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Report On

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 90 and FCC 47 CFR Part 2 (LTE)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00224

Document 75930192 Report 13 Issue 2

June 2015



Product Service

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk

COMMERCIAL-IN-CONFIDENCE

REPORT ON

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 90 and FCC 47 CFR Part 2
(LTE)

Document 75930192 Report 13 Issue 2

June 2015

PREPARED FOR

Sharp Communication Compliance Ltd
Inspired
Easthampstead Road
Bracknell
Berkshire
RG12 1NS

PREPARED BY


Natalie Bennett
Senior Administrator, Project Support

APPROVED BY


Nic Forsyth
Authorised Signatory

DATED

25 June 2015

This report has been up-issued 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 90 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

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 90 and FCC 47 CFR Part 2 (LTE)



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of 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 90 and FCC 47 CFR Part 2.

Objective	To perform 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 90 (2014) FCC 47 CFR Part 2 (2014)
Disposal	Held Pending Disposal
Reference Number	Not Applicable
Date	Not Applicable
Order Number	10563
Date	22 May 2015
Start of Test	28 May 2015
Finish of Test	11 June 2015
Name of Engineer(s)	N Rousell G Lawler
Related Document(s)	ANSI C63.4: 2009



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 90 and FCC 47 CFR Part 2 is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 90	Part 2			
LTE FDD 26					
2.1	-	2.1049	Occupied Bandwidth	Pass	
2.2	90.213	2.1055	Frequency Stability	Pass	
2.3	90.635	2.1046	Maximum Conducted Output Power	Pass	
2.4	-	2.1047 (d)	Modulation Characteristics	-	
2.5	90.691	2.1049	Spurious Emissions at Antenna Terminals	Pass	



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

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 90 and FCC 47 CFR Part 2 (LTE)



Product Service

2.1 OCCUPIED BANDWIDTH**2.1.1 Specification Reference**

FCC 47 CFR Part 2, Clause 2.1049

2.1.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - Modification State 0

2.1.3 Date of Test

9 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

The test was performed in accordance with KDB 971168 D01 v02r02, clause 4.2.

2.1.6 Environmental Conditions

Ambient Temperature	20.5°C
Relative Humidity	37.0%



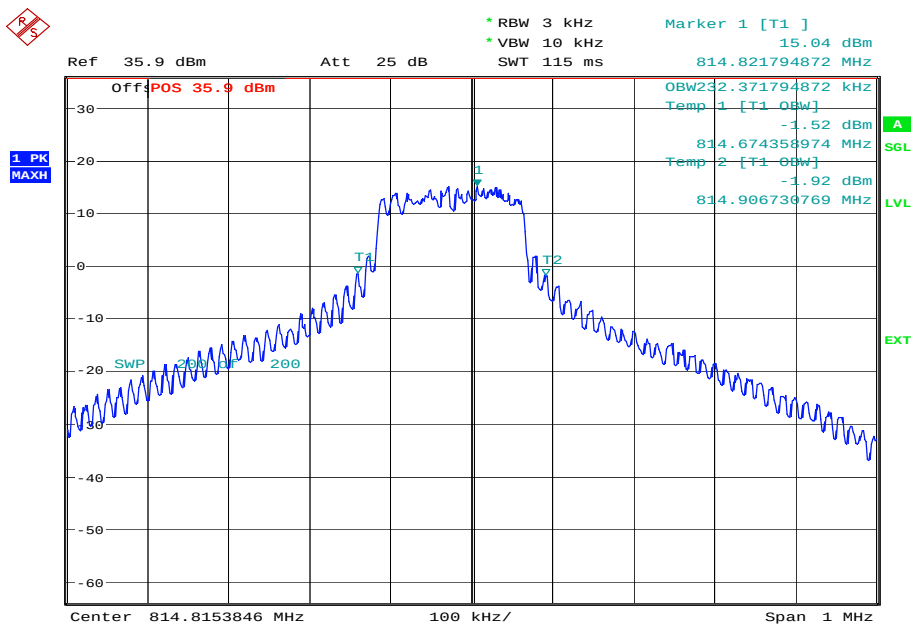
2.1.7 Test Results

4.0 V DC Supply

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

Occupied Bandwidth (kHz)											
814.7 MHz				819.0 MHz				823.3 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	232.4	N/T	1083.3	N/T	232.4	N/T	1089.7	N/T	232.4	N/T	1089.7

LTE FDD 26, 814.7 MHz, 1 Resource Block, Middle, 1.4 MHz Bandwidth, QPSK, Occupied Bandwidth Results

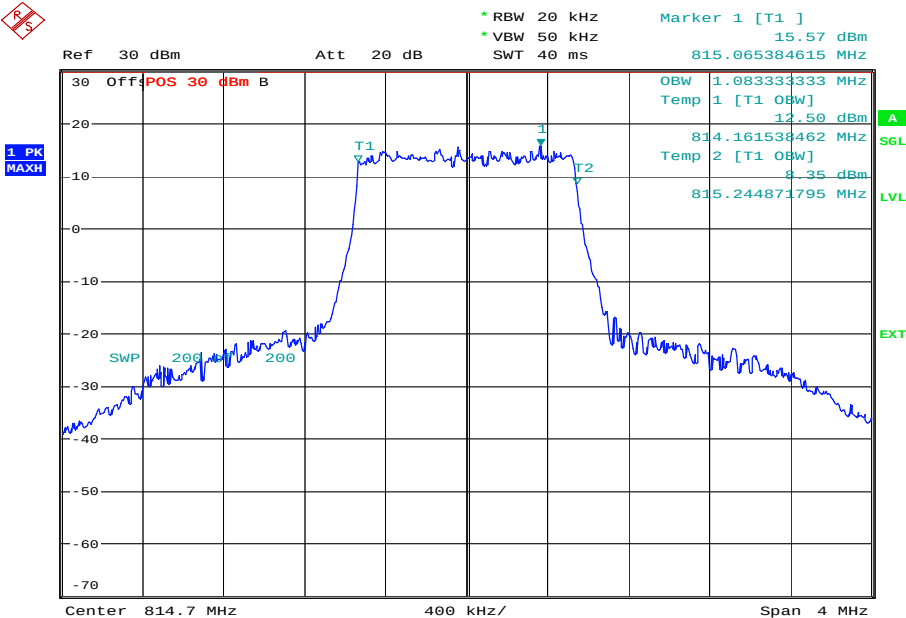


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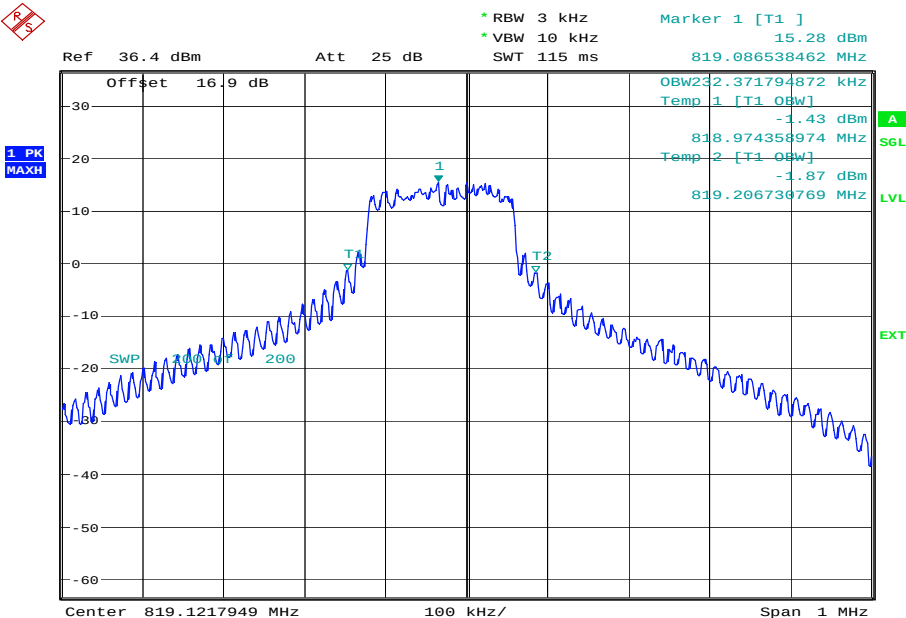
Product Service

LTE FDD 26, 814.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Occupied Bandwidth Results



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LTE FDD 26, 819.0 MHz, 1 Resource Block, Middle, 1.4 MHz Bandwidth, QPSK, Occupied Bandwidth Results

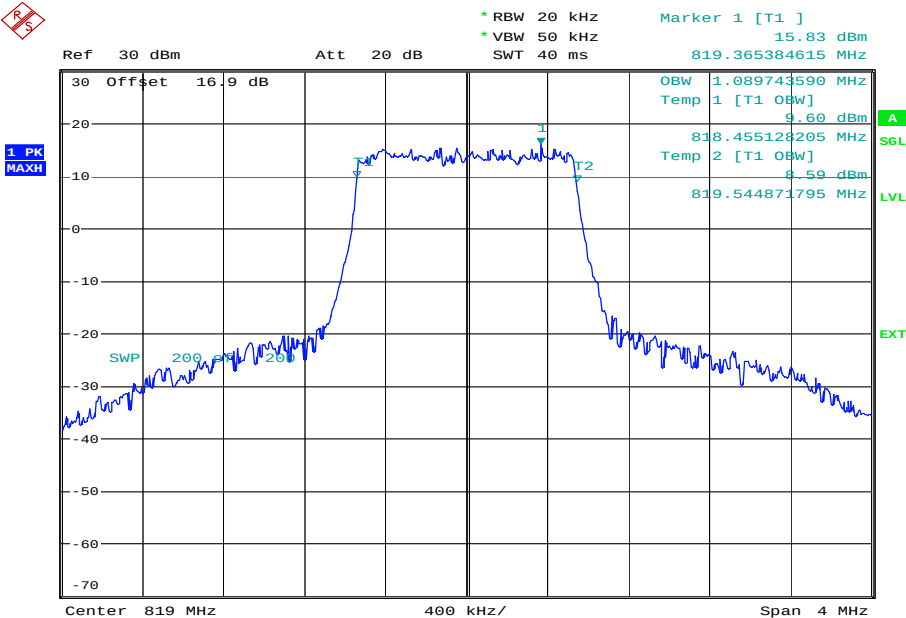


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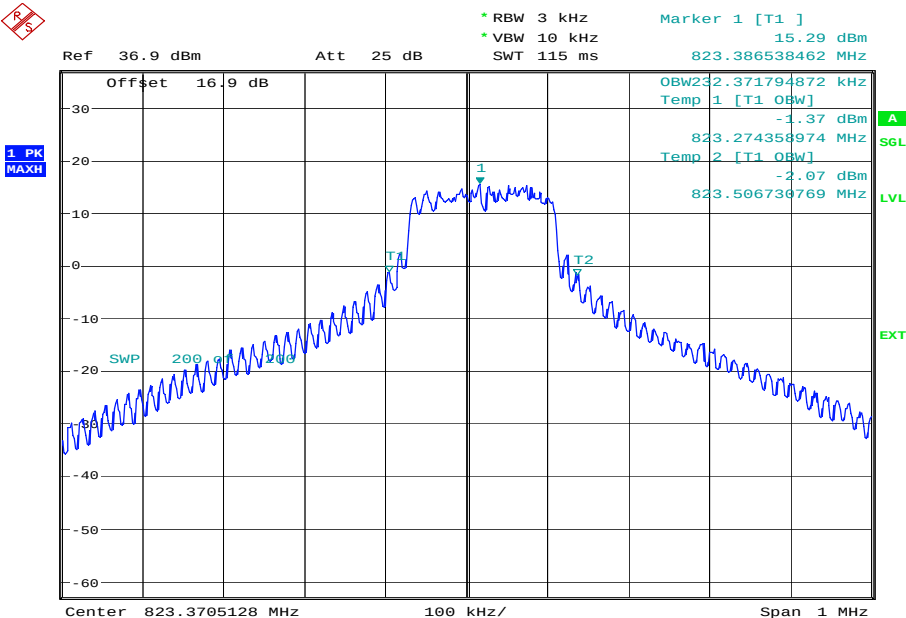


Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Occupied Bandwidth Results



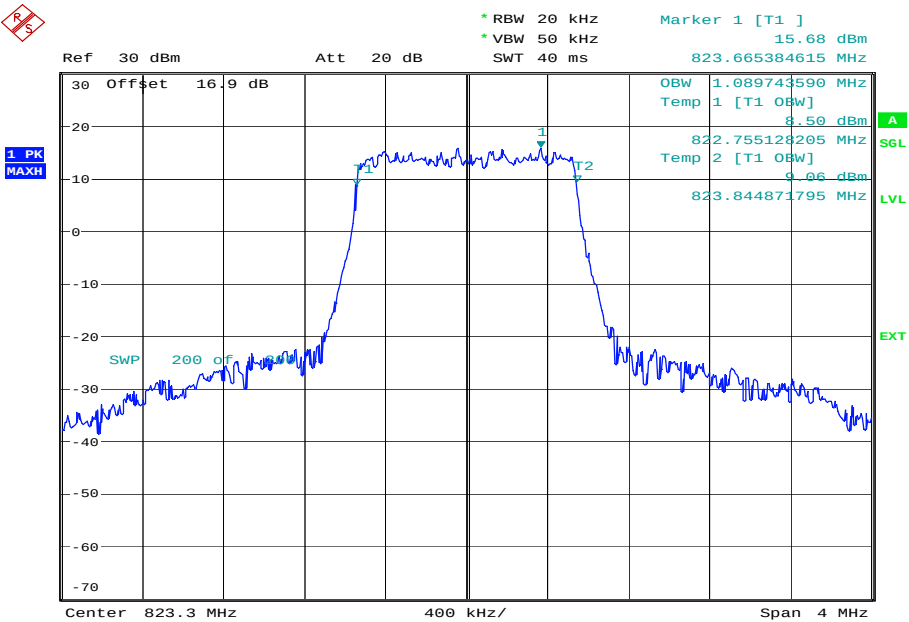
LTE FDD 26, 823.3 MHz, 1 Resource Block, Middle, 1.4 MHz Bandwidth, QPSK, Occupied Bandwidth Results





Product Service

LTE FDD 26, 823.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Occupied Bandwidth Results



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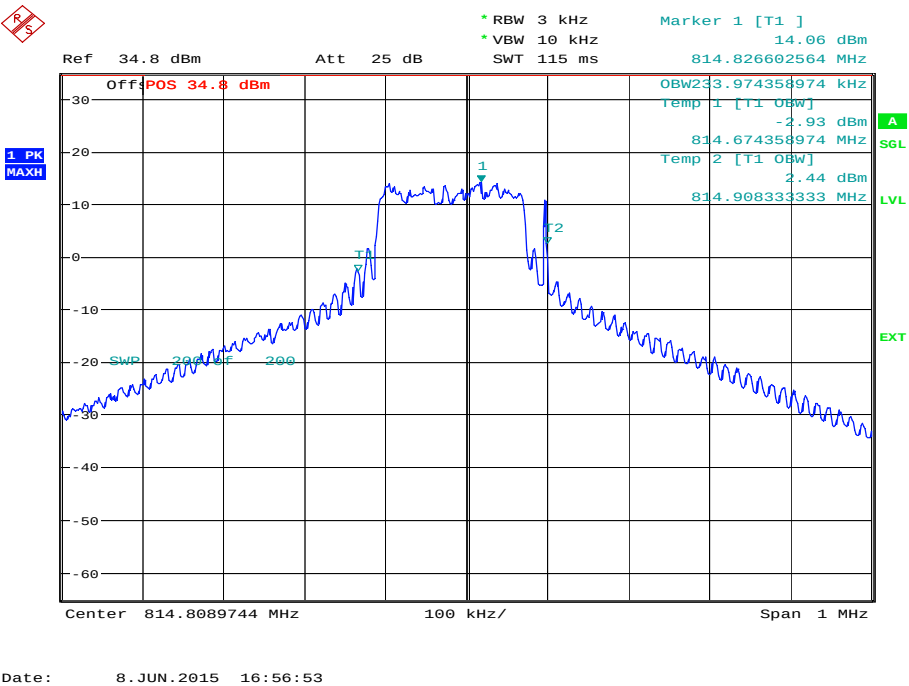


Product Service

LTE FDD 26, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

Occupied Bandwidth (kHz)											
814.7 MHz				819.0 MHz				823.3 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	234.0	N/T	1089.7	N/T	232.4	N/T	1089.7	N/T	230.8	N/T	1102.6

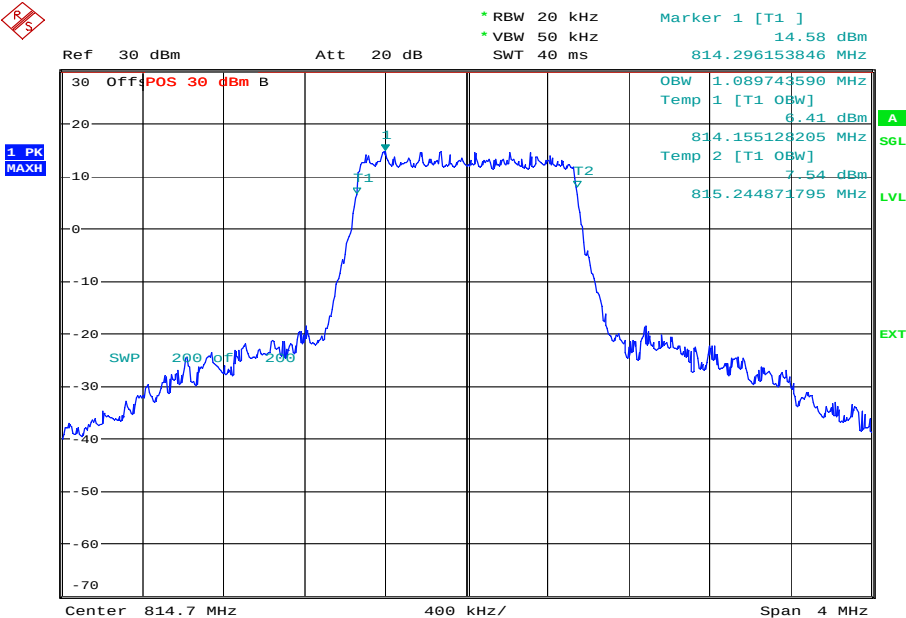
LTE FDD 26, 814.7 MHz, 1 Resource Block, Middle, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results





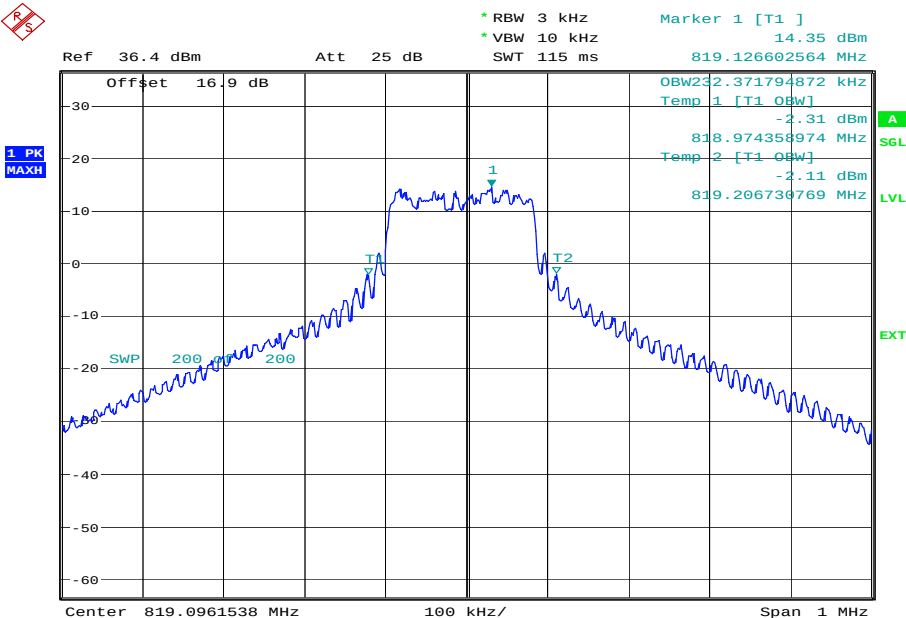
Product Service

LTE FDD 26, 814.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



Date: 8.JUN.2015 16:59:53

LTE FDD 26, 819.0 MHz, 1 Resource Block, Middle, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

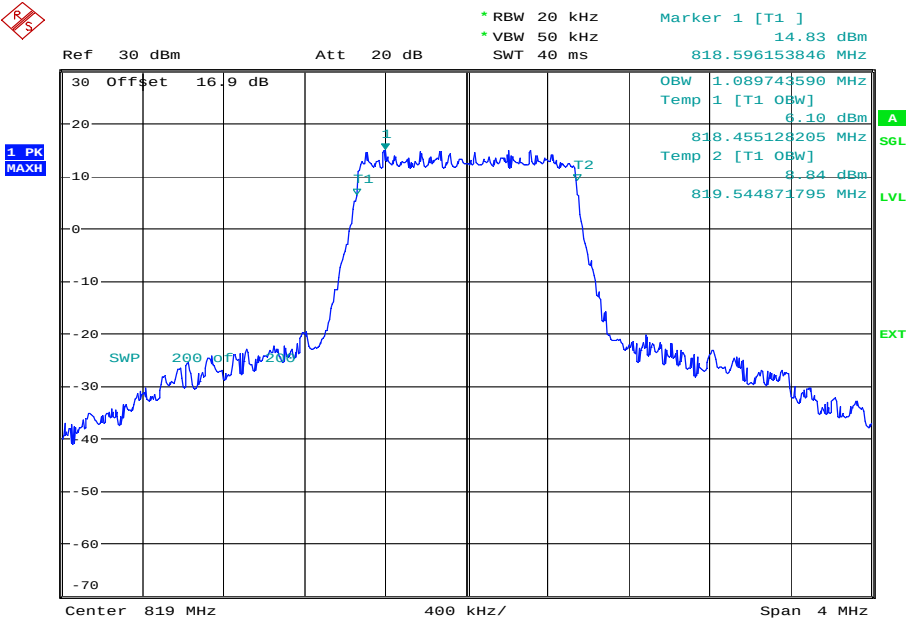


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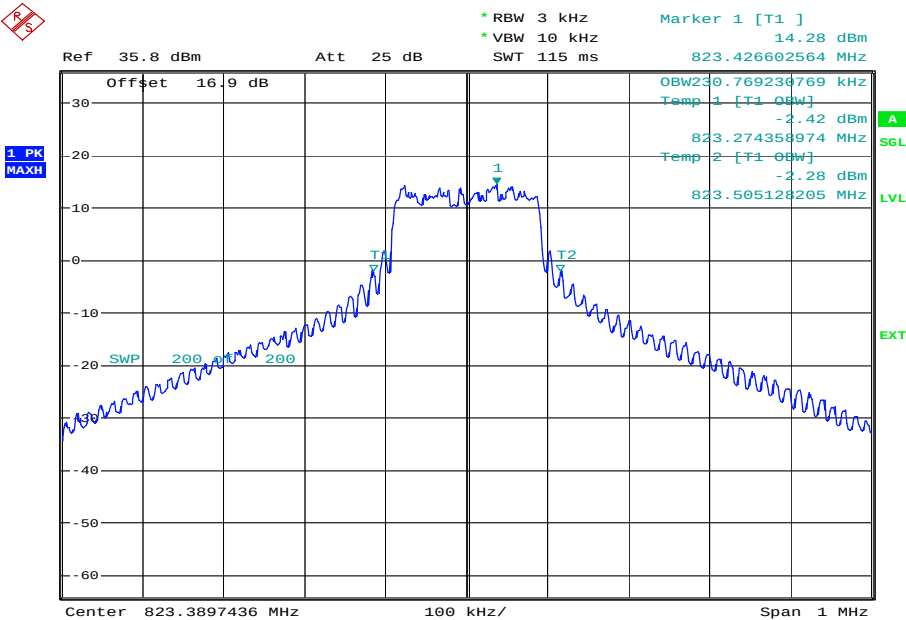
Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



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LTE FDD 26, 823.3 MHz, 1 Resource Block, Middle, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

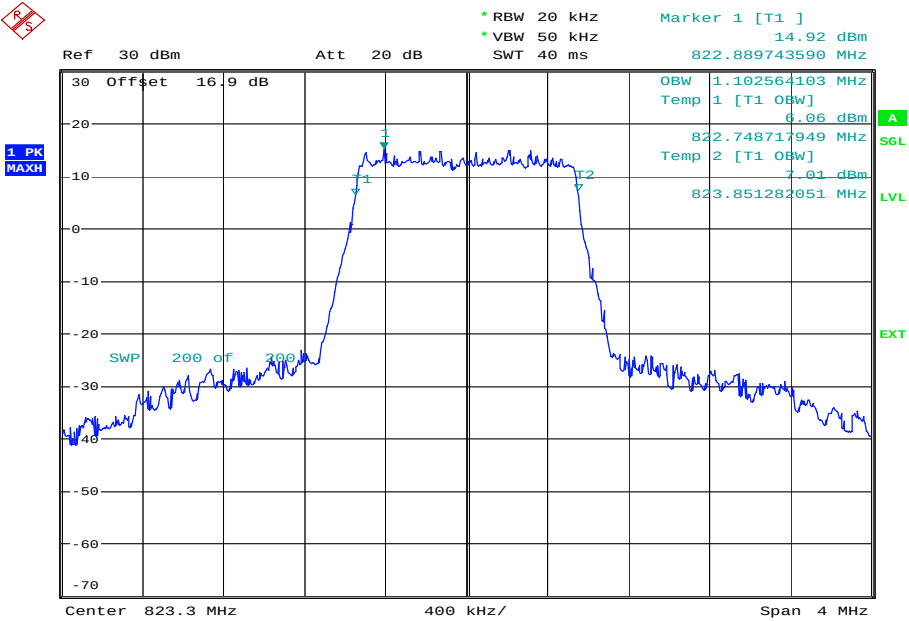


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Product Service

LTE FDD 26, 823.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



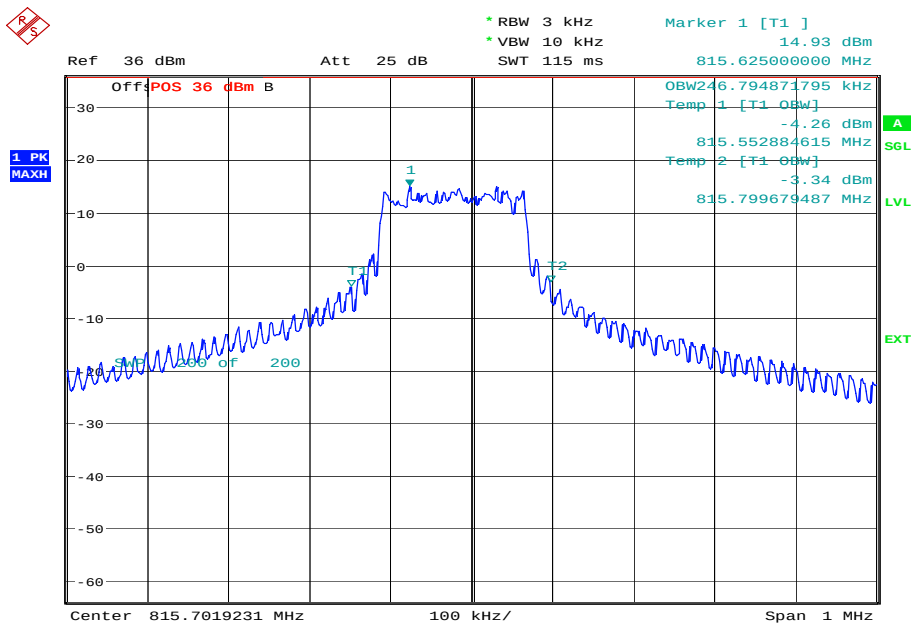
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LTE FDD 26, 3.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results

Occupied Bandwidth (kHz)											
815.5 MHz				819.0 MHz				822.5 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	246.8	N/T	2692.3	N/T	245.2	N/T	2701.9	N/T	243.6	N/T	2692.3

LTE FDD 26, 815.5 MHz, 1 Resource Block, Middle, 3.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results

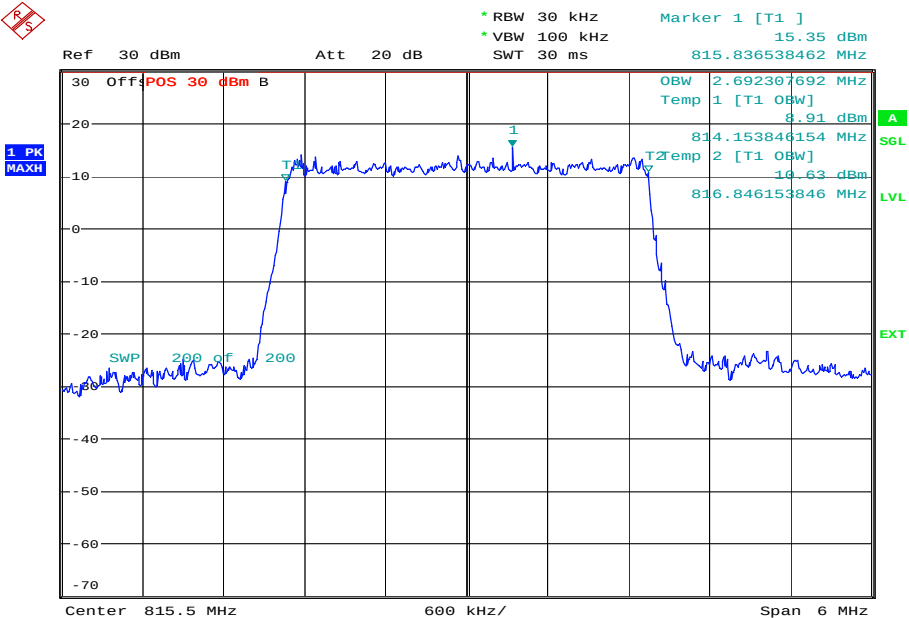


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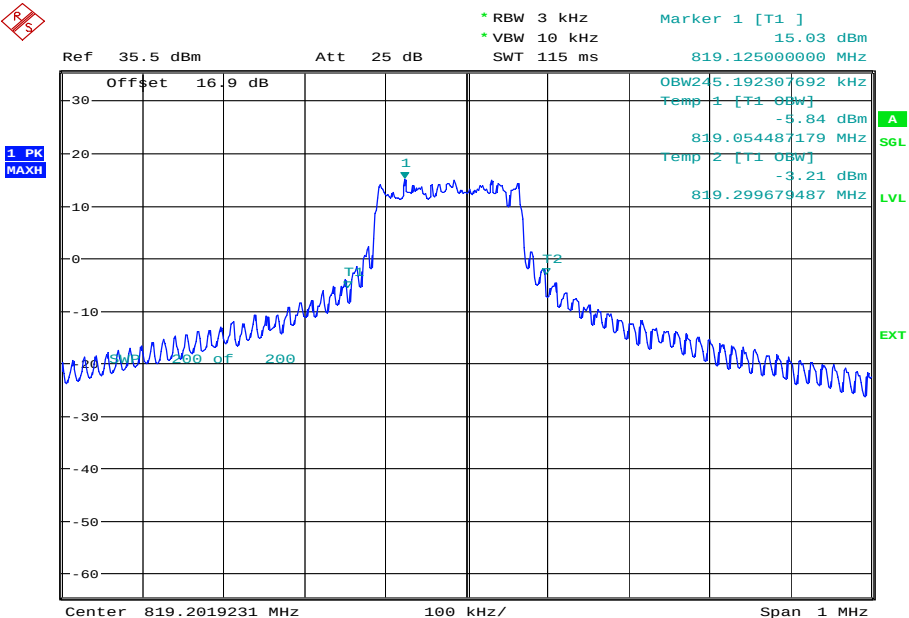
Product Service

LTE FDD 26, 815.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



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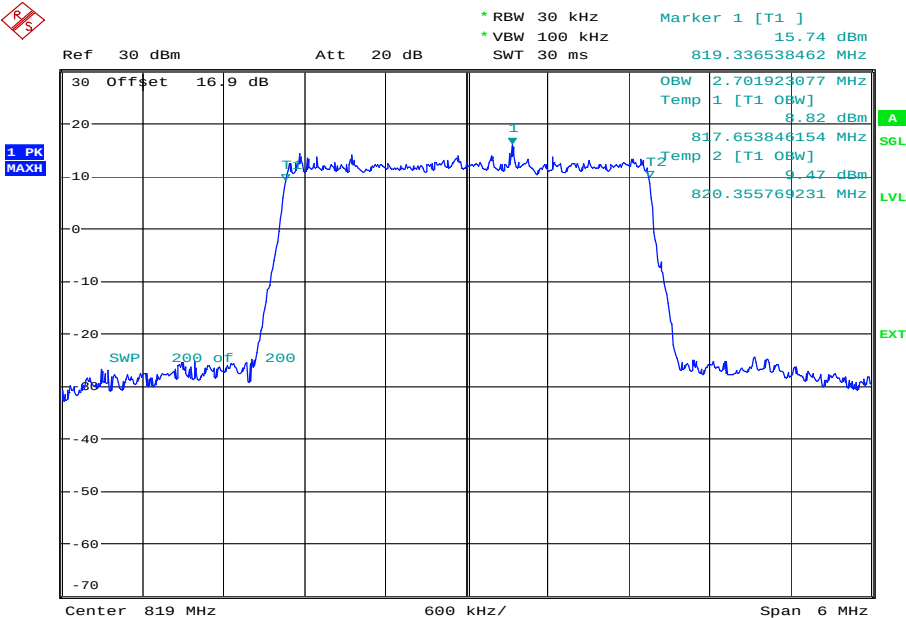


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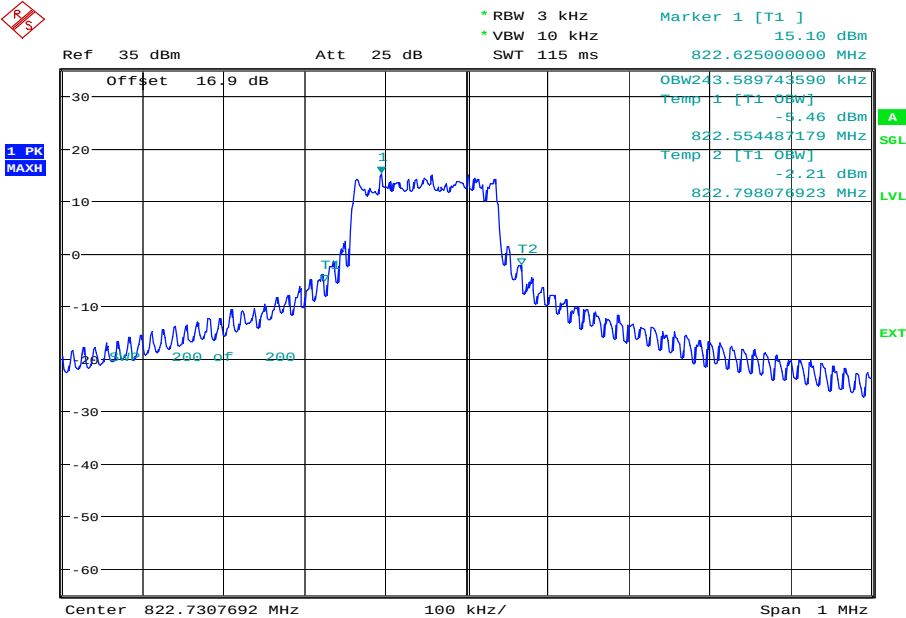
Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



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LTE FDD 26, 822.5 MHz, 1 Resource Block, Middle, 3.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results

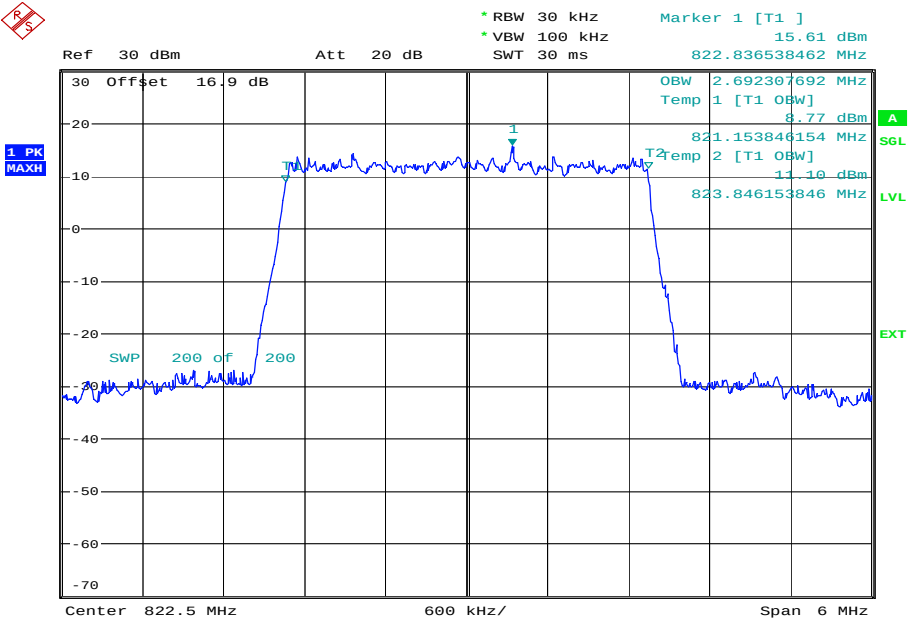


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Product Service

LTE FDD 26, 822.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



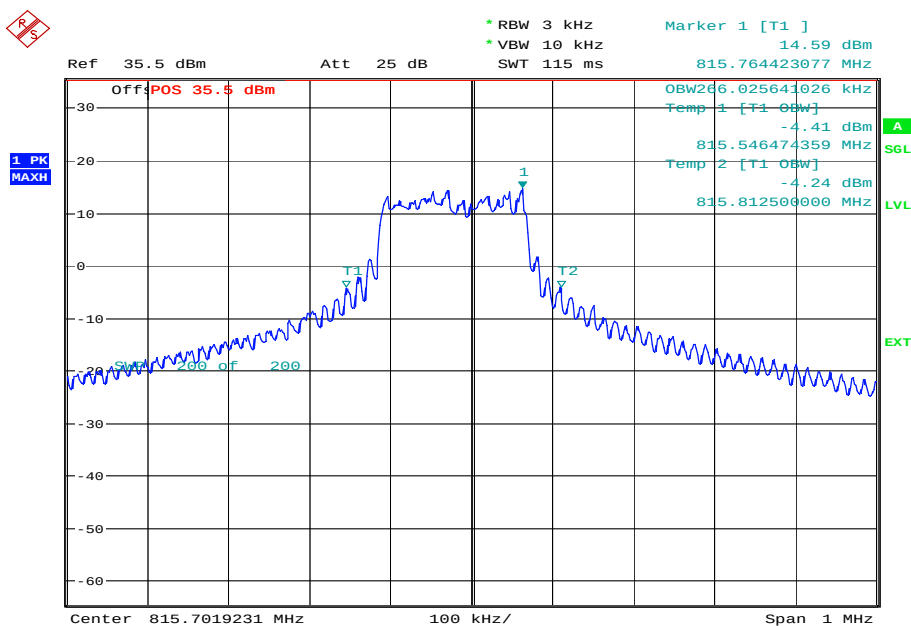
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LTE FDD 26, 3.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

Occupied Bandwidth (kHz)											
815.5 MHz				819.0 MHz				822.5 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	266.0	N/T	2692.3	N/T	264.4	N/T	2682.7	N/T	264.4	N/T	2692.3

LTE FDD 26, 815.5 MHz, 1 Resource Block, Middle, 3.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

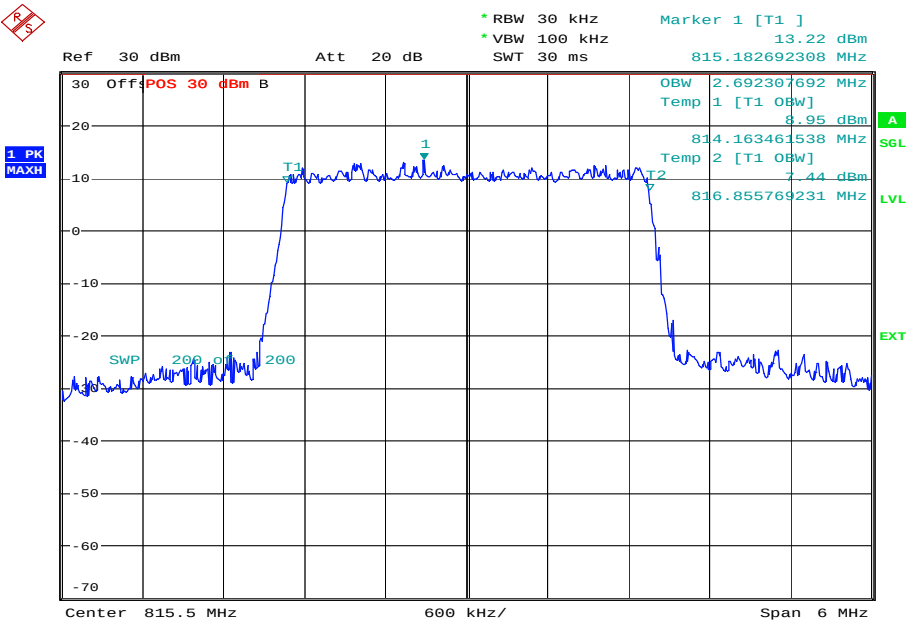


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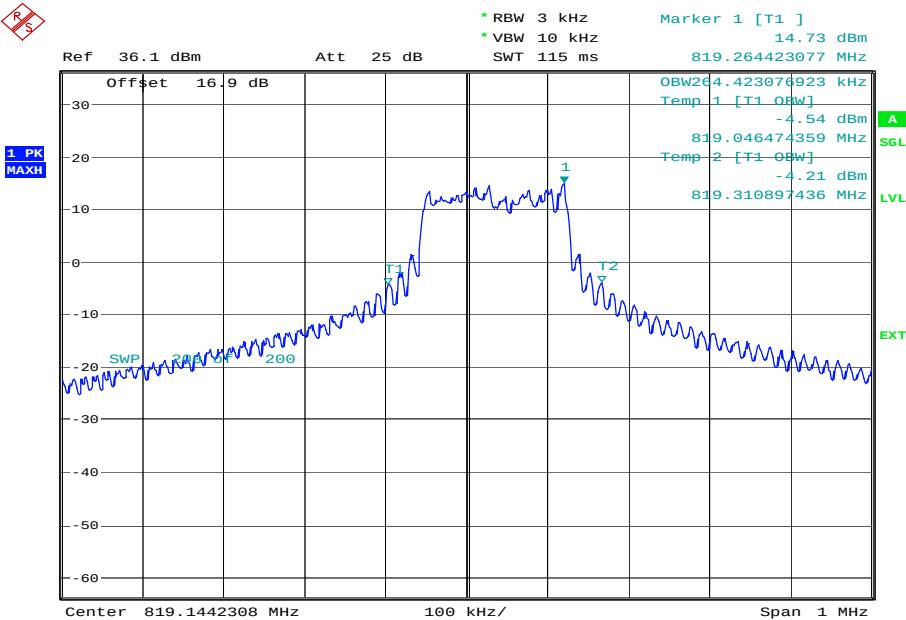
Product Service

LTE FDD 26, 815.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



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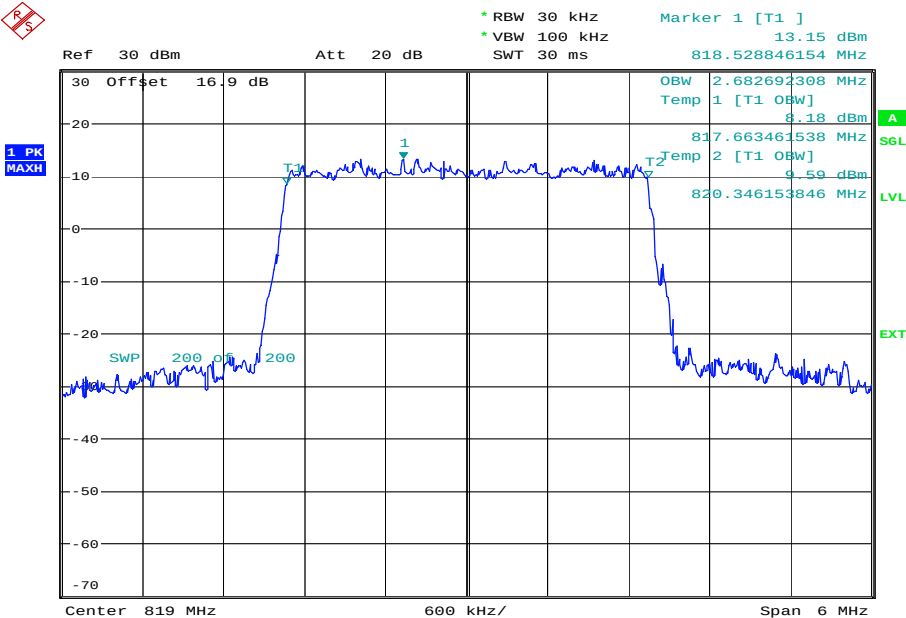


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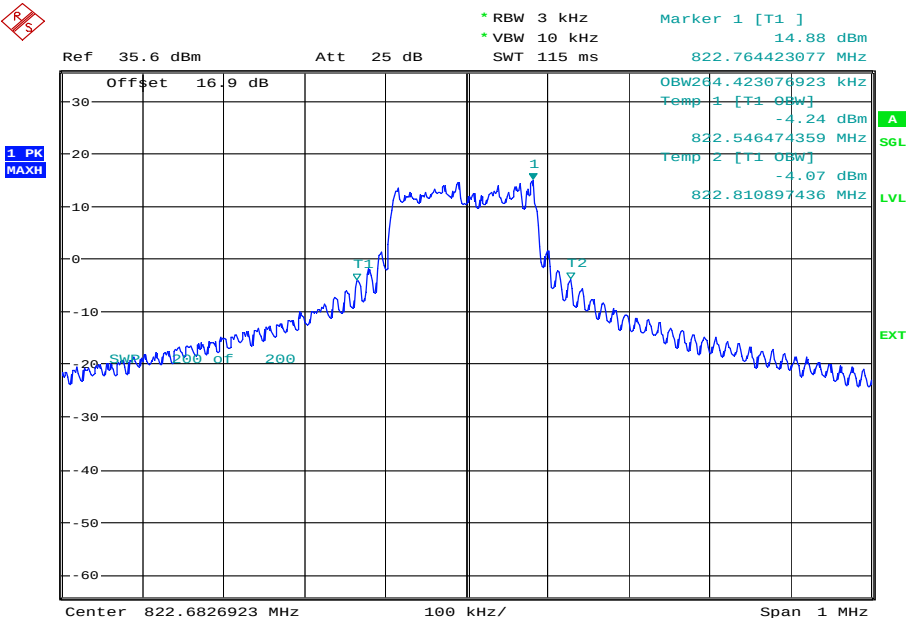
Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



Date: 8.JUN.2015 14:53:08

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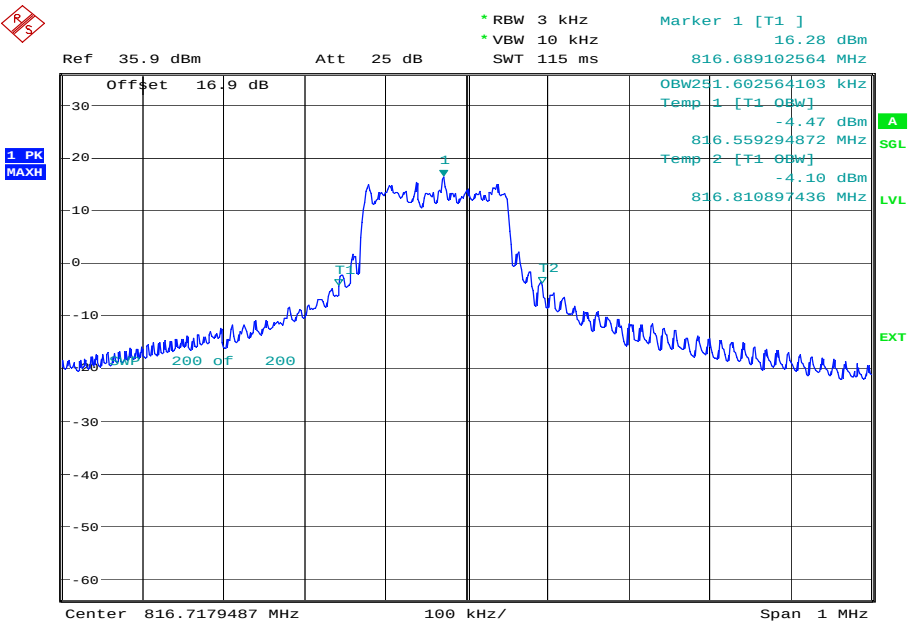


Product Service

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

Occupied Bandwidth (kHz)											
816.5 MHz				819.0 MHz				821.5 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	251.6	N/T	4487.2	N/T	251.6	N/T	4474.4	N/T	253.2	N/T	4487.2

LTE FDD 26, 816.5 MHz, 1 Resource Block, Middle, 5.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results

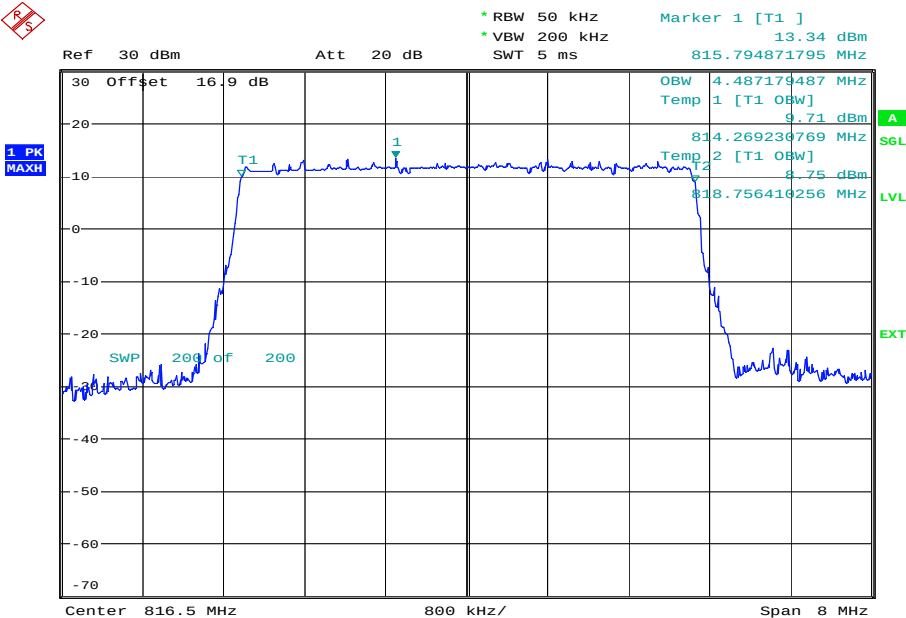


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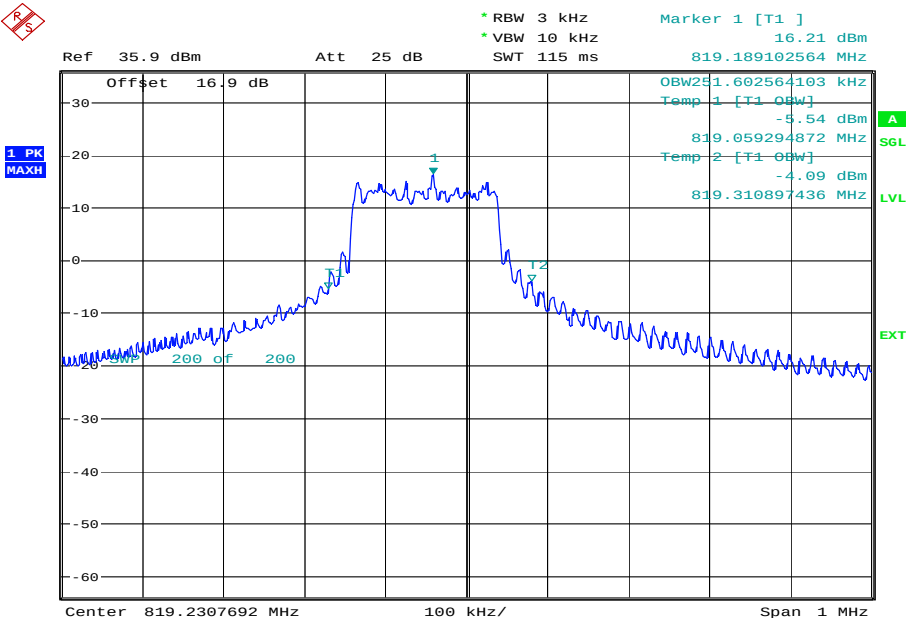
Product Service

LTE FDD 26, 816.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



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LTE FDD 26, 819.0 MHz, 1 Resource Block, Middle, 5.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results

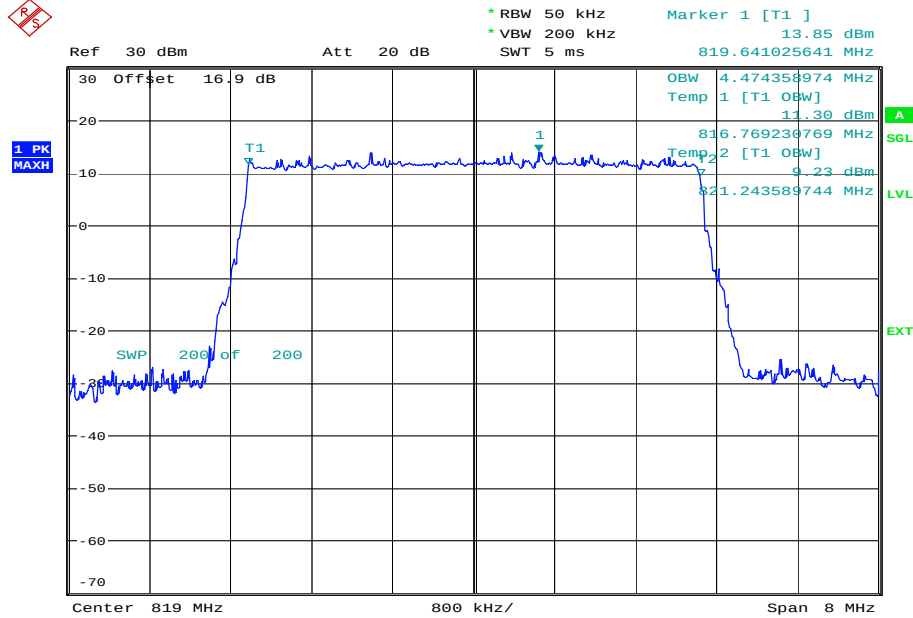


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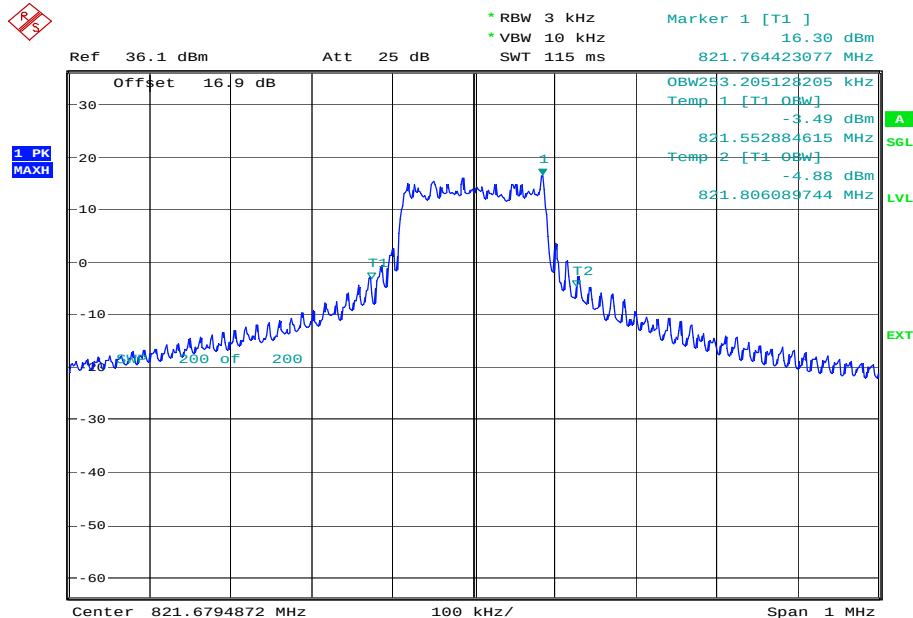
Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



Date: 8 JUN.2015 14:24:39

LTE FDD 26, 821.5 MHz, 1 Resource Block, Middle, 5.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



Date: 9 JUN.2015 09:53:10

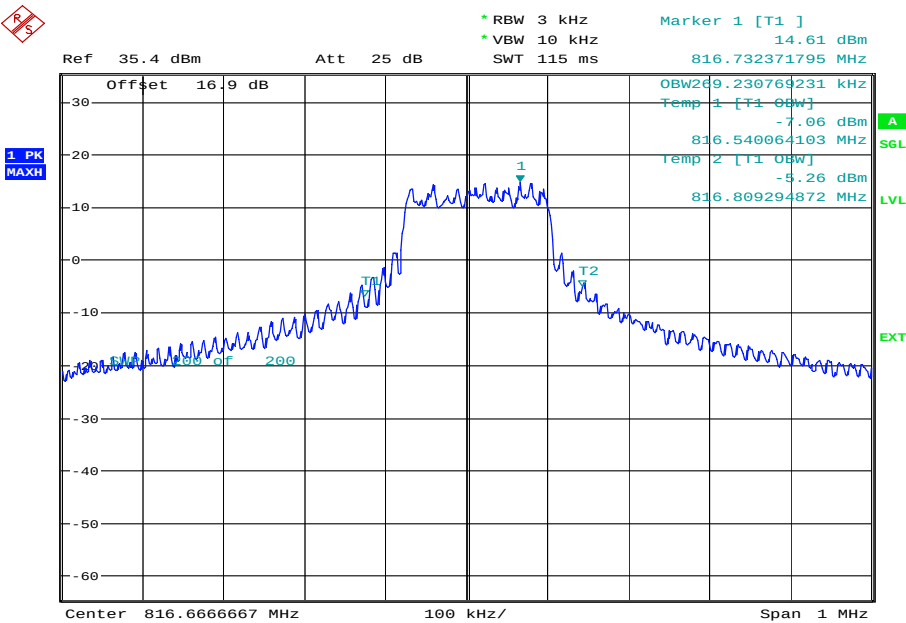


Product Service

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

Occupied Bandwidth (kHz)											
816.5 MHz				819.0 MHz				821.5 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	269.2	N/T	4461.5	N/T	269.2	N/T	4474.4	N/T	278.8	N/T	4461.5

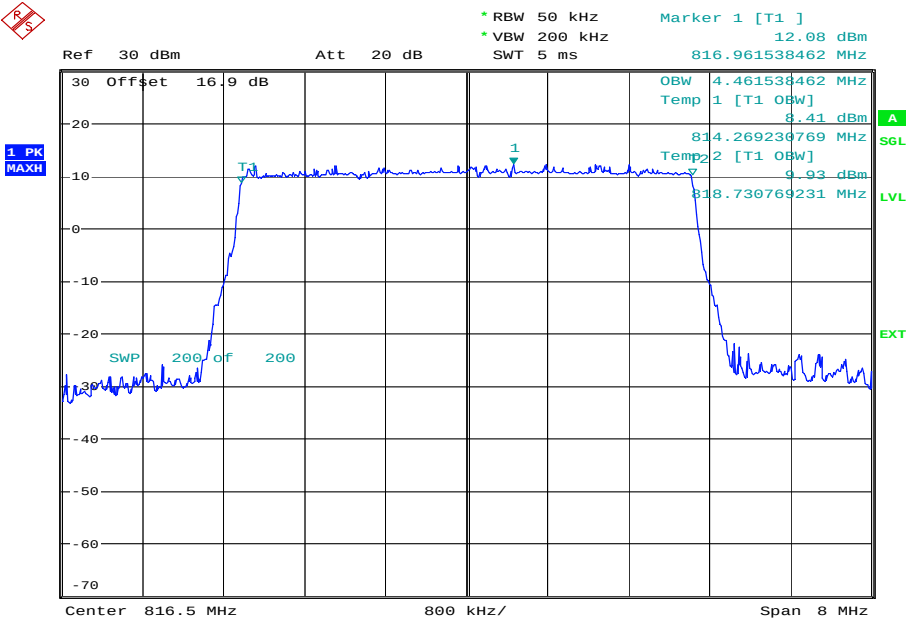
LTE FDD 26, 816.5 MHz, 1 Resource Block, Middle, 5.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



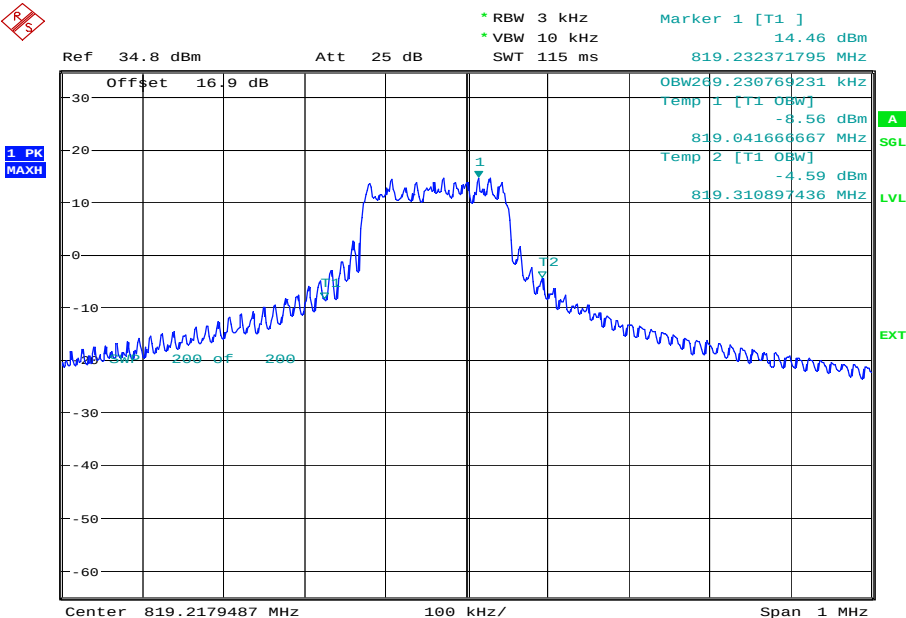


Product Service

LTE FDD 26, 816.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



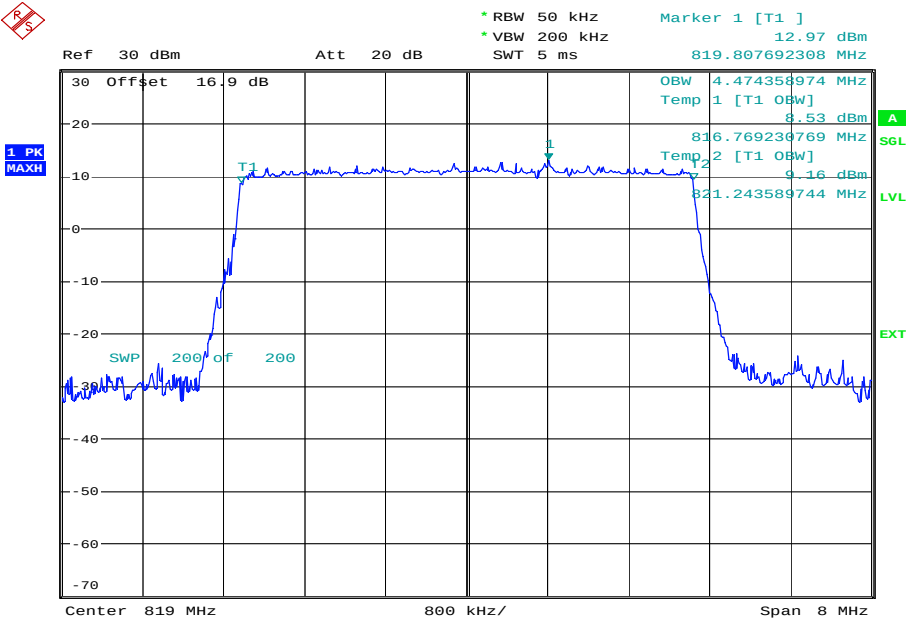
LTE FDD 26, 819.0 MHz, 1 Resource Block, Middle, 5.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results





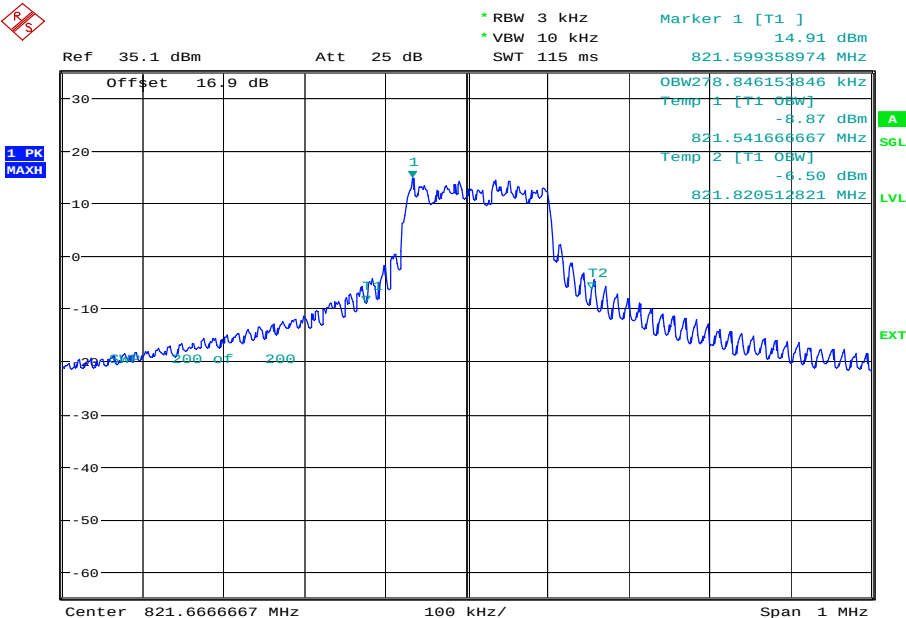
Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



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LTE FDD 26, 821.5 MHz, 1 Resource Block, Middle, 5.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

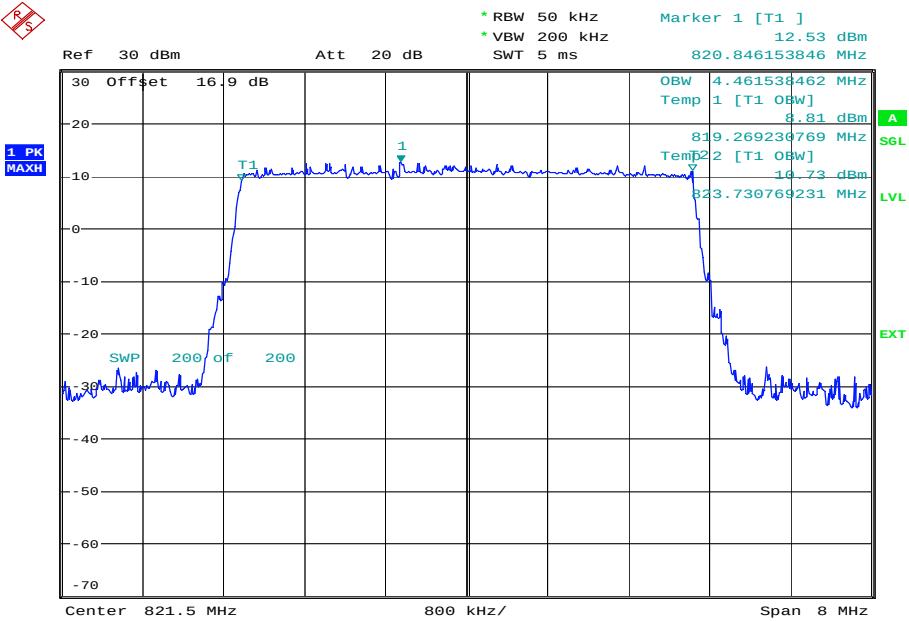


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Product Service

LTE FDD 26, 821.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

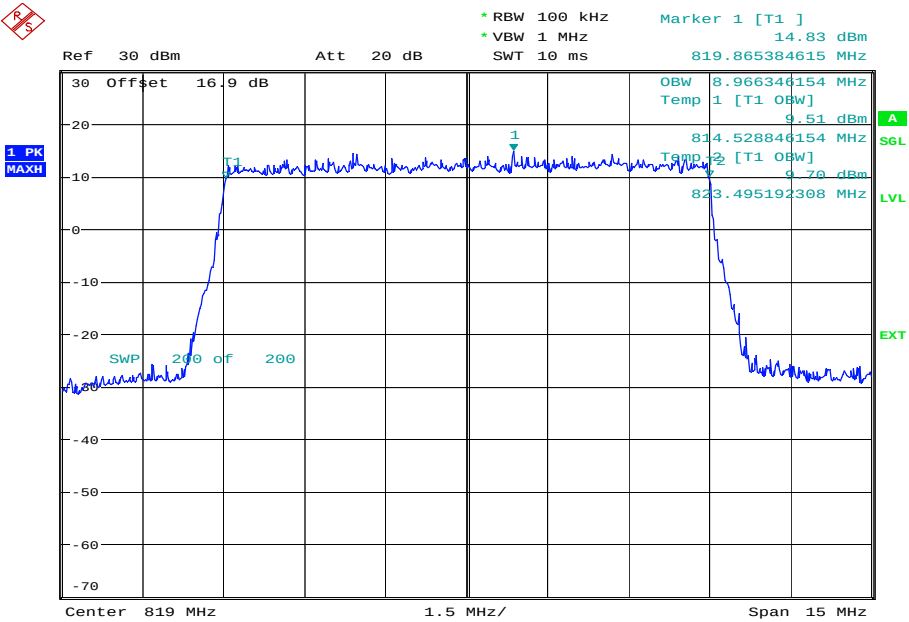


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Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, Occupied Bandwidth Results



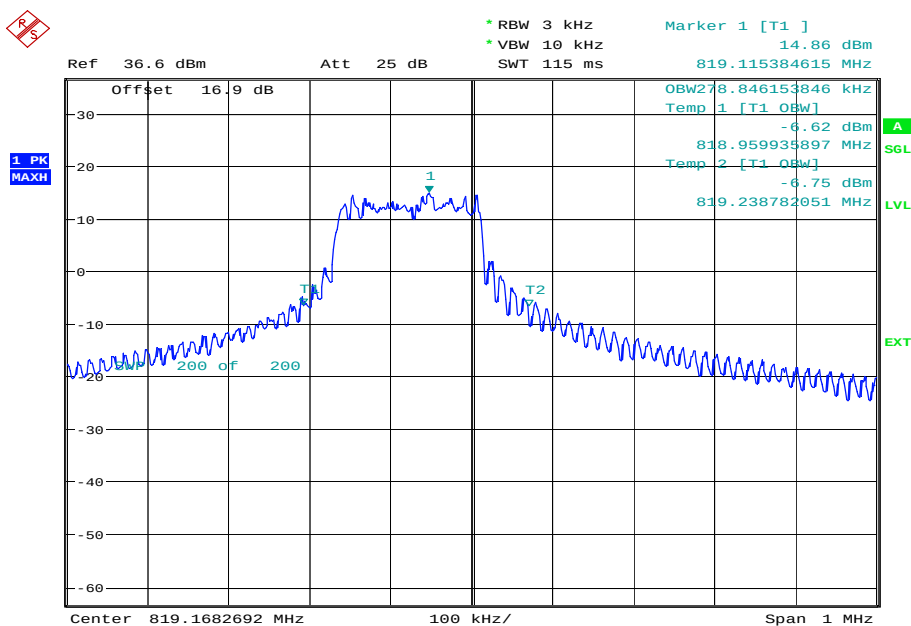
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LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

Occupied Bandwidth (kHz)											
Bottom Channel				819.0 MHz				Top Channel			
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	N/T	N/T	N/T	N/T	278.8	N/T	8966.3	N/T	N/T	N/T	N/T

LTE FDD 26, 819.0 MHz, 1 Resource Block, Middle, 10.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results

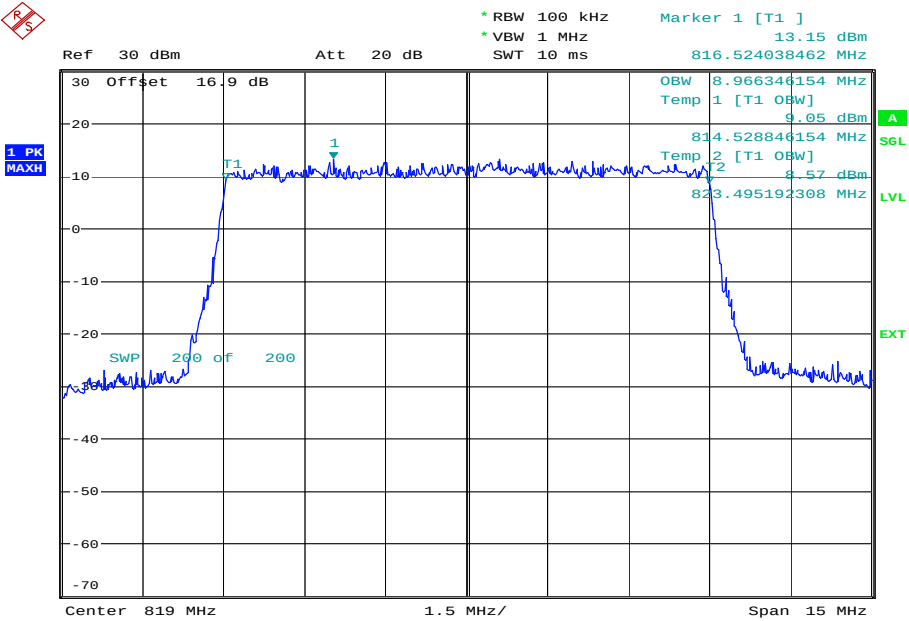


Date: 8 JUN 2015 14:10:06



Product Service

LTE FDD 26, 819.0 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, Occupied Bandwidth Results



Date: 8 JUN 2015 14:06:48

FCC 47 CFR Part 2, Limit Clause

None Specified.



Product Service

2.2 FREQUENCY STABILITY

2.2.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.213
FCC 47 CFR Part 2, Clause 2.1055

2.2.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - Modification State 0

2.2.3 Date of Test

11 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

Using a communication test set, frequency error measurements were made over the range - 30°C to +50°C in 10°C steps. At 20°C, the voltage was varied in accordance with FCC 47 CFR Part 2, clause 2.1055 (d).

The communication test set was connected to an external frequency standard to improve measurement accuracy.

2.2.6 Environmental Conditions

Ambient Temperature	23.8°C
Relative Humidity	47.4%



2.2.7 Test Results

LTE FDD 26, 819.0 MHz, 10 MHz Bandwidth, QPSK, Frequency Tolerance Under Temperature Variations Results

Temperature	Voltage	Fundamental Frequency Error
		All Resource Blocks (ppm)
+20 °C	3.7 V DC	-0.0090
-30 °C	4.0 V DC	-0.0095
-20 °C	4.0 V DC	-0.0082
-10 °C	4.0 V DC	-0.0093
0 °C	4.0 V DC	-0.0095
+10 °C	4.0 V DC	-0.0103
+20 °C	4.0 V DC	-0.0089
+30 °C	4.0 V DC	-0.0098
+40 °C	4.0 V DC	-0.0109
+50 °C	4.0 V DC	-0.0104

LTE FDD 26, 819.0 MHz, 10 MHz Bandwidth, 16-QAM, Frequency Tolerance Under Temperature Variations Results

Temperature	Voltage	Fundamental Frequency Error
		All Resource Blocks (ppm)
+20 °C	3.7 V DC	-0.0096
-30 °C	4.0 V DC	-0.0101
-20 °C	4.0 V DC	-0.0102
-10 °C	4.0 V DC	-0.0091
0 °C	4.0 V DC	-0.0119
+10 °C	4.0 V DC	-0.0095
+20 °C	4.0 V DC	-0.0910
+30 °C	4.0 V DC	-0.0095
+40 °C	4.0 V DC	-0.0104
+50 °C	4.0 V DC	-0.0121

FCC 47 CFR Part 90, Limit Clause 90.213

The frequency error shall not exceed 2.5 ppm



Product Service

2.3 MAXIMUM CONDUCTED OUTPUT POWER

2.3.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.635
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

The test was performed in accordance with KDB 971168 D01 v02r02, clause 5.2.3, 5.6 and 5.7.1.

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 (dBm)											
814.7 MHz				819.0 MHz				823.3 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	
22.98	22.95	23.00	22.06	22.91	22.82	22.97	22.10	22.97	22.91	22.90	22.04

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

Carrier Power (dBm)											
814.7 MHz				819.0 MHz				823.3 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	
21.99	22.01	22.02	21.01	22.09	22.06	22.18	21.06	22.06	22.01	22.04	21.07

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

Carrier Power (dBm)											
815.5 MHz				819.0 MHz				822.5 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	
23.07	23.01	23.04	21.97	23.04	22.98	23.07	22.10	22.95	22.9	22.92	21.96

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

Carrier Power (dBm)											
815.5 MHz				819.0 MHz				822.5 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	
22.16	22.11	22.14	21.02	22.15	22.07	22.20	21.07	21.95	21.91	21.96	21.07



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

Carrier Power (dBm)											
816.5 MHz				819.0 MHz				821.5 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	
22.93	22.93	22.91	22.01	22.77	22.7	22.83	22.07	22.82	22.76	22.77	22.01

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

Carrier Power (dBm)											
816.5 MHz				819.0 MHz				821.5 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	
21.84	21.80	21.79	21.06	21.90	21.87	21.94	21.10	21.95	21.88	21.89	21.01

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

Carrier Power (dBm)											
NA				819.0 MHz				NA			
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	
NA	NA	NA	NA	23.03	22.97	23.00	22.04	NA	NA	NA	NA

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

Carrier Power (dBm)											
NA				819.0 MHz				NA			
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	
NA	NA	NA	NA	22.14	22.09	22.13	21.06	NA	NA	NA	NA



Product Service

FCC 47 CFR Part 90, Limit Clause 90.635

Base Stations in the 851 to 869 MHz and 935 to 940 MHz Band which have a requirement for a 32 km (20 MI) service area radius	
Antenna Height (ATT) meters (feet)	Effective Radiated Power (W)
> 1372 (4500)	65
> 1220 (4000) to 1372 (4500)	70
> 1067 (3500) to 1220 (4000)	75
> 915 (3000) to 1067 (3500)	100
> 763 (2500) to 915 (3000)	140
> 610 (2000) to 763 (2500)	200
> 458 (1500) to 610 (2000)	350
> 305 (1000) to 458 (1500)	600
Up to 305 (1000)	1000

The maximum output power of the transmitter for mobile stations is 100 W (20 dBW).



Product Service

2.4 MODULATION CHARACTERISTICS

2.4.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1047 (d)

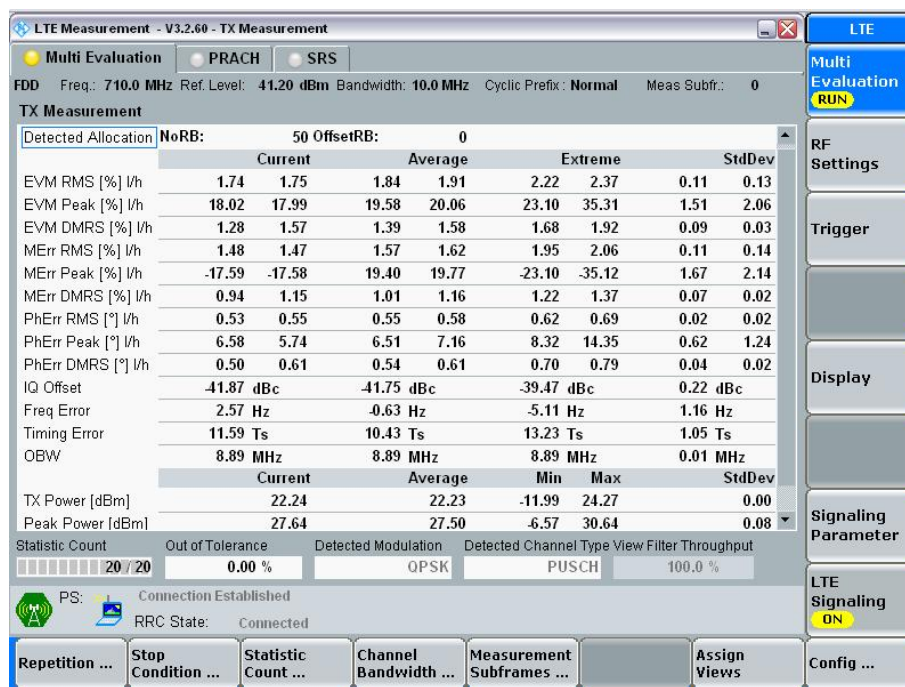
2.4.2 Equipment Under Test

SHF32

2.4.3 Test Results

4.0 V DC Supply

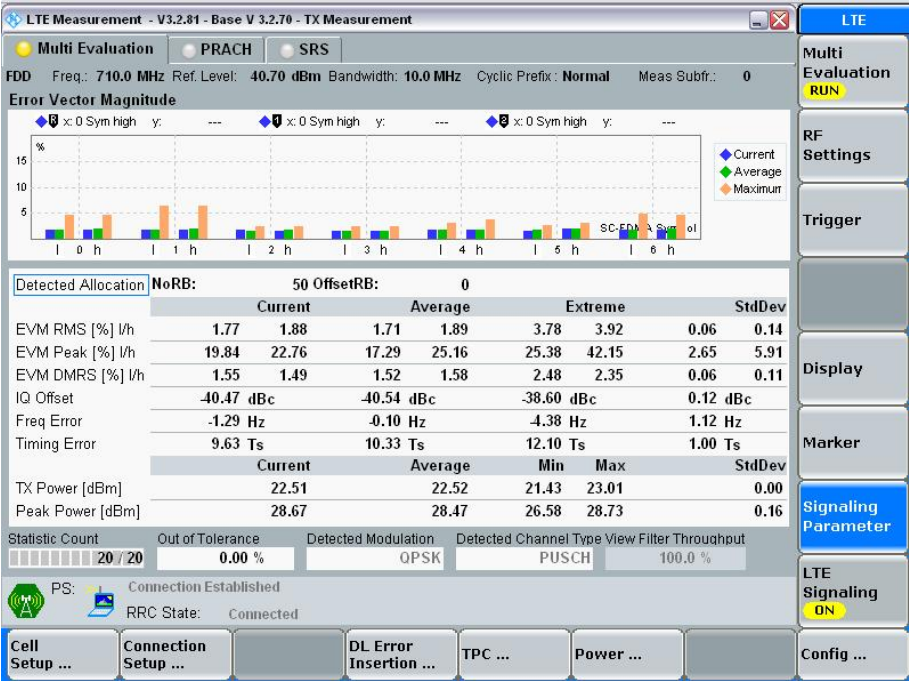
LTE FDD 26, 10.0 MHz Bandwidth, QPSK, Transmitter Summary, Modulation Characteristics, Plot



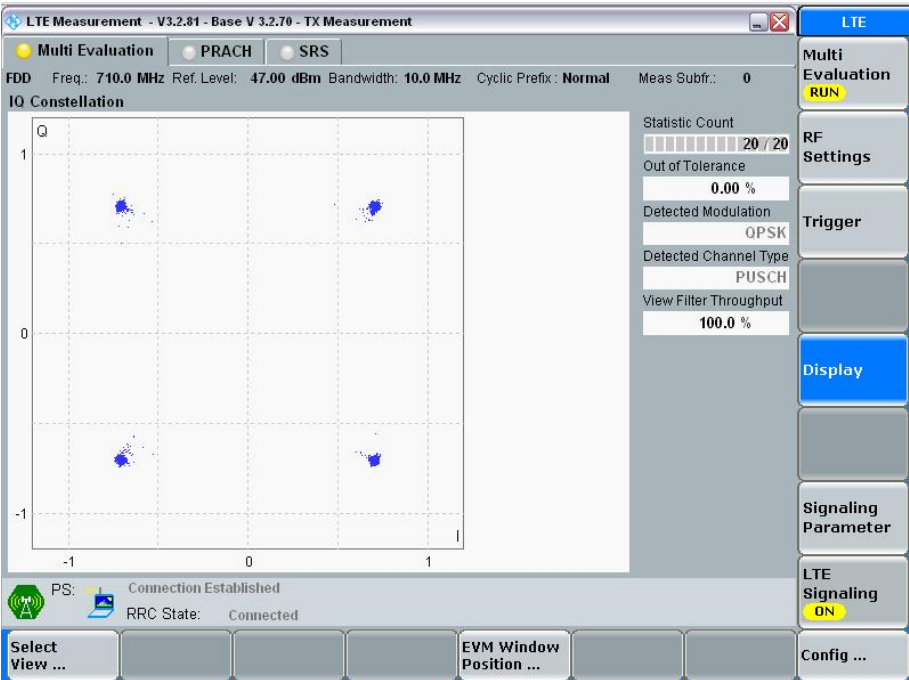


Product Service

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

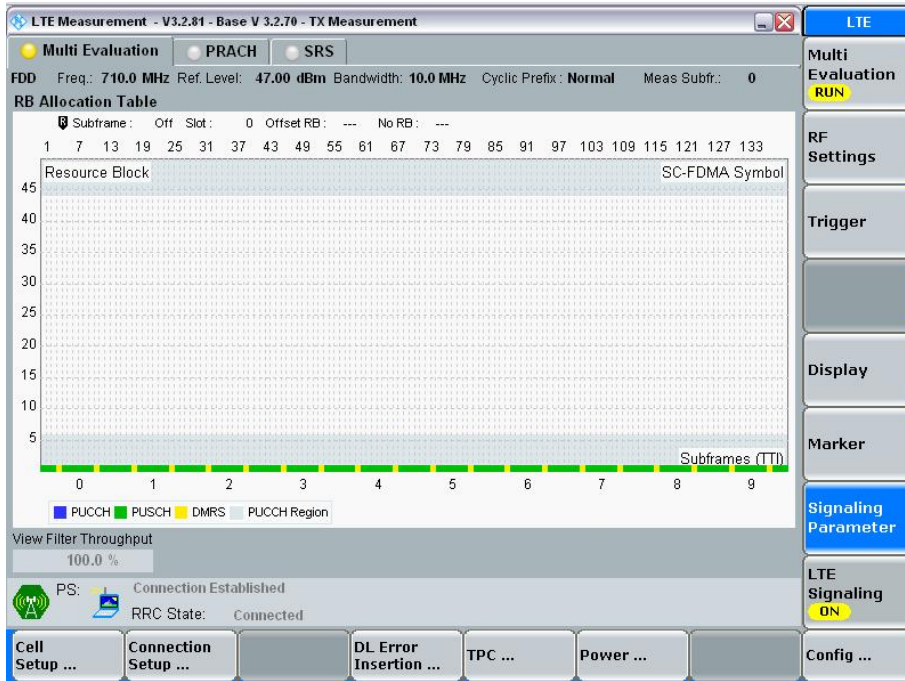


LTE FDD 26, 10.0 MHz Bandwidth, QPSK, IQ Constellation, Modulation Characteristics Plot

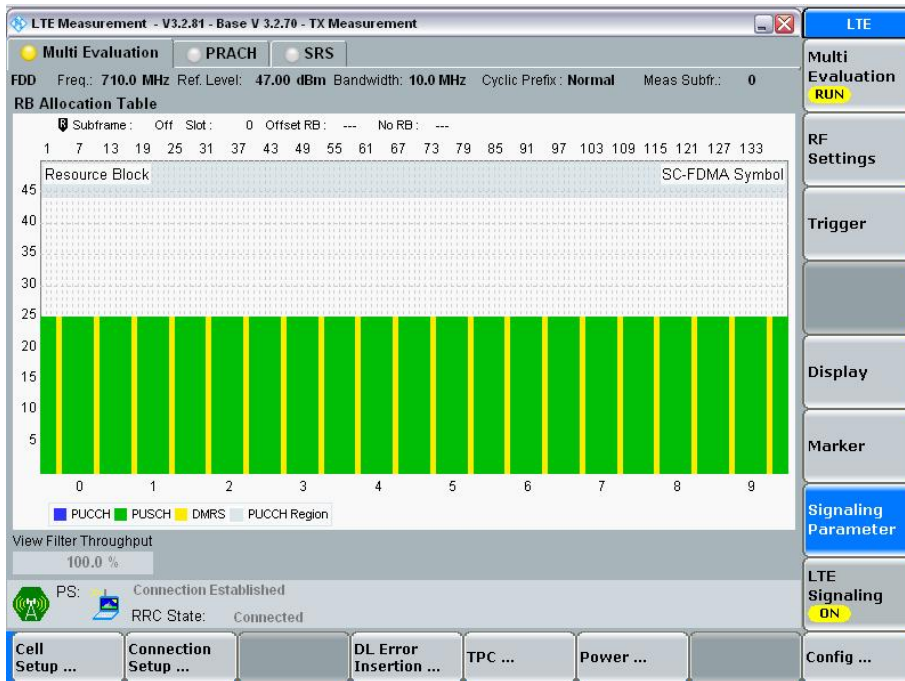




LTE FDD 26, 10.0 MHz Bandwidth, QPSK, 1 Resource Block Allocation, Modulation Characteristics Plot



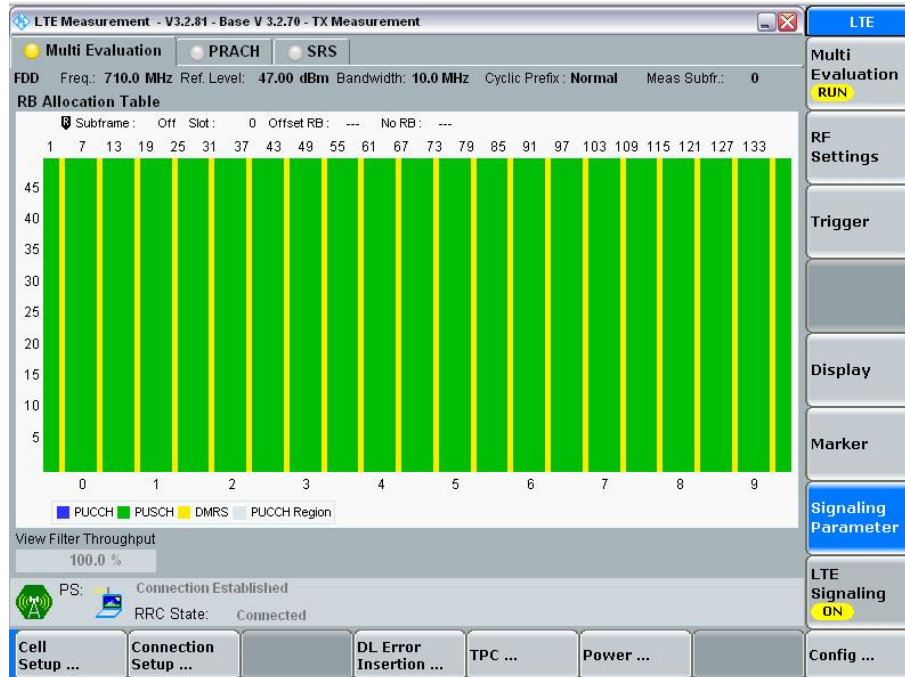
LTE FDD 26, 10.0 MHz Bandwidth, QPSK, 25 Resource Block Allocation, Modulation Characteristics Plot



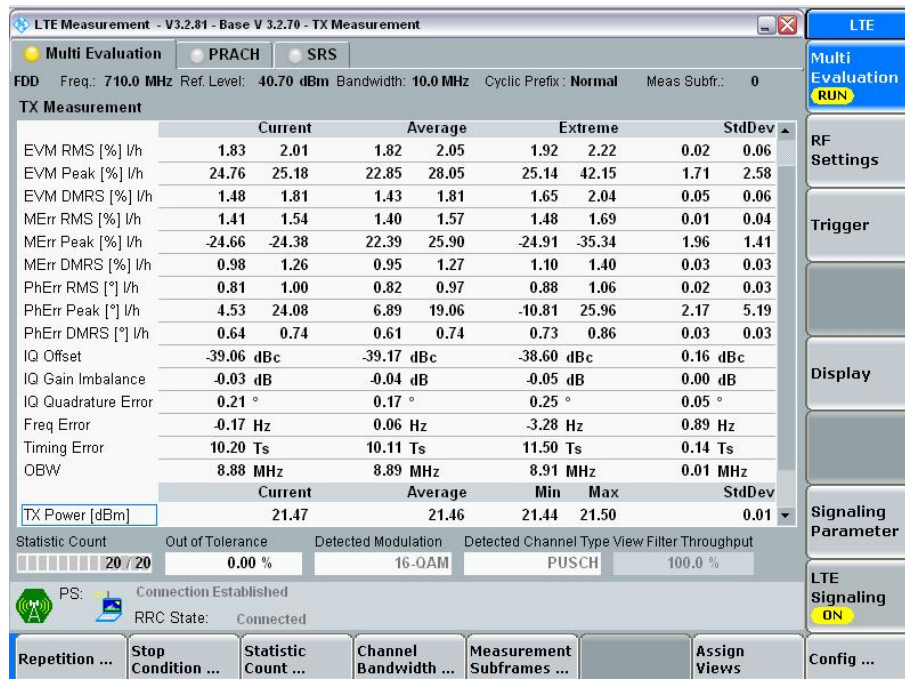


Product Service

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



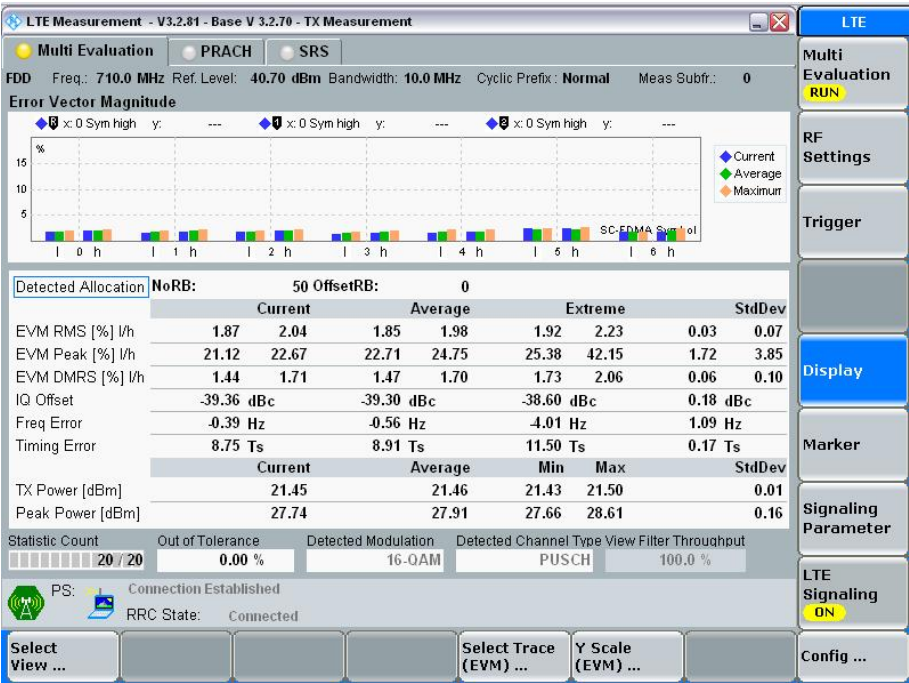
LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, Transmitter Summary, Modulation Characteristics Plot



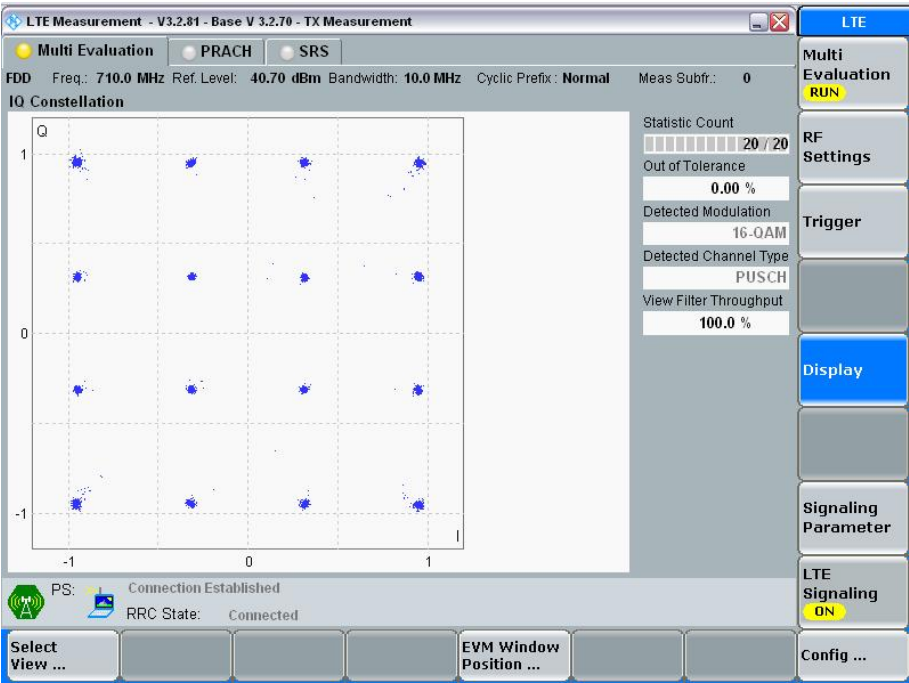


Product Service

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

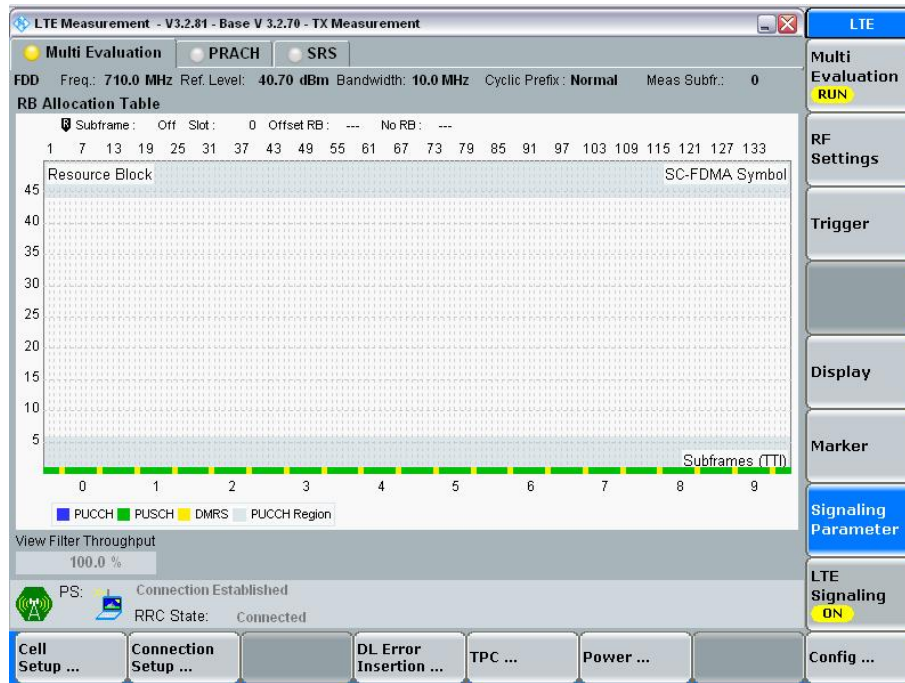


LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, IQ Constellation, Modulation Characteristics Plot

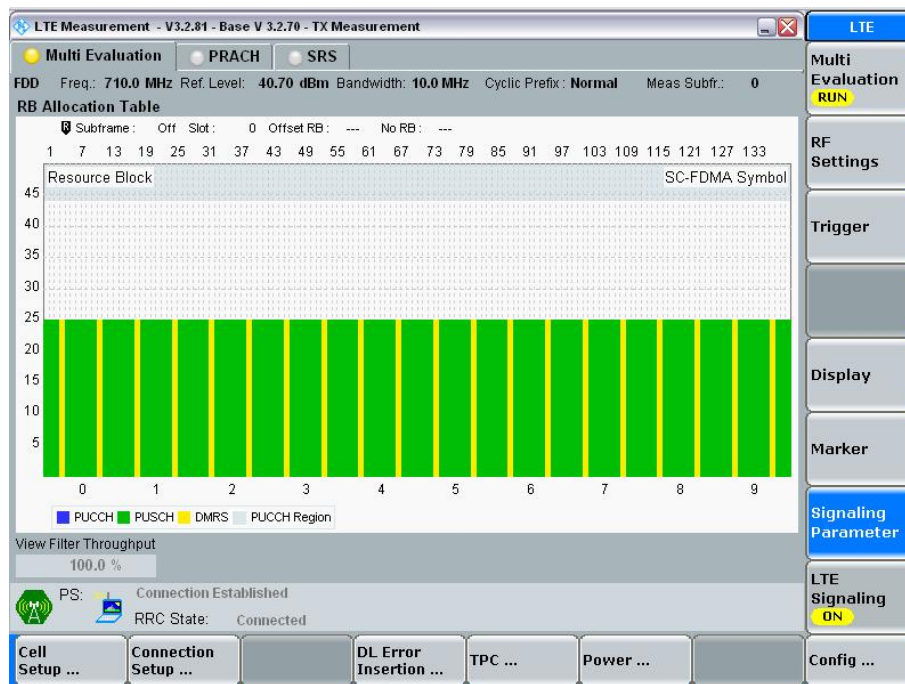




LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, 1 Resource Block Allocation, Modulation Characteristics Plot



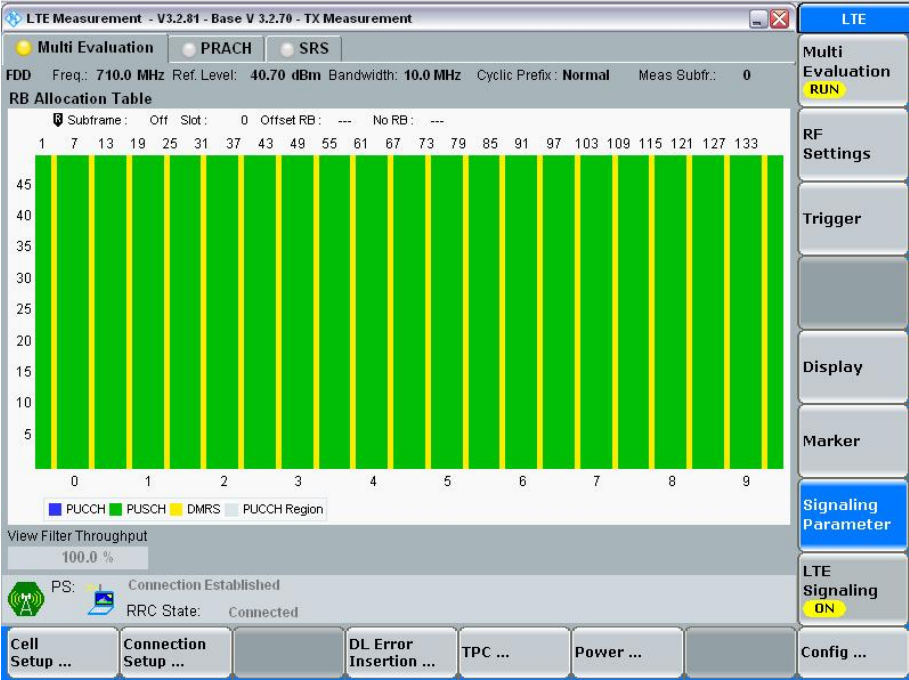
LTE FDD 26, 10.0 MHz Bandwidth, 16-QAM, 25 Resource Block Allocation, Modulation Characteristics Plot





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

2.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

2.5.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.691
FCC 47 CFR Part 2, Clause 2.1049

2.5.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362440 - 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 6.

2.5.6 Environmental Conditions

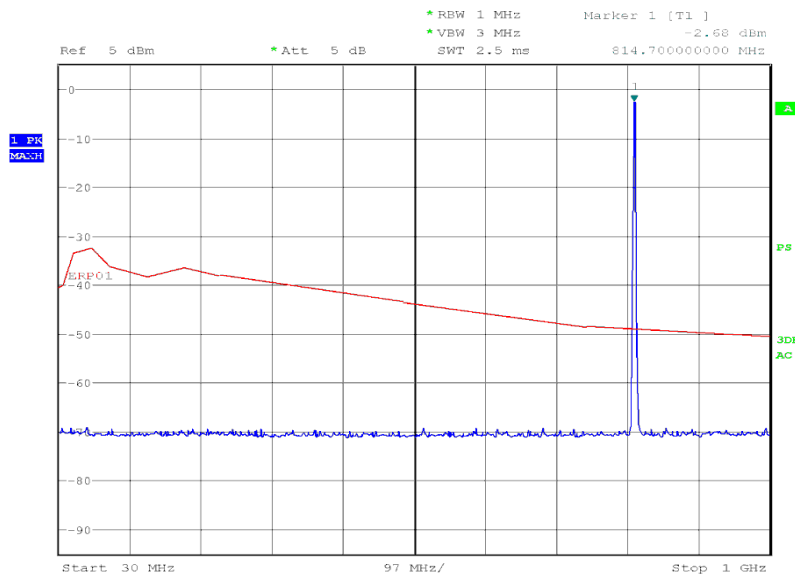
Ambient Temperature	21.5°C
Relative Humidity	33.0%



2.5.7 Test Results

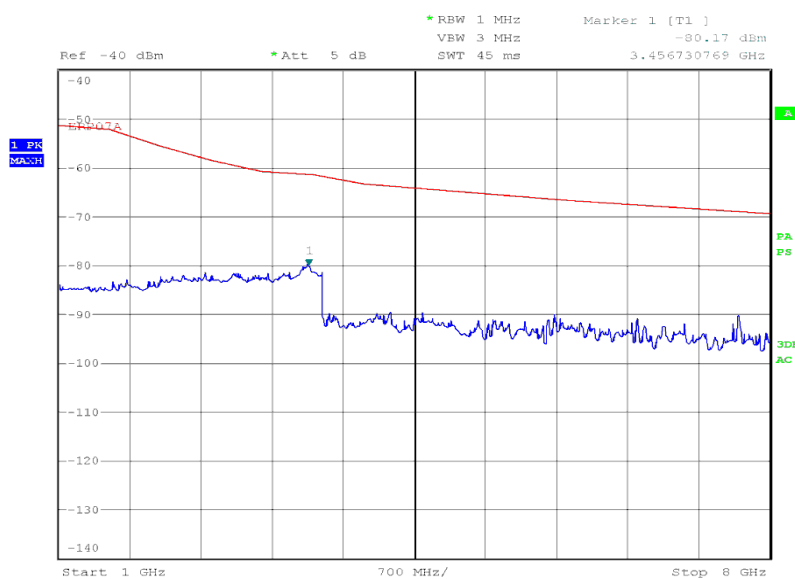
4.0 V DC

LTE FDD 26, 814.7 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:18:28

LTE FDD 26, 814.7 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

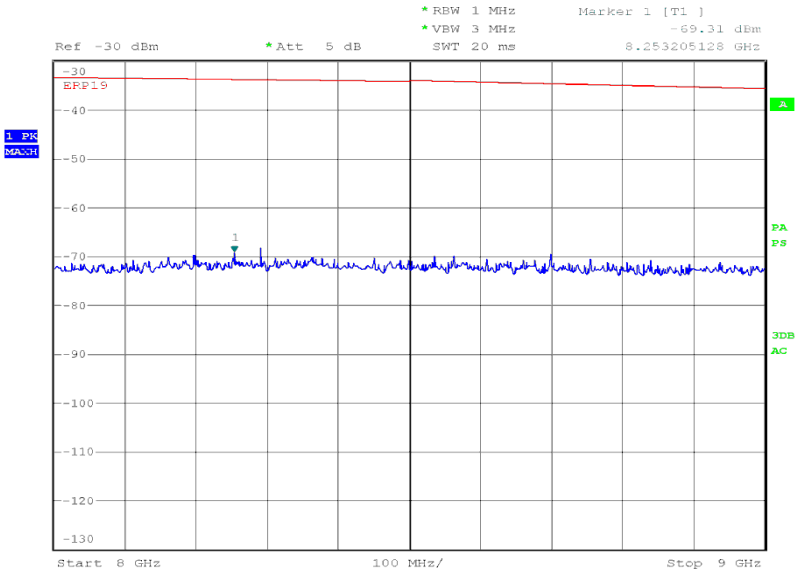


Date: 31.MAY.2015 12:37:18



Product Service

LTE FDD 26, 814.7 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

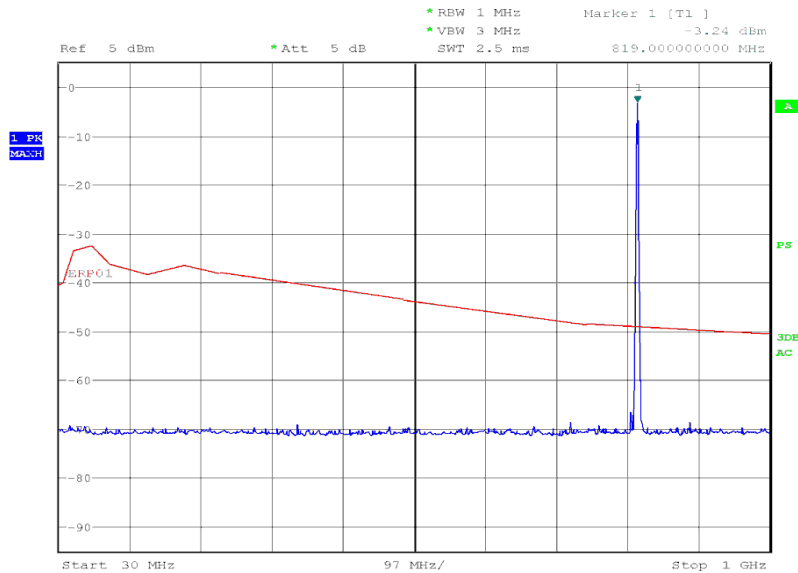


Date: 1.JUN.2015 21:28:57



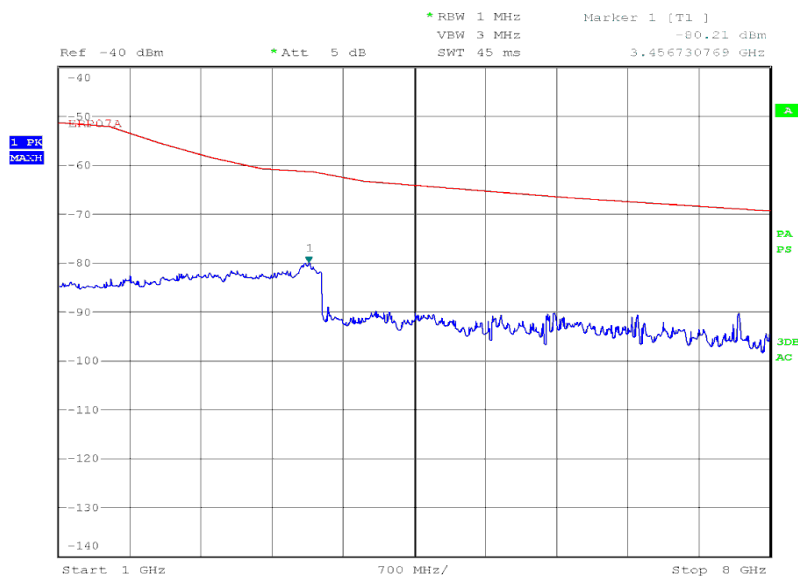
Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:20:56

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

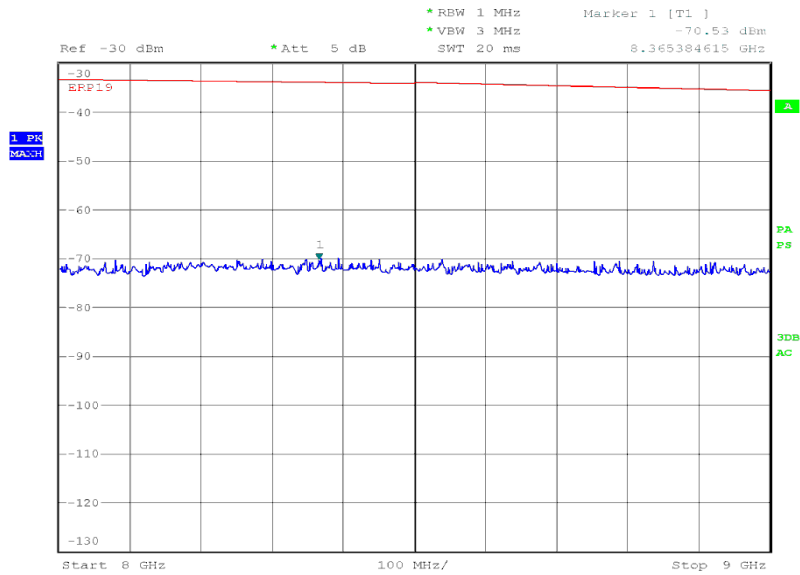


Date: 31.MAY.2015 12:40:18



Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

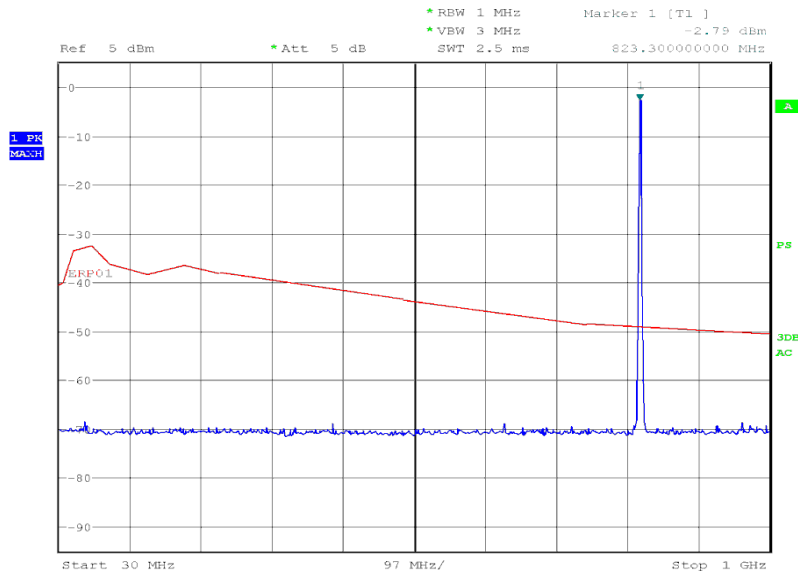


Date: 1.JUN.2015 21:37:03



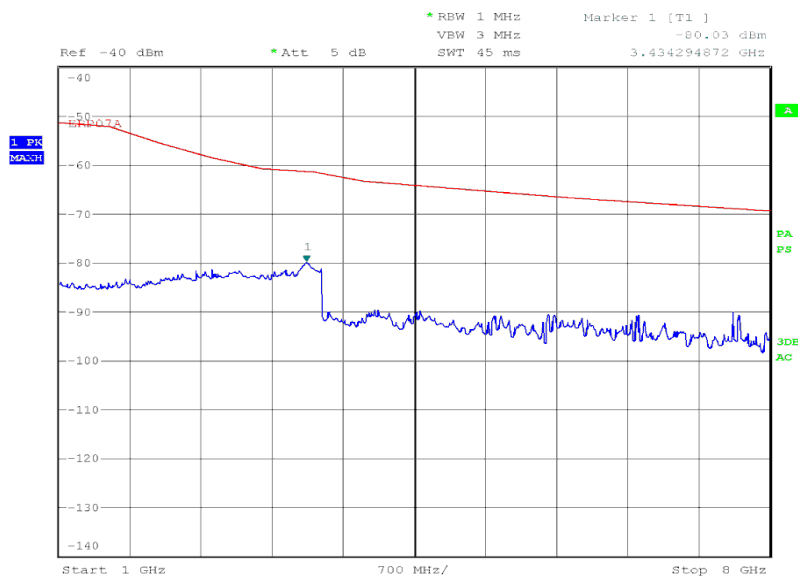
Product Service

LTE FDD 26, 823.3 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:23:45

LTE FDD 26, 823.3 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

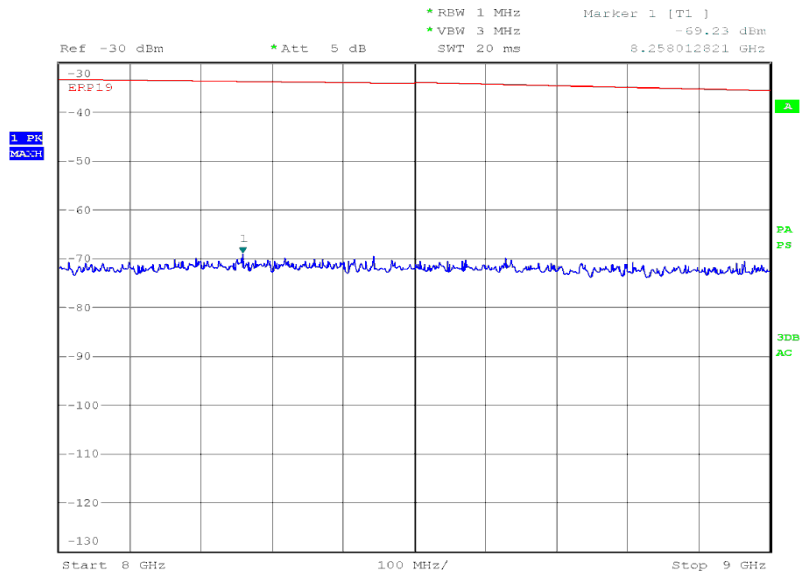


Date: 31.MAY.2015 12:42:38



Product Service

LTE FDD 26, 823.3 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, 8 GHz to 9 GHz,
Spurious at Antenna Terminals Results

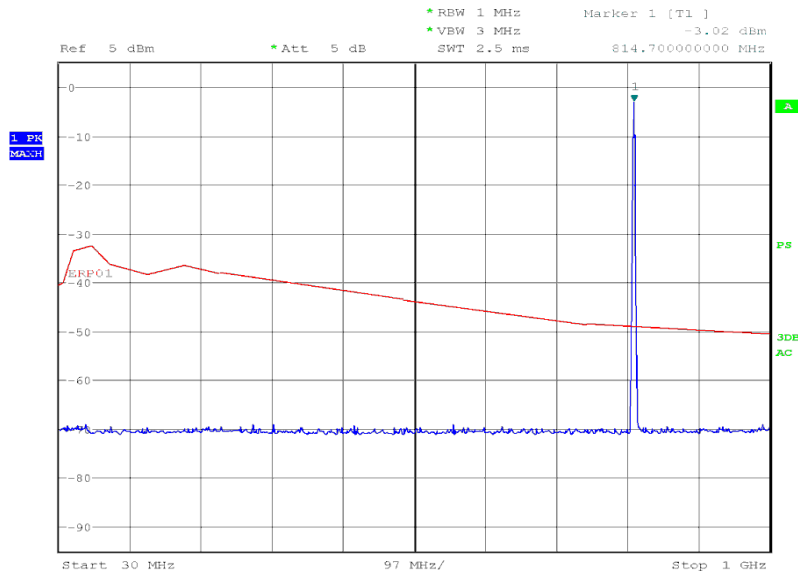


Date: 1.JUN.2015 21:46:13



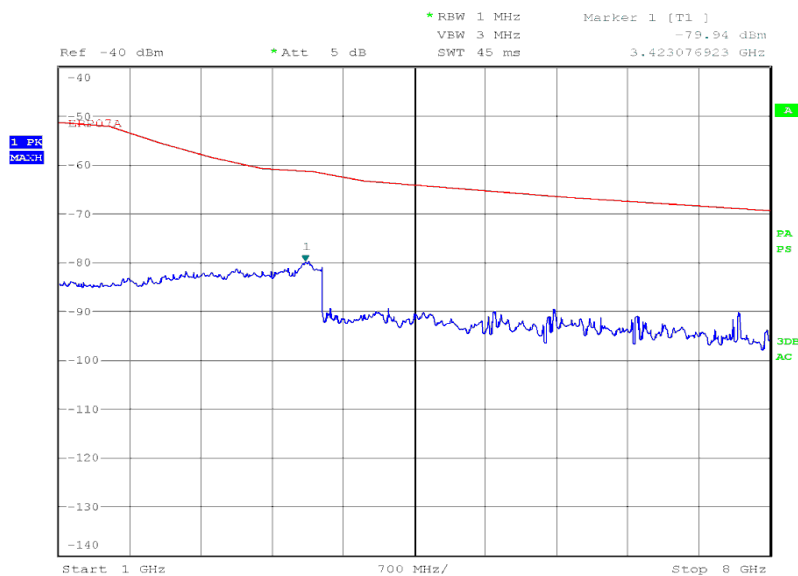
Product Service

LTE FDD 26, 814.7 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:35:07

LTE FDD 26, 814.7 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

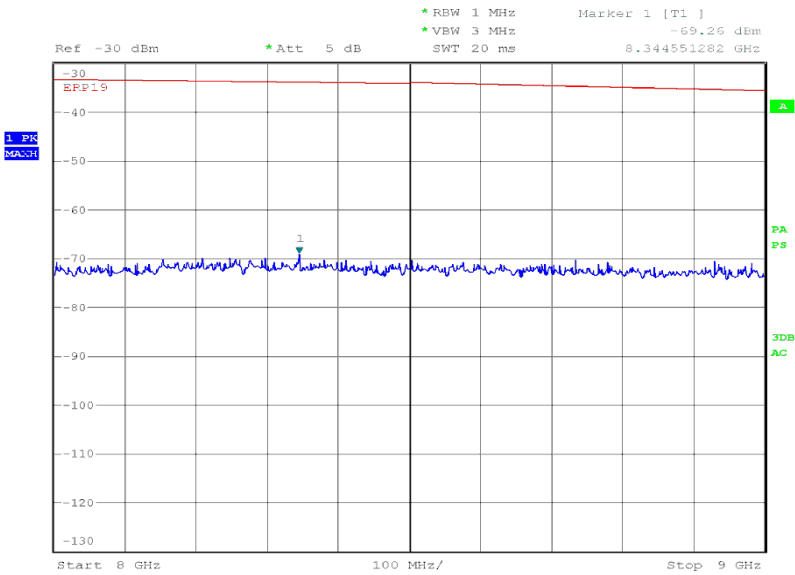


Date: 31.MAY.2015 12:48:53



Product Service

LTE FDD 26, 814.7 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

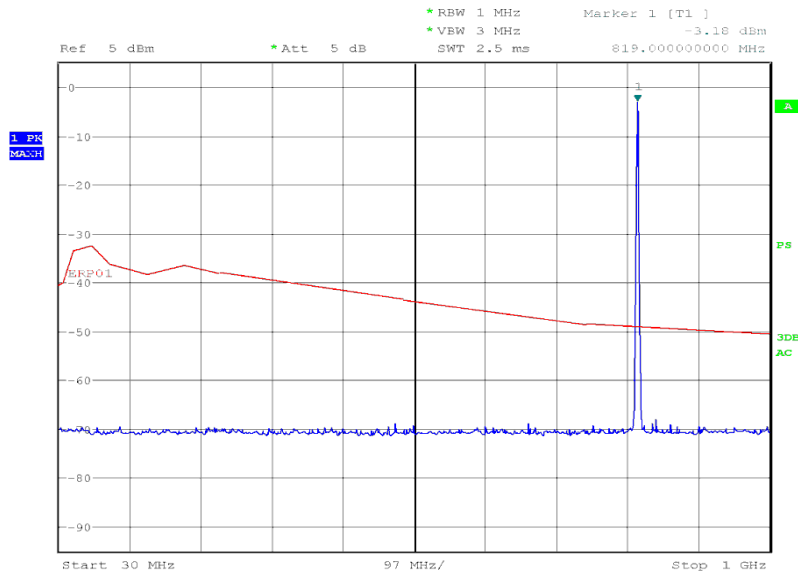


Date: 1.JUN.2015 21:06:00



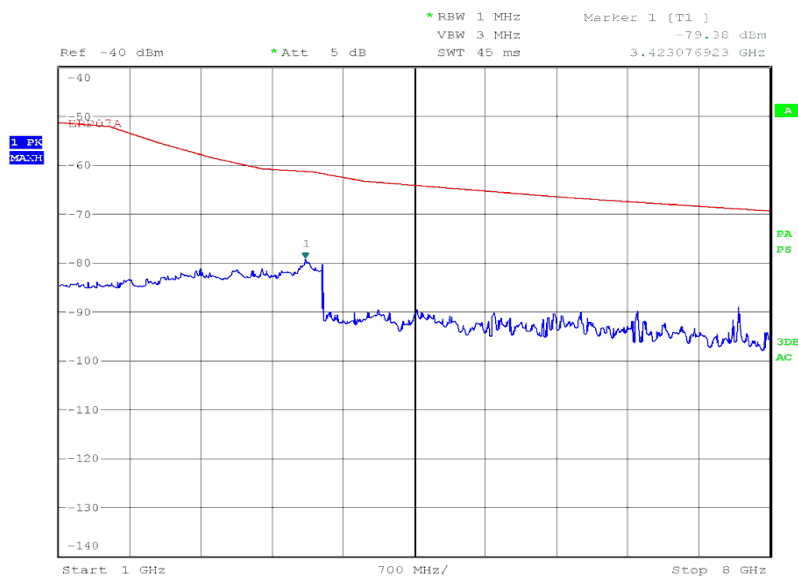
Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:37:59

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

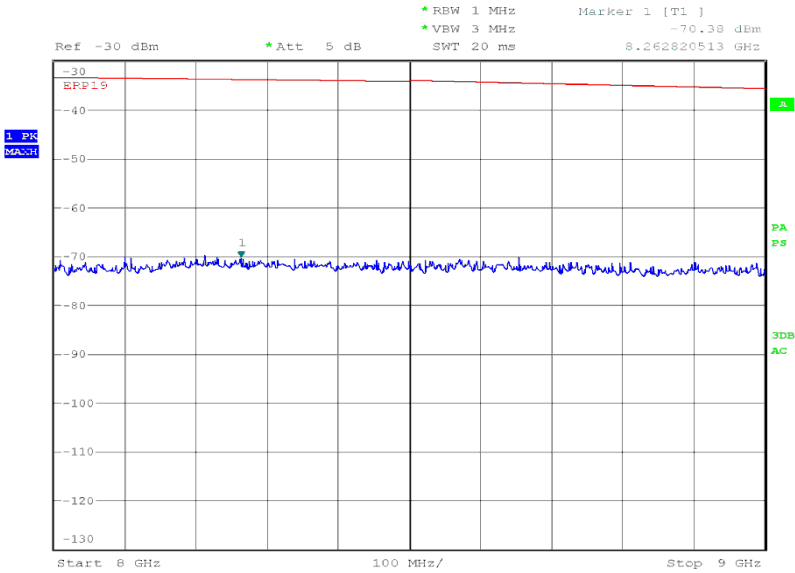


Date: 31.MAY.2015 12:53:34



Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

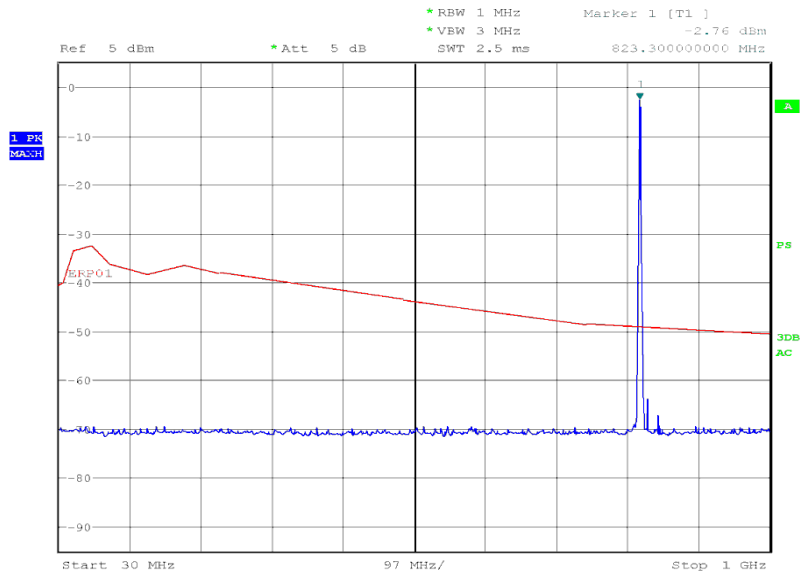


Date: 1.JUN.2015 21:14:12



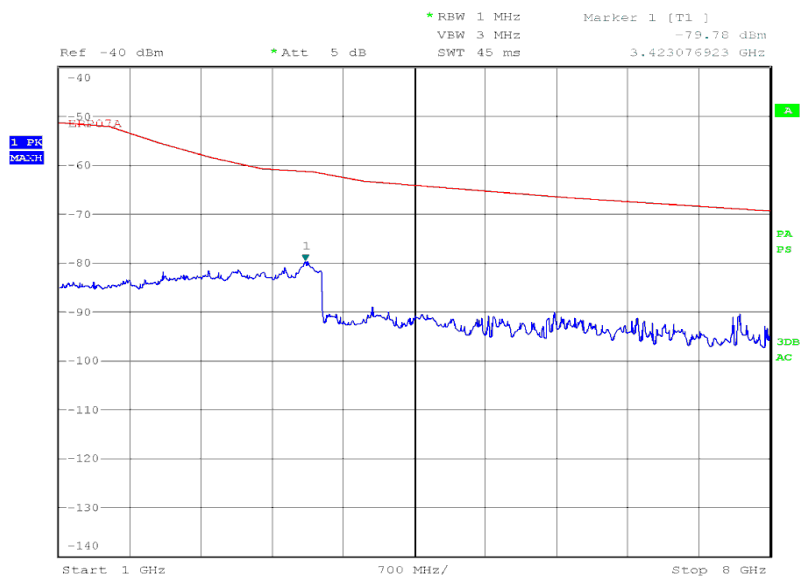
Product Service

LTE FDD 26, 823.3 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:40:08

LTE FDD 26, 823.3 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

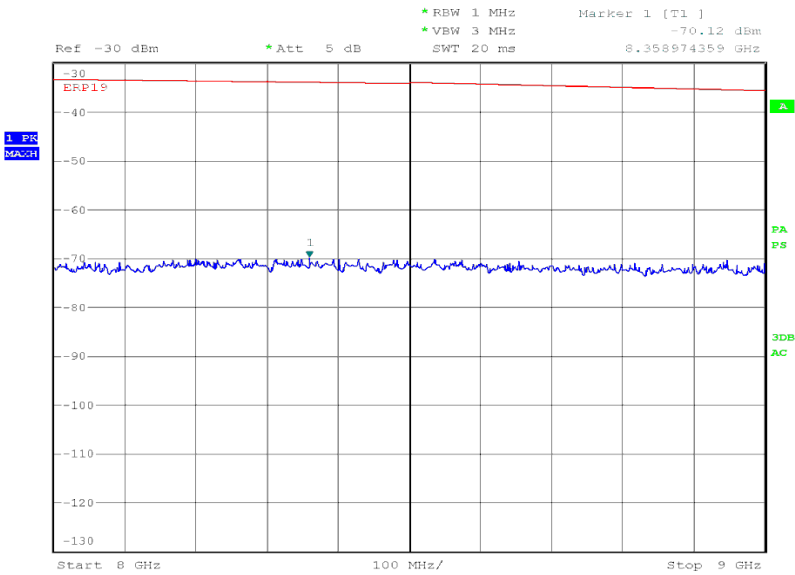


Date: 31.MAY.2015 12:58:32



Product Service

LTE FDD 26, 823.3 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

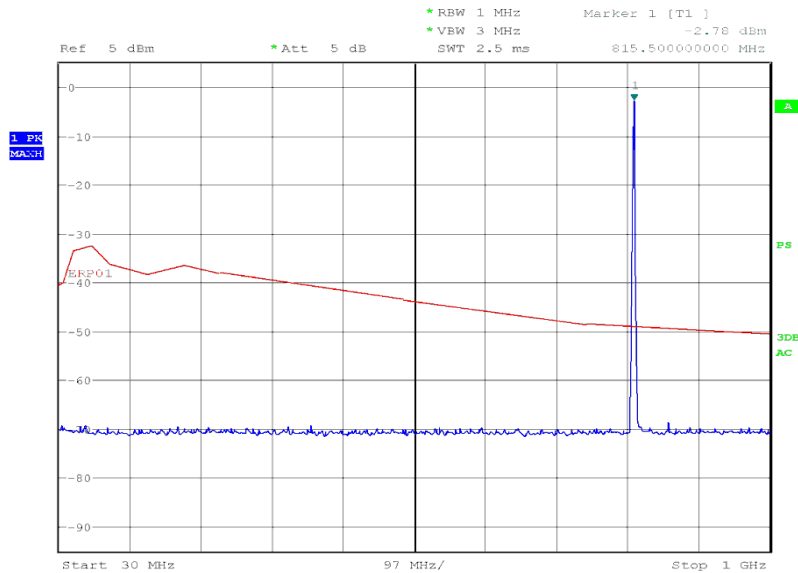


Date: 1.JUN.2015 21:19:15



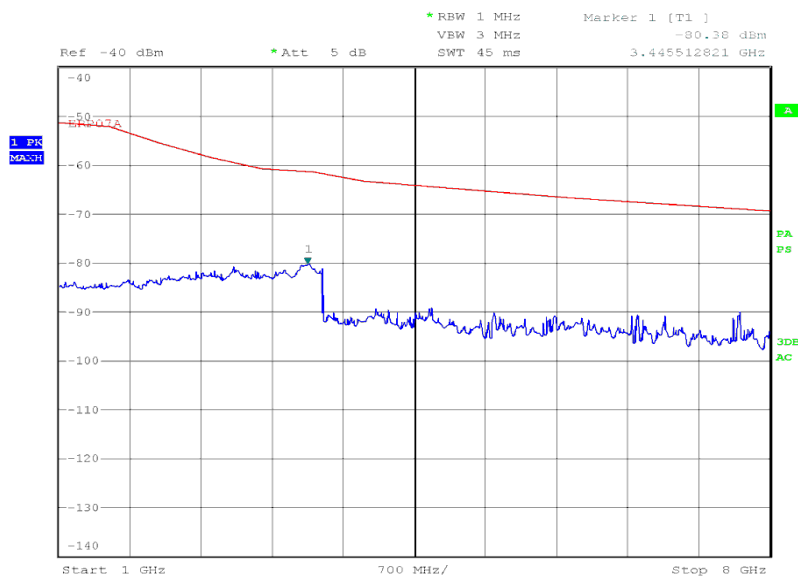
Product Service

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:45:42

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

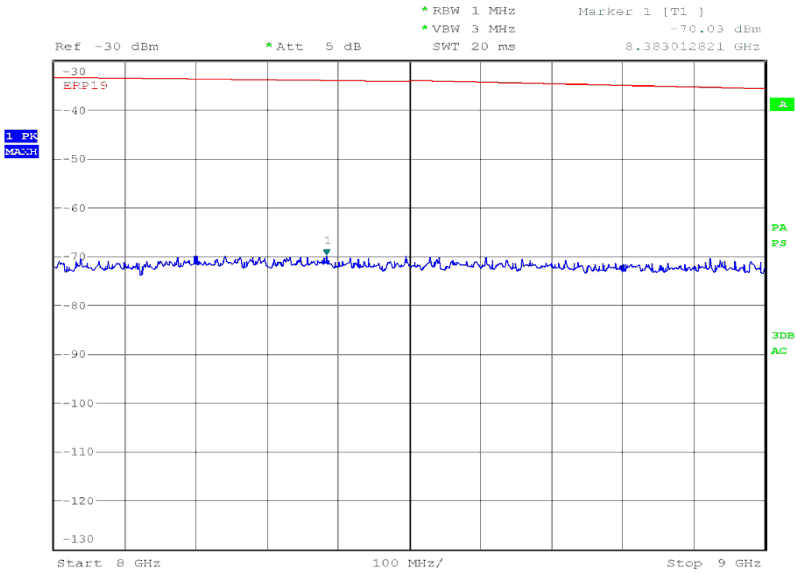


Date: 31.MAY.2015 13:21:57



Product Service

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, 8GMHz to 9 GHz, Spurious at Antenna Terminals Results

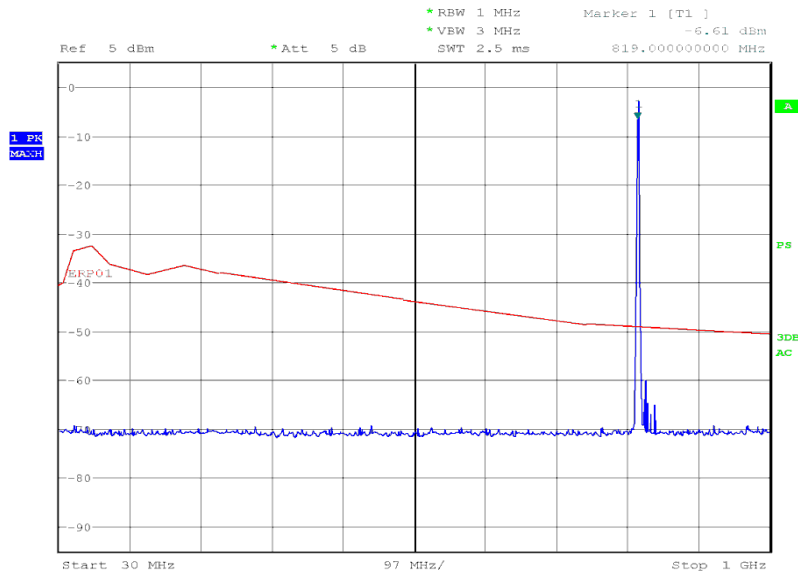


Date: 1.JUN.2015 21:57:59



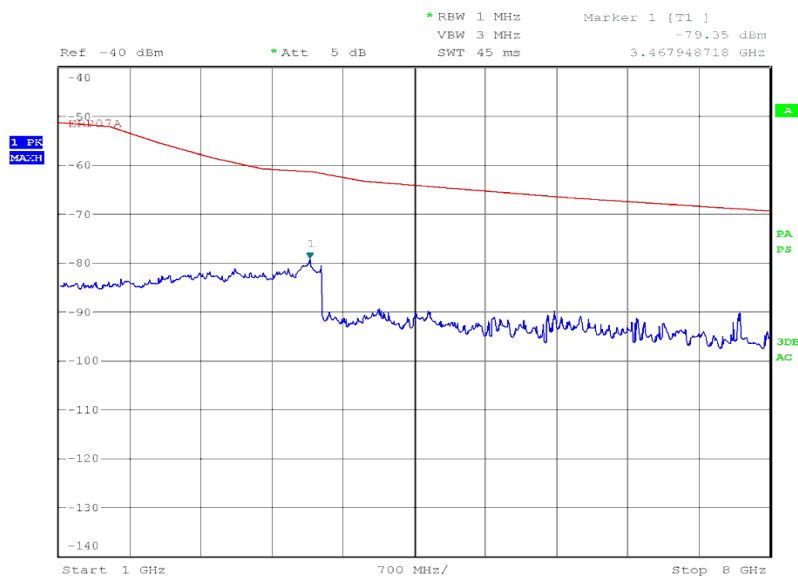
Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:50:57

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

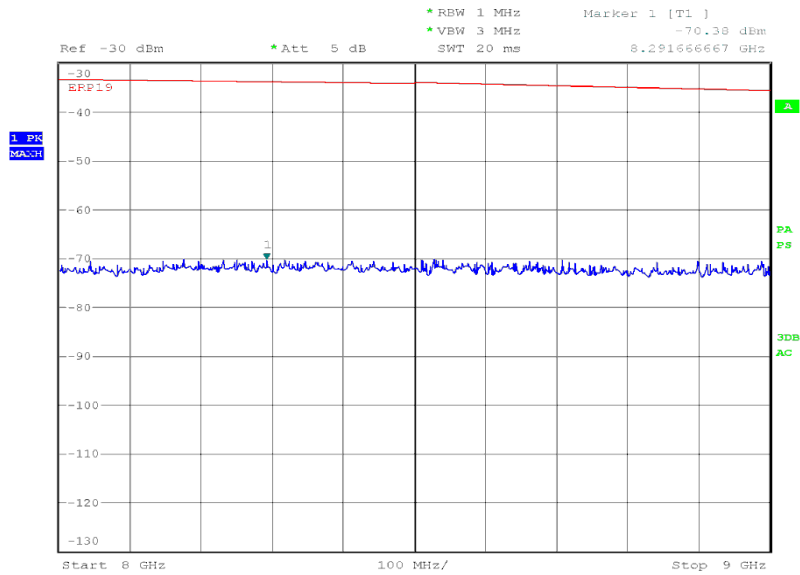


Date: 31.MAY.2015 13:24:52



Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

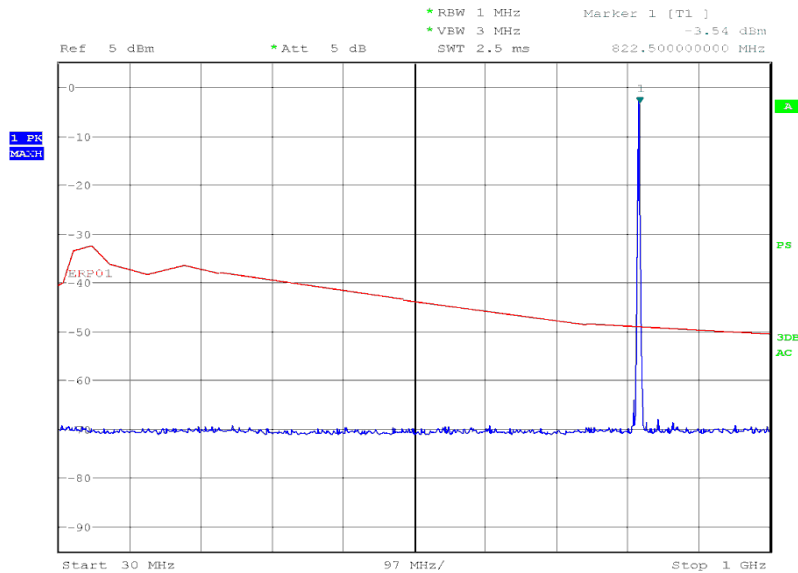


Date: 1.JUN.2015 22:05:47



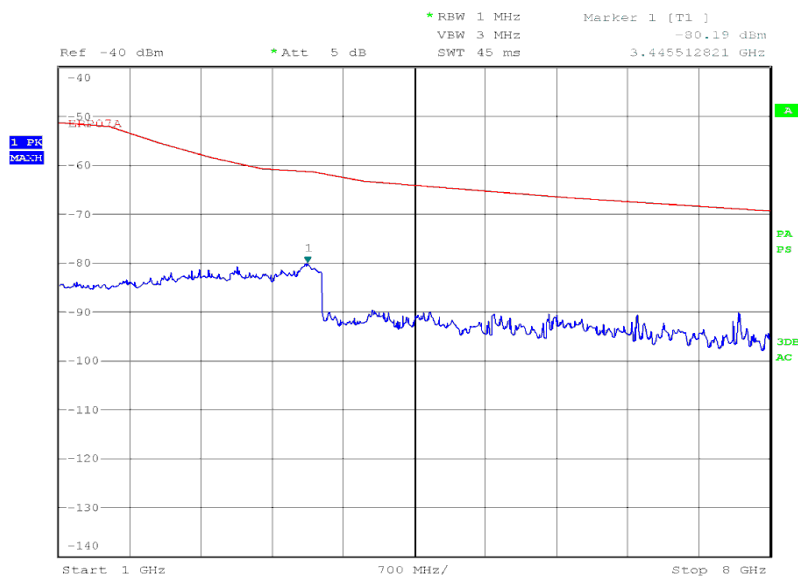
Product Service

LTE FDD 26, 822.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:54:59

LTE FDD 26, 822.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

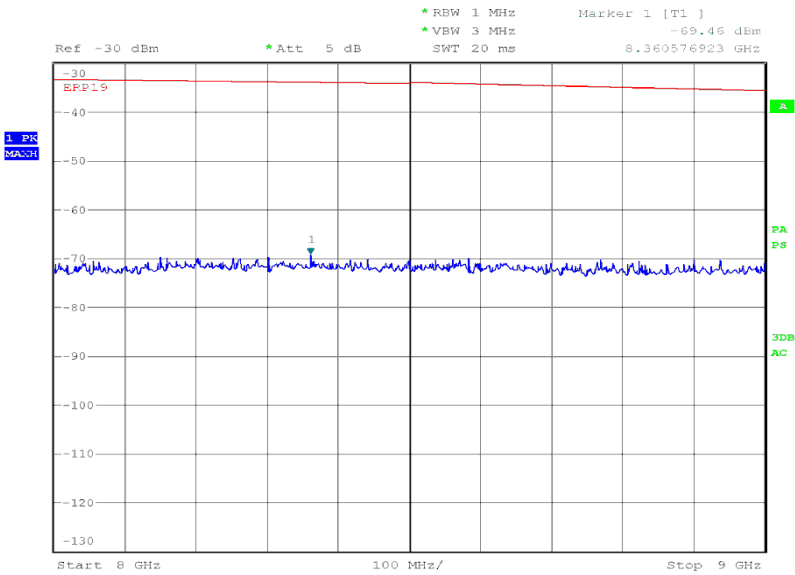


Date: 31.MAY.2015 13:27:24



Product Service

LTE FDD 26, 822.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

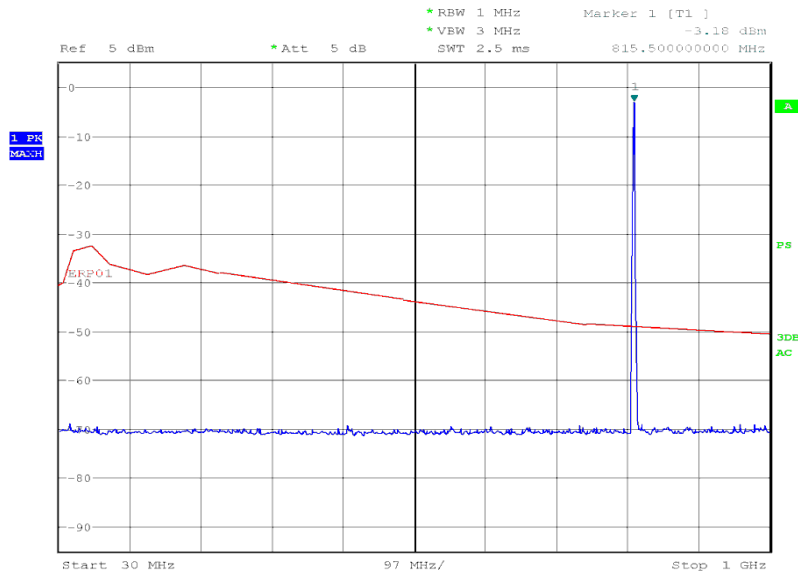


Date: 1.JUN.2015 22:14:55



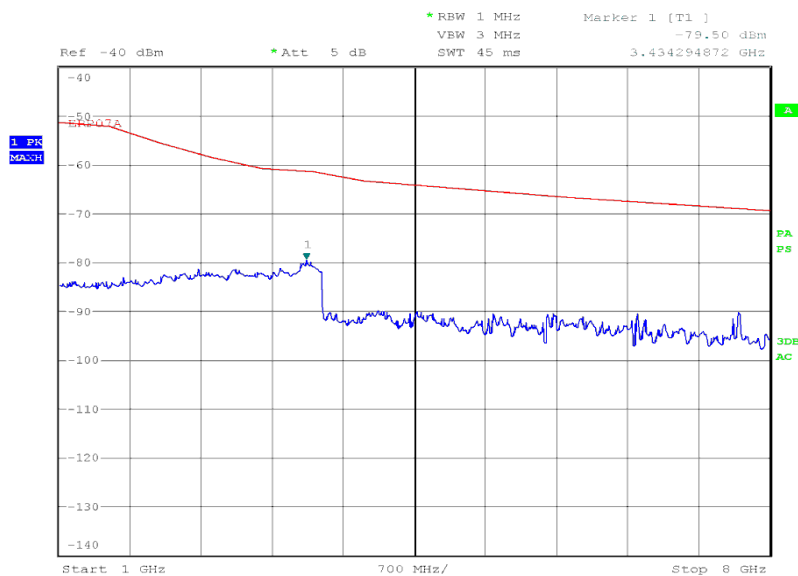
Product Service

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 21:58:07

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

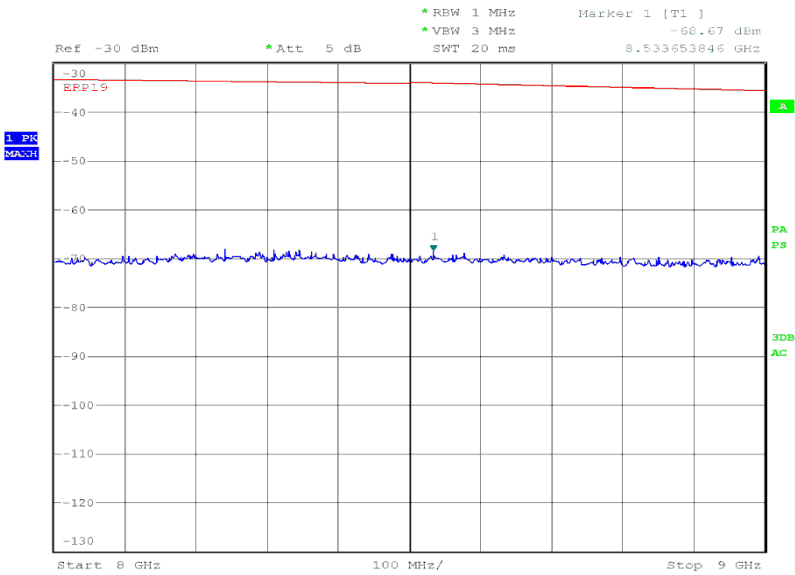


Date: 31.MAY.2015 13:31:08



Product Service

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

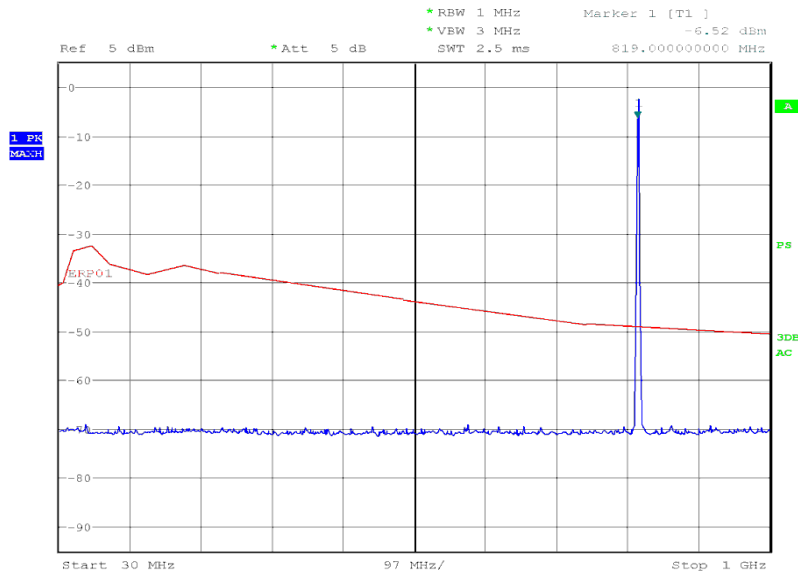


Date: 1.JUN.2015 22:30:14



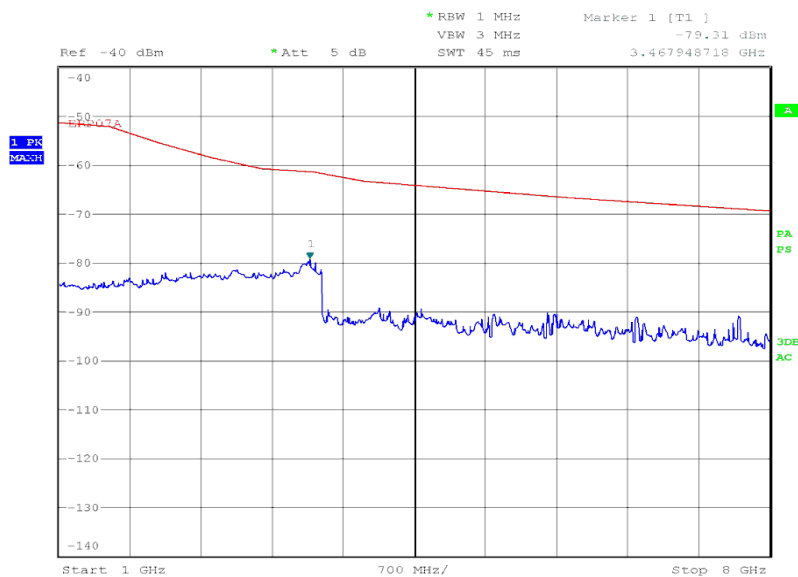
Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:00:45

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

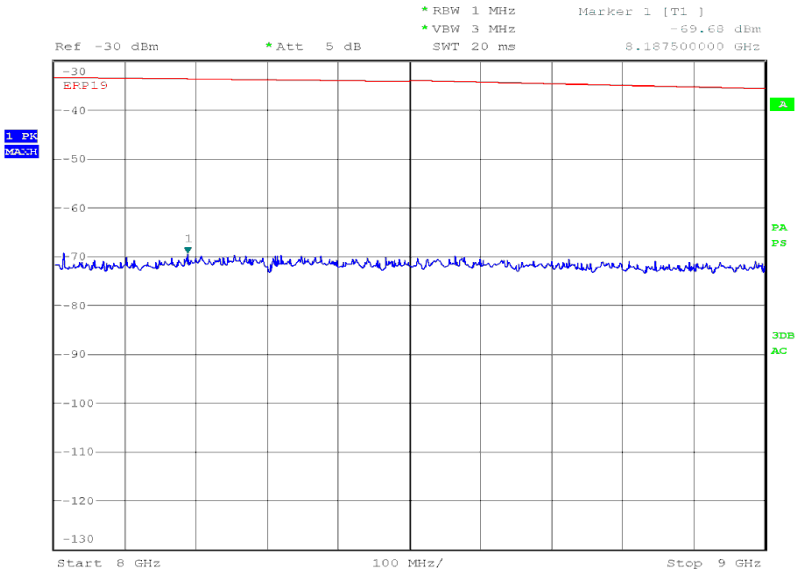


Date: 31.MAY.2015 13:33:52



Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

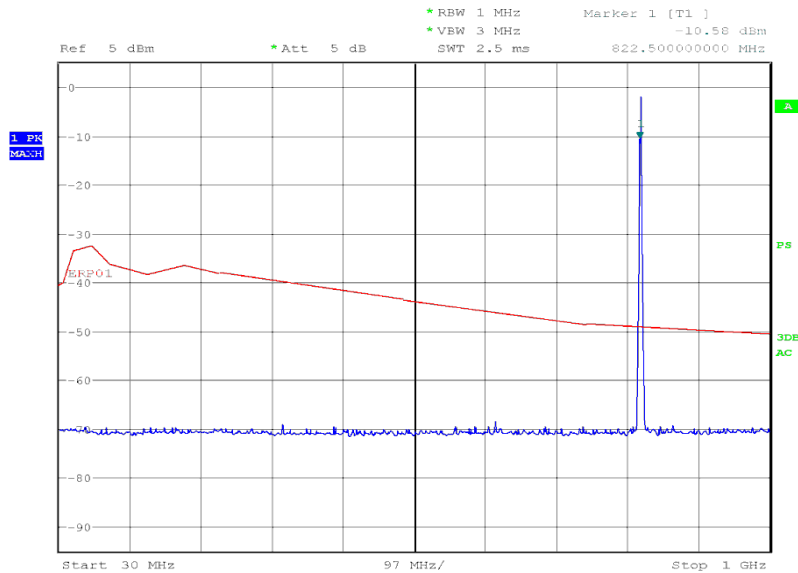


Date: 1.JUN.2015 22:30:34



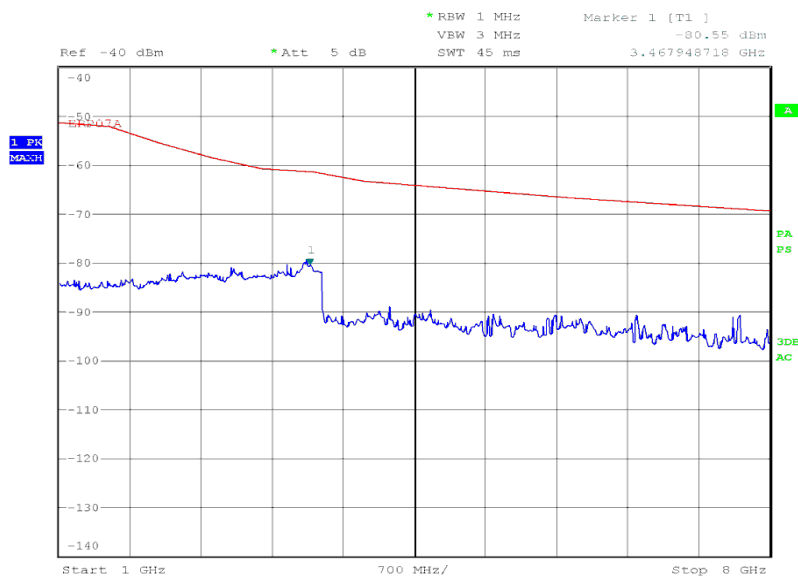
Product Service

LTE FDD 26, 822.5 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:02:53

LTE FDD 26, 822.5 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

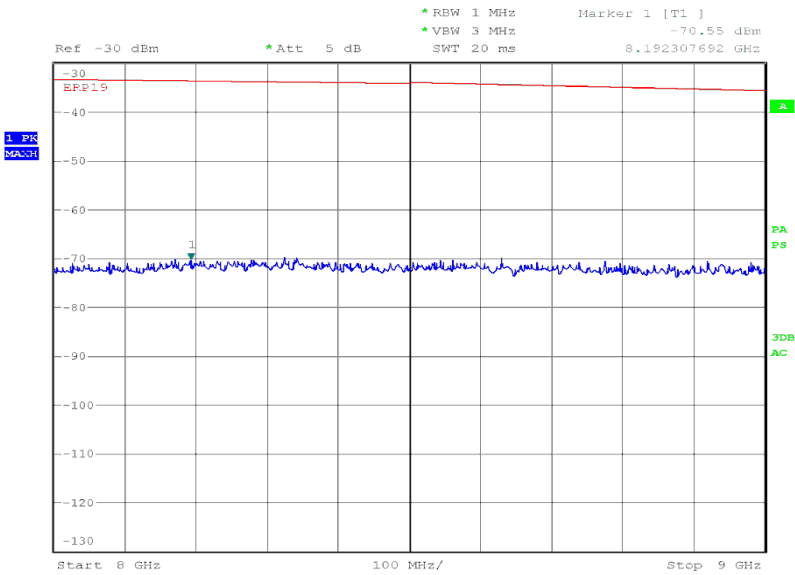


Date: 31.MAY.2015 13:37:39



Product Service

LTE FDD 26, 822.5 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

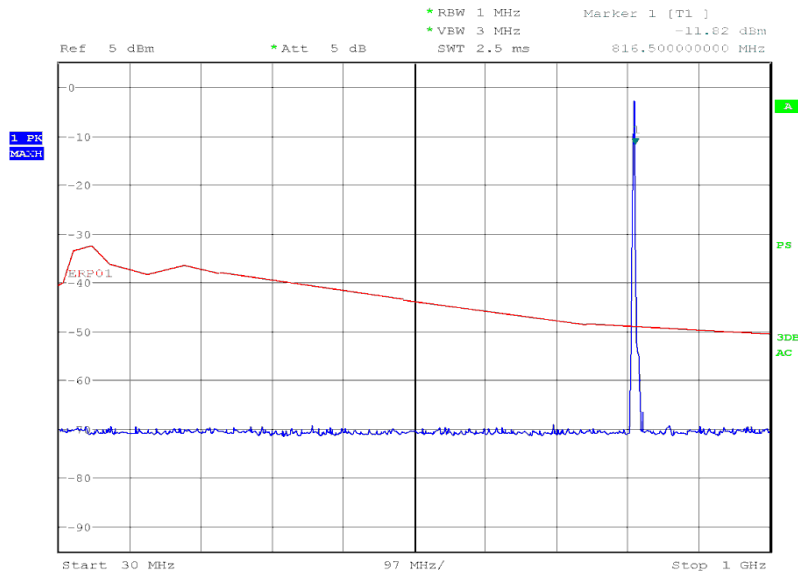


Date: 1.JUN.2015 22:37:28



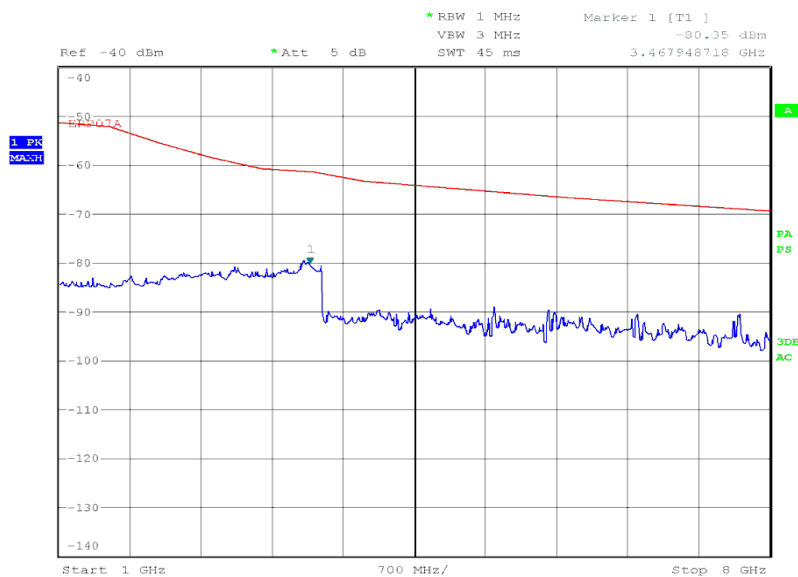
Product Service

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:26:39

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

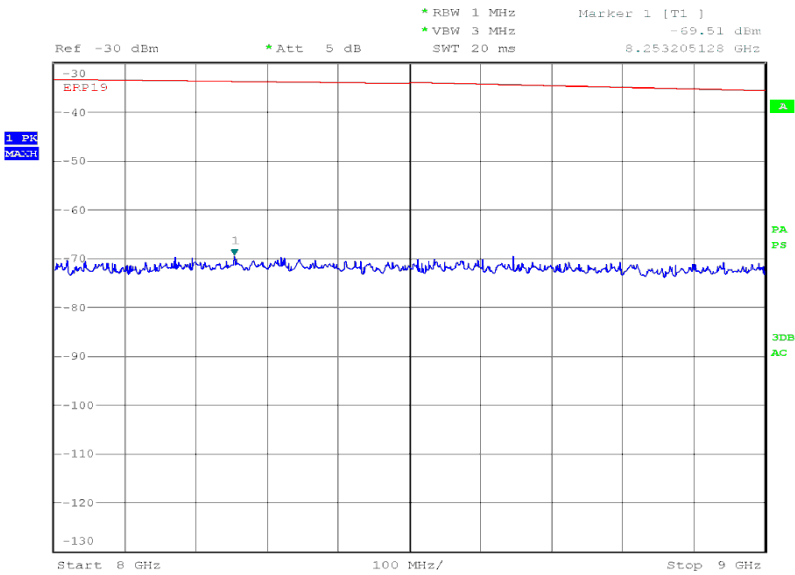


Date: 31.MAY.2015 13:58:24



Product Service

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

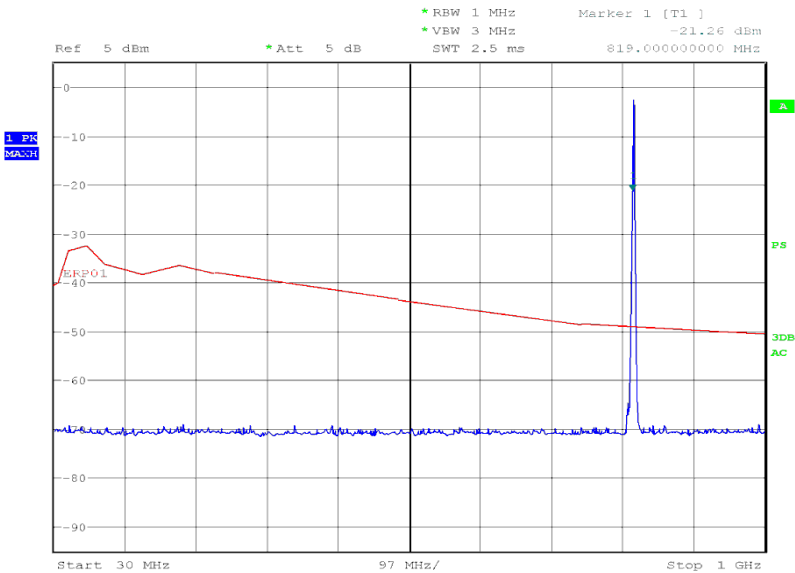


Date: 1.JUN.2015 22:46:57



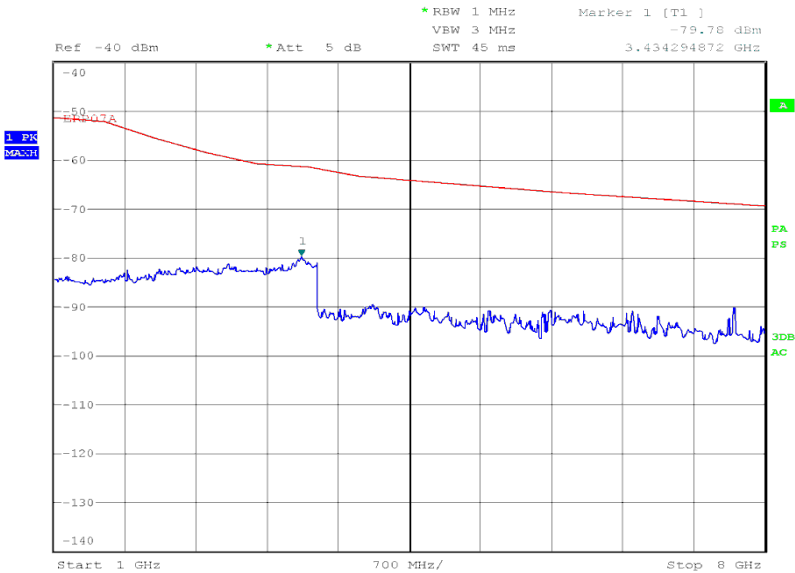
Product Service

LTE FDD 26, 819.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:28:53

LTE FDD 26, 819.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

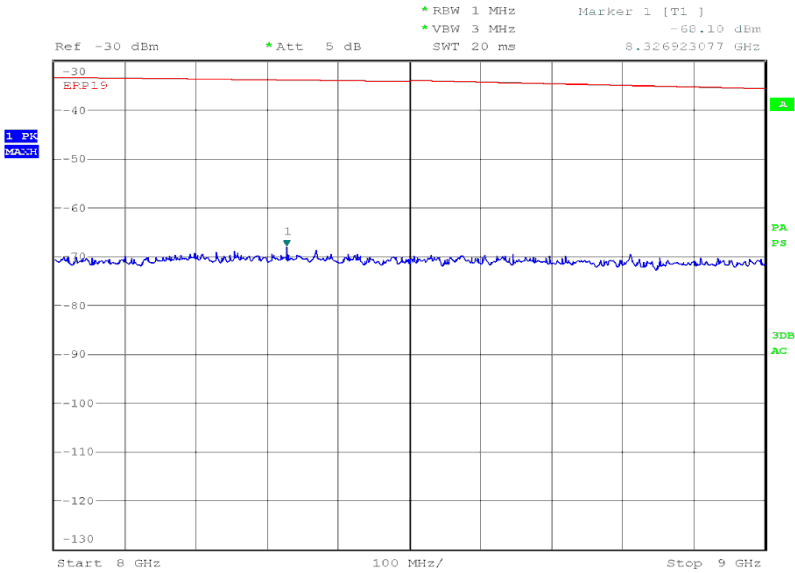


Date: 31.MAY.2015 14:25:22



Product Service

LTE FDD 26, 819.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

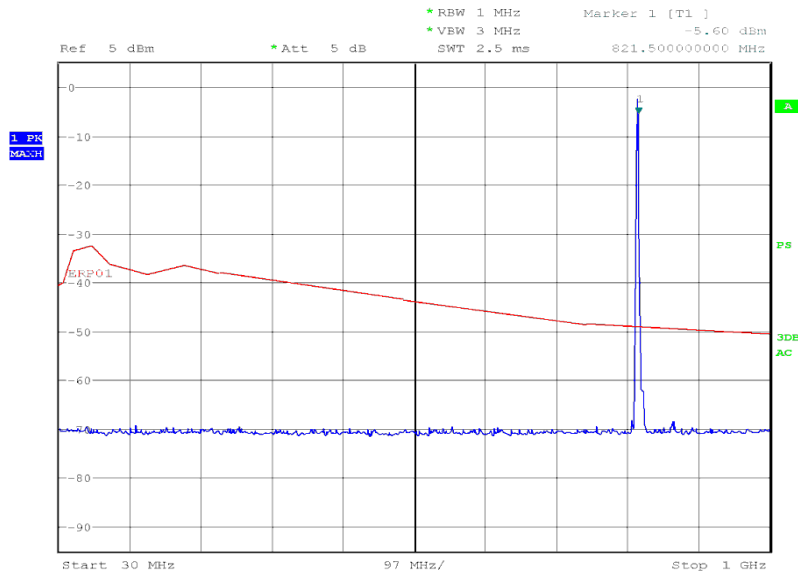


Date: 1.JUN.2015 22:48:53



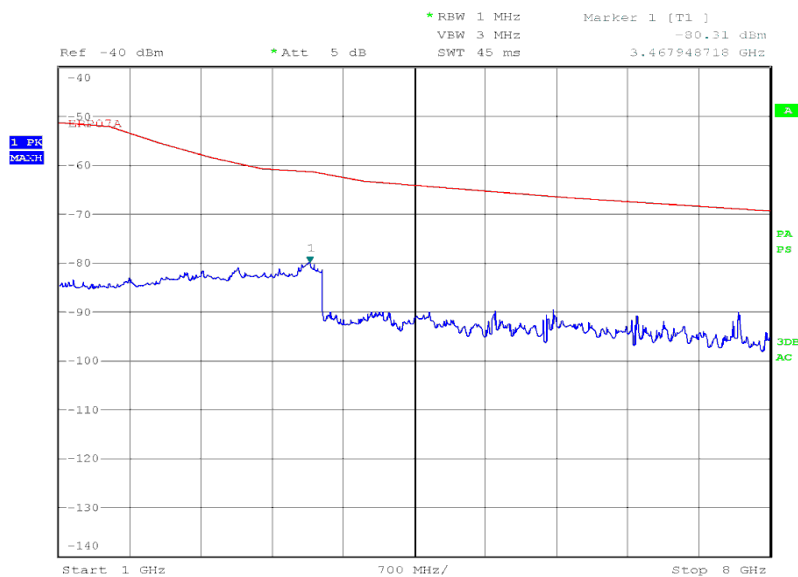
Product Service

LTE FDD 26, 821.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:31:15

LTE FDD 26, 821.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

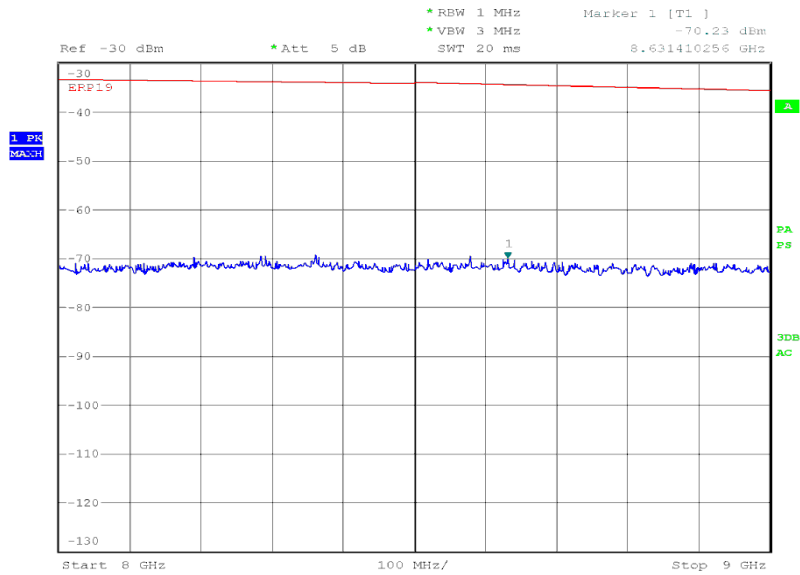


Date: 31.MAY.2015 14:27:55



Product Service

LTE FDD 26, 821.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

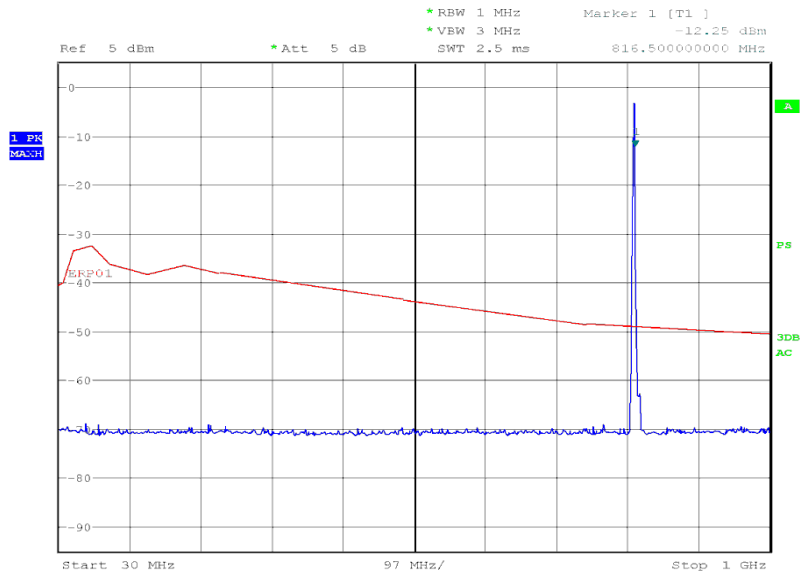


Date: 1.JUN.2015 22:49:50



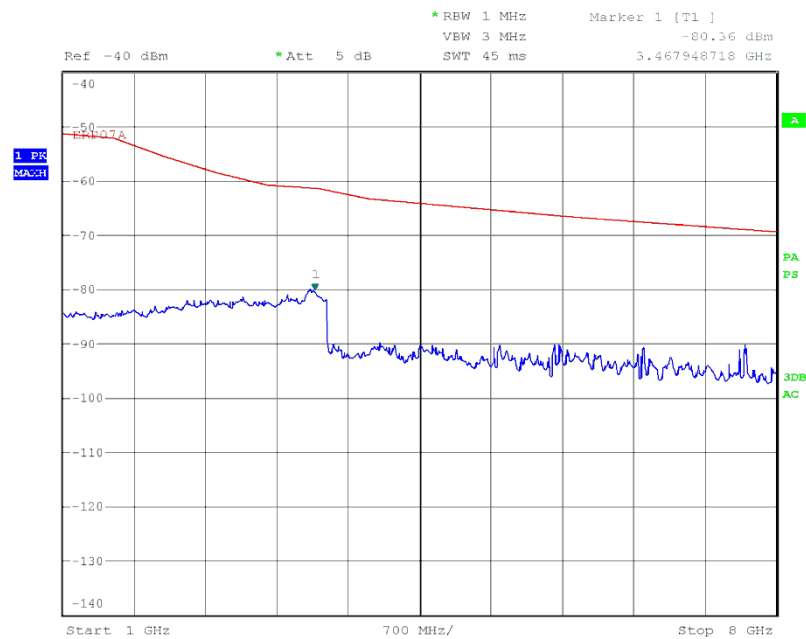
Product Service

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:38:12

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

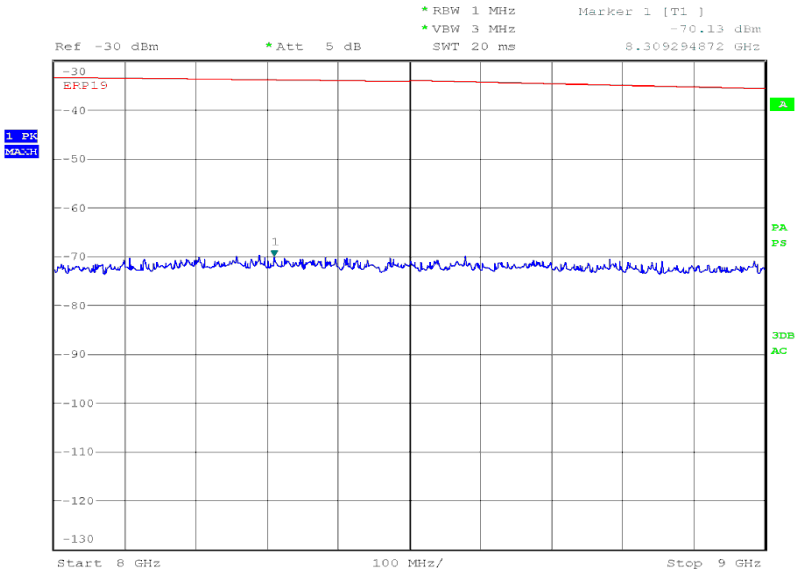


Date: 31.MAY.2015 14:31:01



Product Service

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

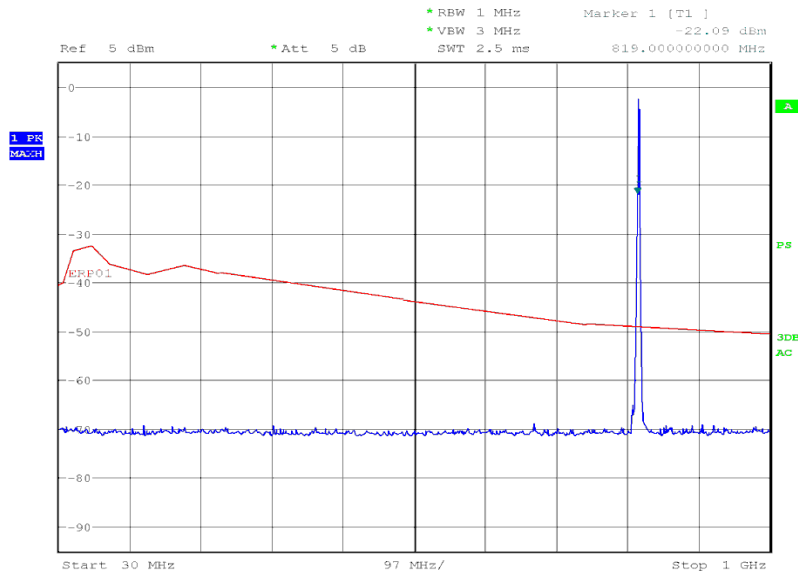


Date: 1.JUN.2015 22:40:21



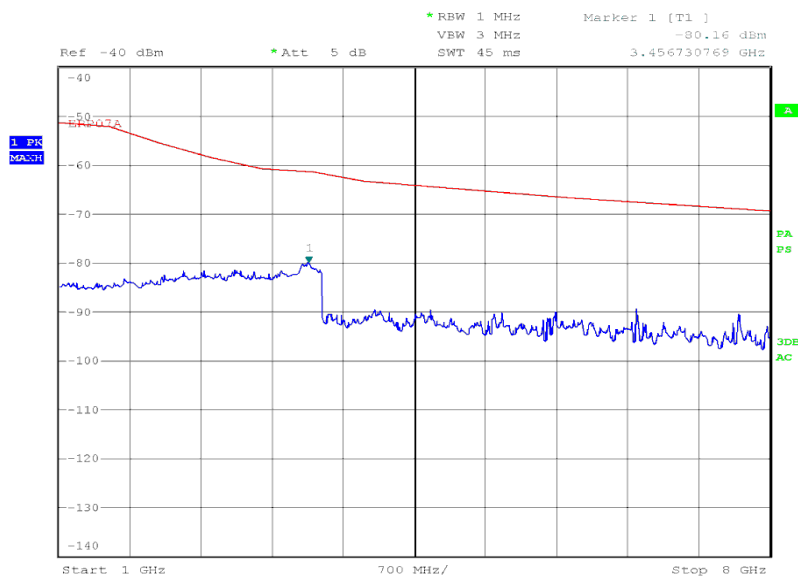
Product Service

LTE FDD 26, 819.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:35:43

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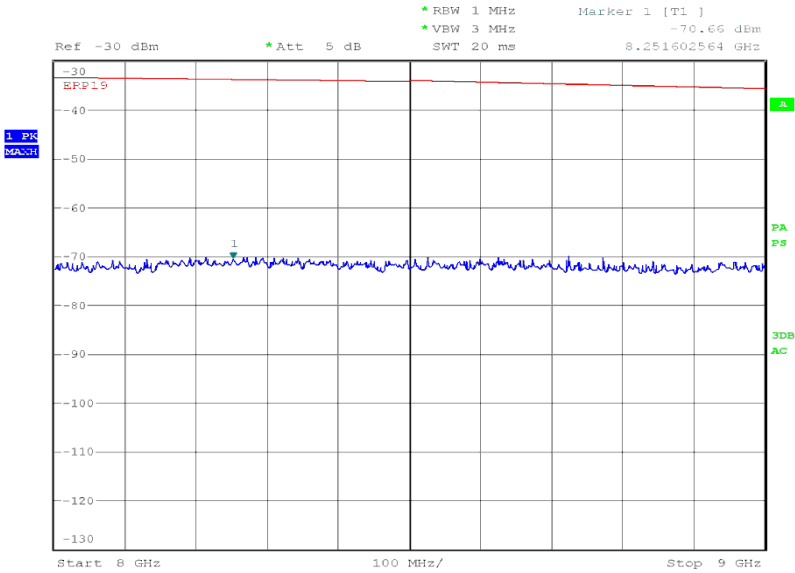


Date: 31.MAY.2015 14:33:41



Product Service

LTE FDD 26, 819.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

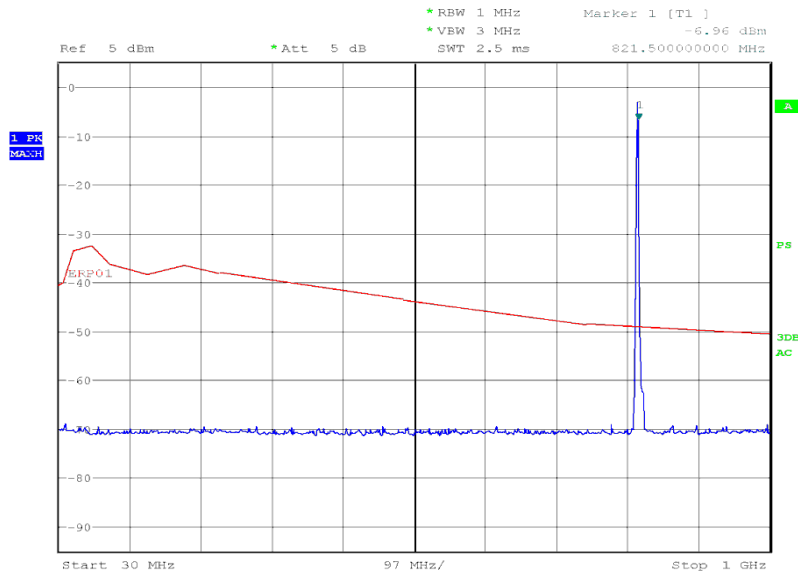


Date: 1.JUN.2015 22:43:00



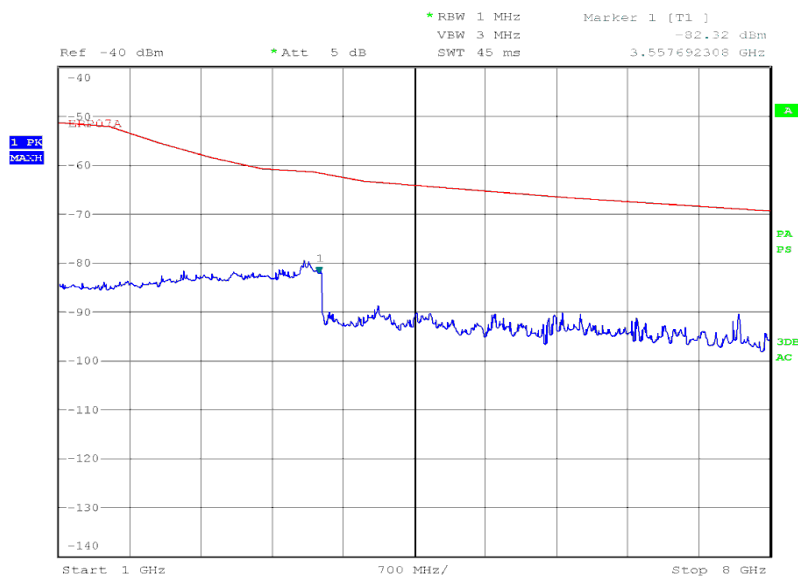
Product Service

LTE FDD 26, 821.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:33:35

LTE FDD 26, 821.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

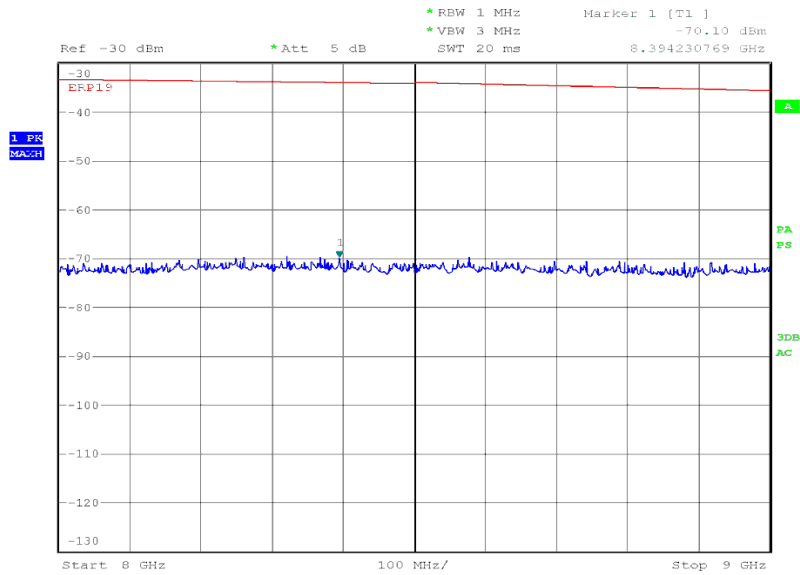


Date: 31.MAY.2015 14:38:00



Product Service

LTE FDD 26, 821.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

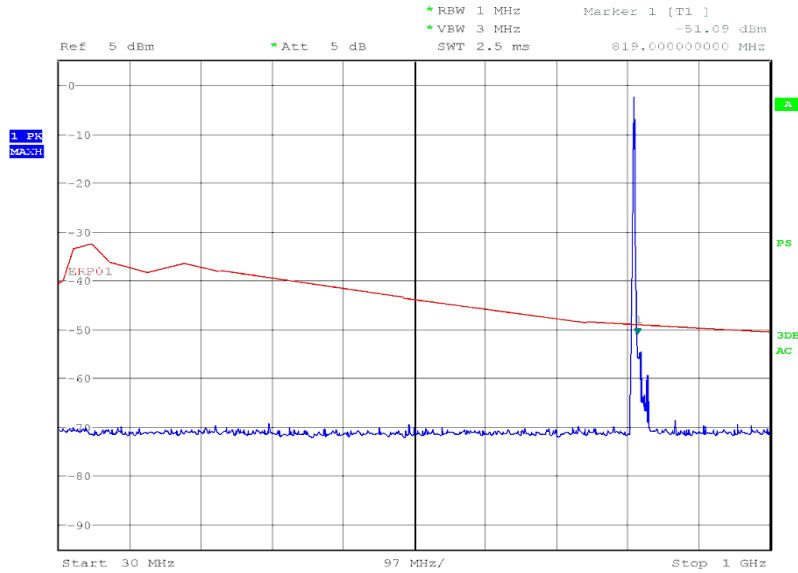


Date: 1.JUN.2015 22:45:55



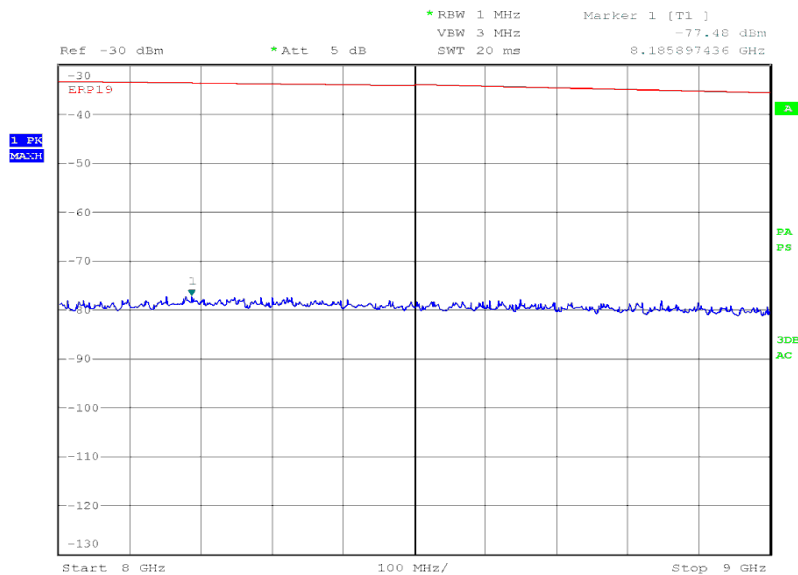
Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:44:00

LTE FDD 26, 819.0 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

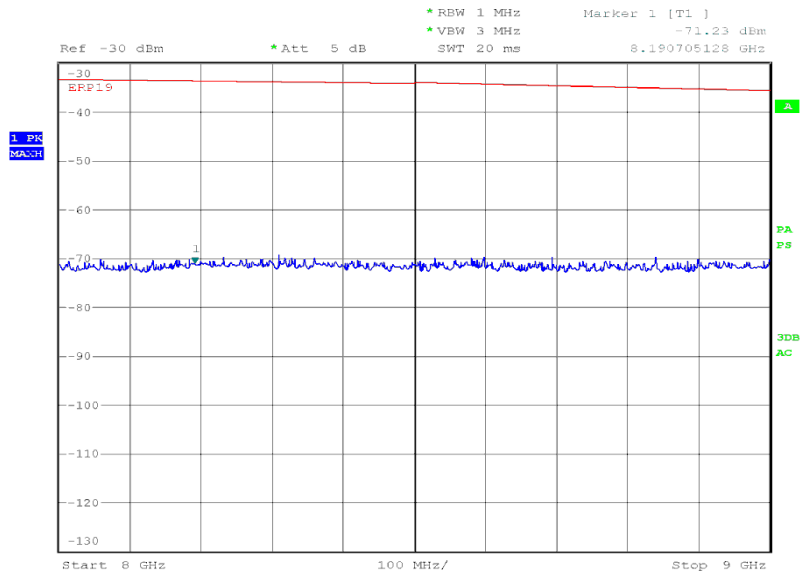


Date: 31.MAY.2015 15:17:28



Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

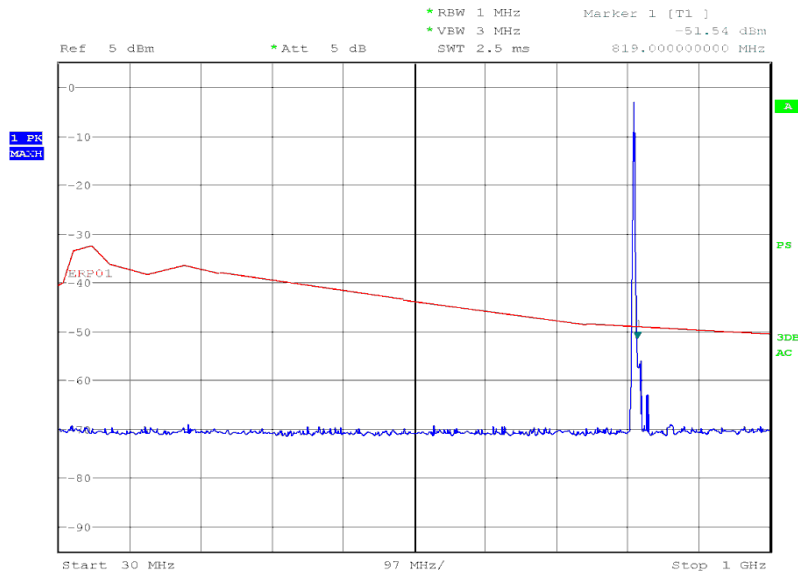


Date: 1.JUN.2015 22:54:51



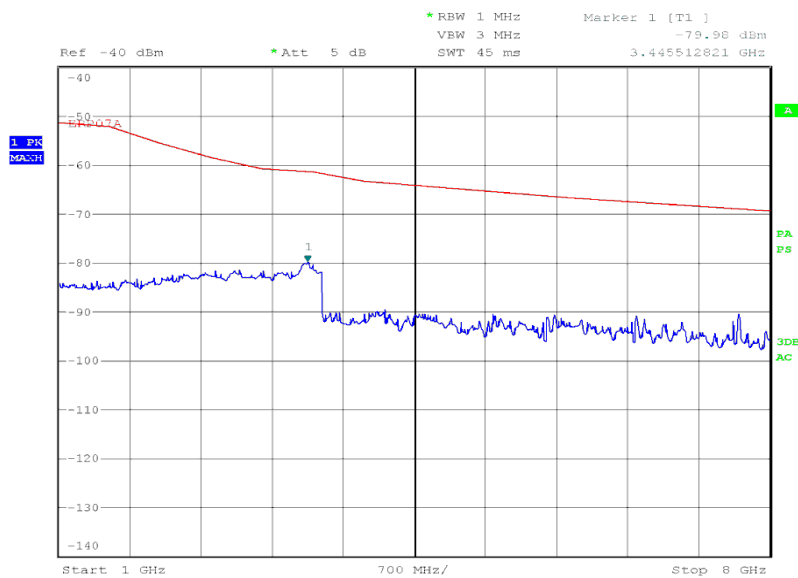
Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Spurious at Antenna Terminals Results



Date: 27.MAY.2015 22:51:09

LTE FDD 26, 819.0 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Spurious at Antenna Terminals Results

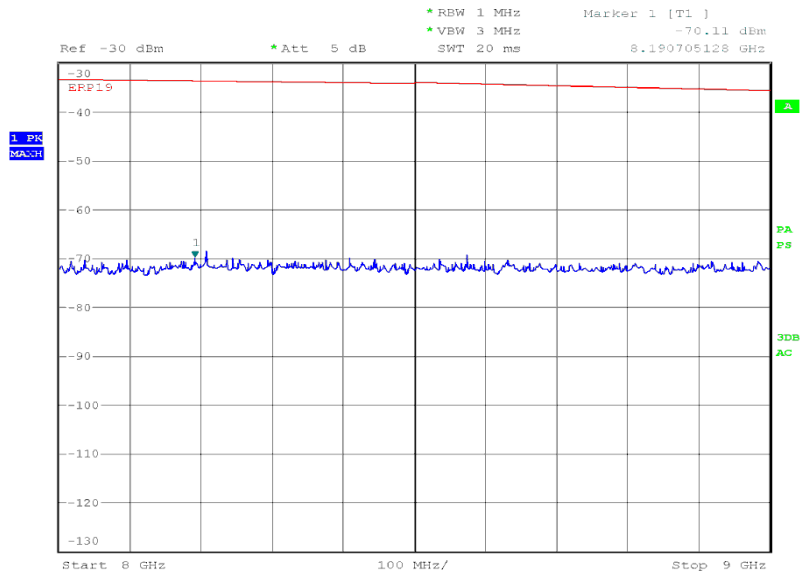


Date: 31.MAY.2015 14:43:54



Product Service

LTE FDD 26, 819.0 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Spurious at Antenna Terminals Results

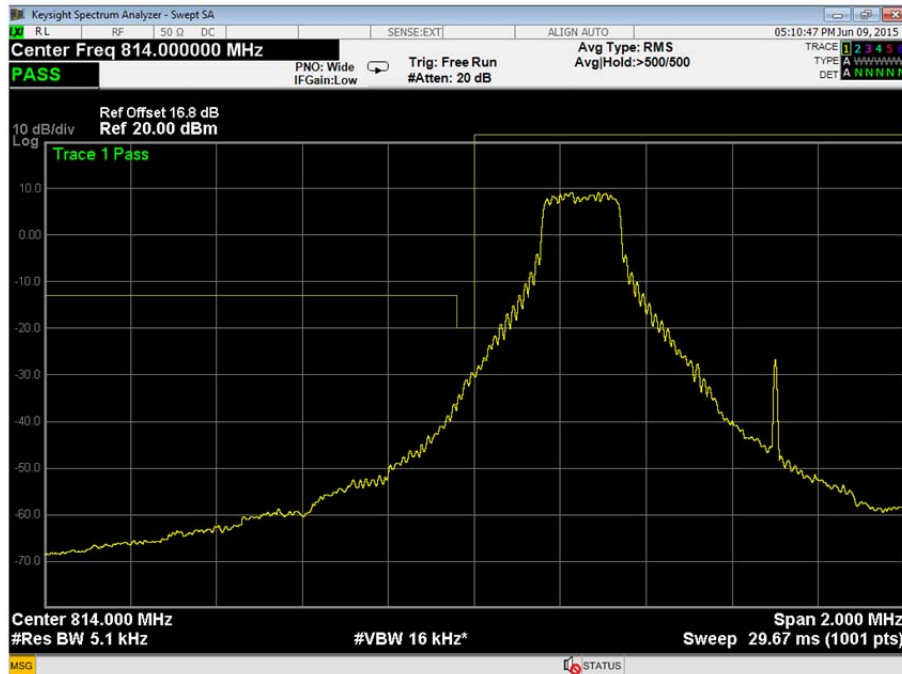


Date: 1.JUN.2015 22:53:26



Product Service

LTE FDD 26, 814.7 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



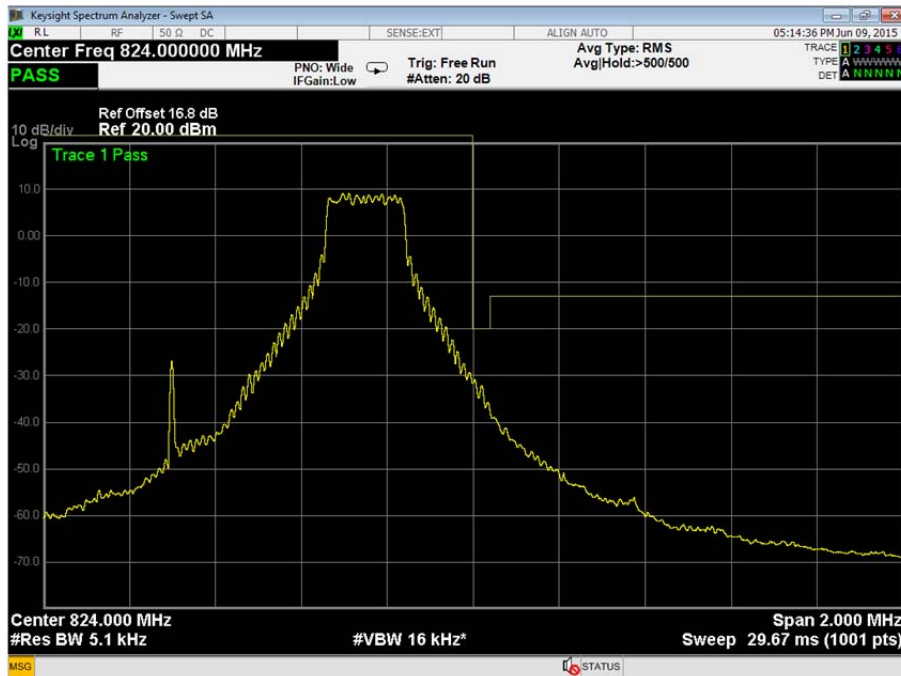
LTE FDD 26, 814.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



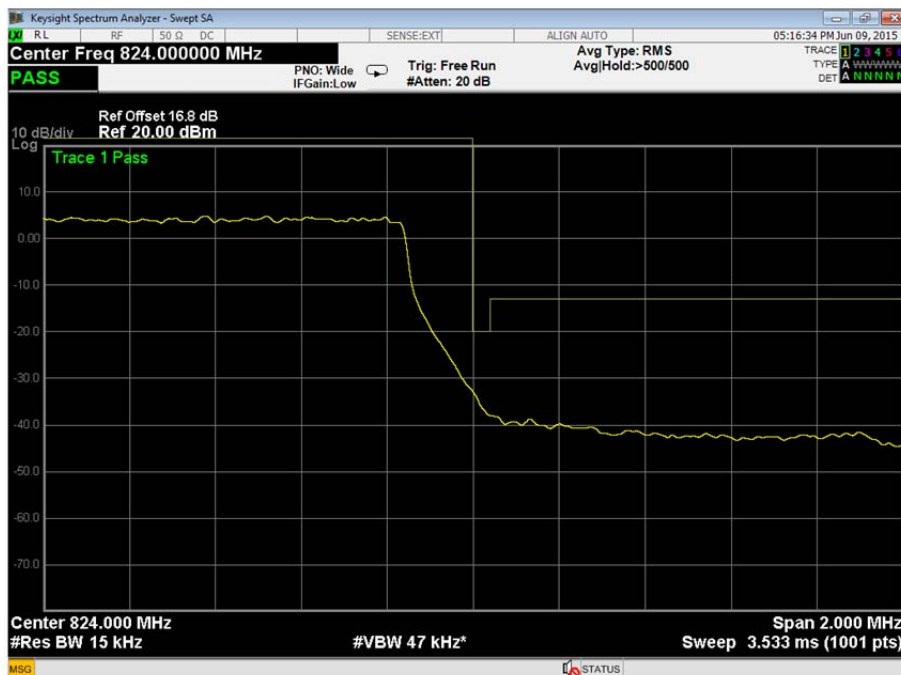


Product Service

LTE FDD 26, 823.3 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



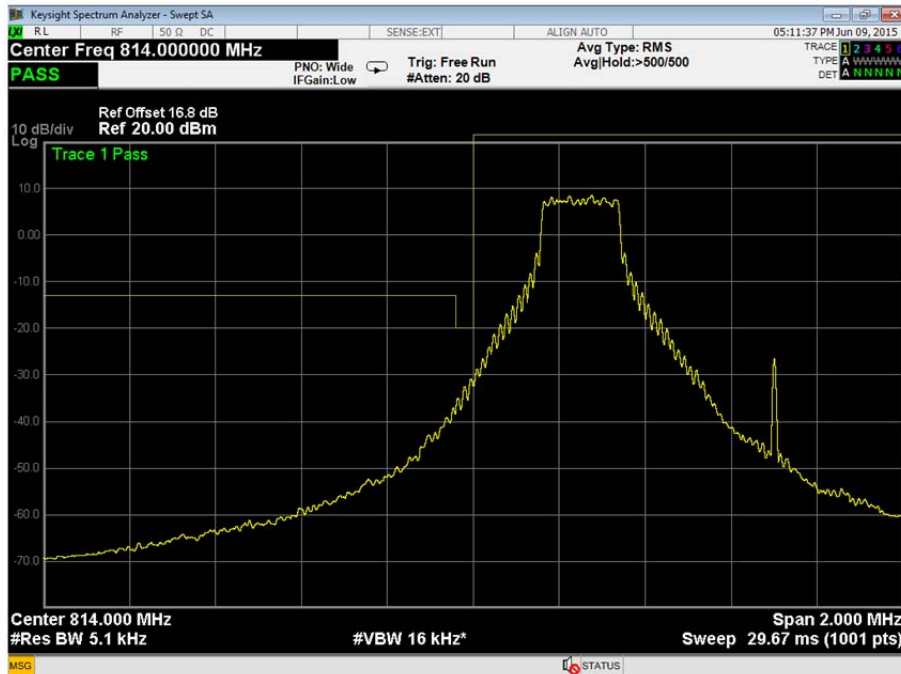
LTE FDD 26, 823.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



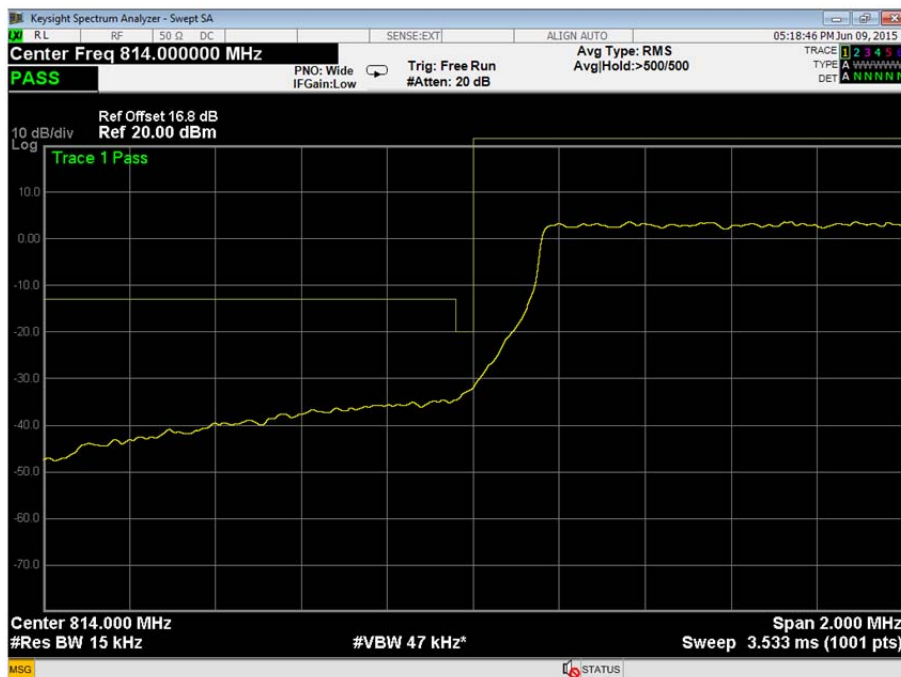


Product Service

LTE FDD 26, 814.7 MHz, 1 Resource Block, Low, 1.4 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



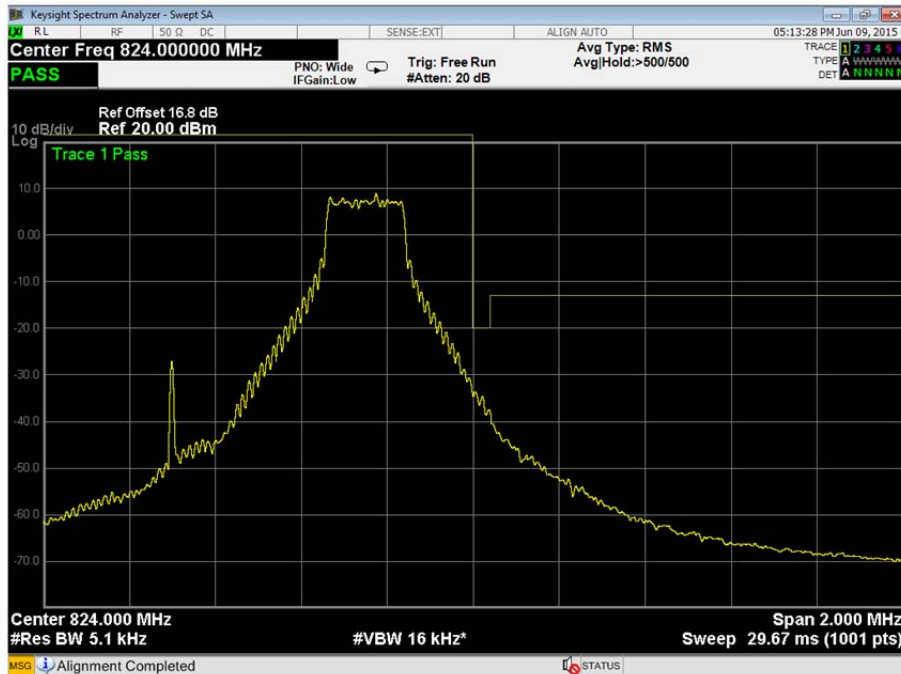
LTE FDD 26, 814.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



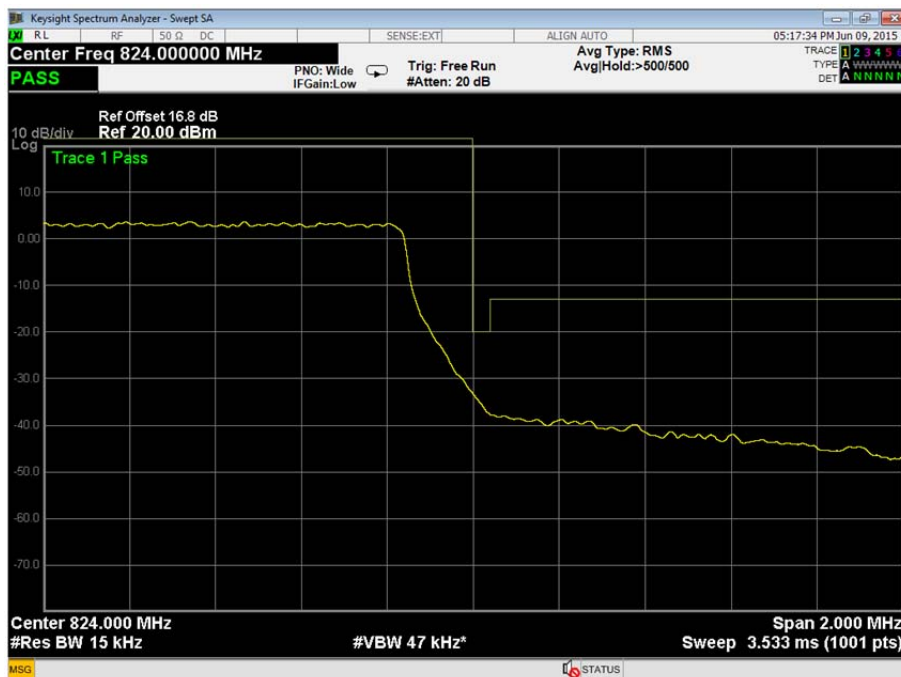


Product Service

LTE FDD 26, 823.3 MHz, 1 Resource Block, High, 1.4 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



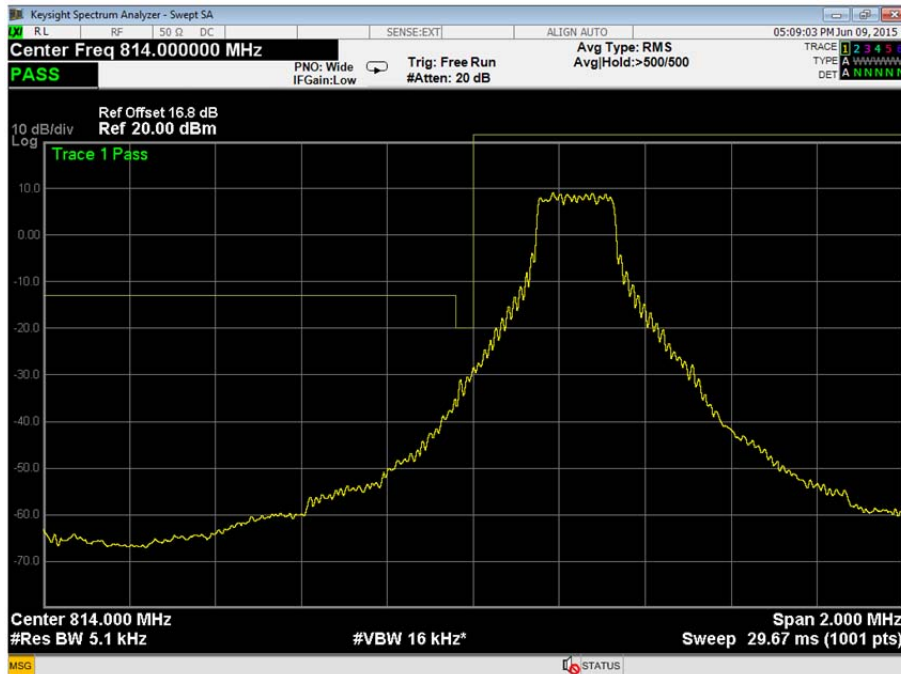
LTE FDD 26, 823.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



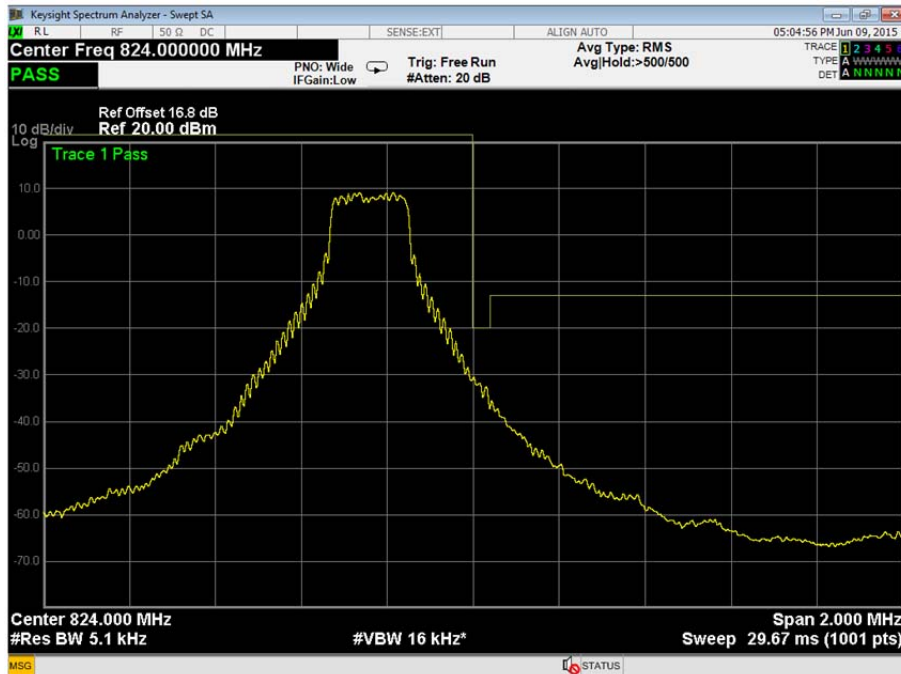
LTE FDD 26, 815.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



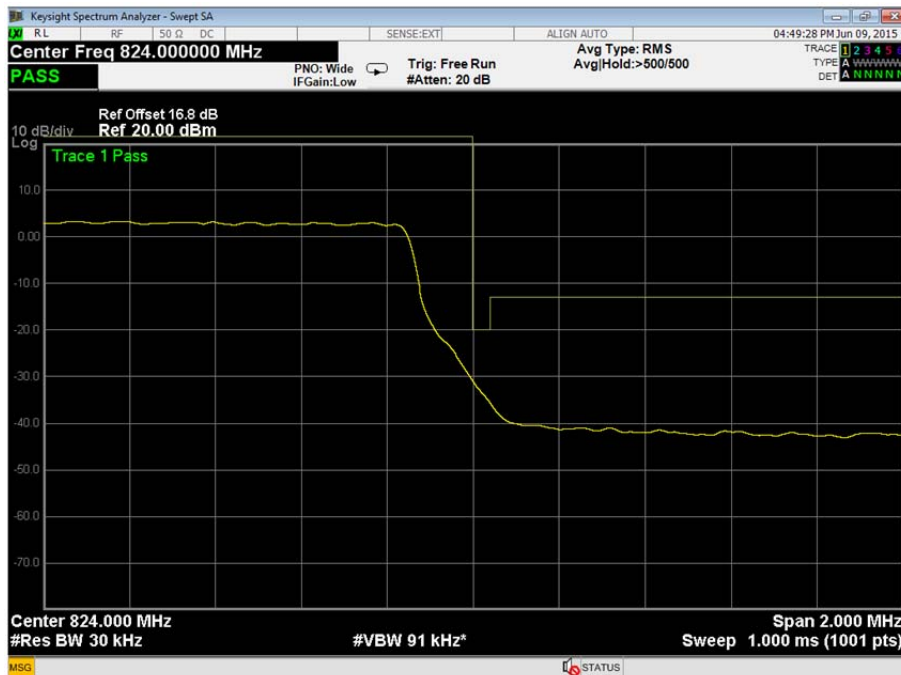


Product Service

LTE FDD 26, 822.5 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



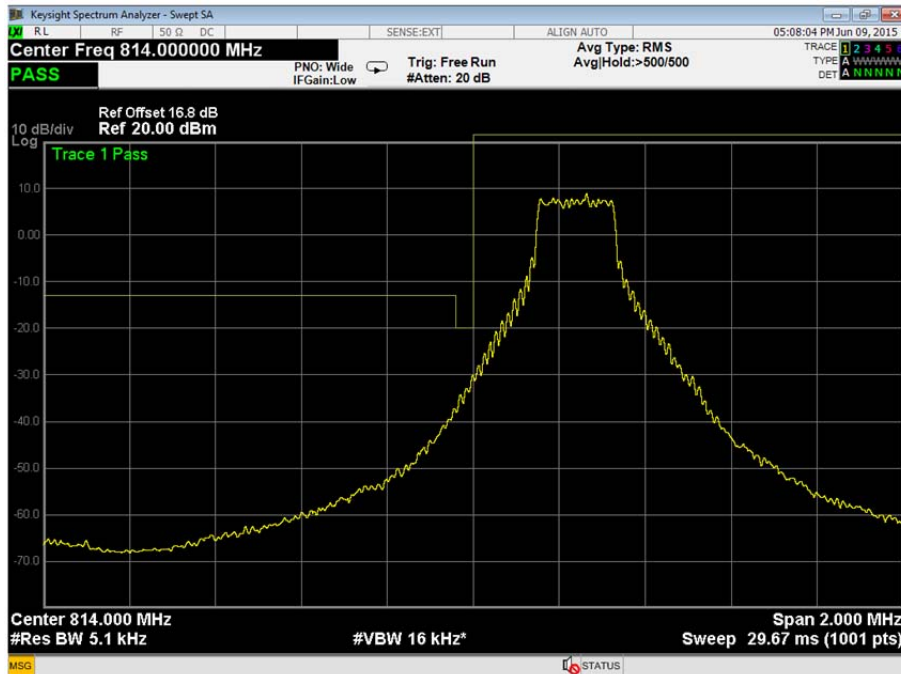
LTE FDD 26, 822.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 815.5 MHz, 1 Resource Block, Low, 3.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



LTE FDD 26, 815.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 822.5 MHz, 1 Resource Block, High, 3.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



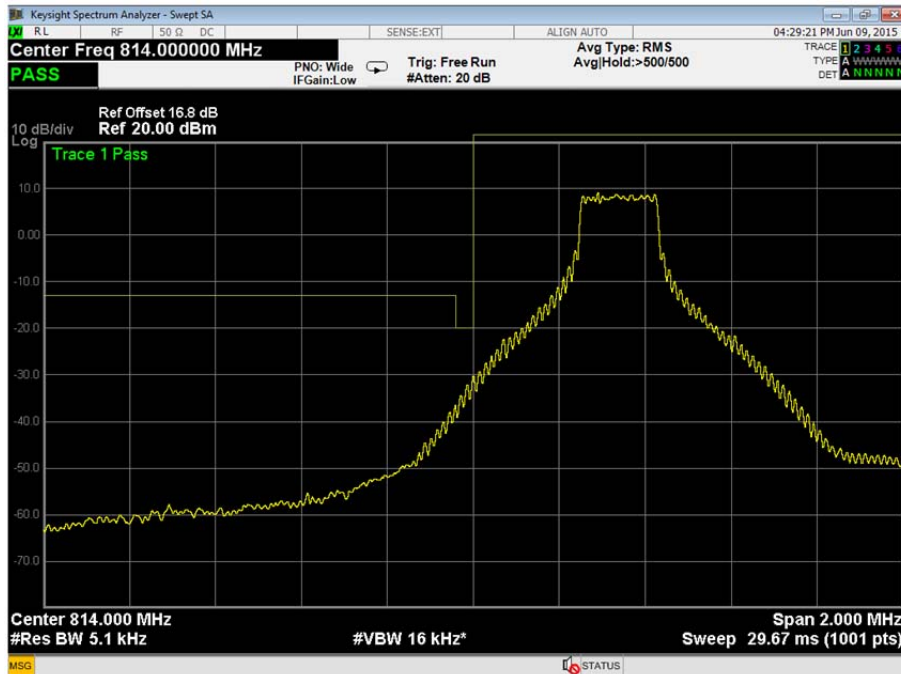
LTE FDD 26, 822.5 MHz, All Resource Blocks, 3.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



LTE FDD 26, 816.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 821.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



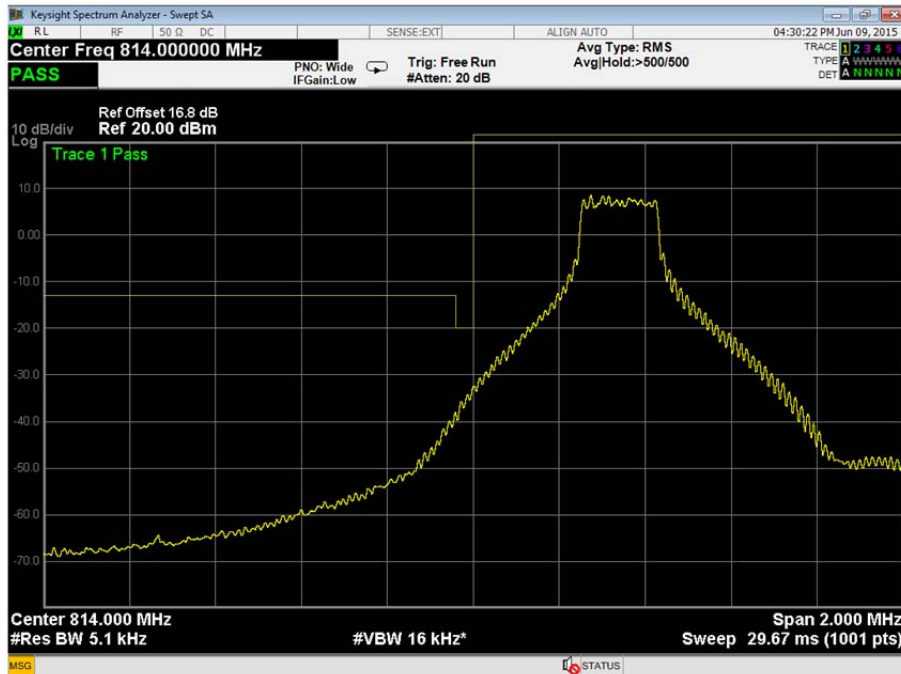
LTE FDD 26, 821.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



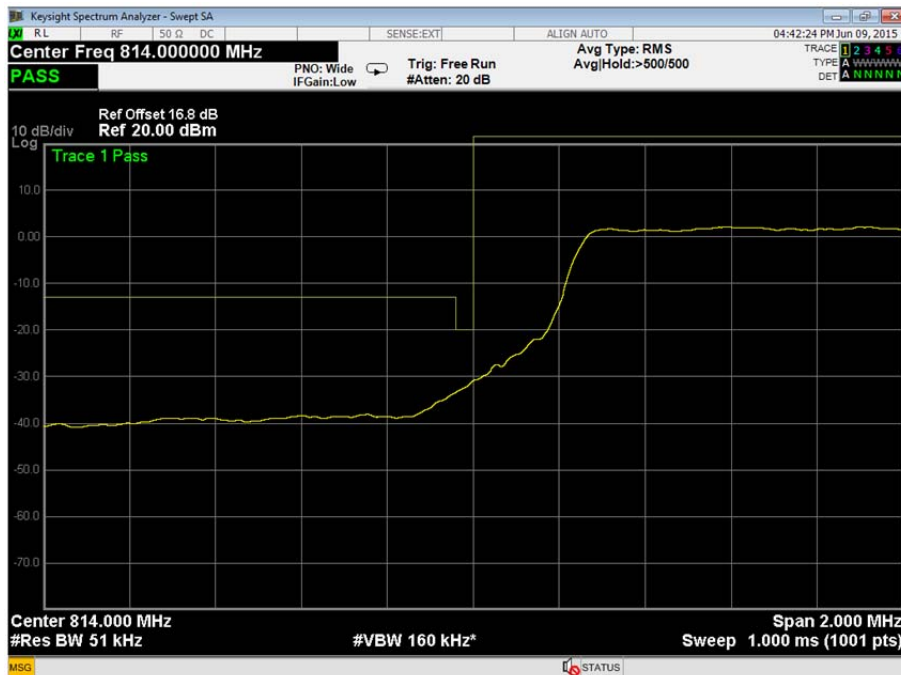


Product Service

LTE FDD 26, 816.5 MHz, 1 Resource Block, Low, 5.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



LTE FDD 26, 816.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 821.5 MHz, 1 Resource Block, High, 5.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



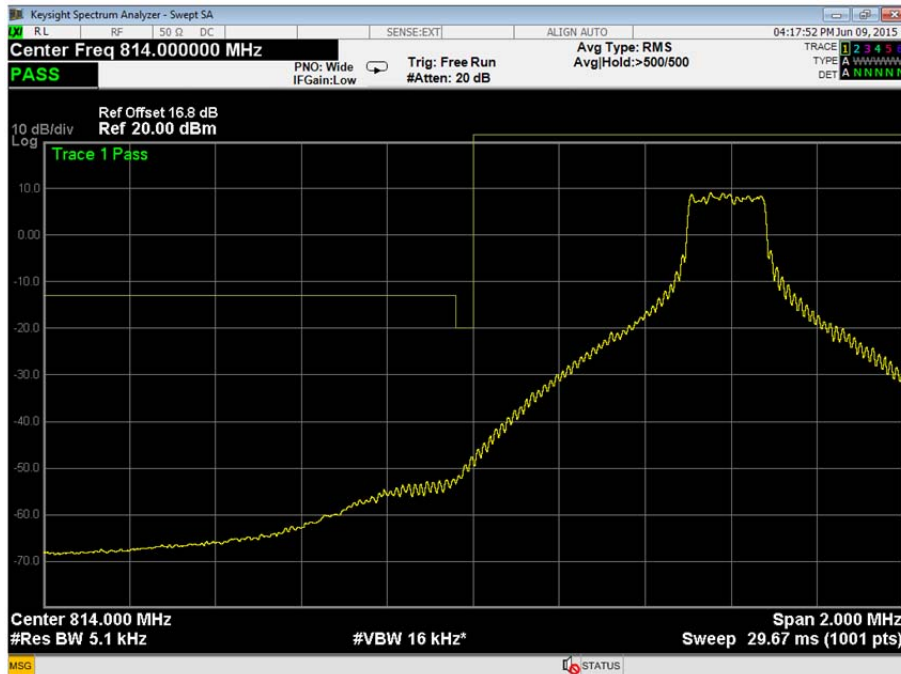
LTE FDD 26, 821.5 MHz, All Resource Blocks, 5.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results





Product Service

LTE FDD 26, 819 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



LTE FDD 26, 819 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



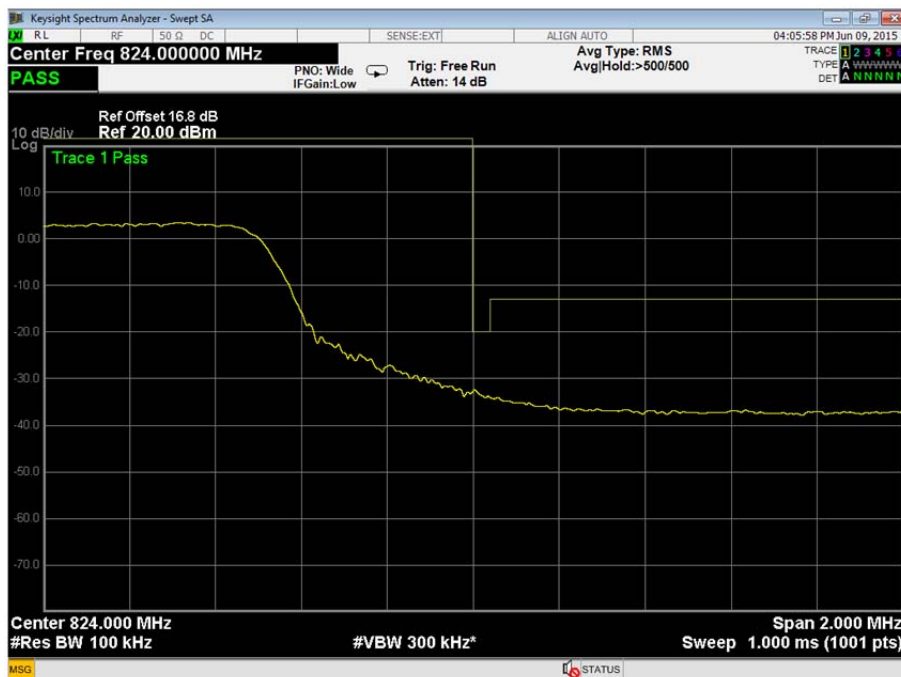


Product Service

LTE FDD 26, 819 MHz, 1 Resource Block, High, 10.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



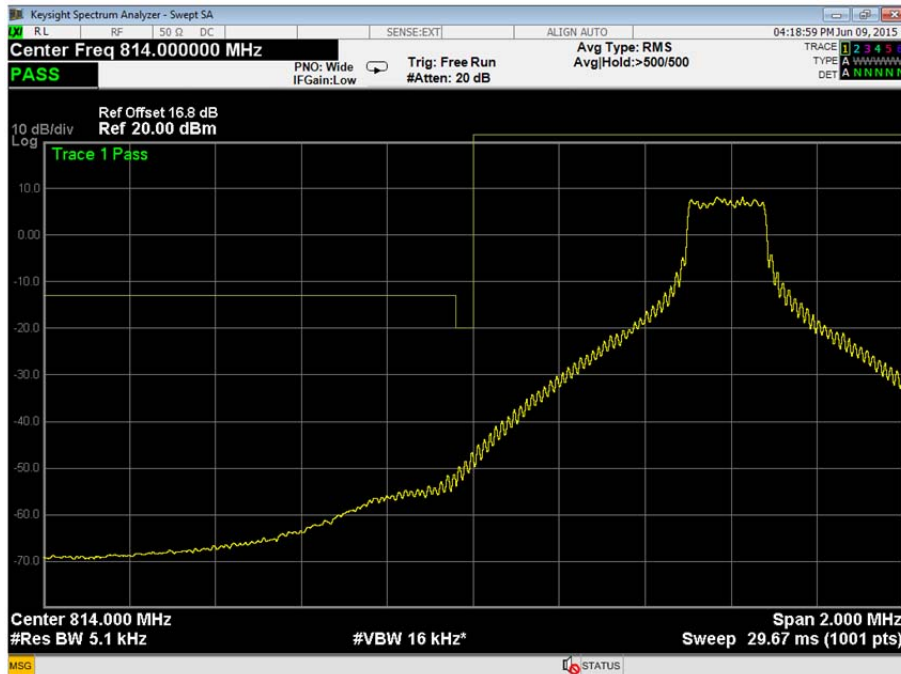
LTE FDD 26, 819 MHz, All Resource Blocks, 10.0 MHz Bandwidth, QPSK, Block Edge, Spurious at Antenna Terminals Results



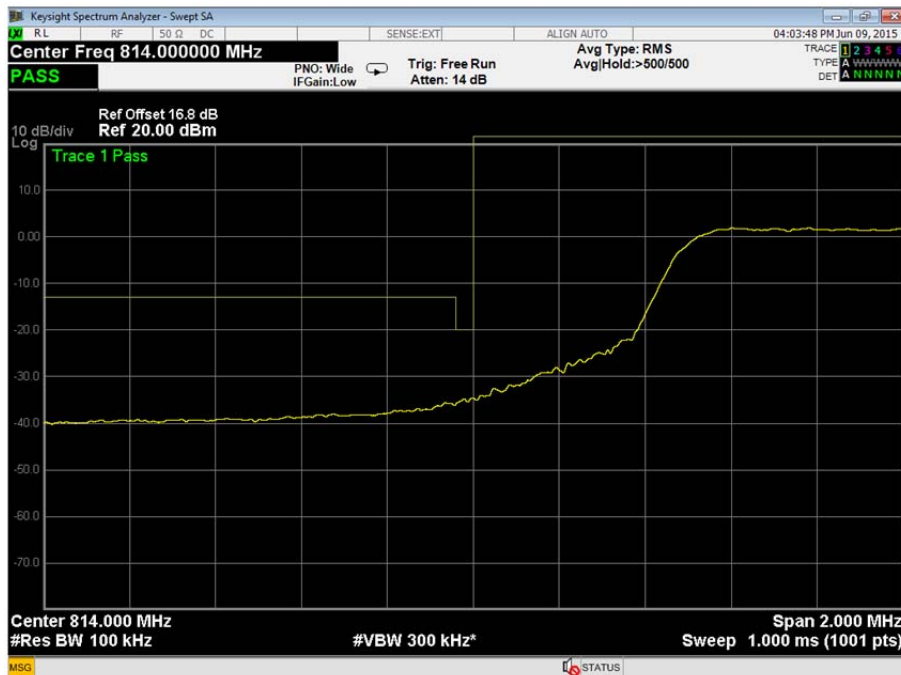


Product Service

LTE FDD 26, 819 MHz, 1 Resource Block, Low, 10.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



LTE FDD 26, 819 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



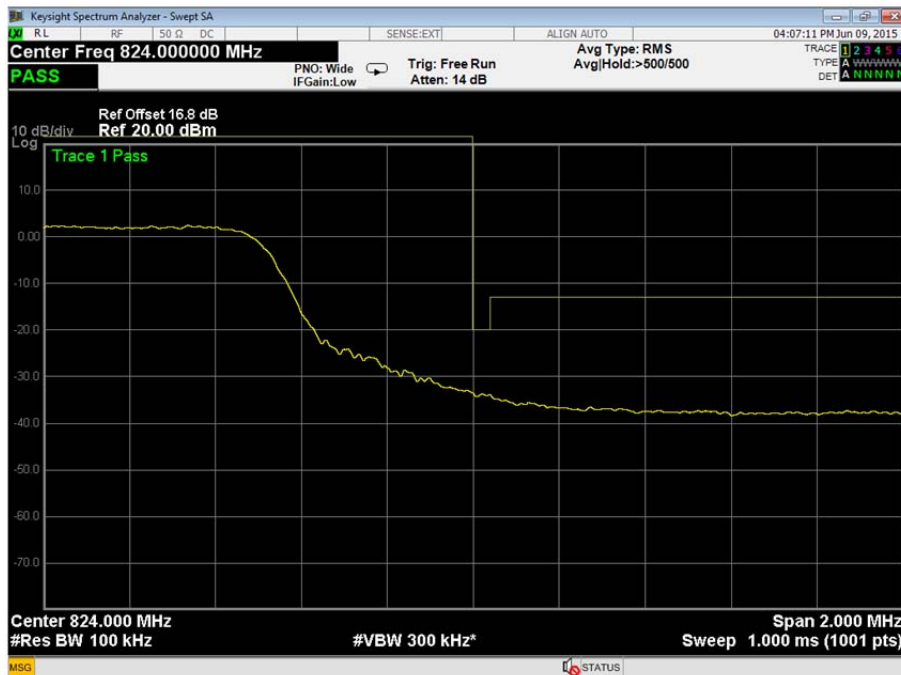


Product Service

LTE FDD 26, 819 MHz, 1 Resource Block, High, 10.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results



LTE FDD 26, 819 MHz, All Resource Blocks, 10.0 MHz Bandwidth, 16-QAM, Block Edge, Spurious at Antenna Terminals Results





Product Service

FCC 47 CFR Part 90, Limit Clause 90.691 (a)(1)(2)

On any frequency removed by up to and include 37.5 kHz	116 + Log ₁₀ (f/6.1) dBc
	50 + Log ₁₀ (P) dBc
	80 dBc
On any frequency removed by > 37.5 kHz	-13 dBm
	80 dBc

Note: Whichever is the lesser attenuation



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 - Occupied Bandwidth					
Power Supply Unit	Hewlett Packard	6253A	441	-	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	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-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
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
Section 2.2 - Frequency Stability					
Radio Communications Test Set	Rohde & Schwarz	CMU 200	39	12	15-Dec-2015
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 Monotel	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



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 – Maximum Conducted Output Power					
Radio Communications Test Set	Rohde & Schwarz	CMU 200	39	12	15-Dec-2015
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



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Spurious Emissions at Antenna Terminals					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
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
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Combiner/Splitter	Weinschel	1506A	3877	12	24-Mar-2016
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
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
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	16-Feb-2016
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-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

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



Product Service

3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Occupied Bandwidth	± 16.74 kHz
Frequency Stability	± 46.70 Hz
Maximum Conducted Output Power	± 0.70 dB
Modulation Characteristics	-
Spurious Emissions at Antenna Terminals	± 3.454 dB



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.

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