MiniCard 8755 Test Report

For

FCC Certification

FCC ID: N7NMC8755

Prepared by
SIERRA WIRELESS INC.
13811 WIRELESS WAY
RICHMOND, BC V6V 3A4
CANADA

Test Date(s): November 9, 2005

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1 Introduction and Purpose

This document provides the FCC test data for the MC8755 wireless modem. The tests included in this report are limited to all conducted tests required. The radiated tests were performed at an external test facility.

2 Test Summary

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2.1051, 22.901(d) 22.917, 24.238(a)	Out of Band Emissions at Antenna Terminals	Complies	14
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2.1053	Field Strength of Spurious Radiation	Complies	See CCS Report
2.1055	Frequency Stability versus Temperature	Complies	45
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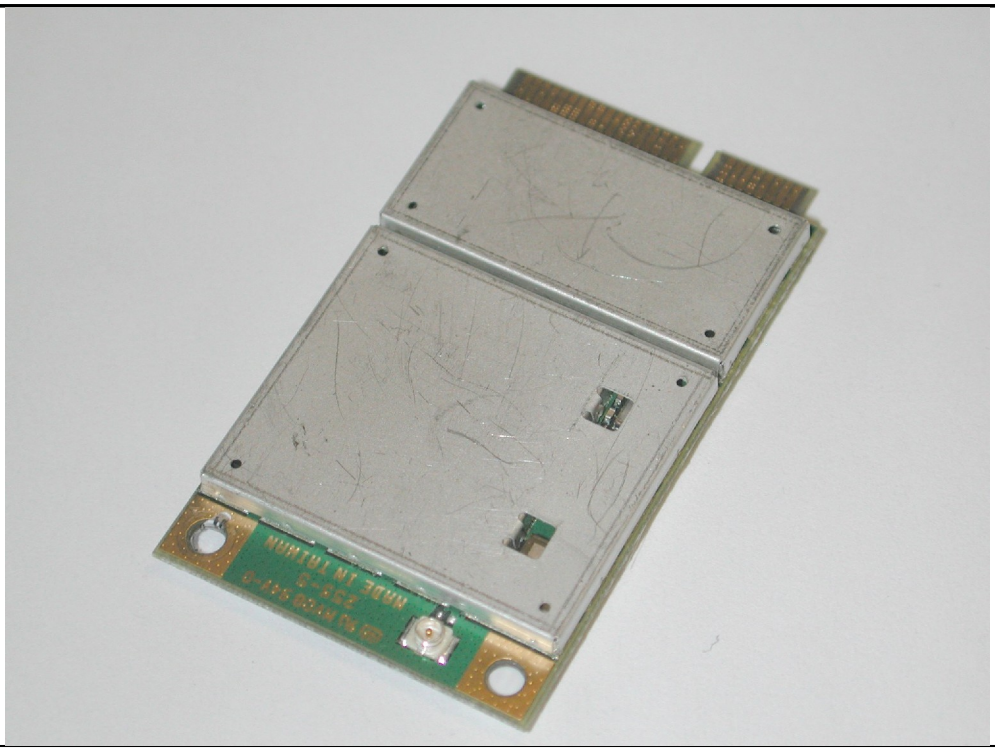
The tests described in this report were performed by Mr. Philip Wright at:

Sierra Wireless, Inc.
13811 Wireless Way
Richmond, B.C. V6V 3A4
Canada

3 Description of Device Under Test

The Sierra Wireless Inc. model MiniCard MC8755 is a five-band USB wireless modem operating on the GSM/GPRS/EDGE/UMTS network. In the US and Canada, only cellular and PCS bands are used for GSM/GPRS operation, so this test report only contains data for these two bands (850MHz and 1900MHz). The DUT was tested in all modes of operation: GMSK modulation and 8-PSK. The DUT is a production sample.



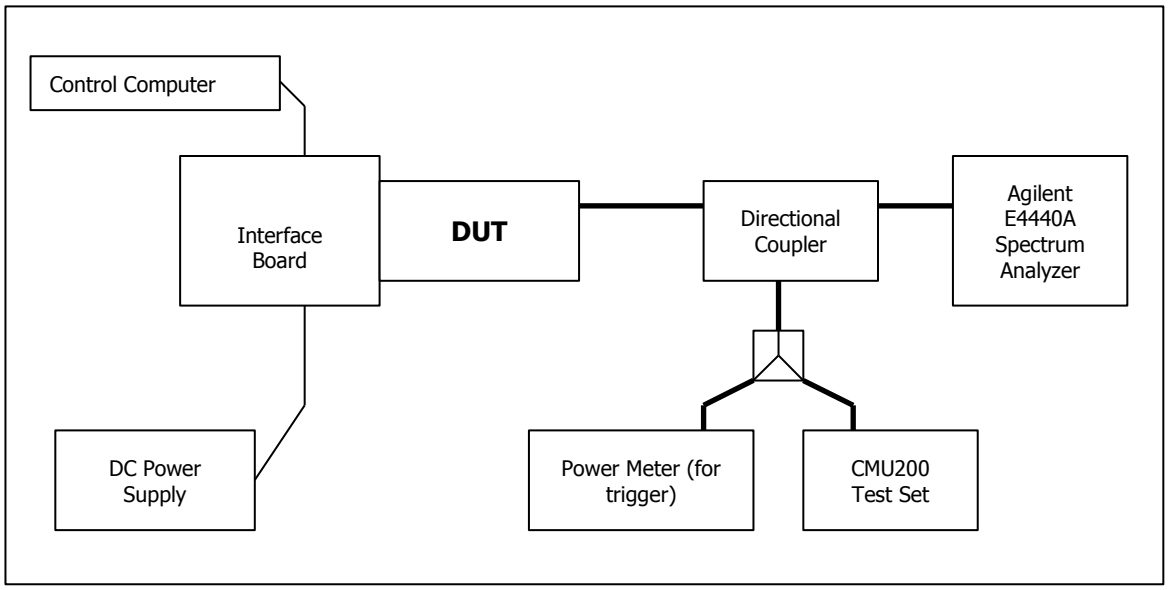
4 RF Power Output

FCC 2.1046

4.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set and configured to operate at maximum power in a call. The power was measured using the spectrum analyzer at three equally spaced operating frequencies for each band. The RBW was set to 300 KHz for the GSM and EDGE measurements. The spectrum analyzer was set to measure the RF output power with the cable and coupler losses accounted for.

Test Setup



4.2 Test Equipment

Instrument List

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	836766/030	N/A
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	Sept. 29, 2004
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

4.3 Test Results

Frequency (MHz)	Channel	Power (dBm)	
		GMSK Mode	8-PSK Mode
824.2	128	31.93	26.75
837.0	192	32.07	26.77
848.8	251	31.78	26.91
1850.2	512	29.12	26.01
1880.0	661	28.95	25.65
1909.8	810	28.90	25.44

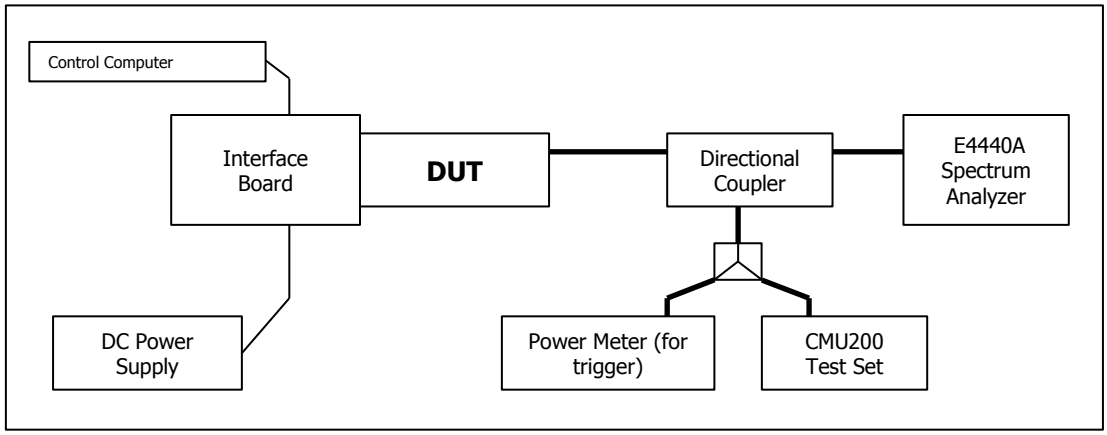
5 Occupied Bandwidth

FCC 2.1049

5.1 Test Procedure

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth (defined as the 99% Power Bandwidth) was measured with the spectrum analyzer at the 3 frequencies in each band. The –26dB bandwidth was also measured and recorded. All results were obtained while in a call.

Test Setup



5.2 Test Results

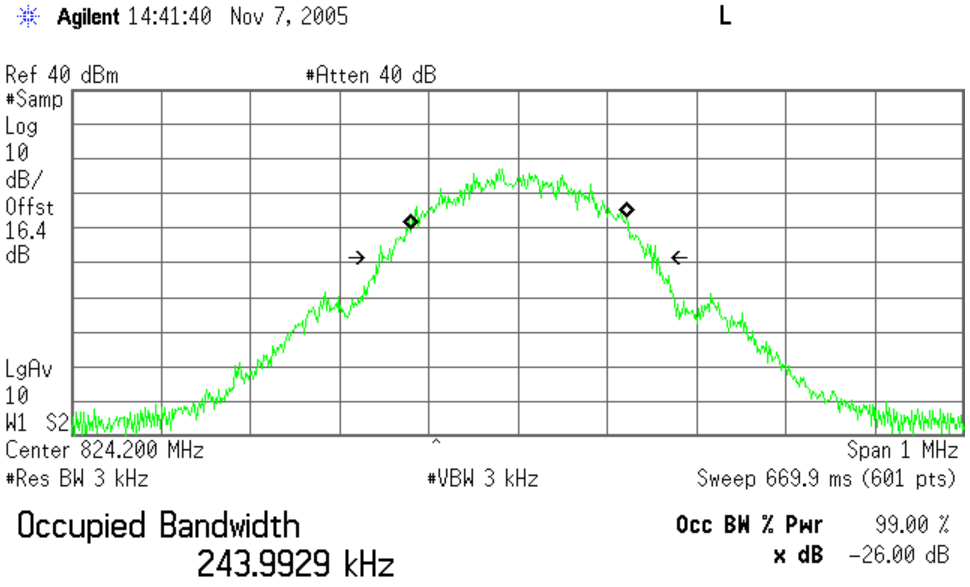
The performance of the GSM 850 MHz cellular band is shown in plots 5.3.1 to 5.3.6.
Performance of the GSM 1900 MHz PCS band is shown in plots 5.3.7 to 5.3.12.

Frequency (MHz)	Channel	99% Occupied Bandwidth (kHz)		-26dBc Occupied Bandwidth (kHz)	
		GMSK Mode	8-PSK Mode	GMSK Mode	8-PSK Mode
824.2	128	243	244	312	305
837.0	192	244	246	312	297
848.8	251	240	246	307	302
1850.2	512	242	243	315	305

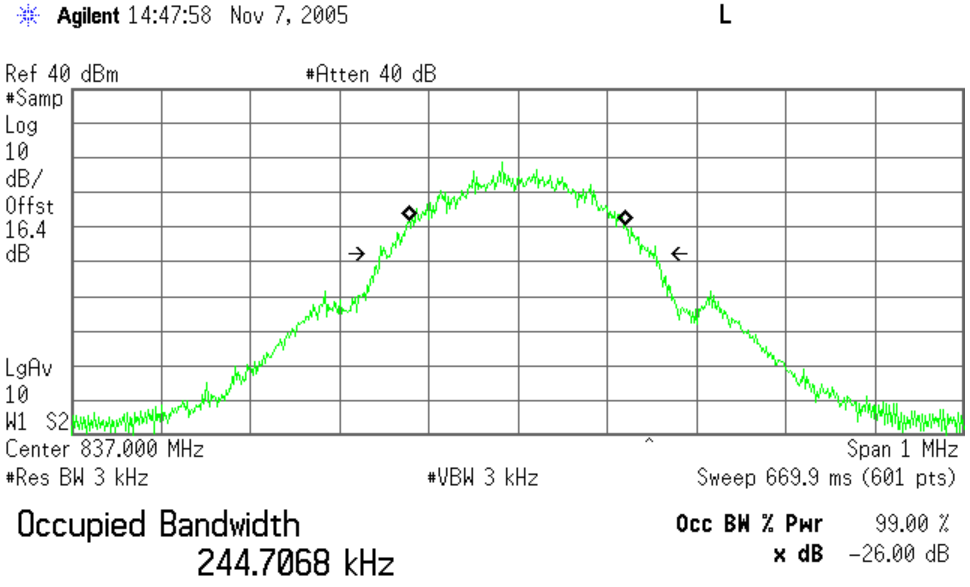
1880.0	661	244	243	314	307
1909.8	810	243	243	316	310

Test Plots

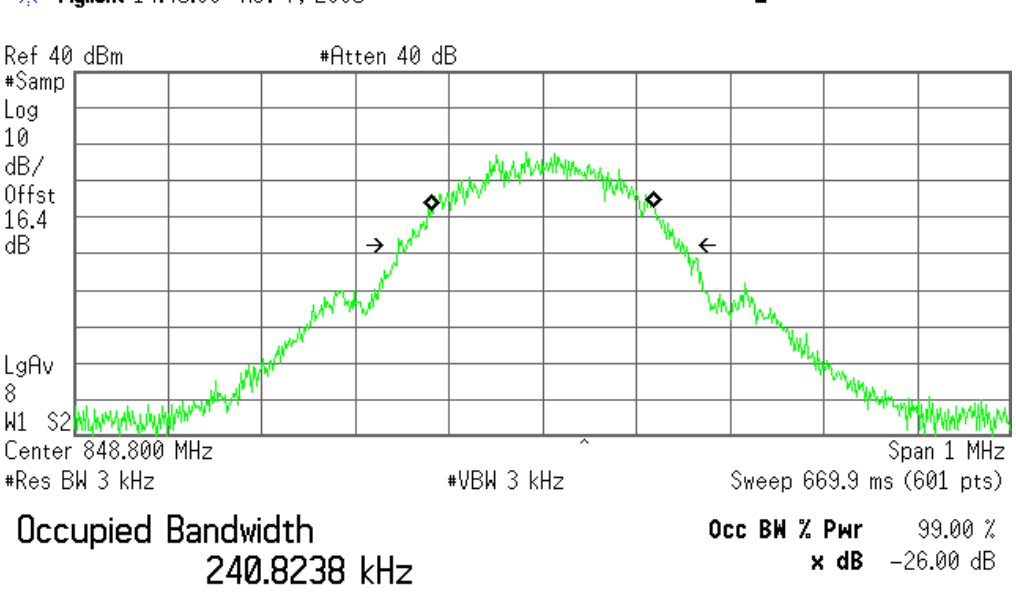
5.3.1) GMSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% bandwidth



5.3.2) GMSK Occupied Bandwidth, Middle channel, 837 MHz, 99% bandwidth

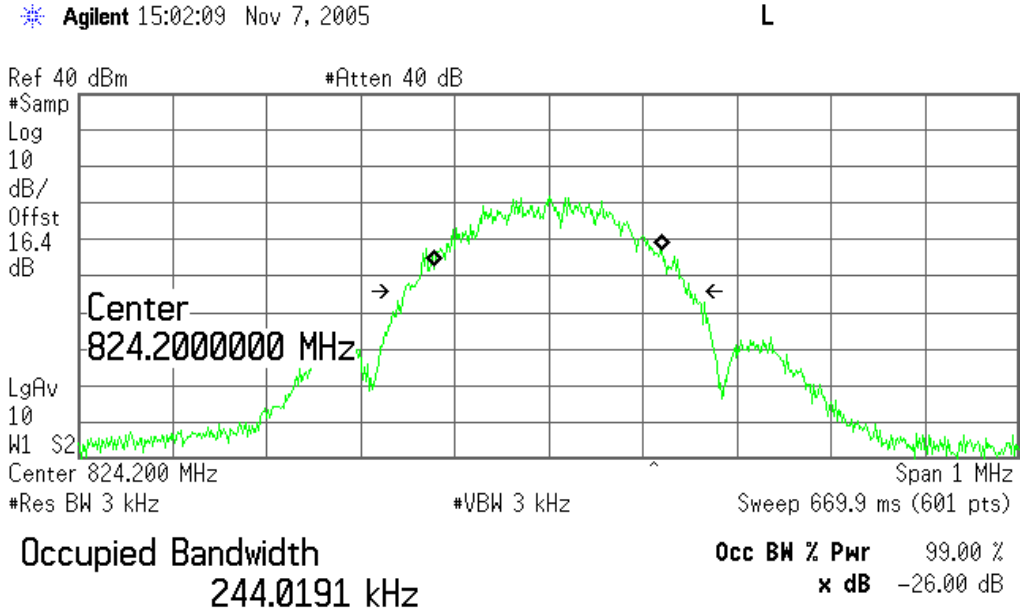


5.3.3) GMSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth



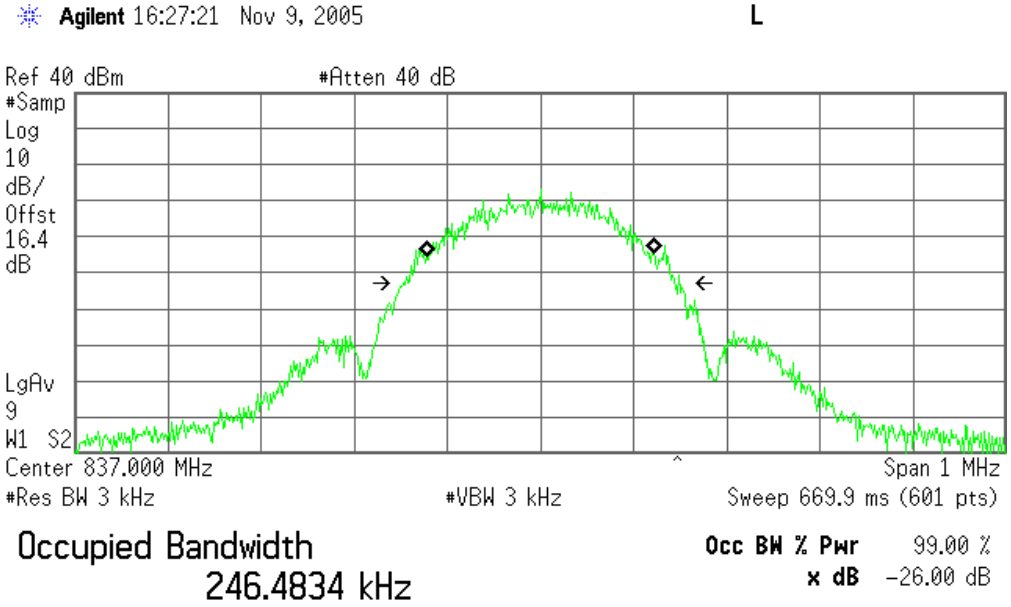
Transmit Freq Error 134.204 mHz
x dB Bandwidth 307.739 kHz*

5.3.4) 8-PSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% bandwidth

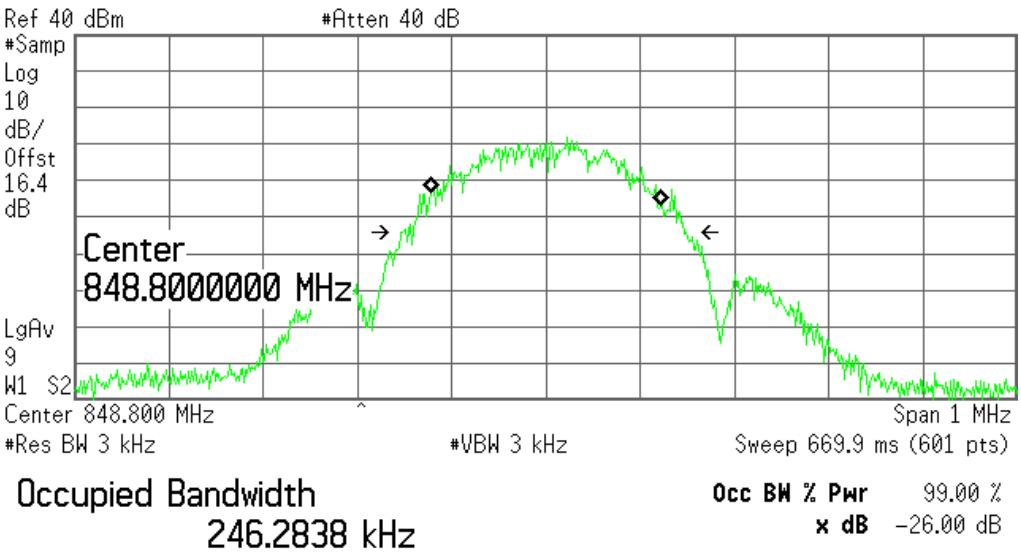


Transmit Freq Error -679.958 Hz
x dB Bandwidth 305.857 kHz*

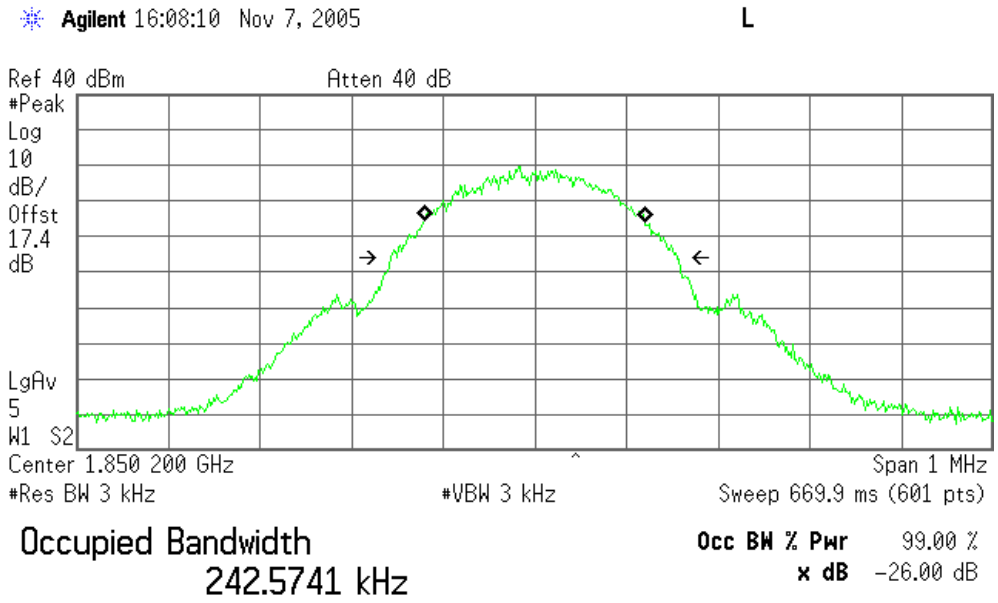
5.3.5) 8-PSK Occupied Bandwidth, Middle channel, 837 MHz, 99% bandwidth



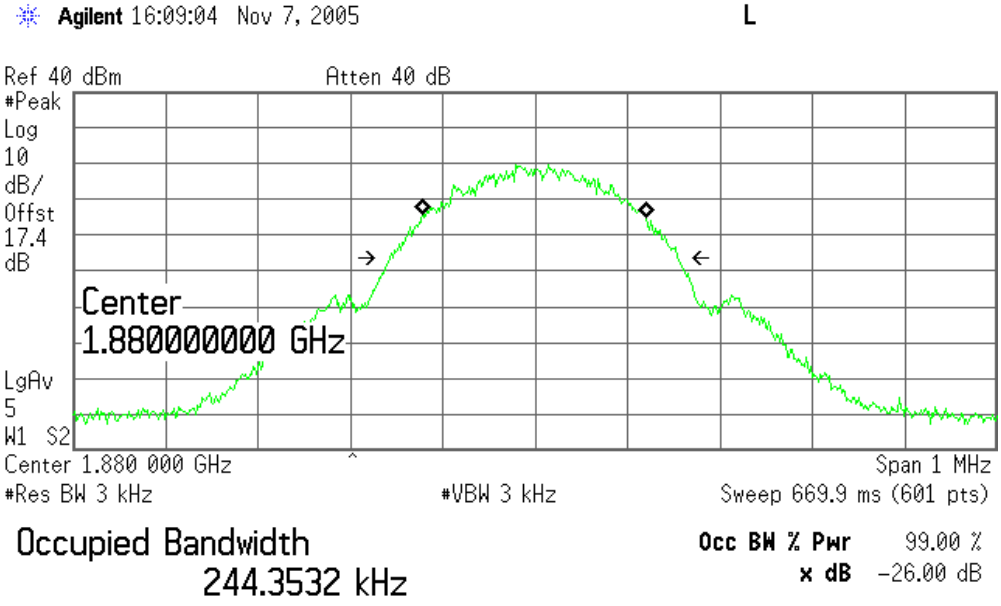
5.3.6) 8-PSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth



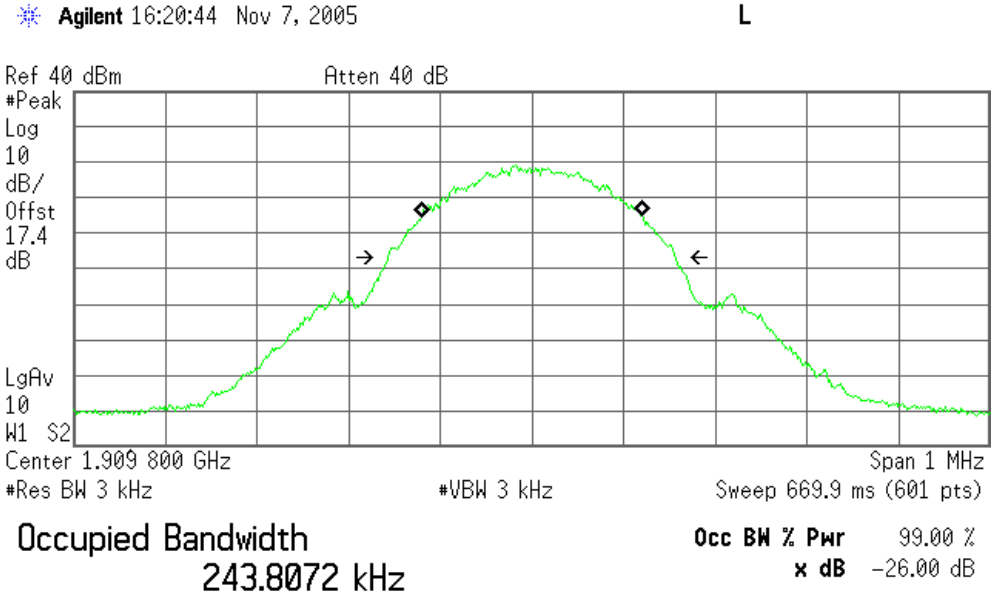
5.3.7) GMSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% bandwidth



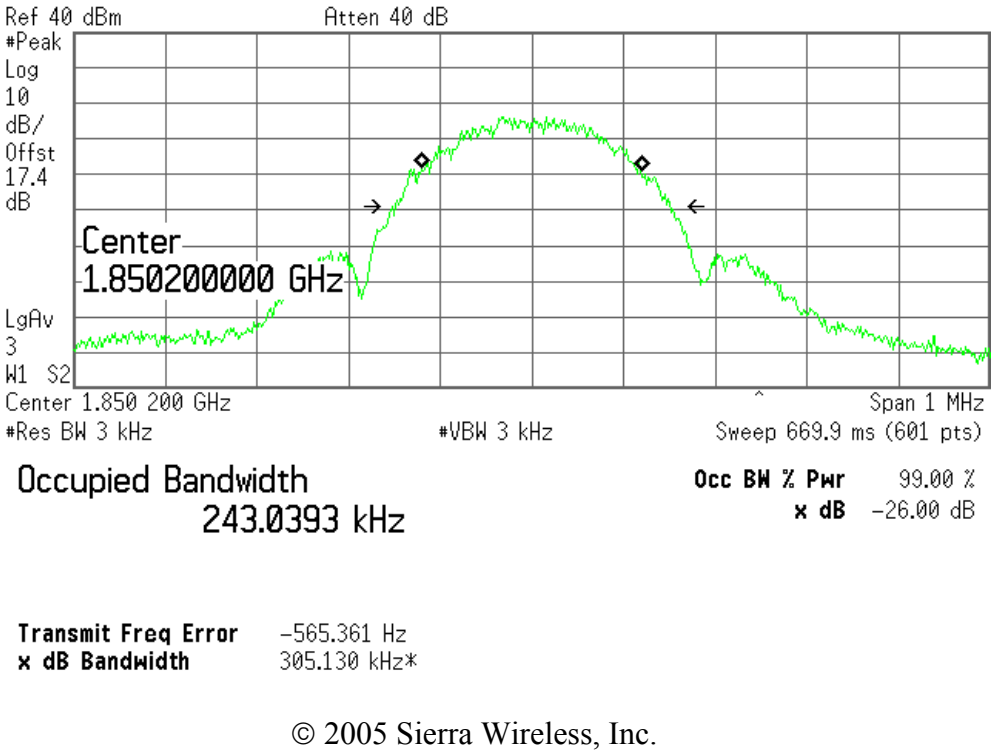
5.3.8) GMSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% bandwidth



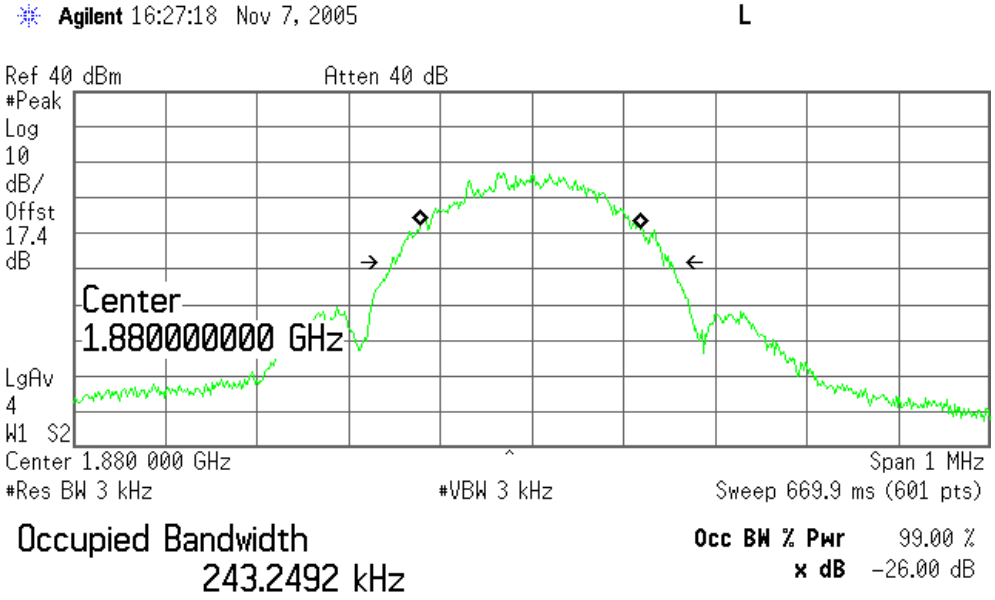
5.3.9) GMSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% bandwidth



5.3.10) 8-PSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% bandwidth

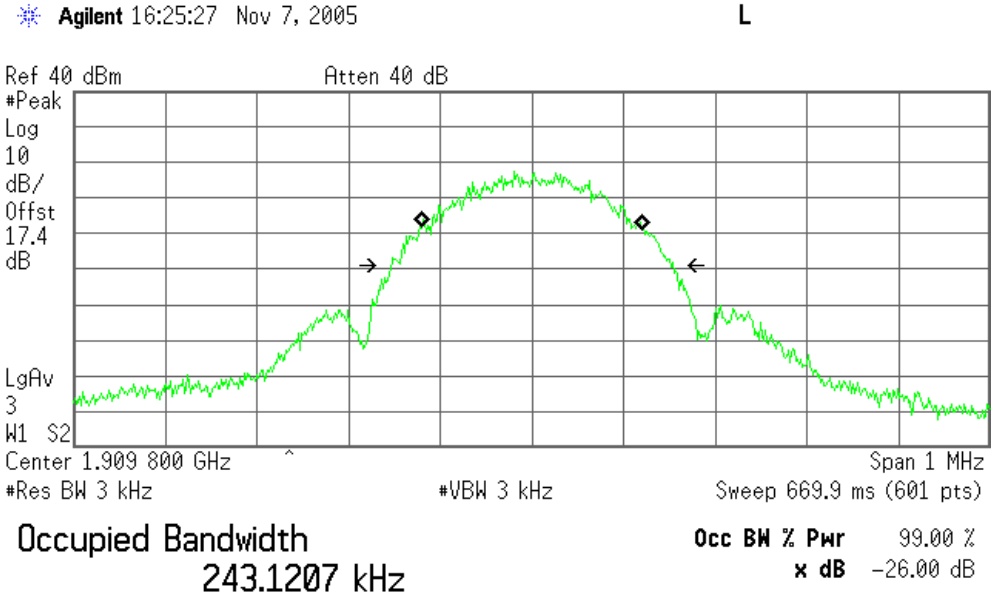


5.3.11) 8-PSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% bandwidth



Transmit Freq Error -1.326 kHz
x dB Bandwidth 307.527 kHz*

5.3.12) 8-PSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% bandwidth



Transmit Freq Error 483.148 Hz
x dB Bandwidth 310.748 kHz*

6 Out of Band Emissions at Antenna Terminals

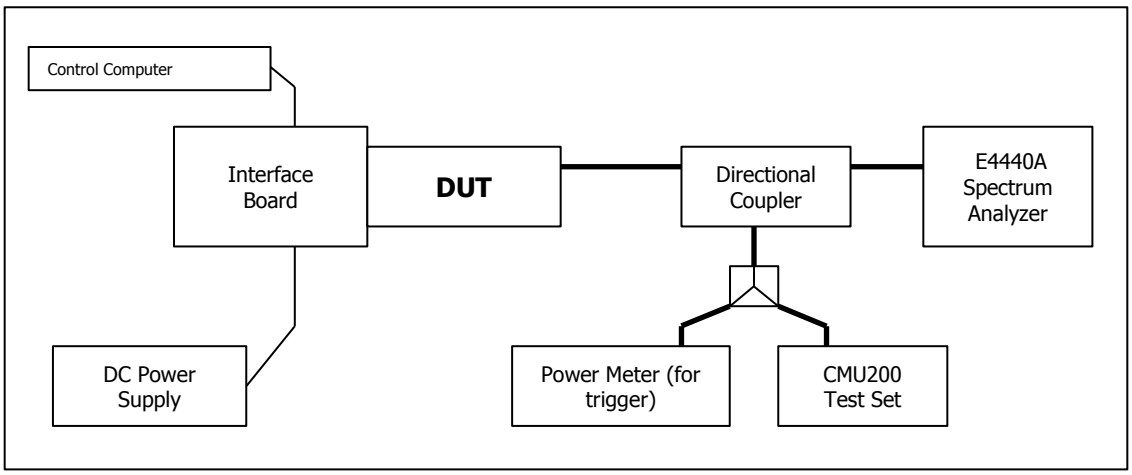
FCC 22.901(d), 22.917, 24.238(a)

Out of Band Emissions:
The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

6.1 Test Procedure

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. The DUT was scanned for spurious emissions from 1MHz to 20GHz with sufficient bandwidth and video resolution. Data plots are included. The measurement cable path loss varies since the coupler used has different loss at higher frequencies when compared to lower frequencies. To be conservative, the worst-case path loss was always chosen. While the unit was in a call, multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

Test Setup



6.2 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	836766/030	N/A
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	Sept. 29, 2004
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

6.3 Test Results

Refer to the following plots.

- **Cellular Band**

Plot Number	Description
6.4.1 – 6.4.3	GMSK Mode, Low channel, 824.20 MHz
6.4.4 – 6.4.6	GMSK Mode, Middle Channel, 837 MHz
6.4.7 – 6.4.9	GMSK Mode, High Channel, 848.8 MHz
6.4.10 – 6.4.12	8-PSK Mode, Low channel, 824.20 MHz
6.4.13 – 6.4.15	8-PSK Mode, Middle Channel, 837 MHz
6.4.16 – 6.4.18	8-PSK Mode, High Channel, 848.8 MHz

- **PCS Band**

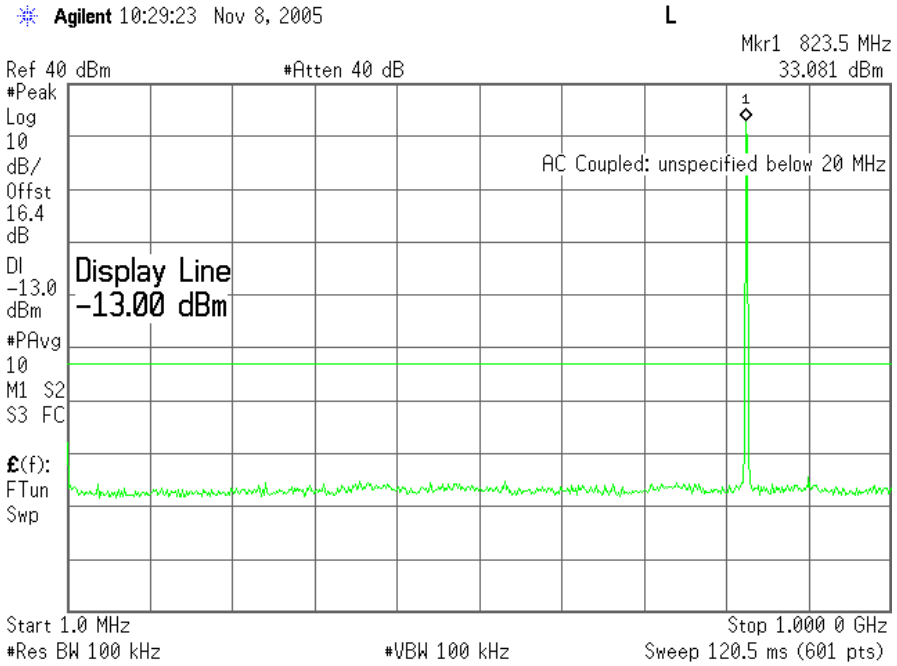
Plot Number	Description
6.4.19 – 6.4.21	GMSK Mode, Low Channel, 1850.2 MHz
6.4.22 – 6.4.24	GMSK Mode, Middle Channel, 1880.0 MHz
6.4.25 – 6.4.27	GMSK Mode, High Channel, 1909.8 MHz
6.4.28 – 6.4.30	8-PSK, Mode, Low Channel, 1850.2 MHz
6.4.31 – 6.4.33	8-PSK Mode, Middle Channel, 1880.0 MHz
6.4.34 – 6.4.36	8-PSK Mode, High Channel, 1909.8 MHz

These plots show that the conducted emission limits requirements are met.

6.4 Test Plots

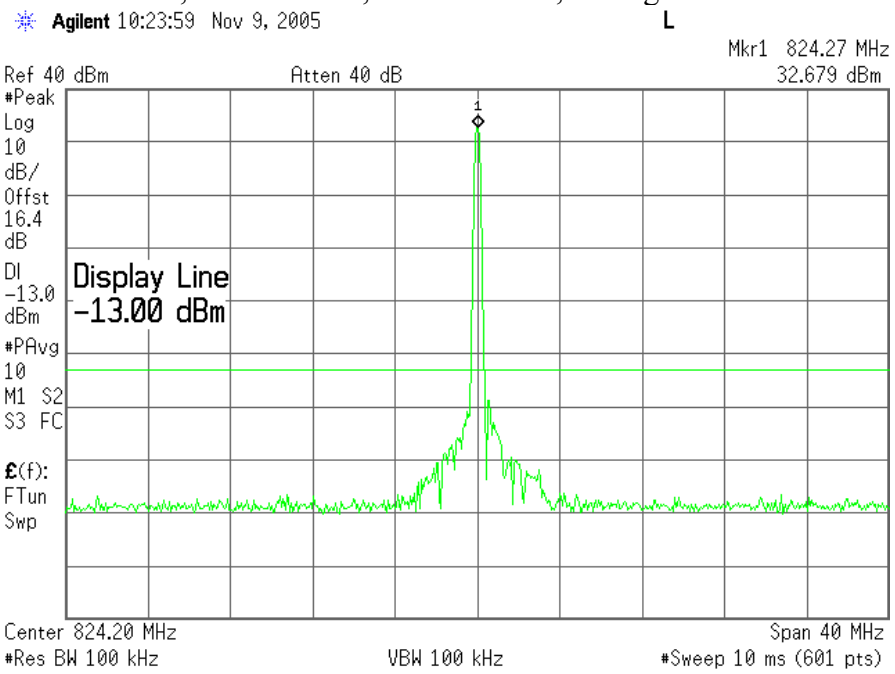
Plot 6.4.1) Out of Band Emissions at Antenna Terminals

GMSK, Low channel, 824.200 MHz, 1 MHz to 1 GHz



Plot 6.4.2) Out of Band Emissions at Antenna Terminals

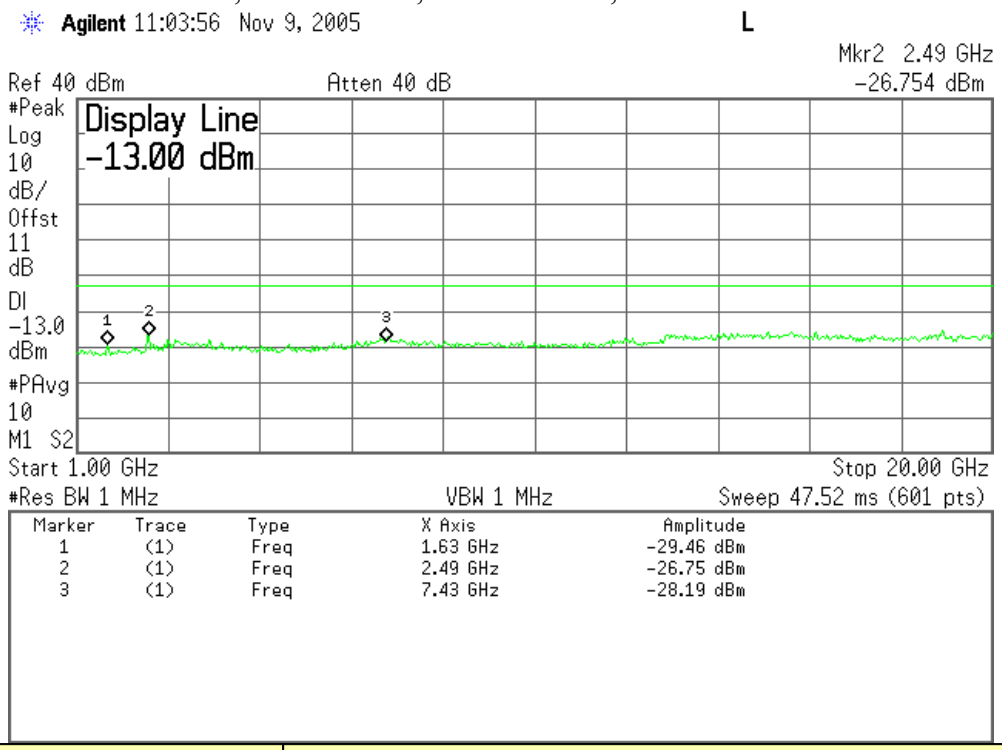
GMSK, Low channel, 824.200 MHz, TX signal +/- 20 MHz



The strong emission shown in each case is the carrier signal.

Plot 6.4.3) Out of Band Emissions at Antenna Terminals

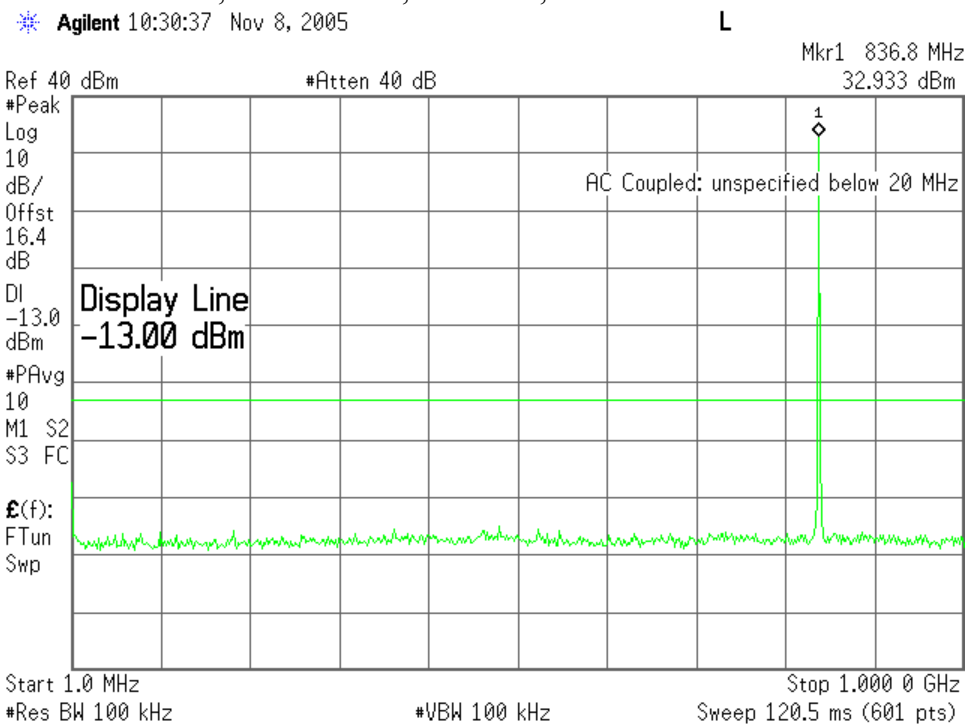
GMSK, Low channel, 824.200 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 128 (824.2 MHz)	Level (dBm)
Second	-29 dBm
Third	-26 dBm
All others	< -30dBm up to 20GHz

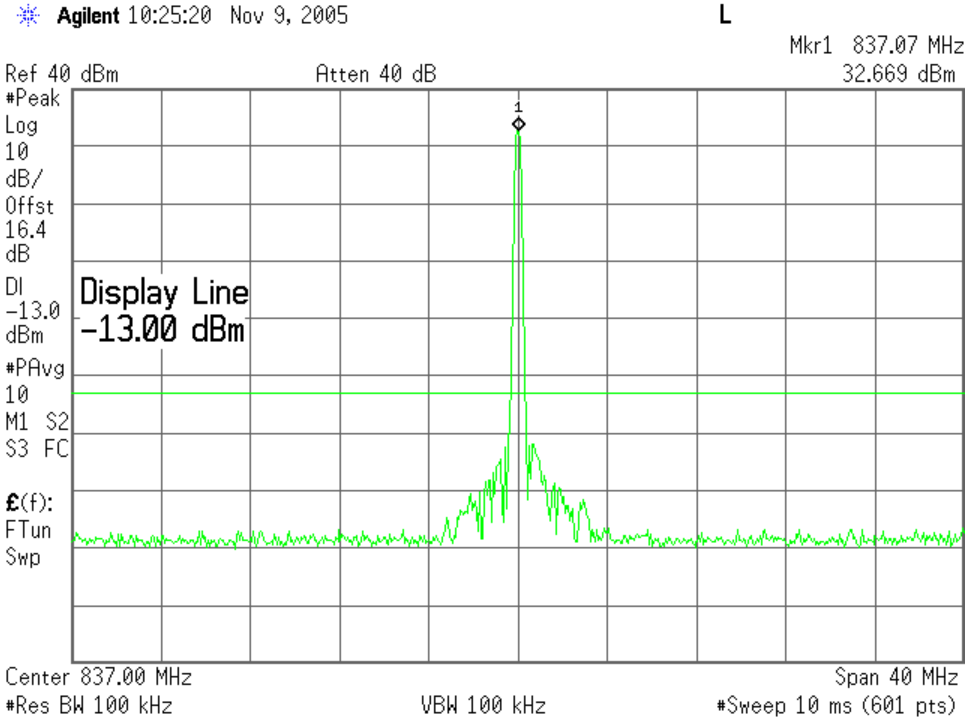
Plot 6.4.4) Out of Band Emissions at Antenna Terminals

GMSK, Mid Channel, 837 MHz, 1 MHz to 1 GHz



Plot 6.4.5) Out of Band Emissions at Antenna Terminals

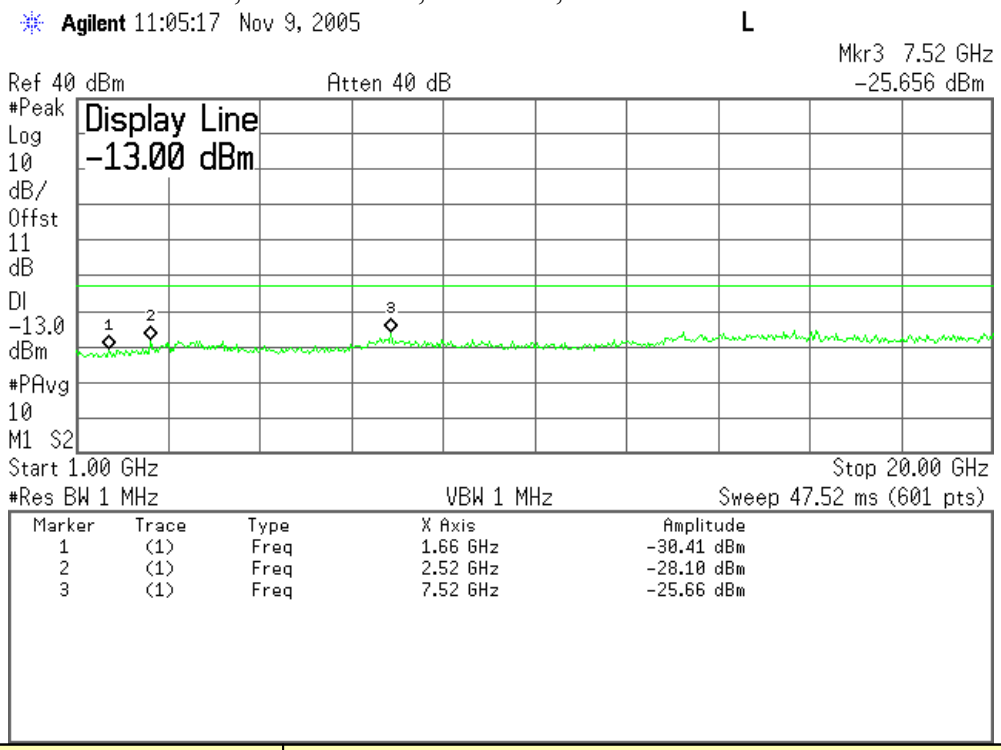
GMSK, Mid Channel, 837 MHz, TX signal +/- 20 MHz



The strong emission shown in each case is the carrier signal.

Plot 6.4.6) Out of Band Emissions at Antenna Terminals

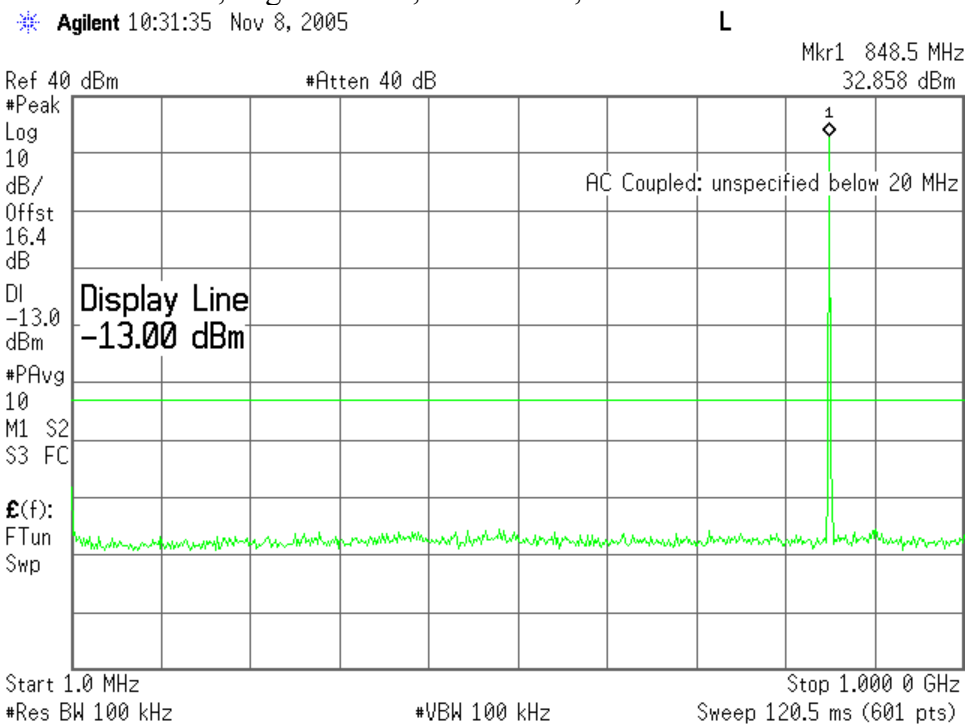
GMSK, Mid Channel, 837 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 190 (836.6 MHz)	Level (dBm)
Second	-30 dBm
Third	-28 dBm
All others	< -30dBm up to 20GHz

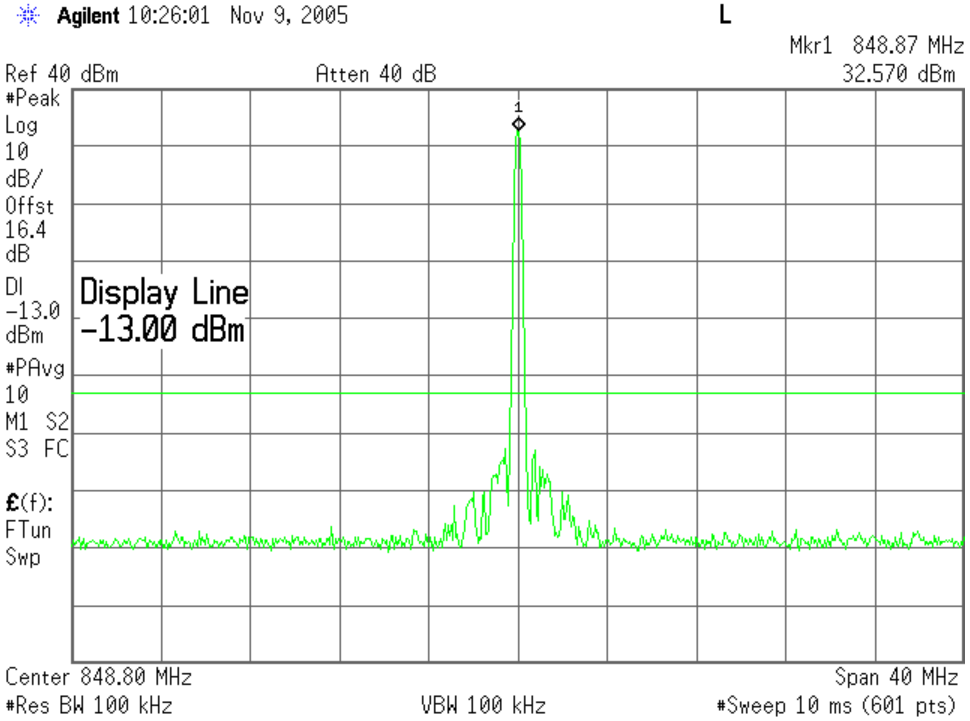
Plot 6.4.7) Out of Band Emissions at Antenna Terminals

GMSK, High Channel, 848.8 MHz, 1 MHz to 1 GHz



Plot 6.4.8) Out of Band Emissions at Antenna Terminals

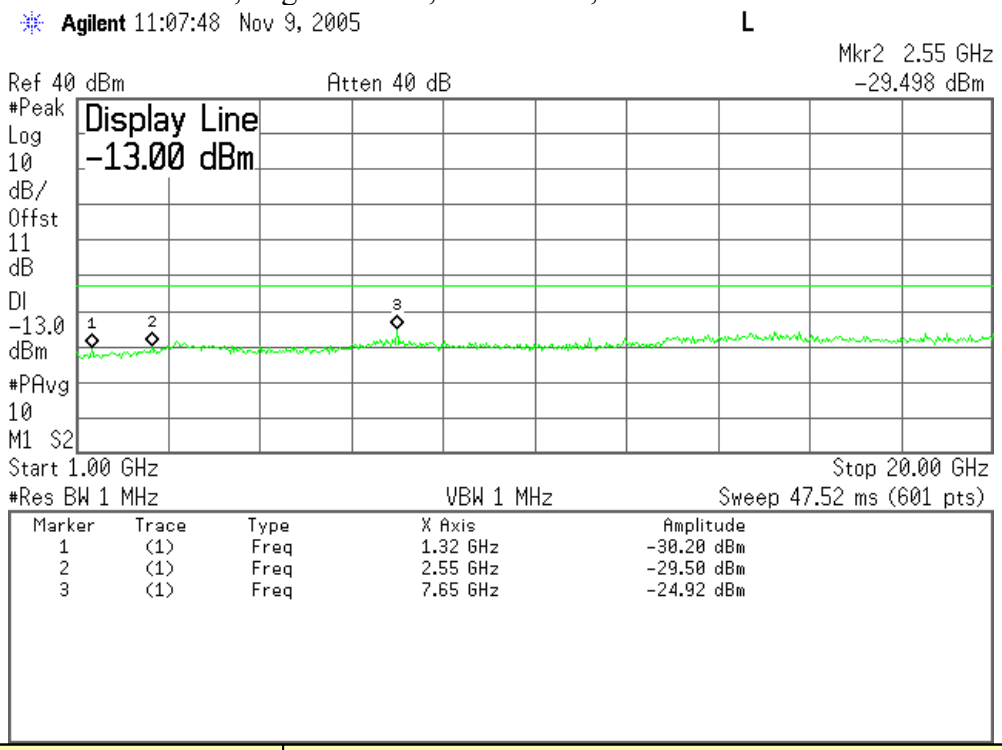
GMSK, High Channel, 848.8 MHz, TX signal +/- 20 MHz



The strong emission shown in each case is the carrier signal.

Plot 6.4.9) Out of Band Emissions at Antenna Terminals

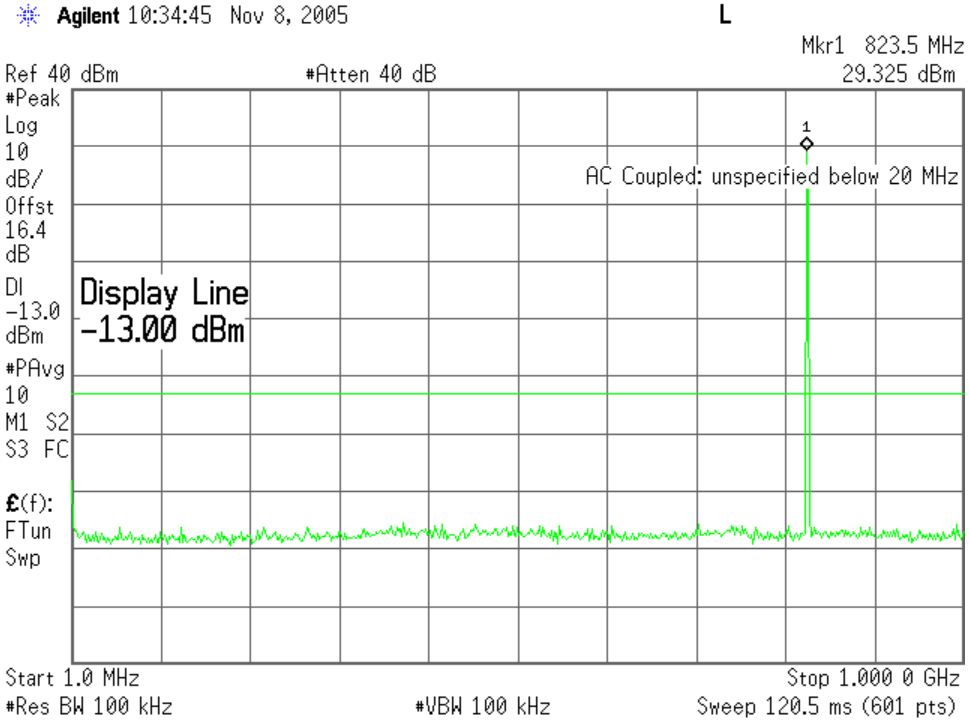
GMSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 251 (848.8 MHz)	Level (dBm)
Second	-30 dBm
Third	-29 dBm
All others	< -30dBm up to 20GHz

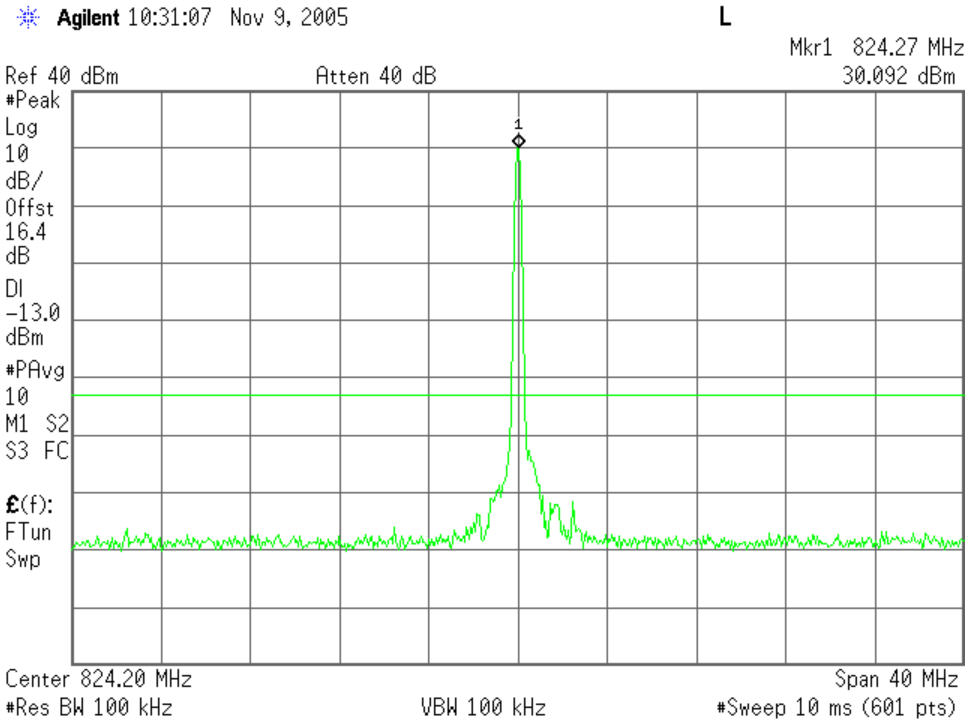
Plot 6.4.10) Out of Band Emissions at Antenna Terminals

8-PSK, Low channel, 824.200 MHz, 1 MHz to 1 GHz



Plot 6.4.11) Out of Band Emissions at Antenna Terminals

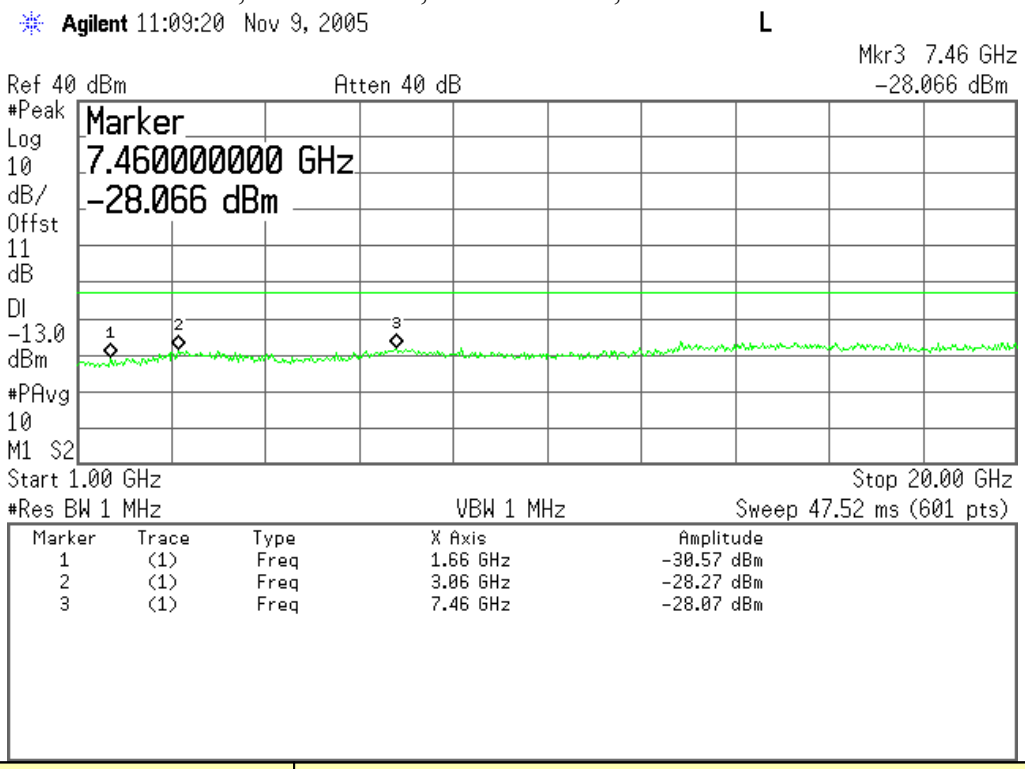
8-PSK, Low channel, 824.200 MHz, TX signal +/- 20 MHz



The strong emission shown in each case is the carrier signal.

Plot 6.4.12) Out of Band Emissions at Antenna Terminals

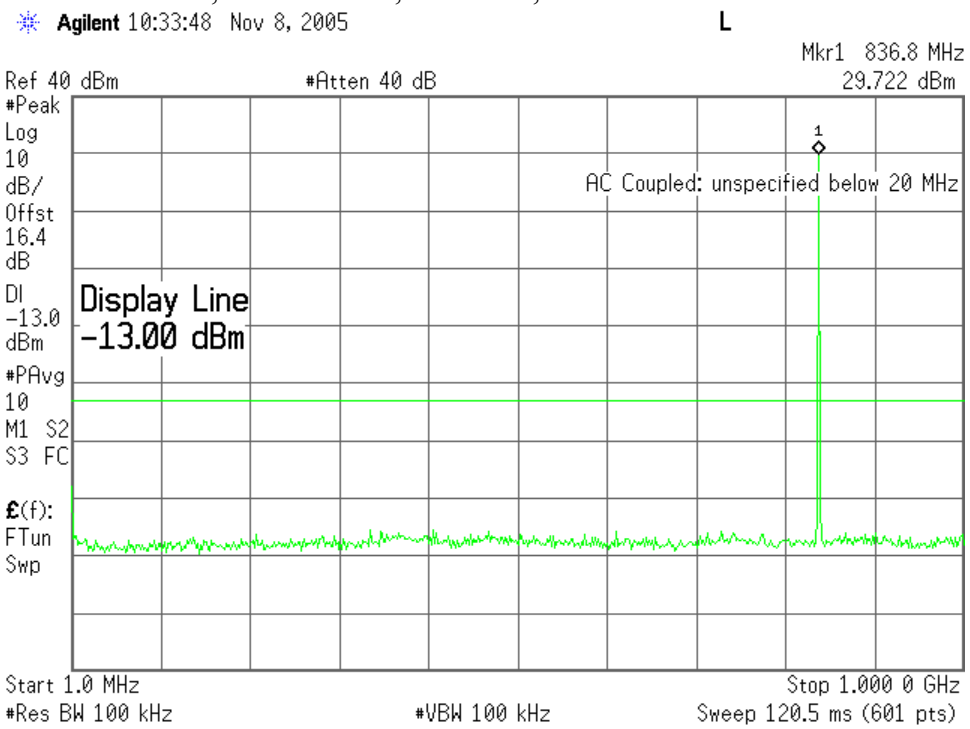
8-PSK, Low channel, 824.200 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 128 (824.2 MHz)	Level (dBm)
Second	**-30dBm**
Third	**-28dBm**
All others	**< -30dBm up to 20GHz**

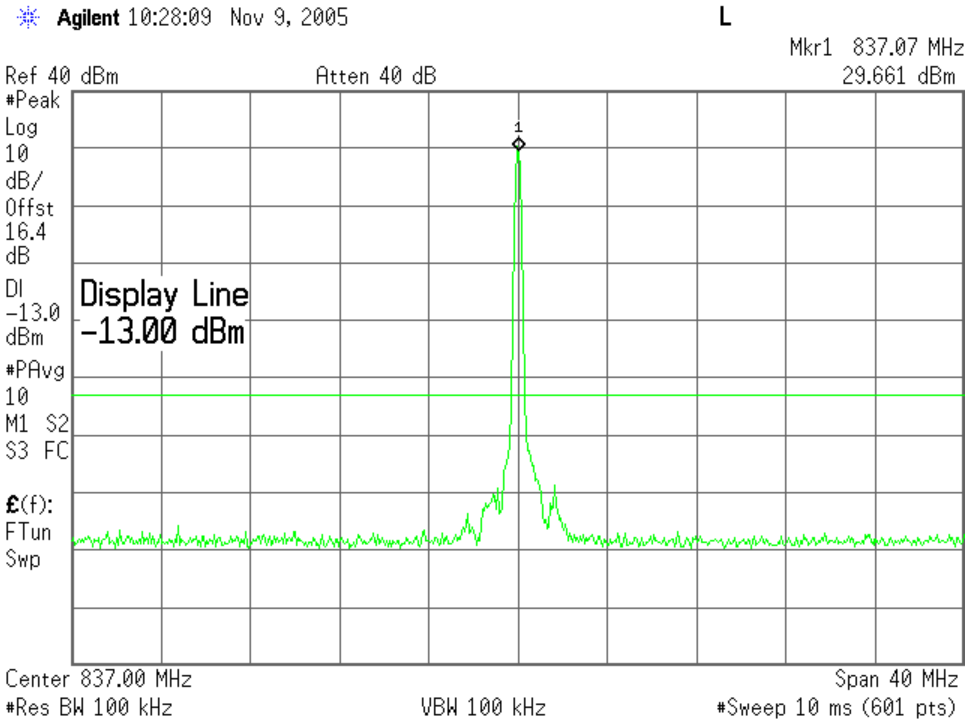
Plot 6.4.13) Out of Band Emissions at Antenna Terminals

8-PSK, Mid Channel, 837 MHz, 1 MHz to 1 GHz



Plot 6.4.14) Out of Band Emissions at Antenna Terminals

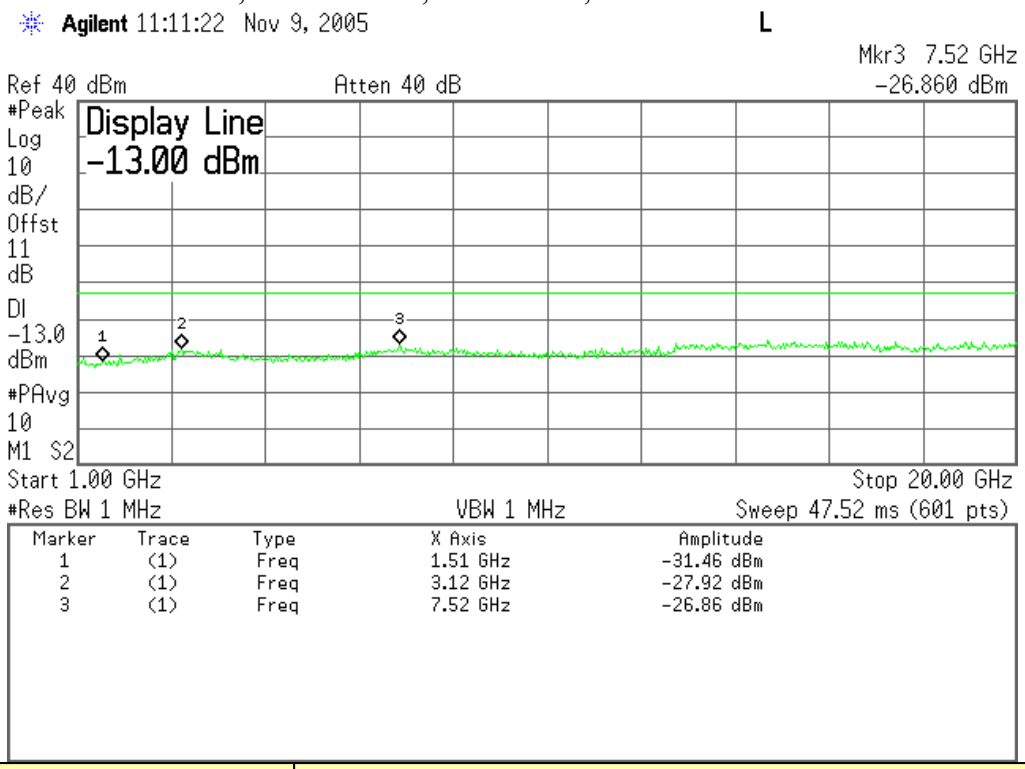
8-PSK, Mid Channel, 837 MHz, TX signal +/- 20 MHz



The strong emission shown in each case is the carrier signal.

Plot 6.4.15) Out of Band Emissions at Antenna Terminals

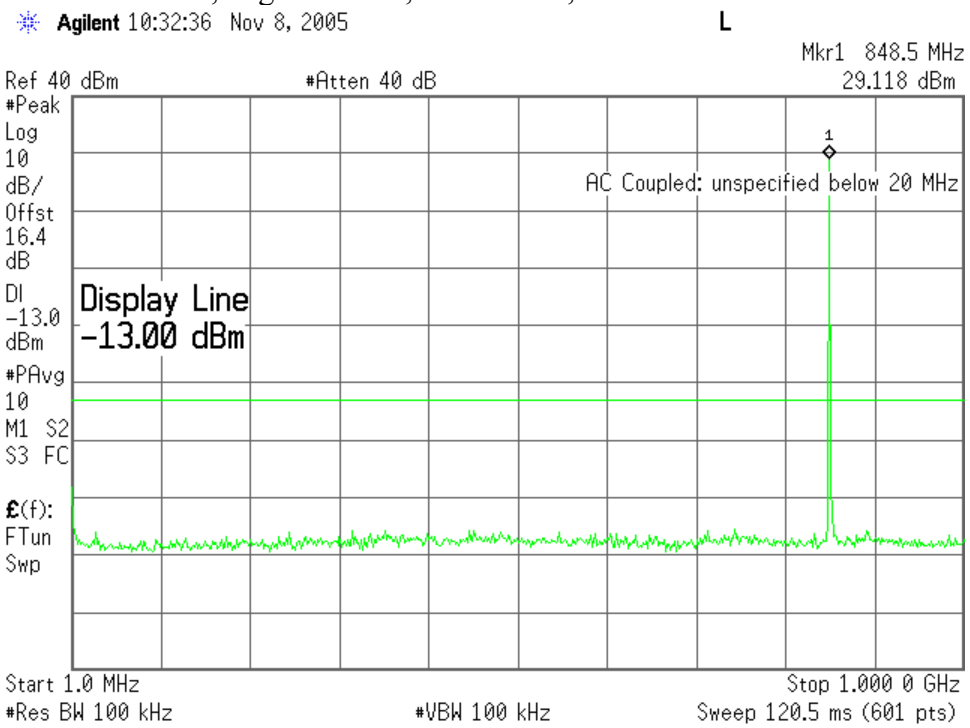
8-PSK, Mid Channel, 836.6 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 190 (836.6 MHz)	Level (dBm)
Second	**--**
Third	**--**
All others	**< -30dBm up to 20GHz**

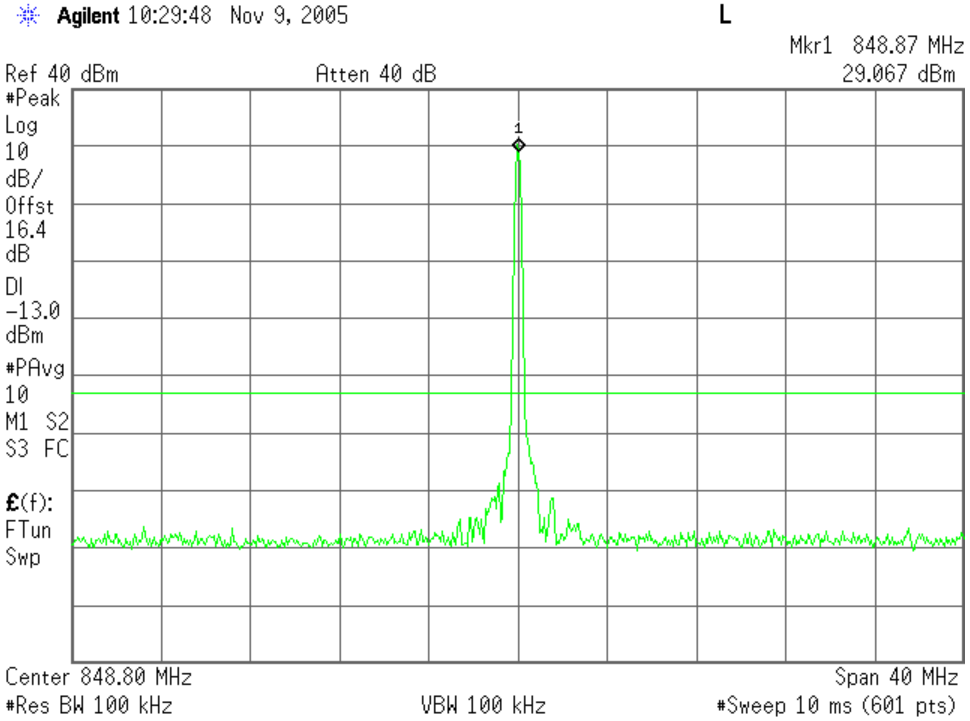
Plot 6.4.16) Out of Band Emissions at Antenna Terminals

8-PSK, High Channel, 848.8 MHz, 1 MHz to 1 GHz



Plot 6.4.17) Out of Band Emissions at Antenna Terminals

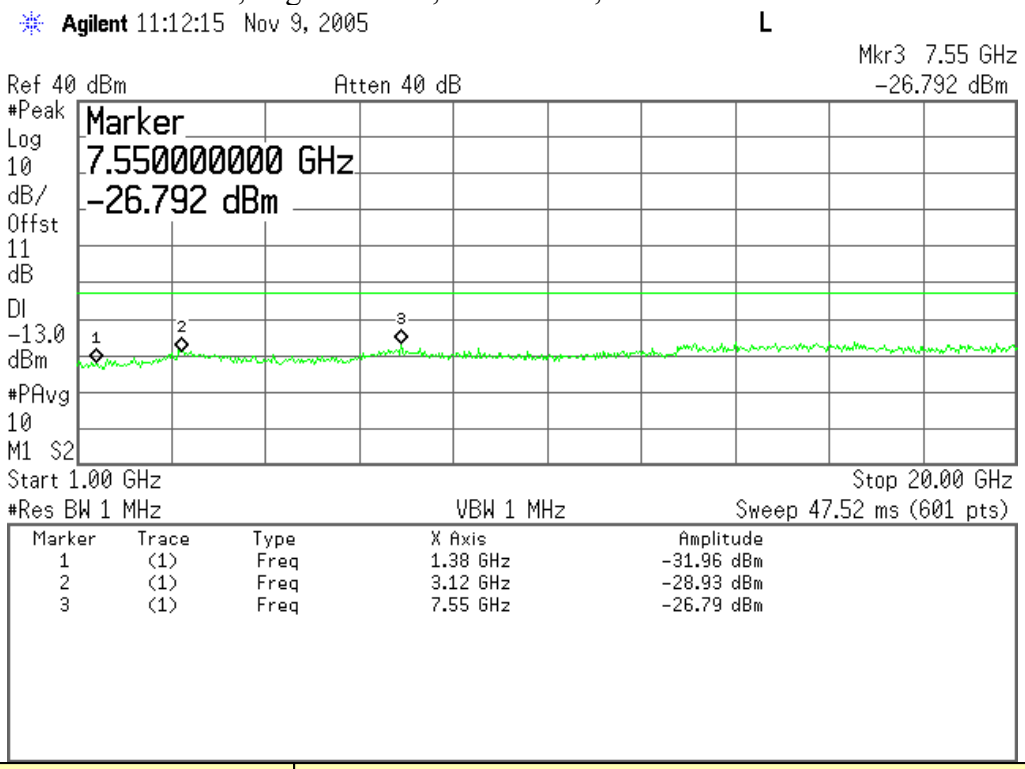
8-PSK, High Channel, 848.8 MHz, TX signal +/- 20 MHz



The strong emission shown in each case is the carrier signal.

Plot 6.4.18) Out of Band Emissions at Antenna Terminals

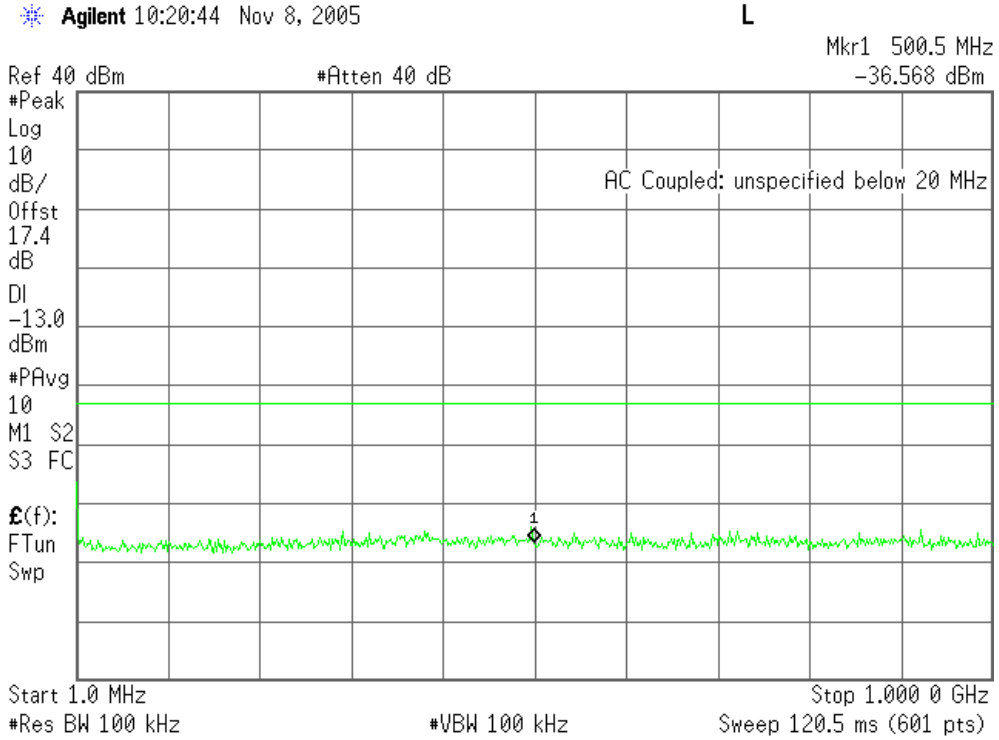
8-PSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 251 (848.8 MHz)	Level (dBm)
Second	**--**
Third	**--**
All others	**< -30dBm up to 20GHz**

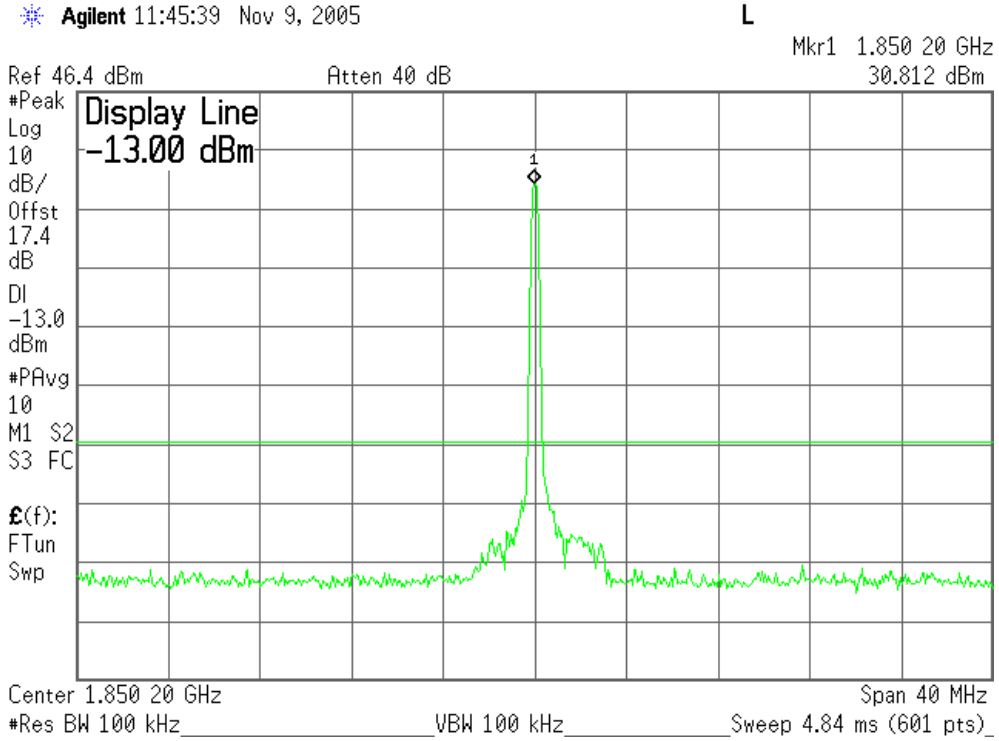
Plot 6.4.19) Out of Band Emissions at Antenna Terminals

GMSK, Low channel, 1850.2 MHz, 1 MHz to 1 GHz



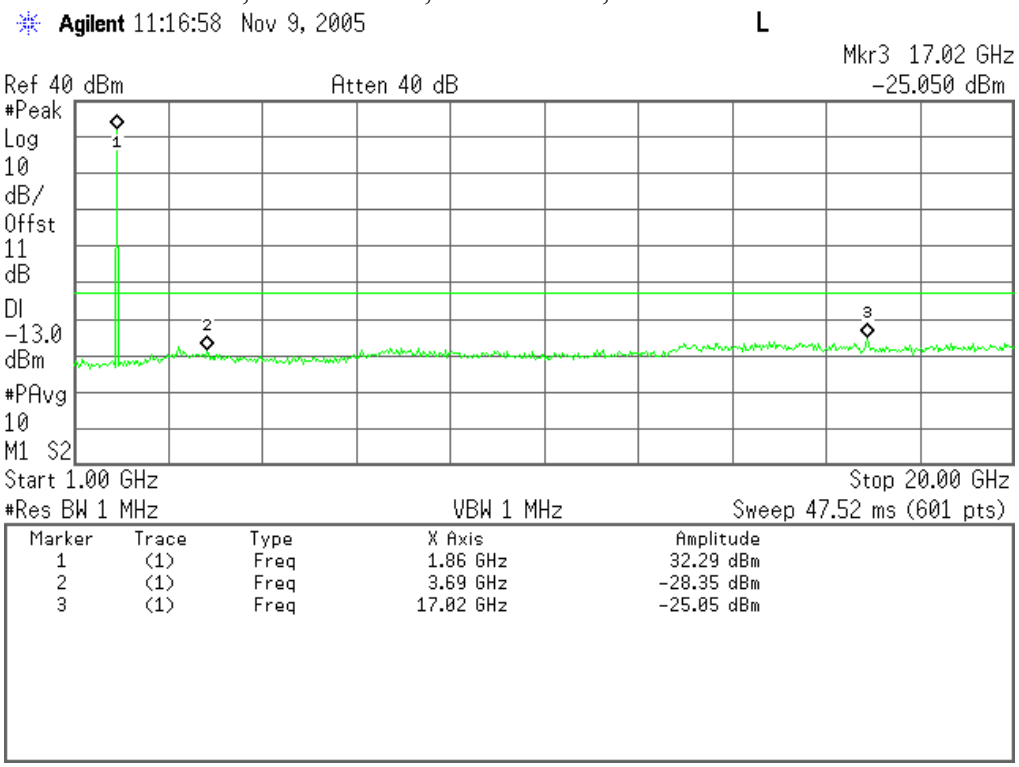
Plot 6.4.20) Out of Band Emissions at Antenna Terminals

GMSK, Low channel, 1850.2 MHz, TX signal +/- 20 MHz



Plot 6.4.21) Out of Band Emissions at Antenna Terminals

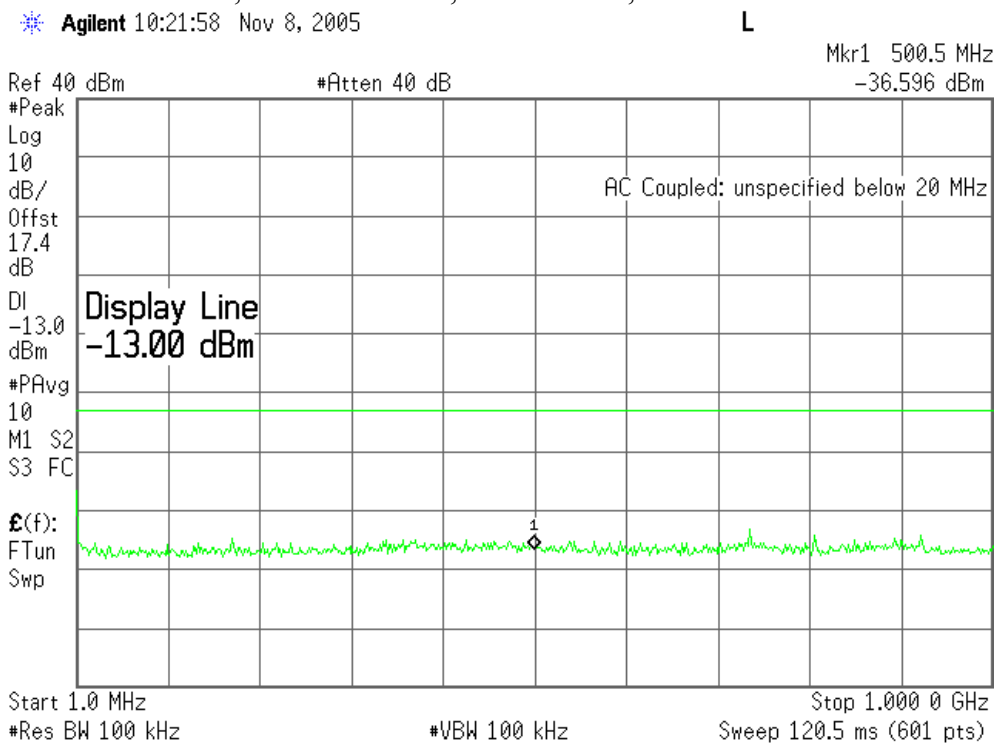
GMSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz



The strong emission shown is the carrier signal.

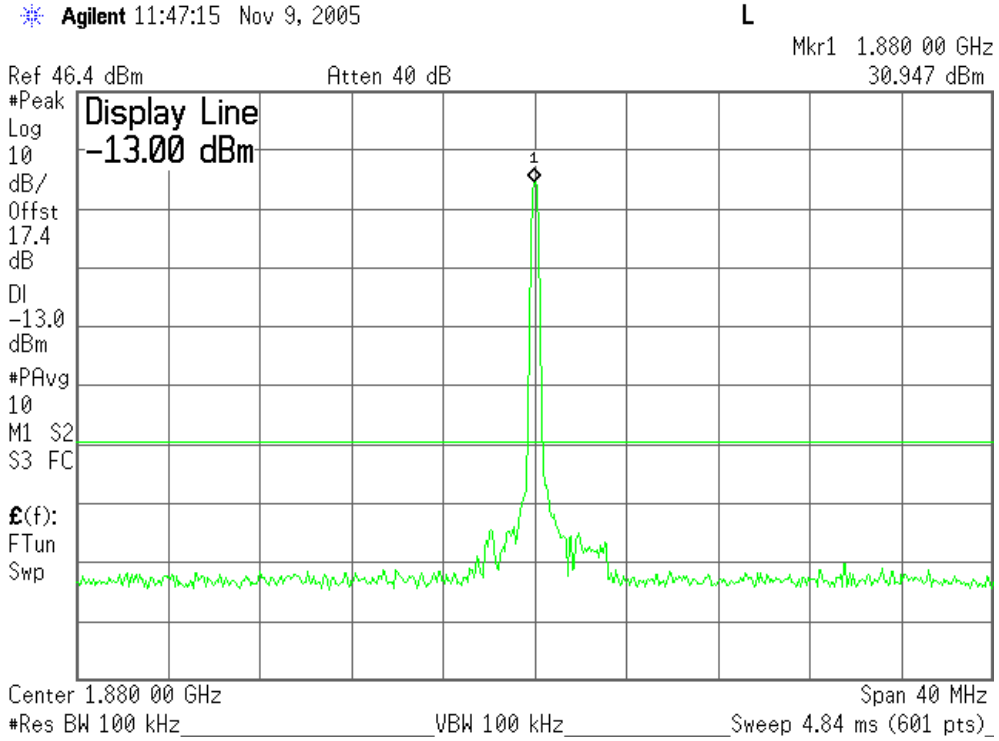
Plot 6.4.22) Out of Band Emissions at Antenna Terminals

GMSK, Middle channel, 1880.0 MHz, 1 MHz to 1 GHz



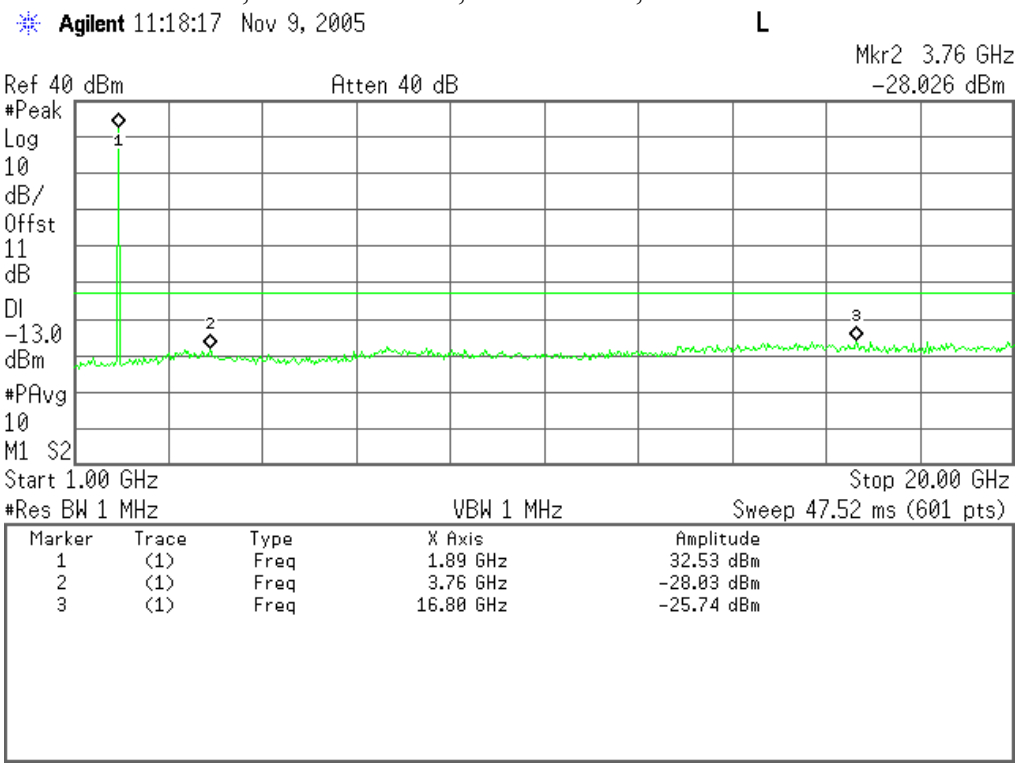
Plot 6.4.23) Out of Band Emissions at Antenna Terminals

GMSK, Middle channel, 1880.0 MHz, TX signal +/- 20 MHz



Plot 6.4.24) Out of Band Emissions at Antenna Terminals

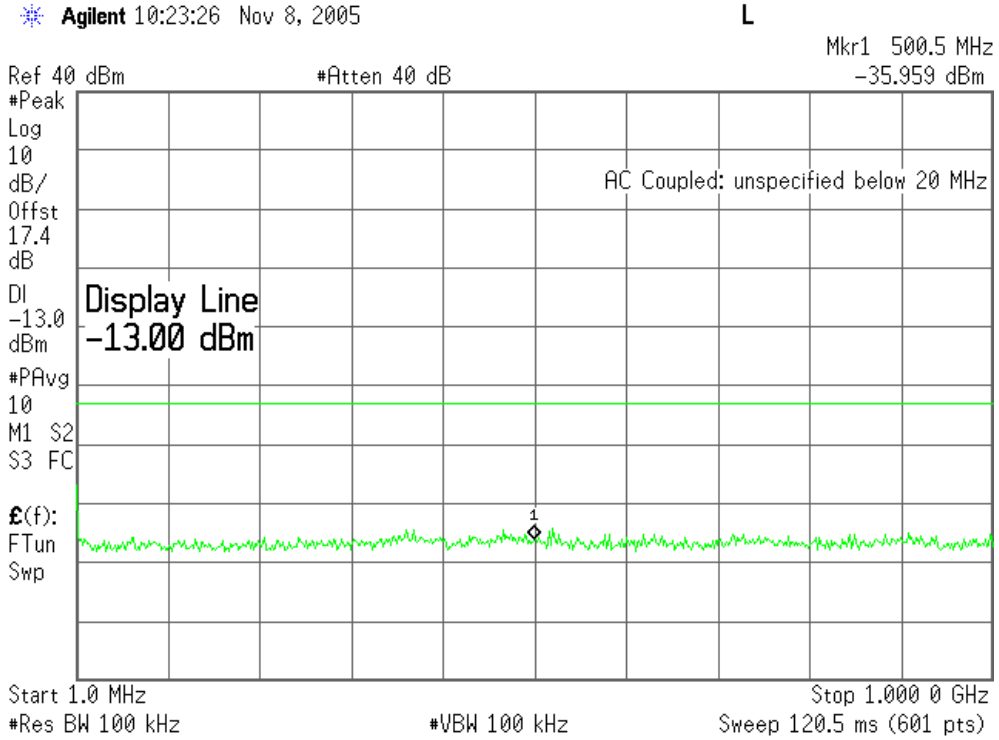
GMSK, Middle channel, 1880.0 MHz, 1 GHz to 20 GHz



The strong emission shown is the carrier signal.

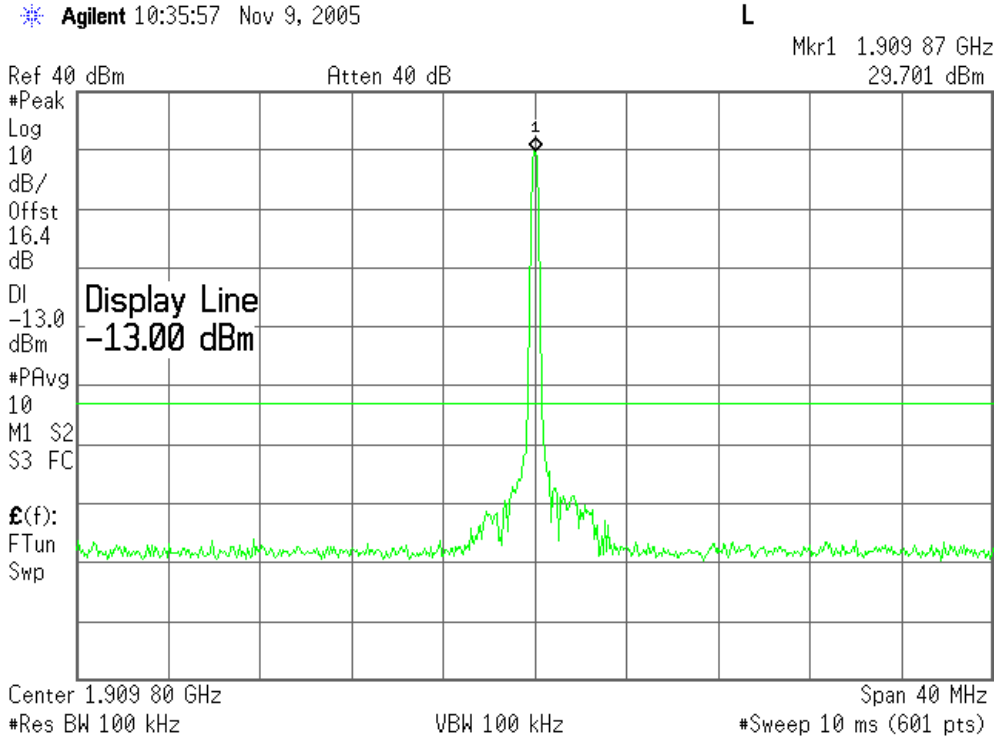
Plot 6.4.25) Out of Band Emissions at Antenna Terminals

GMSK, High channel, 1909.8 MHz, 1 MHz to 1 GHz



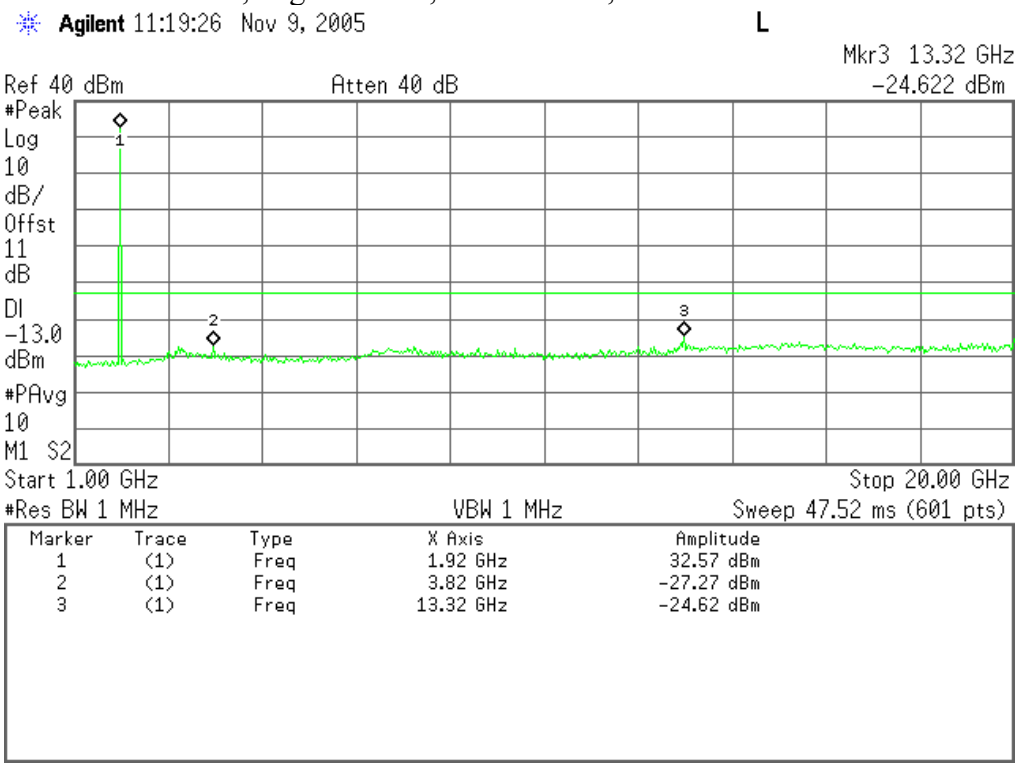
Plot 6.4.26) Out of Band Emissions at Antenna Terminals

GMSK, High channel, 1909.8 MHz, TX signal +/- 20 MHz



Plot 6.4.27) Out of Band Emissions at Antenna Terminals

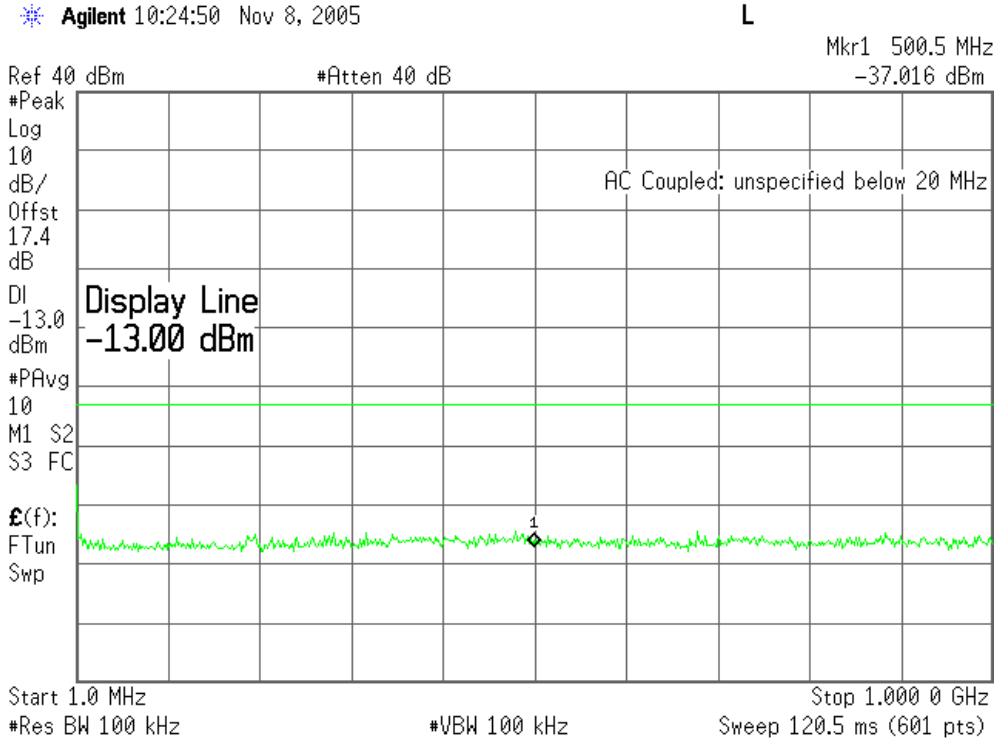
GMSK, High channel, 1909.8 MHz, 1 GHz to 20 GHz



The strong emission shown is the carrier signal.

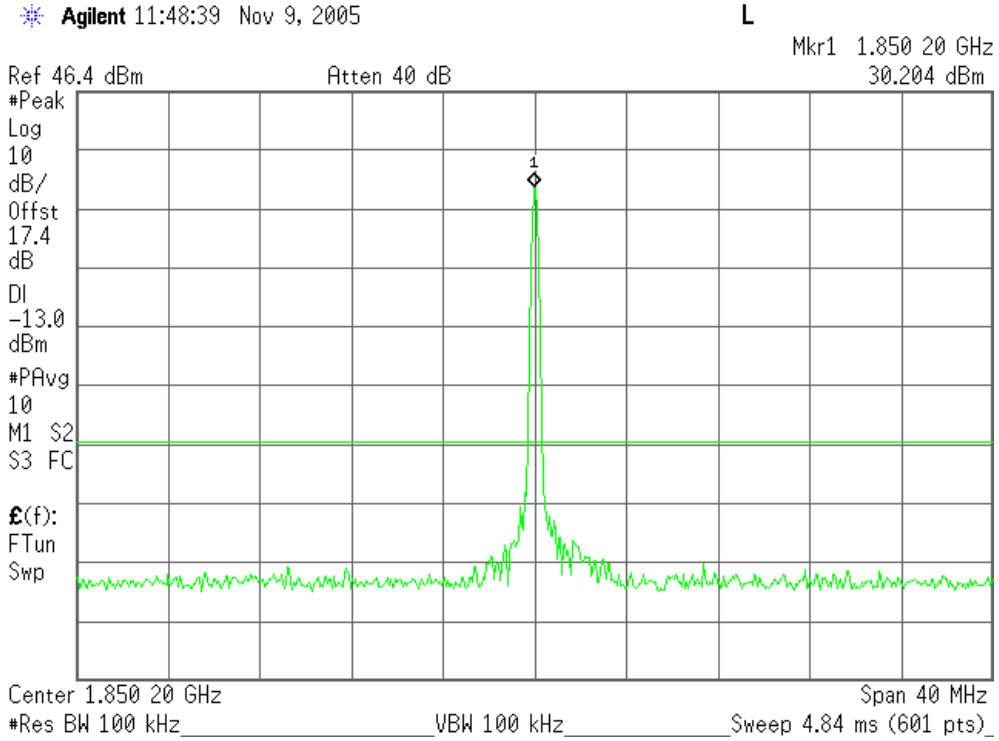
Plot 6.4.28) Out of Band Emissions at Antenna Terminals

8-PSK, Low channel, 1850.2 MHz, 1 MHz to 1 GHz



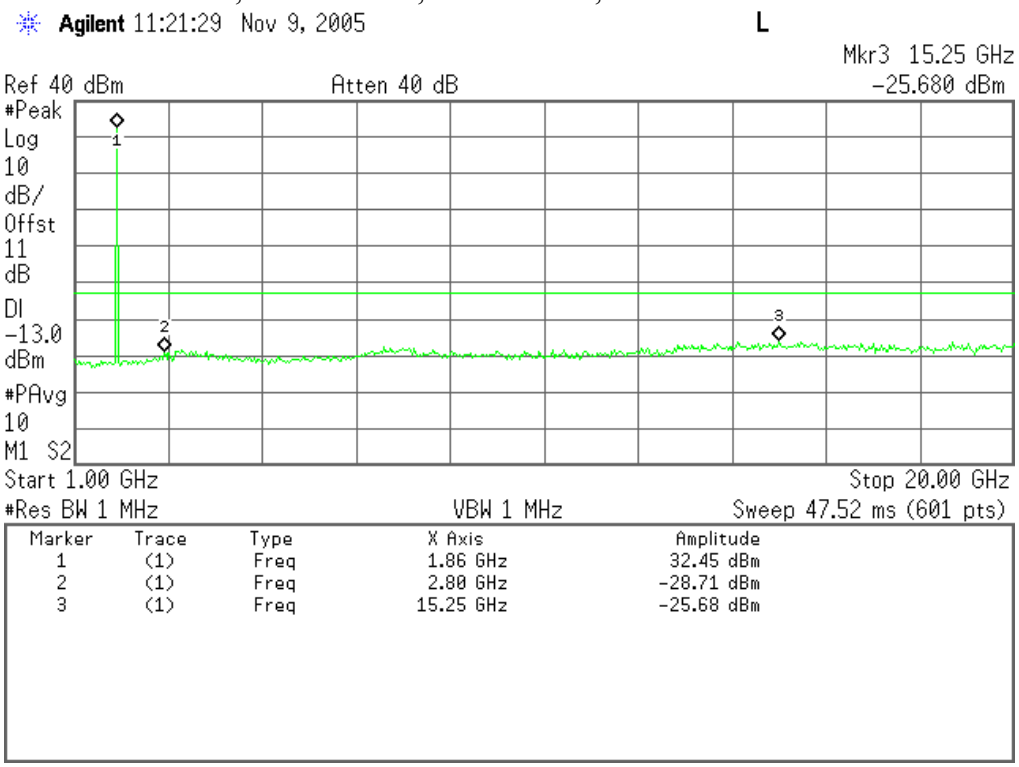
Plot 6.4.29) Out of Band Emissions at Antenna Terminals

8-PSK, Low channel, 1850.2 MHz, TX signal +/- 20 MHz



Plot 6.4.30) Out of Band Emissions at Antenna Terminals

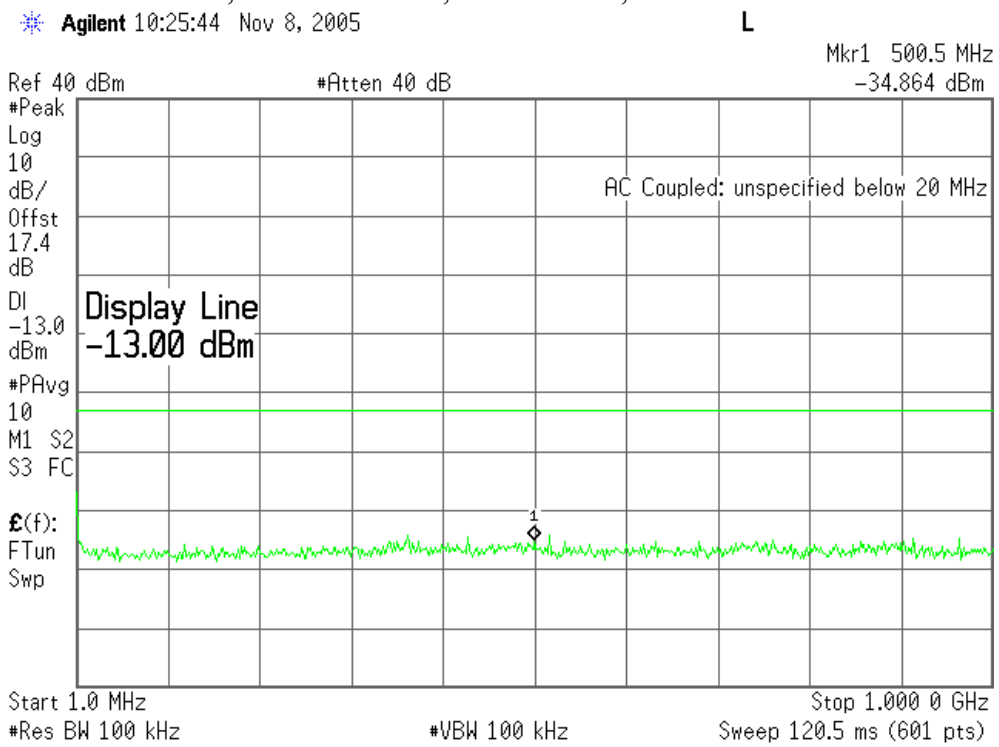
8-PSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz



The strong emission shown is the carrier signal.

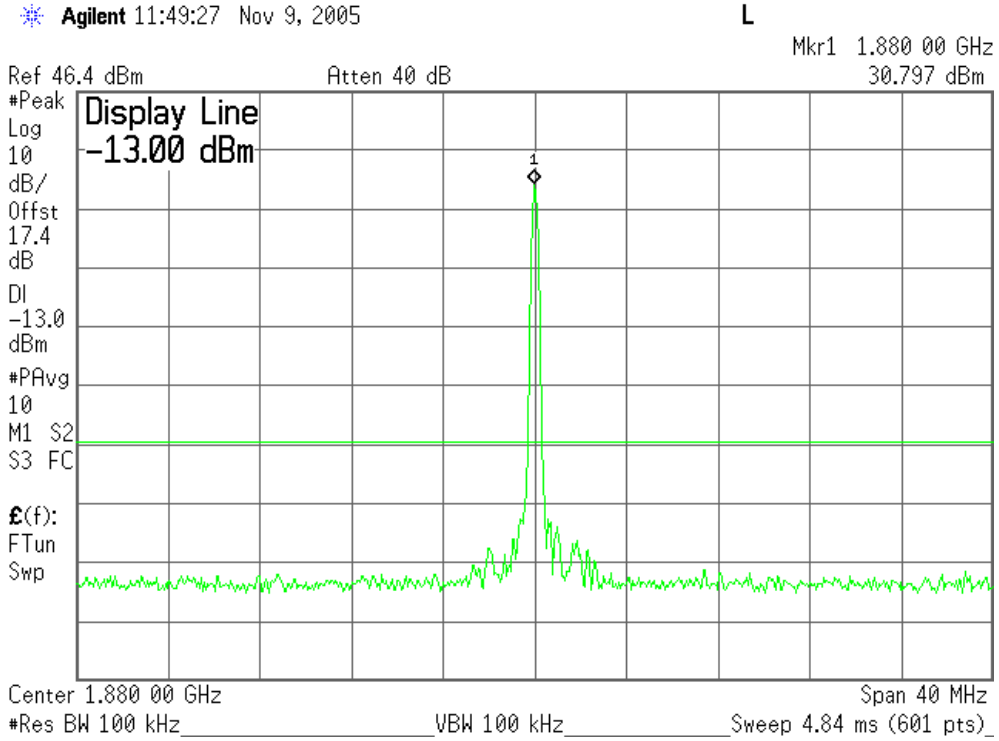
Plot 6.4.31) Out of Band Emissions at Antenna Terminals

8-PSK, Middle channel, 1880.0 MHz, 1 MHz to 1 GHz



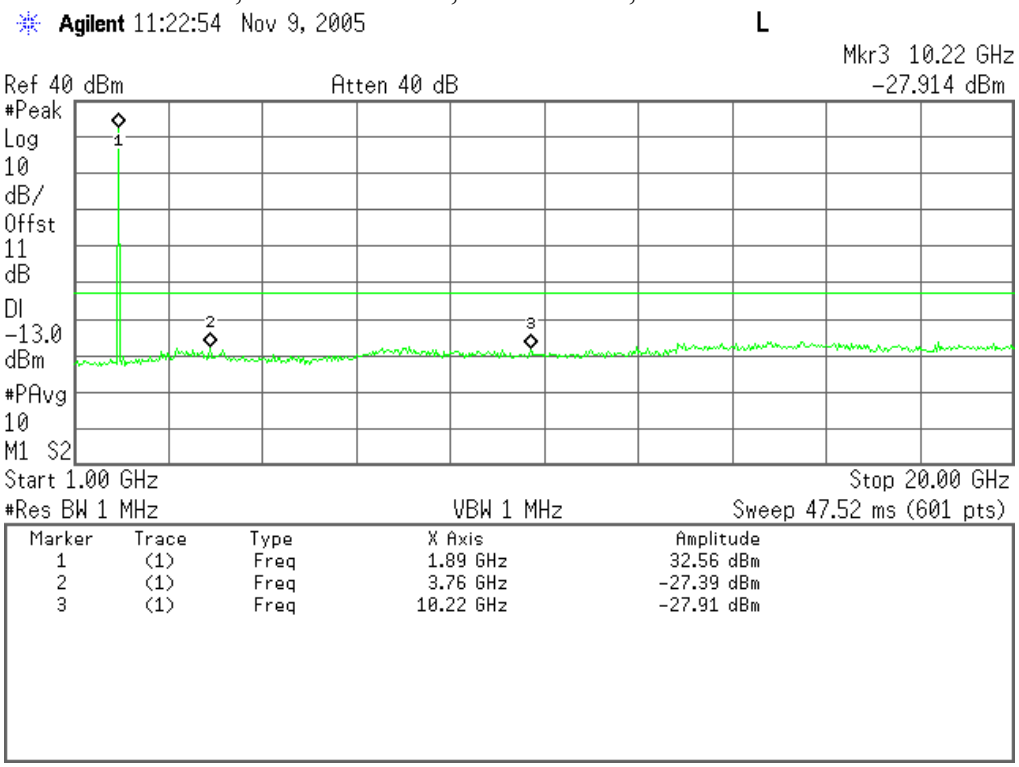
Plot 6.4.32) Out of Band Emissions at Antenna Terminals

8-PSK, Middle channel, 1880.0 MHz, TX signal +/- 20 MHz



Plot 6.4.33) Out of Band Emissions at Antenna Terminals

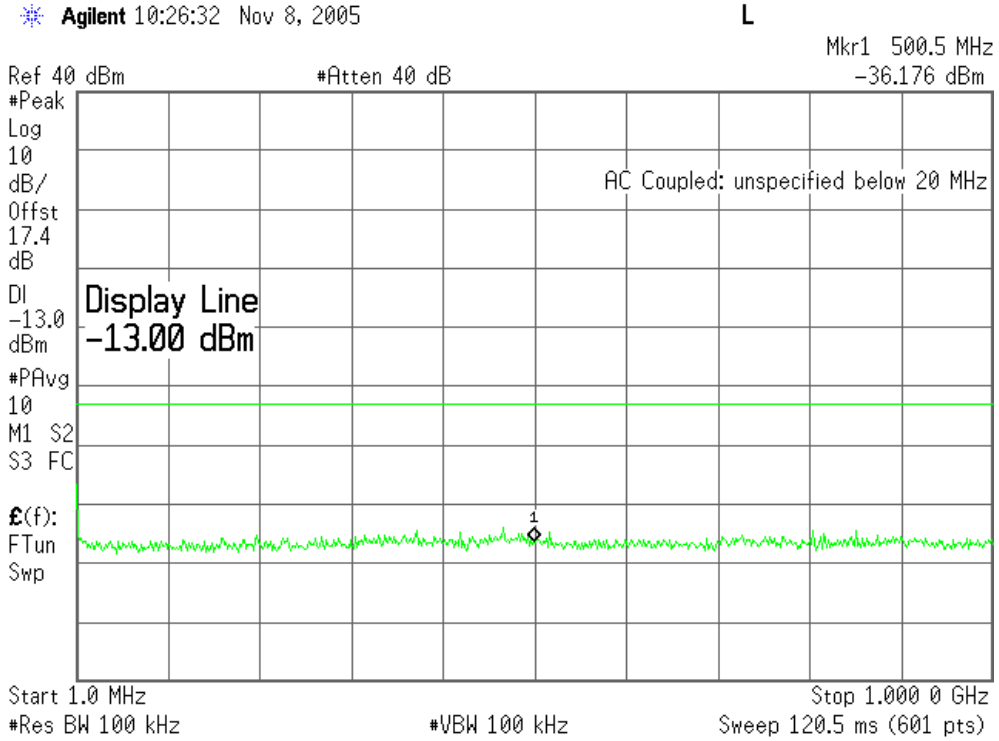
8-PSK, Middle channel, 1880.0 MHz, 1 GHz to 20 GHz



The strong emission shown is the carrier signal.

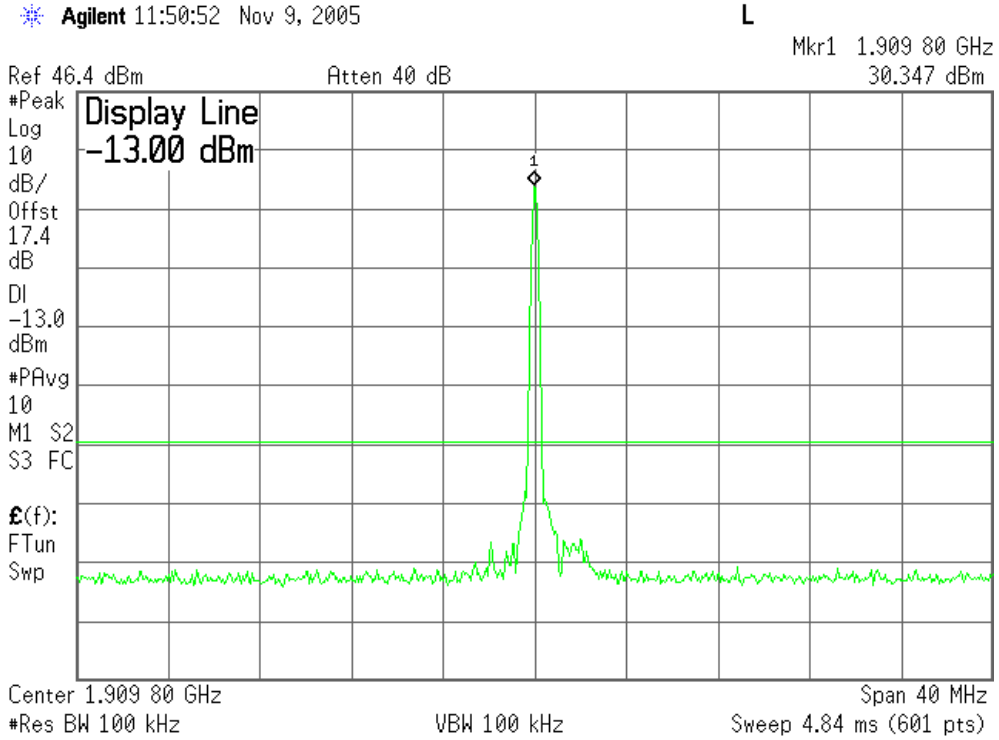
Plot 6.4.34) Out of Band Emissions at Antenna Terminals

8-PSK, High channel, 1909.8 MHz, 1 MHz to 1 GHz



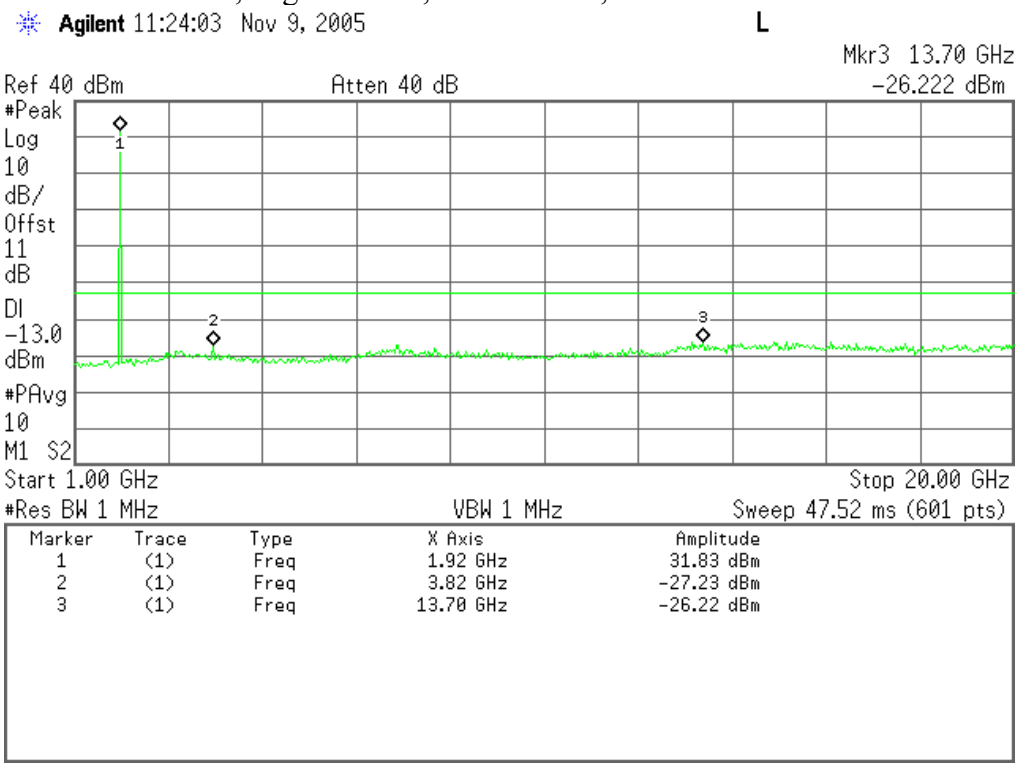
Plot 6.4.35) Out of Band Emissions at Antenna Terminals

8-PSK, High channel, 1909.8 MHz, TX signal +/- 20 MHz



Plot 6.4.36) Out of Band Emissions at Antenna Terminals

8-PSK, High channel, 1909.8 MHz, 1 GHz to 20 GHz



The strong emission shown is the carrier signal.

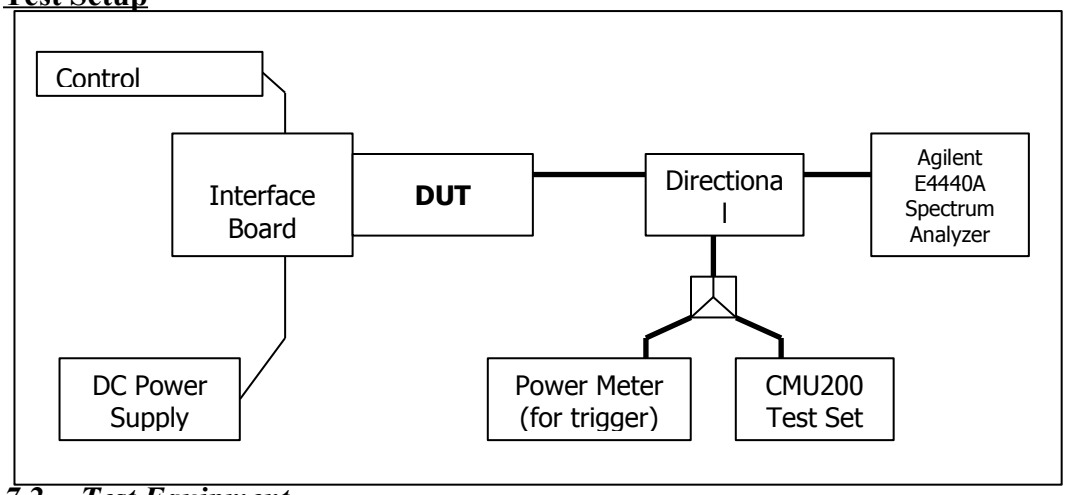
7 Block Edge Compliance

FCC part 22H/24E

7.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set in a call and configured to operate at maximum power. The block edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

Test Setup



7.2 Test Equipment

Instrument List

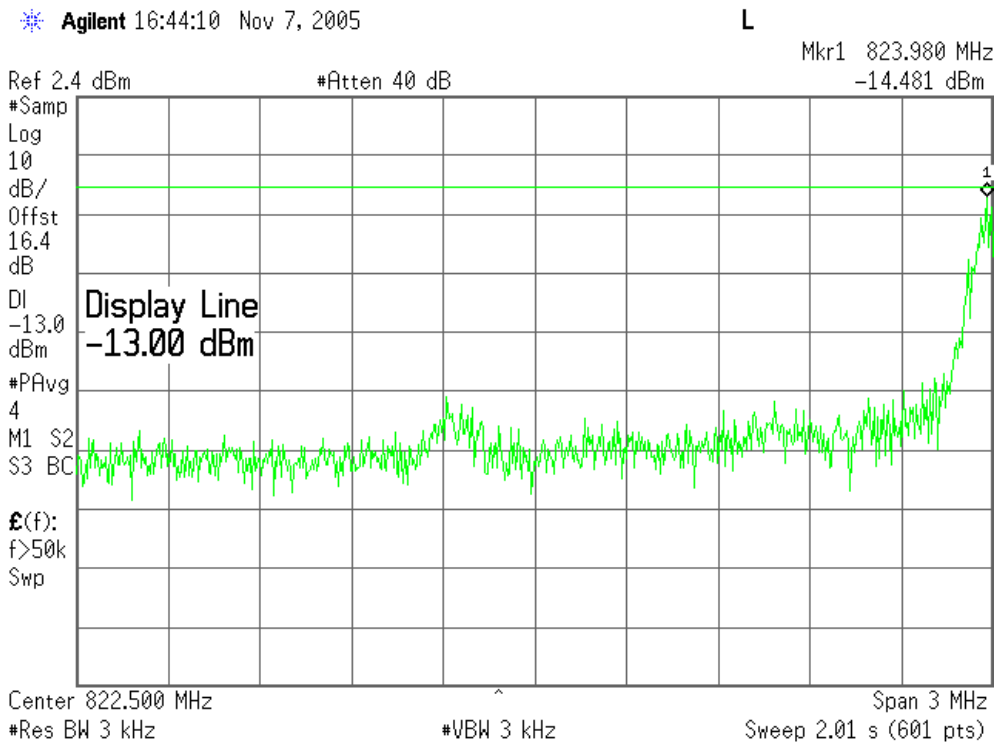
EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	836766/030	N/A
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	Sept. 29, 2004
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

7.3 Test Results

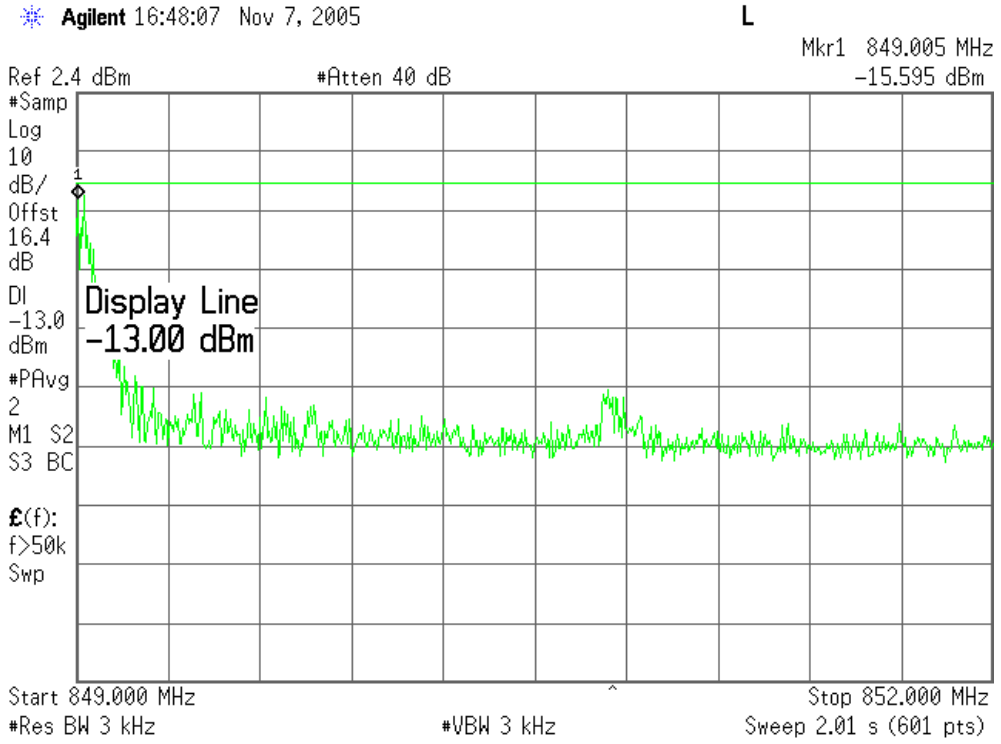
Block Test	Frequency Boundaries (MHz)	Channels Tested	Corresponding Plots	Result
1	GMSK: Below 824 MHz, above 849 MHz	128, 251	7.4.1, 7.4.2	Complies
2	8PSK: Below 824 MHz, above 849 MHz	128, 251	7.4.3, 7.4.4	Complies
3	GMSK: Below 1850MHz, above 1910MHz	512, 810	7.4.5, 7.4.6	Complies
4	8PSK: Below 1850MHz, above 1910MHz	512, 810	7.4.7, 7.4.8	Complies

7.4 Test Plots

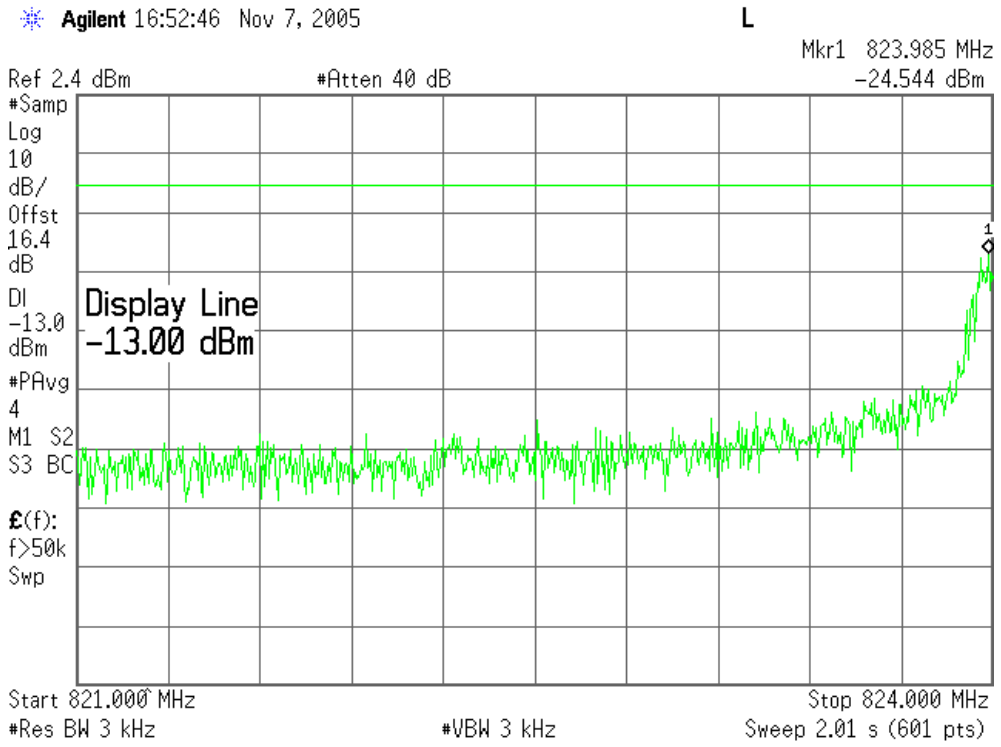
Plot 7.4.1) GSMK; Cellular low channel, below 824 MHz



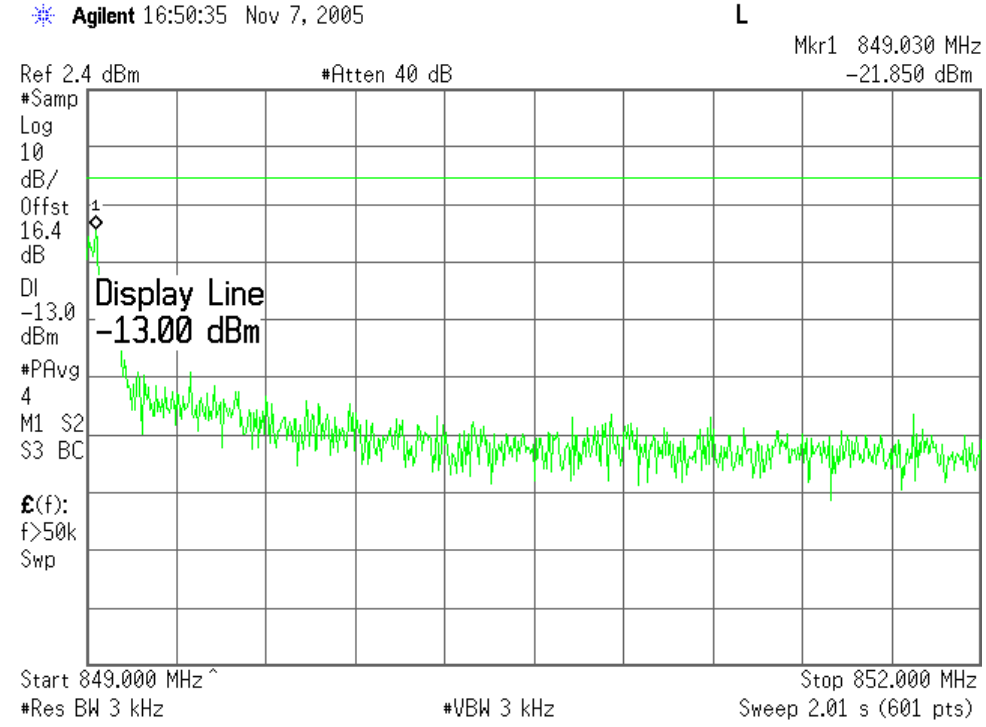
Plot 7.4.2) GMSK; Cellular high channel, above 849 MHz



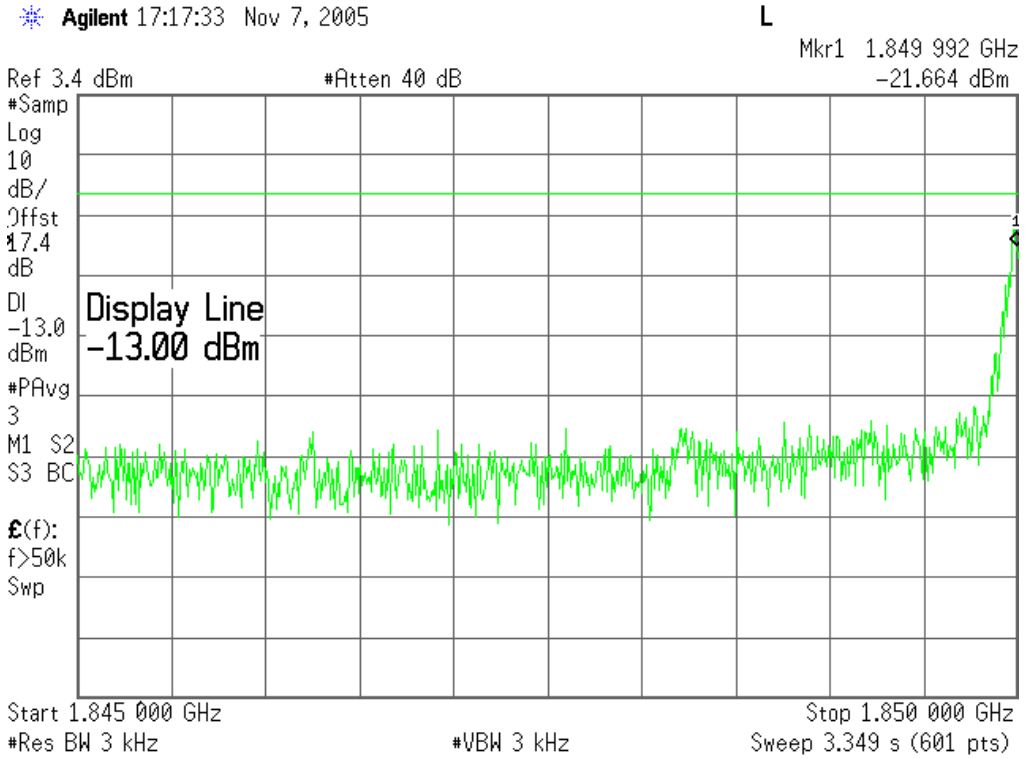
Plot 7.4.3) 8-PSK; Cellular low channel, below 824 MHz



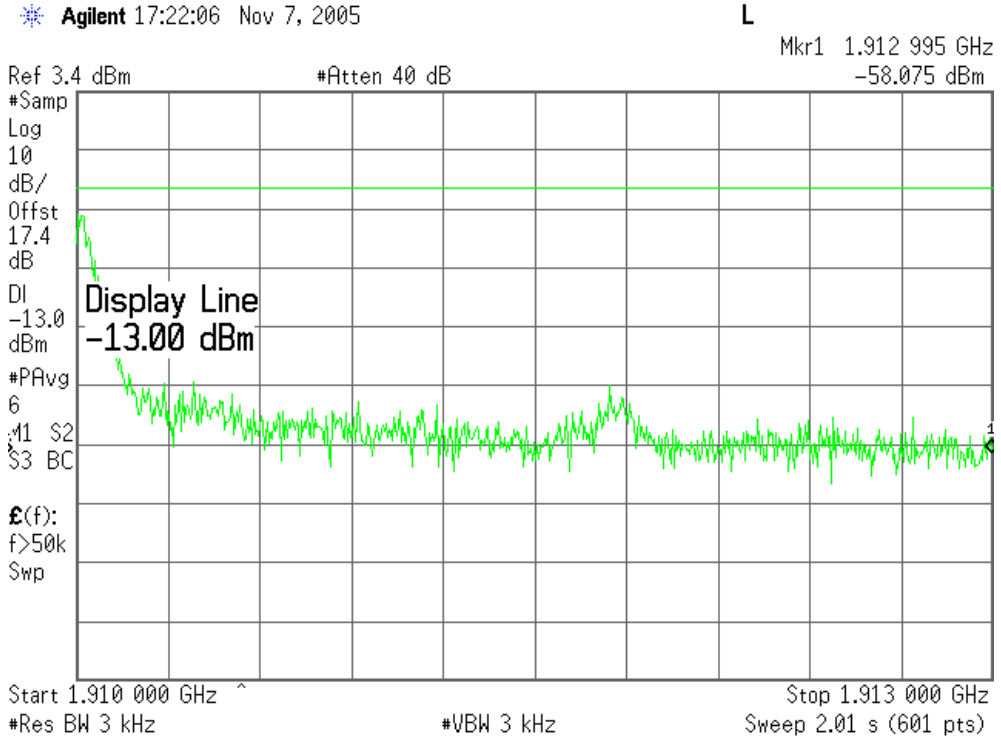
Plot 7.4.4) 8-PSK; Cellular high channel, above 849 MHz



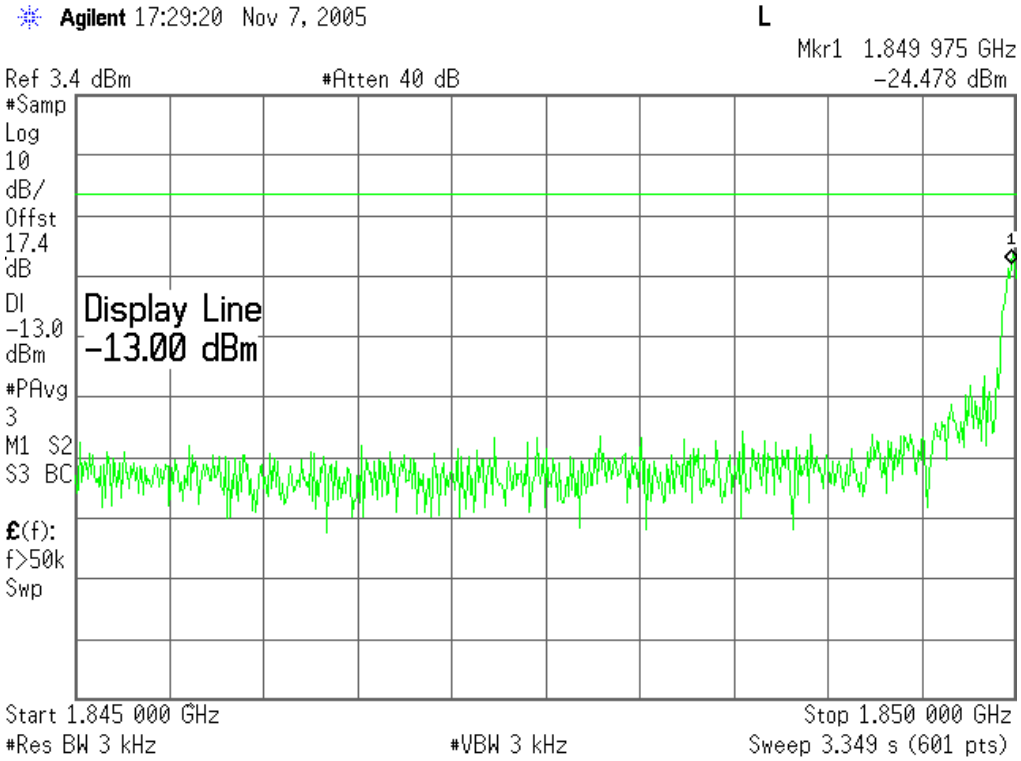
Plot 7.4.5) GMSK; PCS low channel, below 1850 MHz



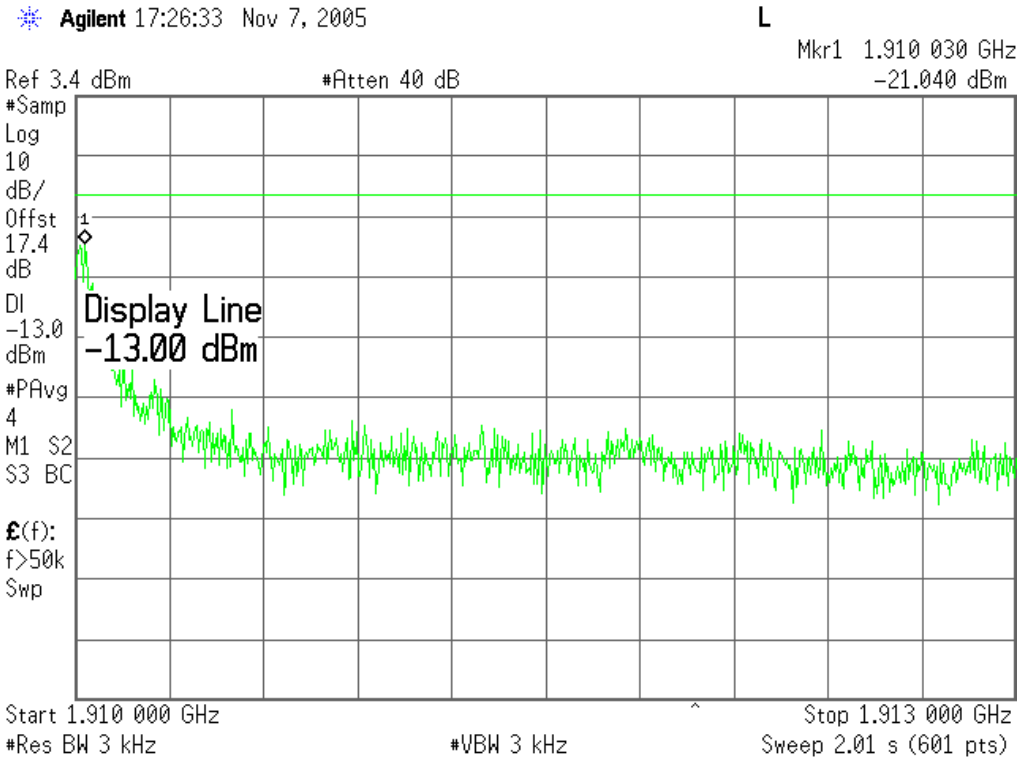
Plot 7.4.6) GMSK; PCS high channel, above 1910 MHz



Plot 7.4.7) 8-PSK; PCS low channel, below 1850 MHz



Plot 7.4.8) 8-PSK; PCS high channel, above 1910 MHz



8 Frequency Stability Versus Temperature

FCC 2.1055

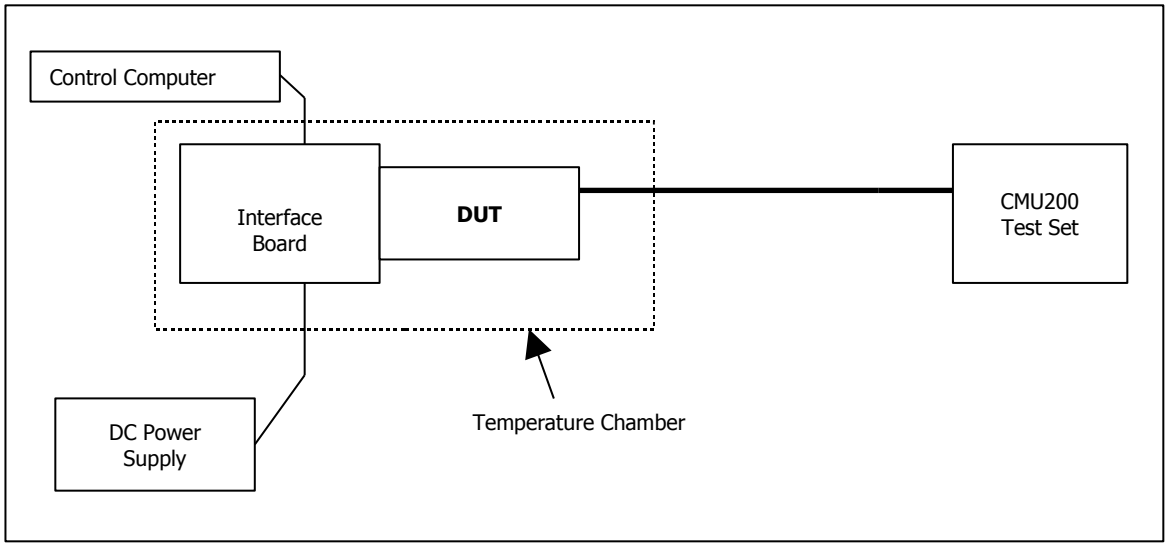
8.1 Summary of Results

The MC8755 Frequency Stability versus temperature meets the requirement of being within ±0.1ppm of the received base station frequency.

8.2 Test Procedure

The MC8755 was placed inside the temperature chamber. The transmitting frequency error is measured at 25 degrees C, then the temperature is set to +80 degrees C and allowed to stabilize. After sufficient soak time, the transmitting frequency offset is measured. The temperature is decreased by 10 degrees, allowed to stabilize and soak, then the measurement is repeated. This is repeated until -30 degrees C is completed. The process is then repeated back up to +80 degrees C. Frequency metering included internal averaging of the CMU200 to stabilize the reading. Reference power supply voltage for these tests is 3.3 volts.

Test Setup

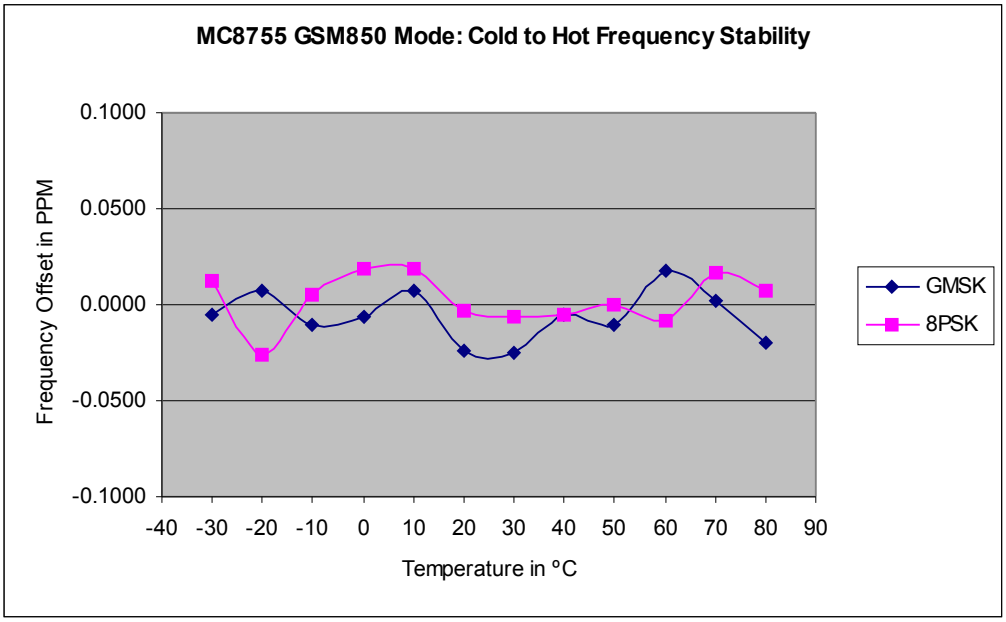


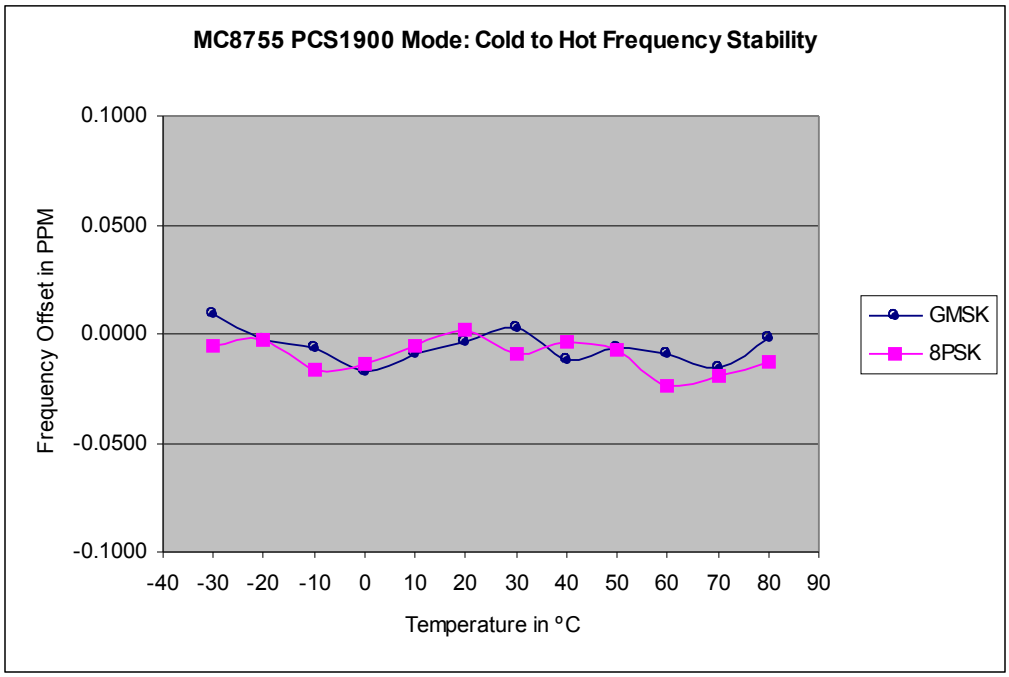
8.3 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	836766/030	N/A
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	Sept. 29, 2004
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

8.4 Test Results

Low to High Temperature Frequency Offset

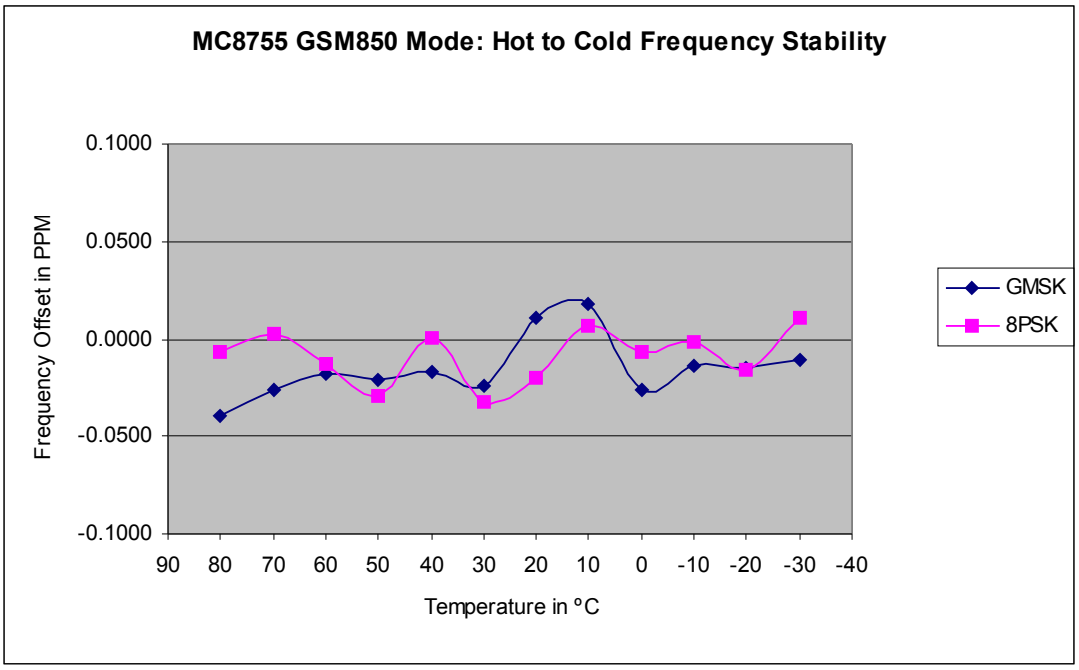


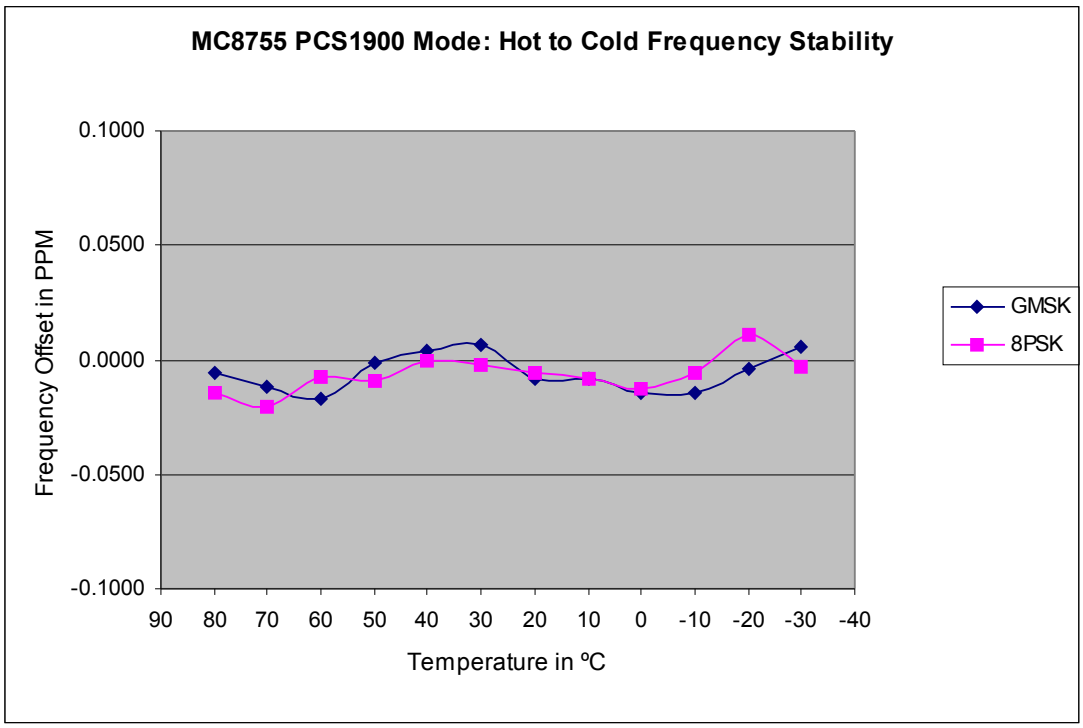


Low to High Temperature Tabular Readings: GSM and 8PSK Modes

Temp °C	Cellular Mode TCH192 (837 MHz)				PCS Mode TCH661(1880 MHz)			
	GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
	Hz	ppm	Hz	ppm	Hz	ppm	Hz	ppm
-30	-4.39	-0.0052	10.27	0.0123	17.24	0.0092	-10.88	-0.0058
-20	5.75	0.0069	-21.92	-0.0262	-5.04	-0.0027	-5.04	-0.0027
-10	-8.78	-0.0105	4.58	0.0055	-11.69	-0.0062	-30.74	-0.0164
0	-5.36	-0.0064	15.95	0.0191	-32.09	-0.0171	-25.73	-0.0137
10	5.68	0.0068	15.79	0.0189	-17.18	-0.0091	-10.49	-0.0056
20	-20.02	-0.0239	-3.00	-0.0036	-6.78	-0.0036	3.45	0.0018
30	-21.18	-0.0253	-5.46	-0.0065	4.71	0.0025	-17.24	-0.0092
40	-4.26	-0.0051	-3.94	-0.0047	-23.05	-0.0123	-6.91	-0.0037
50	-8.39	-0.0100	0.03	0.0000	-12.01	-0.0064	-13.88	-0.0074
60	14.53	0.0174	-6.55	-0.0078	-17.95	-0.0095	-45.62	-0.0243
70	2.13	0.0025	13.95	0.0167	-29.57	-0.0157	-35.93	-0.0191
80	-16.92	-0.0202	5.94	0.0071	-4.13	-0.0022	-23.31	-0.0124

High to Low Temperature Frequency Offset





High to Low Temperature Tabular Readings

Temp °C	Cellular Mode TCH192 (837 MHz)				PCS Mode TCH661(1880 MHz)			
	GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
	Hz	ppm	Hz	ppm	Hz	ppm	Hz	ppm
80	-33.45	-0.0400	-5.42	-0.0065	-10.53	-0.0056	-26.70	-0.0142
70	-22.28	-0.0266	2.20	0.0026	-22.66	-0.0121	-37.81	-0.0201
60	-15.43	-0.0184	-10.56	-0.0126	-31.45	-0.0167	-14.66	-0.0078
50	-17.31	-0.0207	-24.83	-0.0297	-2.45	-0.0013	-18.02	-0.0096
40	-13.95	-0.0167	0.81	0.0010	7.55	0.0040	-0.81	-0.0004
30	-19.76	-0.0236	-26.80	-0.0320	13.04	0.0069	-4.91	-0.0026
20	9.30	0.0111	-16.43	-0.0196	-15.43	-0.0082	-10.07	-0.0054
10	15.43	0.0184	5.88	0.0070	-15.17	-0.0081	-14.85	-0.0079
0	-22.02	-0.0263	-5.26	-0.0063	-27.89	-0.0148	-23.57	-0.0125
-10	-11.69	-0.0140	-1.39	-0.0017	-27.77	-0.0148	-9.88	-0.0053
-20	-12.14	-0.0145	-13.50	-0.0161	-7.75	-0.0041	20.79	0.0111
-30	-9.43	-0.0113	8.78	0.0105	10.91	0.0058	-6.30	-0.0034

9 Frequency Stability Versus Voltage

FCC 2.1055

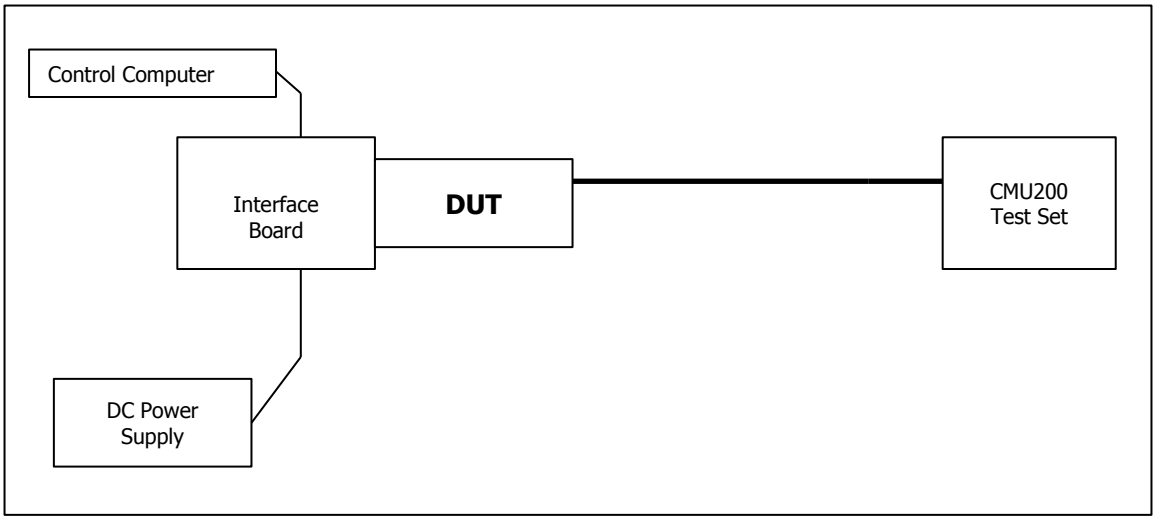
9.1 Summary of Results

The unit meets the limit of less than 0.1ppm of frequency offset from center for 85% and 115% of the supply voltage for 3.3 volts.

9.2 Test Procedure

The MC8755 was connected to a DC Power Supply and a GSM test set (CMU 200) with frequency error measurement capability. The power supply output is adjusted to the test voltage as measured at the input terminals to the module while transmitting. A voltmeter was used to confirm the terminal voltage. The peak frequency offset is recorded (worst case).
The test voltages are 2.805 volts to 3.795 volts.

Test Setup

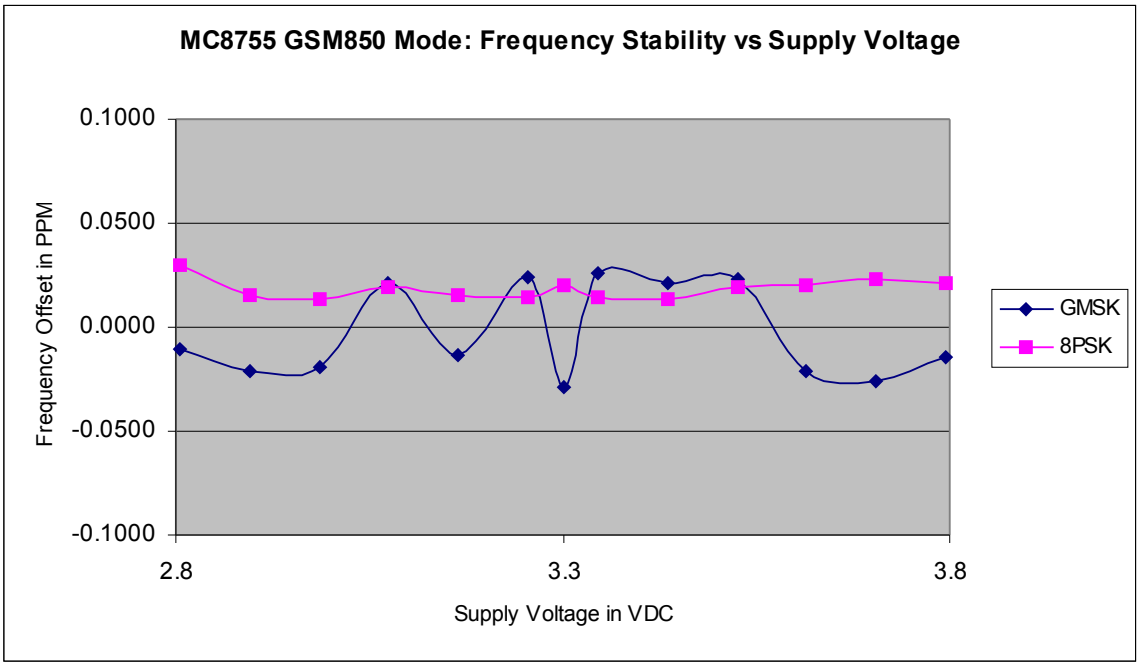


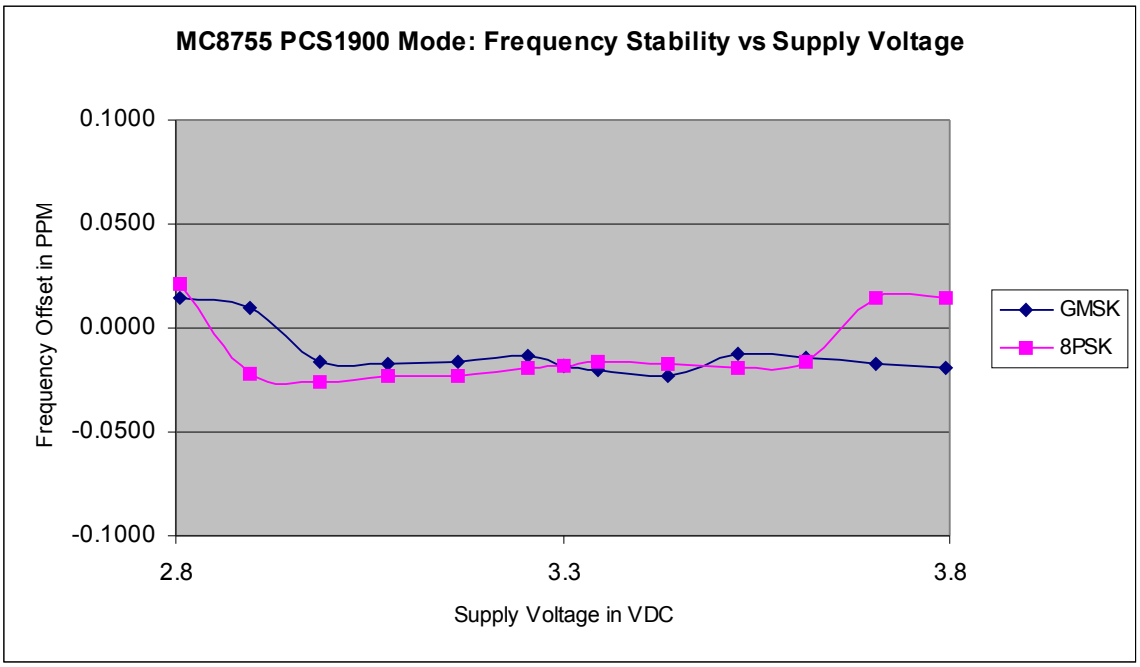
9.3 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	836766/030	N/A
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	Sept. 29, 2004
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

9.4 Test Results

85% to 115% of 3.3 Volts Frequency Offset





85% to 115% of 3.3 Volts Frequency Offset, Tabular Data

Supply VDC	Cellular Mode TCH192 (837 MHz)				PCS Mode TCH661(1880 MHz)			
	GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
	Peak Hz	ppm	Peak Hz	ppm	Peak Hz	ppm	Peak Hz	ppm
2.805	-9.00	-0.0108	25.00	0.0299	28.00	0.0149	39.00	0.0207
2.895	-18.00	-0.0215	13.00	0.0155	18.00	0.0096	-41.00	-0.0218
2.985	-16.00	-0.0191	11.00	0.0131	-30.00	-0.0160	-48.00	-0.0255
3.075	18.00	0.0215	16.00	0.0191	-32.00	-0.0170	-44.00	-0.0234
3.165	-11.00	-0.0131	13.00	0.0155	-31.00	-0.0165	-44.00	-0.0234
3.255	20.00	0.0239	12.00	0.0143	-25.00	-0.0133	-36.00	-0.0191
3.300	-24.00	-0.0287	17.00	0.0203	-35.00	-0.0186	-35.00	-0.0186
3.345	22.00	0.0263	12.00	0.0143	-38.00	-0.0202	-31.00	-0.0165
3.435	18.00	0.0215	11.00	0.0131	-44.00	-0.0234	-32.00	-0.0170
3.525	19.00	0.0227	16.00	0.0191	-24.00	-0.0128	-36.00	-0.0191
3.615	-18.00	-0.0215	17.00	0.0203	-28.00	-0.0149	-30.00	-0.0160
3.705	-22.00	-0.0263	19.00	0.0227	-33.00	-0.0176	27.00	0.0144
3.795	-12.00	-0.0143	18.00	0.0215	-37.00	-0.0197	27.00	0.0144