MC7355 Modem

Test Report

FOR

LTE

FCC and IC Certifications

IC: 2417C-MC7355
FCC ID: N7NMC7355

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1 Introduction and Purpose

This document provides test data for the MC7355 modem output power intended for FCC and Industry Canada certifications.

2 Test Summary

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3 Description of Equipment under Test

The MC7355 modem, referred to as "EUT" hereafter, is a multi-band wireless modem operating on the GSM/GPRS/EDGE/UMTS/LTE/CDMA networks. The table below shows the supported North American bands for the device.

Technology	Band	UL Freq. (MHz)	DL Freq. (MHz)	Max Power
LTE	B2	1850 – 1910	1930 – 1990	23 dBm (+/- 1 dB)
	B4	1710 – 1755	2110 – 2155	23 dBm (+/- 1 dB)
	B5	824 – 849	869 – 894	23 dBm (+/- 1 dB)
	B13	777 – 787	746 – 756	23 dBm (+/- 1 dB)
	B17	704 – 716	734 – 746	23 dBm (+/- 1 dB)
	B25	1850 – 1915	1930 – 1995	23 dBm (+/- 1 dB)
WCDMA / HSDPA/ HSUPA / HSPA+	B2	1850 – 1910	1930 – 1990	23 dBm (+/- 1 dB)
	B4	1710 – 1755	2110 – 2155	23 dBm (+/- 1 dB)
	B5	824 – 849	869 – 894	23 dBm (+/- 1 dB)
CDMA / EVDO	BC0	824 – 849	869 – 894	24 dBm (+0.5 /- 1 dB)
	BC1	1850 – 1910	1930 – 1990	24 dBm (+0.5 /- 1 dB)

	BC10*	816.0 – 823.975	861.0 – 868.975	24 dBm (+0.5 /- 1 dB)
GSM	G850	824 – 849	869 – 894	32dBm (+/-1dB)
	G1900	1850 – 1910	1930 – 1990	29dBm (+/-1dB)
EDGE	G850	824 – 849	869 – 894	27dBm (+/-1dB)
	G1900	1850 – 1910	1930 – 1990	26dBm (+/-1dB)

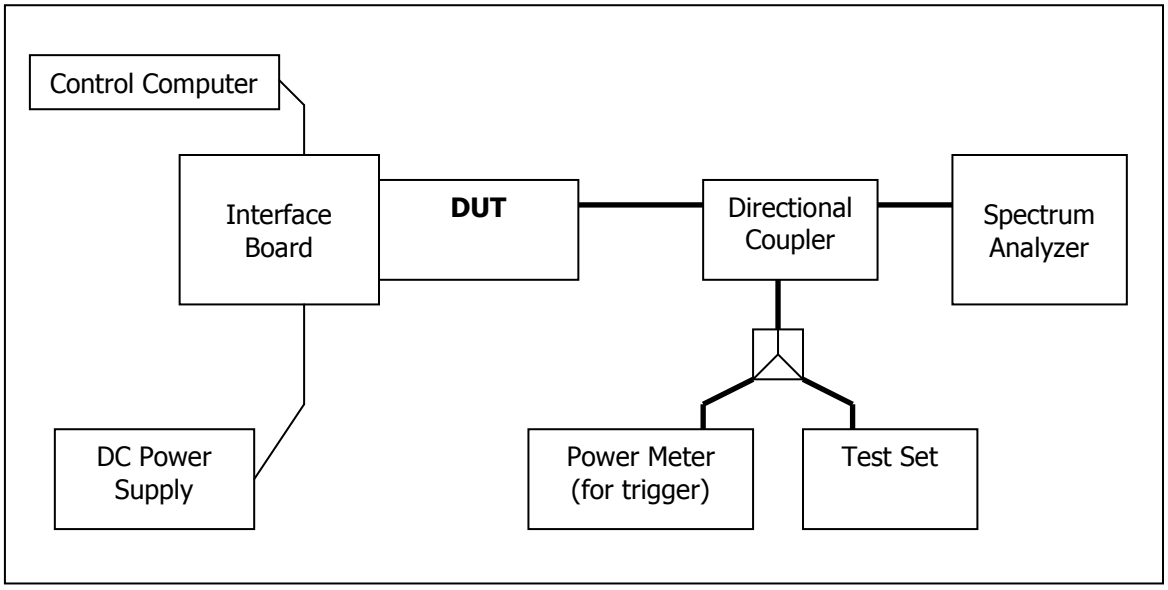
* Only BC10 subclass 2 and 3 frequencies are supported by hardware and firmware.

4 Compliance Test Equipment List

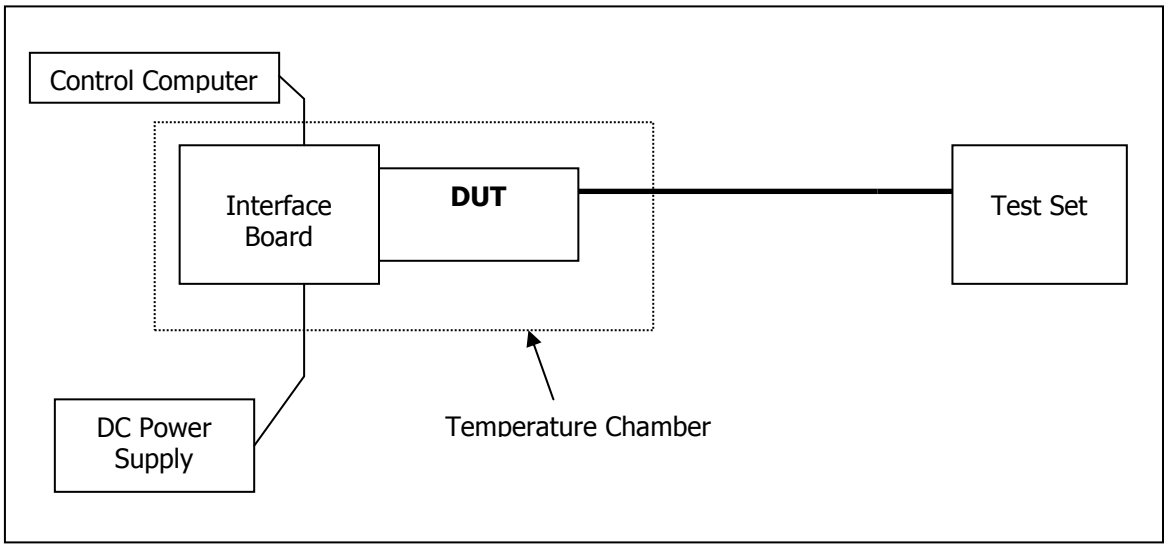
EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	110521	October 30, 2012
Wireless Test Set	Rohde & Schwarz	CMW500	101060	June 08, 2014
Spectrum Analyzer	Rohde & Schwarz	FSP	100060	October 31, 2012
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	ATEMux	N/A	N/A
Directional Coupler	Pasternack	PE2209-10	N/A	N/A

5 Test Setup Block Diagrams

5.1 Test Setup 1



5.2 Test Setup 3



6 RF Power Output

FCC 2.1046, 27.53(h)

6.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMW500 and configured to operate at maximum power in a call. The maximum power was measured using the LTE power measurement of the CMW500. Refer to Test Setup 1.

6.1.1 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 MC7355 module antenna connector using the CMW multi evaluation LTE measurement.

6.2 Maximum Transmit Power Test Results

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

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

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
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

6.2.1 LTE B2 Output Power Results

6.2.1.1 Output Power Results for LTE Band 2, 5 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
18625 (1852.5 MHz)	1	0	QPSK	23.22	28.02	0
	1	24	QPSK	23.36	28.05	0
	25	0	QPSK	22.09	28.54	1
	1	0	16QAM	22.03	27.61	1
	1	24	16QAM	22.07	27.59	1
	25	0	16QAM	21.24	28.32	2
18900 (1880.0 MHz)	1	0	QPSK	23.33	28.14	0
	1	24	QPSK	23.38	28.18	0
	25	0	QPSK	22.3	28.27	1
	1	0	16QAM	22.82	28.84	1
	1	24	16QAM	22.76	28.9	1
	25	0	16QAM	21.41	28.48	2
19175 (1907.5 MHz)	1	0	QPSK	23.44	28.01	0
	1	24	QPSK	23.5	27.7	0
	25	0	QPSK	22.36	28.04	1
	1	0	16QAM	22.29	28.03	1
	1	24	16QAM	22.54	27.88	1
	25	0	16QAM	21.35	27.81	2

6.2.1.2 Output Power Results for LTE Band 2, 10 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
18650 (1855.0 MHz)	1	0	QPSK	23.37	28.49	0
	1	49	QPSK	23.45	28.41	0
	50	0	QPSK	22.18	28.71	1
	1	0	16QAM	22.36	27.78	1
	1	49	16QAM	22.48	27.81	1
	50	0	16QAM	21.13	28.87	2
18900 (1880.0 MHz)	1	0	QPSK	23.36	28.17	0
	1	49	QPSK	23.39	28.23	0
	50	0	QPSK	22.26	28.94	1
	1	0	16QAM	22.22	27.83	1
	1	49	16QAM	22.31	27.88	1
	50	0	16QAM	21.23	28.77	2
19150 (1905.0 MHz)	1	0	QPSK	23.48	27.78	0
	1	49	QPSK	23.51	27.51	0
	50	0	QPSK	22.26	28.32	1
	1	0	16QAM	22.75	28.31	1
	1	49	16QAM	22.71	27.91	1
	50	0	16QAM	21.08	28.4	2

6.2.1.3 Output Power Results for LTE Band 2, 15 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
18675 (1857.5 MHz)	1	0	QPSK	23.24	27.79	0
	1	74	QPSK	23.26	27.78	0
	75	0	QPSK	22.08	28.62	1
	1	0	16QAM	22.37	27.93	1
	1	74	16QAM	22.31	27.84	1
	75	0	16QAM	20.98	28.59	2
18900 (1880.0 MHz)	1	0	QPSK	23.38	28.03	0
	1	74	QPSK	23.25	28.04	0
	75	0	QPSK	22.22	29.21	1
	1	0	16QAM	22.62	28.52	1
	1	74	16QAM	22.54	28.71	1
	75	0	16QAM	21.08	28.88	2
19125 (1902.5 MHz)	1	0	QPSK	23.4	28.12	0
	1	74	QPSK	23.11	28.68	0
	75	0	QPSK	22.02	28.74	1
	1	0	16QAM	22.44	28.3	1
	1	74	16QAM	22.46	27.89	1
	75	0	16QAM	20.99	28.37	2

6.2.1.4 Output Power Results for LTE Band 2, 20 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
18700 (1860.0 MHz)	1	0	QPSK	23.29	28.01	0
	1	99	QPSK	23.37	28.06	0
	100	0	QPSK	22.09	28.59	1
	1	0	16QAM	22.16	27.67	1
	1	99	16QAM	22.28	27.73	1
	100	0	16QAM	21.1	28.44	2
18900 (1880.0 MHz)	1	0	QPSK	23.37	27.9	0
	1	99	QPSK	23.23	27.88	0
	100	0	QPSK	22.22	29.07	1
	1	0	16QAM	22.46	28.28	1
	1	99	16QAM	22.3	28.36	1
	100	0	16QAM	21.23	29.19	2
19100 (1900.0 MHz)	1	0	QPSK	23.3	28.17	0
	1	99	QPSK	23.34	27.78	0
	100	0	QPSK	22.16	28.97	1
	1	0	16QAM	22.36	28.33	1
	1	99	16QAM	22.44	27.96	1
	100	0	16QAM	21.13	28.63	2

6.2.2 LTE B4 Output Power Results

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

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
19975 (1712.5 MHz)	1	0	QPSK	23.43	28.51	0
	1	24	QPSK	23.54	28.25	0
	25	0	QPSK	22.21	28.87	1
	1	0	16QAM	22.4	27.81	1
	1	24	16QAM	22.51	27.67	1
	25	0	16QAM	21.15	28.83	2
20175 (1732.5 MHz)	1	0	QPSK	23.22	27.2	0
	1	24	QPSK	23.44	27.53	0
	25	0	QPSK	22.24	28.14	1
	1	0	16QAM	22.09	26.99	1
	1	24	16QAM	22.31	27.31	1
	25	0	16QAM	21.22	27.95	2
20375 (1752.5 MHz)	1	0	QPSK	23.5	28.08	0
	1	24	QPSK	23.54	27.91	0
	25	0	QPSK	22.16	28.52	1
	1	0	16QAM	22.79	28.58	1
	1	24	16QAM	22.89	28.39	1
	25	0	16QAM	21.15	28.51	2

6.2.2.2 Output Power Results for LTE Band 4, 10 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
20000 (1715.0 MHz)	1	0	QPSK	23.47	28.16	0
	1	49	QPSK	23.44	27.57	0
	50	0	QPSK	22.08	28.04	1
	1	0	16QAM	22.18	27.66	1
	1	49	16QAM	22.23	27.17	1
	50	0	16QAM	21.08	28.13	2
20175 (1732.5 MHz)	1	0	QPSK	23.39	27.2	0
	1	49	QPSK	23.29	27.61	0
	50	0	QPSK	22.17	28.09	1
	1	0	16QAM	22.76	27.63	1
	1	49	16QAM	22.71	28.18	1
	50	0	16QAM	21.15	28.06	2
20350 (1750.0 MHz)	1	0	QPSK	23.37	28.24	0
	1	49	QPSK	23.42	28.17	0
	50	0	QPSK	22.07	28.52	1
	1	0	16QAM	22.39	28.38	1
	1	49	16QAM	22.42	28.35	1

	50	0	16QAM	21.04	28.35	2

6.2.2.3 Output Power Results for LTE Band 4, 15 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
20025 (1717.5 MHz)	1	0	QPSK	23.27	27.82	0
	1	74	QPSK	23.28	27.11	0
	75	0	QPSK	22.04	28.22	1
	1	0	16QAM	22.45	27.83	1
	1	74	16QAM	22.5	27.21	1
	75	0	16QAM	20.99	28.05	2
20175 (1732.5 MHz)	1	0	QPSK	23.42	27.17	0
	1	74	QPSK	23.44	27.83	0
	75	0	QPSK	22.04	28.4	1
	1	0	16QAM	22.61	27.54	1
	1	74	16QAM	22.74	28.34	1
	75	0	16QAM	21.08	28.11	2
20325 (1747.5 MHz)	1	0	QPSK	23.42	28.06	0
	1	74	QPSK	23.46	28.17	0
	75	0	QPSK	22.02	28.73	1
	1	0	16QAM	22.29	28.2	1
	1	74	16QAM	22.44	28.3	1
	75	0	16QAM	21.05	28.44	2

6.2.2.4 Output Power Results for LTE Band 4, 20 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
20050 (1720.0 MHz)	1	0	QPSK	23.41	28.1	0
	1	99	QPSK	23.5	27.31	0
	100	0	QPSK	22.15	27.94	1
	1	0	16QAM	22.23	27.63	1
	1	99	16QAM	22.31	26.92	1
	100	0	16QAM	21.15	27.77	2
20175 (1732.5 MHz)	1	0	QPSK	23.17	27.11	0
	1	99	QPSK	23.33	27.84	0
	100	0	QPSK	22.16	28.38	1
	1	0	16QAM	22.21	27.39	1
	1	99	16QAM	22.37	28.2	1
	100	0	16QAM	21.1	28.31	2
20300 (1745.0 MHz)	1	0	QPSK	23.4	27.76	0
	1	99	QPSK	23.34	28.17	0
	100	0	QPSK	22.15	28.76	1
	1	0	16QAM	22.28	27.89	1
	1	99	16QAM	22.28	28.3	1

	100	0	16QAM	21.1	28.52	2

6.2.3 LTE B5 Output Power Results

6.2.3.1 Output Power Results for LTE Band 5, 5 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
20425 (826.5 MHz)	1	0	QPSK	23.57	27.95	0
	1	24	QPSK	23.51	28.22	0
	25	0	QPSK	22.41	28.37	1
	1	0	16QAM	22.49	27.31	1
	1	24	16QAM	22.61	27.63	1
	25	0	16QAM	21.31	28.55	2
20525 (836.5 MHz)	1	0	QPSK	23.34	27.86	0
	1	24	QPSK	23.4	27.52	0
	25	0	QPSK	22.21	28.36	1
	1	0	16QAM	22.2	27.5	1
	1	24	16QAM	22.19	27.14	1
	25	0	16QAM	21.28	28.26	2
20625 (846.5 MHz)	1	0	QPSK	23.31	27.22	0
	1	24	QPSK	23.38	26.71	0
	25	0	QPSK	22.23	28.24	1
	1	0	16QAM	22.46	27.63	1
	1	24	16QAM	22.52	27.11	1
	25	0	16QAM	21.15	27.93	2

6.2.3.2 Output Power Results for LTE Band 5, 10 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
20450 (829.0 MHz)	1	0	QPSK	23.5	27.71	0
	1	49	QPSK	23.34	28	0
	50	0	QPSK	22.28	28.29	1
	1	0	16QAM	22.21	27.25	1
	1	49	16QAM	22.2	27.61	1
	50	0	16QAM	21.35	28.47	2
20525 (836.5 MHz)	1	0	QPSK	23.27	27.93	0
	1	49	QPSK	23.31	27.29	0
	50	0	QPSK	22.21	28.25	1
	1	0	16QAM	22.7	28.38	1
	1	49	16QAM	22.66	27.71	1
	50	0	16QAM	21.31	28.41	2
20600 (844.0 MHz)	1	0	QPSK	23.4	27.54	0
	1	49	QPSK	23.38	26.97	0
	50	0	QPSK	22.2	28.1	1
	1	0	16QAM	22.29	27.67	1

	1	49	16QAM	22.31	27.21	1
	50	0	16QAM	21.23	27.81	2

6.2.4 LTE B13 Output Power Results

6.2.4.1 Output Power Results for LTE Band 13, 5 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
23205 (779.5 MHz)	1	0	QPSK	23.33	27.42	0
	1	24	QPSK	23.39	27.53	0
	25	0	QPSK	22.19	28.62	1
	1	0	16QAM	22.33	26.97	1
	1	24	16QAM	22.32	27.05	1
	25	0	16QAM	21.1	28.56	2
23230 (782.0 MHz)	1	0	QPSK	23.17	27.25	0
	1	24	QPSK	23.33	27.47	0
	25	0	QPSK	22.16	28.14	1
	1	0	16QAM	22.04	26.99	1
	1	24	16QAM	22.17	27.24	1
	25	0	16QAM	21.05	27.98	2
23255 (784.5 MHz)	1	0	QPSK	23.39	27.11	0
	1	24	QPSK	23.6	27.3	0
	25	0	QPSK	22.35	28.27	1
	1	0	16QAM	22.63	27.58	1
	1	24	16QAM	22.88	27.6	1
	25	0	16QAM	21.22	28.06	2

6.2.4.2 Output Power Results for LTE Band 13, 10 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
23230 (782.0 MHz)	1	0	QPSK	23.25	27.31	0
	1	49	QPSK	23.5	27.59	0
	50	0	QPSK	22.15	28.2	1
	1	0	16QAM	22.3	27.5	1
	1	49	16QAM	22.38	27.8	1
	50	0	16QAM	21.25	28.13	2

6.2.5 LTE B17 Output Power Results

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

CHANNEL	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR

23755 (706.5 MHz)	1	0	QPSK	23.19	27.98	0
	1	24	QPSK	23.29	28.44	0
	25	0	QPSK	22.12	28.76	1
	1	0	16QAM	22.26	27.36	1
	1	24	16QAM	22.25	27.74	1
	25	0	16QAM	21.05	28.7	2
23790 (710.0 MHz)	1	0	QPSK	23	27.87	0
	1	24	QPSK	23.29	27.8	0
	25	0	QPSK	22.16	28.42	1
	1	0	16QAM	21.89	27.52	1
	1	24	16QAM	22.04	27.36	1
	25	0	16QAM	21.11	28.47	2
23825 (713.5 MHz)	1	0	QPSK	23.36	27.66	0
	1	24	QPSK	23.42	27.4	0
	25	0	QPSK	22.14	28.67	1
	1	0	16QAM	22.5	28.1	1
	1	24	16QAM	22.64	27.75	1
	25	0	16QAM	21.14	28.44	2

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

CHANNEL	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
23790 (710.0 MHz)	1	0	QPSK	23.28	27.96	0
	1	49	QPSK	23.34	27.99	0
	50	0	QPSK	22.07	28.6	1
	1	0	16QAM	22.2	28.05	1
	1	49	16QAM	22.19	28.03	1
	50	0	16QAM	21	28.23	2

6.2.6 LTE B25 Output Power Results

6.2.6.1 Output Power Results for LTE Band 25, 5 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
26065 (1852.5 MHz)	1	0	QPSK	23.23	28.44	0
	1	24	QPSK	23.25	28.33	0
	25	0	QPSK	22.04	28.74	1
	1	0	16QAM	22.31	27.76	1
	1	24	16QAM	22.21	27.62	1
	25	0	16QAM	21	28.91	2
26365 (1882.5 MHz)	1	0	QPSK	23.34	28.17	0
	1	24	QPSK	23.27	28.12	0
	25	0	QPSK	22.19	28.87	1
	1	0	16QAM	22.21	27.82	1
	1	24	16QAM	22.18	27.8	1

	25	0	16QAM	21.01	28.54	2
26665 (1912.5 MHz)	1	0	QPSK	23.42	27.41	0
	1	24	QPSK	23.44	27.09	0
	25	0	QPSK	21.99	28.1	1
	1	0	16QAM	22.5	27.76	1
	1	24	16QAM	22.65	27.4	1
	25	0	16QAM	20.96	27.87	2

6.2.6.2 Output Power Results for LTE Band 25, 10 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
26090 (1855.0 MHz)	1	0	QPSK	23.15	27.98	0
	1	49	QPSK	23.22	27.99	0
	50	0	QPSK	21.94	28.22	1
	1	0	16QAM	21.93	27.55	1
	1	49	16QAM	21.97	27.58	1
	50	0	16QAM	20.92	28.45	2
26365 (1882.5 MHz)	1	0	QPSK	23.29	28.14	0
	1	49	QPSK	23.36	28.14	0
	50	0	QPSK	22.05	28.46	1
	1	0	16QAM	22.5	28.76	1
	1	49	16QAM	22.5	28.74	1
	50	0	16QAM	21.06	28.95	2
26640 (1910.0 MHz)	1	0	QPSK	23.25	28.02	0
	1	49	QPSK	23.35	27.28	0
	50	0	QPSK	22.01	28.14	1
	1	0	16QAM	22.27	28.14	1
	1	49	16QAM	22.41	27.52	1
	50	0	16QAM	20.89	27.77	2

6.2.6.3 Output Power Results for LTE Band 25, 15 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
26115 (1857.5 MHz)	1	0	QPSK	23.12	27.72	0
	1	74	QPSK	23.06	27.68	0
	75	0	QPSK	21.97	28.53	1
	1	0	16QAM	22.33	27.9	1
	1	74	16QAM	22.12	27.72	1
	75	0	16QAM	20.97	28.62	2
26365 (1882.5 MHz)	1	0	QPSK	23.18	28.01	0
	1	74	QPSK	23.35	28.04	0
	75	0	QPSK	22.09	28.99	1
	1	0	16QAM	22.37	28.58	1
	1	74	16QAM	22.6	28.61	1
	75	0	16QAM	21.03	28.97	2

26615 (1907.5 MHz)	1	0	QPSK	23.27	28.1	0
	1	74	QPSK	23.32	27.27	0
	75	0	QPSK	22.05	28.63	1
	1	0	16QAM	22.11	28.18	1
	1	74	16QAM	22.28	27.41	1
	75	0	16QAM	20.92	28.44	2

6.2.6.4 Output Power Results for LTE Band 25, 20 MHz Bandwidth

CHANNEL/FREQ	NO. RB	RB START	MODULATION	MAX POWER (RMS)	MAX POWER (PK)	MPR
26140 (1860.0 MHz)	1	0	QPSK	23.2	27.97	0
	1	99	QPSK	23.37	28.05	0
	100	0	QPSK	22.08	28.65	1
	1	0	16QAM	22.08	27.61	1
	1	99	16QAM	22.1	27.65	1
	100	0	16QAM	20.91	28.34	2
26365 (1882.5 MHz)	1	0	QPSK	23.14	27.87	0
	1	99	QPSK	23.2	27.85	0
	100	0	QPSK	22.17	28.91	1
	1	0	16QAM	22.22	28.33	1
	1	99	16QAM	22.42	28.36	1
	100	0	16QAM	21.1	28.88	2
26590 (1905.0 MHz)	1	0	QPSK	23.22	28.07	0
	1	99	QPSK	23.26	27.31	0
	100	0	QPSK	21.98	28.66	1
	1	0	16QAM	22.21	28.21	1
	1	99	16QAM	22.35	27.51	1
	100	0	16QAM	21.02	28.64	2

7 Occupied Bandwidth

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

7.1 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 mid frequency in each band. The –26dB bandwidth was also measured and recorded. Refer to Test Setup 1.

7.2 Test Results

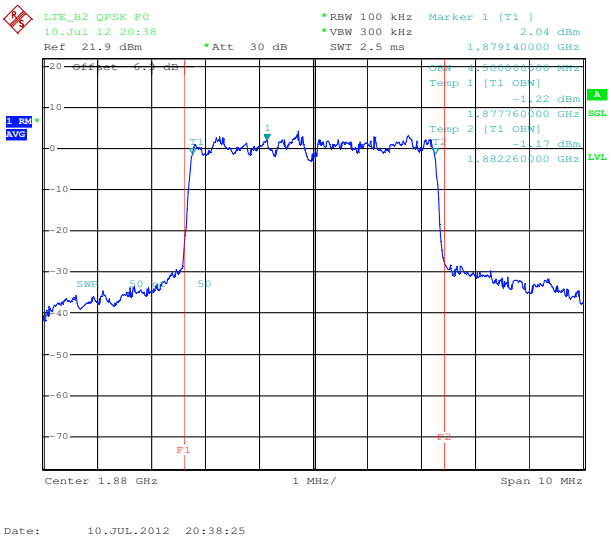
Occupied Bandwidth was only measured at maximum resource block allocation and at center of band for each supported LTE BW.

7.2.1 LTE Summary Results

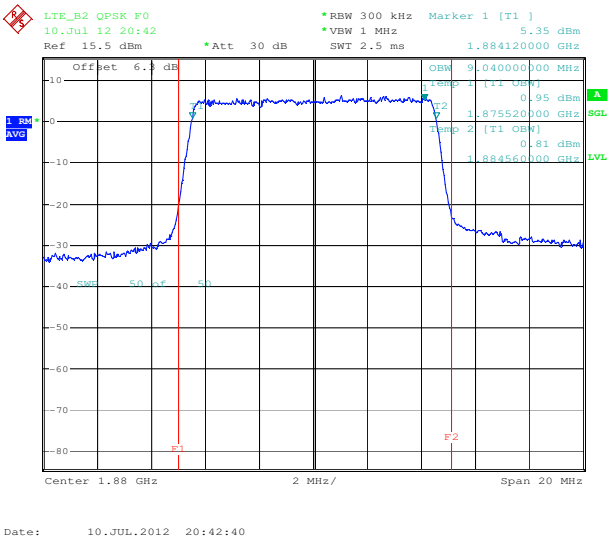
Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	-26dBc Occupied Bandwidth (MHz)	Corresponding Plot number
LTE	QPSK	B2	5	25	0	1880.0	18900	4.50	4.82	7.2.2.1
			10	50				9.04	10.12	7.2.2.2
			15	75				13.44	14.58	7.2.2.3
			20	100				17.92	19.04	7.2.2.4
		B4	5	25	0	1732.5	20175	4.48	4.76	7.2.2.5
			10	50				9.04	9.96	7.2.2.6
			15	75				13.44	14.52	7.2.2.7
			20	100				17.84	18.96	7.2.2.8
		B5	5	25	0	836.5	20525	4.48	4.80	7.2.2.9
			10	50				9.04	9.96	7.2.2.10
		B13	5	25	0	782.0	23230	4.50	4.78	7.2.2.11
			10	50				9.08	10.00	7.2.2.12
		B17	5	25	0	710.0	23790	4.52	4.76	7.2.2.13
			10	50				9.04	10.12	7.2.2.14
		B25	5	25	0	1882.5	26365	4.50	4.82	7.2.2.15
			10	50				9.04	10.04	7.2.2.16
			15	75				13.44	14.58	7.2.2.17
			20	100				17.92	19.12	7.2.2.18
	16-QAM	B2	5	25	0	1880.0	18900	4.52	4.78	7.2.2.19
			10	50				9.04	10.08	7.2.2.20
			15	75				13.50	14.52	7.2.2.21
			20	100				17.84	19.12	7.2.2.22
		B4	5	25	0	1732.5	20175	4.48	4.76	7.2.2.23
			10	50				9.04	10.00	7.2.2.24
			15	75				13.44	14.40	7.2.2.25
			20	100				17.92	19.04	7.2.2.26
		B5	5	25	0	836.5	20525	4.52	4.78	7.2.2.27
			10	50				9.04	10.00	7.2.2.28
		B13	5	25	0	782.0	23230	4.52	4.76	7.2.2.29
			10	50				9.08	9.96	7.2.2.30
		B17	5	25	0	710.0	23790	4.50	4.78	7.2.2.31
			10	50				9.08	10.08	7.2.2.32
		B25	5	25	0	1882.5	26365	4.48	4.78	7.2.2.33
			10	50				9.04	10.08	7.2.2.34
			15	75				13.44	14.52	7.2.2.35
			20	100				17.84	19.12	7.2.2.36

7.2.2 LTE Test Plots

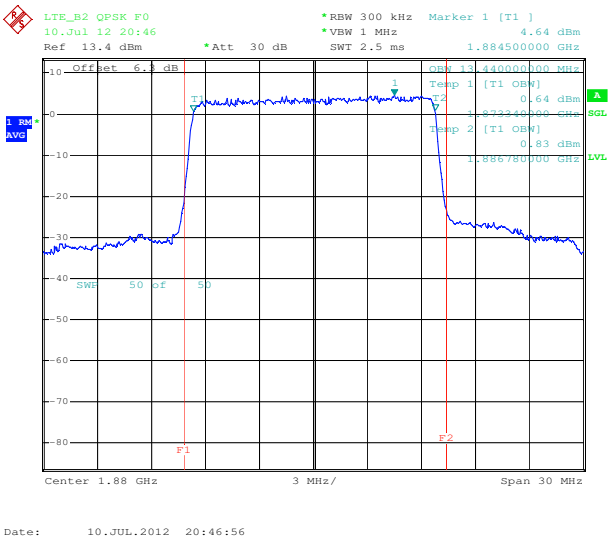
7.2.2.1 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



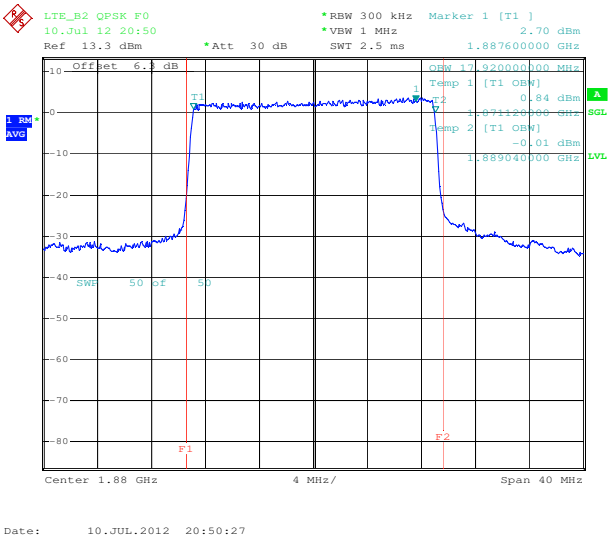
7.2.2.2 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



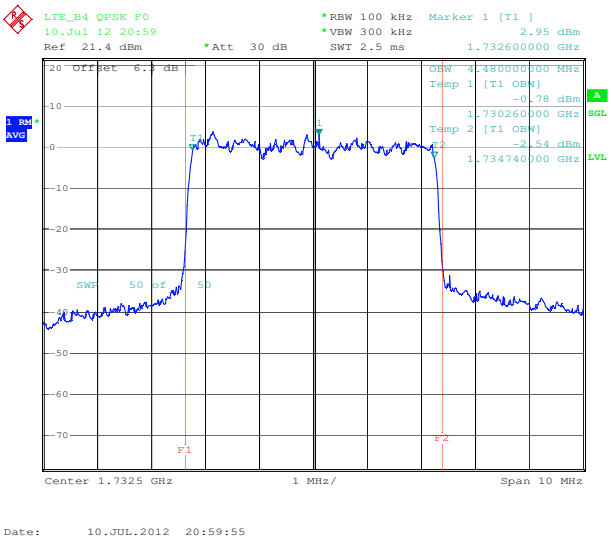
7.2.2.3 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=15MHz RB=75 RB Offset=0 QPSK 99% BW



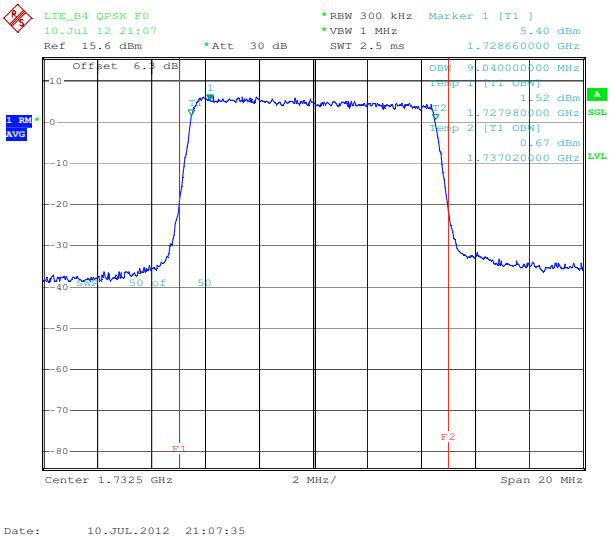
7.2.2.4 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW



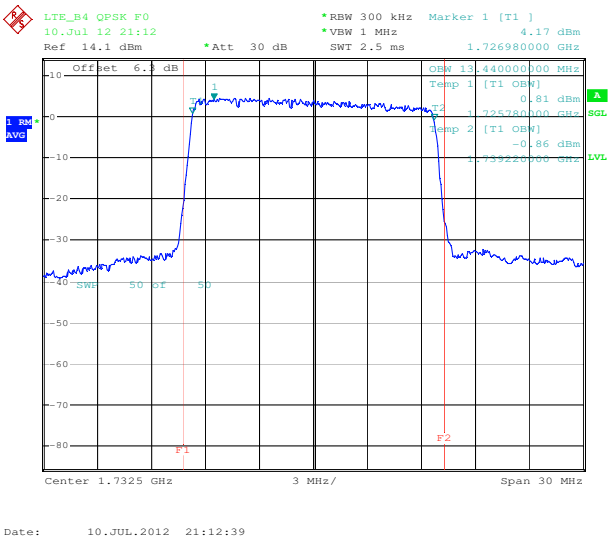
7.2.2.5 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



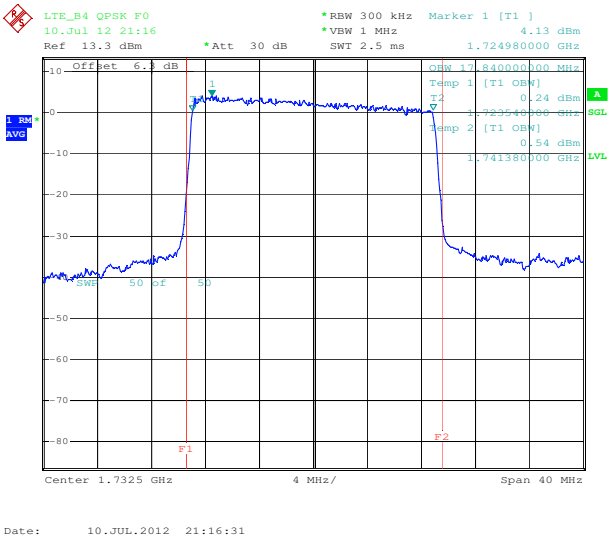
7.2.2.6 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



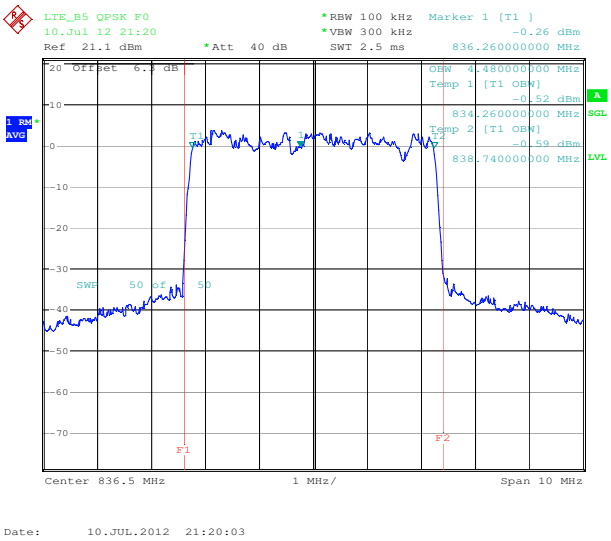
7.2.2.7 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=15MHz RB=75 RB Offset=0 QPSK 99% BW



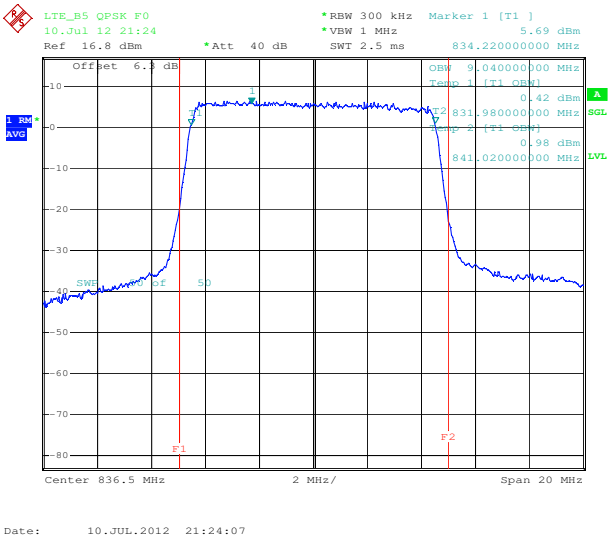
7.2.2.8 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW



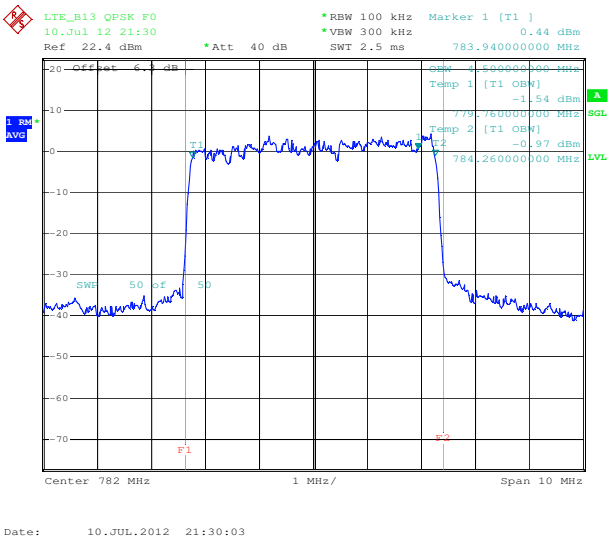
7.2.2.9 LTE Occupied Bandwidth, Band5 mid channel (20525) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



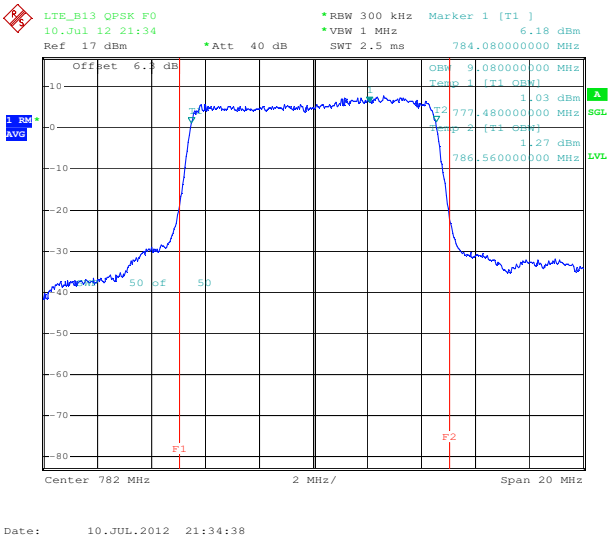
7.2.2.10 LTE Occupied Bandwidth, Band5 mid channel (20525) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



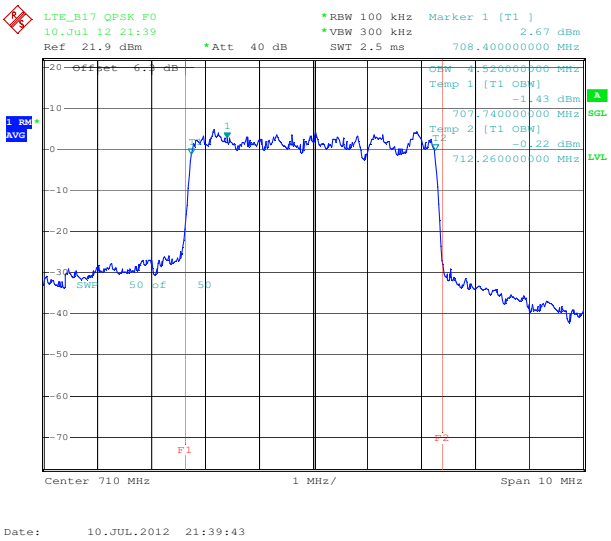
7.2.2.11 LTE Occupied Bandwidth, Band13 mid channel (23230) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



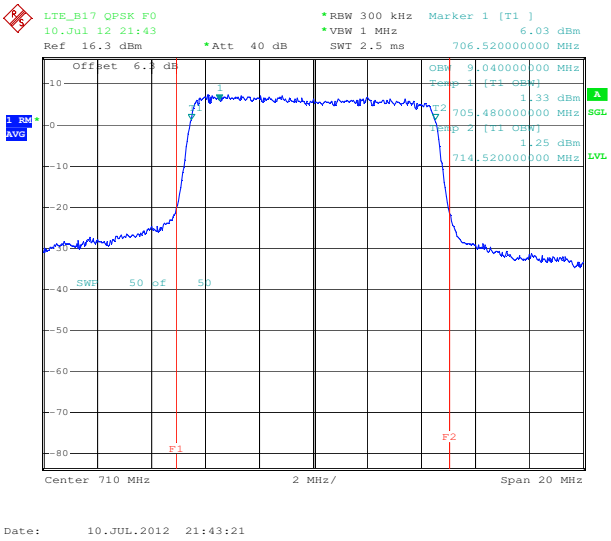
7.2.2.12 LTE Occupied Bandwidth, Band13 mid channel (23230) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW



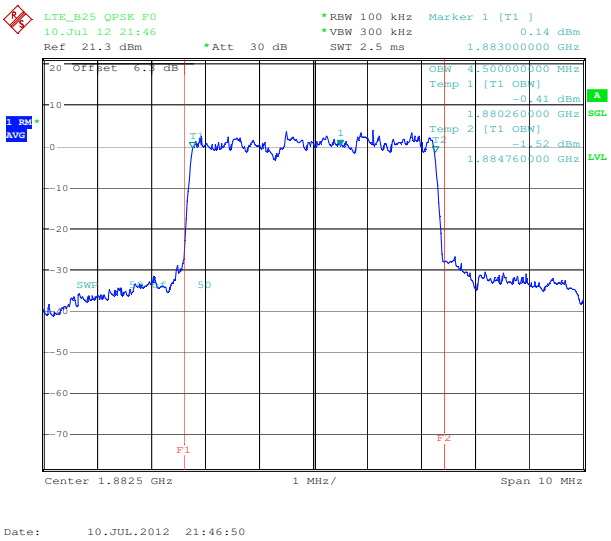
7.2.2.13 LTE Occupied Bandwidth, Band17 mid channel (23790) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



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

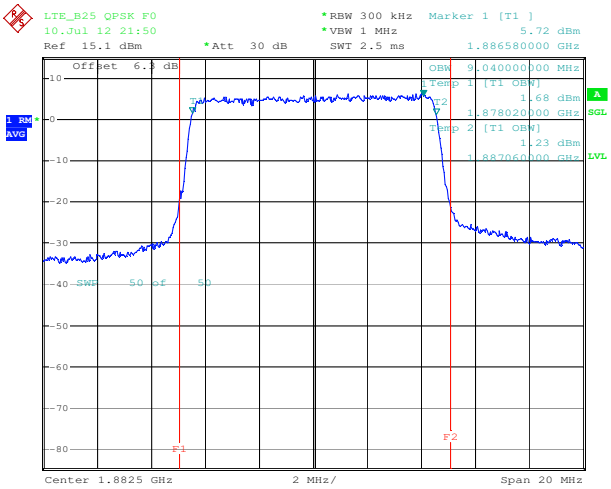


7.2.2.15 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=5MHz RB=25 RB Offset=0 QPSK 99% BW



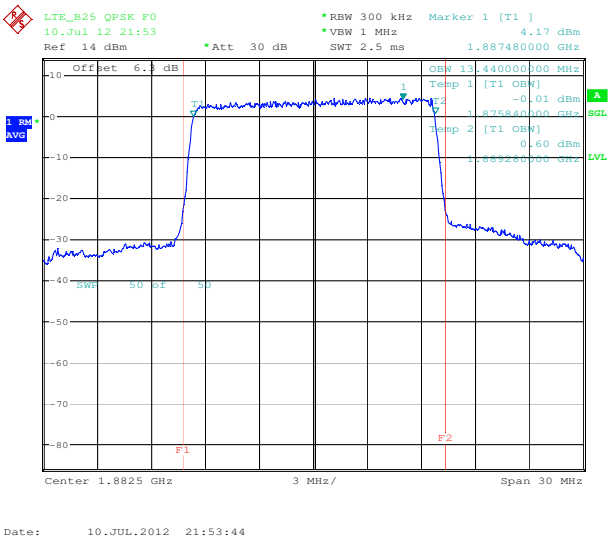
Date: 10.JUL.2012 21:46:50

7.2.2.16 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=10MHz RB=50 RB Offset=0 QPSK 99% BW

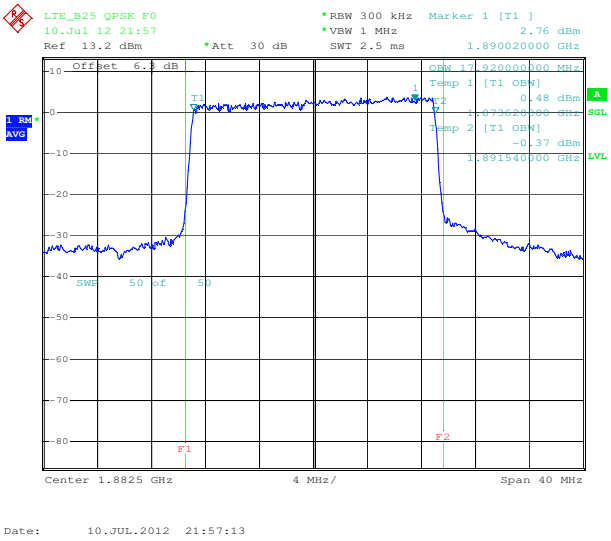


Date: 10.JUL.2012 21:50:18

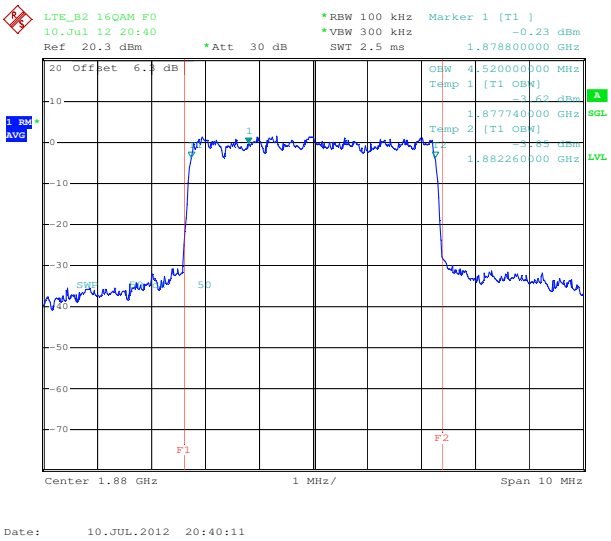
7.2.2.17 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=15MHz RB=75 RB Offset=0 QPSK 99% BW



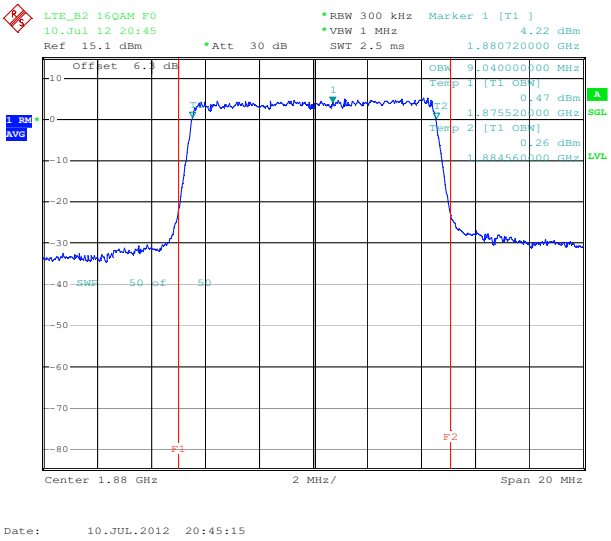
7.2.2.18 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=20MHz RB=100 RB Offset=0 QPSK 99% BW



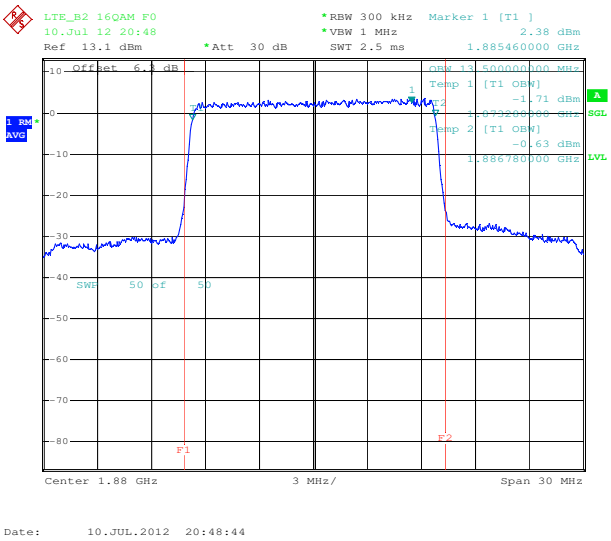
7.2.2.19 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=5MHz RB=25 RB Offset=0 16-QAM 99% BW



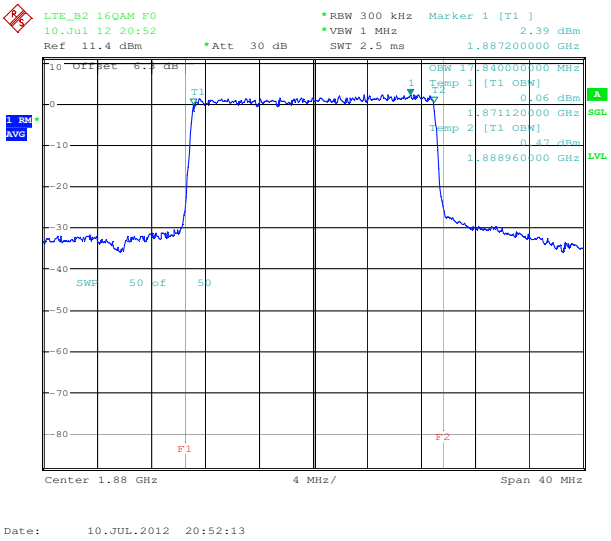
7.2.2.20 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=10MHz RB=50 RB Offset=0 16-QAM 99% BW



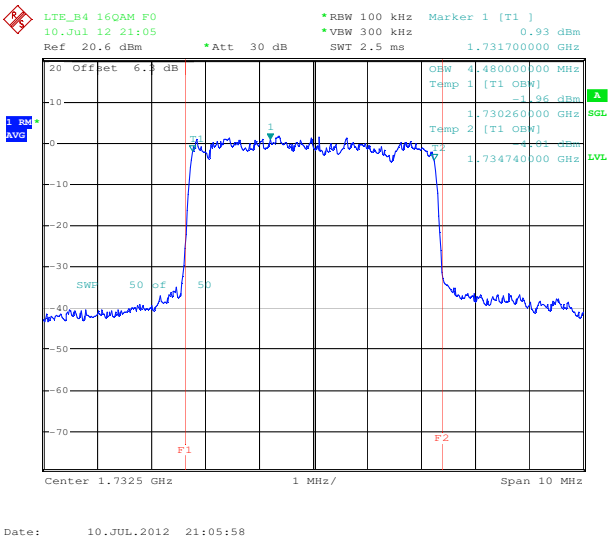
7.2.2.21 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=15MHz RB=75 RB Offset=0 16-QAM 99% BW



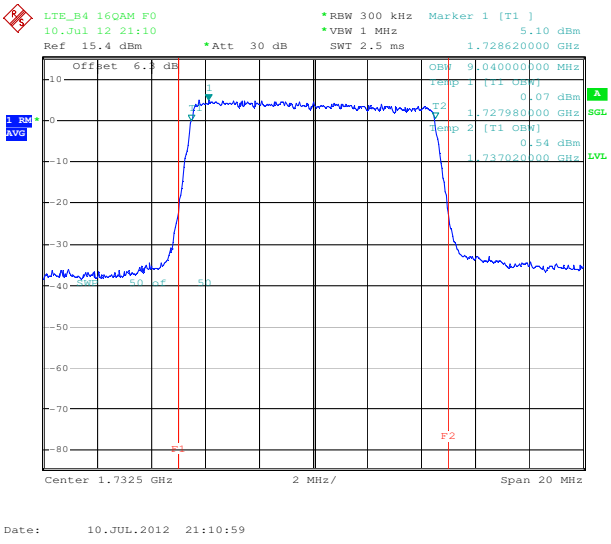
7.2.2.22 LTE Occupied Bandwidth, Band2 mid channel (18900) BW=20MHz RB=100 RB Offset=0 16-QAM 99% BW



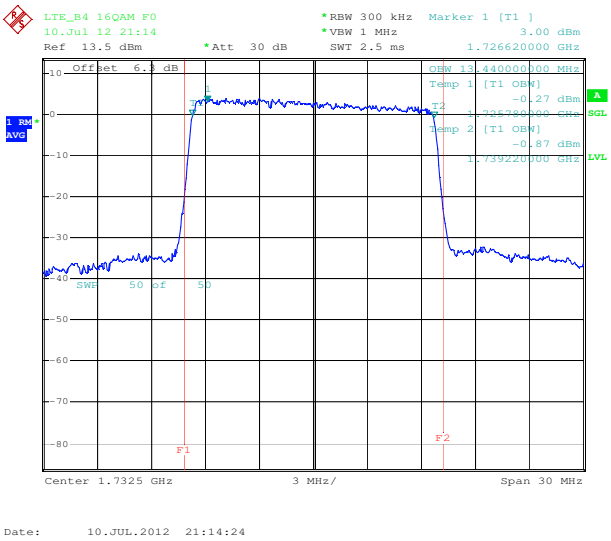
7.2.2.23 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=5MHz RB=25 RB Offset=0 16-QAM 99% BW



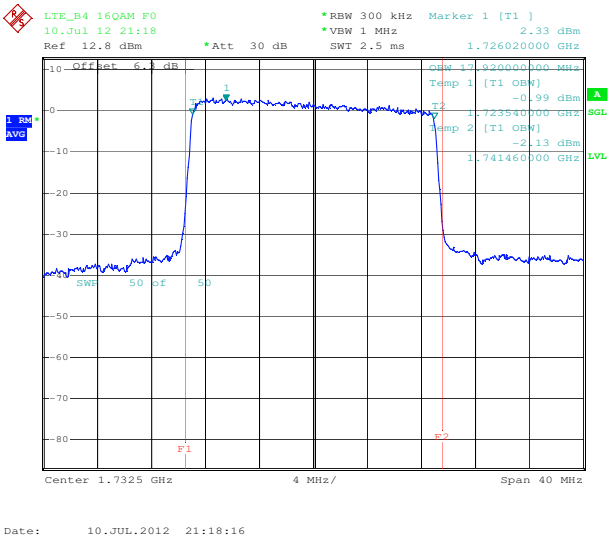
7.2.2.24 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=10MHz RB=50 RB Offset=0 16-QAM 99% BW



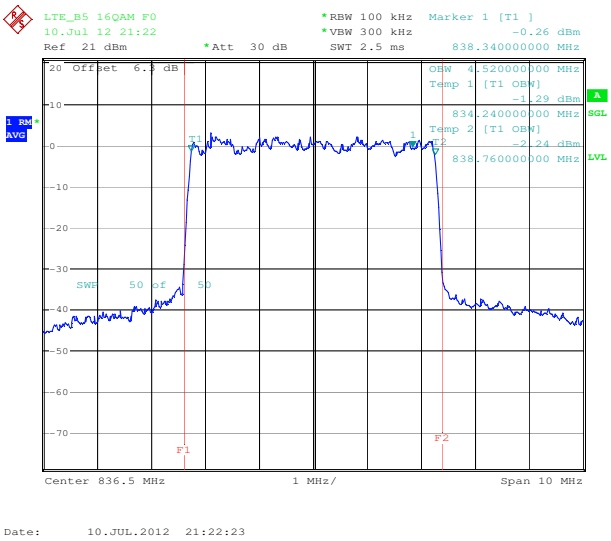
7.2.2.25 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=15MHz RB=75 RB Offset=0 16-QAM 99% BW



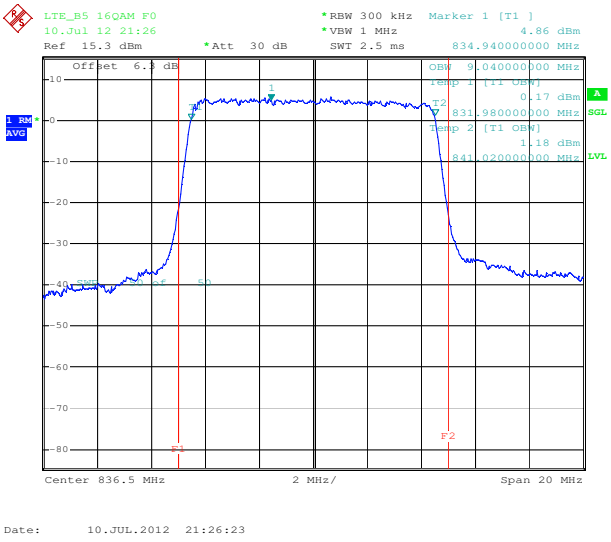
7.2.2.26 LTE Occupied Bandwidth, Band4 mid channel (20175) BW=20MHz RB=100 RB Offset=0 16-QAM 99% BW



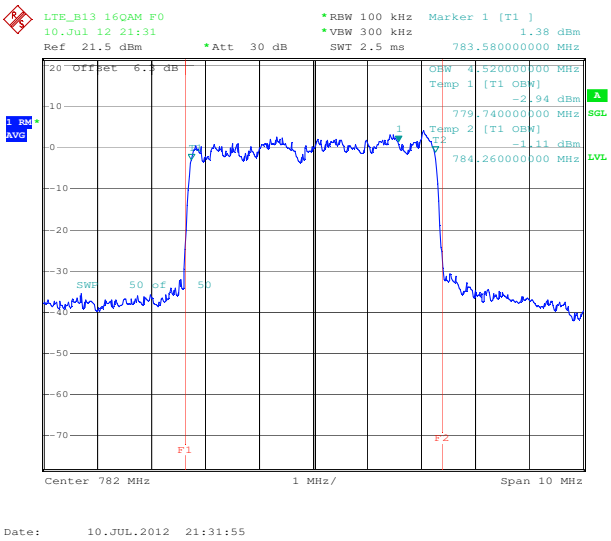
7.2.2.27 LTE Occupied Bandwidth, Band5 mid channel (20525) BW=5MHz RB=25 RB Offset=0 16-QAM 99% BW



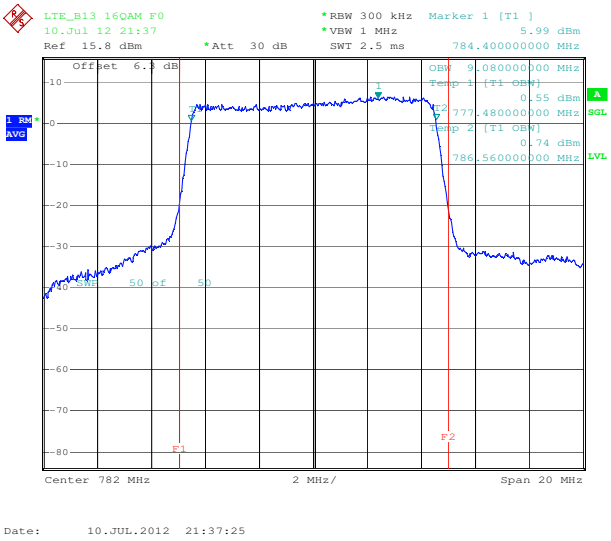
7.2.2.28 LTE Occupied Bandwidth, Band5 mid channel (20525) BW=10MHz RB=50 RB Offset=0 16-QAM 99% BW



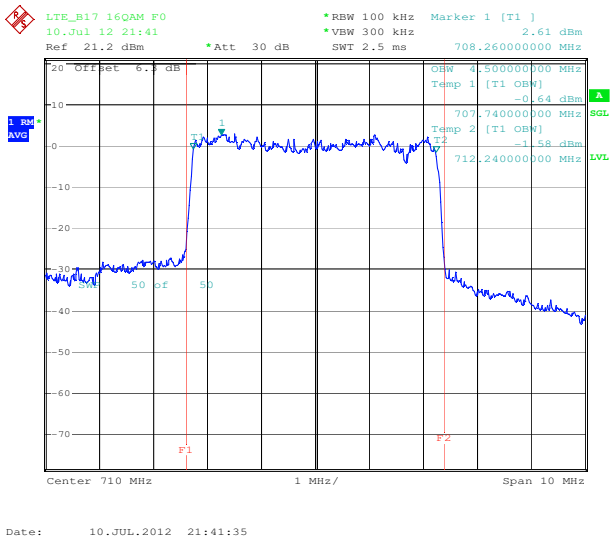
7.2.2.29 LTE Occupied Bandwidth, Band13 mid channel (23230) BW=5MHz RB=25 RB Offset=0 16-QAM 99% BW



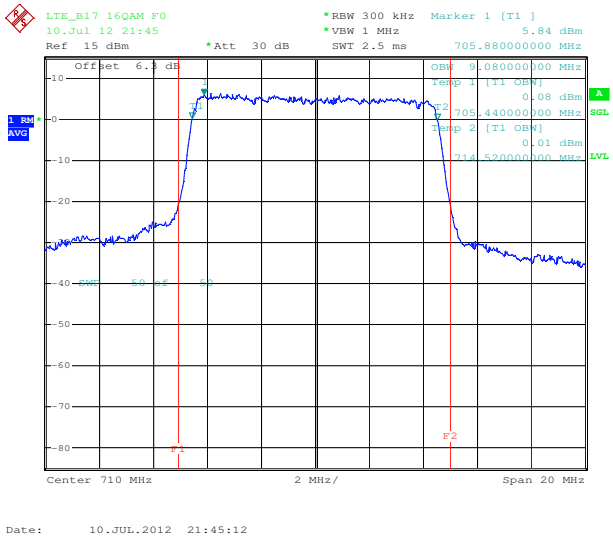
7.2.2.30 LTE Occupied Bandwidth, Band13 mid channel (23230) BW=10MHz RB=50 RB Offset=0 16-QAM 99% BW



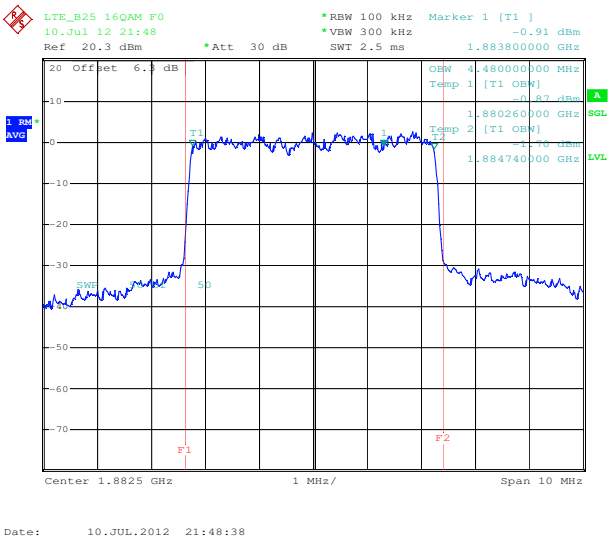
7.2.2.31 LTE Occupied Bandwidth, Band17 mid channel (23790) BW=5MHz RB=25 RB Offset=0 16-QAM 99% BW



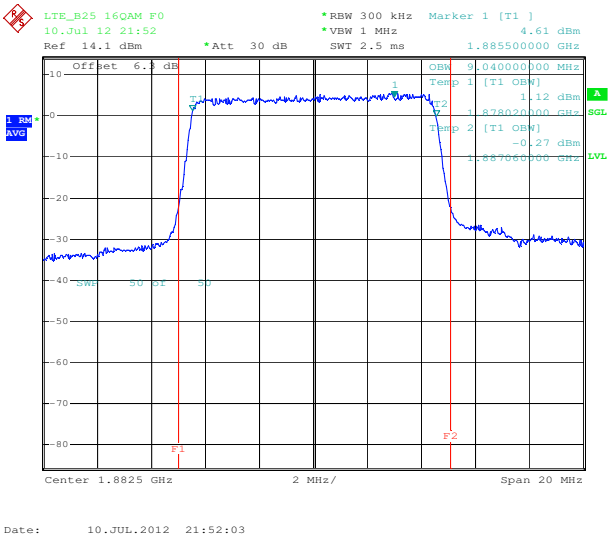
7.2.2.32 LTE Occupied Bandwidth, Band17 mid channel (23790) BW=10MHz RB=50 RB Offset=0 16-QAM 99% BW



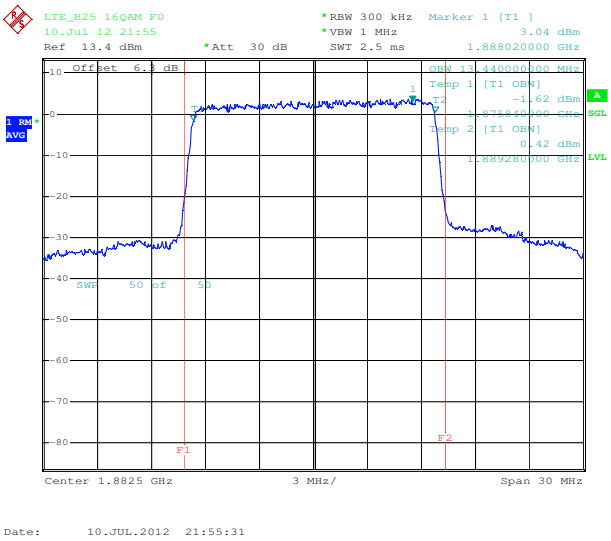
7.2.2.33 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=5MHz RB=25 RB Offset=0 16-QAM 99% BW



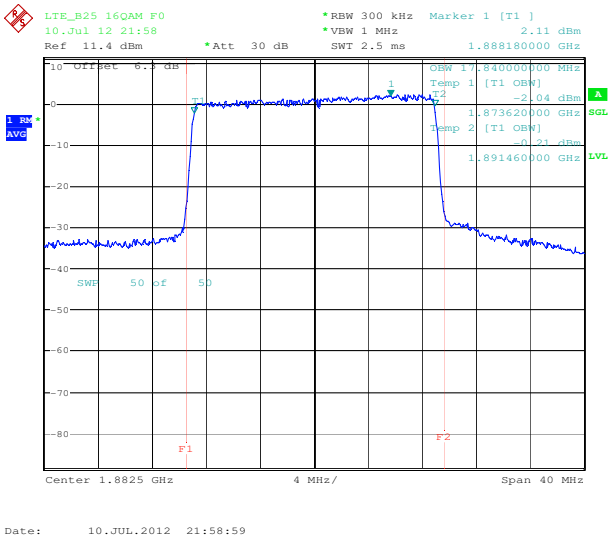
7.2.2.34 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=10MHz RB=50 RB Offset=0 16-QAM 99% BW



7.2.2.35 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=15MHz RB=75 RB Offset=0 16-QAM 99% BW



7.2.2.36 LTE Occupied Bandwidth, Band25 mid channel (26365) BW=20MHz RB=100 RB Offset=0 16-QAM 99% BW



8 Out of Band Emissions at Antenna Terminals

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

Out of Band Emissions:

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

8.1 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. Refer to Test Setup 2.

8.2 Test Results

Refer to the following plots.

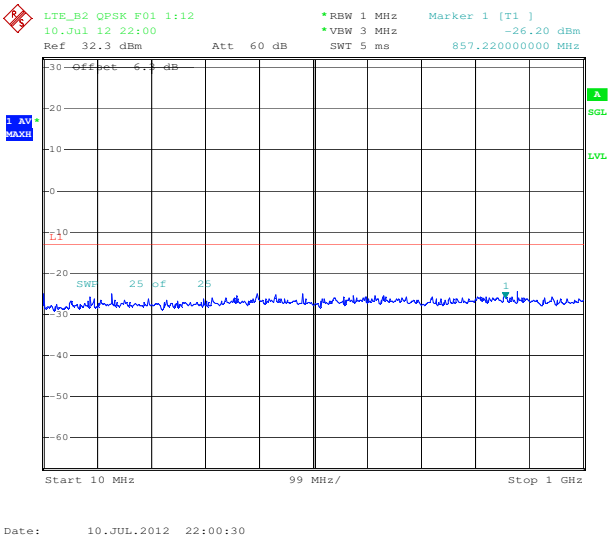
Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	Corresponding Plot number
LTE	QPSK	B2	5	1	12	1880.0	18900	8.2.1.1 -8.2.1.3
			10		25			8.2.1.4 -8.2.1.6
			15		32			8.2.1.7 -8.2.1.9
			20		50			8.2.1.10 -8.2.1.12
		B4	5	1	12	1732.5	20175	8.2.1.13 -8.2.1.15
			10		25			8.2.1.16 -8.2.1.18
			15		32			8.2.1.19 -8.2.1.21
			20		50			8.2.1.22 -8.2.1.24
		B5	5	1	12	836.5	20525	8.2.1.25 -8.2.1.26
			10		25			8.2.1.27 -8.2.1.28
		B13	5	1	12	782.0	23230	8.2.1.29 -8.2.1.30
			10		25			8.2.1.31 -8.2.1.32
		B17	5	1	12	710.0	23790	8.2.1.33 -8.2.1.34
			10		25			8.2.1.35 -8.2.1.36
		B25	5	1	12	1882.5	26365	8.2.1.37 -8.2.1.39
			10		25			8.2.1.40 -8.2.1.42
			15		32			8.2.1.43 -8.2.1.45
			20		50			8.2.1.46 -8.2.1.48

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

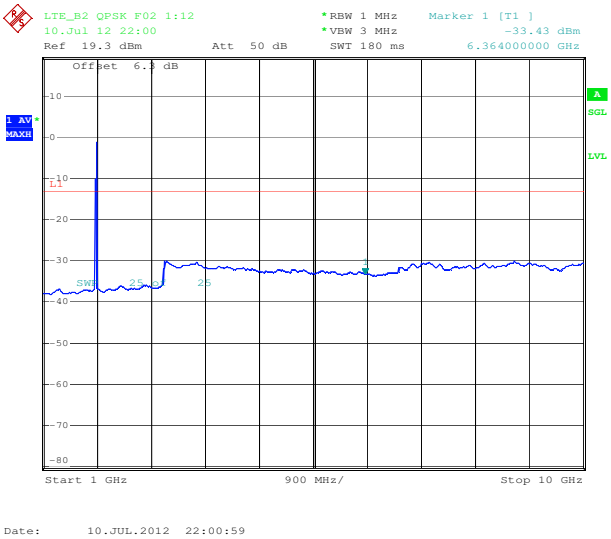
8.2.1 LTE Test Plots

LTE B2

8.2.1.1 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 30MHz to 1 GHz

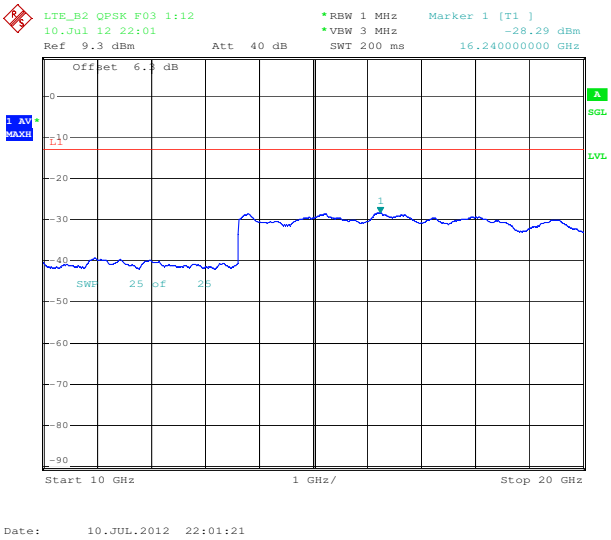


8.2.1.2 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 1 GHz to 10 GHz

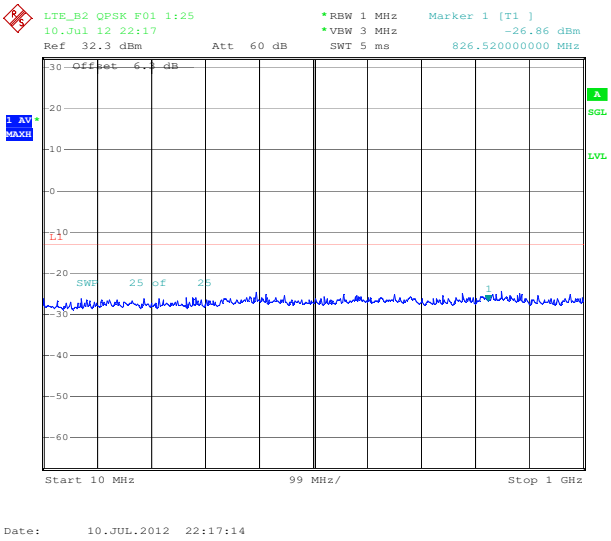


Note: The strong emission shown in each case is the carrier signal.

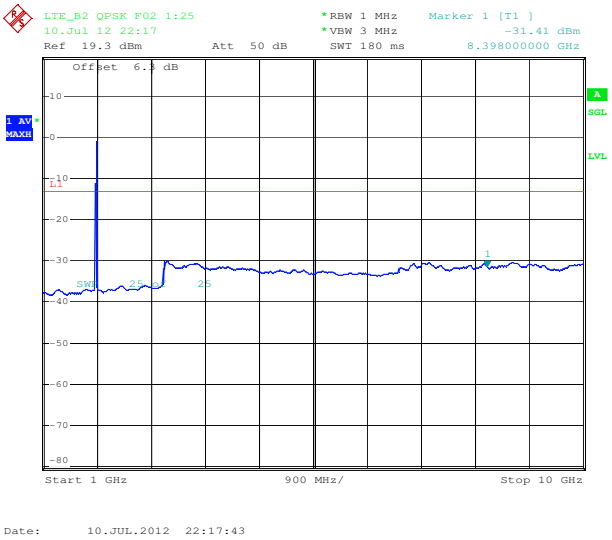
8.2.1.3 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 10 GHz to 20 GHz



8.2.1.4 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 30MHz to 1 GHz

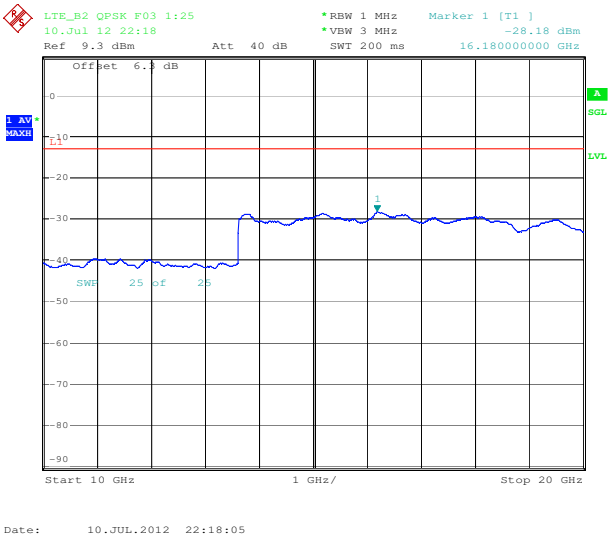


8.2.1.5 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 1 GHz to 10 GHz

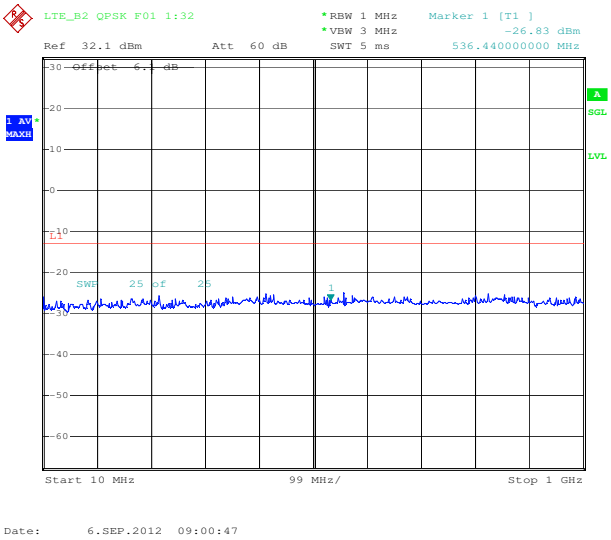


Note: The strong emission shown in each case is the carrier signal.

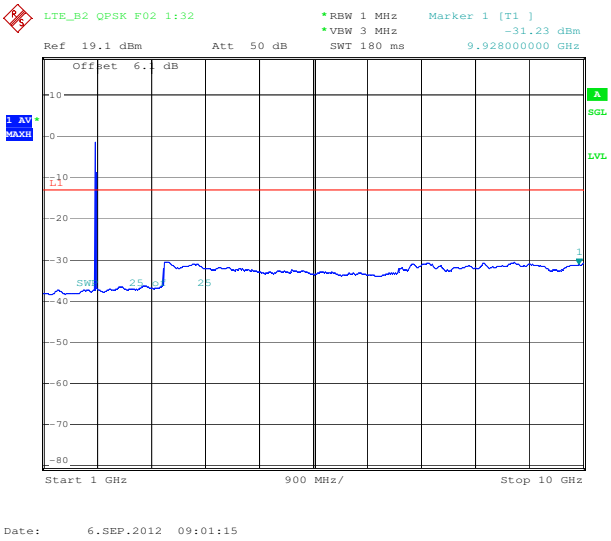
8.2.1.6 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 10 GHz to 20 GHz



8.2.1.7 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 30MHz to 1 GHz

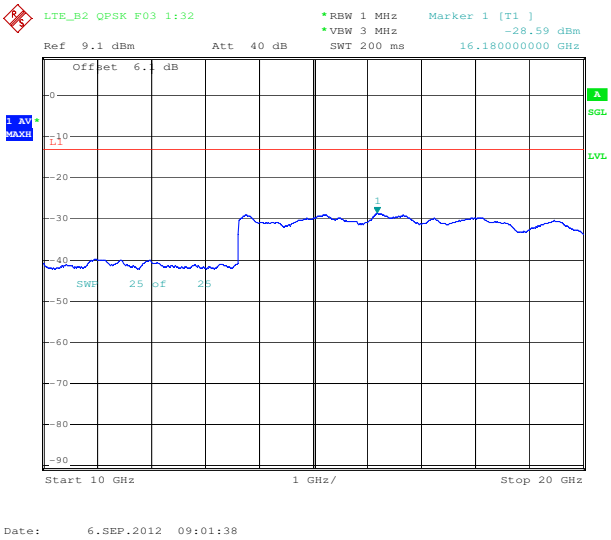


8.2.1.8 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 1 GHz to 10 GHz

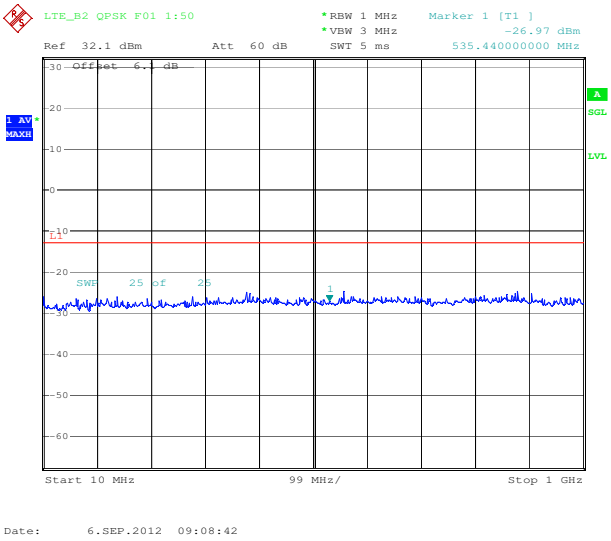


Note: The strong emission shown in each case is the carrier signal.

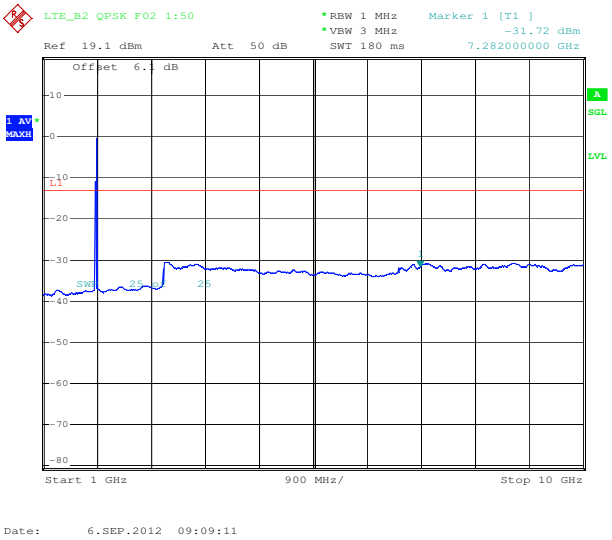
8.2.1.9 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 10 GHz to 20 GHz



8.2.1.10 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 30MHz to 1 GHz

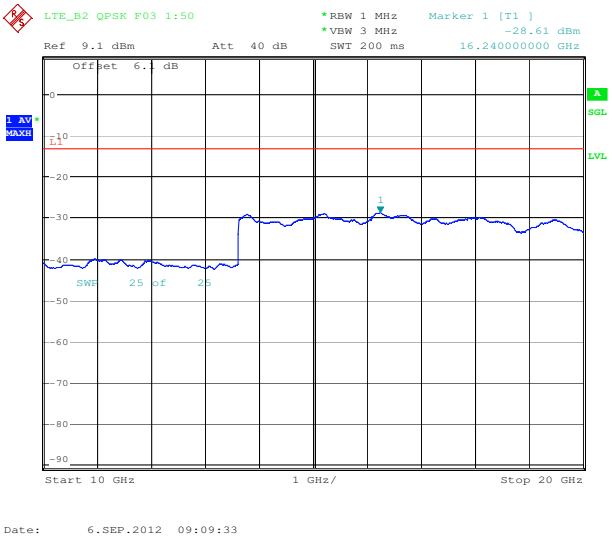


8.2.1.11 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 1 GHz to 10 GHz



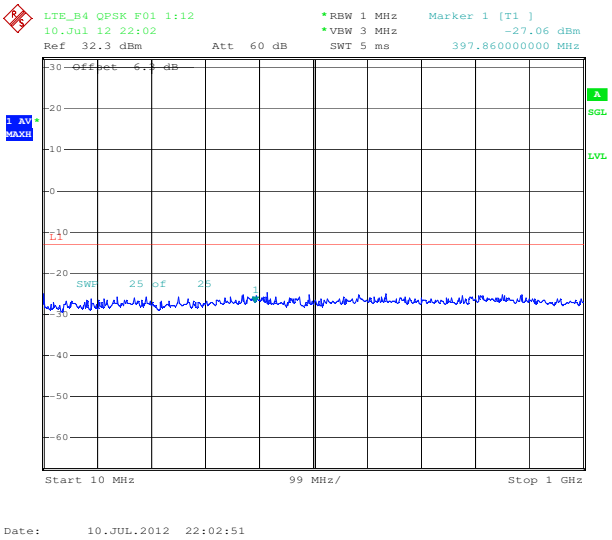
Note: The strong emission shown in each case is the carrier signal.

8.2.1.12 Out of Band Emissions at Antenna Terminals LTE B2, Mid channel, 1880.0 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 10 GHz to 20 GHz

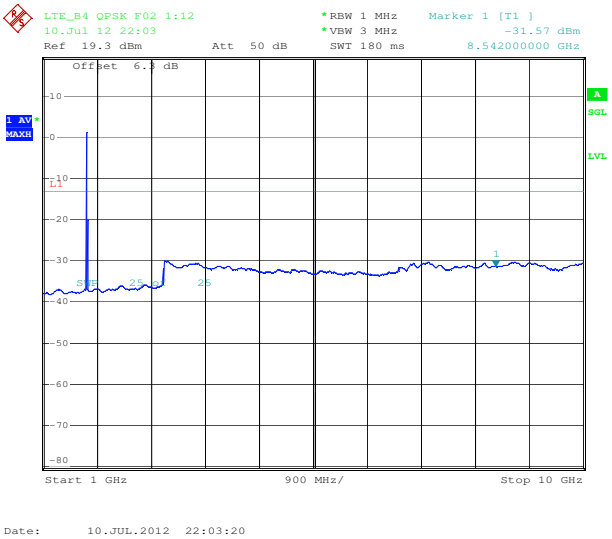


LTE B4

8.2.1.13 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 30MHz to 1 GHz

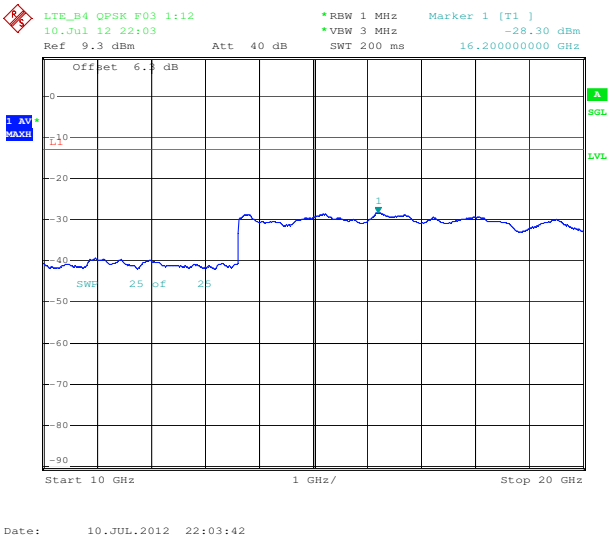


8.2.1.14 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 1 GHz to 10 GHz

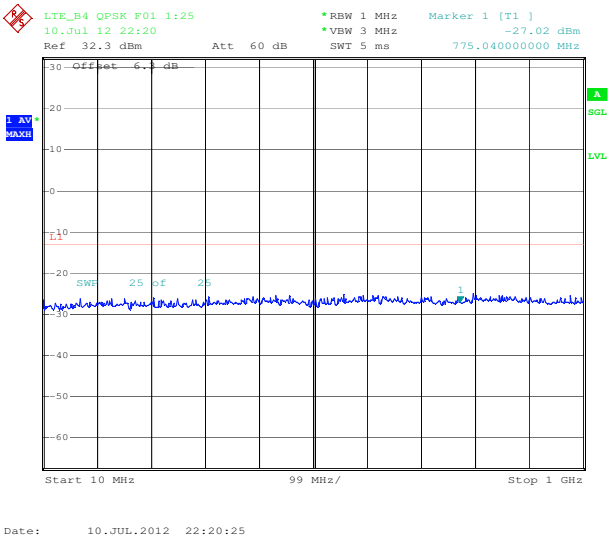


Note: The strong emission shown in each case is the carrier signal.

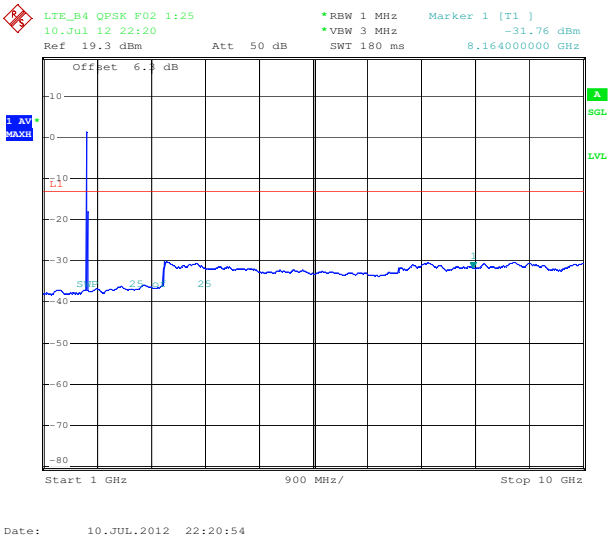
8.2.1.15 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 10 GHz to 20 GHz



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

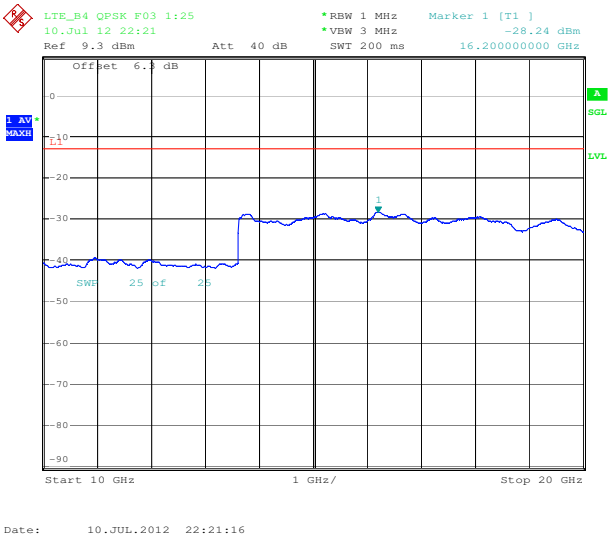


8.2.1.17 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 1 GHz to 10 GHz

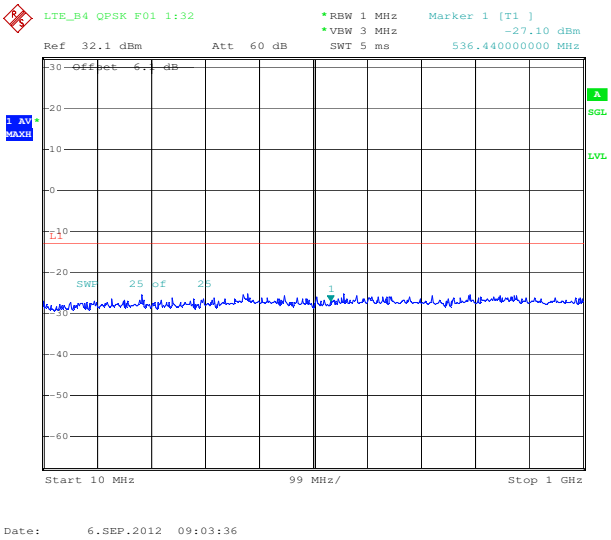


Note: The strong emission shown in each case is the carrier signal.

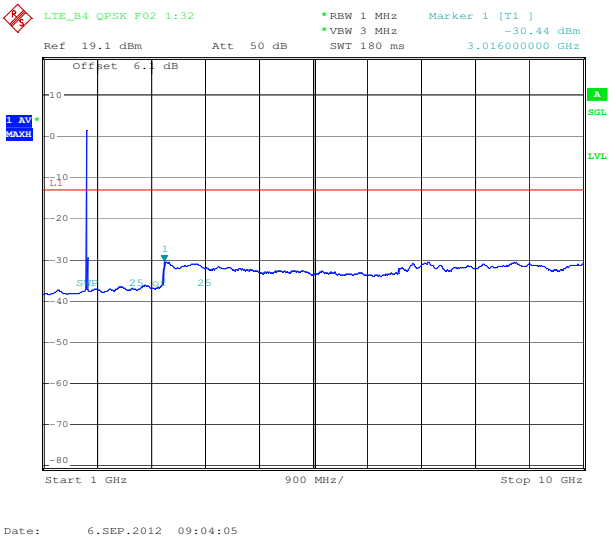
8.2.1.18 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 10 GHz to 20 GHz



8.2.1.19 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 30MHz to 1 GHz

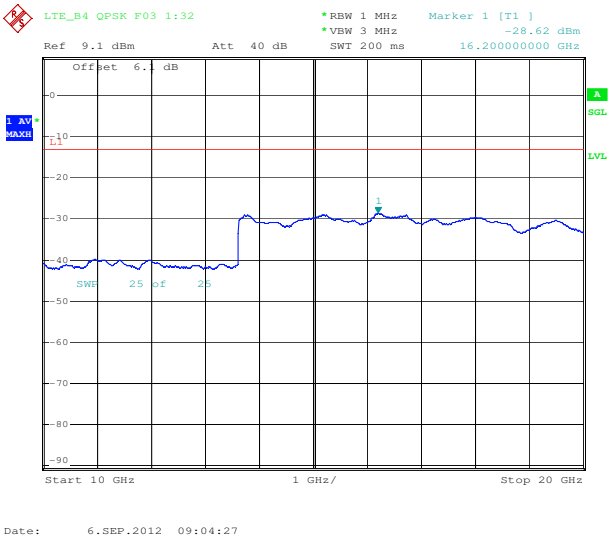


8.2.1.20 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 1 GHz to 10 GHz

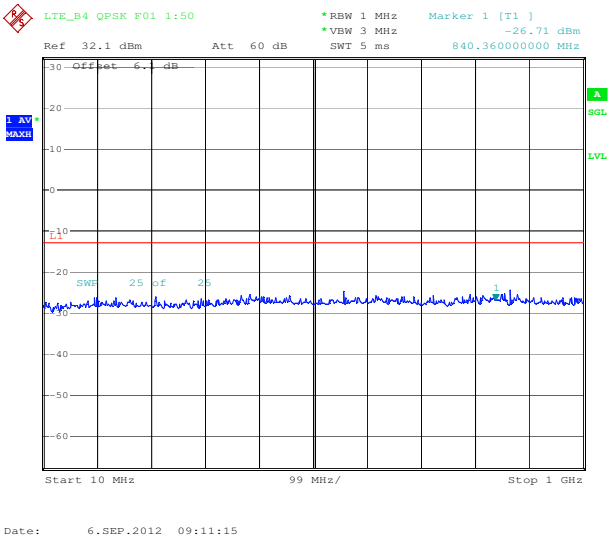


Note: The strong emission shown in each case is the carrier signal.

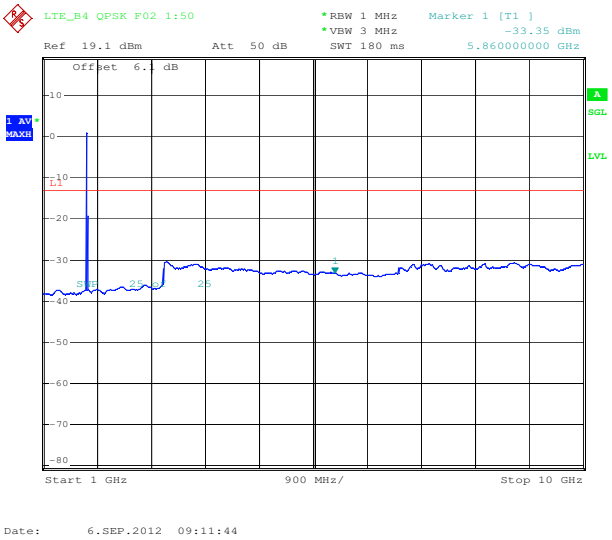
8.2.1.21 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 10 GHz to 20 GHz



8.2.1.22 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 30MHz to 1 GHz

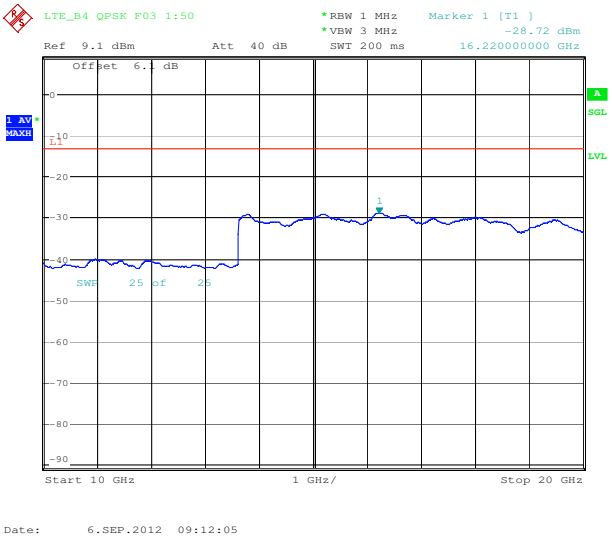


8.2.1.23 Out of Band Emissions at Antenna Terminals LTE B4, Mid channel, 1732.5 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 1 GHz to 10 GHz



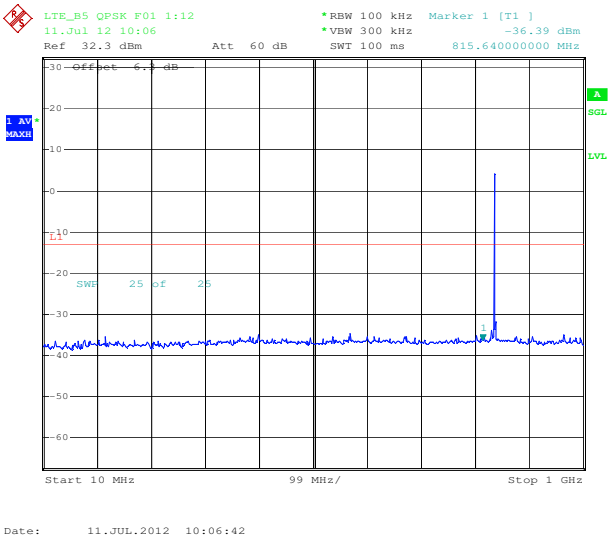
Note: The strong emission shown in each case is the carrier signal.

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



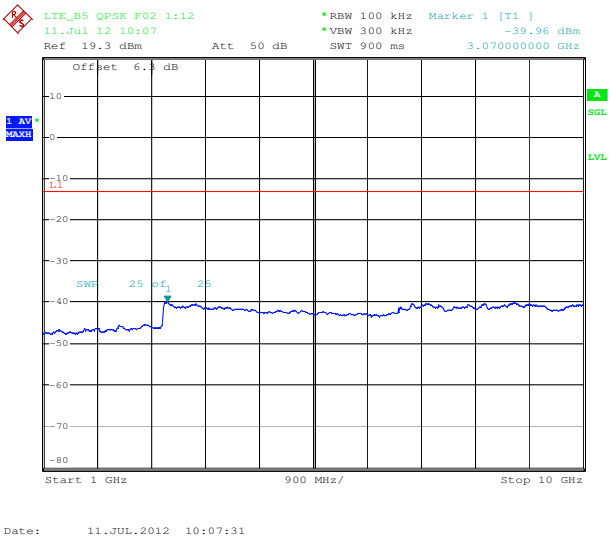
LTE B5

8.2.1.25 Out of Band Emissions at Antenna Terminals LTE B5, Mid channel, 836.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 30MHz to 1 GHz

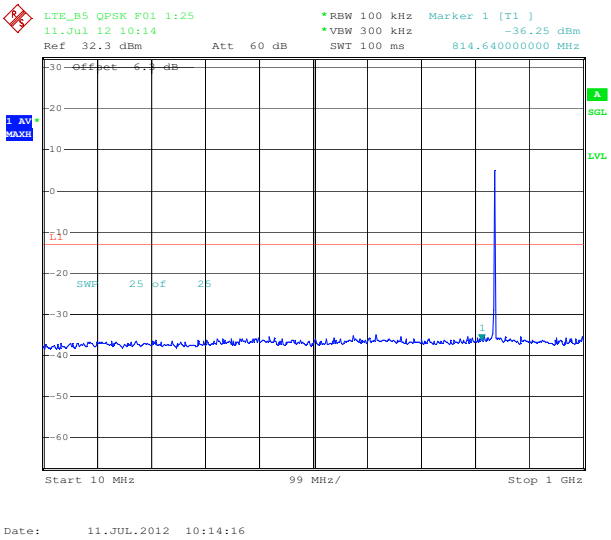


Note: The strong emission shown in each case is the carrier signal.

8.2.1.26 Out of Band Emissions at Antenna Terminals LTE B5, Mid channel, 836.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 1 GHz to 10 GHz

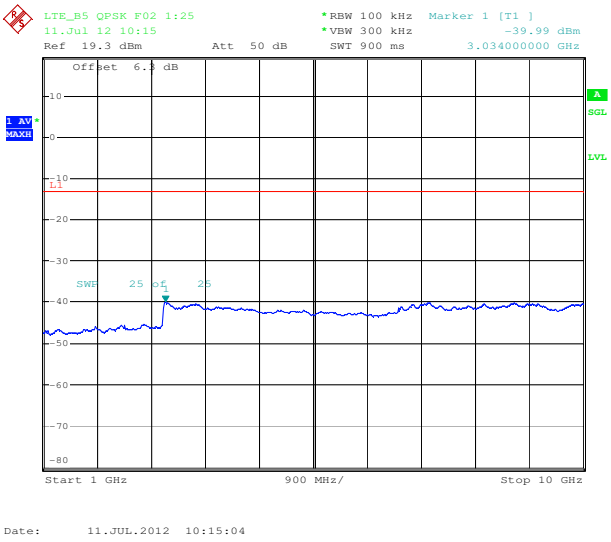


8.2.1.27 Out of Band Emissions at Antenna Terminals LTE B5, Mid channel, 836.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 30MHz to 1 GHz



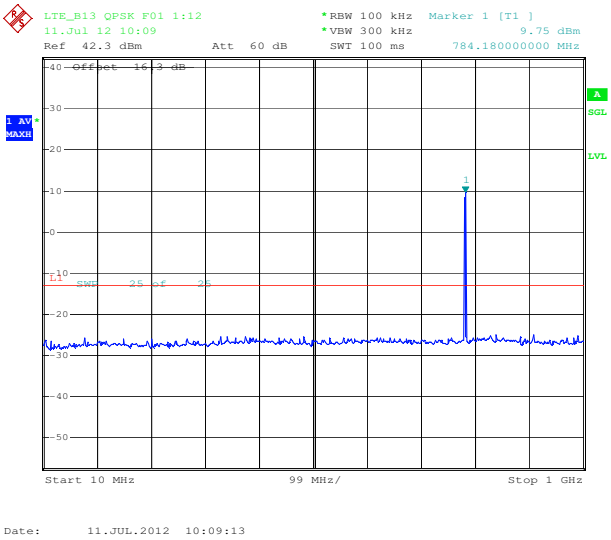
Note: The strong emission shown in each case is the carrier signal.

8.2.1.28 Out of Band Emissions at Antenna Terminals LTE B5, Mid channel, 836.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 1 GHz to 10 GHz



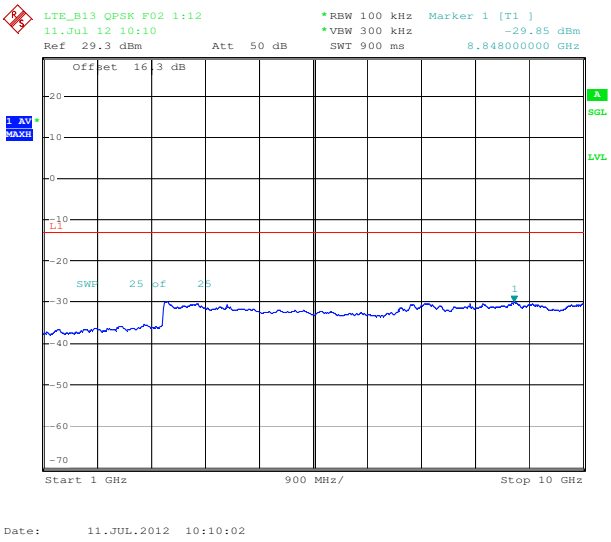
LTE B13

8.2.1.29 Out of Band Emissions at Antenna Terminals LTE B13, Mid channel, 782.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 30MHz to 1 GHz

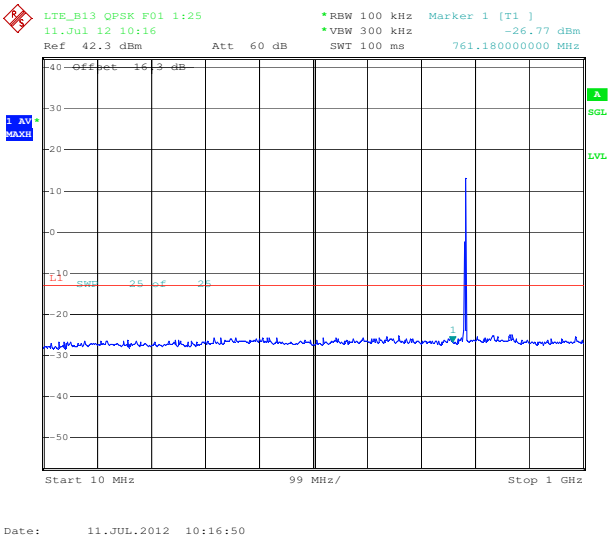


Note: The strong emission shown in each case is the carrier signal.

8.2.1.30 Out of Band Emissions at Antenna Terminals LTE B13, Mid channel, 782.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 1 GHz to 10 GHz

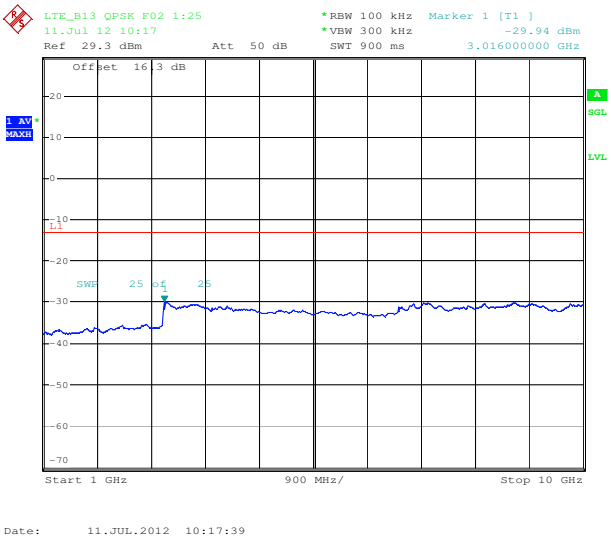


8.2.1.31 Out of Band Emissions at Antenna Terminals LTE B13, Mid channel, 782.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 30MHz to 1 GHz



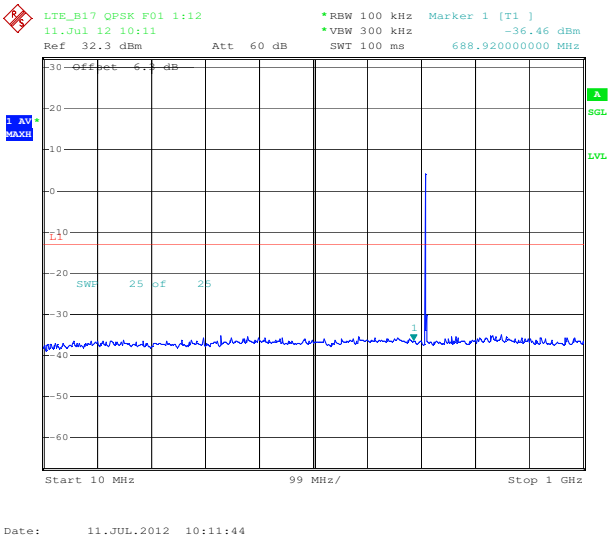
Note: The strong emission shown in each case is the carrier signal.

8.2.1.32 Out of Band Emissions at Antenna Terminals LTE B13, Mid channel, 782.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 1 GHz to 10 GHz



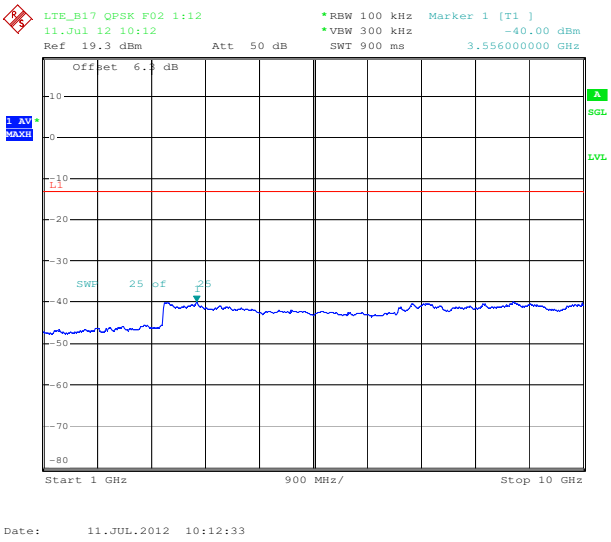
<u>LTE B17</u>

8.2.1.33 Out of Band Emissions at Antenna Terminals LTE B17, Mid channel, 710.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 30MHz to 1 GHz

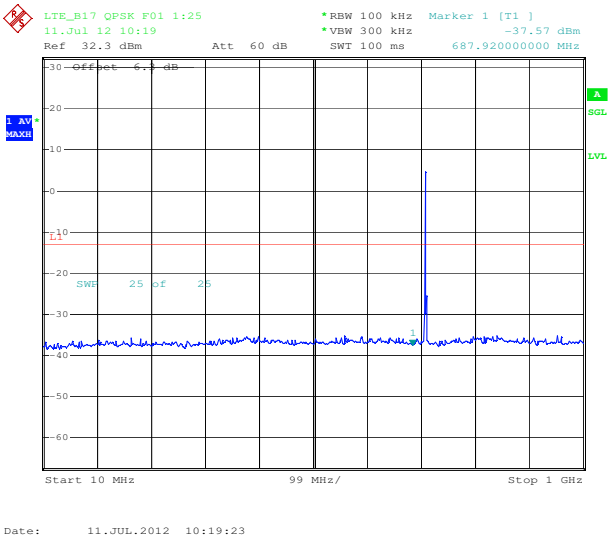


Note: The strong emission shown in each case is the carrier signal.

8.2.1.34 Out of Band Emissions at Antenna Terminals LTE B17, Mid channel, 710.0 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 1 GHz to 10 GHz

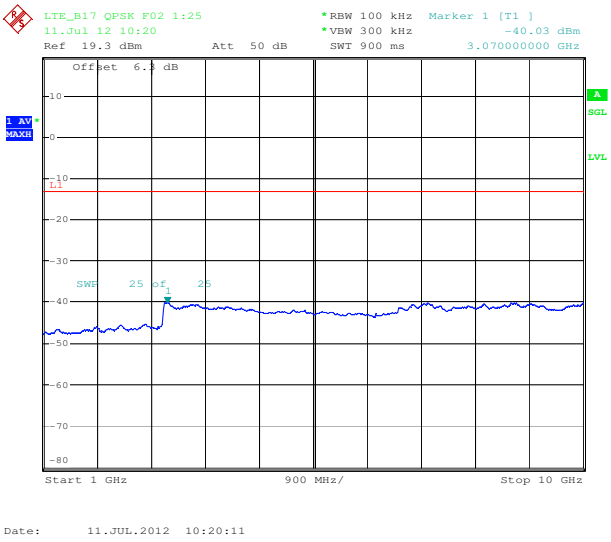


8.2.1.35 Out of Band Emissions at Antenna Terminals LTE B17, Mid channel, 710.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 30MHz to 1 GHz



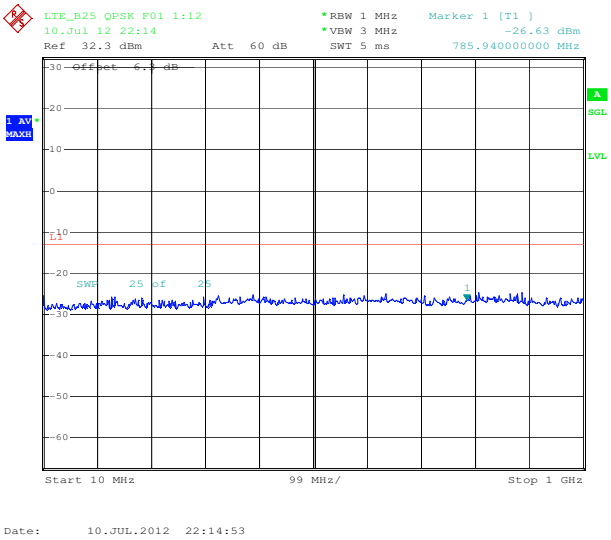
Note: The strong emission shown in each case is the carrier signal.

8.2.1.36 Out of Band Emissions at Antenna Terminals LTE B17, Mid channel, 710.0 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 1 GHz to 10 GHz

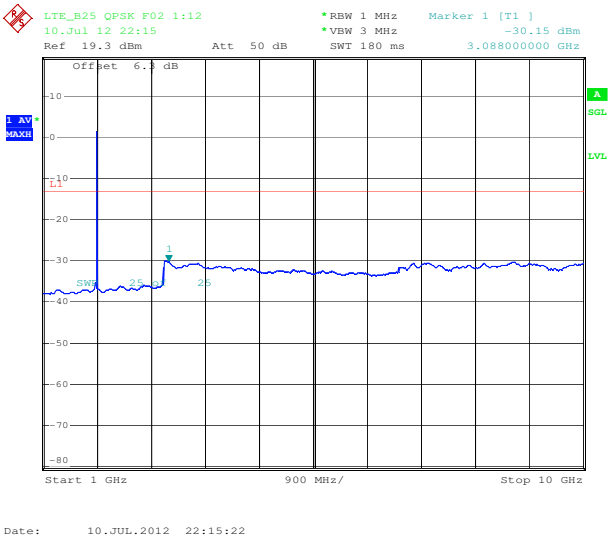


LTE B25

8.2.1.37 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 30MHz to 1 GHz

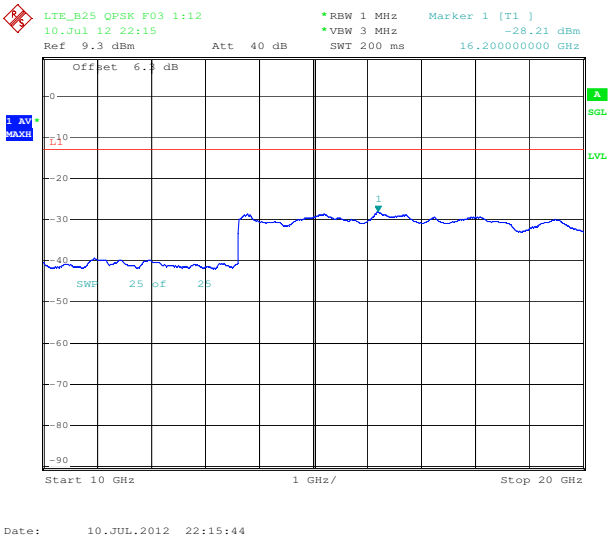


8.2.1.38 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 1 GHz to 10 GHz

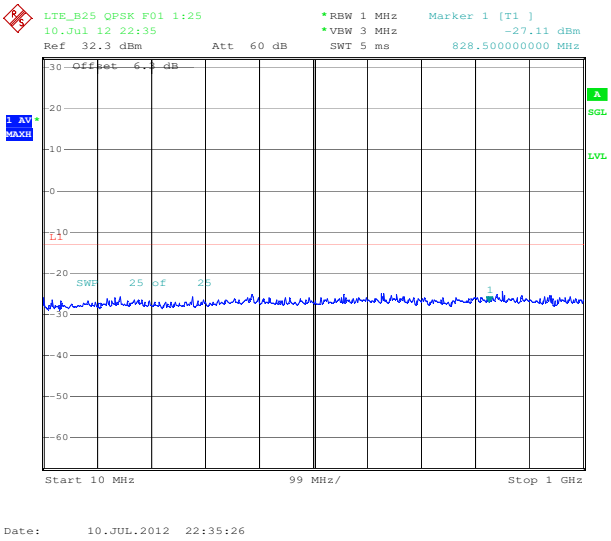


Note: The strong emission shown in each case is the carrier signal.

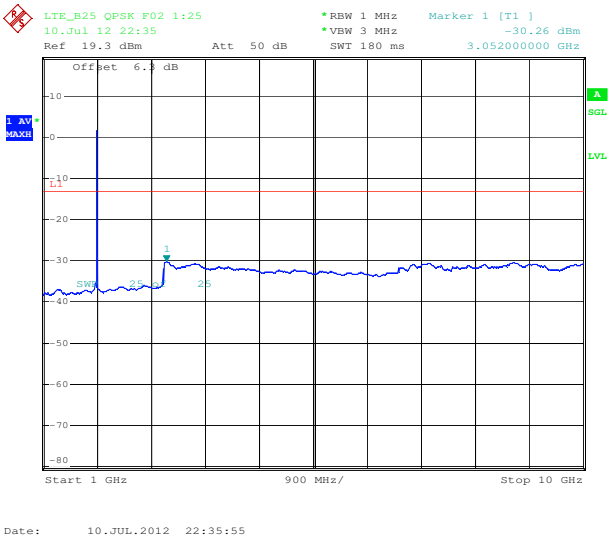
8.2.1.39 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 5MHz BW, 1RB, RB Offset 12, QPSK, 10 GHz to 20 GHz



8.2.1.40 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 30MHz to 1 GHz

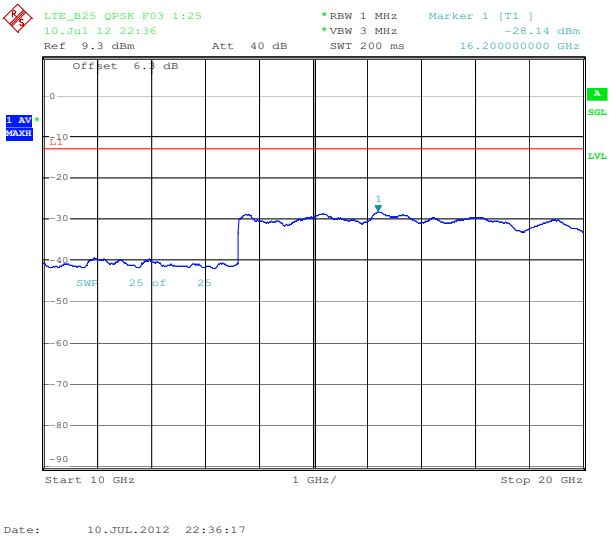


8.2.1.41 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 1 GHz to 10 GHz

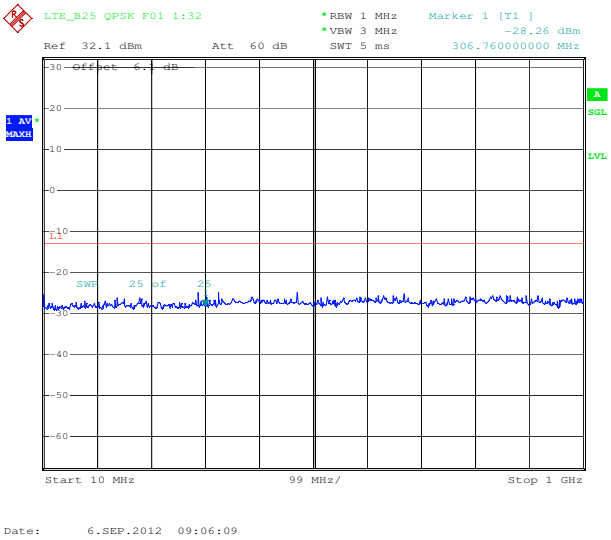


Note: The strong emission shown in each case is the carrier signal.

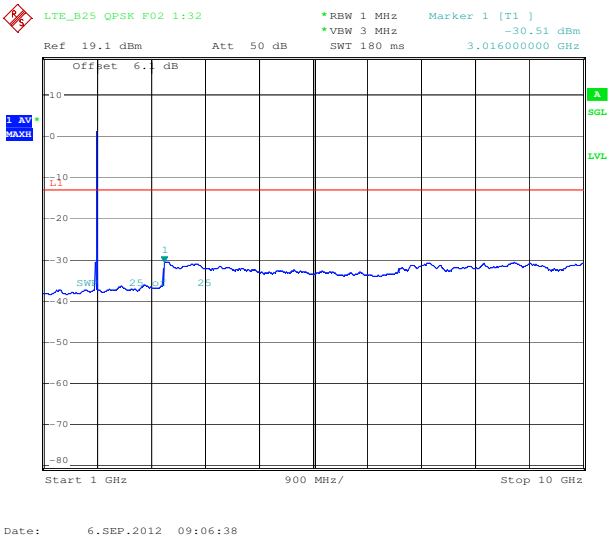
8.2.1.42 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 10MHz BW, 1RB, RB Offset 25, QPSK, 10 GHz to 20 GHz



8.2.1.43 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 30MHz to 1 GHz

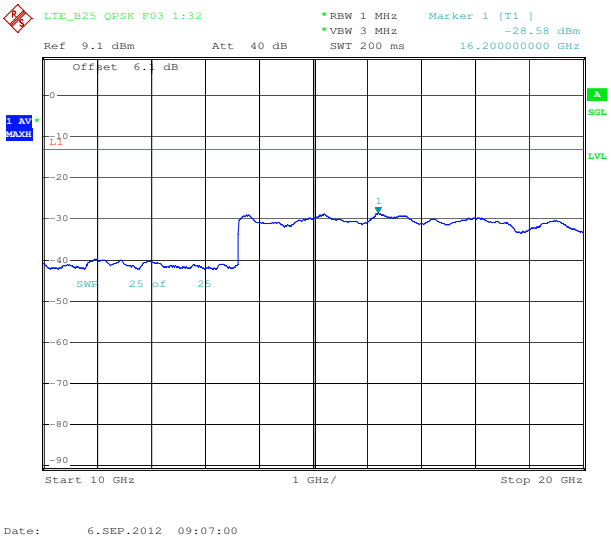


8.2.1.44 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 1 GHz to 10 GHz

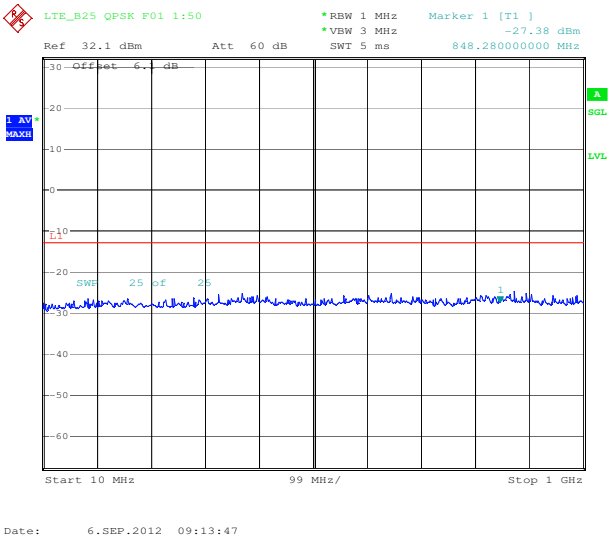


Note: The strong emission shown in each case is the carrier signal.

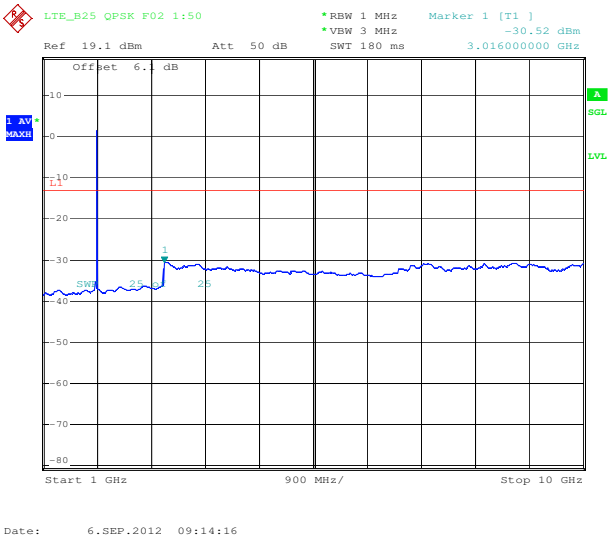
8.2.1.45 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 15MHz BW, 1RB, RB Offset 32, QPSK, 10 GHz to 20 GHz



8.2.1.46 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 30MHz to 1 GHz

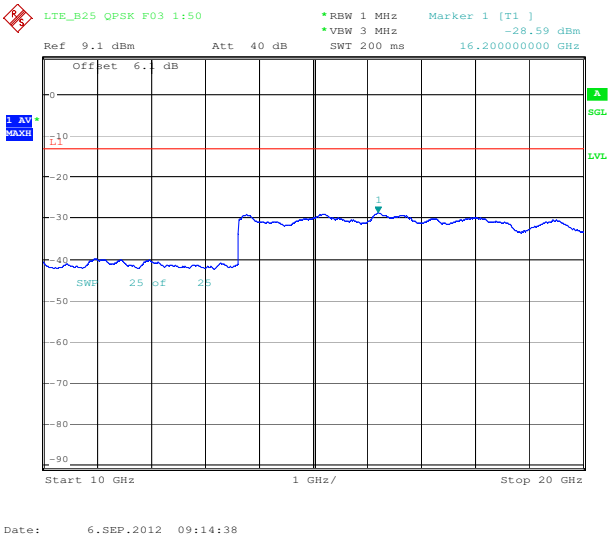


8.2.1.47 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 1 GHz to 10 GHz



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

8.2.1.48 Out of Band Emissions at Antenna Terminals LTE B25, Mid channel, 1882.5 MHz, 20MHz BW, 1RB, RB Offset 50, QPSK, 10 GHz to 20 GHz



9 Block Edge Compliance

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

9.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMW500, 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. Refer to Test Setup 1.

The resolution bandwidth was set to at least 1% of the emission bandwidth (where applicable). The power was scaled accordingly:

Power offset = 10*log(FCC_RBW/Measurement_RBW)

9.2 Test Results

LL = lower left, LR = lower right, UL = upper left, UR = upper right

Mode		Band	BW (MHz)	No. RB	RB Offset	Frequency (MHz)	Channel	Corresponding Plot number
LTE	QPSK	B2	5	1	0	1852.5	18625	9.2.1.1 LL
				25	0			9.2.1.1 UL
				1	24	1907.5	19175	9.2.1.1 LR
				25	0			9.2.1.1 UR
		B2	10	1	0	1855.0	18650	9.2.1.2 LL
				50	0			9.2.1.2 UL
				1	49	1905.0	19150	9.2.1.2 LR
				50	0			9.2.1.2 UR
		B2	15	1	0	1857.5	18675	9.2.1.3 LL
				75	0			9.2.1.3 UL
				1	74	1902.5	19125	9.2.1.3 LR
				75	0			9.2.1.3 UR
		B2	20	1	0	1860.0	18700	9.2.1.4 LL
				100	0			9.2.1.4 UL
				1	99	1900.0	19100	9.2.1.4 LR
				100	0			9.2.1.4 UR
		B4	5	1	0	1712.5	19975	9.2.1.5 LL
				25	0			9.2.1.5 UL
				1	24	1752.5	20375	9.2.1.5 LR
				25	0			9.2.1.5 UR
		B4	10	1	0	1715.0	20000	9.2.1.6 LL
				50	0			9.2.1.6 UL
				1	49	1750.0	20350	9.2.1.6 LR
				50	0			9.2.1.6 UR
		B4	15	1	0	1717.5	20025	9.2.1.7 LL
				75	0			9.2.1.7 UL
				1	74	1747.5	20325	9.2.1.7 LR
				75	0			9.2.1.7 UR
		B4	20	1	0	1720.0	20050	9.2.1.8 LL
				100	0			9.2.1.8 UL
				1	99	1745.0	20300	9.2.1.8 LR

LTE				100	0			9.2.1.8 UR
		B5	5	1	0	826.5	20425	9.2.1.9 LL
				25	0			9.2.1.9 UL
				1	24	846.5	20625	9.2.1.9 LR
				25	0			9.2.1.9 UR
		B5	10	1	0	829.0	20450	9.2.1.10 LL
				50	0			9.2.1.10 UL
				1	49	844.0	20600	9.2.1.10 LR
				50	0			9.2.1.10 UR
		B13	5	1	0	779.5	23205	9.2.1.11 LL
				25	0			9.2.1.11 UL
				1	24	784.5	23255	9.2.1.11 LR
				25	0			9.2.1.11 UR
		B13	10	1	0	782.0	23230	9.2.1.12 LL
				50	0			9.2.1.12 UL
				1	49	782.0	23230	9.2.1.12 LR
				50	0			9.2.1.12 UR
		B17	5	1	0	706.5	23755	9.2.1.13 LL
				25	0			9.2.1.13 UL
				1	24	713.5	23825	9.2.1.13 LR
				25	0			9.2.1.13 UR
		B17	10	1	0	709.0	23780	9.2.1.14 LL
				50	0			9.2.1.14 UL
				1	49	711.0	23800	9.2.1.14 LR
				50	0			9.2.1.14 UR
		B25	5	1	0	1852.5	26065	9.2.1.15 LL
				25	0			9.2.1.15 UL
				1	24	1912.5	26665	9.2.1.15 LR
				25	0			9.2.1.15 UR
		B25	10	1	0	1855.0	26090	9.2.1.16 LL
				50	0			9.2.1.16 UL
				1	49	1910.0	26640	9.2.1.16 LR
				50	0			9.2.1.16 UR
		B25	15	1	0	1857.5	26115	9.2.1.17 LL
				75	0			9.2.1.17 UL
				1	74	1907.5	26615	9.2.1.17 LR
				75	0			9.2.1.17 UR
		B25	20	1	0	1860.0	26140	9.2.1.18 LL
				100	0			9.2.1.18 UL
				1	99	1905.0	26590	9.2.1.18 LR
				100	0			9.2.1.18 UR
	16-QAM	B2	5	1	0	1852.5	18625	9.2.1.19 LL
				25	0			9.2.1.19 UL
				1	24	1907.5	19175	9.2.1.19 LR
				25	0			9.2.1.19 UR

B2	10	1	0	1855.0	18650	9.2.1.20 LL
		50	0			9.2.1.20 UL
		1	49	1905.0	19150	9.2.1.20 LR
		50	0			9.2.1.20 UR
B2	15	1	0	1857.5	18675	9.2.1.21 LL
		75	0			9.2.1.21 UL
		1	74	1902.5	19125	9.2.1.21 LR
		75	0			9.2.1.21 UR
B2	20	1	0	1860.0	18700	9.2.1.22 LL
		100	0			9.2.1.22 UL
		1	99	1900.0	19100	9.2.1.22 LR
		100	0			9.2.1.22 UR
B4	5	1	0	1712.5	19975	9.2.1.23 LL
		25	0			9.2.1.23 UL
		1	24	1752.5	20375	9.2.1.23 LR
		25	0			9.2.1.23 UR
B4	10	1	0	1715.0	20000	9.2.1.24 LL
		50	0			9.2.1.24 UL
		1	49	1750.0	20350	9.2.1.24 LR
		50	0			9.2.1.24 UR
B4	15	1	0	1717.5	20025	9.2.1.25 LL
		75	0			9.2.1.25 UL
		1	74	1747.5	20325	9.2.1.25 LR
		75	0			9.2.1.25 UR
B4	20	1	0	1720.0	20050	9.2.1.26 LL
		100	0			9.2.1.26 UL
		1	99	1745.0	20300	9.2.1.26 LR
		100	0			9.2.1.26 UR
B5	5	1	0	826.5	20425	9.2.1.27 LL
		25	0			9.2.1.27 UL
		1	24	846.5	20625	9.2.1.27 LR
		25	0			9.2.1.27 UR
B5	10	1	0	829.0	20450	9.2.1.28 LL
		50	0			9.2.1.28 UL
		1	49	844.0	20600	9.2.1.28 LR
		50	0			9.2.1.28 UR
B13	5	1	0	779.5	23205	9.2.1.29 LL
		25	0			9.2.1.29 UL
		1	24	784.5	23255	9.2.1.29 LR
		25	0			9.2.1.29 UR
B13	10	1	0	782.0	23230	9.2.1.30 LL
		50	0			9.2.1.30 UL
		1	49	782.0	23230	9.2.1.30 LR
		50	0			9.2.1.30 UR
B17	5	1	0	706.5	23755	9.2.1.31 LL

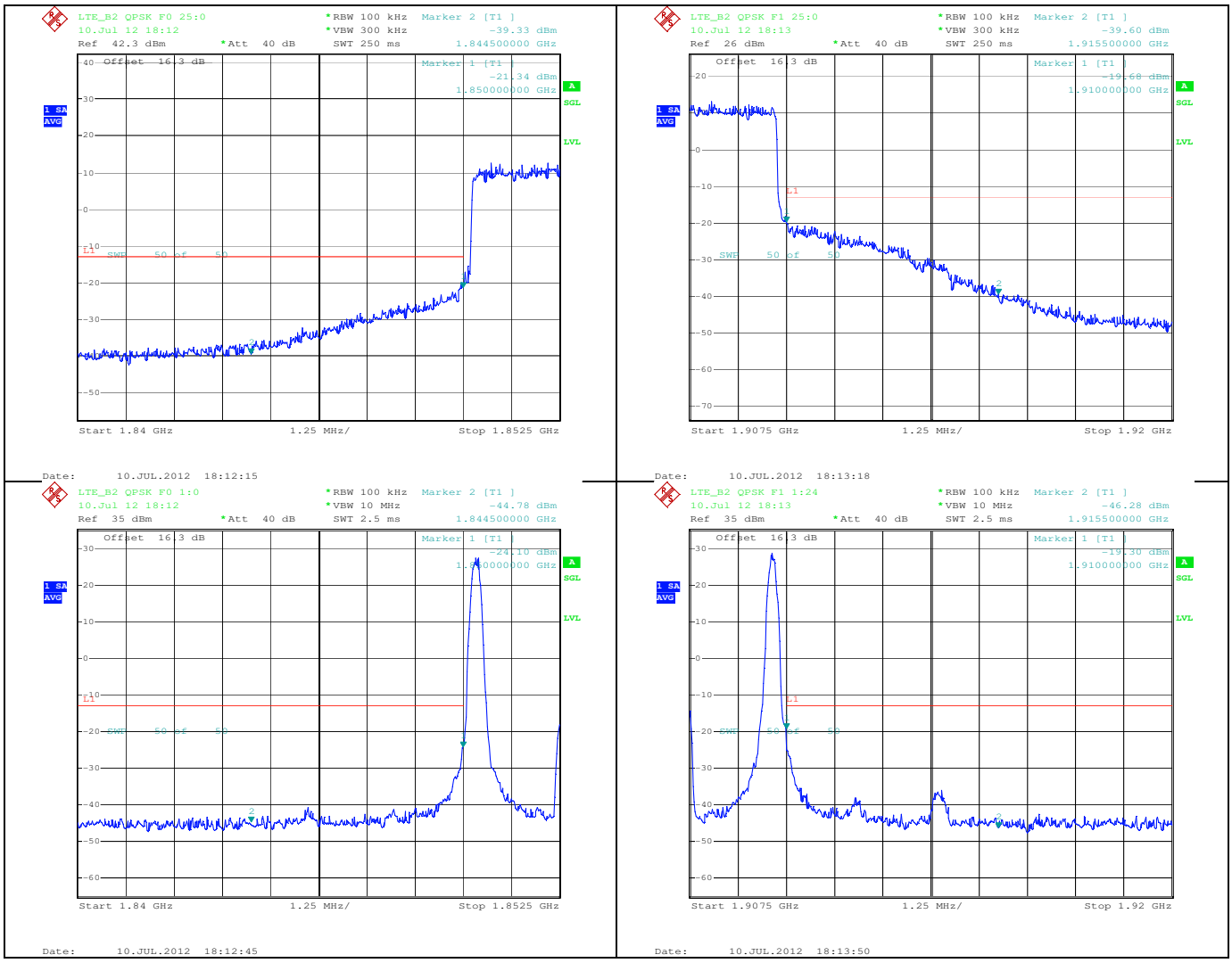
		25	0			9.2.1.31 UL
		1	24	713.5	23825	9.2.1.31 LR
		25	0			9.2.1.31 UR
B17	10	1	0	709.0	23780	9.2.1.32 LL
		50	0			9.2.1.32 UL
		1	49	711.0	23800	9.2.1.32 LR
		50	0			9.2.1.32 UR
B25	5	1	0	1852.5	26065	9.2.1.33 LL
		25	0			9.2.1.33 UL
		1	24	1912.5	26665	9.2.1.33 LR
		25	0			9.2.1.33 UR
B25	10	1	0	1855.0	26090	9.2.1.34 LL
		50	0			9.2.1.34 UL
		1	49	1910.0	26640	9.2.1.34 LR
		50	0			9.2.1.34 UR
B25	15	1	0	1857.5	26115	9.2.1.35 LL
		75	0			9.2.1.35 UL
		1	74	1907.5	26615	9.2.1.35 LR
		75	0			9.2.1.35 UR
B25	20	1	0	1860.0	26140	9.2.1.36 LL
		100	0			9.2.1.36 UL
		1	99	1905.0	26590	9.2.1.36 LR
		100	0			9.2.1.36 UR

9.2.1 LTE Test Plots

LTE B2

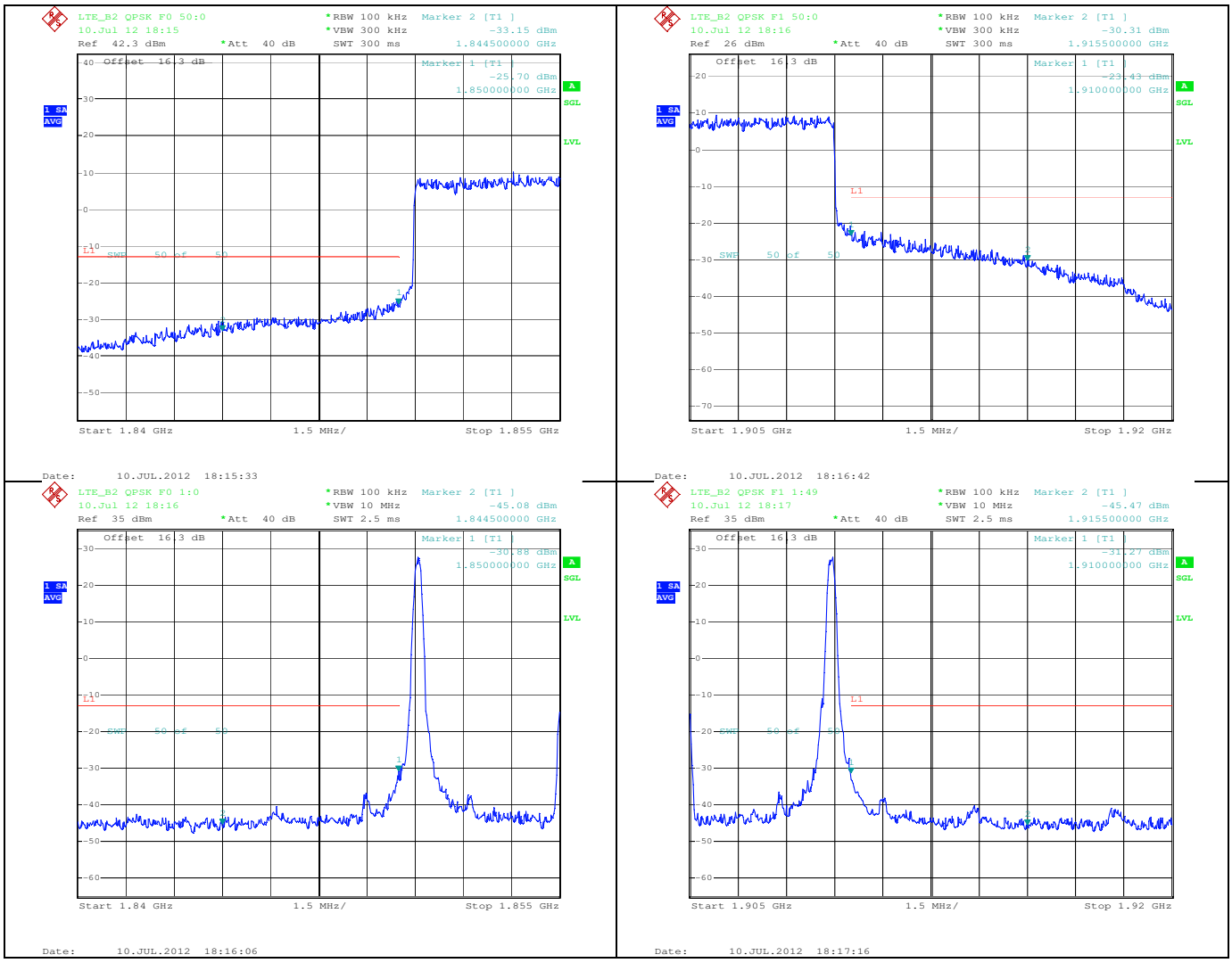
9.2.1.1 LTE; Band2, 5 MHz BW, QPSK

Below 1850 MHz	Above 1910 MHz



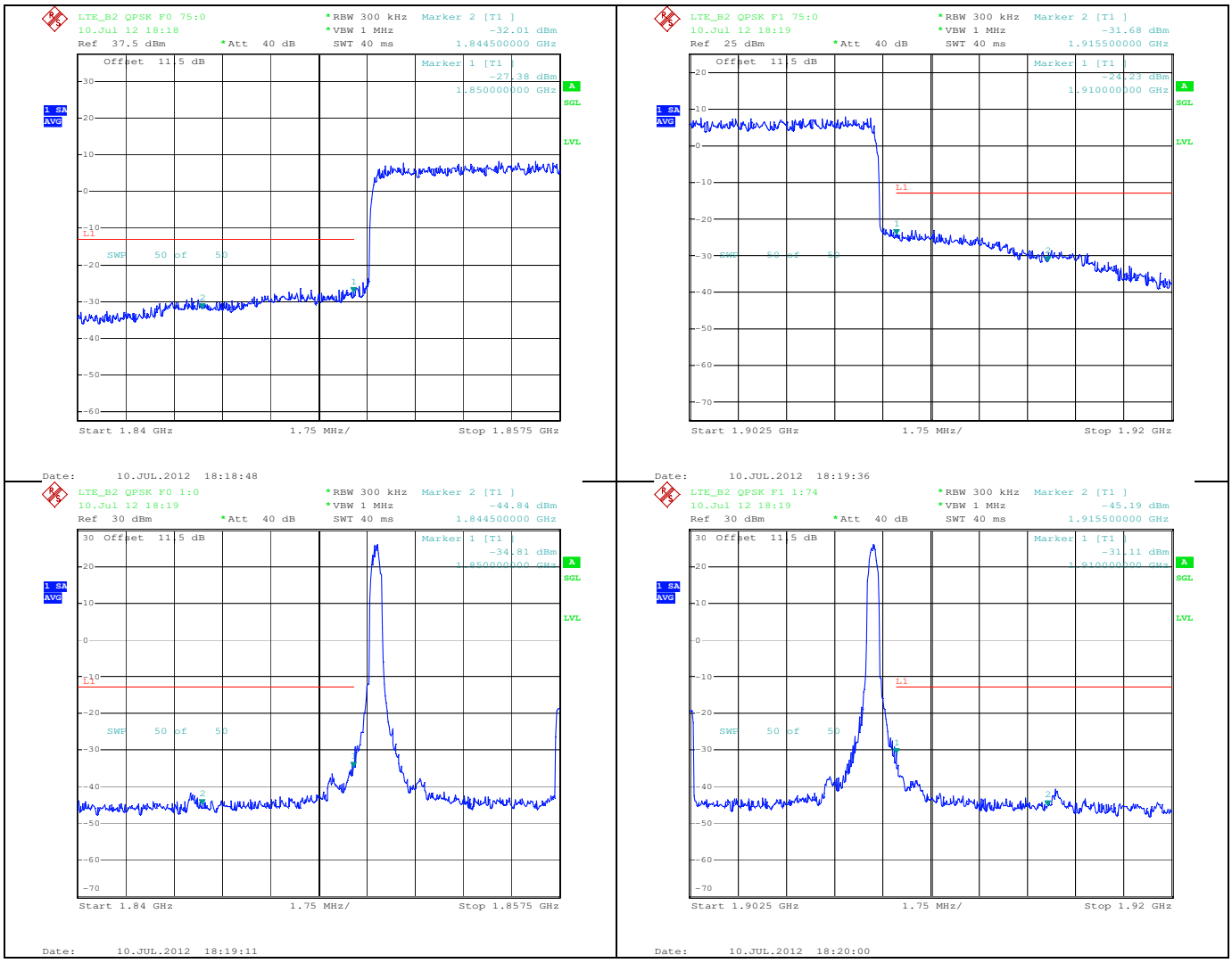
9.2.1.2 LTE; Band2, 10 MHz BW, QPSK

Below 1850 MHz	Above 1910 MHz



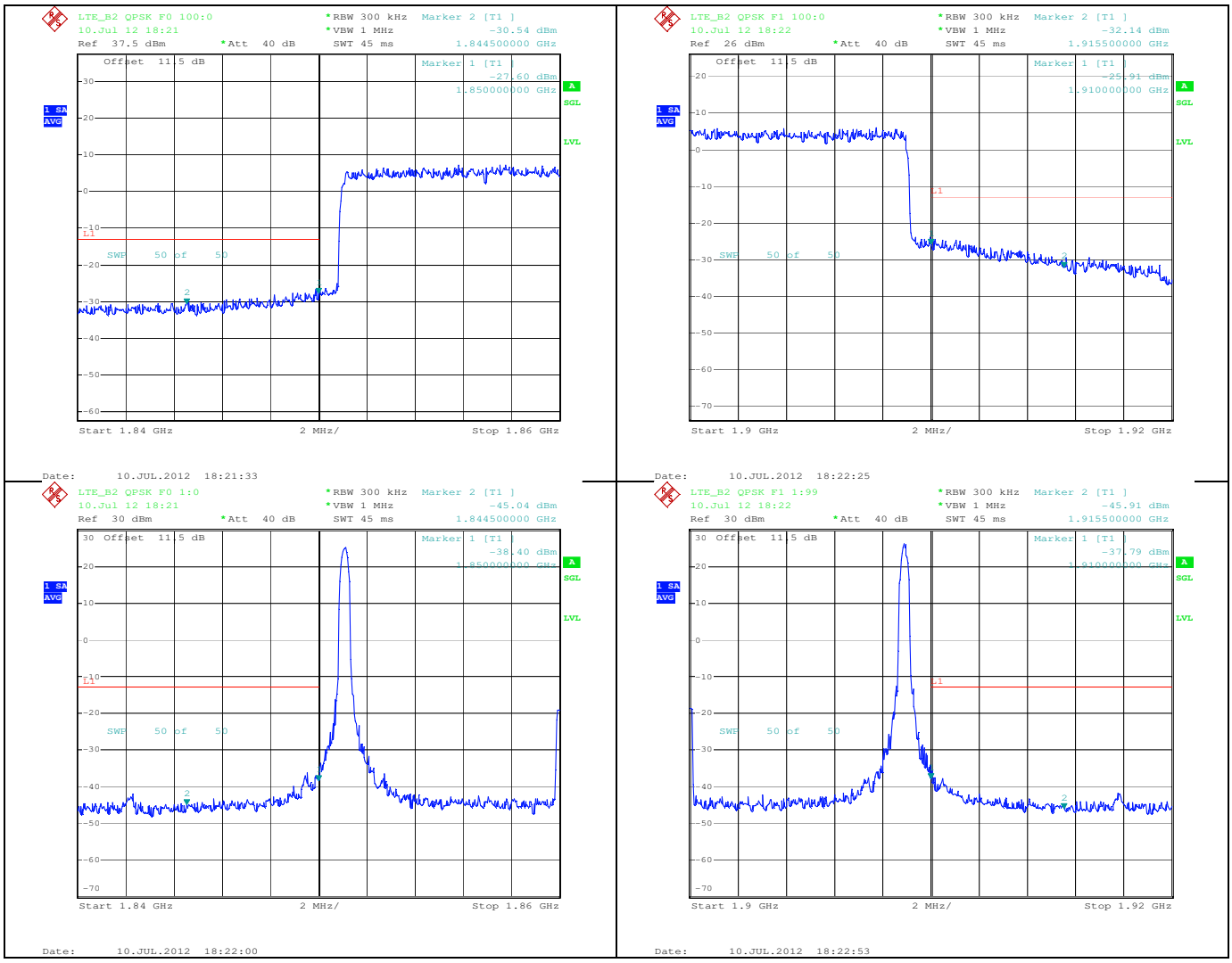
9.2.1.3 LTE; Band2, 15 MHz BW, QPSK

Below 1850 MHz	Above 1910 MHz



9.2.1.4 LTE; Band2, 20 MHz BW, QPSK

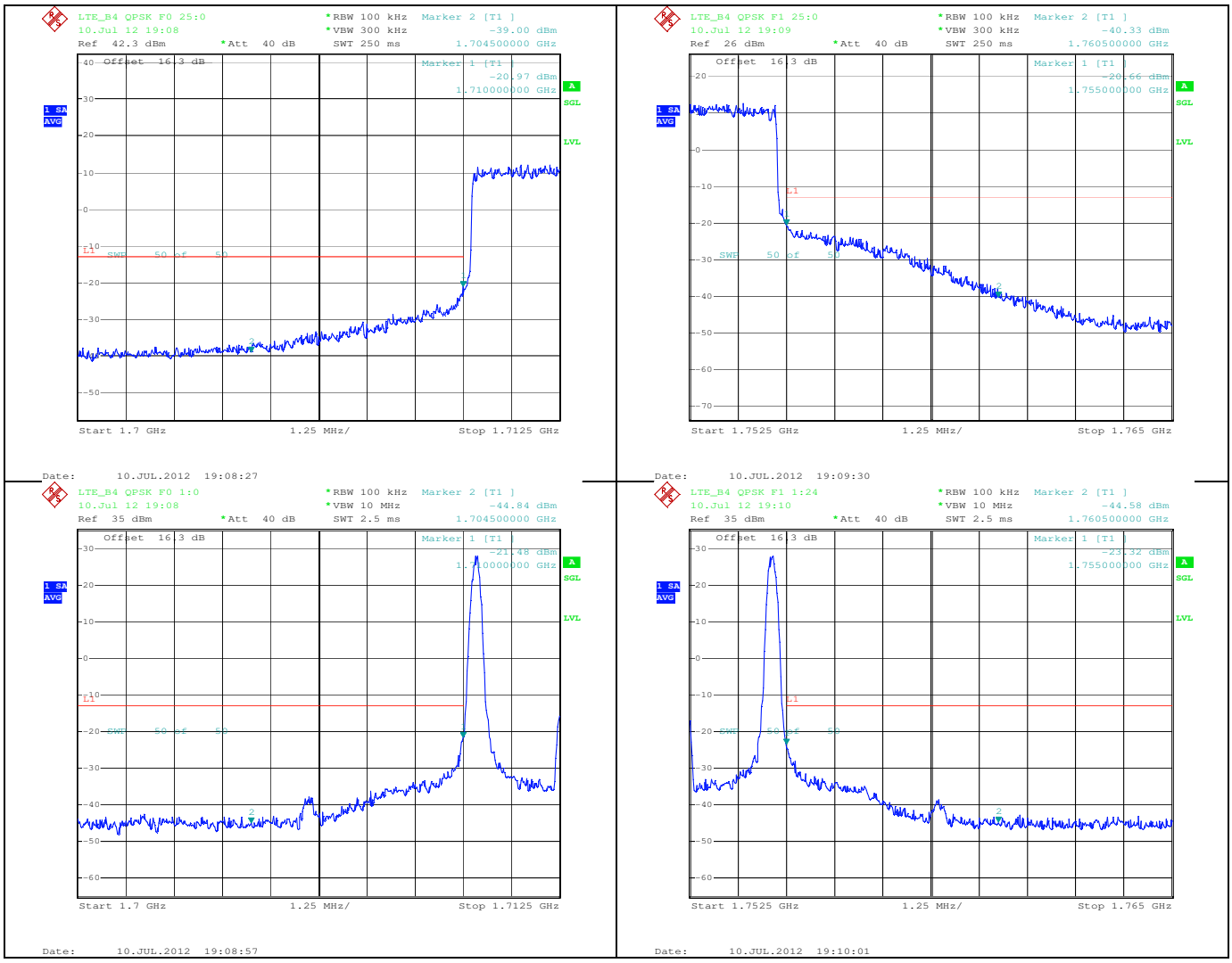
Below 1850 MHz	Above 1910 MHz



LTE B4

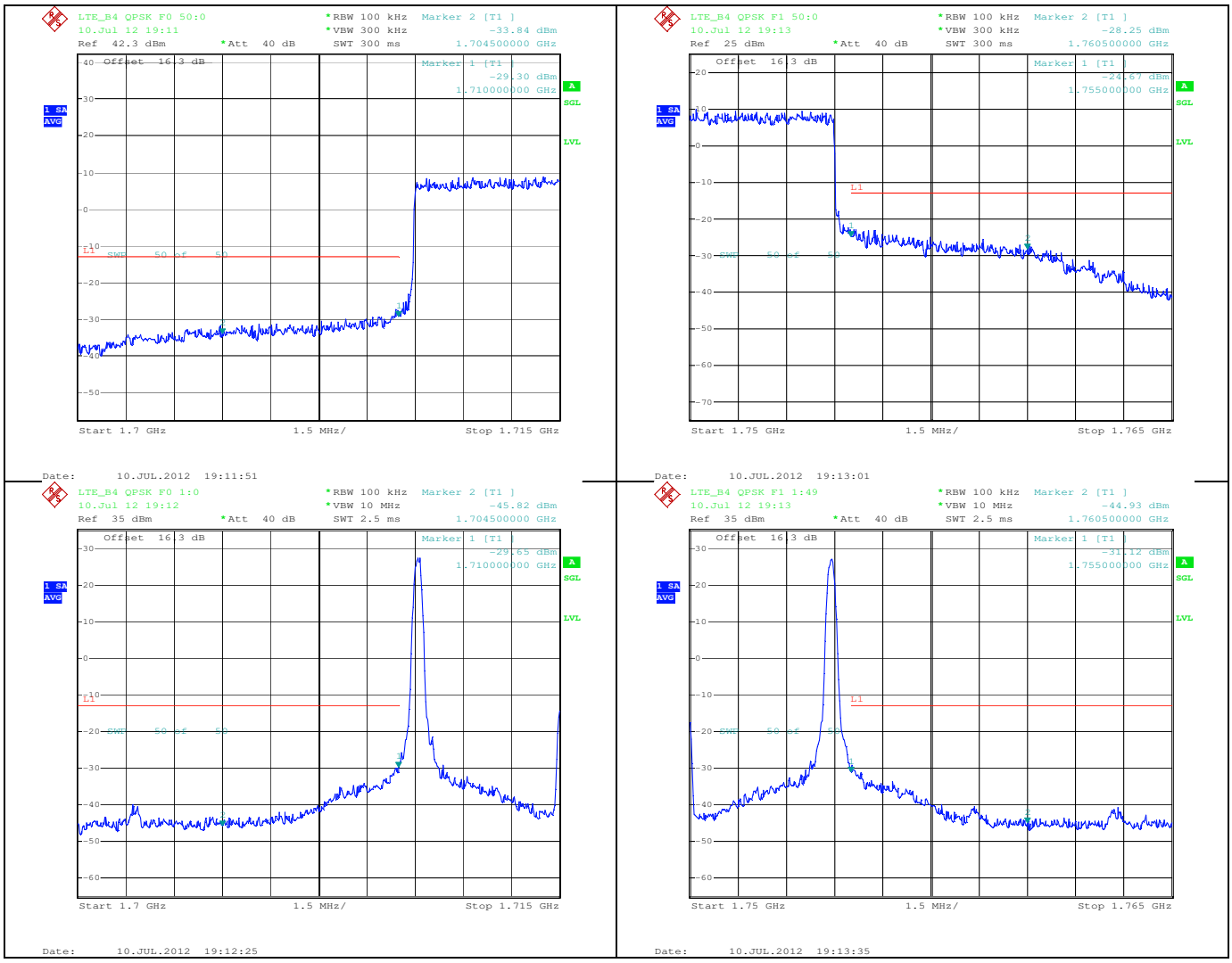
9.2.1.5 LTE; Band4, 5 MHz BW, QPSK

Below 1710 MHz	Above 1755 MHz



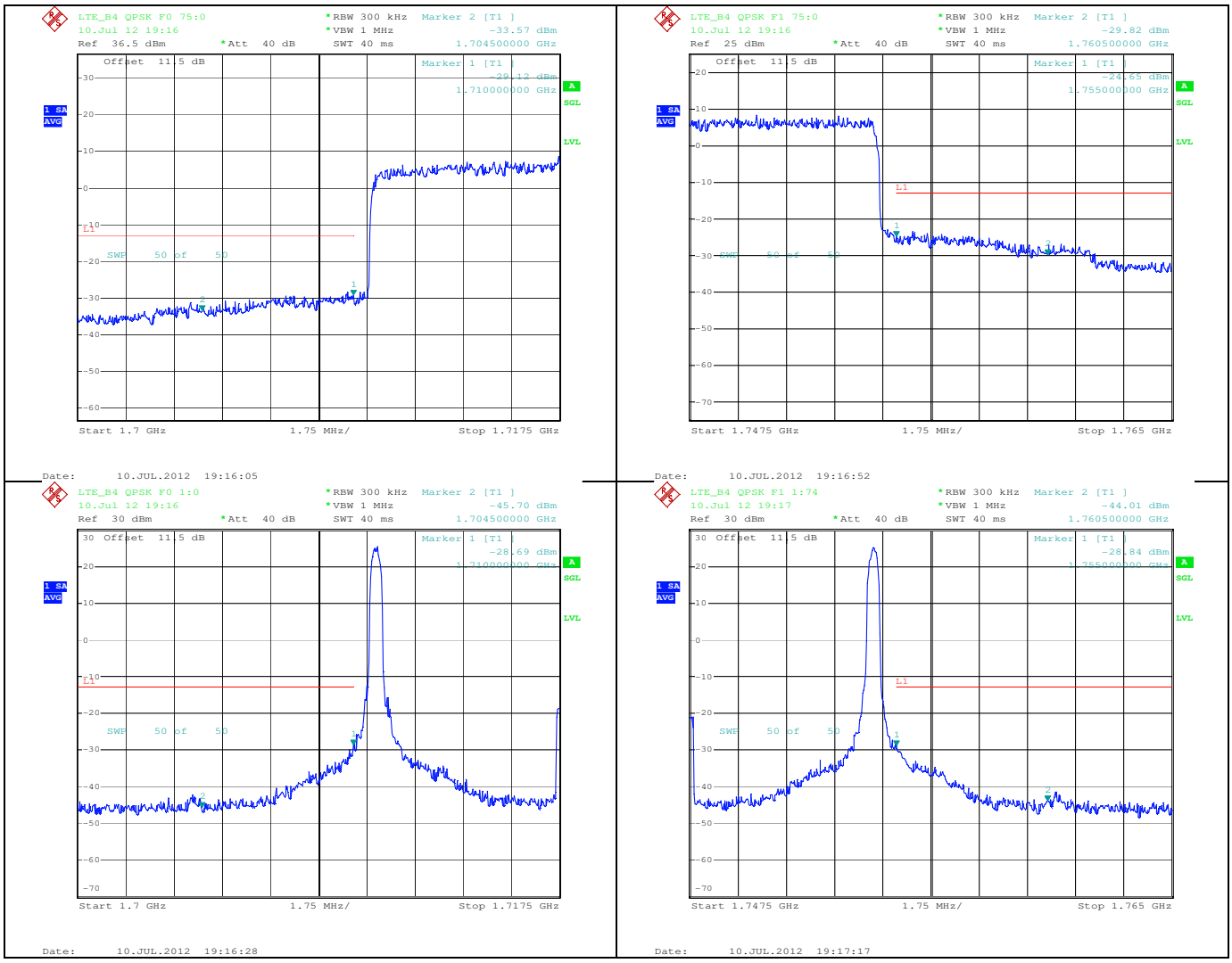
9.2.1.6 LTE; Band4, 10 MHz BW, QPSK

Below 1710 MHz	Above 1755 MHz



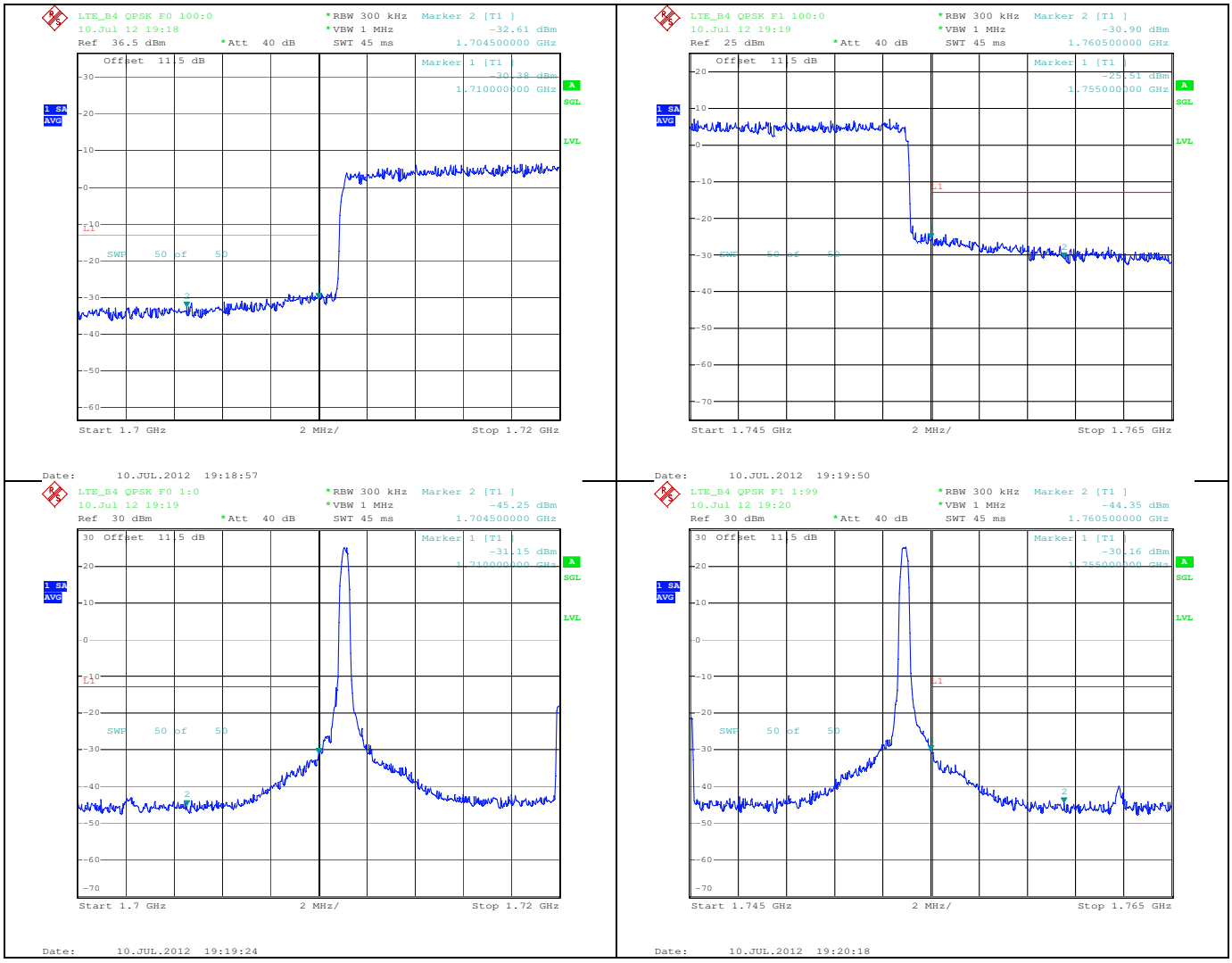
9.2.1.7 LTE; Band4, 15 MHz BW, QPSK

Below 1710 MHz	Above 1755 MHz



9.2.1.8 LTE; Band4, 20 MHz BW, QPSK

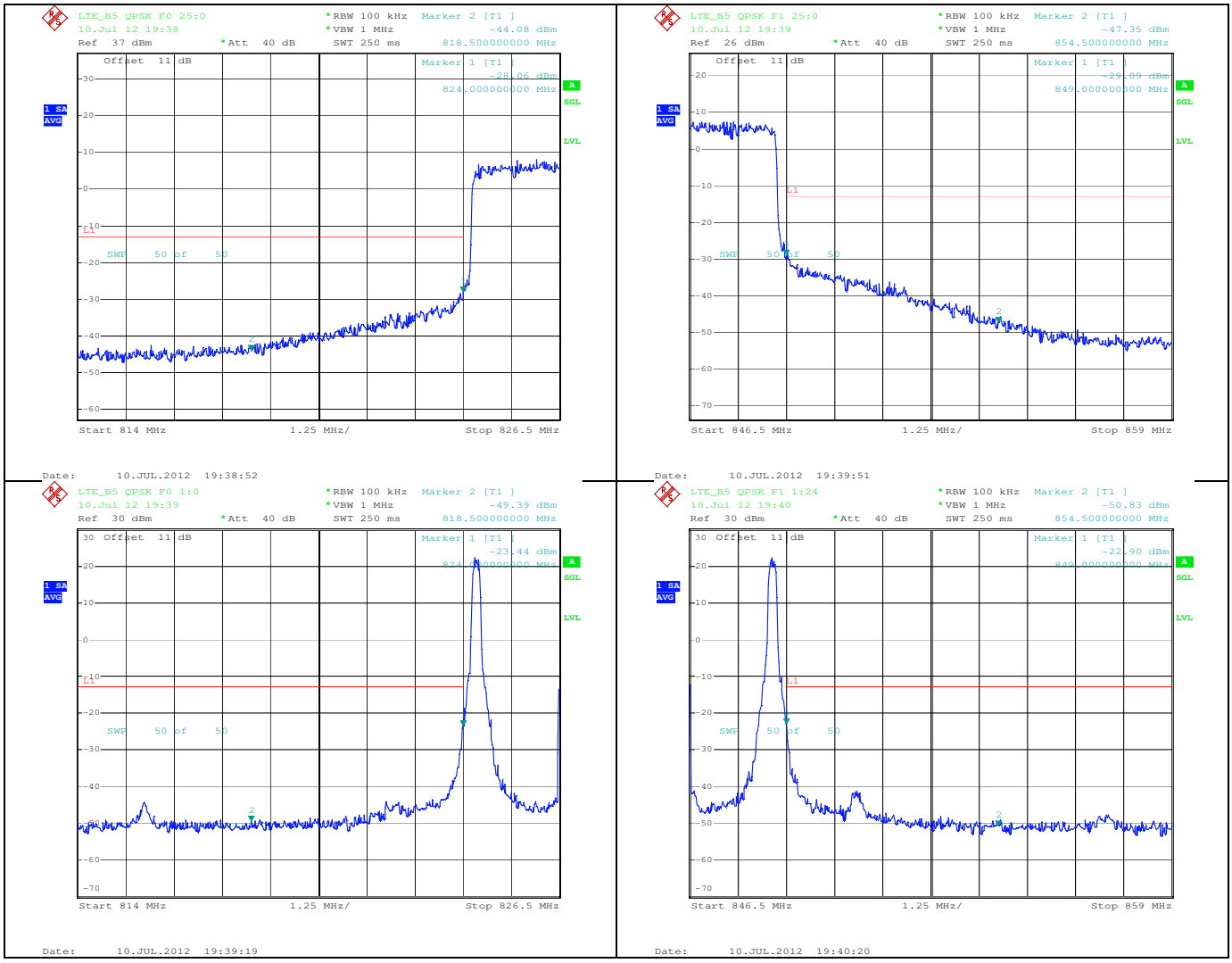
Below 1710 MHz	**Above 1755 MHz**



LTE B5

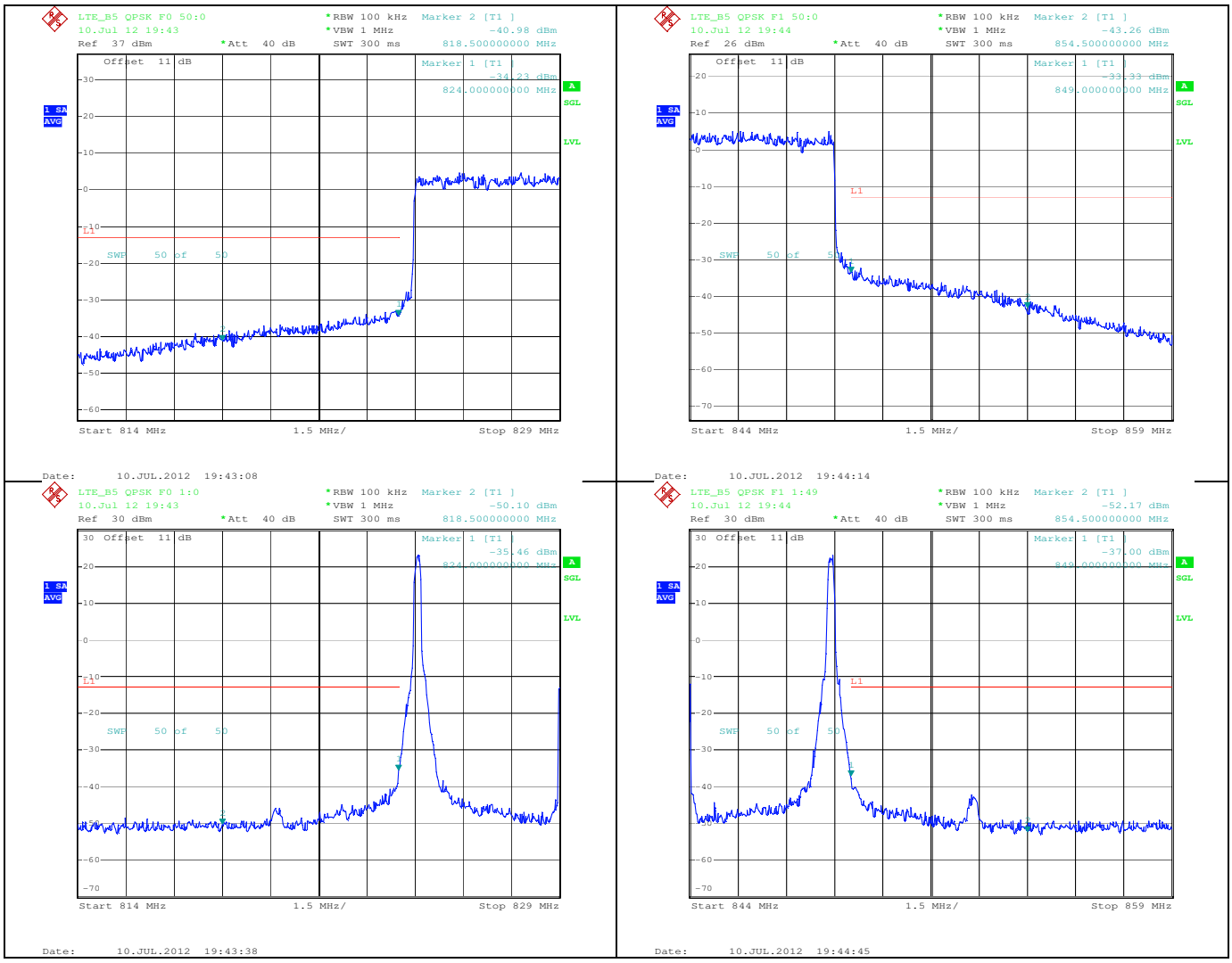
9.2.1.9 LTE; Band5, 5 MHz BW, QPSK

Below 824 MHz	Above 849 MHz



9.2.1.10 LTE; Band5, 10 MHz BW, QPSK

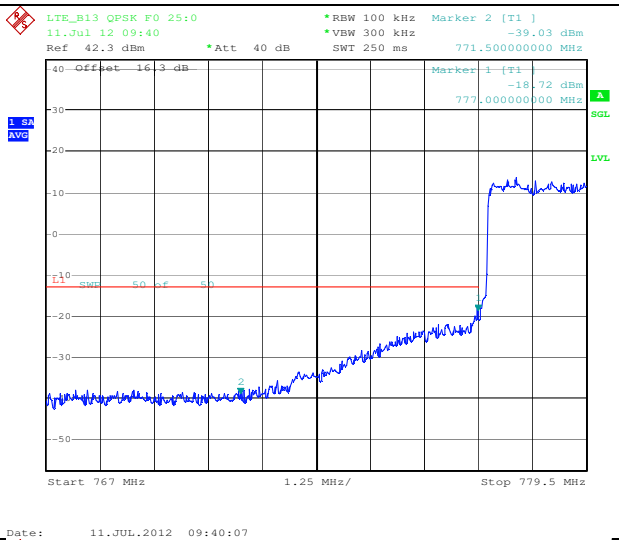
Below 824 MHz	Above 849 MHz

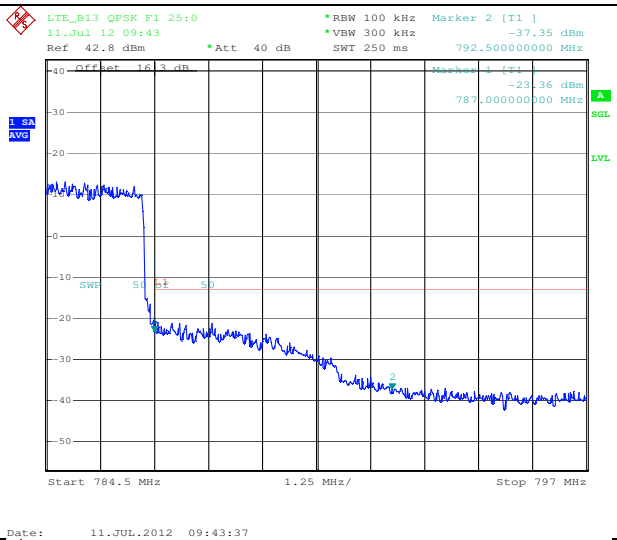


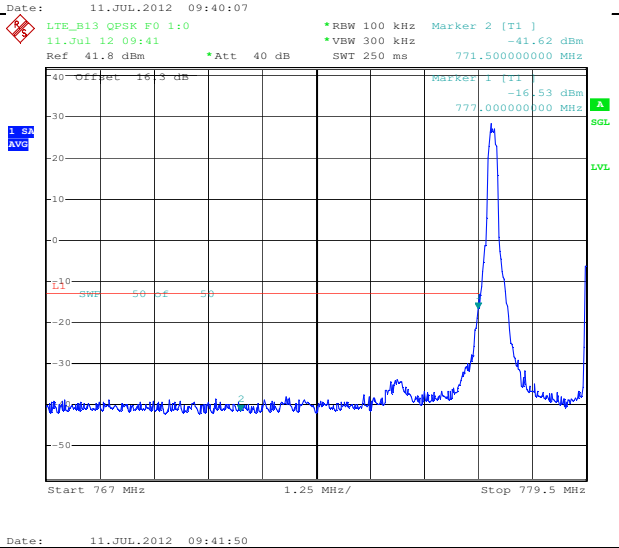
LTE B13

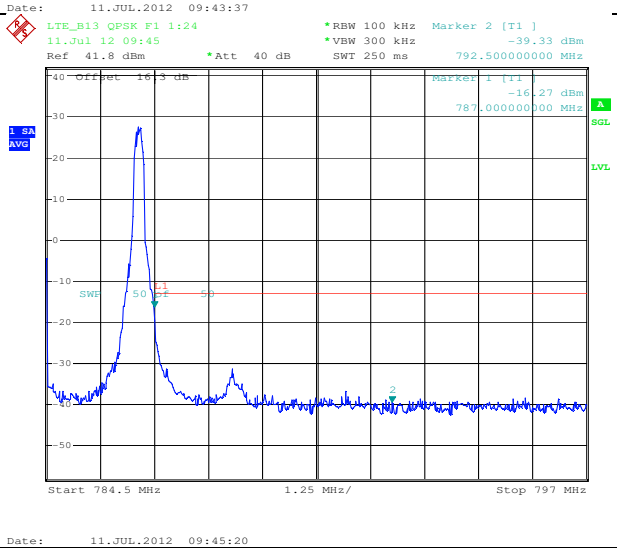
9.2.1.11 LTE; Band13, 5 MHz BW, QPSK

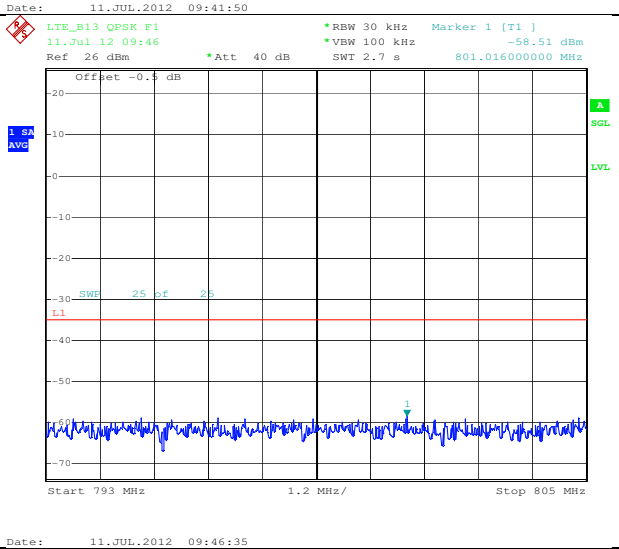
Below 777 MHz	**Above 787 MHz**

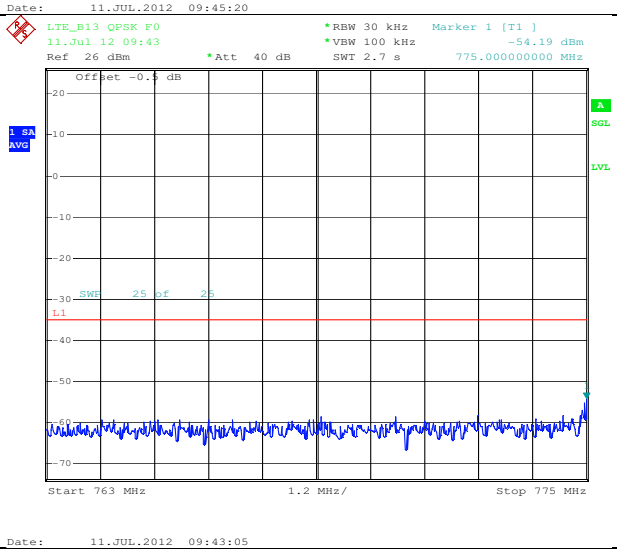




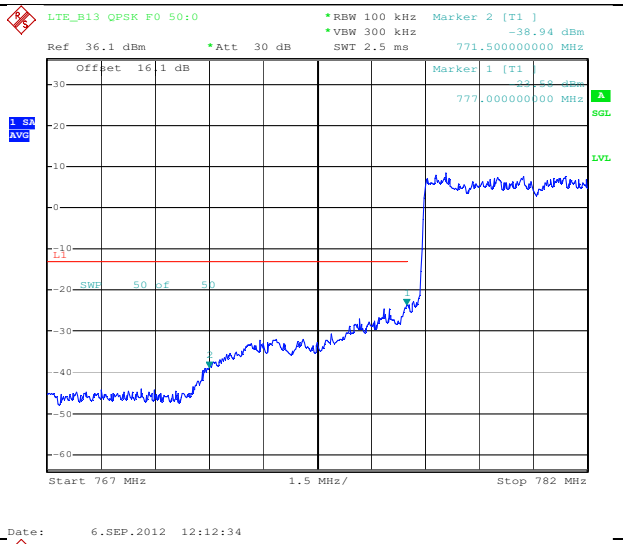
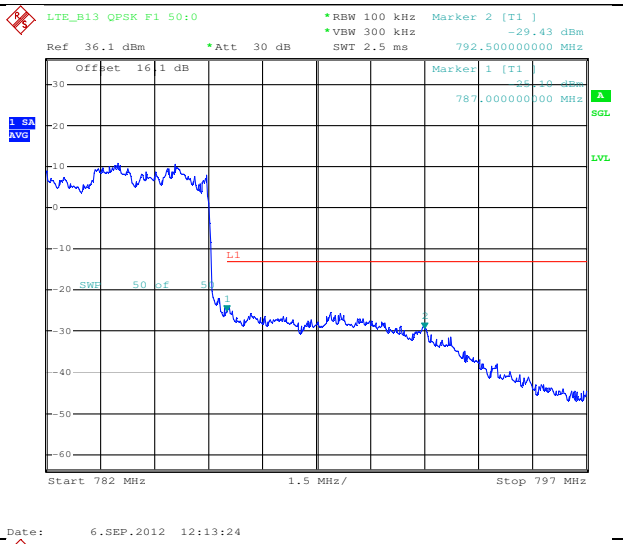
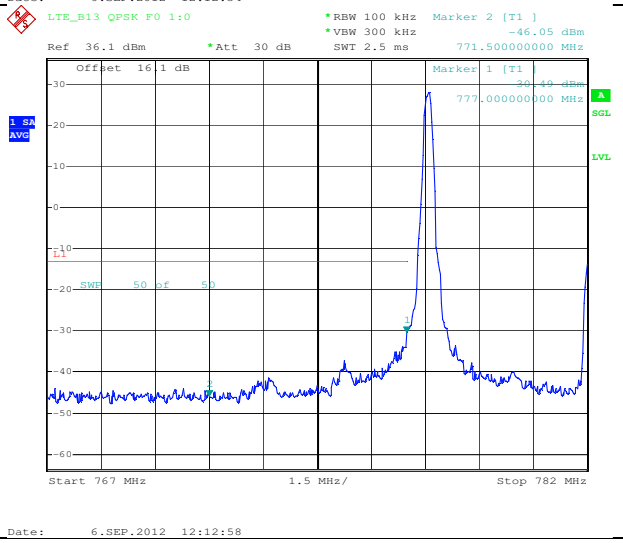
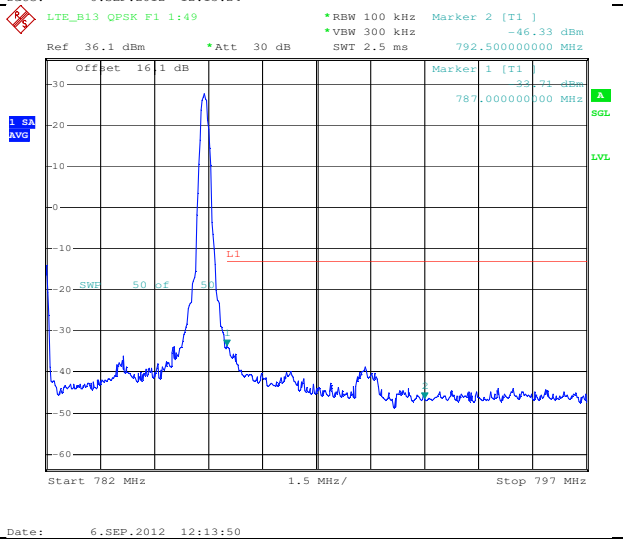


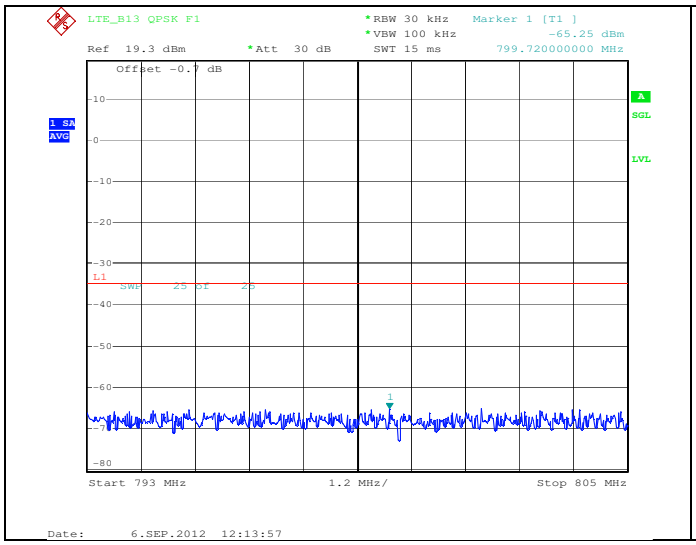


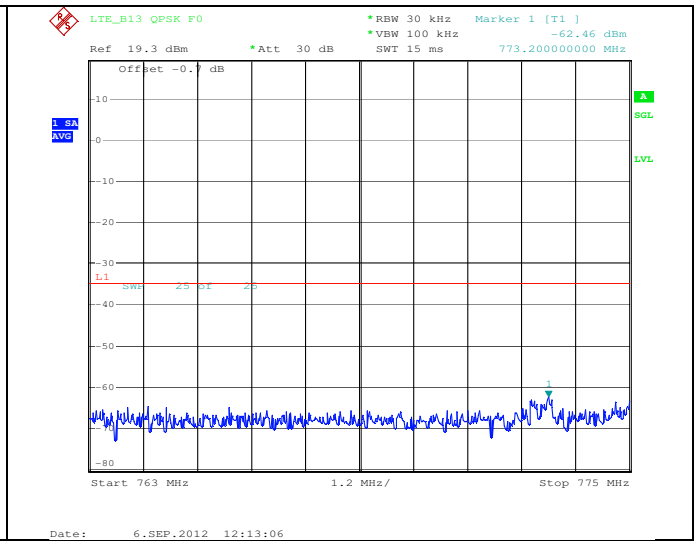




9.2.1.12 LTE; Band13, 10 MHz BW, QPSK

Below 777 MHz	Above 787 MHz
	
	

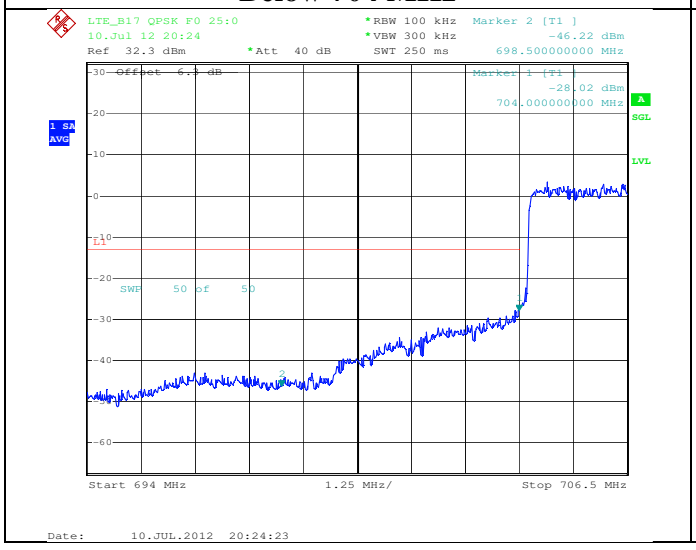




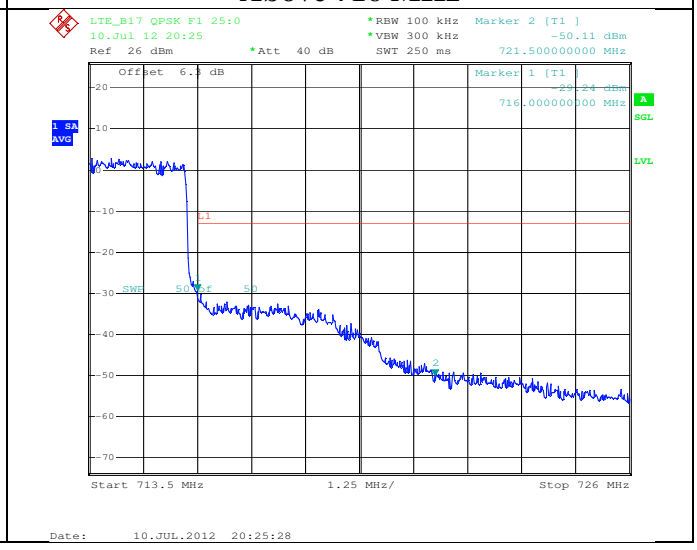
LTE B17

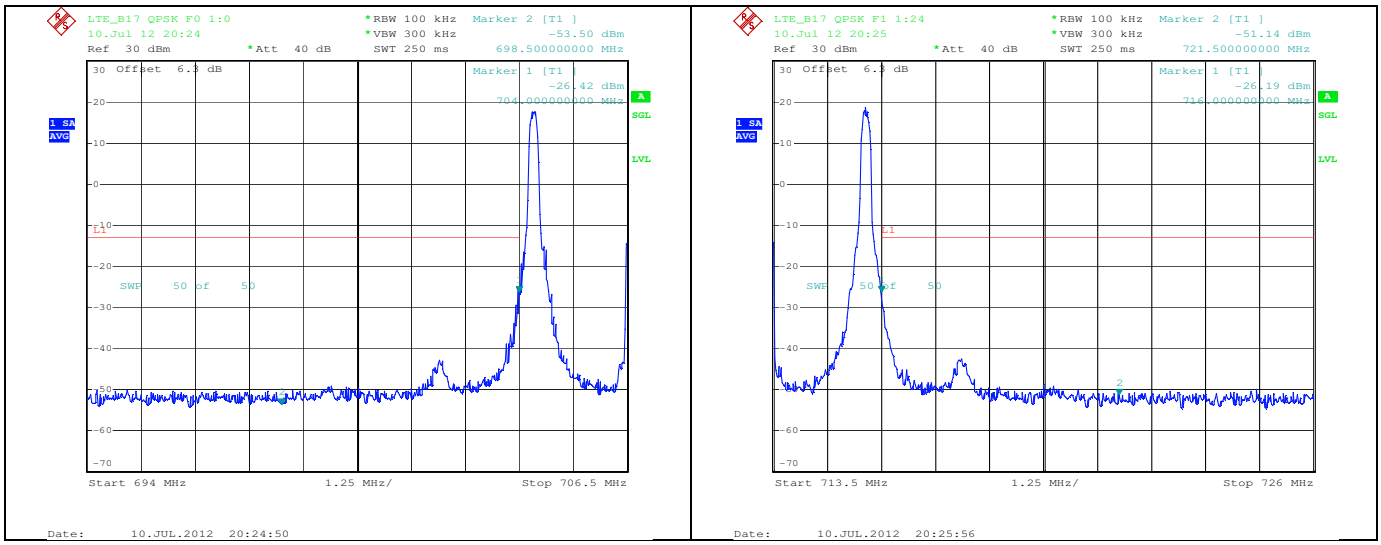
9.2.1.13 LTE; Band17, 5 MHz BW, QPSK

Below 704 MHz

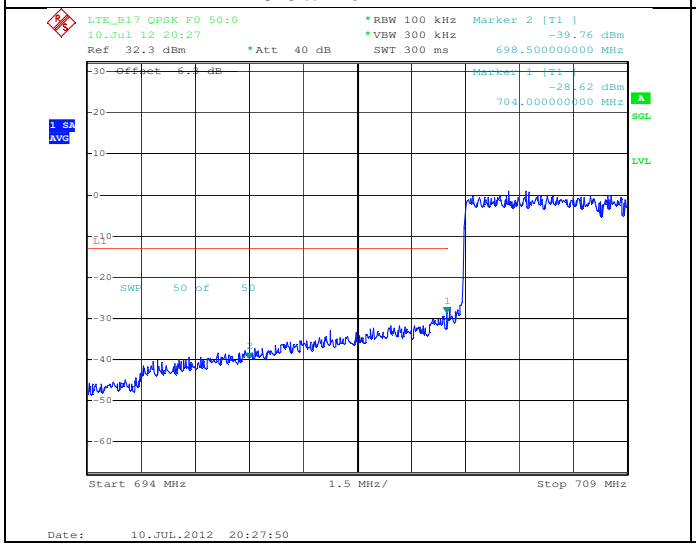
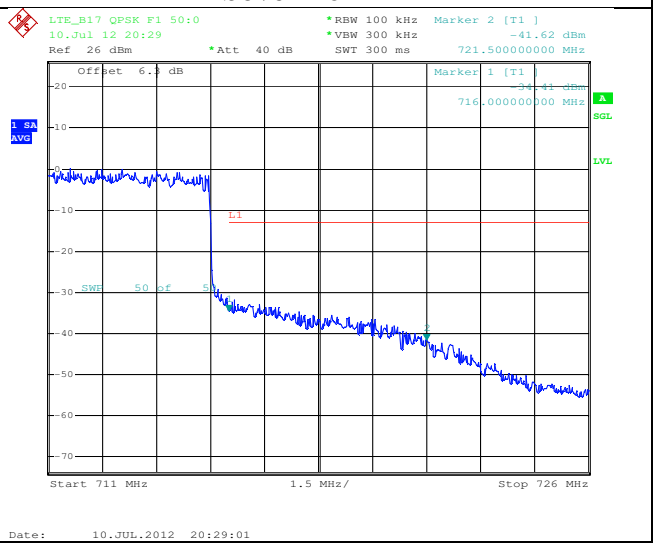


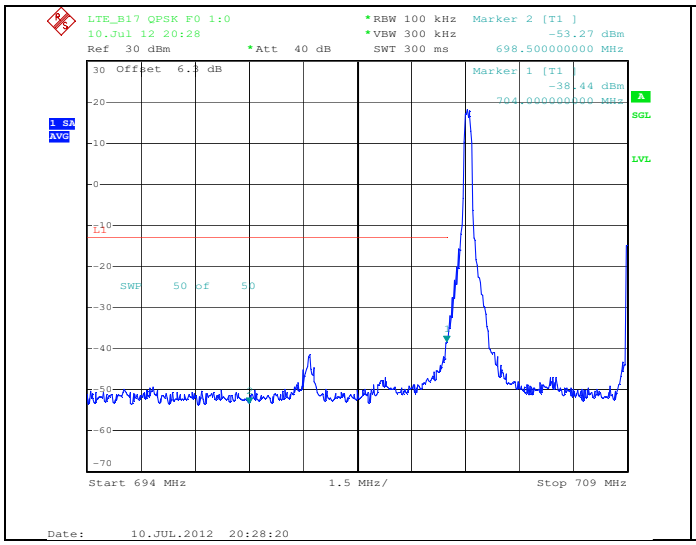
Above 716 MHz

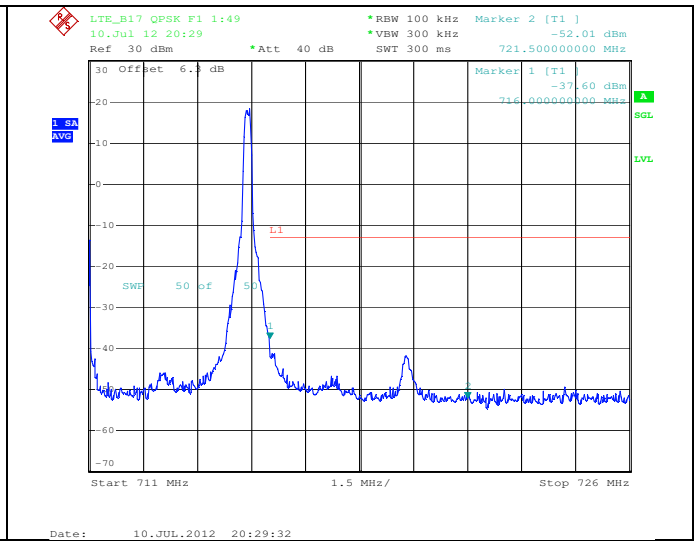




9.2.1.14 LTE; Band17, 10 MHz BW, QPSK

Below 704 MHz	Above 716 MHz
	

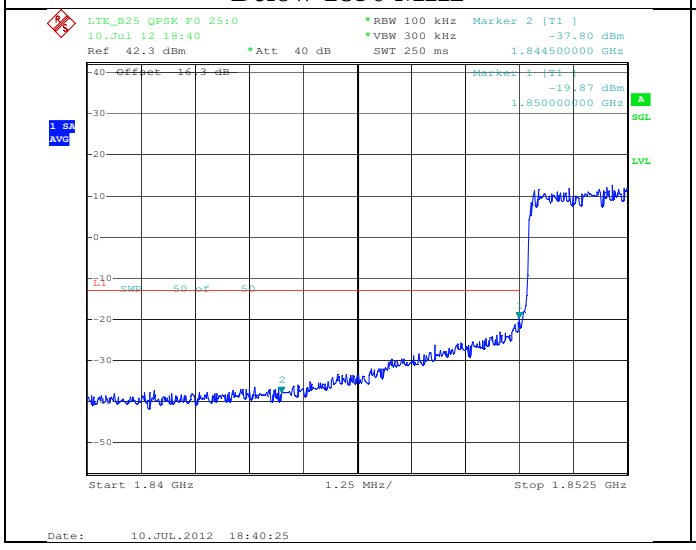




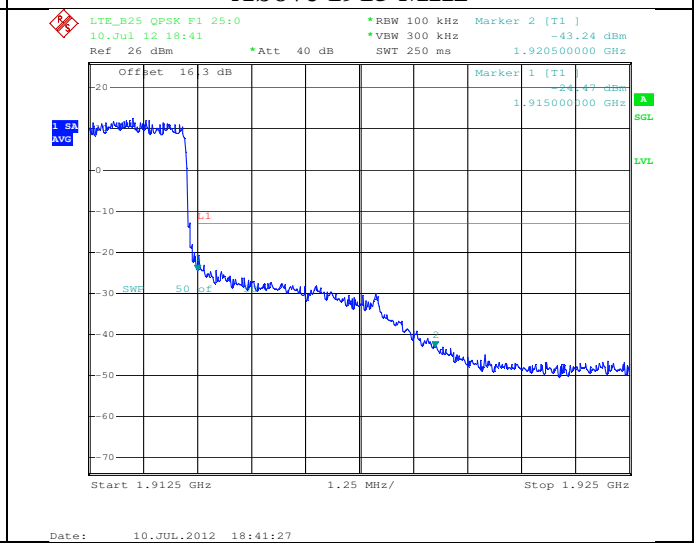
LTE B25

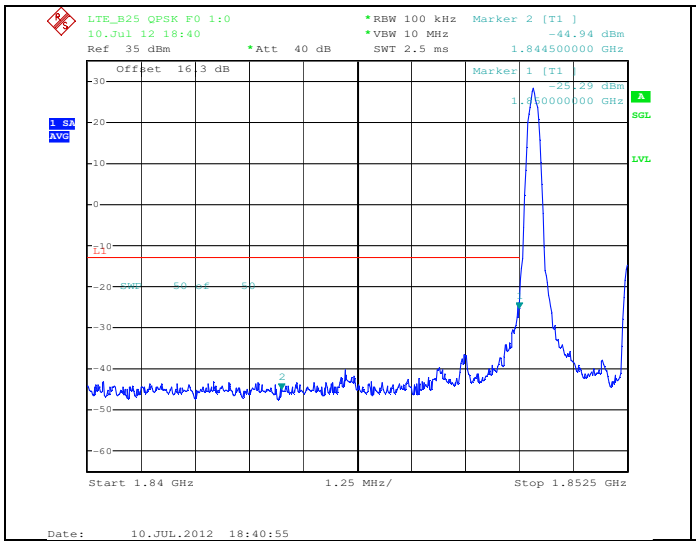
9.2.1.15 LTE; Band25, 5 MHz BW, QPSK

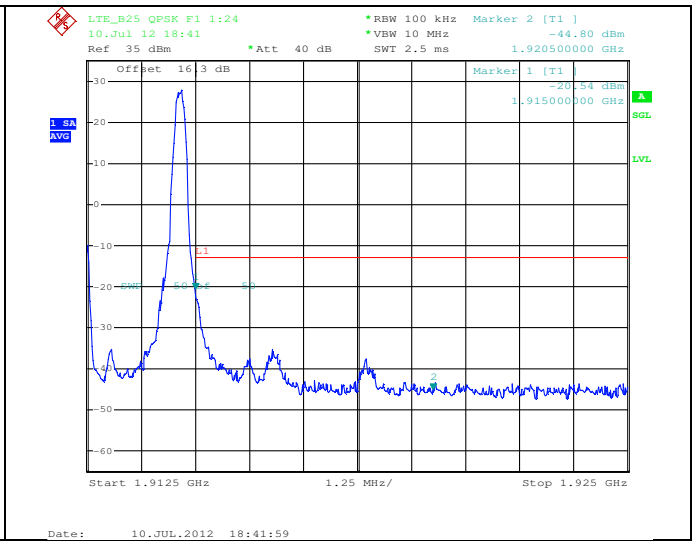
Below 1850 MHz



Above 1915 MHz

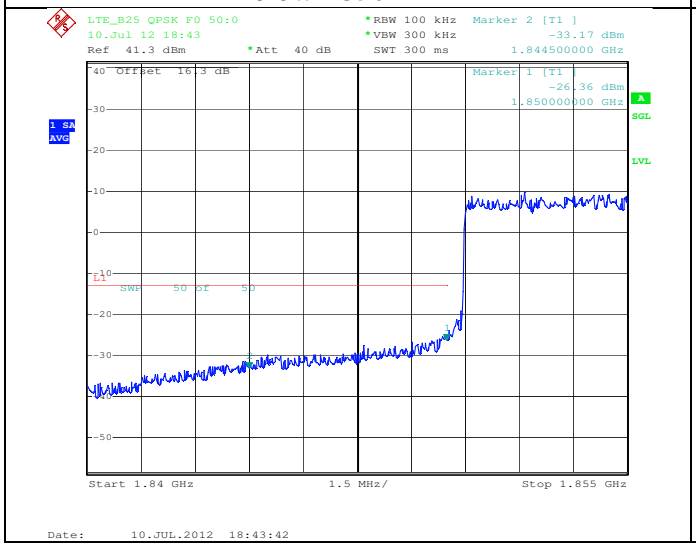


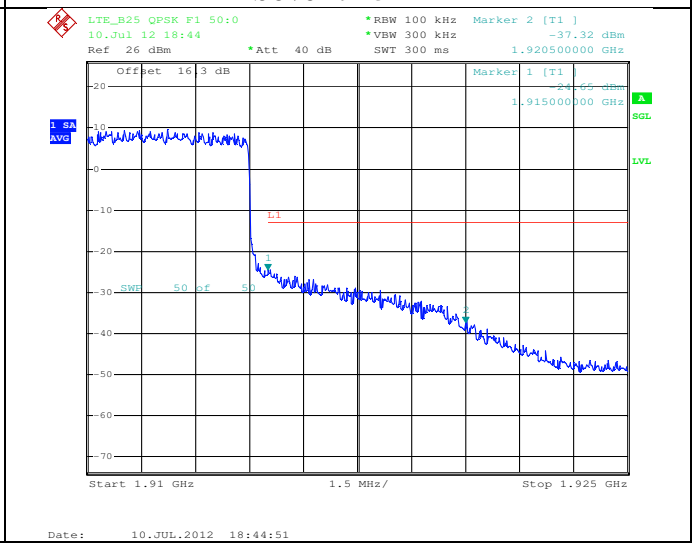


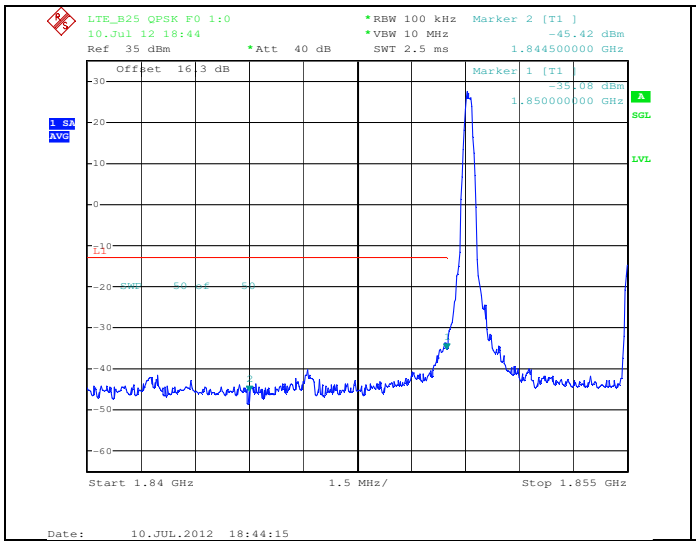


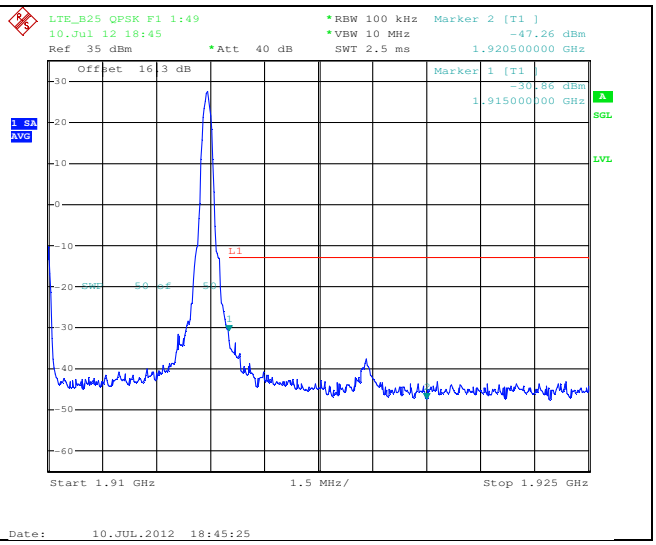
9.2.1.16 LTE; Band25, 10 MHz BW, QPSK

Below 1850 MHz	Above 1915 MHz



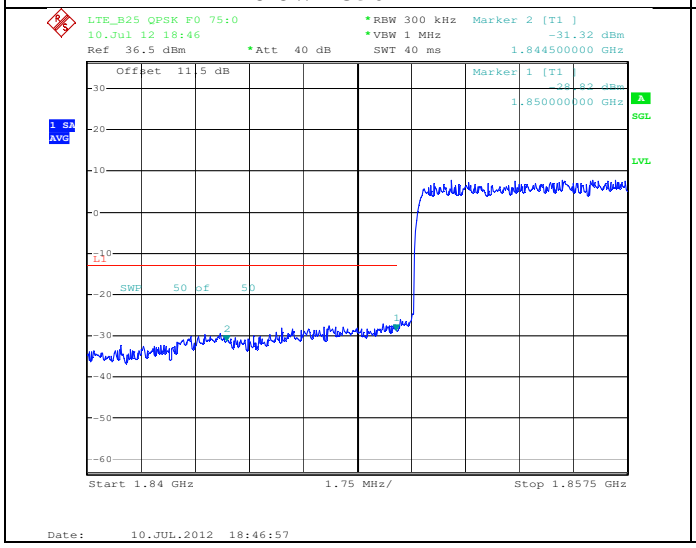


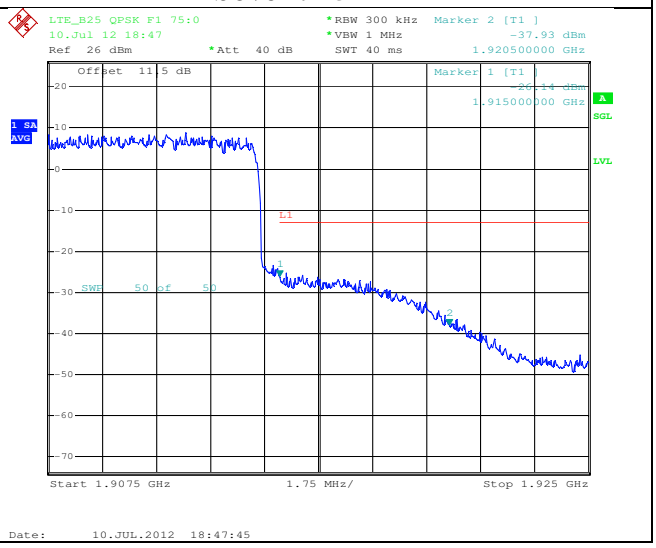


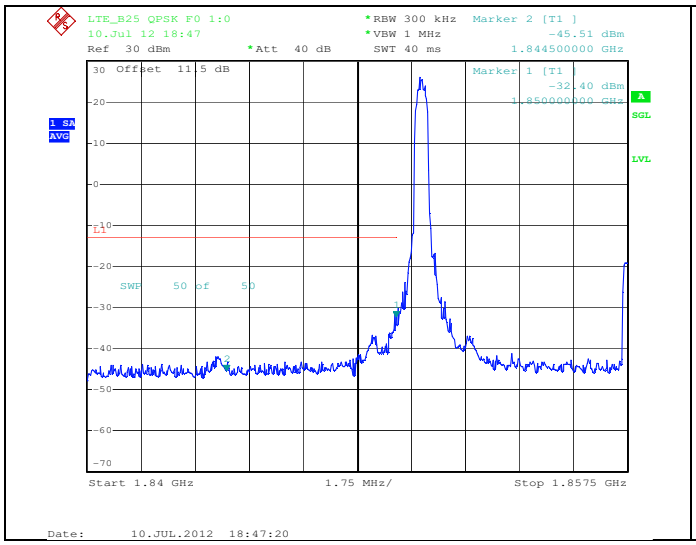


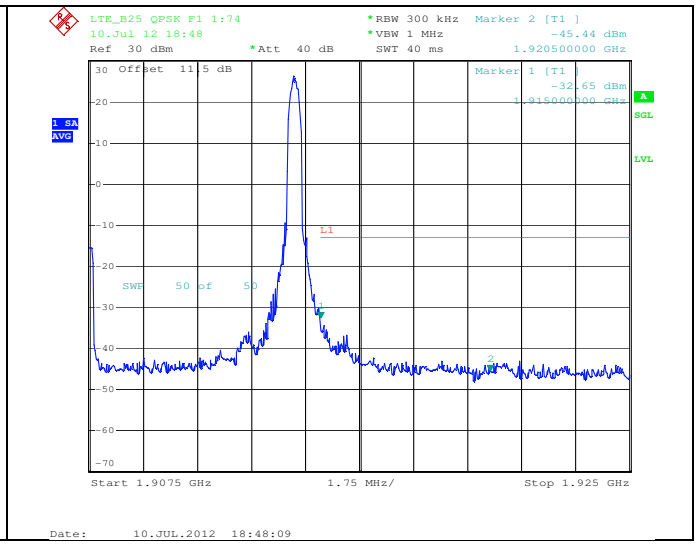
9.2.1.17 LTE; Band25, 15 MHz BW, QPSK

Below 1850 MHz	Above 1915 MHz

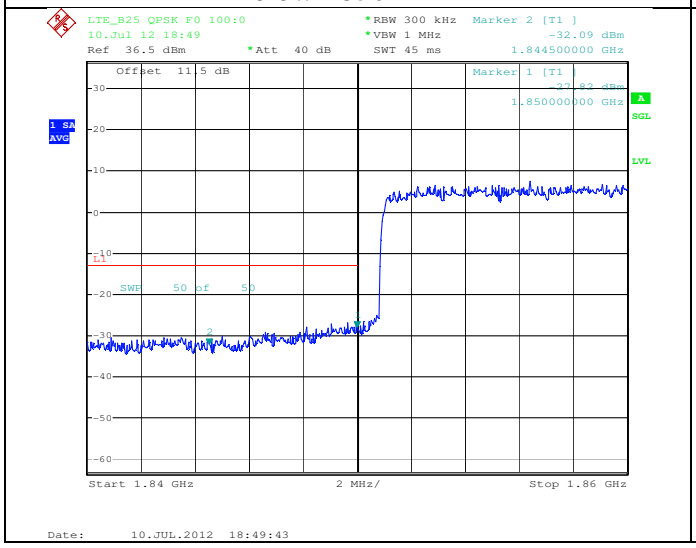
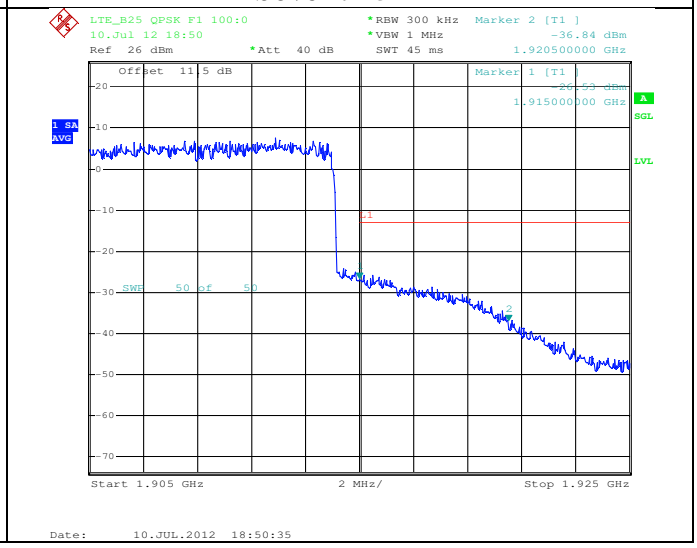


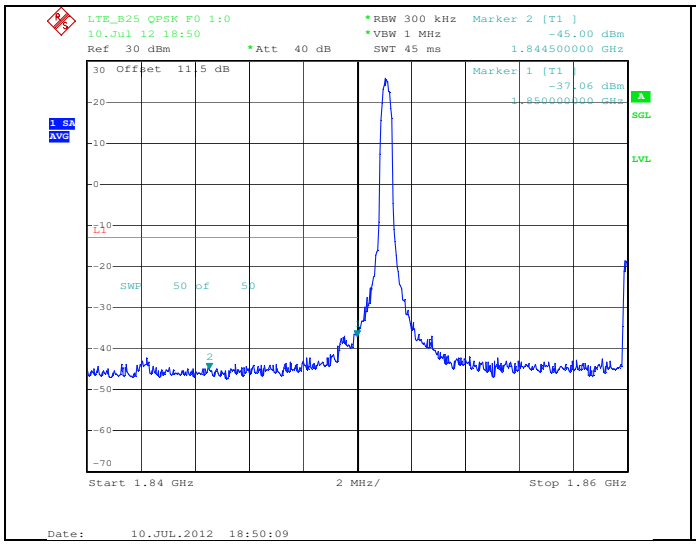


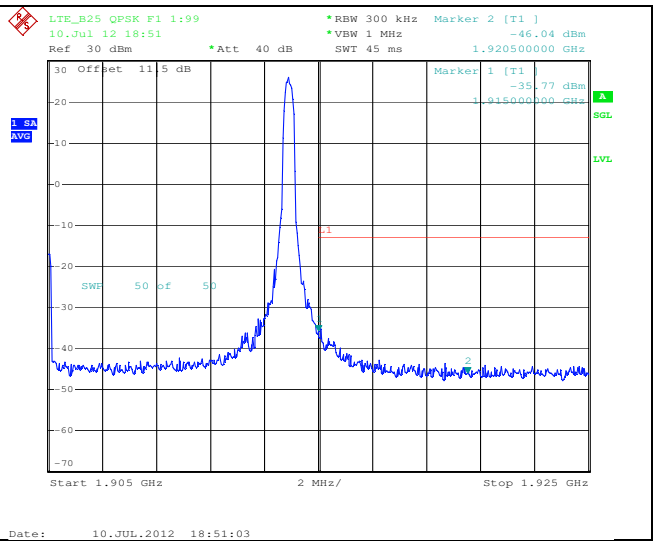




9.2.1.18 LTE; Band25, 20 MHz BW, QPSK

Below 1850 MHz	Above 1915 MHz
	

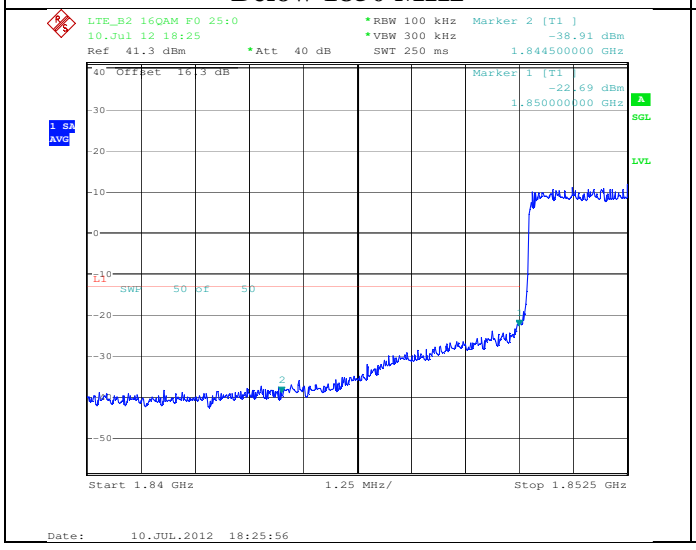




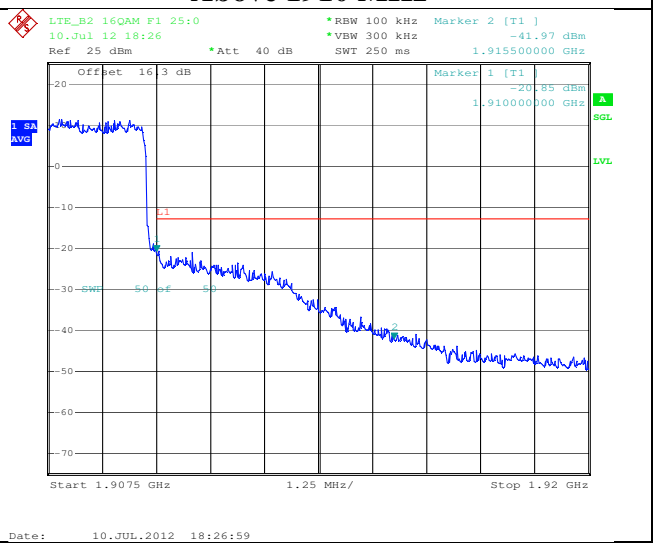
LTE B2

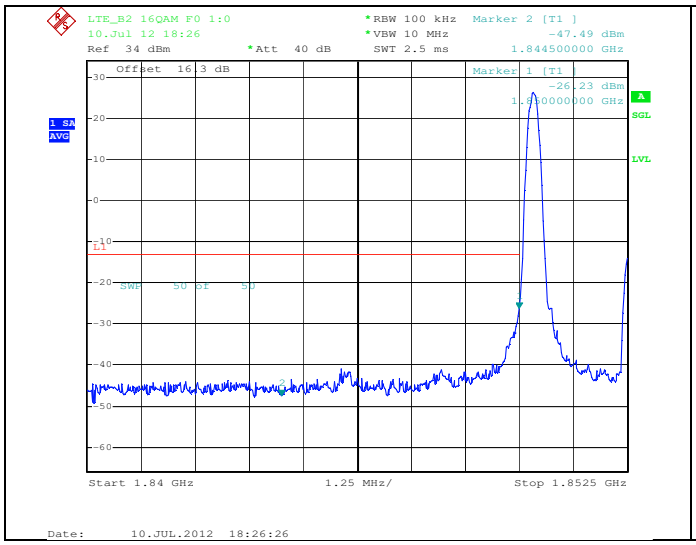
9.2.1.19 LTE; Band2, 5 MHz BW, 16-QAM

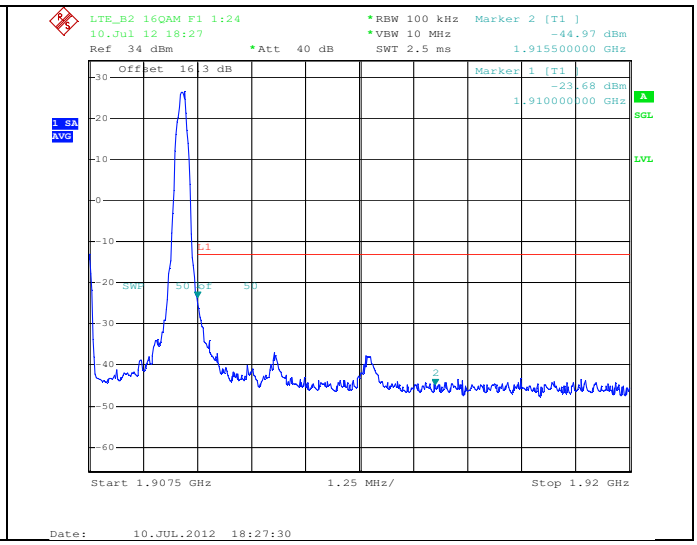
Below 1850 MHz



Above 1910 MHz

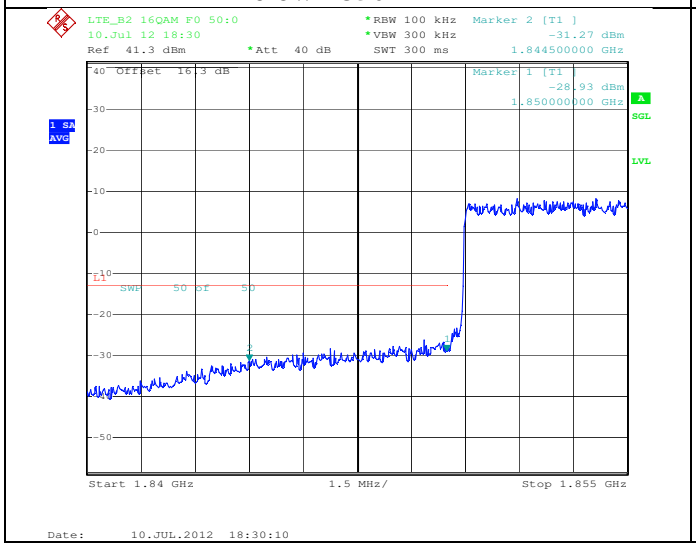


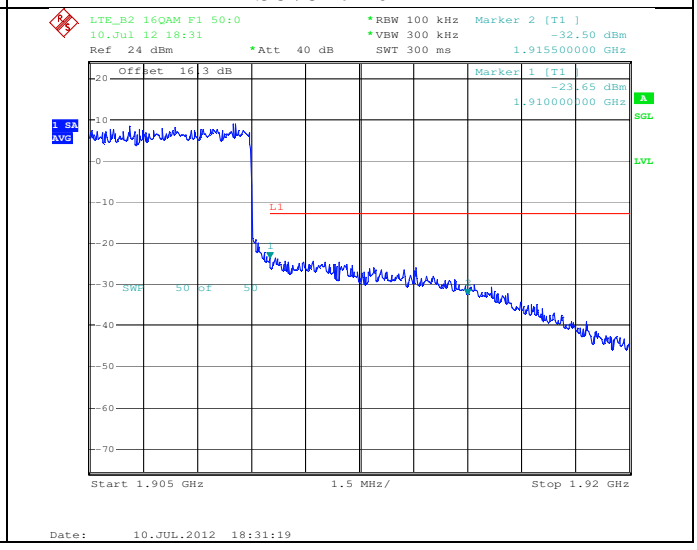


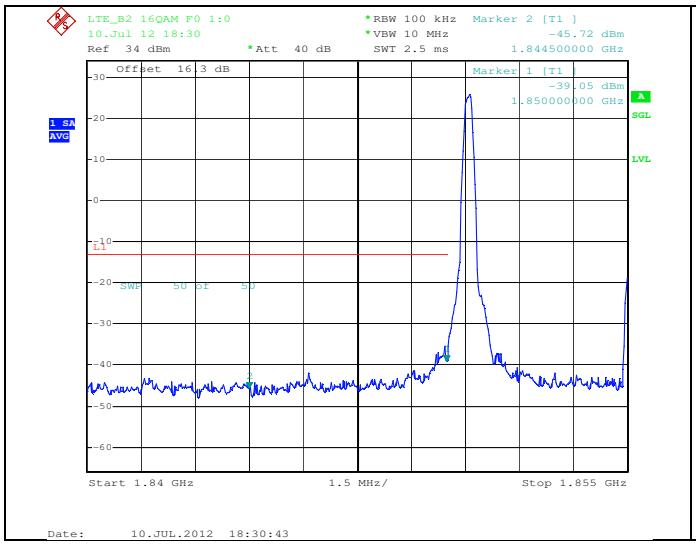


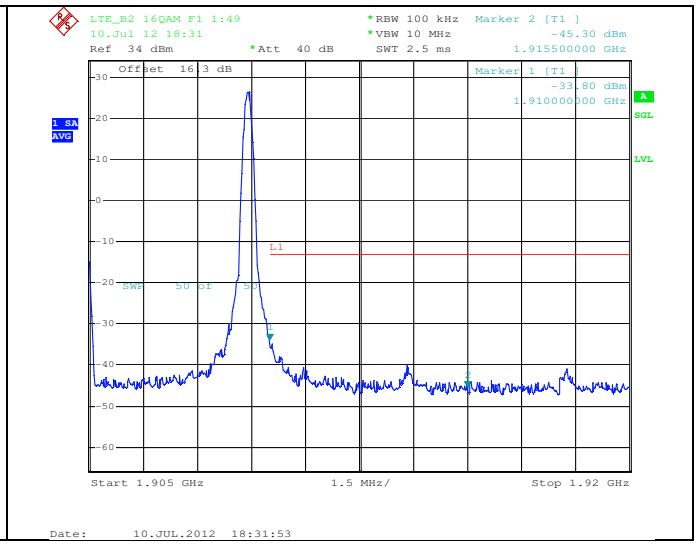
9.2.1.20 LTE; Band2, 10 MHz BW, 16-QAM

Below 1850 MHz	Above 1910 MHz



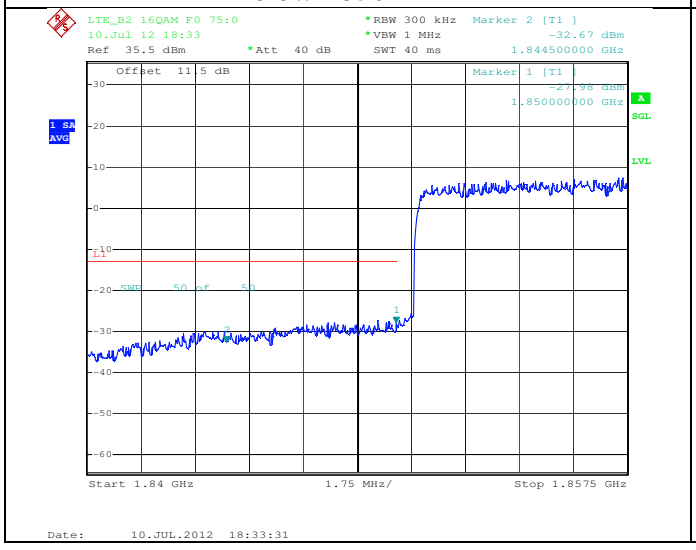


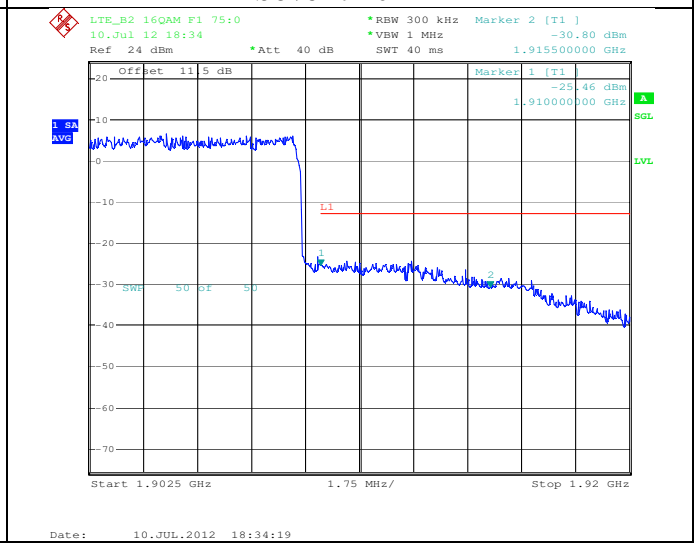


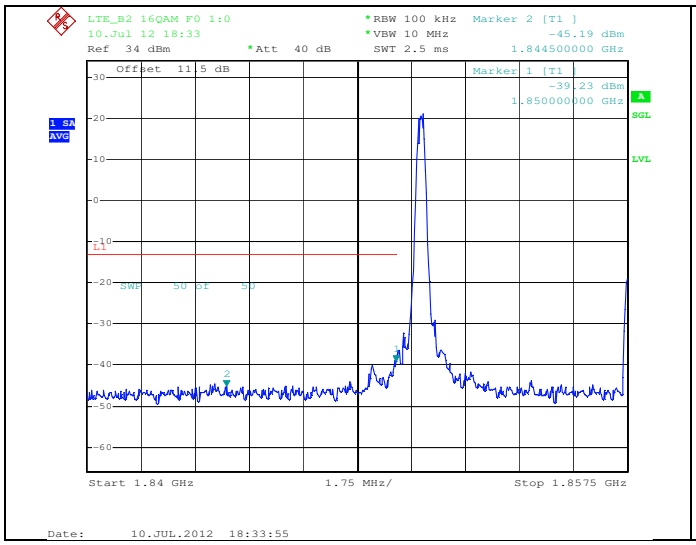


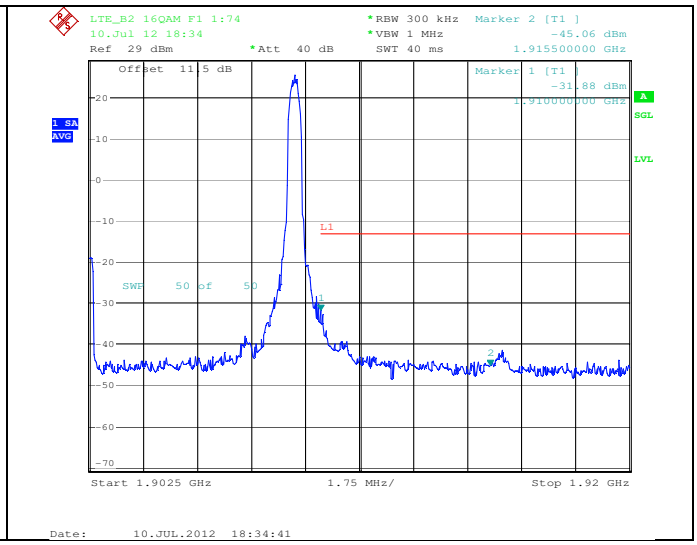
9.2.1.21 LTE; Band2, 15 MHz BW, 16-QAM

Below 1850 MHz	Above 1910 MHz



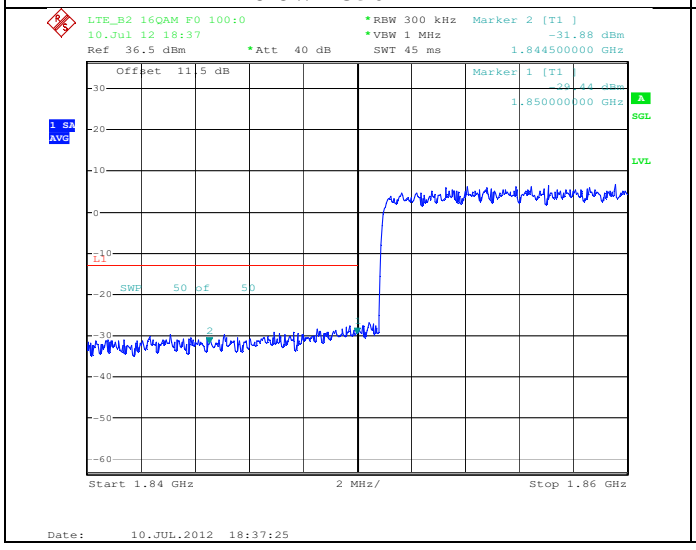


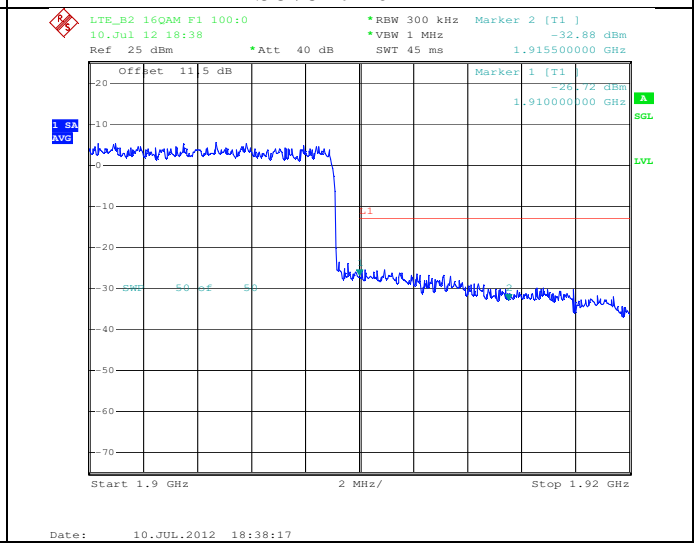


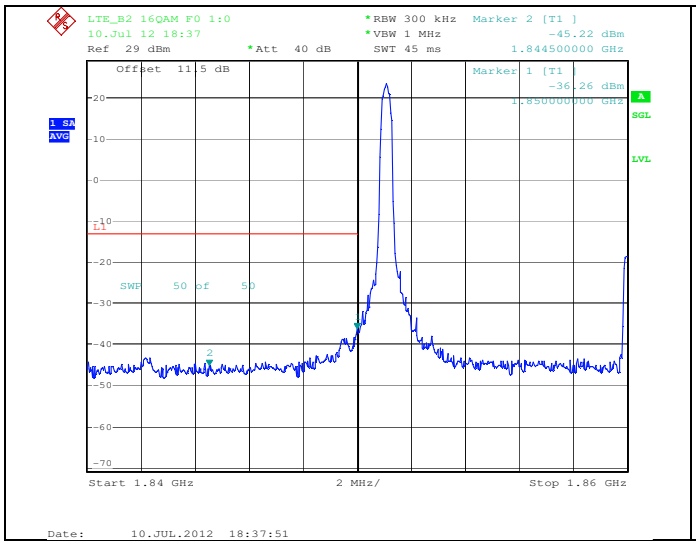


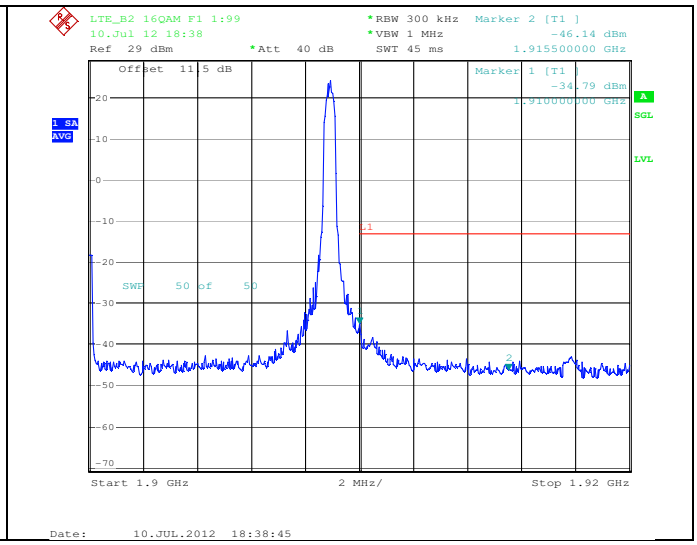
9.2.1.22 LTE; Band2, 20 MHz BW, 16-QAM

Below 1850 MHz	Above 1910 MHz



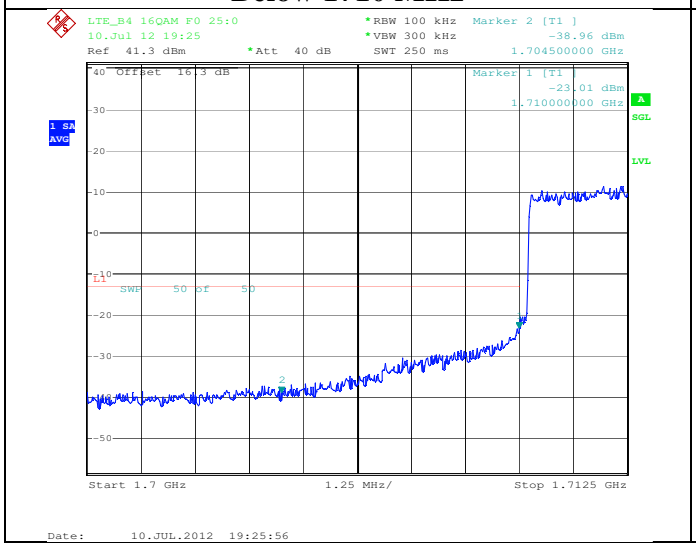
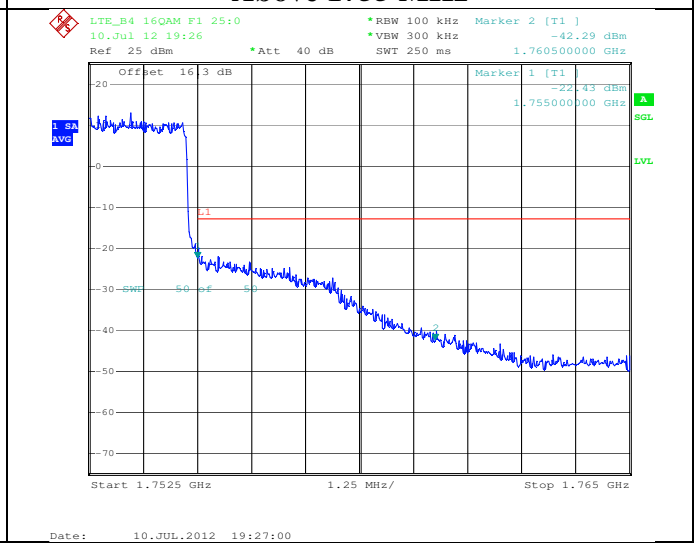


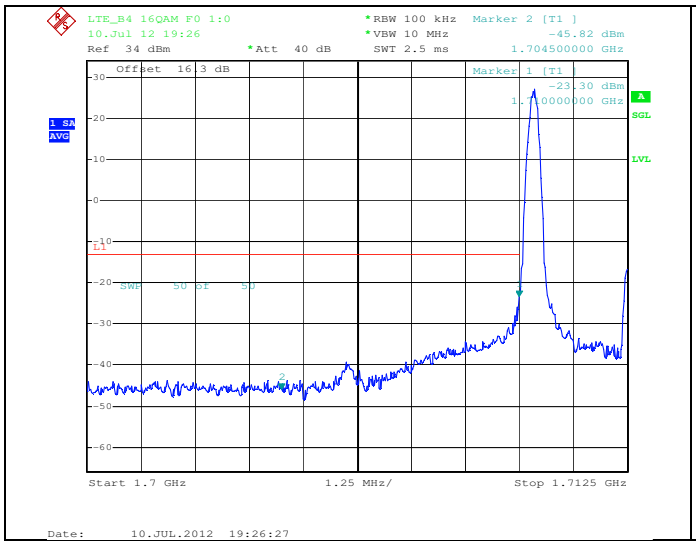


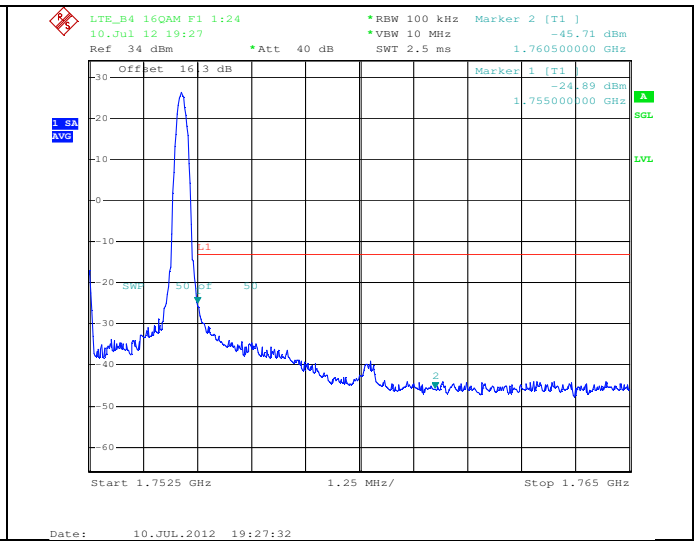


LTE B4

9.2.1.23 LTE; Band4, 5 MHz BW, 16-QAM

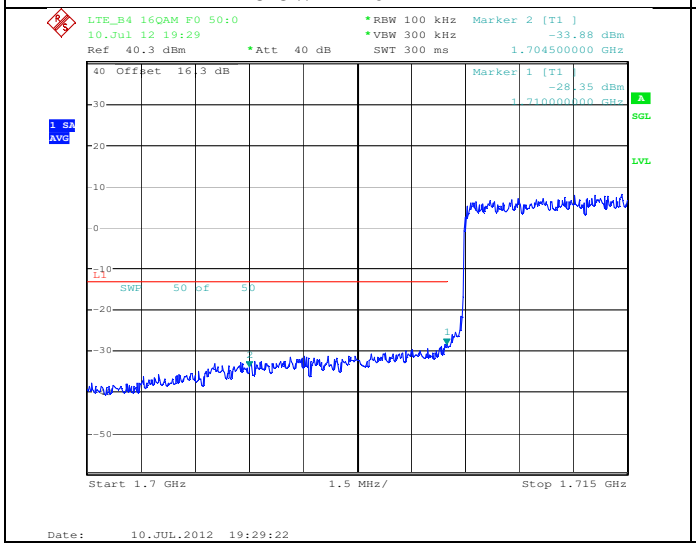
Below 1710 MHz	Above 1755 MHz
	

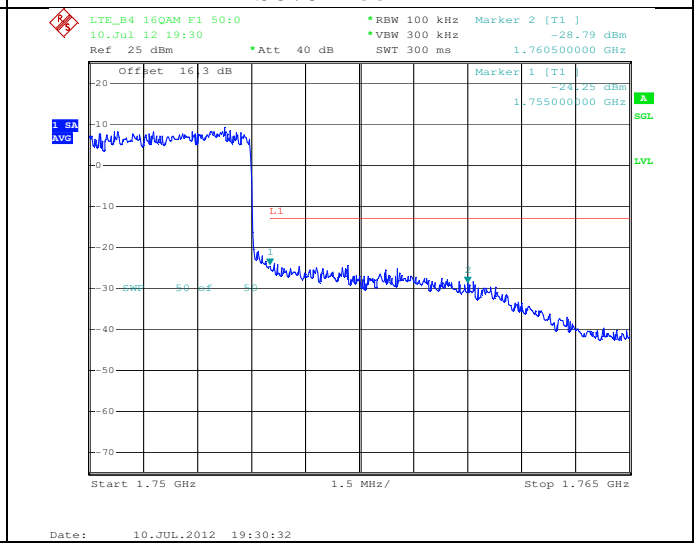


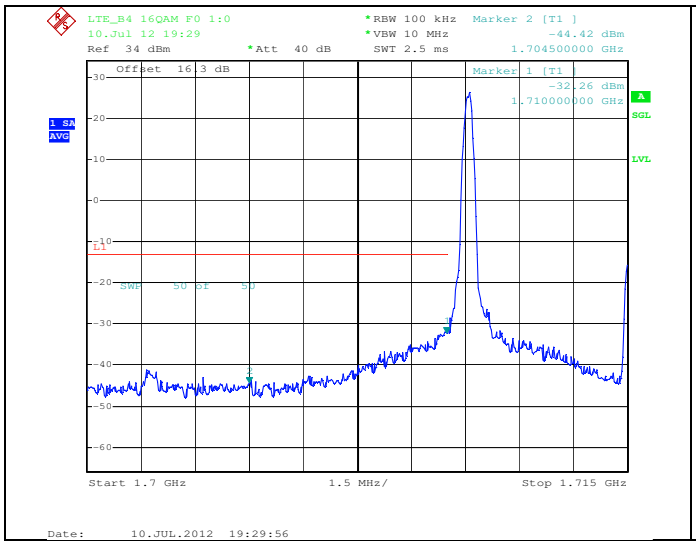


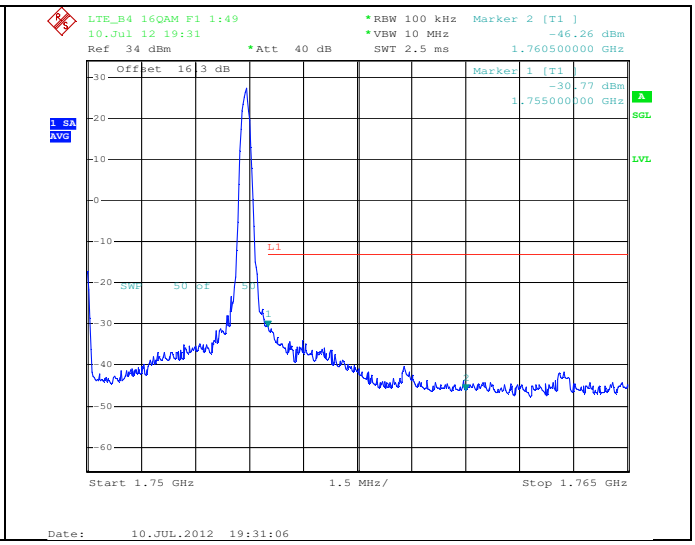
9.2.1.24 LTE; Band4, 10 MHz BW, 16-QAM

Below 1710 MHz	Above 1755 MHz



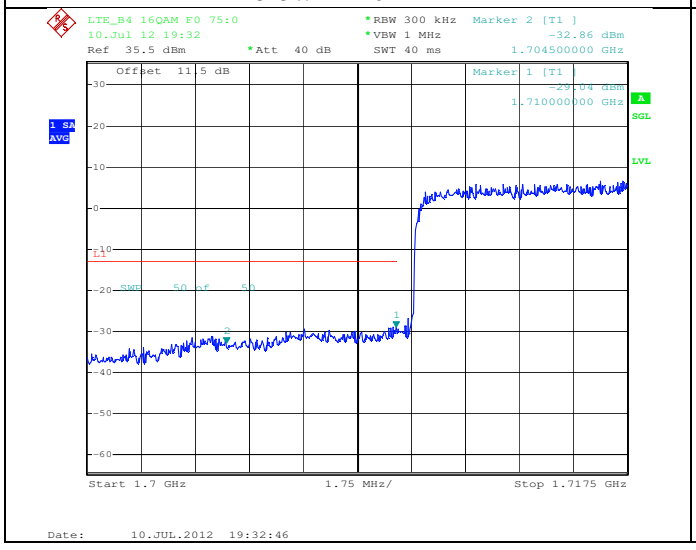


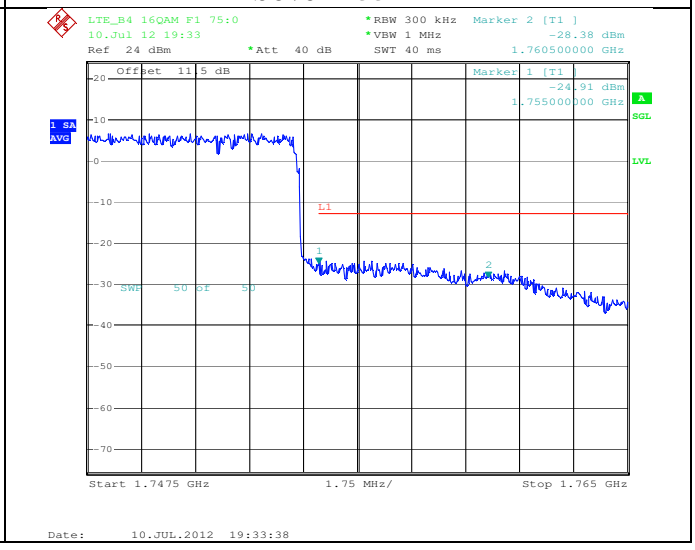


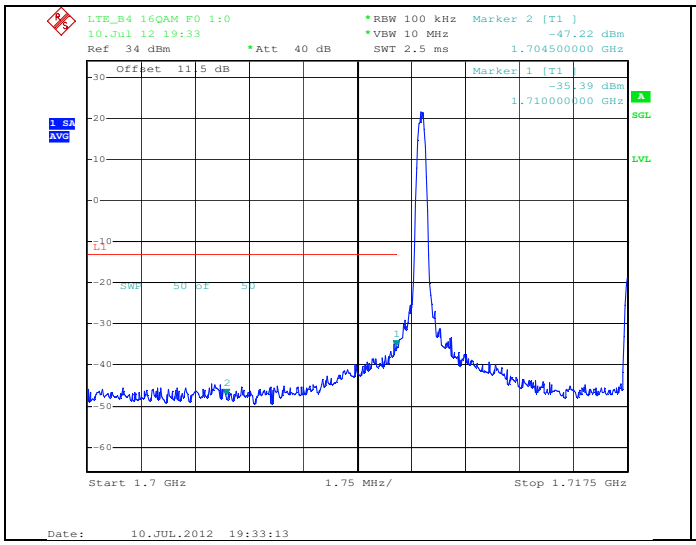


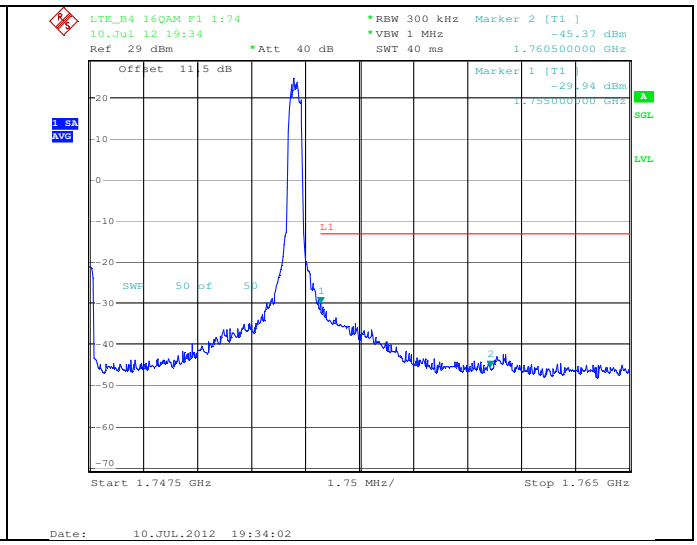
9.2.1.25 LTE; Band4, 15 MHz BW, 16-QAM

Below 1710 MHz	Above 1755 MHz



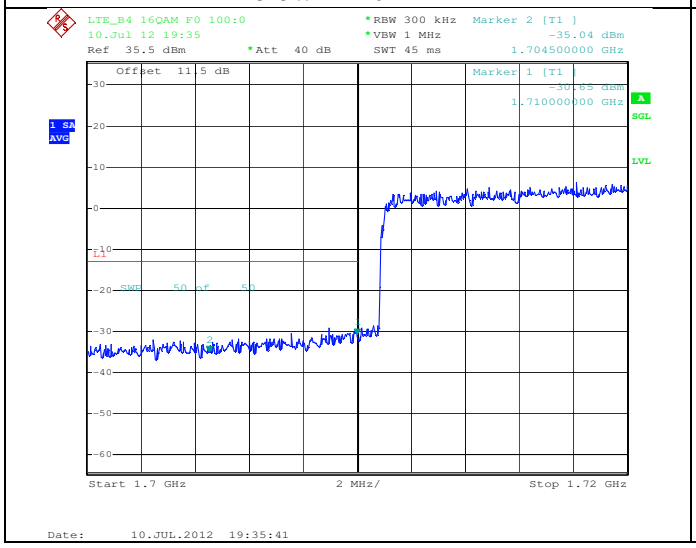


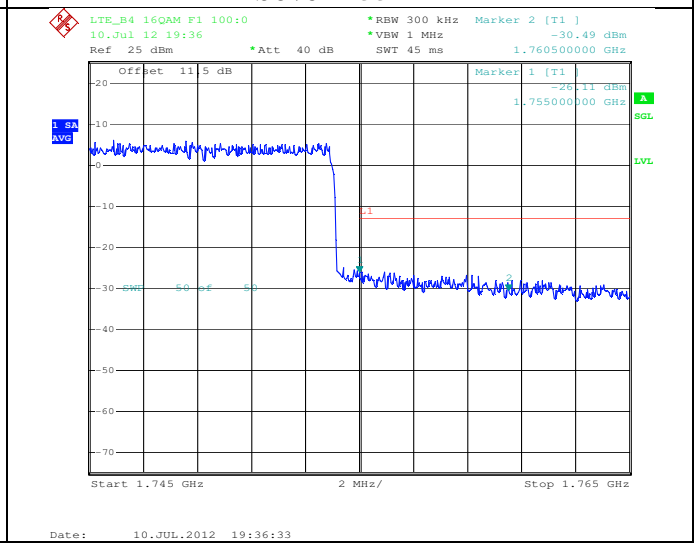


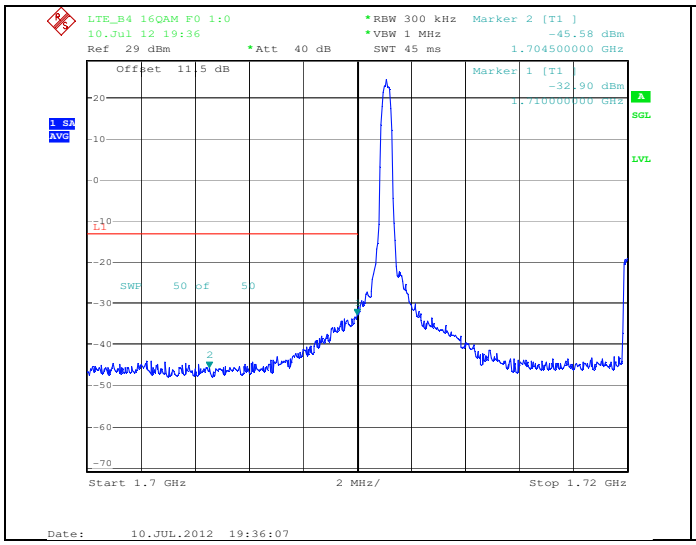


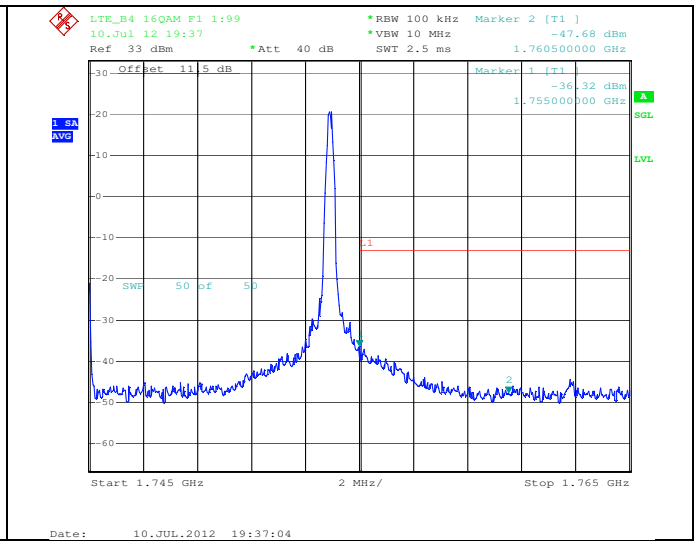
9.2.1.26 LTE; Band4, 20 MHz BW, 16-QAM

Below 1710 MHz	Above 1755 MHz





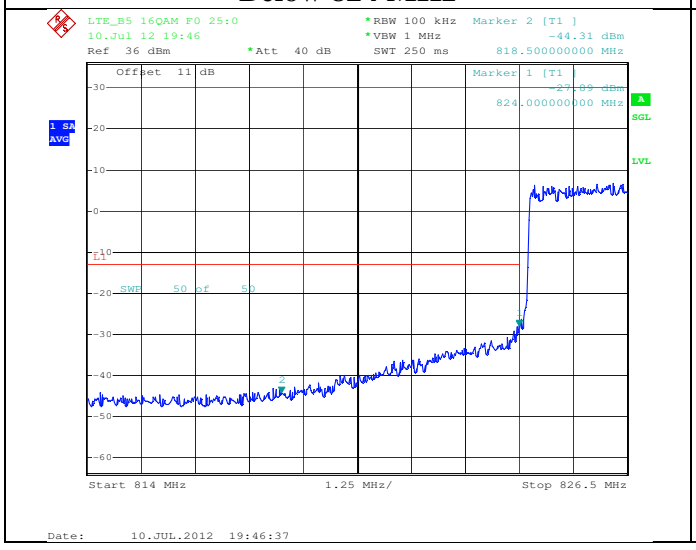




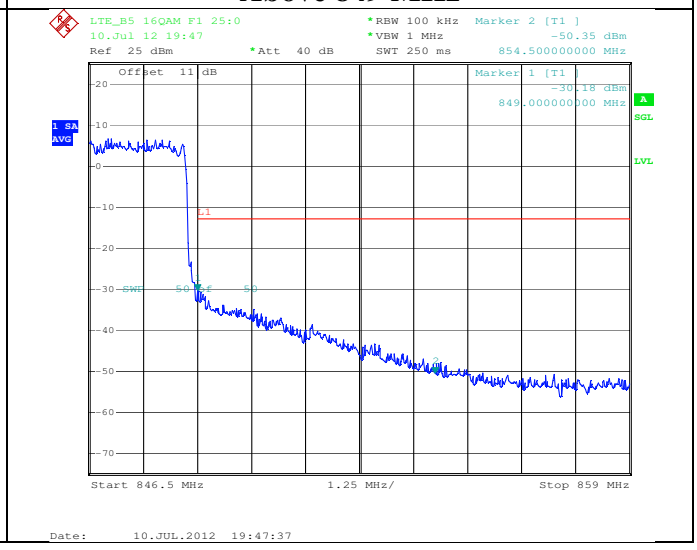
LTE B5

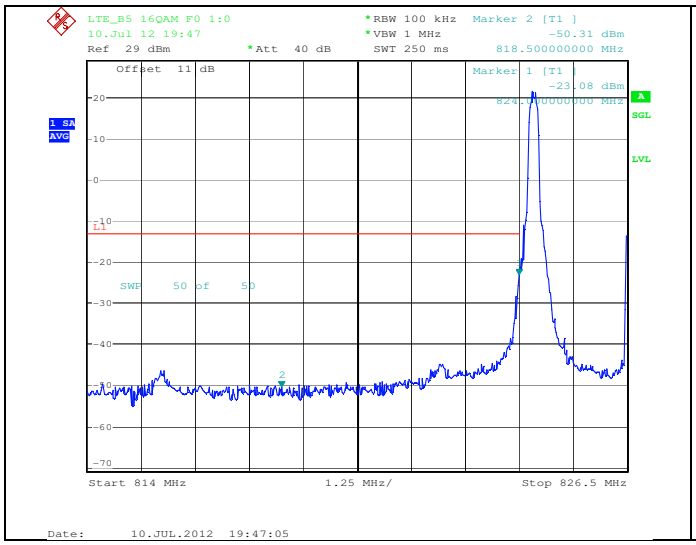
9.2.1.27 LTE; Band5, 5 MHz BW, 16-QAM

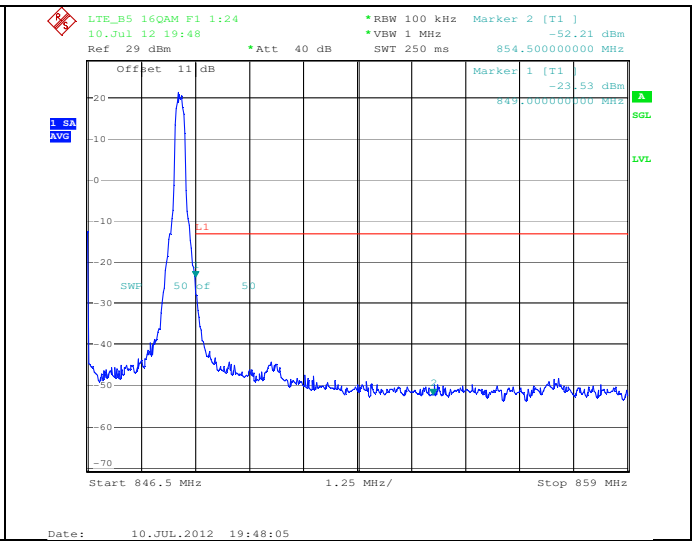
Below 824 MHz



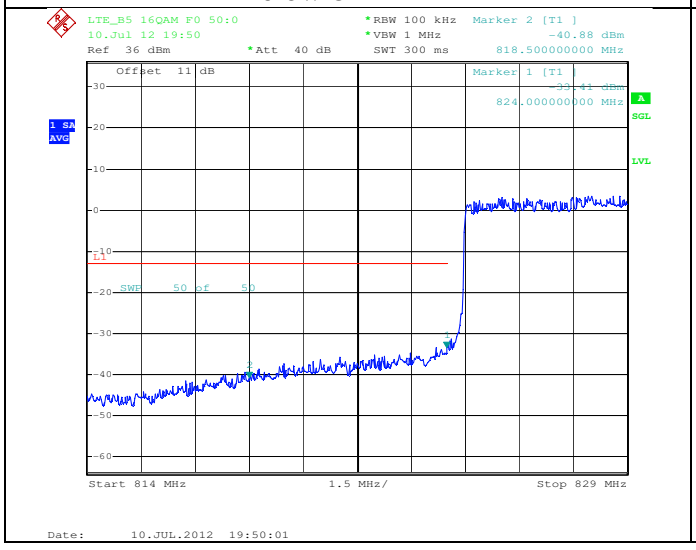
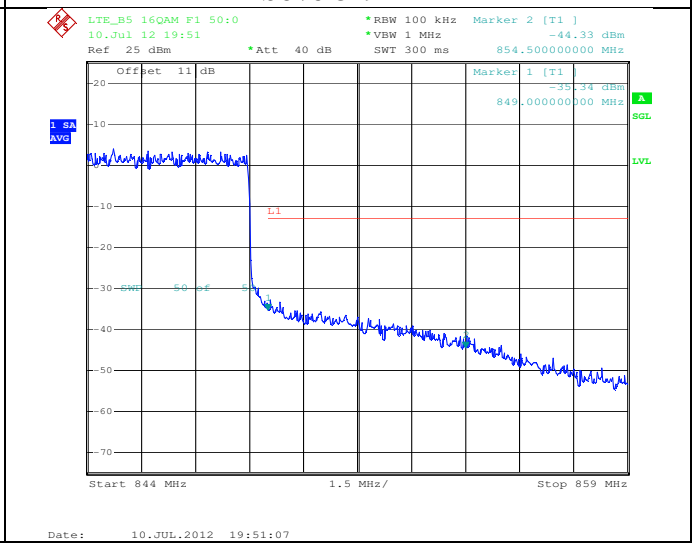
Above 849 MHz

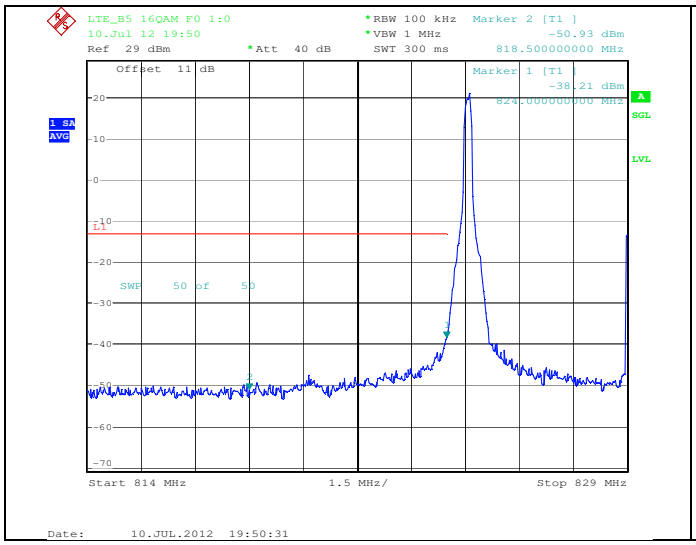


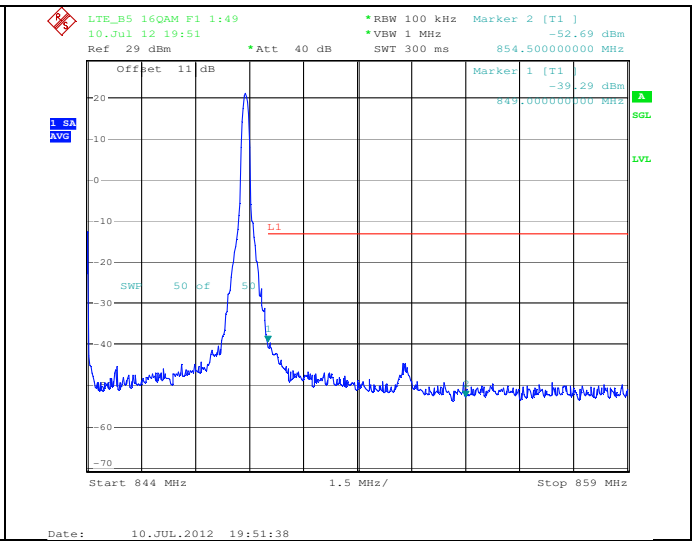




9.2.1.28 LTE; Band5, 10 MHz BW, 16-QAM

Below 824 MHz	Above 849 MHz
	

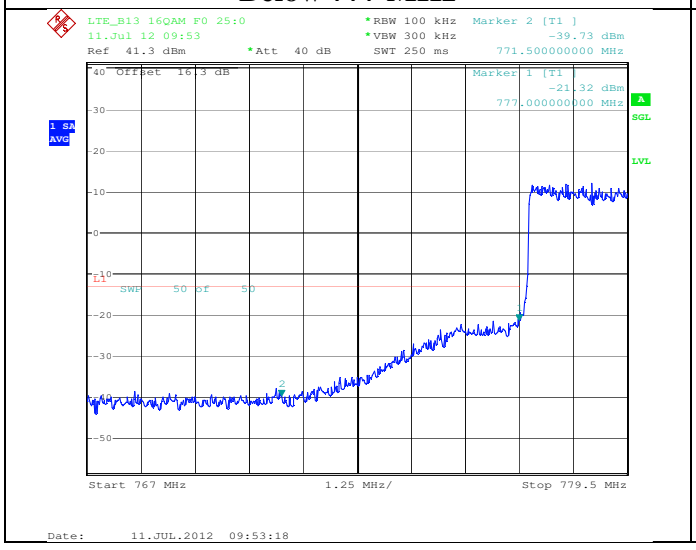




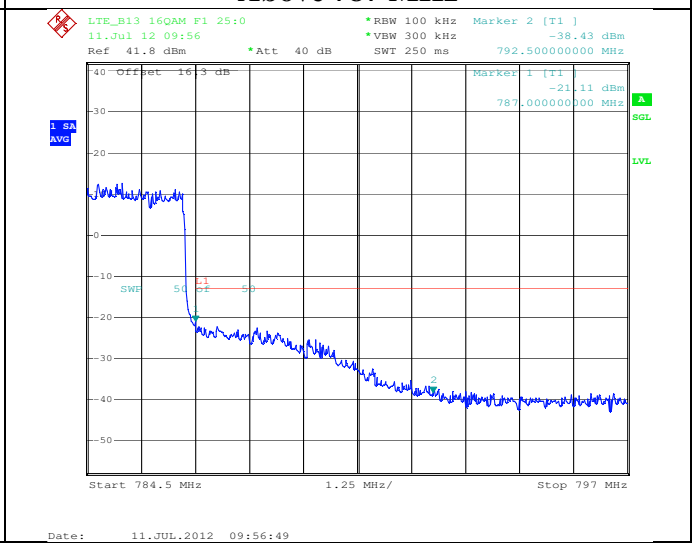
LTE B13

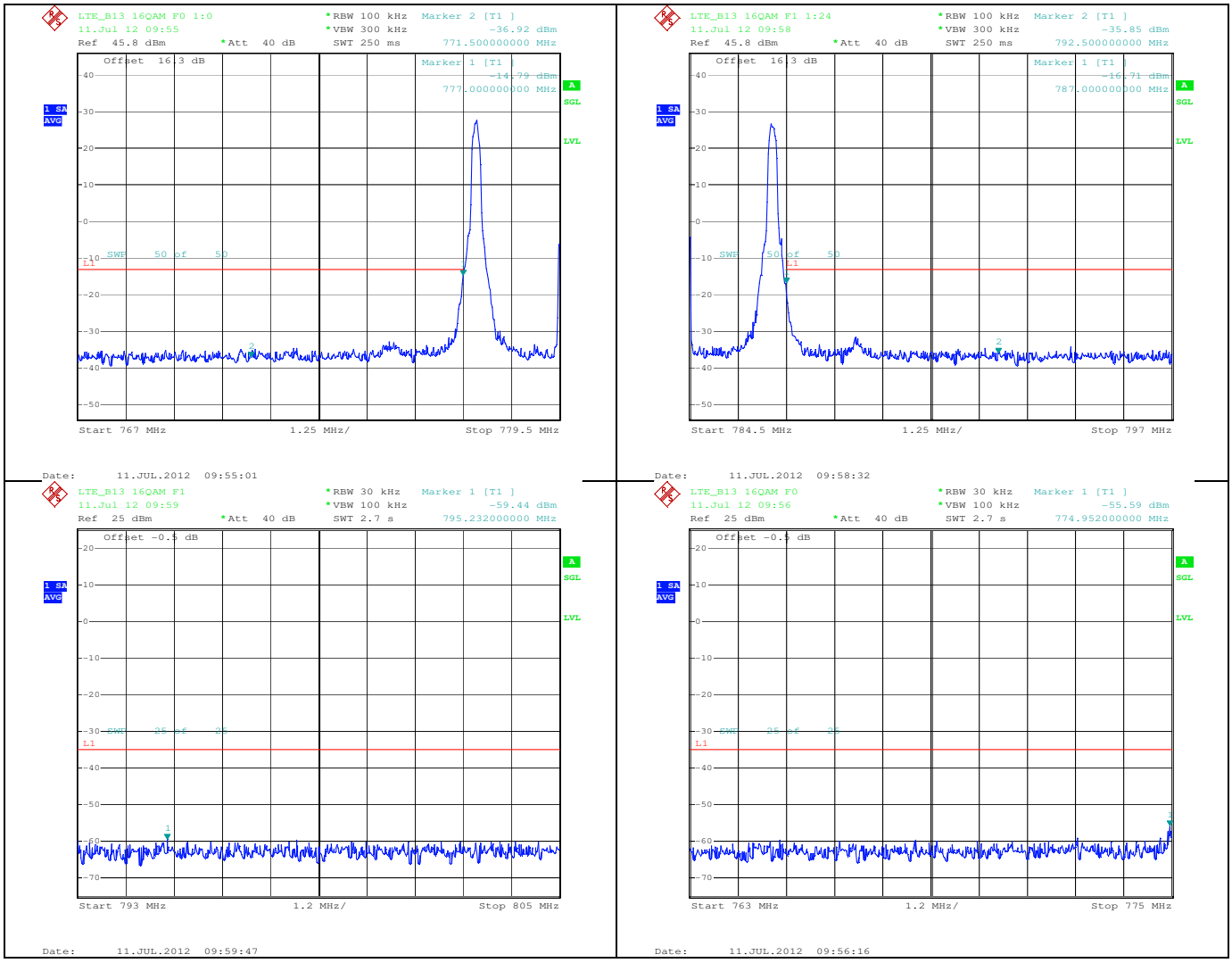
9.2.1.29 LTE; Band13, 5 MHz BW, 16-QAM

Below 777 MHz



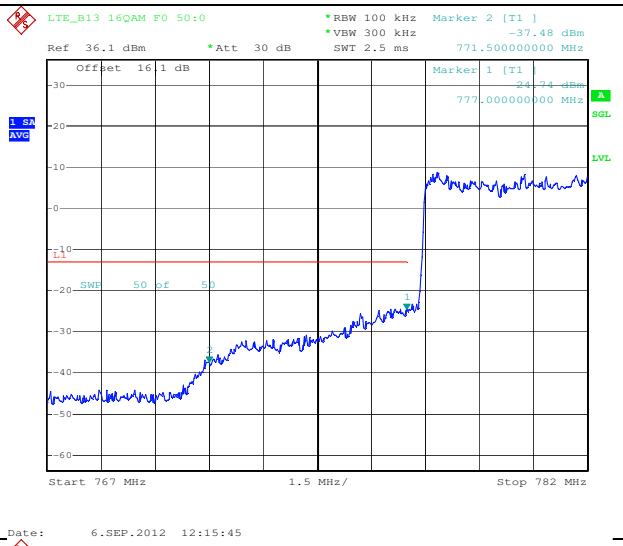
Above 787 MHz

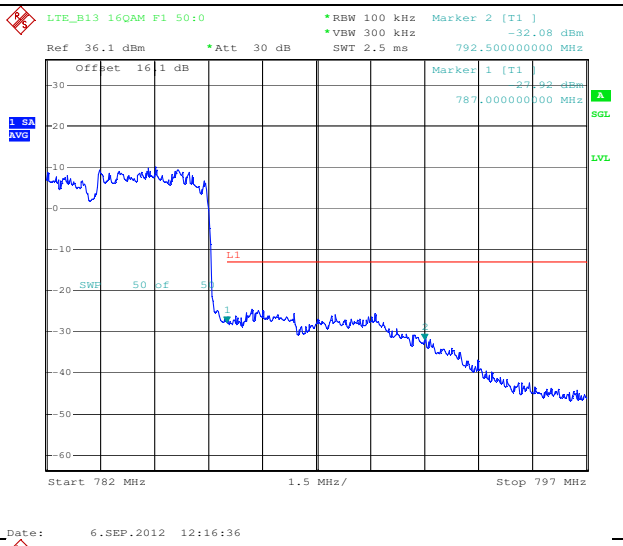


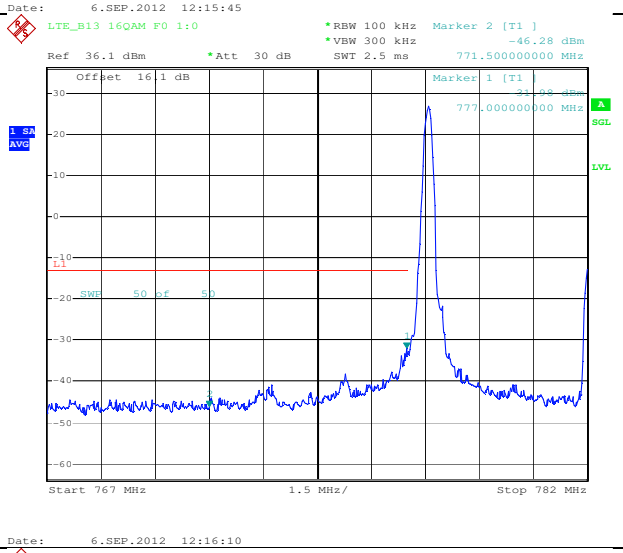


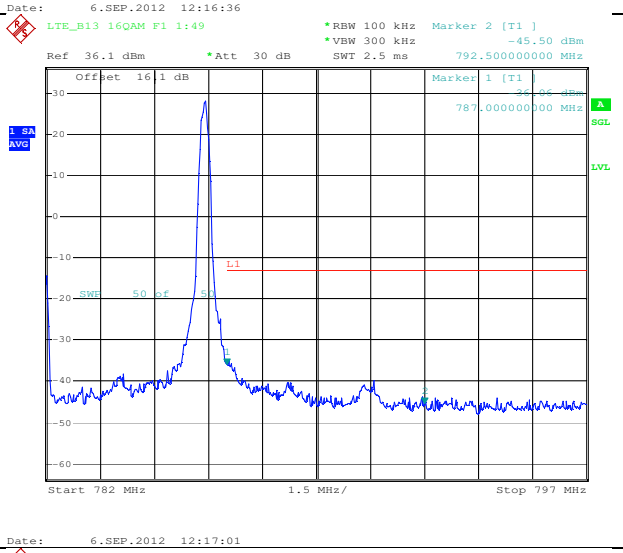
9.2.1.30 LTE; Band13, 10 MHz BW, 16-QAM

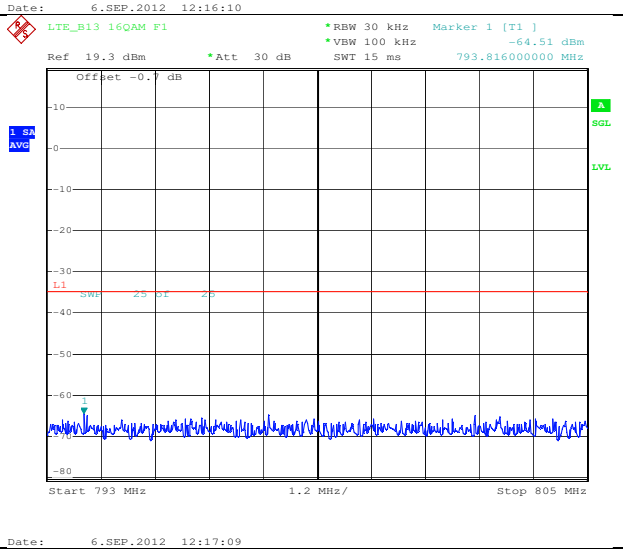
Below 777 MHz	Above 787 MHz

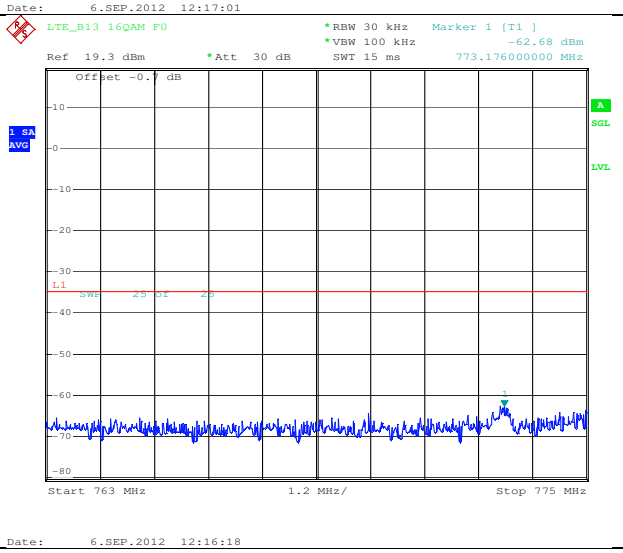






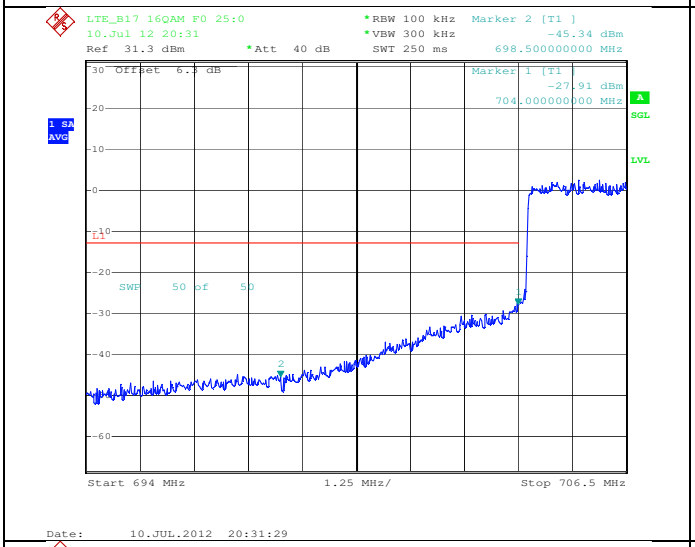
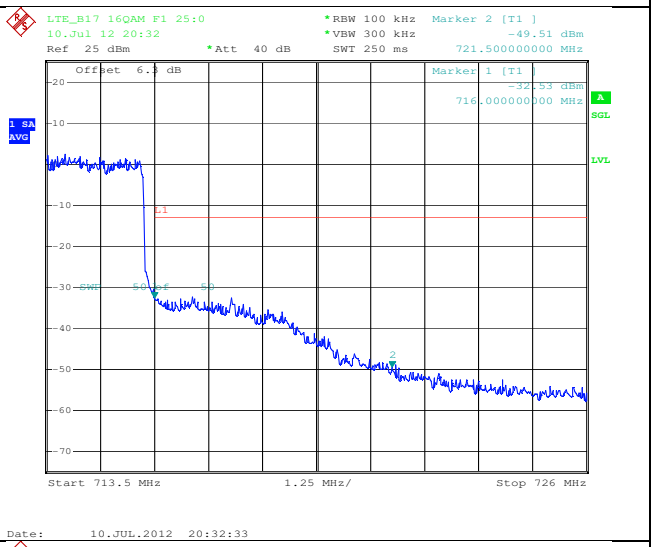
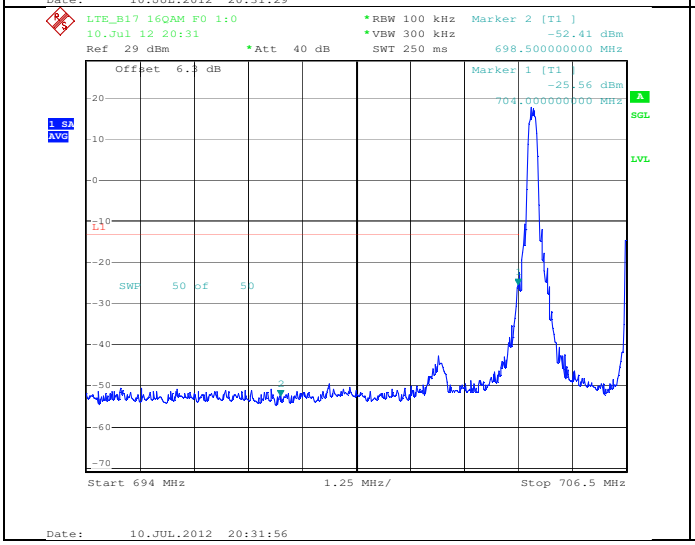
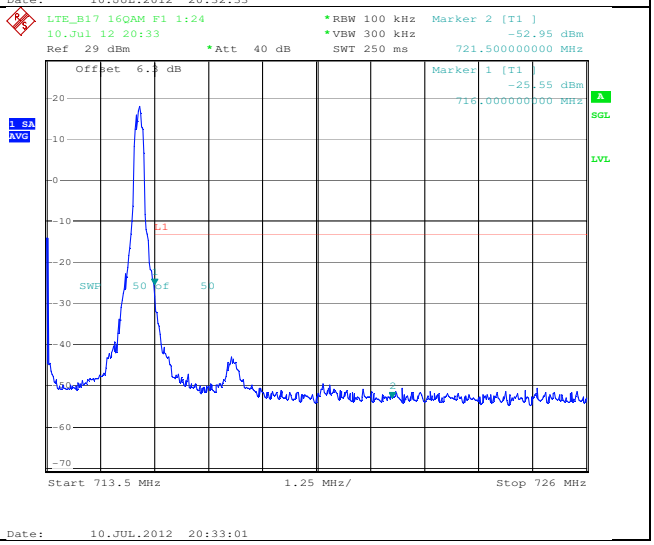






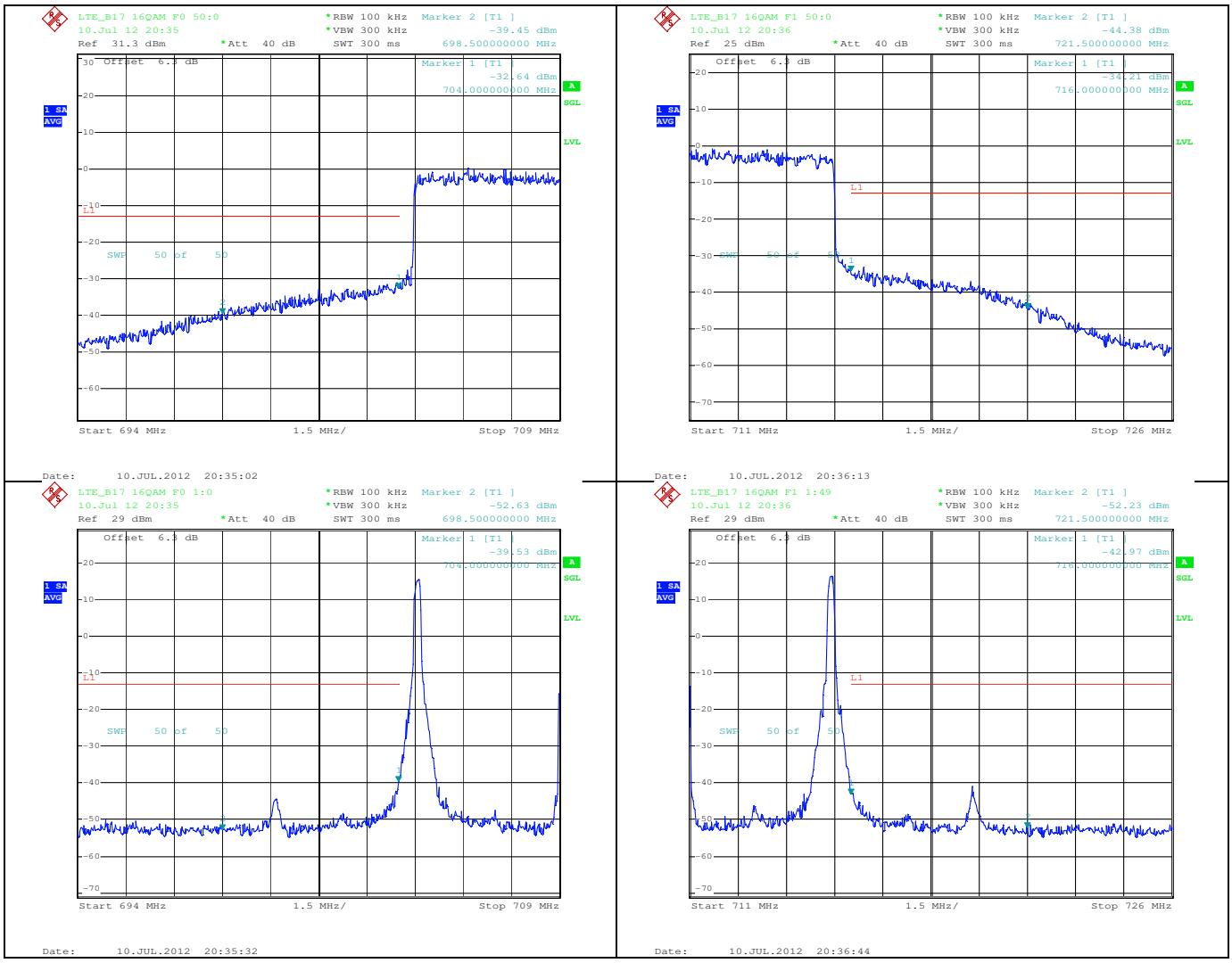
LTE B17

9.2.1.31 LTE; Band17, 5 MHz BW, 16-QAM

Below 704 MHz	Above 716 MHz
	
	

9.2.1.32 LTE; Band17, 10 MHz BW, 16-QAM

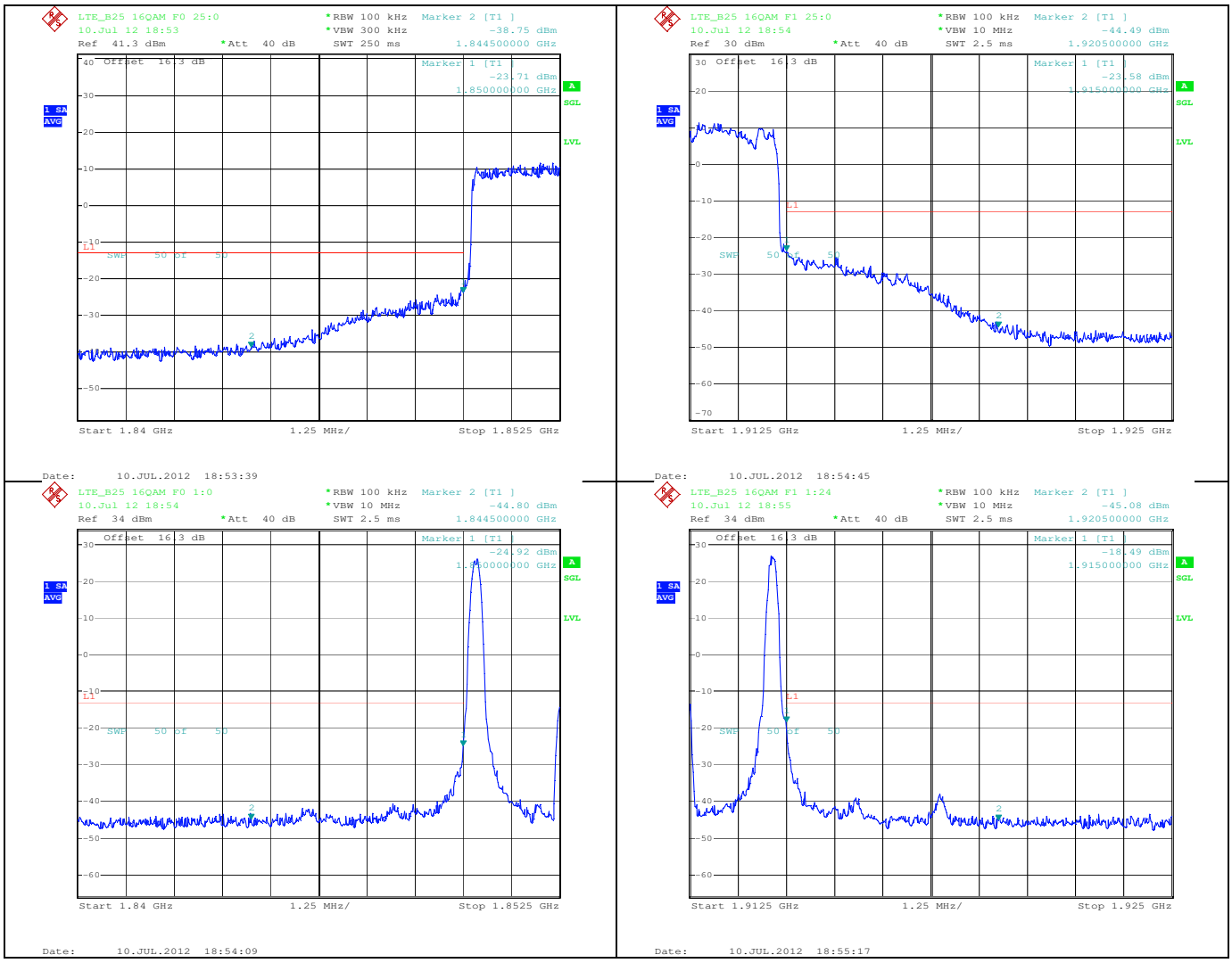
Below 704 MHz	Above 716 MHz



LTE B25

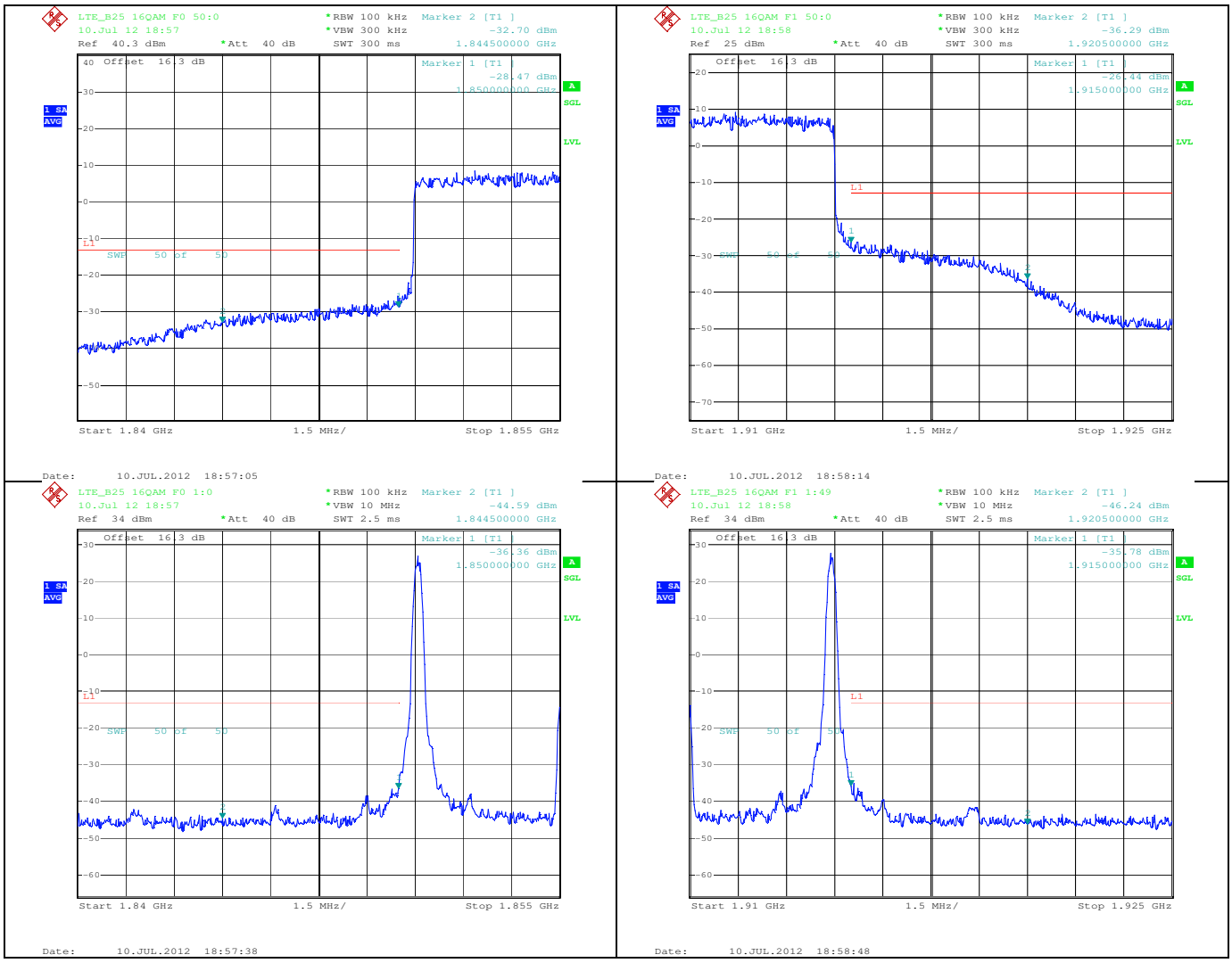
9.2.1.33 LTE; Band25, 5 MHz BW, 16-QAM

Below 1850 MHz	Above 1915 MHz



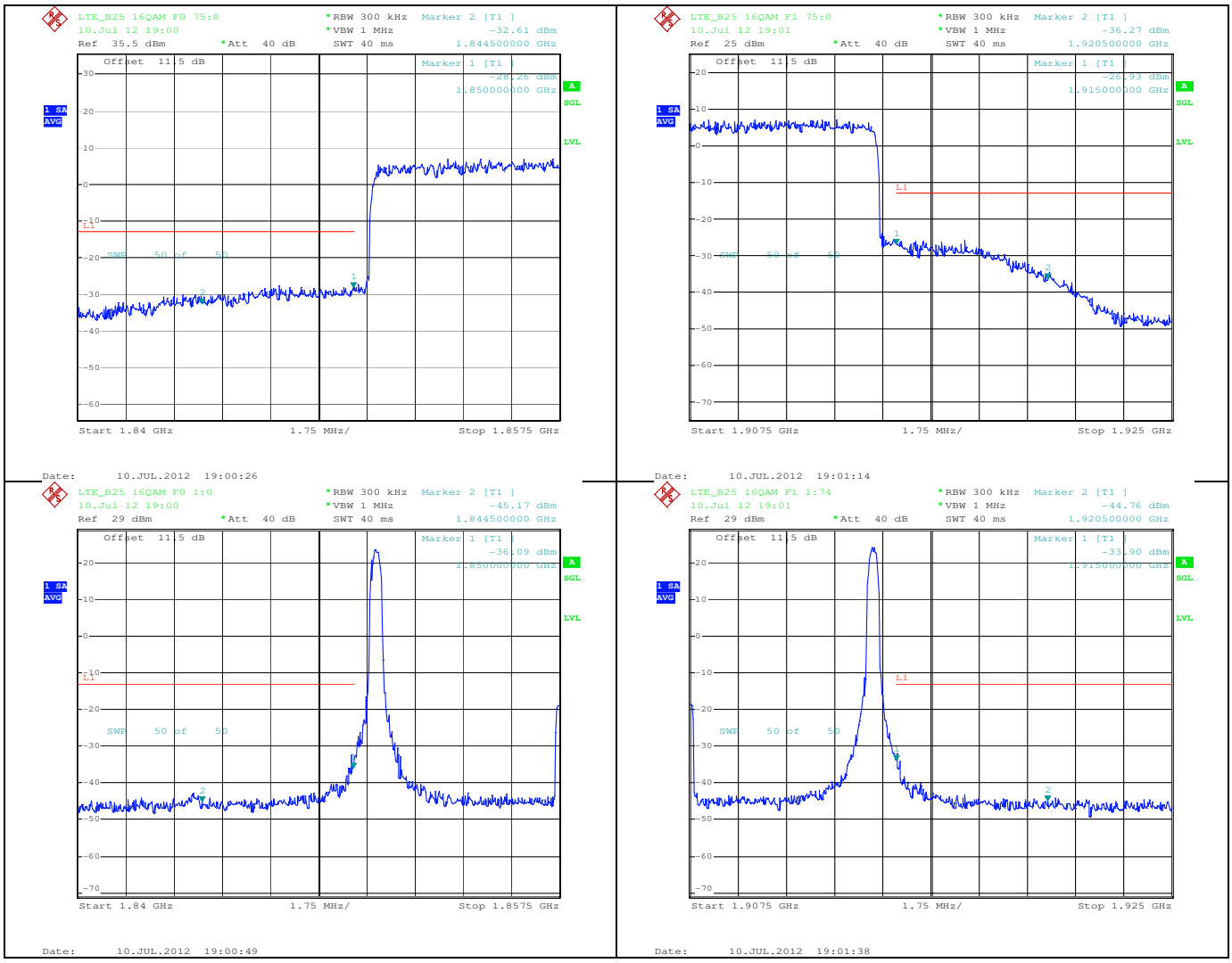
9.2.1.34 LTE; Band25, 10 MHz BW, 16-QAM

Below 1850 MHz	Above 1915 MHz



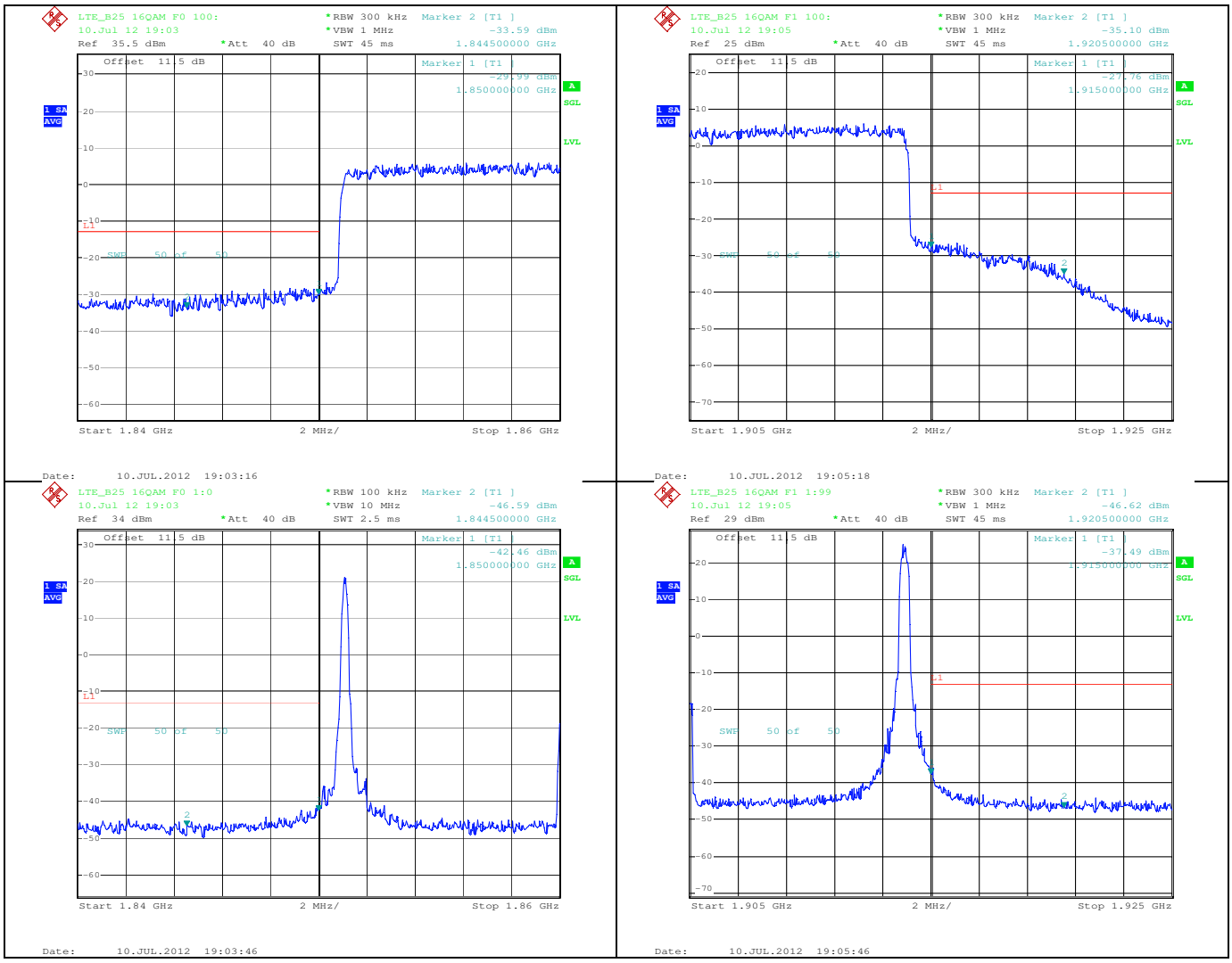
9.2.1.35 LTE; Band25, 15 MHz BW, 16-QAM

Below 1850 MHz	Above 1915 MHz



9.2.1.36 LTE; Band25, 20 MHz BW, 16-QAM

Below 1850 MHz	Above 1915 MHz



10 Frequency Stability versus Temperature

FCC 2.1055, FCC 22.355, FCC 24.235, FCC 27.54

10.1 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.

10.2 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 CMW500 to stabilize the reading. Reference power supply voltage for these tests is 3.3 volts. Refer to Test Setup 2.

10.3 Test Results

Frequency stability is not affected by transmission bandwidth or modulation mode (QPSK, 16-QAM). The measurements below were performed with a 10 MHz transmission bandwidth and QPSK modulation.

10.3.1 LTE Frequency Error over Temperature

		Temperature (°C)								
Band	Offset	-30	-20	-10	0	10	20	30	40	50
B2	Hz	-1.69	-4.15	3.15	-0.04	1.54	-8.47	0.29	-4.15	-6.51
	ppm	-0.0009	-0.0022	0.0017	0.0000	0.0008	-0.0045	0.0002	-0.0022	-0.0035
B4	Hz	1.75	3.15	0.53	1.87	1.27	1.95	2.96	3.79	3.52
	ppm	0.0010	0.0018	0.0003	0.0011	0.0007	0.0011	0.0017	0.0022	0.0020
B5	Hz	2.5	2.13	1.73	1.93	1.29	2.76	0.93	1.4	0.84
	ppm	0.0030	0.0025	0.0021	0.0023	0.0015	0.0033	0.0011	0.0017	0.0010
B13	Hz	0.54	-0.36	1.44	-0.03	-1.32	1.82	-0.59	0.04	2.46
	ppm	0.0007	-0.0005	0.0019	0.0000	-0.0017	0.0023	-0.0008	0.0001	0.0032
B17	Hz	-0.56	-0.77	0.73	0.59	-0.33	0.43	-0.33	0.54	-0.17
	ppm	-0.0008	-0.0010	0.0010	0.0008	-0.0004	0.0006	-0.0004	0.0007	-0.0002
B25	Hz	-1.65	6.14	1.42	-3.39	-6.25	-2.8	1.04	2.13	1.92
	ppm	-0.0009	0.0033	0.0008	-0.0018	-0.0033	-0.0015	0.0006	0.0011	0.0010

11 Frequency Stability versus Voltage

FCC 2.1055, FCC 22.355, FCC 24.235, FCC 27.54

11.1 Summary of Results

The EUT is specified to operate with a supply voltage varying between 3.0 VDC and 4.2 VDC, having a nominal voltage of 3.3 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.

11.2 Test Procedure

The EUT was connected to a DC Power Supply and a 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 3.0 volts to 4.2 volts. Refer to Test Setup 2.

11.3 Test Results

11.3.1 LTE Frequency Error over Voltage

		Voltage (V)		
Band	Offset	3	3.3	4.2
B2	Hz	-2.50	0.31	-3.21
	ppm	-0.0013	0.0002	-0.0017
B4	Hz	1.50	2.90	-5.78
	ppm	0.0009	0.0017	-0.0033
B5	Hz	0.22	5.49	1.95
	ppm	0.0003	0.0066	0.0023
B13	Hz	-0.27	-3.28	-1.51
	ppm	-0.0004	-0.0042	-0.0019
B17	Hz	-1.55	-3.04	-2.87
	ppm	-0.0021	-0.0041	-0.0039
B25	Hz	5.31	1.06	0.78
	ppm	0.0028	0.0006	0.0004

12 Peak to Average Ratio

FCC 27.50(d)

12.1 Summary of Results

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

12.2 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. Refer to Test Setup 1.

12.3 Test Results

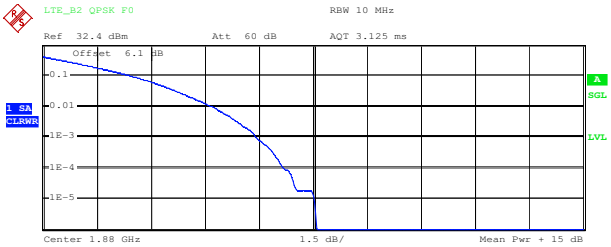
The Peak to Average ration is not bandwidth dependent. The results below were measured with a 5 MHz transmission bandwidth (25 RB).

Band	Channel	Modulation	Plot No.	Peak to Average Ratio
B2	18900	QPSK	12.3.1.1	5.94
		16-QAM	12.3.1.2	6.97
B4	20175	QPSK	12.3.1.3	5.46
		16-QAM	12.3.1.4	6.18
B5	20525	QPSK	12.3.1.5	5.64
		16-QAM	12.3.1.6	6.24

B13	23230	QPSK	12.3.1.7	5.61
		16-QAM	12.3.1.8	6.24
B17	23790	QPSK	12.3.1.9	6.00
		16-QAM	12.3.1.10	6.78
B25	26365	QPSK	12.3.1.11	5.82
		16-QAM	12.3.1.12	6.63

12.3.1 Test Plots

12.3.1.1 LTE peak to average ratio, QPSK Band2, Mid channel, 1880.0 MHz

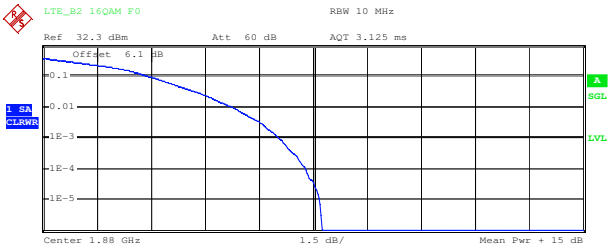


Complementary Cumulative Distribution Function (100000 samples)

Trace 1	
Mean	20.33 dBm
Peak	27.93 dBm
Crest	7.60 dB
10% @	2.55 dB
1% @	4.74 dB
.1% @	5.94 dB

Date: 6.SEP.2012 14:36:04

12.3.1.2 LTE peak to average ratio, 16-QAM Band2, Mid channel, 1880.0 MHz

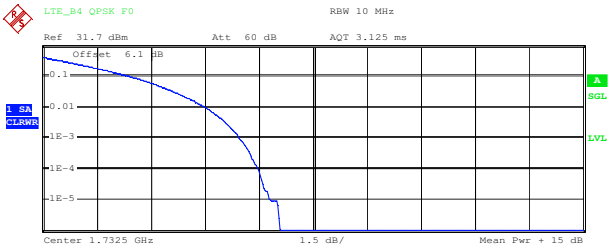


Complementary Cumulative Distribution Function (100000 samples)

Trace 1	
Mean	19.31 dBm
Peak	27.06 dBm
Crest	7.75 dB
10% @	3.06 dB
1% @	5.31 dB
.1% @	6.57 dB

Date: 6.SEP.2012 14:46:42

12.3.1.3 LTE peak to average ratio, QPSK Band4, Mid channel, 1732.5 MHz

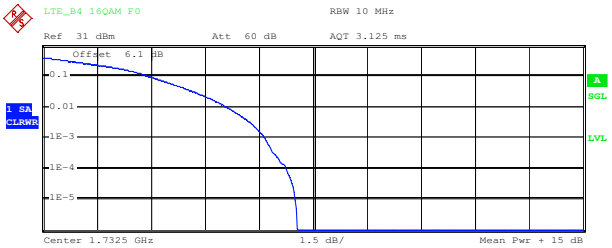


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.31 dBm
Peak	26.88 dBm
Crest	6.57 dB
10% @	2.55 dB
1% @	4.56 dB
.1% @	5.46 dB

Date: 6.SEP.2012 14:37:46

12.3.1.4 LTE peak to average ratio, 16-QAM Band4, Mid channel, 1732.5 MHz

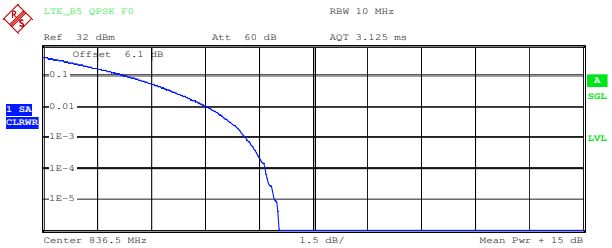


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.18 dBm
Peak	26.26 dBm
Crest	7.07 dB
10% @	3.03 dB
1% @	5.16 dB
.1% @	6.18 dB

Date: 6.SEP.2012 14:48:37

12.3.1.5 LTE peak to average ratio, QPSK Band5, Mid channel, 836.5 MHz

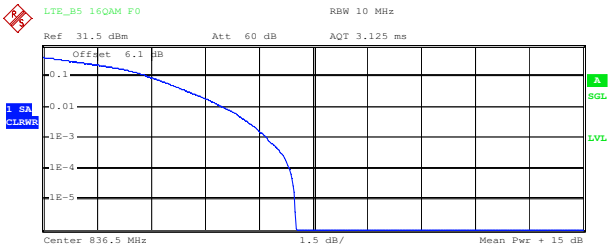


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.46 dBm
Peak	27.02 dBm
Crest	6.56 dB
10% @	2.49 dB
1% @	4.62 dB
.1% @	5.64 dB

Date: 6.SEP.2012 14:39:27

12.3.1.6 LTE peak to average ratio, 16-QAM Band5, Mid channel, 836.5 MHz

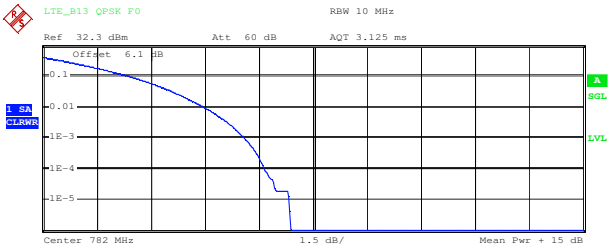


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.58 dBm
Peak	26.60 dBm
Crest	7.02 dB
10% @	3.00 dB
1% @	5.07 dB
.1% @	6.24 dB

Date: 6.SEP.2012 14:50:31

12.3.1.7 LTE peak to average ratio, QPSK Band13, Mid channel, 782.0 MHz

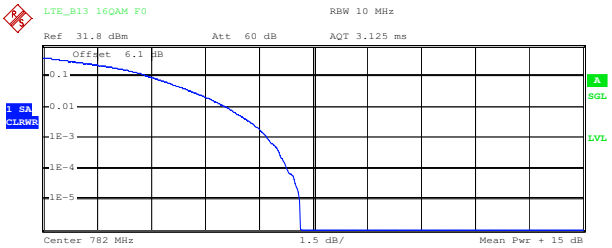


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.59 dBm
Peak	27.46 dBm
Crest	6.87 dB
10% @	2.52 dB
1% @	4.53 dB
.1% @	5.61 dB

Date: 6.SEP.2012 14:41:17

12.3.1.8 LTE peak to average ratio, 16-QAM Band13, Mid channel, 782.0 MHz

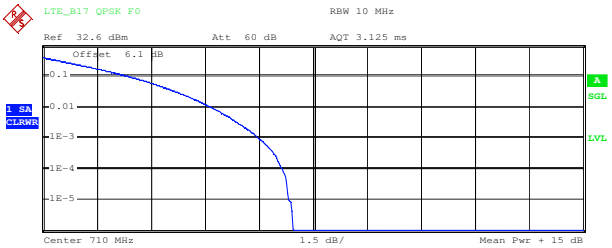


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.48 dBm
Peak	26.64 dBm
Crest	7.16 dB
10% @	3.03 dB
1% @	5.13 dB
.1% @	6.24 dB

Date: 6.SEP.2012 14:52:35

12.3.1.9 LTE peak to average ratio, QPSK Band17, Mid channel, 710.0 MHz

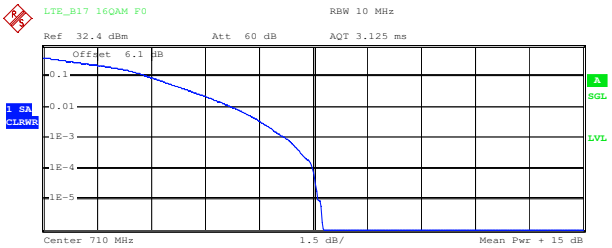


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.62 dBm
Peak	27.56 dBm
Crest	6.95 dB
10% @	2.52 dB
1% @	4.74 dB
.1% @	6.00 dB

Date: 6.SEP.2012 14:43:07

12.3.1.10 LTE peak to average ratio, 16-QAM Band17, Mid channel, 710.0 MHz

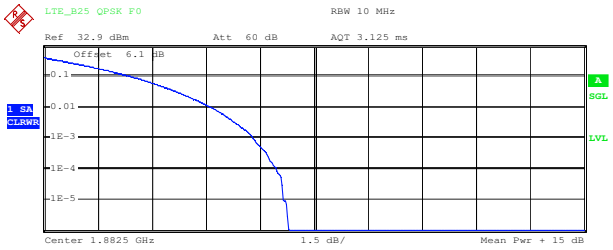


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.67 dBm
Peak	27.43 dBm
Crest	7.77 dB
10% @	3.00 dB
1% @	5.31 dB
.1% @	6.78 dB

Date: 6.SEP.2012 14:54:39

12.3.1.11 LTE peak to average ratio, QPSK Band25, Mid channel, 1882.5 MHz

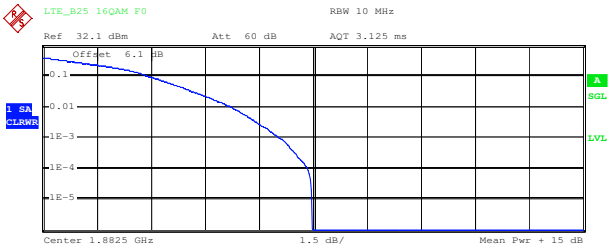


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.40 dBm
Peak	27.19 dBm
Crest	6.79 dB
10% @	2.52 dB
1% @	4.68 dB
.1% @	5.82 dB

Date: 6.SEP.2012 14:44:48

12.3.1.12 LTE peak to average ratio, 16-QAM Band25, Mid channel, 1882.5 MHz



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.35 dBm
Peak	26.83 dBm
Crest	7.48 dB
10% @	3.03 dB
1% @	5.28 dB
.1% @	6.63 dB

Date: 6.SEP.2012 14:56:33