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Report On

Limited FCC Testing of the
Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band
UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular
phone with Bluetooth, WLAN, SRD(FeliCa) and GPS
In accordance with FCC 47 CFR Part 22 and FCC 47 CFR Part 2 (LTE)

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FCC ID: APYHRO00224

Document 75930192 Report 08 Issue 2

June 2015



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REPORT ON

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Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band
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(LTE)

Document 75930192 Report 08 Issue 2

June 2015

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DATED

26 June 2015

This report has been up-issued to Issue 2 to amend the antenna gain.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 22 and FCC 47 CFR Part 2. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

N Rousell

G Lawler

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SECTION 1

REPORT SUMMARY

Limited FCC Testing of the
Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) &
Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and
GPS

In accordance with FCC 47 CFR Part 22 and FCC 47 CFR Part 2 (LTE)



1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC Testing of the Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS to the requirements of FCC 47 CFR Part 22 and FCC 47 CFR Part 2.

Objective	To perform Limited FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Sharp Corporation
Model Number(s)	SHF32
Serial Number(s)	IMEI 004401115362440 IMEI 004401115362366
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 22 (2014) FCC 47 CFR Part 2 (2014)
Disposal	Held Pending Disposal
Reference Number	Not Applicable
Date	Not Applicable
Order Number	10534
Date	17 April 2015
Start of Test	28 May 2015
Finish of Test	15 June 2015
Name of Engineer(s)	N Rousell G Lawler
Related Document(s)	ANSI C63.4 (2009) ANSI TIA-603-C (2004)



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 22 and FCC 47 CFR Part 2 is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 22	Part 2			
LTE FDD 26					
2.1	22.355	2.1055	Frequency Tolerance	Pass	
2.2	22.905	2.1051	Spurious Emissions at Band Edge	Pass	
2.3	22.913 (a)	2.1046	Maximum Conducted Output Power	Pass	
2.4	22.913 (a)	2.1046	Peak to Average Ratio	Pass	
2.5	22.917	-	Emission Limitations for Cellular Equipment	Pass	
2.6	22.917 (b)	2.1049 (h)	26 dB Bandwidth	Pass	
2.7	-	2.1047 (d)	Modulation Characteristics	-	Customer Declaration



1.3 PRODUCT TECHNICAL DESCRIPTION

Please refer to the SHF32 Model Description Form.

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 4.0 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

Limited FCC Testing of the
Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) &
Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and
GPS

In accordance with FCC 47 CFR Part 22 and FCC 47 CFR Part 2 (LTE)



Product Service

2.1 FREQUENCY TOLERANCE

2.1.1 Specification Reference

FCC 47 CFR Part 22, Clause 22.355
FCC 47 CFR Part 2, Clause 2.1055

2.1.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - Modification State 0

2.1.3 Date of Test

11 June 2015

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

This test was performed in accordance with FCC 47 CFR Part 2, clause 2.1055.

Remarks

The frequency measurement function of a CMU 200 was used to measure the frequency error. The CMU200 was connected to an external 10 MHz frequency reference to improve the accuracy of the measurement.

2.1.6 Environmental Conditions

Ambient Temperature	23.8°C
Relative Humidity	47.4%



2.1.7 Test Results

4.0 V DC Supply

LTE FDD 26, 836.5 MHz, 10 MHz Bandwidth, QPSK, Frequency Tolerance Under Temperature Variations Results

Temperature	Voltage	Fundamental Frequency Deviation (ppm)
		All Resource Blocks
+20 °C	3.7 V DC	-0.0084
-30 °C	4.0 V DC	-0.0093
-20 °C	4.0 V DC	-0.0084
-10 °C	4.0 V DC	-0.0092
0 °C	4.0 V DC	-0.0092
+10 °C	4.0 V DC	-0.0100
+20 °C	4.0 V DC	-0.0098
+30 °C	4.0 V DC	-0.0082
+40 °C	4.0 V DC	-0.0111
+50 °C	4.0 V DC	-0.0096

LTE FDD 26, 836.5 MHz, 10 MHz Bandwidth, 16-QAM, Frequency Tolerance Under Temperature Variations Results

Temperature	Voltage	Fundamental Frequency Deviation (ppm)
		All Resource Blocks (ppm)
+20 °C	3.7 V DC	-0.0094
-30 °C	4.0 V DC	-0.0096
-20 °C	4.0 V DC	-0.0116
-10 °C	4.0 V DC	-0.0102
0 °C	4.0 V DC	-0.0110
+10 °C	4.0 V DC	-0.0100
+20 °C	4.0 V DC	-0.0079
+30 °C	4.0 V DC	-0.0094
+40 °C	4.0 V DC	-0.0112
+50 °C	4.0 V DC	-0.0099



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FCC 47 CFR Part 22, Limit Clause 22.355

Frequency Range (MHz)	Base, Fixed (ppm)	Mobile $\leq$ 3 watts (ppm)	Mobile $\leq$ 3 watts (ppm)
25 to 50	20	20	50
50 to 450	5	5	50
450 to 512	2.5	5	5
821 to 896	1.5	2.5	2.5
928 to 929	5.0	-	-
929 to 960	1.5	-	-
2110 to 2220	10	-	-



Product Service

2.2 SPURIOUS EMISSIONS AT BAND EDGE

2.2.1 Specification Reference

FCC 47 CFR Part 22, Clause 22.905
FCC 47 CFR Part 2, Clause 2.1051

2.2.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - Modification State 0

2.2.3 Date of Test

5 June 2015

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

The test was performed in accordance with KDB 971168 D01 v02r02, Clause 6.

2.2.6 Environmental Conditions

Ambient Temperature	21.9°C
Relative Humidity	53.1%



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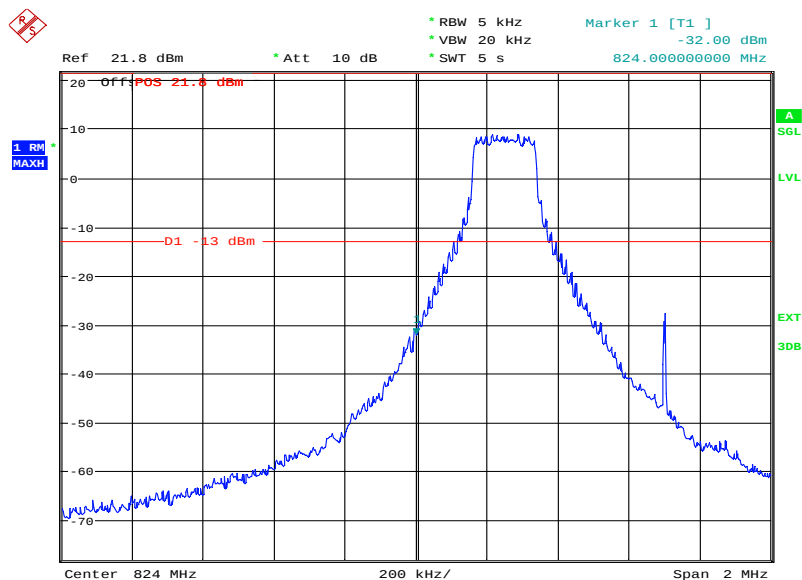
2.2.7 Test Results

4.0 V DC Supply

LTE FDD 26, 1.4 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
824.7 MHz		848.3 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-32.00	-31.62	-25.27	-29.38

LTE FDD 26, 824.7 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

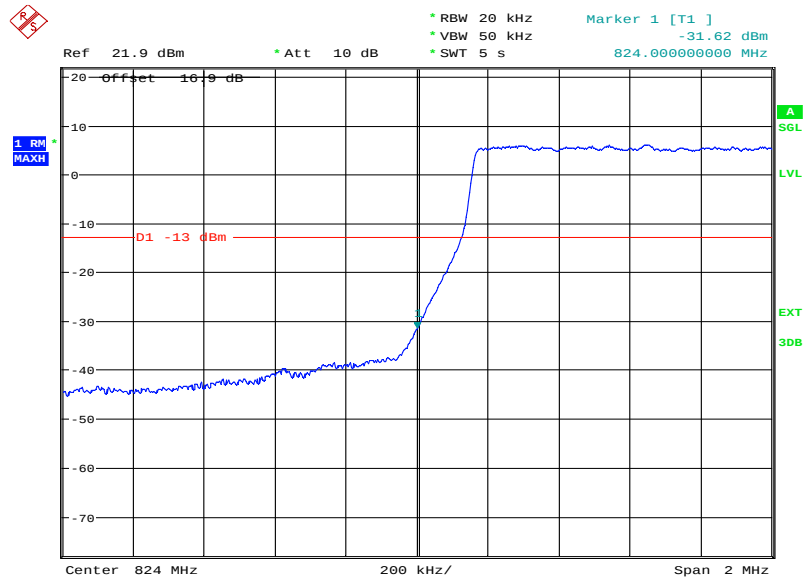


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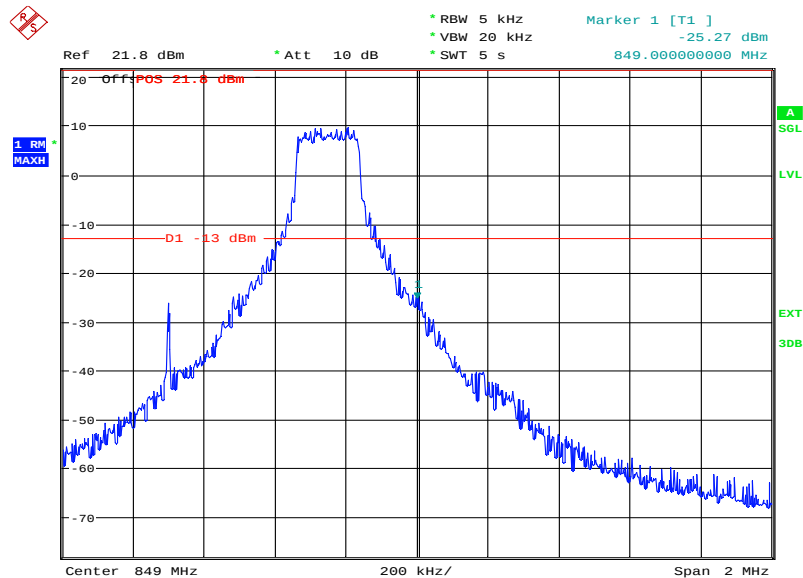
Product Service

LTE FDD 26, 824.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



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LTE FDD 26, 843.3 MHz, 1 Resource Block – High, 1.4 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

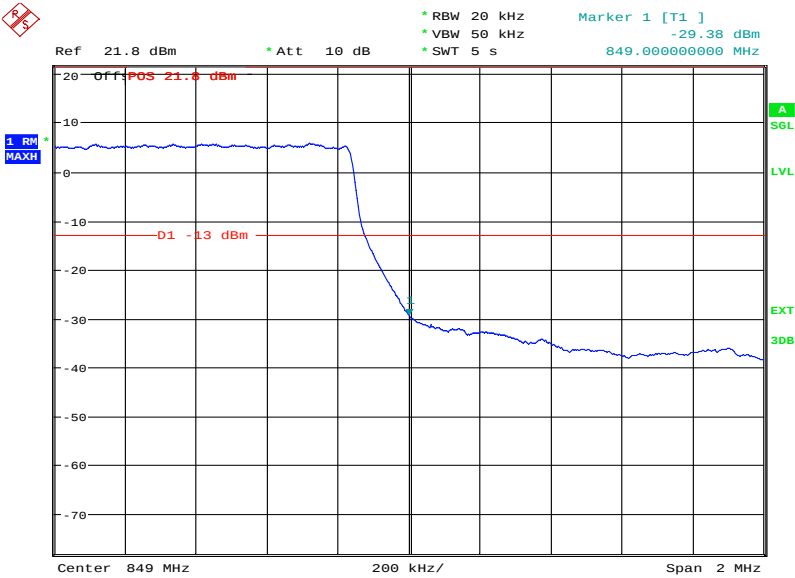


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Product Service

LTE FDD 26, 843.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



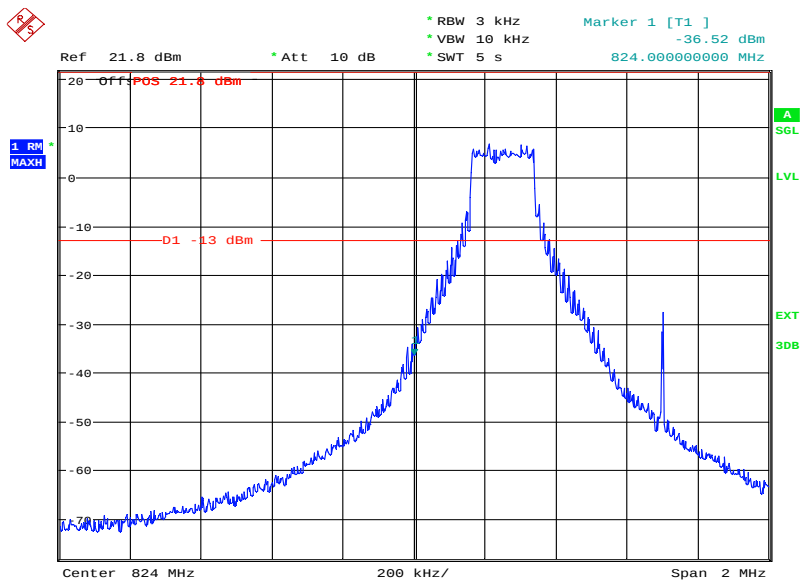
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LTE FDD 26, 1.4 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
824.7 MHz		848.3 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-36.52	-31.70	-28.84	-30.10

LTE FDD 26, 824.7 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

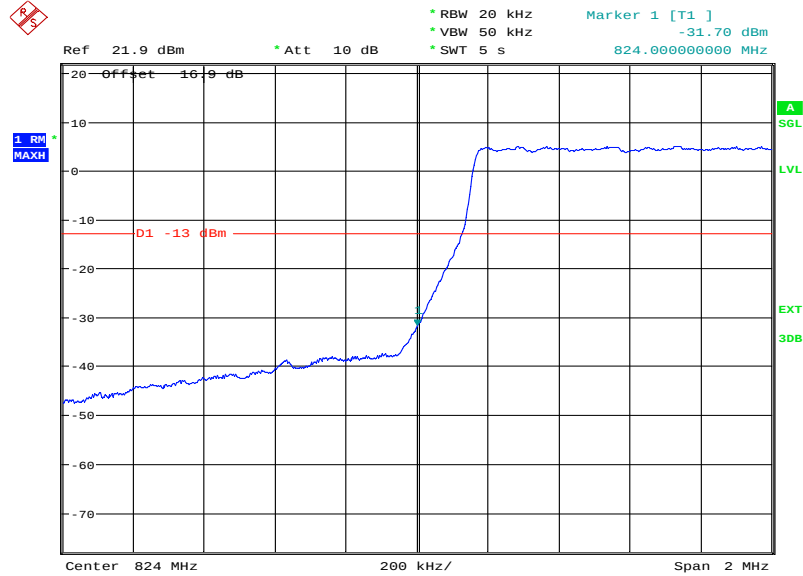


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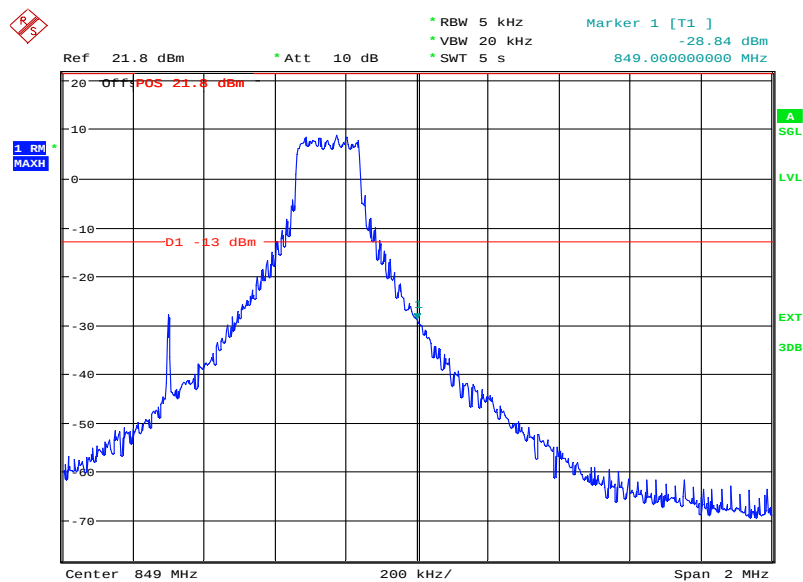
Product Service

LTE FDD 26, 824.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 15:04:20

LTE FDD 26, 848.3 MHz, 1 Resource Block – High, 1.4 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

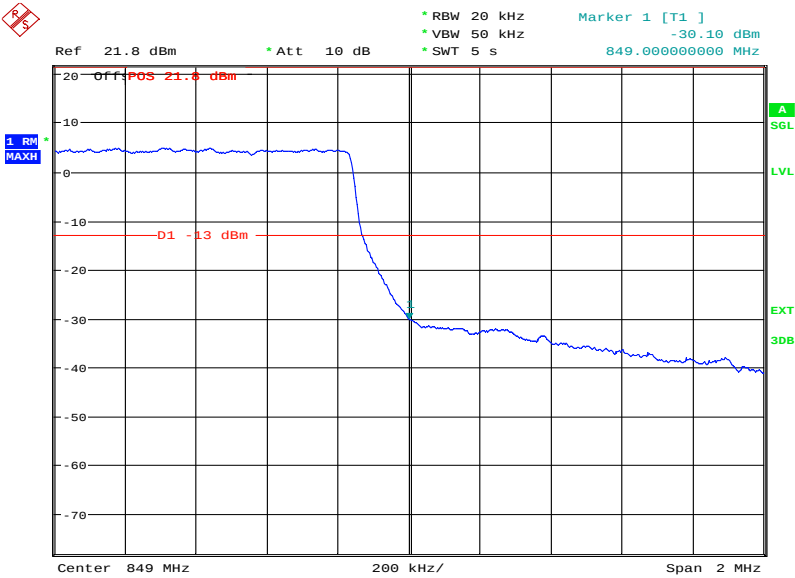


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Product Service

LTE FDD 26, 848.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



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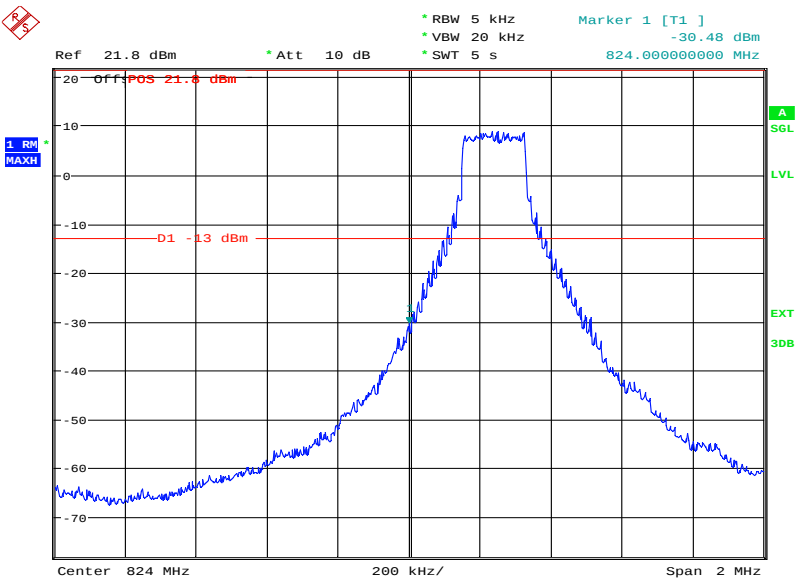


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LTE FDD 26, 3.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
825.5 MHz		847.5 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-30.48	-28.11	-25.25	-28.63

LTE FDD 26, 825.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

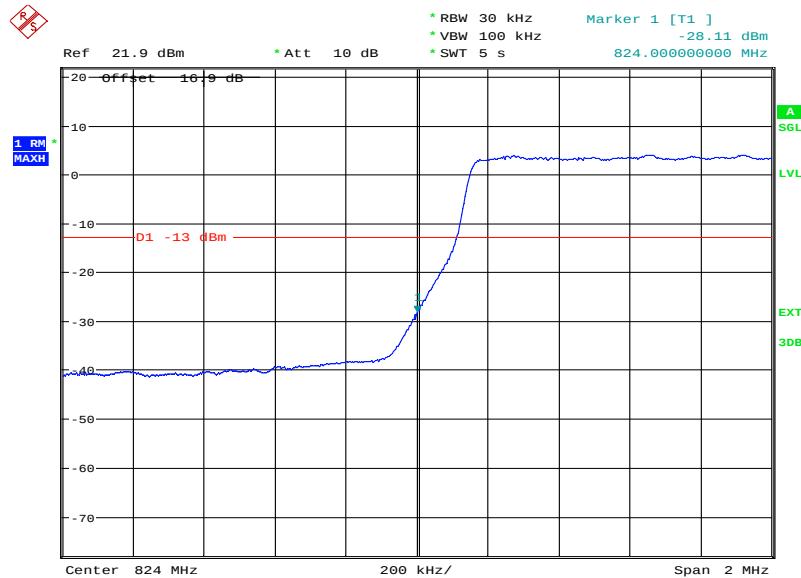


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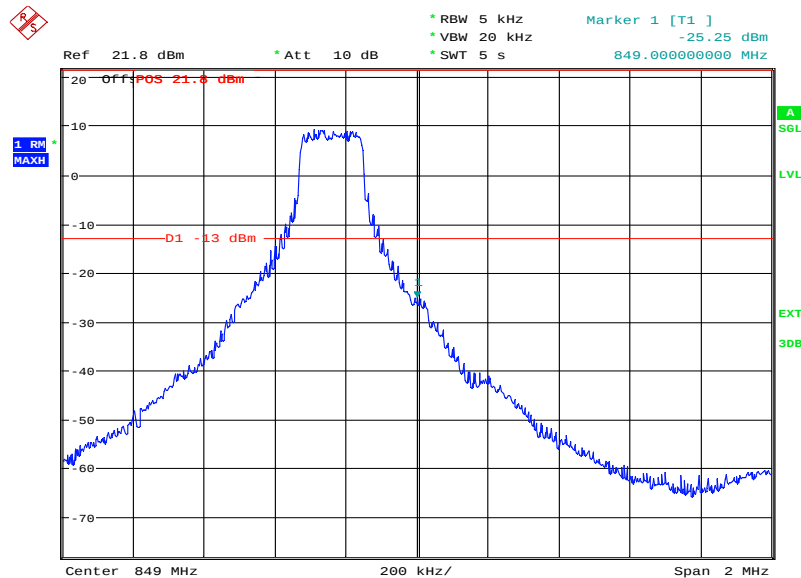
Product Service

LTE FDD 26, 825.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 14:16:37

LTE FDD 26, 847.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

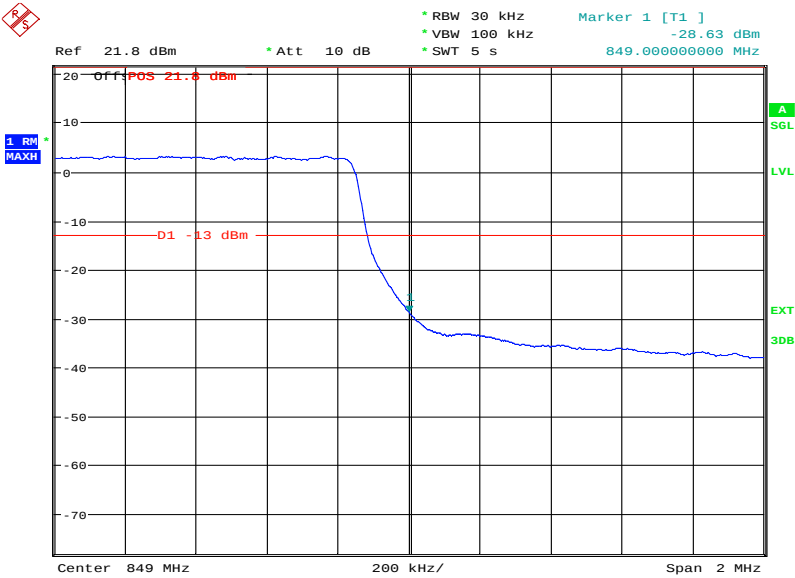


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Product Service

LTE FDD 26, 847.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



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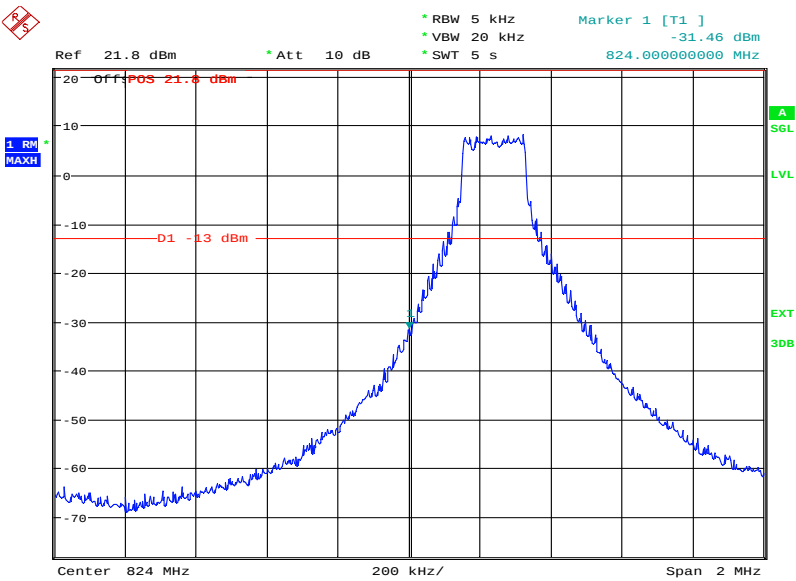


Product Service

LTE FDD 26, 3.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
825.5 MHz		847.5 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-31.46	-29.99	-27.19	-29.17

LTE FDD 26, 825.5 MHz, 1 Resource Block - Low, 3.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

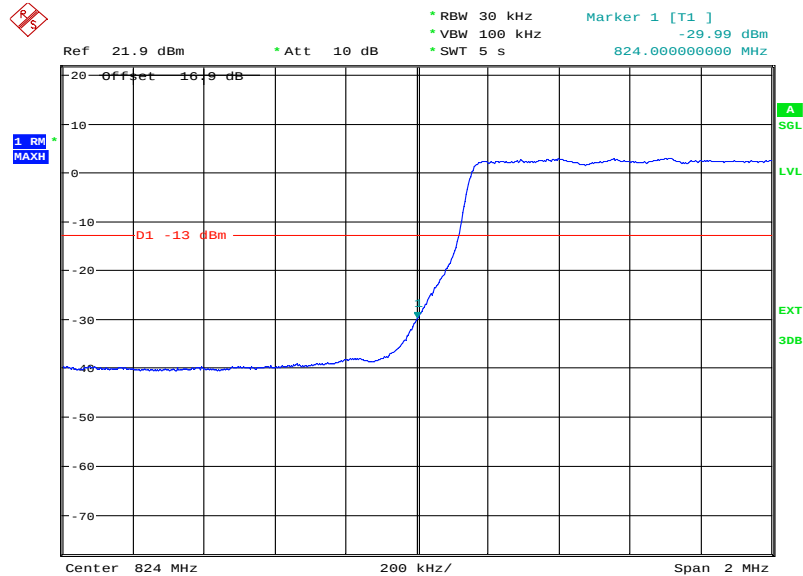


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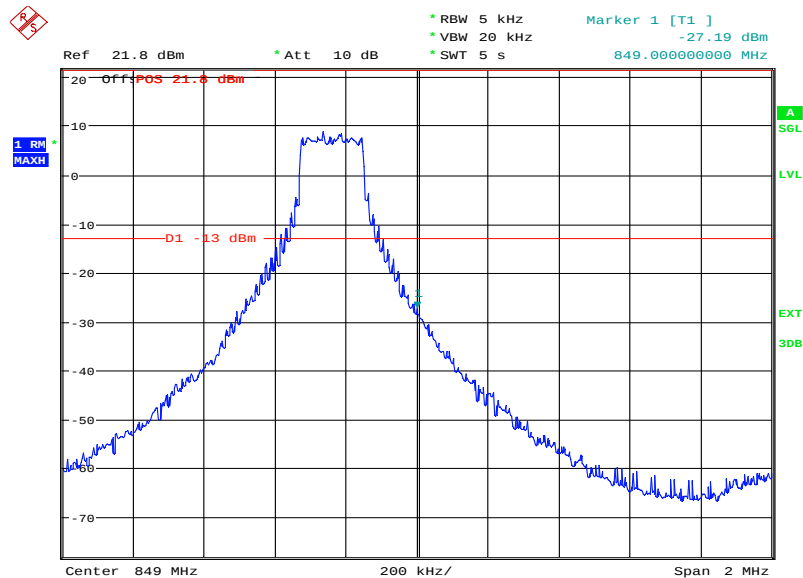
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LTE FDD 26, 825.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 14:22:03

LTE FDD 26, 847.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



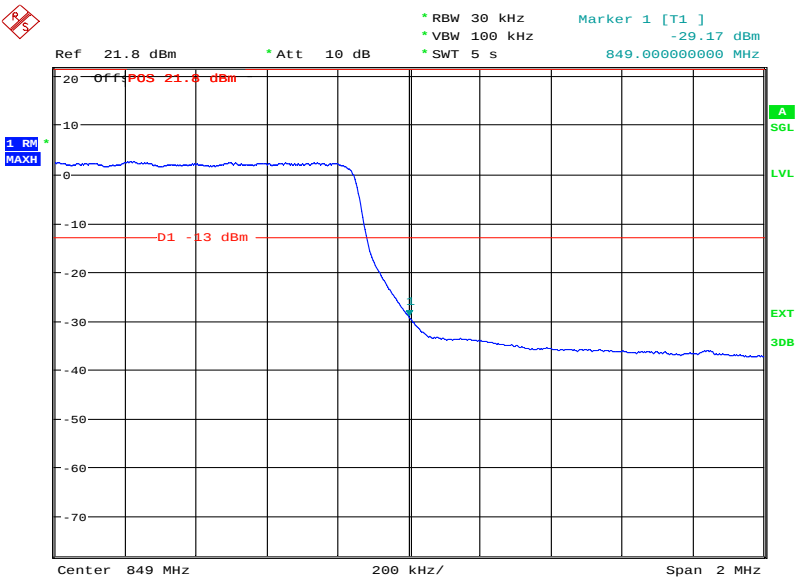
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LTE FDD 26, 847.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Product Service

Emissions at Band Edge Results



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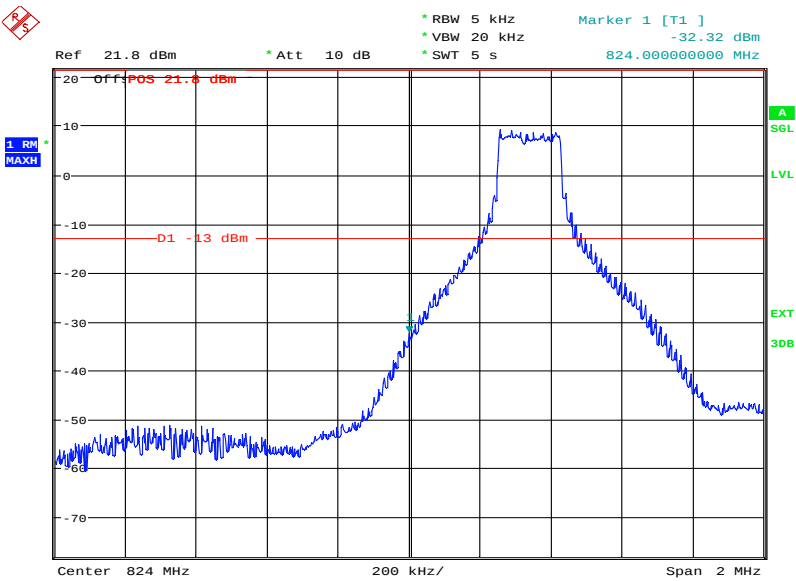


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LTE FDD 26, 5.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
826.5 MHz		846.5 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-32.32	-29.44	-31.36	-29.81

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

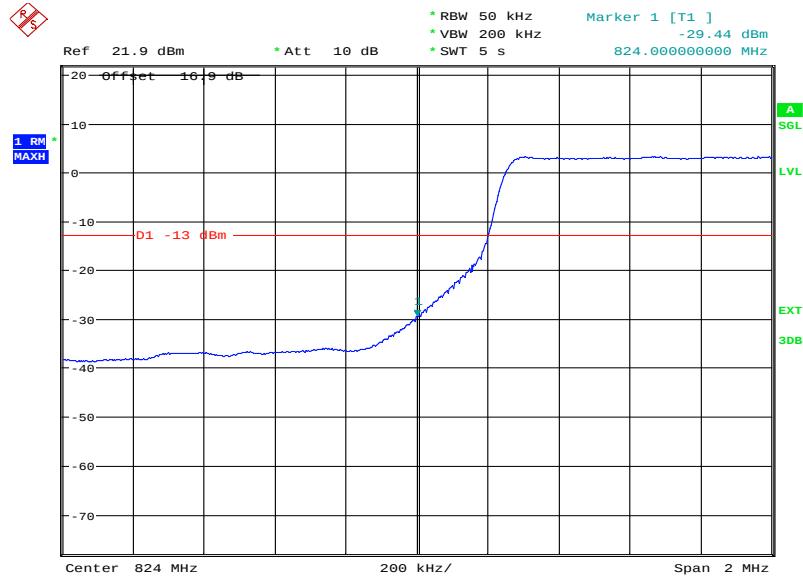


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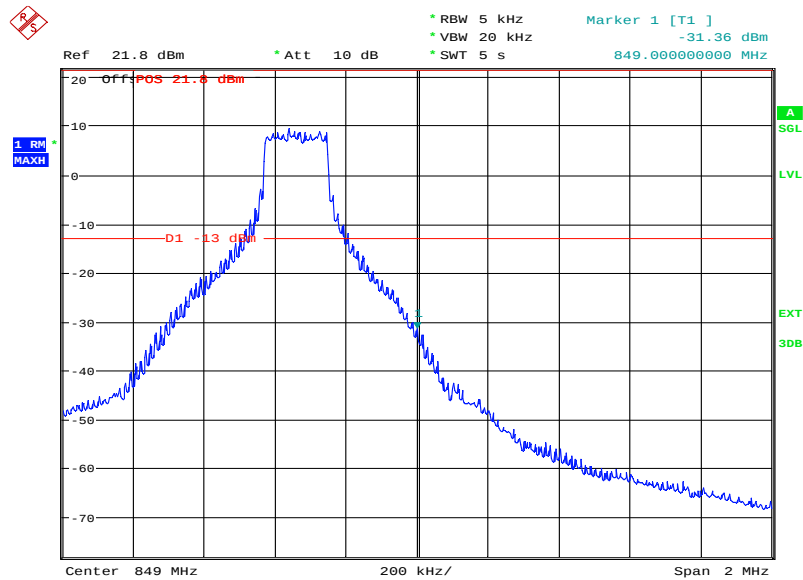
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LTE FDD 26, 826.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 13:43:43

LTE FDD 26, 846.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

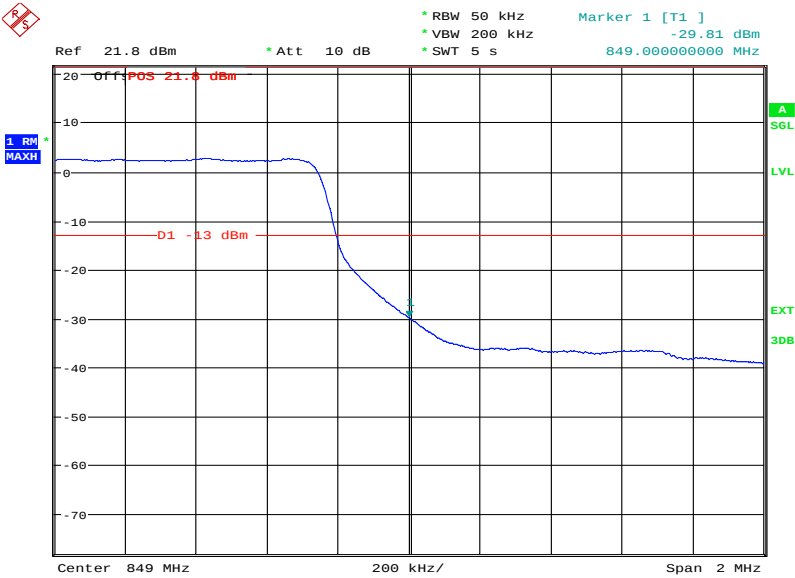


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Product Service

LTE FDD 26, 846.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



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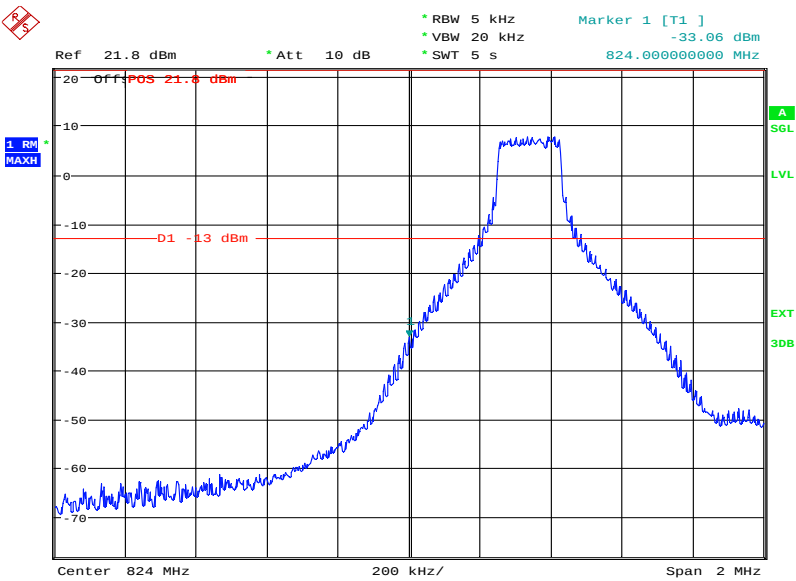


Product Service

LTE FDD 26, 5.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
826.5 MHz		846.5 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-33.06	-30.53	-32.43	-31.01

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

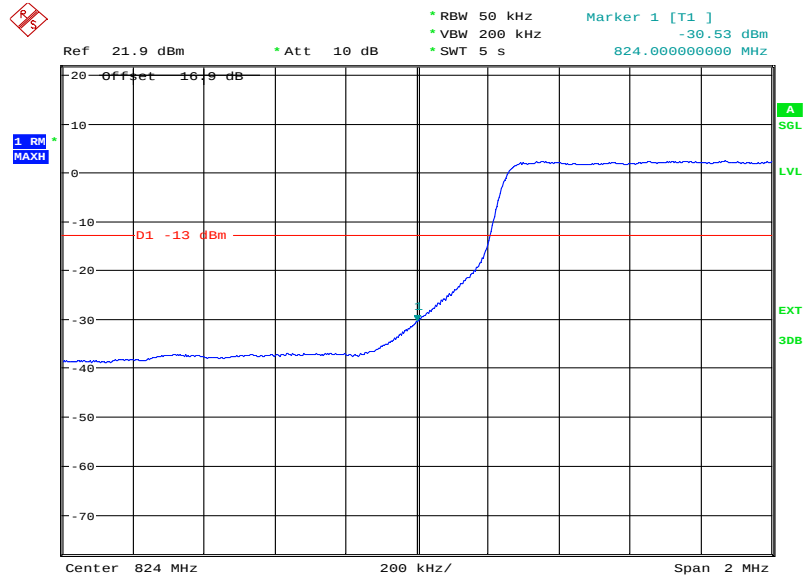


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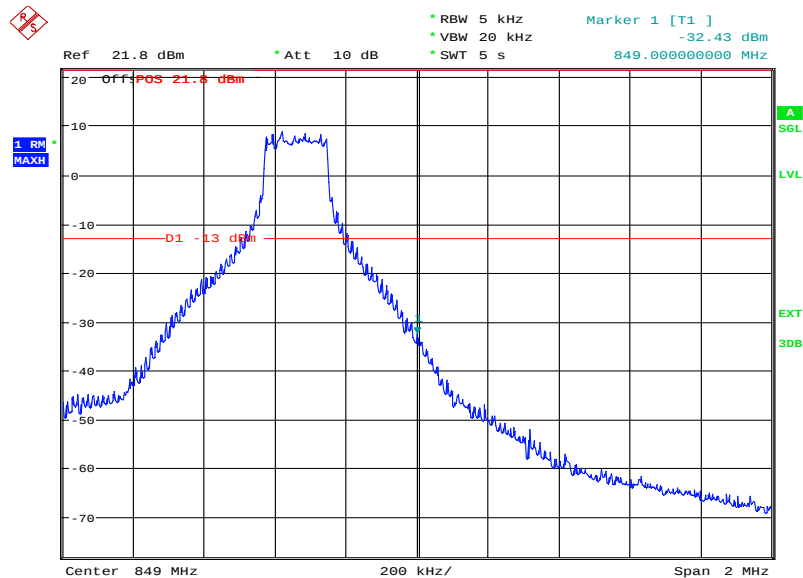
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LTE FDD 26, 826.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 13:48:30

LTE FDD 26, 846.5 MHz, 1 Resource Block - High, 5.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



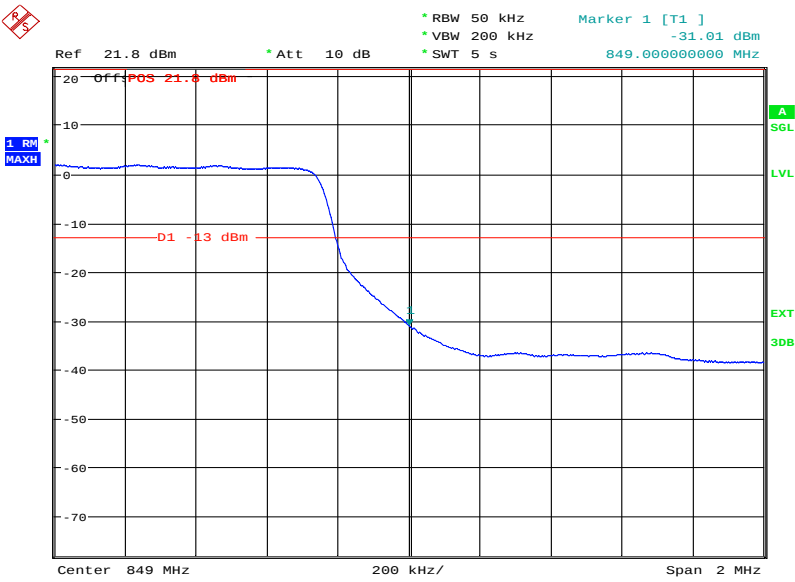
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LTE FDD 26, 846.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Product Service

Emissions at Band Edge Results



Date: 5.JUN.2015 10:59:16

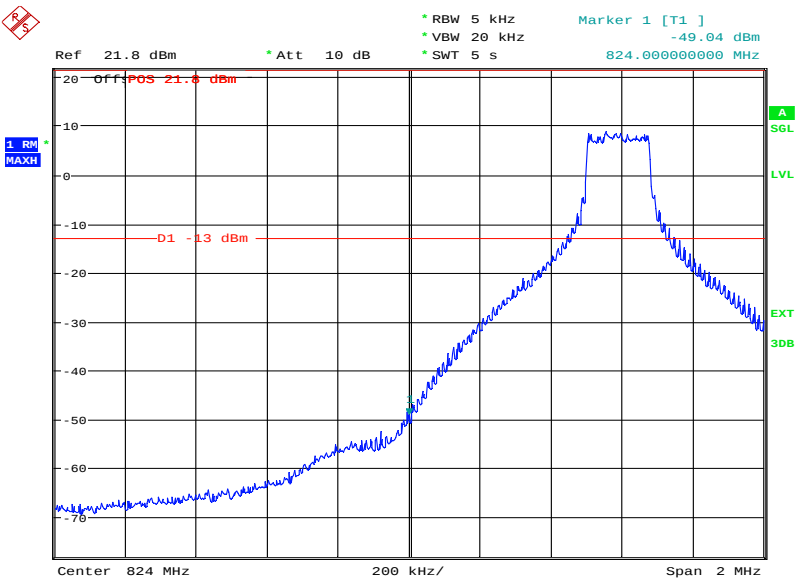


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LTE FDD 26, 10.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
829.0 MHz		844.0 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-49.04	-30.01	-46.47	-34.72

LTE FDD 26, 829.0 MHz, 1 Resource Block - Low, 10.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

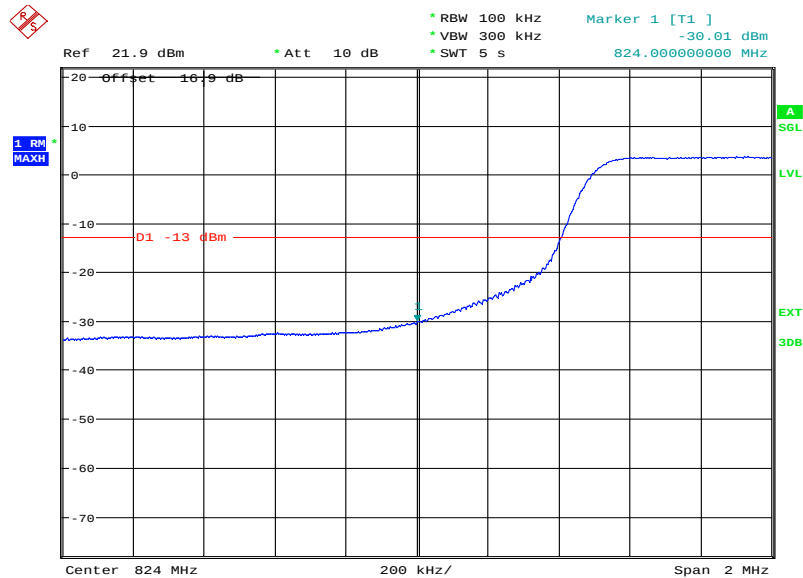


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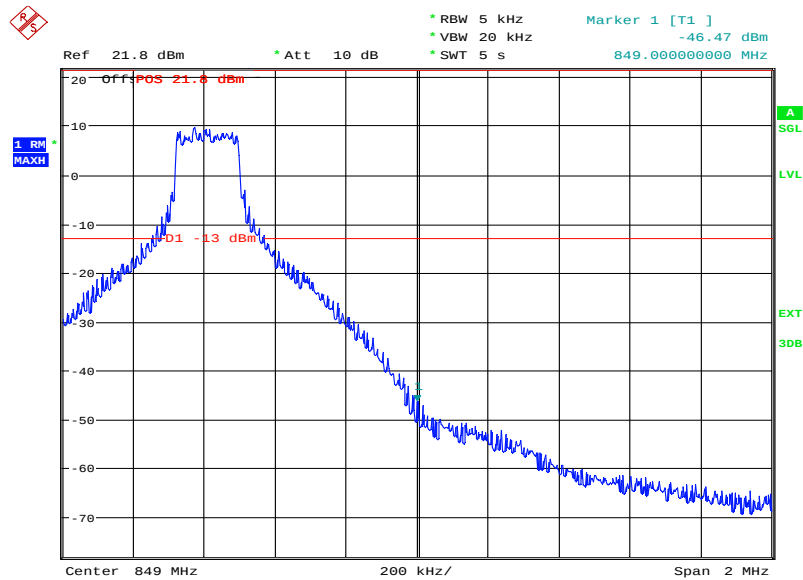
Product Service

LTE FDD 26, 829.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 13:13:10

LTE FDD 26, 844.0 MHz, 1 Resource Block - High, 10.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

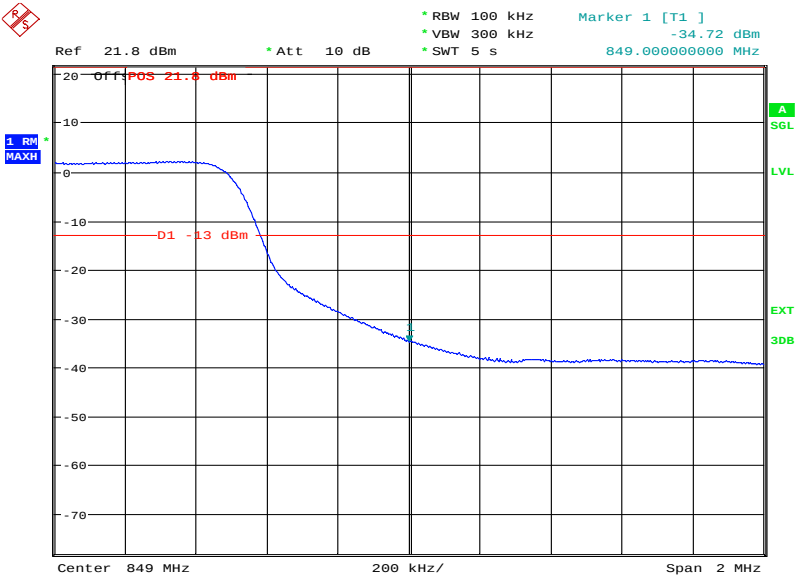


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Product Service

LTE FDD 26, 844.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



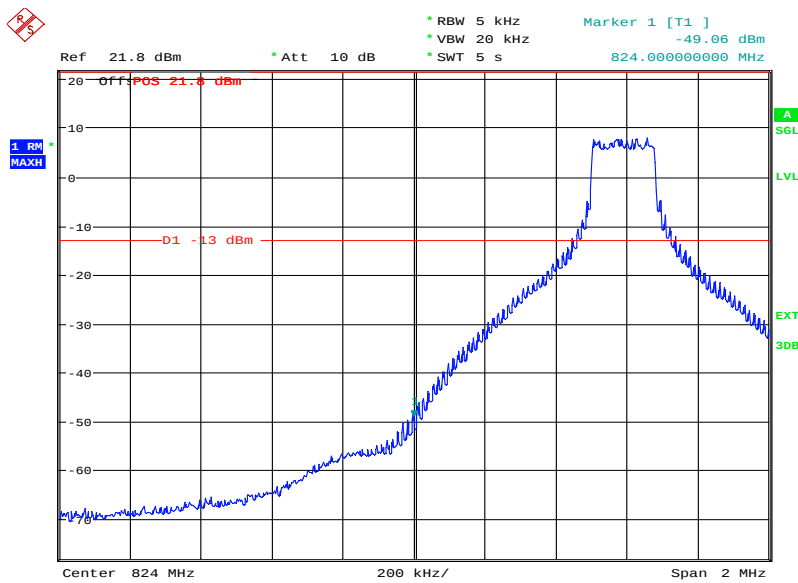
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LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
829.0 MHz		844.0 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-49.06	-31.83	-48.20	-34.78

LTE FDD 26, 829.0 MHz, 1 Resource Block - Low, 10.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

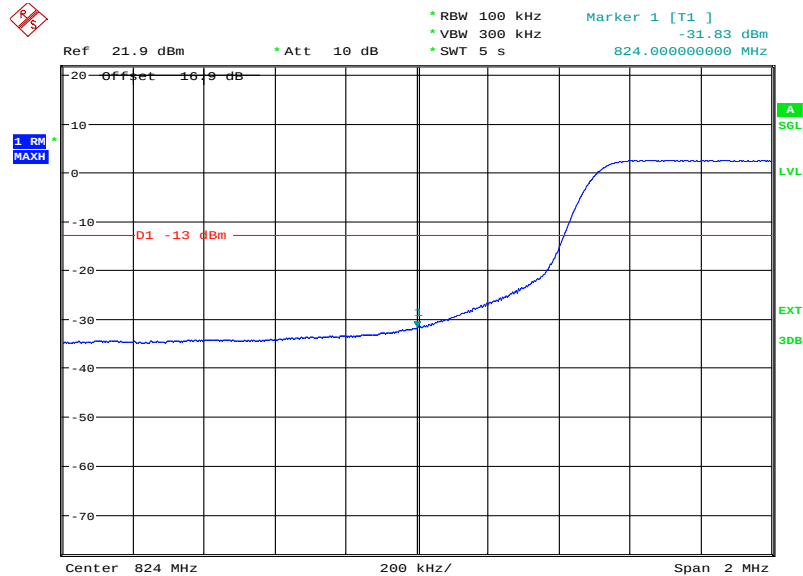


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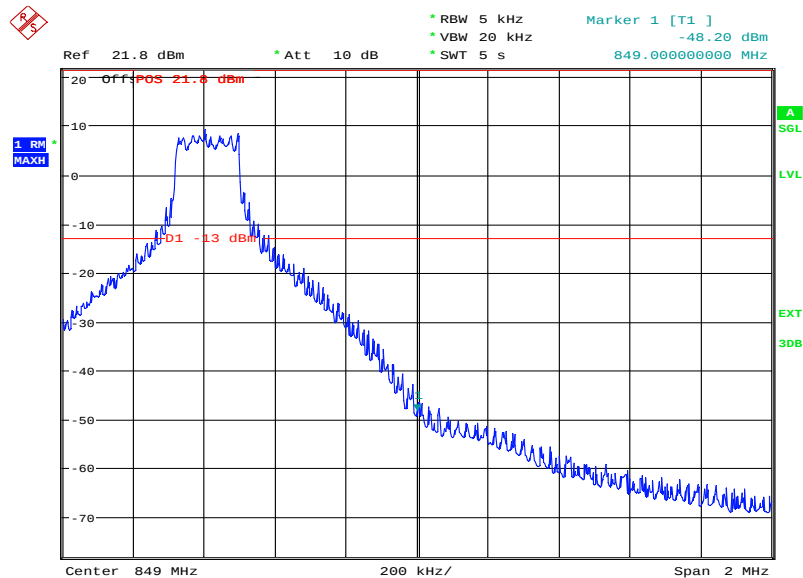
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LTE FDD 26, 829.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 13:19:30

LTE FDD 26, 844.0 MHz, 1 Resource Block - High, 10.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

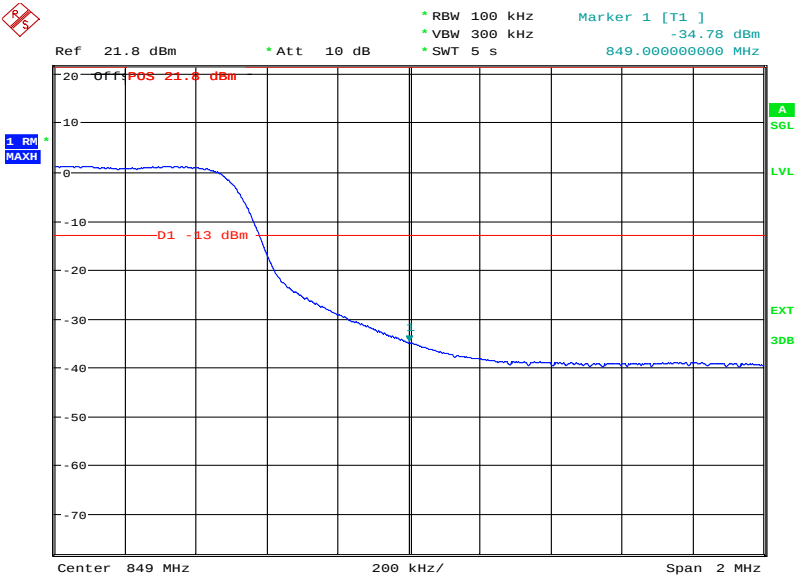


Date: 5.JUN.2015 10:40:37



Product Service

LTE FDD 26, 844.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 5.JUN.2015 10:38:20

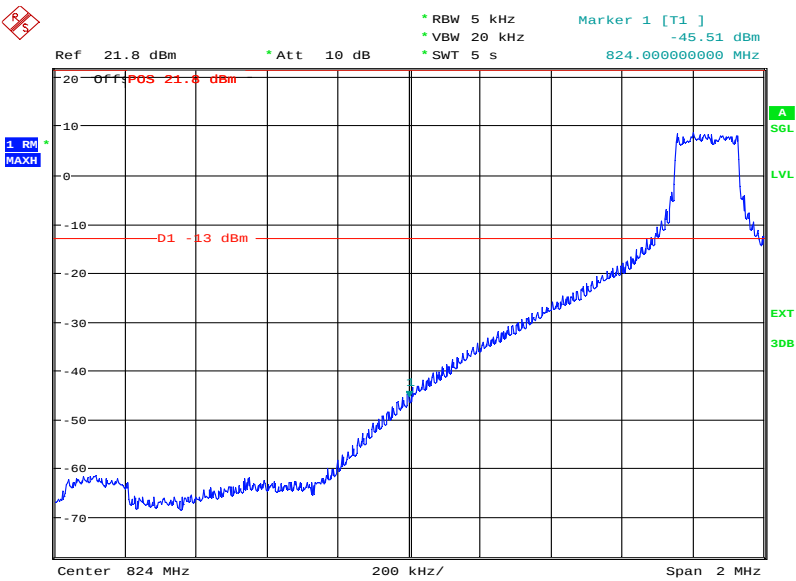


Product Service

LTE FDD 26, 15.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
831.5 MHz		841.5 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-45.51	-29.92	-45.54	-34.36

LTE FDD 26, 831.5 MHz, 1 Resource Block - Low, 15.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

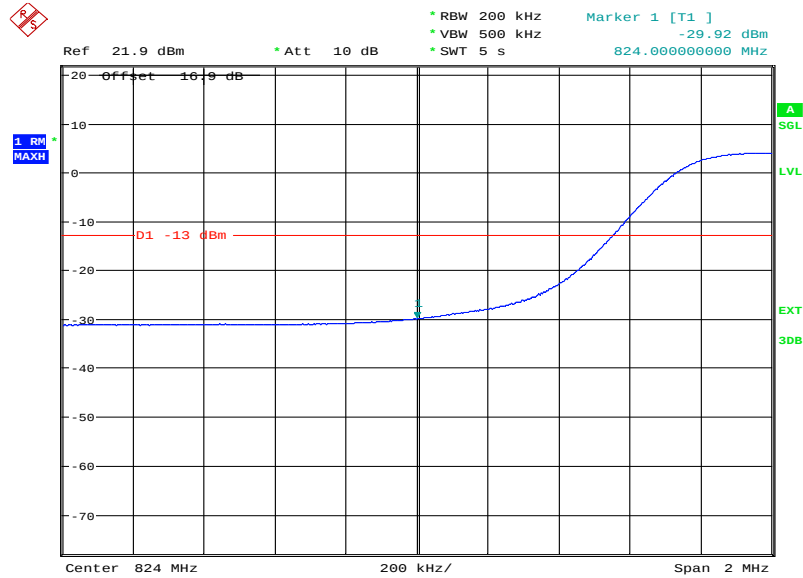


Date: 4.JUN.2015 12:03:25



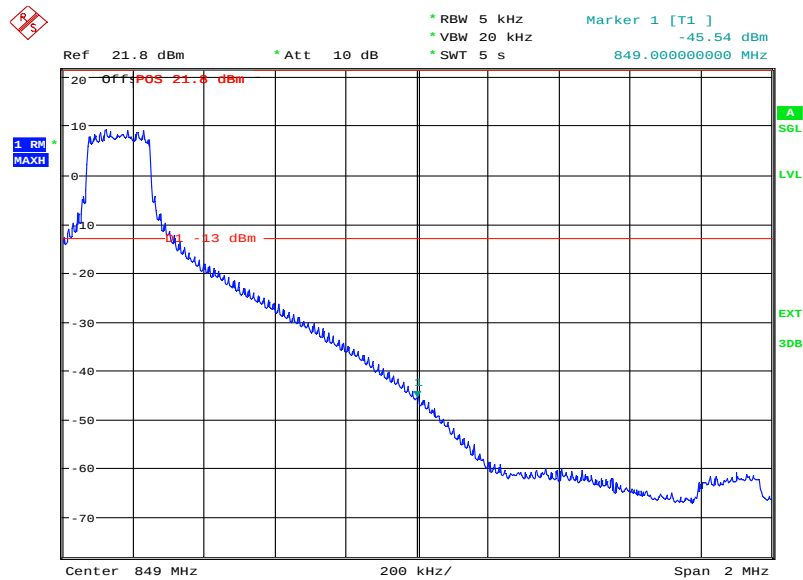
Product Service

LTE FDD 26, 831.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 11:56:02

LTE FDD 26, 841.5 MHz, 1 Resource Block - High, 15.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results

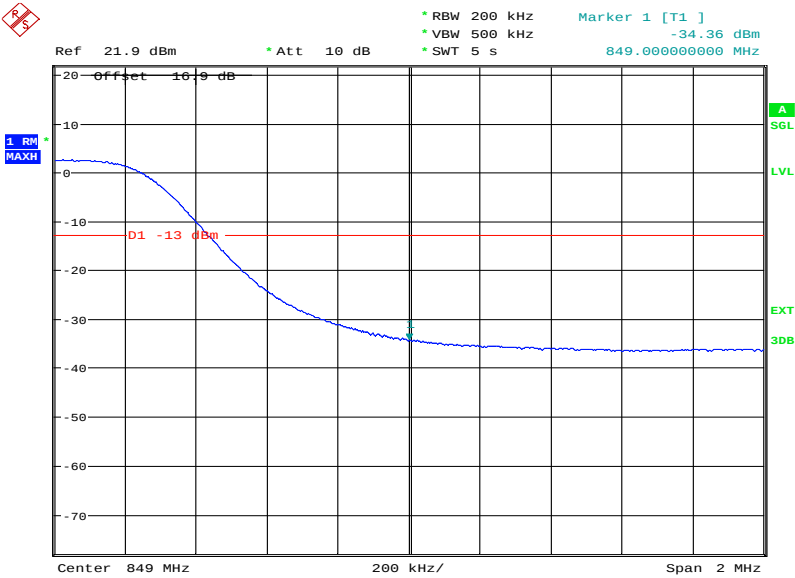


Date: 5.JUN.2015 09:51:49



Product Service

LTE FDD 26, 841.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, QPSK, Spurious Emissions at Band Edge Results



Date: 5.JUN.2015 10:12:08

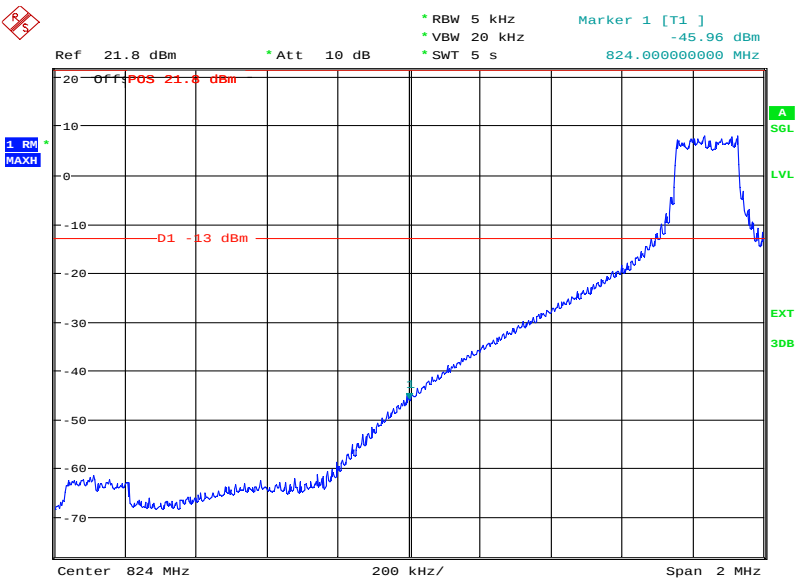


Product Service

LTE FDD 26, 15.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

Band Edge (dBm)			
831.5 MHz		841.5 MHz	
1 Resource Block	All Resource Blocks	1 Resource Block	All Resource Blocks
Low		High	
-45.96	-30.84	-45.93	-34.85

LTE FDD 26, 831.5 MHz, 1 Resource Block - Low, 15.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

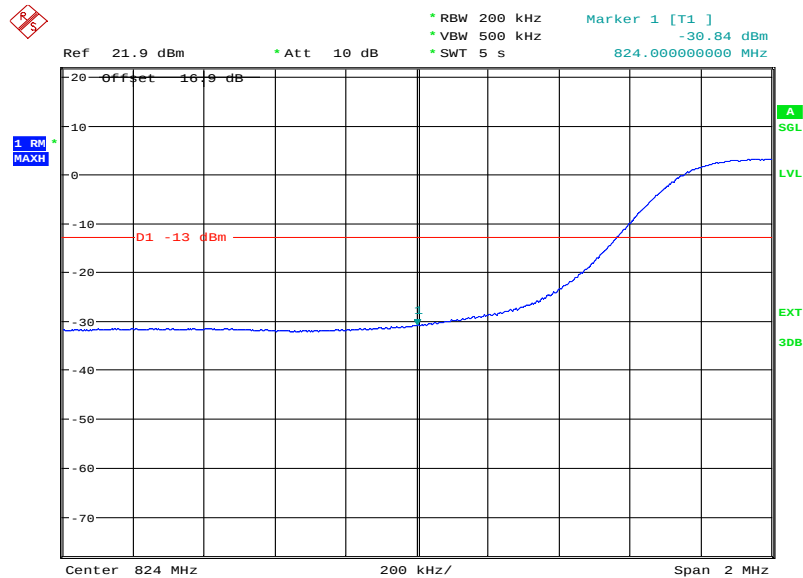


Date: 4.JUN.2015 12:01:20



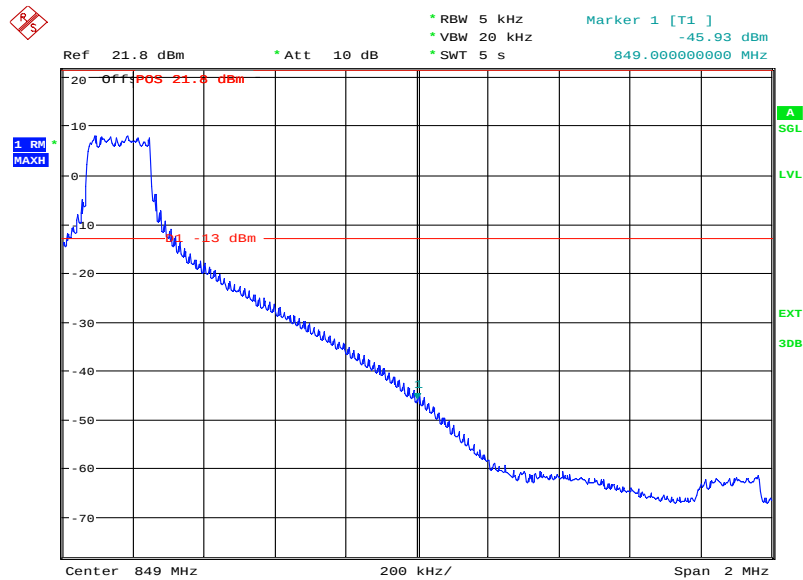
Product Service

LTE FDD 26, 831.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 4.JUN.2015 11:59:15

LTE FDD 26, 841.5 MHz, 1 Resource Block - High, 15.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results

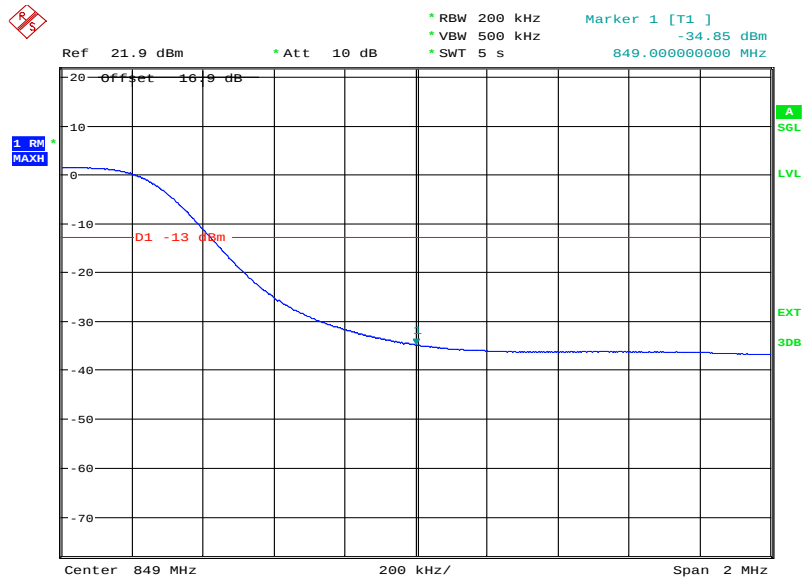


Date: 5.JUN.2015 09:53:50



Product Service

LTE FDD 26, 841.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, 16-QAM, Spurious Emissions at Band Edge Results



Date: 5 JUN.2015 09:57:55

FCC 47 CFR Part 22, Limit Clause 22.905 and 22.917(a)

-13 dBm at block edge.



Product Service

2.3 MAXIMUM CONDUCTED OUTPUT POWER**2.3.1 Specification Reference**

FCC 47 CFR Part 22, Clause 22.913 (a)
FCC 47 CFR Part 2, Clause 2.1046

2.3.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - Modification State 0

2.3.3 Date of Test

28 May 2015

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

Carrier power measurements were performed in accordance with KDB 971168 D01 v02r02, Clause 5.2.3.

2.3.6 Environmental Conditions

Ambient Temperature	25.2°C
Relative Humidity	26.7%



2.3.7 Test Results

4.0 V DC Supply

LTE FDD 26, 1.4 MHz Bandwidth, QPSK, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
824.7 MHz				836.5 MHz				848.3 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
22.9	22.91	22.9	22.06	22.89	22.81	22.83	21.97	22.94	22.79	22.89	22.01

LTE FDD 26, 1.4 MHz Bandwidth, 16-QAM, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
824.7 MHz				836.5 MHz				848.3 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
22.04	22	22.03	21.07	22	21.94	21.97	21.01	22.16	22.07	22.09	20.94

LTE FDD 26, 3.0 MHz Bandwidth, QPSK, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
825.5 MHz				836.5 MHz				847.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
20.88	20.84	20.89	19.98	21	20.94	20.97	19.97	20.87	20.8	20.87	19.94

LTE FDD 26, 3.0 MHz Bandwidth, 16-QAM, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
825.5 MHz				836.5 MHz				847.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
22.88	22.84	22.89	21.98	23	22.94	22.97	21.97	22.87	22.8	22.87	21.94



LTE FDD 26, 5.0 MHz Bandwidth, QPSK, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
826.5 MHz				836.5 MHz				846.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
22.79	22.71	22.74	21.98	22.9	22.82	22.96	21.94	22.86	22.83	22.84	21.86

LTE FDD 26, 5.0 MHz Bandwidth, 16-QAM, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
826.5 MHz				836.5 MHz				846.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
21.93	21.9	21.87	21	21.78	21.76	21.84	21.02	21.72	21.68	21.69	21.09

LTE FDD 26, 10.0 MHz Bandwidth, QPSK, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
829.0 MHz				836.5 MHz				844.0 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
22.91	22.82	22.85	22.01	22.98	22.94	22.95	21.97	22.91	22.76	22.84	21.89

LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
829.0 MHz				836.5 MHz				844.0 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
21.99	21.95	21.94	21	22.06	22.07	22.08	20.98	21.98	21.84	21.86	20.98

LTE FDD 26, 15.0 MHz Bandwidth, QPSK, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
831.5 MHz				836.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
22.9	22.8	22.92	21.97	22.93	22.95	22.96	22.03	22.61	22.71	22.68	21.74



Product Service

LTE FDD 26, 15.0 MHz Bandwidth, 16-QAM, Maximum Conducted Output Power Results

Carrier Power ERP (dBm)											
831.5 MHz				836.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
21.98	21.93	22.02	20.94	22.11	22.12	22.09	21.04	21.84	21.86	21.93	20.97

FCC 47 CFR Part 22, Limit Clause 22.913 (a)(2)

Mobile Transmitters: 7 W or 38.45 dBm



Product Service

2.4 PEAK TO AVERAGE RATIO**2.4.1 Specification Reference**

FCC 47 CFR Part 22, Clause 22.913 (a)
FCC 47 CFR Part 2, Clause 2.1046

2.4.2 Equipment Under Test and Modification State

SHV32 S/N: IMEI 004401115406494 - Modification State 0

2.4.3 Date of Test

28 May 2015 & 15 June 2015

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

Peak to average ratio measurements were performed in accordance with KDB 971168 D01 v02r02, Clause 5.7.1.

2.4.6 Environmental Conditions

Ambient Temperature	23.3 - 25.2°C
Relative Humidity	21.8 - 34.8%



2.4.7 Test Results

4.0 V DC Supply

LTE FDD 26, 1.4 MHz Bandwidth, QPSK, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
824.7 MHz				836.5 MHz				848.3 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
5.8	5.9	5.9	6.8	5.3	5.3	5.2	6.2	5.4	5.4	5.2	6.0

LTE FDD 26, 1.4 MHz Bandwidth, 16-QAM, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
824.7 MHz				836.5 MHz				848.3 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
6.6	6.7	6.6	7.6	6.2	6.1	6.0	6.9	6.4	6.2	6.3	6.9

LTE FDD 26, 3.0 MHz Bandwidth, QPSK, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
825.5 MHz				836.5 MHz				847.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
5.9	6.0	6.0	6.8	5.5	5.3	5.2	6.1	6.1	5.6	5.3	6.3

LTE FDD 26, 3.0 MHz Bandwidth, 16-QAM, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
825.5 MHz				836.5 MHz				847.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
6.8	7.0	7.1	7.8	6.5	6.4	6.3	7.3	7.1	6.7	6.3	7.4



LTE FDD 26, 5.0 MHz Bandwidth, QPSK, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
826.5 MHz				836.5 MHz				846.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
5.9	6.1	6.1	6.9	5.8	5.4	5.3	6.2	5.8	5.8	5.4	6.4

LTE FDD 26, 5.0 MHz Bandwidth, 16-QAM, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
826.5 MHz				836.5 MHz				846.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
6.8	6.9	7.1	7.9	6.8	6.4	6.2	7.3	6.5	6.6	6.5	7.7

LTE FDD 26, 10.0 MHz Bandwidth, QPSK, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
829.0 MHz				836.5 MHz				844.0 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
5.9	6.1	5.8	7.1	5.2	5.3	5.2	6.6	5.1	5.7	5.5	6.8

LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
829.0 MHz				836.5 MHz				844.0 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
6.9	7.2	6.9	8.0	6.3	6.4	6.2	7.5	6.2	6.6	6.4	7.6

LTE FDD 26, 15.0 MHz Bandwidth, QPSK, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
831.5 MHz				836.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
6.1	6.0	5.2	7.1	6.1	5.3	5.3	7.1	5.5	5.2	5.0	6.7



LTE FDD 26, 15.0 MHz Bandwidth, 16-QAM, Peak to Average Ratio Results

Peak To Average Ratio (dB)											
831.5 MHz				836.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
7.0	7.1	6.3	8.0	7.1	6.4	6.4	7.7	6.4	6.0	6.0	7.8

FCC 47 CFR Part 22, Limit Clause

No limit defined.



Product Service

2.5 EMISSION LIMITATIONS FOR CELLULAR EQUIPMENT

2.5.1 Specification Reference

FCC 47 CFR Part 22, Clause 22.917

2.5.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362366 - Modification State 0

2.5.3 Date of Test

1 June 2015

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Procedure

The test was performed in accordance with KDB 971168 D01 v02r02, Clause 5.8 and 7 and ANSI TIA-603-C, Clause 2.2.12. The EUT was configured as defined in ANSI C63.4.

2.5.6 Environmental Conditions

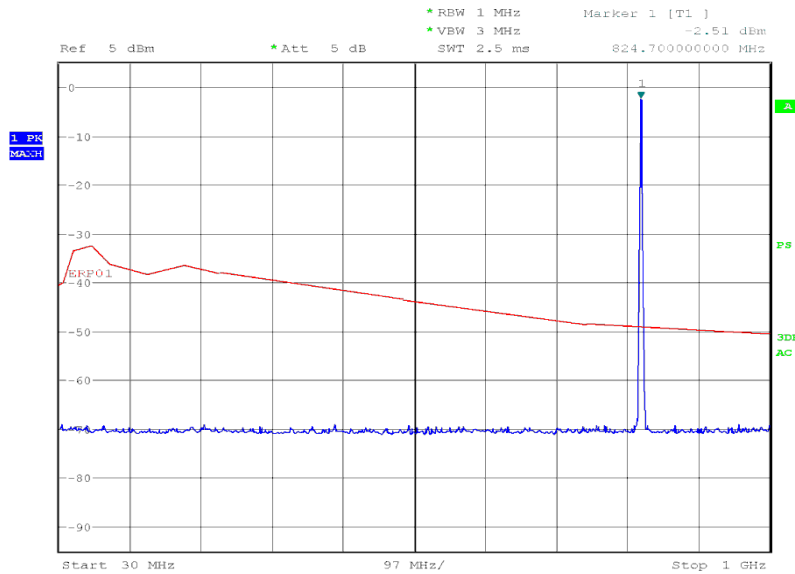
Ambient Temperature	21.5°C
Relative Humidity	33.0%



Product Service

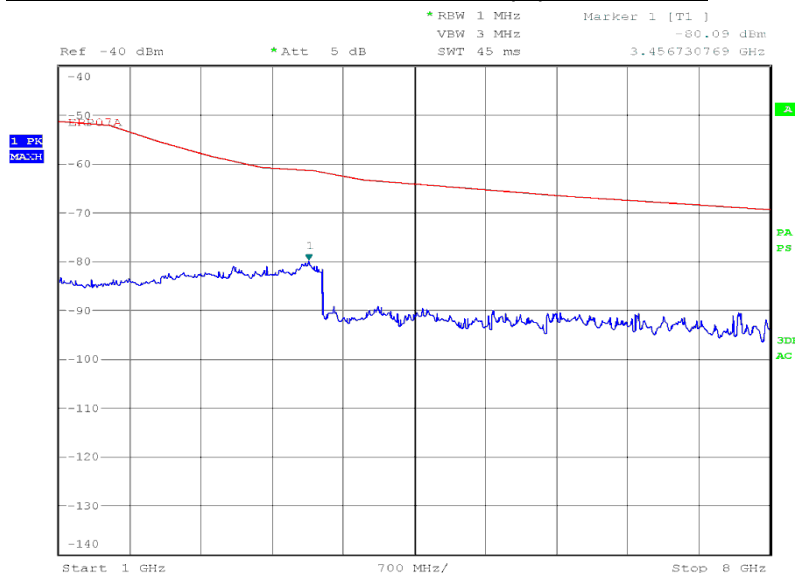
2.5.7 Test Results

LTE FDD 26, 824.7 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 18:28:13

LTE FDD 26, 824.7 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

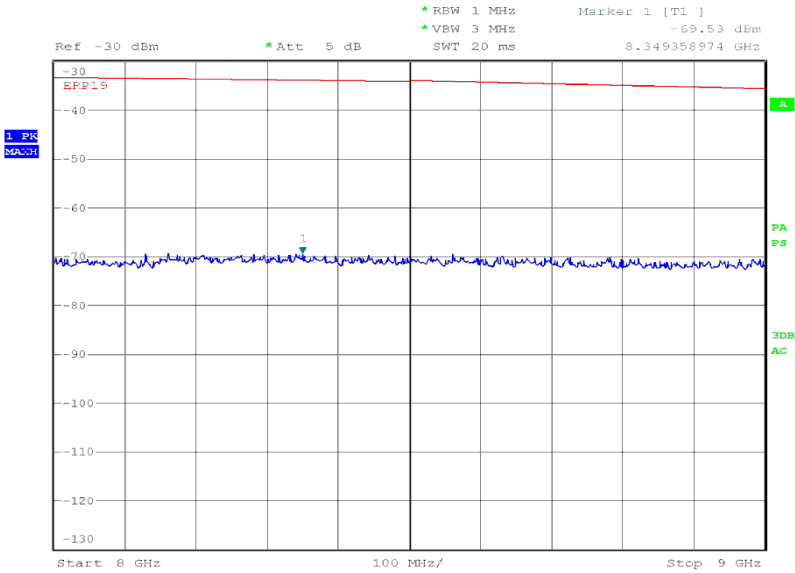


Date: 31.MAY.2015 09:02:45



Product Service

LTE FDD 26, 824.7 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

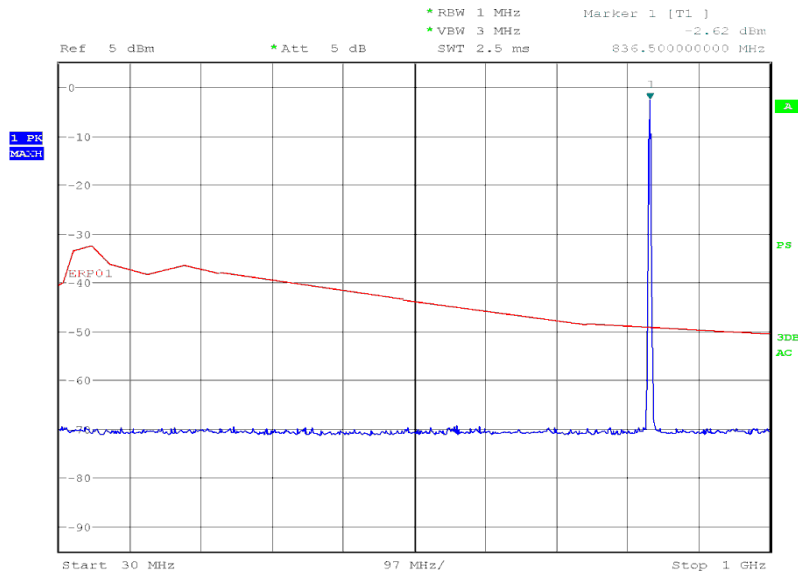


Date: 1.JUN.2015 18:57:59



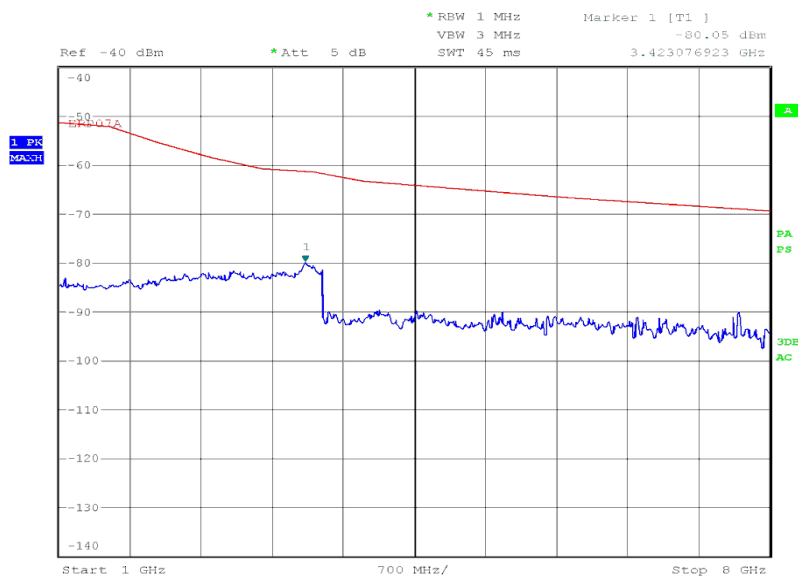
Product Service

LTE FDD 26, 836.5 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 18:30:55

LTE FDD 26, 836.5 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

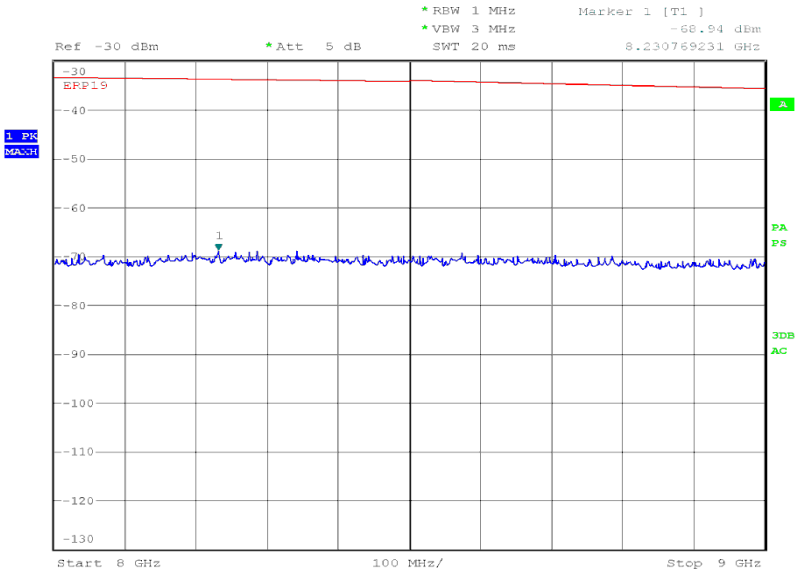


Date: 31.MAY.2015 09:04:42



Product Service

LTE FDD 26, 836.5 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

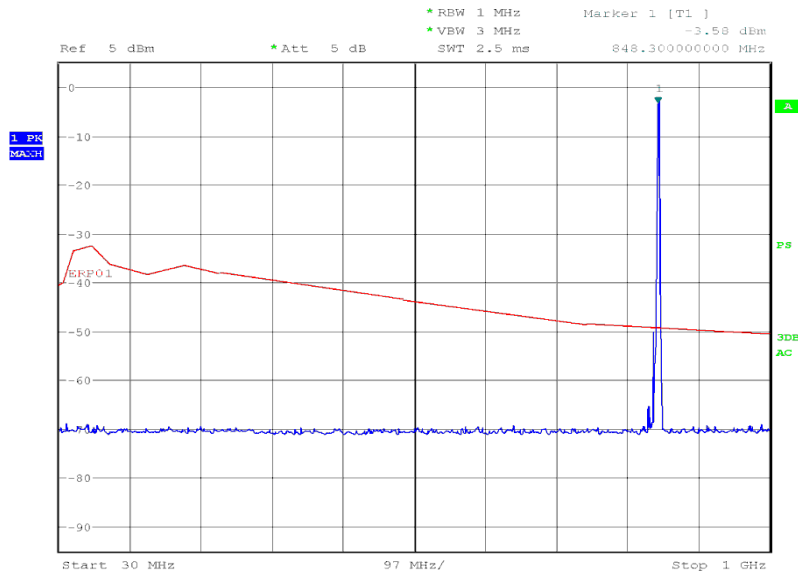


Date: 1.JUN.2015 18:59:59



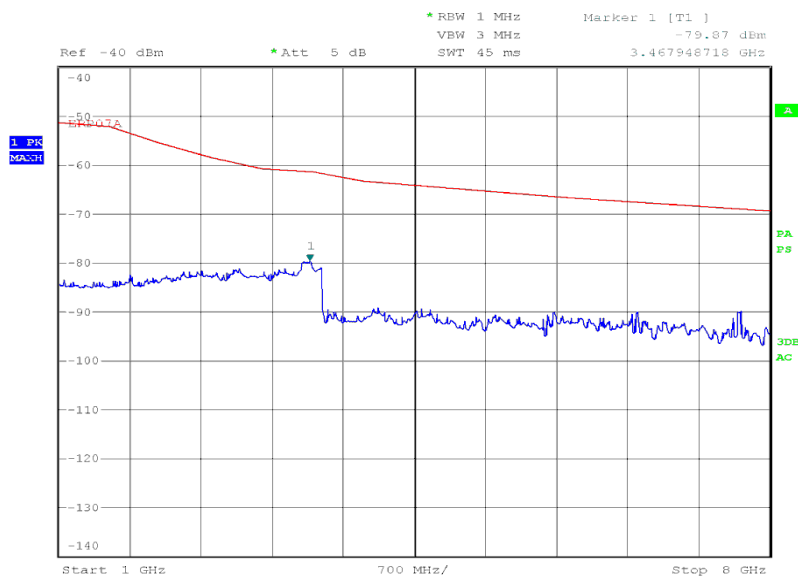
Product Service

LTE FDD 26, 848.3 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 18:40:38

LTE FDD 26, 848.3 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

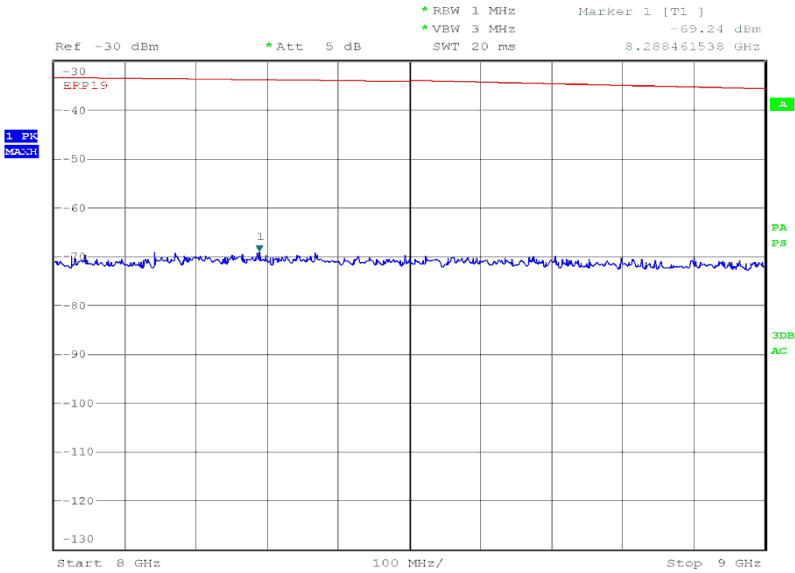


Date: 31.MAY.2015 09:08:07



Product Service

LTE FDD 26, 848.3 MHz, 3 Resource Block – Low, 1.4 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

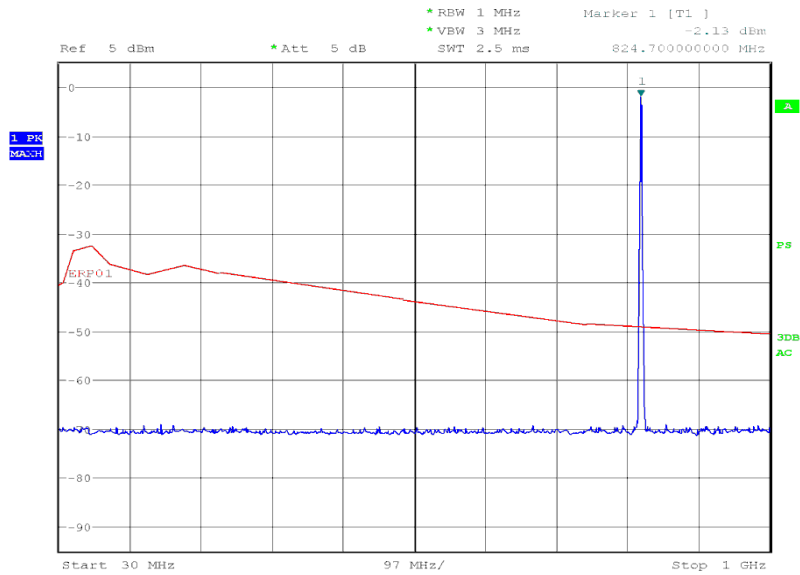


Date: 1.JUN.2015 19:01:40



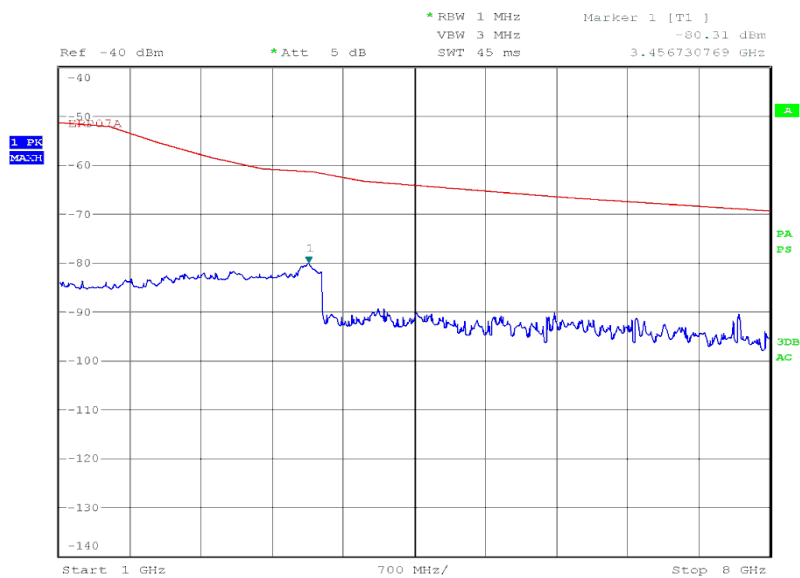
Product Service

LTE FDD 26, 824.7 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 18:44:41

LTE FDD 26, 824.7 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

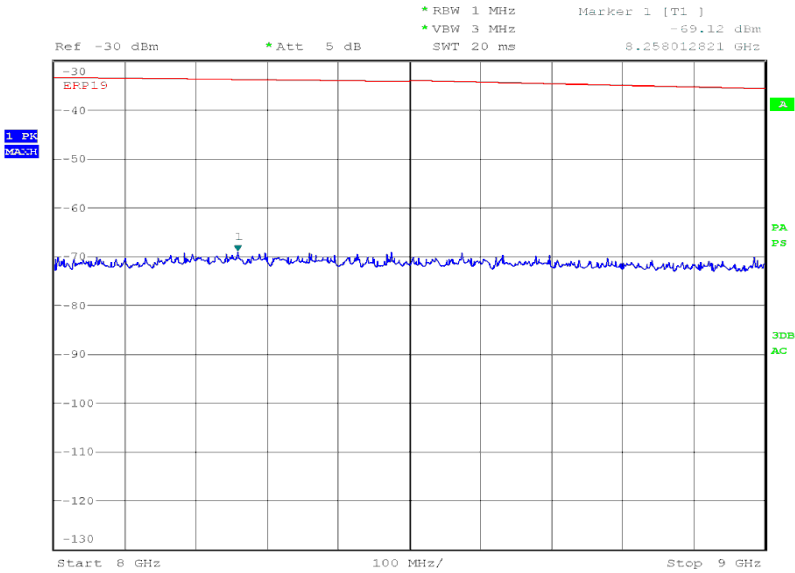


Date: 31.MAY.2015 10:07:30



Product Service

LTE FDD 26, 824.7 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

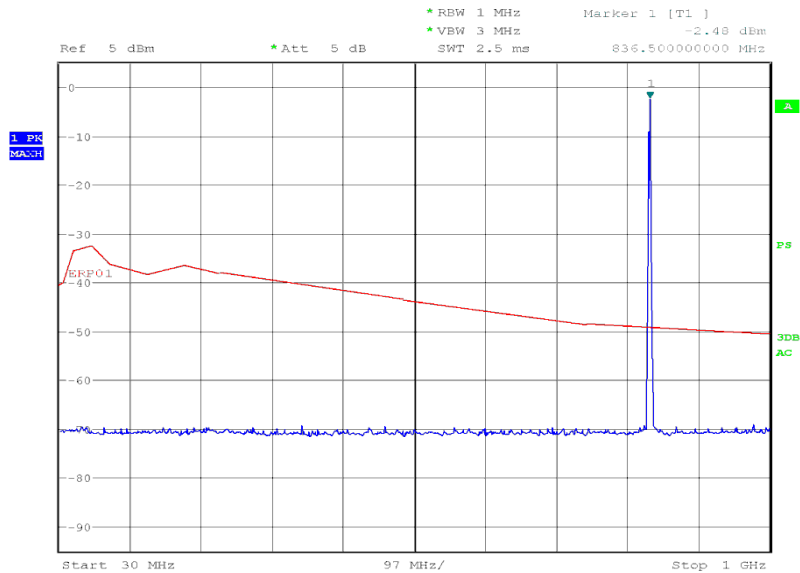


Date: 1.JUN.2015 19:09:34



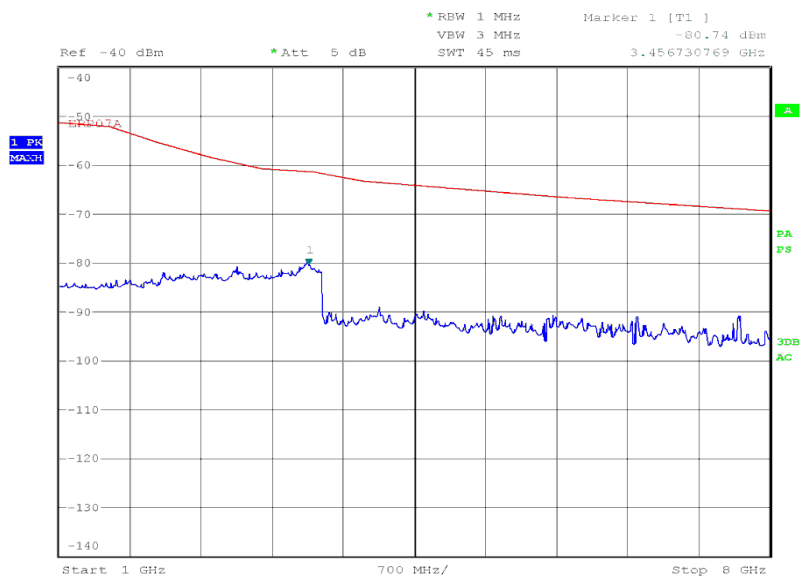
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 18:46:46

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

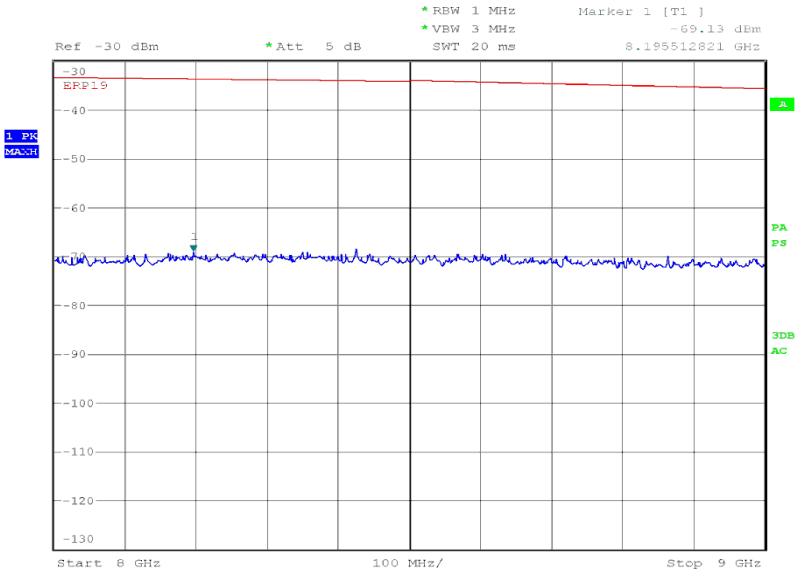


Date: 31.MAY.2015 10:05:36



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

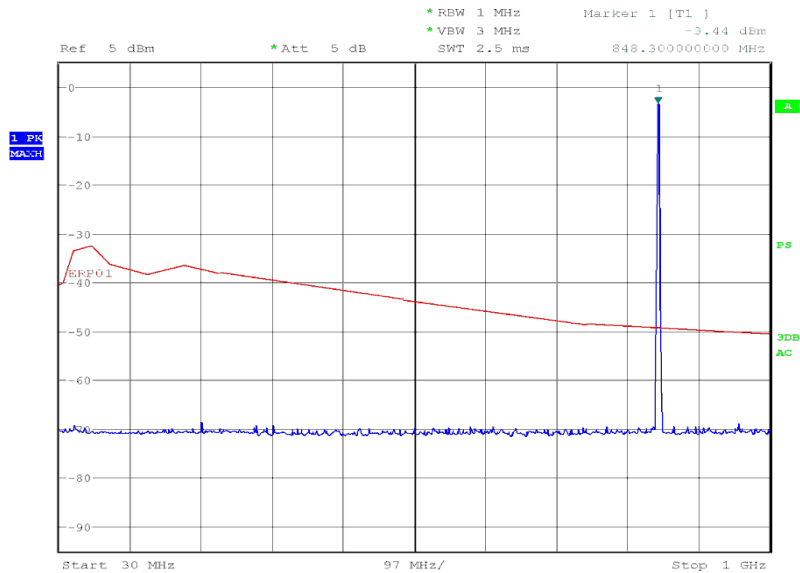


Date: 1.JUN.2015 19:08:19



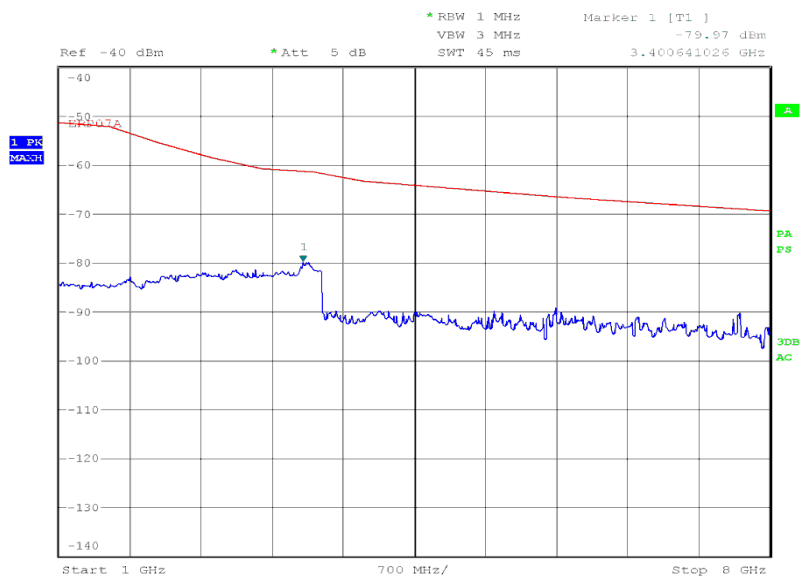
Product Service

LTE FDD 26, 848.3 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 18:48:46

LTE FDD 26, 848.3 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

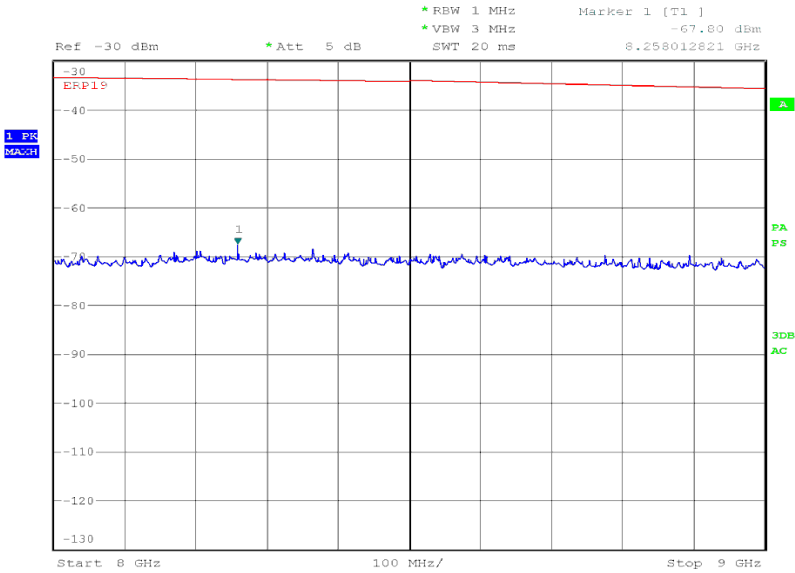


Date: 31.MAY.2015 09:15:06



Product Service

LTE FDD 26, 848.3 MHz, 1 Resource Block – Low, 1.4 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

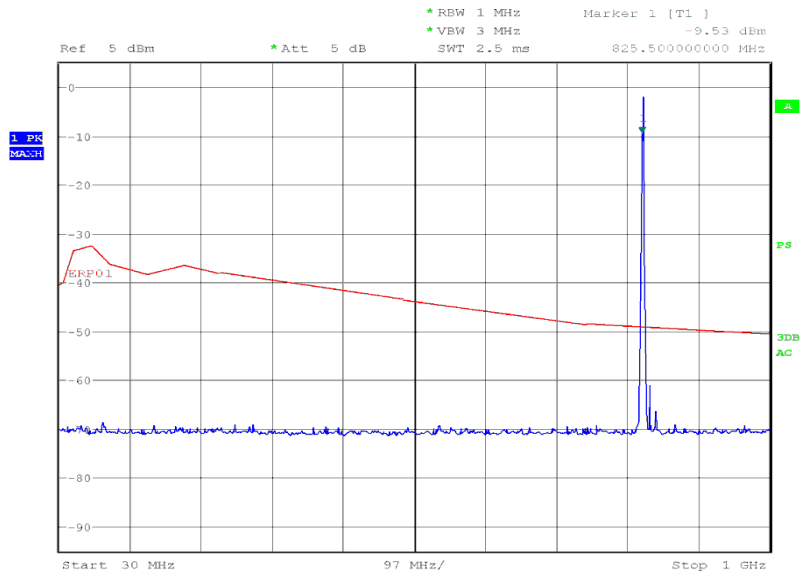


Date: 1.JUN.2015 19:04:06



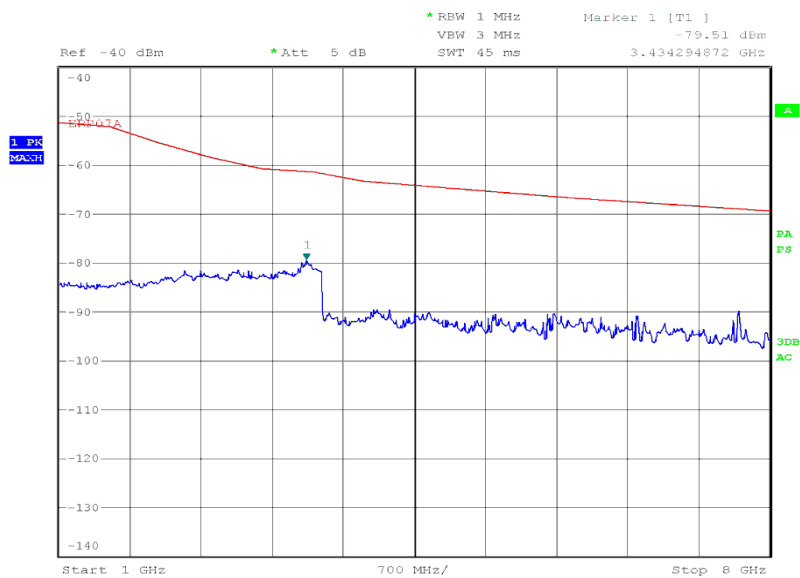
Product Service

LTE FDD 26, 825.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:07:46

LTE FDD 26, 825.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

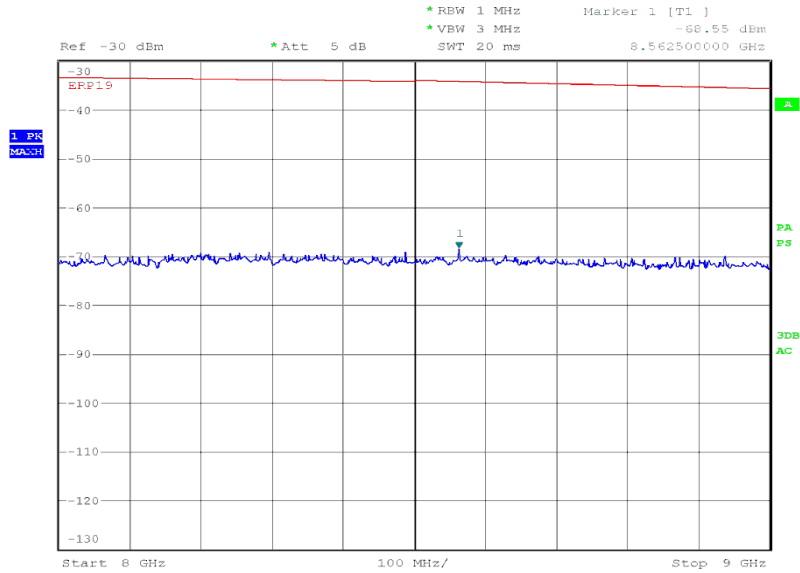


Date: 31.MAY.2015 10:21:12



Product Service

LTE FDD 26, 825.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

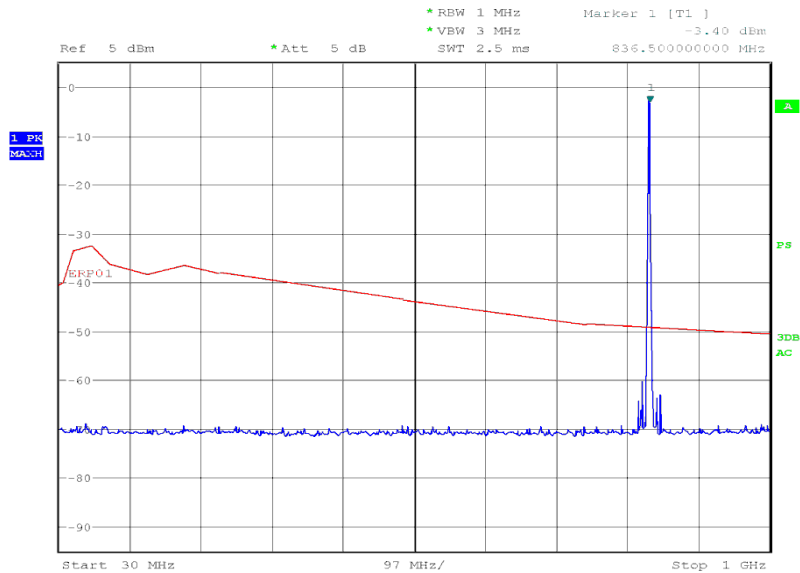


Date: 1.JUN.2015 19:21:56



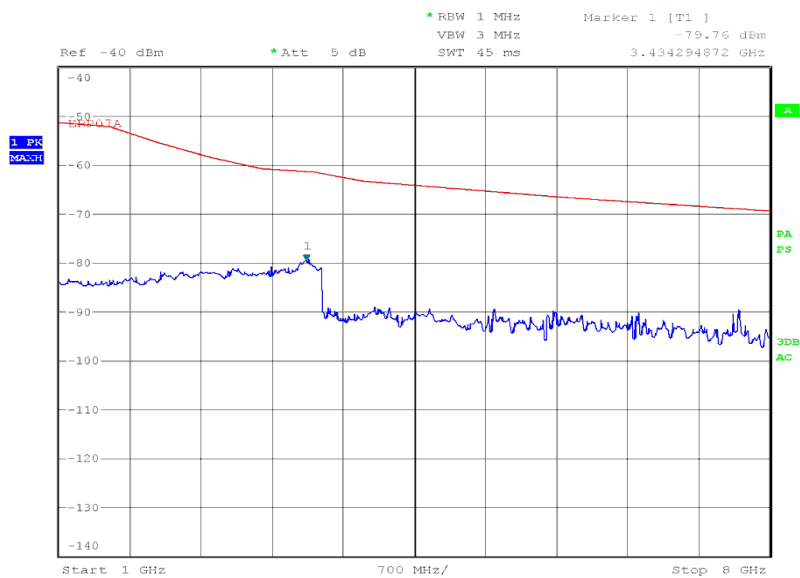
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:10:13

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

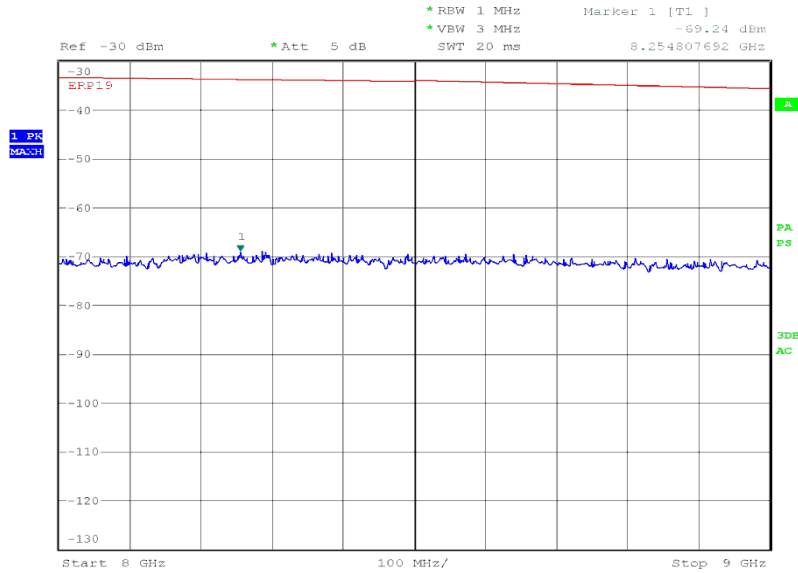


Date: 31.MAY.2015 10:35:21



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

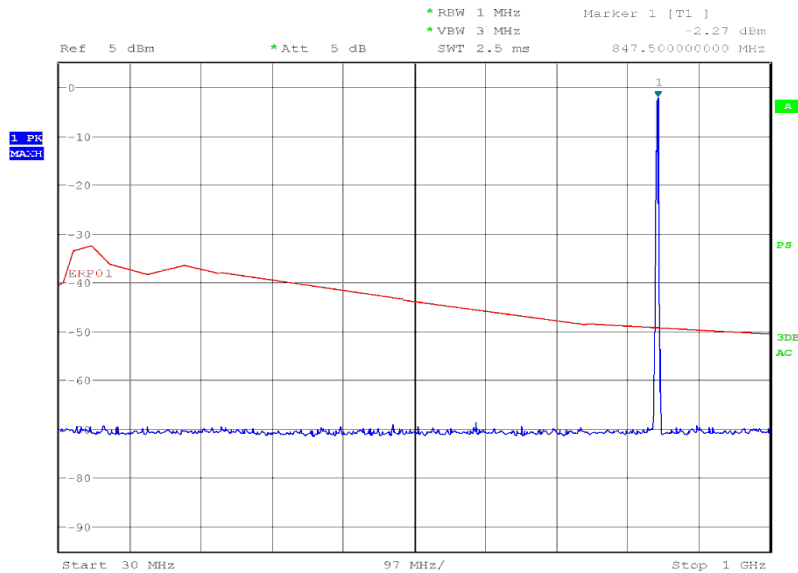


Date: 1.JUN.2015 19:23:50



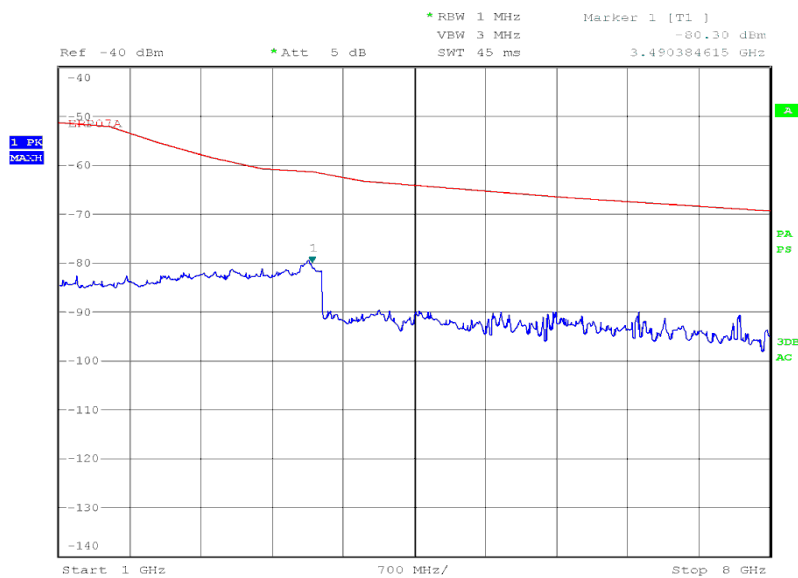
Product Service

LTE FDD 26, 847.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:12:26

LTE FDD 26, 847.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

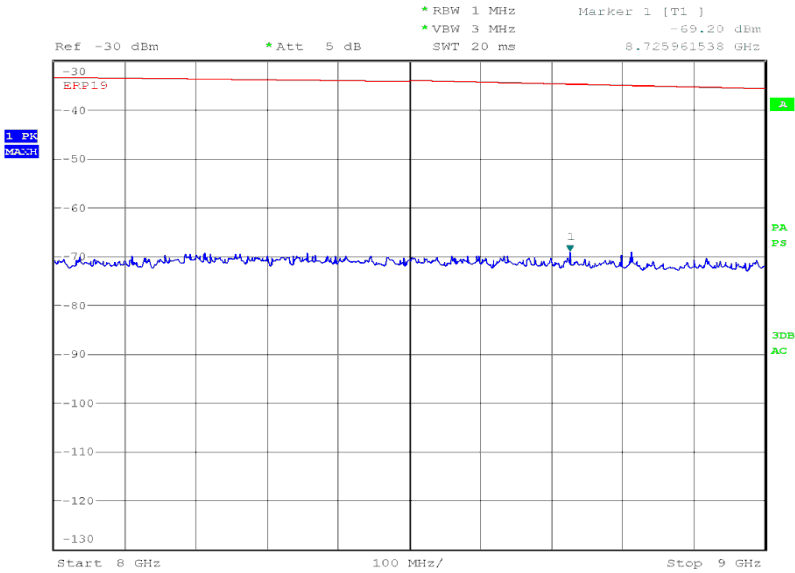


Date: 31.MAY.2015 10:40:05



Product Service

LTE FDD 26, 847.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

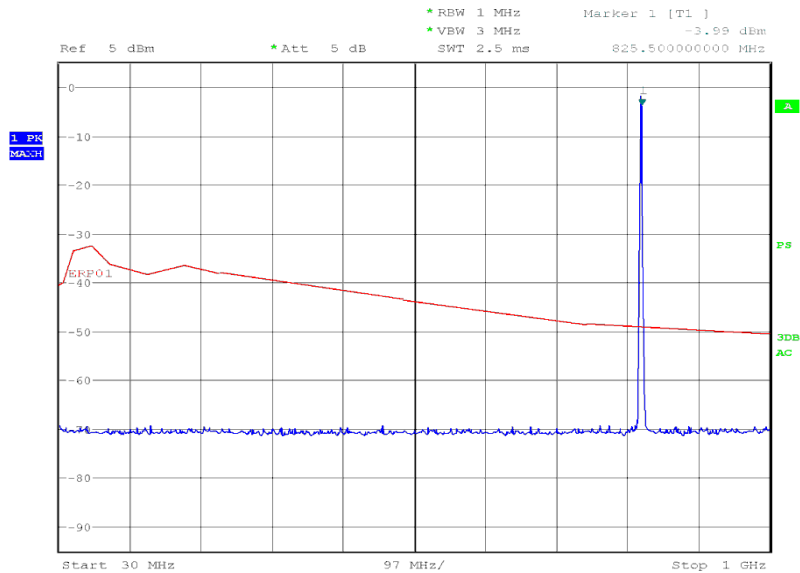


Date: 1.JUN.2015 19:25:54



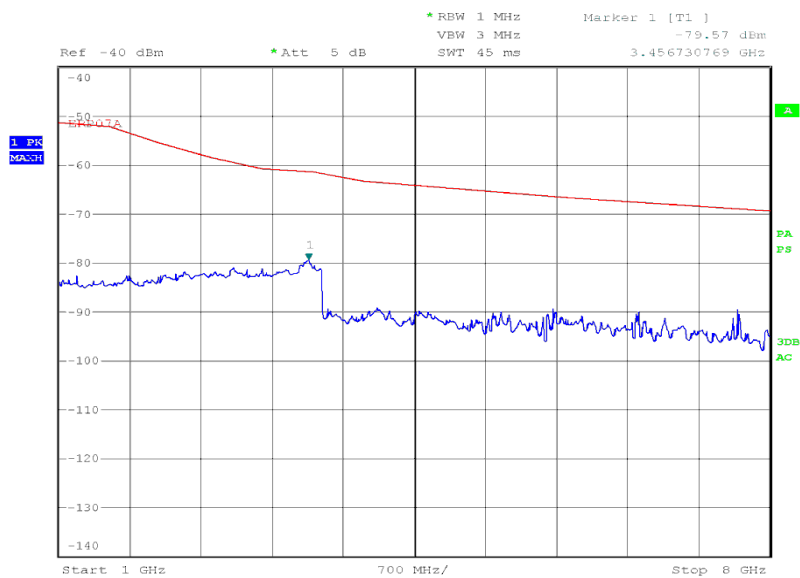
Product Service

LTE FDD 26, 825.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:21:04

LTE FDD 26, 825.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

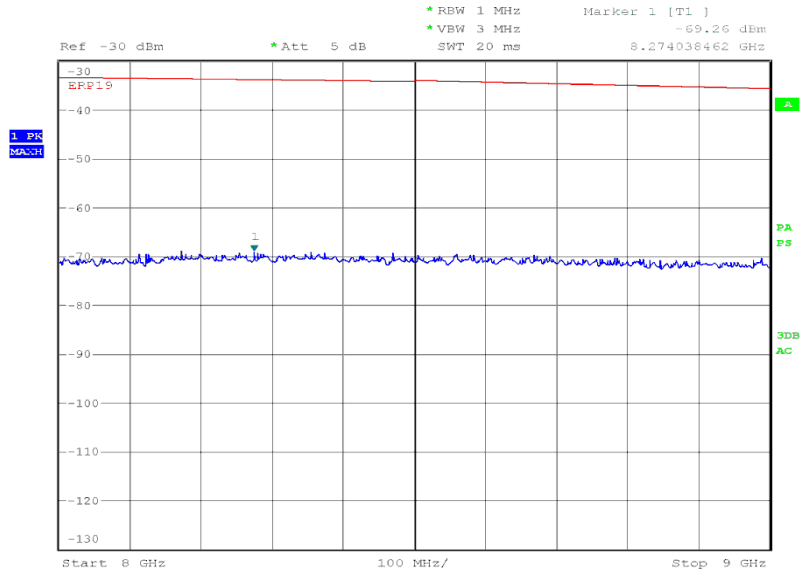


Date: 31.MAY.2015 10:42:59



Product Service

LTE FDD 26, 825.5 MHz, 1 Resource Block – Low, 3.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

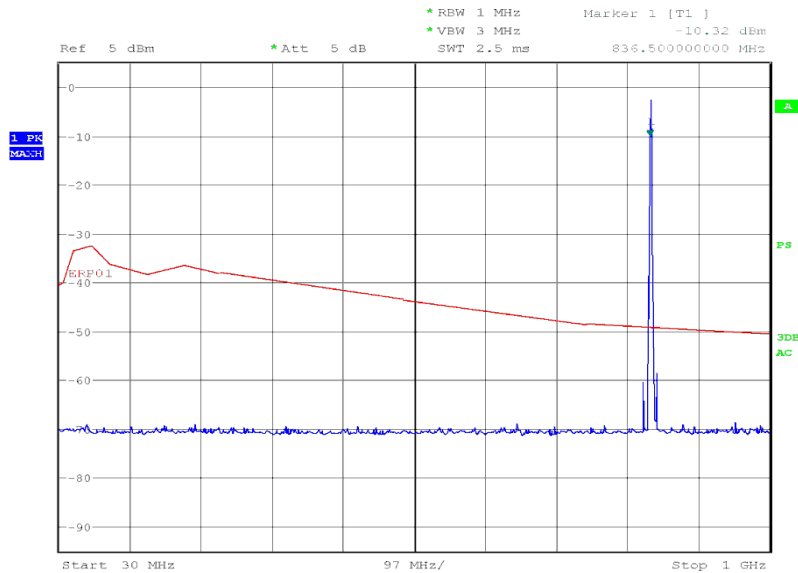


Date: 1.JUN.2015 19:35:51



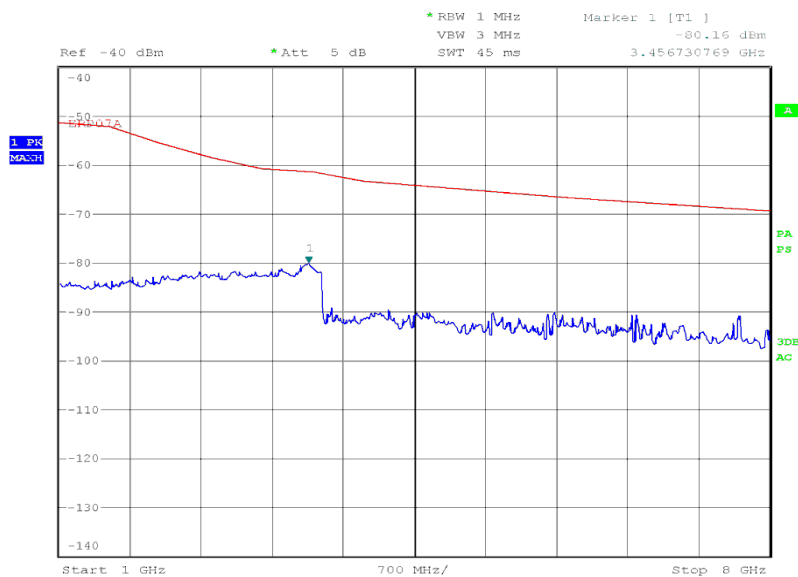
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:18:22

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

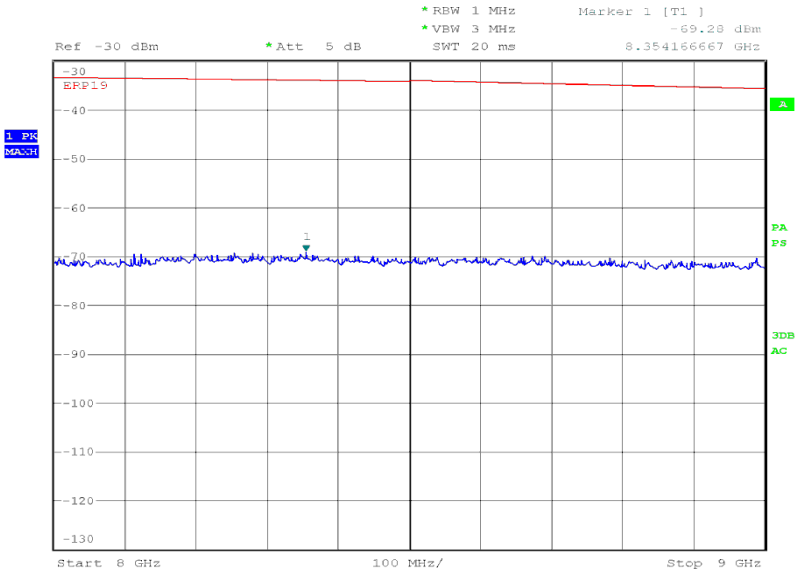


Date: 31.MAY.2015 10:46:04



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

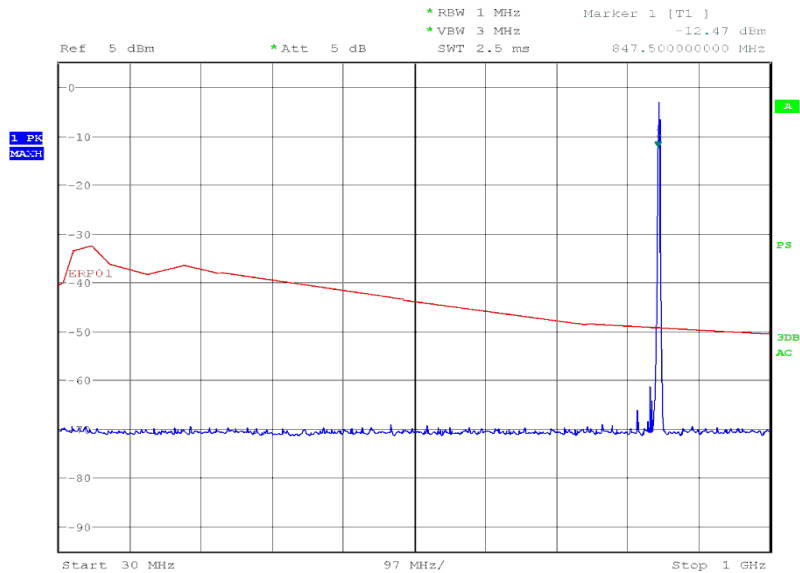


Date: 1.JUN.2015 19:34:04



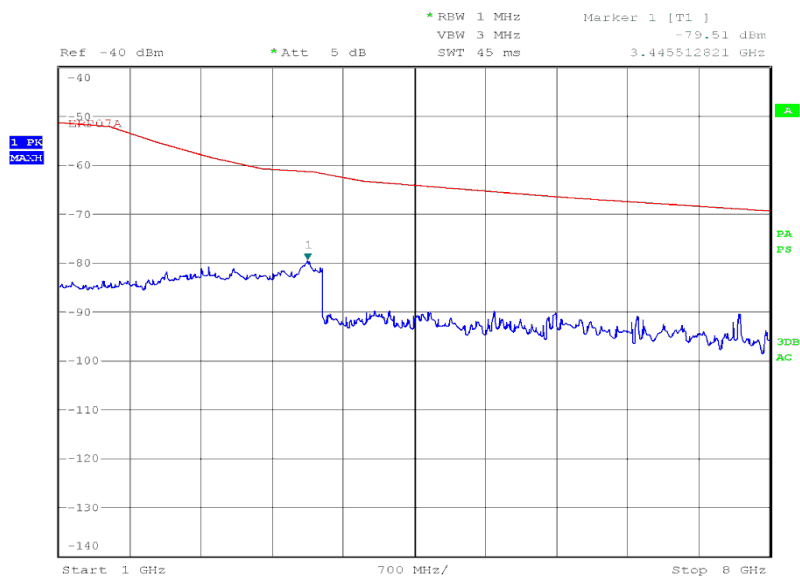
Product Service

LTE FDD 26, 847.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:15:07

LTE FDD 26, 847.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

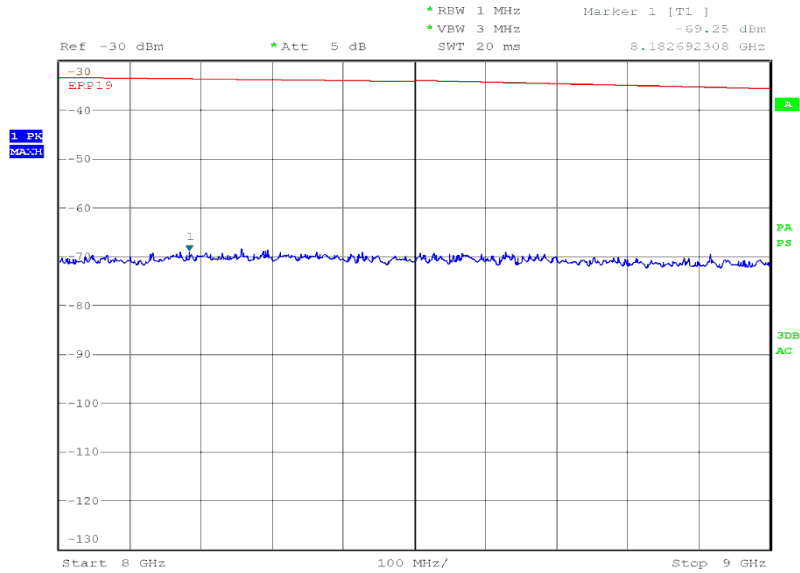


Date: 31.MAY.2015 10:49:48



Product Service

LTE FDD 26, 847.5 MHz, 1 Resource Block – High, 3.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

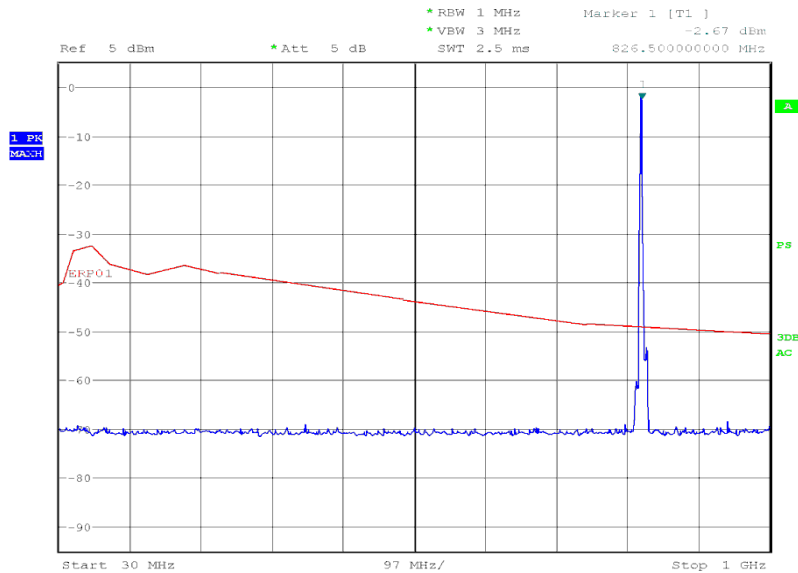


Date: 1.JUN.2015 19:31:06



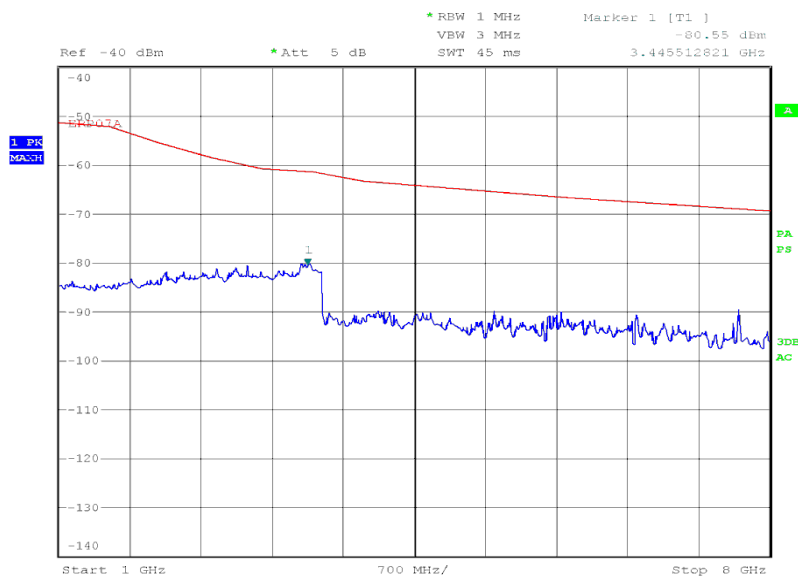
Product Service

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:35:51

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

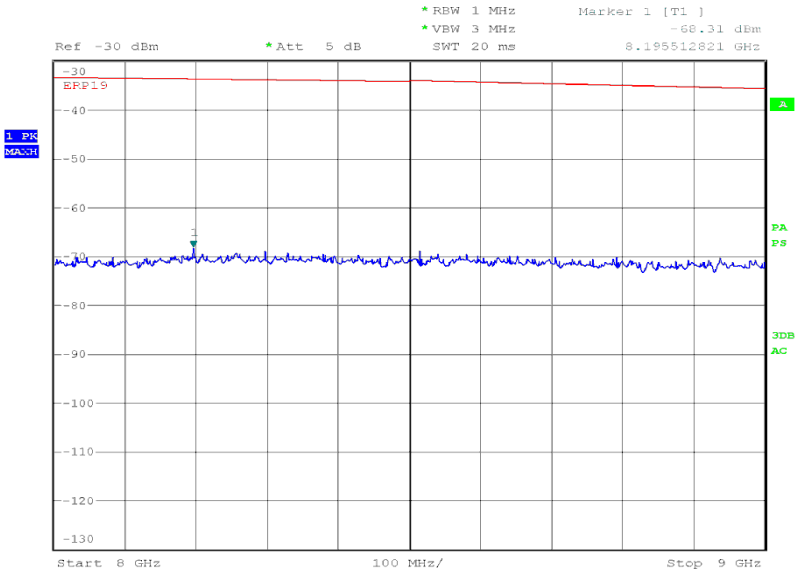


Date: 31.MAY.2015 11:03:51



Product Service

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

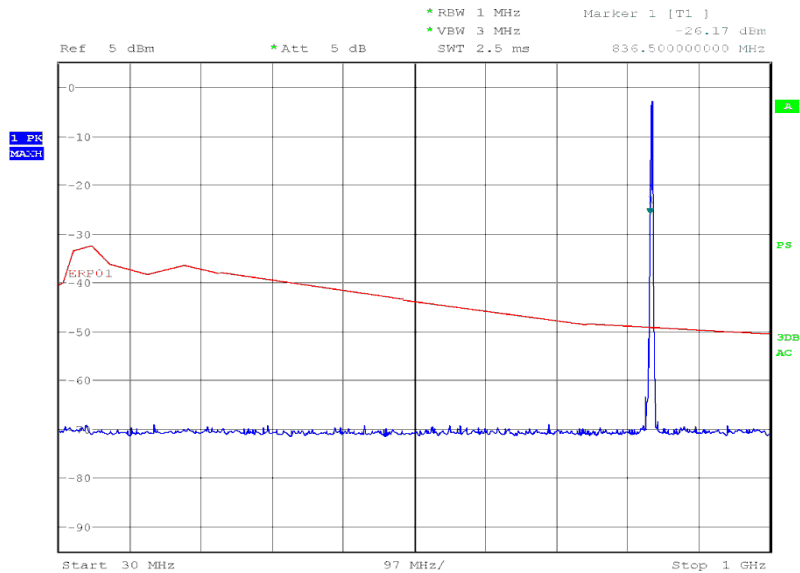


Date: 1.JUN.2015 19:50:41



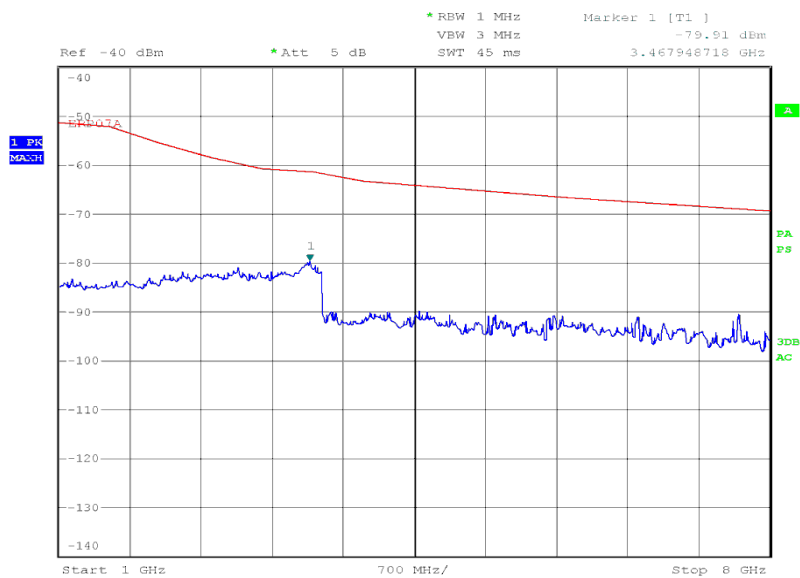
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:38:07

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

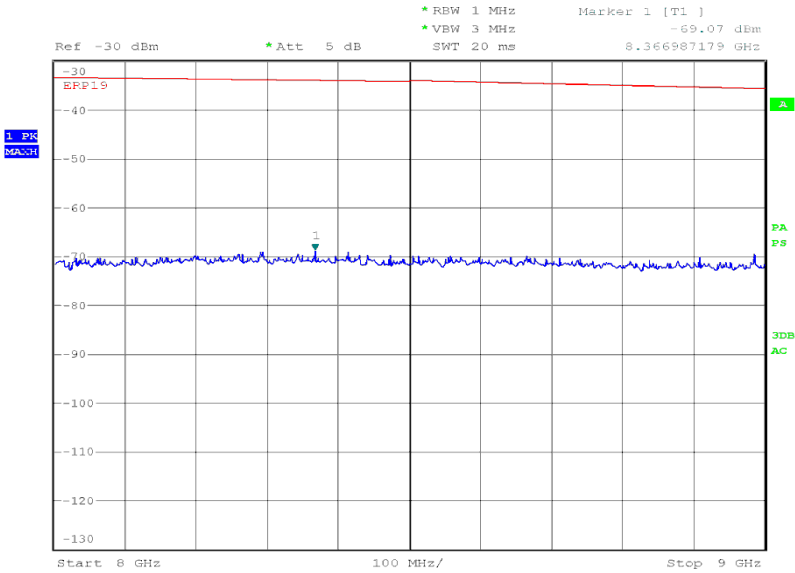


Date: 31.MAY.2015 11:07:36



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

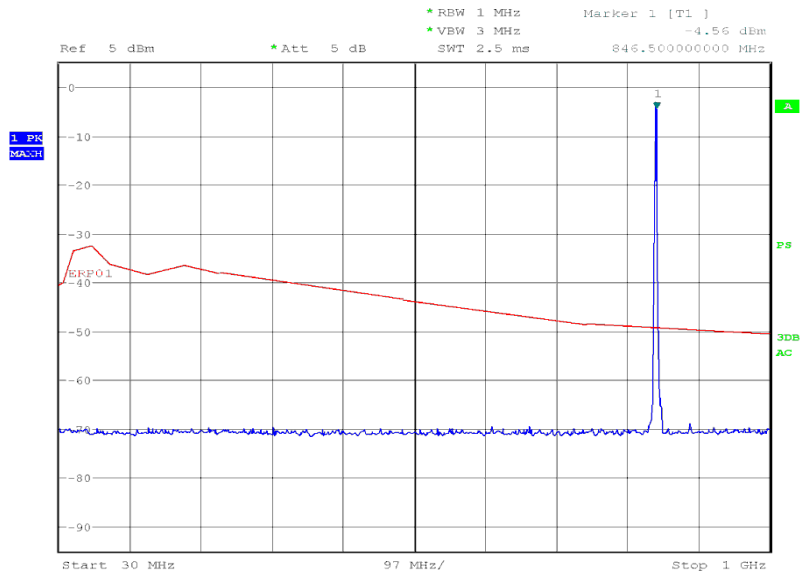


Date: 1.JUN.2015 19:52:37



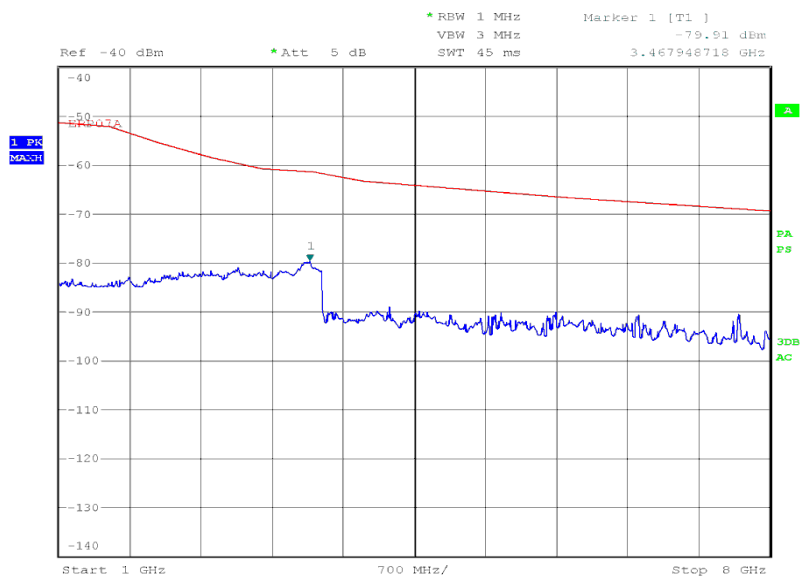
Product Service

LTE FDD 26, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:40:03

LTE FDD 26, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

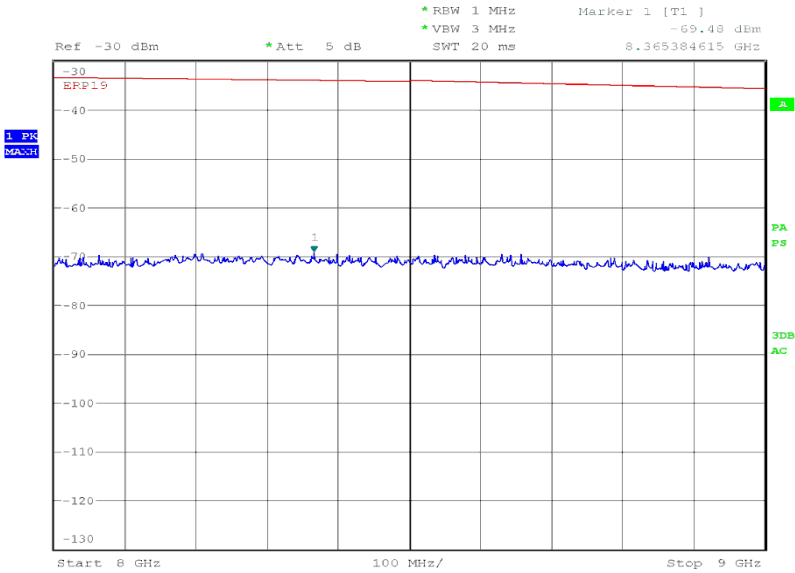


Date: 31.MAY.2015 11:10:33



Product Service

LTE FDD 26, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

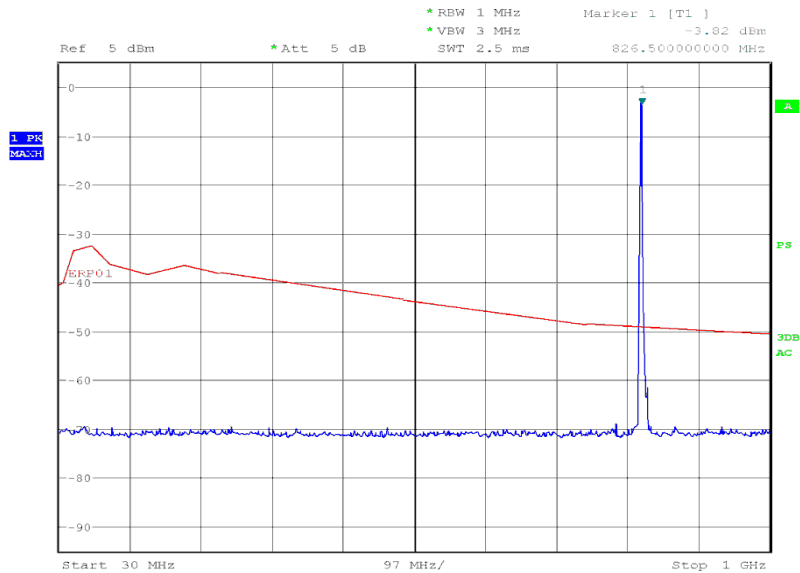


Date: 1.JUN.2015 19:54:24



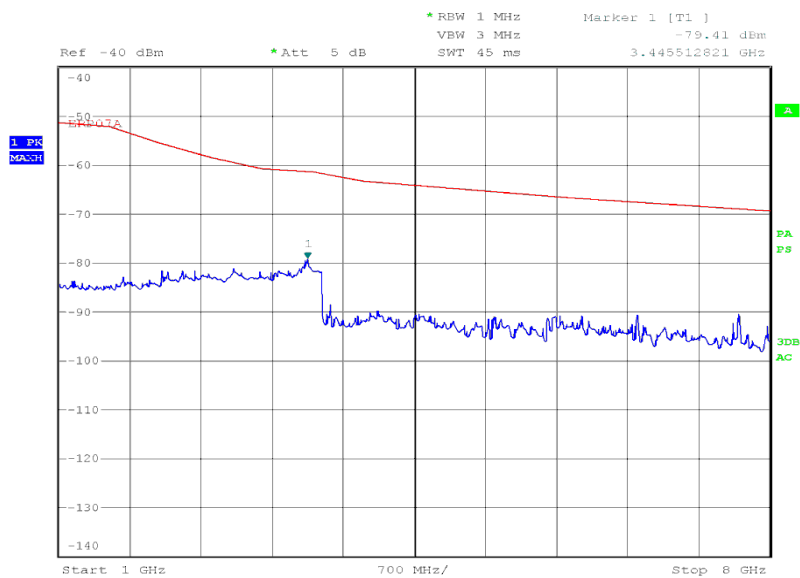
Product Service

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:46:53

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

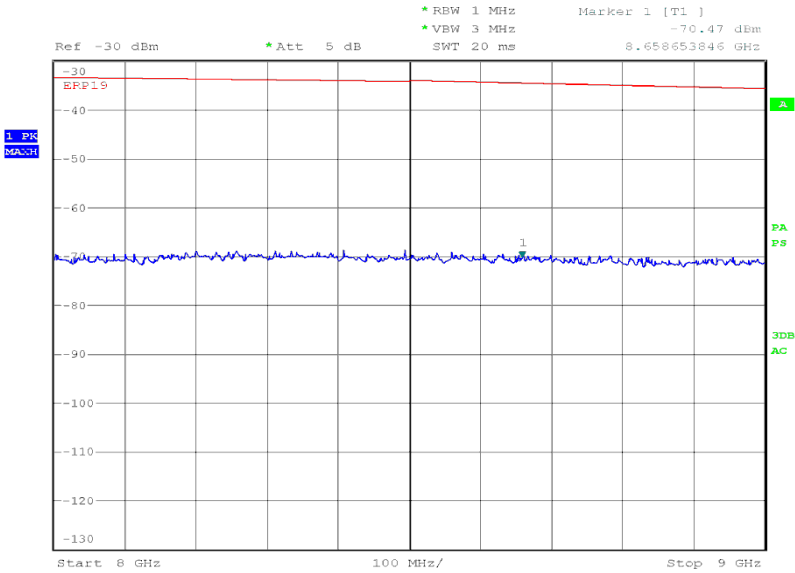


Date: 31.MAY.2015 11:15:54



Product Service

LTE FDD 26, 826.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

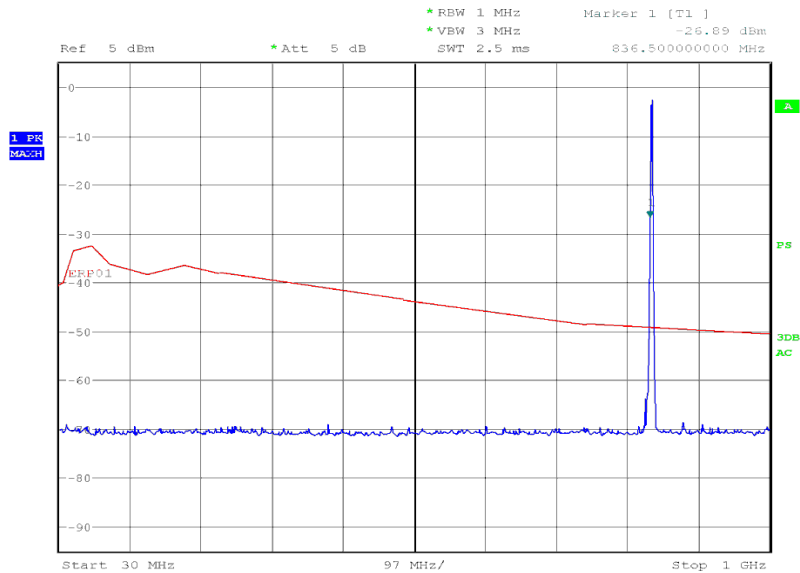


Date: 1.JUN.2015 20:06:21



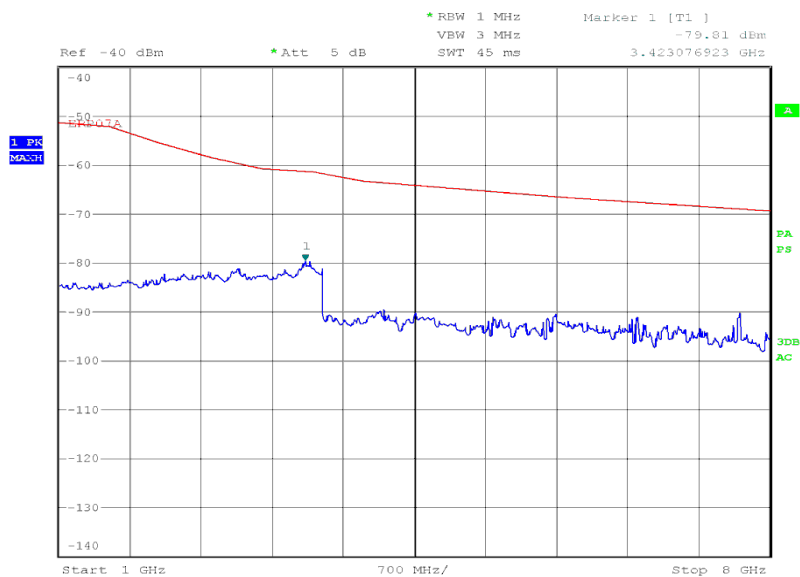
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:43:52

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

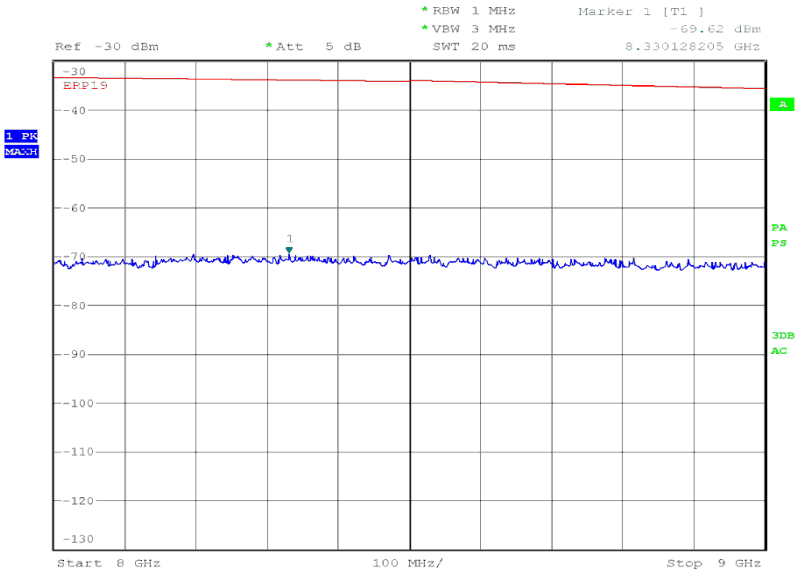


Date: 31.MAY.2015 11:14:32



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, 16-QAM, 8 MHz to 9 GHz, Emission Limitations for Cellular Equipment Results

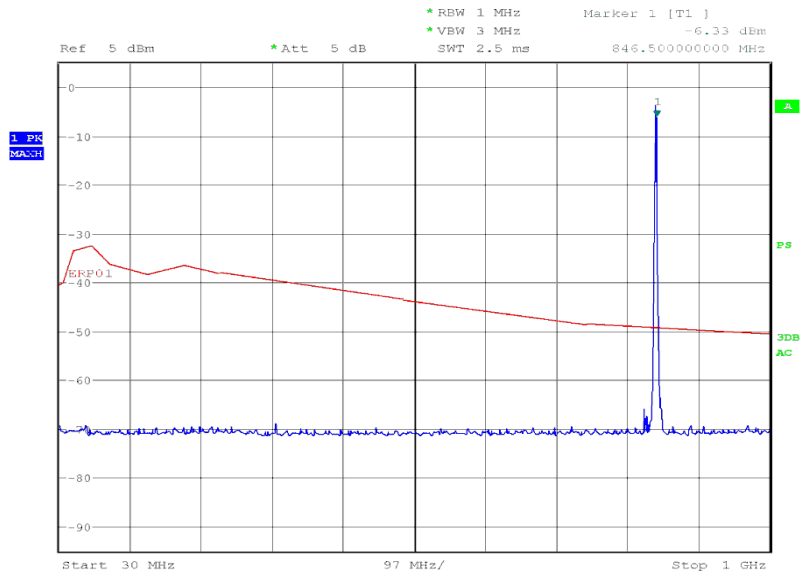


Date: 1.JUN.2015 19:57:55



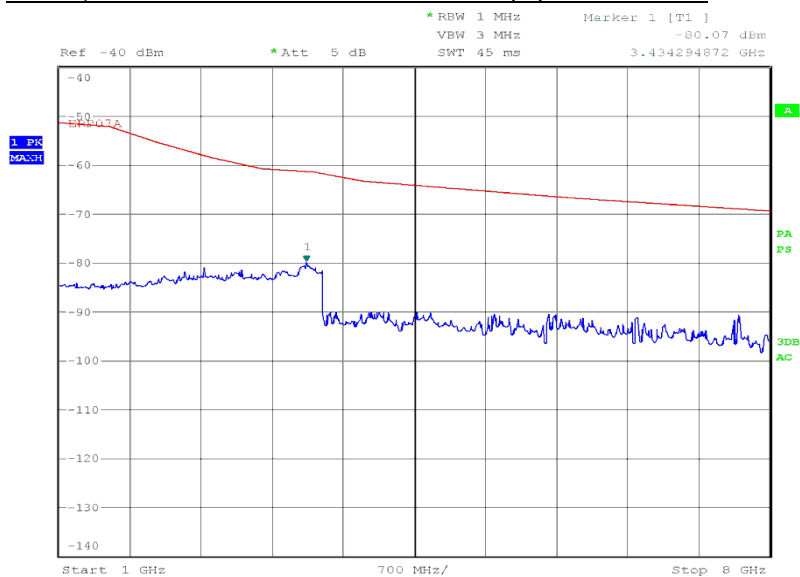
Product Service

LTE FDD 26, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 19:41:46

LTE FDD 26, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

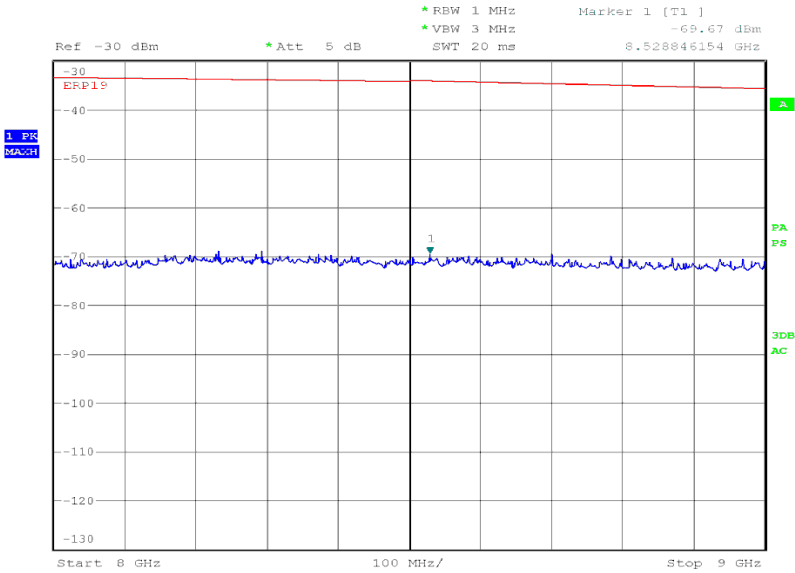


Date: 31.MAY.2015 11:12:35



Product Service

LTE FDD 26, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

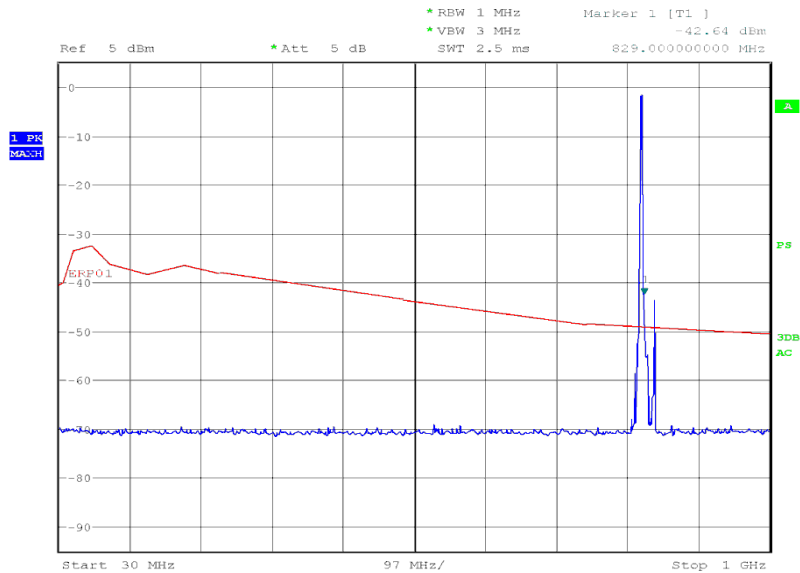


Date: 1.JUN.2015 19:55:55



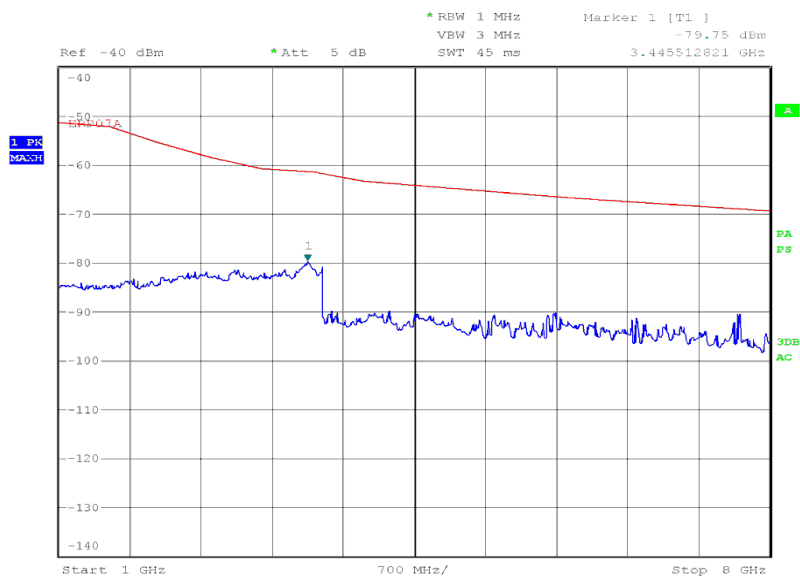
Product Service

LTE FDD 26, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:02:21

LTE FDD 26, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

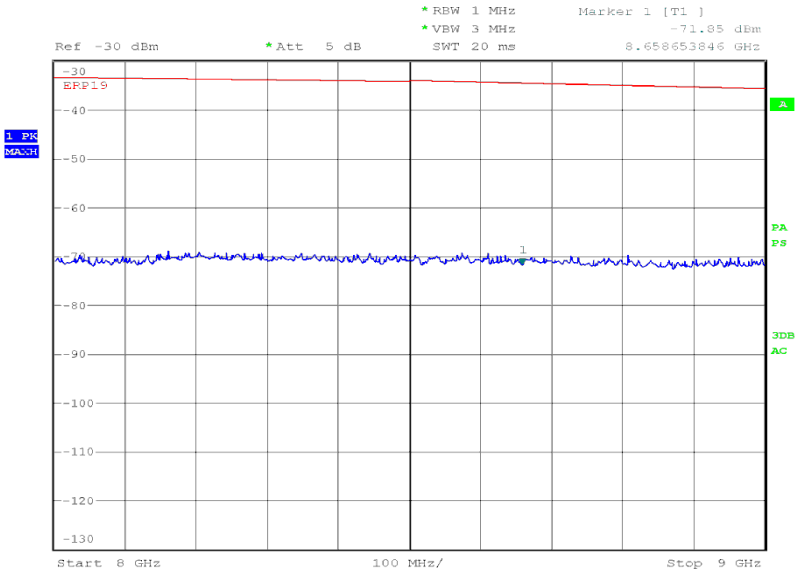


Date: 31.MAY.2015 11:38:01



Product Service

LTE FDD 26, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

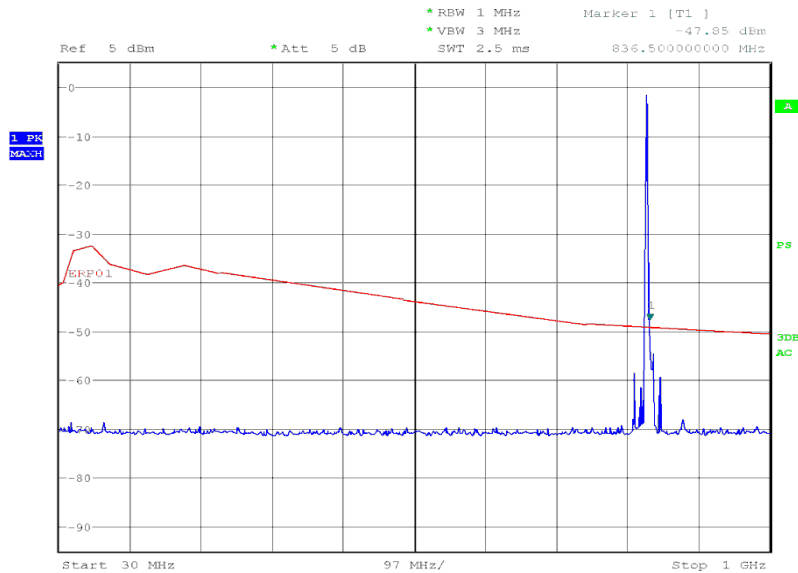


Date: 1.JUN.2015 20:17:36



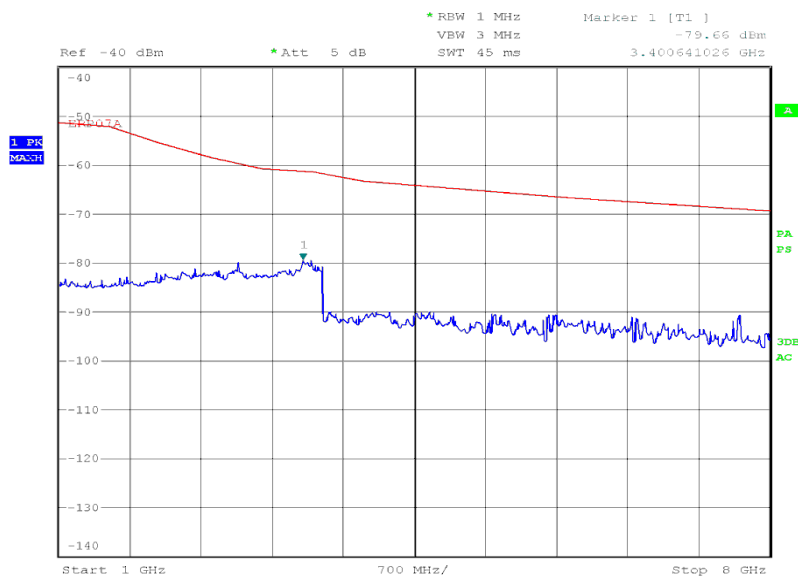
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:04:33

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

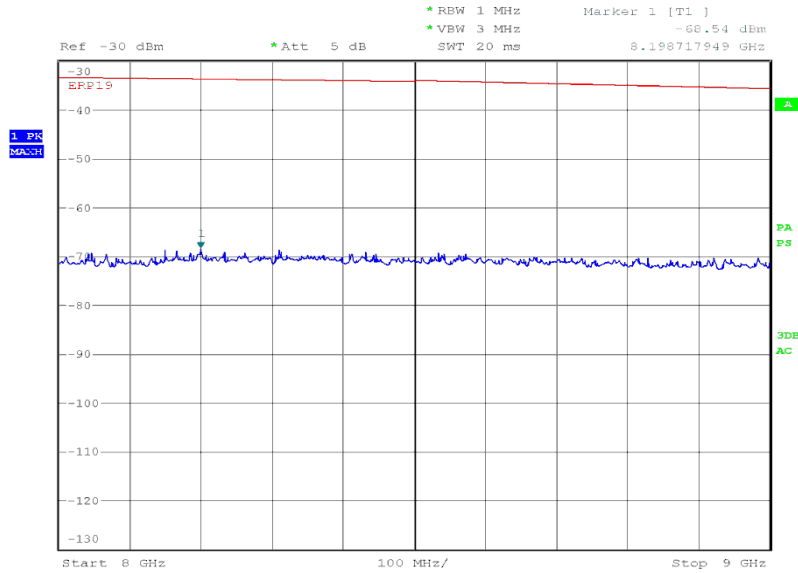


Date: 31.MAY.2015 11:46:59



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

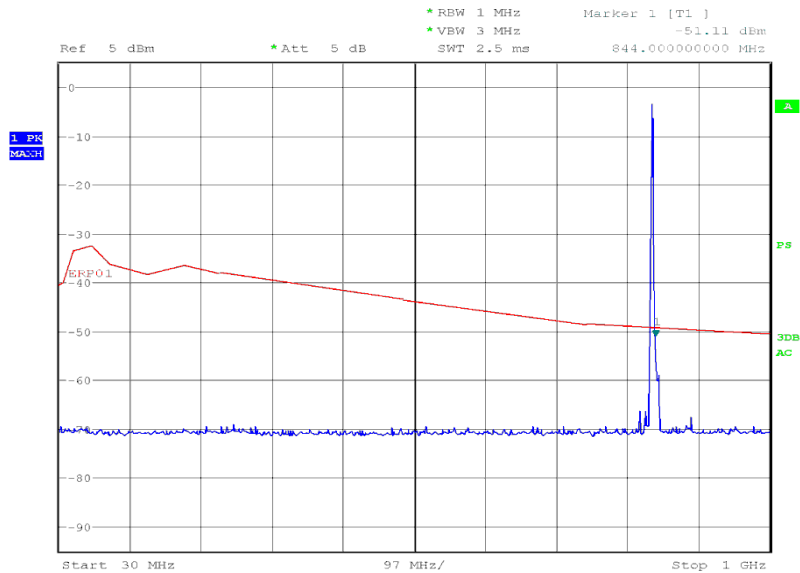


Date: 1.JUN.2015 20:22:45



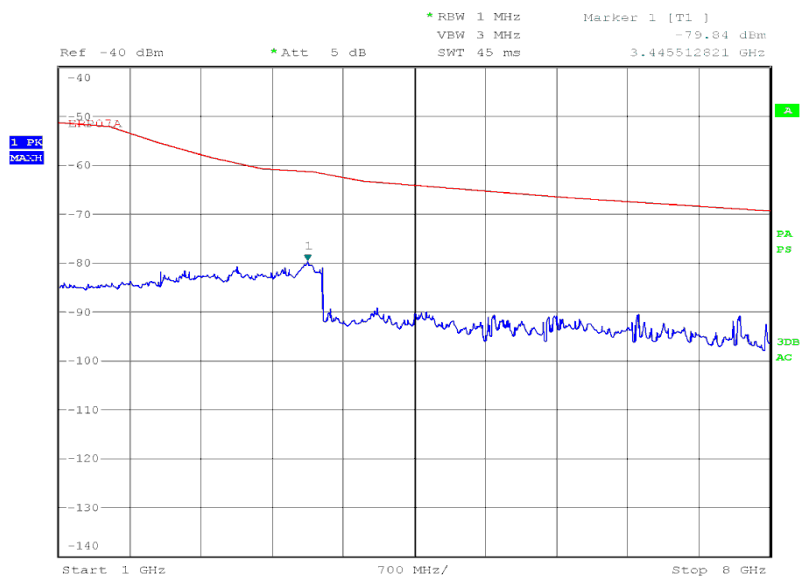
Product Service

LTE FDD 26, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:06:37

LTE FDD 26, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

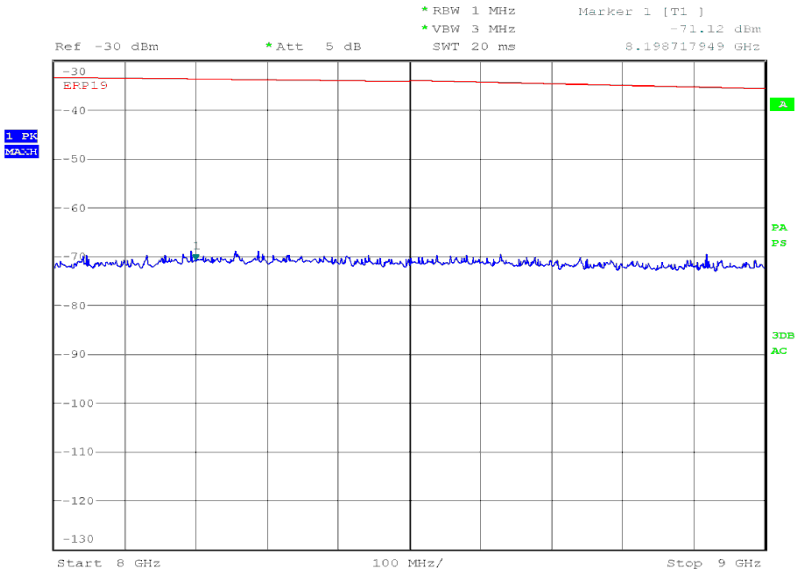


Date: 31.MAY.2015 11:49:04



Product Service

LTE FDD 26, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

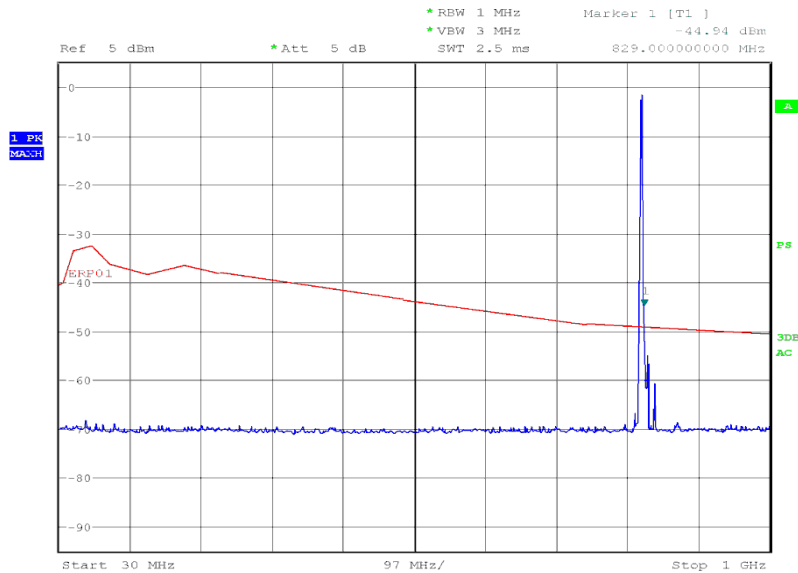


Date: 1.JUN.2015 20:24:22



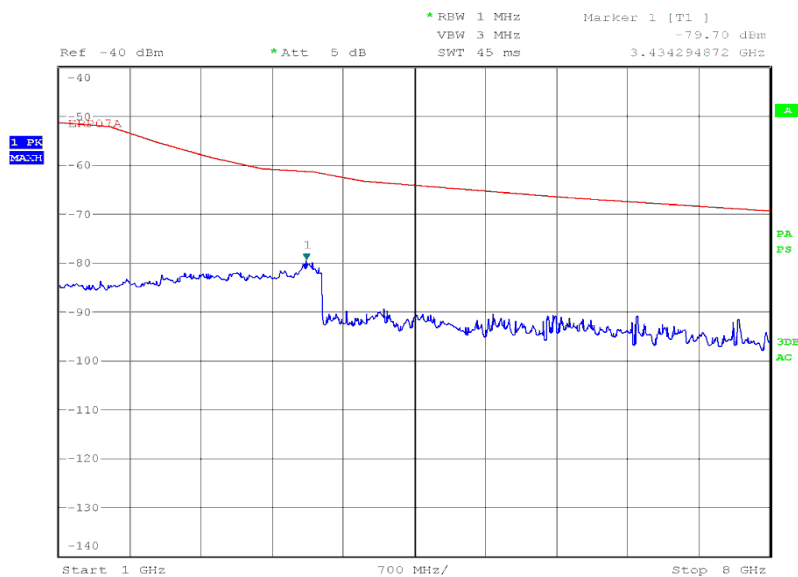
Product Service

LTE FDD 26, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:25:46

LTE FDD 26, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

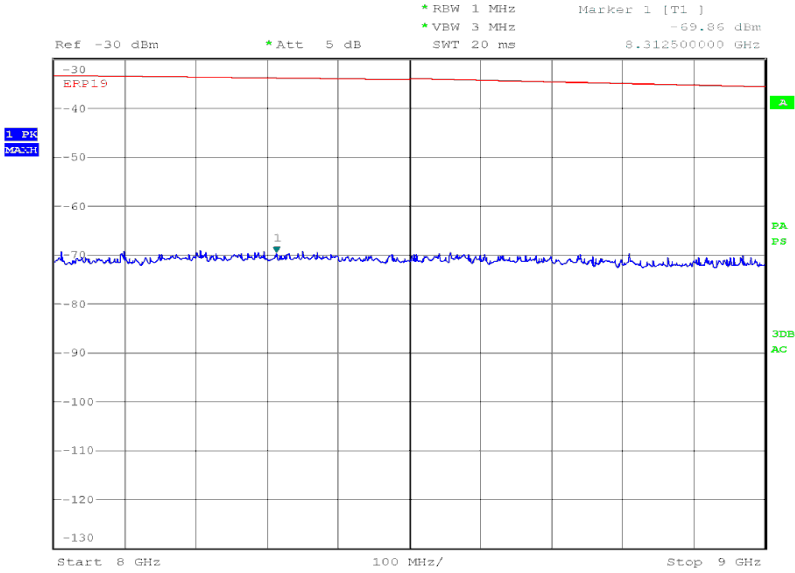


Date: 31.MAY.2015 11:57:03



Product Service

LTE FDD 26, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

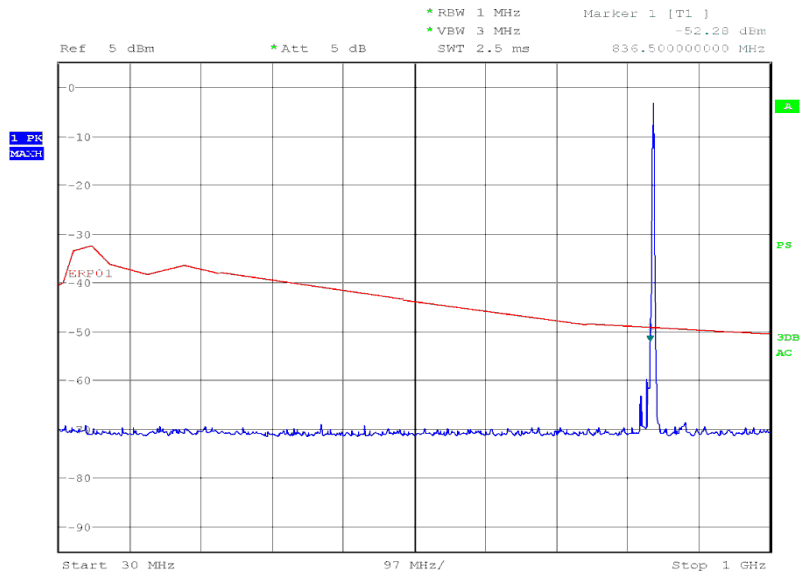


Date: 1.JUN.2015 20:31:48



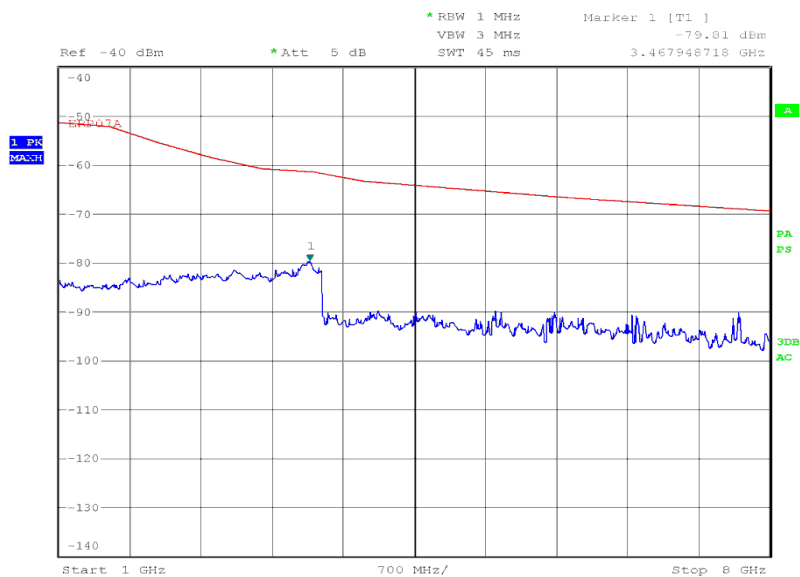
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 10.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:17:26

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 10.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

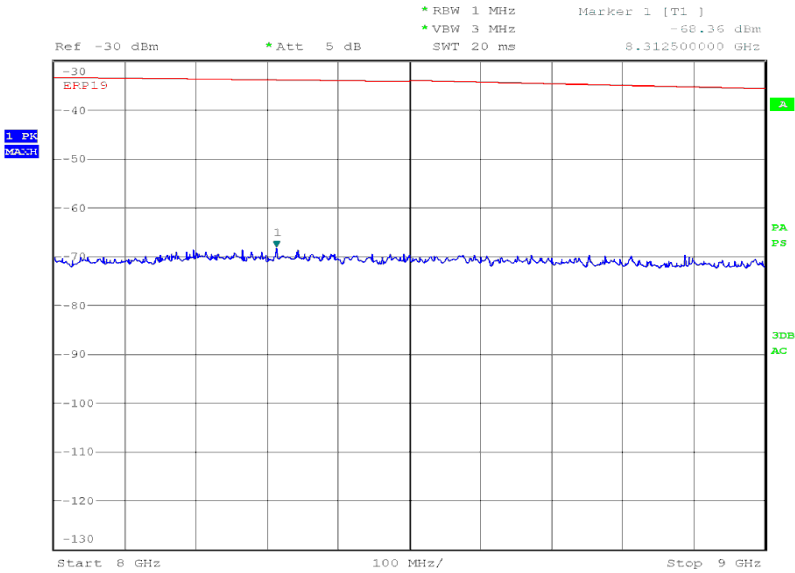


Date: 31.MAY.2015 11:55:03



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

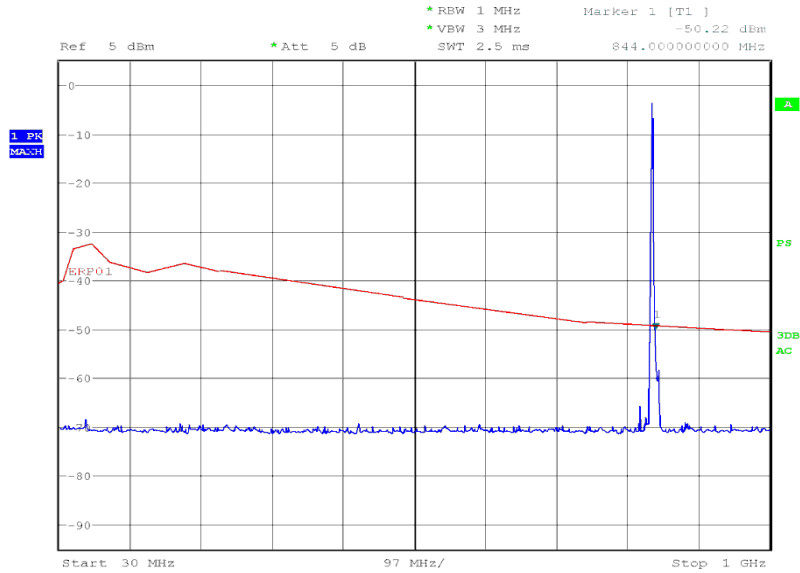


Date: 1.JUN.2015 20:28:42



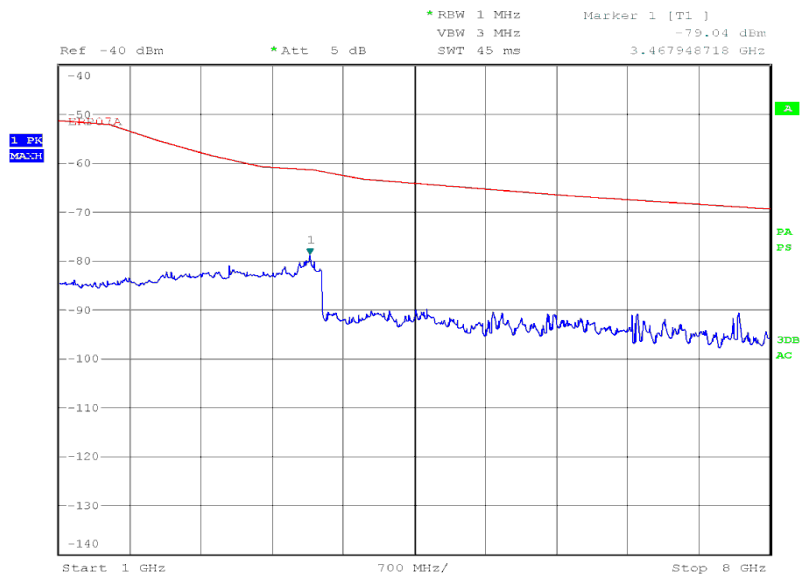
Product Service

LTE FDD 26, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:08:25

LTE FDD 26, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

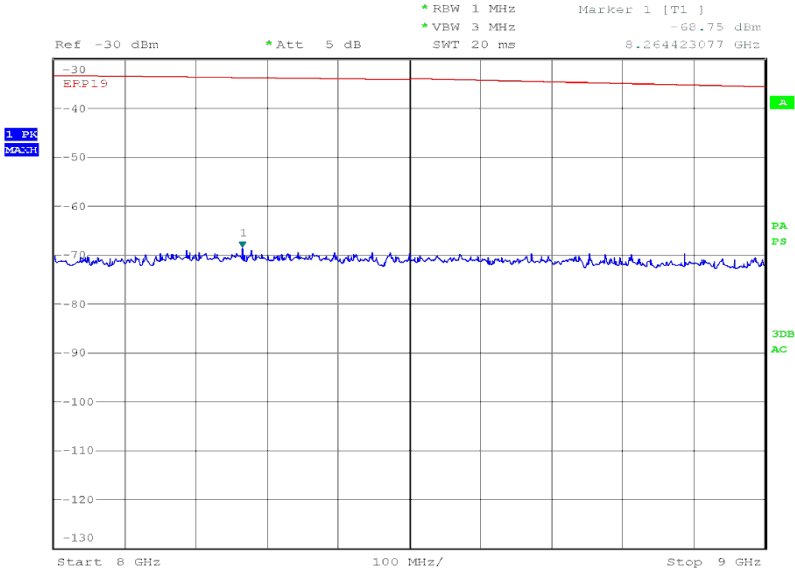


Date: 31.MAY.2015 11:52:44



Product Service

LTE FDD 26, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

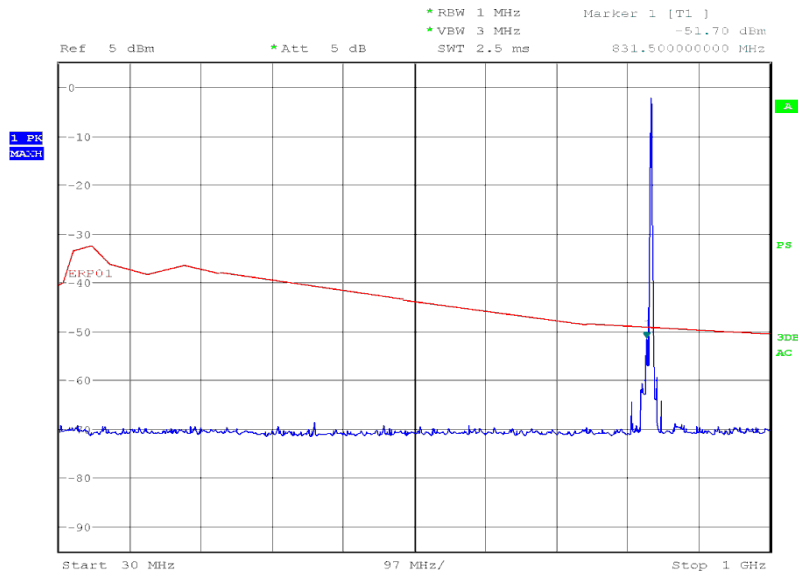


Date: 1.JUN.2015 20:26:38



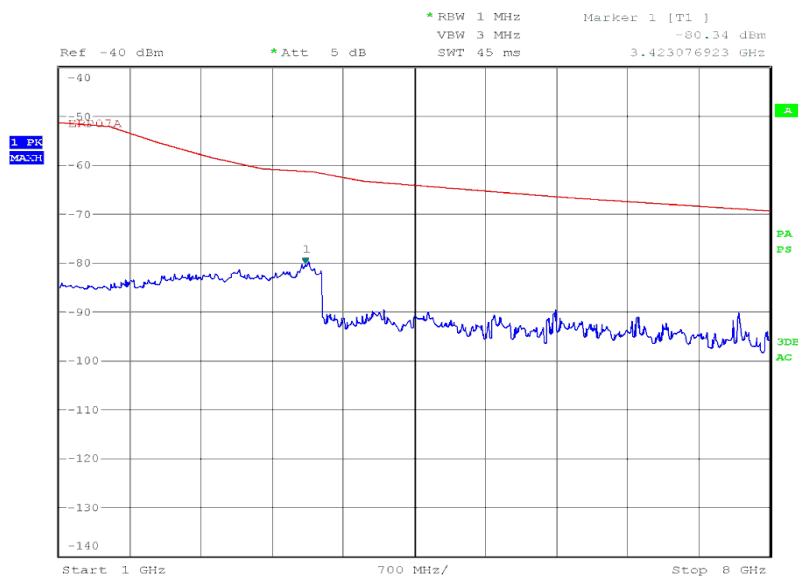
Product Service

LTE FDD 26, 831.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:48:35

LTE FDD 26, 831.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

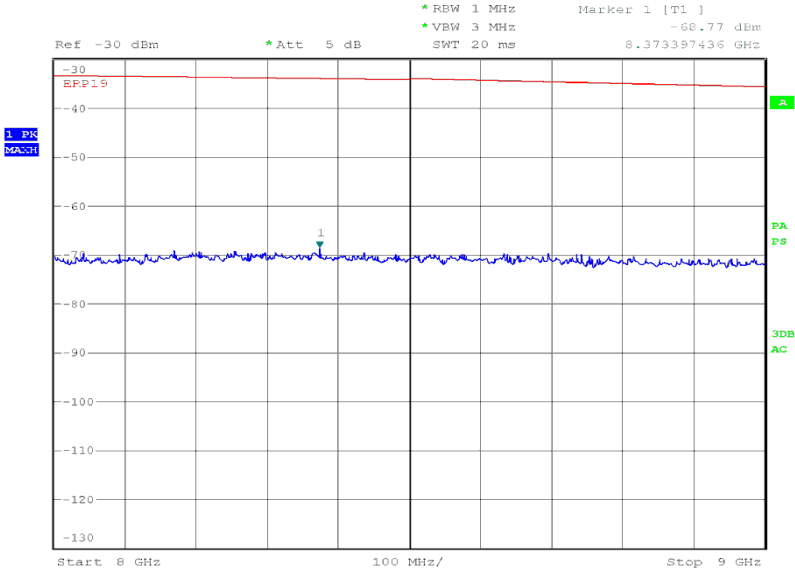


Date: 31.MAY.2015 12:07:28



Product Service

LTE FDD 26, 831.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

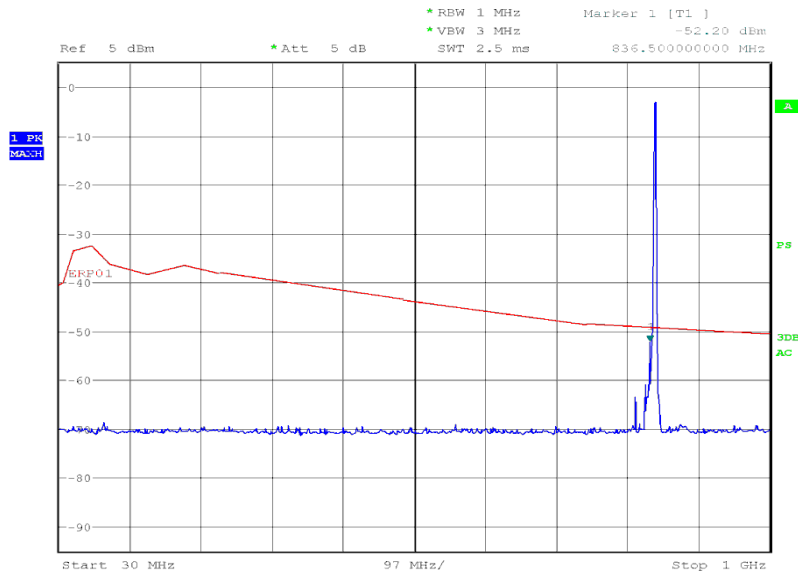


Date: 1.JUN.2015 20:42:09



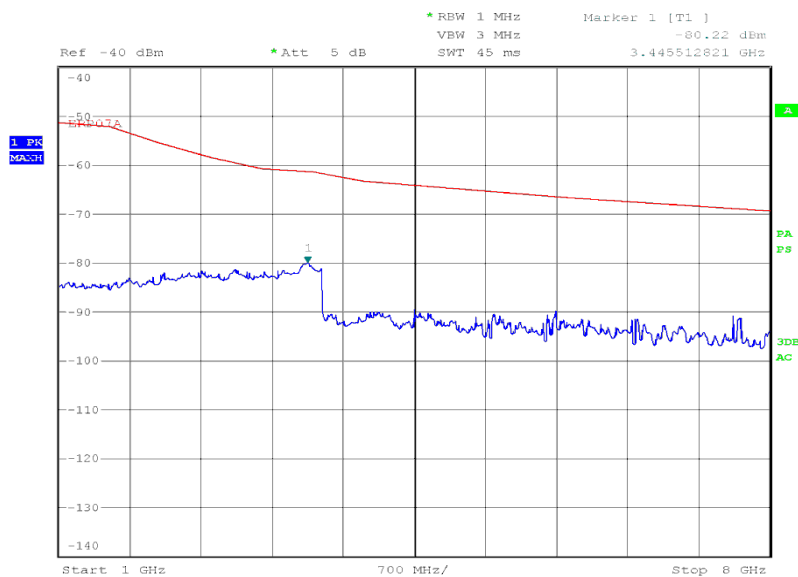
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:52:06

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

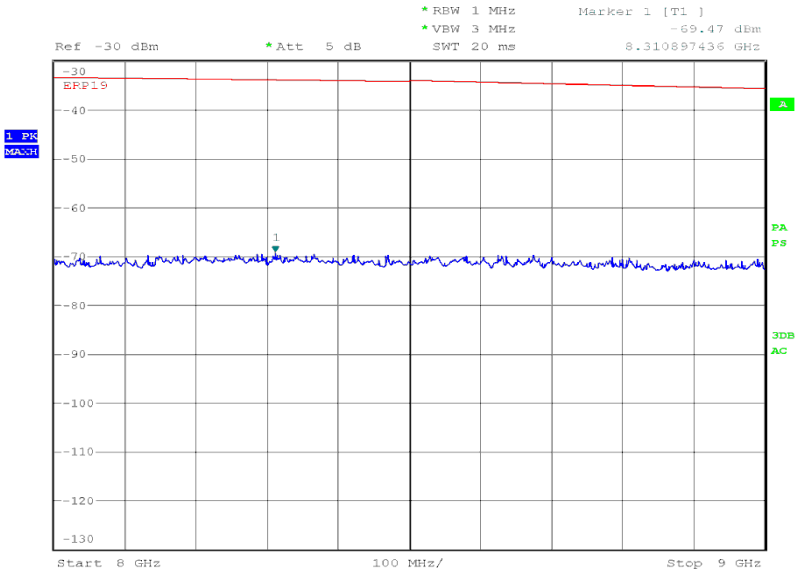


Date: 31.MAY.2015 12:10:40



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

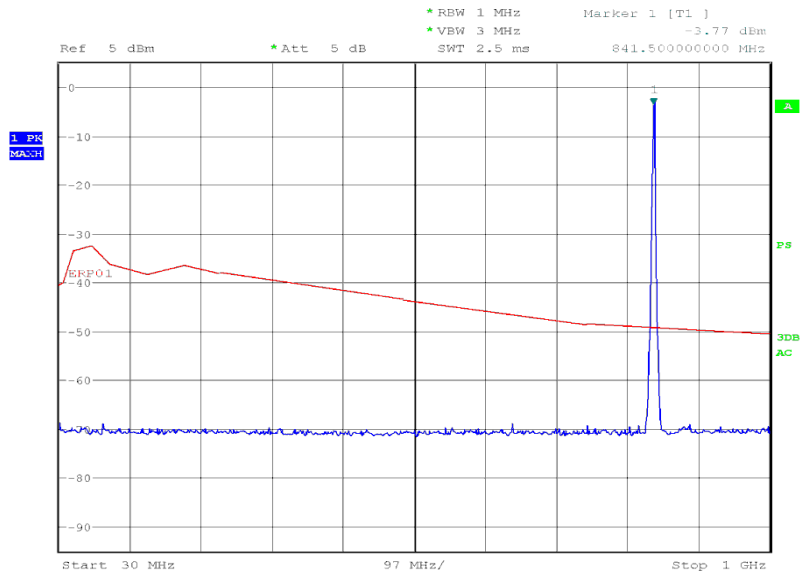


Date: 1.JUN.2015 20:43:58



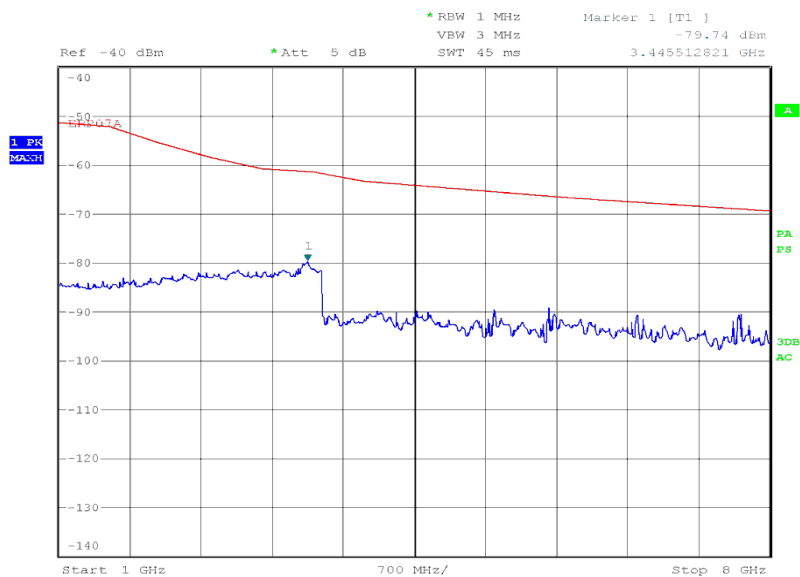
Product Service

LTE FDD 26, 841.5 MHz, 1 Resource Block – Mid, 15.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:54:13

LTE FDD 26, 841.5 MHz, 1 Resource Block – Mid, 15.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

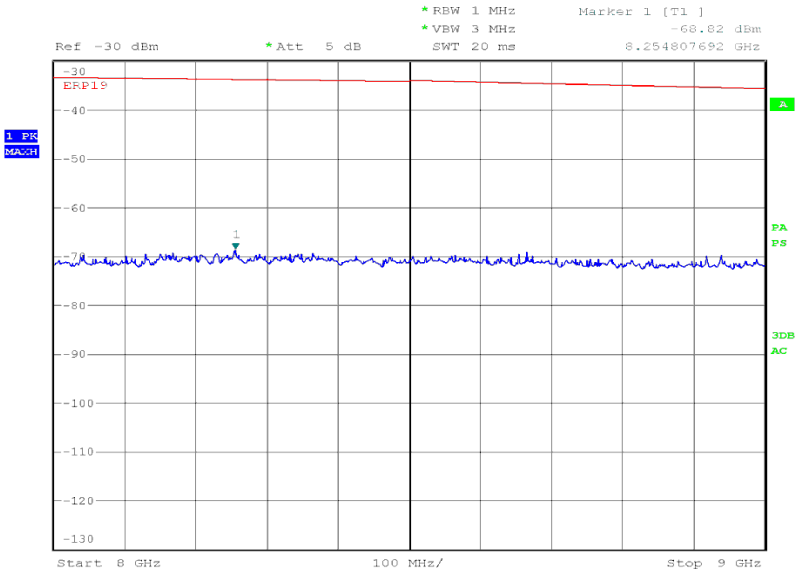


Date: 31.MAY.2015 12:13:24



Product Service

LTE FDD 26, 841.5 MHz, 1 Resource Block – Mid, 15.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

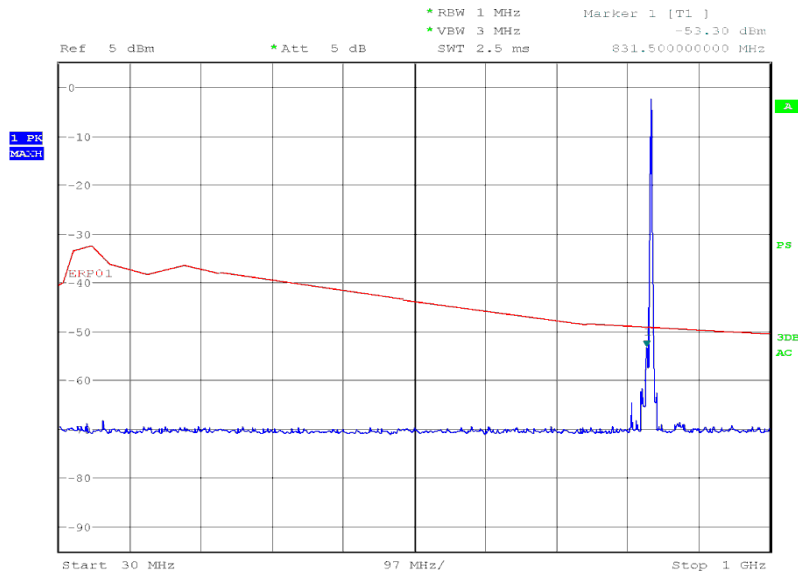


Date: 1 JUN 2015 20:46:33



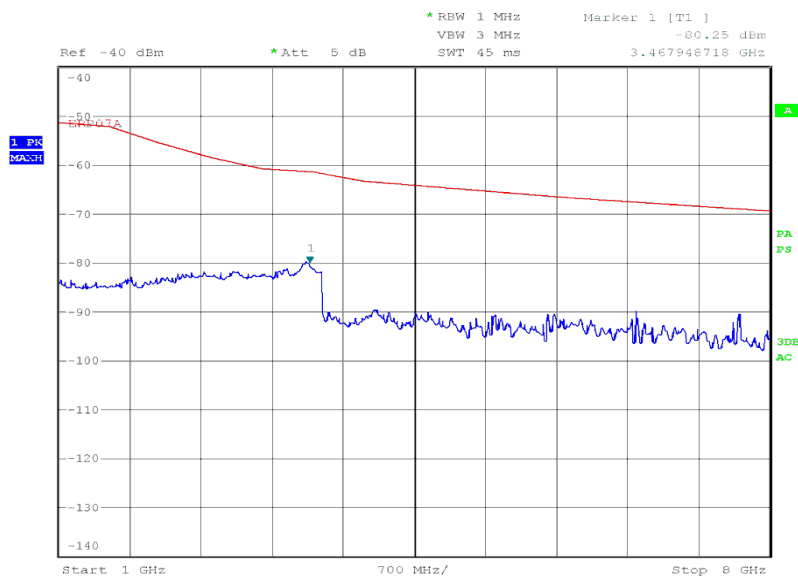
Product Service

LTE FDD 26, 831.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 21:11:27

LTE FDD 26, 831.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

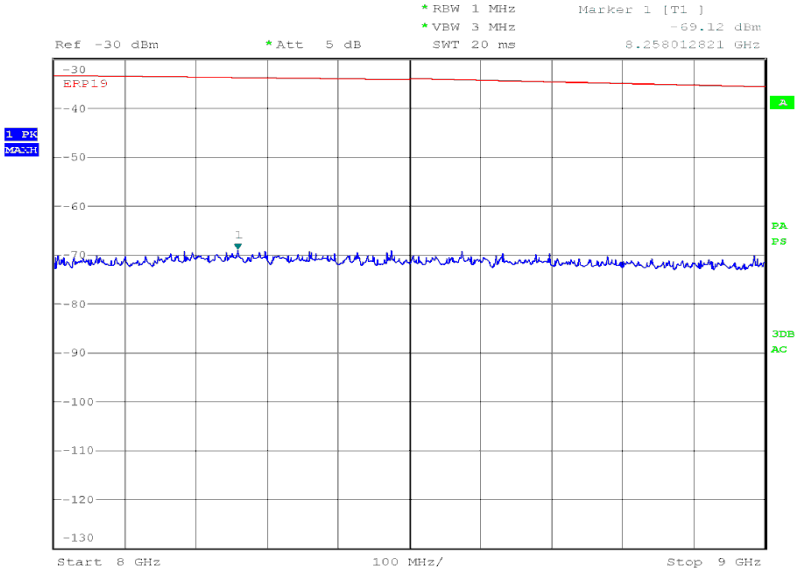


Date: 31.MAY.2015 12:22:01



Product Service

LTE FDD 26, 831.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

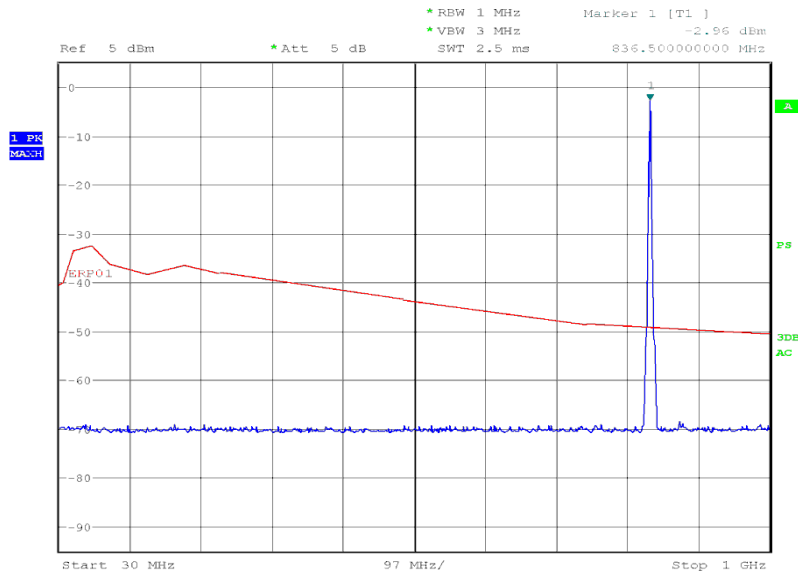


Date: 1.JUN.2015 19:09:34



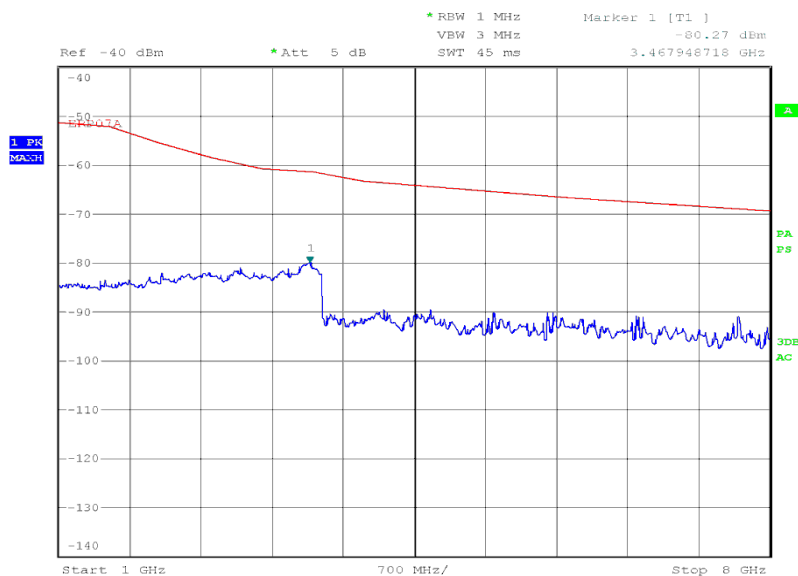
Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Mid, 15.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 21:07:02

LTE FDD 26, 836.5 MHz, 1 Resource Block – Mid, 15.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

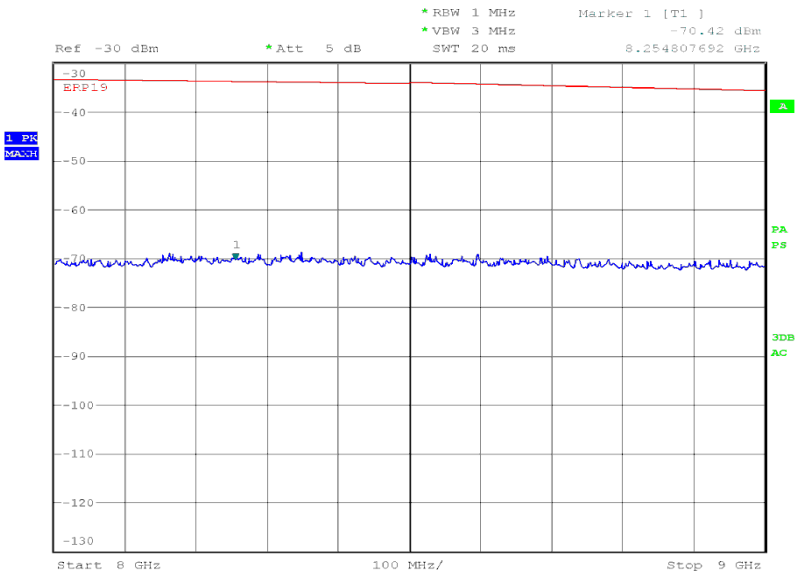


Date: 31.MAY.2015 12:19:21



Product Service

LTE FDD 26, 836.5 MHz, 1 Resource Block – Mid, 15.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

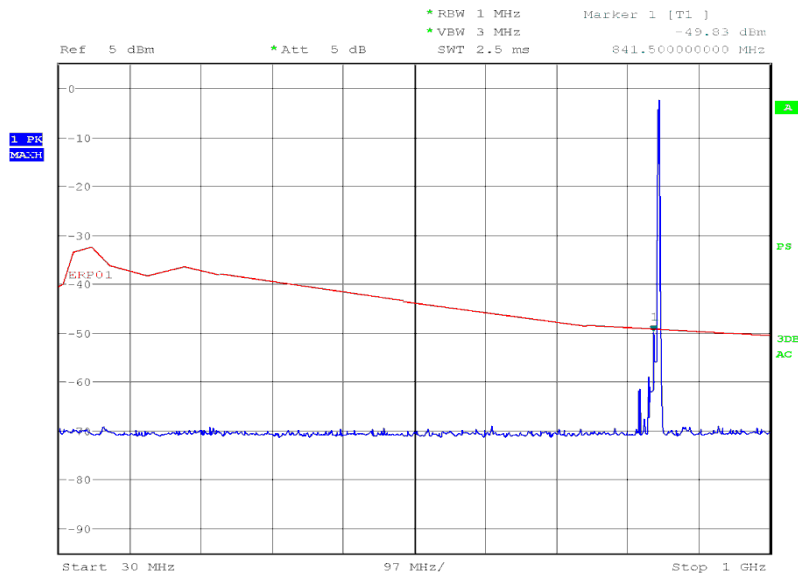


Date: 1.JUN.2015 20:58:33



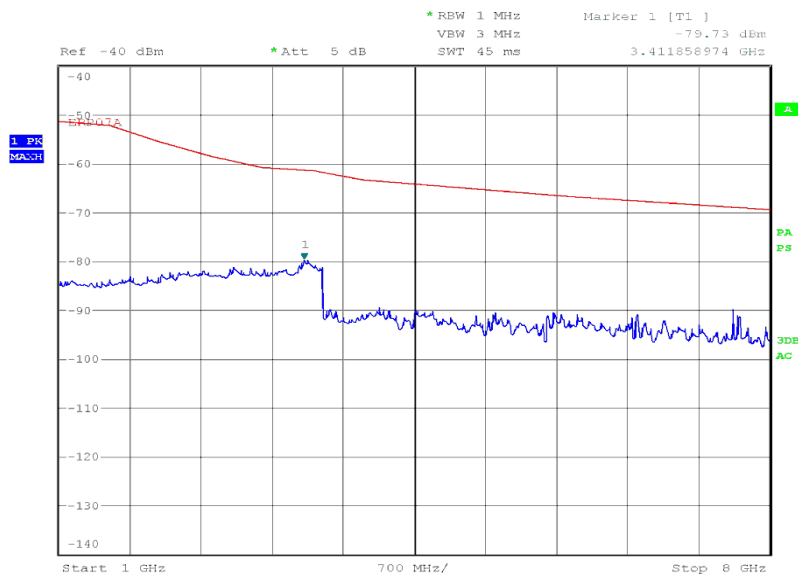
Product Service

LTE FDD 26, 841.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 27.MAY.2015 20:56:47

LTE FDD 26, 841.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

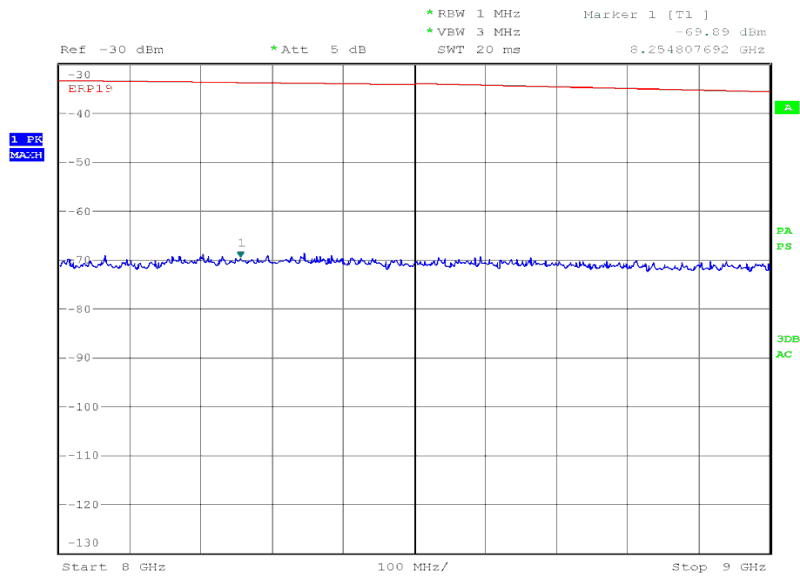


Date: 31.MAY.2015 12:16:52



Product Service

LTE FDD 26, 841.5 MHz, 1 Resource Block – High, 15.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 1.JUN.2015 21:05:12

FCC 47 CFR Part 22, Limit Clause 22.917 (a)

$43 + 10 \log(P)$ or -13 dBm



Product Service

2.6 26 dB BANDWIDTH**2.6.1 Specification Reference**

FCC 47 CFR Part 22, Clause 22.917 (b)
FCC 47 CFR Part 2, Clause 2.1049 (h)

2.6.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - Modification State 0

2.6.3 Date of Test

5 June 2015

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Procedure

The test was performed in accordance with KDB 971168 D01 v02r02, Clause 4.1.

2.6.6 Environmental Conditions

Ambient Temperature	21.9°C
Relative Humidity	53.1%



Product Service

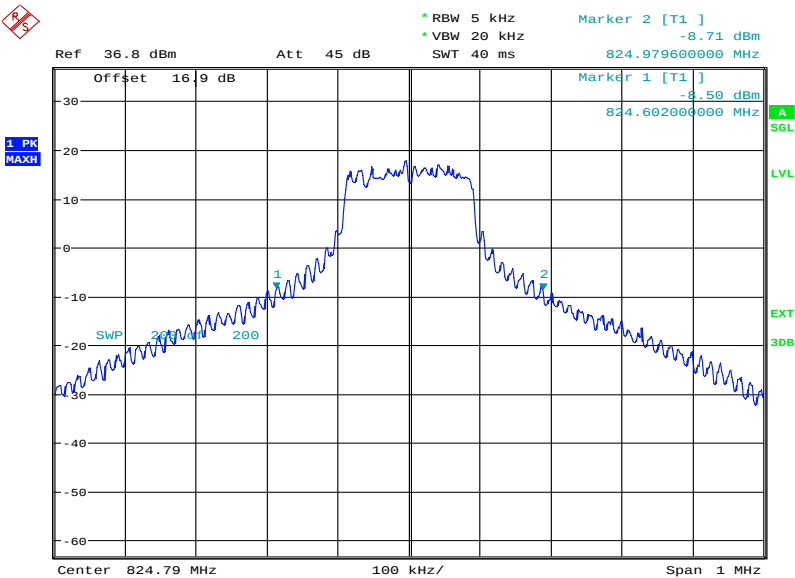
2.6.7 Test Results

4.0 V DC Supply

LTE FDD 26, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
824.7 MHz				836.5 MHz				848.3 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	377.6	N/T	1286.4	N/T	352.0	N/T	1312.0	N/T	376.0	N/T	1216.0

LTE FDD 26, 824.7 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

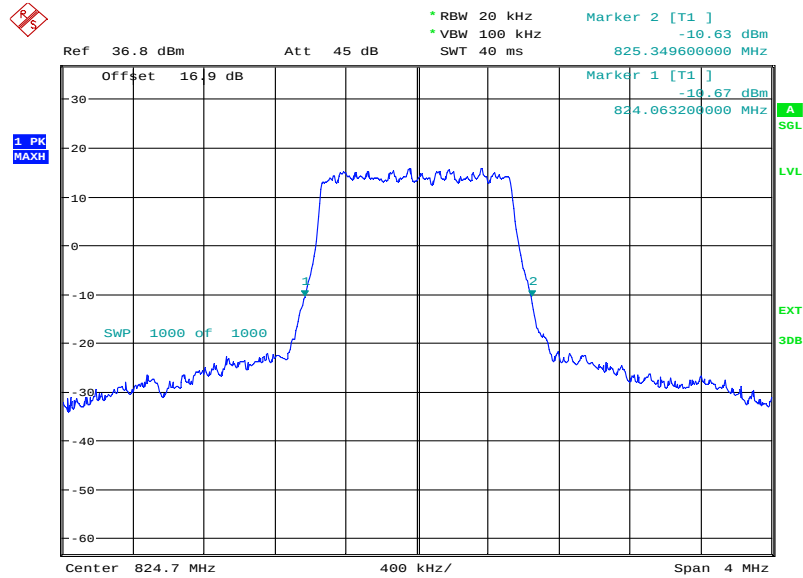


Date: 4 JUN 2015 15:08:02



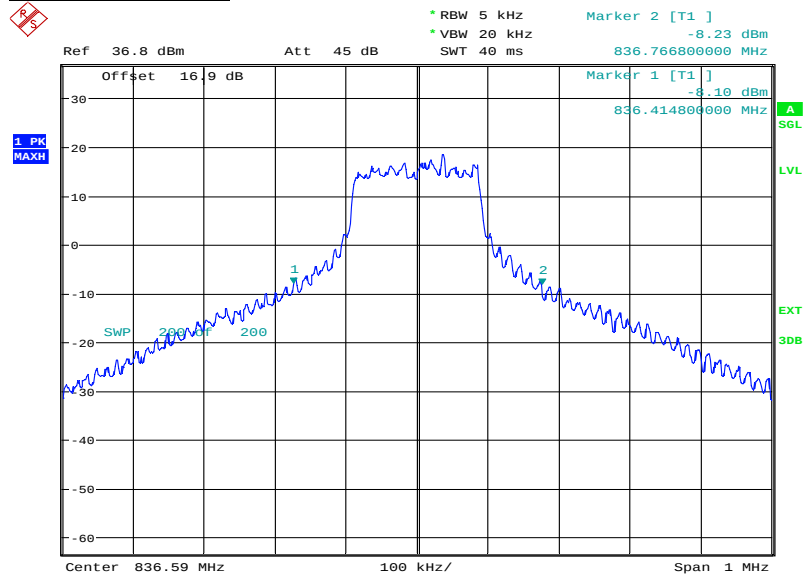
Product Service

LTE FDD 26, 824.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 4.JUN.2015 14:57:18

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

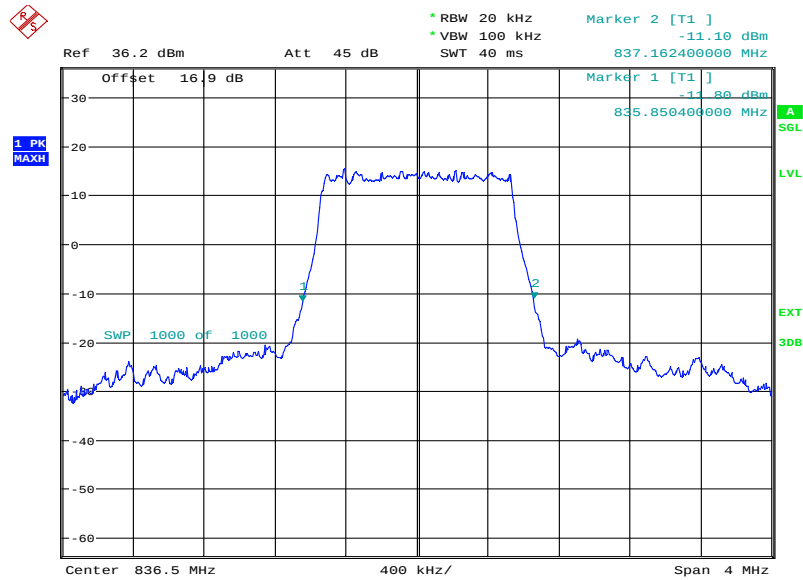


Date: 4.JUN.2015 15:51:41



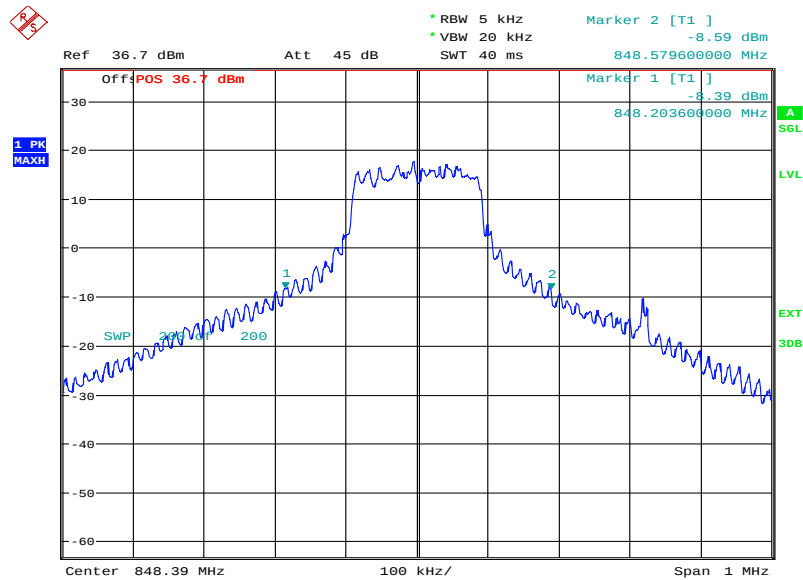
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 4.JUN.2015 15:45:01

LTE FDD 26, 848.3 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

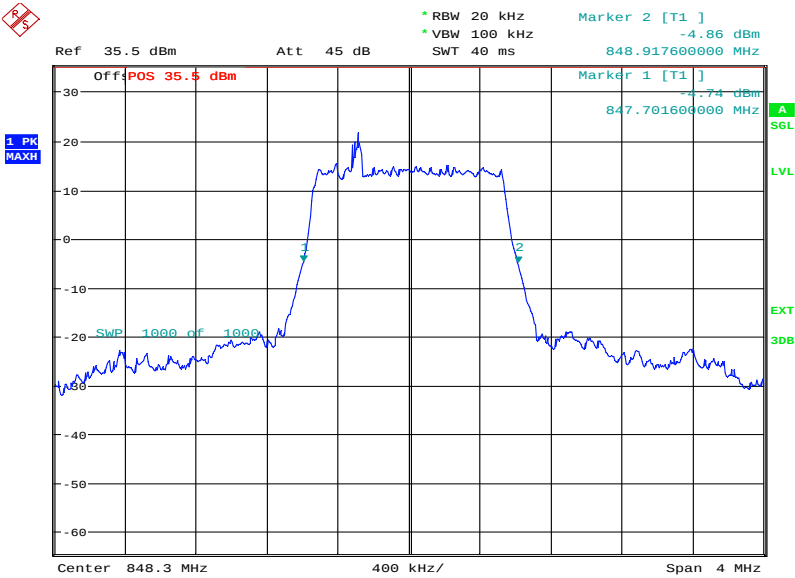


Date: 8.JUN.2015 09:41:53



Product Service

LTE FDD 26, 848.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth
Results

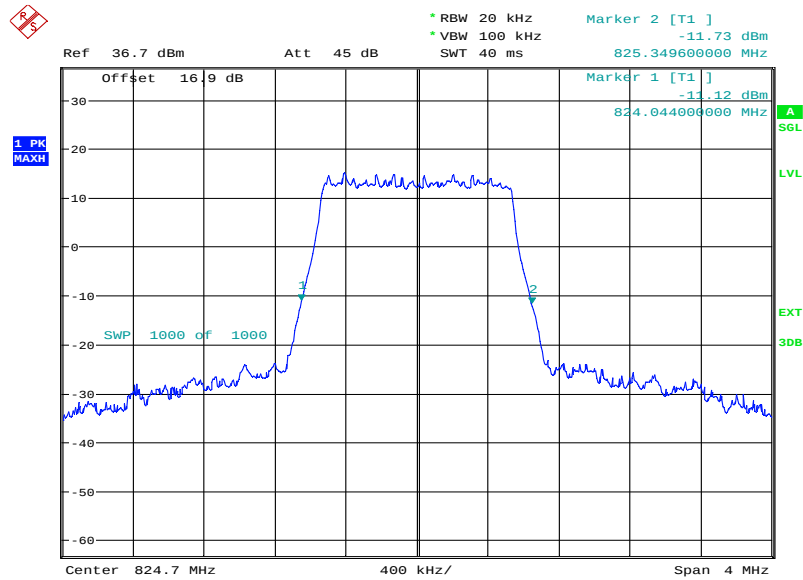


Date: 5 JUN 2015 11:45:43



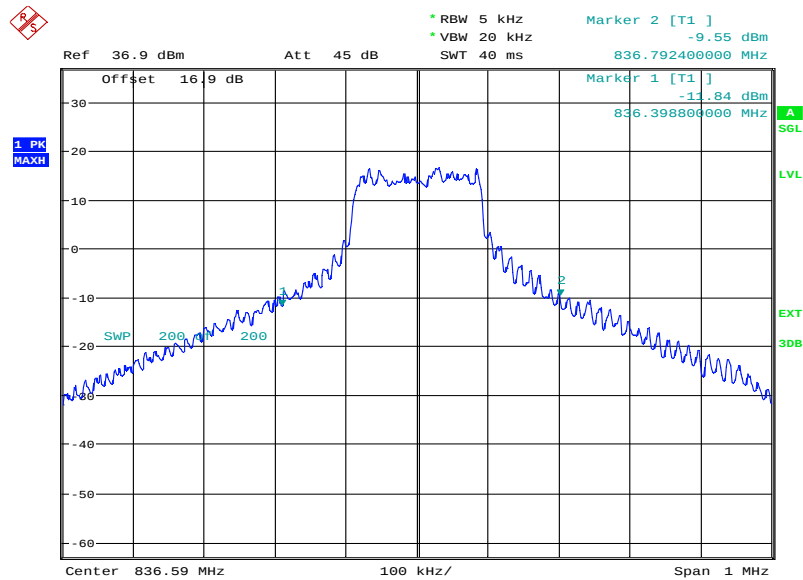
Product Service

LTE FDD 26, 824.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4 JUN.2015 15:03:10

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

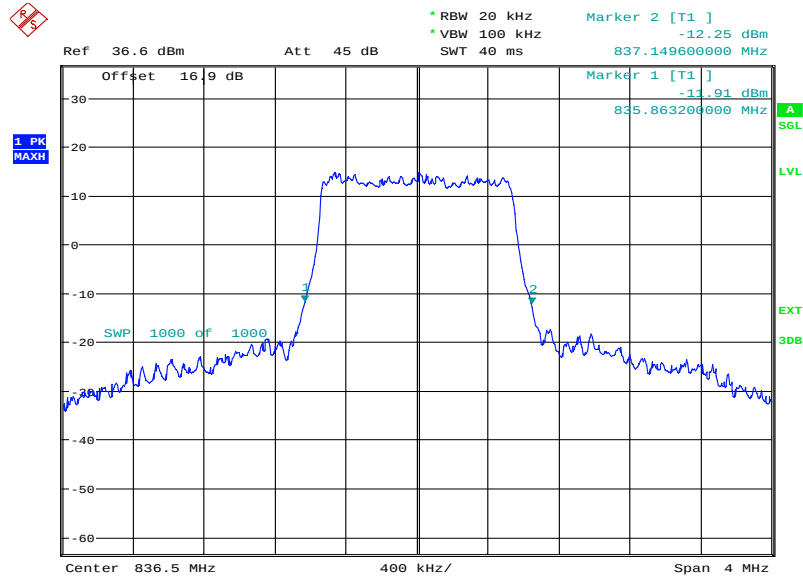


Date: 4 JUN.2015 15:49:54



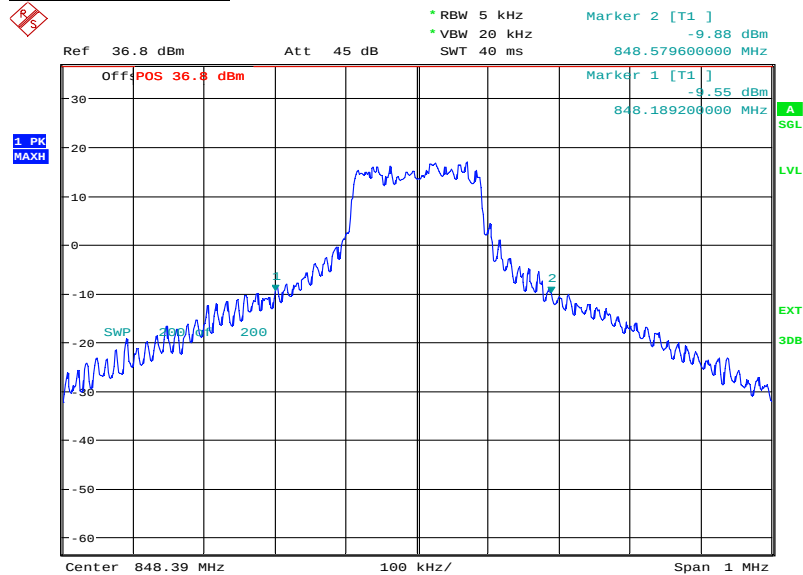
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 15:47:40

LTE FDD 26, 848.3 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

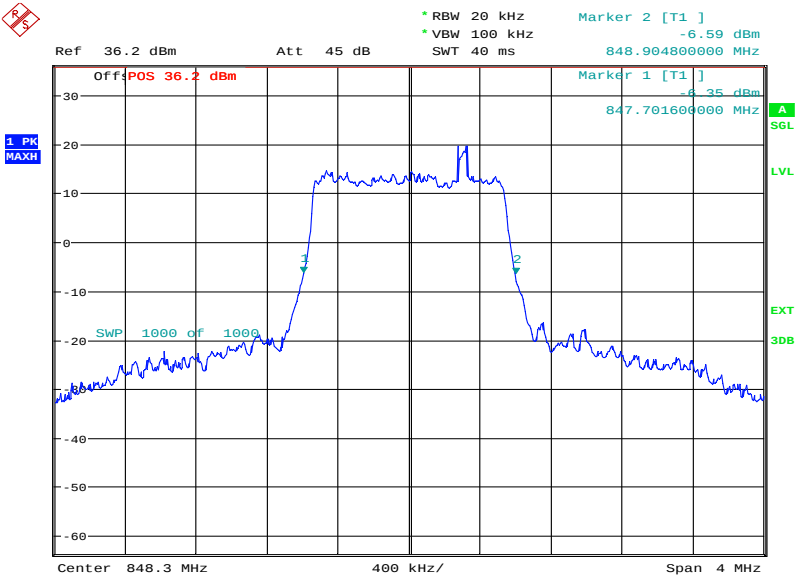


Date: 5.JUN.2015 12:06:10



Product Service

LTE FDD 26, 848.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 5 JUN 2015 11:51:29

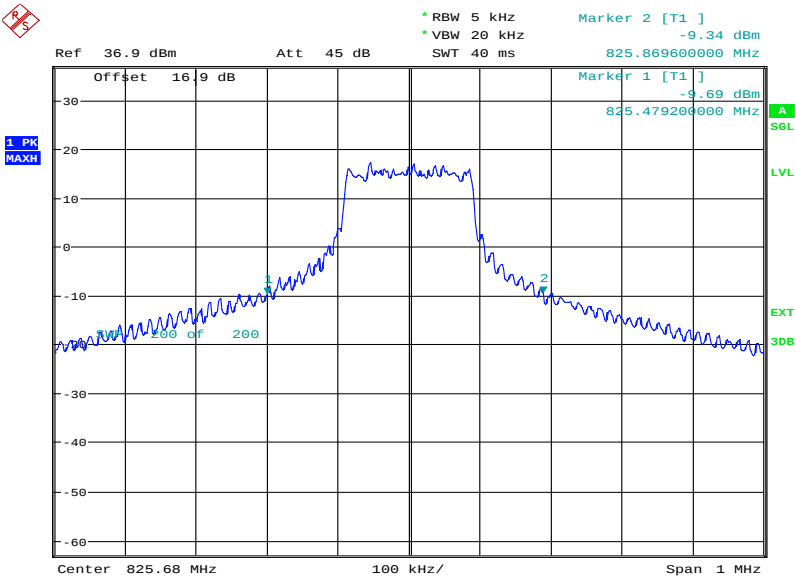


Product Service

LTE FDD 26, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
825.5 MHz				836.5 MHz				847.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	390.4	N/T	2947.2	N/T	403.2	N/T	2956.8	N/T	380.8	N/T	2966.4

LTE FDD 26, 825.5 MHz, 1 Resource Block - Middle, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

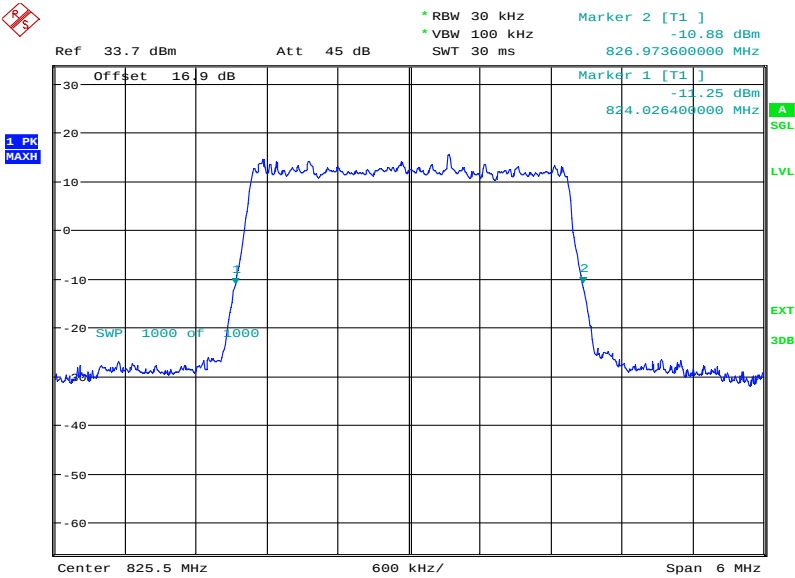


Date: 4 JUN 2015 14:25:50



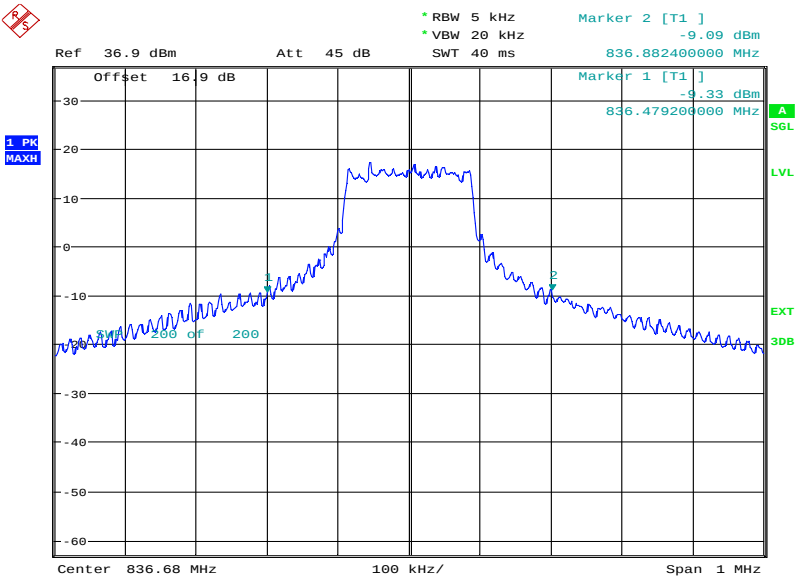
Product Service

LTE FDD 26, 825.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 4.JUN.2015 14:15:29

LTE FDD 26, 836.5 MHz, 1 Resource Block – Middle, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

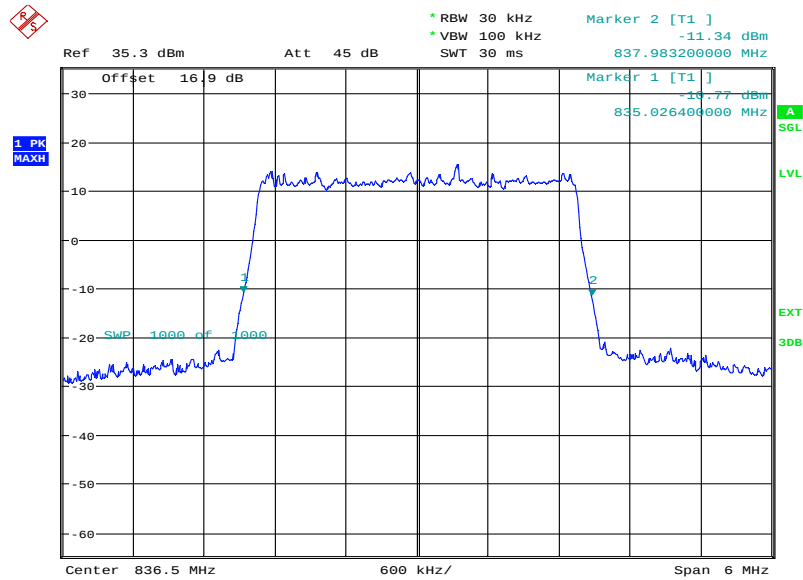


Date: 4.JUN.2015 16:04:49



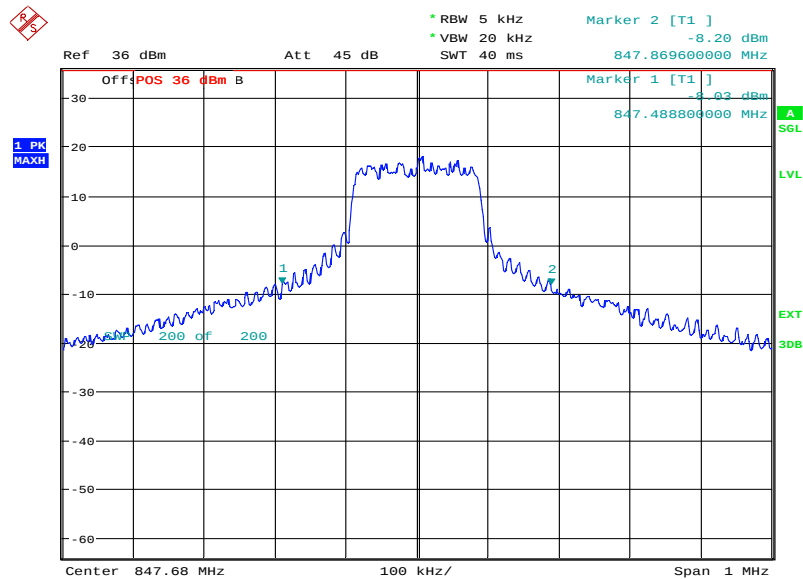
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 4.JUN.2015 15:58:34

LTE FDD 26, 847.5 MHz, 1 Resource Block - Middle, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

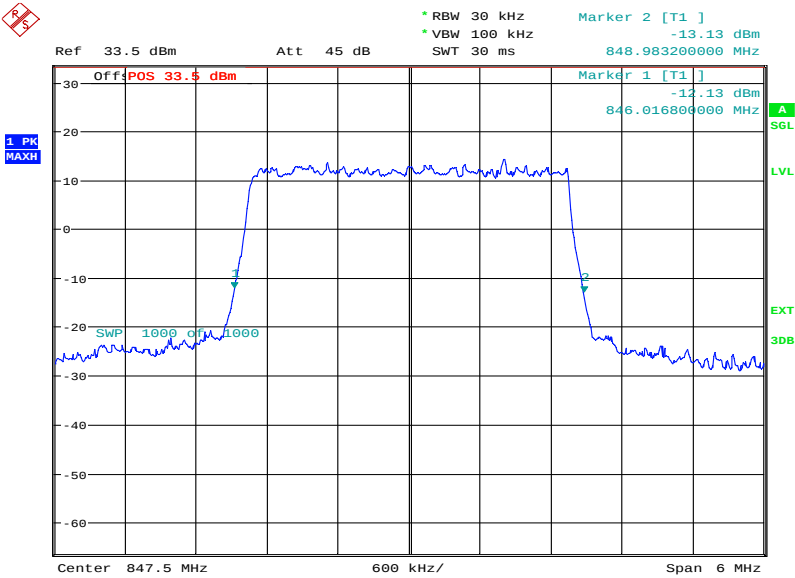


Date: 5.JUN.2015 11:40:35



Product Service

LTE FDD 26, 847.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, 26 dB Bandwidth
Results



Date: 5.JUN.2015 11:12:06

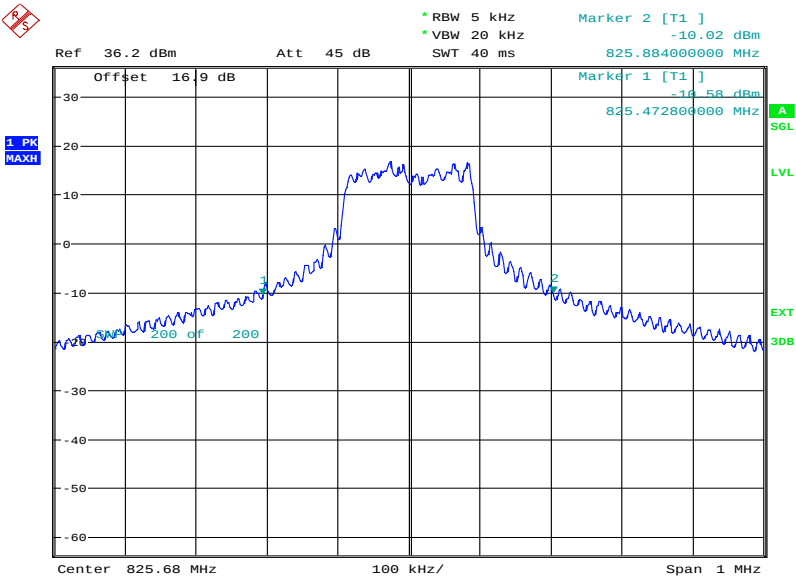


Product Service

LTE FDD 26, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
825.5 MHz				836.5 MHz				847.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	411.2	N/T	2966.4	N/T	411.2	N/T	2976.0	N/T	401.6	N/T	2976.0

LTE FDD 26, 825.5 MHz, 1 Resource Block - Middle, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

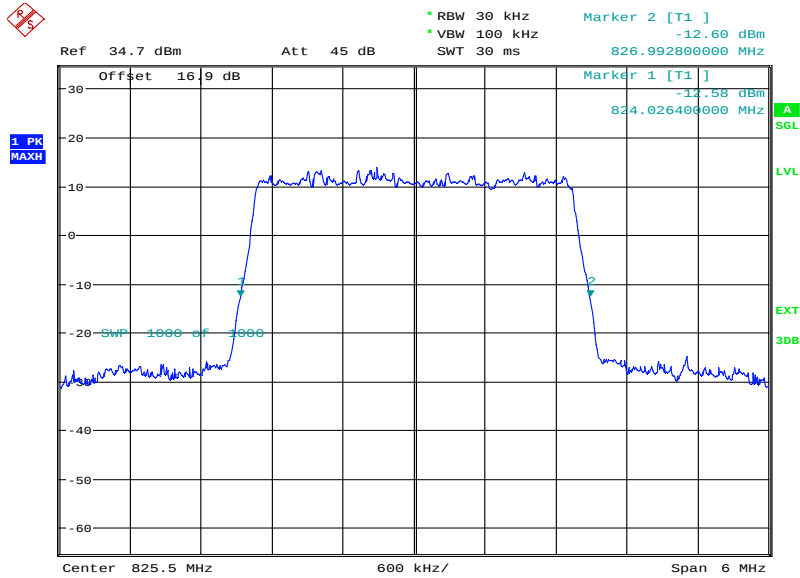


Date: 4 JUN.2015 14:27:30



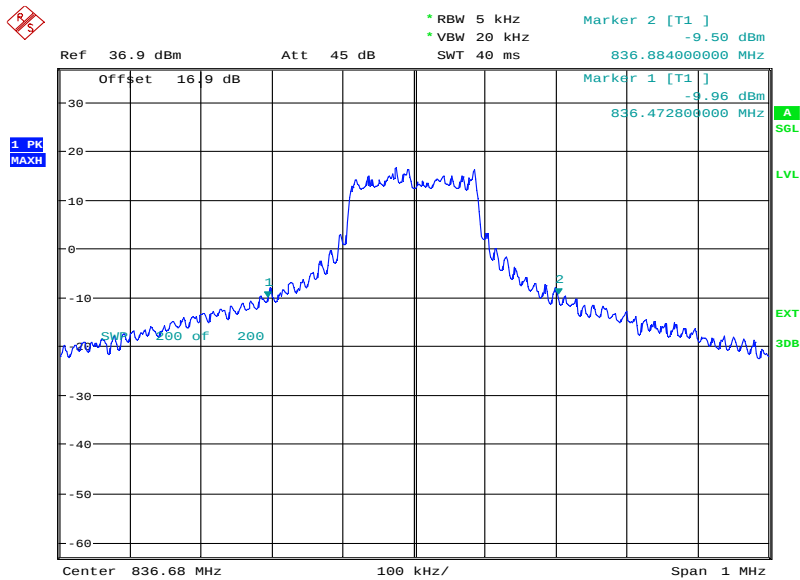
Product Service

LTE FDD 26, 825.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 14:20:54

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

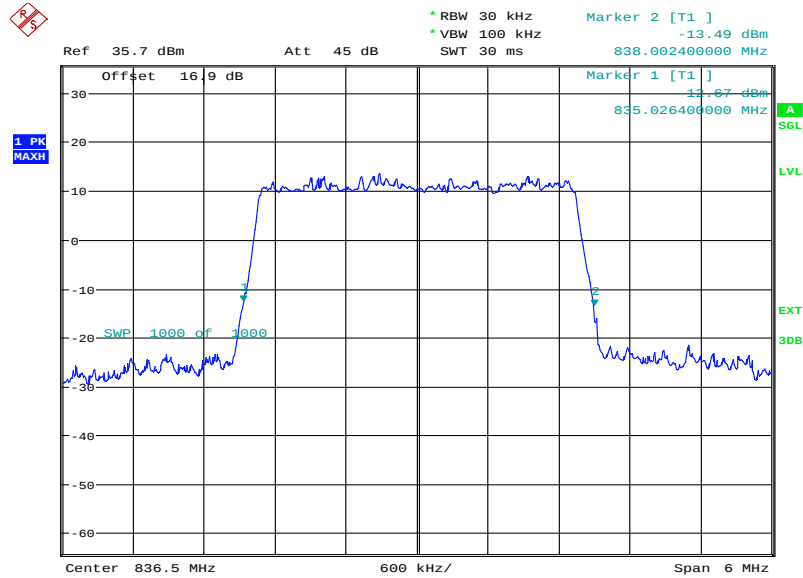


Date: 4.JUN.2015 16:02:59



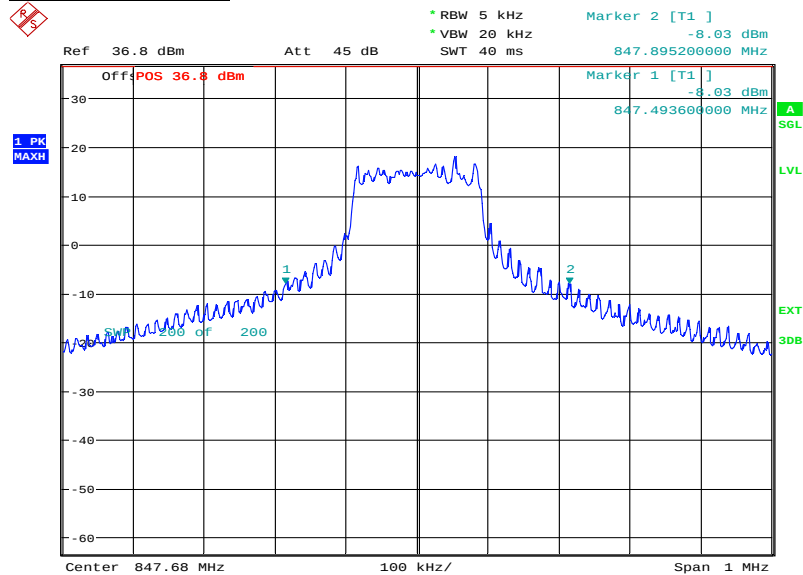
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 16:01:01

LTE FDD 26, 847.5 MHz, 1 Resource Block - Middle, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

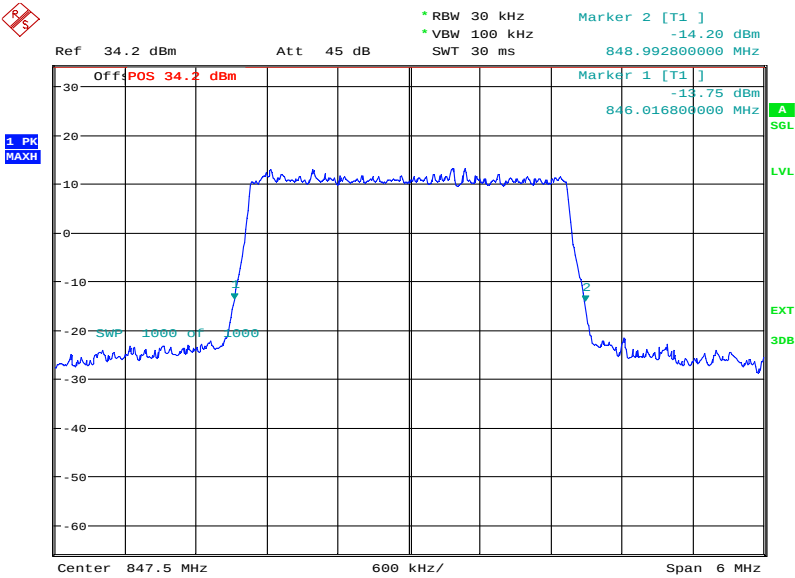


Date: 5.JUN.2015 11:38:07



Product Service

LTE FDD 26, 847.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth
Results



Date: 5 JUN 2015 11:14:54

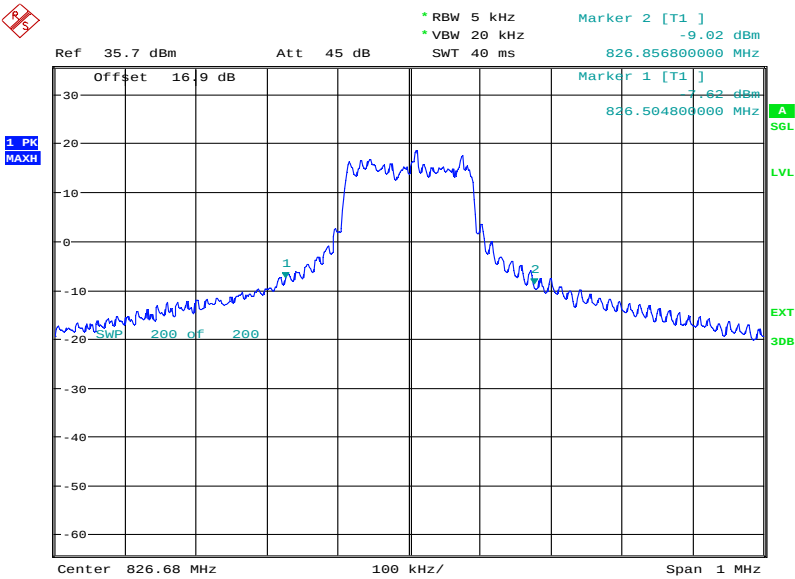


Product Service

LTE FDD 26, 5.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
826.5 MHz				836.5 MHz				846.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	352.0	N/T	4960.0	N/T	387.2	N/T	4976.0	N/T	392.0	N/T	4928.0

LTE FDD 26, 826.5 MHz, 1 Resource Block - Middle, 5.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

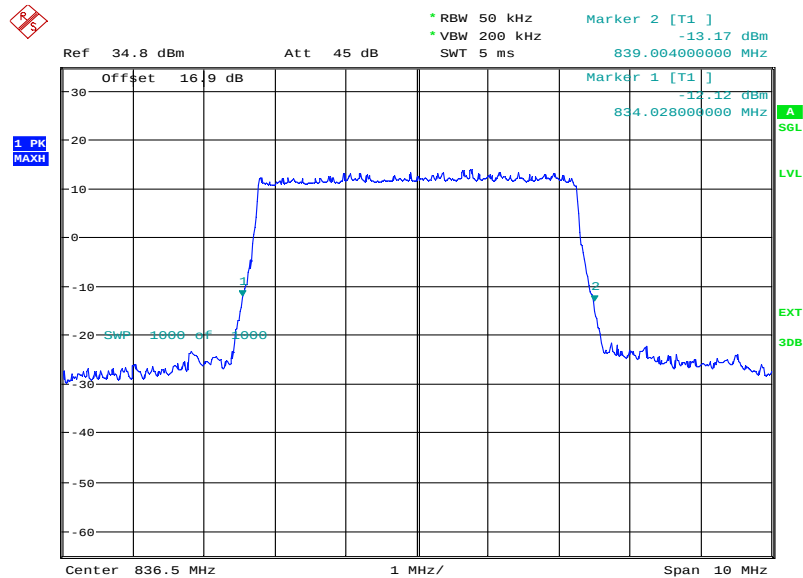


Date: 4 JUN 2015 13:56:03



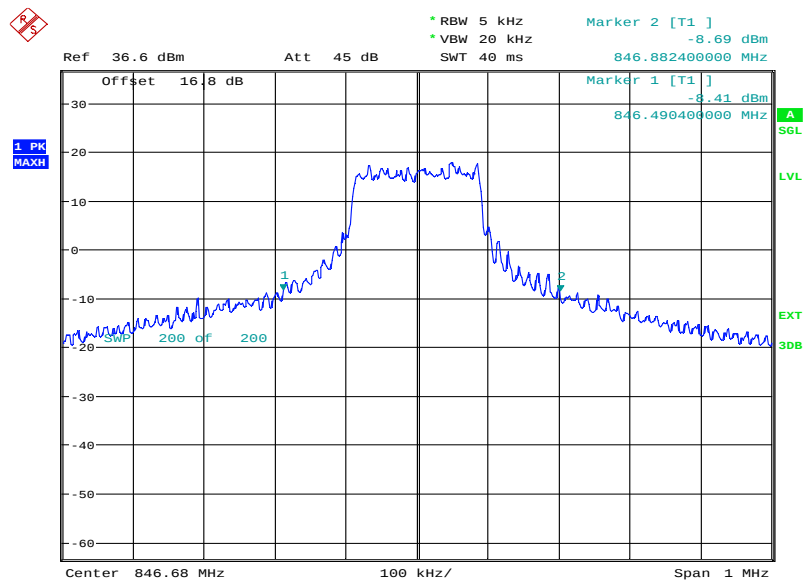
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 4.JUN.2015 16:10:52

LTE FDD 26, 846.5 MHz, 1 Resource Block - Middle, 5.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 5.JUN.2015 11:05:27

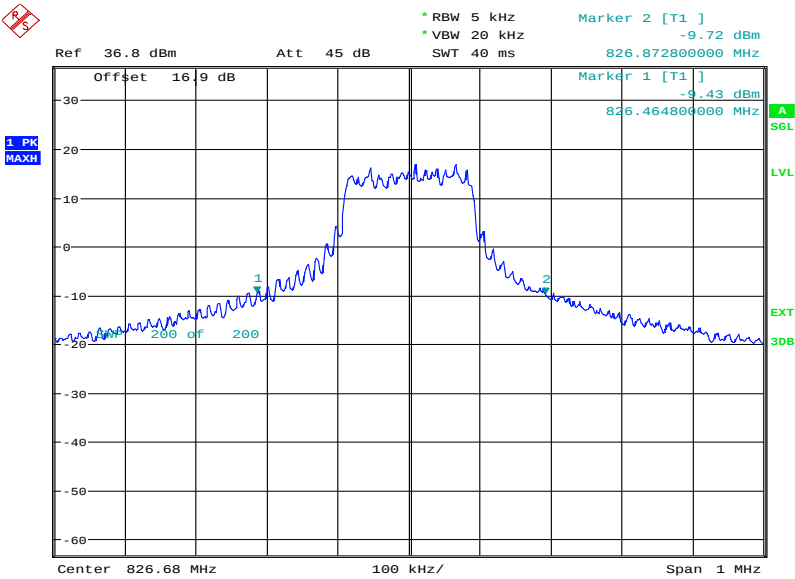


Product Service

LTE FDD 26, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
826.5 MHz				836.5 MHz				846.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	408.0	N/T	4896.0	N/T	395.2	N/T	4880.0	N/T	444.8	N/T	4944.0

LTE FDD 26, 826.5 MHz, 1 Resource Block - Middle, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

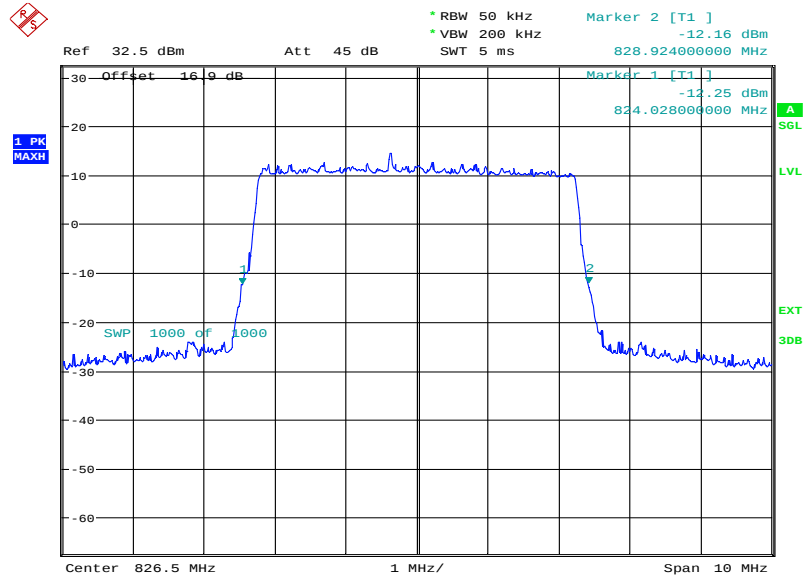


Date: 4 JUN 2015 13:58:24



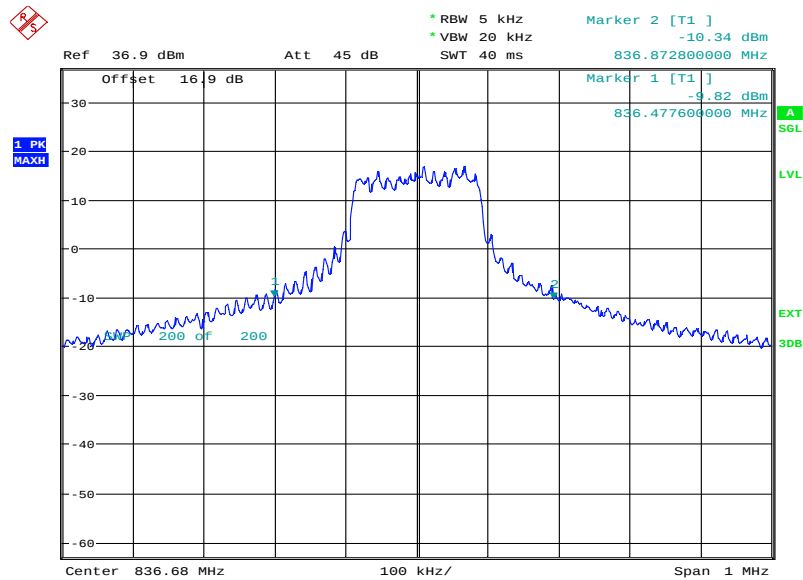
Product Service

LTE FDD 26, 826.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 13:47:21

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

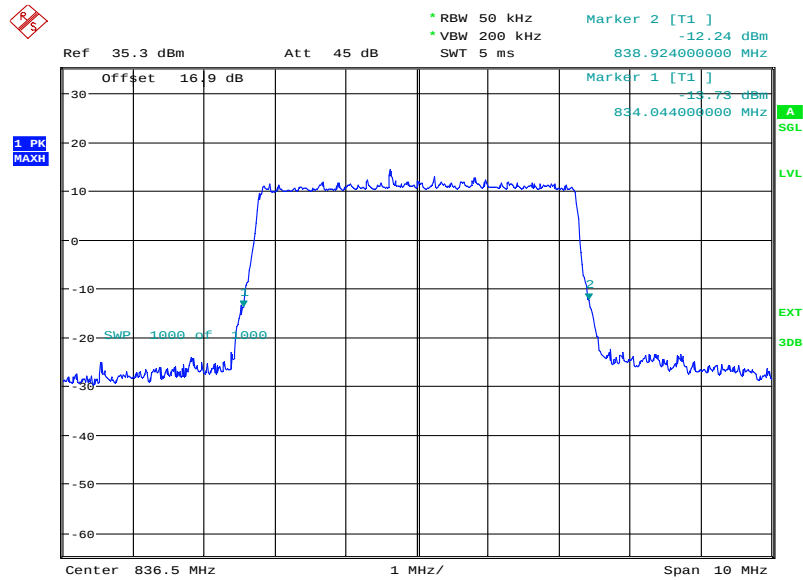


Date: 4.JUN.2015 16:15:15



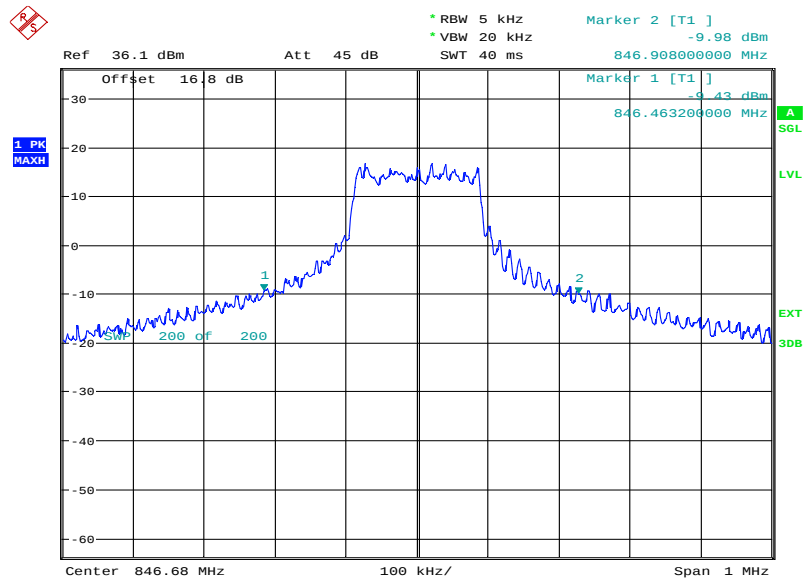
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 16:13:23

LTE FDD 26, 846.5 MHz, 1 Resource Block - Middle, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

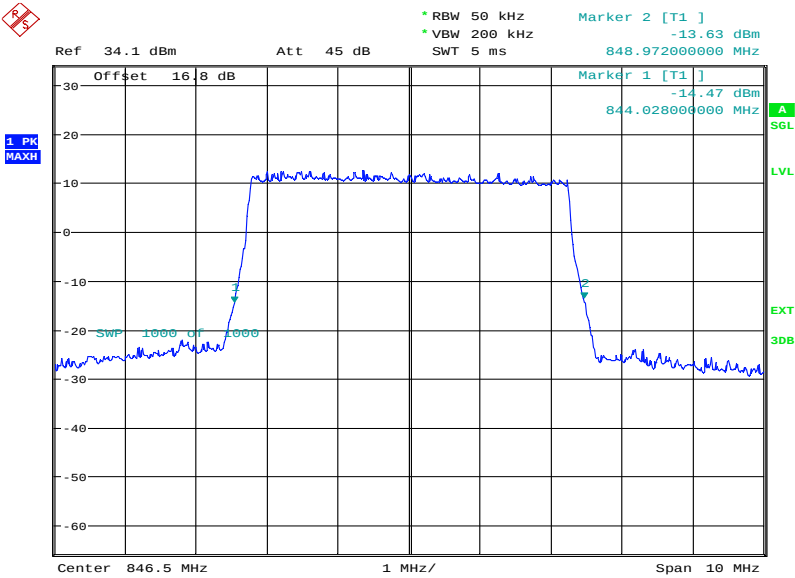


Date: 5.JUN.2015 11:07:19



Product Service

LTE FDD 26, 846.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth
Results



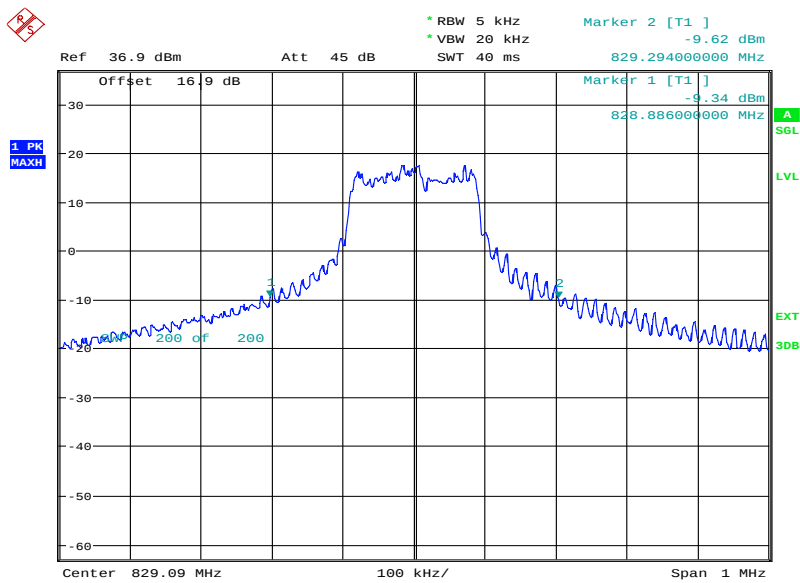
Date: 5 JUN 2015 10:58:30



LTE FDD 26, 10.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
829.0 MHz				836.5 MHz				844.0 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	408.0	N/T	9888.0	N/T	366.4	N/T	9344.0	N/T	392.0	N/T	9824.0

LTE FDD 26, 829.0 MHz, 1 Resource Block - Middle, 10.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

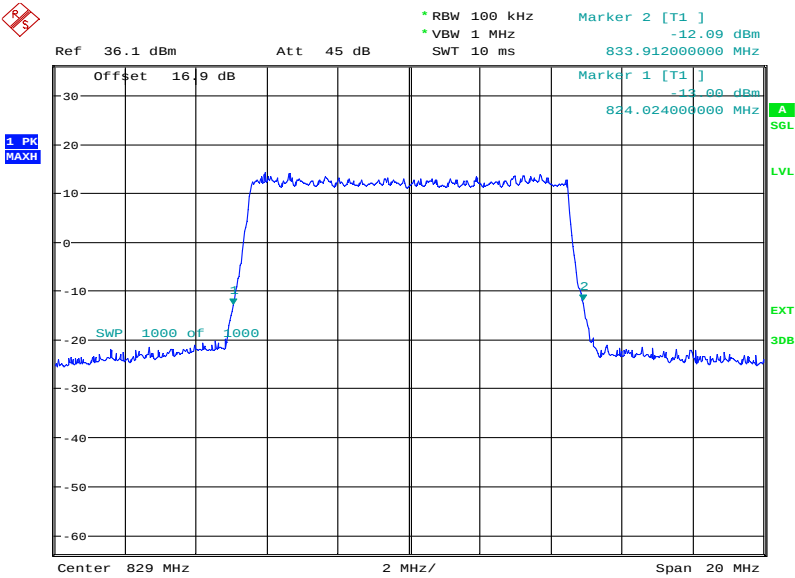


Date: 4 JUN 2015 13:23:31



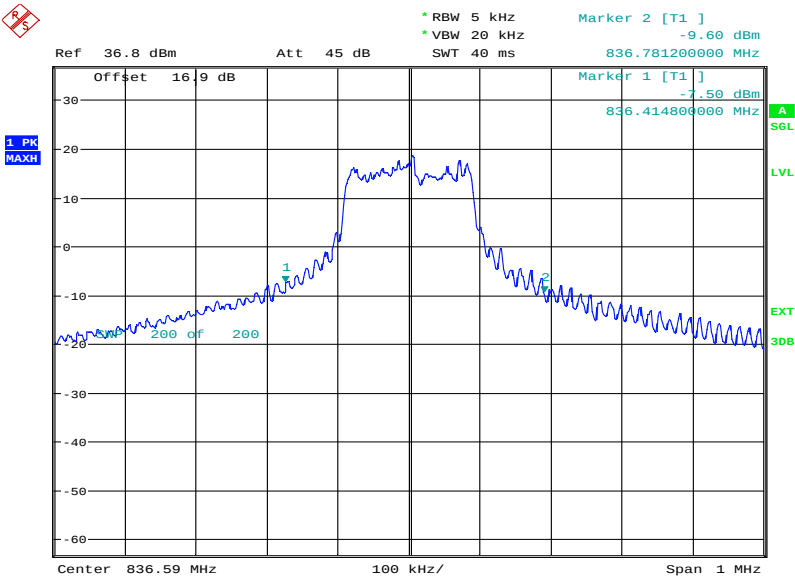
Product Service

LTE FDD 26, 829.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 4.JUN.2015 13:11:57

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 10.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

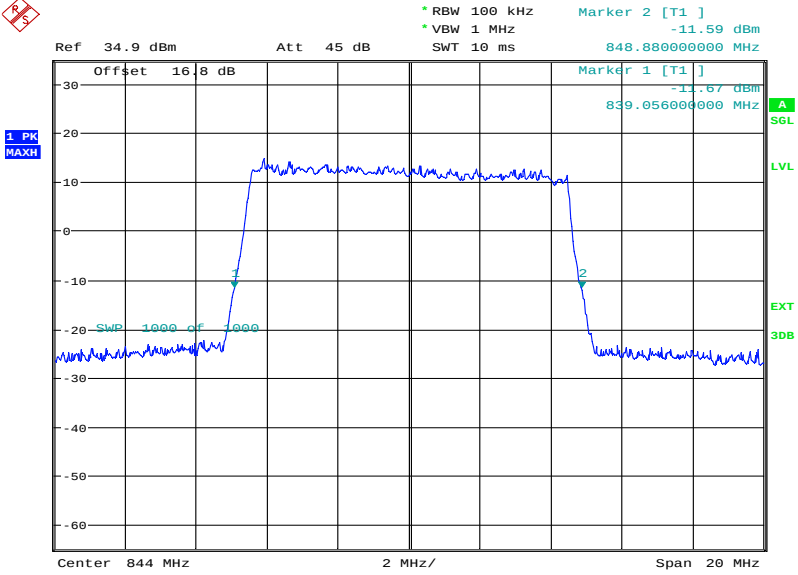


Date: 5.JUN.2015 09:04:46



Product Service

LTE FDD 26, 844.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, 26 dB Bandwidth
Results



Date: 5 JUN 2015 10:33:57

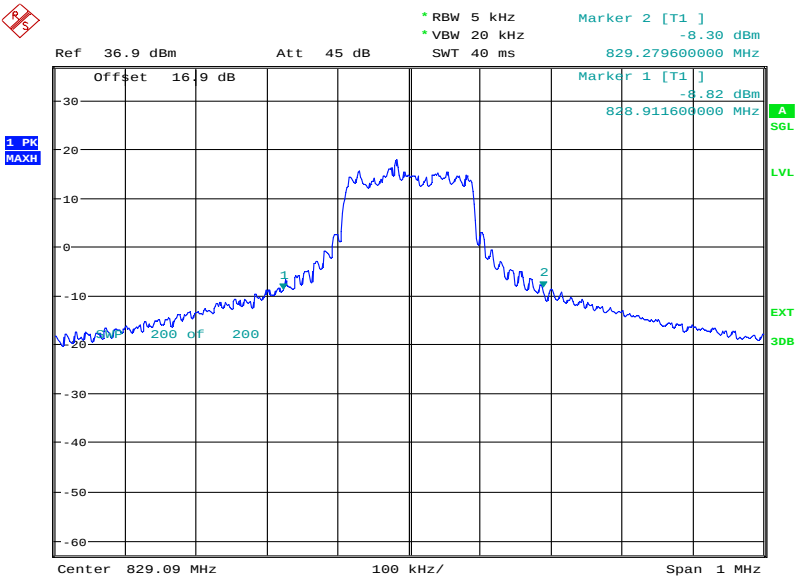


Product Service

LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
829.0 MHz				836.5 MHz				844.0 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	368.0	N/T	9856.0	N/T	433.6	N/T	9696.0	N/T	384.0	N/T	9792.0

LTE FDD 26, 829.0 MHz, 1 Resource Block - Middle, 10.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

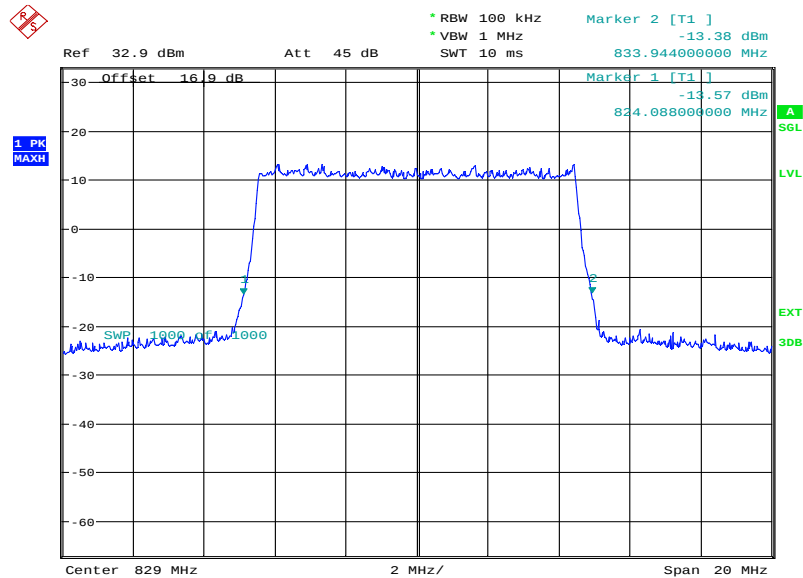


Date: 4 JUN 2015 13:25:35



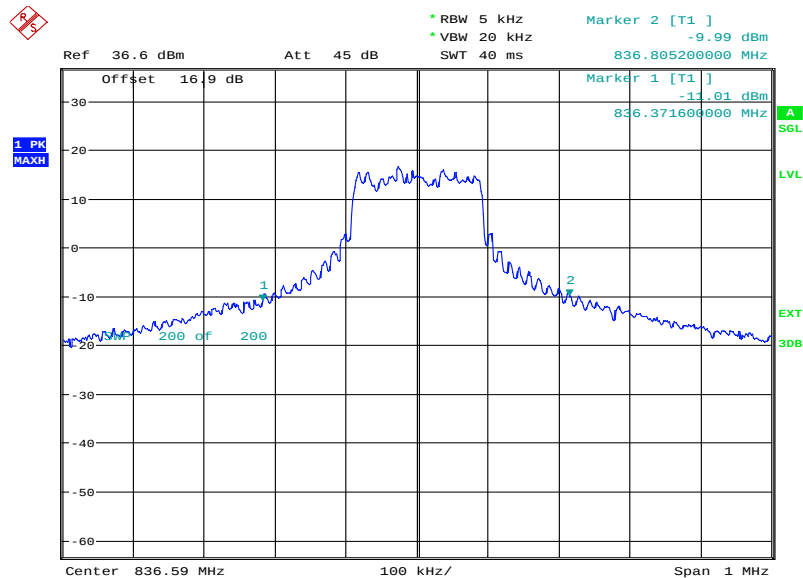
Product Service

LTE FDD 26, 829.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 13:18:19

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 10.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

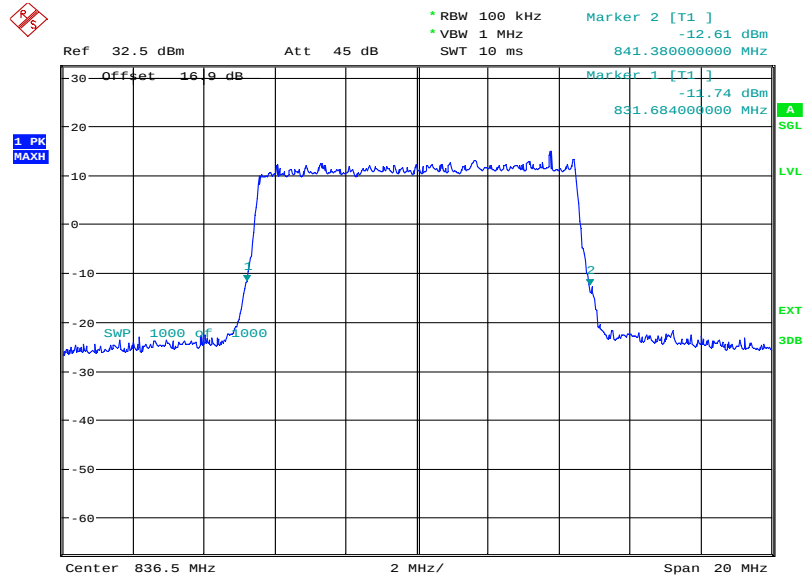


Date: 5.JUN.2015 08:53:46



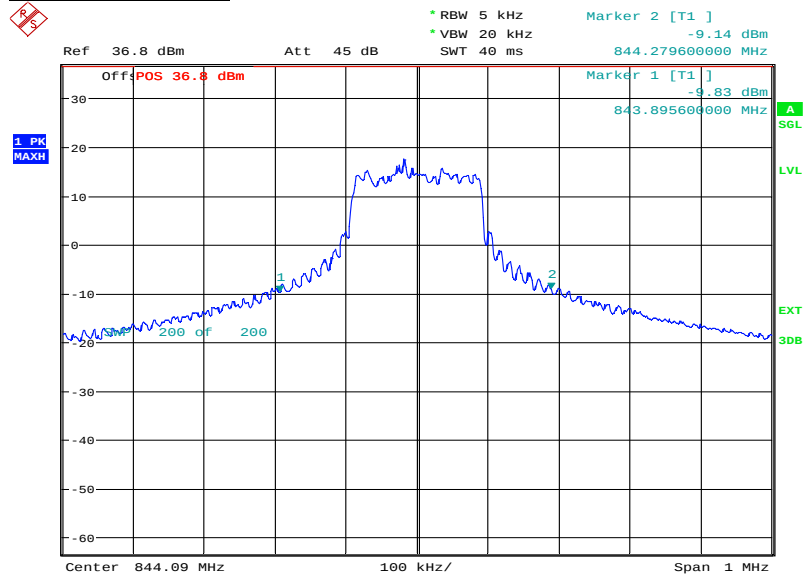
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 5.JUN.2015 08:47:09

LTE FDD 26, 844.0 MHz, 1 Resource Block - Middle, 10.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

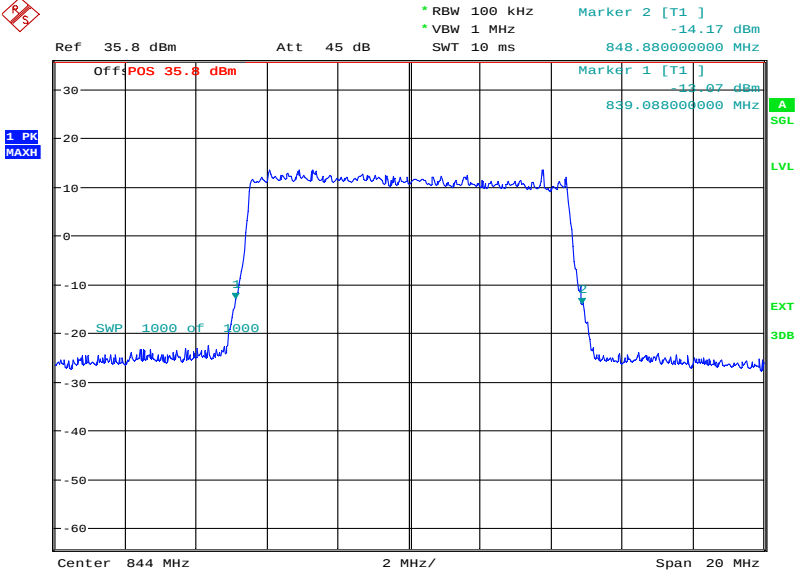


Date: 5.JUN.2015 10:48:06



Product Service

LTE FDD 26, 844.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, 26 dB
Bandwidth Results



Date: 5.JUN.2015 10:37:34

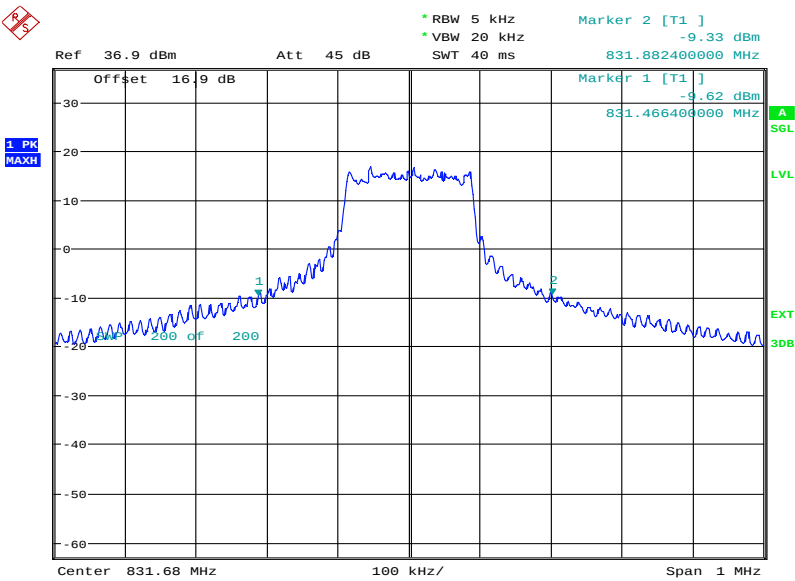


Product Service

LTE FDD 26, 15.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
831.5 MHz				836.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	416.0	N/T	14880.0	N/T	403.2	N/T	14640.0	N/T	380.8	N/T	14592.0

LTE FDD 26, 831.5 MHz, 1 Resource Block - Middle, 15.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

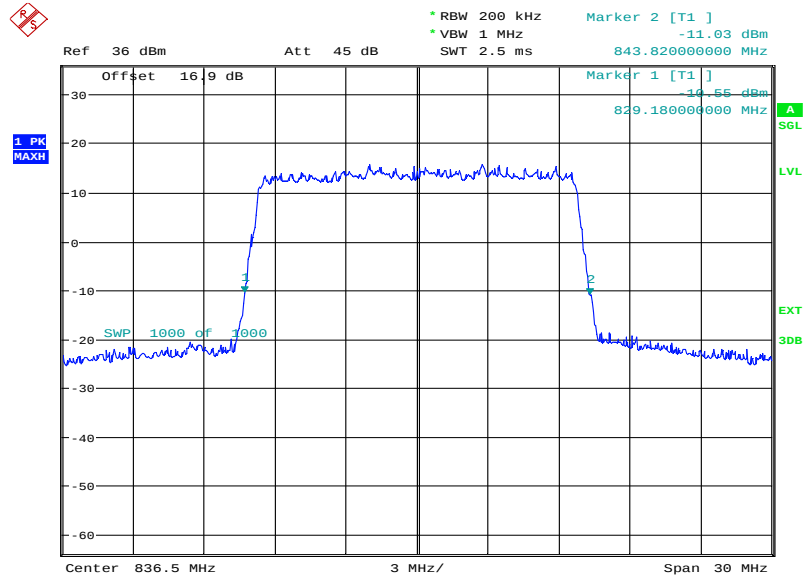


Date: 4 JUN 2015 11:34:40



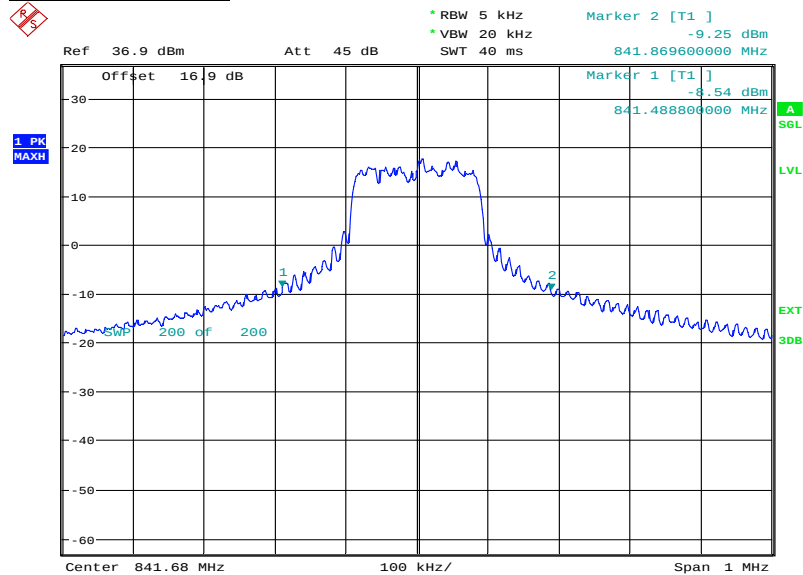
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 5.JUN.2015 09:25:38

LTE FDD 26, 841.5 MHz, 1 Resource Block - Middle, 15.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

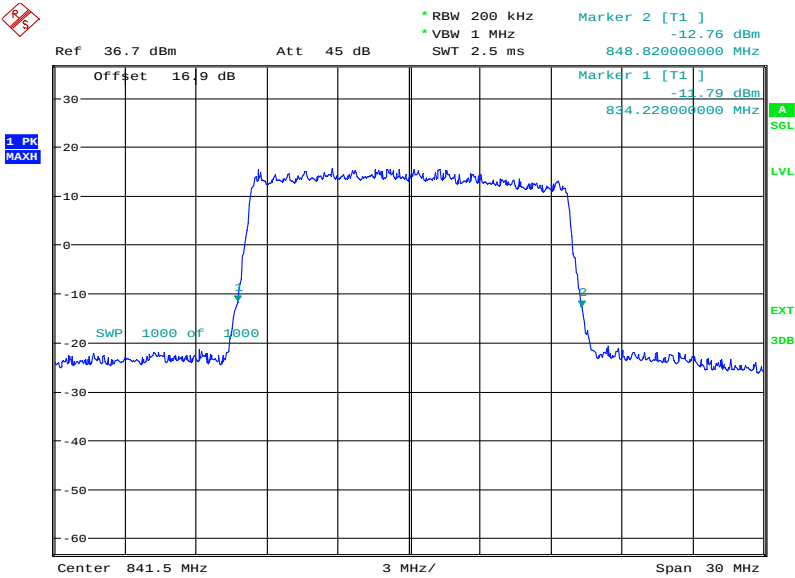


Date: 5.JUN.2015 09:45:17



Product Service

LTE FDD 26, 841.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, QPSK, 26 dB Bandwidth
Results



Date: 5.JUN.2015 10:11:26

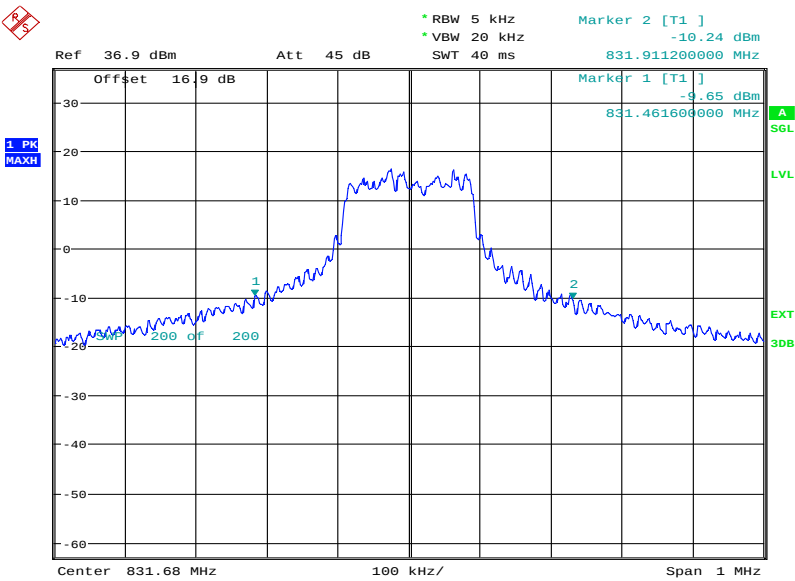


Product Service

LTE FDD 26, 15.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

26 dB Bandwidth (kHz)											
831.5 MHz				836.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High		Low	Mid	High	
N/T	449.6	N/T	14688.0	N/T	417.6	N/T	14640.0	N/T	393.6	N/T	14640.0

LTE FDD 26, 831.5 MHz, 1 Resource Block - Middle, 15.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

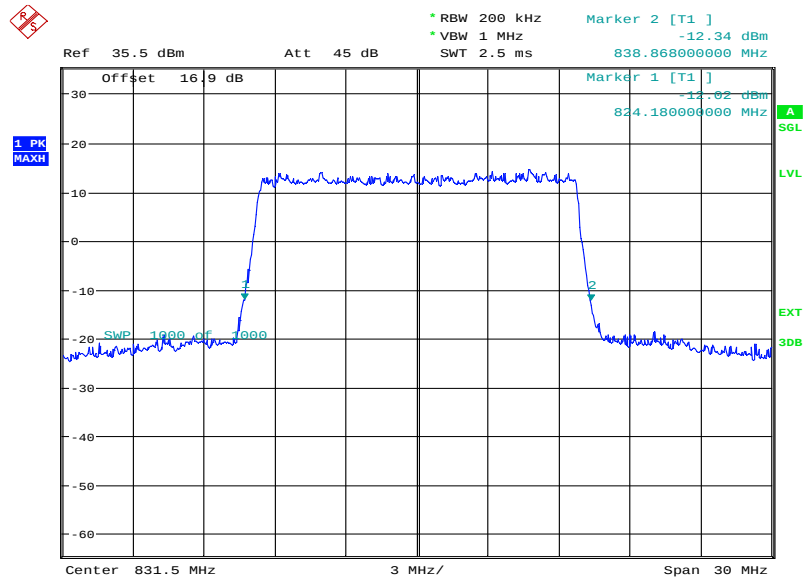


Date: 4 JUN 2015 11:37:49



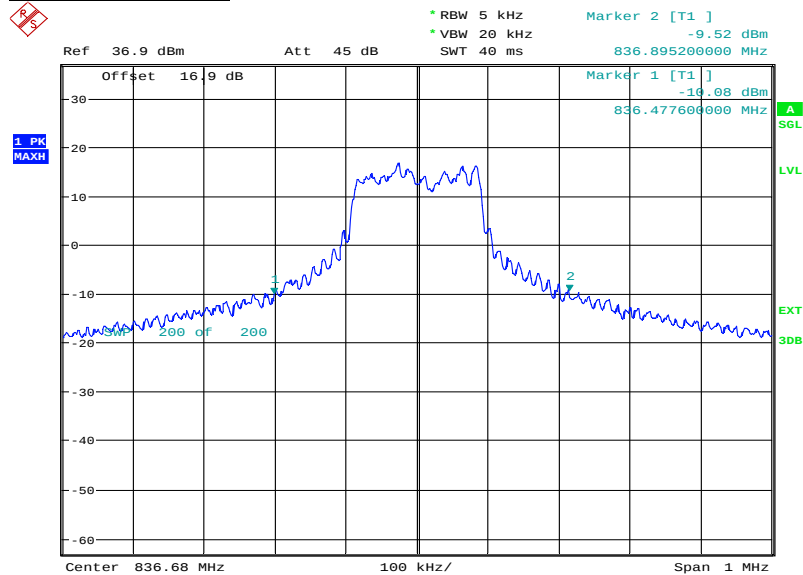
Product Service

LTE FDD 26, 831.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 4.JUN.2015 11:57:58

LTE FDD 26, 836.5 MHz, 1 Resource Block - Middle, 15.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

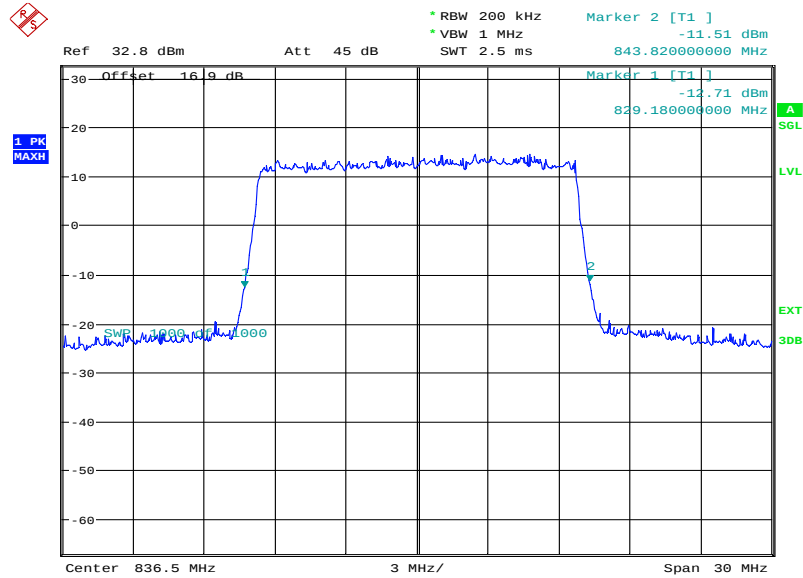


Date: 5.JUN.2015 09:30:25



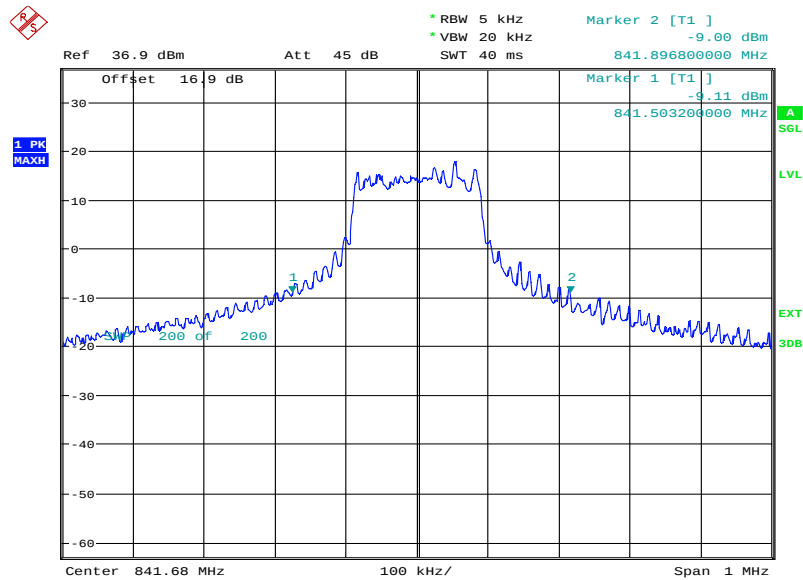
Product Service

LTE FDD 26, 836.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results



Date: 5.JUN.2015 09:28:29

LTE FDD 26, 841.5 MHz, 1 Resource Block - Middle, 15.0 MHz Bandwidth, 16-QAM, 26 dB Bandwidth Results

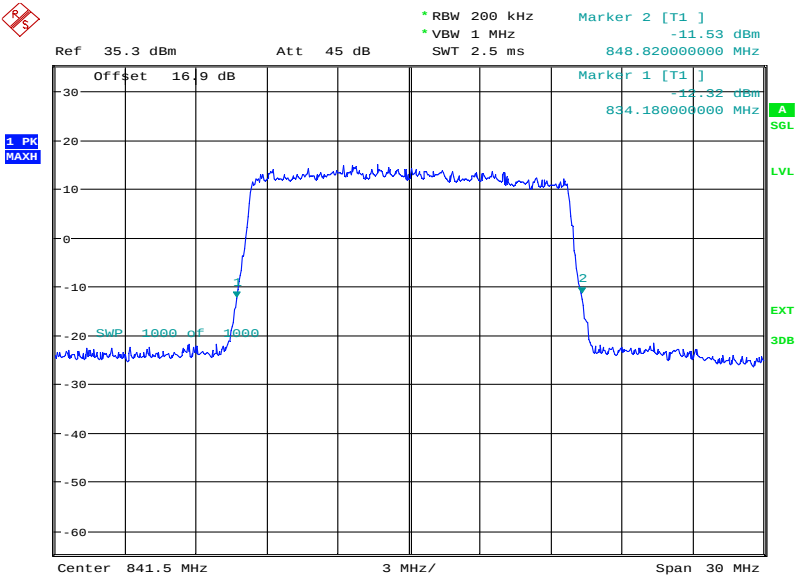


Date: 5.JUN.2015 09:43:26



Product Service

LTE FDD 26, 841.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, 16-QAM, 26 dB
Bandwidth Results



Date: 5 JUN 2015 09:57:09

FCC 47 CFR Part 22, Limit Clause

None specified.



Product Service

2.7 MODULATION CHARACTERISTICS

2.7.1 Specification Reference

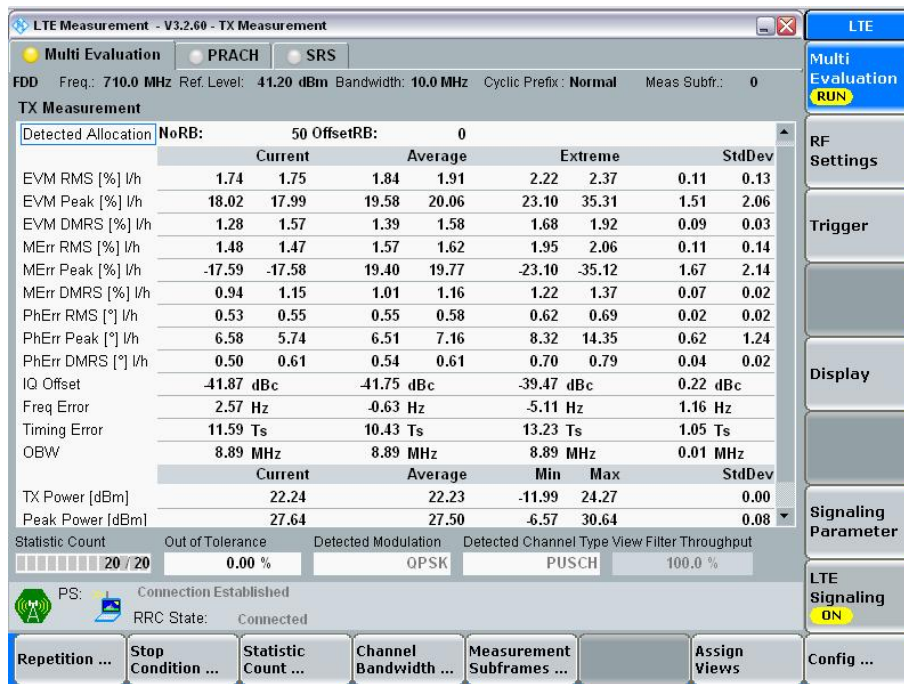
FCC 47 CFR Part 22 and FCC 47 CFR Part 2, Clause 2.1047 (d)

2.7.2 Equipment Under Test

SHF32

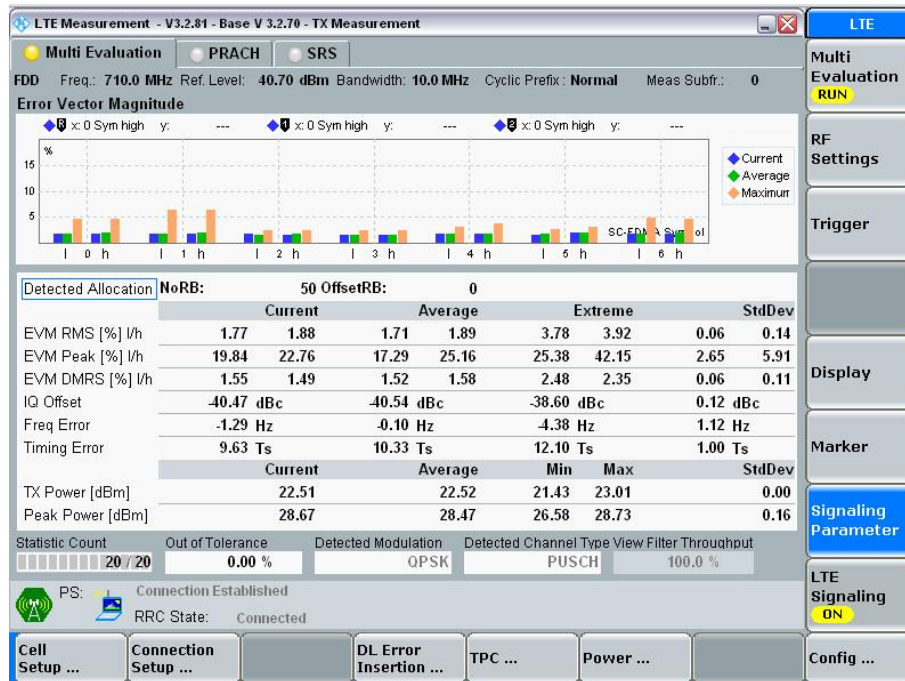
2.7.3 Test Results

LTE FDD 26, 10.0 MHz Bandwidth – QPSK, Transmitter Summary, Modulation Characteristics, Plot

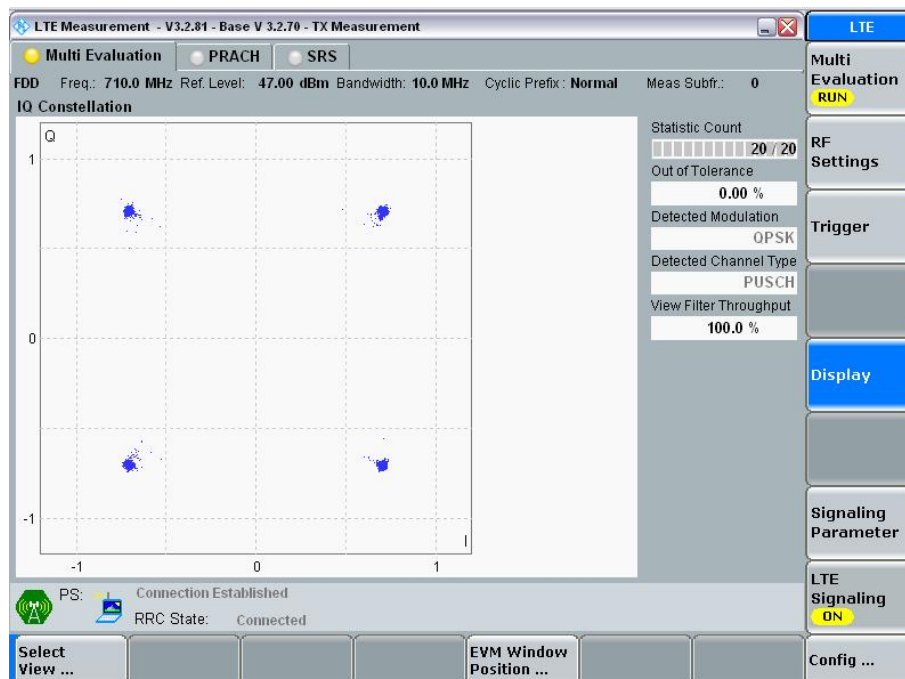




LTE FDD 26, 10.0 MHz Bandwidth – QPSK, EVM, Modulation Characteristics Plot



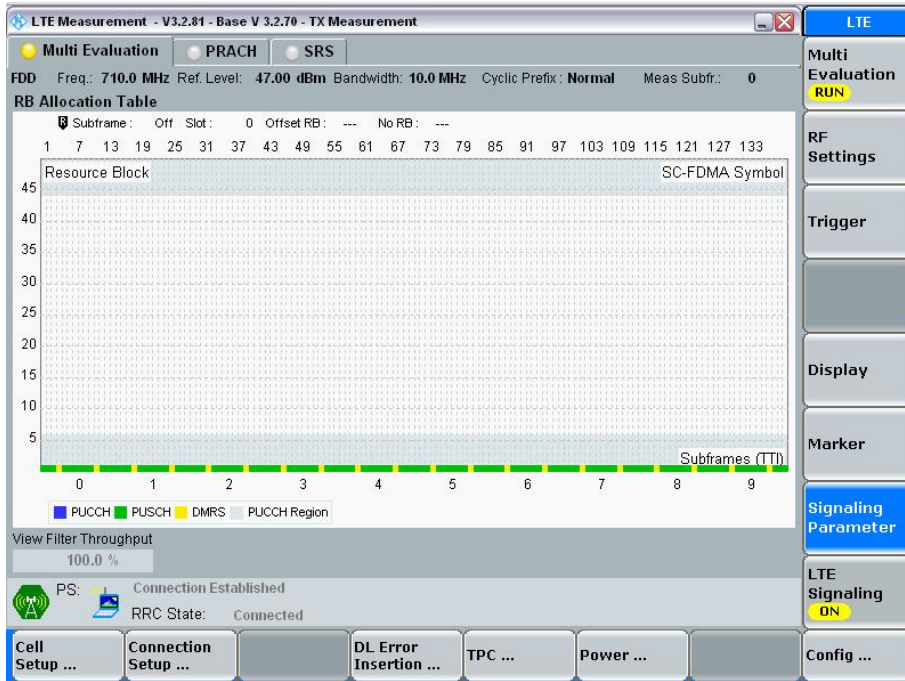
LTE FDD 26, 10.0 MHz Bandwidth – QPSK, IQ Constellation, Modulation Characteristics Plot



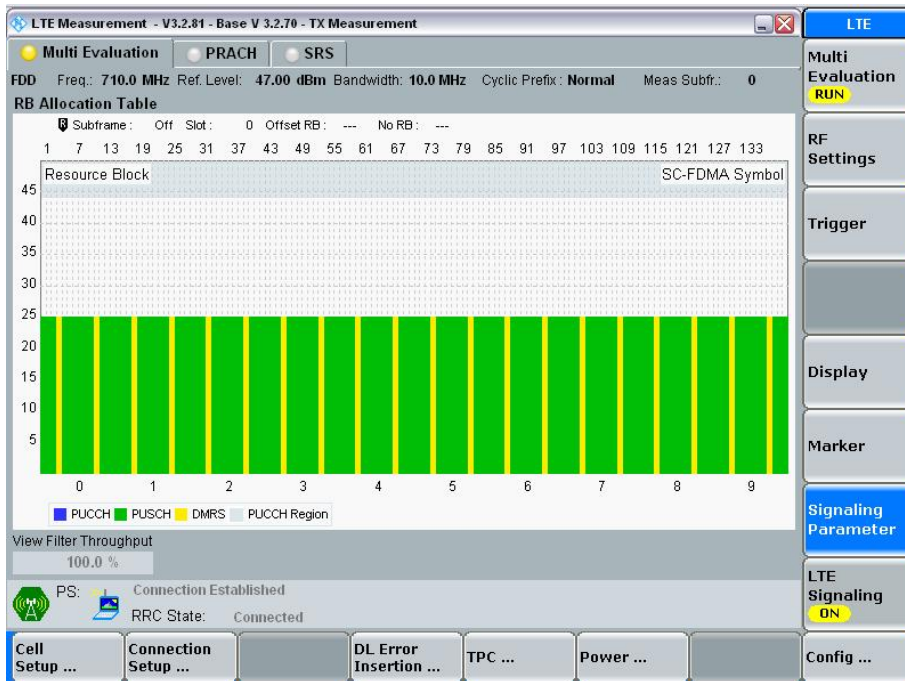


Product Service

LTE FDD 26, 10.0 MHz Bandwidth – QPSK, 1 Resource Block Allocation, Modulation Characteristics Plot

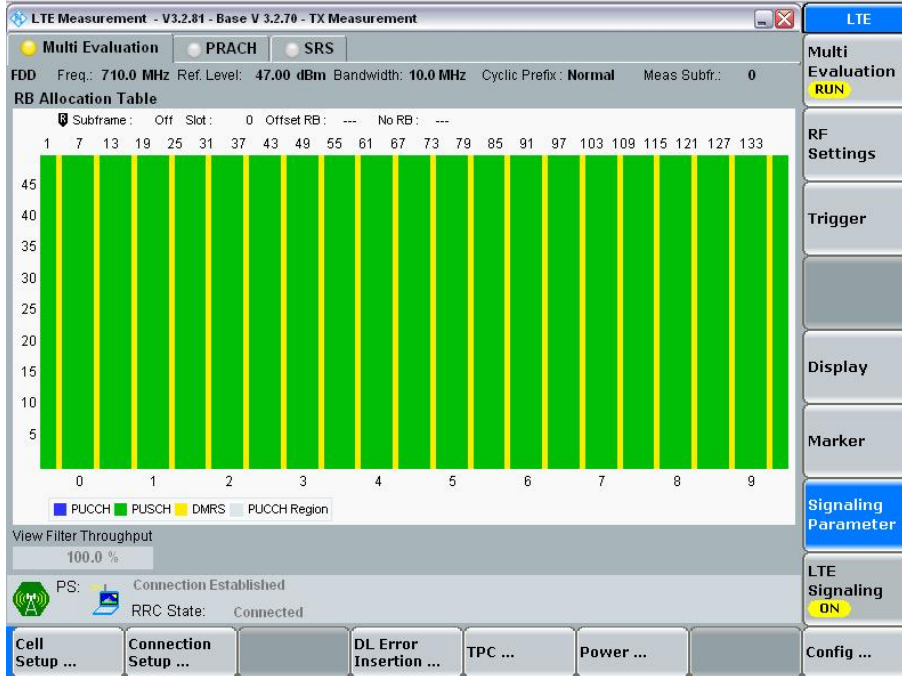


LTE FDD 26, 10.0 MHz Bandwidth – QPSK, 25 Resource Block Allocation, Modulation Characteristics Plot

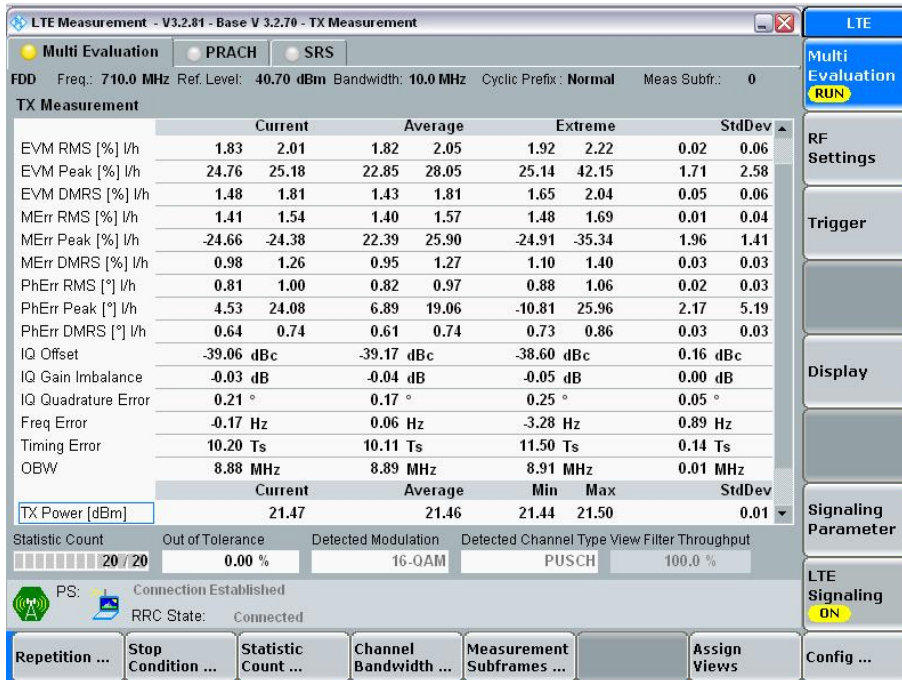




LTE FDD 26, 10.0 MHz Bandwidth – QPSK, 50 Resource Block Allocation, Modulation Characteristics Plot



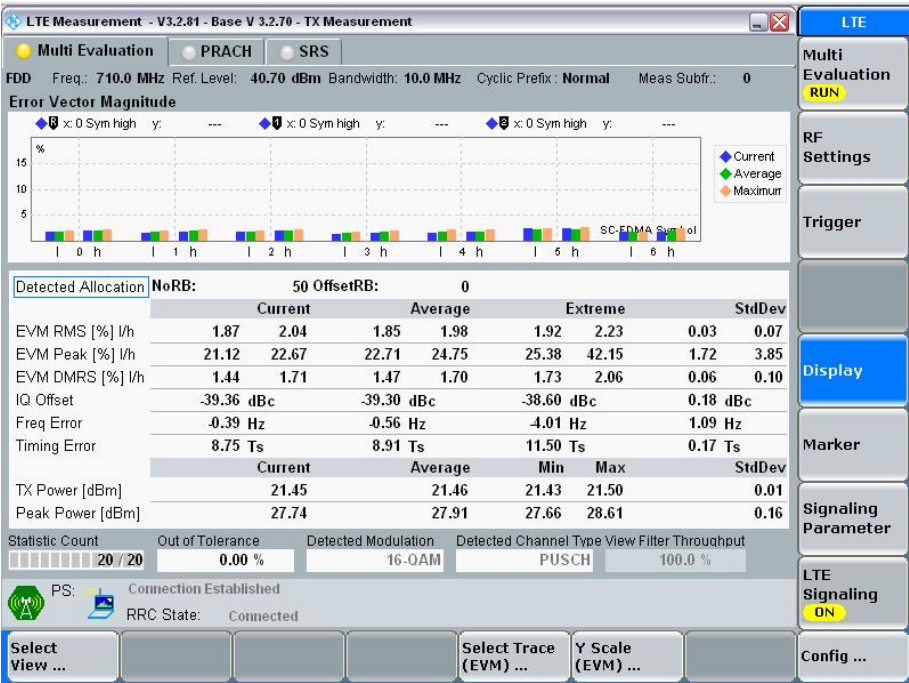
LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, Transmitter Summary, Modulation Characteristics Plot



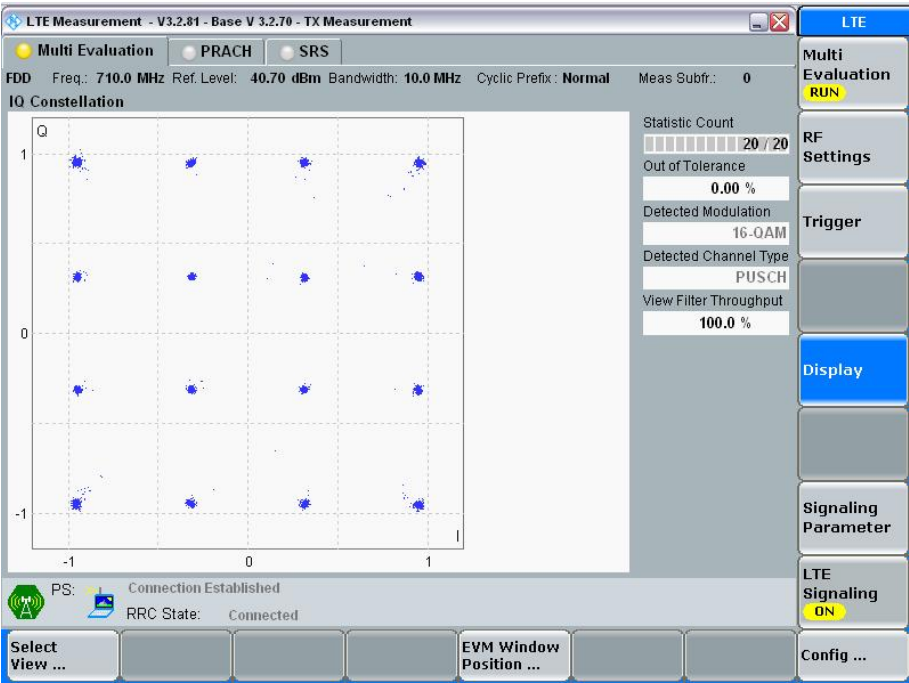


Product Service

LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, EVM, Modulation Characteristics Plot

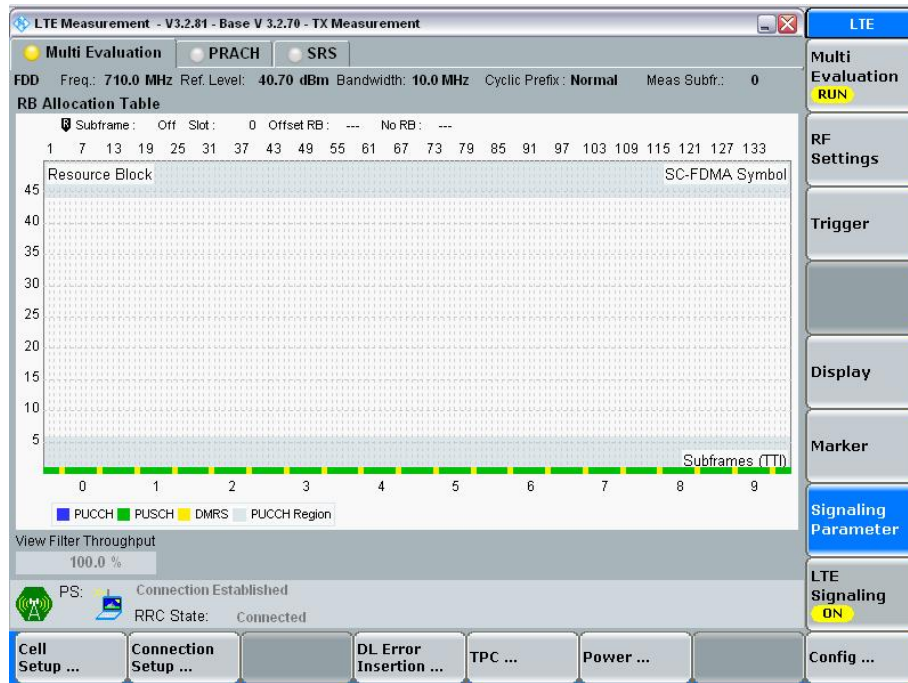


LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, IQ Constellation, Modulation Characteristics Plot

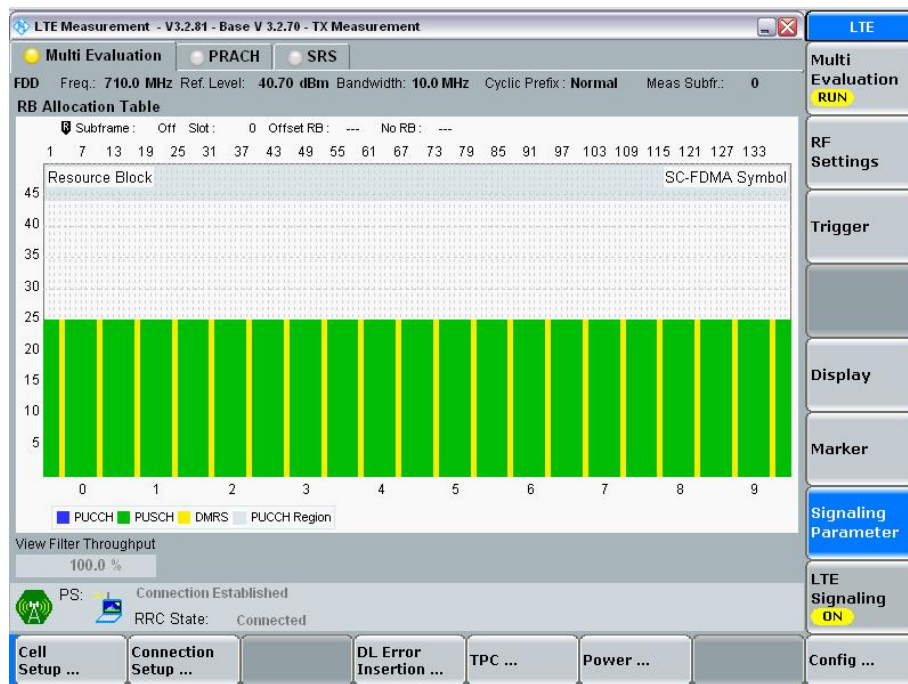




LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, 1 Resource Block Allocation, Modulation Characteristics Plot



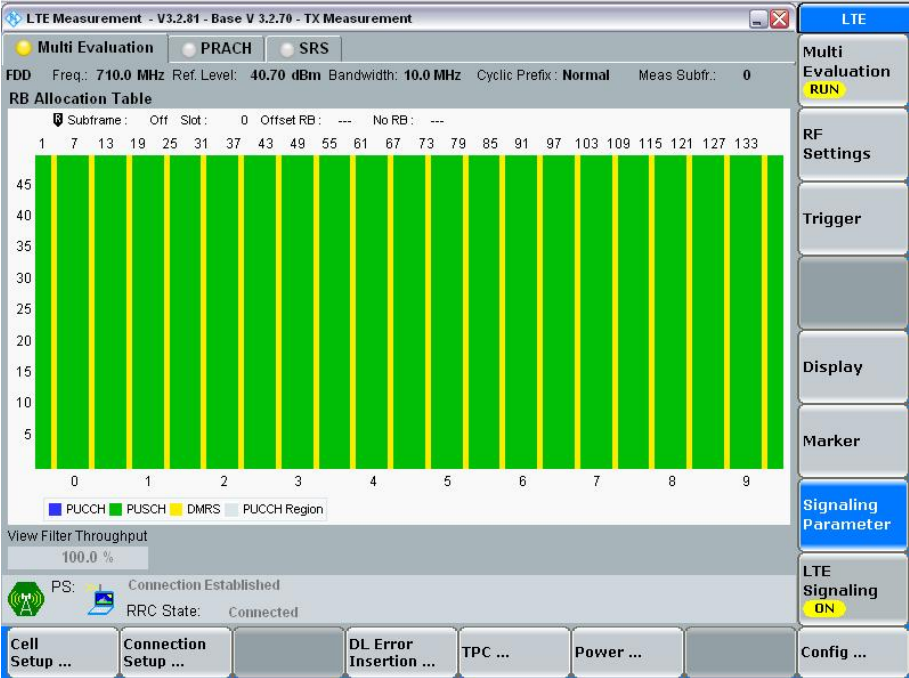
LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, 25 Resource Block Allocation, Modulation Characteristics Plot





Product Service

LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, 50 Resource Block Allocation, Modulation Characteristics Plot



FCC 47 CFR Part 2, Limit Clause 2.1047 (d)

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Frequency Tolerance					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Digital Thermometer	Digitron	T208	2831	12	31-Jul-2015
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	6-Nov-2015
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	12-Dec-2015
Thermocouple Thermometer	Fluke	51	3173	12	4-Dec-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2015
MasterCard Reference Terminal	Sagem Monetel	EFT 30	3745	-	TU
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	22-Oct-2015
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	22-Oct-2015
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	12	7-Nov-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
2 metre SMA Cable	IW Microwave	3PS-1806LC-788-3PS	4525	12	29-Jan-2016
Section 2.2 - Spurious Emissions at Band Edge					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Attenuator (10dB)	Weinschel	47-10-34	481	12	1-Apr-2016
Power Splitter	Weinschel	1506A	606	12	24-Mar-2016
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	20-Jan-2016
Hygrometer	Rotronic	I-1000	2891	12	16-Jul-2015
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2015
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	6-Aug-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Combiner/Splitter	Weinschel	1506A	3877	12	24-Mar-2016
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	22-Oct-2015
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	12	7-Nov-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	23-Jan-2016



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 – Maximum Conducted Output Power					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
20dB/2W Attenuator	Narda	4772-20	462	-	TU
Attenuator (10dB)	Weinschel	47-10-34	481	12	1-Apr-2016
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	20-Jan-2016
Hygrometer	Rotronic	I-1000	2891	12	16-Jul-2015
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2015
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	6-Aug-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Combiner/Splitter	Weinschel	1506A	3877	12	24-Mar-2016
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	22-Oct-2015
P-Series Power Meter	Agilent Technologies	N1911A	3980	12	22-Sep-2015
P-Series Power Meter	Agilent Technologies	N1911A	3981	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3982	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3983	12	22-Sep-2015
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	12	7-Nov-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
2 metre N-Type Cable	IW Microwave	NPS-1806LC-788-NPS	4503	12	20-May-2016
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	23-Jan-2016



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 – Peak to Average Ratio					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
20dB/2W Attenuator	Narda	4772-20	462	-	TU
Attenuator (10dB)	Weinschel	47-10-34	481	12	1-Apr-2016
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	20-Jan-2016
Hygrometer	Rotronic	I-1000	2891	12	16-Jul-2015
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2015
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	6-Aug-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
Combiner/Splitter	Weinschel	1506A	3877	12	24-Mar-2016
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	22-Oct-2015
P-Series Power Meter	Agilent Technologies	N1911A	3980	12	22-Sep-2015
P-Series Power Meter	Agilent Technologies	N1911A	3981	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3982	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3983	12	22-Sep-2015
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	12	7-Nov-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
2 metre N-Type Cable	IW Microwave	NPS-1806LC-788-NPS	4503	12	20-May-2016
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	23-Jan-2016
Section 2.5 - Emission Limitations for Cellular Equipment					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	12	23-Dec-2015
Screened Room (5)	Rainford	Rainford	1545	24	26-Jun-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Filter (Hi Pass)	Lorch	9HP7-7000-SR	2833	12	5-Feb-2016
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-2016
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	24-Mar-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	6	29-Jul-2015
0.5m SMA Cable (Rx)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	29-Jul-2015
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	23-Jan-2016



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.6 - 26 dB Bandwidth					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Attenuator (10dB)	Weinschel	47-10-34	481	12	1-Apr-2016
Power Splitter	Weinschel	1506A	606	12	24-Mar-2016
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	20-Jan-2016
Hygrometer	Rotronic	I-1000	2891	12	16-Jul-2015
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2015
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	6-Aug-2015
Combiner/Splitter	Weinschel	1506A	3877	12	24-Mar-2016
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	22-Oct-2015
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	12	7-Nov-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	23-Jan-2016

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Modulation Characteristics	-
Frequency Tolerance	± 46.75 Hz
Maximum Conducted Output Power	± 0.70 dB
Emission Limitations for Cellular Equipment	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB
Spurious Emissions at Band Edge	± 0.70 dB ± 49.27 kHz
26 dB Bandwidth	± 288.51 kHz



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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