

# **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-13**, 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 Section 27.50(d)(5)	Modulation Characteristics Peak-to-Average ratio (PAR)
Measurement: 3	Section 2.1049	(a) Emissions Bandwidth (b) Occupied Bandwidth/Band Edge spurious Emissions
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  
&**

**Section 27.50(d)(5)  
Measurement of Peak-to-Average ratio (PAR)**

## **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 plots of graphs show the modulation components: In phase (I) and Quadrature (Q) components.

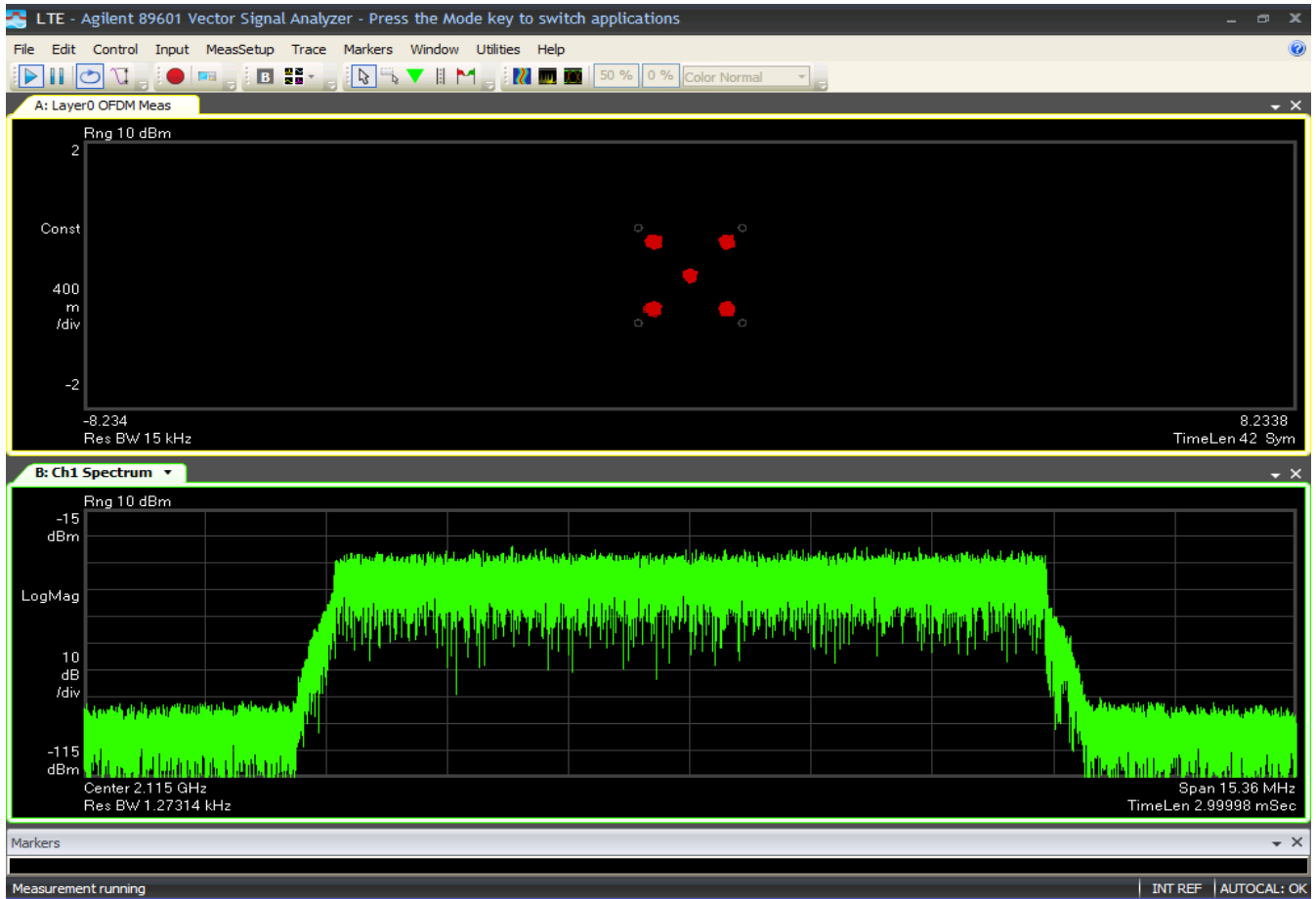
- (1) Quadrature Phase Shift Keying (QPSK) modulation scheme uses 2 bits are transmitted simultaneously (one per channel) and a symbol can be represented by 2 bits. Therefore there are  $2^2 = 4$  states (Binary 00 to 11). The theoretical bandwidth is 2bits/second/Hz.
- (2) 16 Quadrature amplitude modulation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

## **Section 27.50(d)(5)**

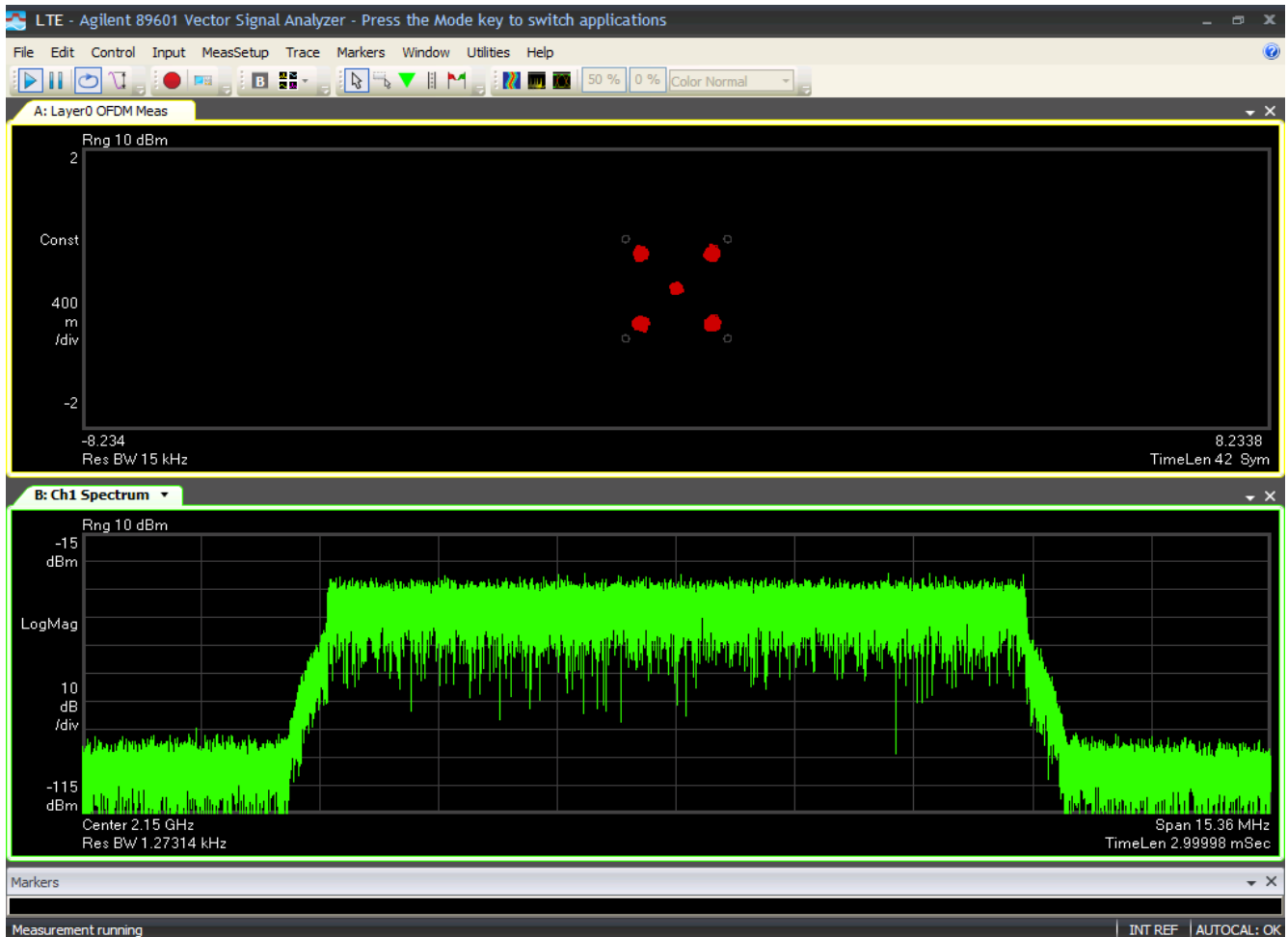
### **Measurement of Peak-to-Average ratio (PAR)**

The peak-to-average (PAR) is plotted along with demodulated constellation plots. The plots show that average and peak values in dBm. The difference of peak-to-averages ratio does not exceed 13 dB as required in section 27.50(d) (5).

**QPSK 120 watts  
2115MHz & 2150 MHz (10 MHz BW)**

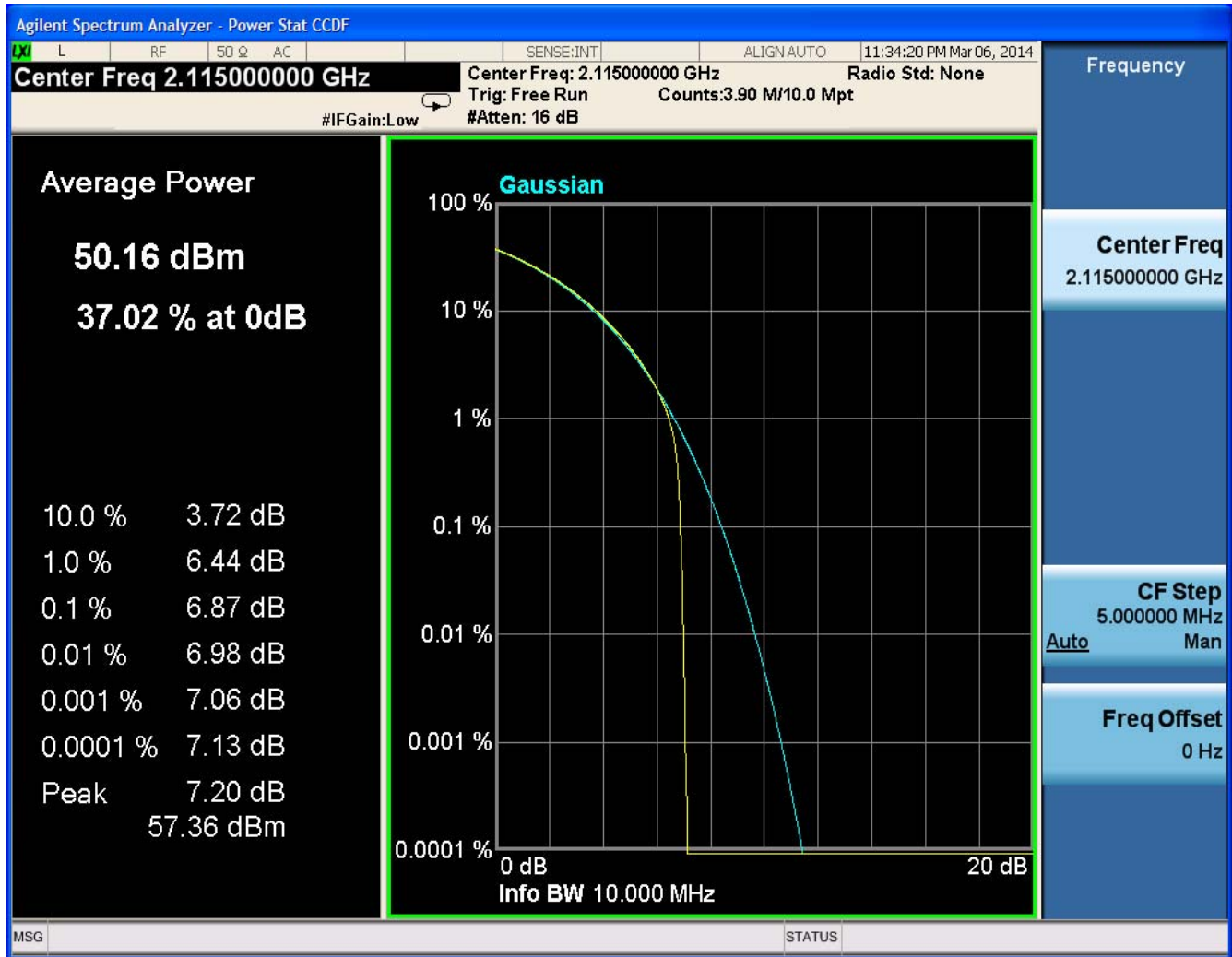


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block A (2110-2120 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG



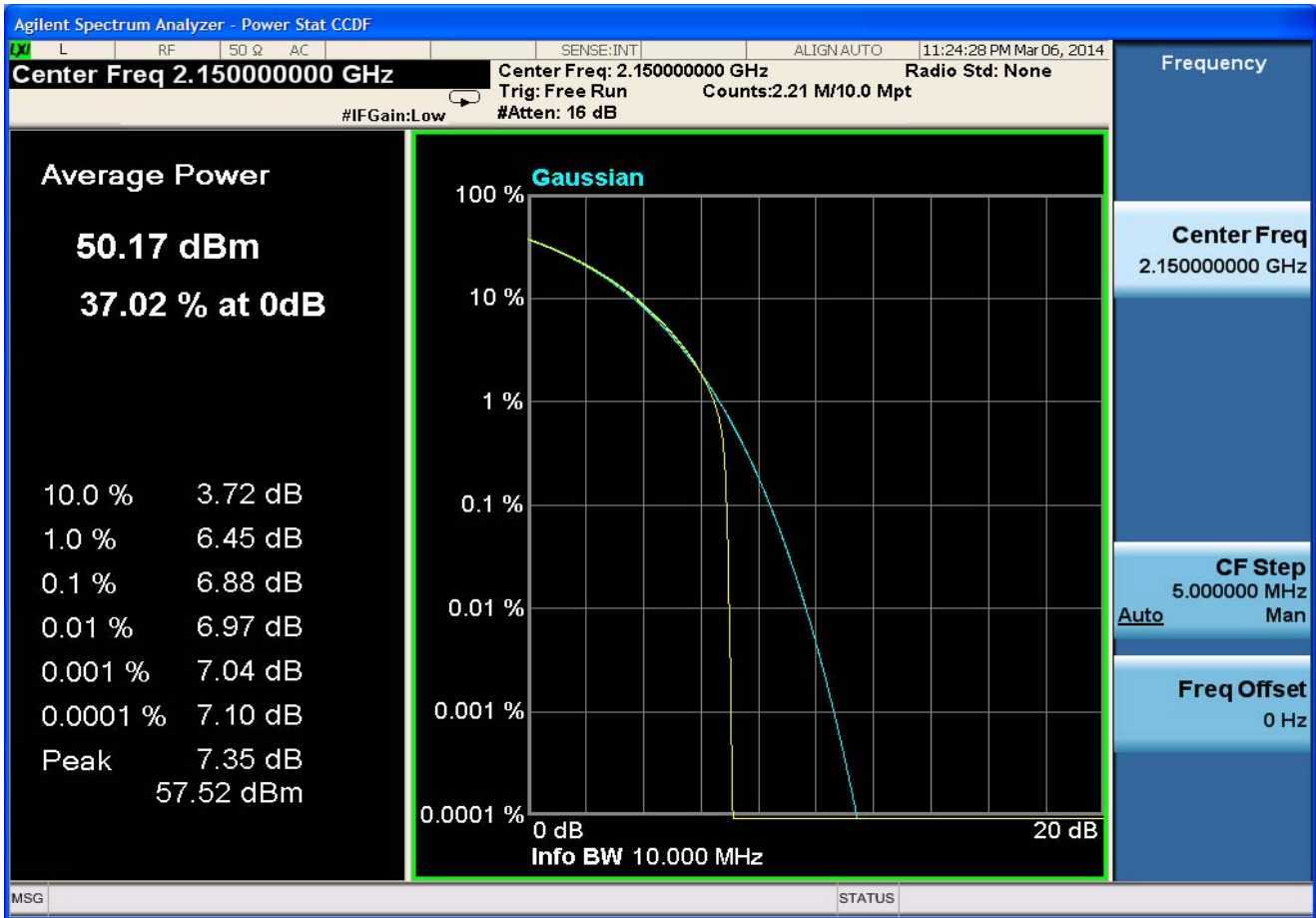
TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block F (2145-2155 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

Peak to Average  
QPSK 120 watts  
2115MHz & 2150MHz (10 MHz BW)



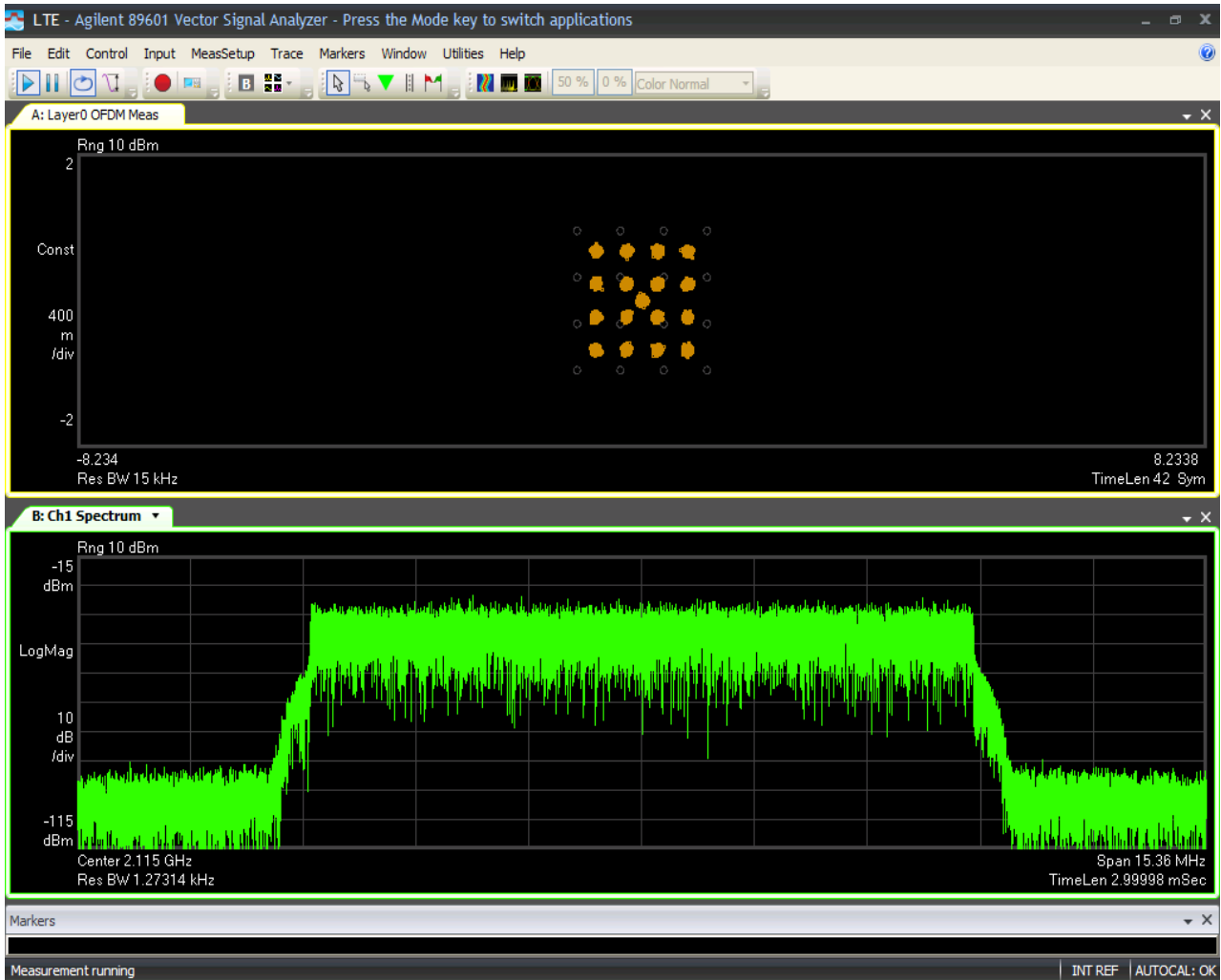
TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block A (2110-2120 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG



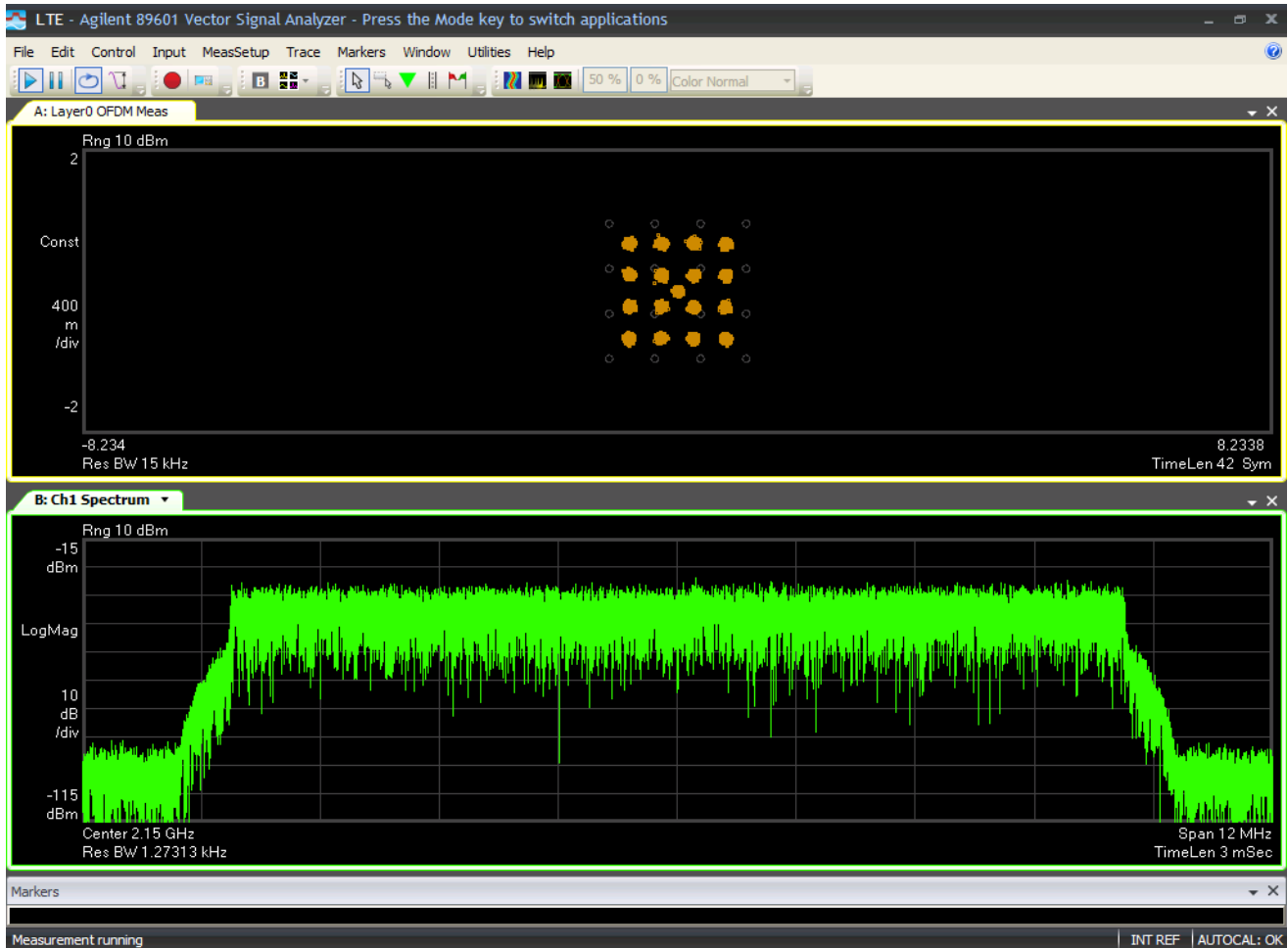


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block F (2145-2155 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

**16QAM 120 watts  
2115MHz & 2150 (10 MHz BW)**

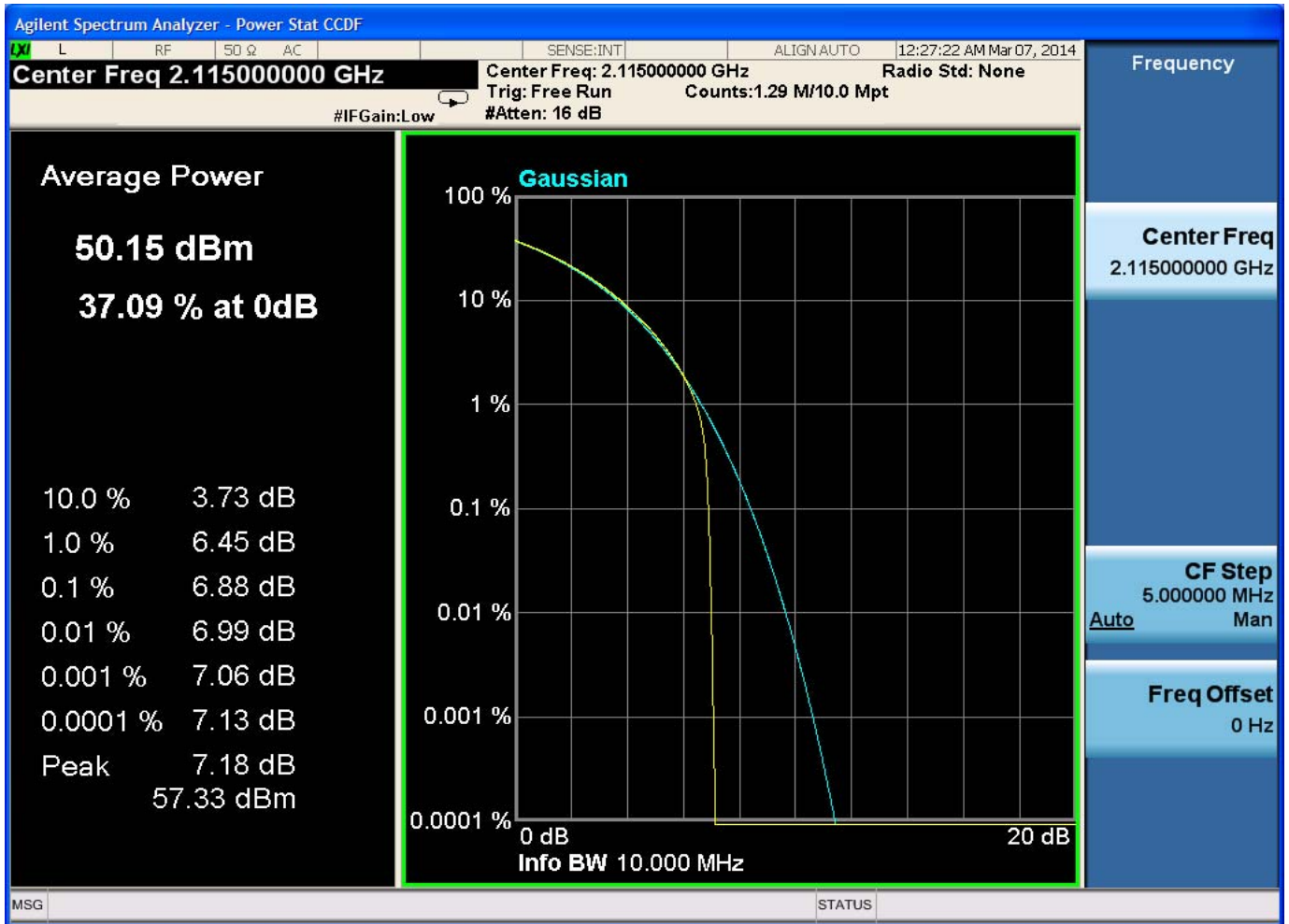


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block A (2110-2120 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

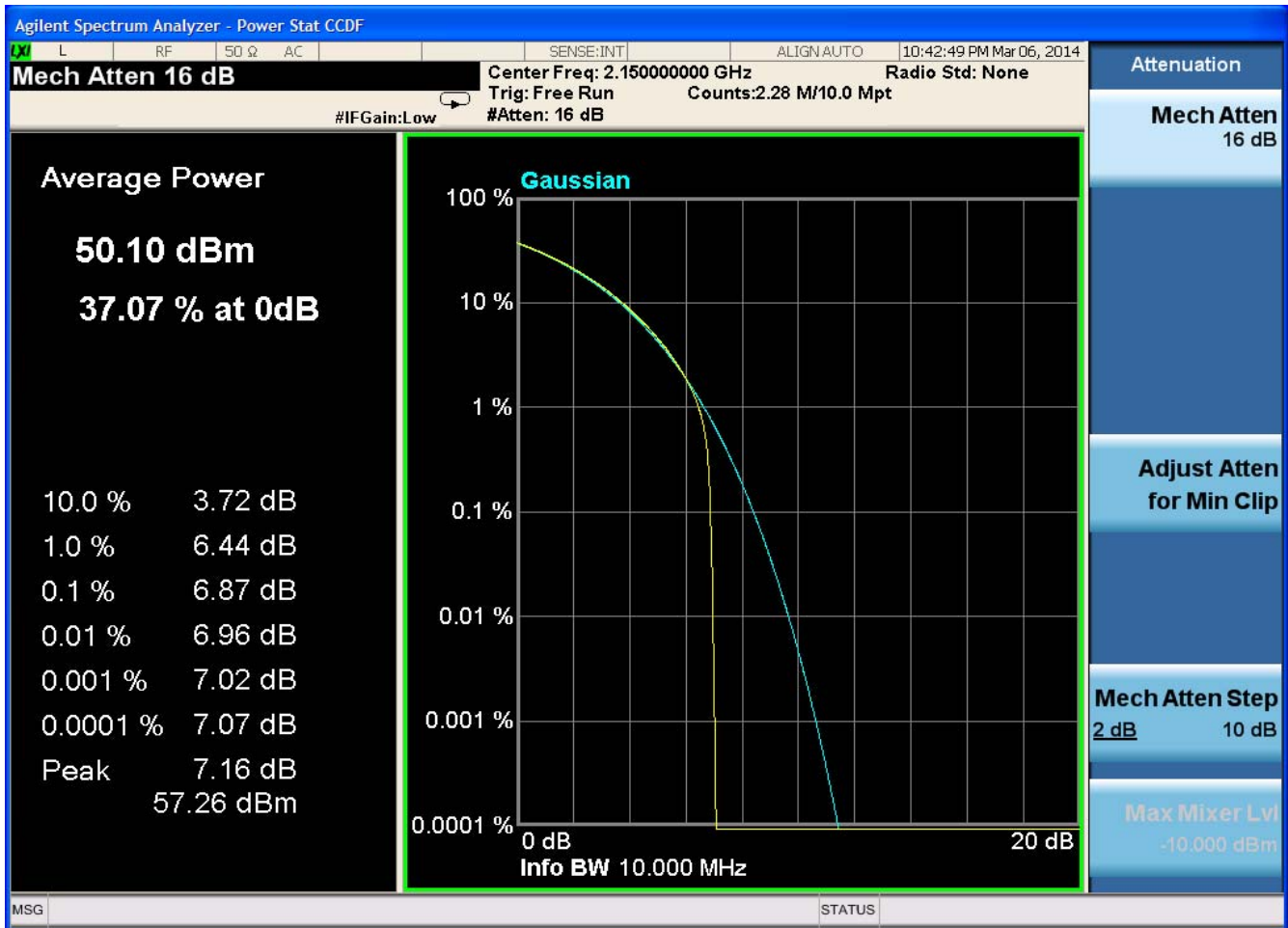


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block F (2145-2155 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

**Peak to Average  
16QAM 120 watts  
2115MHz & 2150MHz (10 MHz BW)**

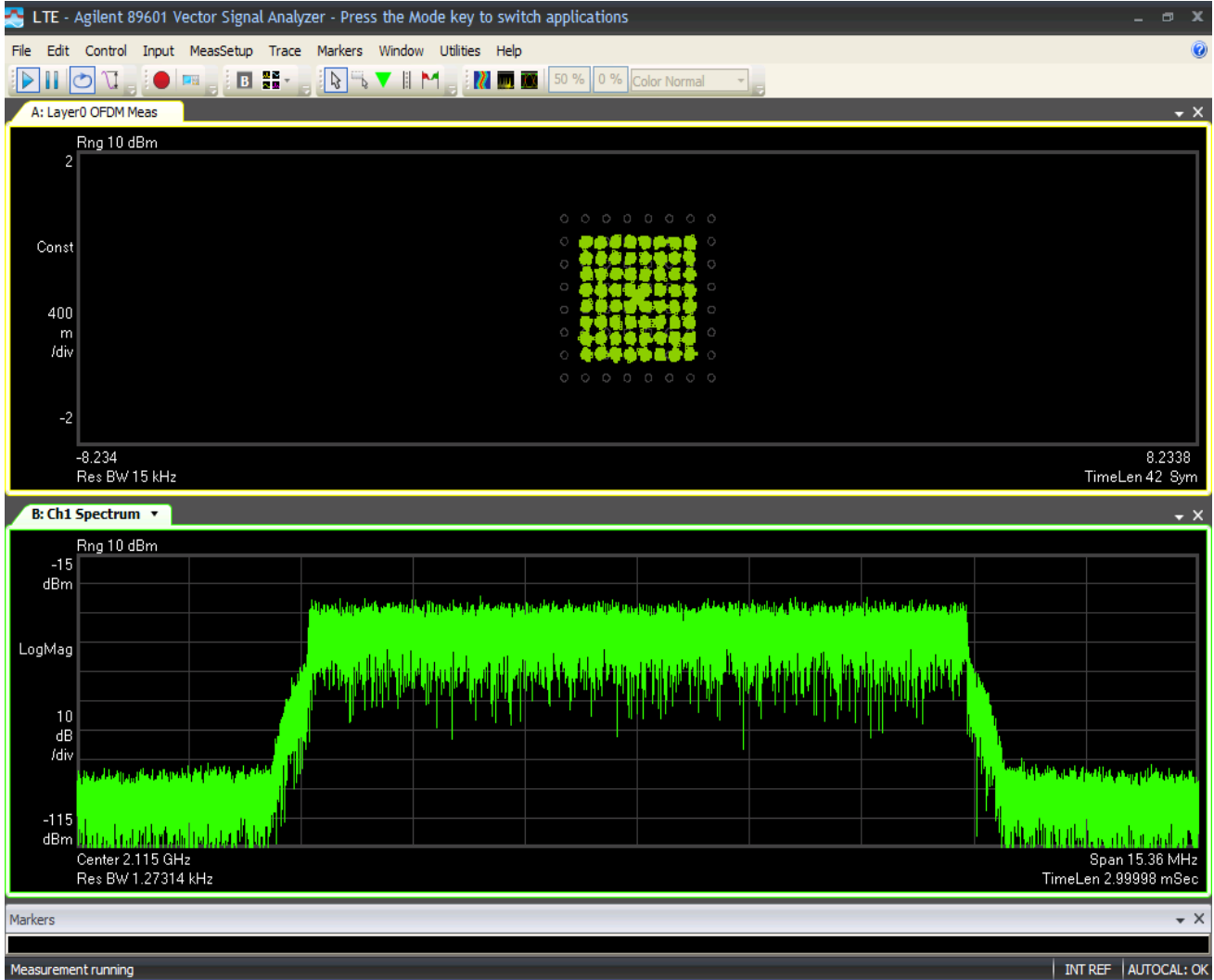


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block A (2110-2120 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

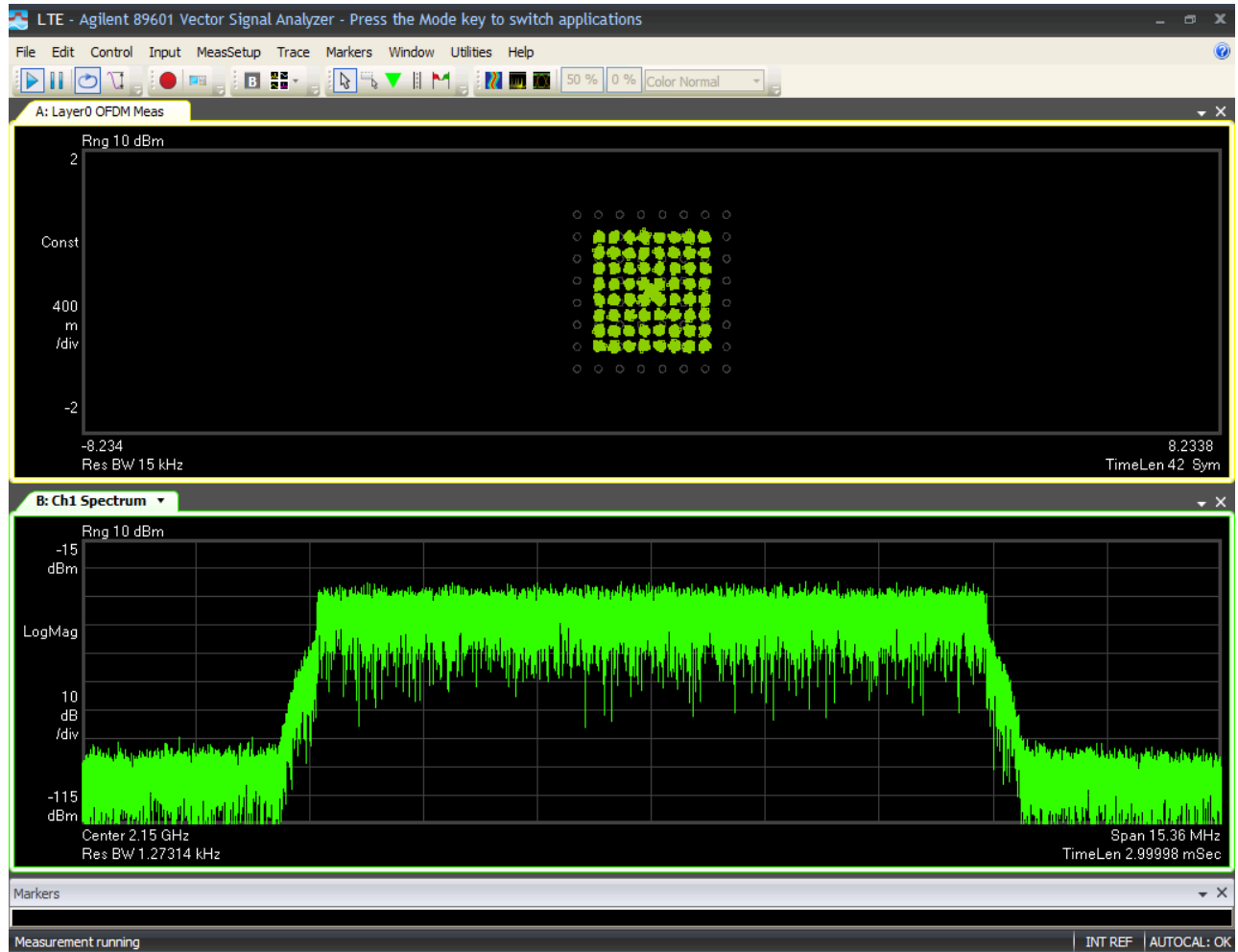


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block F (2145-2155 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

**64QAM 120 Watts  
2115MHz & 2150MHz (10 MHz BW)**

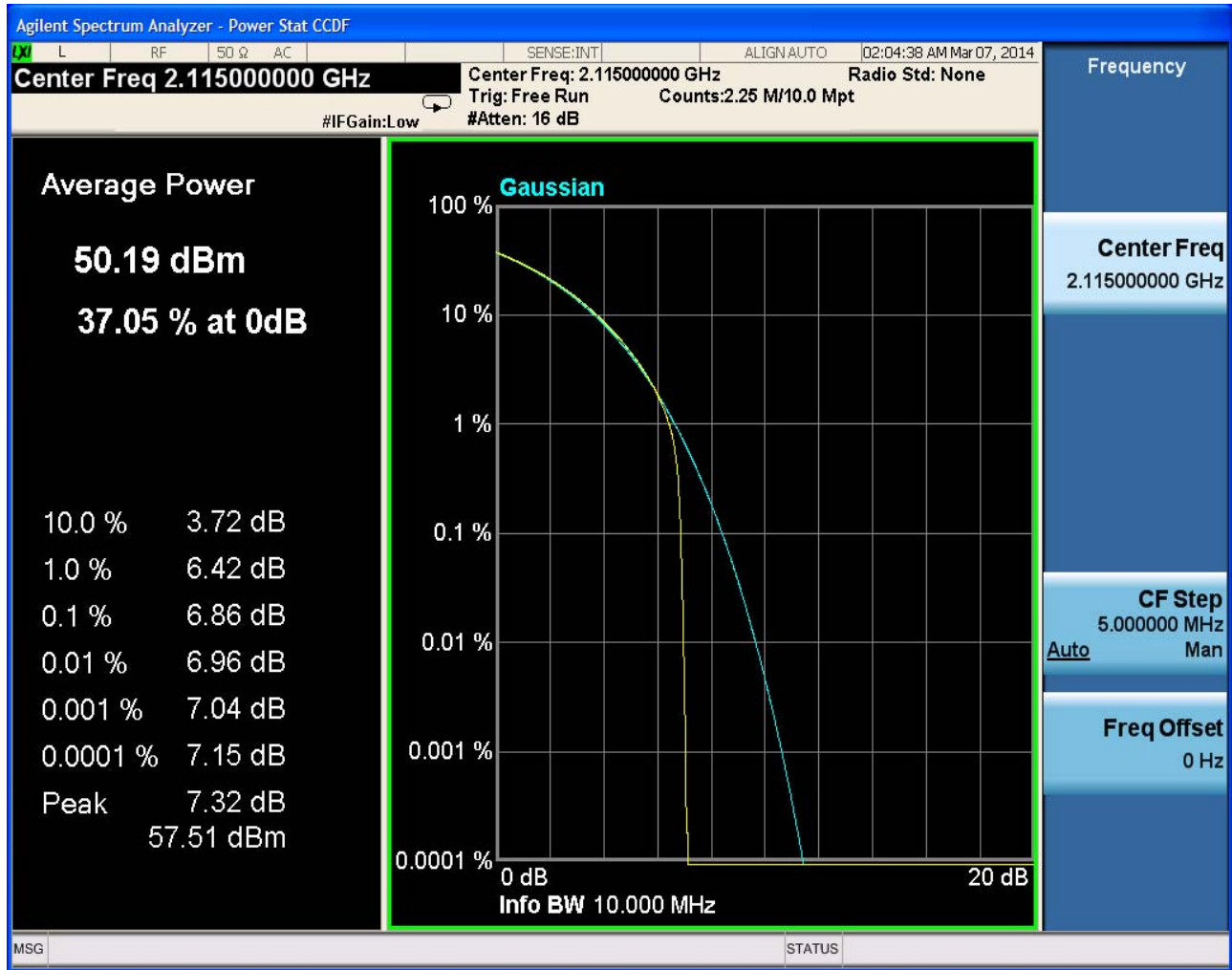


TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block A (2110-2120 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG



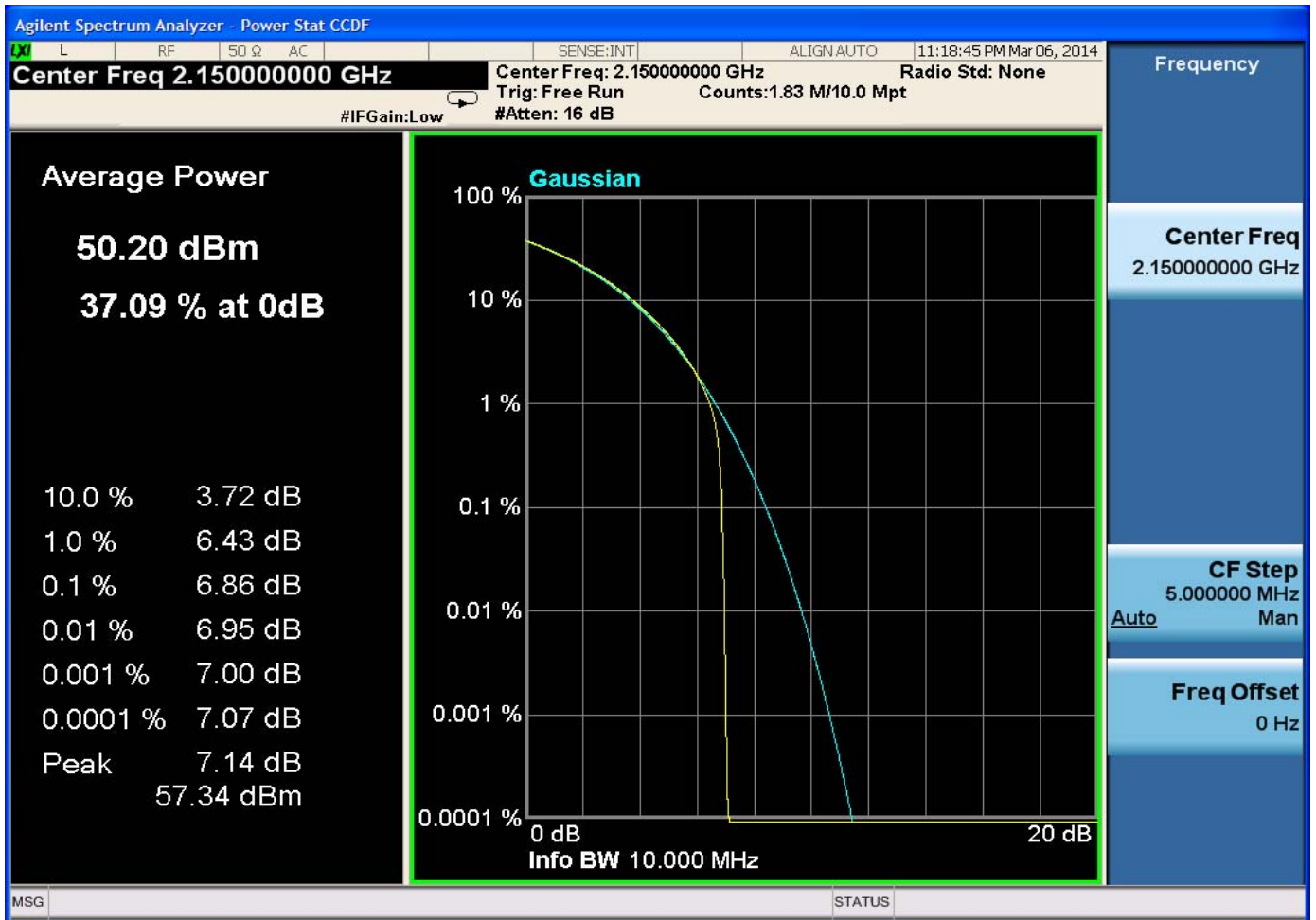
TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block F (2145-2155 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

**Peak to Average  
64QAM 120 watts  
2115MHz & 2150MHz (10 MHz BW)**



TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block A (2110-2120 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG





TRDU 2x120 Band 4 AWS (LTRE-RF)  
FCC Part 27.53 Block F (2145-2155 MHz); PWR: 120 (2x120W MIMO)  
FCCID: AS5BBTRX-13  
TEST ENGINEER: SEG

## **Measurement 3**

### **FCC Section 2.1049**

- (a) Emissions Bandwidth Measurement
- (b) Occupied Bandwidth Measurement showing spurious Emissions **1MHz close to Block edges.**

# Spectrum Bandwidth Measurement For Emissions Type

**FCC approved measurement method for Spectrum Bandwidth.**

(A) 26 dB Band width.

**This method was 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: 9.45 MHz for 10 MHz Bandwidth.  
Therefore, Measured Emission type: **9M45F9W** for 10 MHz Bandwidth.

**MEASUREMENT OF EMISSIONS BANDWIDTH  
26 dB POWER BANDWIDTH**

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

The occupied bandwidth of the Long Term Evolution (LTE) is measured using a Rohde & Schwarz ESI Spectrum Analyzer/Receiver and an HP Model 520 DeskJet Printer. The emissions bandwidth is described in section 27.53 (g) (3). 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 “TRDU 2x120 Band 4 AWS (LTRE-RF)” in the following configurations:

1. QPSK
2. 16 QAM
3. 64 QAM

**Results:**

The plots are provided for following modulations: QPSK, 16QAM and 64QAM.

Table for 10MHz for 120W all Contiguous Bands

<b>Frequency Range (MHz) &amp; Block</b>	<b>Bandwidth (MHz)</b>	<b>Center Frequency (MHz)</b>	<b>Power (Watts)</b>
2110-2120 (A)	10	2115	120
2120-2130 (B)	10	2125	120
2130-2140 (C+D)	10	2135	120
2135-2145 (D+E)	10	2140	120
2145-2155 (F)	10	2150	120

The Measured 26dB emissions bandwidth is:

<b>BW</b>	<b>Tested BW (MHz)</b>
10 MHz 120 Watts	9.45

**Block: A**

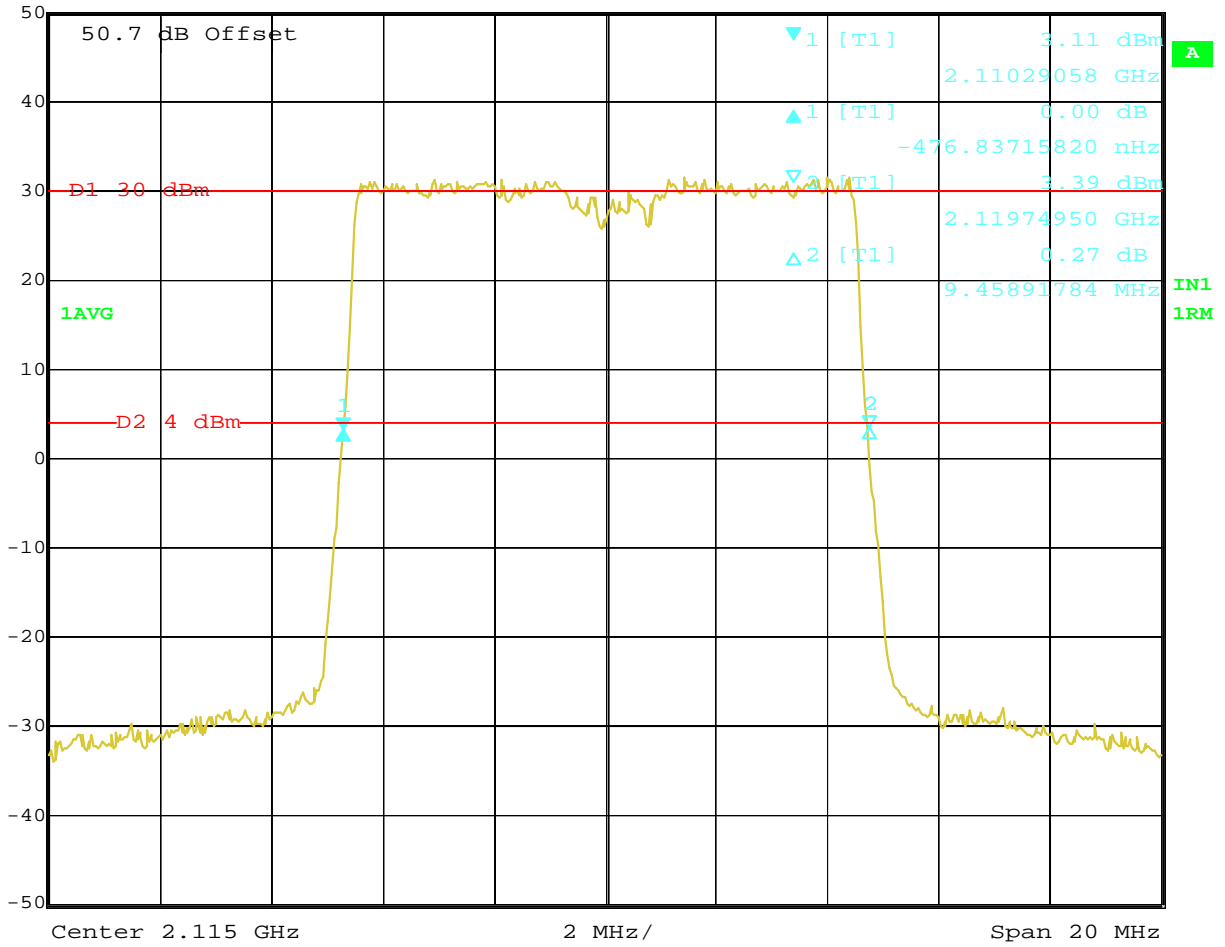
**10 MHz Bandwidth (2110-2120 MHz)**

**2x120 watts (MIMO)**

**(26dB Bandwidth)**



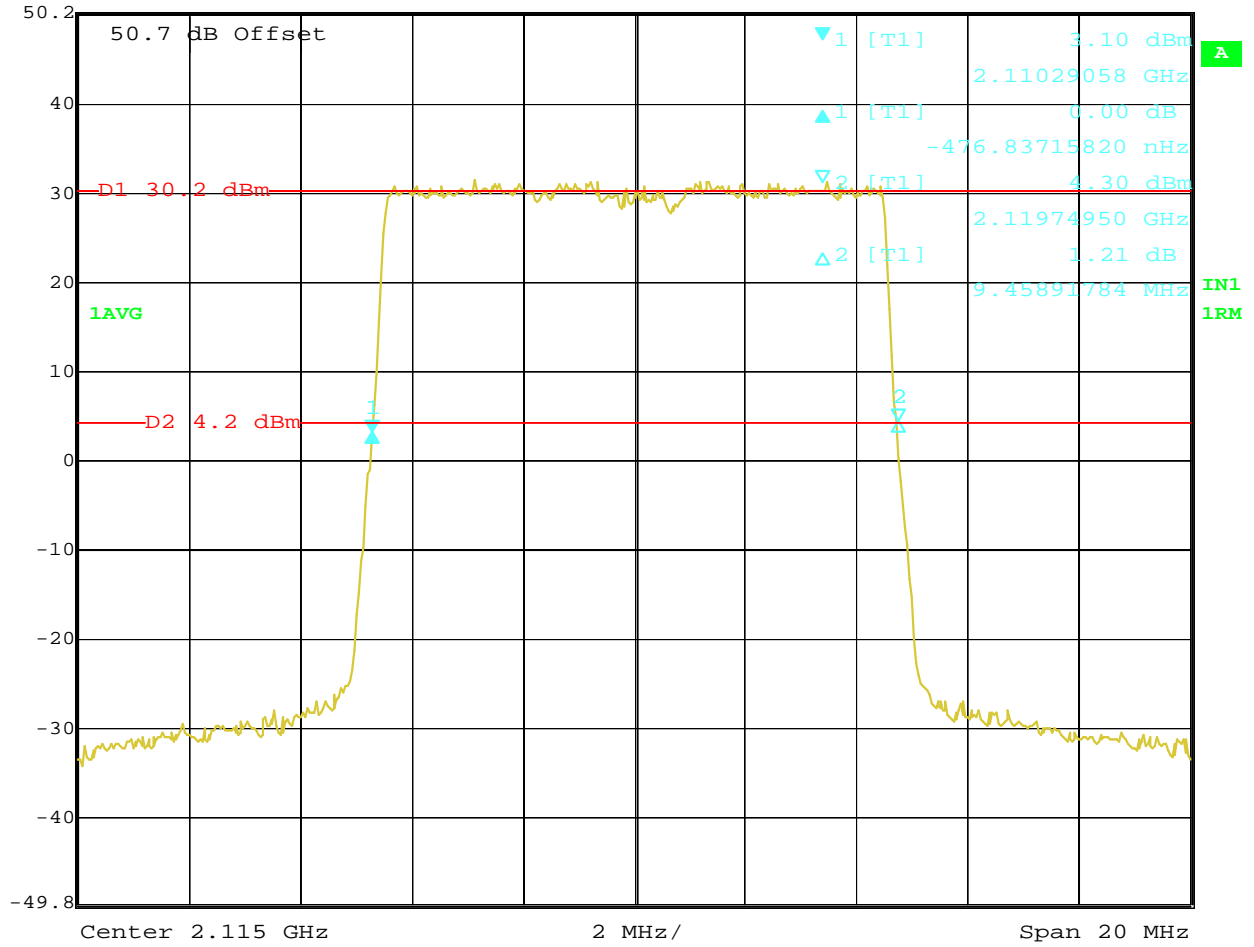
Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	10 dB
50 dBm	0.00 dB	VBW	1 MHz		
	-476.83715820 nHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
 PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
 Date: 6.MAR.2014 10:27:19



Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	10 dB
50.2 dBm	0.00 dB	VBW	1 MHz		
	-476.83715820 nHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG

Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz

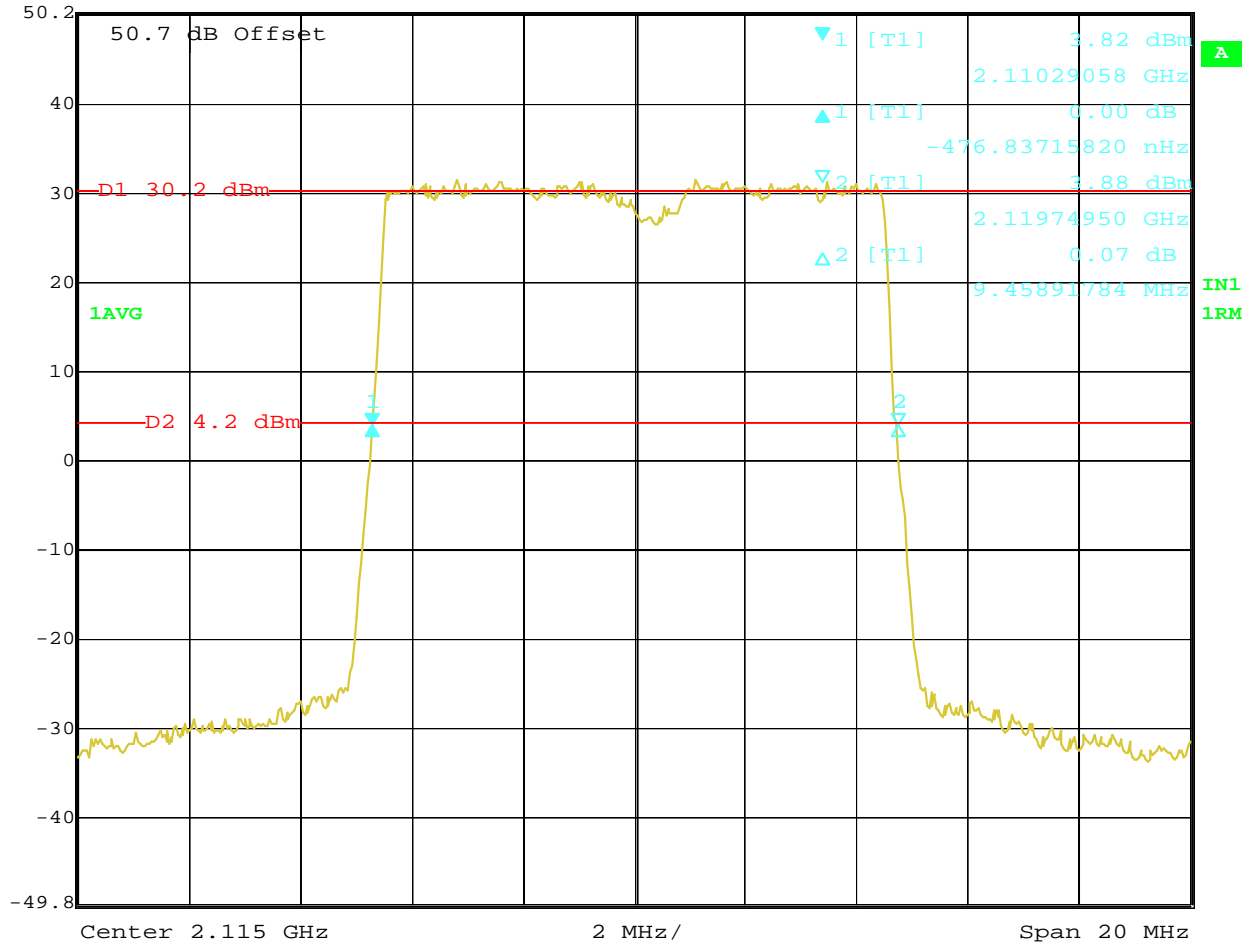
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13

Date: 6.MAR.2014 11:04:28





Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	10 dB
50.2 dBm	0.00 dB	VBW	1 MHz		
	-476.83715820 nHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
 PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
 Date: 6.MAR.2014 13:22:55

**Block: B**

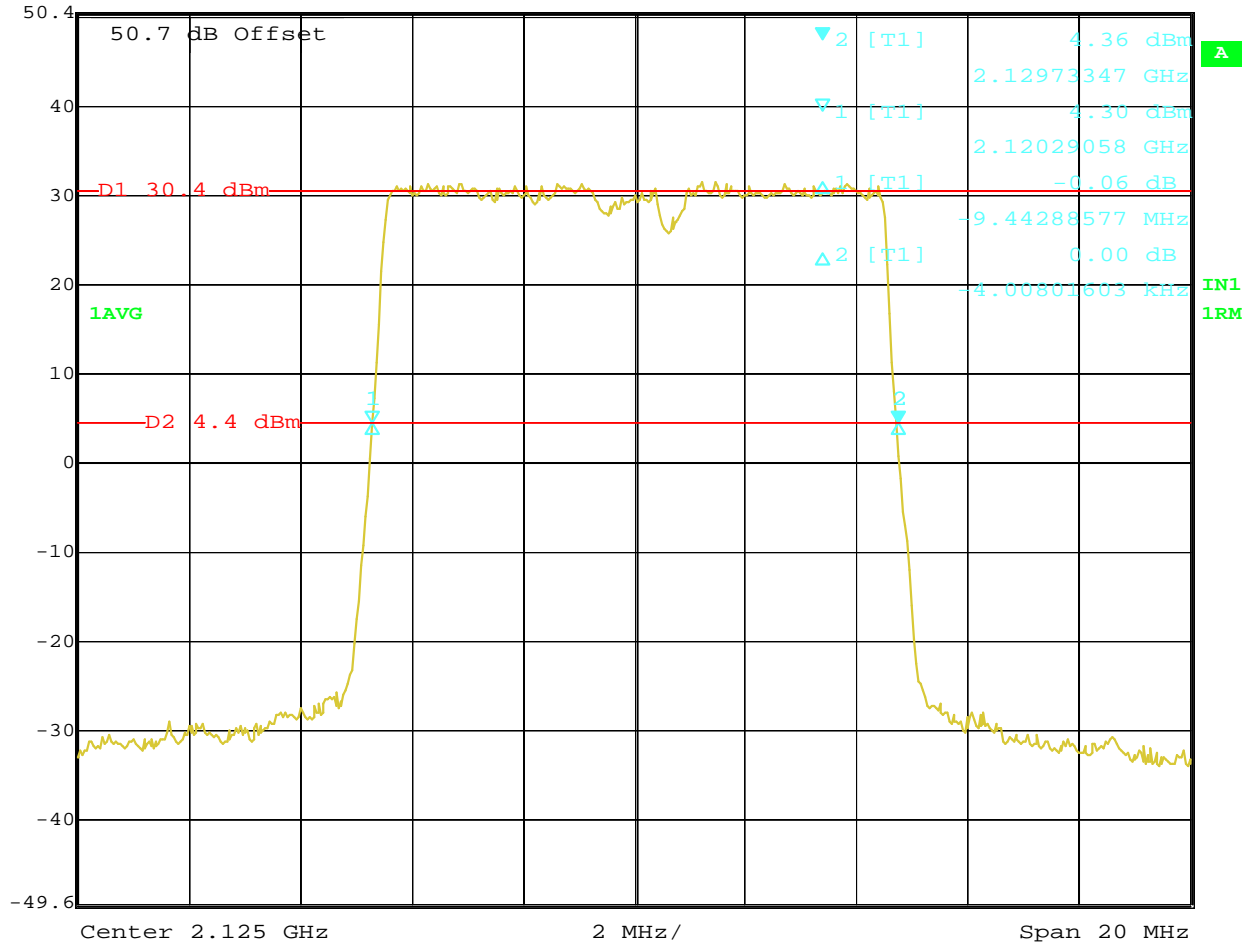
**10 MHz Bandwidth (2120-2130 MHz)**

**2x120 watts (MIMO)**

**(26dB Bandwidth)**



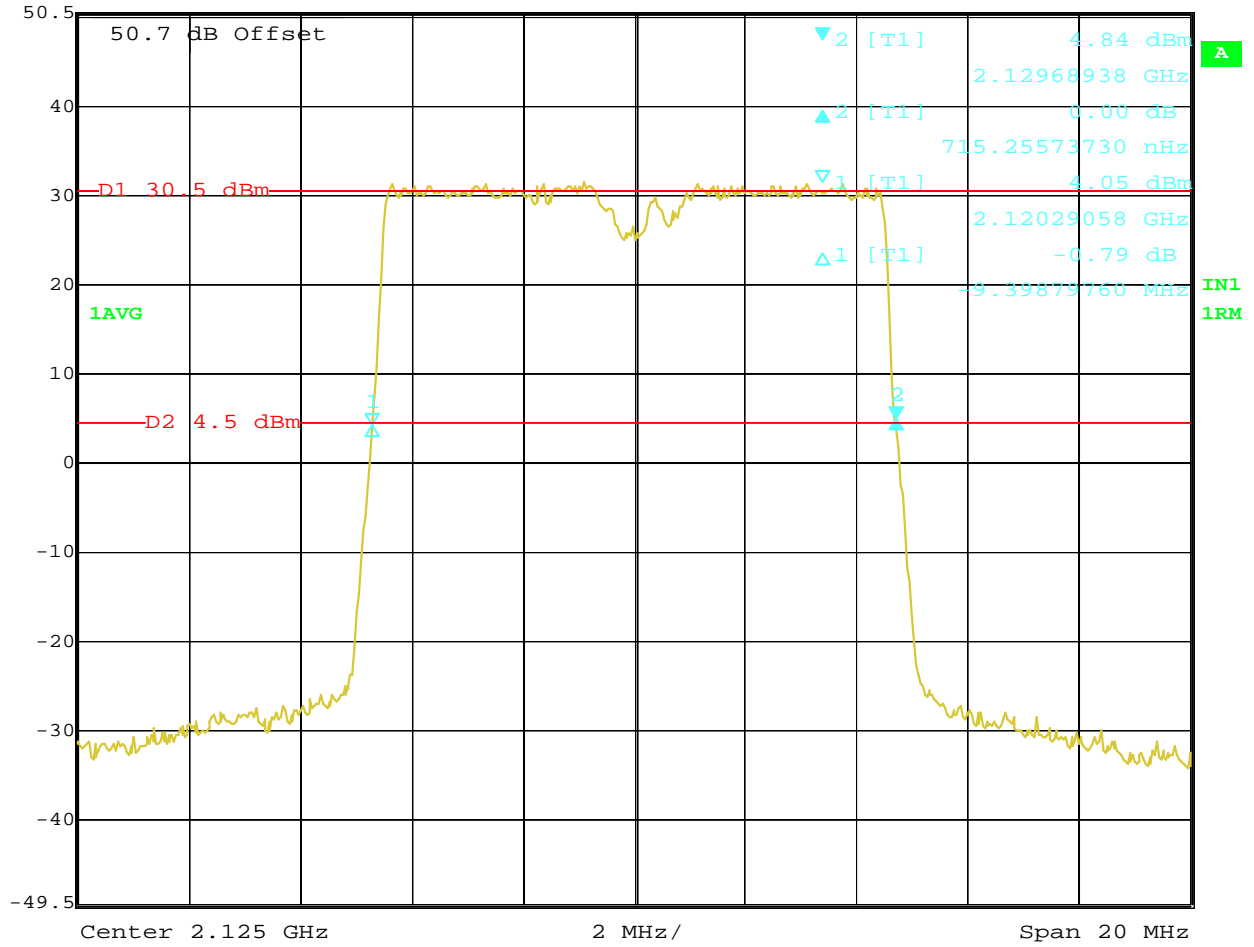
Marker 2 [T1] RBW 100 kHz RF Att 10 dB  
 Ref Lvl 4.36 dBm VBW 1 MHz  
 50.4 dBm 2.12973347 GHz SWT 5 ms Unit dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
 PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
 Date: 7.MAR.2014 13:09:13



	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.5 dBm	715.25573730 nHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG

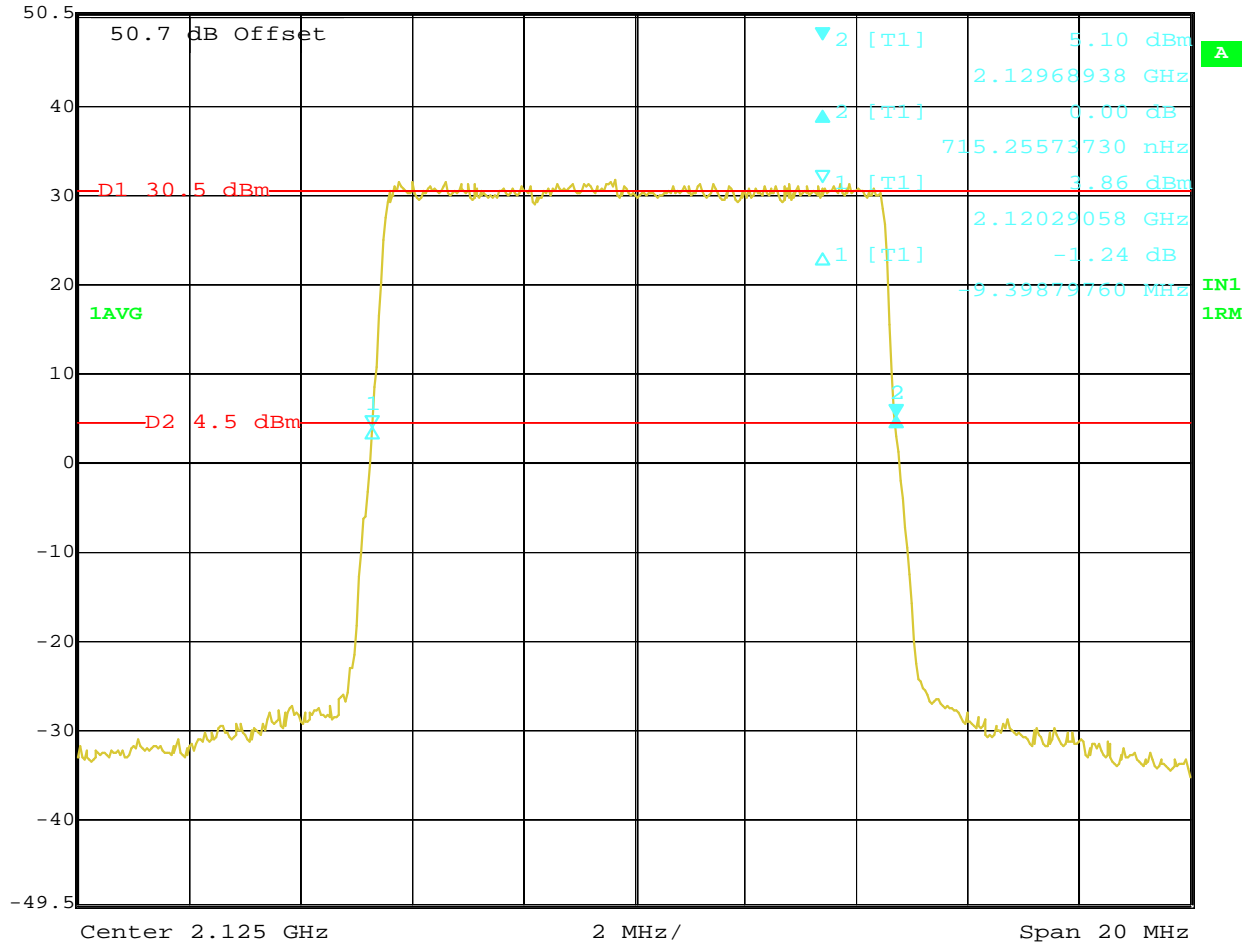
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz

PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG

Date: 7.MAR.2014 08:23:18



Delta 2 [T1] RBW 100 kHz RF Att 10 dB  
 Ref Lvl 0.00 dB VBW 1 MHz  
 50.5 dBm 715.25573730 nHz SWT 5 ms Unit dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
 PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
 Date: 6.MAR.2014 14:37:52

**Block: C+D**

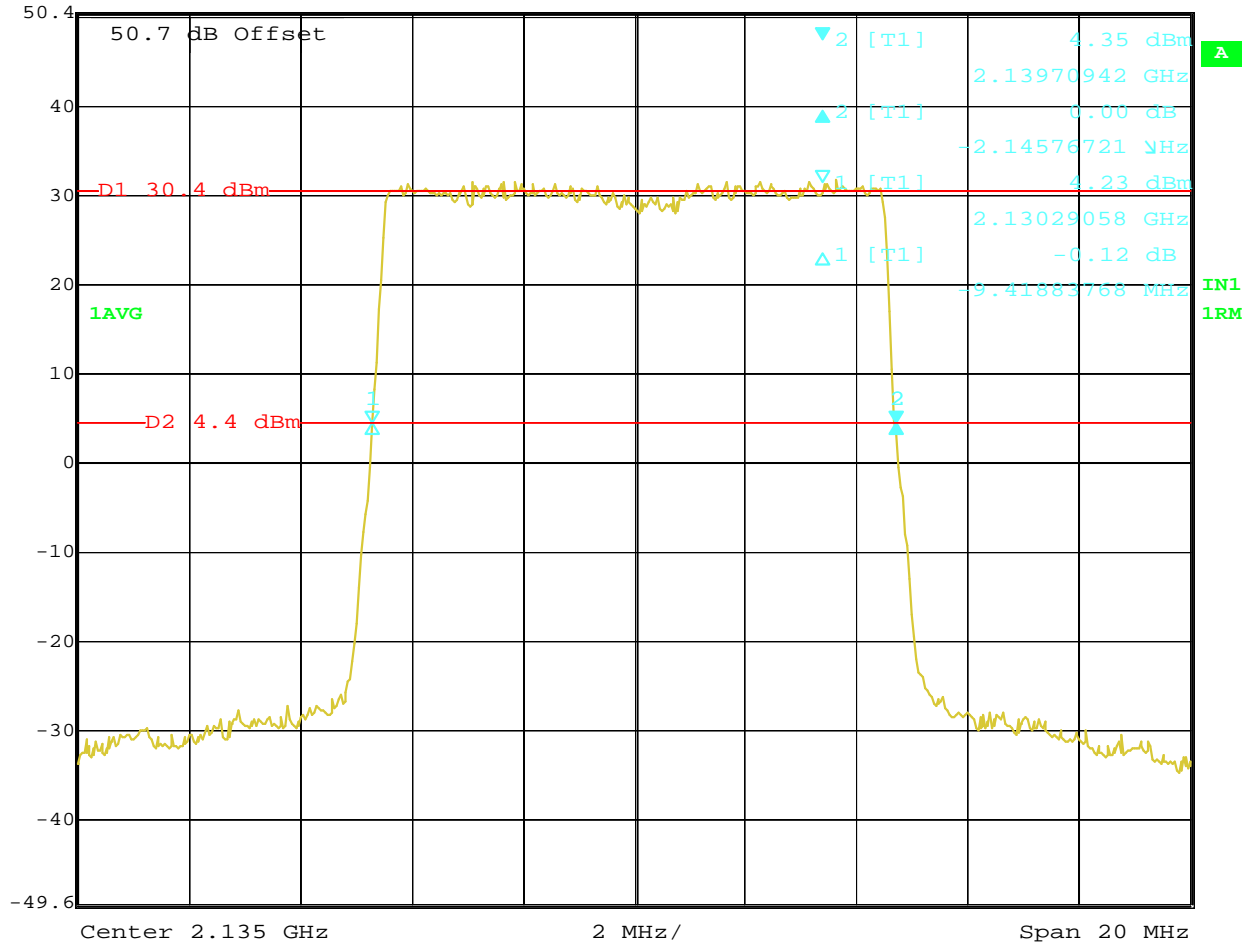
**10 MHz Bandwidth (2130-2140 MHz)**

**2x120 watts (MIMO)**

**(26dB Bandwidth)**



	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.4 dBm	-2.14576721 MHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG

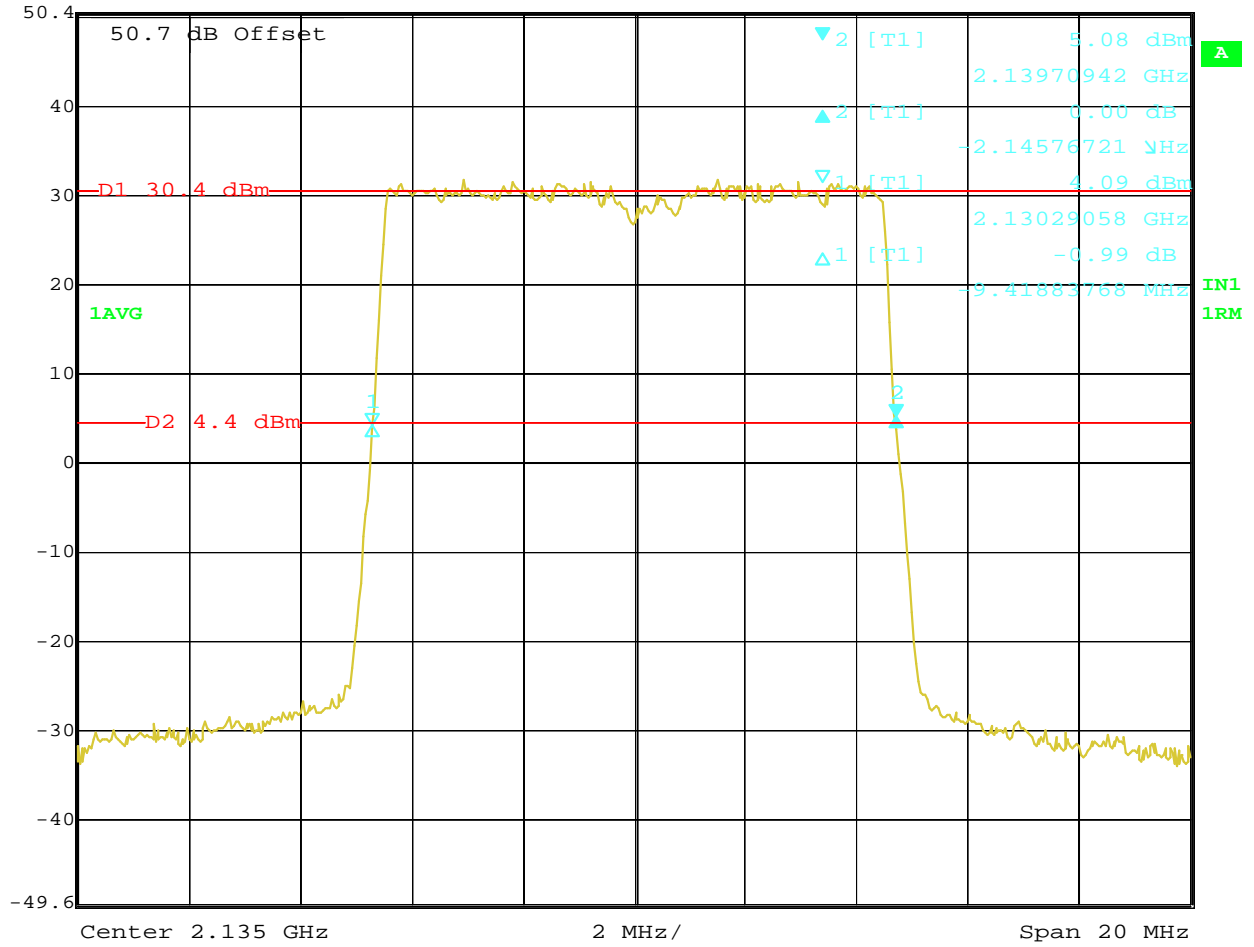
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:C+D; 2135MHz

PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG

Date: 7.MAR.2014 14:03:58



	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.4 dBm	-2.14576721 MHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG

Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:C+D; 2135MHz

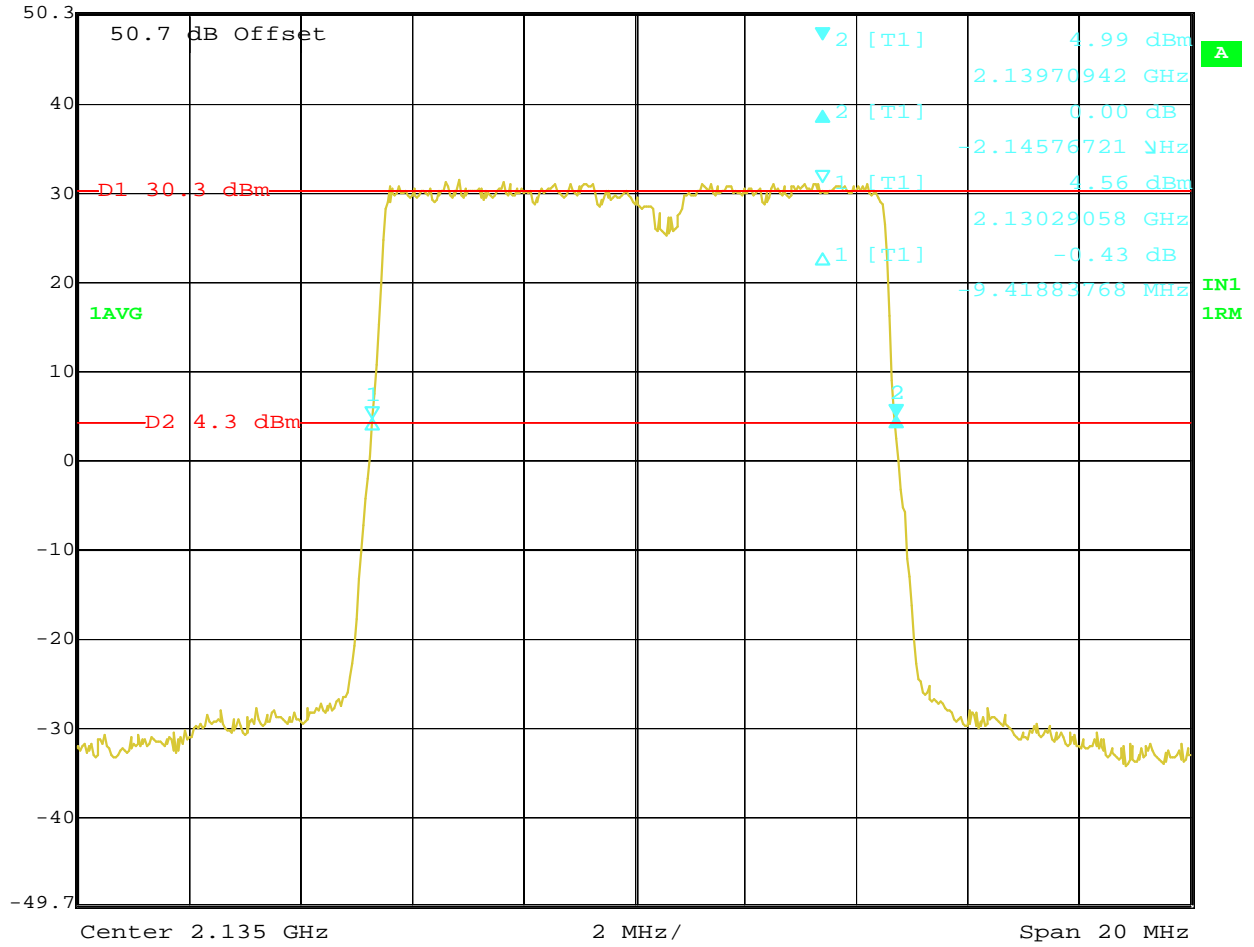
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG

Date: 10.MAR.2014 08:05:07





	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.3 dBm	-2.14576721 MHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG

Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:C+D; 2135MHz

PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG

Date: 10.MAR.2014 08:46:36

**Block: D+E**

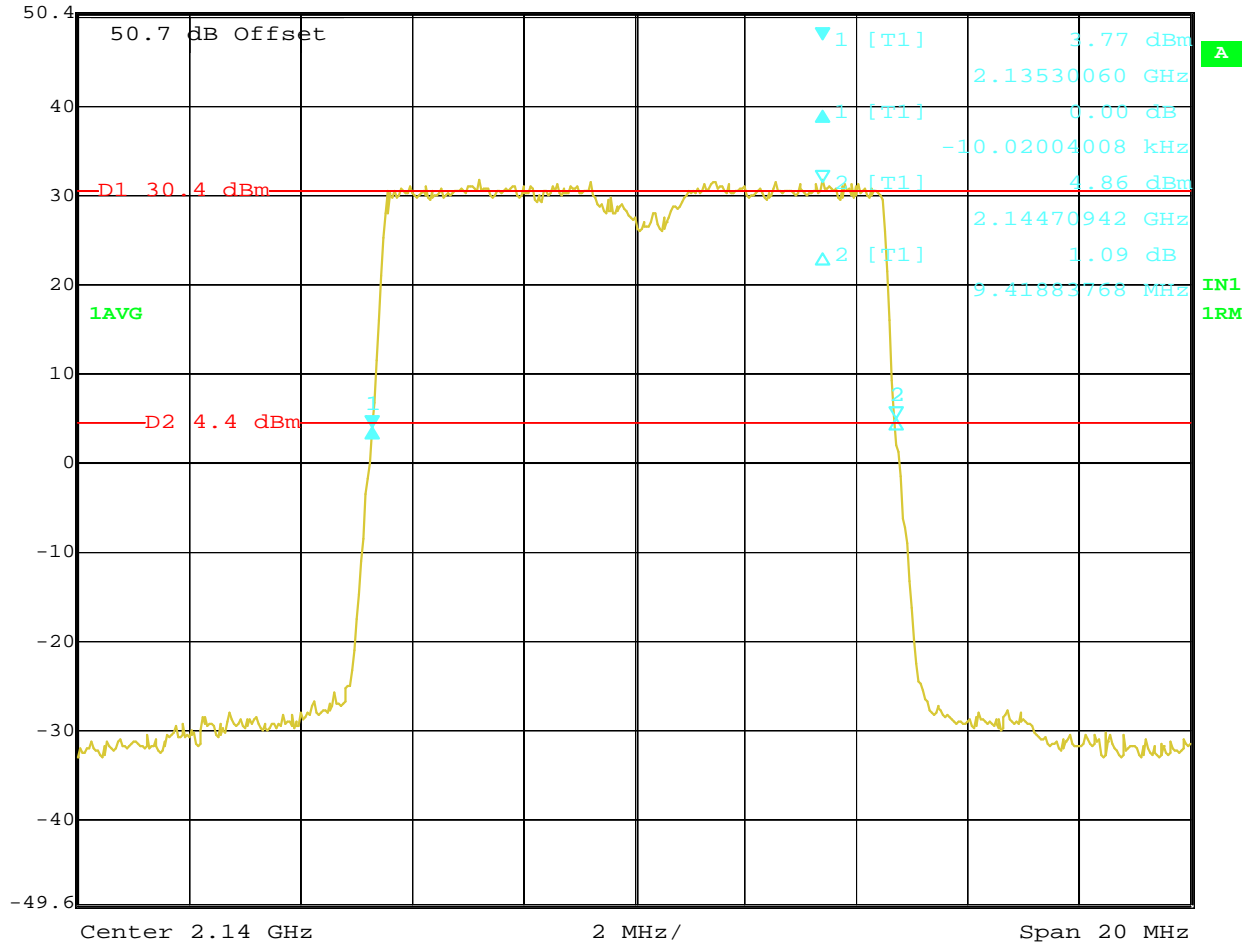
**10 MHz Bandwidth (2135-2145 MHz)**

**2x120 watts (MIMO)**

**(26dB Bandwidth)**



	Delta 1 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.4 dBm	-10.02004008 kHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG

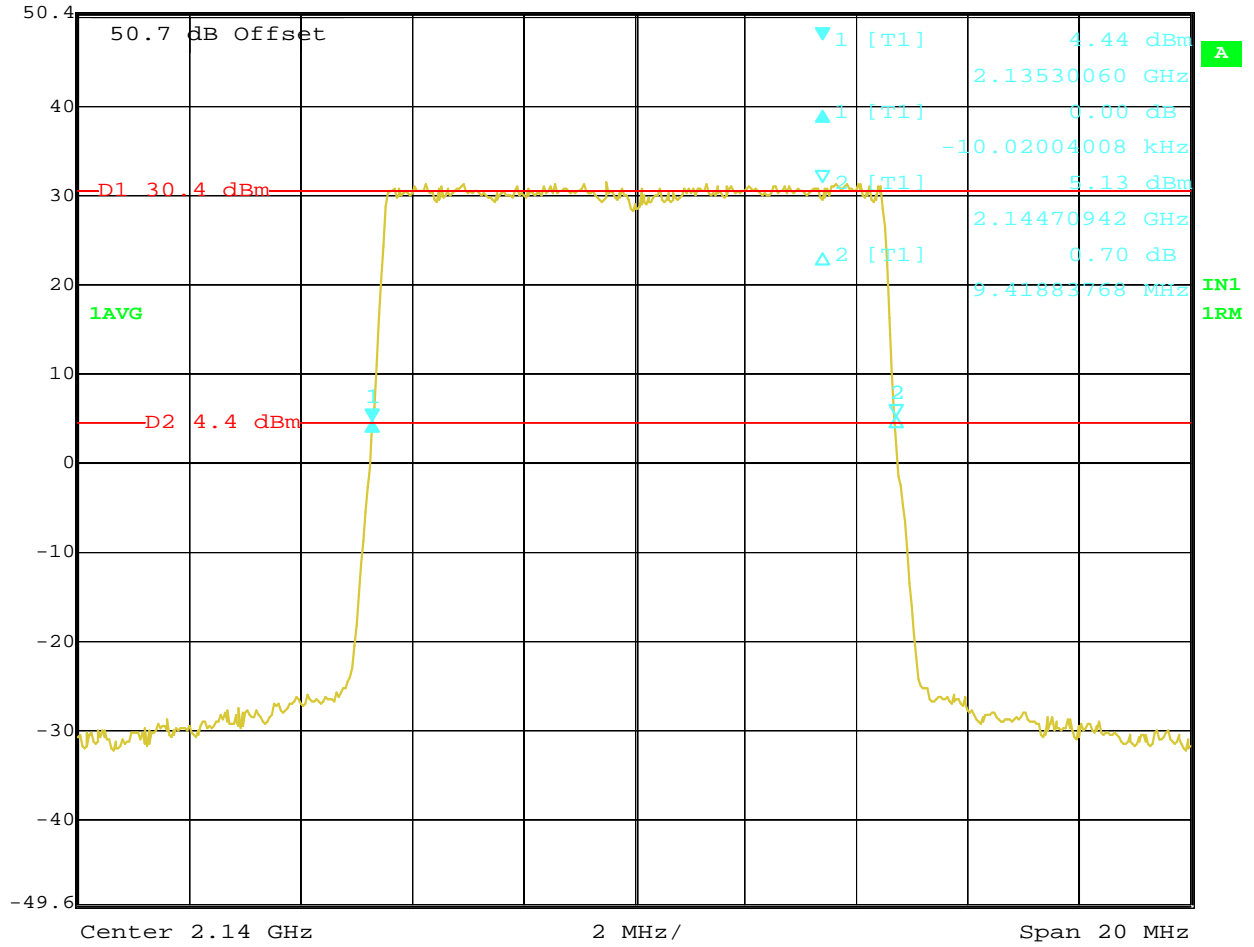
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz

PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG

Date: 10.MAR.2014 11:43:30



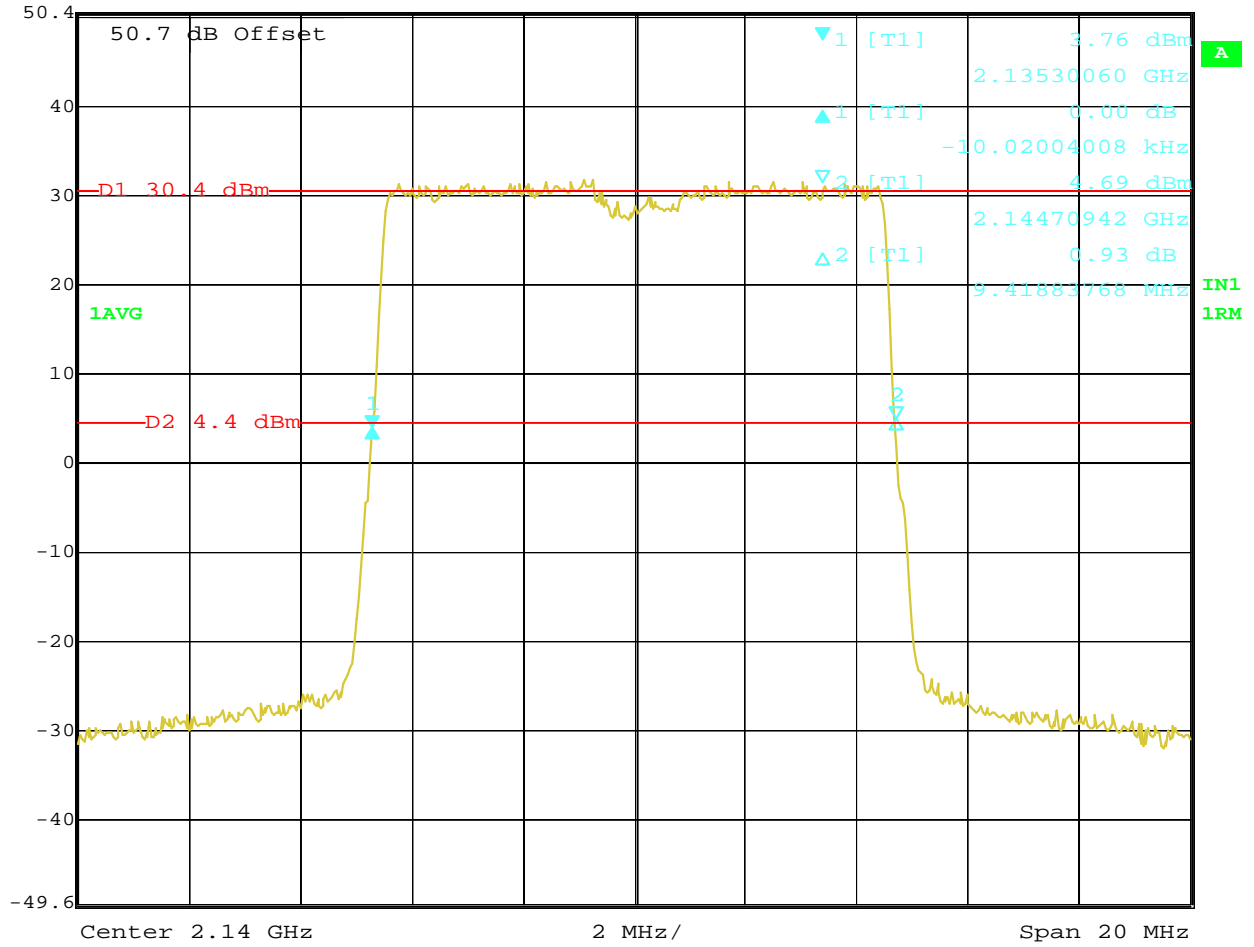
	Delta 1 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.4 dBm	-10.02004008 kHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
 PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
 Date: 10.MAR.2014 10:26:05



	Delta 1 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.4 dBm	-10.02004008 kHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
 PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
 Date: 10.MAR.2014 09:46:17

**Block: F**

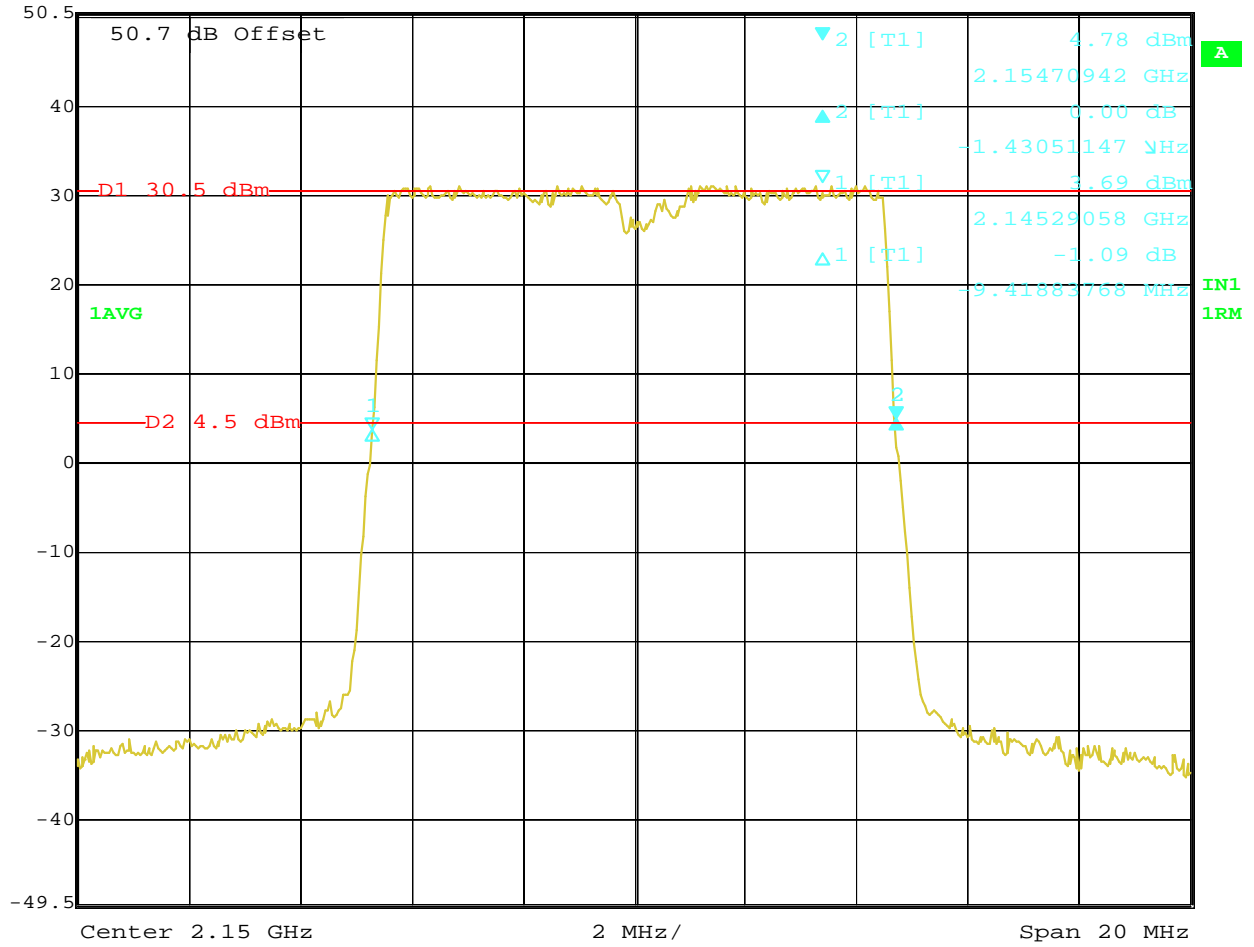
**10 MHz Bandwidth (2145-2155 MHz)**

**2x120 watts (MIMO)**

**(26dB Bandwidth)**



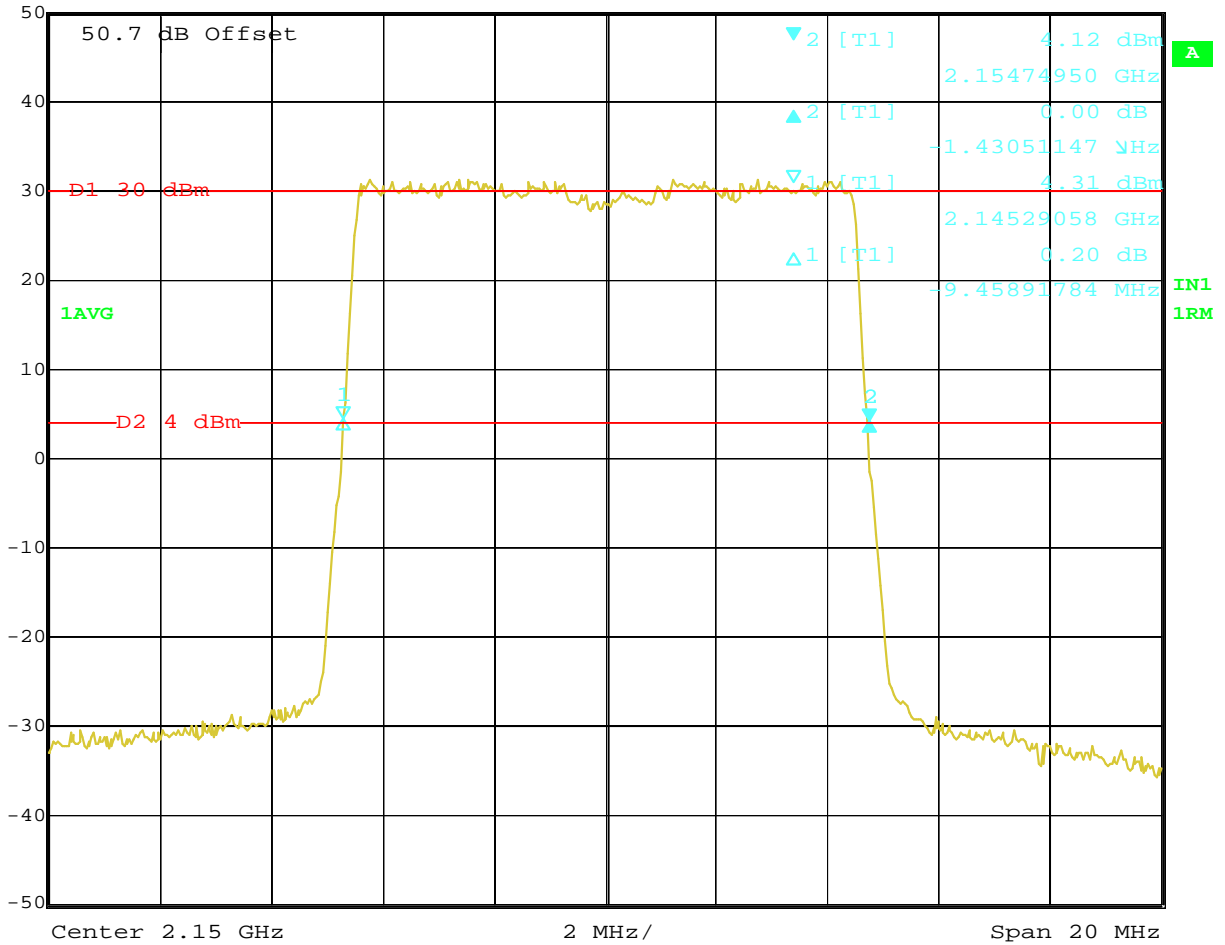
	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50.5 dBm	-1.43051147 MHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
 PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
 Date: 5.MAR.2014 13:47:58



	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50 dBm	-1.43051147 MHz	SWT	5 ms	Unit	dBm

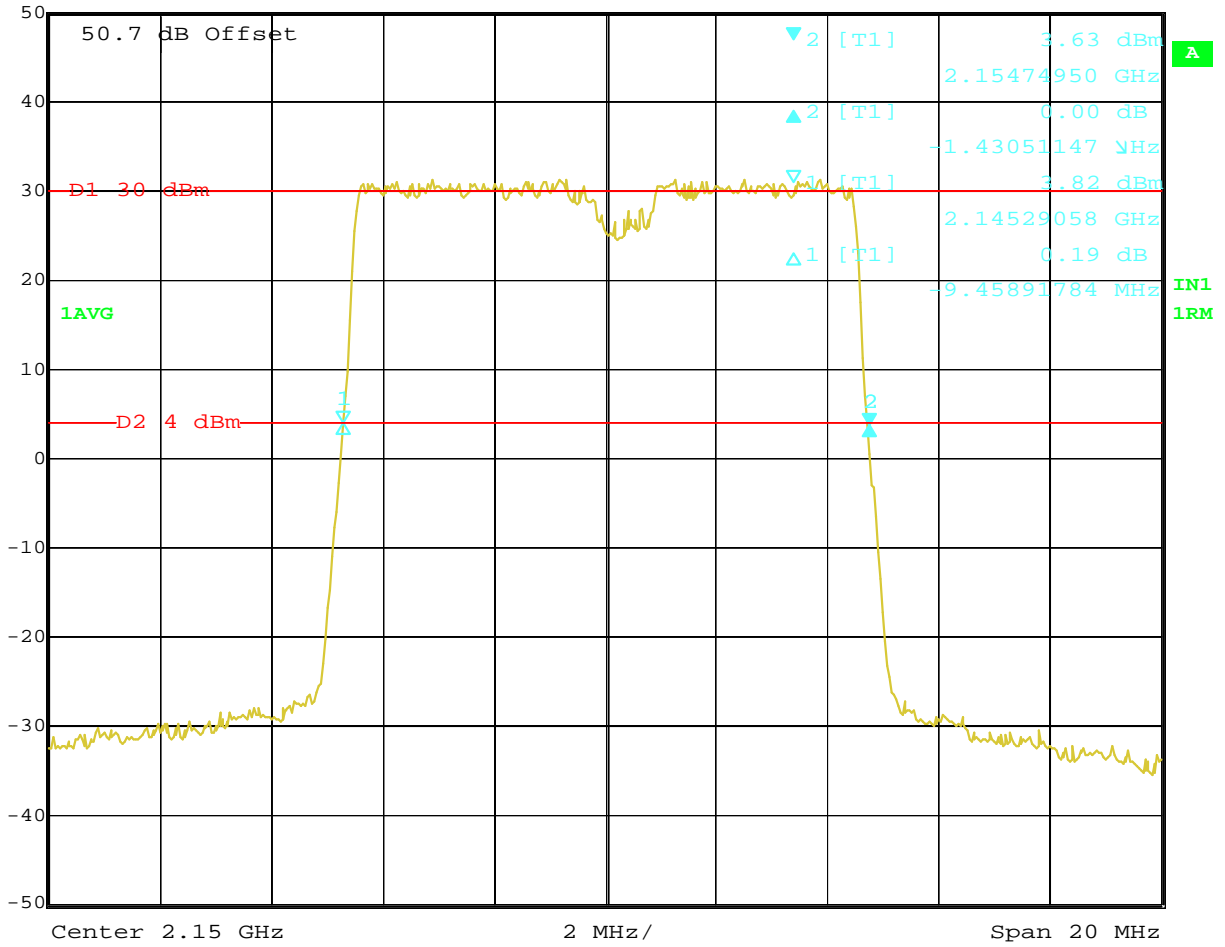


Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
 PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
 Date: 6.MAR.2014 08:58:39





	Delta 2 [T1]	RBW	100 kHz	RF Att	10 dB
Ref Lvl	0.00 dB	VBW	1 MHz		
50 dBm	-1.43051147 MHz	SWT	5 ms	Unit	dBm



Title: 26dB BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
 PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
 Date: 6.MAR.2014 09:25:03

**MEASUREMENT OF  
SPECTRUM MASK/OCCUPIED BANDWIDTH  
(1MHz 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. While adjusting the corrected RF power level in the spectrum analyzer, the attenuator and resolution BW of spectrum analyzer were considered.

The measurements were made on a “TRDU 2x120 Band 4 AWS (LTRE-RF)”.

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 120 Watts (50.7 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 AWS TRDUs are capable of operating in the band of 2110 MHz to 2155 MHz (Block A,B,C,D,E and F). The Base station presently tested was configured to operate at 10 MHz Bands. Blocks and bands listed in Table below 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. All tests were performed for QPSK, 16QAM and 64QAM modulations.*

### ***Block edge requirements:***

***FCC Section 27.53(g)(3): Based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.***

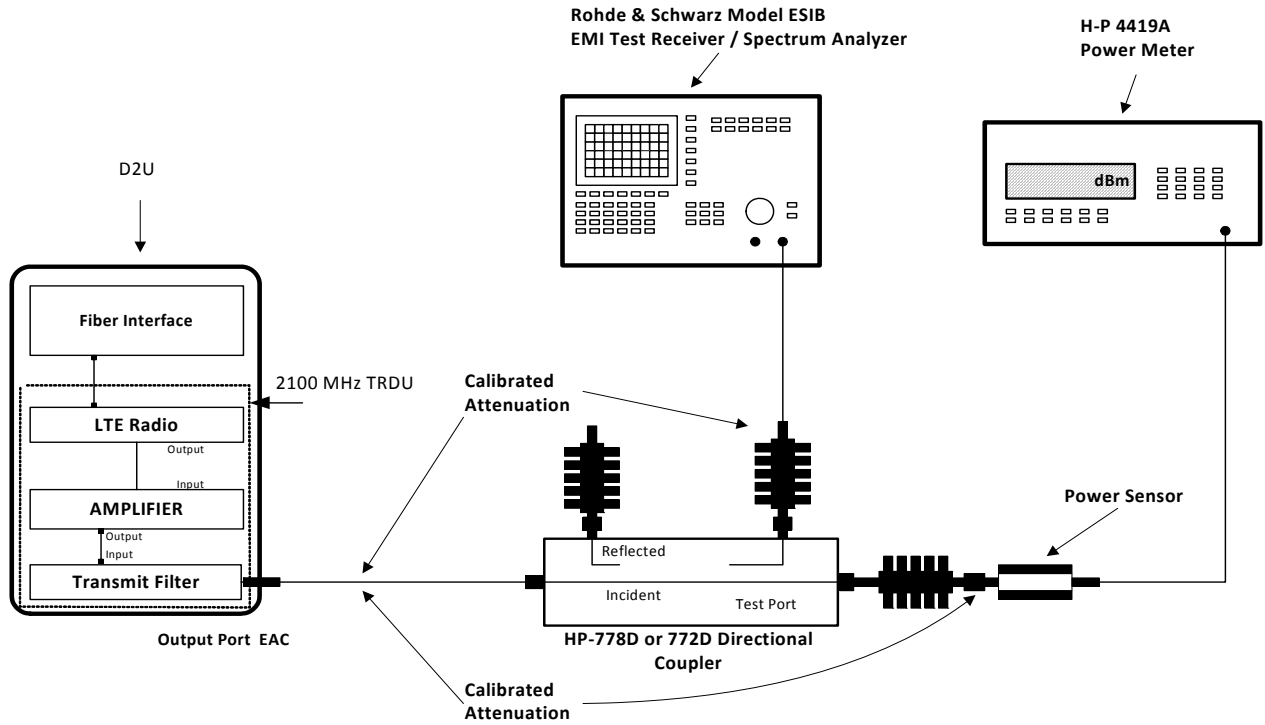
***Pursuant to FCC OET RULES 662911 D01 and D02 for two antenna MIMO mode of operations, the FCC limit of -13dBm shall be 3dB more stringent, therefore all channel edge and out of band spurious emissions shall be -16dBm. For 10MHz BW, the one percent of emissions BW is 100 kHz.***

The list of blocks and bands, tested are listed below:

Table for 10MHz for 120W all Contiguous Bands

<b>Frequency Range (MHz) &amp; Block</b>	<b>Bandwidth (MHz)</b>	<b>Center Frequency (MHz)</b>	<b>Power (Watts)</b>
2110-2120 (A)	10	2115	120
2120-2130 (B)	10	2125	120
2130-2140 (C+D)	10	2135	120
2135-2145 (D+E)	10	2140	120
2145-2155 (F)	10	2150	120

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



All components are calibrated over the frequency range of interest

**Block: A**

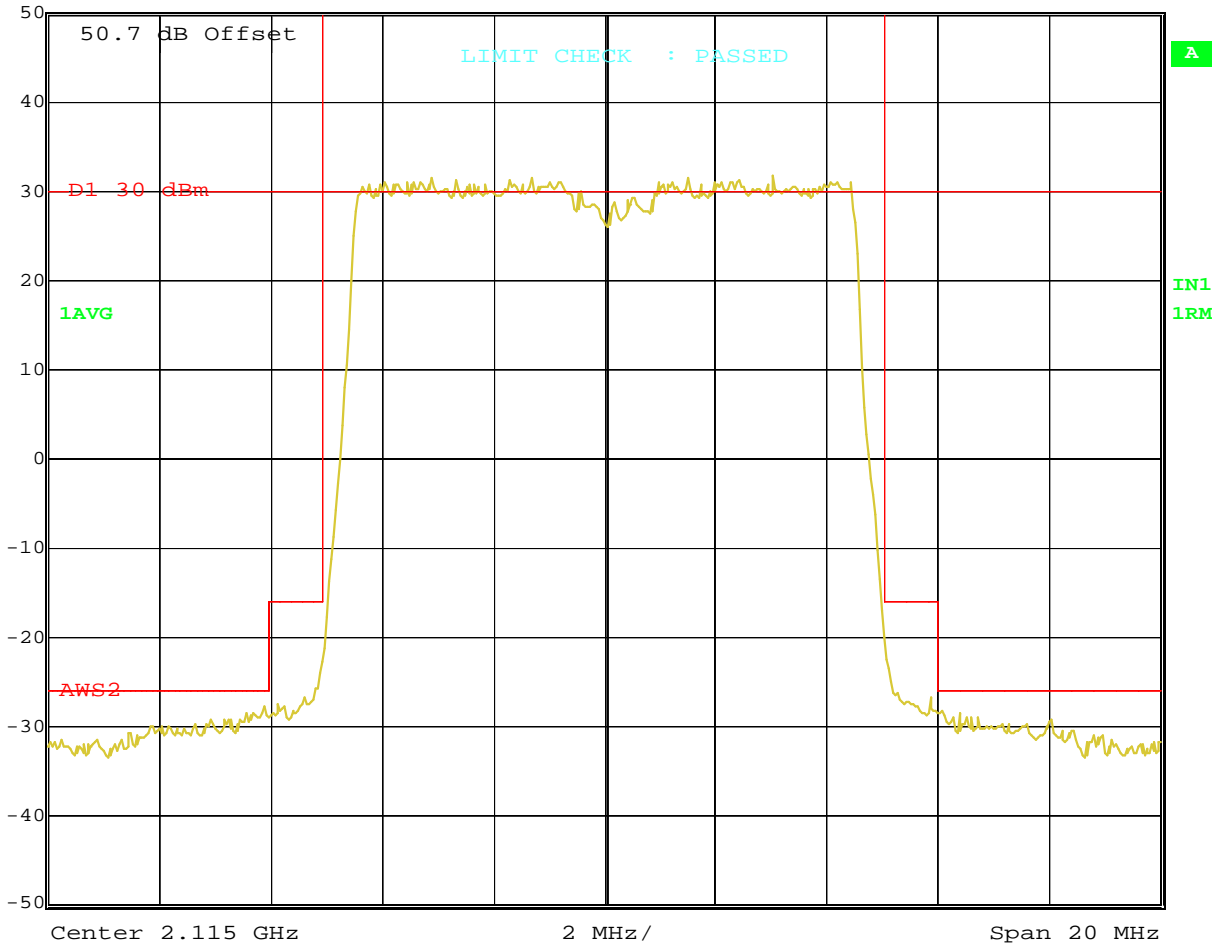
**10 MHz Bandwidth (2110-2120 MHz)**

**2x120 watts (MIMO)**

**SPECTRUM MASK/OCCUPIED BANDWIDTH**



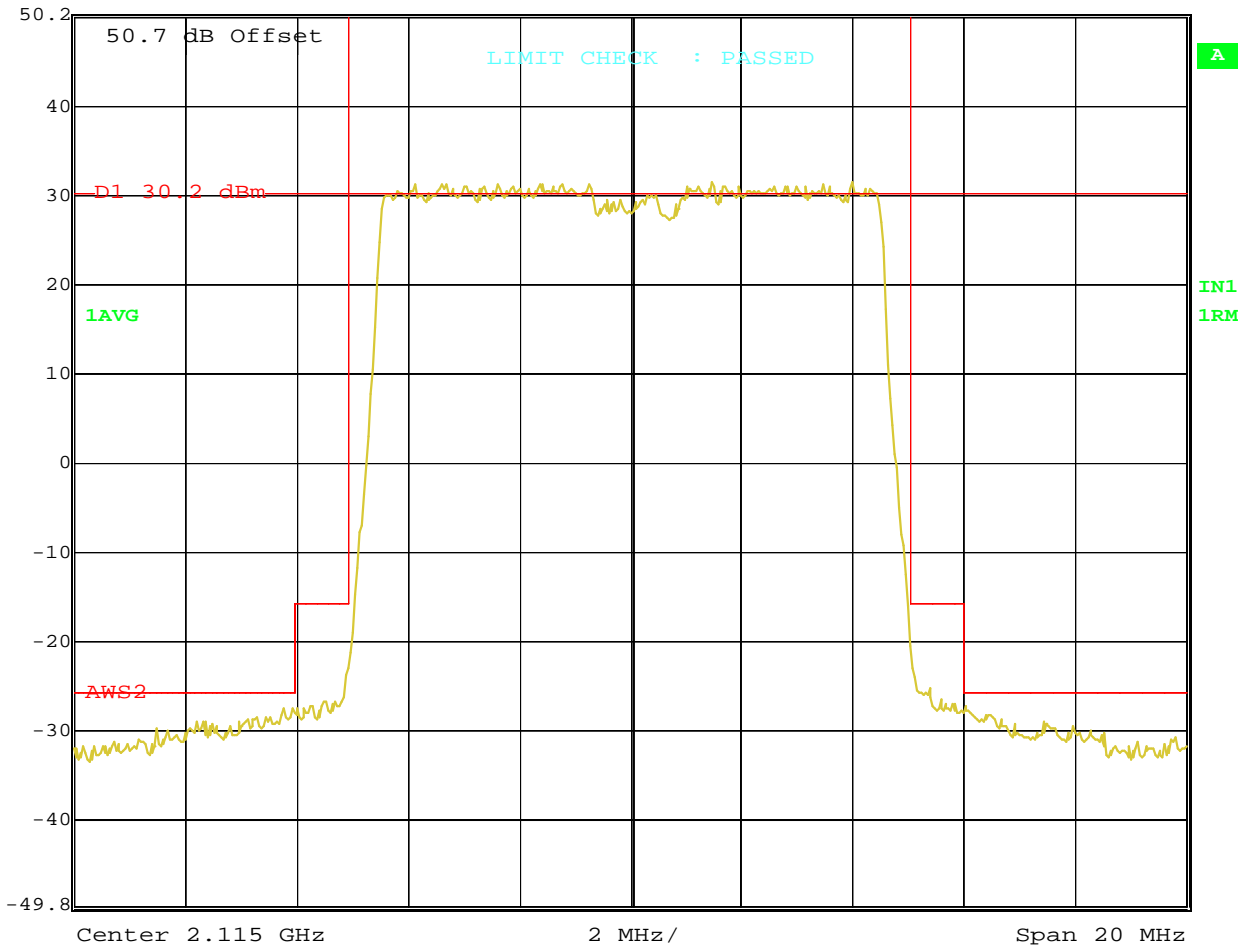
Ref Lvl 50 dBm  
RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 10:23:41



Ref Lvl 50.2 dBm RBW 100 kHz RF Att 10 dB  
50.7 dB Offset VBW 1 MHz  
AWS2 Unit dBm

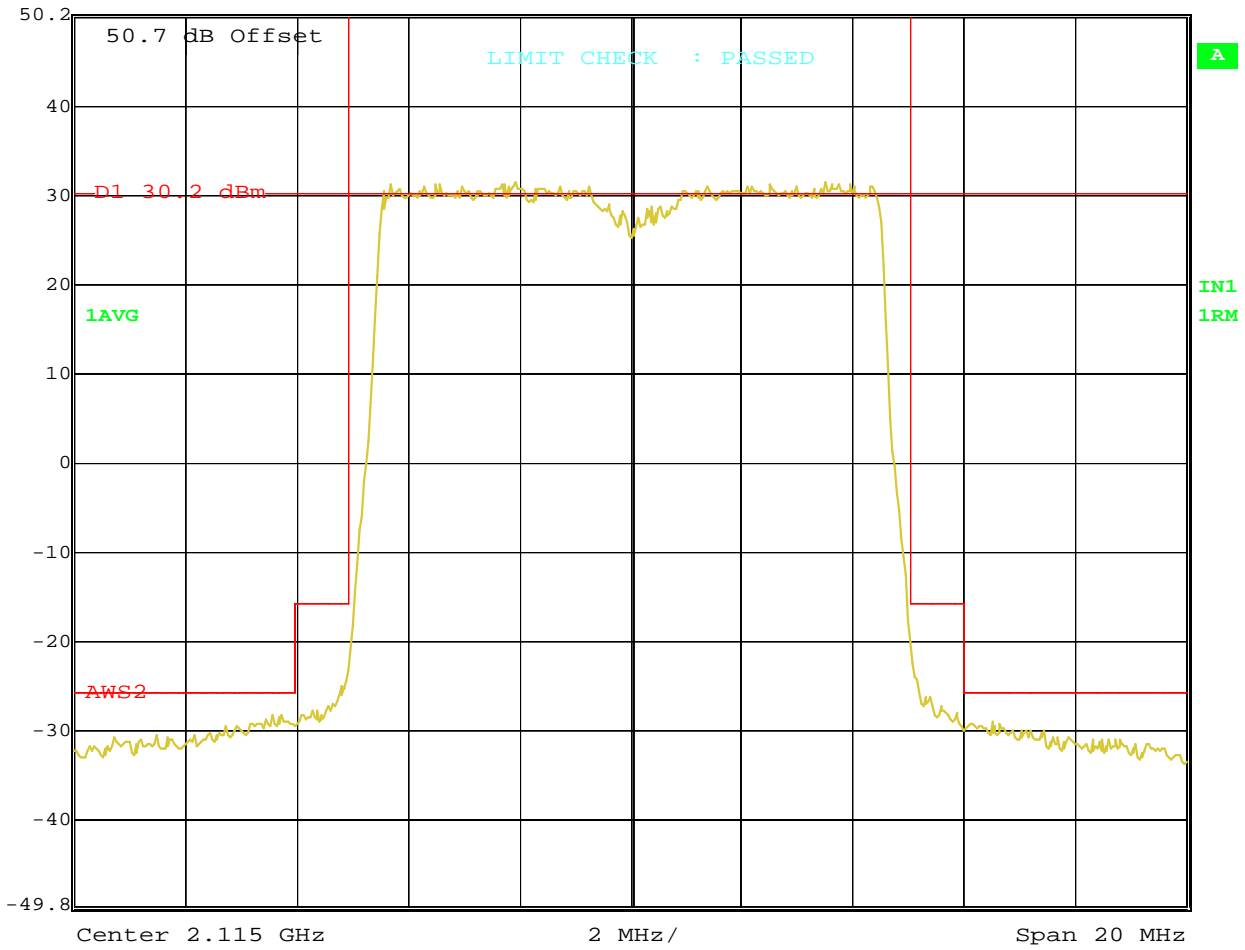


Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 11:01:17





Ref Lvl 50.2 dBm RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm



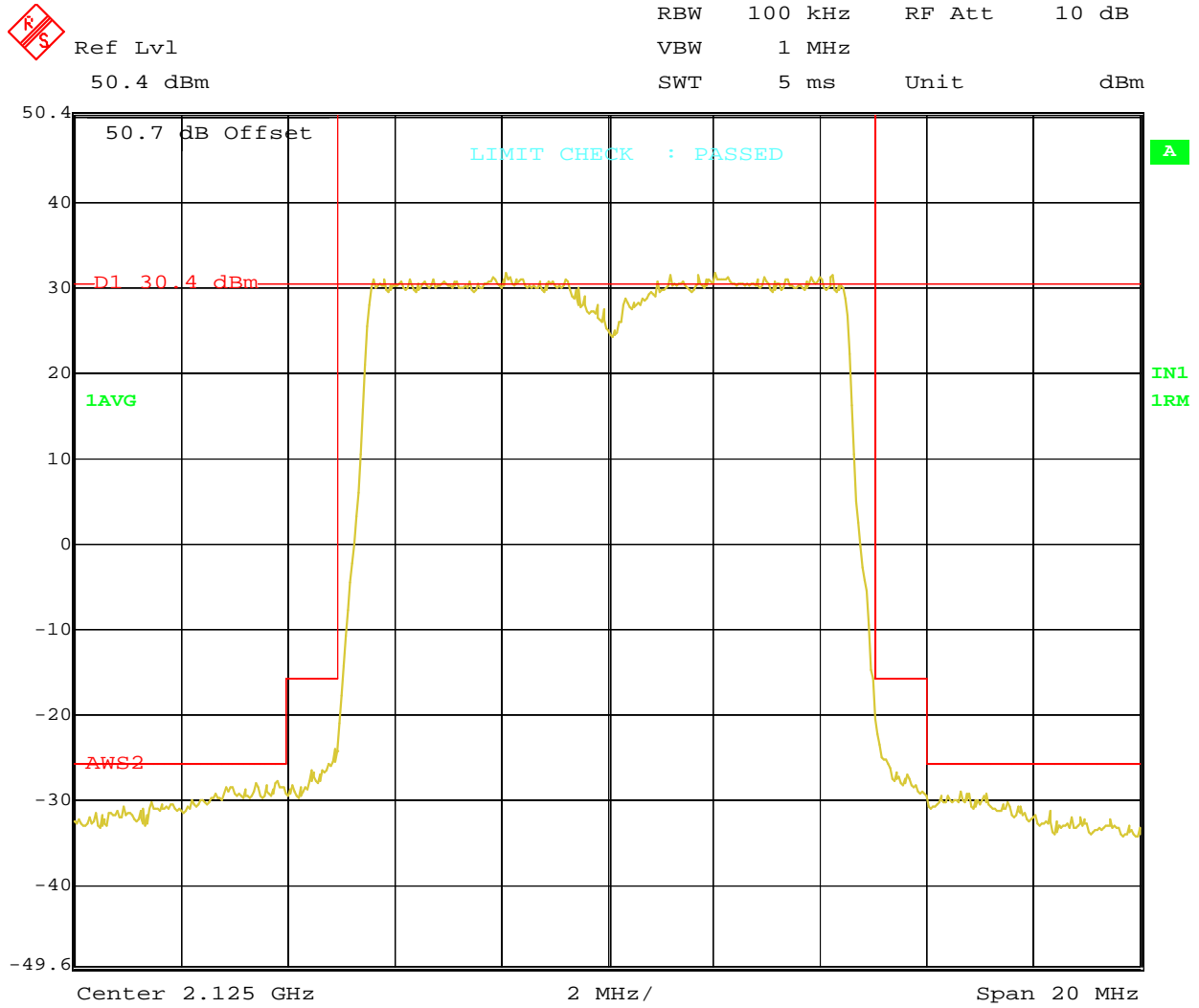
Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 12:54:58

**Block: B**

**10 MHz Bandwidth (2120-2130 MHz)**

**2x120 watts (MIMO)**

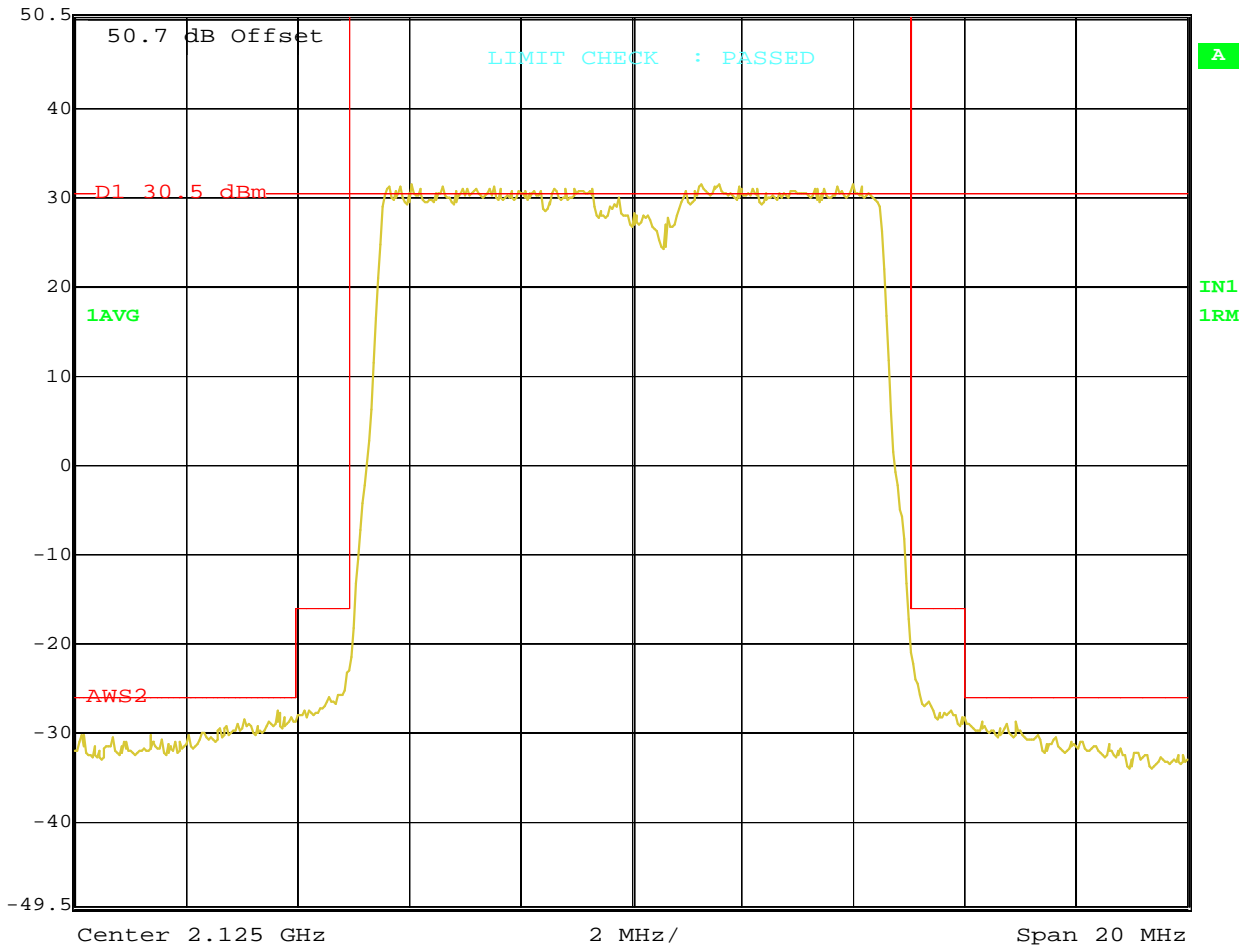
**SPECTRUM MASK/OCCUPIED BANDWIDTH**



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 13:04:57



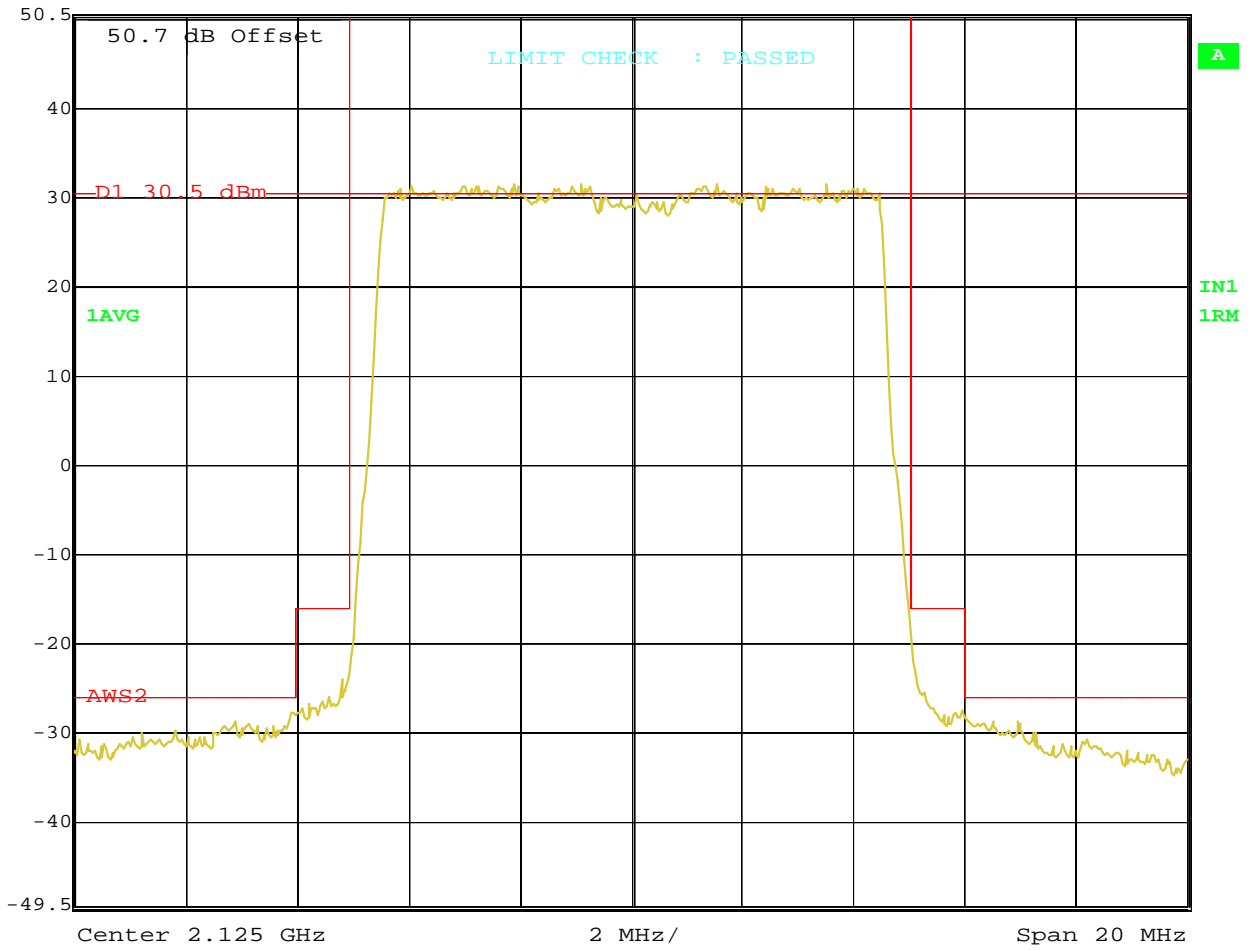
Ref Lvl 50.5 dBm  
RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 09:16:01



Ref Lvl 50.5 dBm  
RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm



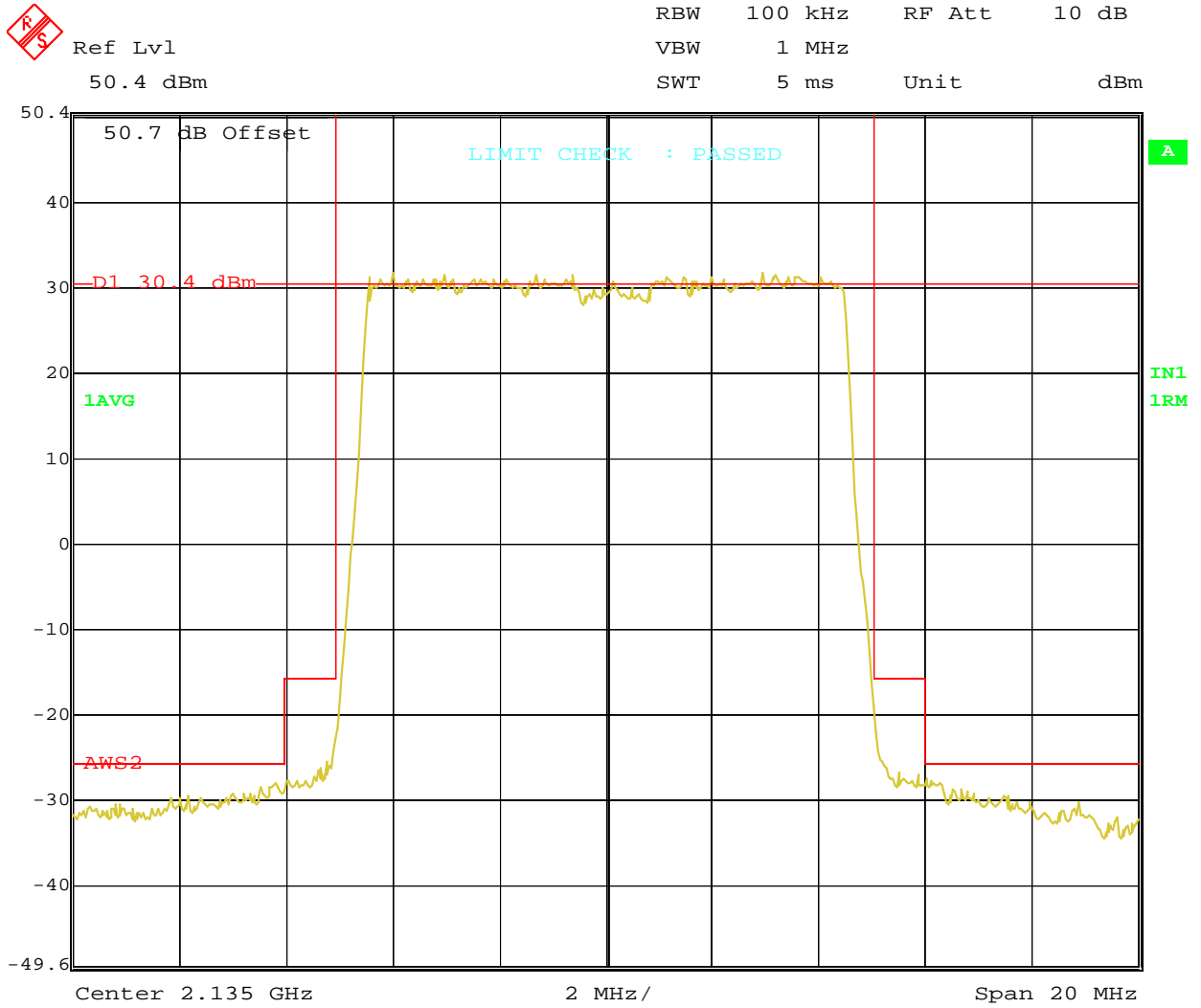
Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 6.MAR.2014 14:34:05

**Block: C+D**

**10 MHz Bandwidth (2130-2140 MHz)**

**2x120 watts (MIMO)**

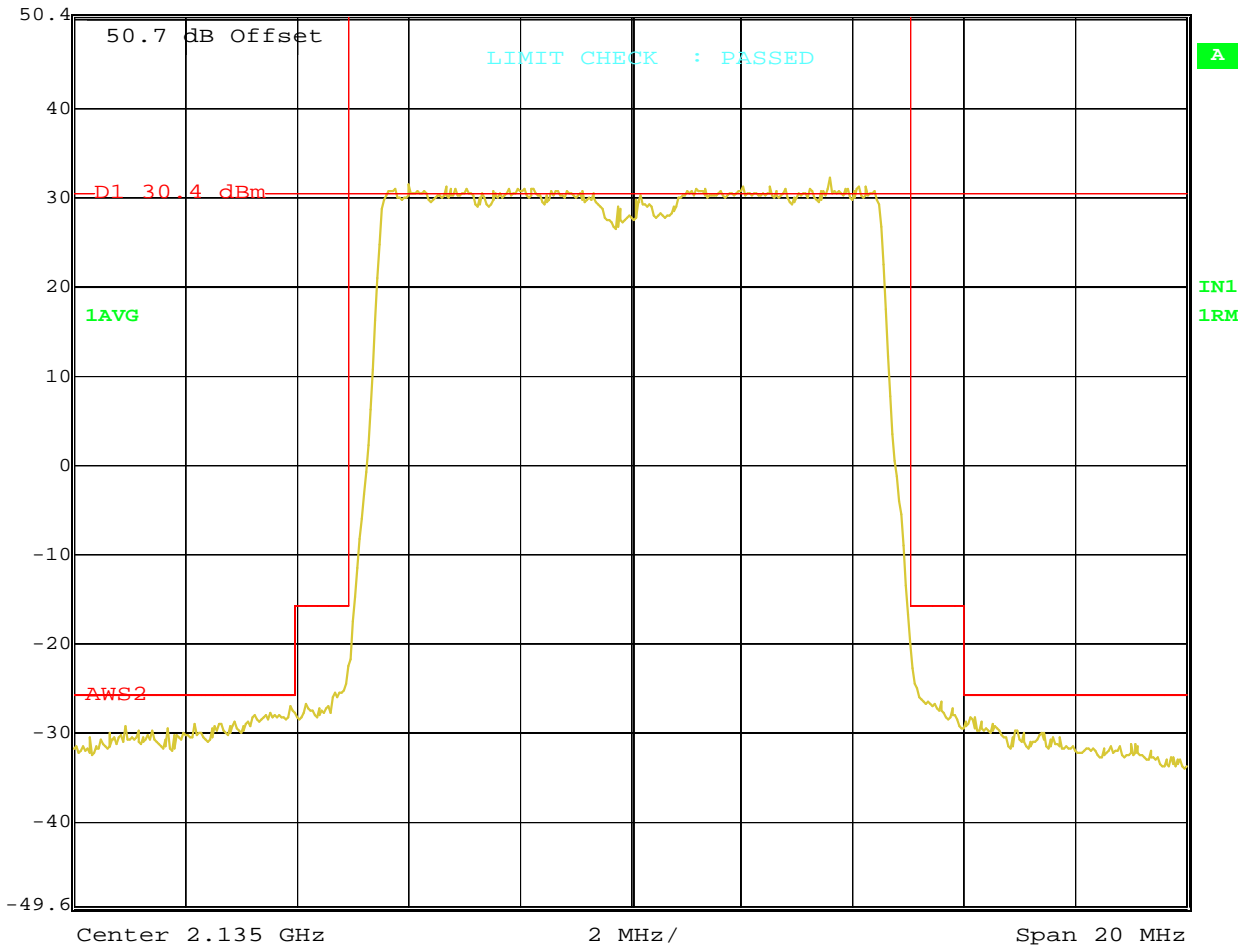
**SPECTRUM MASK/OCCUPIED BANDWIDTH**



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:C+D; 2135MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 13:57:35



Ref Lvl 50.4 dBm RBW 100 kHz RF Att 10 dB  
50.7 dB Offset VBW 1 MHz Unit dBm  
SWT 5 ms

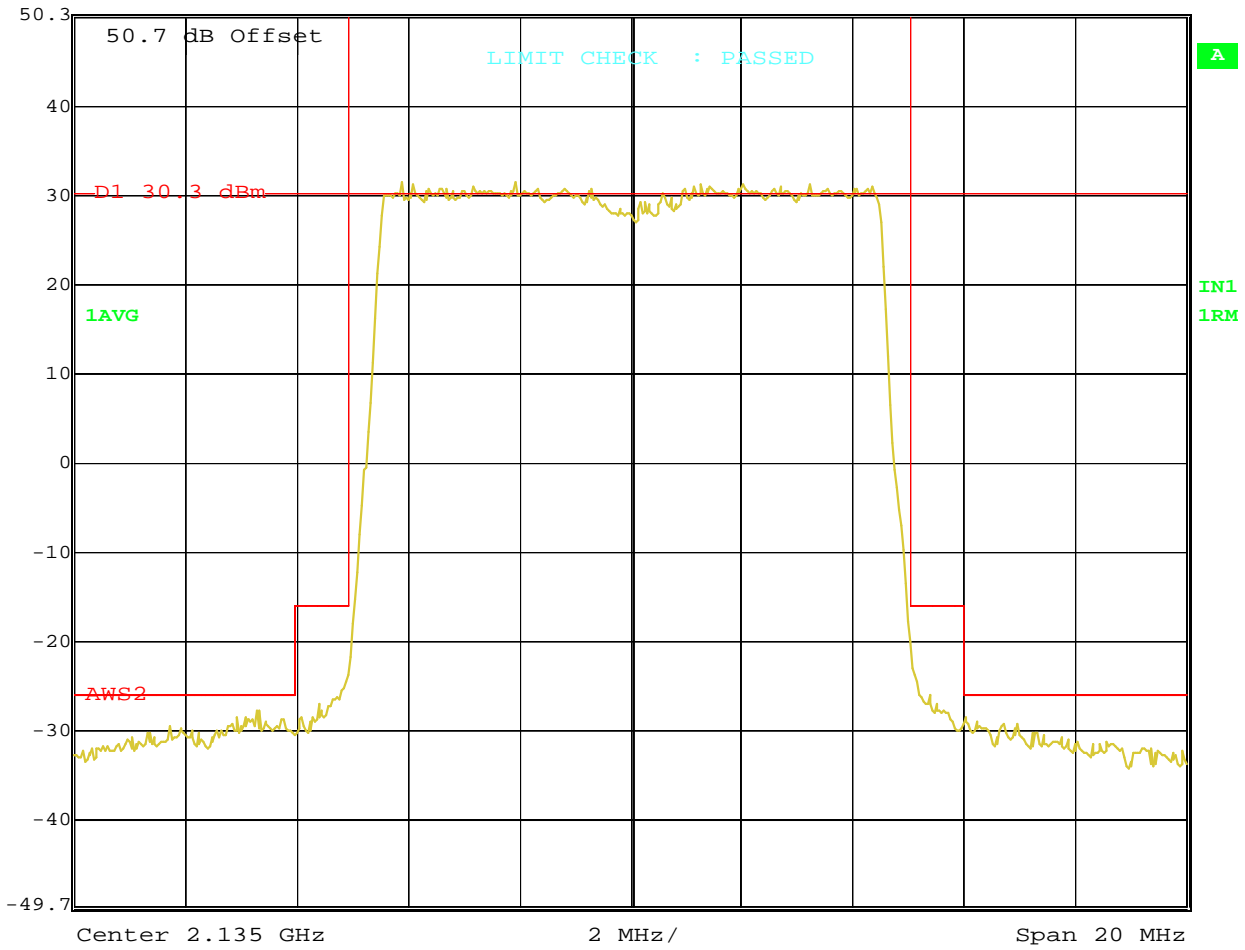


Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:C+D; 2135MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 08:06:41





Ref Lvl 50.3 dBm RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm



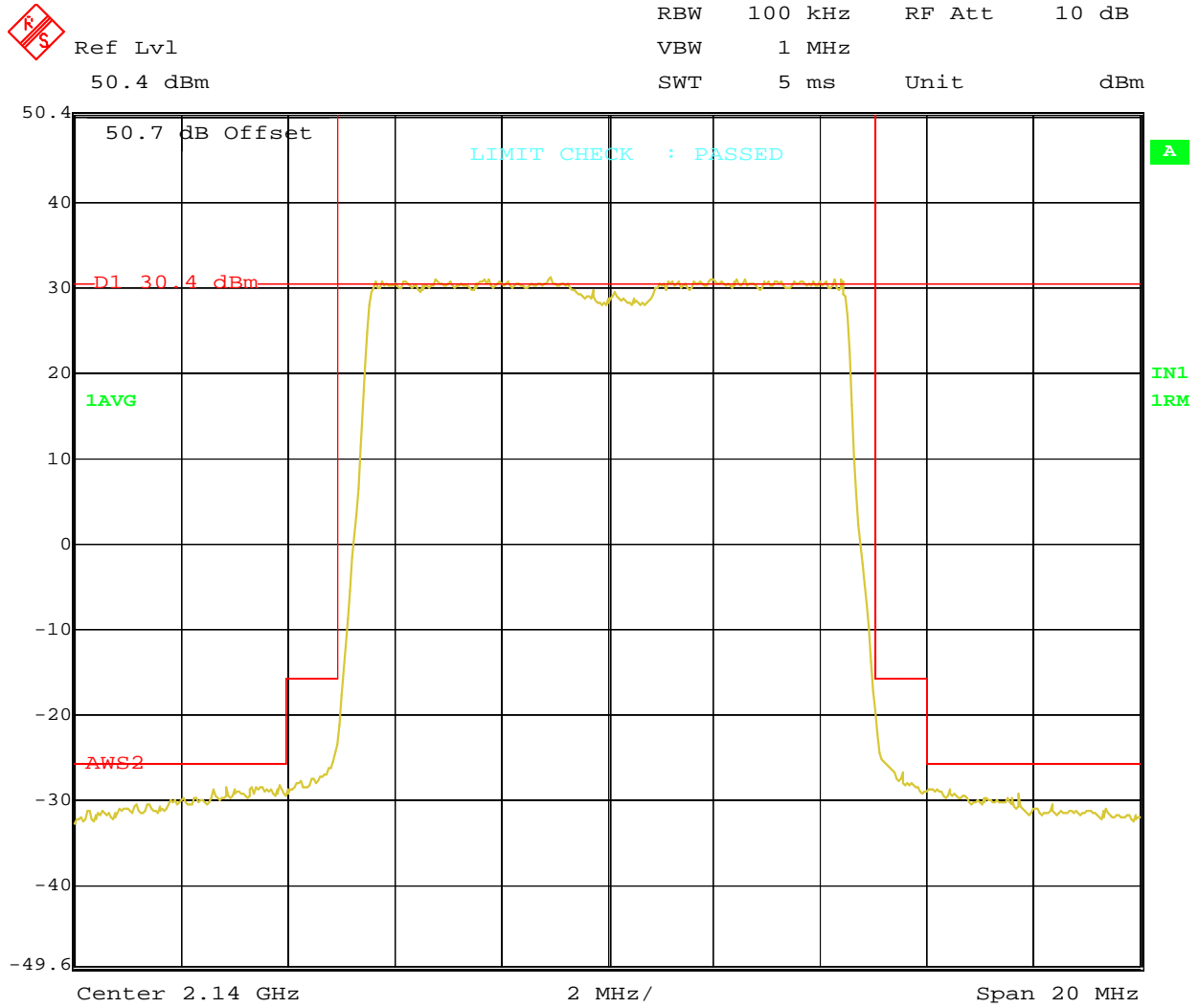
Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:C+D; 2135MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 08:44:31

**Block: D+E**

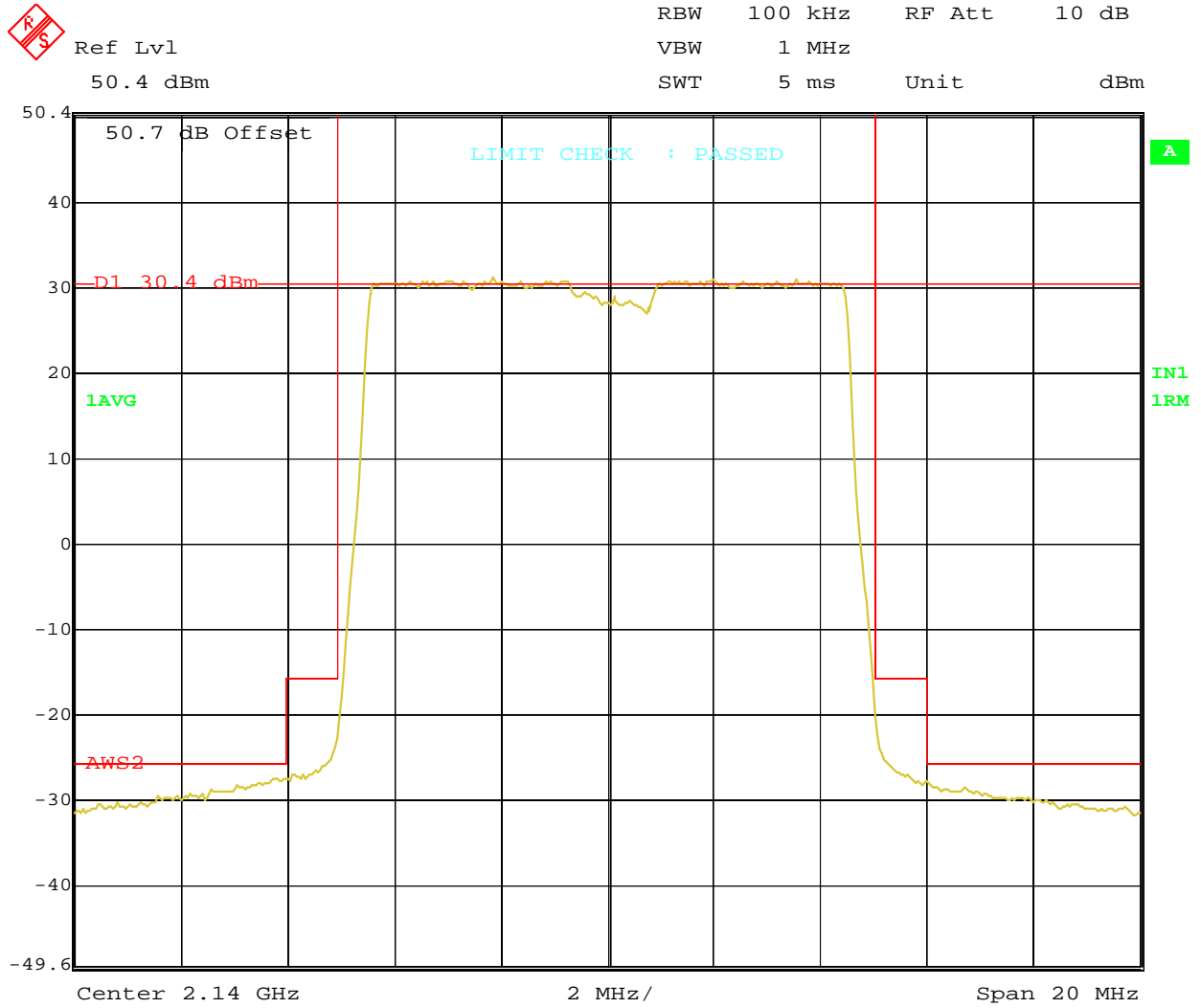
**10 MHz Bandwidth (2135 - 2145 MHz)**

**2x120 watts (MIMO)**

**SPECTRUM MASK/OCCUPIED BANDWIDTH**



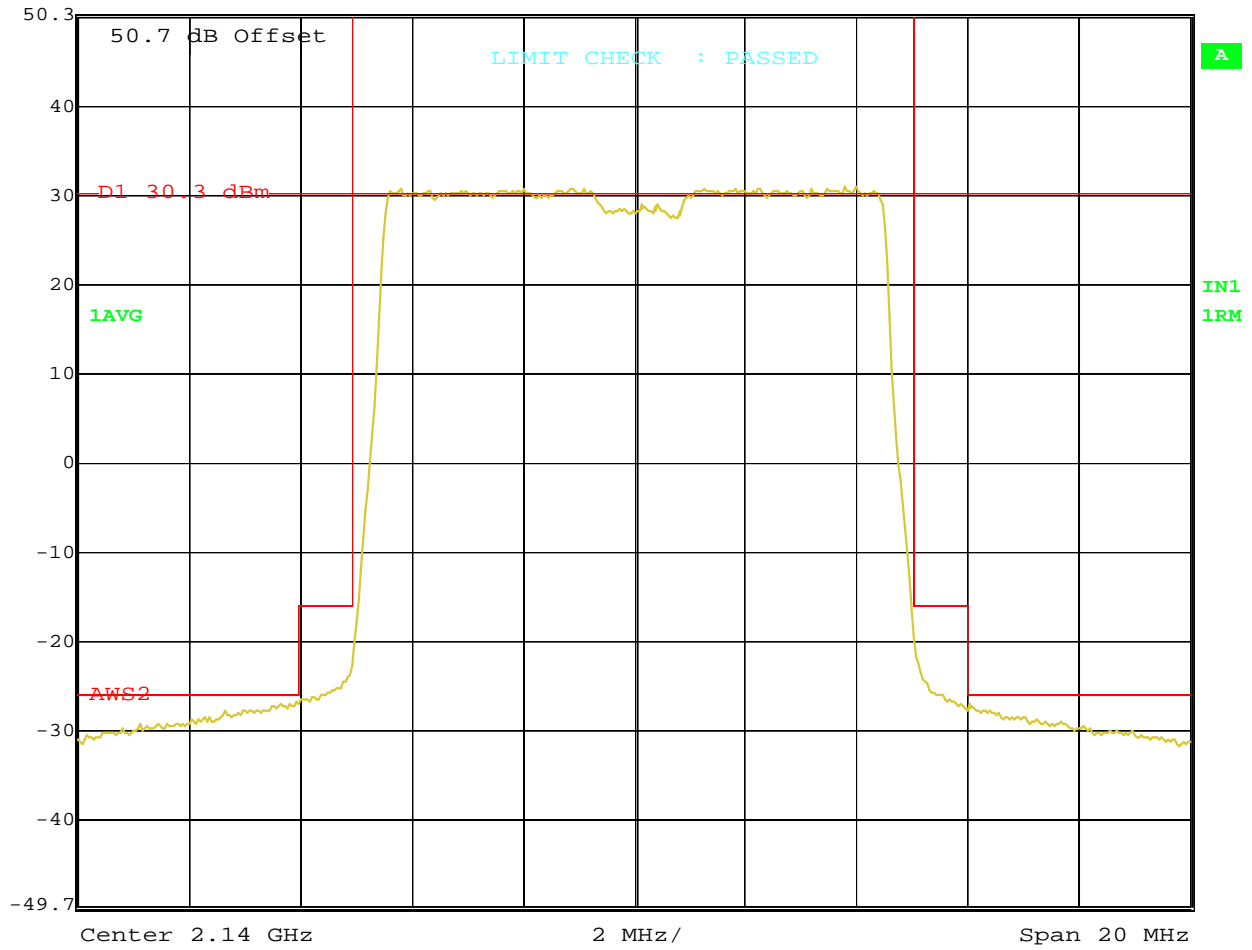
Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 11:37:35



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 10:24:24



Ref Lvl 50.3 dBm  
RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 09:31:44

**Block: F**

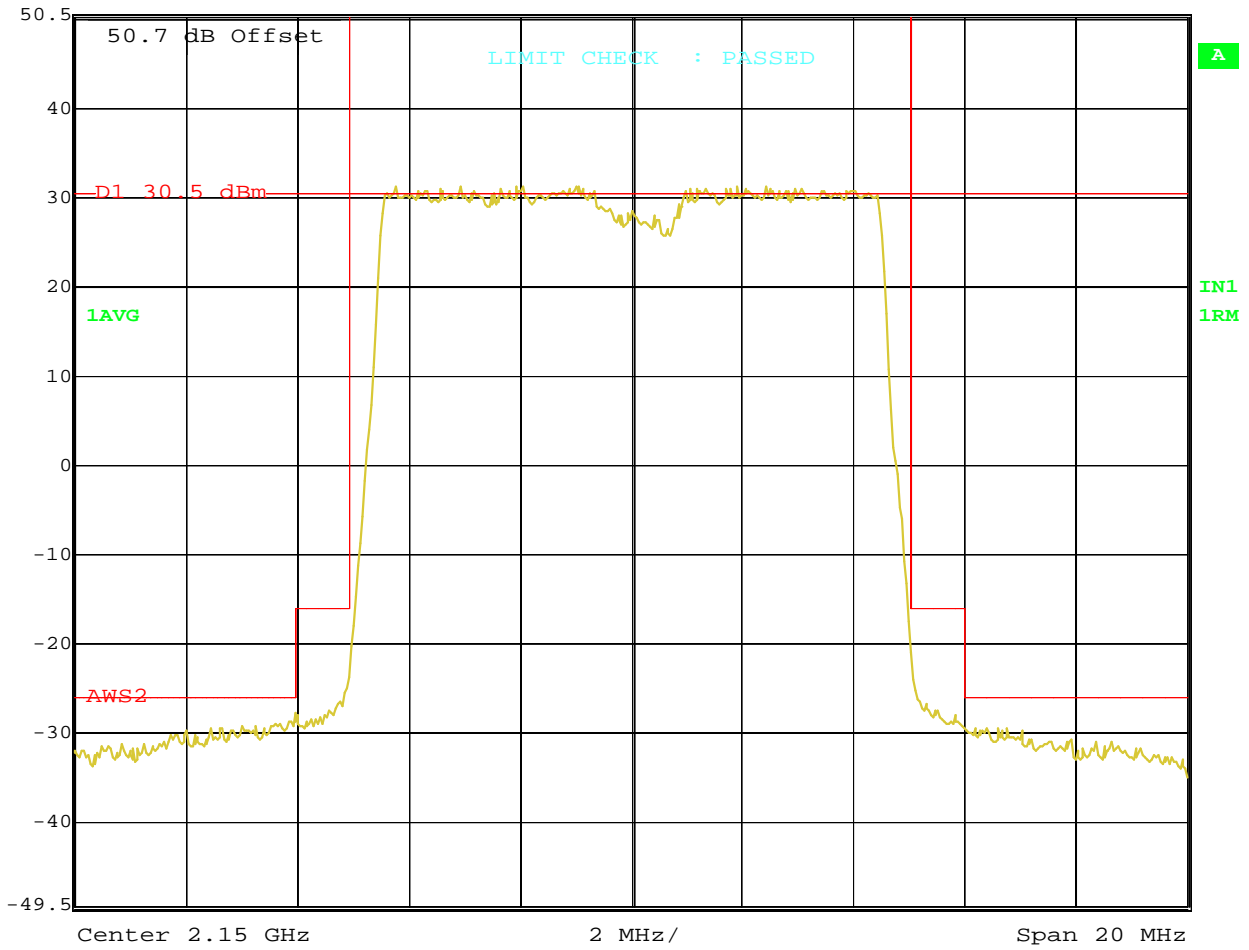
**10 MHz Bandwidth (2145 - 2155 MHz)**

**2x120 watts (MIMO)**

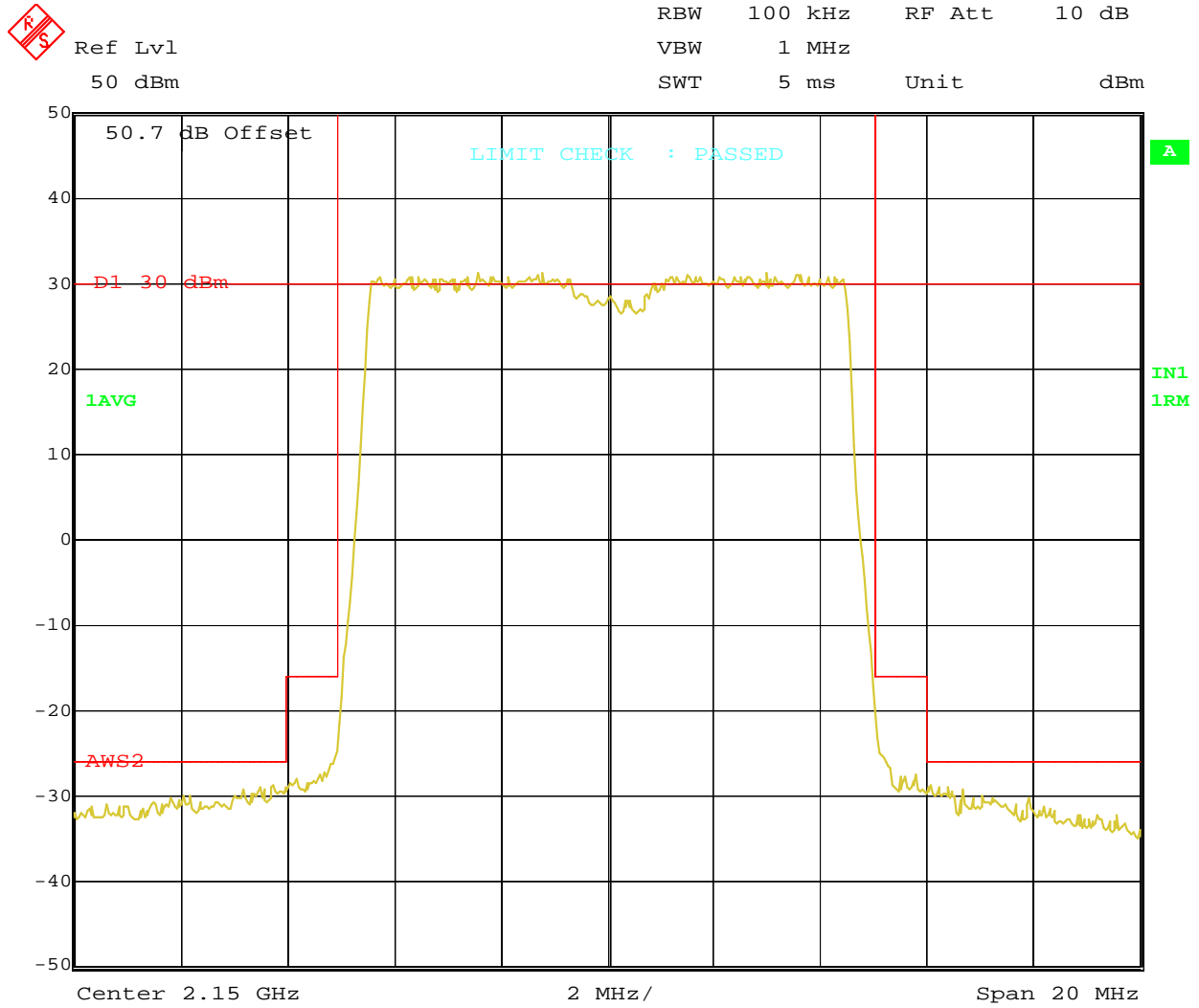
**SPECTRUM MASK/OCCUPIED BANDWIDTH**



Ref Lvl 50.5 dBm  
RBW 100 kHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dBm

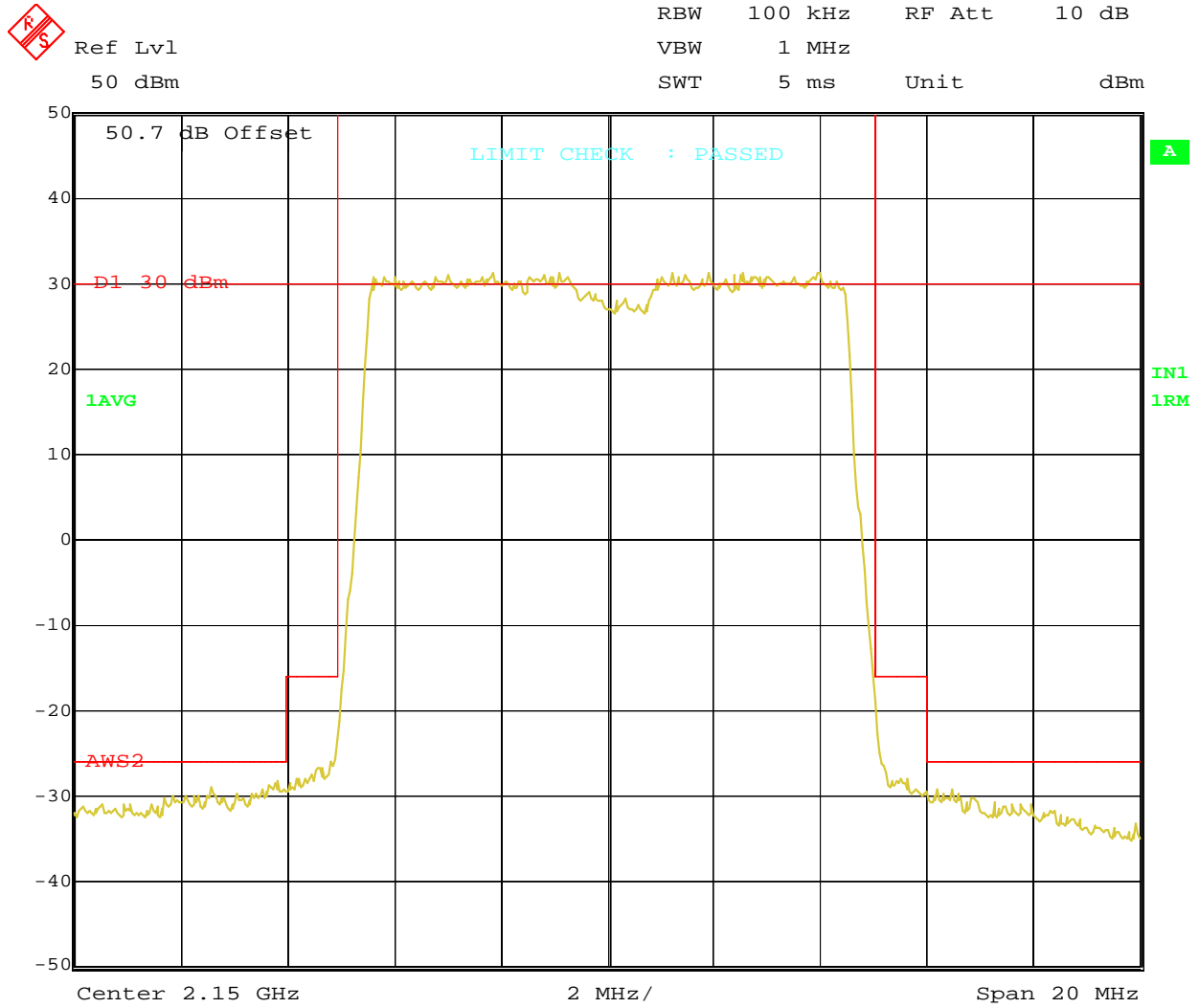


Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 5.MAR.2014 13:38:06



Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 08:56:09





Title: OCCUPIED BANDWIDTH; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 09:21:01

## **Measurement 4**

### **FCC Section 2.1051 and 27.53 (C) Spurious Emissions at Antenna Transmit Terminals**

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

**Spurious Emissions at Transmit Antenna Terminals**

Spurious Emissions at the transmit-antenna terminals were investigated over the frequency range of 9 kHz to the 22 GHz. The test setup is as described in Figure B. 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 B. The required emission limitation is specified in 27.53 (g) and FCC Part 24 Subpart E section 24.238. Measurements were made at 120W per carrier for 10 MHz Bandwidth at antenna terminals. The measured spurious emission levels were plotted for the frequency range 9 kHz to 22 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 22 GHz	1 MHz

The list of blocks and bands, tested are listed below:

Table for 10MHz for 120W all Contiguous Bands

Frequency Range (MHz) & Block	Bandwidth (MHz)	Center Frequency (MHz)	Power (Watts)
2110-2120 (A)	10	2115	120
2120-2130 (B)	10	2125	120
2130-2140 (C+D)	10	2135	120
2135-2145 (D+E)	10	2140	120
2145-2155 (F)	10	2150	120

*FCC Section 27.53(g)(3) Based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter 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 following modulation configurations:

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

**RESULTS:**

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

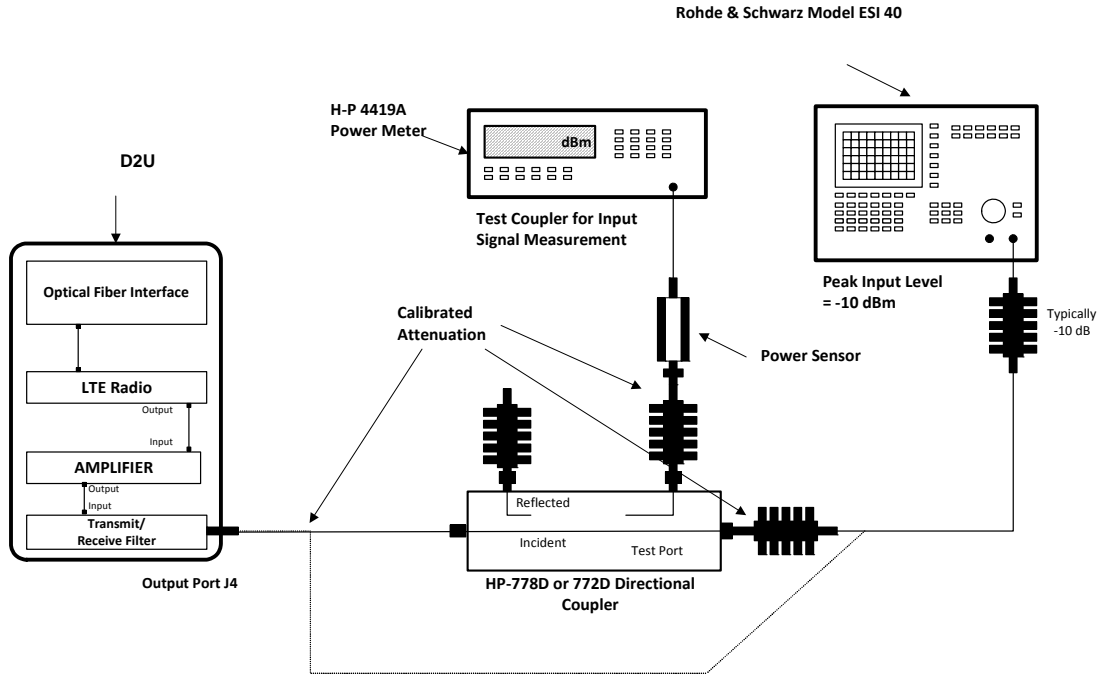
Measurement uncertainty:

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 B. TEST CONFIGURATION FOR CONDUCTED SPURIOUS

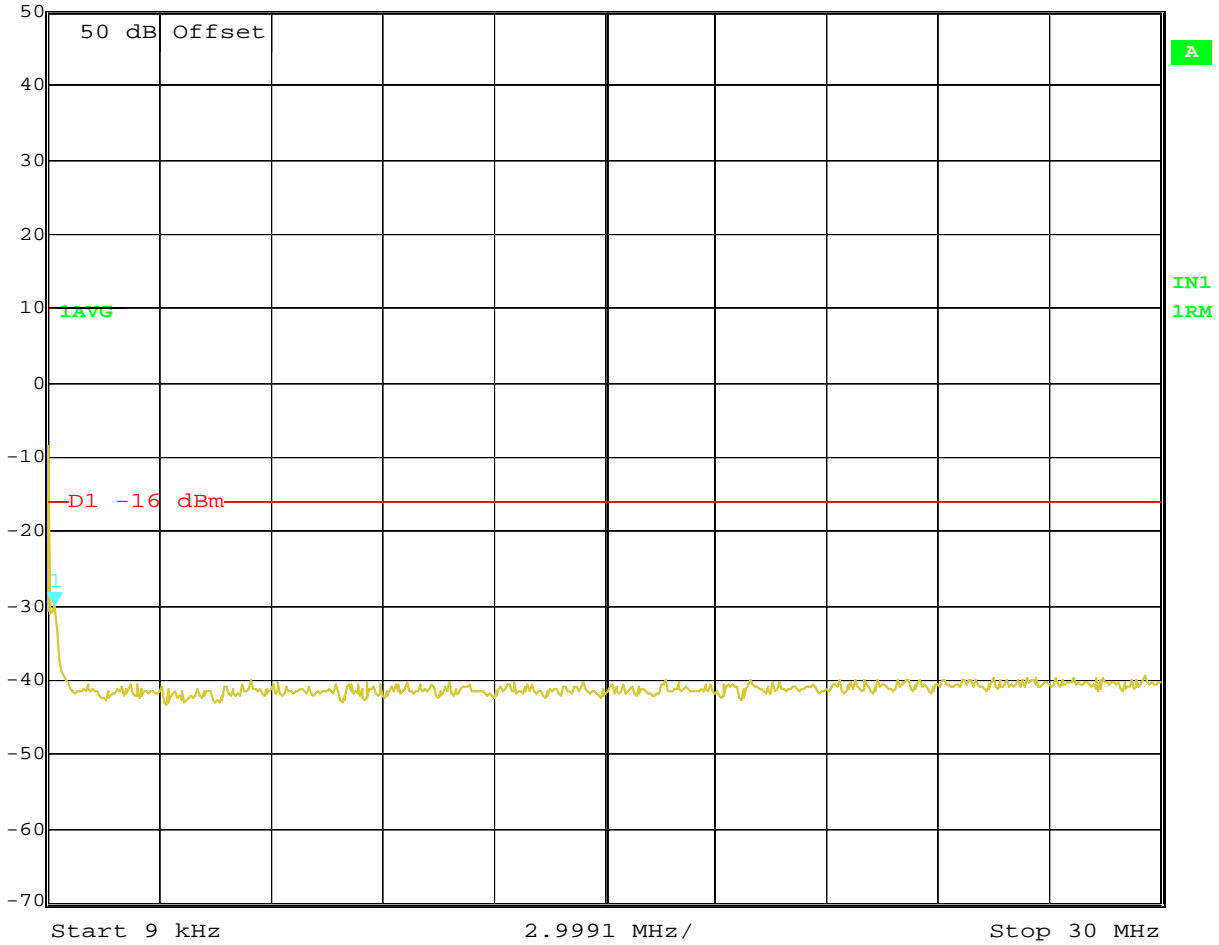


**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: A  
10 MHz Bandwidth (2110 - 2120 MHz)  
2x120 watts (MIMO)  
QPSK Modulation**



Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -29.96 dBm VBW 30 kHz  
50 dBm 189.30661323 kHz SWT 760 ms Unit dBm

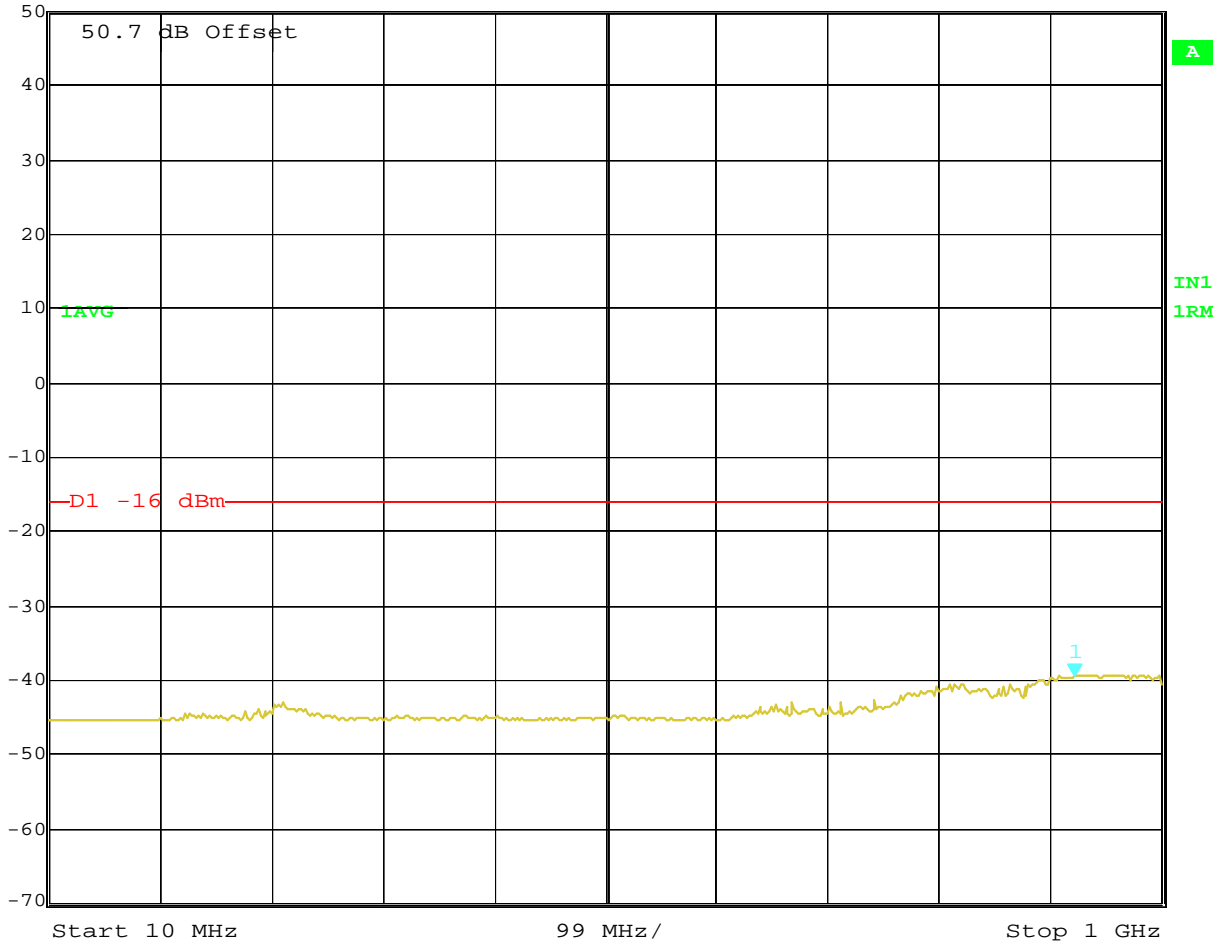


Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 10:21:45





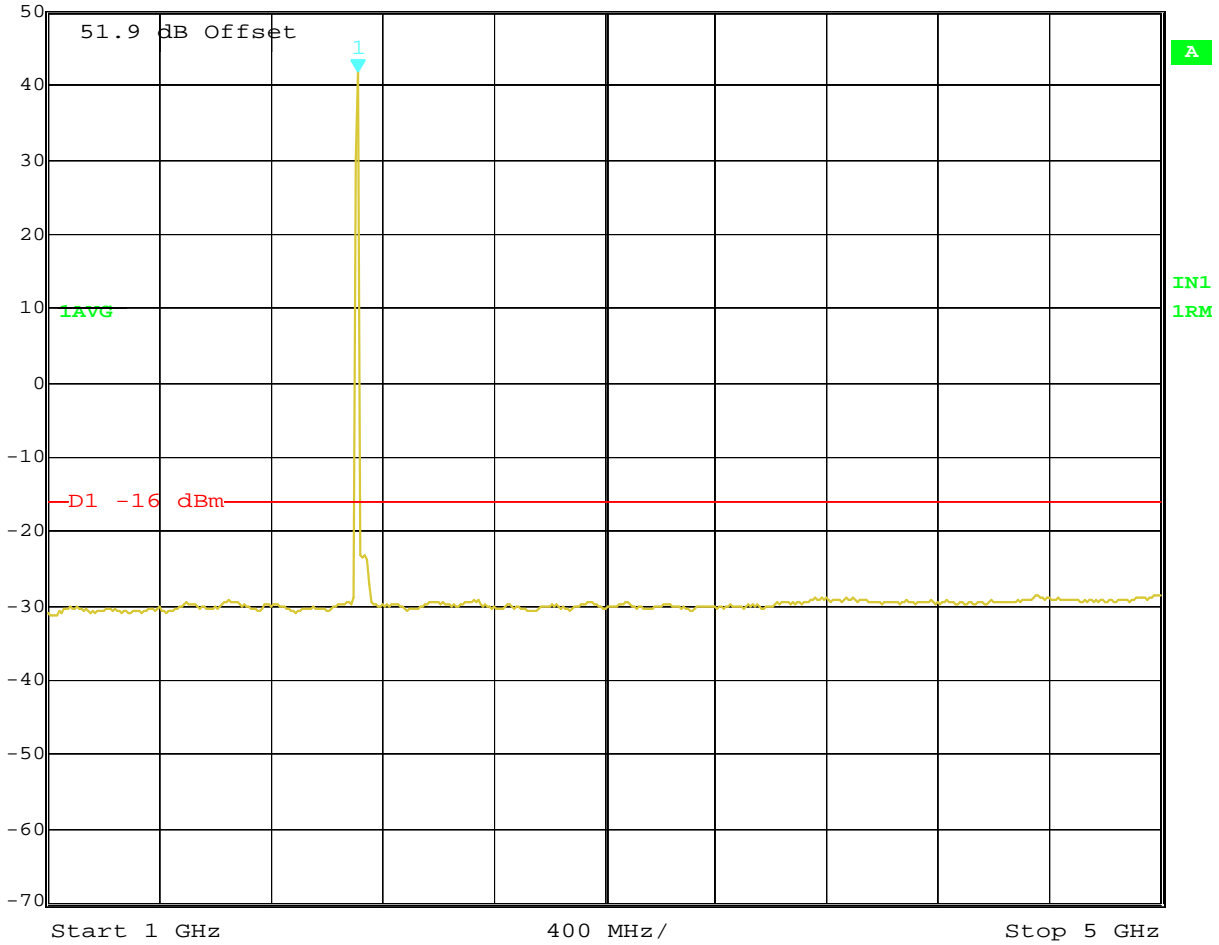
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.54 dBm VBW 300 kHz  
50 dBm 922.62525050 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 10:19:57



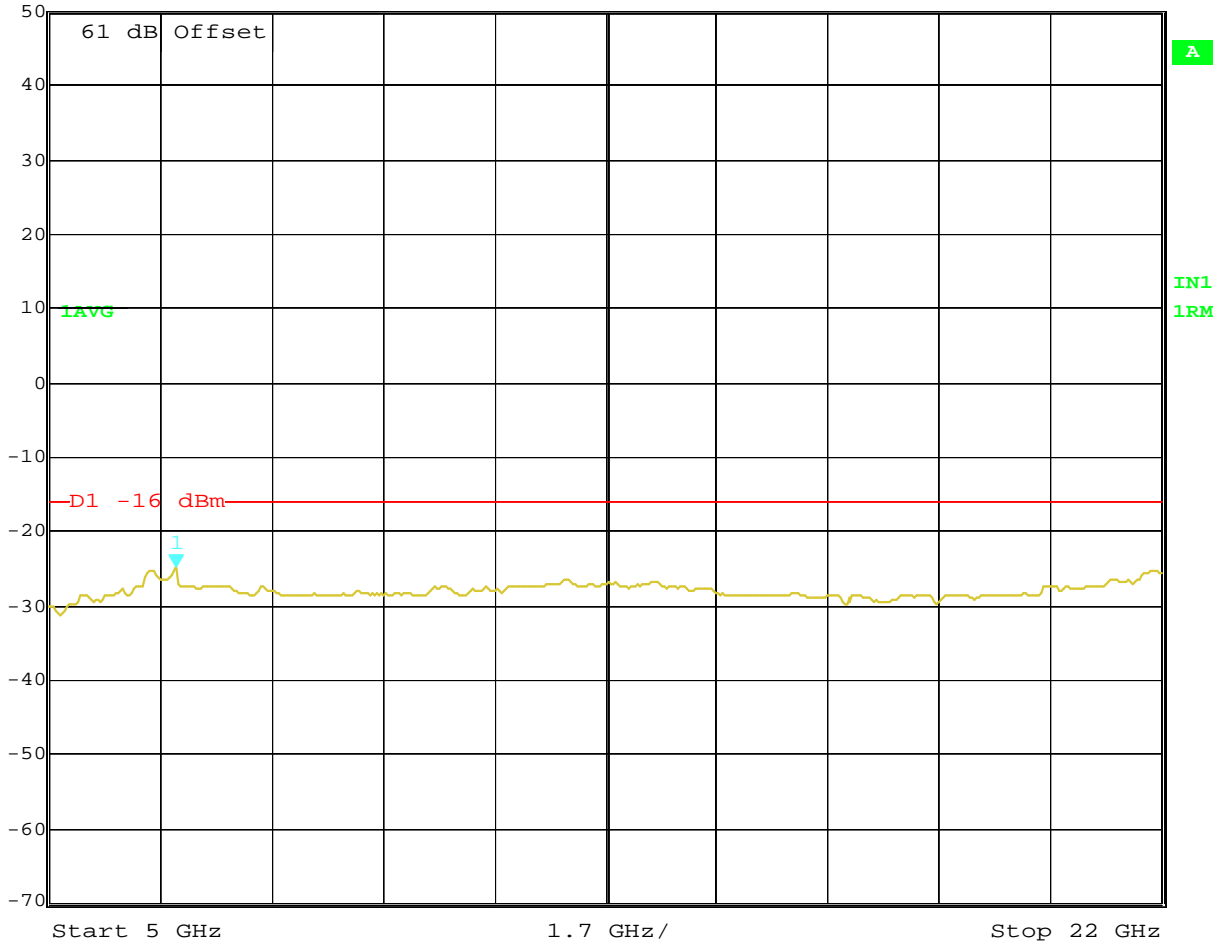
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl 41.82 dBm VBW 3 MHz  
50 dBm 2.11422846 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 10:18:30



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.75 dBm VBW 3 MHz  
50 dBm 6.94188377 GHz SWT 170 ms Unit dBm



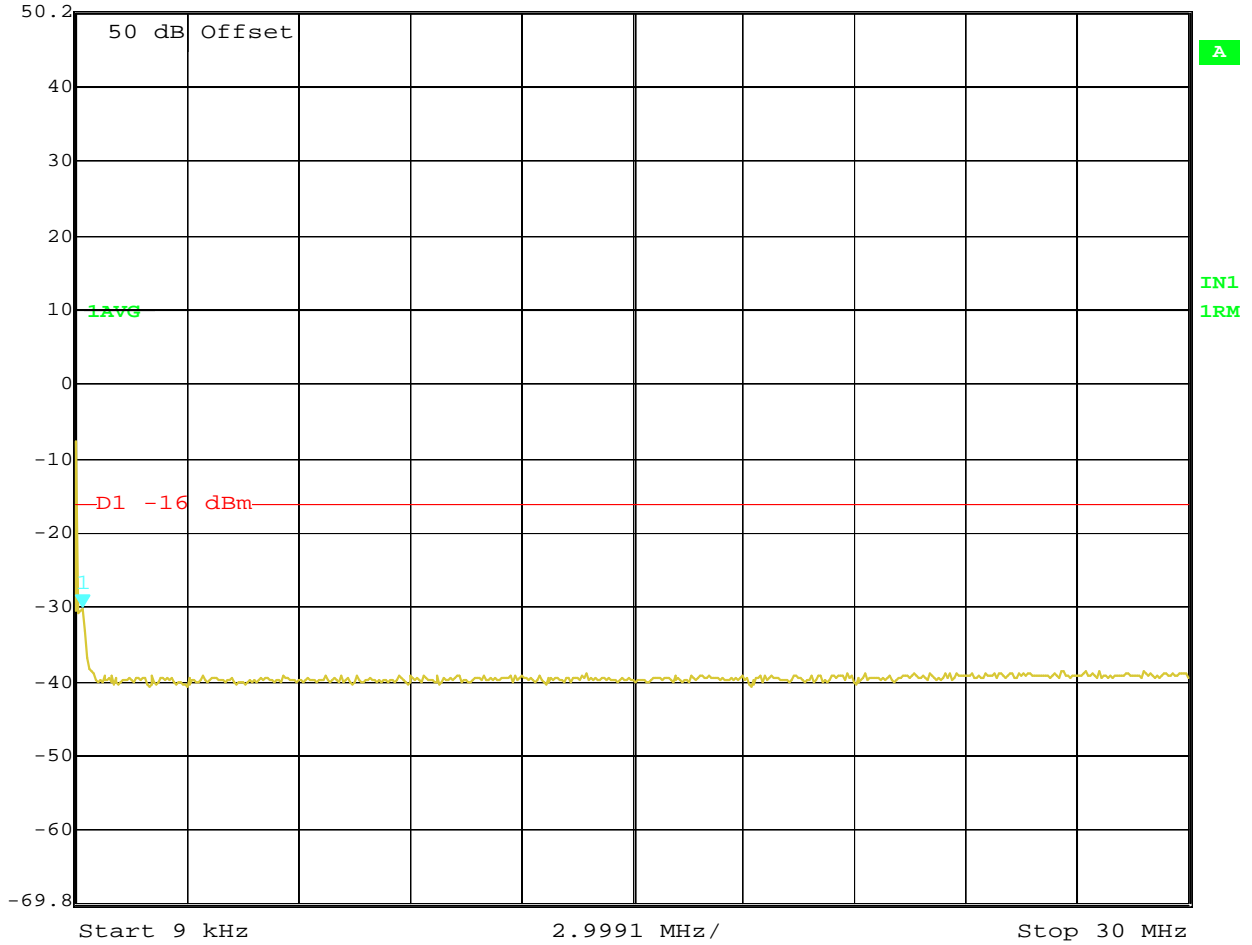
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 10:14:12

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: A  
10 MHz Bandwidth (2110 - 2120 MHz)  
2x120 watts (MIMO)  
16QAM Modulation**



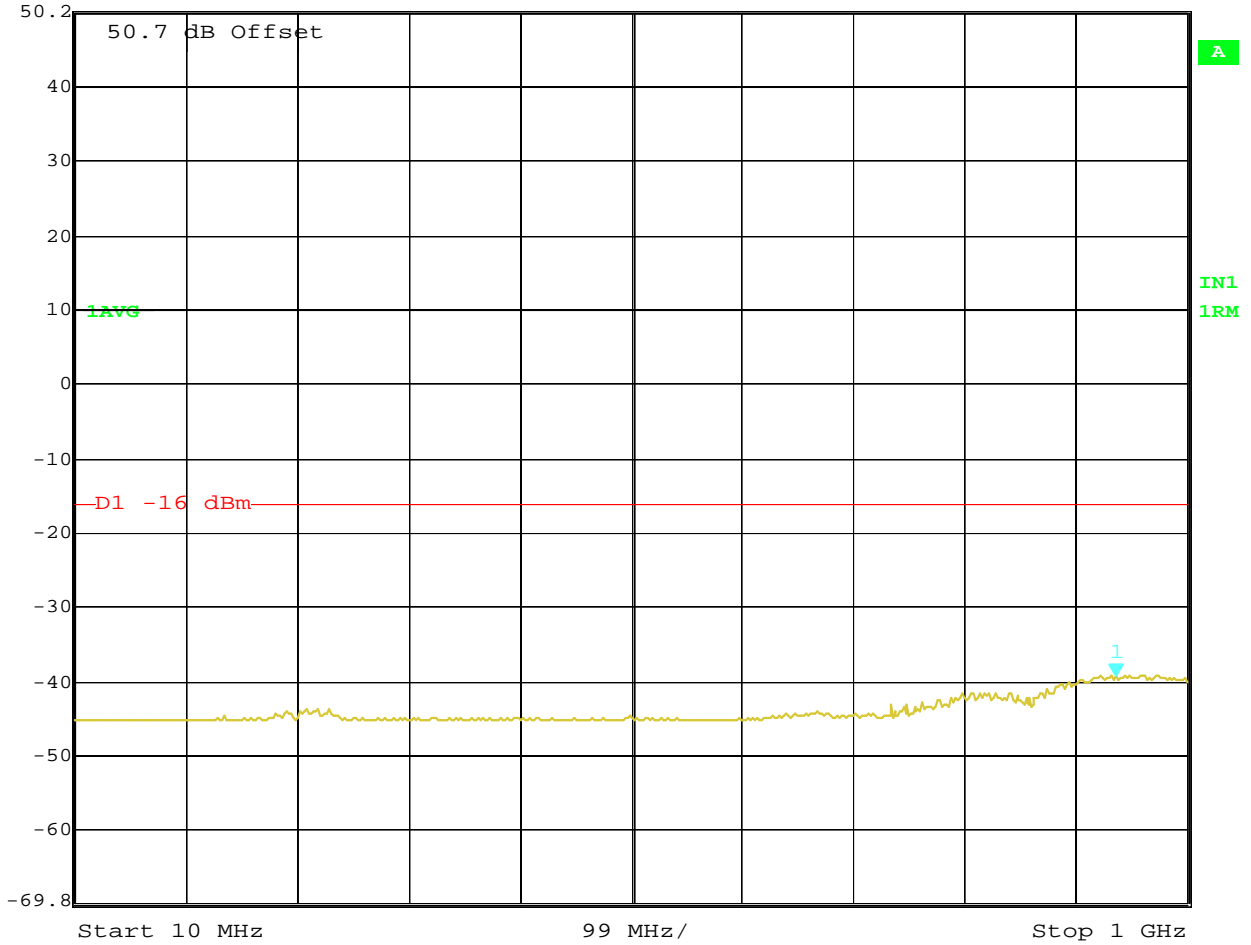
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -29.93 dBm VBW 30 kHz  
50.2 dBm 189.30661323 kHz SWT 760 ms Unit dBm




Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 11:07:08

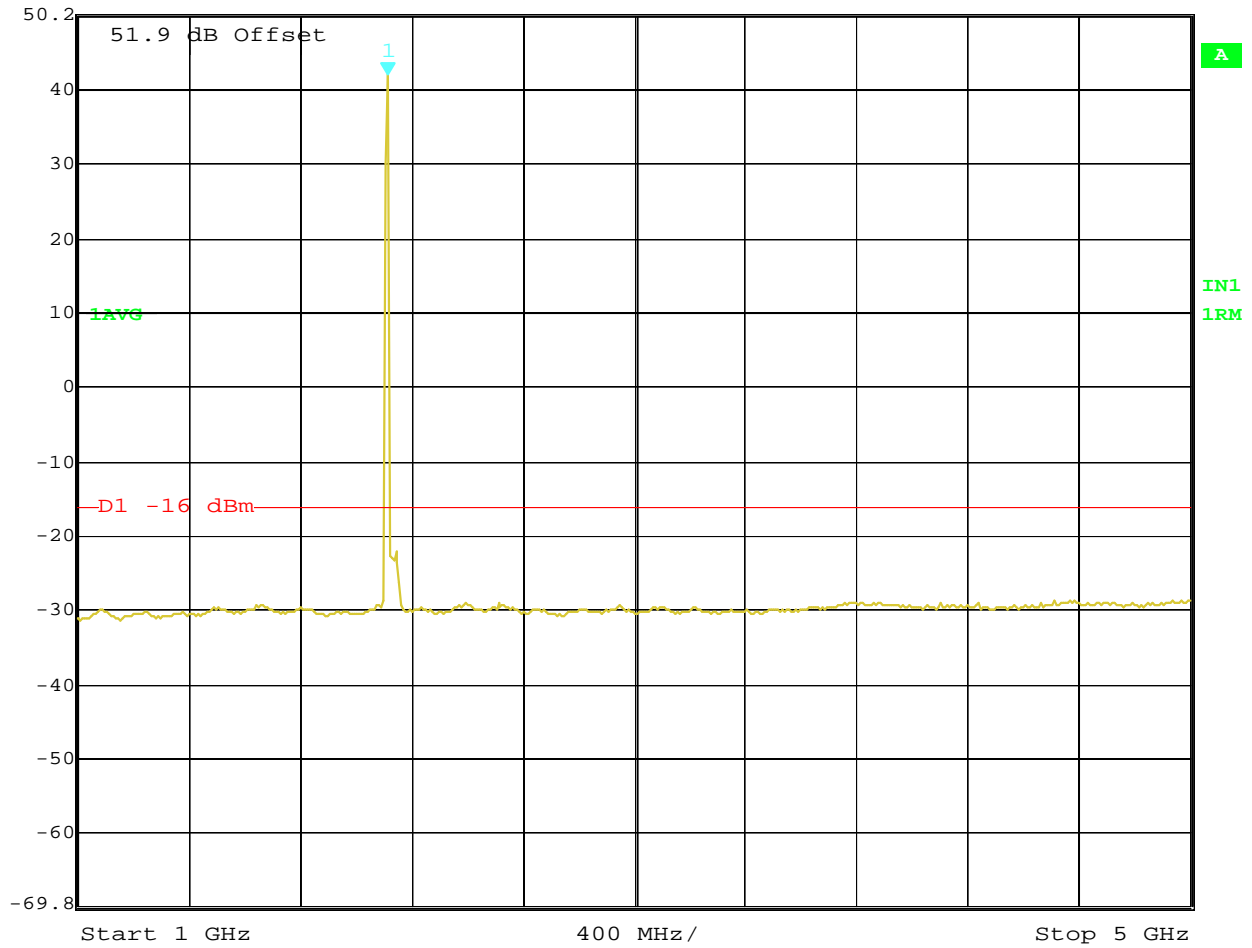


Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.34 dBm VBW 300 kHz  
50.2 dBm 936.51302605 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 11:09:17

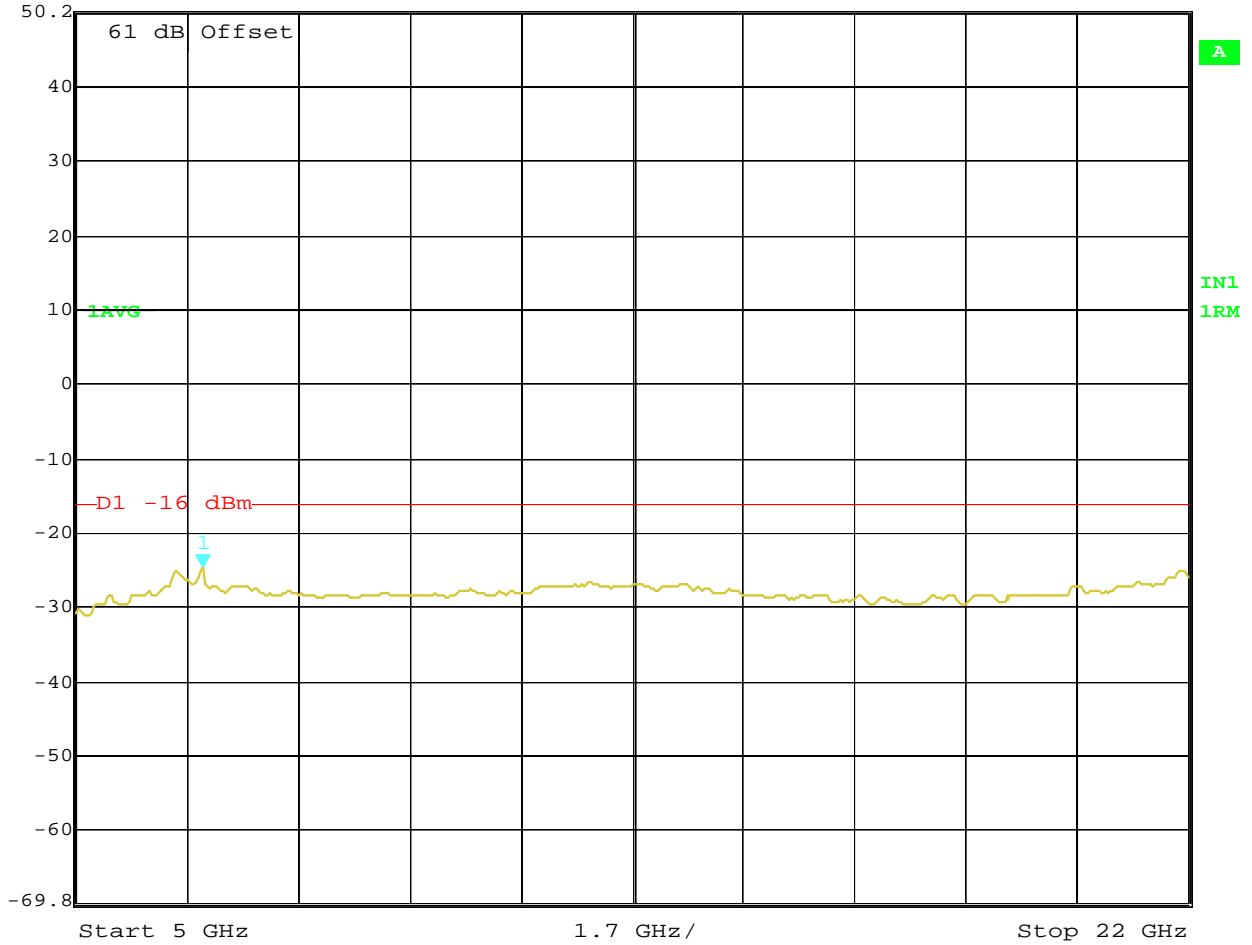
 Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl 41.88 dBm VBW 3 MHz  
50.2 dBm 2.11422846 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 11:10:33



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.69 dBm VBW 3 MHz  
50.2 dBm 6.94188377 GHz SWT 170 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 11:13:48

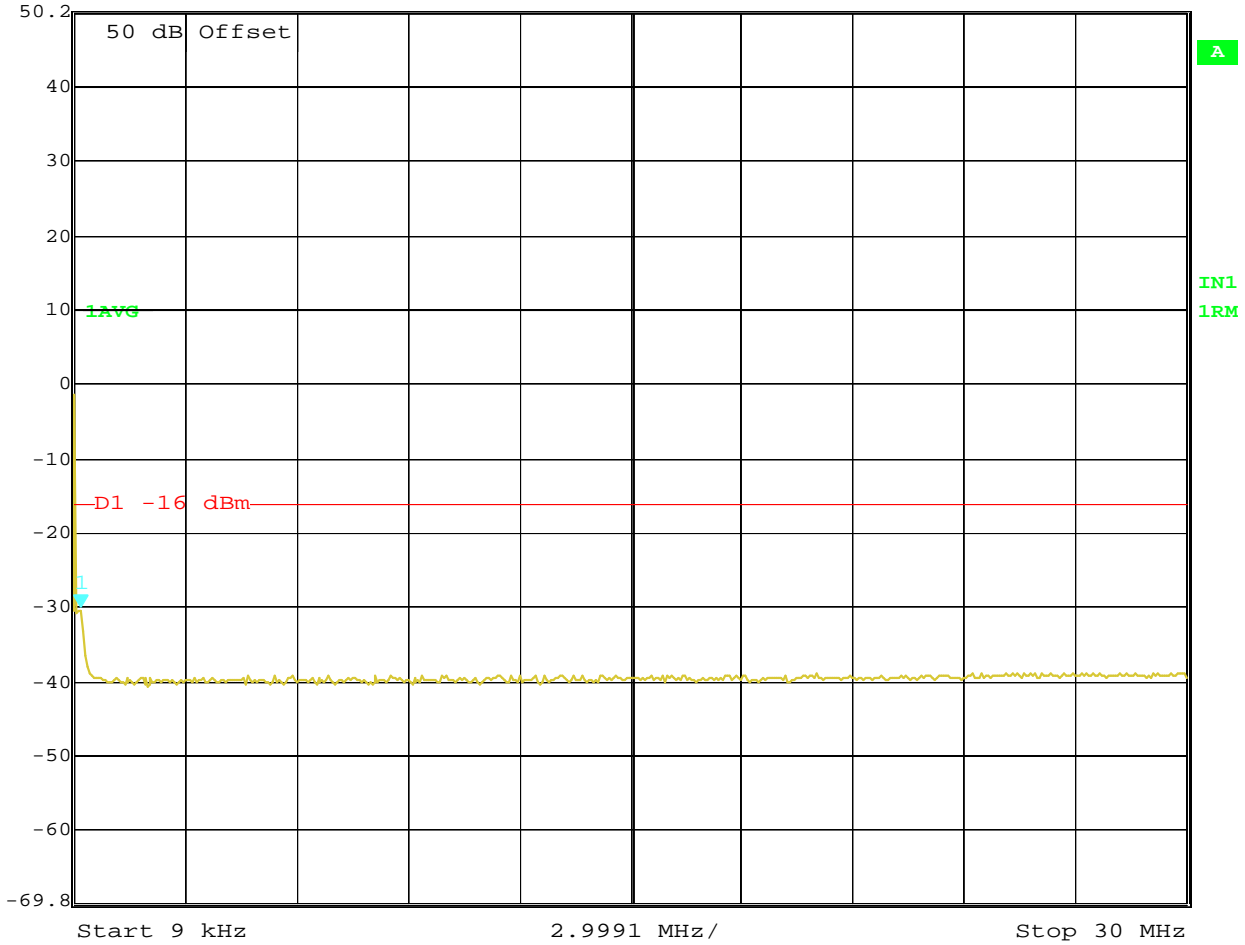


**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: A  
10 MHz Bandwidth (2110 - 2120 MHz)  
2x120 watts (MIMO)  
64QAM Modulation**



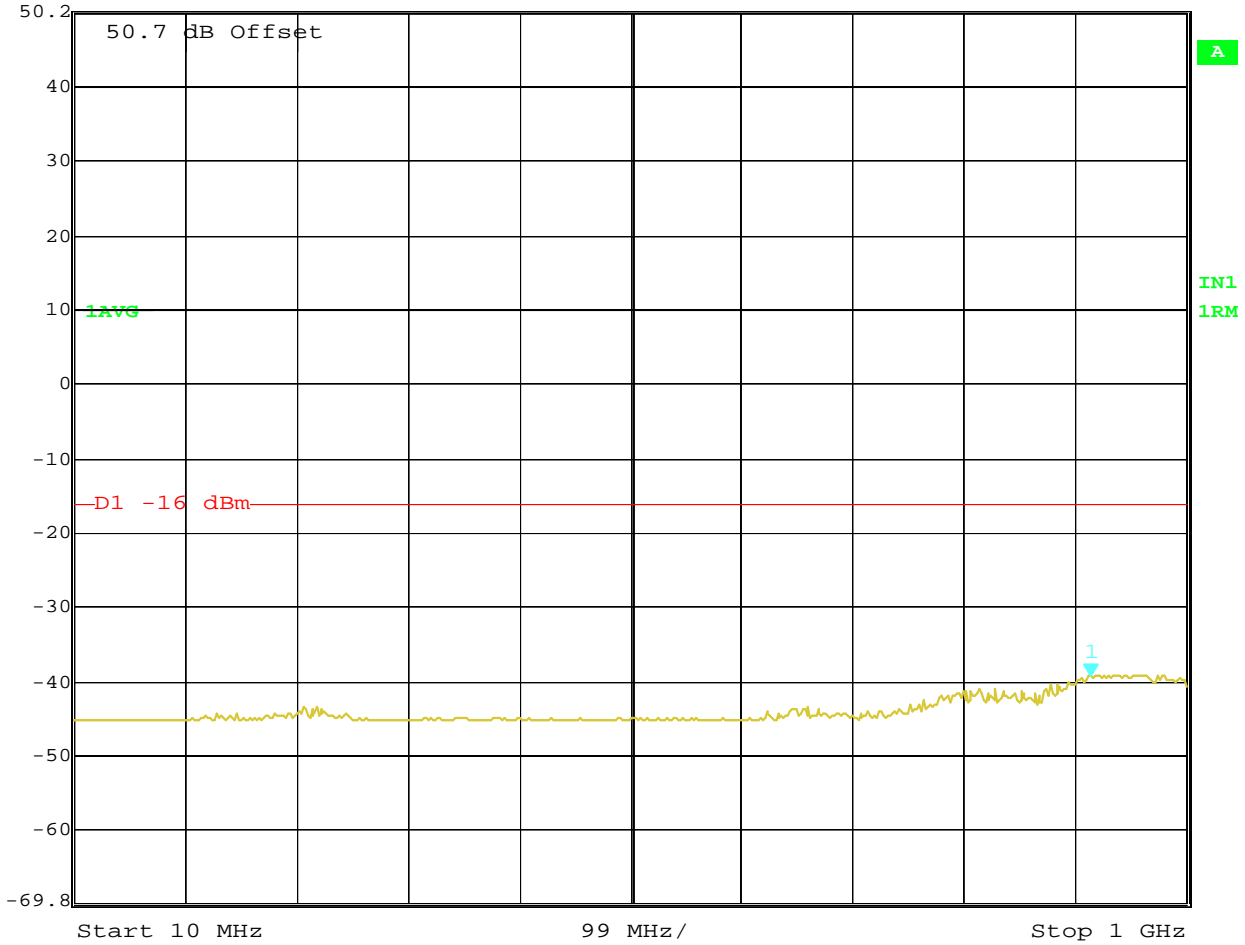
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -30.10 dBm VBW 30 kHz  
50.2 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 12:53:06



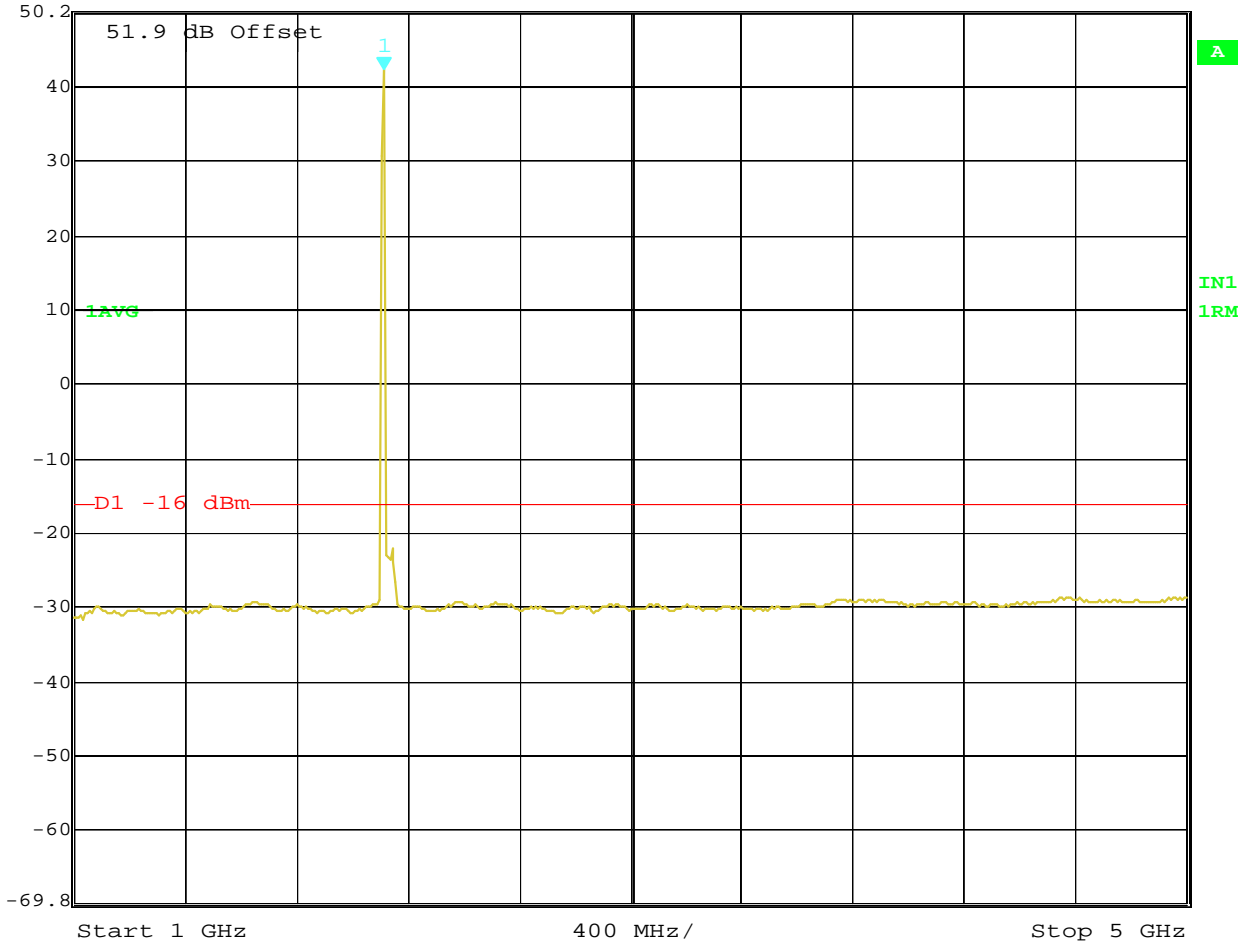
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.34 dBm VBW 300 kHz  
50.2 dBm 914.68937876 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 12:50:33



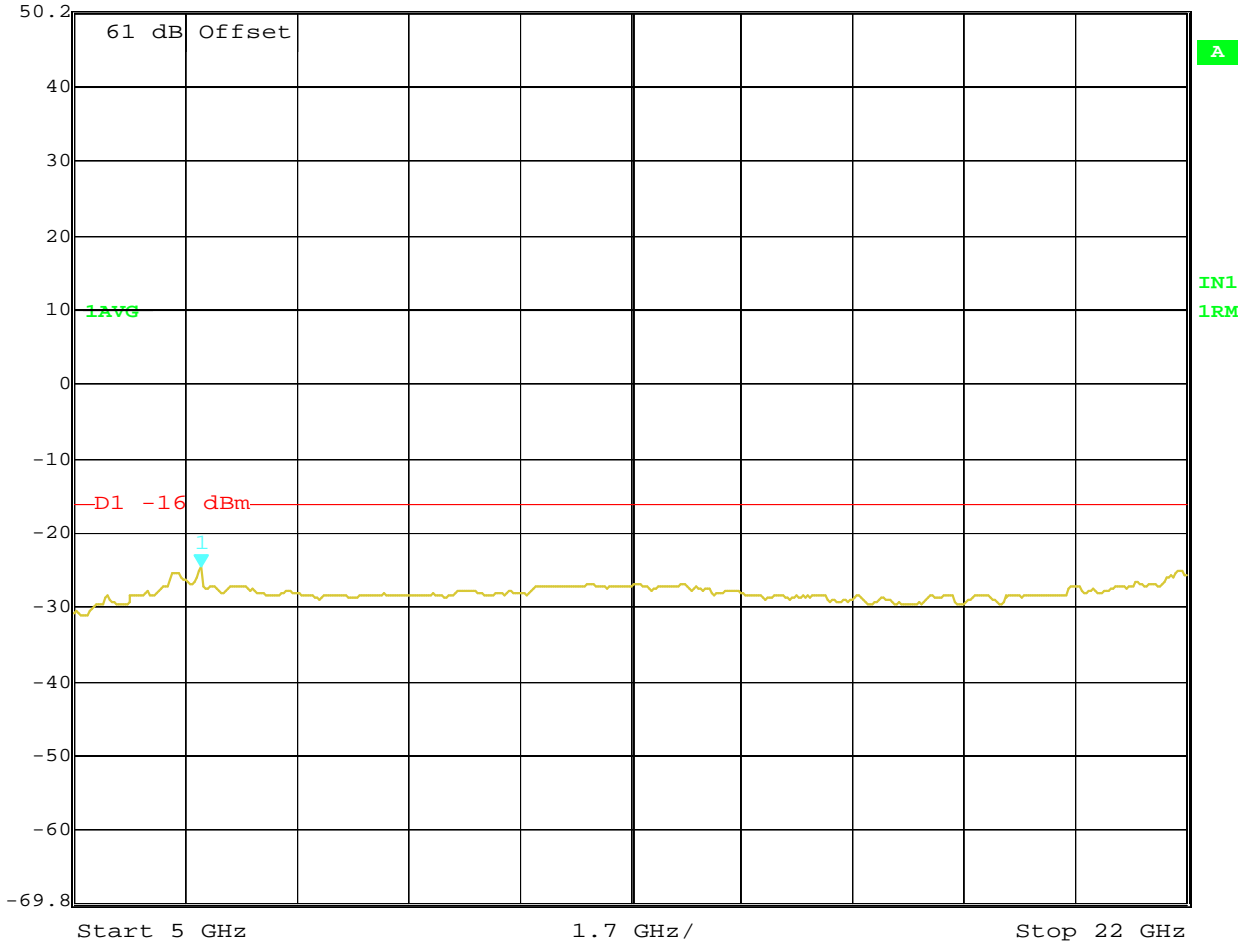
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl 42.22 dBm VBW 3 MHz  
50.2 dBm 2.11422846 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 12:49:18



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.69 dBm VBW 3 MHz  
50.2 dBm 6.94188377 GHz SWT 170 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:A; 2115MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 12:45:15

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: B  
10 MHz Bandwidth (2120 - 2130 MHz)  
2x120 watts (MIMO)  
QPSK Modulation**



Marker 1 [T1]

RBW 10 kHz RF Att 30 dB

Ref Lvl -29.80 dBm

VBW 30 kHz

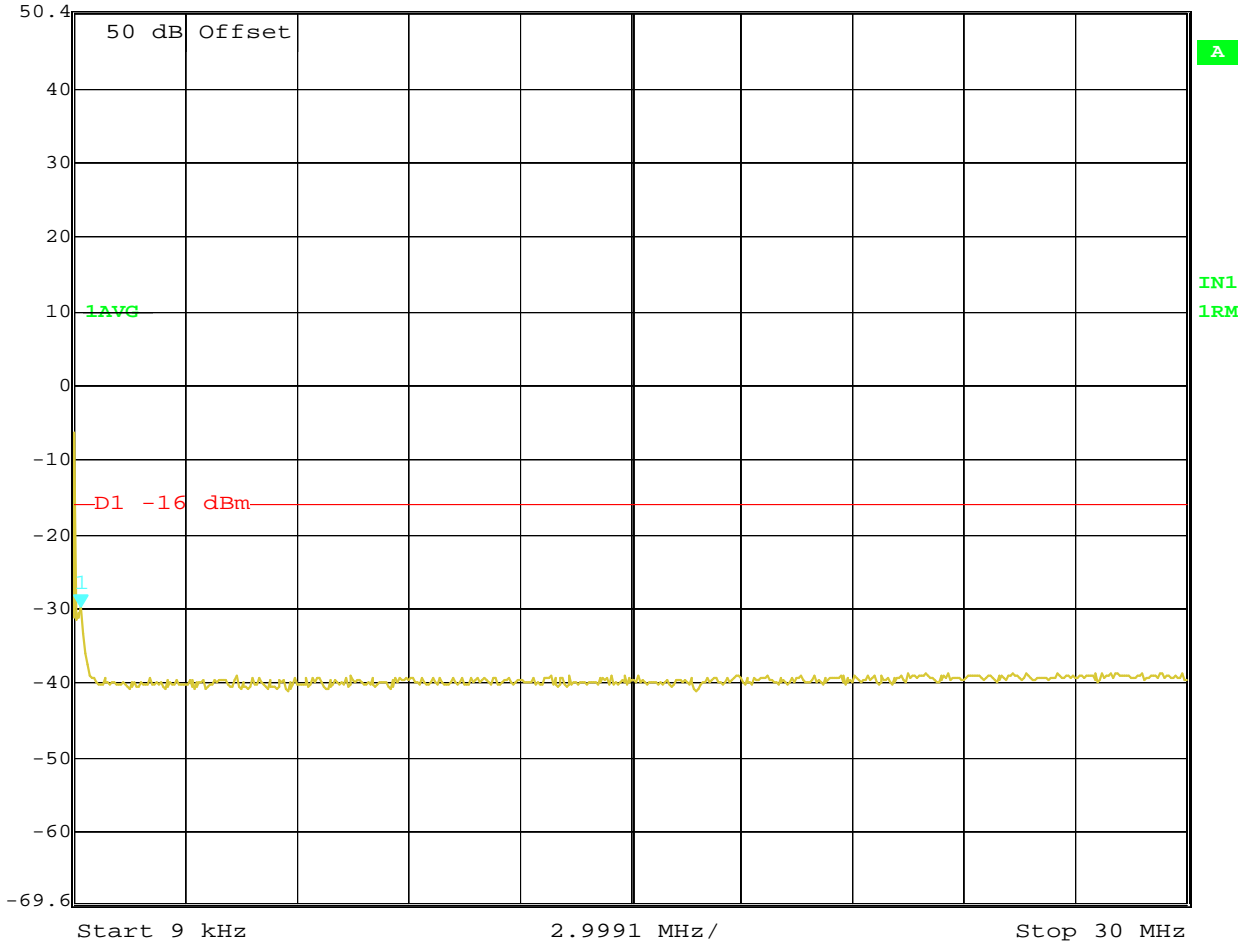
50.4 dBm

189.30661323 kHz

SWT 760 ms

Unit

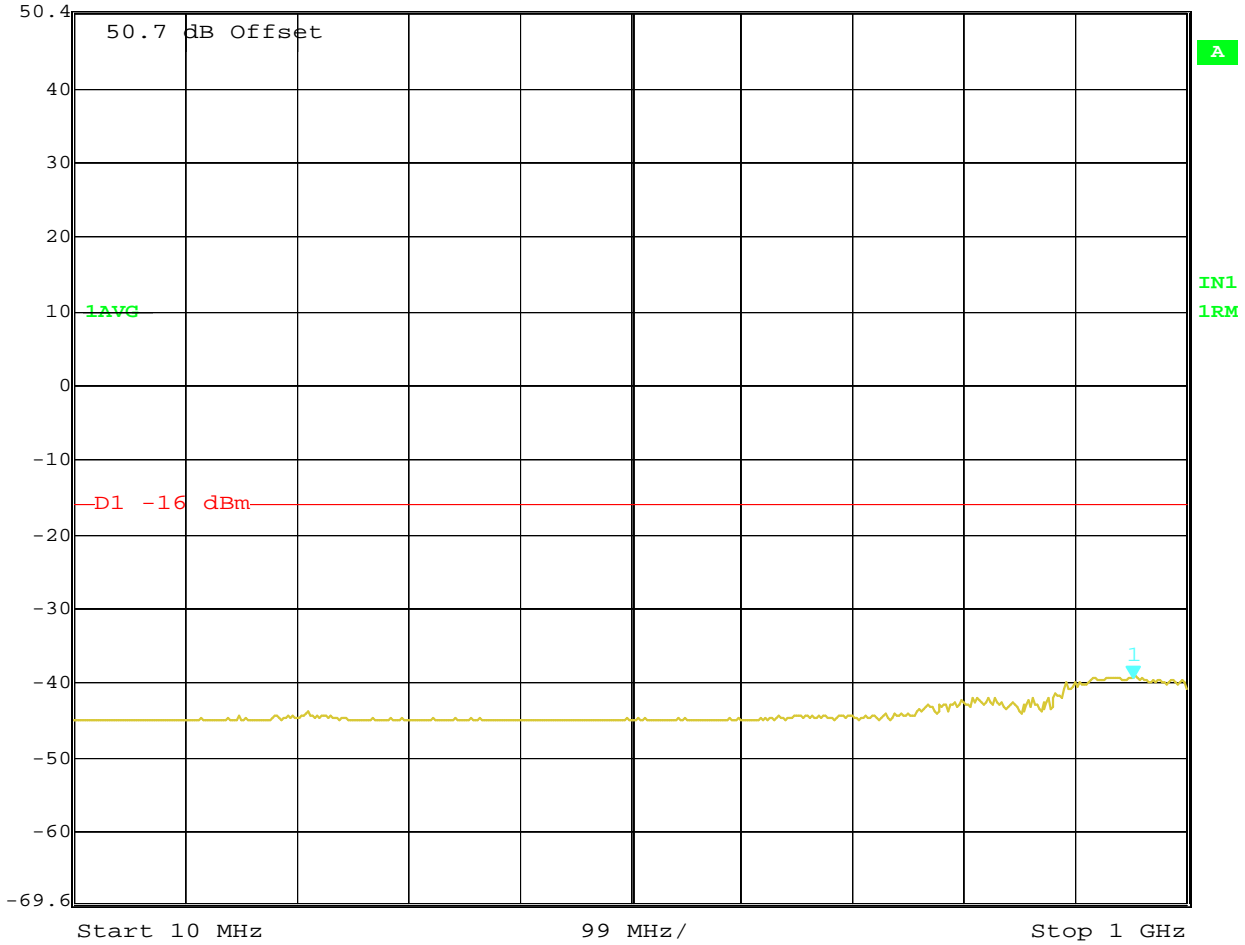
dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 13:12:30



Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.49 dBm VBW 300 kHz  
50.4 dBm 952.38476954 MHz SWT 250 ms Unit dBm

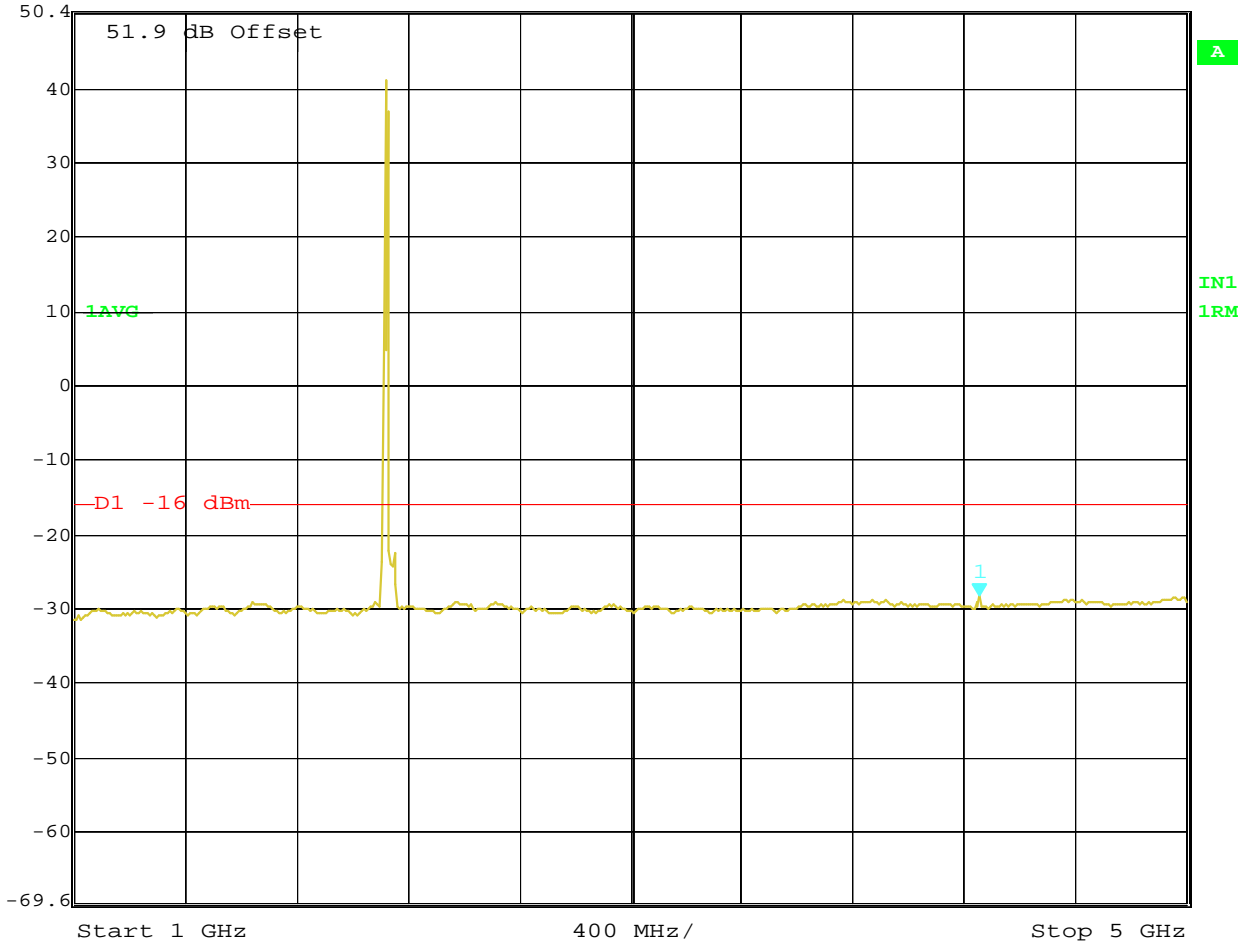


Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 13:14:04





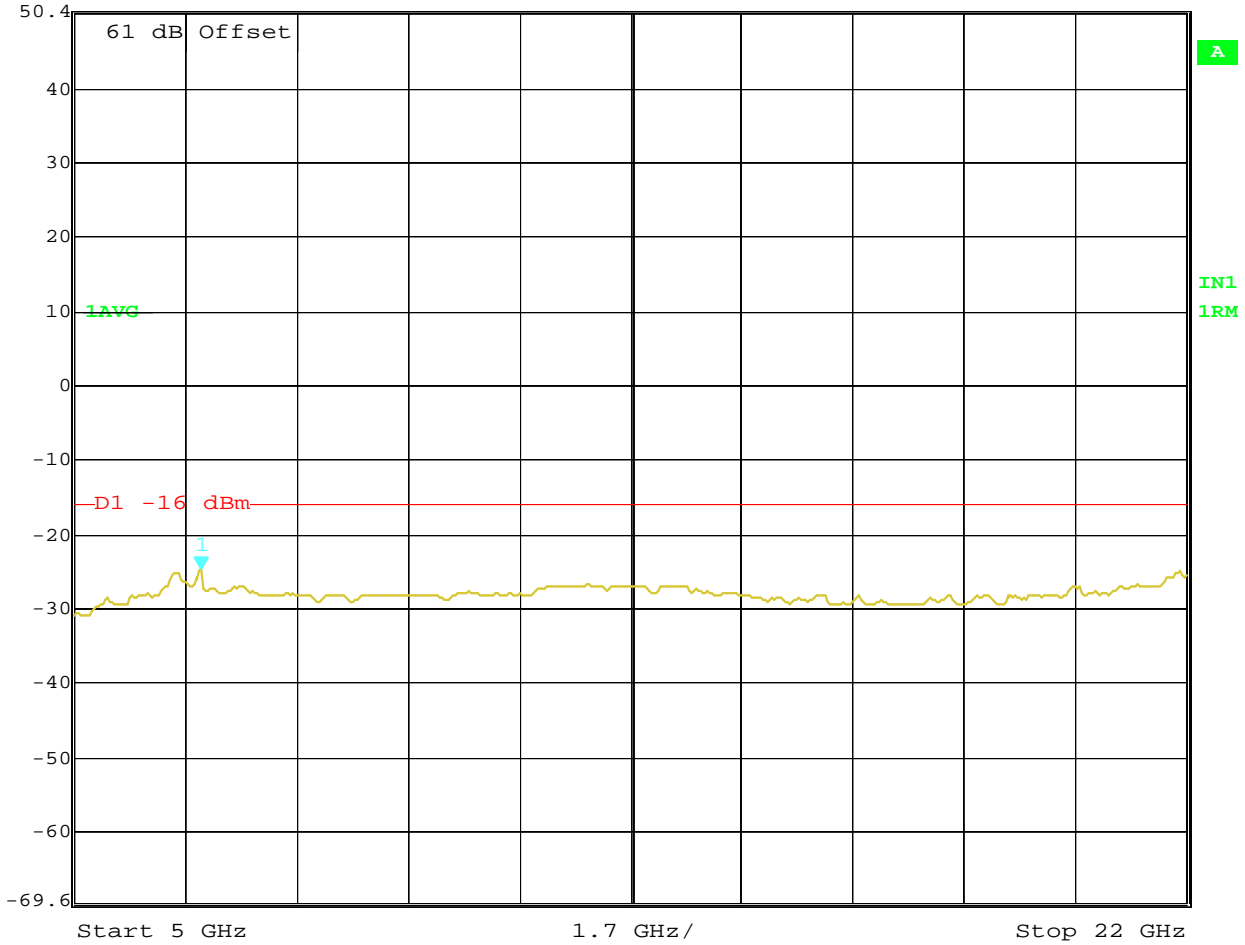
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -28.31 dBm VBW 3 MHz  
50.4 dBm 4.25450902 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 13:15:33



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.88 dBm VBW 3 MHz  
50.4 dBm 6.94188377 GHz SWT 170 ms Unit dBm



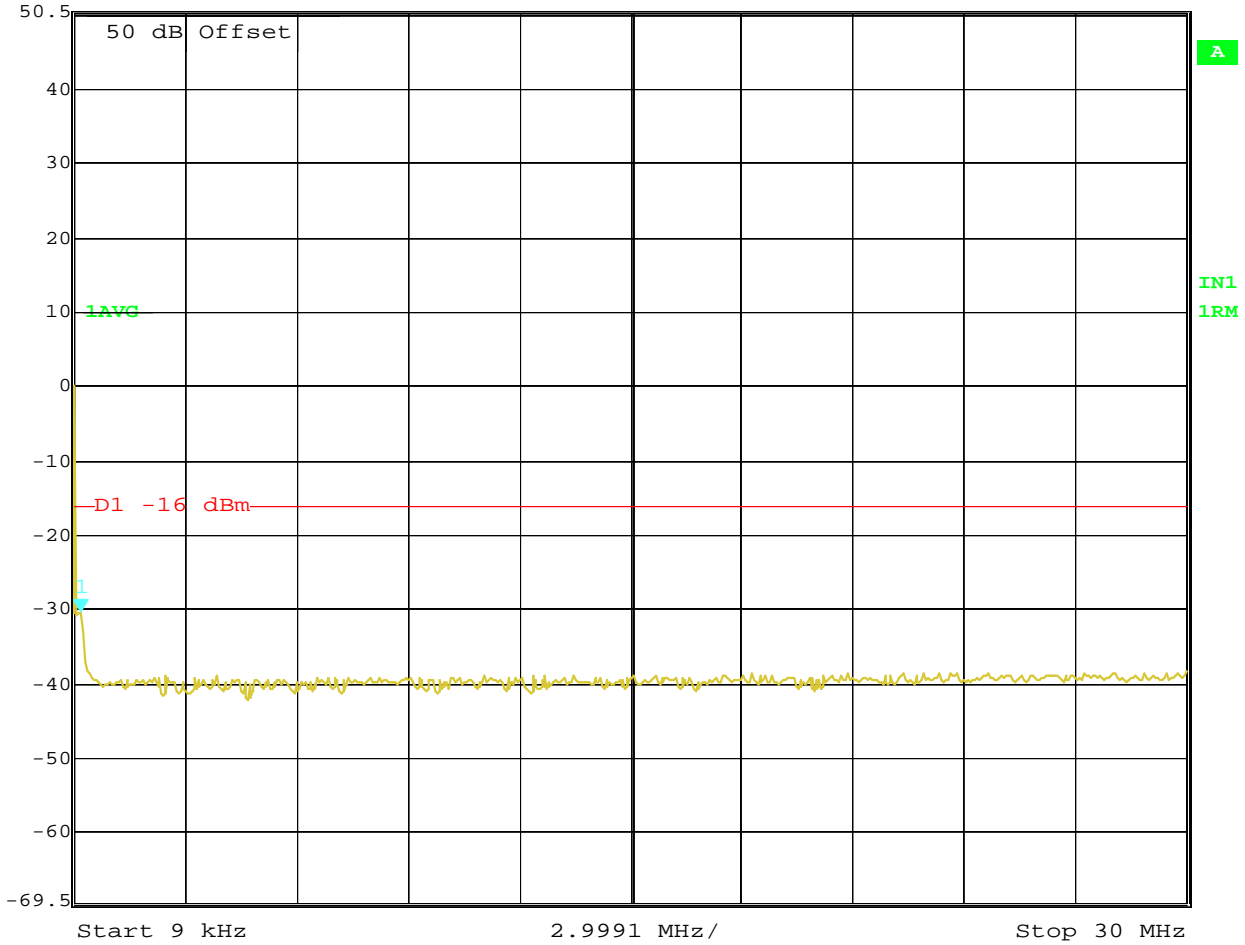
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
Date: 7.MAR.2014 13:18:27

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: B  
10 MHz Bandwidth (2120-2130 MHz)  
2x120 watts (MIMO)  
16QAM Modulation**



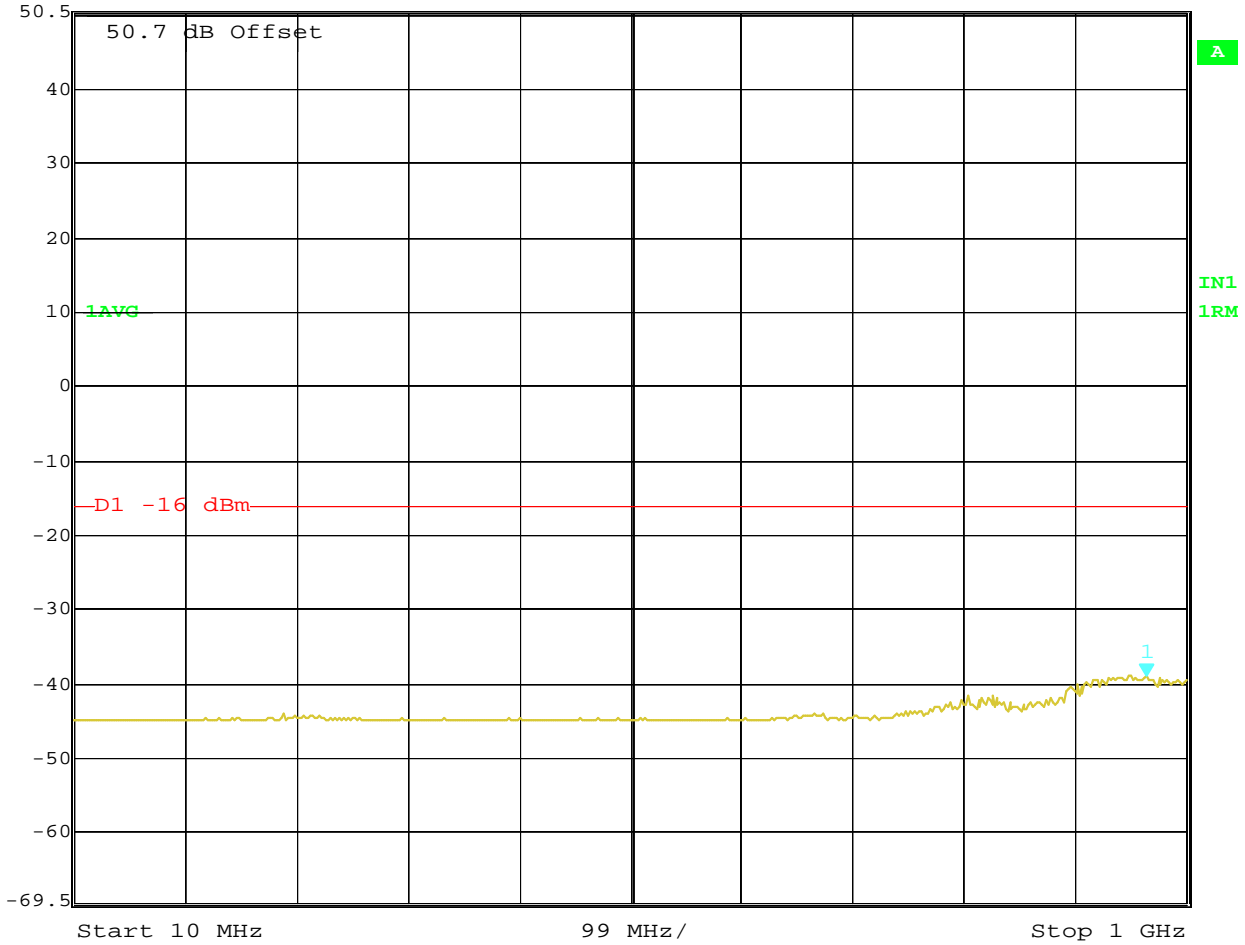
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -30.33 dBm VBW 30 kHz  
50.5 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 08:18:38



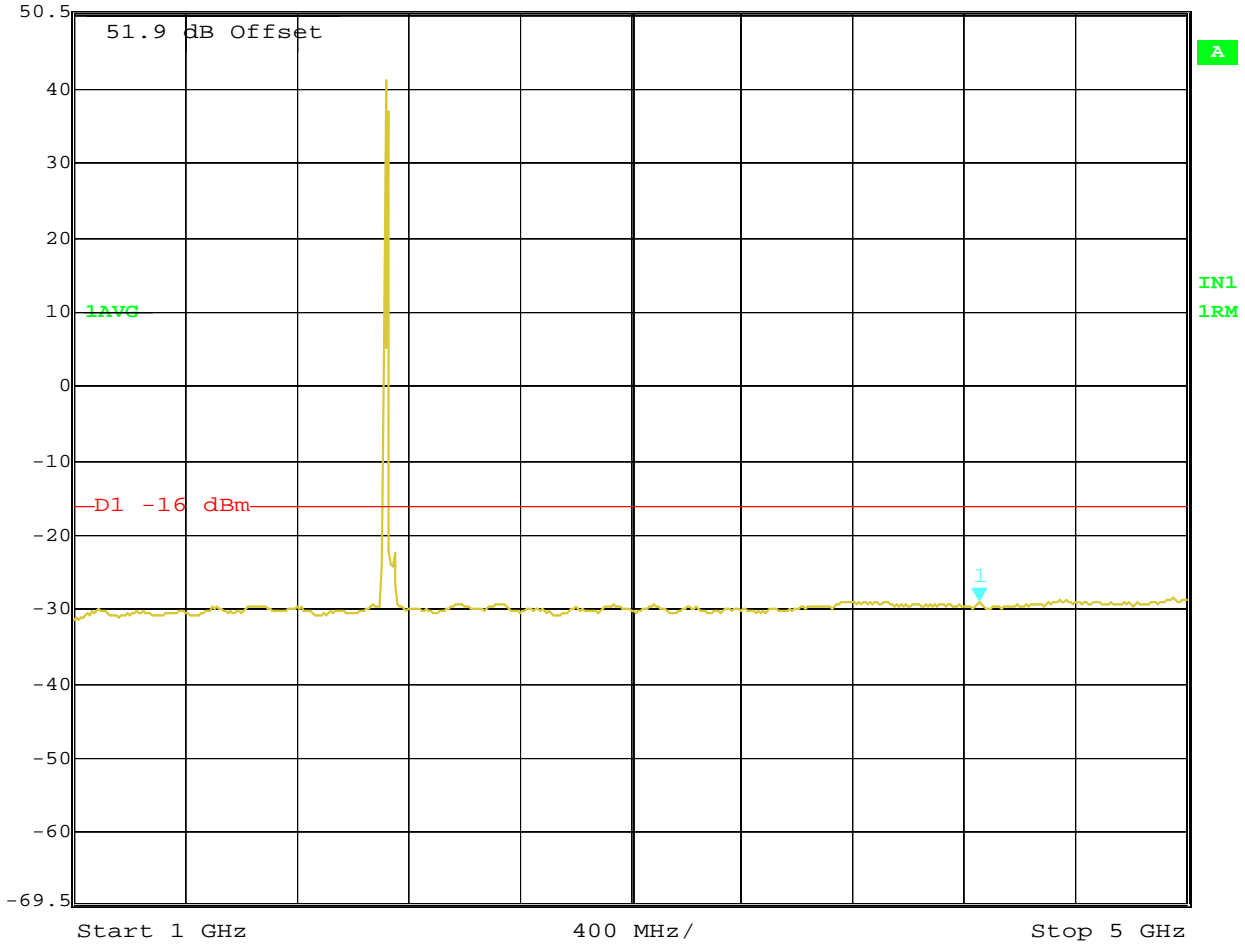
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.18 dBm VBW 300 kHz  
50.5 dBm 964.28857715 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 08:17:15



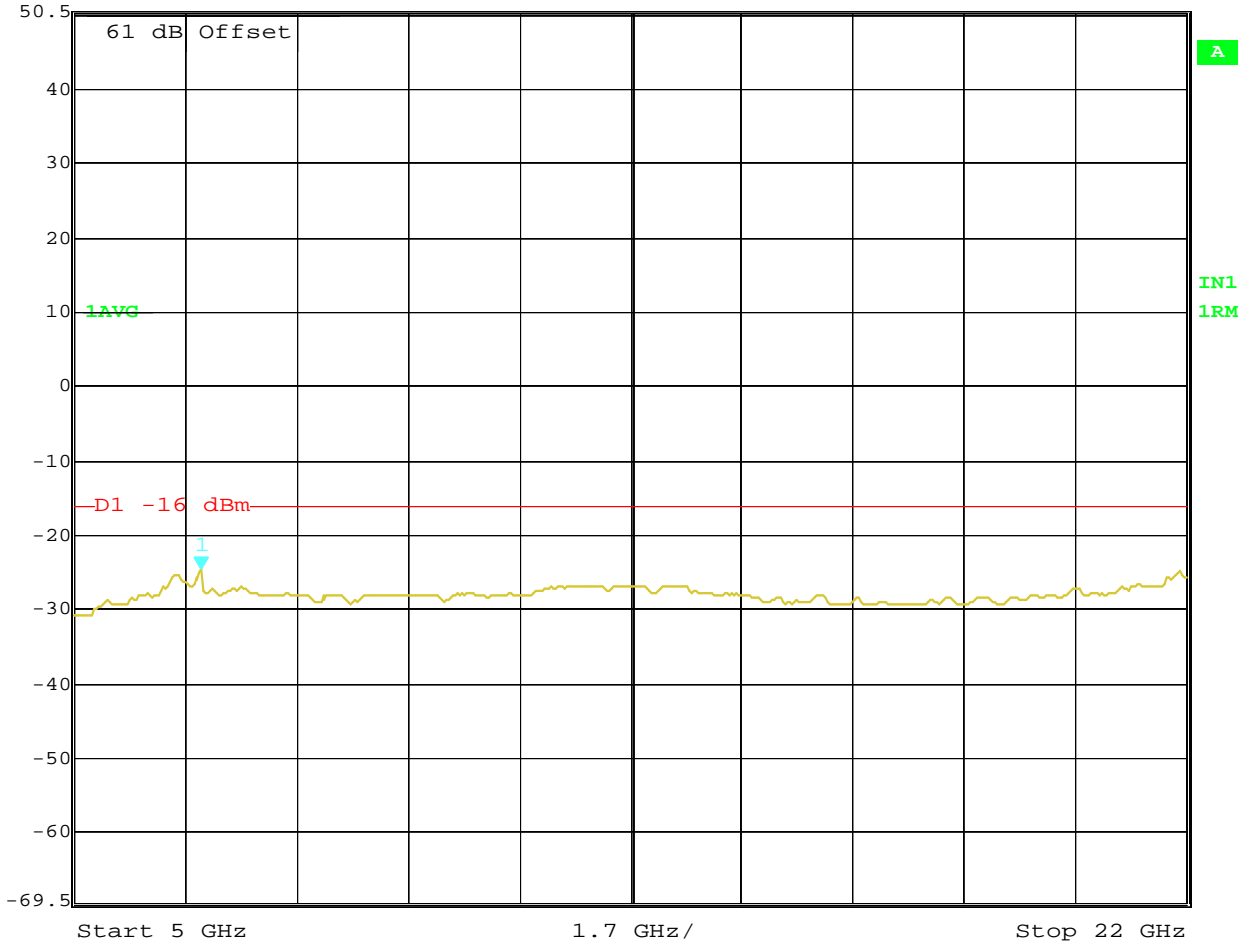
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -28.82 dBm VBW 3 MHz  
50.5 dBm 4.25450902 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 7.MAR.2014 08:13:49



	Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
Ref Lvl	-24.72 dBm	VBW	3 MHz		
50.5 dBm	6.94188377 GHz	SWT	170 ms	Unit	dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
 PWR:120W;16QAM; FCC PRT 27;FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
 Date: 7.MAR.2014 08:09:36

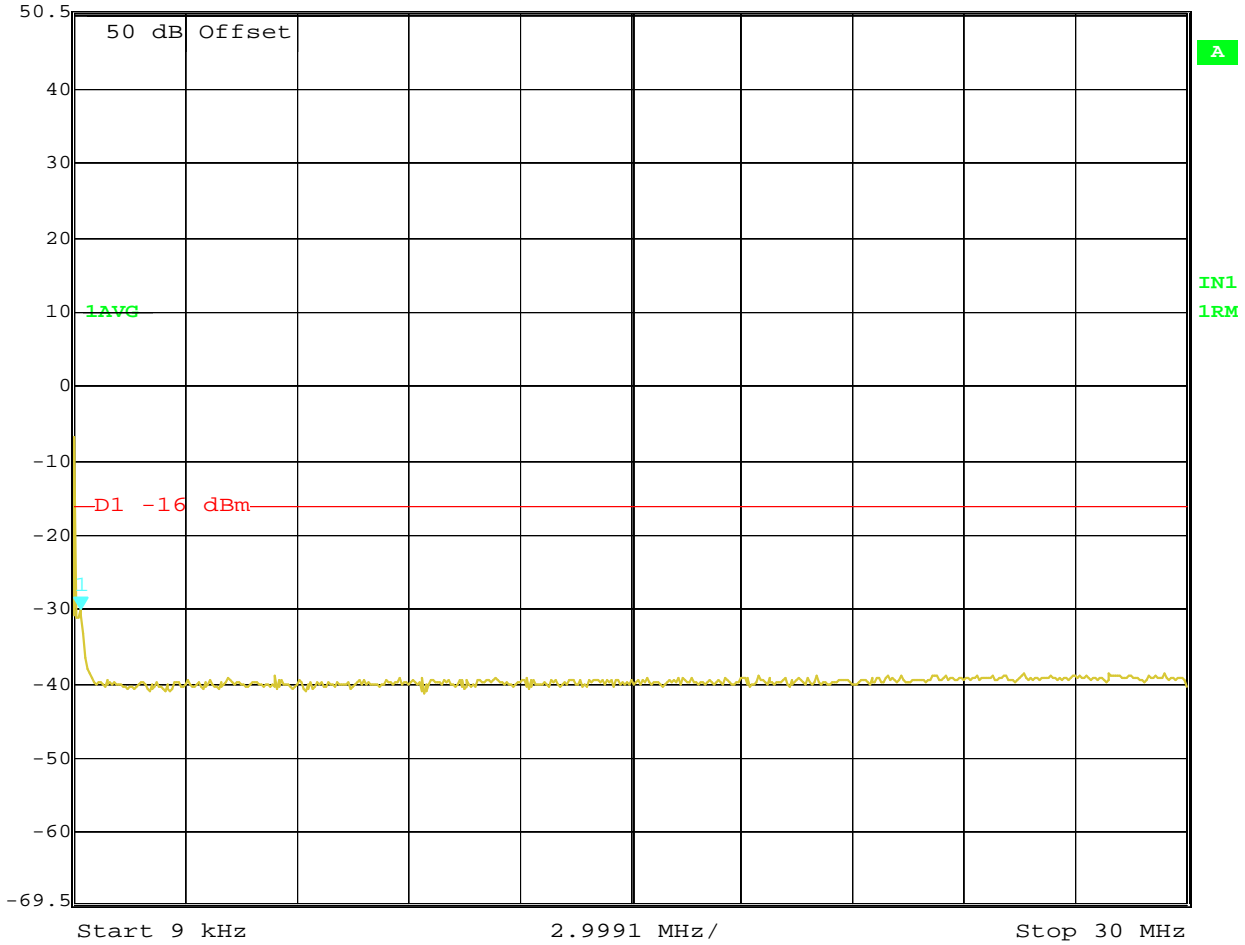
**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: B  
10 MHz Bandwidth (2120-2130 MHz)  
2x120 watts (MIMO)  
64QAM Modulation**





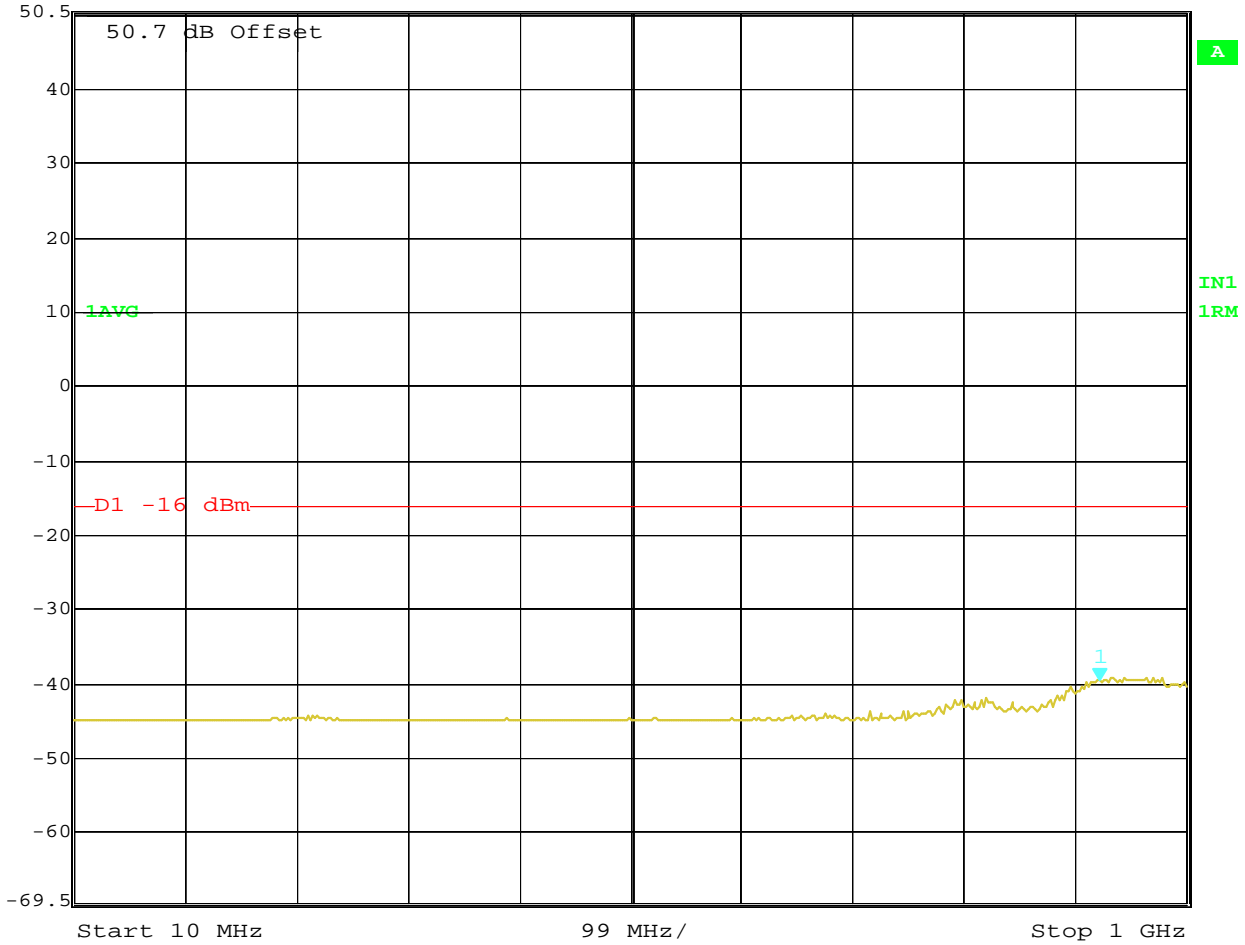
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -29.92 dBm VBW 30 kHz  
50.5 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 6.MAR.2014 14:44:28



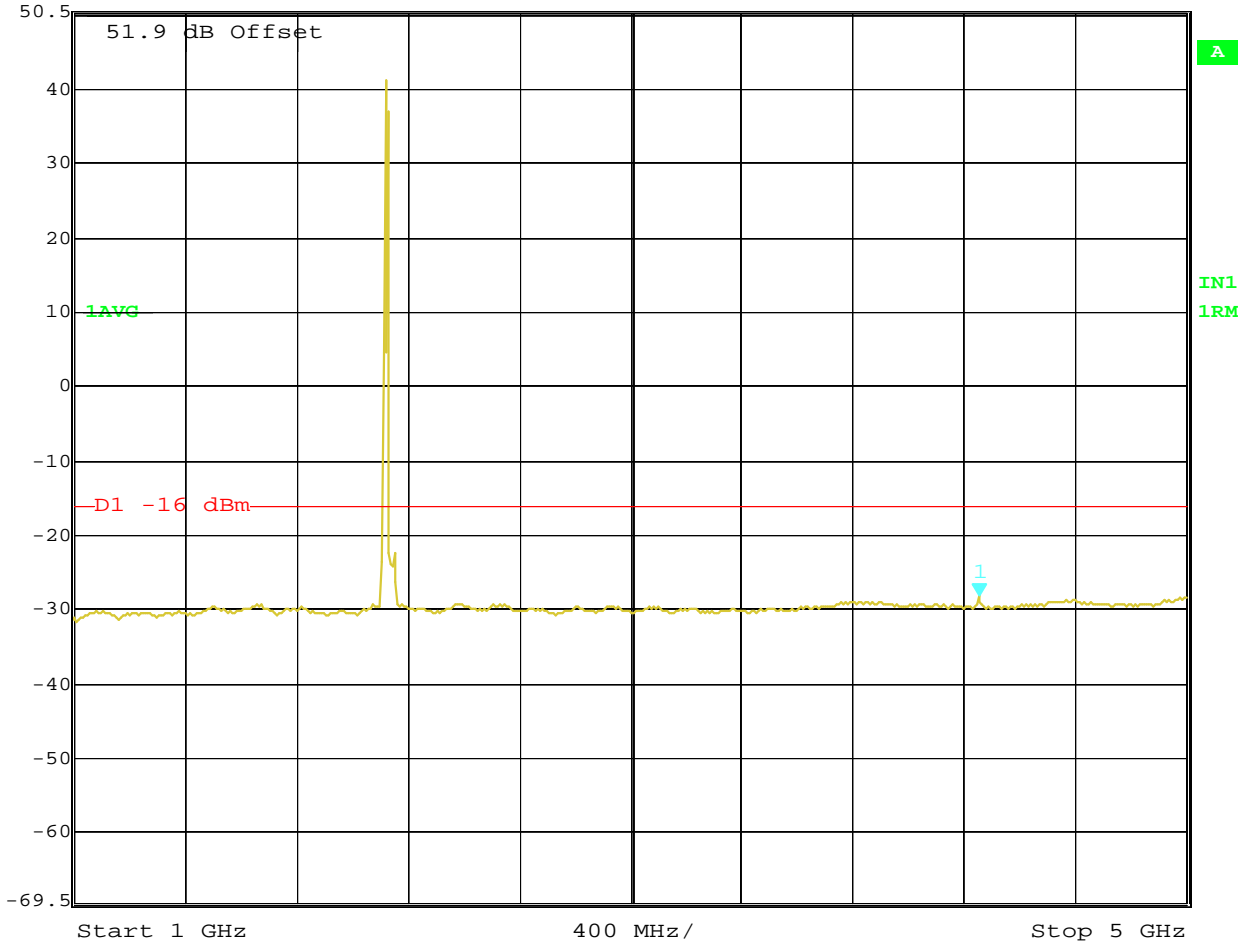
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.52 dBm VBW 300 kHz  
50.5 dBm 922.62525050 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 6.MAR.2014 14:46:23



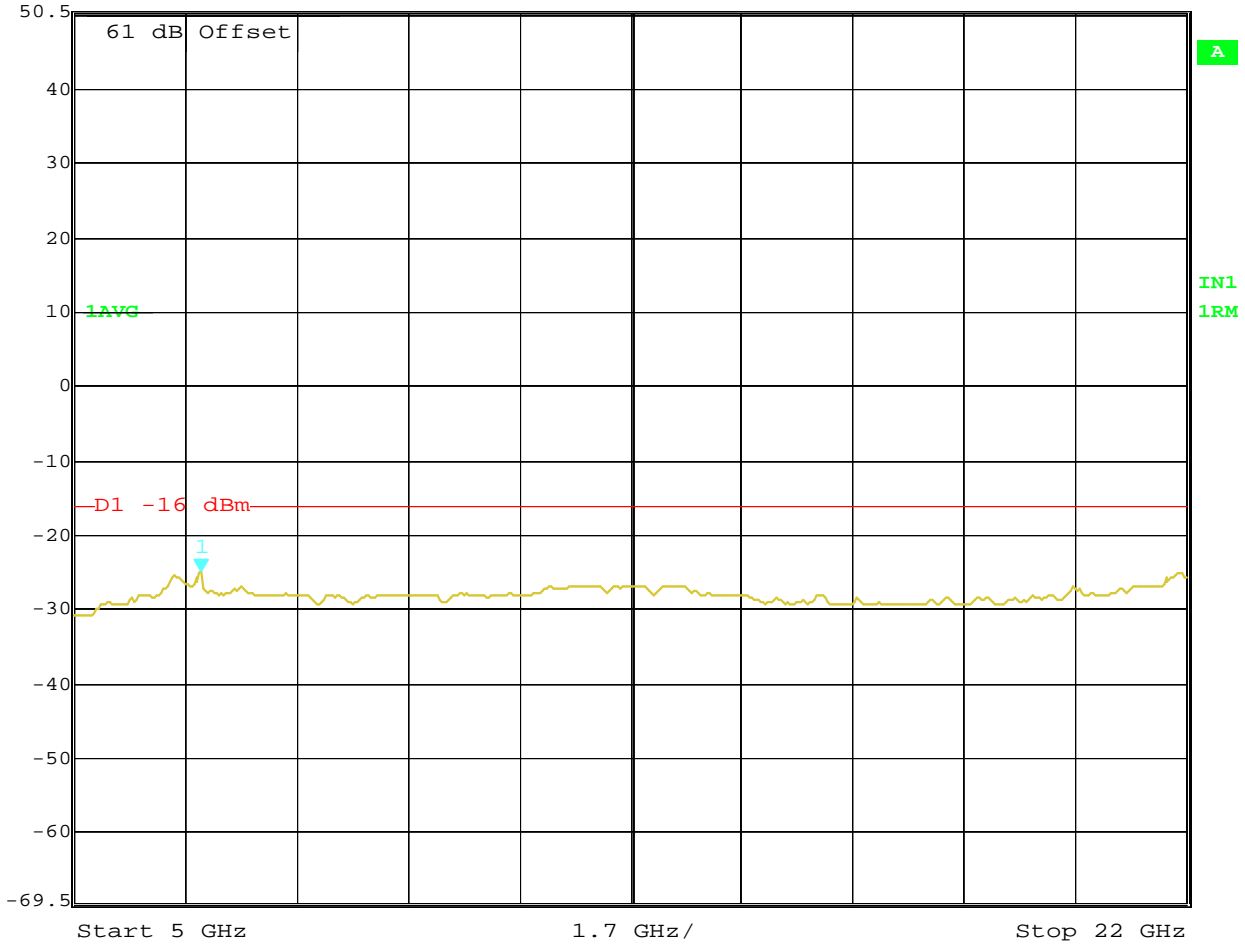
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -28.33 dBm VBW 3 MHz  
50.5 dBm 4.25450902 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 6.MAR.2014 14:47:40



	Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
Ref Lvl	-24.95 dBm	VBW	3 MHz		
50.5 dBm	6.94188377 GHz	SWT	170 ms	Unit	dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:B; 2125MHz  
 PWR:120W;64QAM; FCC PRT 27;FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
 Date: 6.MAR.2014 14:50:17

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: C+D  
10 MHz Bandwidth (2130 - 2140 MHz)  
2x120 watts (MIMO)  
QPSK Modulation**



Marker 1 [T1]

RBW 10 kHz RF Att 30 dB

Ref Lvl -29.87 dBm

VBW 30 kHz

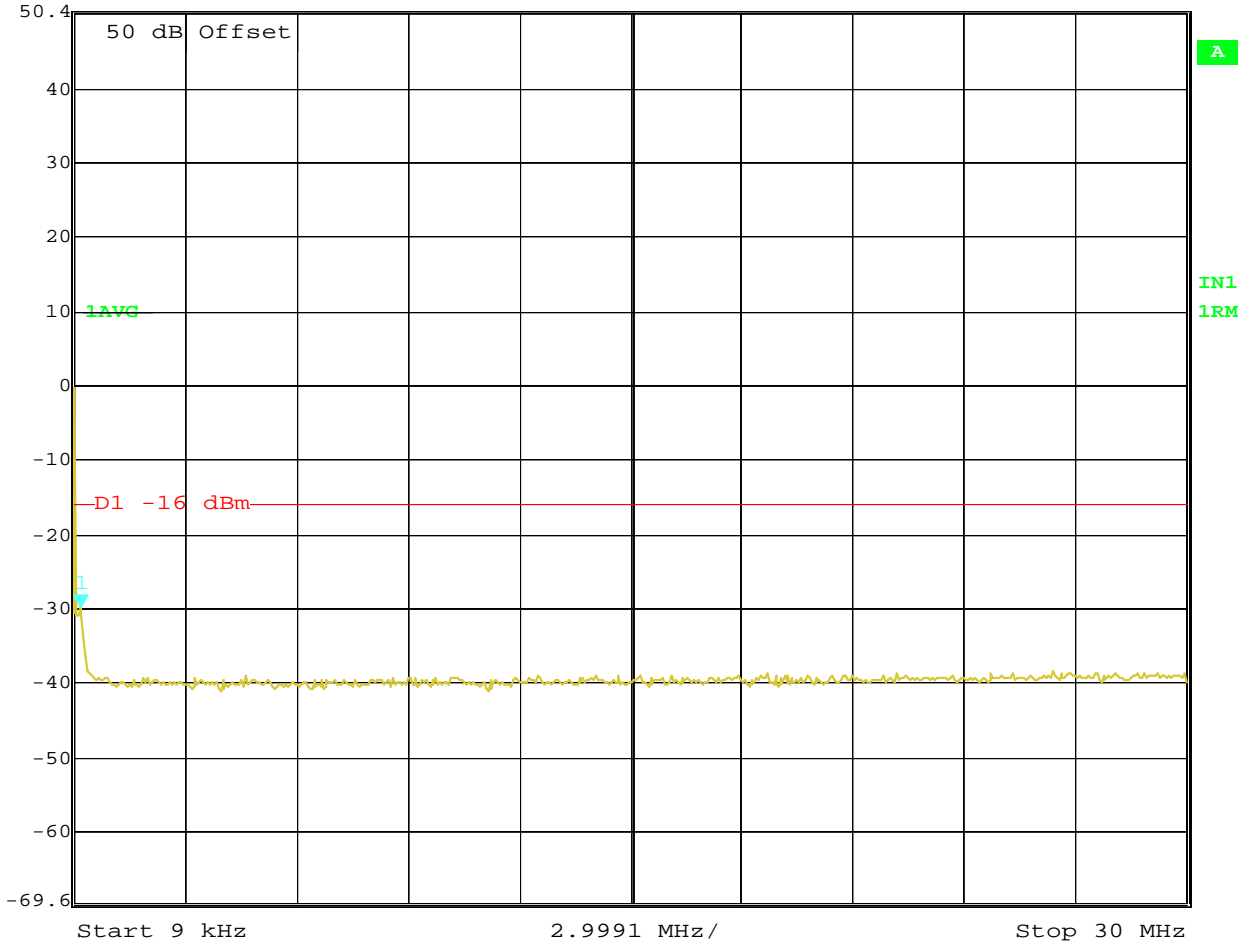
50.4 dBm

189.30661323 kHz

SWT 760 ms

Unit

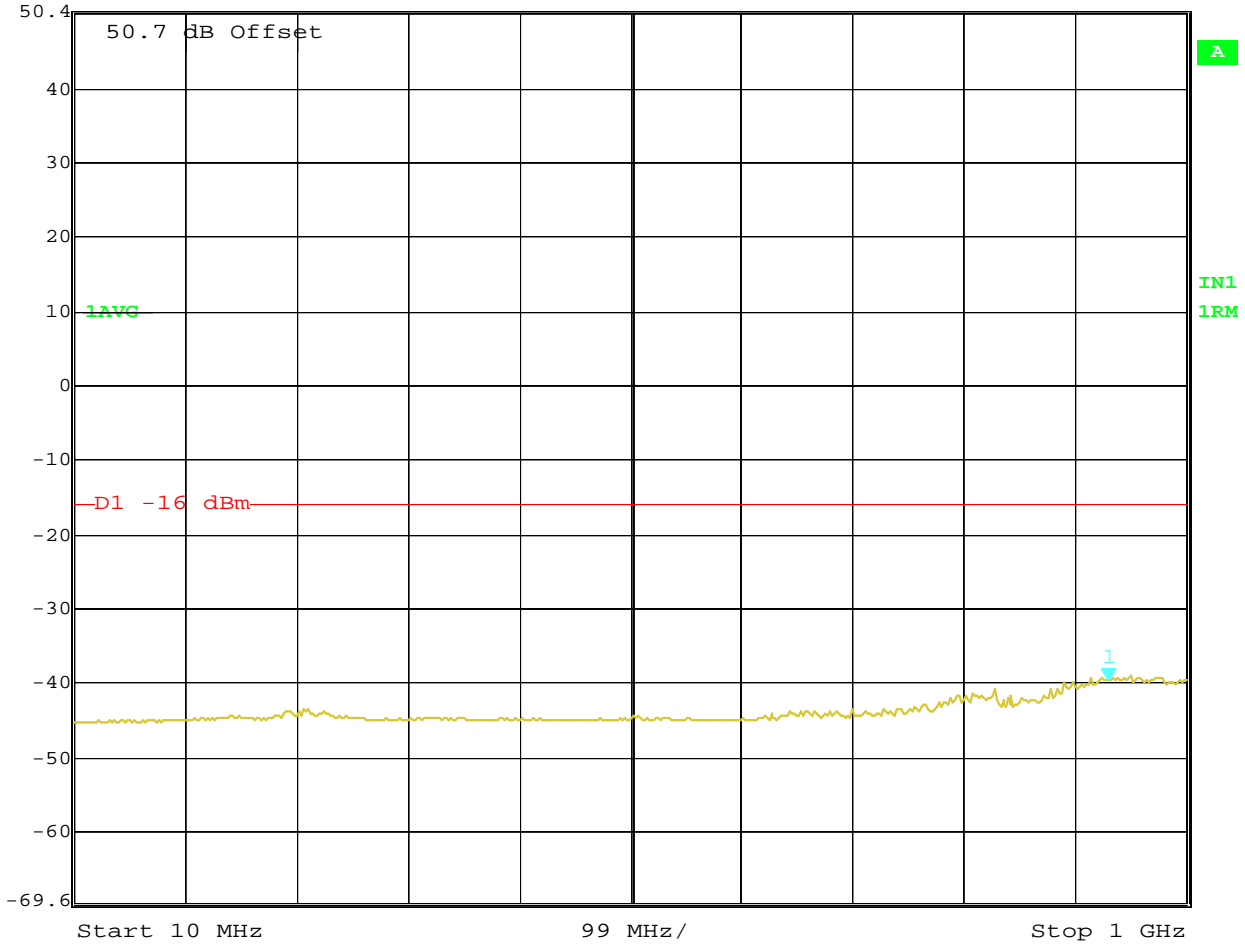
dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 7.MAR.2014 13:55:21



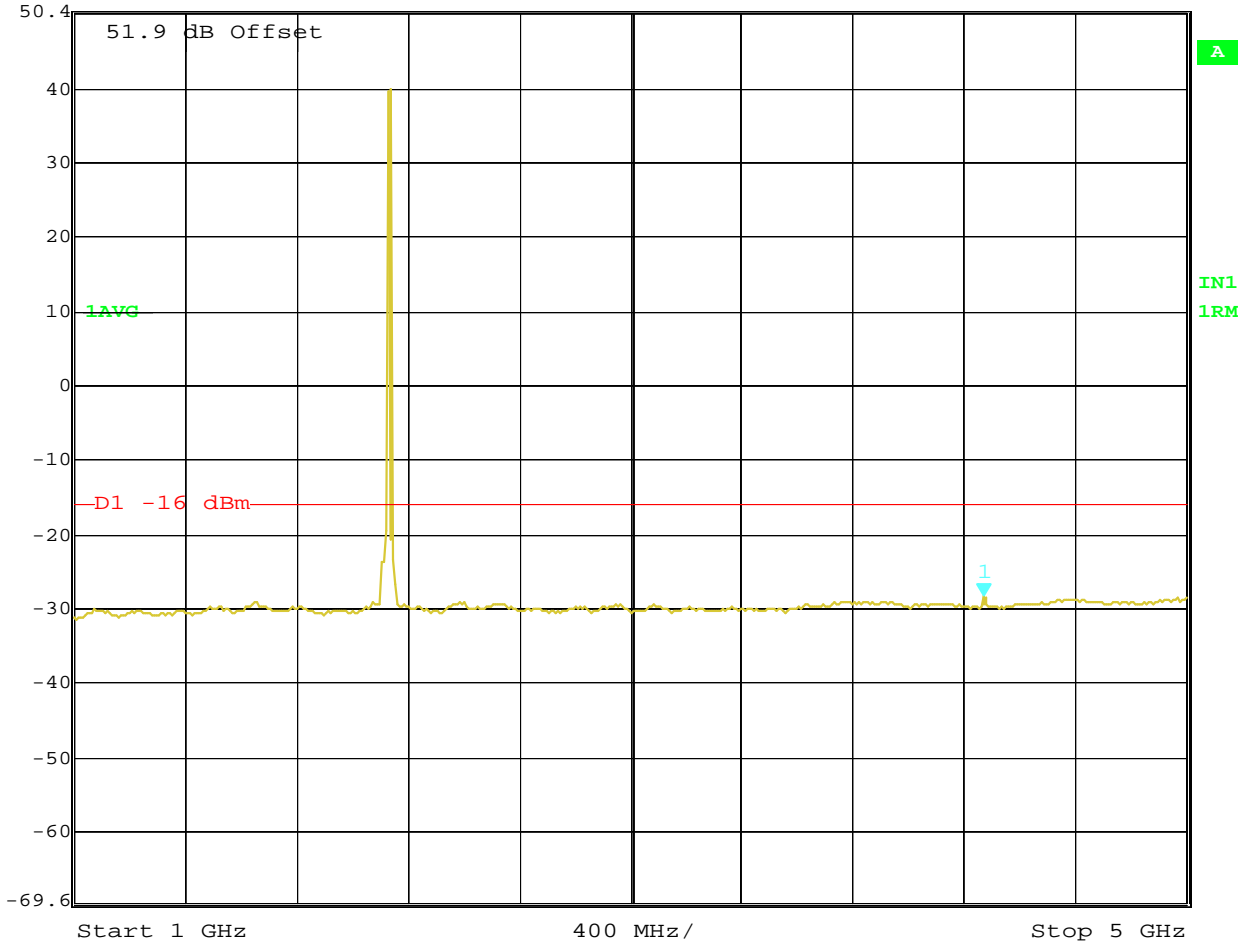
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.78 dBm VBW 300 kHz  
50.4 dBm 930.56112224 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 7.MAR.2014 13:53:53



Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -28.40 dBm VBW 3 MHz  
50.4 dBm 4.27054108 GHz SWT 10 ms Unit dBm

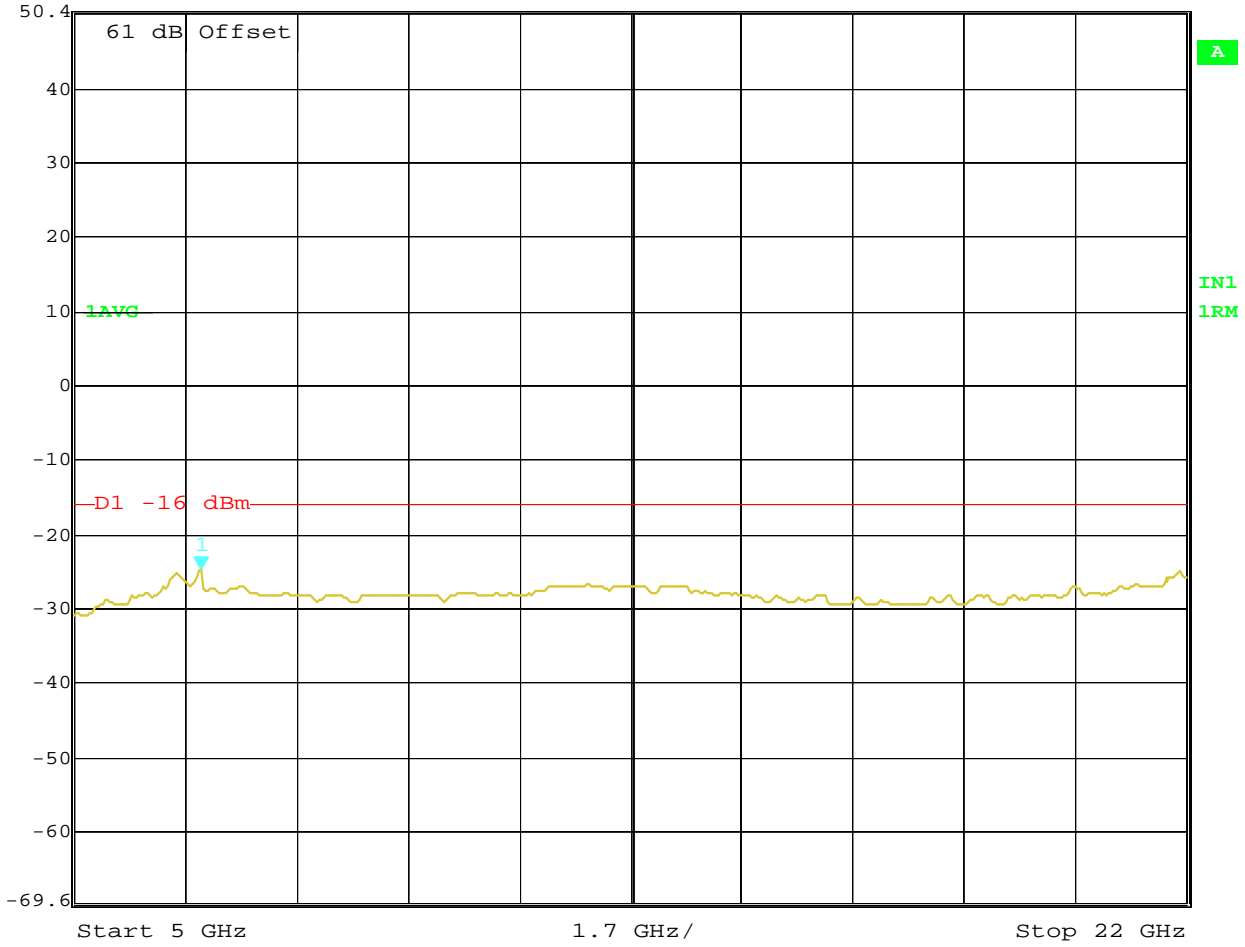


Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 7.MAR.2014 13:52:15





Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.77 dBm VBW 3 MHz  
50.4 dBm 6.94188377 GHz SWT 170 ms Unit dBm



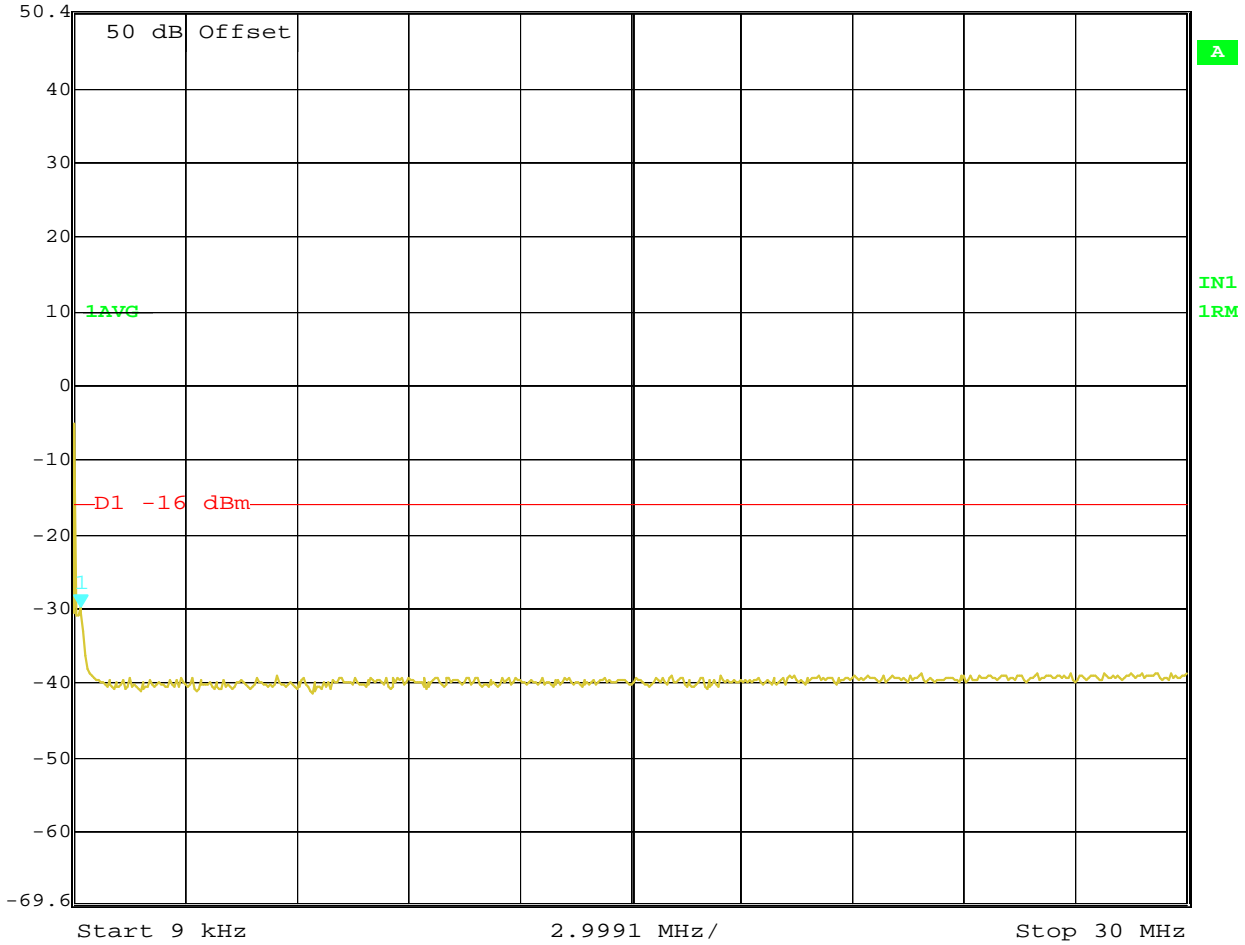
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
Date: 7.MAR.2014 13:49:42

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: C+D  
10 MHz Bandwidth (2130 - 2140 MHz)  
2x120 watts (MIMO)  
16QAM Modulation**



Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -29.95 dBm VBW 30 kHz  
50.4 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 10.MAR.2014 08:08:31



Marker 1 [T1]

RBW 100 kHz RF Att 10 dB

Ref Lvl -39.58 dBm

VBW 300 kHz

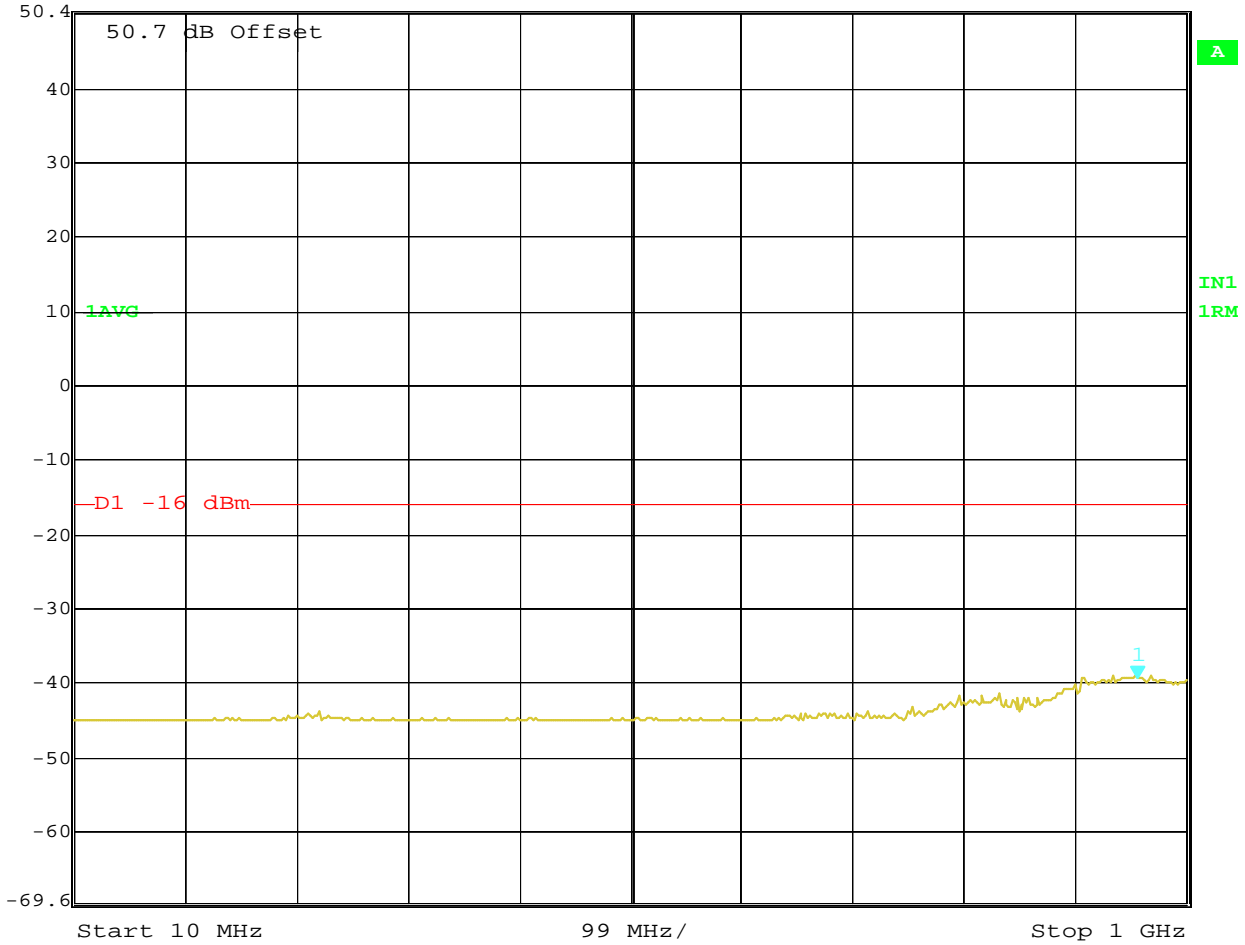
50.4 dBm

956.35270541 MHz

SWT 250 ms

Unit

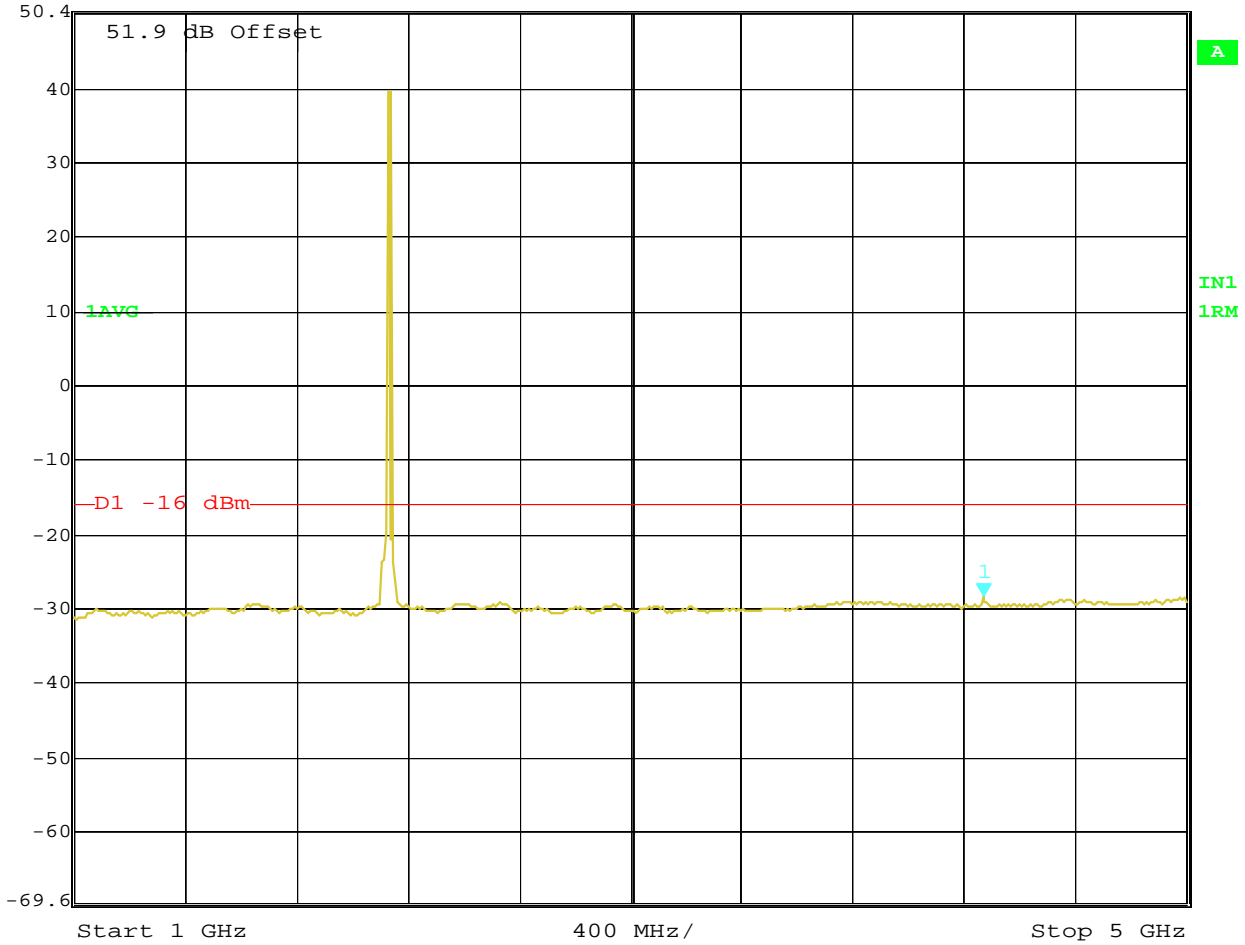
dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 10.MAR.2014 08:09:49



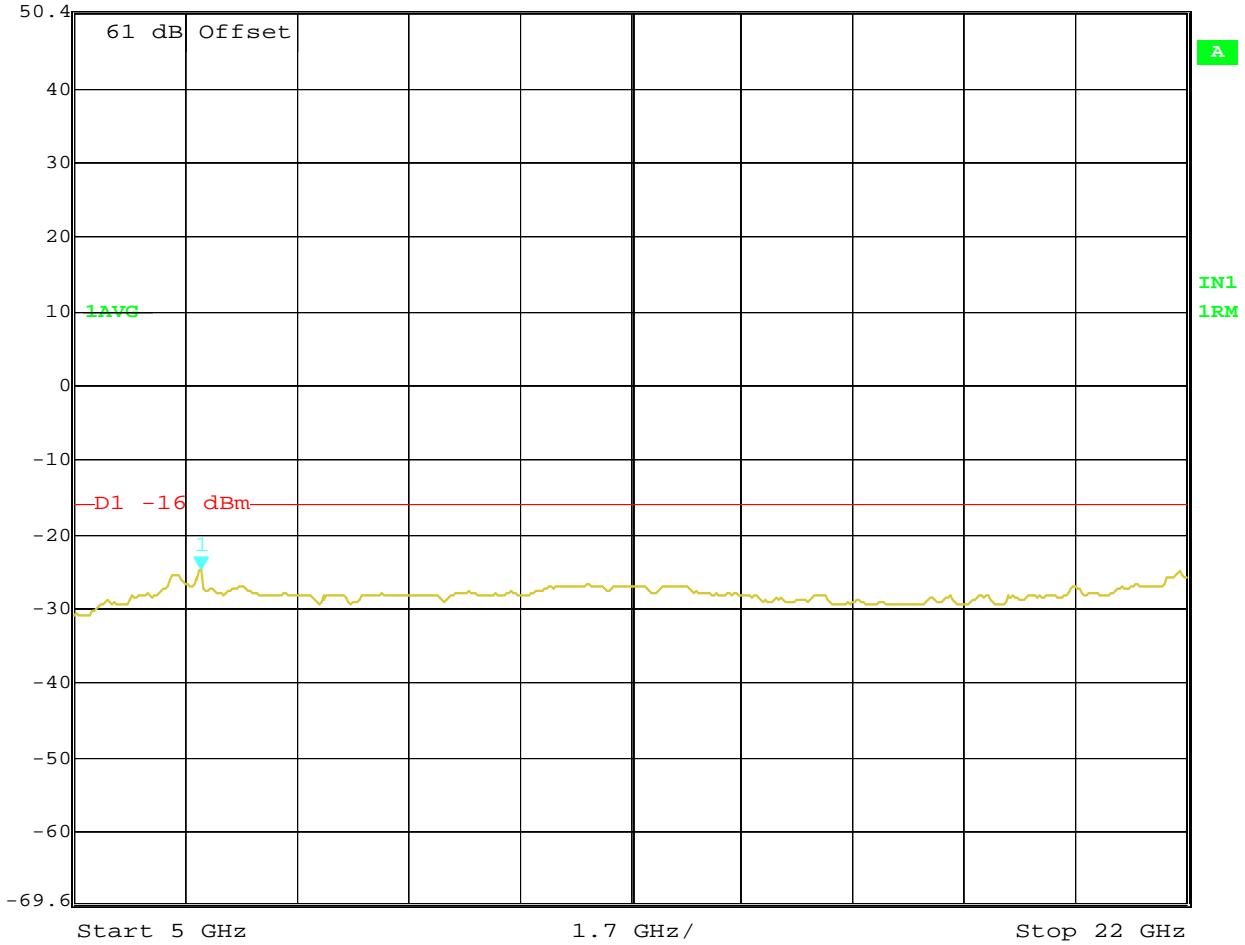
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -28.23 dBm VBW 3 MHz  
50.4 dBm 4.27054108 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 10.MAR.2014 08:11:05



Ref Lvl	50.4 dBm	Marker 1 [T1]	-24.88 dBm	RBW	1 MHz	RF Att	0 dB
			6.94188377 GHz	VBW	3 MHz	Unit	
				SWT	170 ms		dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG;HP  
Date: 10.MAR.2014 08:13:35

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: C+D  
10 MHz Bandwidth (2130 - 2140 MHz)  
2x120 watts (MIMO)  
64QAM Modulation**



Marker 1 [T1]

RBW 10 kHz RF Att 30 dB

Ref Lvl -29.79 dBm

VBW 30 kHz

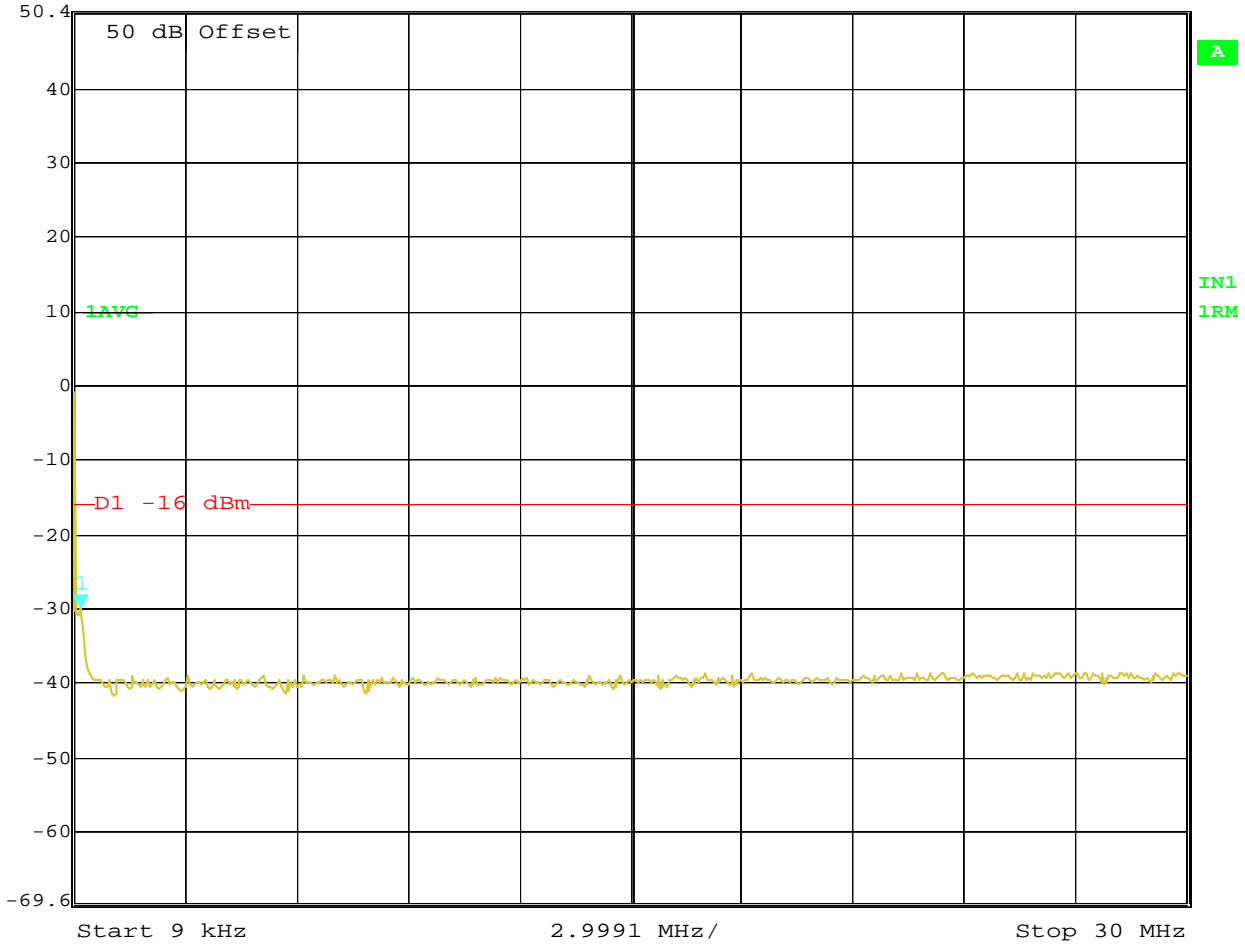
50.4 dBm

189.30661323 kHz

SWT 760 ms

Unit

dBm

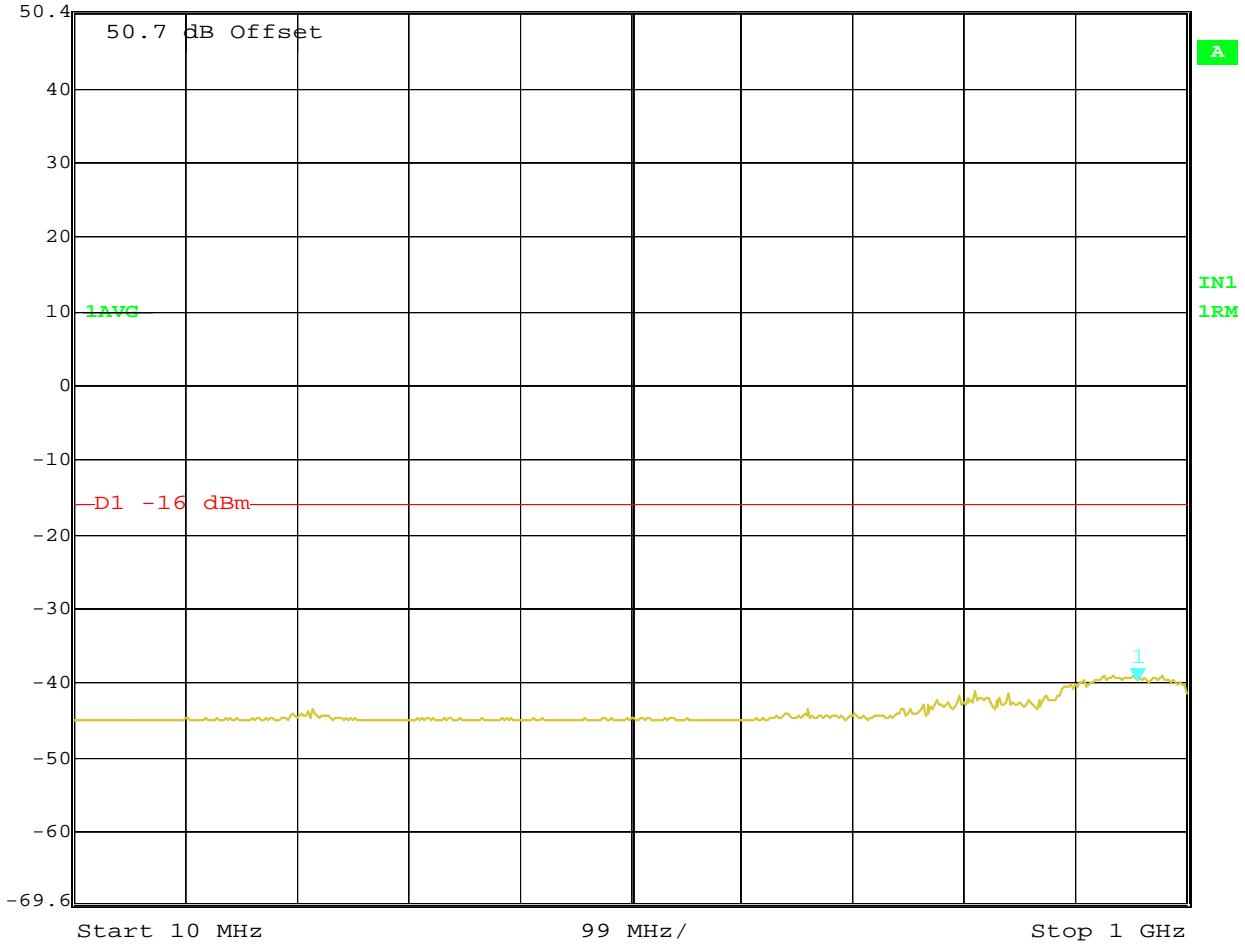


Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 08:41:57





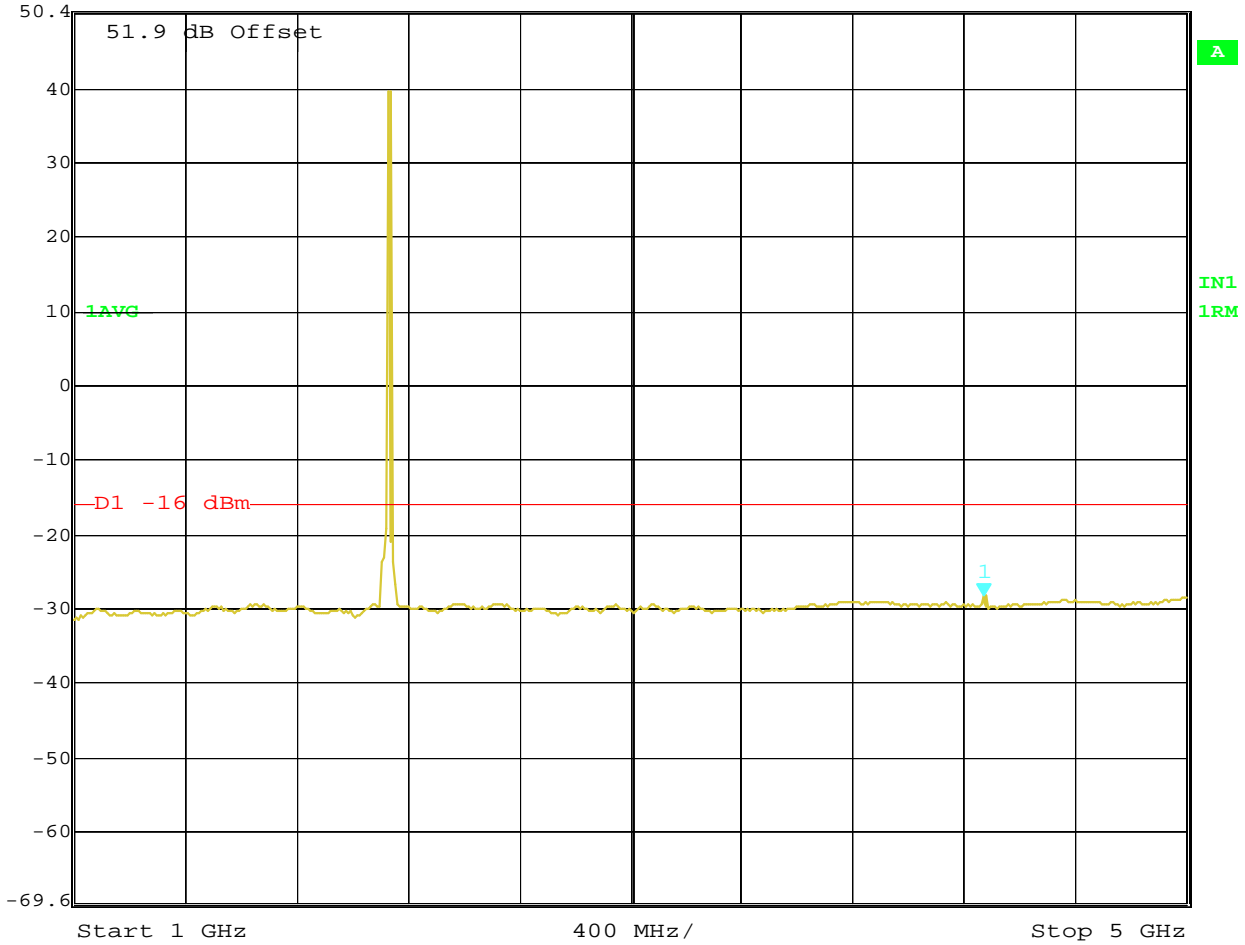
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.70 dBm VBW 300 kHz  
50.4 dBm 956.35270541 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 08:40:39



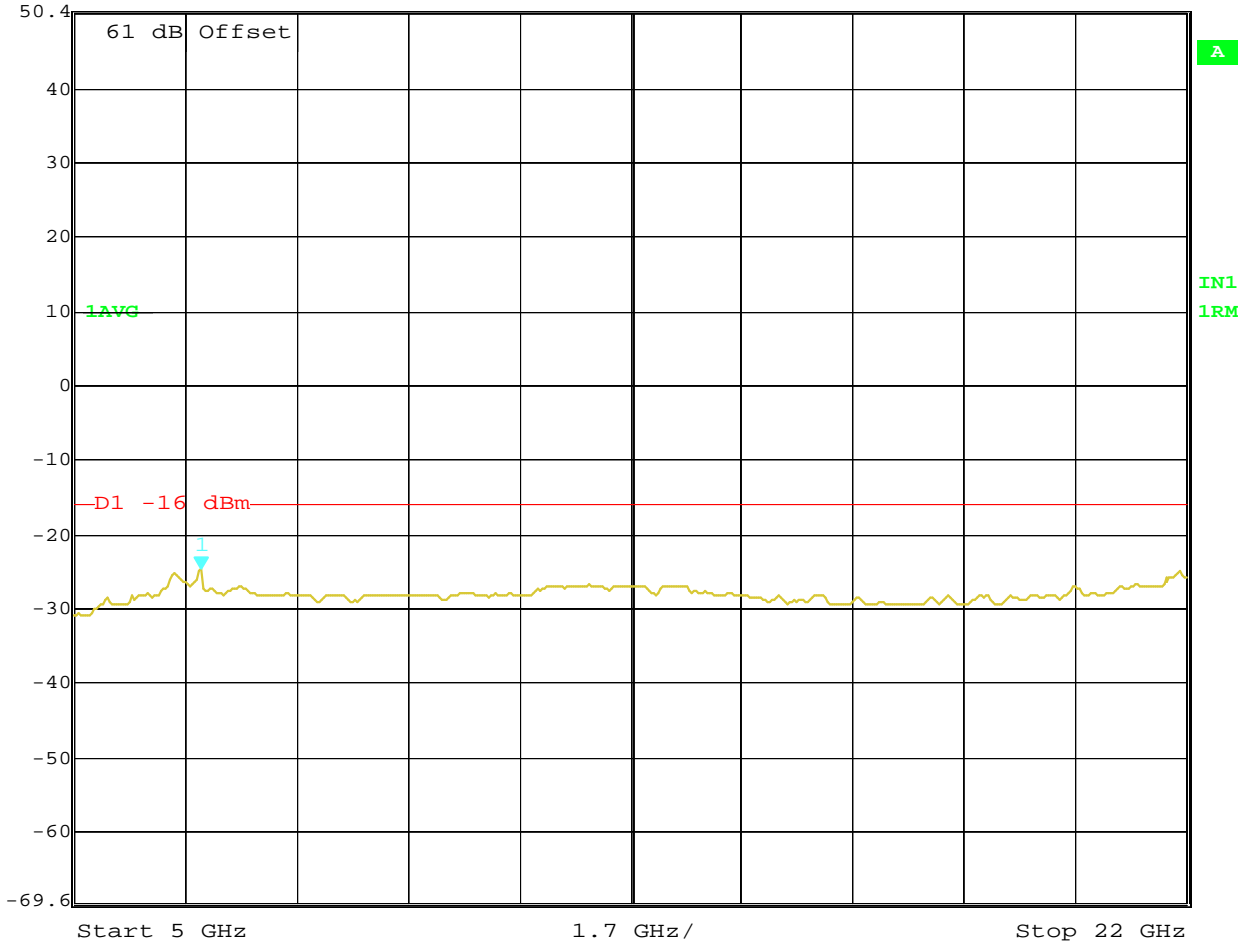
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -28.28 dBm VBW 3 MHz  
50.4 dBm 4.27054108 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 08:39:22



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.66 dBm VBW 3 MHz  
50.4 dBm 6.94188377 GHz SWT 170 ms Unit dBm



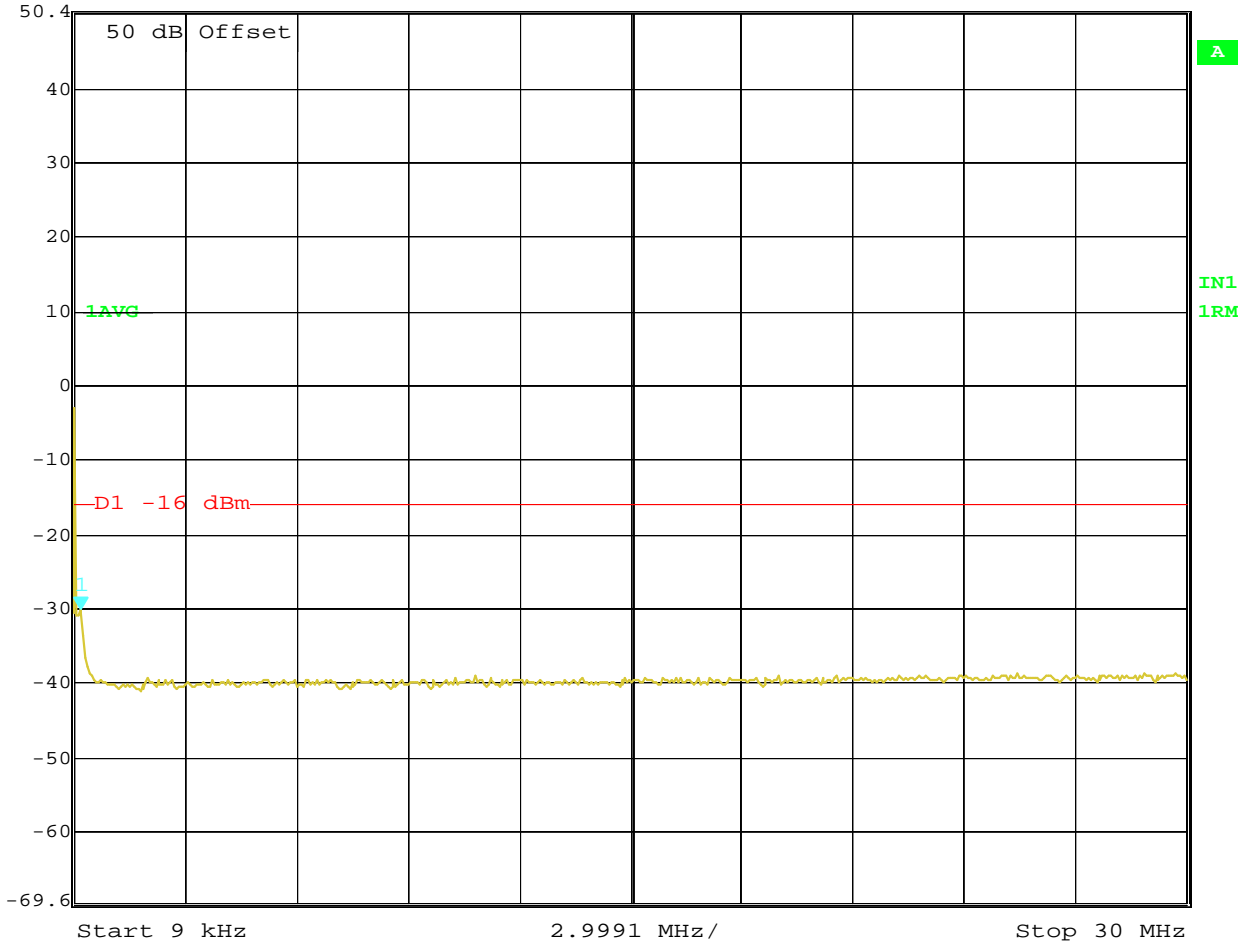
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:C+D; 2135MHz  
PWR:120W;64QAM; FCC PRT 27;FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
Date: 10.MAR.2014 08:35:40

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: D+E  
10 MHz Bandwidth (2135 - 2145 MHz)  
2x120watts (MIMO)  
QPSK Modulation**



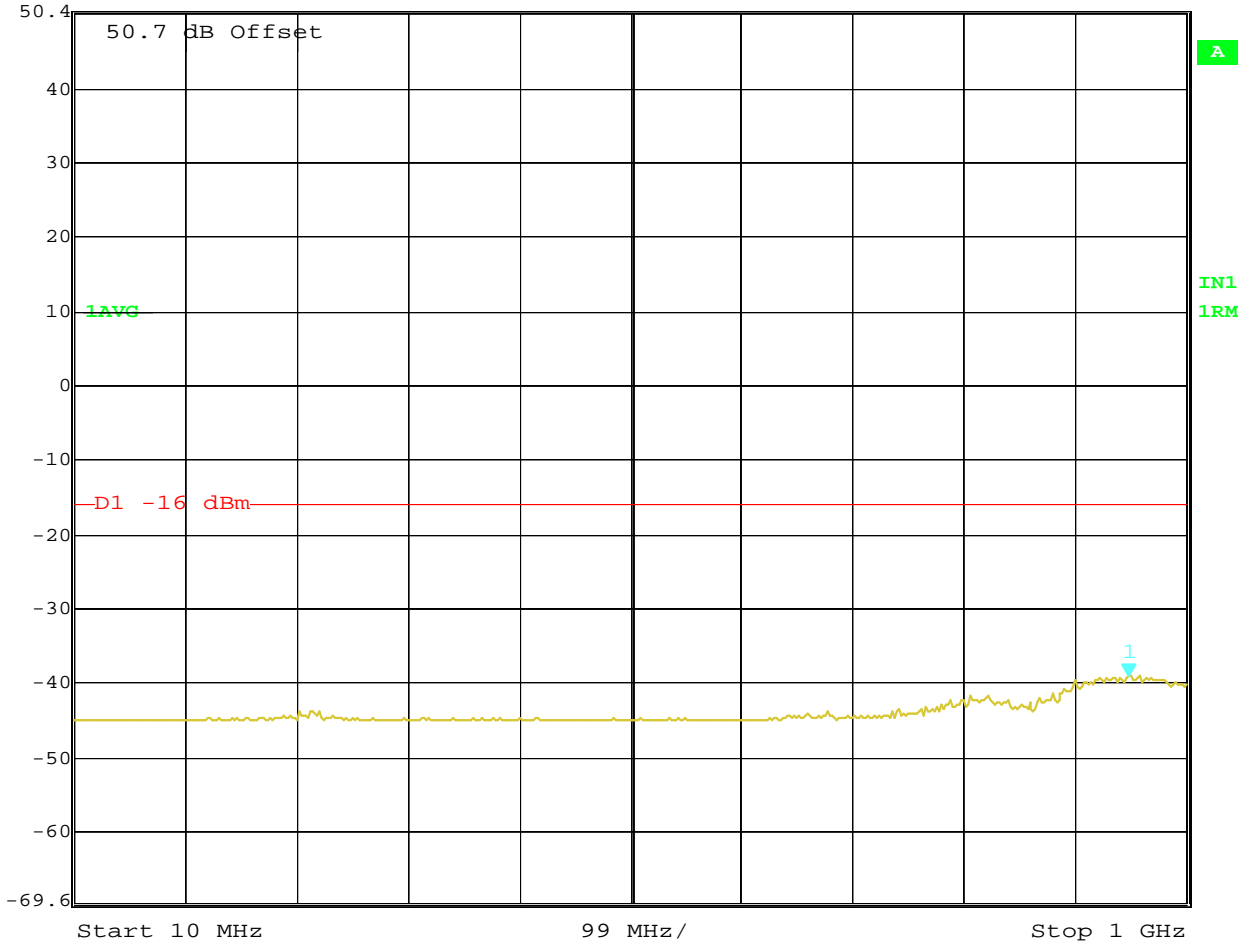
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -30.00 dBm VBW 30 kHz  
50.4 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 11:56:55



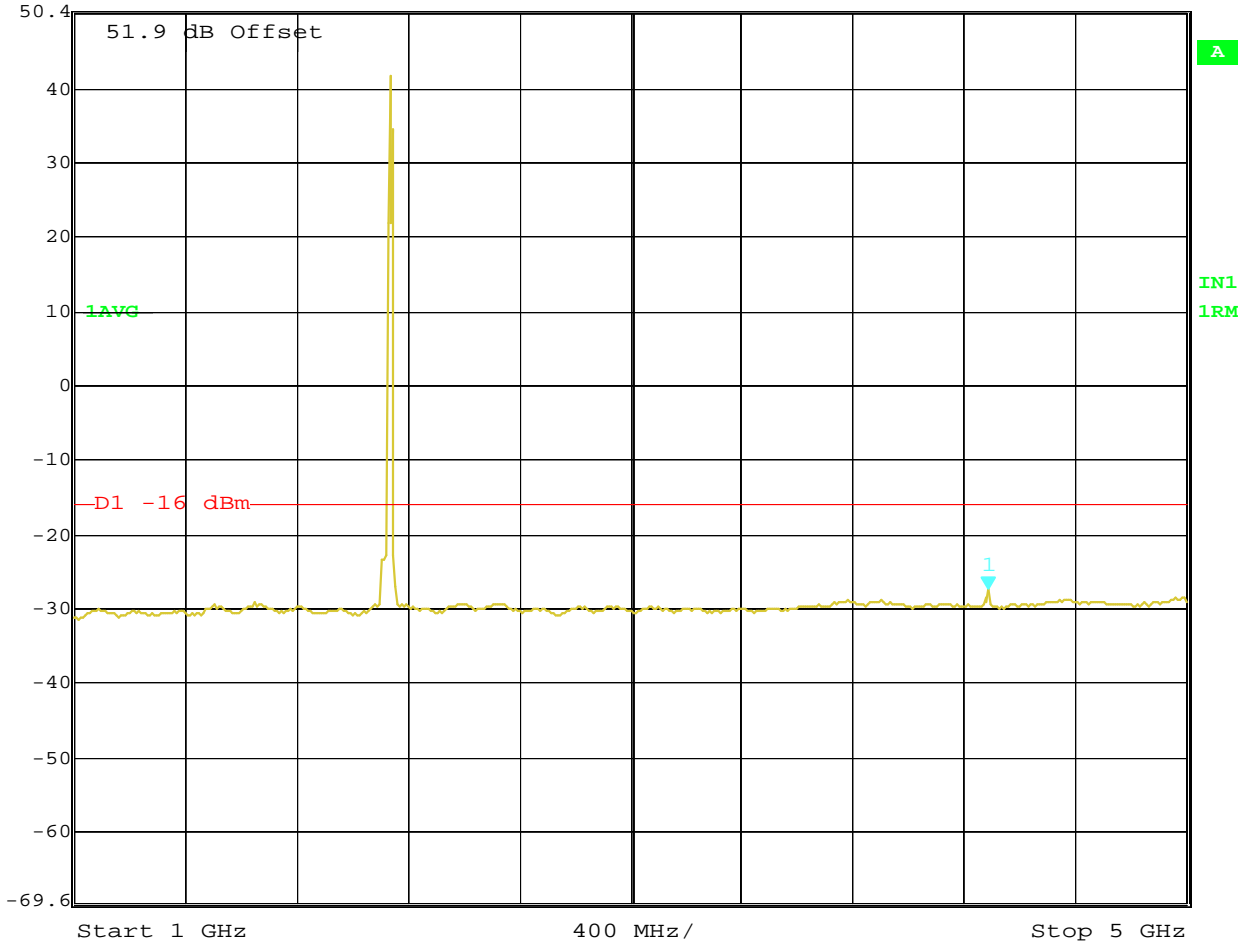
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.14 dBm VBW 300 kHz  
50.4 dBm 948.41683367 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 11:58:14



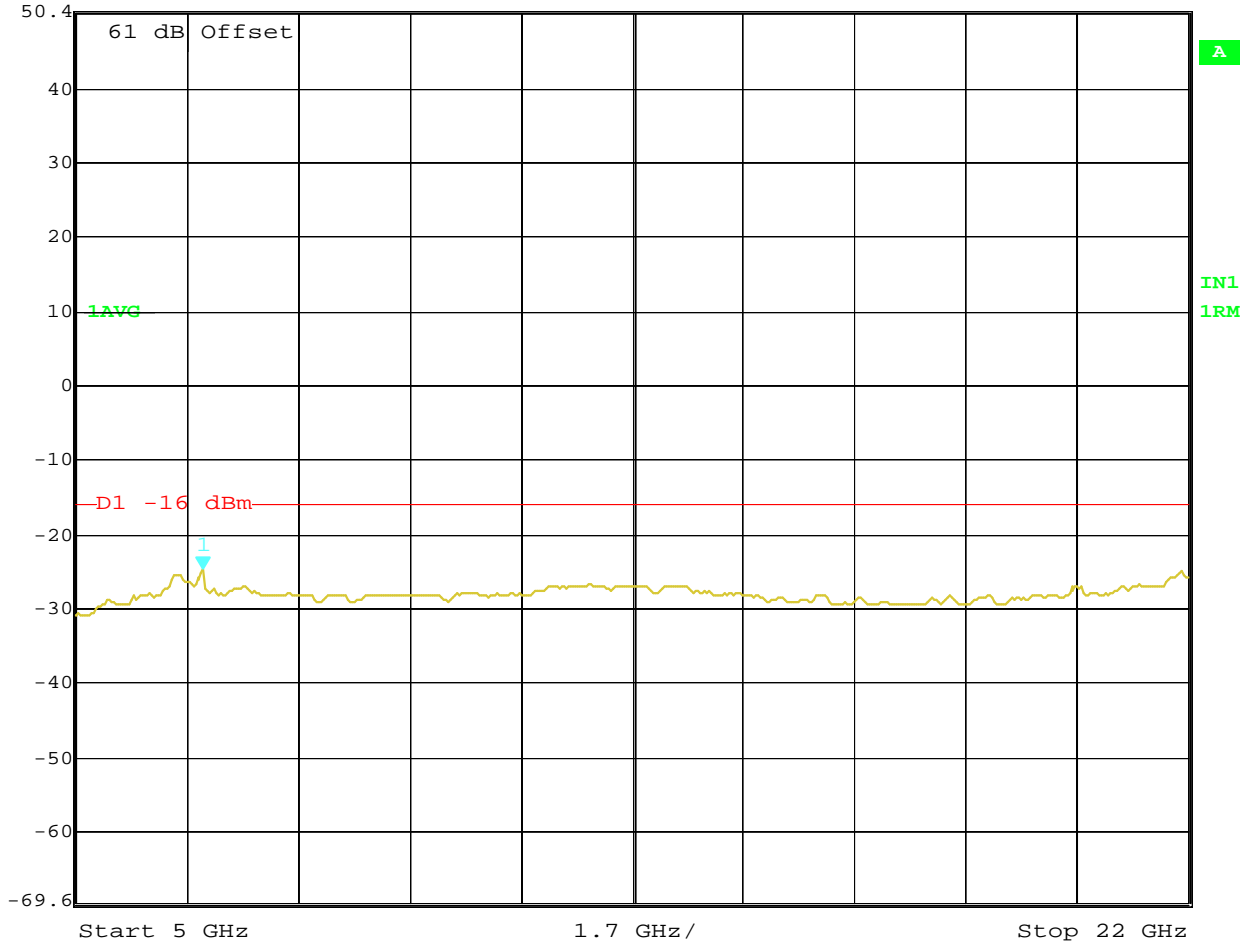
Ref Lvl	50.4 dBm	Marker 1 [T1]	-27.58 dBm	RBW	1 MHz	RF Att	10 dB
			4.28657315 GHz	VBW	3 MHz		
				SWT	10 ms	Unit	dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 11:59:55



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.86 dBm VBW 3 MHz  
50.4 dBm 6.94188377 GHz SWT 170 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;QPSK;FCC PRT 27;FCCID:AS5BBTRX-13; CLS II CHNG;HPF  
Date: 10.MAR.2014 12:02:31



**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: D+E  
10 MHz Bandwidth (2135 - 2145 MHz)  
2x120watts (MIMO)  
16QAM Modulation**



Marker 1 [T1]

RBW 10 kHz RF Att 30 dB

Ref Lvl -30.14 dBm

VBW 30 kHz

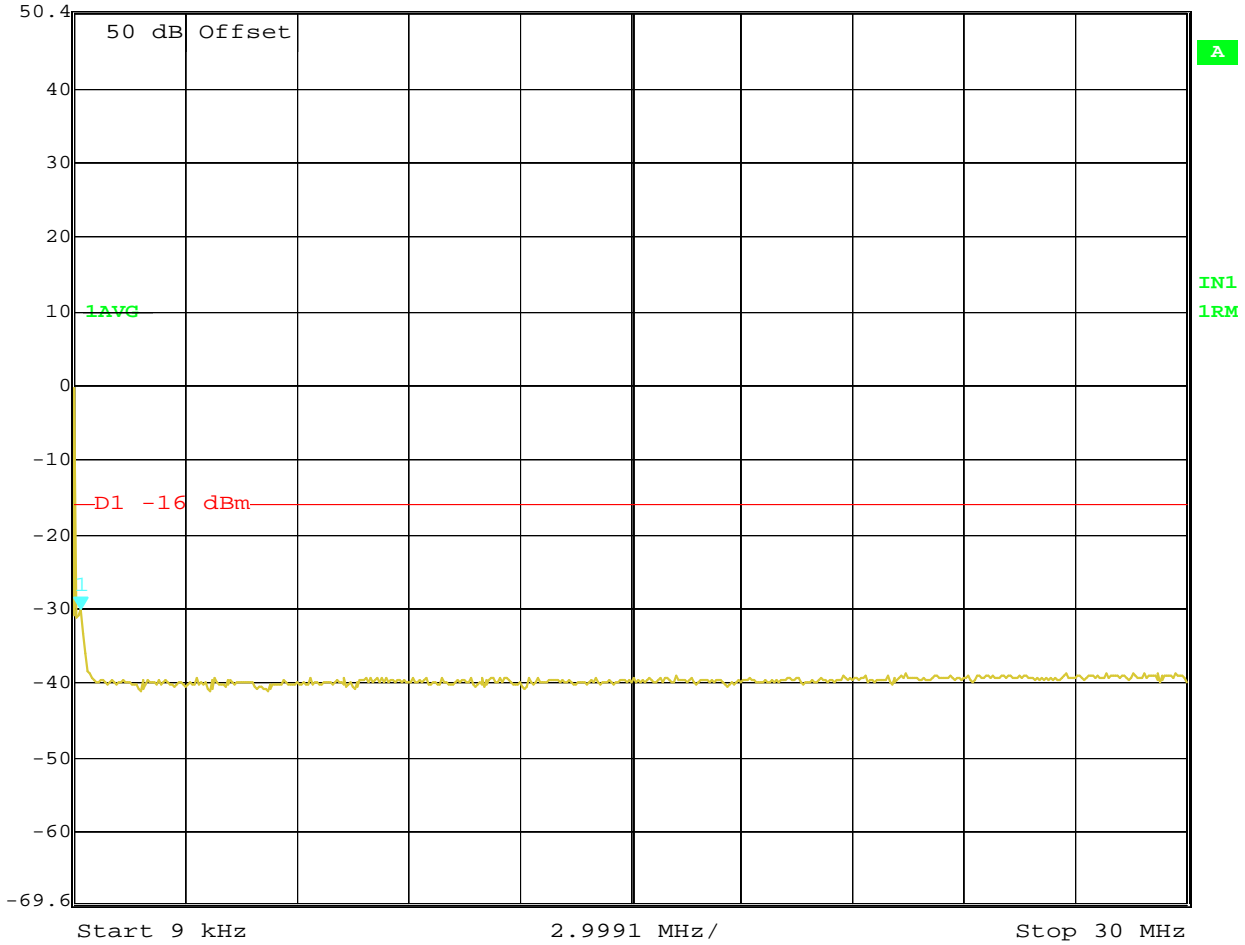
50.4 dBm

189.30661323 kHz

SWT 760 ms

Unit

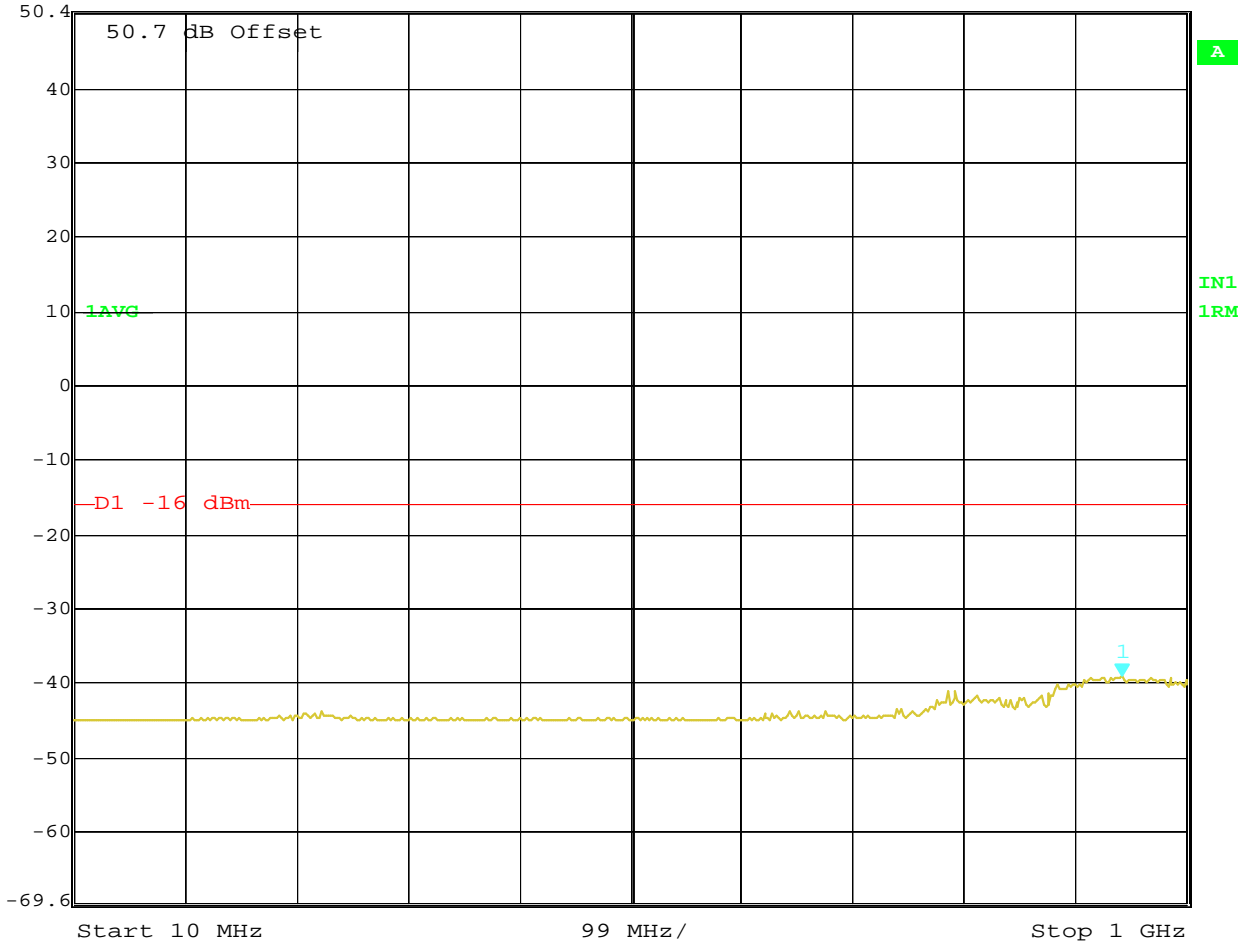
dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 10:22:37



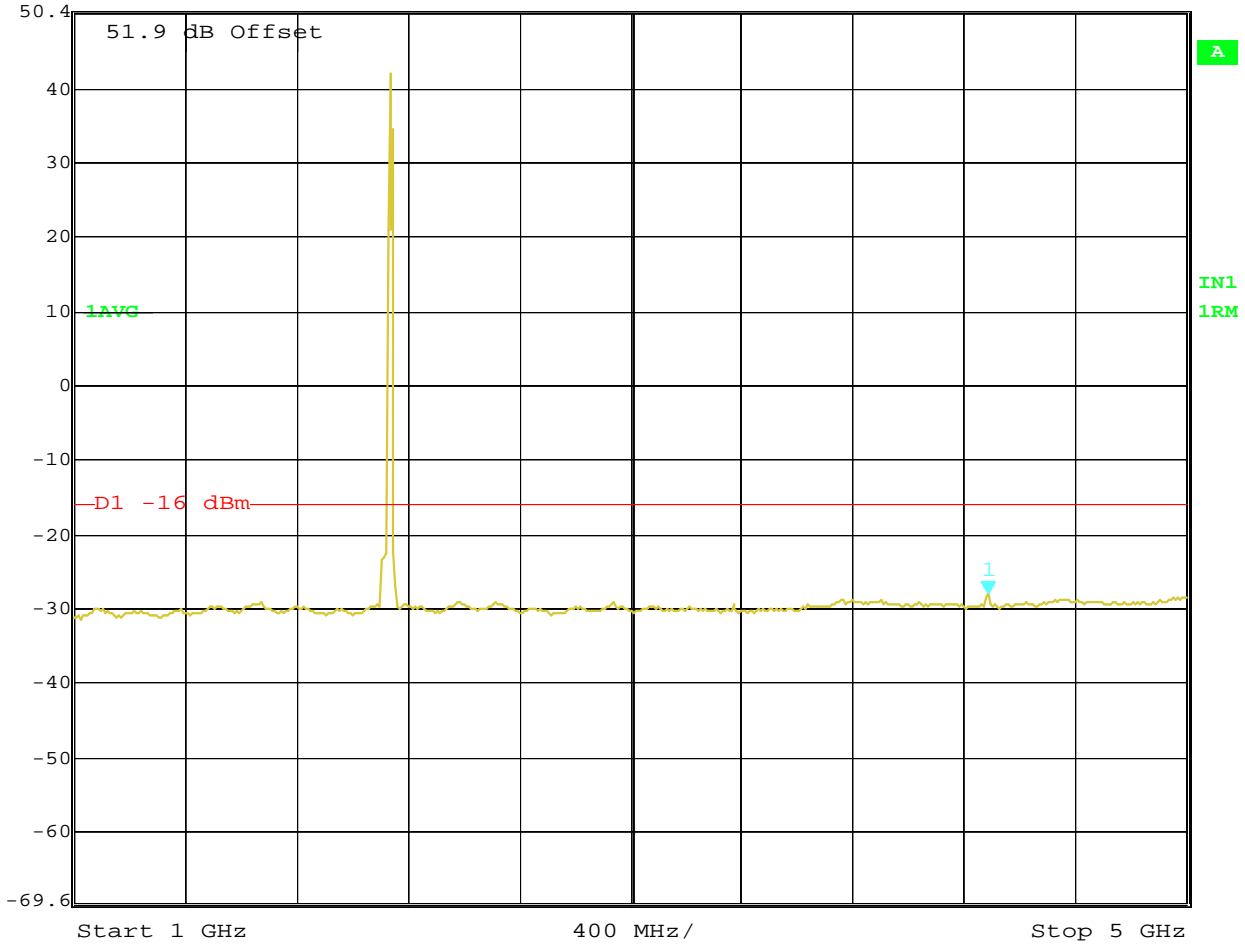
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.14 dBm VBW 300 kHz  
50.4 dBm 942.46492986 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 10:20:53



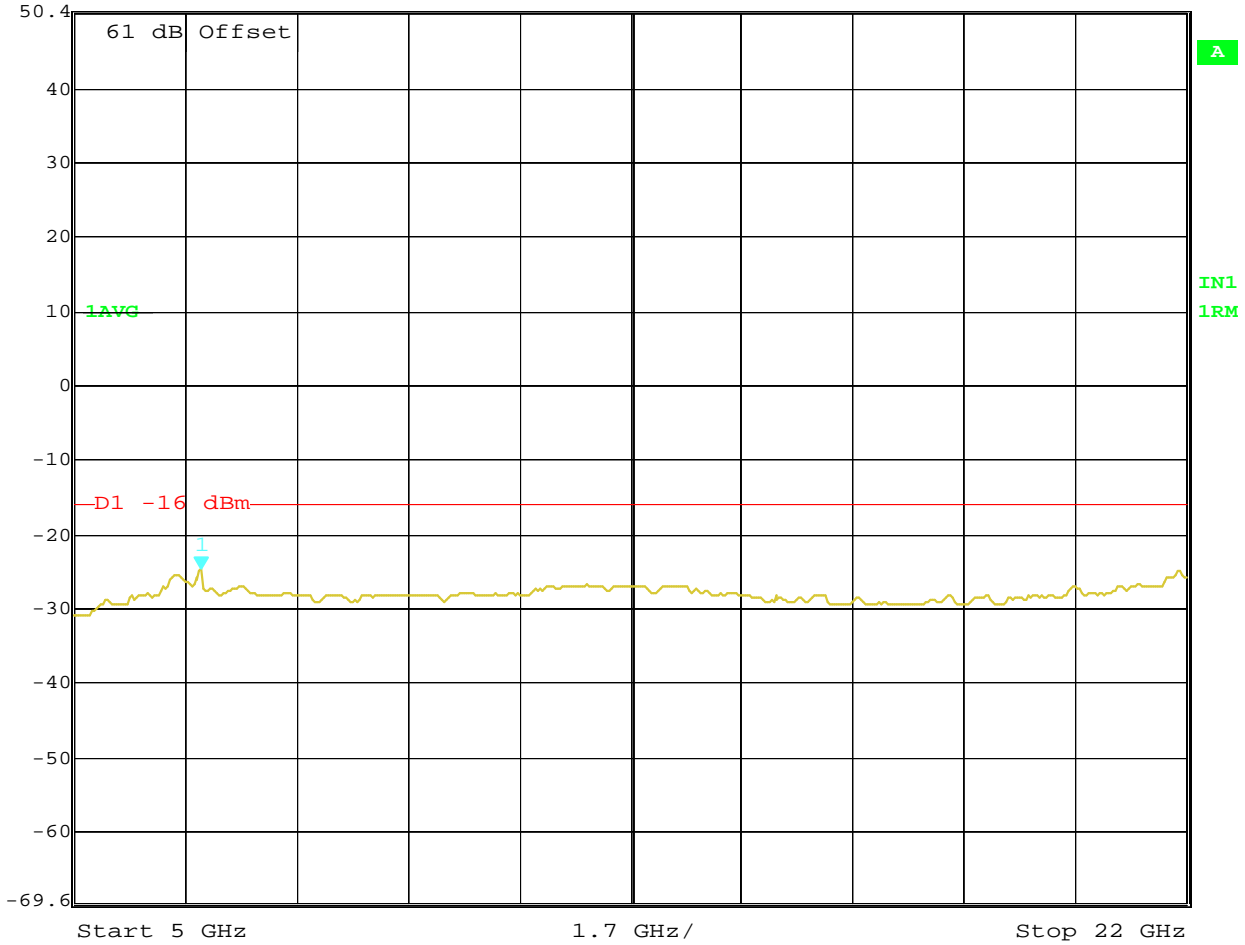
Ref Lvl	50.4 dBm	Marker 1 [T1]	-27.99 dBm	RBW	1 MHz	RF Att	10 dB
			4.28657315 GHz	VBW	3 MHz		
				SWT	10 ms	Unit	dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; CLS II CHNG  
Date: 10.MAR.2014 10:19:48



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.77 dBm VBW 3 MHz  
50.4 dBm 6.94188377 GHz SWT 170 ms Unit dBm



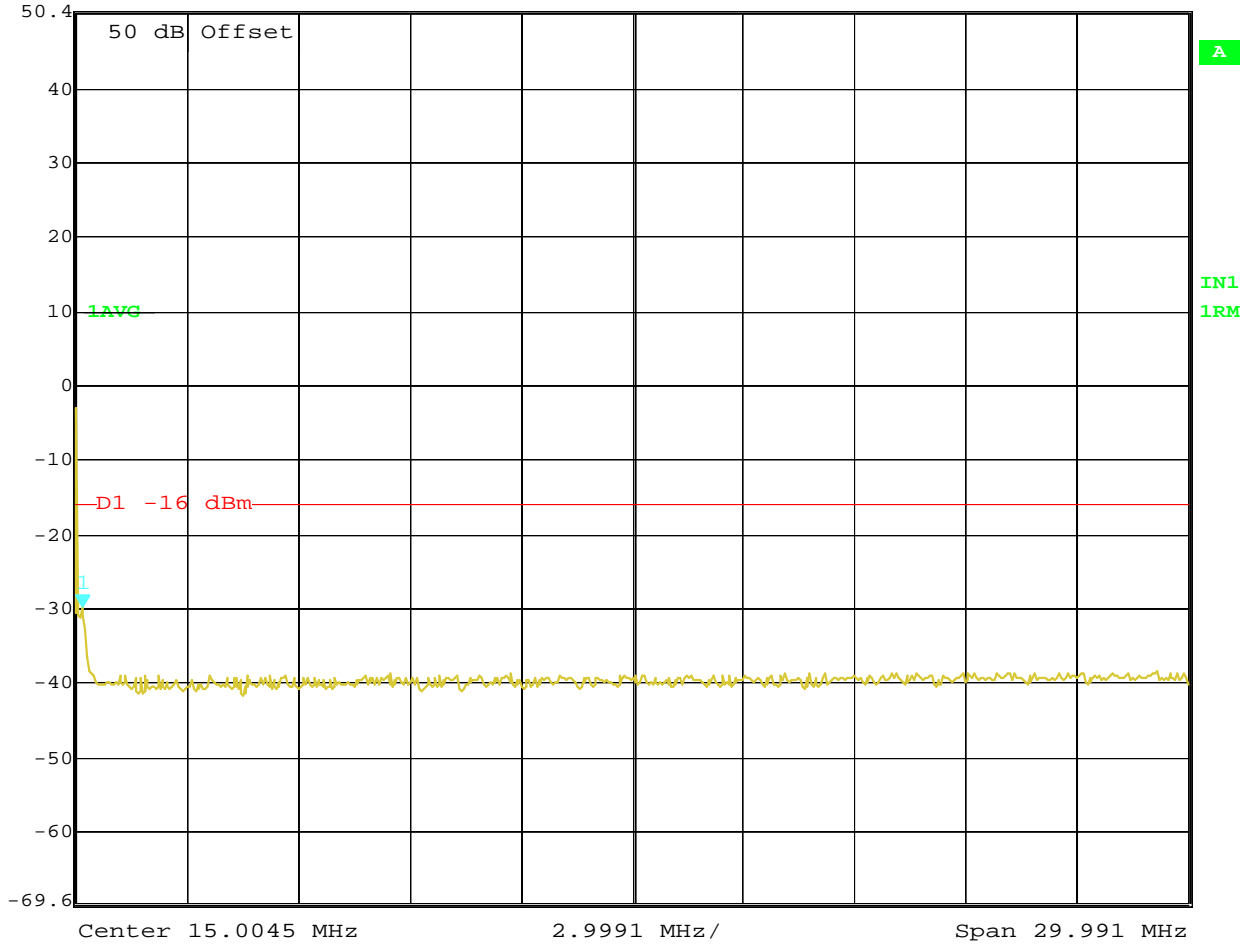
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;16QAM;FCC PRT 27;FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
Date: 10.MAR.2014 10:14:54

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: D+E  
10 MHz Bandwidth (2135 - 2145 MHz)  
2x120watts (MIMO)  
64QAM Modulation**



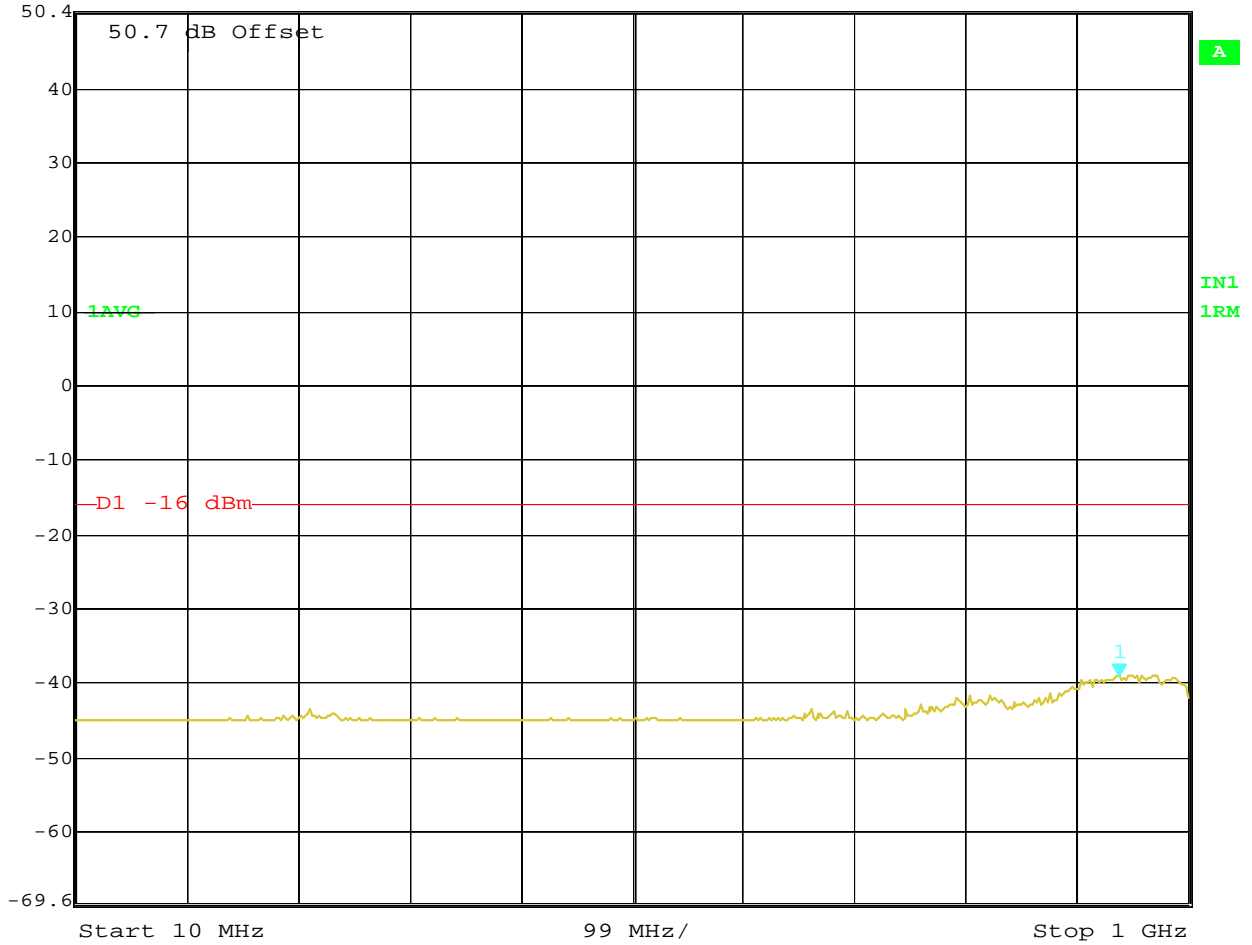
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -29.92 dBm VBW 30 kHz  
50.4 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
PWR:120W;64QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 10.MAR.2014 09:59:25



Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.14 dBm VBW 300 kHz  
50.4 dBm 938.49699399 MHz SWT 250 ms Unit dBm

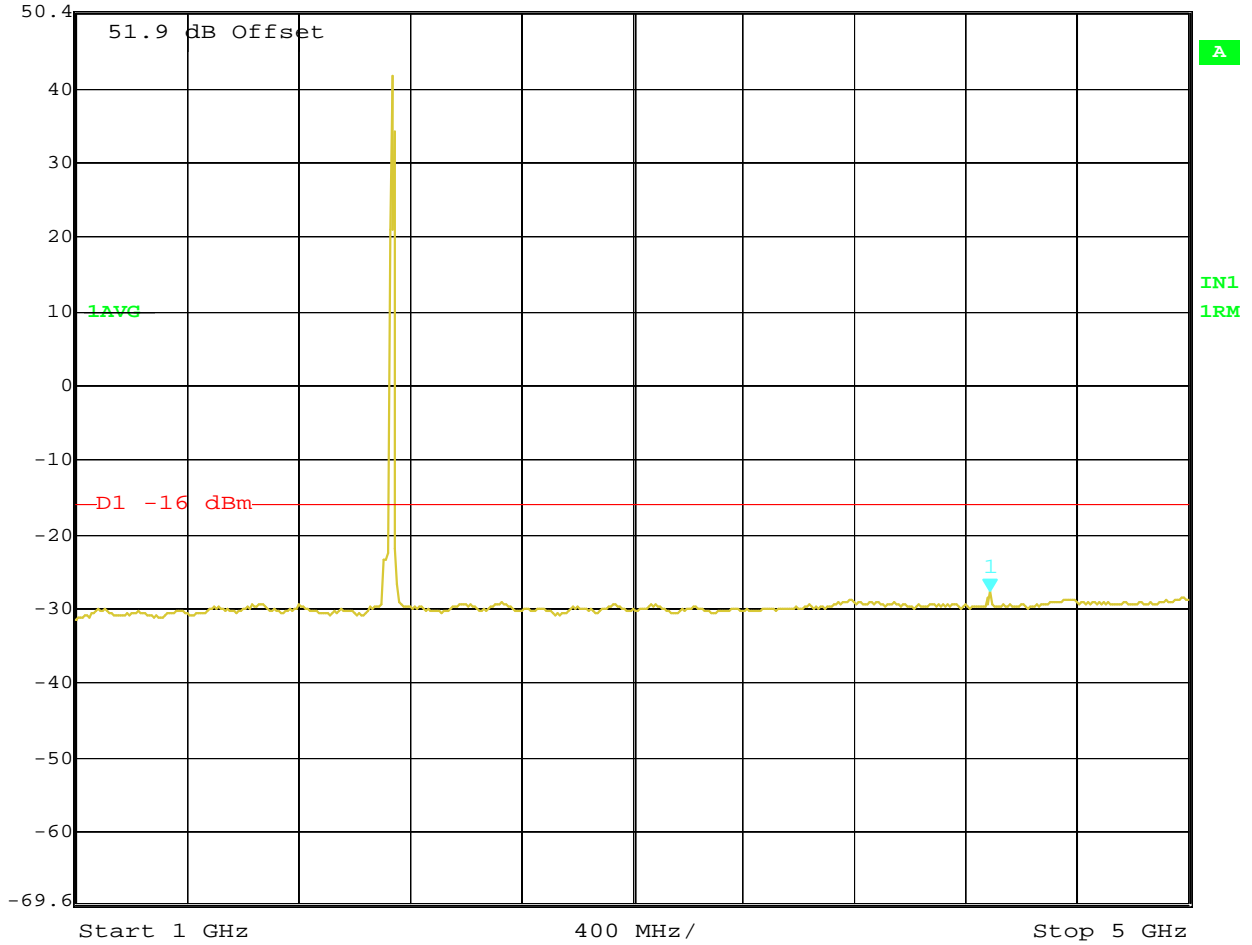


Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
PWR:120W;64QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 10.MAR.2014 10:00:52





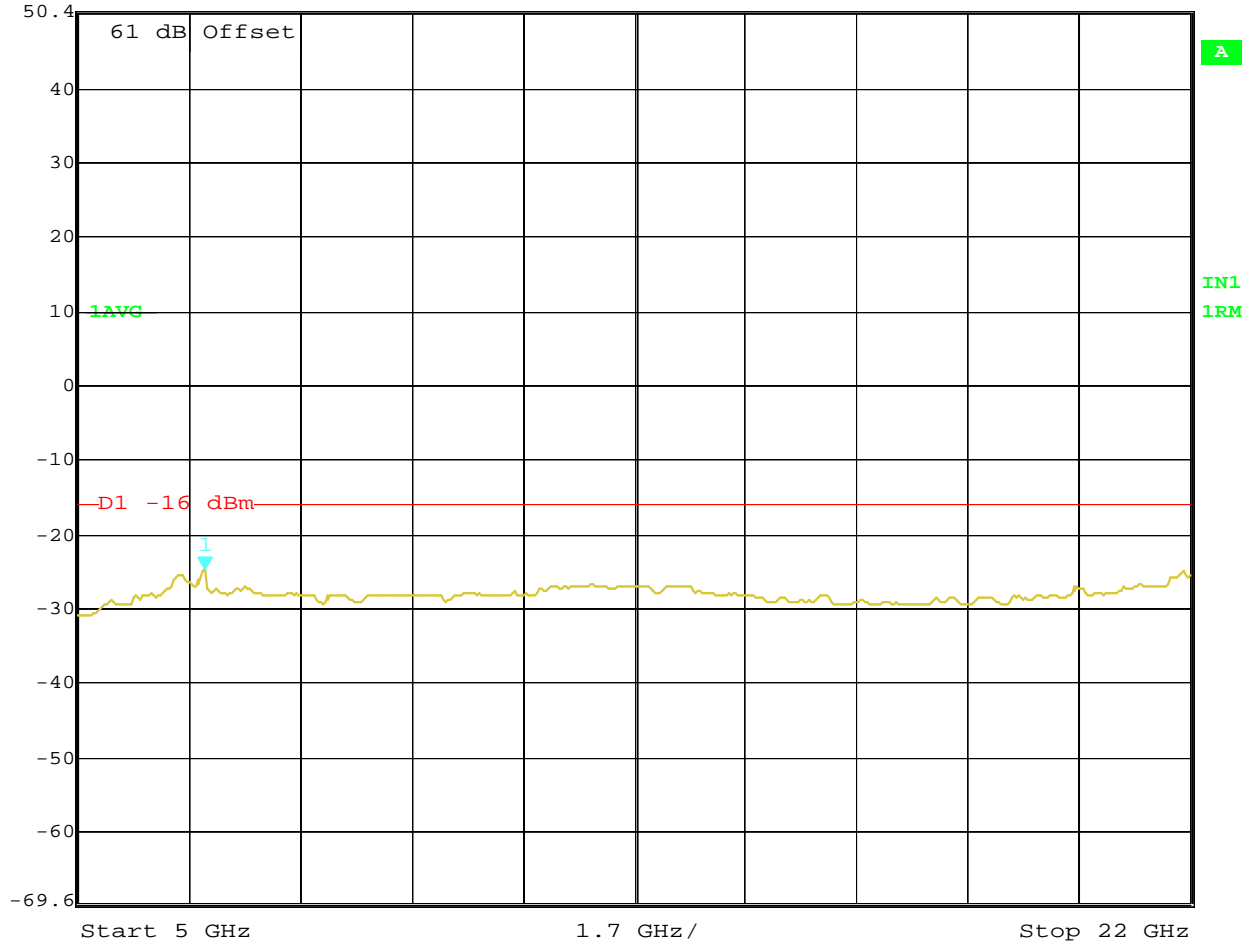
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -27.79 dBm VBW 3 MHz  
50.4 dBm 4.28657315 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF);-48VDC; BLK:D+E; 2140MHz  
PWR:120W;64QAM; FCC PRT 27; FCCID:AS5BBTRX-13;CLS II CHNG  
Date: 10.MAR.2014 10:02:01



Marker 1 [T1]      RBW      1 MHz      RF Att      0 dB  
 Ref Lvl                      -24.80 dBm      VBW      3 MHz  
 50.4 dBm                      6.94188377 GHz      SWT      170 ms      Unit              dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
 Comment A: TRDU 2X120 BAND 4 AWS (LTE-RF); -48VDC; BLK:D+E; 2140MHz  
 PWR:120W;64QAM;FCC PRT 27;FCCID:AS5BBTRX-13;CLS II CHNG;HPF  
 Date: 10.MAR.2014 10:04:10

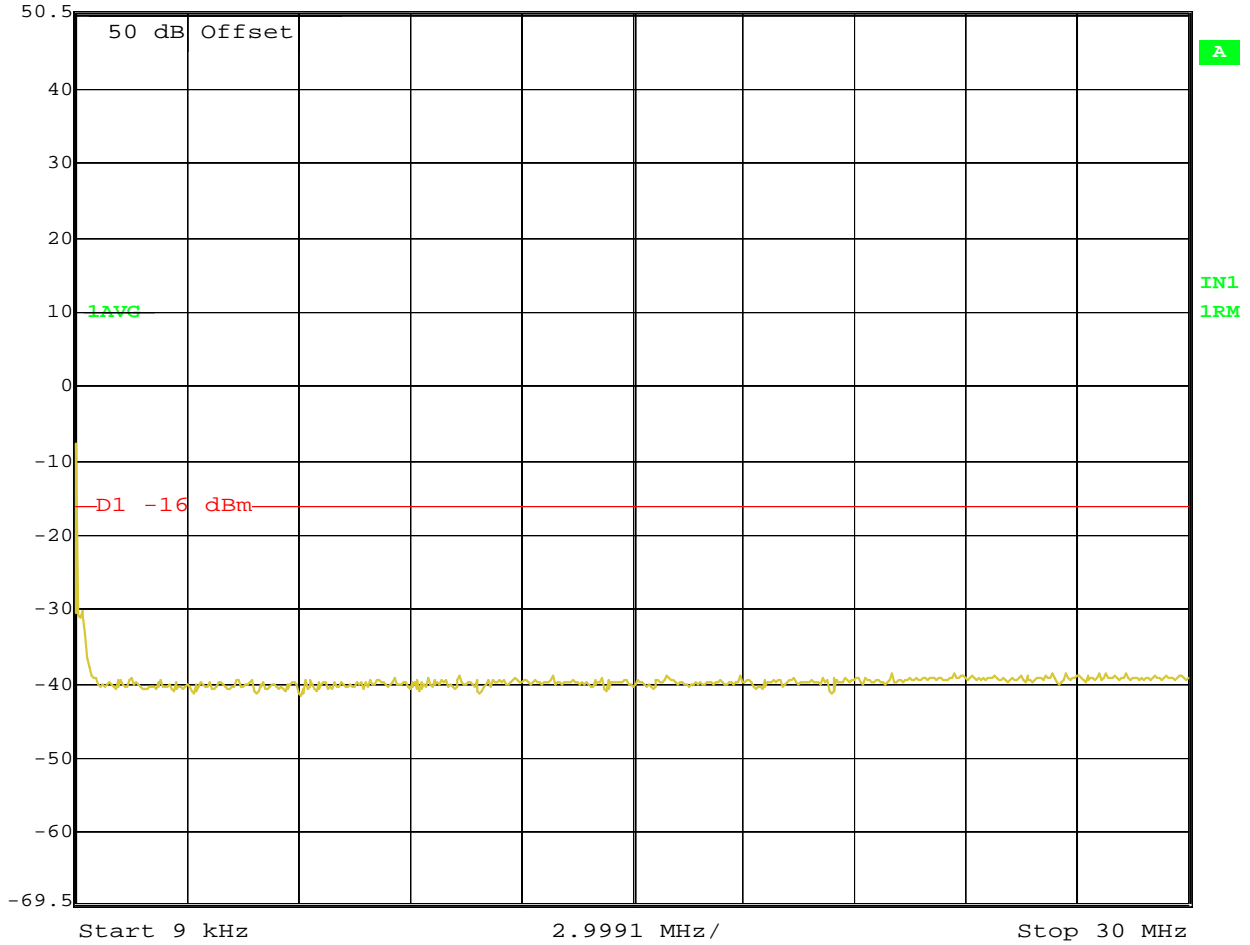
**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: F  
10 MHz Bandwidth (2145 - 2155 MHz)  
2x120watts (MIMO)  
QPSK Modulation**




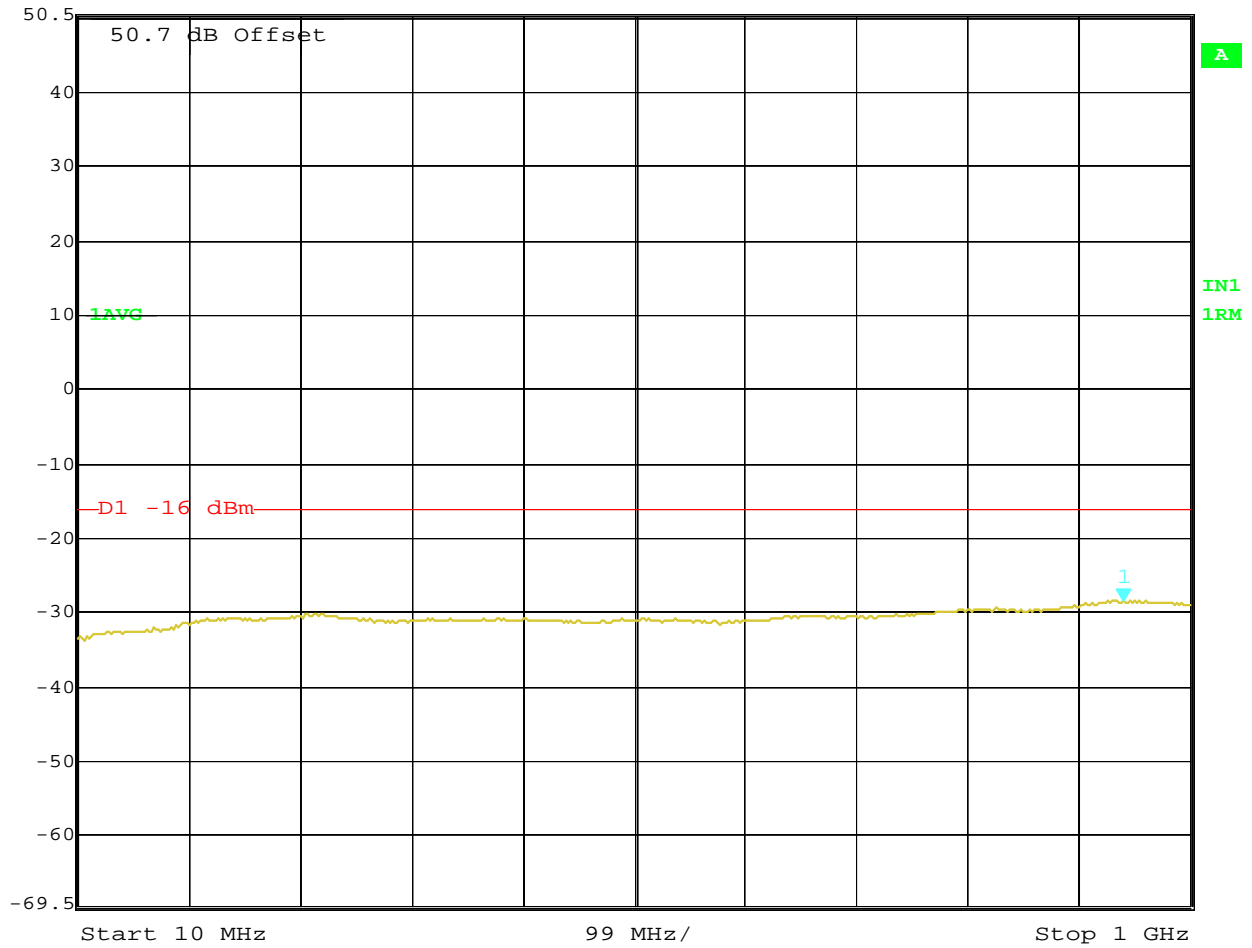
Ref Lvl  
50.5 dBm

RBW 10 kHz RF Att 30 dB  
VBW 30 kHz  
SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 5.MAR.2014 14:14:03

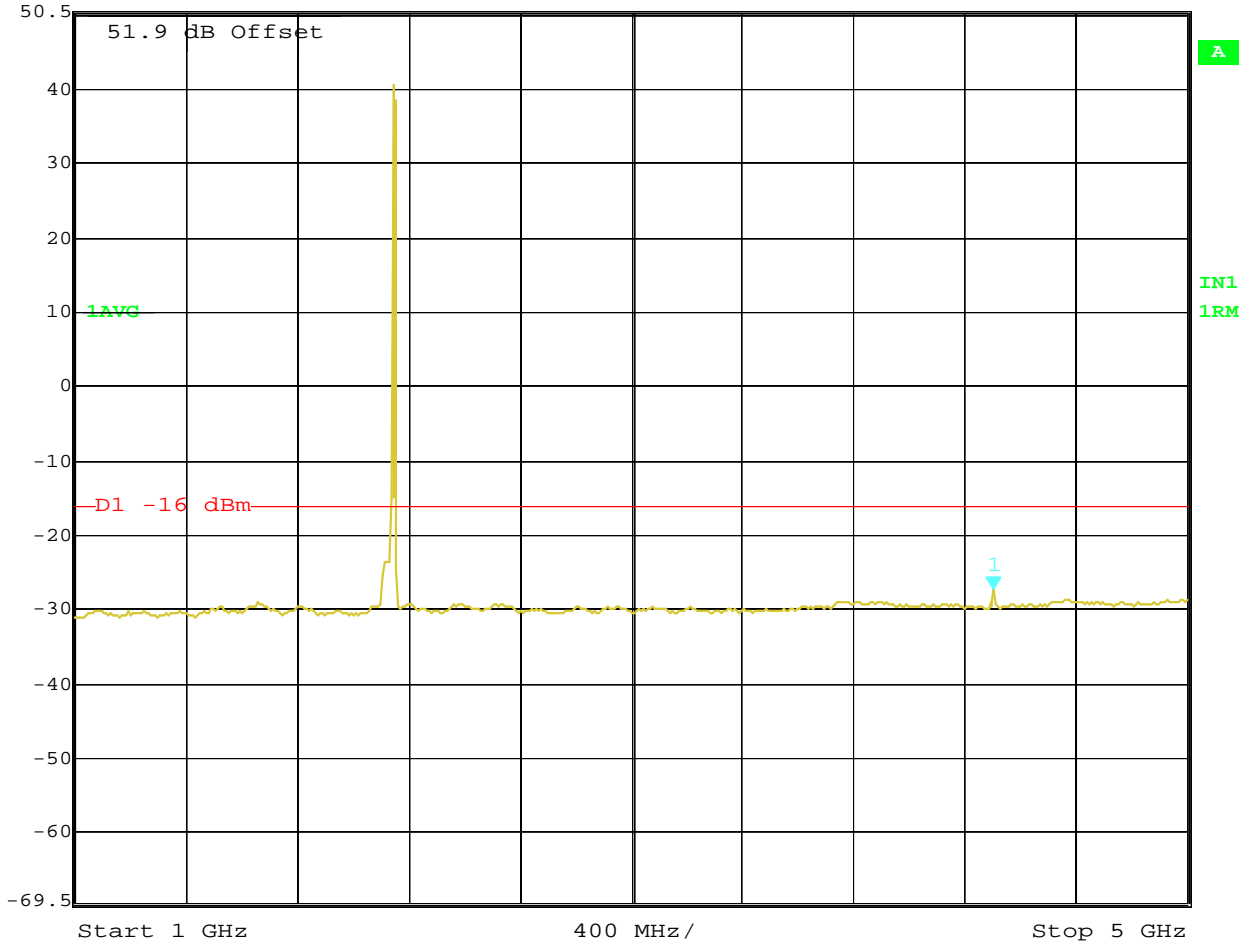
 Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl -28.63 dBm VBW 300 kHz  
50.5 dBm 940.48096192 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 5.MAR.2014 14:16:00



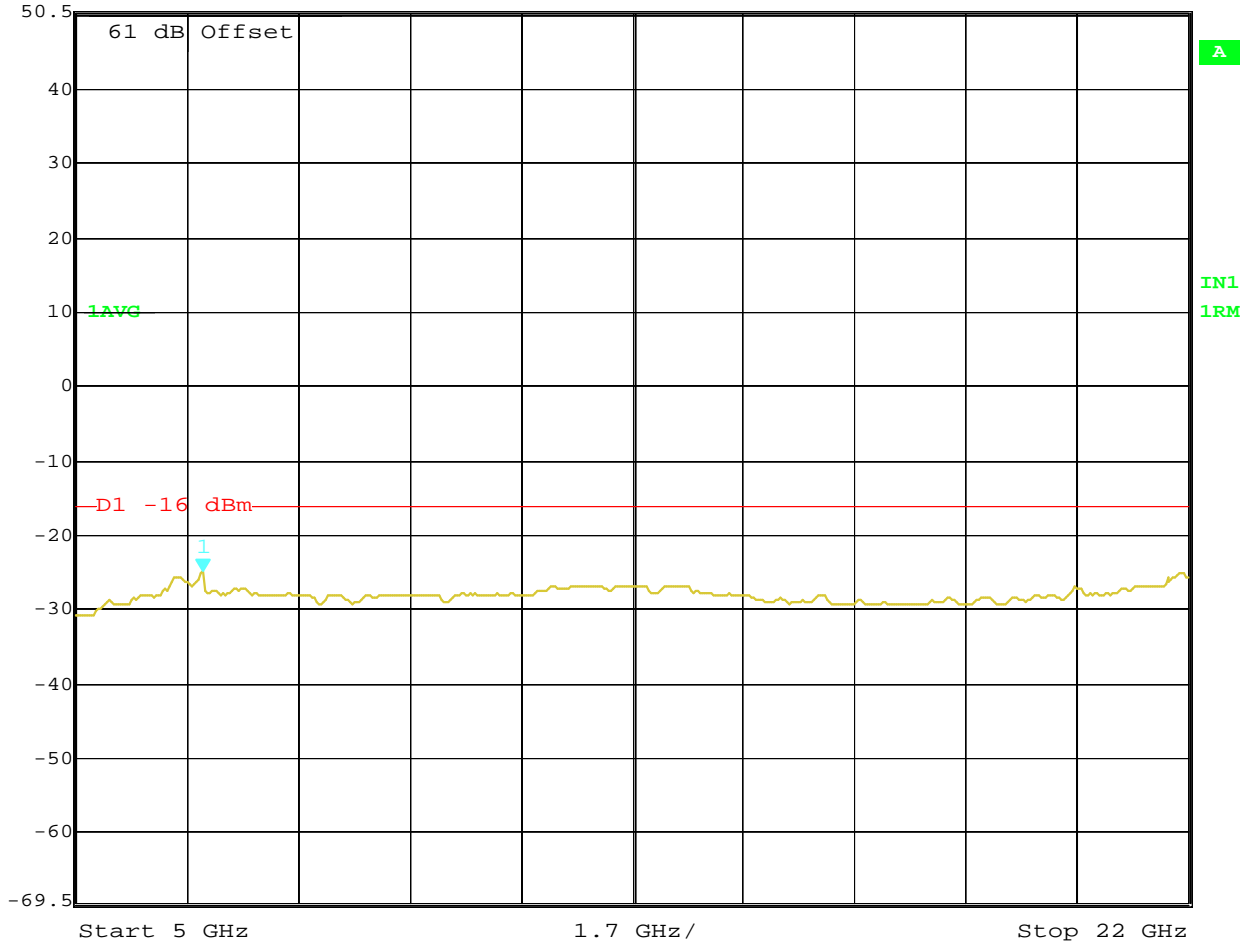
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -27.22 dBm VBW 3 MHz  
50.5 dBm 4.30260521 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 5.MAR.2014 14:20:34



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.84 dBm VBW 3 MHz  
50.5 dBm 6.94188377 GHz SWT 170 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; QPSK; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 5.MAR.2014 14:32:34

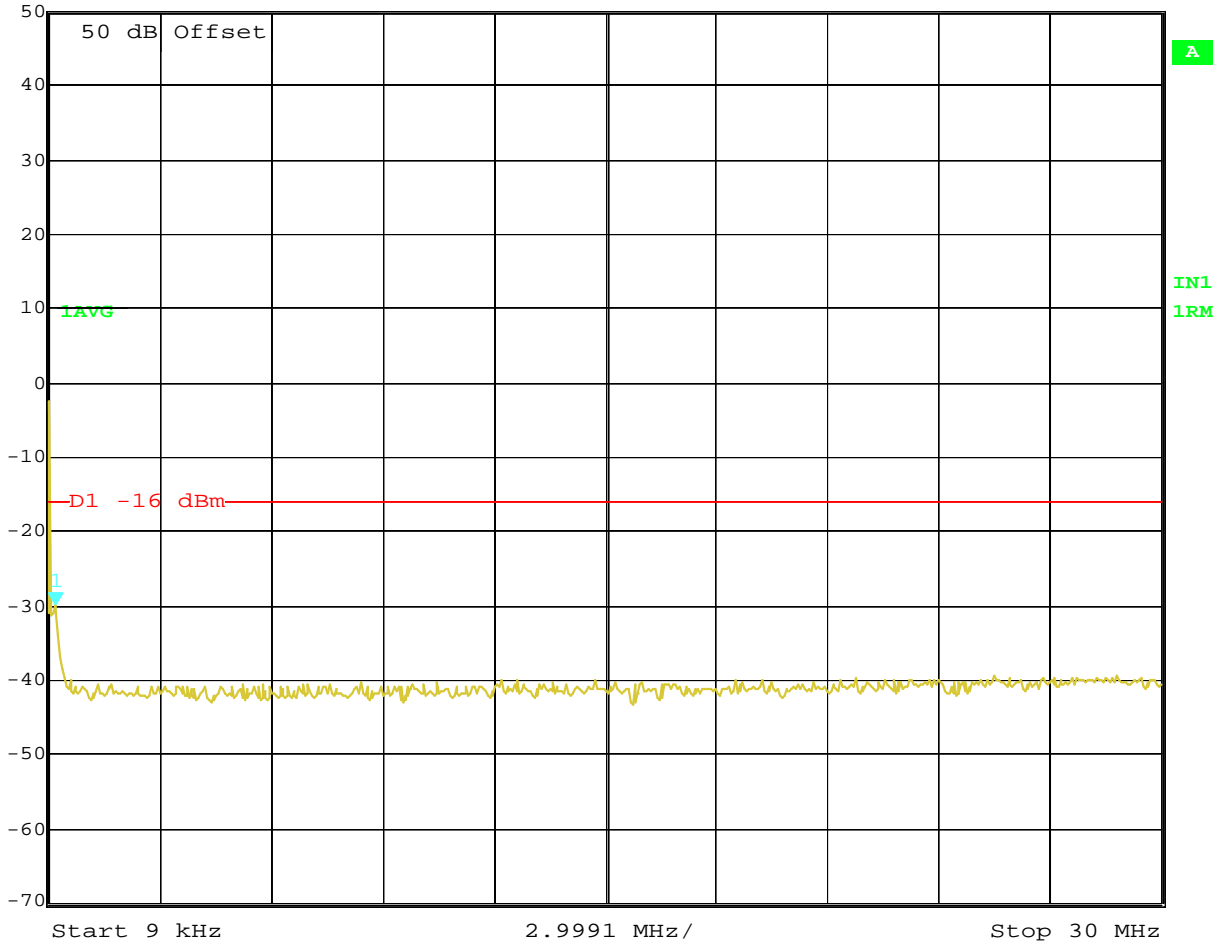
**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: F  
10 MHz Bandwidth (2145 - 2155 MHz)  
2x120watts (MIMO)  
16QAM Modulation**





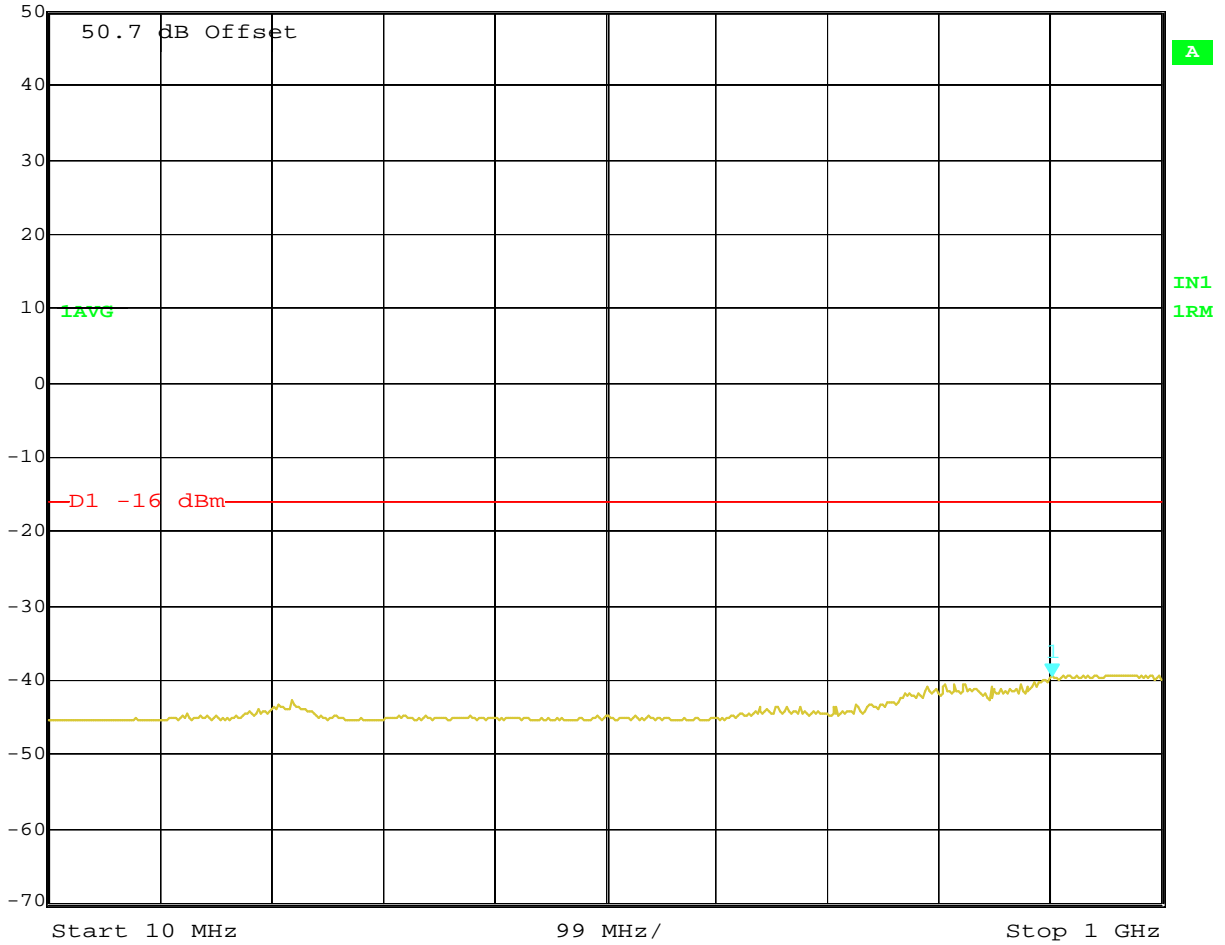
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -30.01 dBm VBW 30 kHz  
50 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 08:51:13



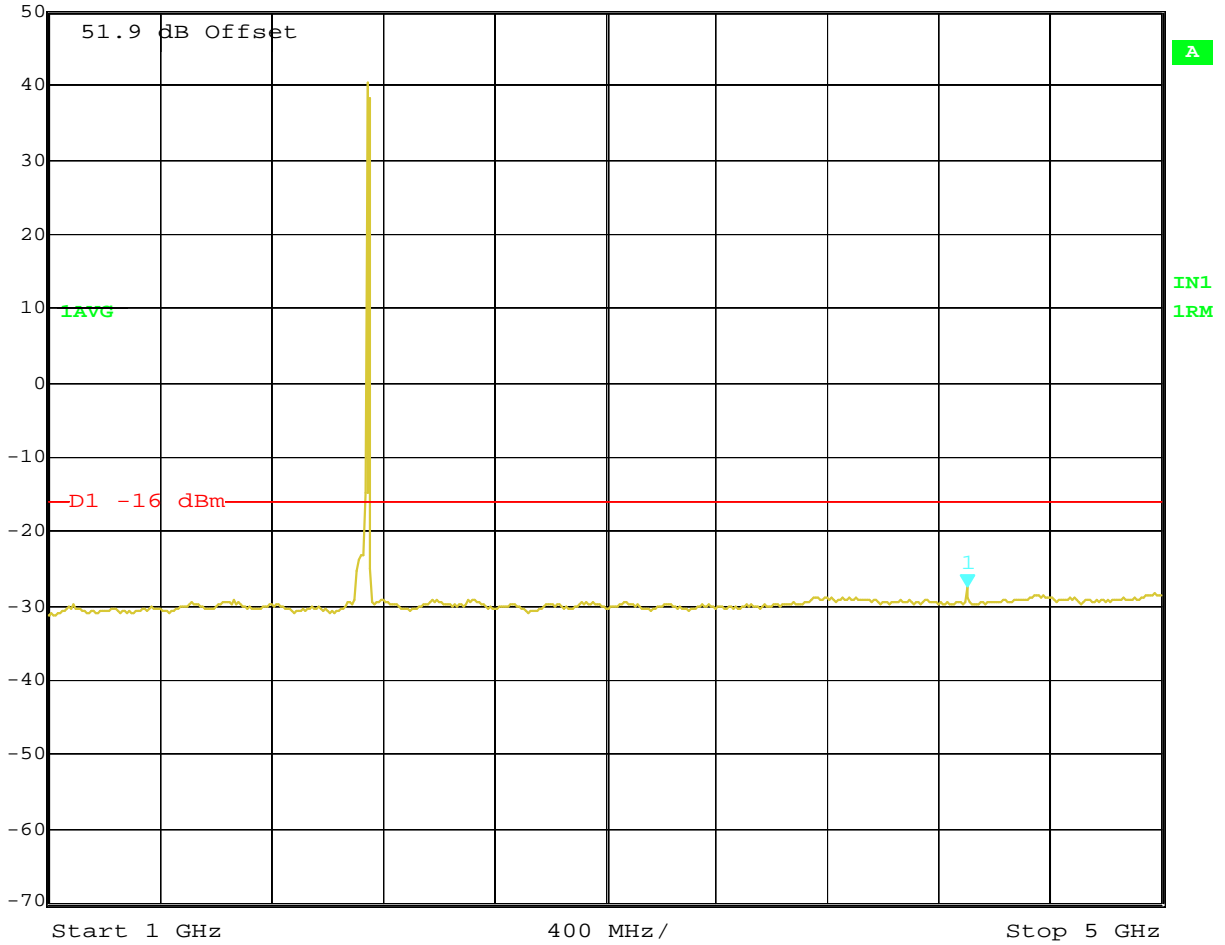
Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.54 dBm VBW 300 kHz  
50 dBm 902.78557114 MHz SWT 250 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 08:48:37



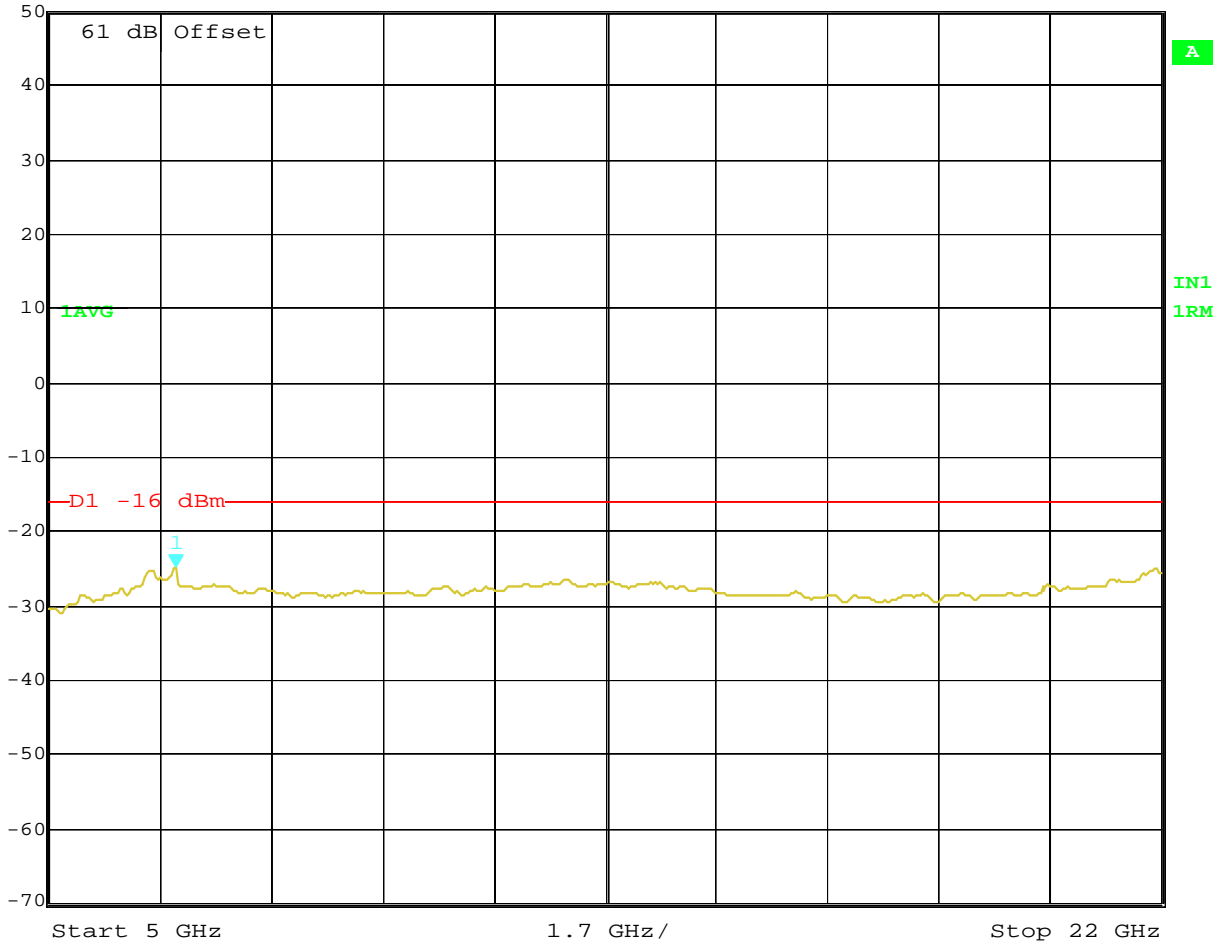
Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
Ref Lvl -27.45 dBm VBW 3 MHz  
50 dBm 4.30260521 GHz SWT 10 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 08:46:55



Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.74 dBm VBW 3 MHz  
50 dBm 6.94188377 GHz SWT 170 ms Unit dBm



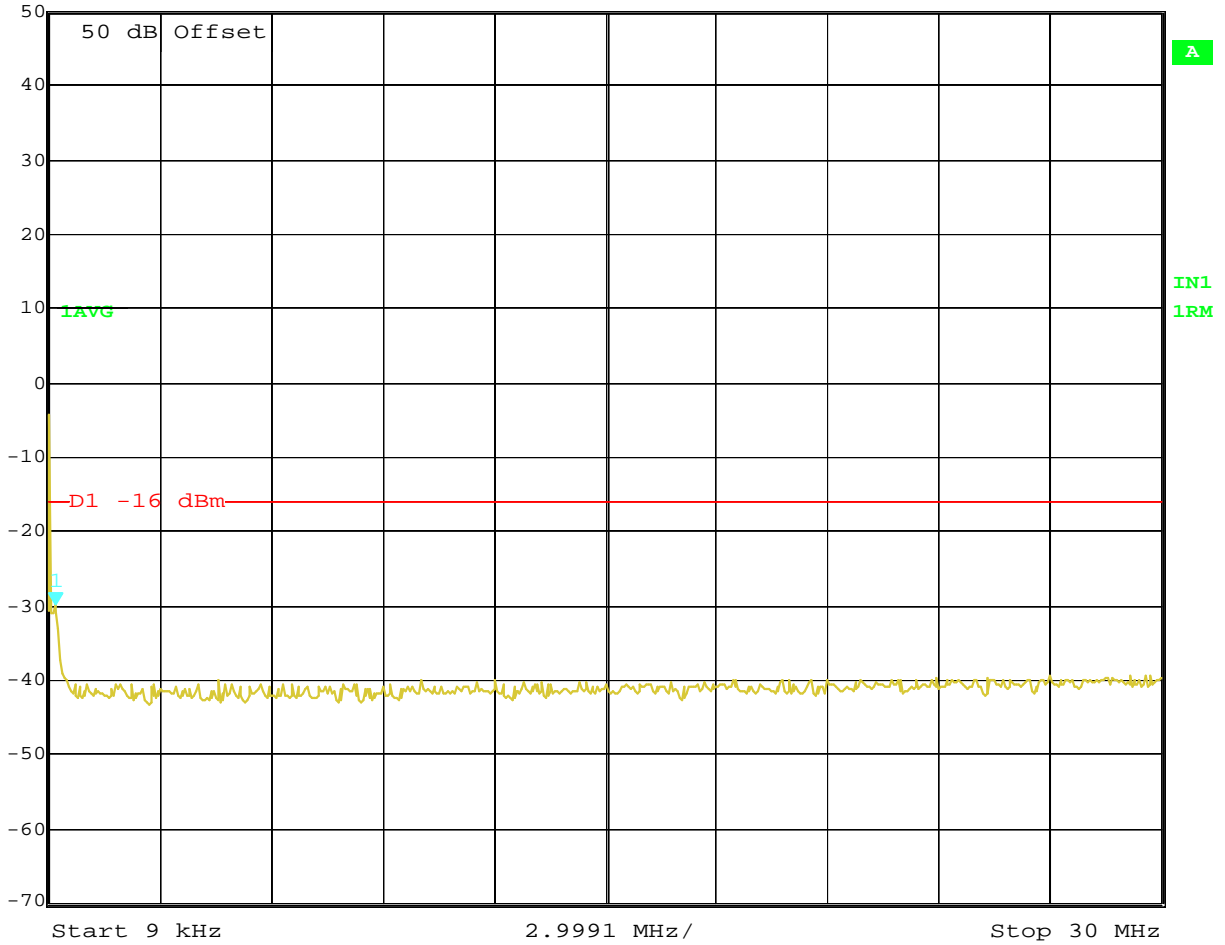
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 16QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 08:43:30

**Transmit Port  
Antenna Conducted Spurious Emissions**

**Block: F  
10 MHz Bandwidth (2145 - 2155 MHz)  
2x120watts (MIMO)  
64QAM Modulation**



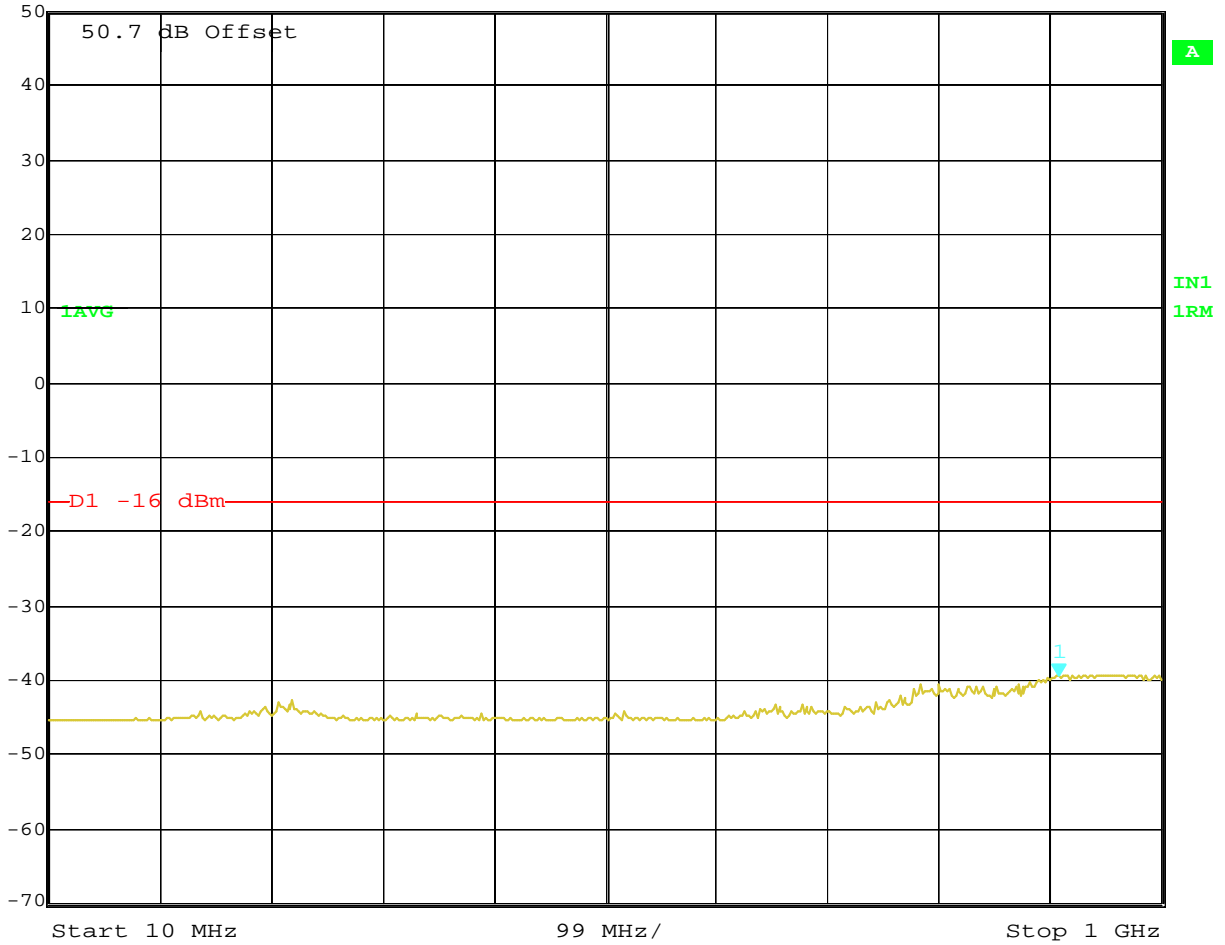
Marker 1 [T1] RBW 10 kHz RF Att 30 dB  
Ref Lvl -30.05 dBm VBW 30 kHz  
50 dBm 189.30661323 kHz SWT 760 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 09:38:30



Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -39.54 dBm VBW 300 kHz  
50 dBm 908.73747495 MHz SWT 250 ms Unit dBm



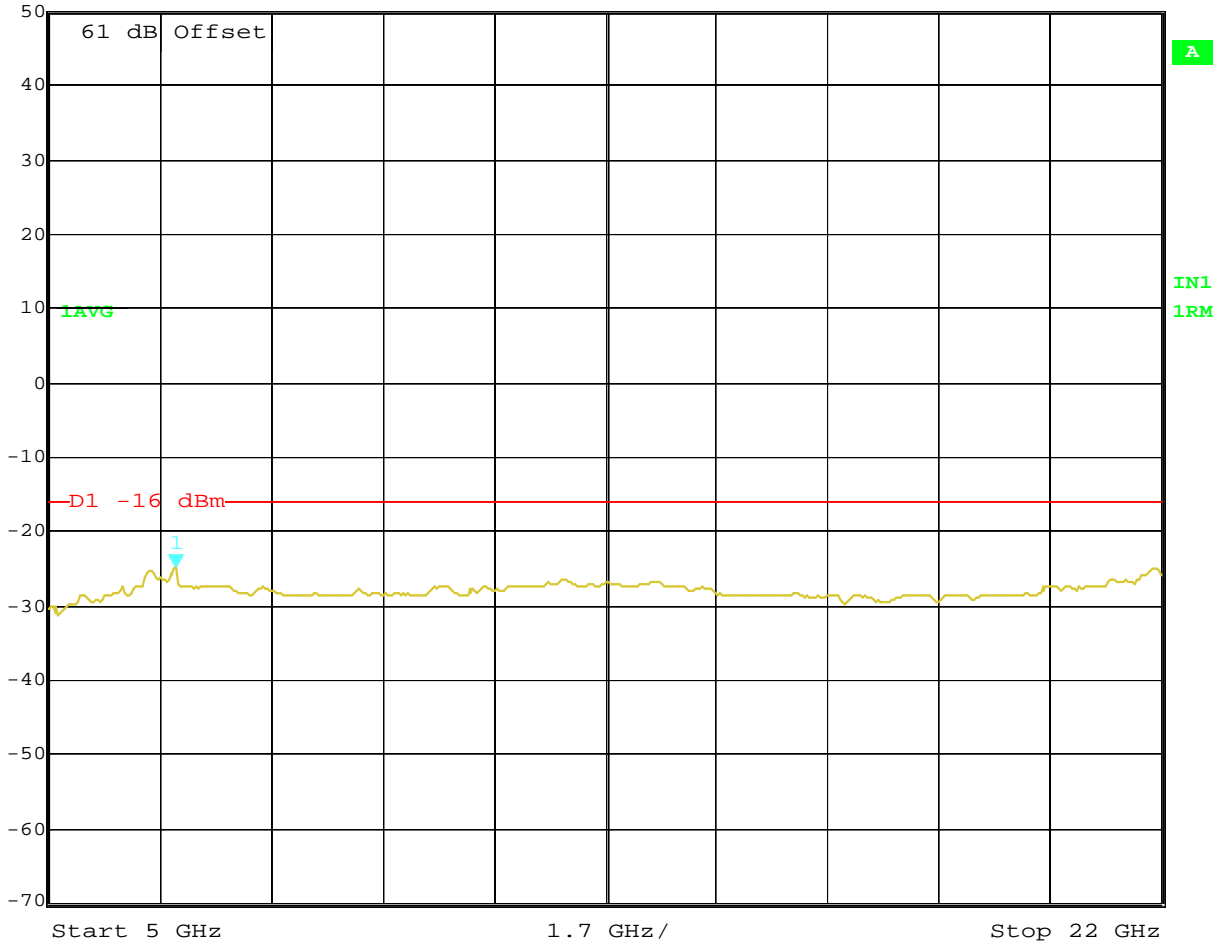
Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13  
Date: 6.MAR.2014 09:28:22







Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
Ref Lvl -24.72 dBm VBW 3 MHz  
50 dBm 6.94188377 GHz SWT 170 ms Unit dBm



Title: TX SPURIOUS EMISSIONS ; 1C; 10 MHz BW; Test Engineer: SEG  
Comment A: TRDU 2X120 BAND 4 AWS PAN.(LTE-RF); -48VDC; BLK:F; 2150MHz  
PWR:120W; 64QAM; FCC PRT 27; FCCID: AS5BBTRX-13; HPF  
Date: 6.MAR.2014 09:32:01

### Test Instrumentation List

Manufacturer	Model	Serial #	Description	Manual #	Last Cal Date	Cal Cycle Month
Hewlett Packard	437B	3125U21137	RF Power Meter	E760	10/16/2013	12
Agilent	N9020A	MY52090740	MXA Analyzer 10 Hz – 3.6 GHz	N/A	7/13/2012	24
Rohde & Schwarz	ESIB40	100044	EMI Test Receiver (20Hz to 40 GHz)-150 +30dBm	E567	7/2/2013	24
Hewlett Packard	8481A	US37294629	Power Sensor 10 MHz-18 GHz	E839	9/16/2013	12
Weinschel	66-20-34	BW7319	Attenuator 20dB 150W DC-18 GHz	E816	9/27/2013	15
Weinschel	48-30-33	AY8323	Attenuator DC - 18GHz 100 Watt	E961	N/A	N/A
Hewlett Packard	773D	2839A01399	Directional coupler 2 – 18 GHz	E1176	N/A	N/A

**Measurement -5**

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

**TRDU 2x120 Band 4 AWS (LTRE-RF)**

**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 353147).

The “TRDU 2x120 Band 4 AWS (LTRE-RF) with FCCID: AS5BBTRX-13” was tested at a RF output of **120 W at Antenna Interface Connector (AIC)**. These tests were performed in LTE 9412 cabinet with (6) TRDU 2x120 Band 4 AWS (LTRE-RF) and one D2UV5 Base band unit (BBU). Each TRDU is designed to provide (1) 120 Watts LTE Carriers. The interconnection between the TRDU and D2U was through optical fiber. The radiated emissions tests were performed with the TRDUs were operating with 10 MHz bandwidth in the frequency blocks combinations listed for Antenna Conducted spurious emissions. All tests were performed with the TRDU operating in QPSK and 64QAM modulations simultaneously. During testing, the TRDU AIC were terminated with 50 ohm load. The spectrum from 10 MHz to the 10th harmonic (22 GHz) 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 frequency.

FCC Section 27.53(h): the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  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 Recommendation ITU-R, SM.329-11, “*Unwanted emissions in the spurious domain*” January 2011.

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

$$20 \log (E * 106) - (46 + 10 \log P) = 79.2 \text{ dB } \mu\text{V/meter}$$

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 79.2dBμV/meter. Reportable measurements are equal to or greater than 59.2dBμV/meter. Over the spectrum investigated, 10 MHz to 10th of the carrier (22 GHz), no reportable spurious emissions were detected. This demonstrates that the “TRDU 2x120 Band 4 AWS (LTRE-RF)” the subject of this application, complies with Sections 2.1053, 27.53 (g) and 2.1057 of the Rules.

## **Measurement -6**

### **MEASUREMENT OF FREQUENCY STABILITY**

**(There is no change in circuitry or product construction including frequency stabilizing circuits. For this class II filing new data is not considered required)**

**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 function 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