



RF TEST REPORT

Report No.: SET2013-02952
Product: GSM Tracker
FCC ID: ZKQ-PRS
Model No.: PR100
Applicant: Micron Electronics LLC
Address: 601 North Congress Ave Suite 439, Delray Beach, FL 33445
Issued by: CCIC-SET
Lab Location: Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen China
Tel: 86 755 26627338 **Fax:** 86 755 26627238

This test report consists of 75 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.



Test Report

Product: GSM Tracker

Model No.: PR100

Brand Name.....: PRIME

Trade Name.....: PRIME

Applicant.....: Micron Electronics LLC

Applicant Address: 601 North Congress Ave Suite 439, Delray Beach, FL 33445

Manufacturer: Micron Electronics LLC

Manufacturer Address: 601 North Congress Ave Suite 439, Delray Beach, FL 33445

Test Standards: 47 CFR Part 2(10-1-09 Edition) Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
47 CFR Part 22(10-1-09 Edition) Public Mobile Services
47 CFR Part 24(10-1-09 Edition)Personal Communications Services

Test Date: June 14, 2013 to June 28, 2013

Tested by:  2013-07-05

Lu Lei, Test Engineer

Reviewed by:  2013-07-05

Shuangwen Zhang, Senior Engineer

Product:  2013-07-05

Wu Li'an, Manager



Table of Contents

1.	GENERAL INFORMATION	4
1.1	EUT Description	4
1.2	Test Standards and Results.....	5
1.3	Facilities and Accreditations.....	6
2.	47 CFR PART 2, PART 22H & 24E REQUIREMENTS	7
2.1	Conducted RF Output Power	7
2.2	99% Occupied Bandwidth	15
2.3	Frequency Stability.....	28
2.4	Conducted Out of Band Emissions	31
2.5	Band Edge	47
2.6	Transmitter Radiated Power (EIRP/ERP).....	52
2.7	Radiated Out of Band Emissions	61



1. GENERAL INFORMATION

1.1 EUT Description

EUT Type.....: GSM Tracker
Serial No.....: (n.a, marked #1 by test site)
FCC ID: ZKQ-PRS
Hardware Version: N/A
Software Version: N/A
Frequency Range: GSM 850MHz:
Tx: 824.20 - 848.80MHz (at intervals of 200kHz);
Rx: 869.20 - 893.80MHz (at intervals of 200kHz)
GSM 1900MHz:
Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);
Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)
Modulation Type.....: GPRS/GSM Mode with GMSK Modulation
Multislot Class.....: GPRS: Multislot Class10
Antenna Type.....: PIFA Antenna
Emission Designators: GSM850:248KGXW, GSM1900:244KGXW,
GPRS850:248KGXW,GPRS1900:248KGXW

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

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

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



1.2 Test Standards and Results

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

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-09 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-09 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-09 Edition)	Personal Communications Services

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

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

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



1.3 Facilities and Accreditations

1.3.1 Test Facilities

CNAS-Lab Code: L1659

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

FCC-Registration No.: 406086

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 406086, Renewal date Nov. 19, 2011, valid time is until Nov. 18, 2014.

1.3.2 Test Environment Conditions

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

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

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

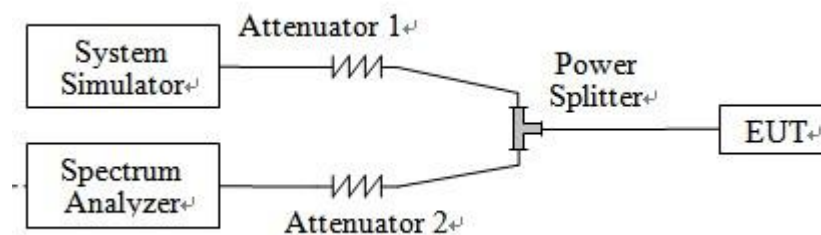
2.1 Conducted RF Output Power

2.1.1 Requirement

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

2.1.2 Test Description

1. Test Setup:



The EUT, which is powered by the adapter, 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
System Simulator	Agilent	E5515C	MY47510547	2013.09.13
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2013.06.09
Power Meter	Agilent	E4418B	GB43318055	2013.06.09
Power Splitter	Weinschel	1506A	NW521	2013.06.11
Attenuator 1	MCE/weinschel	10dB	BN3693	2013.06.11
Attenuator 2	Resnet	3dB	(n.a.)	2013.06.09

The Cal. Interval was one year.

2.1.3 Test Results

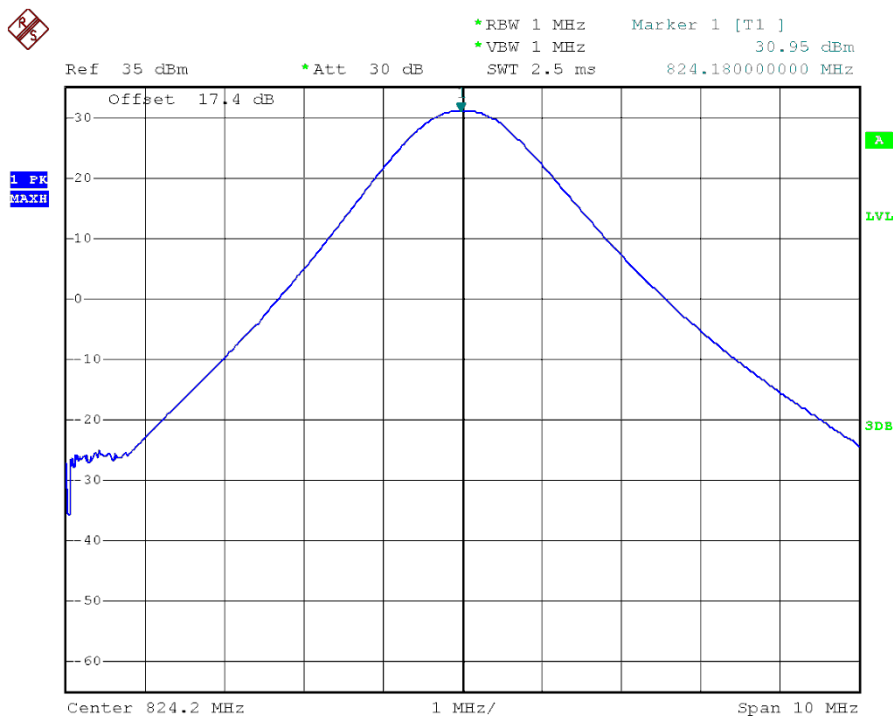
Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

1. Test Verdict:

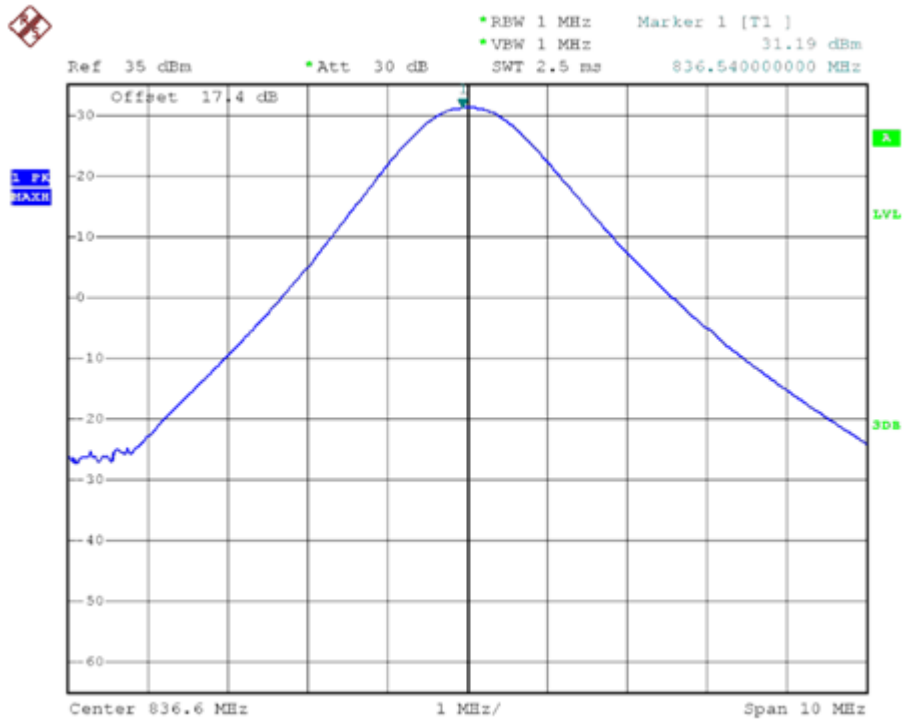
Band	Channel	Frequency (MHz)	Measured Output Power		Limit dBm	Verdict
			dBm	Refer to Plot		
GSM 850MHz	128	824.2	30.95	Plot A1 to A3	35	PASS
	190	836.6	31.19			PASS
	251	848.8	31.11			PASS
GSM 1900MHz	512	1850.2	29.14	Plot B1 to B3	32	PASS
	661	1880.0	29.35			PASS
	810	1909.8	29.09			PASS
GPRS 850MHz	128	824.2	29.61	Plot C1 to C3	35	PASS
	190	836.6	29.79			PASS
	251	848.8	29.76			PASS
GPRS 1900MHz	512	1850.2	28.04	Plot D1 to D3	32	PASS
	661	1880.0	28.24			PASS
	810	1909.8	28.01			PASS

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

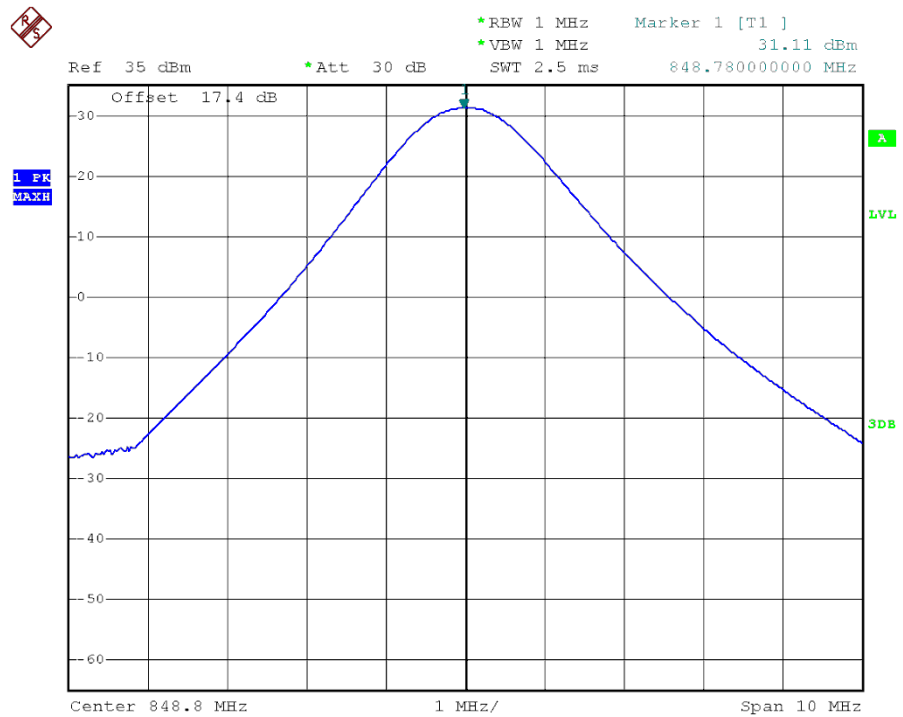
2. Test Plots:



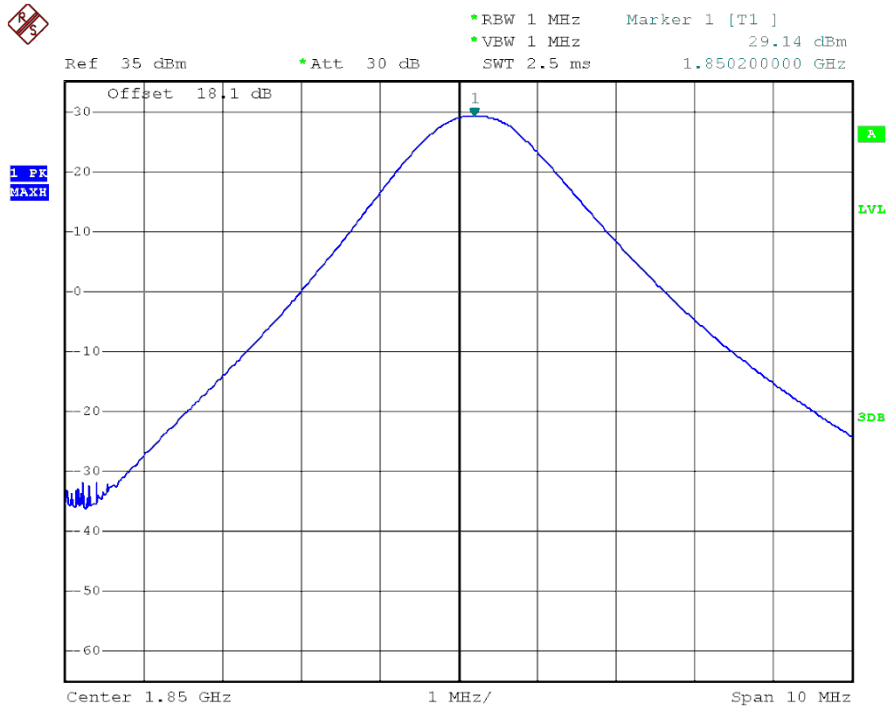
(Plot A1: GSM 850MHz Channel = 128)



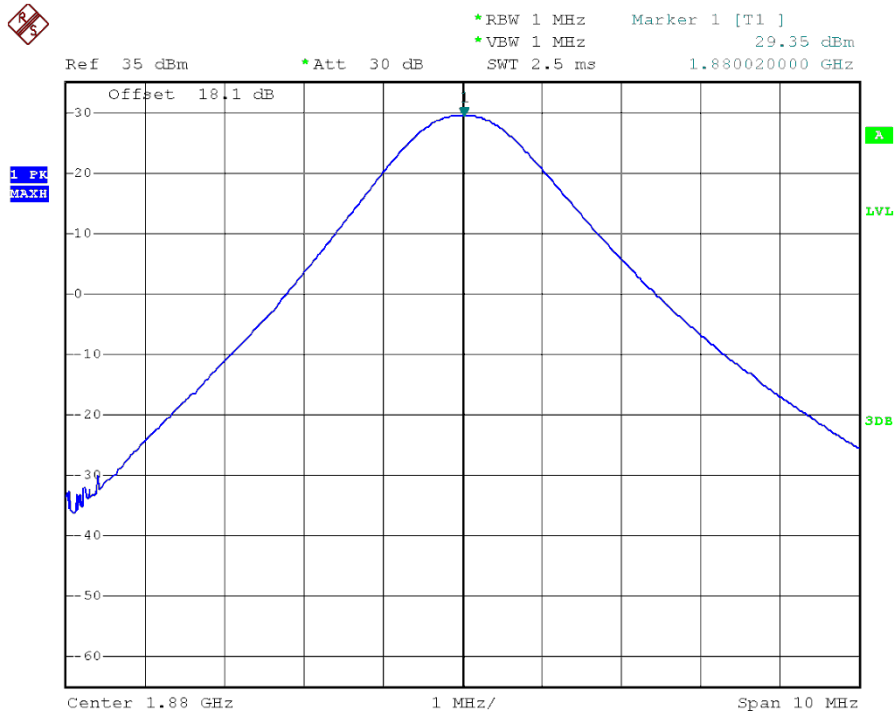
(Plot A2: GSM 850MHz Channel = 190)



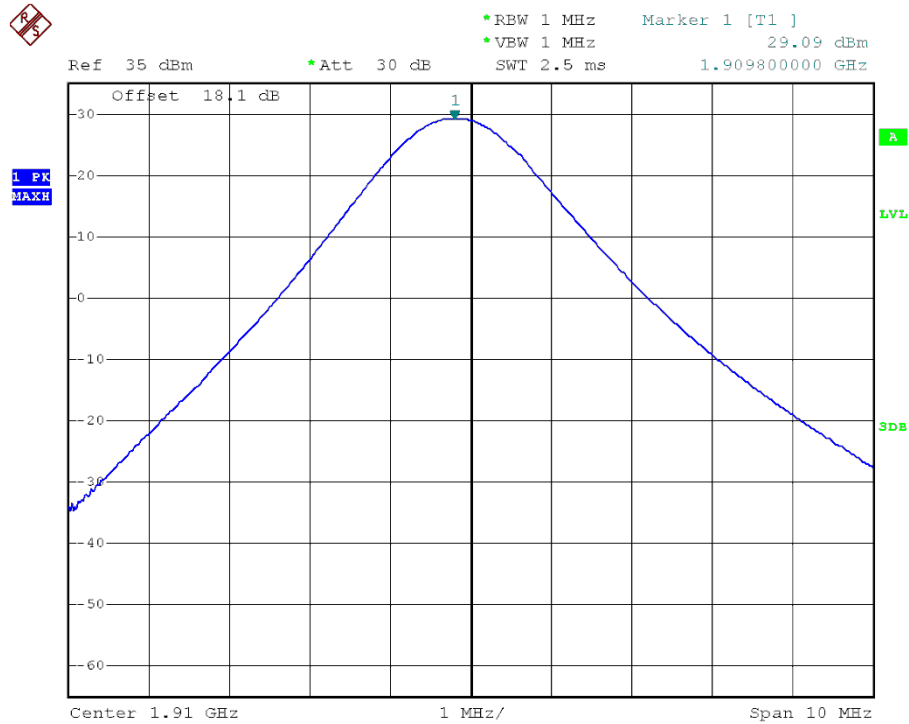
(Plot A3: GSM 850MHz Channel = 251)



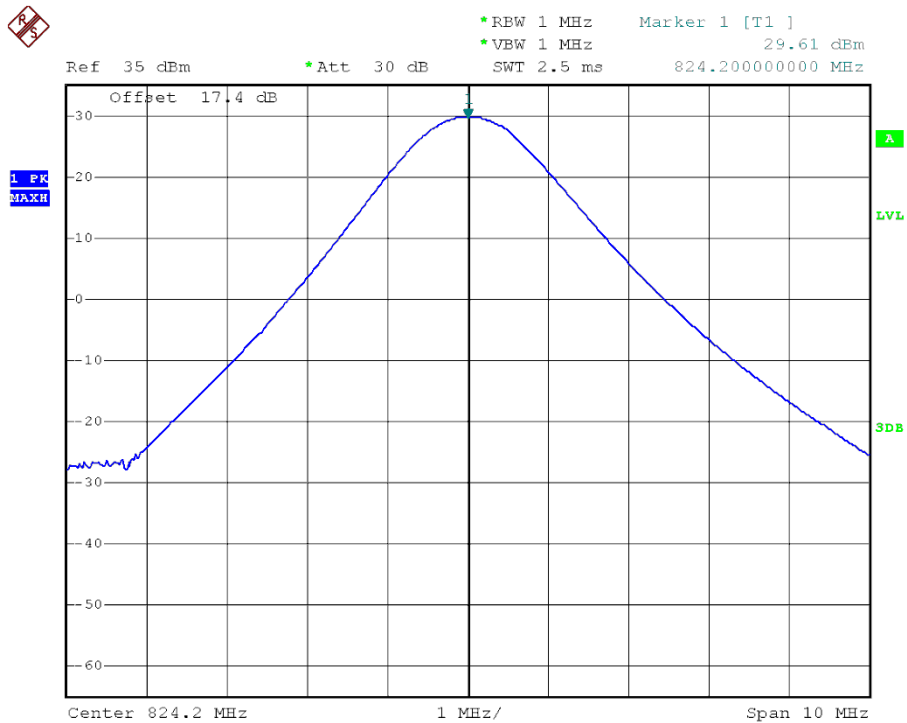
(Plot B1: GSM 1900MHz Channel = 512)



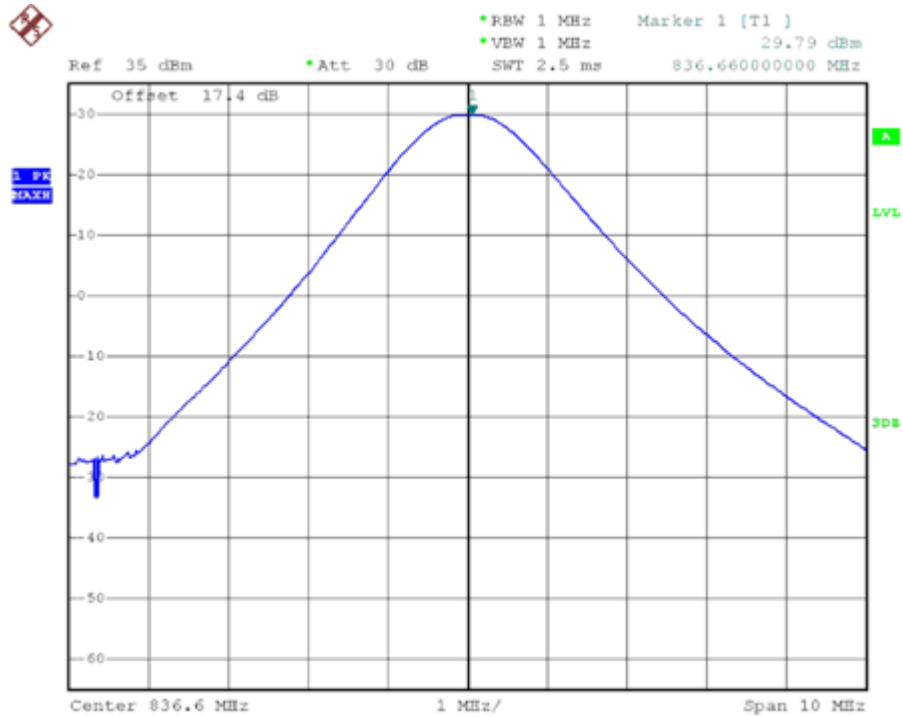
(Plot B2: GSM 1900MHz Channel = 661)



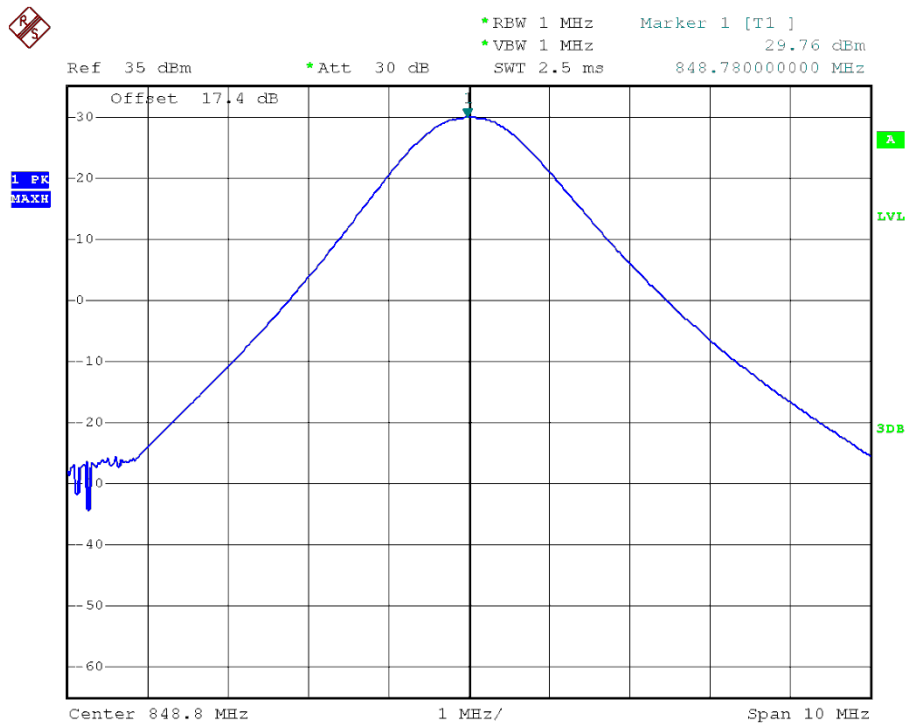
(Plot B3: GSM 1900MHz Channel = 810)



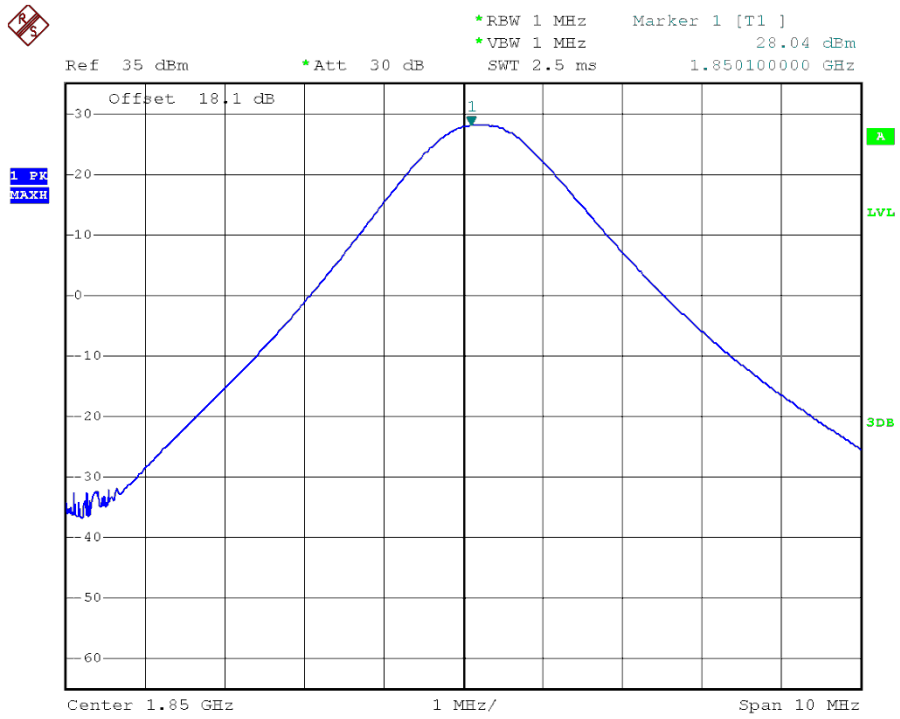
(Plot C1: GPRS 850MHz Channel = 128)



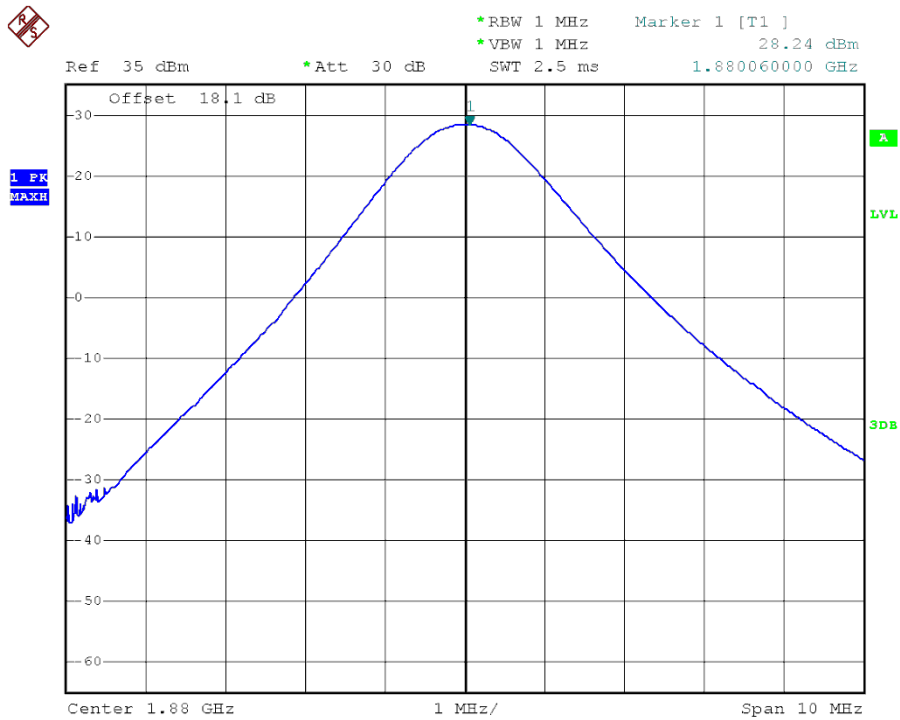
(Plot C2: GPRS 850MHz Channel = 190)



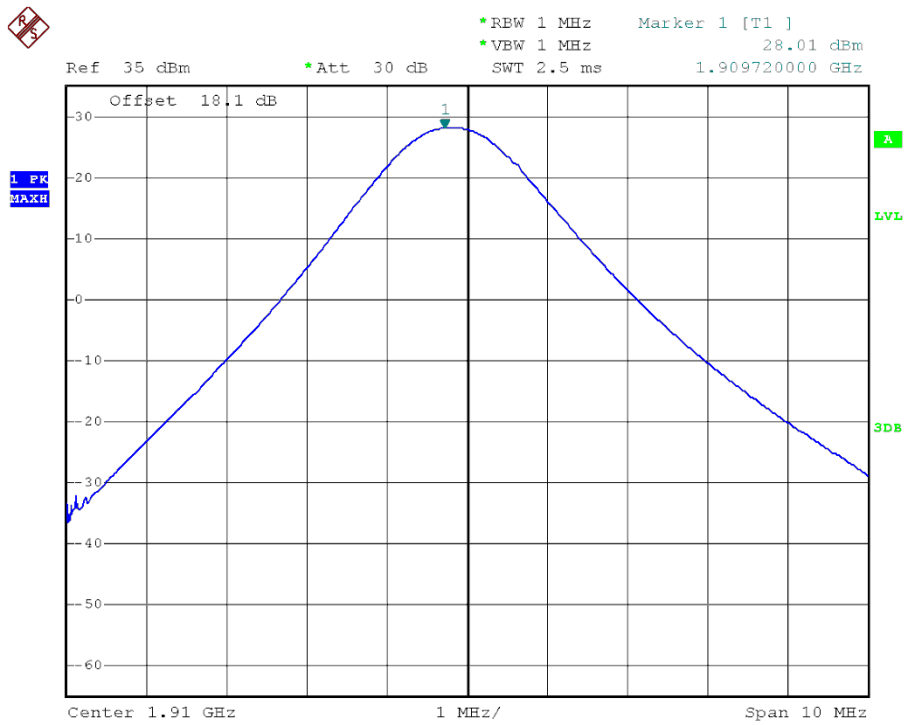
(Plot C3: GPRS 850MHz Channel = 251)



(Plot D1: GPRS 1900MHz Channel = 512)



(Plot D2: GPRS 1900MHz Channel = 661)



(Plot D3: GPRS 1900Hz Channel = 810)



2.2 99% Occupied Bandwidth

2.2.1 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,

2.2.2 Test Description

See section 2.1.2 of this report.

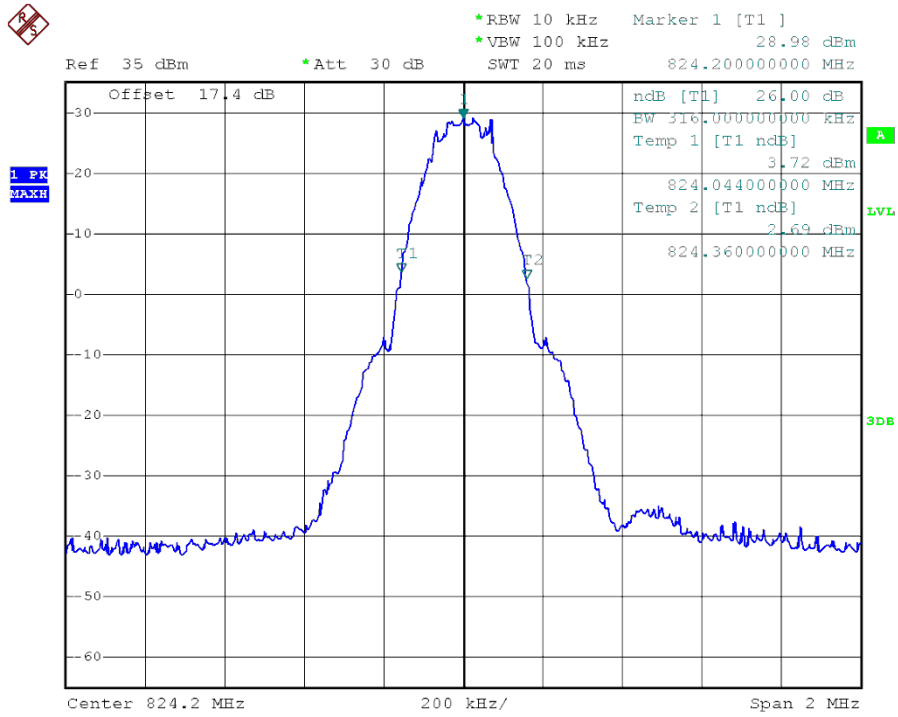
2.2.3 Test Verdict

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

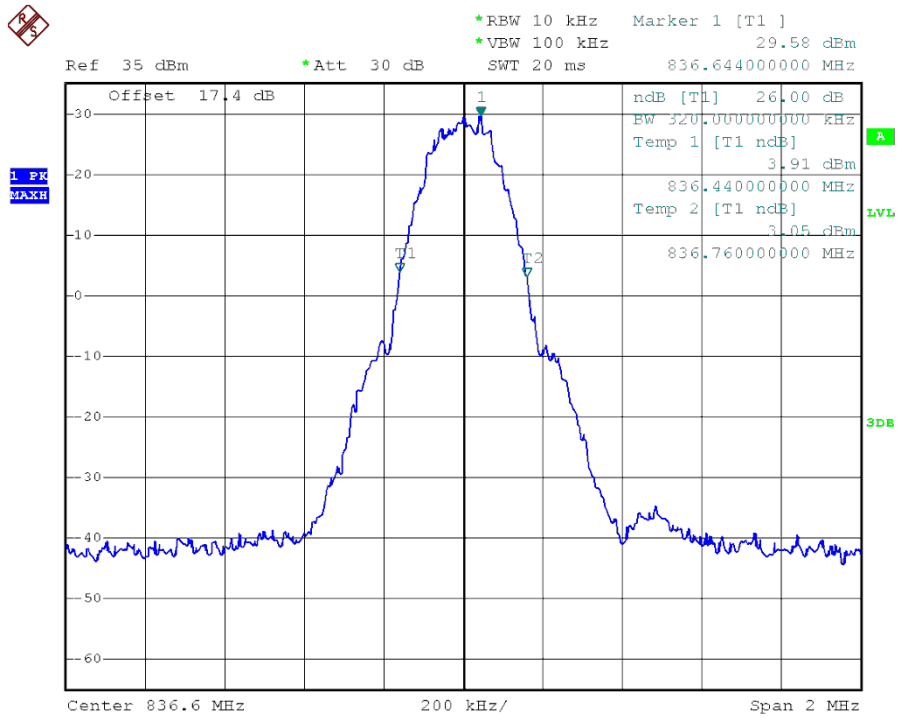
1. Test Verdict:

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
GSM 850MHz	128	824.2	316.00kHz	244.00kHz	Plot A1
	190	836.6	320.00 kHz	248.00kHz	Plot B1
	251	848.8	320.00 kHz	244.00kHz	Plot C1
GSM 1900MHz	512	1850.2	324.00 kHz	244.00kHz	Plot D1
	661	1880.0	324.00 kHz	244.00kHz	Plot E1
	810	1909.8	324.00 kHz	244.00kHz	Plot F1
GPRS 850MHz	128	824.2	324.00 kHz	244.00kHz	Plot A2
	190	836.6	320.00 kHz	248.00kHz	Plot B2
	251	848.8	320.00 kHz	248.00kHz	Plot C2
GPRS 1900MHz	512	1850.2	316.00 kHz	248.00kHz	Plot D2
	661	1880.0	320.00 kHz	244.00kHz	Plot E2
	810	1909.8	320.00 kHz	244.00kHz	Plot F2

2. Test Plots:



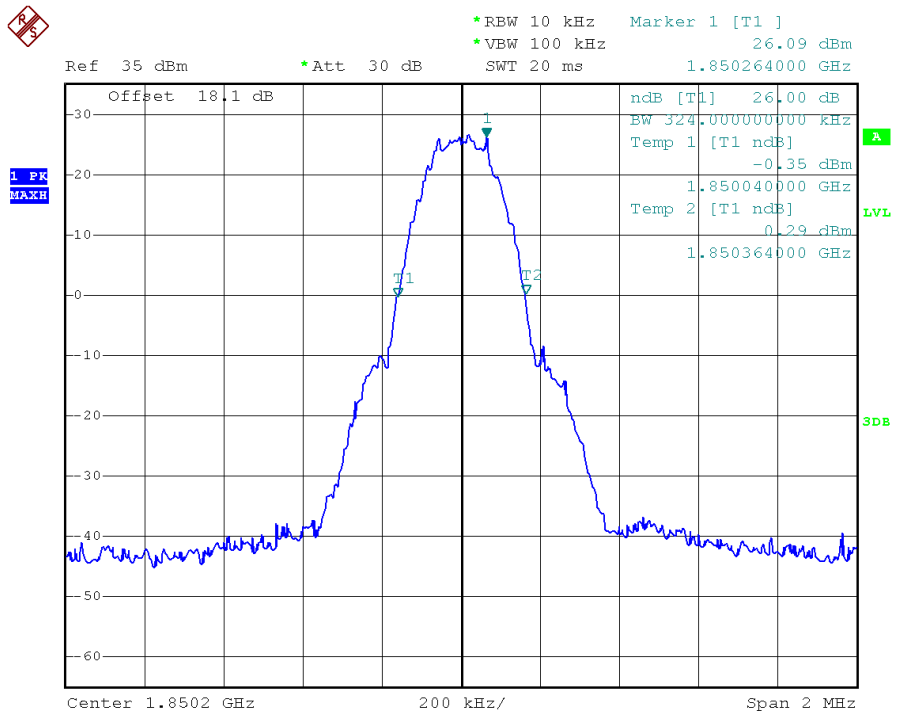
(Plot A1: GSM 850MHz Channel = 128@26dB bandwidth)



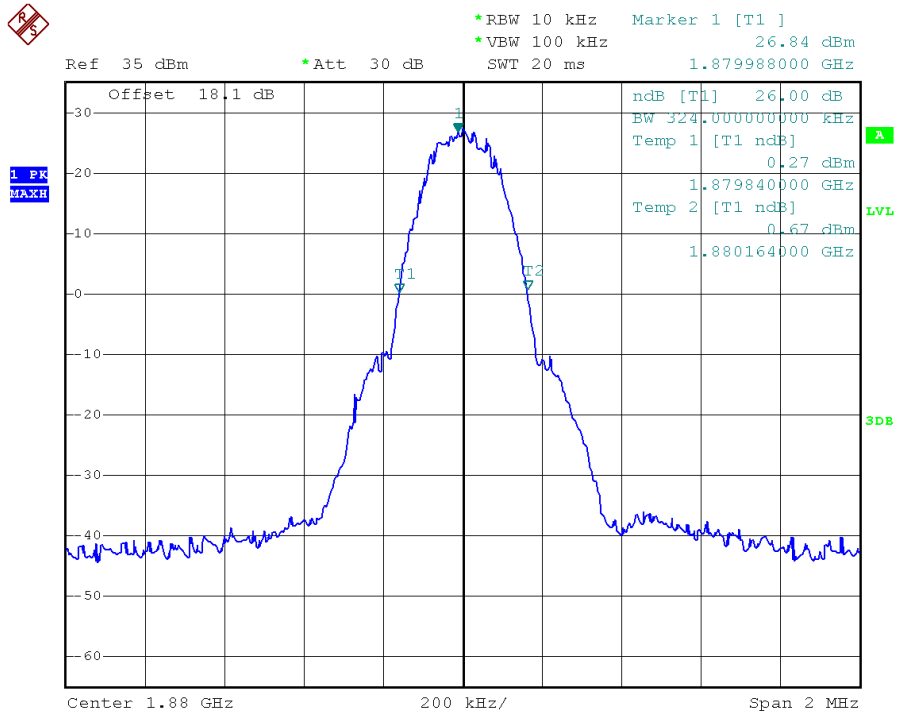
(Plot B1: GSM 850MHz Channel = 190@26dB bandwidth)



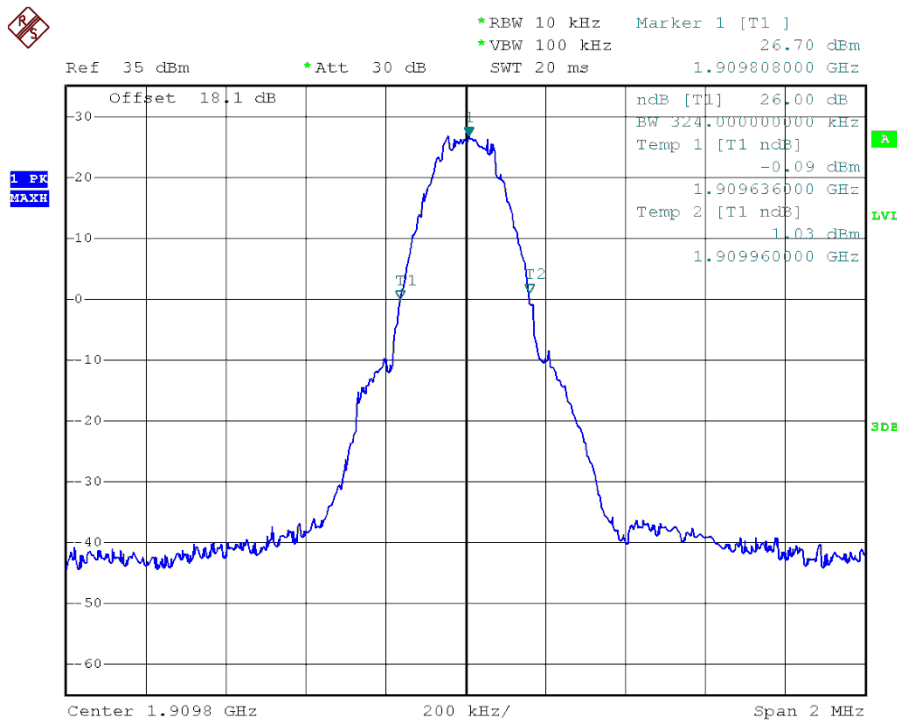
(Plot C1: GSM 850MHz Channel = 251@26dB bandwidth)



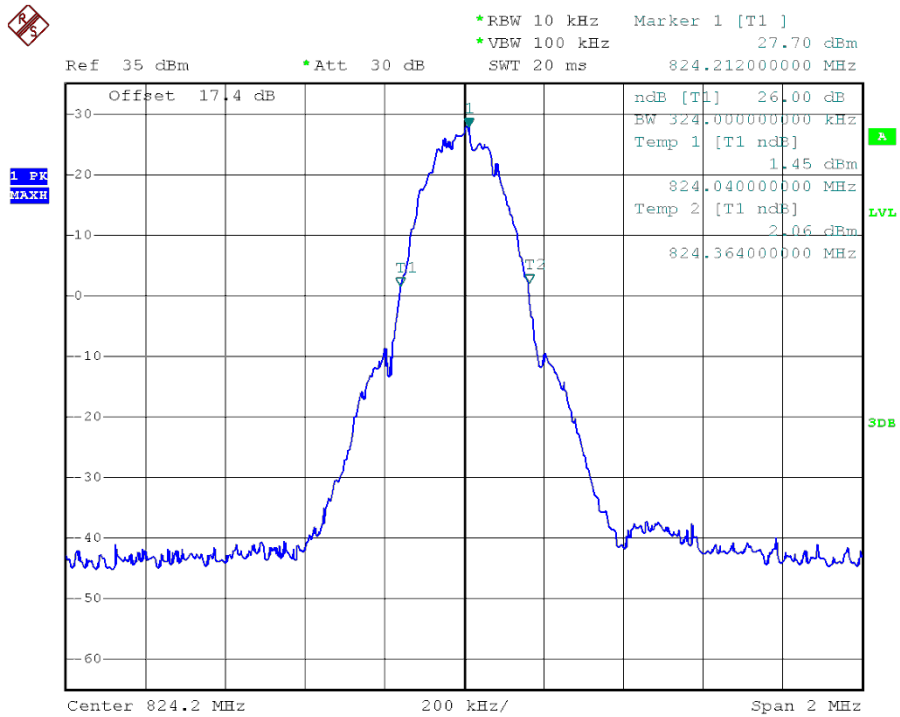
(Plot D1: GSM 1900MHz Channel = 512@26dB bandwidth)



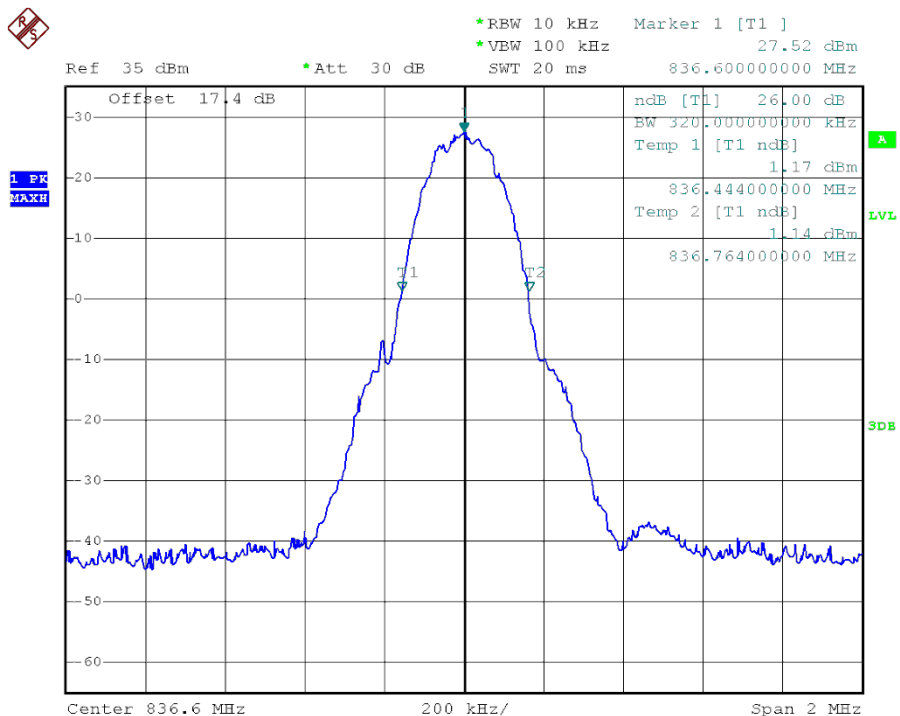
(Plot E1: GSM 1900MHz Channel = 661 @ 26dB bandwidth)



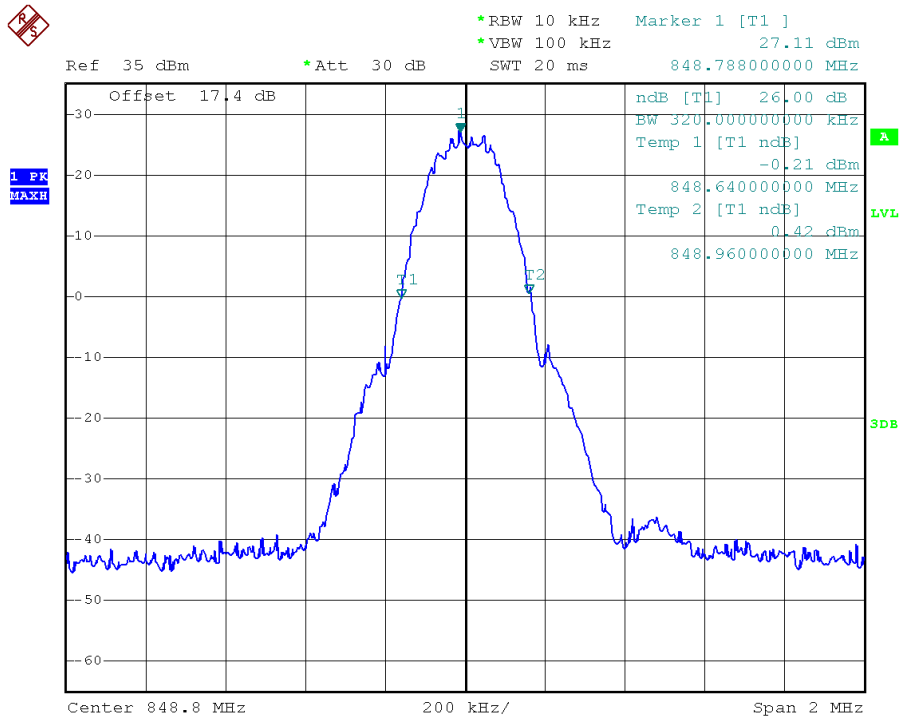
(Plot F1: GSM 1900MHz Channel = 810 @ 26dB bandwidth)



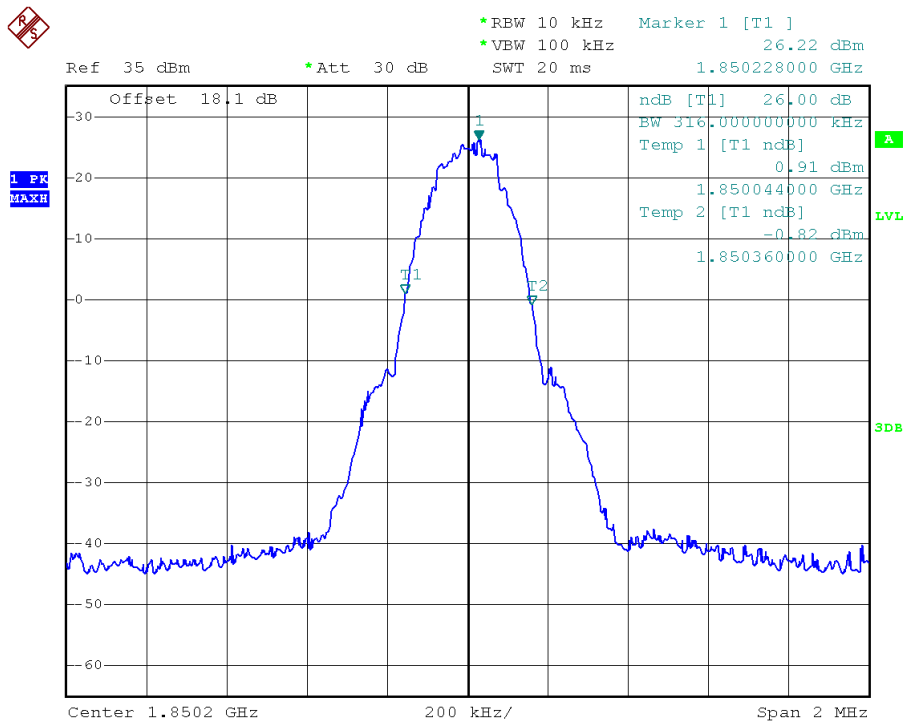
(Plot A2: GPRS 850MHz Channel = 128@26dB bandwidth)



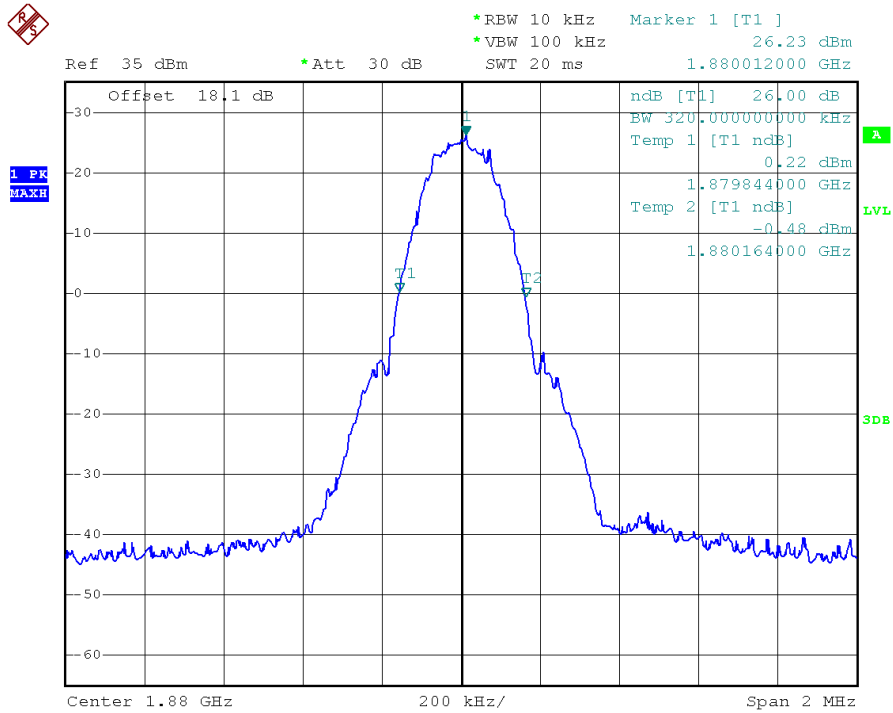
(Plot B2: GPRS 850MHz Channel = 190@26dB bandwidth)



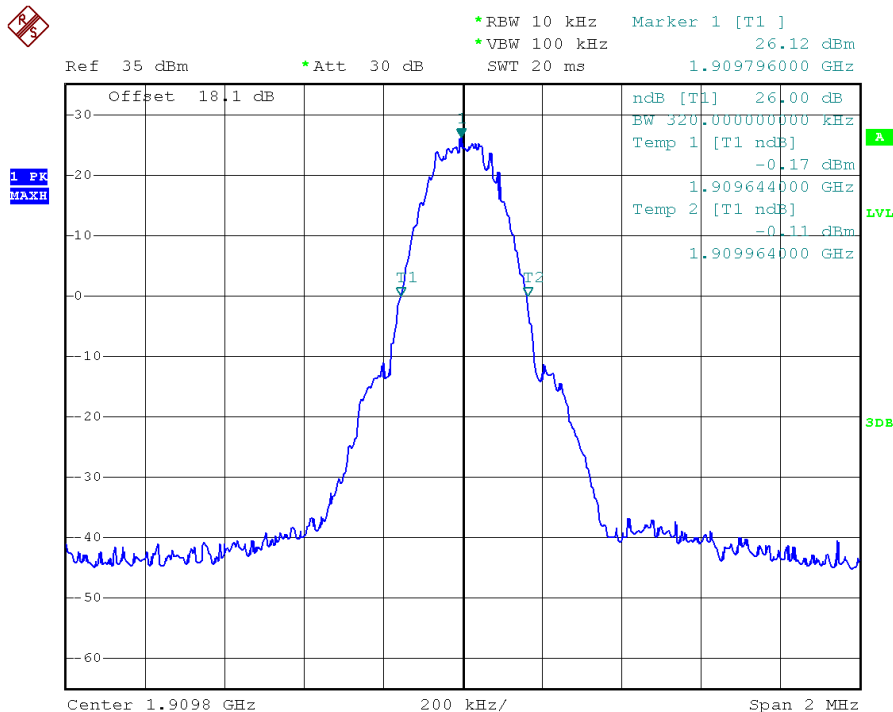
(Plot C2: GPRS 850MHz Channel = 251@26dB bandwidth)



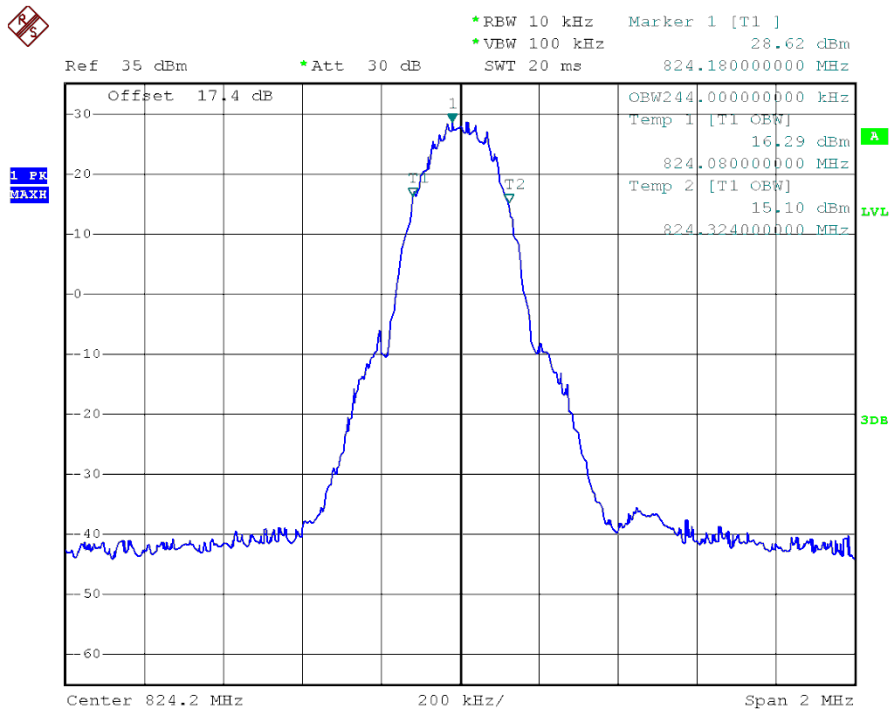
(Plot D2: GPRS 1900MHz Channel = 512@26dB bandwidth)



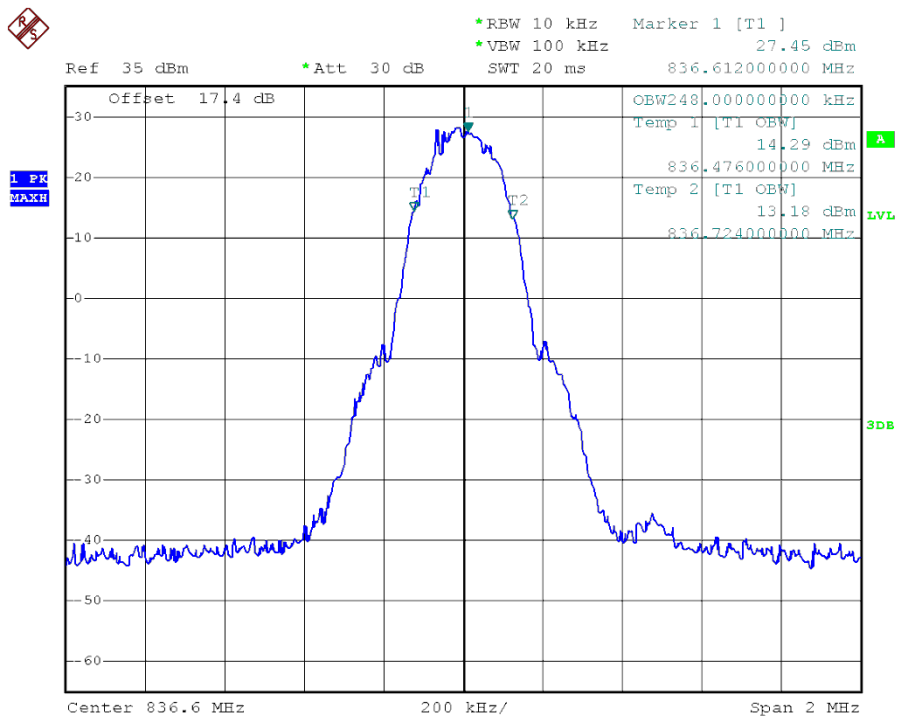
(Plot E2: GPRS 1900MHz Channel = 661 @ 26dB bandwidth)



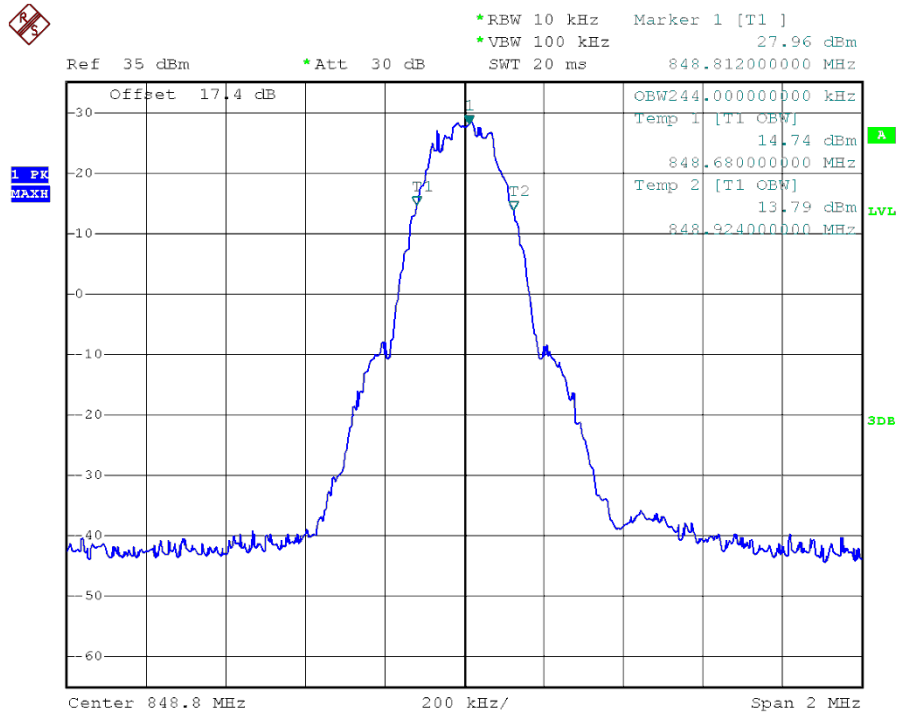
(Plot F2: GPRS 1900MHz Channel = 810 @ 26dB bandwidth)



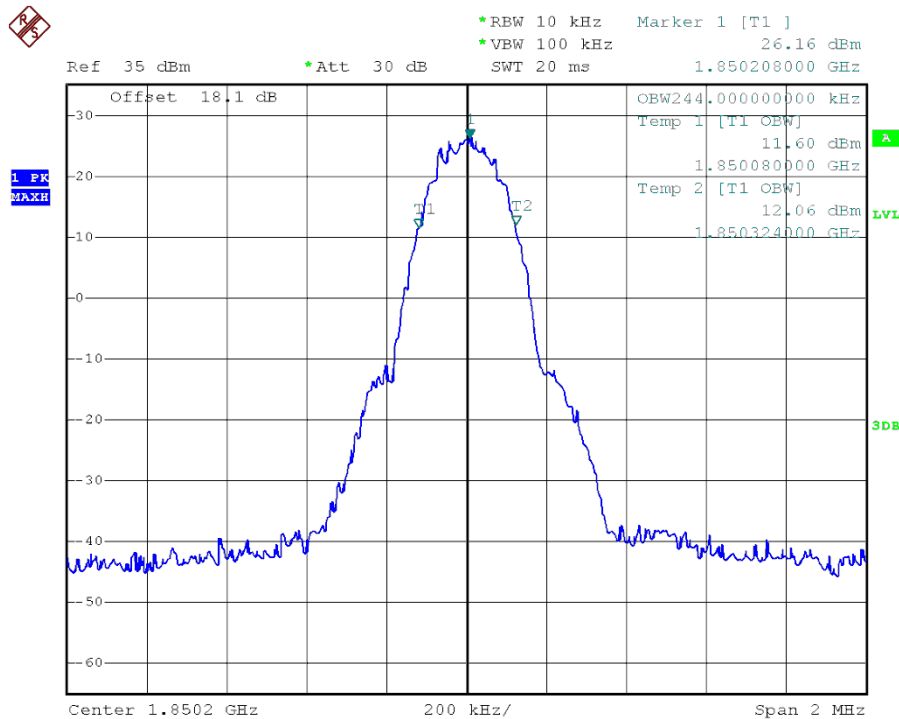
(Plot A2: GSM 850MHz Channel = 128@99% Occupied Bandwidth)



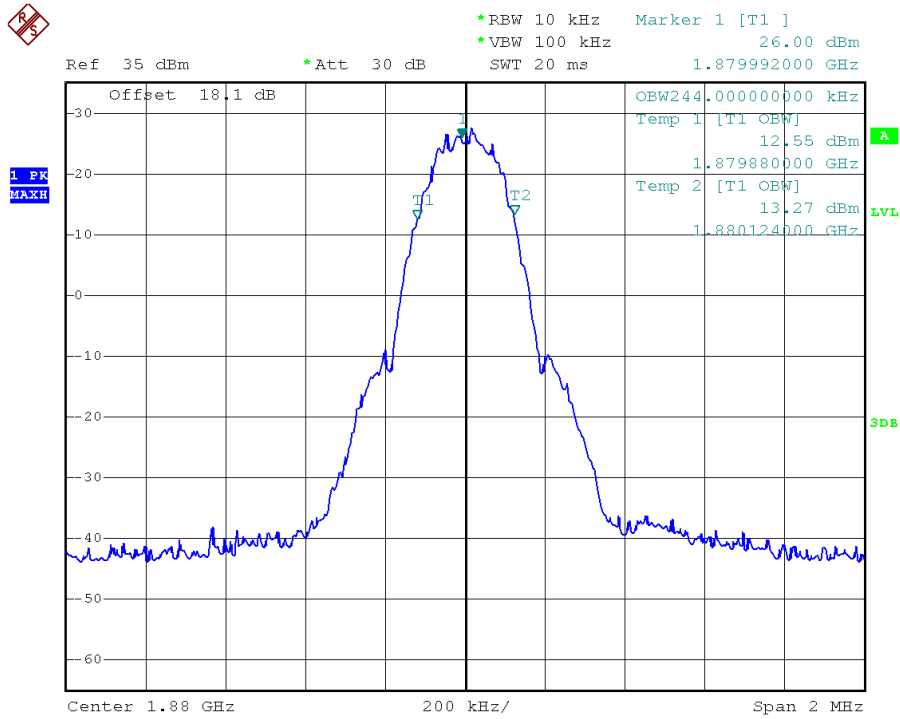
(Plot B2: GSM 850MHz Channel = 190@99% Occupied Bandwidth)



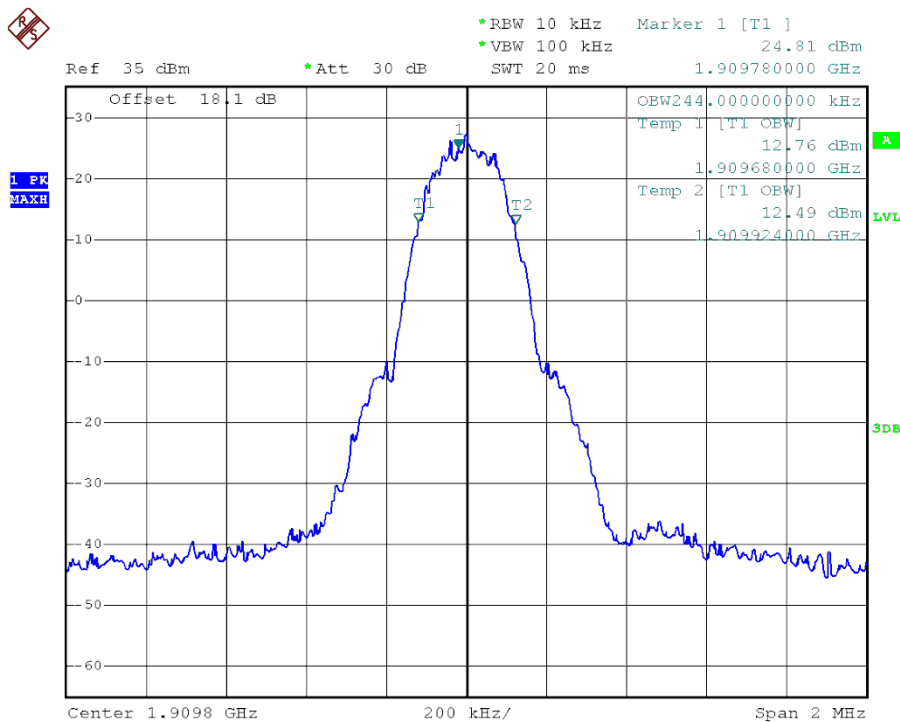
(Plot C2: GSM 850MHz Channel = 251 @99% Occupied Bandwidth)



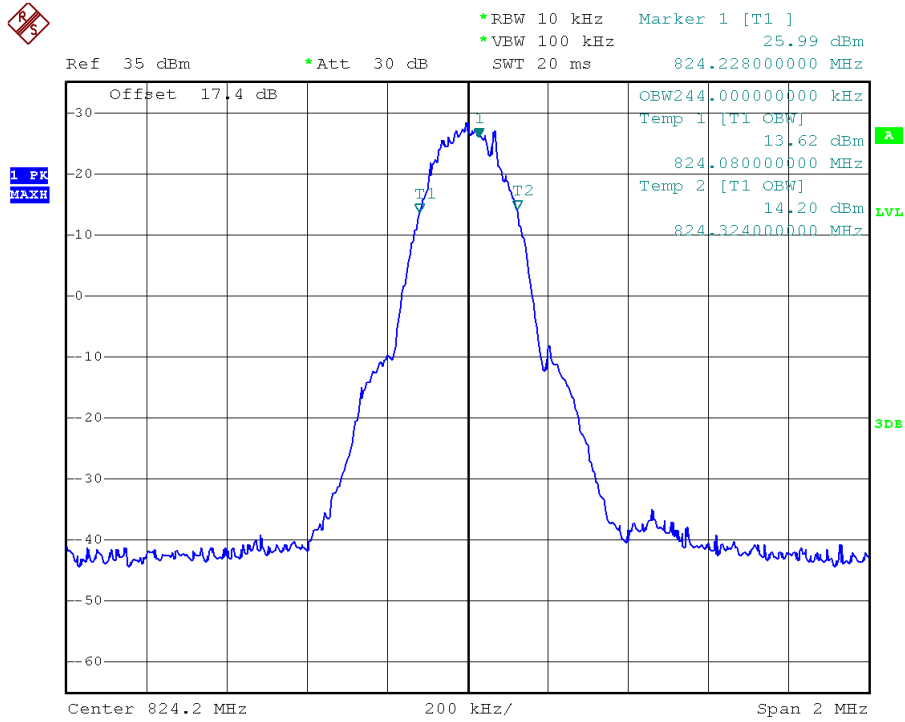
(Plot D2: GSM 1900MHz Channel = 512 @99% Occupied Bandwidth)



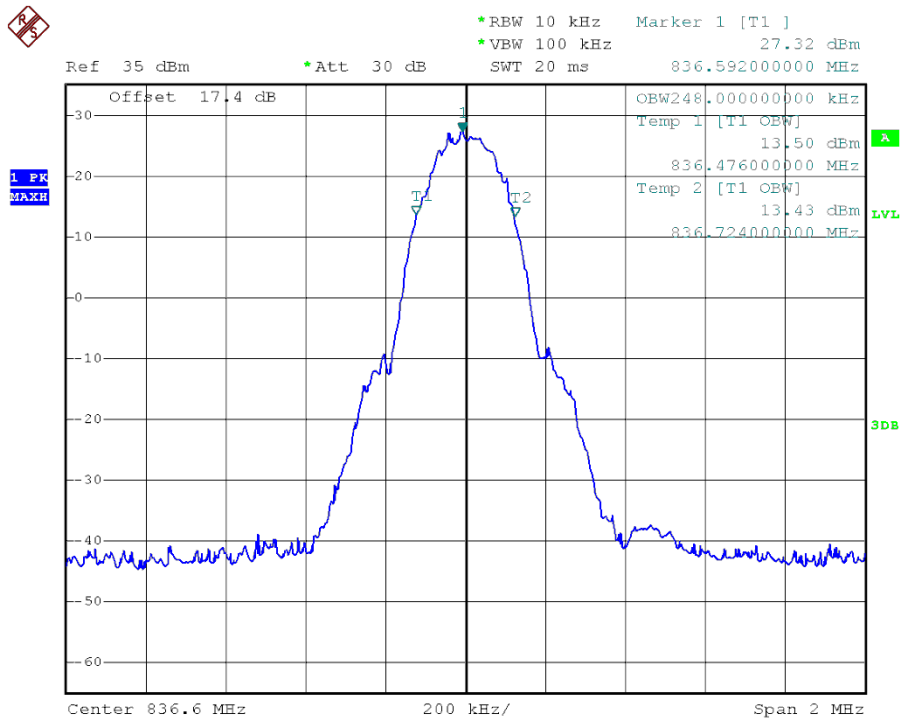
(Plot E2: GSM 1900MHz Channel = 661@99% Occupied Bandwidth)



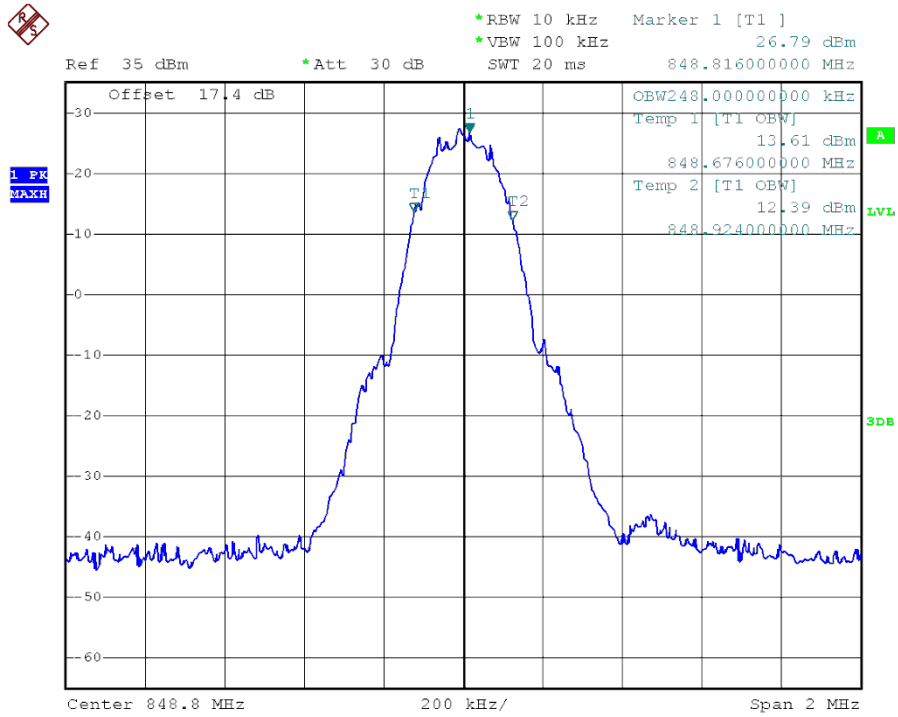
(Plot F2: GSM 1900MHz Channel = 810@99% Occupied Bandwidth)



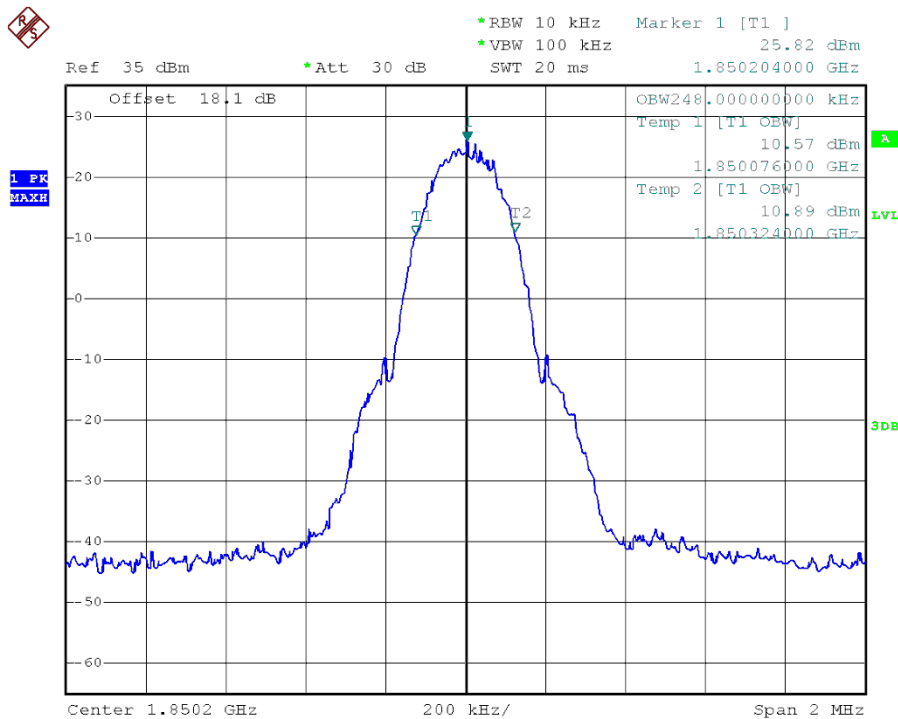
(Plot G2: GPRS 850MHz Channel = 128@99% Occupied Bandwidth)



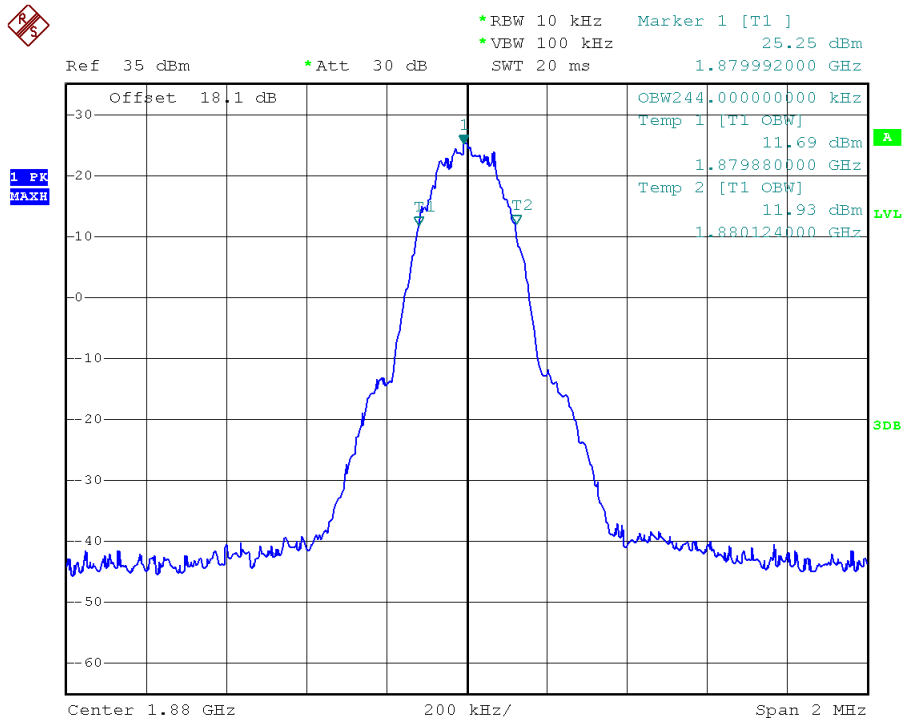
(Plot H2: GPRS 850MHz Channel = 190@99% Occupied Bandwidth)



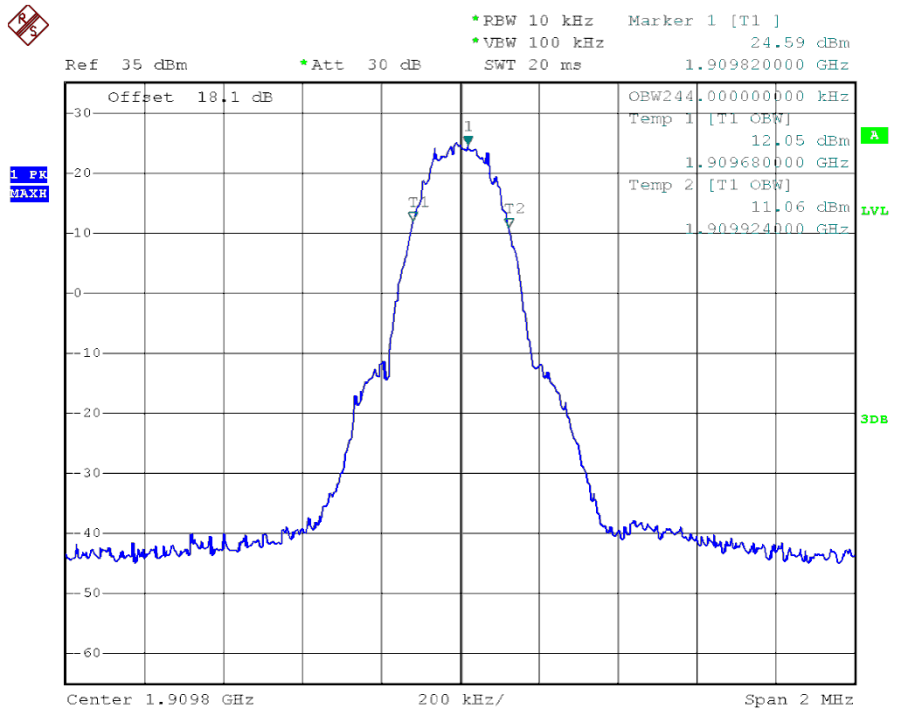
(Plot I2: GPRS 850MHz Channel = 251@99% Occupied Bandwidth)



(Plot J2: GPRS 1900MHz Channel = 512@99% Occupied Bandwidth)



(Plot K2: GPRS 1900MHz Channel = 661@99% Occupied Bandwidth)



(Plot L2: GPRS 1900MHz Channel = 810@99% Occupied Bandwidth)

2.3 Frequency Stability

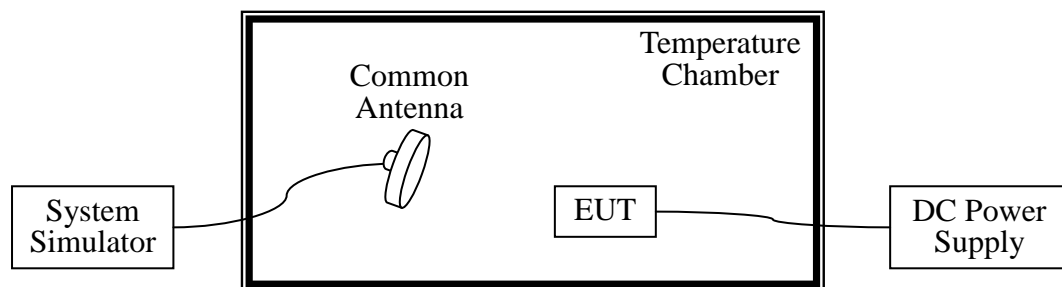
2.3.1 Requirement

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.

2.3.2 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
System Simulator	Agilent	E5515C	GB43130131	2013.06.10
DC Power Supply	Good Will	GPS-3030DD	EF920938	2013.06.10
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2013.06.10

The Cal. Interval was one year.

2.3.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.4VDC, which are specified by the applicant; the normal temperature here used is 25 °C. The frequency deviation limit of 850MHz band is ± 2.0 ppm, and 1900MHz is ± 1 ppm

1. GSM 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	12.02	± 2060.5	-9.14	± 2091.5	15.04	± 2122	PASS
	-20	-11.24		12.71		18.42		
	-10	17.08		-11.01		10.11		
	0	-24.01		21.09		24.34		
	+10	-13.00		11.04		10.14		
	+20	-9.31		-12.16		-10.55		
	+30	20.75		-12.05		10.41		
	+40	25.34		-29.71		-21.85		
+50	-22.11	10.31	11.54					
4.2	+25	21.04	10.61	25.17				
3.4	+25	22.21	-20.74	-14.97				

2. GSM 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	-1.34	± 1850.2	3.88	± 1880.0	21.07	± 1909.8	PASS
	-20	20.71		-12.15		19.22		
	-10	15.34		30.07		-12.90		
	0	-2.11		11.09		12.66		
	+10	24.77		-12.84		5.05		
	+20	-15.34		-12.31		13.02		
	+30	-14.87		20.12		-23.01		
	+40	41.19		14.13		10.52		
+50	4.79	-18.57	2.41					
4.2	+25	11.17	3.17	-6.74				
3.4	+25	32.01	-2.06	-21.06				



3. GPRS 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	-23.10	±2060.5	20.71	±2091.5	7.59	±2122	PASS
	-20	38.28		7.39		-19.33		
	-10	-2.15		-17.07		23.07		
	0	40.10		21.01		27.44		
	+10	-1.94		-27.11		3.92		
	+20	-9.06		-9.13		9.79		
	+30	12.54		27.02		-16.87		
	+40	26.61		1.63		-22.17		
+55	9.98	-13.65	-10.91					
4.2	+25	25.71	13.99	-21.01				
3.4	+25	-17.22	6.25	26.73				

4. GPRS 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	-24.07	±1850.2	0.81	±1880.0	31.12	±1909.8	PASS
	-20	25.33		31.01		-22.04		
	-10	11.02		-21.74		-2.771		
	0	12.74		-21.02		13.23		
	+10	-4.76		8.01		-5.37		
	+20	-12.17		-2.19		13.24		
	+30	14.04		24.11		-26.70		
	+40	15.02		-10.08		-9.01		
+55	-22.11	26.21	-20.54					
4.2	+25	9.89	13.13	16.01				
3.4	+25	-18.37	-2.14	19.92				



2.4 Conducted Out of Band Emissions

2.4.1 Requirement

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

2.4.2 Test Description

See section 2.1.2 of this report.

2.4.3 Test Result

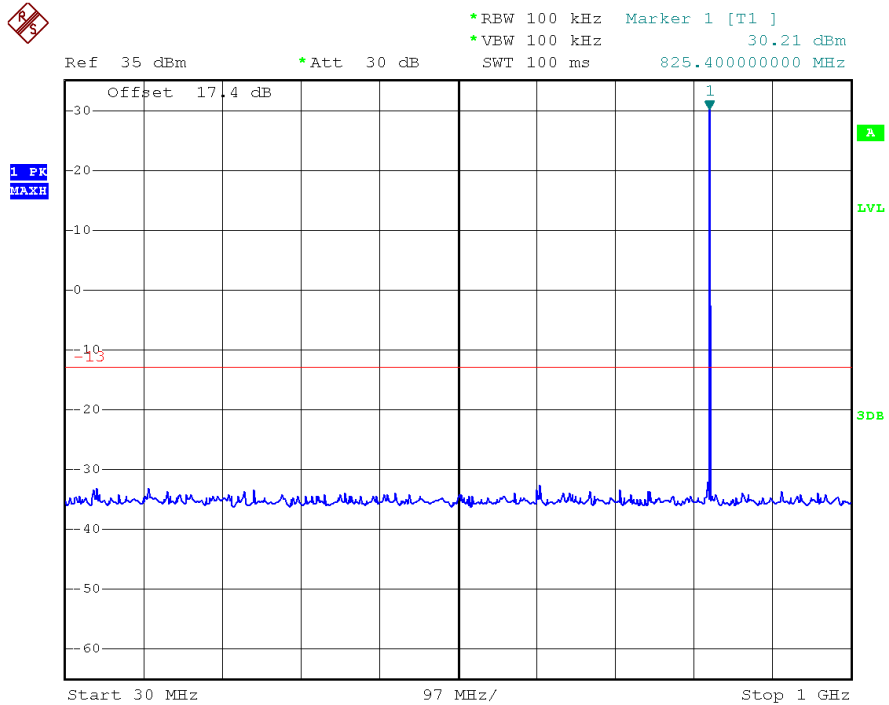
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

1. Test Verdict:

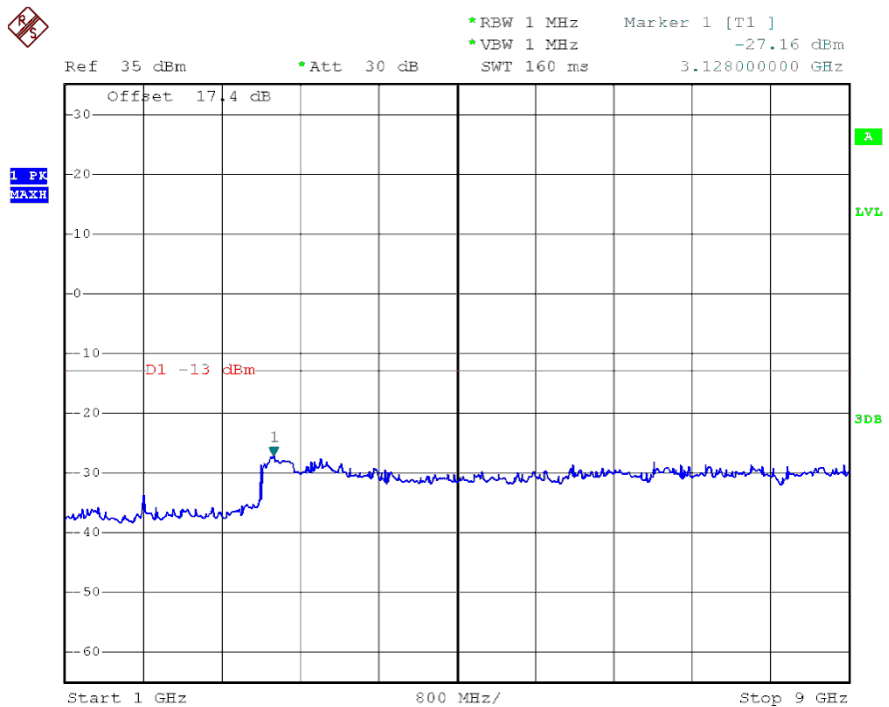
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-27.16	Plot A1toA2	-13	PASS
	190	836.6	-26.17	Plot A3toA4		PASS
	251	848.8	-27.06	Plot A5toA6		PASS
GSM 1900MHz	512	1850.2	-17.22	Plot B1toB3	-13	PASS
	661	1880.0	-18.50	Plot B4toB6		PASS
	810	1909.8	-17.92	Plot B7toB9		PASS
GPRS 850MHz	128	824.2	-27.72	Plot C1toC2	-13	PASS
	190	836.6	-26.59	Plot C3toC4		PASS
	251	848.8	-27.59	Plot C5toC6		PASS
GPRS 1900MHz	512	1850.2	-19.46	Plot D1toD3	-13	PASS
	661	1880.0	-18.61	Plot D4toD6		PASS
	810	1909.8	-18.57	Plot D7toD9		PASS

2. Test Plots for the Whole Measurement Frequency Range:

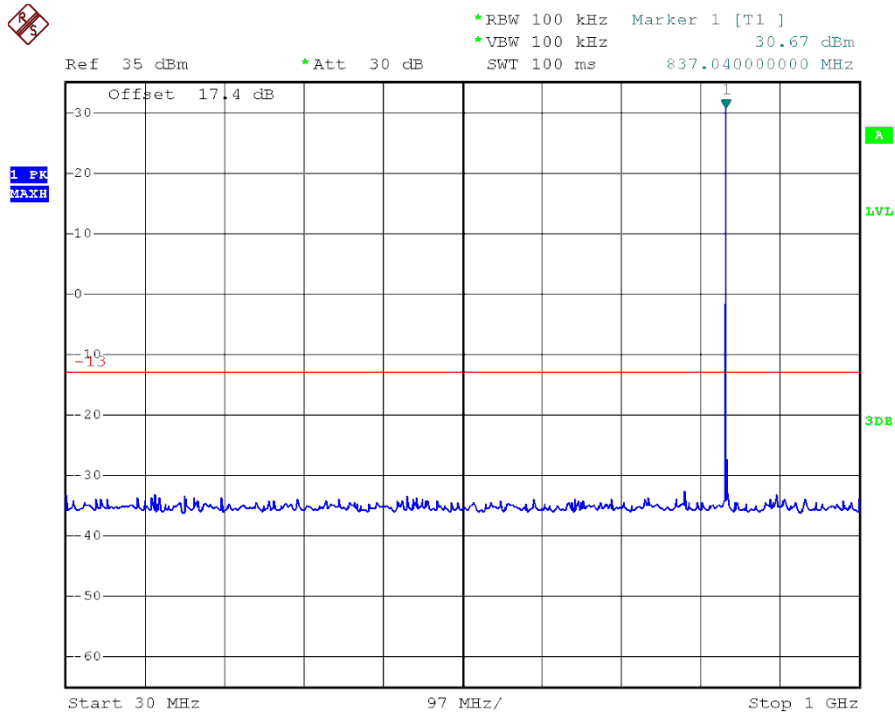
Note: the power of the EUT transmitting frequency should be ignored.



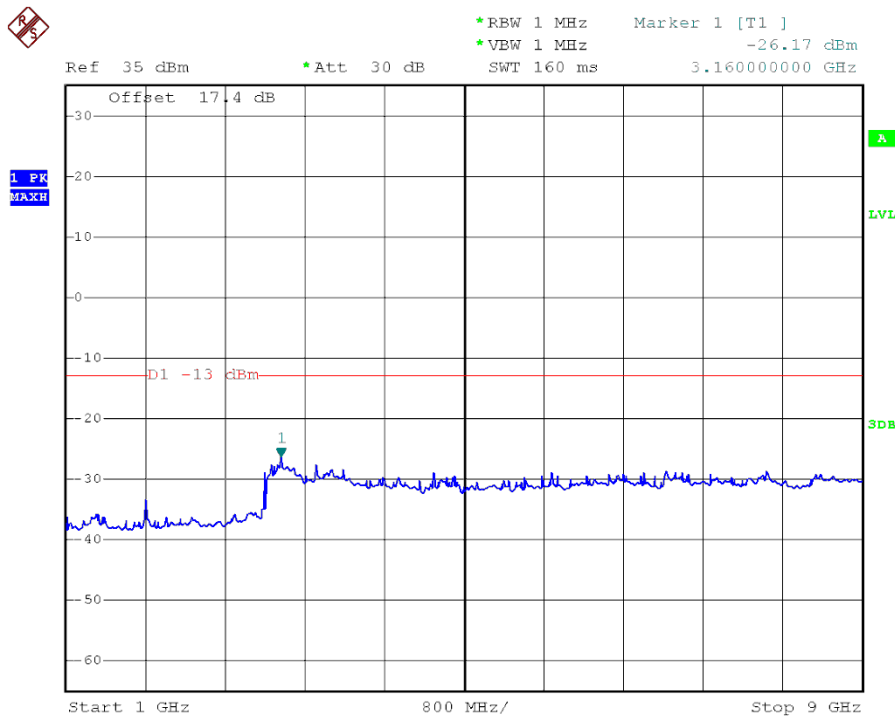
(Plot A1: GSM 850MHz Channel = 128, 30MHz to 1GHz)



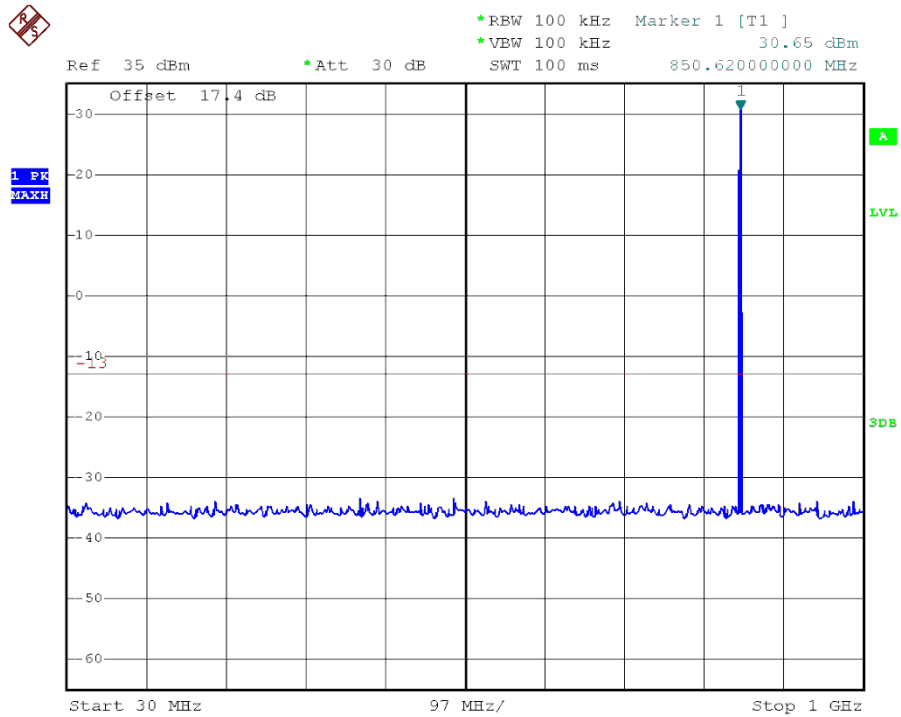
(Plot A2: GSM 850MHz Channel = 128, 1GHz to 9GHz)



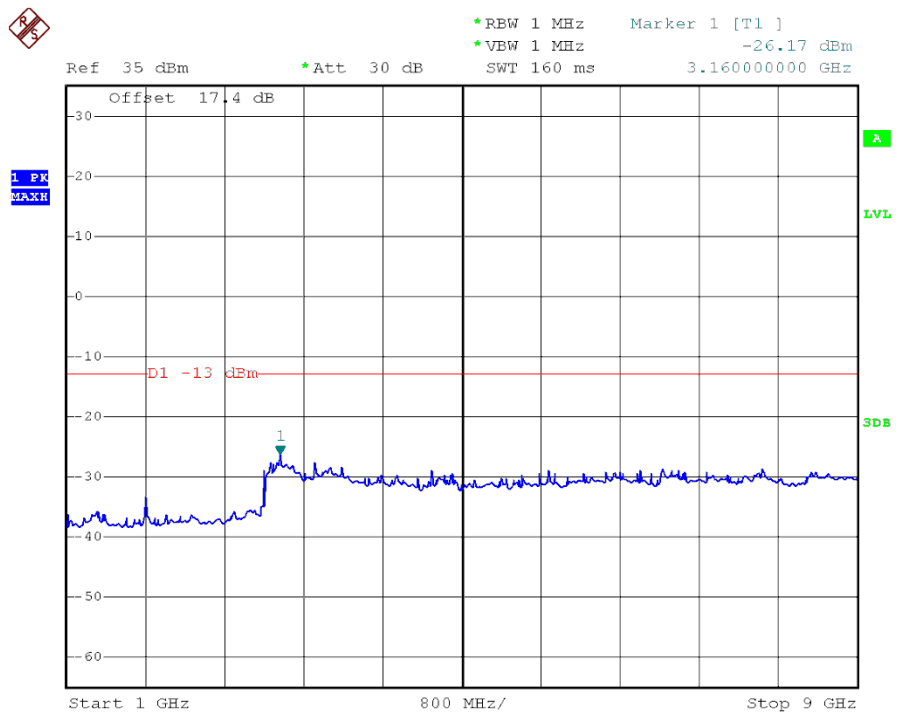
(Plot A3: GSM 850MHz Channel = 190, 30MHz to 1GHz)



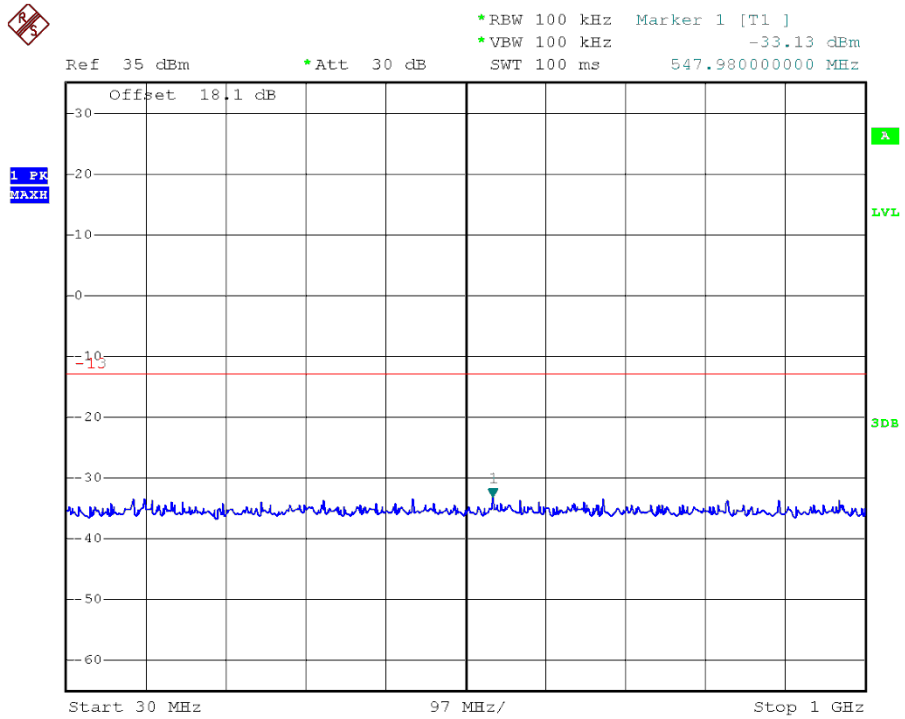
(Plot A4: GSM 850MHz Channel = 190, 1GHz to 9GHz)



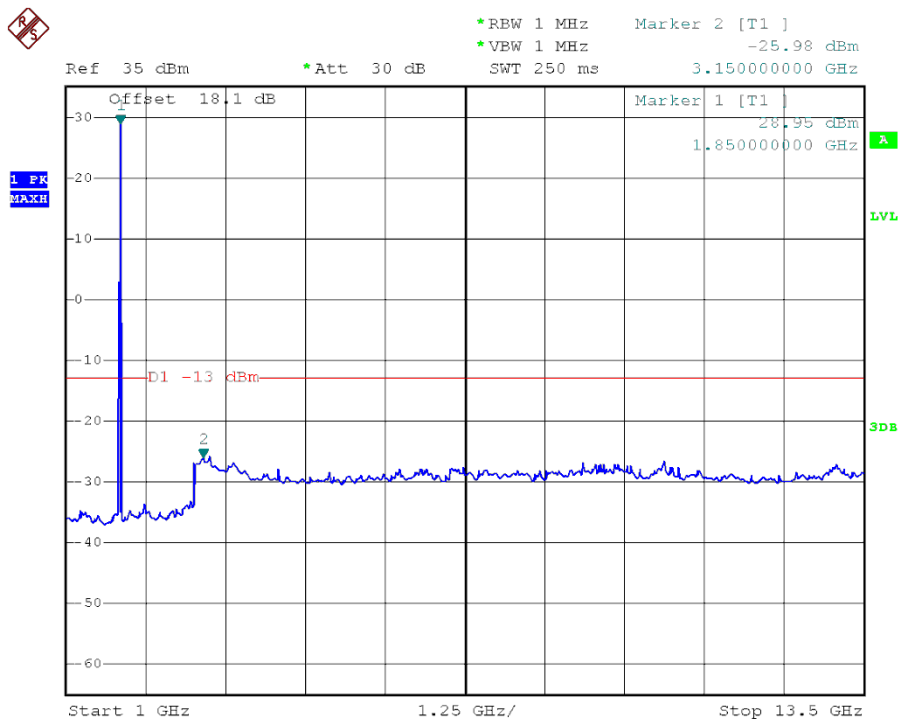
(Plot A5: GSM 850MHz Channel = 251, 30MHz to 1GHz)



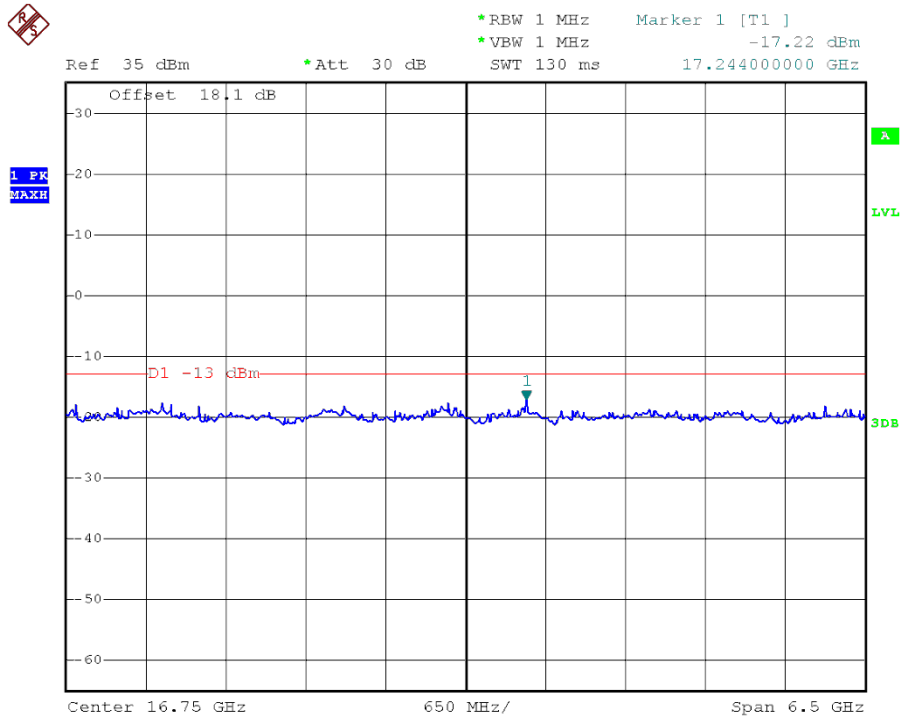
(Plot A6: GSM 850MHz Channel = 251, 1GHz to 9GHz)



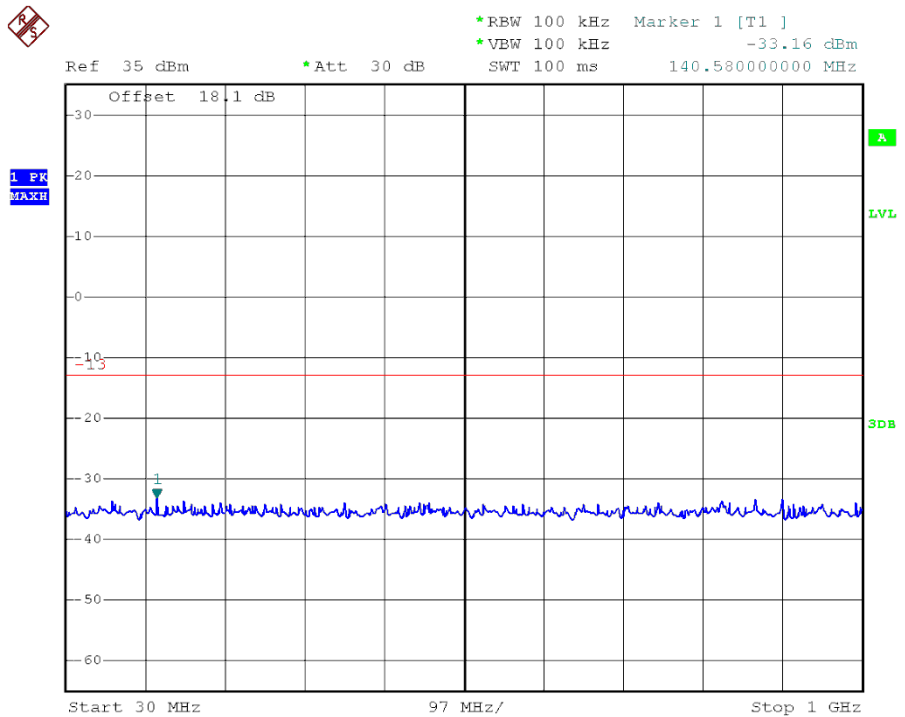
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



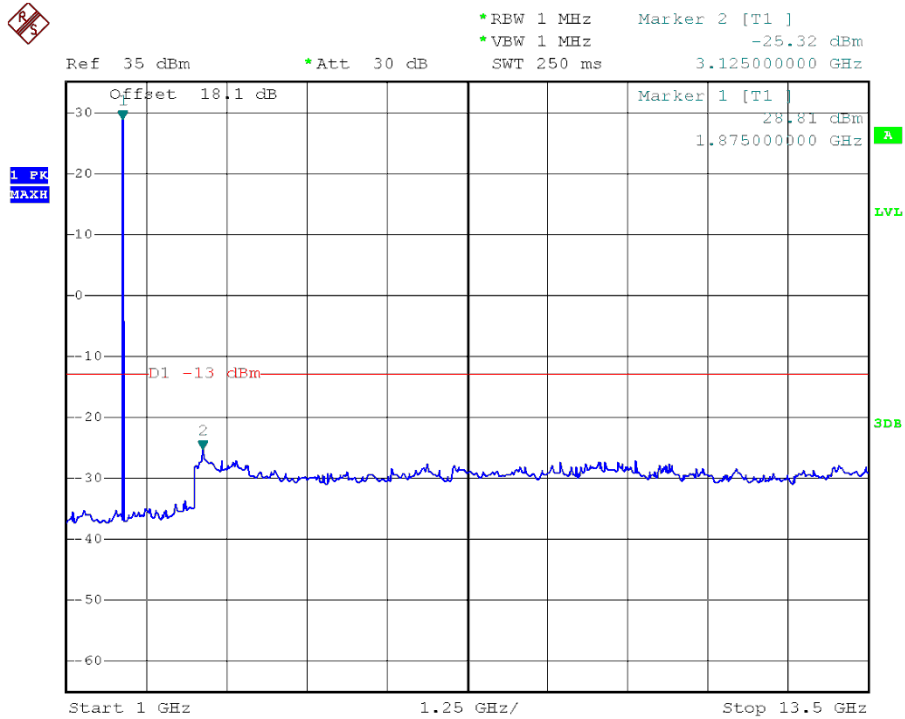
(Plot B2: GSM 1900MHz Channel = 512, 1GHz to 13.5GHz)



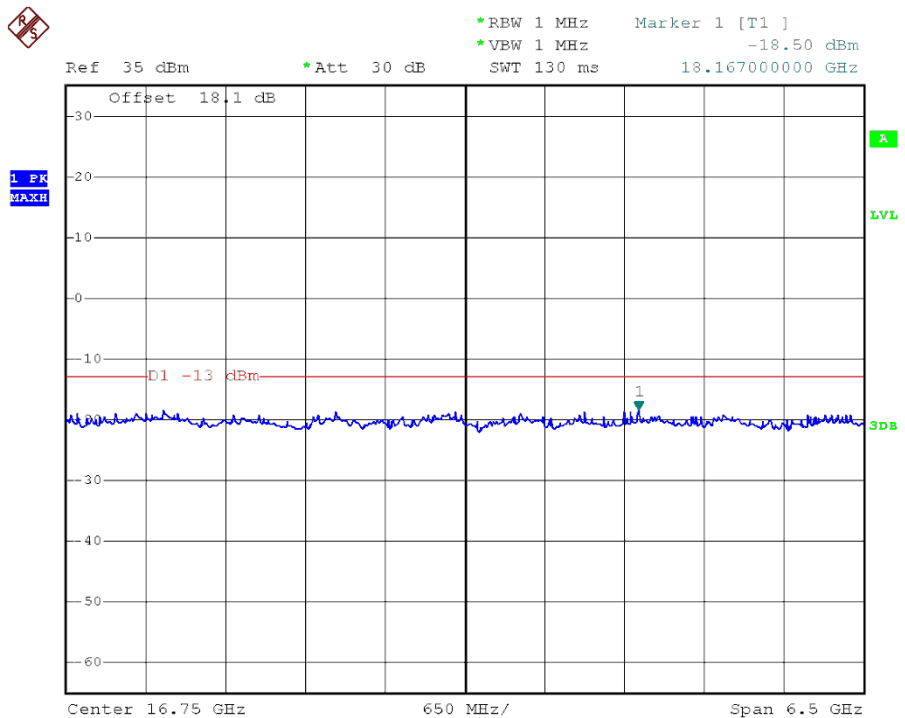
(Plot B3: GSM 1900MHz Channel = 512, 13.5GHz to 20GHz)



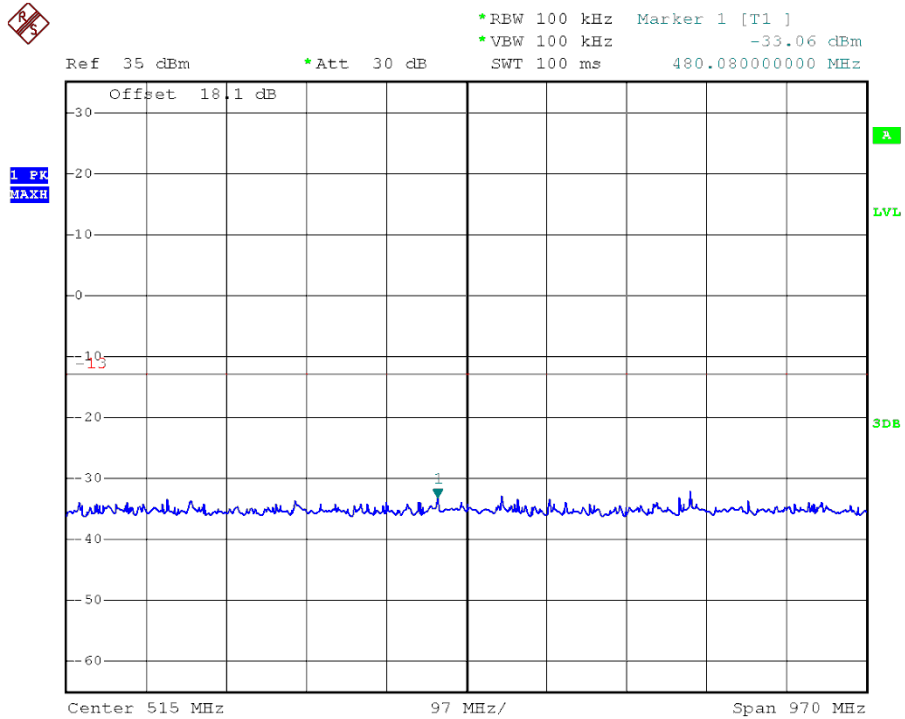
(Plot B4: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



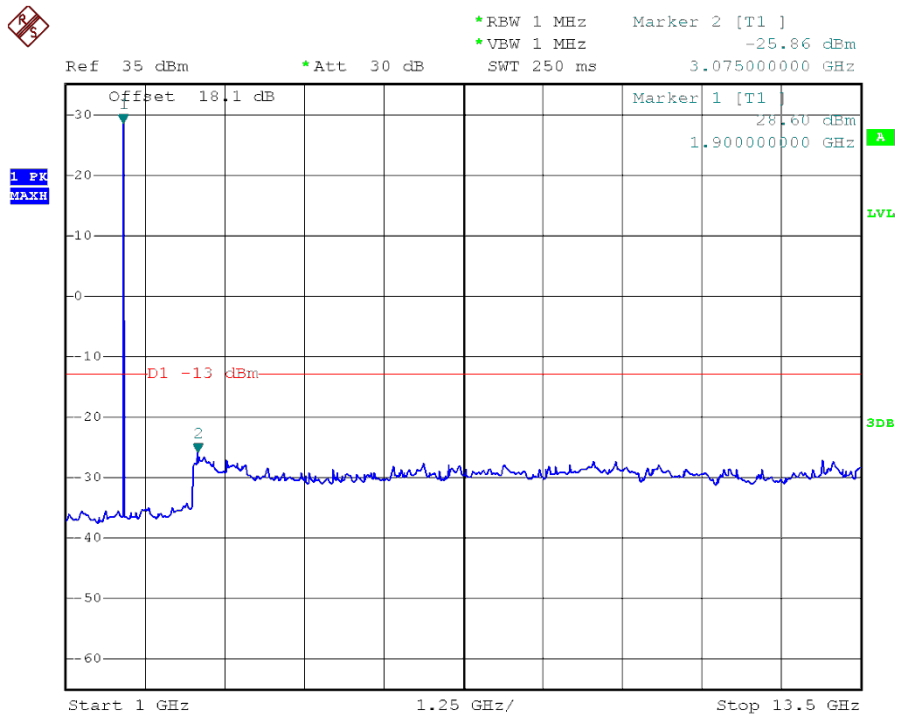
(Plot B5: GSM 1900MHz Channel = 661, 1GHz to 13.5GHz)



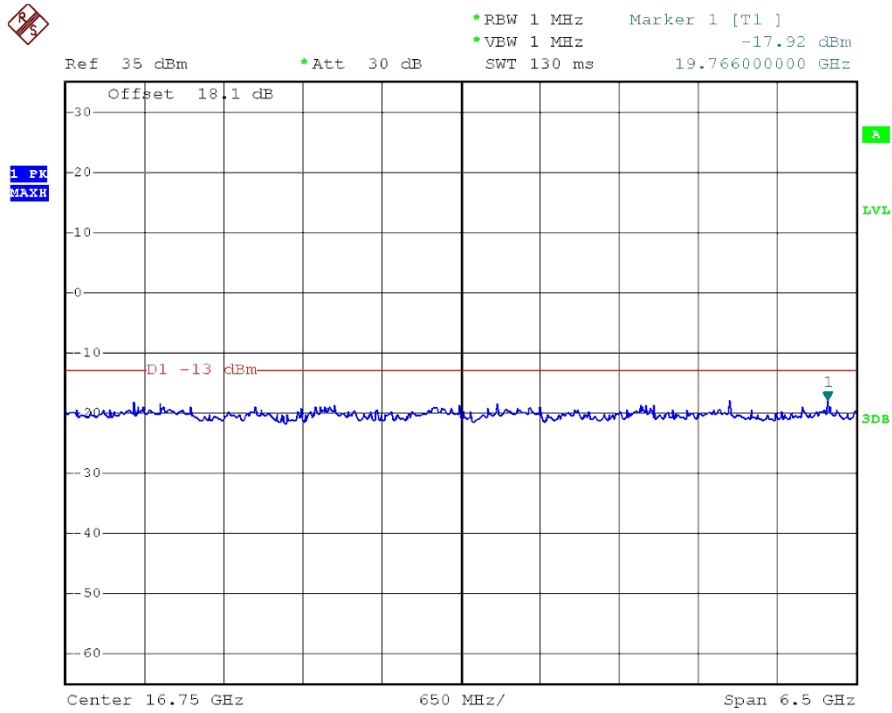
(Plot B6: GSM 1900MHz Channel = 661, 13.5GHz to 20GHz)



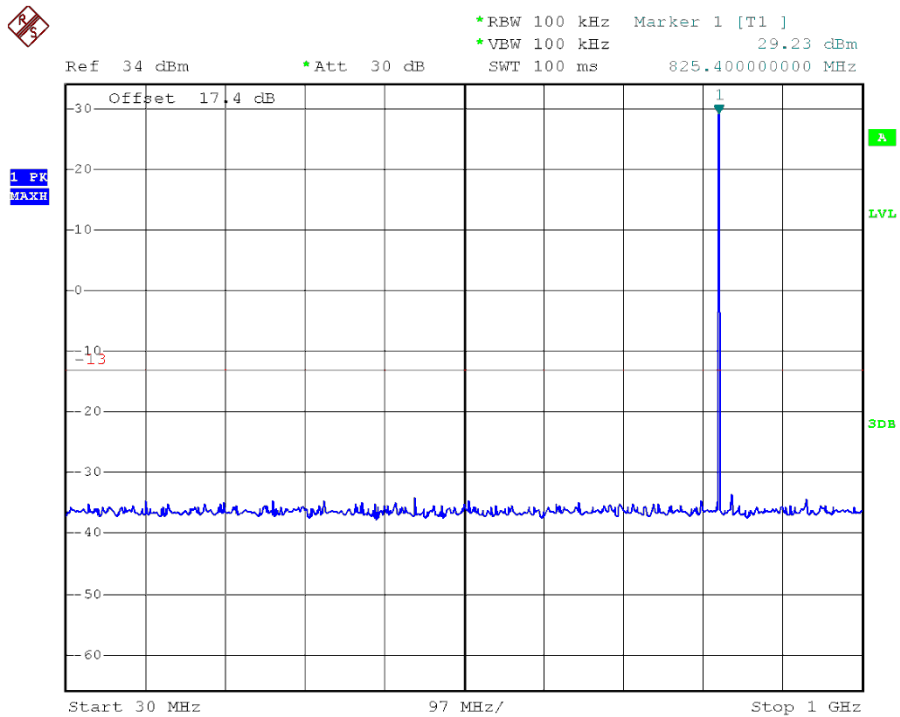
(Plot B7: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



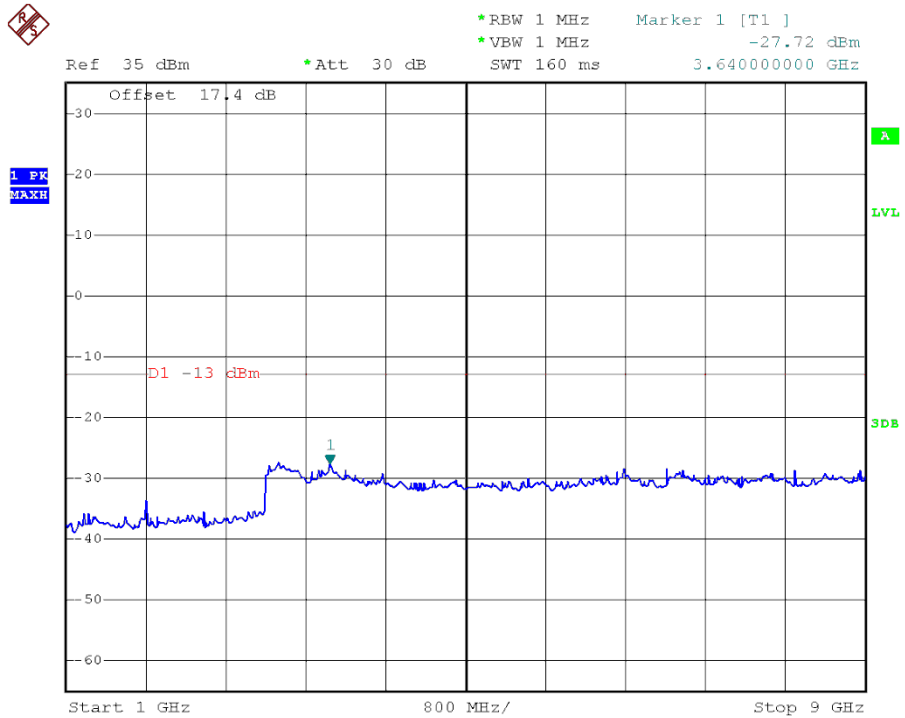
(Plot B8: GSM 1900MHz Channel = 810, 1GHz to 13.5GHz)



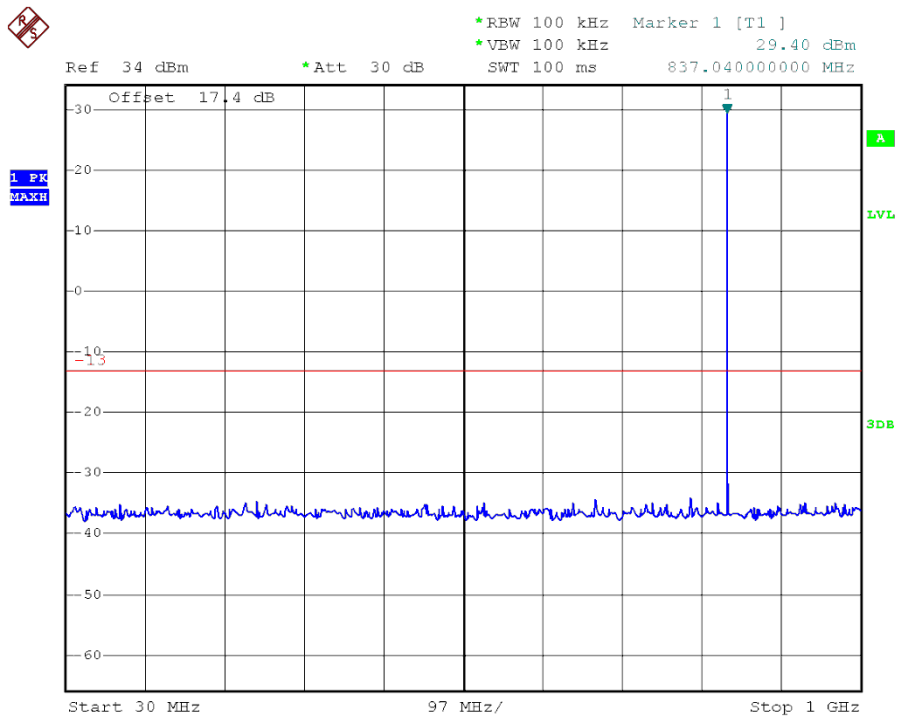
(Plot B8: GSM 1900MHz Channel = 810, 13.5GHz to 20GHz)



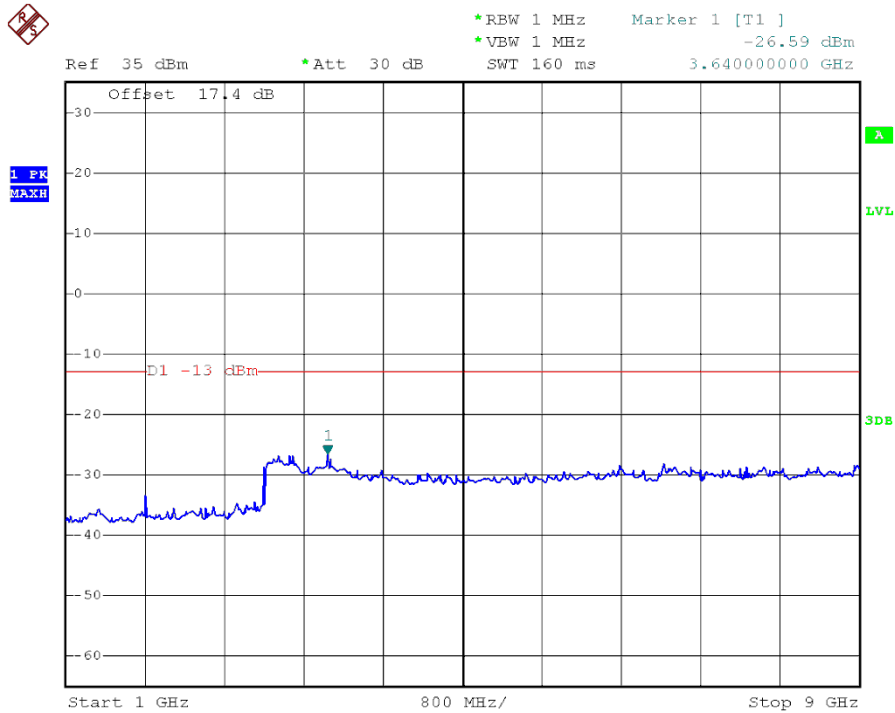
(Plot C1: GPRS 850MHz Channel = 128, 30MHz to 1GHz)



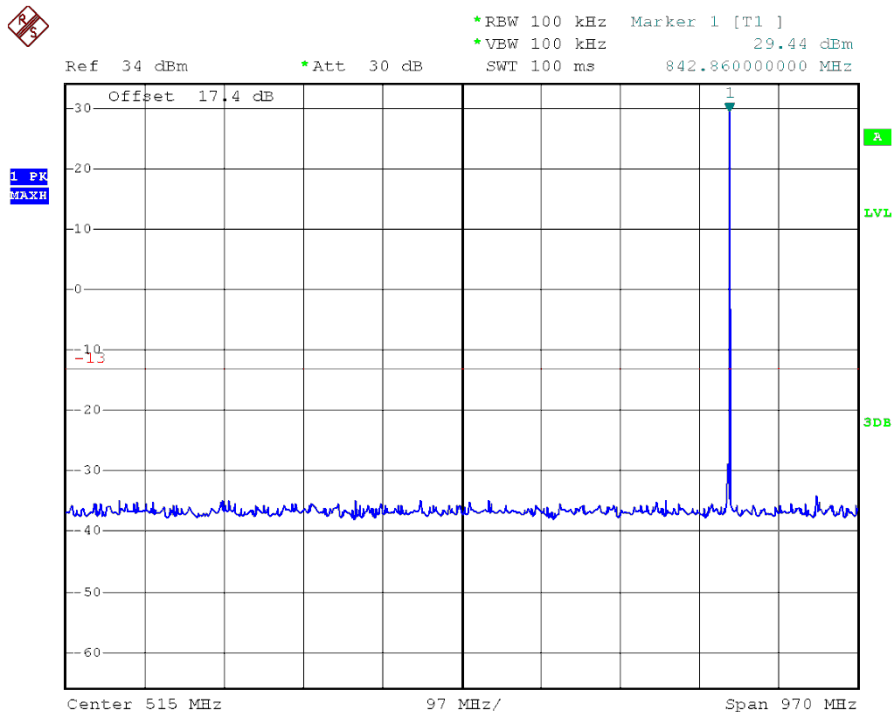
(Plot C2: GPRS 850MHz Channel = 128, 1GHz to 9GHz)



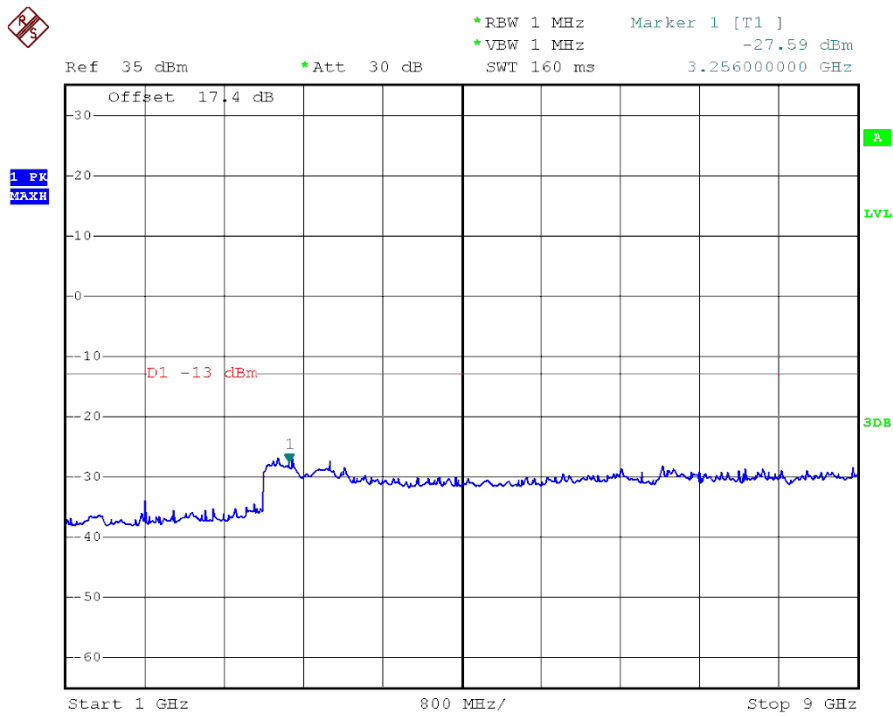
(Plot C3: GPRS 850MHz Channel = 190, 30MHz to 1GHz)



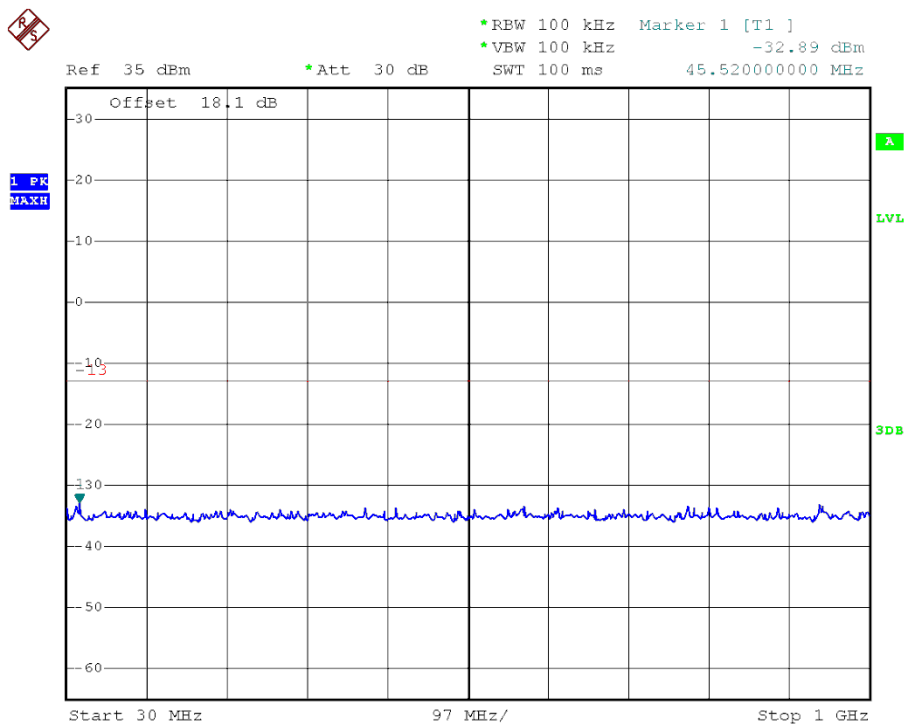
(Plot C4: GPRS 850MHz Channel = 190, 1GHz to 9GHz)



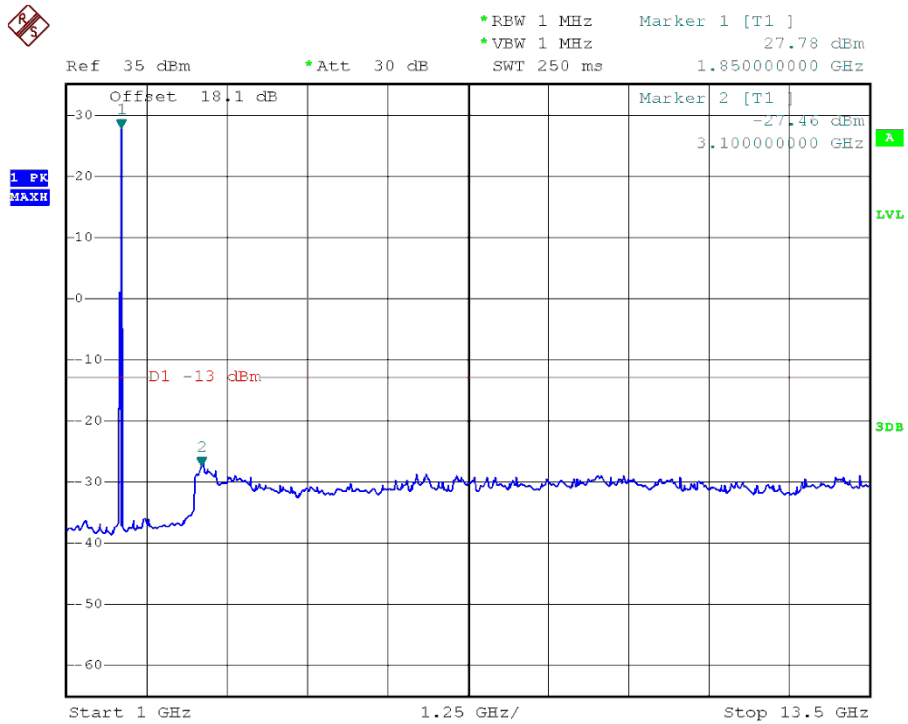
(Plot C5: GPRS 850MHz Channel = 251, 30MHz to 1GHz)



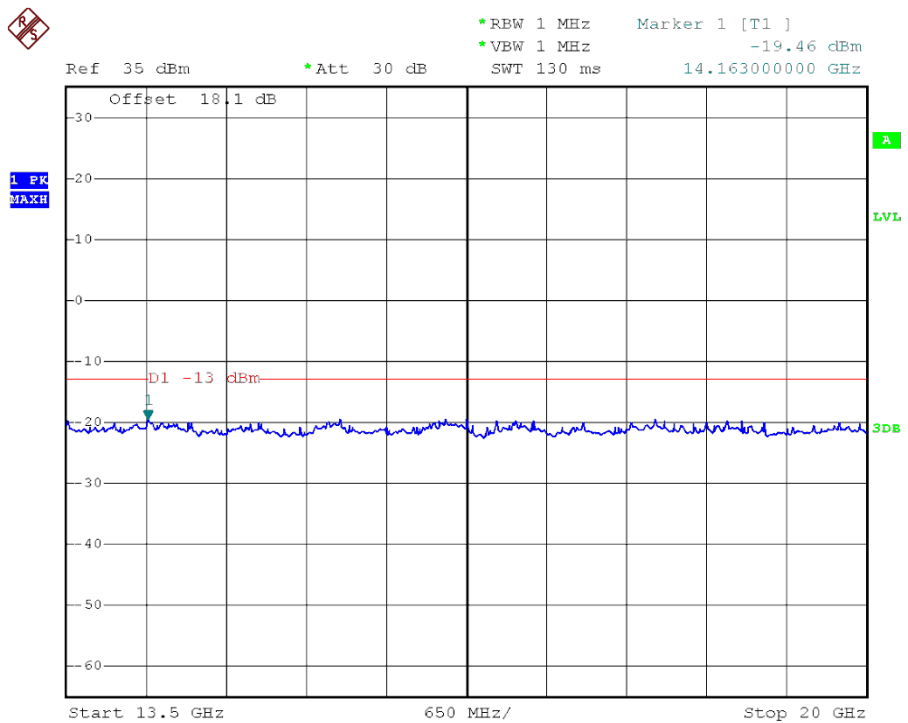
(Plot C6: GPRS 850MHz Channel = 251, 1GHz to 9GHz)



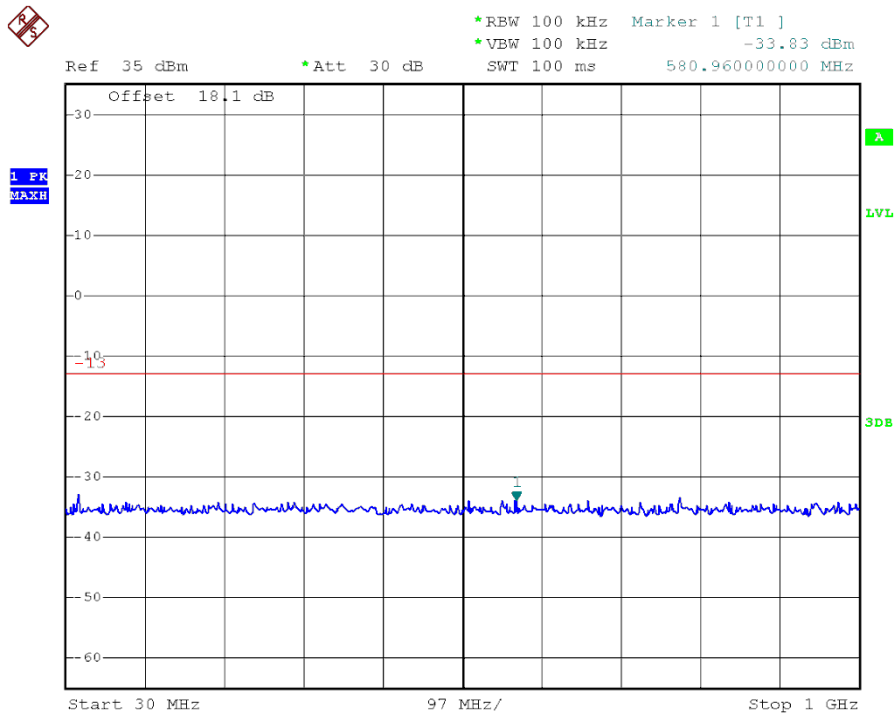
(Plot D1: GPRS 1900MHz Channel = 512, 30MHz to 1GHz)



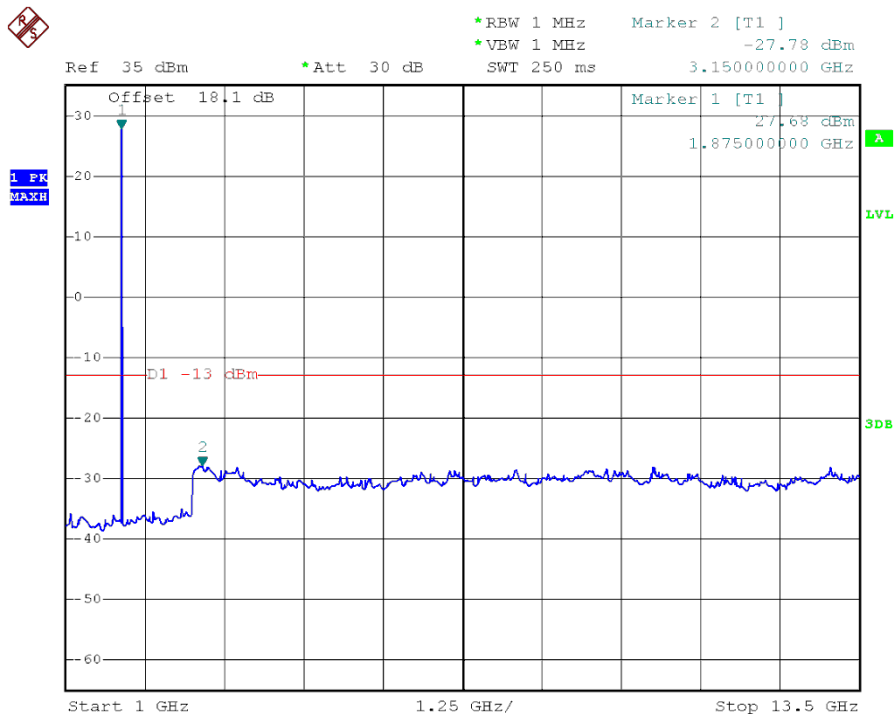
(Plot D2: GPRS 1900MHz Channel = 512, 1GHz to 13.5GHz)



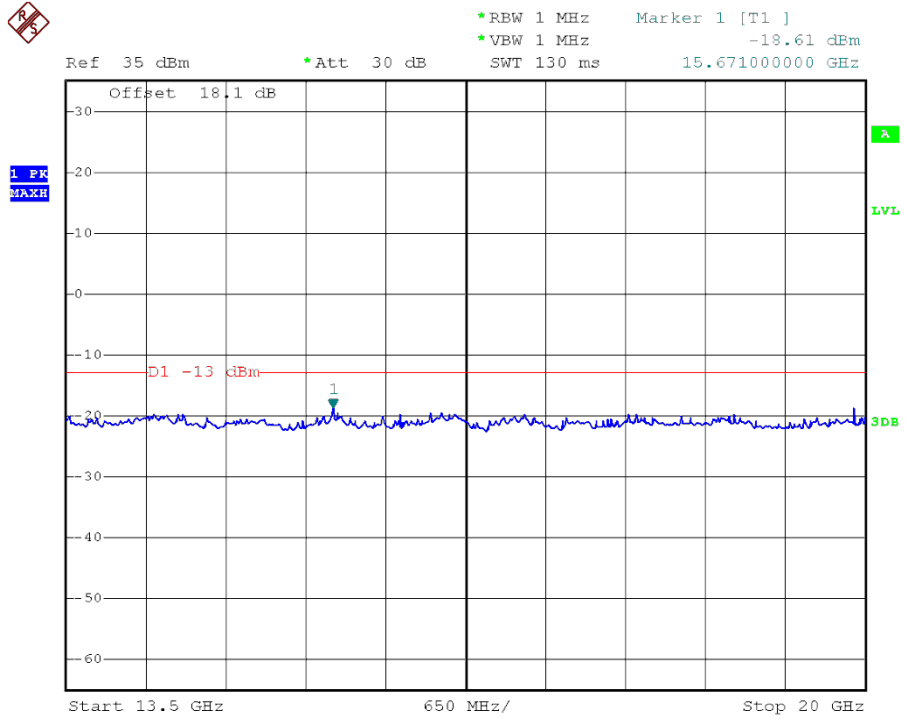
(Plot D3: GPRS 1900MHz Channel = 512, 13.5GHz to 20GHz)



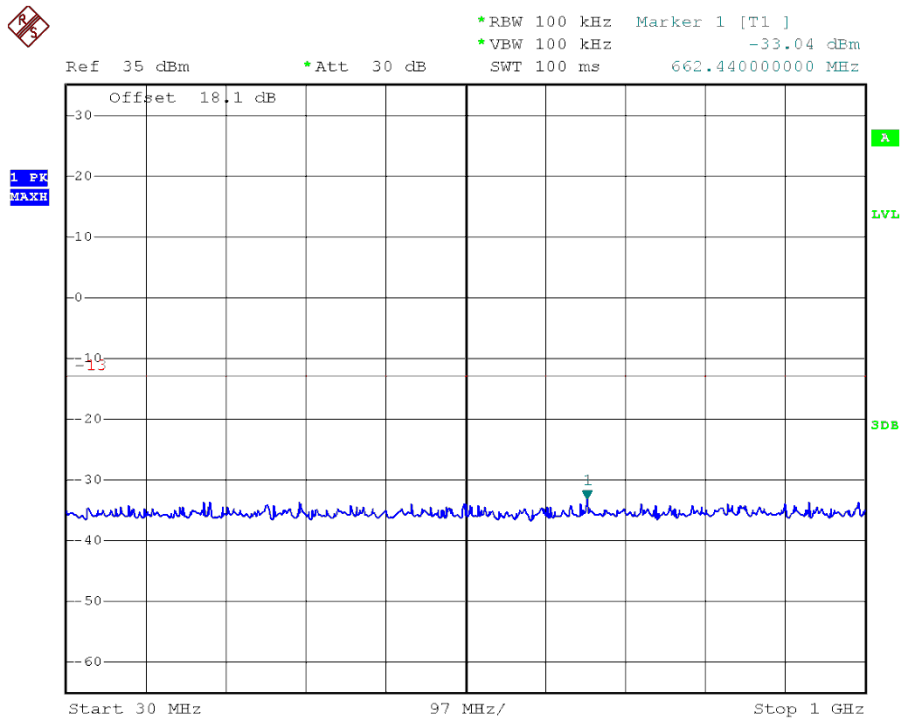
(Plot D4: GPRS 1900MHz Channel = 661, 30MHz to 1GHz)



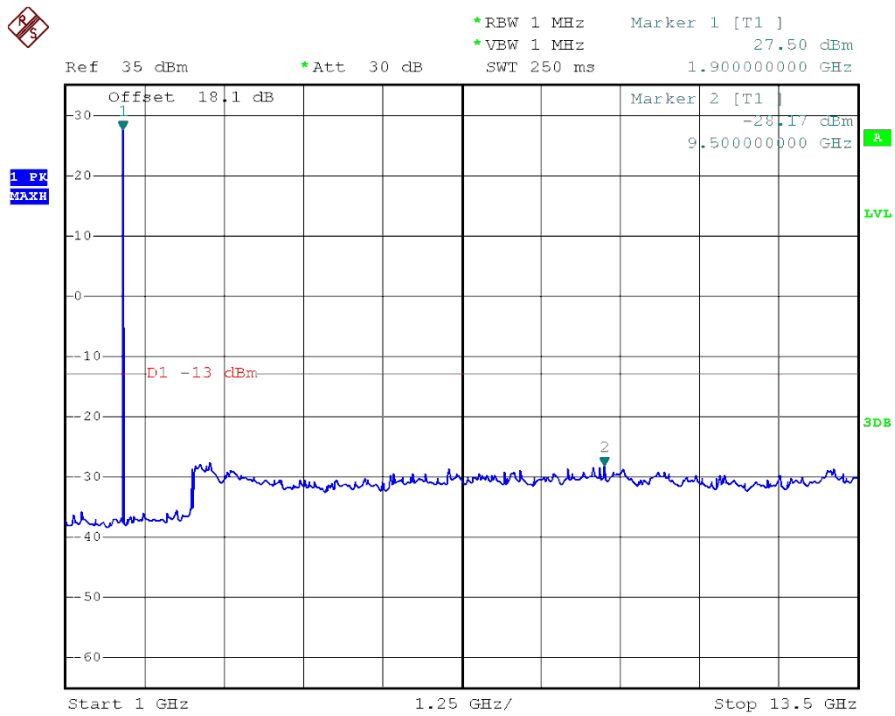
(Plot D5: GPRS 1900MHz Channel = 661, 1GHz to 13.5GHz)



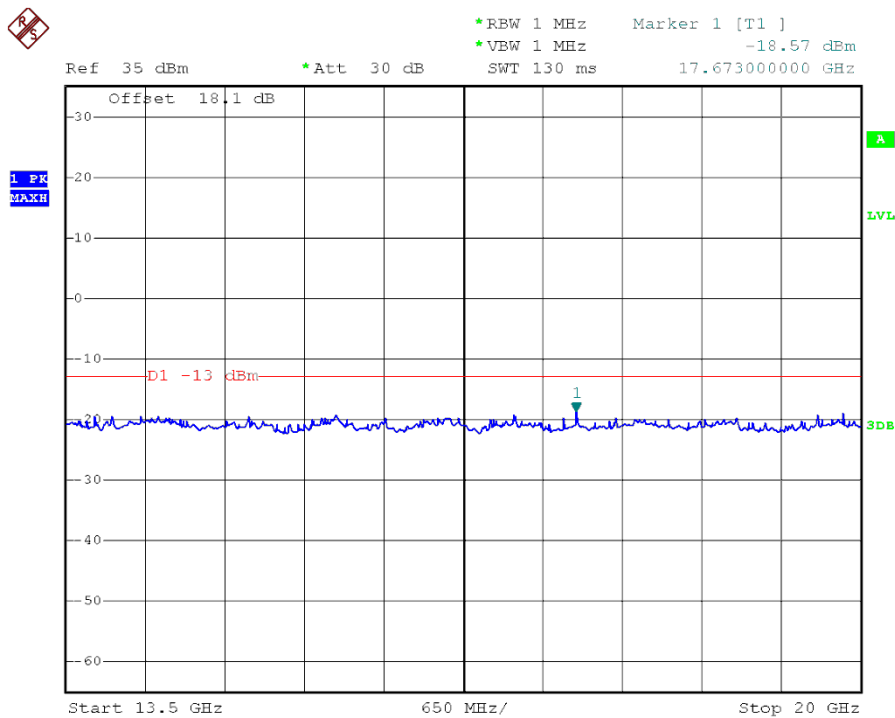
(Plot D6: GPRS 1900MHz Channel = 661, 13.5GHz to 20GHz)



(Plot D7: GPRS 1900MHz Channel = 810, 30MHz to 1GHz)



(Plot D9: GPRS 1900MHz Channel = 810, 1GHz to 13.5GHz)



(Plot D9: GPRS 1900MHz Channel = 810, 13.5GHz to 20GHz)



2.5 Band Edge

2.5.1 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.

2.5.2 Test Description

See section 2.1.2 of this report.

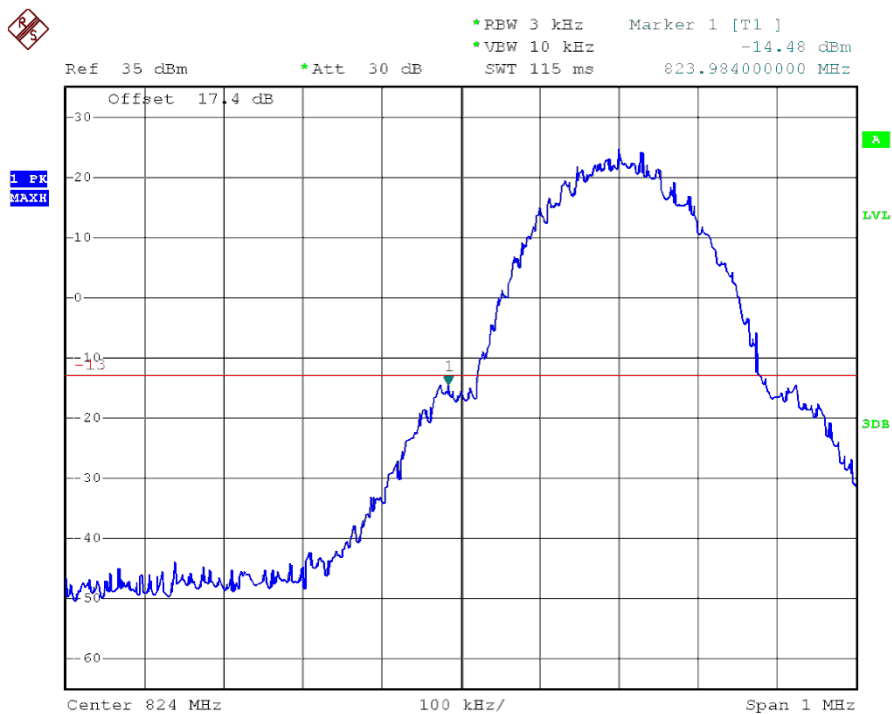
2.5.3 Test Result

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

1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-14.48	Plot 1	-13	PASS
	251	848.8	-15.03	Plot 2		PASS
GSM 1900MHz	512	1850.2	-14.91	Plot 3	-13	PASS
	810	1909.8	-14.44	Plot 4		PASS
GPRS 850MHz	128	824.2	-15.13	Plot 5	-13	PASS
	251	848.8	-13.98	Plot 6		PASS
GPRS 1900MHz	512	1850.2	-14.93	Plot 7	-13	PASS
	810	1909.8	-15.53	Plot 8		PASS

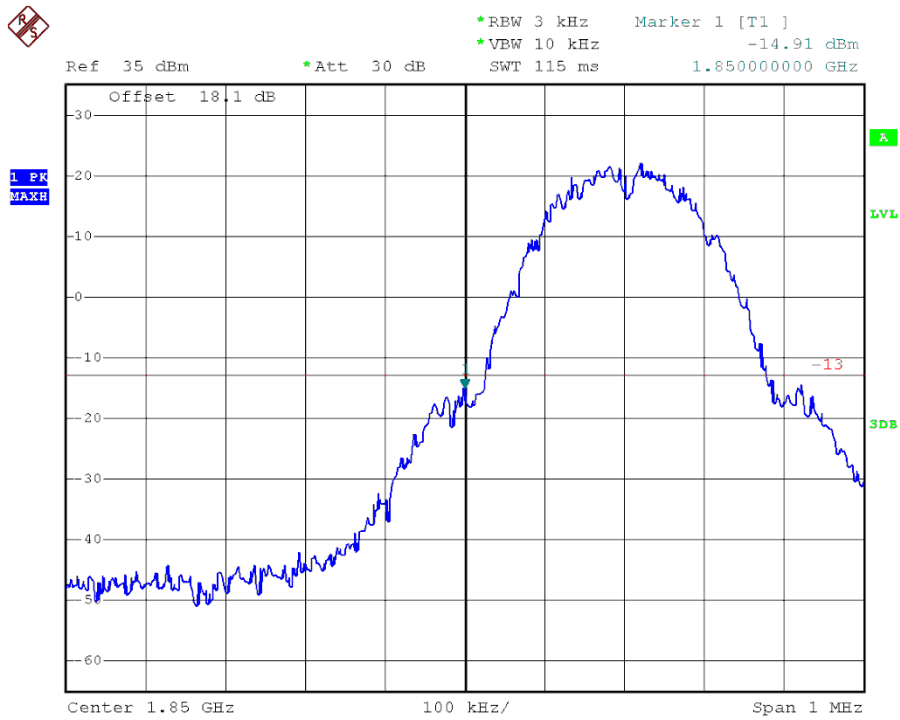
2. Test Plots:



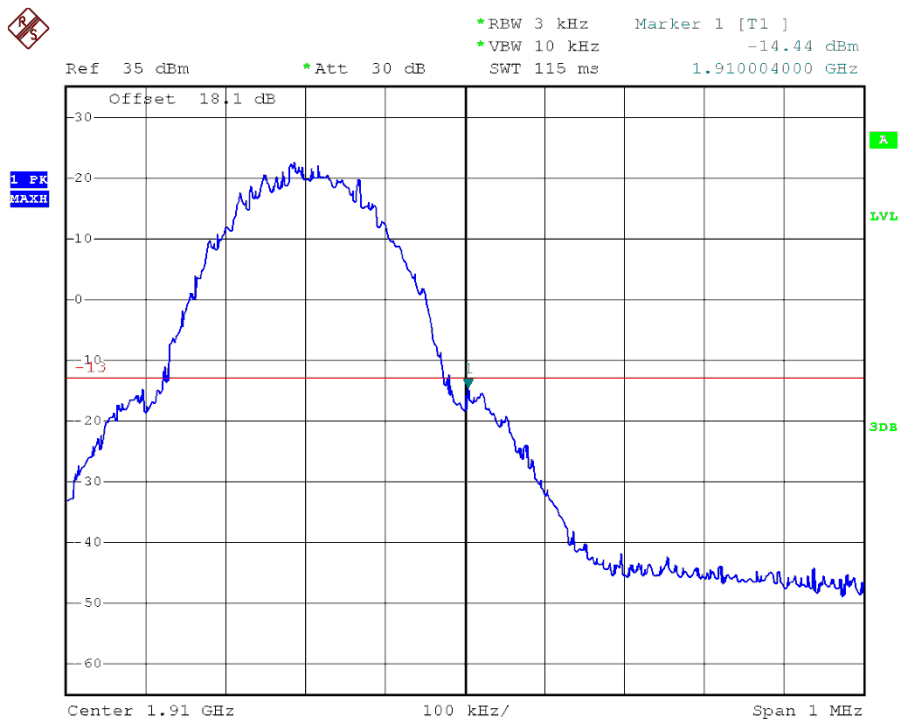
(Plot 1: GSM 850 Channel = 128)



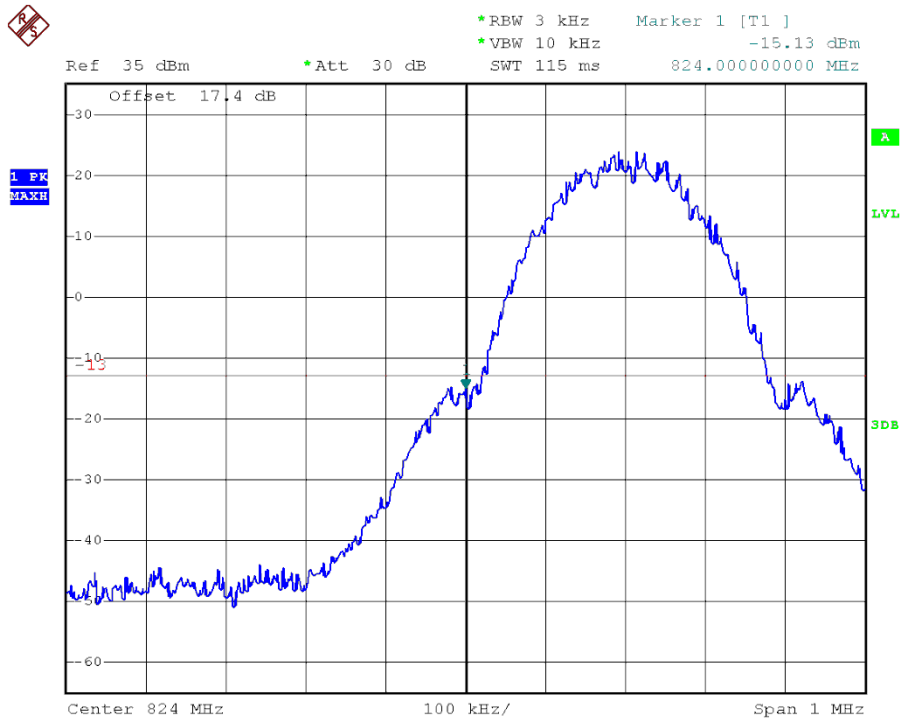
(Plot 2: GSM 850 Channel = 251)



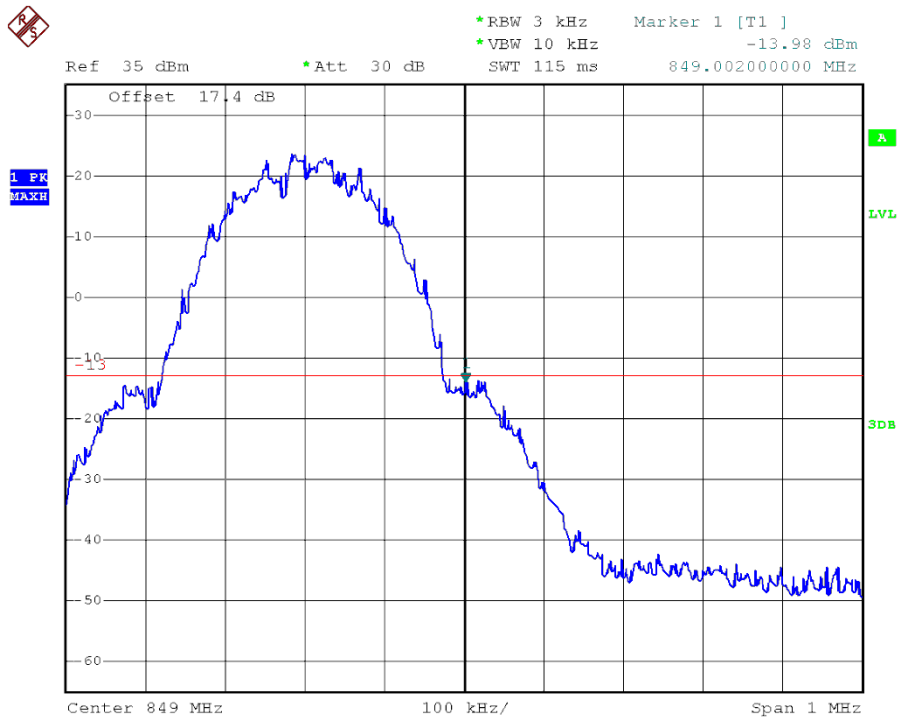
(Plot 3: GSM 1900 Channel = 512)



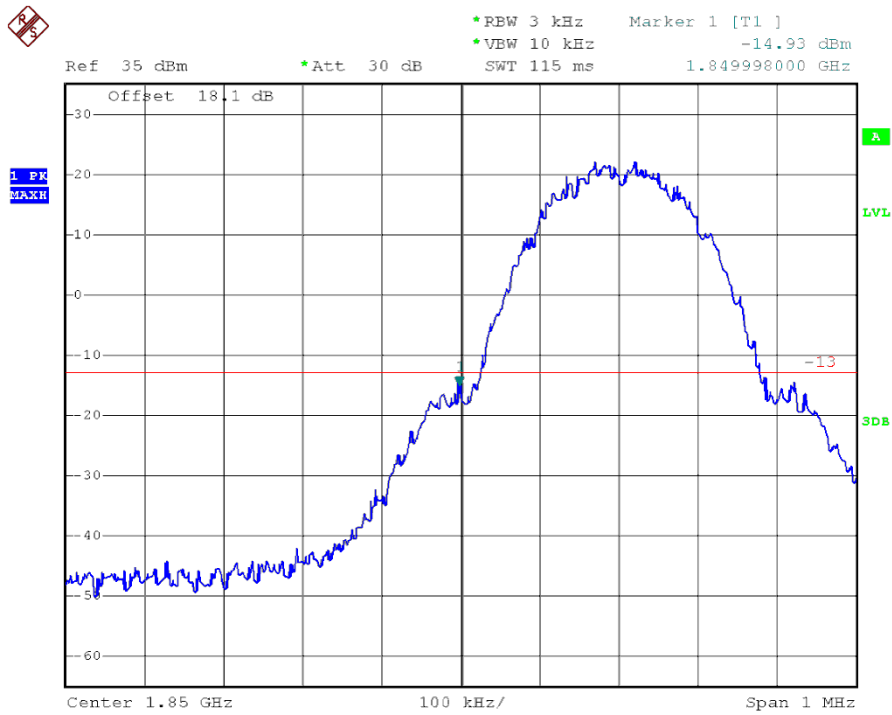
(Plot 4: GSM 1900 Channel = 810)



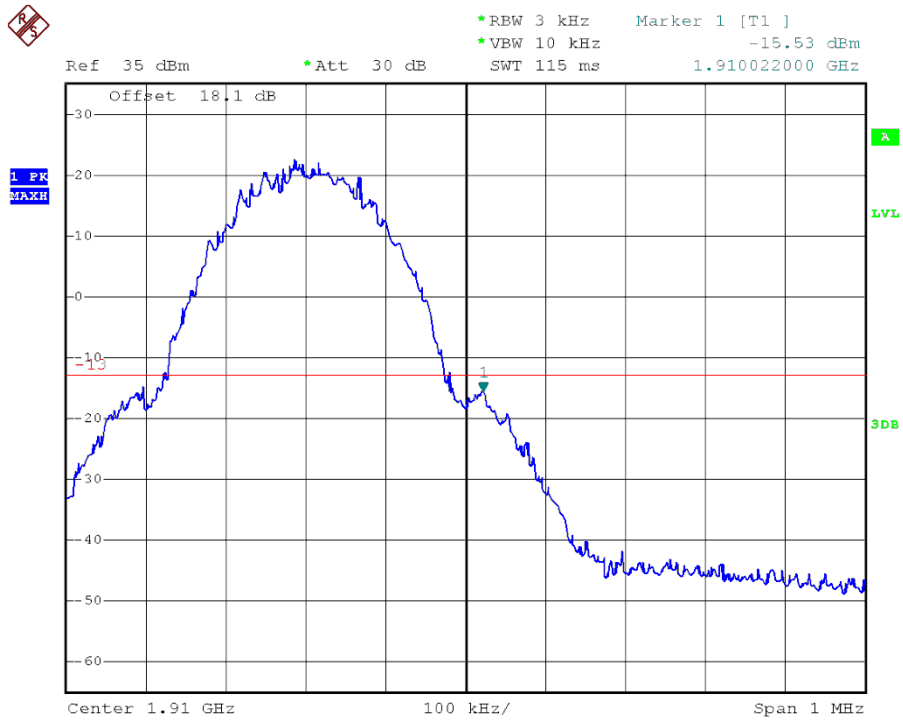
(Plot 5: GPRS 850 Channel = 128)



(Plot 6: GPRS 850 Channel = 251)



(Plot 7: GPRS 1900 Channel = 512)



(Plot 8: GPRS 1900 Channel = 810)

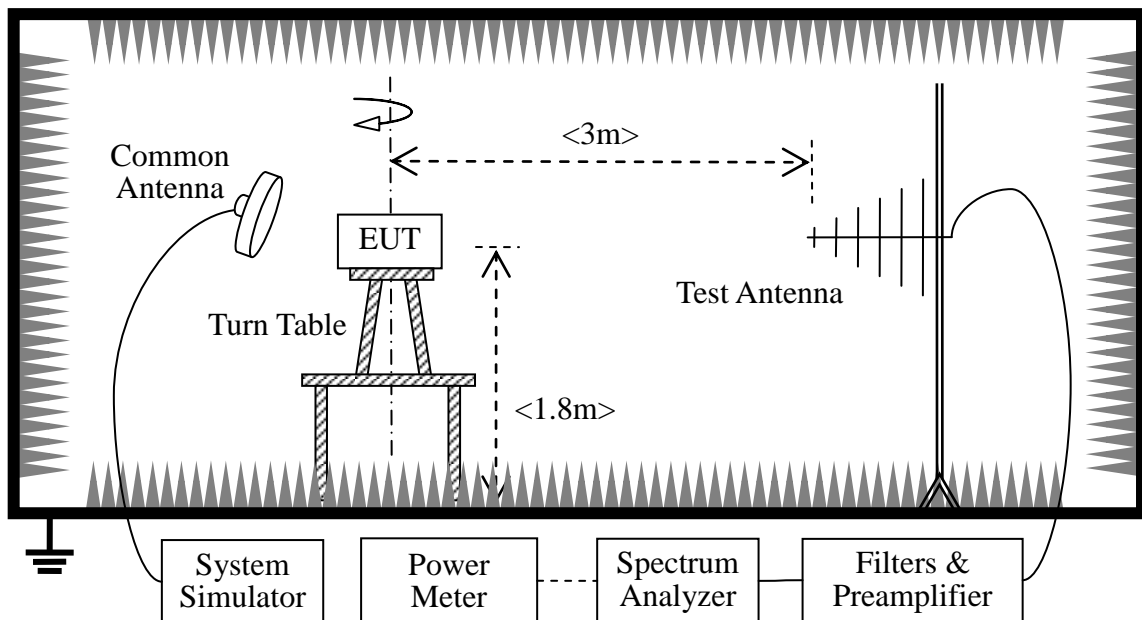
2.6 Transmitter Radiated Power (EIRP/ERP)

2.6.1 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 2 Watts e.i.r.p. peak power.

2.6.2 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.

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

- GSM Maximum RF output power: GSM850 31.11dBm, GSM1900 29.35dBm, Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM850 3.6dBm, GSM 1900 0.4dBm.

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
Spectrum Analyzer	Agilent	E7405A	US44210471	2013.06.10
Power Meter	Agilent	E4418B	GB43318055	2013.06.10
Full-Anechoic Chamber	Albatross ~ Projects	12.8m*6.8m* 6.4m	A0412372	2013.01.14
Double ridge horn antenna	R&S	HF906	A0304225	2013.06.07
Ultra-wideband antenna	R&S	HL562	A0304224	2013.06.05
Loop antenna	R&S	HFH2-Z2	A0304226	2013.06.05

The Cal. Interval was one year.

2.6.3 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.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST_TX}} - P_{\text{SUBST_RX}} - L_{\text{SUBST_CABLES}} + G_{\text{SUBST_TX_ANT}}$$

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

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

$P_{\text{SUBST_TX}}$ is signal generator level,

$P_{\text{SUBST_RX}}$ is receiver level,

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

$G_{\text{SUBST_TX_ANT}}$ is substitution antenna gain.

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

During the test, the data of A_{TOT} was added in the Test Software, so Test Software reading is the final values which contain the data of A_{TOT} .



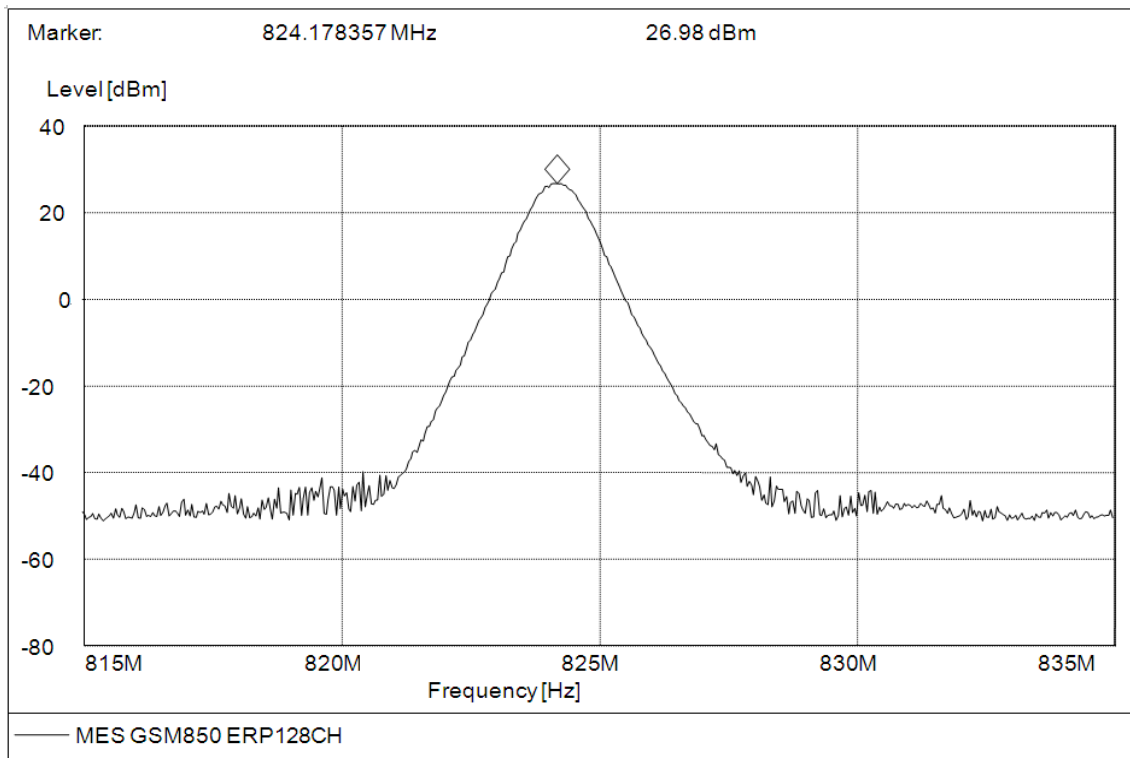
1. GSM Model Test Verdict:

Band	Channel	Frequency (MHz)	PCL	Measured ERP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GSM 850MHz	128	824.20	5	26.98	0.499	Plot A	38.5	7	PASS
	190	836.60	5	26.63	0.460				PASS
	251	848.80	5	27.14	0.518				PASS
GPRS 850MHz	128	824.20	5	26.53	0.449	Plot B ^{Note 1}	38.5	7	PASS
	190	836.60	5	26.44	0.441				PASS
	251	848.80	5	26.82	0.481				PASS

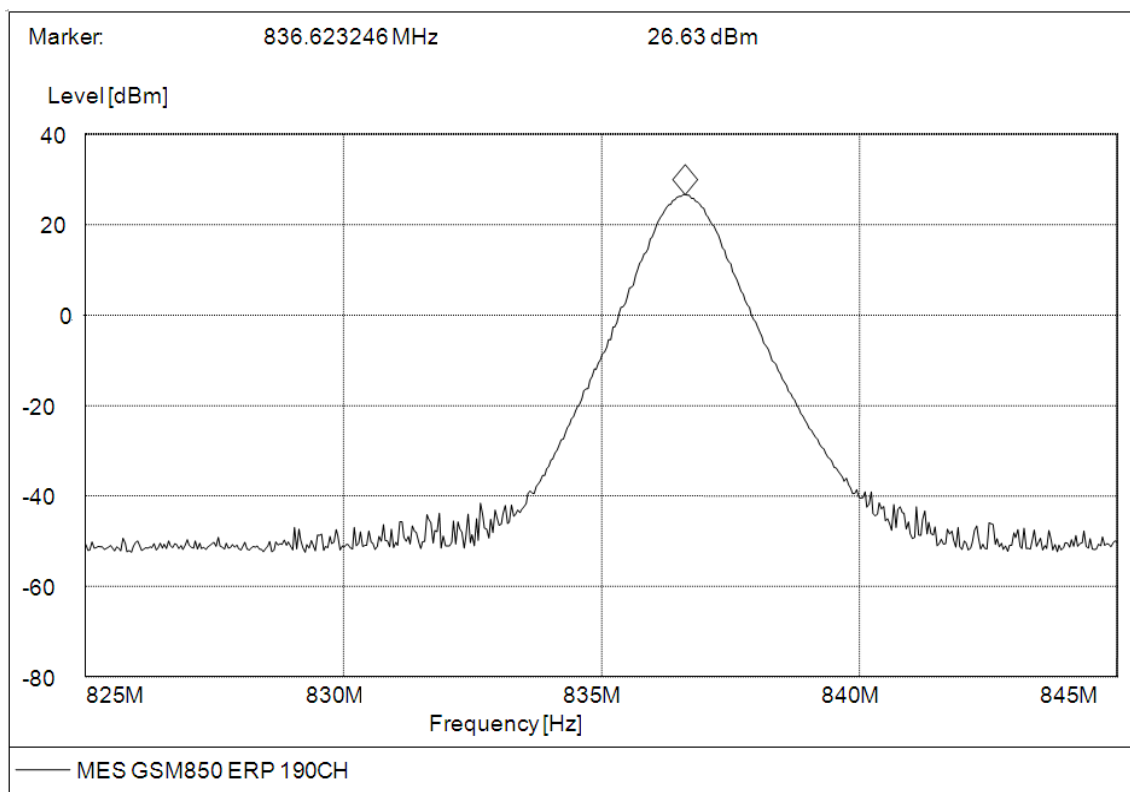
Band	Channel	Frequency (MHz)	PCL	Measured EIRP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GSM 1900MHz	512	1850.2	0	26.15	0.412	Plot D	33	2	PASS
	661	1880.0	0	26.28	0.425				PASS
	810	1909.8	0	25.88	0.387				PASS
GPRS 1900MHz	512	1850.2	0	26.11	0.408	Plot E ^{Note 1}	33	2	PASS
	661	1880.0	0	26.05	0.403				PASS
	810	1909.8	0	25.76	0.377				PASS

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

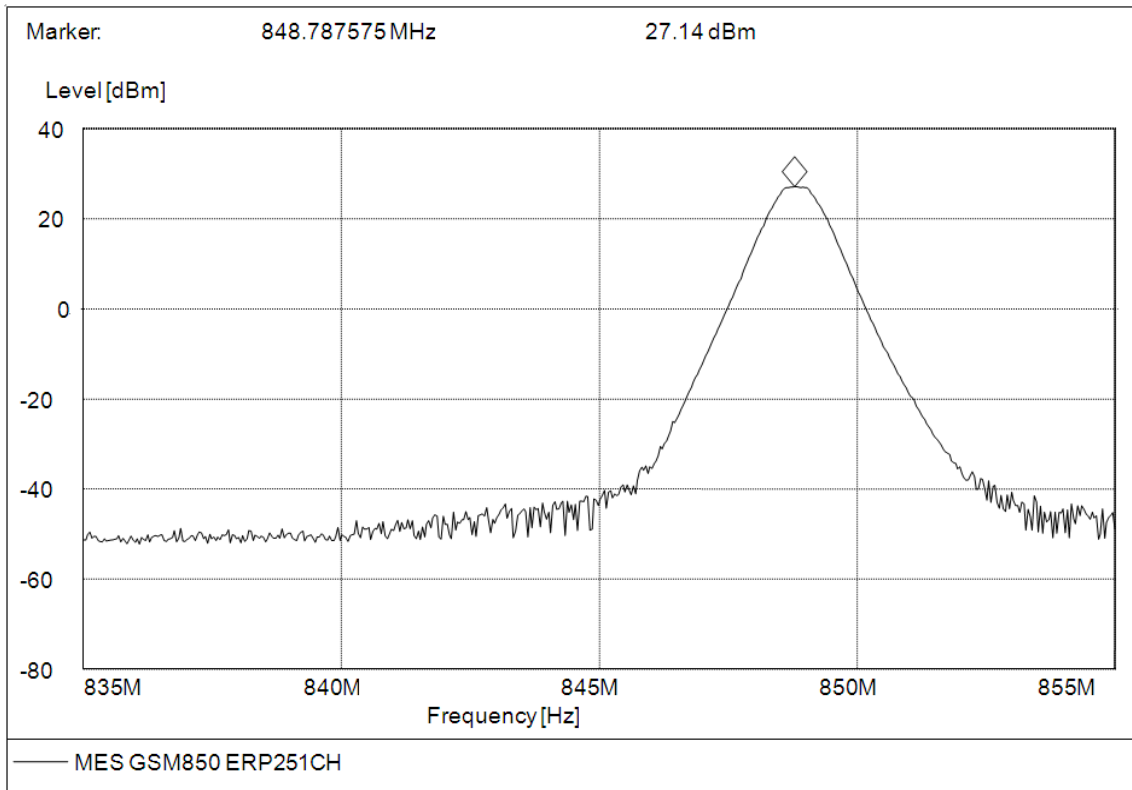
2. Test Plots:



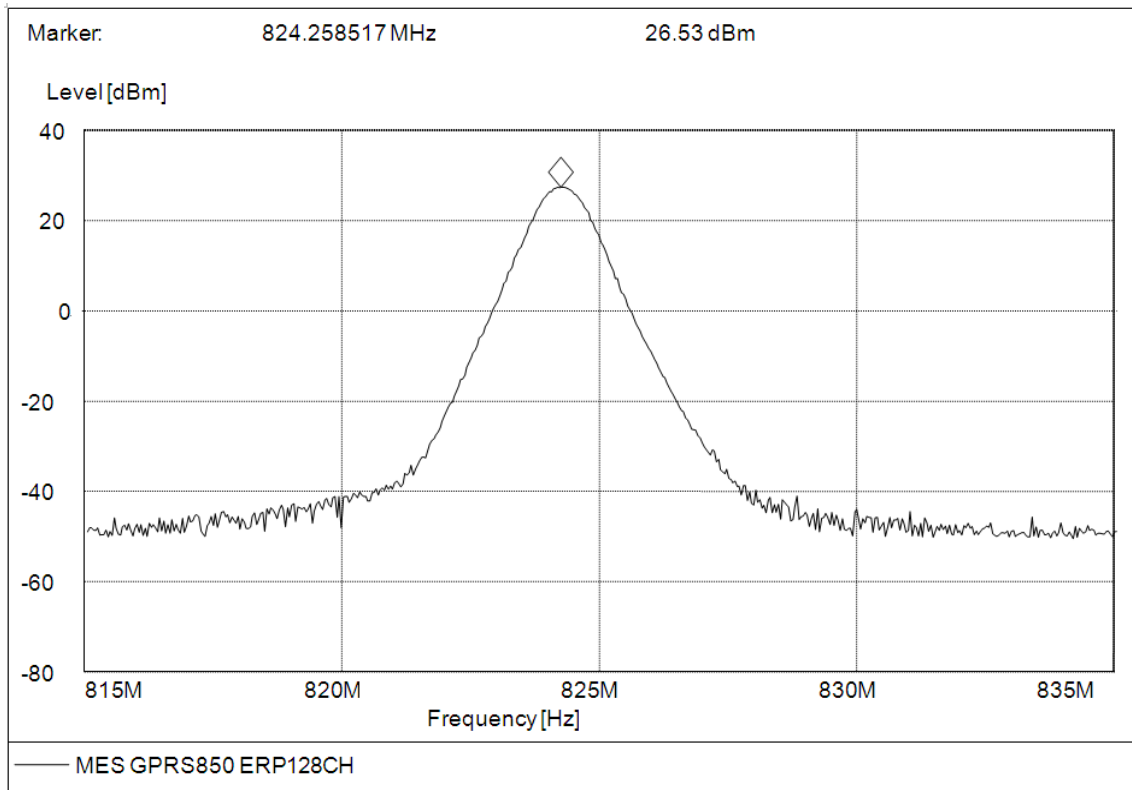
(Plot A1: GSM 850MHz Channel = 128)



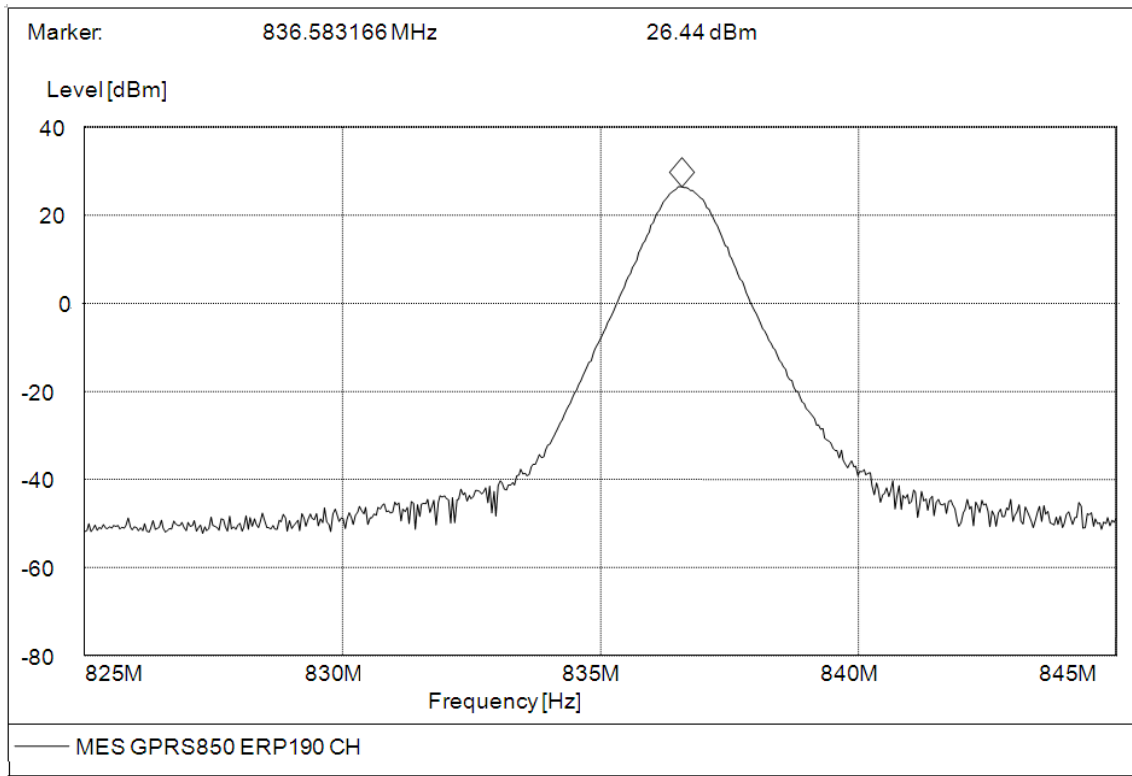
(Plot B1: GSM 850MHz Channel = 190)



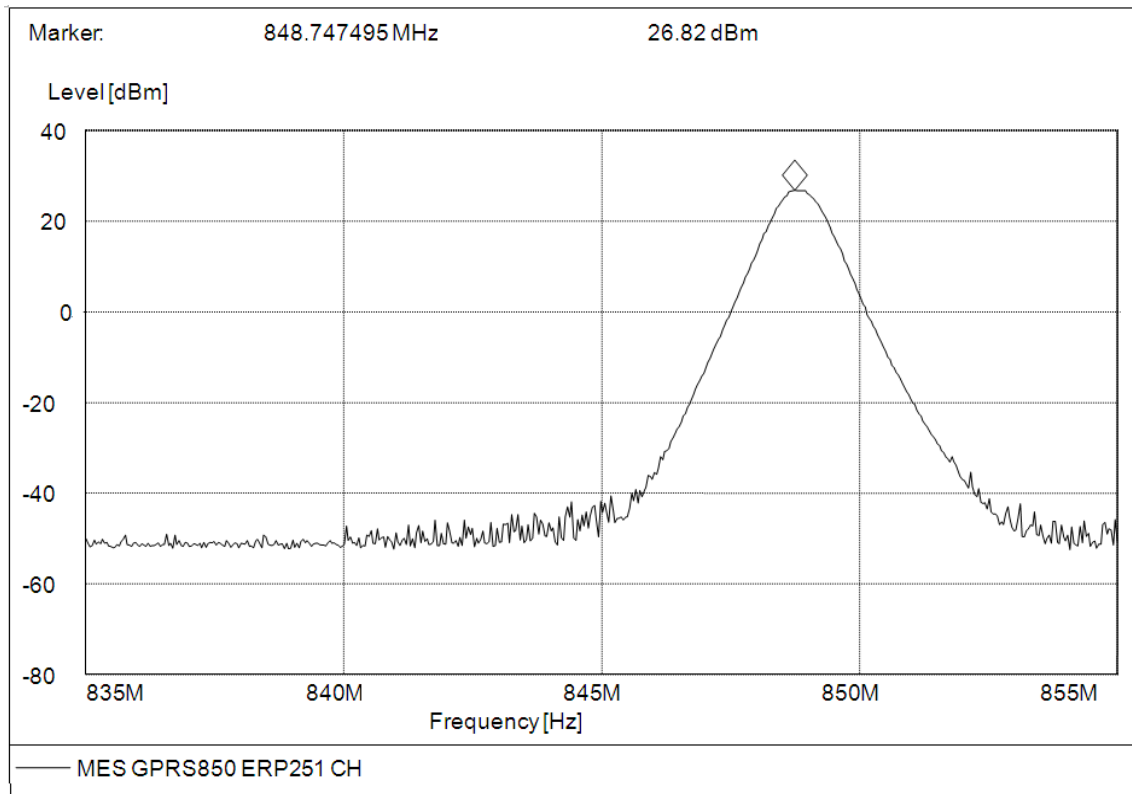
(Plot C1: GSM 850MHz Channel = 251)



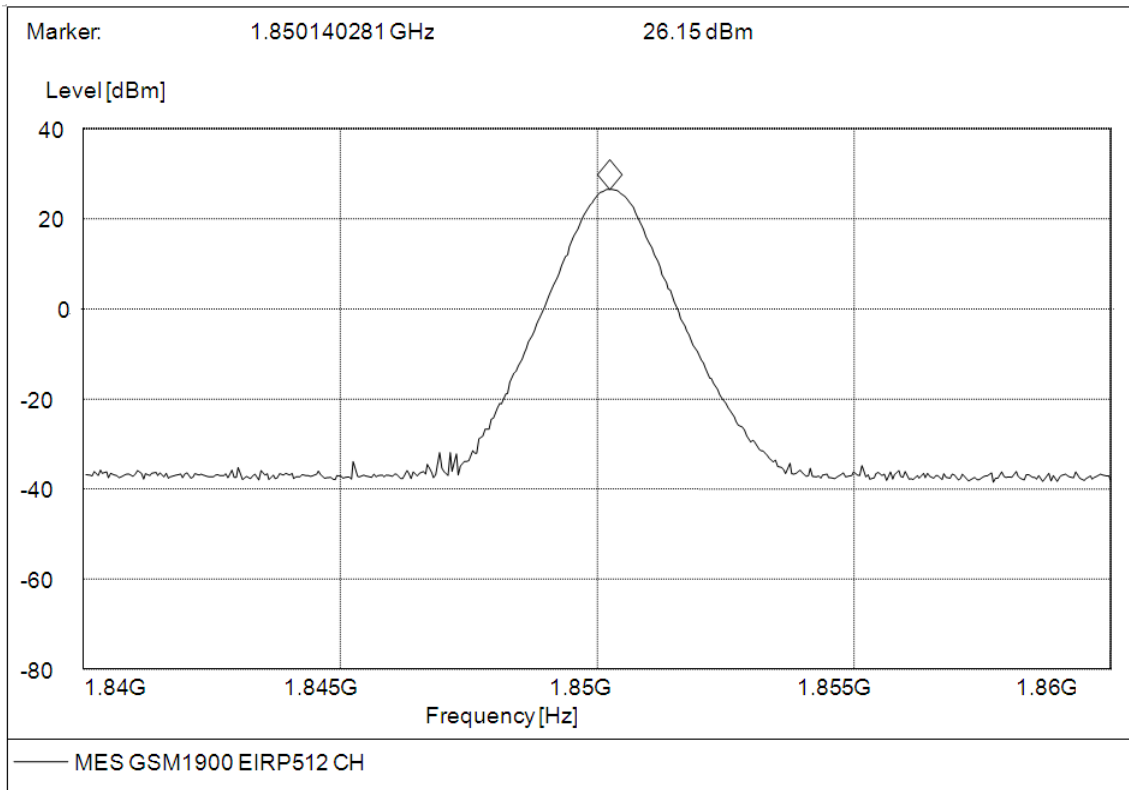
(Plot A2: GPRS 850MHz Channel = 128)



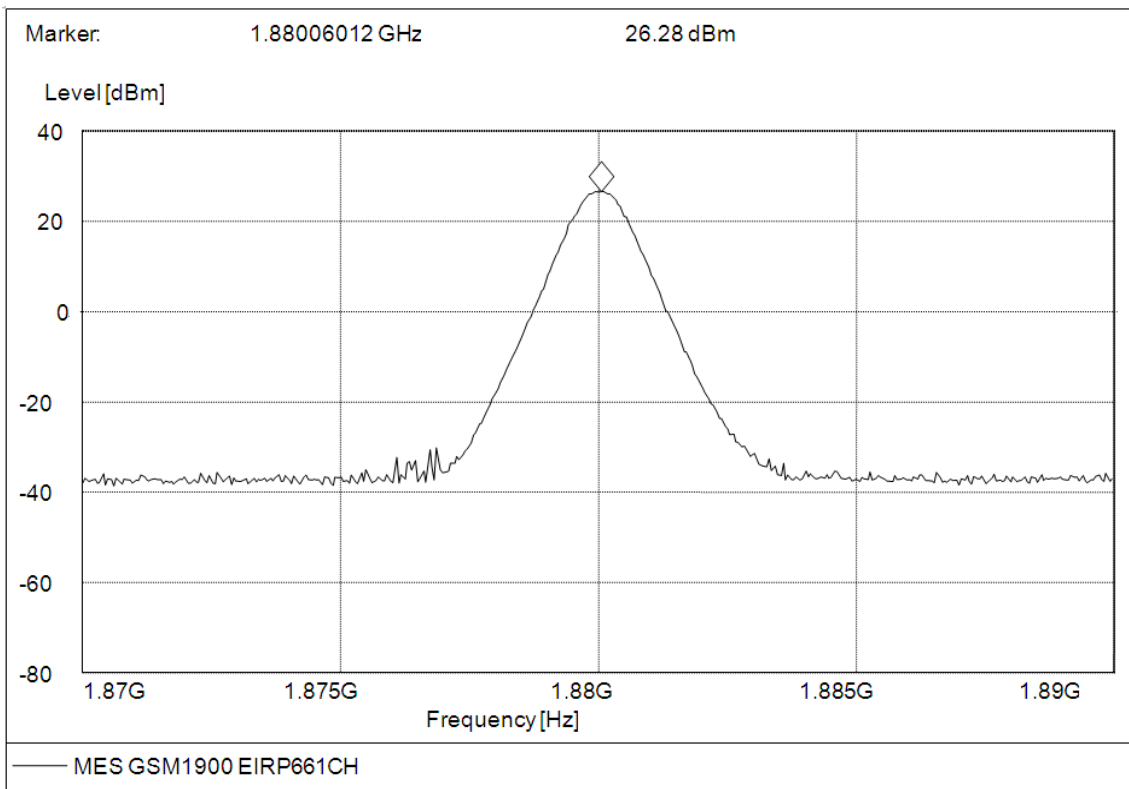
(Plot B2: GPRS 850MHz Channel = 190)



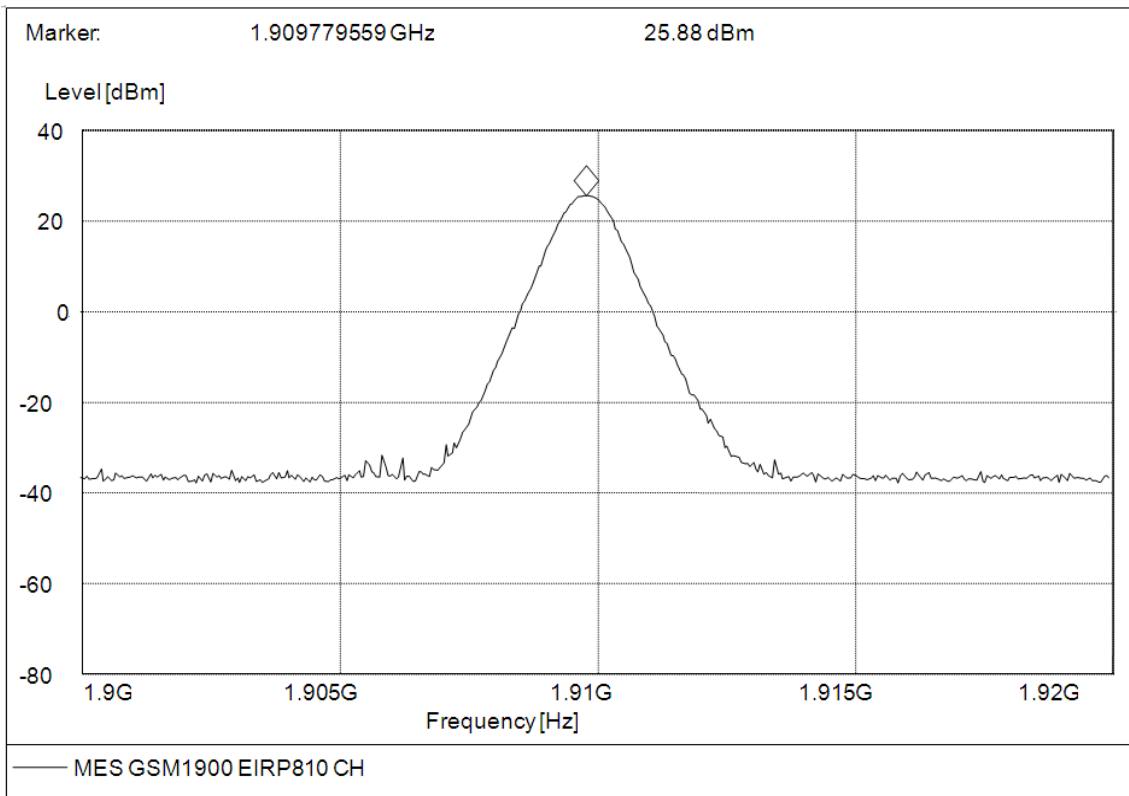
(Plot C2: GPRS 850MHz Channel = 251)



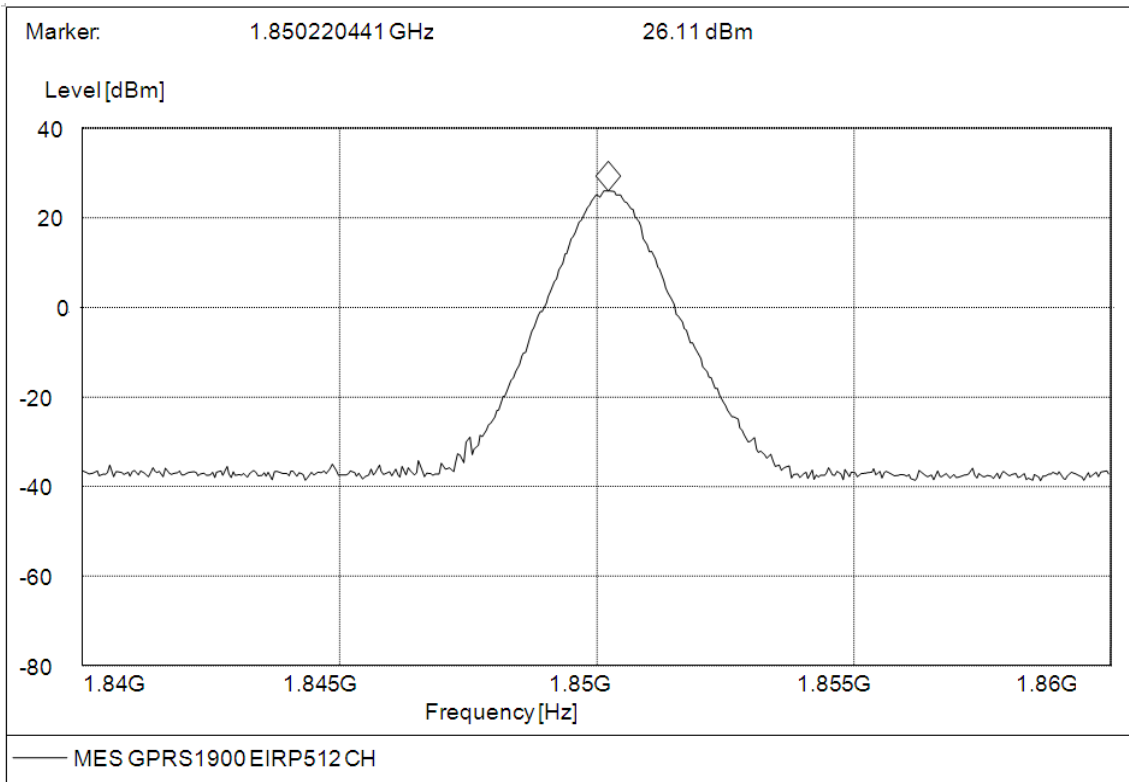
(Plot D1: GSM 1900MHz Channel = 512)



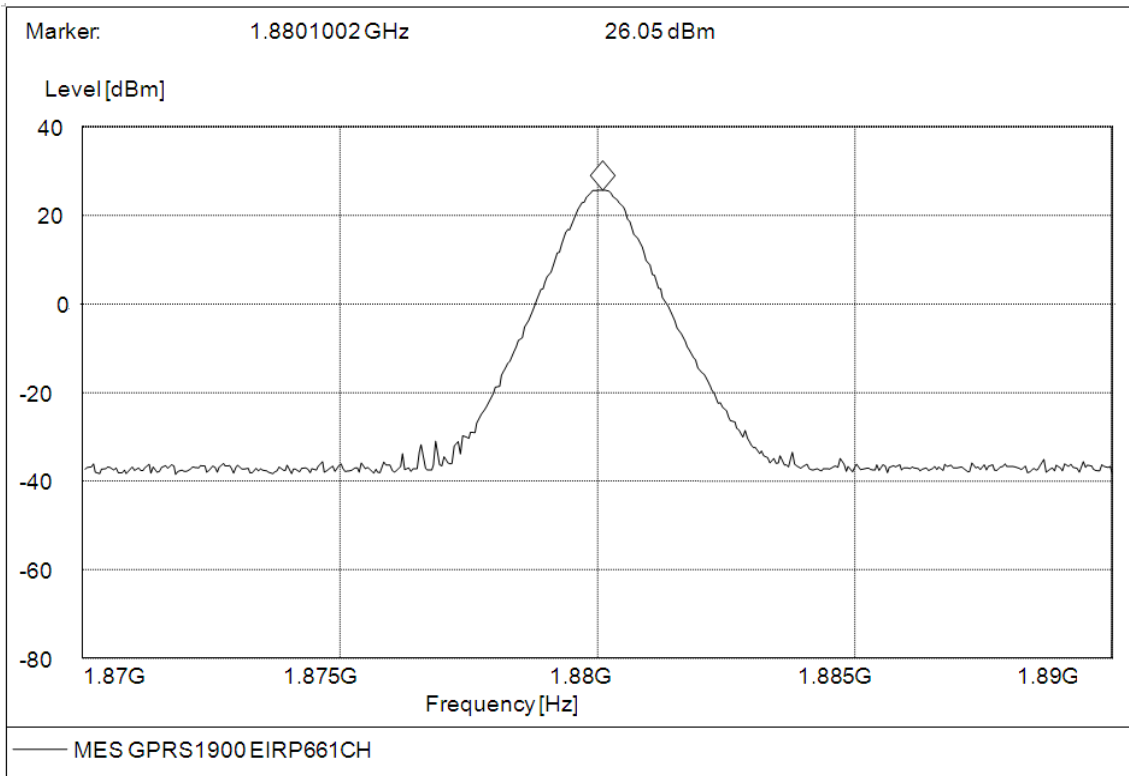
(Plot E1: GSM 1900MHz Channel = 661)



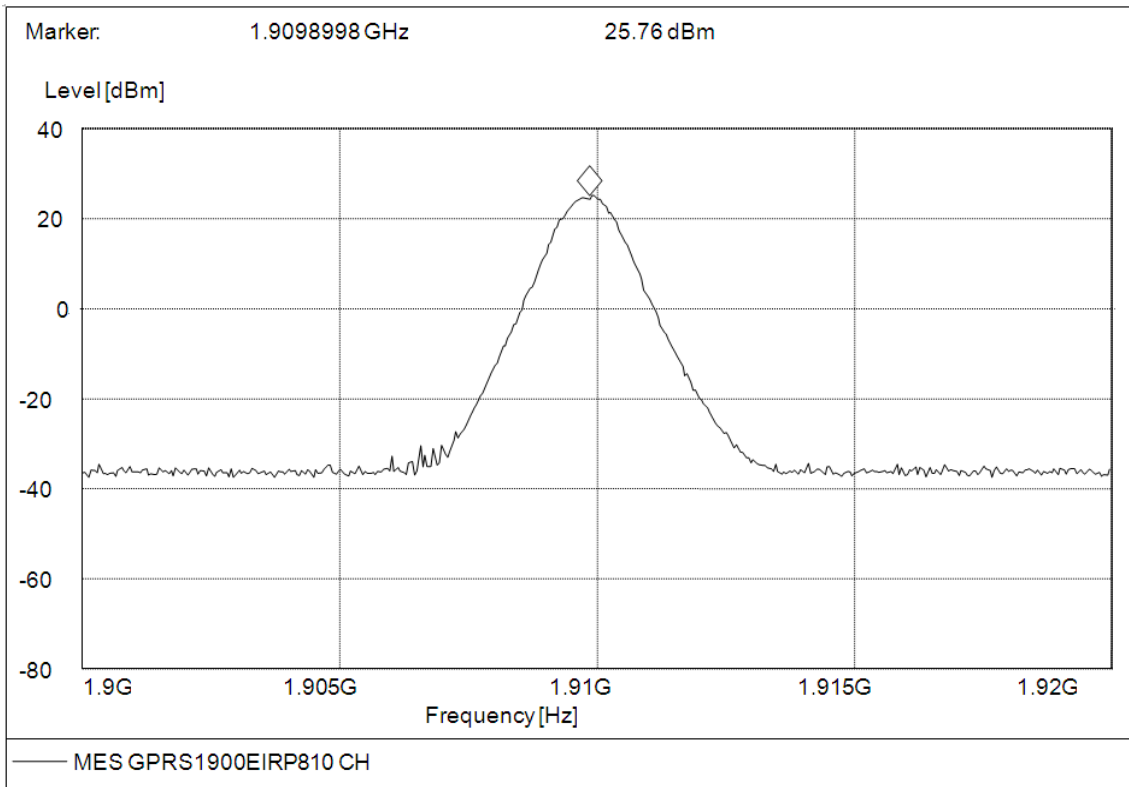
(Plot F1: GSM 1900MHz Channel = 810)



(Plot D2: GPRS 1900MHz Channel = 512)



(Plot E2: GPRS 1900MHz Channel = 661)



(Plot F2: GPRS 1900MHz Channel = 810)



2.7 Radiated Out of Band Emissions

2.7.1 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.

2.7.2 Test Description

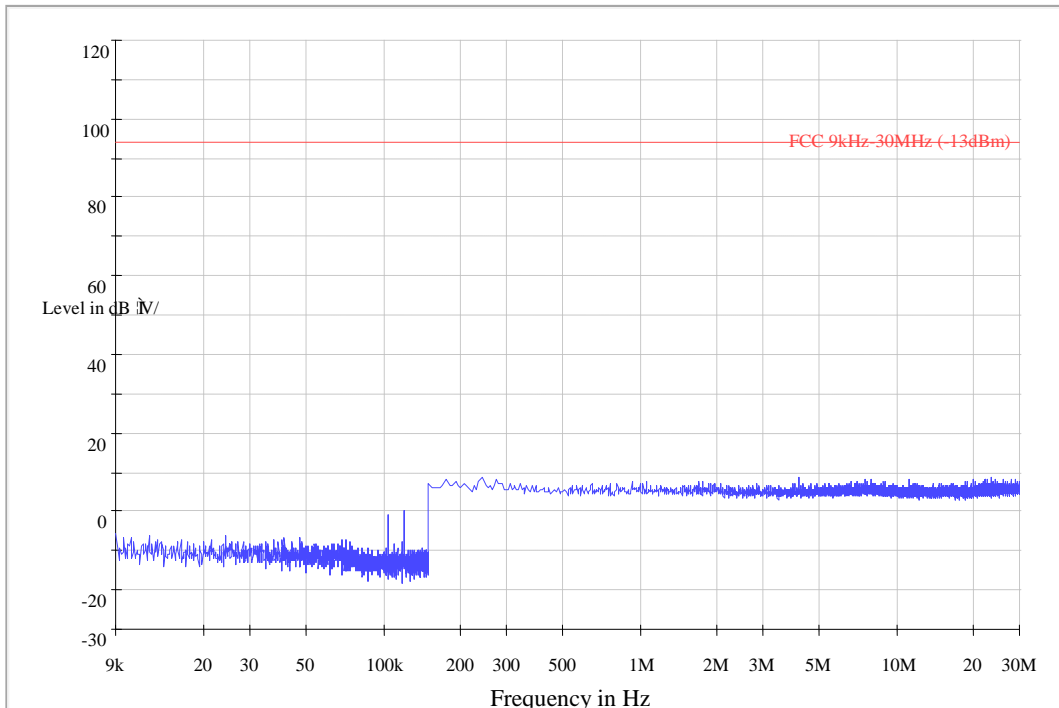
See section 2.6.2 of this report.

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

In all of the measurements set forth in §§2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal(32.768kHz) generated in the equipment, without going below 9 kHz, up to at least the tenth harmonic of the highest fundamental frequency.

2.7.3 Test Result

The measurement frequency range is from 9KHz to 30MHz and 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.



9KHz~30MHz

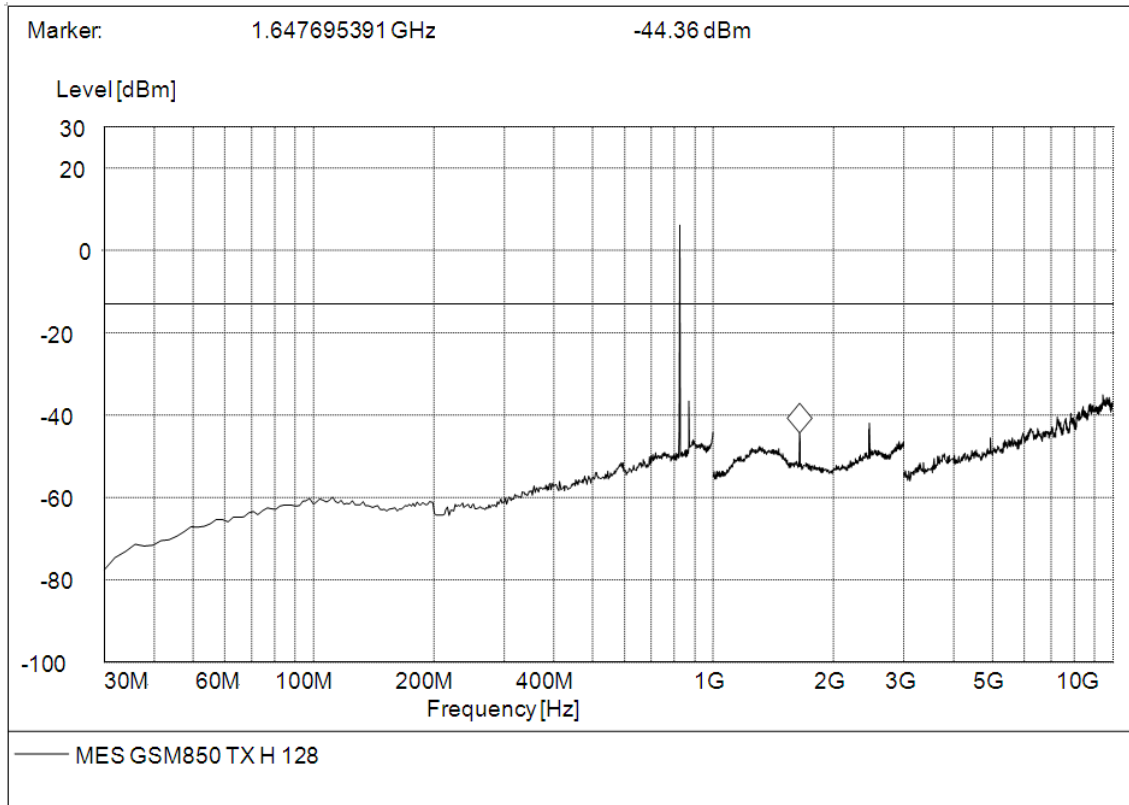
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
GSM 850MHz	128	824.2	< -30	< -30	Plot A.1/A.2	-13	PASS
	190	836.6	< -30	< -30	Plot A.3/A.4		PASS
	251	848.8	< -30	< -30	Plot A.5/A.6		PASS
GSM 1900MHz	512	1850.2	< -30	< -30	Plot B.1/B.2	-13	PASS
	661	1880.0	< -30	< -30	Plot B.3/B.4		PASS
	810	1909.8	< -30	< -30	Plot B.5/B.6		PASS
GPRS 850MHz	128	824.2	< -30	< -30	Plot C.1/C.2	-13	PASS
	190	836.6	< -30	< -30	Plot C.3/C.4		PASS
	251	848.8	< -30	< -30	Plot C.5/C.6		PASS
GPRS 1900MHz	512	1850.2	< -30	< -30	Plot D.1/D.2	-13	PASS
	661	1880.0	< -30	< -30	Plot D.3/D.4		PASS
	810	1909.8	< -30	< -30	Plot D.5/D.6		PASS

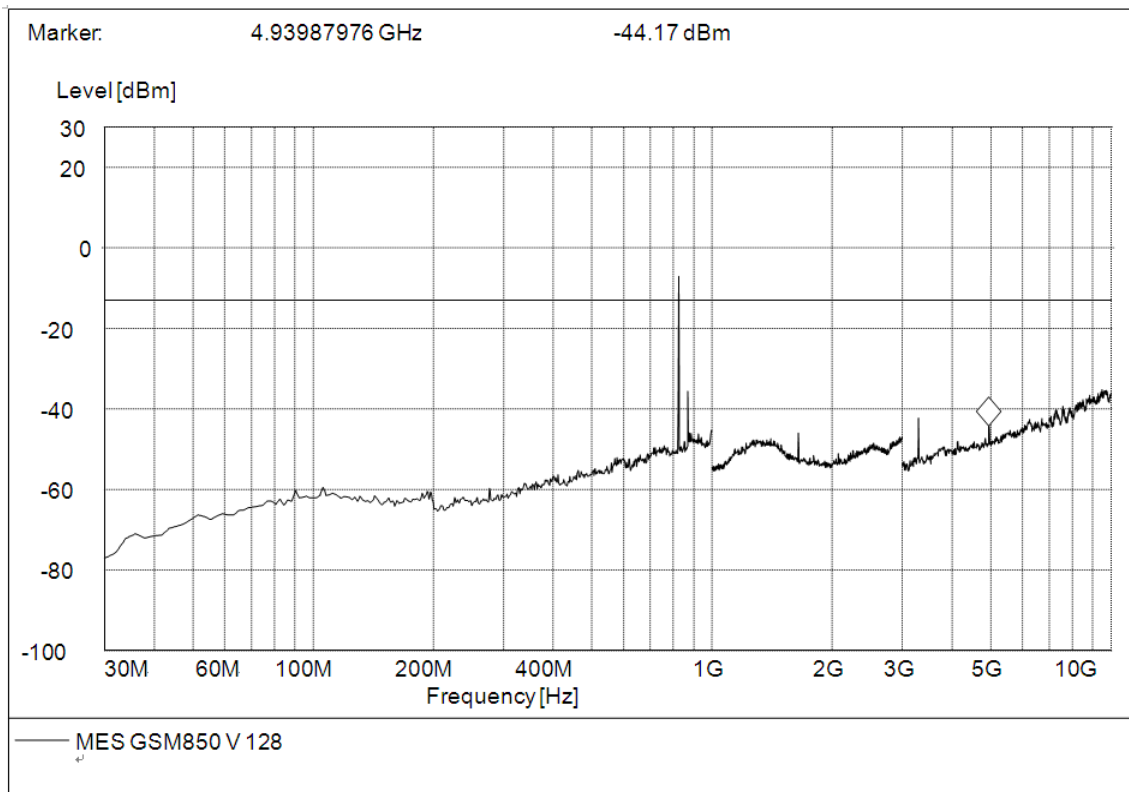
2. Test Plots for the Whole Measurement Frequency Range:

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

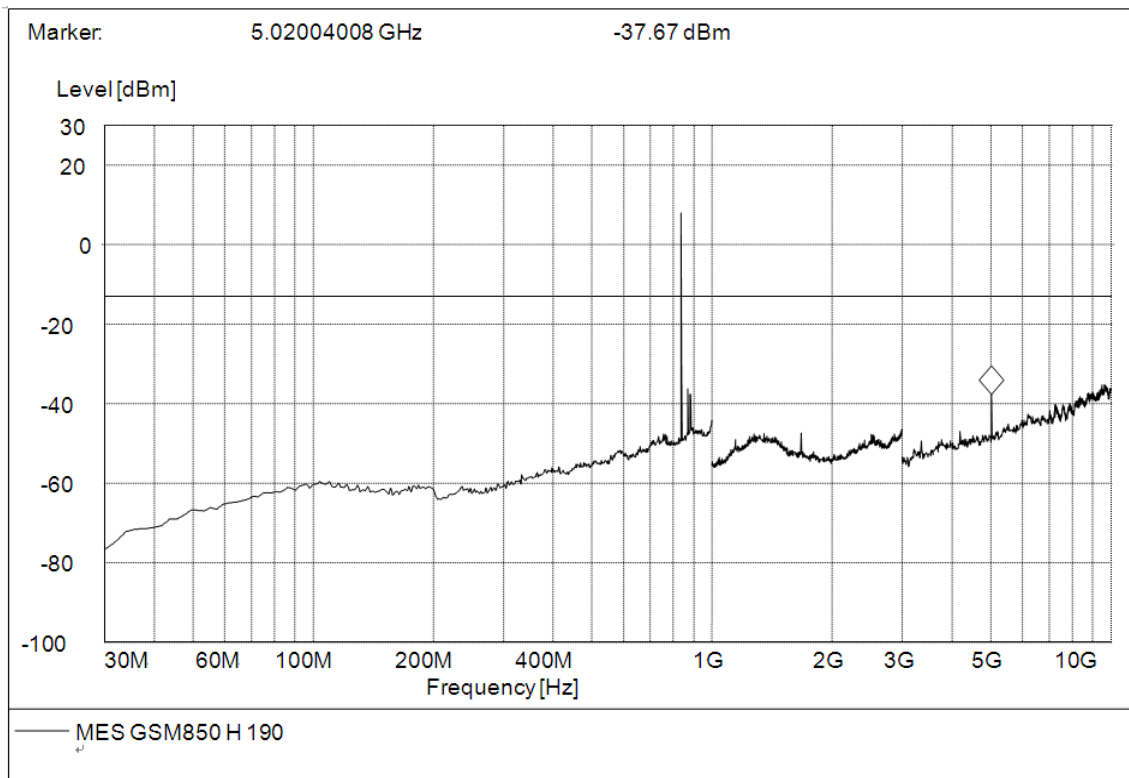
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.



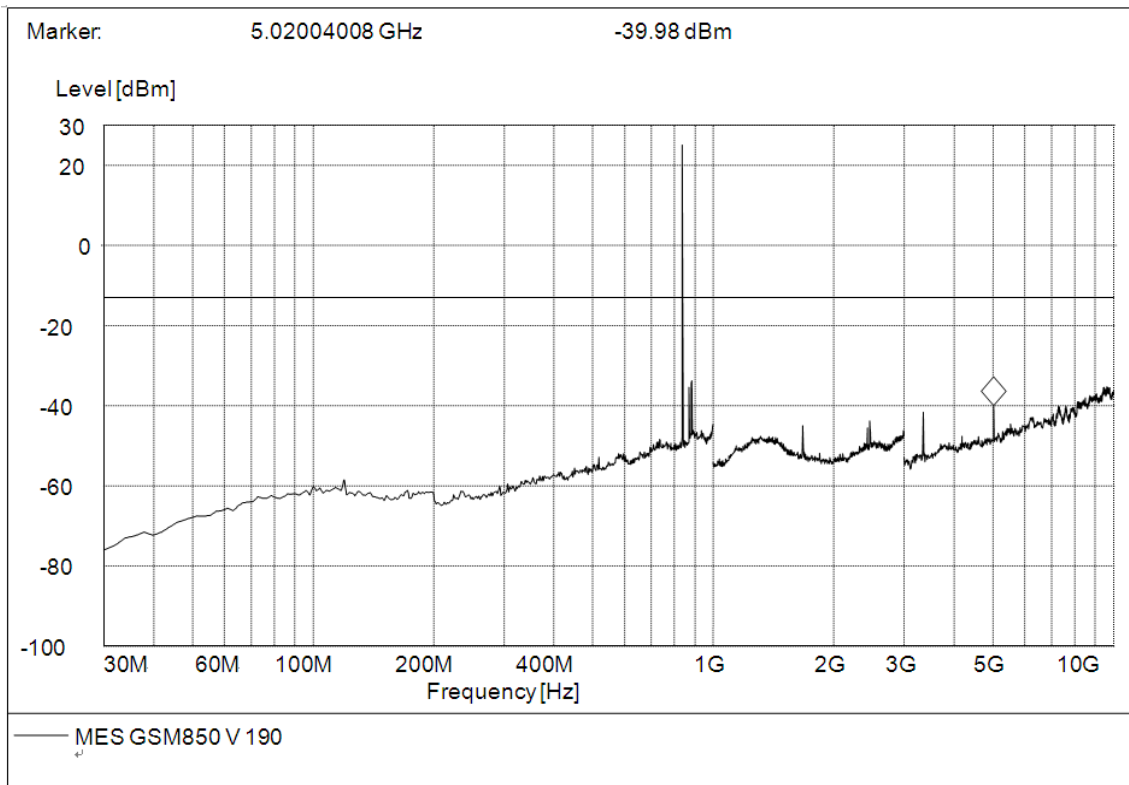
(Plot A.1: GSM 850MHz Channel = 128, Test Antenna Horizontal)



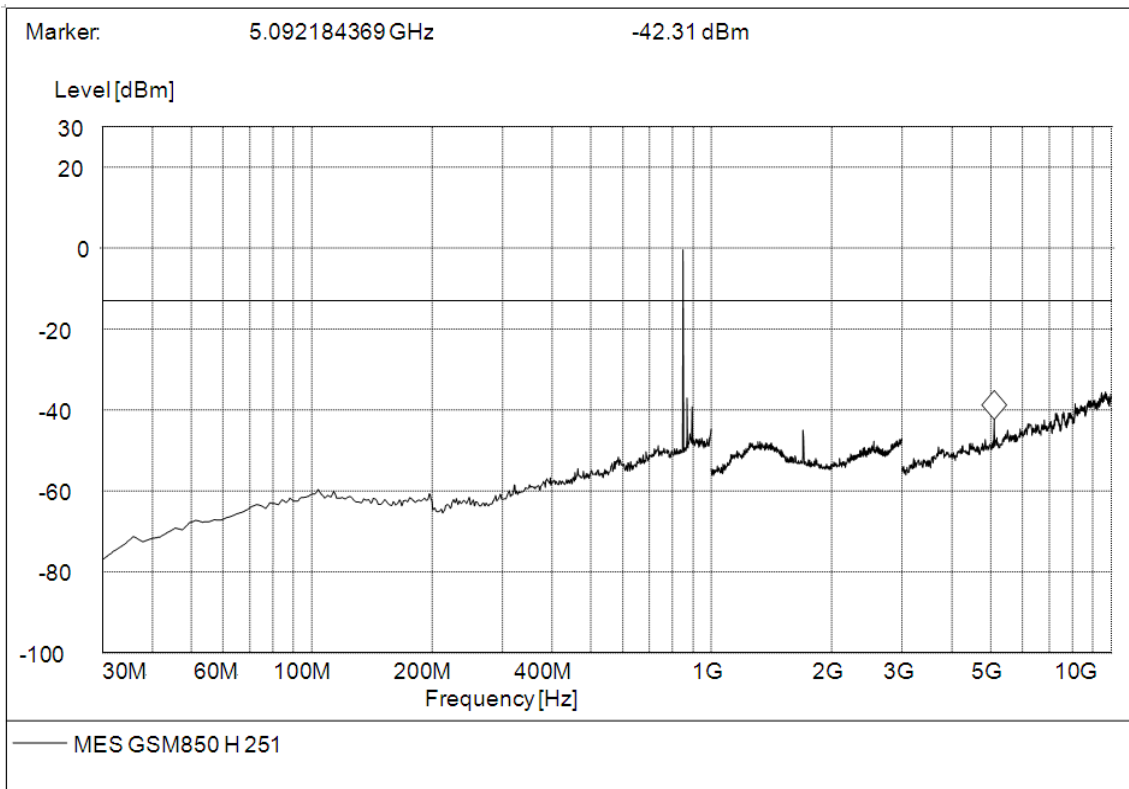
(Plot A.2: GSM 850MHz Channel = 128, Test Antenna Vertical)



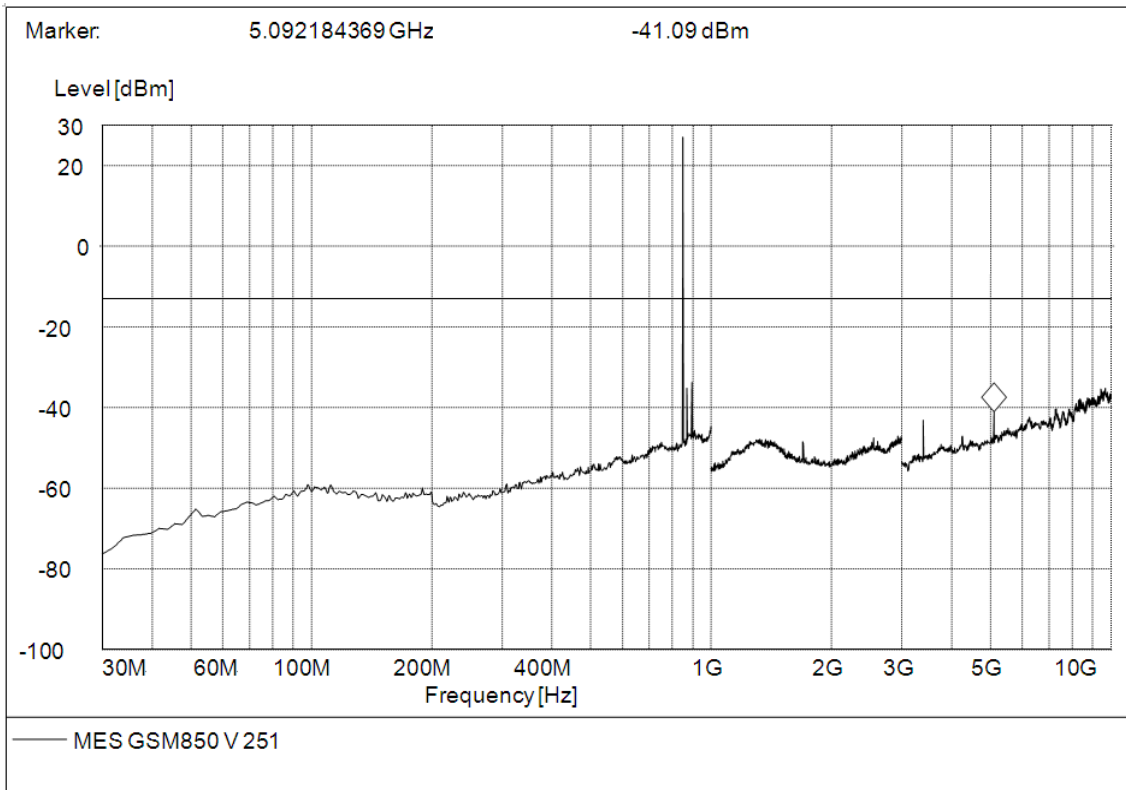
(Plot A.3: GSM 850MHz Channel = 190, Test Antenna Horizontal)



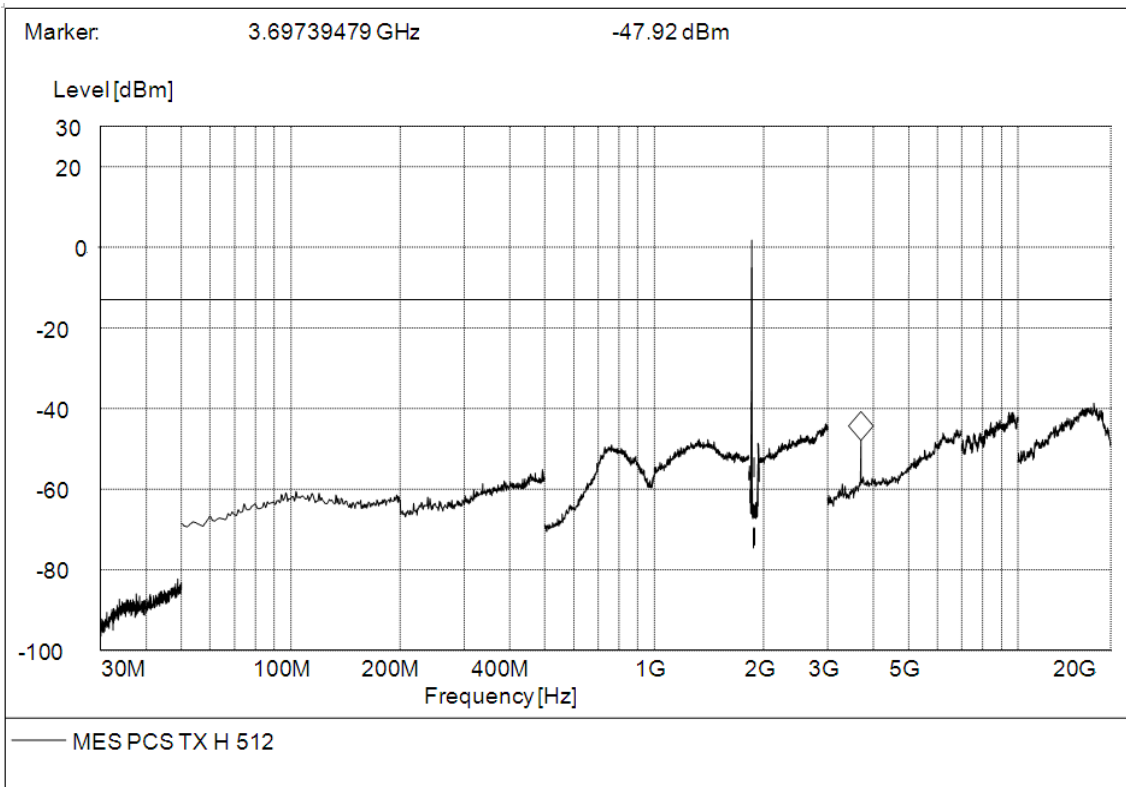
(Plot A.4: GSM 850MHz Channel = 190, Test Antenna Vertical)



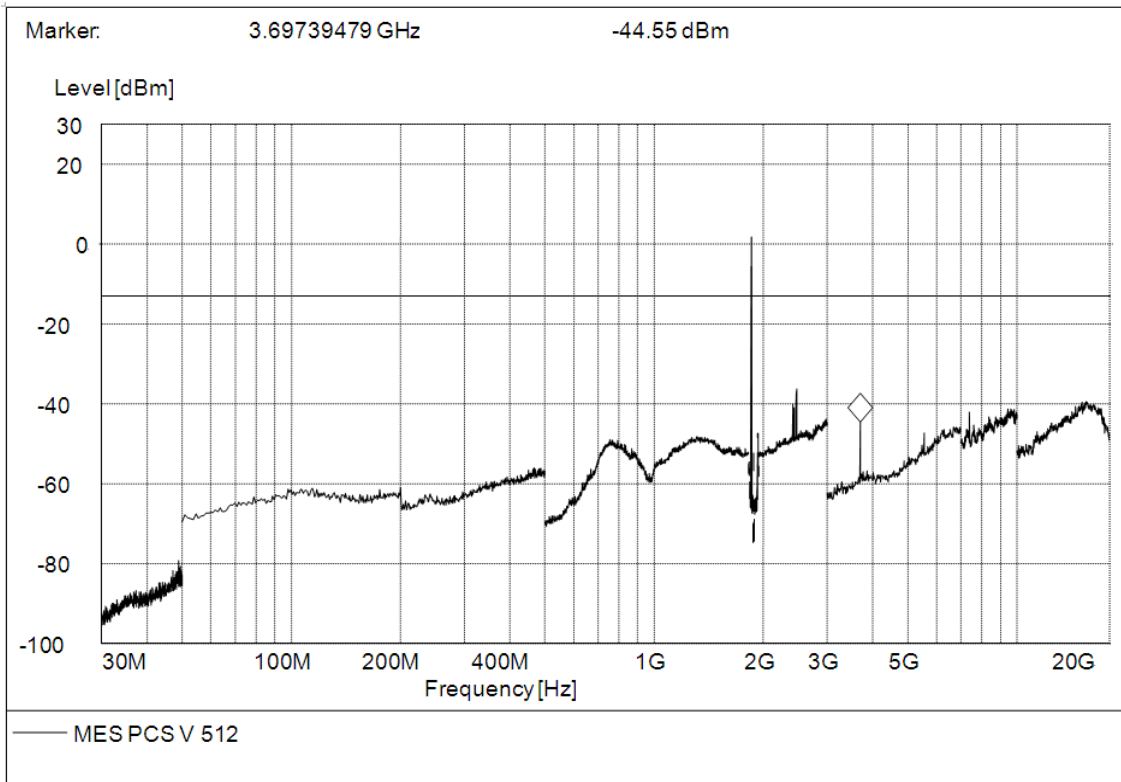
(Plot A.5: GSM 850MHz Channel = 251, Test Antenna Horizontal)



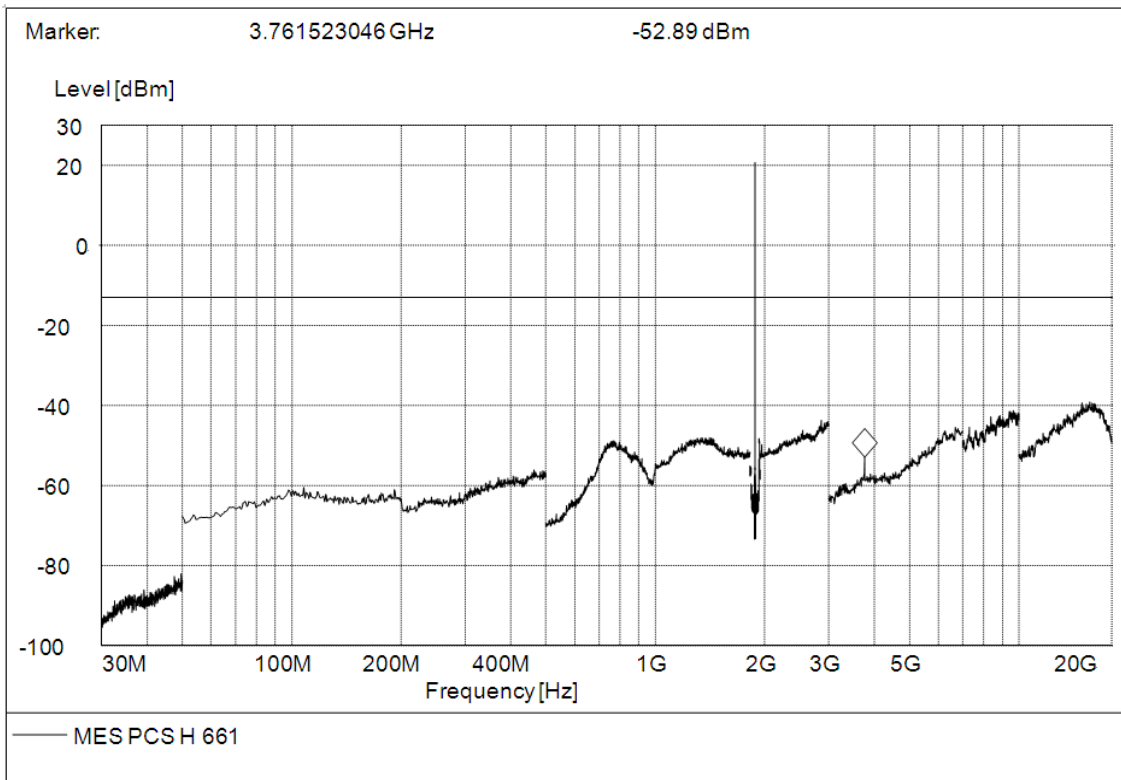
(Plot A.6: GSM 850MHz Channel = 251, Test Antenna Vertical)



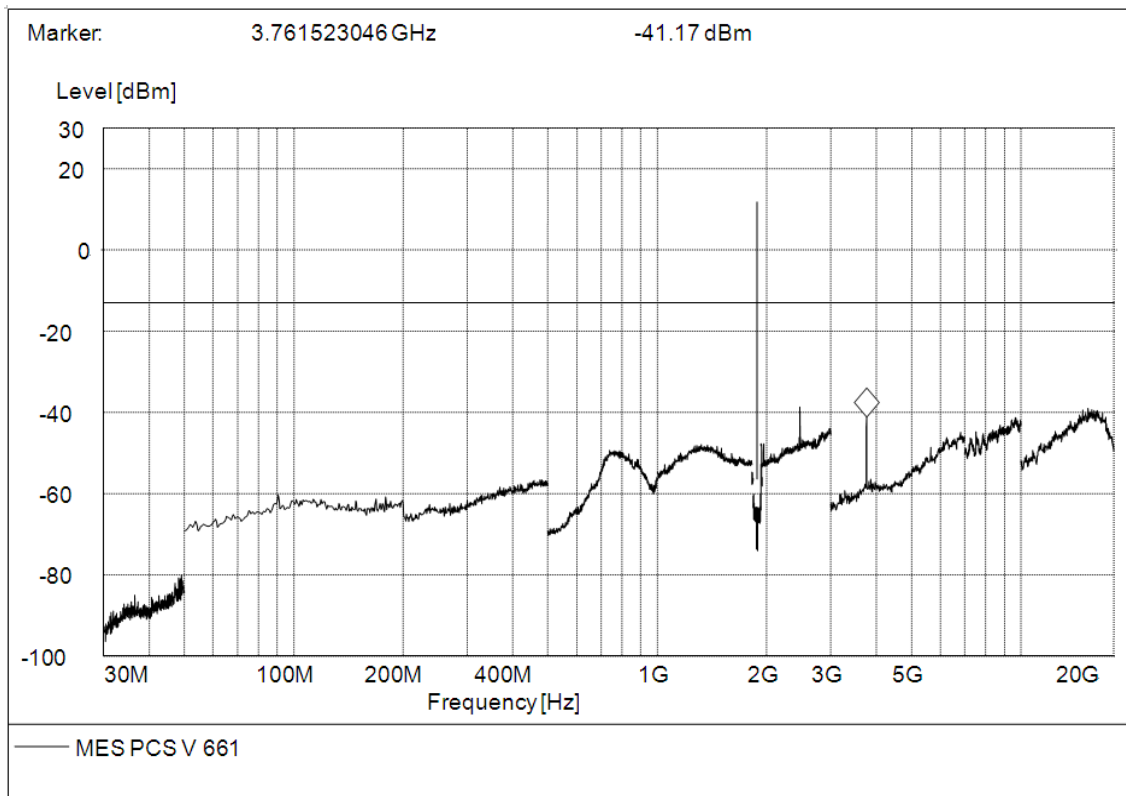
(Plot B.1: GSM 1900MHz Channel = 512, Test Antenna Horizontal)



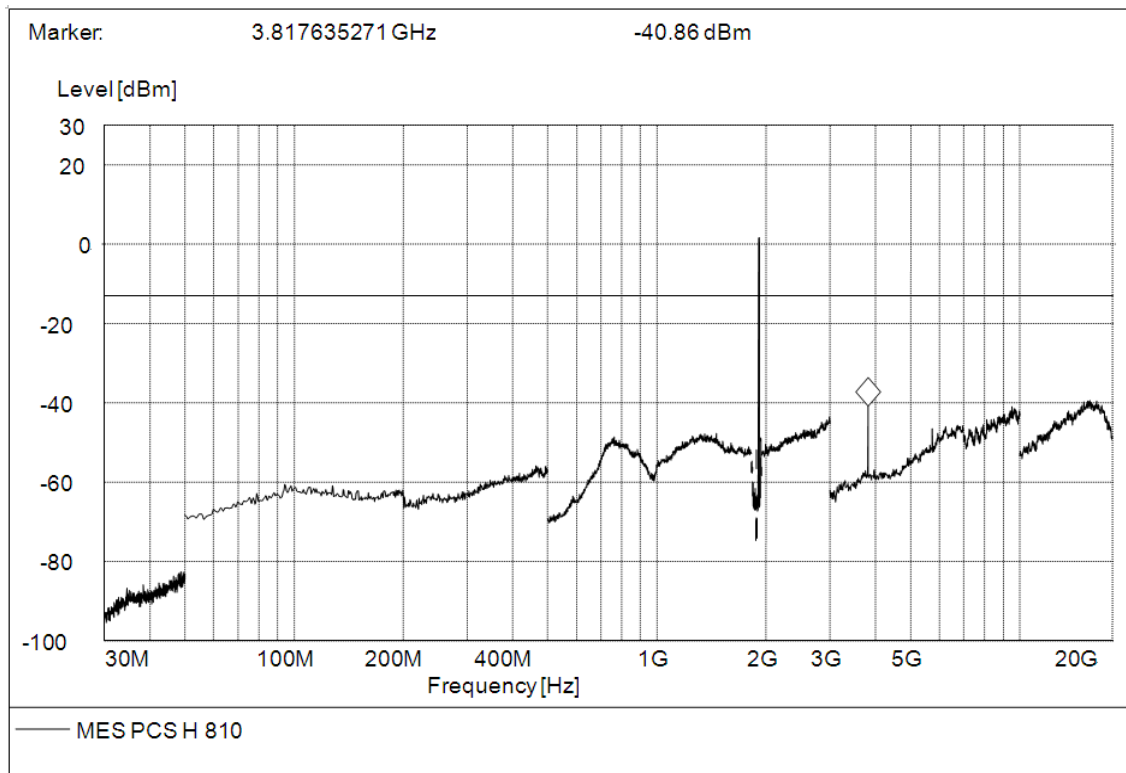
(Plot B.2: GSM 1900MHz Channel = 512, Test Antenna Vertical)



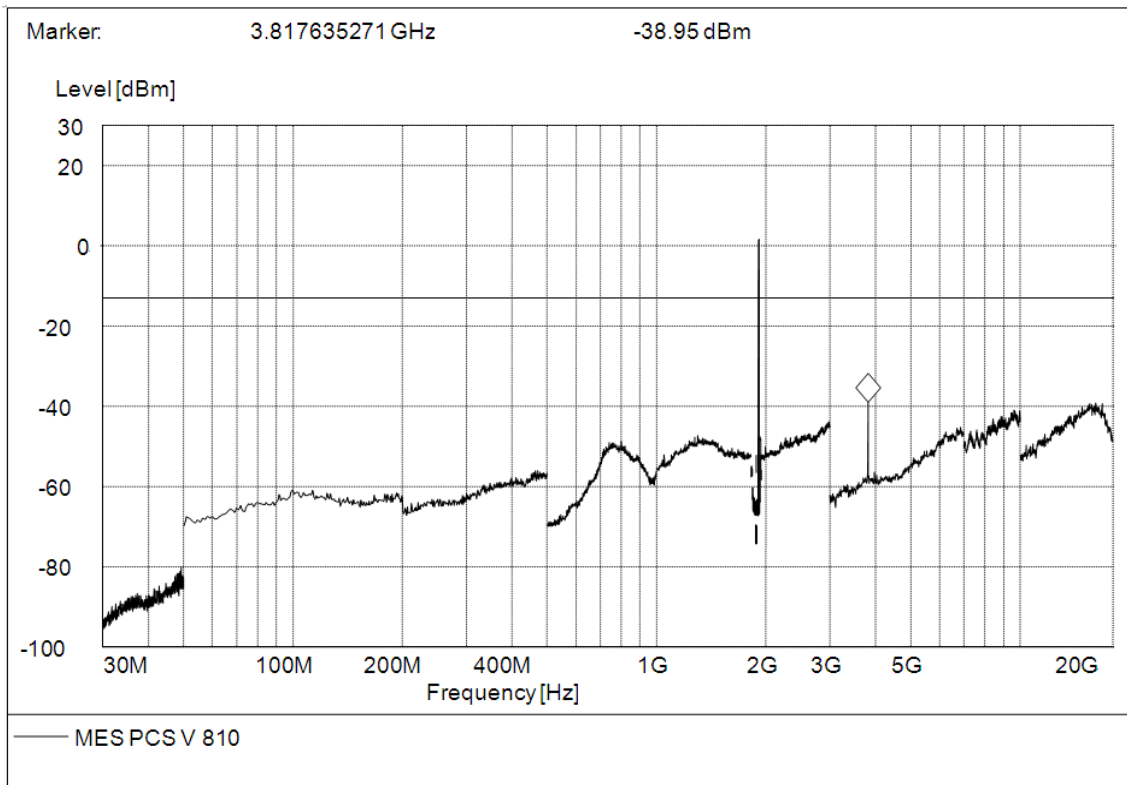
(Plot B.3: GSM 1900MHz Channel = 661, Test Antenna Horizontal)



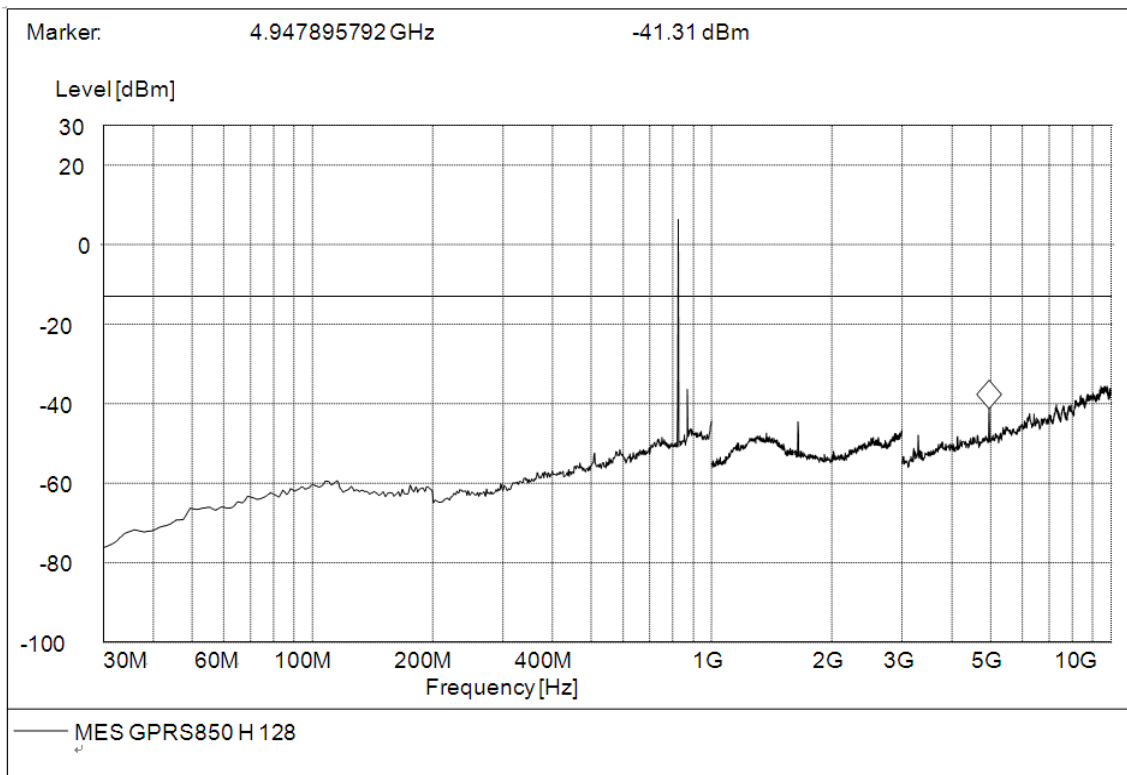
(Plot B.4: GSM 1900MHz Channel = 661, Test Antenna Vertical)



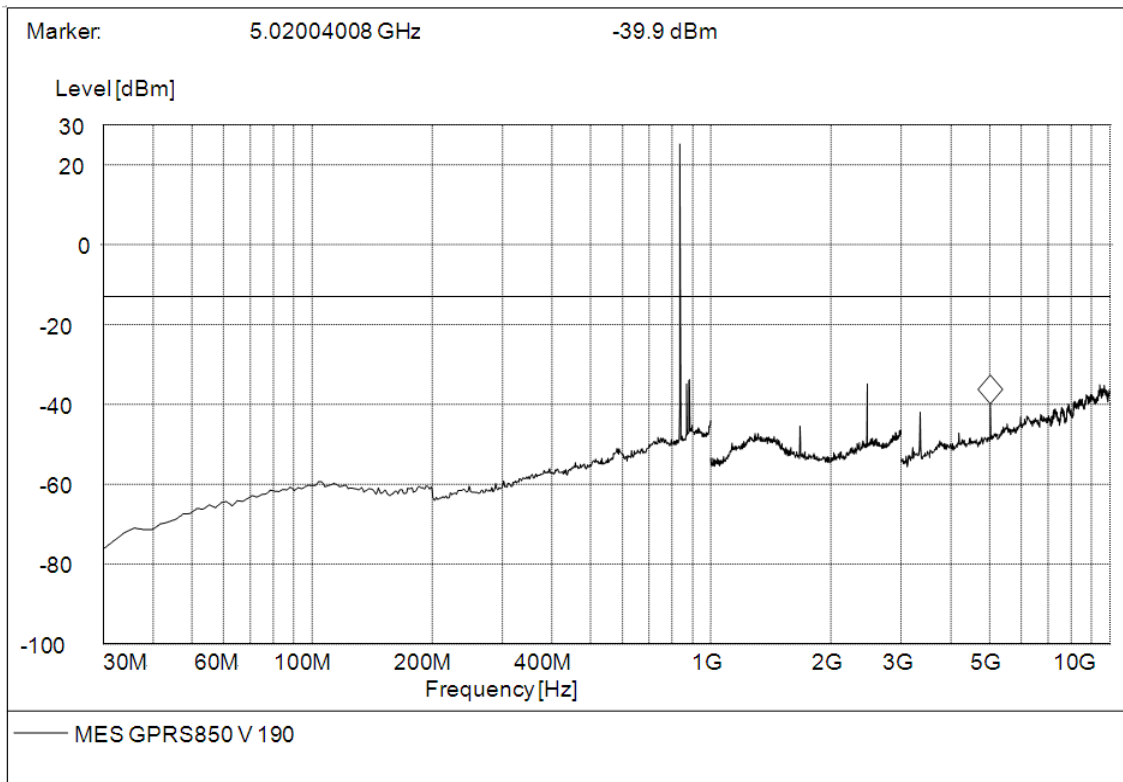
(Plot B.5: GSM 1900MHz Channel = 810, Test Antenna Horizontal)



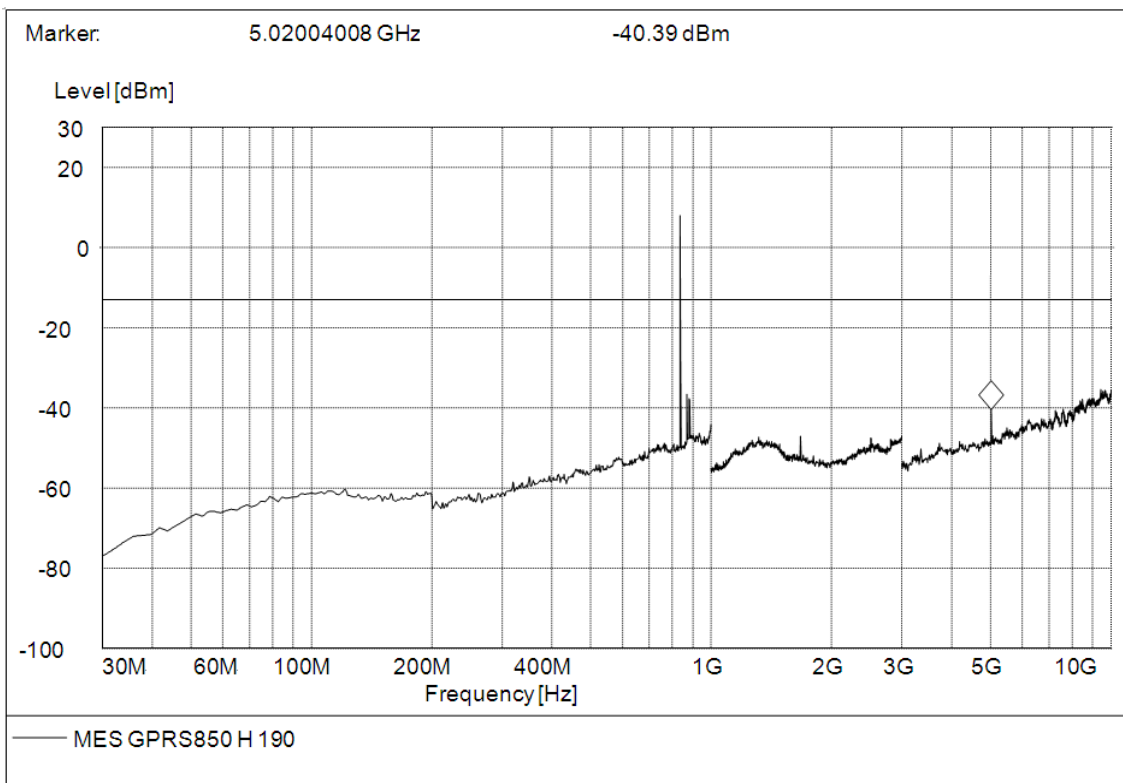
(Plot B.6: GSM 1900MHz Channel = 810, Test Antenna Vertical)



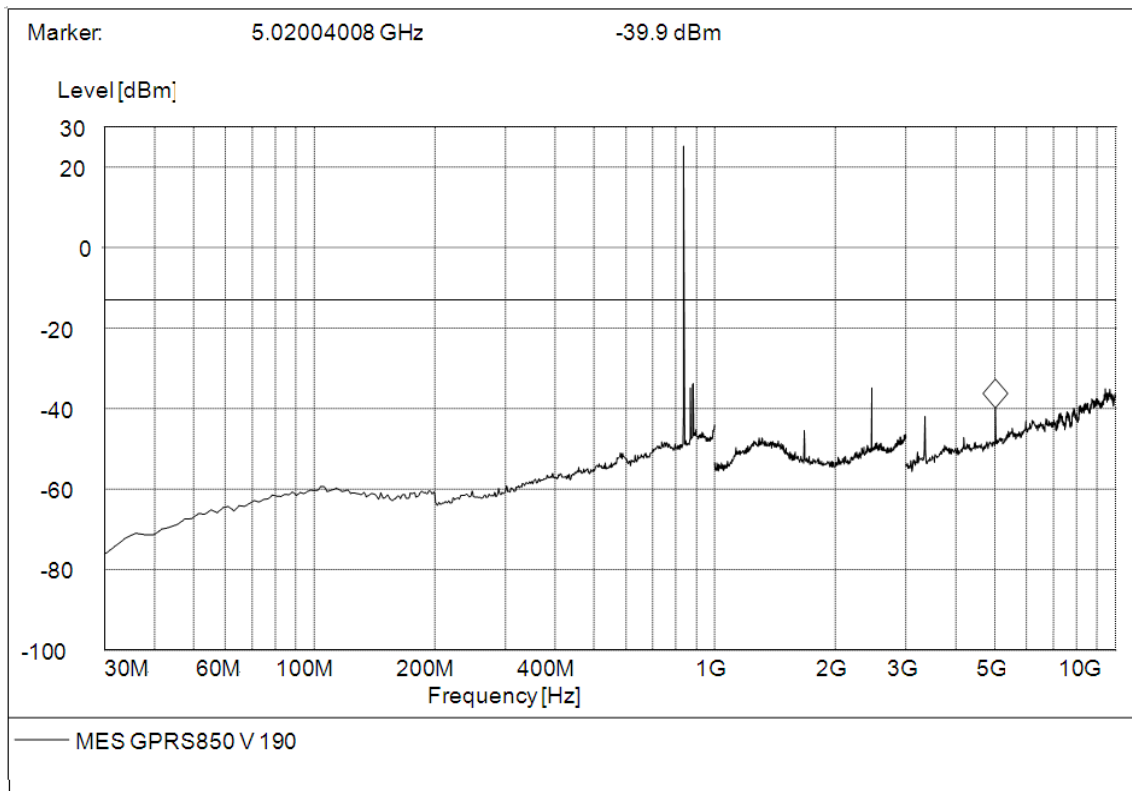
(Plot C.1: GPRS 850MHz Channel = 128, Test Antenna Horizontal)



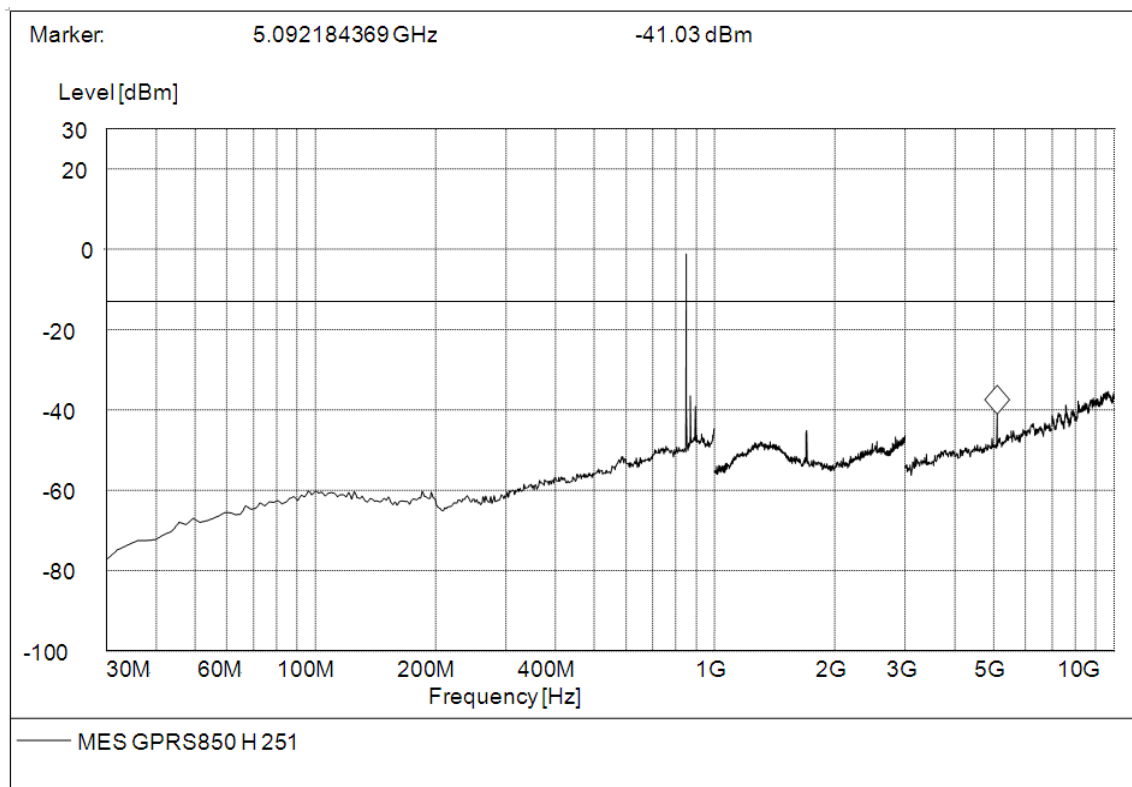
(Plot C.2: GPRS 850MHz Channel = 128, Test Antenna Vertical)



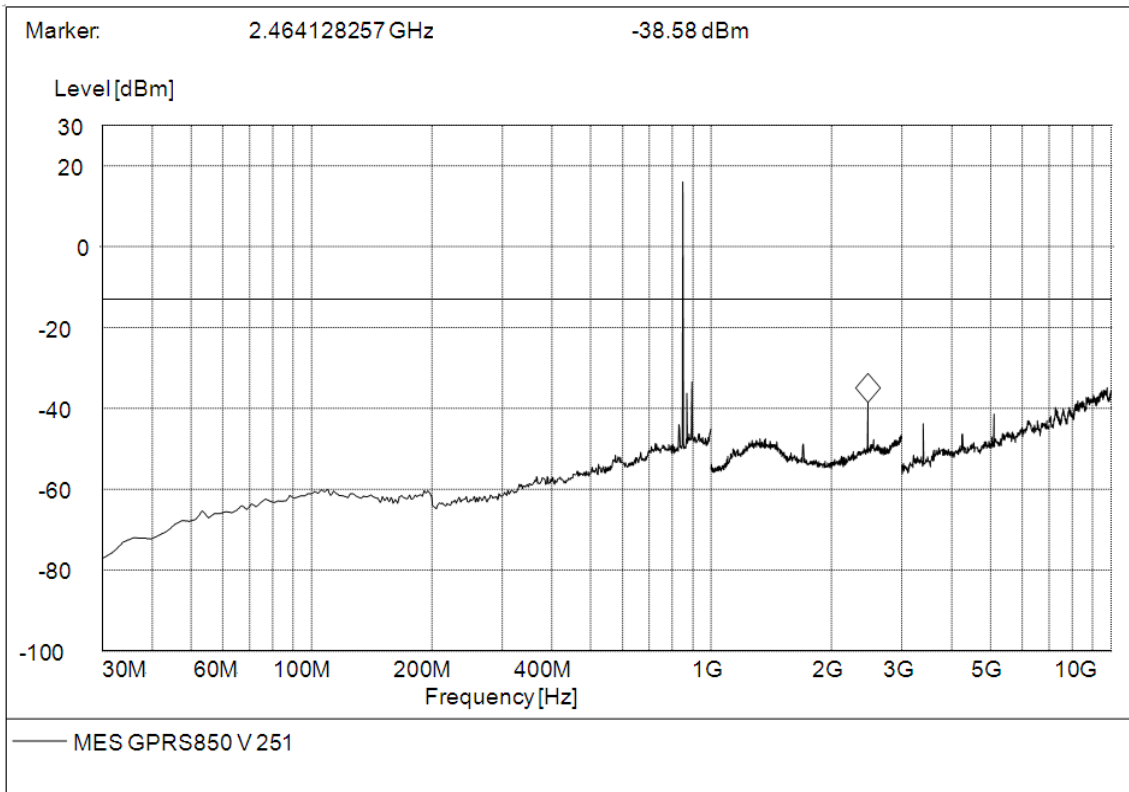
(Plot C.3: GPRS 850MHz Channel = 190, Test Antenna Horizontal)



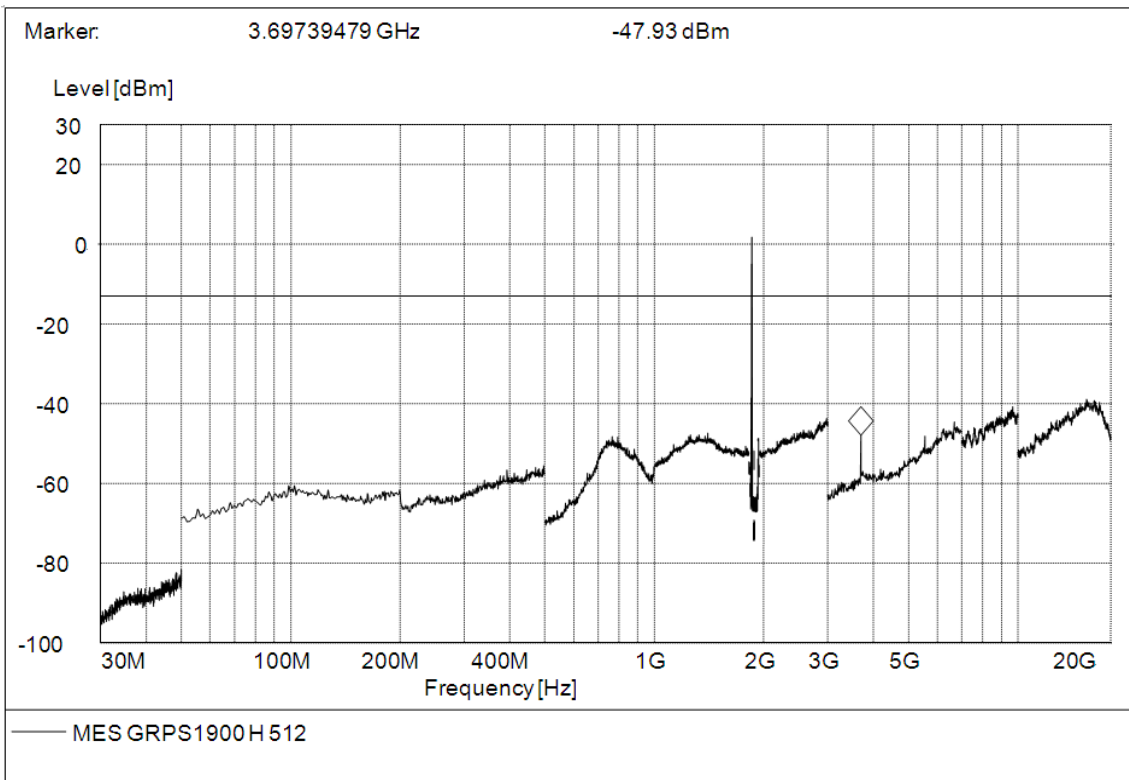
(Plot C.4: GPRS 850MHz Channel = 190, Test Antenna Vertical)



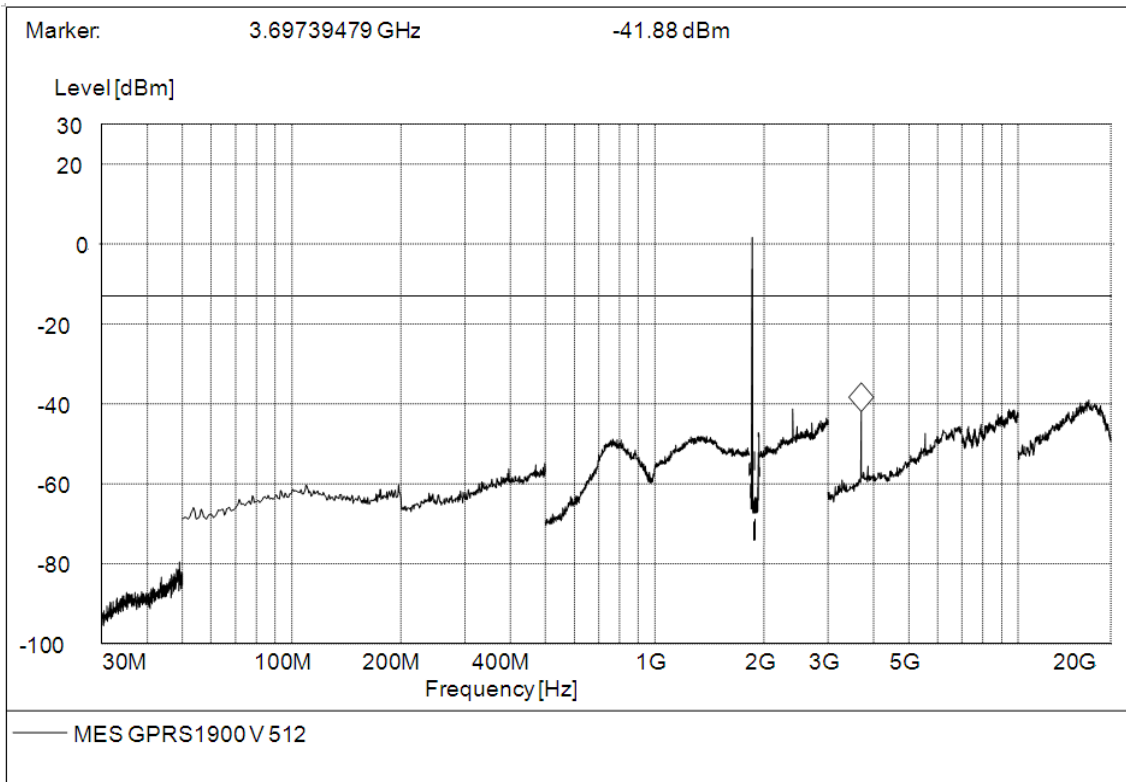
(Plot C.5: GPRS 850MHz Channel = 251, Test Antenna Horizontal)



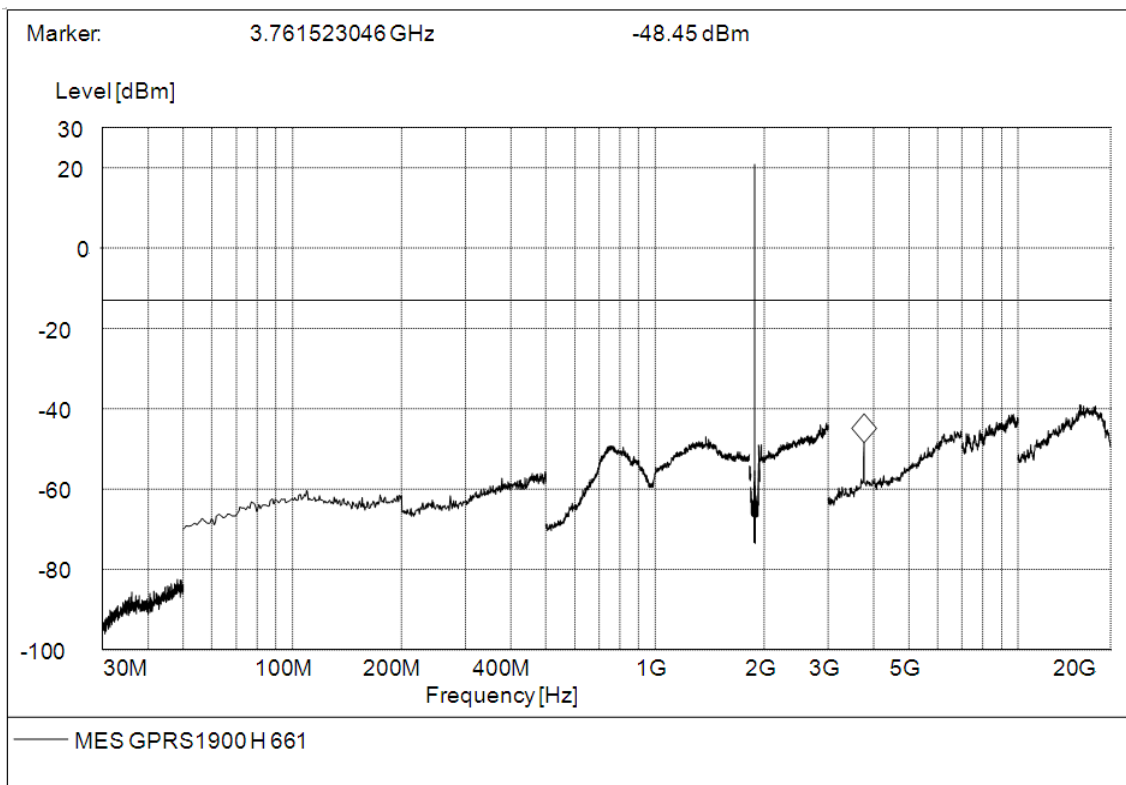
(Plot C.6: GPRS 850MHz Channel = 251, Test Antenna Vertical)



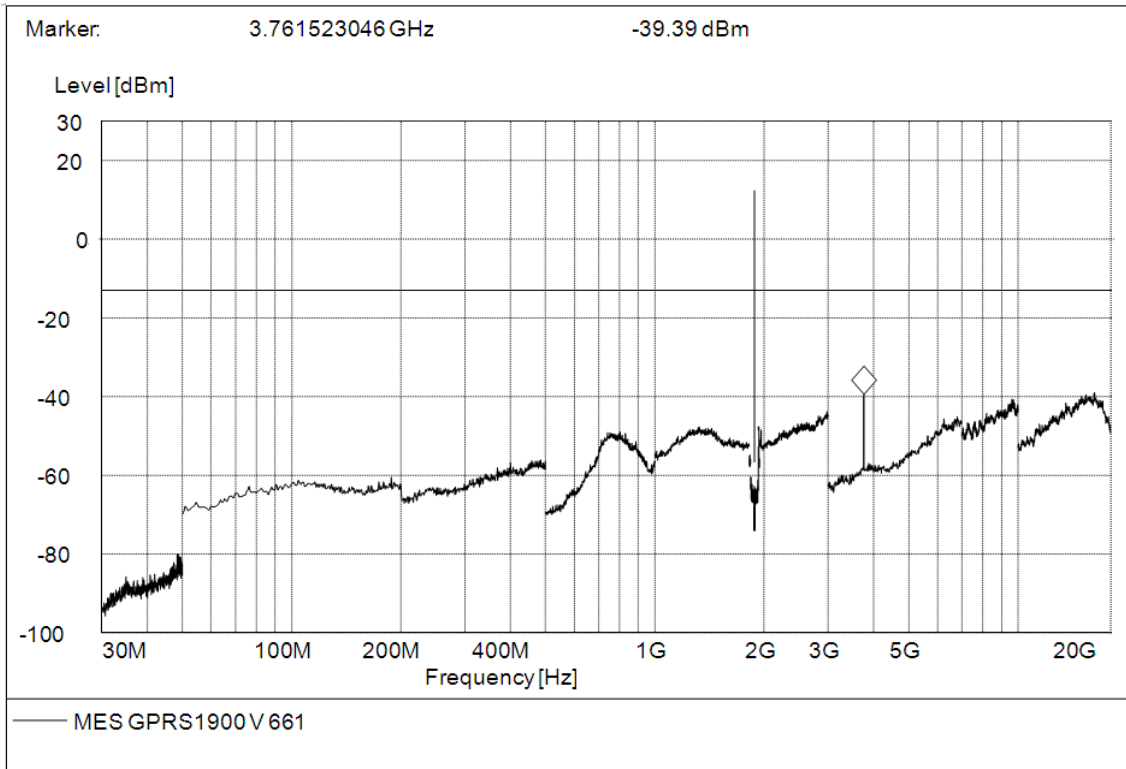
(Plot D.1: GPRS 1900MHz Channel = 512, Test Antenna Horizontal)



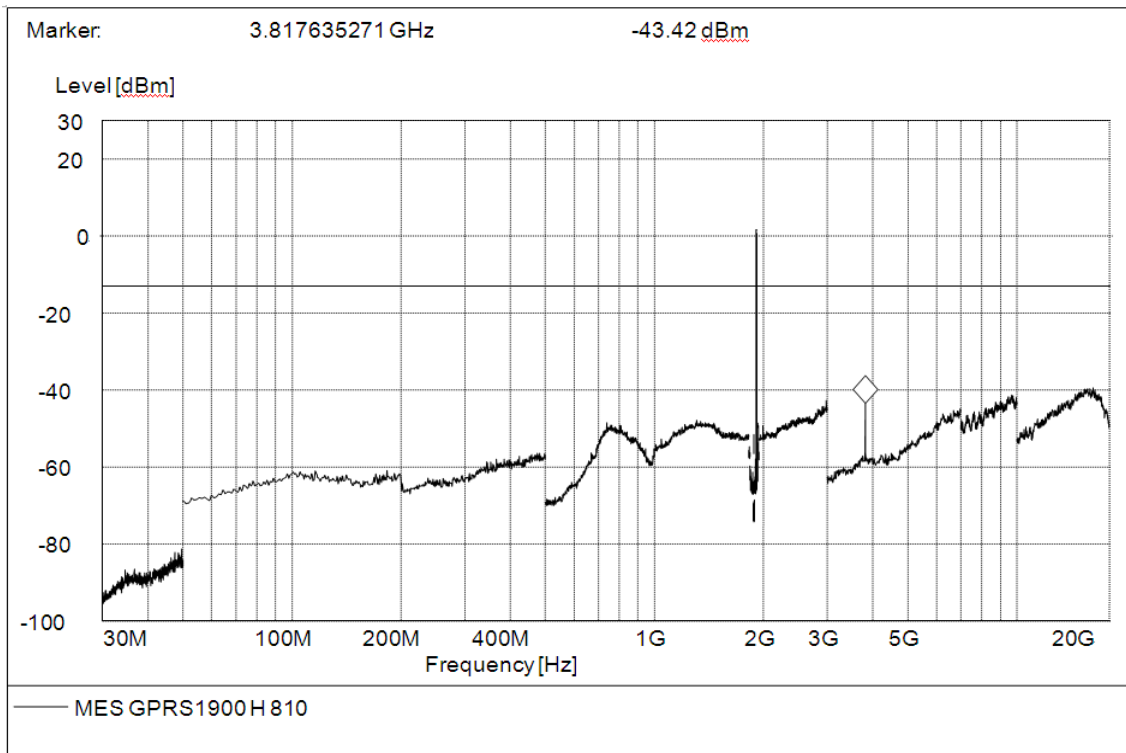
(Plot D.2: GPRS 1900MHz Channel = 512, Test Antenna Vertical)



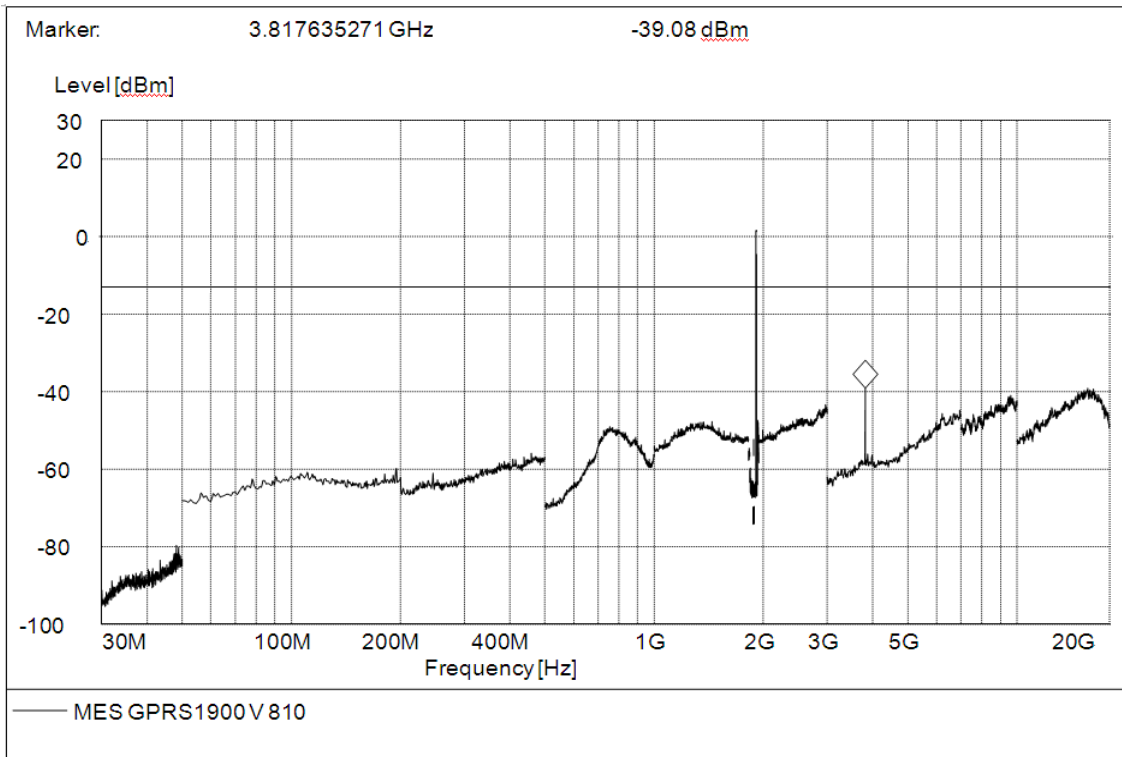
(Plot D.3: GPRS 1900MHz Channel = 661, Test Antenna Horizontal)



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



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



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

** END OF REPORT **