MOBILE DEVICES BUSINESS

PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

Test Report Number – 24659-1 LTE

Report Date – September 28, 2011

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature:  Name: Albert J. Patapack

Title: EMC Engineer Date: September 28, 2011

THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY UKAS OR ANY AGENCY OF THE U.S. GOVERNMENT.

UKAS Certificate Number: 2404

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Test Report Details

Tests Performed By:	ADR Testing Service Location Code: ADR LV Motorola Mobility Inc Product Safety and Compliance Group 600 North US Hwy 45 Libertyville, IL 60048 FCC Registration Number: 316588 Industry Canada Number: 109O-1
Tests Requested By:	Motorola Mobility Inc. 600 North US Hwy 45 Libertyville, IL 60048
Product Type:	Tablet
Signaling Capability:	CDMA 800/1900, CDMA 1X/EV-DO Release A, LTE Band 13, GSM 850/1900,EDGE, GPRS, Bluetooth+EDR, 802.11a/802.11b/802.11g/802.11n **Note:** The GSM/EDGE/WCDMA network functions have been disabled by firmware and are SIM locked for all US operators.
FCC ID:	IHDP56MF1
Serial Numbers:	KFLC110321, KFLC110368, KFLC110340, KFLC110326
Testing Complete Date:	September 27, 2011

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

__X__ Part 2
__X__ Part 22 Subpart H - Public Mobile Services
__X__ Part 24 Subpart E – Personal Communications Services
__X__ Part 27

Applicable Standards: ANSI 63.4 2003, ANSI/TIA-603-C-2004, RSS-Gen Issue 3, RSS-129 Issue 2, RSS-132 Issue 2, RSS-133 Issue 5

Summary of Testing

Test #	Test Name	Pass/Fail
1	RF Power Output	NA
2	ERP (Effective Radiated Power)	Pass
3	Occupied Bandwidth	Pass
4	Band Edge	Pass
5	Spurious Emissions at Antenna Terminal	Pass
6	Field Strength of Spurious Emissions	Pass
7	Frequency Stability	Pass

Test #	Test Name	Margin with respect to the Limit
1	RF Power Output	NA
2	ERP (Effective Radiated Power)	See results
3	Occupied Bandwidth	See Plots
4	Band Edge	See Plots
5	Spurious Emissions at Antenna Terminal	See Plots
6	Field Strength of Spurious Emissions	See results
7	Frequency Stability	See results

The margin with respect to the limit is the minimum margin for all modes and bands.

General and Special Conditions

This product utilizes an internal battery that is not removable. When applicable, EMC testing was performed with the internal battery fully charged. Where the internal battery could not be used due to the need for a controlled variation of input voltage, the internal battery was disconnected and an external power supply was utilized.

In addition to the CDMA bands, the EUT operates on LTE Band 13. The transmitting frequency range for LTE is 777-787 MHz. It supports both QPSK and 16 QAM modulation scheme. The bandwidth supported is 10 MHz.

All testing was done in an indoor controlled environment. The temperature and the relative humidity were maintained within the ANSI C63.4 2003 Standard requirements during the entire duration of testing.

Equipment List

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde & Schwarz	Receiver	ESI26	100001	9/23/2011
Rohde & Schwarz	Receiver	ESIB40	100226	3/30/2012
Hewlett Packard	EMC Analyzer	E7405	US40240219	10/19/2011
Agilent	MXA Signal Analyzer	N9020A	US46470586	12/18/2011
Agilent	Signal Generator	83712A	3429A00286	3/26/2013
ETS	DRG Horn Antenna	3115	6222	3/16/2012
A. H. Systems	DRG Horn Antenna	SAS 200/571	265	9/09/2011
A. H. Systems	DRG Horn Antenna	SAS 200/571	365	8/24/2012
ETS	Log-Periodic Antenna	3148	1189	1/19/2012
ETS	Biconical Antenna	3110B	3370	1/19/2012
Attenuator	Weinschel	AS-6	6675	NCR
Attenuator	Weinschel	AS-6	6677	NCR
Thermotron	Environmental Chamber	S-4	31580	1/13/2012
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	103402	02/21/2012
Agilent	Power Meter	E4416A	GB41293246	12/10/2011
Agilent	Power Sensor	E9323A	US40412067	11/15/2011
Agilent	Microwave Preamplifier	8449B	3008A00535	10/05/2011

Note that the power meter, signal generator and microwave preamplifier are on a two-year calibration cycle. All other equipment is on a one-year calibration cycle. All testing was performed using equipment that was within calibration at the time that the test was performed. No equipment listed in the table above was used after the specified calibration due date. If, during the course of product testing, a piece of equipment went out of calibration and that piece of equipment was needed to complete product testing, a similar piece of calibrated equipment was substituted. If a substitution was made, that new piece of equipment would be listed in the above table along with the piece that was removed from service.

Measurement Procedures and Data

RF POWER OUTPUT

Measurement Procedure

The RF output port of the Equipment Under Test, EUT, is directly coupled to the input of a Wideband Communication Tester through a 20dB passive attenuator, adaptor (if needed), and specialized RF connector. The power output is measured.

Measurement Results

Band	Channel	Conducted power (dBm) for LTE modes			
		QPSK, Start RB: 13, RB Aloc 50%	QPSK, Start RB: 0, RB Aloc 100%	QPSK, Start RB: 49, RB Aloc: 1RB@high end	QPSK, Start RB: 0, RB Aloc: 1RB@low end
LTE Band 13	23230	23.9	23.9	23.8	23.8

Band	Channel	Conducted power (dBm) for LTE modes			
		16QAM, Start RB: 13, RB Aloc 50%	16QAM, Start RB: 0, RB Aloc 100%	16QAM, Start RB: 49, RB Aloc: 1RB@high end	16QAM, Start RB: 0, RB Aloc: 1RB@low end
LTE Band 13	23230	23.0	23.0	23.8	24.0

RADIATED POWER (ERP)

§27.50 (b) (10)

Measurement Procedure

The EUT was tested in a 5 meter anechoic chamber with a 2-axis position system that permits taking complete spherical scans of the EUT's radiation patterns. For all tests, the EUT was supported in a free space type environment, vertically oriented in the chamber.

All measurements were made with the EUT placed in a call using a mobile station test set. The EUT was weakly coupled to the test set and configured to transmit in the below RB configurations. Radiated power was measured at each 15 degree step. The radiated power was measured using a Rhode & Schwarz FSP Spectrum Analyzer using the Peak Detector. From these measurements, the software calculates the angle at which maximum radiated power occurs for each case, and the radiated power at this angle was extracted from the data. To get ERP (Effective Radiated Power referenced to a half-wave dipole), subtract 2.1 dB from these numbers.

Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

Measurement Results

	RB's Confuration	EIRP dBm	ERP dBm
LTE Band 13	**QPSK, Start RB: 13, RB Aloc 50%**	28.6	26.5
	QPSK, Start RB: 0, RB Aloc 100%	27.1	25.0
	QPSK, Start RB: 49, RB Aloc: 1RB@high end	30.7	28.6
	QPSK, Start RB: 0, RB Aloc: 1RB@low end	30.4	28.3
	16QAM, Start RB: 13, RB Aloc 50%	28.9	26.8
	16QAM, Start RB: 0, RB Aloc 100%	28.1	26.0
	16QAM, Start RB: 49, RB Aloc: 1RB@high end	30.8	**28.7**
	16QAM, Start RB: 0, RB Aloc: 1RB@low end	30.7	28.6

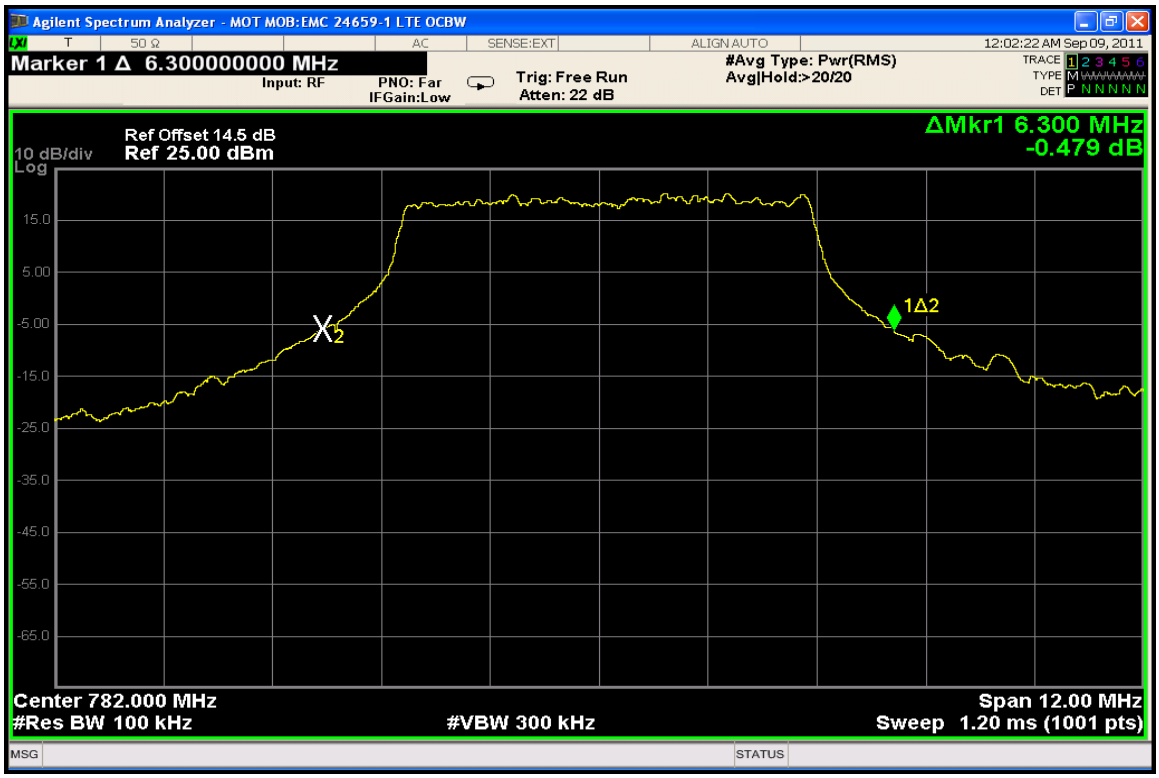
OCCUPIED BANDWIDTH
§ 2.1049

Measurement Procedure

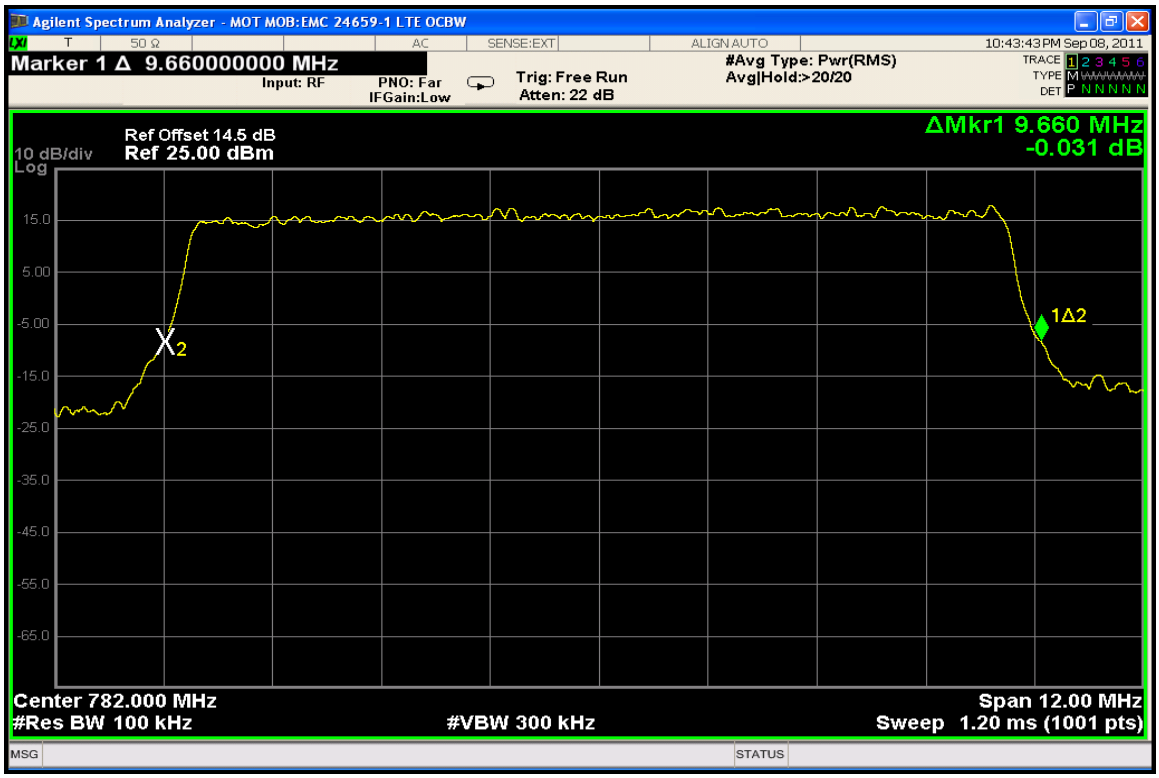
The RF output port of the EUT is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. The amplitude of the spectrum analyzer is corrected for the attenuator and any other applicable losses. The analyzer is set for Peak Detector and each trace is set for Max Hold. The fully charged internal battery was used for the supply voltage.

Measurement Results
Attached

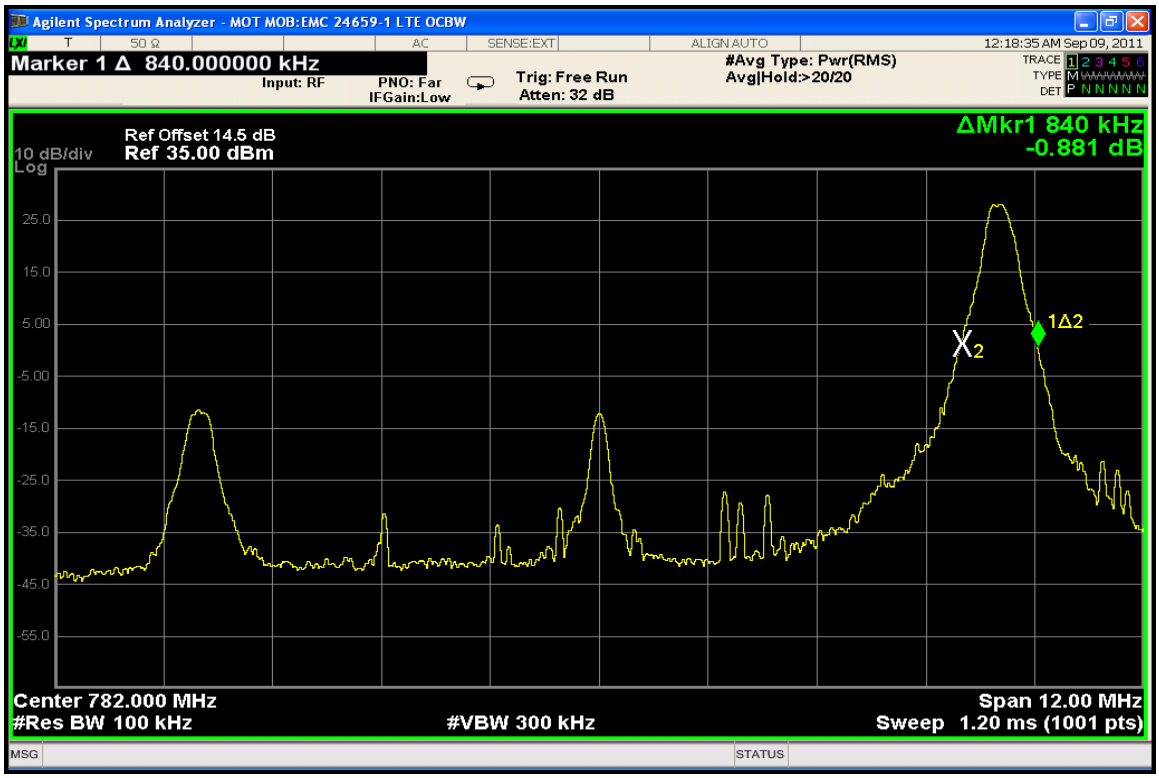
Measurement Results



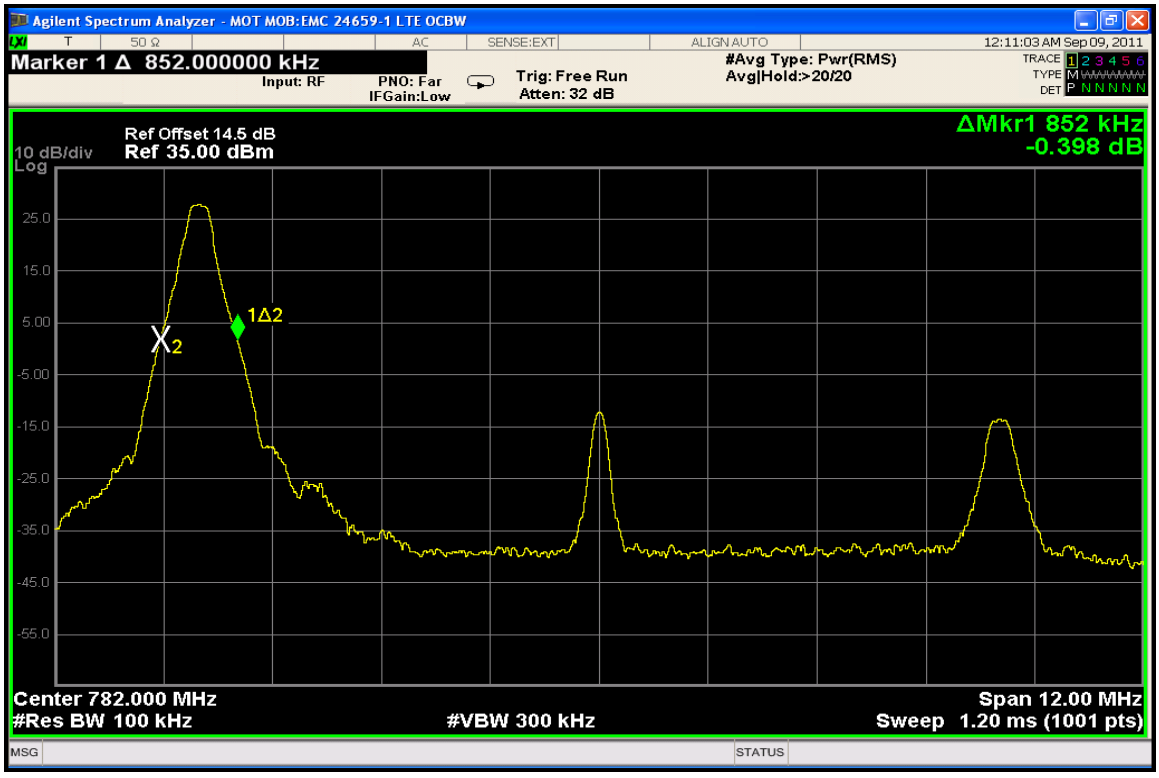
LTE – Band 13 - QPSK, Start RB: 13, RB Allocation 50%



LTE – Band 13 - QPSK, Start RB: 0, RB Allocation 100%

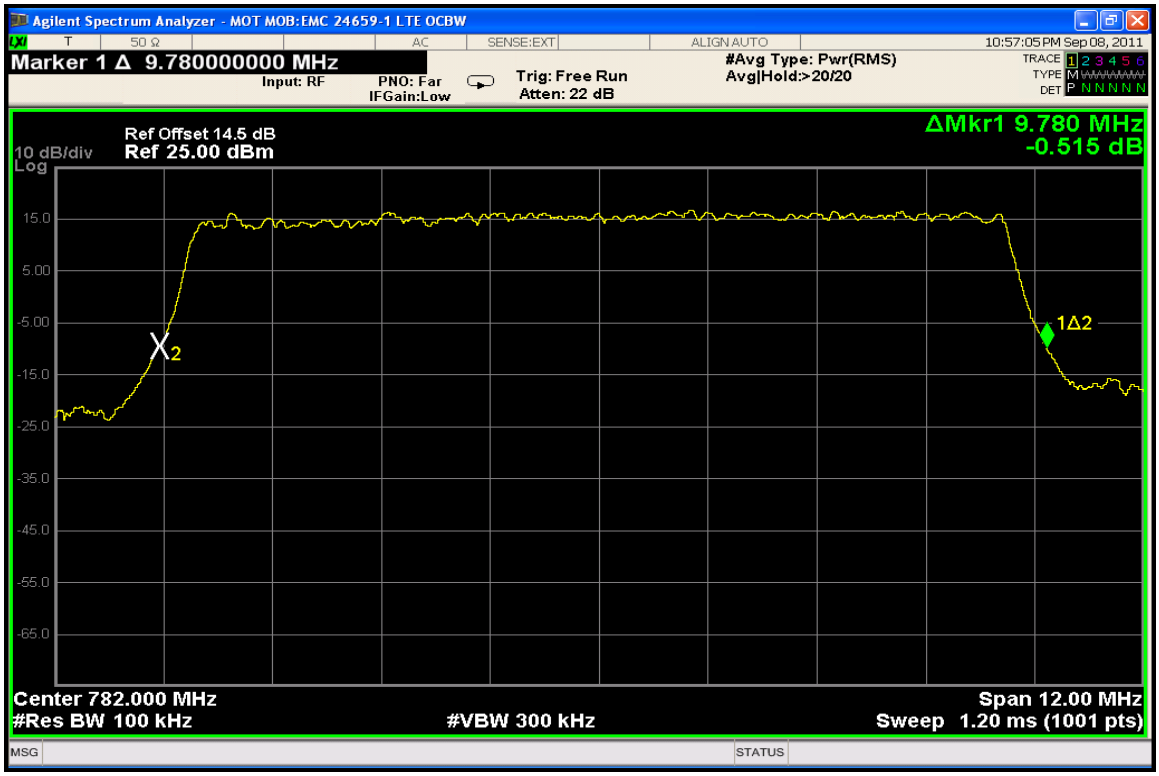


LTE – Band 13 - QPSK, Start RB: 49, 1RB@ high end

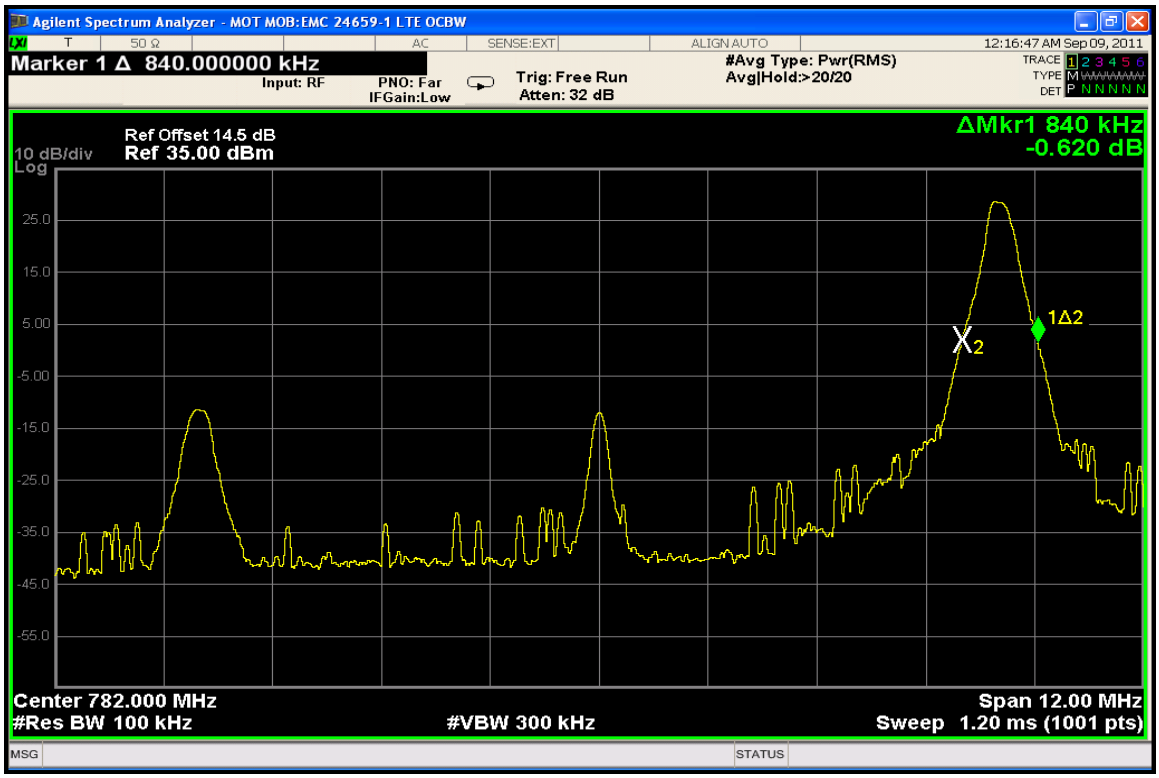


LTE – Band 13 - QPSK, Start RB: 0, 1RB@ low end

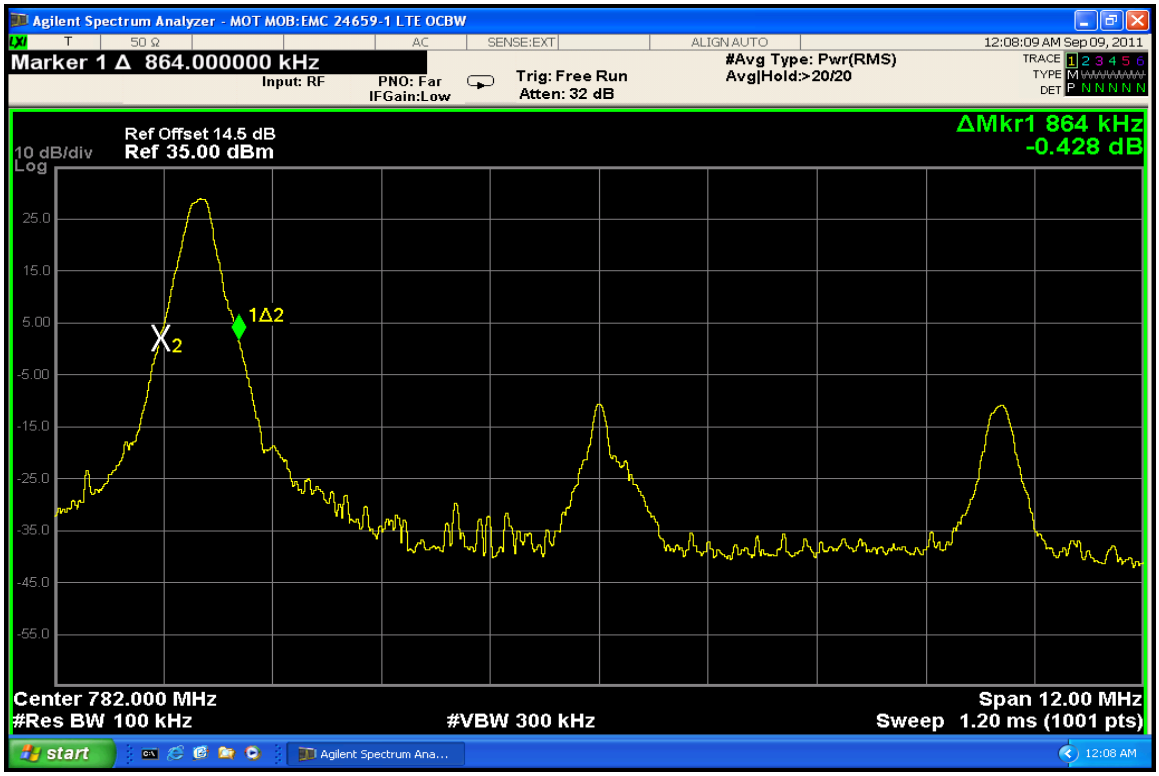
LTE – Band 13 - 16 QAM, Start RB: 13, RB Allocation 50%



LTE – Band 13 - 16 QAM, Start RB: 0, RB Allocation 100%



LTE – Band 13 - 16 QAM, Start RB: 49, 1RB@ high end



LTE – Band 13 - 16 QAM, Start RB: 0, 1RB@ low end

BAND EDGE MEASUREMENTS

§27.53 C (4)

Measurement Procedure

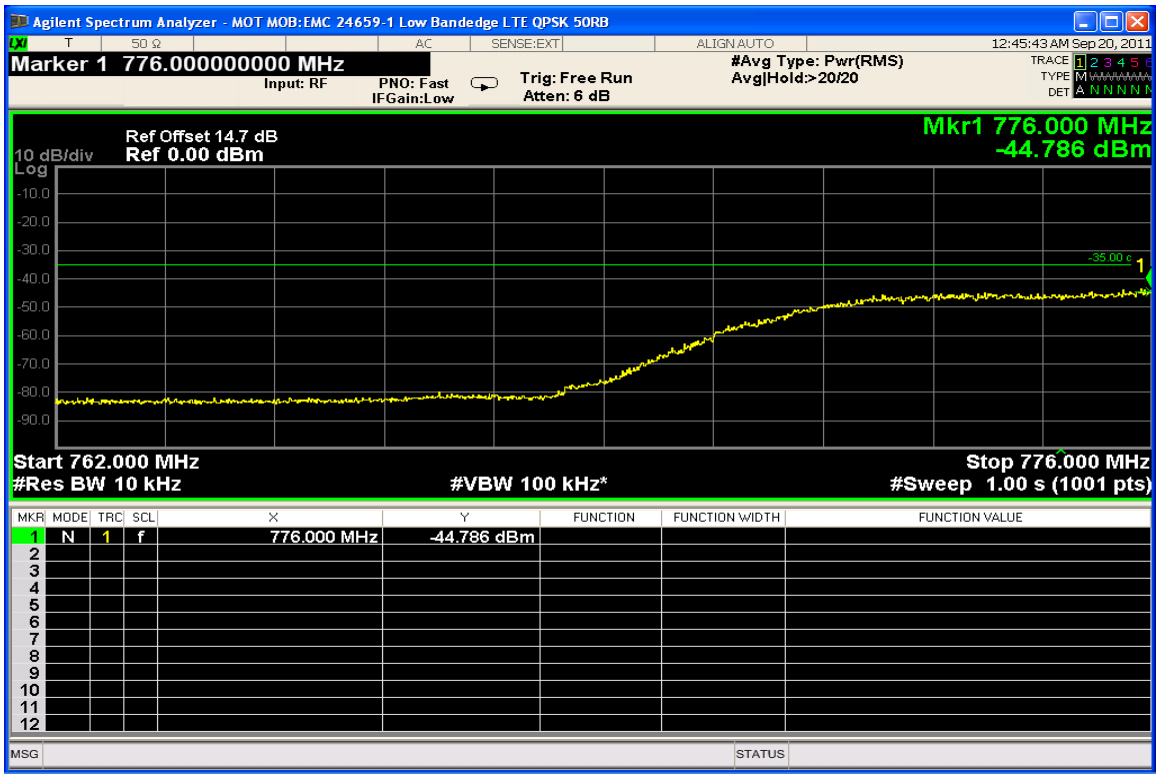
The RF output port of the EUT is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. The amplitude of the spectrum analyzer is corrected for the attenuator and any other applicable losses. The analyzer is set for Peak Detector and each trace is set for Max Hold. The fully charged internal battery was used for the supply voltage.

Any emissions in the band 763–775 MHz and 793–805 MHz, has to be less by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

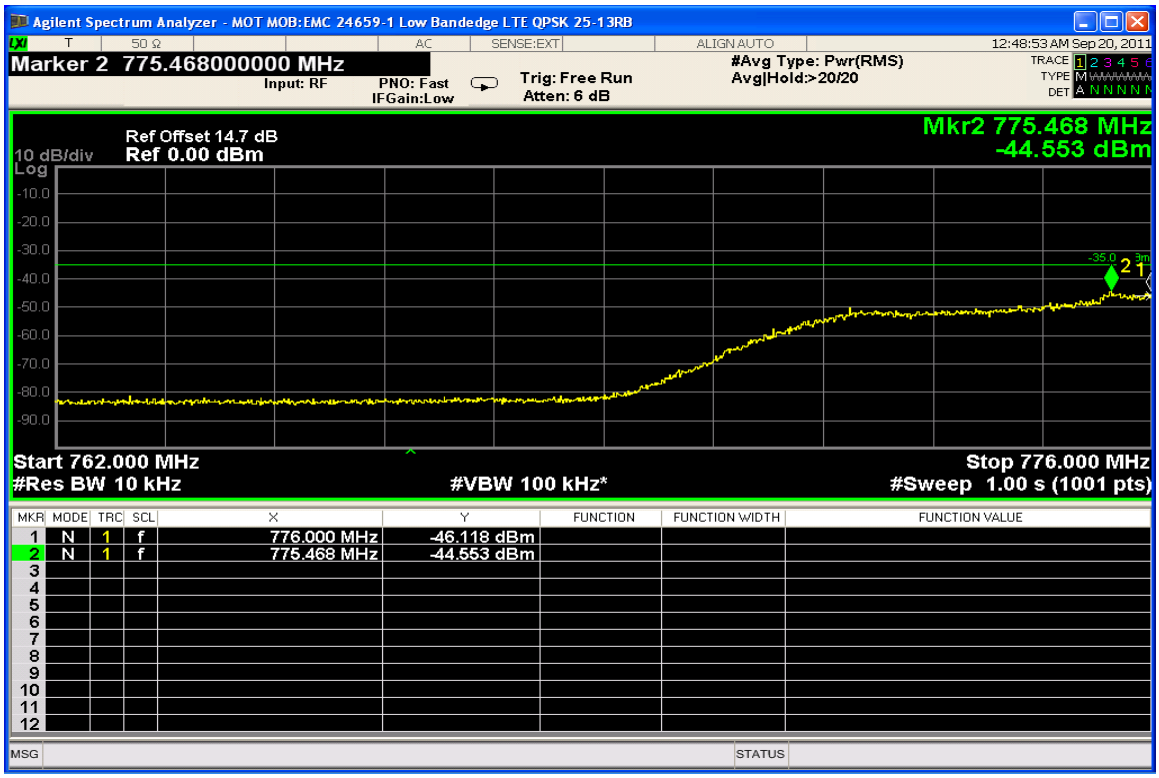
All measurements were performed with a 10 kHz Resolution bandwidth and the limit line was set at -35 dBm.

Measurement Results
Attached

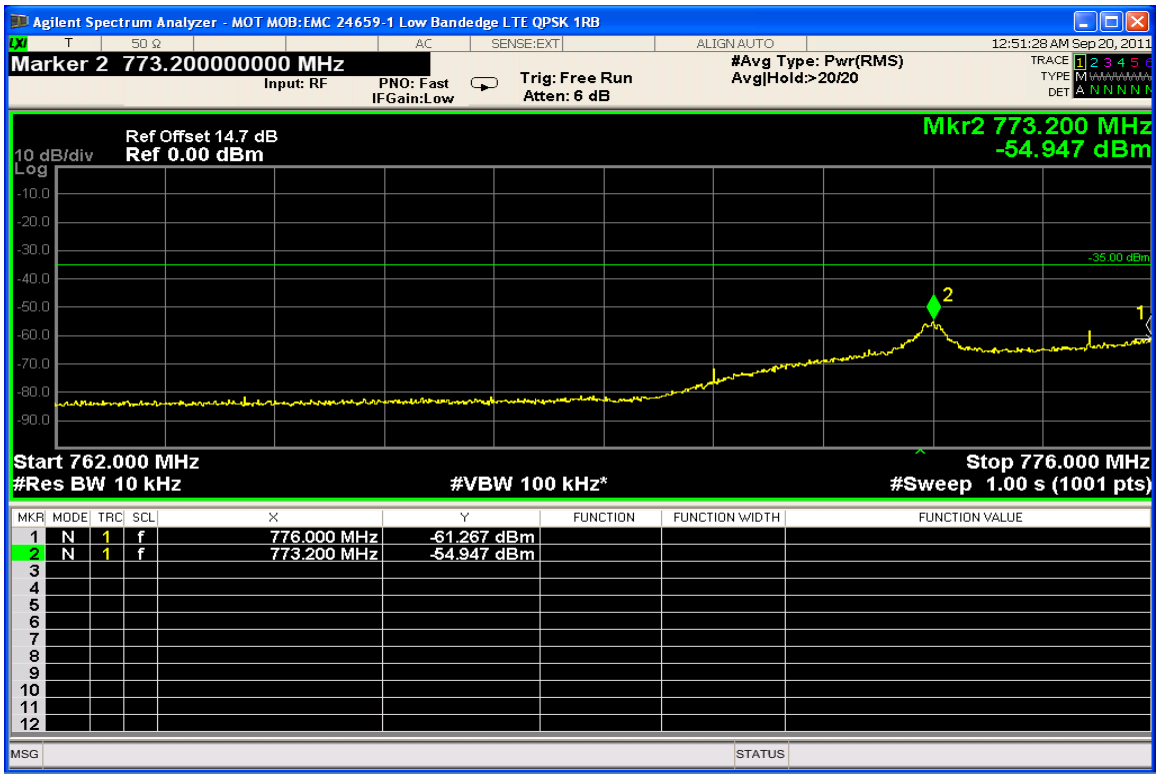
Measurement Results: Low Band Edge



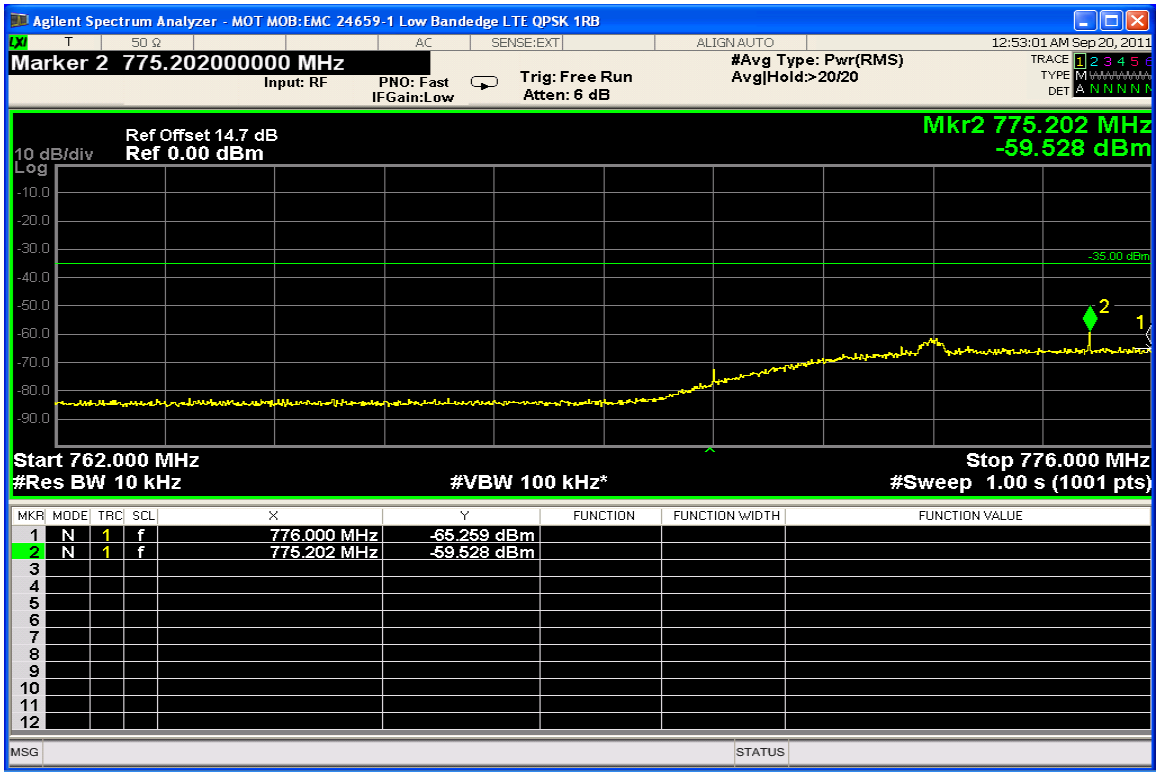
LTE – Band 13 - QPSK, Start RB: 0, RB Allocation 100%



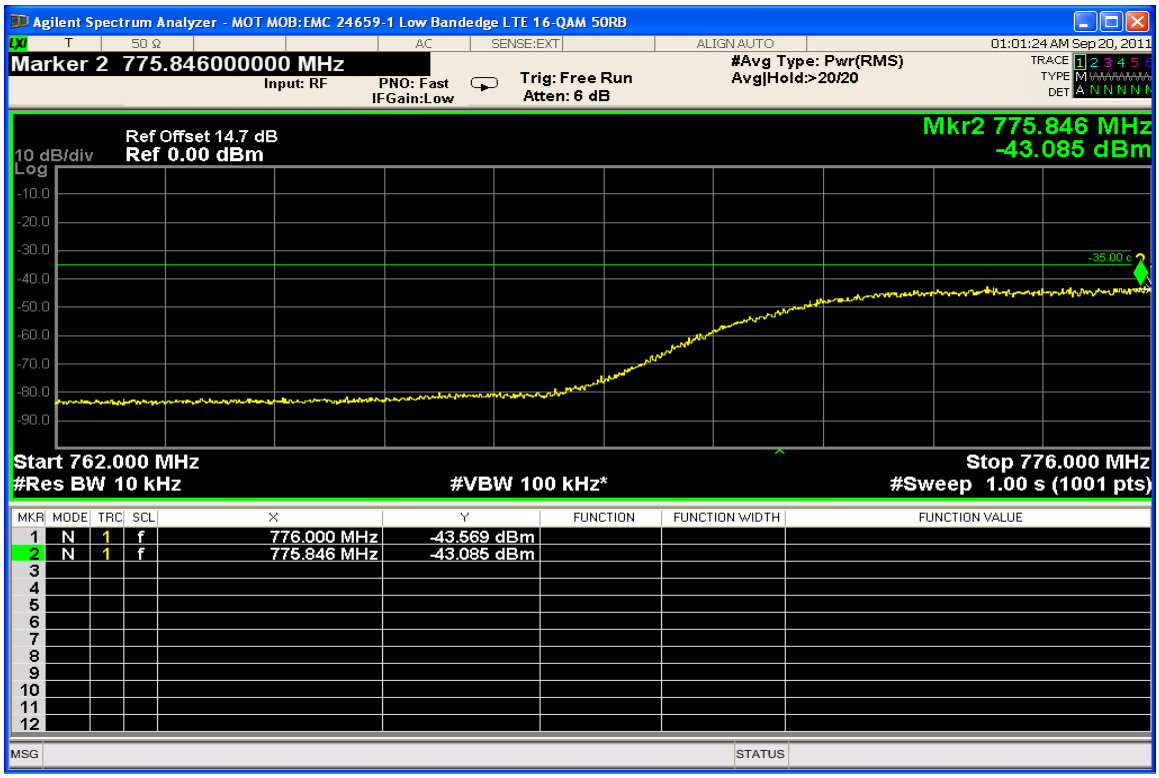
LTE – Band 13 - QPSK, Start RB: 13, RB Allocation 50%



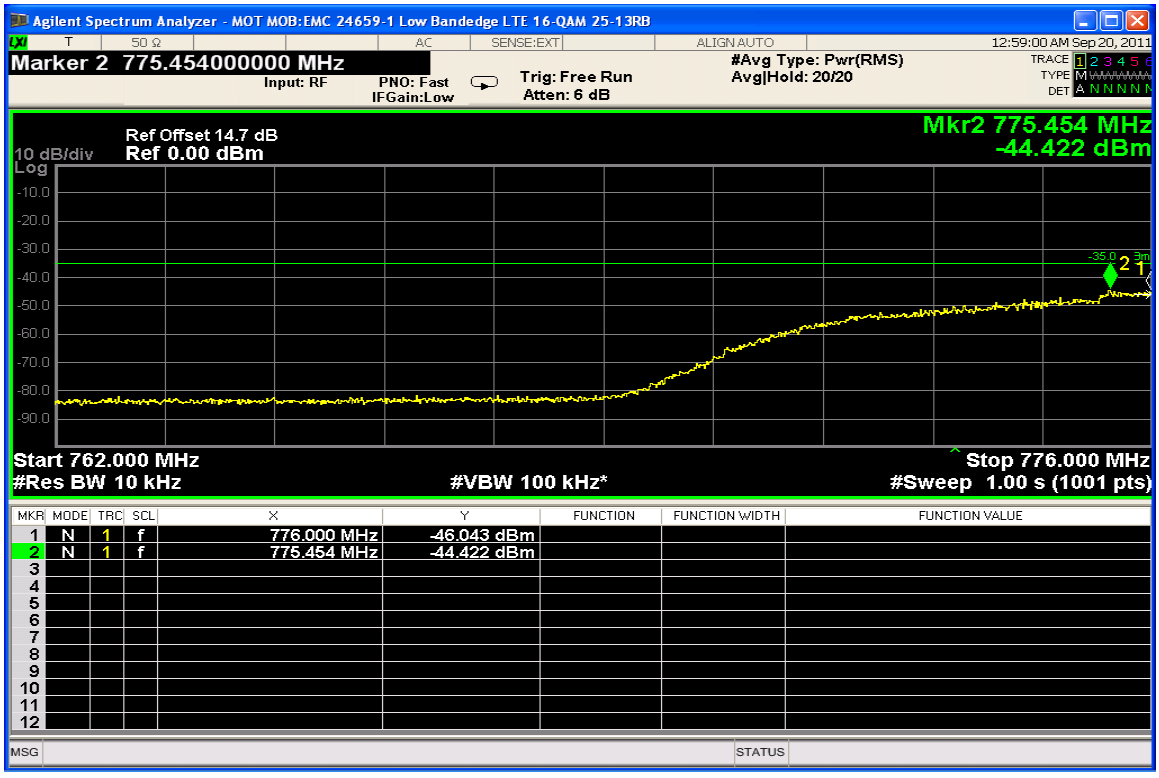
LTE – Band 13 - QPSK, Start RB: 0, 1RB@ low end



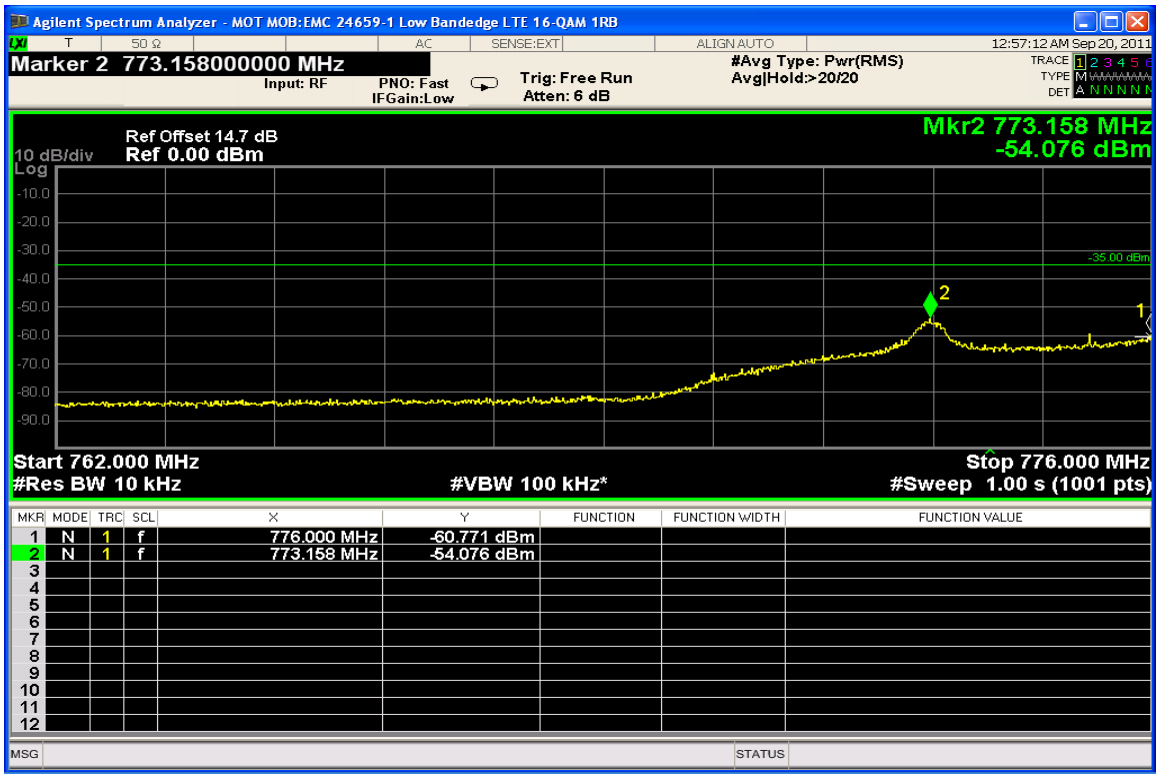
LTE – Band 13 - QPSK, Start RB: 49, 1RB@ high end



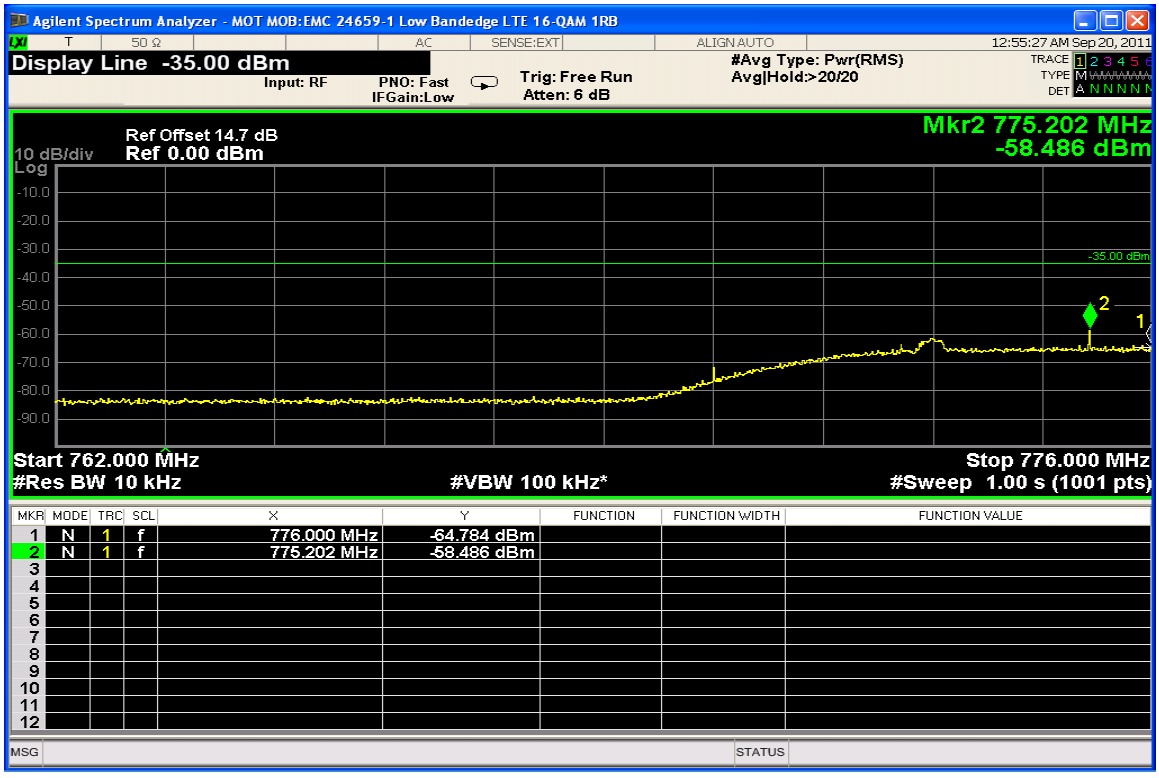
LTE – Band 13 - 16 QAM, Start RB: 0, RB Allocation 100%



LTE – Band 13 – 16 QAM, Start RB: 13, RB Allocation 50%

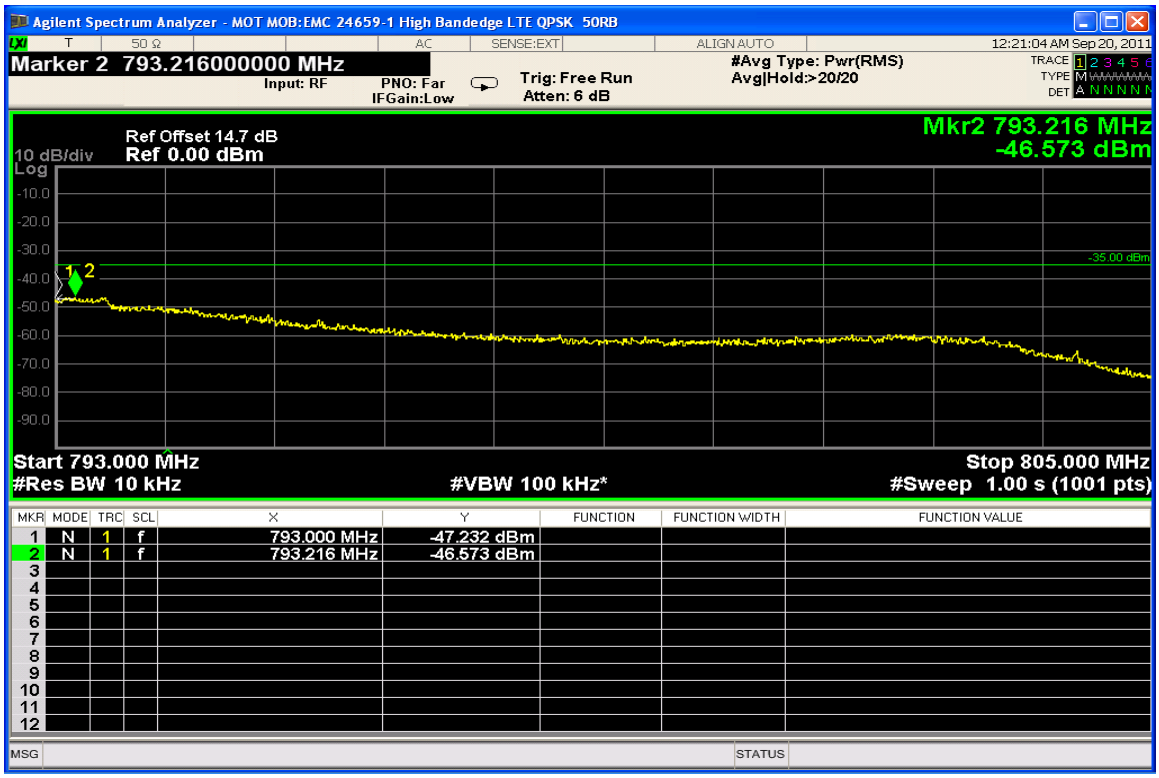


LTE – Band 13 – 16 QAM, Start RB: 0, 1RB@ low end

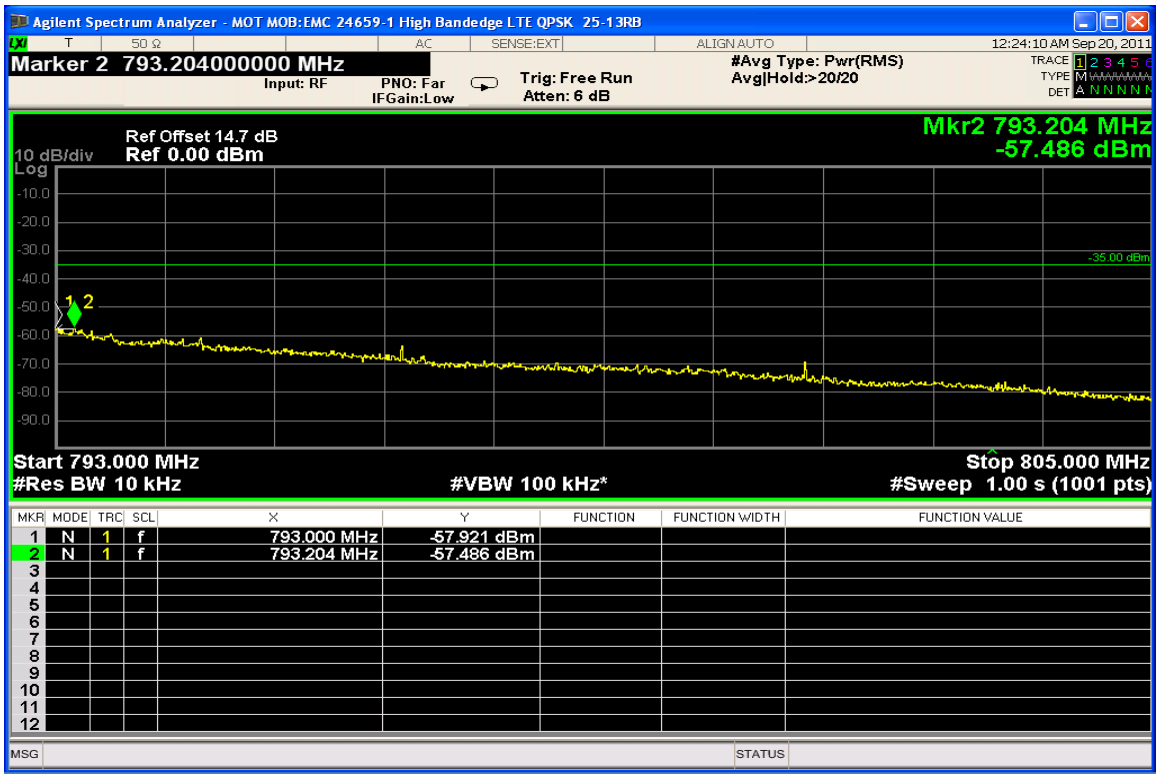


LTE – Band 13 – 16 QAM, Start RB: 49, 1RB@ high end

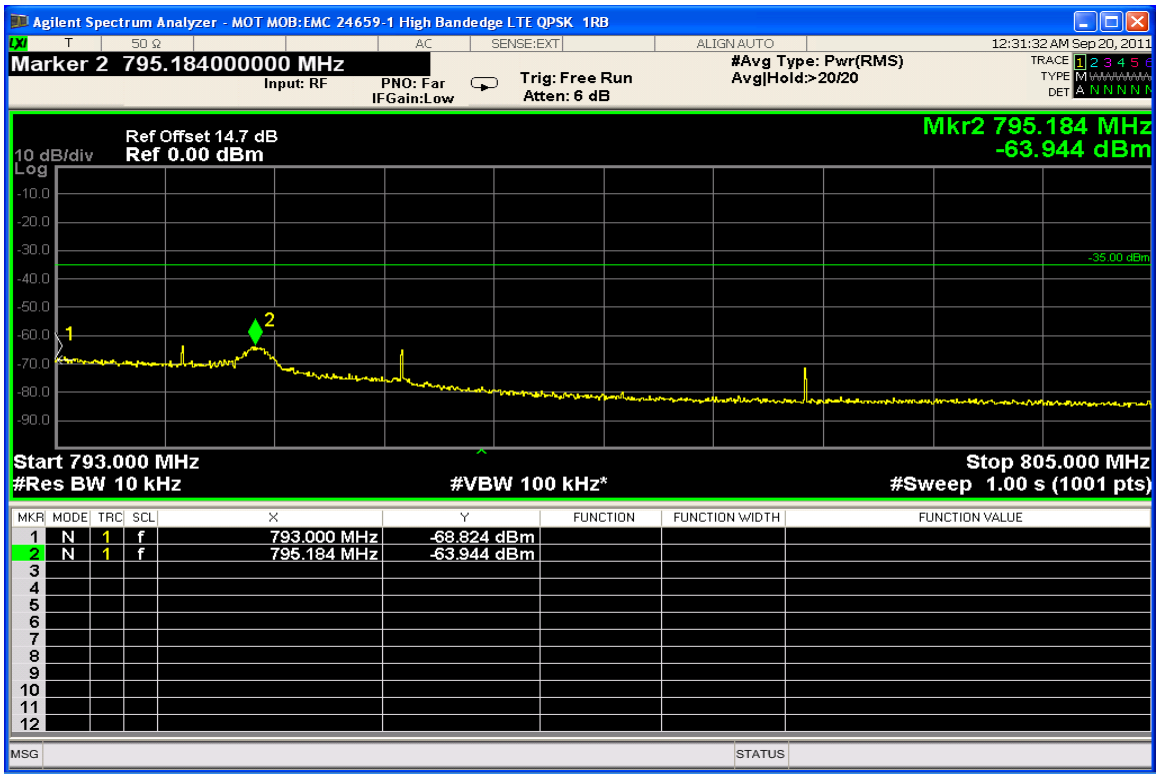
Measurement Results: High Band Edge



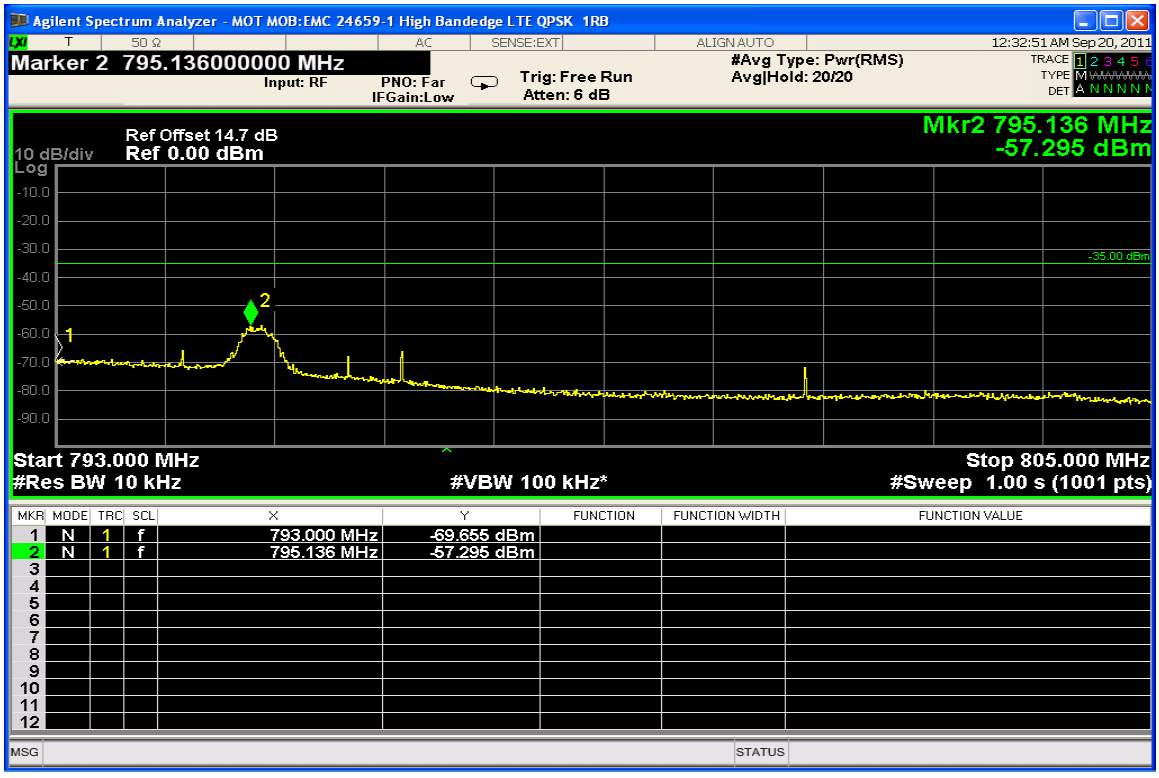
LTE – Band 13 - QPSK, Start RB: 0, RB Allocation 100%



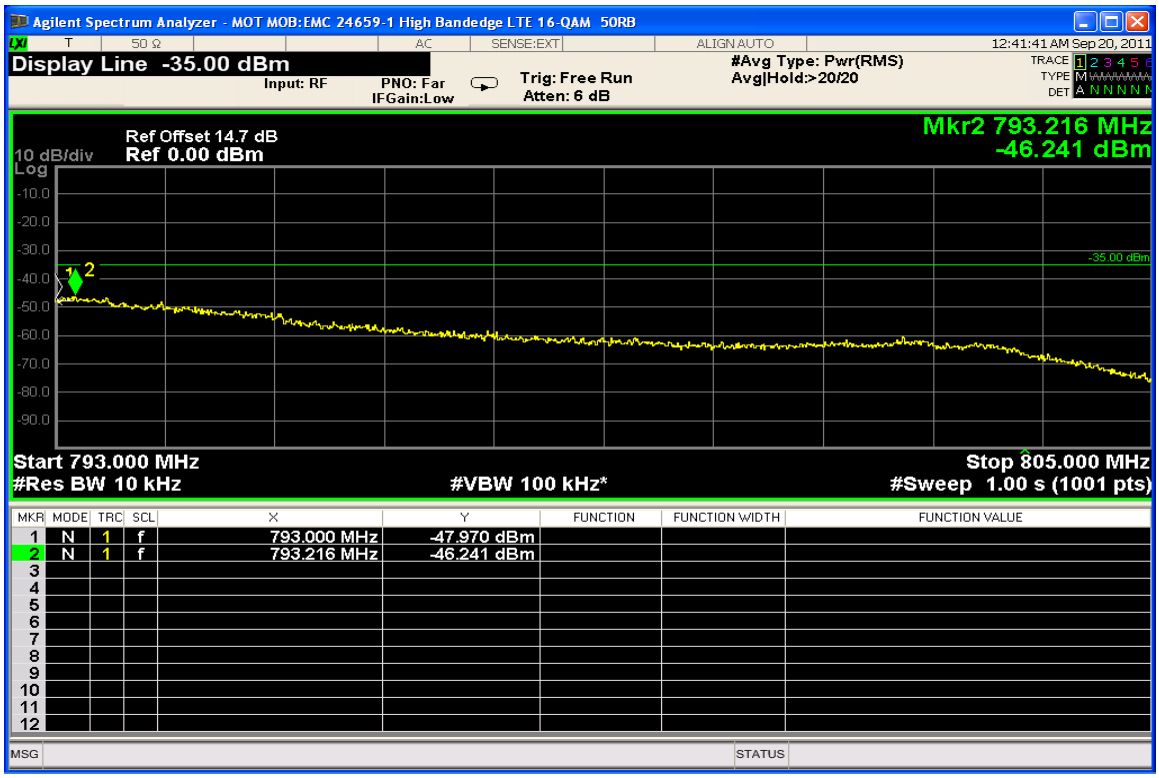
LTE – Band 13 - QPSK, Start RB: 13, RB Allocation 50%



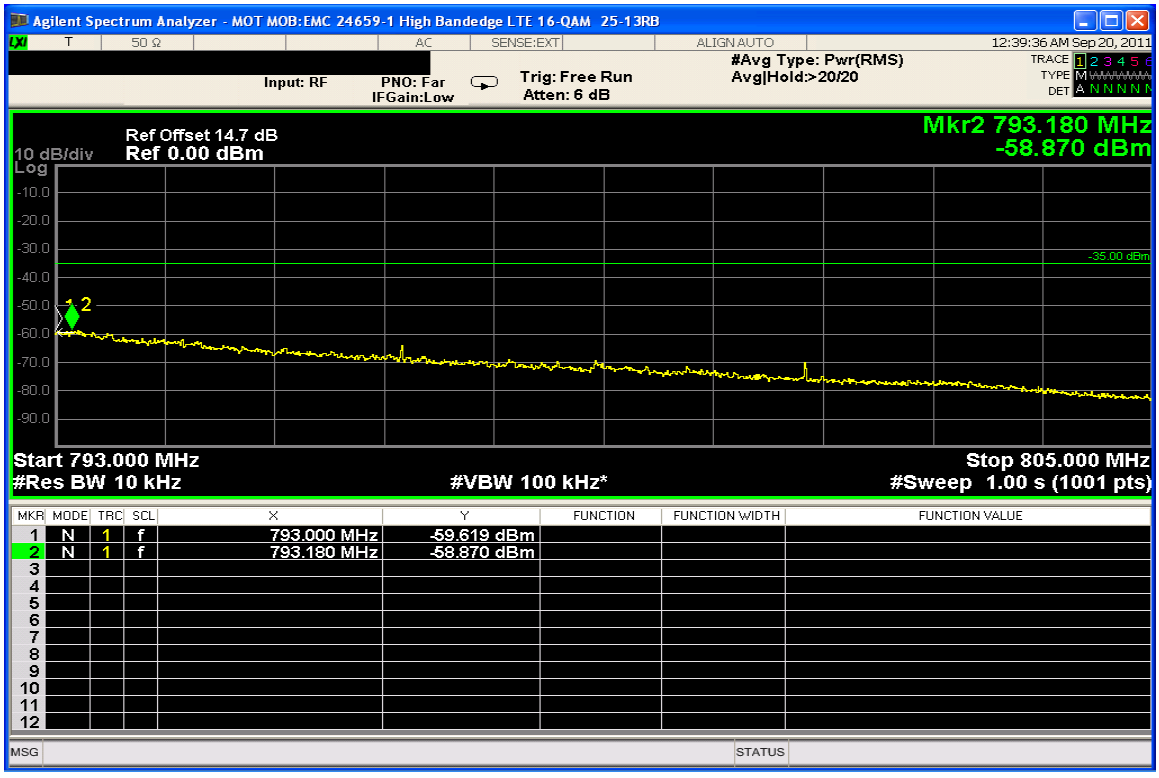
LTE – Band 13 - QPSK, Start RB: 0, 1RB@ low end



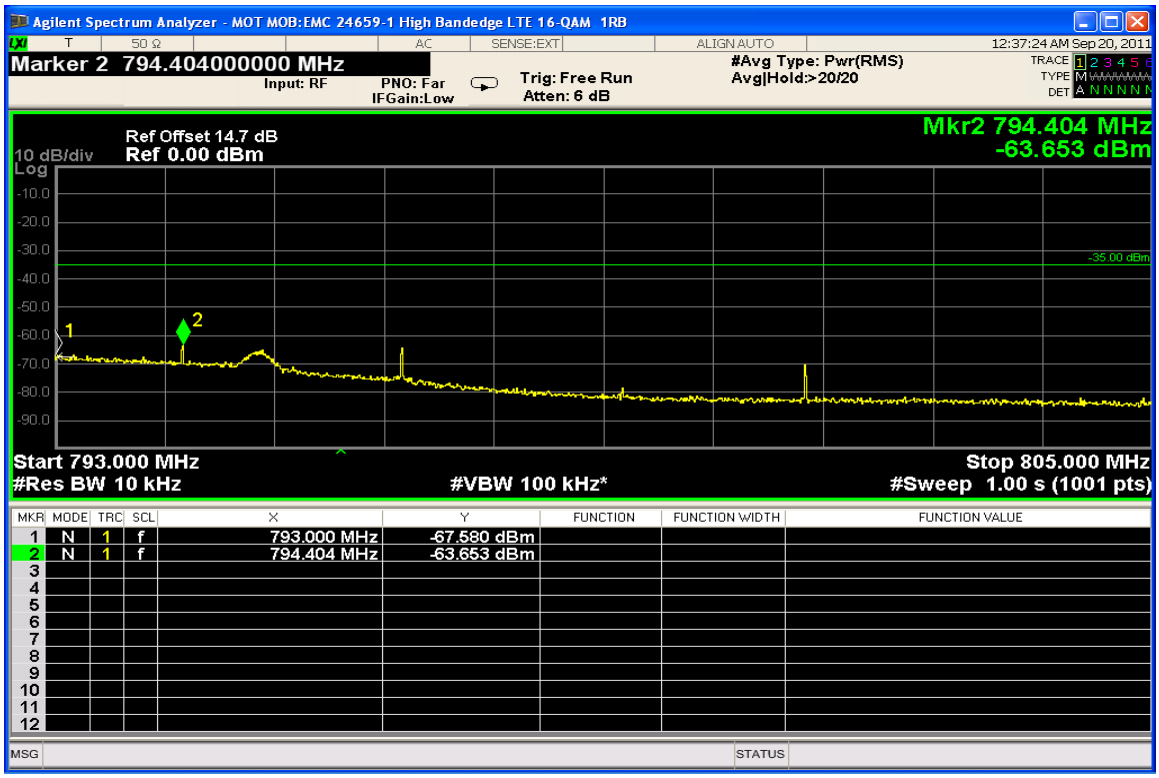
LTE – Band 13 - QPSK, Start RB: 49, 1RB@ high end



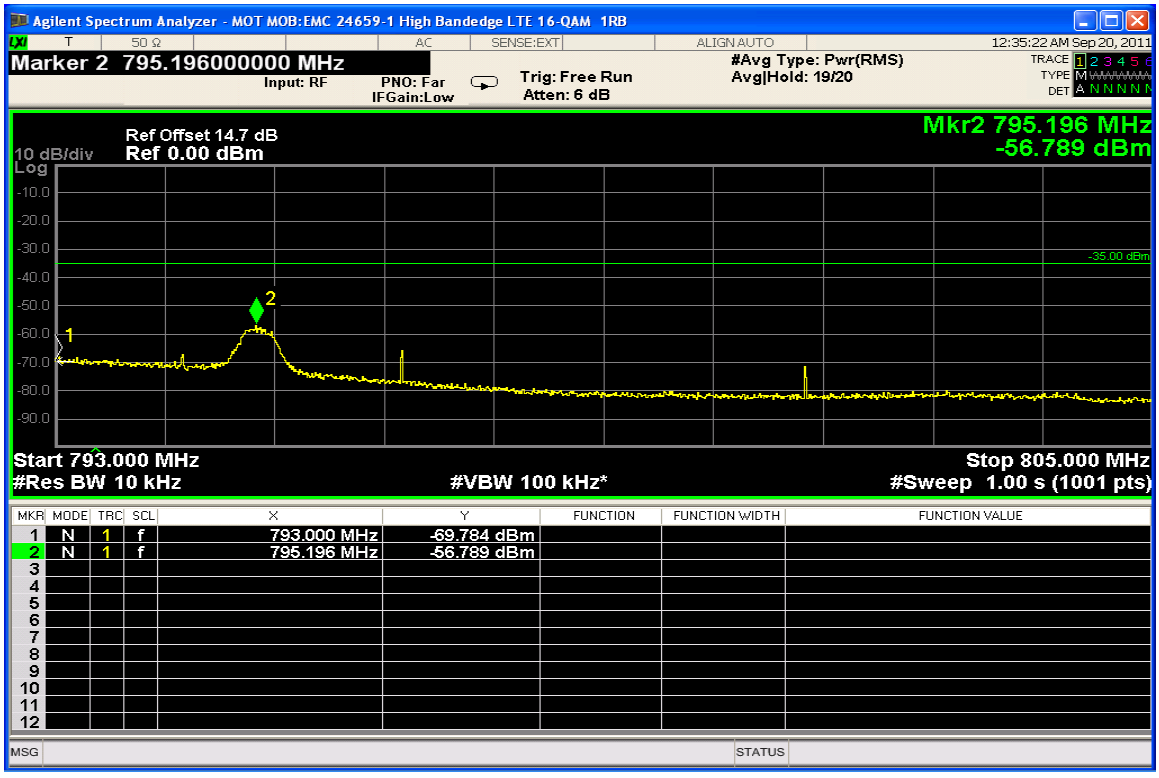
LTE – Band 13 - 16 QAM, Start RB: 0, RB Allocation 100%



LTE – Band 13 – 16 QAM, Start RB: 13, RB Allocation 50%



LTE – Band 13 – 16 QAM, Start RB: 0, 1RB@ low end



LTE – Band 13 – 16 QAM, Start RB: 49, 1RB@ high end

SPURIOUS EMISSIONS AT ANTENNA TERMINALS
§27.53 C (2)

Measurement Procedure

The RF output port of the EUT is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. The fully charged internal battery was used for the supply voltage.

The spectrum was investigated from the lowest frequency signal generated, without going below 9 kHz, up to at least the tenth harmonic of the fundamental or 40 GHz, whichever is lower.

Any emissions outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

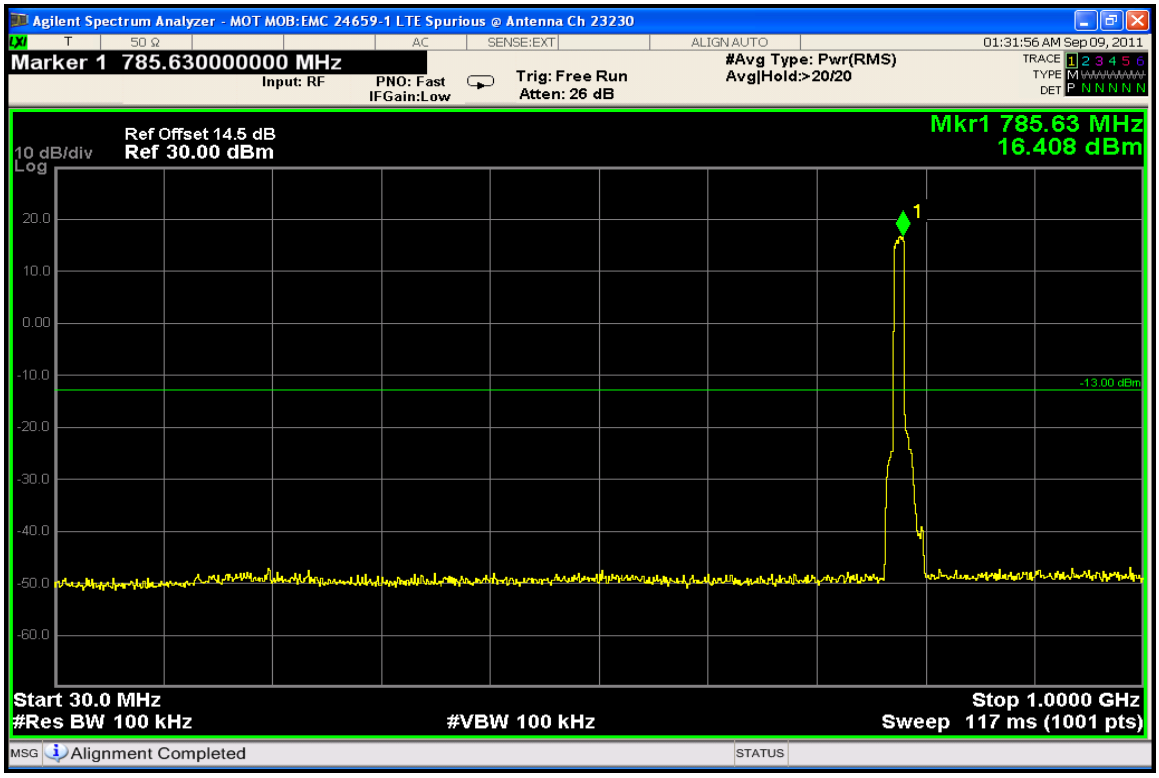
All measurements were performed with a 100 kHz Resolution bandwidth and the limit line was set at -13 dBm.

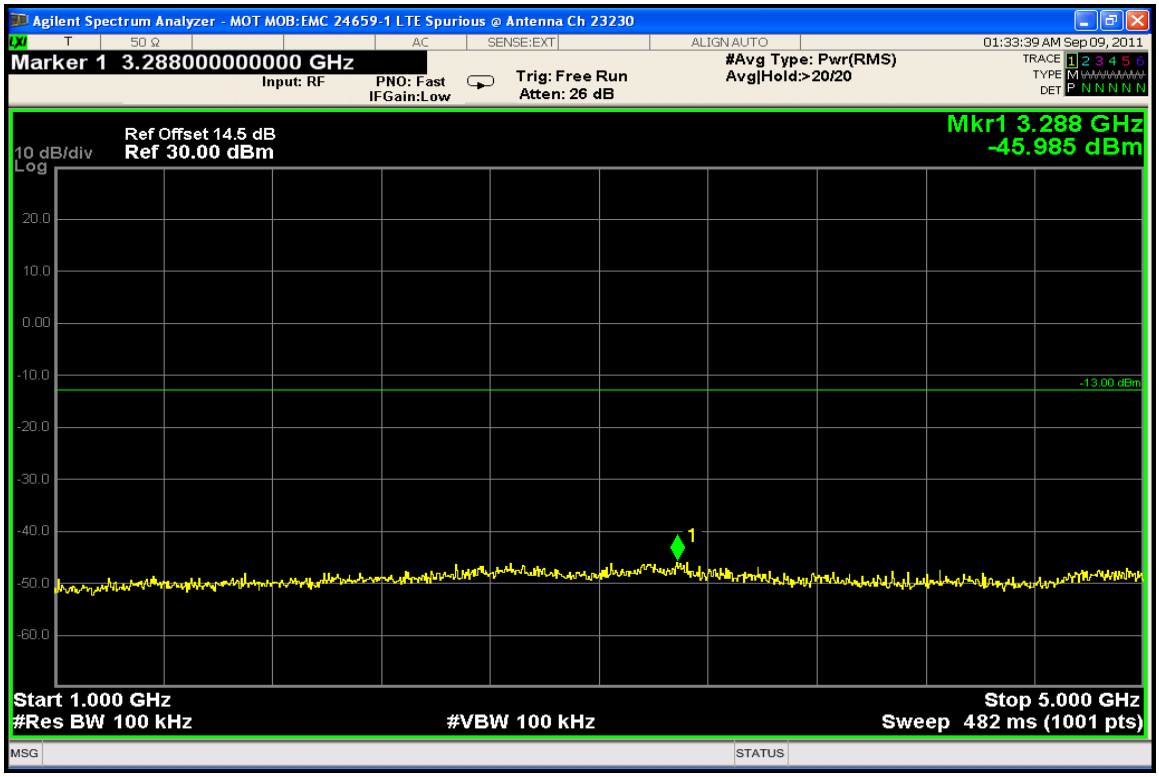
The spectrum analyzer settings were as follows:

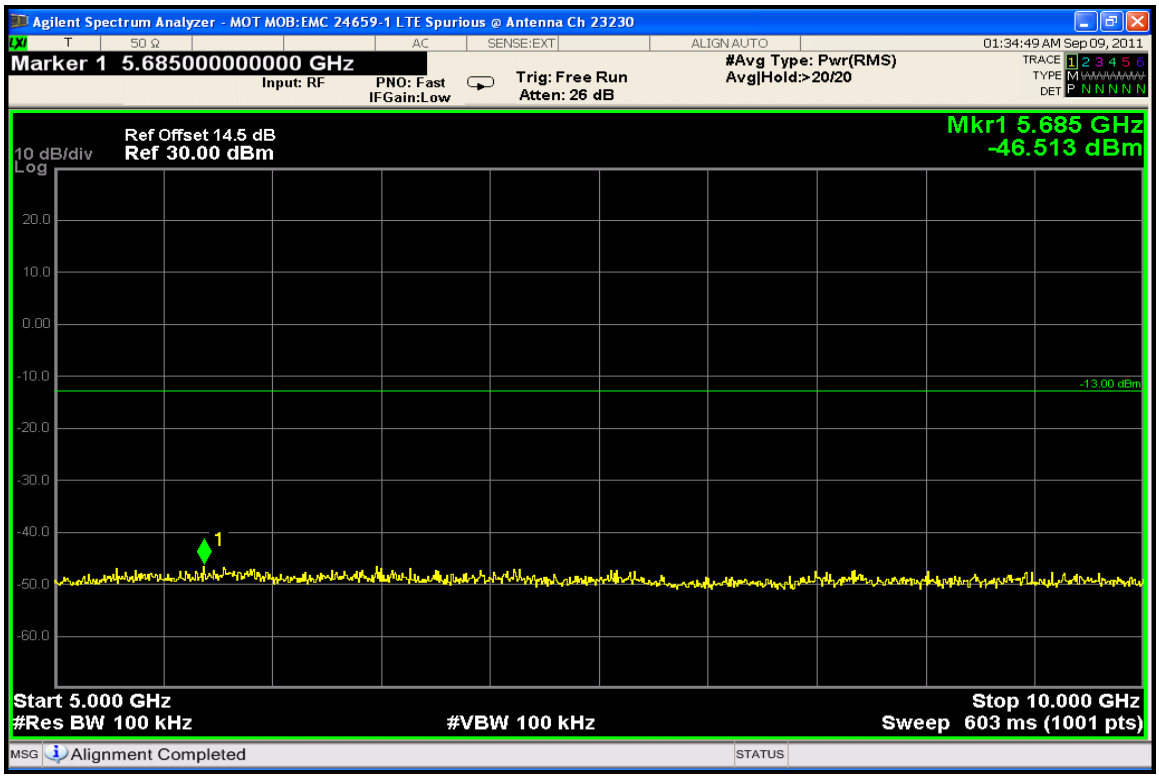
Units	dBm
Divisions	10 dB
Detector	Average Detector
Resolution Bandwidth	100 kHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results

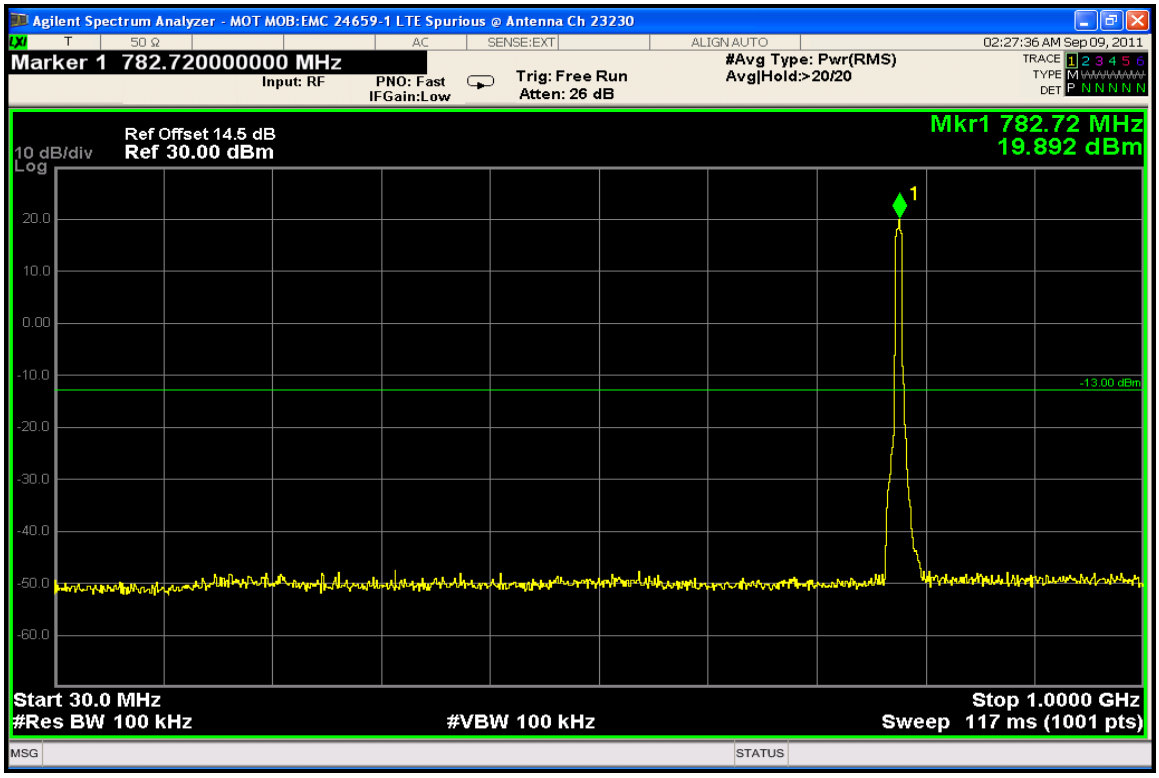
Mode: LTE – Band 13 - QPSK, Start RB: 0, RB Allocation 100%

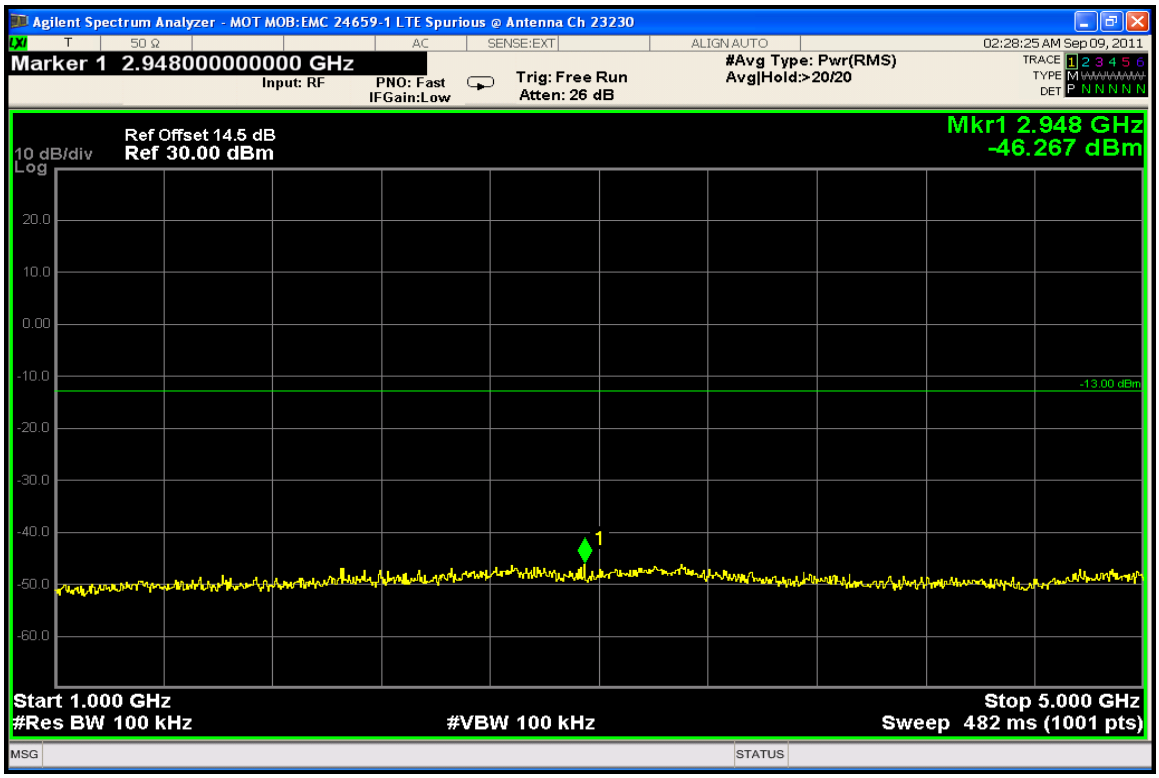


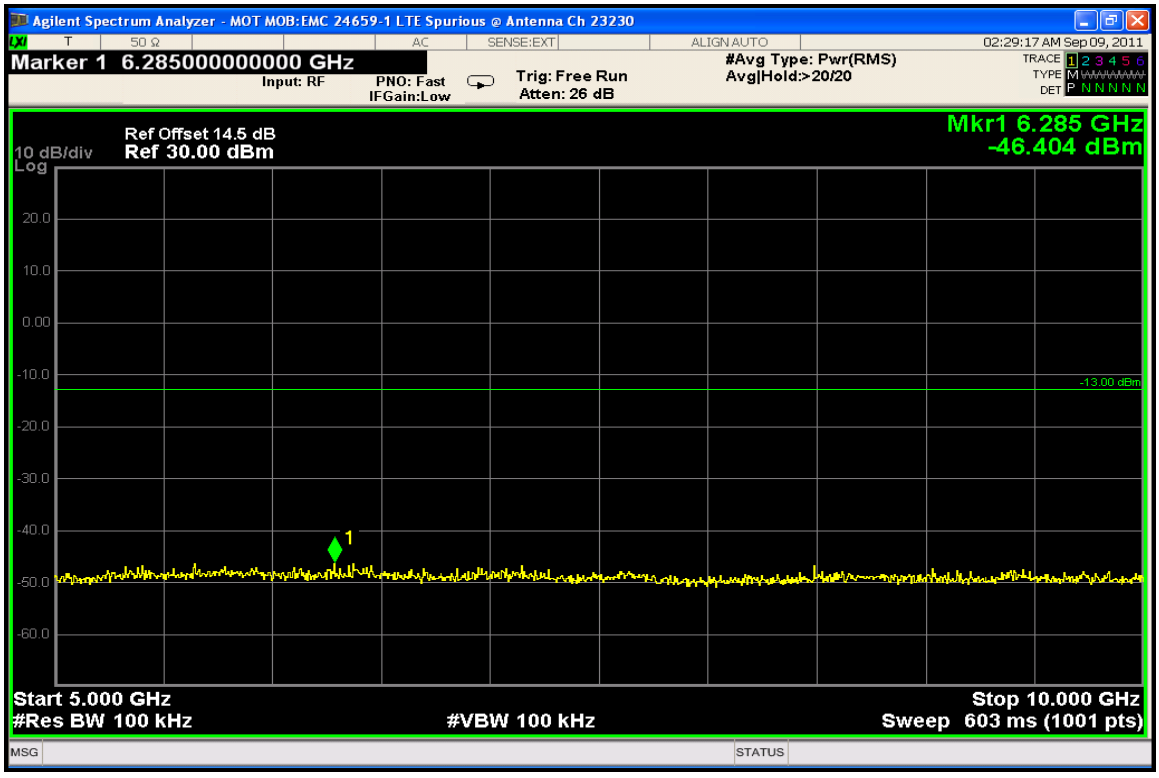




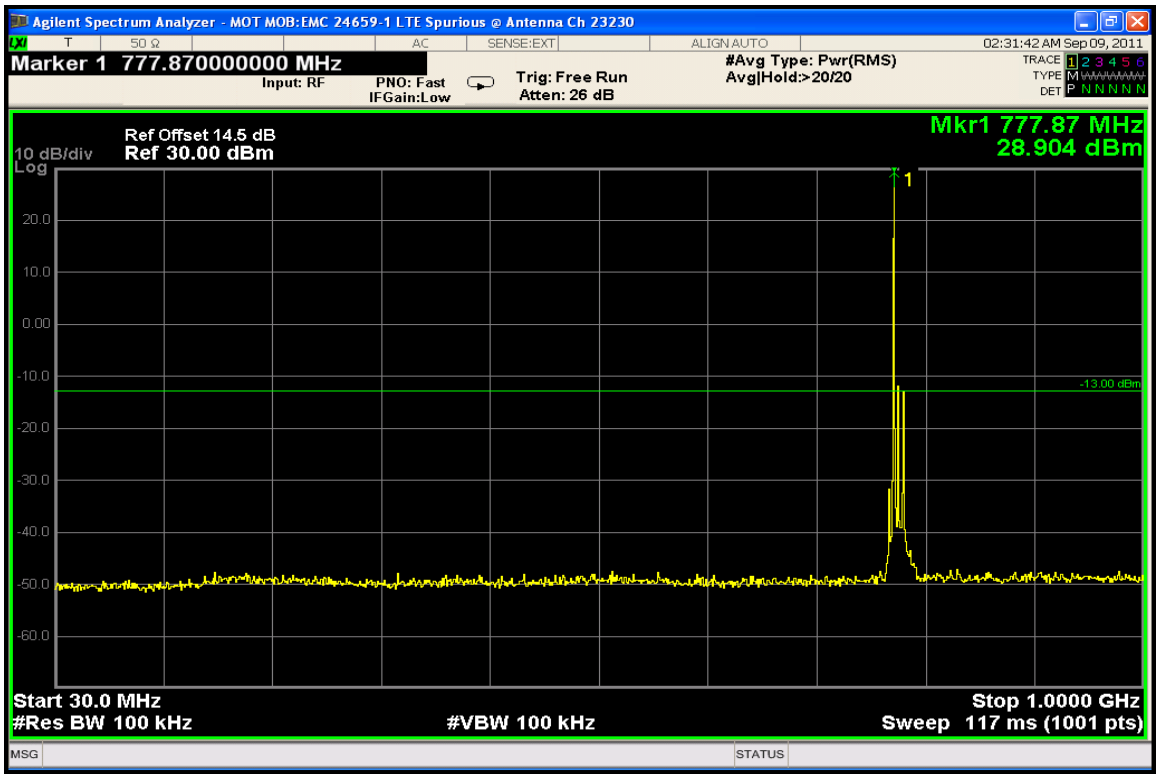
Mode: LTE – Band 13 - QPSK, Start RB: Start RB: 13, RB Allocation 50%

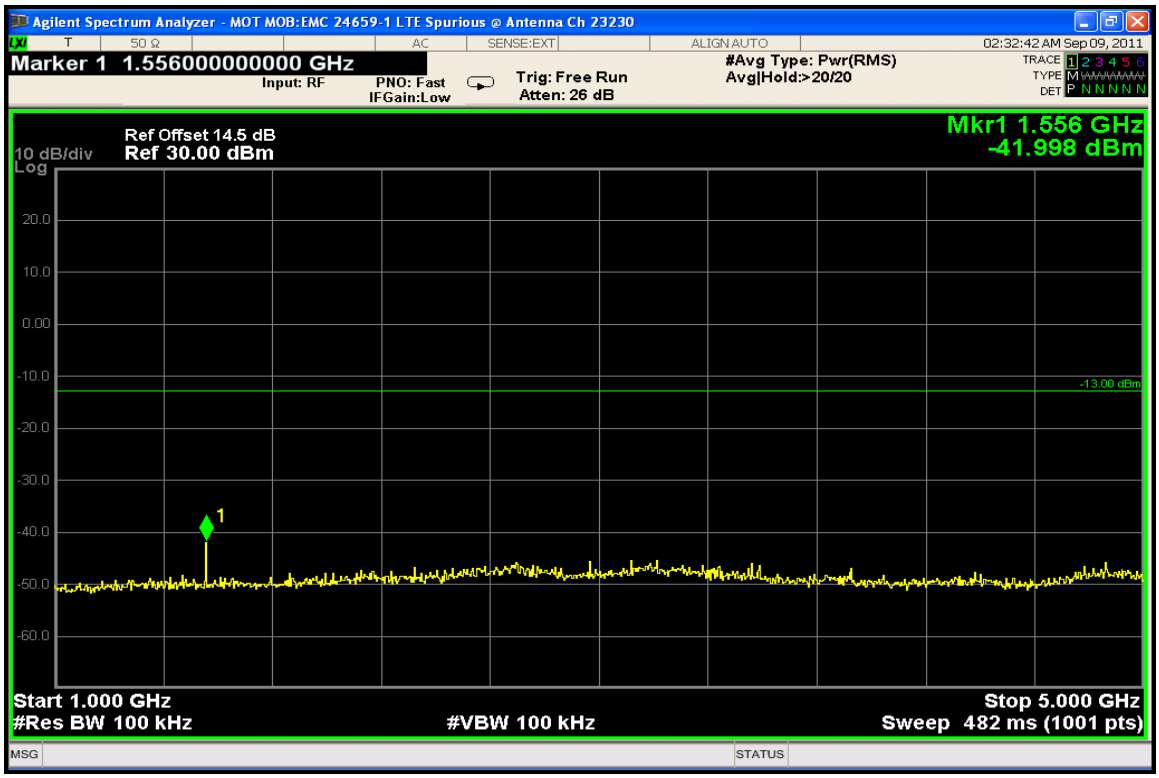


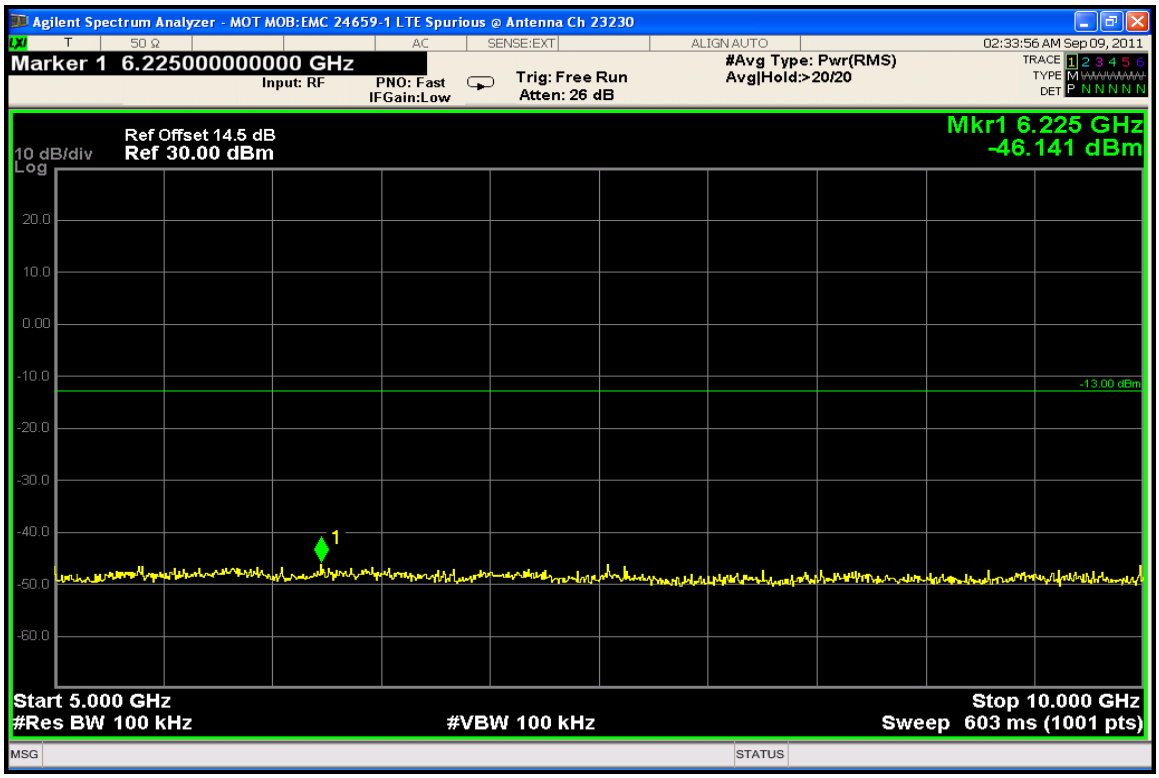

Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
Marker 1 2.948000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
02:28:25 AM Sep 09, 2011
Ref Offset 14.5 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 2.948 GHz
-46.267 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
Sweep 482 ms (1001 pts)
MSG
STATUS


Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
Marker 1 6.285000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
02:29:17 AM Sep 09, 2011
Ref Offset 14.5 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 6.285 GHz
-46.404 dBm
-13.00 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
MSG
STATUS

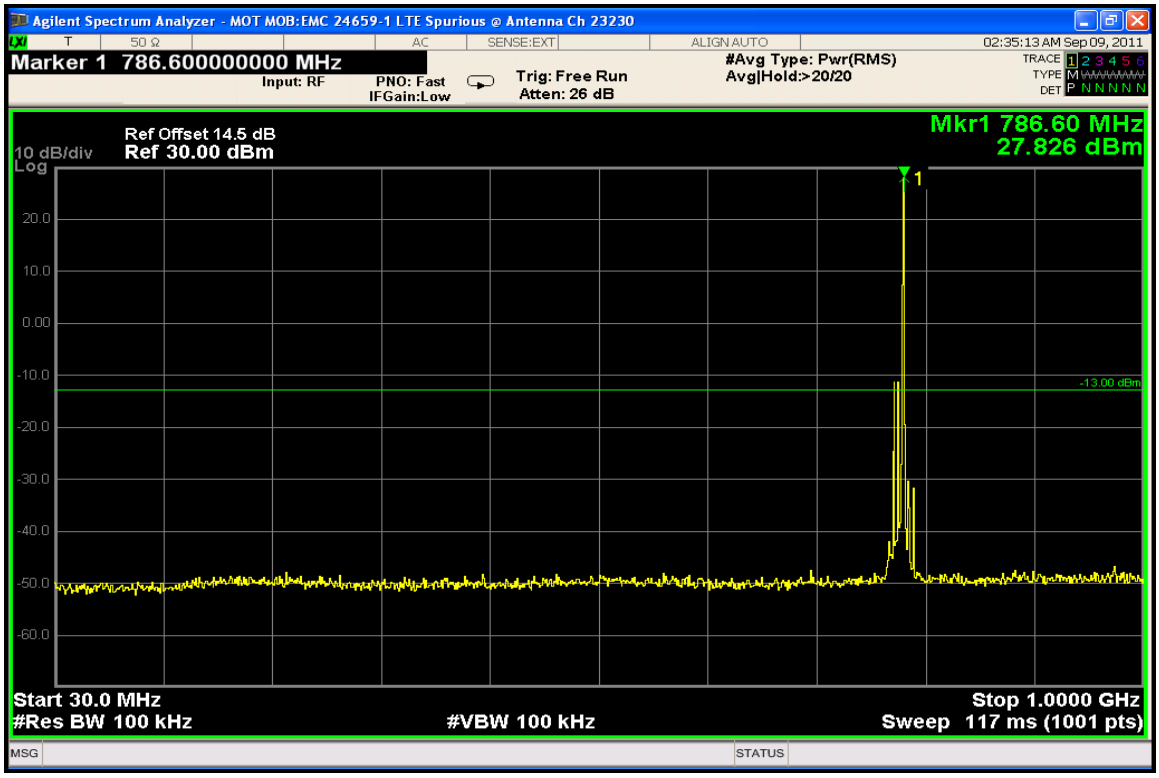
Mode: LTE – Band 13 - QPSK, Start RB: 0, 1RB@ low end

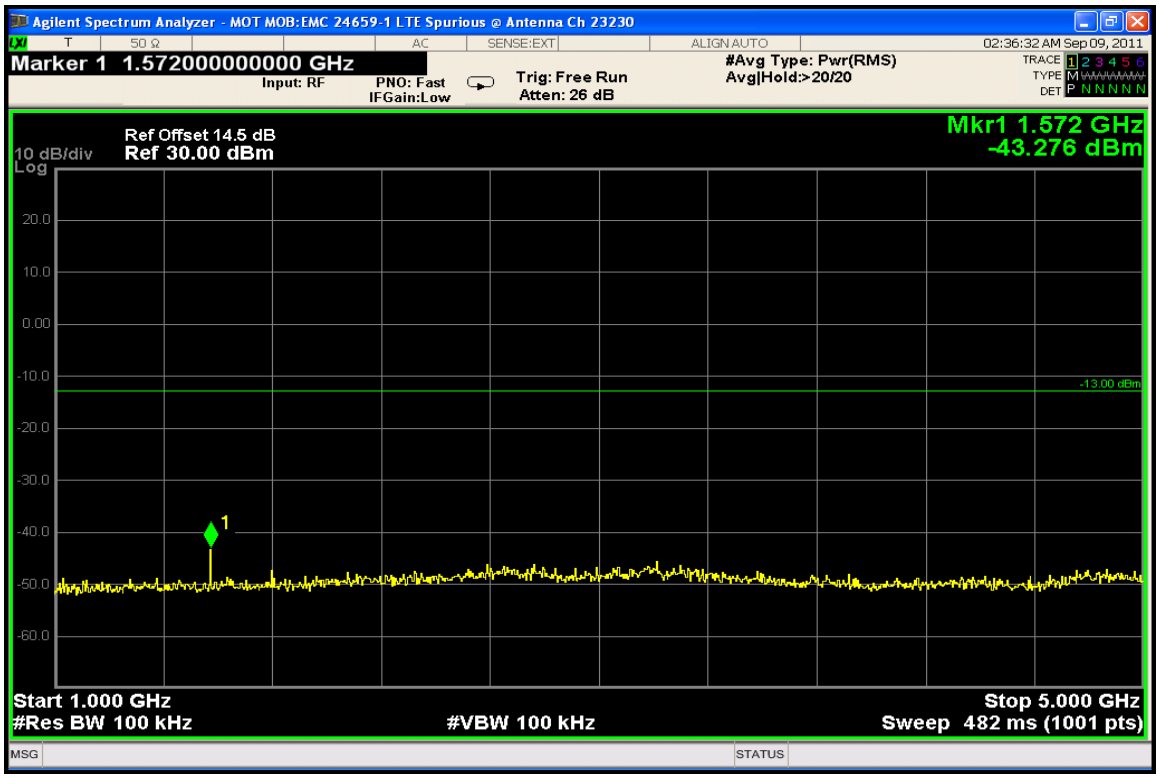


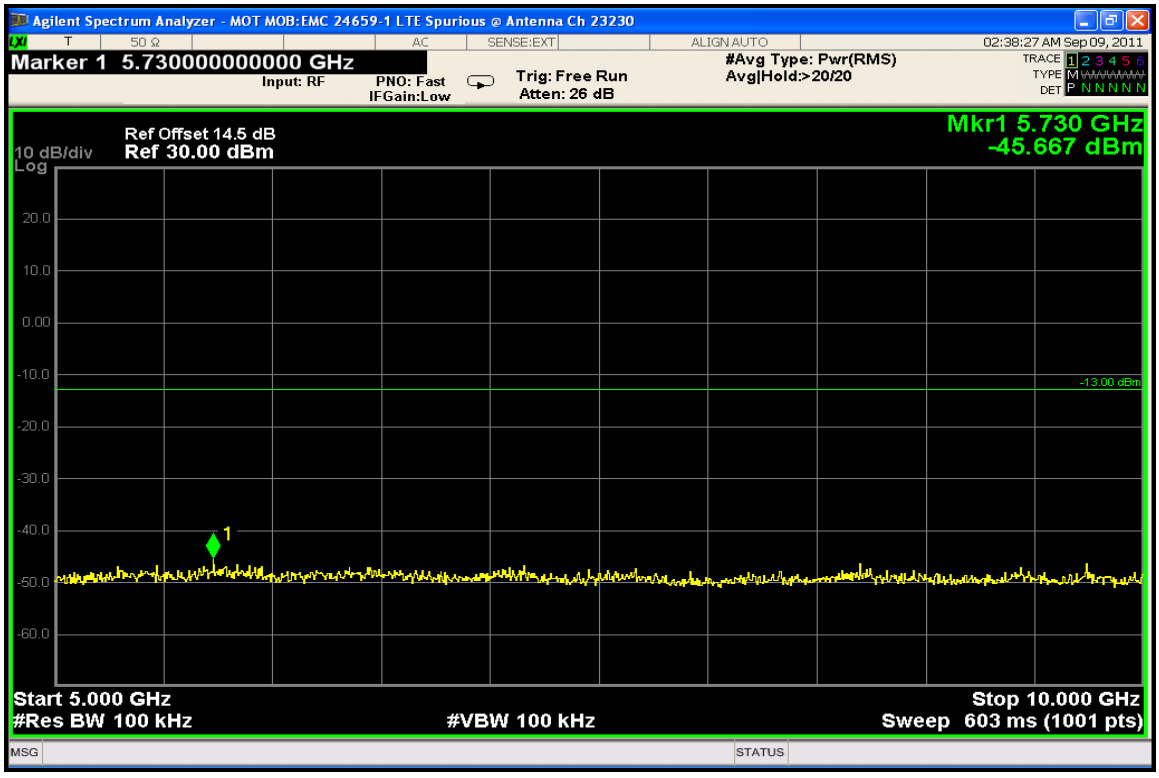




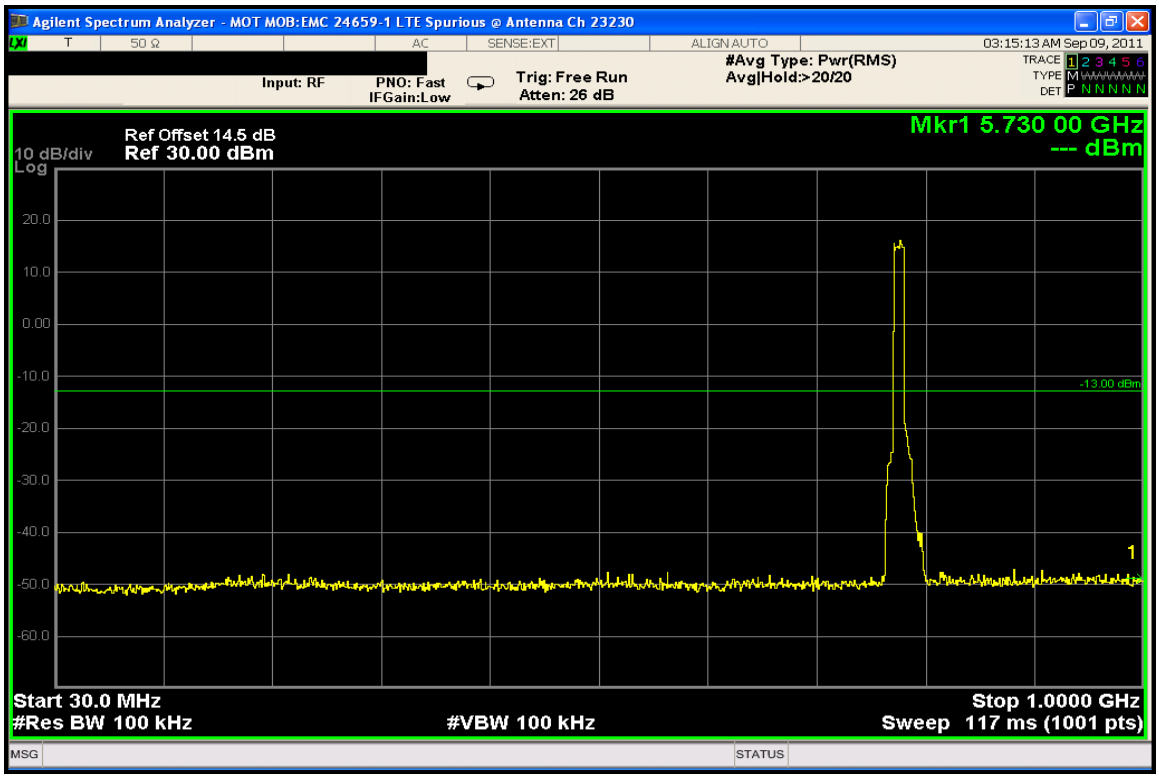
Mode: LTE – Band 13 - QPSK, Start RB: 49, 1RB@ high end

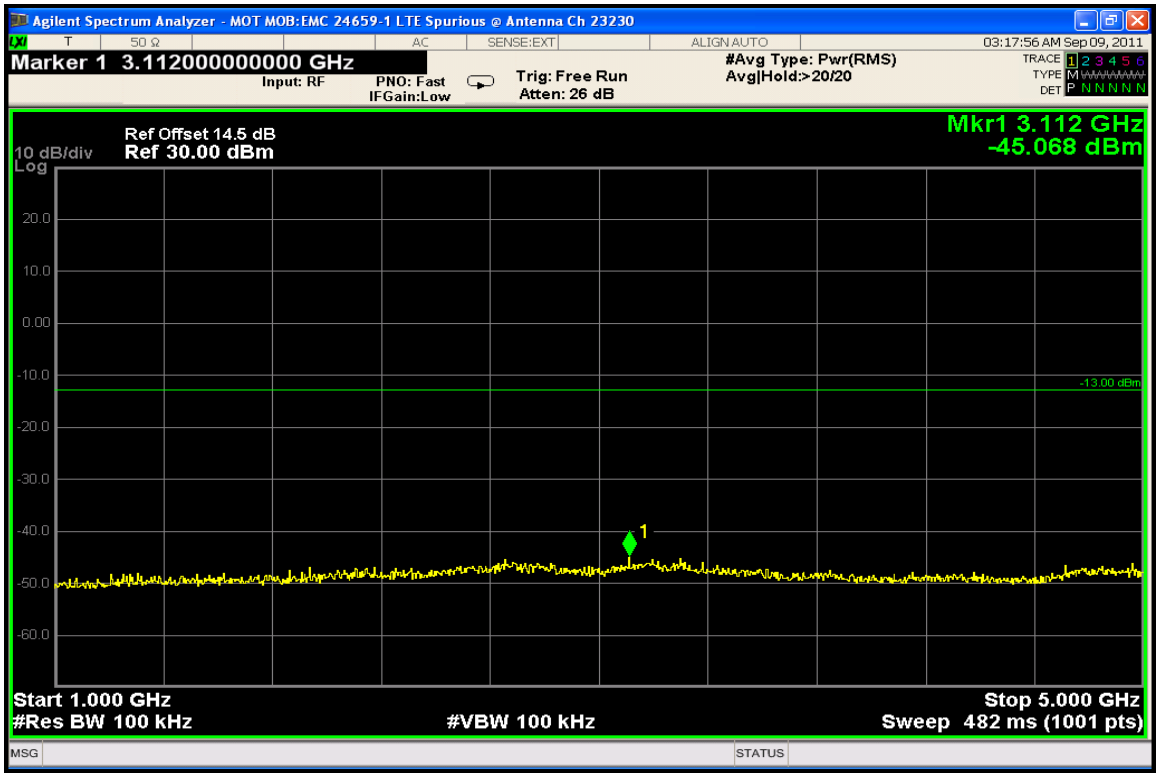


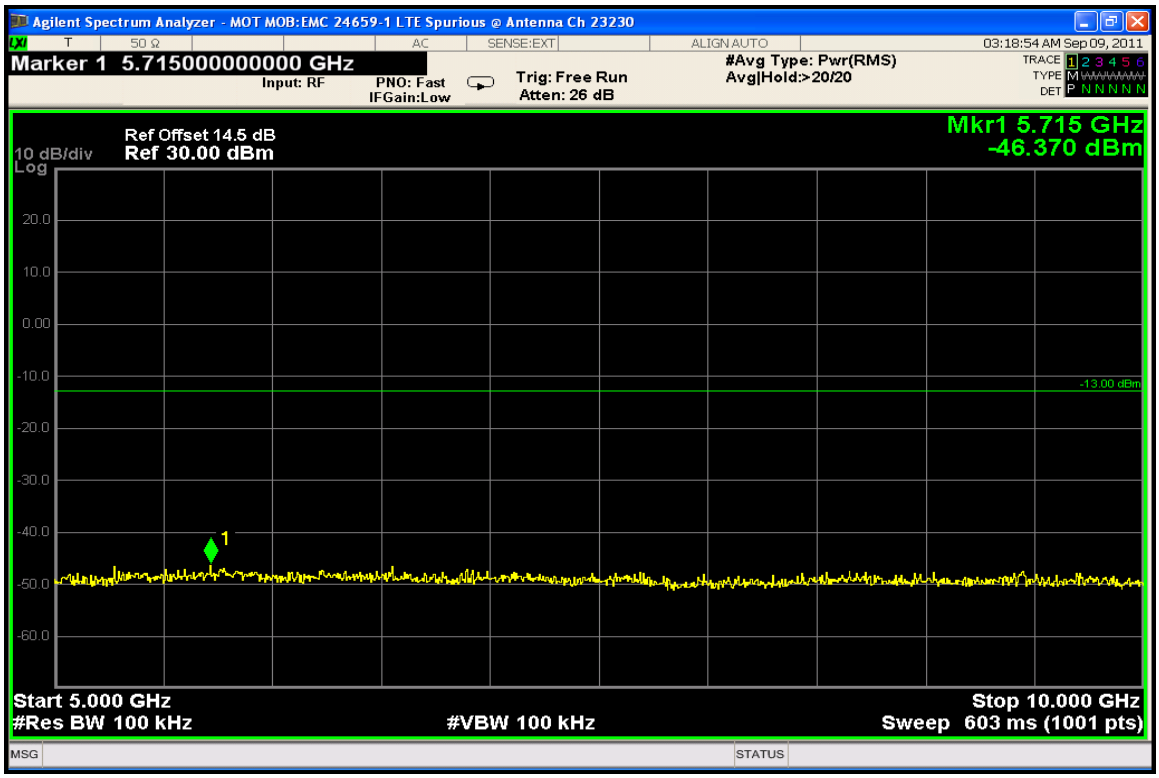

Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
02:36:32 AM Sep 09, 2011
Marker 1 1.572000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
Ref Offset 14.5 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 1.572 GHz
-43.276 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
Sweep 482 ms (1001 pts)
MSG
STATUS


Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
02:38:27 AM Sep 09, 2011
Marker 1 5.730000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
Ref Offset 14.5 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 5.730 GHz
-45.667 dBm
-13.00 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
MSG
STATUS

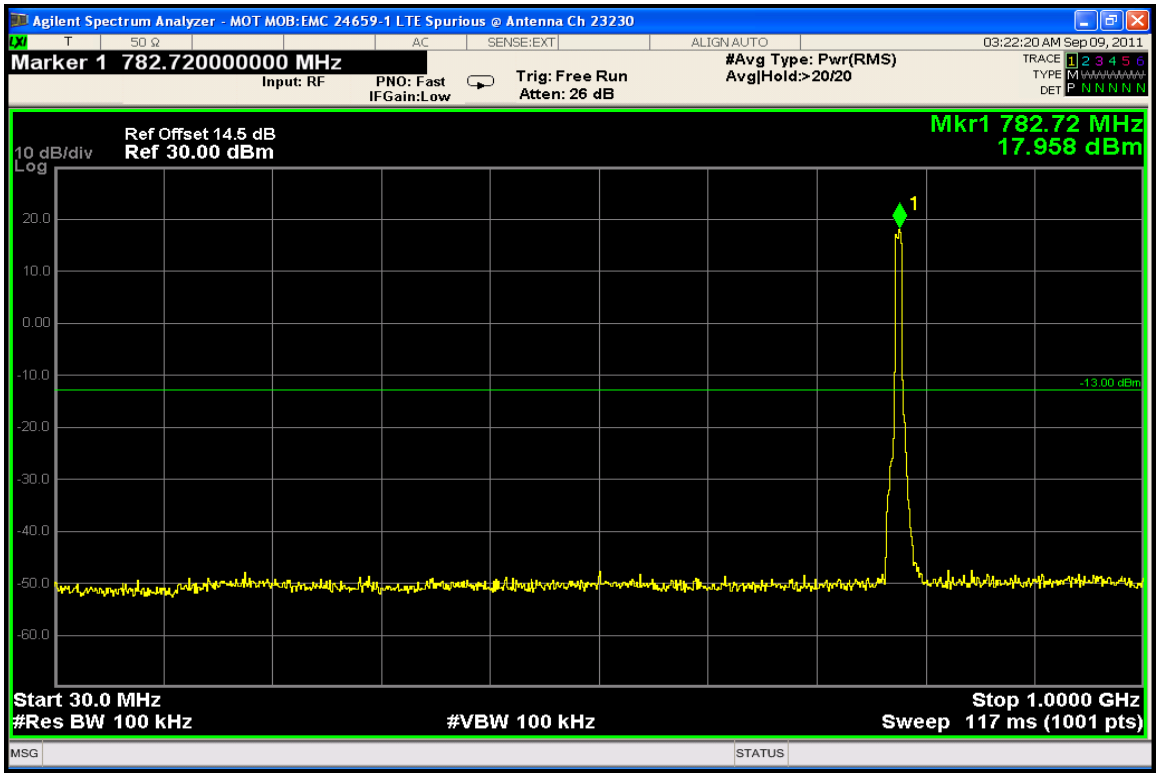
Mode: LTE – Band 13 - 16 QAM, Start RB: 0, RB Allocation 100%

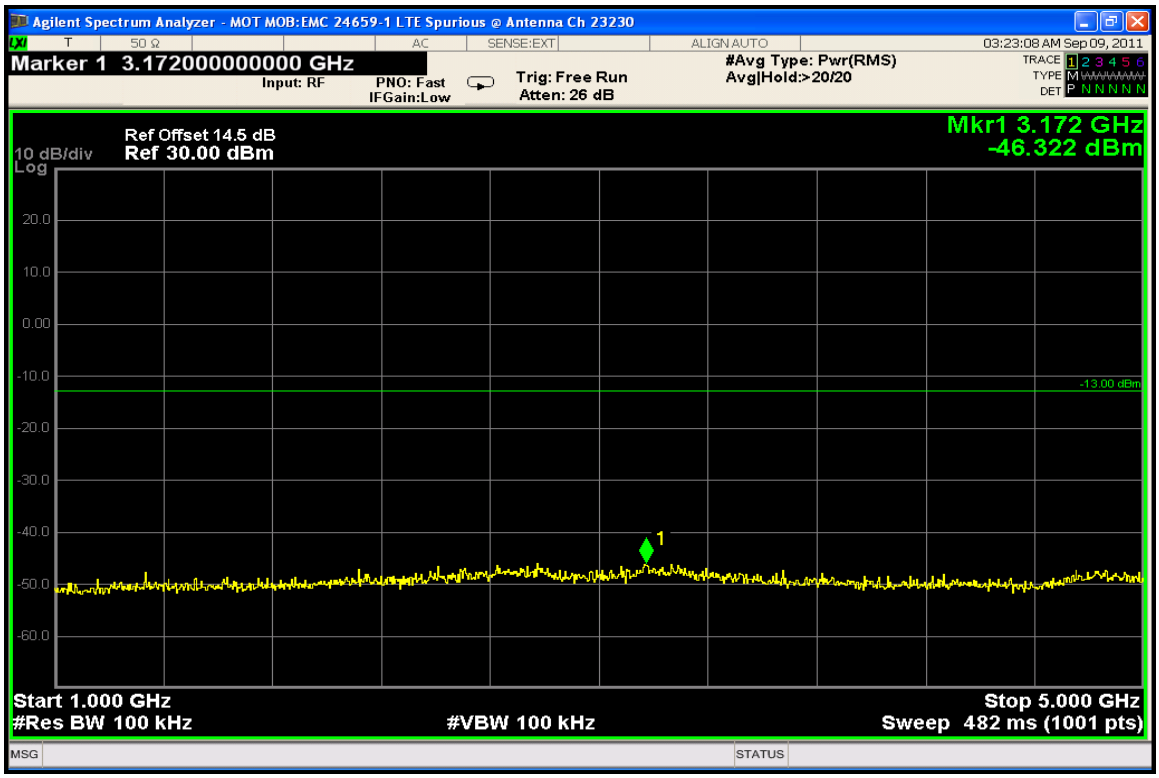


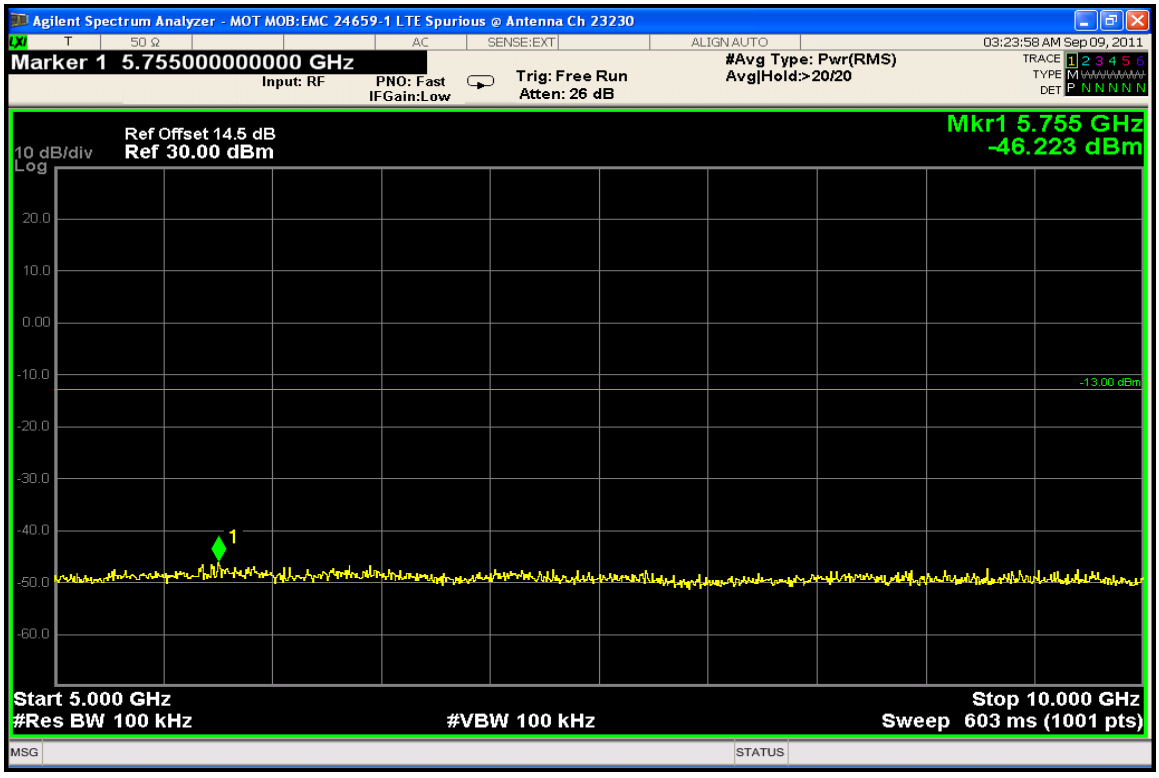




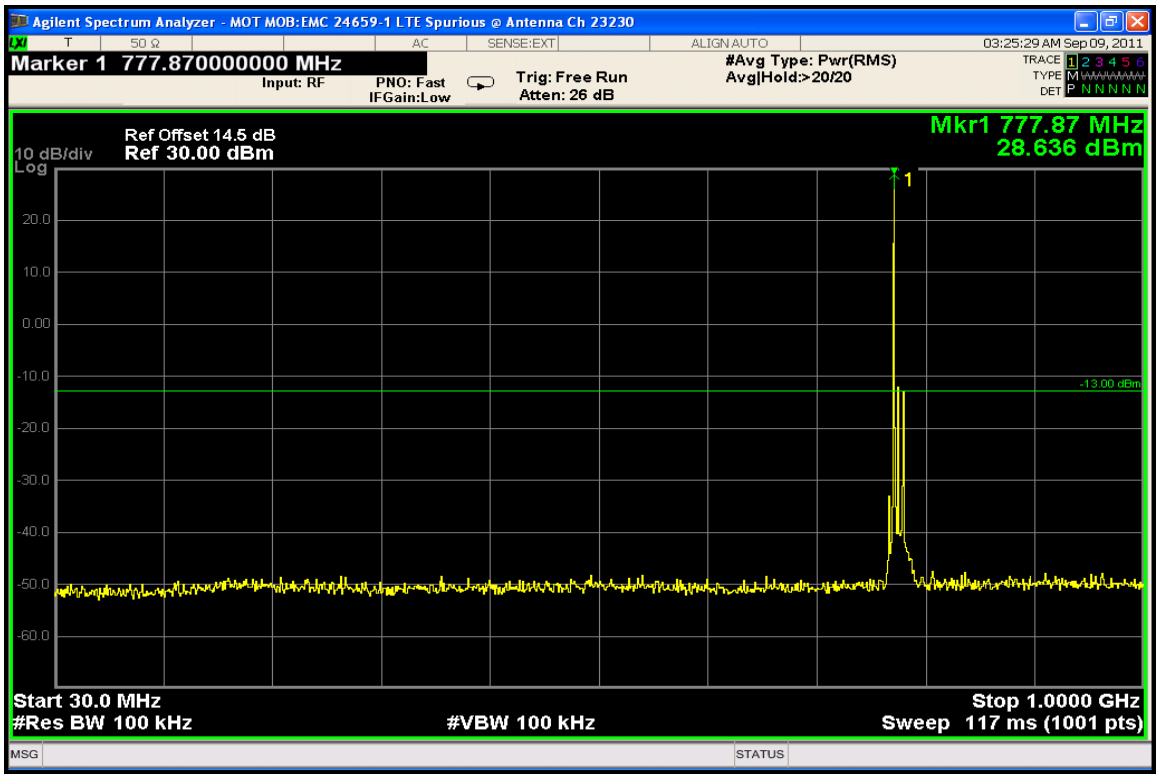
Mode: LTE – Band 13 - 16 QAM, Start RB: 13, RB Allocation 50%

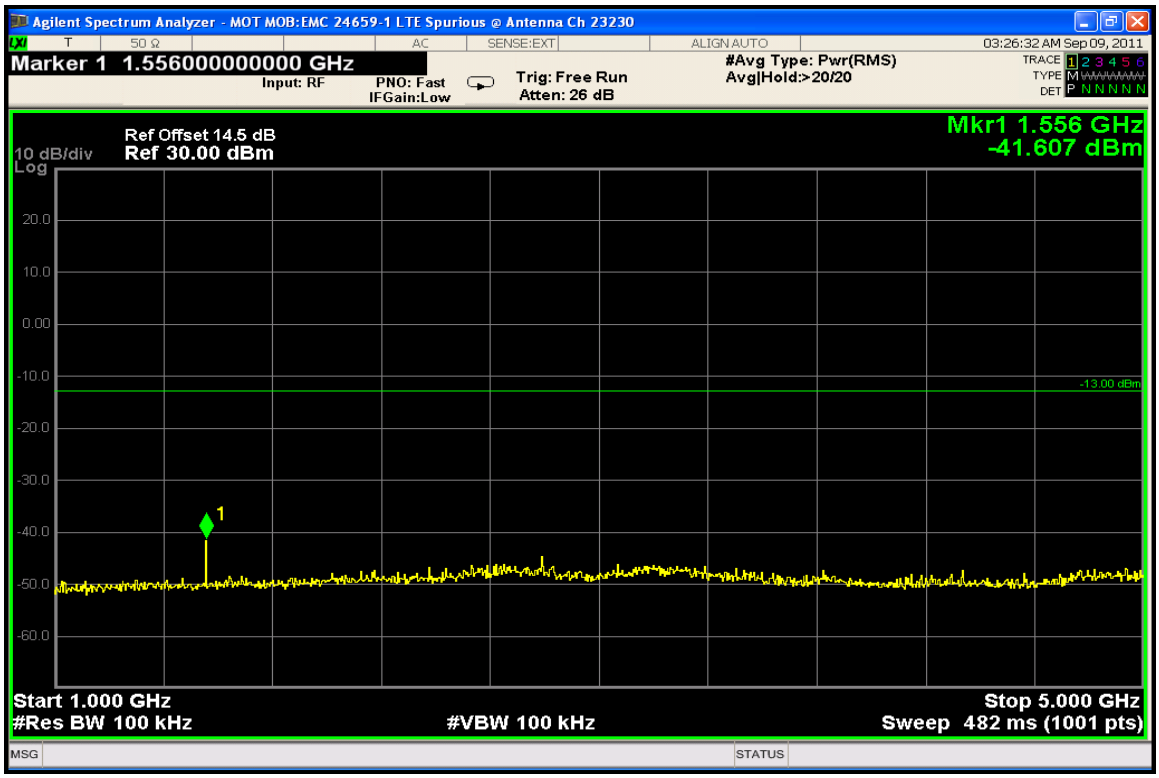


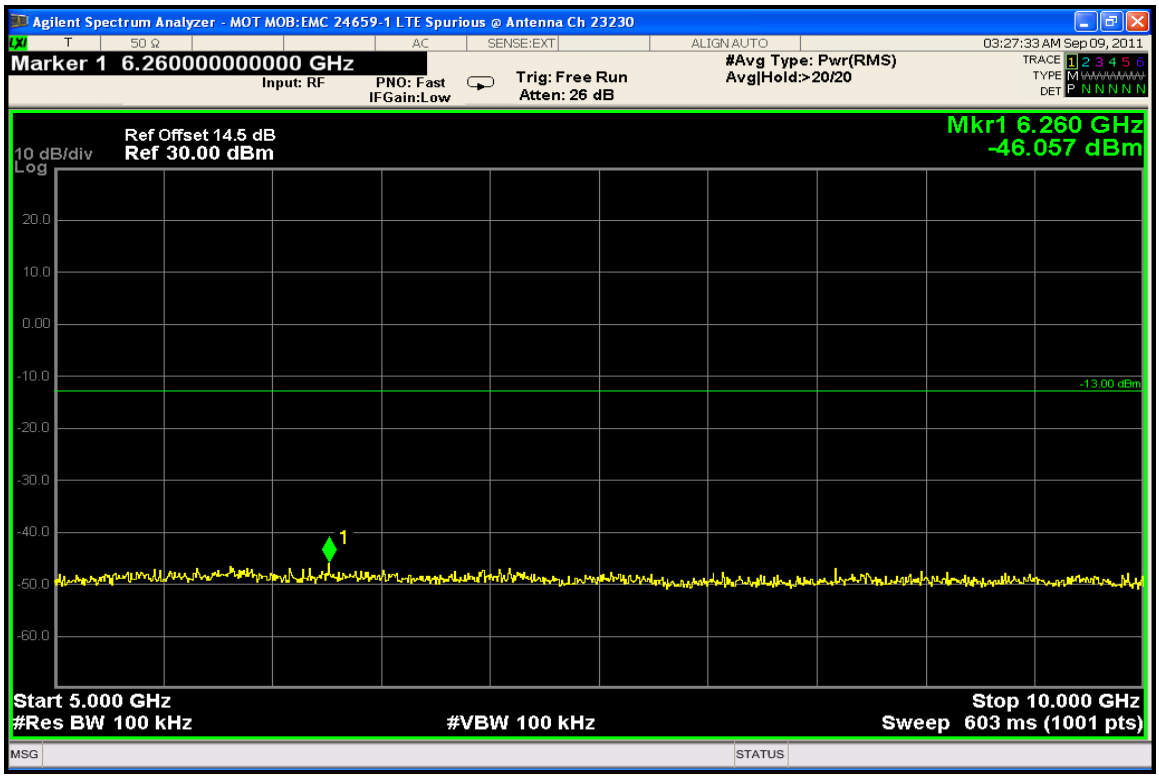

Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
Marker 1 3.172000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
03:23:08 AM Sep 09, 2011
Ref Offset 14.5 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 3.172 GHz
-46.322 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
Sweep 482 ms (1001 pts)


Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
Marker 1 5.755000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
03:23:58 AM Sep 09, 2011
Ref Offset 14.5 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 5.755 GHz
-46.223 dBm
-13.00 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)

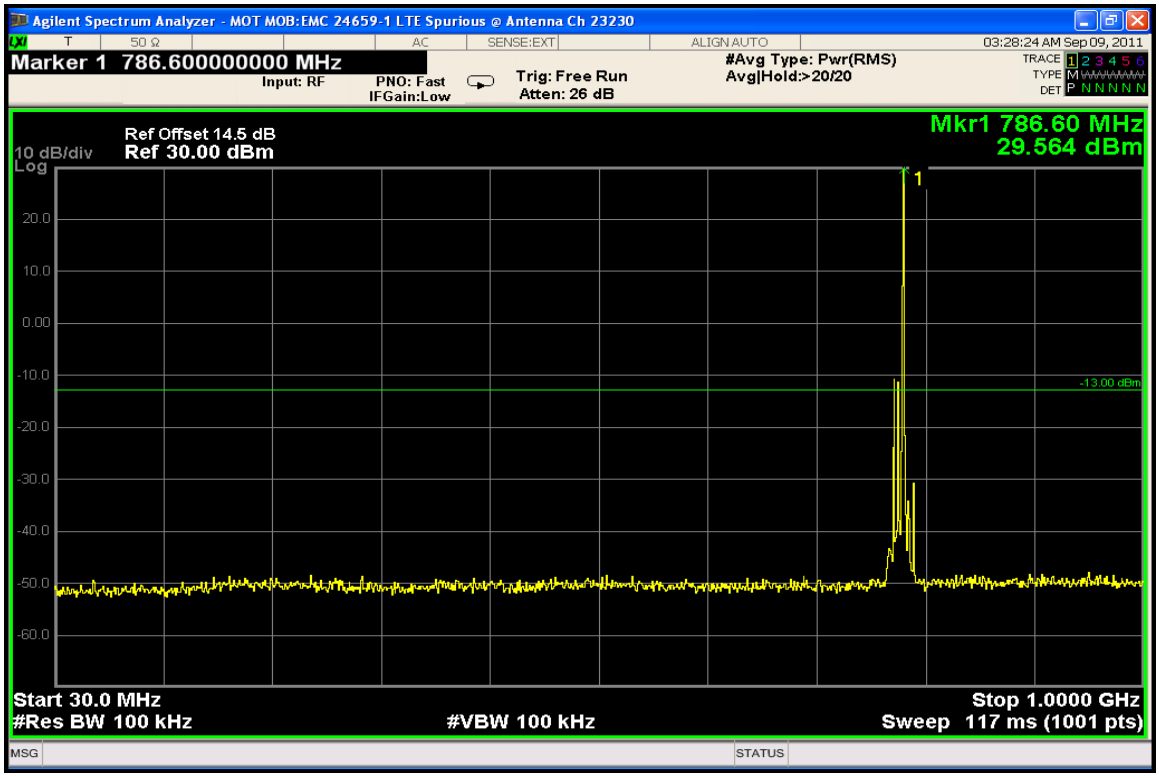
Mode: LTE – Band 13 - 16 QAM, Start RB: 0, 1RB@ low end

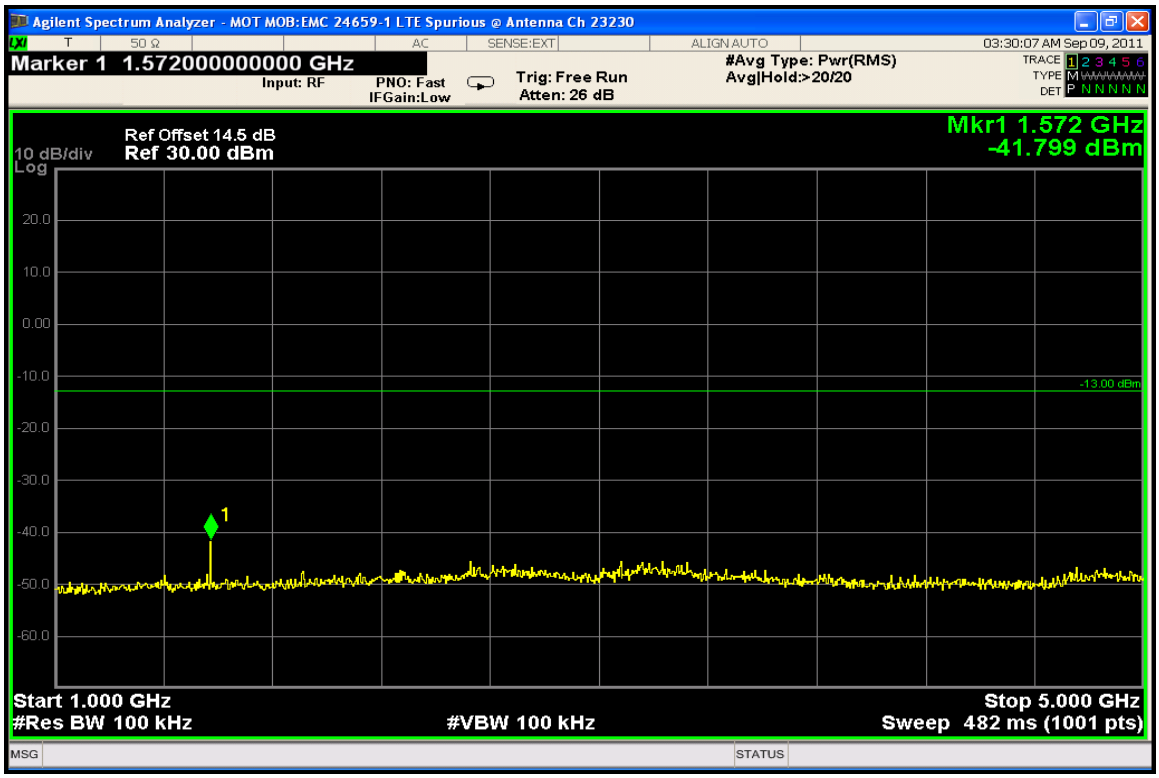


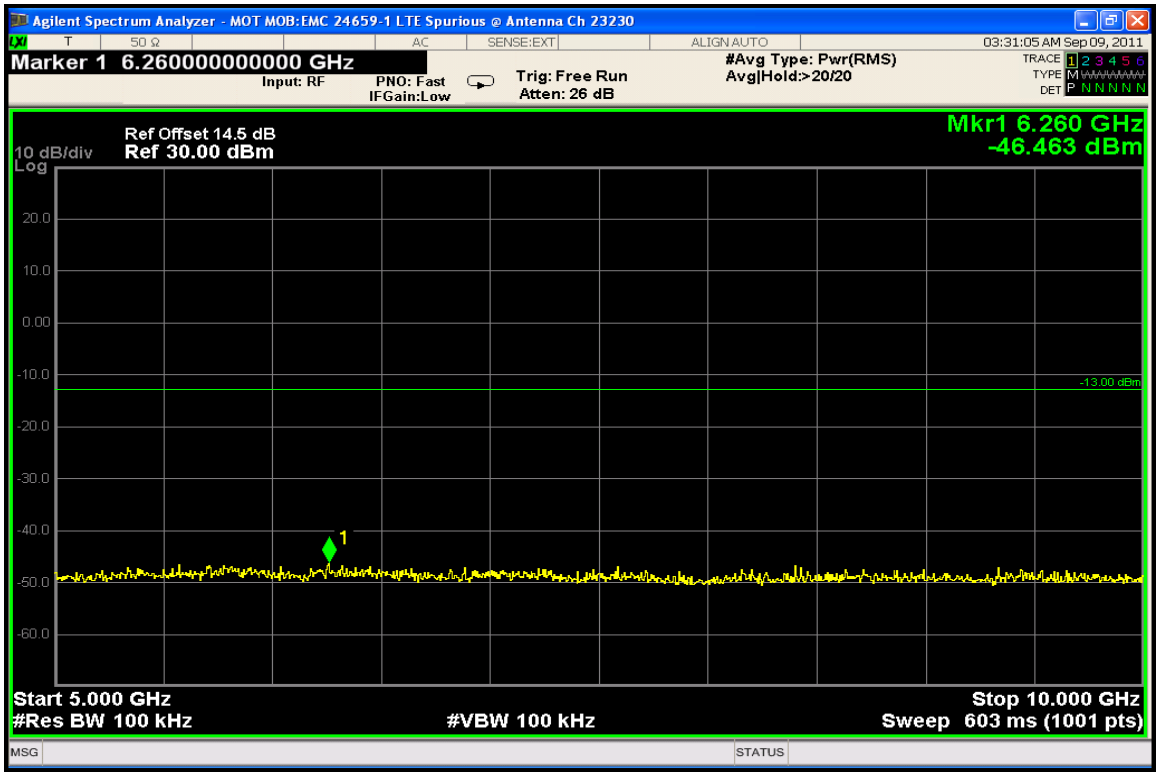




Mode: LTE – Band 13 - 16 QAM, Start RB: 49, 1RB@ high end




Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
Marker 1 1.572000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
03:30:07 AM Sep 09, 2011
Ref Offset 14.5 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 1.572 GHz
-41.799 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
Sweep 482 ms (1001 pts)
MSG
STATUS


Agilent Spectrum Analyzer - MOT MOB:EMC 24659-1 LTE Spurious @ Antenna Ch 23230
Marker 1 6.260000000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
#Avg Type: Pwr(RMS)
Avg|Hold:>20/20
03:31:05 AM Sep 09, 2011
Ref Offset 14.5 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 6.260 GHz
-46.463 dBm
-13.00 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
MSG
STATUS

FIELD STRENGTH OF SPURIOUS EMISSIONS
§27.53 C (2)

Measurement Procedure

The EUT is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The EUT is then replaced with a substitution antenna fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain a maximum reading at the spectrum analyzer. The output of the signal generator is then adjusted until a reading identical to that obtained with the actual transmitter is achieved.

The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole. The fully charged internal battery was used for the supply voltage.

Any emissions outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

The settings of the receiver were as follows:

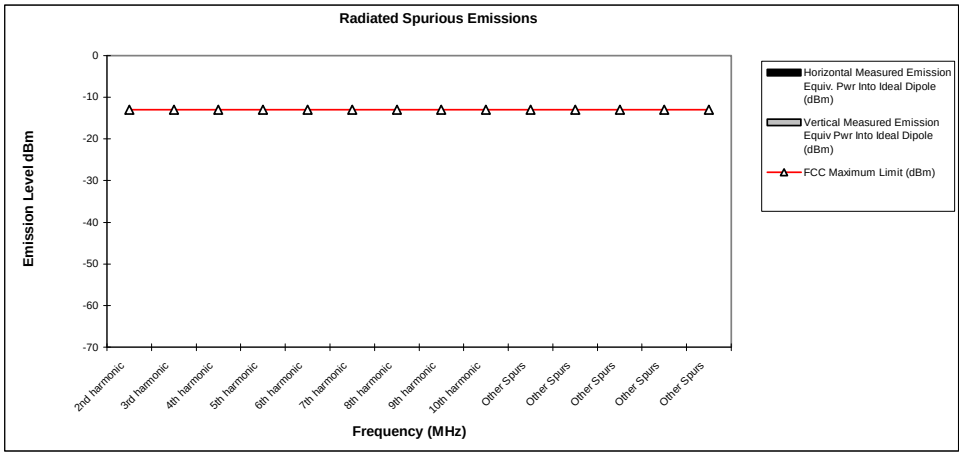
Units	dBm
Divisions	5 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results

Band: LTE Band 13.
Modulation: QPSK and 16 QAM.
RB configuration: 1 RB Start 0, 1 RB Start 49, 25 RB's Start 13, 50 RB's

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
2nd harmonic	-13	*	*
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*



Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.

The margin with respect to the limit is the minimum margin for all modes and bands.

FIELD STRENGTH OF SPURIOUS EMISSIONS IN 1559-1610 MHz
§27.53 C (f)

Measurement Procedure

The EUT is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The EUT is then replaced with a substitution antenna fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain a maximum reading at the spectrum analyzer. The output of the signal generator is then adjusted until a reading identical to that obtained with the actual transmitter is achieved.

The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole. The fully charged internal battery was used for the supply voltage.

The power any emissions in the 1559-1610 MHz band shall be < - 40 dBm/MHz EIRP (Wideband) and < - 50dBm EIRP (narrowband).

The settings of the receiver were as follows:

Units	dBm
Divisions	5 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz for Wideband Emissions
Resolution bandwidth	1 kHz for Narrowband Emisssions
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results

Band: LTE Band 13.
Modulation: QPSK and 16 QAM.
RB configuration: 1 RB Start 0, 1 RB Start 49, 25 RB's Start 13, 50 RB's

There were no emissions found in the 1559-1610 MHz band.

FREQUENCY STABILITY

§Part 27.54

Measurement Procedure

The EUT is placed in an environmental chamber. The antenna port of the EUT is directly coupled to the input of the measurement equipment through a specialized RF connector. A power supply is attached as the primary voltage supply.

Frequency measurements are made at the extremes of the temperature range -30º C to +60º C and at intervals of 10º C with the primary supply voltage set to the nominal battery operating voltage. A period of time sufficient to stabilize all components of the equipment is allowed at each frequency measurement. The maximum variation of frequency is measured.

At room temperature, the primary supply voltage is reduced to the battery operating endpoint of the equipment under test. The maximum variation of frequency is measured. A power supply was used for the input supply voltage.

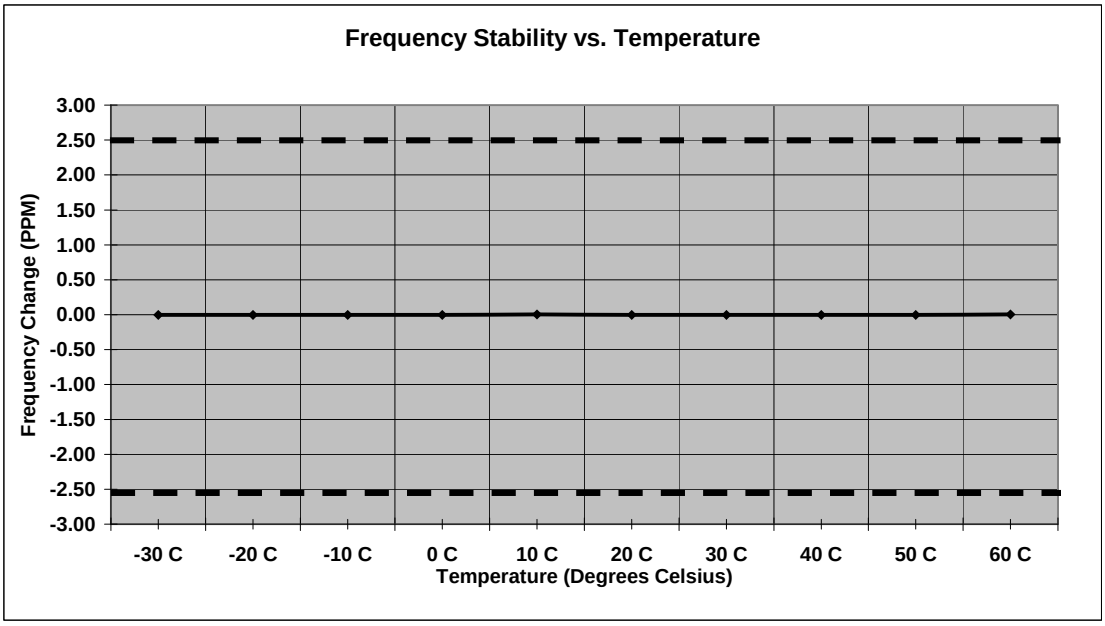
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Measurement Results

Modulation: LTE Band 13 QPSK

Mode: LTE Band 13 **Operating Frequency:** 782
Channel: 23230 **Deviation Limit (PPM):** 2.5 ppm
50 RB low QPSK

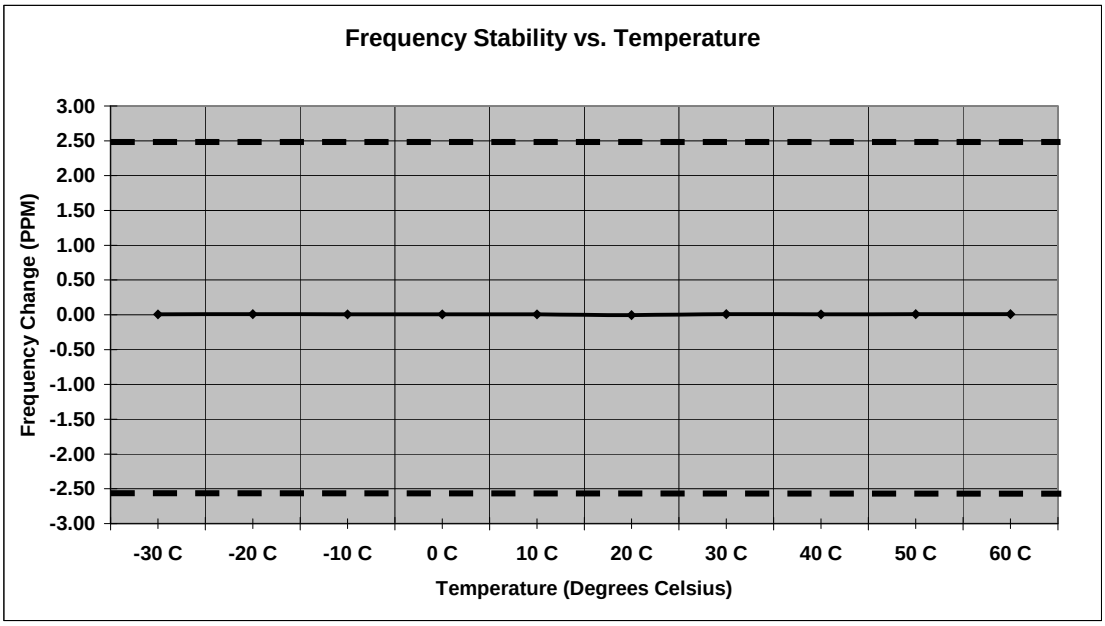
Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	**-2.66**	**-0.003**	100%	3.80
-20 C	**-3.18**	**-0.004**	100%	3.80
-10 C	**-3.45**	**-0.004**	100%	3.80
0 C	**-2.47**	**-0.003**	100%	3.80
10 C	**2.73**	**0.003**	100%	3.80
20 C	**-3.50**	**-0.004**	100%	3.80
30 C	**-3.43**	**-0.004**	100%	3.80
40 C	**-3.02**	**-0.004**	100%	3.80
50 C	**-3.03**	**-0.004**	100%	3.80
60 C	**3.30**	**0.004**	100%	3.80
20 C	**-2.57**	**-0.003**	Battery Endpoint	3.42



Modulation: LTE Band 13 16 QAM

Mode: LTE Band 13 **Operating Frequency:** 782 MHz
Channel: 23230 **Deviation Limit (PPM):** 2.5 ppm
50 RB low 16 QAM

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	**6.72**	**0.009**	100%	3.80
-20 C	**7.72**	**0.010**	100%	3.80
-10 C	**6.78**	**0.009**	100%	3.80
0 C	**6.04**	**0.008**	100%	3.80
10 C	**6.71**	**0.009**	100%	3.80
20 C	**-3.99**	**-0.005**	100%	3.80
30 C	**8.00**	**0.010**	100%	3.80
40 C	**6.74**	**0.009**	100%	3.80
50 C	**7.91**	**0.010**	100%	3.80
60 C	**8.24**	**0.011**	100%	3.80
20 C	**5.66**	**0.007**	Battery Endpoint	3.42



End of Test Report