



47 CFR PART 22 SUBPART H & 24 SUBPART E

TEST REPORT

of

WCDMA mobile phone

Model Name: A1680
Brand Name: Motorola
Report No.: SH10030063R07
FCC ID: IHDP56LR1
Type Name: IUQ6-34411A11

prepared for

Motorola Inc. (Mobile Devices Business)
600 N. U.S. Highway 45 Libertyville, IL 60048-5343 U.S.A



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Bluetooth®

CTIA Authorized Test Lab

LAB CODE 20081223-00

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1. TEST CERTIFICATION

Equipment under Test: WCDMA mobile phone

Brand Name: Motorola
Model Name: A1680
FCC ID: IHDP56LR1
Applicant: Motorola Inc. (Mobile Devices Business)
600 N. U.S. Highway 45 Libertyville, IL 60048-5343 U.S.A
Manufacturer: Motorola Electronics Taiwan Ltd.
8F, No. 9, Songgao Rd., Taipei 110, Taiwan, R. O. C.

Test Standards: 47 CFR Part 2
47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E

Test Date(s): July 2 ,2010 –July 5 , 2010

Test Result: PASS

* We Hereby Certify That:

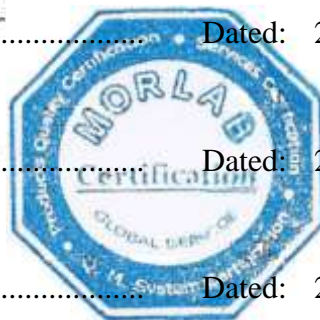
The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

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:  Dated: 2010-7-5
Huangyunlong

Reviewed by:  Dated: 2010-7-5
Zhang Jun

Approved by:  Dated: 2010-7-5
Wei Bei





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
4	ANSI/TIA/EIA-603-C (2004)	Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards
5	ANSI C63.4-2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

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 Service for Conformity Assessment (CNAS) 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:

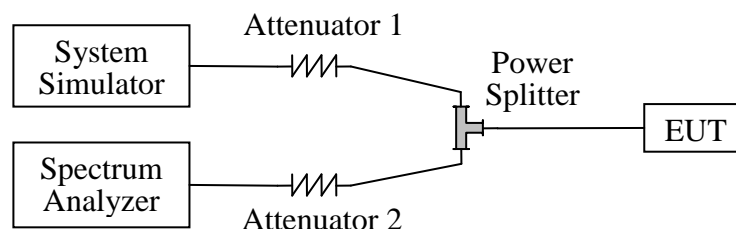
- (a) Channel Block A:
 Mobile 824 - 835MHz, Base 869 - 880MHz;
 Mobile 845 - 846.5MHz, Base 890 - 891.5MHz
- (b) Channel Block B:
 Mobile 835 - 845 MHz, Base 880 - 890MHz;
 Mobile 846.5 - 849 MHz, Base 891.5 - 894MHz

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
Spectrum Analyzer	Rohde Schwarz	FSP13	M-030176	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

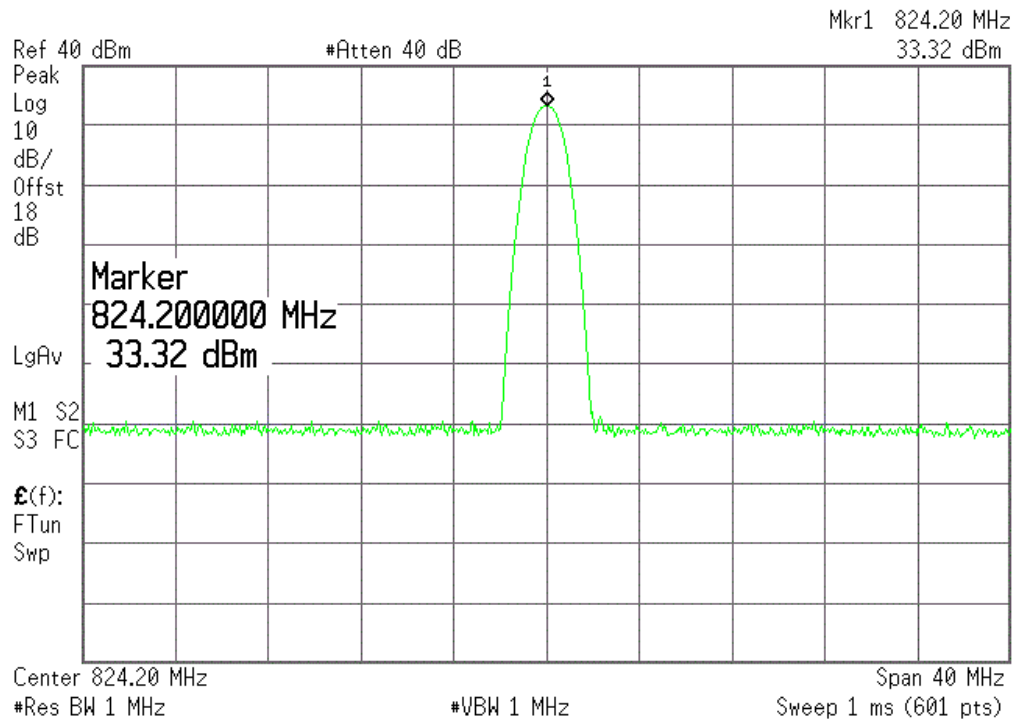
The Tx frequency arrangement of the GSM 850MHz band employed by the EUT should be from 824.2MHz to 848.8MHz (the corresponding frequency block is from 824MHz to 849MHz), and Tx frequency arrangement of the PCS 1900MHz band employed by the EUT should be from 1850.2MHz to 1909.8MHz (the corresponding frequency 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:

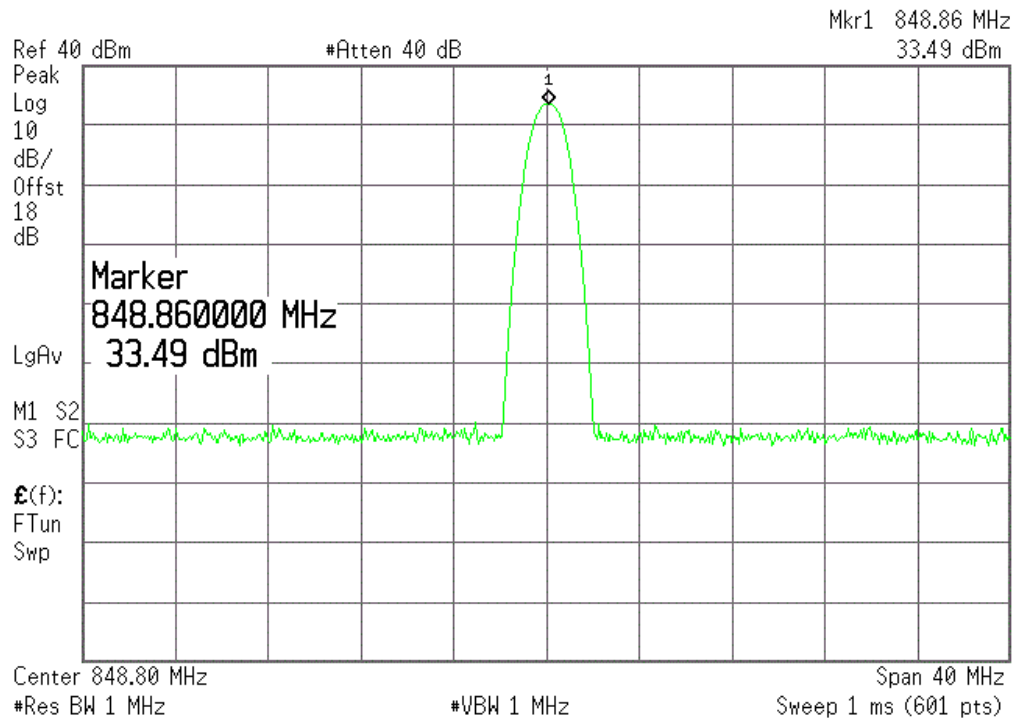
The required frequency block is employed legally, the verdict is PASS.

Band	Channel	Frequency (MHz)	Measured Carrier (dBm)	Refer to Plot
GSM 850MHz	128	824.2	33.32	Plot A1
	251	848.8	33.49	Plot B1
GSM 1900MHz	512	1850.2	30.59	Plot C1
	810	1909.8	30.52	Plot D1
GPRS 850MHz	128	824.16	33.53	Plot E1
	251	848.8	33.45	Plot F1
GPRS 1900MHz	512	1850.2	30.58	Plot G1
	810	1909.8	30.36	Plot H1
EGPRS 850MHz	128	824.2	27.06	Plot I1
	251	848.8	27.02	Plot J1
EGPRS 1900MHz	512	1850.13	26.15	Plot K1
	810	1909.8	26.08	Plot L1

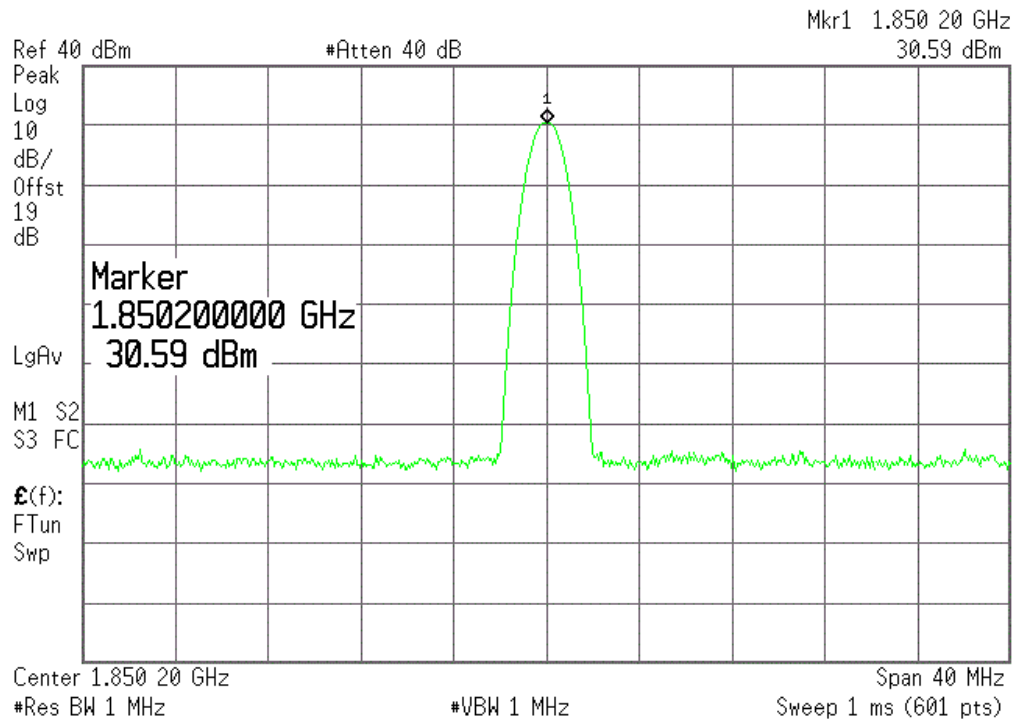
2. Test Plot:



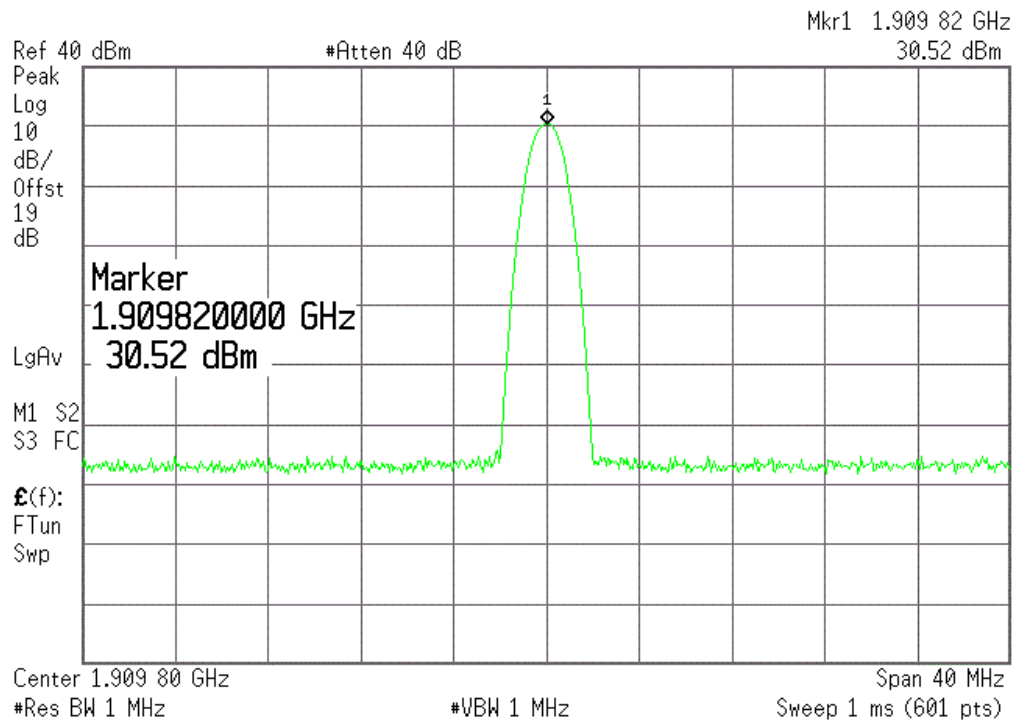
(Plot A1: GSM 850MHz Channel = 128)



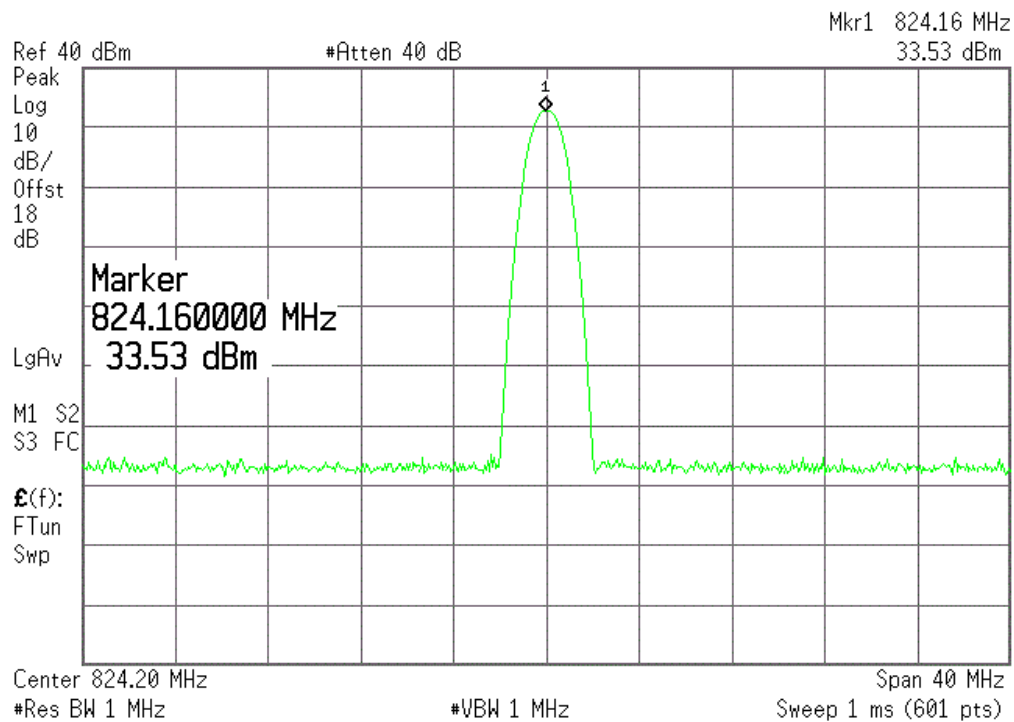
(Plot B1: GSM 850MHz Channel = 251)



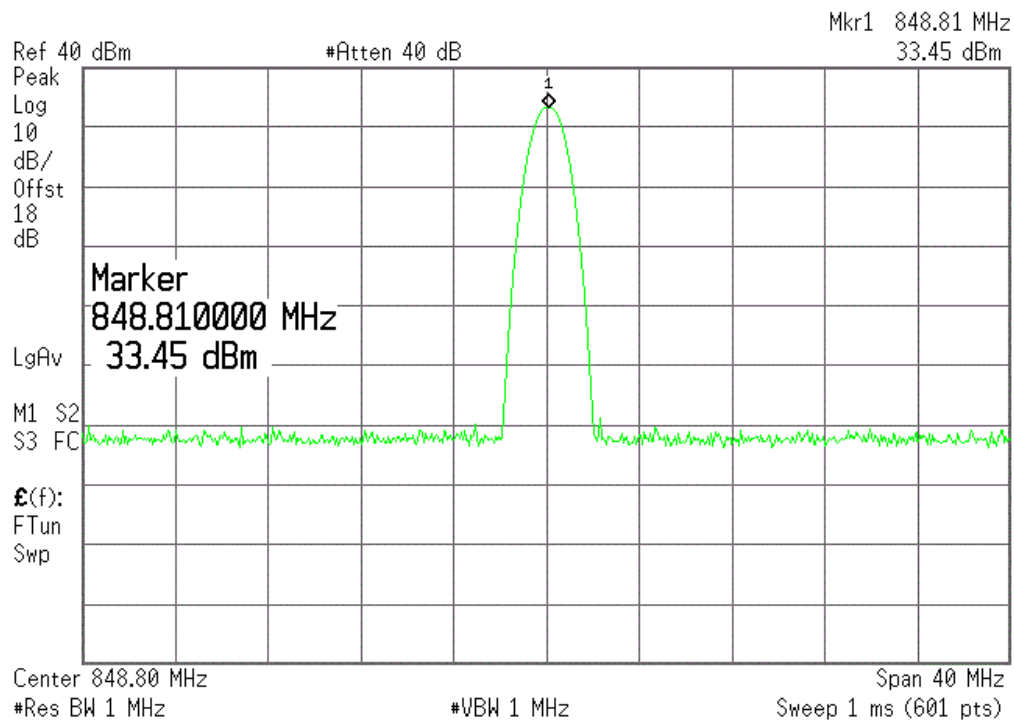
(Plot C1: GSM 1900MHz Channel = 512)



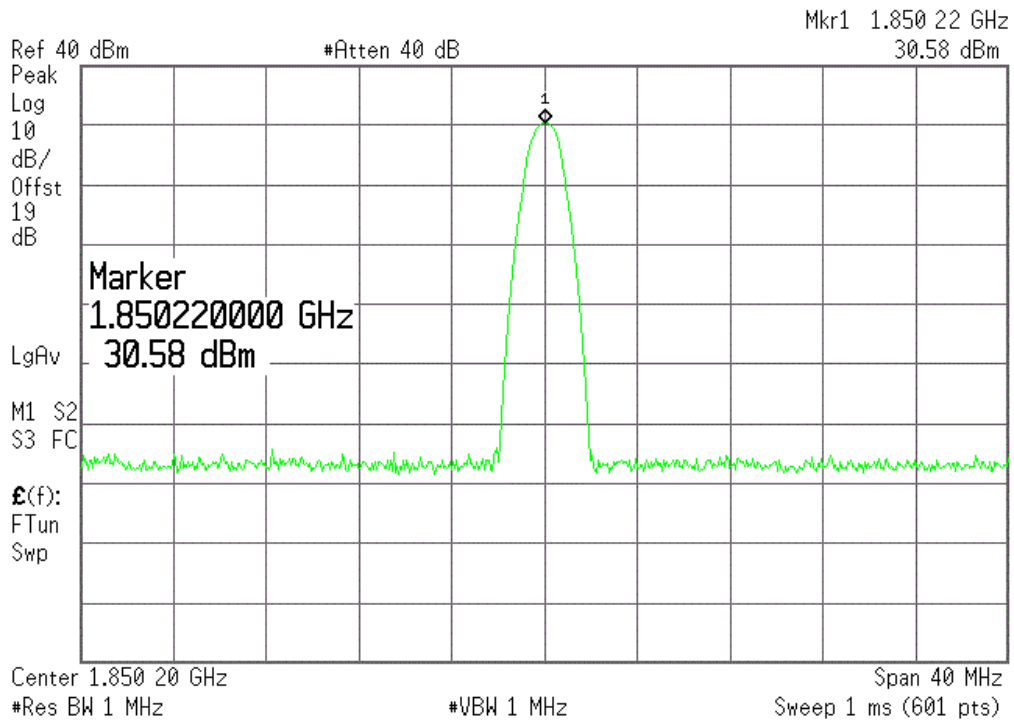
(Plot D1: GSM 1900MHz Channel = 810)



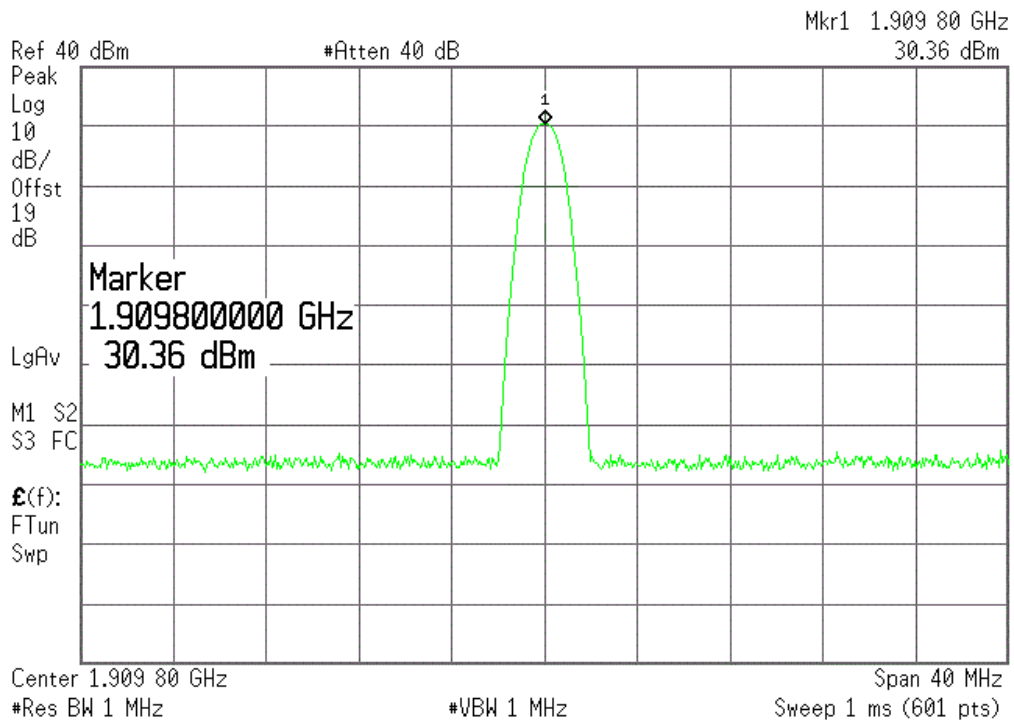
(Plot E1: GPRS 850MHz Channel = 128)



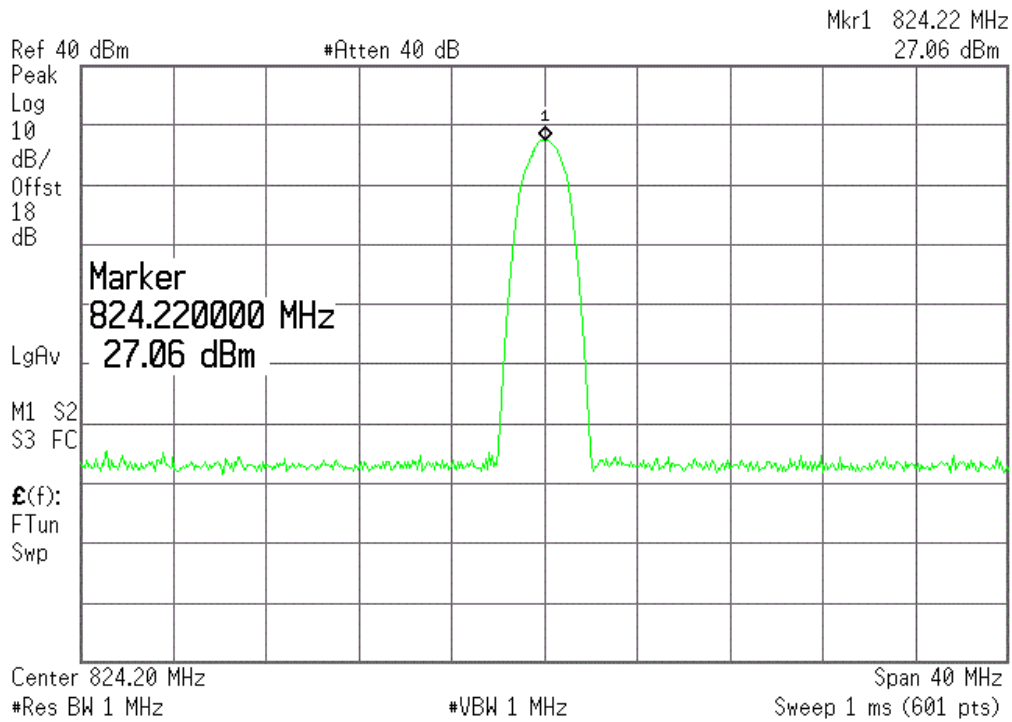
(Plot F1: GPRS 850MHz Channel = 251)



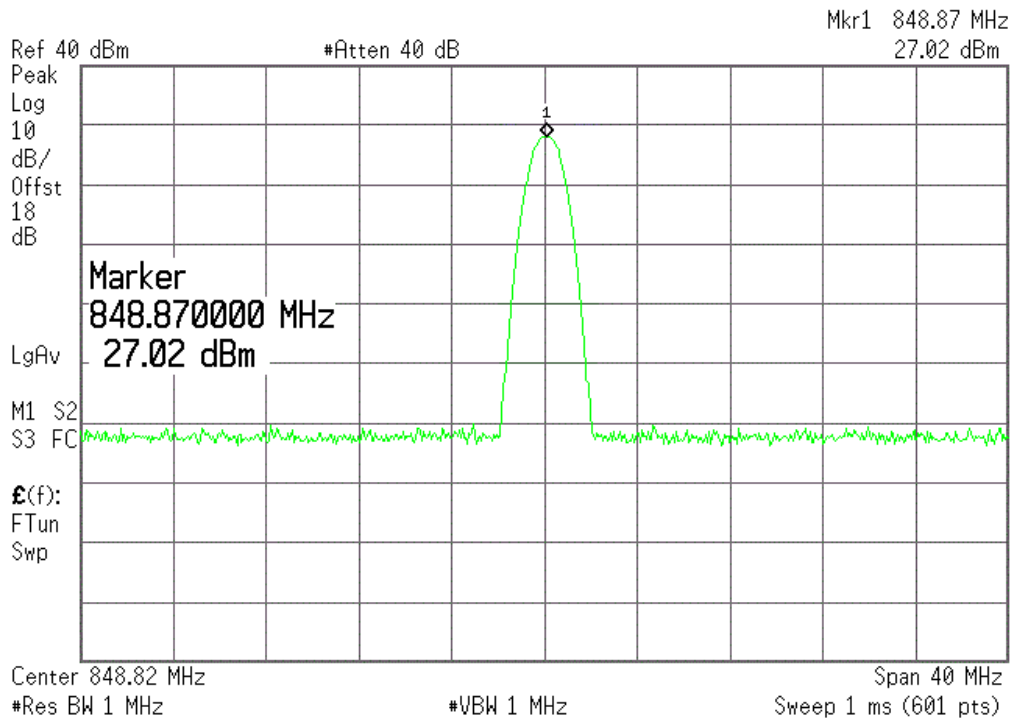
(Plot G1: GPRS 1900MHz Channel = 512)



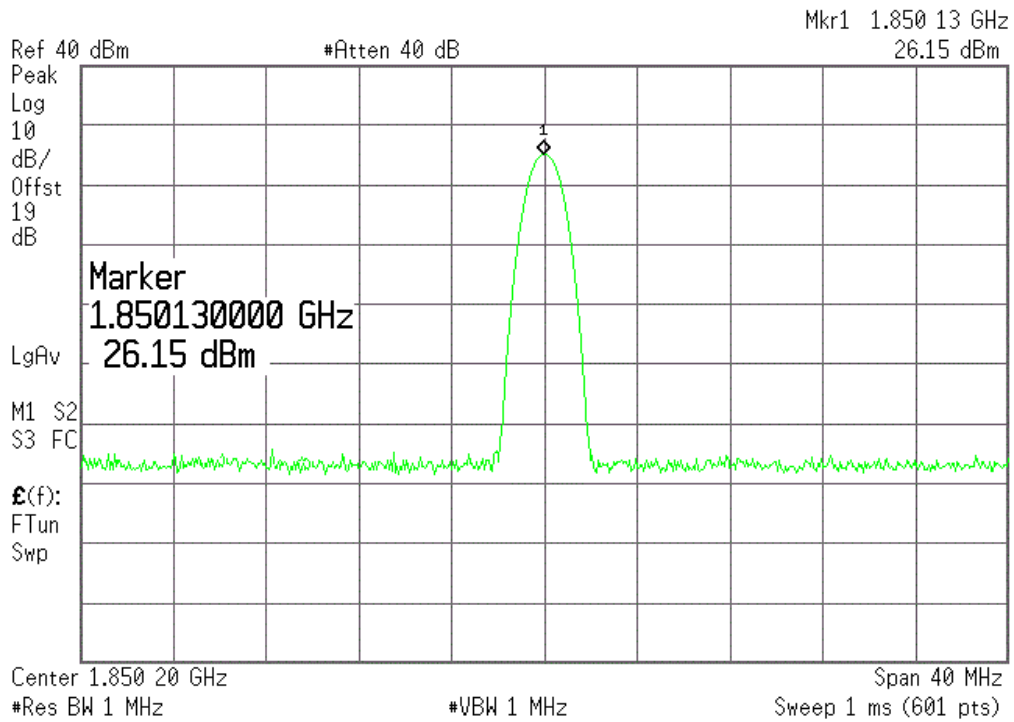
(Plot H1: GPRS 1900MHz Channel = 810)



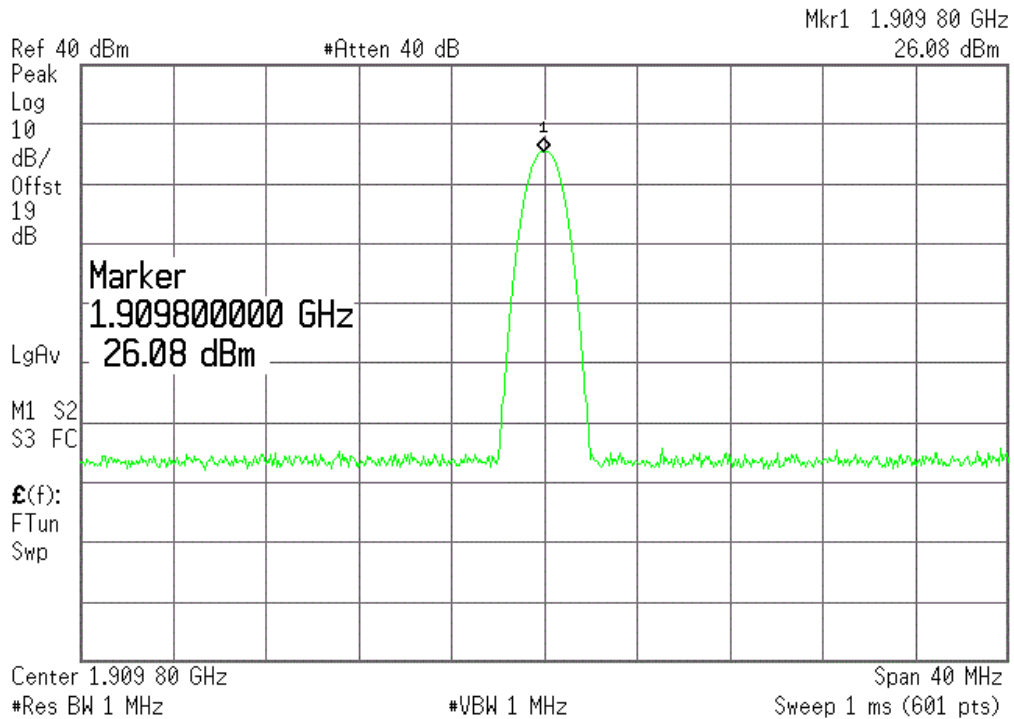
(Plot I1: EGPRS 850MHz Channel = 128)



(Plot J1: EGPRS 850MHz Channel = 251)



(Plot K1: EGPRS 1900MHz Channel = 512)



(Plot L1: EGPRS 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 ± 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 ± 3 dB.

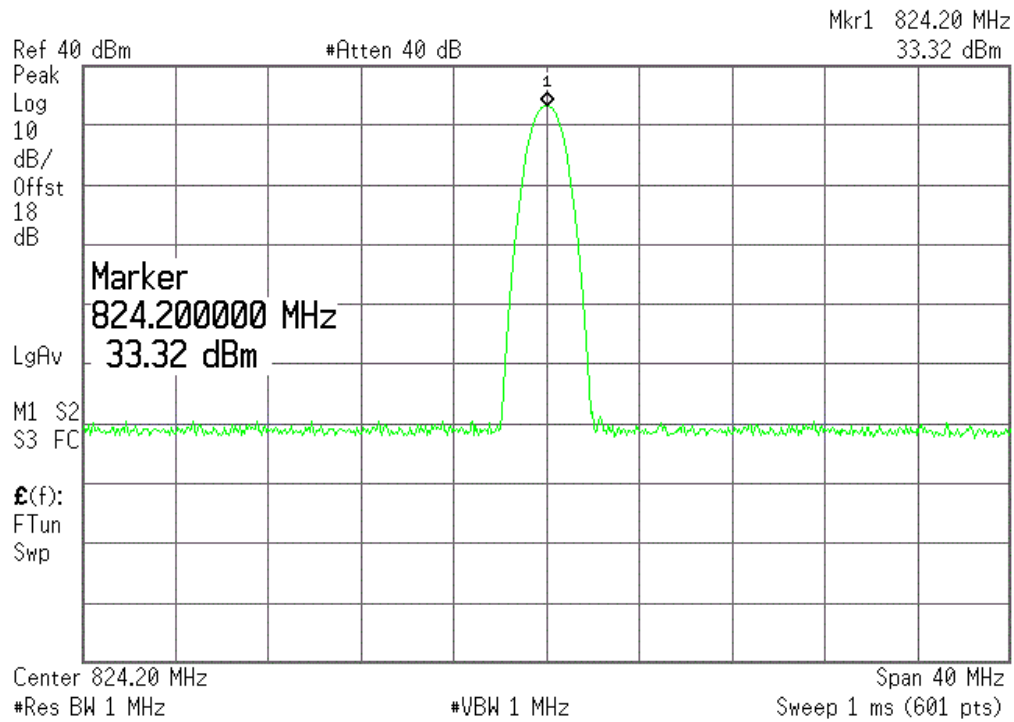
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Output Power		Rated Output Power		Verdict
			dBm	Refer to Plot	dBm	Tolerance (dB)	
GSM 850MHz	128	824.2	33.32	Plot A2	33	± 3	PASS
	190	836.6	33.60	Plot B2			PASS
	251	848.8	33.49	Plot C2			PASS
GSM 1900MHz	512	1850.2	30.59	Plot D2	30	± 3	PASS
	661	1880	30.64	Plot E2			PASS
	810	1909.8	30.52	Plot F2			PASS
GPRS 850MHz	128	824.16	33.53	Plot G2	33	± 3	PASS
	190	836.6	33.45	Plot H2			PASS
	251	848.81	33.45	Plot I2			PASS
GPRS 1900MHz	512	1850.2	30.58	Plot J2	30	± 3	PASS
	661	1880	30.55	Plot K2			PASS
	810	1909.8	30.36	Plot L2			PASS

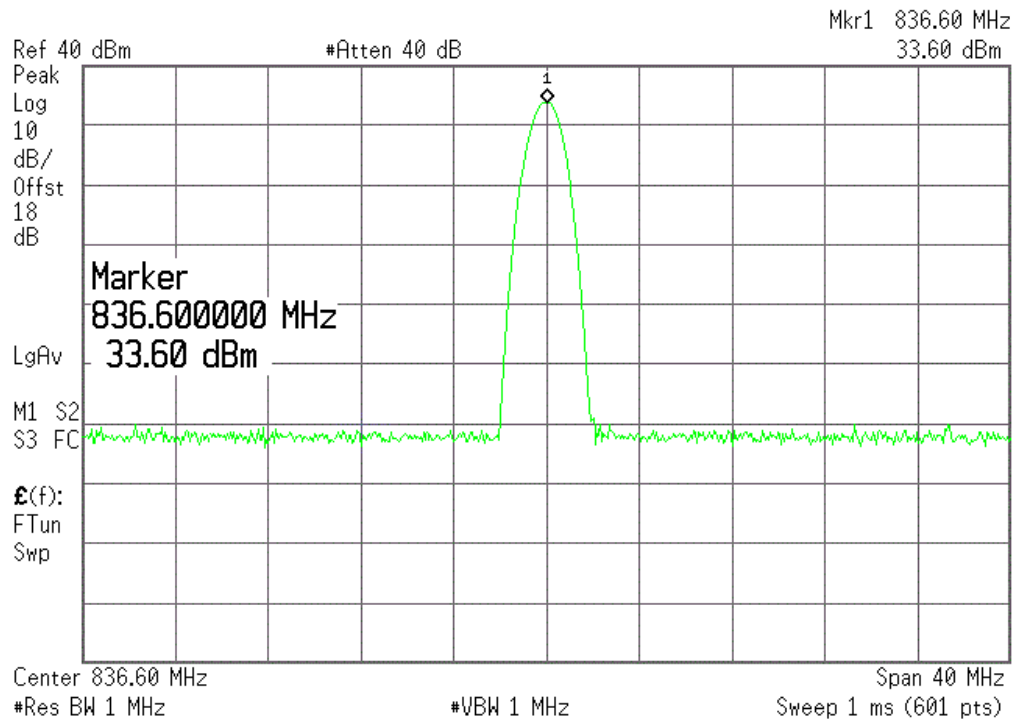


Band	Channel	Frequency (MHz)	Measured Output Power		Rated Output Power		Verdict
			dBm	Refer to Plot	dBm	Tolerance (dB)	
EGPRS 850MHz	128	824.22	27.06	Plot M2	33	±3	PASS
	190	836.6	27.18	Plot N2			PASS
	251	848.87	27.02	Plot O2			PASS
EGPRS 1900MHz	512	1850.13	26.15	Plot P2	30	±3	PASS
	661	1879.93	26.17	Plot Q2			PASS
	810	1909.8	26.08	Plot R2			PASS

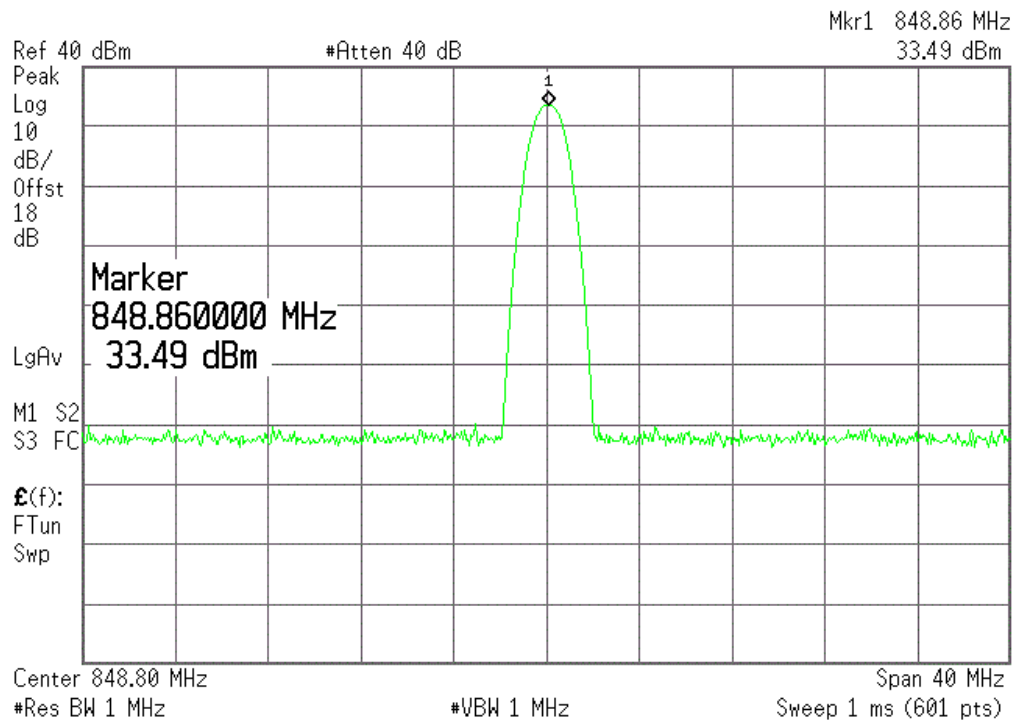
2. Test Plot:



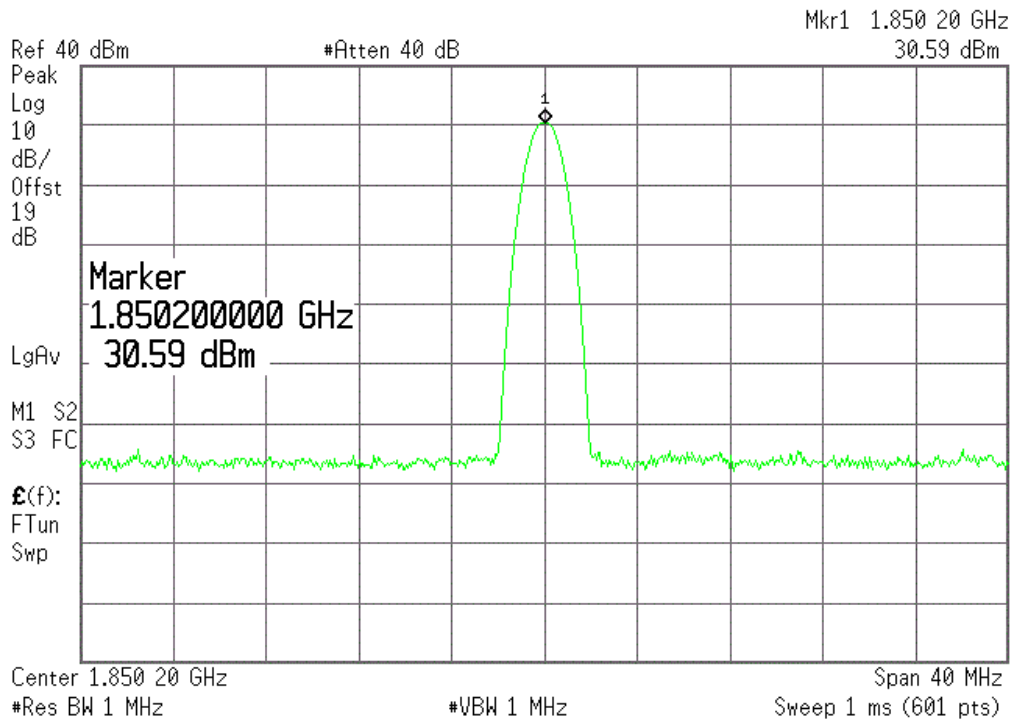
(Plot A2: GSM 850MHz Channel = 128)



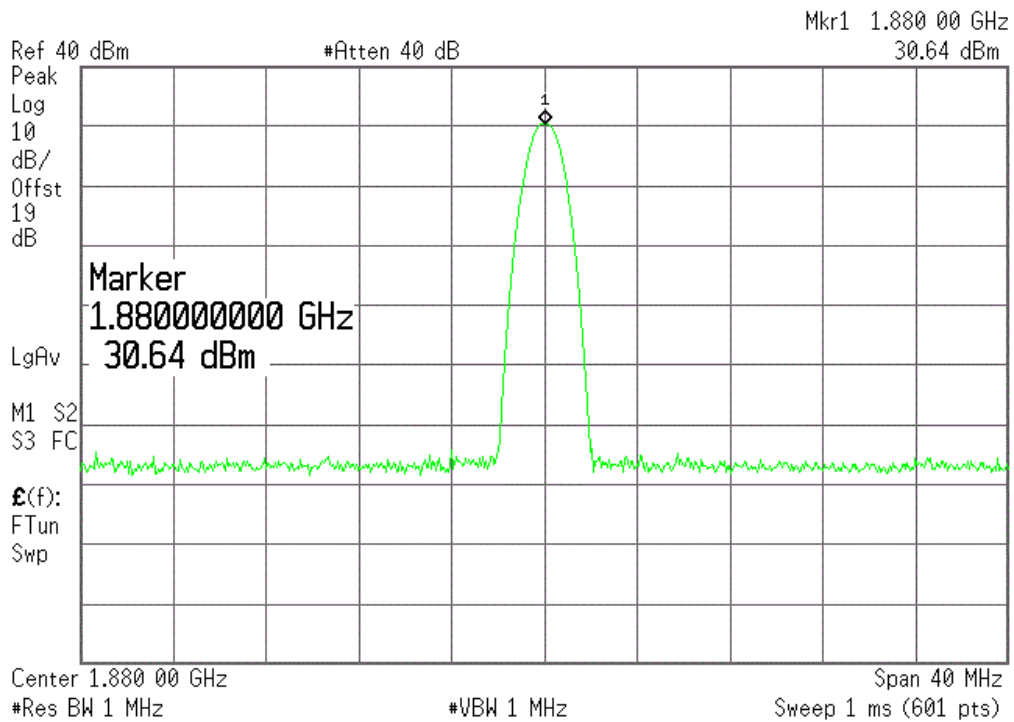
(Plot B2: GSM 850MHz Channel = 190)



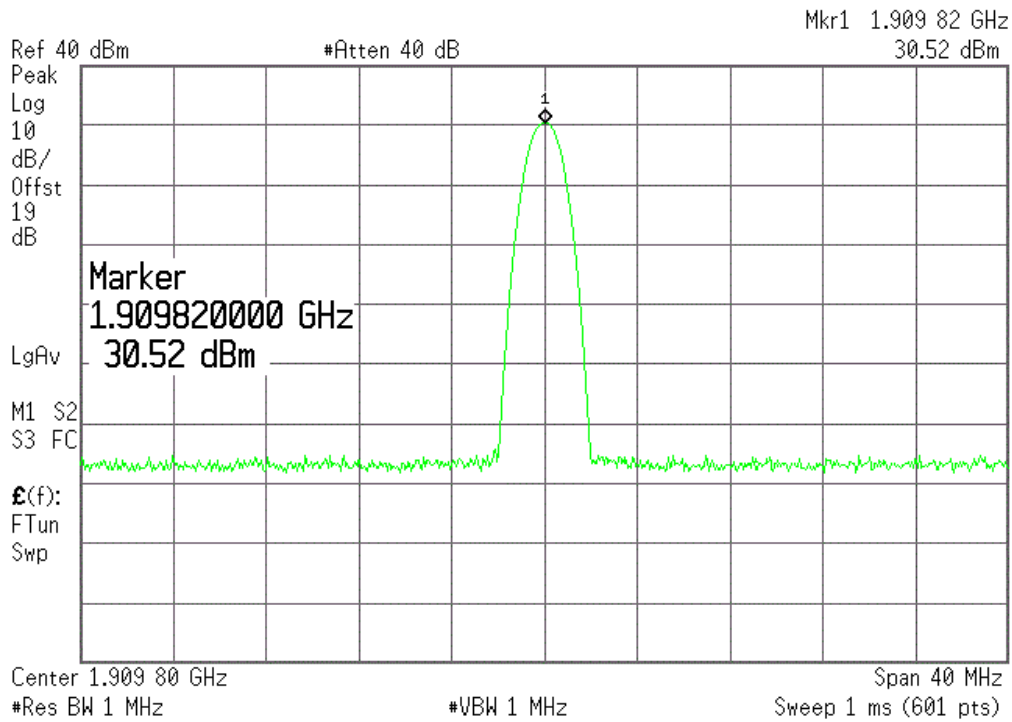
(Plot C2: GSM 850MHz Channel = 251)



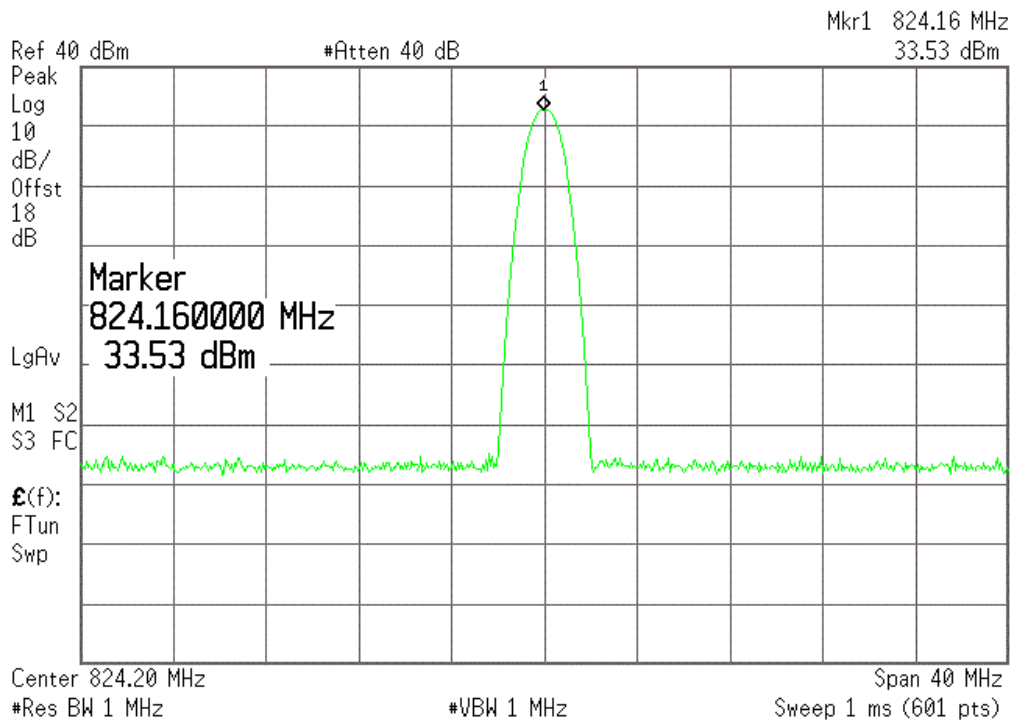
(Plot D2: GSM 1900MHz Channel = 512)



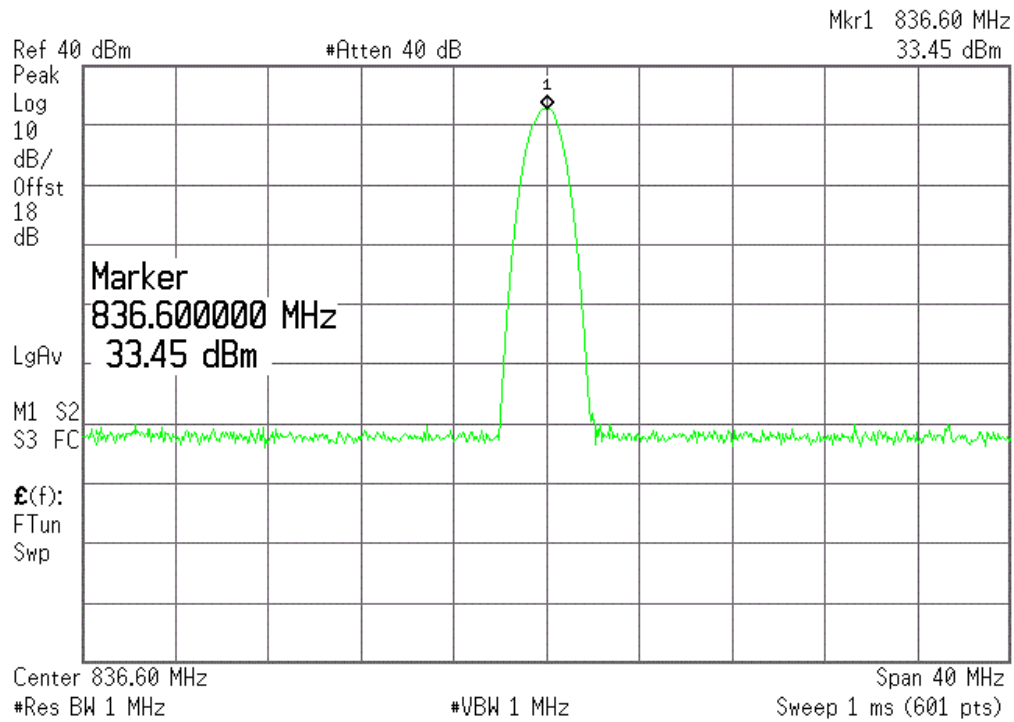
(Plot E2: GSM 1900MHz Channel = 661)



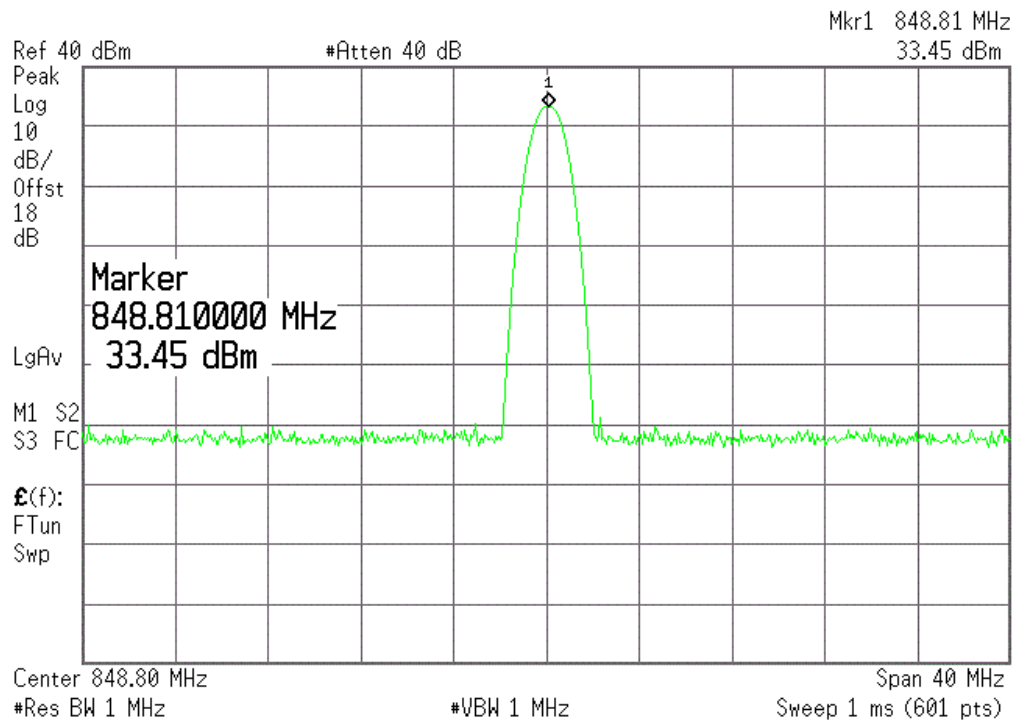
(Plot F2: GSM 1900MHz Channel = 810)



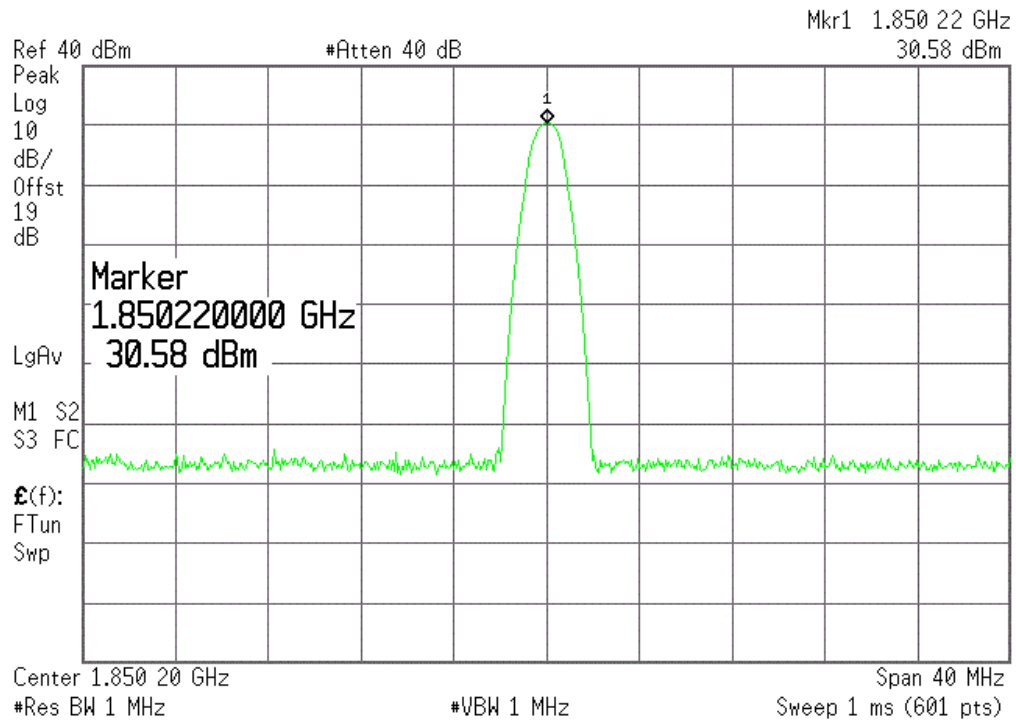
(Plot G2:GPRS 850MHz Channel = 128)



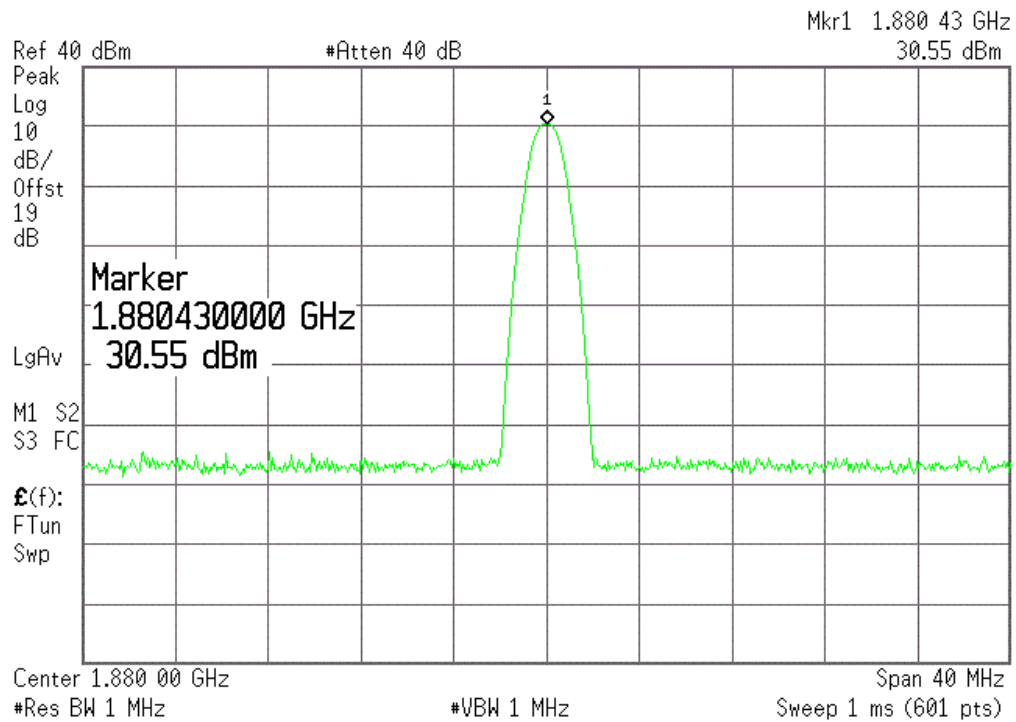
(Plot H2: GPRS 850MHz Channel = 190)



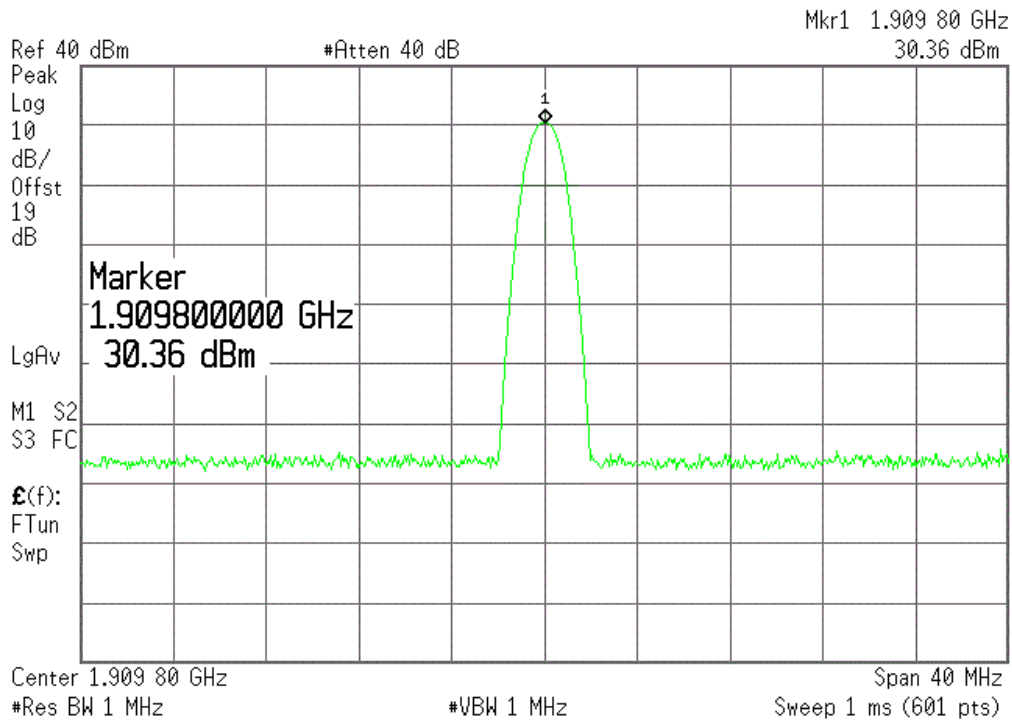
(Plot I2: GPRS 850MHz Channel = 251)



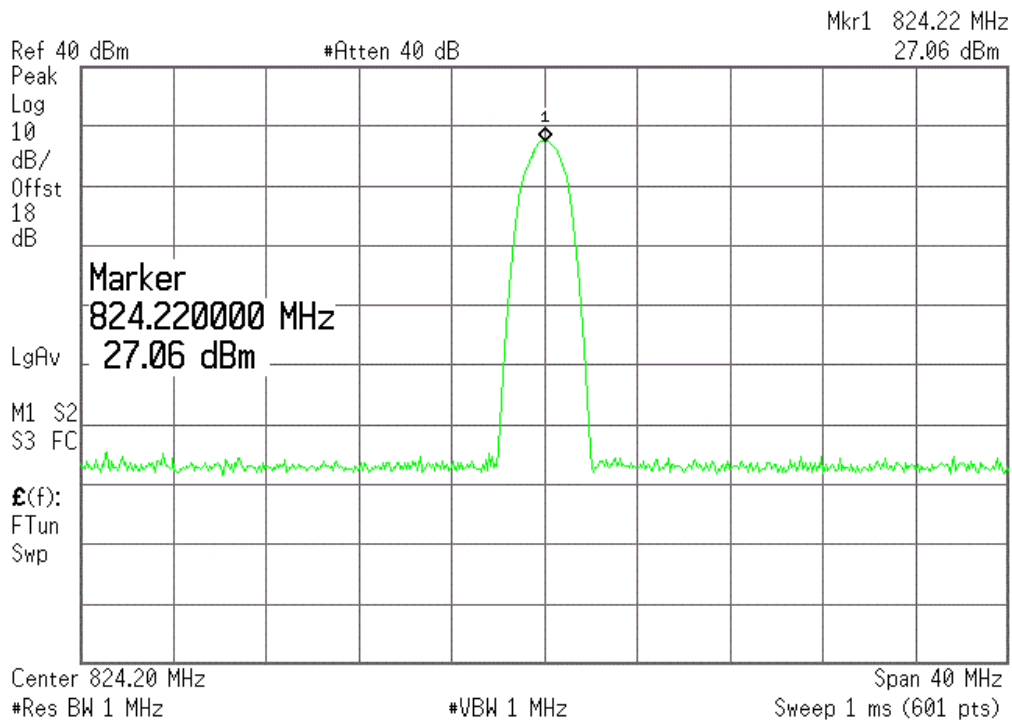
(Plot J2: GPRS 1900MHz Channel = 512)



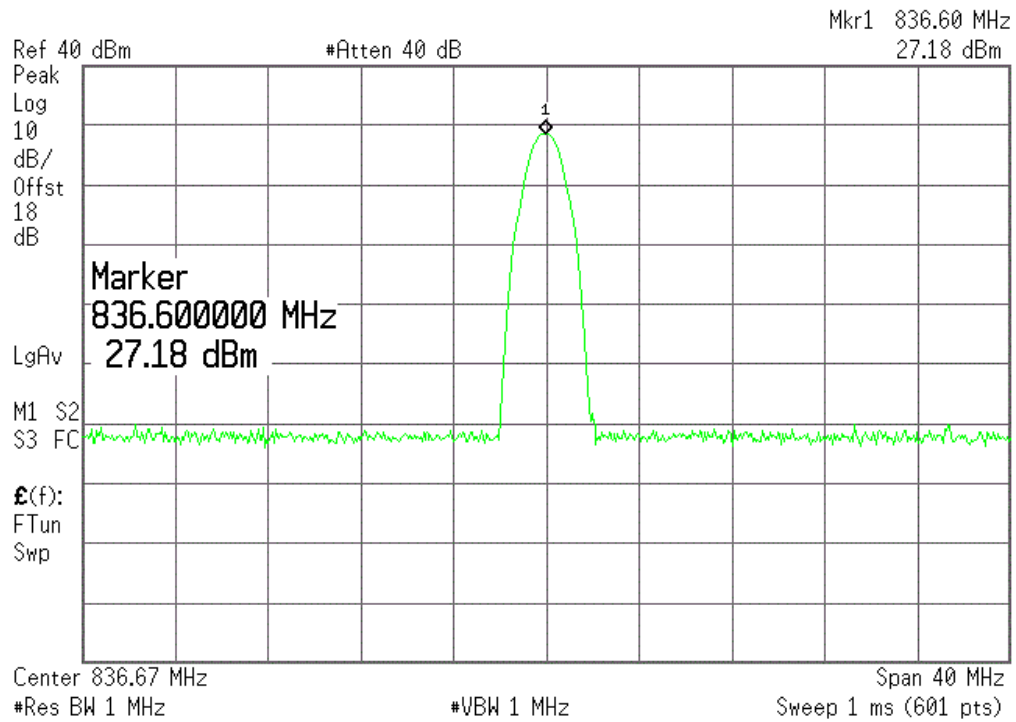
(Plot K2: GPRS 1900MHz Channel = 661)



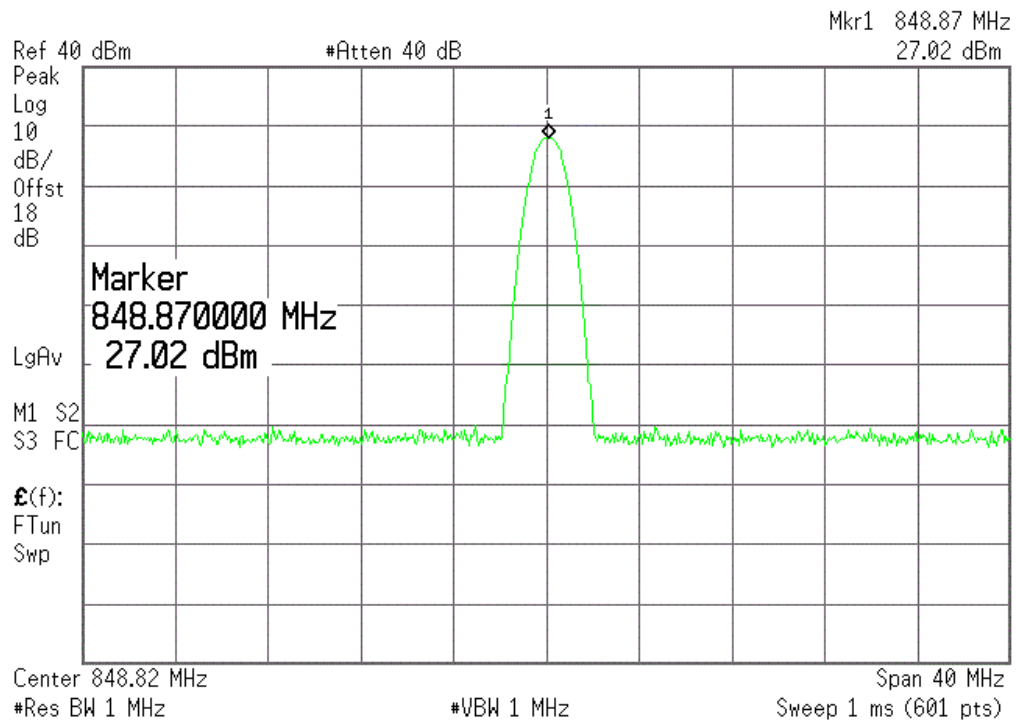
(Plot L2: GPRS 1900MHz Channel = 810)



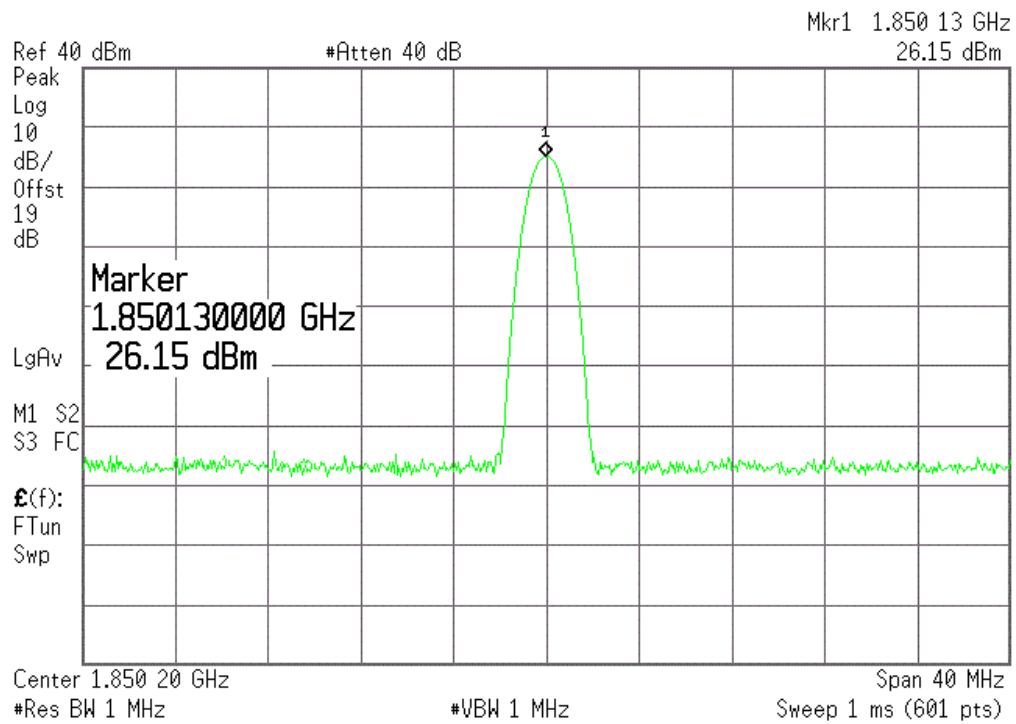
(Plot M2:EGPRS 850MHz Channel = 128)



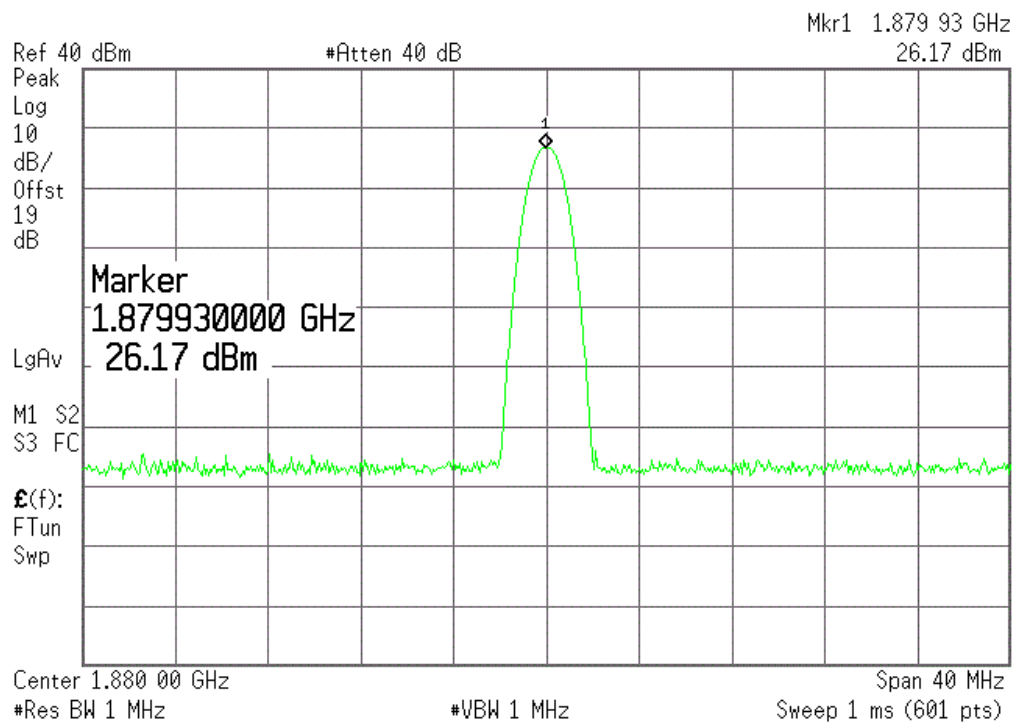
(Plot N2:EGPRS 850MHz Channel = 190)



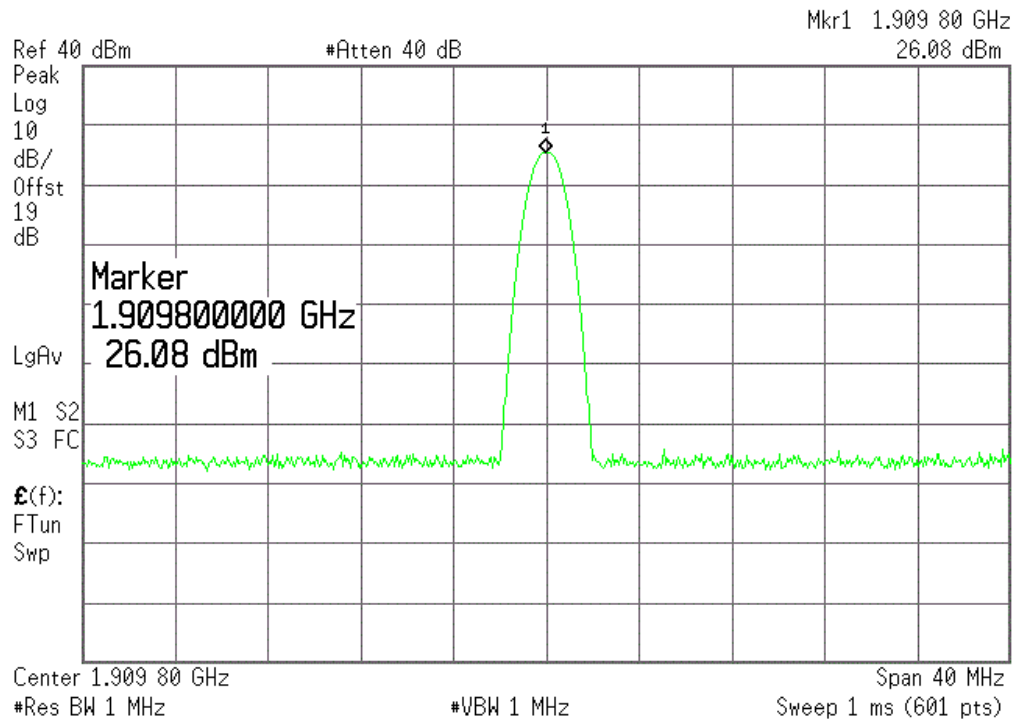
(Plot O2:EGPRS 850MHz Channel = 251)



(Plot P2:EGPRS 1900MHz Channel = 512)



(Plot Q2:EGPRS 1900MHz Channel = 661)



(Plot R2:EGPRS 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 ($10 \cdot \log_{10} 1\% = 20\text{dB}$) 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. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE).

1. Test Verdict:

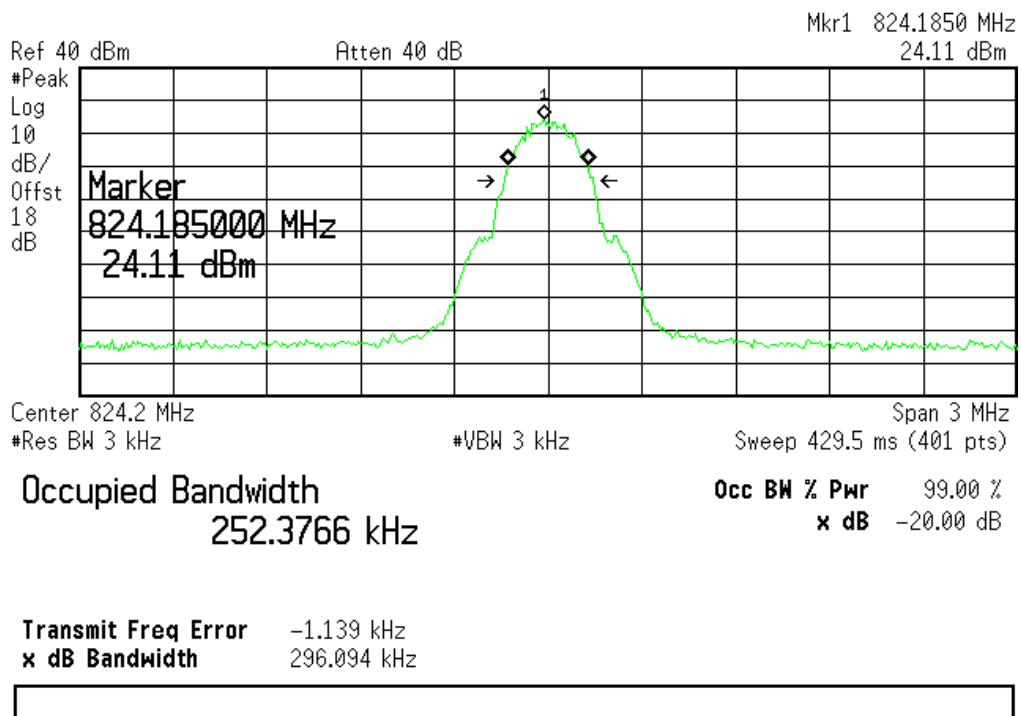
Band	Channel	Measured 20dB Occupied Bandwidth (kHz)	Refer to Plot
GSM 850MHz	128	296.094	Plot A3
	190	296.551	Plot B3
	251	295.111	Plot C3
GSM 1900MHz	512	295.218	Plot D3
	661	290.756	Plot E3
	810	293.026	Plot F3

Band	Channel	Measured 20dB Occupied Bandwidth (kHz)	Refer to Plot
GPRS 850MHz	128	288.206	Plot A3.1
	190	288.740	Plot B3.1
	251	288.820	Plot C3.1
GPRS 1900MHz	512	288.904	Plot D3.1
	661	288.280	Plot E3.1
	810	288.338	Plot F3.1

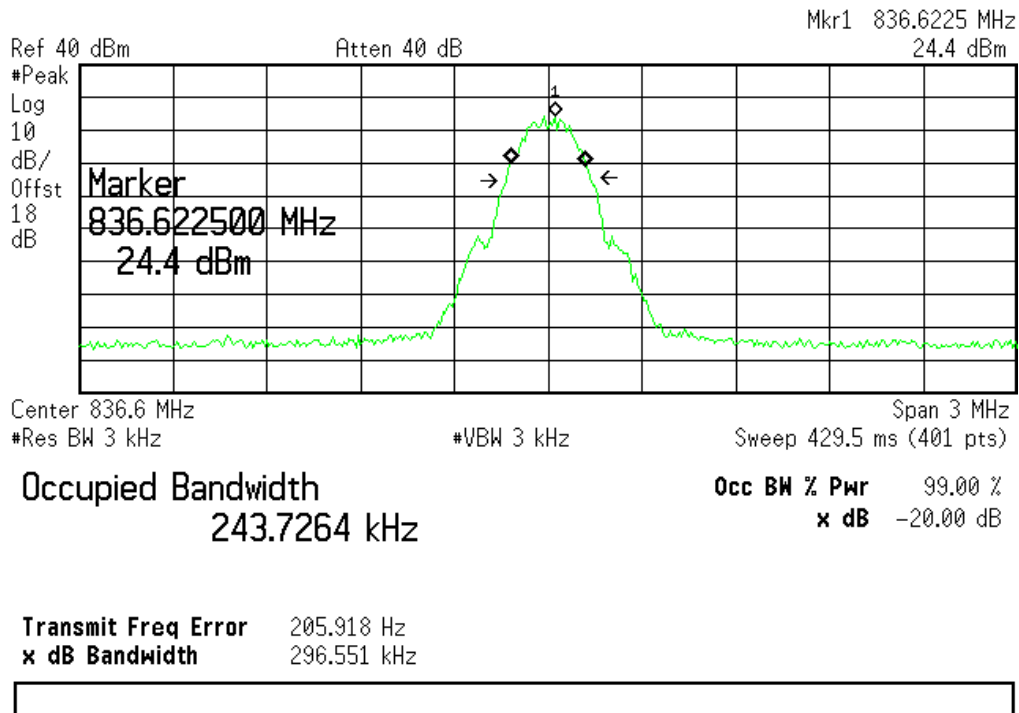


Band	Channel	Measured 20dB Occupied Bandwidth (kHz)	Refer to Plot
EGPRS 850MHz	128	276.377	Plot A3.2
	190	271.157	Plot B3.2
	251	270.436	Plot C3.2
EGPRS 1900MHz	512	276.053	Plot D3.2
	661	270.976	Plot E3.2
	810	271.421	Plot F3.2

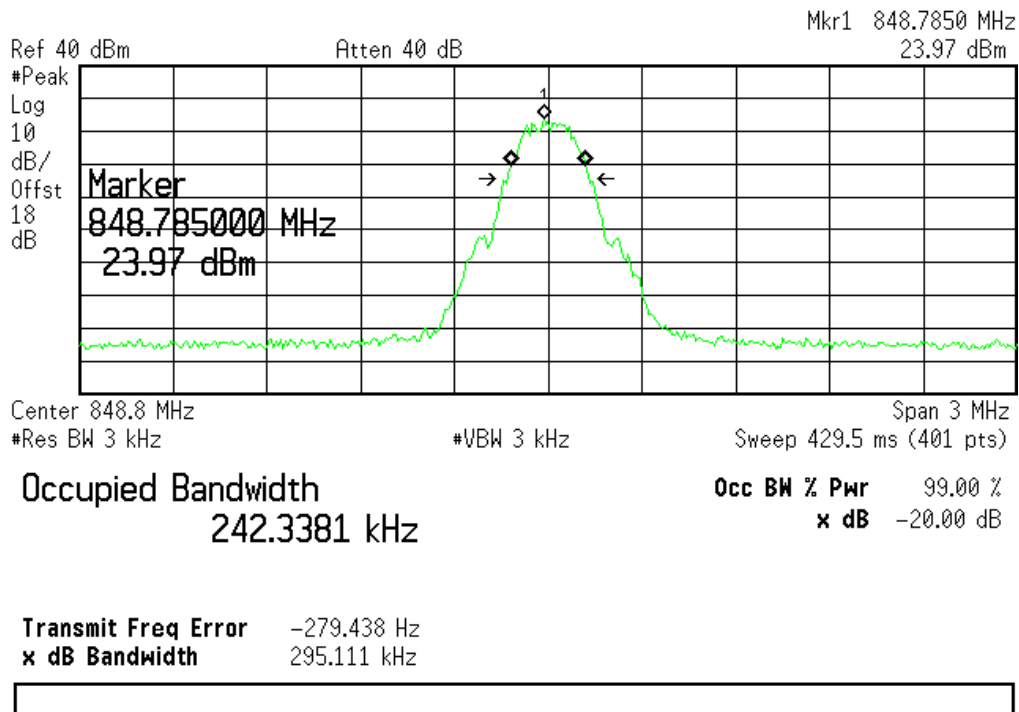
2. Test Plot:



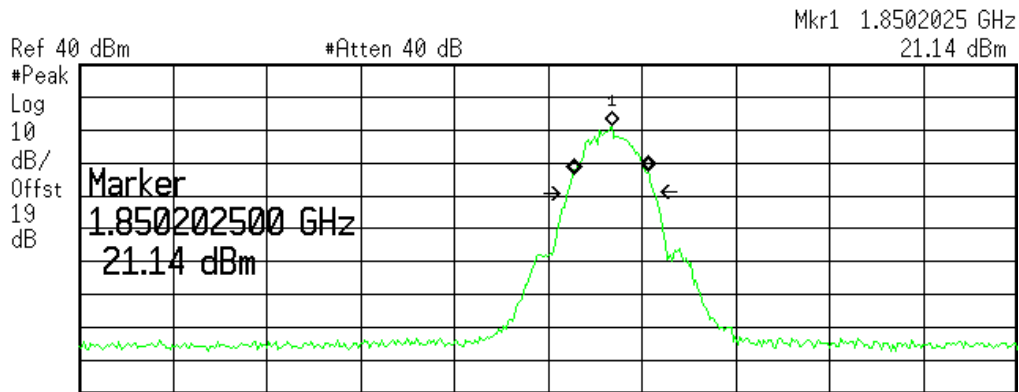
(Plot A3: GSM 850MHz Channel = 128)



(Plot B3: GSM 850MHz Channel = 190)



(Plot C3: GSM 850MHz Channel = 251)



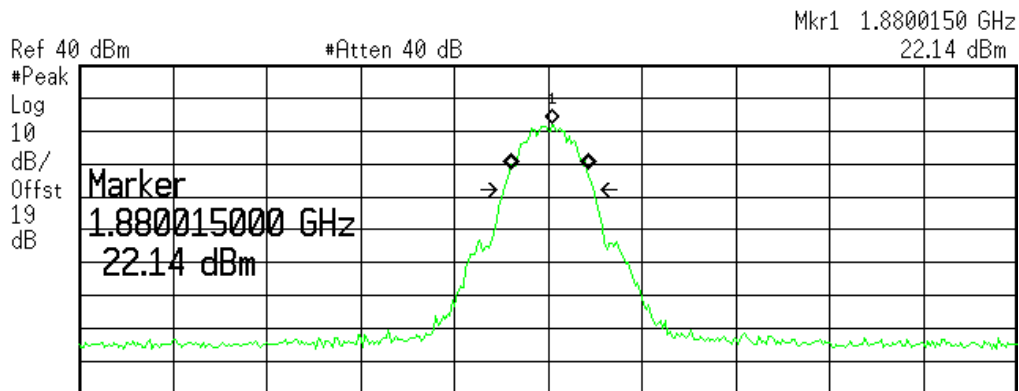
Center 1.85 GHz Span 3 MHz
#Res BW 3 kHz #VBW 3 kHz Sweep 429.5 ms (401 pts)

Occupied Bandwidth
244.3563 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 201.045 kHz
x dB Bandwidth 295.218 kHz

(Plot D3: GSM 1900MHz Channel = 512)



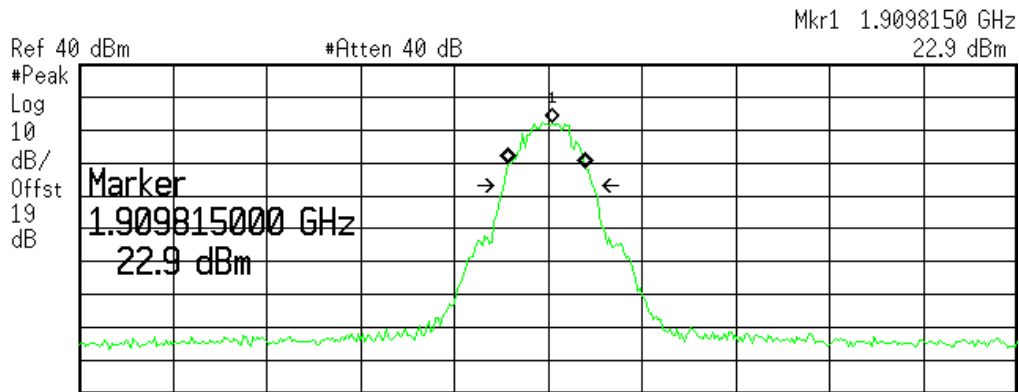
Center 1.88 GHz Span 3 MHz
#Res BW 3 kHz #VBW 3 kHz Sweep 429.5 ms (401 pts)

Occupied Bandwidth
246.4049 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 699.847 Hz
x dB Bandwidth 290.756 kHz

(Plot E3: GSM 1900MHz Channel = 661)



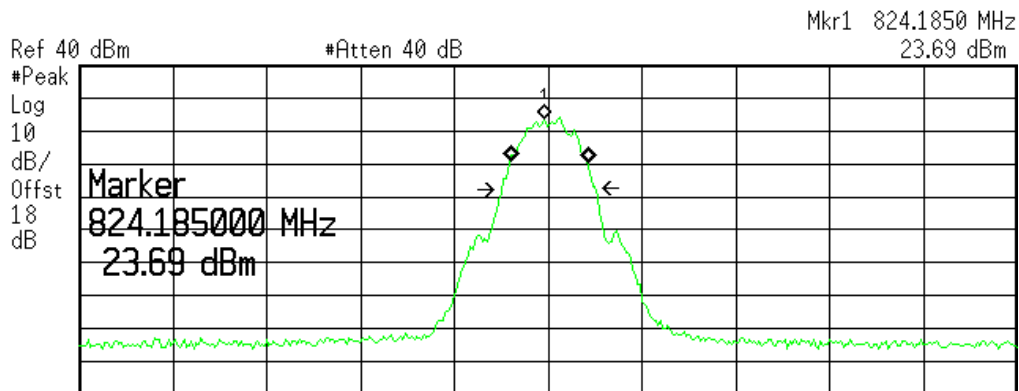
Ref 40 dBm #Atten 40 dB Mkr1 1.9098150 GHz 22.9 dBm
Center 1.91 GHz Span 3 MHz
#Res BW 3 kHz #VBW 3 kHz Sweep 429.5 ms (401 pts)

Occupied Bandwidth
249.1077 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -1.769 kHz
x dB Bandwidth 293.026 kHz

(Plot F3: GSM 1900MHz Channel = 810)



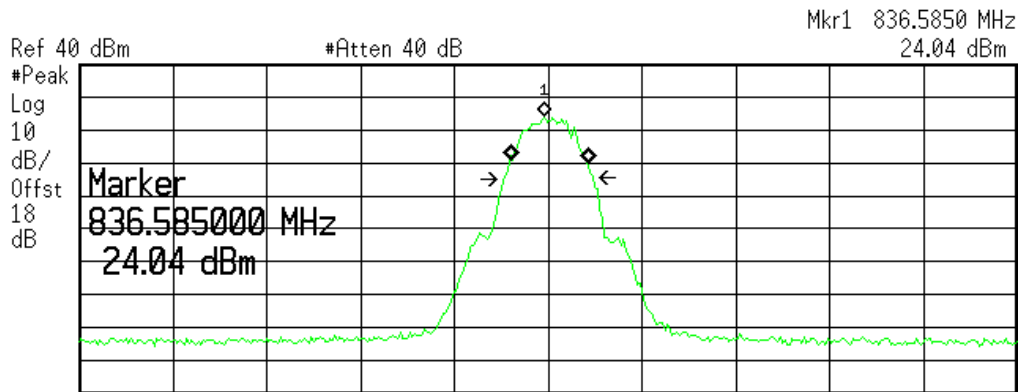
Ref 40 dBm #Atten 40 dB Mkr1 824.1850 MHz 23.69 dBm
Center 824.2 MHz Span 3 MHz
#Res BW 3 kHz #VBW 3 kHz Sweep 429.5 ms (401 pts)

Occupied Bandwidth
247.3441 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 1.103 kHz
x dB Bandwidth 288.206 kHz

(Plot A3.1: GPRS 850MHz Channel = 128)



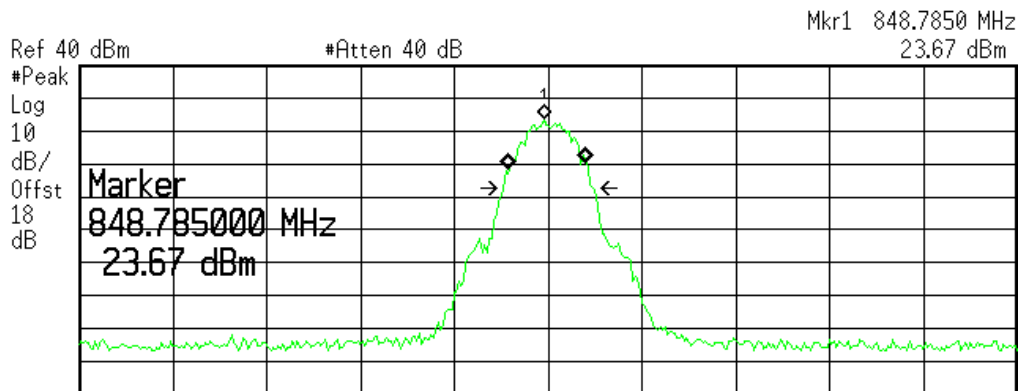
Center 836.6 MHz Span 3 MHz
#Res BW 3 kHz #VBW 3 kHz Sweep 429.5 ms (401 pts)

Occupied Bandwidth
246.9417 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 1.191 kHz
x dB Bandwidth 288.740 kHz

(Plot B3.1: GPRS 850MHz Channel = 190)



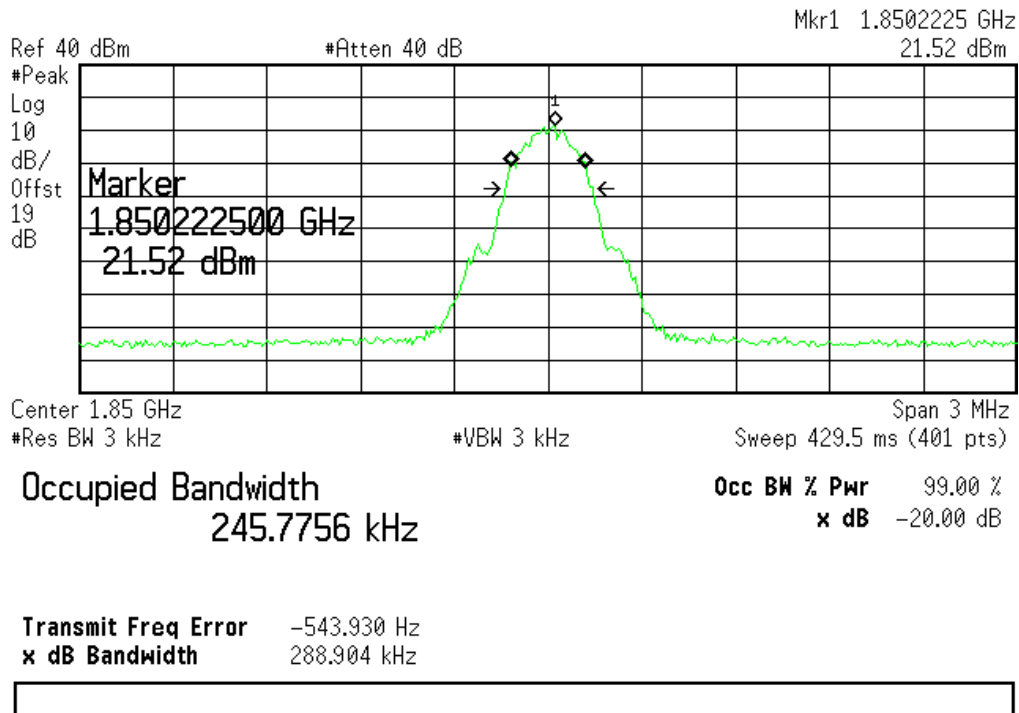
Center 848.8 MHz Span 3 MHz
#Res BW 3 kHz #VBW 3 kHz Sweep 429.5 ms (401 pts)

Occupied Bandwidth
247.5392 kHz

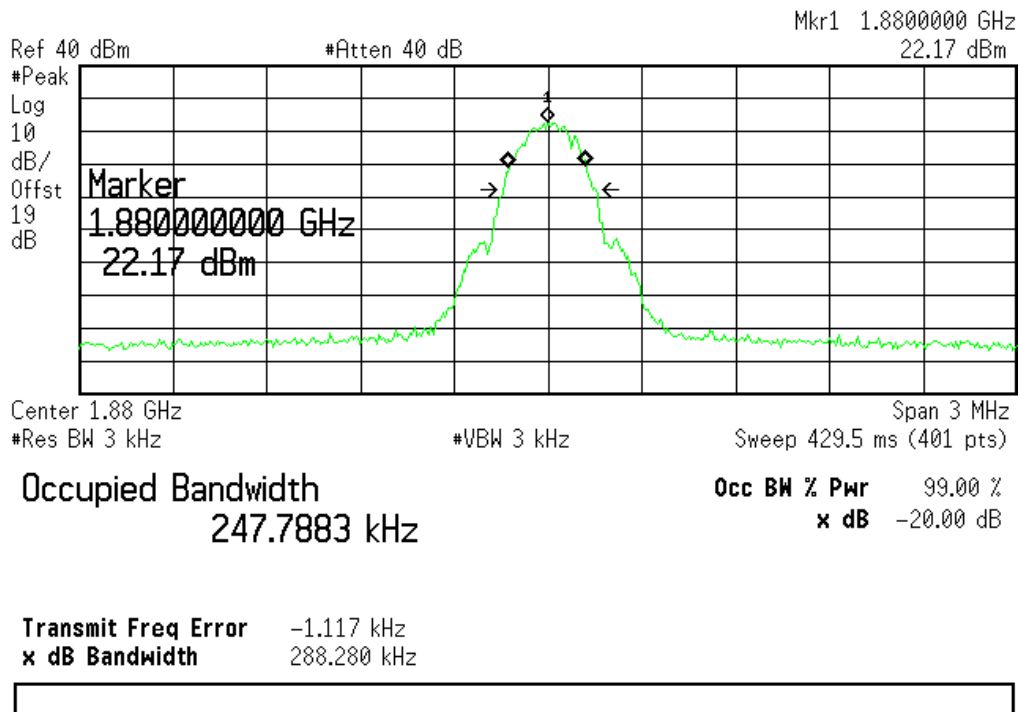
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -462.247 Hz
x dB Bandwidth 288.820 kHz

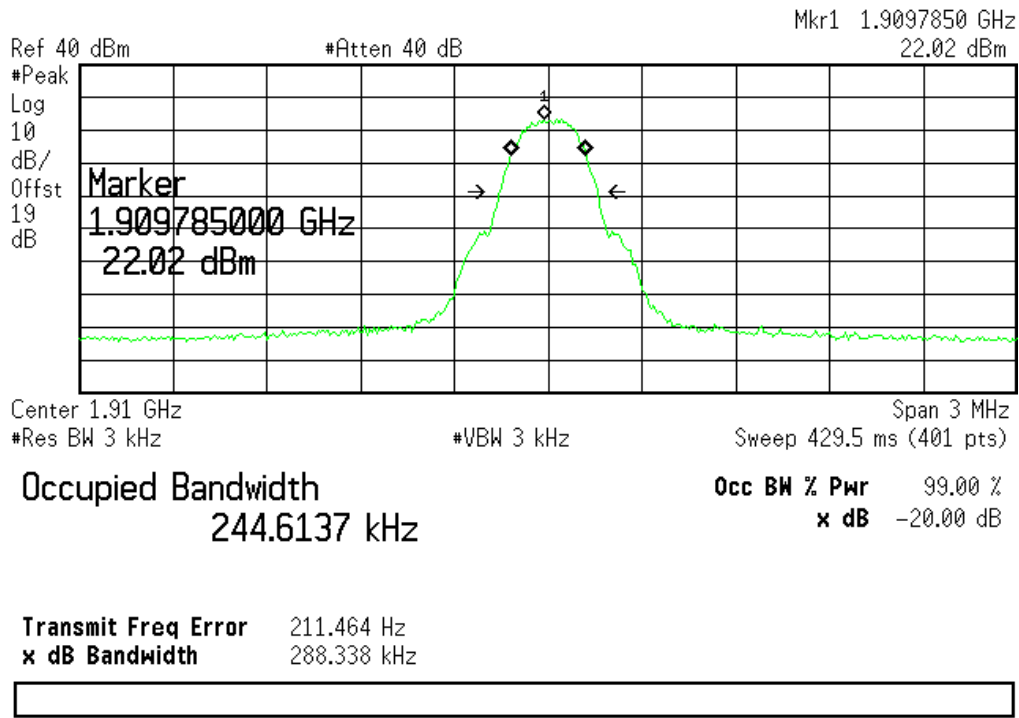
(Plot C3.1: GPRS 850MHz Channel = 251)



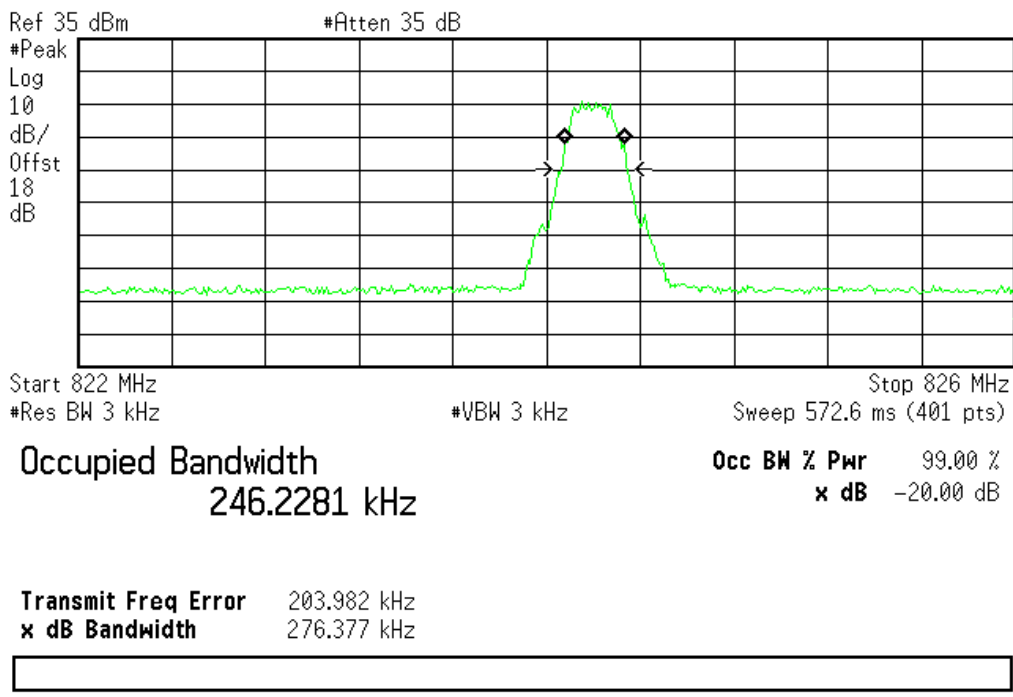
(Plot D3.1: GPRS 1900MHz Channel = 512)



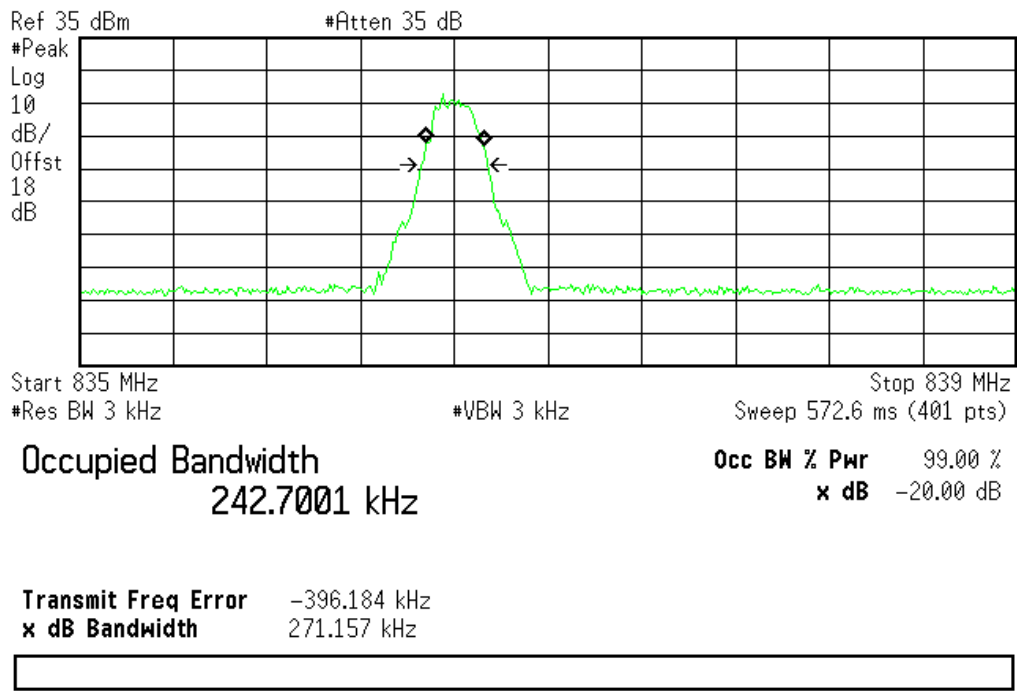
(Plot E3.1: GPRS 1900MHz Channel = 661)



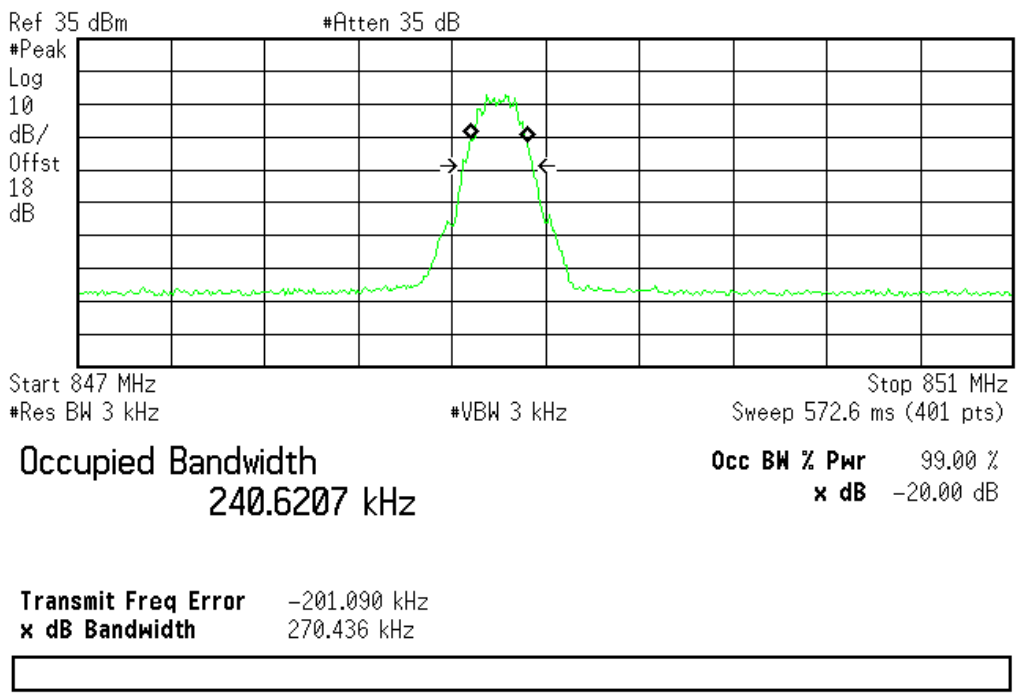
(Plot F3.1: GPRS 1900MHz Channel = 810)



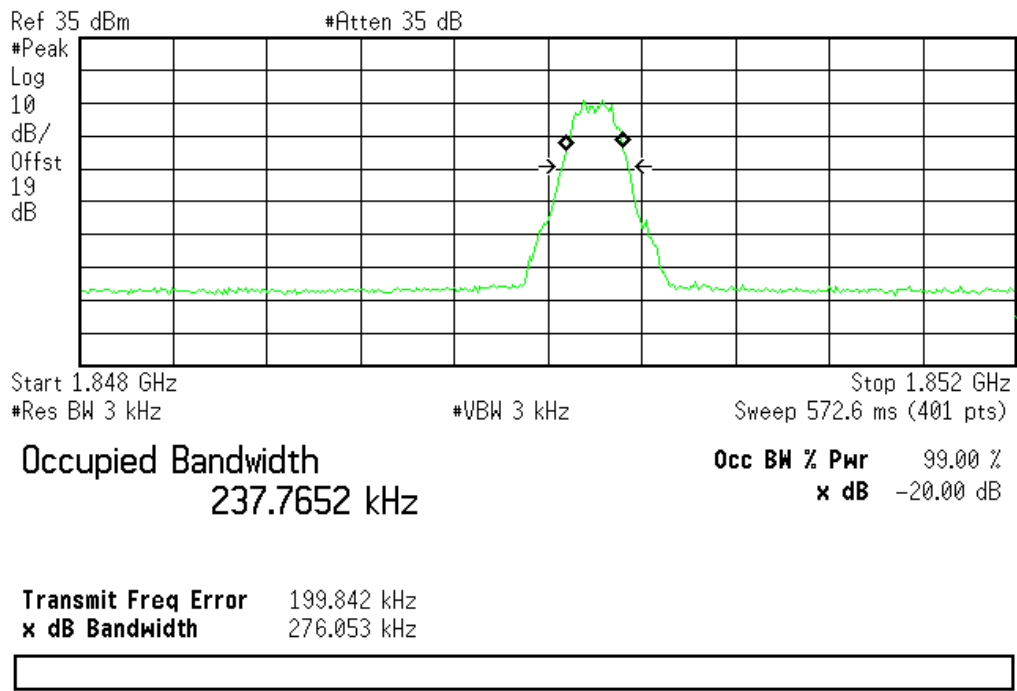
(Plot A3.2: EGPRS 850MHz Channel = 128)



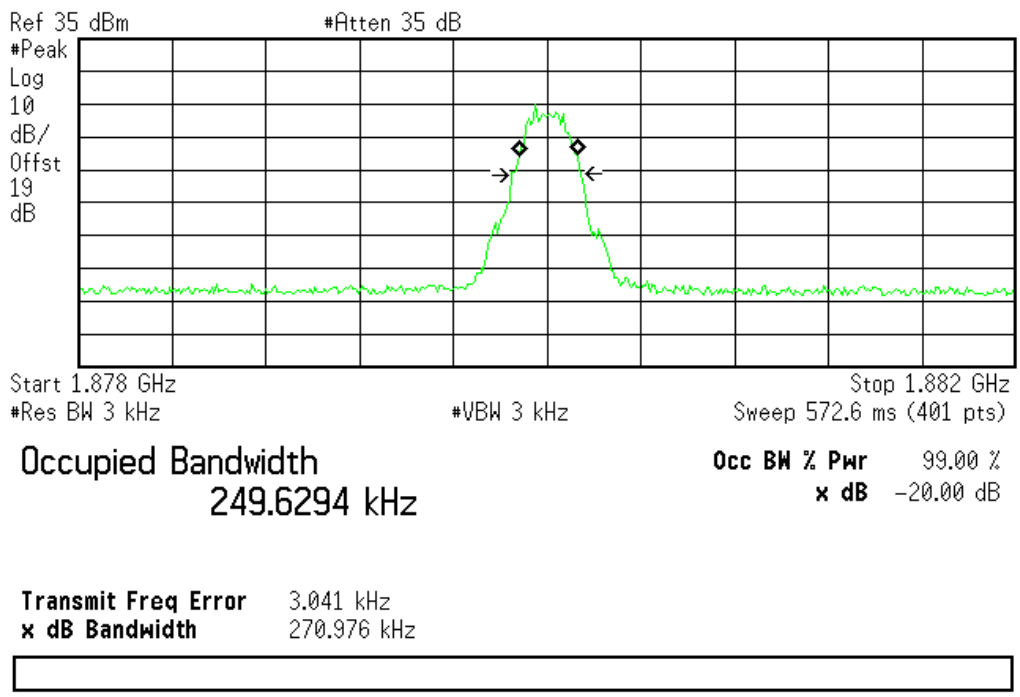
(Plot B3.2: EGPRS 850MHz Channel = 190)



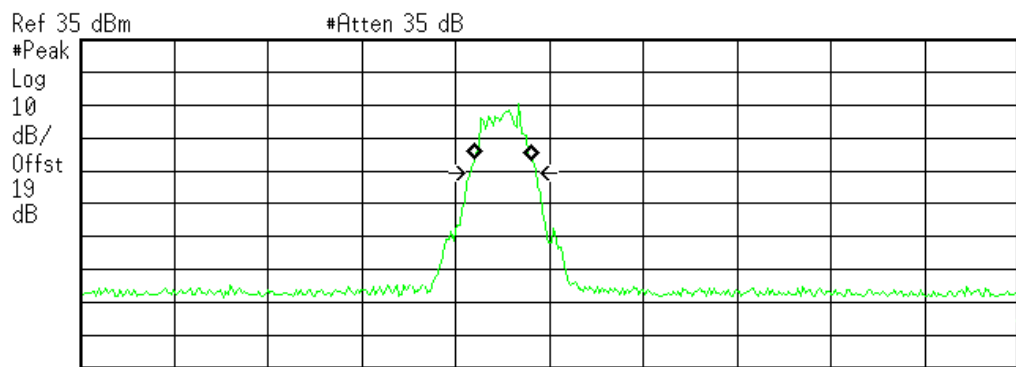
(Plot C3.2: EGPRS 850MHz Channel = 251)



(Plot D3.2: EGPRS 1900MHz Channel = 512)



(Plot E3.2: EGPRS 1900MHz Channel = 661)



Ref 35 dBm #Atten 35 dB
 Start 1.908 GHz Stop 1.912 GHz
 #Res BW 3 kHz #VBW 3 kHz Sweep 572.6 ms (401 pts)

Occupied Bandwidth
 242.0336 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -197.263 kHz
x dB Bandwidth 271.421 kHz



(Plot F3.2: EGPRS 1900MHz Channel = 810)

3.4 Frequency Stability

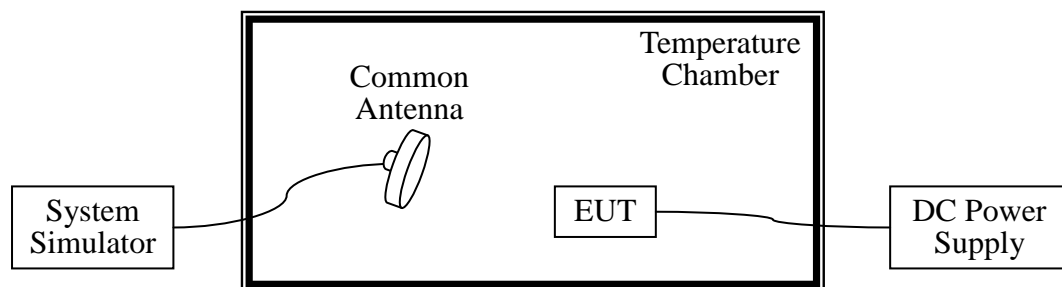
3.4.1 Requirement

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 $-30\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ at intervals of not more than $10\text{ }^{\circ}\text{C}$.
- (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 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.

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 $25\text{ }^{\circ}\text{C}$. The frequency

deviation limit is ± 2.5 ppm. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE).

Band	Test Conditions		Frequency Deviation						Verdict
	Power (V DC)	Temperature (°C)	Low Channel		Middle Channel		High Channel		Limit ± 2.5 ppm (ppm)
			Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	
GSM 850MHz	3.7	-30	2	0	3	0	-6	0	PASS
		-20	3	0	-4	0	-2	0	
		-10	-3	0	9	0	3	0	
		0	-6	0	-3	0	4	0	
		+10	4	0	-4	0	-6	0	
		+20	-7	0	-7	0	4	0	
		+30	-2	0	7	0	-3	0	
		+40	-6	0	-1	0	6	0	
		+50	-7	0	3	0	-1	0	
	4.2	+25	4	0	-3	0	-1	0	
3.6	+25	9	0	-9	0	-4	0		
GSM 1900MHz	3.7	-30	-3	0	-2	0	-5	0	PASS
		-20	-5	0	5	0	1	0	
		-10	8	0	9	0	-7	0	
		0	-3	0	4	0	-5	0	
		+10	1	0	8	0	-7	0	
		+20	3	0	6	0	-3	0	
		+30	-1	0	-2	0	5	0	
		+40	-6	0	3	0	6	0	
		+50	-4	0	1	0	-3	0	
	4.2	+25	8	0	-9	0	-1	0	
3.6	+25	-7	0	-9	0	7	0		
GPRS 850MHz	3.7	-30	6	0	4	0	-3	0	PASS
		-20	-3	0	-0	0	-7	0	
		-10	4	0	9	0	-2	0	
		0	-5	0	1	0	1	0	
		+10	3	0	2	0	2	0	
		+20	-1	0	-2	0	-5	0	
		+30	6	0	3	0	-2	0	
		+40	-5	0	-3	0	1	0	



Band	Test Conditions		Frequency Deviation						Verdict
	Power (V DC)	Temperature (°C)	Low Channel		Middle Channel		High Channel		Limit ±2.5ppm (ppm)
			Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	
		+50	3	0	-3	0	4	0	
	4.2	+25	7	0	-3	0	5	0	
	3.6	+25	-1	0	-8	0	-2	0	
GPRS 1900MHz	3.7	-30	6	0	-2	0	-4	0	PASS
		-20	-2	0	5	0	-2	0	
		-10	-1	0	9	0	1	0	
		0	4	0	4	0	-4	0	
		+10	8	0	8	0	-6	0	
		+20	3	0	6	0	-2	0	
		+30	-2	0	-2	0	6	0	
		+40	6	0	3	0	7	0	
		+50	3	0	1	0	-2	0	
	4.2	+25	-6	0	-9	0	-4	0	
	3.6	+25	-7	0	-9	0	6	0	



Band	Test Conditions		Frequency Deviation						Verdict
	Power (V DC)	Temperature (°C)	Low Channel		Middle Channel		High Channel		Limit ±2.5ppm (ppm)
			Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	
EGPRS 850MHz	3.7	-30	-4	0	3	0	-3	0	PASS
		-20	5	0	4	0	-1	0	
		-10	6	0	7	0	-6	0	
		0	-2	0	-3	0	5	0	
		+10	-1	0	-1	0	-4	0	
		+20	-4	0	6	0	-2	0	
		+30	-3	0	7	0	-1	0	
		+40	8	0	2	0	-4	0	
		+50	4	0	-1	0	-5	0	
	4.2	+25	5	0	-6	0	-3	0	
3.6	+25	-6	0	-4	0	1	0		
EGPRS 1900MHz	3.7	-30	2	0	-2	0	-3	0	PASS
		-20	5	0	3	0	4	0	
		-10	8	0	7	0	2	0	
		0	-4	0	-4	0	-7	0	
		+10	-3	0	-2	0	-2	0	
		+20	4	0	4	0	-1	0	
		+30	8	0	-5	0	6	0	
		+40	-3	0	7	0	-3	0	
		+50	6	0	-3	0	-1	0	
	4.2	+25	1	0	4	0	4	0	
	3.6	+25	-5	0	-6	0	6	0	
3.6	+25	-2	0	-7	0	1	0		

3.5 Conducted Out of Band Emissions

3.5.1 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.

3.5.2 Test Description

See section 3.1.2 of this report.

3.5.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE).

Test Verdict:

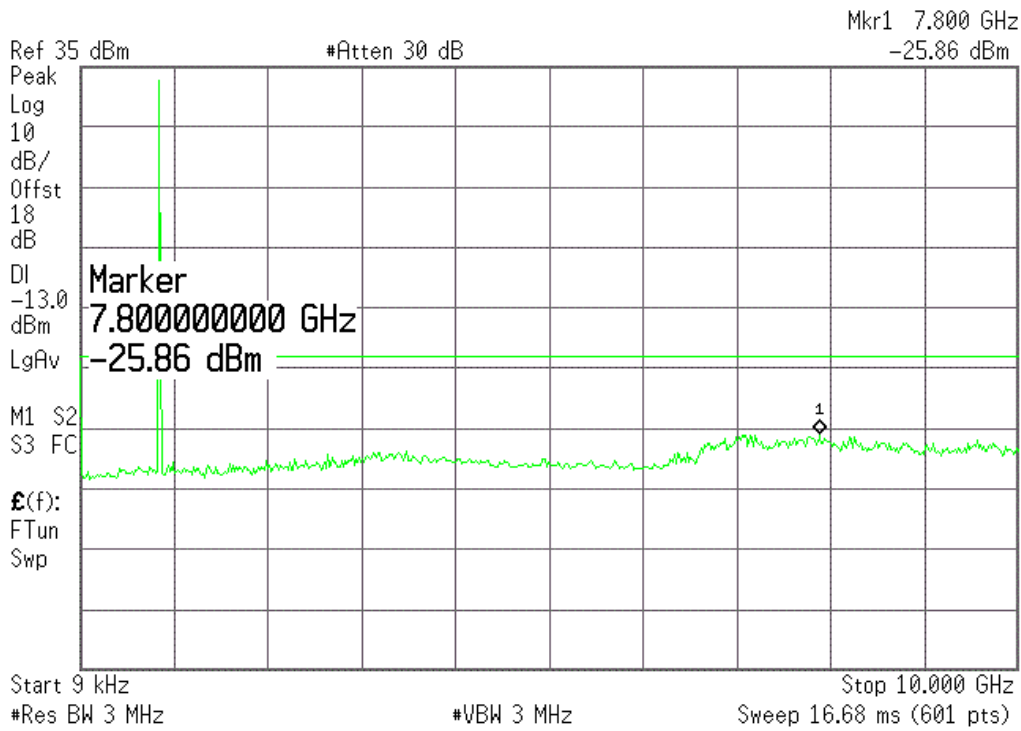
Band	Channel	Frequency (GHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	7.8	-25.86	Plot A4	-13	PASS
	190	8.23	-26.13	Plot B4		PASS
	251	7.903	-25.05	Plot C4		PASS
GSM 1900MHz	512	16.73	-22.3	Plot D4	-13	PASS
	661	13.48	-22.17	Plot E4		PASS
	810	15.21	-22.27	Plot F4		PASS
GPRS 850MHz	128	7.61	-25.81	Plot G4	-13	PASS
	190	7.71	-27.06	Plot H4		PASS
	251	7.21	-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 L4		PASS
EGPRS 850MHz	128	7.75	-26.57	Plot M4	-13	PASS
	190	7.78	-26.48	Plot N4		PASS
	251	7.83	-27.07	Plot O4		PASS



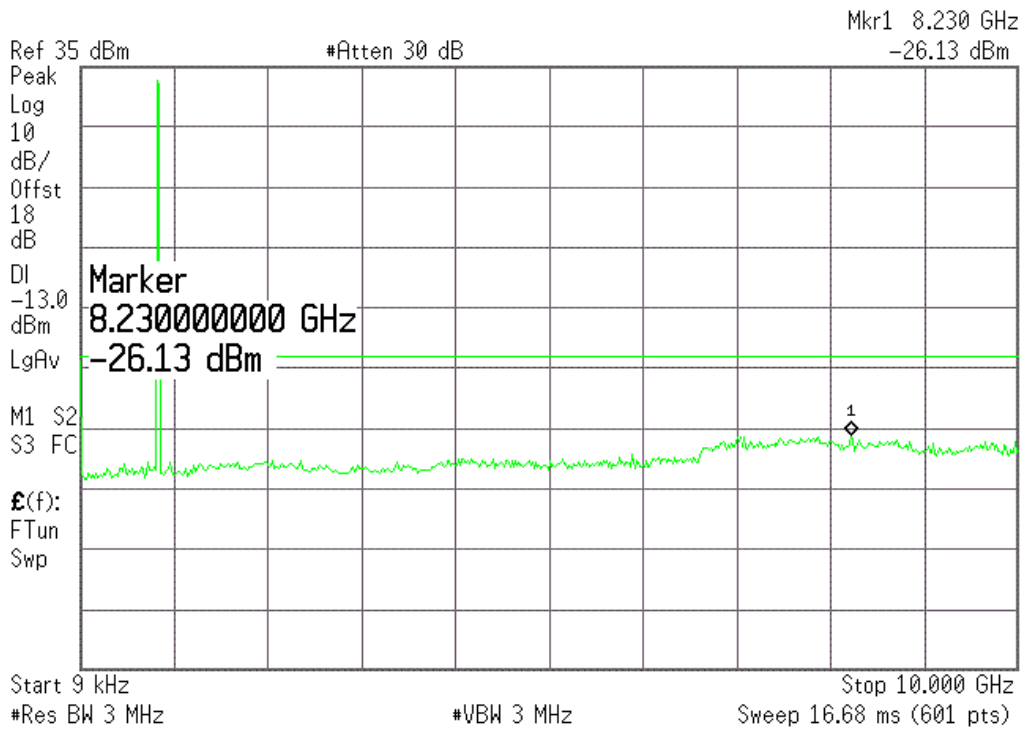
Band	Channel	Frequency (GHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
EGPRS 1900MHz	128	13.3	-23.99	PlotP4	-13	PASS
	190	15.27	-23.74	PlotQ4		PASS
	251	13.63	-24.00	Plot R4		PASS

3. Test Plot for the Whole Measurement Frequency Range:

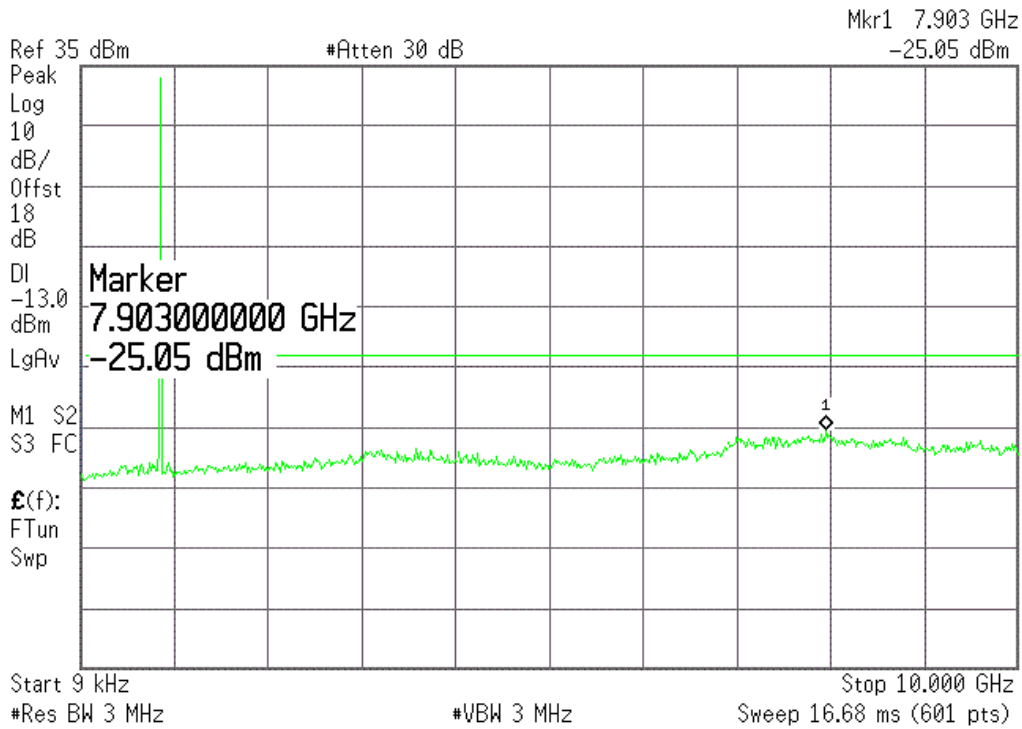
Note: the power of the EUT transmitting frequency should be ignored.



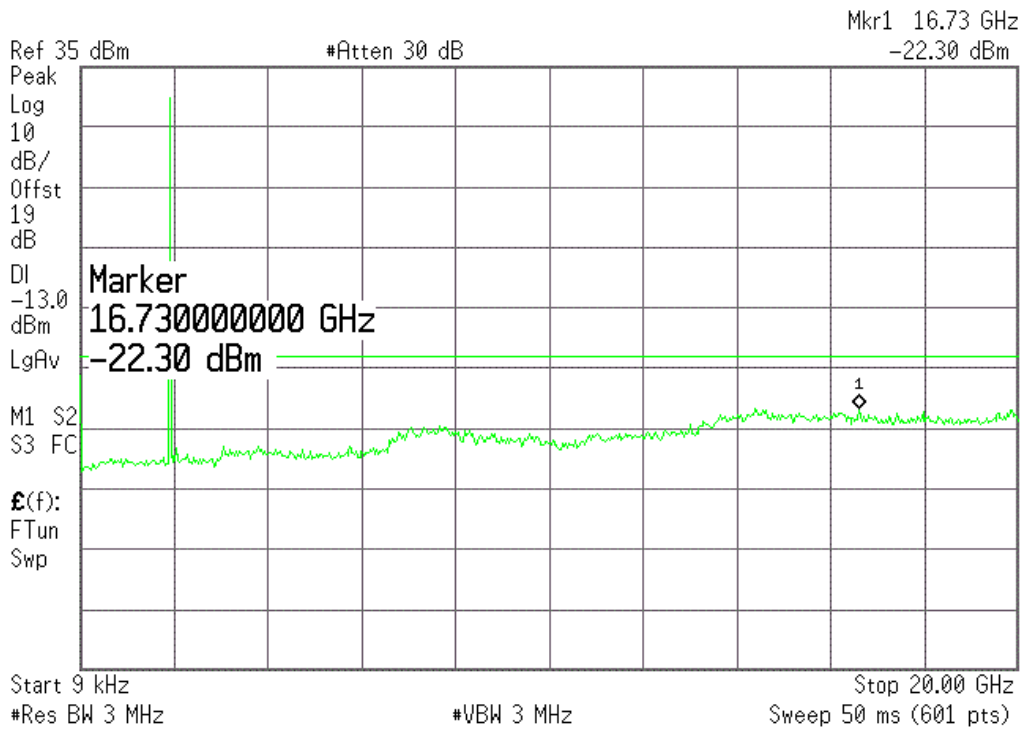
(Plot A4.:GSM 850MHz Channel = 128, 9KHz to 10GHz)



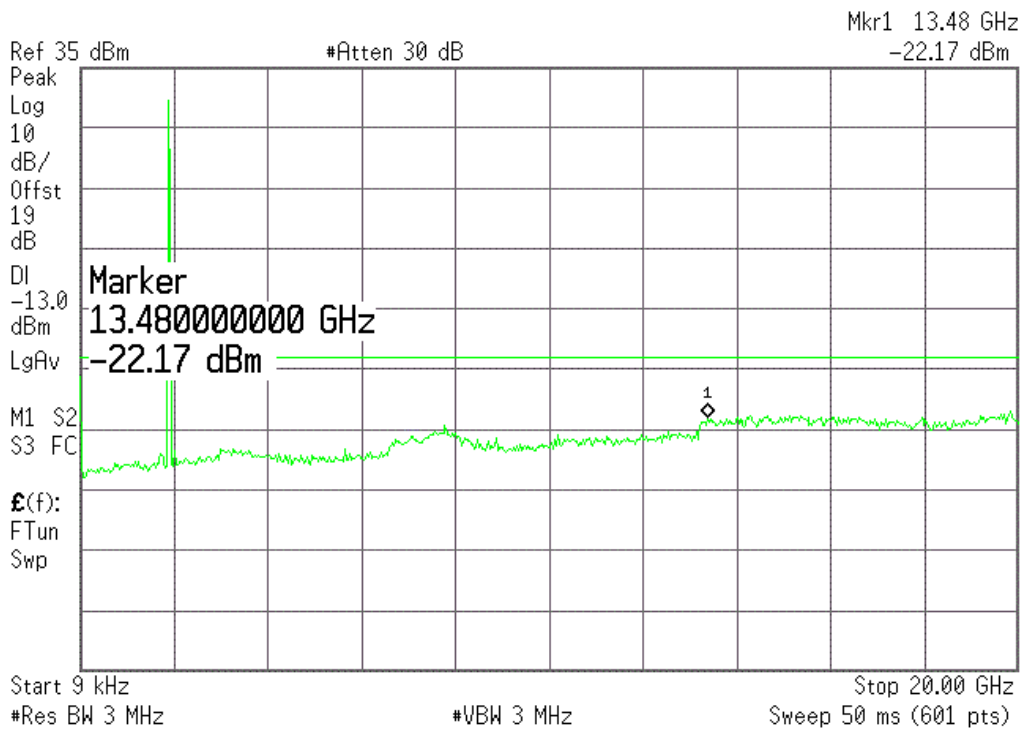
(Plot B4.:GSM 850MHz Channel = 190, 9KHz to 10GHz)



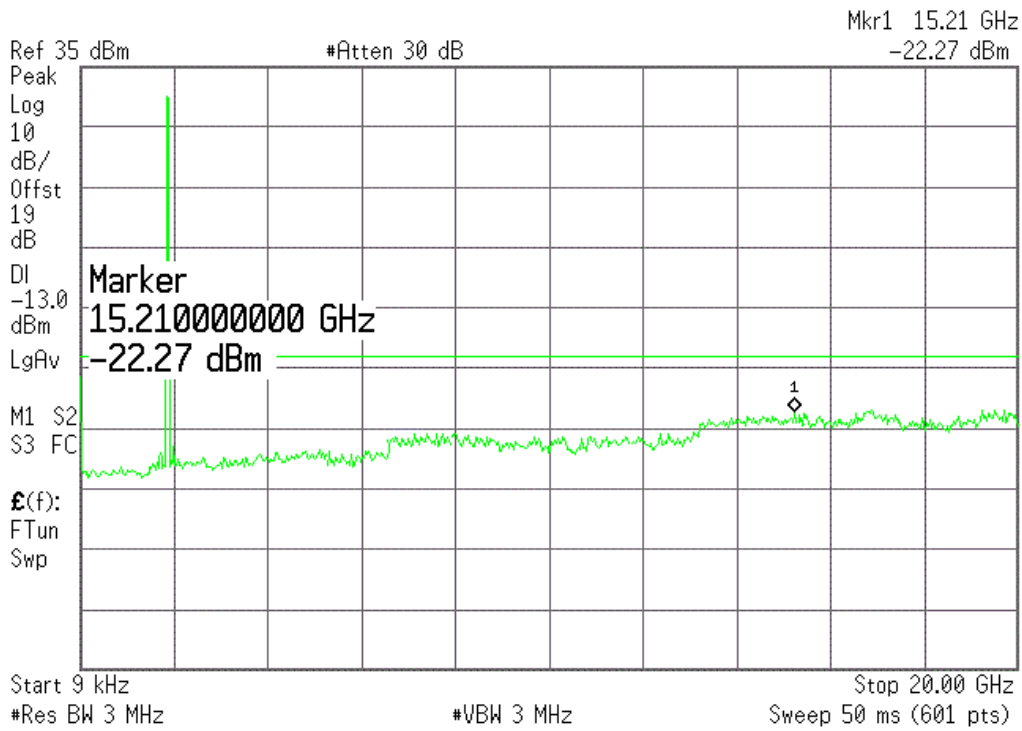
(Plot C4.:GSM 850MHz Channel = 251, 9KHz to 10GHz)



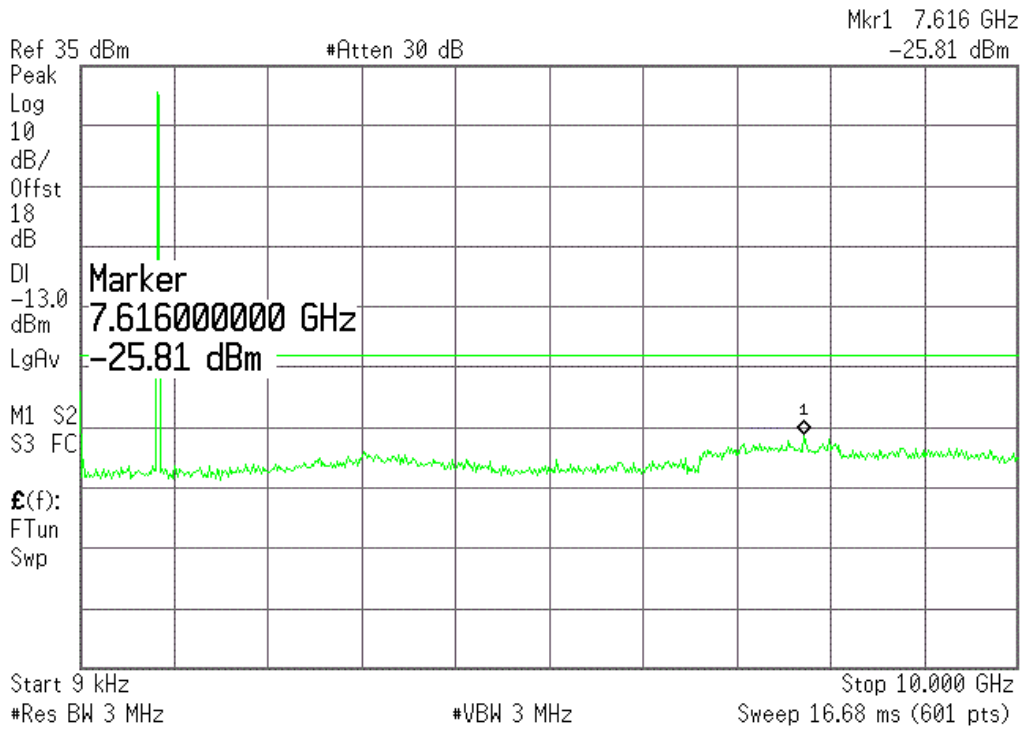
(Plot D4.:GSM 1900MHz Channel = 512, 9KHz to 20GHz)



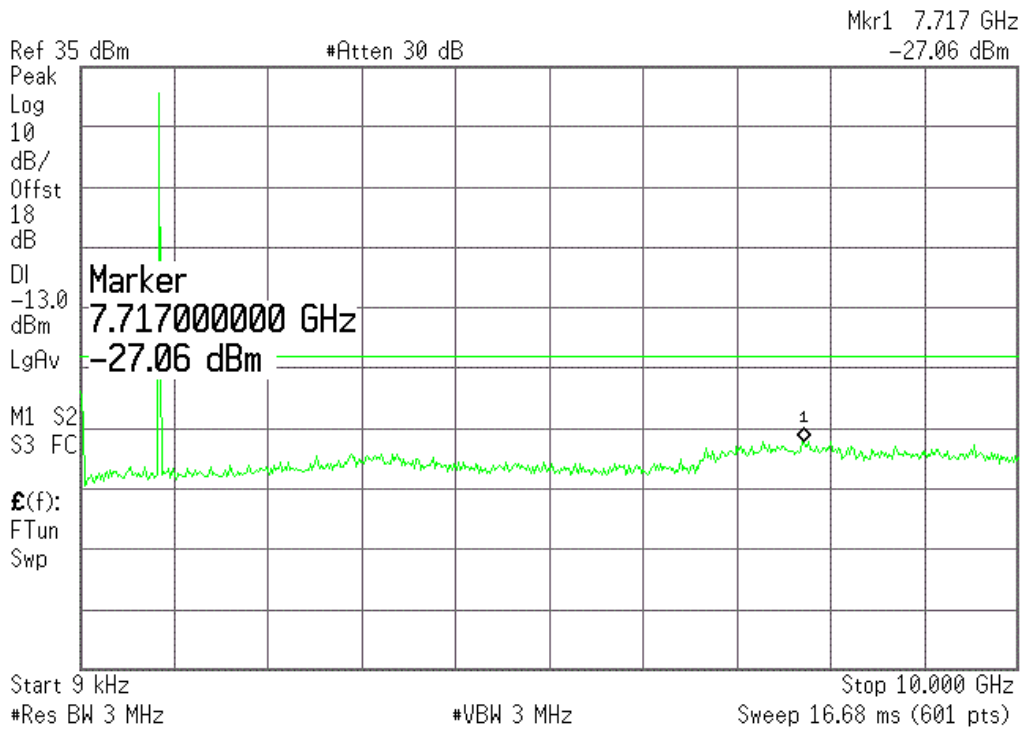
(Plot E4.: GSM 1900MHz Channel = 661, 9KHz to 20GHz)



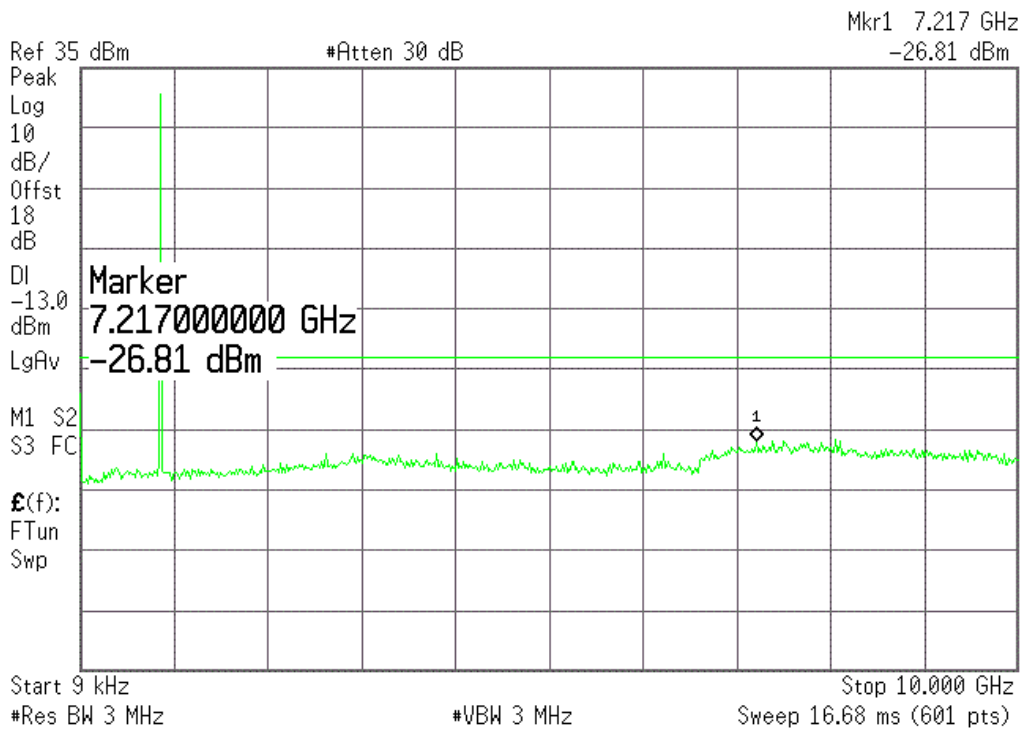
(Plot F4.: GSM 1900MHz Channel = 810, 9KHz to 20GHz)



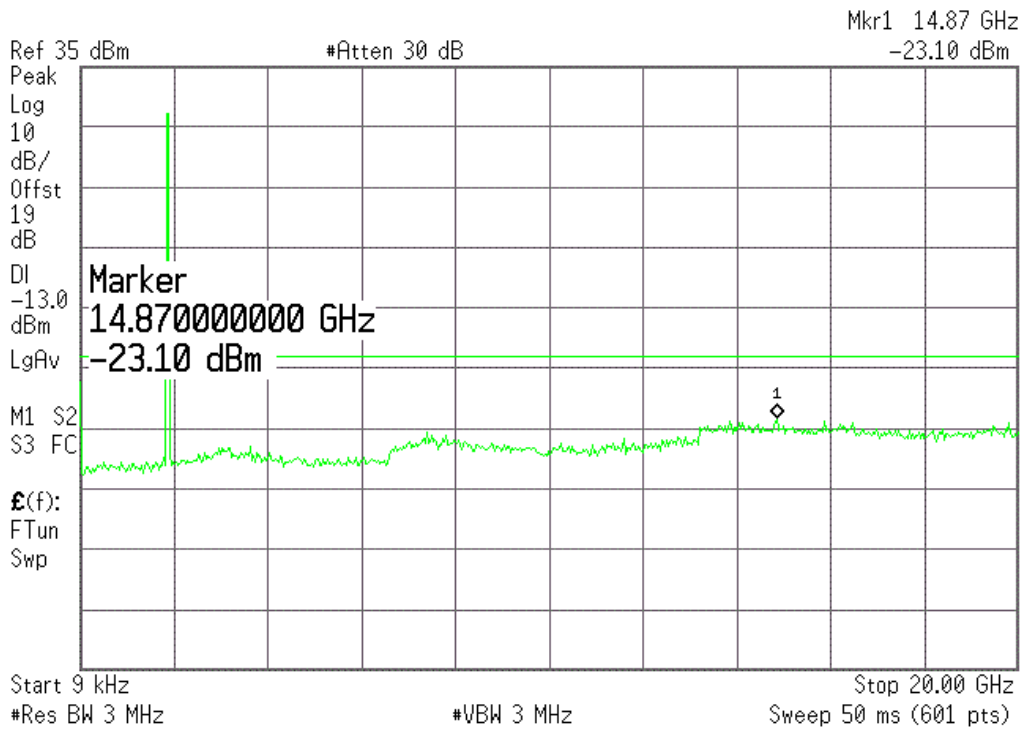
(Plot G4.:GPRS 850MHz Channel = 128, 9KHz to 10GHz)



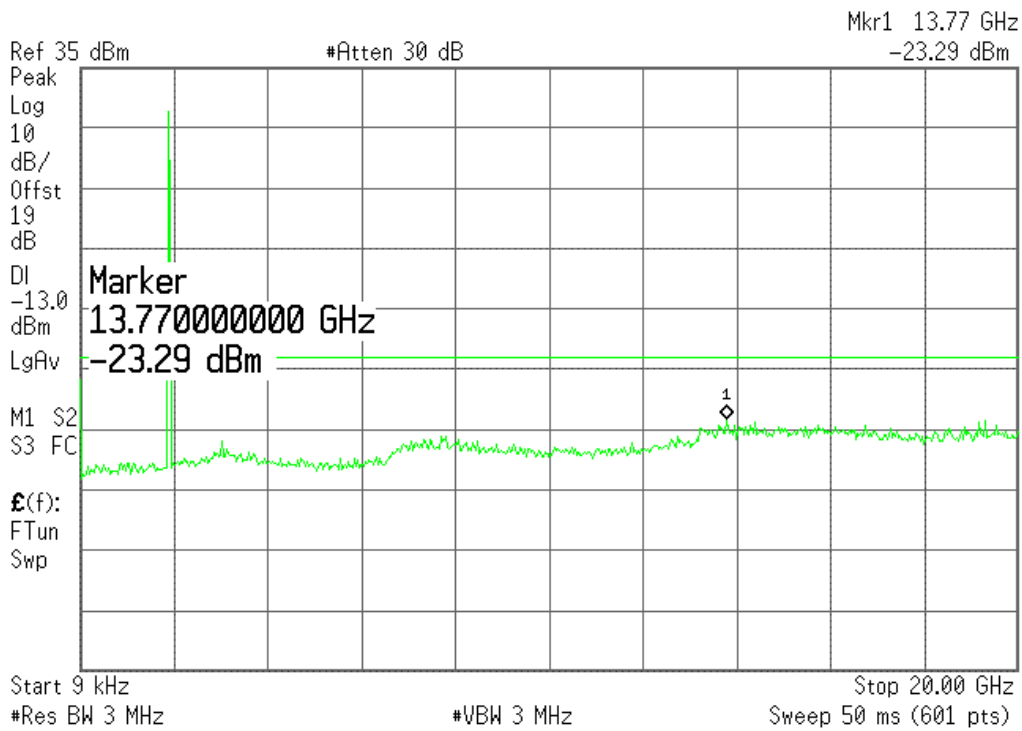
(Plot H4.: GPRS 850MHz Channel = 190, 9KHz to 10GHz)



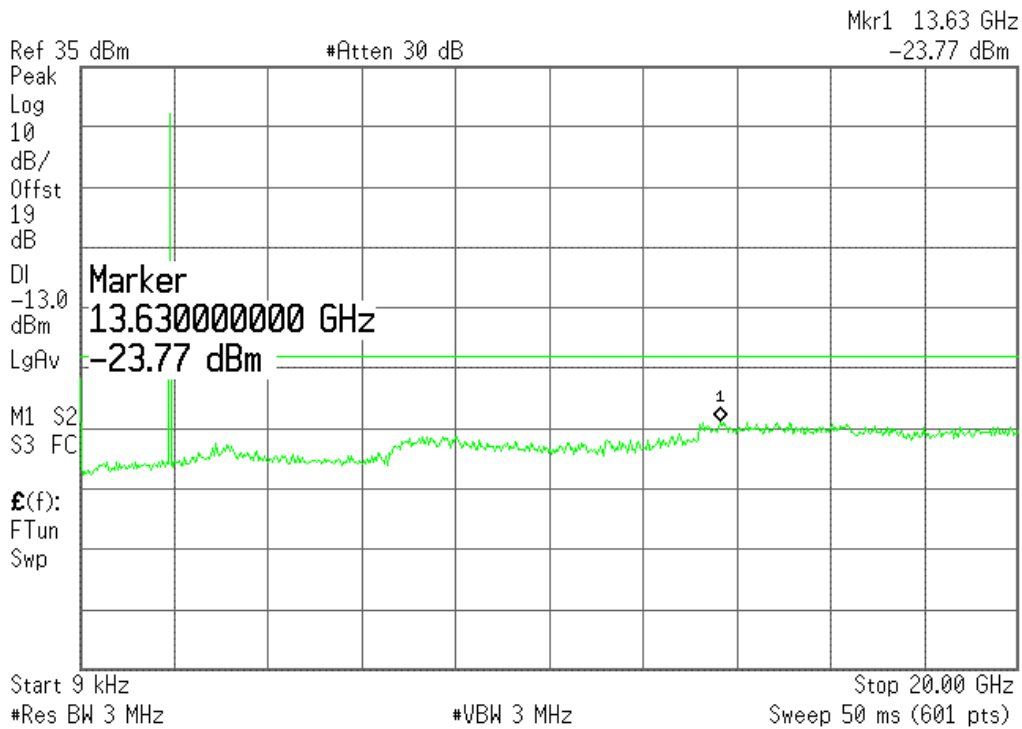
(Plot I4.: GPRS 850MHz Channel = 251, 9KHz to 10GHz)



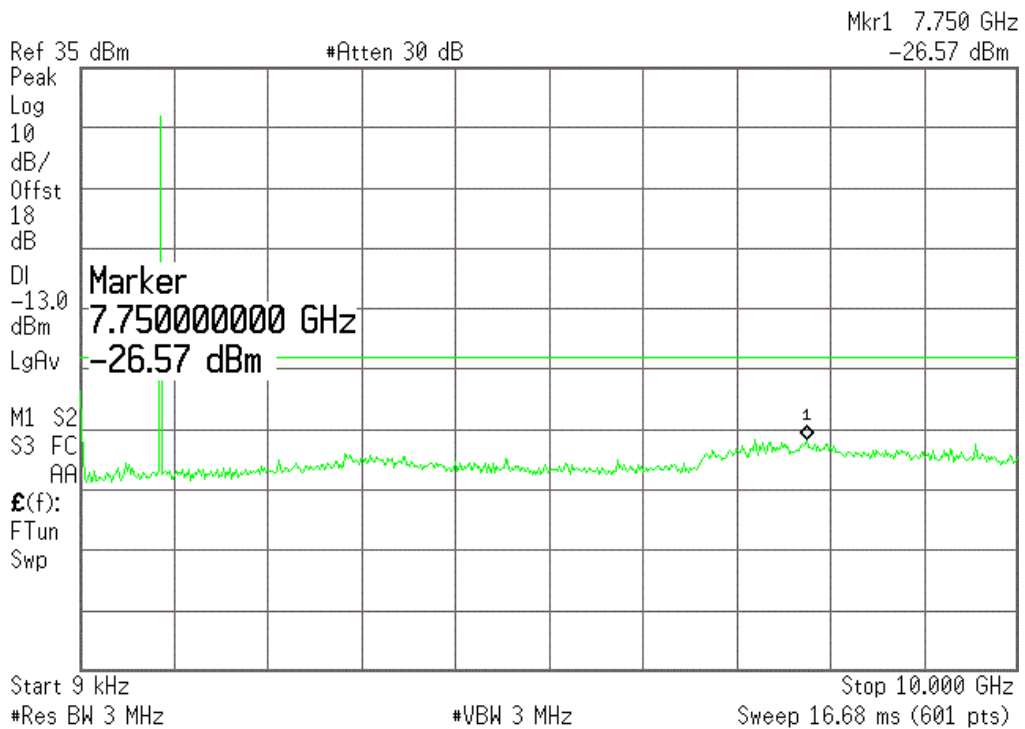
(Plot J4.: GPRS 1900MHz Channel = 512, 9KHz to 20GHz)



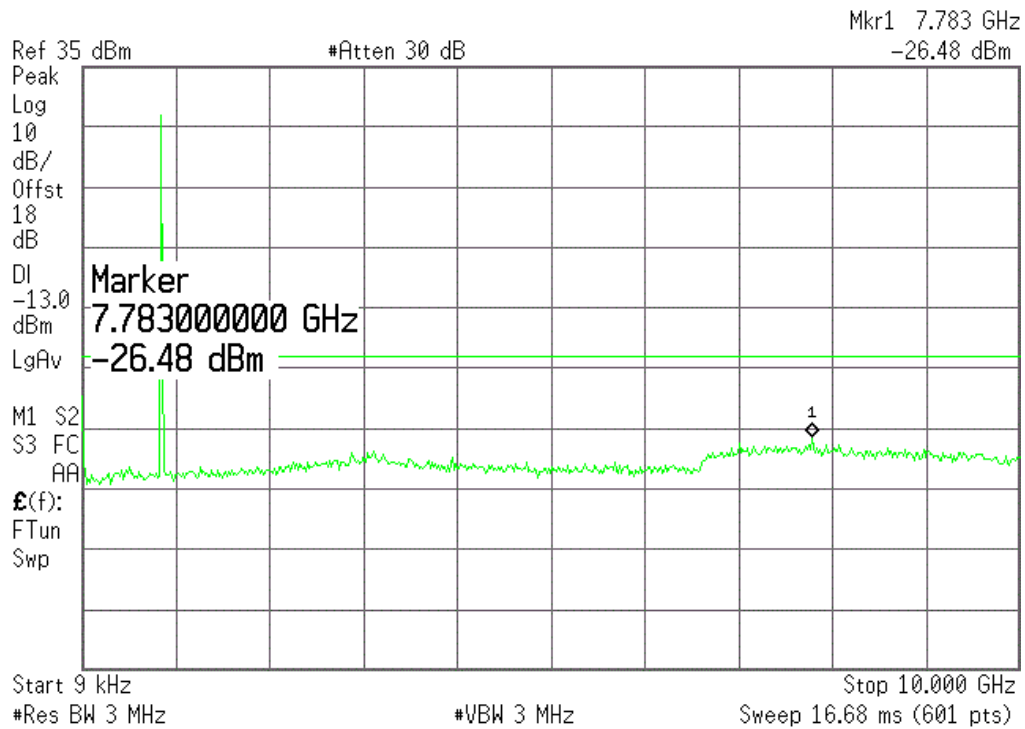
(Plot K4.: GPRS 1900MHz Channel = 661, 9KHz to 20GHz)



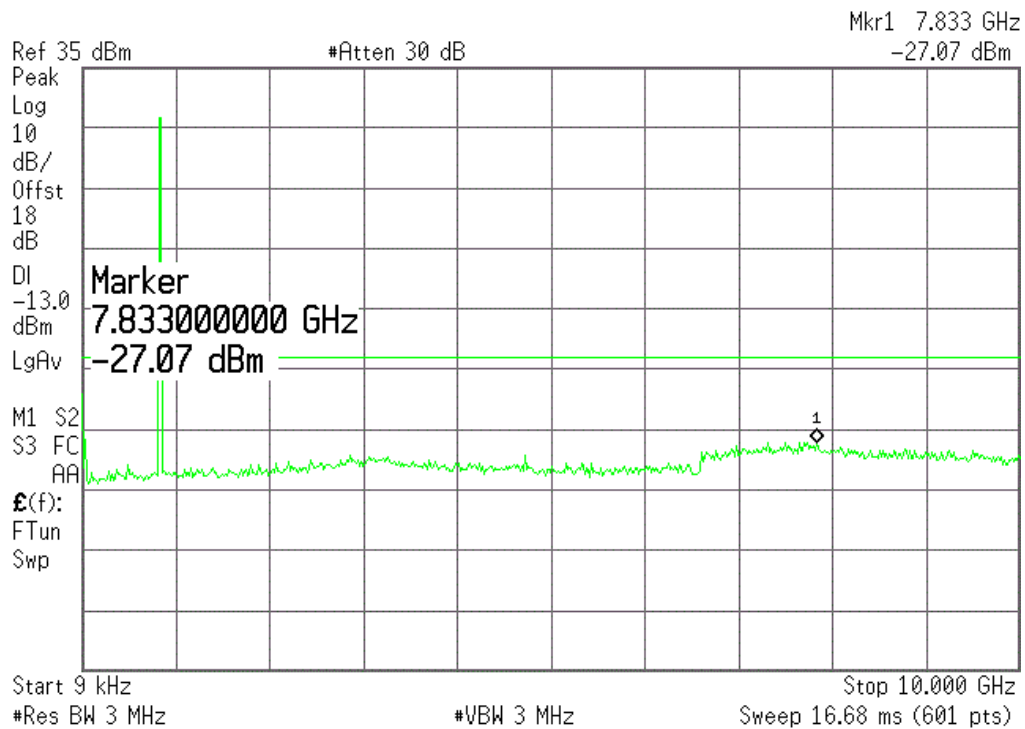
(Plot L4.: GPRS 1900MHz Channel = 810, 9KHz to 20GHz)



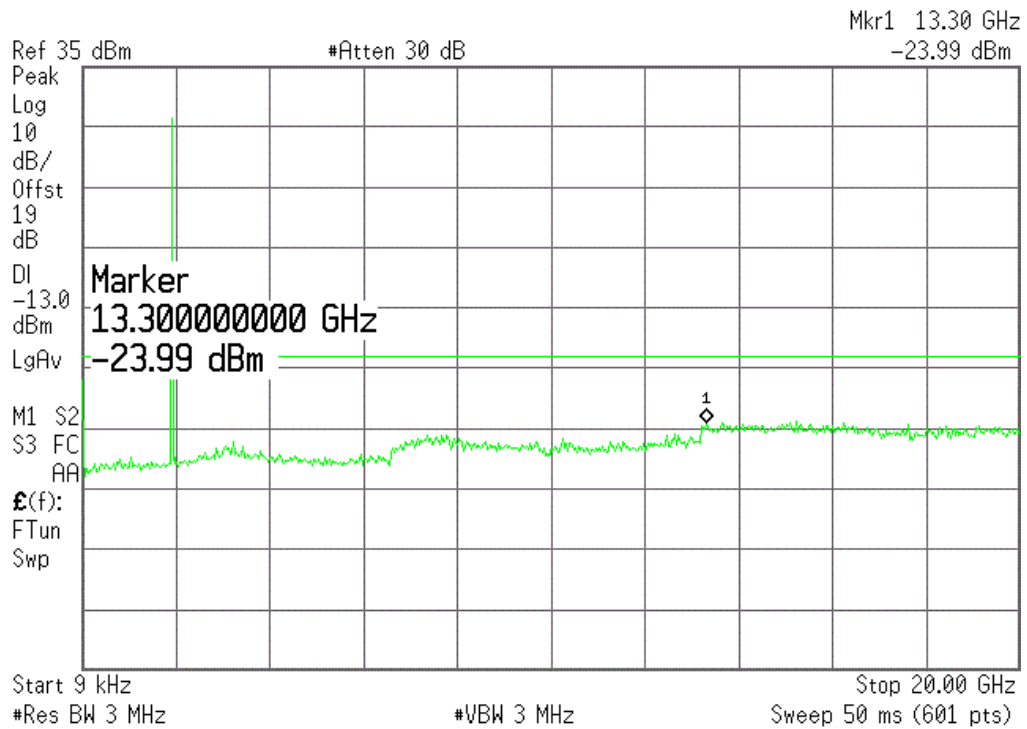
(Plot M4.:EGPRS 850MHz Channel = 128, 9KHz to 10GHz)



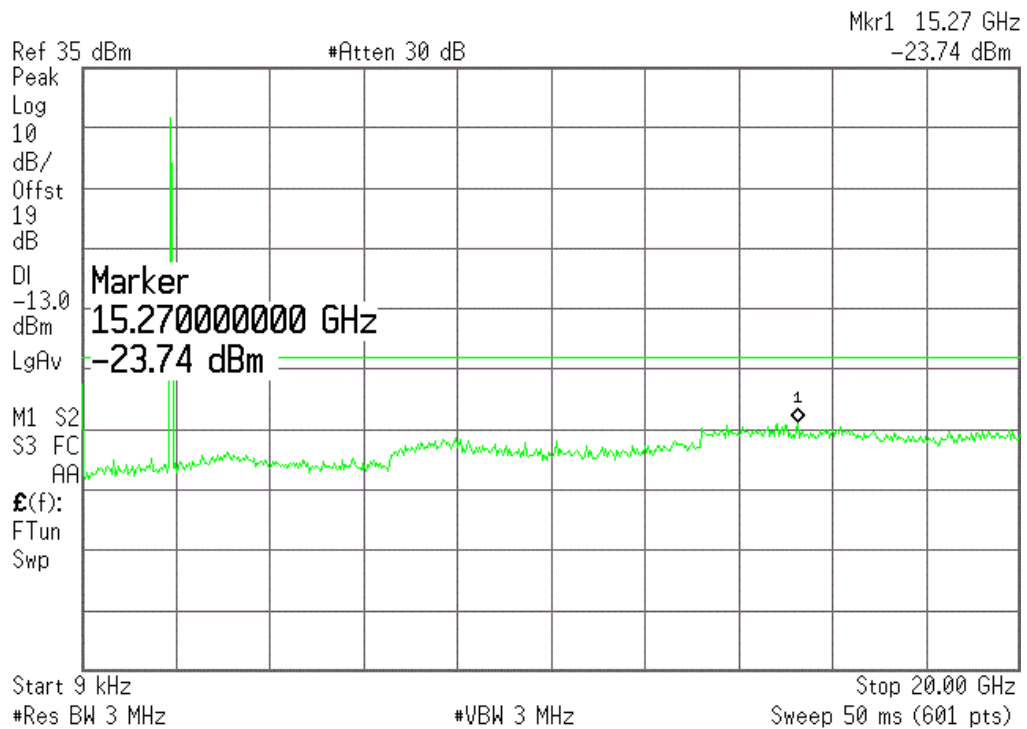
(Plot N4.:EGPRS 850MHz Channel = 190, 9KHz to 10GHz)



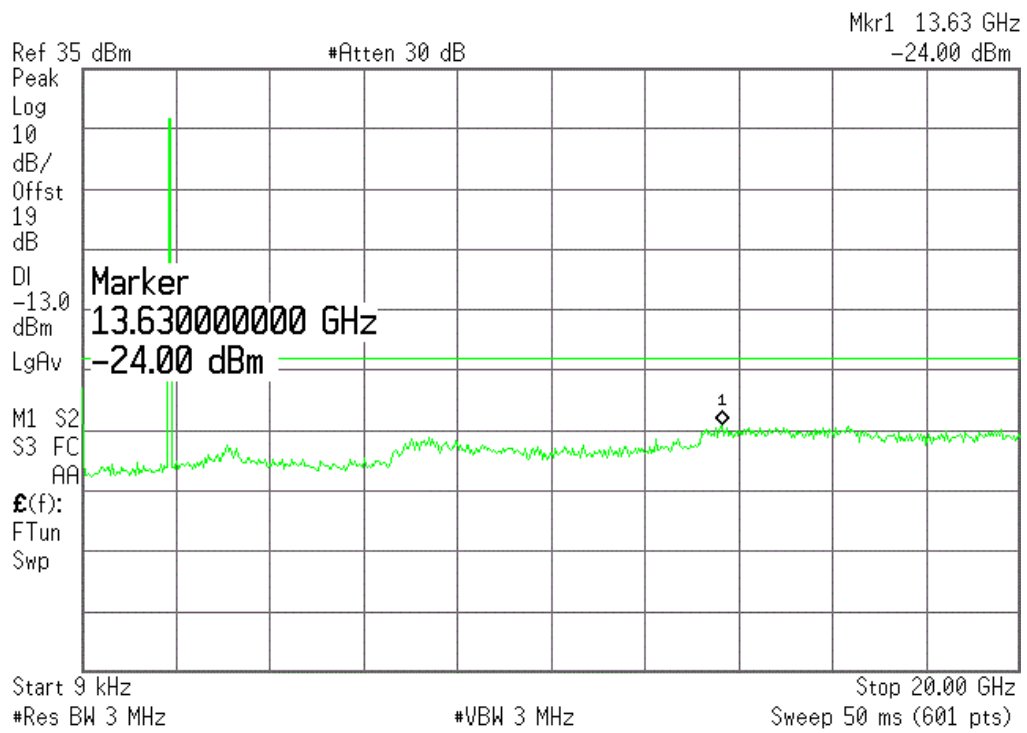
(Plot O4.:EGPRS 850MHz Channel = 251, 9KHz to 10GHz)



(Plot P4.:EGPRS 1900MHz Channel = 512, 9KHz to 20GHz)



(Plot Q4.:EGPRS 1900MHz Channel = 661, 9KHz to 20GHz)



(Plot R4.:EGPRS 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.

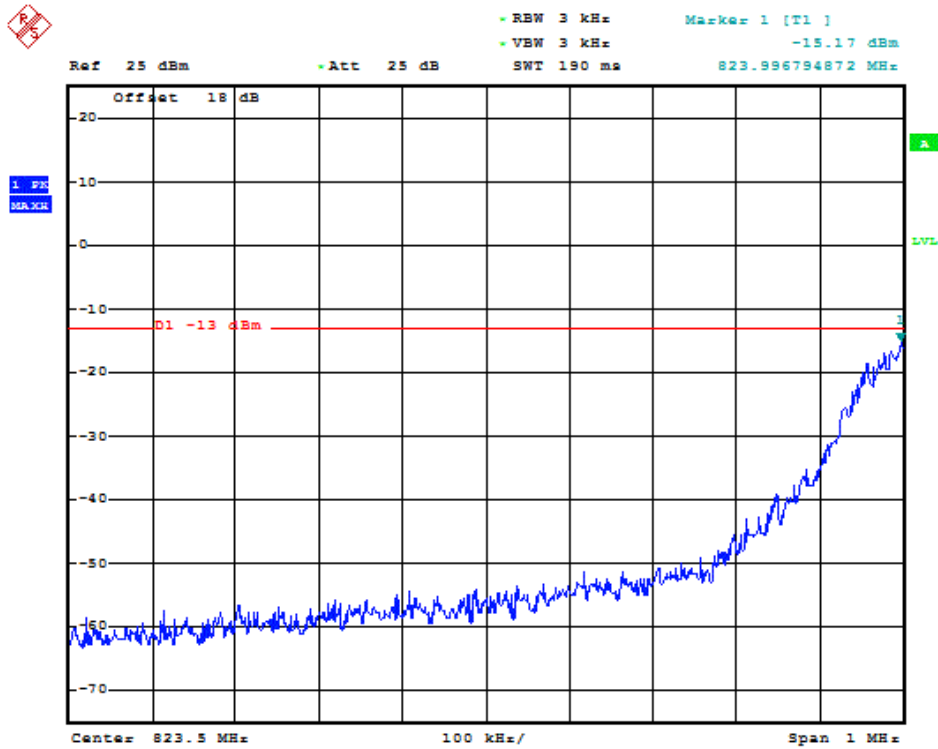
3.6.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE).

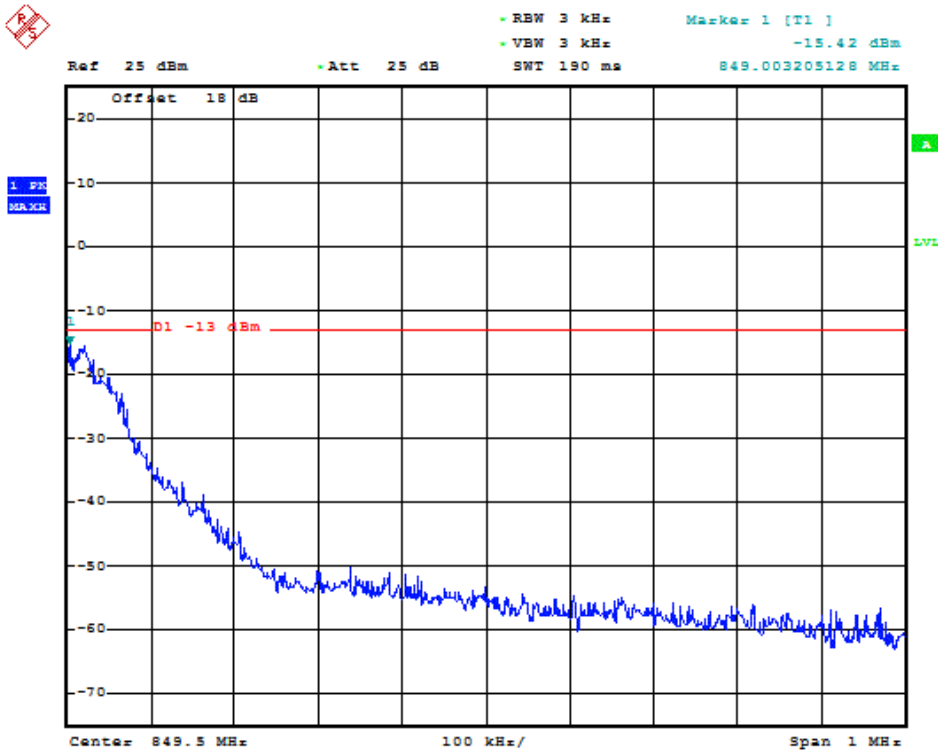
Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	823.99	-15.17	Plot A5	-13	PASS
	251	849	-15.42	Plot B5		PASS
GSM 1900MHz	512	1850	-14.35	Plot C5		PASS
	810	1910	-13.41	Plot D5		PASS
GPRS 850MHz	128	823.99	-14.08	Plot E5		PASS
	251	849	-14.83	Plot F5		PASS
GPRS 1900MHz	512	1849.9	-15.13	Plot G5		PASS
	810	1910	-14.42	Plot H5		PASS
EGPRS 850MHz	128	823.99	-21.91	Plot I5		PASS
	251	849	-23.06	Plot J5		PASS
EGPRS 1900MHz	512	1849.9	-25.35	Plot K5		PASS
	810	1910	-27.67	Plot L5		PASS

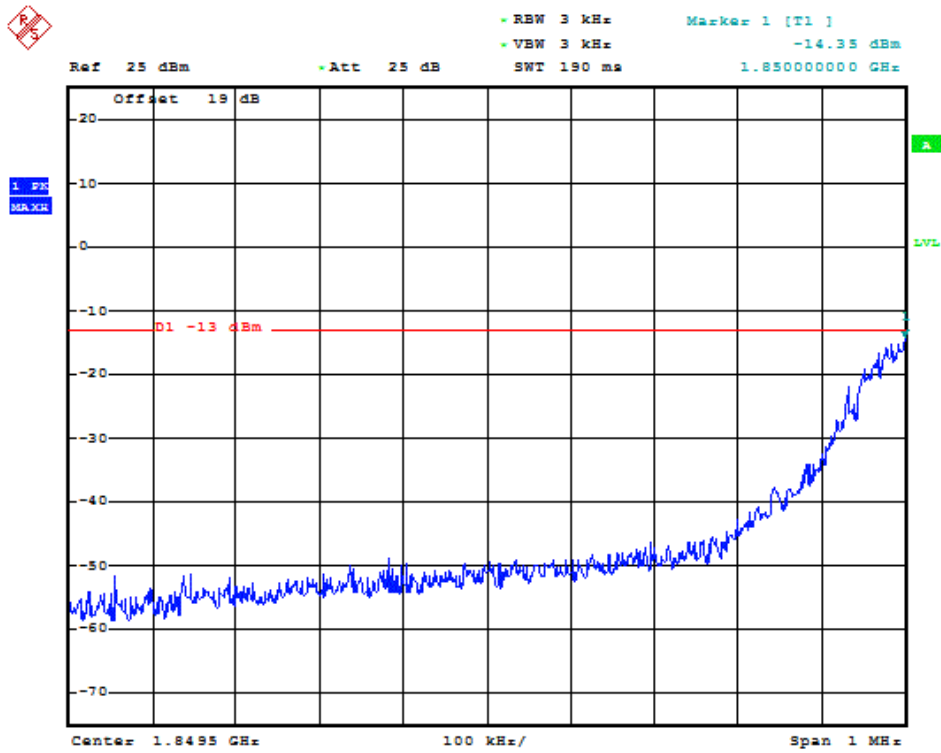
4. Test Plot:



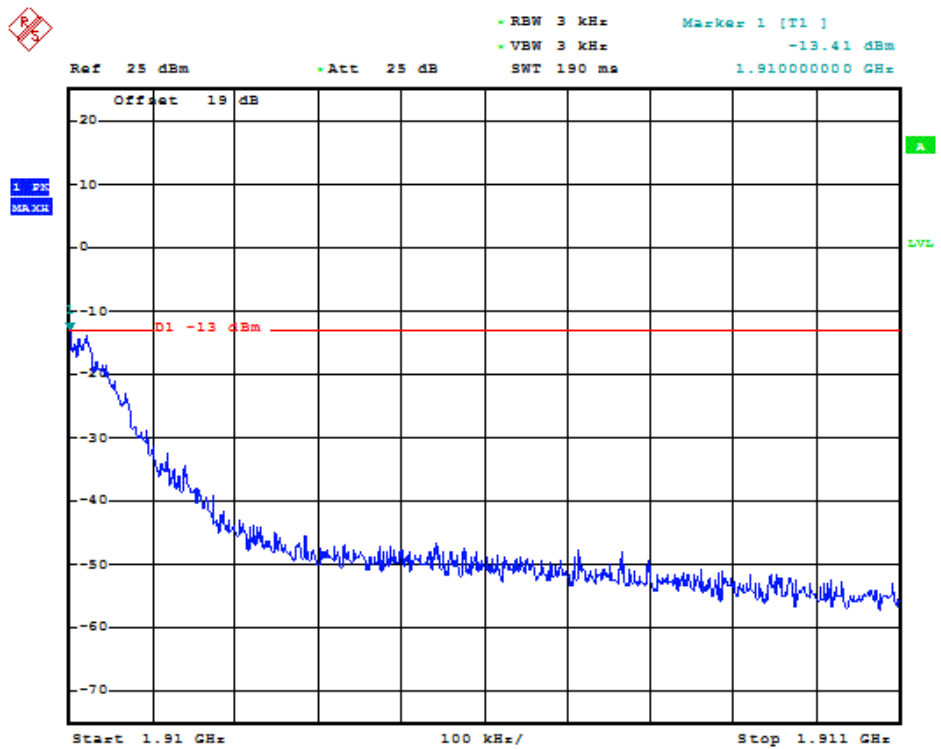
(Plot A5: GSM 850MHz Channel = 128)



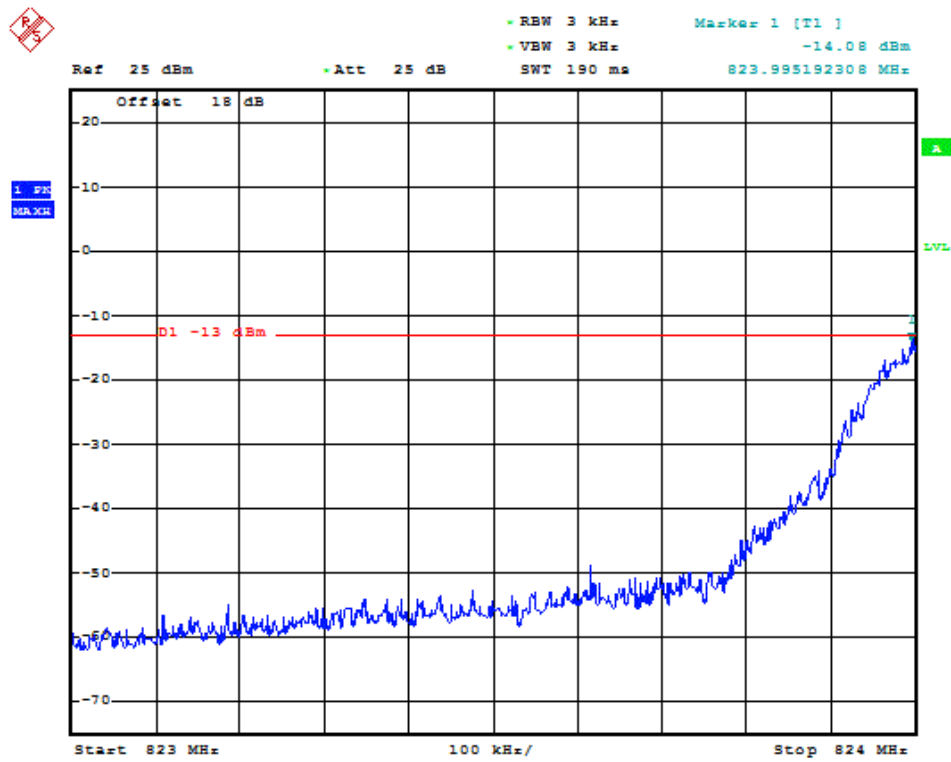
(Plot B5: GSM 850MHz Channel = 251)



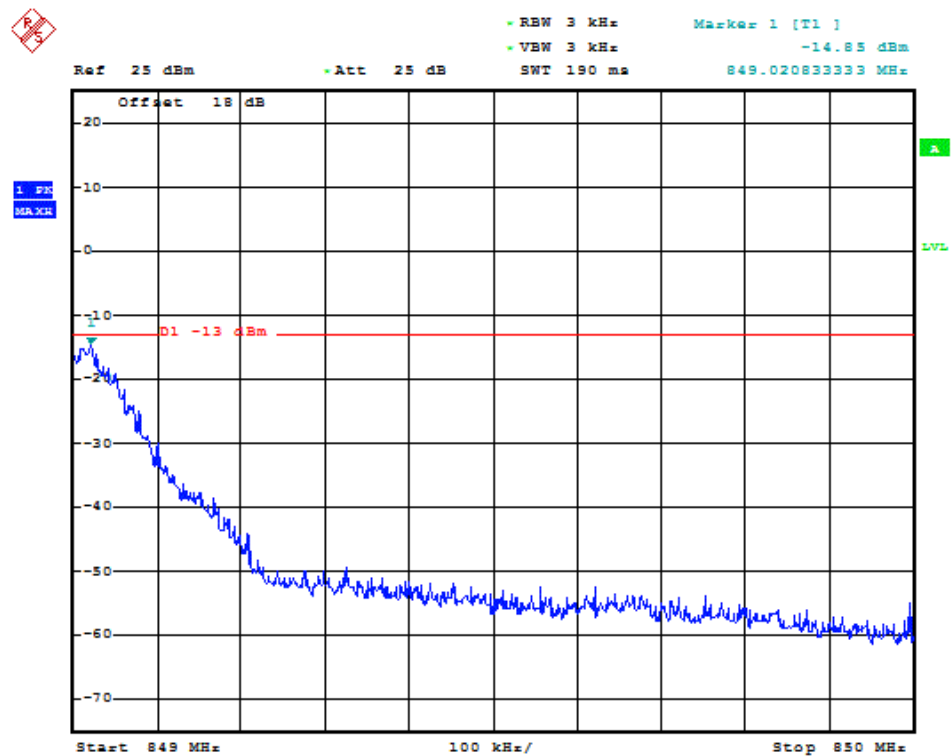
(Plot C5: GSM 1900MHz Channel = 512)



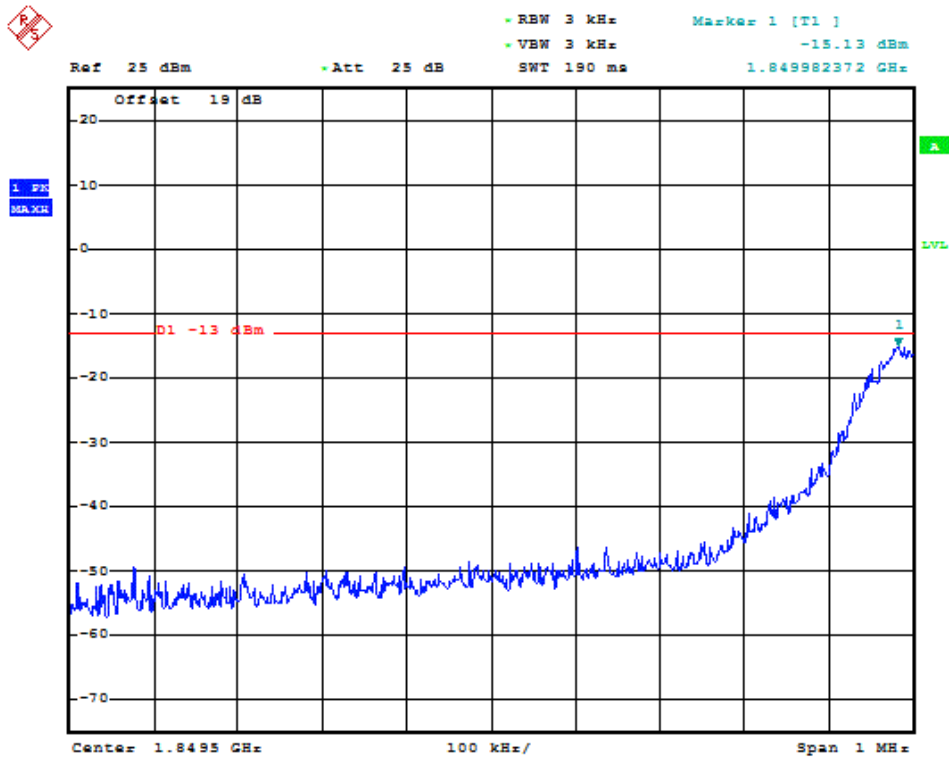
(Plot D5: GSM 1900MHz Channel = 810)



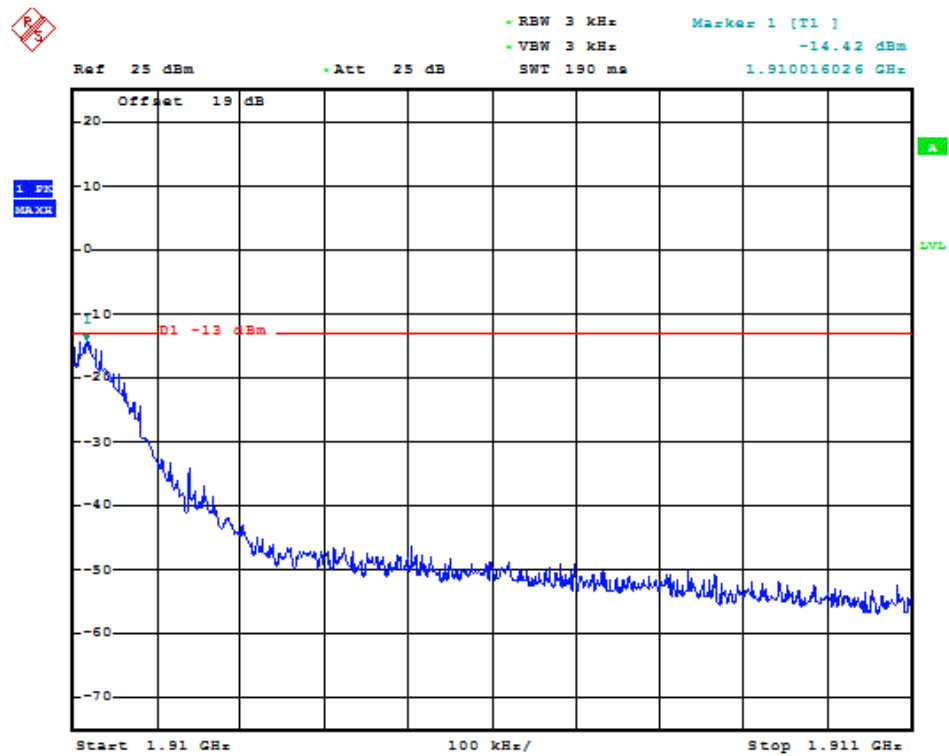
(Plot E5: GPRS 850MHz Channel = 128)



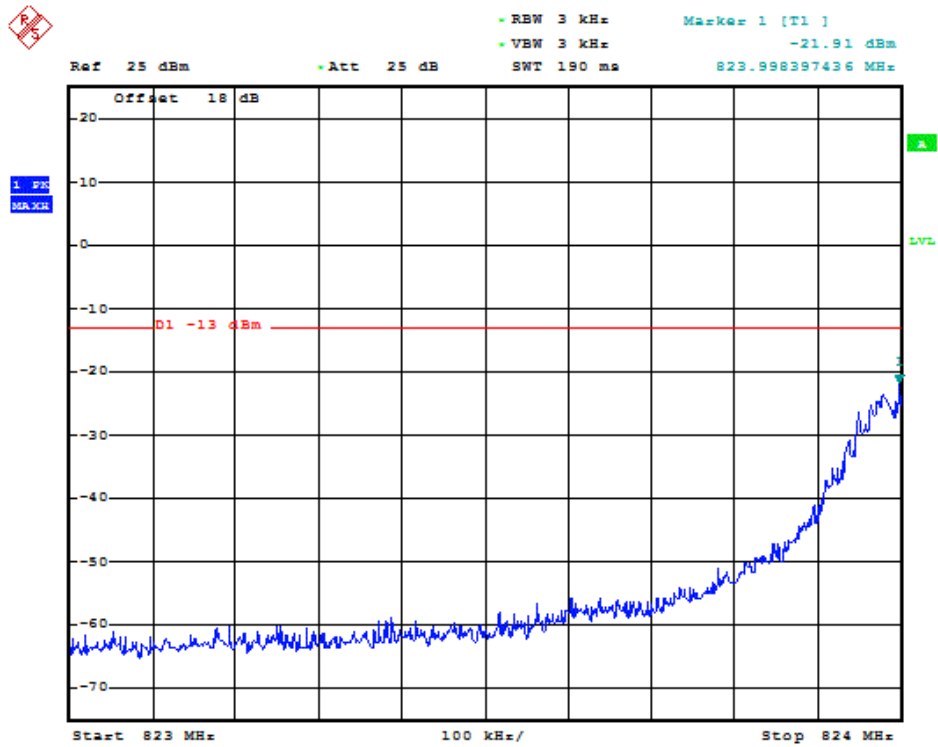
(Plot F5: GPRS 850MHz Channel = 251)



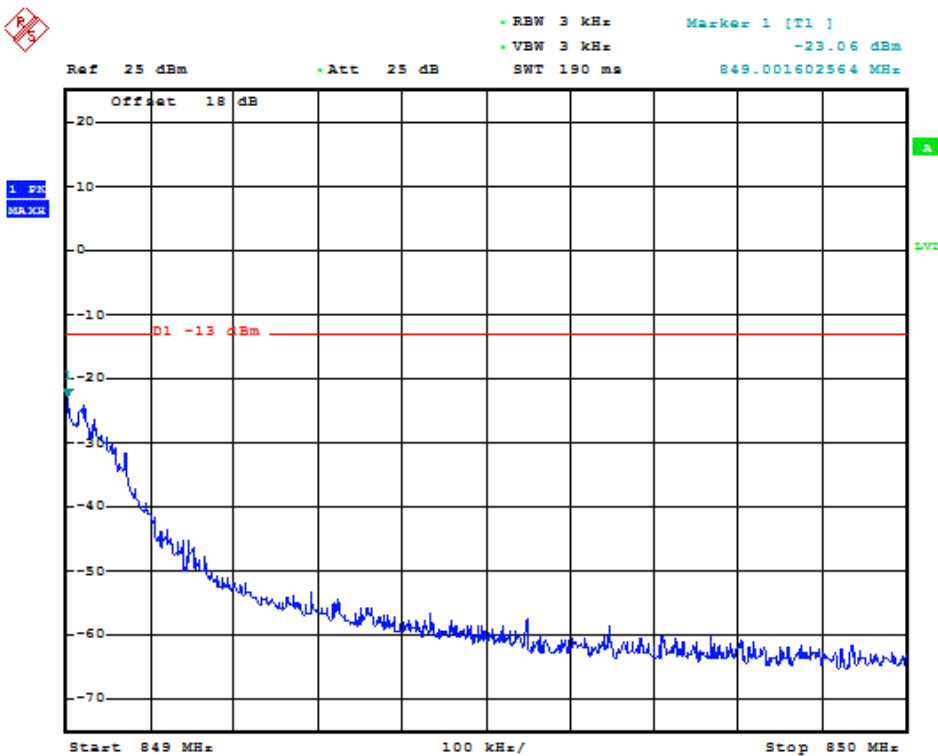
(Plot G5: GPRS 1900MHz Channel = 512)



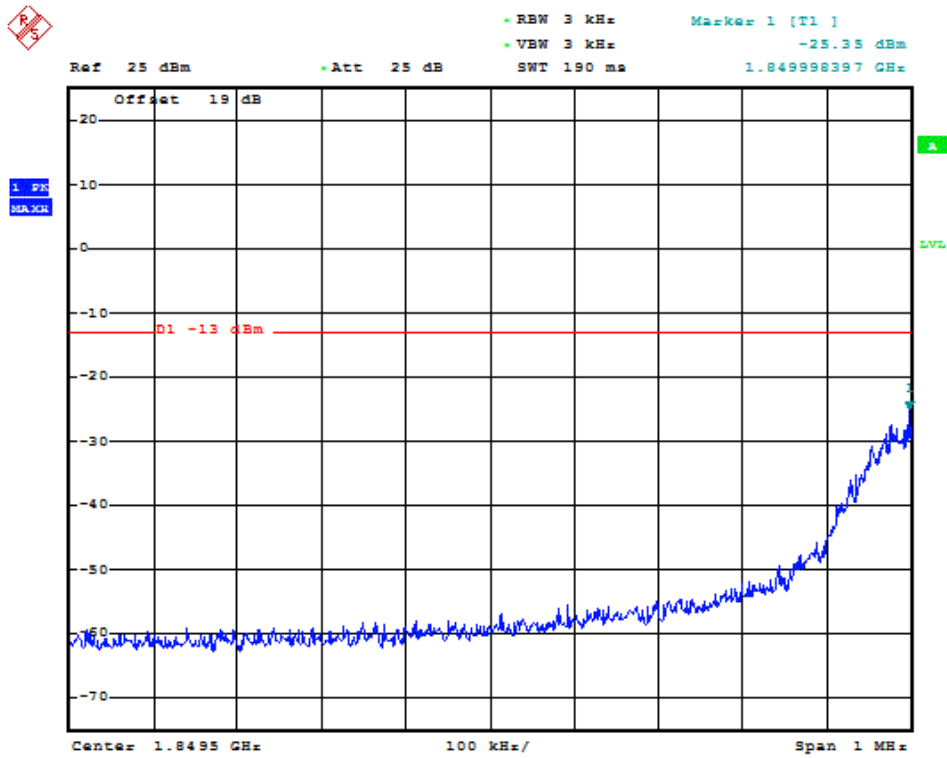
(Plot H5: GPRS 1900MHz Channel = 810)



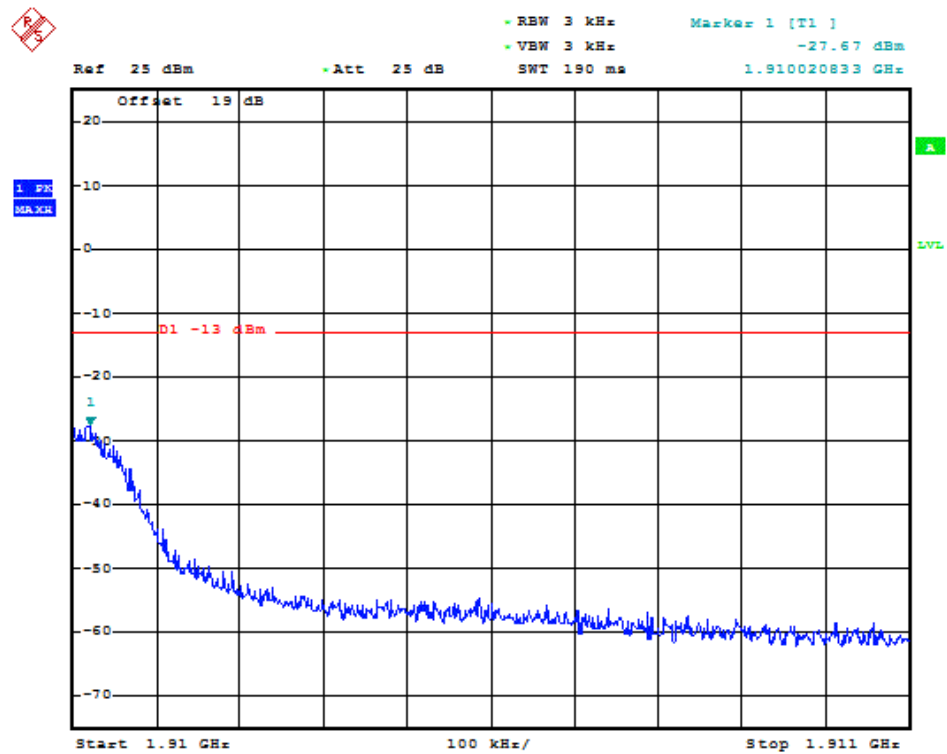
(Plot I5: EGPRS 850MHz Channel = 128)



(Plot J5: EGPRS 850MHz Channel = 251)



(Plot K5: EGPRS 1900MHz Channel = 512)



(Plot L5: EGPRS 1900MHz Channel = 810)

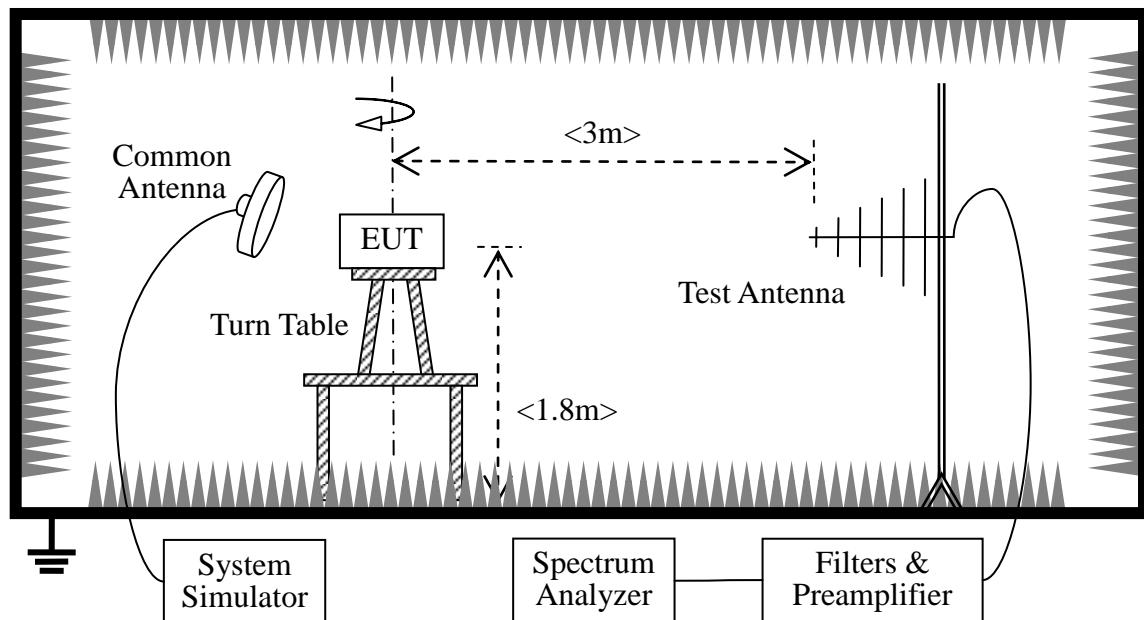
3.7 Transmitter Radiated Power (EIRP/ERP)

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.

According to FCC §22.913, the ERP of Cellular mobile transmitters must not exceed 7 Watts (38.5dBm).

The measurements procedures in TIA-603C-2004 are used.

1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (P_{in}) is applied to the input of the dipole, and the power received (P_r) at the chamber's probe antenna is recorded.
2. The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as $A_{Rpl} = P_{in} - P_r$. The A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the cable loss and the air loss.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{Mea} + A_{Rpl}$$

3. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
5. The EUT is then put into continuously transmitting mode at its maximum power level.
6. Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step 1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (P_{in})
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.
9. The test system should be checked before test by a standard comb signal source. The signal source put on the position, instead of the EUT. The test result should be compared with the test result before. If the test result is similar with the initial one, then the test system can work stably.

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. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE).

Test Verdict:

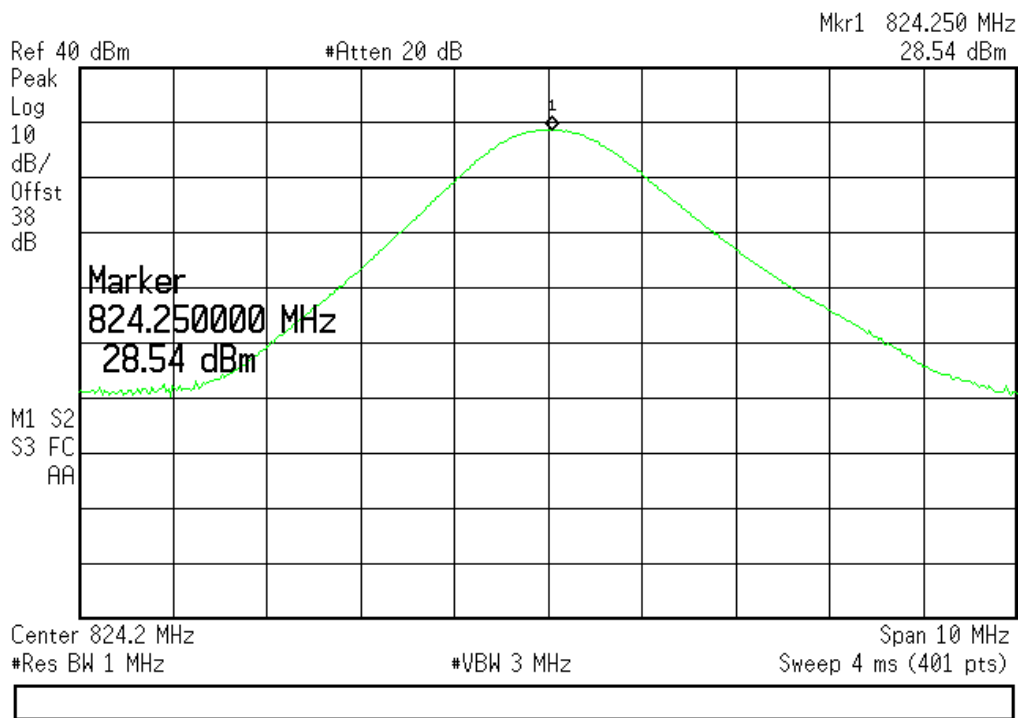
Band	Channel	Measured ERP			Limit		Verdict
		dBm	W	Refer to Plot	dBm	W	
GSM 850MHz	128	28.54	0.71	Plot A6	<38.5	<7	PASS
	190	28.97	0.78	Plot B6			PASS
	251	28.72	0.74	Plot C6			PASS
GSM 1900MHz	512	26.84	0.48	Plot D6	<33.0	<2	PASS
	661	28.74	0.74	Plot E6			PASS
	810	27.93	0.62	Plot F6			PASS

Band	Channel	Measured ERP			Limit		Verdict
		dBm	W	Refer to Plot	dBm	W	
GPRS 850MHz	128	28.38	0.68	Plot A6.1	<38.5	<7	PASS
	190	28.50	0.70	Plot B6.1			PASS
	251	28.01	0.63	Plot C6.1			PASS
GPRS 1900MHz	512	26.64	0.46	Plot D6.1	<33.0	<2	PASS
	661	27.05	0.50	Plot E6.1			PASS
	810	27.89	0.61	Plot F6.1			PASS

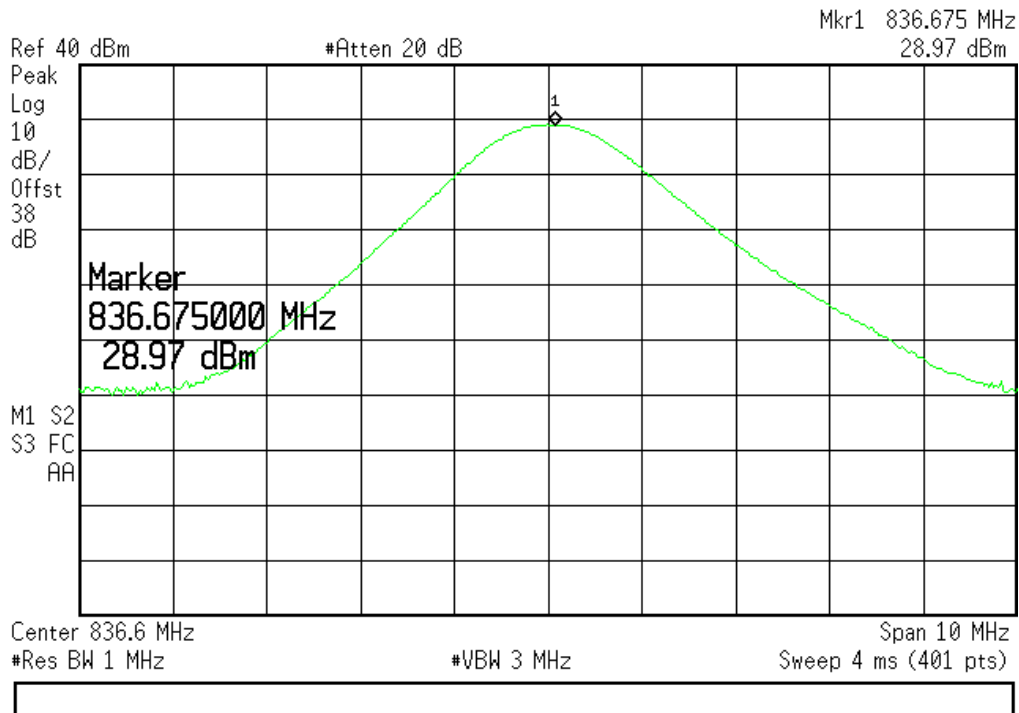


Band	Channel	Measured ERP			Limit		Verdict
		dBm	W	Refer to Plot	dBm	W	
EGPRS 850MHz	128	20.65	0.12	Plot A6.2	<38.5	<7	PASS
	190	22.56	0.18	Plot B6.2			PASS
	251	23.40	0.21	Plot C6.2			PASS
EGPRS 1900MHz	512	20.58	0.11	Plot D6.2	<33.0	<2	PASS
	661	21.66	0.15	Plot E6.2			PASS
	810	19.78	0.10	Plot F6.2			PASS

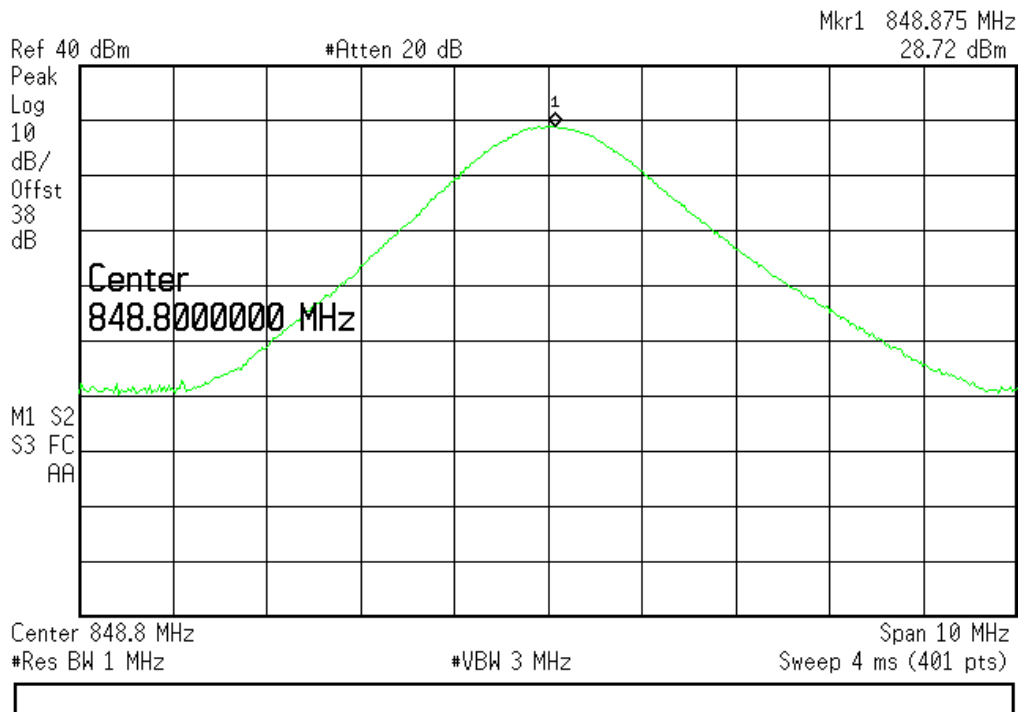
3. Test Plot



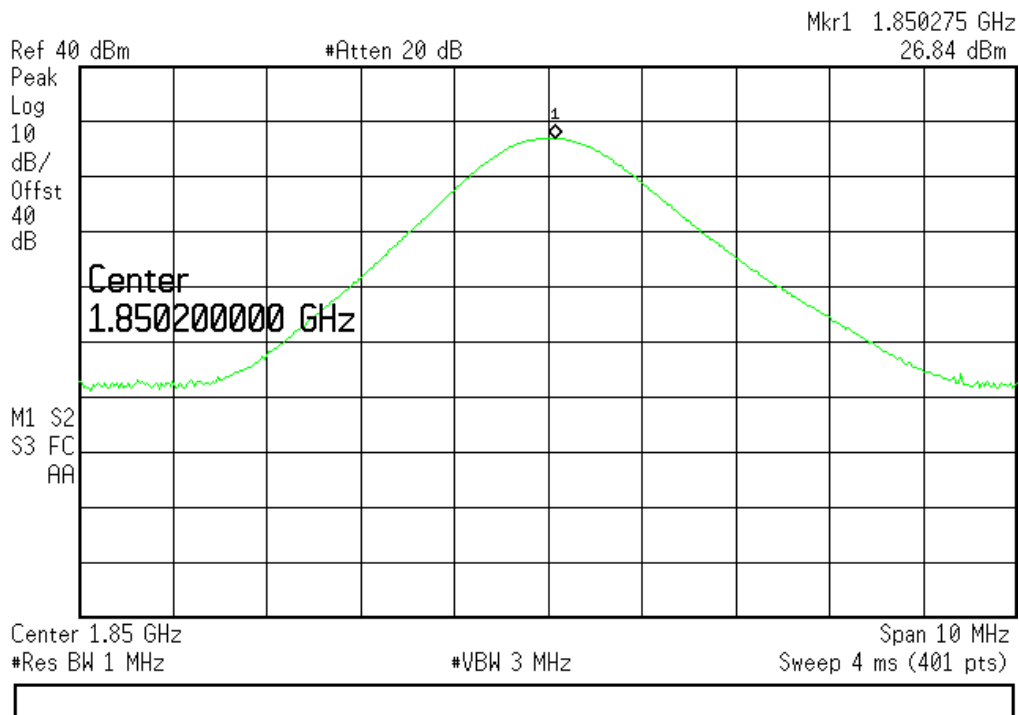
(Plot A6:GSM 850MHz Channel = 128)



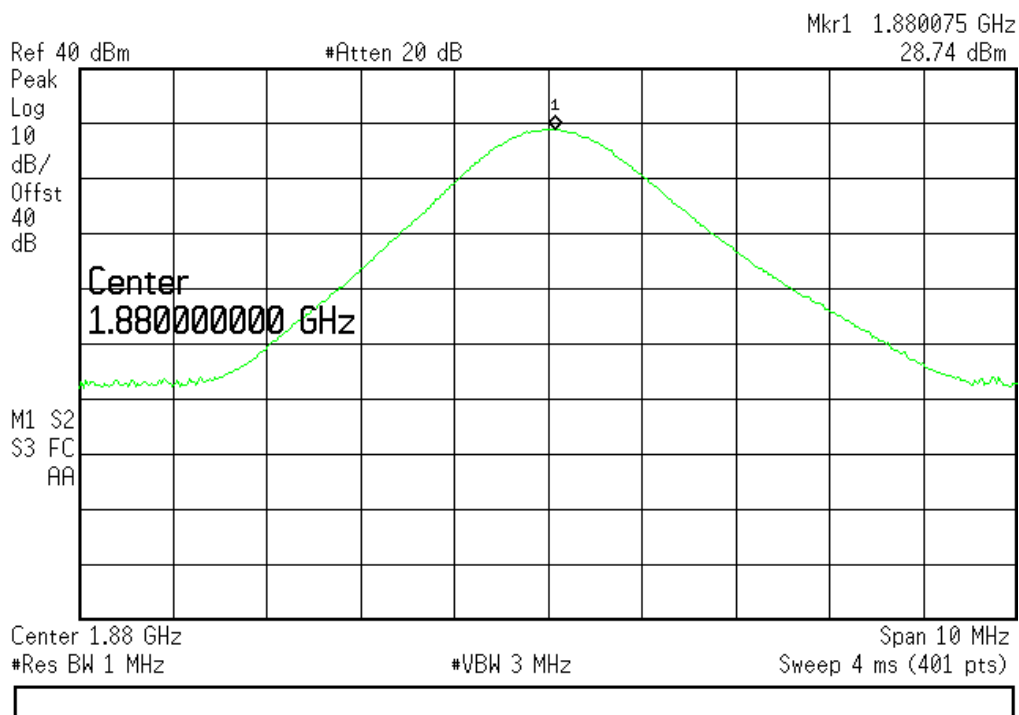
(Plot B6:GSM 850MHz Channel = 190)



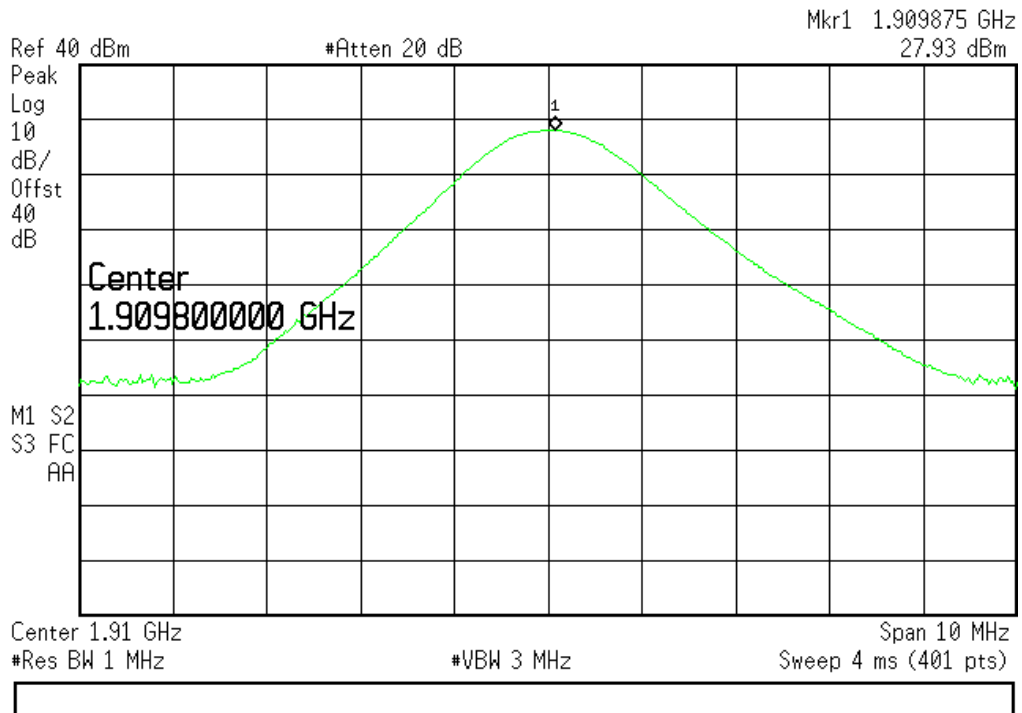
(Plot C6:GSM 850MHz Channel = 251)



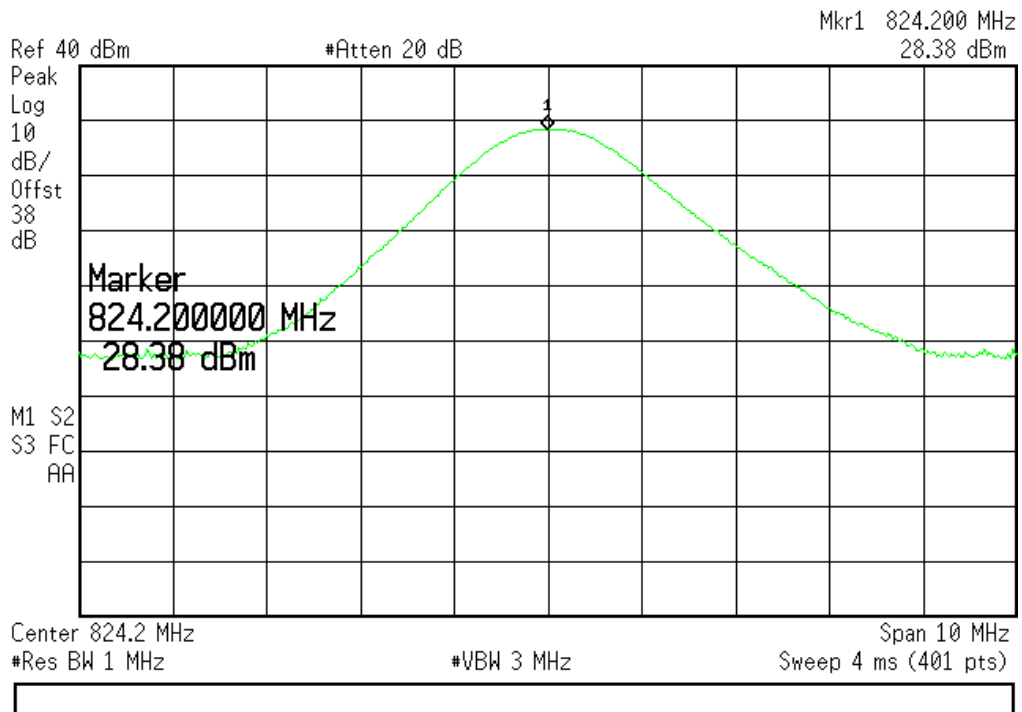
(Plot D6:GSM 1900MHz Channel = 512)



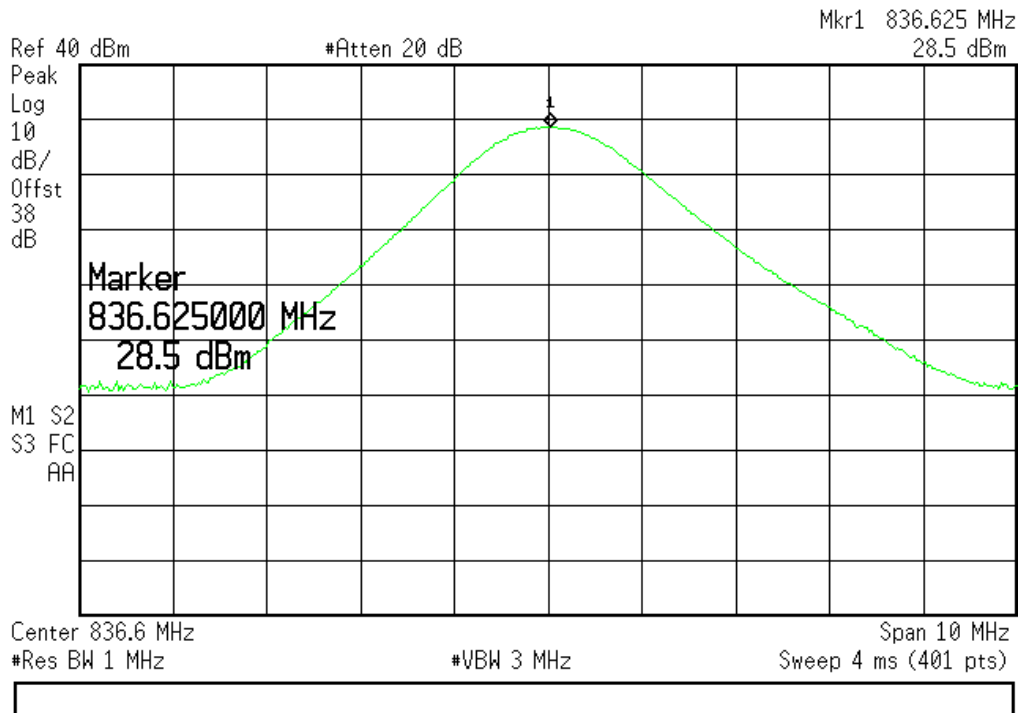
(Plot E6:GSM 1900MHz Channel = 661)



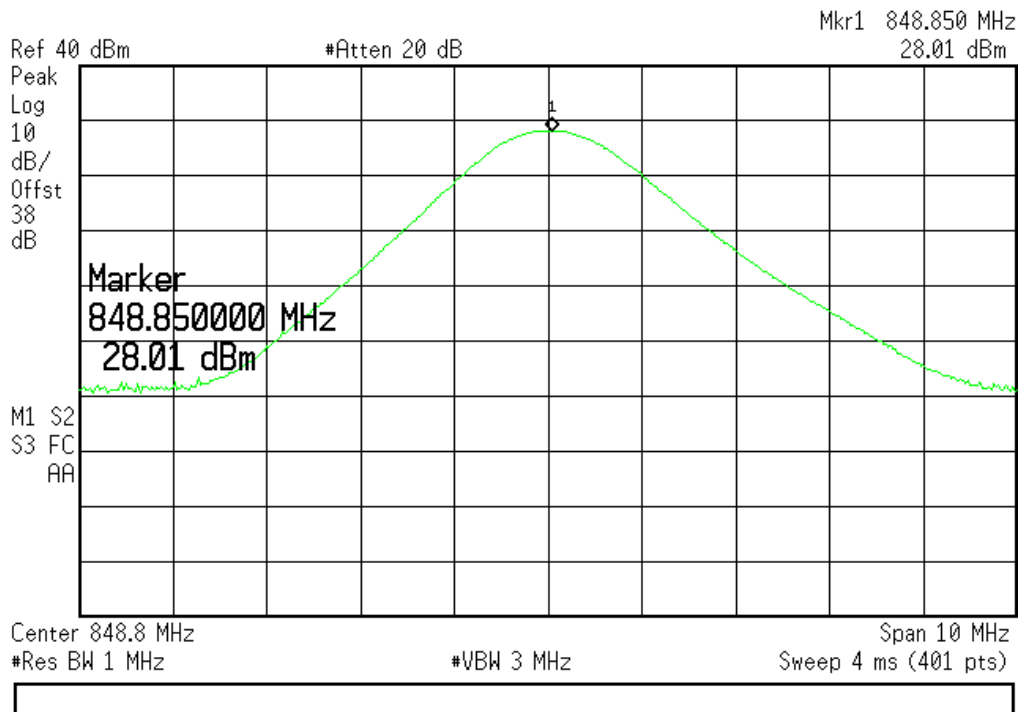
(Plot F6:GSM 1900MHz Channel = 810)



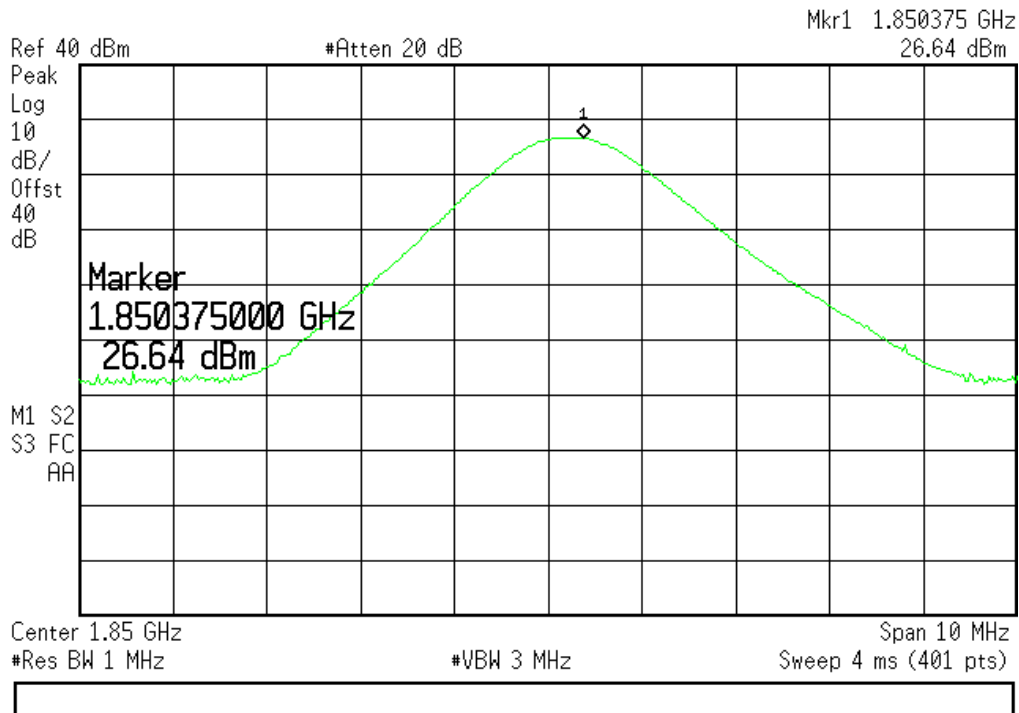
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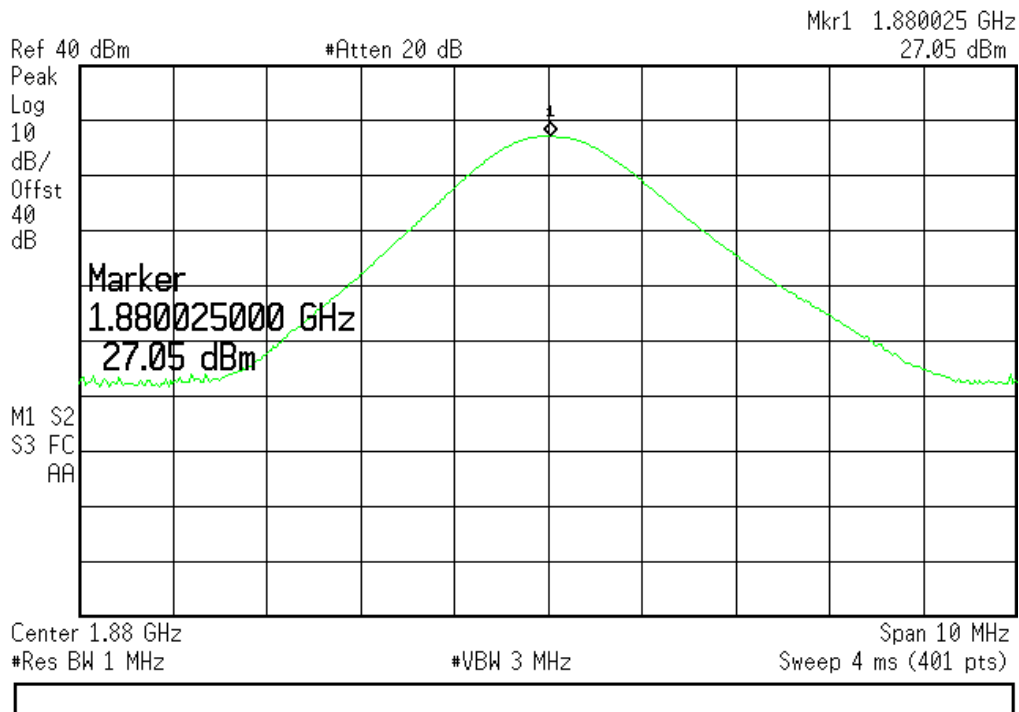
(Plot B6.1:GPRS 850MHz Channel = 190)



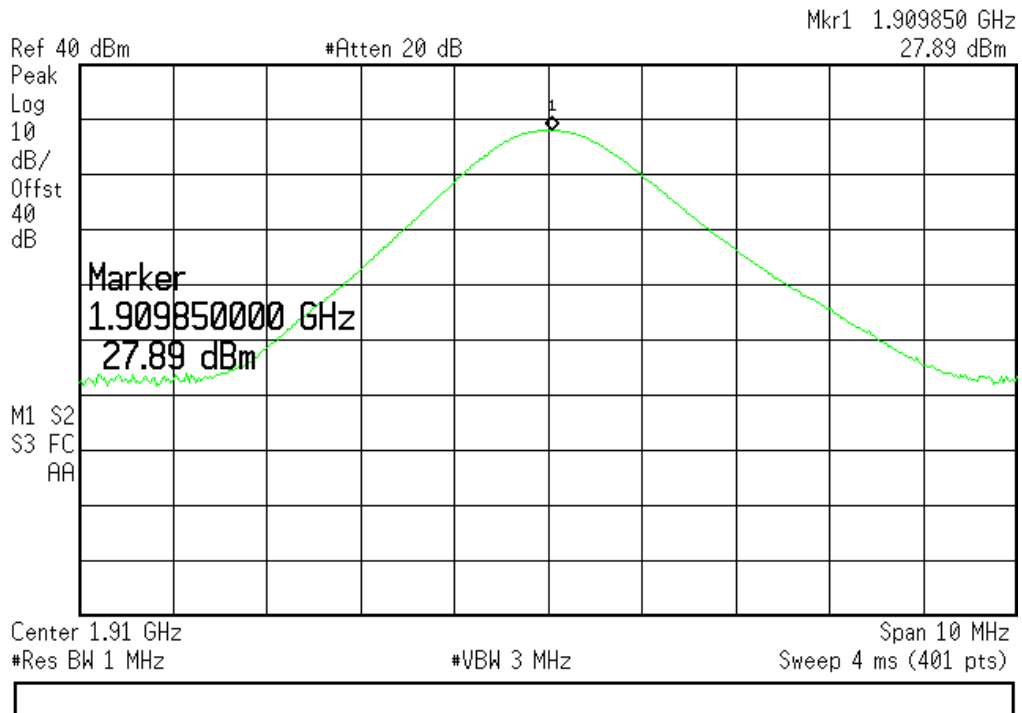
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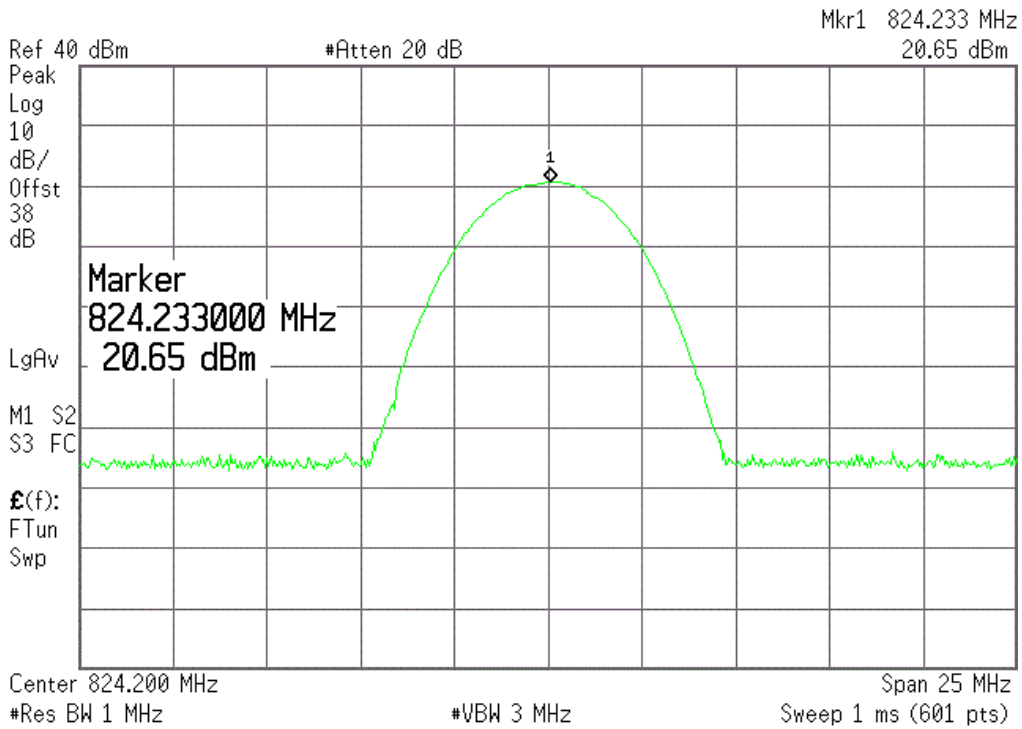
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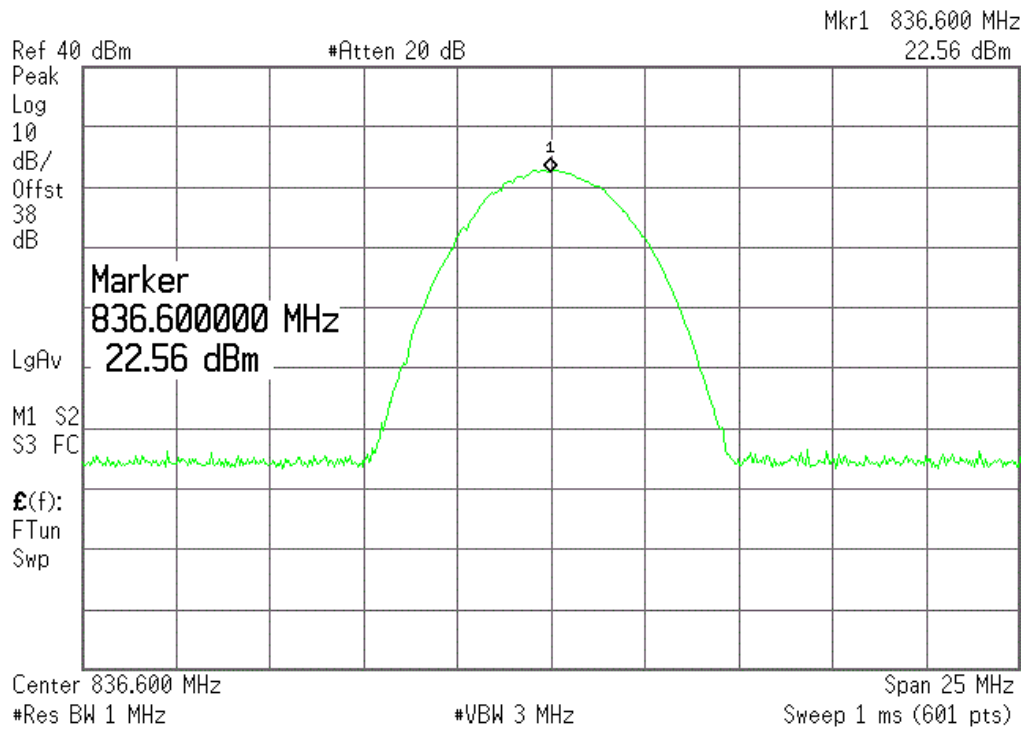
(Plot E6.1:GPRS 1900MHz Channel = 661)



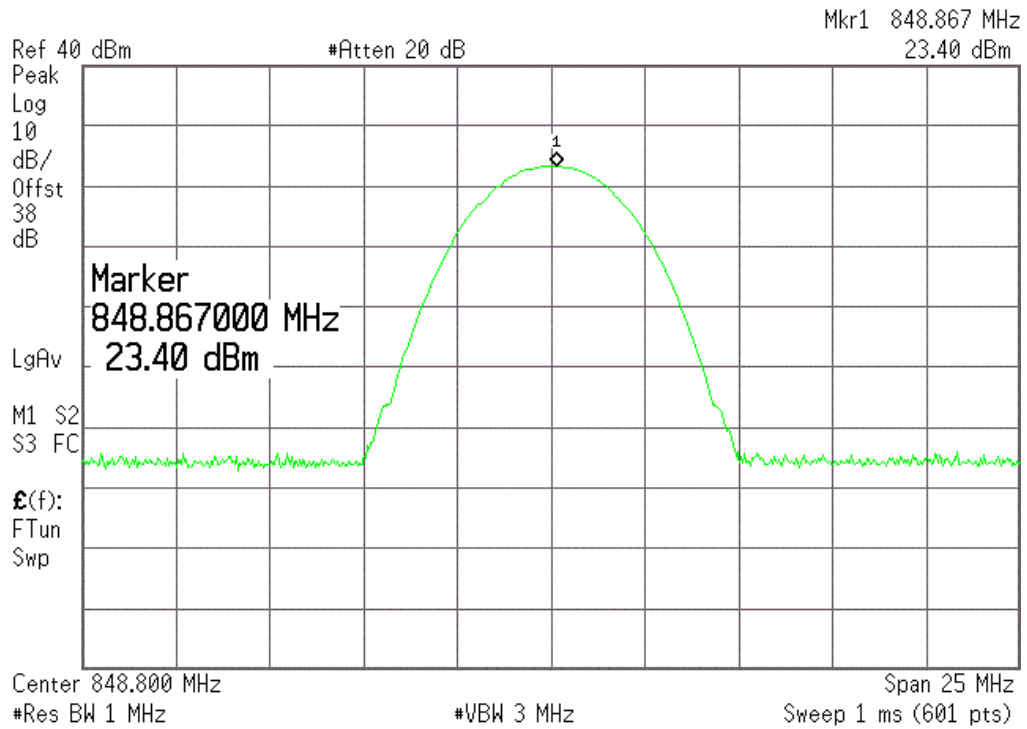
(Plot F6.1:GPRS 1900MHz Channel = 810)



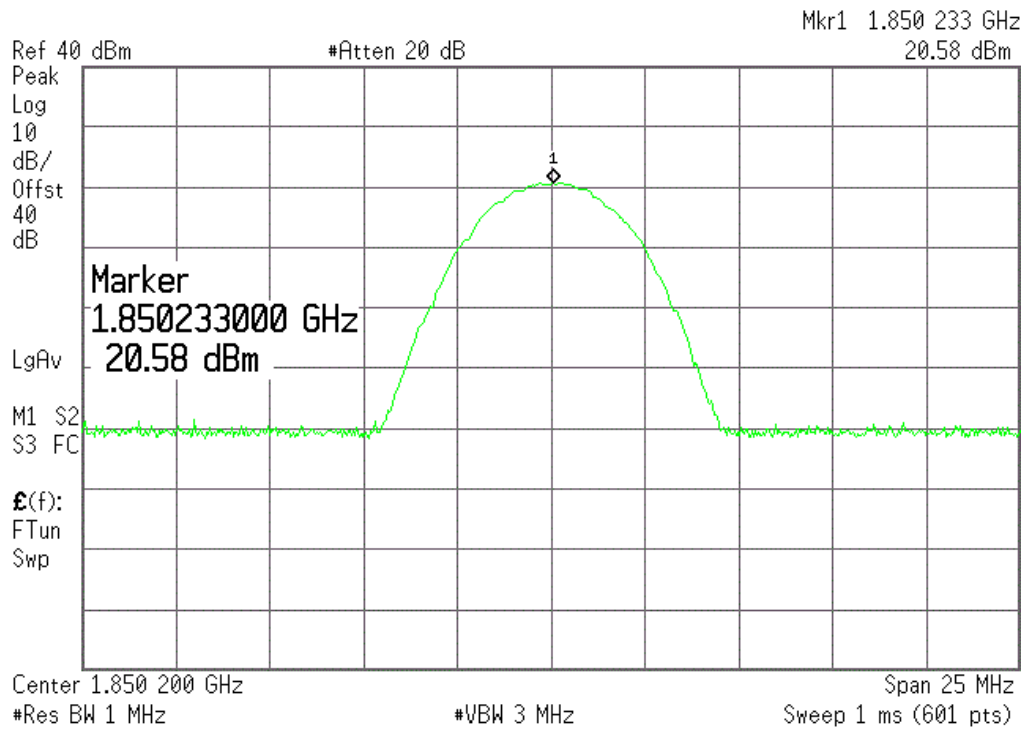
(Plot A6.2:EGPRS 850MHz Channel = 128)



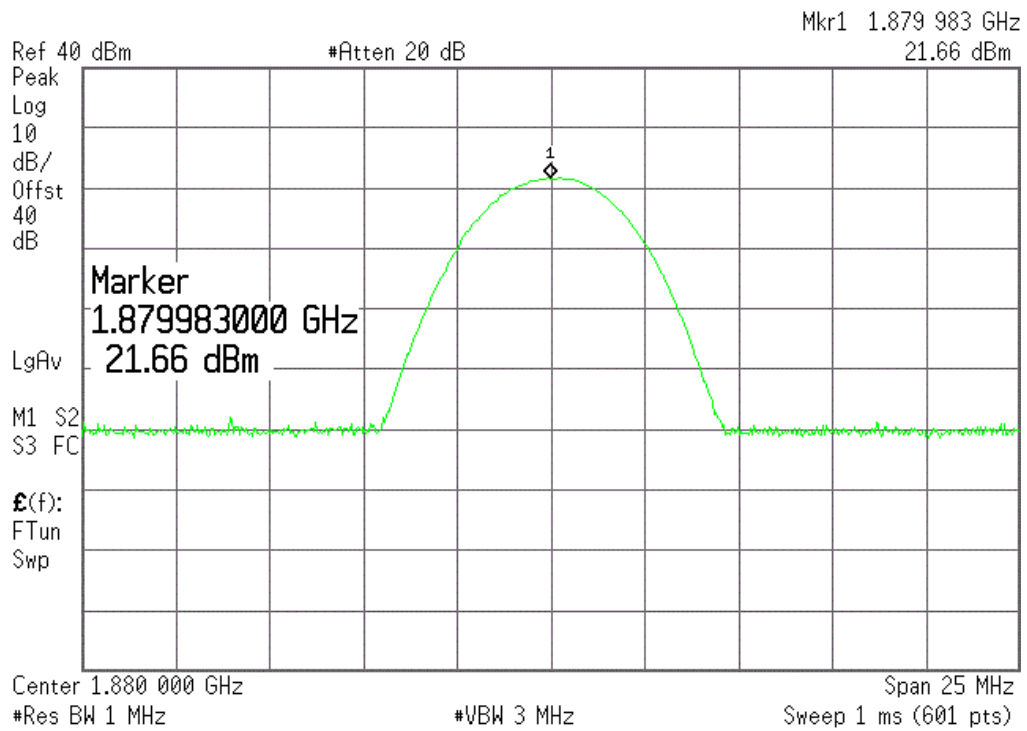
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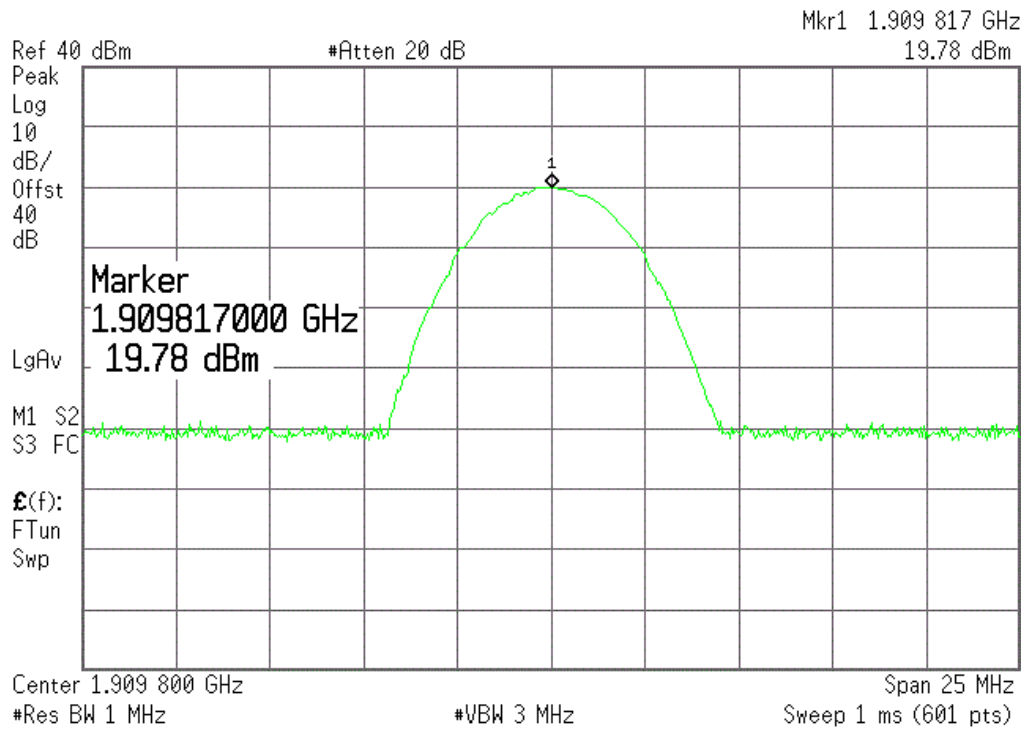
(Plot C6.2:EGPRS 850MHz Channel = 251)



(Plot D6.2:EGPRS 1900MHz Channel = 512)



(Plot E6.2:EGPRS 1900MHz Channel = 661)



(Plot F6.2:EGPRS 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 10th 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

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. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE).

I GSM 850MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 190 (836.6MHz)				
10	1673.25	-56.61	-55.91	-13
11	2481.14	---	---	-13
12	2944.51	---	---	-13
13	3915.14	---	---	-13
14	4181.25	-42.66	-40.38	-13
15	5954.56	---	---	-13
16	6691.87	---	-40.52	-13
17	7456.48	---	---	-13
18	8054.48	---	---	-13

II GSM 1900MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 661 (1880.2MHz)				
10	3738.75	---	---	-13
11	5608.12	---	-43.80	-13
12	7479.37	---	---	-13
13	9423.00	---	---	-13
14	11286.00	---	---	-13
15	13168.00	---	---	-13
16	1442.62	-33.98	-33.05	-13
17	16926.00	---	---	-13
18	18800.00	---	---	-13

III GPRS 850MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 190 (836.6MHz)				
10	1929.93	-42.35	-42.27	-13
11	2481.14	---	---	-13
12	2944.51	---	---	-13
13	3915.14	---	---	-13
14	4183	-42.52	-48.42	-13
15	5954.56	---	---	-13
16	6691.87	---	---	-13
17	7456.48	---	---	-13
18	8054.48	---	---	-13

IV GPRS 1900MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 661 (1880.2MHz)				
10	3759.37	-36.51	-43.19	-13
11	5640	-38.83	-40.23	-13
12	7479.37	---	---	-13
13	9423.00	---	---	-13
14	11280	---	-40.71	-13
15	13168.00	---	---	-13
16	1442.62			-13
17	16926.00	---	---	-13
18	18800.00	---	---	-13



V EGPRS 850MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 190 (836.6MHz)				
10	1930.12	-42.48	-42.55	-13
11	2510	-45.93	-51.00	-13
12	2944.51	---	---	-13
13	3915.14	---	---	-13
14	4183	-41.08	-46.86	-13
15	5954.56	---	---	-13
16	6691.87	---	---	-13
17	7456.48	---	---	-13
18	8054.48	---	---	-13

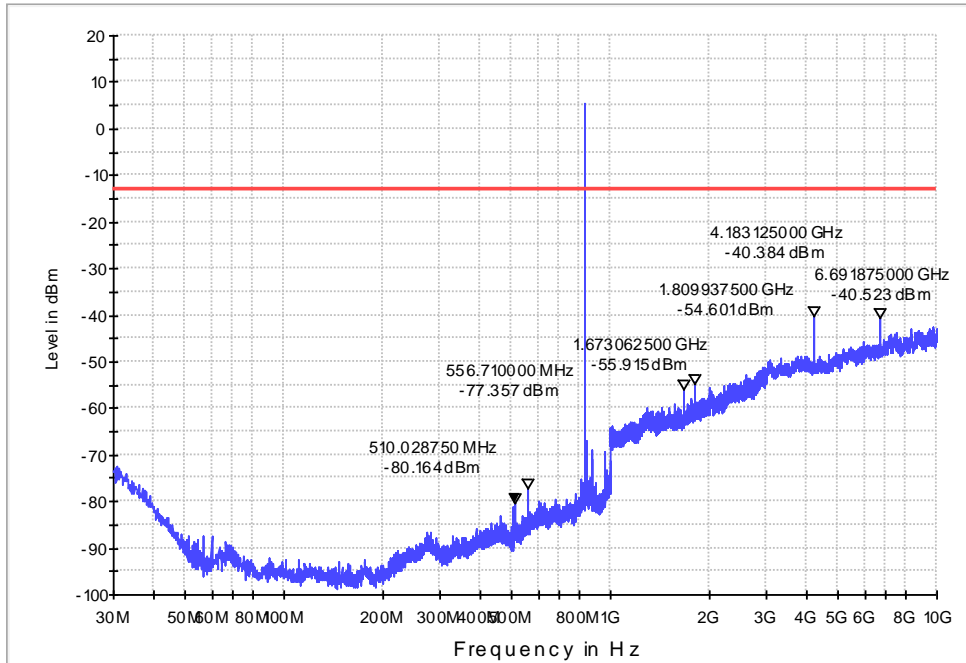
VI EGPRS 1900MHz

No.	Frequency (MHz)	Emission Power (dBm)		Limit (dBm)
		Test Antenna Vertical	Test Antenna Horizontal	
TCH number set to 661 (1880.2MHz)				
10	3759.37	-36.35	-44.07	-13
11	5640	-38.52	-35.97	-13
12	7479.37	---	---	-13
13	9423.00	---	---	-13
14	11280	-39.11	-40.30	-13
15	13168.00	---	---	-13
16	1442.62			-13
17	16926.00	---	---	-13
18	18800.00	---	---	-13



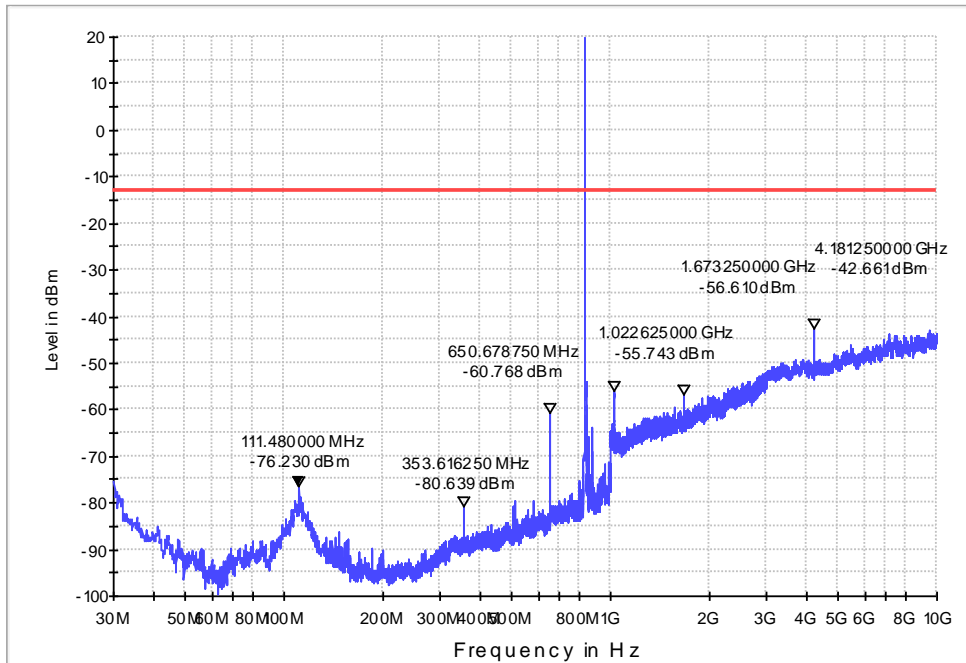
Test Plot

MORLAB-RSE-FCC-GSM850 30M-18G

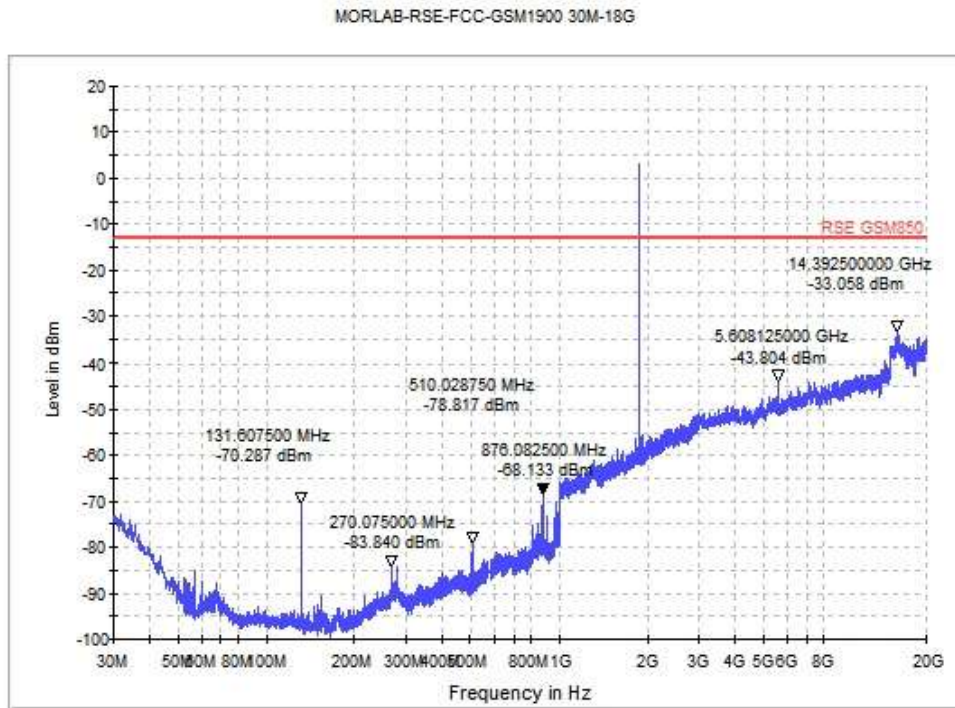


GSM850 CH190-H

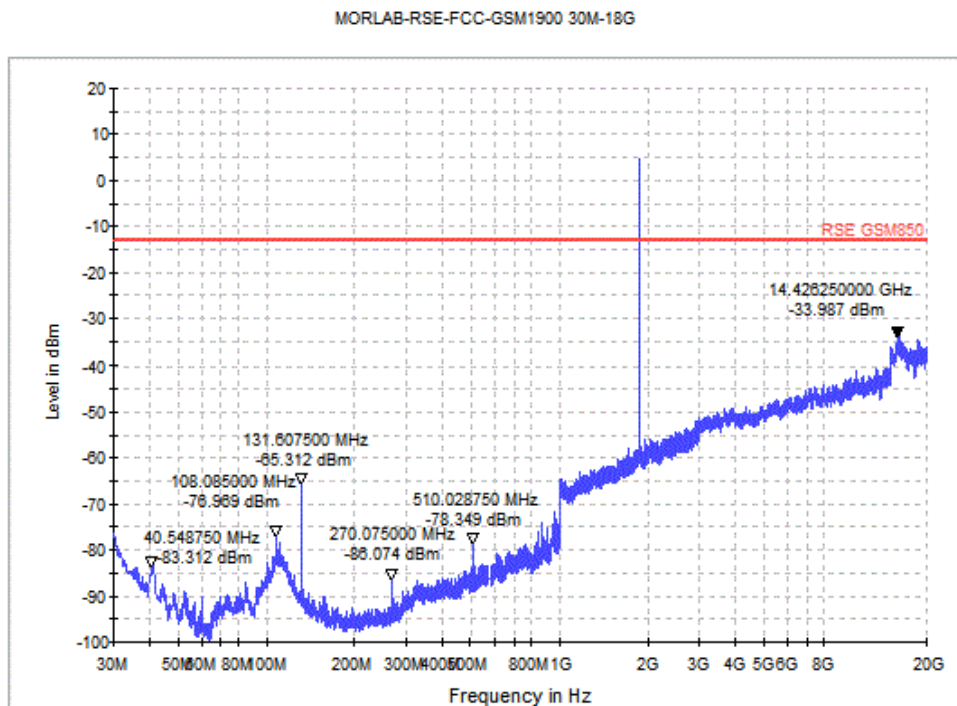
MORLAB-RSE-FCC-GSM850 30M-18G



GSM850 CH190-V

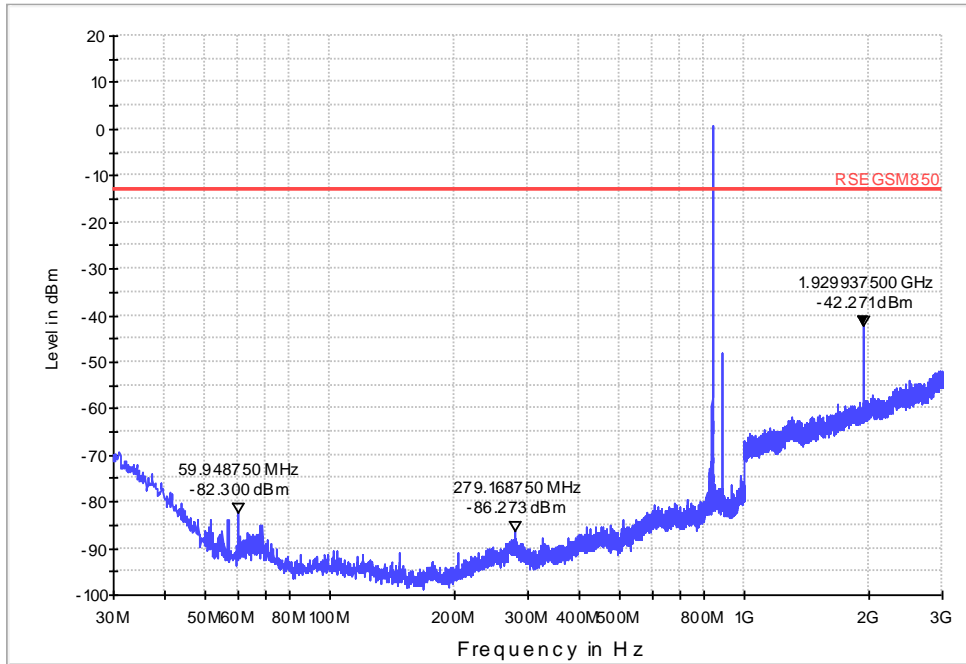


GSM1900 CH661-H



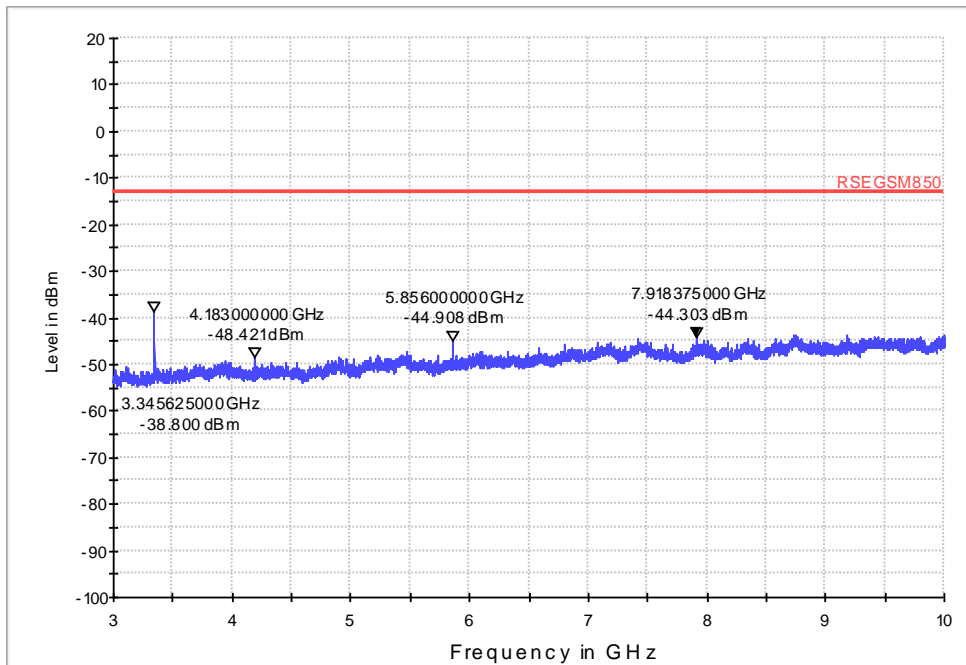
GSM1900 CH661-V

MORLAB-RSE-FCC-GSM850 30M-3G



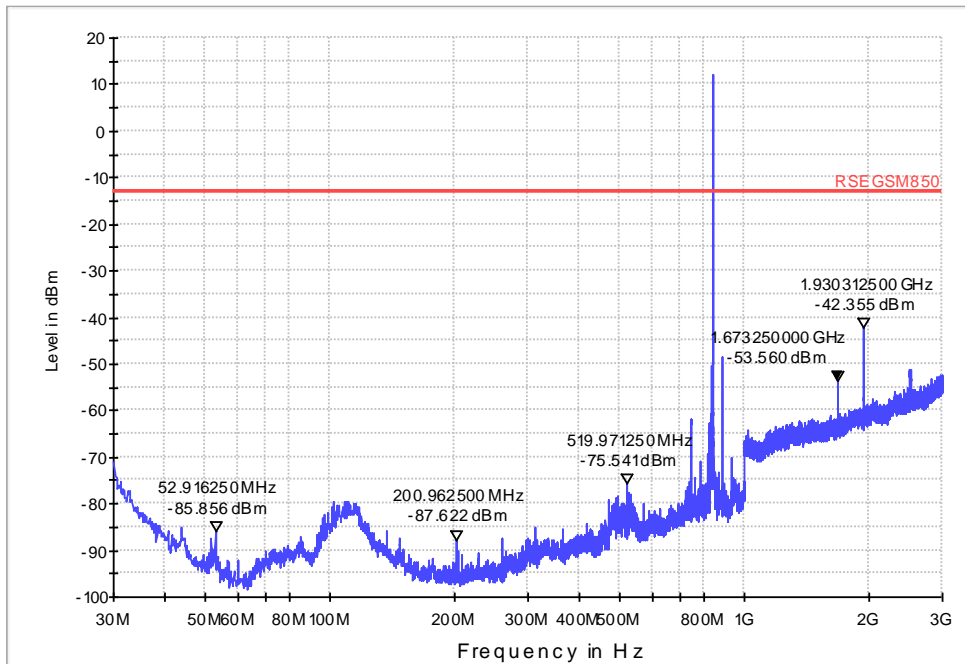
GPRS850 CH190-H 30M-3G

MORLAB-RSE-FCC-GSM850 3G-10G



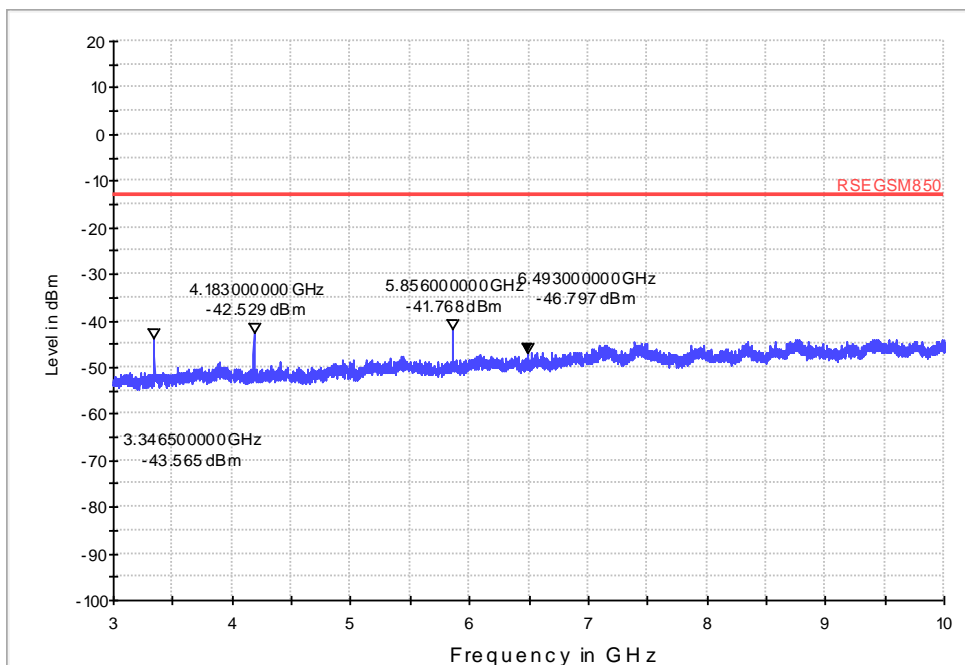
GPRS850 CH190-H 3G-10G

MORLAB-RSE-FCC-GSM850 30M-3G



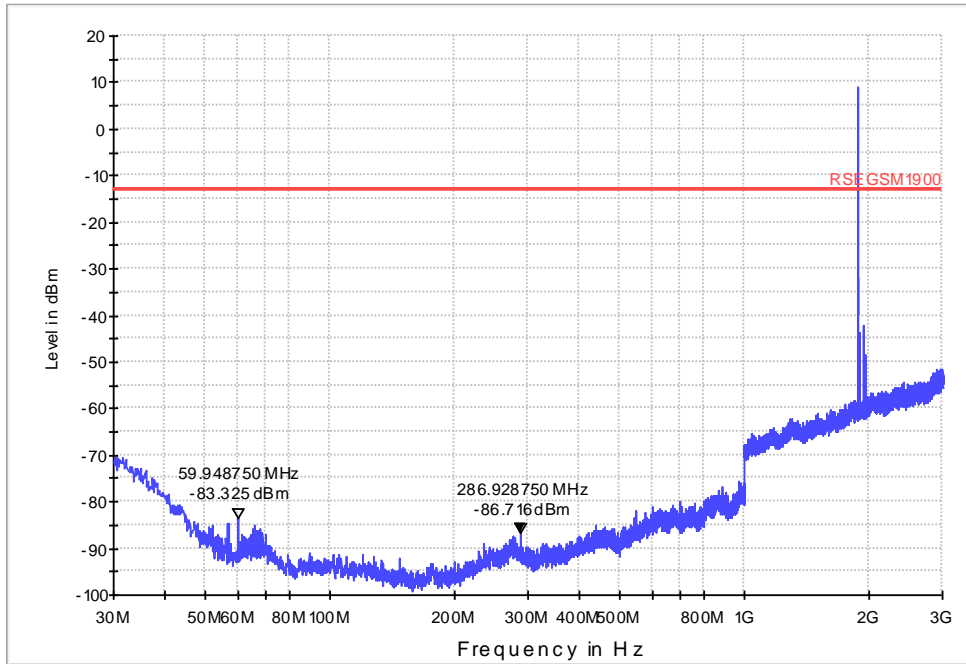
GPRS850 CH190-V 30M-3G

MORLAB-RSE-FCC-GSM850 3G-10G



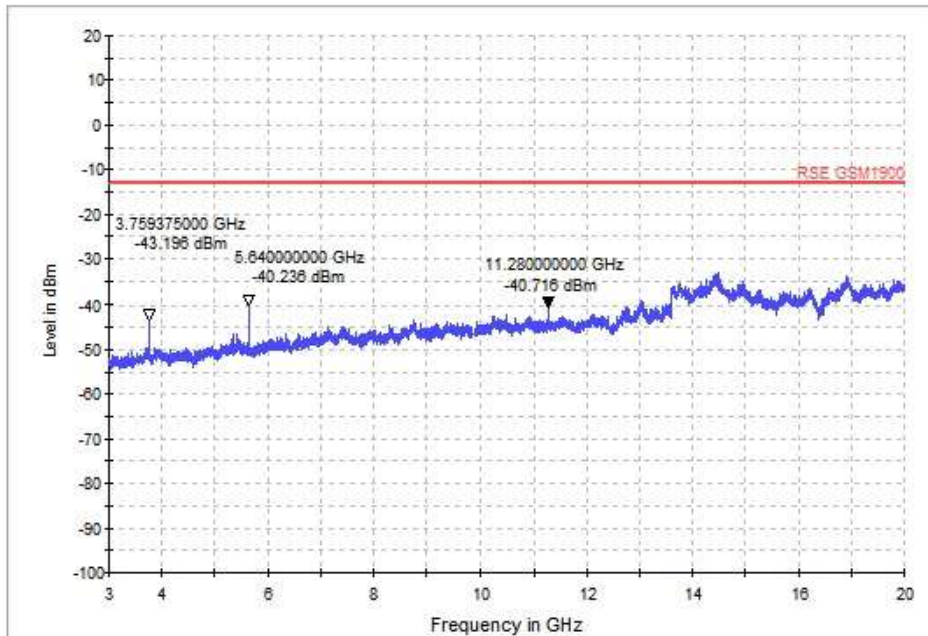
GPRS850 CH190-V 3G-10G

MORLAB-RSE-FCC-GSM1900 30M-3G



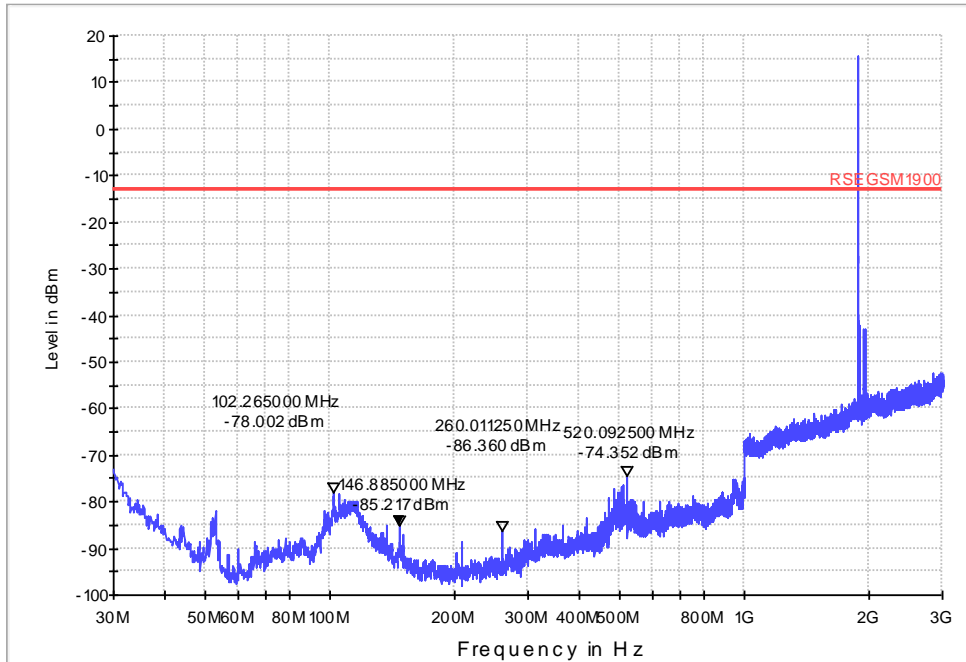
GPRS1900 CH661-H 30M-3G

MORLAB-RSE-FCC-GSM1900 3G-20G



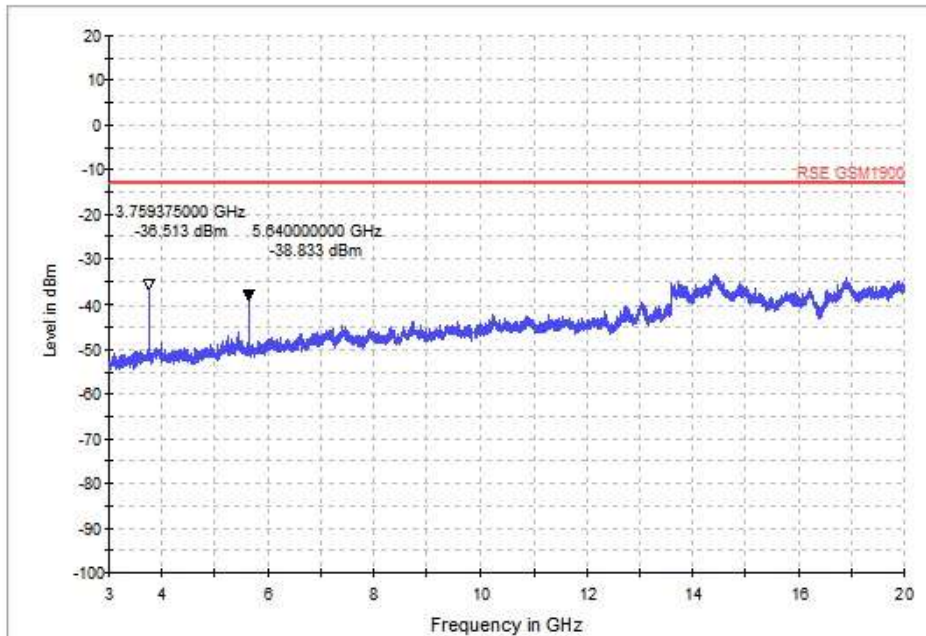
GPRS1900 CH661-H 3G-20G

MORLAB-RSE-FCC-GSM1900 30M-3G



GPRS1900 CH661-V 30M-3G

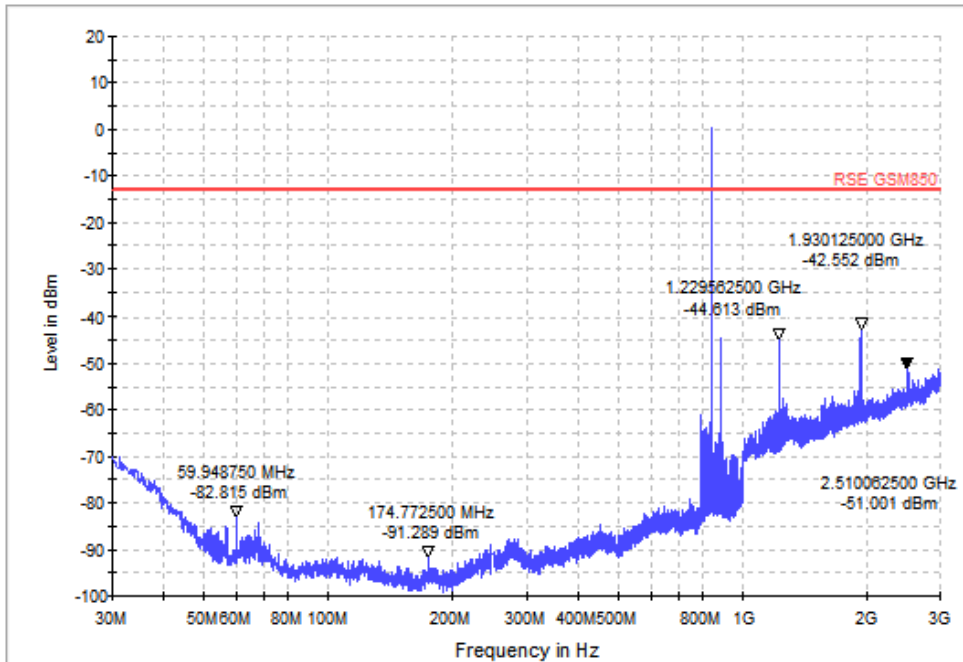
MORLAB-RSE-FCC-GSM1900 3G-20G



GPRS1900 CH661-V 3G-20G

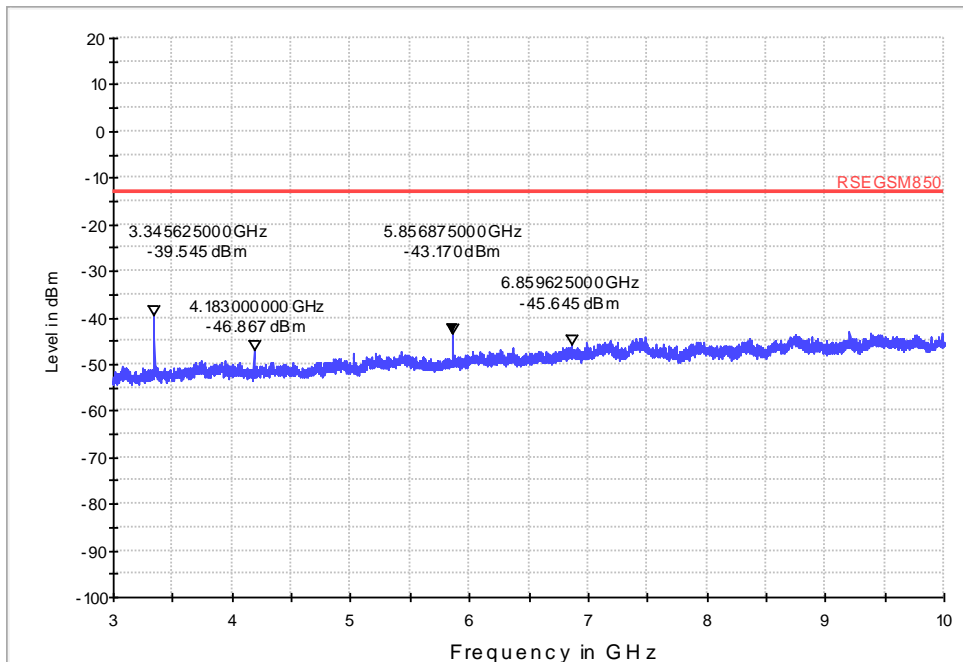


MORLAB-RSE-FCC-GSM850 30M-3G



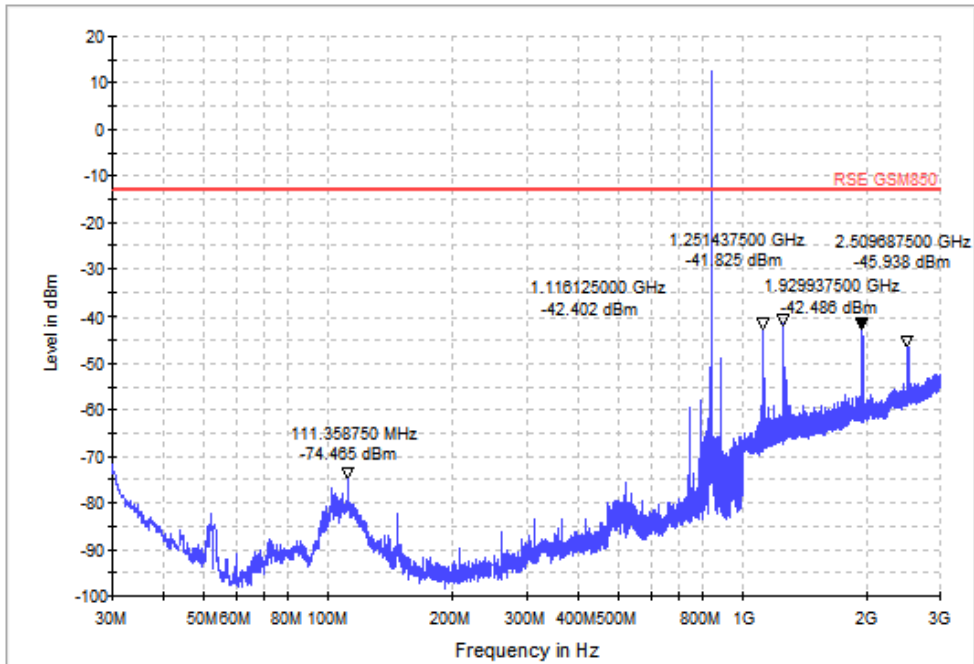
EGPRS850 CH190-H 30M-3G

MORLAB-RSE-FCC-GSM850 3G-10G



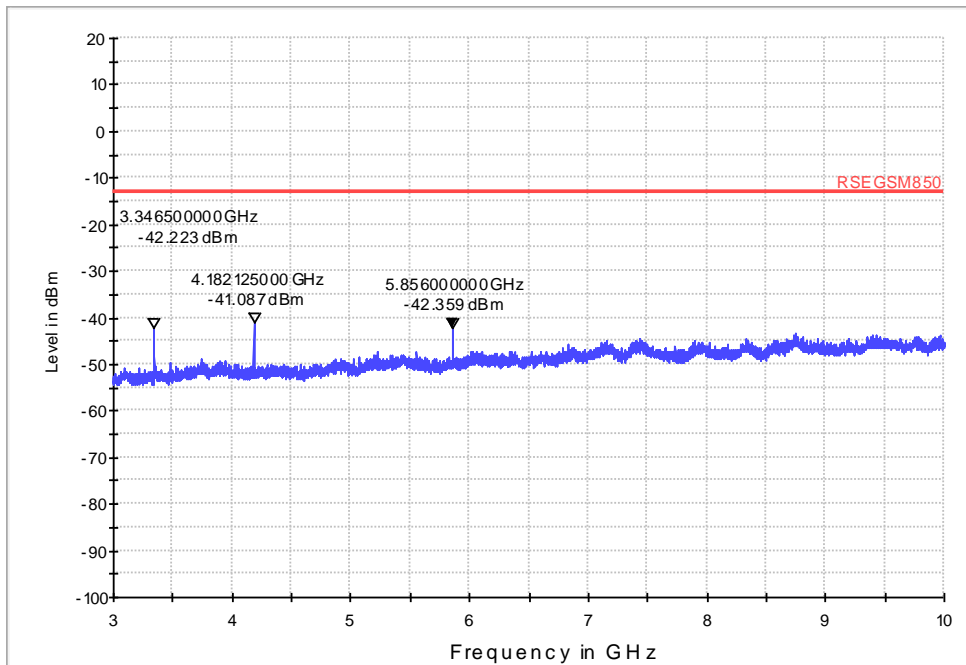
EGPRS850 CH190-H 3G-10G

MORLAB-RSE-FCC-GSM850 30M-3G



EGPRS850 CH190-V 30M-3G

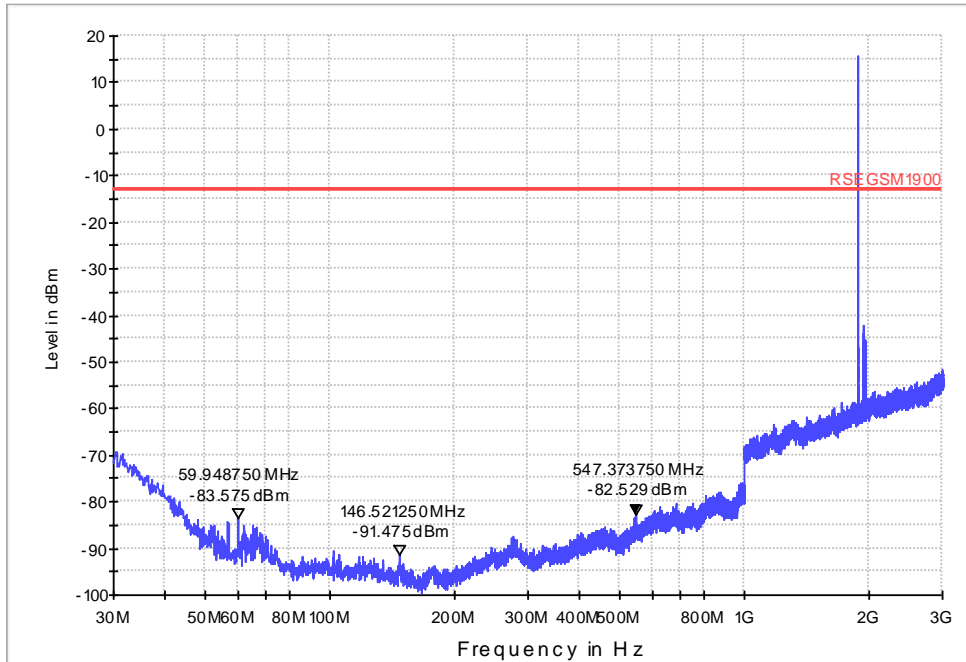
MORLAB-RSE-FCC-GSM850 3G-10G



EGPRS850 CH190-V 3G-10G

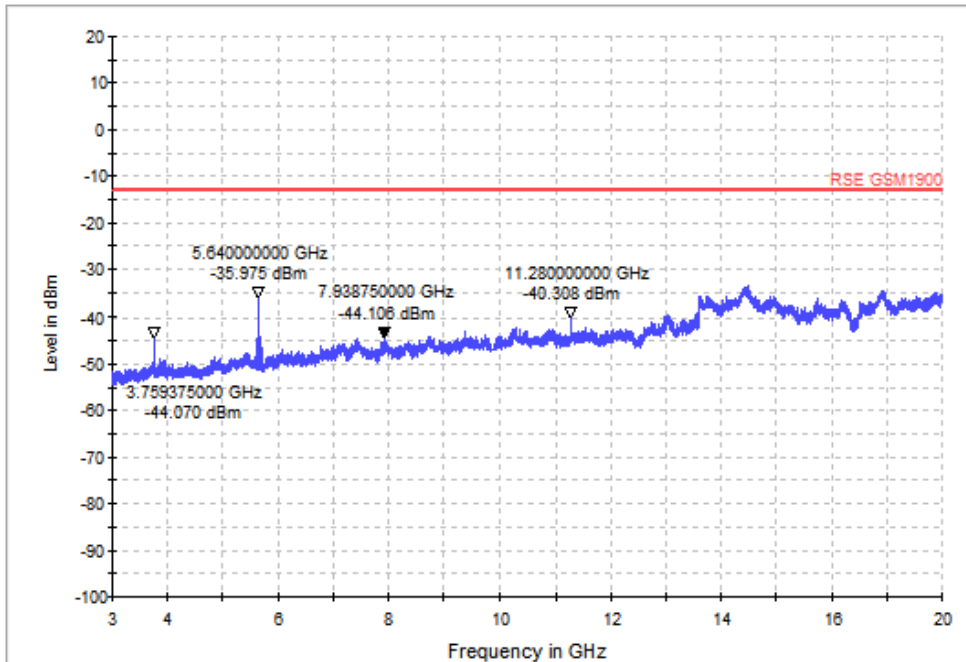


MORLAB-RSE-FCC-GSM1900 30M-3G



EGPRS1900 CH661-H 30M-3G

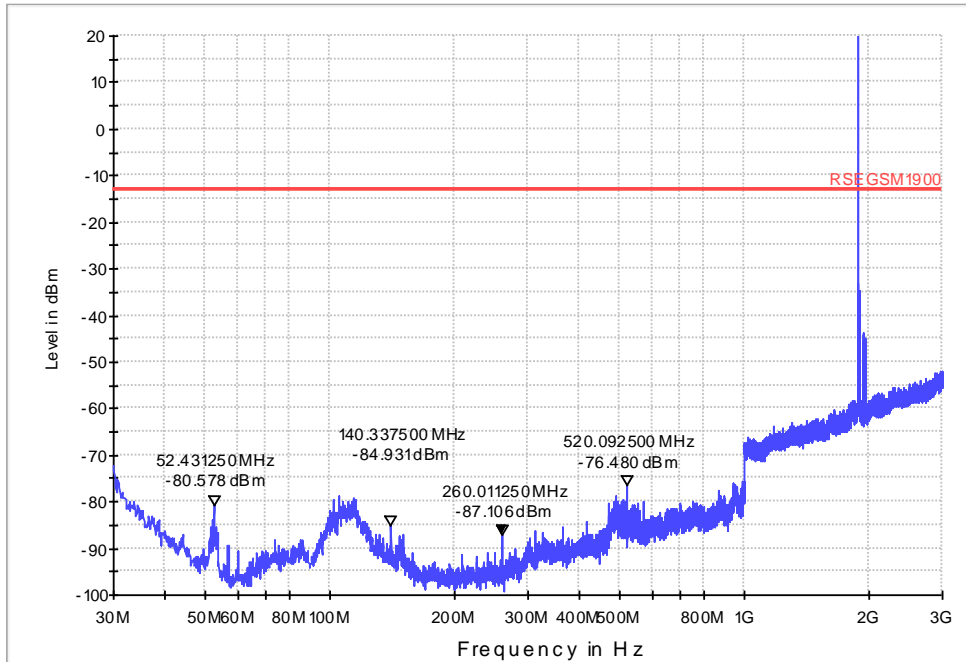
MORLAB-RSE-FCC-GSM1900 3G-20G



EGPRS1900 CH661-H 3G-20G

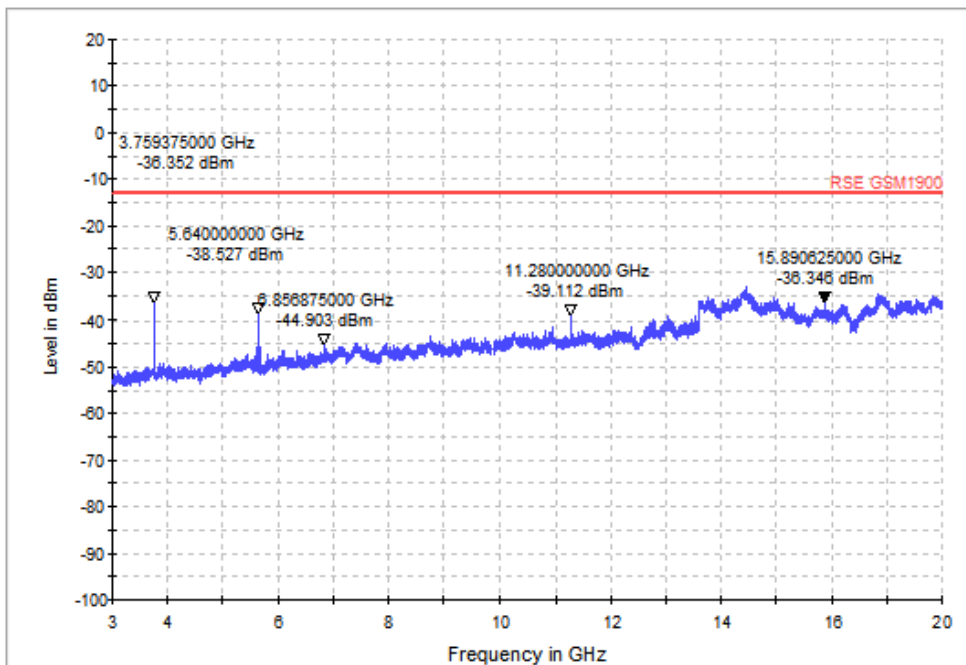


MORLAB-RSE-FCC-GSM1900 30M-3G



EGPRS1900 CH661-V 30M-3G

MORLAB-RSE-FCC-GSM1900 3G-20G



EGPRS1900 CH661-V 3G-20G

** END OF REPORT **