MC7700 Modem

Test Report

FOR

FCC and IC Certifications

IC: 2417C-MC7700
FCC ID: N7NMC7700

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1 Introduction and Purpose

This document provides test data for the MC7700 modem output power intended for FCC and Industry Canada certifications.

2 Test Summary

FCC Rule	IC Standards	DESCRIPTION OF TEST	RESULT	PAGE
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2.1049, 24.238(a)(b), 27.53(h)	RSS-Gen, 4.6	Occupied Bandwidth	Complies	16
2.1051, 22.901(d) 22.917, 24.238(a), 27.53(h)	RSS-132, 4.5 RSS-133, 6.5	Out of Band Emissions at Antenna Terminals	Complies	45
FCC Part 22(h)/24(e)/27.54(h)	RSS-Gen, 4.6	Block Edge Compliance	Complies	86
2.1055, 22.355, 24.235, 27.54	RSS-132, 4.3 RSS-133, 6.3	Frequency Stability versus Temperature	Complies	98
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24.232(d), 27.50(d)		Peak to Average Ratio	Complies	103

3 Description of Equipment under Test

The MC7700 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 17 and Band 4 are used, so this test report only contains data for these four bands (850MHz, 1900MHz, 700MHz Band 17, and 1700MHz Band 4).

4 RF Power Output

FCC 2.1046, 27.53(h)

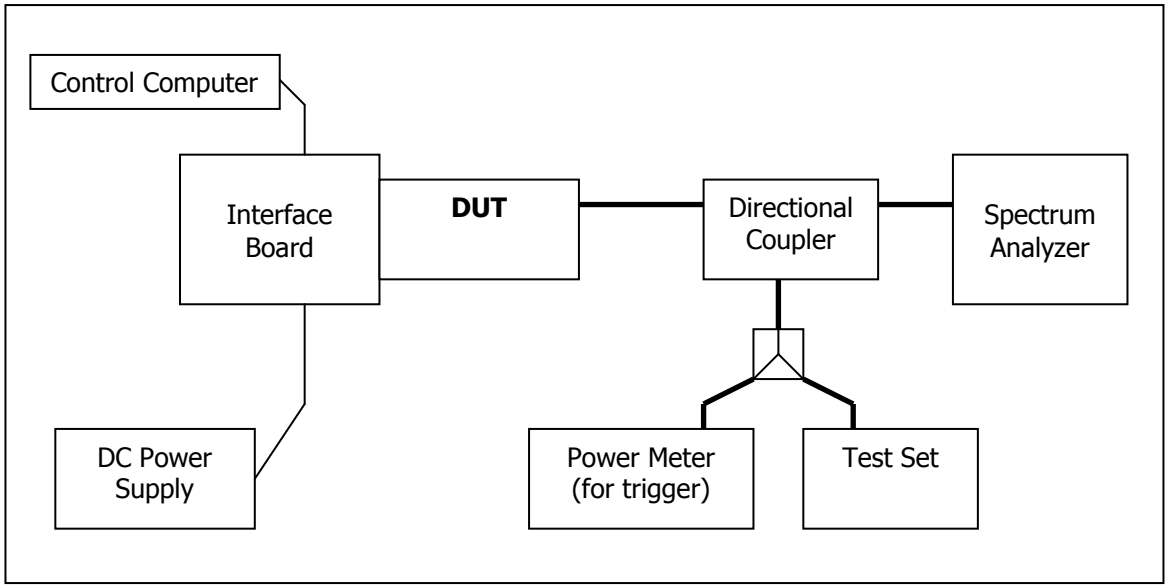
4.1 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
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 5MHz 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 MC7700 module.
- Measure the power at the MC7700 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 look 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 Sebtest1 according to Table 4.2
- Send continuously Up power control commands to the MC7700 module
- Measure the power at the MC7700 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 MC7700 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 MC7700 module is equal to the target E-TFCI in Table 4.2. If the E-TFCI transmitted by the MC7700 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

- 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	
Subtest	Mode	Loopback Mode	Rel99 RMC	HDPA FRC	HSUPA Test	βc	βd	CM	MPR	Power Class 3 limit (dBm)	ΔACK	ΔNAK	ΔCQI	ACK-NAK repetition factor	CQI Feedback (Table 5.2B.4)	CQI Repetition Factor (Table 5.2B.4)	Ahs = βhs/βc	Δ E-DPCCH	ΔHARQ	AG Index	ERFCI (from 34.121 Table C.11.1.3)	Associated Max UL Data Rate kbps
1	Rel99	Testmode 1	12.2kbps	-	-			-		24 (+1.7/-3.7 dB)												
1	Rel6 HSDPA	Testmode 1	12.2kbps	H-Set 1	-	2/15	15/15	0	0	24 (+1.7/-3.7 dB)	8	8	8	3	4 ms	2	30/15					
2	Rel6 HSDPA	Testmode 1	12.2kbps	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	Testmode 1	12.2kbps	H-Set 1	-	15/15	8/15	1.5	0.5	23.5 (+2.2/-3.7 dB)	8	8	8	3	4 ms	2	30/15					
4	Rel6 HSDPA	Testmode 1	12.2kbps	H-Set 1	-	15/15	4/15	1.5	0.5	23.5 (+2.2/-3.7 dB)	8	8	8	3	4 ms	2	30/15					
1	Rel6 HSUPA	Testmode 1	12.2kbps	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	Testmode 1	12.2kbps	H-Set 1	HSUPA Loopback	6/15	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	Testmode 1	12.2kbps	H-Set 1	HSUPA Loopback	15/15	9/15	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	Testmode 1	12.2kbps	H-Set 1	HSUPA Loopback	2/15	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	Testmode 1	12.2kbps	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

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 (rhoB/rhoA: 1)
- Active TPC Setup: Max Power
- Security Settings: Authentication OFF, NAS Security OFF, AS Security OFF
- Integrity Algortithm: 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 MC7700 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
			Peak Power (dBm)	Peak Power (dBm)	Peak Power (dBm)	Peak Power (dBm)
GSM850	824.2	128	32.39	32.25	MC7700 is Class 10 for GMSK Mode.	
	836.6	190	32.34	32.21		
	848.8	251	32.24	32.13		
GSM1900	1850.2	512	29.66	29.59		

	1880	661	29.53	29.44	
	1909.8	810	29.56	29.47	

Note: All measurements are based on peak detector.

Band	Frequency (MHz)	Channel	8PSK Mode (MCS9)			
			1 Time Slot	2Time Slots	3Time Slots	4Time Slots
			Peak Power (dBm)	Peak Power (dBm)	Peak Power (dBm)	Peak Power (dBm)
GSM850	824.2	128	28.50	28.45	28.38	28.40
	836.6	190	28.50	28.41	28.43	28.35
	848.8	251	28.55	28.50	28.49	28.39
GSM1900	1850.2	512	28.71	28.64	28.54	28.47
	1880	661	28.52	28.38	28.32	28.31
	1909.8	810	28.45	28.43	28.32	28.27

Note: All measurements are based on peak detector.

4.3.2 Test Results for WCDMA/HSDPA/HSUPA Output Power

		Band V (800 MHz) Channel Power (dBm)			Band II (1900 MHz) Channel Power (dBm)			
Mode	3GPP Subtest	4132	4182	4233	9262	9400	9538	MPR
Rel99	1	24.22	24.42	24.46	24.51	24.82	24.67	N/A
Rel6 HSDPA	1	23.71	23.89	24.13	24.56	24.24	24.45	0
	2	23.98	24.04	24.20	23.83	24.6	24.43	0
	3	23.10	23.42	23.63	24.54	24.04	23.77	0.5
	4	22.36	23.41	23.04	24.45	23.93	23.89	0.5
Rel6 HSUPA	1	23.18	23.83	23.59	23.20	23.69	23.37	0
	2	22.36	22.57	22.89	23.86	23.21	22.98	2
	3	23.12	23.29	23.26	23.27	23.62	23.28	1
	4	22.99	23.01	23.30	23.99	23.82	23.70	2
	5	23.77	23.63	23.68	23.91	24.02	23.79	0

Note: All measurements are based on an average detector.

4.3.3 Test Results for LTE Output Power

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. The limits for these power levels can be found in Table 6.2.3.5-1 (UE Power Class Test Requirements) of 3GPP 36.521. The highlighted columns represent the bandwidths supported by MC7700.

Modulation	**Channel Bandwidth/Transmission Bandwidth Configuration (RB)**						**MPR (dB)**
	1.4MHz	3.0MHz	5.0MHz	10MHz	15MHz	20MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

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	24.20	29.16	0
			1	25	24.02	29.36	0
			1	49	24.38	29.61	0
			12	0	23.95	29.34	0
			12	19	23.82	29.46	0
			12	38	23.87	29.71	0
			25	0	23.03	28.99	1
			25	12	22.97	28.97	1
			25	25	22.87	28.87	1
			50	0	22.85	29.63	1
		16QAM	1	0	23.19	28.64	1
			1	25	23.09	29.03	1
			1	49	23.1	29.15	1
			12	0	22.88	29.08	1
			12	19	22.83	29.17	1
			12	38	22.87	29.22	1
			25	0	22.11	29.15	2
			25	12	22.07	29.36	2
			25	25	22.05	29.4	2
			50	0	22.03	29.54	2
1732.5	20175	QPSK	1	0	24.19	29.51	0
			1	25	24.26	29.55	0
			1	49	24.12	29.36	0
			12	0	23.92	29.62	0
			12	19	23.96	29.67	0
			12	38	23.83	29.62	0
			25	0	23.04	29.18	1
			25	12	23.09	29.23	1

			25	25	23.00	29.00	1
			50	0	23.02	29.64	1
		16QAM	1	0	23.23	29.24	1
			1	25	23.12	29.21	1
			1	49	23.38	29.15	1
			12	0	22.81	29.3	1
			12	19	22.95	29.33	1
			12	38	22.76	29.18	1
			25	0	22.16	29.41	2
			25	12	22.22	29.53	2
			25	25	22.12	29.56	2
			50	0	22.17	29.62	2
1750.0	20350	QPSK	1	0	24.04	28.68	0
			1	25	24.02	28.54	0
			1	49	23.85	28.64	0
			12	0	23.78	28.77	0
			12	19	23.71	28.60	0
			12	38	23.62	28.72	0
			25	0	22.81	28.49	1
			25	12	22.85	28.45	1
			25	25	22.73	28.33	1
			50	0	22.74	28.72	1
		16QAM	1	0	23.16	28.48	1
			1	25	23.64	28.52	1
			1	49	23.15	28.56	1
			12	0	22.65	28.57	1
			12	19	22.62	28.36	1
			12	38	22.57	28.34	1
			25	0	21.95	28.73	2
			25	12	21.95	28.56	2
			25	25	21.88	28.66	2
			50	0	21.93	28.69	2

4.3.3.2 Output Power Results for LTE Band 4, 5 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
1712.5	19975	QPSK	1	0	24.16	28.79	0
			1	25	24.19	28.87	0
			1	49	24.13	29.02	0
			12	0	23.90	29.01	0
			12	19	23.90	28.96	0

			12	38	23.71	28.98	0
			25	0	22.97	29.08	1
			25	12	22.95	28.92	1
			25	25	22.88	29.00	1
			50	0	22.97	28.78	1
		16QAM	1	0	23.33	28.72	1
			1	25	22.93	28.79	1
			1	49	22.74	28.91	1
			12	0	23.17	29.32	1
			12	19	23.22	29.31	1
			12	38	23.08	29.54	1
			25	0	21.86	28.53	2
			25	12	21.85	28.53	2
			25	25	21.84	28.72	2
			50	0	22.15	29.74	2
1732.5	20175	QPSK	1	0	24.29	29.15	0
			1	25	24.42	29.18	0
			1	49	24.25	29.12	0
			12	0	23.91	29.23	0
			12	19	23.91	29.09	0
			12	38	23.87	29.23	0
			25	0	23.02	29.44	1
			25	12	23.07	29.21	1
			25	25	22.96	29.32	1
			50	0	23.04	28.70	1
		16QAM	1	0	23.56	29.41	1
			1	25	23.23	29.02	1
			1	49	23.71	29.4	1
			12	0	23.24	29.91	1
			12	19	23.32	29.77	1
			12	38	23.21	29.77	1
			25	0	21.98	28.75	2
			25	12	21.95	28.83	2
			25	25	21.86	28.56	2
			50	0	22.23	29.98	2
1752.5	20375	QPSK	1	0	24.01	28.33	0
			1	25	23.90	28.20	0
			1	49	23.91	28.36	0
			12	0	23.56	28.36	0
			12	19	23.59	28.25	0
			12	38	23.55	28.44	0
			25	0	22.64	28.59	1
			25	12	22.70	28.32	1
			25	25	22.68	28.59	1
			50	0	22.72	28.14	1

		16QAM	1	0	22.9	28.39	1
			1	25	23.04	28.19	1
			1	49	22.88	28.42	1
			12	0	22.88	28.85	1
			12	19	22.91	28.71	1
			12	38	22.91	28.85	1
			25	0	21.57	28.01	2
			25	12	21.56	28.05	2
			25	25	21.58	28.07	2
			50	0	21.85	29.13	2

4.3.3.3 Output Power Results for LTE Band 17, 10 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
710.0	23790	QPSK	1	0	23.95	29.35	0
			1	25	23.75	29.08	0
			1	49	23.79	29.08	0
			12	0	23.80	29.47	0
			12	19	23.78	29.23	0
			12	38	23.22	29.31	0
			25	0	22.85	28.99	1
			25	12	22.79	29.18	1
			25	25	22.59	29.05	1
			50	0	22.73	29.49	1
		16QAM	1	0	22.77	28.95	1
			1	25	22.63	29.05	1
			1	49	22.52	28.87	1
			12	0	22.69	29.31	1
			12	19	22.7	29.16	1
			12	38	22.63	29.26	1
			25	0	21.93	29.36	2
			25	12	21.98	29.41	2
			25	25	21.74	29.36	2
			50	0	21.74	28.95	2

4.3.3.4 Output Power Results for LTE Band 17, 5 MHz Bandwidth

FREQUENCY (MHz)	UL CHANNEL	MODULATION	UL NO RB	RB START	MAX POWER (RMS)	MAX POWER (PK)	MPR (dB)
706.5	23755	QPSK	1	0	23.94	28.98	0
			1	25	23.98	28.99	0
			1	49	23.99	28.85	0

			12	0	23.70	29.13	0
			12	19	23.80	29.04	0
			12	38	23.72	29.08	0
			25	0	22.85	29.14	1
			25	12	22.87	29.36	1
			25	25	22.88	29.18	1
			50	0	22.77	28.61	1
		16QAM	1	0	22.72	29.02	1
			1	25	22.9	28.85	1
			1	49	23.12	29.28	1
			12	0	22.92	29.45	1
			12	19	23.08	29.4	1
			12	38	23.01	29.57	1
			25	0	21.67	28.71	2
			25	12	21.65	28.65	2
			25	25	21.67	28.73	2
			50	0	21.85	29.02	2
710.0	23790	QPSK	1	0	24.08	29.04	0
			1	25	23.80	28.90	0
			1	49	23.73	28.94	0
			12	0	23.84	29.19	0
			12	19	23.13	28.78	0
			12	38	23.66	29.11	0
			25	0	22.94	29.28	1
			25	12	22.81	29.30	1
			25	25	22.84	29.27	1
			50	0	22.88	28.98	1
		16QAM	1	0	22.56	28.27	1
			1	25	23.47	29.26	1
			1	49	22.88	29.22	1
			12	0	23.12	29.45	1
			12	19	23.13	29.34	1
			12	38	23	29.6	1
			25	0	21.69	28.63	2
			25	12	21.7	28.73	2
			25	25	21.62	28.84	2
			50	0	21.91	29.74	2
713.5	23825	QPSK	1	0	24.03	29.02	0
			1	25	23.97	28.99	0
			1	49	23.77	28.73	0
			12	0	23.17	29.08	0
			12	19	23.69	28.94	0
			12	38	23.63	29.01	0
			25	0	22.73	29.25	1
			25	12	22.90	29.31	1

			25	25	22.86	29.23	1
			50	0	22.82	28.94	1
		16QAM	1	0	22.99	29.17	1
			1	25	23.02	28.97	1
			1	49	21.99	25.89	1
			12	0	22.94	29.52	1
			12	19	22.99	29.34	1
			12	38	23.01	29.54	1
			25	0	21.5	28.78	2
			25	12	21.68	28.79	2
			25	25	21.67	28.82	2
			50	0	21.93	29.76	2

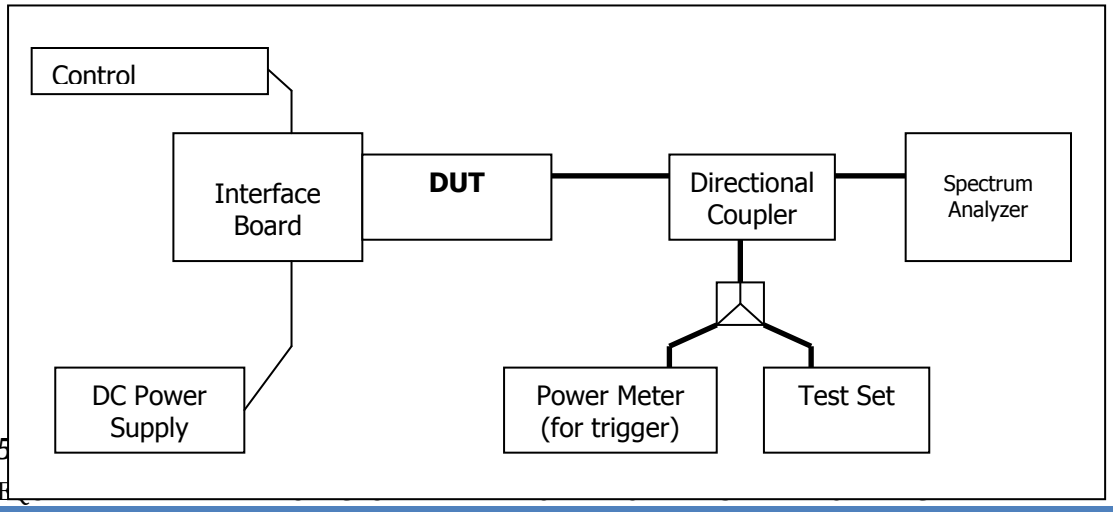
5 Occupied Bandwidth

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



5
R

Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
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

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)	250.60	Plot 5.3.4.1
		836.6	190 (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
		836.6	190 (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	4.1322	4.612	Plot 5.3.6.1
		836.4	4182	4.1233	4.610	Plot 5.3.6.2
		846.6	4233	4.1562	4.602	Plot 5.3.6.3
		1852.4	9262	4.1658	4.604	Plot 5.3.6.4
		1880	9400	4.1368	4.616	Plot 5.3.6.5
		1907.5	9538	4.1509	4.655	Plot 5.3.6.6

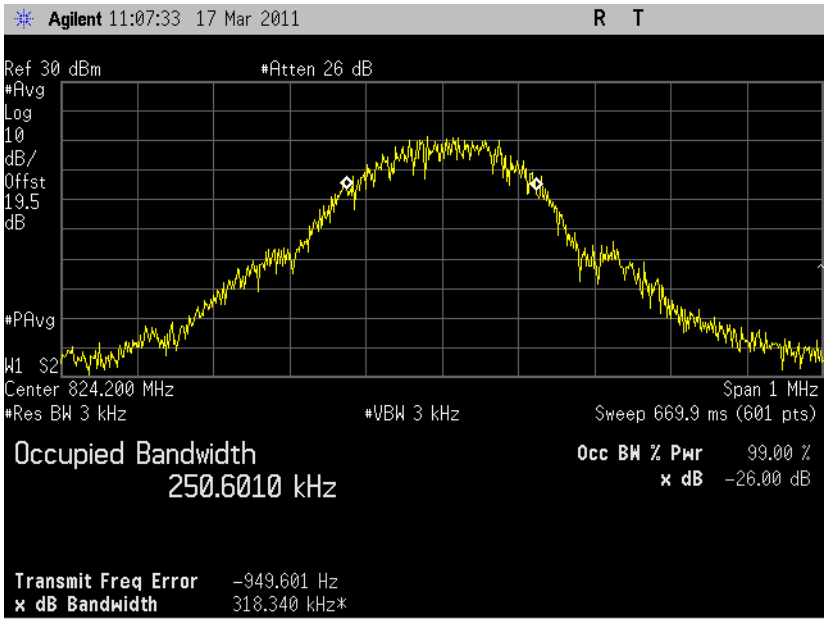
	HSUPA Rel 6 Subtest 5	826.4	4132	4.1425	4.606	Plot 5.3.7.1
		836.4	4182	4.1625	4.630	Plot 5.3.7.2
		846.6	4233	4.1724	4.601	Plot 5.3.7.3
		1852.4	9262	4.1281	4.609	Plot 5.3.7.4
		1880	9400	4.1408	4.615	Plot 5.3.7.5
		1907.5	9538	4.1451	4.629	Plot 5.3.7.6

5.3.3 LTE Summary Results

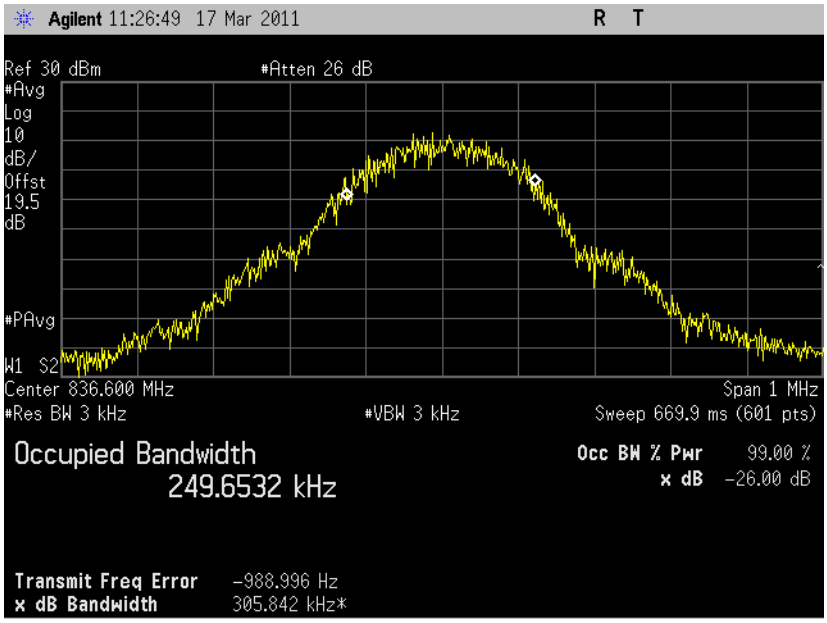
Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	-26dBc Occupied Bandwidth (MHz)	Corresponding Plot number
LTE	QPSK	B17	5	1	0	706.5	23755	0.3120	0.3988	Plot 5.3.8.1
				1	24	713.5	23825	0.3084	0.3993	Plot 5.3.8.2
				25	0	706.5	23755	4.5281	4.957	Plot 5.3.8.3
						710.0	23790	4.5281	4.944	Plot 5.3.8.4
						713.5	23825	4.5171	4.937	Plot 5.3.8.5
			10	50	0	710.0	23790	8.9431	9.444	Plot 5.3.8.6
		B4	5	1	0	1712.5	19975	0.2994	0.3950	Plot 5.3.8.13
				1	24	1752.5	20375	0.3059	0.3989	Plot 5.3.8.14
				25	0	1712.5	19975	4.5313	4.937	Plot 5.3.8.15
						1732.5	20175	4.5413	4.955	Plot 5.3.8.16
						1752.5	20375	4.5253	4.939	Plot 5.3.8.17
			10	50	0	1715.0	20000	8.9261	9.447	Plot 5.3.8.23
						1732.5	20175	8.9237	9.442	Plot 5.3.8.24
						1750.0	20350	8.9304	9.435	Plot 5.3.8.25
	16QAM	B17	5	1	0	706.5	23755	0.2993	0.3871	Plot 5.3.8.7
				1	24	713.5	23825	0.3135	0.4040	Plot 5.3.8.8
				25	0	706.5	23755	4.5329	4.954	Plot 5.3.8.9
						710.0	23790	4.5244	4.934	Plot 5.3.8.10
						713.5	23825	4.5336	4.964	Plot 5.3.8.11
			10	50	0	710.0	23790	8.9183	9.445	Plot 5.3.8.12
		B4	5	1	0	1712.5	19975	0.3031	0.3988	Plot 5.3.8.18
				1	24	1752.5	20375	0.3081	0.4029	Plot 5.3.8.19
				25	0	1712.5	19975	4.5258	4.929	Plot 5.3.8.20
						1732.5	20175	4.5408	4.945	Plot 5.3.8.21
						1752.5	20375	4.5318	4.931	Plot 5.3.8.22
			10	50	0	1715.0	20000	8.9194	9.436	Plot 5.3.8.26
						1732.5	20175	8.9214	9.452	Plot 5.3.8.27
						1750.0	20350	8.9236	9.444	Plot 5.3.8.28

5.3.4 GSM Test Plots

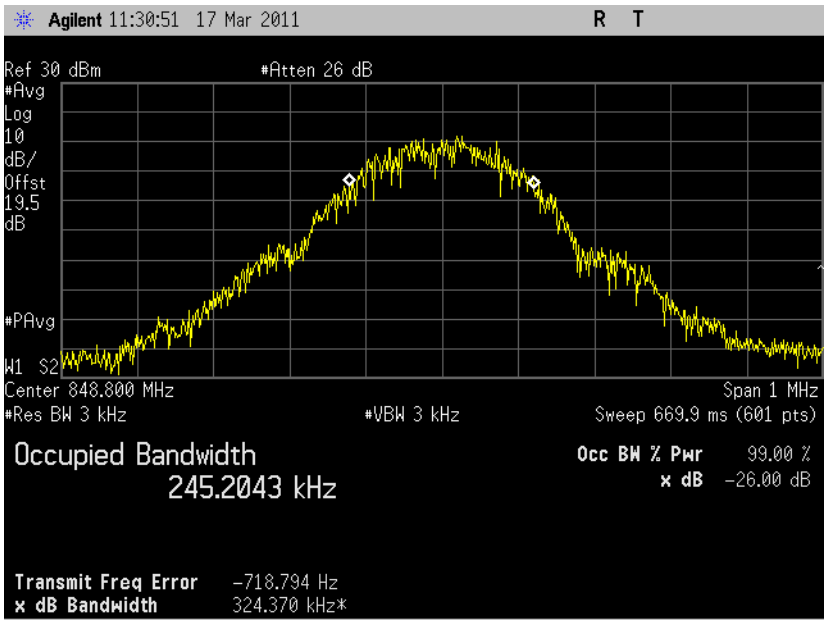
5.3.4.1 GMSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% BW



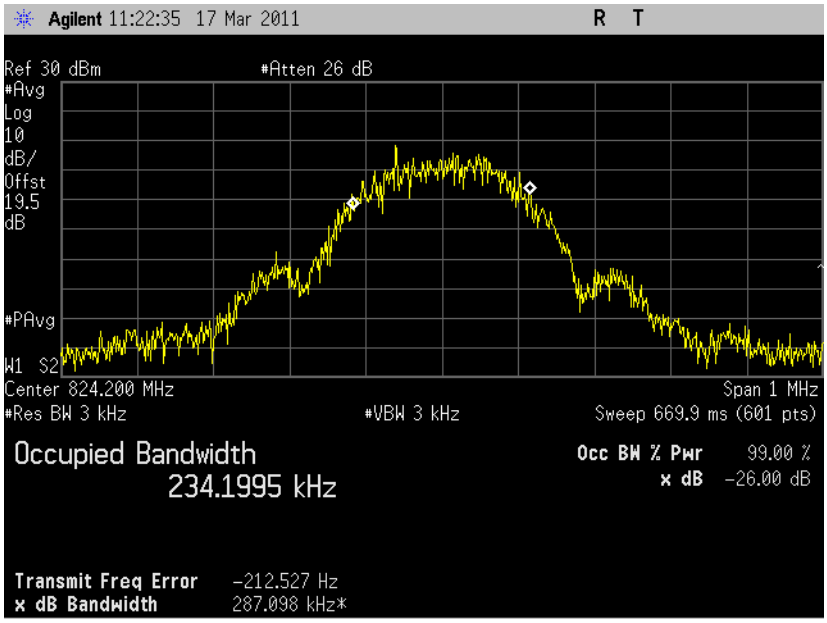
5.3.4.2 GMSK Occupied Bandwidth, Middle channel, 836.6 MHz, 99% bandwidth



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

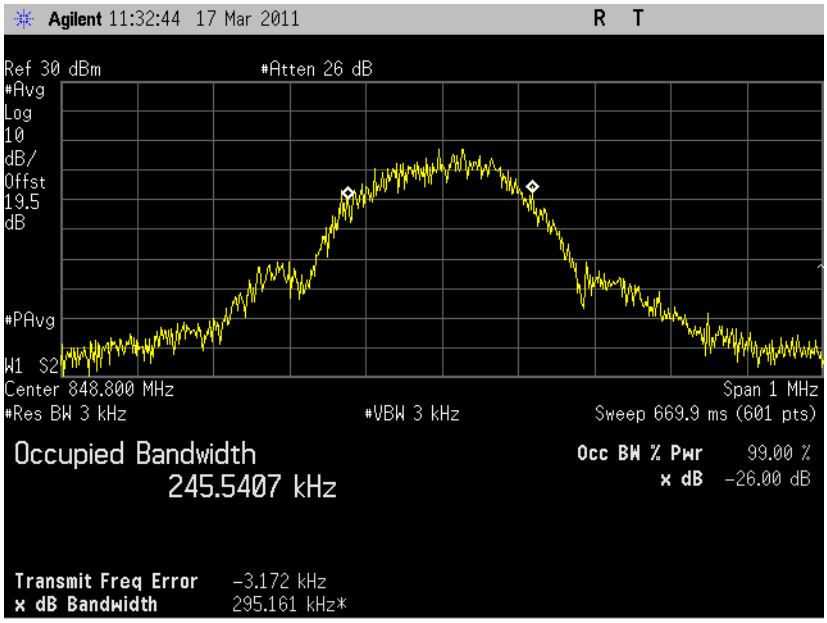


5.3.4.4 8-PSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% BW

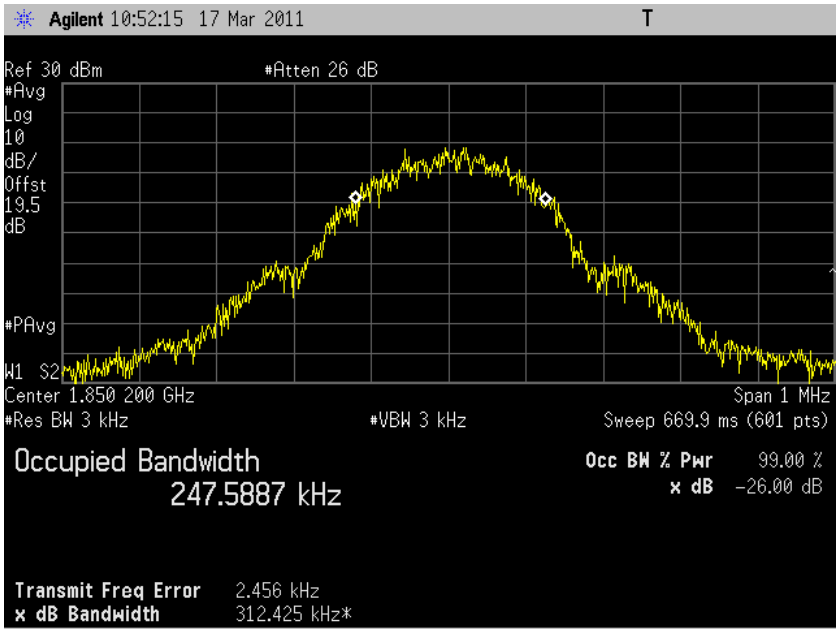


5.3.4.5 8-PSK Occupied Bandwidth, Middle channel, 836.6 MHz, 99% bandwidth

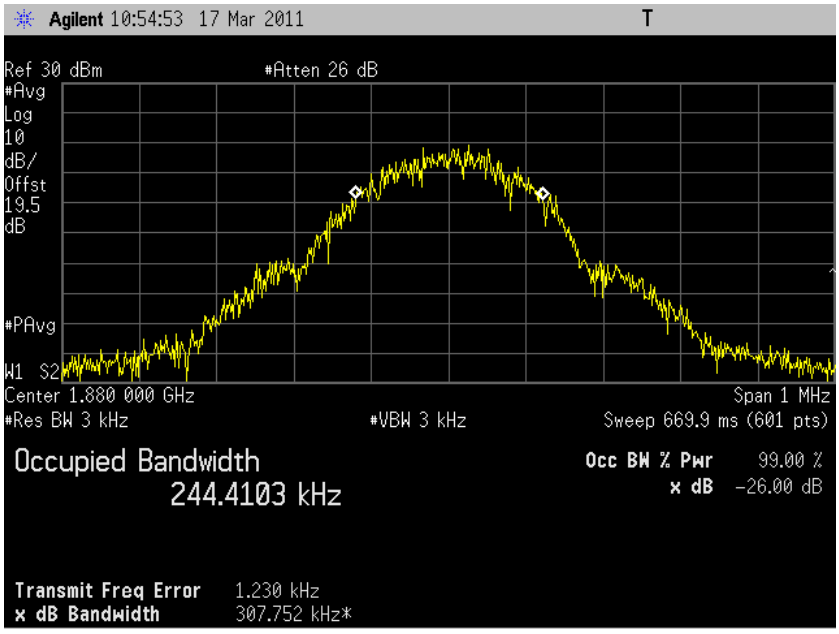
5.3.4.6 8-PSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth



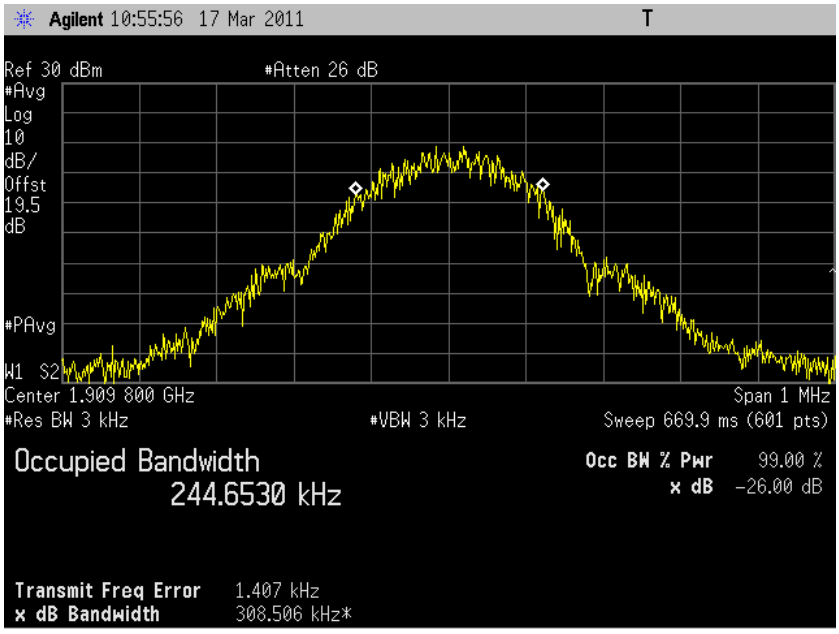
5.3.4.7 GMSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% BW



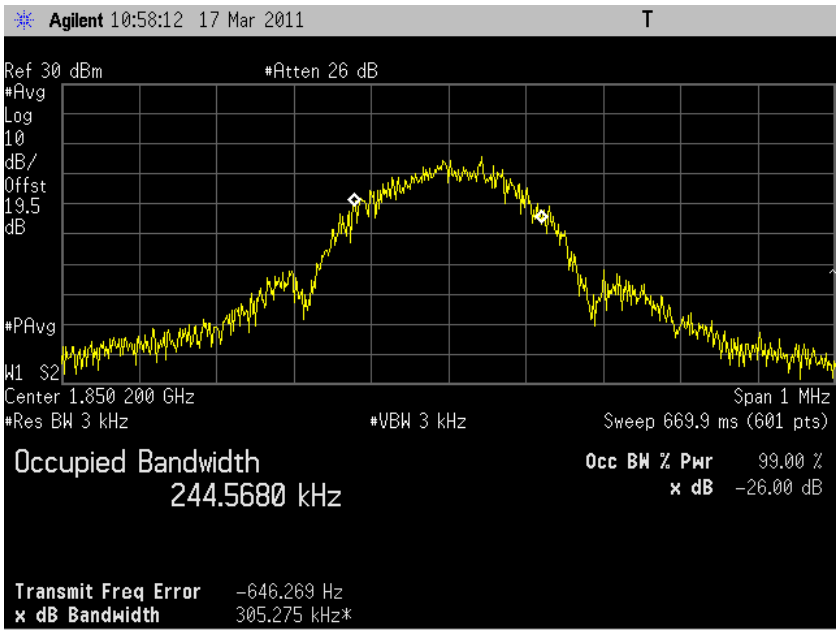
5.3.4.8 GMSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% BW



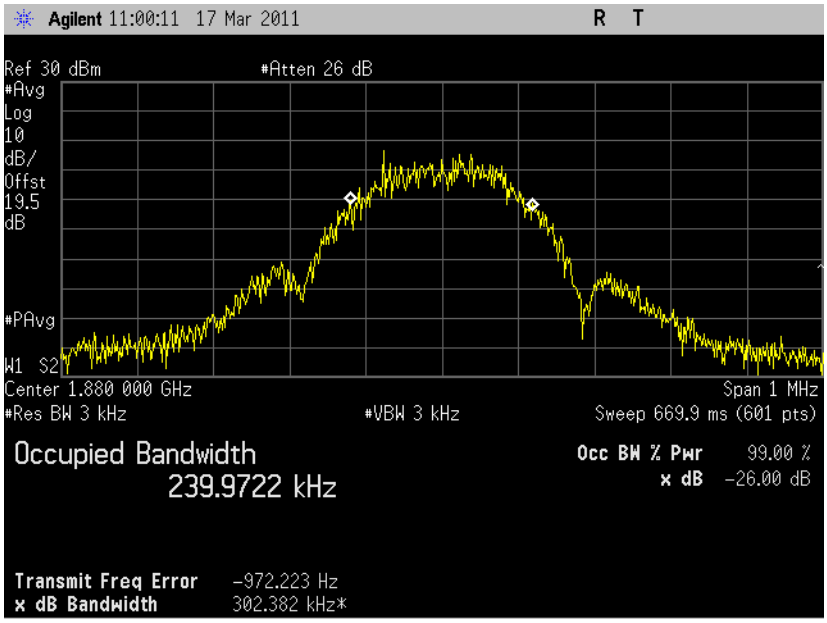
5.3.4.9 GMSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% BW



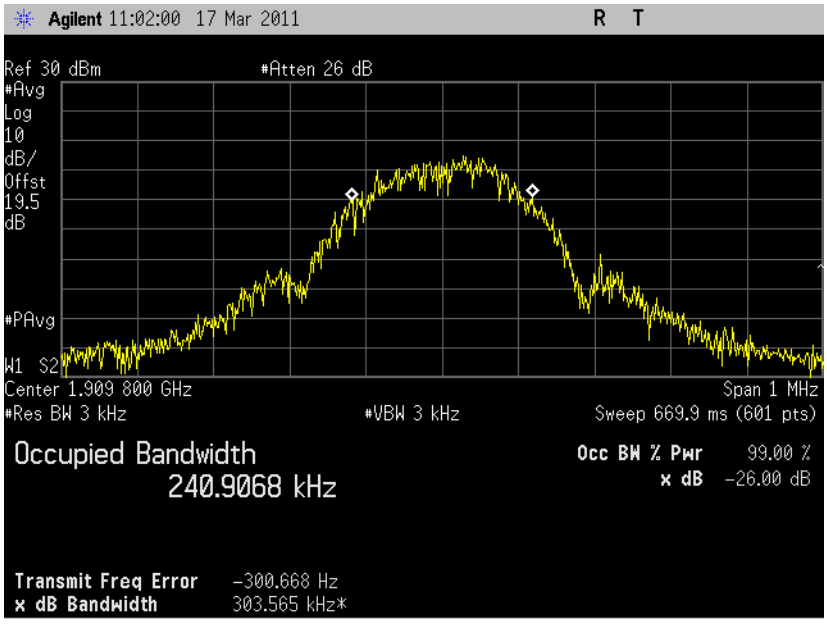
5.3.4.10 8-PSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% BW



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

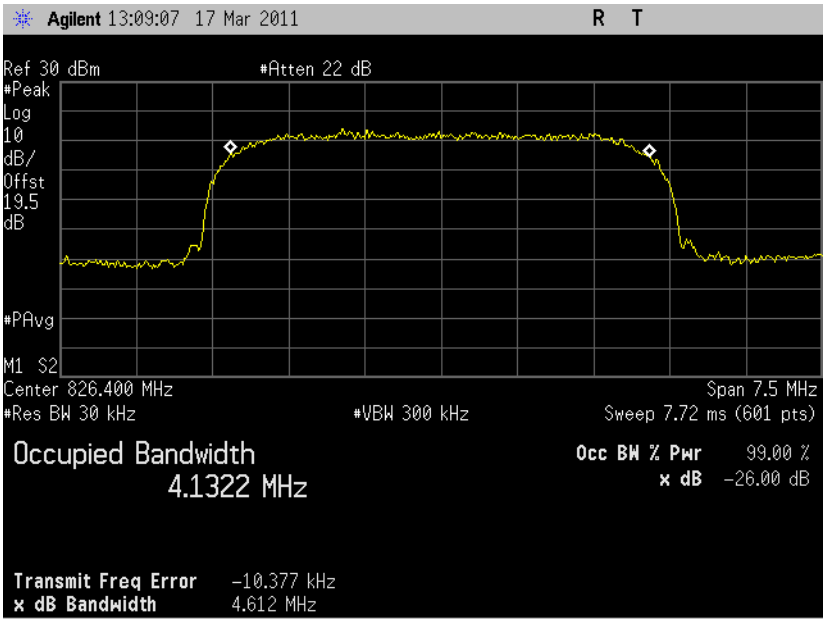


5.3.4.12 8-PSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% BW

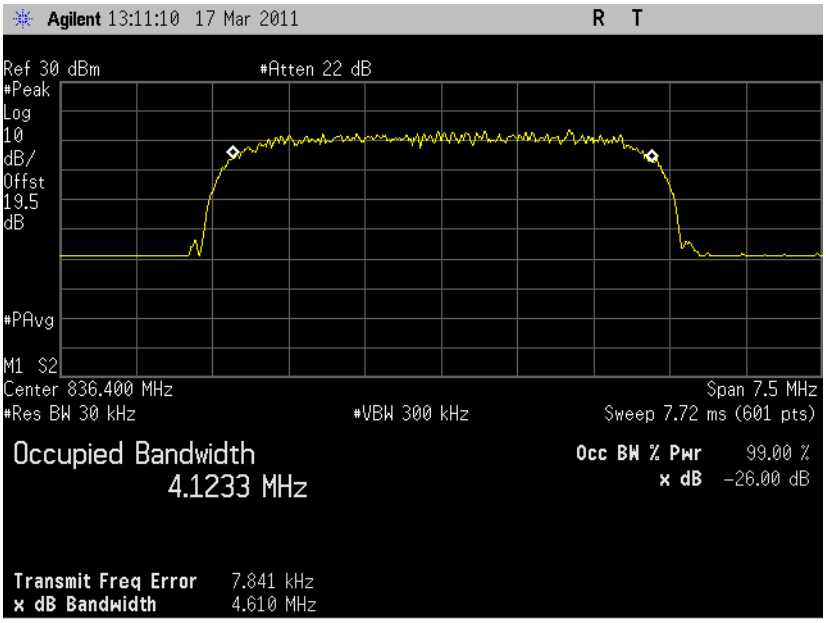


5.3.5 WCDMA Rel99 Test Plots

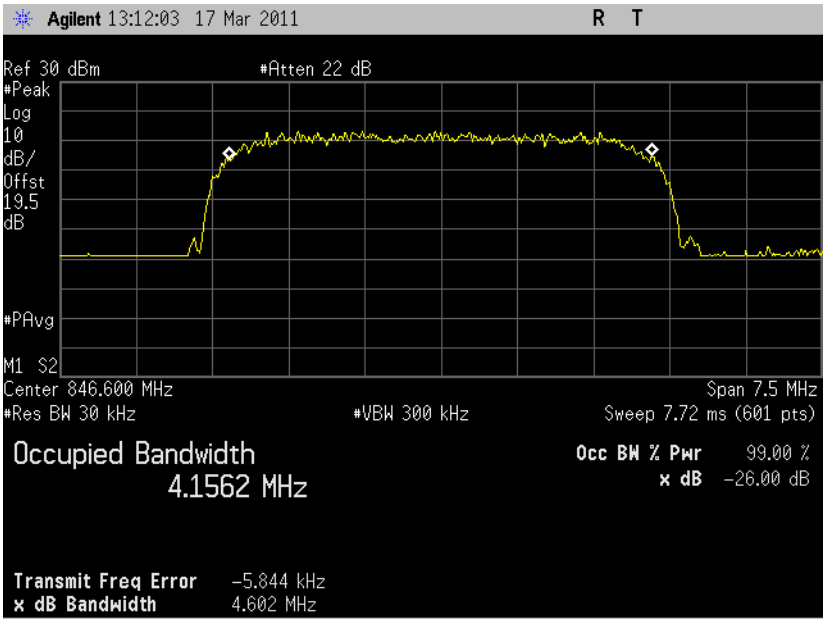
5.3.5.1 WCDMA Occupied Bandwidth, Cellular Low channel, 826.4 MHz, 99% BW



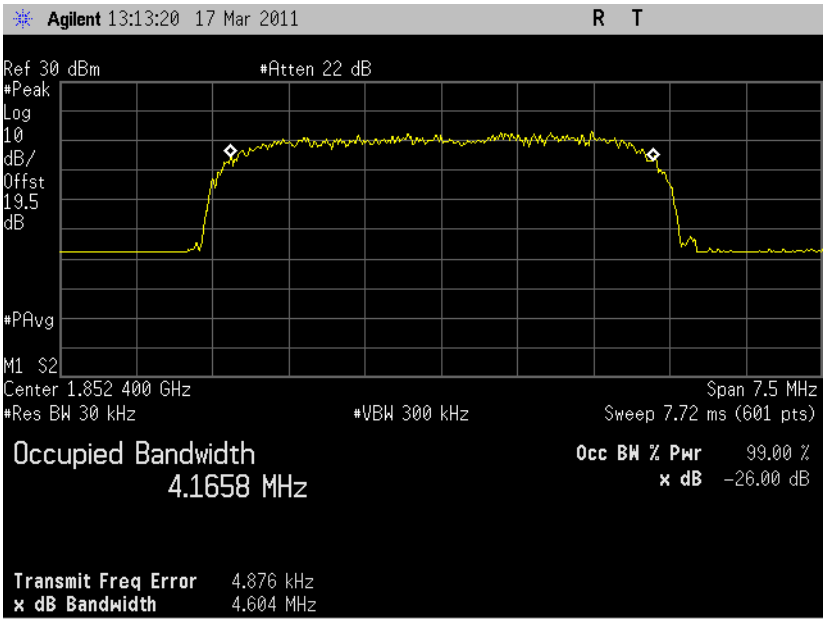
5.3.5.2 WCDMA Occupied Bandwidth, Cellular Middle channel, 836.4 MHz, 99% BW



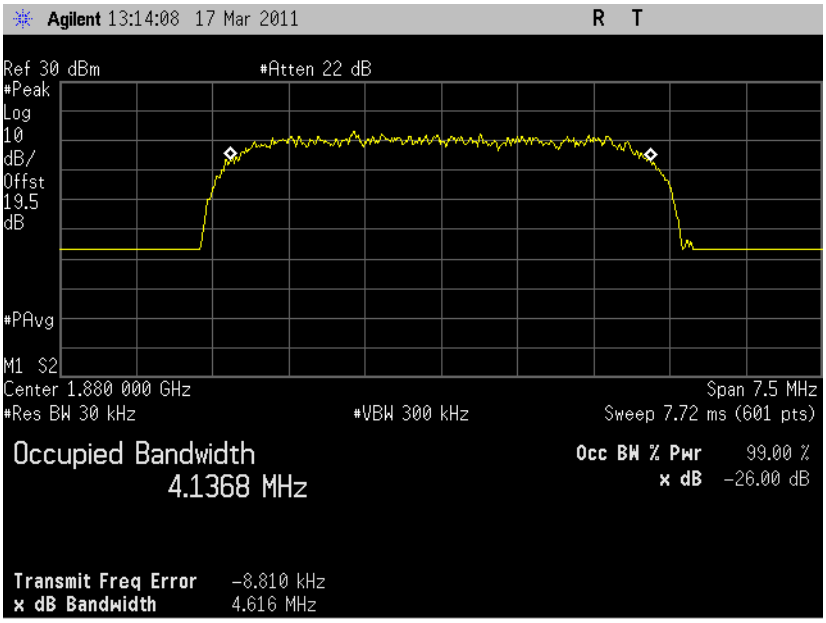
5.3.5.3 WCDMA Occupied Bandwidth, Cellular High channel, 846.6 MHz, 99% BW



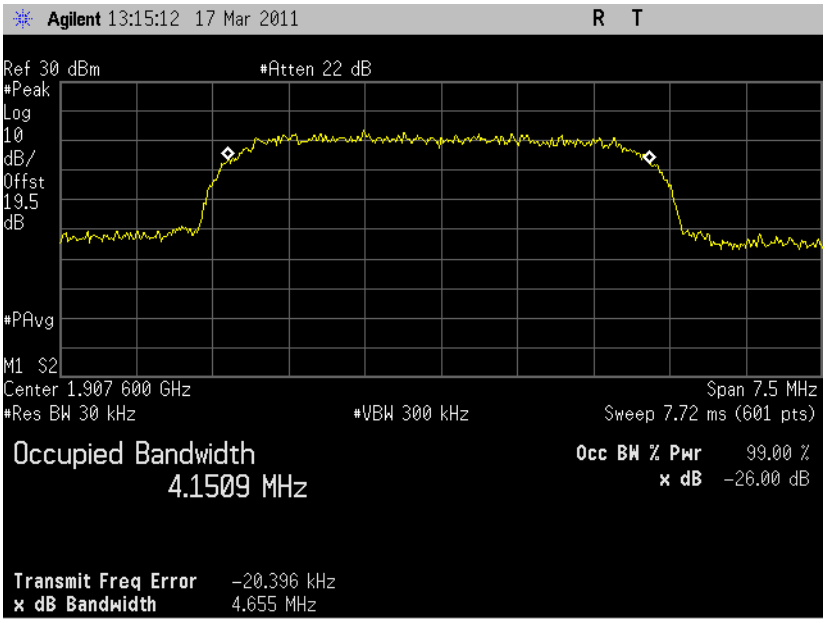
5.3.5.4 WCDMA Occupied Bandwidth, PCS Low channel, 1852.4 MHz, 99% BW



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

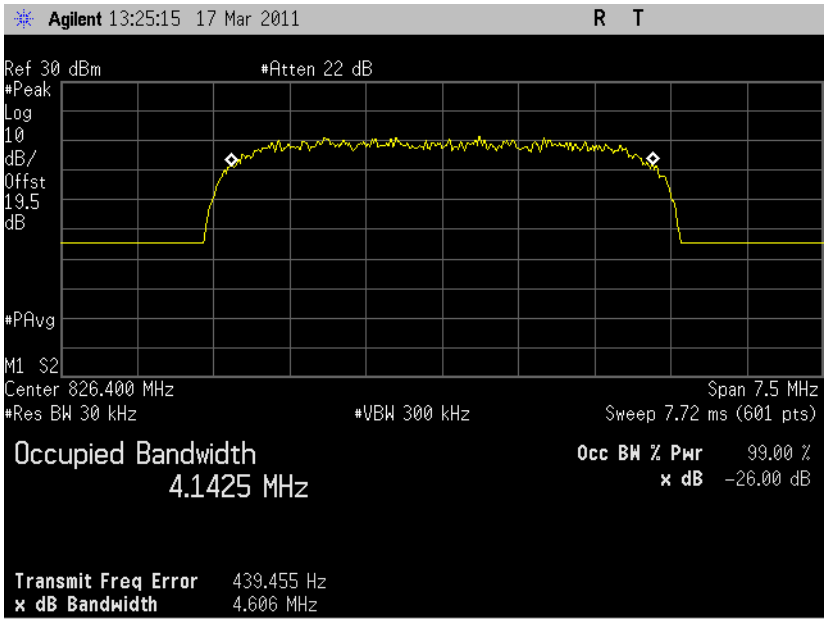


5.3.5.6 WCDMA Occupied Bandwidth, PCS High channel, 1907.6 MHz, 99% BW

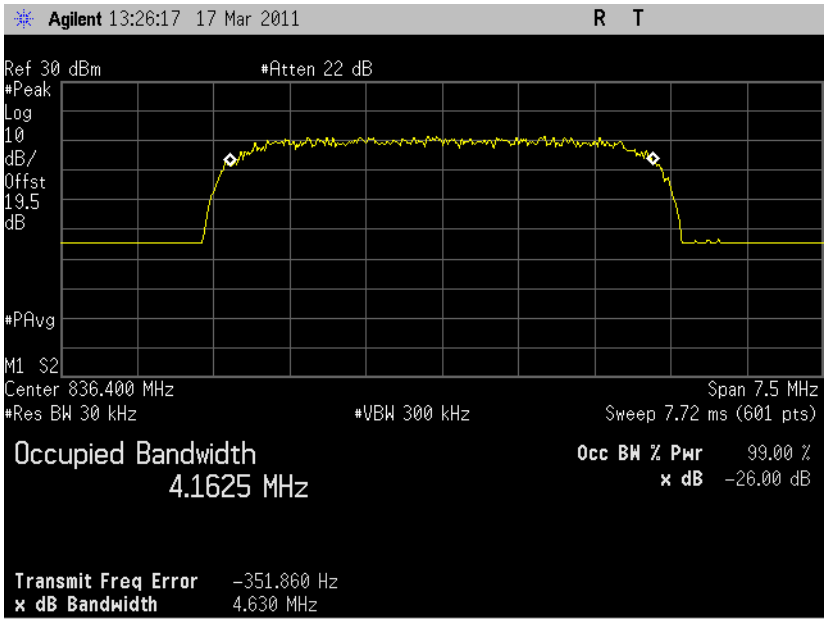


5.3.6 HSUPA Rel6 (Subtest 5) Test Plots

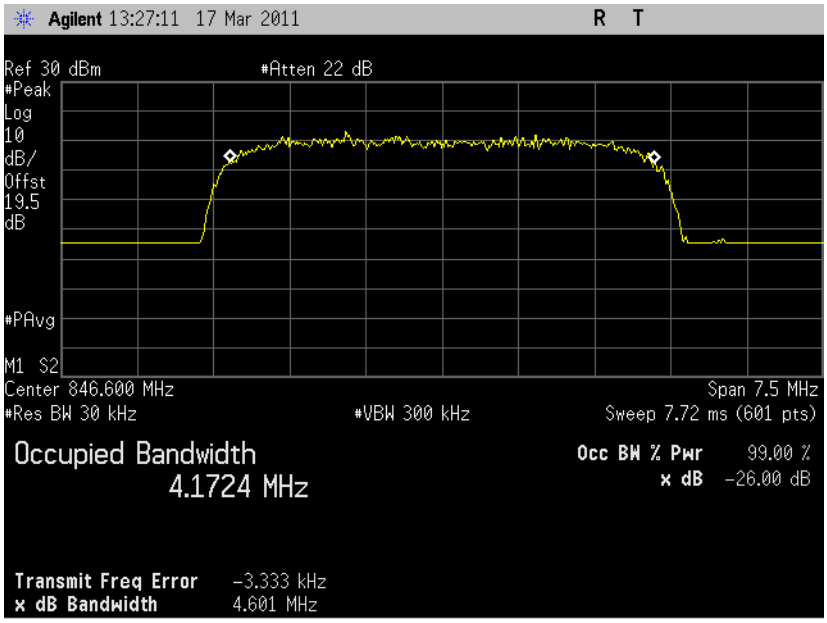
5.3.6.1 HSUPA Occupied Bandwidth, Cellular Low channel, 826.4 MHz, 99% BW



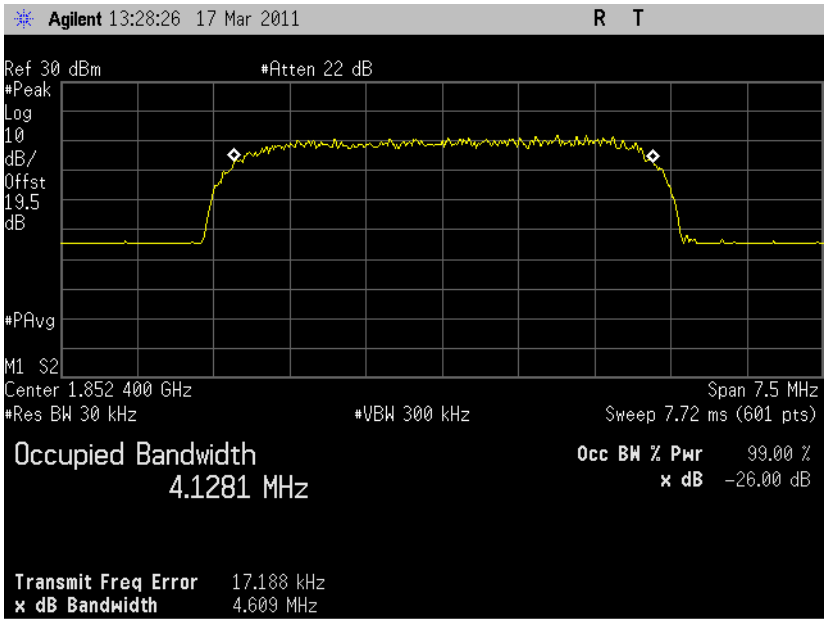
5.3.6.2 HSUPA Occupied Bandwidth, Cellular Middle channel, 836.4 MHz, 99% BW



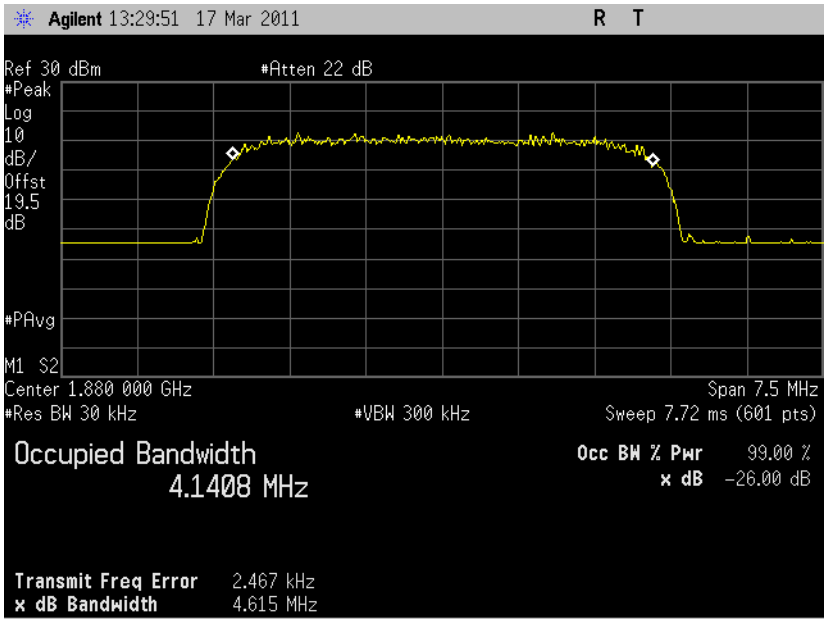
5.3.6.3 HSUPA Occupied Bandwidth, Cellular High channel, 846.6 MHz, 99% BW



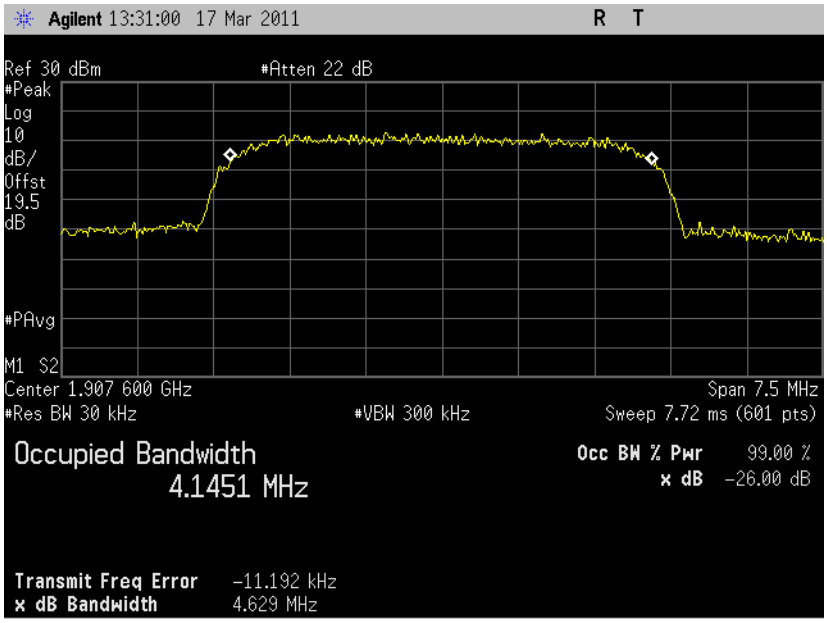
5.3.6.4 HSUPA Occupied Bandwidth, PCS Low channel, 1852.4 MHz, 99% BW



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

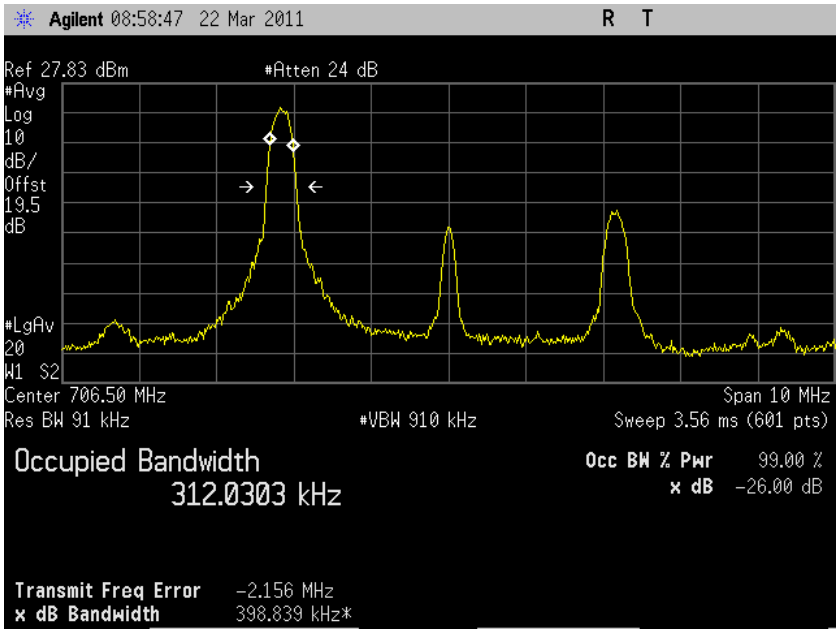


5.3.6.6 HSUPA Occupied Bandwidth, PCS High channel, 1907.6 MHz, 99% BW

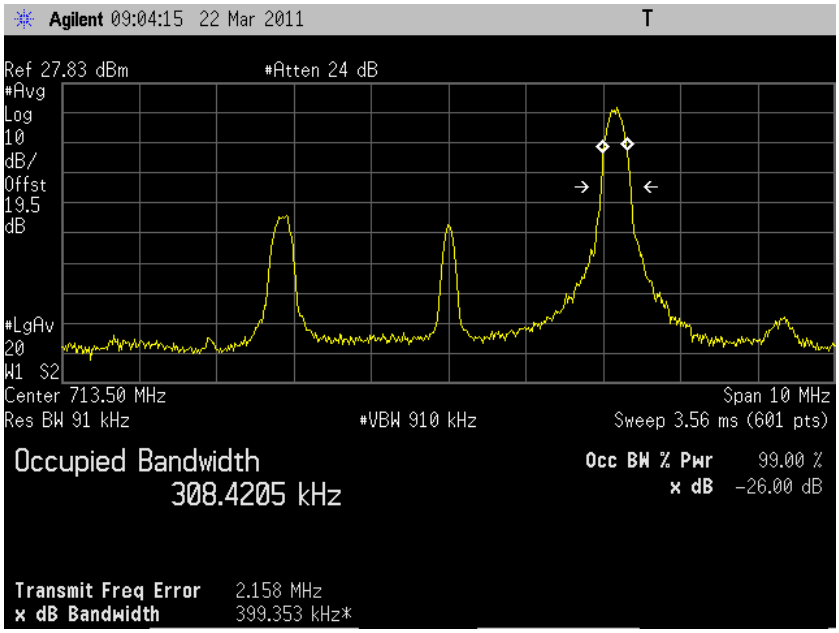


5.3.7 LTE Test Plots

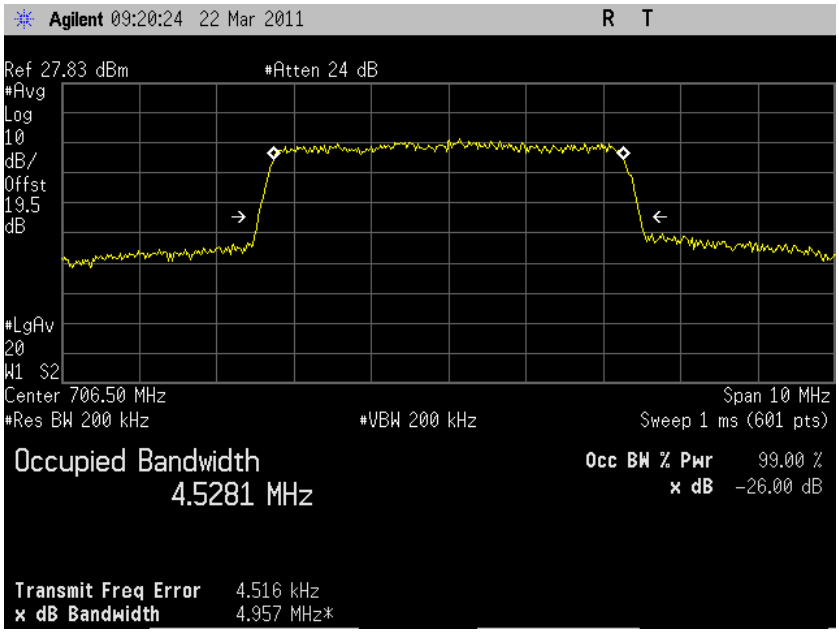
5.3.7.1 LTE Occupied Bandwidth, Band17 low channel (23755) BW=5MHz RB=1 RB Offset=0 QPSK 99% BW



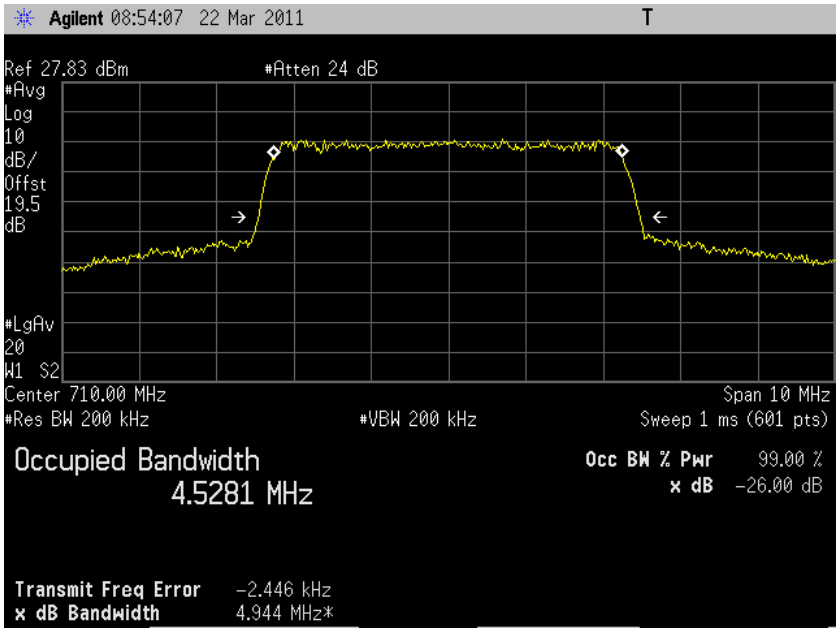
5.3.7.2 LTE Occupied Bandwidth, Band17 high channel (23825) BW=5MHz RB=1 RB Offset=24 QPSK 99% BW



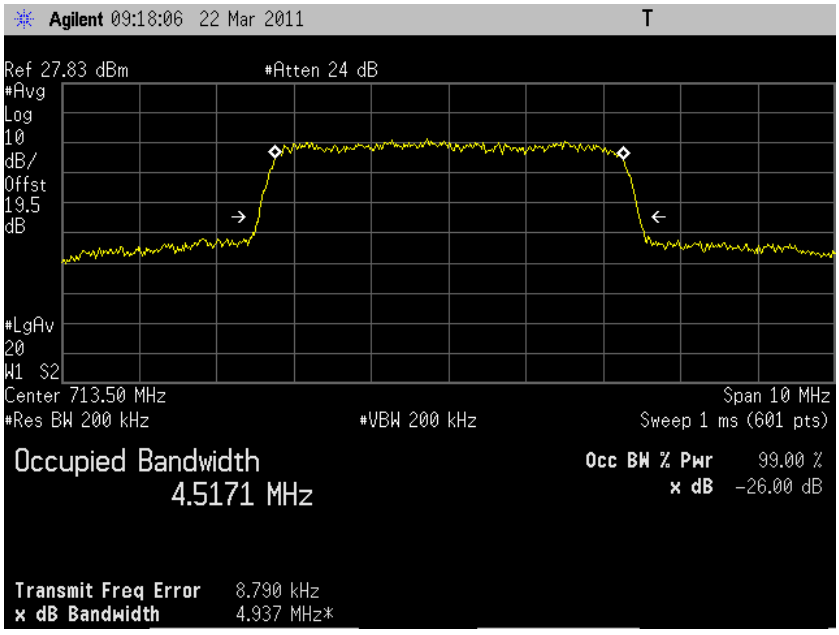
5.3.7.3 LTE Occupied Bandwidth, Band17 low channel (23755) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



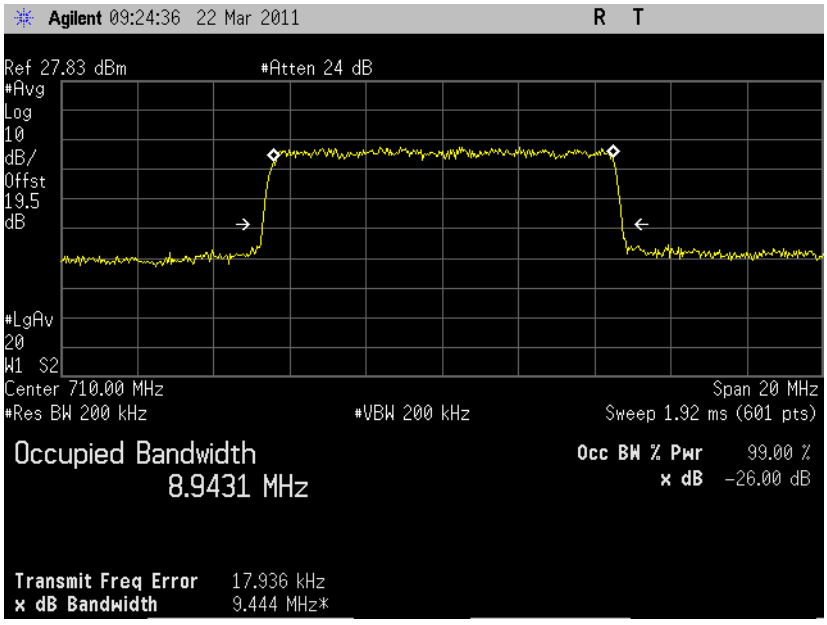
5.3.7.4 LTE Occupied Bandwidth, Band17 mid channel (23790) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



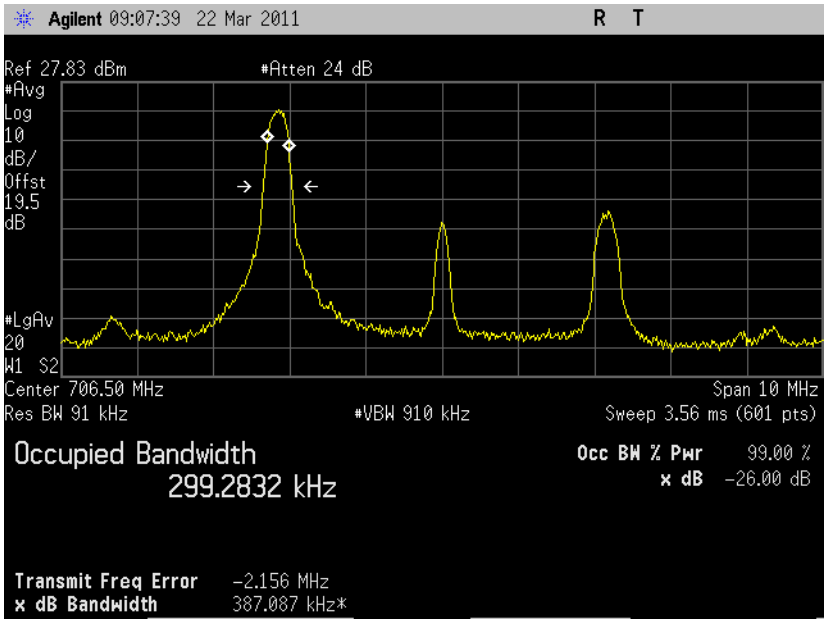
5.3.7.5 LTE Occupied Bandwidth, Band17 high channel (23825) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



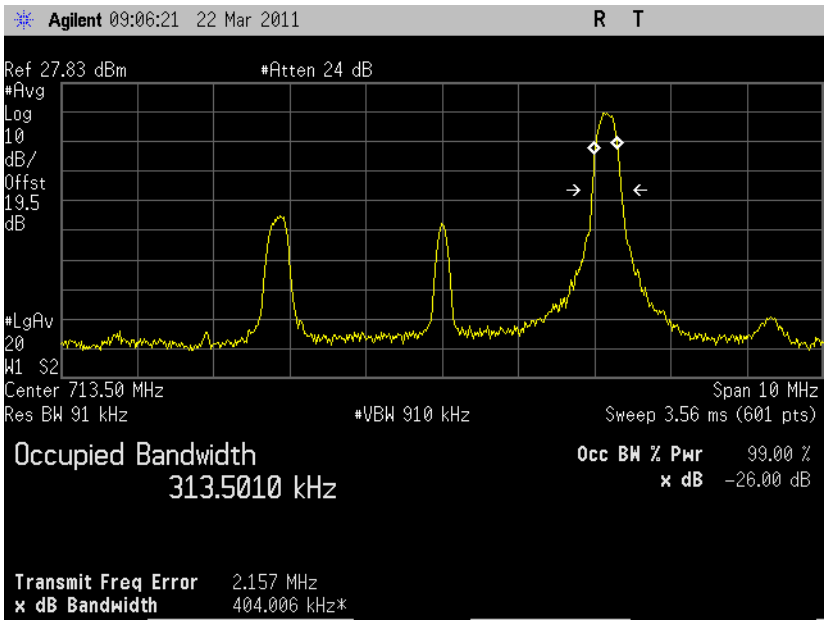
5.3.7.6 LTE Occupied Bandwidth, Band17 channel (23790) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



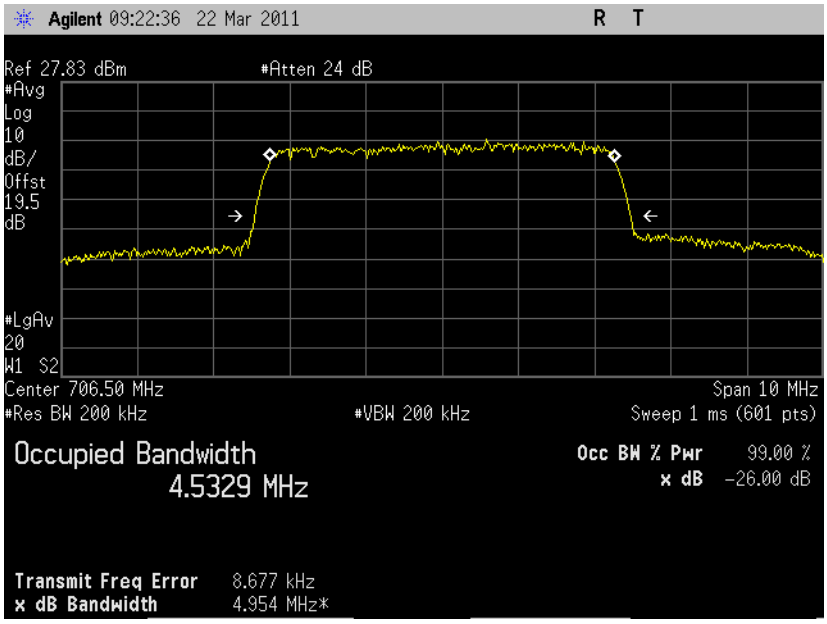
5.3.7.7 LTE Occupied Bandwidth, Band17 low channel (23756) BW=5MHz RB=1 Offset=0 16QAM 99% BW



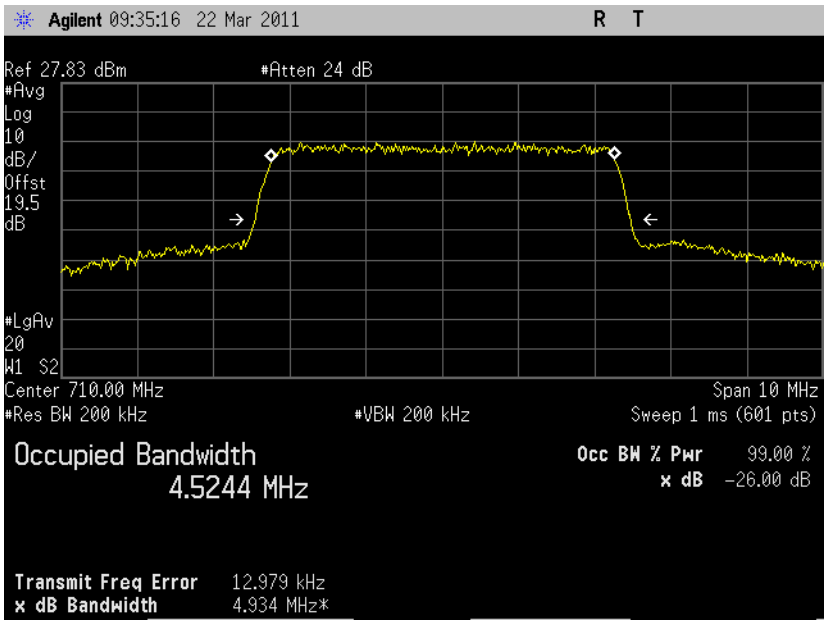
5.3.7.8 LTE Occupied Bandwidth, Band17 high channel (23825) BW=5MHz RB=1 Offset=24 16QAM 99% BW



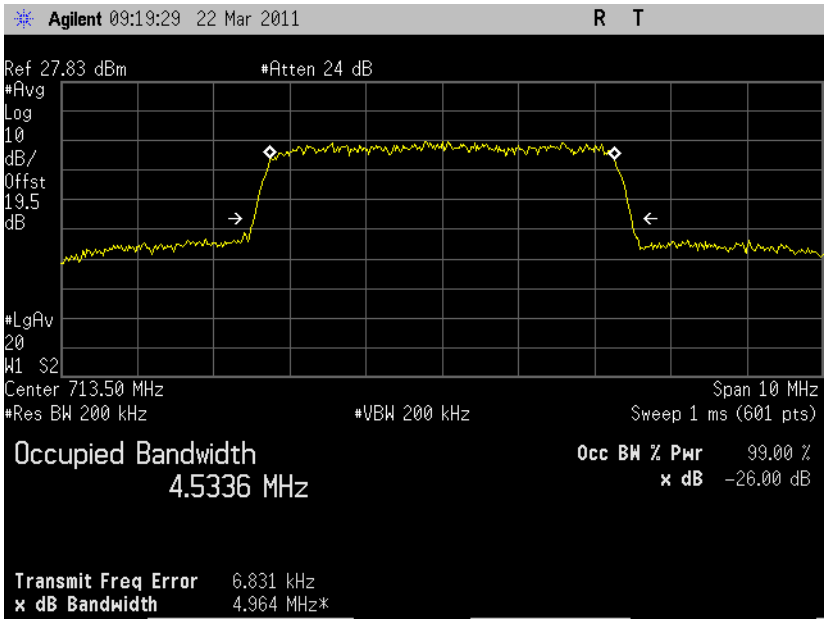
5.3.7.9 LTE Occupied Bandwidth, Band17 low channel (23755) BW=5MHz RB=25 Offset=0 16QAM 99% BW



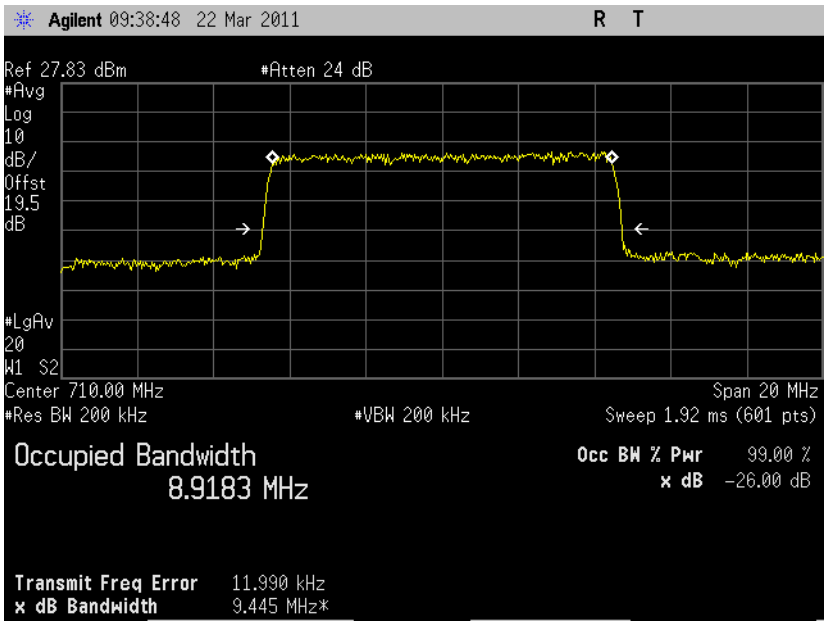
5.3.7.10 LTE Occupied Bandwidth, Band17 mid channel (23790) BW=5MHz RB=25 Offset=0 16QAM 99% BW



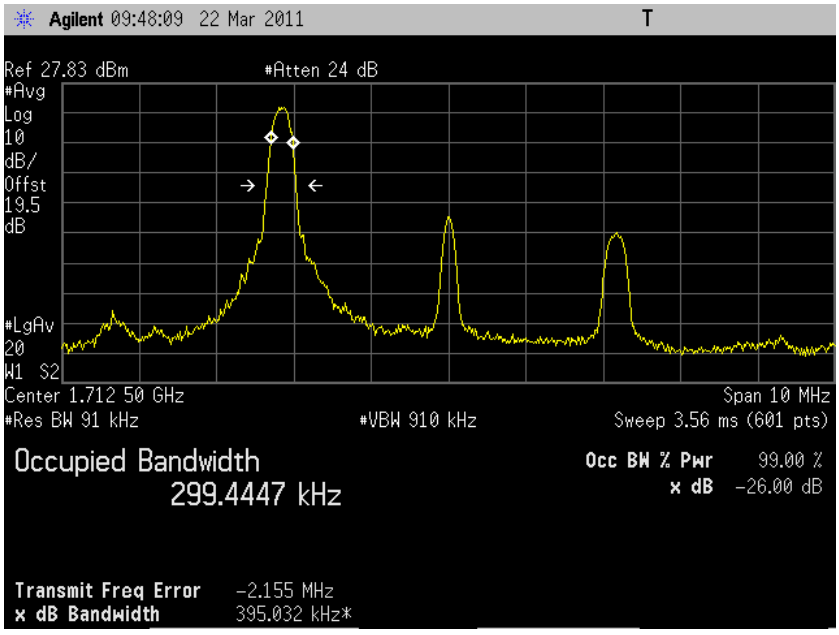
5.3.7.11 LTE Occupied Bandwidth, Band17 high channel (23825) BW=5MHz RB=25 Offset=0 16QAM 99% BW



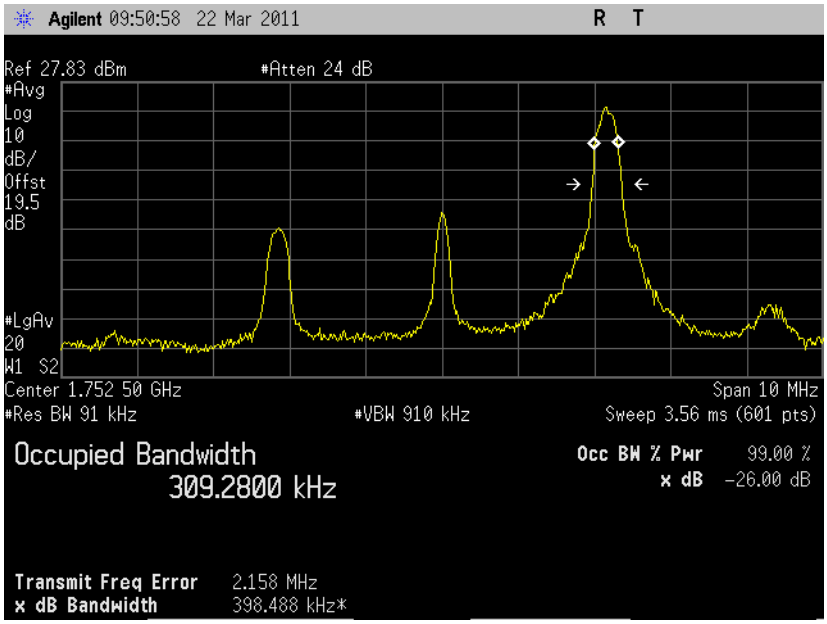
5.3.7.12 LTE Occupied Bandwidth, Band17 mid channel (23790) BW=10MHz RB=50 Offset=0 16QAM 99% BW



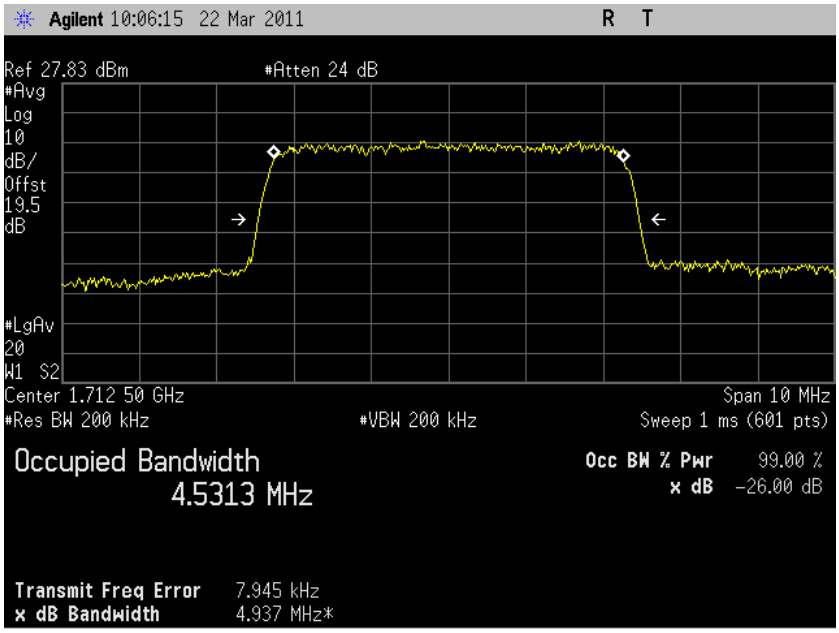
5.3.7.13 LTE Occupied Bandwidth, Band4 low channel (19975) BW=5MHz RB=1 RB Offset=0 QPSK 99% BW



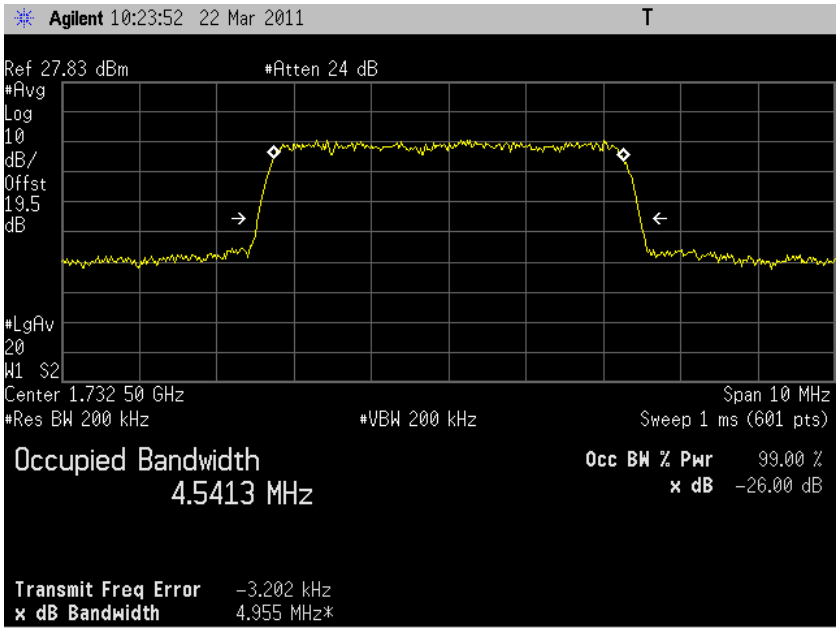
5.3.7.14 LTE Occupied Bandwidth, Band4 high channel (20375) BW=5MHz RB=1 RB Offset=24 QPSK 99% BW



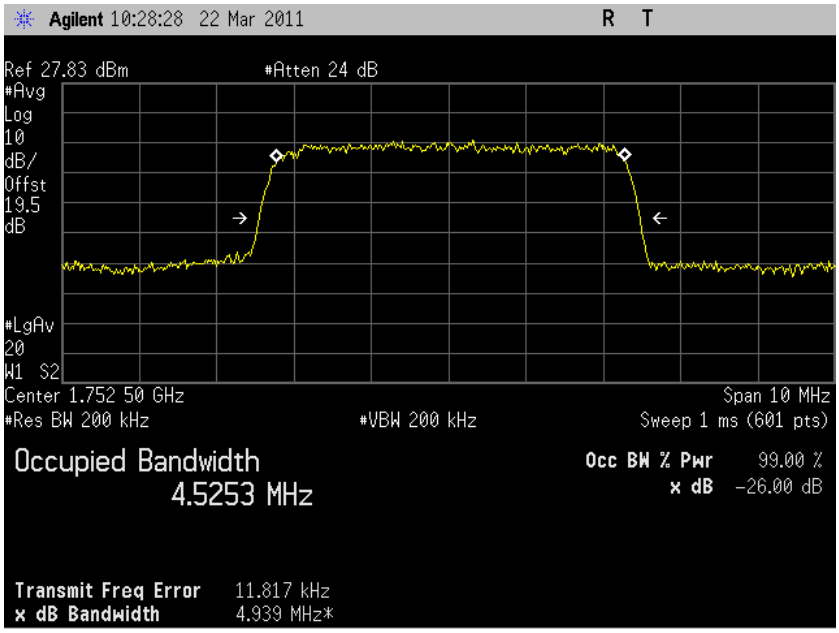
5.3.7.15 LTE Occupied Bandwidth, Band4 low channel (19975) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



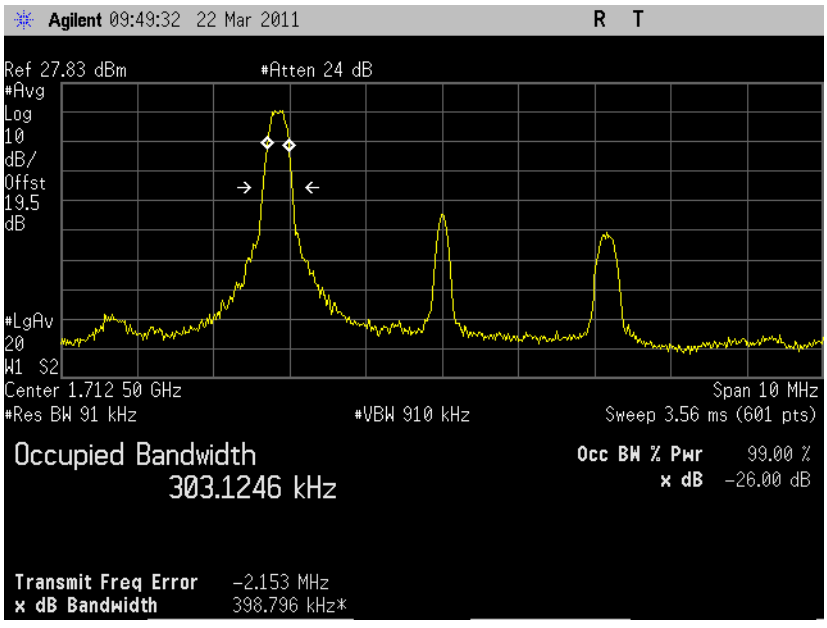
5.3.7.16 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



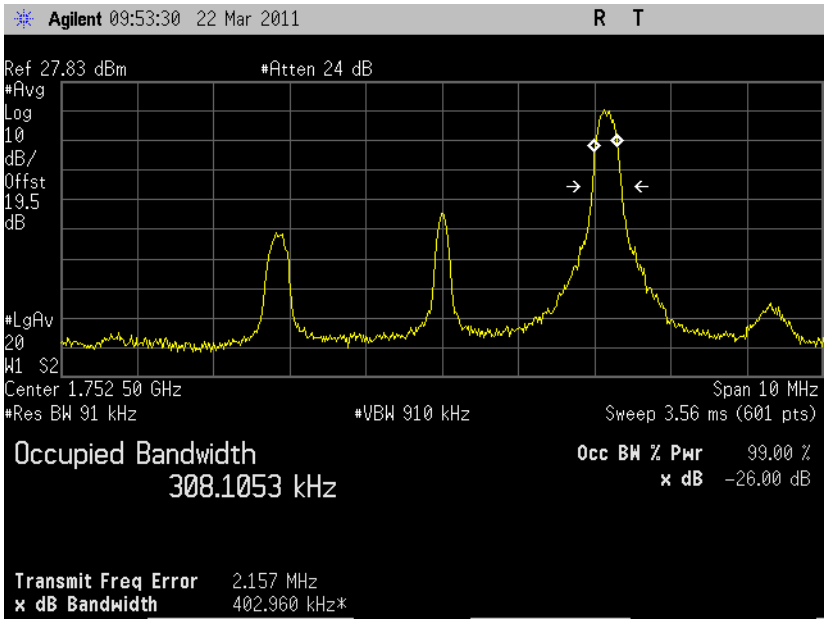
5.3.7.17 LTE Occupied Bandwidth, Band4 high channel (20375) BW=5MHz RB=25 RB Offset QPSK 99% BW



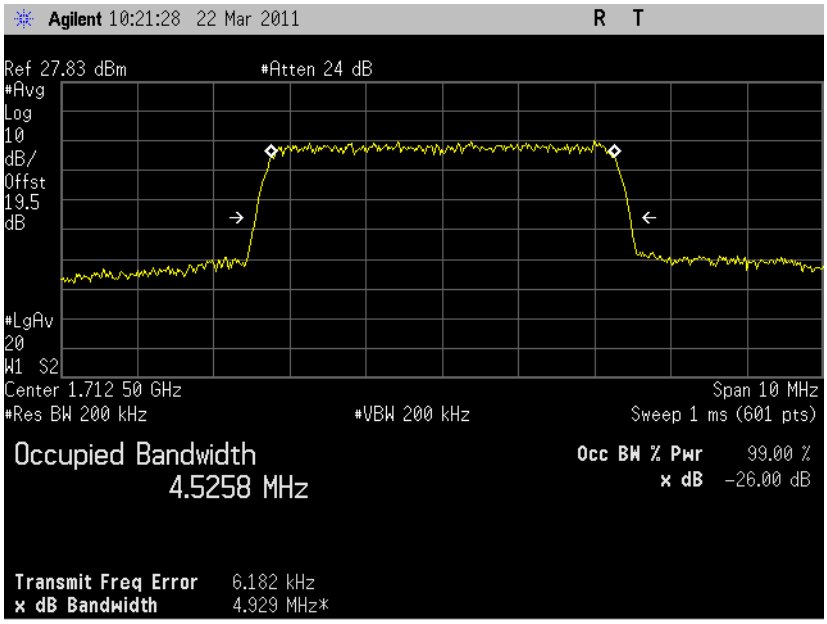
5.3.7.18 LTE Occupied Bandwidth, Band4 low channel (19975) BW=5MHz RB=1 RB Offset=0 16QAM 99% BW



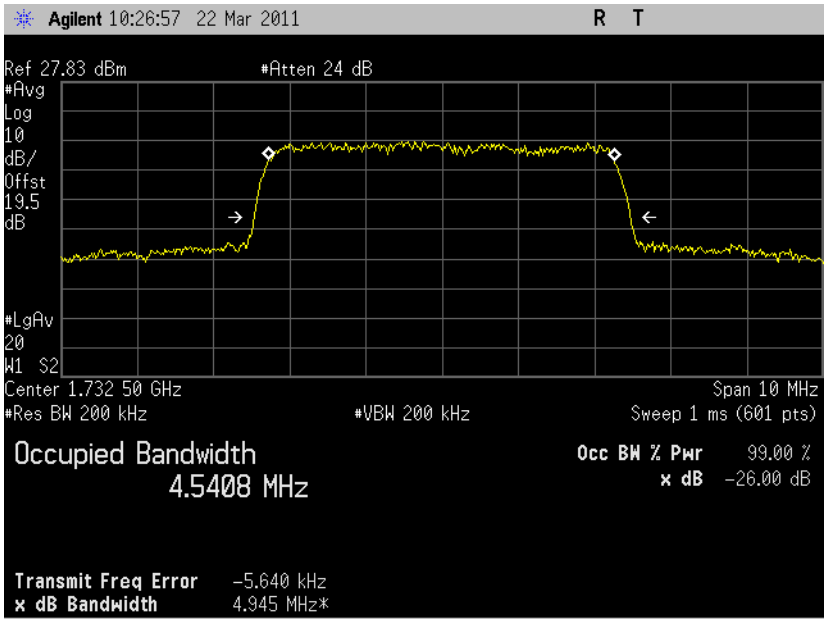
5.3.7.19 LTE Occupied Bandwidth, Band4 high channel (20375) BW=5MHz RB=1 RB Offset=24 16QAM 99% BW



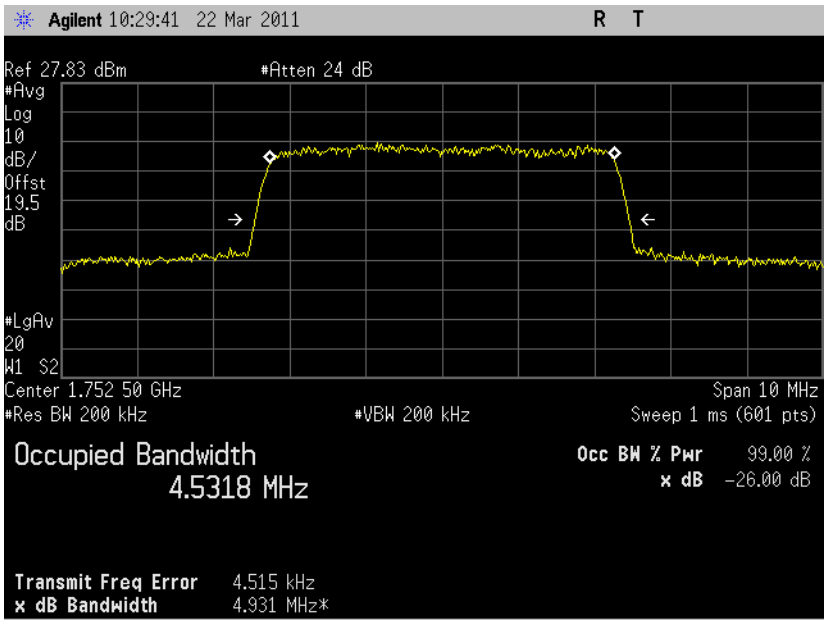
5.3.7.20 LTE Occupied Bandwidth, Band4 low channel (19975) BW=5MHz RB=25 RB Offset=0 16QAM 99% BW



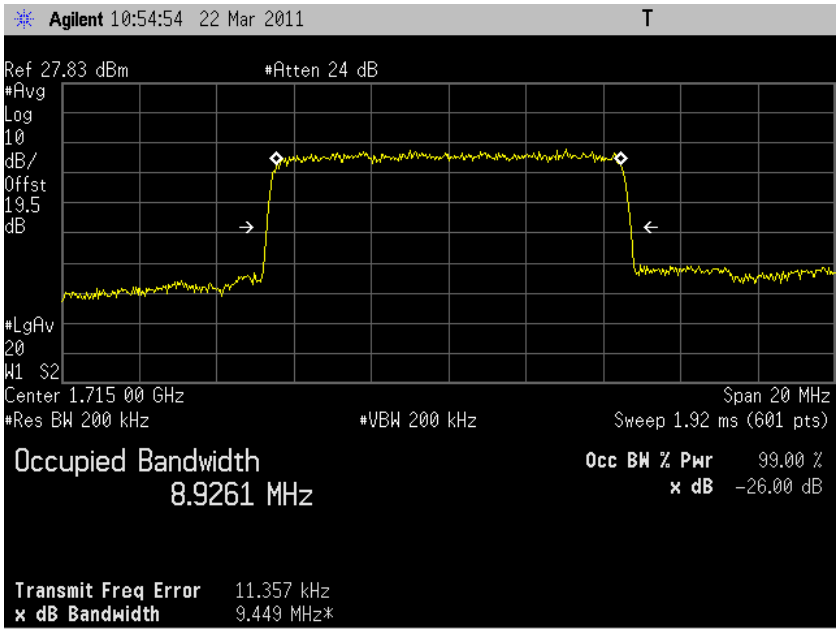
5.3.7.21 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=5MHz RB=25 RB Offset=0 16QAM 99% BW



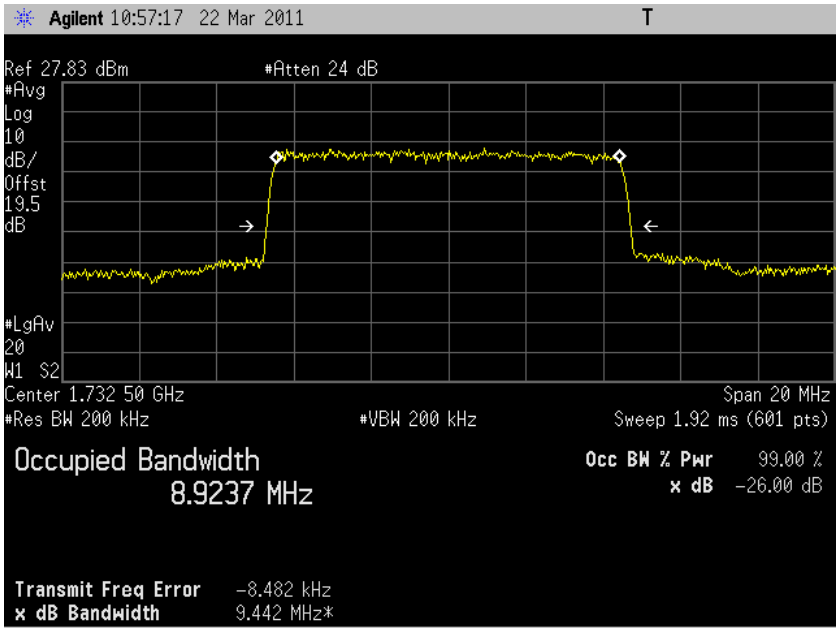
5.3.7.22 LTE Occupied Bandwidth, Band4 high channel (20375) BW=5MHz RB=25 RB Offset 16QAM 99% BW



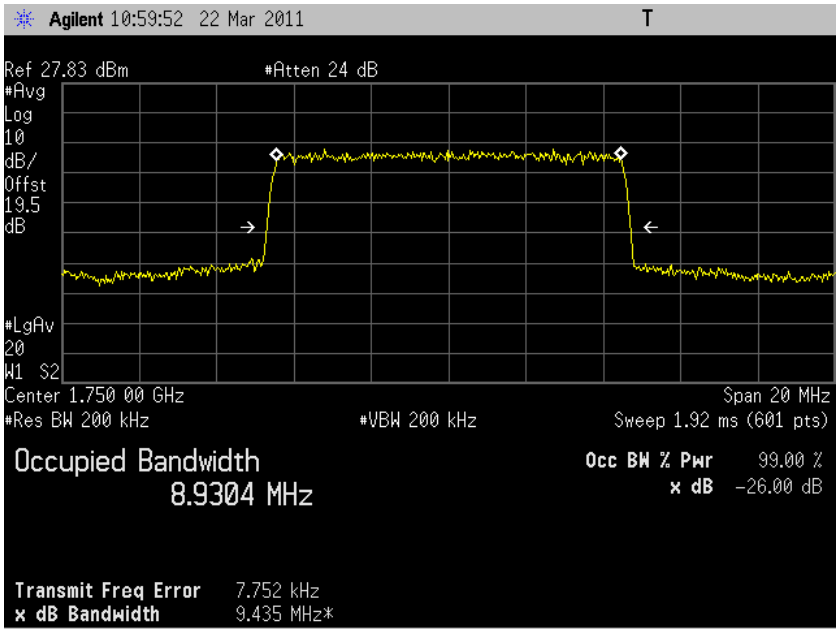
5.3.7.23 LTE Occupied Bandwidth, Band4 low channel (20000) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



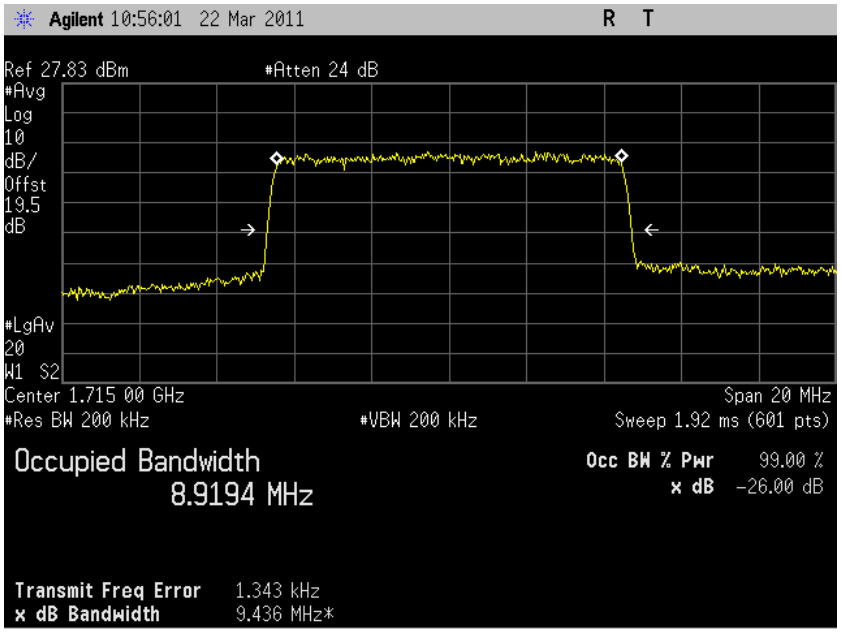
5.3.7.24 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



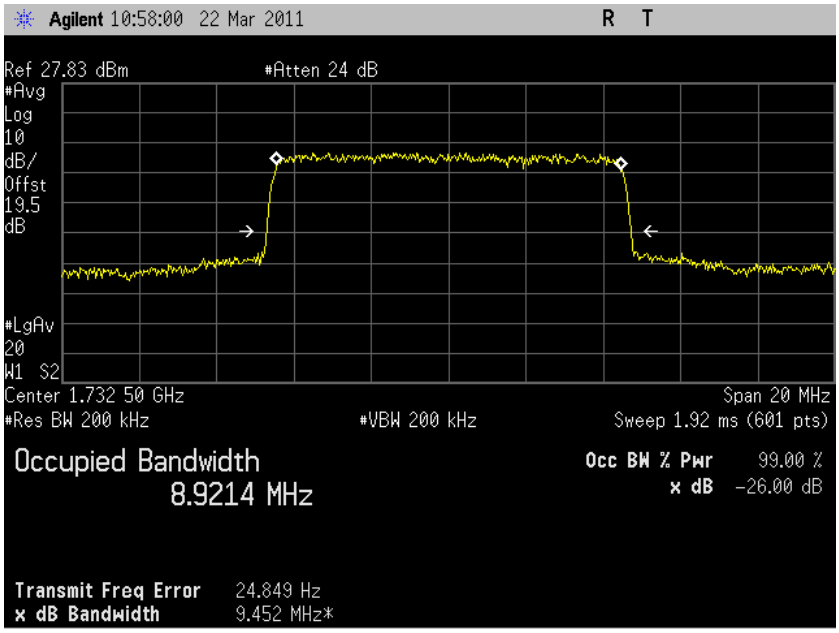
5.3.7.25 LTE Occupied Bandwidth, Band4 high channel (20350) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



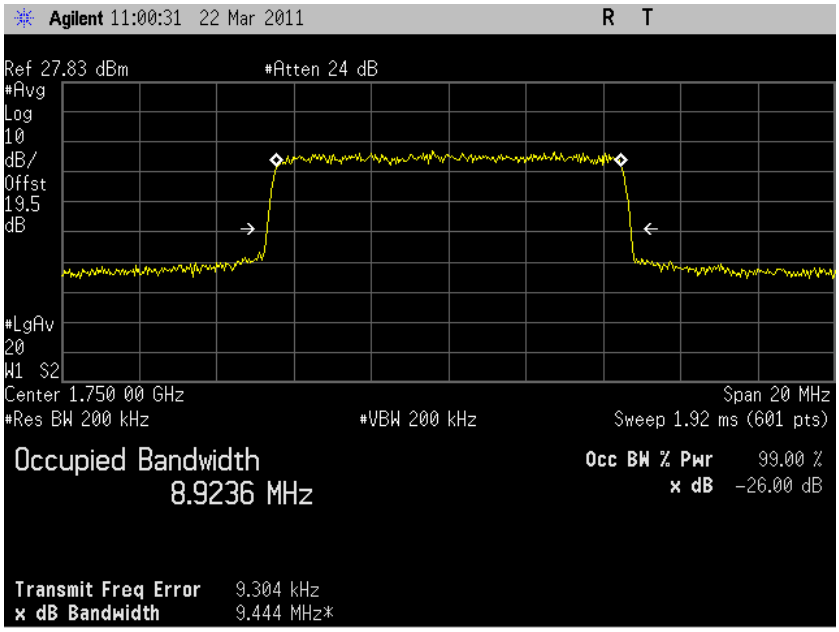
5.3.7.26 LTE Occupied Bandwidth, Band4 low channel (20000) BW=10MHz RB=50 RB Offset=0 16QAM 99% BW



5.3.7.27 LTE Occupied Bandwidth, Band4 high channel (20734) BW=5MHz RB=25 QPSK 99% BW



5.3.7.28 LTE Occupied Bandwidth, Band4 high channel (20734) BW=5MHz RB=25 16QAM 99% BW



6 Out of Band Emissions at Antenna Terminals

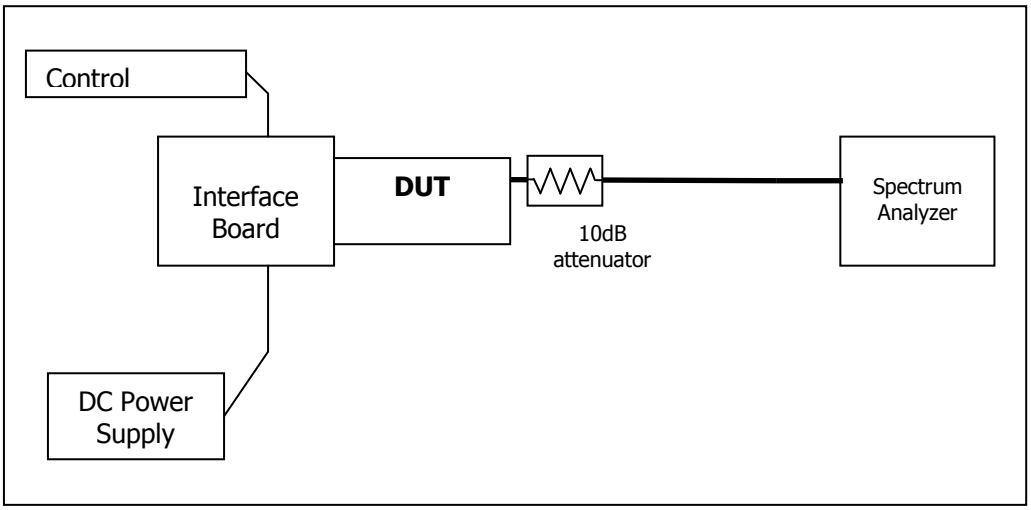
FCC 22.901(d), 22.917, 24.238(a), 27.53(h)

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

6.1 Test Procedure

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band emissions, if any, up to 10th harmonic. The 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 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
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.

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

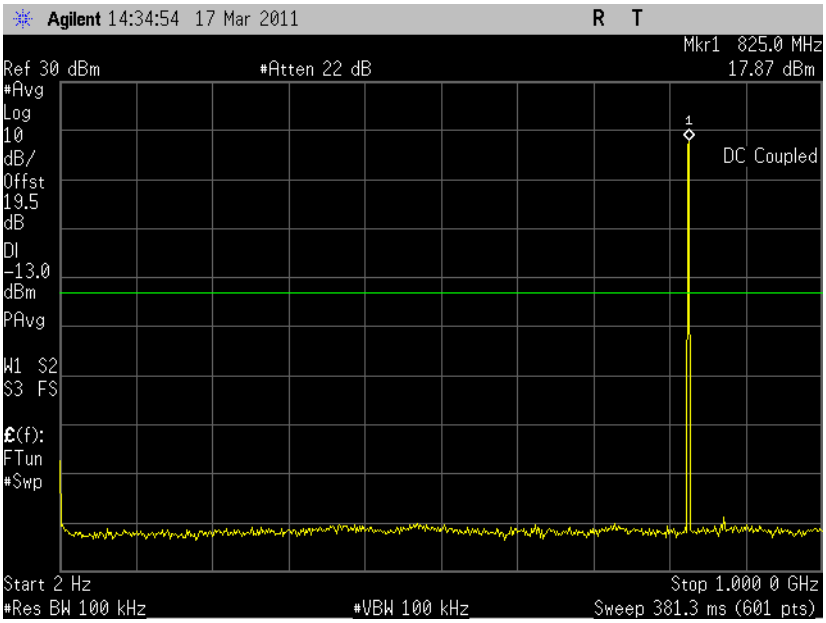
Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	Corresponding Plot number
LTE	QPSK	B17	5	25	0	706.5	23755	Plot 6.3.3.1, Plot 6.3.3.2
						710.0	23790	Plot 6.3.3.3, Plot 6.3.3.4
						713.5	23825	Plot 6.3.3.5, Plot 6.3.3.6
			10	50	0	710.0	23790	Plot 6.3.3.13, Plot 6.3.3.14
		B4	5	25	0	1712.5	19975	Plot 6.3.3.17, Plot 6.3.3.18
						1732.5	20175	Plot 6.3.3.19, Plot 6.3.3.20
						1752.5	20375	Plot 6.3.3.20, Plot 6.3.3.21
			10	50	0	1715.0	20000	Plot 6.3.3.28, Plot 6.3.3.29
						1732.5	20175	Plot 6.3.3.30, Plot 6.3.3.31
						1750.0	20350	Plot 6.3.3.32, Plot 6.3.3.33
	16QA	B17	5	25	0	706.5	23755	Plot 6.3.3.7, Plot 6.3.3.8

	M					710.0	23790	Plot 6.3.3.9, Plot 6.3.3.10
						713.5	23825	Plot 6.3.3.11, Plot 6.3.3.12
			10	50	0	710.0	23790	Plot 6.3.3.15, Plot 6.3.3.16
		B4	5	25	0	1712.5	19975	Plot 6.3.3.22, Plot 6.3.3.23
						1732.5	20175	Plot 6.3.3.24, Plot 6.3.3.25
						1752.5	20375	Plot 6.3.3.26, Plot 6.3.3.27
			10	50	0	1715.0	20000	Plot 6.3.3.34, Plot 6.3.3.35
						1732.5	20175	Plot 6.3.3.36, Plot 6.3.3.37
						1750.0	20350	Plot 6.3.3.38, Plot 6.3.3.39

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

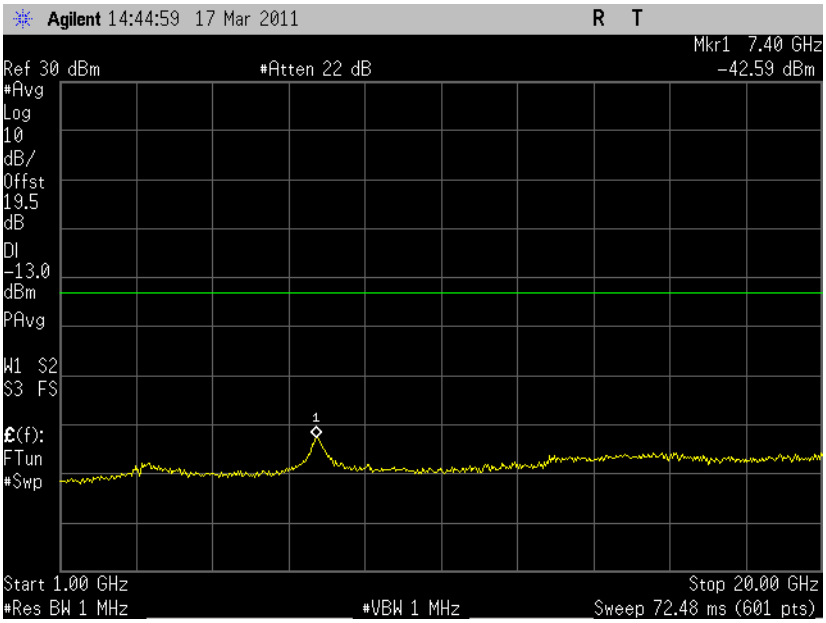
6.3.1 GSM Test Plots

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

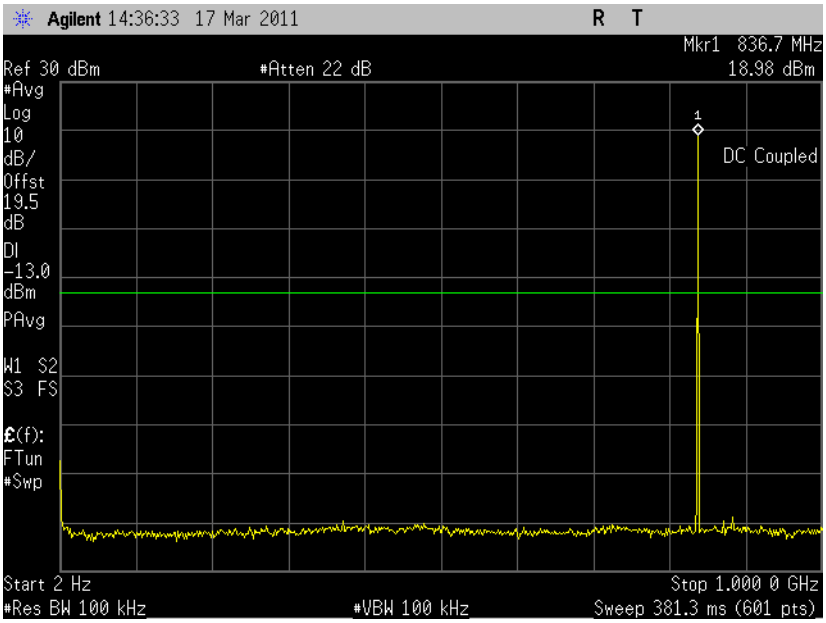


Note: The strong emission shown in each case is the carrier signal.

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

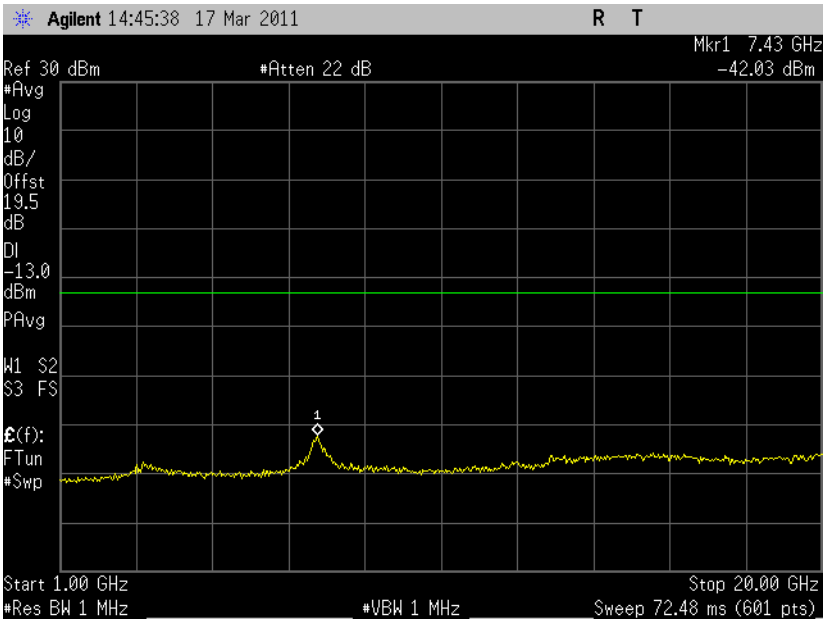


6.3.1.3 Out of Band Emissions at Antenna Terminals GMSK, Mid Channel, 836.6 MHz, 2 Hz to 1 GHz

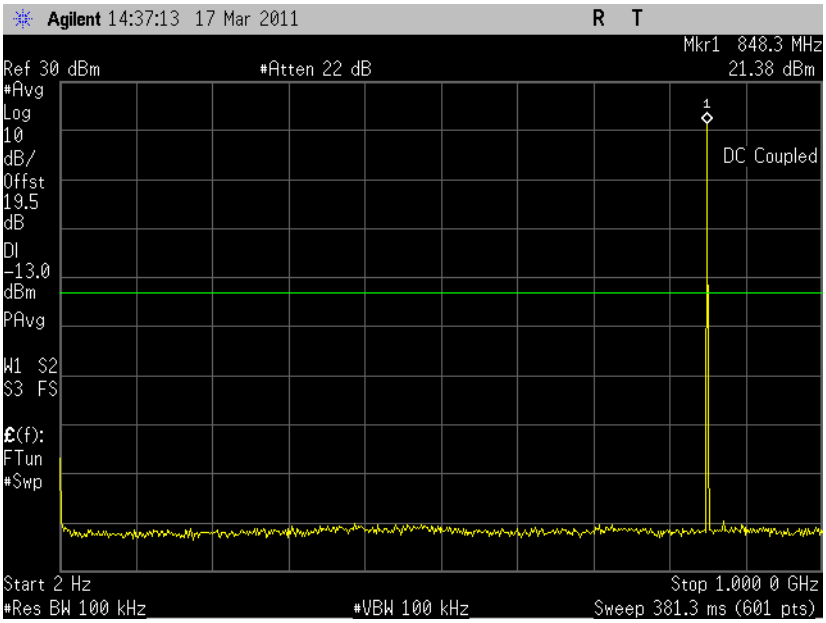


Note: The strong emission shown in each case is the carrier signal.

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

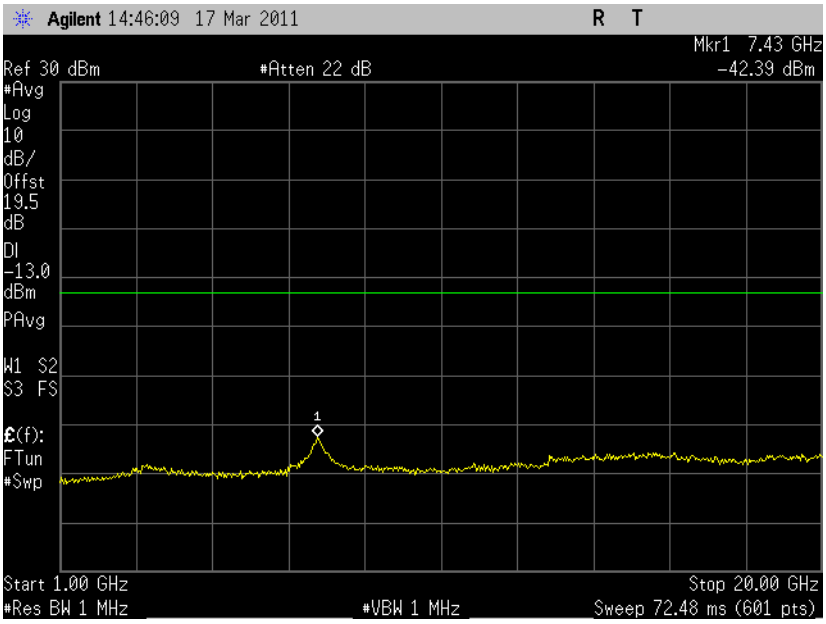


6.3.1.5 Out of Band Emissions at Antenna Terminals GMSK, High Channel, 848.8 MHz, 2 Hz to 1 GHz

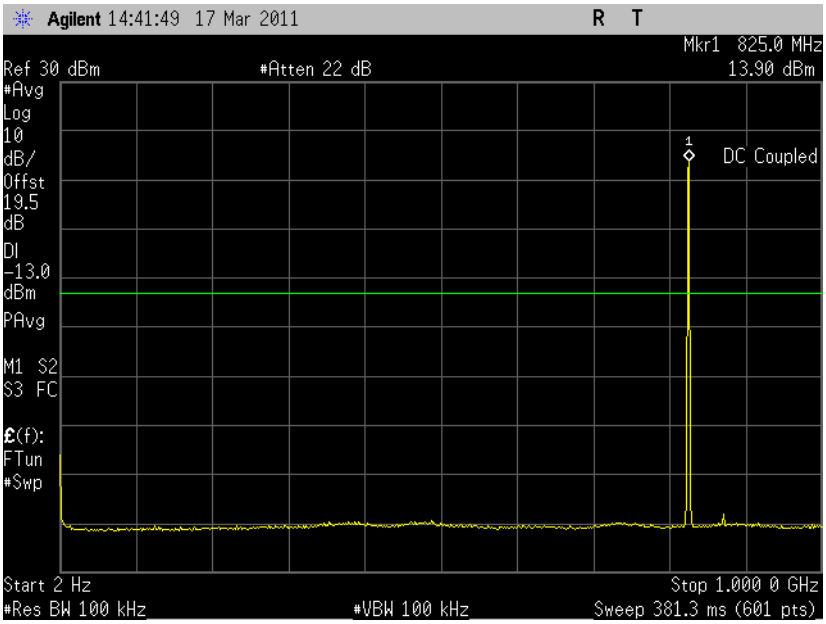


Note: The strong emission shown in each case is the carrier signal.

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

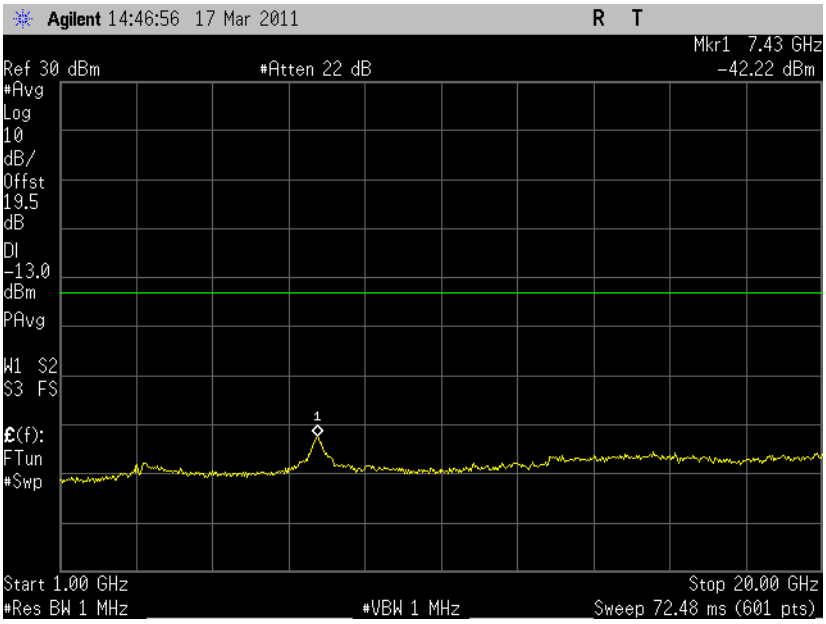


6.3.1.7 Out of Band Emissions at Antenna Terminals 8-PSK, Low channel, 824.200 MHz,2 Hz to 1 GHz

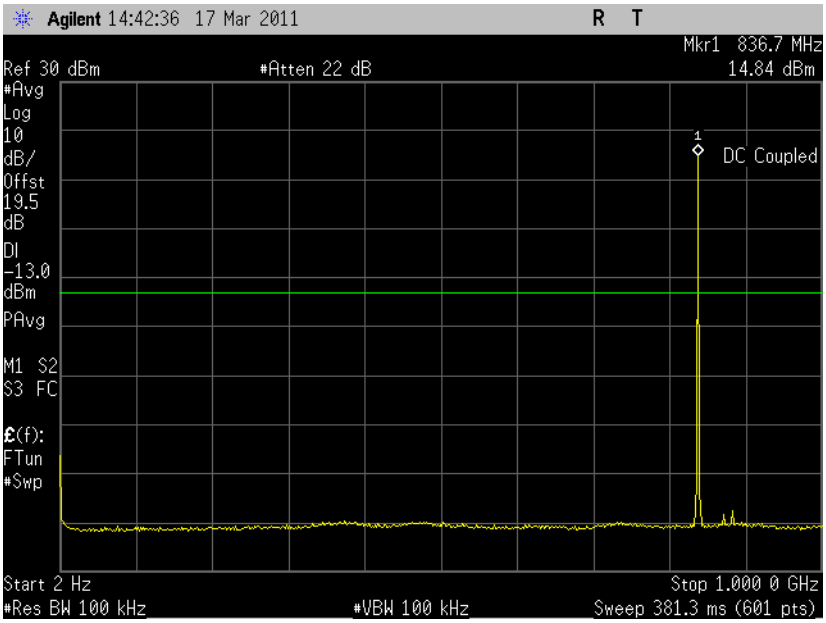


Note: The strong emission shown in each case is the carrier signal.

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

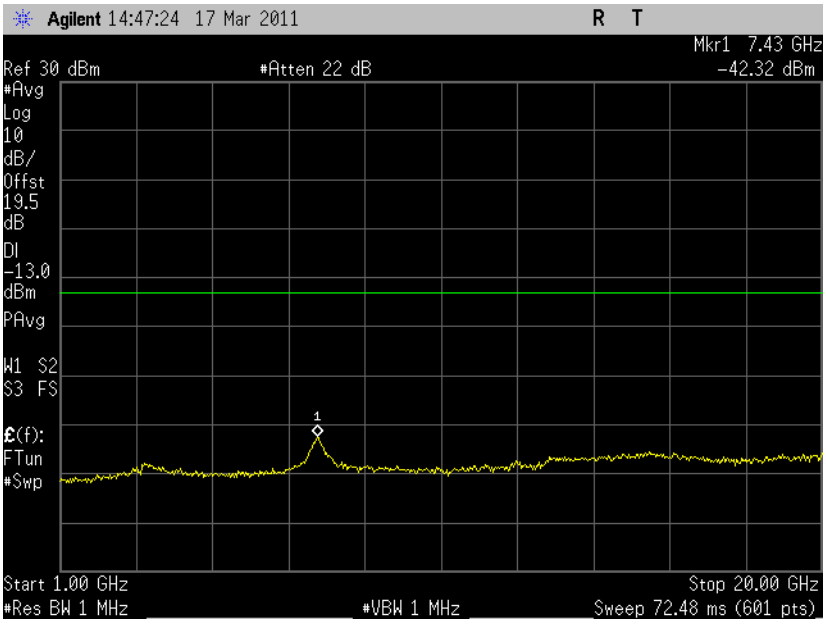


6.3.1.9 Out of Band Emissions at Antenna Terminals 8-PSK, Mid Channel, 836.6 MHz, 2 Hz to 1 GHz

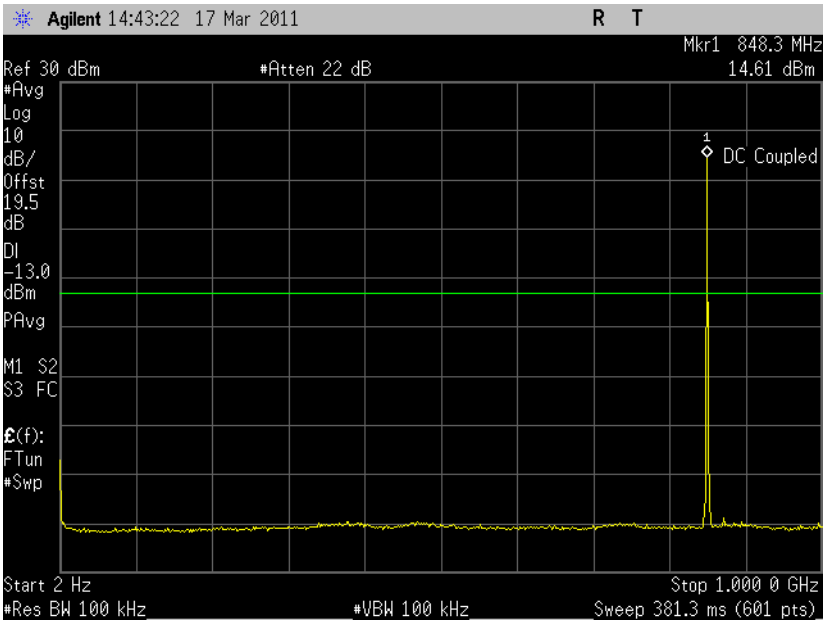


Note: The strong emission shown in each case is the carrier signal.

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

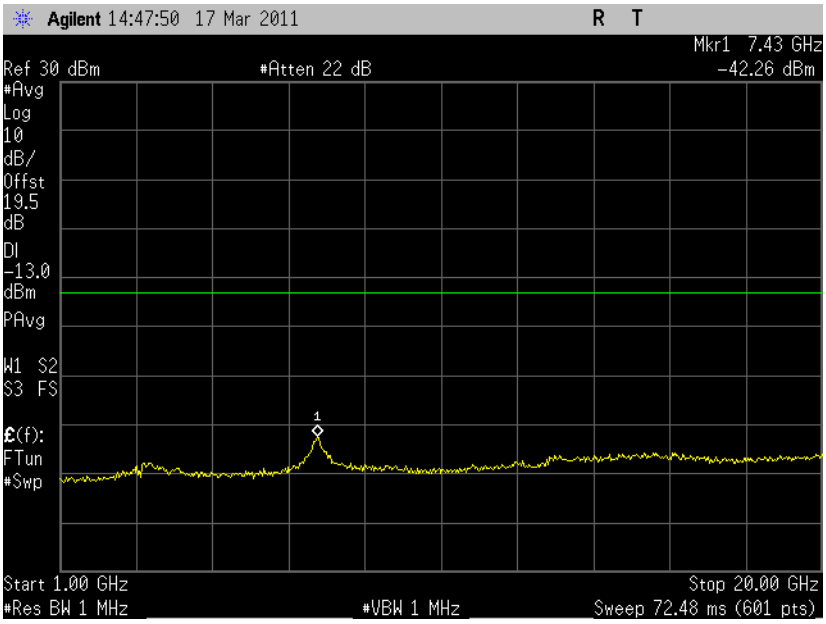


6.3.1.11 Out of Band Emissions at Antenna Terminals 8-PSK, High Channel, 848.8 MHz, 2 Hz to 1 GHz

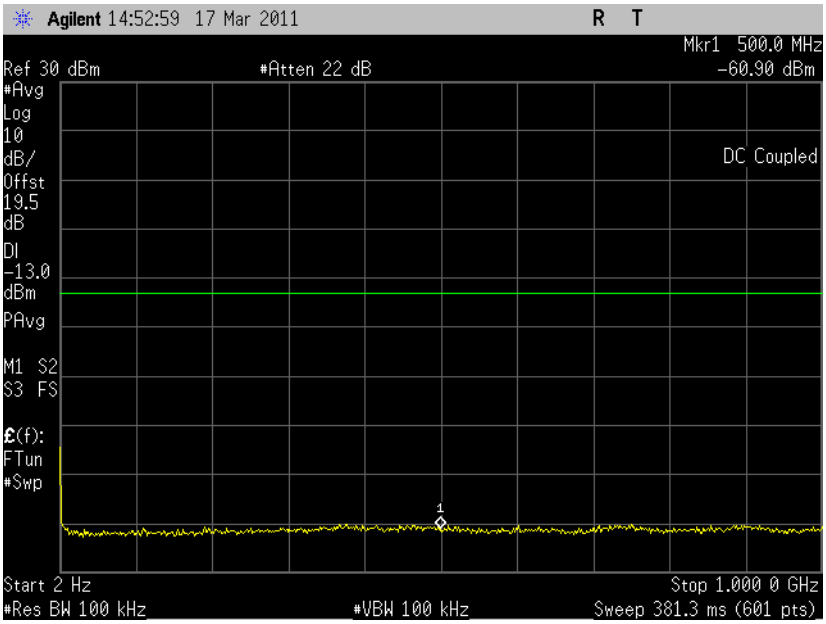


Note: The strong emission shown in each case is the carrier signal.

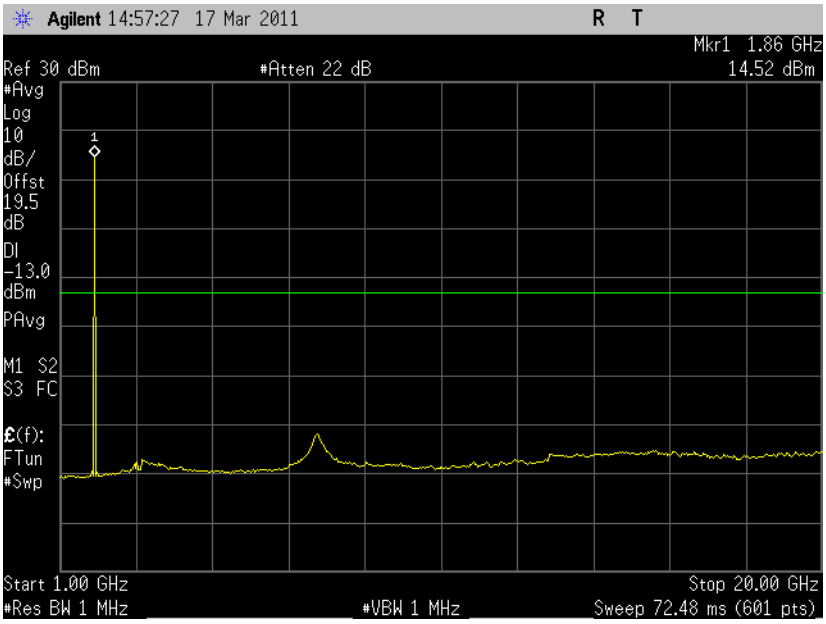
6.3.1.12 Out of Band Emissions at Antenna Terminals 8-PSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz



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

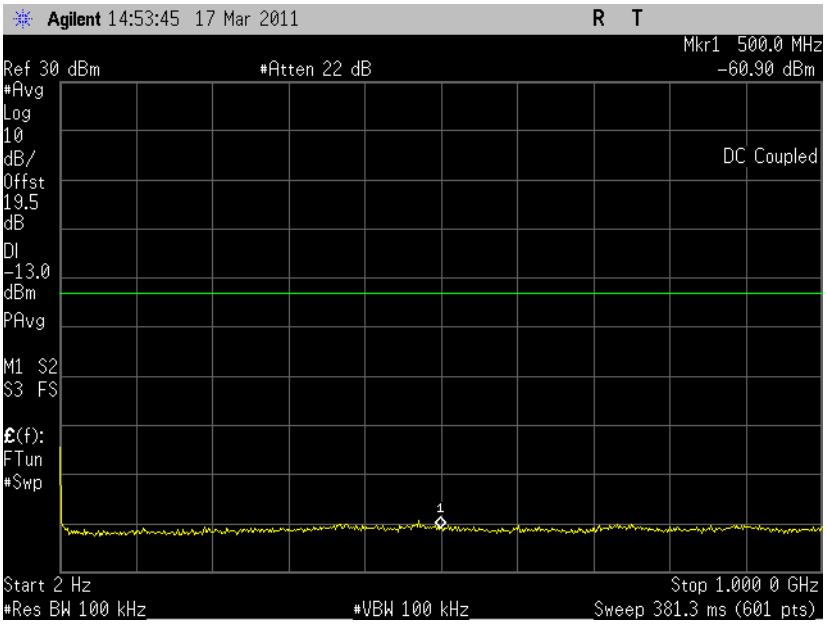


6.3.1.14 Out of Band Emissions at Antenna Terminals GMSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz

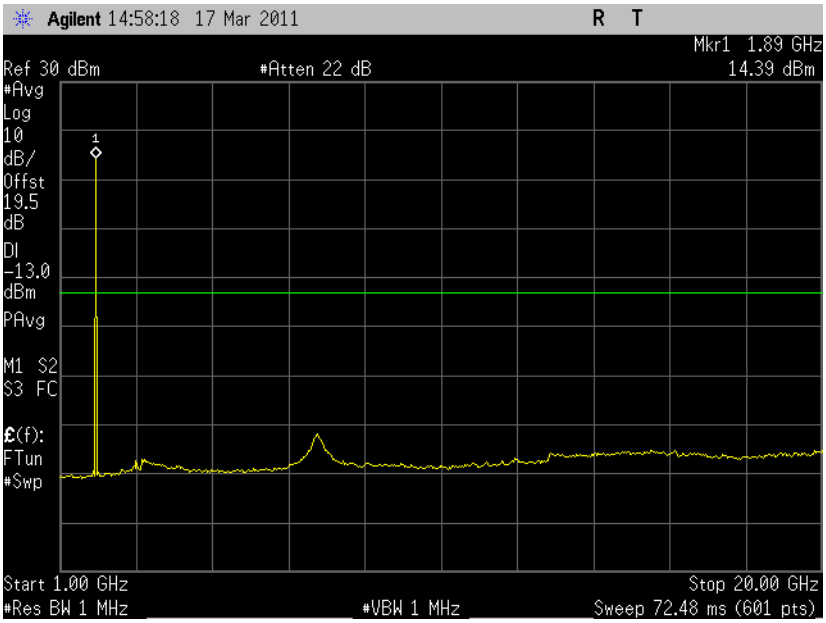


Note: The strong emission shown is the carrier signal.

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

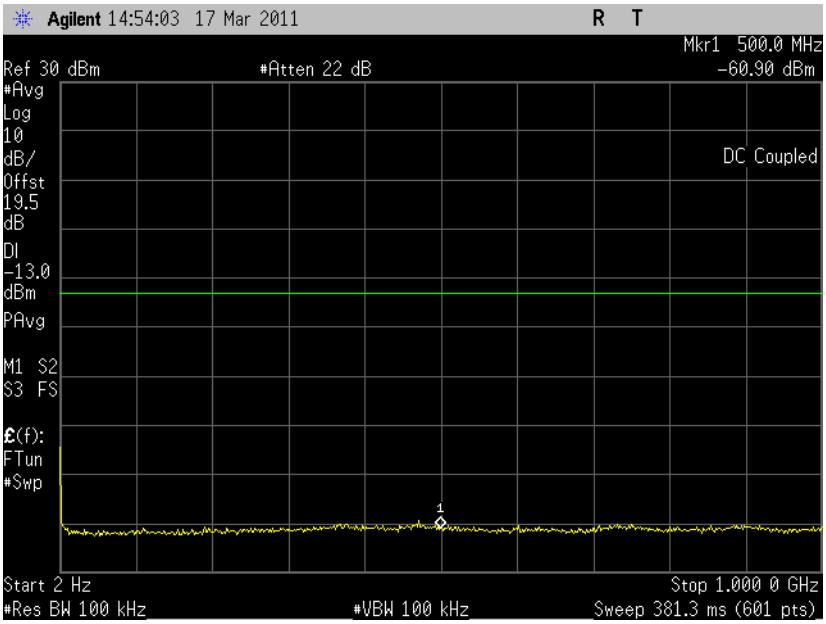


6.3.1.16 Out of Band Emissions at Antenna Terminals GMSK, Middle channel, 1880.0 MHz, 1 GHz to 20 GHz

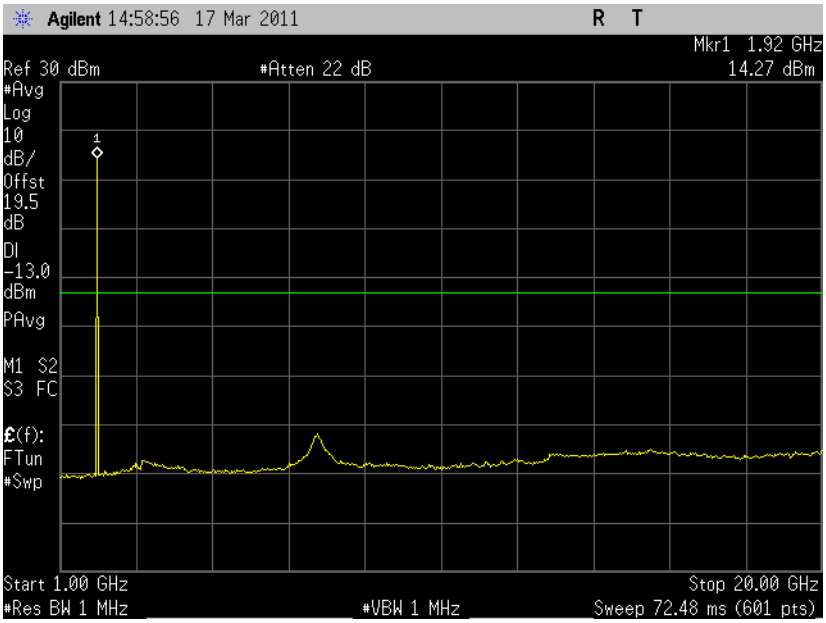


Note: The strong emission shown is the carrier signal.

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

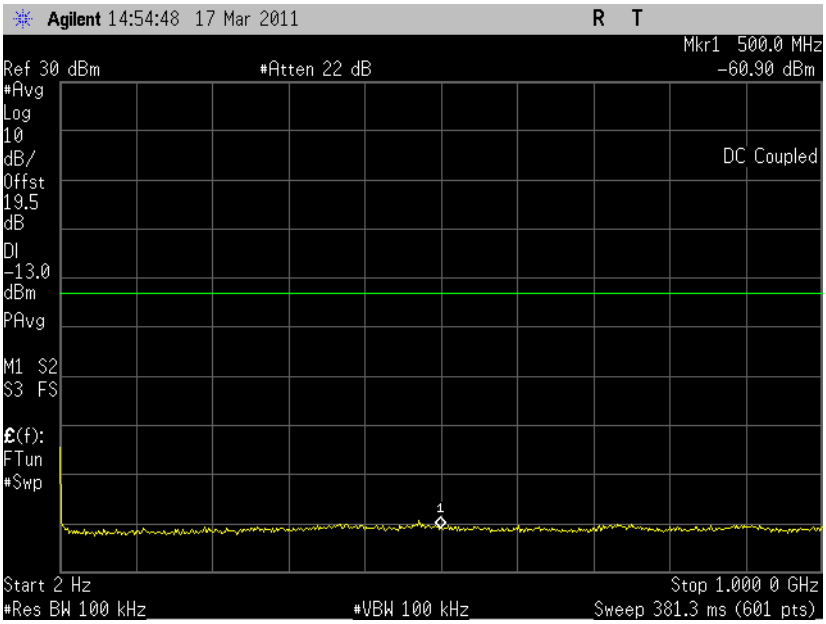


6.3.1.18 Out of Band Emissions at Antenna Terminals GMSK, High channel, 1909.8 MHz, 1 GHz to 20 GHz

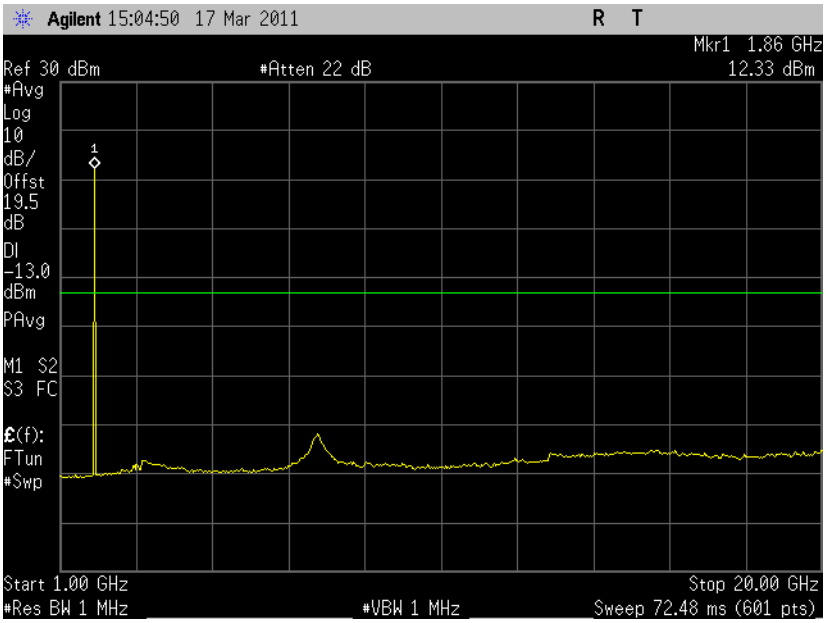


Note: The strong emission shown is the carrier signal.

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

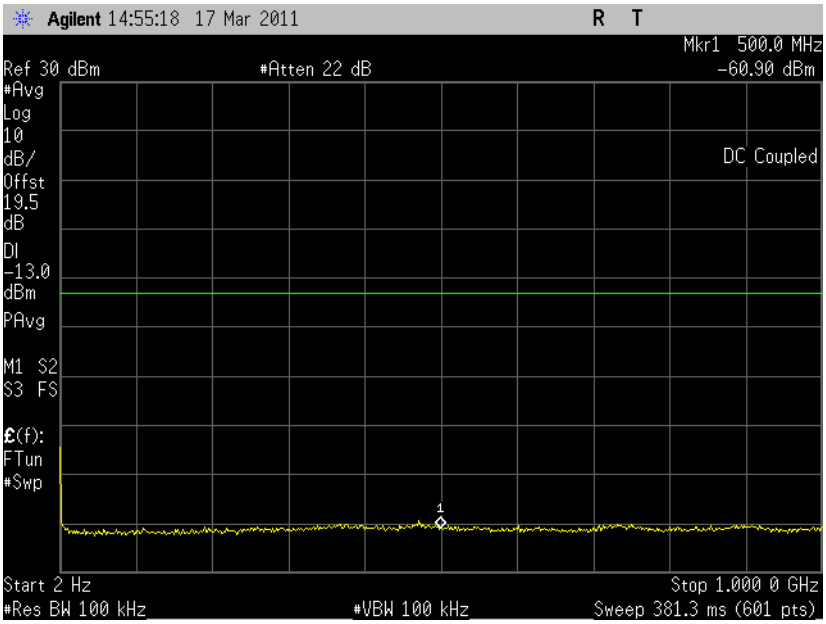


6.3.1.20 Out of Band Emissions at Antenna Terminals 8-PSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz

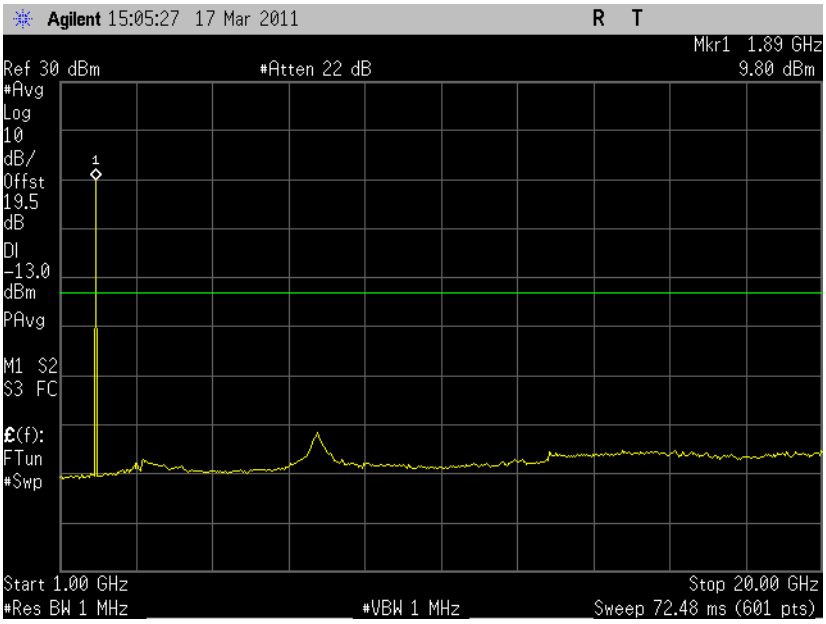


Note: The strong emission shown is the carrier signal.

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

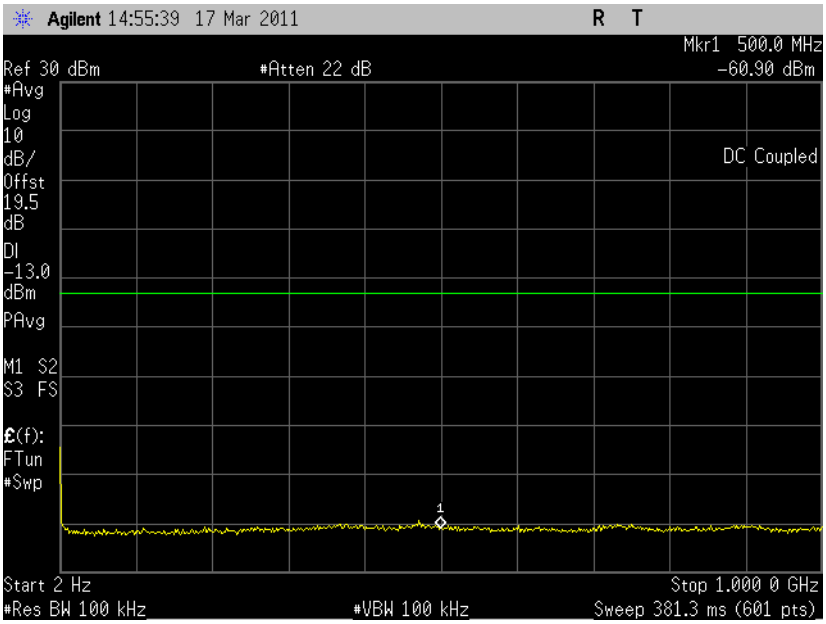


6.3.1.22 Out of Band Emissions at Antenna Terminals 8-PSK, Middle channel, 1880.0 MHz, 2 Hz to 20 GHz

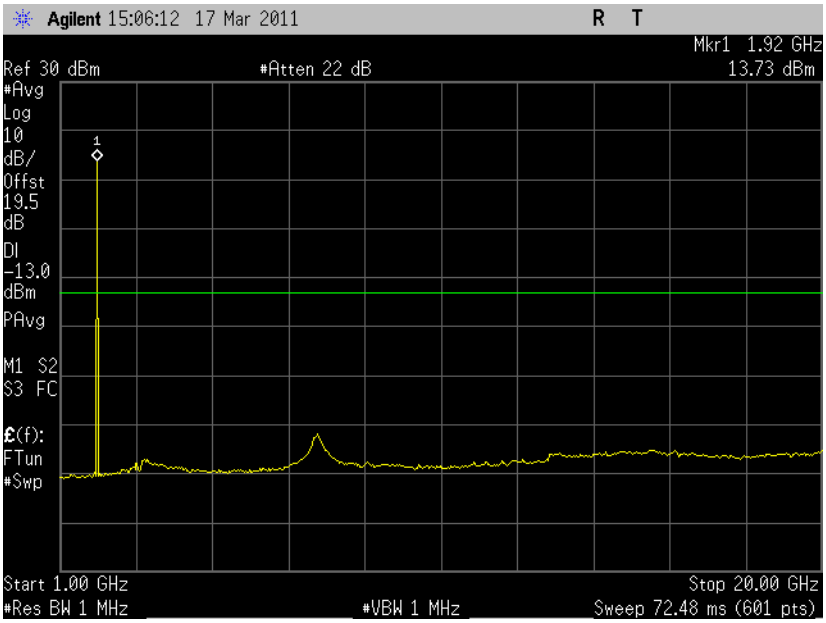


Note: The strong emission shown is the carrier signal.

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



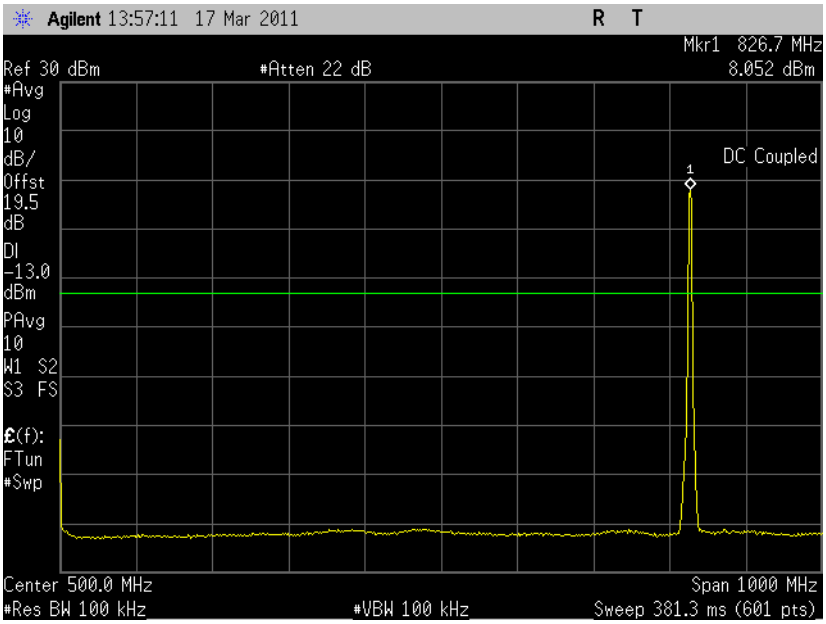
6.3.1.24 Out of Band Emissions at Antenna Terminals 8-PSK, High channel, 1909.8 MHz, 2 Hz to 20 GHz



Note: The strong emission shown is the carrier signal.

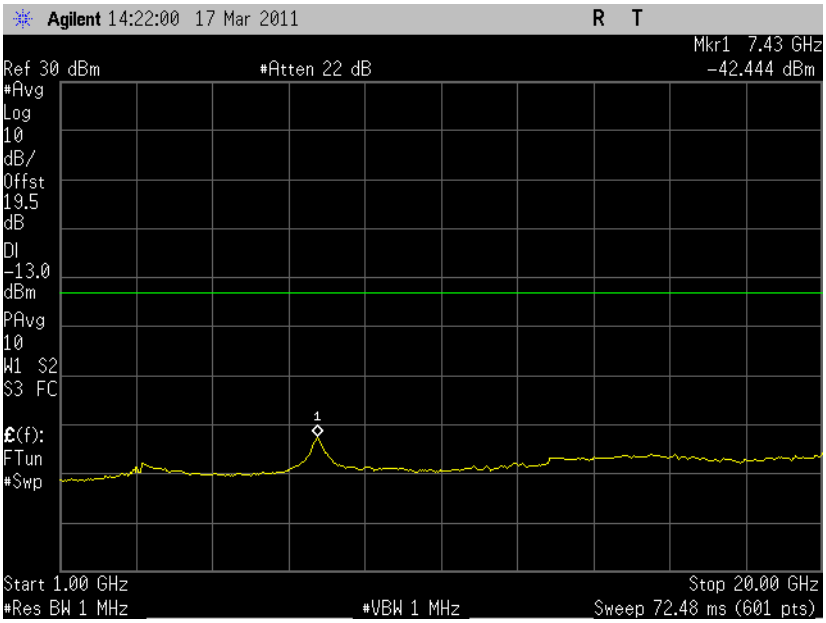
6.3.2 WCDMA Rel99 Test Plots

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

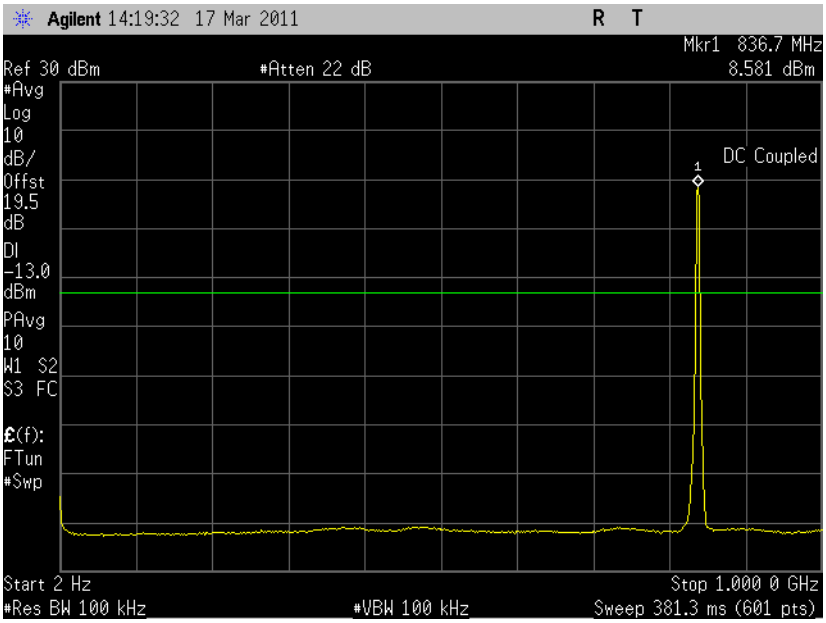


Note: The strong emission shown in each case is the carrier signal.

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

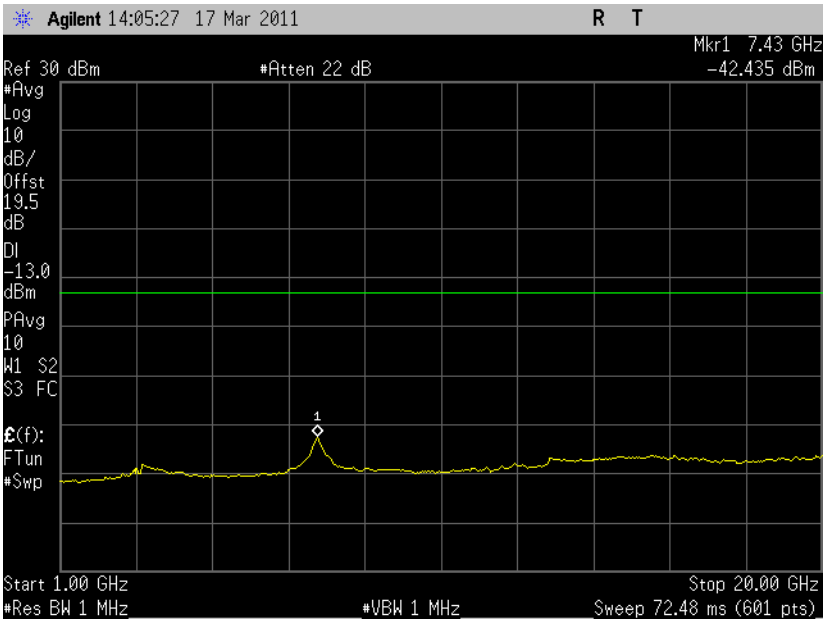


6.3.2.3 Out of Band Emissions at Antenna Terminals WCDMA, Middle channel, 836.4 MHz, 2 Hz to 1 GHz

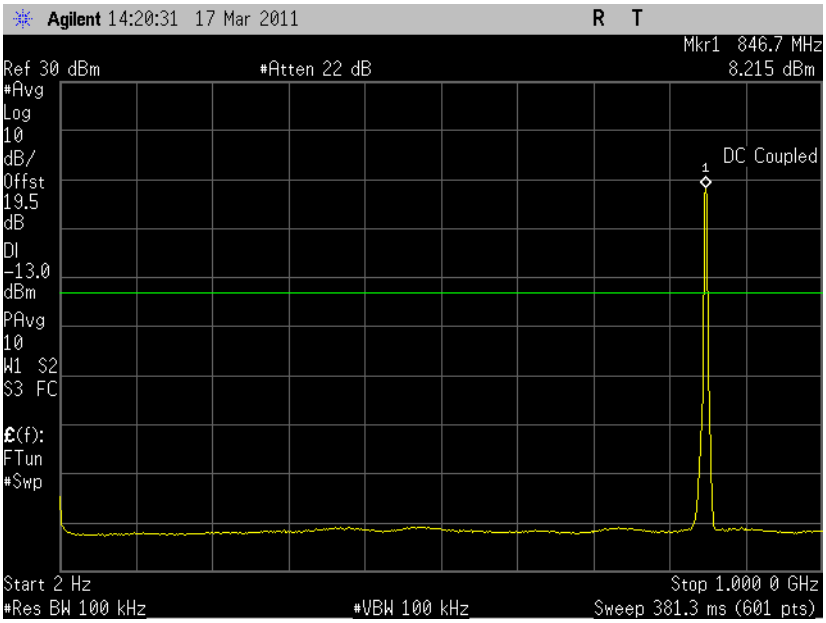


Note: The strong emission shown in each case is the carrier signal.

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

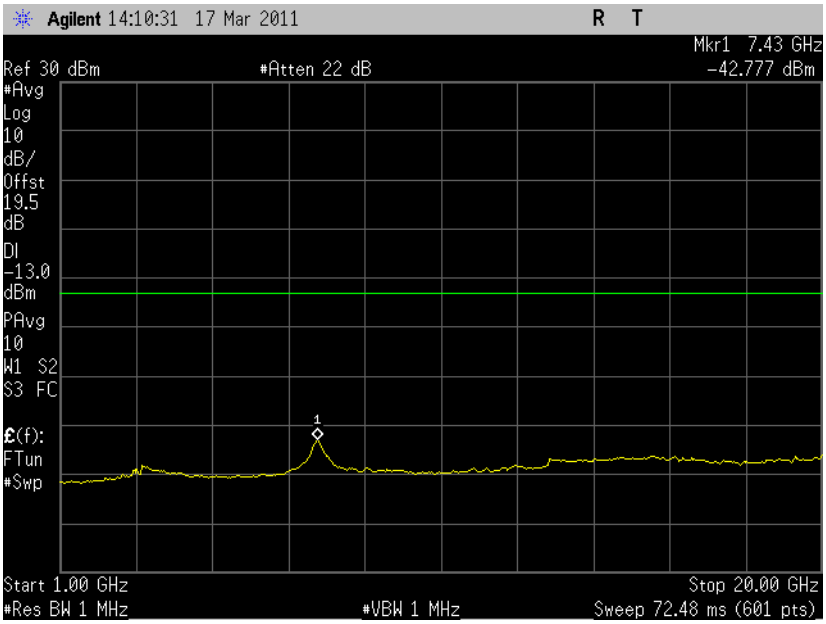


6.3.2.5 Out of Band Emissions at Antenna Terminals WCDMA, High Channel, 846.6 MHz, 2 Hz to 1 GHz

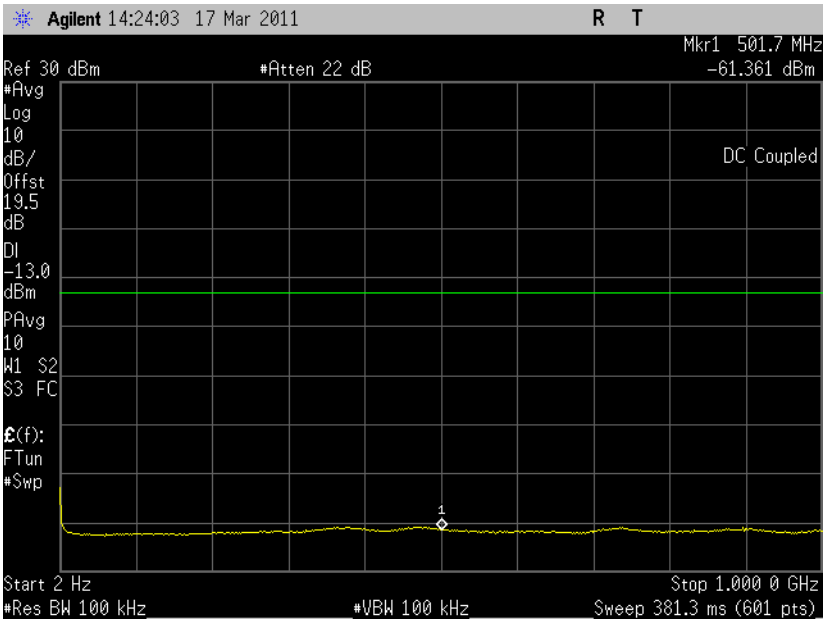


Note: The strong emission shown in each case is the carrier signal.

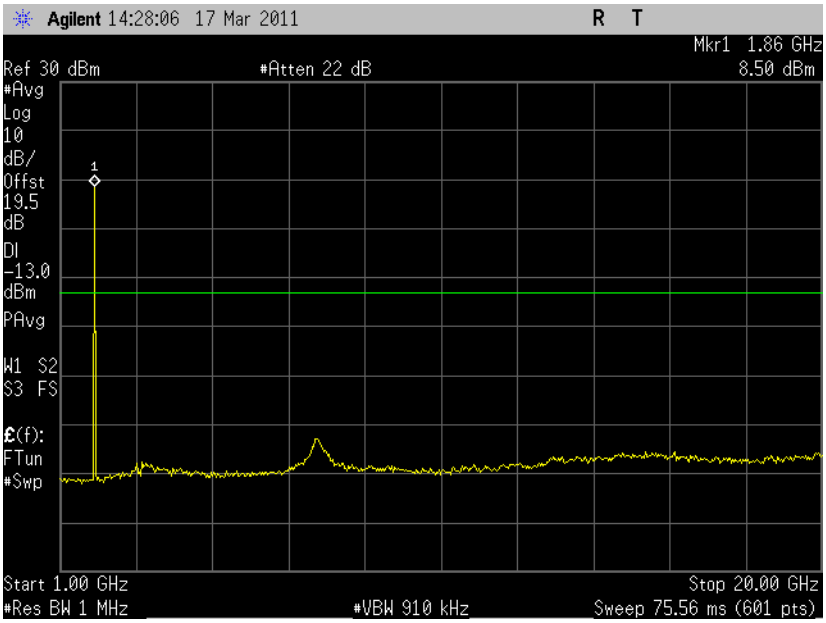
6.3.2.6 Out of Band Emissions at Antenna Terminals WCDMA, High Channel, 846.6 MHz, 1 GHz to 20 GHz



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

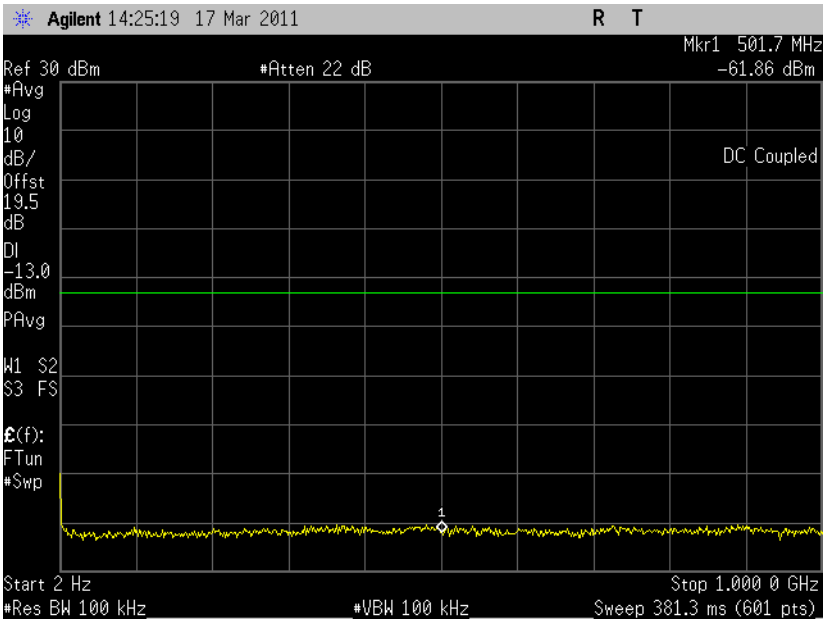


6.3.2.8 Out of Band Emissions at Antenna Terminals WCDMA, Low channel, 1852.4 MHz, 1 GHz to 20 GHz

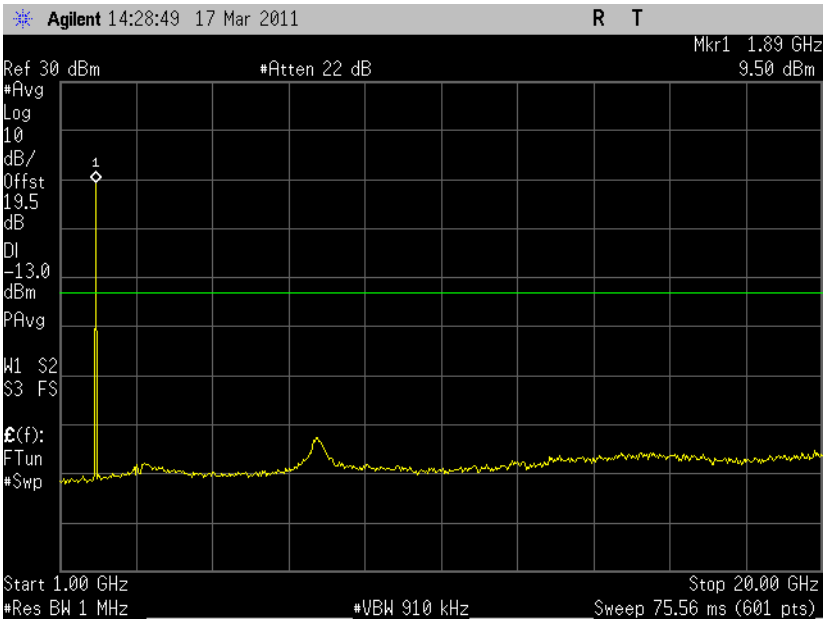


Note: The strong emission shown is the carrier signal.

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

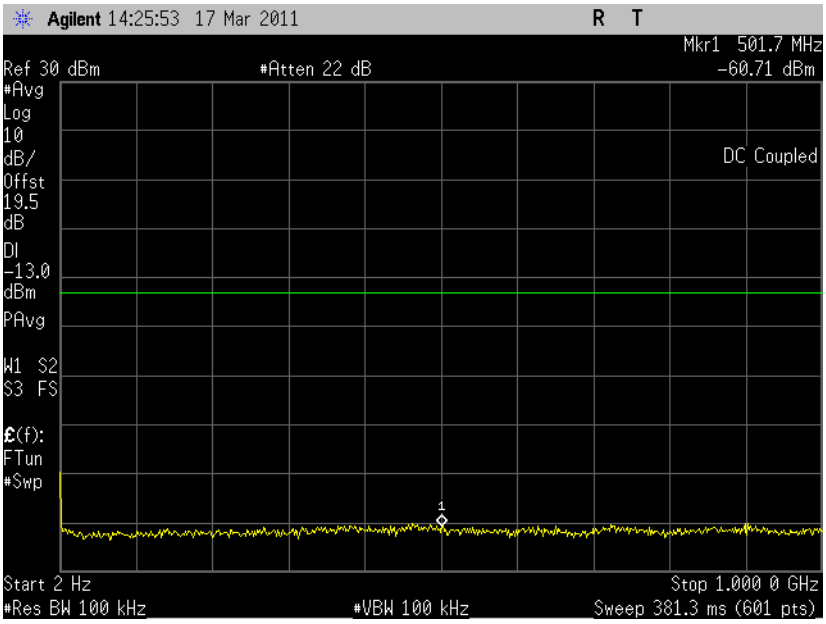


6.3.2.10 Out of Band Emissions at Antenna Terminals WCDMA, Middle channel, 1880 MHz, 1 GHz to 20 GHz

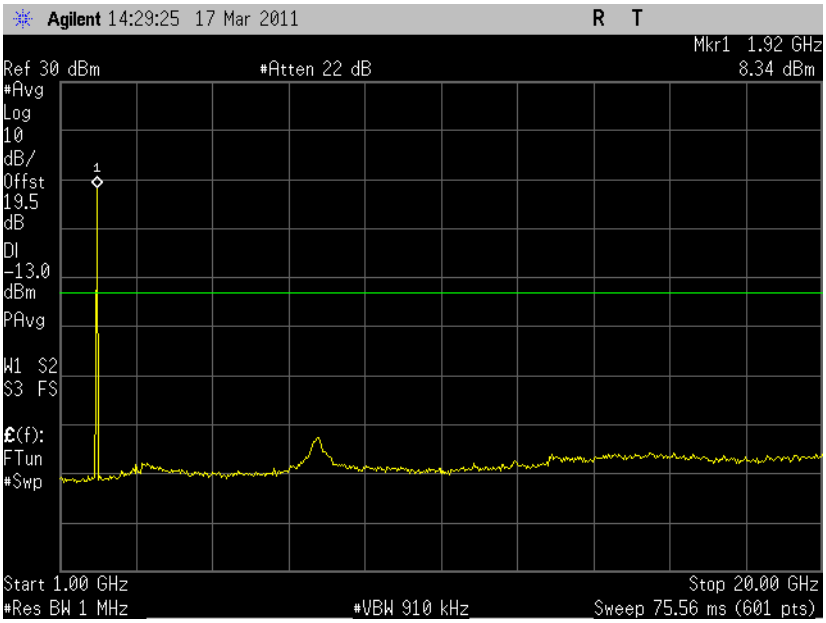


Note: The strong emission shown is the carrier signal.

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



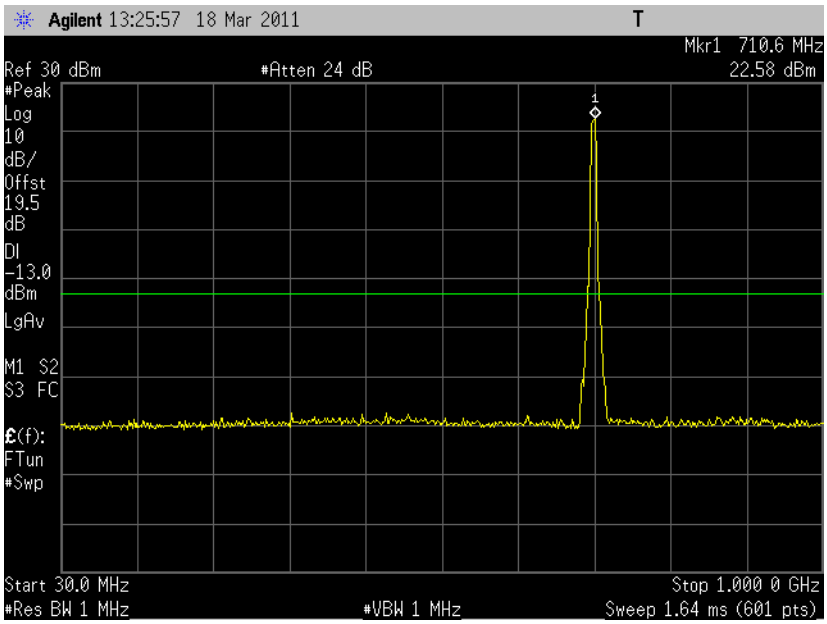
6.3.2.12 Out of Band Emissions at Antenna Terminals WCDMA, High channel, 1907.6 MHz, 1 GHz to 20 GHz



Note: The strong emission shown is the carrier signal.

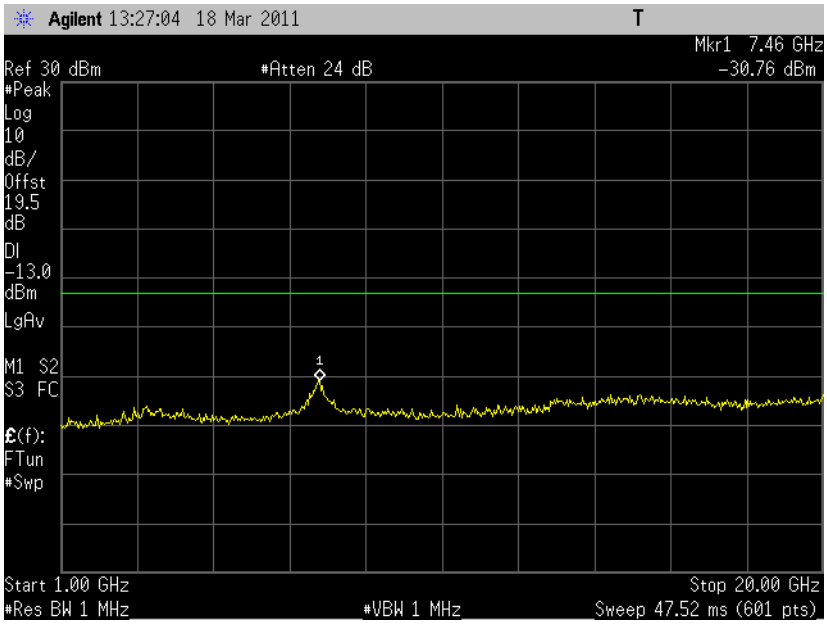
6.3.3 LTE Test Plots

6.3.3.1 Out of Band Emissions at Antenna Terminals LTE, Low channel, 706.5 MHz, 5MHz BW, 25RB, QPSK, 30MHz to 1 GHz

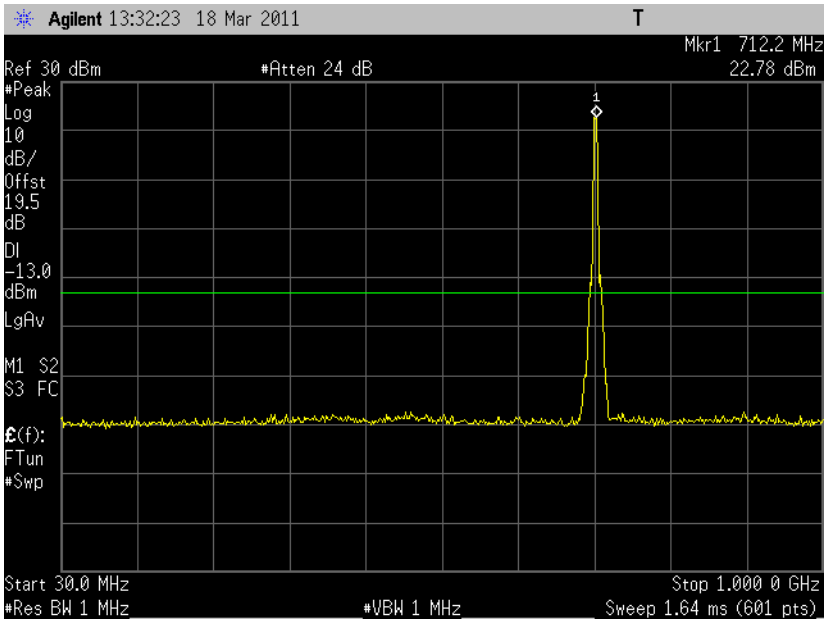


Note: The strong emission shown in each case is the carrier signal.

6.3.3.2 Out of Band Emissions at Antenna Terminals LTE, Low channel, 706.5 MHz, 5MHz BW, 25RB, QPSK, 1 GHz to 20 GHz

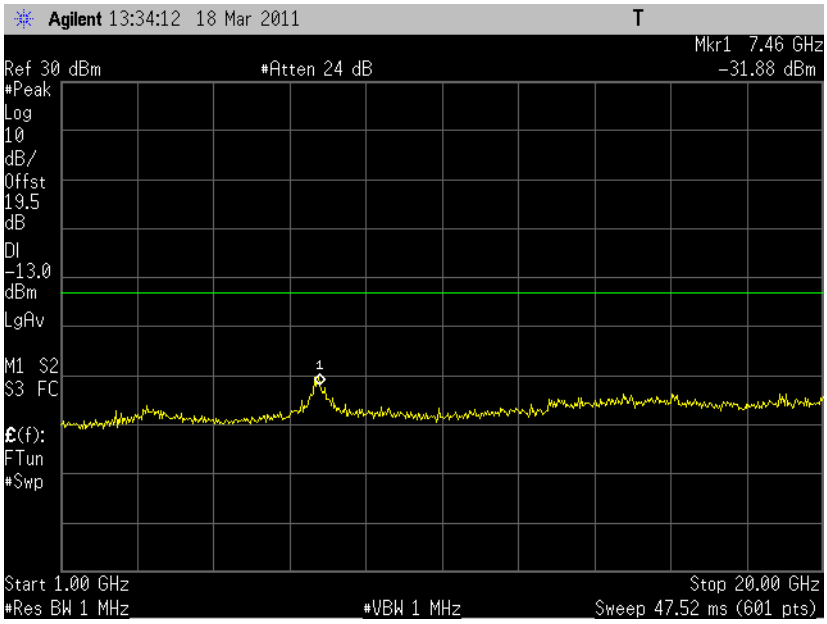


6.3.3.3 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 5MHz BW, 25RB, QPSK, 30MHz to 1 GHz

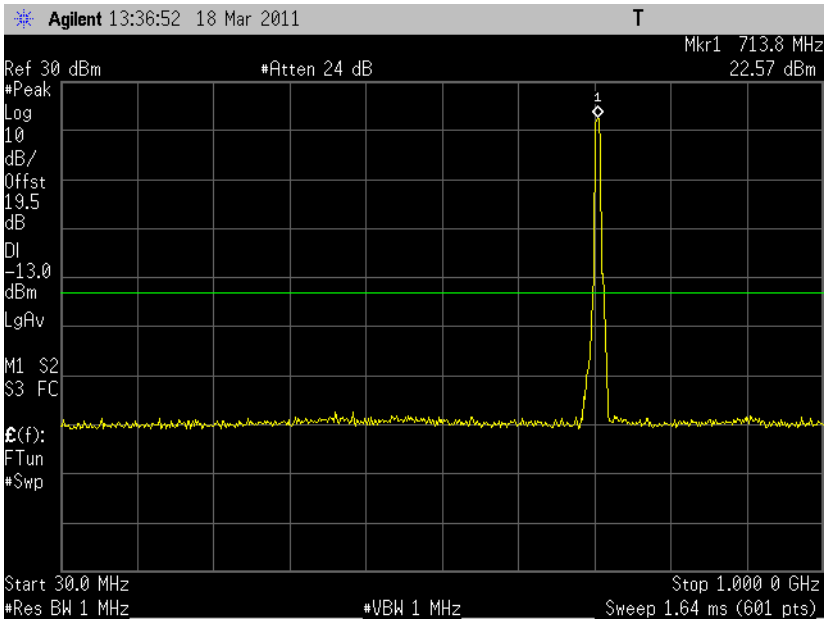


Note: The strong emission shown in each case is the carrier signal.

6.3.3.4 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 5MHz BW, 25RB, QPSK, 1 GHz to 20 GHz

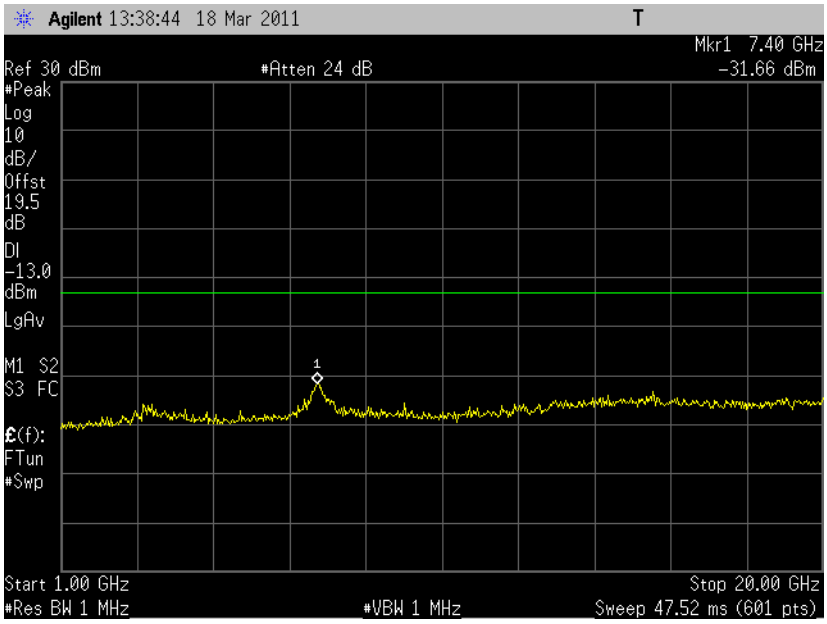


6.3.3.5 Out of Band Emissions at Antenna Terminals LTE, High channel, 713.5 MHz, 5MHz BW, 25RB, QPSK, 30MHz to 1 GHz

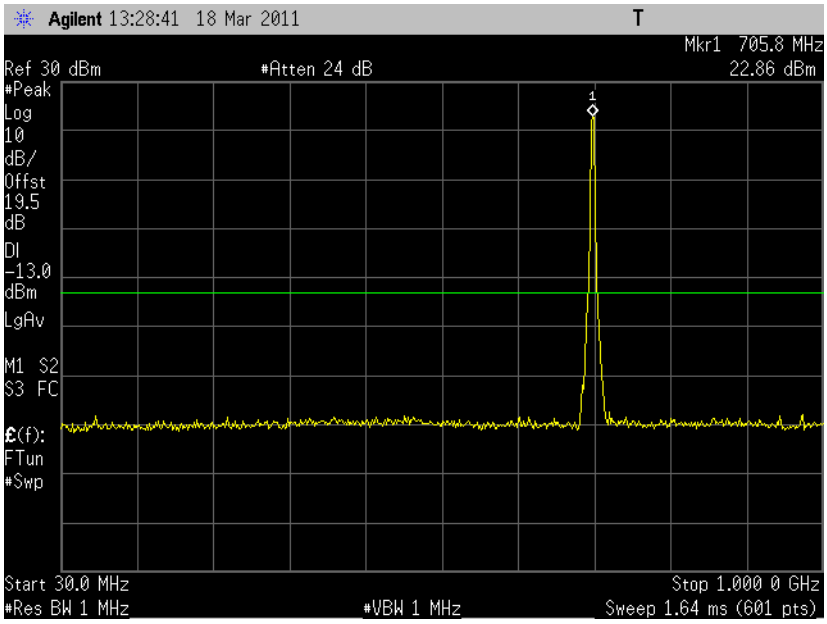


Note: The strong emission shown in each case is the carrier signal.

6.3.3.6 Out of Band Emissions at Antenna Terminals LTE, High channel, 713.5 MHz, 5MHz BW, 25RB, QPSK, 1 GHz to 20 GHz

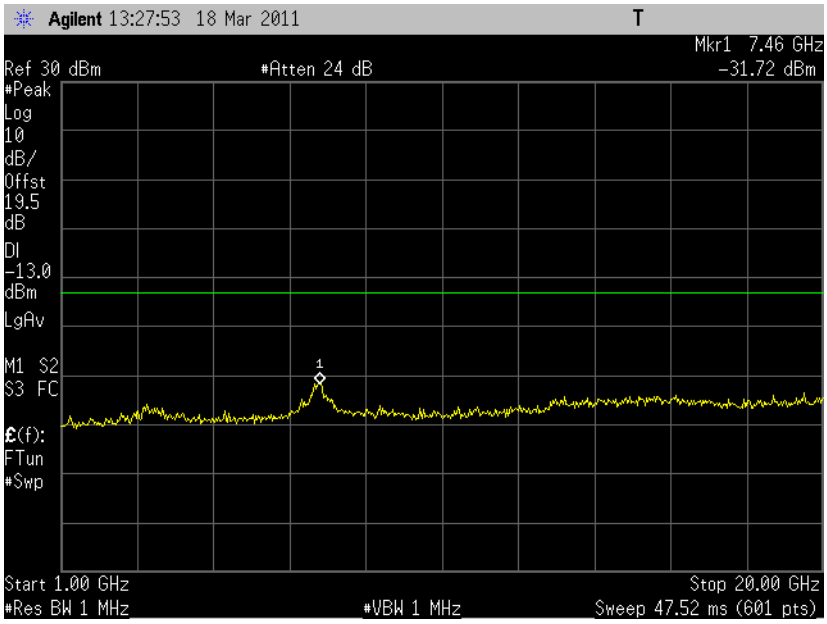


6.3.3.7 Out of Band Emissions at Antenna Terminals LTE, Low channel, 706.5 MHz, 5MHz BW, 25RB, 16-QAM, 30MHz to 1 GHz

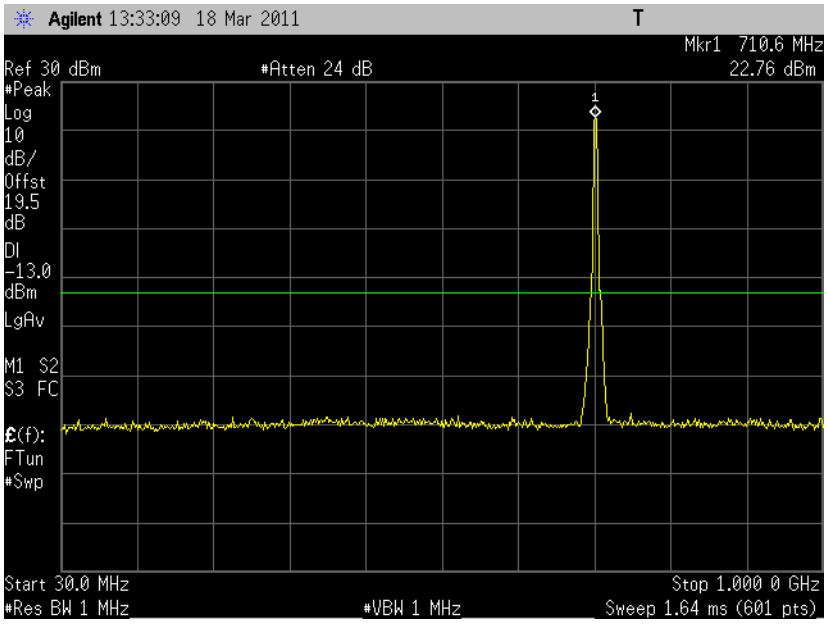


Note: The strong emission shown in each case is the carrier signal.

6.3.3.8 Out of Band Emissions at Antenna Terminals LTE, Low channel, 706.5 MHz, 5MHz BW, 25RB, 16-QAM, 1 GHz to 20 GHz

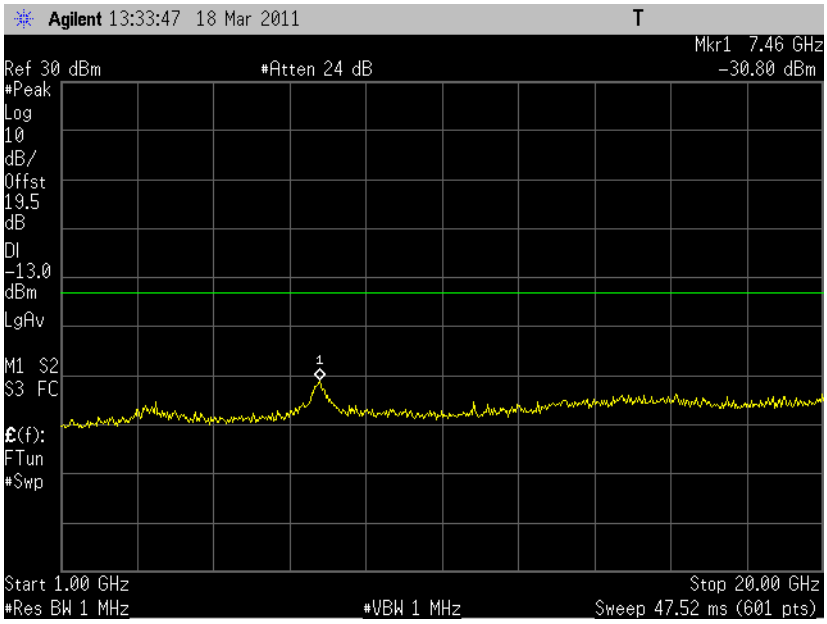


6.3.3.9 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 5MHz BW, 25RB, 16-QAM, 30MHz to 1 GHz

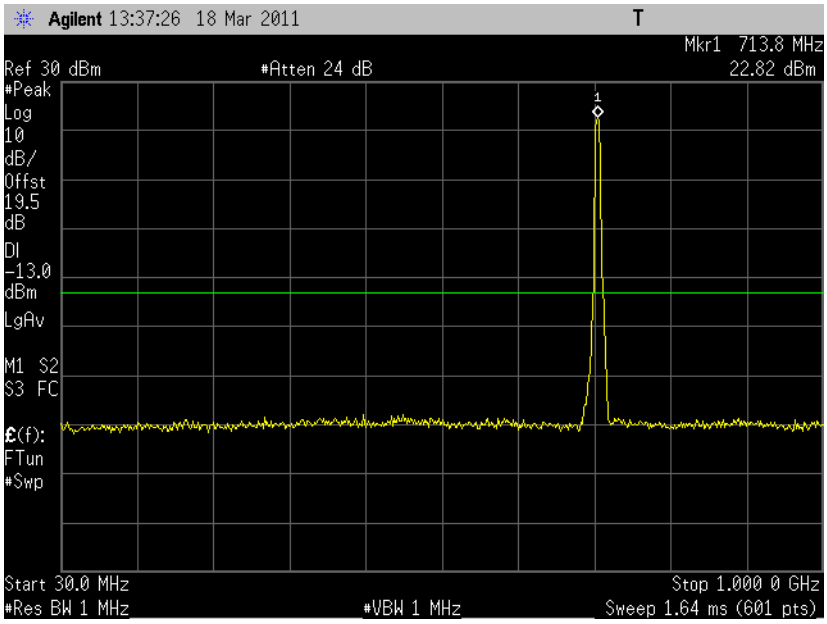


Note: The strong emission shown in each case is the carrier signal.

6.3.3.10 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 5MHz BW, 25RB, 16-QAM, 1 GHz to 20 GHz

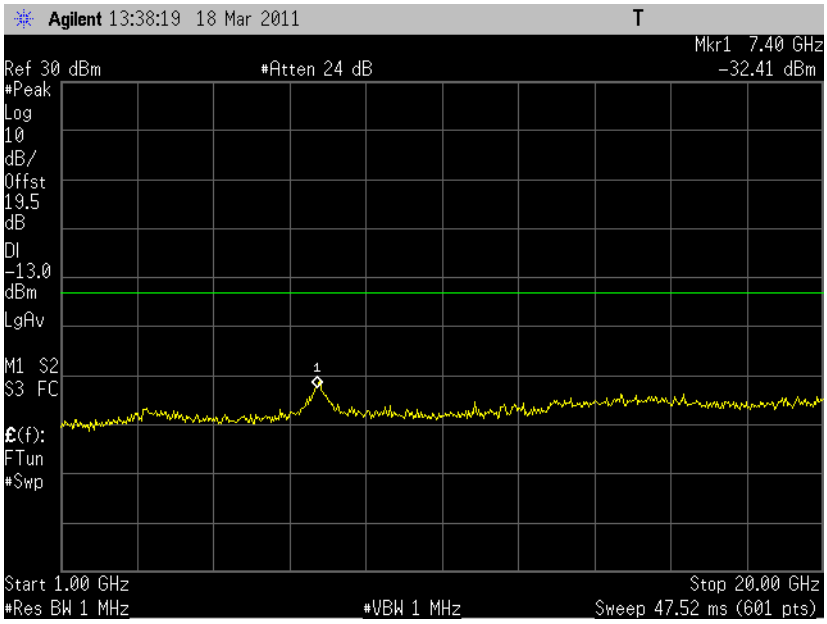


6.3.3.11 Out of Band Emissions at Antenna Terminals LTE, High channel, 713.5 MHz, 5MHz BW, 25RB, 16-QAM, 30MHz to 1 GHz

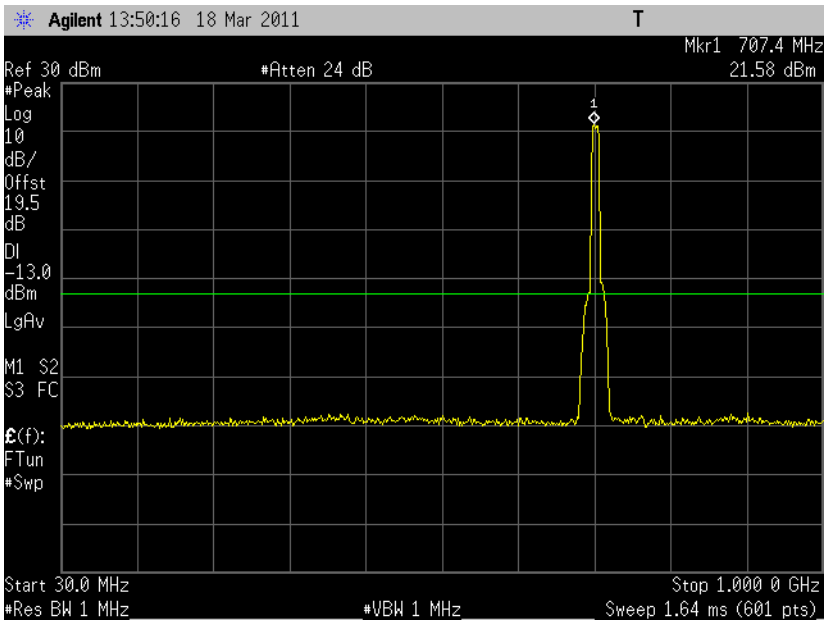


Note: The strong emission shown in each case is the carrier signal.

6.3.3.12 Out of Band Emissions at Antenna Terminals LTE, High channel, 713.5 MHz, 5MHz BW, 25RB, 16-QAM, 1 GHz to 20 GHz

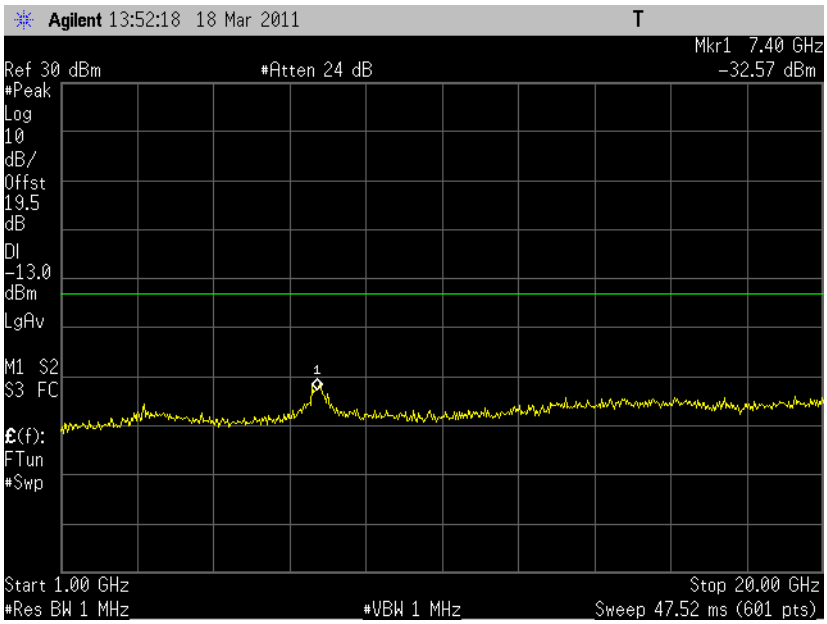


6.3.3.13 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz

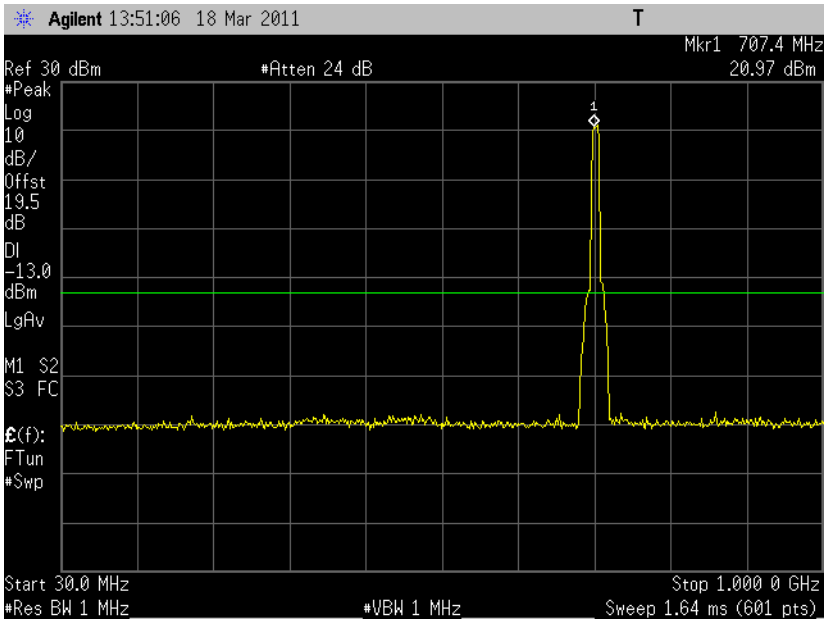


Note: The strong emission shown in each case is the carrier signal.

6.3.3.14 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 20 GHz

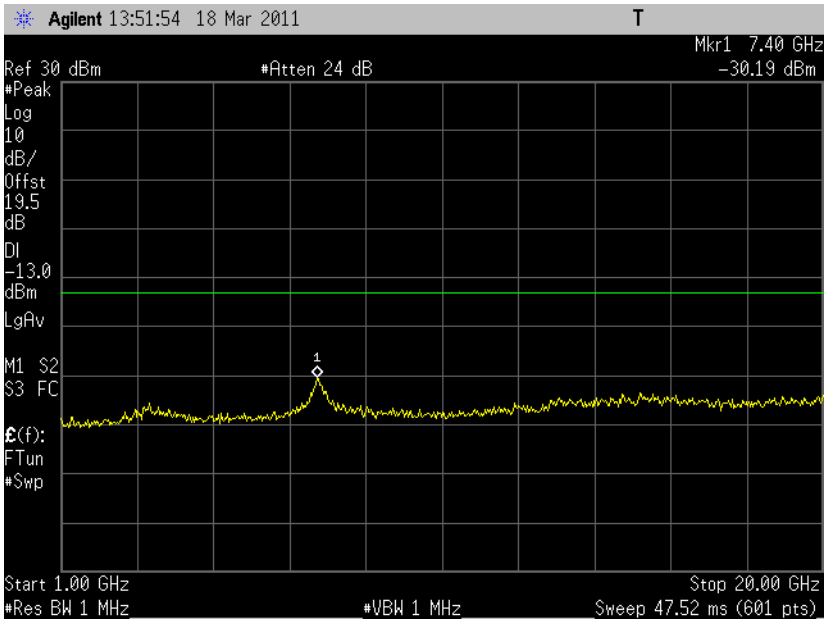


6.3.3.15 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 10MHz BW, 50RB, 16QAM, 30MHz to 1 GHz

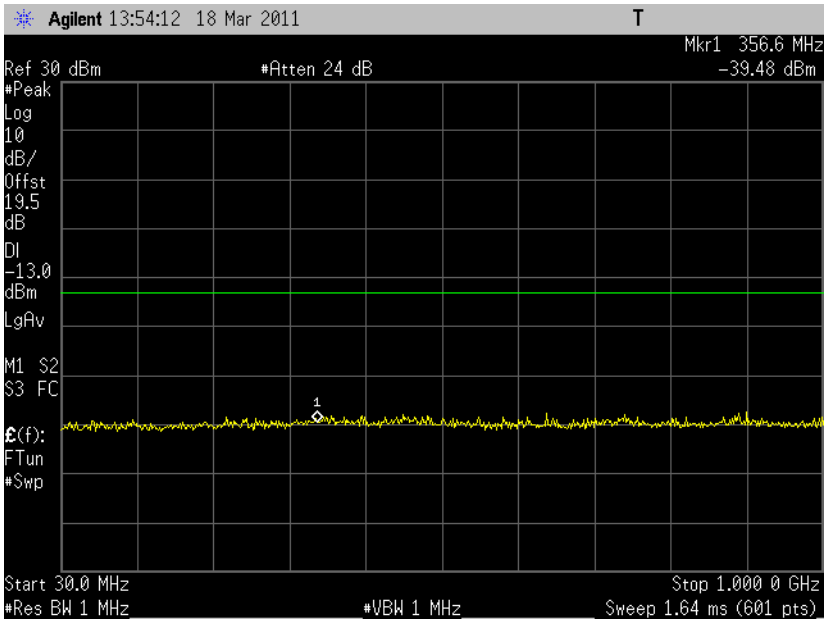


Note: The strong emission shown in each case is the carrier signal.

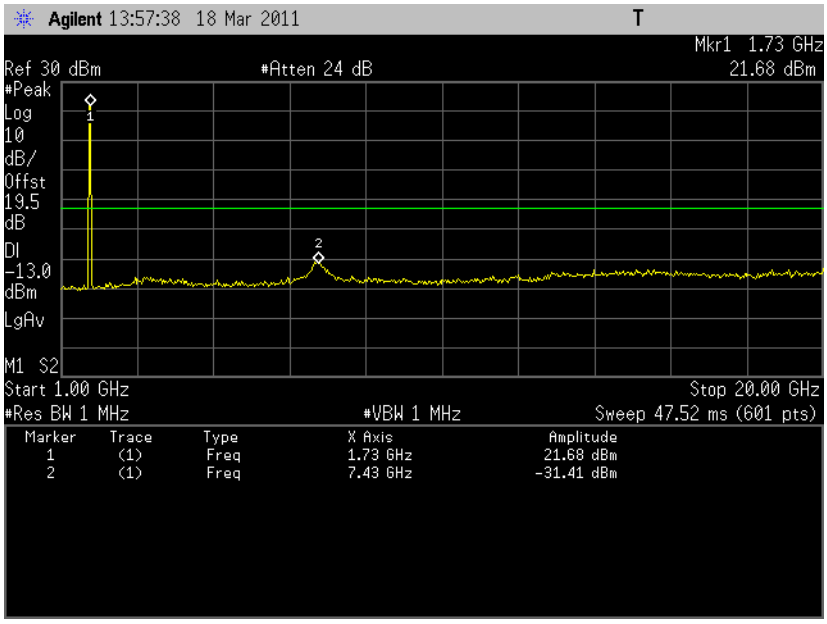
6.3.3.16 Out of Band Emissions at Antenna Terminals LTE, Mid channel, 710.0 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 20 GHz



6.3.3.17 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1712.5 MHz, 5MHz BW, 25RB, QPSK, 30MHz to 1 GHz

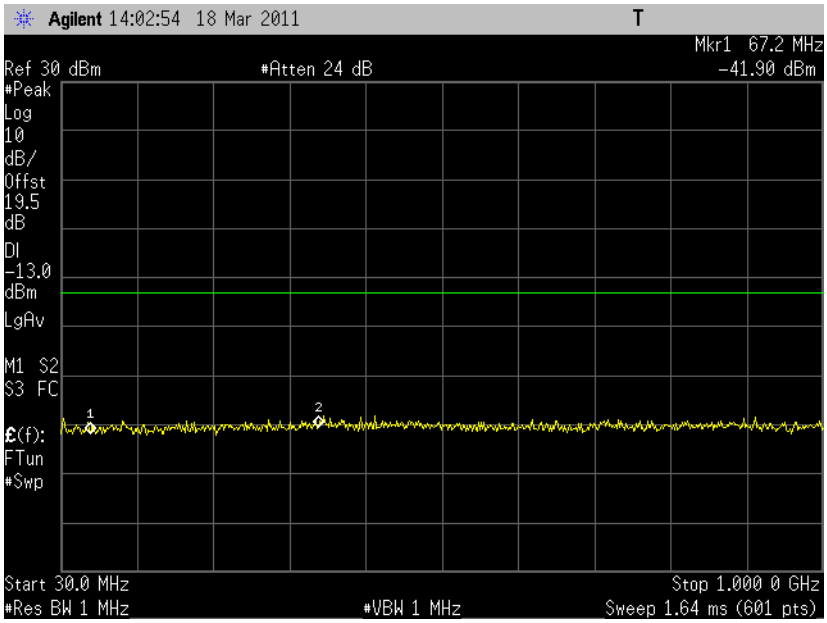


6.3.3.18 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1712.5 MHz, 5MHz BW, 25RB, QPSK, 1 GHz to 20 GHz

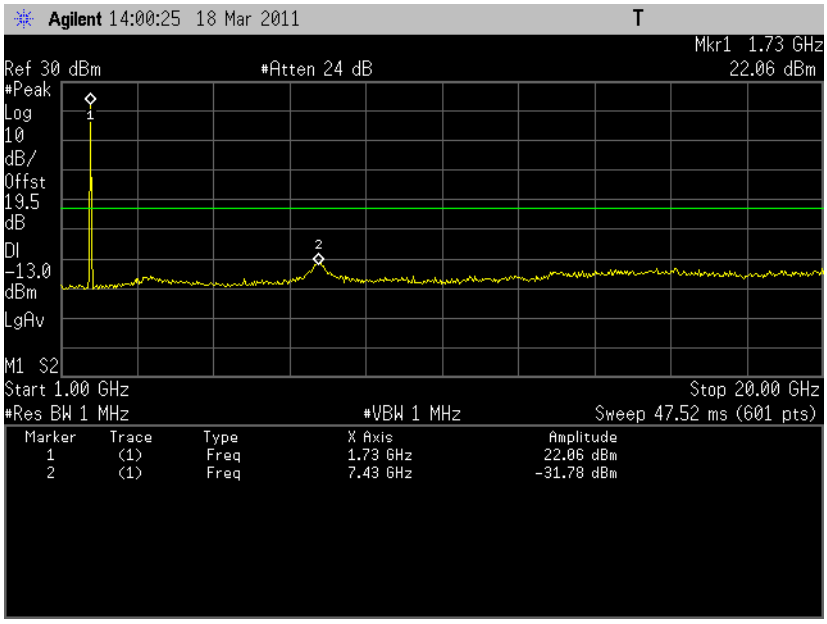


Note: The strong emission shown is the carrier signal.

6.3.3.19 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 25RB, QPSK, 30MHz to 1 GHz

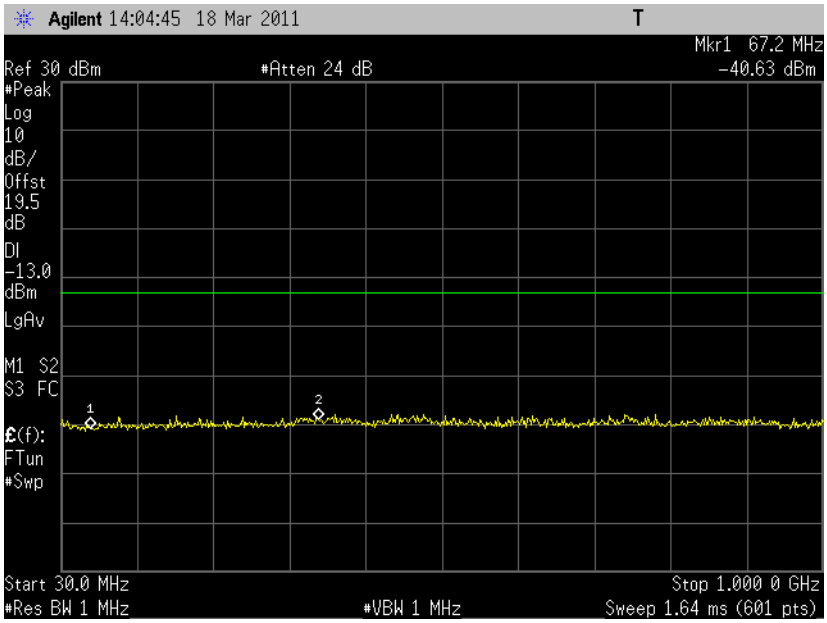


6.3.3.20 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 25RB, QPSK, 1 GHz to 20 GHz

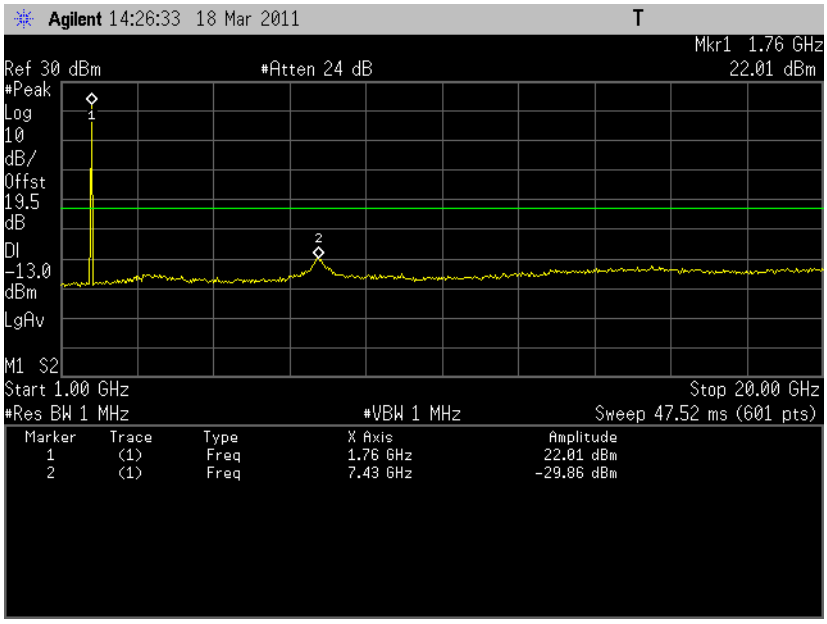


Note: The strong emission shown is the carrier signal.

6.3.3.21 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1752.5 MHz, 5MHz BW, 25RB, QPSK, 30MHz to 1 GHz

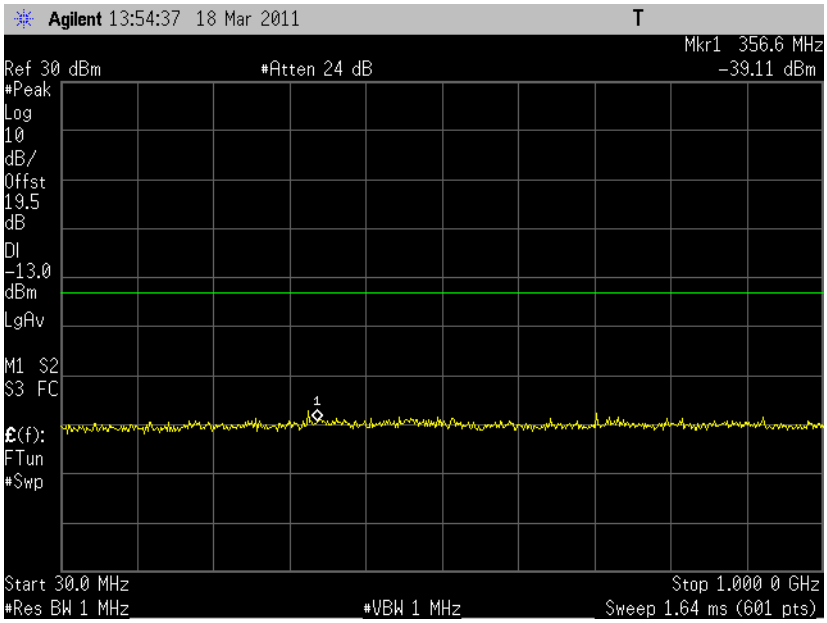


6.3.3.22 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1752.5 MHz, 5MHz BW, 25RB, QPSK, 1 GHz to 20 GHz

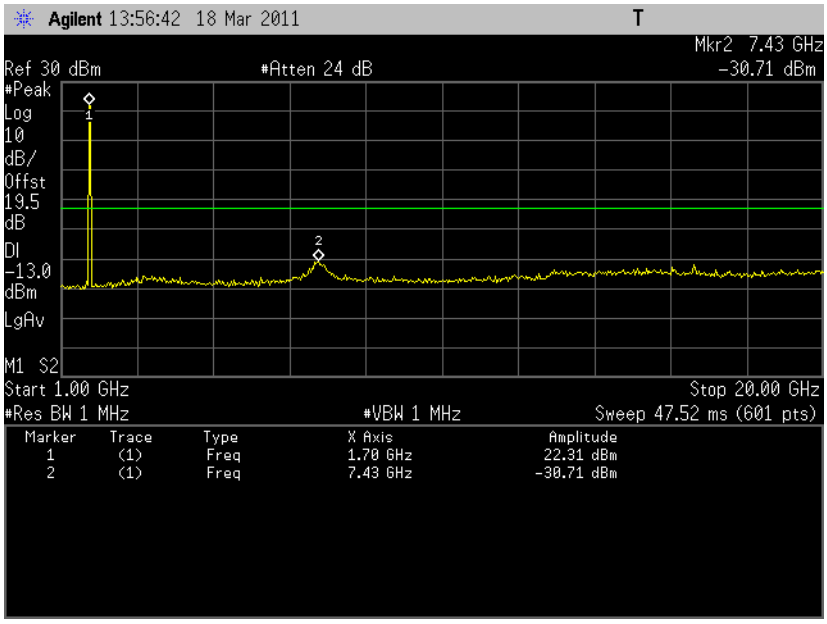


Note: The strong emission shown is the carrier signal.

6.3.3.23 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1712.5 MHz, 5MHz BW, 25RB, 16QAM, 30MHz to 1 GHz

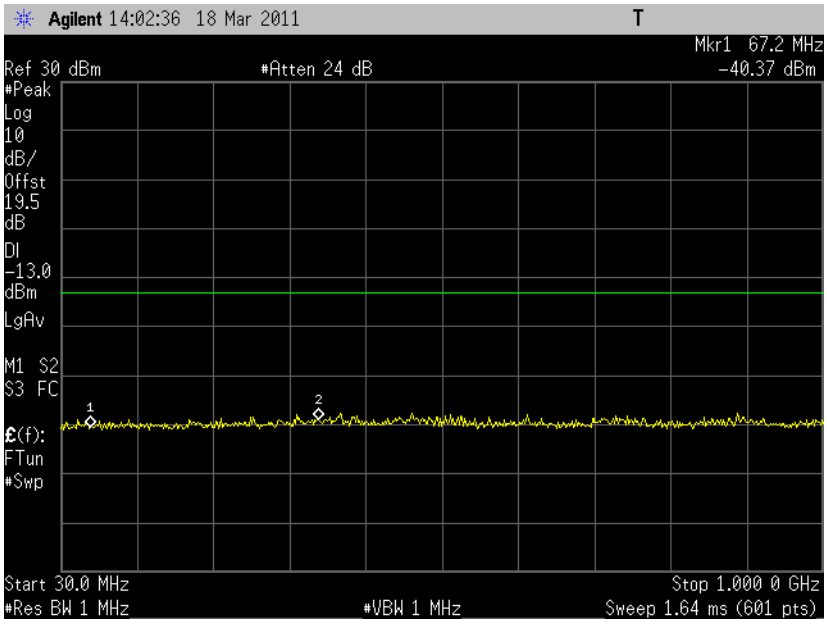


6.3.3.24 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1712.5 MHz, 5MHz BW, 25RB, 16QAM, 1 GHz to 20 GHz

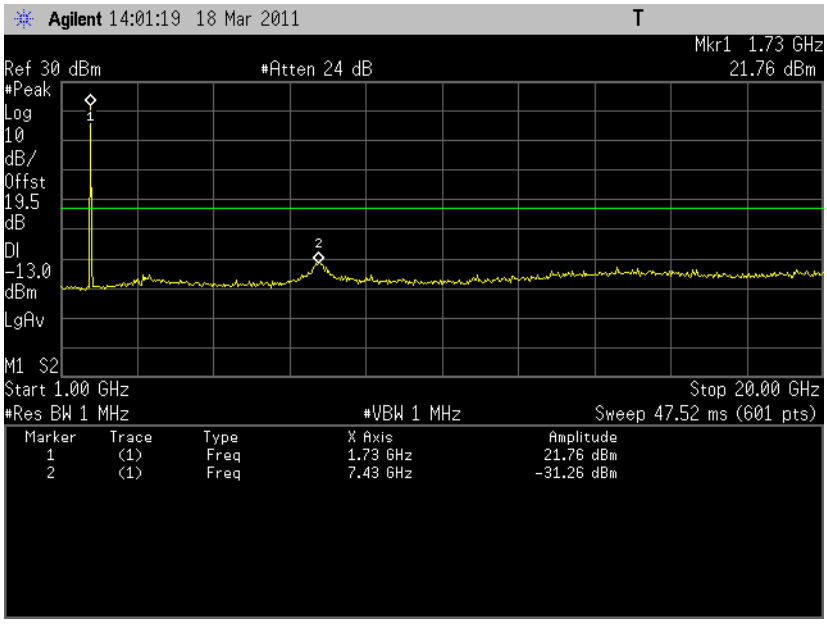


Note: The strong emission shown is the carrier signal.

6.3.3.25 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 25RB, 16QAM, 30MHz to 1 GHz

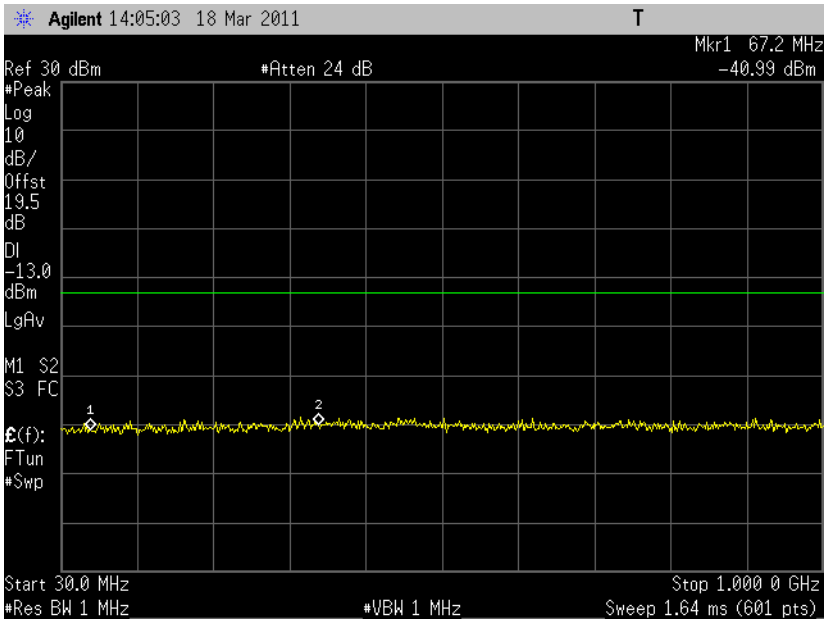


6.3.3.26 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 25RB, 16QAM, 1 GHz to 20 GHz

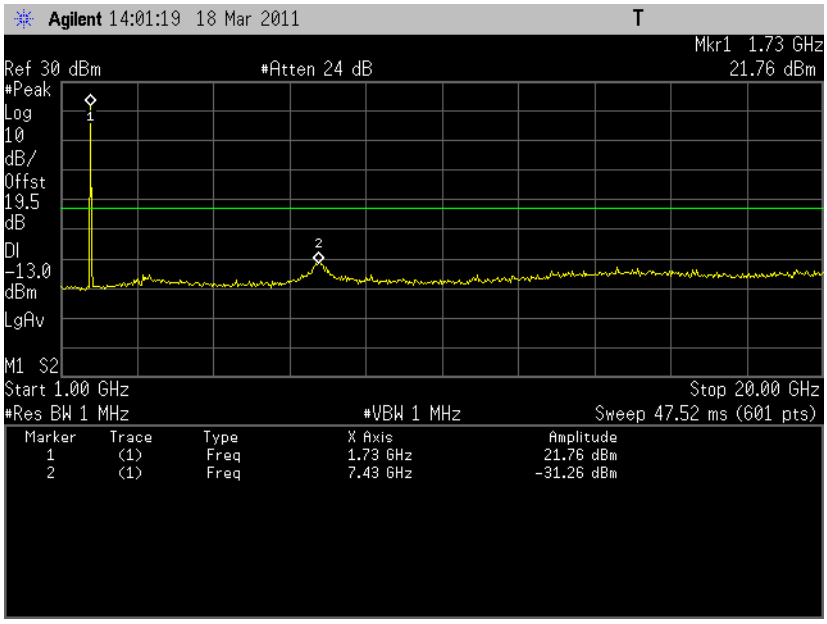


Note: The strong emission shown is the carrier signal.

6.3.3.27 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1752.5 MHz, 5MHz BW, 25RB, 16QAM, 30MHz to 1 GHz

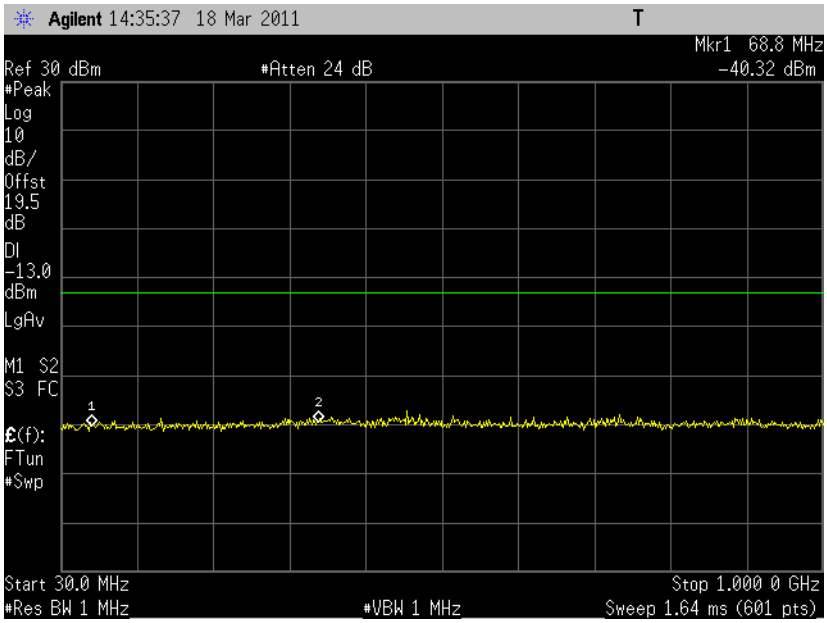


6.3.3.28 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1752.5 MHz, 5MHz BW, 25RB, 16QAM, 1 GHz to 20 GHz

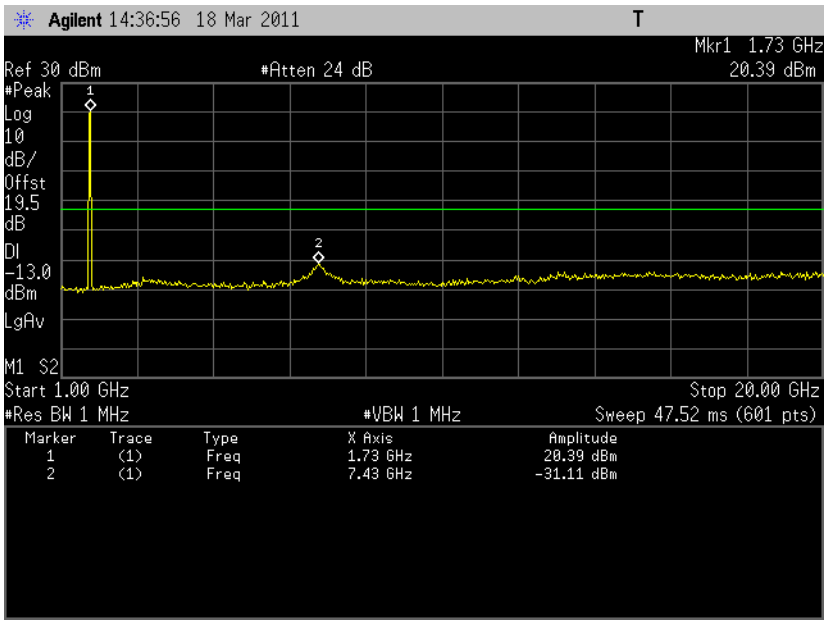


Note: The strong emission shown is the carrier signal.

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

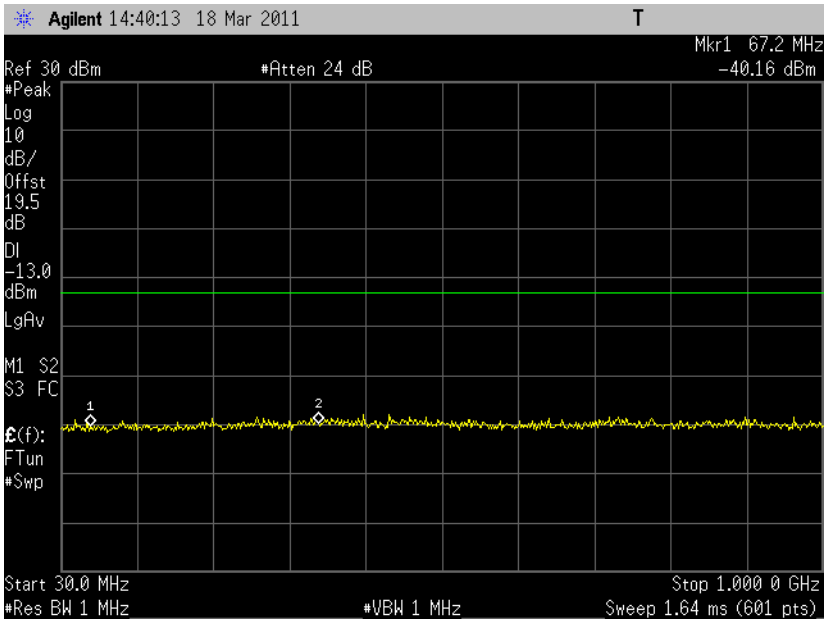


6.3.3.30 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 20 GHz

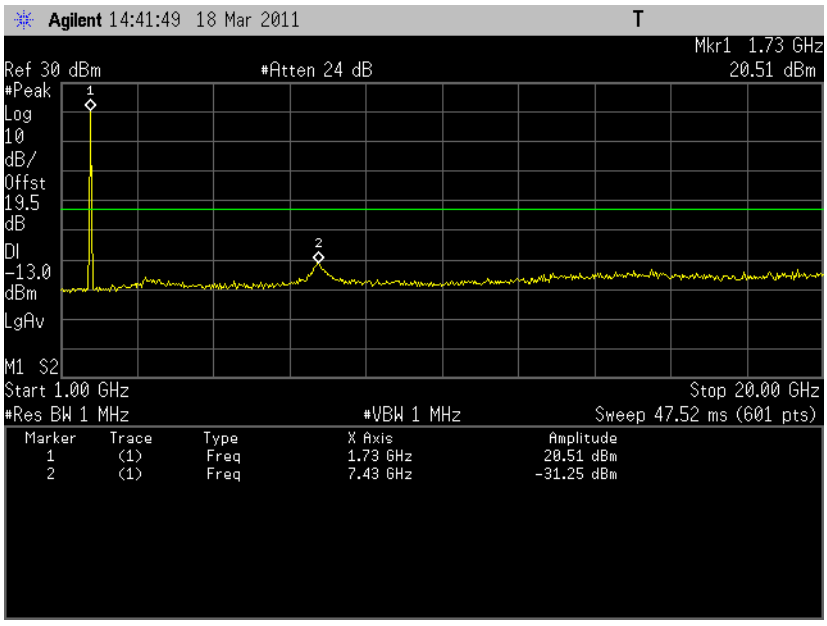


Note: The strong emission shown is the carrier signal.

6.3.3.31 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz

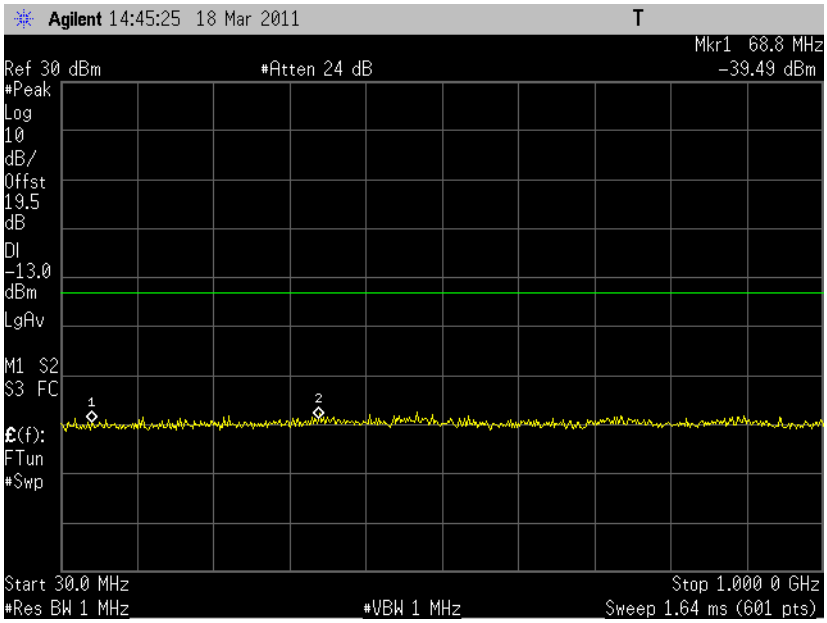


6.3.3.32 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 20 GHz

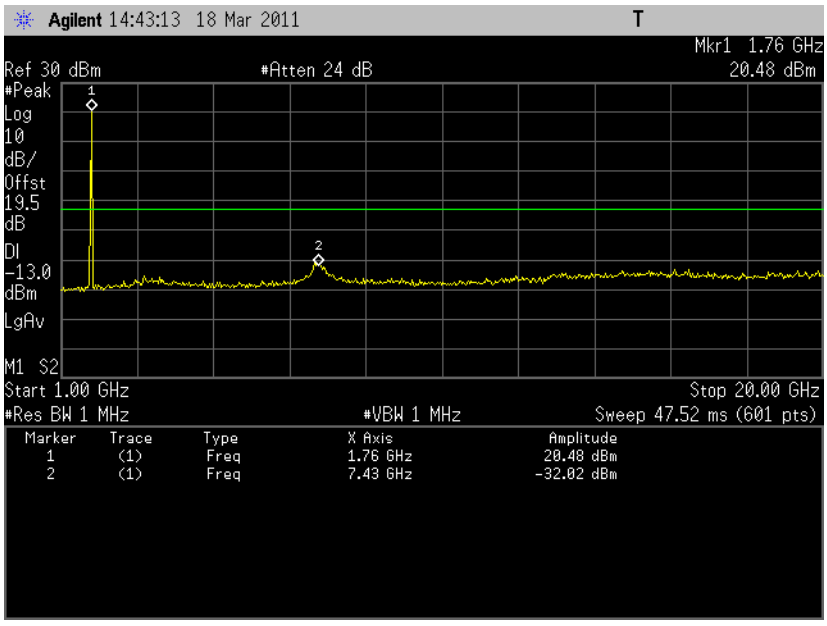


Note: The strong emission shown is the carrier signal.

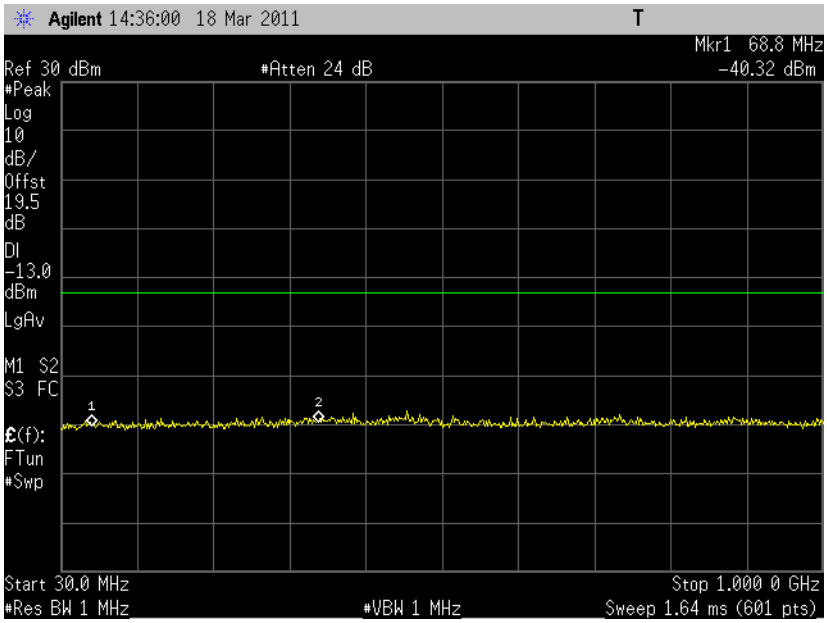
6.3.3.33 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, QPSK, 30MHz to 1 GHz



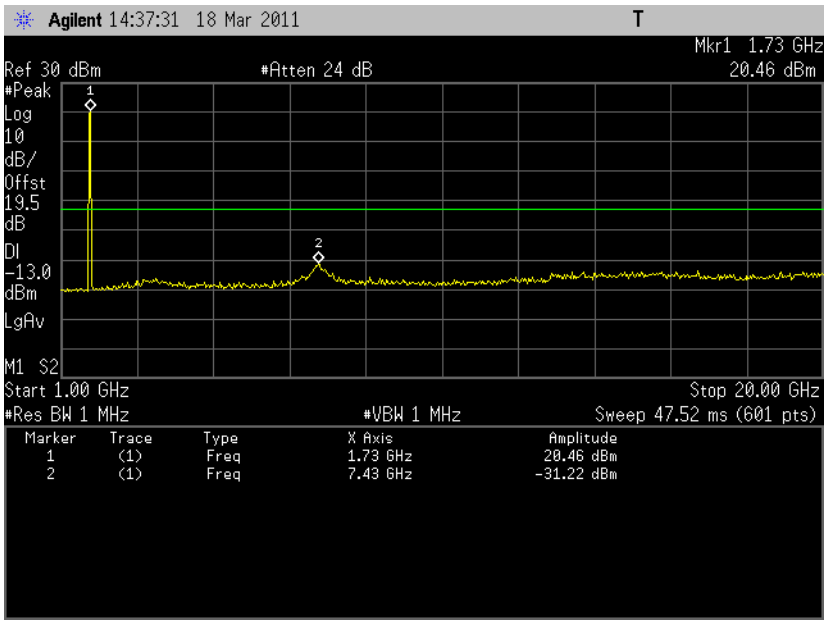
6.3.3.34 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, QPSK, 1 GHz to 20 GHz



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

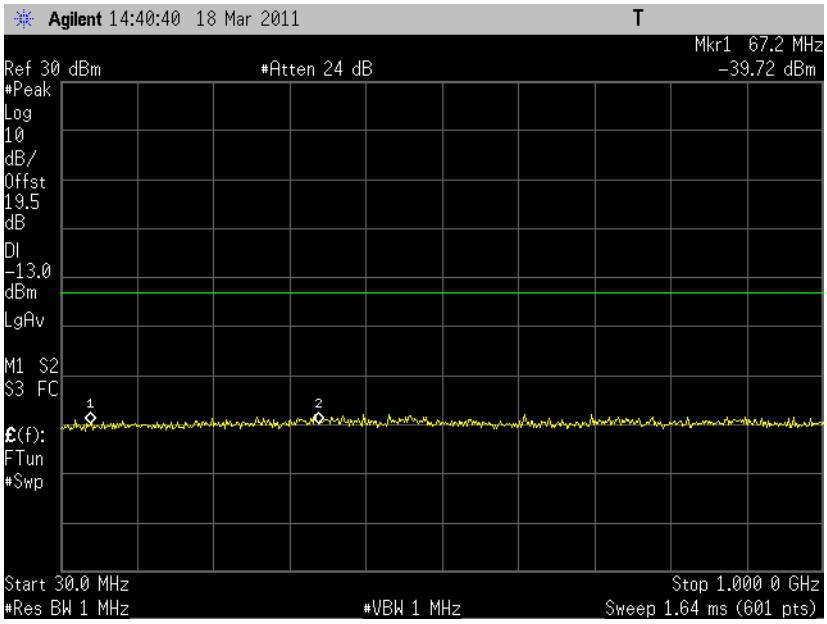


6.3.3.36 Out of Band Emissions at Antenna Terminals LTE B4, Low channel, 1715.0 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 20 GHz

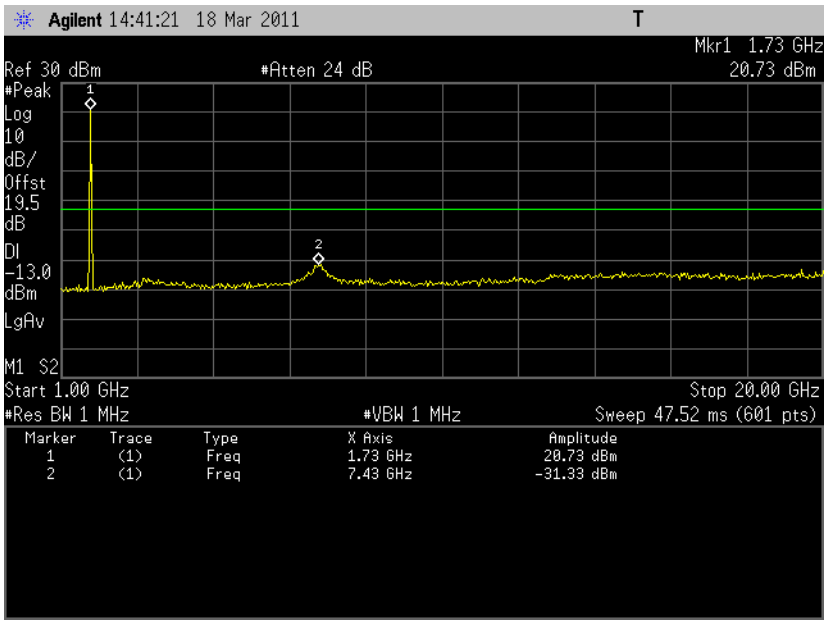


Note: The strong emission shown is the carrier signal.

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

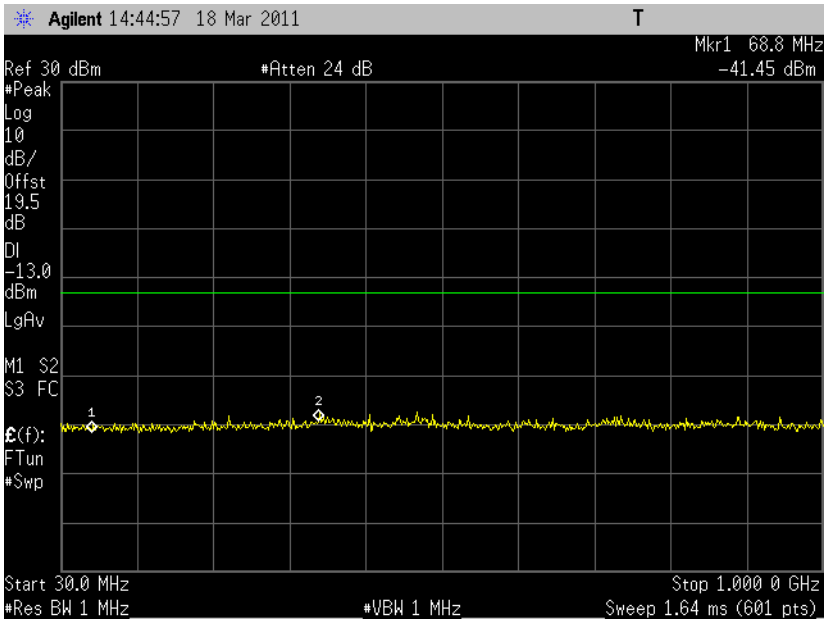


6.3.3.38 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 20 GHz

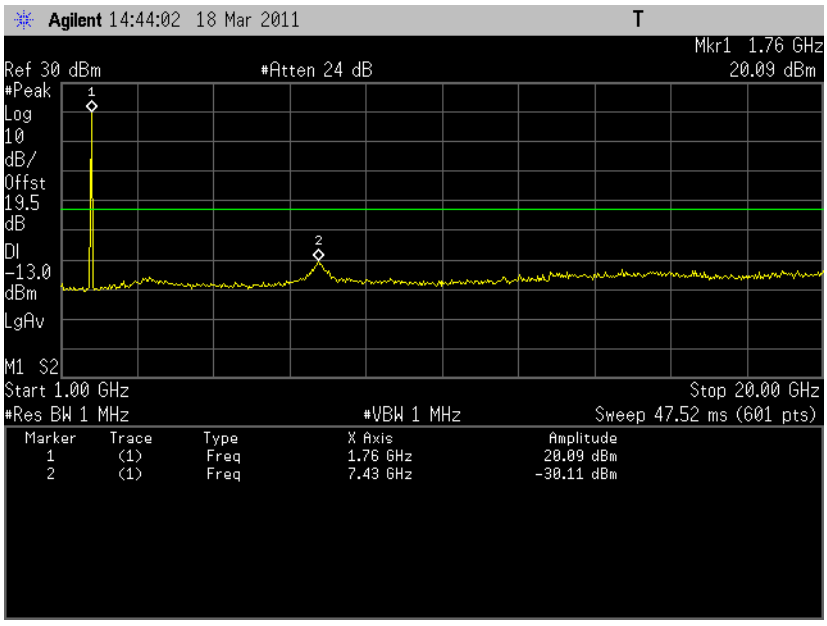


Note: The strong emission shown is the carrier signal.

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



6.3.3.40 Out of Band Emissions at Antenna Terminals LTE B4, High channel, 1750.0 MHz, 10MHz BW, 50RB, 16QAM, 1 GHz to 20 GHz



Note: The strong emission shown is the carrier signal.

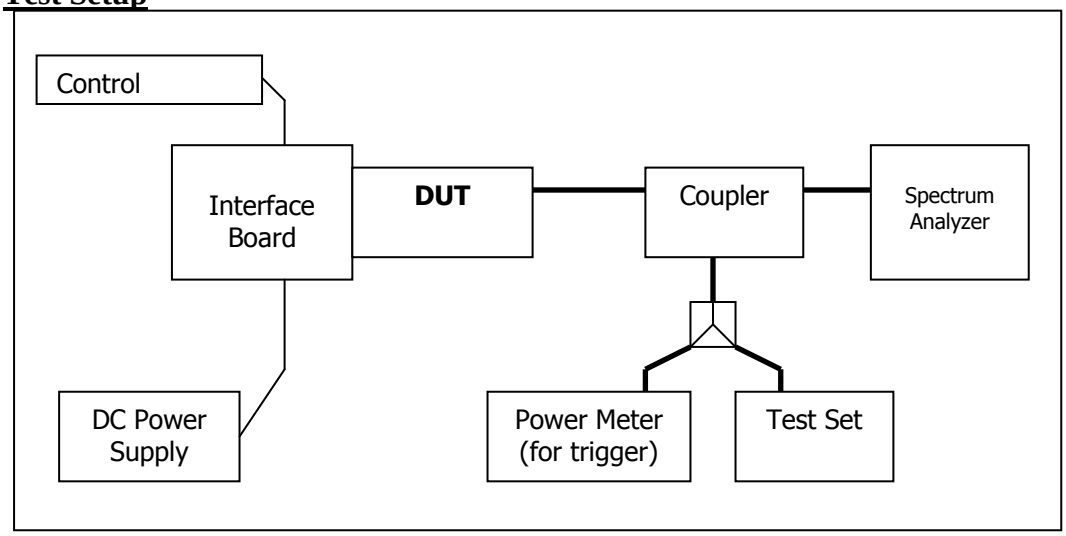
7 Block Edge Compliance

FCC Part 22(h)/24(e)/27.54(h)

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



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 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
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

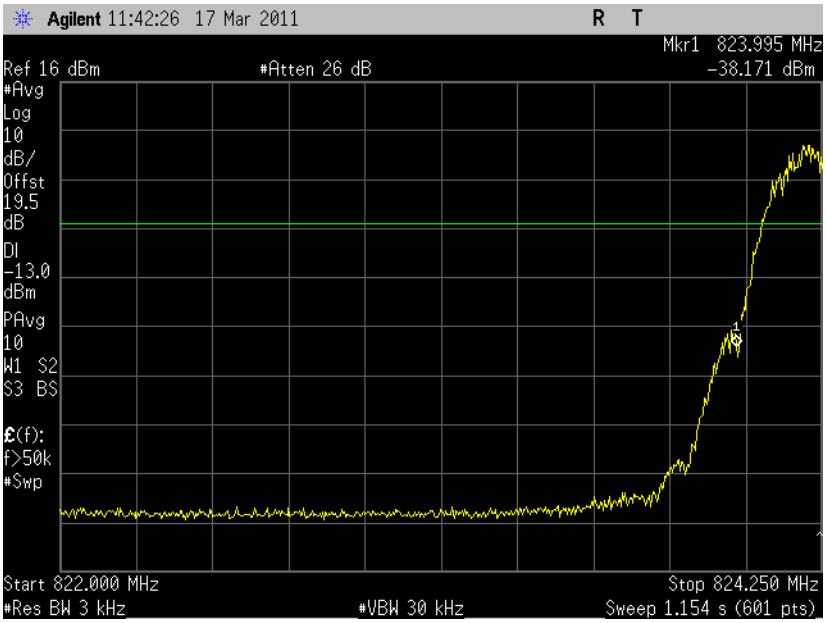
	Below 1850MHz, above 1910MHz	512, 810	7.3.1.5, 7.3.1.6	Complies
8PSK	Below 824 MHz, above 849 MHz	128, 251	7.3.1.3, 7.3.1.4	Complies
	Below 1850MHz, above 1910MHz	512, 810	7.3.1.7, 7.3.1.8	Complies

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

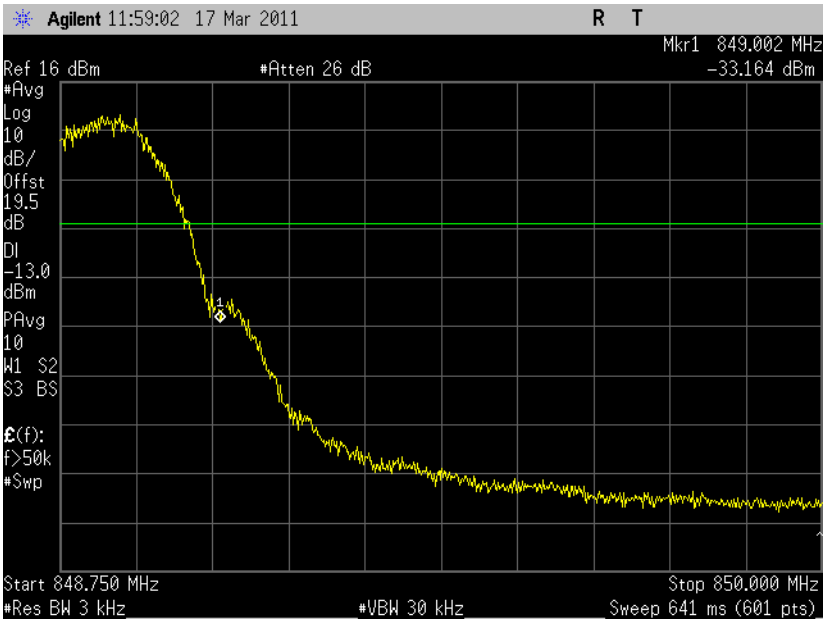
Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	Corresponding Plot number
LTE	QPSK	B17	5	25	0	706.5	23755	7.3.3.1
						713.5	23825	7.3.3.2
		B4	5	25	0	1712.5	19975	7.3.3.5
						1752.5	20375	7.3.3.6
	16QAM	B17	5	25	0	706.5	23755	7.3.3.3
						713.5	23825	7.3.3.4
		B4	5	25	0	1712.5	19975	7.3.3.7
						1752.5	20375	7.3.3.8

7.3.1 GSM Test Plots

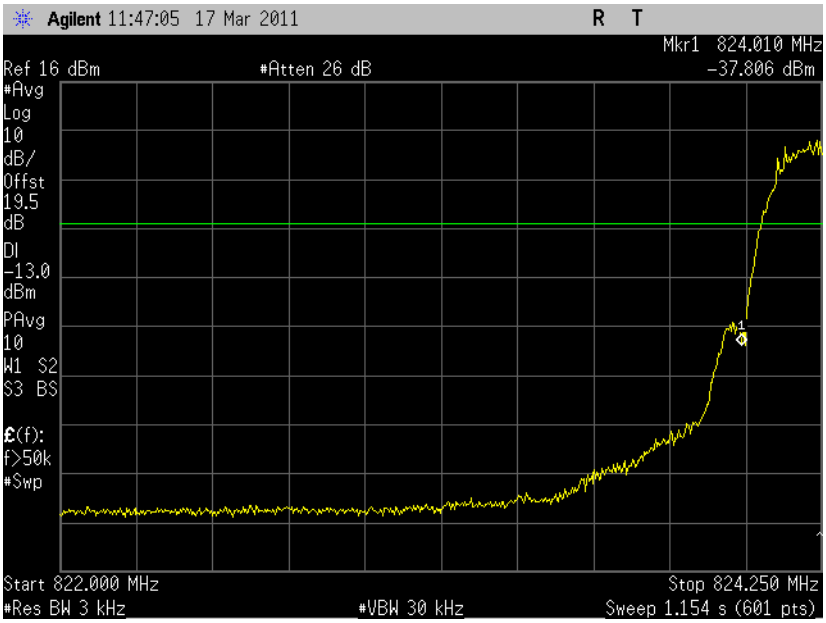
7.3.1.1 GSMK; Cellular low channel, below 824 MHz



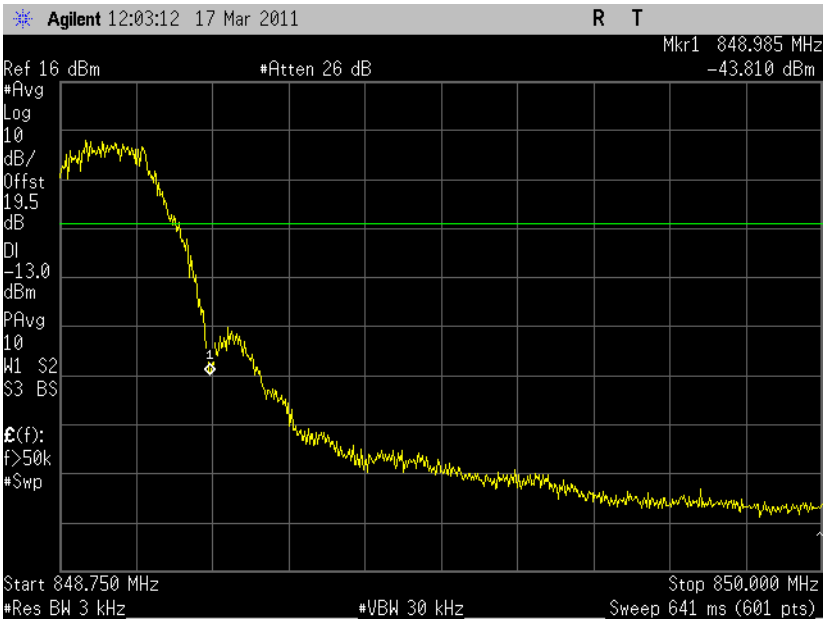
7.3.1.2 GMSK; Cellular high channel, above 849 MHz



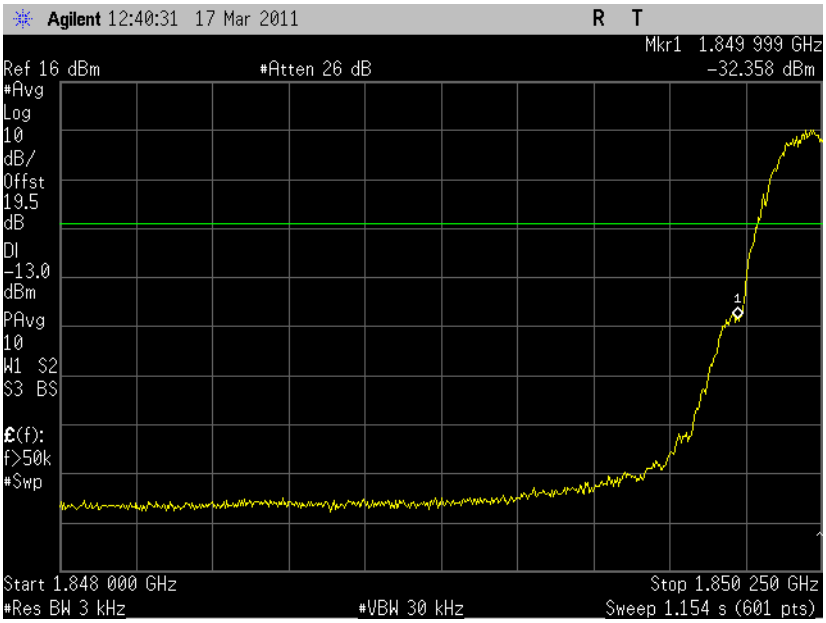
7.3.1.3 8-PSK; Cellular low channel, below 824 MHz



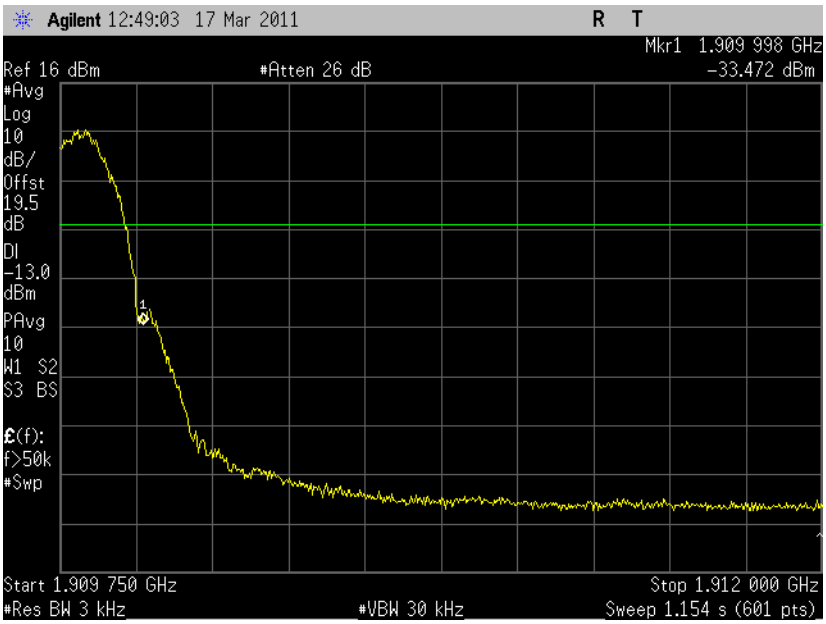
7.3.1.4 8-PSK; Cellular high channel, above 849 MHz



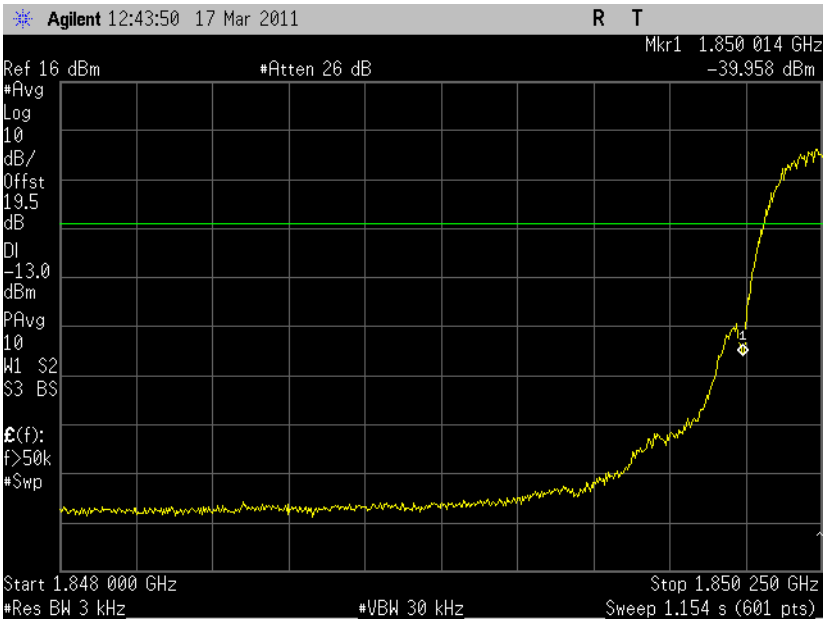
7.3.1.5 GMSK; PCS low channel, below 1850 MHz



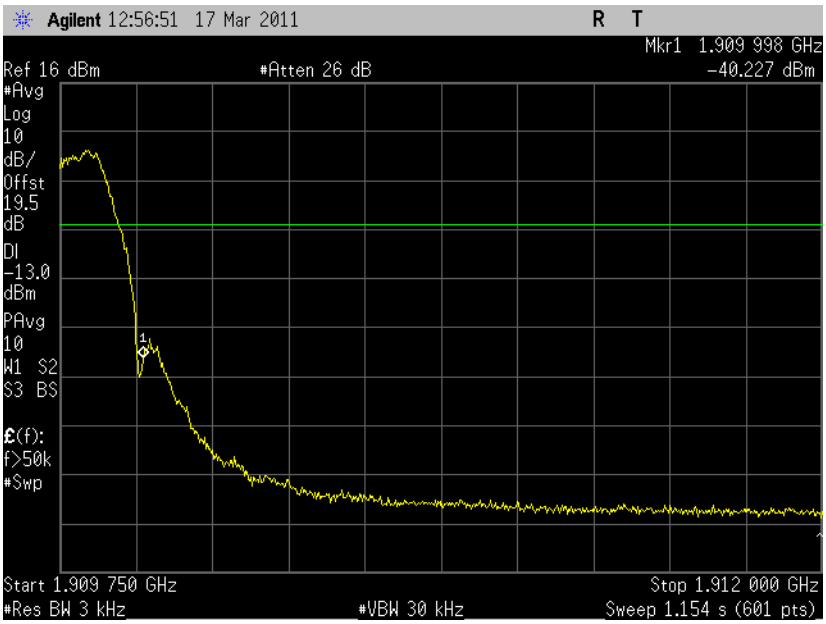
7.3.1.6 GMSK; PCS high channel, above 1910 MHz



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

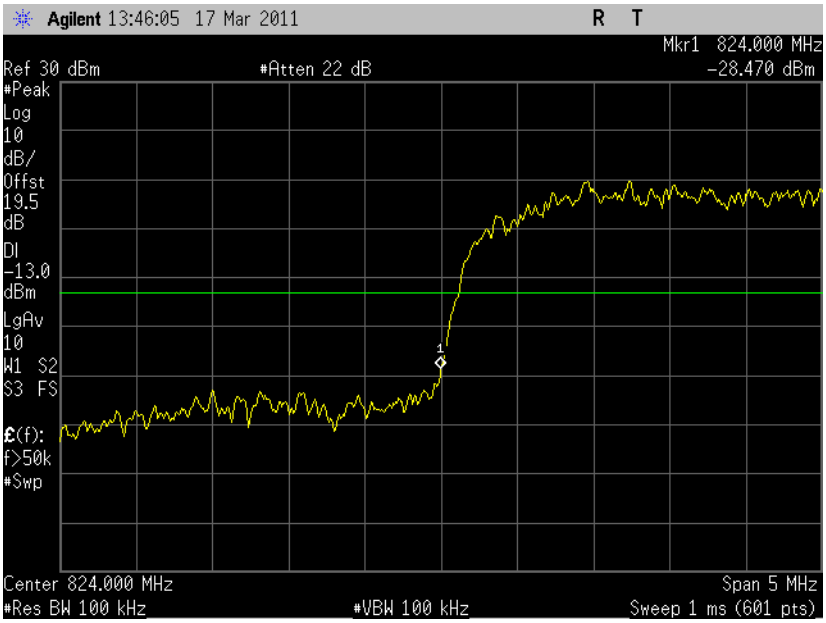


7.3.1.8 8-PSK; PCS high channel, above 1910 MHz

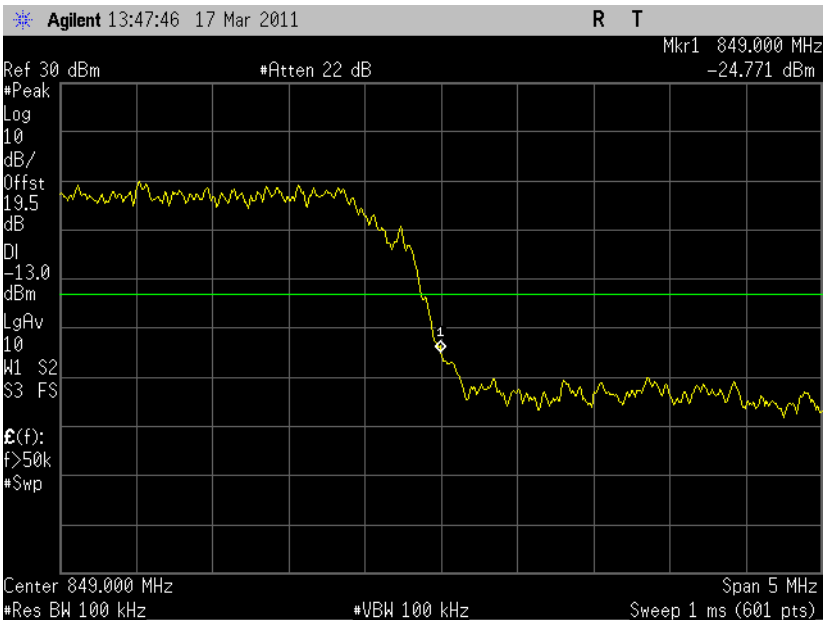


7.3.2 WCDMA Test Plots

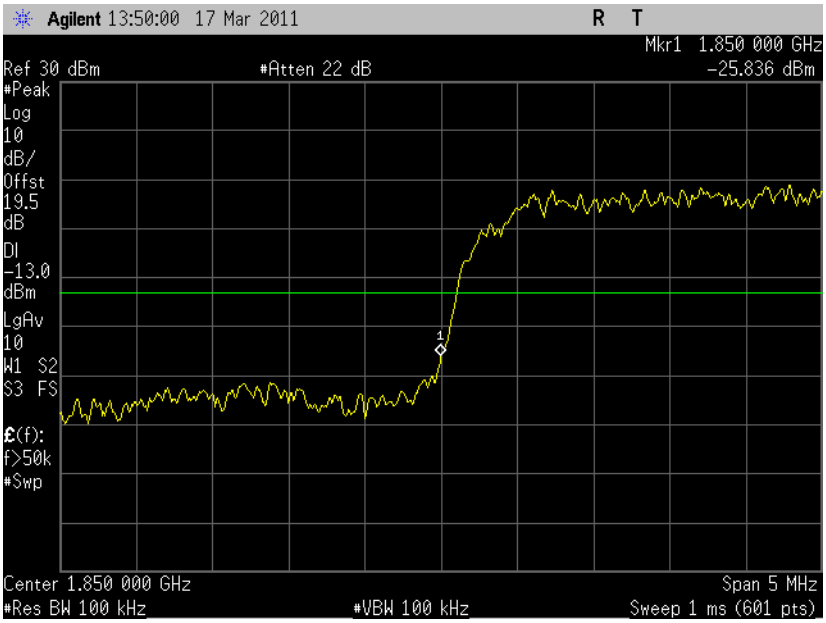
7.3.2.1 WCDMA; Cellular low channel, below 824 MHz



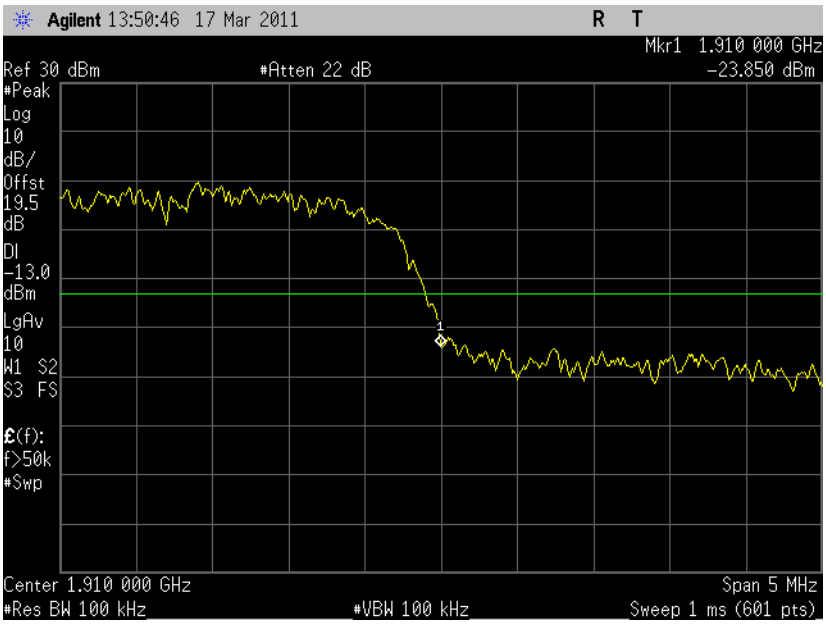
7.3.2.2 WCDMA; Cellular high channel, above 849 MHz



7.3.2.3 WCDMA; PCS low channel, below 1850 MHz

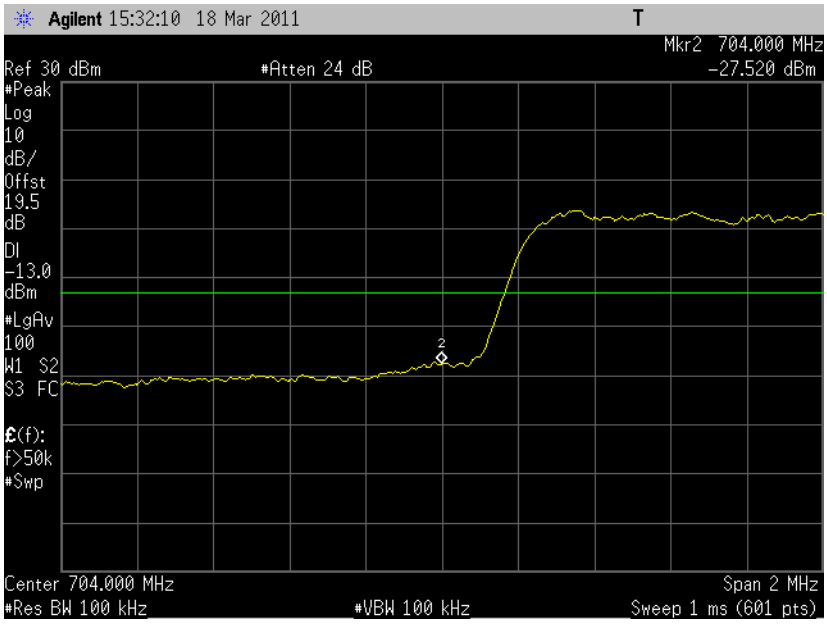


7.3.2.4 WCDMA; PCS high channel, above 1910 MHz

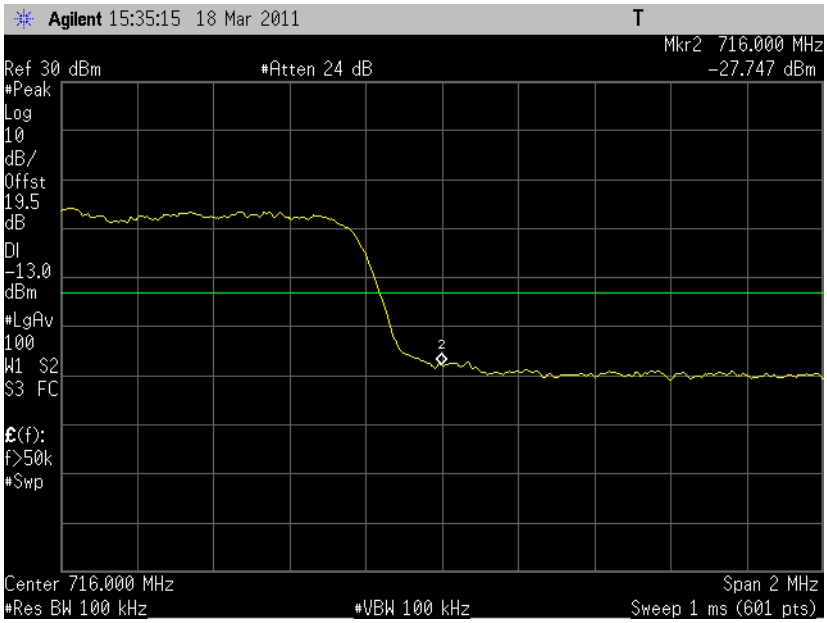


7.3.3 LTE Test Plots

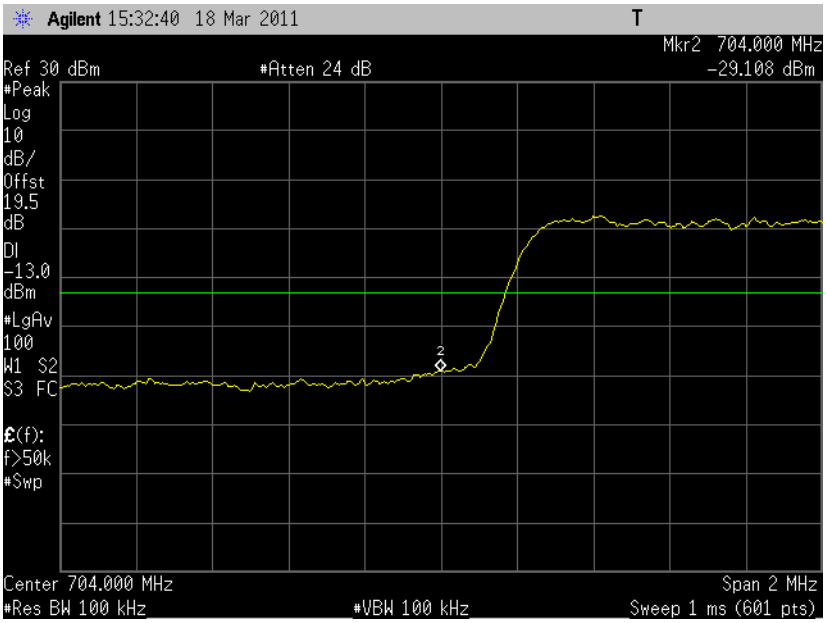
7.3.3.1 LTE; Band17 below 704 MHz with ch23755, 5MHz, QPSK, 25RB



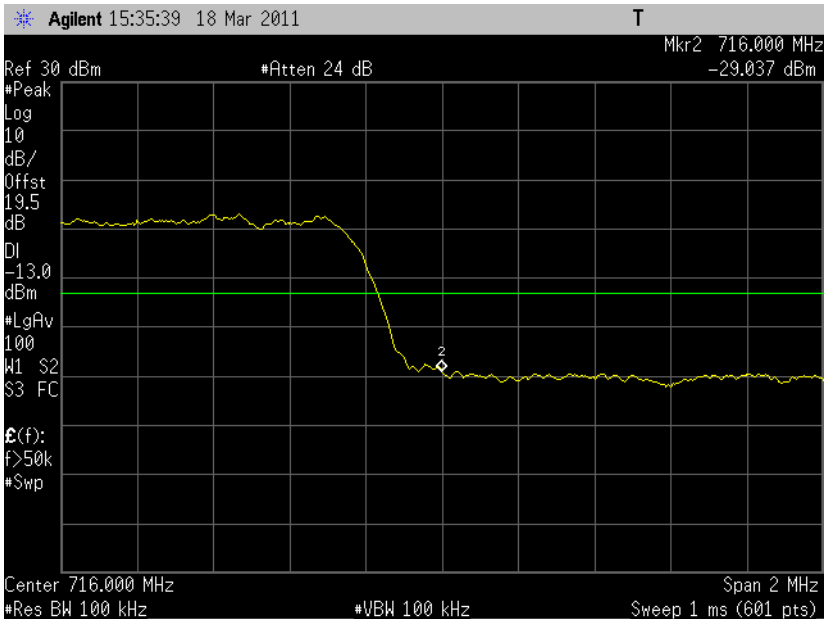
7.3.3.2 LTE; Band17 above 716 MHz, with ch23825, 5MHz, QPSK, 25RB



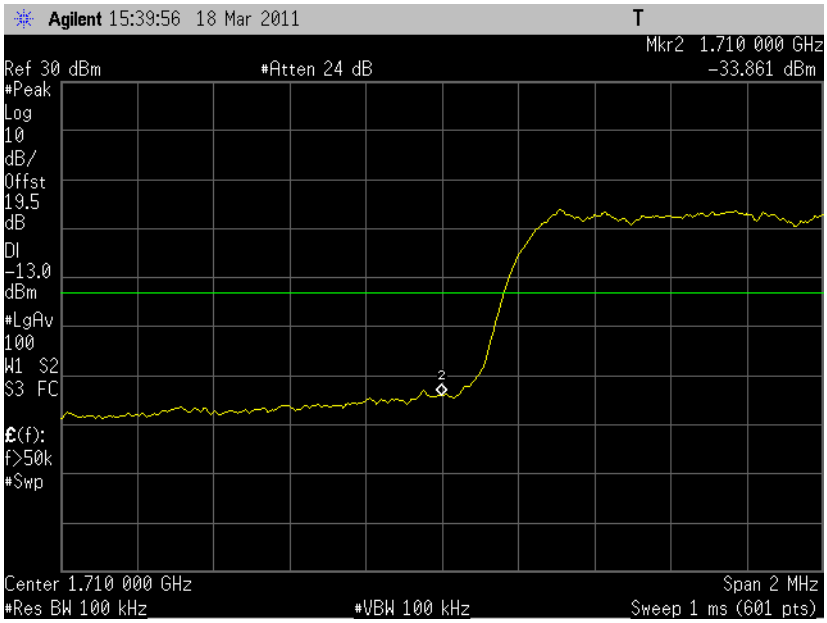
7.3.3.3 LTE; Band17 below 704 MHz with ch23755, 5MHz, 16QAM, 25RB



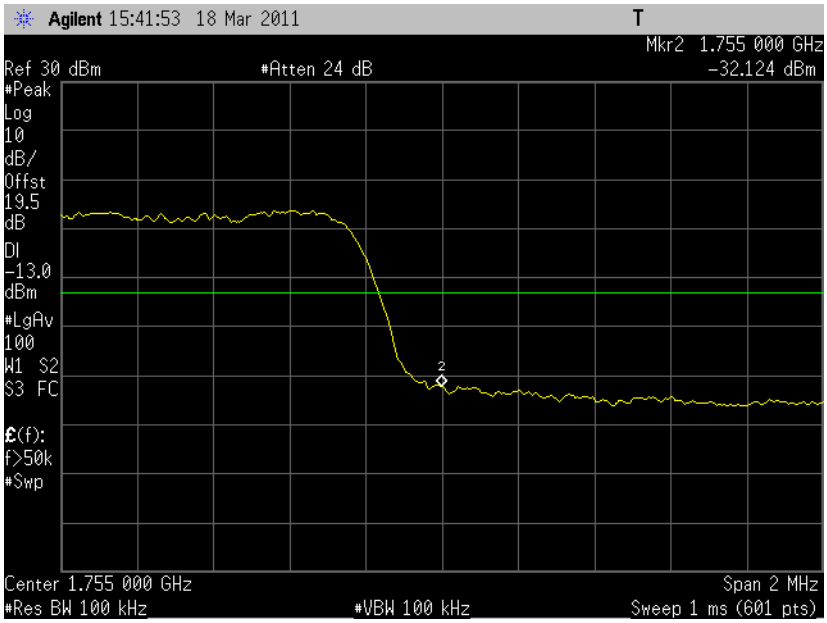
7.3.3.4 LTE; Band17 above 716 MHz, with ch23825, 5MHz, 16QAM, 25RB



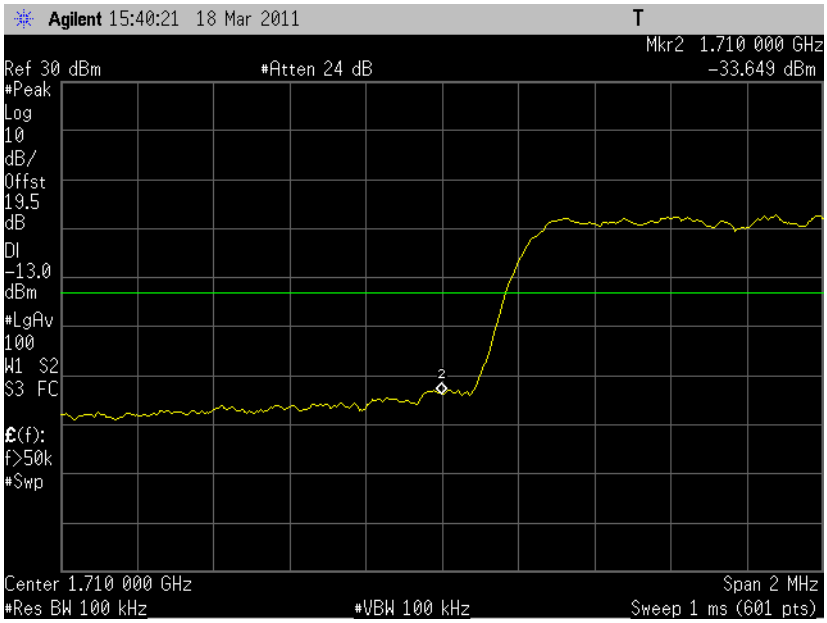
7.3.3.5 LTE; Band4 below 1710 MHz, with ch19975, 5MHz, QPSK, 25RB



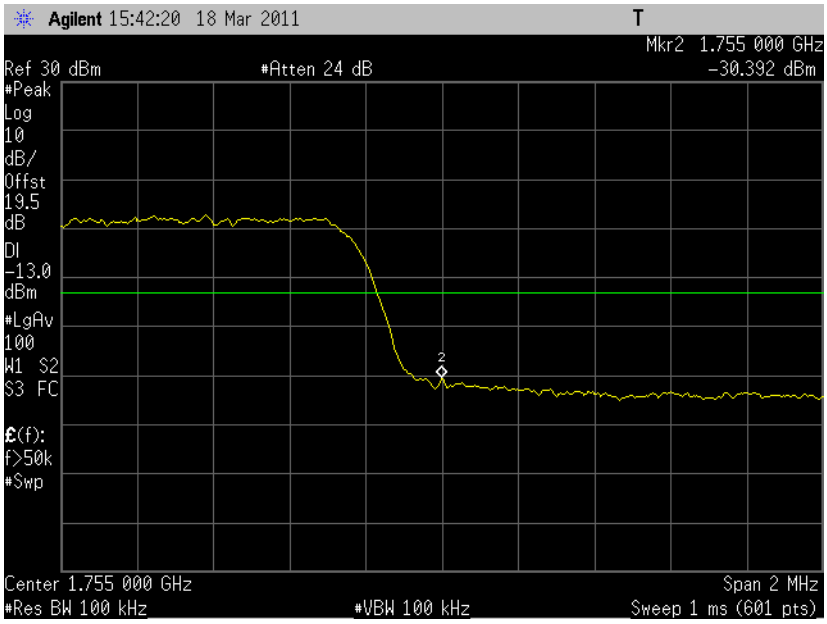
7.3.3.6 LTE; Band4 above 1755 MHz, with ch20375, 5MHz, QPSK, 25RB



7.3.3.7 LTE; Band4 below 1710 MHz, with ch19975, 5MHz, 16QAM, 25RB



7.3.3.8 LTE; Band4 above 1755 MHz, with ch20375, 5MHz, 16QAM, 25RB



8 Frequency Stability versus Temperature

FCC 2.1055, FCC 22.355, FCC 24.235, FCC 27.54

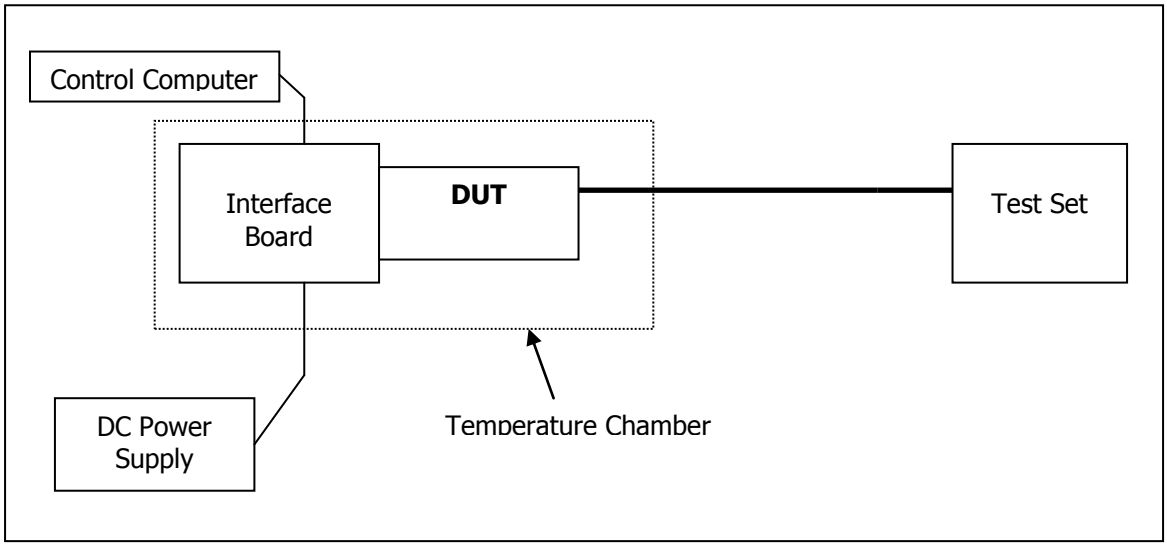
8.1 Summary of Results

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.

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 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
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	-16.2	-0.0193	22.5	0.0270	-4.2	-0.0022	4.9	0.0026
-20	13.8	0.0165	-13.7	-0.0163	38.3	0.0204	44.6	0.0237
-10	-0.5	-0.0006	-4.2	-0.0050	-28.3	-0.0150	-6.6	-0.0035
0	26.3	0.0315	25.4	0.0304	-11.0	-0.0059	-10.1	-0.0054
10	31.6	0.0378	-2.5	-0.0030	47.6	0.0253	-31.1	-0.0166
20	24.1	0.0288	-30.6	-0.0366	2.6	0.0014	33.3	0.0177
30	-10.2	-0.0122	14.0	0.0167	-41.2	-0.0219	9.9	0.0053
40	-15.3	-0.0183	33.9	0.0406	-1.4	-0.0007	-35.3	-0.0188
50	25.7	0.0308	18.0	-0.048	32.6	0.0173	-47.3	-0.0252

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	-4.2	-0.0050	-15.3	-0.0082
-20	-11.9	-0.0142	-18.1	-0.0096
-10	8.9	0.0107	-4.2	-0.0023
0	-3.3	-0.0039	6.6	0.0035
10	13.2	0.0158	-7.1	-0.0038
20	3.0	0.0036	-13.6	-0.0072
30	-4.0	-0.0048	17.6	0.0093
40	17.3	0.0207	-19.8	-0.0106
50	-6.6	-0.0079	15.3	0.0081

8.4.3 LTE Frequency Error over Temperature

Temp (°C)	LTE Band 17: 704MHz to 716MHz				LTE Band 4: 1710MHz to 1755MHz			
	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	-85.8	-0.1208	23.0	0.0325	39.6	0.0230	84.1	0.0488
-20	-2.1	-0.0030	-65.1	-0.0917	-56.3	-0.0327	-50.5	-0.0293
-10	-65.1	-0.0917	67.1	0.0946	-19.3	-0.0112	-39.3	-0.0228
0	15.2	0.0214	7.0	0.0098	98.8	0.0573	11.7	0.0068

10	-13.3	-0.0187	-85.0	-0.1198	-55.4	-0.0321	-6.1	-0.0035
20	-79.4	-0.1118	58.4	0.0822	67.2	0.0389	45.4	0.0263
30	32.8	0.0463	-73.9	-0.1041	-60.8	-0.0353	-94.4	-0.0547
40	-90.8	-0.1280	-28.3	-0.0399	81.5	0.0473	59.0	0.0342
50	-74.7	-0.1052	36.9	0.0519	-42.7	-0.0248	32.4	0.0188

9 Frequency Stability versus Voltage

FCC 2.1055, FCC 22.355, FCC 24.235, FCC 27.54

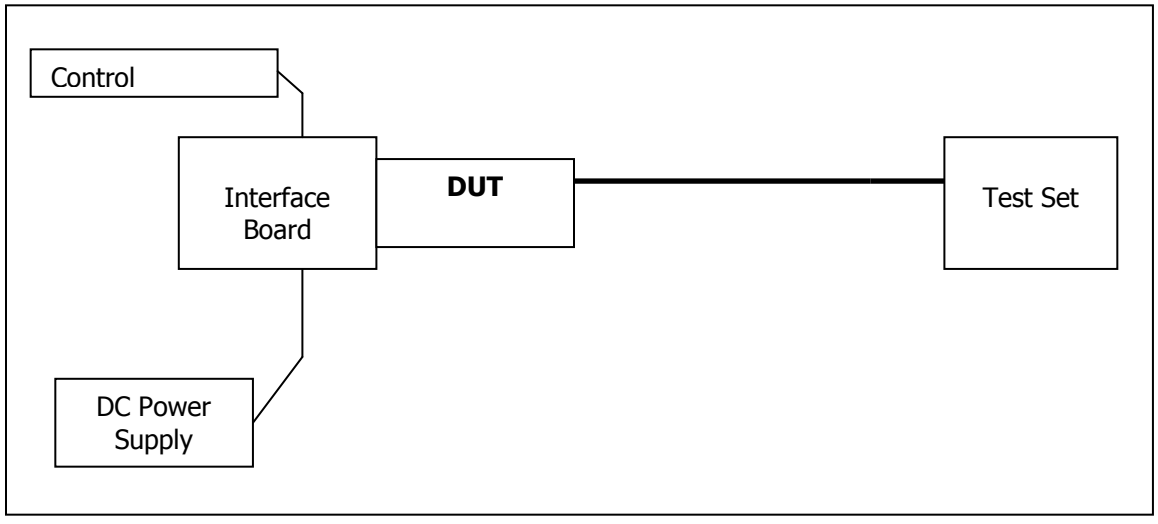
9.1 Summary of Results

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 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 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
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	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
3.00	32.0	0.0383	-11.4	-0.0137	-36.1	-0.0192	-40.5	-0.0215
3.30	16.8	0.0201	-47.6	-0.0570	-49.8	-0.0265	46.3	0.0246
3.60	-42.1	-0.0503	18.2	0.0218	35.7	0.0190	18.7	0.0099

9.4.2 UMTS Frequency Error over Voltage

Voltage (V)	850 MHz Band		1900 MHz Band	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
3.0	-11.2	-0.0134	-5.5	-0.0029
3.3	-30.1	-0.0361	16.2	0.0086
3.6	40.5	0.0485	13.8	0.0074

9.4.3 LTE Frequency Error over Voltage

Voltage (V)	LTE Band 17: 704MHz to 716MHz				LTE Band 4: 1710MHz to 1755MHz			
	QPSK Mode		16QAM Mode		QPSK Mode		16QAM Mode	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
3.0	-1.8	-0.0025	33.3	0.0469	-31.0	-0.0180	-21.0	-0.0122
3.3	-26.3	-0.0371	-28.1	-0.0396	9.1	0.0053	-34.0	-0.0197
3.6	36.5	0.0514	33.2	0.0468	-43.4	-0.0252	-24.5	-0.0142

10 Peak to Average Ratio

FCC 27.50(d)

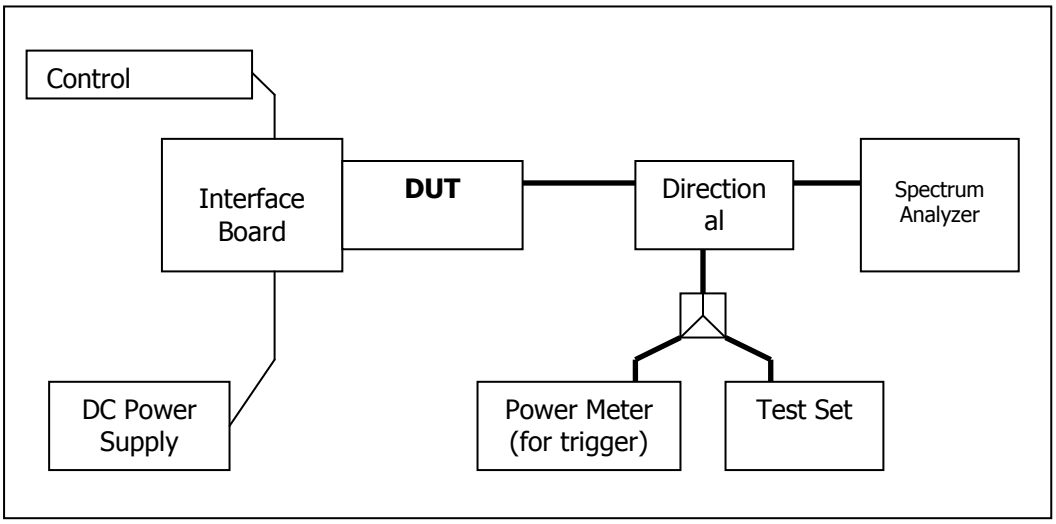
10.1 Summary of Results

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



10.3 Test Equipment

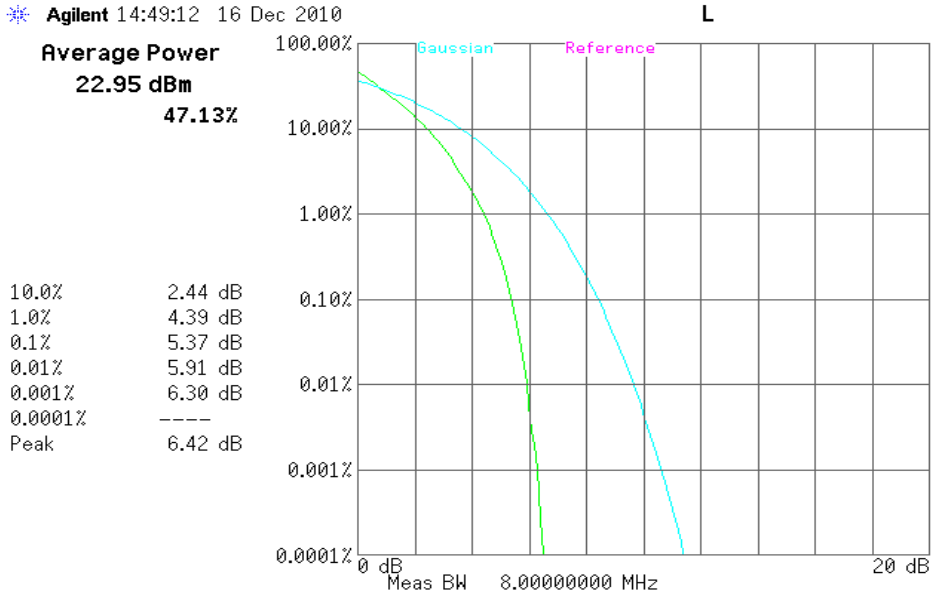
EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 31, 2010
Wireless Test Set	Rohde & Schwarz	CMW500	101060	May 10, 2010
Spectrum Analyzer	Agilent	E4440A	US41422168	November 26, 2010
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

10.4 Test Results

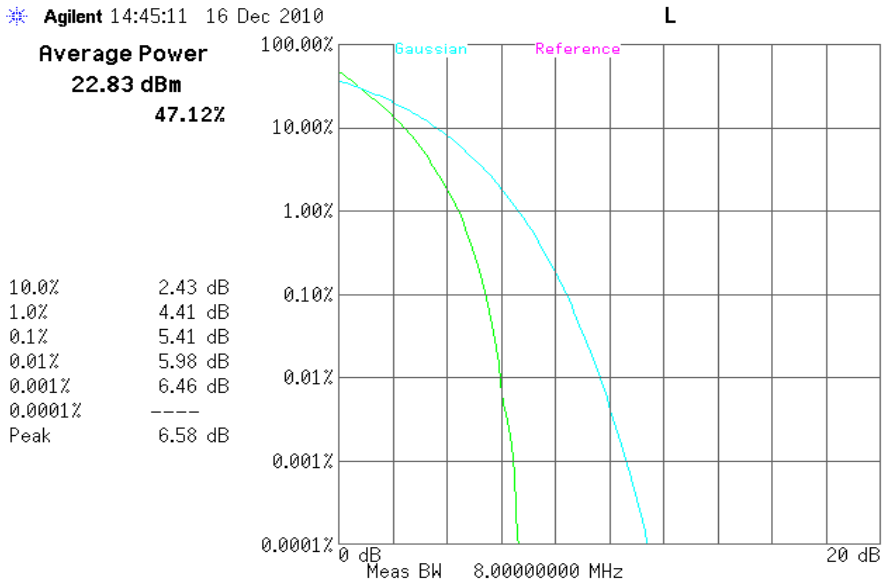
Frequency (MHz)	Channel	Modulation	BW	RB	Plots	Peak to Average Ratio (dB)
706.5	23755	QPSK	5	25	8.5.1	6.42
710	23790	QPSK	5	25	8.5.2	6.58
710	23790	QPSK	10	50	8.5.3	6.38
713.5	23825	QPSK	5	25	8.5.4	6.39
706.5	23755	16-QAM	5	25	8.5.5	7.21
710	23790	16-QAM	5	25	8.5.6	7.41
710	23790	16-QAM	10	50	8.5.7	7.87
713.5	23825	16-QAM	5	25	8.5.8	7.31
1712.5	19975	QPSK	5	25	8.5.9	6.32
1732.5	20175	QPSK	5	25	8.5.10	6.77
1732.5	20175	QPSK	10	50	8.5.11	6.46
1752.5	20325	QPSK	5	25	8.5.12	6.05
1712.5	19975	16-QAM	5	25	8.5.13	7.03
1732.5	20175	16-QAM	5	25	8.5.14	7.46
1732.5	20175	16-QAM	10	50	8.5.15	7.67
1752.5	20325	16-QAM	5	25	8.5.16	6.86

10.4.1 Test Plots

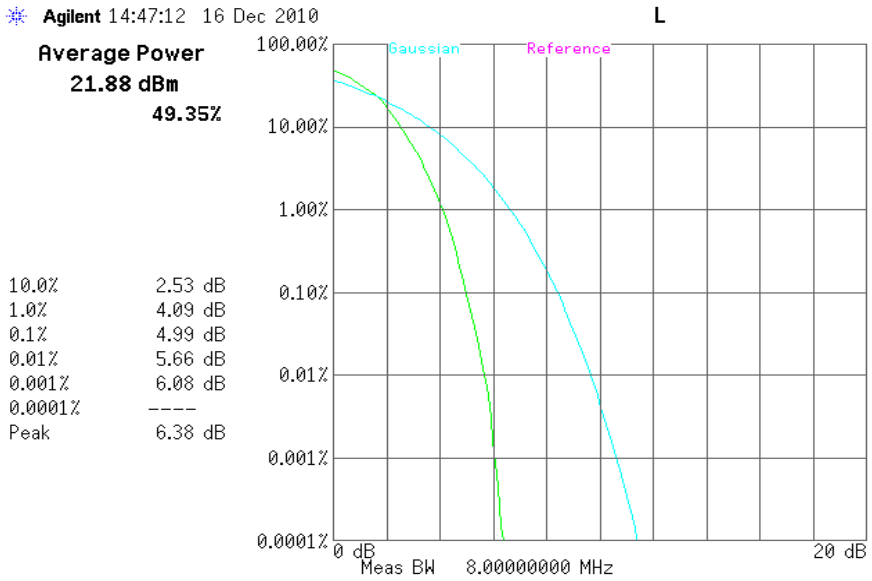
10.4.1.1 LTE peak to average ratio, QPSK Band17, Low channel, 706.5 MHz, 5MHz BW, 25RB



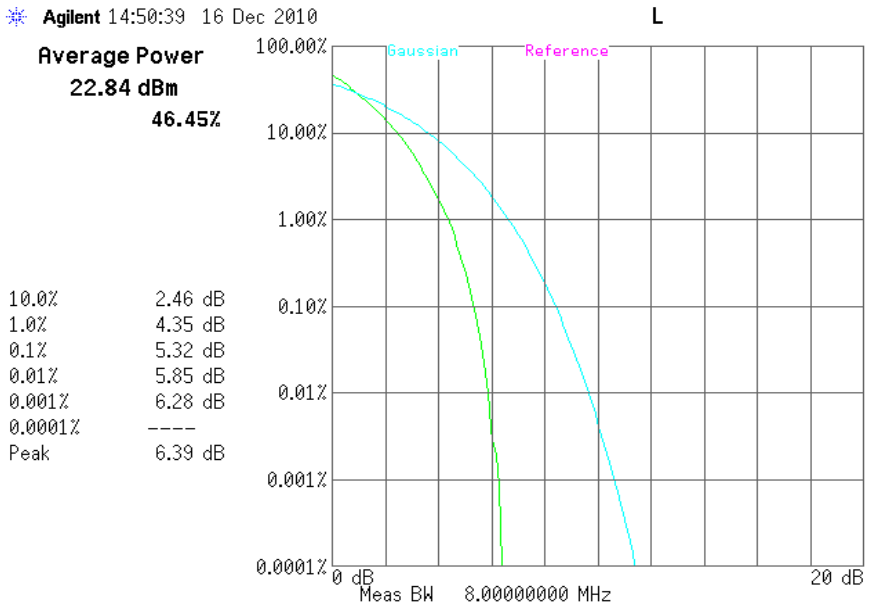
10.4.1.2 LTE peak to average ratio, QPSK Band17, mid channel, 710 MHz, 5MHz BW, 25RB



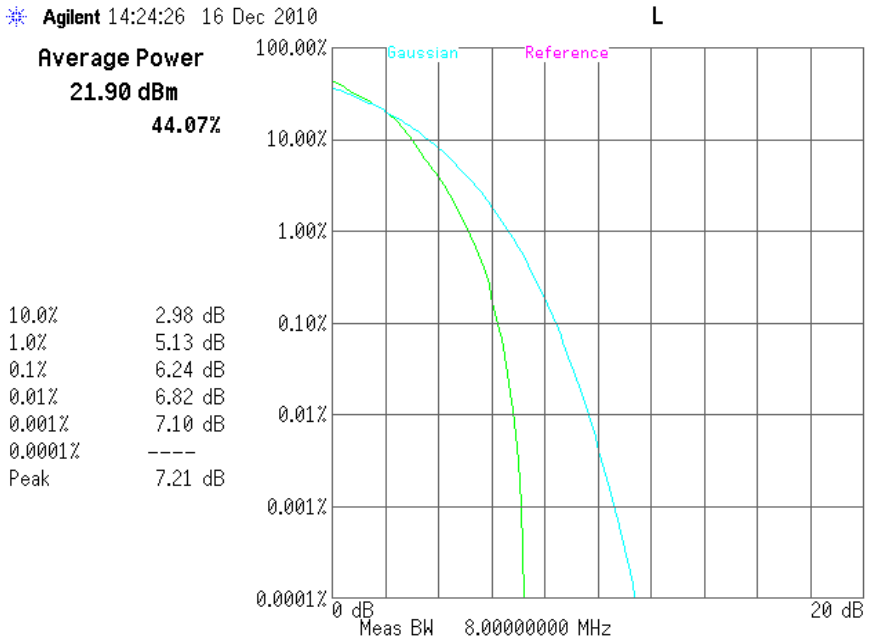
10.4.1.3 LTE peak to average ratio, QPSK Band17, mid channel, 710 MHz, 10MHz BW, 50RB



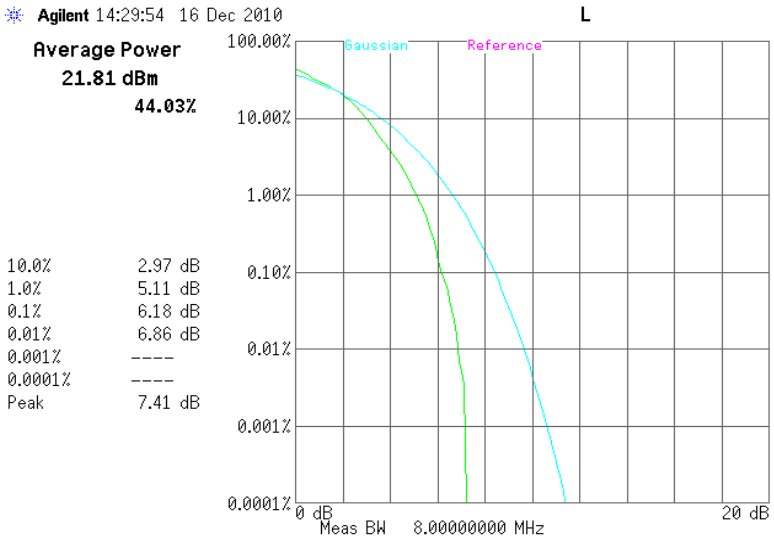
10.4.1.4 LTE peak to average ratio, QPSK Band17, high channel, 710 MHz, 10MHz BW, 50RB



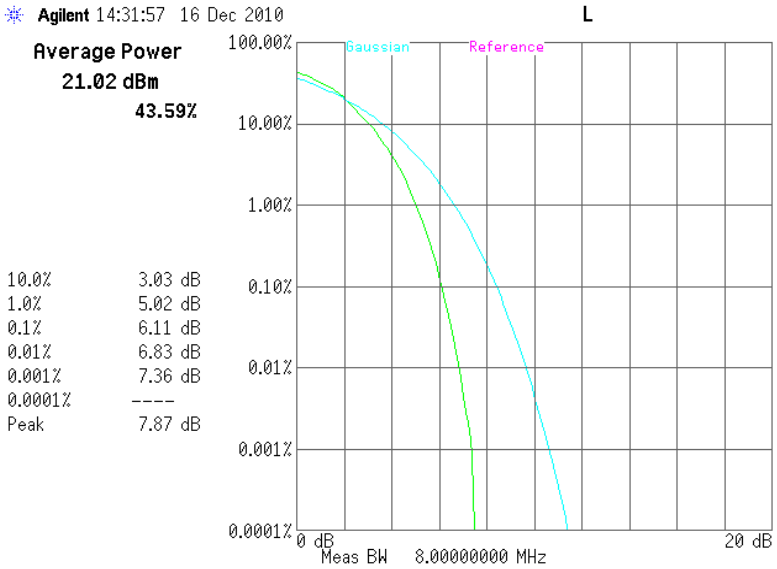
10.4.1.5 LTE peak to average ratio, 16-QAM Band17, Low channel, 706.5 MHz, 5MHz BW, 25RB



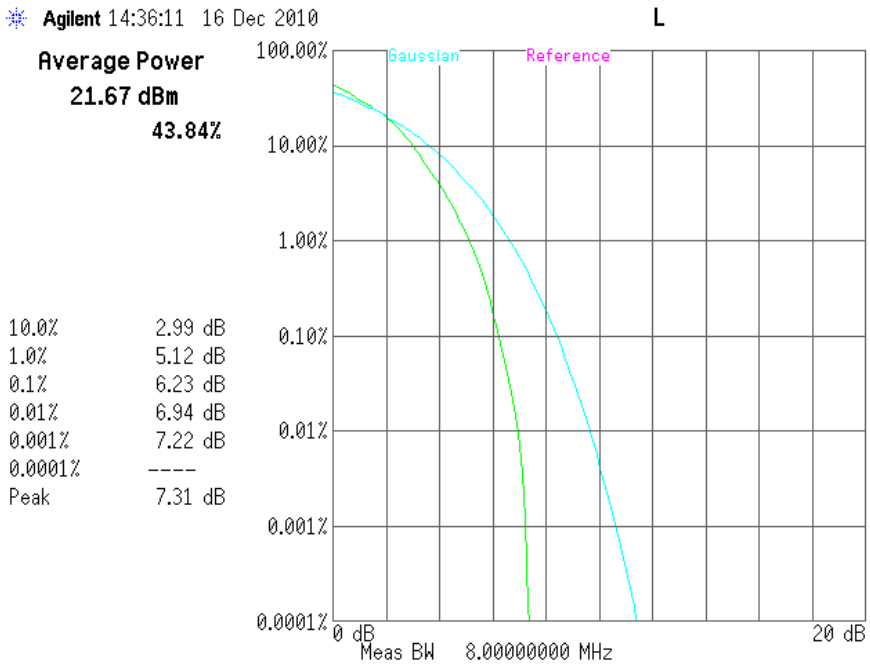
10.4.1.6 LTE peak to average ratio, 16-QAM Band17, Mid channel, 710 MHz, 5MHz BW, 25RB



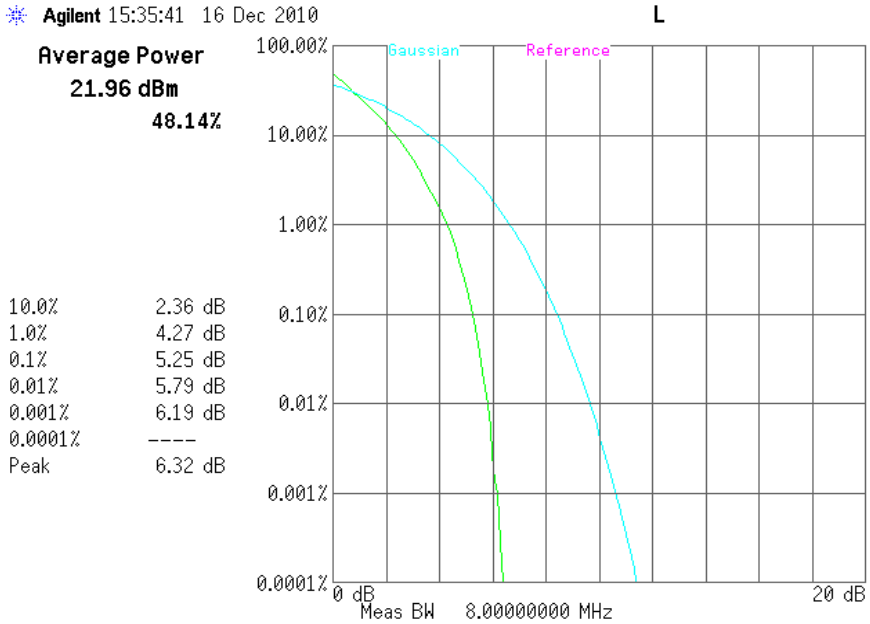
10.4.1.7 LTE peak to average ratio, 16-QAM Band17, Mid channel, 710 MHz, 10MHz BW, 50RB



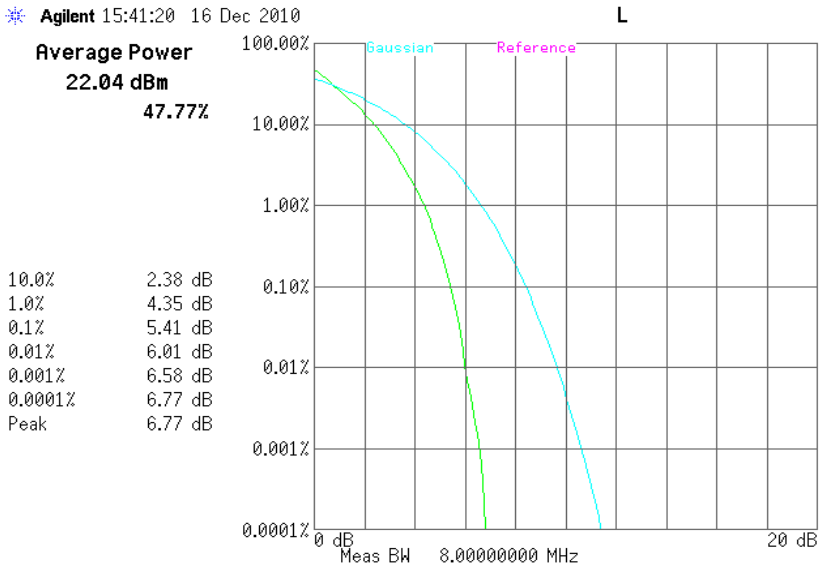
10.4.1.8 LTE peak to average ratio, 16-QAM Band17, high channel, 713.5 MHz, 5MHz BW, 25RB



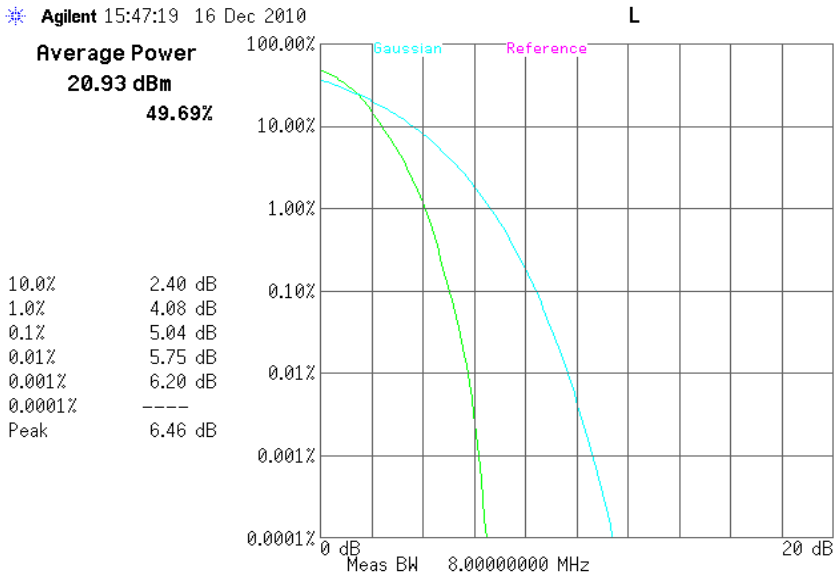
10.4.1.9 LTE peak to average ratio, QPSK Band4, low channel, 1712.5 MHz, 5MHz BW, 25RB



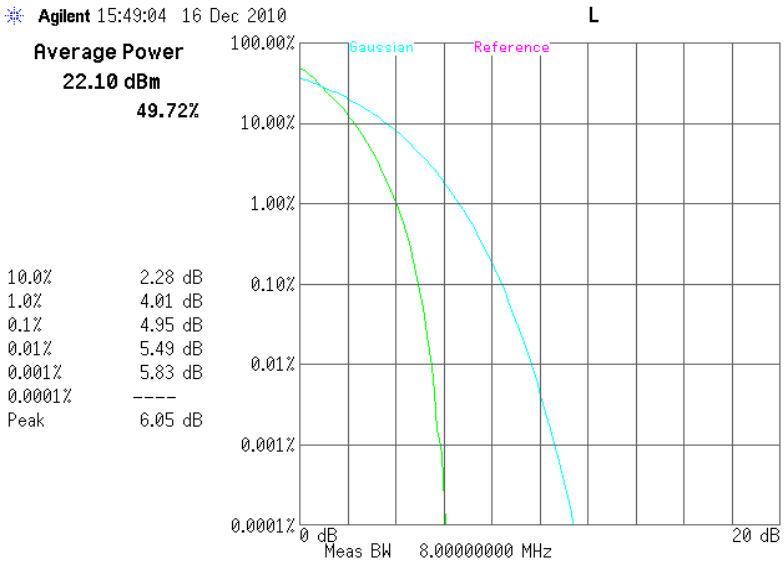
10.4.1.10 LTE peak to average ratio, QPSK Band4, mid channel, 1732.5 MHz, 5MHz BW, 25RB



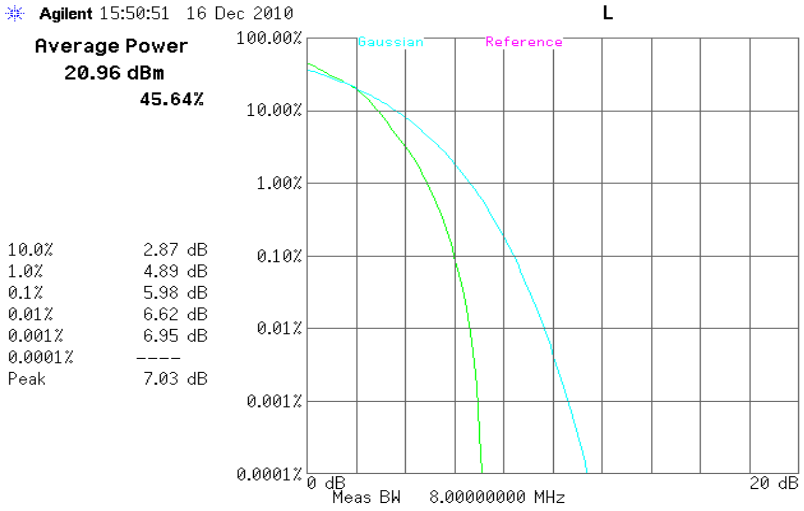
10.4.1.11 LTE peak to average ratio, QPSK Band4, mid channel, 1732.5 MHz, 10MHz BW, 50RB



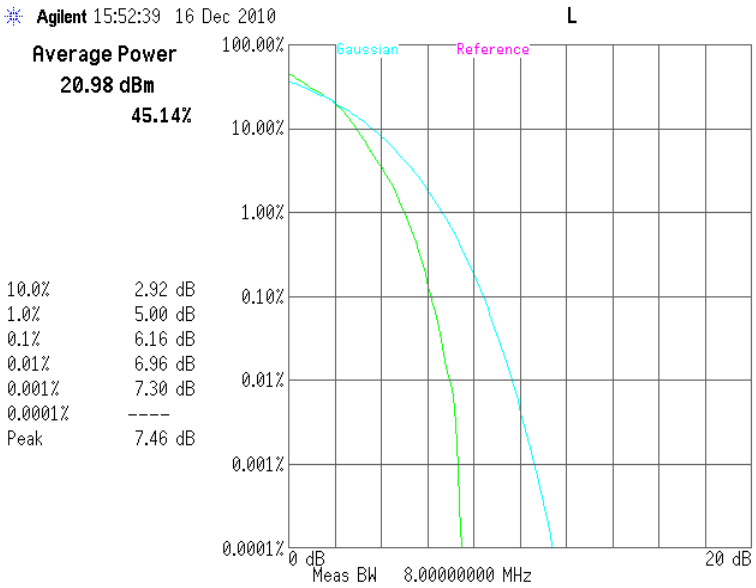
10.4.1.12 LTE peak to average ratio, QPSK Band4, high channel, 1752.5 MHz, 5MHz BW, 25RB



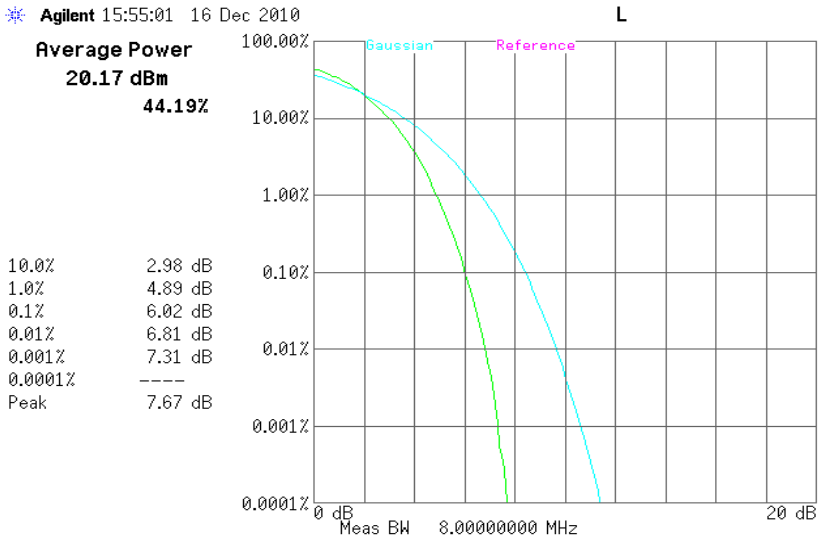
10.4.1.13 LTE peak to average ratio, 16QAM Band4, low channel, 1712.5 MHz, 5MHz BW, 25RB



10.4.1.14 LTE peak to average ratio, 16QAM Band4, mid channel, 1732.5 MHz, 5MHz BW, 25RB



10.4.1.15 LTE peak to average ratio, 16QAM Band4, mid channel, 1732.5 MHz, 10MHz BW, 50RB



10.4.1.16 LTE peak to average ratio, 16QAM Band4, high channel, 1752.5 MHz, 5MHz BW, 25RB