



## 47 CFR PART 22 SUBPART H & 24 SUBPART E

# TEST REPORT

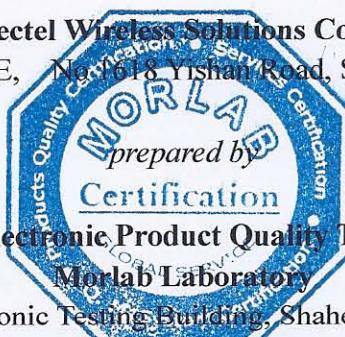
of

### GPS TRACKER

Model Name: GS200  
Brand Name: QUECTEL  
Report No.: SH10010035R01  
FCC ID: XMR-16182010001

*prepared for*

Quectel Wireless Solutions Co.,Ltd  
Room 801, Building E, No.618 Yishan Road, Shanghai, China, 201103



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Bluetooth®

CTIA Authorized Test Lab  
LAB CODE 20081223-00

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## 1. TEST CERTIFICATION

Equipment under Test: GPS TRACKER

Brand Name: QUECTEL

Model Name: GS200

FCC ID: XMR-16182010001

Applicant: Quectel Wireless Solutions Co.,Ltd

Room 801, Building E, No 1618 Yishan Road,  
Shanghai,China,201103

Manufacturer: Quectel Wireless Solutions Co.,Ltd

Room 801, Building E, No 1618 Yishan Road,  
Shanghai,China,201103

Test Standards: 47 CFR Part 2

47 CFR Part 22 Subpart H

47 CFR Part 24 Subpart E

Test Date(s): Jan 25 ,2010 –Jan 27 , 2010

Test Result: PASS

### \* We Hereby Certify That:

The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by:

..... Zhang Wenjie .....  
Zhang Wenjie

Reviewed by:

..... Zhang Jun .....  
Zhang Jun

Approved by:

..... Su Feng .....  
Su Feng



## 2. GENERAL INFORMATION

### 2.1 EUT Description

EUT Type .....: GPS TRACKER  
Model Name .....: GS200  
Serial No. ....: (n.a)  
IMEI .....: 0000000000000000  
Hardware Version .....: V1.02  
Software Version .....: B03  
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.....: GMSK  
Power Supply .....: Battery  
Brand name: Jiade  
Mode Name.: GS200  
Capacitance: 1150mAh  
Rated voltage: 3.7V  
Charge limited: 4.2V  
Manufacturer: Jiade Energy Technology(ZHUHAI)Co.,Ltd.  
2/F,Helping Industrial Center Building,#209  
Shihua Road West, Jida Area Zhuhai, China  
Ancillary Equipments.....: AC Adapter (Charger for Battery)  
Brand name: SOMETHING  
Mode Name.: P-051B-050050  
Rated Input: AC 100/240V,200mA,50/60Hz  
Rated Output: DC 5V,500mA,Max 2.5W  
Manufacturer: SOMETHING HIGH ELECTRIC ( XIAMEN )  
Co.,Ltd.  
No.421, Xiahushe, Houkengshe Area, Huli  
Industrial Park, Xiamen, China

*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 (ARFCNs) 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.

## 2.2 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 (10-1-05 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-05 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-05 Edition)	Personal Communications Services

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

No.	Section	Description	Result
1	2.106 22.905 24.229	Frequencies	PASS
2	2.1046	Conducted RF Output Power	PASS
3	2.1049	20dB Occupied Bandwidth	PASS
4	2.1055 22.355 24.235	Frequency Stability	PASS
5	2.1051 2.1057 22.917 24.238	Conducted Out of Band Emissions	PASS
6	2.1051 2.1057 22.917 24.238	Band Edge	PASS
7	22.913 24.232	Transmitter Radiated Power (EIPR/ERP)	PASS
8	2.1053 2.1057 22.917 24.238	Radiated Out of Band Emissions	PASS

## 2.3 Facilities and Accreditations

### 2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Board for Laboratories (CNAL) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. 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 741109.

### 2.3.2 Test Environment Conditions

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

Temperature (°C):	20 - 25
Relative Humidity (%):	40 - 60
Atmospheric Pressure (kPa):	96

### 3. 47 CFR PART 2, PART 22H &24E REQUIREMENTS

#### 3.1 Frequencies

##### 3.1.1 Requirement

According to FCC section 22.905, the frequency blocks assignment for the cellular radiotelephone service is listed as below:

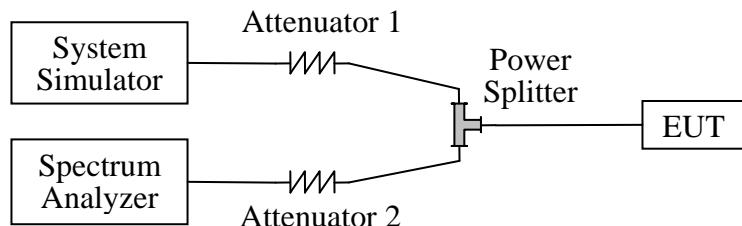
- (a) Channel Block A:
  - Mobile 824 - 835MHz, Base 869 - 880MHz;
  - Mobile 845 - 846.5MHz, Base 890 - 891.5MHz
- (b) Channel Block B:
  - Mobile 835 - 845 MHz, Base 880 - 890MHz;
  - Mobile 846.5 - 849 MHz, Base 891.5 - 894MHz

According to FCC section 24.229, the frequencies available in the Broadband PCS services are listed as below, in accordance with the frequency allocations table of FCC section 2.106.

- (a) The following frequency blocks are available for assignment on an MTA basis:
  - Block A: 1850 - 1865MHz paired with 1930 - 1945MHz;
  - Block B: 1870 - 1885MHz paired with 1950 - 1965MHz.
- (b) The following frequency blocks are available for assignment on a BTA basis:
  - Block C: 1895 - 1910 MHz paired with 1975 - 1990MHz;
  - Block D: 1865 - 1870 MHz paired with 1945 - 1950MHz;
  - Block E: 1885 - 1890 MHz paired with 1965 - 1970MHz;
  - Block F: 1890 - 1895 MHz paired with 1970 - 1975MHz.

##### 3.1.2 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.

## 2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
SS	Agilent	E5515C	GB46040102	2009.10	1year
Spectrum Analyzer	Agilent	E4440A	MY46187763	2009.10	1year
Power Splitter	HP	11667B	00164	(n.a.)	(n.a.)
Attenuator 1	Resnet	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	10dB	(n.a.)	(n.a.)	(n.a.)

### 3.1.3 Test Result

The Tx frequency arrangement of the Cellular 850MHz band employed by the EUT should be from 824.2MHz to 848.8MHz (the corresponding frequency block is from 824MHz to 849MHz), and Tx frequency arrangement of the PCS 1900MHz band employed by the EUT should be from 1850.2MHz to 1909.8MHz (the corresponding frequency block is from 1850MHz to 1910MHz). Here the lowest and highest channels are tested to verify the EUT's using the frequency block required.

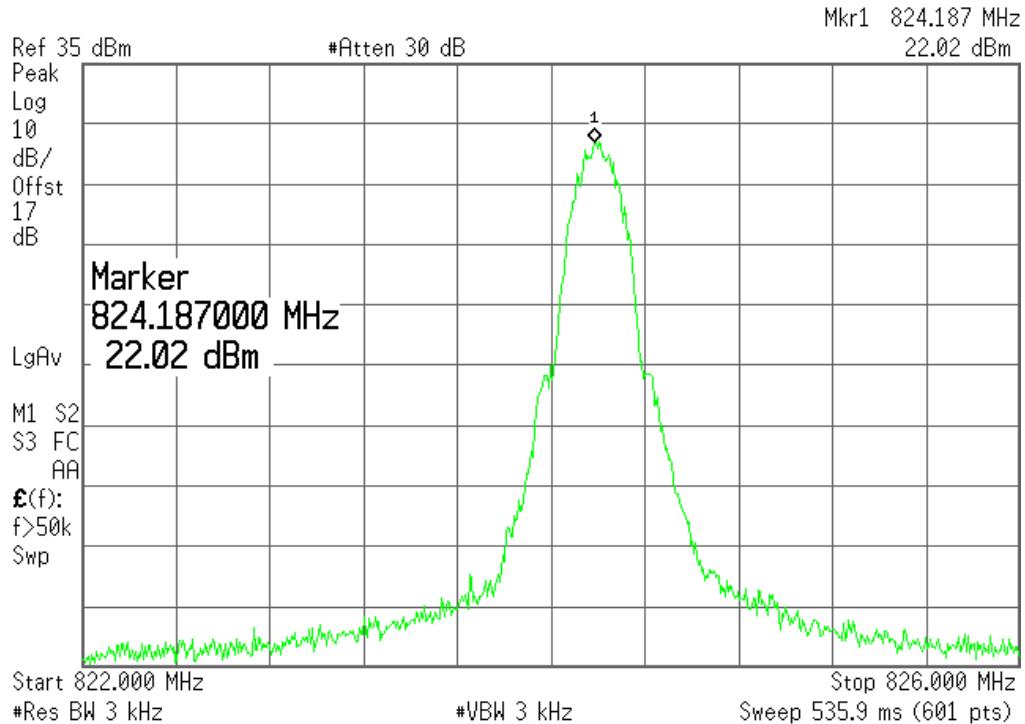
#### 1. Test Verdict:

The required frequency block is employed legally, the verdict is PASS.

Band	Channel	Frequency (MHz)	Measured Carrier (dBm)	Refer to Plot
GSM 850MHz	128	824.18	22.02	Plot A1
	251	848.81	22.11	Plot B1
GSM 1900MHz	512	1850.18	18.15	Plot C1
	810	1909.78	19.05	Plot D1
GPRS 850MHz	128	824.21	23.00	Plot E1
	251	848.76	21.67	Plot F1
GPRS 1900MHz	512	1850.18	17.74	Plot G1
	810	1909.86	18.60	Plot H1

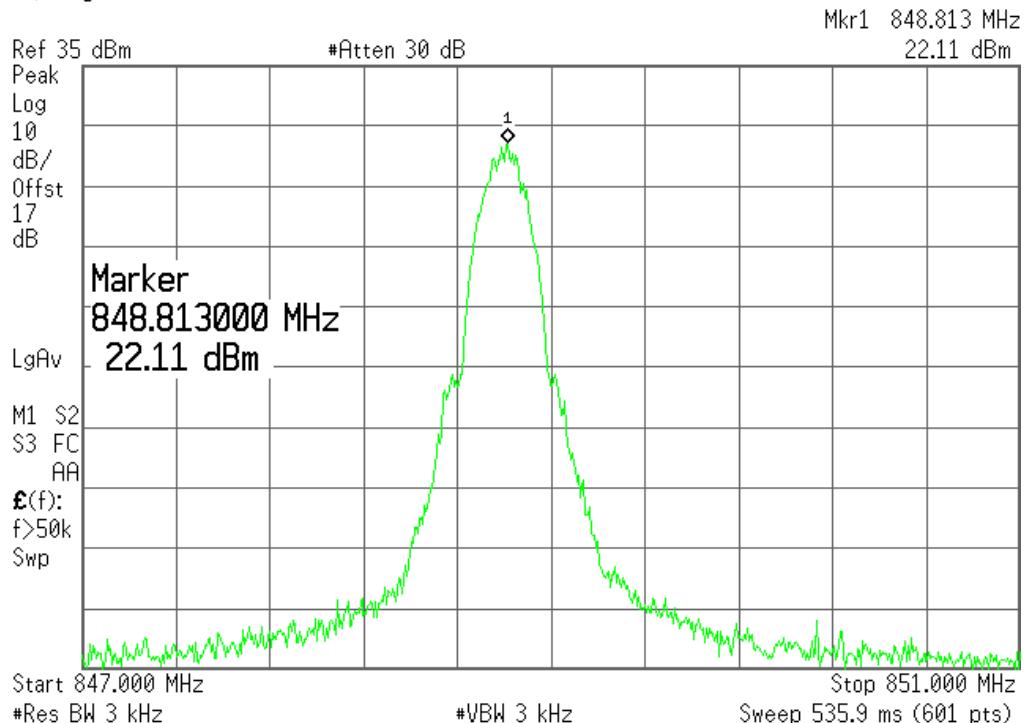
#### 2. Test Plot:

\* Agilent 15:19:45 Jan 24, 2010



(Plot A1: GSM 850MHz Channel = 128)

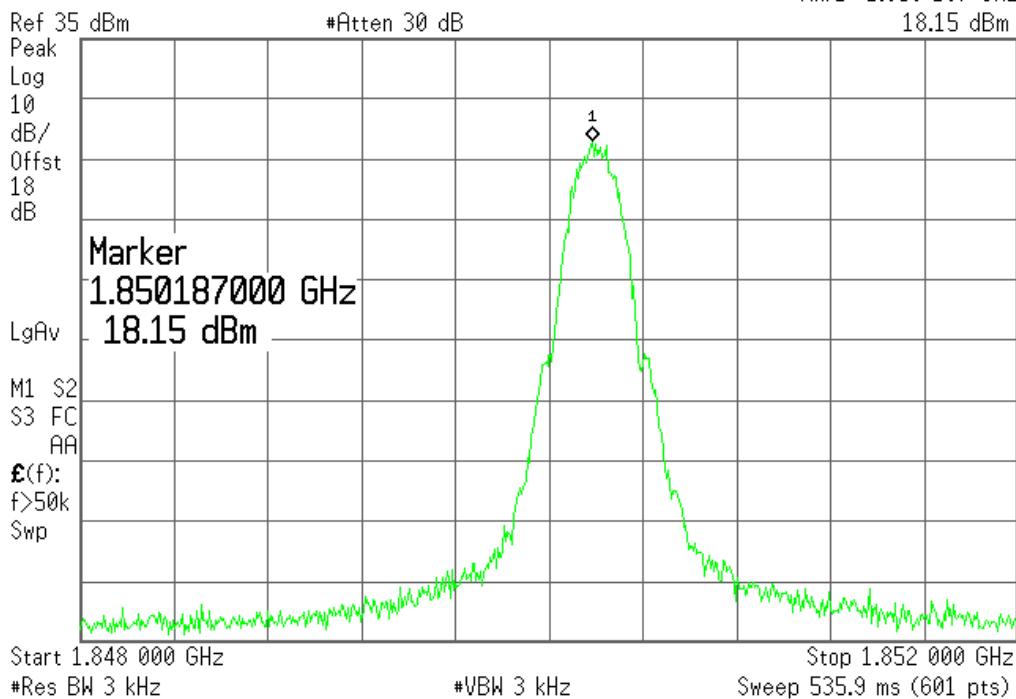
\* Agilent 15:23:56 Jan 24, 2010



(Plot B1: GSM 850MHz Channel = 251)

\* Agilent 15:28:52 Jan 24, 2010

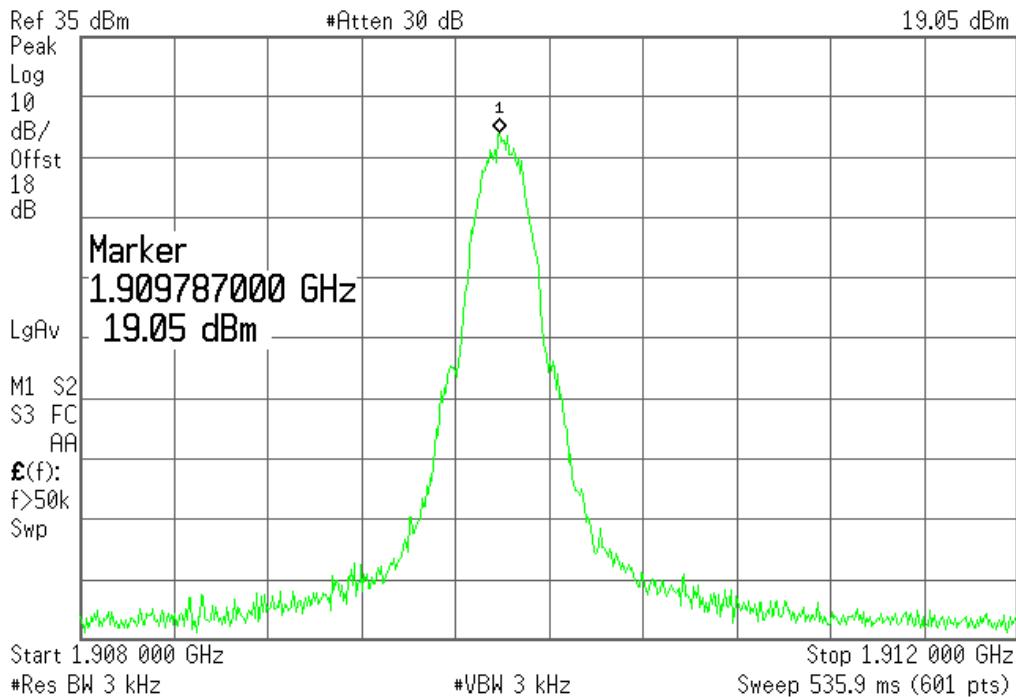
Mkr1 1.850 187 GHz



(Plot C1: GSM 1900MHz Channel = 512)

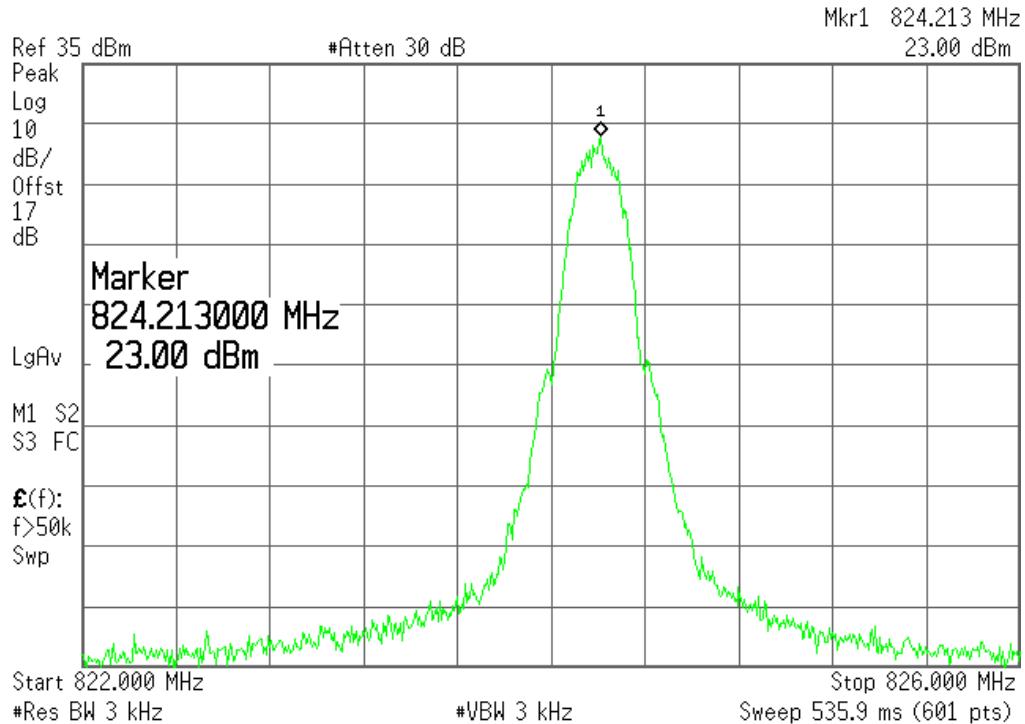
\* Agilent 15:30:18 Jan 24, 2010

Mkr1 1.909 787 GHz



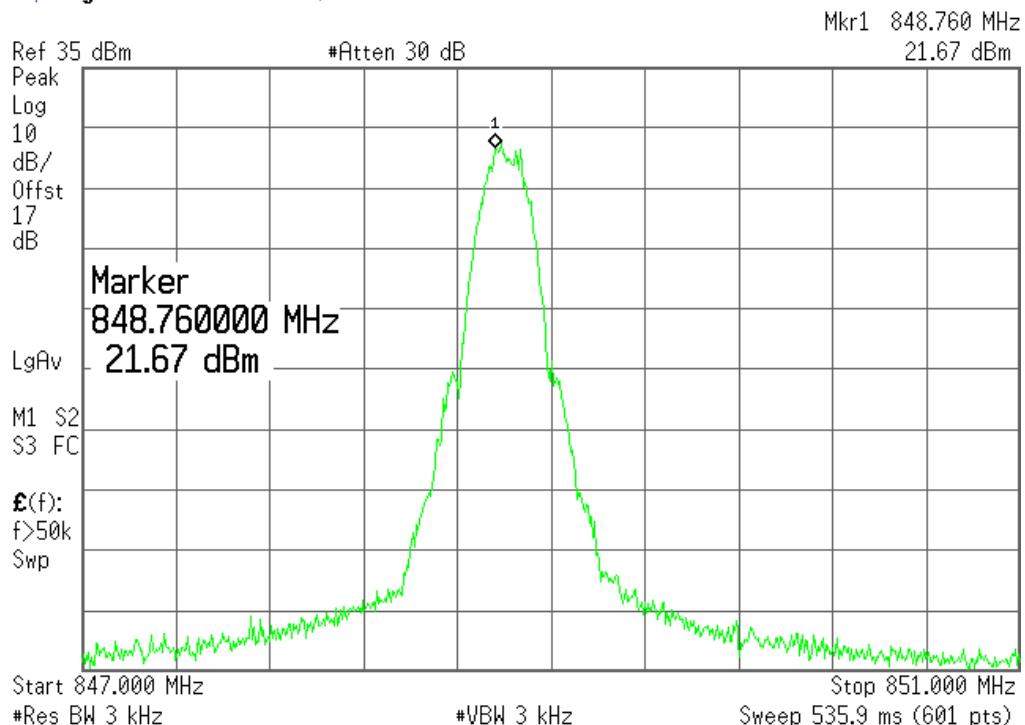
(Plot D1: GSM 1900MHz Channel = 810)

\* Agilent 10:58:27 Jan 25, 2010



(Plot E1: GPRS 850MHz Channel = 128)

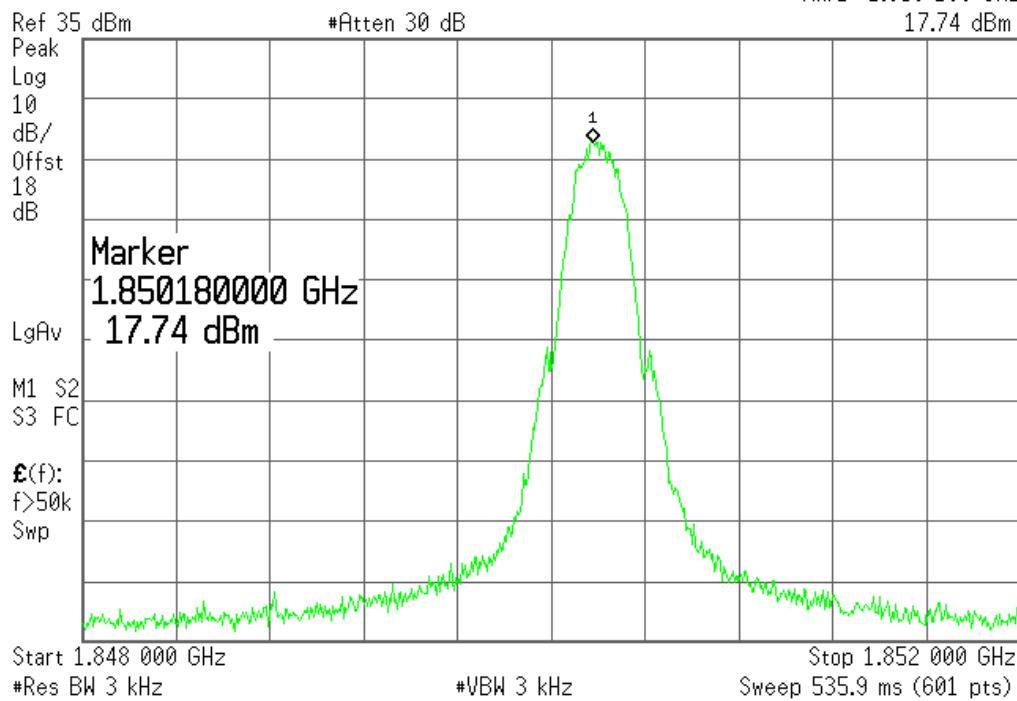
\* Agilent 10:59:19 Jan 25, 2010



(Plot F1: GPRS 850MHz Channel = 251)

\* Agilent 10:09:58 Jan 25, 2010

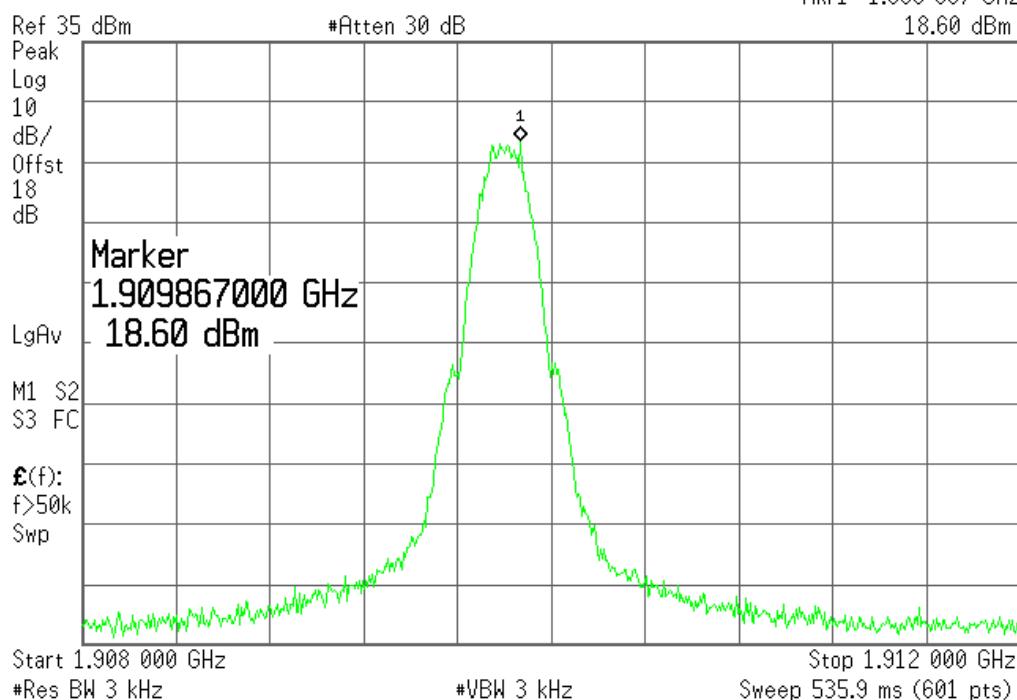
Mkr1 1.850 180 GHz  
17.74 dBm



(Plot G1: GPRS 1900MHz Channel = 512)

\* Agilent 10:17:22 Jan 25, 2010

Mkr1 1.909 867 GHz  
18.60 dBm



(Plot H1: GPRS 1900MHz Channel = 810)

### 3.2 Conducted RF Output Power

#### 3.2.1 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).

#### 3.2.2 Test Description

See section 3.1.2 of this report.

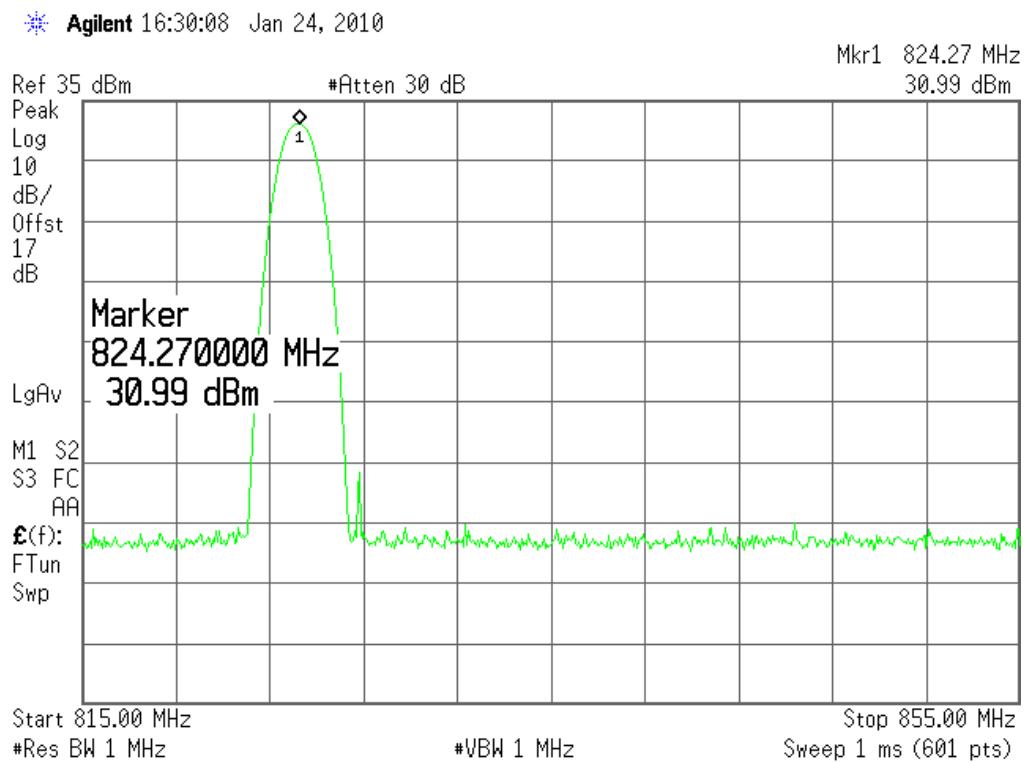
#### 3.2.3 Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT. For the GSM 850MHz operates at PCL=5 (where Power Class is 4), the rated conducted RF output power is 33dBm within the tolerance of  $\pm 3$ dB, and For the GSM 1900MHz operates at PCL=0 (where Power Class is 1), the rated conducted RF output power is 30dBm within the tolerance of  $\pm 3$ dB.

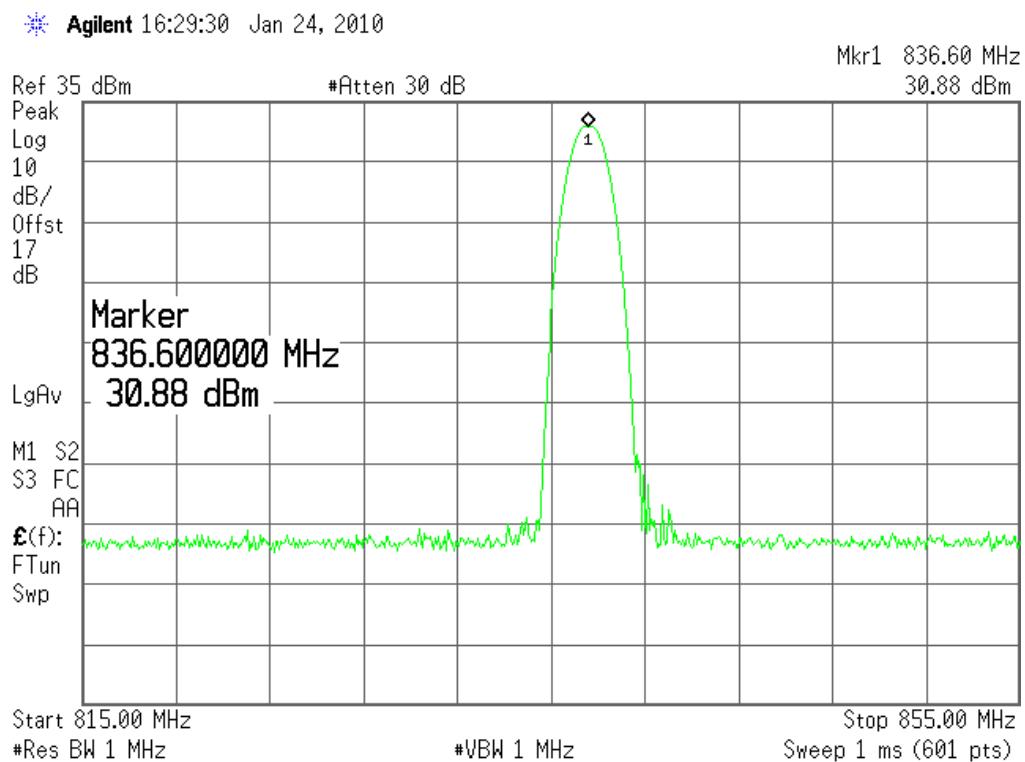
##### 1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Output Power		Rated Output Power		Verdict
			dBm	Refer to Plot	dBm	Tolerance (dB)	
GSM 850MHz	128	824.27	30.99	Plot A2	33	$\pm 3$	PASS
	190	836.60	30.88	Plot B2			PASS
	251	848.87	30.81	Plot C2			PASS
GSM 1900MHz	512	1850.13	27.55	Plot D2	30	$\pm 3$	PASS
	661	1880.00	27.79	Plot E2			PASS
	810	1909.73	27.61	Plot F2			PASS
GPRS 850MHz	128	824.13	30.65	Plot G2	33	$\pm 3$	PASS
	190	836.53	30.55	Plot H2			PASS
	251	848.80	30.47	Plot I2			PASS
GPRS 1900MHz	512	1850.13	27.05	Plot J2	30	$\pm 3$	PASS
	661	1880.00	27.35	Plot K2			PASS
	810	1909.73	27.11	Plot L2			PASS

## 2. Test Plot:

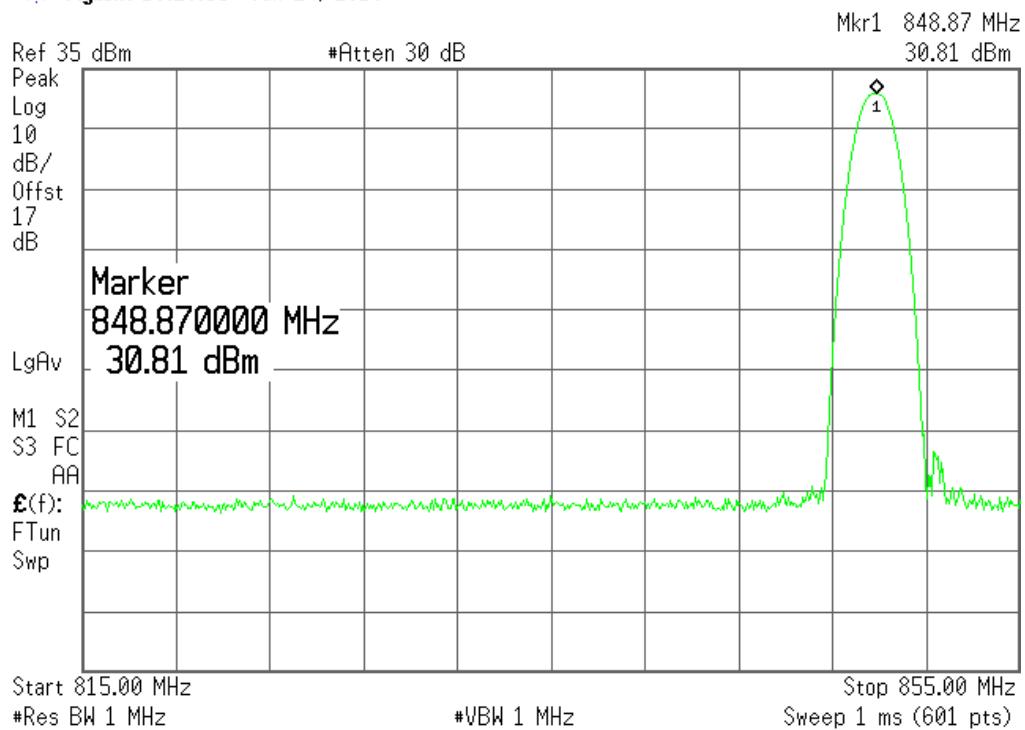


(Plot A2: GSM 850MHz Channel = 128)



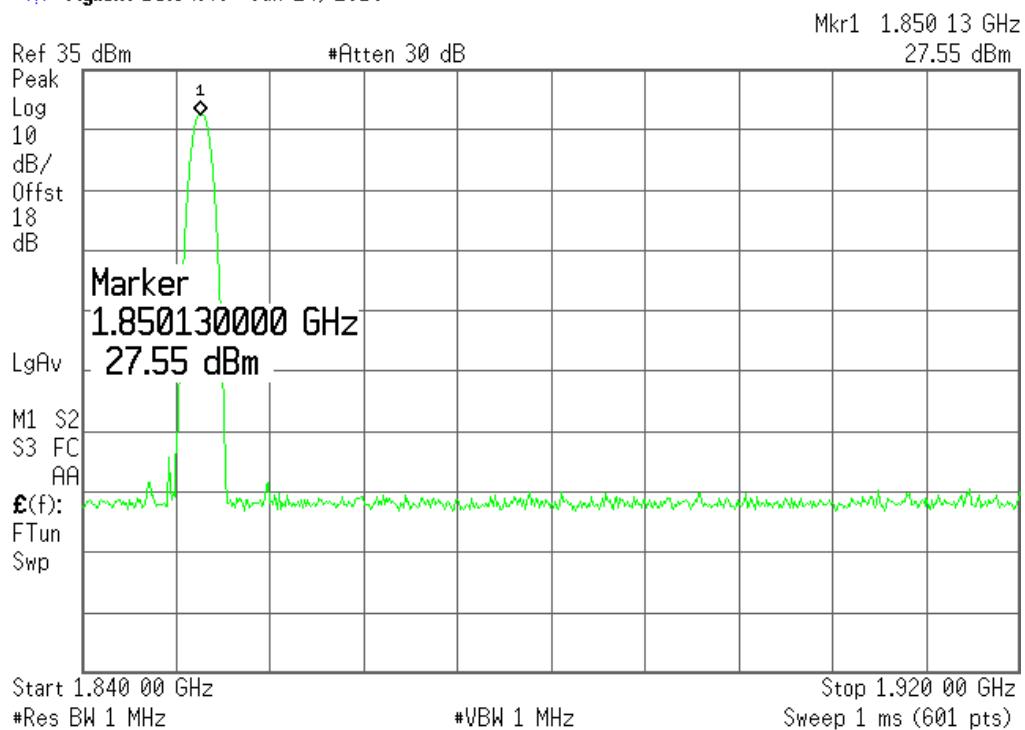
(Plot B2: GSM 850MHz Channel = 190)

Agilent 16:28:55 Jan 24, 2010



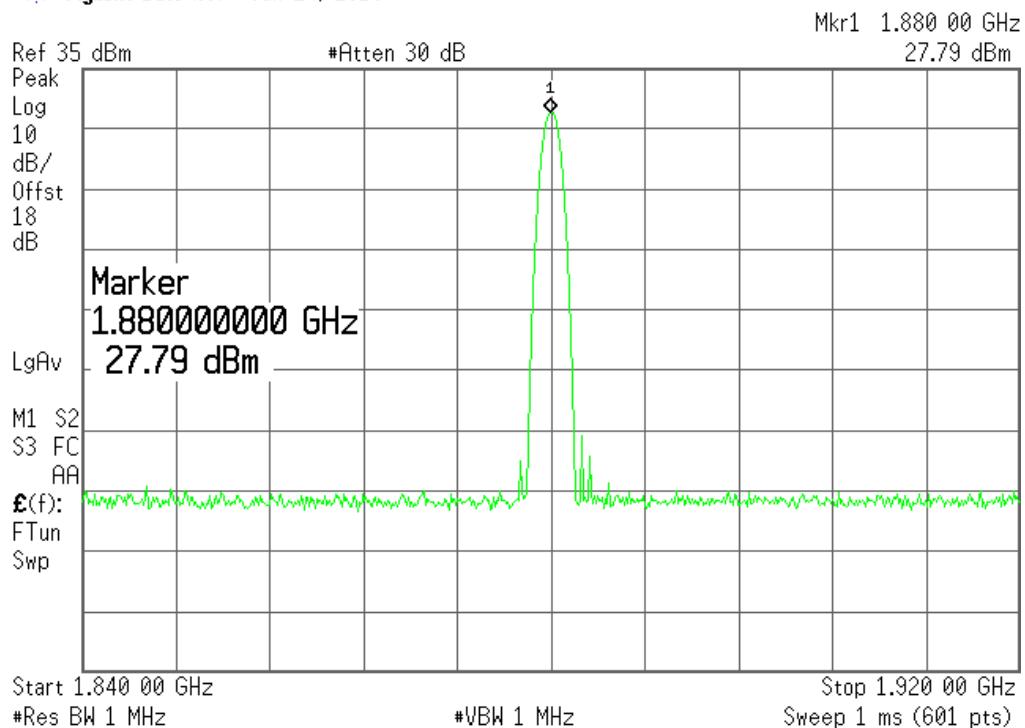
(Plot C2: GSM 850MHz Channel = 251)

Agilent 15:34:40 Jan 24, 2010



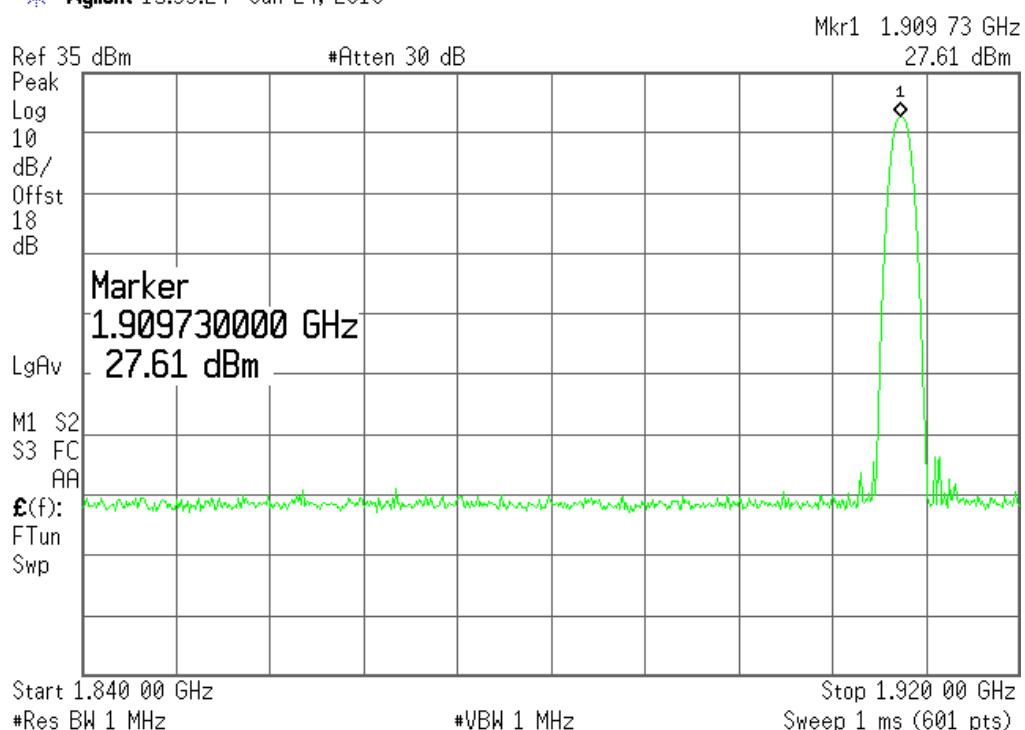
(Plot D2: GSM 1900MHz Channel = 512)

Agilent 15:34:07 Jan 24, 2010



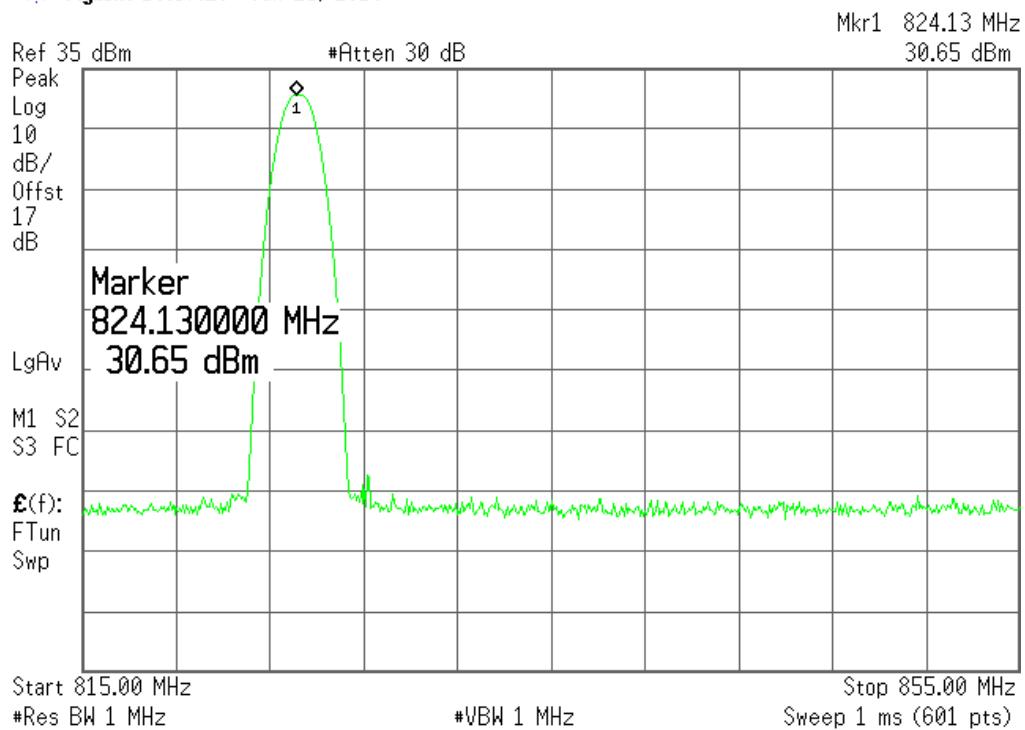
(Plot E2: GSM 1900MHz Channel = 661)

Agilent 15:33:24 Jan 24, 2010



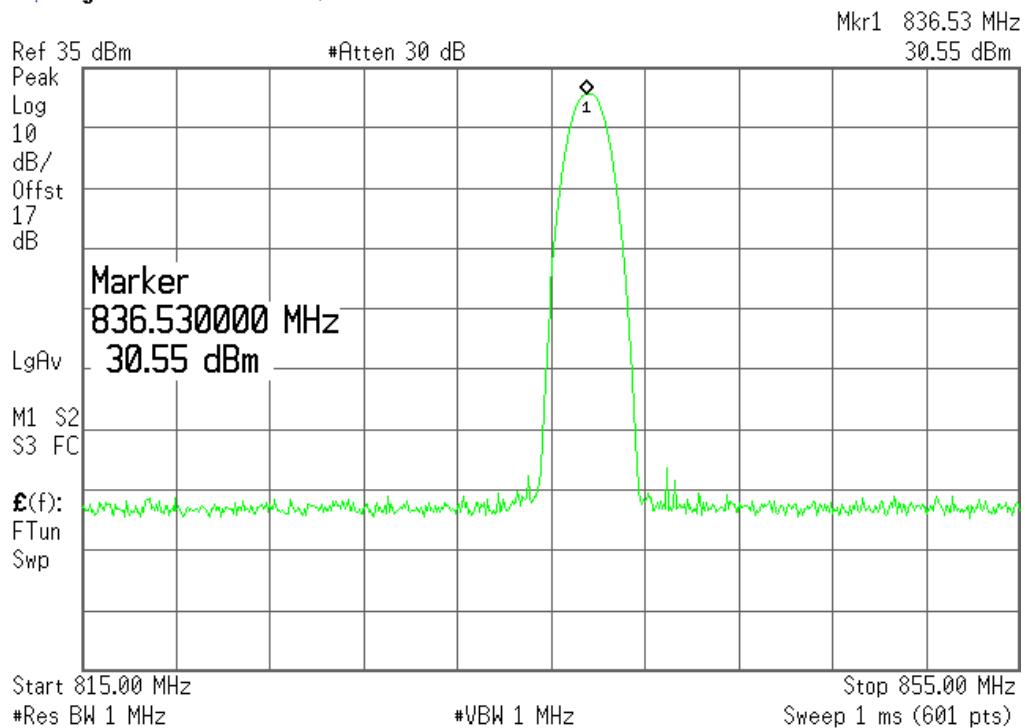
(Plot F2: GSM 1900MHz Channel = 810)

Agilent 10:57:29 Jan 25, 2010



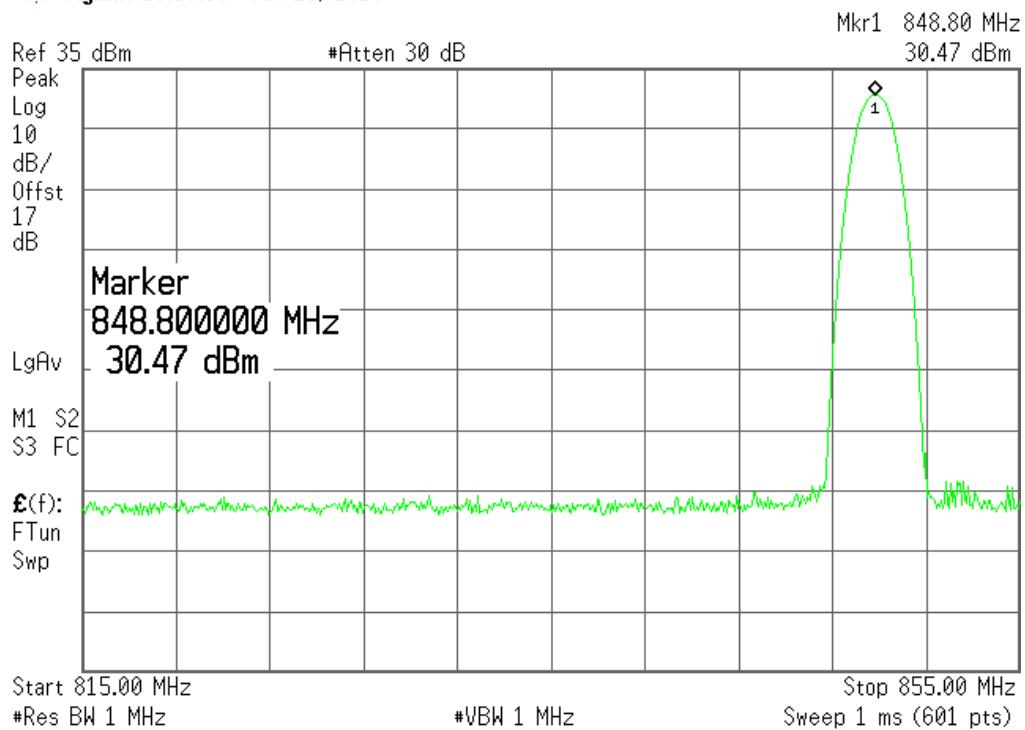
(Plot G2:GPRS 850MHz Channel = 128)

Agilent 10:57:05 Jan 25, 2010



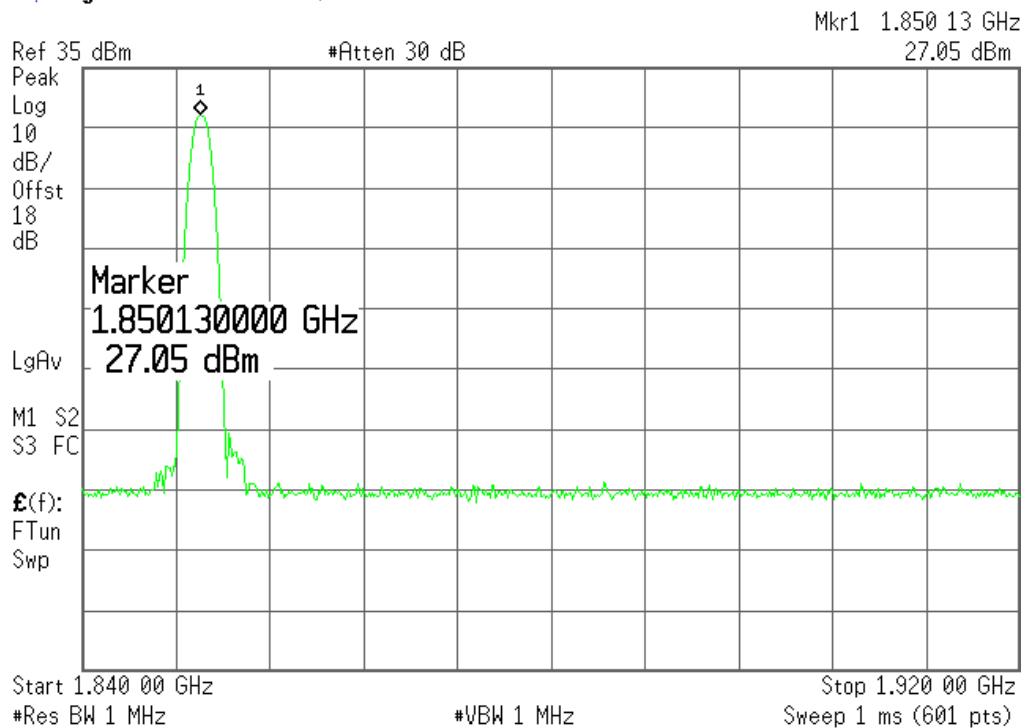
(Plot H2: GPRS 850MHz Channel = 190)

Agilent 10:56:38 Jan 25, 2010

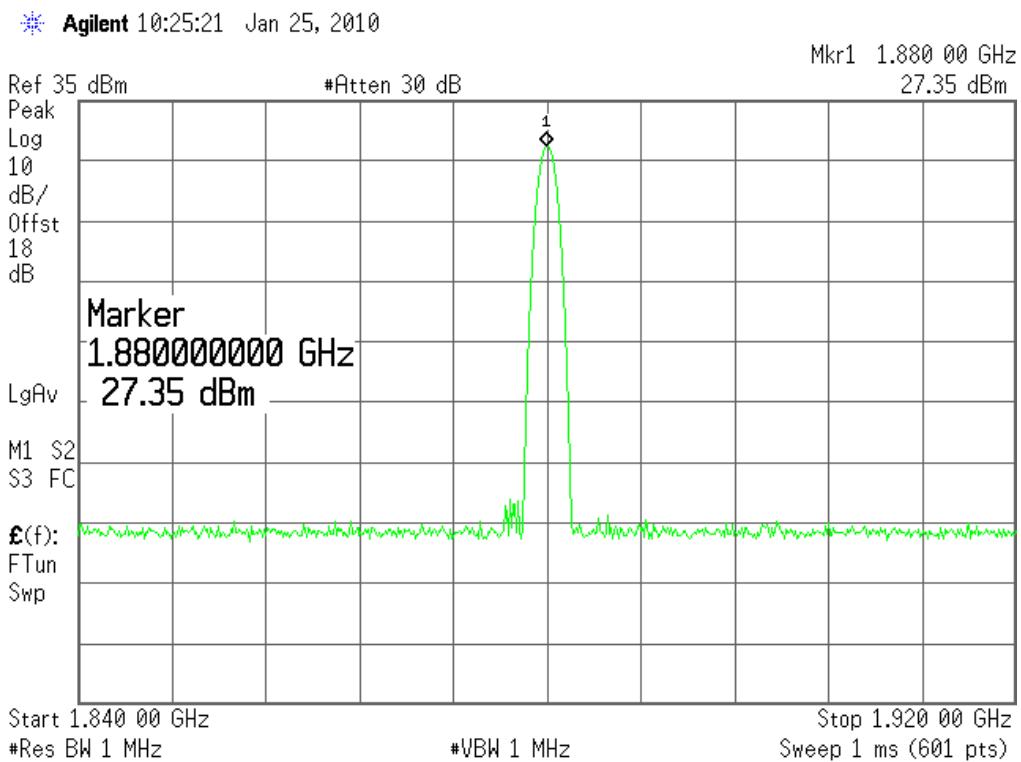


(Plot I2: GPRS 850MHz Channel = 251)

Agilent 10:24:19 Jan 25, 2010



(Plot J2: GPRS 1900MHz Channel = 512)



(Plot K2: GPRS 1900MHz Channel = 661)



(Plot L2: GPRS 1900MHz Channel = 810)

### 3.3 20dB Occupied Bandwidth

#### 3.3.1 Definition

According to FCC section 2.1049, 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, or 20dB bandwidth ( $10 \log 1\% = 20\text{dB}$ ) taking the total RF output power as reference.

#### 3.3.2 Test Description

See section 3.1.2 of this report.

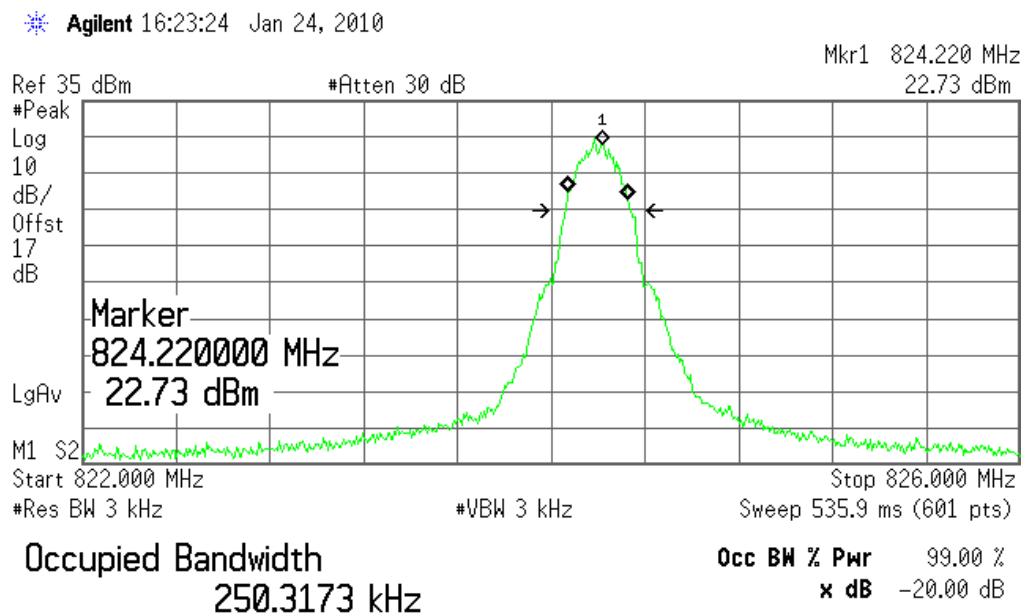
#### 3.3.3 Test Verdict

Here the lowest, middle and highest channels are tested to record the 20dB occupied bandwidth, it's about 300kHz.

##### 1. Test Verdict:

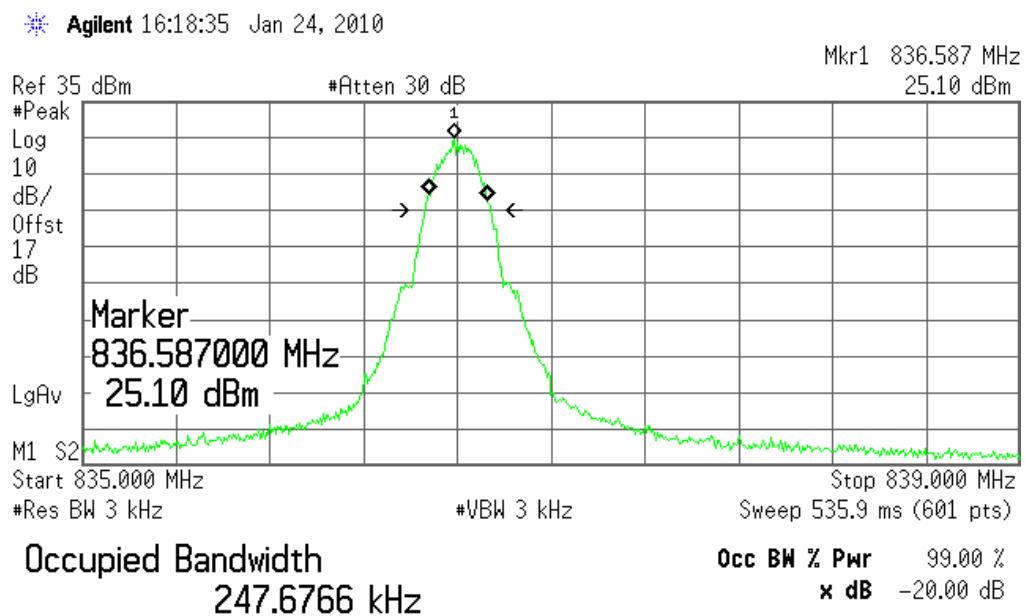
Band	Channel	Frequency (MHz)	Measured 20dB Occupied Bandwidth (kHz)	Refer to Plot
GSM 850MHz	128	824.22	250.3173	Plot A3
	190	836.58	247.6766	Plot B3
	251	848.81	266.6435	Plot C3
GSM 1900MHz	512	1850.20	244.4706	Plot D3
	661	1880.01	260.5780	Plot E3
	810	1909.77	256.0993	Plot F3
GPRS 850MHz	128	824.22	243.8432	Plot G3
	190	836.62	255.1031	Plot H3
	251	848.78	246.9023	Plot I3
GPRS 1900MHz	512	1850.17	243.2314	Plot J3
	661	1879.98	246.8038	Plot K3
	810	1909.84	247.9707	Plot L3

## 2. Test Plot:



Transmit Freq Error 201.125 kHz  
x dB Bandwidth 276.983 kHz

(Plot A3: GSM 850MHz Channel = 128)

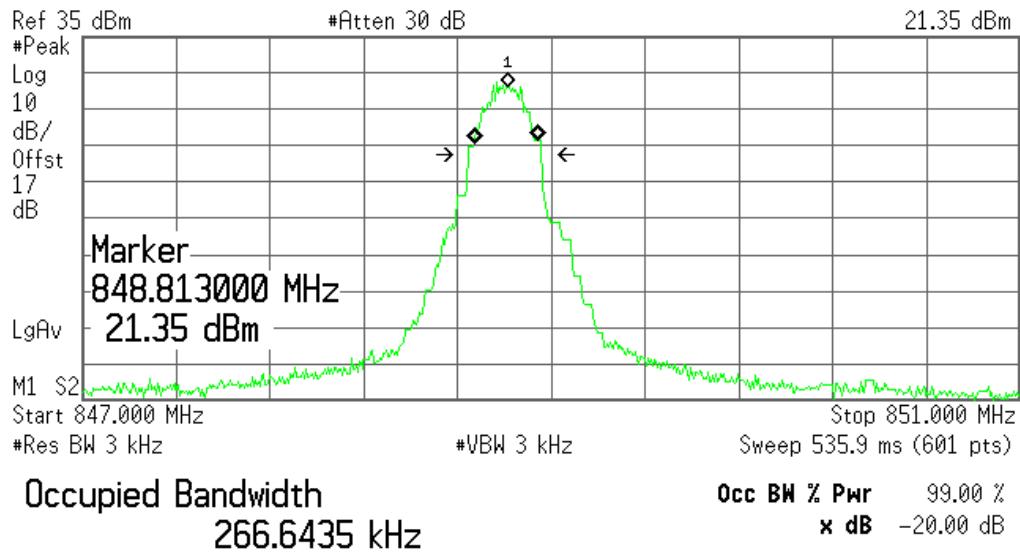


Transmit Freq Error -398.349 kHz  
x dB Bandwidth 280.866 kHz

(Plot B3: GSM 850MHz Channel = 190)

\* Agilent 16:26:46 Jan 24, 2010

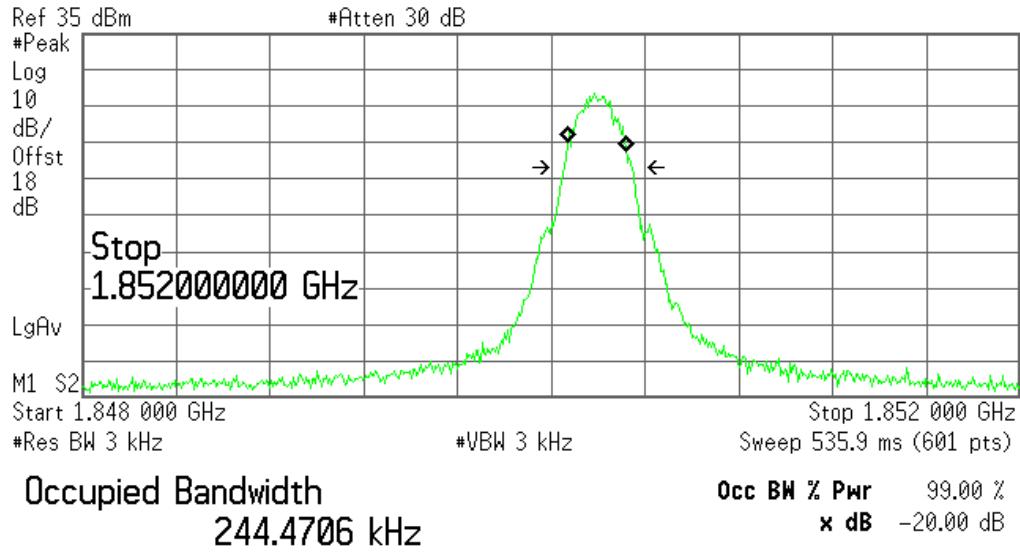
Mkr1 848.813 MHz



Transmit Freq Error -194.737 kHz  
x dB Bandwidth 313.447 kHz

(Plot C3: GSM 850MHz Channel = 251)

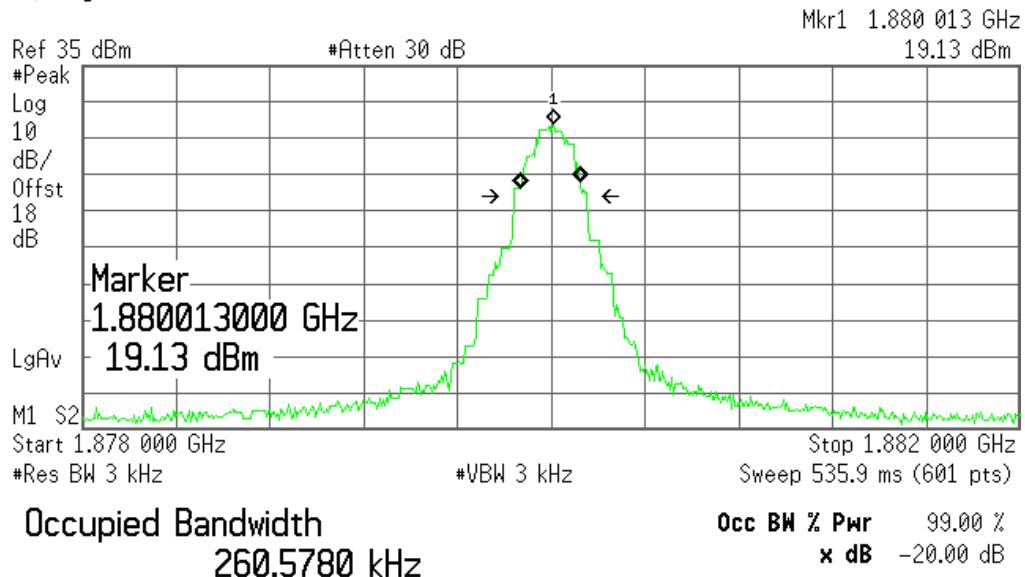
\* Agilent 15:42:50 Jan 24, 2010



Transmit Freq Error 196.851 kHz  
x dB Bandwidth 285.329 kHz

(Plot D3: GSM 1900MHz Channel = 512)

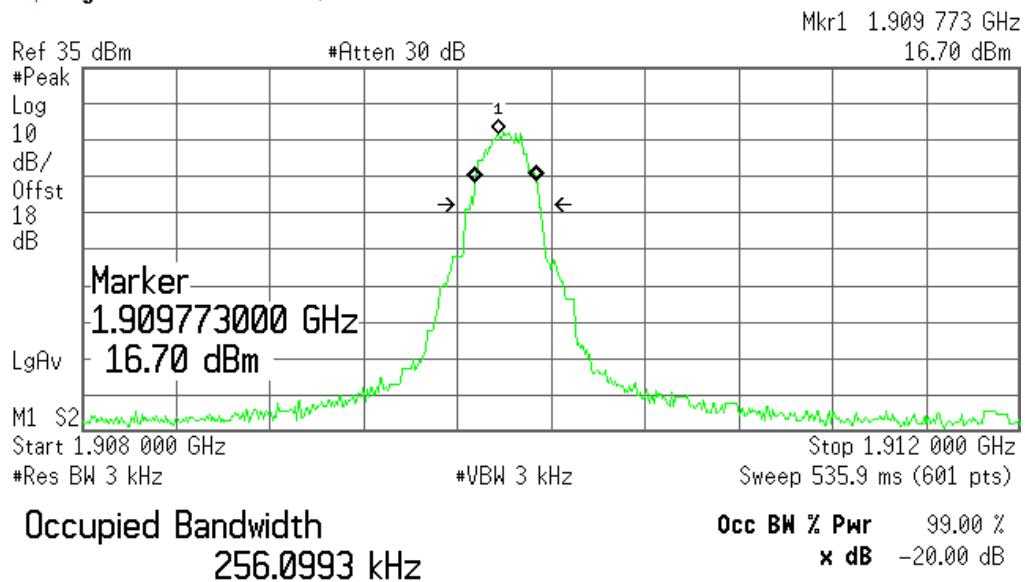
\* Agilent 15:44:19 Jan 24, 2010



Transmit Freq Error -6.026 kHz  
 x dB Bandwidth 317.302 kHz

(Plot E3: GSM 1900MHz Channel = 661)

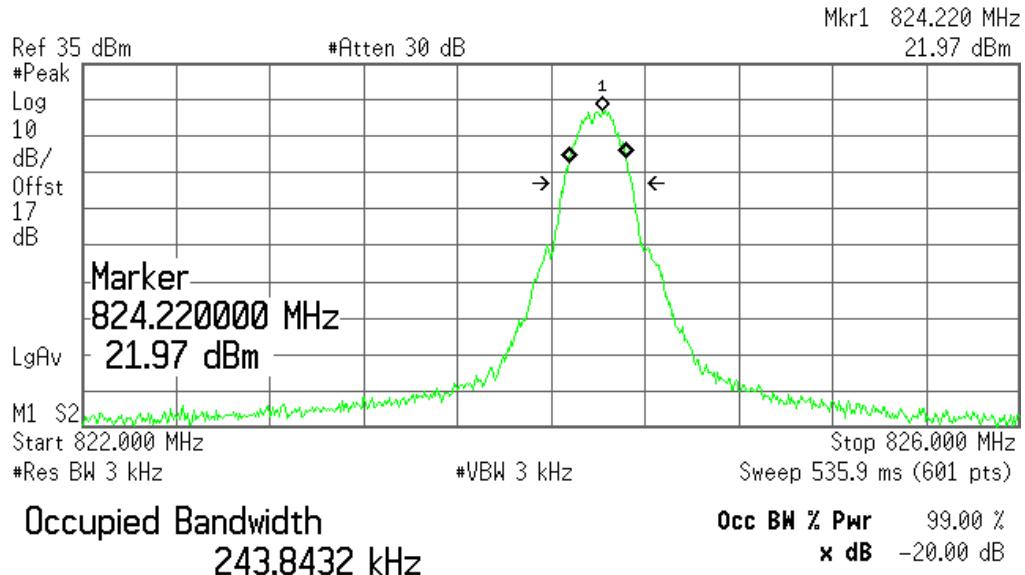
\* Agilent 15:45:38 Jan 24, 2010



Transmit Freq Error -195.603 kHz  
 x dB Bandwidth 291.296 kHz

(Plot F3: GSM 1900MHz Channel = 810)

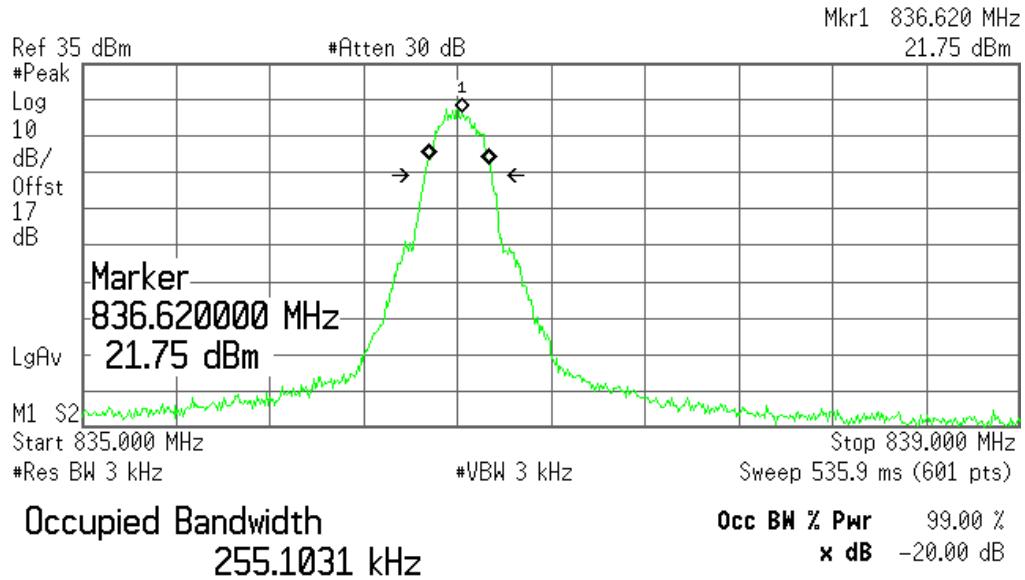
\* Agilent 10:53:07 Jan 25, 2010



Transmit Freq Error 199.658 kHz  
x dB Bandwidth 287.312 kHz

(Plot G3:GPRS 850MHz Channel = 128)

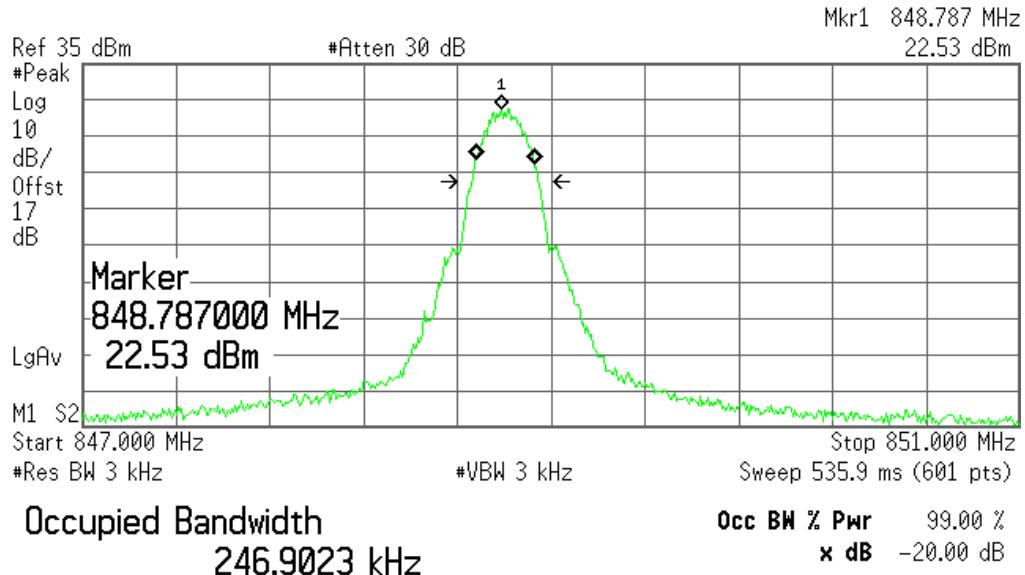
\* Agilent 10:54:21 Jan 25, 2010



Transmit Freq Error -395.429 kHz  
x dB Bandwidth 282.537 kHz

(Plot H3: GPRS 850MHz Channel = 190)

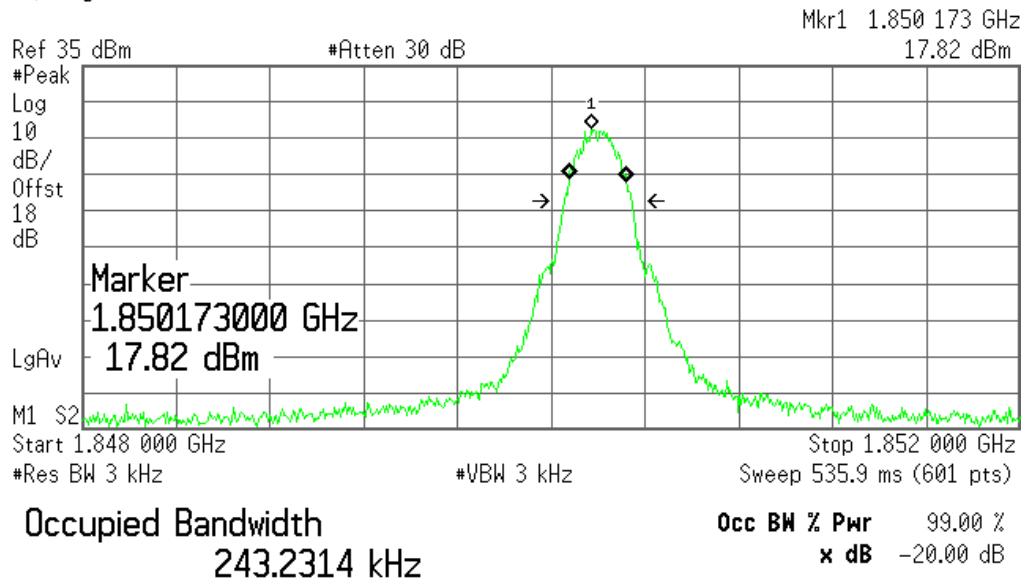
\* Agilent 10:55:29 Jan 25, 2010



Transmit Freq Error -199.182 kHz  
x dB Bandwidth 278.159 kHz

(Plot I3: GPRS 850MHz Channel = 251)

\* Agilent 10:33:36 Jan 25, 2010

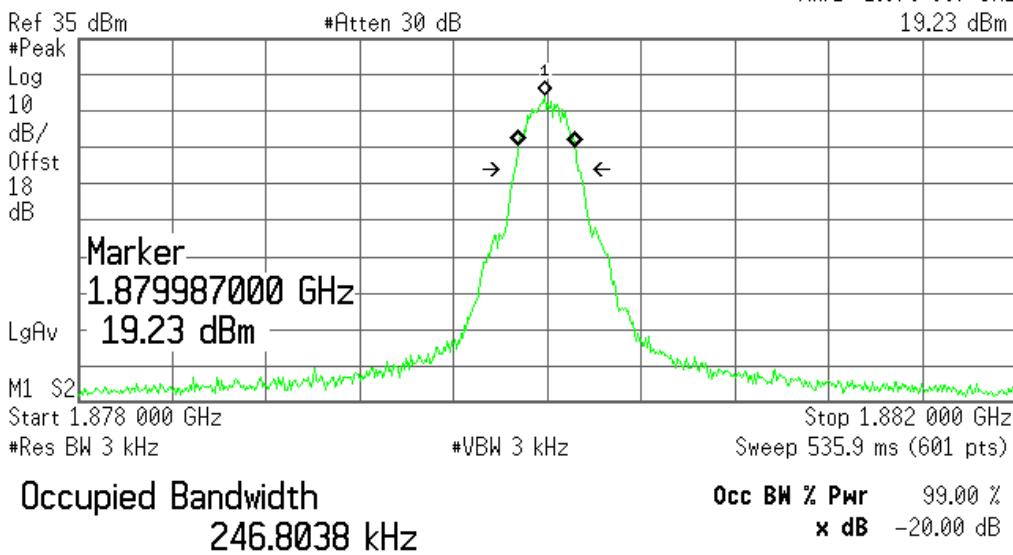


Transmit Freq Error 200.204 kHz  
x dB Bandwidth 285.647 kHz

(Plot J3: GPRS 1900MHz Channel = 512)

\* Agilent 10:30:59 Jan 25, 2010

Mkr1 1.879 987 GHz

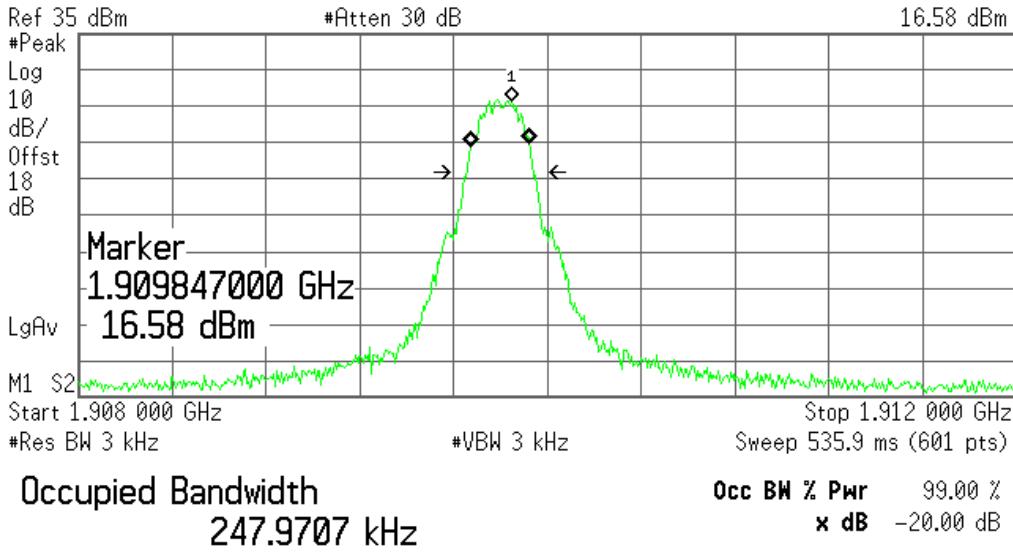


Transmit Freq Error -1.343 kHz  
x dB Bandwidth 273.491 kHz

(Plot K3: GPRS 1900MHz Channel = 661)

\* Agilent 10:34:57 Jan 25, 2010

Mkr1 1.909 847 GHz



Transmit Freq Error -202.098 kHz  
x dB Bandwidth 282.376 kHz

(Plot L3: GPRS 1900MHz Channel = 810)

### 3.4 Frequency Stability

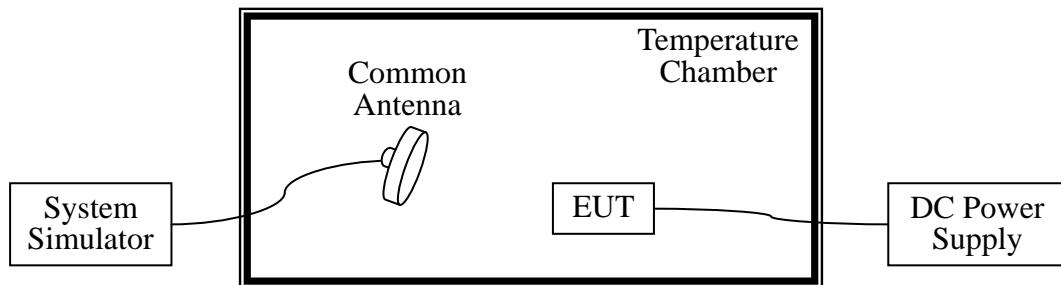
#### 3.4.1 Requirement

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:

- (a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer. 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.

#### 3.4.2 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
CMU200	Rohde&Schwarz	FSP30	101020	2009.10	1year
DC Power Supply	Good Will	GPS-3030DD	EF920938	2009.10	2year
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2009.10	1year

#### 3.4.3 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°C. The frequency

deviation limit is  $\pm 2.5$ ppm.

Band	Test Conditions		Frequency Deviation						Verdict	
	Power (VD C)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)			
			Hz	Limit	Hz	Limit	Hz	Limit		
GSM 850MHz	3.7	-30	-14.17	$\pm 2060.5$	14.52	$\pm 2091.5$	13.24	$\pm 2122.0$	PASS	
		-20	12.50		-13.37		16.54			
		-10	-10.09		9.27		-13.24			
		0	-14.33		11.49		13.86			
		+10	11.27		12.26		11.27			
		+20	-11.32		-12.50		-11.32			
		+30	14.22		10.21		14.22			
		+40	-19.11		-13.69		-19.11			
		+50	-12.53		-20.28		11.20			
	4.2	+25	-14.13		-13.24		-10.59			
	3.6	+25	-13.18		-18.88		21.33			
GSM 1900MHz	3.7	-30	15.31	$\pm 1550.2$	15.64	$\pm 1550.0$	24.54	$\pm 1707.5$	PASS	
		-20	18.64		-5.86		12.14			
		-10	10.54		14.13		-12.19			
		0	17.58		11.80		-16.16			
		+10	-11.23		17.56		15.45			
		+20	-15.54		19.24		-20.12			
		+30	13.38		10.91		-10.12			
		+40	18.33		20.14		14.79			
		+50	-13.54		24.42		-12.17			
	4.2	+25	-14.89		13.78		-15.83			
	3.6	+25	16.56		-12.53		15.50			
GPRS 850MHz	3.7	-30	-15.17	$\pm 2060.5$	-14.13	$\pm 2091.5$	-16.45	$\pm 2122.0$	PASS	
		-20	13.10		-13.18		-10.17			
		-10	14.22		-12.21		16.67			
		0	-14.13		-8.73		16.12			
		+10	-19.11		-16.45		10.22			
		+20	-12.53		-10.17		15.20			
		+30	11.27		16.67		13.78			
		+40	-11.32		16.12		13.24			
		+50	-13.18		10.22		12.27			
	4.2	+25	-10.09		15.20		13.92			

Band	Test Conditions		Frequency Deviation						Verdict	
	Power (VD C)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)			
			Hz	Limit	Hz	Limit	Hz	Limit		
GPRS190 0MHz	3.7	3.6	+25	14.92		-18.88		12.14		PASS
		-30	-14.17		-16.16		24.54			
		-20	12.50		15.45		12.14			
		-10	-10.09		-20.12		-20.12			
		0	-14.33		-10.12		-14.17			
		+10	12.27		14.79		12.50			
		+20	13.92		-12.17		-10.09			
		+30	12.14		-15.83		-14.17			
		+40	24.54		15.50		-10.12			
		+50	12.14		18.69		14.79			
	4.2	+25	-12.19		-21.44		-12.17			
		3.6	+25	14.92	-18.54		-10.12			

### 3.5 Conducted Out of Band Emissions

### 3.6 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.

#### 3.6.1 Test Description

See section 3.1.2 of this report.

#### 3.6.2 Test Result

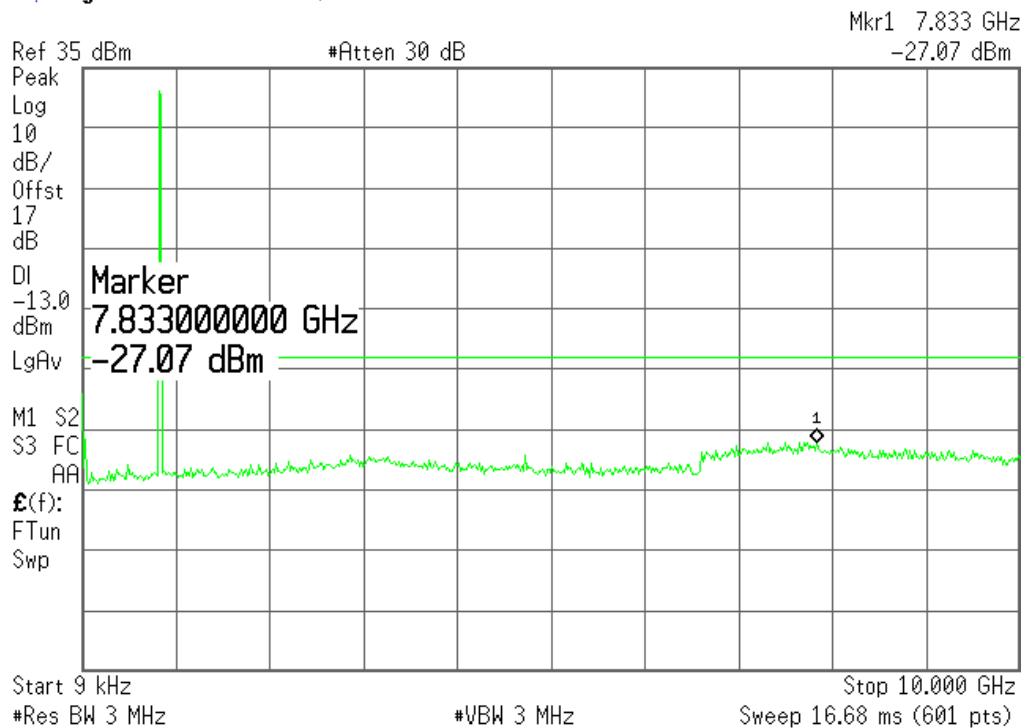
The measurement frequency range is from 30MHz to the 10<sup>th</sup> harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

##### 1. Test Verdict:

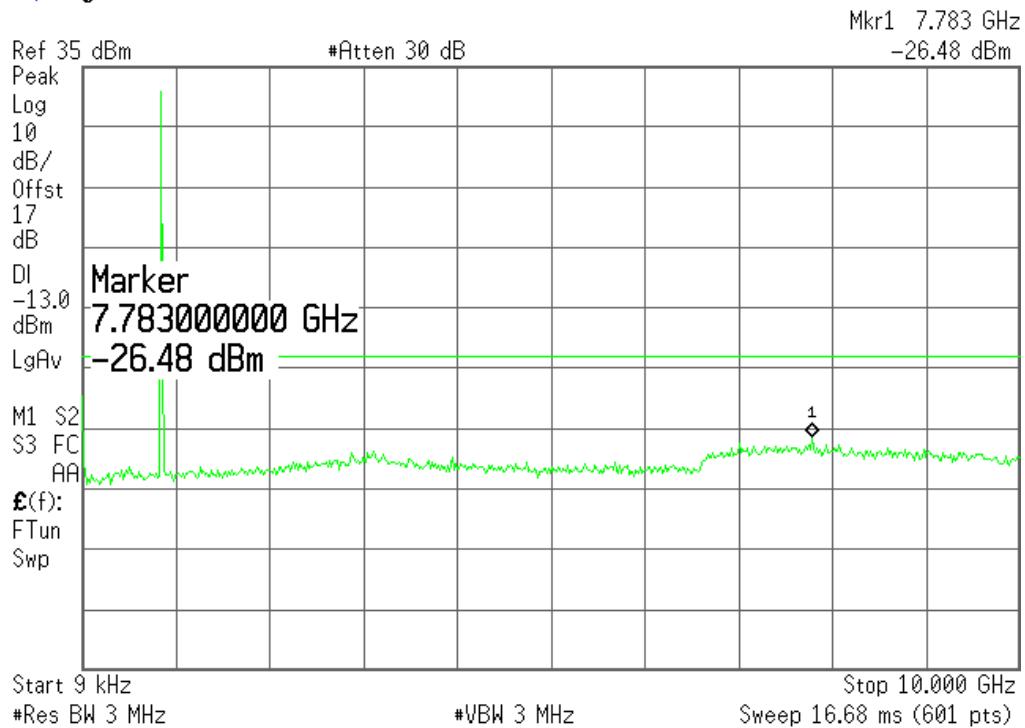
Band	Channel	Frequency (GHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	7.833	-27.07	Plot A4	-13	PASS
	190	7.783	-26.48	Plot B4		PASS
	251	7.750	-26.57	Plot C4		PASS
GSM 1900MHz	512	13.63	-24.00	Plot D4	-13	PASS
	661	15.27	-23.74	Plot E4		PASS
	810	13.30	-23.99	Plot F4		PASS
GPRS 850MHz	128	7.333	-25.97	Plot G4	-13	PASS
	190	7.717	-27.06	Plot H4		PASS
	251	7.217	-26.81	Plot I4		PASS
GPRS 1900MHz	512	14.87	-23.10	Plot J4	-13	PASS
	661	13.77	-23.29	Plot K4		PASS
	810	13.63	-23.77	Plot L		PASS

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

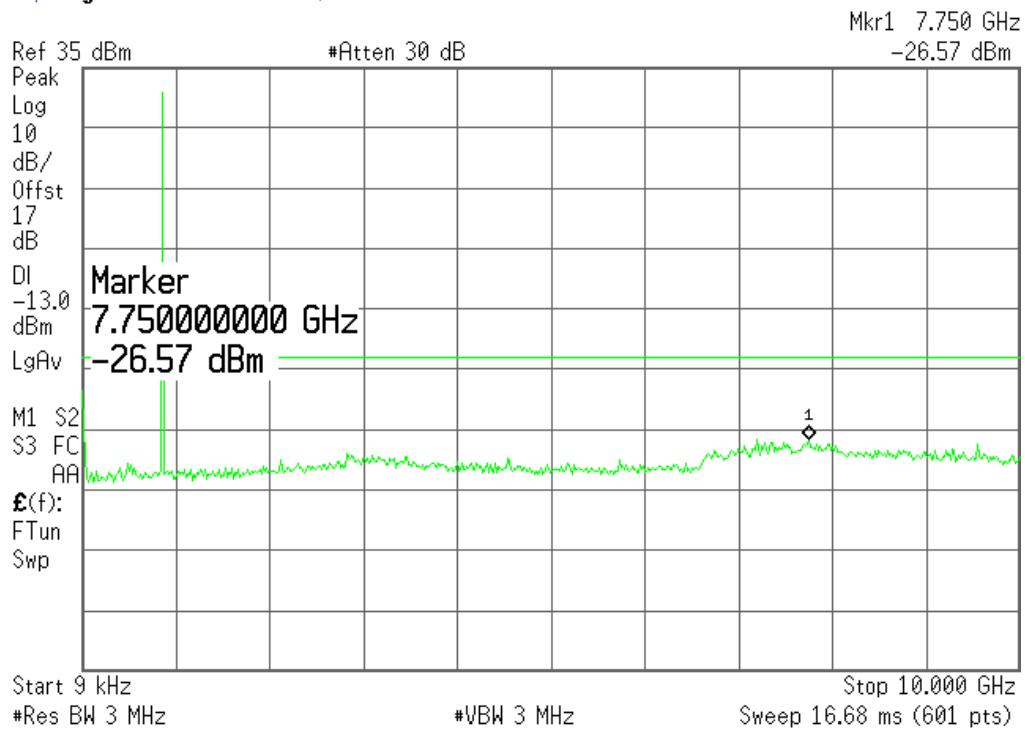
Note: the power of the EUT transmitting frequency should be ignored.

**\* Agilent 16:06:47 Jan 24, 2010**


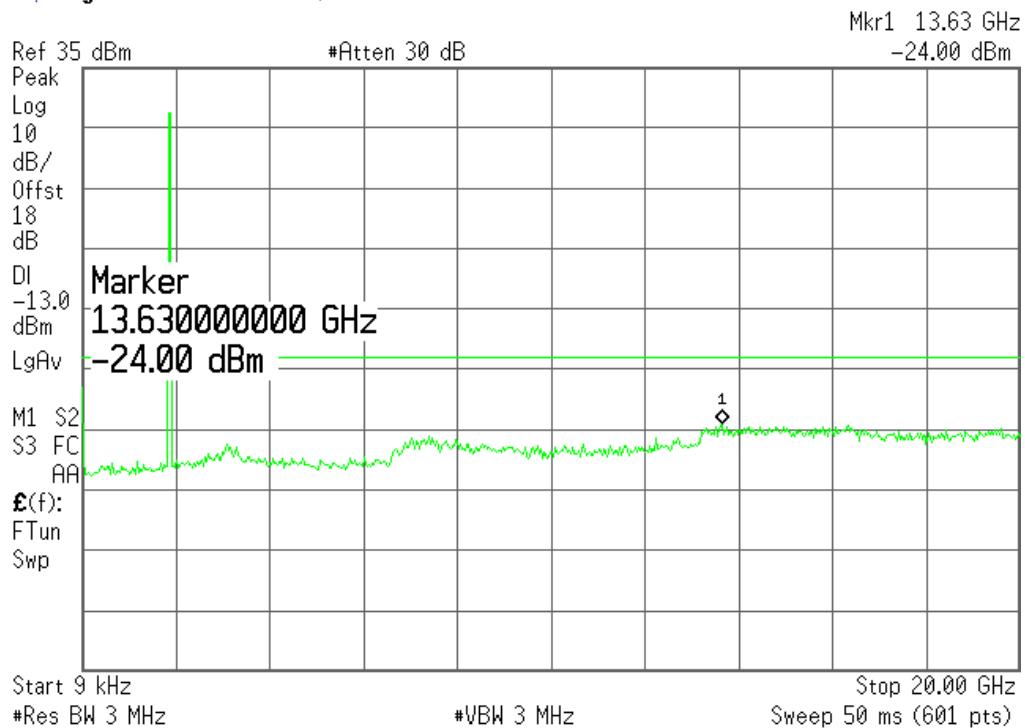
(Plot A4.:GSM 850MHz Channel = 128, 9KHz to 10GHz)

**\* Agilent 16:05:22 Jan 24, 2010**


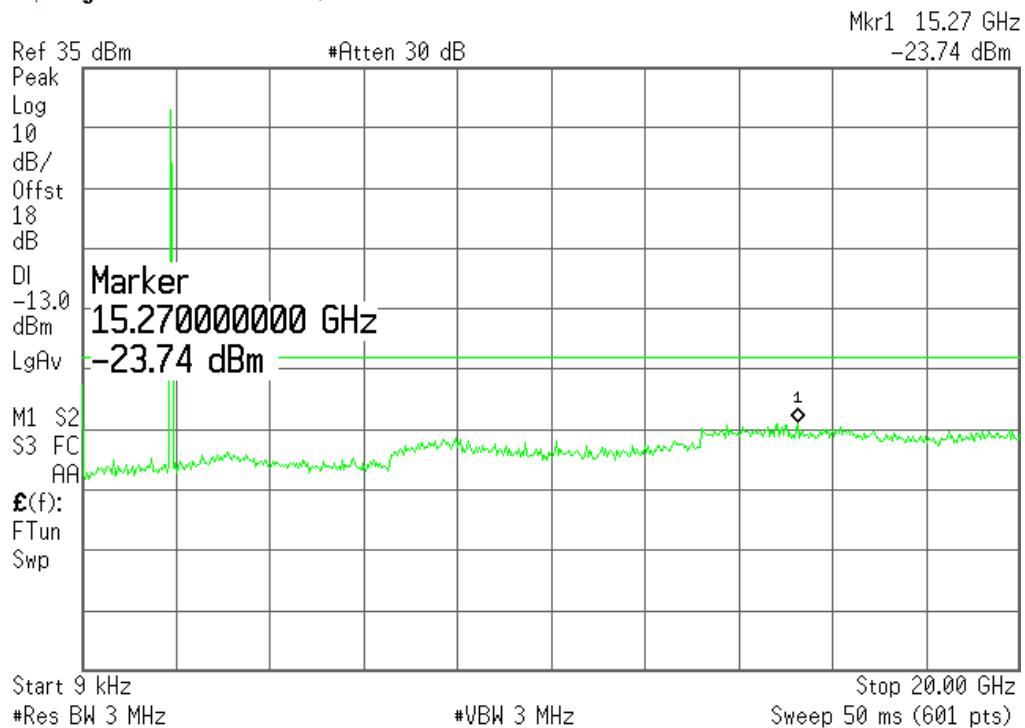
(Plot B4.:GSM 850MHz Channel = 190, 9KHz to 10GHz)

**\* Agilent 16:03:13 Jan 24, 2010**


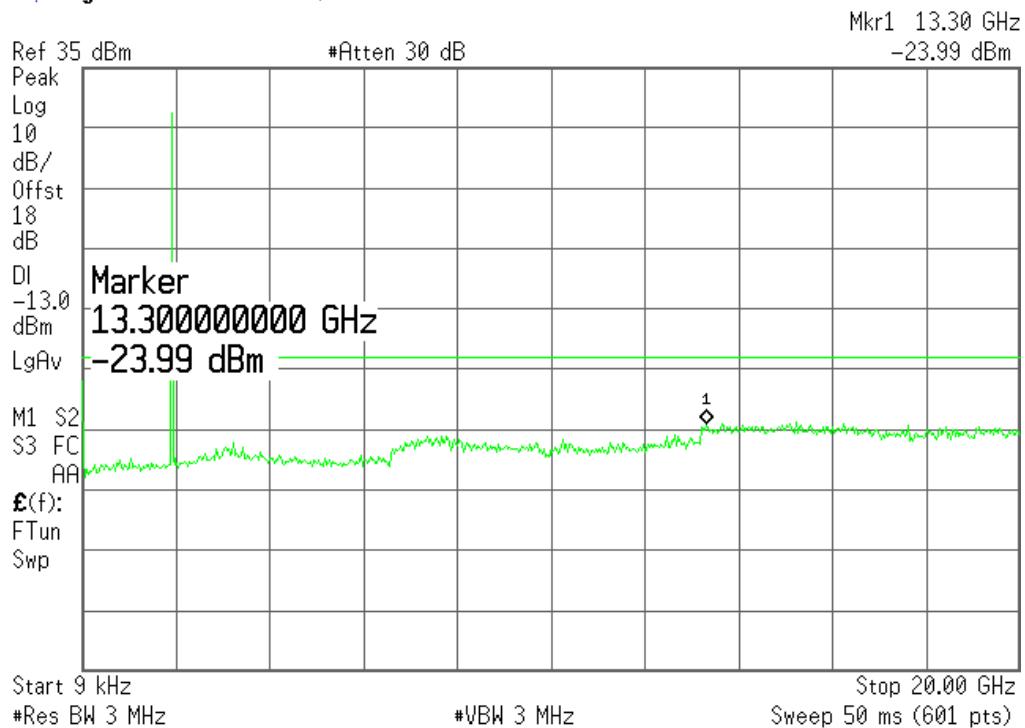
(Plot C4.:GSM 850MHz Channel = 251, 9KHz to 10GHz)

**\* Agilent 15:50:20 Jan 24, 2010**


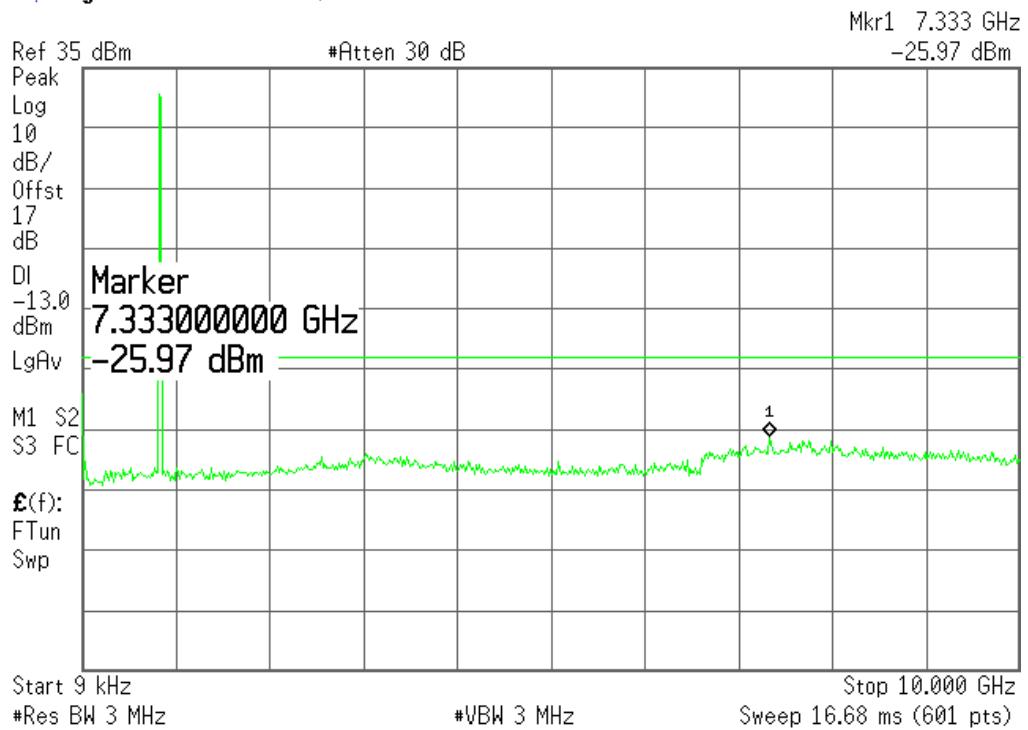
(Plot D4.:GSM 1900MHz Channel = 512, 9KHz to 20GHz)

**\* Agilent 15:49:24 Jan 24, 2010**


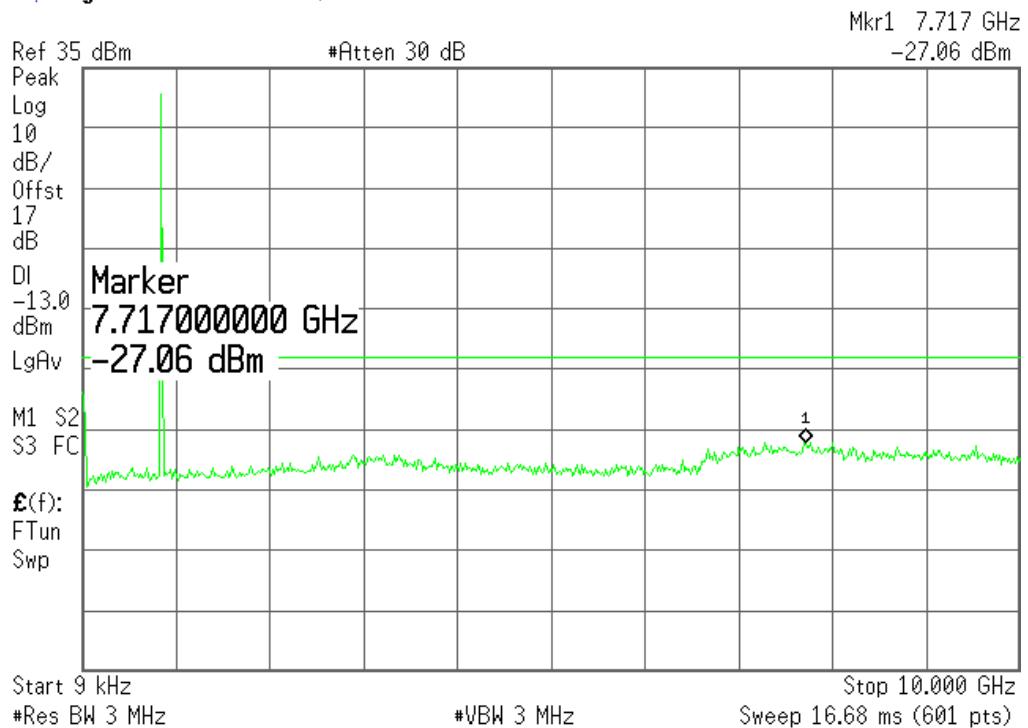
(Plot E4.: GSM 1900MHz Channel = 661, 9KHz to 20GHz)

**\* Agilent 15:48:32 Jan 24, 2010**


(Plot F4.: GSM 1900MHz Channel = 810, 9KHz to 20GHz)

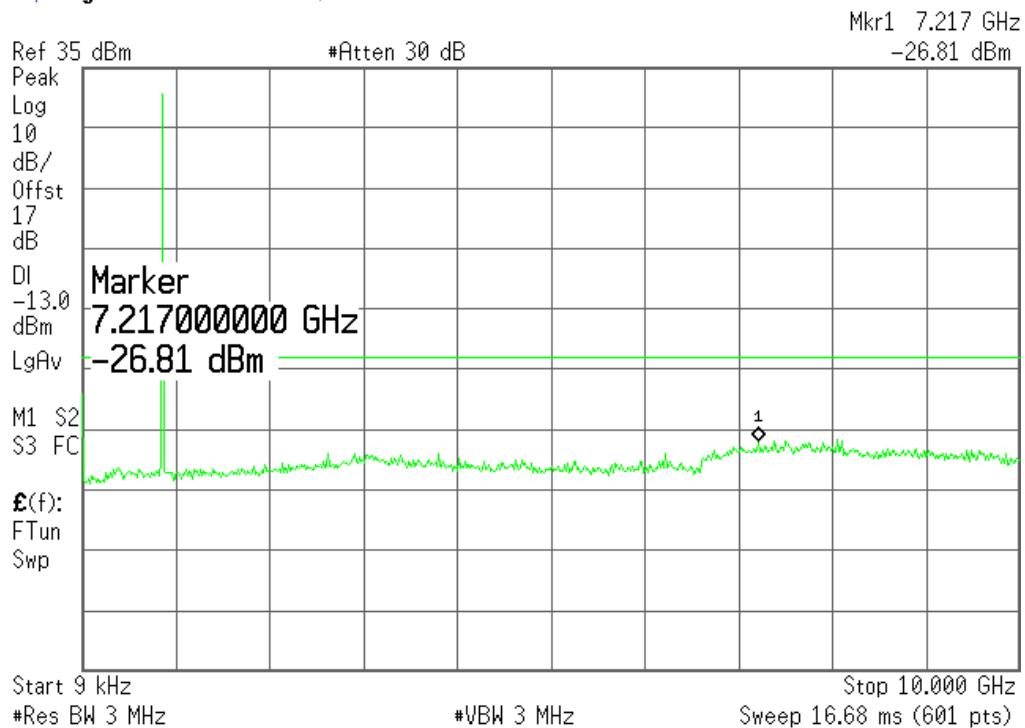
**\* Agilent 10:51:33 Jan 25, 2010**


(Plot G4.:GPRS 850MHz Channel = 128, 9KHz to 10GHz)

**\* Agilent 10:50:41 Jan 25, 2010**


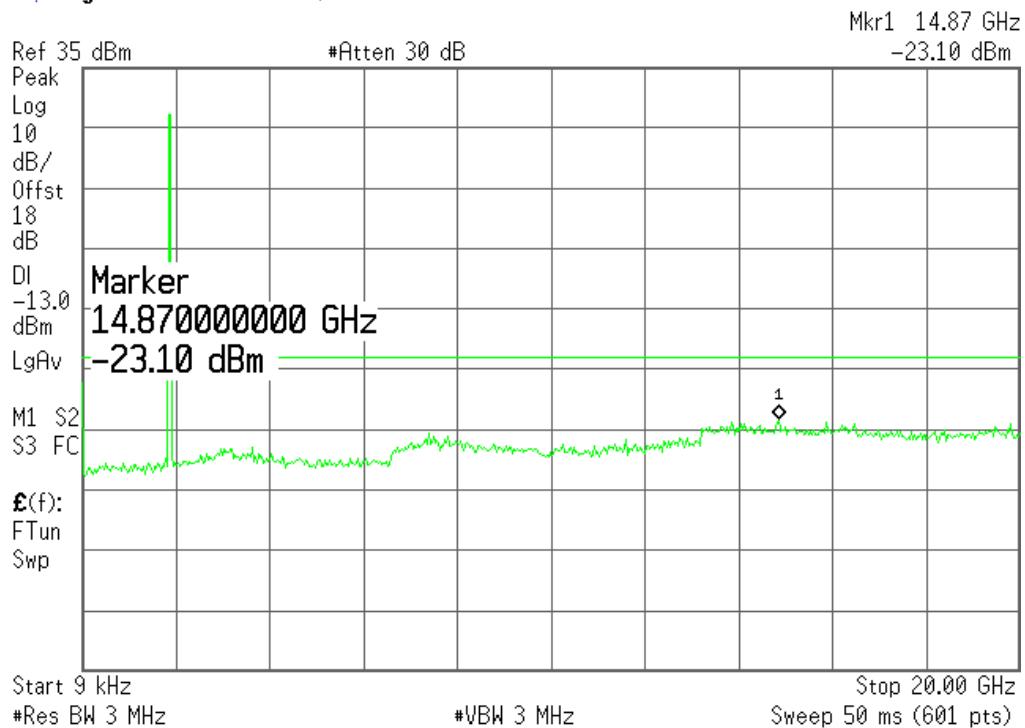
(Plot H4.: GPRS 850MHz Channel = 190, 9KHz to 10GHz)

\* Agilent 10:49:42 Jan 25, 2010

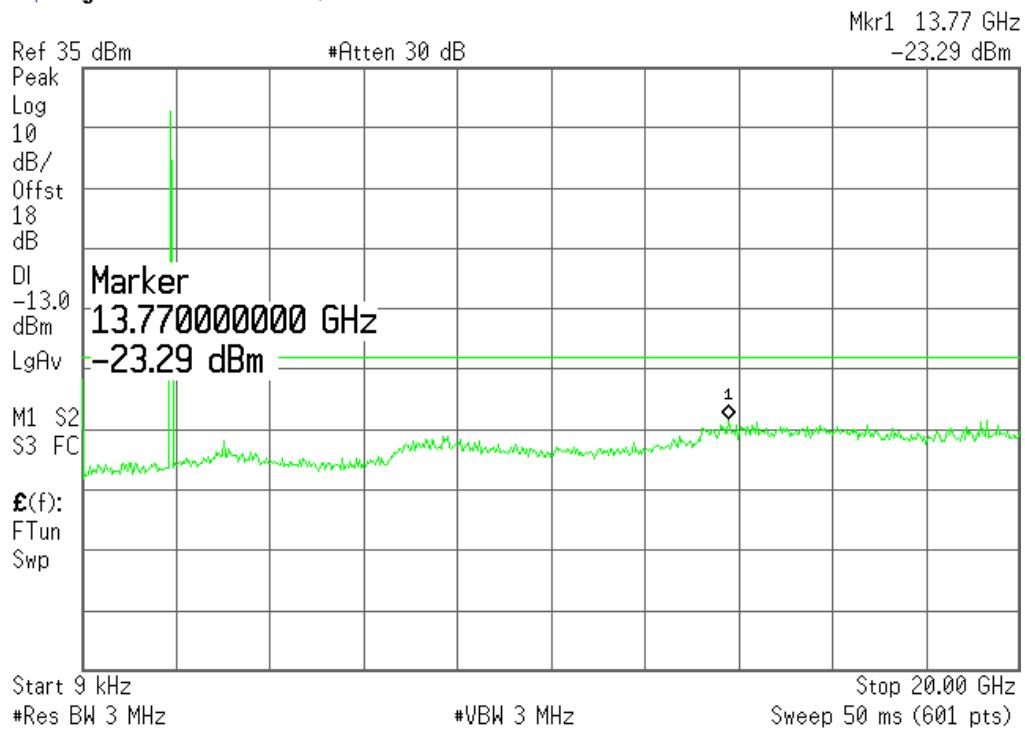


(Plot I4.: GPRS 850MHz Channel = 251, 9KHz to 10GHz)

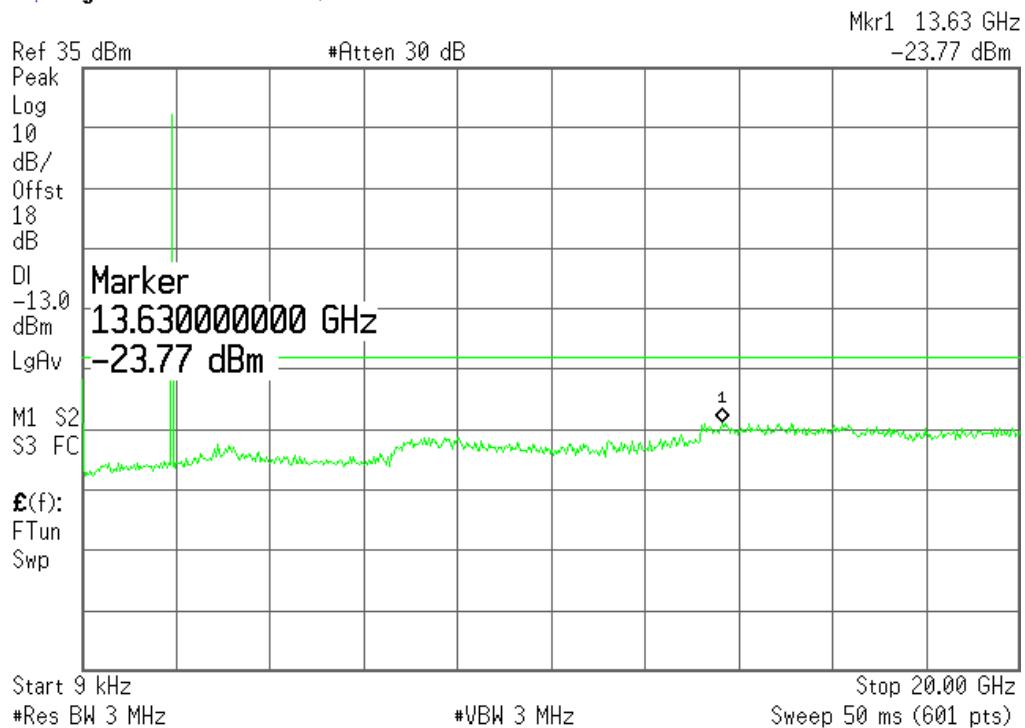
\* Agilent 10:40:29 Jan 25, 2010



(Plot J4.: GPRS 1900MHz Channel = 512, 9KHz to 20GHz)

**\* Agilent 10:38:27 Jan 25, 2010**


(Plot K4.: GPRS 1900MHz Channel = 661, 9KHz to 20GHz)

**\* Agilent 10:37:32 Jan 25, 2010**


(Plot L4.: GPRS 1900MHz Channel = 810, 9KHz to 20GHz)

## 3.6 Band Edge

### 3.6.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b), 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.

### 3.6.2 Test Description

See section 3.1.2 of this report.

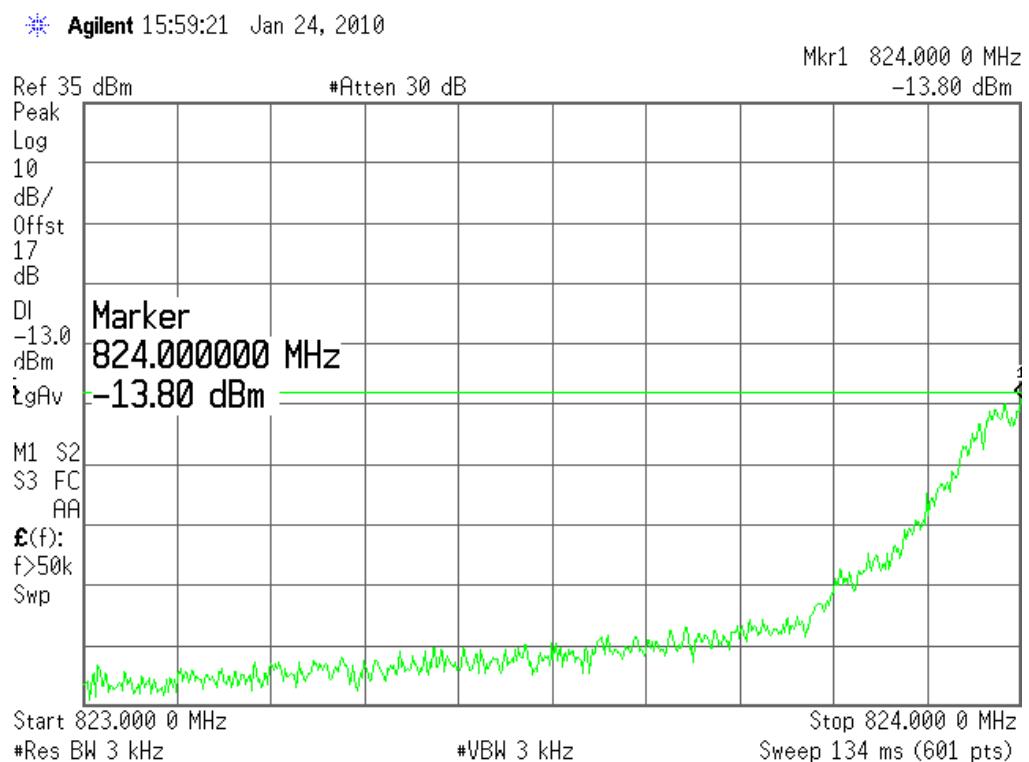
### 3.6.3 Test Result

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

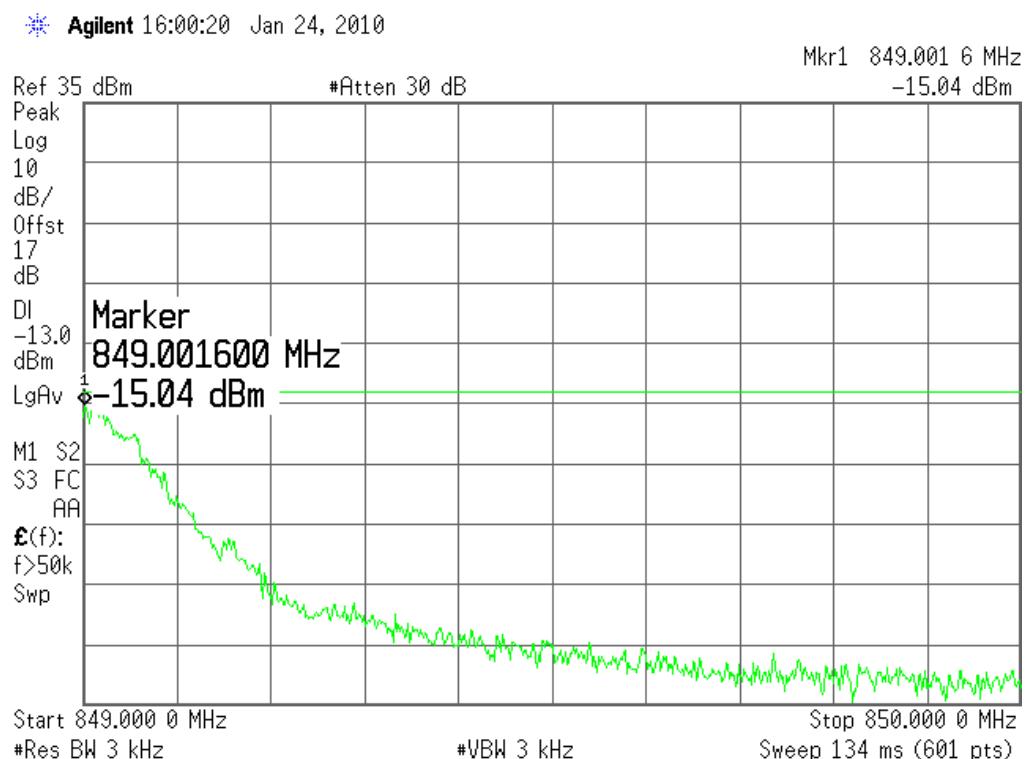
#### 1. Test Verdict:

Band	Channe 1	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.00	-13.80	Plot A5	-13	PASS
	251	849.00	-15.04	Plot B5		PASS
GSM 1900MHz	512	1849.99	-15.90	Plot C5	-13	PASS
	810	1910.00	-18.26	Plot D5		PASS
GPRS 850MHz	128	823.97	-14.11	Plot E5	-13	PASS
	251	849.01	-13.58	Plot F5		PASS
GPRS 1900MHz	512	1850.00	-16.99	Plot G5	-13	PASS
	810	1910.01	-20.19	Plot H5		PASS

## 2. Test Plot:

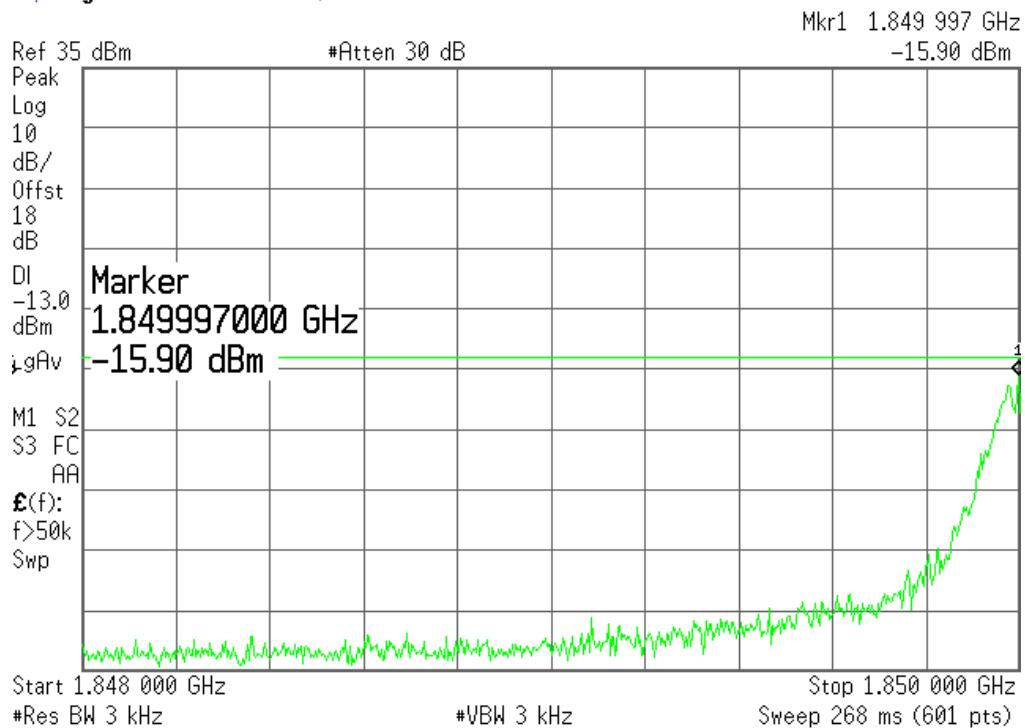


(Plot A5: GSM 850MHz Channel = 128)



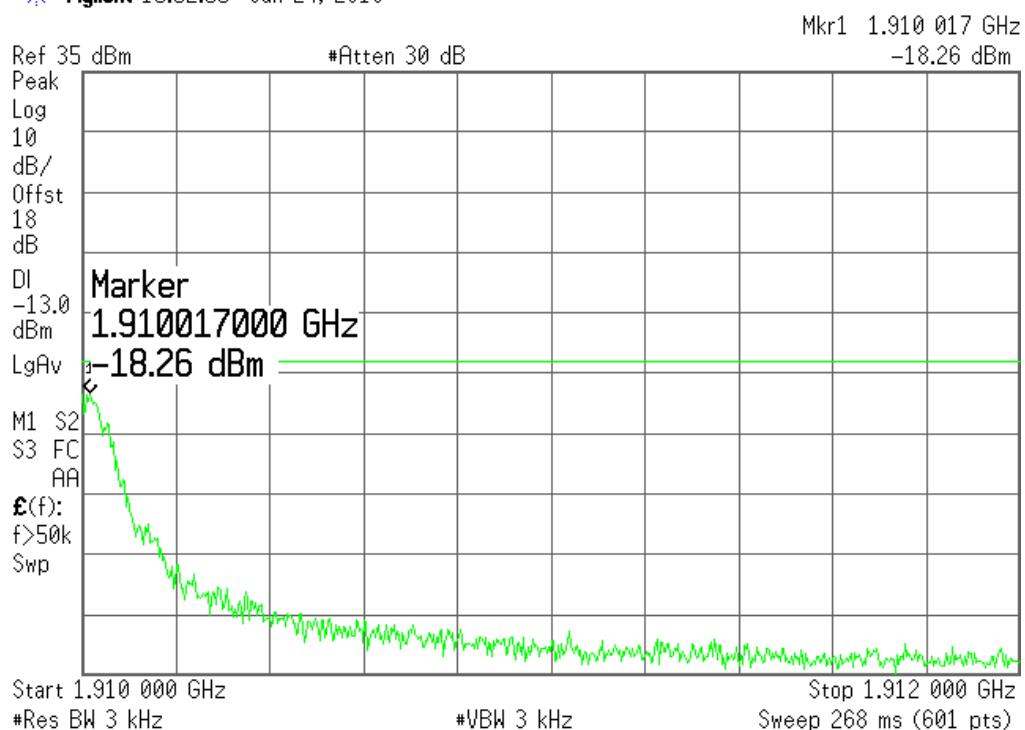
(Plot B5: GSM 850MHz Channel = 251)

\* Agilent 15:51:49 Jan 24, 2010



(Plot C5: GSM 1900MHz Channel = 512)

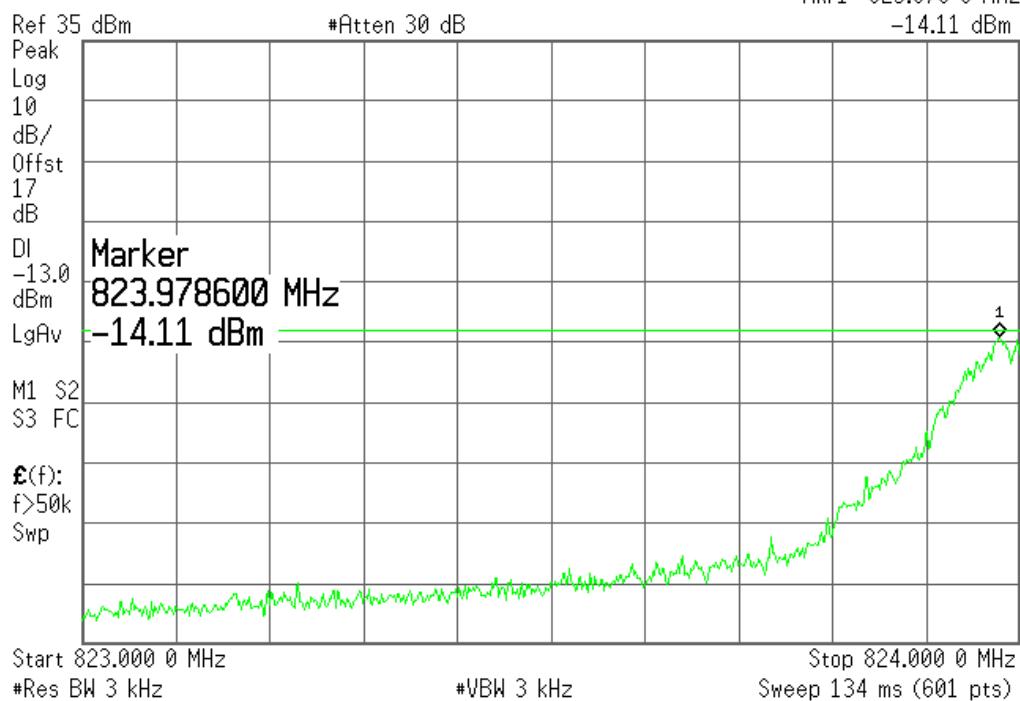
\* Agilent 15:52:55 Jan 24, 2010



(Plot D5: GSM 1900MHz Channel = 810)

\* Agilent 10:46:46 Jan 25, 2010

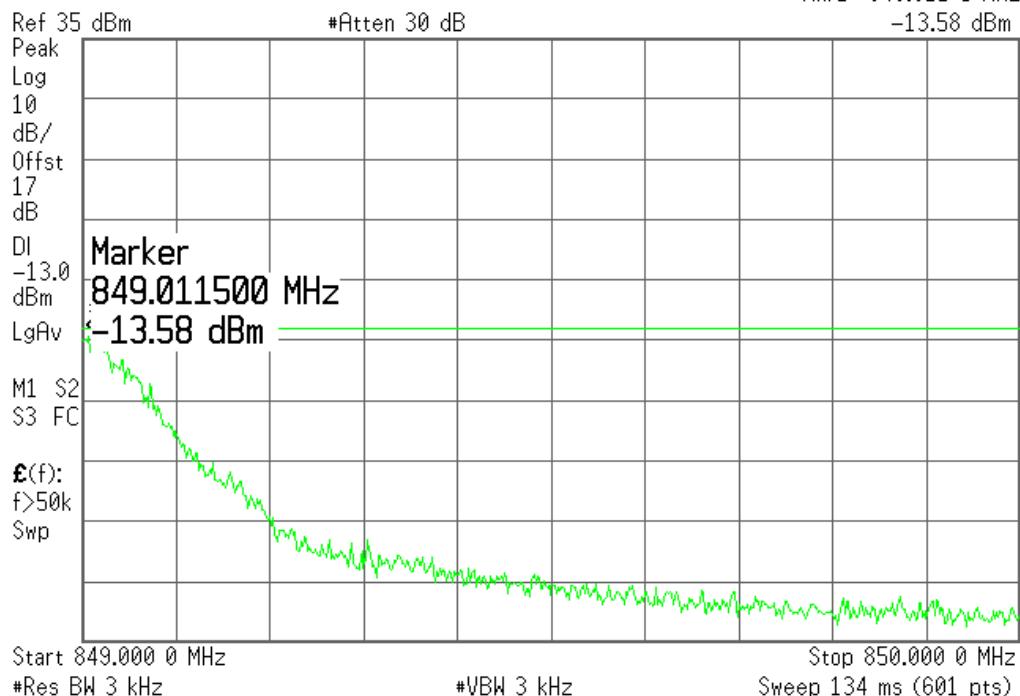
Mkr1 823.978 6 MHz



(Plot E5: GPRS 850MHz Channel = 128)

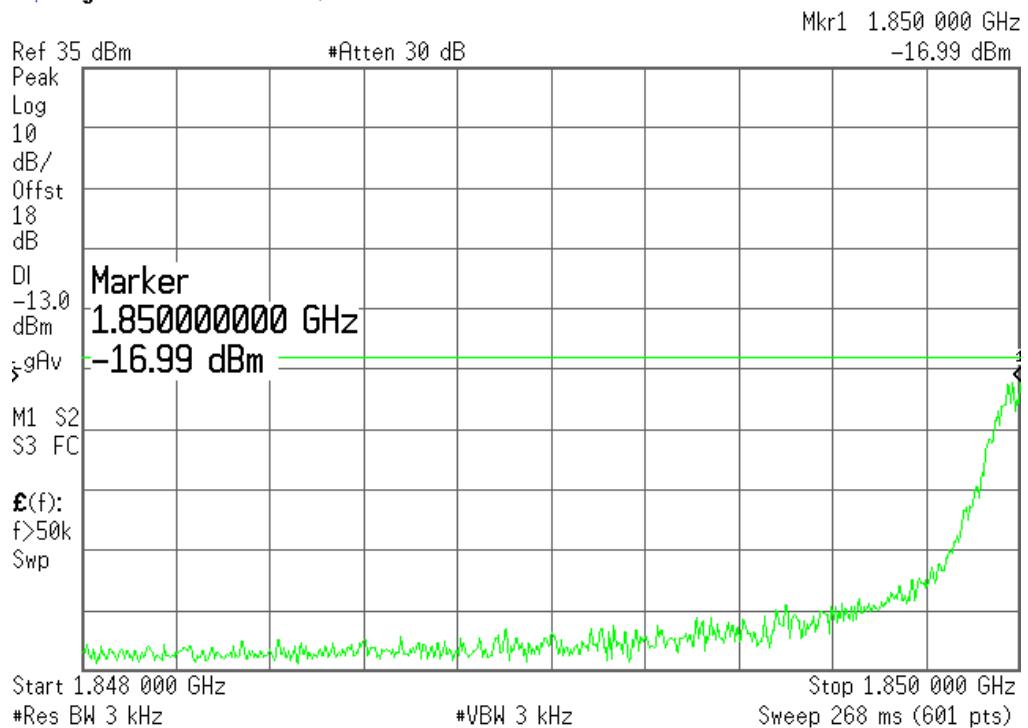
\* Agilent 10:47:52 Jan 25, 2010

Mkr1 849.011 5 MHz



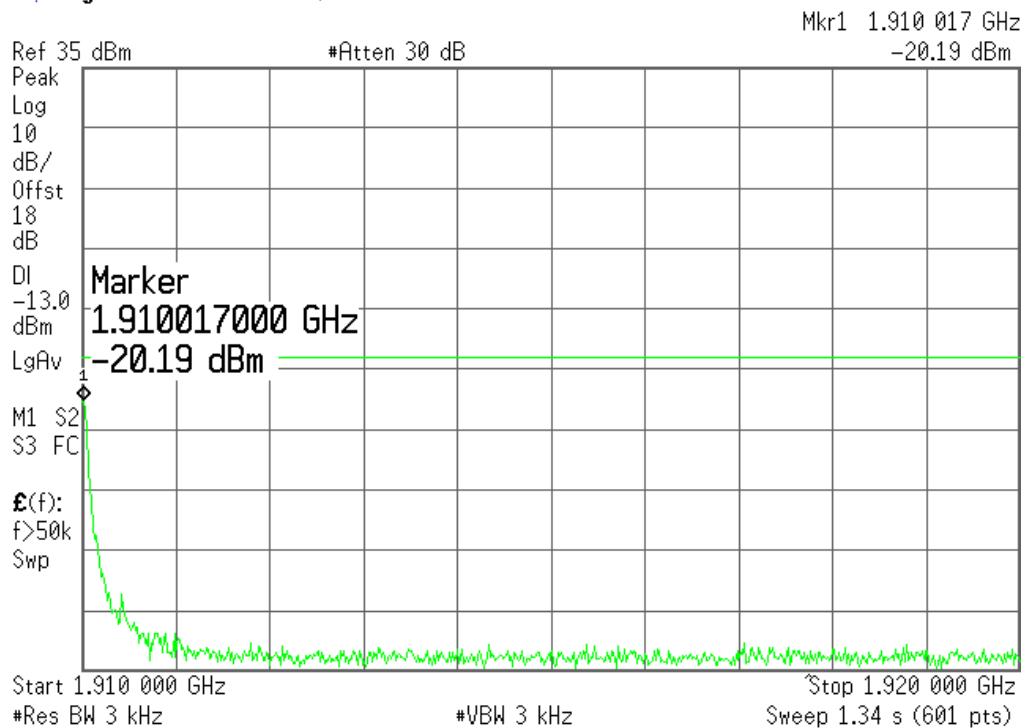
(Plot F5: GPRS 850MHz Channel = 251)

\* Agilent 10:42:13 Jan 25, 2010



(Plot G5: GPRS 1900MHz Channel = 512)

\* Agilent 10:43:19 Jan 25, 2010



(Plot H5: GPRS 1900MHz Channel = 810)

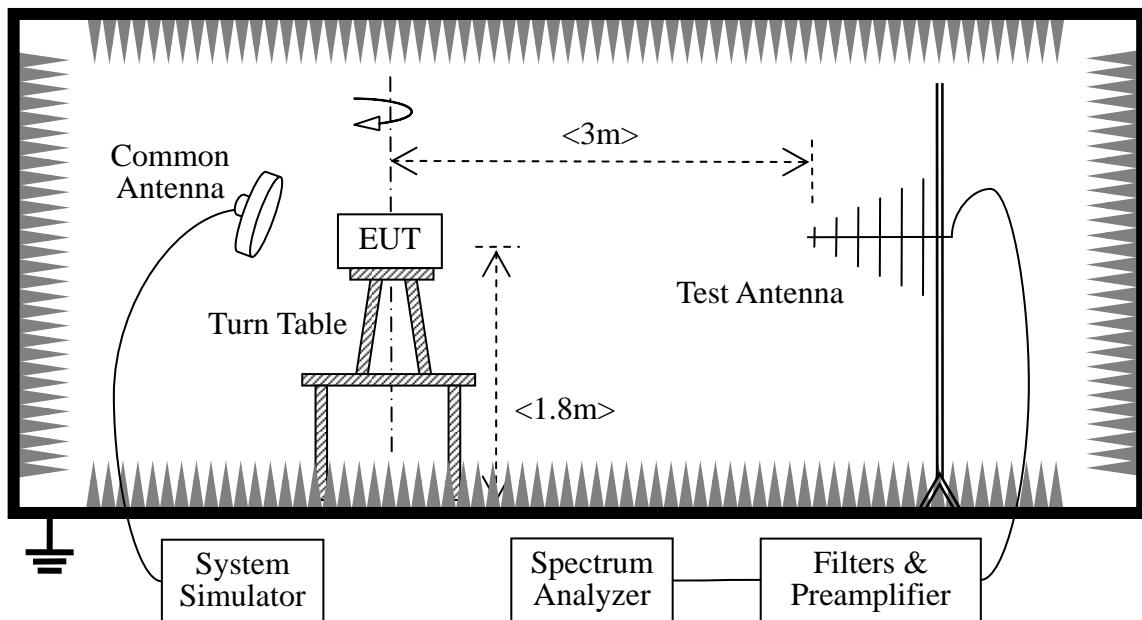
### 3.7 Transmitter Radiated Power (EIRP/ERP)

#### 3.7.1 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 2Watts e.i.r.p. peak power.

#### 3.7.2 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. The EUT is commanded by the SS to operate at the maximum output power i.e. GSM850MHz band Power Control Level (PCL) = 5 and Power Class = 4 and GSM1900MHz band Power Control Level (PCL) = 0 and Power Class = 1. A call is established between the EUT and the SS via a Common Antenna.

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
SS	Agilent	E5515C	GB46040102	2009.10	1year
Spectrum Analyzer	Agilent	E4440A	MY46187763	2009.10	1year
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2009.10	2year
Test Antenna - Bi-Log	Rohde&Schwarz	HL562	100385	2009.10	1year
Test Antenna - Horn	Rohde&Schwarz	HF906	100565	2009.10	1year

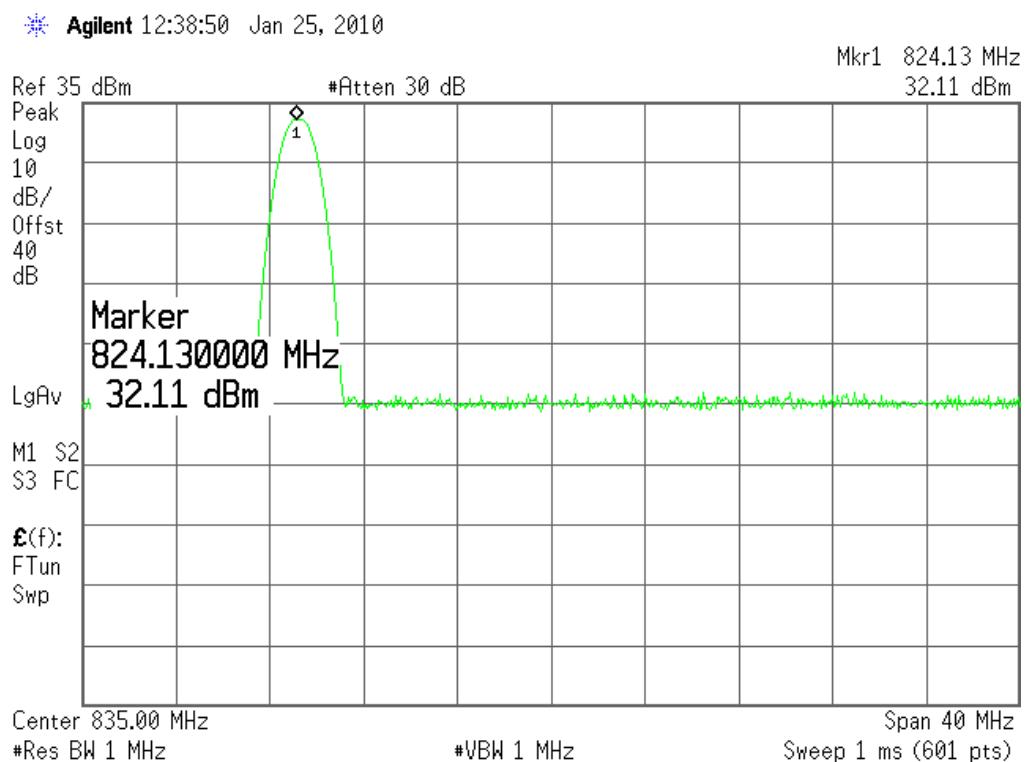
### 3.7.3 Test Result

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.

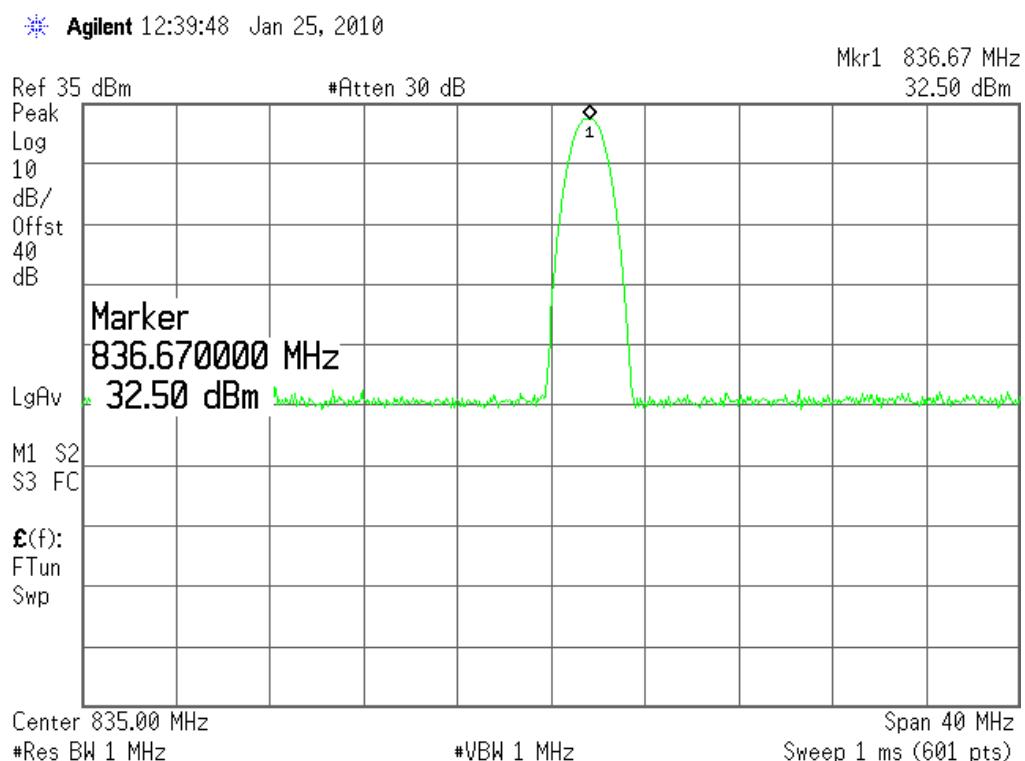
#### 1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured ERP			Limit		Verdict
			dBm	W	Refer to Plot	dBm	W	
GSM 850MHz	128	824.13	32.11	1.625	Plot A6	<38.5	<7	PASS
	190	836.67	32.50	1.778	Plot B6			PASS
	251	848.73	31.43	1.389	Plot C6			PASS
GSM 1900MHz	512	1850.00	31.29	1.345	Plot D6	<33.0	<2	PASS
	661	1880.00	30.93	1.238	Plot E6			PASS
	810	1909.87	30.67	1.116	Plot F6			PASS
GPRS 850MHz	128	824.20	29.66	0.924	Plot G6	<38.5	<7	PASS
	190	836.60	29.94	0.986	Plot H6			PASS
	251	848.80	29.65	0.922	Plot I6			PASS
GPRS 1900MHz	512	1850.13	27.49	0.561	Plot J6	<33.0	<2	PASS
	661	1880.13	27.52	0.564	Plot K6			PASS
	810	1909.87	27.77	0.598	Plot L6			PASS

## 2. Test Plot

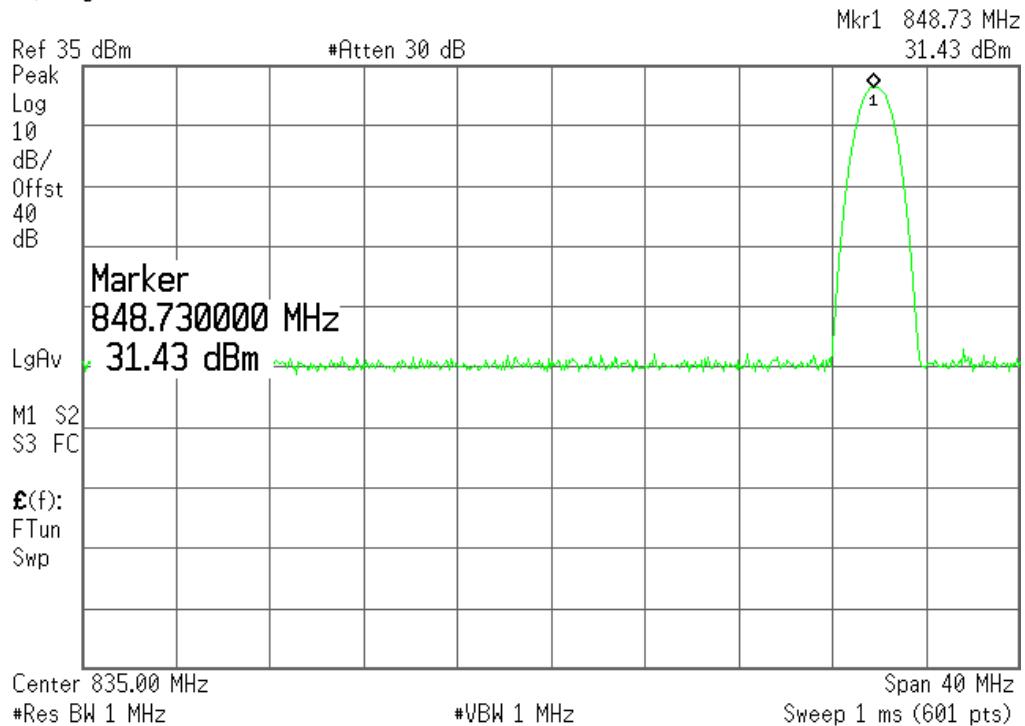


(Plot A6:GSM 850MHz Channel = 128)



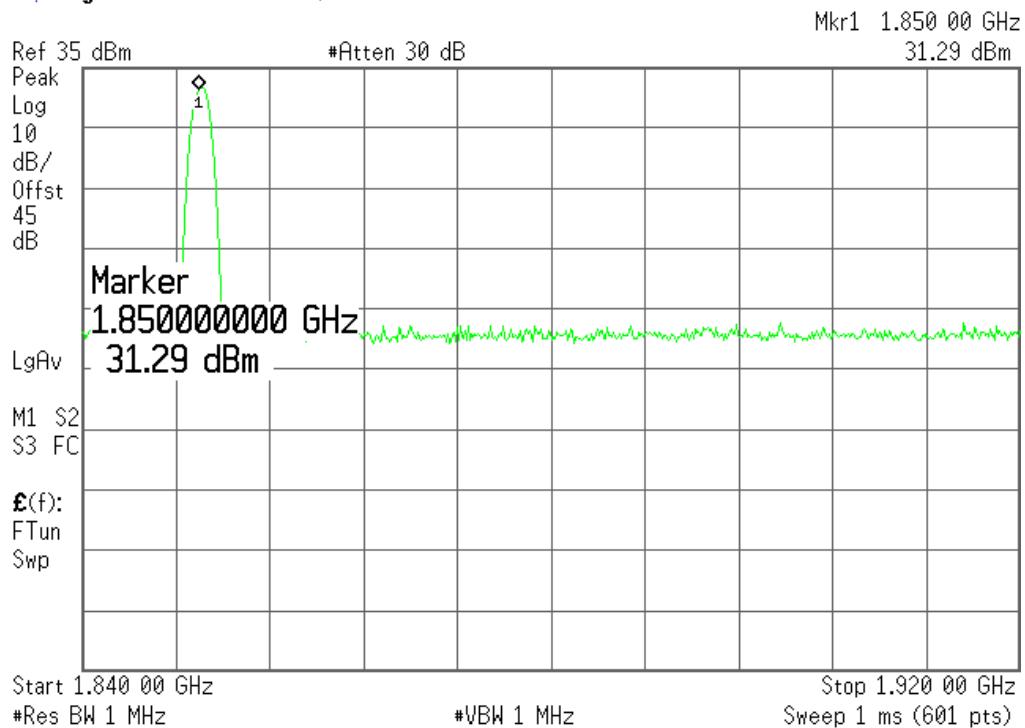
(Plot B6:GSM 850MHz Channel = 190)

\* Agilent 12:40:39 Jan 25, 2010

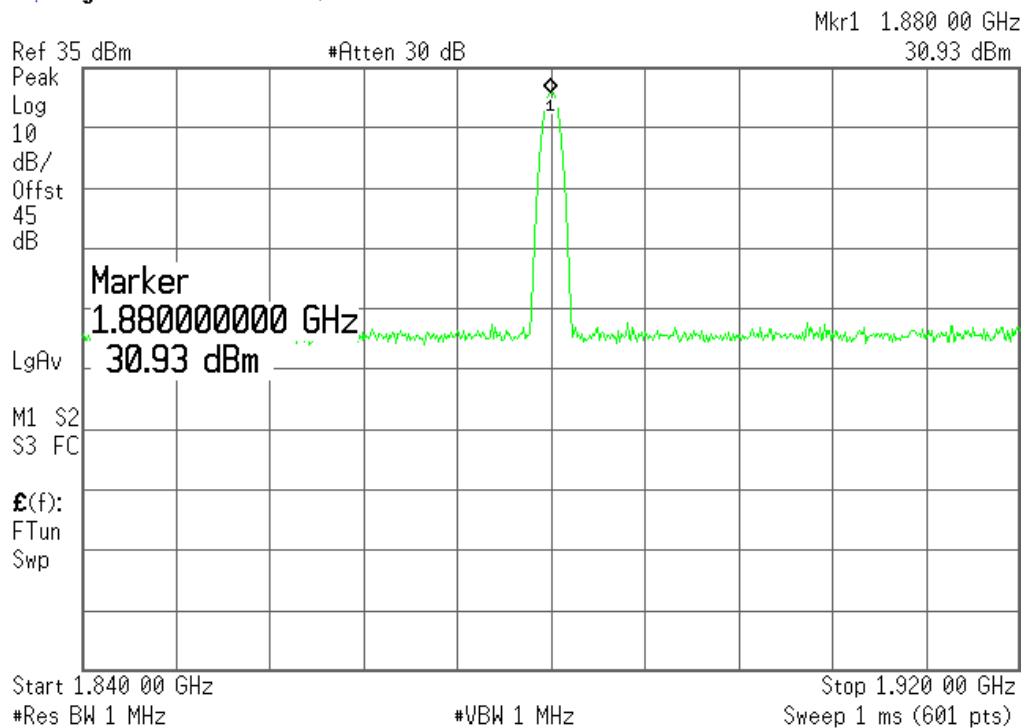


(Plot C6:GSM 850MHz Channel = 251)

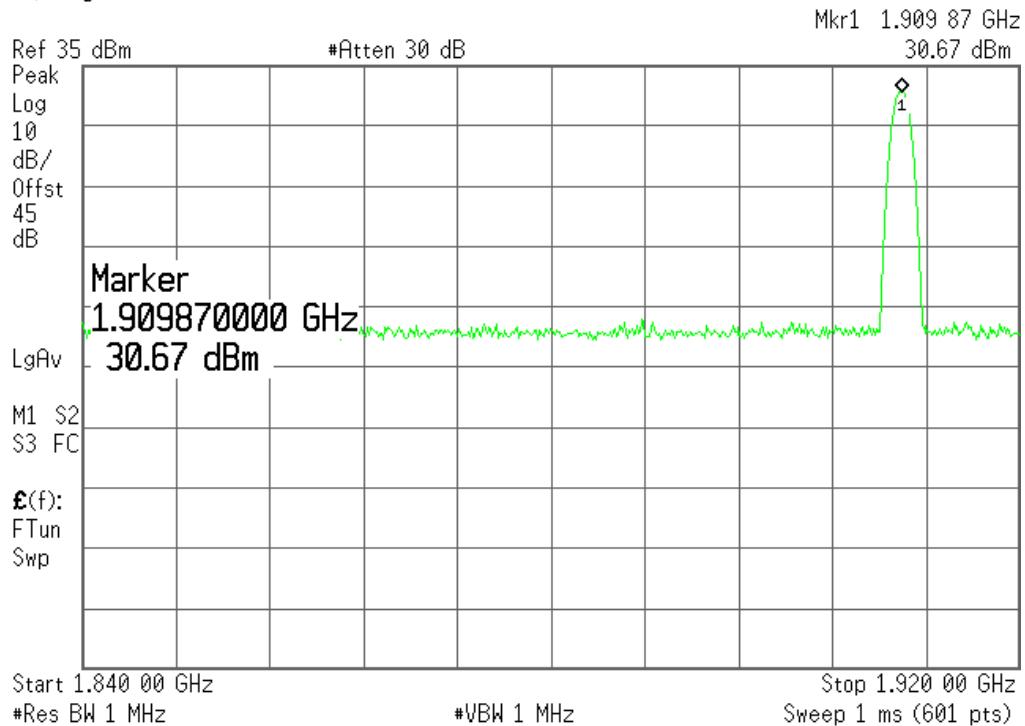
\* Agilent 12:33:38 Jan 25, 2010



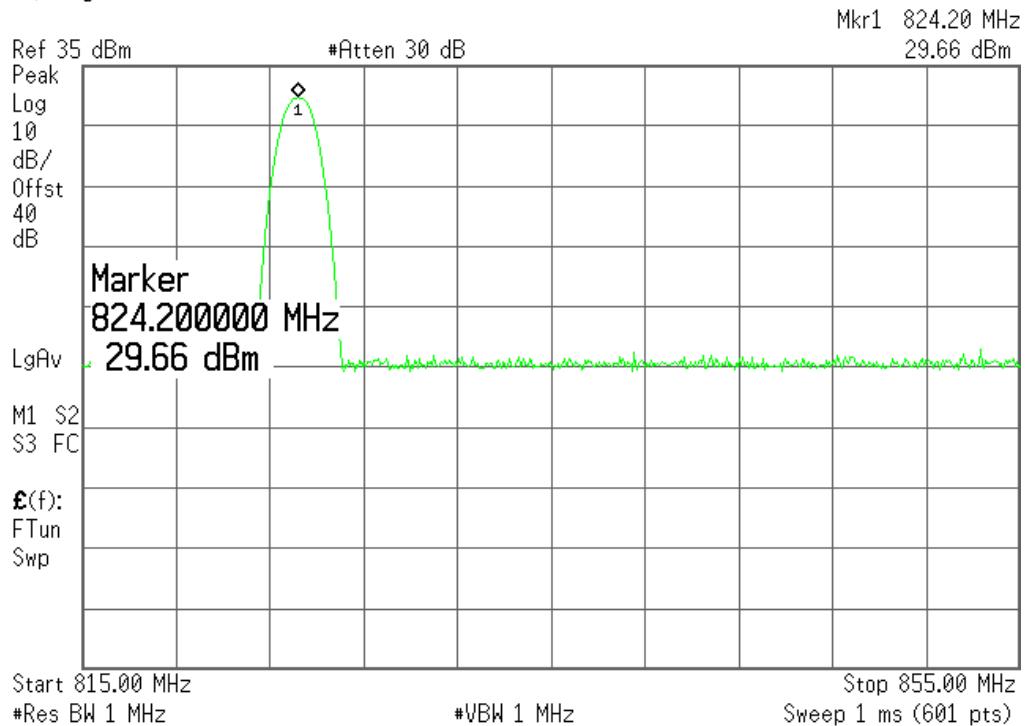
(Plot D6:GSM 1900MHz Channel = 512)

**\* Agilent 12:34:27 Jan 25, 2010**


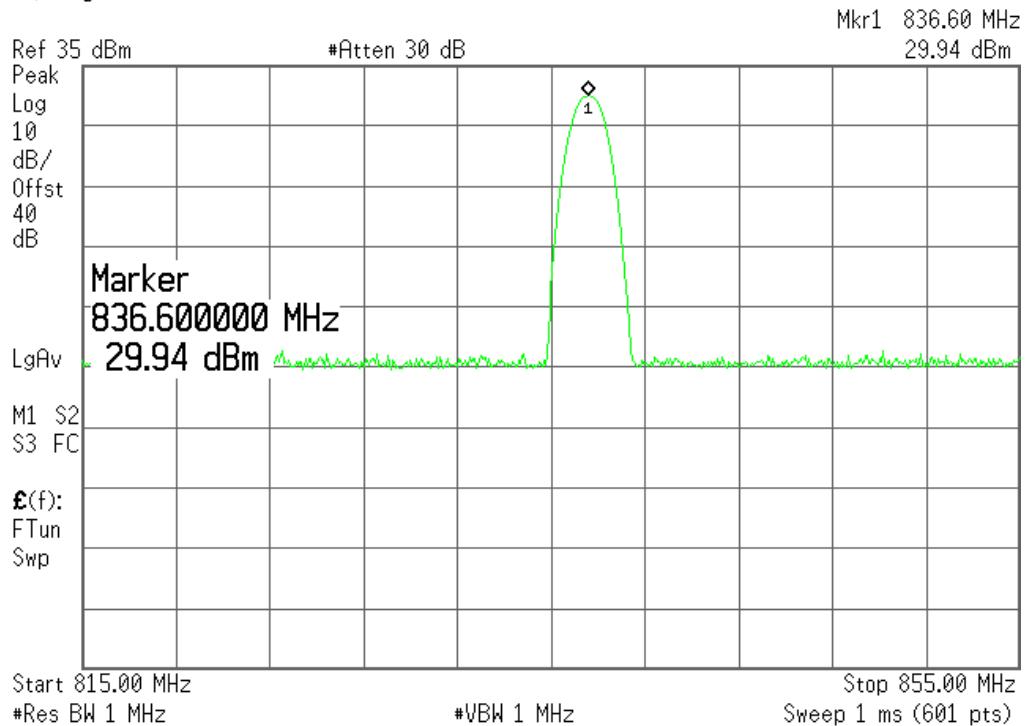
(Plot E6:GSM 1900MHz Channel = 661)

**\* Agilent 12:35:19 Jan 25, 2010**


(Plot F6:GSM 1900MHz Channel = 810)

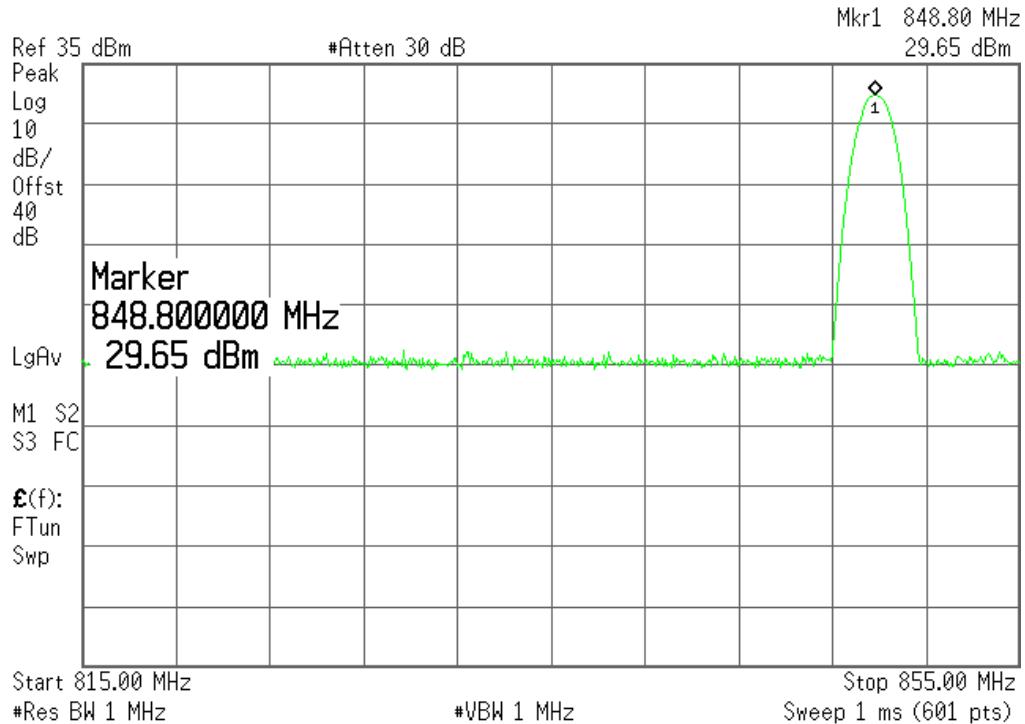
**\* Agilent 12:22:59 Jan 25, 2010**


(Plot G6:GPRS 850MHz Channel = 128)

**\* Agilent 12:21:57 Jan 25, 2010**


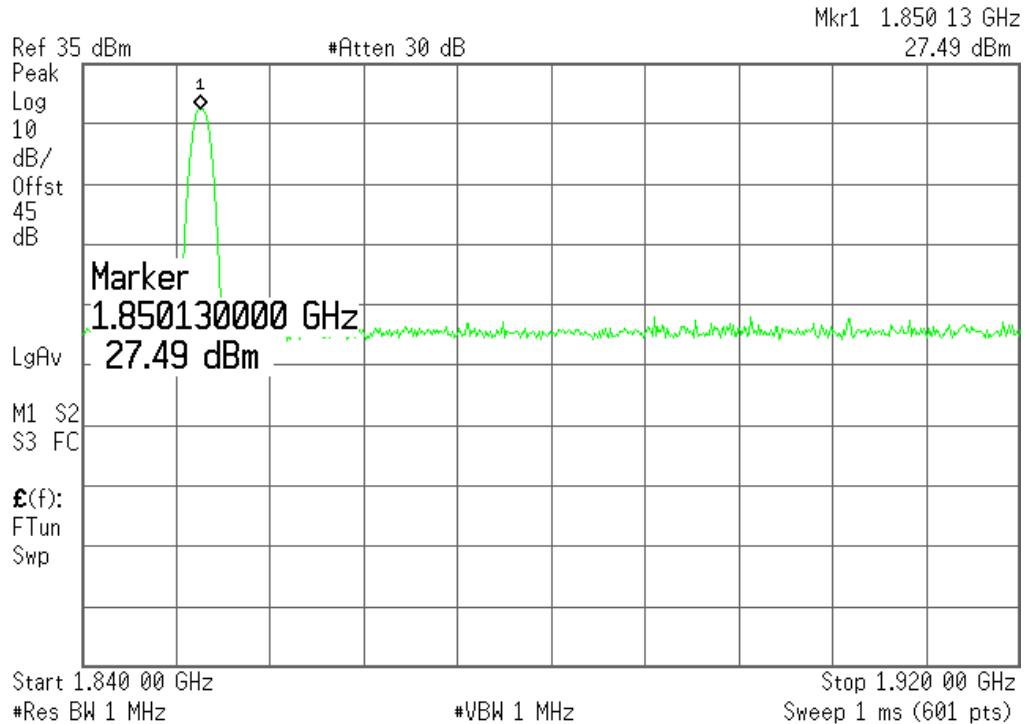
(Plot H6: GPRS 850MHz Channel = 190)

\* Agilent 12:20:36 Jan 25, 2010

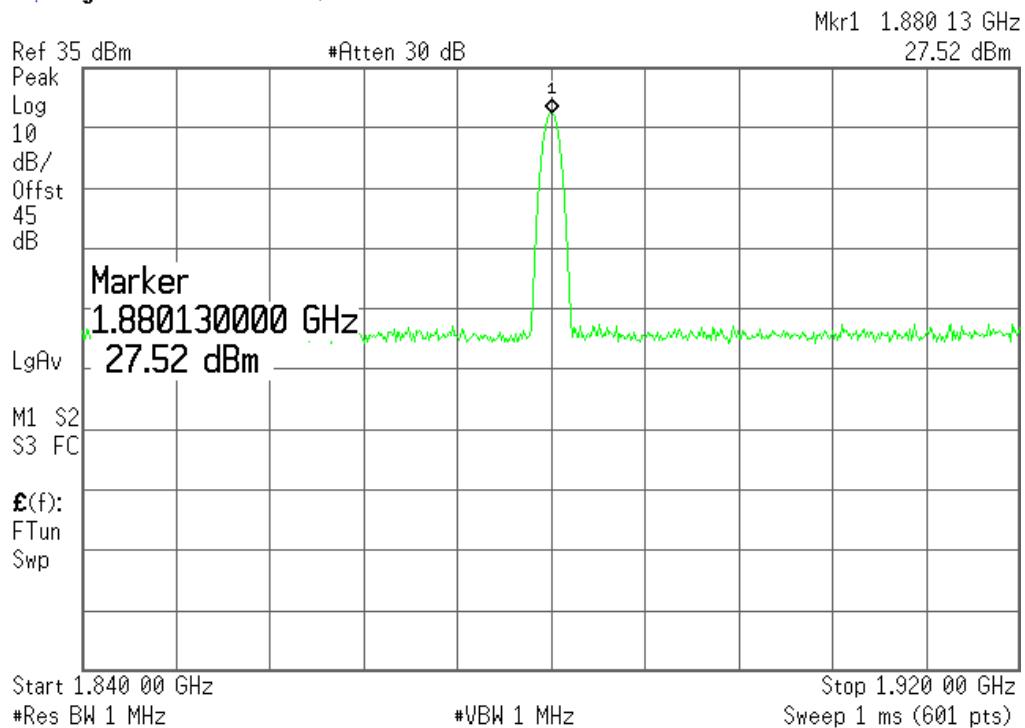


(Plot I6: GPRS 850MHz Channel = 251)

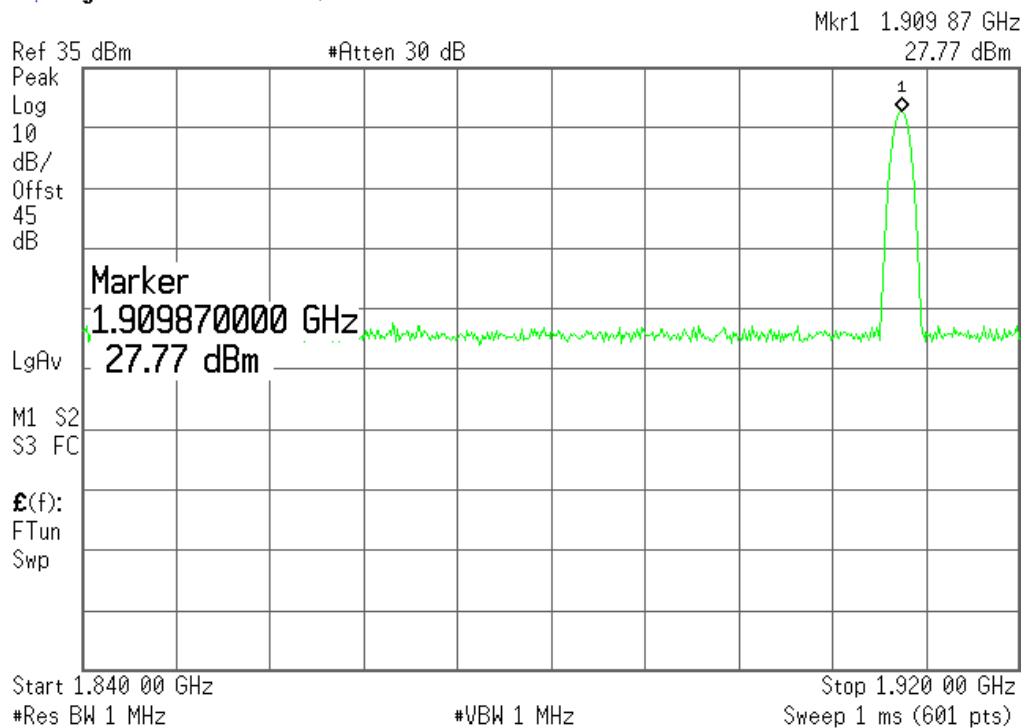
\* Agilent 12:28:21 Jan 25, 2010



(Plot J6: GPRS 1900MHz Channel = 512)

**\* Agilent 12:27:27 Jan 25, 2010**


(Plot K6: GPRS 1900MHz Channel = 661)

**\* Agilent 12:25:55 Jan 25, 2010**


(Plot L6:GPRS 1900MHz Channel = 810)

## 3.8 Radiated Out of Band Emissions

### 3.8.1 Requirement

According to FCC section 22.917(a) and 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.

### 3.8.2 Test Description

See section 3.7.2 of this report.

### 3.8.3 Test Procedure

1. Perform test system setup as section 2.4.2
2. Make a limit line whose value is -13dBm on the Spectrum Analyzer, and set the RBW of the Spectrum Analyzer to 1MHz.
3. The lowest and the highest channel were selected to perform tests respectively.
4. Employ the bi-log Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 30MHz to 3GHz.
5. The measurement is performed with the Test Antenna at both horizontal and vertical polarization respectively. Set the polarization of the Test Antenna to be horizontal.
6. Actuate the Turn Table to turn from 0 degrees to 360 degrees to find the maximum reading via the Spectrum Analyzer, mark the fundamental frequency and the harmonics thereof, after then record the harmonics and the plot.
7. Set the polarization of the Test Antenna to be vertical, then repeat step 6.
8. Employ the horn Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 3GHz to 10<sup>th</sup> harmonic of the fundamental frequency (here used 10GHz), then repeat step 5 to 7.
9. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

### 3.8.4 Test Result

#### 3.8.4.1 Table for the Harmonics

NOTE: “---” in the table following means that the emission power was too small to be measured and was at least 12dB below the limit.

##### I GSM 850MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 128 (824.2MHz)				
1	1652.51	-40.95	-44.21	-13
2	2438.22	---	---	-13
3	3356.20	---	---	-13
4	4561.58	---	---	-13
5	4489.14	---	---	-13
6	5927.24	---	---	-13
7	6748.45	---	---	-13
8	7951.45	---	---	-13
9	8598.74	---	---	-13
TCH number set to 190 (836.6MHz)				
10	1688.25	-40.12	-40.74	-13
11	2481.14	---	---	-13
12	2944.51	---	---	-13
13	3915.14	---	---	-13
14	4842.44	---	---	-13
15	5954.56	---	---	-13
16	6942.48	---	---	-13
17	7456.48	---	---	-13
18	8054.48	---	---	-13
TCH number set to 251 (848.8MHz)				
19	1743.58	-39.51	-41.37	-13
20	2545.22	---	---	-13
21	3395.96	---	---	-13
22	4256.70	---	---	-13
23	5088.44	---	---	-13
24	5561.18	---	---	-13
25	6786.92	---	---	-13
26	7622.66	---	---	-13
27	8158.40	---	---	-13

## II GSM 1900MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
<b>TCH number set to 512 (1850.2MHz)</b>				
1	3758.26	-43.55	-42.05	-13
2	5545.75	---	---	-13
3	7406.00	---	---	-13
4	9056.25	---	---	-13
5	11108.50	---	---	-13
6	12561.75	---	---	-13
7	14810.00	---	---	-13
8	16661.25	---	---	-13
9	18515.50	---	---	-13
<b>TCH number set to 661 (1880.2MHz)</b>				
10	3804.23	-39.15	-37.56	-13
11	5635.00	---	---	-13
12	7524.00	---	---	-13
13	9423.00	---	---	-13
14	11286.00	---	---	-13
15	13168.00	---	---	-13
16	15048.00	---	---	-13
17	16926.00	---	---	-13
18	18800.00	---	---	-13
<b>TCH number set to 810 (1909.8MHz)</b>				
19	3952.10	-41.51	-41.28	-13
20	5729.25	---	---	-13
21	7633.00	---	---	-13
22	9545.75	---	---	-13
23	11452.50	---	---	-13
24	13362.25	---	---	-13
25	15272.00	---	---	-13
26	17175.75	---	---	-13
27	19088.50	---	---	-13

**III GPRS 850MHz**

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
<b>TCH number set to 128 (824.2MHz)</b>				
1	1518.61	-41.52	-42.05	-13
2	2540.15	---	---	-13
3	3594.84	---	---	-13
4	4156.47	---	---	-13
5	4625.94	---	---	-13
6	5126.48	---	---	-13
7	6545.75	---	---	-13
8	7406.00	---	---	-13
9	9258.25	---	---	-13
<b>TCH number set to 190 (836.6MHz)</b>				
10	1784.93	-40.25	-41.33	-13
11	2635.00	---	---	-13
12	3524.00	---	---	-13
13	4423.00	---	---	-13
14	5286.00	---	---	-13
15	6168.00	---	---	-13
16	7048.00	---	---	-13
17	8926.00	---	---	-13
18	9800.00	---	---	-13
<b>TCH number set to 251 (848.8MHz)</b>				
19	1180.64	-44.32	-45.21	-13
20	2729.25	---	---	-13
21	3633.00	---	---	-13
22	4545.75	---	---	-13
23	5452.50	---	---	-13
24	6165.18	---	---	-13
25	7156.00	---	---	-13
26	8548.75	---	---	-13
27	9518.50	---	---	-13

**IV GPRS 1900MHz**

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
<b>TCH number set to 512 (1850.2MHz)</b>				
1	3848.50	-40.32	-43.14	-13
2	5545.75	---	---	-13
3	7406.00	---	---	-13
4	9258.25	---	---	-13
5	11108.50	---	---	-13
6	12956.75	---	---	-13
7	14810.00	---	---	-13
8	16661.25	---	---	-13
9	18515.50	---	---	-13
<b>TCH number set to 661 (1880.2MHz)</b>				
10	3936.60	-39.74	-38.56	-13
11	5635.00	---	---	-13
12	7524.00	---	---	-13
13	9423.00	---	---	-13
14	11286.00	---	---	-13
15	13168.00	---	---	-13
16	15048.00	---	---	-13
17	16926.00	---	---	-13
18	18800.00	---	---	-13
<b>TCH number set to 810 (1909.8MHz)</b>				
19	3485.85	-42.49	-45.26	-13
20	5729.25	---	---	-13
21	7633.00	---	---	-13
22	9545.75	---	---	-13
23	11452.50	---	---	-13
24	13362.25	---	---	-13
25	15272.00	---	---	-13
26	17175.75	---	---	-13
27	19088.50	---	---	-13

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

\*\* END OF REPORT \*\*