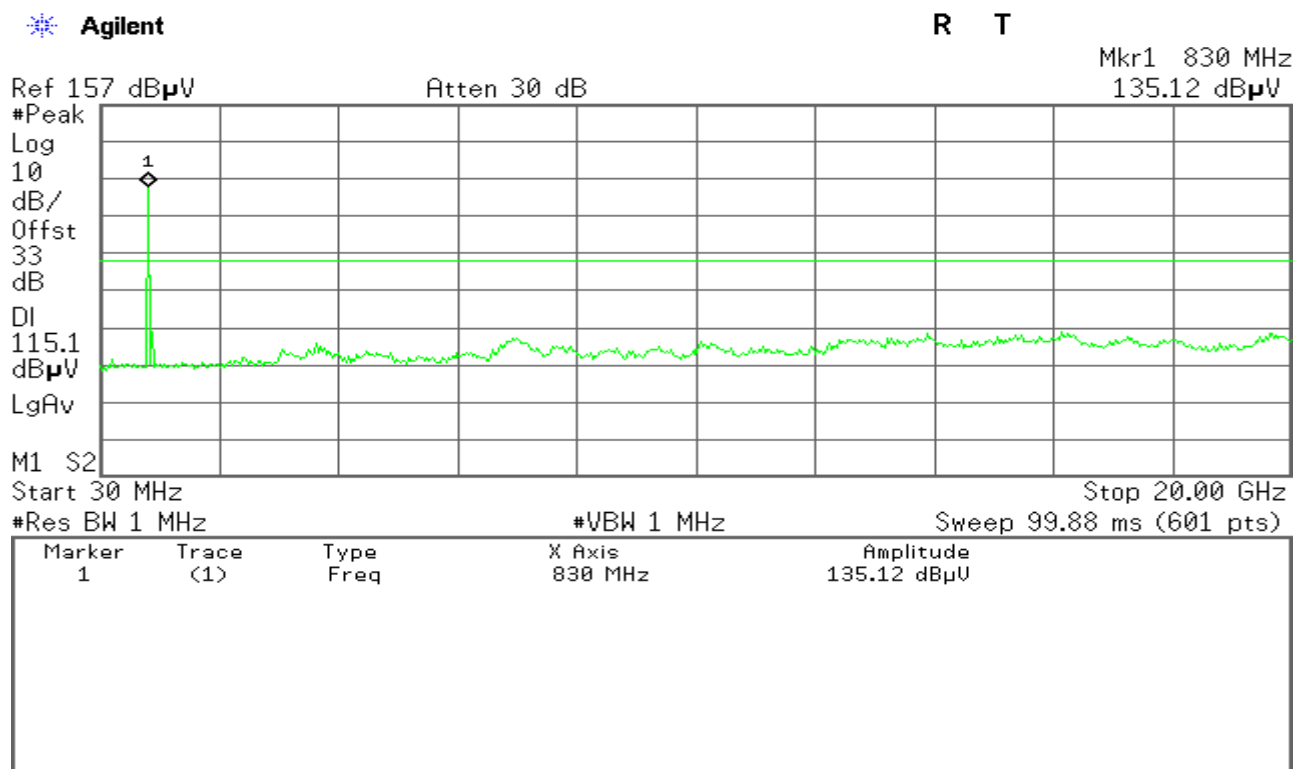
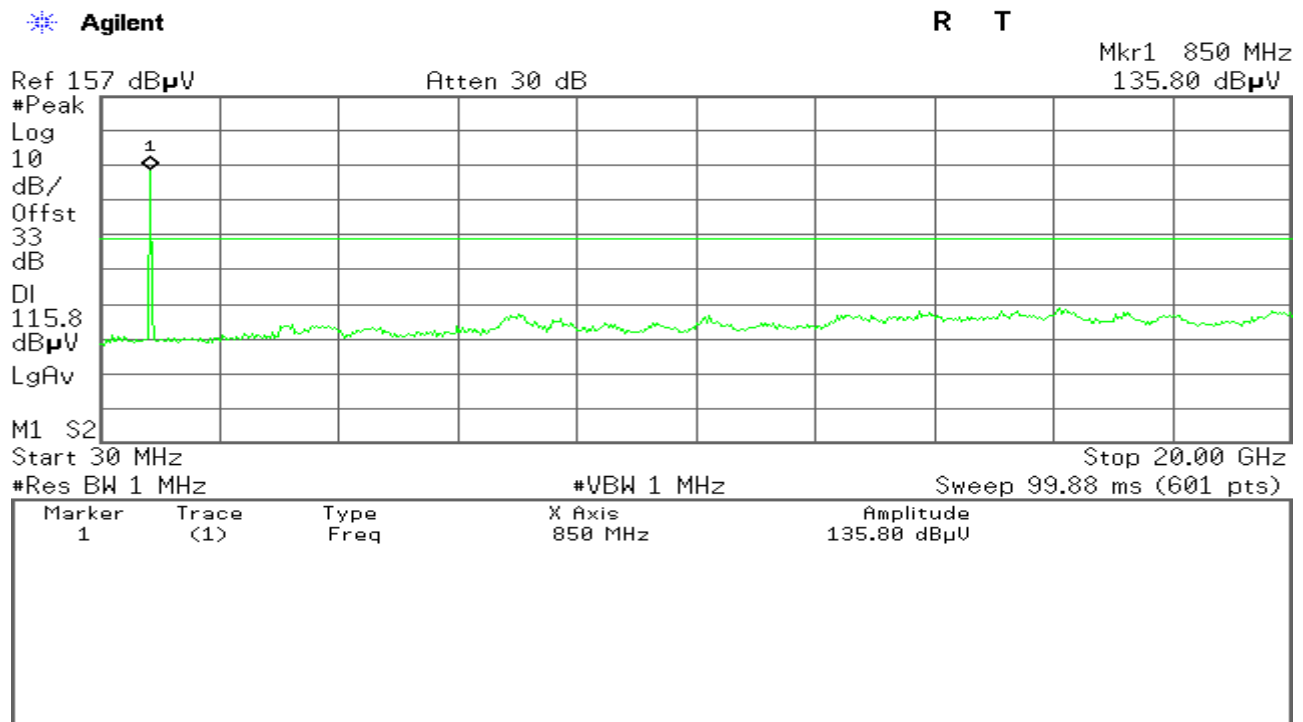




Figure 7-3: Out of Band emission at antenna terminals – GPRS CH High



GPRS 1900

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

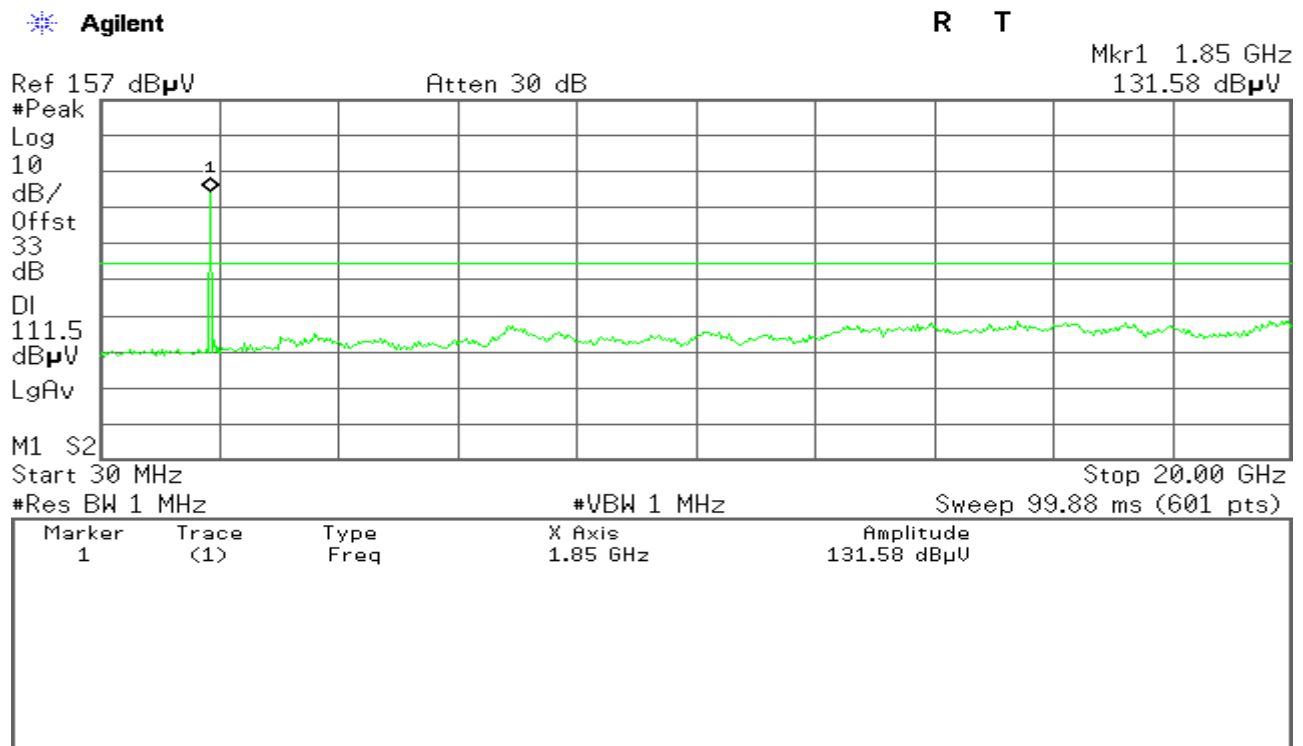




Figure 8-2: Out of Band emission at antenna terminals – GPRS CH Mid

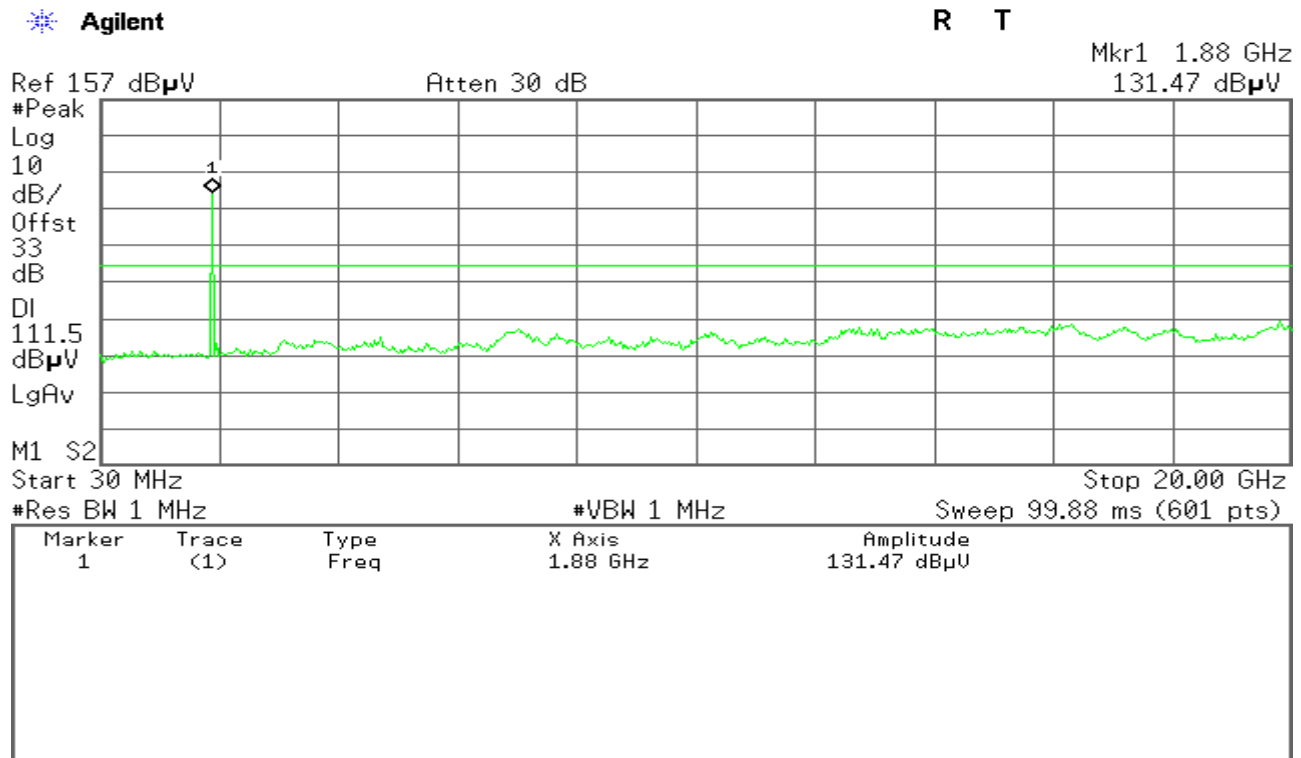
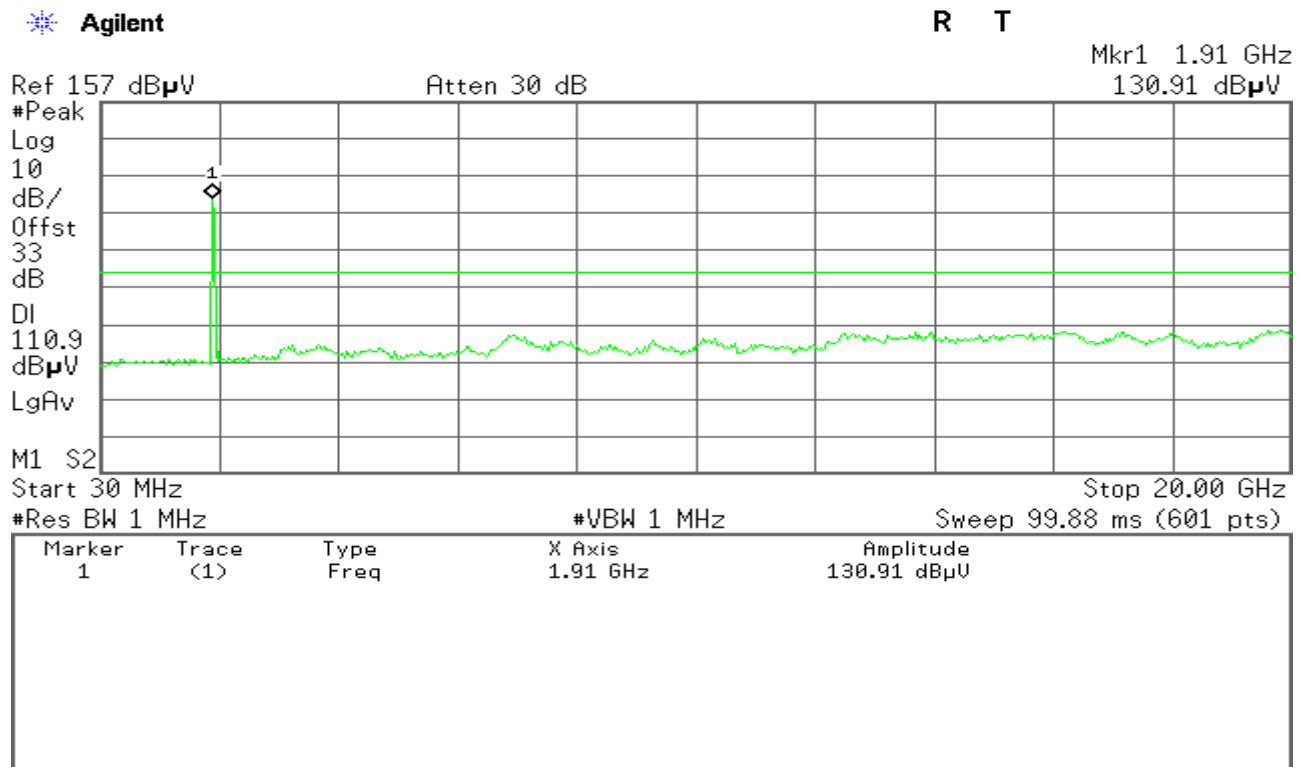


Figure 8-3: Out of Band emission at antenna terminals – GPRS CH High





GPRS 850

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

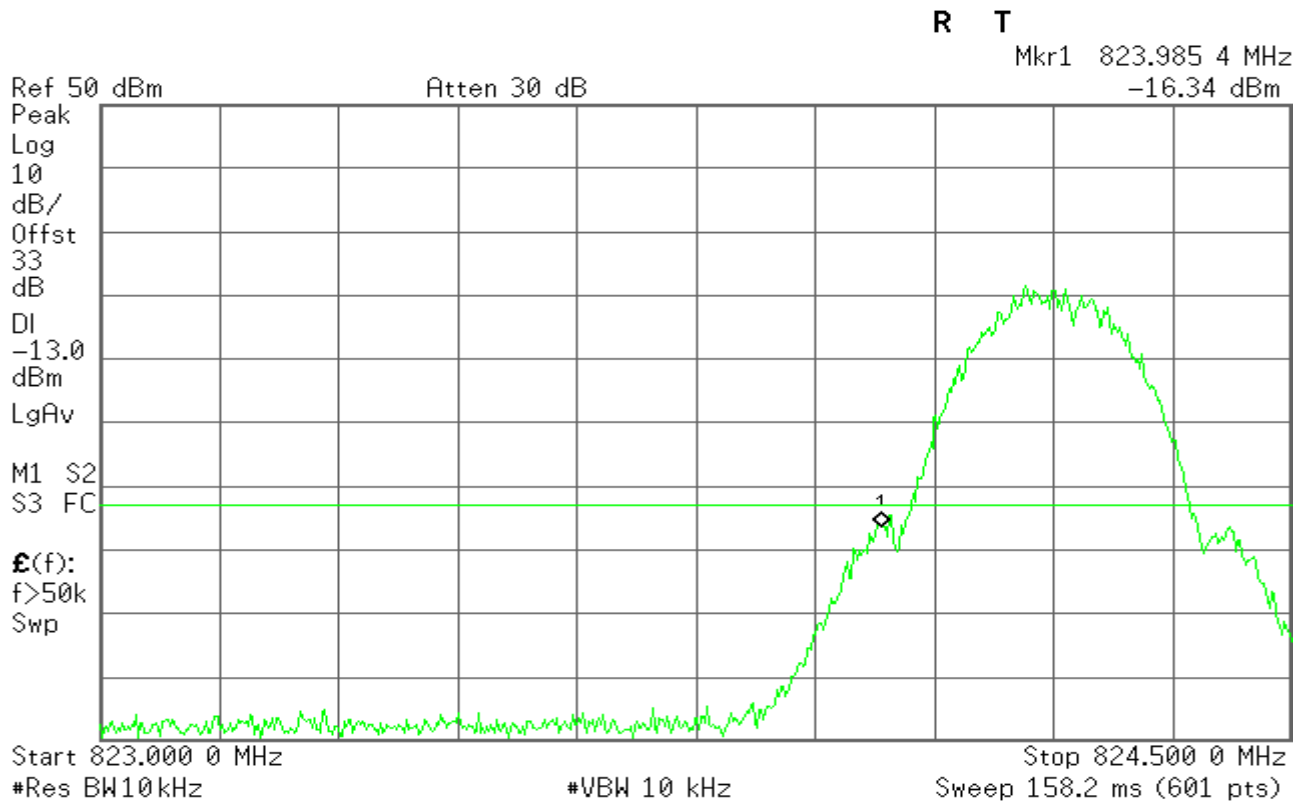
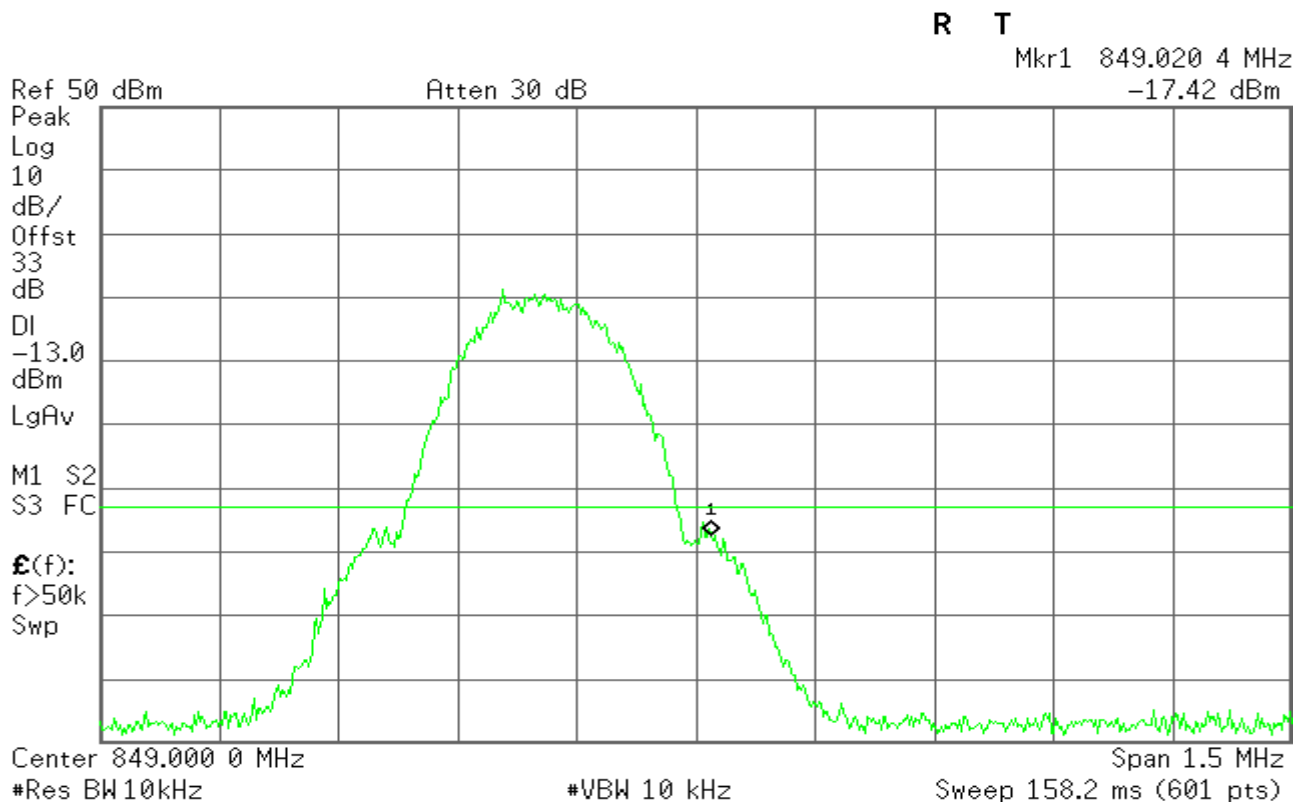


Figure 9-2: Band Edge emissions –GPRS CH High





GPRS 1900

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

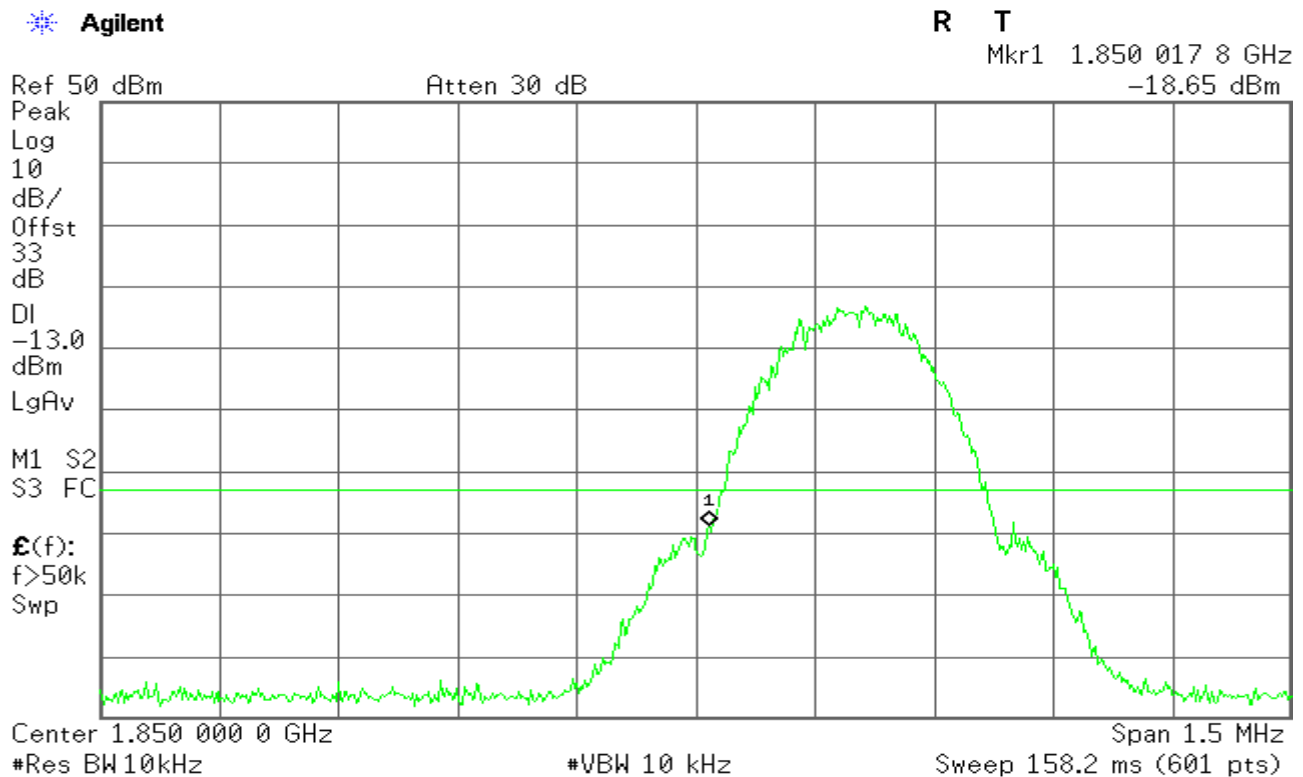
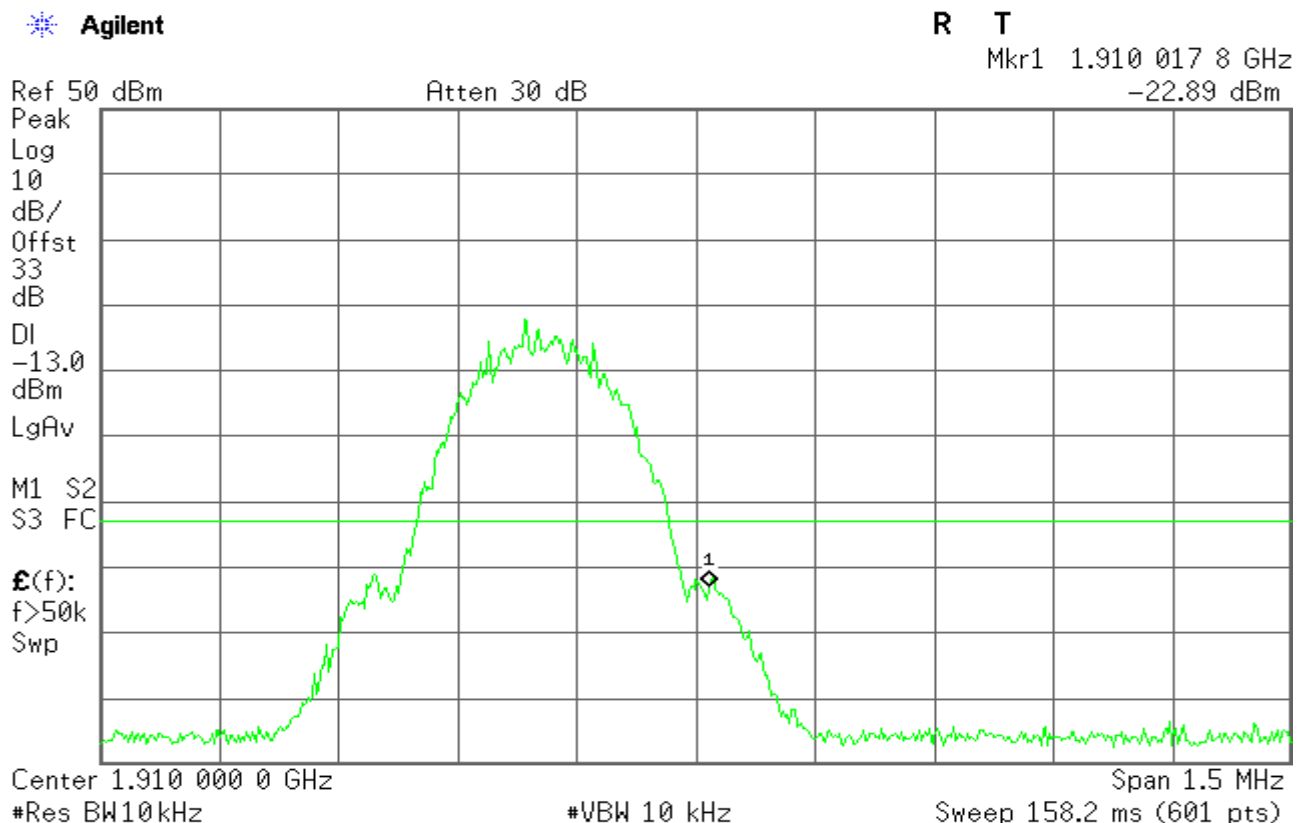


Figure 10-2: Band Edge emissions – GPRS CH High





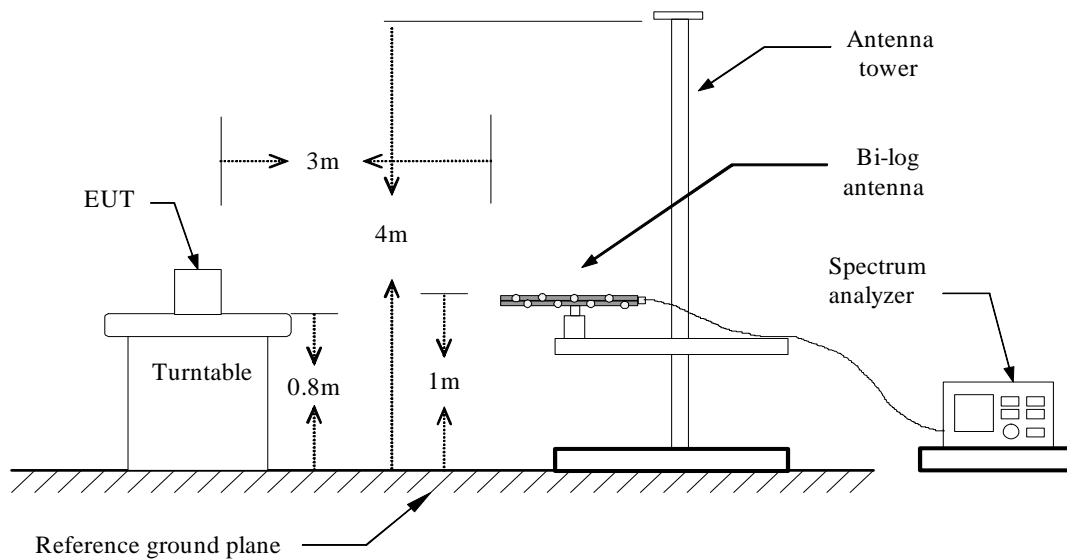
7.5. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

LIMIT

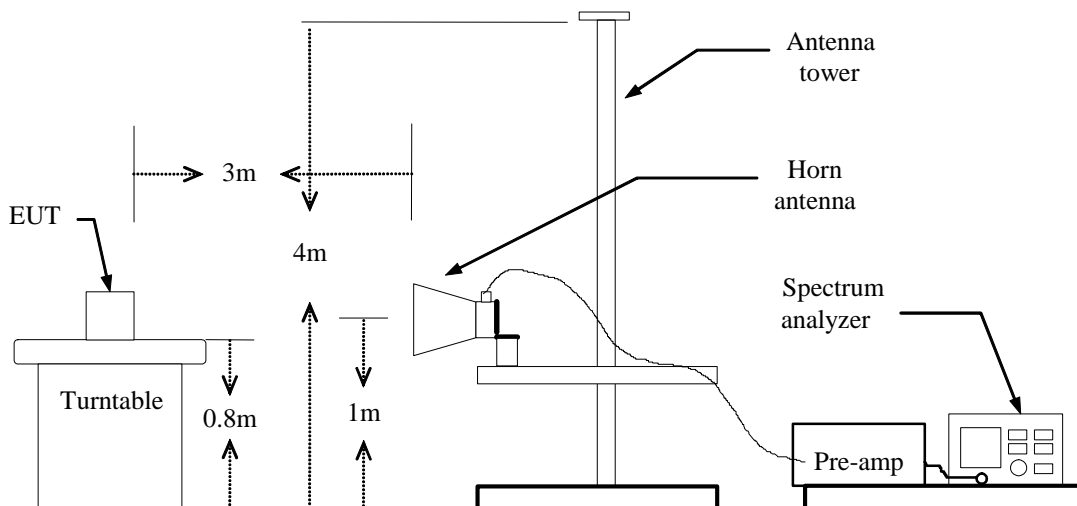
According to FCC §2.1053

TEST CONFIGURATION

Below 1 GHz

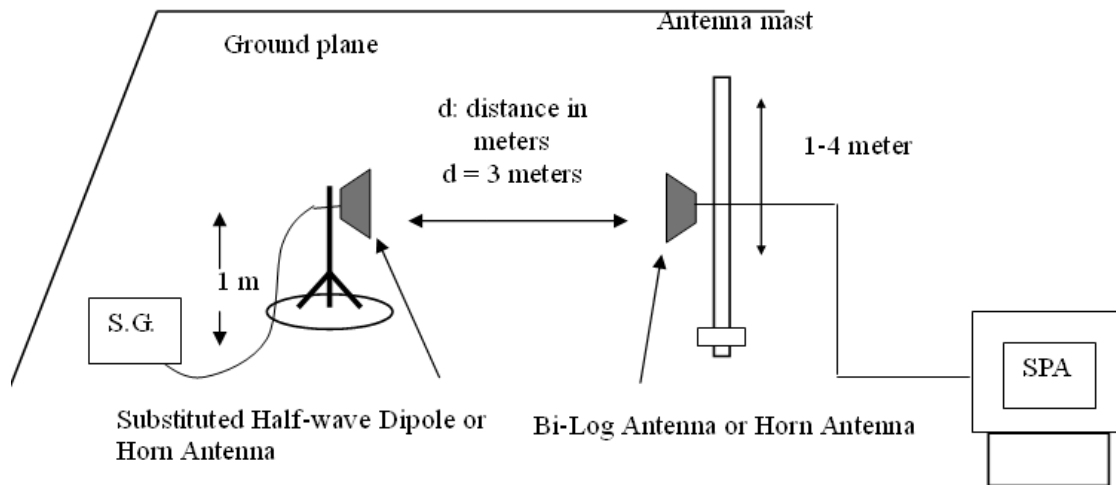


Above 1 GHz





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:	GPRS 850 / TX / CH 128	Test Date:	October 19,2012
Temperature:	23°C	Tested by:	Sean.Yu
Humidity:	51 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
65.46	V	-36.75	-10.70	-42.36	-13.00	-29.36
110.35	V	-41.14	-5.90	-52.36	-13.00	-39.36
156.35	V	-38.47	-8.85	-13.26	-13.00	-0.26
250.36	V	-37.25	-9.18	-46.43	-13.00	-33.43
255.36	V	-33.26	-9.44	-42.70	-13.00	-29.70
360.35	V	-35.26	-6.68	-41.94	-13.00	-28.94
35.25	H	-30.46	-16.87	-47.33	-13.00	-34.33
40.36	H	-36.23	-8.79	-45.02	-13.00	-32.02
600.12	H	-35.16	-8.95	-44.11	-13.00	-31.11
200.62	H	-34.26	-10.97	-45.23	-13.00	-32.23
300.46	H	-35.26	-9.01	-44.27	-13.00	-31.27
420.65	H	-42.35	-4.31	-46.66	-13.00	-33.66



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCCHANGE

Date of Issue : October 20, 2012

Operation Mode:	GPRS 850 / TX / CH 190	Test Date:	October 19,2012
Temperature:	23°C	Tested by:	Sean.Yu
Humidity:	51 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
61.33	V	-35.22	-10.70	-45.92	-13.00	-32.92
123.46	V	-42.74	-5.90	-48.64	-13.00	-35.64
185.85	V	-39.24	-8.85	-48.09	-13.00	-35.09
269.45	V	-36.25	-9.18	-45.43	-13.00	-32.43
291.59	V	-35.41	-9.44	-44.85	-13.00	-31.85
362.13	V	-36.47	-6.68	-43.15	-13.00	-30.15
31.26	H	-31.25	-16.87	-48.12	-13.00	-35.12
39.46	H	-36.12	-8.79	-44.91	-13.00	-31.91
130.29	H	-35.74	-8.95	-44.69	-13.00	-31.69
163.46	H	-36.24	-10.97	-47.21	-13.00	-34.21
295.85	H	-35.32	-9.01	-44.33	-13.00	-31.33
417.69	H	-43.51	-4.31	-47.82	-13.00	-34.82

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 850 / TX / CH 251	Test Date:	October 19,2012
Temperature:	23°C	Tested by:	Sean.Yu
Humidity:	51 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
165.35	V	-51.16	-13.84	-65.00	-13.00	-52.00
265.36	V	-47.26	-13.71	-60.97	-13.00	-47.97
400.63	V	-47.19	-11.17	-58.36	-13.00	-45.36
500.68	V	-54.25	-8.40	-62.65	-13.00	-49.65
695.68	V	-58.46	-6.25	-64.71	-13.00	-51.71
800.64	V	-60.29	-4.98	-65.27	-13.00	-52.27
115.26	H	-55.59	-13.90	-69.49	-13.00	-56.49
250.34	H	-48.46	-14.15	-62.61	-13.00	-49.61
300.65	H	-52.25	-14.06	-66.31	-13.00	-53.31
400.85	H	-51.46	-10.96	-62.42	-13.00	-49.42
498.46	H	-49.26	-8.28	-57.54	-13.00	-44.54
695.26	H	-57.46	-6.18	-63.64	-13.00	-50.64

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 1900 / TX / CH 512	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
134.46	V	-43.85	-12.75	-56.60	-13.00	-43.60
226.29	V	-40.42	-14.56	-54.98	-13.00	-41.98
400.36	V	-41.52	-11.22	-52.74	-13.00	-39.74
500.64	V	-49.15	-8.38	-57.53	-13.00	-44.53
697.69	V	-54.85	-6.25	-61.10	-13.00	-48.10
801.16	V	-52.46	-4.97	-57.43	-13.00	-44.43
102.56	H	-35.59	-16.71	-52.30	-13.00	-39.30
194.49	H	-42.75	-13.34	-56.09	-13.00	-43.09
400.52	H	-46.59	-10.96	-57.55	-13.00	-44.55
460.49	H	-51.46	-9.30	-60.76	-13.00	-47.76
724.58	H	-49.59	-6.03	-55.62	-13.00	-42.62
801.46	H	-55.45	-4.87	-60.32	-13.00	-47.32

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 1900 / TX / CH 661	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
42.35	V	-47.26	-12.36	-59.62	-13.00	-46.62
135.46	V	-43.46	-12.84	-56.30	-13.00	-43.30
228.59	V	-39.26	-14.56	-53.82	-13.00	-40.82
400.15	V	-41.49	-11.22	-52.71	-13.00	-39.71
500.59	V	-49.59	-8.38	-57.97	-13.00	-44.97
799.46	V	-51.52	-4.97	-56.49	-13.00	-43.49
117.59	H	-37.46	-13.90	-51.36	-13.00	-38.36
191.59	H	-42.59	-13.48	-56.07	-13.00	-43.07
400.46	H	-46.59	-10.87	-57.46	-13.00	-44.46
501.59	H	-53.49	-8.27	-61.76	-13.00	-48.76
721.46	H	-54.75	-6.14	-60.89	-13.00	-47.89
800.59	H	-55.56	-4.88	-60.44	-13.00	-47.44

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 1900 / TX / CH 810	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
135.69	V	-41.25	-12.84	-54.09	-13.00	-41.09
205.46	V	-41.24	-14.98	-56.22	-13.00	-43.22
401.59	V	-41.62	-11.17	-52.79	-13.00	-39.79
500.46	V	-49.64	-8.38	-58.02	-13.00	-45.02
695.59	V	-55.85	-6.25	-62.10	-13.00	-49.10
801.16	V	52.56	-4.92	47.64	-13.00	60.64
116.59	H	-38.59	-14.09	-52.68	-13.00	-39.68
194.59	H	-42.16	-13.34	-55.50	-13.00	-42.50
400.46	H	-46.59	-10.96	-57.55	-13.00	-44.55
500.26	H	-53.16	-8.27	-61.43	-13.00	-48.43
698.59	H	-52.75	-6.18	-58.93	-13.00	-45.93
799.56	H	-54.16	-4.89	-59.05	-13.00	-46.05

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.



Radiated Spurious Emission Measurement Result / Above 1GHz

Operation Mode:	GPRS 850 / TX / CH 128	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1678.60	V	-52.46	0.73	-51.73	-13.00	-38.73
6955.60	V	-53.35	13.76	-39.59	-13.00	-26.59
1678.63	H	-54.16	0.84	-53.32	-13.00	-40.32
6673.42	H	-59.26	12.80	-46.46	-13.00	-33.46

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 850 / TX / CH 190	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1678.46	V	-50.26	0.73	-49.53	-13.00	-36.53
6950.29	V	-55.79	13.76	-42.03	-13.00	-29.03
1675.46	H	-55.26	0.84	-54.42	-13.00	-41.42
6675.25	H	-61.49	12.80	-48.69	-13.00	-35.69

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 850 / TX / CH 251	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1398.46	V	-58.62	0.05	-58.57	-13.00	-45.57
5688.46	V	-60.16	9.95	-50.21	-13.00	-37.21
1395.59	H	-52.26	0.90	-51.36	-13.00	-38.36
5241.49	H	-60.46	10.22	-50.24	-13.00	-37.24

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 1900 / TX / CH 512	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
5395.49	V	-55.46	9.86	-45.60	-13.00	-32.60
7133.59	V	-55.59	14.34	-41.25	-13.00	-28.25
5437.46	H	-51.59	10.24	-41.35	-13.00	-28.35
7621.59	H	-52.46	16.14	-36.32	-13.00	-23.32

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 1900 / TX / CH 661	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
5640.59	V	-58.46	9.94	-48.52	-13.00	-35.52
7348.46	V	-61.95	14.97	-46.98	-13.00	-33.98
5640.59	H	-52.65	10.28	-42.37	-13.00	-29.37
8012.46	H	-61.46	13.34	-48.12	-13.00	-35.12

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.



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPATOCHANGEL

Date of Issue : October 20, 2012

Operation Mode:	GPRS 1900 / TX / CH 810	Test Date:	October 19,2012
Temperature:	21°C	Tested by:	Sean.Yu
Humidity:	53 % RH	Polarity:	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
4761.46	V	-61.65	8.99	-52.66	-13.00	-39.66
7075.25	V	-60.35	14.17	-46.18	-13.00	-33.18
5192.46	H	-50.35	10.22	-40.13	-13.00	-27.13
7033.25	H	-55.35	14.23	-41.12	-13.00	-28.12

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.



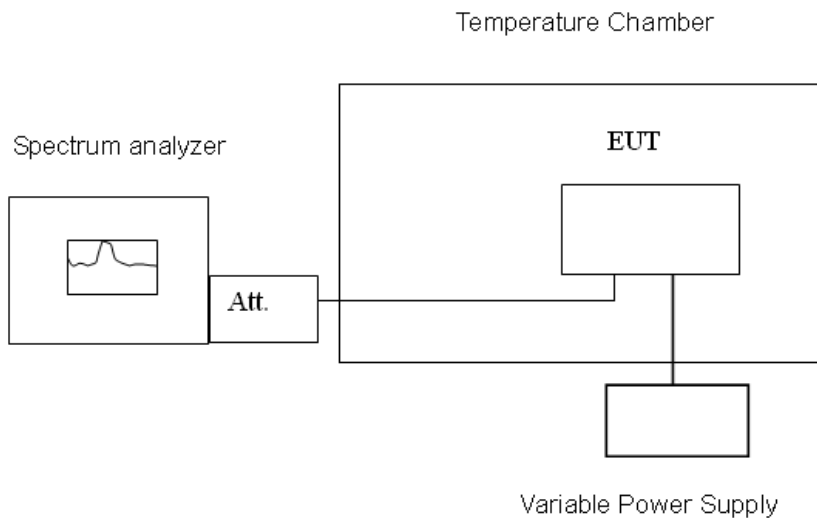
7.6. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

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 = 2091.5 Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	45	836600027	27	2091.5
	40	836600031	31	
	30	836600023	23	
	20	836599985	15	
	10	836600026	26	
	0	836600027	27	
	-5	836600036	36	
	-10	836600038	38	

Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700 Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	45	1879999983	-17	4700
	40	1879999983	-17	
	30	1879999979	-21	
	20	1880000015	15	
	10	1879999991	-9	
	0	1879999977	-23	
	-5	1879999982	-18	
	-10	1879999986	-14	

Reference Frequency: GPRS Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2090 Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	45	83660018	18	2090
	40	83660020	20	
	30	83660024	20	
	20	83659985	15	
	10	83660014	14	
	0	83660017	17	
	-5	83660010	10	
	-10	83660023	23	



Compliance Certification Services Inc.

Report No : KS121016A03-RP1

FCC ID: PPAT0CHANGEL

Date of Issue : October 20, 2012

Reference Frequency: GPRS Mid Channel 1880 MHz @ 20°C

Limit: ± 2.5 ppm = 4700 Hz

Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	45	1880000050	50	4700
	40	1880000047	47	
	30	1880000051	51	
	20	1879999954	46	
	10	1880000045	45	
	0	1880000052	52	
	-5	1880000047	47	
	-10	1880000051	51	

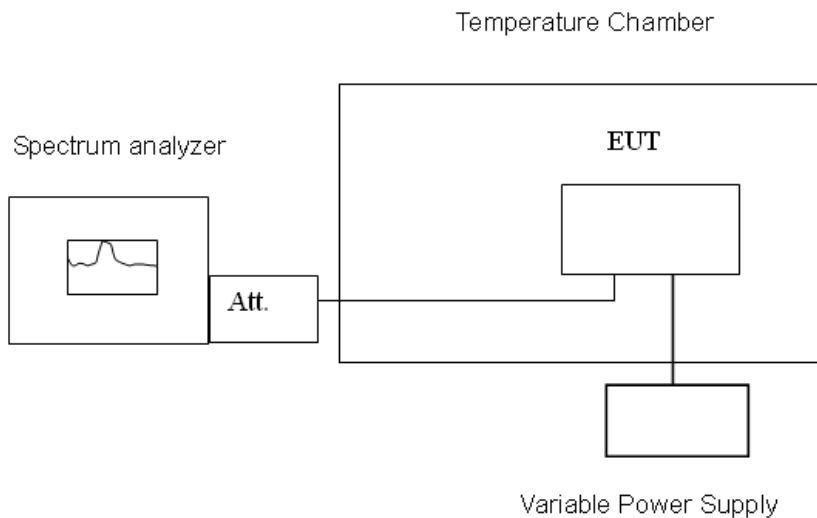


7.7. REQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235,

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 ($\pm 10\%$) and endpoint, record the maximum frequency change.



TEST RESULTS

No non-compliance noted.

Reference Frequency: GPRS Mid Channel 836.6 MHz @ 20°C

Limit: ± 2.5 ppm = 2090Hz

Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	83599987	2	2090
3.7		83599985	0	
3.6 end		83599982	-3	

Reference Frequency: GPRS Mid Channel 1880 MHz @ 20°C

Limit: ± 2.5 ppm = 4700 Hz

Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	1879999950	-50	4700
3.7		1879999954	46	
3.6 end		1879999951	-49	



7.8. POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

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 I 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.

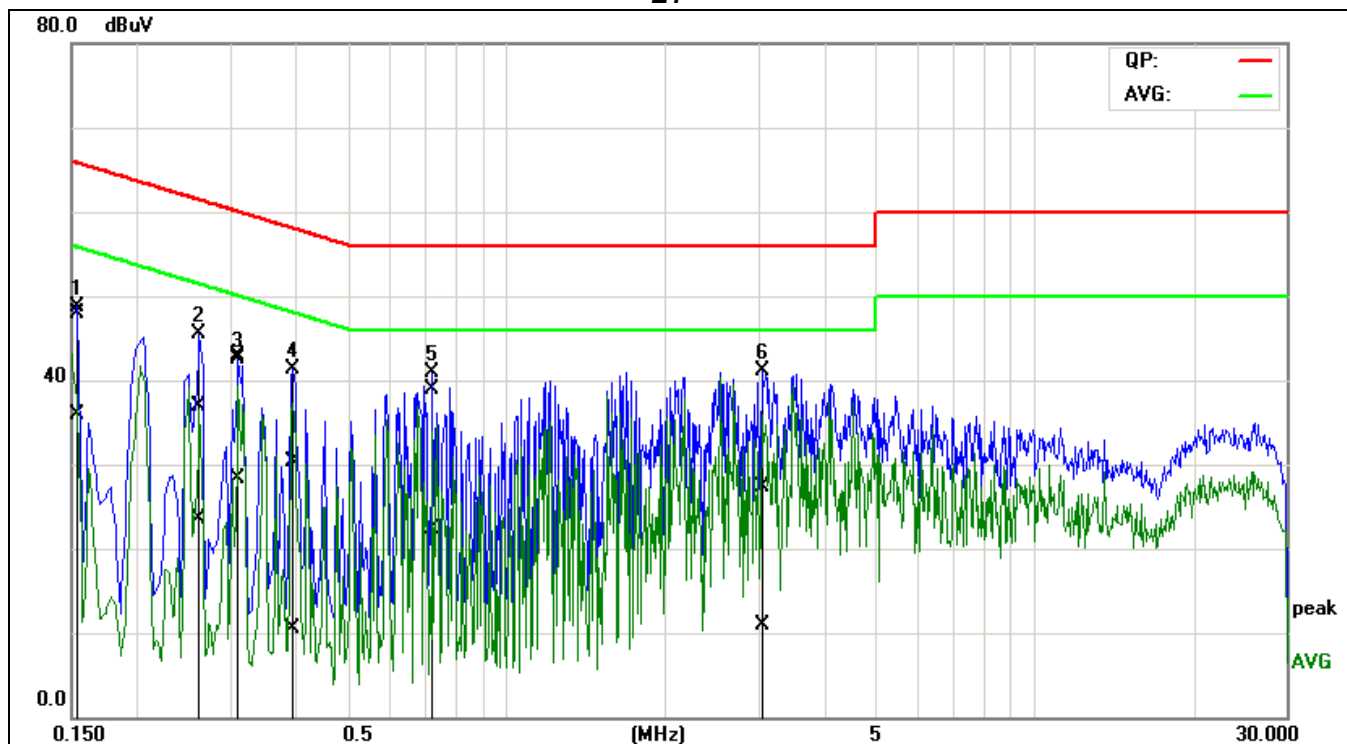


TEST RESULTS

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:	October 19,2012
Temperature:	23°C	Tested by:	Sean.Yu
Humidity:	50% RH		

L1



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1511	37.75	25.58	10.25	48.00	35.83	65.94	55.94	-17.94	-20.11	Pass
2	0.2640	26.58	13.18	10.24	36.82	23.42	61.30	51.30	-24.48	-27.88	Pass
3*	0.3122	32.56	18.03	10.29	42.85	28.32	59.91	49.91	-17.06	-21.59	Pass
4	0.3925	20.10	0.22	10.30	30.40	10.52	58.01	48.01	-27.61	-37.49	Pass
5	0.7247	28.61	12.01	10.29	38.90	22.30	56.00	46.00	-17.10	-23.70	Pass
6	3.0059	17.09	0.67	10.29	27.38	10.96	56.00	46.00	-28.62	-35.04	Pass

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)

"-" means Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary



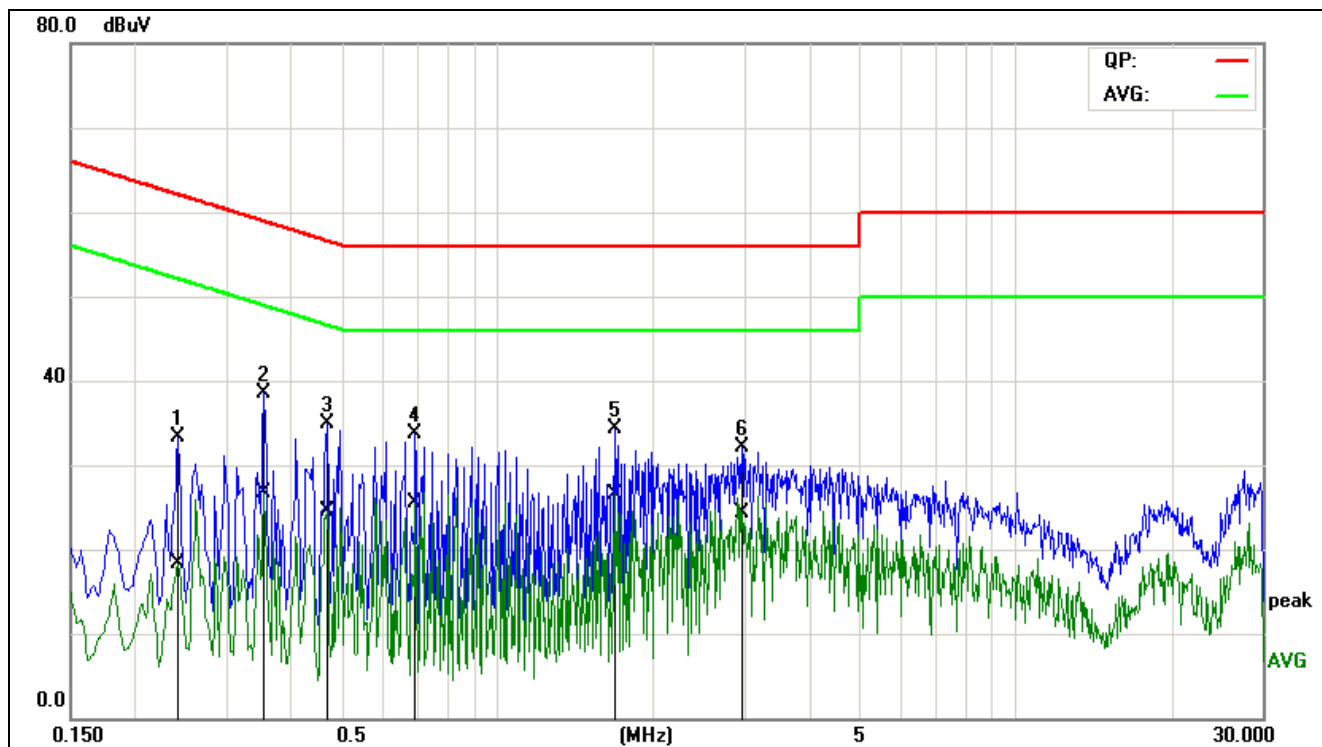
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L2



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2420	22.91	7.97	10.38	33.29	18.35	62.03	52.03	-28.74	-33.68	Pass
2	0.3540	28.04	16.05	10.56	38.60	26.61	58.87	48.87	-20.27	-22.26	Pass
3	0.4700	24.09	13.77	10.73	34.82	24.50	56.51	46.51	-21.69	-22.01	Pass
4	0.6940	22.95	14.64	10.81	33.76	25.45	56.00	46.00	-22.24	-20.55	Pass
5*	1.6860	23.43	15.50	10.91	34.34	26.41	56.00	46.00	-21.66	-19.59	Pass
6	2.9740	21.06	13.45	10.95	32.01	24.40	56.00	46.00	-23.99	-21.60	Pass

Remark:

- Measuring frequencies from 0.15 MHz to 30MHz.
- The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
- 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;
- L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

"-" means Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary

END OF REPORT