



## **AirCard 330U Modem**

Test Report

FOR

FCC and IC Certifications

**IC: 2417C-AC330U**  
**FCC ID: N7NAC330U**

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## 1 Introduction and Purpose

This document provides test data for the AC330U modem output power intended for FCC and Industry Canada certifications.

## 2 Test Summary

FCC Rule	IC Standards	DESCRIPTION OF TEST	RESULT	PAGE
2.1046	RSS-132, 4.4 RSS-133, 6.4 RSS-199, 4.4	RF Power Output	Complies	5
2.1049	RSS-Gen, 4.6	Occupied Bandwidth	Complies	16
2.1051, 22.917, 24.238, 27.53	RSS-132, 4.5 RSS-133, 6.5 RSS-199, 4.5	Out of Band Emissions at Antenna Terminals	Complies	45
22.917, 24.238, 27.53	RSS-Gen, 4.6	Block Edge Compliance	Complies	106
2.1055, 22.355, 24.235, 27.54	RSS-132, 4.3 RSS-133, 6.3 RSS-199, 4.3	Frequency Stability versus Temperature	Complies	122
2.1055, 22.355, 24.235, 27.54	RSS-132, 4.3 RSS-133, 6.3 RSS-199, 4.3	Frequency Stability versus Voltage	Complies	124
24.232, 27.50		Peak to Average Ratio	Complies	126

## 3 Description of Equipment under Test

The AC330U modem, referred to as “EUT” hereafter, is a multi-band wireless modem operating on the GSM/GPRS/EDGE/UMTS/LTE networks. In the US and Canada, cellular and PCS bands are used for GSM/GPRS/UMTS operation, and LTE Band 7 and Band 4 are used, so this test report only contains data for these four bands (850MHz, 1900MHz, 2600MHz Band 7, and 1700MHz Band 4).

## 4 RF Power Output

FCC 2.1046, 27.53(h)

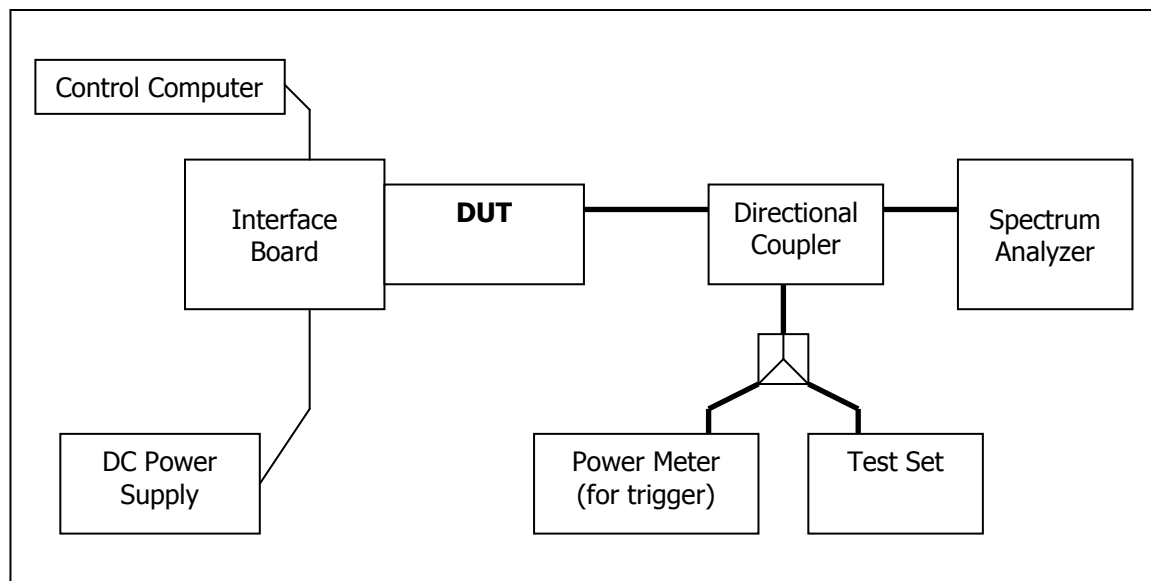
### 4.1 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

### 4.2 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set (for GSM and WCDMA) or a CMW500 (for LTE) 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, 5MHz for the WCDMA and HSPA measurements, and 10MHz for LTE. The spectrum analyzer was set to measure the RF output power with the cable and coupler losses accounted for.

### Test Setup



**4.2.1 WCDMA/HSDPA/HSUPA Max Power setup**

Configure the call box to support all WCDMA tests in respect to the 3GPP 34.121 (listed in Table 4.2). Measure the power at Ch4132, 4182 and 4233 for US cell; Ch9262, 9400 and 9538 for US PCS band.

**For Rel99 per 3GPP 35.121 5.2**

- Set a Test Mode 1 loop back with a 12.2kbps Reference Measurement Channel (RMC)
- Set and send continuously Up power control commands to the AC330U module.
- Measure the power at the AC330U module antenna connector using the power meter with average detector

**For HSDPA Rel 7 3 per GPP 35.121 5.2AA**

- Establish a Test Mode 1 loop back with both 1 12.2kbps RMC channel and an H-Set1 Fixed Reference Channel (FRC). With the CMU200 this is accomplished by setting the signal Channel Coding to “Fixed Reference Channel” and configuring for HSET-1 QKSP.
- Set beta values and HSDPA settings for HSDPA Subtest1 according to Table 4.2
- Send continuously Up power control commands to the AC330U module
- Measure the power at the AC330U module antenna connector using the power meter with modulated average detector
- Repeat the measurement for the HSDPA Subtest2, 3 and 4 as given in Table 4.2

**For HSUPA Rel 6 per 3GPP 35.121 5.2B**

- Use UL RMC 12.2kbps and FRC H-Set1 QPSK, Test Mode 1 loop back. With the CMU200 this is accomplished by setting the signal Channel Coding to “E-DCH Test Channel” and configuring the equipment category to Cat5\_10ms.
- Set the Absolute Grant for HSUPA Subtest1 according to Table 4.2
- Set the AC330U module power to be at least 5dB lower than the Maximum output power
- Send power control bits to give one TPC\_cmd = +1 command to the UNDP. If UNDP doesn’t send any E-DPCH data with decreased E-TFCI within 500ms, then repeat this process until the decreased E-TFCI is reported.
- Confirm that the E-TFCI transmitted by the AC330U module is equal to the target E-TFCI in Table 4.2. If the E-TFCI transmitted by the AC330U module is not equal to the target E-TFCI, then send power control bits to give one TPC\_cmd = -1 command to the UE. If UE sends any E-DPCH data with decreased E-TFCI within 500 ms, send new power control bits to give one TPC\_cmd = -1 command to the UE. Then confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table 4.2. If the E-TFCI transmitted by the UE is not equal to the target E-TFCI, then fail the UE
- Measure the power using the power meter with an average detector

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- Repeat the measurement for the HSUPA Subtest2, 3 and 4 as given in Table 4.2
- Test case 5 is tested using all up bits for maximum output power per 3GPP 34.521.

**Table 4.2 3GPP Rel99/HSPA Subtest Settings**

						Common Settings					HSDPA Specific Settings							HSUPA Sepcific Settings			HSUPA Additional Info	
Subt est	Mode	Loopba ck Mode	Rel99 RMC	HDP A FRC	HSUPA Test	$\beta_c$	$\beta_d$	C M	M PR	Power Class 3 limit (dBm)	$\Delta A CK$	$\Delta N AK$	$\Delta C QI$	ACK- NAK repeti tion factor	CQI Feed back (Tabl e 5.2B. 4)	CQI Repeti tion Factor (Table 5.2B.4 )	Ahs = $\beta_{hs} / \beta_c$	$\Delta E- DPC CH$	$\Delta H A R Q$	AG Ind ex	ERFCI (from 34.12 1 Table C.11. 1.3)	Associ ated Max UL Data Rate kbps
1	Rel99	Testmo de 1	12.2k bps	-	-			-		24 (+1.7/- 3.7 dB)												
1	Rel6 HSDPA	Testmo de 1	12.2k bps	H-Set 1	-	2/1 5	15/ 15	0	0	24 (+1.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15					
2	Rel6 HSDPA	Testmo de 1	12.2k bps	H-Set 1	-	12/ 15	15/ 15	1	0	24 (+1.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15					
3	Rel6 HSDPA	Testmo de 1	12.2k bps	H-Set 1	-	15/ 15	8/1 5	1. 5	0. 5	23.5 (+2.2/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15					
4	Rel6 HSDPA	Testmo de 1	12.2k bps	H-Set 1	-	15/ 15	4/1 5	1. 5	0. 5	23.5 (+2.2/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15					
1	Rel6 HSUPA	Testmo de 1	12.2k bps	H-Set 1	HSUPA Loopback	11/ 15	15/ 15	1	0	24 (+1.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15	6	0	20	75	242.1
2	Rel6 HSUPA	Testmo de 1	12.2k bps	H-Set 1	HSUPA Loopback	6/1 5	15/ 15	3	2	22 (+3.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15	8	0	12	67	174.9
3	Rel6 HSUPA	Testmo de 1	12.2k bps	H-Set 1	HSUPA Loopback	15/ 15	9/1 5	2	1	23 (+2.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15	8	0	15	92	482.8
4	Rel6 HSUPA	Testmo de 1	12.2k bps	H-Set 1	HSUPA Loopback	2/1 5	15/ 15	3	2	22 (+3.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15	5	0	17	71	205.8
5	Rel6 HSUPA	Testmo de 1	12.2k bps	H-Set 1	HSUPA Loopback	15/ 15	15/ 15	1	0	24 (+1.7/- 3.7 dB)	8	8	8	3	4 ms	2	30/ 15	7	0	81	81	308.9

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#### 4.2.2 GSM/GPRS/EDGE Max Power Setup

Configure the CMU200 Communication Tester to support GMSK and 8PSK call respectively, and set one timeslot transmission for GMSK GSM/GPRS and 8PSK EDGE. Measure and record power outputs for both modulations.

#### 4.2.3 LTE Max Power Setup

Configure the CMW500 call box to support all LTE tests in respect to the 3GPP 36.521.

- UE term. Conn: User defined Channels
  - Exp. Nominal Power Mode: According to UL Power Control Settings
  - RS EPRE: -75.0 dBm/15kHz Full Cell BW Power: -50.2 dBm
  - PSS Power Offset = SSS Power Offset = PBCH Power Offset = PCFICH Power Offset = PDCCH Power Offset = 0.0 dB
  - PHICH Power Offset = -12 dB
  - OCNG ON
  - PDSCH Power Offset PA: 0 dB, Power Ratio Index PB: 0 ( $\rho_B/\rho_A$ : 1)
  - Active TPC Setup: Max Power
  - Security Settings: Authentication OFF, NAS Security OFF, AS Security OFF
  - Integrity Algorithm: NULL
  - Milenage OFF
- 
- Configure the desired channel, BW, resource block allocation and modulation.
  - Connect to test set.
  - Set CMW500 TPC Setup to Max Power (Up power control command).
  - Measure the power at the AC330U module antenna connector using the CMW multi evaluation LTE measurement.

### 4.3 Maximum Transmit Power Test Results

#### 4.3.1 Test Results GSM/EDGE Output Power

Band	Frequency (MHz)	Channel	GMSK Mode (MCS4)					
			1 Time Slot		2Time Slots		3Time Slots	4Time Slots
			RMS Power (dBm)	Peak Power (dBm)	RMS Power (dBm)	Peak Power (dBm)	Peak Power (dBm)	Peak Power (dBm)
GSM850	824.2	128	32.71	32.92	32.03	32.24	AC330U is Class 10 for GMSK Mode.	
	836.6	190	32.52	32.76	31.78	32.02		
	848.8	251	32.53	32.78	31.73	31.98		

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GSM1900	1850.2	512	30.43	30.64	29.56	29.77
	1880	661	30.31	30.55	29.61	29.85
	1909.8	810	30.24	30.49	29.67	29.92

Band	Frequency (MHz)	Channel	8PSK Mode (MCS9)							
			1 Time Slot		2Time Slots		3Time Slots		4Time Slots	
			RMS Power (dBm)	Peak Power (dBm)	RMS Power (dBm)	Peak Power (dBm)	RMS Power (dBm)	Peak Power (dBm)	RMS Power (dBm)	Peak Power (dBm)
GSM850	824.2	128	26.23	29.48	26.19	29.44	25.92	29.17	25.85	29.1
	836.6	190	26.31	29.53	26.14	29.36	26.08	29.3	25.93	29.15
	848.8	251	26.19	29.34	26.09	29.24	25.89	29.04	25.8	28.95
GSM1900	1850.2	512	25.88	29.13	25.84	29.09	25.64	28.89	24.37	27.62
	1880	661	25.93	29.15	25.85	29.07	25.67	28.89	24.32	27.54
	1909.8	810	25.81	28.96	25.77	28.92	25.54	28.69	24.24	27.39

## 4.3.2 Test Results for WCDMA/HSDPA/HSUPA Output Power

Mode	3GPP Subtest	Band V (800 MHz) Channel Power (dBm)			Band II (1900 MHz) Channel Power (dBm)			MPR
		4132	4182	4233	9262	9400	9538	
Rel99	1	23.06	23.01	23.02	22.05	22.31	22.24	N/A
Rel6 HSDPA	1	22.73	22.47	22.41	21.46	21.77	21.71	0
	2	22.77	22.56	22.51	21.47	21.87	21.80	0
	3	22.35	22.06	22.03	21.00	21.37	21.36	0.5
	4	22.33	22.10	22.06	21.08	21.38	21.27	0.5
Rel6 HSUPA	1	22.38	22.45	22.13	22.03	22.13	21.61	0
	2	20.95	20.86	20.79	20.73	20.56	20.61	2
	3	21.81	21.78	21.81	20.94	20.90	20.85	1
	4	21.80	21.71	21.79	20.62	20.59	20.63	2
	5	22.44	22.45	22.32	21.75	21.94	22.18	0

Note: All measurements are based on an average detector.

## 4.3.3 Test Results for LTE Output Power

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According to 3GPP 36.521, V9.1.0., the output power level for Power Class 3 LTE is to be 23.0dBm  $\pm$  2.7dB. The lower limit is shifted down by the MPR amount allowed for certain configurations.

Maximum Power Reduction (MPR) is allowed due to higher order modulation and transmit bandwidth configurations. These MPR levels reduce the lower limit of each output power by the either 1 or 2dB per 3GPP 36.521.

## 4.3.3.1 Output Power Results for LTE Band 4, 10 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
1715.0	20000	QPSK	1	0	22.13	26.67	0
			1	25	22.17	26.48	0
			1	49	22.45	26.80	0
			12	0	22.16	27.03	0
			12	19	22.11	26.77	0
			12	38	22.16	26.94	0
			25	0	21.07	26.48	1
			25	12	21.10	26.40	1
			25	25	21.20	26.57	1
			50	0	21.13	26.97	1
		16QAM	1	0	21.27	26.38	1
			1	25	20.98	25.99	1
			1	49	21.34	26.34	1
			12	0	21.57	27.10	1
			12	19	21.42	26.87	1
			12	38	21.53	27.06	1
			25	0	19.90	26.51	2
			25	12	20.05	26.44	2
			25	25	20.12	26.63	2
			50	0	20.39	26.96	2
1732.5	20175	QPSK	1	0	22.47	27.61	0
			1	25	22.49	27.54	0
			1	49	22.55	27.65	0
			12	0	22.43	28.03	0
			12	19	22.37	27.93	0
			12	38	22.42	27.97	0
			25	0	21.36	27.46	1
			25	12	21.36	27.41	1
			25	25	21.43	27.45	1
			50	0	21.40	27.85	1
		16QAM	1	0	21.43	27.06	1
			1	25	21.25	26.89	1

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			1	49	21.40	27.04	1
			12	0	21.75	28.21	1
			12	19	21.71	28.10	1
			12	38	21.76	28.15	1
			25	0	20.25	27.66	2
			25	12	20.35	27.64	2
			25	25	20.30	27.63	2
			50	0	20.68	27.94	2
1750.0	20350	QPSK	1	0	22.26	27.37	0
			1	25	22.18	27.03	0
			1	49	22.36	27.18	0
			12	0	22.07	27.66	0
			12	19	22.13	27.44	0
			12	38	22.15	27.36	0
			25	0	21.10	26.97	1
			25	12	21.11	26.88	1
			25	25	21.16	26.86	1
			50	0	21.09	27.24	1
		16QAM	1	0	20.97	26.63	1
			1	25	20.96	26.42	1
			1	49	21.22	26.61	1
			12	0	21.39	27.80	1
			12	19	21.42	27.62	1
			12	38	21.49	27.53	1
			25	0	20.02	27.22	2
			25	12	20.05	27.09	2
			25	25	20.07	26.94	2
			50	0	20.30	27.46	2

## 4.3.3.2 Output Power Results for LTE Band 4, 20 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
1720.0	20050	QPSK	1	0	21.85	26.13	0
			1	50	22.44	26.40	0
			1	99	22.54	27.08	0
			18	0	21.91	26.72	0
			18	41	22.36	27.10	0
			18	82	22.38	27.77	0
			50	0	21.30	26.65	1
			50	25	21.49	26.79	1
			50	50	21.41	27.09	1
			100	0	21.37	27.29	1

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		16QAM	1	0	21.18	25.73	1
			1	50	21.14	26.51	1
			1	99	21.01	27.01	1
			18	0	20.97	26.12	1
			18	41	21.18	26.69	1
			18	82	21.17	27.31	1
			50	0	20.16	25.91	2
			50	25	20.29	26.19	2
			50	50	20.28	26.60	2
			100	0	20.16	26.62	2
1732.5	20175	QPSK	1	0	22.44	26.79	0
			1	50	22.49	27.17	0
			1	99	22.08	26.75	0
			18	0	22.45	27.63	0
			18	41	22.39	27.93	0
			18	82	22.21	27.64	0
			50	0	21.55	27.55	1
			50	25	21.45	27.51	1
			50	50	21.35	27.35	1
			100	0	21.39	27.66	1
		16QAM	1	0	21.09	26.76	1
			1	50	21.00	26.93	1
			1	99	21.05	26.96	1
			18	0	21.28	27.30	1
			18	41	21.06	27.13	1
			18	82	20.96	26.99	1
			50	0	20.35	26.73	2
			50	25	20.26	26.70	2
			50	50	20.16	26.51	2
			100	0	20.11	26.85	2
1745.0	20300	QPSK	1	0	22.33	26.94	0
			1	50	22.26	26.74	0
			1	99	22.34	26.64	0
			18	0	22.40	27.92	0
			18	41	22.22	27.71	0
			18	82	22.14	27.18	0
			50	0	21.43	27.37	1
			50	25	21.31	27.31	1
			50	50	21.12	26.91	1
			100	0	21.36	27.58	1
		16QAM	1	0	21.00	27.02	1
			1	50	20.86	26.82	1
			1	99	21.01	26.55	1

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			18	0	21.15	27.32	1
			18	41	20.93	26.98	1
			18	82	20.93	26.79	1
			50	0	20.17	26.68	2
			50	25	20.15	26.46	2
			50	50	20.03	26.23	2
			100	0	20.06	26.57	2

## 4.3.3.3 Output Power Results for LTE Band 7, 10 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
2505	20800	QPSK	1	0	21.51	27.06	0
			1	25	21.58	27.04	0
			1	49	21.71	27.06	0
			12	0	21.2	27.28	0
			12	19	21.43	27.32	0
			12	38	21.52	27.35	0
			25	0	20.36	26.79	1
			25	12	20.46	26.81	1
			25	25	20.44	26.84	1
			50	0	20.54	27.2	1
		16QAM	1	0	19.66	25.95	1
			1	25	20.42	26.34	1
			1	49	20.18	26.24	1
			12	0	20.01	27.27	1
			12	19	21.14	27.66	1
			12	38	21.17	27.69	1
			25	0	19.39	27.13	2
			25	12	19.32	27.03	2
			25	25	19.69	27.21	2
			50	0	19.06	26.76	2
2535	21100	QPSK	1	0	21.63	26.77	0
			1	25	21.86	26.93	0
			1	49	21.83	27.01	0
			12	0	21.74	27.17	0
			12	19	21.76	27.16	0
			12	38	21.66	27.26	0
			25	0	20.7	26.88	1
			25	12	20.76	26.85	1
			25	25	20.64	26.85	1
			50	0	20.75	27.33	1
		16QAM	1	0	20.59	26.36	1

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			1	25	20.33	26.19	1
			1	49	20.65	26.55	1
			12	0	21.02	27.27	1
			12	19	21.07	27.25	1
			12	38	20.93	27.38	1
			25	0	19.75	27.1	2
			25	12	19.74	27.08	2
			25	25	19.59	27.07	2
			50	0	19.96	27.27	2
2565	21400	QPSK	1	0	21.8	27.11	0
			1	25	21.85	26.91	0
			1	49	21.65	26.7	0
			12	0	21.53	27.3	0
			12	19	21.62	27.1	0
			12	38	21.57	27.04	0
			25	0	20.57	26.88	1
			25	12	20.55	26.68	1
			25	25	20.57	26.65	1
		16QAM	50	0	20.69	27.11	1
			1	0	20.09	26.24	1
			1	25	20.35	26.21	1
			1	49	20.43	26.22	1
			12	0	20.88	27.5	1
			12	19	20.99	27.23	1
			12	38	20.83	27.17	1
			25	0	19.61	27.2	2
			25	12	19.37	26.88	2
			25	25	19.48	26.89	2
			50	0	19.1	26.73	2

## 4.3.3.4 Output Power Results for LTE Band 7, 20 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
2510	20850	QPSK	1	0	21.45	26.4	0
			1	50	21.76	26.56	0
			1	99	22.12	26.83	0
			18	0	21.33	27.18	0
			18	41	21.81	27.36	0
			18	82	21.85	27.5	0
			50	0	20.57	26.78	1
			50	25	20.86	27.1	1

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			50	50	20.94	26.94	1
			100	0	20.66	26.91	1
		16QAM	1	0	20.27	26.83	1
			1	50	20.45	26.75	1
			1	99	20.12	26.65	1
			18	0	20.49	27.17	1
			18	41	20.96	27.4	1
			18	82	20.96	27.41	1
			50	0	19.71	26.69	2
			50	25	19.9	26.69	2
			50	50	20.07	26.83	2
			100	0	19.28	26.49	2
2535	21100	QPSK	1	0	21.57	26.17	0
			1	50	21.84	26.52	0
			1	99	21.77	26.61	0
			18	0	21.59	26.97	0
			18	41	21.82	27.13	0
			18	82	21.67	27.36	0
			50	0	20.76	26.91	1
			50	25	20.74	26.97	1
			50	50	20.74	26.86	1
			100	0	20.83	27.27	1
		16QAM	1	0	20.28	26.4	1
			1	50	20.7	26.72	1
			1	99	20.03	26.56	1
			18	0	20.69	26.9	1
			18	41	20.79	27.1	1
			18	82	20.77	27.26	1
			50	0	19.77	26.67	2
			50	25	19.96	26.7	2
			50	50	19.96	26.91	2
			100	0	19.75	26.79	2
2560	21350	QPSK	1	0	21.16	26.13	0
			1	50	21.7	26.5	0
			1	99	21.48	26.1	0
			18	0	21.66	27.33	0
			18	41	21.47	27.1	0
			18	82	21.44	26.79	0
			50	0	20.67	26.99	1
			50	25	20.57	26.94	1
			50	50	20.54	26.67	1
			100	0	20.5	26.97	1
		16QAM	1	0	20.16	26.61	1

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			1	50	20.3	26.61	1
			1	99	20.33	26.39	1
			18	0	20.72	27.23	1
			18	41	20.51	27.06	1
			18	82	20.49	26.72	1
			50	0	20.39	26.78	2
			50	25	19.57	26.72	2
			50	50	19.71	26.63	2
			100	0	19.54	26.91	2

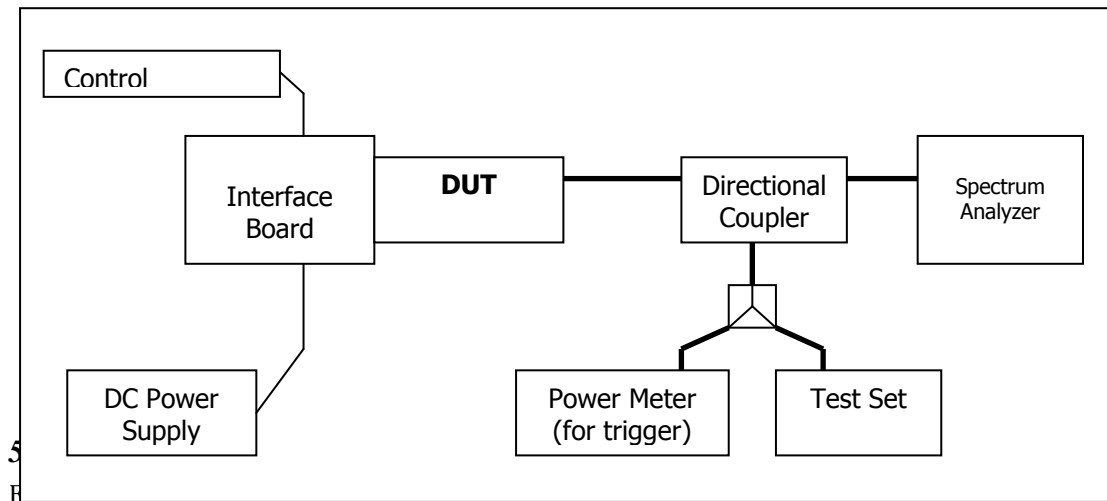
## 5 Occupied Bandwidth

FCC 2.1049, 24.238(a)(b), 27.53(h)

### 5.1 Test Procedure

The transmitter output was connected to a spectrum analyzer through a calibrated coaxial cable and a directional coupler. The occupied bandwidth (defined as the 99% Power Bandwidth) was measured with the spectrum analyzer at low, middle, and high frequencies in each band. The -26dB bandwidth was also measured and recorded.

### Test Setup



Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

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## 5.3 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.

Performance of the UMTS 850 Cellular band is shown in plots 5.3.13 to 5.3.15.

Performance of the UMTS 1900 PCS band is shown in plots 5.3.16 to 5.3.18.

The following GSM test results are based on single slot, and use CS1 for GMSK and MCS9 for 8PSK mode. For WCDMA testing, RMC 12.2kps has been used.

### 5.3.1 GSM Summary Results

Mode		Frequency (MHz)	Channel	99% Occupied Bandwidth (kHz)	Corresponding Plot
GSM GPRS EDGE	GMSK	824.2	128 (low)	246.30	Plot 5.3.4.1
		836.4	189 (mid)	249.65	Plot 5.3.4.2
		848.8	251 (high)	245.20	Plot 5.3.4.3
		1850.2	512 (low)	247.59	Plot 5.3.4.7
		1880	661 (mid)	244.41	Plot 5.3.4.8
		1909.8	810 (high)	244.65	Plot 5.3.4.9
	8PSK	824.2	128 (low)	234.20	Plot 5.3.4.4
		836.4	189 (mid)	240.10	Plot 5.3.4.5
		848.8	251 (high)	245.54	Plot 5.3.4.6
		1850.2	512 (low)	244.57	Plot 5.3.4.10
		1880	661 (mid)	239.97	Plot 5.3.4.11
		1909.8	810 (high)	240.91	Plot 5.3.4.12

### 5.3.2 WCDMA Summary Results

Mode		Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	-26dBc Occupied Bandwidth (MHz)	Corresponding Plot number
WCDMA HSDPA HSUPA	Rel99	826.4	4132	4.1622	4.662	Plot 5.3.5.1
		836.4	4182	4.1633	4.640	Plot 5.3.5.2
		846.6	4233	4.1662	4.682	Plot 5.3.5.3
		1852.4	9262	4.1658	4.684	Plot 5.3.5.4
		1880	9400	4.1668	4.676	Plot 5.3.5.5
		1907.5	9538	4.1709	4.685	Plot 5.3.5.6
	HSUPA Rel 6	826.4	4132	4.1625	4.666	Plot 5.3.6.1
		836.4	4182	4.1525	4.660	Plot 5.3.6.2

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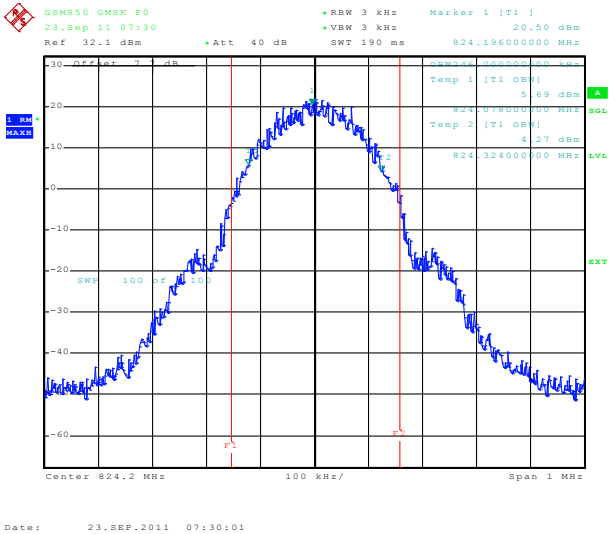
	Subtest 5	846.6	4233	4.1524	4.681	Plot 5.3.6.3
		1852.4	9262	4.1781	4.689	Plot 5.3.6.4
		1880	9400	4.1708	4.675	Plot 5.3.6.5
		1907.5	9538	4.1751	4.689	Plot 5.3.6.6

## 5.3.3 LTE Summary Results

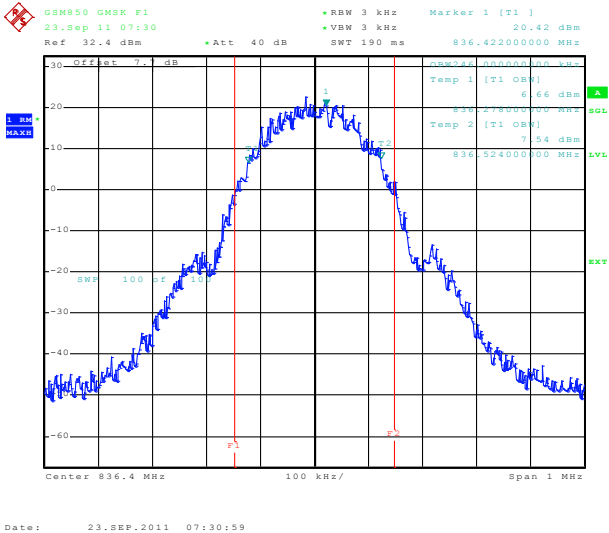
Mode	Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	-26dBc Occupied Bandwidth (MHz)	Corresponding Plot number
LTE	QPSK	10	50	0	1715.0	20000	9.040	10.040	Plot 5.3.7.1
					1732.5	20175	9.080	10.000	Plot 5.3.7.2
					1750.0	20350	9.040	9.960	Plot 5.3.7.3
		20	100	0	1720.0	20050	17.840	18.960	Plot 5.3.7.4
					1732.5	20175	17.840	19.040	Plot 5.3.7.5
					1745.0	20300	17.920	18.960	Plot 5.3.7.6
		10	50	0	2505.0	20800	9.000	10.000	Plot 5.3.7.7
					2535.0	21100	9.040	10.000	Plot 5.3.7.8
					2565.0	21400	9.000	9.960	Plot 5.3.7.9
			100	0	2510.0	20850	17.840	18.960	Plot 5.3.7.10
					2535.0	21100	17.840	19.040	Plot 5.3.7.11
					2560.0	21350	17.840	19.040	Plot 5.3.7.12
	16QAM	10	50	0	1715.0	20000	9.000	10.000	Plot 5.3.7.13
					1732.5	20175	9.080	10.000	Plot 5.3.7.14
					1750.0	20350	9.040	9.960	Plot 5.3.7.15
		20	100	0	1720.0	20050	17.840	18.960	Plot 5.3.7.16
					1732.5	20175	17.840	19.040	Plot 5.3.7.17
					1745.0	20300	17.840	19.040	Plot 5.3.7.18
		10	50	0	2505.0	20800	9.040	10.000	Plot 5.3.7.19
					2535.0	21100	9.040	10.040	Plot 5.3.7.20
					2565.0	21400	9.040	10.040	Plot 5.3.7.21
			100	0	2510.0	20850	17.840	18.960	Plot 5.3.7.22
					2535.0	21100	17.920	19.040	Plot 5.3.7.23
					2560.0	21350	17.840	19.040	Plot 5.3.7.24

5.3.4 GSM Test Plots

5.3.4.1 GMSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% BW



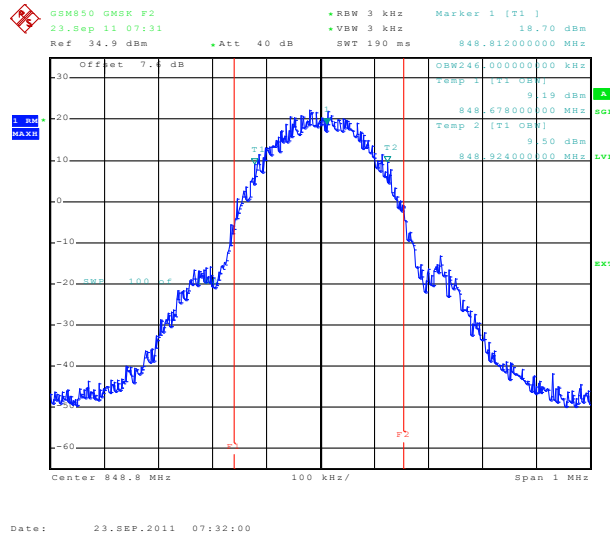
5.3.4.2 GMSK Occupied Bandwidth, Middle channel, 836.4 MHz, 99% bandwidth



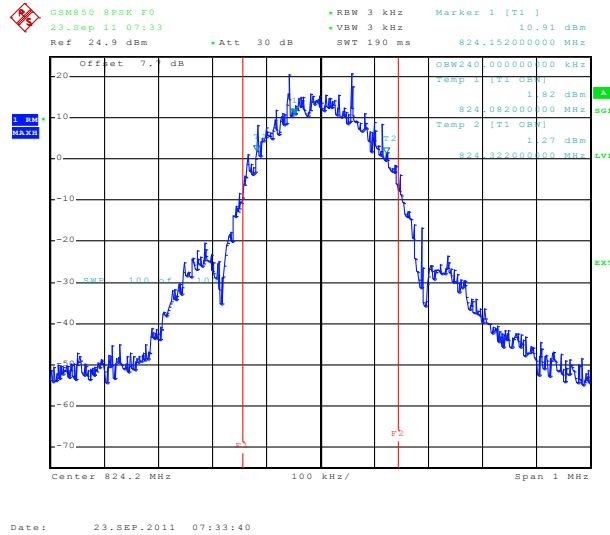
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## 5.3.4.3 GMSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth

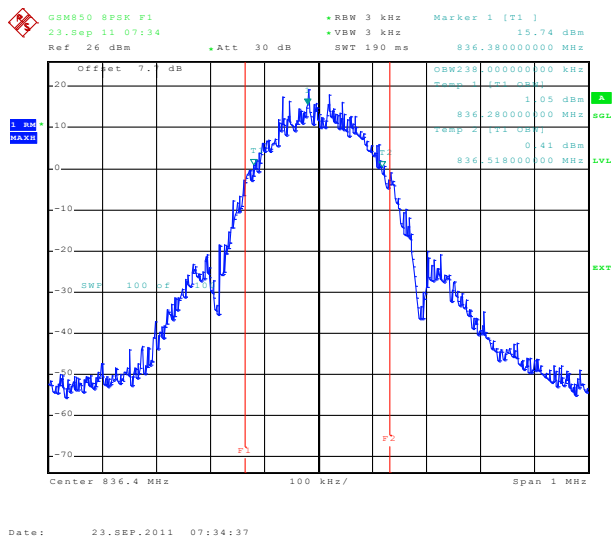


## 5.3.4.4 8-PSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% BW

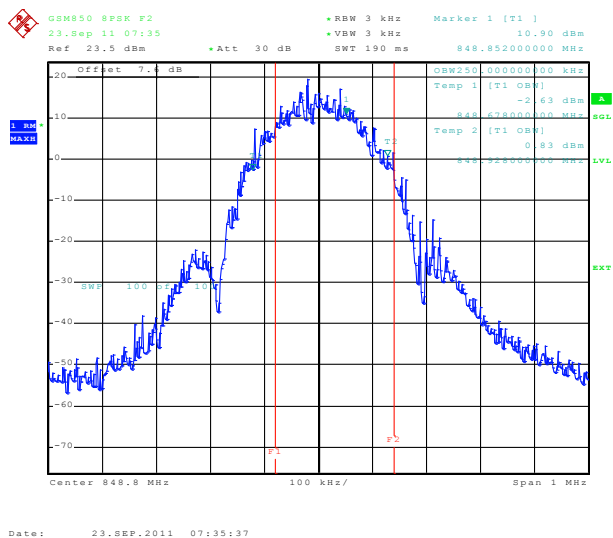


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#### 5.3.4.5 8-PSK Occupied Bandwidth, Middle channel, 836.4 MHz, 99% bandwidth



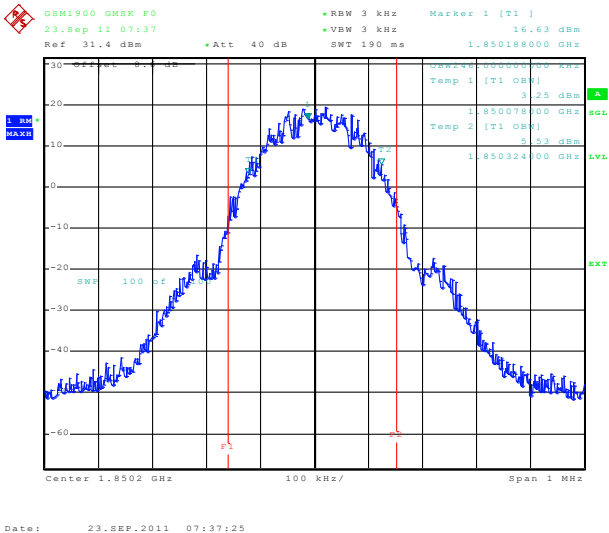
#### 5.3.4.6 8-PSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth



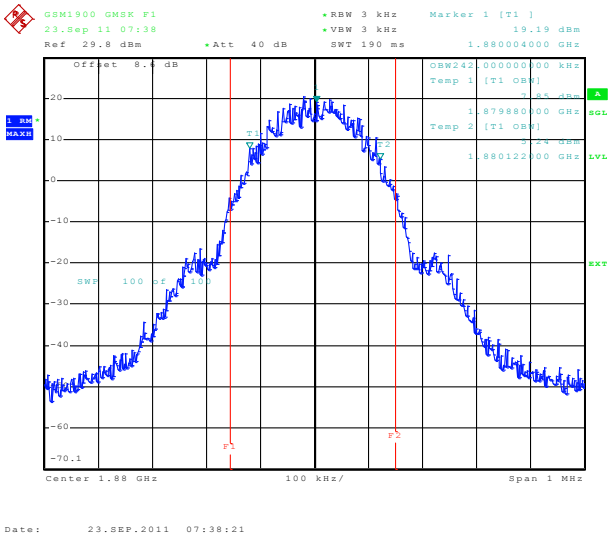
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5.3.4.7 GMSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% BW



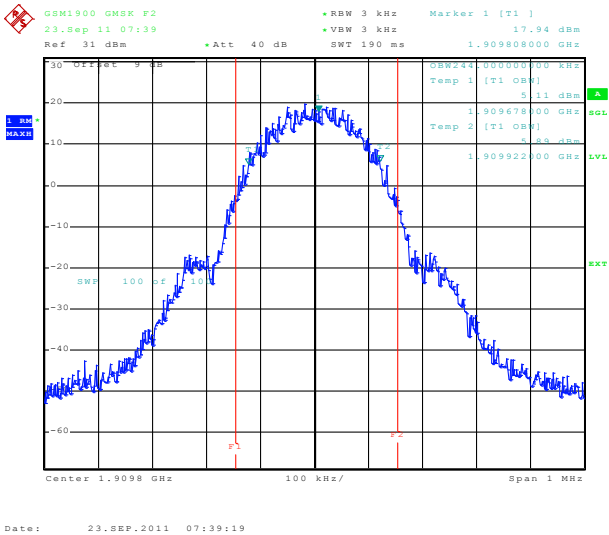
5.3.4.8 GMSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% BW



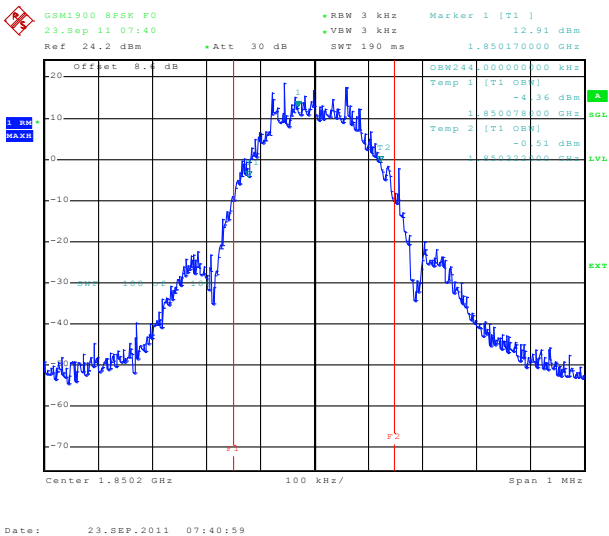
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5.3.4.9 GMSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% BW



5.3.4.10 8-PSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% BW

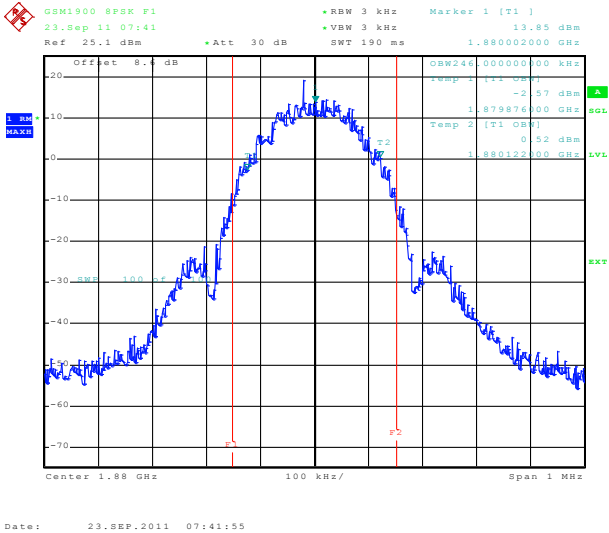




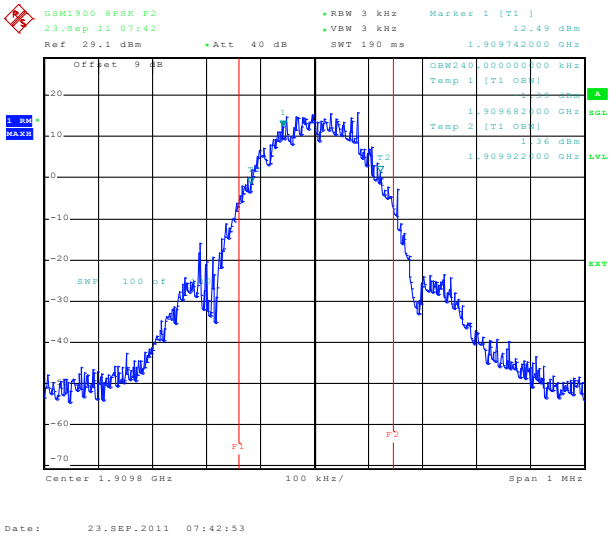
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5.3.4.11 8-PSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% BW

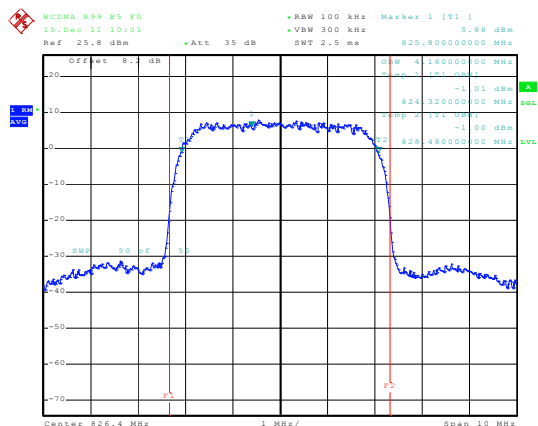


5.3.4.12 8-PSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% BW



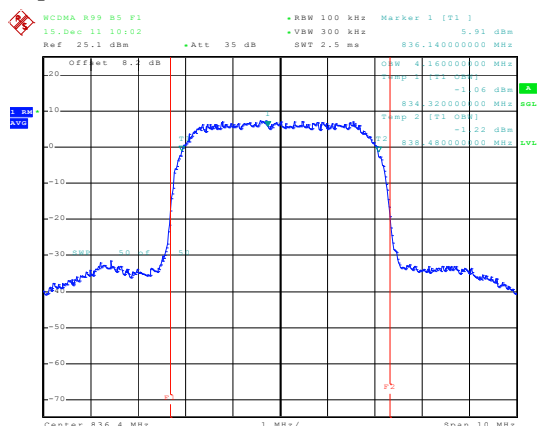
## 5.3.5 WCDMA Rel99 Test Plots

### 5.3.5.1 WCDMA Occupied Bandwidth, Cellular Low channel, 826.4 MHz, 99% BW



Date: 15.DEC.2011 10:01:42

### 5.3.5.2 WCDMA Occupied Bandwidth, Cellular Middle channel, 836.4 MHz, 99% BW

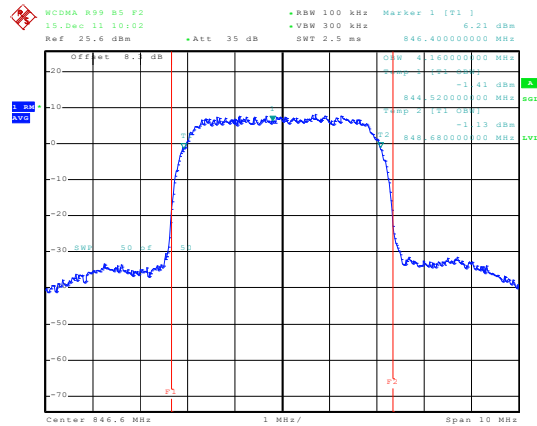


Date: 15.DEC.2011 10:02:00

# SIERRA WIRELESS, INC.

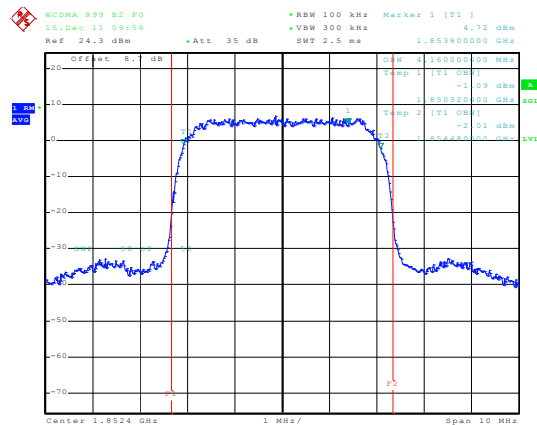
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## 5.3.5.3 WCDMA Occupied Bandwidth, Cellular High channel, 846.6 MHz, 99% BW



Date: 15.DEC.2011 10:02:18

## 5.3.5.4 WCDMA Occupied Bandwidth, PCS Low channel, 1852.4 MHz, 99% BW

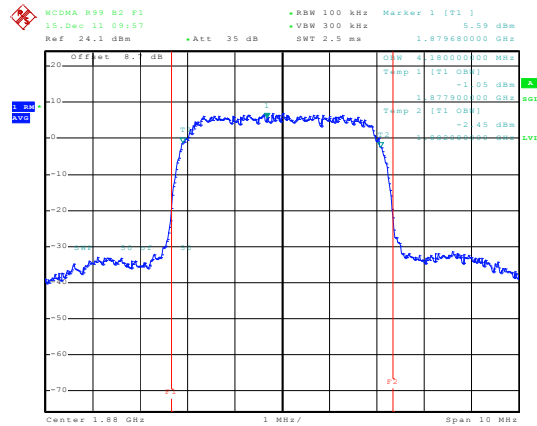


Date: 15.DEC.2011 09:56:48

# SIERRA WIRELESS, INC.

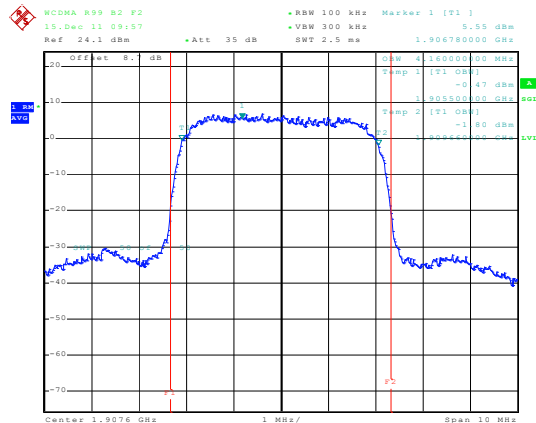
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## 5.3.5.5 WCDMA Occupied Bandwidth, PCS Middle channel, 1880 MHz, 99% BW



Date: 15.DEC.2011 09:57:06

## 5.3.5.6 WCDMA Occupied Bandwidth, PCS High channel, 1907.6 MHz, 99% BW



Date: 15.DEC.2011 09:57:25

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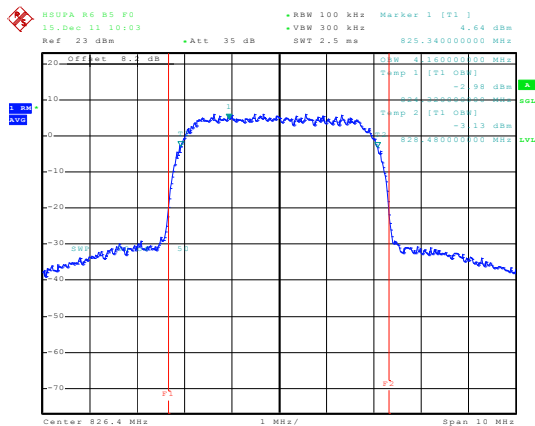
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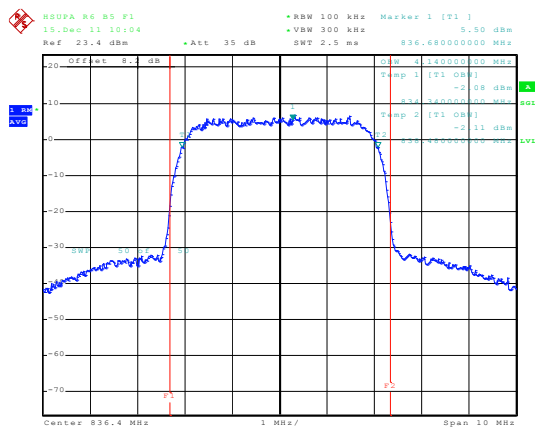
### 5.3.6 HSUPA Rel6 (Subtest 5) Test Plots

#### 5.3.6.1 HSUPA Occupied Bandwidth, Cellular Low channel, 826.4 MHz, 99% BW



Date: 15.DEC.2011 10:03:57

#### 5.3.6.2 HSUPA Occupied Bandwidth, Cellular Middle channel, 836.4 MHz, 99% BW

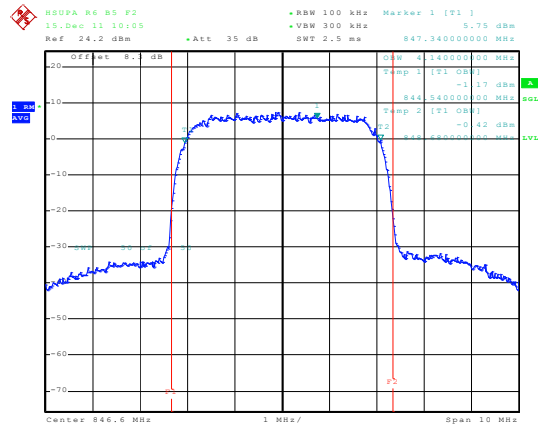


Date: 15.DEC.2011 10:04:46

# SIERRA WIRELESS, INC.

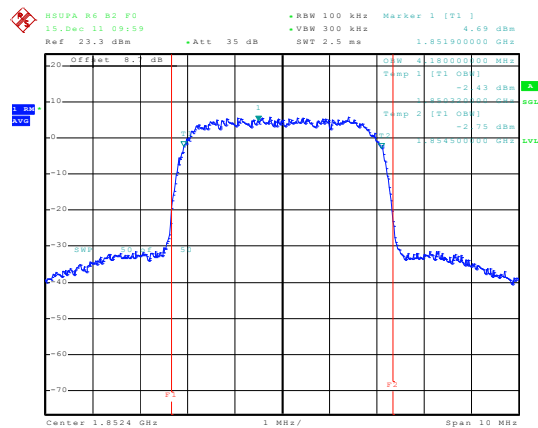
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## 5.3.6.3 HSUPA Occupied Bandwidth, Cellular High channel, 846.6 MHz, 99% BW



Date: 15.DEC.2011 10:05:36

## 5.3.6.4 HSUPA Occupied Bandwidth, PCS Low channel, 1852.4 MHz, 99% BW

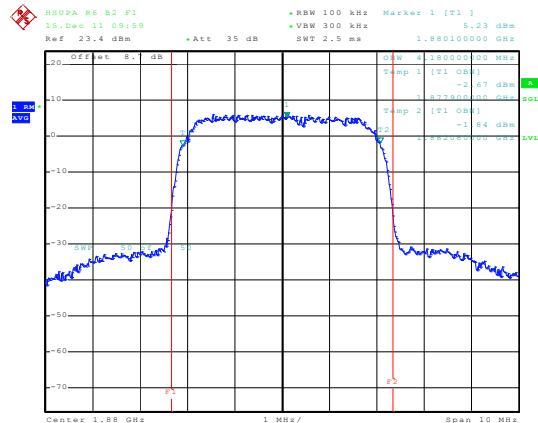


Date: 15.DEC.2011 09:59:05

# SIERRA WIRELESS, INC.

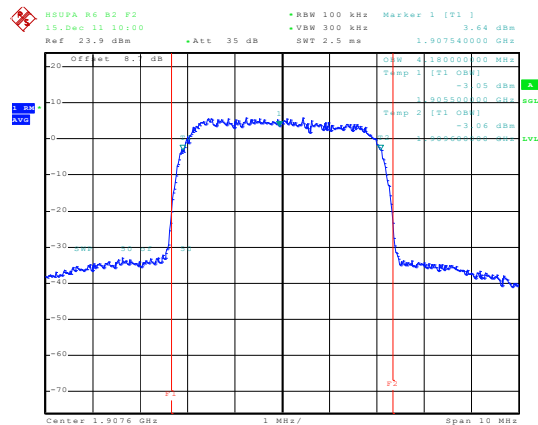
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## 5.3.6.5 HSUPA Occupied Bandwidth, PCS Middle channel, 1880 MHz, 99% BW



Date: 15.DEC.2011 09:59:53

## 5.3.6.6 HSUPA Occupied Bandwidth, PCS High channel, 1907.6 MHz, 99% BW



Date: 15.DEC.2011 10:00:42

## 5.3.7 LTE Test Plots

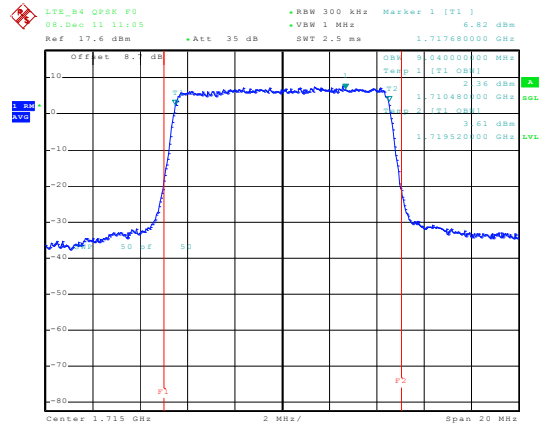
### 5.3.7.1 LTE Occupied Bandwidth, Band4 low channel (20000) BW=10MHz, RB=50 RB Offset=0 QPSK 99% BW

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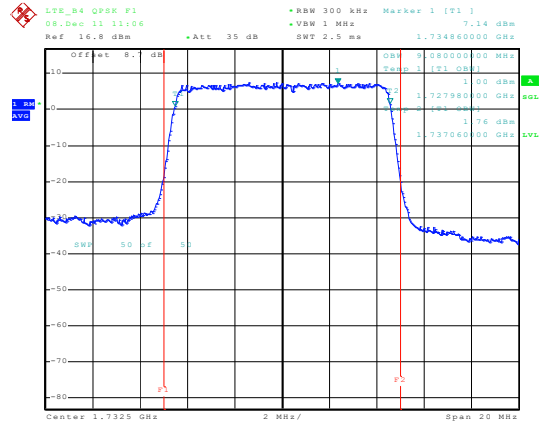
# SIERRA WIRELESS, INC.

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Date: 8.DEC.2011 11:05:51

## 5.3.7.2 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



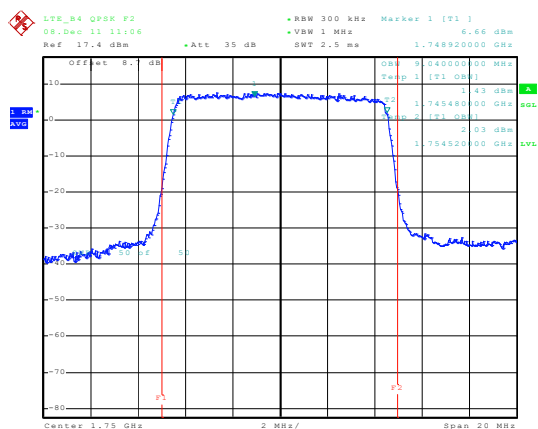
Date: 8.DEC.2011 11:06:08



# SIERRA WIRELESS, INC.

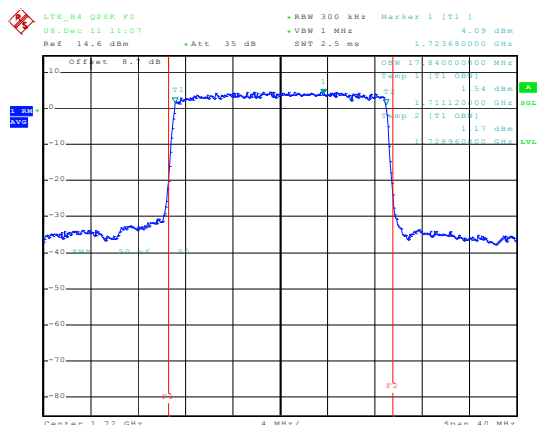
FCC Part 22/24/27, RSS-132/133/139/199	AC330U	16 January 2012	Page 33 of 130
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## 5.3.7.3 LTE Occupied Bandwidth, Band4 high channel (20350) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:06:26

## 5.3.7.4 LTE Occupied Bandwidth, Band4 low channel (20050) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:07:35

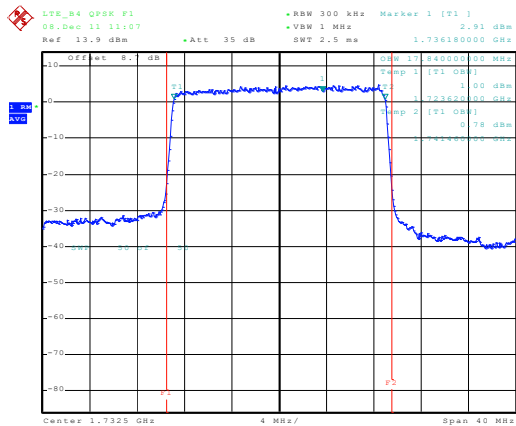
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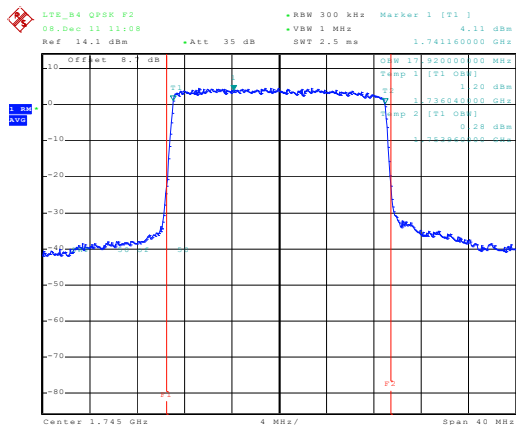
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#### 5.3.7.5 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:07:56

#### 5.3.7.6 LTE Occupied Bandwidth, Band4 high channel (20300) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW

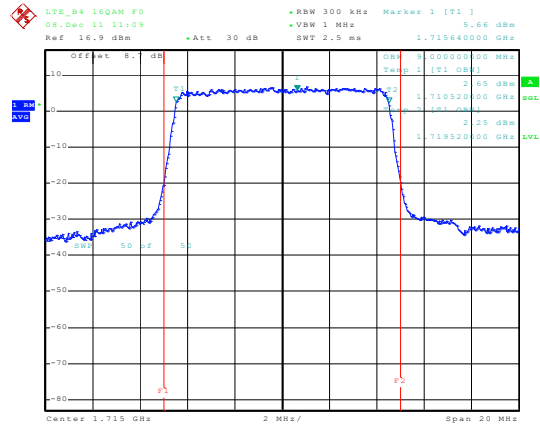


Date: 8.DEC.2011 11:08:17

# SIERRA WIRELESS, INC.

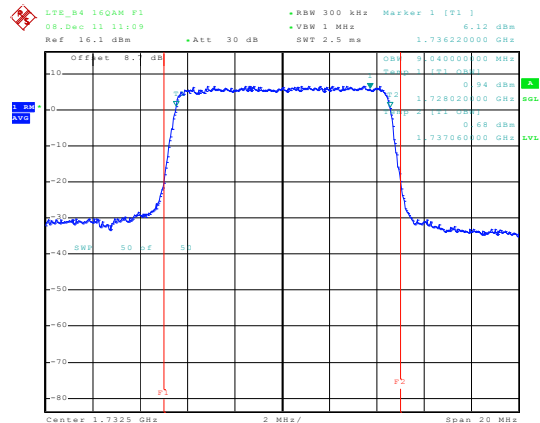
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## 5.3.7.7 LTE Occupied Bandwidth, Band4 low channel (20000) BW=10MHz RB=50 Offset=0 16QAM 99% BW



Date: 8.DEC.2011 11:09:25

## 5.3.7.8 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=10MHz RB=50 Offset=0 16QAM 99% BW

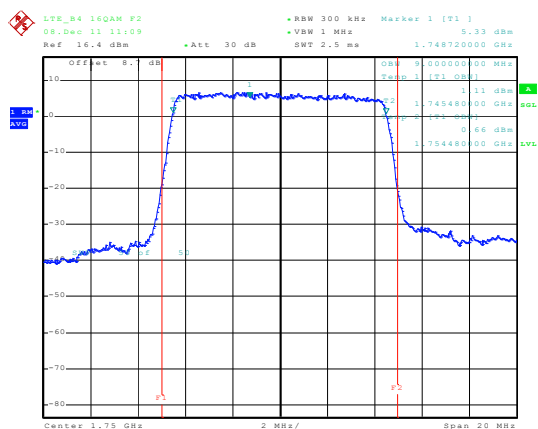


Date: 8.DEC.2011 11:09:42

# SIERRA WIRELESS, INC.

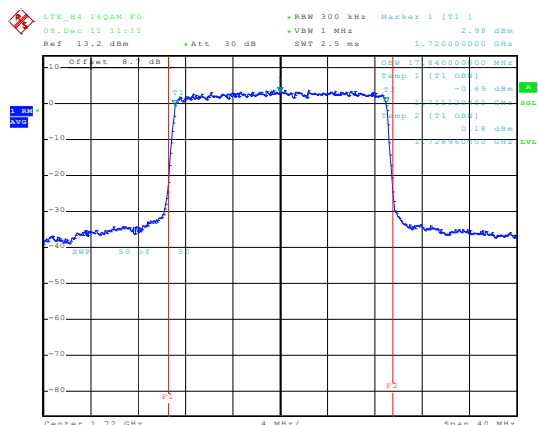
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## 5.3.7.9 LTE Occupied Bandwidth, Band4 high channel (20350) BW=10MHz RB=50 Offset=0 16QAM 99% BW



Date: 8.DEC.2011 11:09:59

## 5.3.7.10 LTE Occupied Bandwidth, Band4 low channel (20050) BW=20MHz RB=100 Offset=0 16QAM 99% BW

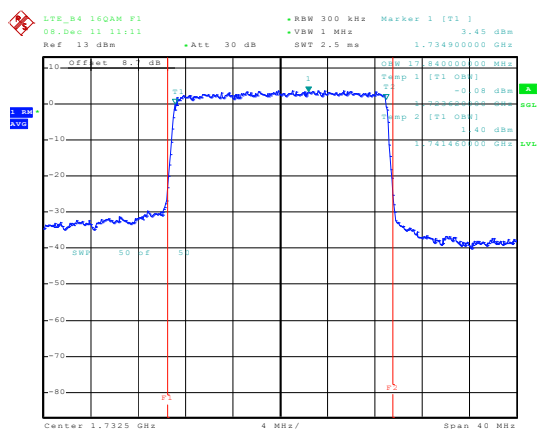


Date: 8.DEC.2011 11:11:10

# SIERRA WIRELESS, INC.

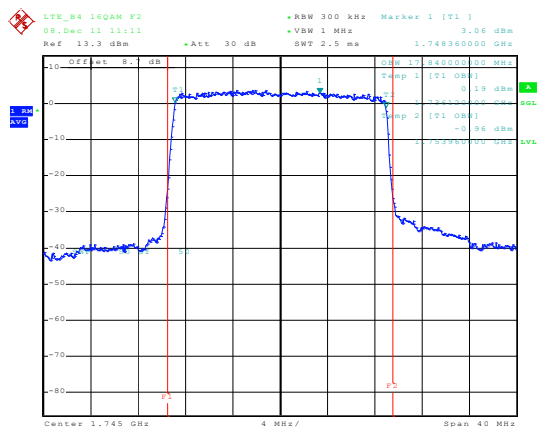
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## 5.3.7.11 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=20MHz RB=100 Offset=24 16QAM 99% BW



Date: 8.DEC.2011 11:11:31

## 5.3.7.12 LTE Occupied Bandwidth, Band4 high channel (20300) BW=20MHz RB=100 Offset=0 16QAM 99% BW

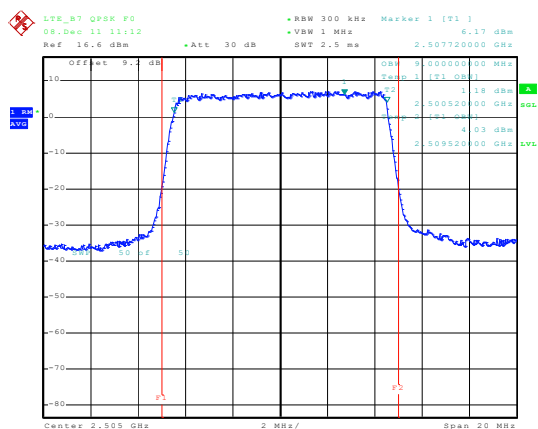


Date: 8.DEC.2011 11:11:51

# SIERRA WIRELESS, INC.

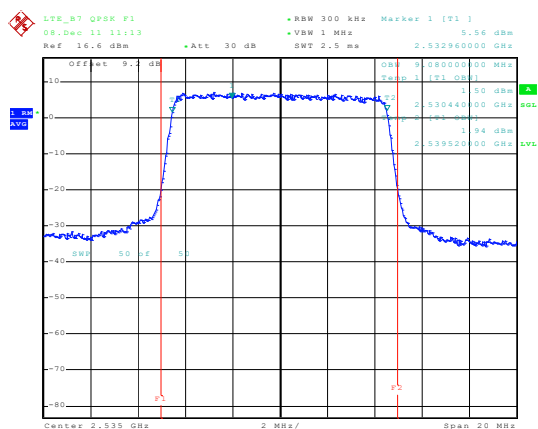
FCC Part 22/24/27, RSS-132/133/139/199	AC330U	16 January 2012	Page 38 of 130
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## 5.3.7.13 LTE Occupied Bandwidth, Band7 low channel (20800) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:12:57

## 5.3.7.14 LTE Occupied Bandwidth, Band7 mid channel (21100) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:13:15

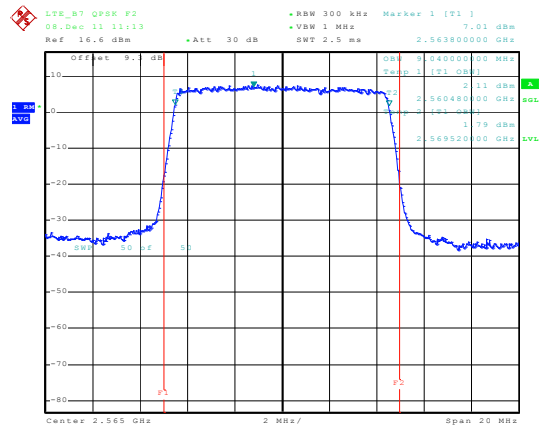
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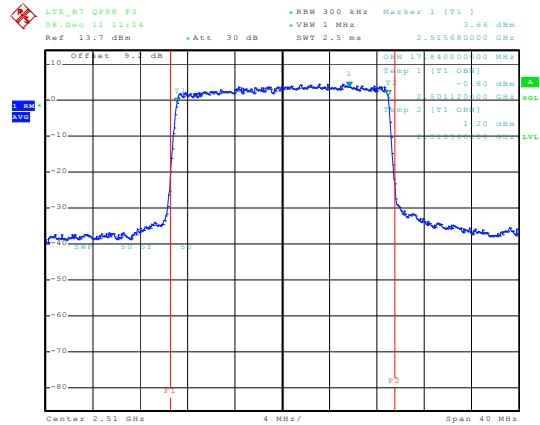
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## 5.3.7.15 LTE Occupied Bandwidth, Band7high channel (21400) BW=10MHz RB=50 RB Offset QPSK 99% BW



Date: 8.DEC.2011 11:13:33

## 5.3.7.16 LTE Occupied Bandwidth, Band7 low channel (20800) BW=10MHz RB=50 RB Offset=0 16QAM 99% BW

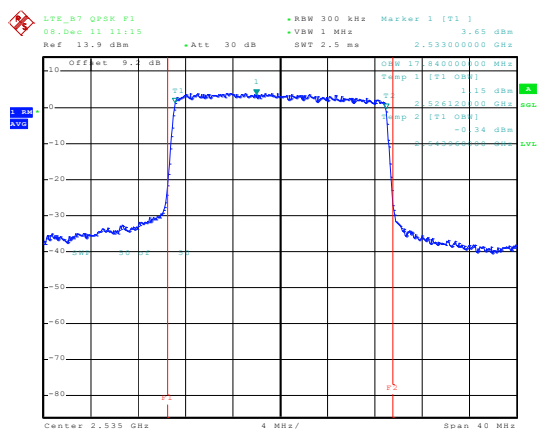


Date: 8.DEC.2011 11:14:42

# SIERRA WIRELESS, INC.

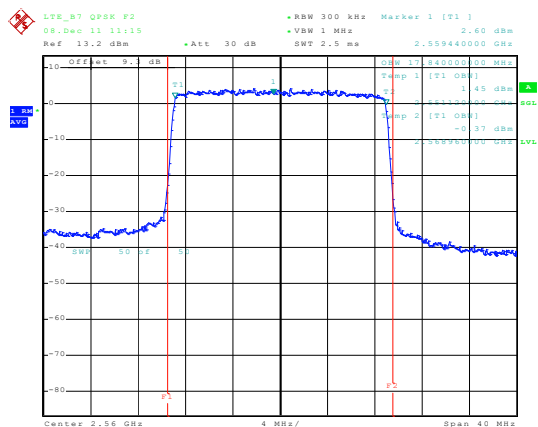
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## 5.3.7.17 LTE Occupied Bandwidth, Band7 mid channel (21100) BW=10MHz RB=50 RB Offset=0 16QAM 99% BW



Date: 8.DEC.2011 11:15:03

## 5.3.7.18 LTE Occupied Bandwidth, Band7 high channel (21400) BW=10MHz RB=50 RB Offset 16QAM 99% BW



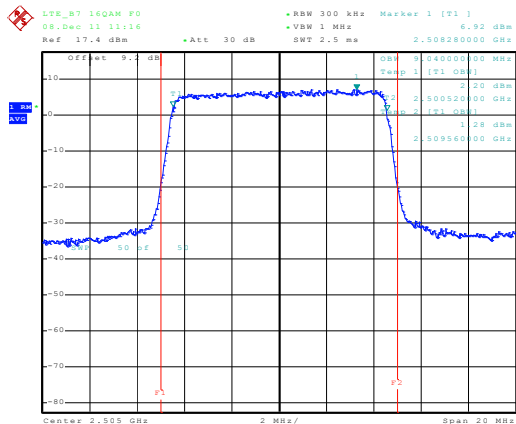
Date: 8.DEC.2011 11:15:24



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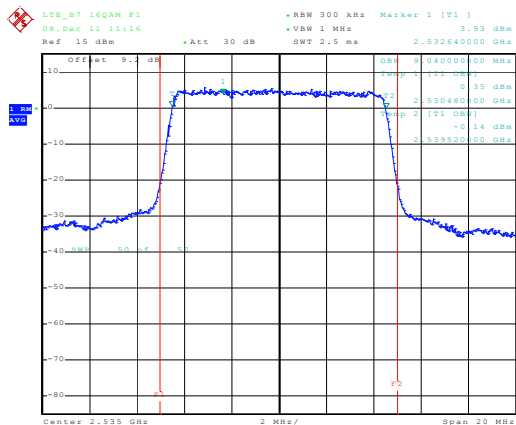
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5.3.7.19 LTE Occupied Bandwidth, Band7 low channel (20850) BW=20MHz RB=100  
RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:16:31

5.3.7.20 *LTE Occupied Bandwidth, Band7 mid channel (21100) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW*

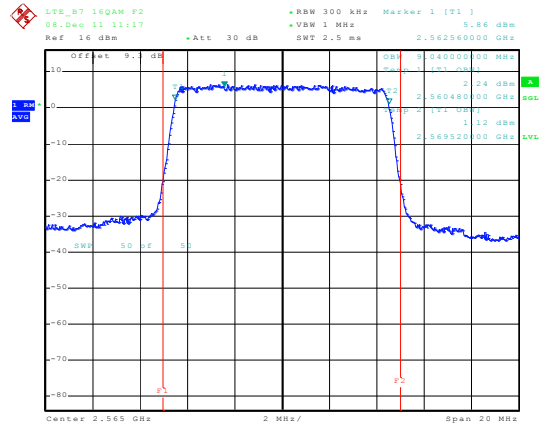


Date: 8.DEC.2011 11:16:49

# SIERRA WIRELESS, INC.

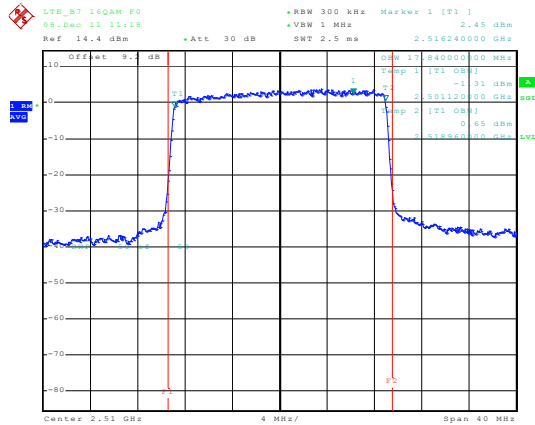
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## 5.3.7.21 LTE Occupied Bandwidth, Band7 high channel (21350) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW



Date: 8.DEC.2011 11:17:07

## 5.3.7.22 LTE Occupied Bandwidth, Band7 low channel (20850) BW=20MHz RB=100 RB Offset=0 16QAM 99% BW



Date: 8.DEC.2011 11:18:18

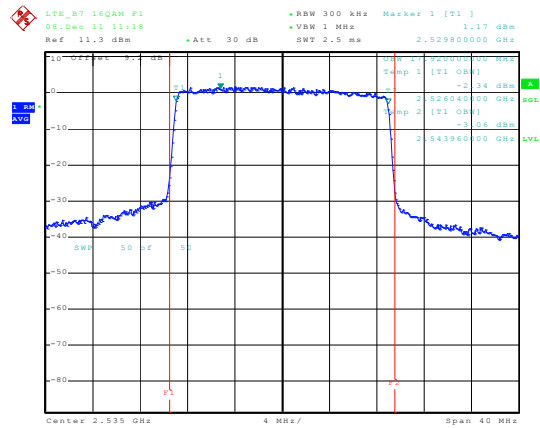
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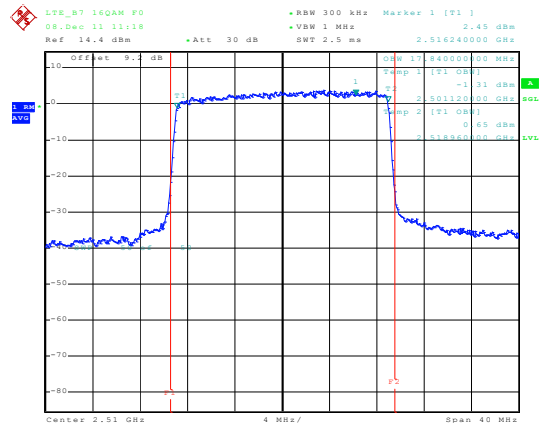
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## 5.3.7.23 LTE Occupied Bandwidth, Band7 mid channel (21100) BW=20MHz RB=100 16QAM 99% BW



Date: 8.DEC.2011 11:18:39

## 5.3.7.24 LTE Occupied Bandwidth, Band7 high channel (21350) BW=20MHz RB=100 16QAM 99% BW



Date: 8.DEC.2011 11:18:18

## 6 Out of Band Emissions at Antenna Terminals

FCC 22.901(d), 22.917, 24.238(a), 27.53(h)(m)

### 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

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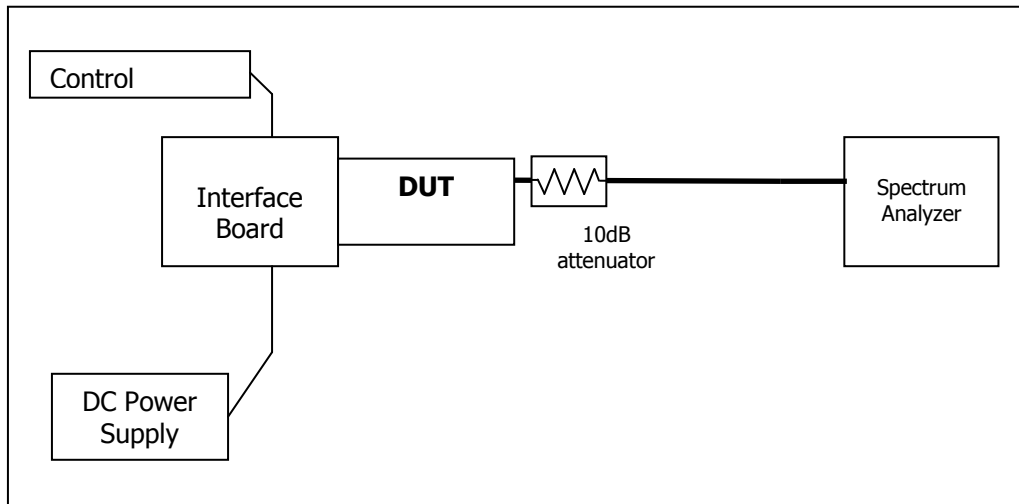
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(43 + 10 log P) dB. The out of band emission limit translates to a worst case absolute limit of -13dBm in this case. For LTE Band 7 the applicable limit 5.5MHz above the band edge is -25 dBm (as per 27.53(m)).

### 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 10<sup>th</sup> harmonic. The EUT was scanned for spurious emissions from 1MHz to 20GHz with sufficient bandwidth and video resolution. Data plots are included. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were captured.

### 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	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

### 6.3 Test Results

Refer to the following plots.

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Mode			Frequency (MHz)	Channel	Corresponding Plot
GSM GPRS EDGE	GMSK	GSM850	824.2	128 (low)	Plot 6.3.1.1, Plot 6.3.1.2
			836.6	190 (mid)	Plot 6.3.1.3, Plot 6.3.1.4
			848.8	251 (high)	Plot 6.3.1.5, Plot 6.3.1.6
		GSM1900	1850.2	512 (low)	Plot 6.3.1.13, Plot 6.3.1.14
			1880	661 (mid)	Plot 6.3.1.15, Plot 6.3.1.16
			1909.8	810 (high)	Plot 6.3.1.17, Plot 6.3.1.18
	8PSK	GSM850	824.2	128 (low)	Plot 6.3.1.7, Plot 6.3.1.8
			836.6	190 (mid)	Plot 6.3.1.9, Plot 6.3.1.10
			848.8	251 (high)	Plot 6.3.1.11, Plot 6.3.1.12
		GSM1900	1850.2	512 (low)	Plot 6.3.1.19, Plot 6.3.1.20
			1880	661 (mid)	Plot 6.3.1.21, Plot 6.3.1.22
			1909.8	810 (high)	Plot 6.3.1.23, Plot 6.3.1.23

Mode		Frequency (MHz)	Channel	Corresponding Plot number
WCDMA Rel99	B5	826.4	4132	Plot 6.3.2.1, Plot 6.3.2.2
		836.4	4182	Plot 6.3.2.3, Plot 6.3.2.4
		846.6	4233	Plot 6.3.2.5, Plot 6.3.2.6
	B2	1852.4	9262	Plot 6.3.2.7, Plot 6.3.2.8
		1880.0	9400	Plot 6.3.2.9, Plot 6.3.2.10
		1907.5	9538	Plot 6.3.2.11, Plot 6.3.2.11

Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	Corresponding Plot number
LTE	QPSK	B4	10	50	0	1715.0	20000	Plot 6.3.3.1 - Plot 6.3.3.3
						1732.5	20175	Plot 6.3.3.4 - Plot 6.3.3.6
						1750.0	20350	Plot 6.3.3.7 - Plot 6.3.3.9
			20	100	0	1720.0	20050	Plot 6.3.3.19 - Plot 6.3.3.21
						1732.5	20175	Plot 6.3.3.22 - Plot 6.3.3.24
						1745.0	20300	Plot 6.3.3.25 - Plot 6.3.3.27
		B7	10	50	0	2510.0	20800	Plot 6.3.3.35 - Plot 6.3.3.38
						2535.0	21100	Plot 6.3.3.39 - Plot 6.3.3.42
						2560.0	21400	Plot 6.3.3.43 - Plot 6.3.3.46
			20	100	0	2515.0	20850	Plot 6.3.3.59 - Plot 6.3.3.62
						2535.0	21100	Plot 6.3.3.63 - Plot 6.3.3.66
						2555.0	21350	Plot 6.3.3.67 - Plot 6.3.3.70
	16QAM	B4	10	50	0	1715.0	20000	Plot 6.3.3.47 - Plot 6.3.3.50
						1732.5	20175	Plot 6.3.3.51 - Plot 6.3.3.54
						1750.0	20350	Plot 6.3.3.55 - Plot 6.3.3.58
			20	100	0	1720.0	20050	Plot 6.3.3.28 - Plot 6.3.3.30

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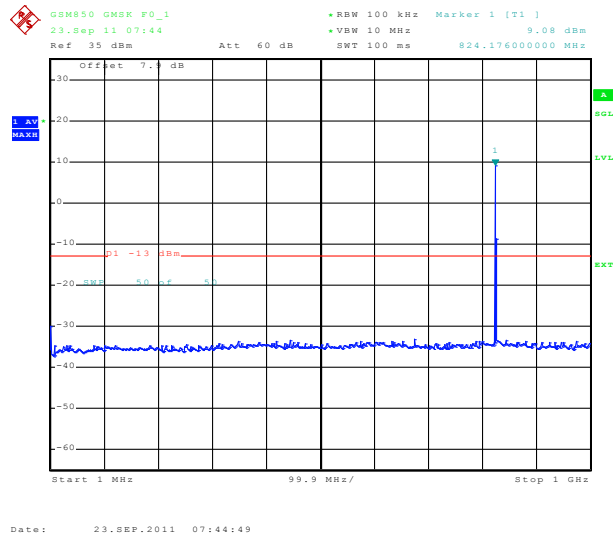
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		B7		10	50	0	1732.5	20175	Plot 6.3.3.31 - Plot 6.3.3.33
							1745.0	20300	Plot 6.3.3.34 - Plot 6.3.3.35
							2510.0	20800	Plot 6.3.3.31, Plot 6.3.3.32
			20	100	0		2535.0	21100	Plot 6.3.3.33, Plot 6.3.3.34
							2560.0	21400	Plot 6.3.3.35, Plot 6.3.3.36
							2515.0	20850	Plot 6.3.3.71 - Plot 6.3.3.74
							2535.0	21100	Plot 6.3.3.75 - Plot 6.3.3.78
							2555.0	21350	Plot 6.3.3.79 - Plot 6.3.3.82

The plots below show that the conducted emission limits requirements are met.

6.3.1 GSM Test Plots

6.3.1.1 Out of Band Emissions at Antenna Terminals GMSK, Low channel, 824.200 MHz, 2 Hz to 1 GHz

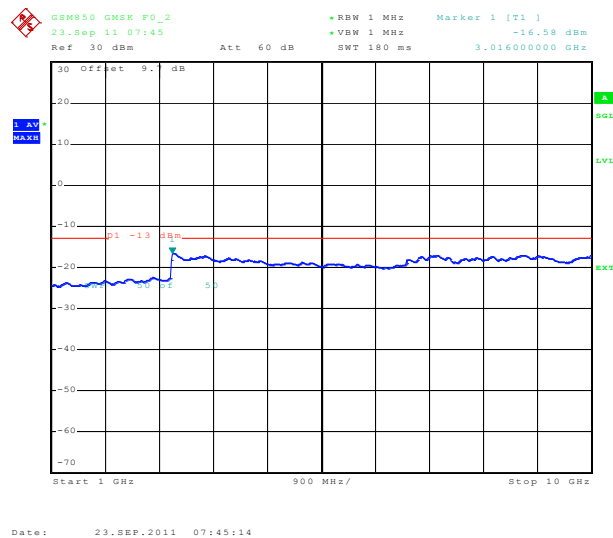


Note: The strong emission shown in each case is the carrier signal.

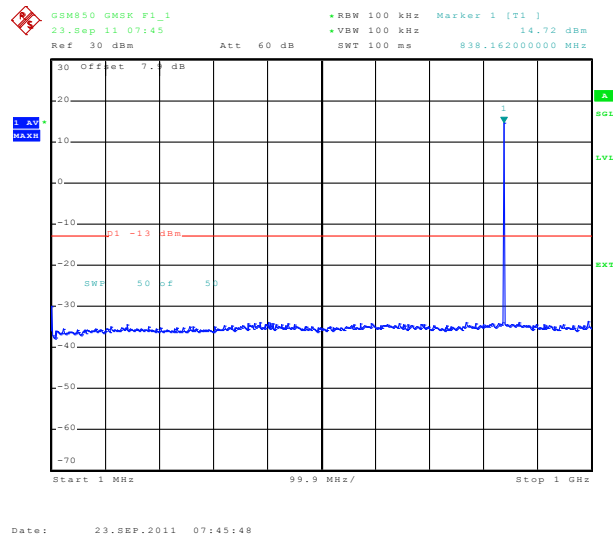
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## 6.3.1.2 Out of Band Emissions at Antenna Terminals GMSK, Low channel, 824.200 MHz, 1 GHz to 20 GHz



## 6.3.1.3 Out of Band Emissions at Antenna Terminals GMSK, Mid Channel, 836.6 MHz, 2 Hz to 1 GHz

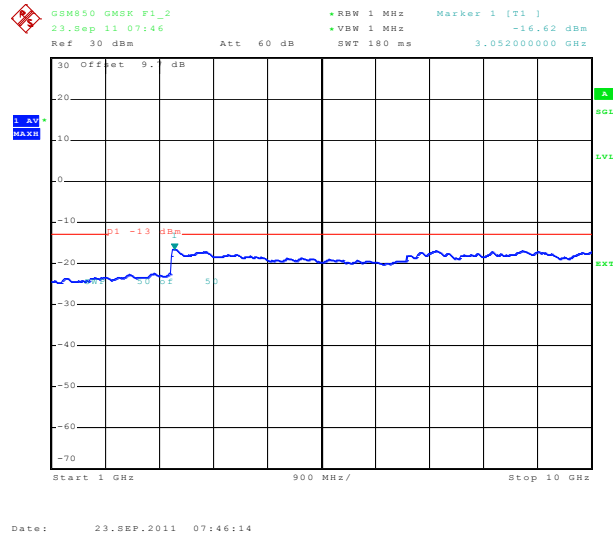


Note: The strong emission shown in each case is the carrier signal.

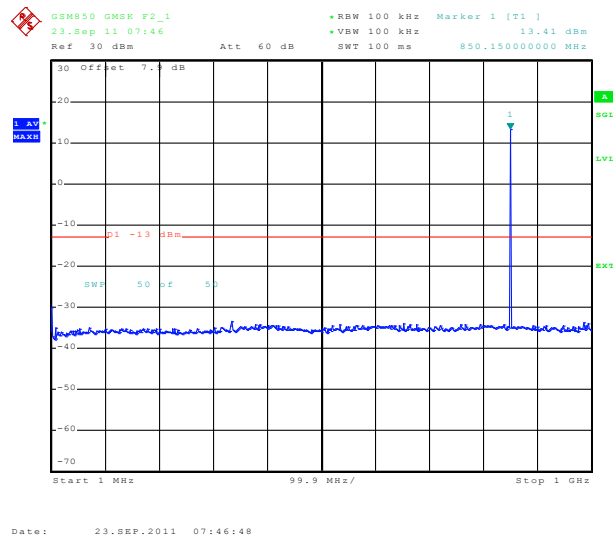
# SIERRA WIRELESS, INC.

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## 6.3.1.4 Out of Band Emissions at Antenna Terminals GMSK, Mid Channel, 836.6 MHz, 1 GHz to 20 GHz



## 6.3.1.5 Out of Band Emissions at Antenna Terminals GMSK, High Channel, 848.8 MHz, 2 Hz to 1 GHz



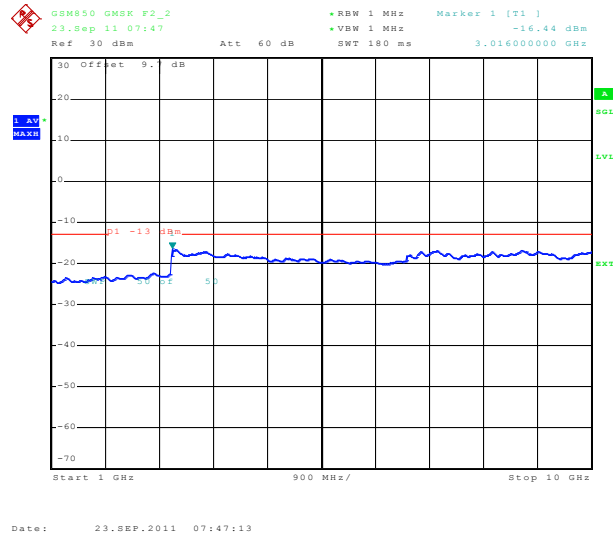
Note: The strong emission shown in each case is the carrier signal.



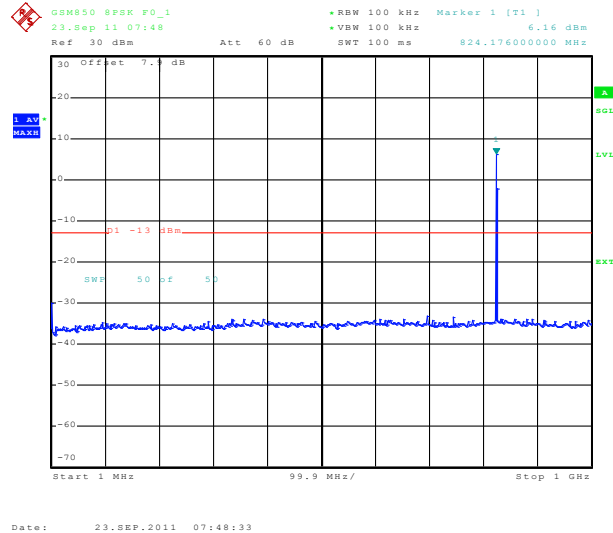
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## 6.3.1.6 Out of Band Emissions at Antenna Terminals GMSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz



## 6.3.1.7 Out of Band Emissions at Antenna Terminals 8-PSK, Low channel, 824.200 MHz, 2 Hz to 1 GHz

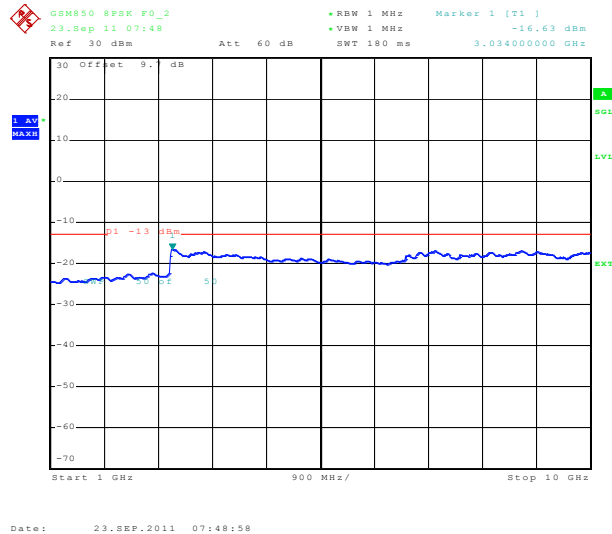


Note: The strong emission shown in each case is the carrier signal.

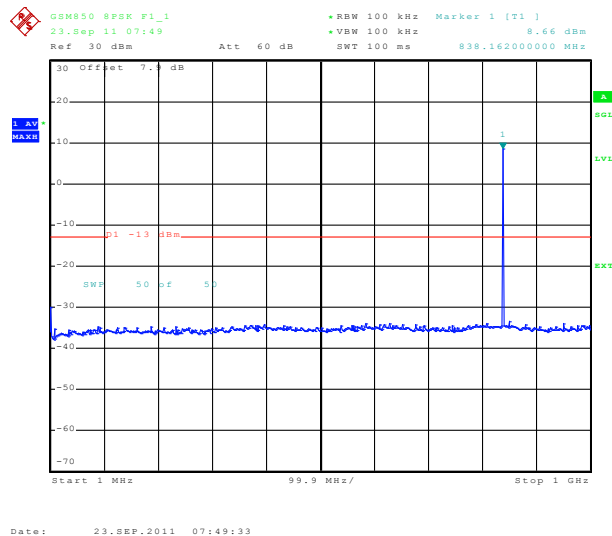
# SIERRA WIRELESS, INC.

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## 6.3.1.8 Out of Band Emissions at Antenna Terminals 8-PSK, Low channel, 824.200 MHz, 1 GHz to 20 GHz



## 6.3.1.9 Out of Band Emissions at Antenna Terminals 8-PSK, Mid Channel, 836.6 MHz, 2 Hz to 1 GHz

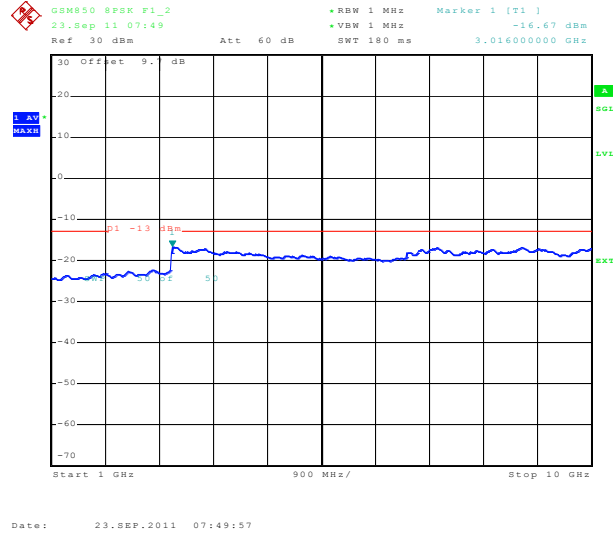


Note: The strong emission shown in each case is the carrier signal.

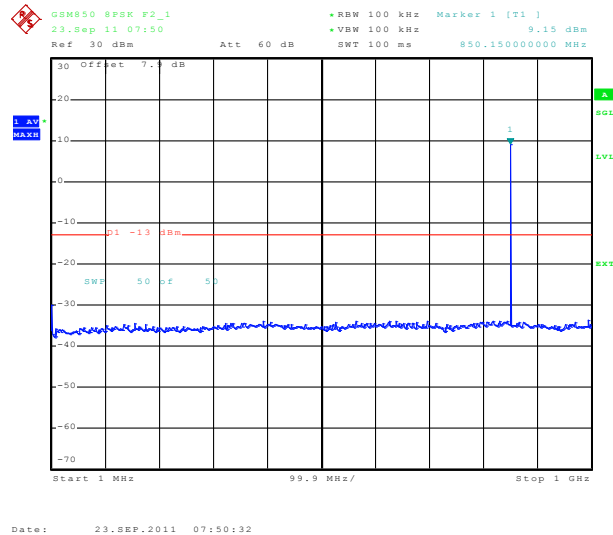
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## 6.3.1.10 Out of Band Emissions at Antenna Terminals 8-PSK, Mid Channel, 836.6 MHz, 1 GHz to 20 GHz



## 6.3.1.11 Out of Band Emissions at Antenna Terminals 8-PSK, High Channel, 848.8 MHz, 2 Hz to 1 GHz

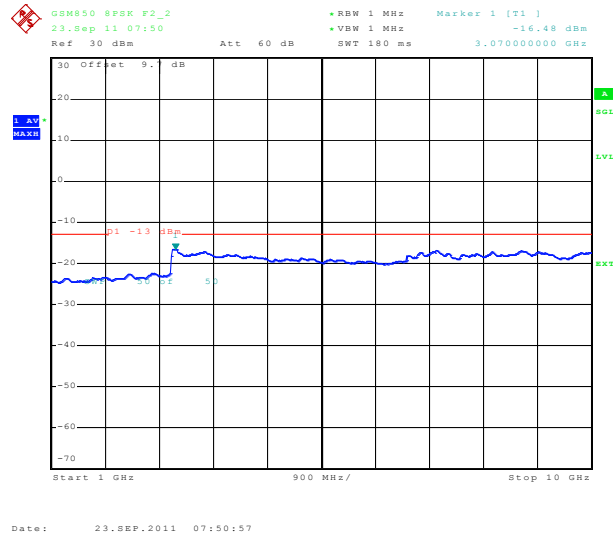


Note: The strong emission shown in each case is the carrier signal.

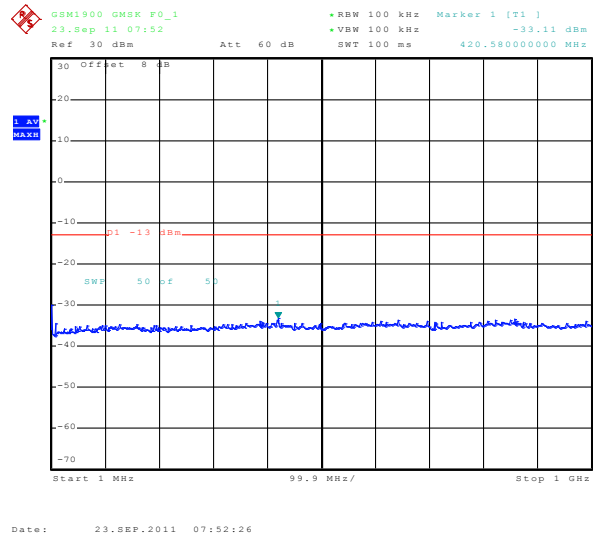
# SIERRA WIRELESS, INC.

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## 6.3.1.12 Out of Band Emissions at Antenna Terminals 8-PSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz



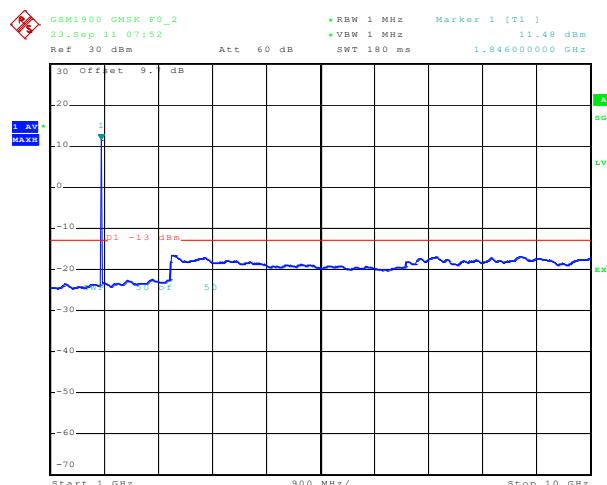
## 6.3.1.13 Out of Band Emissions at Antenna Terminals GMSK, Low channel, 1850.2 MHz, 2 Hz to 1 GHz



# SIERRA WIRELESS, INC.

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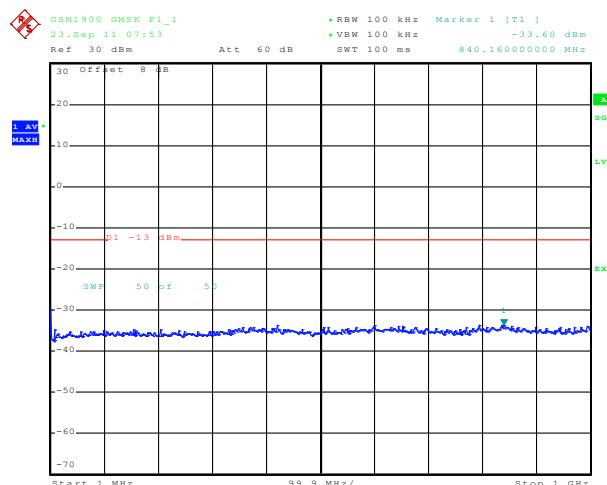
## 6.3.1.14 Out of Band Emissions at Antenna Terminals GMSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 07:52:51

Note: The strong emission shown is the carrier signal.

## 6.3.1.15 Out of Band Emissions at Antenna Terminals GMSK, Middle channel, 1880.0 MHz, 2 Hz to 1 GHz

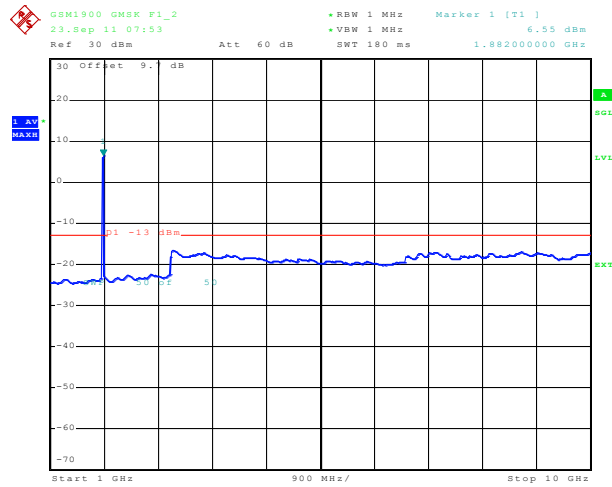


Date: 23.SEP.2011 07:53:26

# SIERRA WIRELESS, INC.

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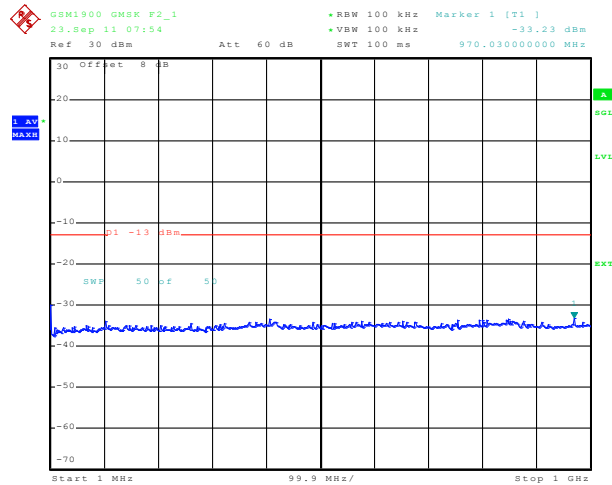
## 6.3.1.16 Out of Band Emissions at Antenna Terminals GMSK, Middle channel, 1880.0 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 07:53:51

Note: The strong emission shown is the carrier signal.

## 6.3.1.17 Out of Band Emissions at Antenna Terminals GMSK, High channel, 1909.8 MHz, 2 Hz to 1 GHz

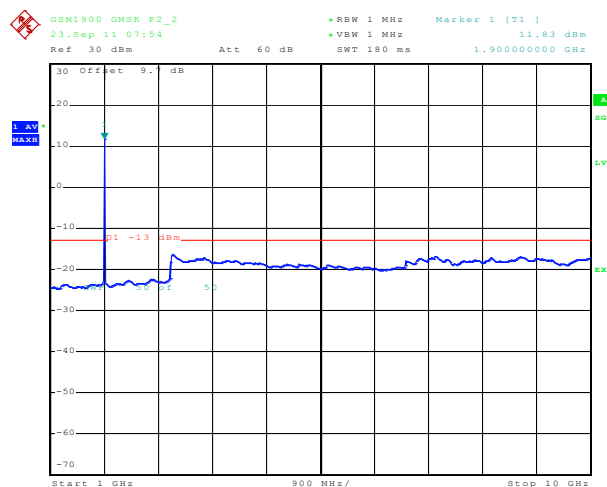


Date: 23.SEP.2011 07:54:25

# SIERRA WIRELESS, INC.

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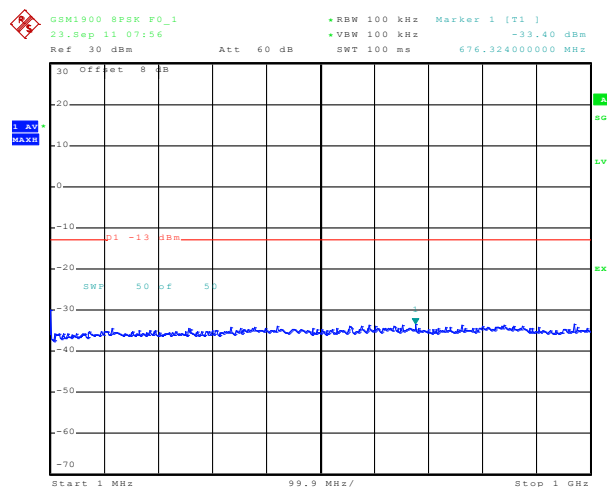
## 6.3.1.18 Out of Band Emissions at Antenna Terminals GMSK, High channel, 1909.8 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 07:54:50

Note: The strong emission shown is the carrier signal.

## 6.3.1.19 Out of Band Emissions at Antenna Terminals 8-PSK, Low channel, 1850.2 MHz, 2 Hz to 1 GHz

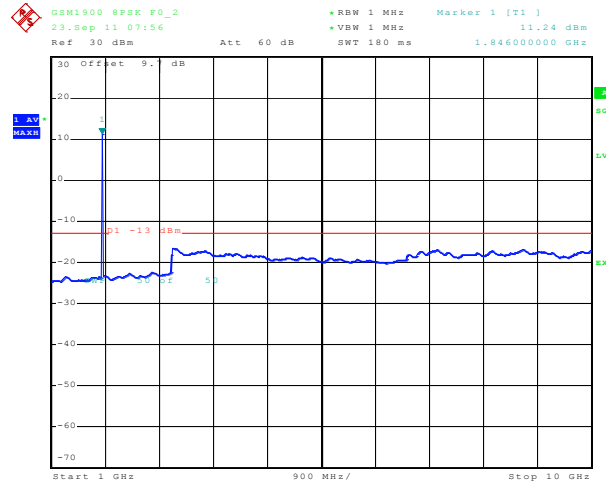


Date: 23.SEP.2011 07:56:09

# SIERRA WIRELESS, INC.

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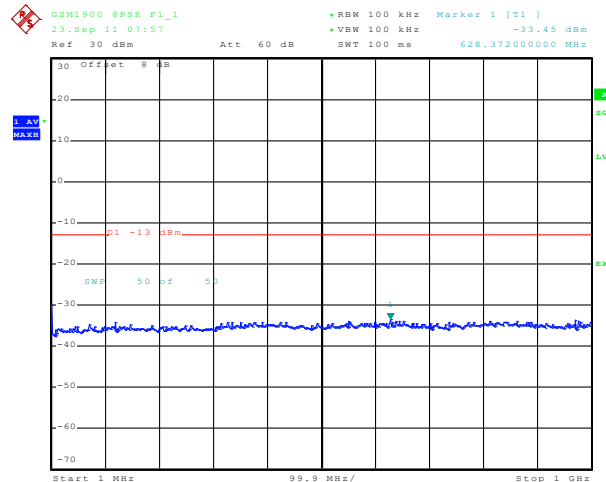
## 6.3.1.20 Out of Band Emissions at Antenna Terminals 8-PSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 07:56:34

Note: The strong emission shown is the carrier signal.

## 6.3.1.21 Out of Band Emissions at Antenna Terminals 8-PSK, Middle channel, 1880.0 MHz, 2 Hz to 1 GHz



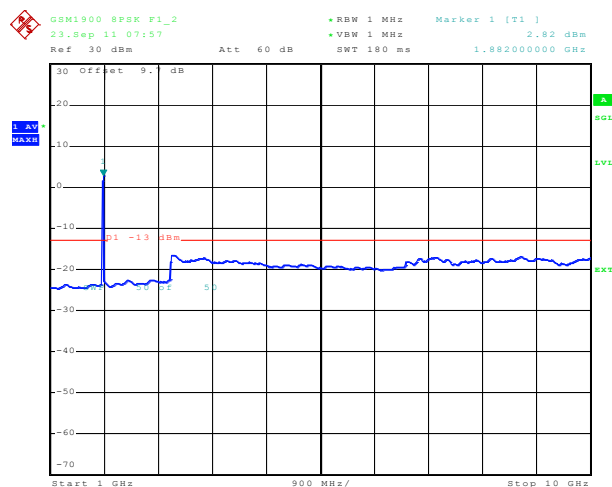
Date: 23.SEP.2011 07:57:08



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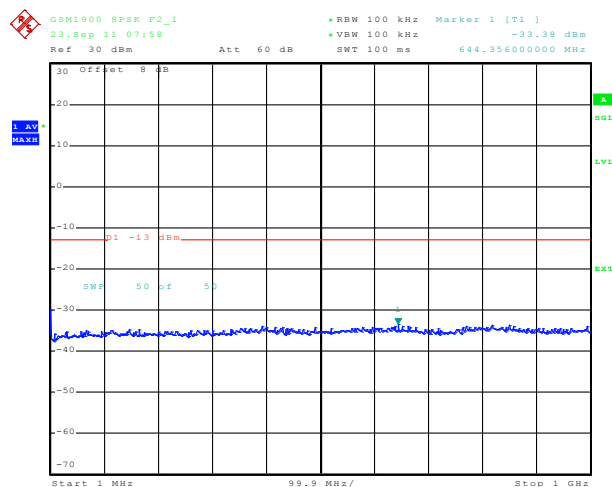
## 6.3.1.22 Out of Band Emissions at Antenna Terminals 8-PSK, Middle channel, 1880.0 MHz, 2 Hz to 20 GHz



Date: 23.SEP.2011 07:57:34

Note: The strong emission shown is the carrier signal.

## 6.3.1.23 Out of Band Emissions at Antenna Terminals 8-PSK, High channel, 1909.8 MHz, 2 Hz to 1 GHz

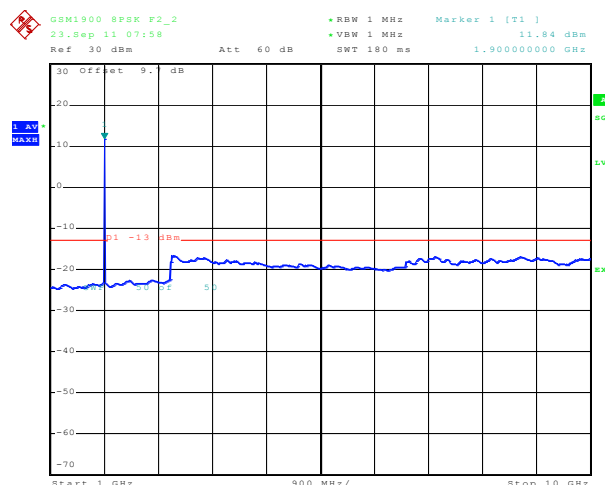


Date: 23.SEP.2011 07:58:08

# SIERRA WIRELESS, INC.

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## 6.3.1.24 Out of Band Emissions at Antenna Terminals 8-PSK, High channel, 1909.8 MHz, 2 Hz to 20 GHz

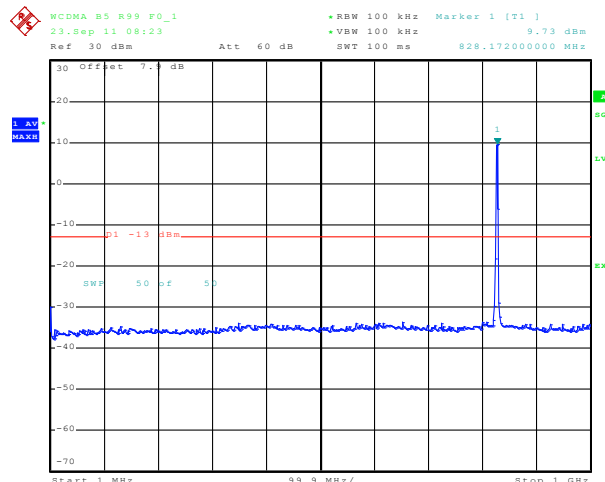


Date: 23.SEP.2011 07:58:33

Note: The strong emission shown is the carrier signal.

## 6.3.2 WCDMA Rel99 Test Plots

### 6.3.2.1 Out of Band Emissions at Antenna Terminals WCDMA, Low channel, 826.4 MHz, 1 MHz to 1 GHz



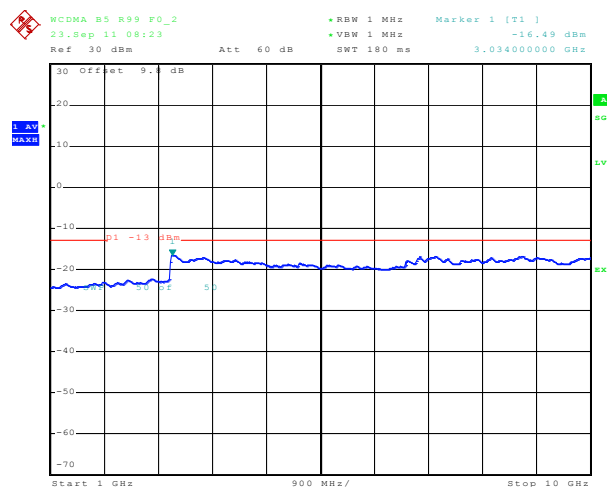
Date: 23.SEP.2011 08:23:18

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

# SIERRA WIRELESS, INC.

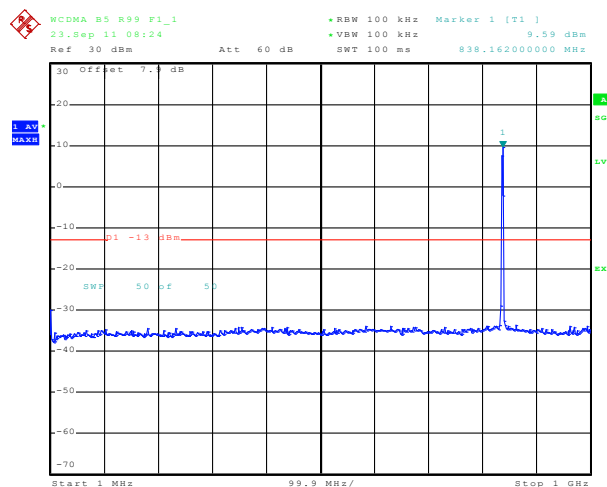
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## 6.3.2.2 Out of Band Emissions at Antenna Terminals WCDMA, Low channel, 826.4 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 08:23:43

## 6.3.2.3 Out of Band Emissions at Antenna Terminals WCDMA, Middle channel, 836.4 MHz, 2 Hz to 1 GHz



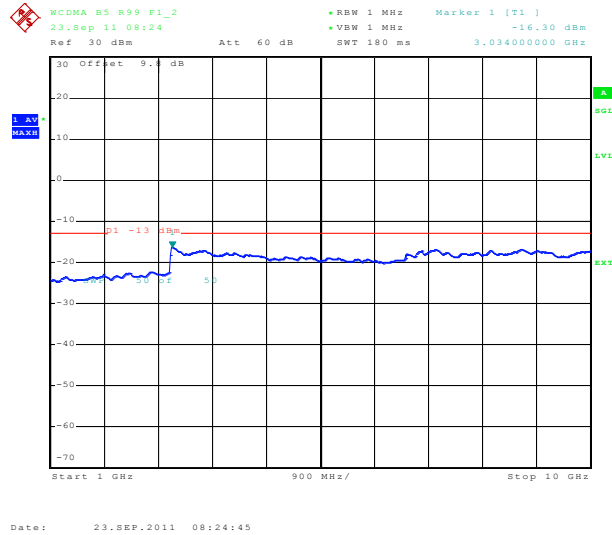
Date: 23.SEP.2011 08:24:20

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

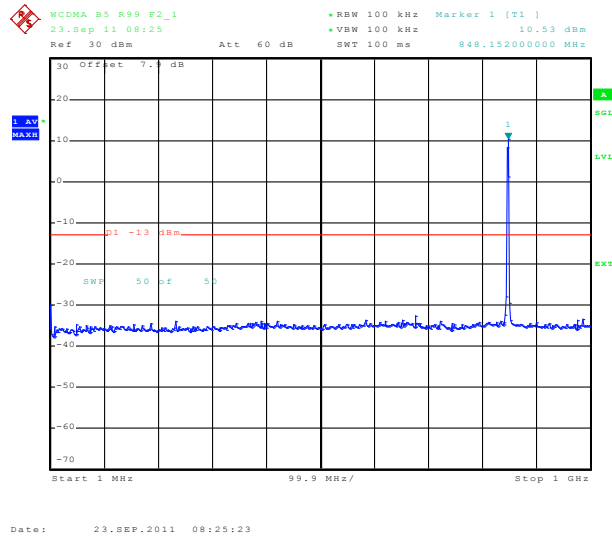
# SIERRA WIRELESS, INC.

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#### 6.3.2.4 Out of Band Emissions at Antenna Terminals WCDMA, Middle channel, 836.4 MHz, 1 GHz to 20 GHz



### 6.3.2.5 Out of Band Emissions at Antenna Terminals WCDMA, High Channel, 846.6 MHz, 2 Hz to 1 GHz

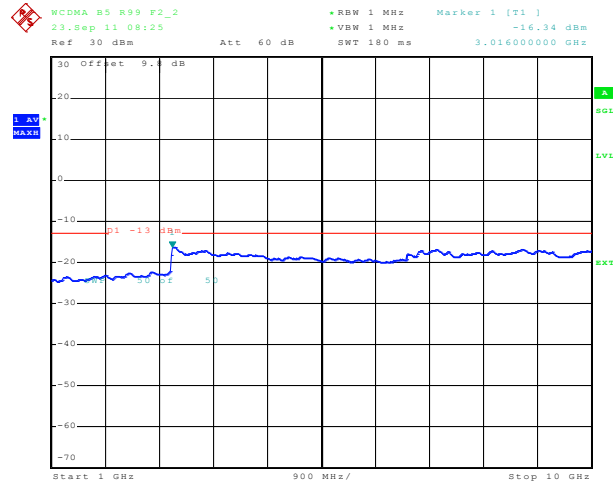


Note: The strong emission shown in each case is the carrier signal.

# SIERRA WIRELESS, INC.

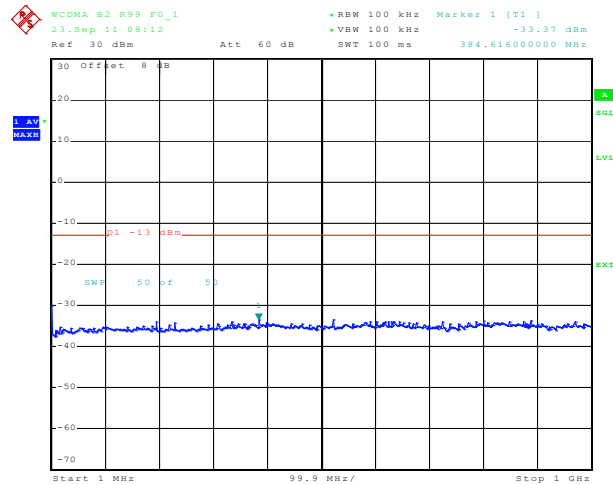
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## 6.3.2.6 Out of Band Emissions at Antenna Terminals WCDMA, High Channel, 846.6 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 08:25:48

## 6.3.2.7 Out of Band Emissions at Antenna Terminals WCDMA, Low channel, 1852.4 MHz, 2 Hz to 1 GHz

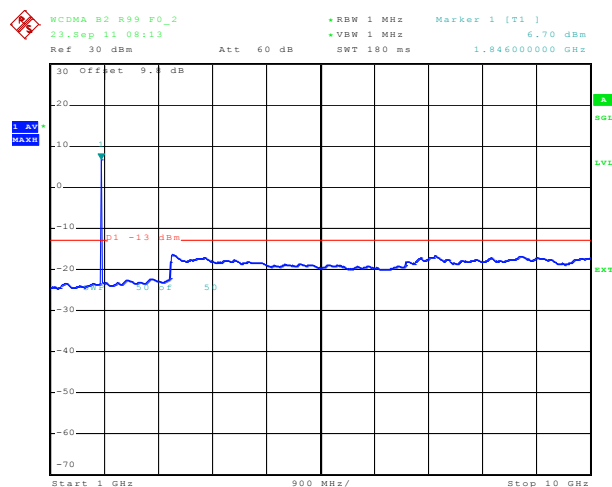


Date: 23.SEP.2011 08:12:54

# SIERRA WIRELESS, INC.

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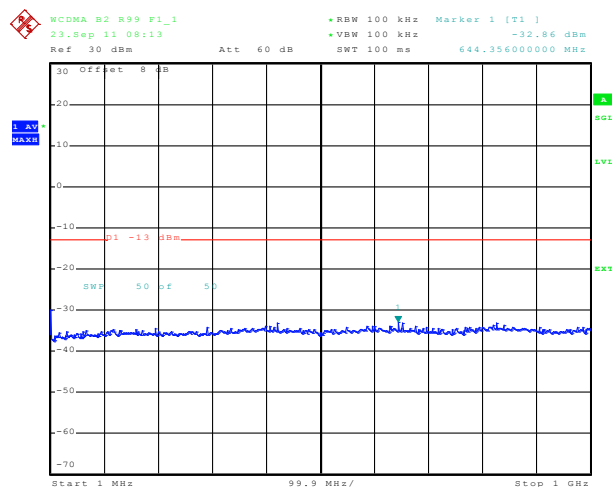
## 6.3.2.8 Out of Band Emissions at Antenna Terminals WCDMA, Low channel, 1852.4 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 08:13:19

Note: The strong emission shown is the carrier signal.

## 6.3.2.9 Out of Band Emissions at Antenna Terminals WCDMA, Middle channel, 1880 MHz, 2 Hz to 1 GHz

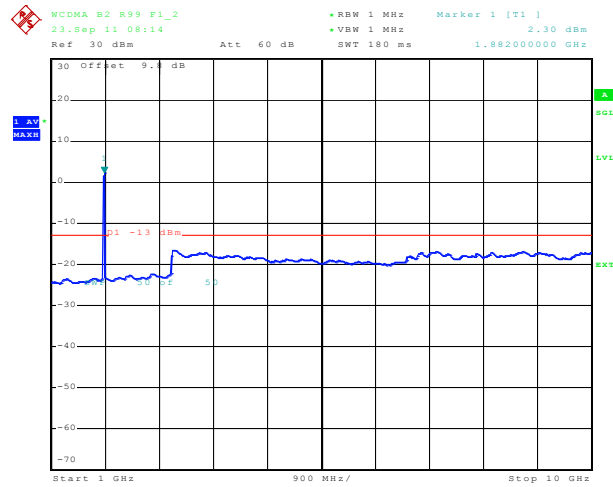


Date: 23.SEP.2011 08:13:57

# SIERRA WIRELESS, INC.

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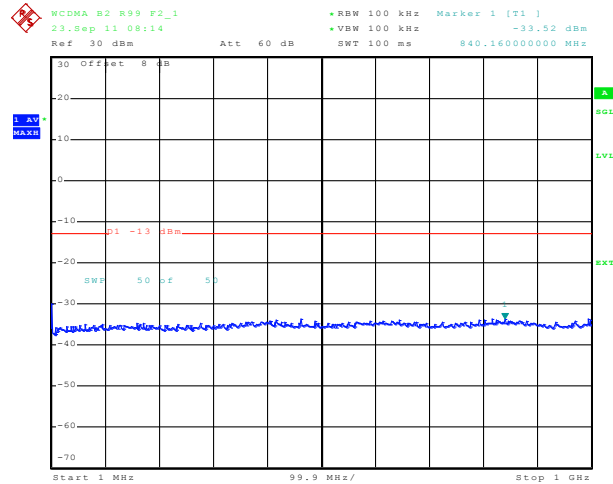
## 6.3.2.10 Out of Band Emissions at Antenna Terminals WCDMA, Middle channel, 1880 MHz, 1 GHz to 20 GHz



Date: 23.SEP.2011 08:14:22

Note: The strong emission shown is the carrier signal.

## 6.3.2.11 Out of Band Emissions at Antenna Terminals WCDMA, High channel, 1907.6 MHz, 2 Hz to 1 GHz

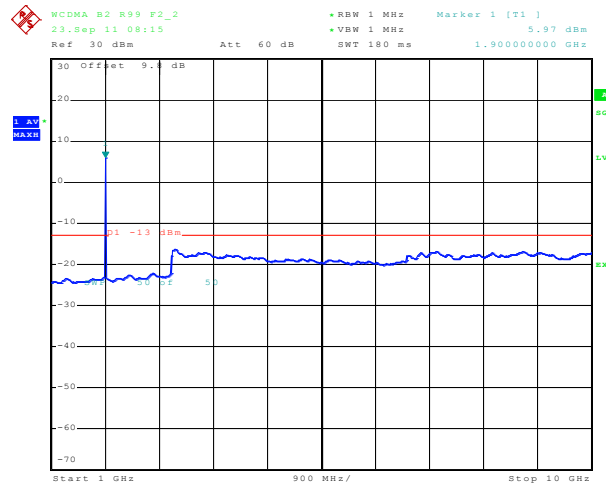


Date: 23.SEP.2011 08:14:59

# SIERRA WIRELESS, INC.

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## 6.3.2.12 Out of Band Emissions at Antenna Terminals WCDMA, High channel, 1907.6 MHz, 1 GHz to 20 GHz

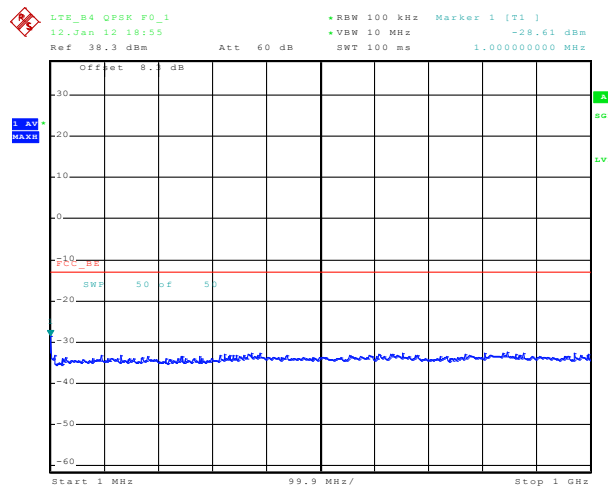


Date: 23.SEP.2011 08:15:24

Note: The strong emission shown is the carrier signal.

## 6.3.3 LTE Test Plots

### 6.3.3.1 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz



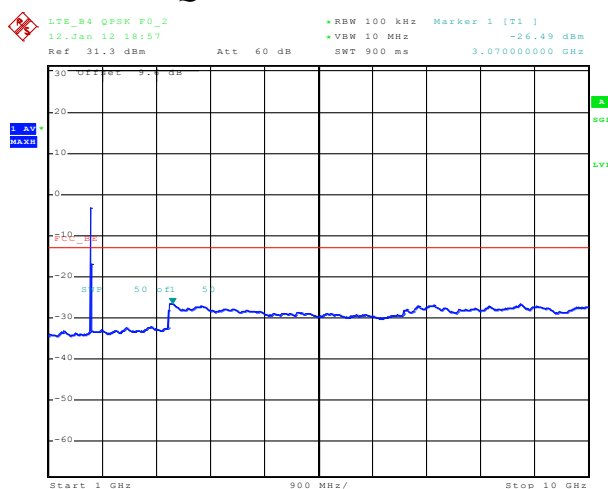
Date: 12.JAN.2012 18:55:25



# SIERRA WIRELESS, INC.

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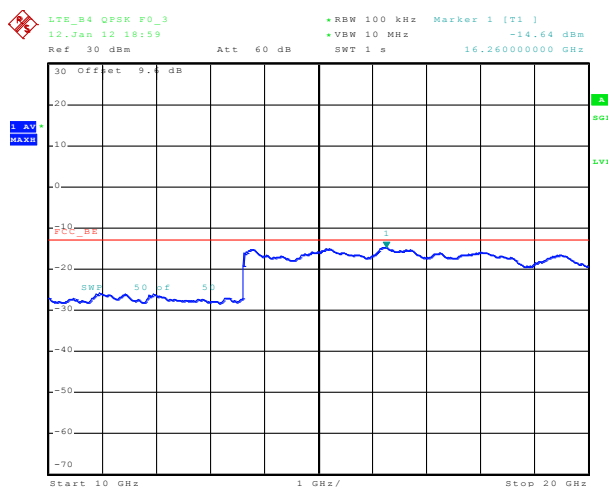
## 6.3.3.2 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, QPSK, 1GHz to 10 GHz



Date: 12.JAN.2012 18:57:36

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

## 6.3.3.3 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, QPSK, 10 GHz to 20 GHz

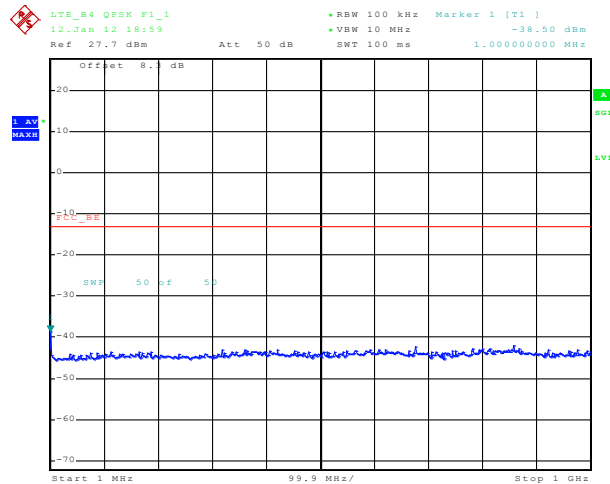


Date: 12.JAN.2012 18:59:21

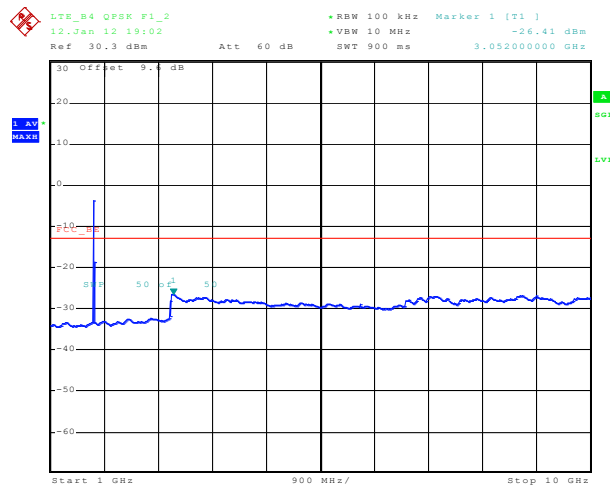
# SIERRA WIRELESS, INC.

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## 6.3.3.4 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 25RB, QPSK, 30MHz to 1 GHz



## 6.3.3.5 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 10 GHz

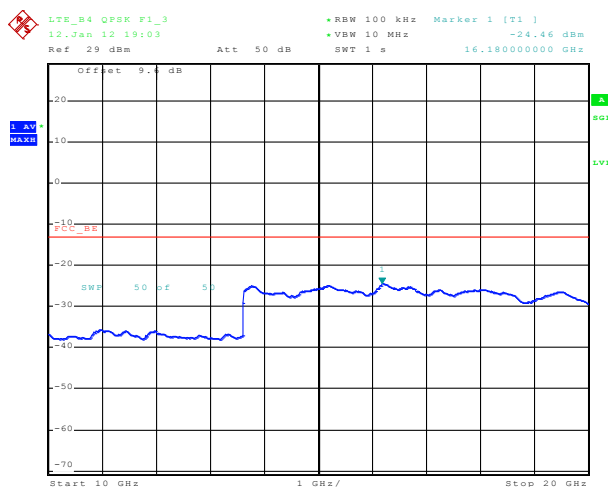


Note: The strong emission shown in each case is the carrier signal.

# SIERRA WIRELESS, INC.

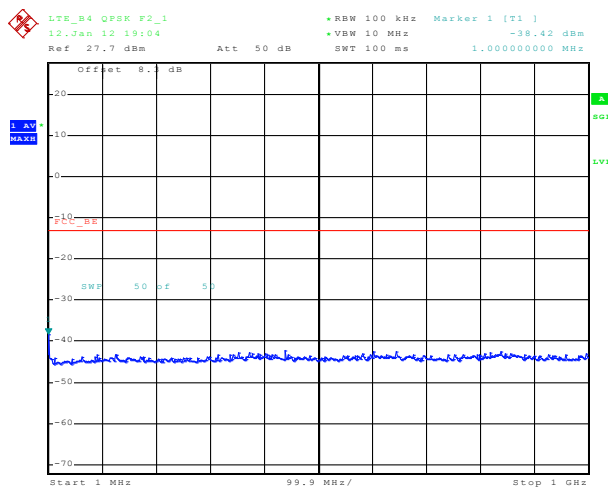
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## 6.3.3.6 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 20 GHz



Date: 12.JAN.2012 19:03:52

## 6.3.3.7 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz

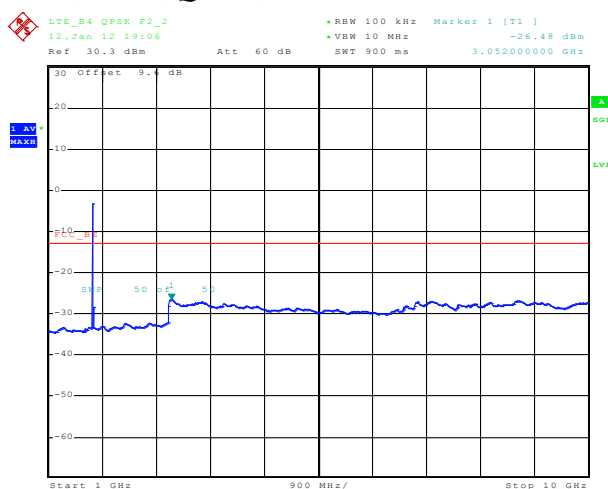


Date: 12.JAN.2012 19:04:28

# SIERRA WIRELESS, INC.

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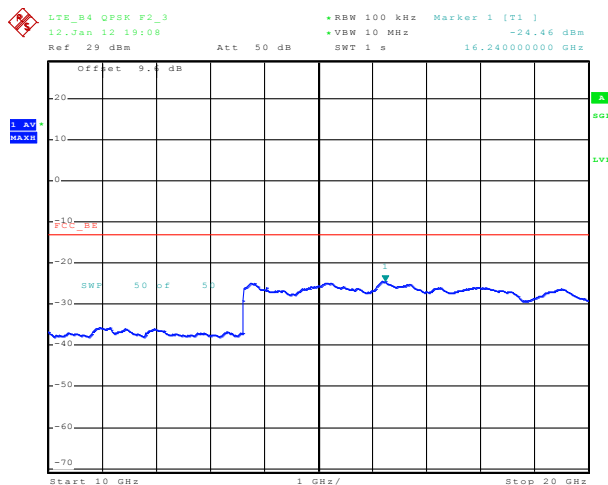
## 6.3.3.8 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 10 GHz



Date: 12.JAN.2012 19:06:39

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

## 6.3.3.9 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, QPSK, 10 GHz to 20 GHz

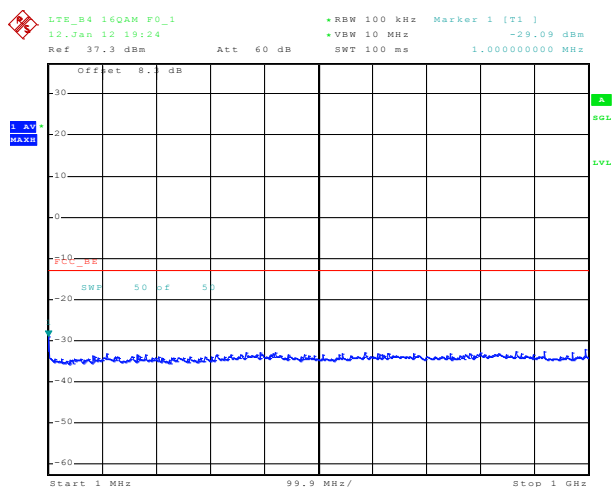


Date: 12.JAN.2012 19:08:23

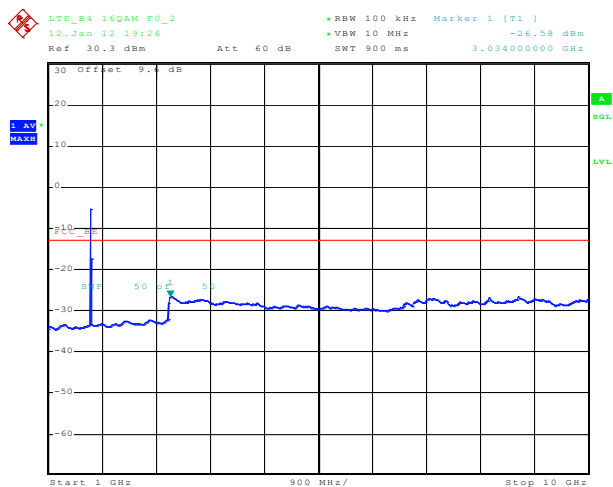
# SIERRA WIRELESS, INC.

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## 6.3.3.10 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, 16-QAM, 30MHz to 1 GHz



## 6.3.3.11 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, 16-QAM, 1 GHz to 10 GHz

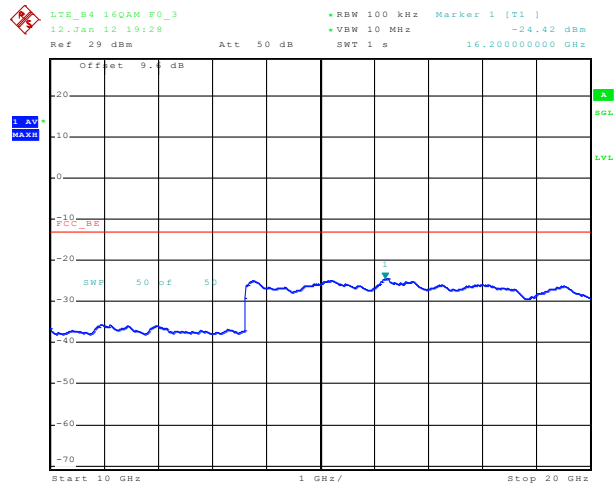


Note: The strong emission shown in each case is the carrier signal.

# SIERRA WIRELESS, INC.

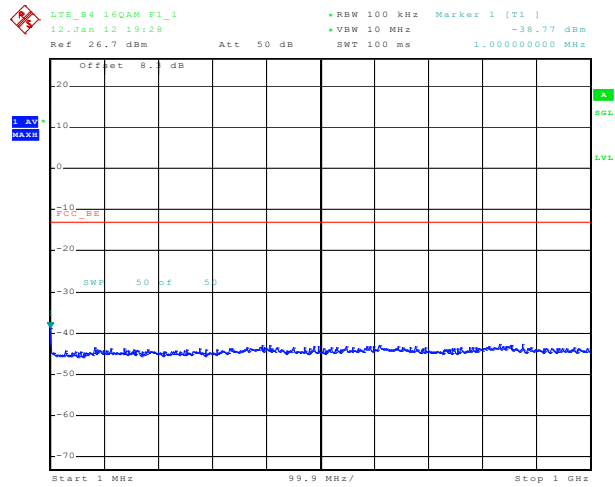
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## 6.3.3.12 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, 16-QAM, 10 GHz to 20 GHz



Date: 12.JAN.2012 19:28:14

## 6.3.3.13 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, 16-QAM, 30MHz to 1 GHz

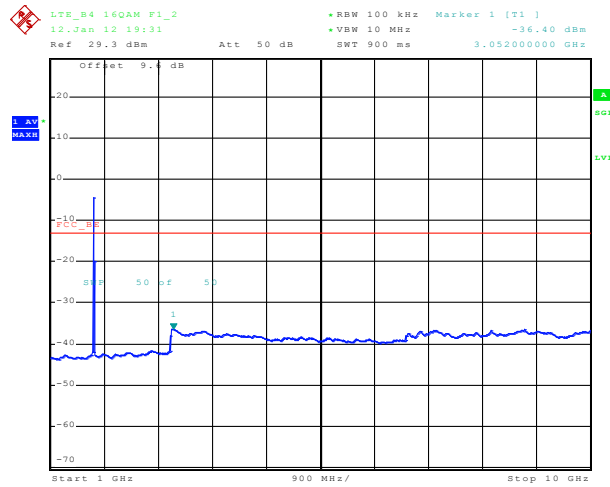


Date: 12.JAN.2012 19:28:50

# SIERRA WIRELESS, INC.

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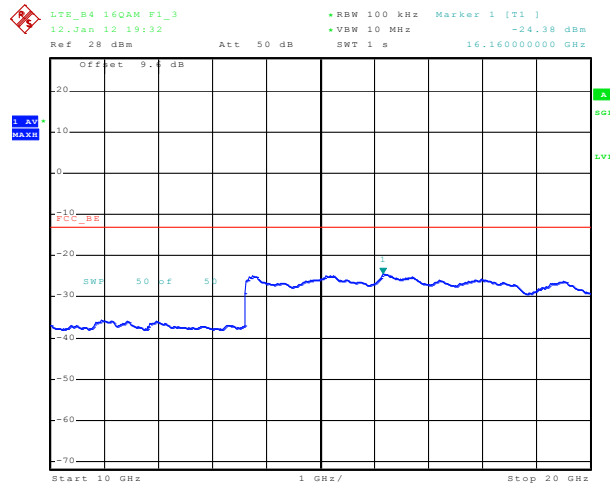
## 6.3.3.14 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, 16-QAM, 1 GHz to 10 GHz



Date: 12.JAN.2012 19:31:01

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

## 6.3.3.15 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, 16-QAM, 10 GHz to 20 GHz

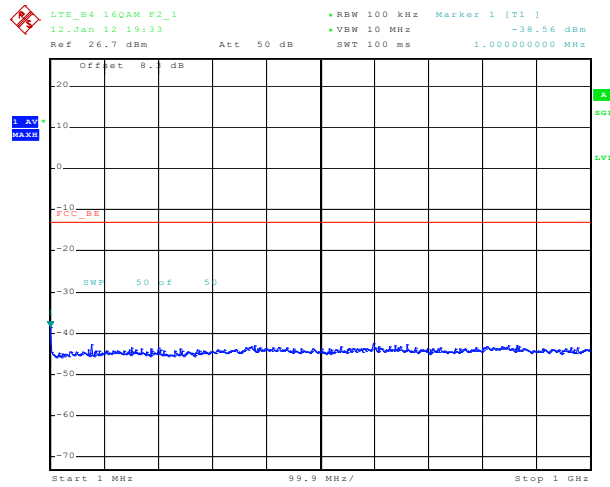


Date: 12.JAN.2012 19:32:46

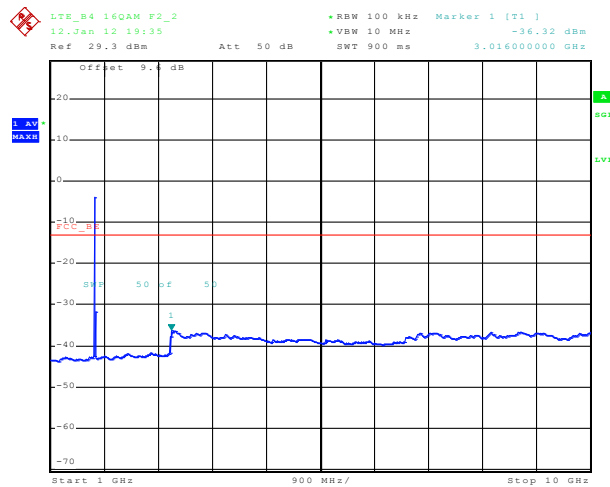
# SIERRA WIRELESS, INC.

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## 6.3.3.16 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, 16-QAM, 30MHz to 1 GHz



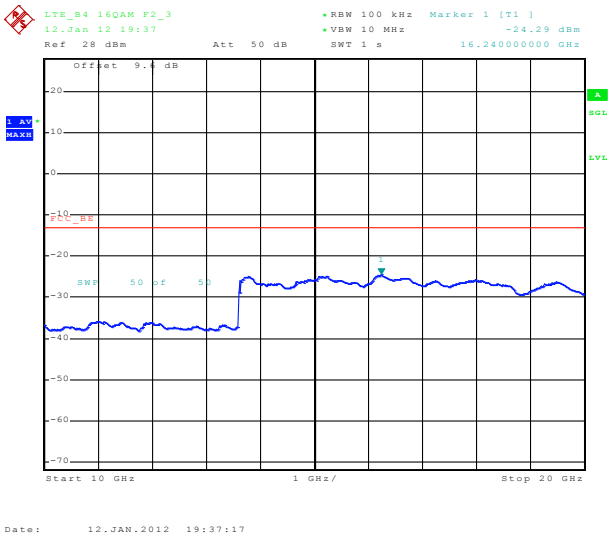
## 6.3.3.17 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, 16-QAM, 1 GHz to 10 GHz



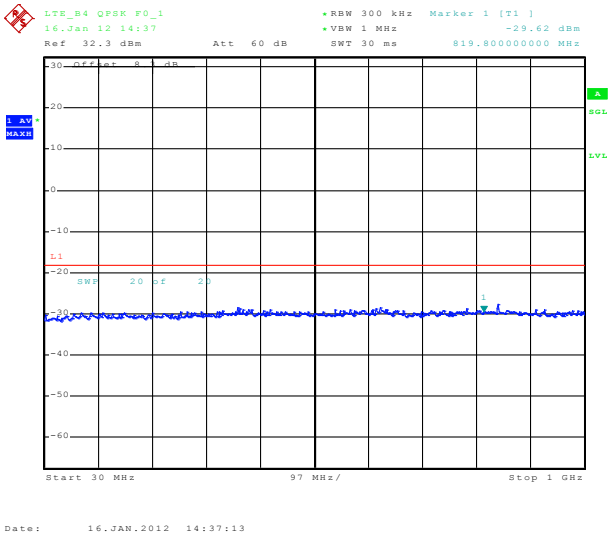
Note: The strong emission shown in each case is the carrier signal.



6.3.3.18 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, 16-QAM, 10 GHz to 20 GHz



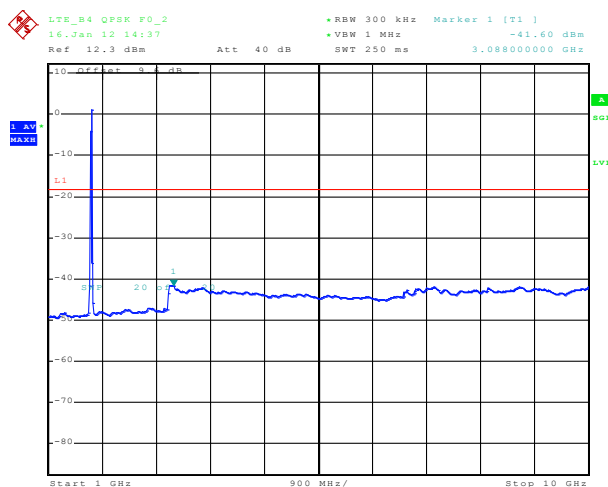
6.3.3.19 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1720.0 MHz, 20MHz BW, 100RB, QPSK, 30MHz to 1 GHz



# SIERRA WIRELESS, INC.

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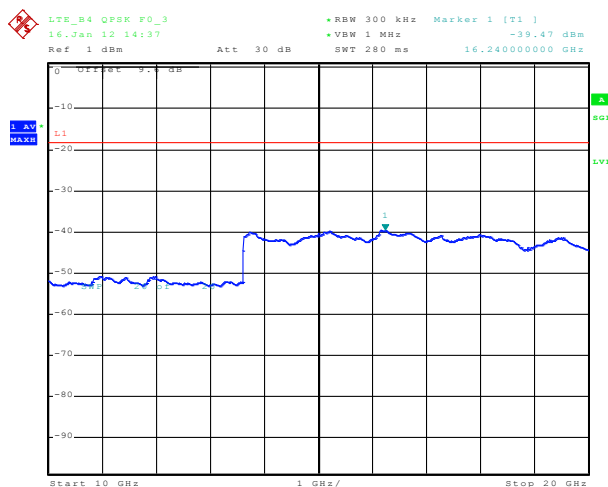
## 6.3.3.20 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1720.0 MHz, 20MHz BW, 100RB, QPSK, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:37:39

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

## 6.3.3.21 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1720.0 MHz, 20MHz BW, 100RB, QPSK, 10 GHz to 20 GHz

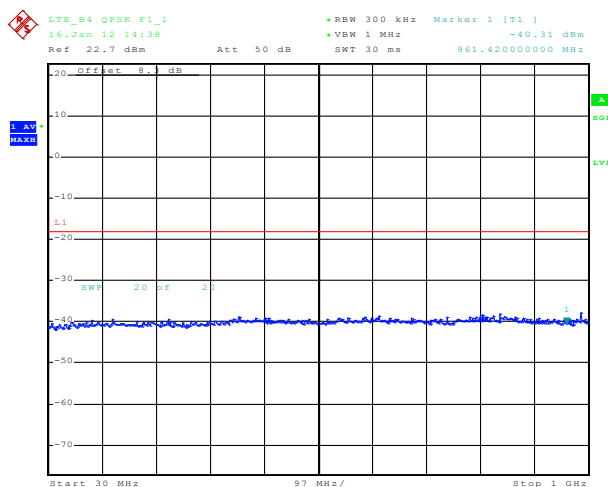


Date: 16-JAN-2012 14:37:58

# SIERRA WIRELESS, INC.

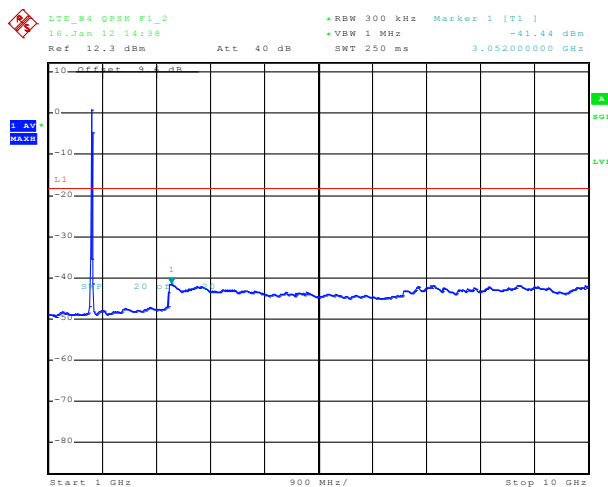
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## 6.3.3.22 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 100RB, QPSK, 30MHz to 1 GHz



Date: 16-JAN-2012 14:38:14

## 6.3.3.23 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 100RB, QPSK, 1 GHz to 10 GHz



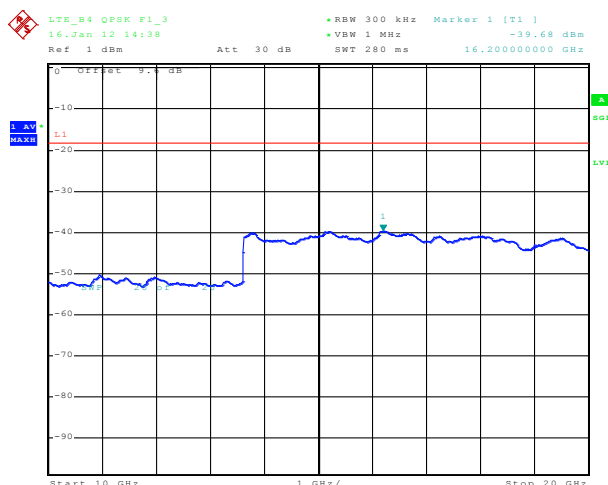
Date: 16-JAN-2012 14:38:40

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

# SIERRA WIRELESS, INC.

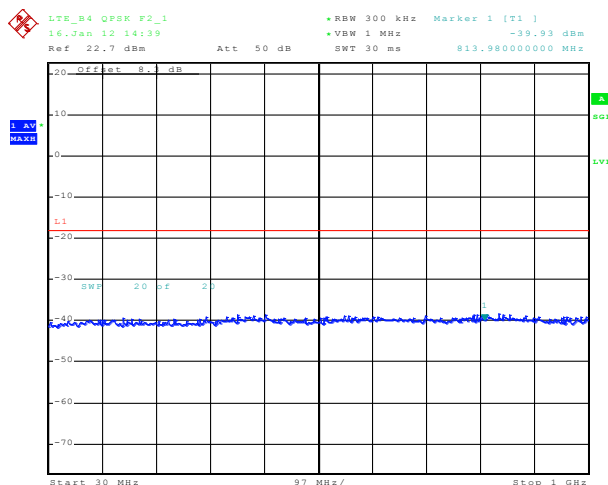
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## 6.3.3.24 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 100RB, QPSK, 10 GHz to 20 GHz



Date: 16.JAN.2012 14:38:59

## 6.3.3.25 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1745.0 MHz, 20MHz BW, 100RB, QPSK, 30MHz to 1 GHz

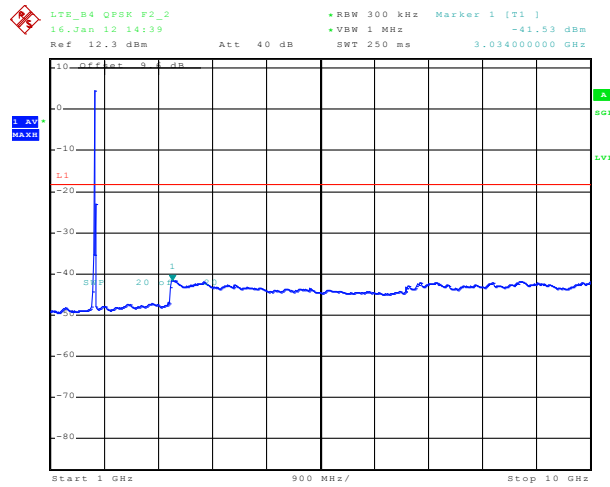


Date: 16.JAN.2012 14:39:14

# SIERRA WIRELESS, INC.

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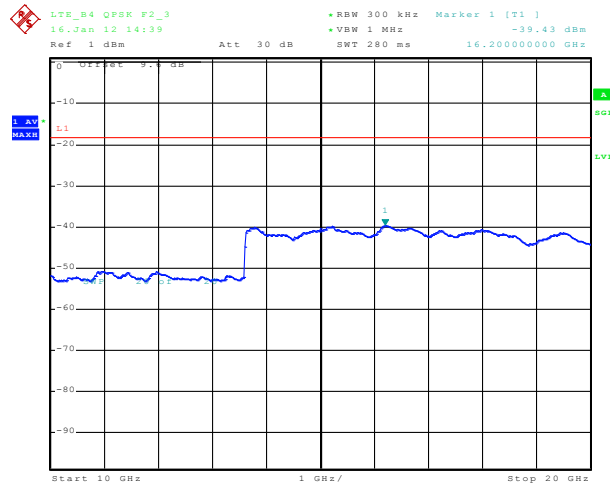
## 6.3.3.26 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1745.0 MHz, 20MHz BW, 100RB, QPSK, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:39:40

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

## 6.3.3.27 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1745.0 MHz, 20MHz BW, 100RB, QPSK, 10 GHz to 20 GHz

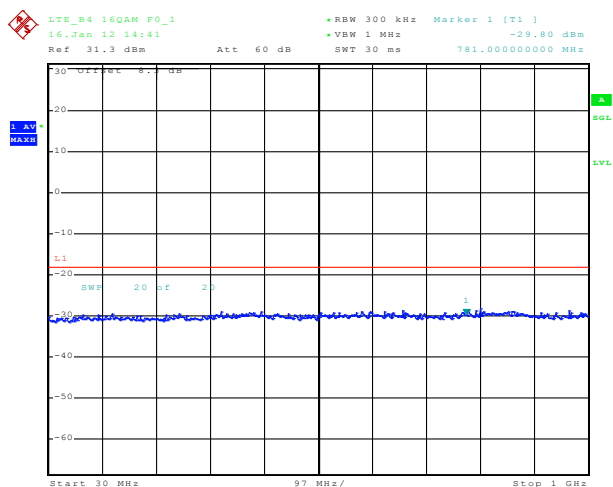


Date: 16-JAN-2012 14:39:59

# SIERRA WIRELESS, INC.

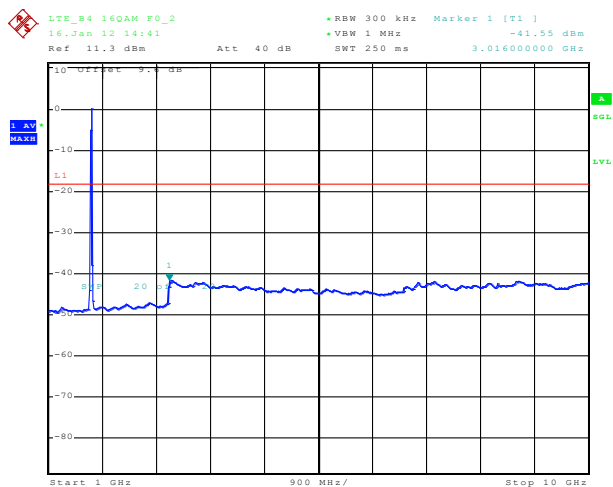
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## 6.3.3.28 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1720.0 MHz, 20MHz BW, 100RB, 16-QAM, 30MHz to 1 GHz



Date: 16.JAN.2012 14:41:05

## 6.3.3.29 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1720.0 MHz, 20MHz BW, 100RB, 16-QAM, 1 GHz to 10 GHz



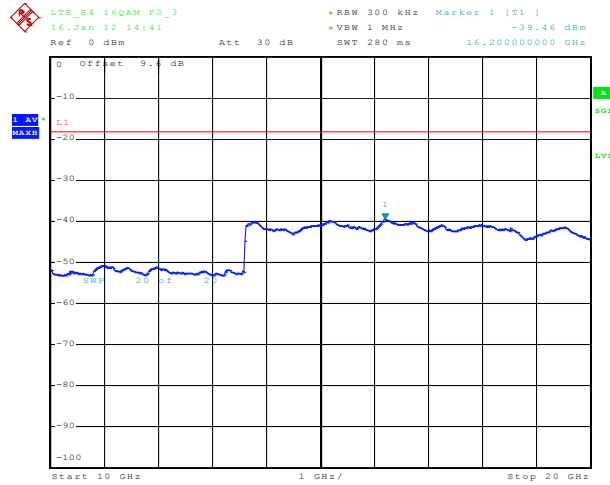
Date: 16.JAN.2012 14:41:31

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

# SIERRA WIRELESS, INC.

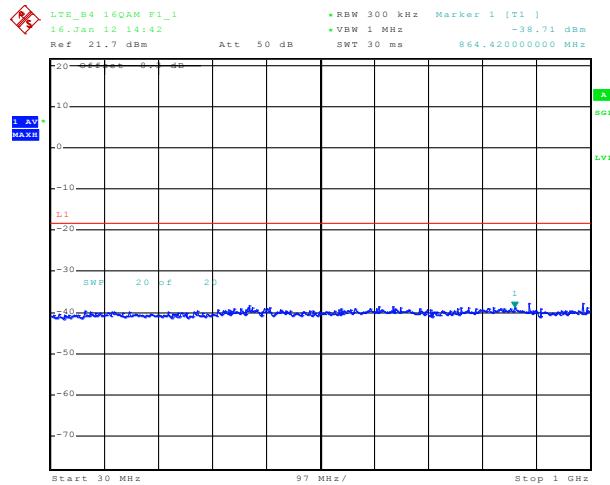
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## 6.3.3.30 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1720.0 MHz, 20MHz BW, 100RB, 16-QAM, 10 GHz to 20 GHz



Date: 16.JAN.2012 14:41:50

## 6.3.3.31 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 100RB, 16-QAM, 30MHz to 1 GHz

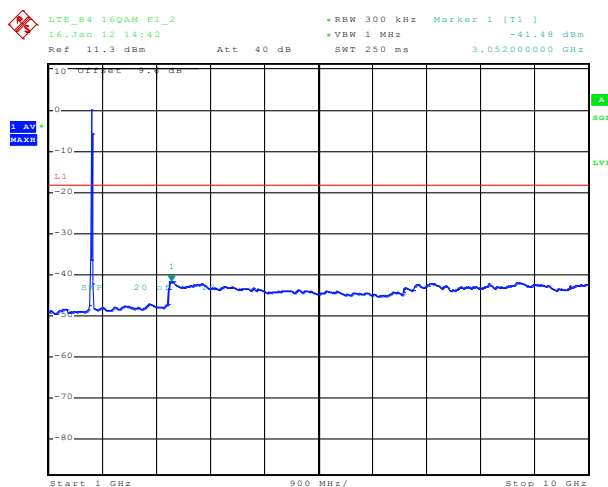


Date: 16.JAN.2012 14:42:06

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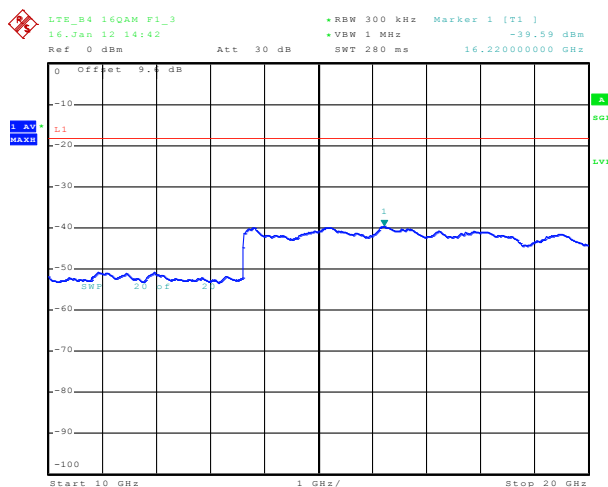
## 6.3.3.32 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 100RB, 16-QAM, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:42:31

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

## 6.3.3.33 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 100RB, 16-QAM, 10 GHz to 20 GHz



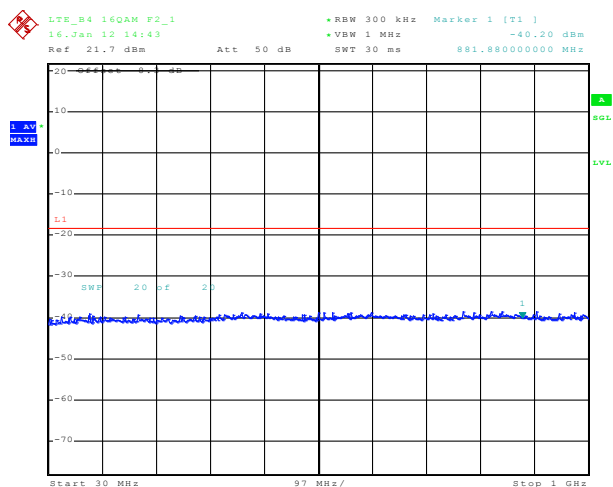
Date: 16-JAN-2012 14:42:50



# SIERRA WIRELESS, INC.

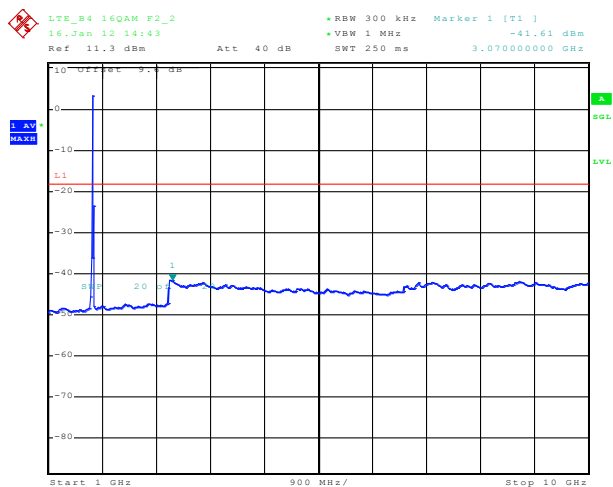
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## 6.3.3.34 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1745.0 MHz, 20MHz BW, 100RB, 16-QAM, 30MHz to 1 GHz



Date: 16.JAN.2012 14:43:06

## 6.3.3.35 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1745.0 MHz, 20MHz BW, 100RB, 16-QAM, 1 GHz to 10 GHz



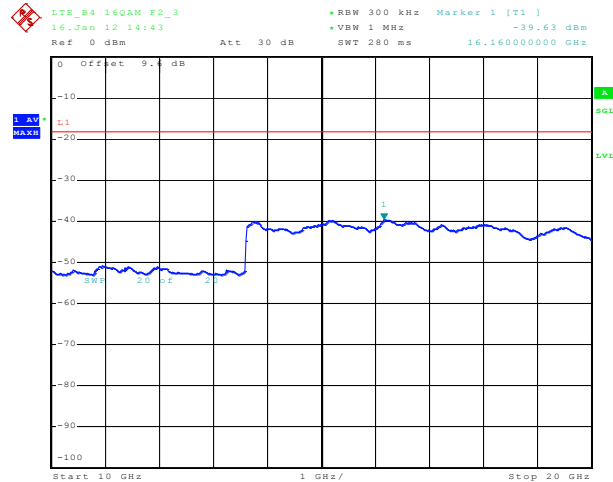
Date: 16.JAN.2012 14:43:31

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

# SIERRA WIRELESS, INC.

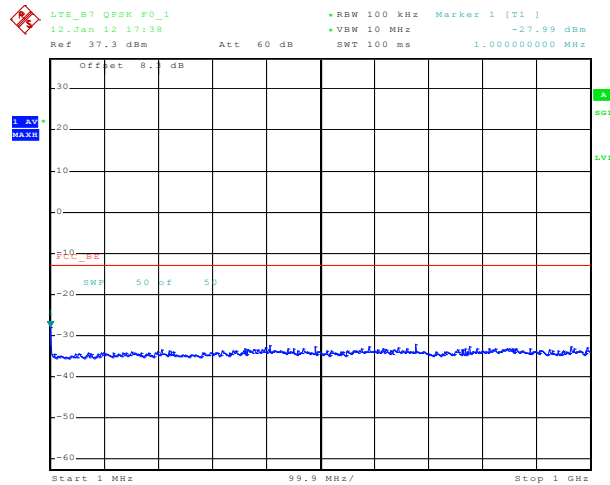
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## 6.3.3.36 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1745.0 MHz, 20MHz BW, 100RB, 16-QAM, 10 GHz to 20 GHz



Date: 16.JAN.2012 14:43:50

## 6.3.3.37 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz

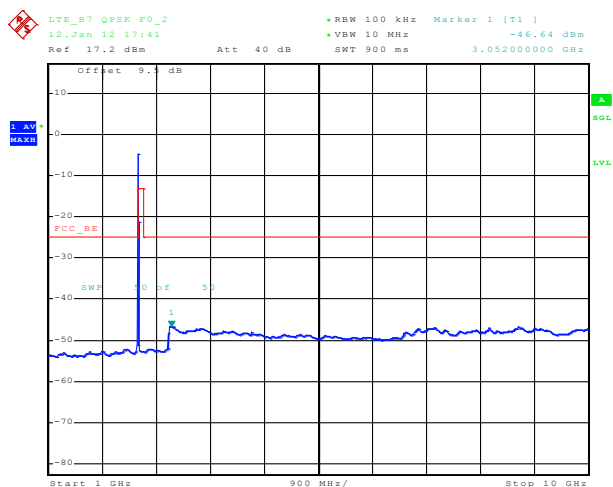


Date: 12.JAN.2012 17:38:54

# SIERRA WIRELESS, INC.

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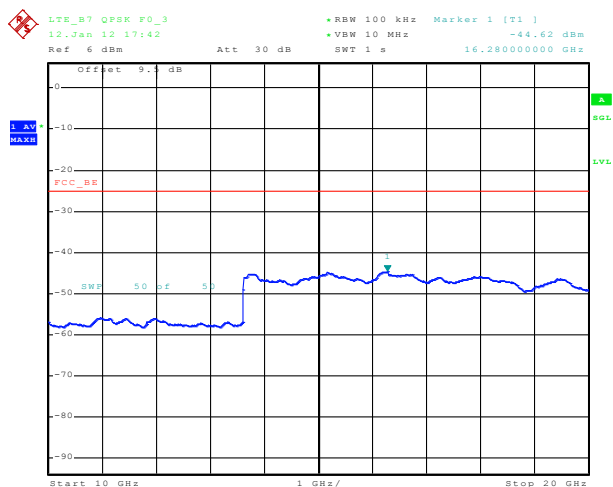
## 6.3.3.38 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 10 GHz



Date: 12-JAN-2012 17:41:06

Note: The strong emission shown is the carrier signal.

## 6.3.3.39 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, QPSK, 10 GHz to 20 GHz

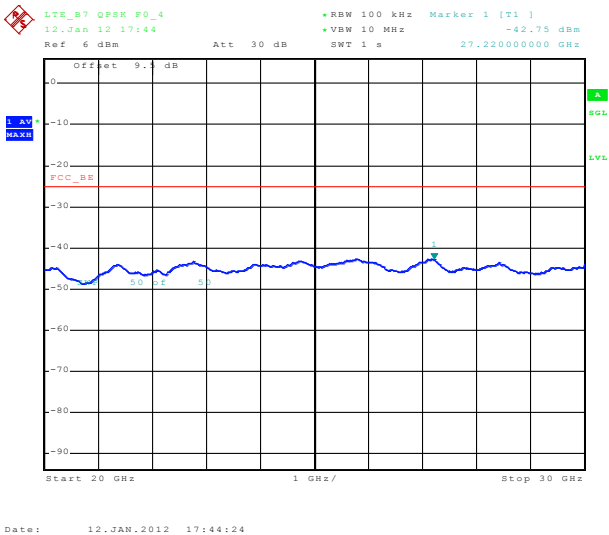


Date: 12-JAN-2012 17:42:51

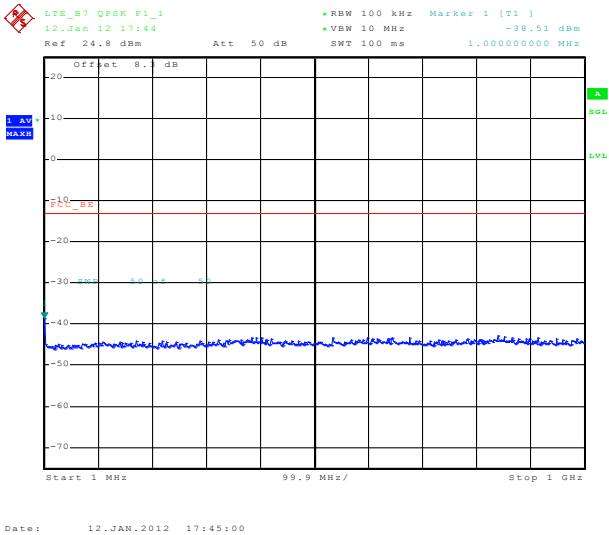
SIERRA WIRELESS, INC.

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6.3.3.40 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, QPSK, 20 GHz to 30 GHz



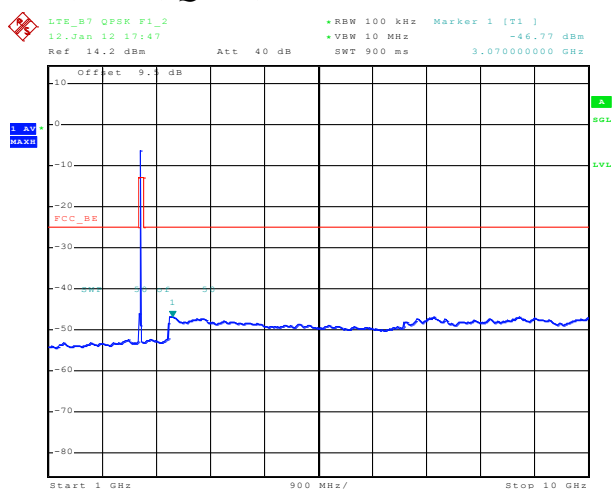
6.3.3.41 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz



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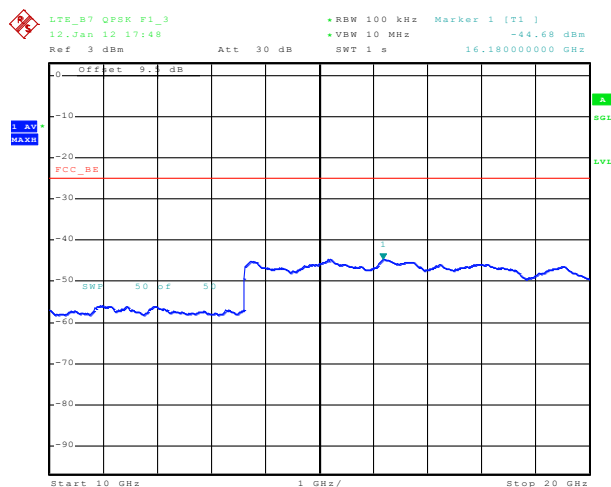
## 6.3.3.42 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 10 GHz



Date: 12-JAN-2012 17:47:11

Note: The strong emission shown is the carrier signal.

## 6.3.3.43 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, QPSK, 10 GHz to 20 GHz

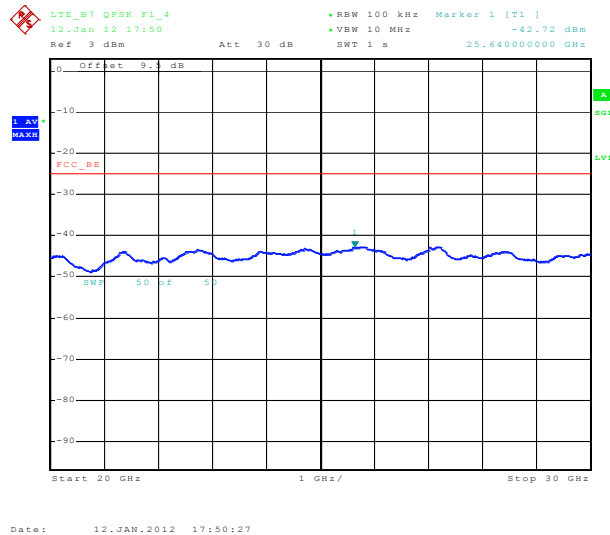


Date: 12-JAN-2012 17:48:55

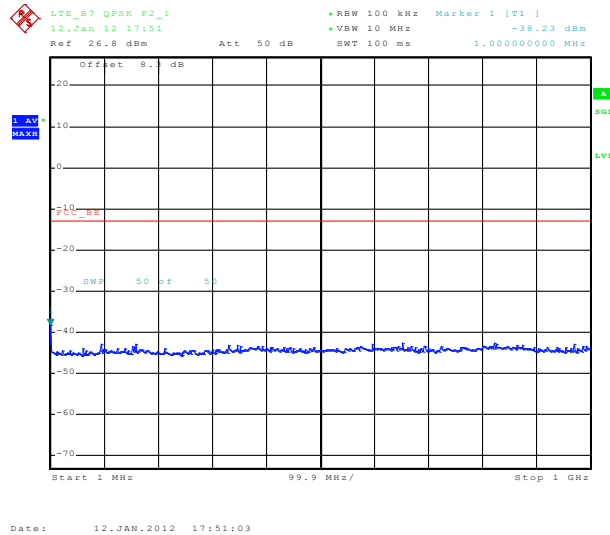
# SIERRA WIRELESS, INC.

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## 6.3.3.44 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, QPSK, 20 GHz to 30 GHz



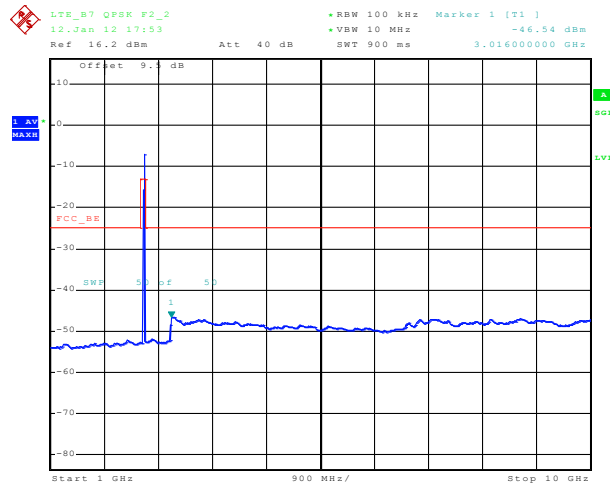
## 6.3.3.45 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz



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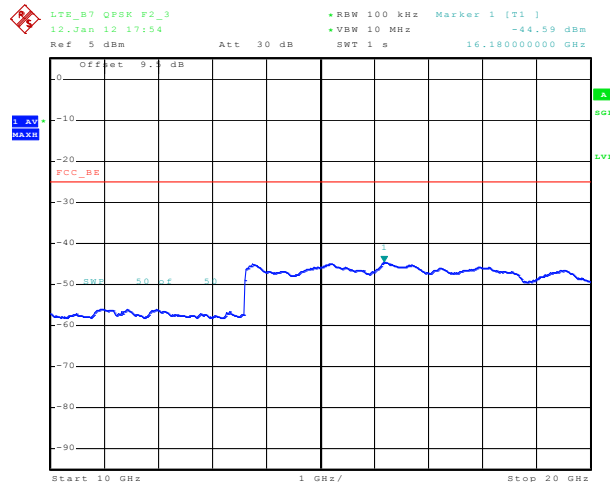
## 6.3.3.46 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 10 GHz



Date: 12-JAN-2012 17:53:14

Note: The strong emission shown is the carrier signal.

## 6.3.3.47 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, QPSK, 10 GHz to 20 GHz

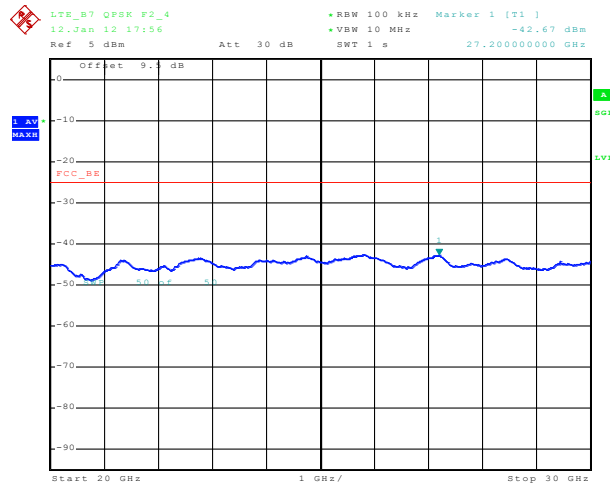


Date: 12-JAN-2012 17:54:59

# SIERRA WIRELESS, INC.

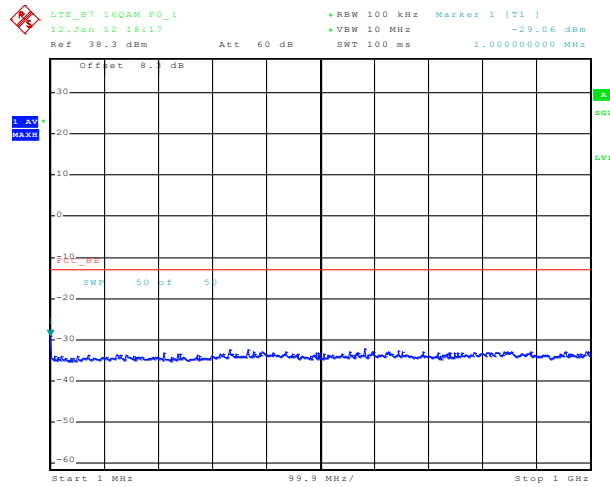
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## 6.3.3.48 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, QPSK, 20 GHz to 30 GHz



Date: 12.JAN.2012 17:56:32

## 6.3.3.49 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, 16QAM, 30MHz to 1 GHz



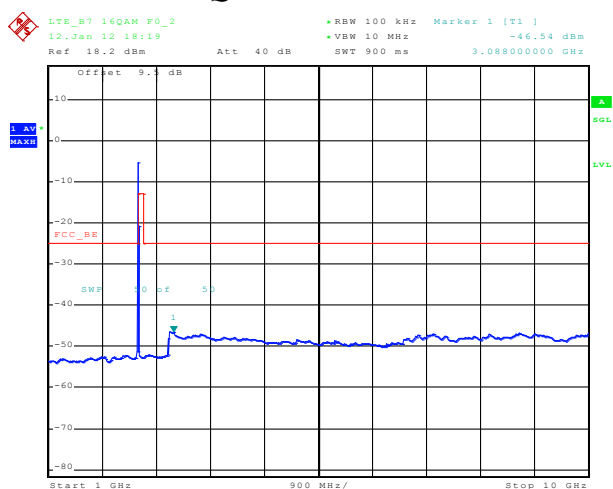
Date: 12.JAN.2012 18:17:11



# SIERRA WIRELESS, INC.

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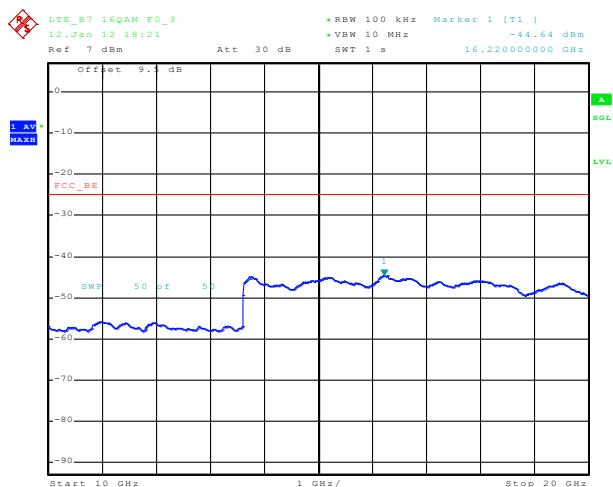
## 6.3.3.50 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 10 GHz



Date: 12.JAN.2012 18:19:23

Note: The strong emission shown is the carrier signal.

## 6.3.3.51 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, 16QAM, 10 GHz to 20 GHz

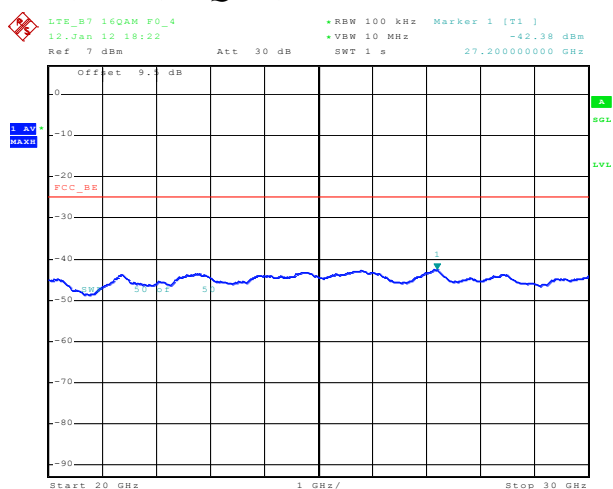


Date: 12.JAN.2012 18:21:09

# SIERRA WIRELESS, INC.

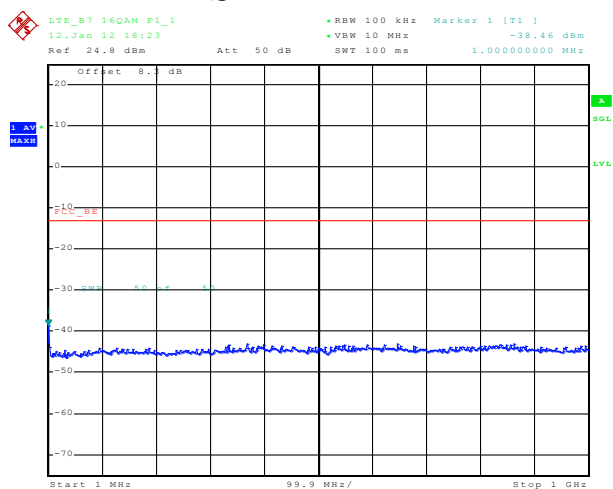
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## 6.3.3.52 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2505.0 MHz, 10MHz BW, 50RB, 16QAM, 20 GHz to 30 GHz



Date: 12.JAN.2012 18:22:41

## 6.3.3.53 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, 16QAM, 30MHz to 1 GHz

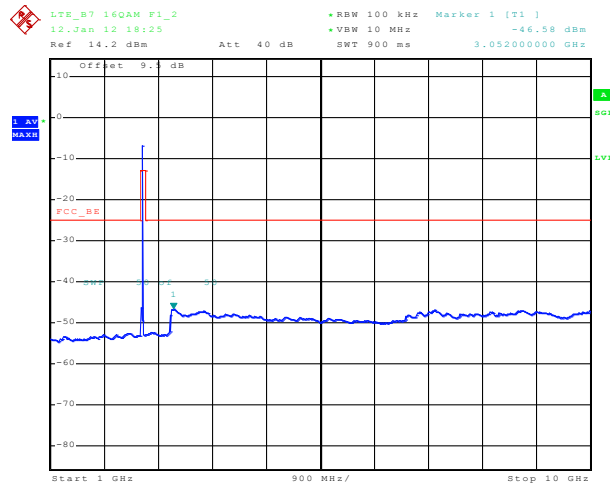


Date: 12.JAN.2012 18:23:18

# SIERRA WIRELESS, INC.

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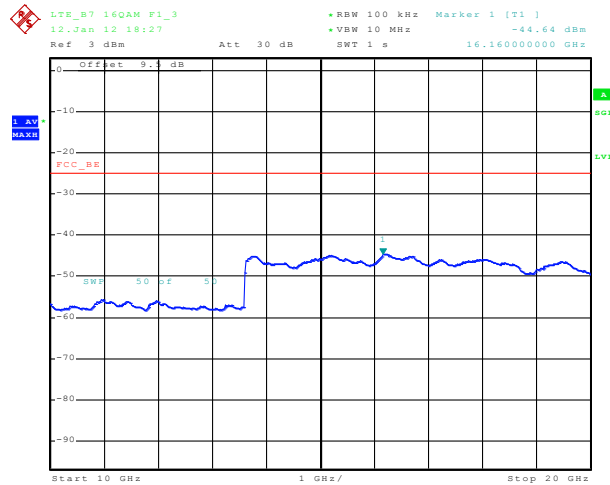
## 6.3.3.54 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 10 GHz



Date: 12-JAN-2012 18:25:29

Note: The strong emission shown is the carrier signal.

## 6.3.3.55 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, 16QAM, 10 GHz to 20 GHz

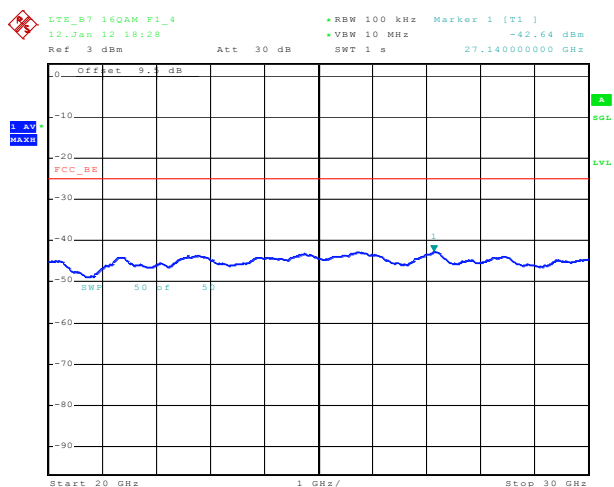


Date: 12-JAN-2012 18:27:15

# SIERRA WIRELESS, INC.

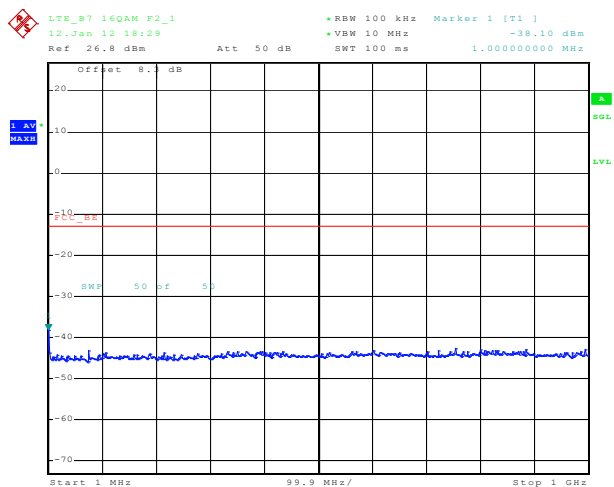
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## 6.3.3.56 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB, 16QAM, 20 GHz to 30 GHz



Date: 12.JAN.2012 18:28:48

## 6.3.3.57 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, 16QAM, 30MHz to 1 GHz

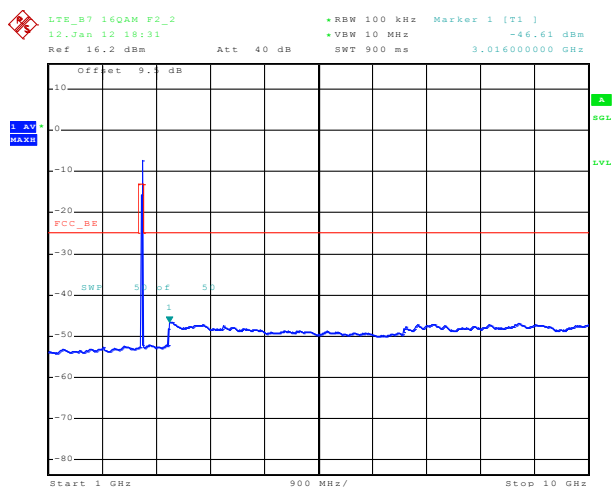


Date: 12.JAN.2012 18:29:24

# SIERRA WIRELESS, INC.

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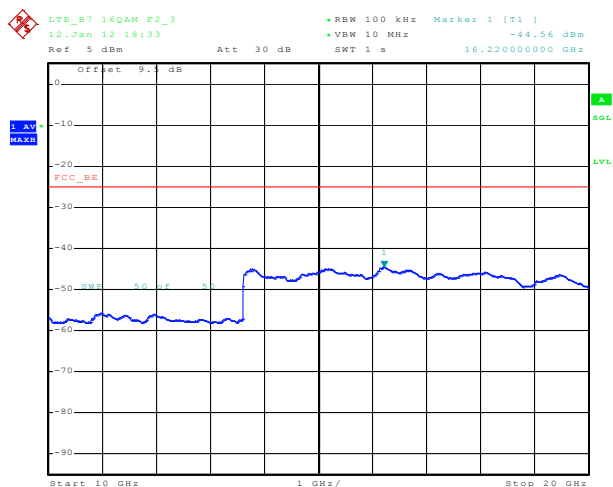
## 6.3.3.58 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 10 GHz



Date: 12.JAN.2012 18:31:36

Note: The strong emission shown is the carrier signal.

## 6.3.3.59 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, 16QAM, 10 GHz to 20 GHz

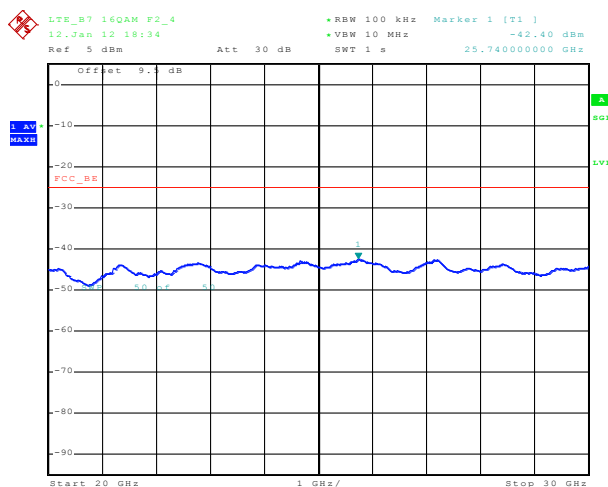


Date: 12.JAN.2012 18:33:21

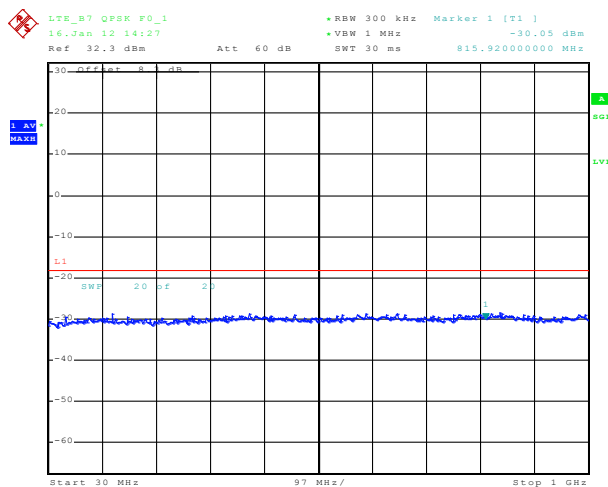
# SIERRA WIRELESS, INC.

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## 6.3.3.60 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2565.0 MHz, 10MHz BW, 50RB, 16QAM, 20 GHz to 30 GHz



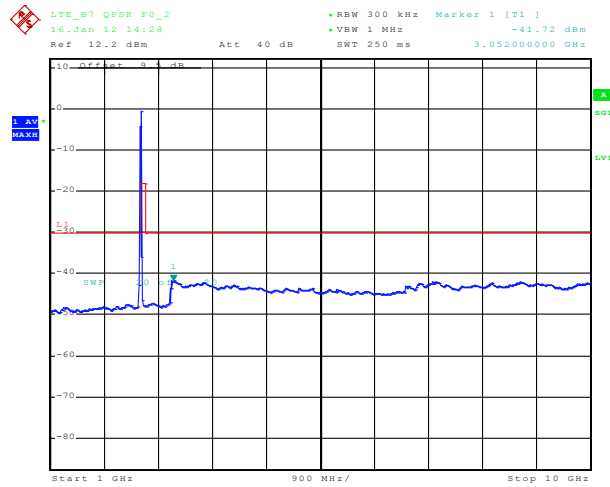
## 6.3.3.61 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, QPSK, 30MHz to 1 GHz



# SIERRA WIRELESS, INC.

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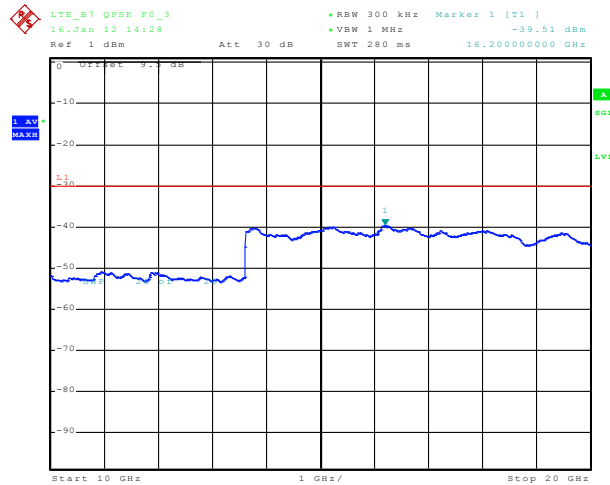
## 6.3.3.62 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, QPSK, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:28:14

Note: The strong emission shown is the carrier signal.

## 6.3.3.63 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, QPSK, 10 GHz to 20 GHz

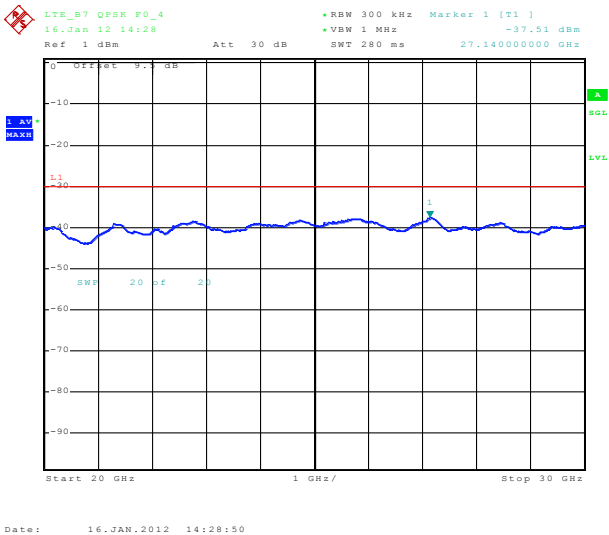


Date: 16-JAN-2012 14:28:33

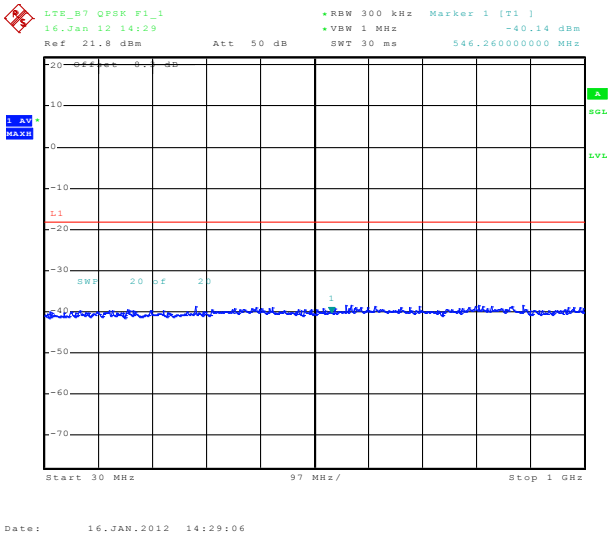
SIERRA WIRELESS, INC.

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6.3.3.64 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, QPSK, 20 GHz to 30 GHz



6.3.3.65 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, QPSK, 30MHz to 1 GHz

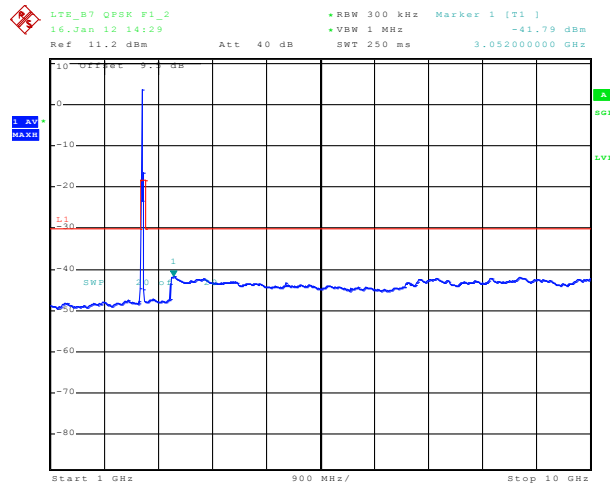




# SIERRA WIRELESS, INC.

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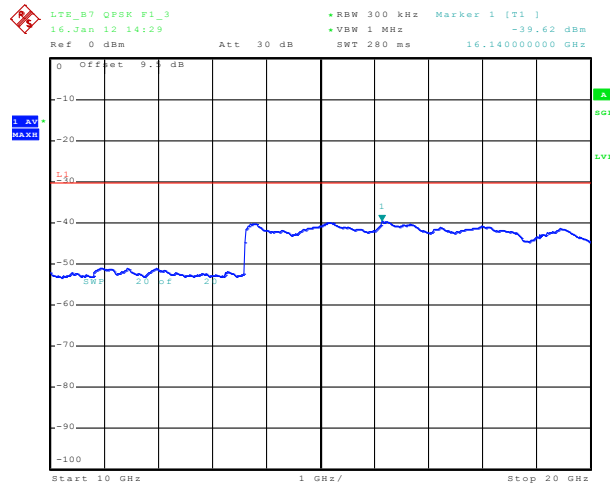
## 6.3.3.66 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, QPSK, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:29:31

Note: The strong emission shown is the carrier signal.

## 6.3.3.67 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, QPSK, 10 GHz to 20 GHz

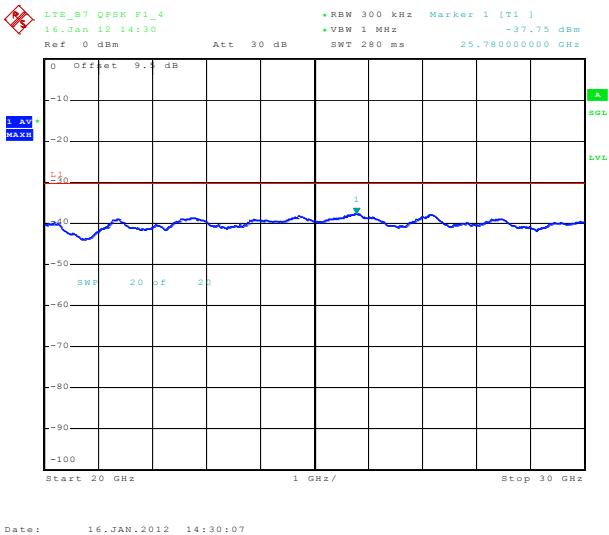


Date: 16-JAN-2012 14:29:50

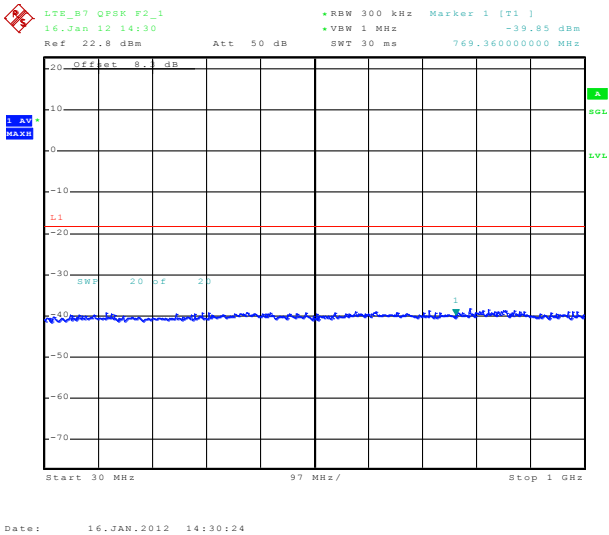
SIERRA WIRELESS, INC.

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6.3.3.68 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, QPSK, 20 GHz to 30 GHz



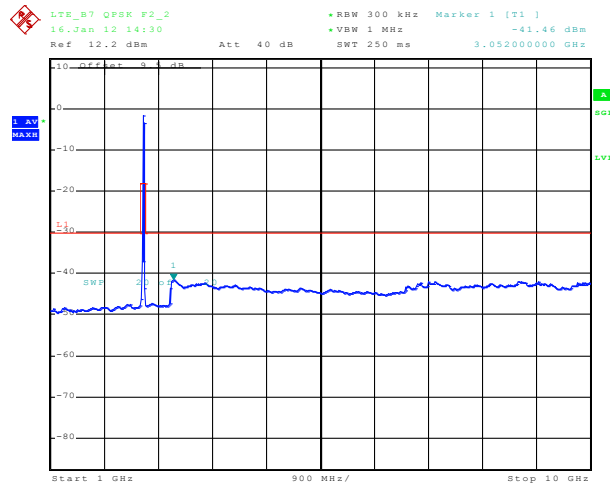
6.3.3.69 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, QPSK, 30MHz to 1 GHz



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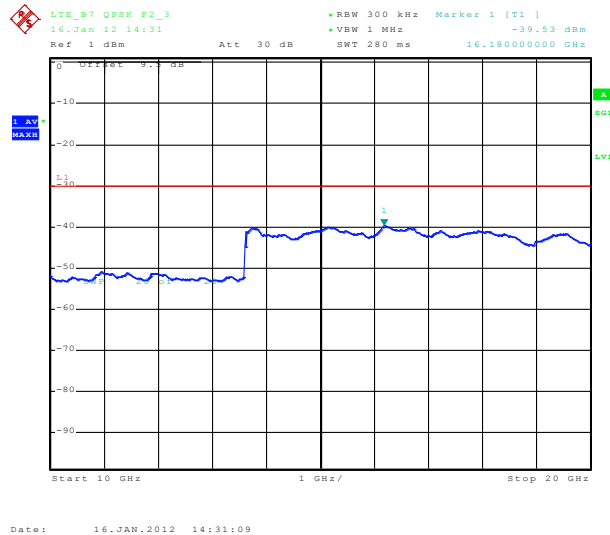
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## 6.3.3.70 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, QPSK, 1 GHz to 10 GHz



Note: The strong emission shown is the carrier signal.

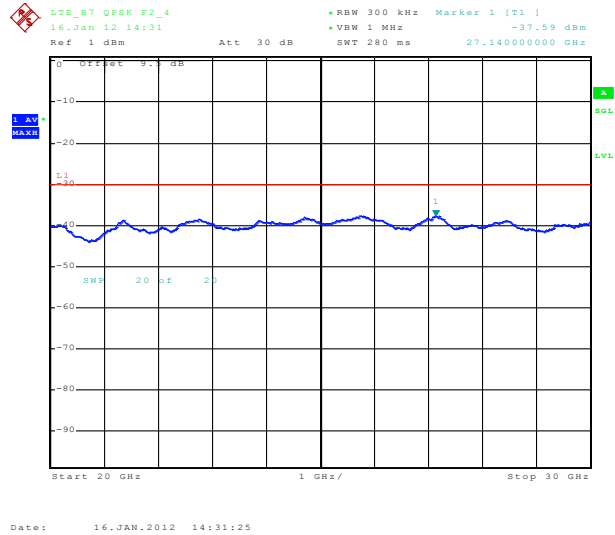
## 6.3.3.71 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, QPSK, 10 GHz to 20 GHz



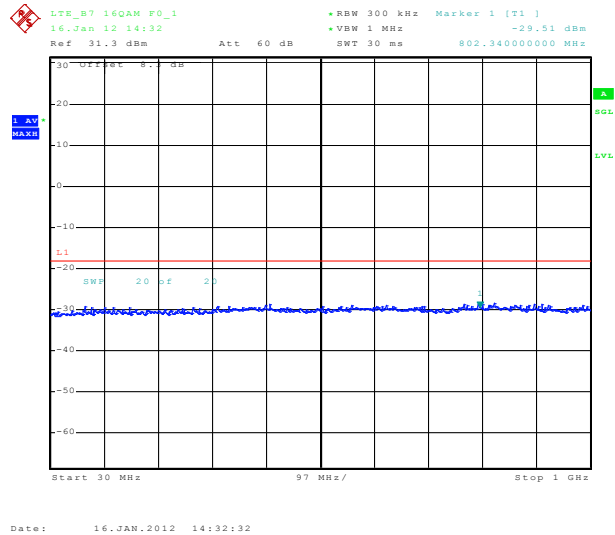
# SIERRA WIRELESS, INC.

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## 6.3.3.72 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, QPSK, 20 GHz to 30 GHz



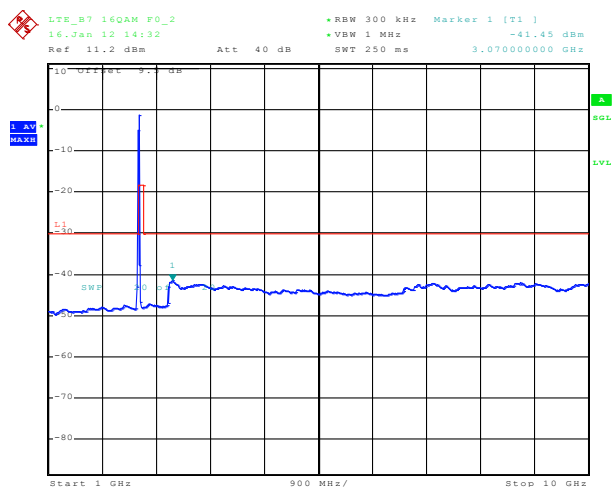
## 6.3.3.73 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, 16QAM, 30MHz to 1 GHz



# SIERRA WIRELESS, INC.

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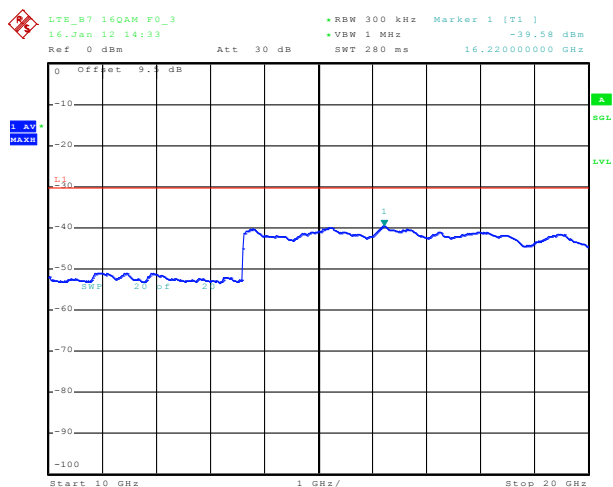
## 6.3.3.74 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, 16QAM, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:32:57

Note: The strong emission shown is the carrier signal.

## 6.3.3.75 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, 16QAM, 10 GHz to 20 GHz

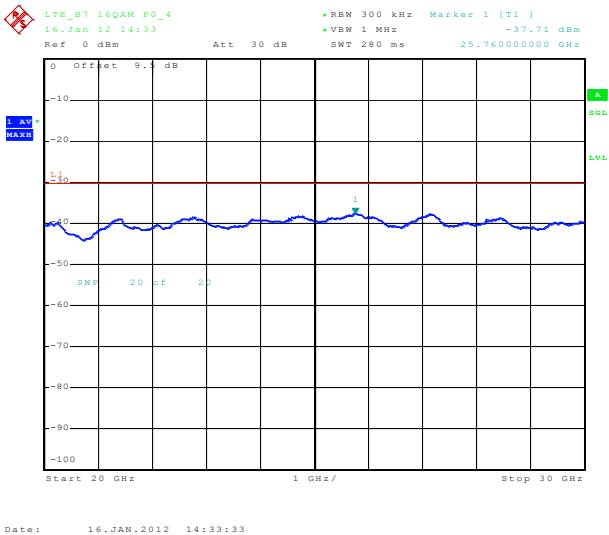


Date: 16-JAN-2012 14:33:17

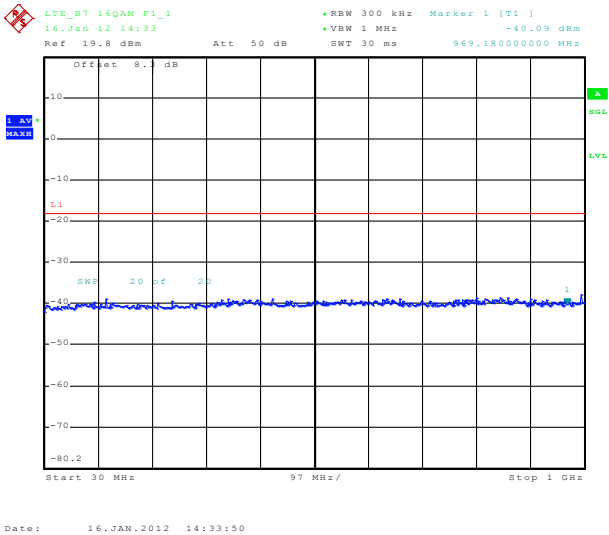
SIERRA WIRELESS, INC.

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6.3.3.76 Out of Band Emissions at Antenna Terminals LTE B7, Low channel, 2510.0 MHz, 20MHz BW, 100RB, 16QAM, 20 GHz to 30 GHz



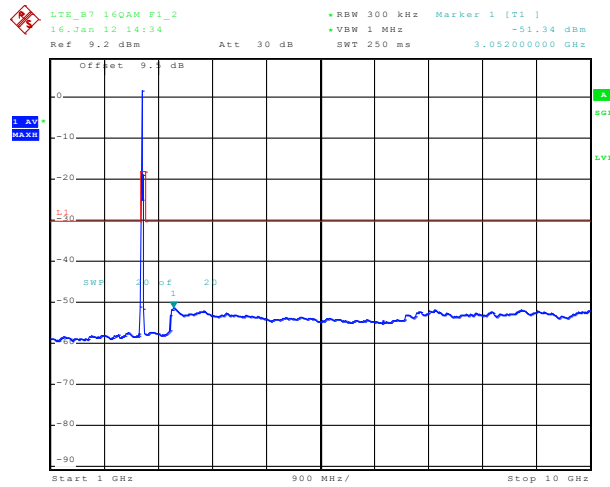
6.3.3.77 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, 16QAM, 30MHz to 1 GHz



# SIERRA WIRELESS, INC.

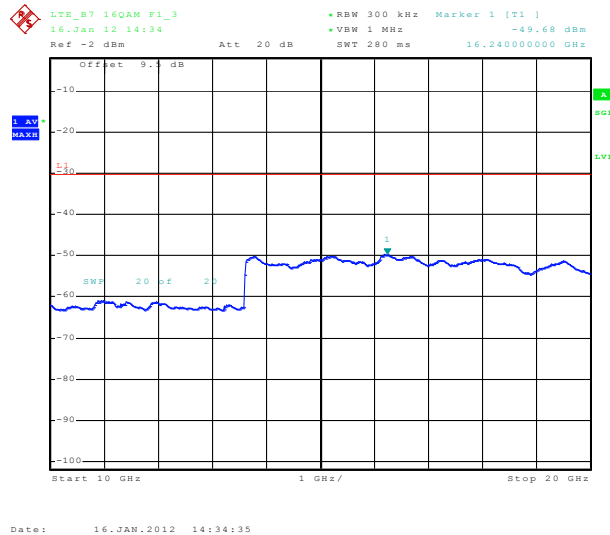
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## 6.3.3.78 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, 16QAM, 1 GHz to 10 GHz



Note: The strong emission shown is the carrier signal.

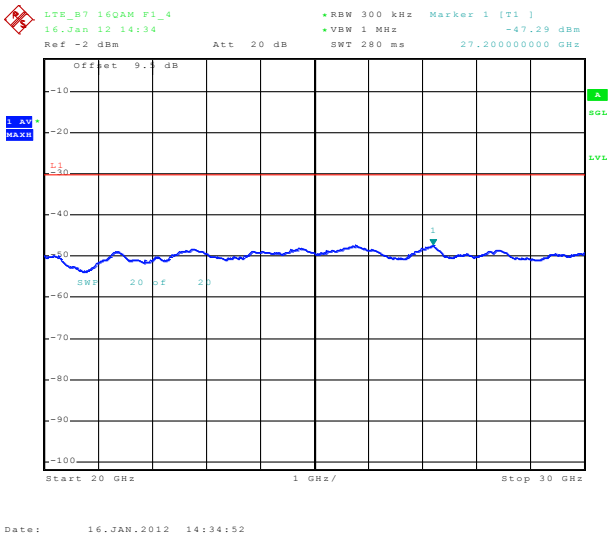
## 6.3.3.79 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, 16QAM, 10 GHz to 20 GHz



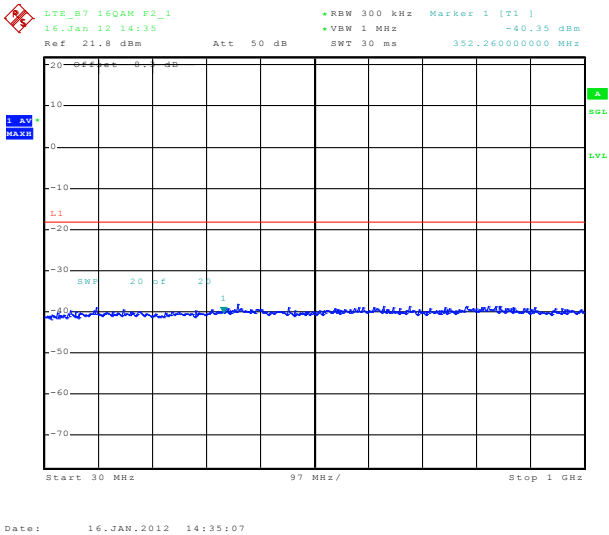
SIERRA WIRELESS, INC.

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6.3.3.80 Out of Band Emissions at Antenna Terminals LTE B7, Mid channel, 2535.0 MHz, 20MHz BW, 100RB, 16QAM, 20 GHz to 30 GHz



6.3.3.81 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, 16QAM, 30MHz to 1 GHz

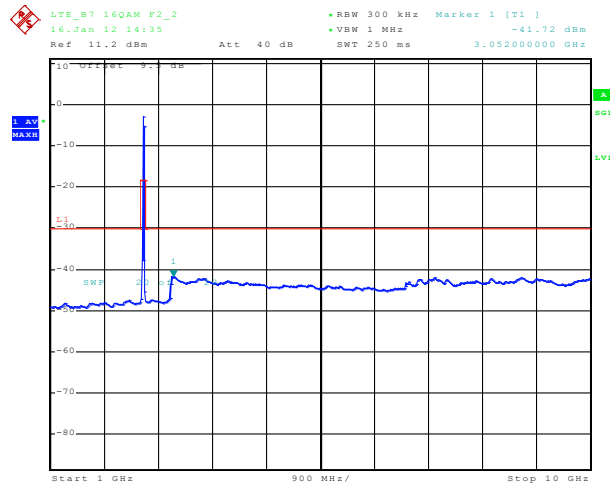




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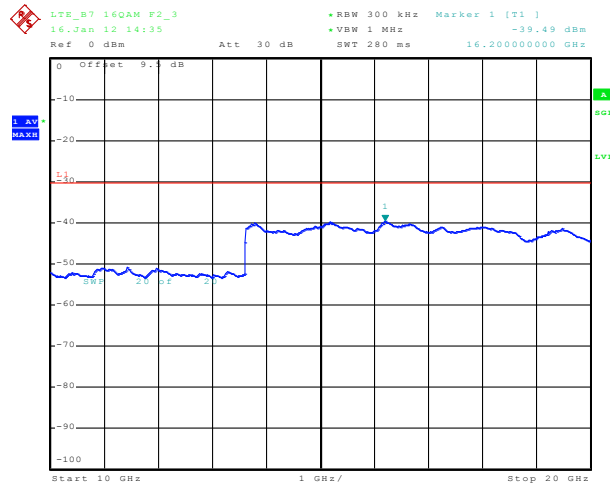
## 6.3.3.82 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, 16QAM, 1 GHz to 10 GHz



Date: 16-JAN-2012 14:35:33

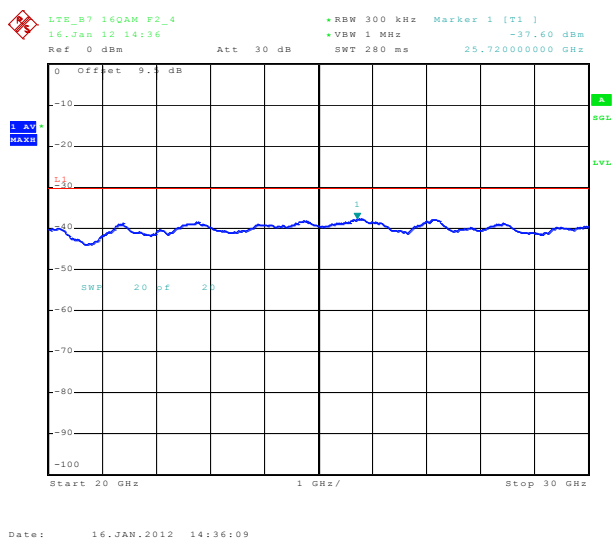
Note: The strong emission shown is the carrier signal.

## 6.3.3.83 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, 16QAM, 10 GHz to 20 GHz



Date: 16-JAN-2012 14:35:52

### 6.3.3.84 Out of Band Emissions at Antenna Terminals LTE B7, High channel, 2560.0 MHz, 20MHz BW, 100RB, 16QAM, 20 GHz to 30 GHz



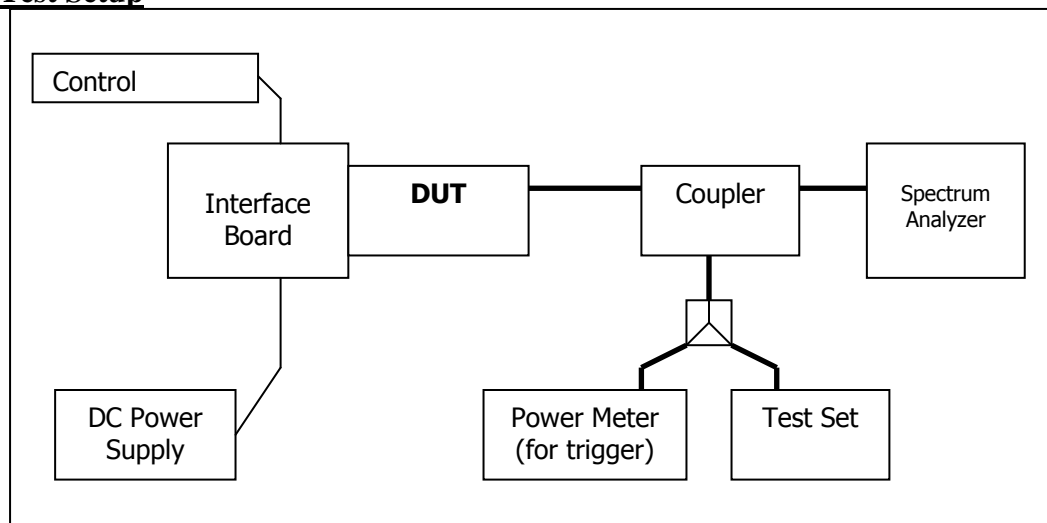
## 7 Block Edge Compliance

FCC Part 22(h)/24(e)/27.53(h)(m)

### 7.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set (or CMW500 for LTE), through a coaxial RF cable and a directional coupler, 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



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## 7.2 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

## 7.3 Test Results

Block Test	Frequency Boundaries (MHz)	Channels Tested	Corresponding Plots	Result
GMSK	Below 824 MHz, above 849 MHz	128, 251	7.3.1.1, 7.3.1.2	Complies
	Below 1850MHz, above 1910MHz	512, 810	7.3.1.5, 7.3.1.6	Complies
8PSK	Below 824 MHz, above 849 MHz	128, 251	7.3.1.3, 7.3.1.4	Complies
	Below 1850MHz, above 1910MHz	512, 810	7.3.1.7, 7.3.1.8	Complies

Block Test	Frequency Boundaries (MHz)	Channels Tested	Corresponding Plots	Result
WCDMA	Below 824MHz, above 849MHz	4132, 4233	7.3.2.1, 7.3.2.2	Complies
	Below 1850MHz, above 1910MHz	9262, 9538	7.3.2.3, 7.3.2.4	Complies

Mode	Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	Corresponding Plot number
LTE	B4	10	50	0	1715.0	20000	7.3.3.1
					1750.0	20350	7.3.3.2
		20	100	0	1720.0	20050	7.3.3.9
					1745.0	20300	7.3.3.10
	B7	10	50	0	2505.0	20800	7.3.3.5

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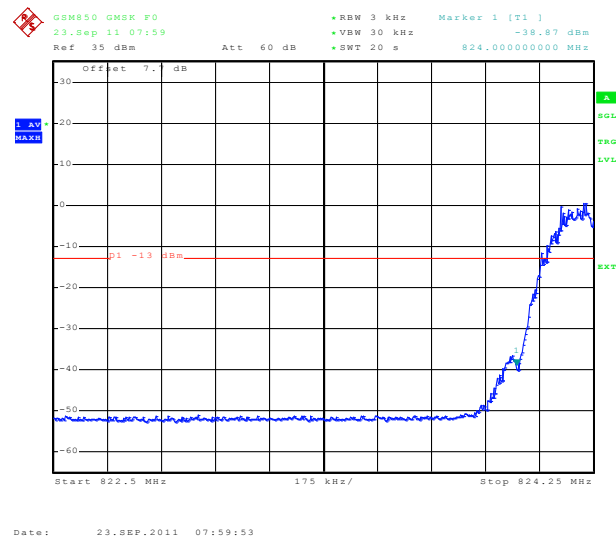
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	16QAM	B4				2565.0	21400	7.3.3.6
			20	100	0	2510.0	20850	7.3.3.13
						2560.0	21350	7.3.3.14
		B7	10	50	0	1715.0	20000	7.3.3.3
						1750.0	20350	7.3.3.4
			20	100	0	1720.0	20050	7.3.3.11
	16QAM	B4				1745.0	20300	7.3.3.12
			10	50	0	2505.0	20800	7.3.3.7
						2565.0	21400	7.3.3.8
		B7				2510.0	20850	7.3.3.15
			20	100	0			
						2560.0	21350	7.3.3.16

7.3.1 GSM Test Plots

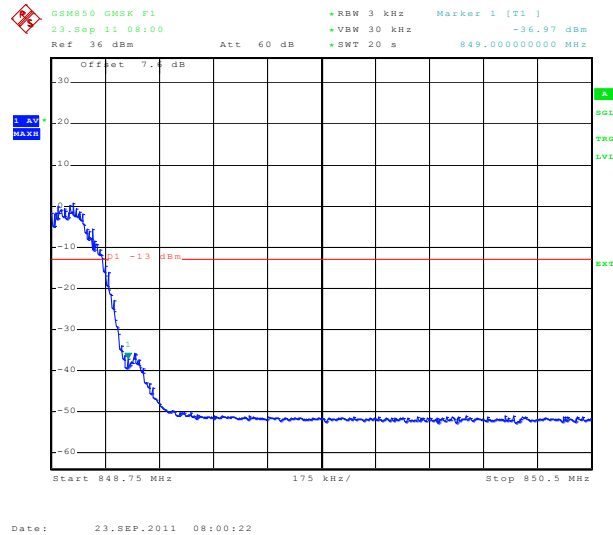
7.3.1.1 GSMK; Cellular low channel, below 824 MHz



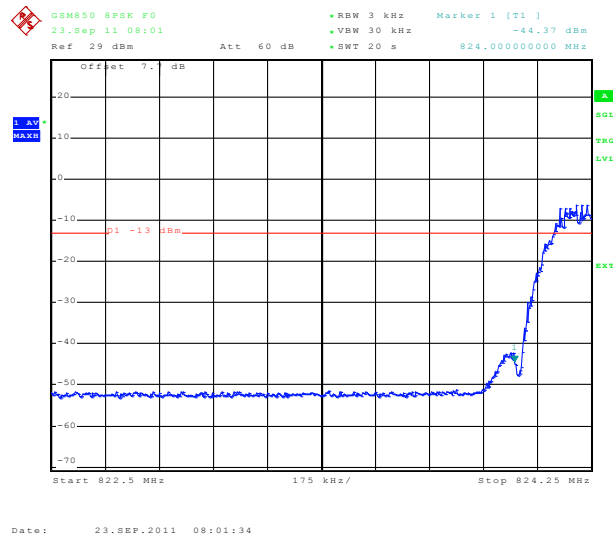
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## 7.3.1.2 GMSK; Cellular high channel, above 849 MHz



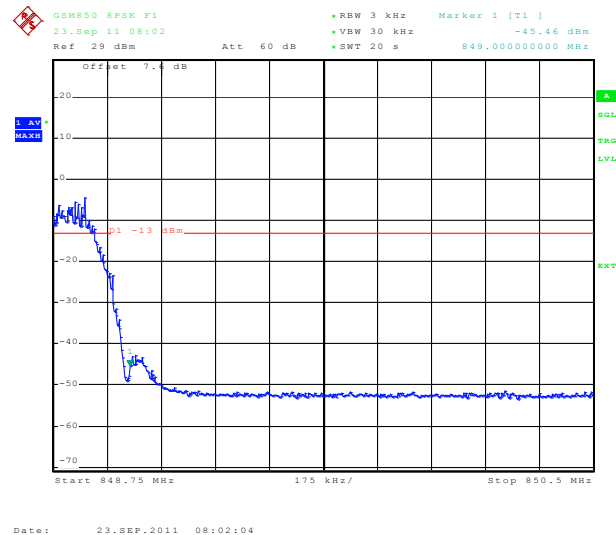
## 7.3.1.3 8-PSK; Cellular low channel, below 824 MHz



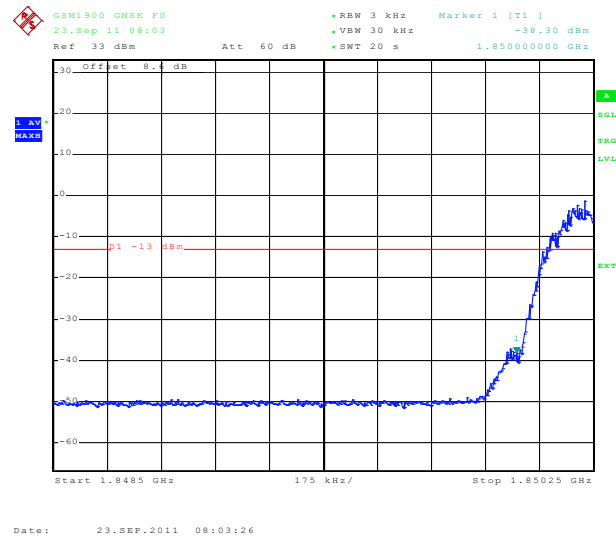
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7.3.1.4 8-PSK; Cellular high channel, above 849 MHz



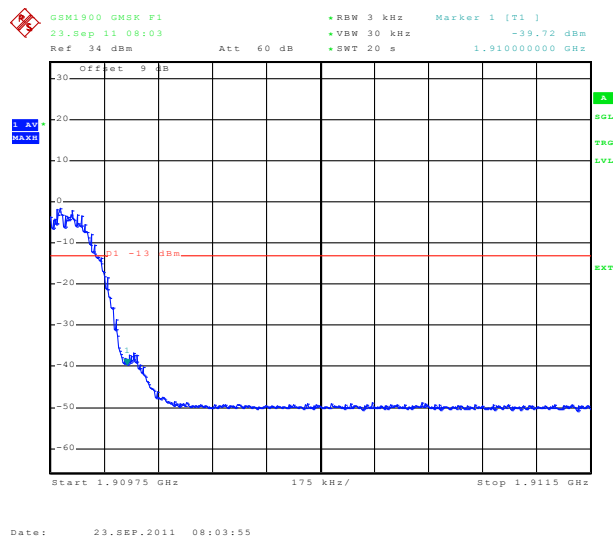
7.3.1.5 GMSK; PCS low channel, below 1850 MHz



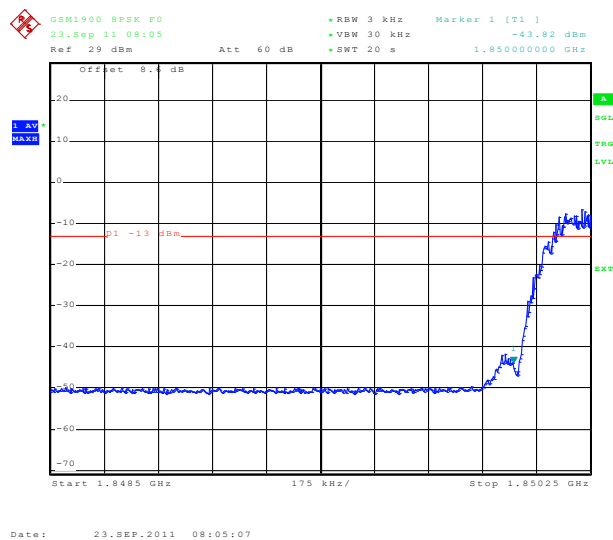
# SIERRA WIRELESS, INC.

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## 7.3.1.6 GMSK; PCS high channel, above 1910 MHz



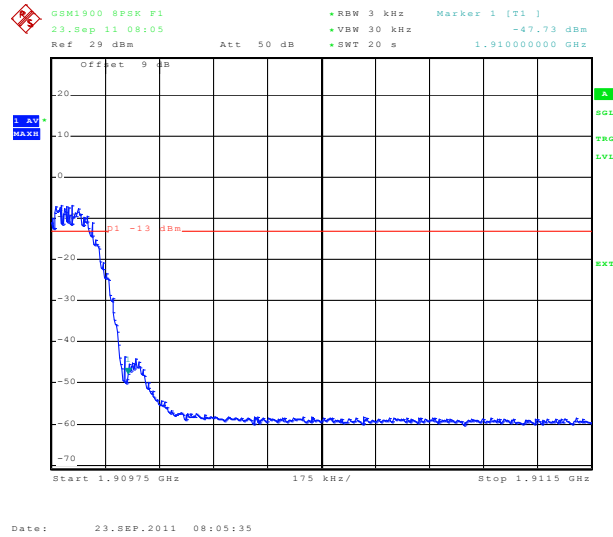
## 7.3.1.7 8-PSK; PCS low channel, below 1850 MHz



# SIERRA WIRELESS, INC.

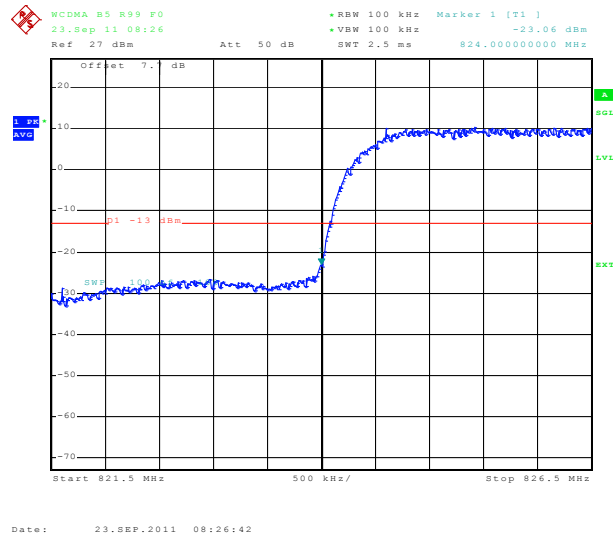
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## 7.3.1.8 8-PSK; PCS high channel, above 1910 MHz



## 7.3.2 WCDMA Test Plots

### 7.3.2.1 WCDMA; Cellular low channel, below 824 MHz

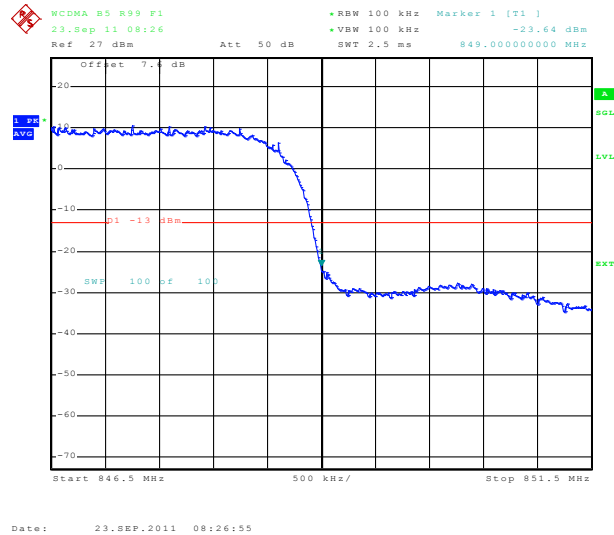




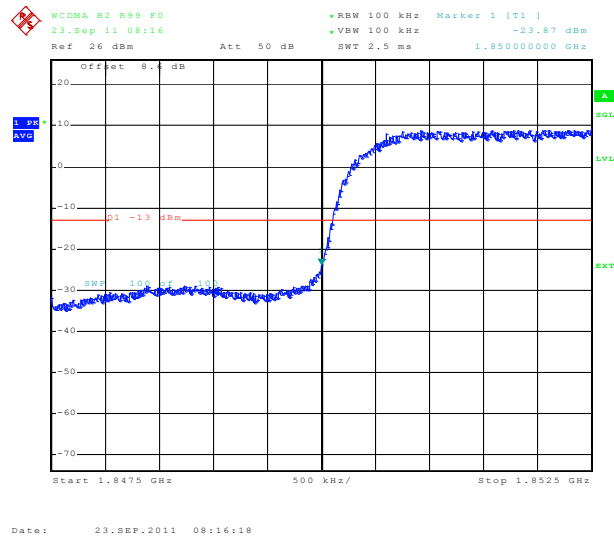
# SIERRA WIRELESS, INC.

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## 7.3.2.2 WCDMA; Cellular high channel, above 849 MHz



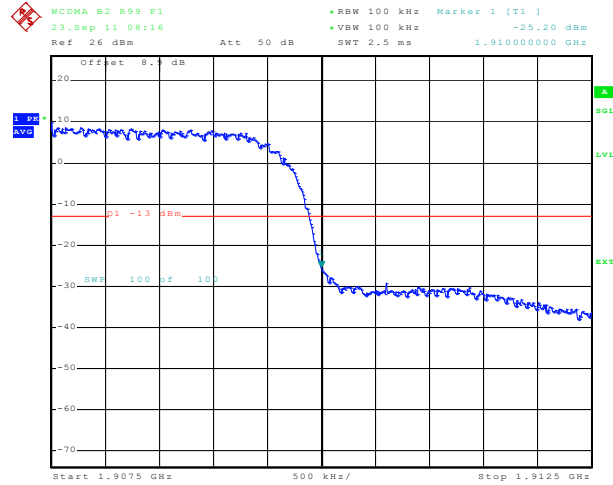
## 7.3.2.3 WCDMA; PCS low channel, below 1850 MHz



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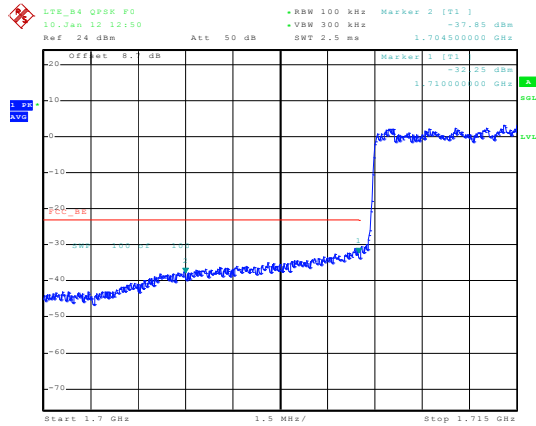
## 7.3.2.4 WCDMA; PCS high channel, above 1910 MHz



Date: 23.SEP.2011 08:16:31

## 7.3.3 LTE Test Plots

### 7.3.3.1 LTE; Band4 below 1710 MHz, with ch20000, 10MHz, QPSK, 50RB



Date: 10.JAN.2012 12:50:41

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

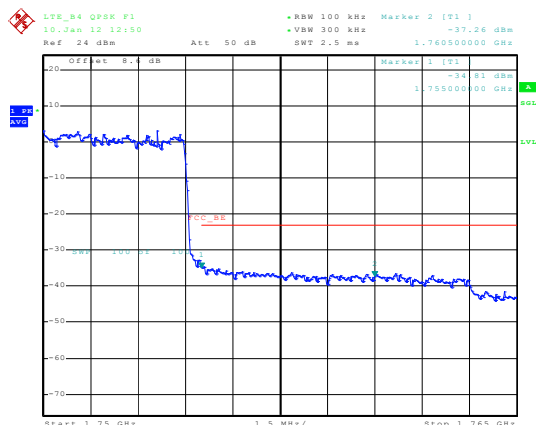
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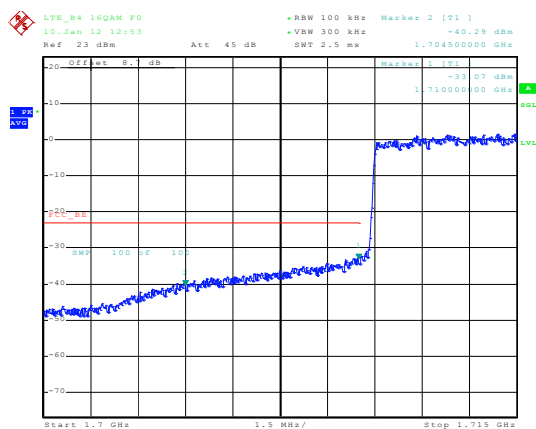
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## 7.3.3.2 LTE; Band4 above 1755 MHz, with ch20350, 10MHz, QPSK, 50RB



Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 7.3.3.3 LTE; Band4 below 1710 MHz, with ch20000, 10MHz, 16QAM, 50RB

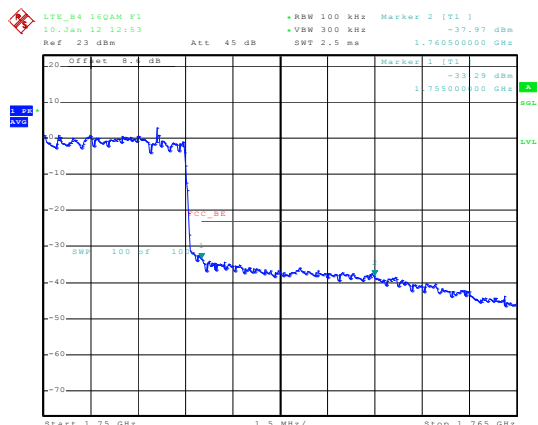


Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

# SIERRA WIRELESS, INC.

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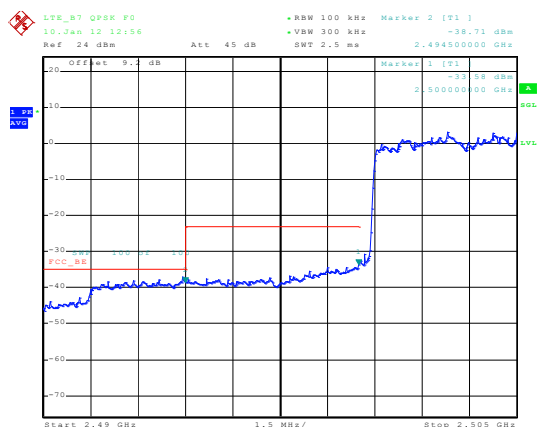
## 7.3.3.4 LTE; Band4 above 1755 MHz, with ch20350, 10MHz, 16QAM, 50RB



Date: 10.JAN.2012 12:53:35

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 7.3.3.5 LTE; Band7 below 2500 MHz, with ch20800, 10MHz, QPSK, 50RB



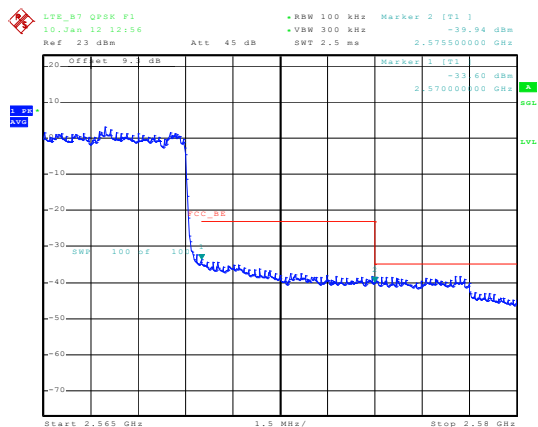
Date: 10.JAN.2012 12:56:03

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

# SIERRA WIRELESS, INC.

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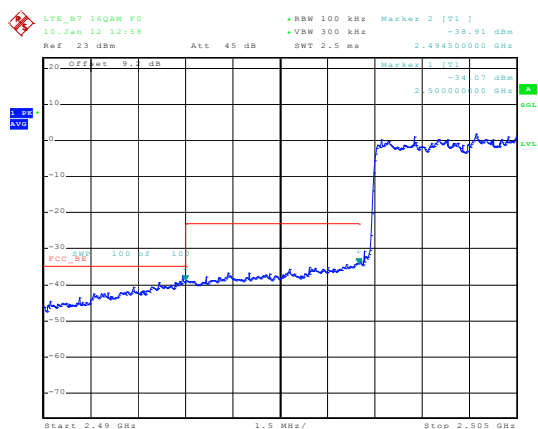
## 7.3.3.6 LTE; Band7 above 2570 MHz, with ch21400, 10MHz, QPSK, 50RB



Date: 10.JAN.2012 12:56:16

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 7.3.3.7 LTE; Band7 below 2500 MHz, with ch20800, 10MHz, 16QAM, 50RB



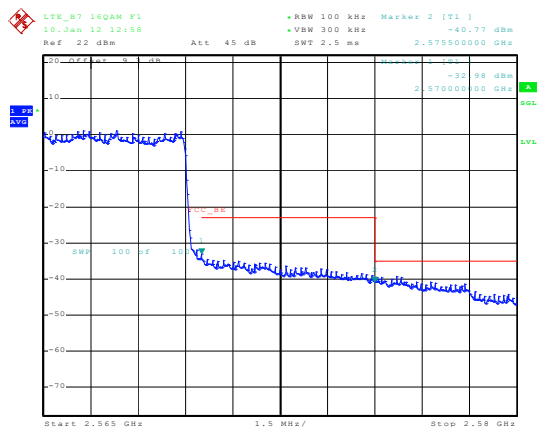
Date: 10.JAN.2012 12:58:44

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

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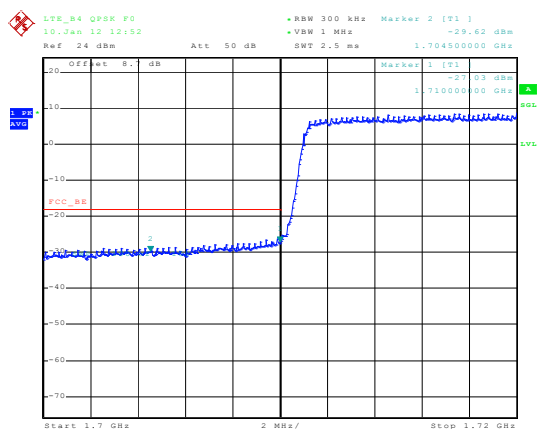
## 7.3.3.8 LTE; Band7 above 2570 MHz, with ch21400, 10MHz, 16QAM, 50RB



Date: 10.JAN.2012 12:58:57

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 7.3.3.9 LTE; Band4 below 1710 MHz, with ch20050, 20MHz, QPSK, 100RB



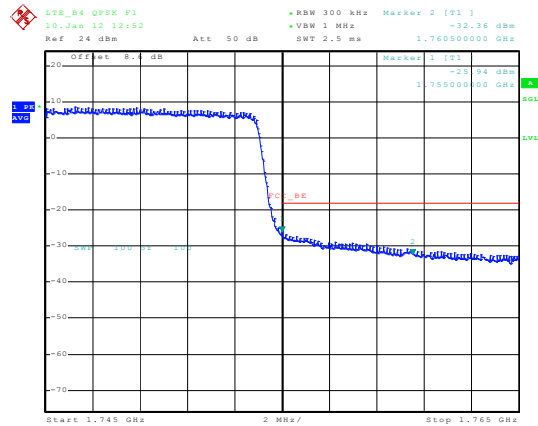
Date: 10.JAN.2012 12:52:01

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

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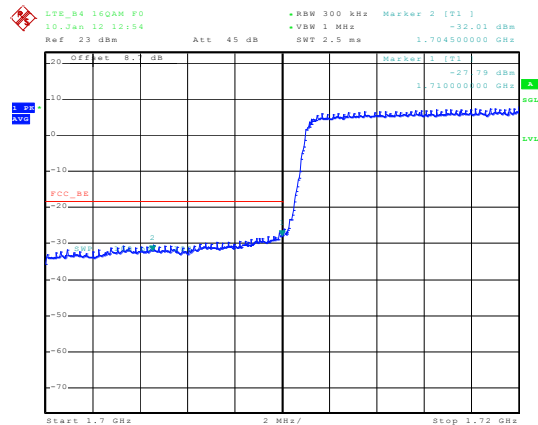
## 7.3.3.10 LTE; Band4 above 1755 MHz, with ch20300, 20MHz, QPSK, 100RB



Date: 10.JAN.2012 12:52:18

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 7.3.3.11 LTE; Band4 below 1710 MHz, with ch20050, 20MHz, 16QAM, 100RB



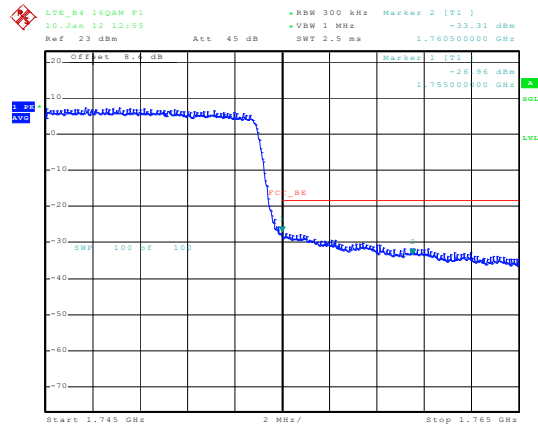
Date: 10.JAN.2012 12:54:44

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

# SIERRA WIRELESS, INC.

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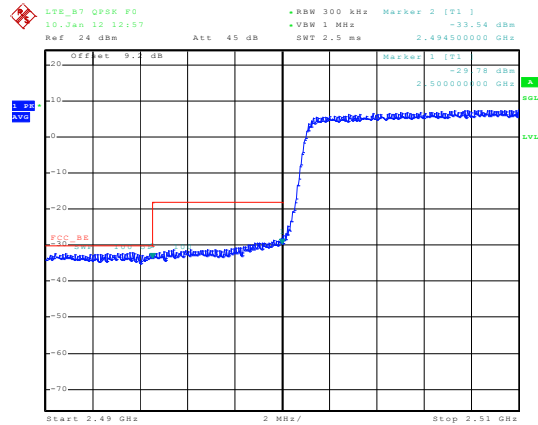
## 7.3.3.12 LTE; Band4 above 1755 MHz, with ch20350, 20MHz, 16QAM, 100RB



Date: 10.JAN.2012 12:55:01

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 7.3.3.13 LTE; Band7 below 2500 MHz, with ch20850, 20MHz, QPSK, 100RB



Date: 10.JAN.2012 12:57:23

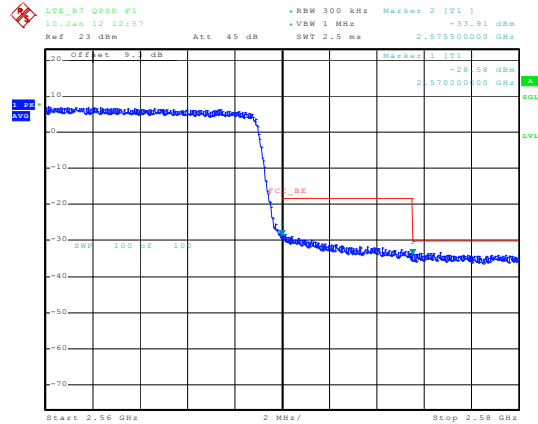
Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.



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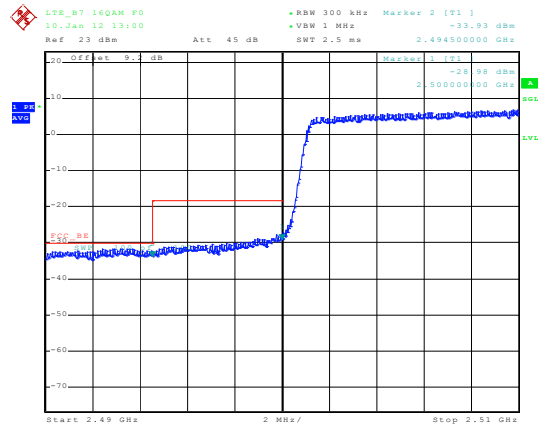
## 7.3.3.14 LTE; Band7 above 2570 MHz, with ch21350, 20MHz, QPSK, 100RB



Date: 10.JAN.2012 12:57:40

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

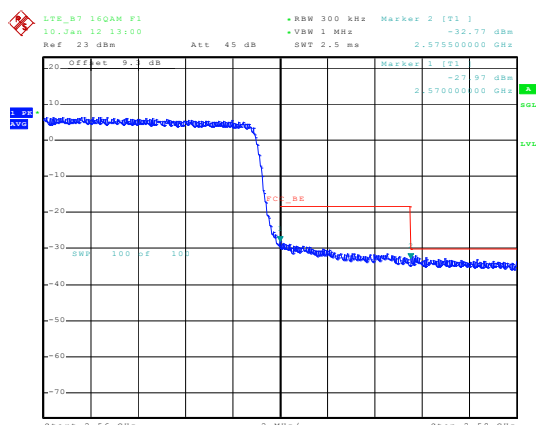
## 7.3.3.15 LTE; Band7 below 2500 MHz, with ch20850, 20MHz, 16QAM, 100RB



Date: 10.JAN.2012 13:00:05

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

### 7.3.3.16 LTE; Band7 above 2570 MHz, with ch21350, 20MHz, 16QAM, 100RB



Date: 10.JAN.2012 13:00:22

Note: Limit has been adjusted by  $10 \cdot \log(\text{RBW})$  to reflect a 1 MHz measurement bandwidth.

## 8 Frequency Stability versus Temperature

FCC 2.1055, FCC 22.355, FCC 24.235, FCC 27.54

### 8.1 Summary of Results

The EUT's Frequency Stability versus temperature meets the requirements of less than 2.5ppm when temperature varies from -30°C to +50°C.

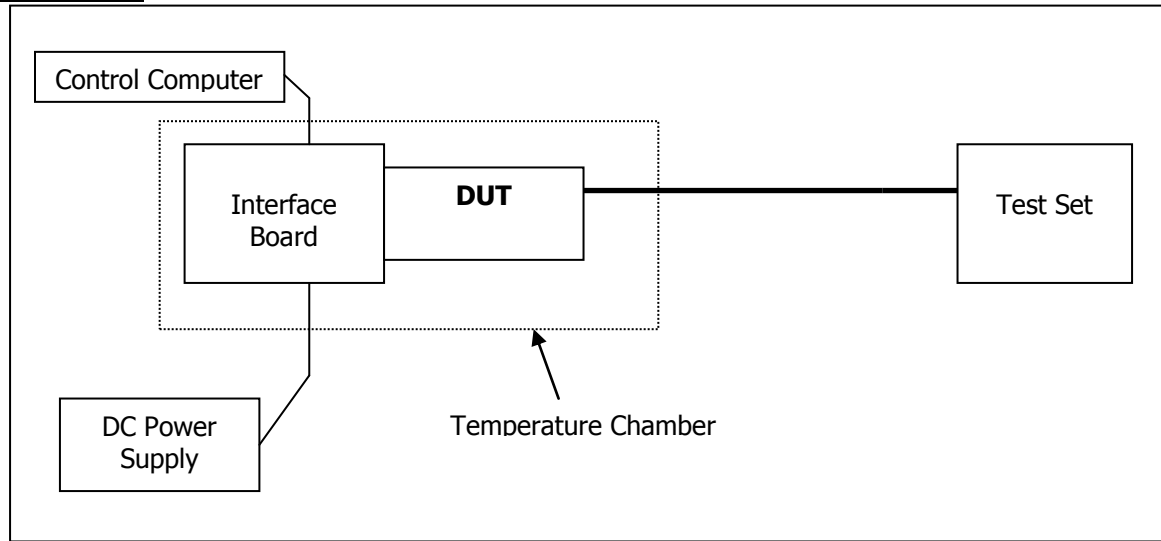
### 8.2 Test Procedure

The EUT was placed inside a temperature chamber. The temperature was set to -30°C and maintained to stabilize. After sufficient soak time, the transmitting frequency error was measured. The temperature was then increased by 10 degrees, maintained to stabilize, and the measurement was repeated. This procedure was repeated until +50°C is reached. Frequency metering included internal averaging of the CMU200 (for GSM/WCDMA) or the CMW500 (for LTE) to stabilize the reading. Reference power supply voltage for these tests is 5.0 volts.

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## 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	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

## 8.4 Test Results

### 8.4.1 GSM Frequency Error over Temperature

Temp (°C)	Cellular Band: 824MHz to 848MHz				PCS Band: 1850MHz to 1910MHz			
	GMSK Mode		8PSK Mode		GMSK Mode		8PSK Mode	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
-30	-22.5	-0.0269	-25.0	-0.0300	-50.8	-0.0270	-2.0	-0.001
-20	-15.3	-0.0182	20.9	0.0250	29.8	0.0158	3.3	0.002
-10	15.0	0.0180	0.0	0.0000	-31.4	-0.0167	12.5	0.007
0	2.6	0.0031	-5.7	-0.0069	-31.2	-0.0166	-15.9	-0.008
10	4.2	0.0050	1.5	0.0018	-11.6	-0.0062	-21.4	-0.011
20	7.2	0.0086	33.1	0.0396	-3.9	-0.0021	-18.9	-0.010
30	8.8	0.0106	-11.6	-0.0139	36.5	0.0194	-47.2	-0.025

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40	-17.8	-0.0213	2.8	0.0034	0.3	0.0002	-8.2	-0.004
50	-22.9	-0.0274	3.4	0.0041	37.6	0.0200	54.8	0.029

## 8.4.2 UMTS Frequency Error over Temperature

Temp (°C)	UMTS Mode			
	850 MHz Band		1900 MHz Band	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
-30	-19.8	-0.0237	15.2	0.0182
-20	7.9	0.0095	3.9	0.0046
-10	3.7	0.0044	-28.8	-0.0344
0	40.0	0.0479	-1.9	-0.0023
10	-16.1	-0.0192	15.8	0.0189
20	36.8	0.0441	-1.6	-0.0019
30	3.8	0.0045	-26.8	-0.0321
40	-28.0	-0.0334	-5.5	-0.0066
50	-19.6	-0.0234	-33.4	-0.0399

## 8.4.3 LTE Frequency Error over Temperature

Temp (°C)	LTE Band 4				LTE Band 7			
	QPSK Mode		16QAM Mode		QPSK Mode		16QAM Mode	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
-30	-46.1	-0.0266	26.5	0.0153	-18.5	-0.0073	-19.0	-0.0075
-20	0.3	0.0002	-17.7	-0.0102	-74.7	-0.0295	-60.6	-0.0239
-10	-46.3	-0.0267	-0.5	-0.0003	32.5	0.0129	5.8	0.0023
0	-20.3	-0.0117	-88.4	-0.0510	11.1	0.0044	-12.5	-0.0049
10	2.9	0.0017	-29.6	-0.0171	-44.6	-0.0176	7.1	0.0028
20	15.5	0.0090	55.5	0.0320	38.6	0.0153	7.8	0.0031
30	35.7	0.0206	22.7	0.0131	-7.9	-0.0031	-88.6	-0.0350
40	111.6	0.0644	24.8	0.0143	-50.2	-0.0198	13.2	0.0052
50	15.2	0.0087	-23.8	-0.0137	-84.1	-0.0333	6.5	0.0026

## 9 Frequency Stability versus Voltage

FCC 2.1055, FCC 22.355, FCC 24.235, FCC 27.54

### 9.1 Summary of Results

The EUT is specified to operate with a supply voltage varying between 4.25VDC and 5.75VDC, having a nominal voltage of 5.0 VDC. It meets the frequency stability limit of

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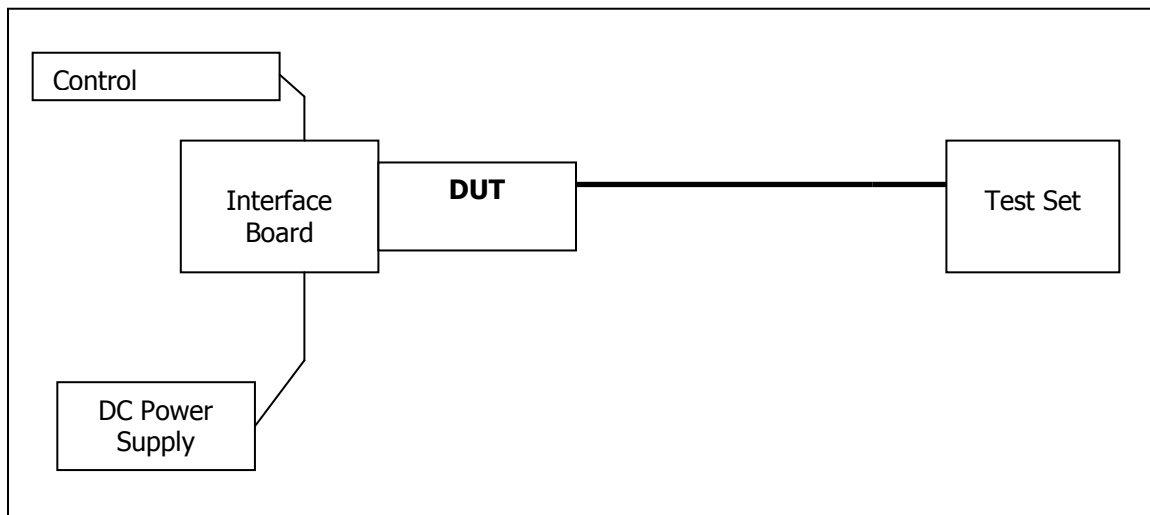
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less than 2.5ppm when supply voltage varies within the specified limits. Operation above or below these voltage limits is prohibited by firmware in order to prevent improper operation.

## 9.2 Test Procedure

The EUT was connected to a DC Power Supply and a UMTS test set (CMU 200, or LTE test set CMW500) with frequency error measurement capability. The power supply output was adjusted to the test voltage as measured at the input terminals to the device while transmitting. A voltmeter was used to confirm the terminal voltage. The peak frequency error is recorded (worst case). The test voltages are 4.25 volts to 5.75 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	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

## 9.4 Test Results

### 9.4.1 GSM Frequency Error over Voltage

Voltage (V)	Cellular Band: 824MHz to 848MHz		PCS Band: 1850MHz to 1910MHz	
	GMSK Mode	8PSK Mode	GMSK Mode	8PSK Mode

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	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
4.5	-22.5	-0.0269	9.5	0.0113	-1.1	-0.0006	16.1	0.009
5	-21.5	-0.0257	-8.2	-0.0098	15.4	0.0082	8.8	0.005
5.5	-20.5	-0.0245	-17.6	-0.0210	-83.4	-0.0444	-36.9	-0.020

### 9.4.2 UMTS Frequency Error over Voltage

Voltage (V)	850 MHz Band		1900 MHz Band	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
4.5	-20.3	-0.0243	23.1	0.0277
5	-18.2	-0.0218	-13.0	-0.0155
5.5	-29.8	-0.0357	-15.2	-0.0181

### 9.4.3 LTE Frequency Error over Voltage

Voltage (V)	LTE Band 4				LTE Band 7			
	QPSK Mode		16QAM Mode		QPSK Mode		16QAM Mode	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
4.5	47.6	0.0275	29.0	0.0167	74.5	0.0294	-52.9	-0.0209
5.0	-62.9	-0.0363	70.0	0.0404	11.8	0.0047	-46.6	-0.0184
5.5	-52.7	-0.0304	2.8	0.0016	42.1	0.0166	1.7	0.0007

## 10 Peak to Average Ratio

### FCC 27.50(d)

#### 10.1 Summary of Results

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

#### 10.2 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each band on the Spectrum Analyzer.

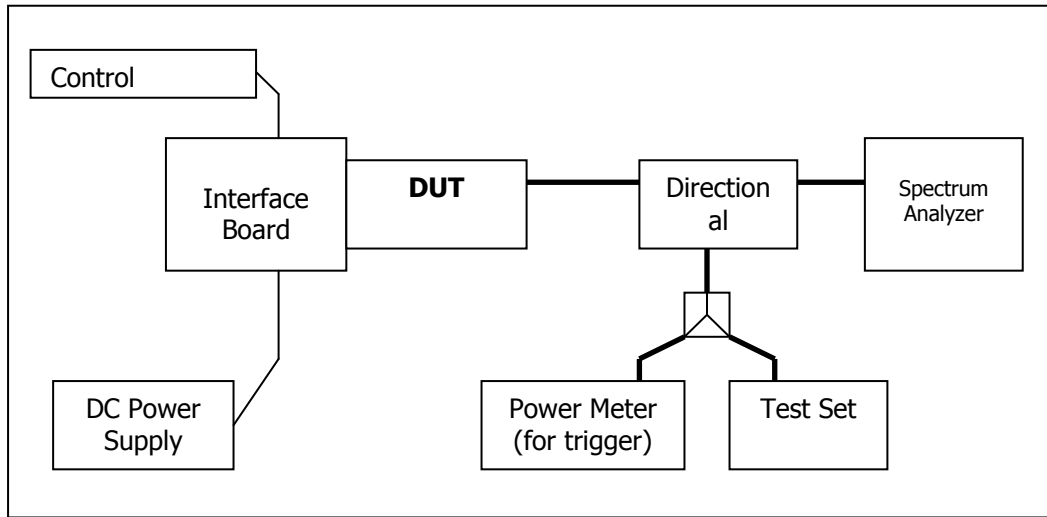
### Test Setup

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### 10.3 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 30, 2011
Wireless Test Set	Rohde & Schwarz	CMW500	101060	October 12, 2011
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2011
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

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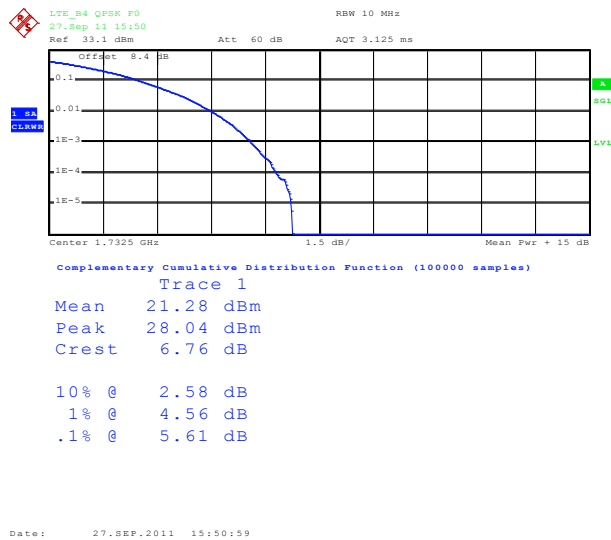
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## 10.4 Test Results

Frequency (MHz)	Channel	Modulation	BW	RB	Plots	Peak to Average Ratio (dB)
1732.5	20175	QPSK	10	50	10.4.1.1	5.61
1732.5	20175	16-QAM	10	50	10.4.1.2	6.36
2535.0	21100	QPSK	10	25	10.4.1.3	5.52
2535.0	21100	16-QAM	10	25	10.4.1.4	6.39

### 10.4.1 Test Plots

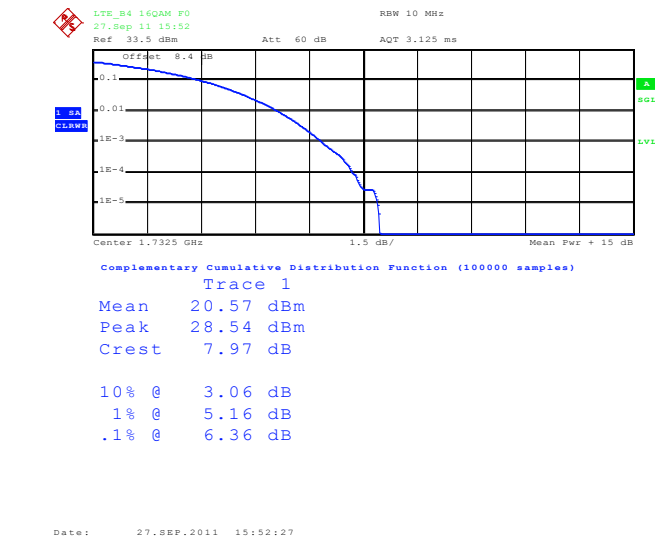
#### 10.4.1.1 LTE peak to average ratio, QPSK Band4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB



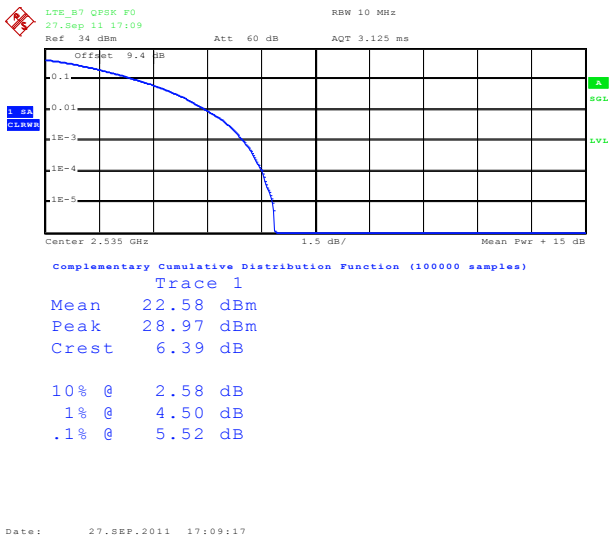


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10.4.1.2 LTE peak to average ratio, 16-QAM Band4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB



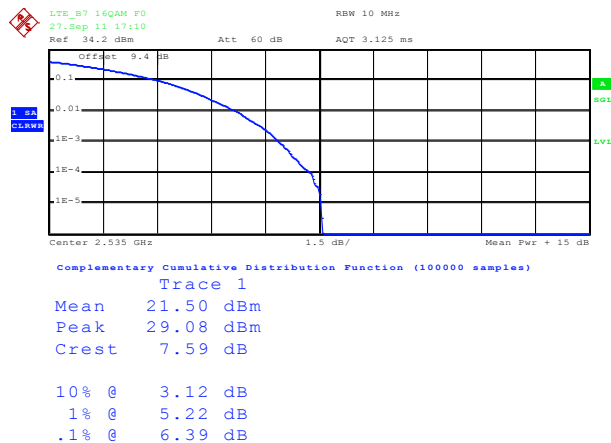
10.4.1.3 LTE peak to average ratio, QPSK Band7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB



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10.4.1.4 LTE peak to average ratio, 16QAM Band7, Mid channel, 2535.0 MHz, 10MHz BW, 50RB



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