

TEST REPORT

MEASUREMENT PER SECTION 2.1033 (C) (14) OF THE RULES

SECTION 2.1033 (c) (14)

The data required by Section 2.1046 through 2.1057, inclusive, measured in accordance with the procedures set out in Section 2.1041.

RESPONSE:

The following pages include the data required for the **AS5BBTRX-06**, measured in accordance with the procedures set out in Section 2.1033 (c) (14) of the Rules.

Each required measurement and its corresponding exhibit number are:

Measurement: 1	Section 2.1046	RF Power Output - See Measurement 3
Measurement: 2	Section 2.1047	Modulation Characteristics
Measurement: 3	Section 2.1049	(a) Emissions Bandwidth (b) Occupied Bandwidth
Measurement: 4	Section 2.1051	Spurious Emissions at Antenna Terminals
Measurement: 5	Section 2.1053	Field Strength of Spurious Radiation
Measurement: 6	Section 2.1055	Measurement of Frequency Stability
	Section 2.1057	Frequency Spectrum to be Investigated

Measurement 1

FCC Section 2.1046 RF Power output

Refer to Measurement 3 Occupied Bandwidth Measurement during that measurement RF Output was continuously monitored.

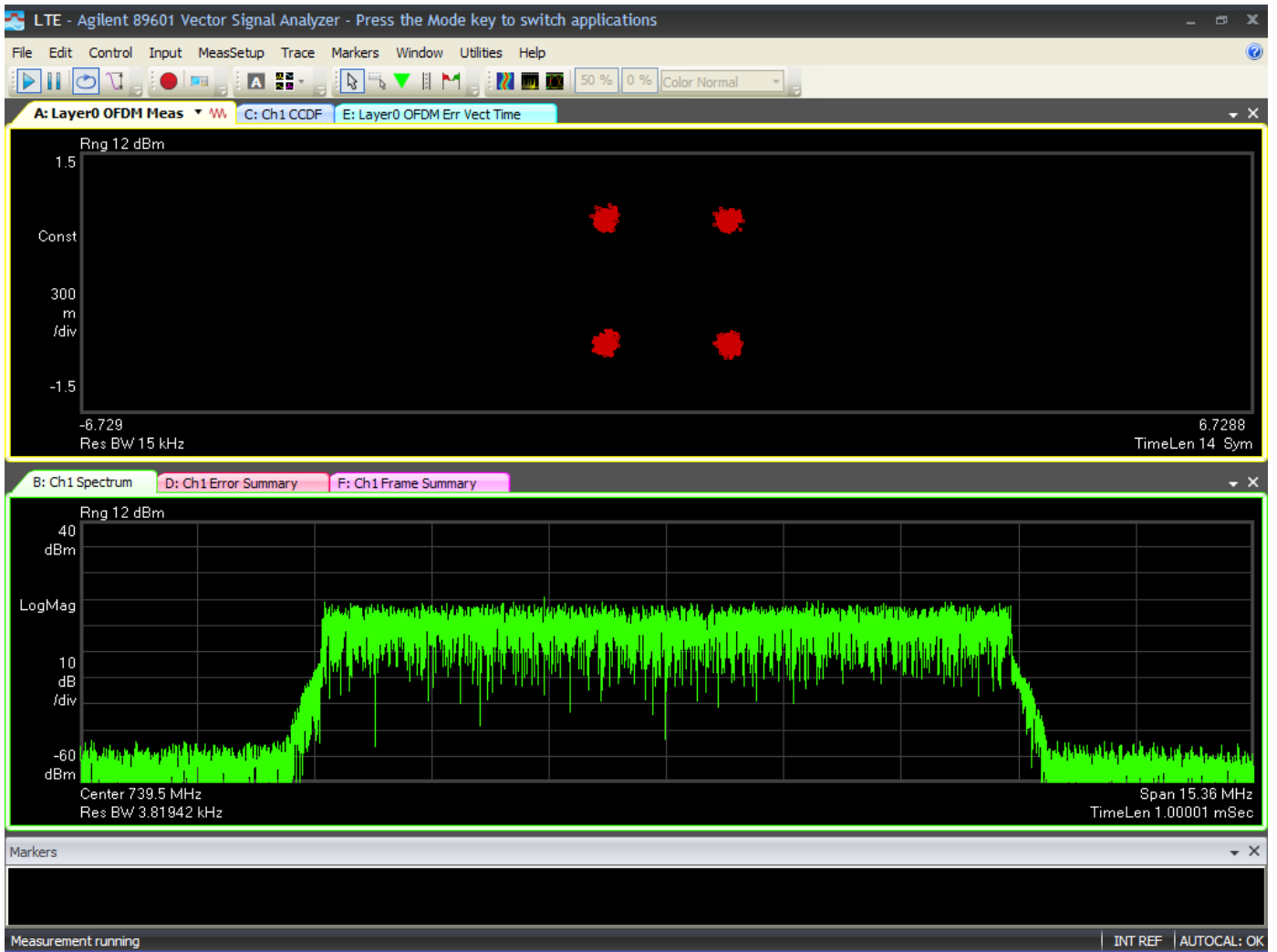
Measurement 2

FCC Section 2.1047 Modulation Characteristics

The modulation techniques used are explained in the submission as part section 2.1033 (c) (13). The RF signal at the antenna port was demodulated and verified for correctness of modulation signal used before each test was performed. The attached plot of graphs shows the modulation components: In phase (I) and Quadrature (Q) components.

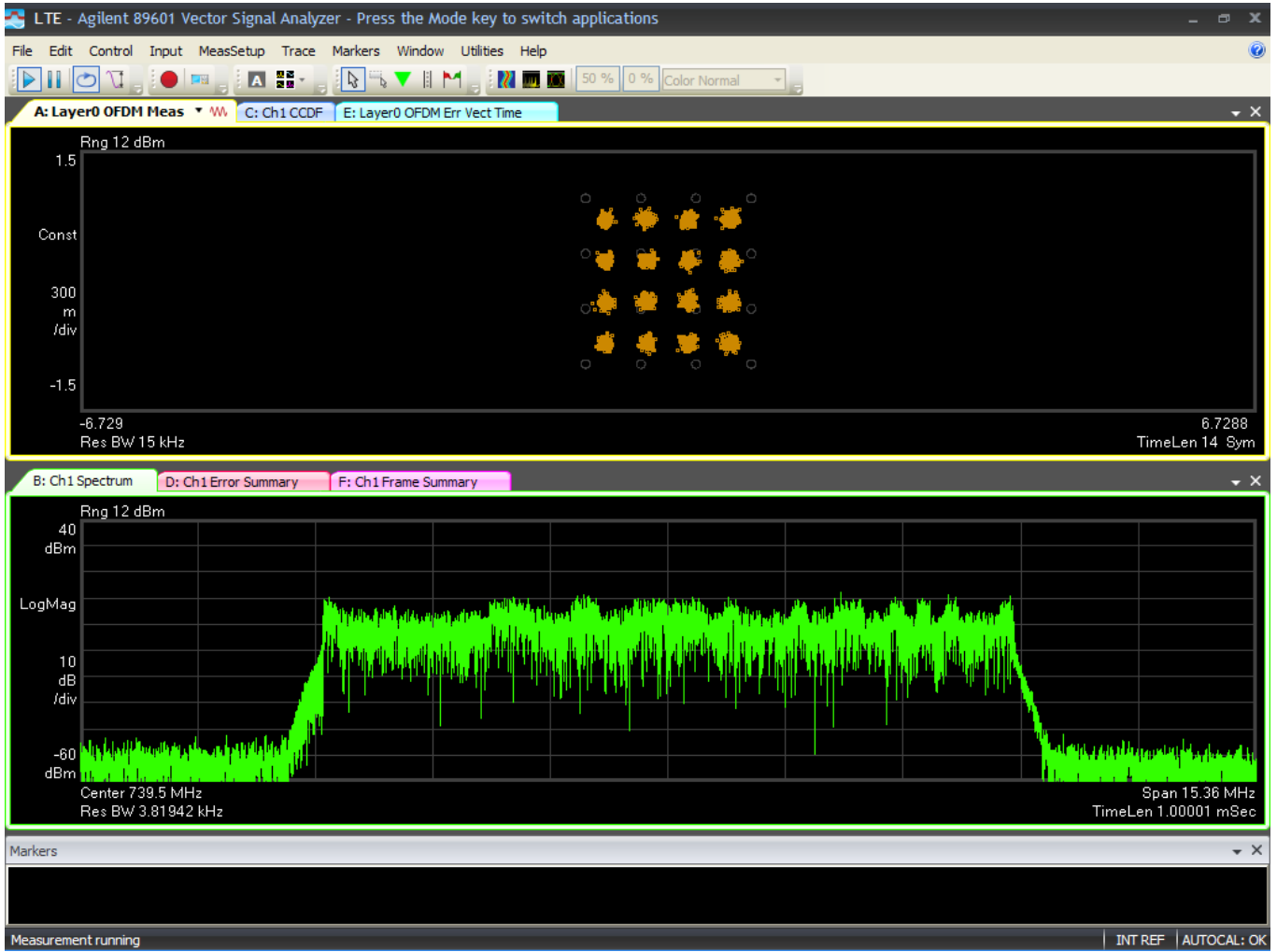
- (1) Quadrature Phase Shift Keying (QPSK) modulation scheme uses 2 bits transmitted simultaneously (one per channel) and a symbol can be represented by 2 bits. Therefore there are $2^2 = 4$ states (Binary 00 to 11). The theoretical bandwidth is 2bits/second/Hz.
- (2) 16 Quadrature amplitude modulation (QAM): In 16QAM, there are 16-states. There are four I values and four Q values. Therefore, 4 bits are available to represent a symbol. Therefore there are $2^4 = 16$ states (Binary 0000 to 1111). The theoretical bandwidth is 4bits/second/Hz.
- (3) 64 Quadrature amplitude modulation (QAM): In 64QAM: The 64QAM is similar to 16QAM and there will be 64 states and 6 bits are available to represent a symbol.

QPSK MODULATION



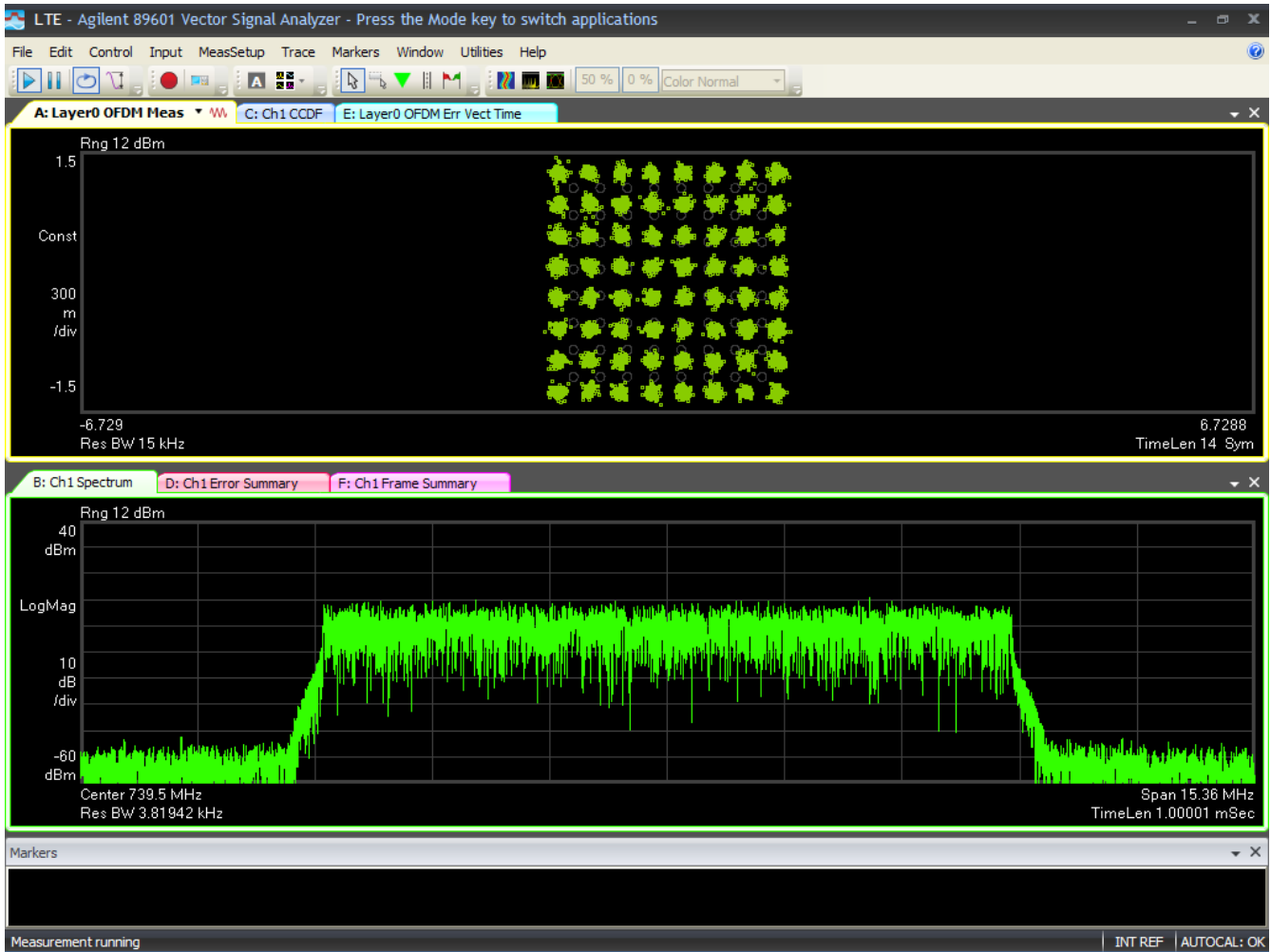
LTE-ATT CR RRH 2x40-700 Lower-ATT
FCC Part 27.53 Block B+C; QPSK Modulation; PWR: 40 (2x40W MIMO)
FCCID: AS5BBTRX-06
TEST ENGINEER: SEG

16QAM MODULATION



LTE-ATT CR RRH 2x40-700 Lower-ATT
FCC Part 27.53 Block B+C; 16QAM Modulation; PWR: 40 (2x40W MIMO)
FCCID: AS5BBTRX-06
TEST ENGINEER: SEG

64QAM MODULATION



LTE-ATT CR RRH 2x40-700 Lower-ATT
FCC Part 27.53 Block B+C; 64QAM Modulation; PWR: 40 (2x40W MIMO)
FCCID: AS5BBTRX-06
TEST ENGINEER: SEG

Measurement 3

FCC Section 2.1049

- (a) Emissions Bandwidth Measurement
- (b) Occupied Bandwidth Measurement showing spurious Emissions 100 kHz close to Block edges.

Spectrum Bandwidth Measurement For Emissions Type

FCC approves two measurement methods for Spectrum Bandwidth.

- (A) 99% Bandwidth
- (B) 26 dB Band width.

Both methods were used to measure the bandwidth at modulations and highest is recorded. The modulations used are:

1. QPSK
2. 16 QAM
3. 64 QAM

Highest Bandwidth is used for Emissions type designation: 9.37 MHz for 10 MHz Bandwidth, and 4.68 MHz for 5 MHz Bandwidth.

Therefore:

Measured Emission type: **9M37F9W** for 10 MHz Bandwidth.

Measured Emission type: **4M68F9W** for 5 MHz Bandwidth.

**MEASUREMENT OF OCCUPIED BANDWIDTH
(A) 99% POWER BANDWIDTH**

**MEASUREMENT OF
OCCUPIED BANDWIDTH
For Emissions Type**

The emissions bandwidth is not provided in section 27.53 for 700 MHz bands. The occupied bandwidth of the **LTE RRH2X40-07L-AT** was measured using the Rohde & Schwarz ESI Spectrum analyzer/Receiver designed to measure 99% power bandwidth. The measurements were made on blocks A, A+B, B, B+C, and C of the **LTE RRH2X40-07L-AT** with 5 MHz and 10 MHz bandwidths.

The measurements were made on a “**LTE RRH2X40-07L-AT**” cabinet in the following modulation configurations:

1. QPSK
2. 16 QAM
3. 64 QAM

This measurement also determines emission type.

Results:

The plots are provided for QPSK, 16QAM and 64QAM modulations of 5 MHz and 10 MHz band of the **LTE RRH2X40-07L-AT**.

The Measured 99% power bandwidth is 8.94 MHz for 10 MHz band and 4.48 MHz for 5 MHz band.

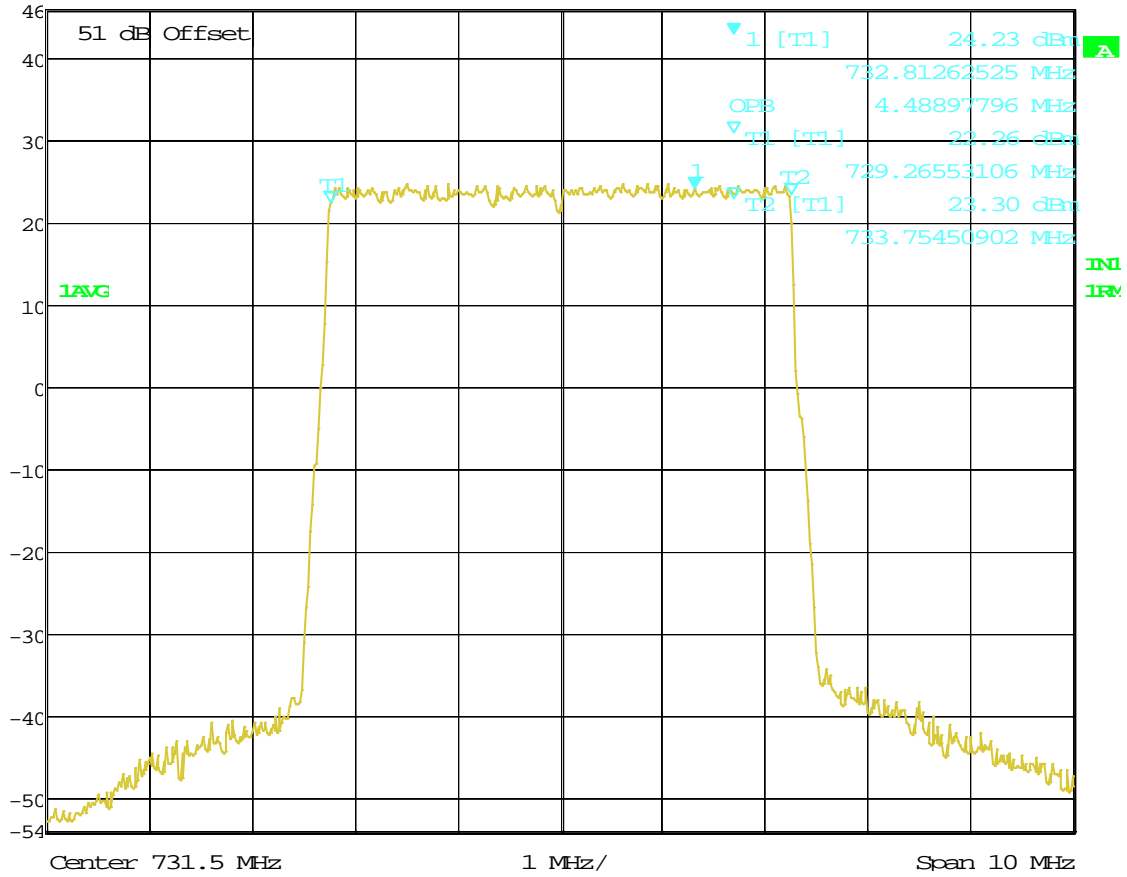
Block: A

5 MHz Bandwidth 729 – 734 MHz

(99% Power Bandwidth)



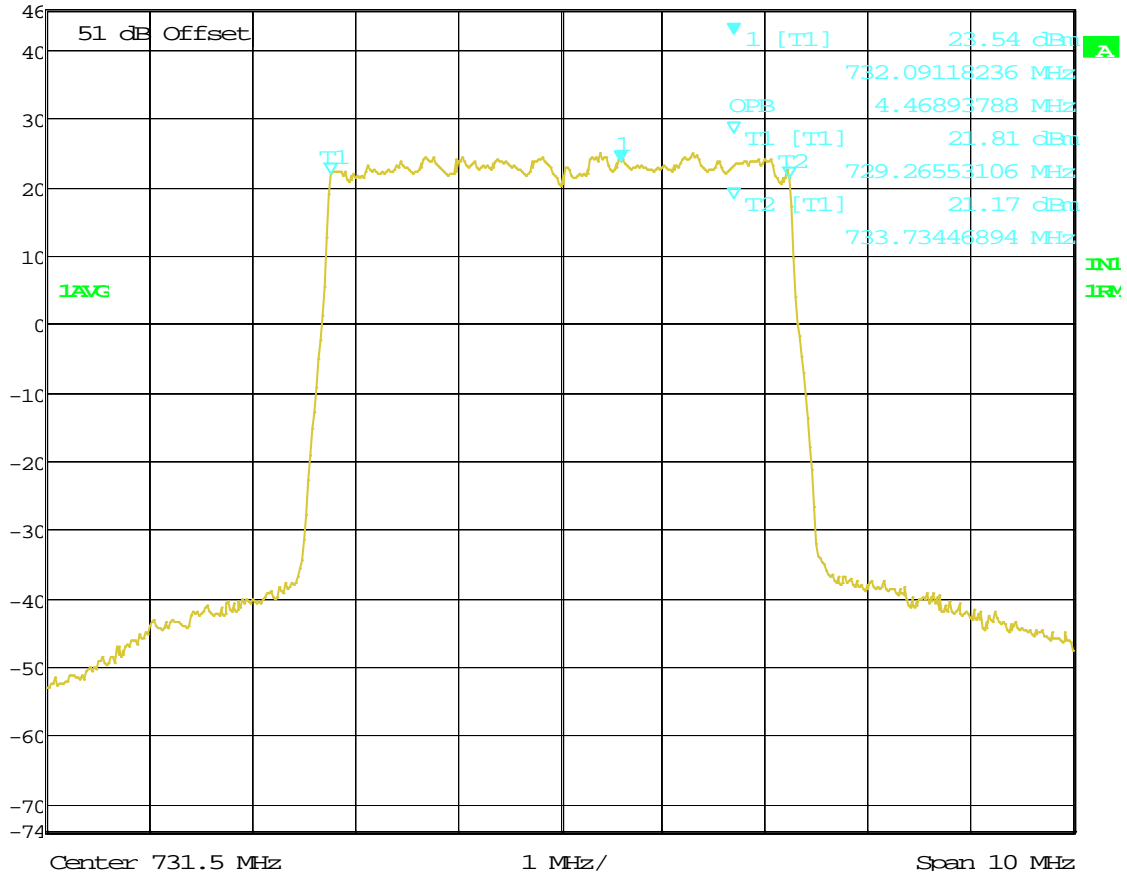
Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 24.23 dBm VBW 300 kHz
 46 dBm 732.81262525 MHz SWT 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 07:58:56



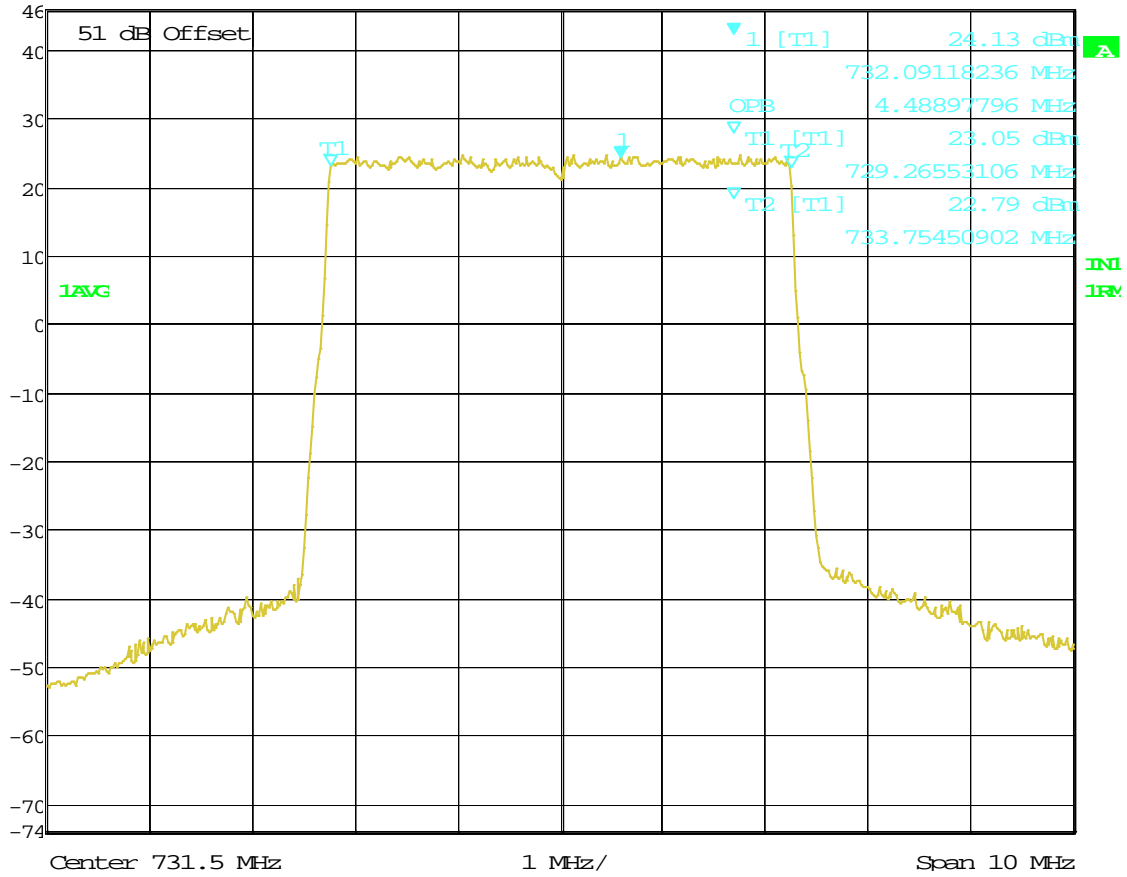
Marker 1 [T1] RBW 30 kHz RF Att 10 dB
Ref Lvl 23.54 dBm VBW 300 kHz
46 dBm 732.09118236 MHz SWT 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
Date: 14.AUG.2012 09:15:37



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 24.13 dBm VBW 300 kHz
 46 dBm 732.09118236 MHz SWT 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 11:47:39

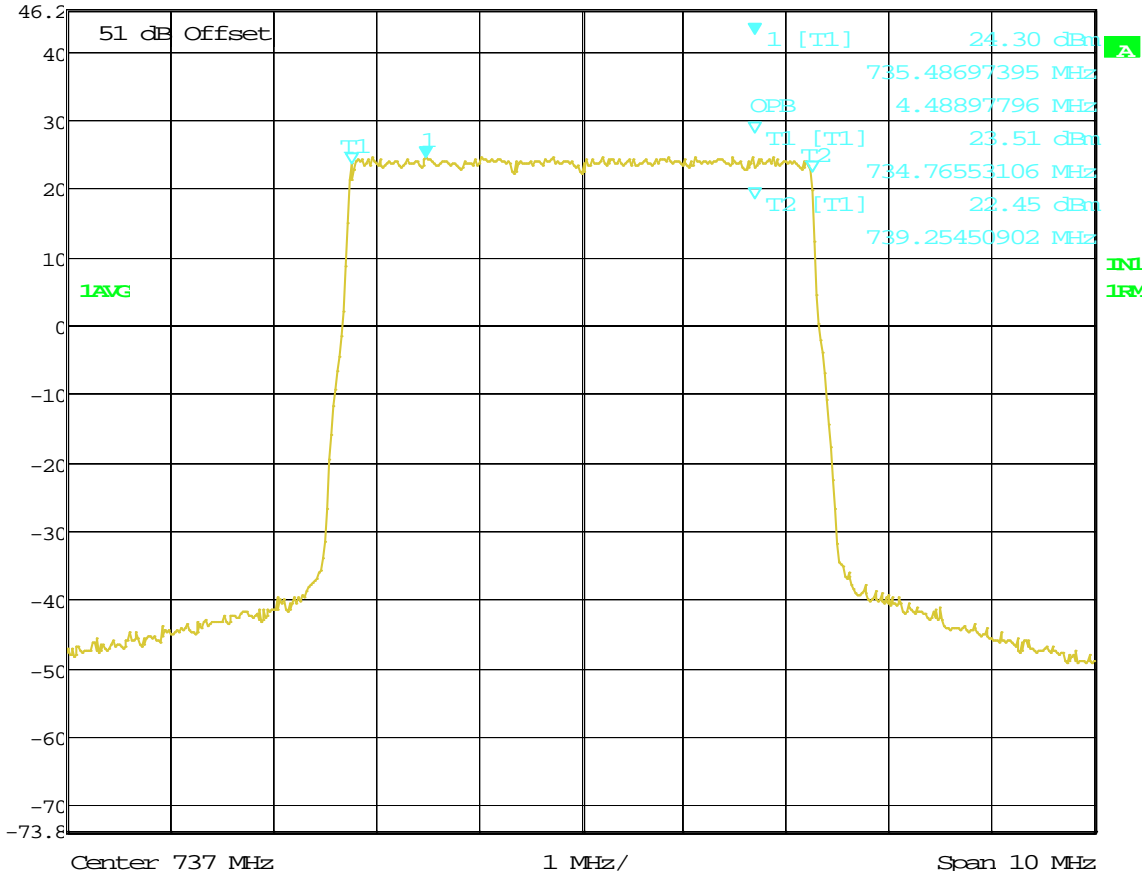
Block: B

5 MHz Bandwidth 734.5 – 739.5 MHz

(99% Power Bandwidth)



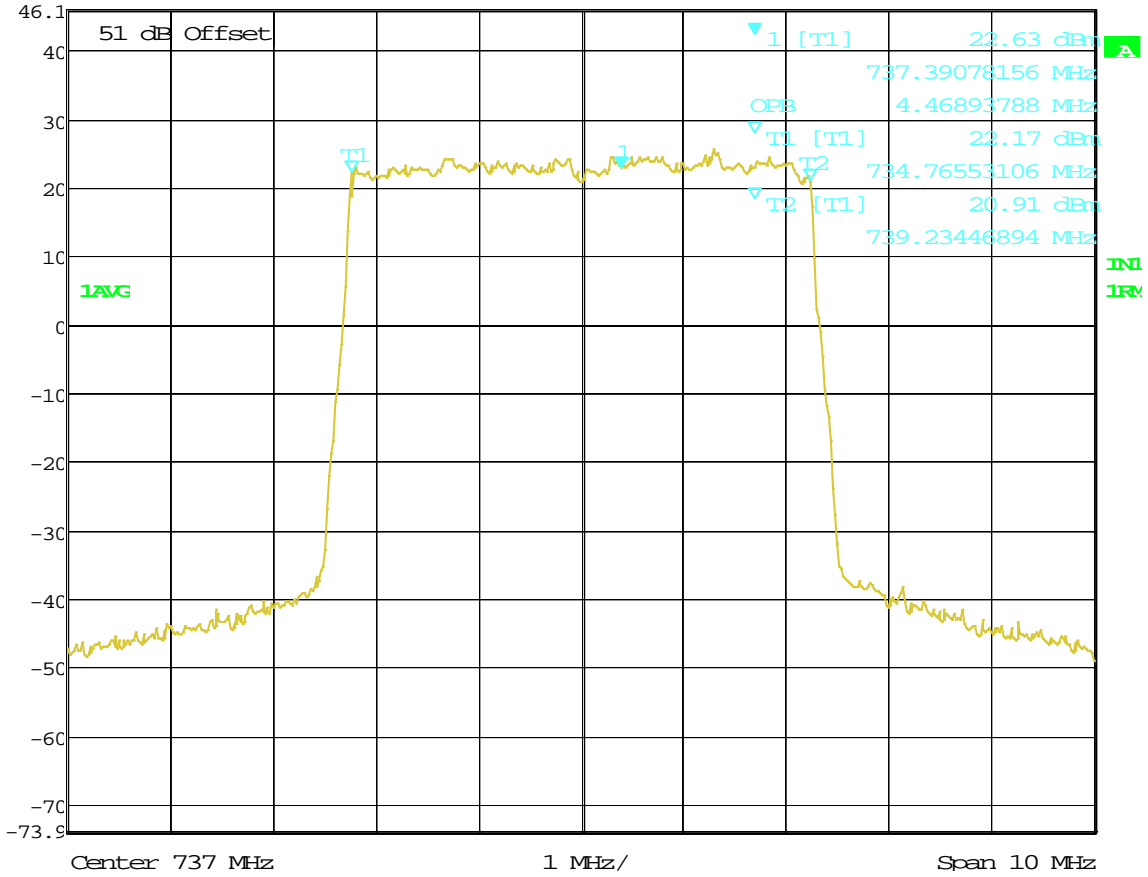
Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 24.30 dBm VBW 300 kHz
 46.2 dBm 735.48697395 MHz SWI 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B; 734.5 - 739.5 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 05:32:28



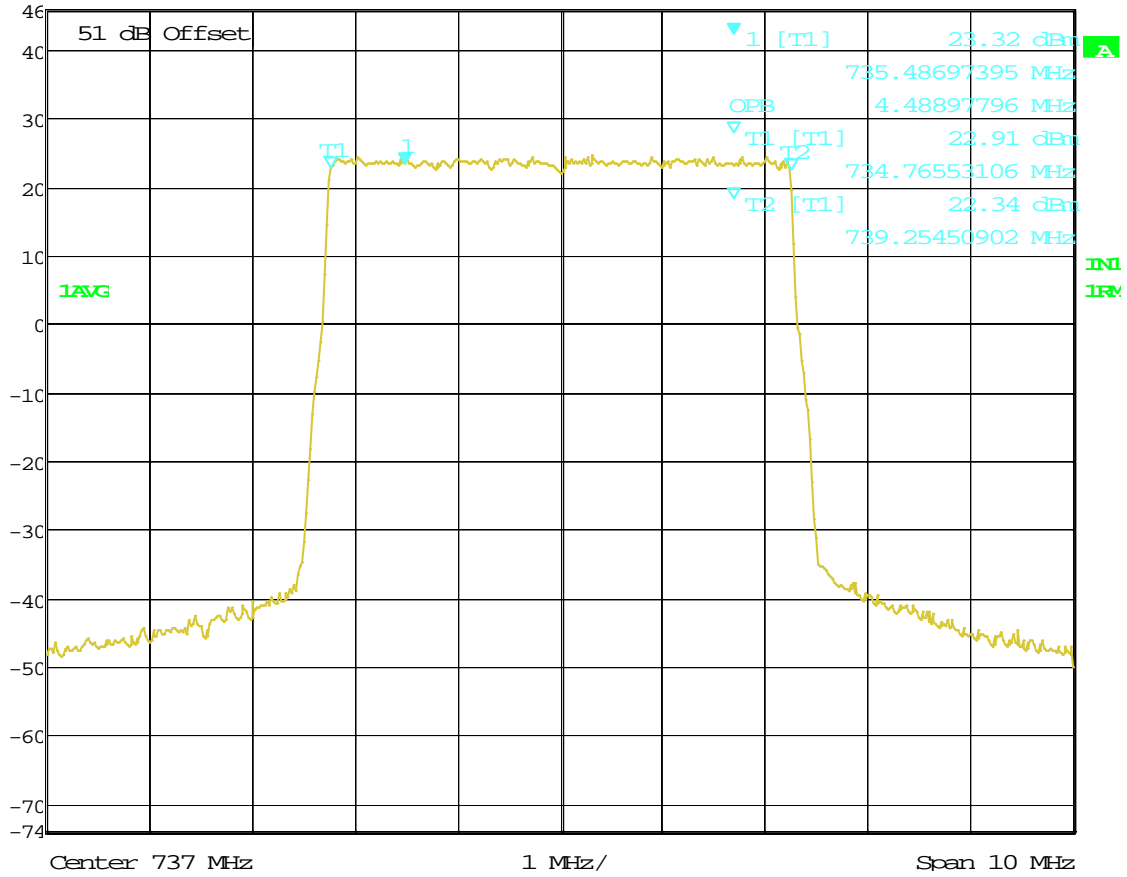
Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 22.63 dBm VBW 300 kHz
 46.1 dBm 737.39078156 MHz SWI 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B; 734.5 - 739.5 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 07:07:52



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 23.35 dBm VBW 300 kHz
 46 dBm 735.48697395 MHz SWT 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A11; BLK B; 734.5 - 739.5 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 12:42:41

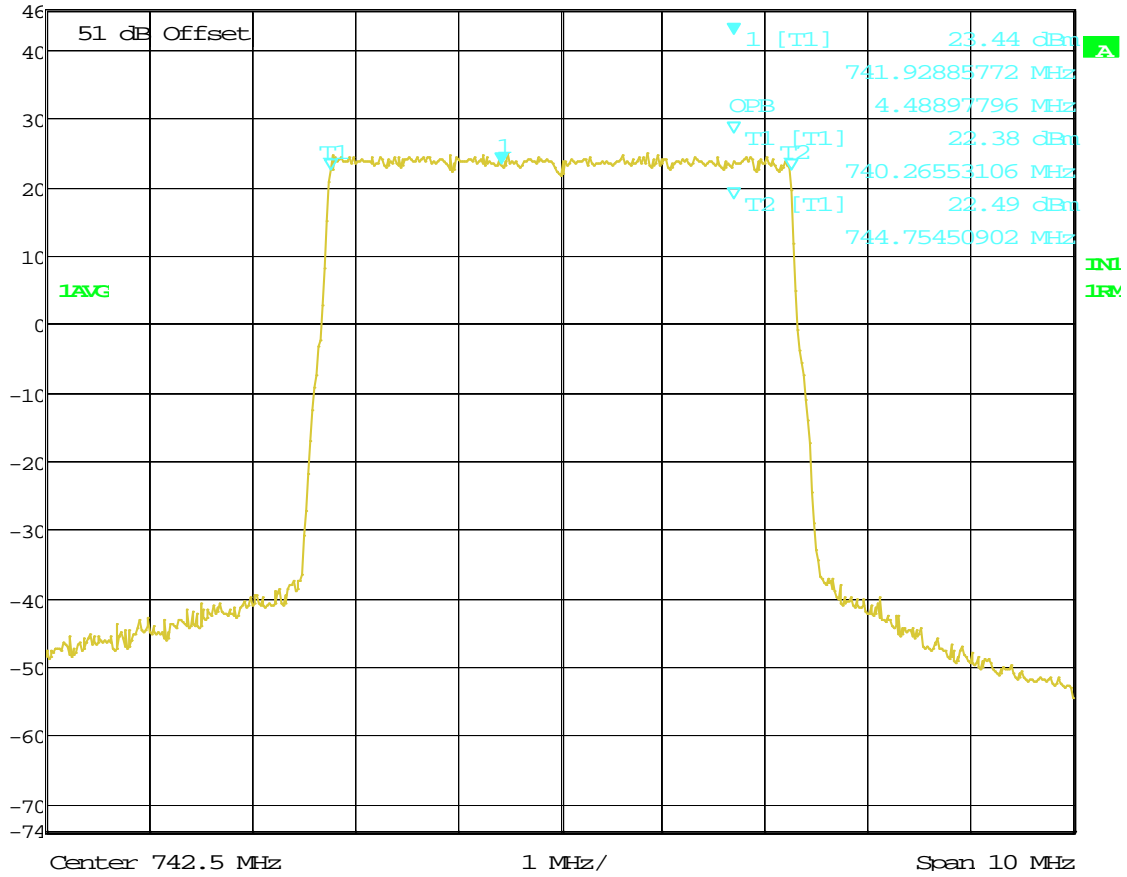
Block: C

5 MHz Bandwidth 740 – 745 MHz

(99% Power Bandwidth)



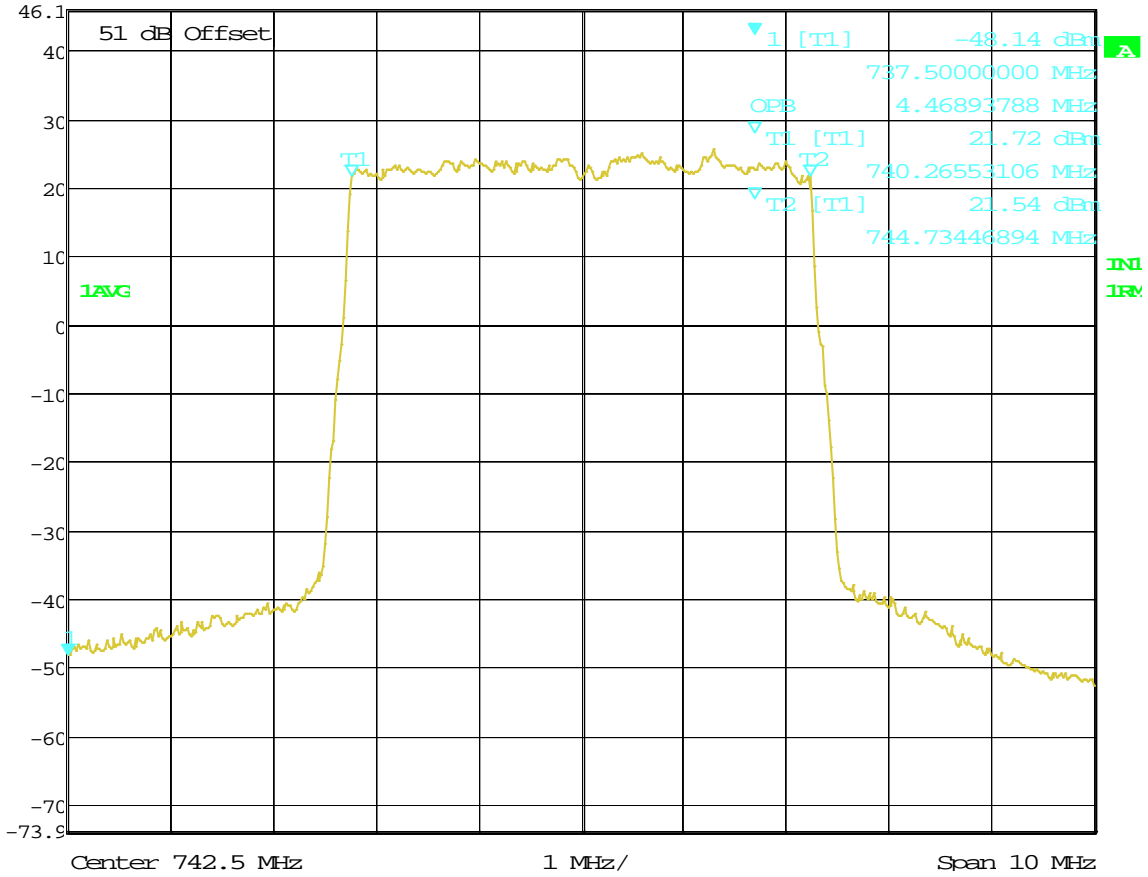
Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl 23.44 dBm VBW 300 kHz
 46 dBm 741.92885772 MHz SWT 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 09:05:04



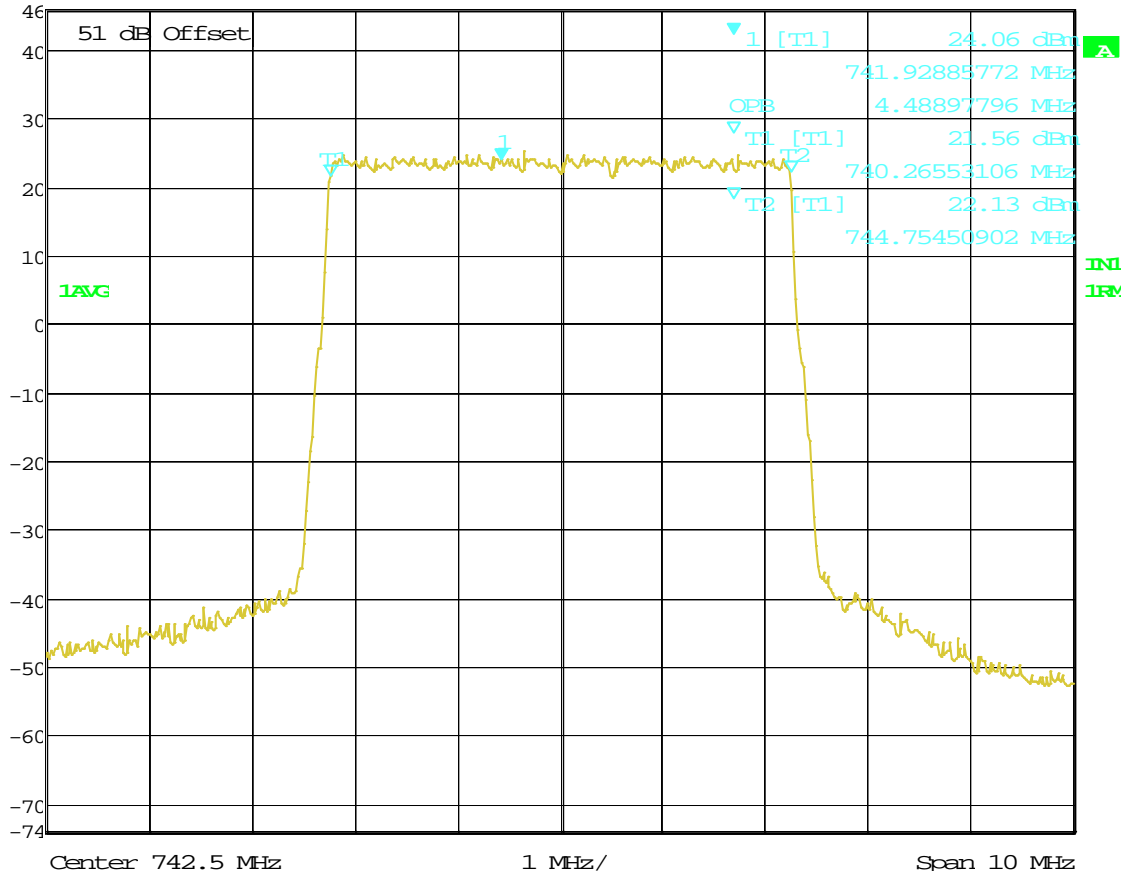
Marker 1 [T1] RBW 30 kHz RF Att 10 dB
 Ref Lvl -48.14 dBm VBW 300 kHz
 46.1 dBm 737.5000000 MHz SWI 28 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 07:29:35



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	10 dB
46 dBm	24.06 dBm	VBW	300 kHz		
	741.92885772 MHz	SWT	28 ms	Unit	dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEB
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A11; BLK C; 740 - 745 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 11:35:02

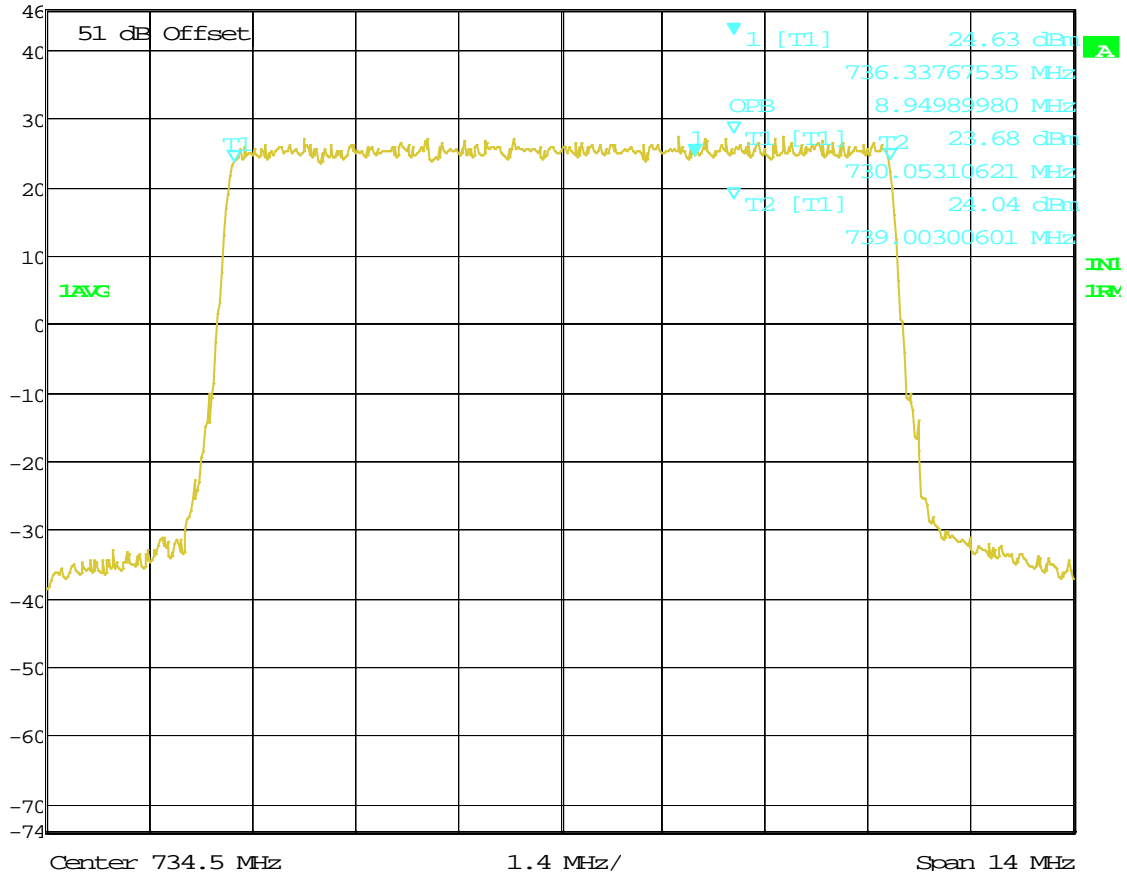
Block: A+B

10 MHz Bandwidth 729.5 – 739.5 MHz

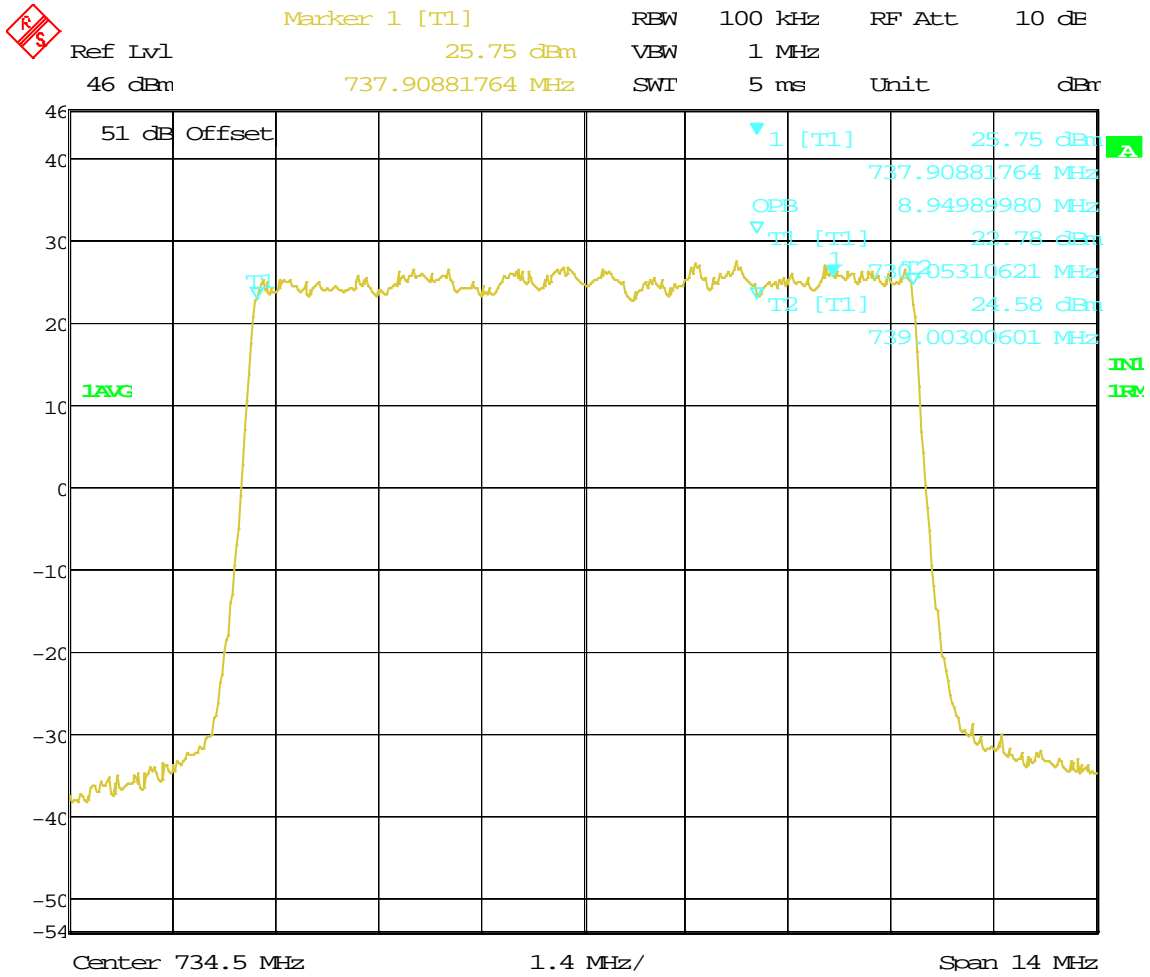
(99% Power Bandwidth)



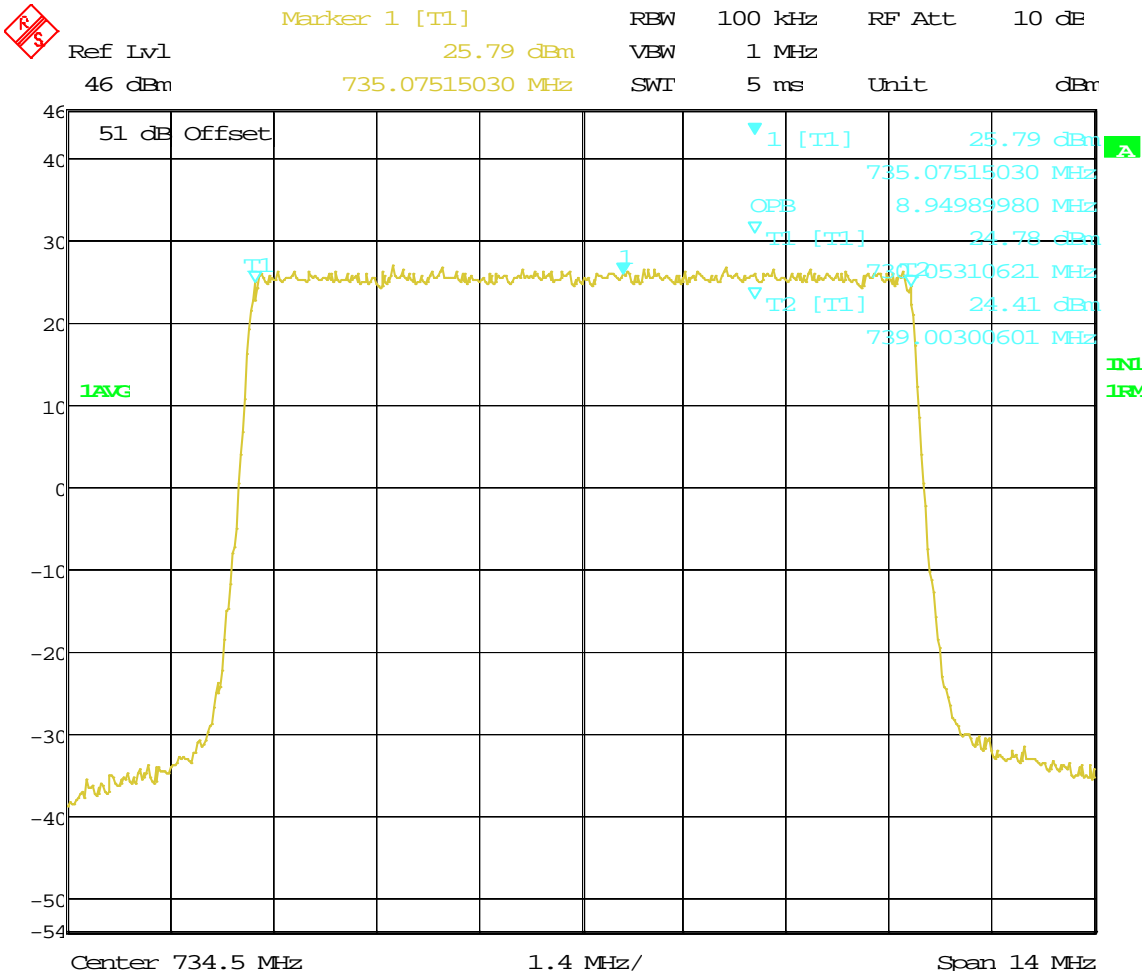
Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 24.63 dBm VBW 1 MHz
 46 dBm 736.33767535 MHz SWT 5 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 16.AUG.2012 10:56:58



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-ATT CR RRH 2X40-700 Lower ATT; Blk A+B; 729.5-739.5 MHz
 PWR:40W; 16QAM; FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 13.SEP.2012 13:12:20



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-ATT CR RRH 2X40-700 Lower ATT; Blk A+B; 729.5-739.5 MHz
 PWR:40W; 64QAM; FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 13.SEP.2012 11:55:33

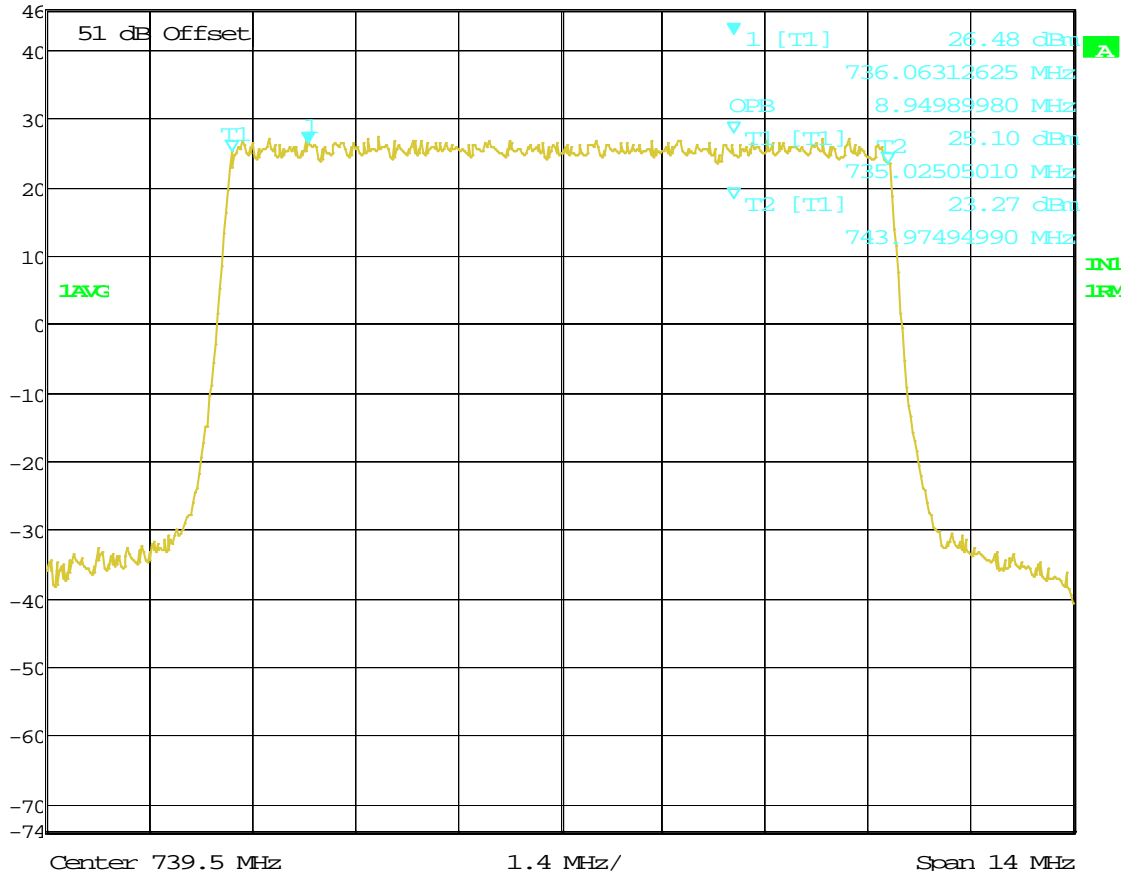
Block: B+C

10 MHz Bandwidth 734.5 – 744.5 MHz

(99% Power Bandwidth)



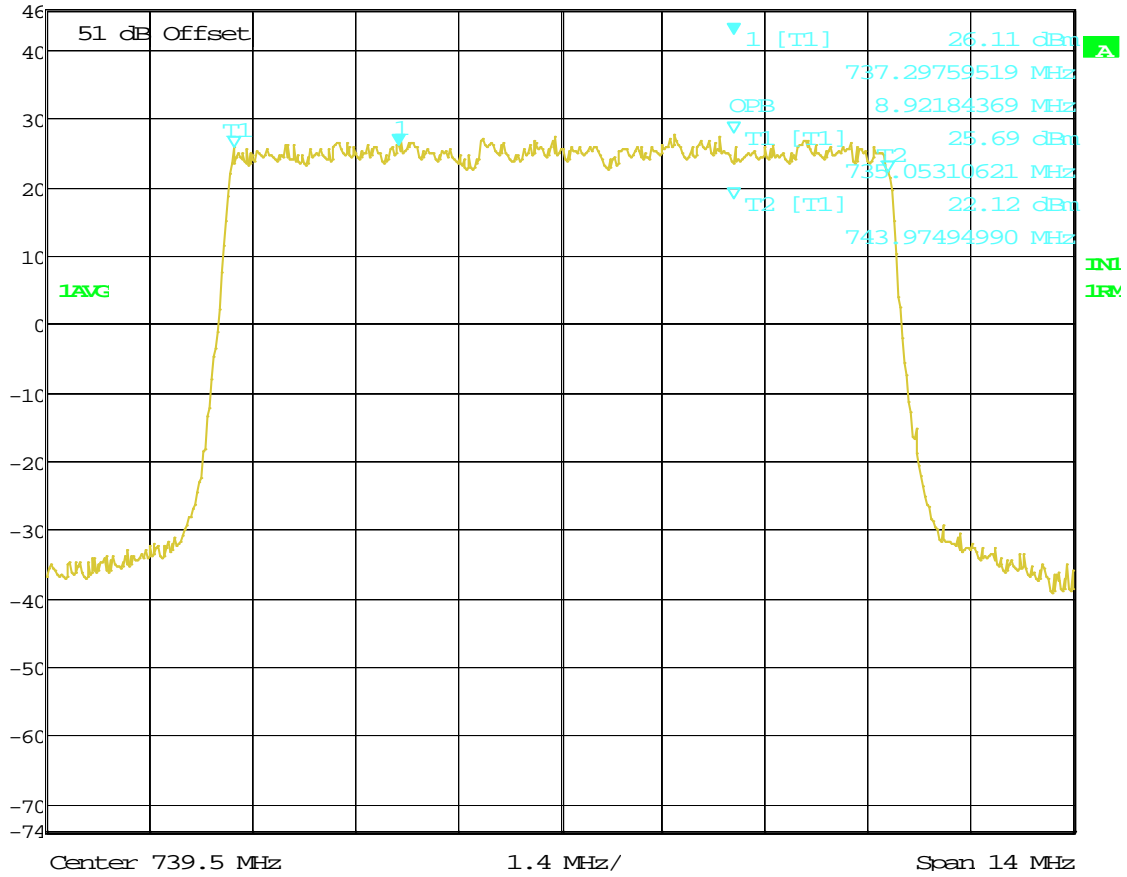
Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 26.48 dBm VBW 1 MHz
 46 dBm 736.06312625 MHz SWT 5 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 16.AUG.2012 07:02:12



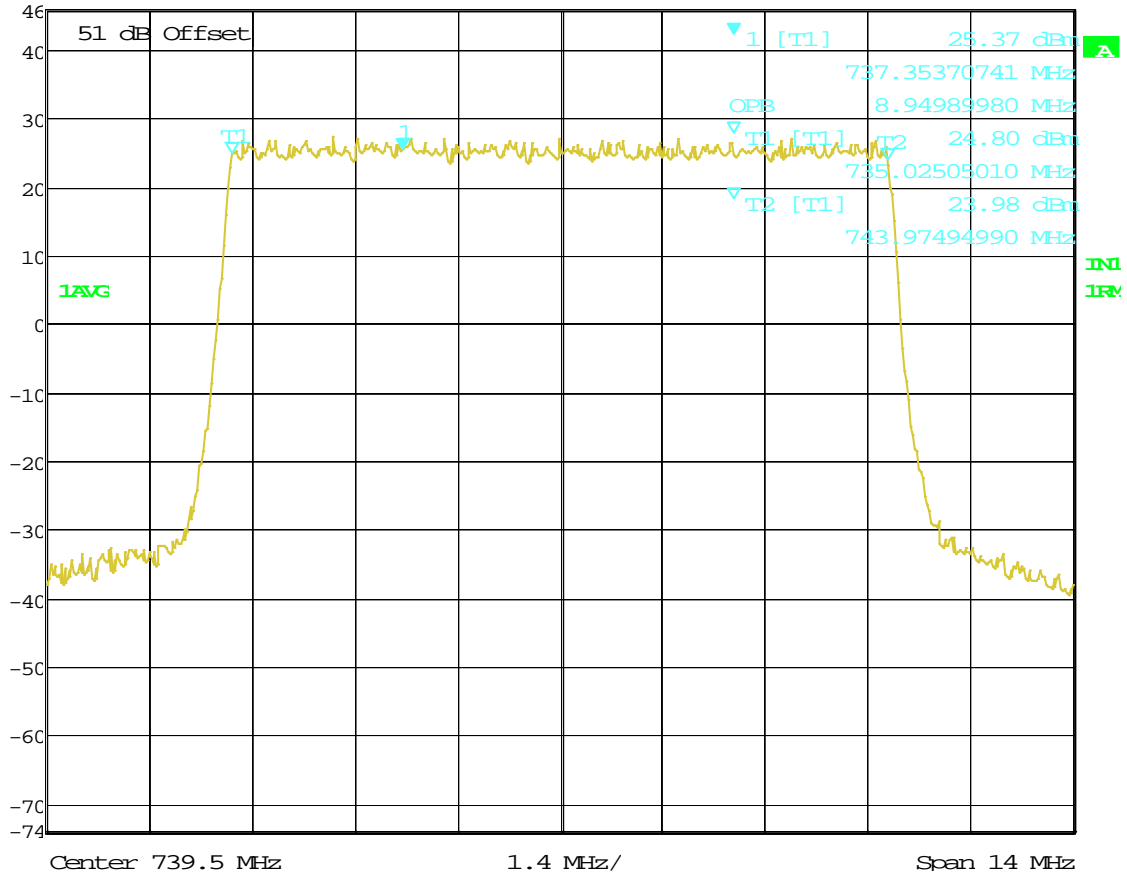
Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 26.11 dBm VBW 1 MHz
 46 dBm 737.29759519 MHz SWT 5 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 16.AUG.2012 06:44:44



Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 25.37 dBm VBW 1 MHz
 46 dBm 737.35370741 MHz SWT 5 ms Unit dBm



Title: 99% POWER BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A11; BLK B+C; 734.5-744.5 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 12:29:54

MEASUREMENT OF SPECTRUM BANDWIDTH 26 dB POWER BANDWIDTH

APPLICANT: **Alcatel-Lucent**

FCC ID: **AS5BBTRX-06**

**(b) MEASUREMENT OF
SPECTRUM BANDWIDTH
For Emissions Type**

The occupied bandwidth of the “LTE RRH2X40-07L-AT” is measured using a Rohde & Schwarz ESI Spectrum Analyzer/Receiver and an HP Model 520 DeskJet Printer. The emissions bandwidth is not provided in the section 27.53 for 700 MHz bands. Therefore emissions band width definition provided in section 27.53 (h) (1) is used. Accordingly “The emissions bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.”

The measurements were made on a “LTE RRH2X40-07L-AT” in the following configurations:

1. QPSK
2. 16 QAM
3. 64 QAM

Results:

The plots are provided for QPSK, 16QAM and 64QAM modulations for 5MHz and 10 MHz bands.
The Measured 26dB emissions bandwidth is 4.68 MHz for 5 MHz band and 9.37 MHz for 10 MHz band.

Block: A

5 MHz Bandwidth 729 – 734 MHz

(26dB Bandwidth)



Delta 1 [T1]

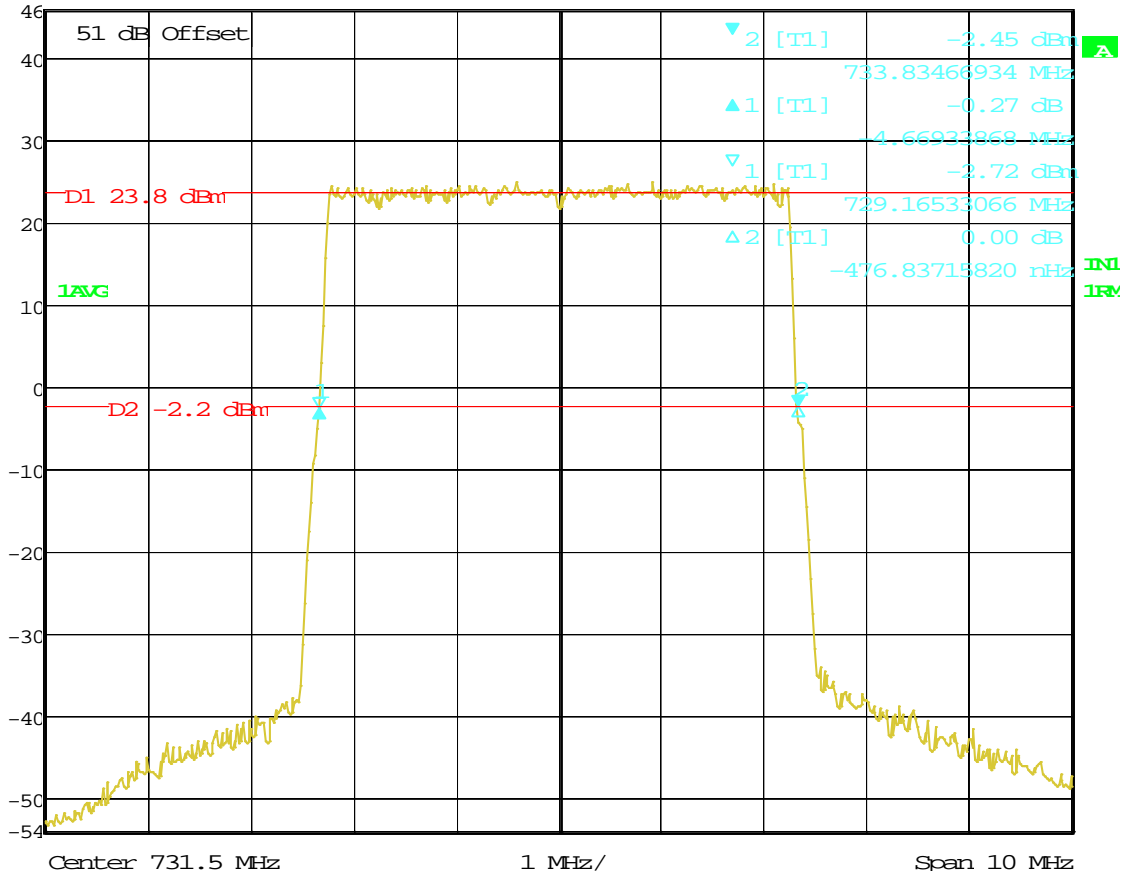
RBW 30 kHz RF Att 10 dB

Ref Lvl -0.27 dB

VBW 300 kHz

46 dBm -4.66933868 MHz

SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 07:52:32

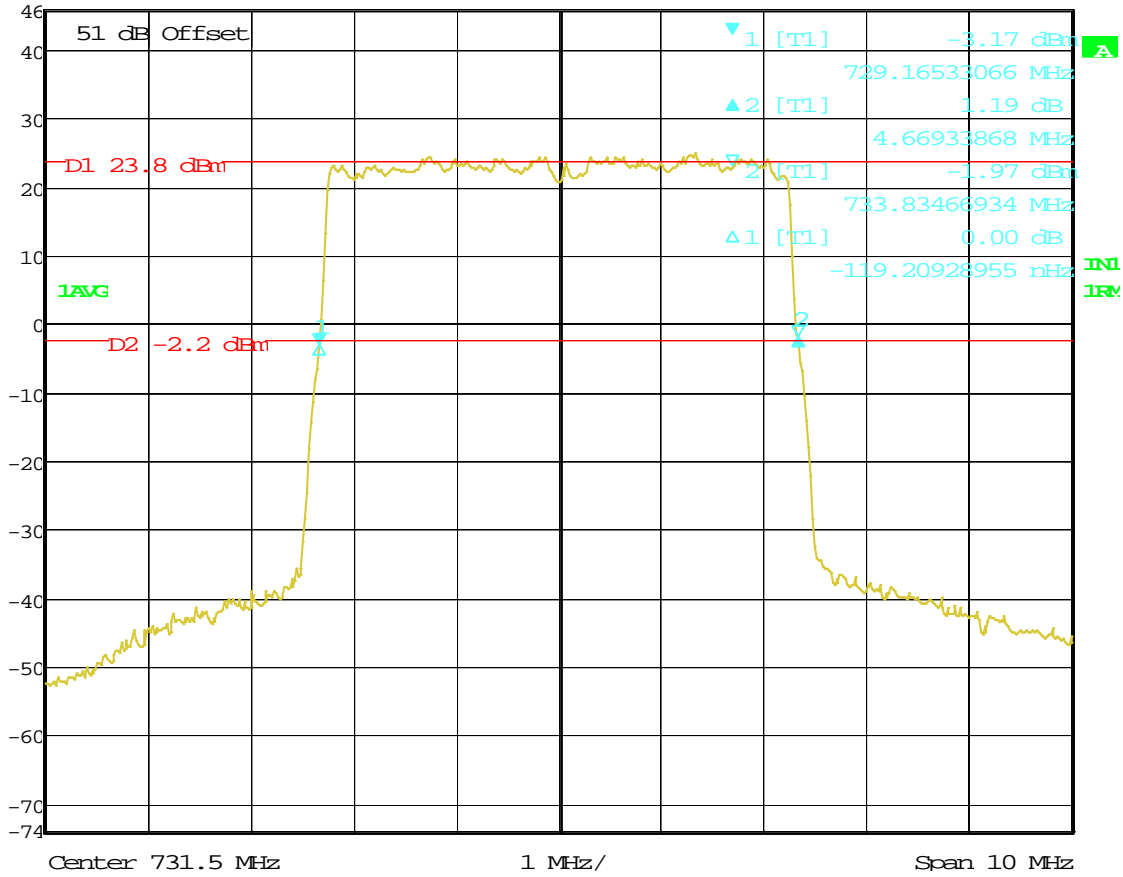


Delta 2 [T1]

RBW 30 kHz RF Att 10 dB

Ref Lvl 1.19 dB
46 dBm 4.66933868 MHz

VBW 300 kHz
SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 09:13:13

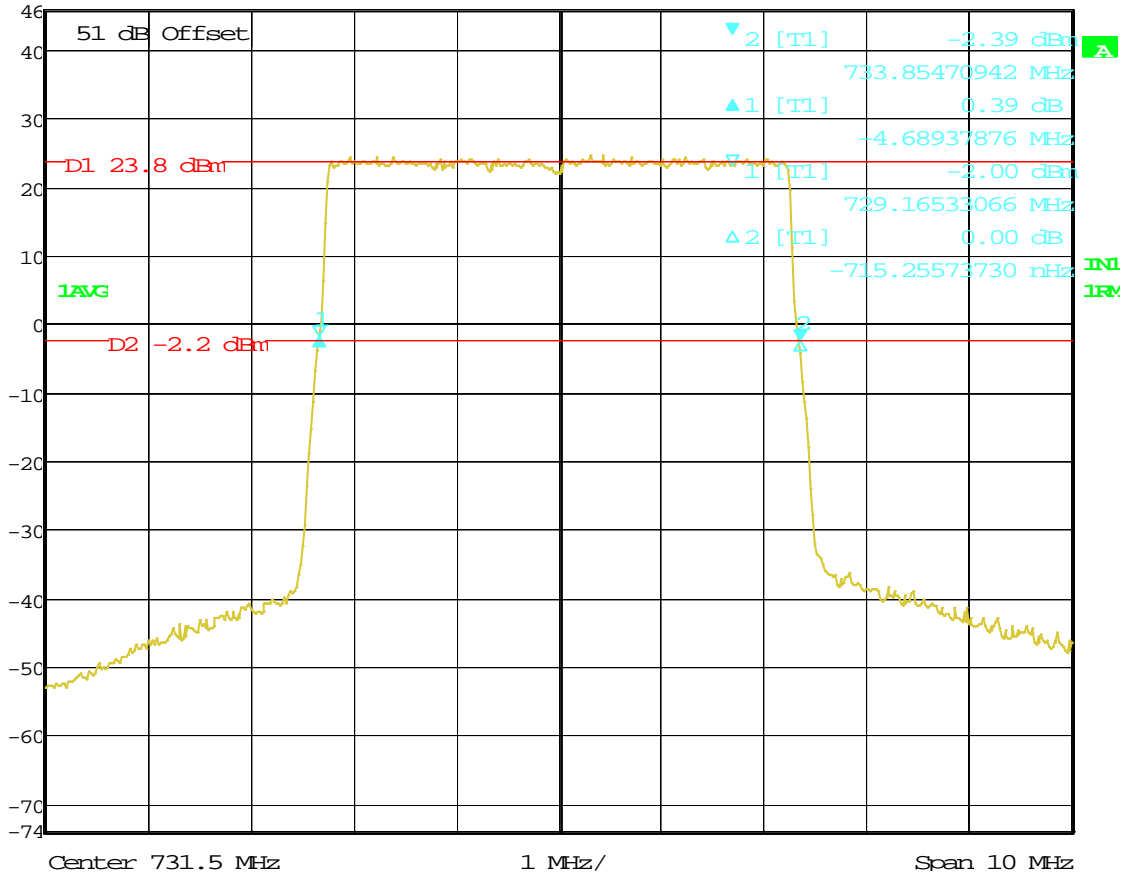


Delta 1 [T1]

RBW 30 kHz RF Att 10 dB

Ref Lvl 0.39 dB
46 dBm -4.68937876 MHz

VBW 300 kHz
SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 11:52:08

Block: B

5 MHz Bandwidth 734.5 – 739.5 MHz

(26dB Bandwidth)



Marker 2 [T1]

RBW 30 kHz RF Att 10 dB

Ref Lvl -2.30 dBm

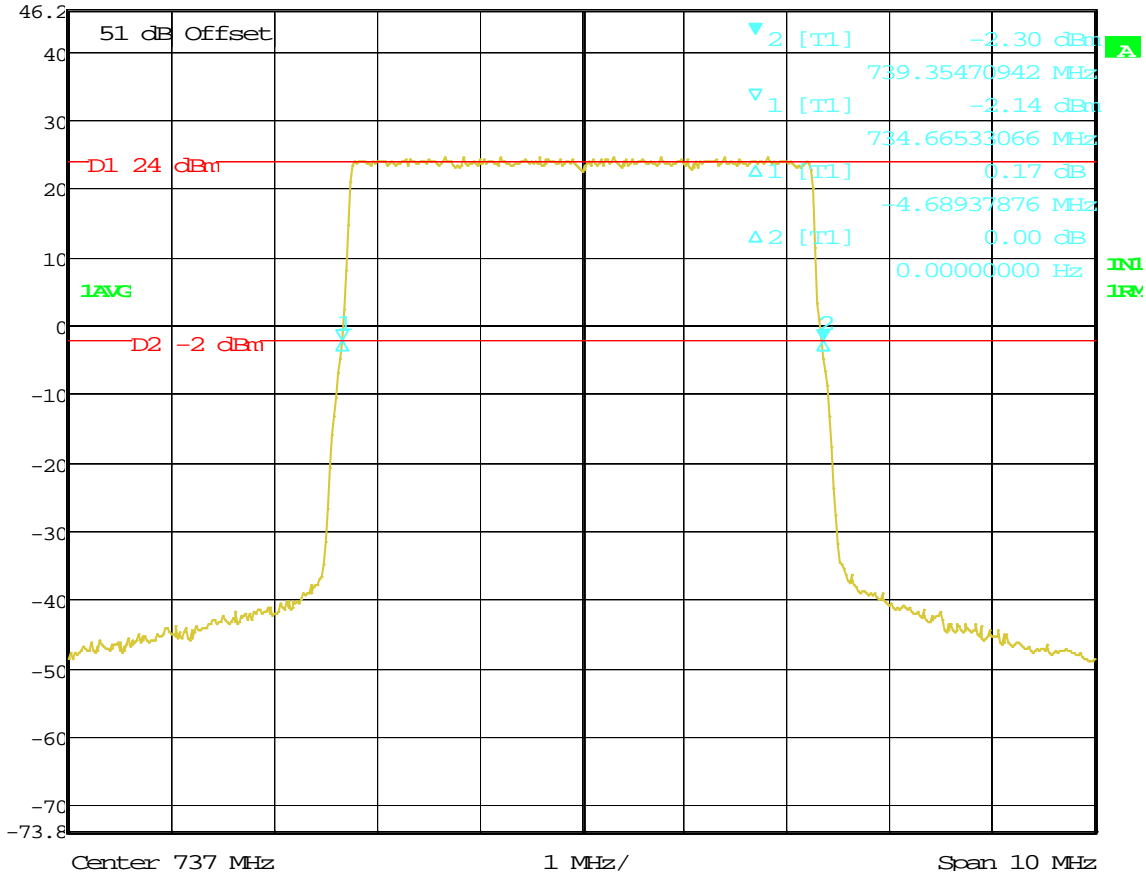
VBW 300 kHz

46.2 dBm

739.35470942 MHz

SWT 28 ms

Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A11; BLK B; 734.5 - 739.5 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 05:39:23



Delta 1 [T1]

RBW 30 kHz RF Att 10 dB

Ref Lvl -0.70 dB

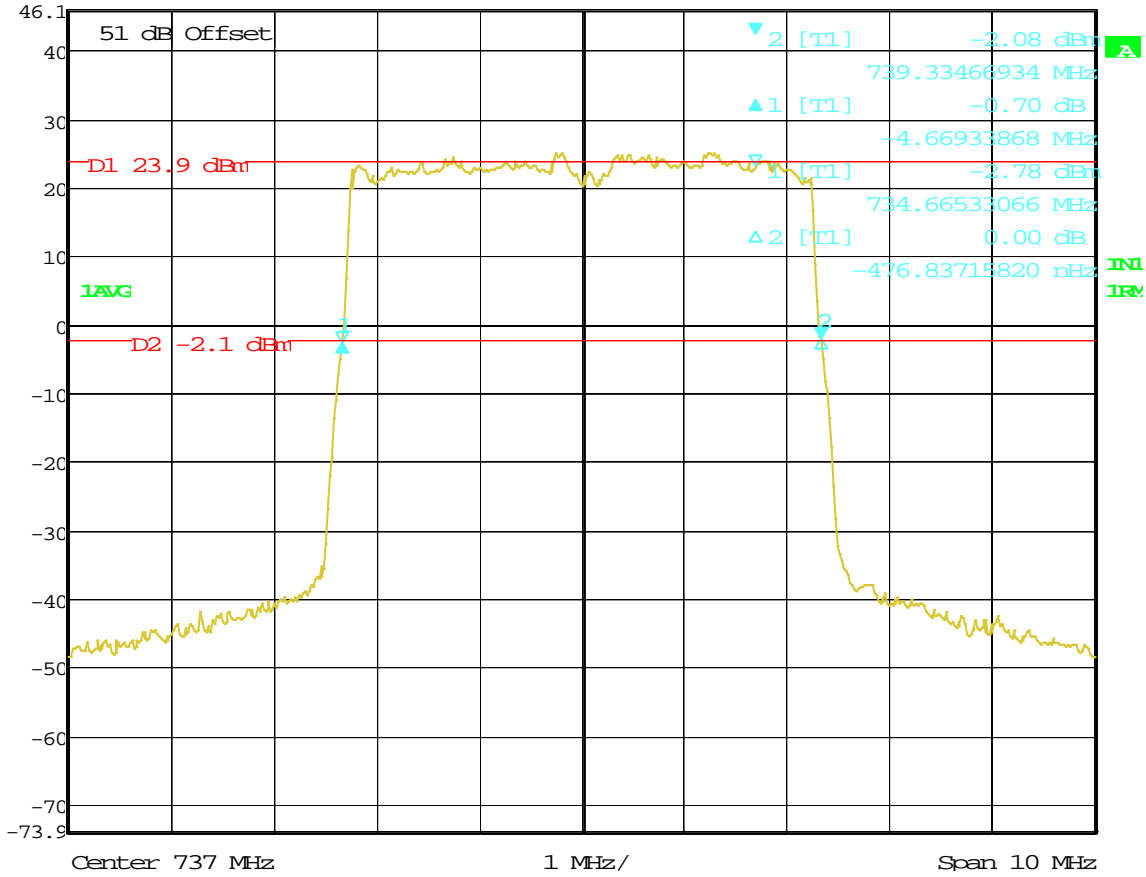
VBW 300 kHz

46.1 dBm

-4.66933868 MHz

SWT 28 ms

Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B; 734.5 - 739.5 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 07:06:30

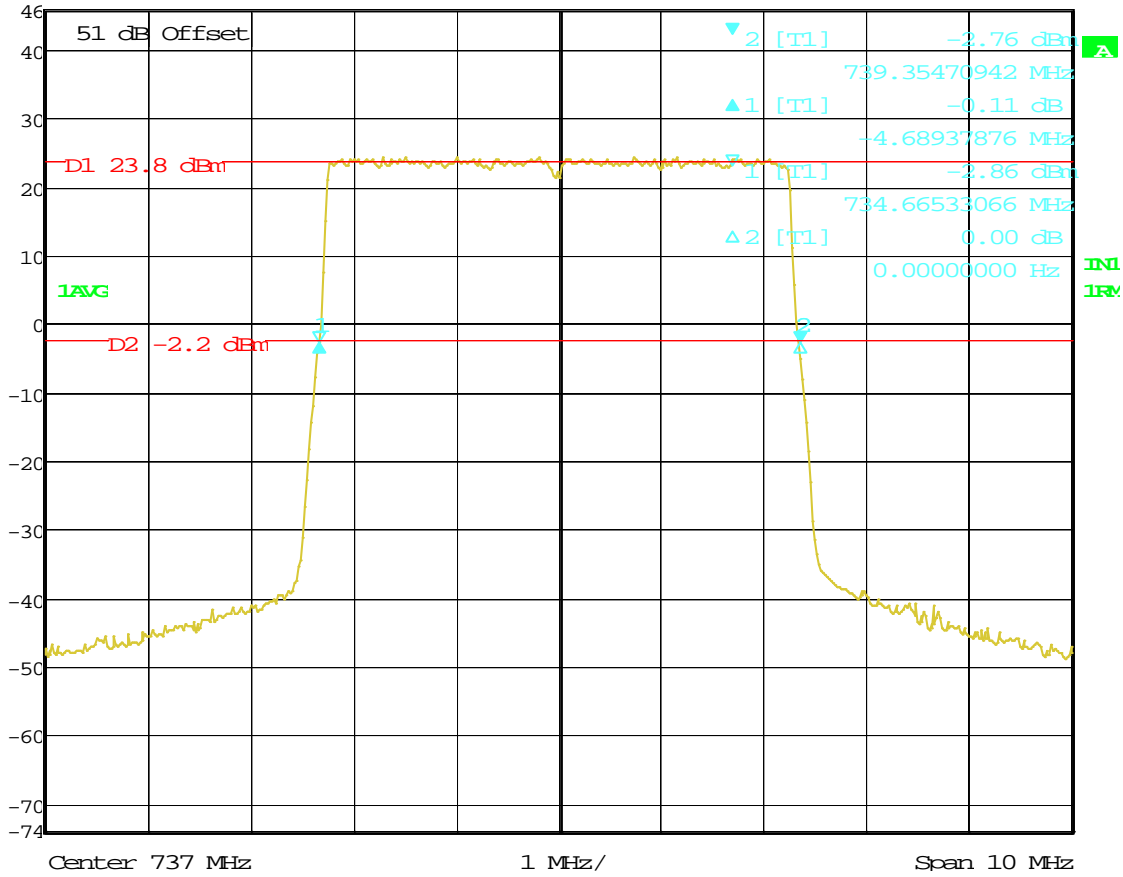


Delta 1 [T1]

RBW 30 kHz RF Att 10 dB

Ref Lvl 46 dBm
-0.11 dB
-4.68937876 MHz

VBW 300 kHz
SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B; 734.5 - 739.5 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 14.AUG.2012 12:40:12

Block: C

5 MHz Bandwidth 740 – 745 MHz

(26dB Bandwidth)



Delta 1 [T1]

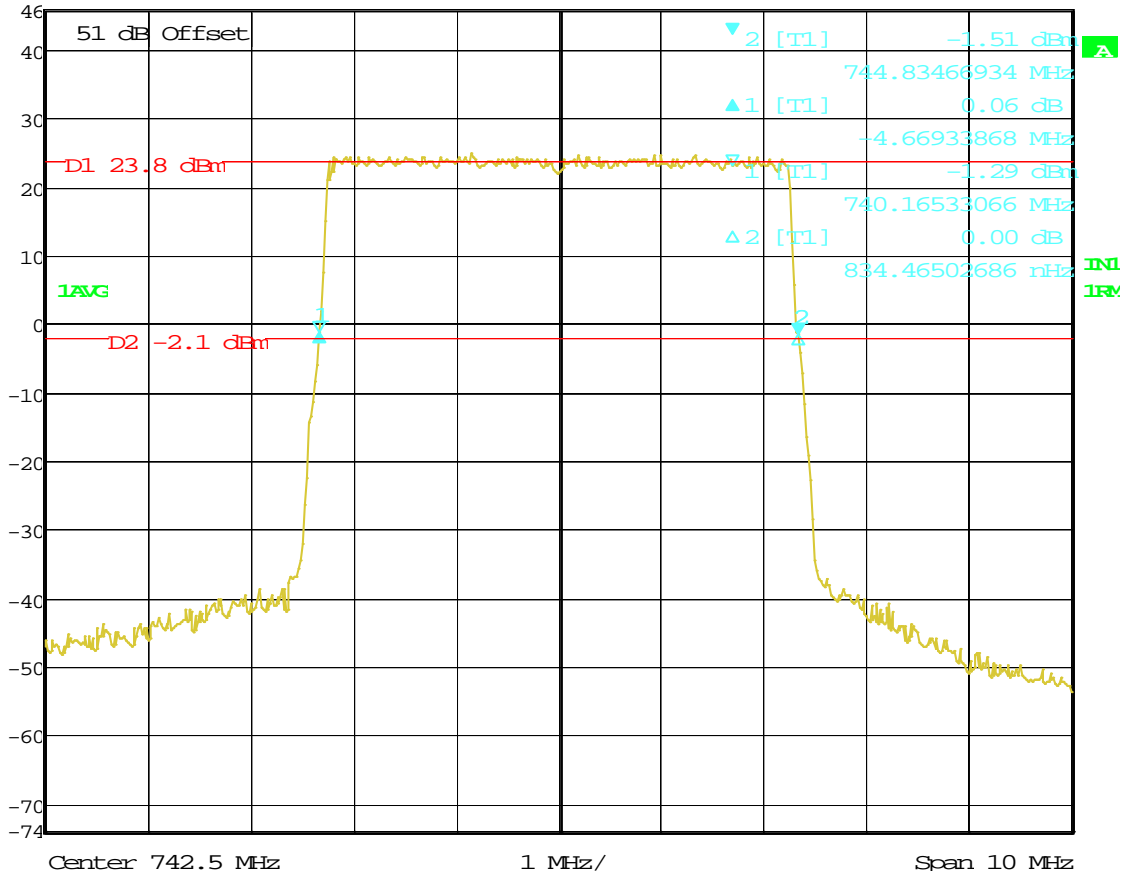
RBW 30 kHz RF Att 10 dB

Ref Lvl 0.06 dB

VBW 300 kHz

46 dBm -4.66933868 MHz

SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 09:03:44



Delta 1 [T1]

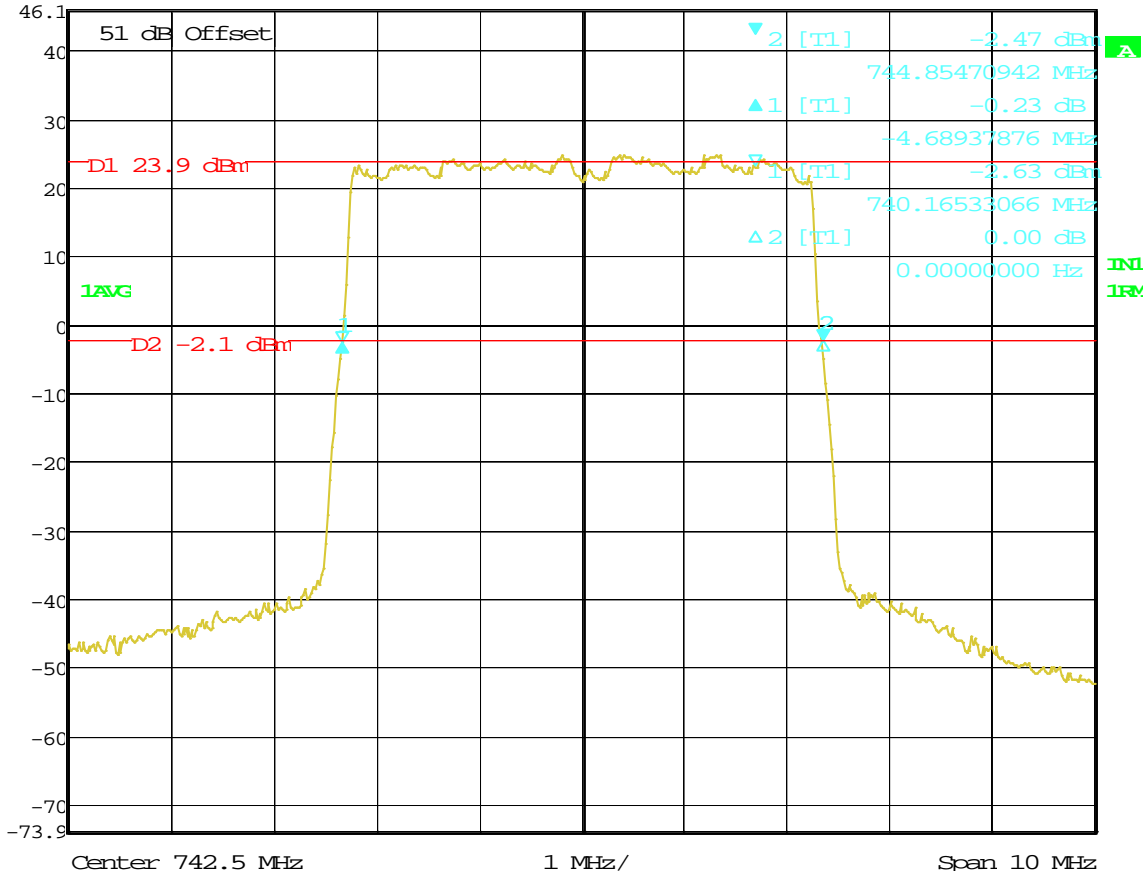
RBW 30 kHz RF Att 10 dB

Ref Lvl -0.23 dB

VBW 300 kHz

46.1 dBm -4.68937876 MHz

SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 07:36:08



Delta 1 [T1]

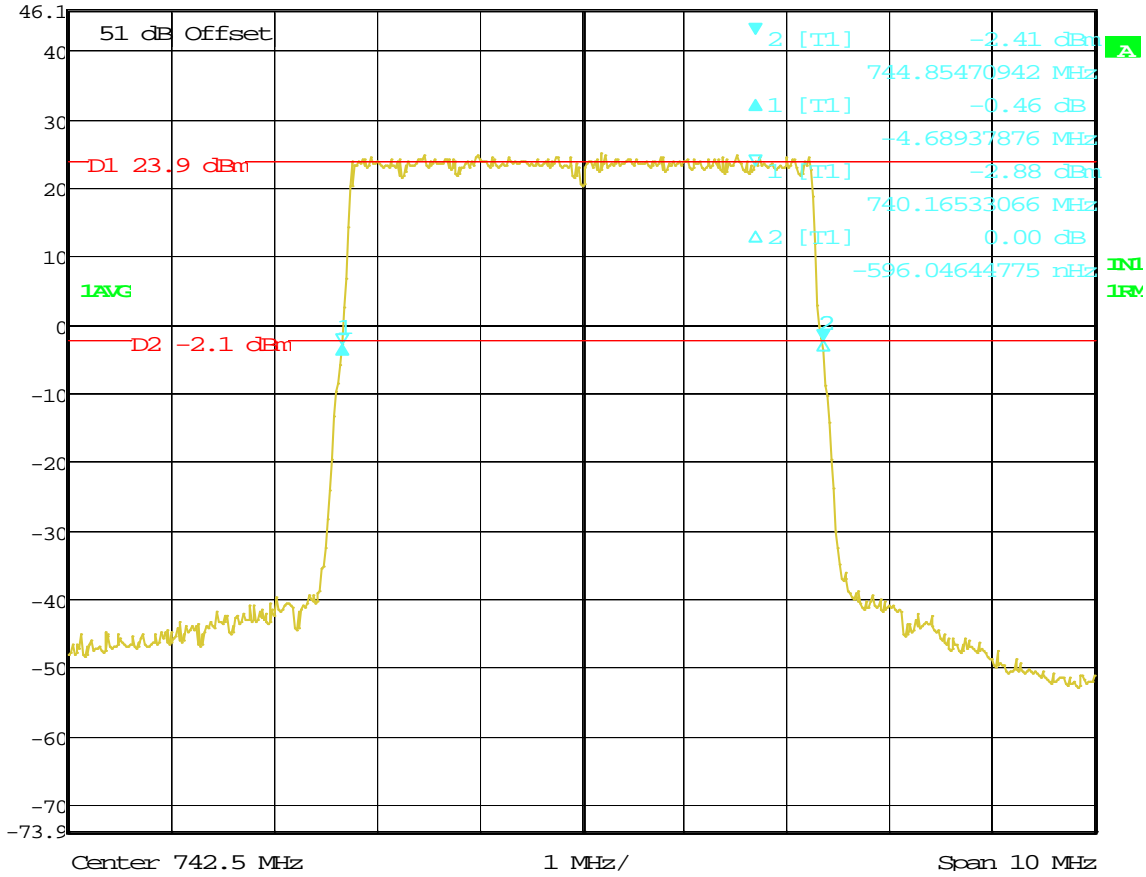
RBW 30 kHz RF Att 10 dB

Ref Lvl -0.46 dB

VBW 300 kHz

46.1 dBm -4.68937876 MHz

SWT 28 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A11; BLK C; 740 - 745 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 11:44:58

Block: A+B

10 MHz Bandwidth 729.5 – 739.5 MHz

(26dB Bandwidth)

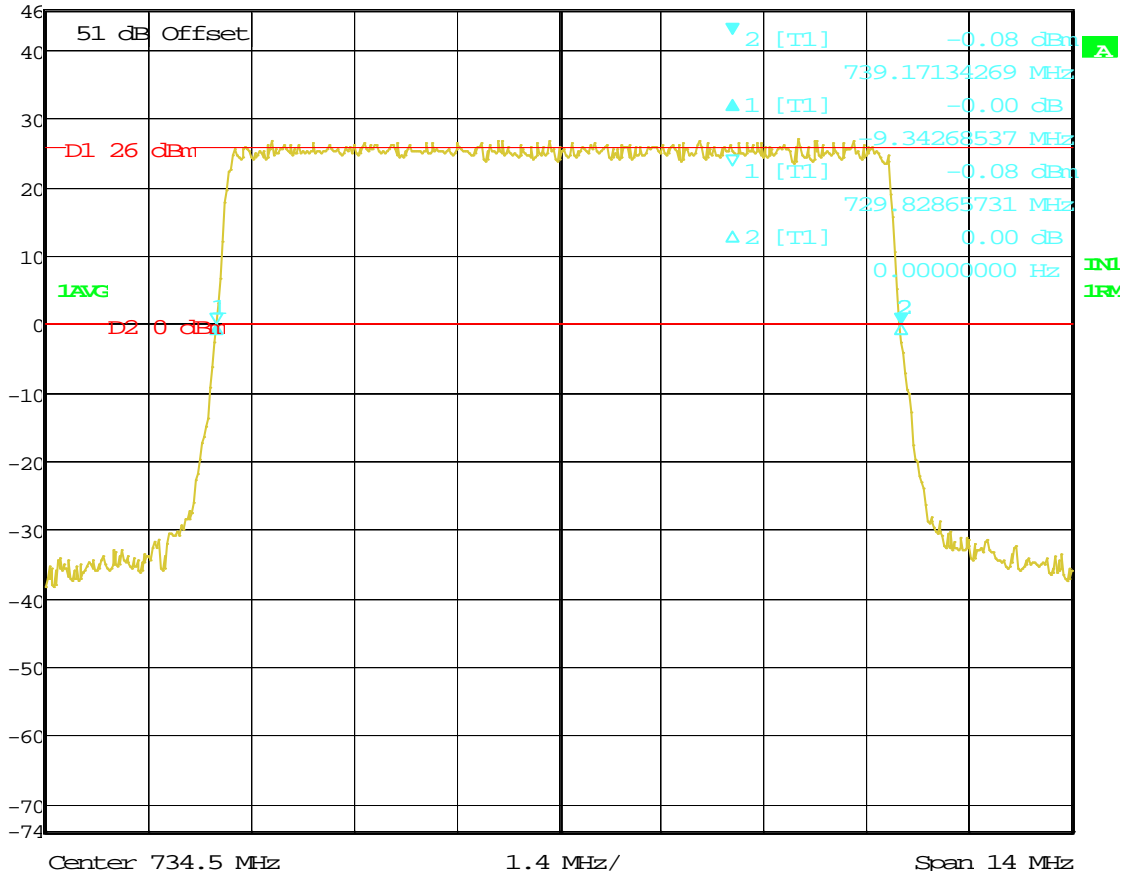


Delta 1 [T1]

RBW 100 kHz RF Att 10 dB

Ref Lvl -0.00 dB
46 dBm -9.34268537 MHz

VBW 1 MHz
SWT 5 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A11; BLK A+B; 729.5-739.5 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 16.AUG.2012 10:55:26

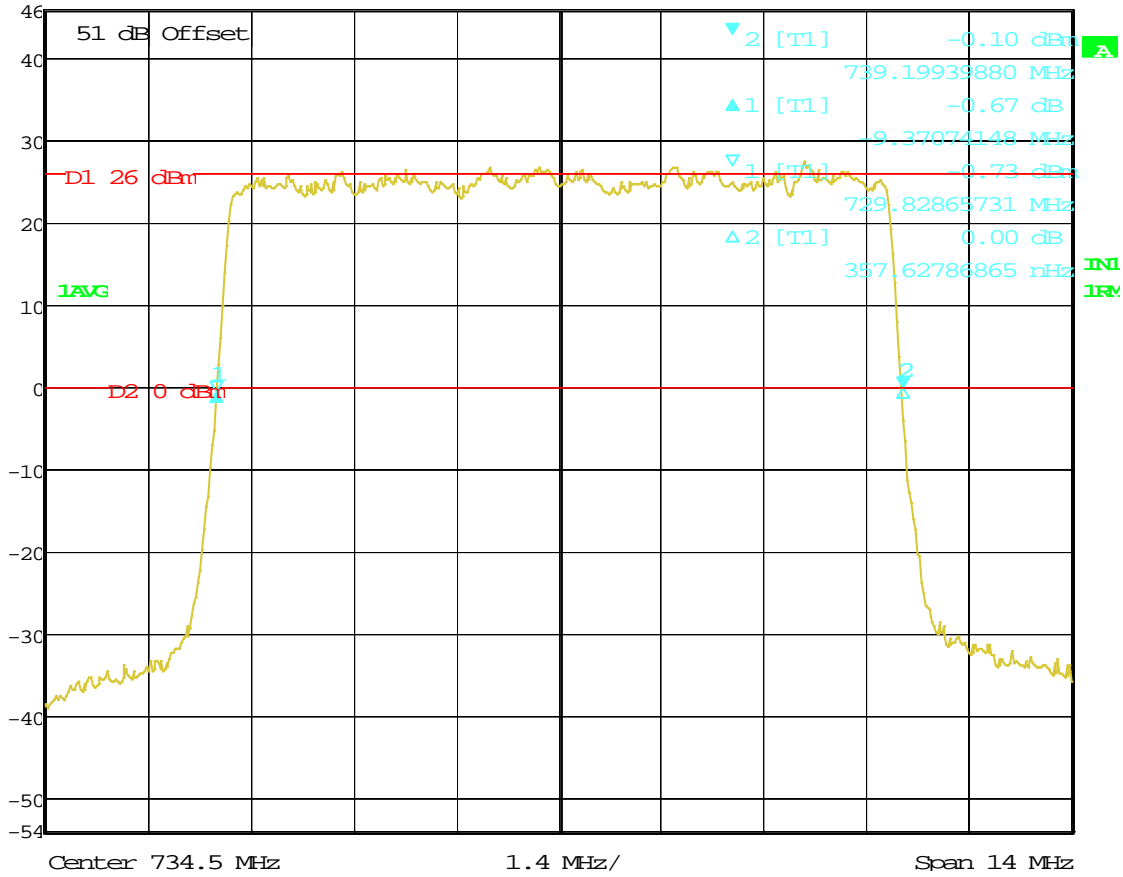


Delta 1 [T1]

RBW 100 kHz RF Att 10 dB

Ref Lvl 46 dBm
 Offset -0.67 dB
 -9.37074148 MHz

VBW 1 MHz
 SWI 5 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1T CR RRH 2X40-700 Lower A1T; Blk A+B; 729.5-739.5 MHz
 PWR:40W; 16QAM; FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 13.SEP.2012 13:07:54

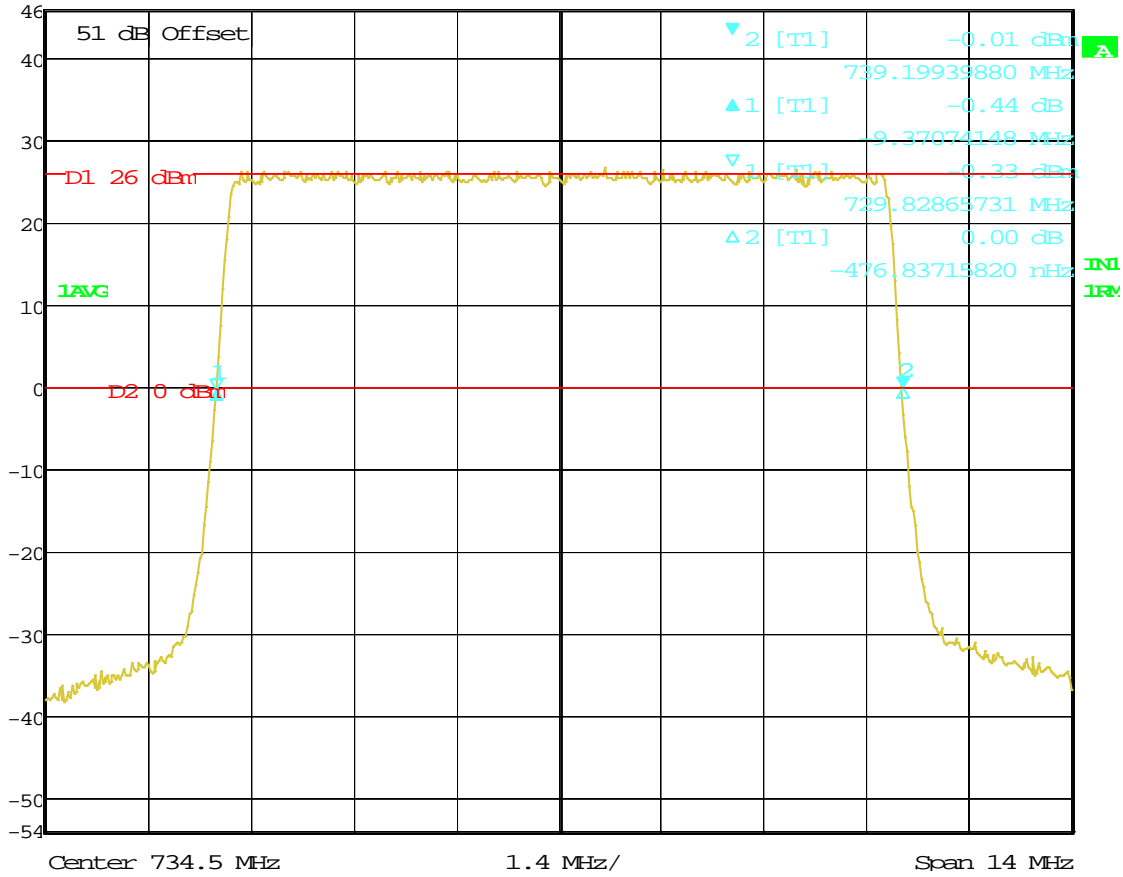


Delta 1 [T1]

RBW 100 kHz RF Att 10 dB

Ref Lvl 46 dBm
 Offset -0.44 dB
 -9.37074148 MHz

VBW 1 MHz
 SWT 5 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1T CR RRH 2X40-700 Lower A1T; Blk A+B; 729.5-739.5 MHz
 PWR:40W; 64QAM; FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 13.SEP.2012 11:58:04

Block: B+C

10 MHz Bandwidth 734.5 – 744.5 MHz

(26dB Bandwidth)

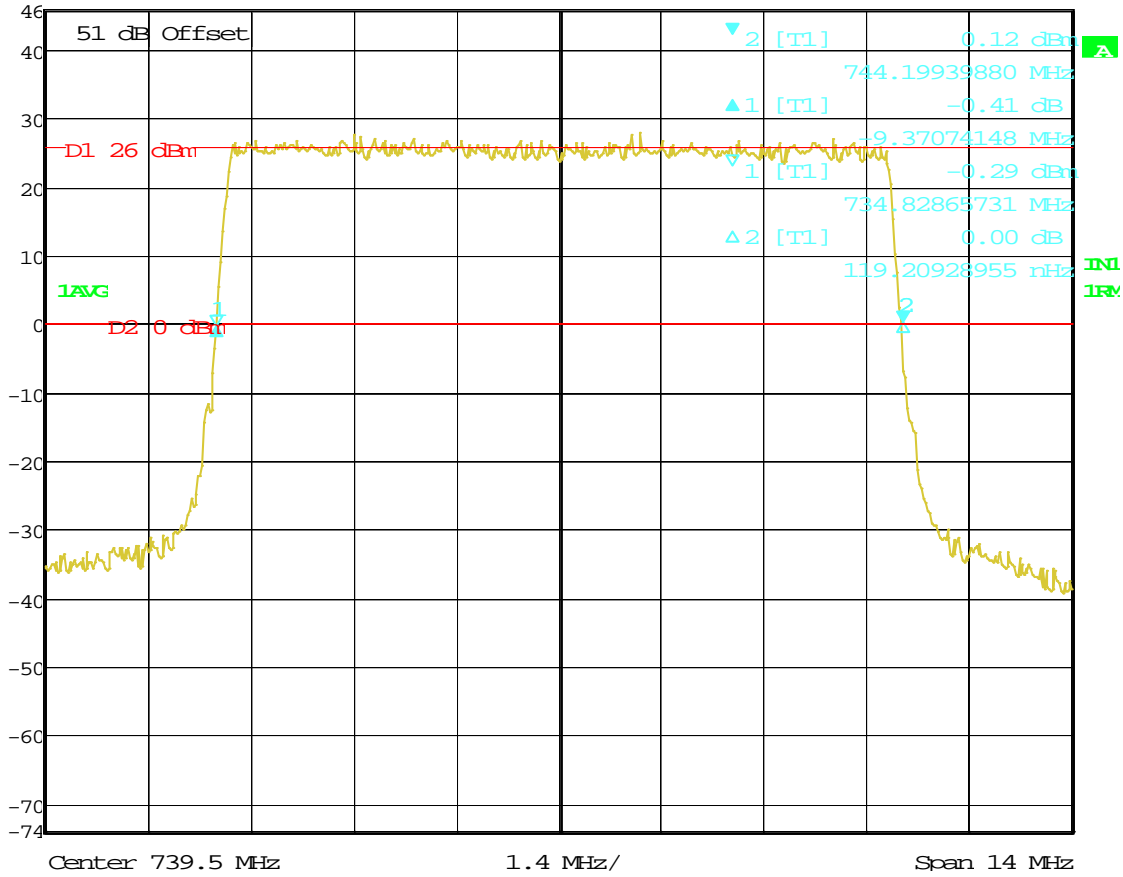


Delta 1 [T1]

RBW 100 kHz RF Att 10 dB

Ref Lvl 46 dBm
 -0.41 dB
 -9.37074148 MHz

VBW 1 MHz
 SWT 5 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
 PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 16.AUG.2012 07:06:34

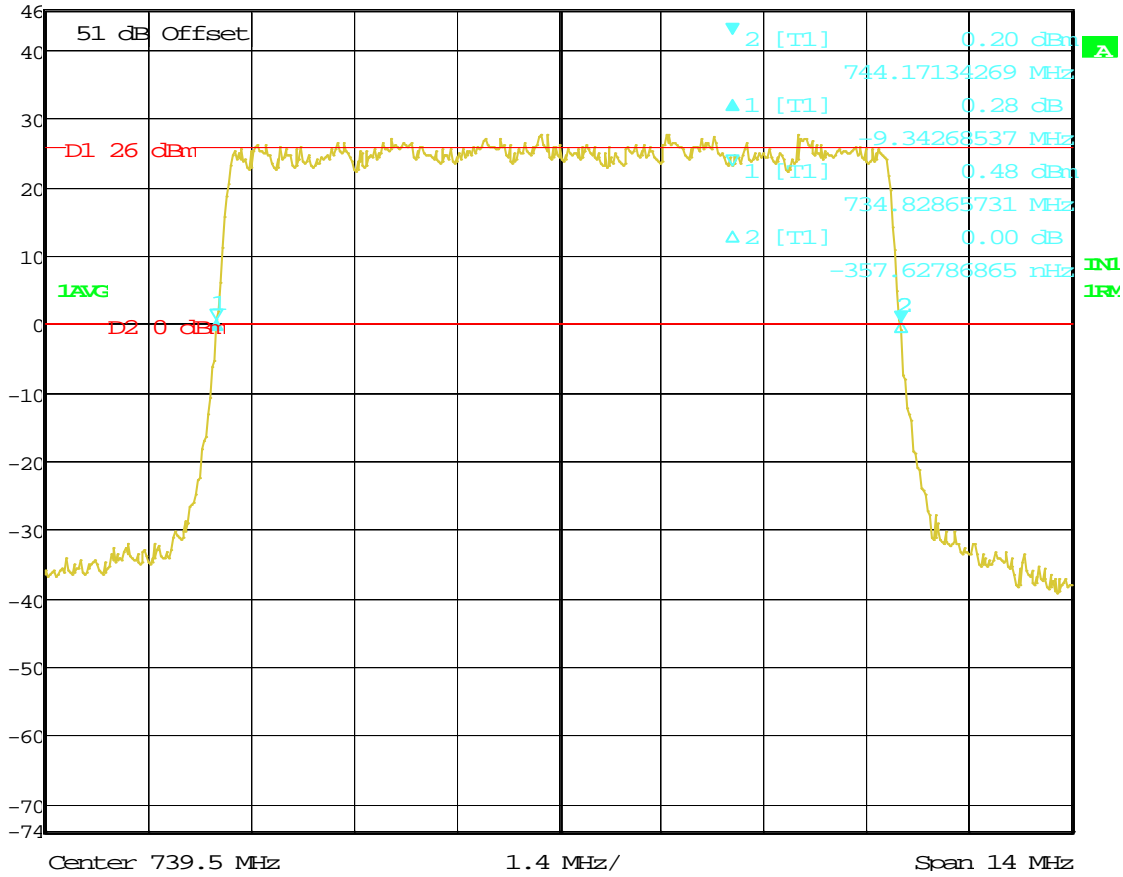


Delta 1 [T1]

RBW 100 kHz RF Att 10 dB

Ref Lvl 0.28 dB
46 dBm -9.34268537 MHz

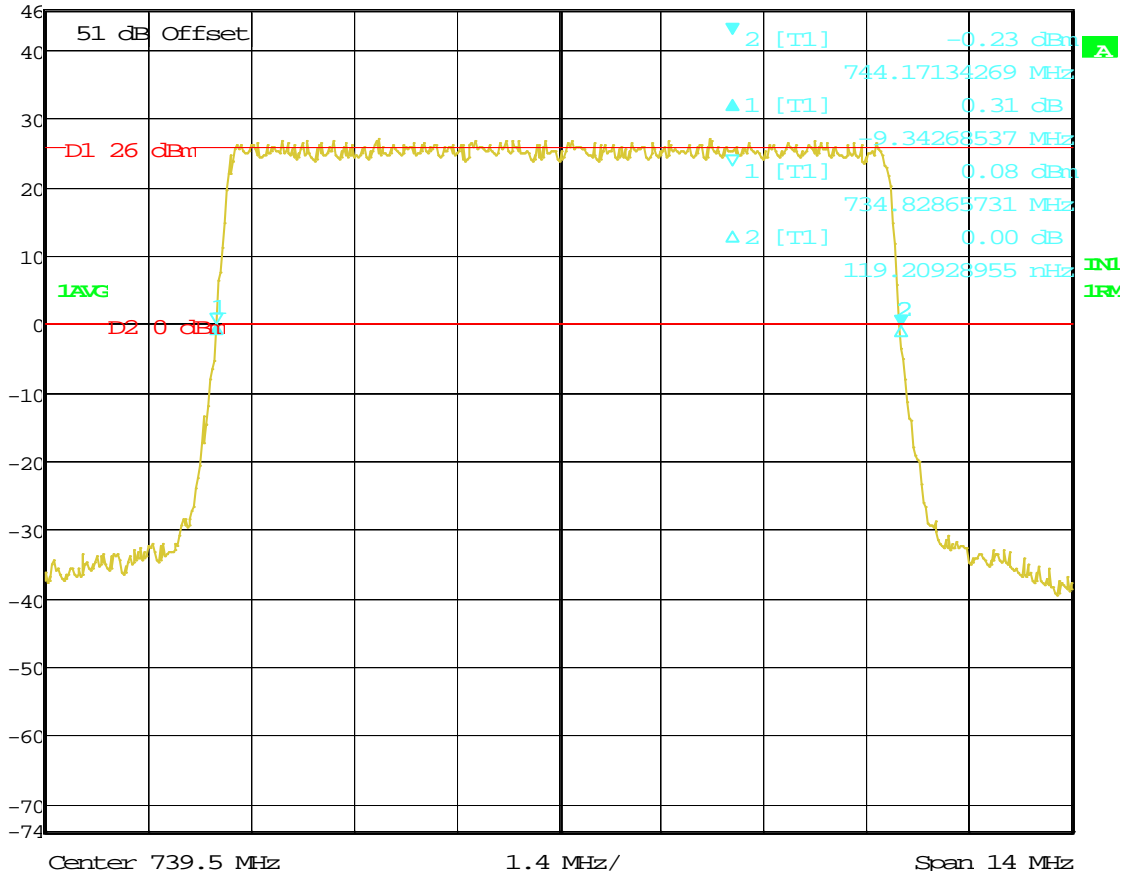
VBW 1 MHz
SWT 5 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
 PWR: 40W; 16QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 16.AUG.2012 06:42:20



Delta 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 0.31 dB VBW 1 MHz
 46 dBm -9.34268537 MHz SWI 5 ms Unit dBm



Title: 26dB BANDWIDTH; Test Engineer: SEG
 Comment A: LTE-A1 CR RRH 2X40-700 Lower A1T; BLK B+C; 734.5-744.5 MHz
 PWR: 40W; 64QAM; FCC Prt 27.53; FCCID: AS5BBTRX-06
 Date: 15.AUG.2012 12:27:43

**MEASUREMENT OF
SPECTRUM MASK/OCCUPIED BANDWIDTH
(100 kHz ADJACENT TO CHANNEL EDGE)
Section 27.53 (G)**

**MEASUREMENT OF SPECTRUM MASK
OCCUPIED BANDWIDTH**

The Spectrum mask close to the center of the carrier frequency (Occupied bandwidth) of the Long Term Evolution (LTE) was measured using a Rohde & Schwarz ESI Spectrum Analyzer/Receiver and an HP Model 520 DeskJet Printer. The RF power level was measured using RF power meter as shown in the test setup in Figure A. The RF output from the LTE EAC port to spectrum analyzer was reduced (to an amplitude usable by the spectrum analyzer) by using a calibrated attenuator. This attenuation was offset on the display and the signal for single carrier was adjusted to the corrected RF power level for a 100 kHz resolution bandwidth for 10MHz wide transmit signal, and 30 kHz resolution bandwidth for 5 MHz wide transmit signal. While adjusting the corrected RF power level in the spectrum analyzer, the attenuator and resolution BW of the spectrum analyzer were considered.

The measurements were made on a LTE RRH2X40-07L-AT.

The reference line on the spectrum analyzer display corresponds to level measured by the RF power meter. Occupied Bandwidth plots were made at antenna terminals for an output of 40 Watts (46.0 dBm)/carrier.

The frequencies and blocks used were tabulated on the bottom of each plot. The output signals at RF filter were plotted at each frequency/block. The LTE RRH2X40-07L-AT is capable of operating in the band of 729 MHz to 745 MHz. The Base station presently tested was configured to operate in Blocks A, B, C, A+B, B+C. Plots were provided for a single carrier. These frequencies were chosen to show the occupied bandwidth in the blocks in the frequency band in which this radio can be operated.

Block edge requirements:

FCC Section 27.53(g): Based on measurement instrument employing resolution bandwidth of 100 kHz bands or greater out band shall be attenuated at least 43+10log (P) dB or -13dBm. However in 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. Pursuant to FCC OET RULES 662911 D01 and D02 for two antenna MIMO mode of operations, the FCC limit of -13dBm shall be 3dB more stringent, therefore all channel edge and out of band spurious emissions shall be -16dBm.

Note: For all tests 100 kHz resolution bandwidth was used for the 10 MHz Carrier Bandwidth, while 30 kHz resolution bandwidth was used for the 5 MHz Carrier Bandwidth.

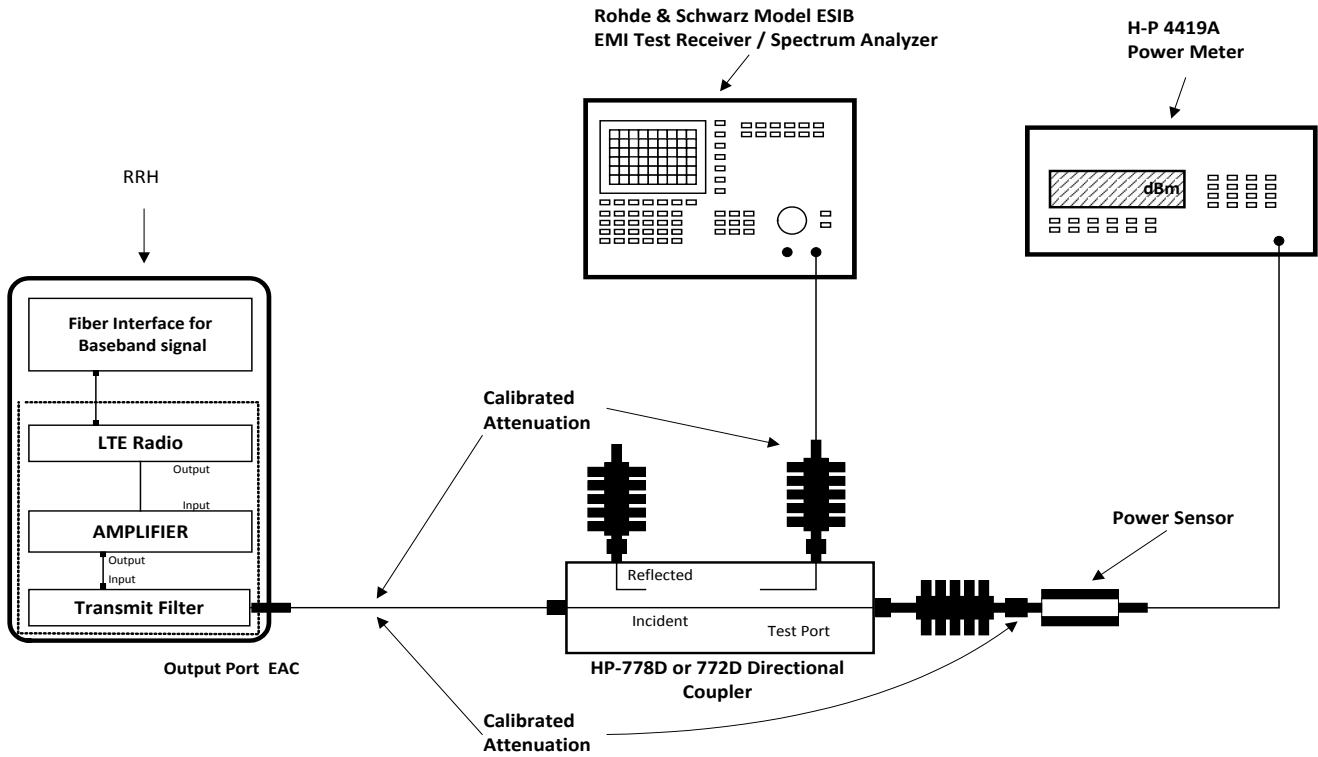
The list of band, channels, RF filters (EAC) and Amplifiers tested are listed below:

Band	Block	Center Frequency (MHz)	Carrier Bandwidth (MHz)	RF Filter	Power (Watts)
	A	731.5	5	M1	40
	B	737	5	M1	40
	C	742.5	5	M1	40
	A+B	734.5	10	M1	40
	B+C	739.5	10	M1	40

Measurement uncertainty:

Frequency: 100 Hz
Amplitude: 0.5 dB

Figure A. TEST CONFIGURATION FOR SPECTRUM MASK (OCCUPIED BANDWIDTH)



All components are calibrated over the frequency range of interest

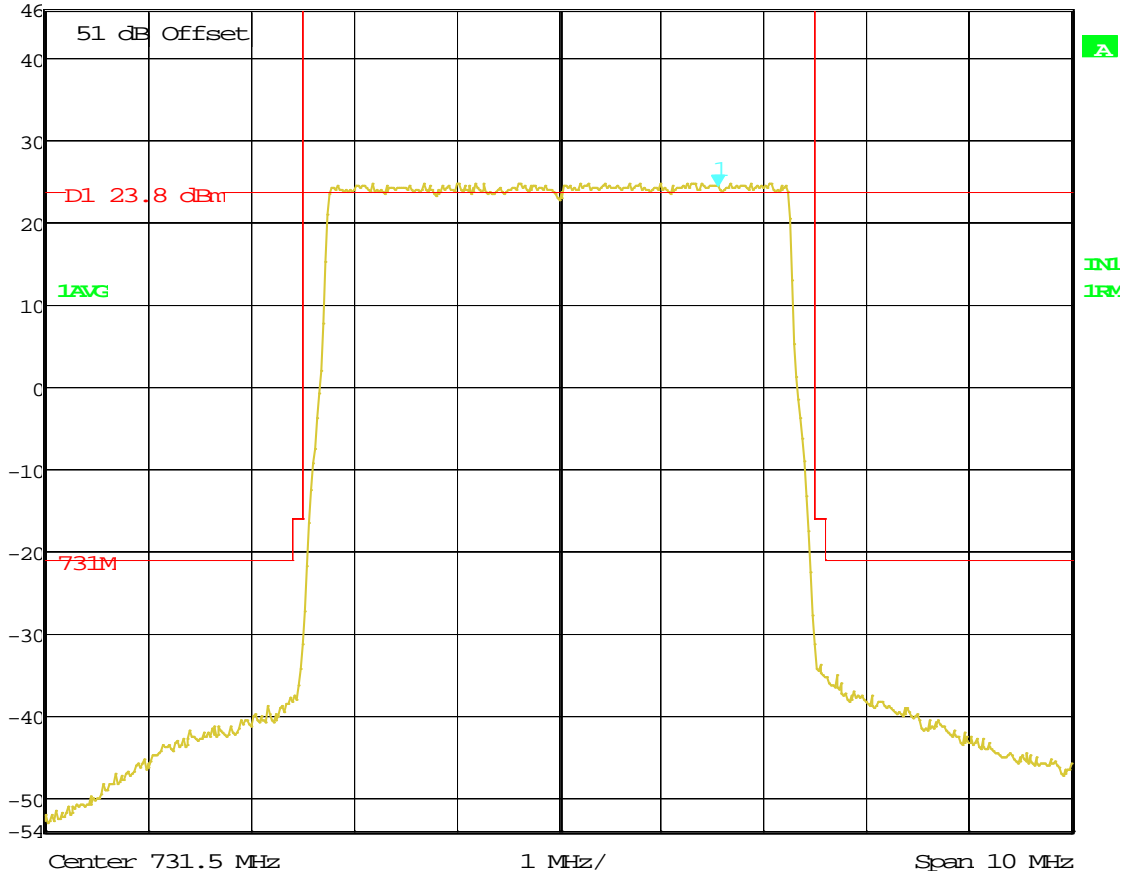
Block: A

5 MHz Bandwidth 729 – 734 MHz

SPECTRUM MASK/OCCUPIED BANDWIDTH



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
Ref Lvl 24.45 dBm VBW 300 kHz
46 dBm 733.05310621 MHz SWI 28 ms Unit dBm

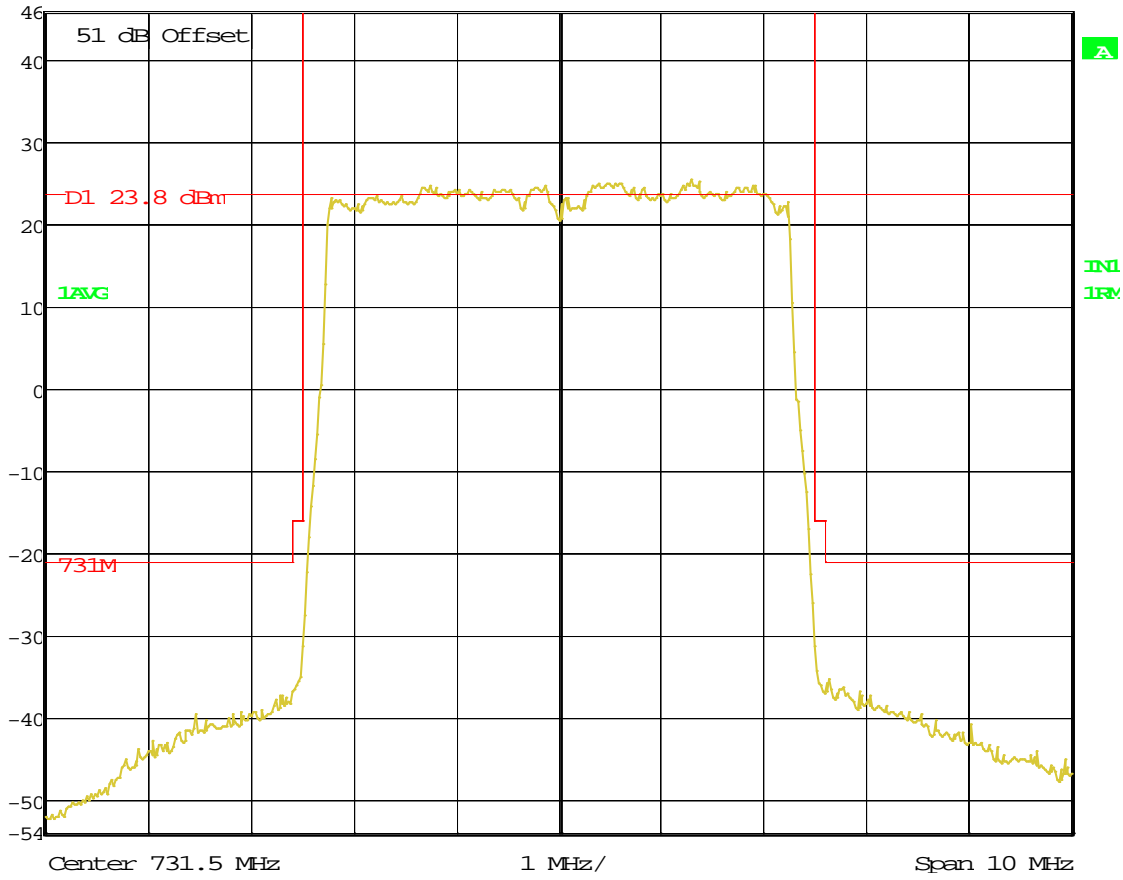


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:07:26



Ref Lvl
46 dBm

RBW 30 kHz RF Att 10 dB
VBW 300 kHz
SWT 28 ms Unit dBm

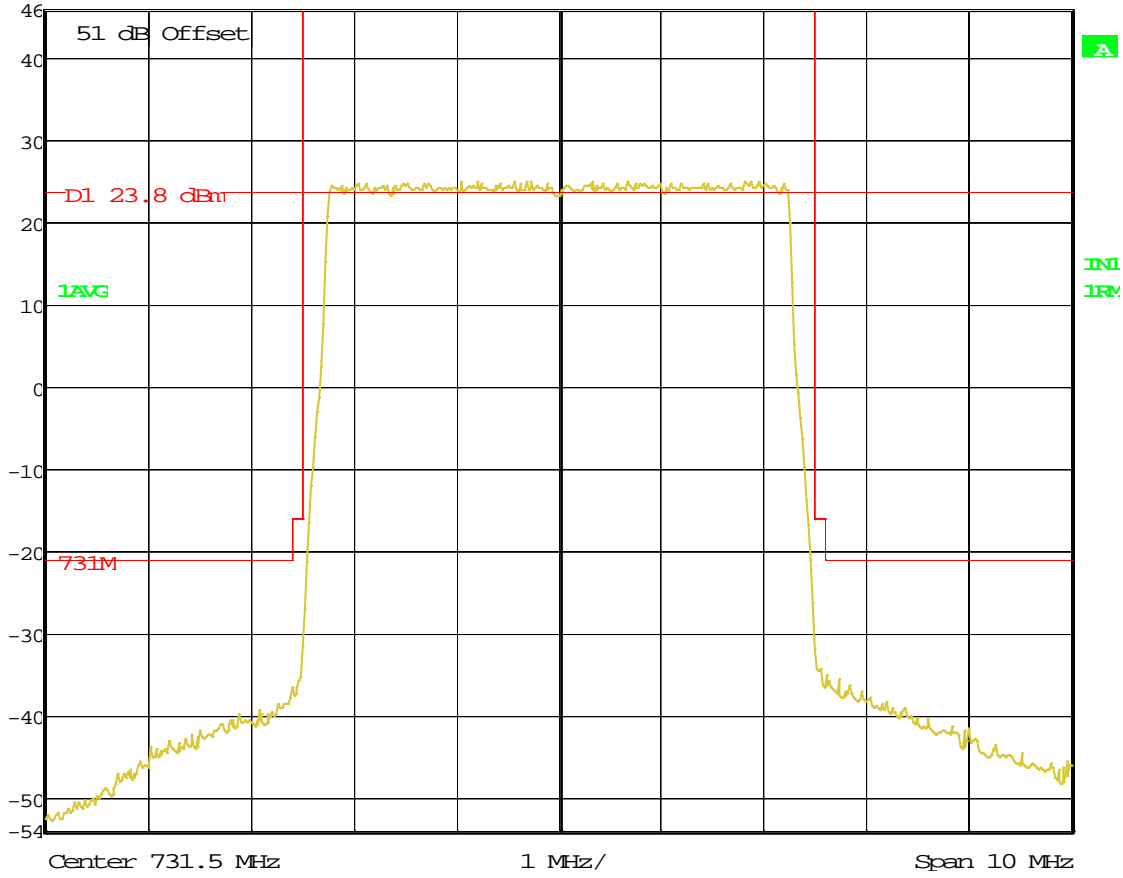


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:32:16



Ref Lvl
46 dBm

RBW 30 kHz RF Att 10 dB
VBW 300 kHz
SWT 28 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:59:17

Block: B

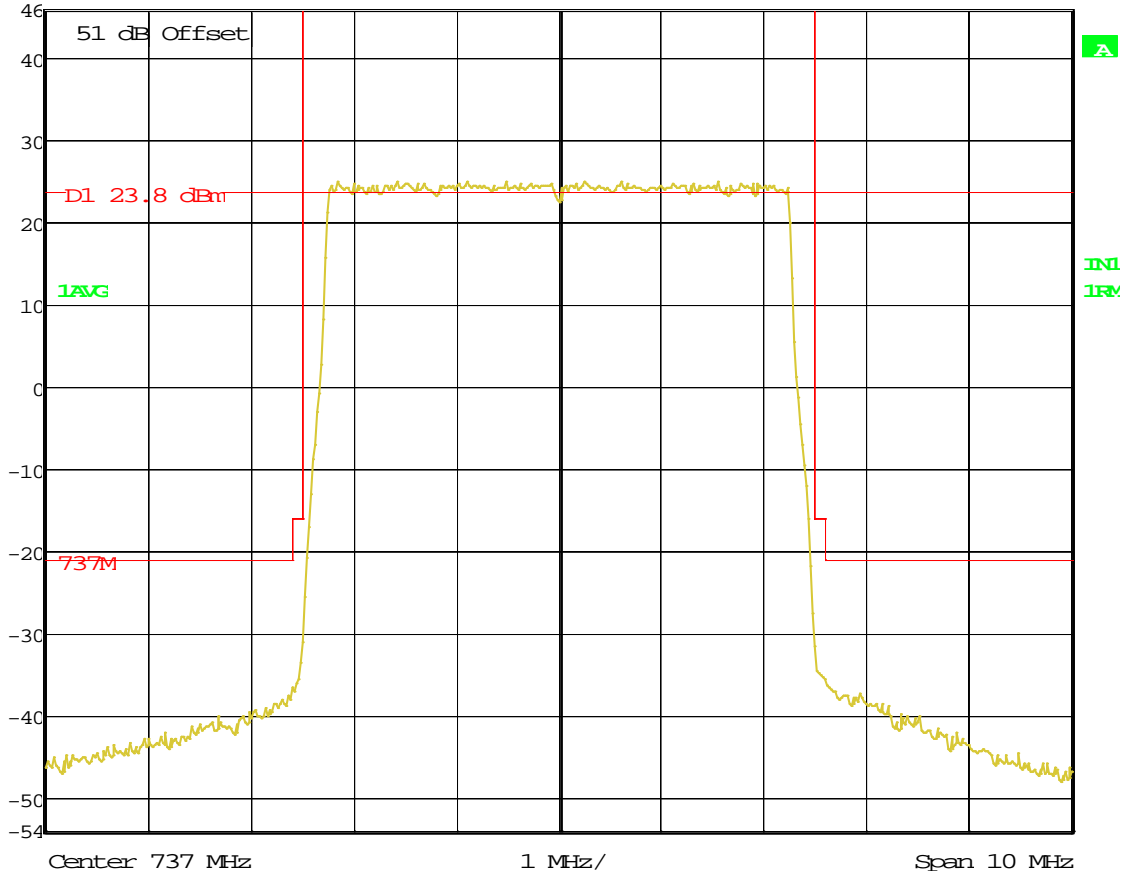
5 MHz Bandwidth 734.5 – 739.5 MHz

SPECTRUM MASK/OCCUPIED BANDWIDTH



Ref Lvl
46 dBm

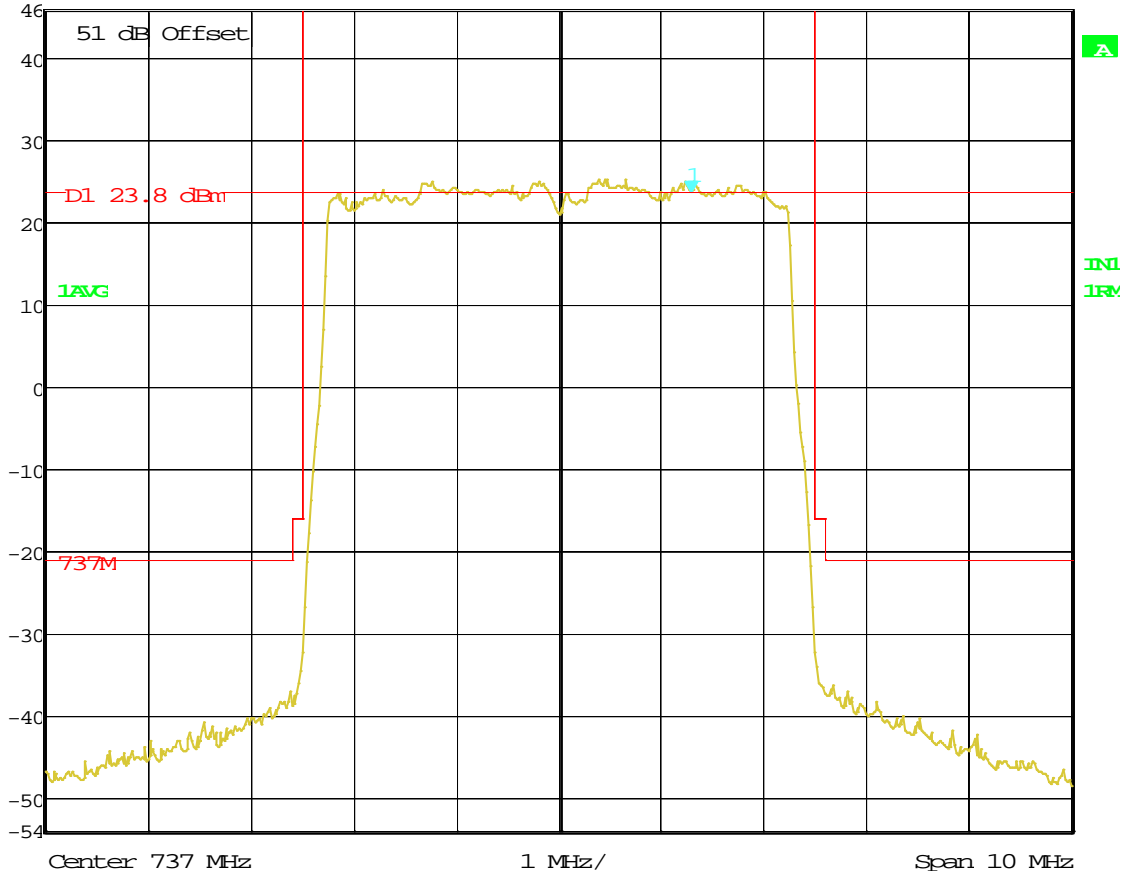
RBW 30 kHz RF Att 10 dB
VBW 300 kHz
SWT 28 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:53:30



Marker 1 [T1] RBW 30 kHz RF Att 10 dB
Ref Lvl 23.66 dBm VBW 300 kHz
46 dBm 738.29258517 MHz SWI 28 ms Unit dBm

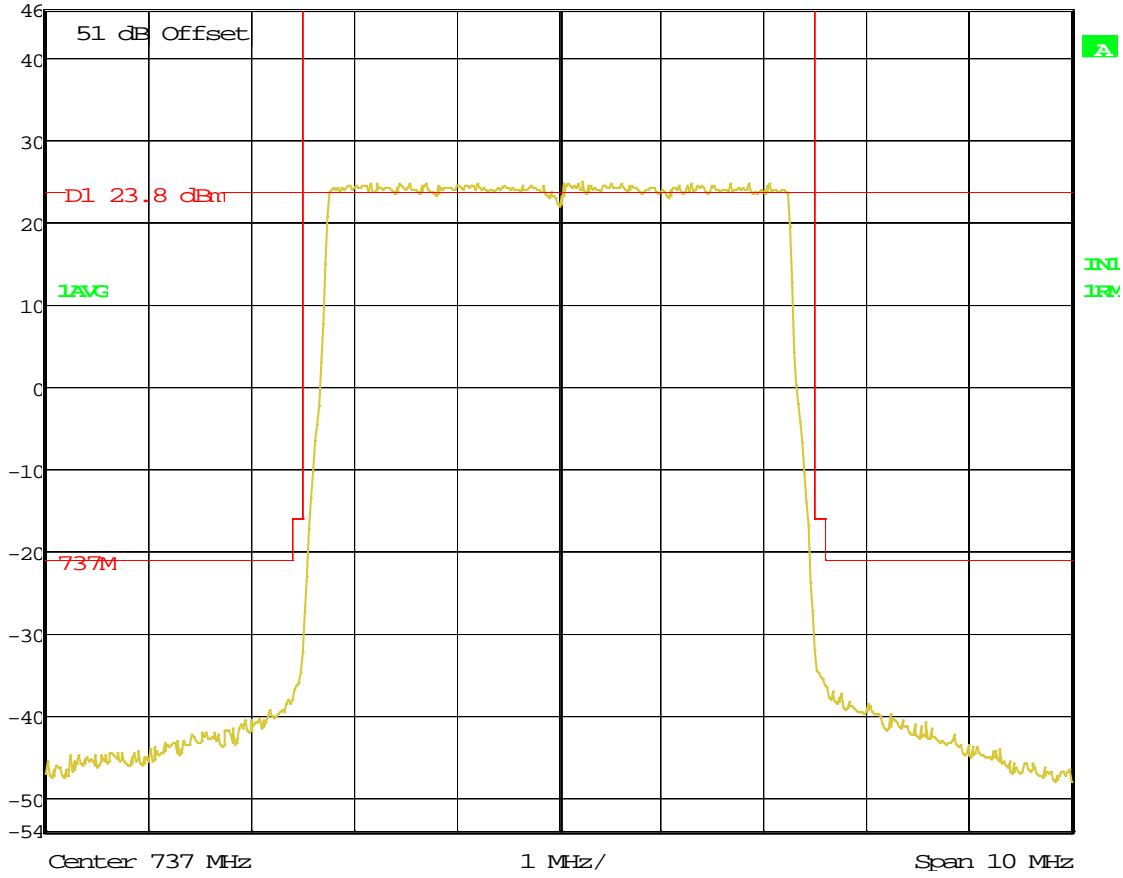


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:28:48



Ref Lvl
46 dBm

RBW 30 kHz RF Att 10 dB
VBW 300 kHz
SWT 28 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:17:20

Block: C

5 MHz Bandwidth 740 – 745 MHz

SPECTRUM MASK/OCCUPIED BANDWIDTH



Marker 1 [T1]

RBW 30 kHz RF Att 10 dB

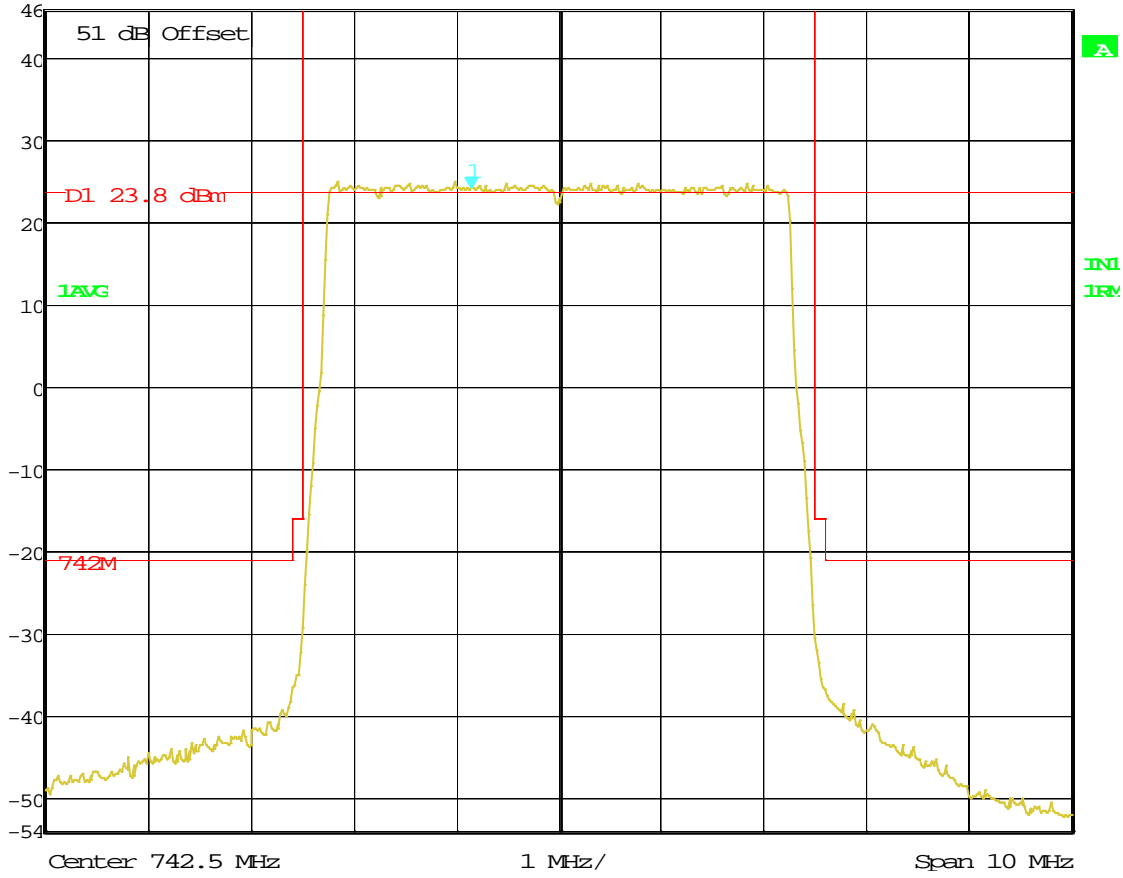
Ref Lvl 24.07 dBm

VBW 300 kHz

46 dBm 741.64829659 MHz

SWT 28 ms

Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 14:22:03



Marker 1 [T1]

RBW 30 kHz RF Att 10 dB

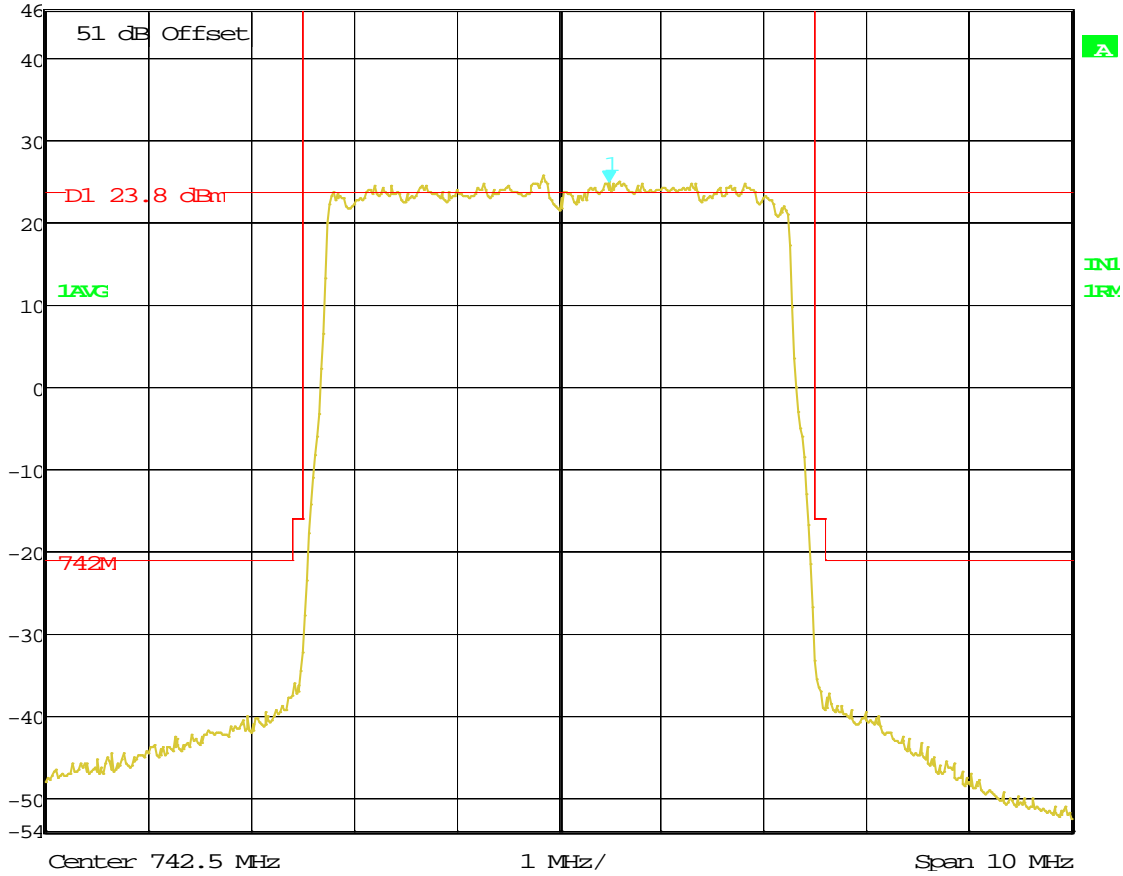
Ref Lvl 24.83 dBm

VBW 300 kHz

46 dBm 742.99098196 MHz

SWT 28 ms

Unit dBm

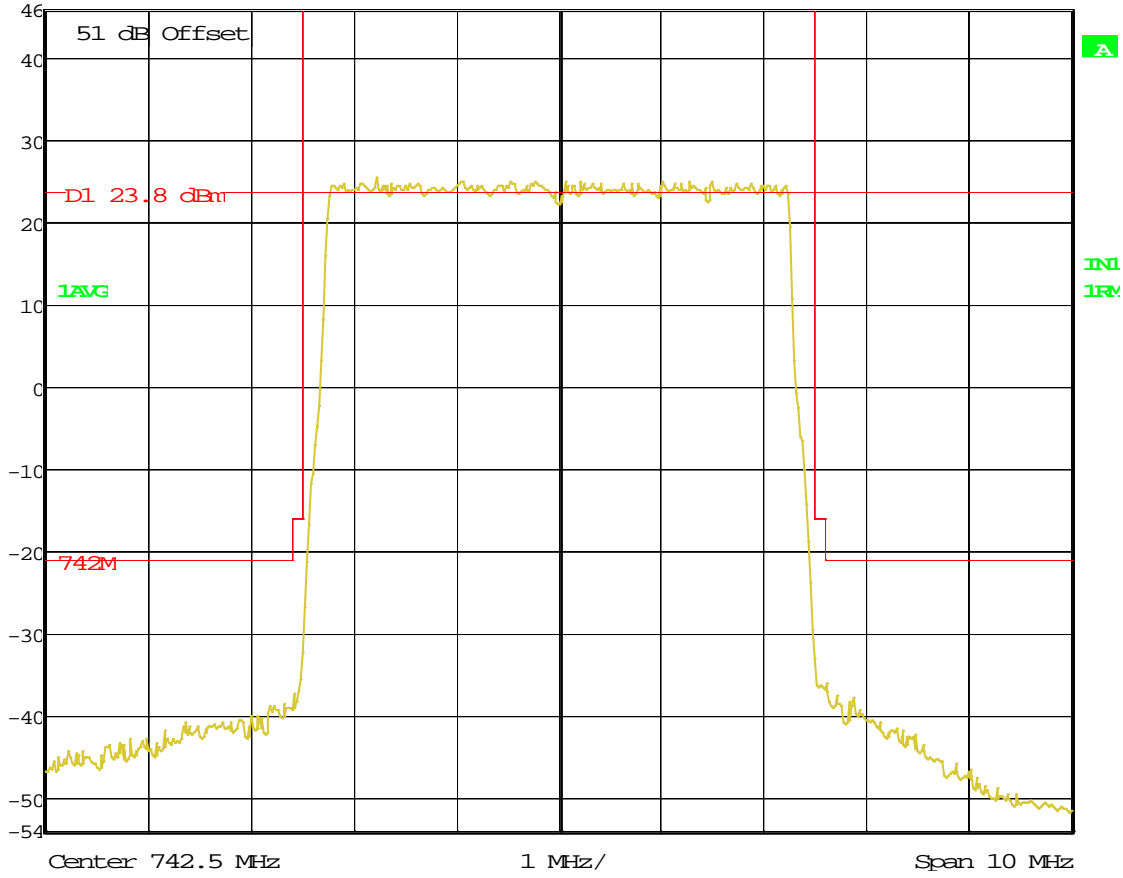


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 09:54:33



Ref Lvl
46 dBm

RBW 30 kHz RF Att 10 dB
VBW 300 kHz
SWT 28 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:14:03

Block: A+B

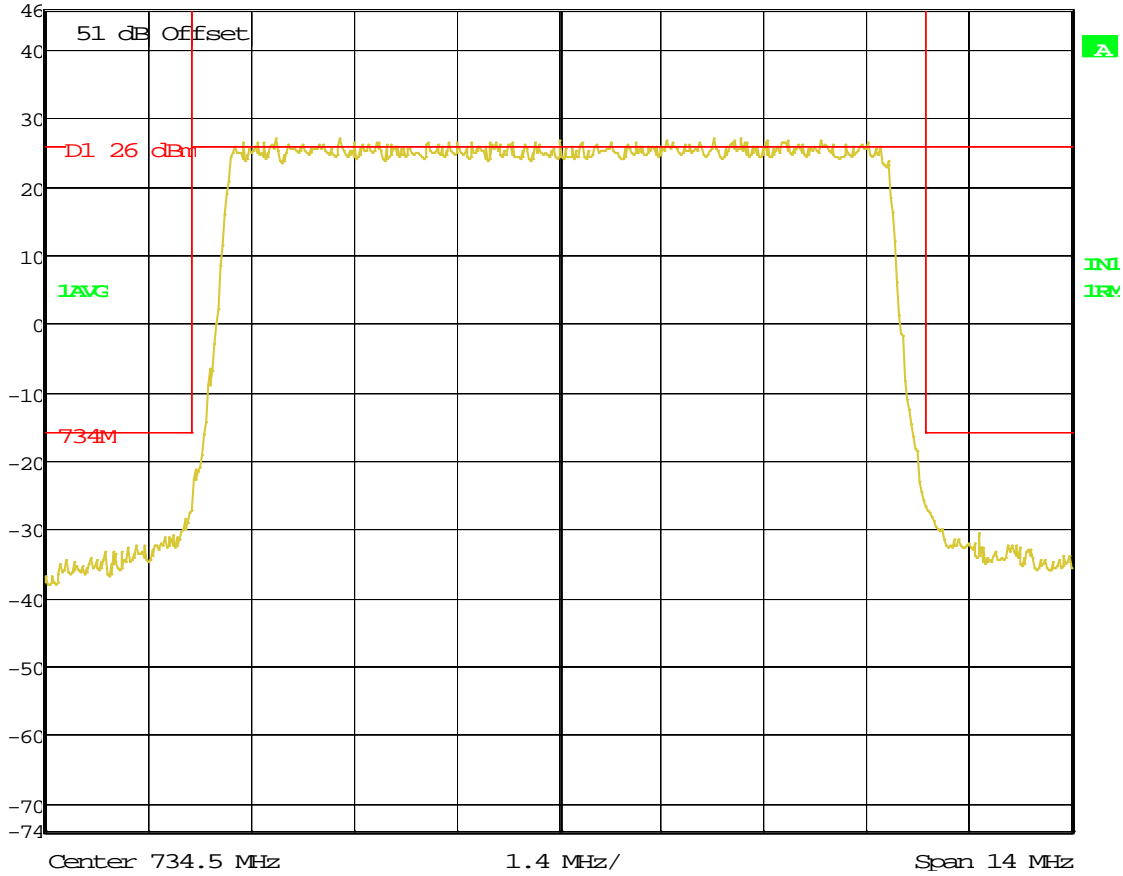
10 MHz Bandwidth 729.5 – 739.5 MHz

SPECTRUM MASK/OCCUPIED BANDWIDTH



Ref Lvl
46 dBm

RBW 100 kHz RF Att 10 dB
VBW 1 MHz
SWT 5 ms Unit dBm

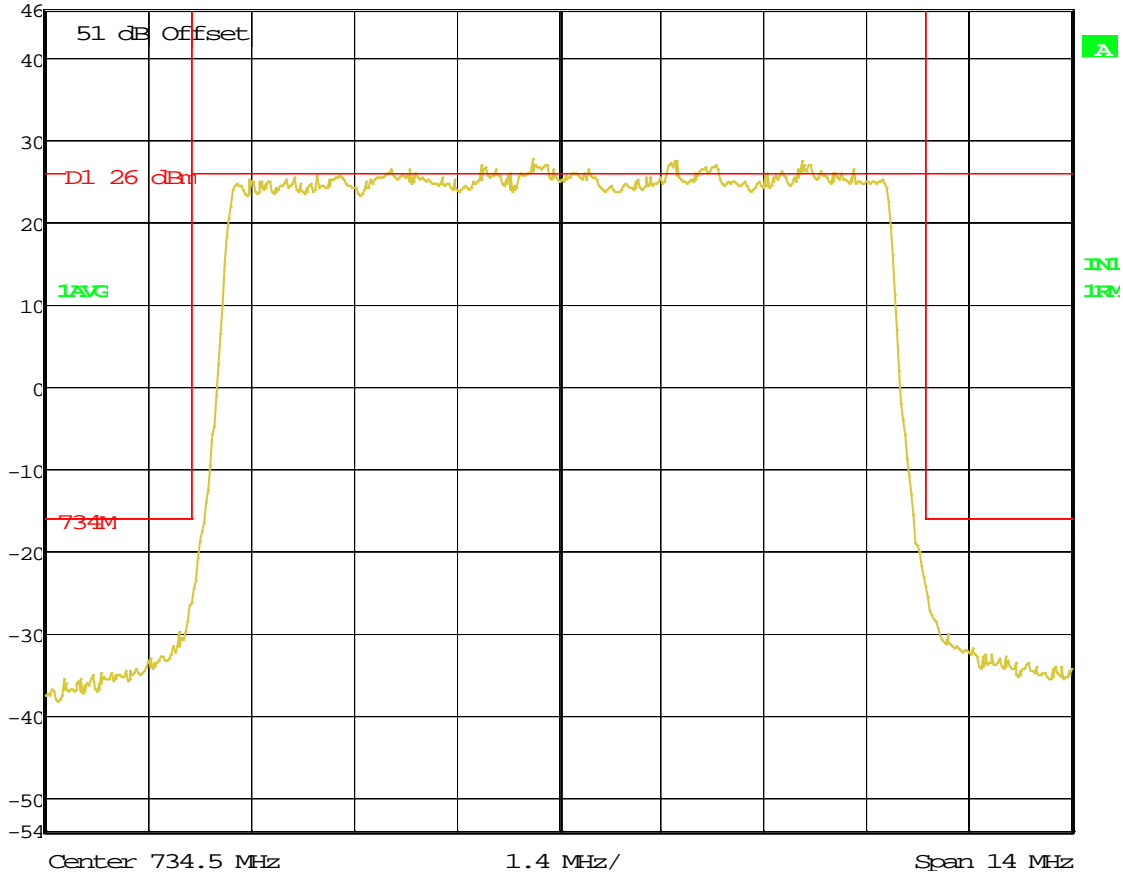


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A+B; 729.5-739.5 MHz
PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
Date: 16.AUG.2012 10:34:52



Ref Lvl
46 dBm

RBW 100 kHz RF Att 10 dB
VBW 1 MHz
SWT 5 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A+B; 729.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 13:59:19



Marker 1 [T1]

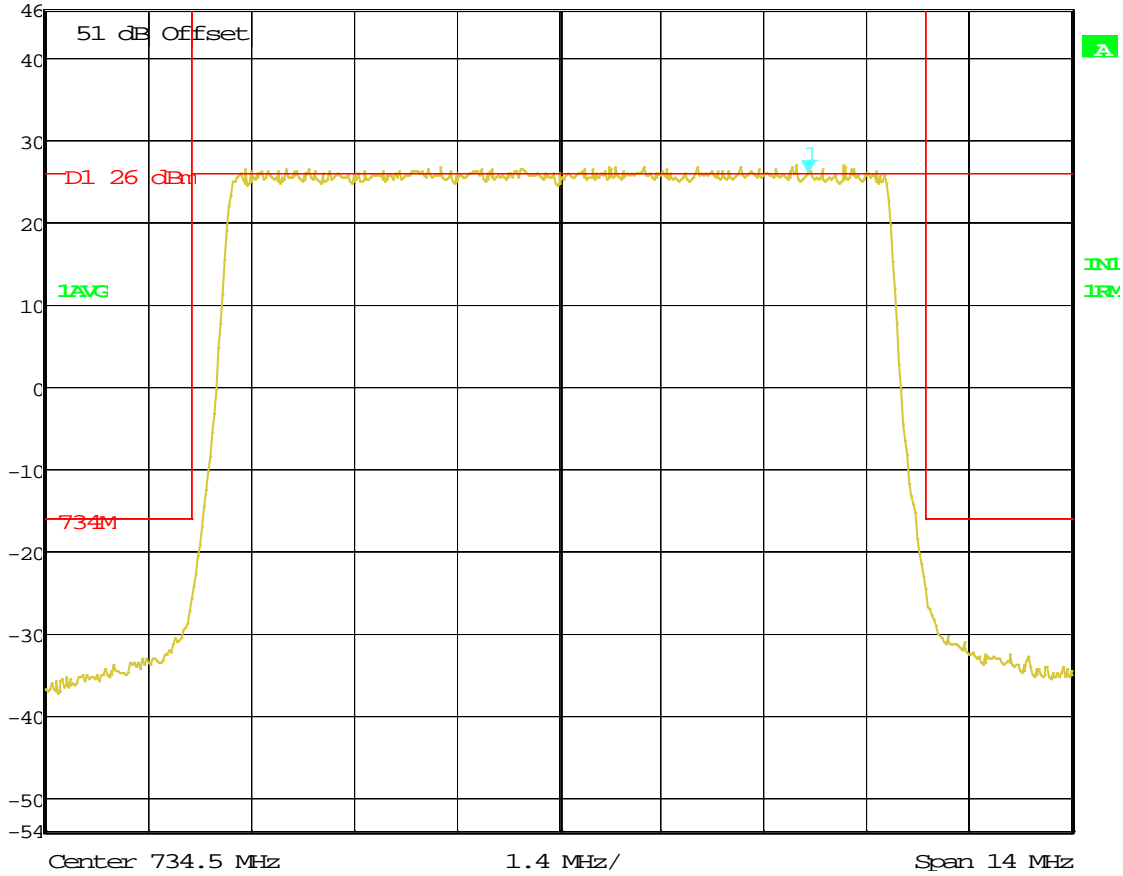
RBW 100 kHz RF Att 10 dB

Ref Lvl 26.22 dBm

VBW 1 MHz

46 dBm 737.91482966 MHz

SWT 5 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A+B; 729.5-739.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 13:10:41

Block: B+C

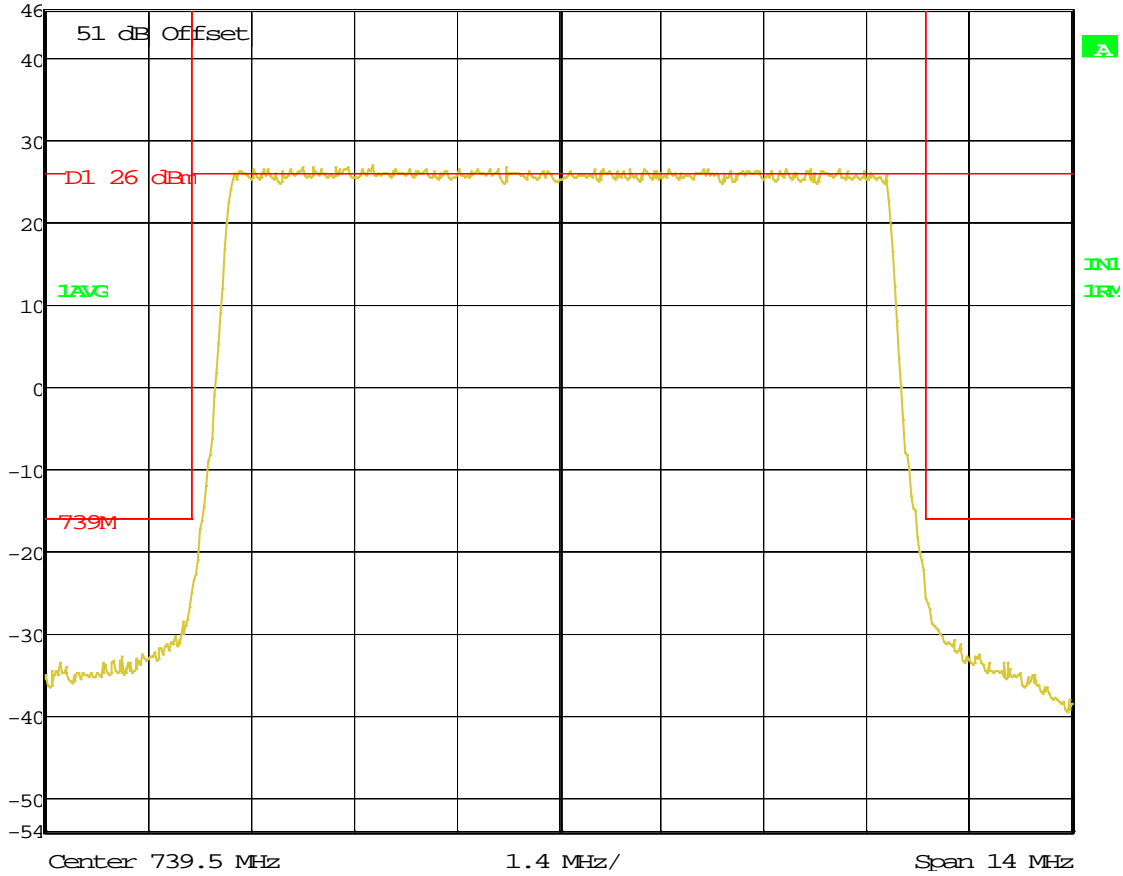
10 MHz Bandwidth 734.5 – 744.5 MHz

SPECTRUM MASK/OCCUPIED BANDWIDTH



Ref Lvl
46 dBm

RBW 100 kHz RF Att 10 dB
VBW 1 MHz
SWT 5 ms Unit dBm

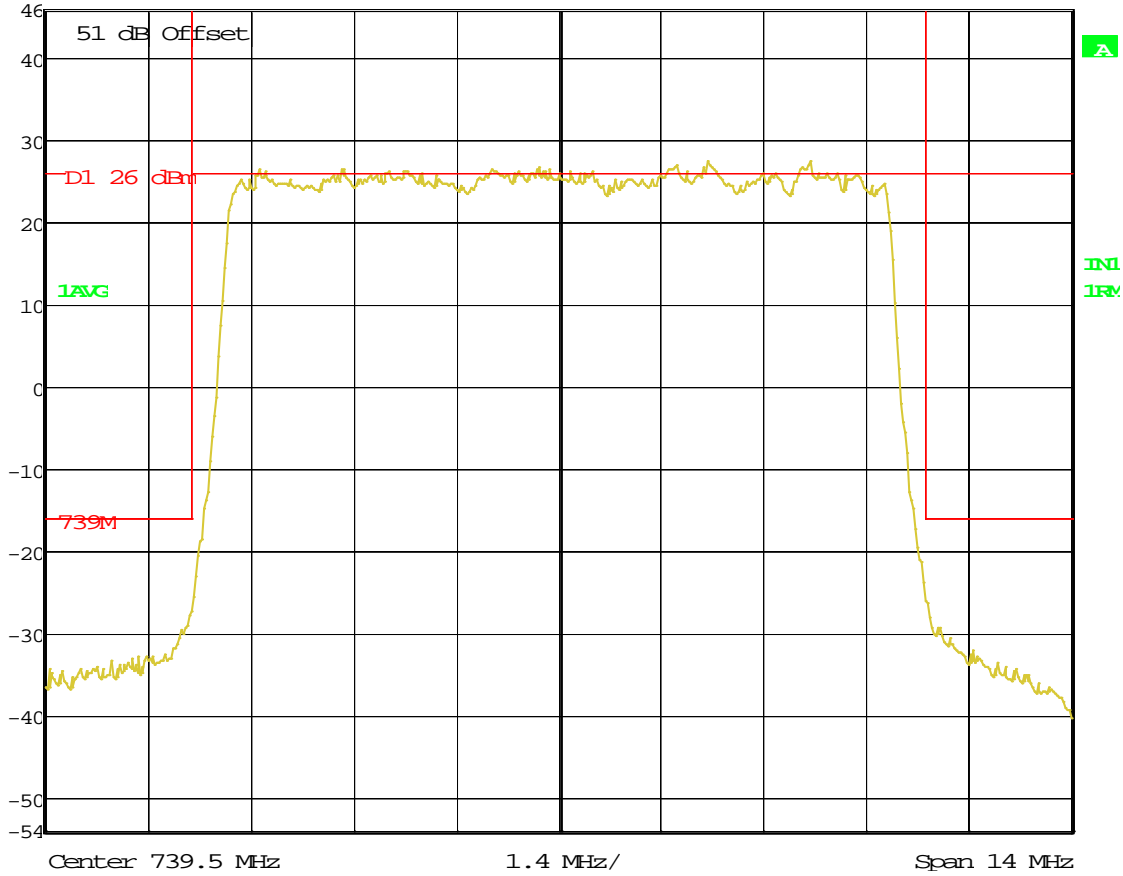


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B+C; 734.5-744.5 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 11:07:52



Ref Lvl
46 dBm

RBW 100 kHz RF Att 10 dB
VBW 1 MHz
SWT 5 ms Unit dBm

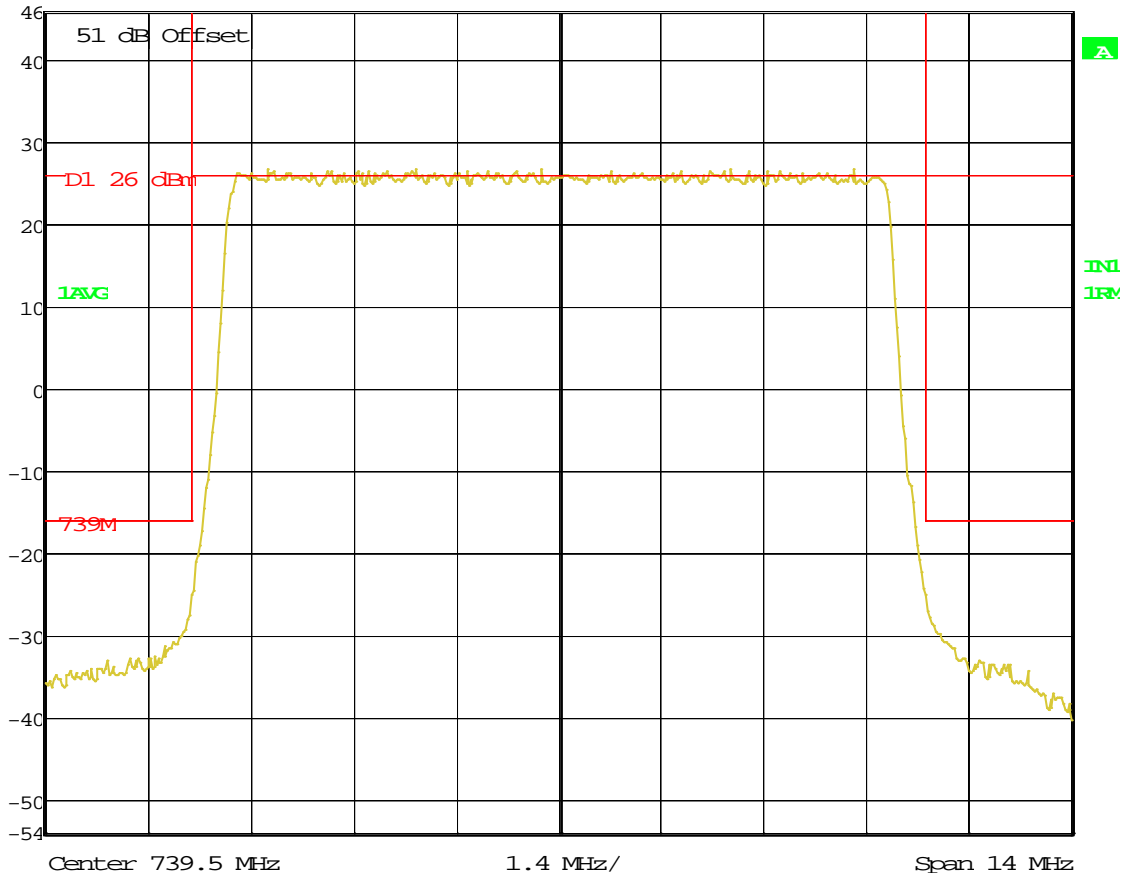


Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B+C; 734.5-744.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 12:07:11



Ref Lvl
46 dBm

RBW 100 kHz RF Att 10 dB
VBW 1 MHz
SWT 5 ms Unit dBm



Title: OCCUPIED BANDWIDTH; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B+C; 734.5-744.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 12:54:02

Measurement 4

FCC Section 2.1051 and 27.53 (g) Spurious Emissions at Antenna Transmit Terminals

Measurement 4

MEASUREMENT OF SPURIOUS EMISSIONS AT TRANSMIT ANTENNA PORT FCC 27.53 (g)

Spurious Emissions at Transmit Antenna Terminals

Spurious Emissions at the transmit-antenna terminals were investigated over the frequency range of 9 kHz to 12.5 GHz. The test setup is as described in Figure A. Measurements were made using a Rohde & Schwarz ESI 40 (9 kHz to 40 GHz) EMI Test receiver and a HP Model 520 DeskJet Printer. The RF output from the transmitter was reduced (to an amplitude usable by the receivers) using calibrated attenuators. The RF power level was continuously monitored via RF Power Meter as shown in the test setup in Figure A. The required emission limitation is specified in 27.53 (g). Measurements were made at 40W per carrier for 10 MHz Bandwidth, and 40W per carrier for 5MHz Bandwidth at antenna terminals. The measured spurious emission levels were plotted for the frequency range 9 kHz to 12.5 GHz. The measurements were made using following receiver parameters:

Frequency Range	Resolution Bandwidth
9 kHz to 30 MHz	10 kHz
30 MHz to 1 GHz	100 kHz
1 GHz to 12.5 GHz	1 MHz

The list of band, channels, RF filters (J4) and Amplifiers tested are listed below:

Band	Block	Center Frequency (MHz)	Carrier Bandwidth (MHz)	RF Filter	Power (Watts)
	A	731.5	5	M1	40
	B	737	5	M1	40
	C	742.5	5	M1	40
	A+B	734.5	10	M1	40
	B+C	739.5	10	M1	40

FCC Section 27.53(g): Based on measurement instrument employing resolution bandwidth of 100 kHz bands or greater out band emissions shall be attenuated at least 43 + 10log (P) dB or -13dBm. However in 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. Pursuant to FCC OET RULES 662911 D01 and D02 for two antenna MIMO mode of operations, the FCC limit of -13dBm shall be 3dB more stringent, therefore all channel edge and out of band spurious emissions shall be -16dBm.

The tests were performed in the following modulation configurations:

- A. QPSK
- B. 16QAM
- C. 64QAM

RESULTS:

The magnitude of spurious emissions is within the specification limits of FCC Part 27.53(g).

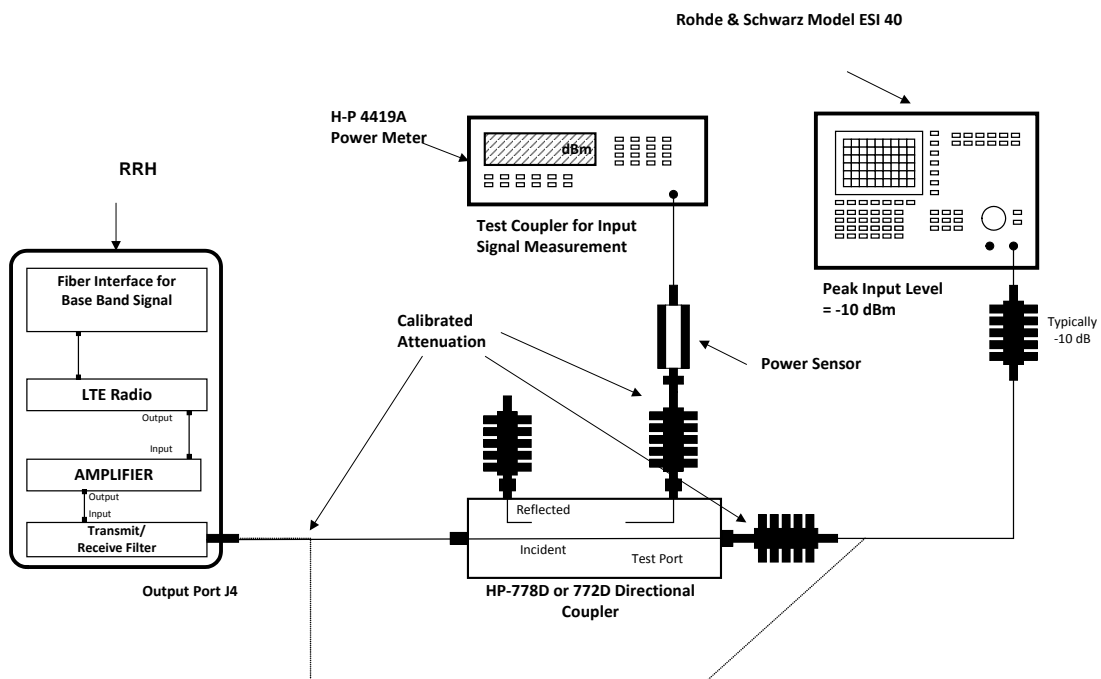
Measurement uncertainty:

9 kHz to 20 MHz: Frequency = 10 Hz, Amplitude = 0.5 dB

20 MHz to 1 GHz: Frequency = 100Hz, Amplitude = 0.5 dB

1 GHz to 10 GHz: Frequency = 10 kHz, Amplitude = 0.5 dB

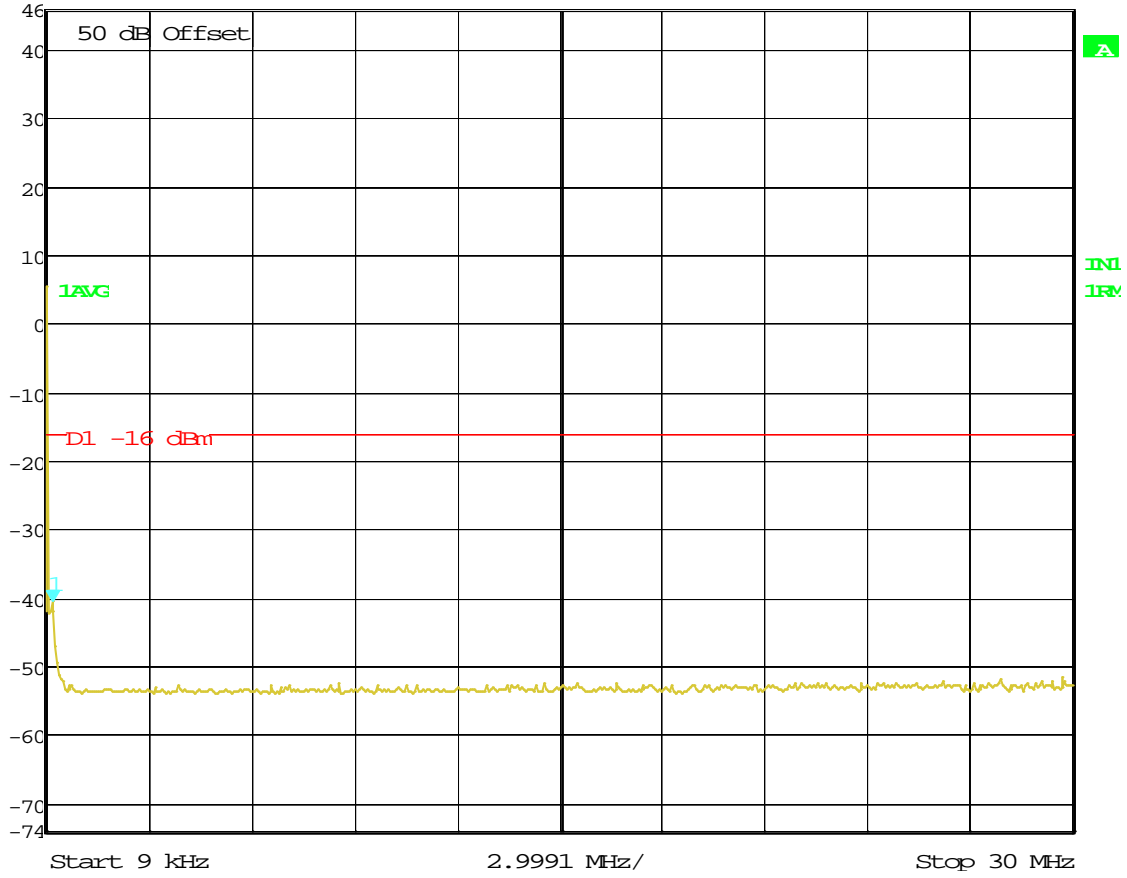
Figure A. TEST CONFIGURATION FOR CONDUCTED SPURIOUS



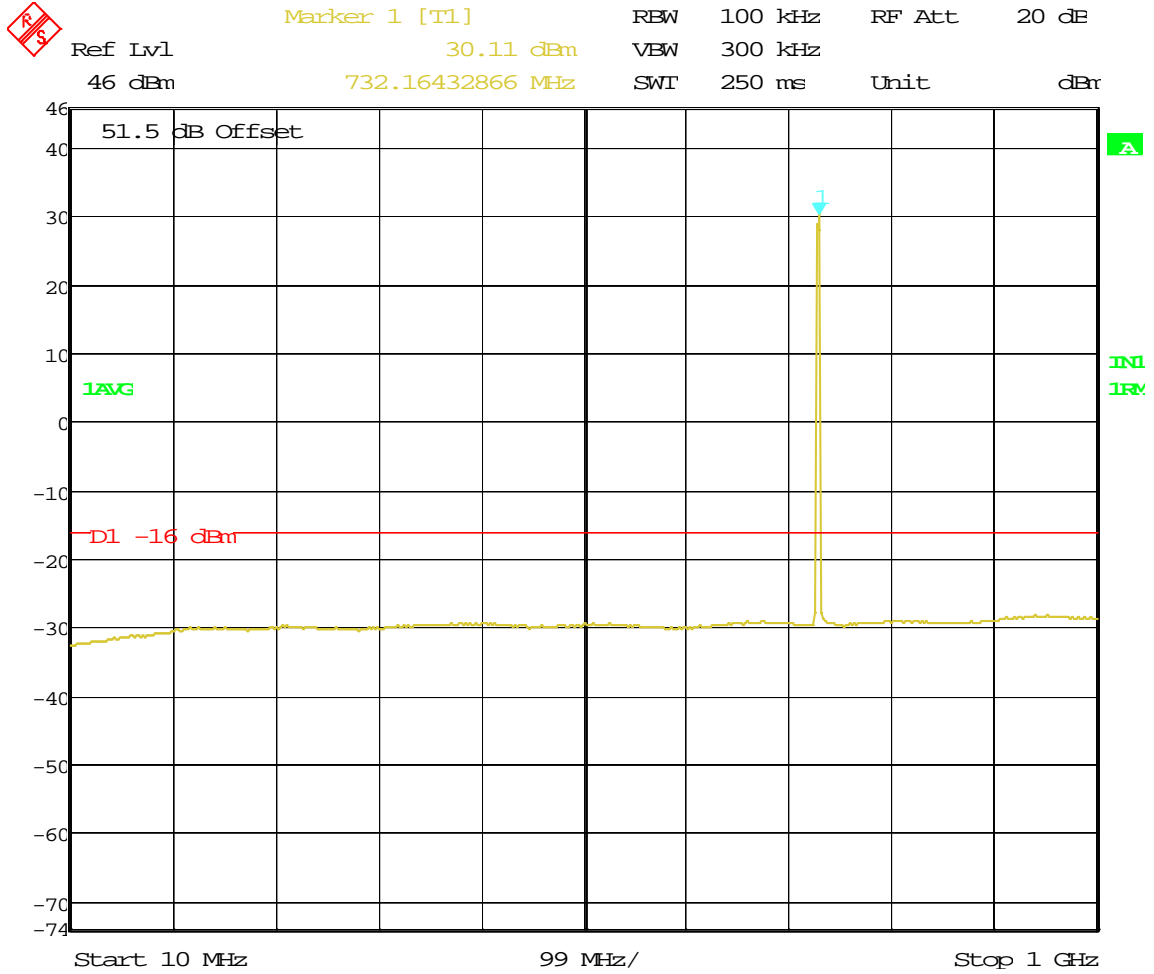
**Transmit Port
Antenna Conducted Spurious Emissions**

**Block: A
QPSK Modulation
Bandwidth 729 – 734 MHz**

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.53 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



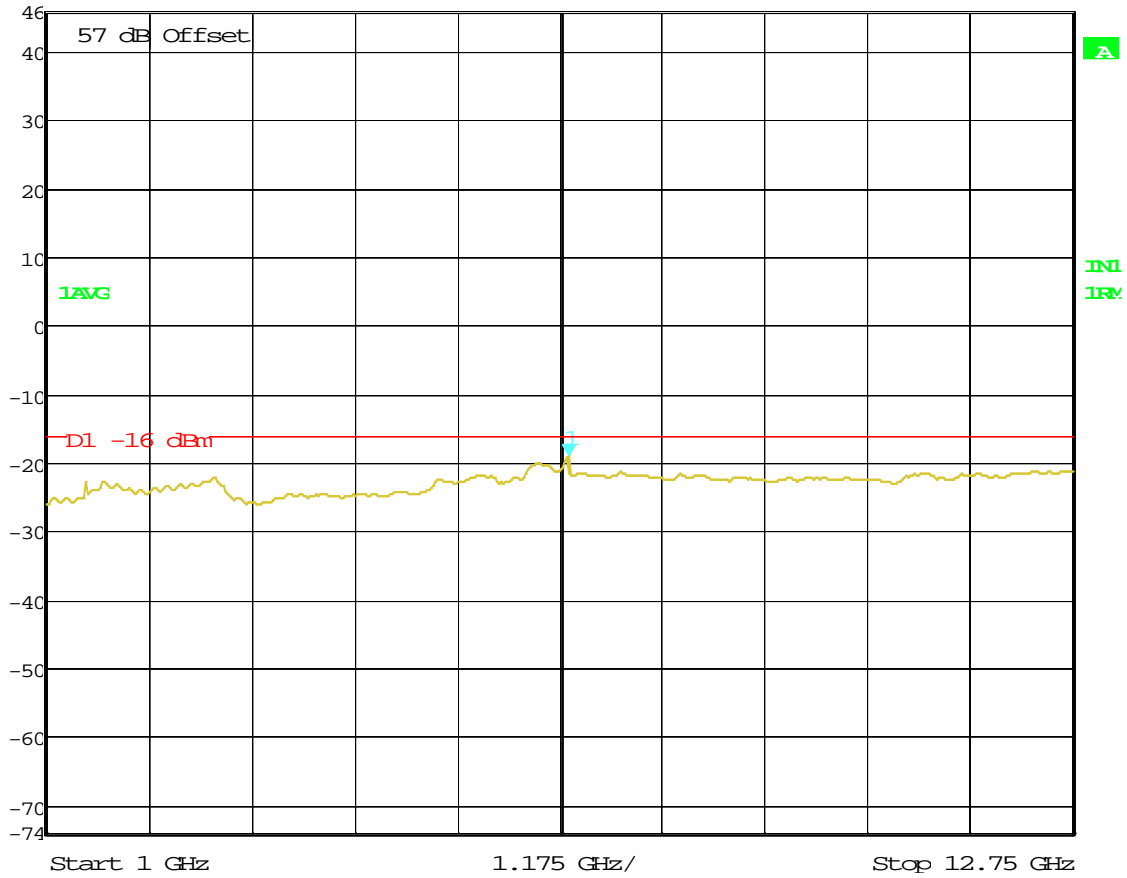
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:17:31



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:16:06



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.89 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm

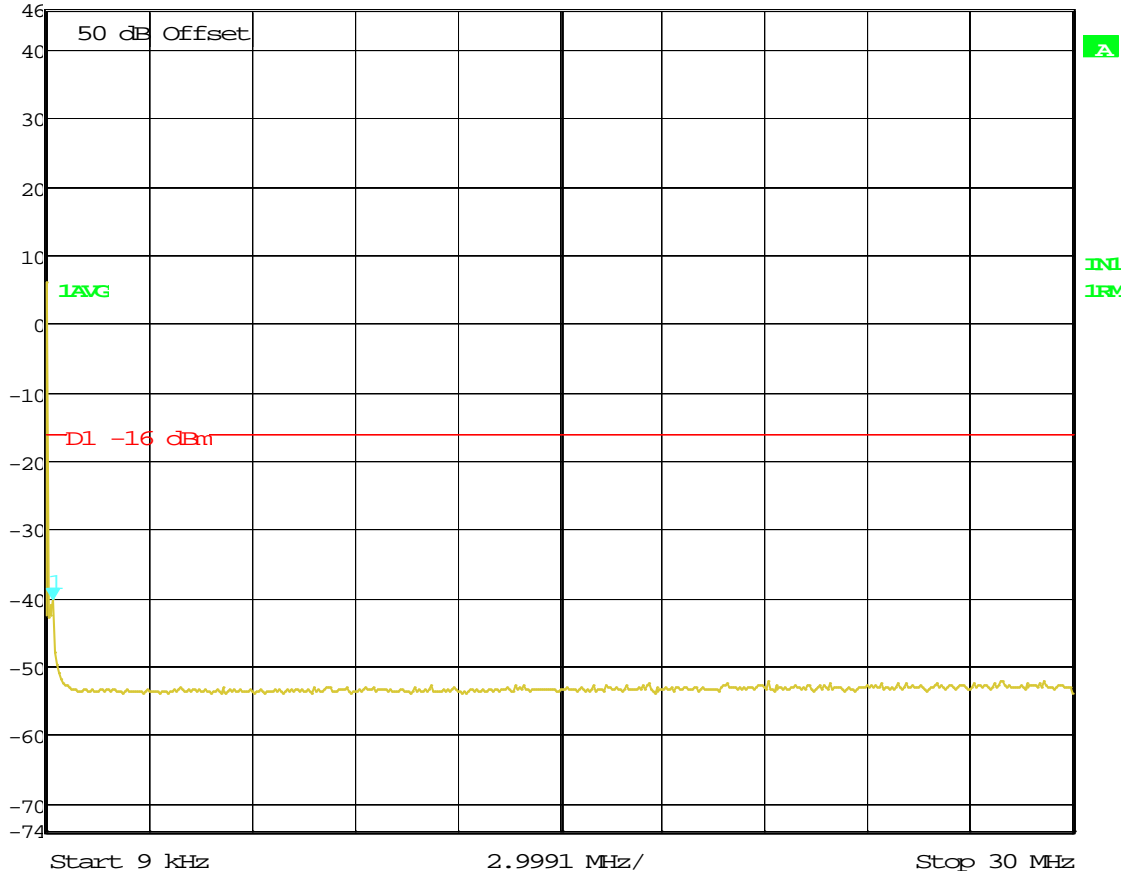


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:14:11

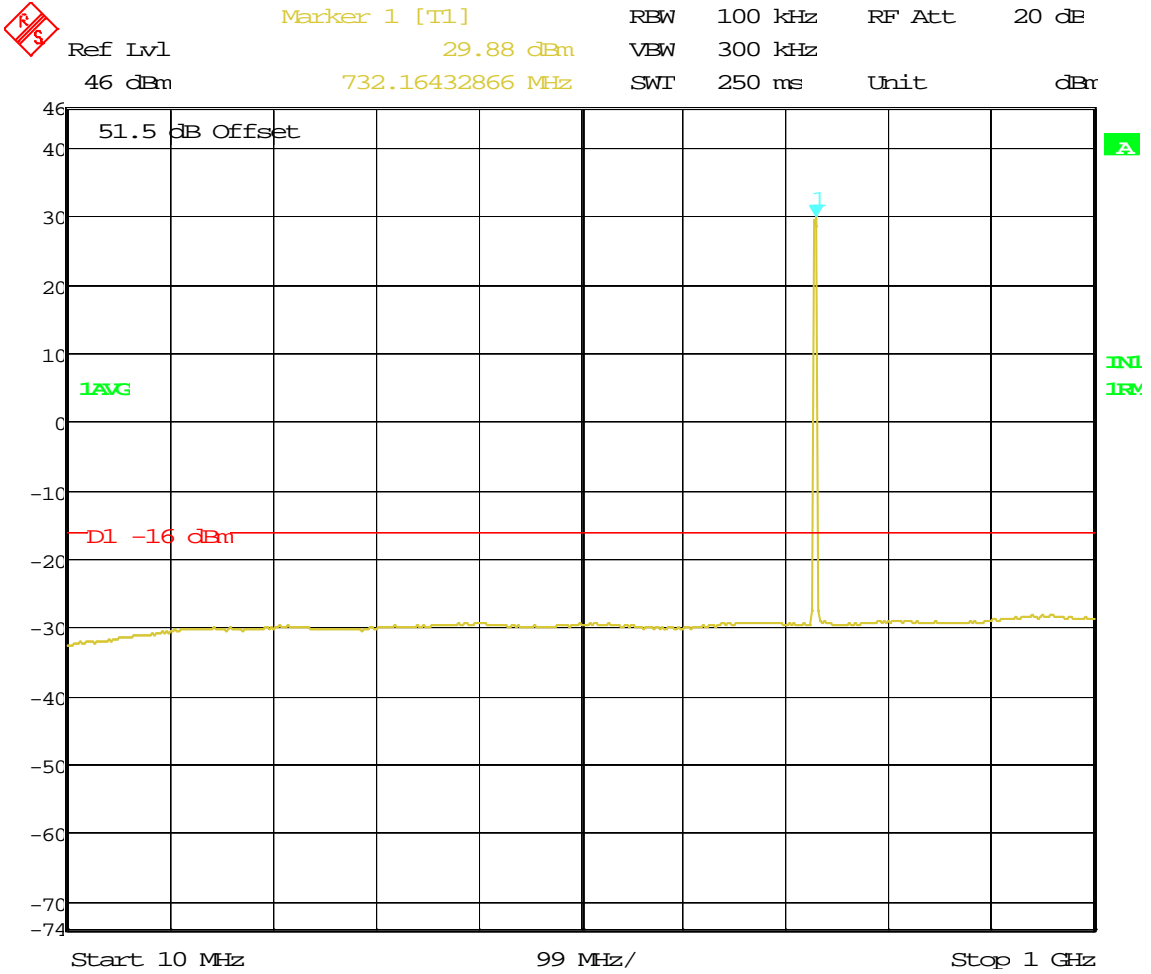
**Transmit Port
Antenna Conducted Spurious Emissions**

**Block: A
16QAM Modulation
Bandwidth 729 – 734 MHz**

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.22 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm

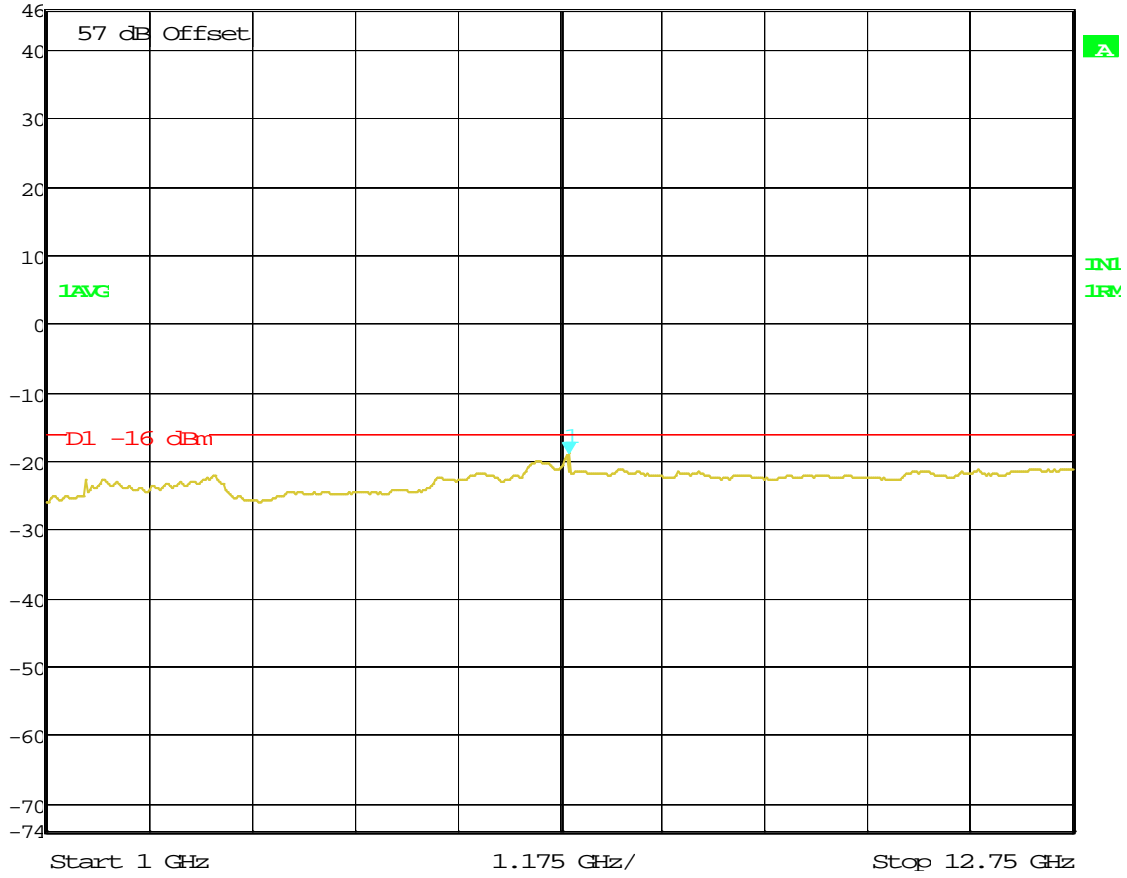


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:34:41



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:36:30

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.89 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm

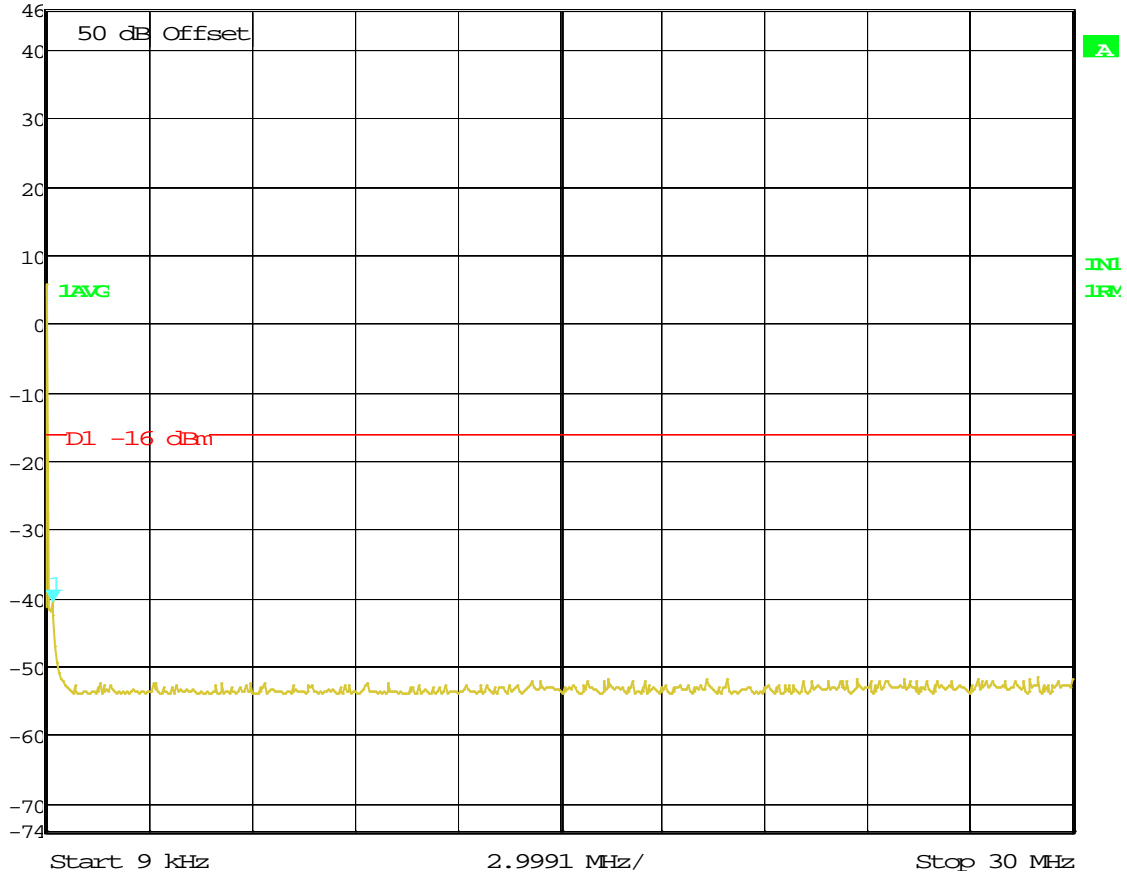


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 14:38:34

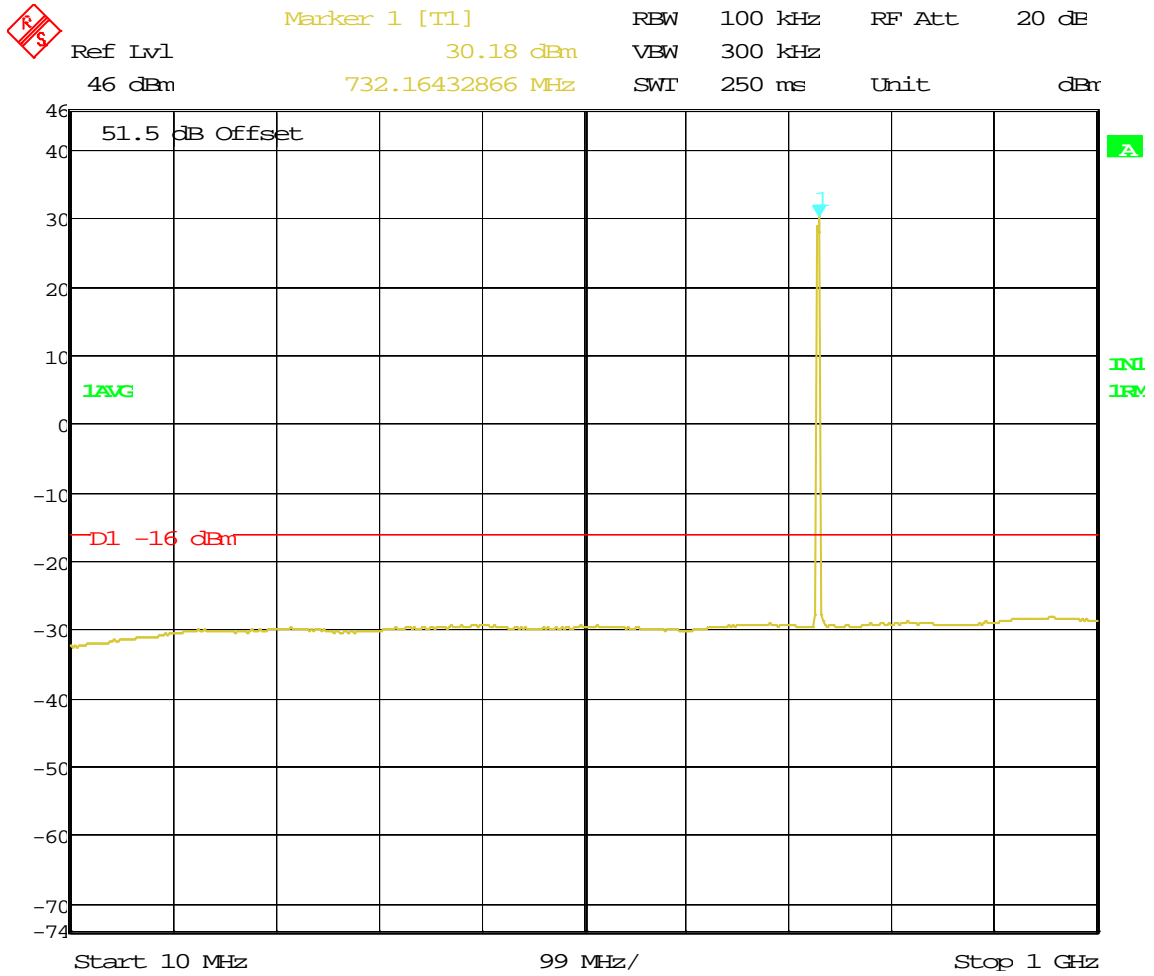
**Transmit Port
Antenna Conducted Spurious Emissions**

**Block: A
64QAM Modulation
Bandwidth 729 – 734 MHz**

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.70 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 15:06:02



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK A; 729 - 734 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 15:04:55



Marker 1 [T1]

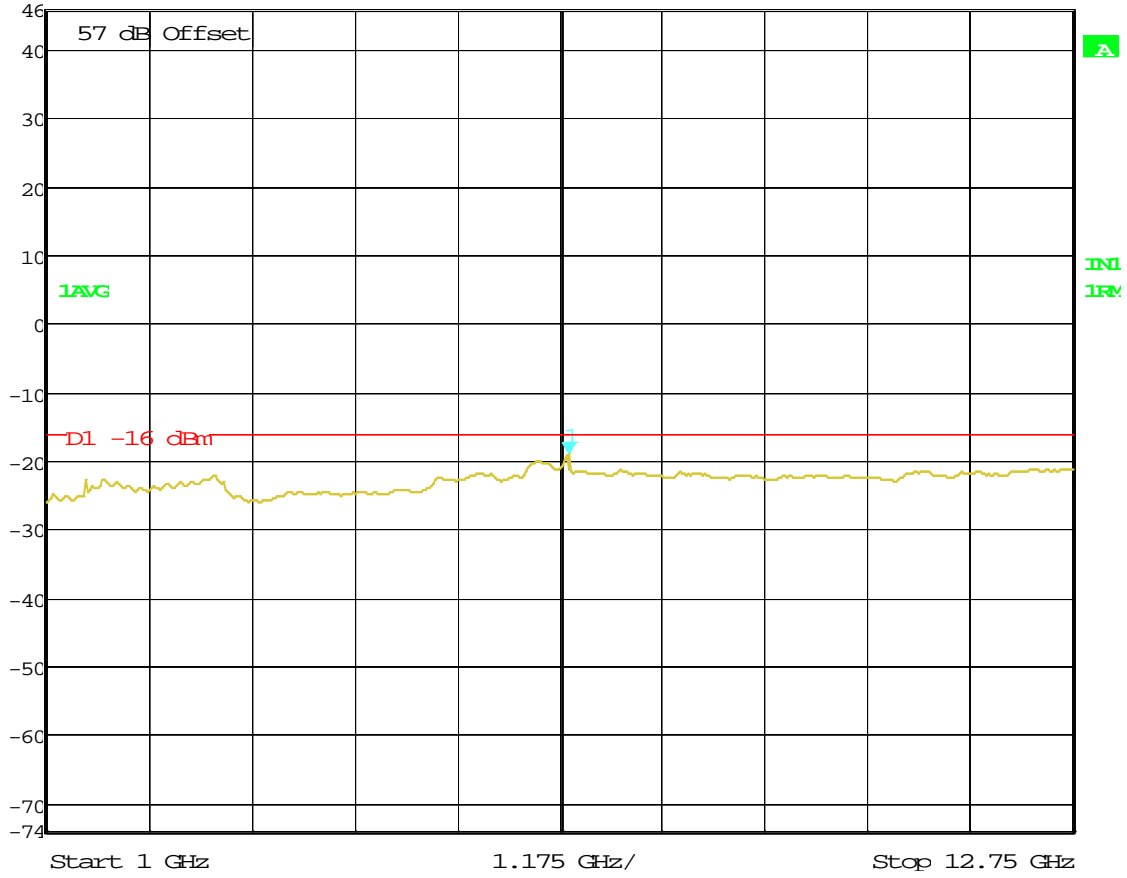
RBW 1 MHz RF Att 10 dB

Ref Lvl -18.94 dBm

VBW 3 MHz

46 dBm 6.98096192 GHz

SWT 120 ms Unit dBm

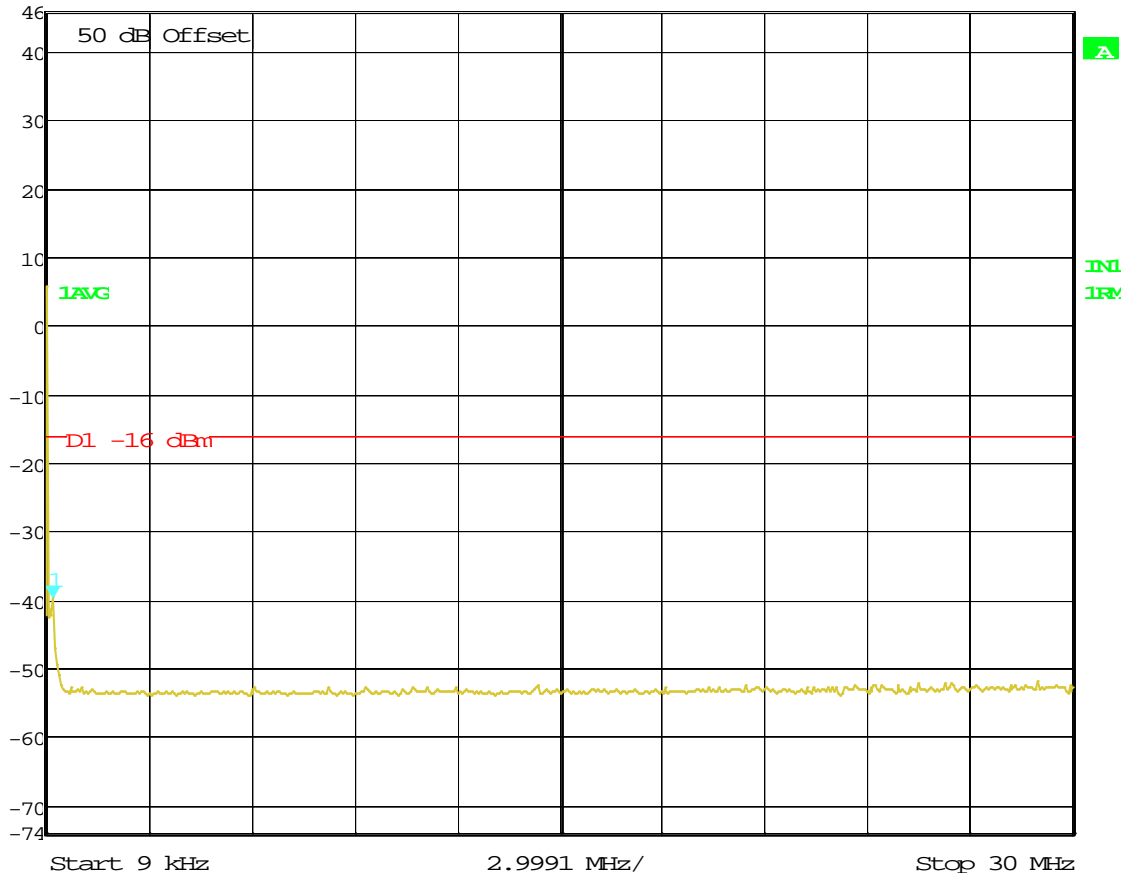


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A; 729 - 734 MHz
 PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 6.SEP.2012 15:03:22

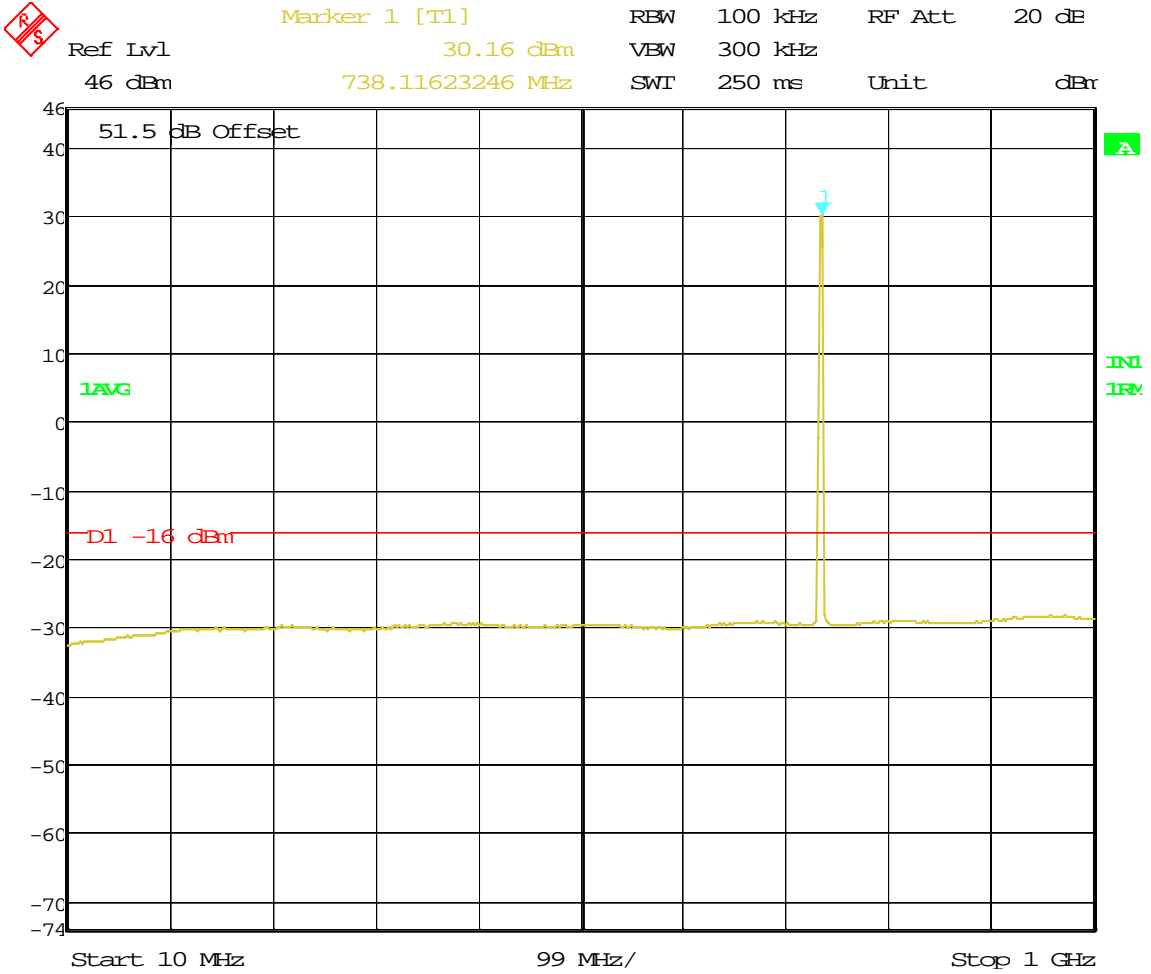
**Transmit Port
Antenna Conducted Spurious Emissions**

**Block: B
QPSK Modulation
Bandwidth 734.5 – 739.5 MHz**

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -39.80 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm

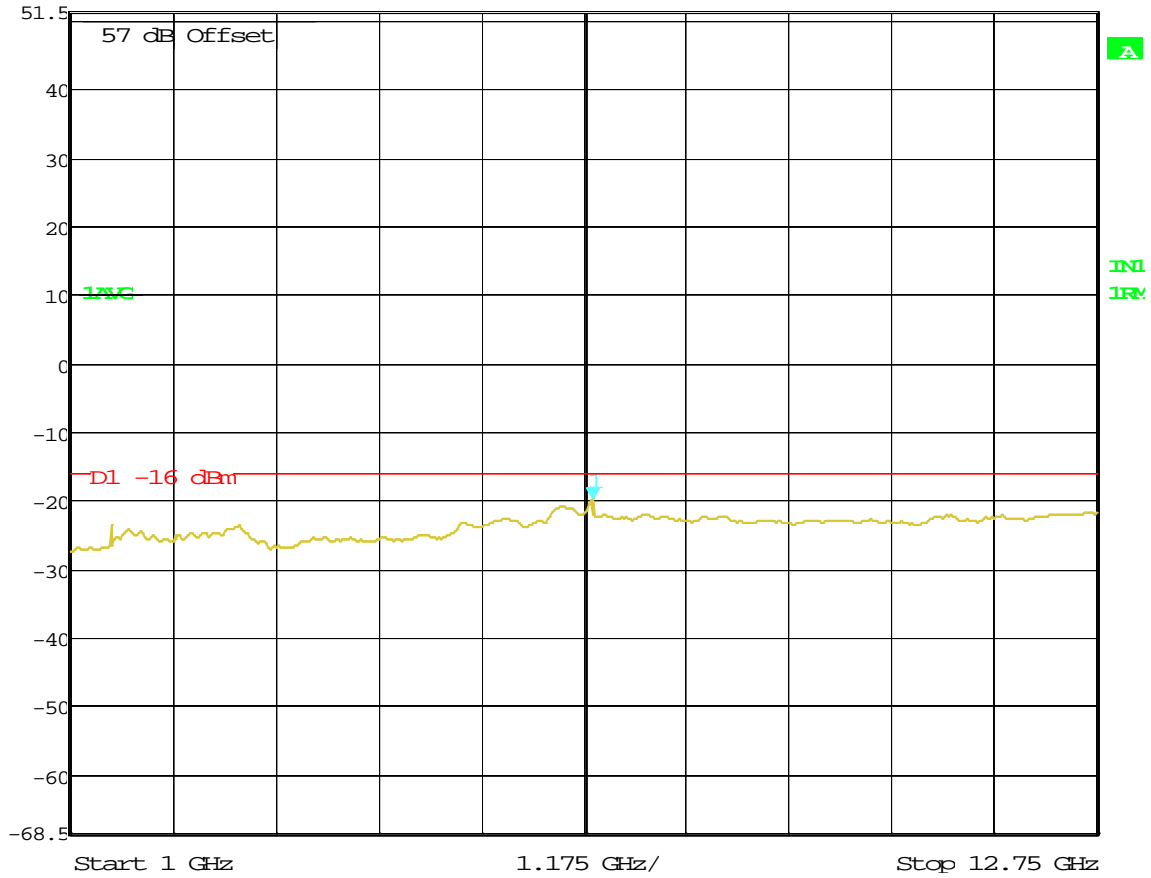


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-A/T CR RRH 2X40-700 Lower A/T; BLK B; 734.5-739.5 MHz
PWR:40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:45:55



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:47:02

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -19.74 dBm VBW 3 MHz
51.5 dBm 6.98096192 GHz SWT 120 ms Unit dBm

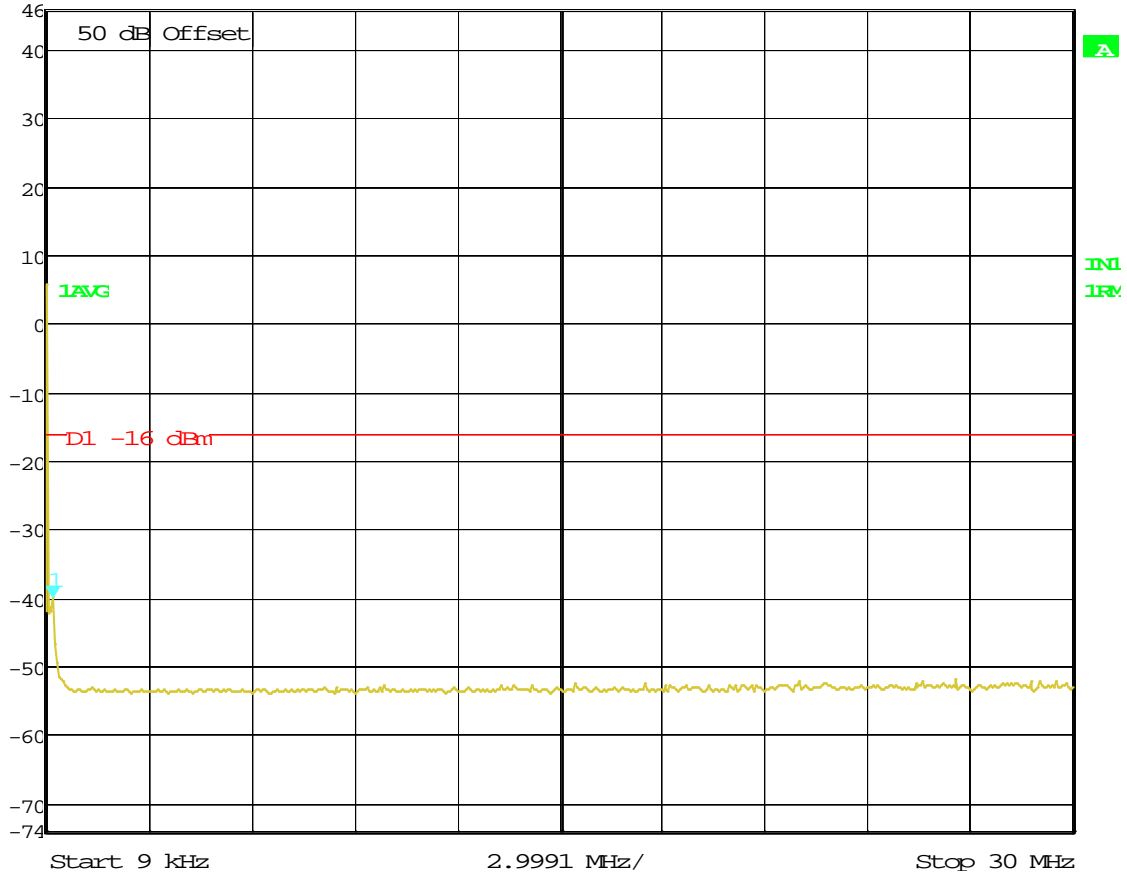


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B; 734.5-739.5 MHz
PWR:40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:48:08

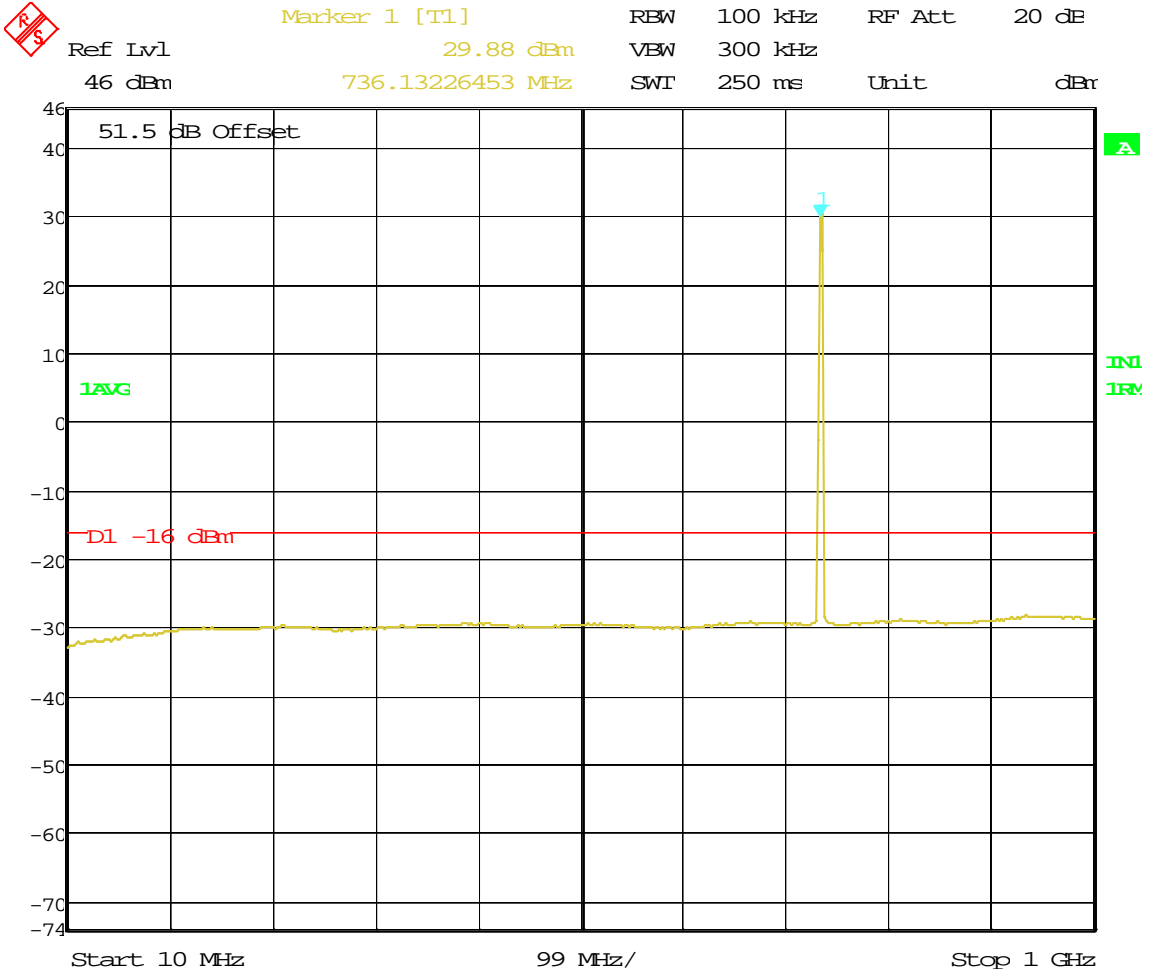
**Transmit Port
Antenna Conducted Spurious Emissions**

**Block: B
16QAM Modulation
Bandwidth 734.5 – 739.5 MHz**

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -39.98 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm

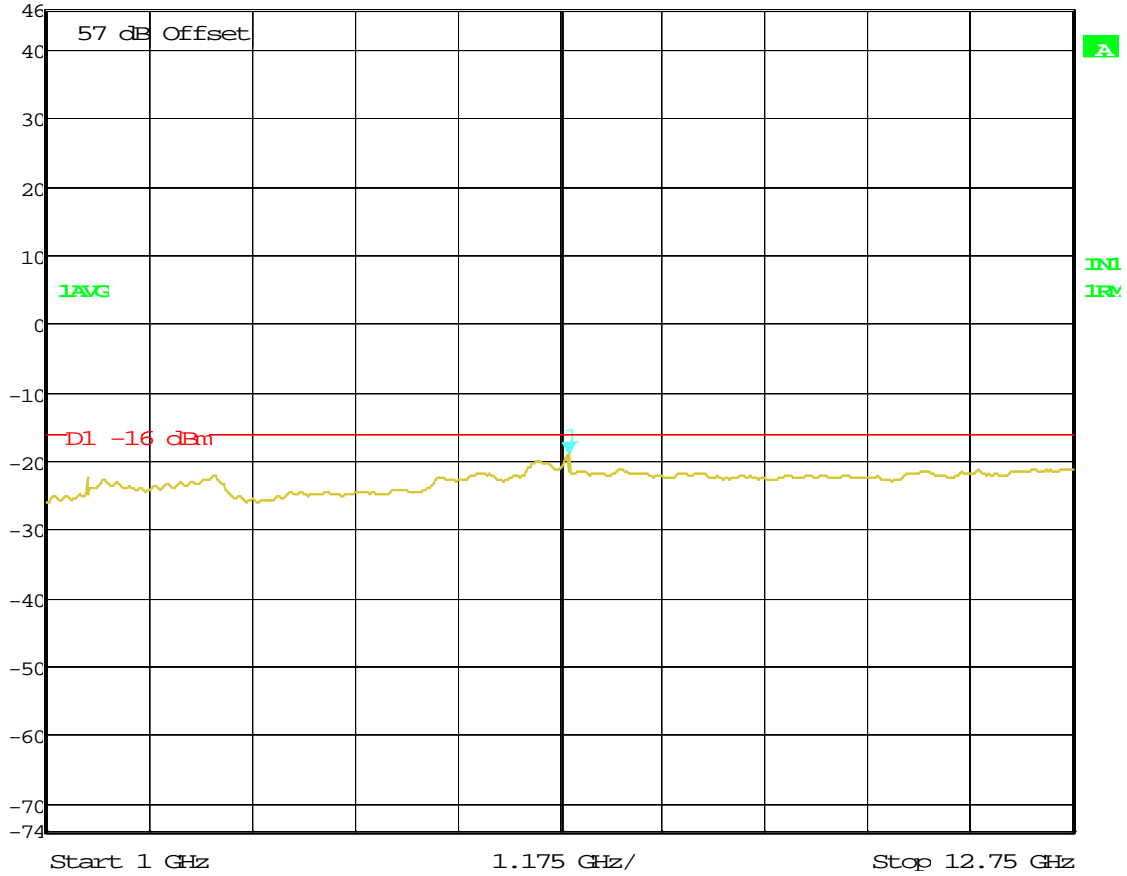


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:35:40



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:34:19

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.91 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 13:33:04

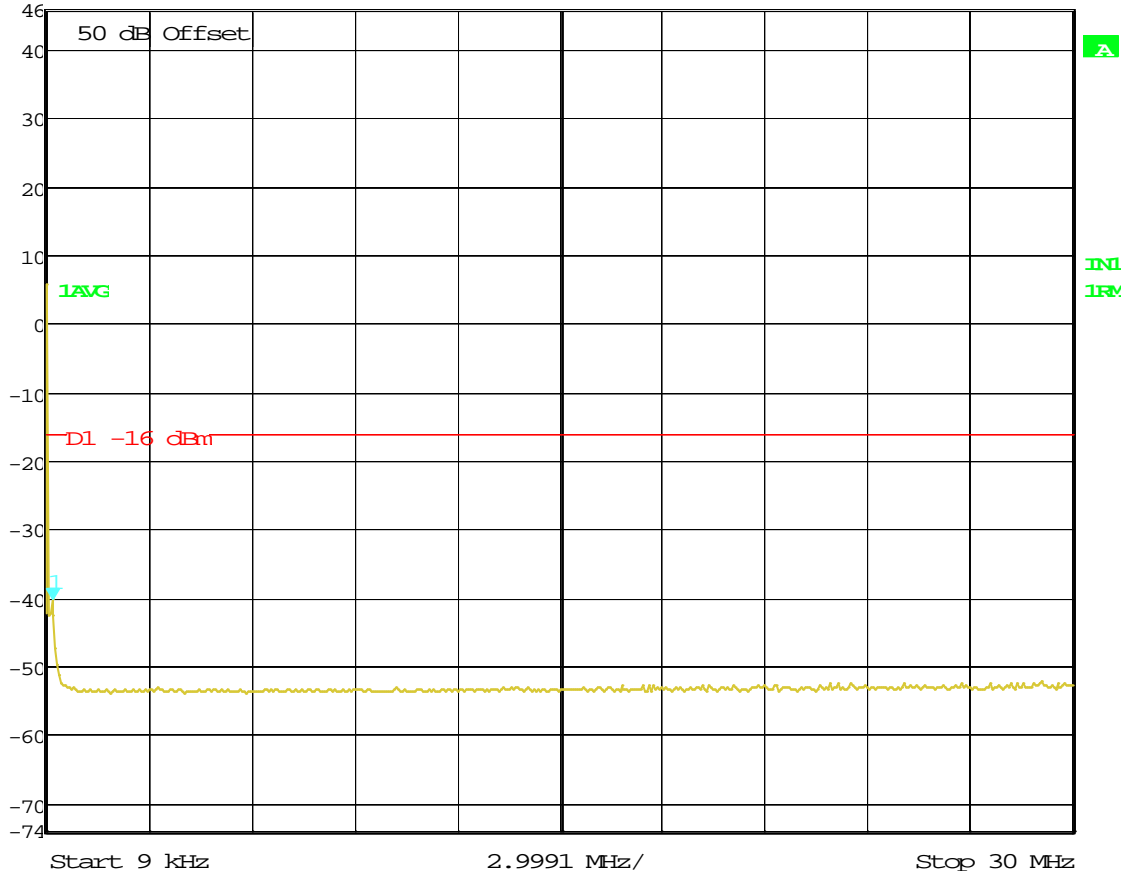
Antenna Conducted Spurious Emissions

Block: B

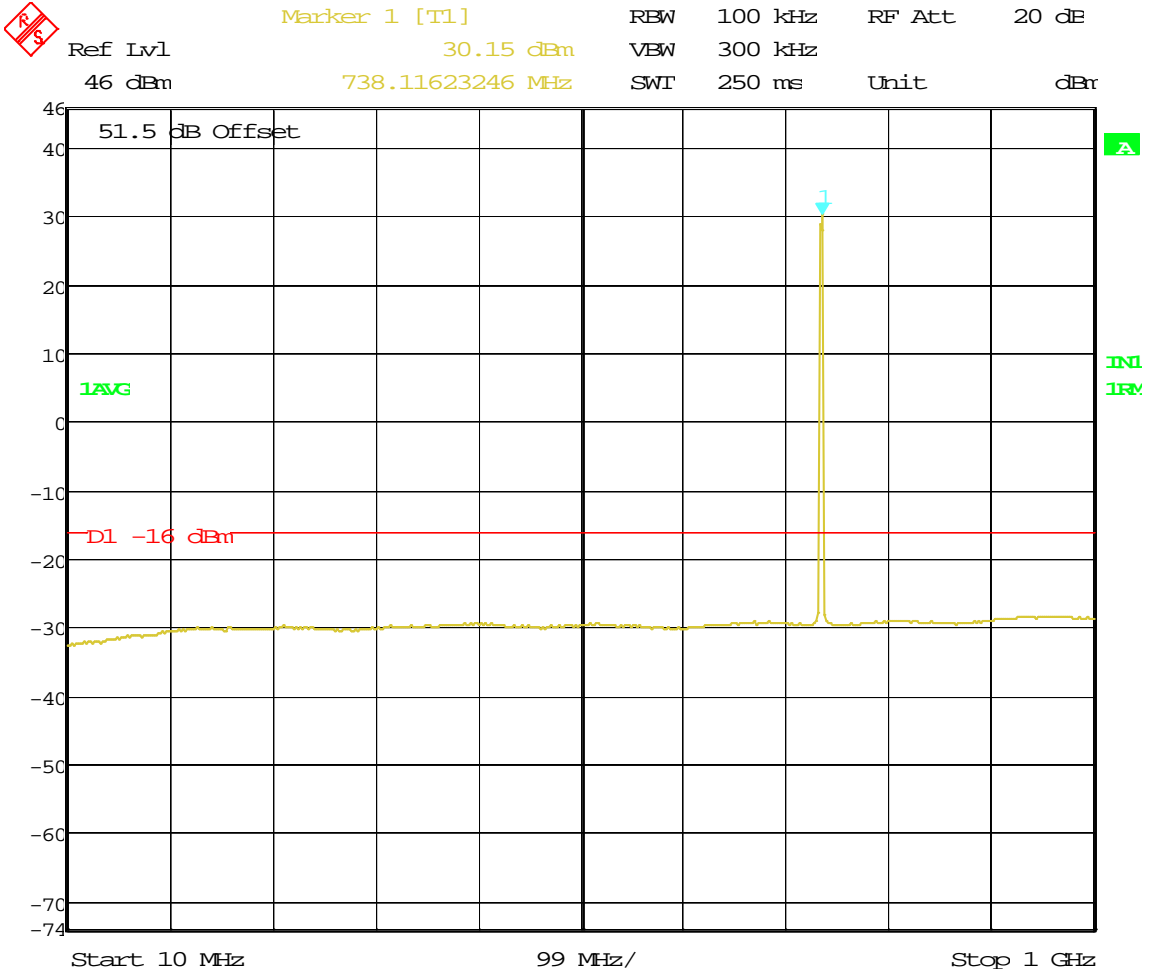
64QAM Modulation

Bandwidth 734.5 – 739.5 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.16 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm

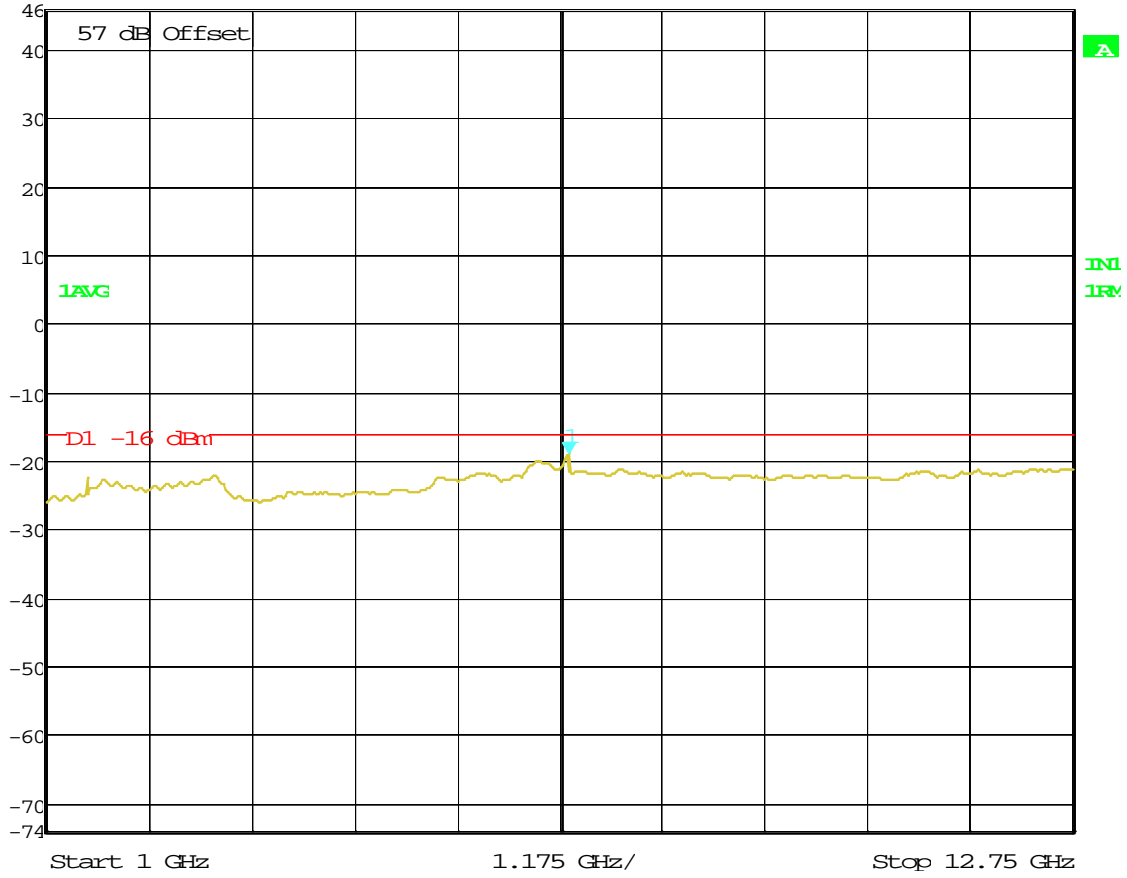


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 11:31:42



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 11:32:41

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.95 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm

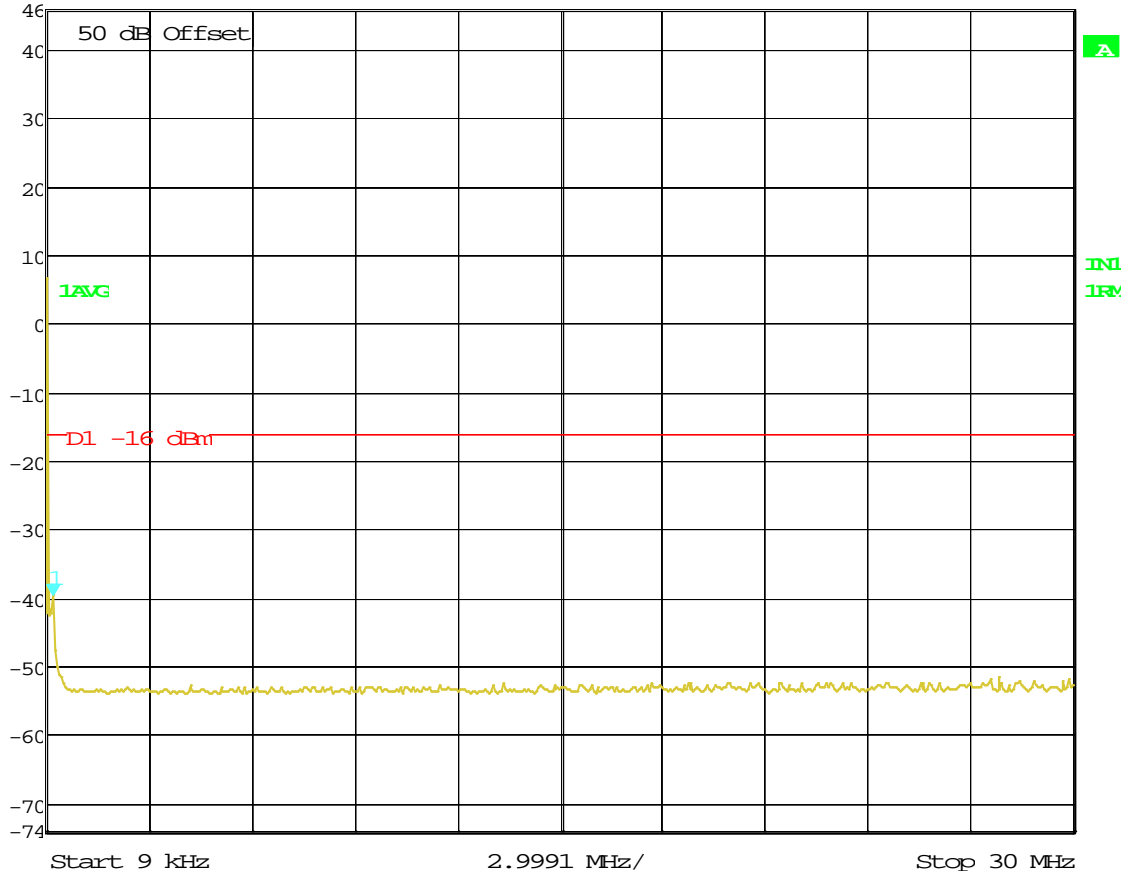


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK B; 734.5-739.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 11:34:24

Antenna Conducted Spurious Emissions

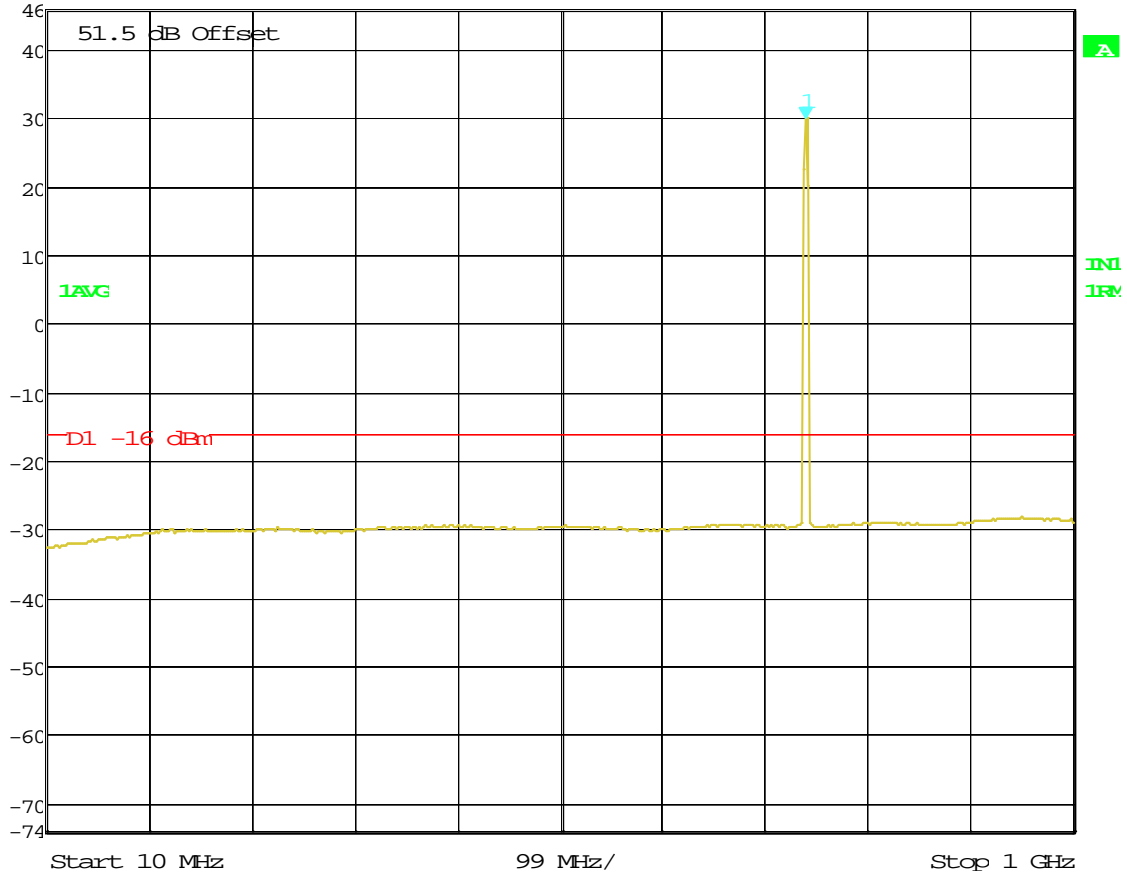
Block: C
QPSK Modulation
Bandwidth 740 – 745 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -39.70 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 14:35:56

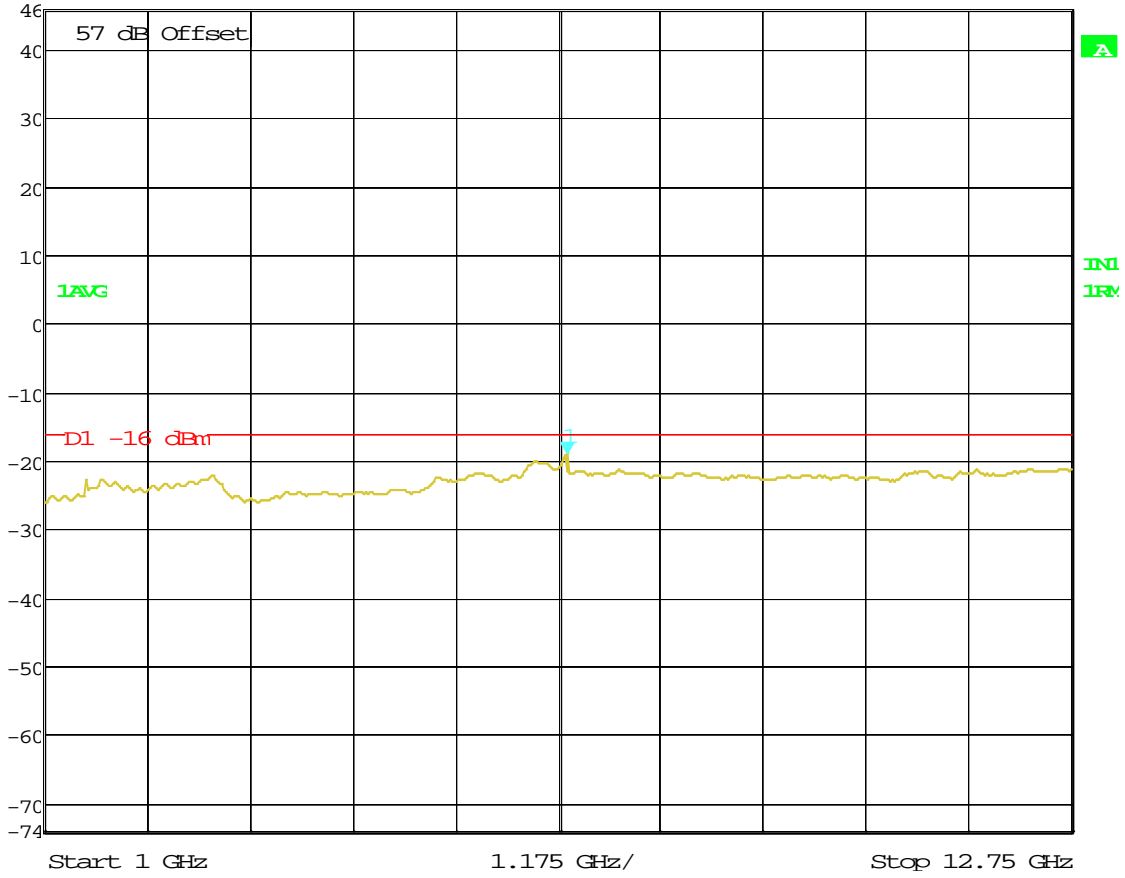
 Marker 1 [T1] RBW 100 kHz RF Att 20 dB
Ref Lvl 29.93 dBm VBW 300 kHz
46 dBm 742.08416834 MHz SWT 250 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTIENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 14:34:53



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
-18.98 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm

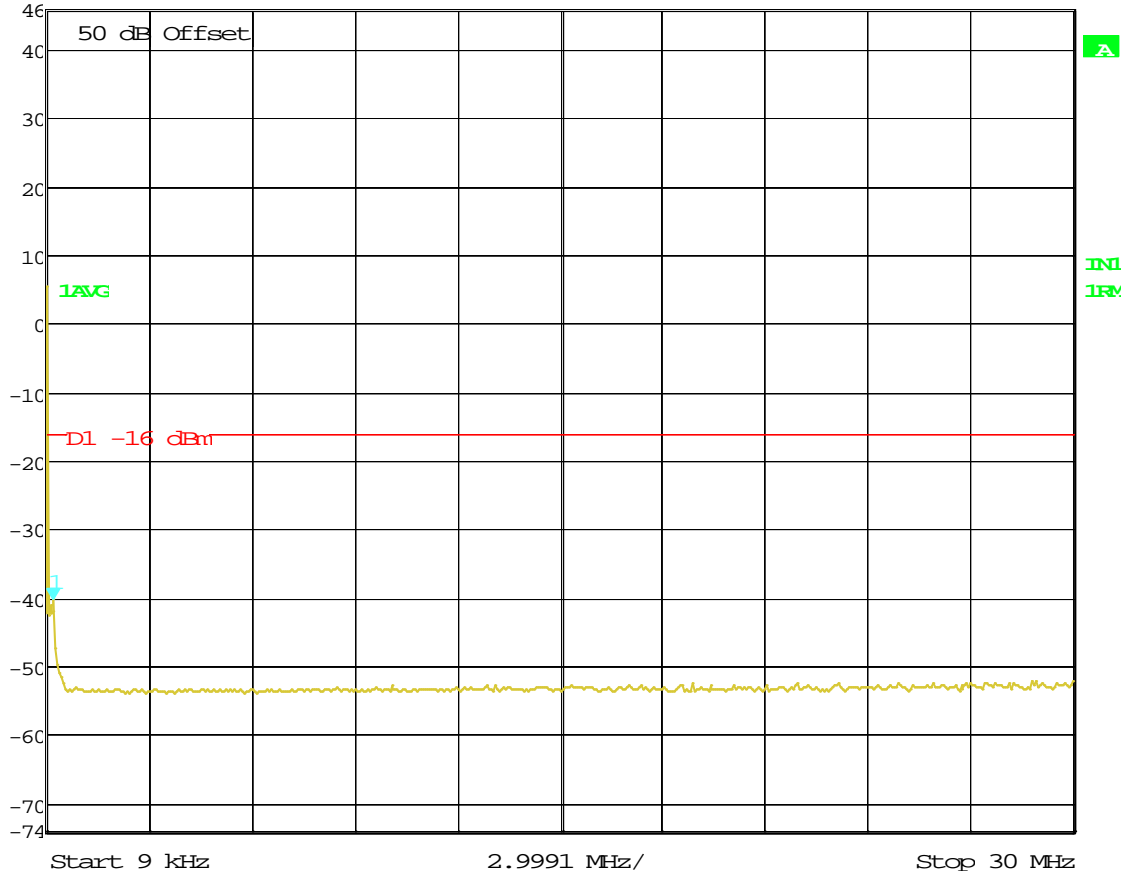


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
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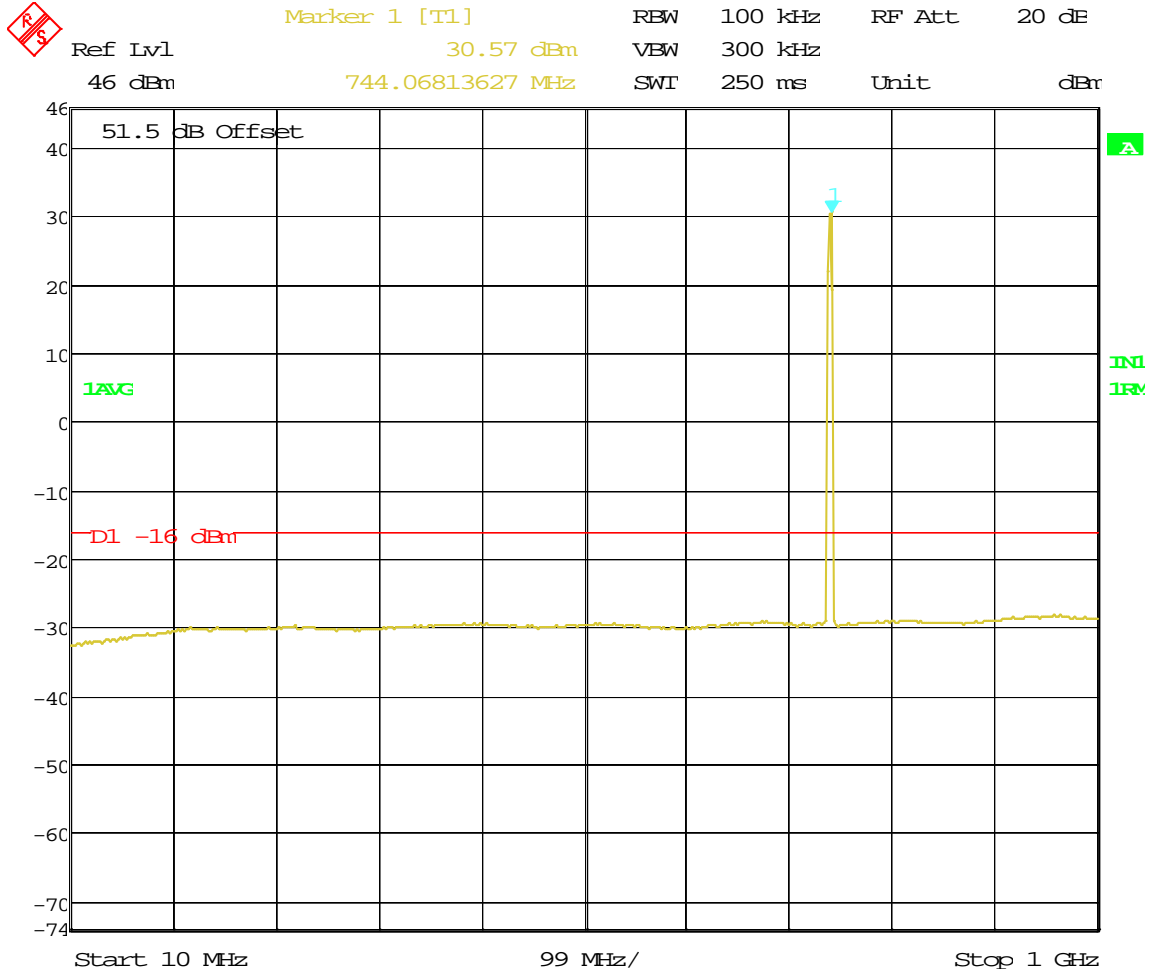
Antenna Conducted Spurious Emissions

Block: C
16QAM Modulation
Bandwidth 740 – 745 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.19 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



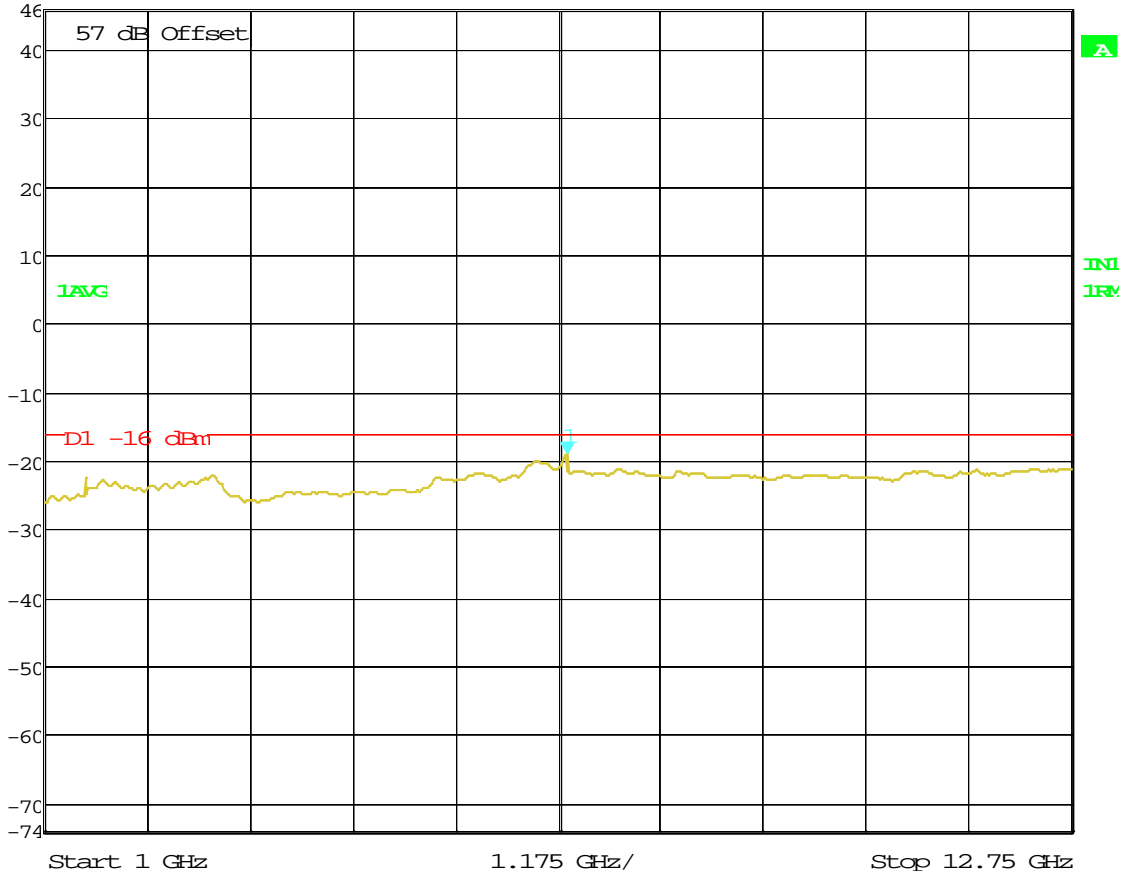
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 09:46:06



Title: SPURIOUS EMISSIONS AT TX ANTIENNA PORT; Test Engineer: SEG
 Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
 PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 6.SEP.2012 09:47:31



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
-18.85 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm

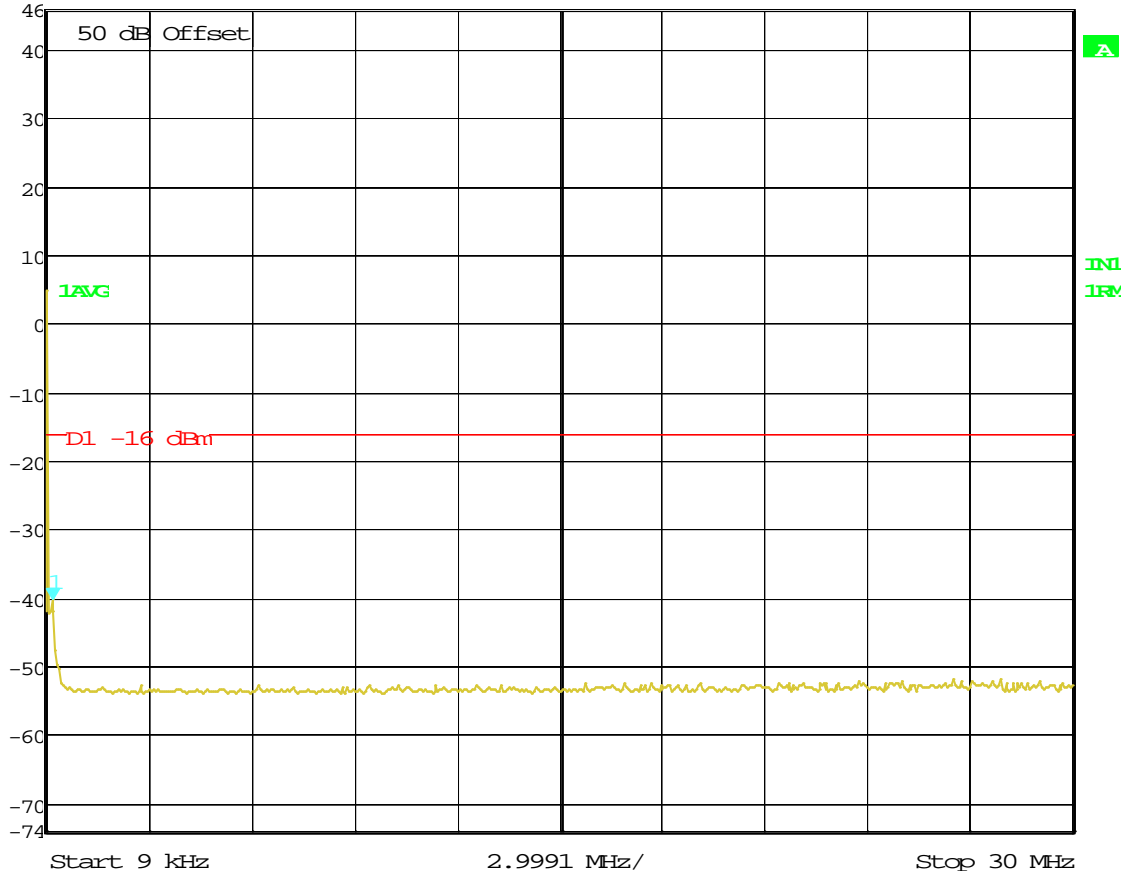


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 09:48:46

Antenna Conducted Spurious Emissions

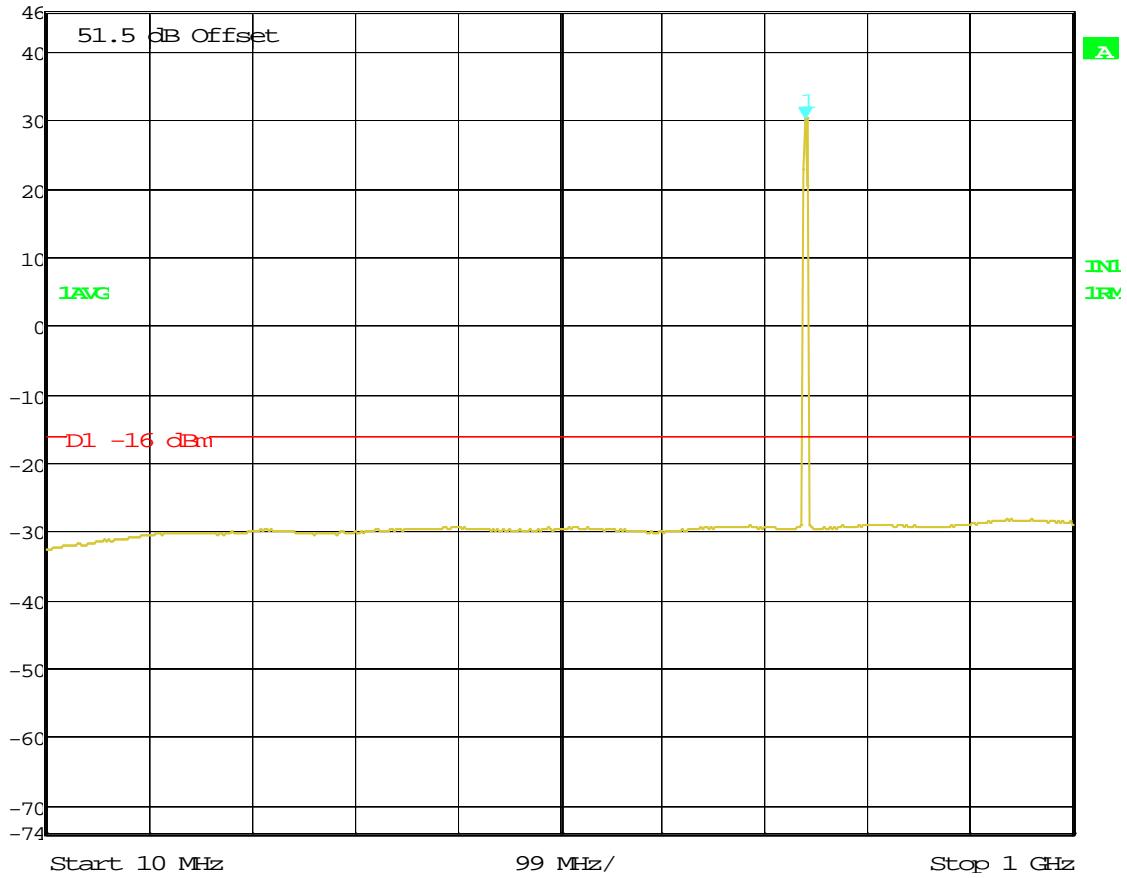
Block: C
64QAM Modulation
Bandwidth 740 – 745 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.28 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:33:06

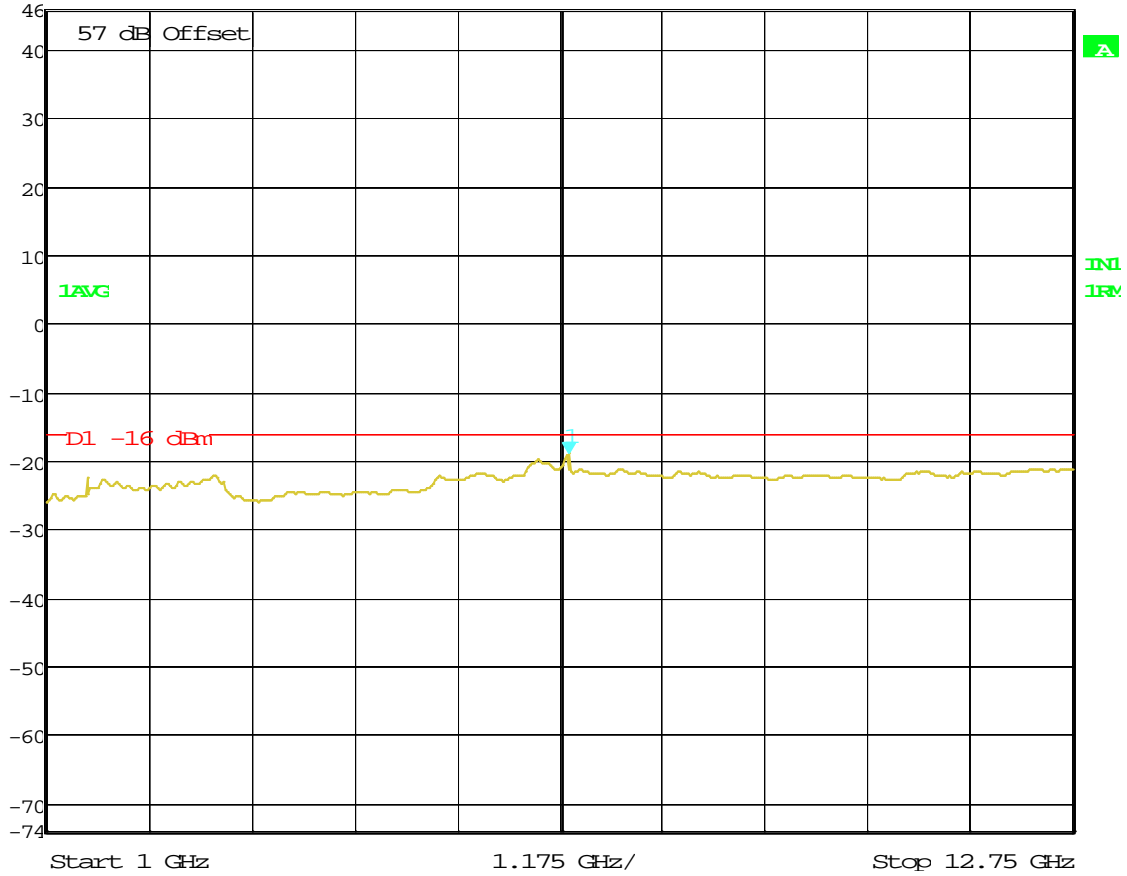
 Marker 1 [T1] RBW 100 kHz RF Att 20 dB
Ref Lvl 30.28 dBm VBW 300 kHz
46 dBm 742.08416834 MHz SWT 250 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:31:31



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
-18.87 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:25:58

Antenna Conducted Spurious Emissions

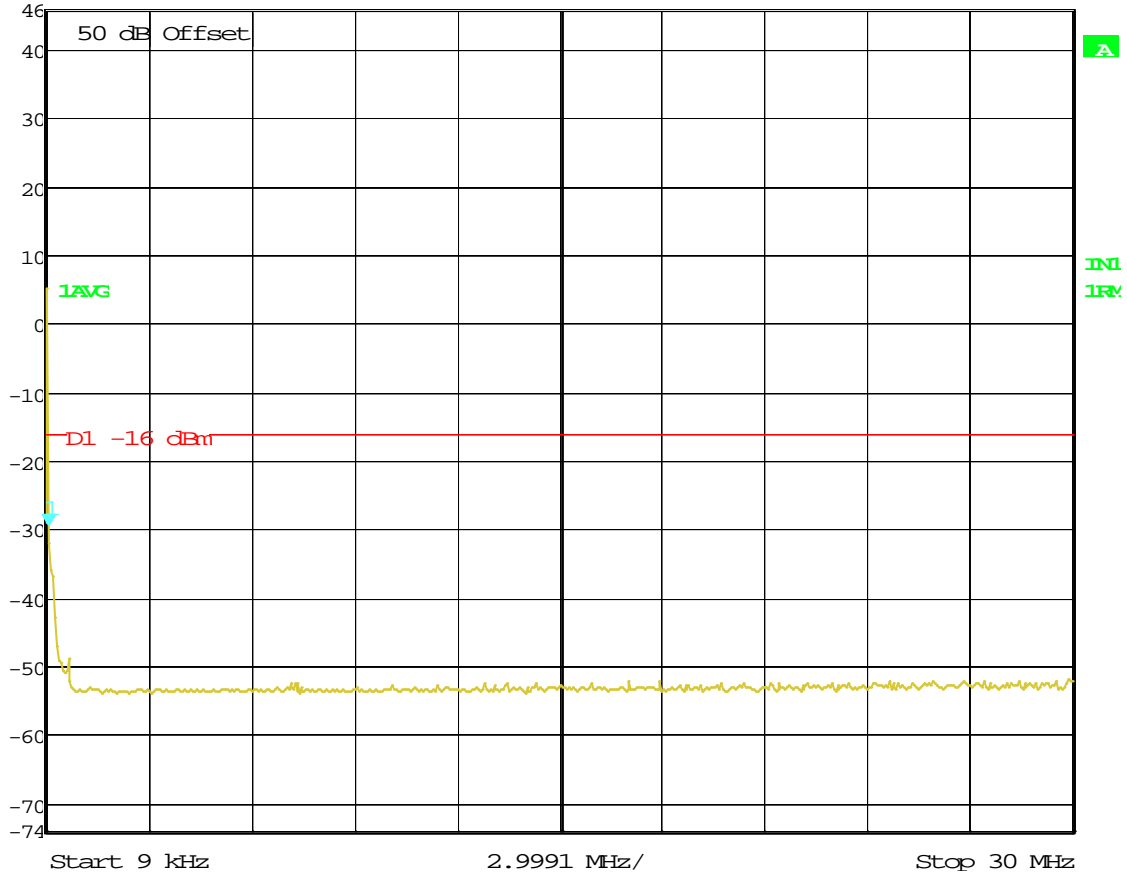
Block: A+B

QPSK Modulation

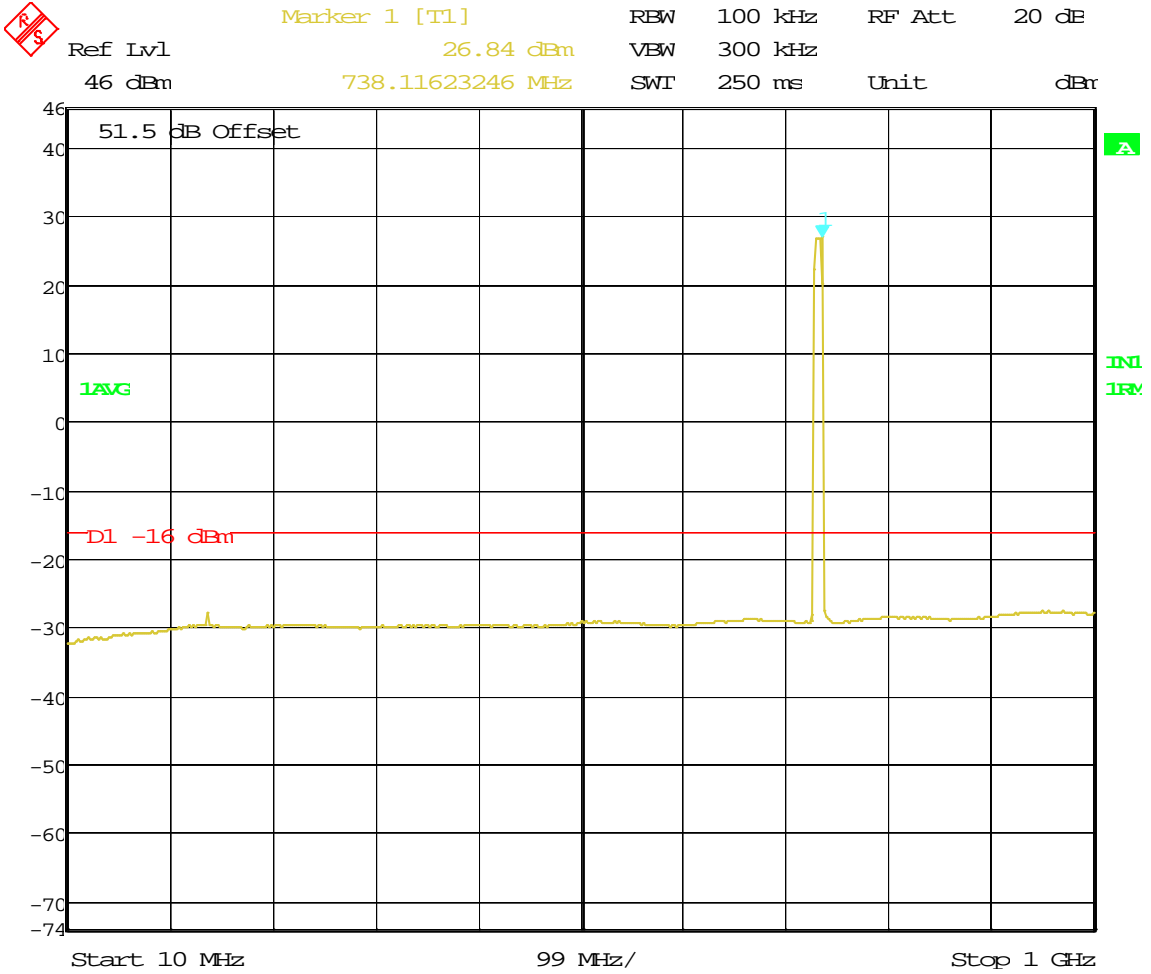
Bandwidth 729.5 – 739.5 MHz



Marker 1 [T1] RBW 10 kHz RF Att 20 dB
-29.40 dBm VBW 30 kHz
46 dBm 69.10220441 kHz SWT 760 ms Unit dBm

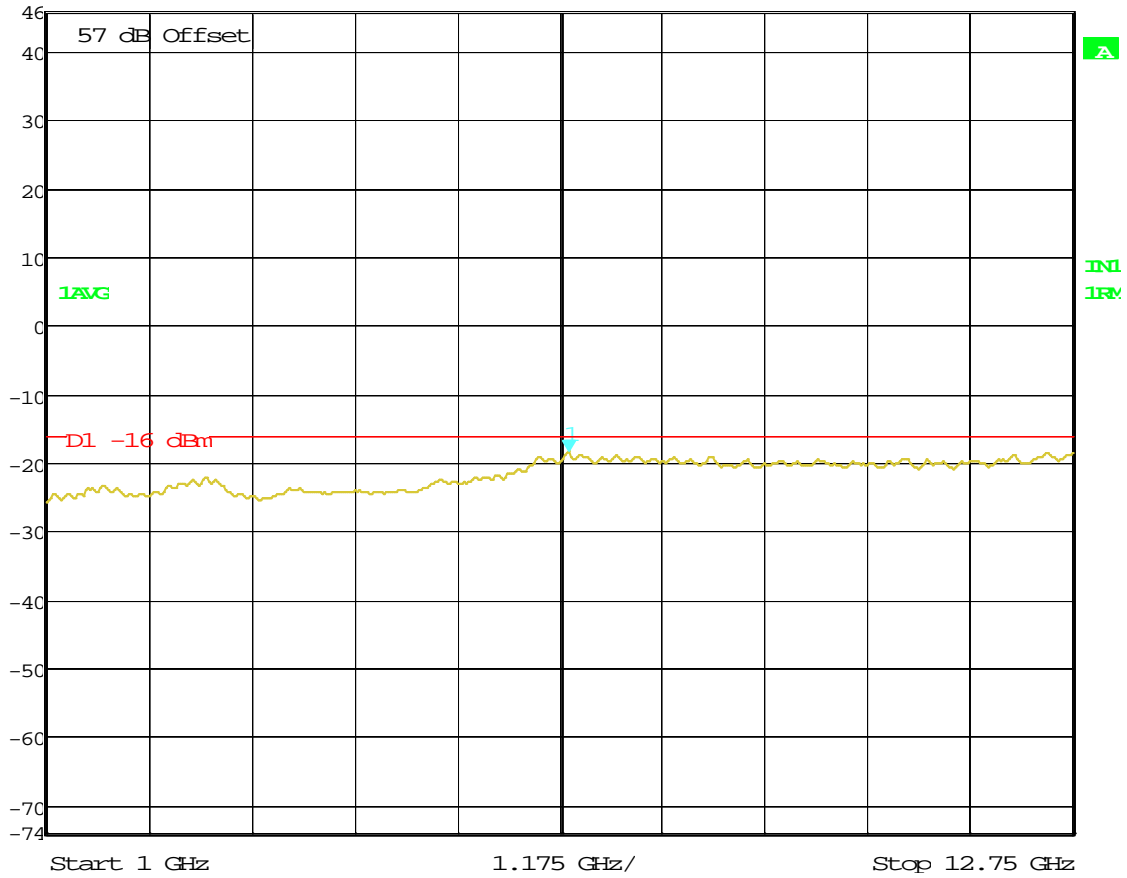


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
Date: 16.AUG.2012 11:00:02



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
Date: 16.AUG.2012 11:02:20

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.45 dBm VBW 1 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
PWR: 40W; QPSK; FCC Prt 27.53; FCCID: AS5BBTRX-06
Date: 16.AUG.2012 11:04:48

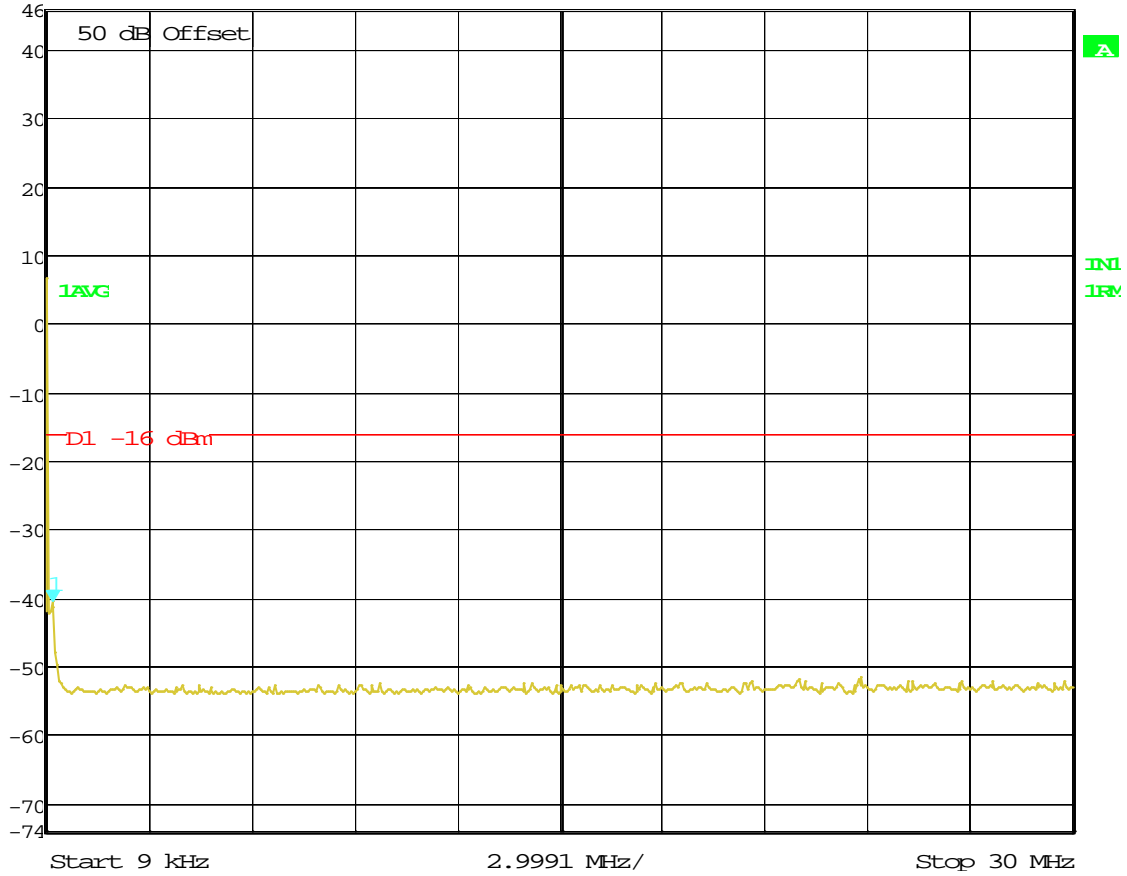
Antenna Conducted Spurious Emissions

Block: A+B

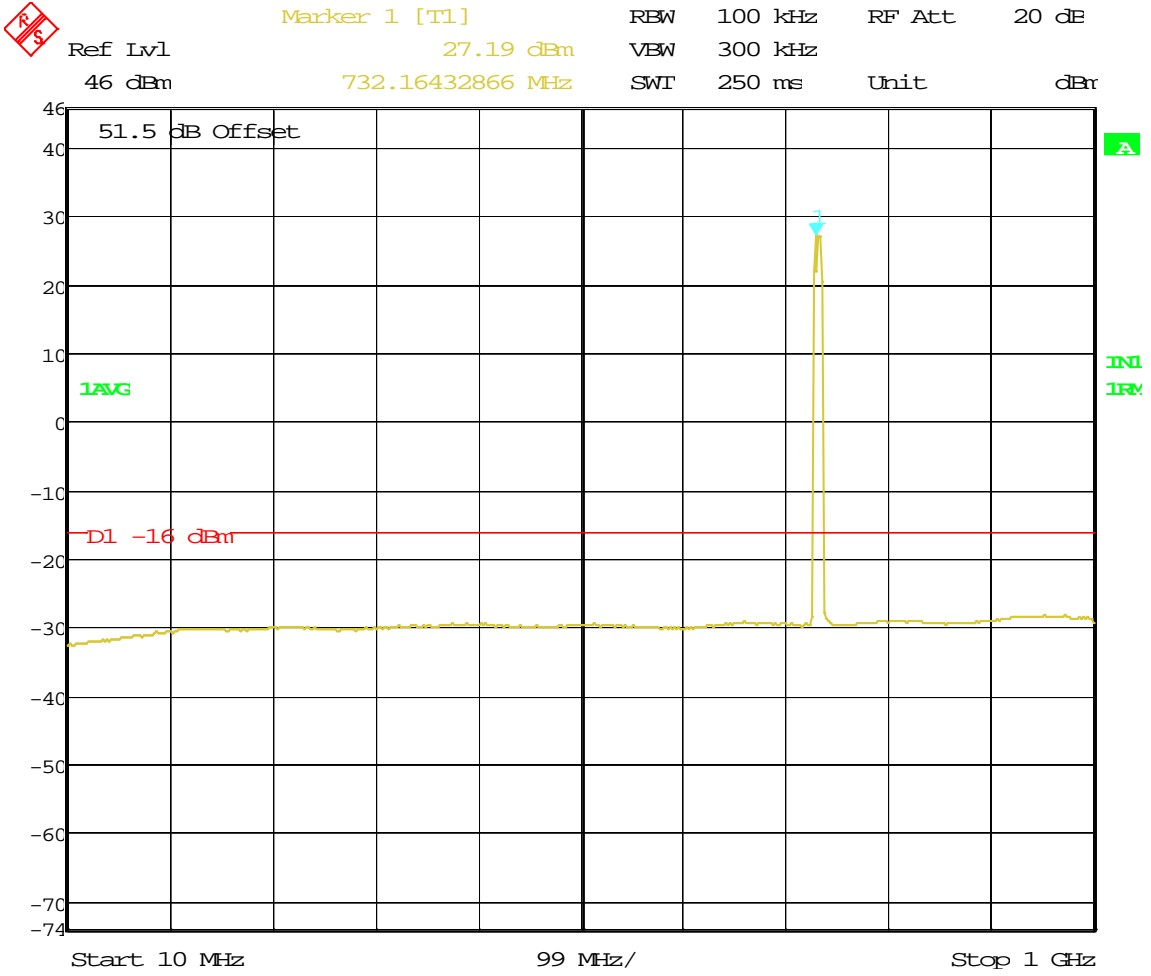
16QAM Modulation

Bandwidth 729.5 – 739.5 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.50 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



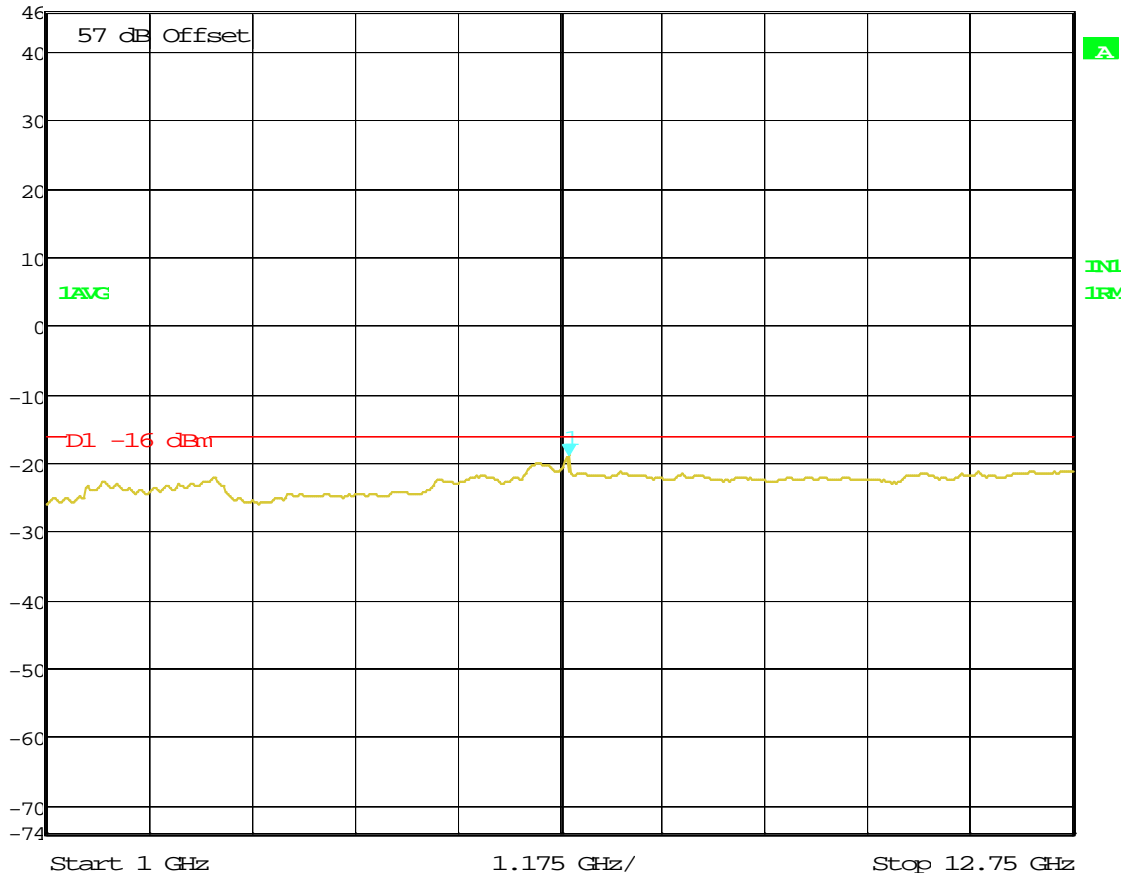
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 13:48:05



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 13:49:17



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.87 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK A+B; 729.5-739.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 13:51:51

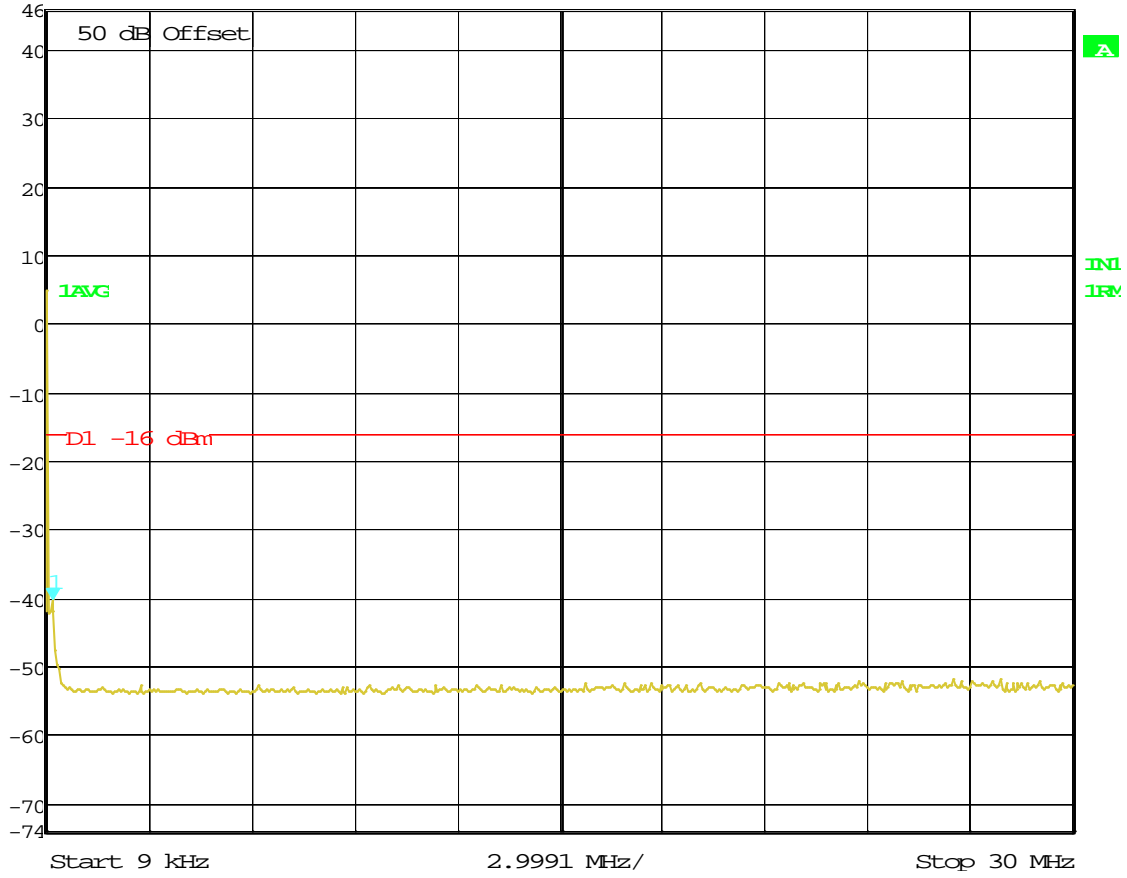
Antenna Conducted Spurious Emissions

Block: A+B

64QAM Modulation

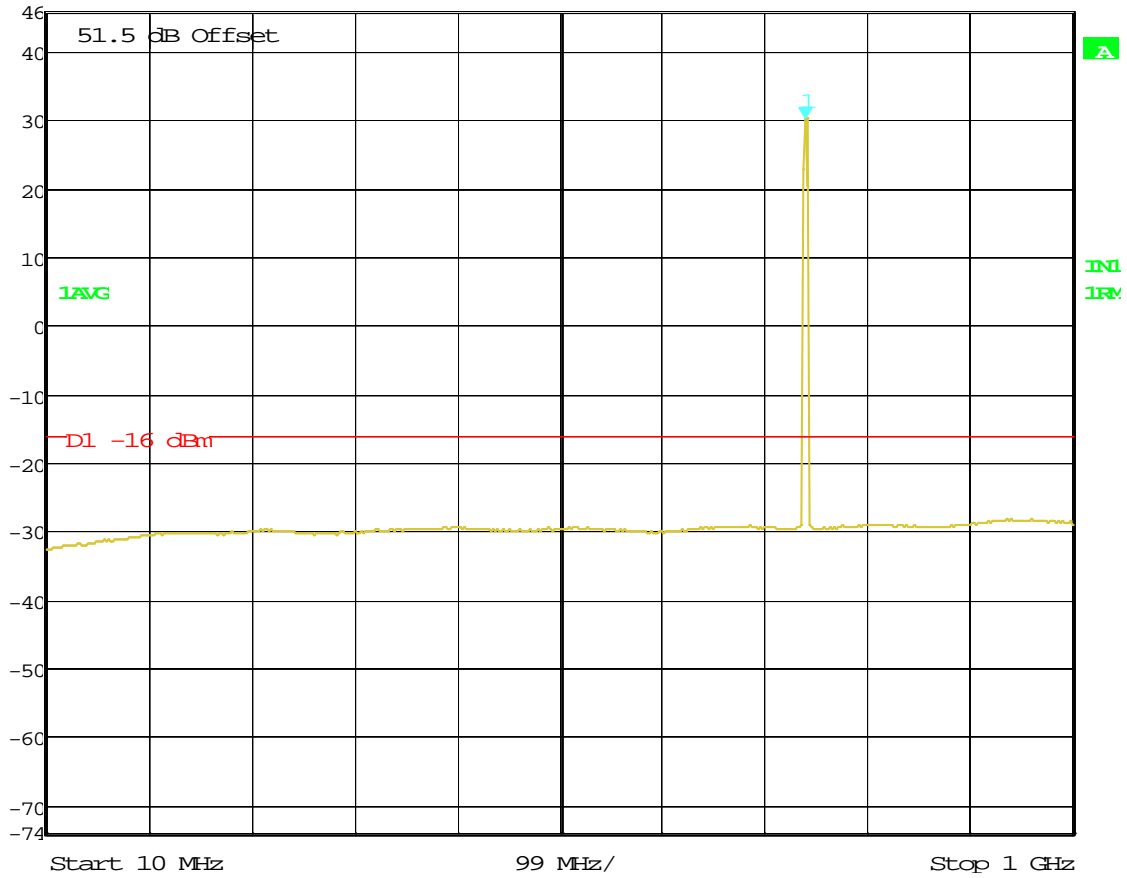
Bandwidth 729.5 – 739.5 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -40.28 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



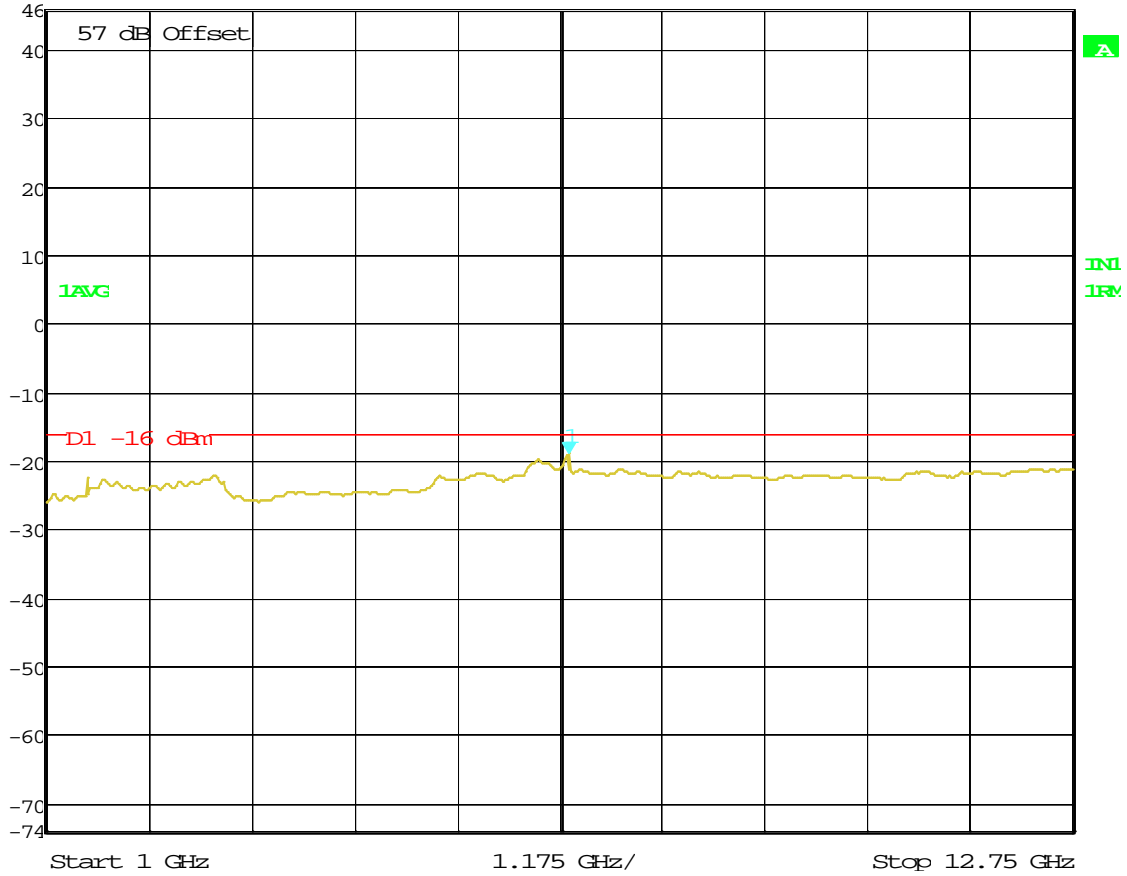
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:33:06

 Marker 1 [T1] RBW 100 kHz RF Att 20 dB
Ref Lvl 30.28 dBm VBW 300 kHz
46 dBm 742.08416834 MHz SWT 250 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower ATT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:31:31

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.87 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK C; 740 - 745 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 6.SEP.2012 10:25:58

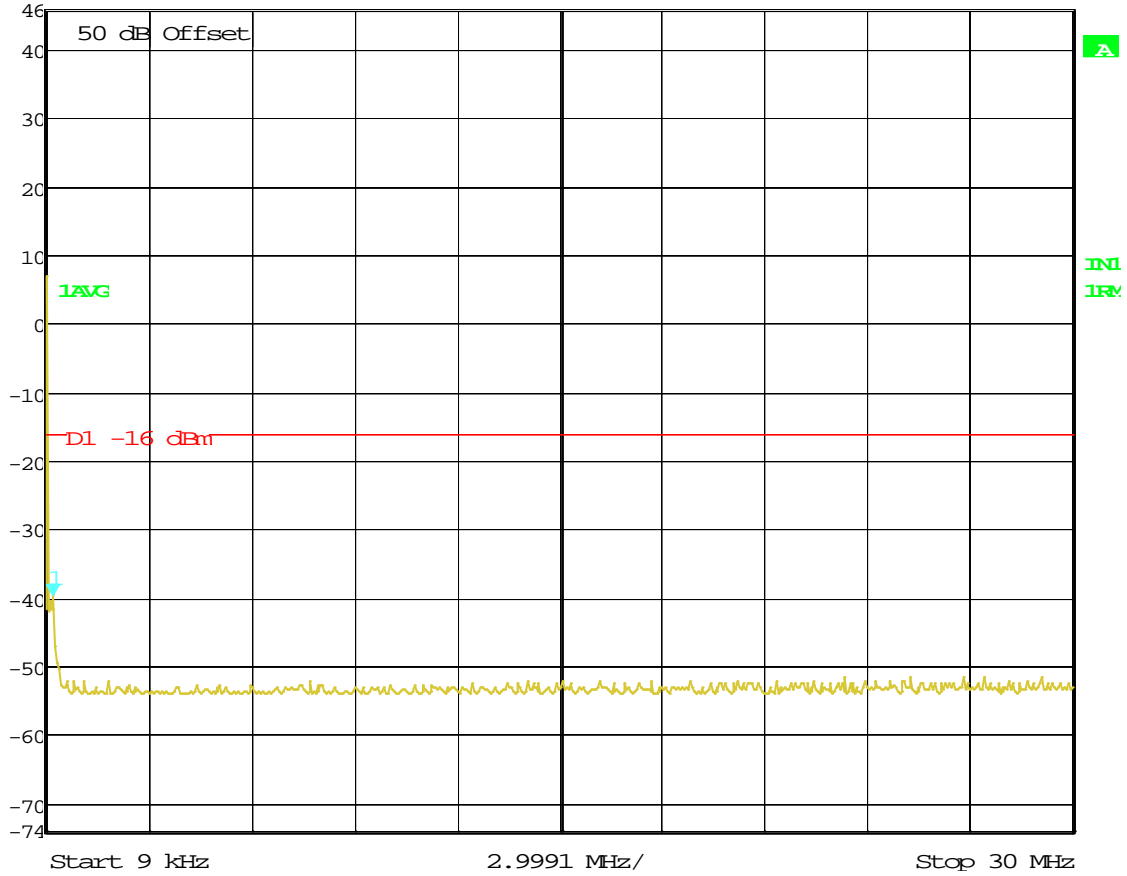
Antenna Conducted Spurious Emissions

Block: B+C

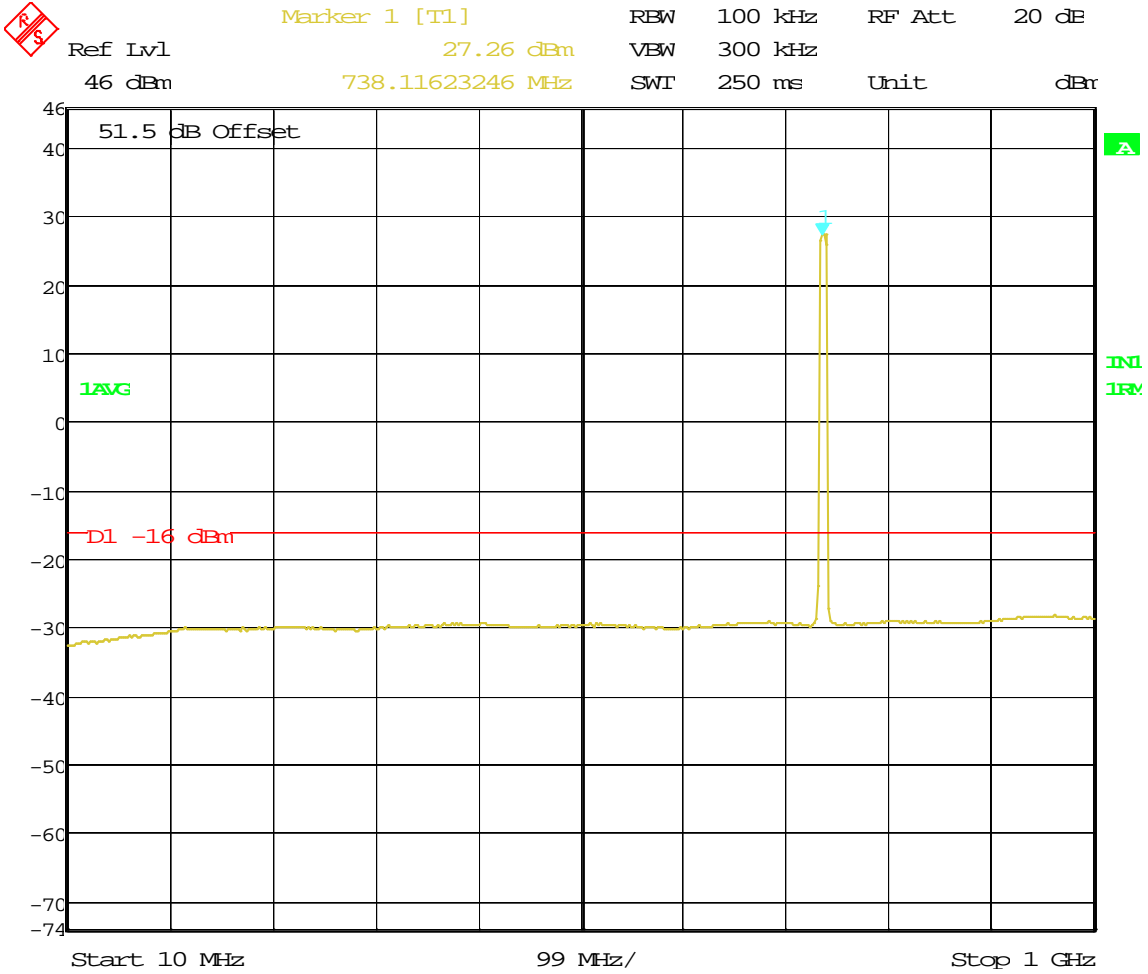
QPSK Modulation

Bandwidth 734.5 – 744.5 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -39.80 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm

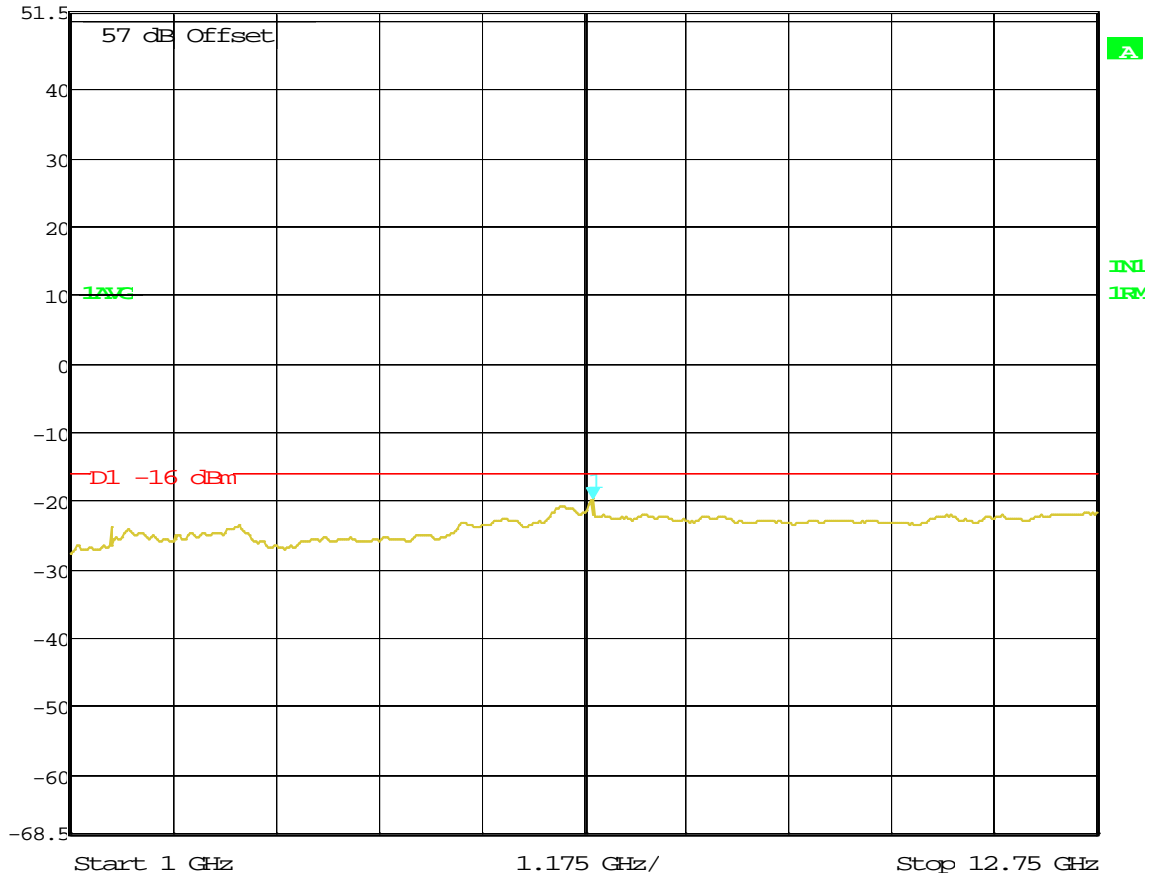


Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 11:12:04



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-A/T CR RRH 2X40-700 Lower A/T; BLK B+C; 734.5-744.5 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 11:13:09

 Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -19.67 dBm VBW 3 MHz
51.5 dBm 6.98096192 GHz SWT 120 ms Unit dBm



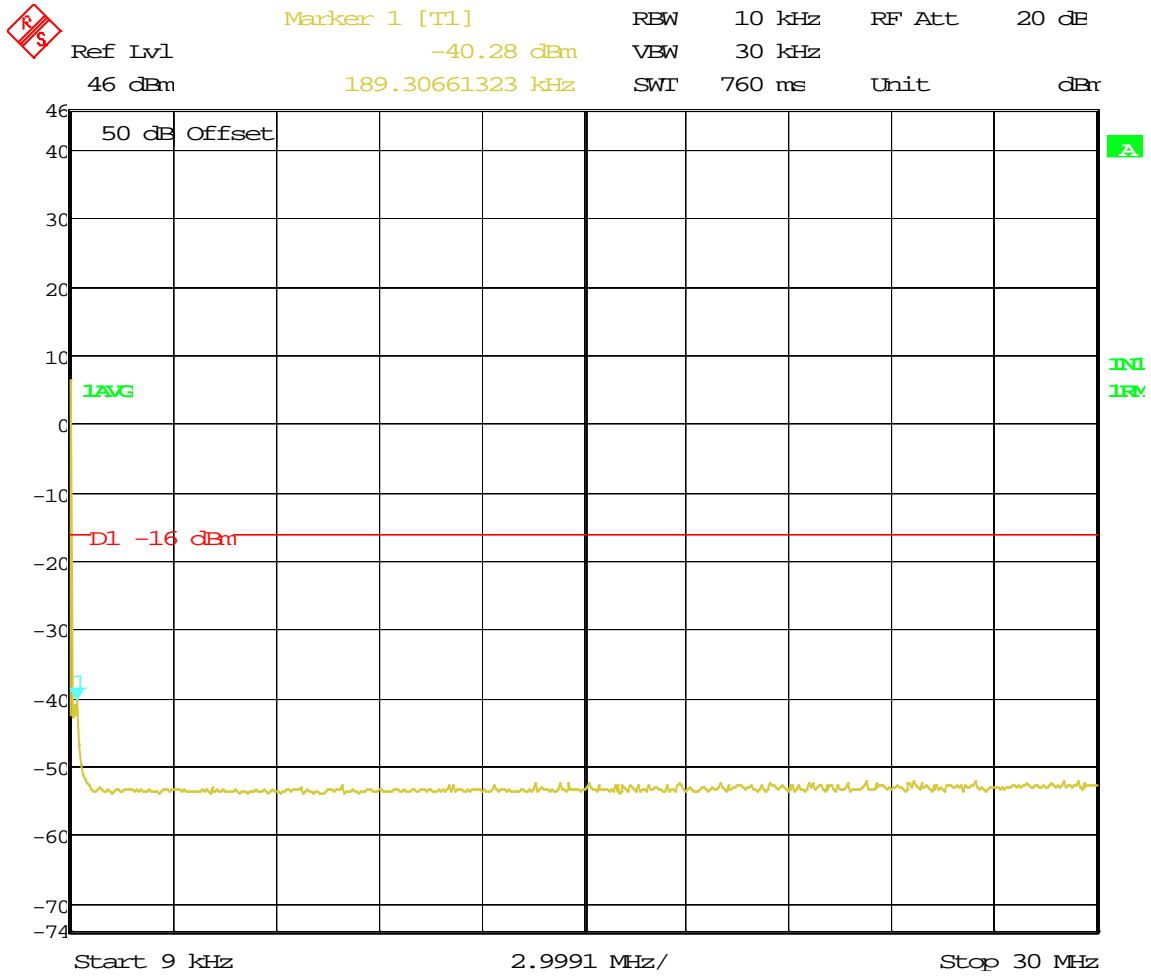
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
PWR: 40W; QPSK; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 11:15:27

Antenna Conducted Spurious Emissions

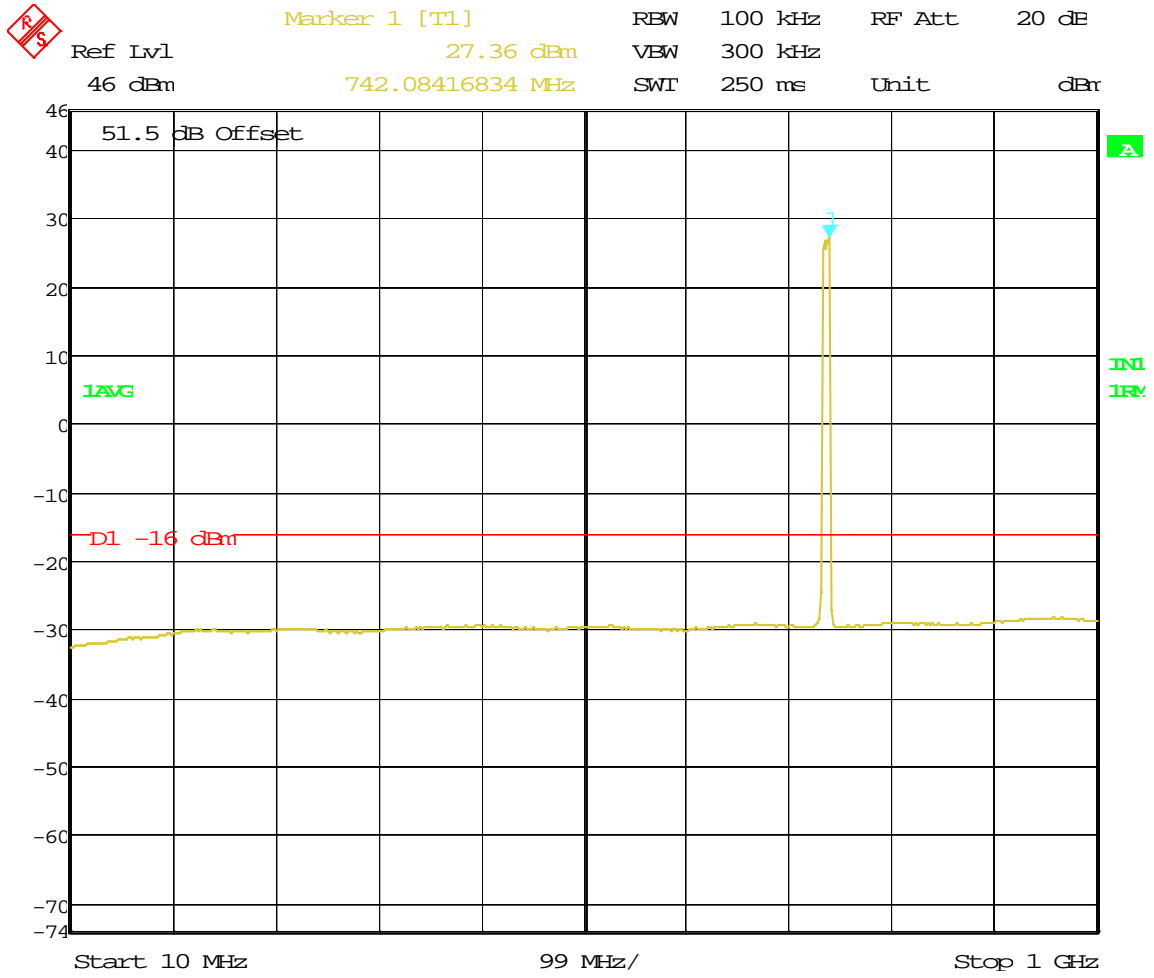
Block: B+C

16QAM Modulation

Bandwidth 734.5 – 744.5 MHz



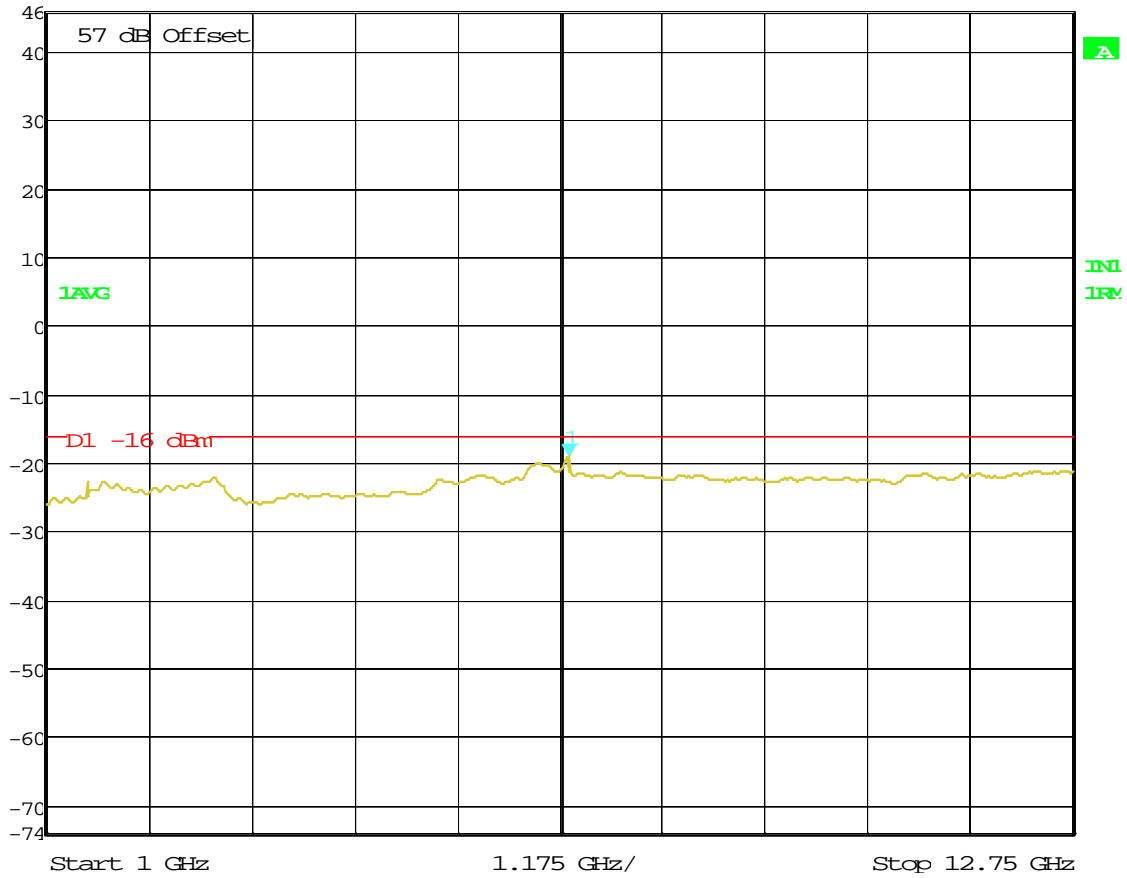
Title: SPURIOUS EMISSIONS AT TX ANTIENNA PORT; Test Engineer: SEG
 Comment A: LITE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
 PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
 Date: 5.SEP.2012 12:15:43



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 12:14:17



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl -18.92 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm




Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
PWR:40W; 16QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
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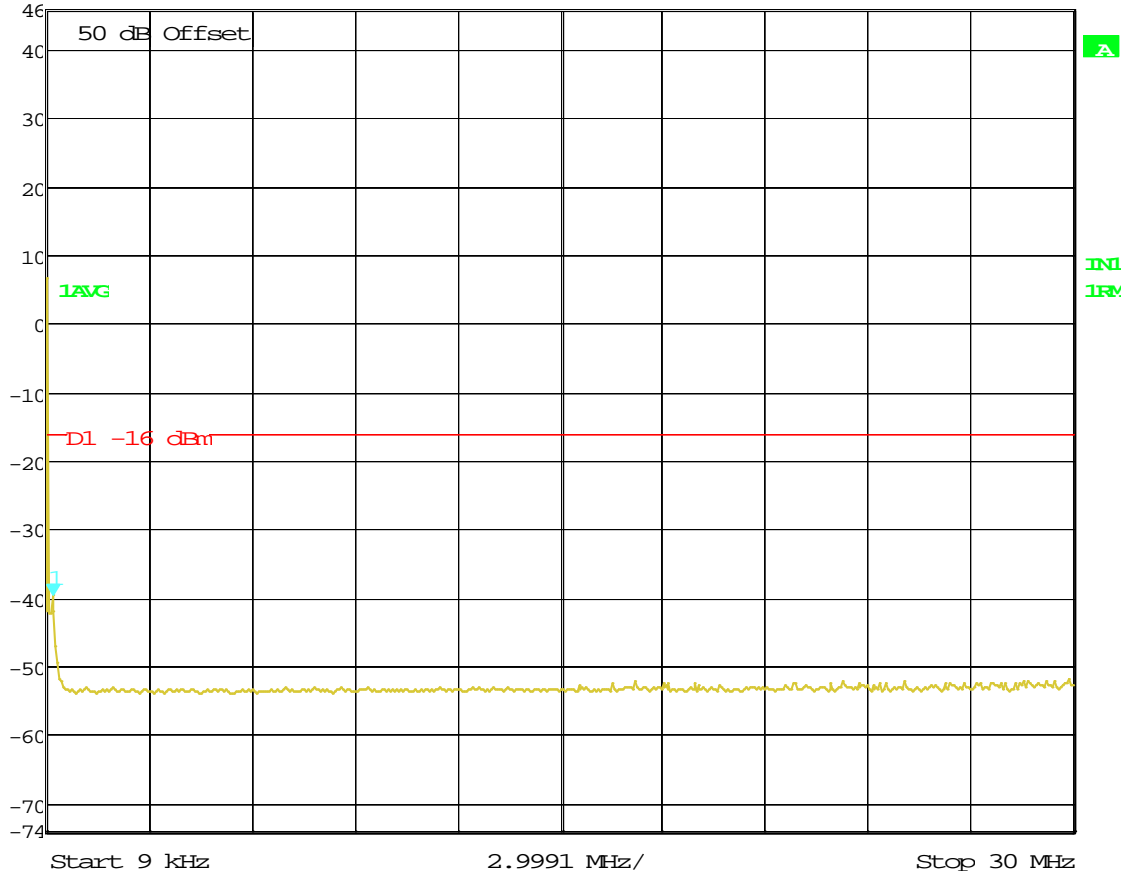
Antenna Conducted Spurious Emissions

Block: B+C

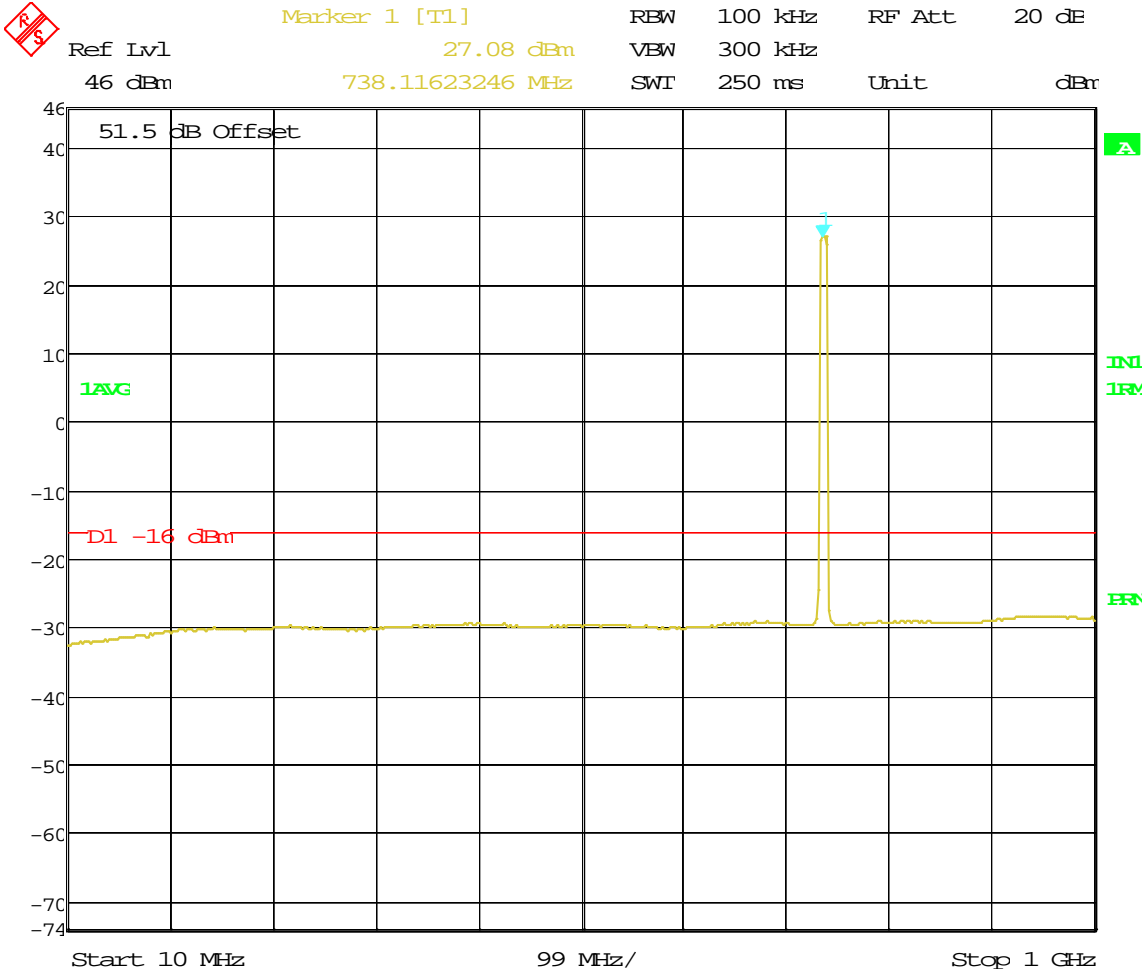
64QAM Modulation

Bandwidth 734.5 – 744.5 MHz

 Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl -39.78 dBm VBW 30 kHz
46 dBm 189.30661323 kHz SWT 760 ms Unit dBm



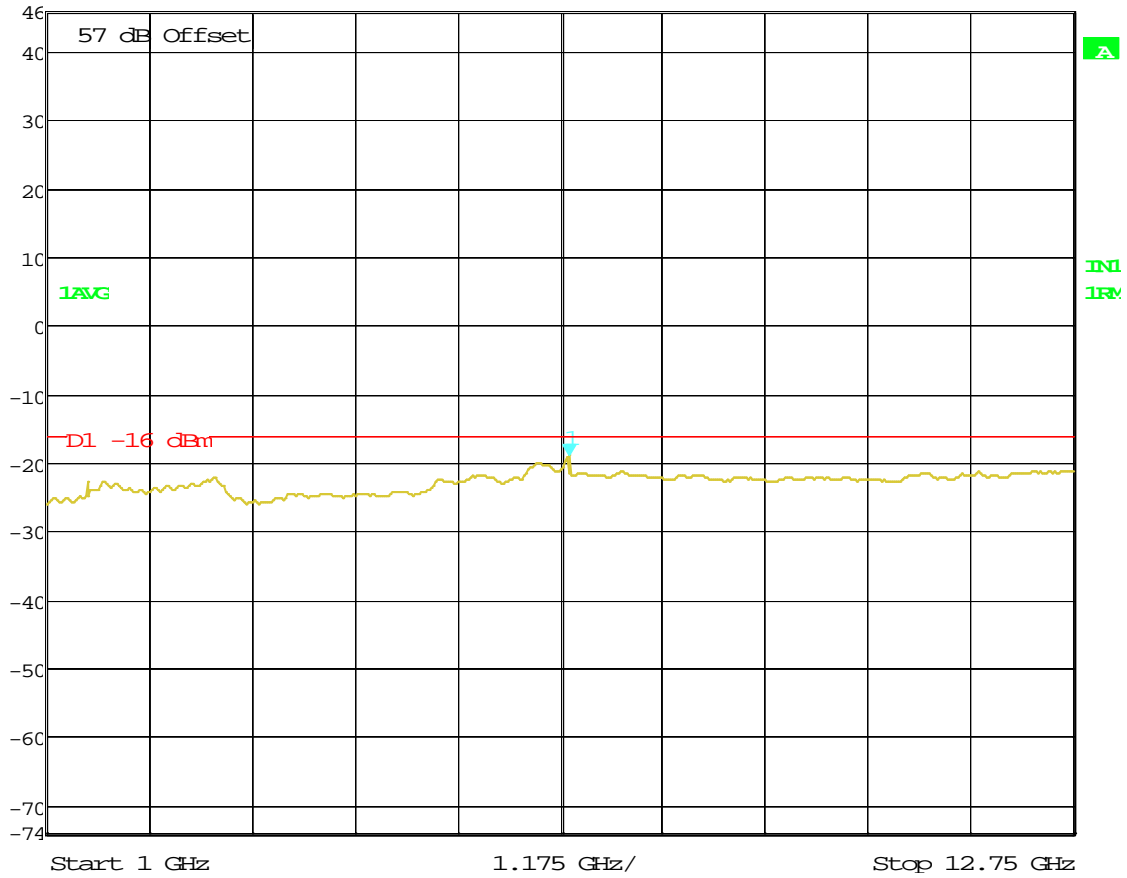
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 12:43:44



Title: SPURIOUS EMISSIONS AT TX ANTIENNA PORT; Test Engineer: SEG
Comment A: LTE-AT CR RRH 2X40-700 Lower AIT; BLK B+C; 734.5-744.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 12:45:19

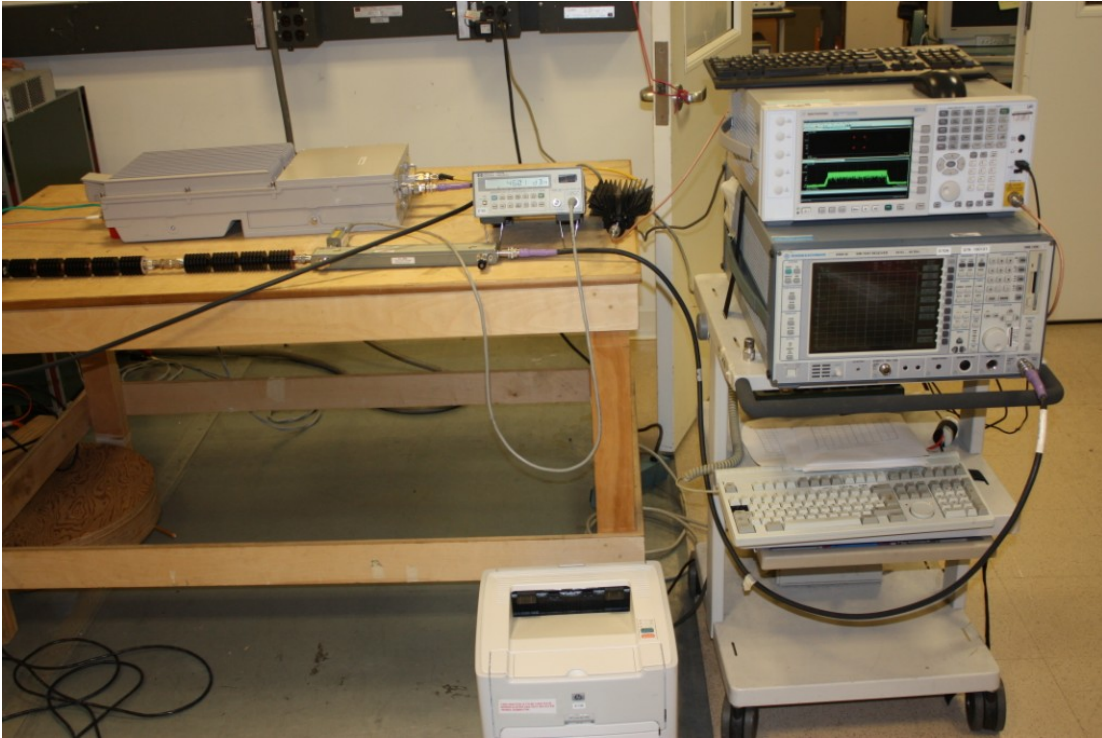


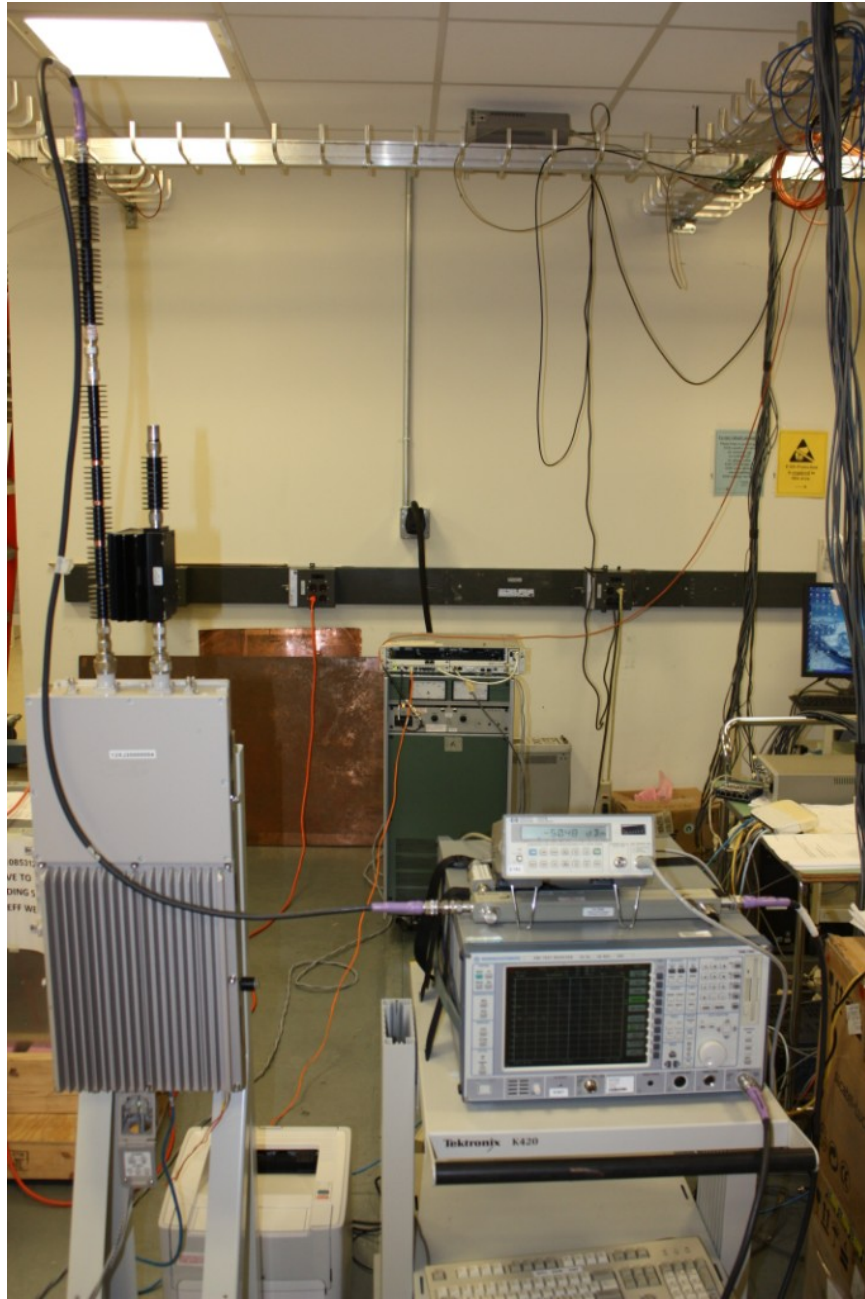
Marker 1 [T1] RBW 1 MHz RF Att 10 dB
-18.94 dBm VBW 3 MHz
46 dBm 6.98096192 GHz SWT 120 ms Unit dBm



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT; Test Engineer: SEG
Comment A: LTE-A/T CR RRH 2X40-700 Lower A/T; BLK B+C; 734.5-744.5 MHz
PWR:40W; 64QAM; 2X2 MIMO, FCC PART 27.53; FCCID: AS5BBTRX-06
Date: 5.SEP.2012 12:48:36

PHOTOGRAPH(S)





TEST INSTRUMENTATION

Manufacturer	Model	Serial #	Description	Manual #	Last Cal Date	Cal Cycle Month
Rohde & Schwarz	ESIB40	100044	EMI Test Receiver (20Hz to 40 GHz)-150 +30dBm	E567	6/27/2012	14
Hewlett Packard	8481A	3318A90195	Power Sensor .10 MHz-18 GHz	E752	7/26/2012	12
Hewlett Packard	437B	3125U06345	RF Power Meter	E782	3/6/2012	12
Weinschel	66-20-34	BW7320	Attenuator 20dB 150W DC-18 GHz	E815	8/31/2011	15
Weinschel	48-30-33	AY8323	Attenuator DC - 18GHz 100 Watt	E961	N/A	N/A
Hewlett Packard	778D	18655	Dual Directional Coupler 0.1-2.0 GHz 20 dB	E1122	N/A	N/A

Measurement -5

FIELD STRENGTH OF SPURIOUS RADIATION SECTION 2.1053 and 27.53 (g)

FILTER- M1**SECTION 2.1053****FIELD STRENGTH OF SPURIOUS RADIATION**

Field strength measurements of radiated spurious emissions were made at 3 m semi anechoic room of Global Product Compliance Laboratory of Alcatel-Lucent Murray Hill. A complete description and full measurement data for the site is on file with the Commission (FCC File 515091).

The “LTE RRH2X40-07L-AT” with FCCID: AS5BBTRX-06” was tested at a RF output of **40W at Antenna Interface Connector (AIC)**. The operation of RRH was simulated using Base Band Unit (BBU)/(D2U placed outside the chamber. The interconnection between RRH and D2U was through optical fiber. The radiated emissions tests were performed serially with RRH operating with 5 MHz and 10 MHz bandwidths in the frequency blocks A, B, C, A+B, & B+C. All tests were performed with the RRH operating in QPSK, 16QAM and 64QAM modulations. During testing, the RRH AIC were terminated with 50 ohm load. The spectrum from 10 MHz to the 10th harmonic (8GHz) of the carrier was searched for spurious radiation. Measurements were made according to ANSI C63.4. All emissions more than 20 dB below the specification limit were considered not reportable (Section 2.1057(c)).

All emissions more than 20 dB below the specification limit were considered not reportable (Section 2.1057(c)).

The calculated emission levels were found by:

$$\text{Measured level (dB}\mu\text{V)} + \text{Cable Loss(dB)} + \text{Antenna Factor(dB)} = \text{Field Strength (dB}\mu\text{V/m)}$$

Section 27.53 and 2.1053 contains the requirements for the levels of spurious radiation as a function of the level of the un-modulated carrier.

FCC Section 27.53(g): Based on measurement instrument employing resolution bandwidth of 100 kHz bands or greater out band shall be attenuated at least $43 + 10 \log (P)$ dB or -13dBm. Pursuant to FCC OET RULES 662911 D01 and D02 for two antenna MIMO mode of operations, the FCC limit of -13dBm shall be 3dB more stringent, therefore all channel edge and out of band spurious emissions shall be -16dBm.

The reference level for the un-modulated carriers is calculated as the field produced by an ideal isotropic antenna excited by the transmitter output power according to the following relation taken from Reference Data for Radio Engineers, Page 27-7 6th edition, IT&T Corp

$$E = [(30 * P)^{1/2}] / R$$

$$20 \log (E * 10^6) - (46 + 10 \log P) = 79.2 \text{ dB } \mu\text{V/meter}$$

E = Field Intensity in Volts/meter

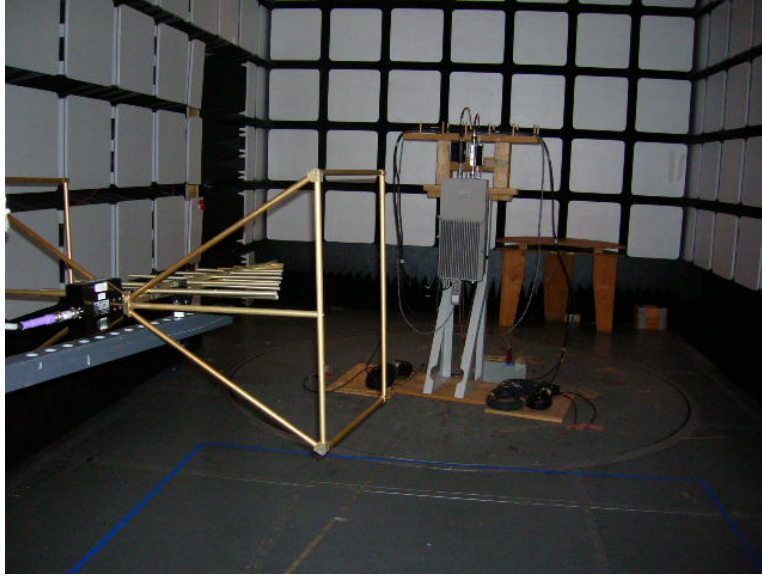
P = Transmitted Power in Watts

R = Distance from the ideal isotropic antenna in meters = 3 m

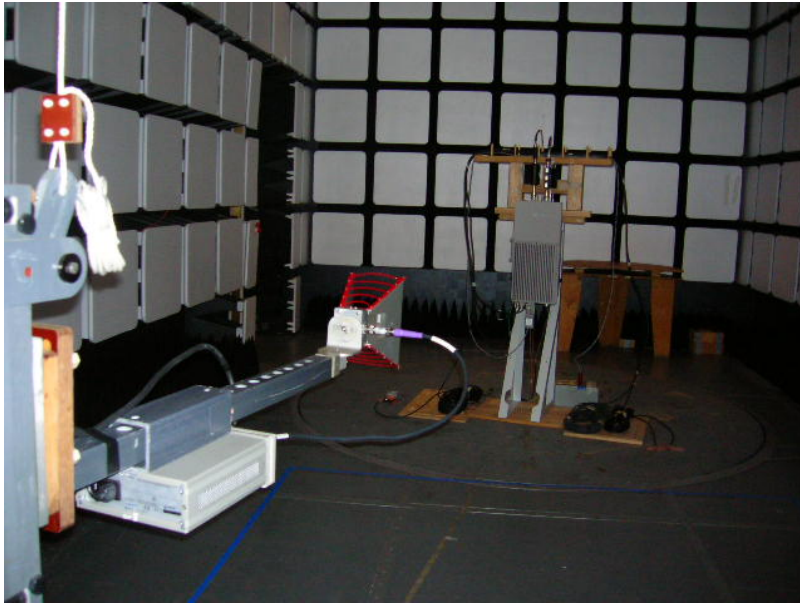
RESULTS:

For this particular test, the field strength of any spurious radiation is required to be less than 79.2 dB μ V/meter. Reportable measurements are equal to or greater than 59.2 dB μ V/meter. Over the spectrum investigated, 10 MHz to 10th of the carrier (8 GHz), no reportable spurious emissions were detected. This demonstrates that the "LTE 9442 Remote Radio Head (RRH)" the subject of this application, complies with Sections 2.1053, 27.53 (g) and 2.1057 of the Rules.

**PHOTOGRAPH(S) OF EUT ARRANGEMENT
DURING FINAL RADIATED EMISSIONS TESTING
30-1000 MHz**



**PHOTOGRAPH(S) OF EUT ARRANGEMENT
DURING FINAL RADIATED EMISSIONS TESTING
1-13 GHz**



TEST INSTRUMENTATION

Manufacturer	Model	Serial #	Description	Manual #	Last Cal Date	Cal Cycle Month
Hewlett Packard	8593E	3911A04009	Spectrum Analyzer 9 KHz-22 GHz	E375	9/22/2011	12
Sonoma Instrument Co.	310N	185785	Amplifier 9kHz-1GHz	E494	10/18/2011	12
A.H. Systems	SAS-521-2	410	Biological Antenna 25 - 2000 MHz	E602	9/22/2011	12
Weinschel	2-6	BX3438	6 dB Attenuator DC-18GHz 5 Watt	E889	1/23/2012	12
Rohde & Schwarz	ESIB40	100121	EMI Test Receiver (20Hz to 40 GHz)-150 +30dBm	E704	9/14/2011	12
EMCO	3115	9006-3460	Double Ridged Horn 1-18 GHz	E057	1/27/2012	12
Agilent	8449B	3008A01550	Preamplifier 1-26.5 GHz 30dB	E519	11/4/2011	12

Measurement -6

MEASUREMENT OF FREQUENCY STABILITY

Measurement -6

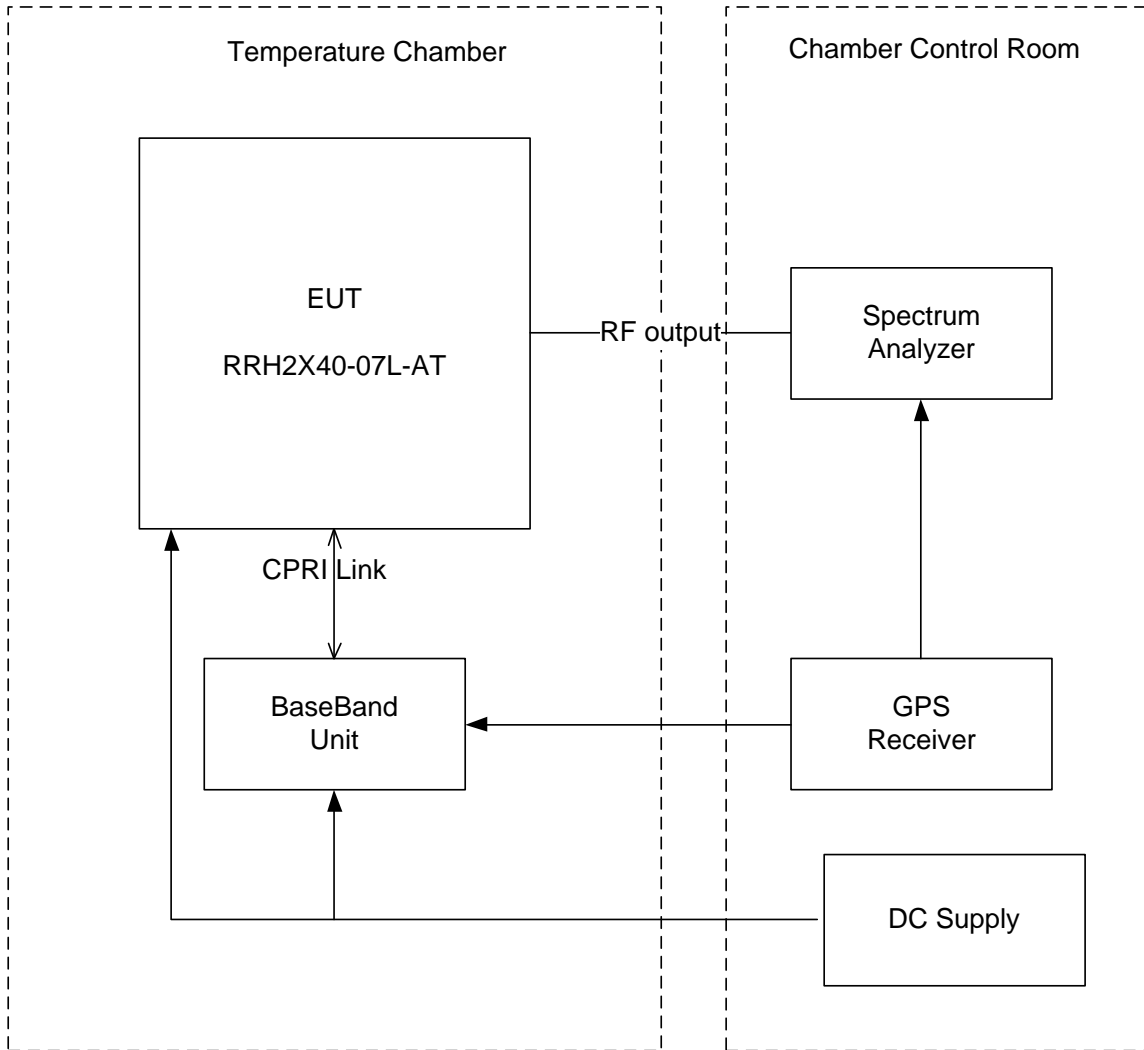
MEASUREMENT OF FREQUENCY STABILITY LTE RRH2X40-07L-AT

MEASUREMENT OF FREQUENCY STABILITY

The frequency stabilization and accuracy of the LTE signals modulated and amplified by the 700 MHz Transmitter is a function of the input signal which is derived from the CPRI link coming from the Baseband Unit (d2uV5).

The RRH and the Baseband Unit were subjected to the FCC specified environments while operating at full rated power of 2x40W at External Antenna Connector (EAC) port. The carrier Frequency deviations were measured. The nominal Voltage input to this device is -48V DC. The RRH2x40-07L-AT is designed to operate in the Voltage range of 38.0V to 57.0V and in the temperature range of -40C to +55C.

The measurement setup is depicted in Block diagram A.



Block Diagram A RRH2X40-07L-AT measure setup

Transmit Frequency Deviation at -48VDC Over Temperature Range

Temperature in Degrees Celsius	TX Frequency Deviation in (Hz)	
	Tx1	Tx2
25	-0.13	-2.39
30	-1.02	-0.5
40	-2.13	-0.76
55	0.45	-0.97
50	0.65	0.34
40	0.57	-1.68

Temperature in Degrees Celsius	TX Frequency Deviation in (Hz)	
	Tx1	Tx2
30	-1.25	-0.37
20	1.34	-2.58
10	0.22	0.12
0	-2.2	0.62
-10	-0.15	1.25
-20	0.73	-1.13
-30	0.23	0.93
-40	-1.27	-0.1
-30	-2.2	-0.6
-20	-1.39	2.64
-10	0.12	1.08
0	0.76	-0.83
10	1.73	2.21
20	0.67	0.32
25	-0.2	1.31

Result: Maximum Frequency error for temperature variation is 2.39 Hz

Transmit Frequency (737 MHz) Deviation at 25C Over Voltage Range

Voltage id DC	TX Frequency Deviation in (Hz)	
	Tx1	Tx2
-48	0.32	-0.13
-47	-1.18	-0.74
-46	-2.33	-1.63
-45	-0.91	0.45
-44	0.27	-1.72
-43	-0.56	0.49
-42	1.88	-2.89
-41	-1.27	0.23
-40	-0.39	0.29
-39	-2.67	-1.72
-38	1.12	-1.44
-39	-0.89	-0.18
-40	-2.21	0.22
-41	-0.6	-0.83
-42	1.63	2.62
-43	1.32	-0.77
-44	-1.26	0.12
-45	-2.42	0.36
-46	0.26	1.63
-47	-1.7	2.12
-48	2.37	-0.68
-49	1.36	-2.98
-50	-0.32	0.13
-51	0.67	-0.15
-52	1.87	-0.49
-53	-0.03	2.28
-54	-0.82	1.38
-55	0.37	1.2
-56	-1.38	1.73
-57	-0.76	-1.55

Result: Maximum Frequency error for voltage variation is 2.89 Hz

Instrument Used for Measurement

Equipment description	Manufacture	Model	Serial Number	Calibration Due Date
Signal Analyzer	Agilent	MXA N9020A	MY49100007	19OCT2014
Environmental Chamber	LINPIN	LP/JDGS- 010C	LP-11-708	28JUN2014

**FREQUENCY SPECTRUM TO BE INVESTIGATED
SECTION 2.1057**

SECTION 2.1057

FREQUENCY SPECTRUM TO BE INVESTIGATED

Frequency Spectrum to be investigated, Measurement Bandwidth and detector functions used meet or exceed the Specification contained in Section 2.1057, 27, and 3GPP TS36.104 V8.4.0 (2008-12)

Measurement Instrumentation and Antennas

All instrumentations, antennas and test Chamber used for the purpose of tests contained in the report were in calibration and calibrations are traceable to NIST