

Report No.: SZ13050128W01



# FCC PART 22&24 TEST REPORT

Issued to

Launch Tech Co., Ltd.

For

RCU

Model Name: RCU-G  
Trade Name: LAUNCH  
Brand Name: LAUNCH  
FCC ID: XUJRCUG  
Standard: 47 CFR Part 22 Subpart H  
47 CFR Part 24 Subpart E  
Test date: 2013-6-20 to 2013-6-28  
Issue date: 2013-7-9

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Date

2013.07.09



CTIA Authorized Test Lab

IEEE 1725

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Change History		
Issue	Date	Reason for change
1.0	Jul 9, 2013	First edition

## 1. GENERAL INFORMATION

### 1.1 EUT Description

EUT Type .....: RCU  
Serial No.....: (n.a, marked #1 by test site)  
Hardware Version .....: V1.00.003  
Software Version .....: V1.00.001  
Applicant .....: Launch Tech Co., Ltd.  
Launch Industrial Park, North of Wuhe Rd., Banxuegang,  
Longgang, Shenzhen, China  
Manufacturer .....: Launch Tech Co., Ltd.  
Launch Industrial Park, North of Wuhe Rd., Banxuegang,  
Longgang, Shenzhen, China  
Frequency Range .....: GSM 850MHz:  
Tx: 824.20 - 848.80MHz (at intervals of 200kHz);  
Rx: 869.20 - 893.80MHz (at intervals of 200kHz)  
GSM 1900MHz:  
Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);  
Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)  
Modulation Type.....: GPRS Mode with GMSK Modulation  
Multislot Class.....: GPRS: Multislot Class10  
Antenna Type.....: PIFA Antenna  
Emission Designators .....: GPRS850:255KGXW,GPRS 1900:246KGXW

*Note 1:* The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula  $F(n)=824.2+0.2*(n-128)$ ,  $128 \leq n \leq 251$ ; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).

*Note 2:* The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula  $F(n)=1850.2+0.2*(n-512)$ ,  $512 \leq n \leq 810$ ; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).

*Note 3:* For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and Part 24 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-12 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-12 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-12 Edition)	Personal Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	2.1046	Conducted RF Output Power	PASS
2.	24.232(d) ,	Peak to average radio	PASS
2	2.1049,22.917 24.238,	99% Occupied Bandwidth	PASS
3	2.1055,22.355 24.235,	Frequency Stability	PASS
4	2.1051,2.1057 22.917,24.238,	Conducted Out of Band Emissions	PASS
5	2.1051,2.1057 22.917,24.238	Band Edge	PASS
6	22.913,24.232	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053,2.1057 22.917,24.238	Radiated Out of Band Emissions	PASS

NOTE: Measurement method according to TIA/EIA 603.D-2010

### 1.3 Facilities and Accreditations

#### 1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, No.8 LongChang Road,Block 67, BaoAn District, ShenZhen, GuangDong Province,P. R. China 518101. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 695796.

#### 1.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 -106

## 2. 47 CFR PART 2, PART 22H & 24E REQUIREMENTS

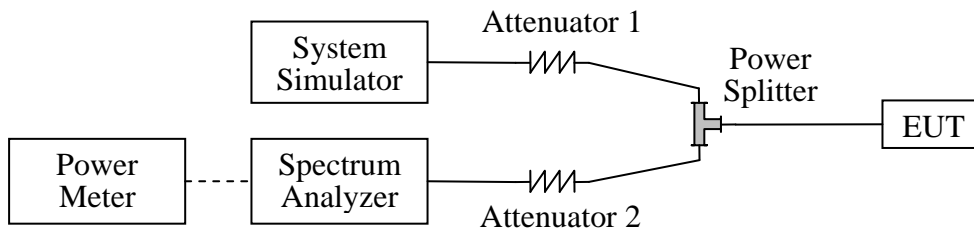
### 2.1 Conducted RF Output Power

#### 2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

#### 2.1.2 Test Description

##### 1. Test Setup:



The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

The Power Meter was just used for the Conducted RF Output Power test of WCDMA Model.

##### 2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2012.05	2014.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2014.05
Power Meter	Agilent	E4418B	GB43318055	2012.05	2014.05
Power Sensor	Agilent	8482A	MY41091706	2012.05	2014.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2014.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2014.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2014.05

### 2.1.3 Test Results

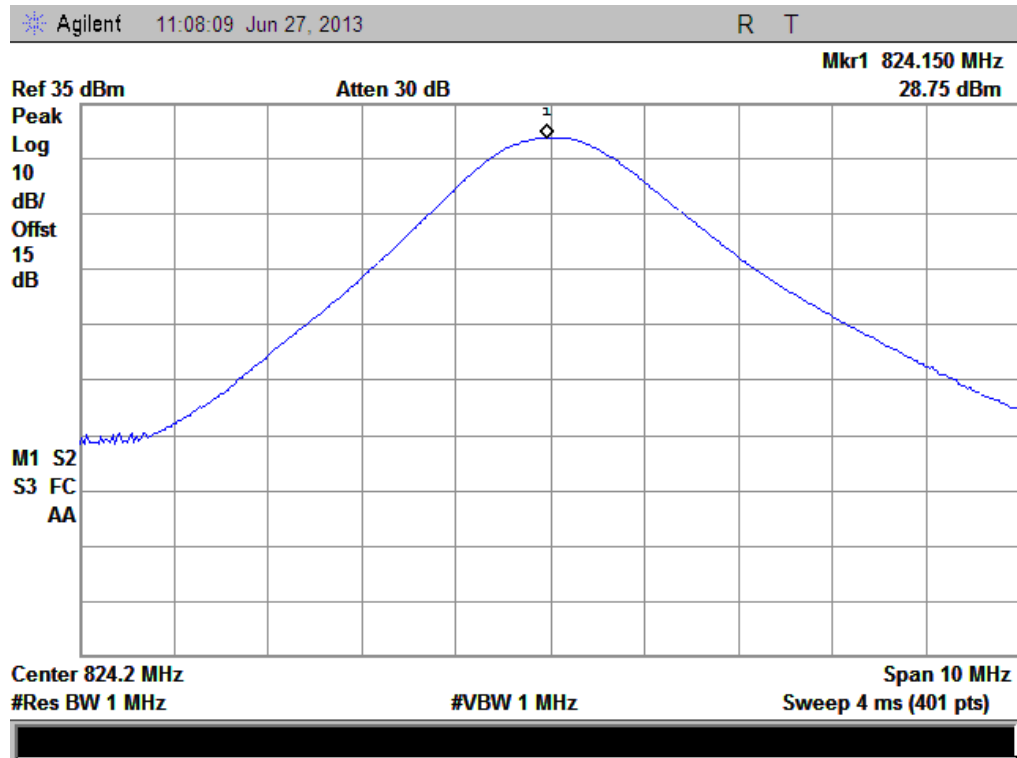
Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

#### 1. GSM Model Test Verdict:

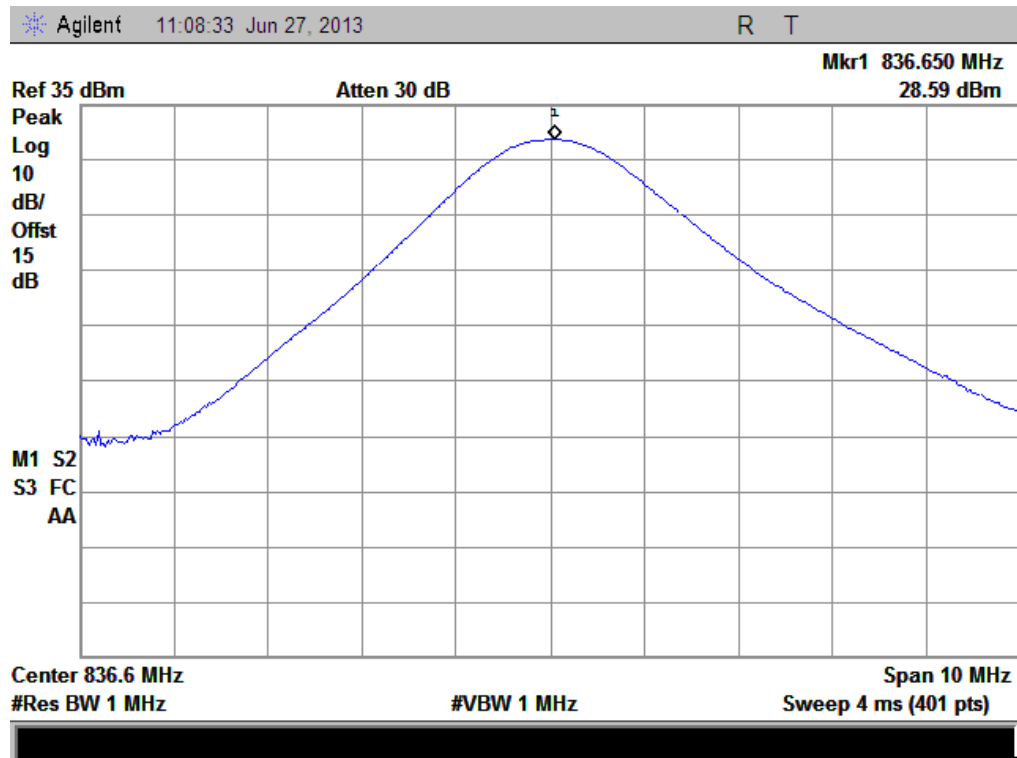
Band	Channel	Frequency (MHz)	Measured Output Power		Limit	Verdict
			dBm	Refer to Plot	dBm	
GPRS 850MHz	128	824.2	28.75	Plot A1 to A3	35	PASS
	190	836.6	28.59			PASS
	251	848.8	28.17			PASS
GPRS 1900MHz	512	1850.2	30.44	Plot B1 to B3	32	PASS
	661	1880.0	30.59			PASS
	810	1909.8	29.54			PASS

Note 1: For the GPRS model, all the slots were tested and just the worst data was record in this report.

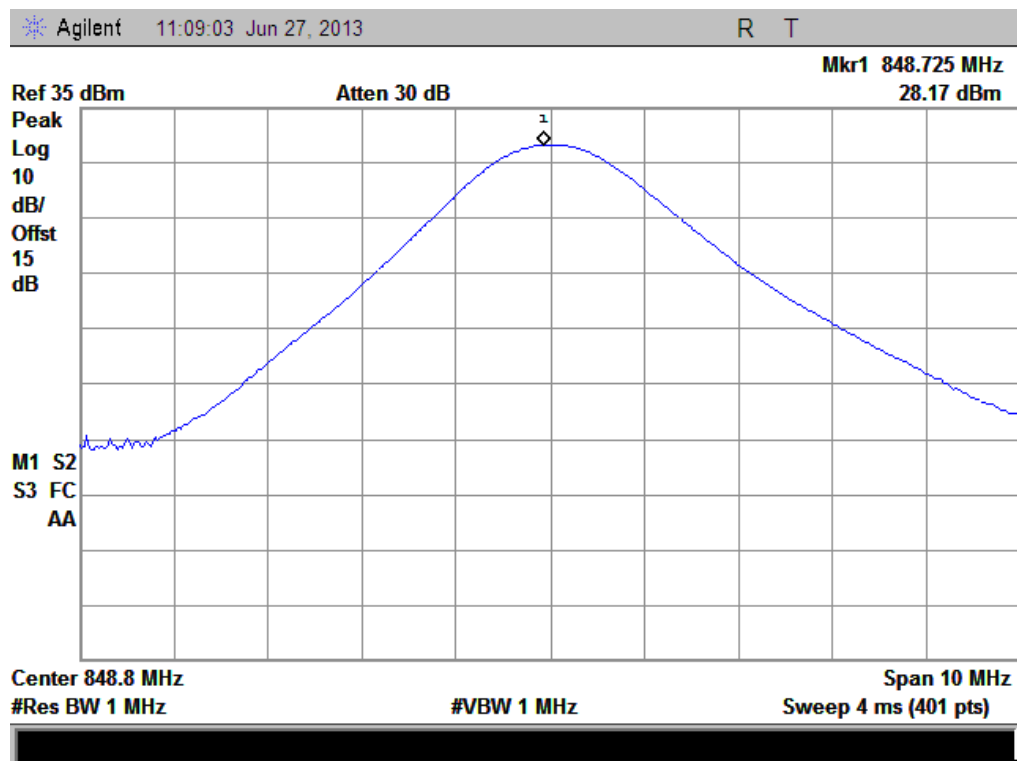
## 2. GPRS Model Test Plots:



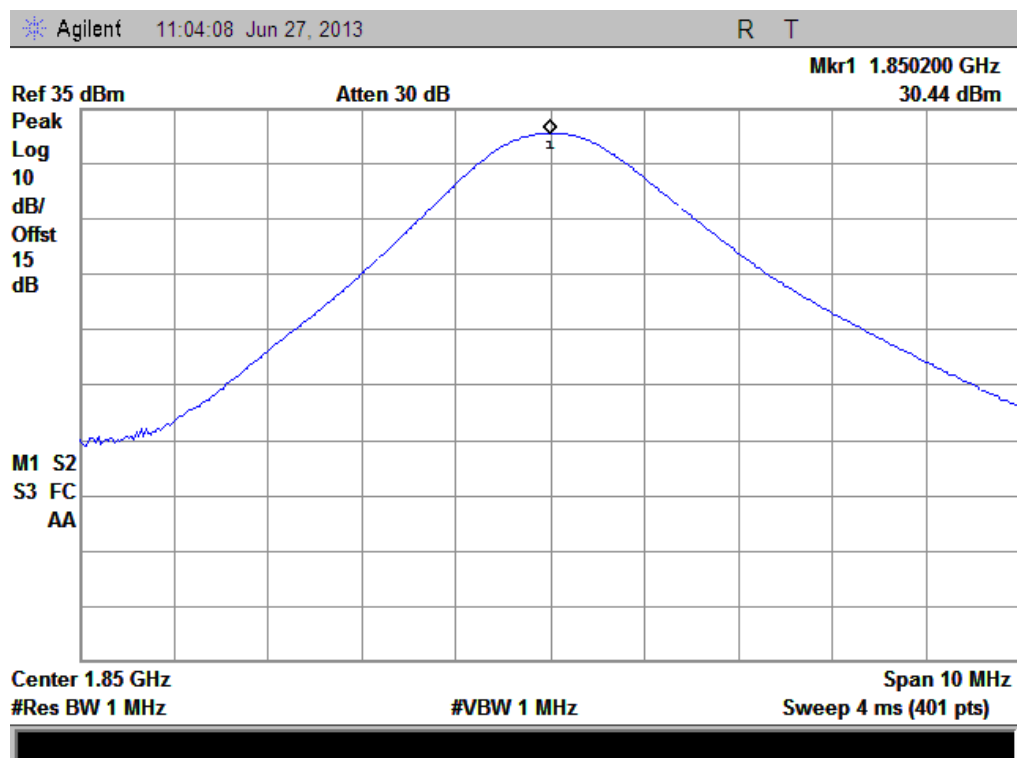
(Plot A1: GORS 850MHz Channel = 128)



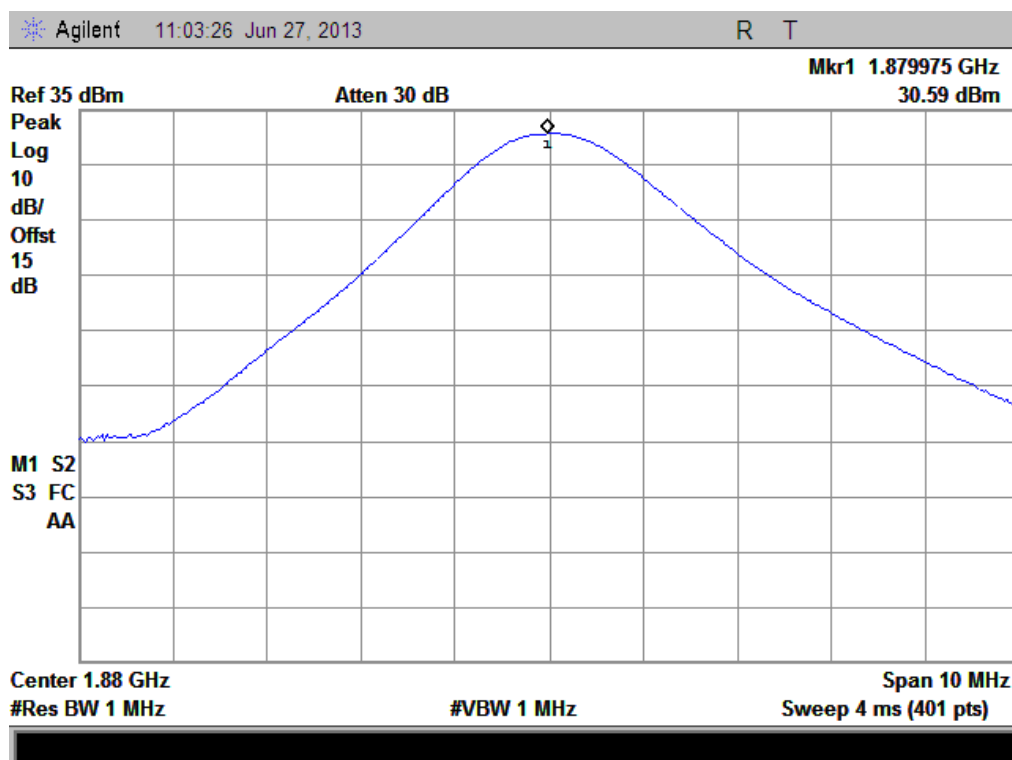
(Plot A2: GPRS 850MHz Channel = 190)



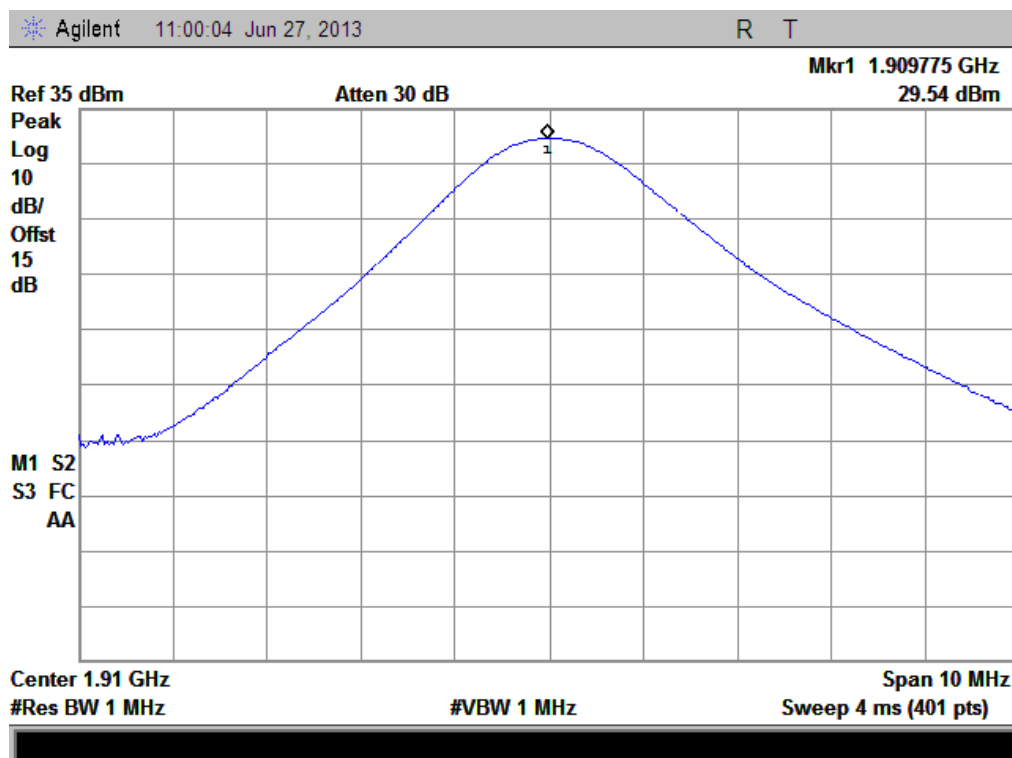
(Plot A3: GPRS 850MHz Channel = 251)



(Plot B1: GPRS 1900MHz Channel = 512)



(Plot B2: GPRS 1900MHz Channel = 661)



(Plot B3: GPRS 1900Hz Channel = 810)

## 2.2 Peak to Average Ratio

### 2.2.1 Definition

According to FCC section 2.1049 and FCC 24.232(d), the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 2.2.2 Test Description

See section 2.1.2 of this report.

### 2.2.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

Test procedures:

A .For GSM/EGPRS operating mode:

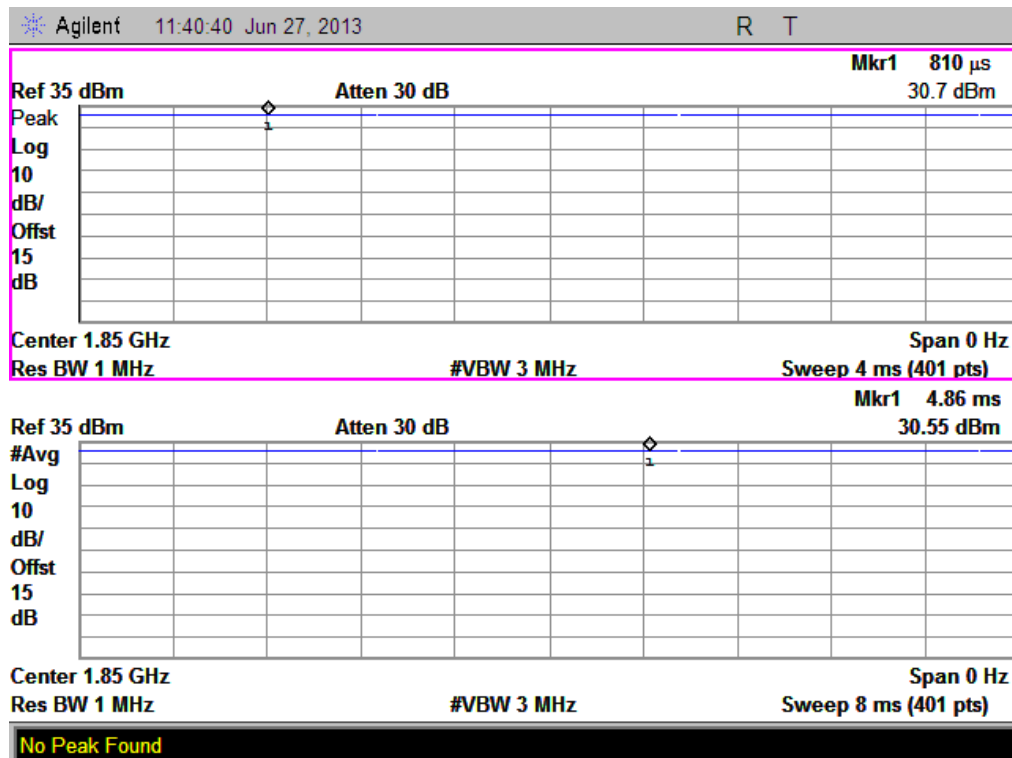
- Set RBW=1MHz, VBW=1MHz, peak detector in spectrum analyzer.
- Set EUT in maximum output power, and triggered the bust signal.
- Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.

B. For UMTS operating mode:

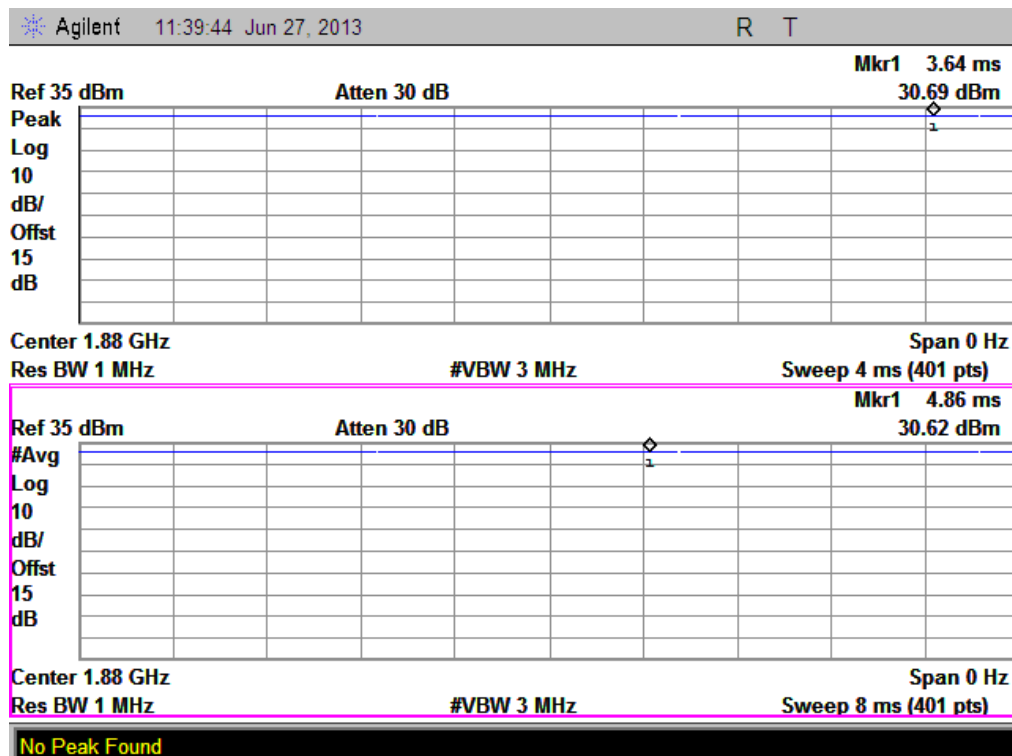
- Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

1. Test Verdict:

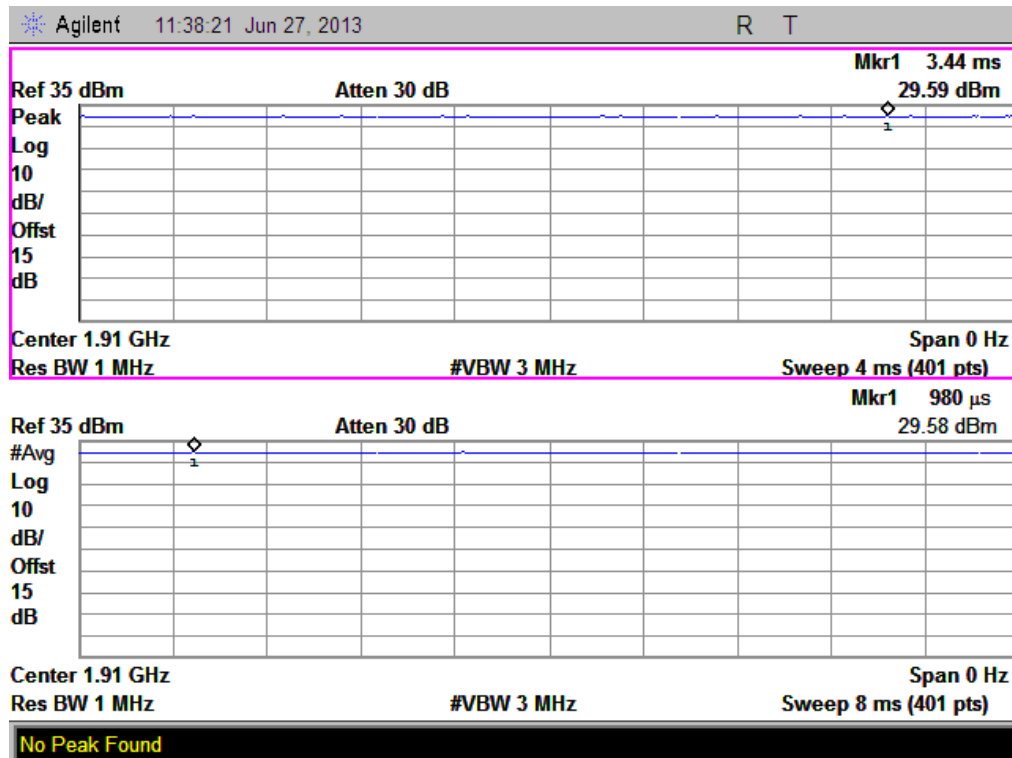
Band	Channel	Frequency (MHz)	Peak to Average ratio		Limit	Verdict
			dBm	Refer to Plot	dBm	
GPRS 1900MHz	512	1850.2	0.15	Plot A1 to A3	13	PASS
	661	1880.0	0.07			PASS
	810	1909.8	0.01			PASS



(Plot A1: GPRS 1900 MHz Channel = 512)



(Plot A2: GPRS 1900 MHz Channel = 661)



(Plot A3: GPRS 1900MHz Channel = 810)

## 2.3 99% Occupied Bandwidth

### 2.3.1 Definition

According to FCC section 2.1049 and FCC § 22.917 & 24.238 and 27.53(g), the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth,

### 2.3.2 Test Description

See section 2.1.2 of this report.

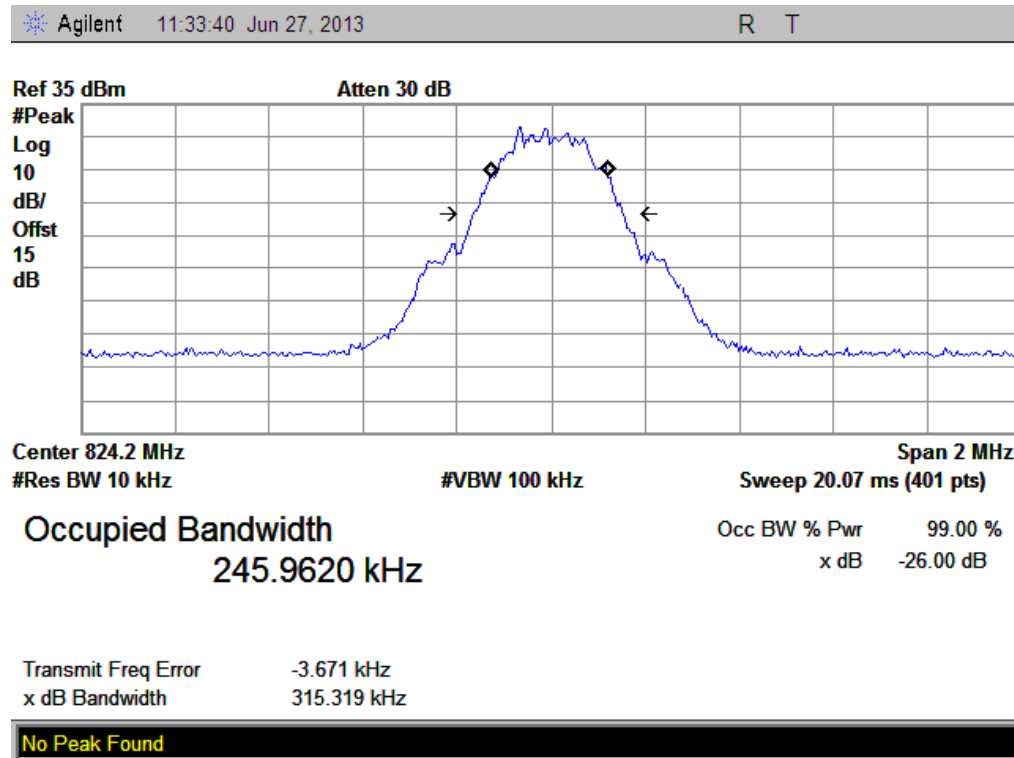
### 2.3.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

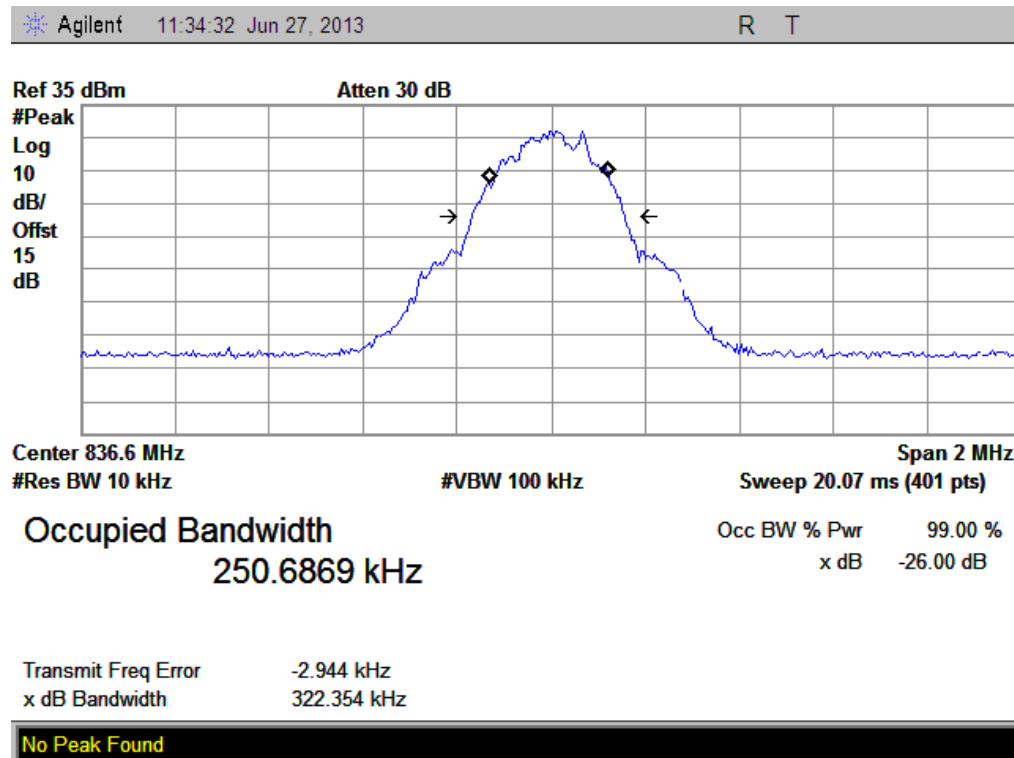
#### 2. Test Verdict:

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
GPRS 850MHz	128	824.2	315.319 KHz	245.9620 KHz	Plot A
	190	836.6	322.354 KHz	250.6869 KHz	Plot B
	251	848.8	320.944 KHz	254.5086 KHz	Plot C
GPRS 1900MHz	512	1850.2	317.837 KHz	246.4996 KHz	Plot D
	661	1880.0	312.520 KHz	242.7719 KHz	Plot E
	810	1909.8	308.833 KHz	242.2338 KHz	Plot F

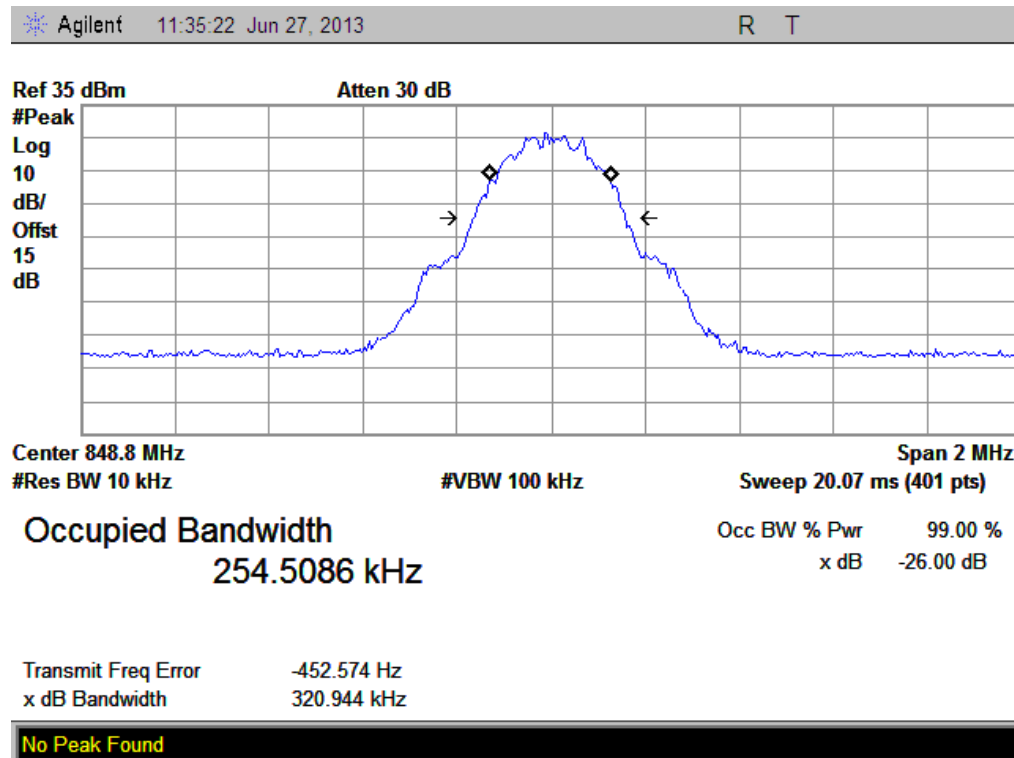
### 3. Test Plots:



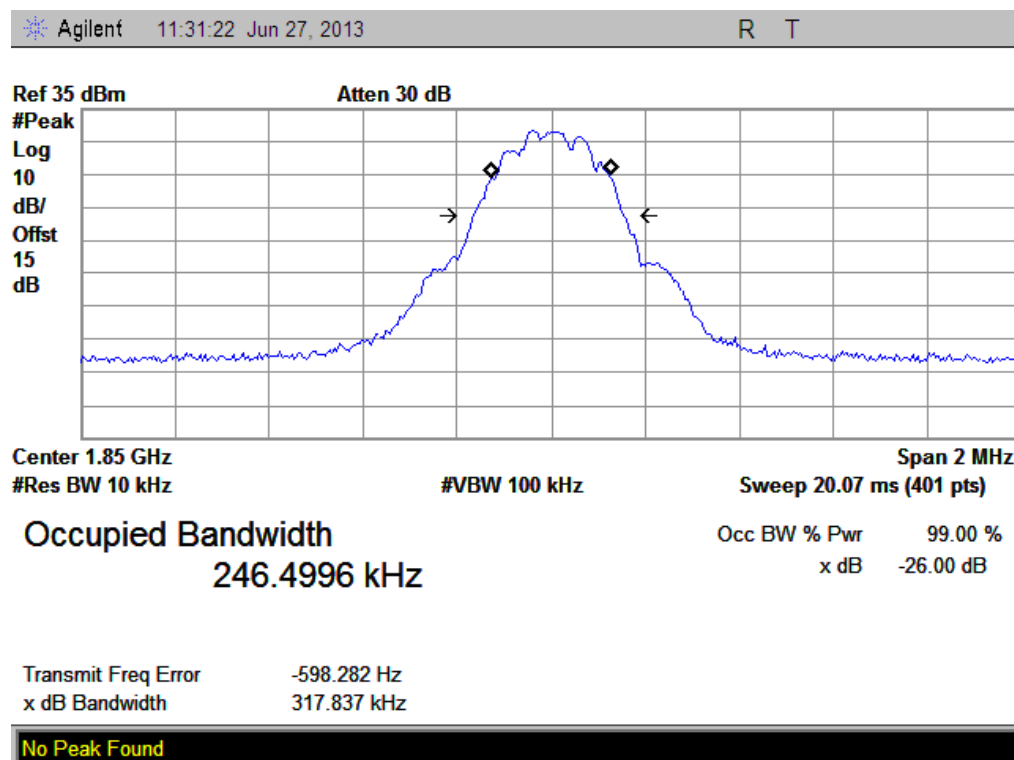
(Plot A: GPRS 850MHz Channel = 128)



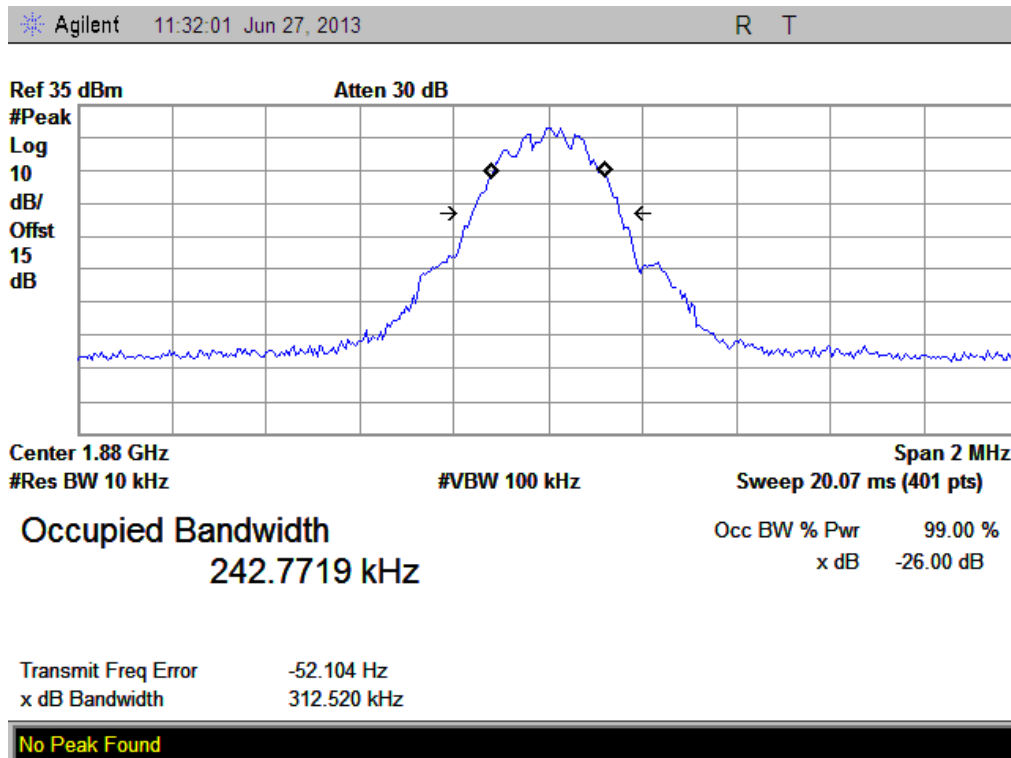
(Plot B: GPRS 850MHz Channel = 190)



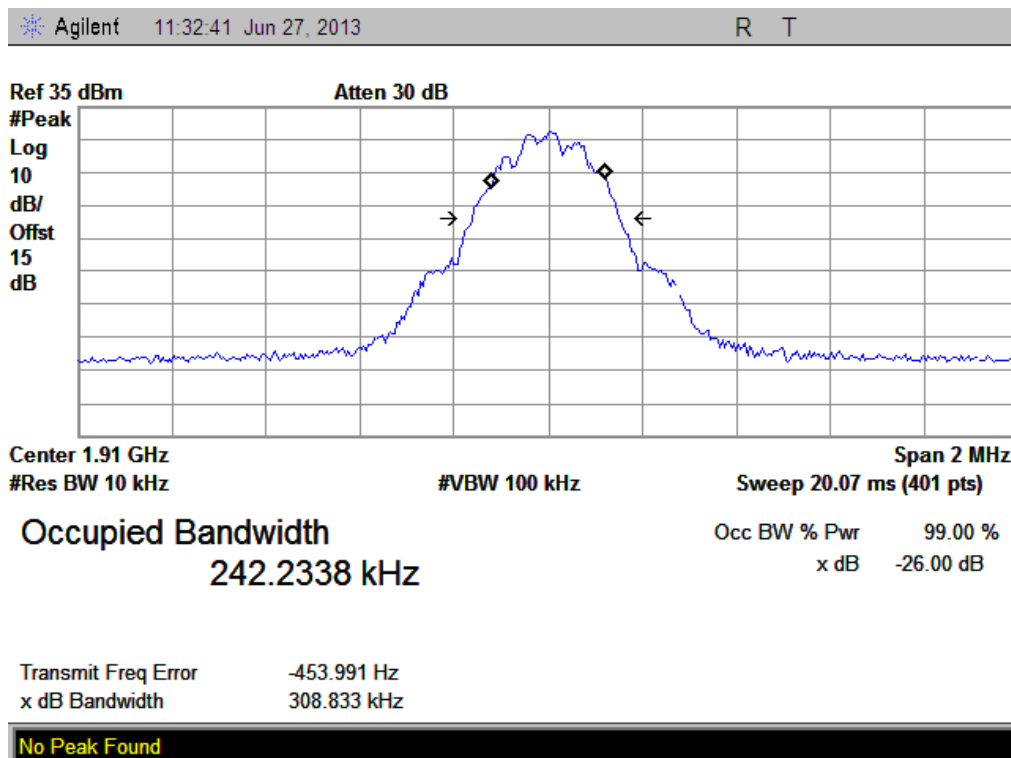
(Plot C: GPRS 850MHz Channel = 251)



(Plot D: GPRS1900MHz Channel = 512)



(Plot E: GPRS1900MHz Channel = 661)



(Plot F: GPRS 1900MHz Channel = 810)

## 2.4 Frequency Stability

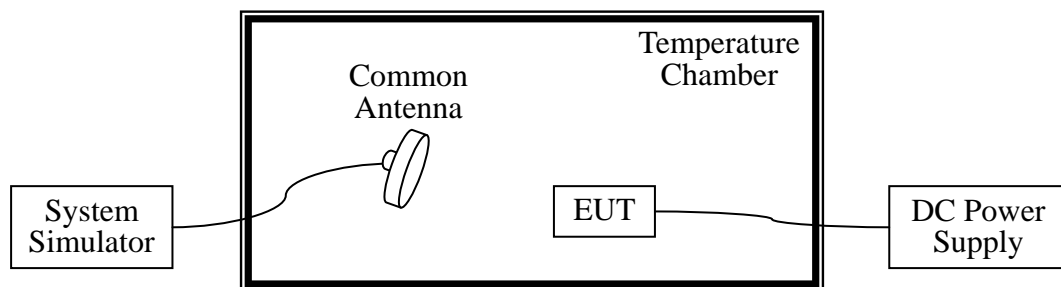
### 2.4.1 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- The temperature is varied from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  at intervals of not more than  $10^{\circ}\text{C}$ .
- For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

### 2.4.2 Test Description

#### 1. Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

#### 2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2012.05	2014.05
DC Power Supply	Good Will	GPS-3030DD	EF920938	2012.05	2014.05
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2012.05	2014.05

### 2.4.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is  $25^{\circ}\text{C}$ . The frequency

deviation limit of 850MHz band is  $\pm 2.5$ ppm, and 1900MHz is  $\pm 1$ ppm

### 1. GPRS 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	-21.33	±2060.5	11.19	±2091.5	18.52	±2122	PASS
	-20	20.23		15.33		-13.61		
	-10	-2.15		-17.56		11.16		
	0	30.16		32.11		15.09		
	+10	21.99		-25.03		22.02		
	+20	-19.16		-17.19		10.76		
	+30	35.26		19.36		-16.51		
	+40	42.63		19.64		-2.10		
	+55	35.28		22.27		-12.99		
4.2	+25	-14.73		28.95		-7.53		
3.6	+25	-17.75		36.23		6.78		

### 2. GPRS 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	15.23	±1850.2	23.62	±1880.0	30.21	±1909.8	PASS
	-20	-21.76		25.11		-17.71		
	-10	-1.26		-21.28		-18.28		
	0	-18.68		-13.16		17.03		
	+10	-21.61		-18.38		25.31		
	+20	14.58		-21.61		35.26		
	+30	-0.68		15.52		-23.28		
	+40	5.33		-0.68		19.33		
	+55	-2.56		33.27		-19.27		
4.2	+25	17.60		23.82		26.29		
3.6	+25	-8.09		15.32		18.93		

## 2.5 Conducted Out of Band Emissions

### 2.5.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43+10*\log(P)$ dB. This calculated to be -13dBm.

### 2.5.2 Test Description

See section 2.1.2 of this report.

### 2.5.3 Test Result

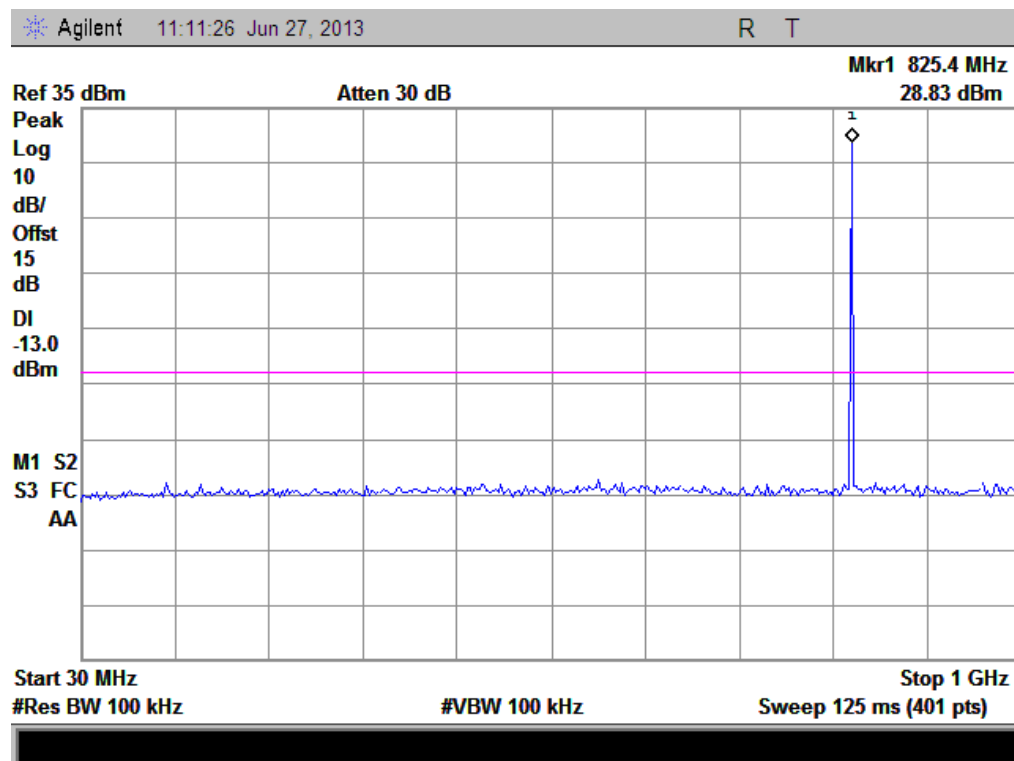
The measurement frequency range is from 30MHz to the 10<sup>th</sup> harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

#### 1. Test Verdict:

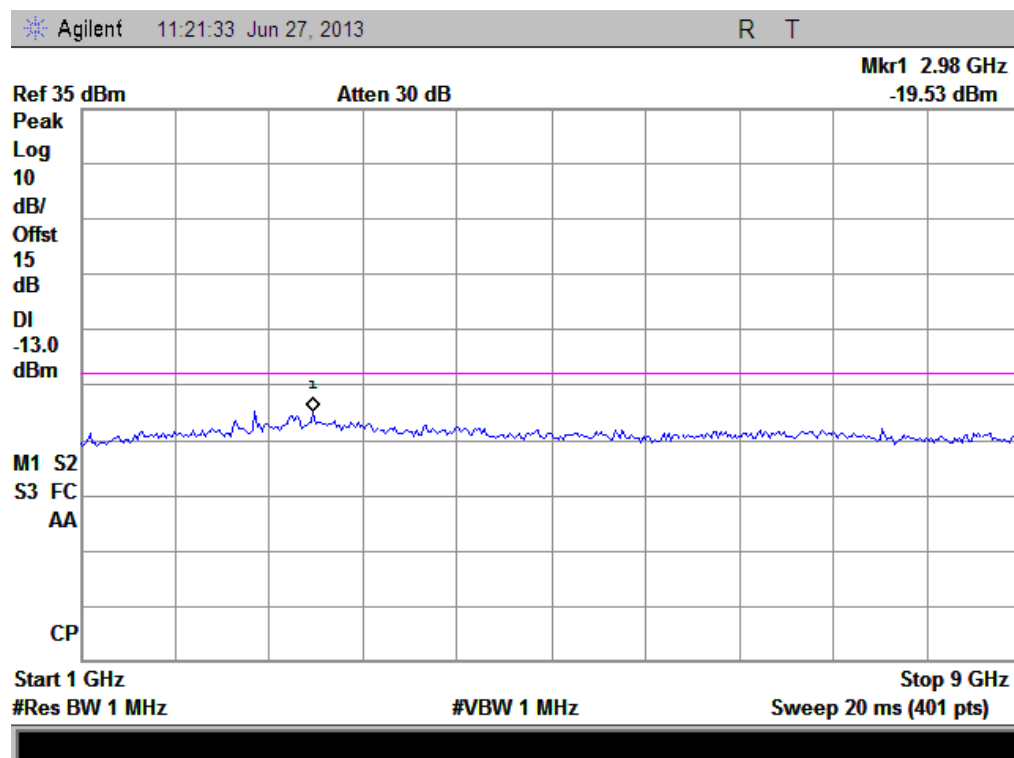
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GPRS 850MHz	128	824.2	-19.53	Plot A1toA1.1	-13	PASS
	190	836.6	-20.78	Plot A2toA2.1		PASS
	251	848.8	-21.38	Plot A3toA3.1		PASS
GPRS 1900MHz	512	1850.2	-21.50	Plot B1toB1.1	-13	PASS
	661	1880.0	-20.89	Plot B2toB2.1		PASS
	810	1909.8	-19.76	Plot B3toB3.1		PASS

#### 2. Test Plots for the Whole Measurement Frequency Range:

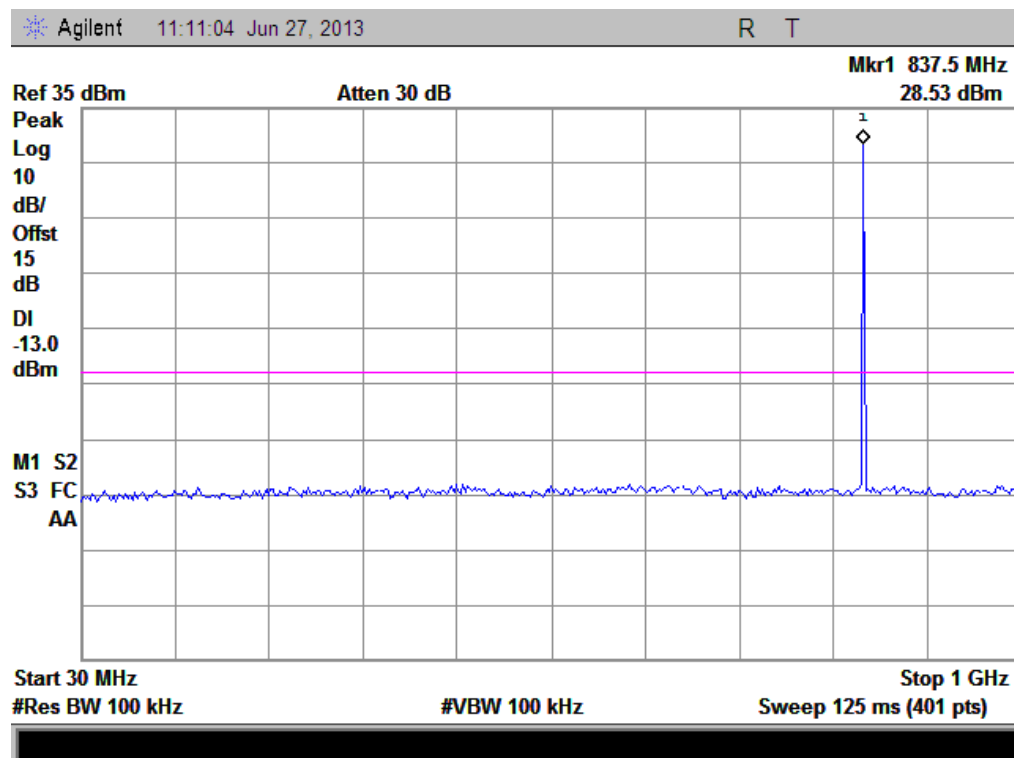
Note: the power of the EUT transmitting frequency should be ignored.



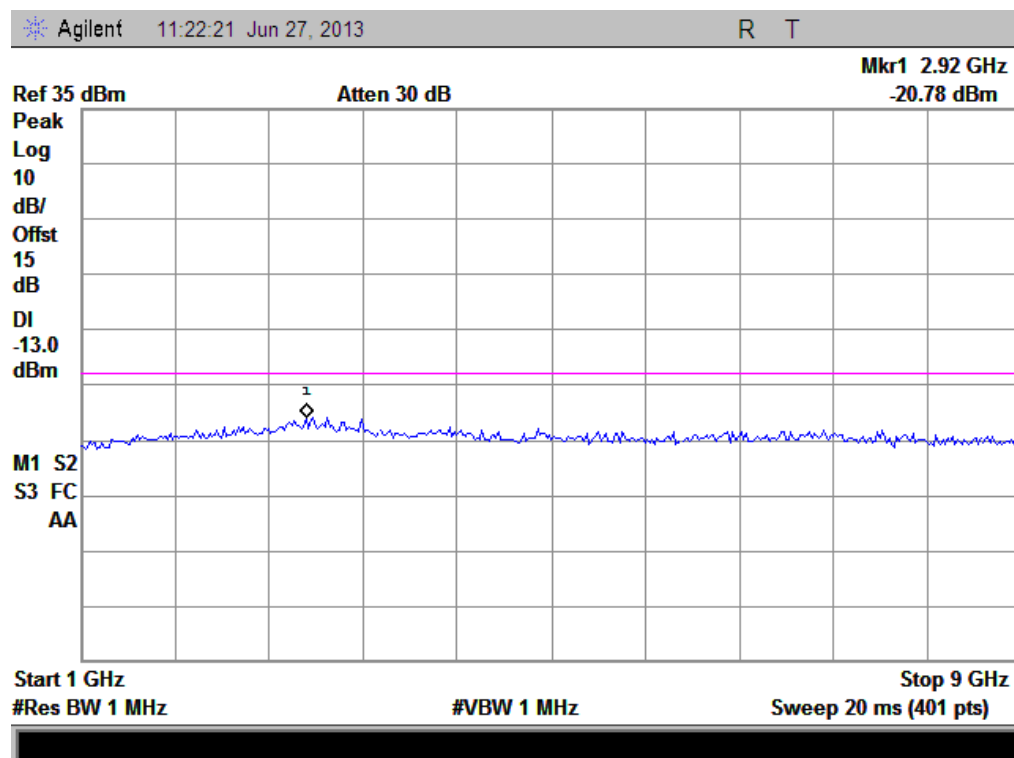
(Plot A1: GPRS 850MHz Channel = 128, 30MHz to 1GHz)



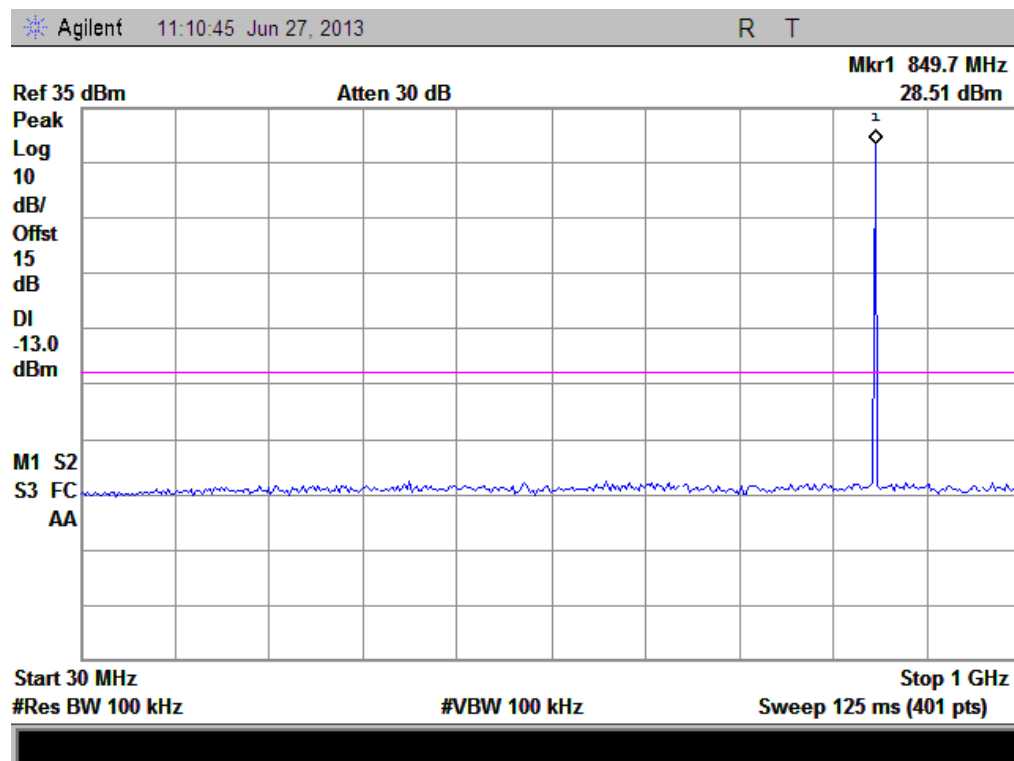
(Plot A1.1: GPRS 850MHz Channel = 128, 1GHz to 9GHz)



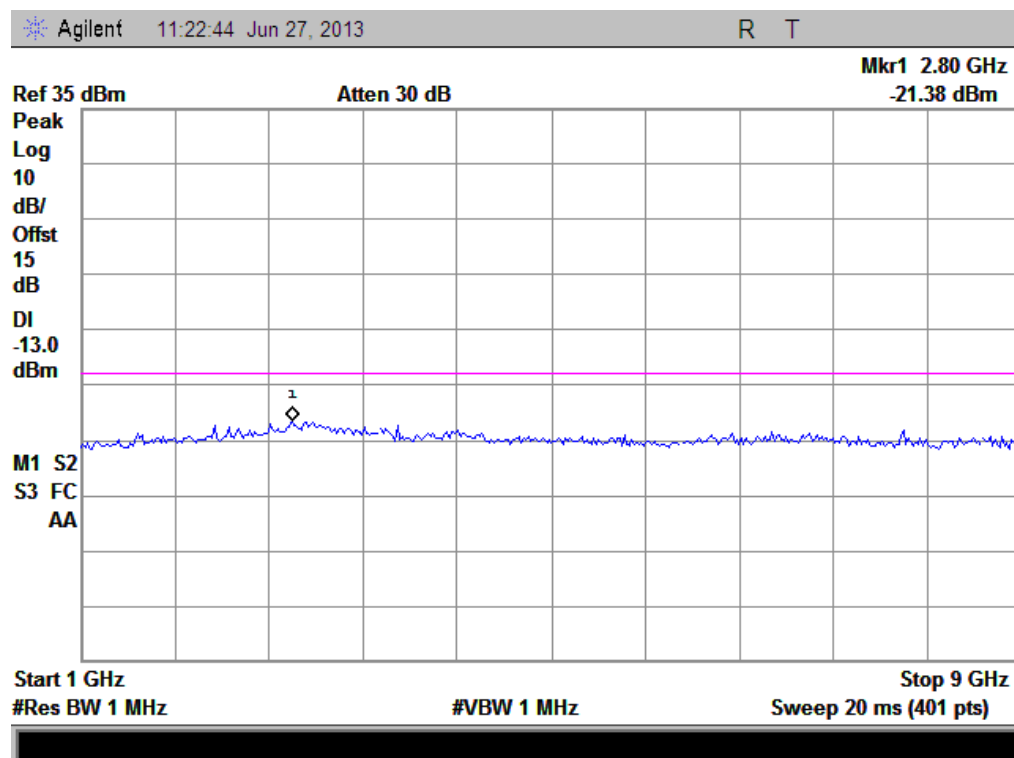
(Plot A2: GPRS 850MHz Channel = 190, 30MHz to 1GHz)



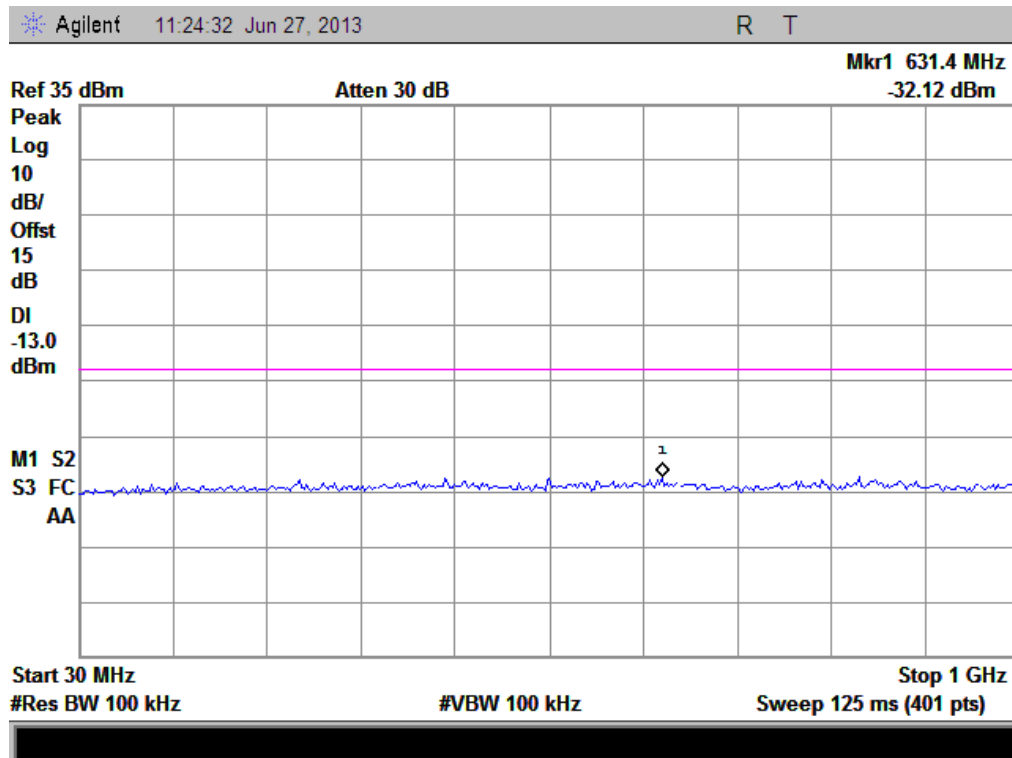
(Plot A2.1: GPRS 850MHz Channel = 190, 1GHz to 9GHz)



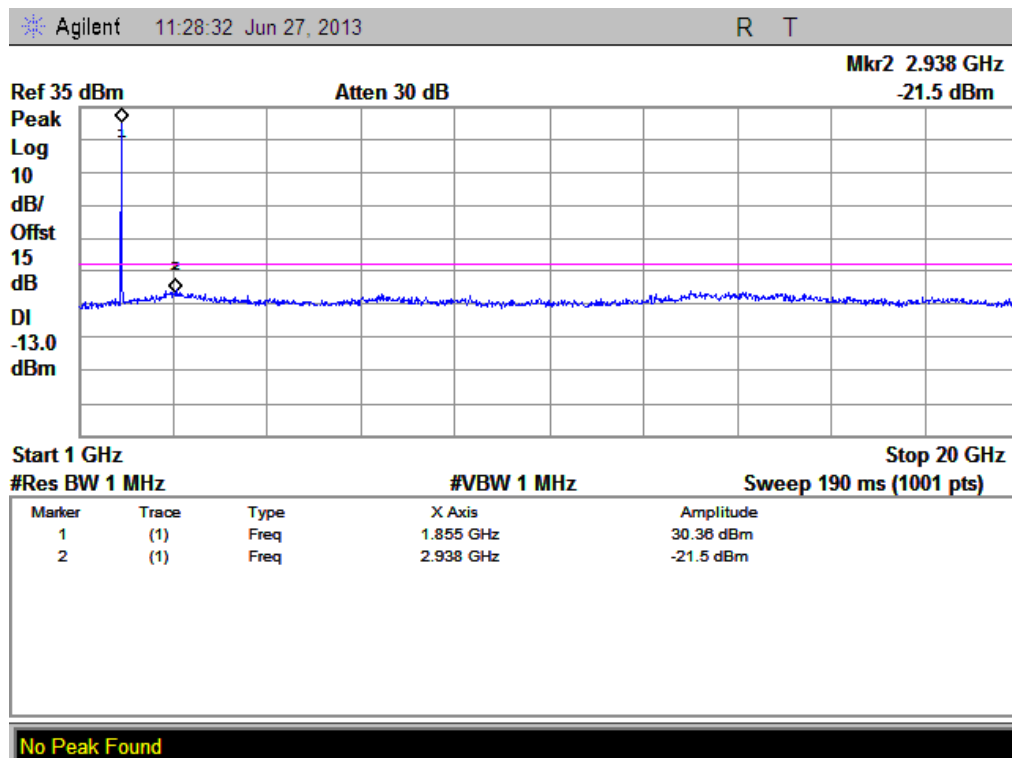
(Plot A3: GPRS 850MHz Channel = 251, 30MHz to 1GHz)



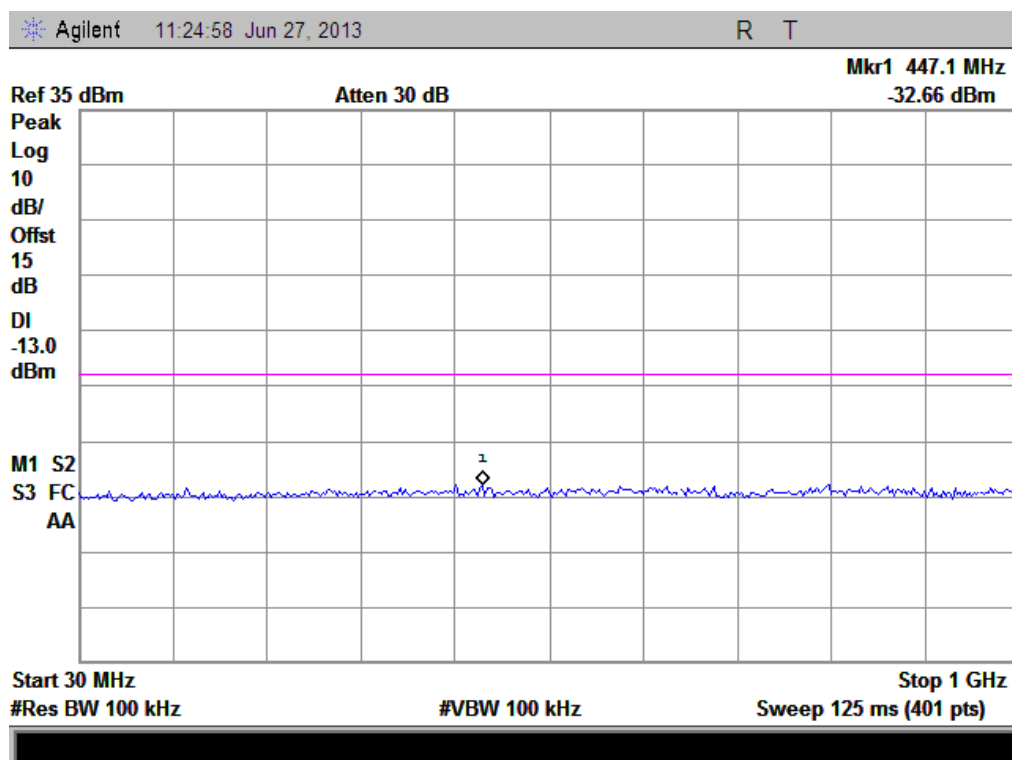
(Plot A3.1: GPRS 850MHz Channel = 251, 1GHz to 9GHz)



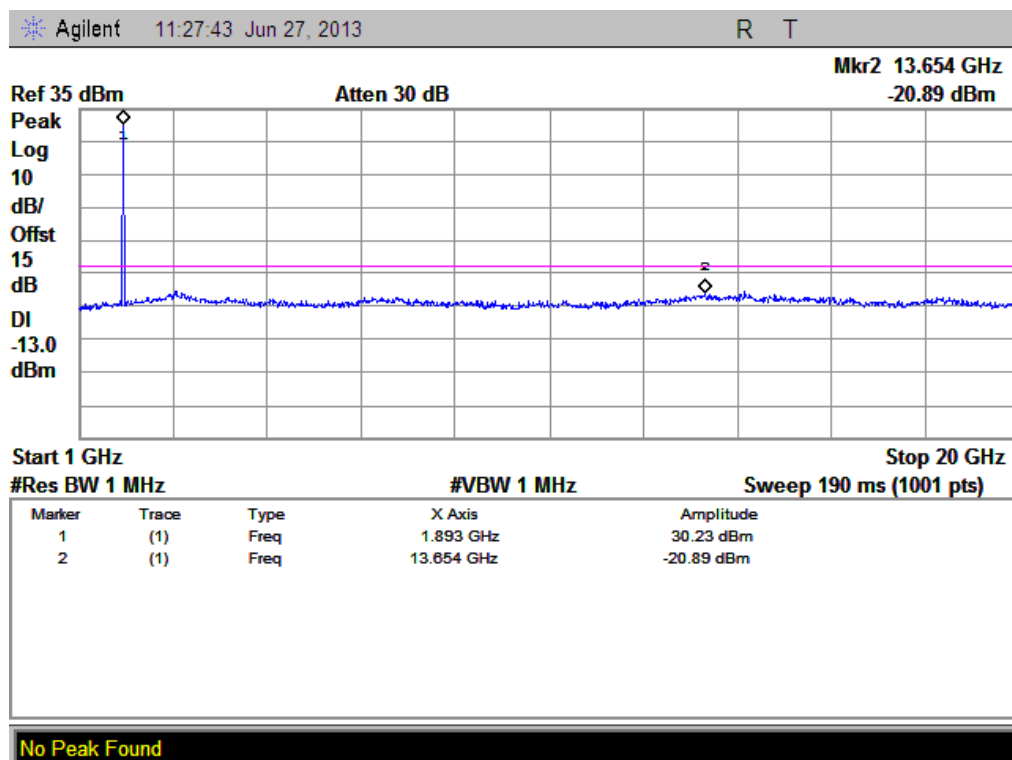
(Plot B1: GPRS 1900MHz Channel = 512, 30MHz to 1GHz)



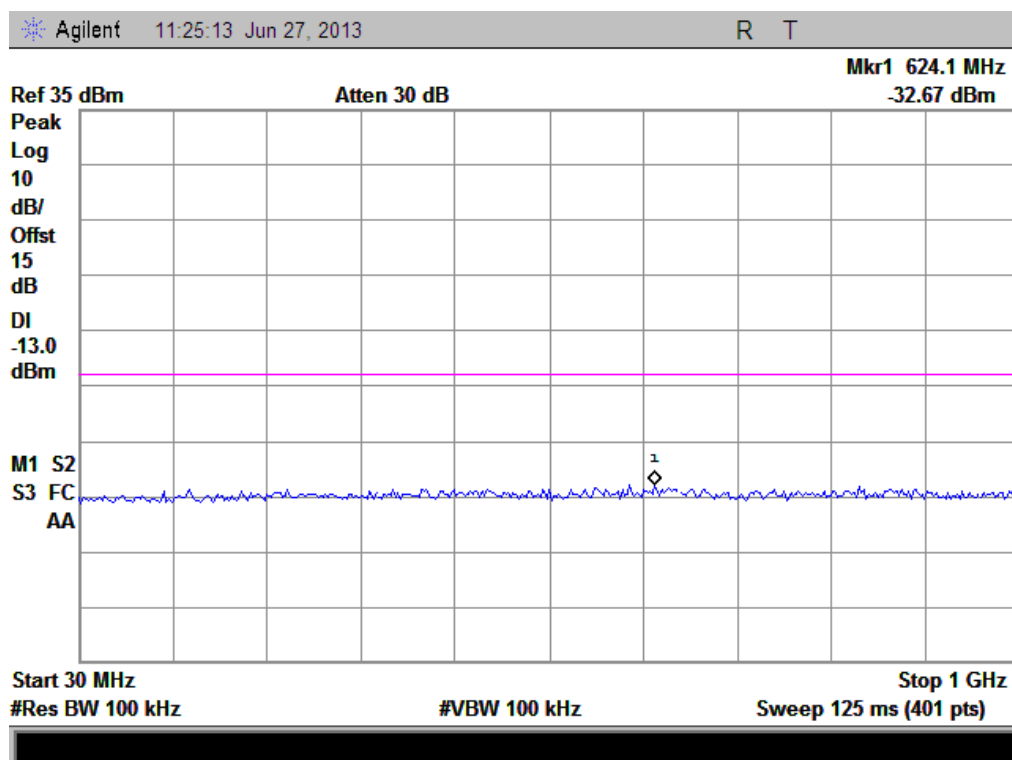
(Plot B1.1: GPRS 1900MHz Channel = 512, 1GHz to 20GHz)



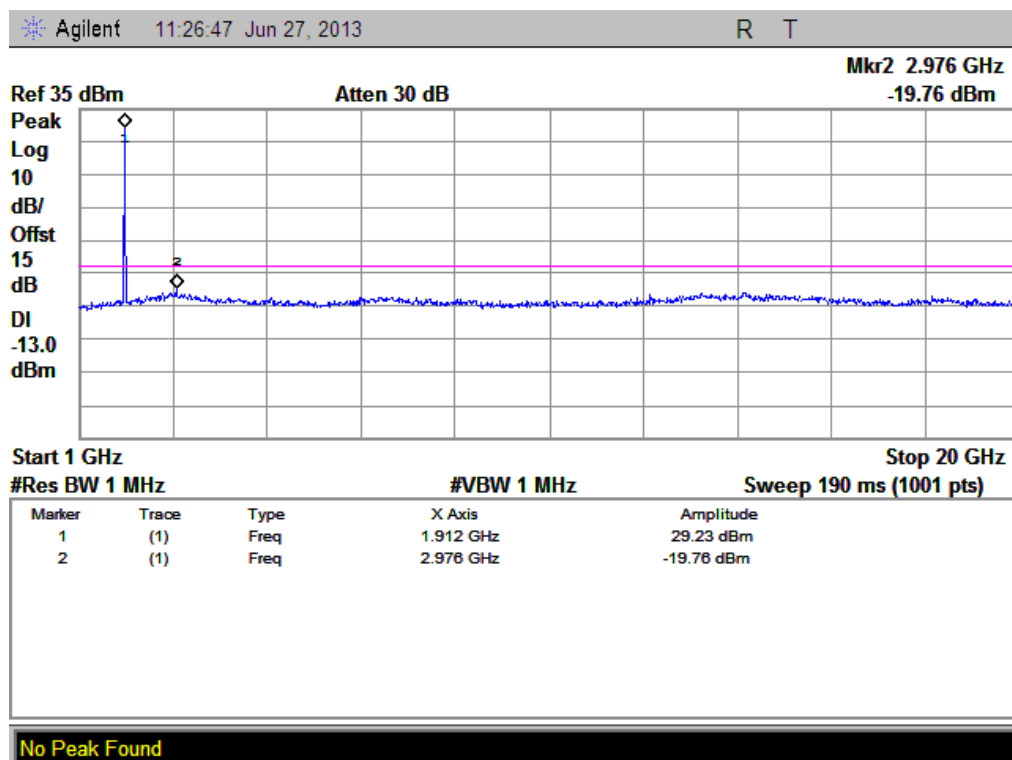
(Plot B2: GPRS 1900MHz Channel = 661, 30MHz to 1GHz)



(Plot B2.1: GPRS 1900MHz Channel = 661, 1GHz to 20GHz)



(Plot B3: GPRS1900MHz Channel = 810, 30MHz to 1GHz)



(Plot B3.1: GPRS 1900MHz Channel = 810, 1GHz to 20GHz)

## 2.6 Band Edge

### 2.6.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b), 27.53(g)(h) in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

### 2.6.2 Test Description

See section 2.1.2 of this report.

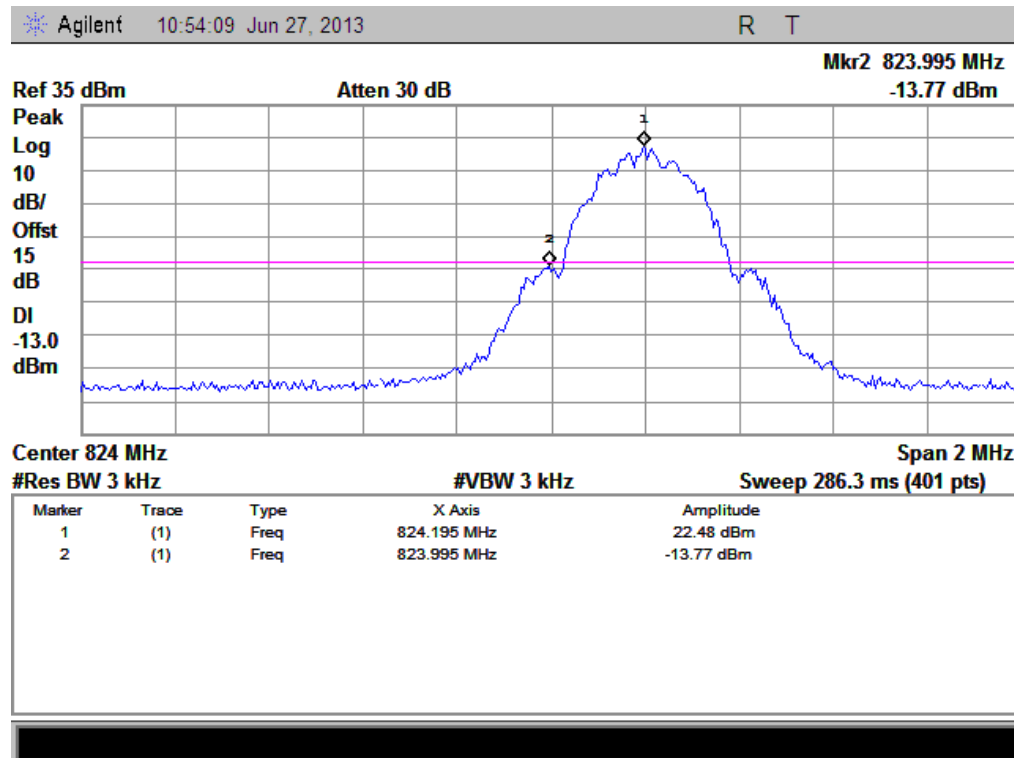
### 2.6.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions.

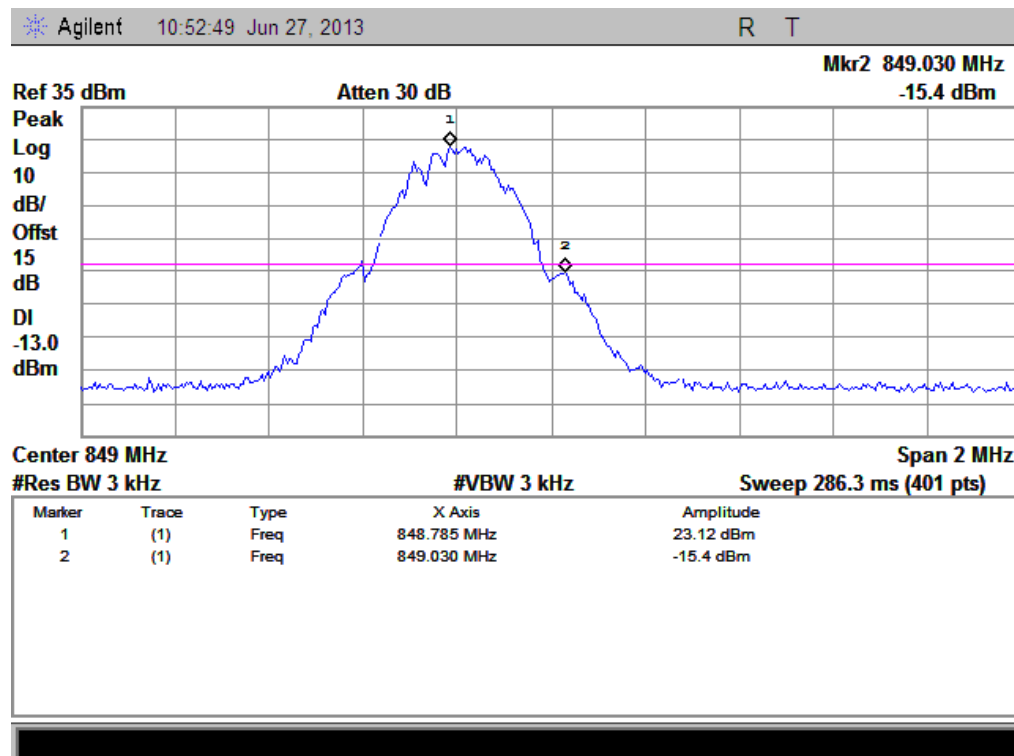
#### 1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GPRS 850MHz	128	824.2	-13.77	Plat A	-13	PASS
	251	848.8	-15.40	Plot B		PASS
GPRS 1900MHz	512	1850.2	-15.68	Plat C	-13	PASS
	810	1909.8	-17.12	Plot D		PASS

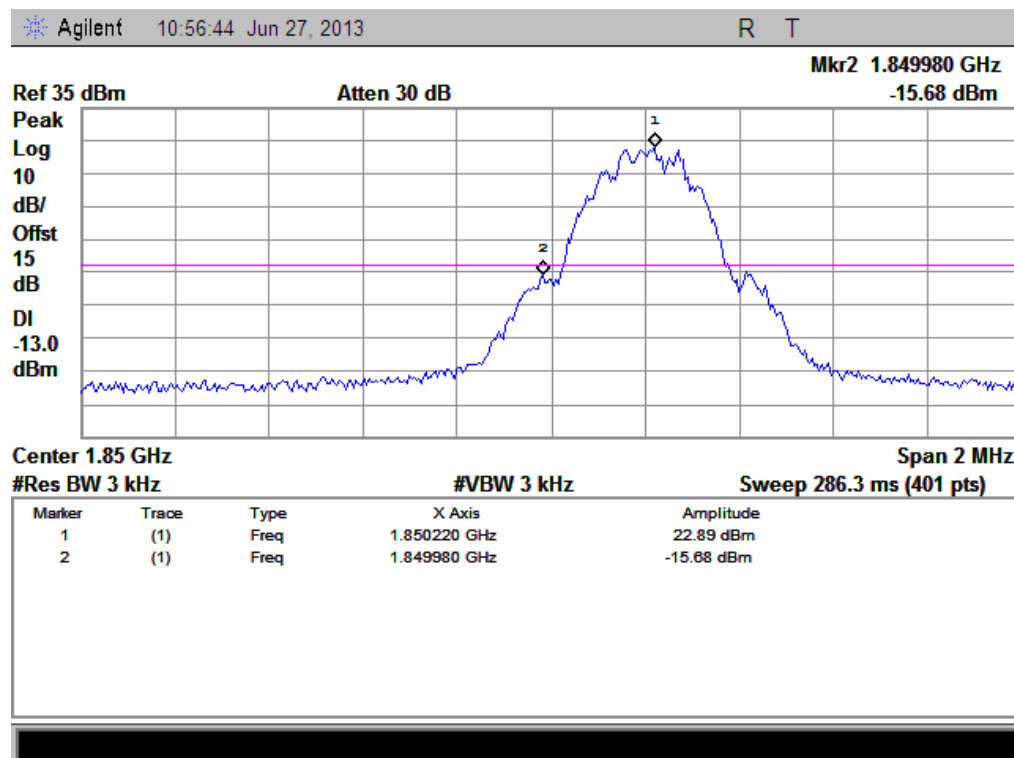
#### 2. Test Plots:



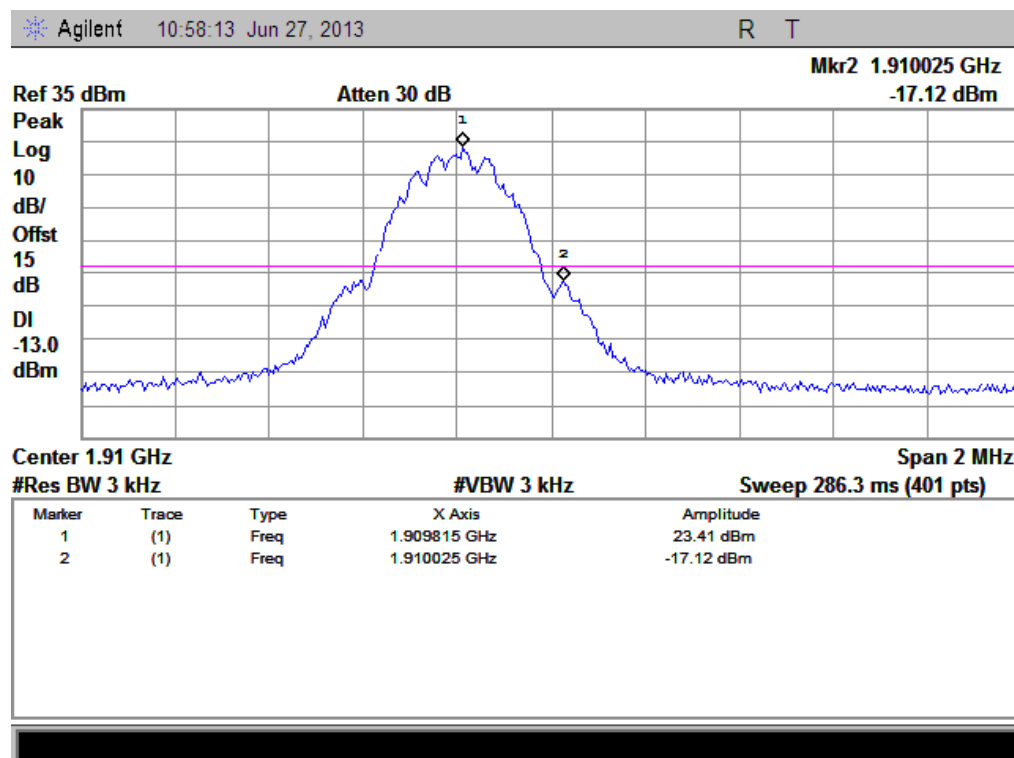
(Plot A: GPRS 850 Channel = 128)



(Plot B: GPRS 850 Channel = 251)



(Plot C: GPRS 1900 Channel = 512)



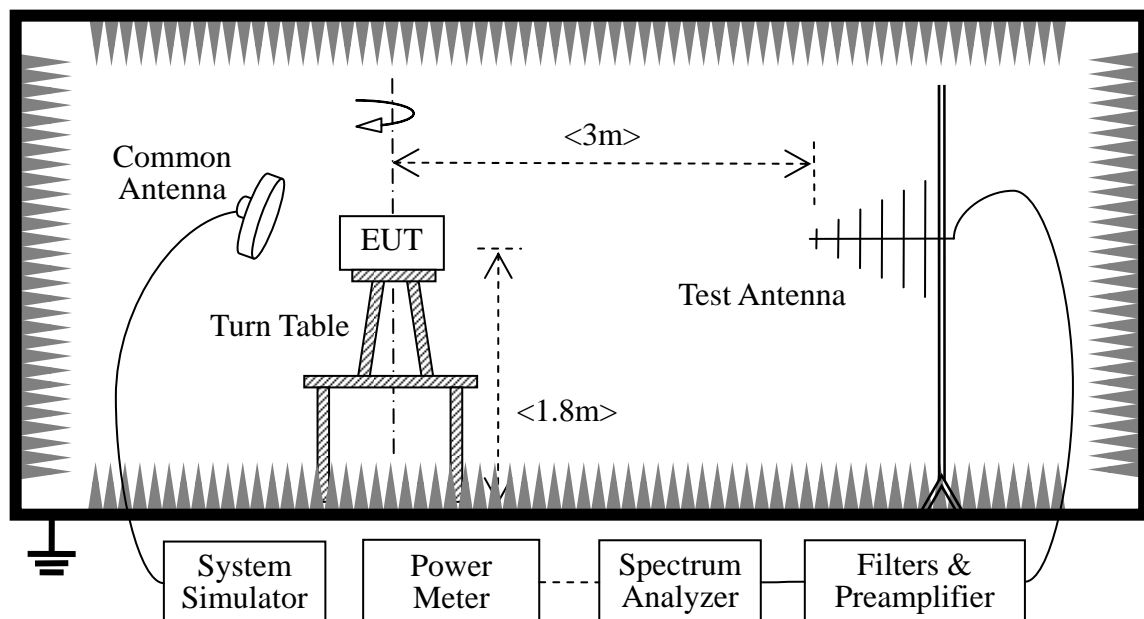
(Plot D: GPRS 1900 Channel = 810)

## 2.6.4 Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

## 2.6.5 Test Description

### 1. Test Setup:



The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM850MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM1900MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded.

- GSM Maximum RF output power: GPRS 850 28.75dBm, GPRS 1900 30.59dBm, Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GPRS 850 2.0dBm, GPRS 1900 0.27dBm.

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), and it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

## 2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2012.05	2014.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2014.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05	2014.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05	2014.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2014.05
Substitution Antenna	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2014.05
Pre-AMPs	lucix	S10M100L3802	S020180L3203	2012.05	2014.05
Notch Filter	COM-MW	ZBSF-C836.5-25-X	NA	2012.05	2014.05
Notch Filter	COM-MW	ZBSF-C1747.5-75-X2	NA	2012.05	2014.05
Notch Filter	COM-MW	ZBSF-C1880-60-X2	NA	2012.05	2014.05

### 2.6.6 Test Result

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST\_TX}} - P_{\text{SUBST\_RX}} - L_{\text{SUBST\_CABLES}} + G_{\text{SUBST\_TX\_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where  $A_{\text{SUBST}}$  is the final substitution correction including receive antenna gain.

$P_{\text{SUBST\_TX}}$  is signal generator level,

$P_{\text{SUBST\_RX}}$  is receiver level,

$L_{\text{SUBST\_CABLES}}$  is cable losses including TX cable,

$G_{\text{SUBST\_TX\_ANT}}$  is substitution antenna gain.

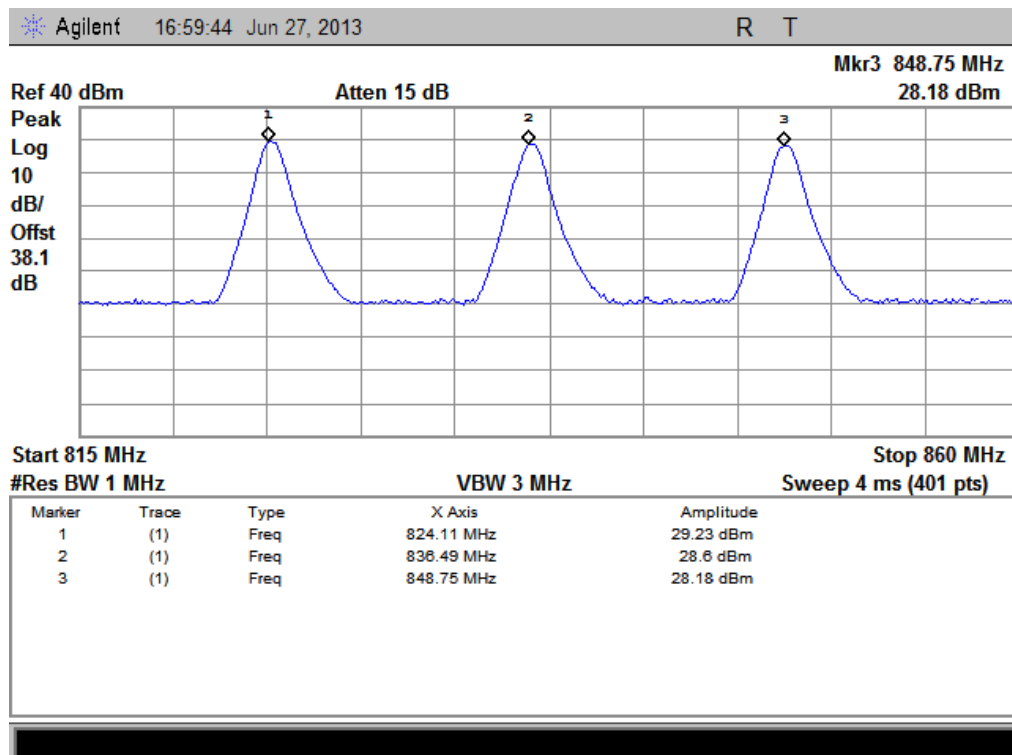
$A_{\text{TOT}}$  is total correction factor including cable loss and substitution correction

During the test, the data of  $A_{\text{TOT}}$  was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of  $A_{\text{TOT}}$ .

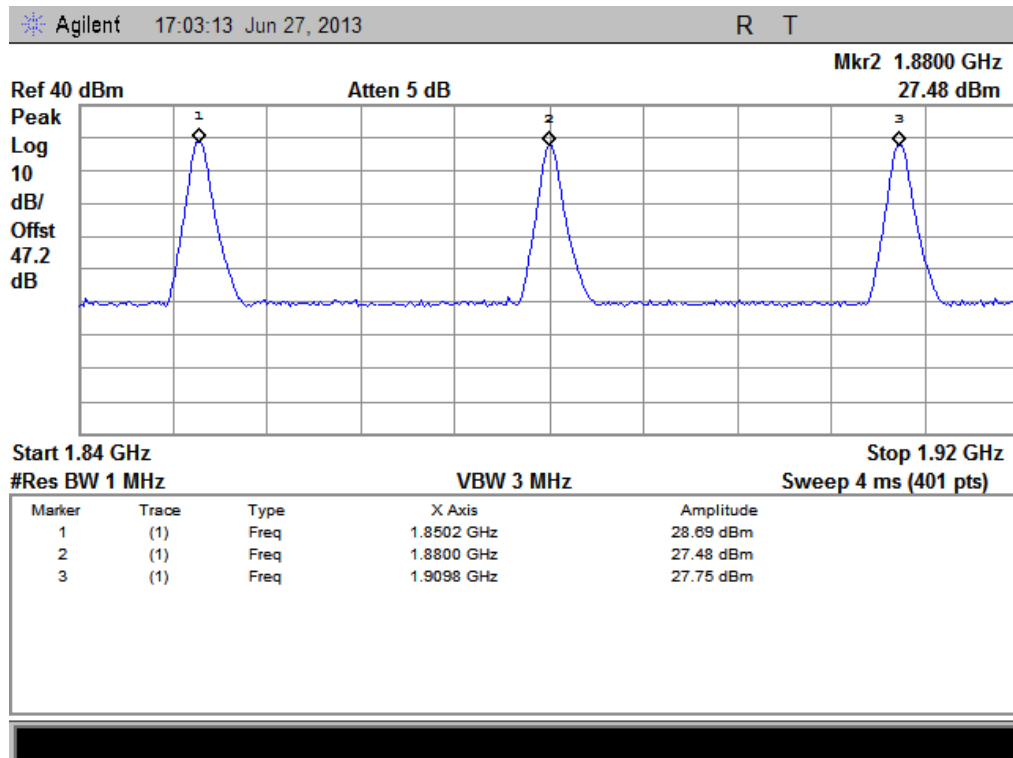
### 1. GPRS Model Test Verdict:

Band	Channel	Frequency (MHz)	PCL	Measured ERP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GPRS 850MHz	128	824.20	5	29.23	0.838	Plot A <sup>Note 1</sup>	38.5	7	PASS
	190	836.60	5	28.60	0.724				PASS
	251	848.80	5	28.18	0.658				PASS
Band	Channel	Frequency (MHz)	PCL	Measured EIRP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GPRS 1900MHz	512	1850.2	0	28.69	0.740	Plot B <sup>Note 1</sup>	33	2	PASS
	661	1880.0	0	27.48	0.560				PASS
	810	1909.8	0	27.75	0.596				PASS
Note 1:	For the GPRS model, all the slots were tested and just the worst data was record in this report.								

### 2. Test Plots:



(Plot A: GPRS 850MHz Channel = 128, 190, 251)



(Plot B: GPRS 1900MHz Channel = 512, 661, 810)

## 2.7 Radiated Out of Band Emissions

### 2.7.1 Requirement

According to FCC section 22.917(a) and section 24.238(a), 27.53(g) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43+10*\log(P)$ dB. This calculated to be -13dBm.

The spurious emission with frequency band 1900 according to FCC section 2.1057.

### 2.7.2 Test Description

See section 2.6.5 of this report.

Equipment List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2012.05	2014.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2012.05	2014.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05	2014.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05	2014.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2014.05
Substitution Antenna	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2014.05
Pre-AMPs	lucix	S10M100L3802	S020180L3203	2012.05	2014.05
Notch Filter	COM-MW	ZBSF-C836.5-25-X	NA	2012.05	2014.05
Notch Filter	COM-MW	ZBSF-C1747.5-75-X2	NA	2012.05	2014.05
Notch Filter	COM-MW	ZBSF-C1880-60-X2	NA	2012.05	2014.05

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

### 2.7.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

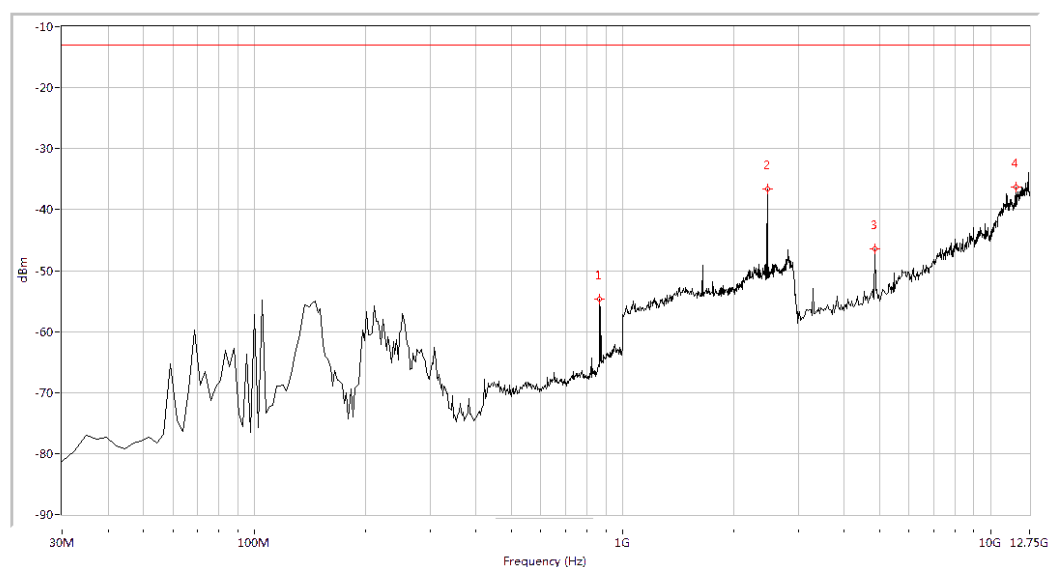
## 1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
GPRS 850MHz	128	824.2	< -25	< -25	Plot A.1/A.2	-13	PASS
	190	836.6	< -25	< -25	Plot A.3/A.4		PASS
	251	848.8	< -25	< -25	Plot A.5/A.6		PASS
GPRS 1900MHz	512	1850.2	< -25	< -25	Plot B.1/B.2	-13	PASS
	661	1880.0	< -25	< -25	Plot B.3/B.4		PASS
	810	1909.8	< -25	< -25	Plot B.5/B.6		PASS

## 2. Test Plots for the Whole Measurement Frequency Range:

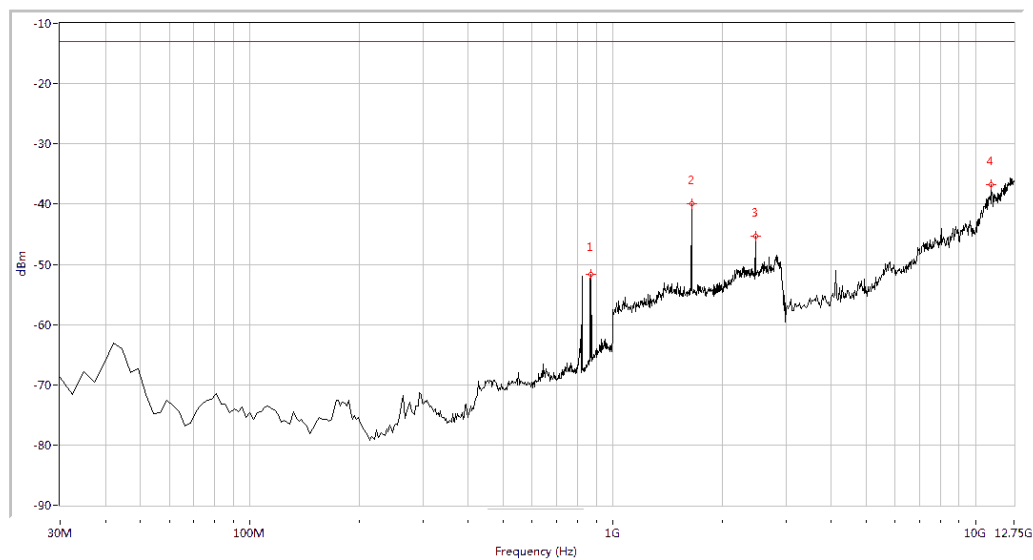
Note1: the power of the EUT transmitting frequency should be ignored.

Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.



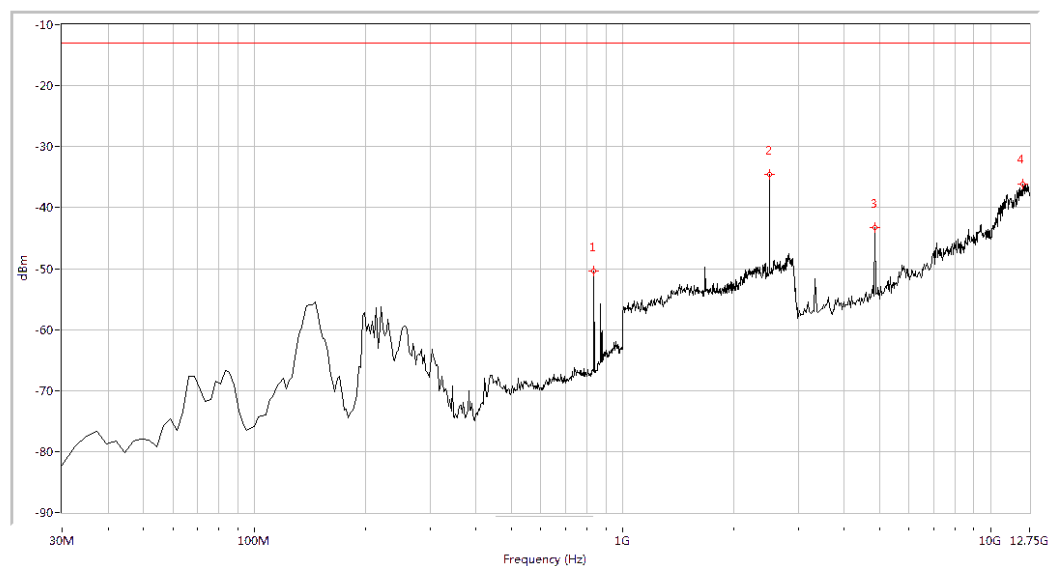
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
866.958	-54.68	-13.0	41.7	25.8	Horizontal	PASS
2471.322	-36.54	-13.0	23.5	158.3	Horizontal	PASS
4847.880	-46.41	-13.0	33.4	14.6	Horizontal	PASS
11680.175	-36.34	-13.0	23.3	29.8	Horizontal	PASS

(Plot A.1: GPRS 850MHz Channel = 128, Test Antenna Horizontal)



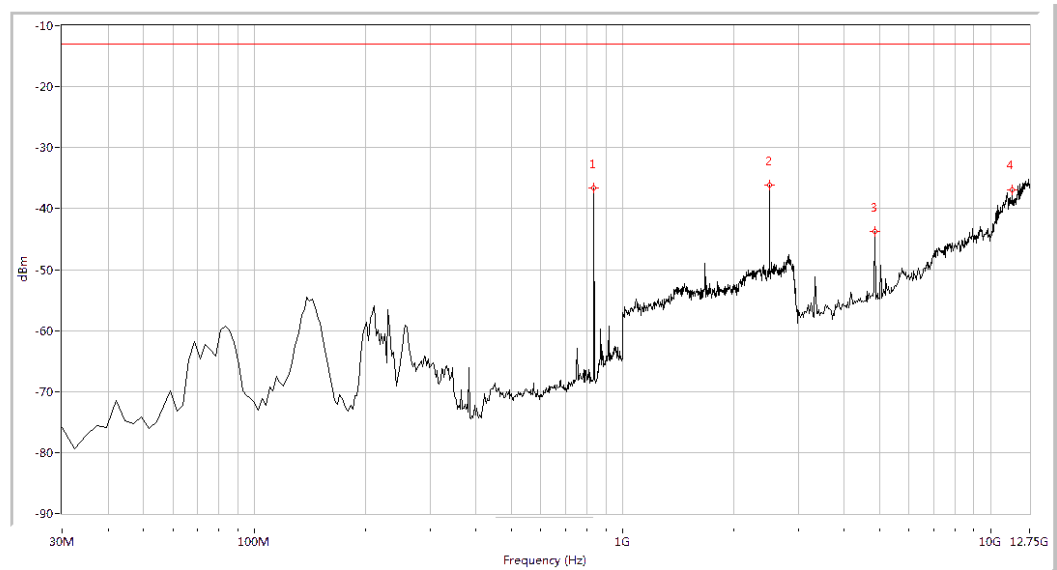
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
871.796	-51.60	-13.0	38.6	42.9	Vertical	PASS
1648.379	-39.97	-13.0	27.0	106.8	Vertical	PASS
2471.322	-45.37	-13.0	32.4	247.8	Vertical	PASS
11023.691	-36.79	-13.0	23.8	332.0	Vertical	PASS

(Plot A.2: GPRS 850MHz Channel = 128, Test Antenna Vertical)



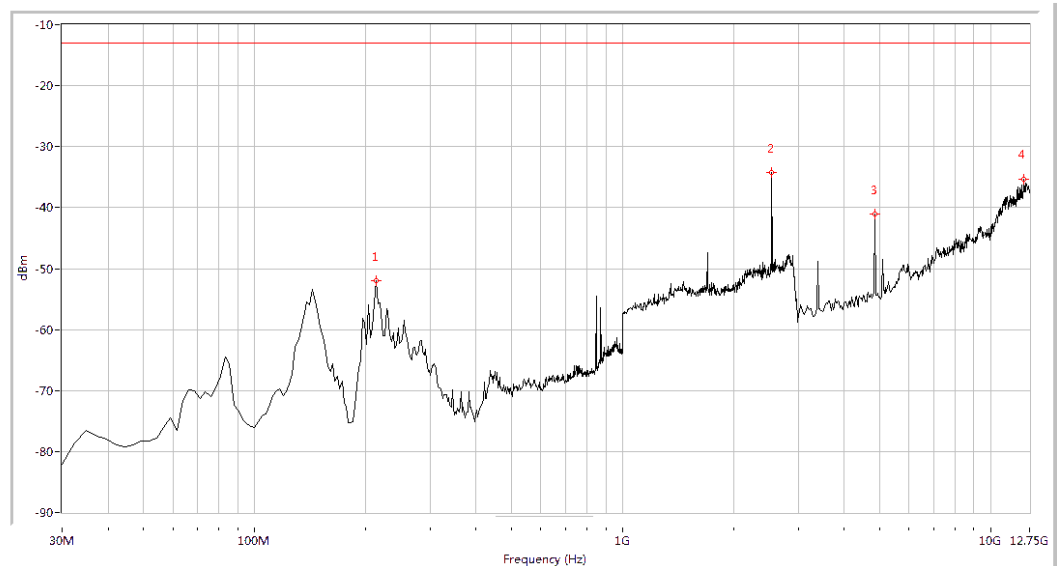
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
835.511	-50.43	-13.0	37.4	348.8	Horizontal	PASS
2506.234	-34.52	-13.0	21.5	248.2	Horizontal	PASS
4847.880	-43.30	-13.0	30.3	324.0	Horizontal	PASS
12190.773	-36.16	-13.0	23.2	14.2	Horizontal	PASS

(Plot A.3: GPRS 850MHz Channel = 190, Test Antenna Horizontal)



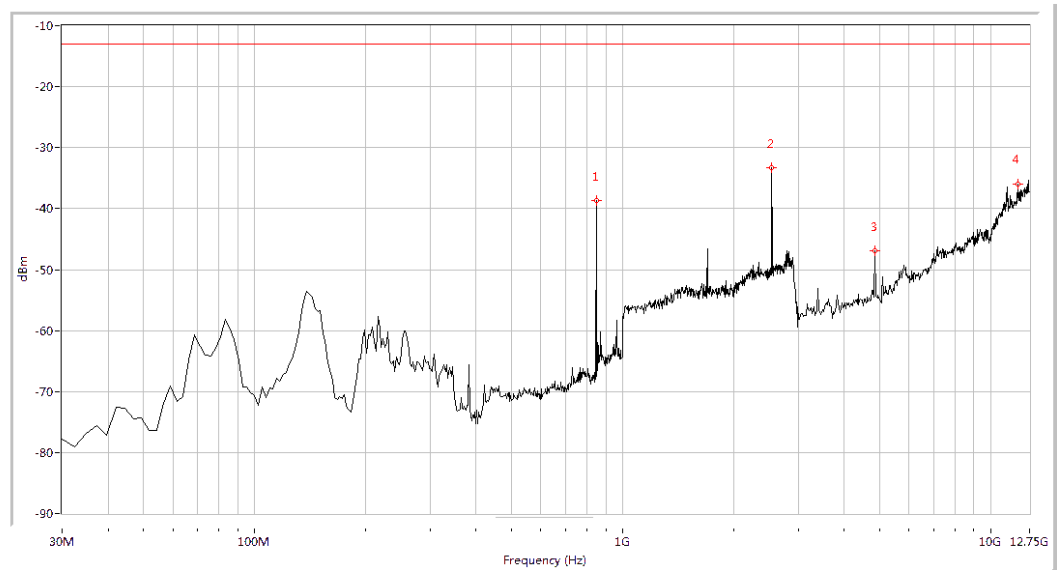
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
835.511	-36.65	-13.0	23.6	14.5	Vertical	PASS
2506.234	-36.10	-13.0	23.1	20.7	Vertical	PASS
4847.880	-43.70	-13.0	30.7	147.2	Vertical	PASS
11437.032	-36.99	-13.0	24.0	240.2	Vertical	PASS

(Plot A.4: GPRS 850MHz Channel = 190, Test Antenna Vertical)



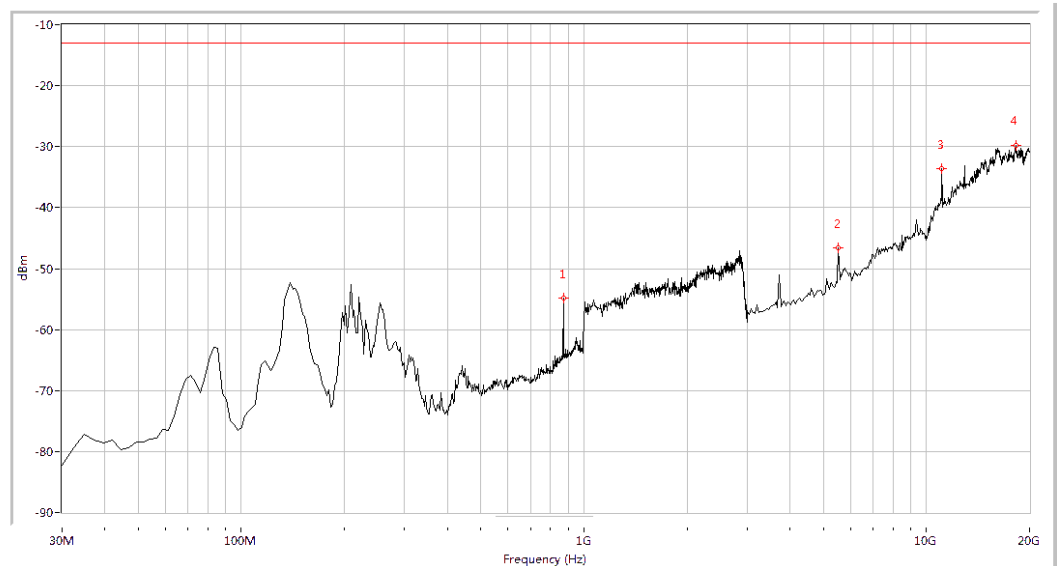
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
213.840	-51.98	-13.0	39.0	51.0	Horizontal	PASS
2541.147	-34.25	-13.0	21.3	53.2	Horizontal	PASS
4847.880	-41.05	-13.0	28.0	41.8	Horizontal	PASS
12288.030	-35.36	-13.0	22.4	159.8	Horizontal	PASS

(Plot A.5: GPRS 850 MHz Channel = 251, Test Antenna Horizontal)



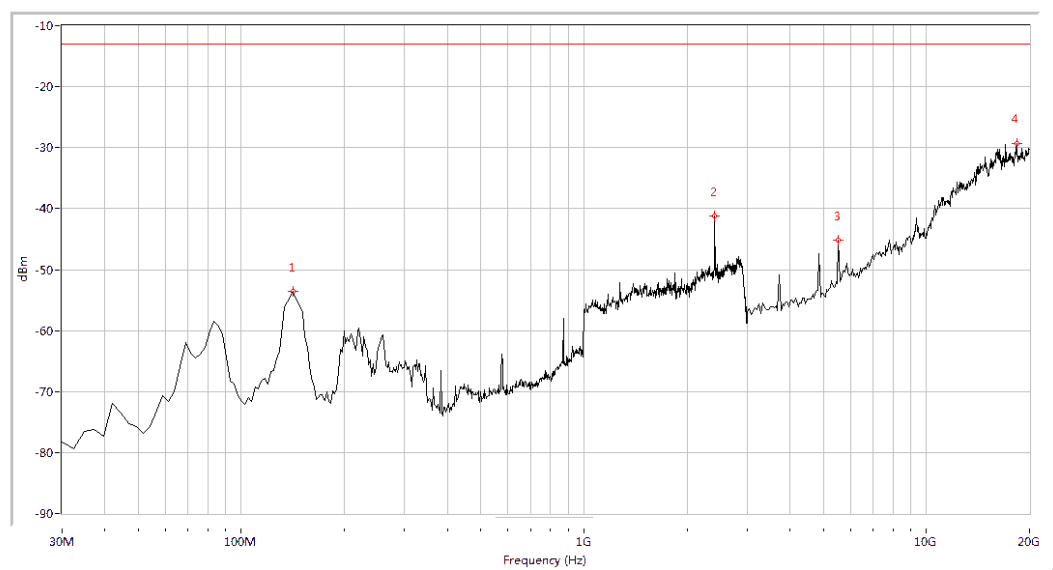
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
847.606	-38.72	-13.0	25.7	195.0	Vertical	PASS
2541.147	-33.35	-13.0	20.4	254.2	Vertical	PASS
4847.880	-46.89	-13.0	33.9	59.2	Vertical	PASS
11874.688	-36.02	-13.0	23.0	90.5	Vertical	PASS

(Plot A.6: GPRS 850MHz Channel = 251, Test Antenna Vertical)



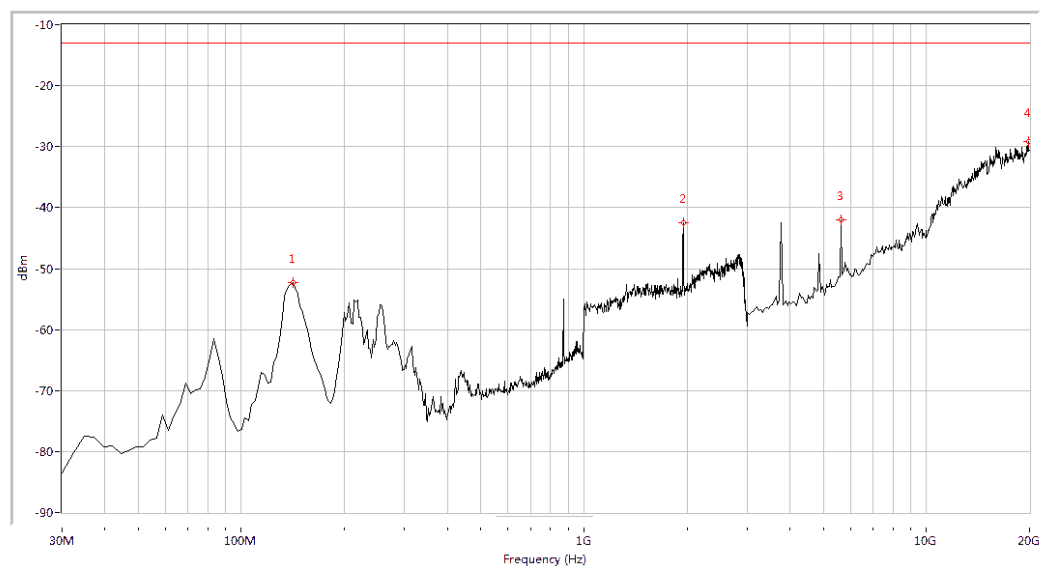
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
871.796	-54.87	-13.0	41.9	99.5	Horizontal	PASS
5543.641	-46.64	-13.0	33.6	104.4	Horizontal	PASS
11097.257	-33.53	-13.0	20.5	92.1	Horizontal	PASS
18219.451	-29.85	-13.0	16.9	81.4	Horizontal	PASS

(Plot B.1: GPRS 1900MHz Channel = 512, Test Antenna Horizontal)



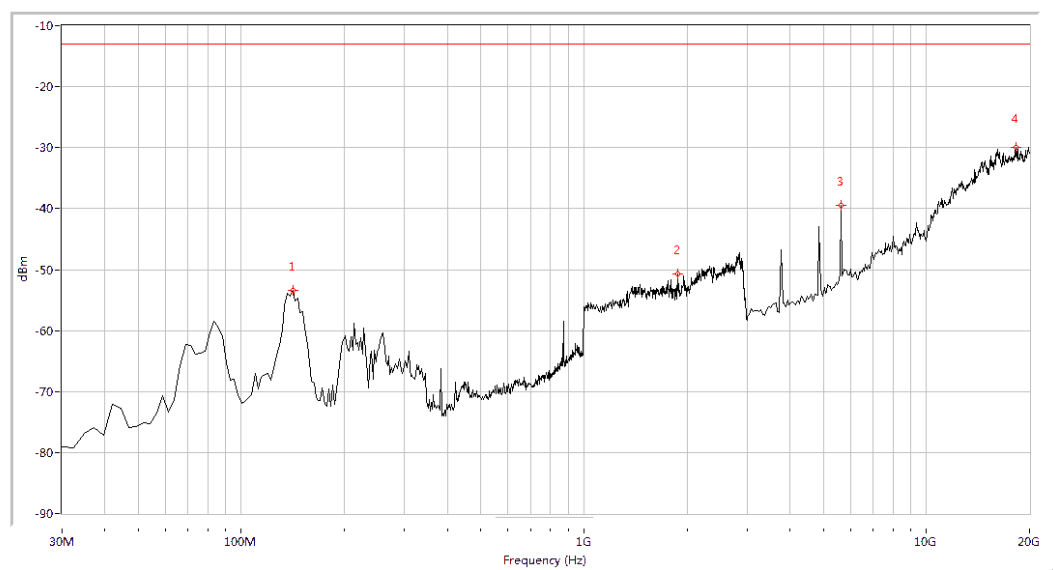
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
141.272	-53.55	-13.0	40.6	49.8	Vertical	PASS
2411.471	-41.25	-13.0	28.3	145.8	Vertical	PASS
5543.641	-45.23	-13.0	32.2	180.5	Vertical	PASS
18346.633	-29.37	-13.0	16.4	95.8	Vertical	PASS

(Plot B.2: GPRS 1900MHz Channel = 512, Test Antenna Vertical)



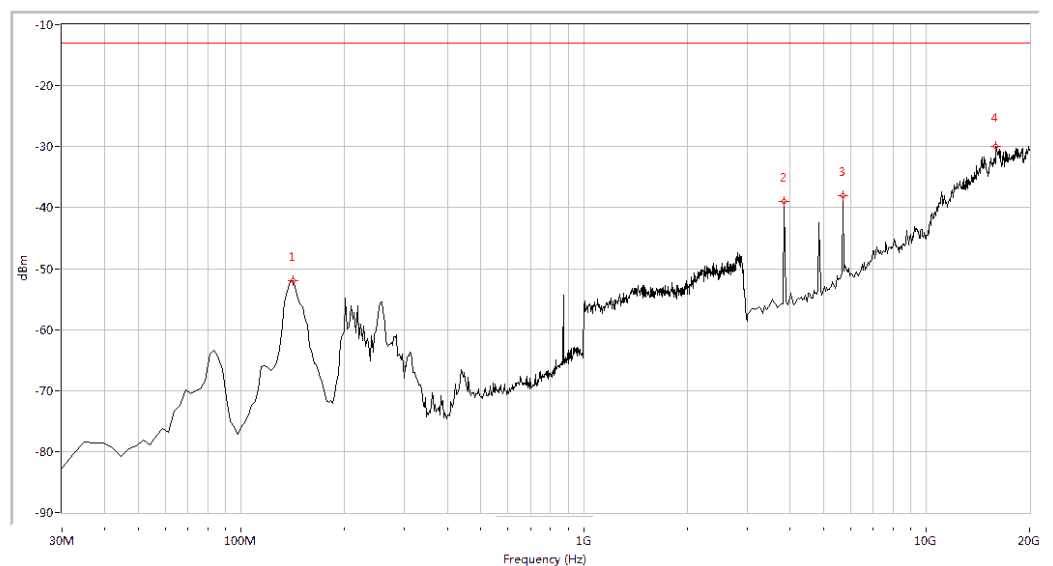
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
141.272	-52.23	-13.0	39.2	98.5	Horizontal	PASS
1952.618	-42.52	-13.0	29.5	105.8	Horizontal	PASS
5628.429	-41.97	-13.0	29.0	58.1	Horizontal	PASS
19830.424	-29.16	-13.0	16.2	85.2	Horizontal	PASS

(Plot B.3: GPRS 1900MHz Channel = 661, Test Antenna Horizontal)



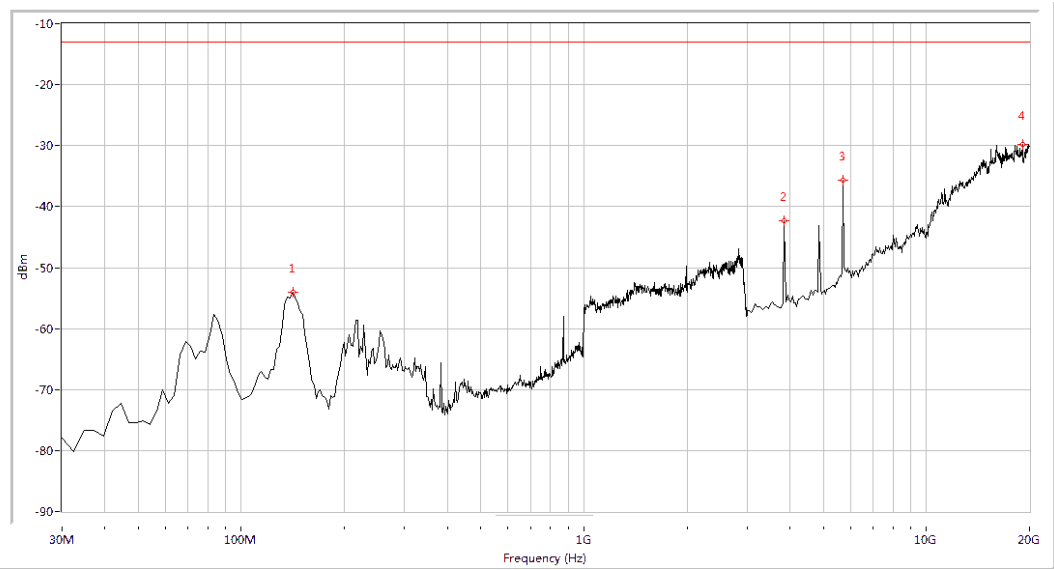
Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
141.272	-53.45	-13.0	40.5	111.8	Vertical	PASS
1877.805	-50.77	-13.0	37.8	1.5	Vertical	PASS
5628.429	-39.39	-13.0	26.4	2.9	Vertical	PASS
18219.451	-29.96	-13.0	17.0	58.9	Vertical	PASS

(Plot B.4: GPRS 1900MHz Channel = 661, Test Antenna Vertical)



Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
141.272	-51.99	-13.0	39.0	95.5	Horizontal	PASS
3847.880	-38.95	-13.0	26.0	124.4	Horizontal	PASS
5713.217	-38.11	-13.0	25.1	82.5	Horizontal	PASS
15930.175	-29.98	-13.0	17.0	42.8	Horizontal	PASS

(Plot B.5: GPRS 1900MHz Channel = 810, Test Antenna Horizontal)



Fre. (MHz)	Peak	Limit(PK)	Margin	Degree	Antenna	Verdict
141.272	-54.07	-13.0	41.1	259.8	Vertical	PASS
3847.880	-42.29	-13.0	29.3	241.0	Vertical	PASS
5713.217	-35.66	-13.0	22.7	321.5	Vertical	PASS
19109.726	-29.75	-13.0	16.8	98.8	Vertical	PASS

(PlotB.6: GPRS 1900MHz Channel = 810, Test Antenna Vertical)

**\*\* END OF REPORT \*\***