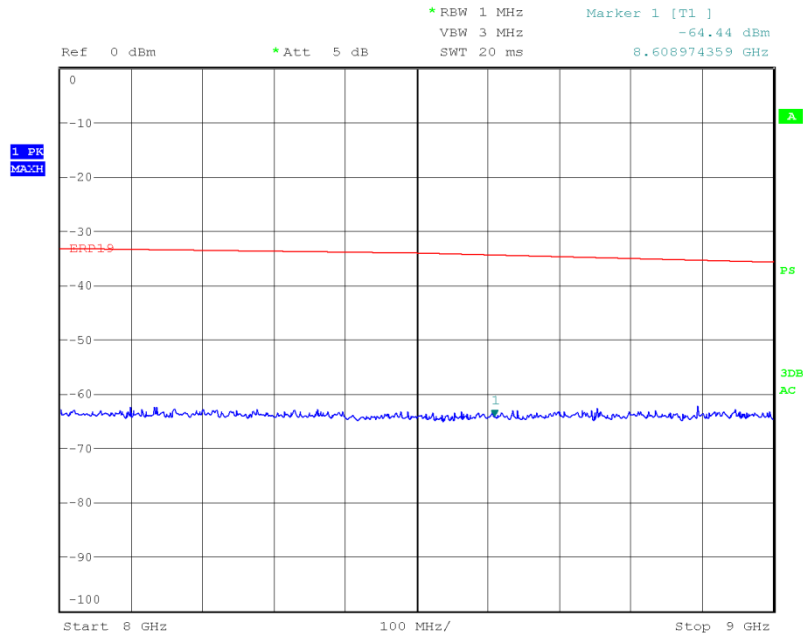




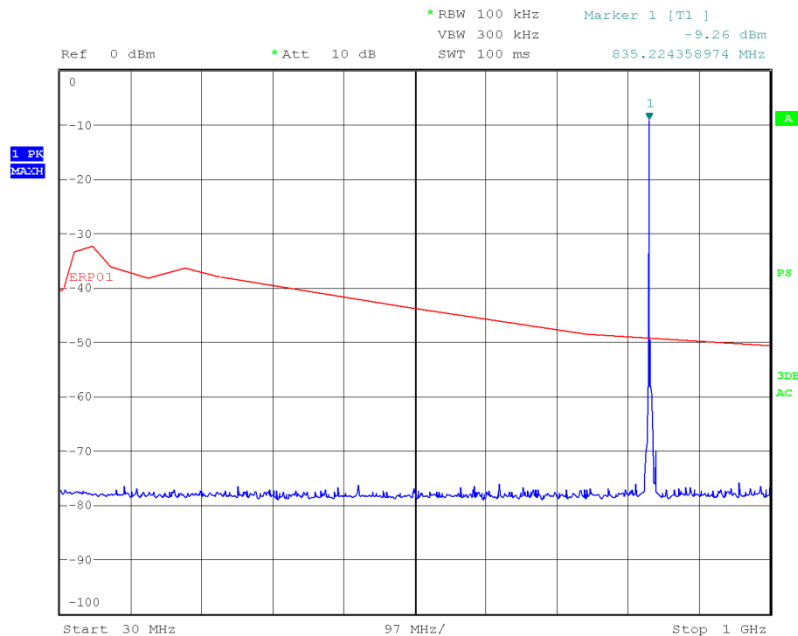
Product Service

LTE FDD 5, 826.5 MHz, 1 Resource Block – High, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 03:07:33

LTE FDD 5, 836.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results

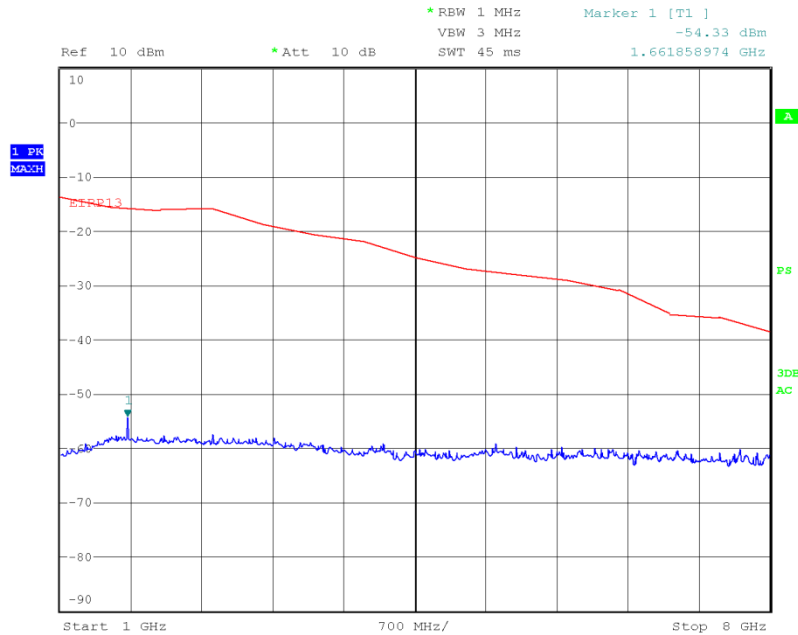


Date: 1.MAY.2015 01:14:37



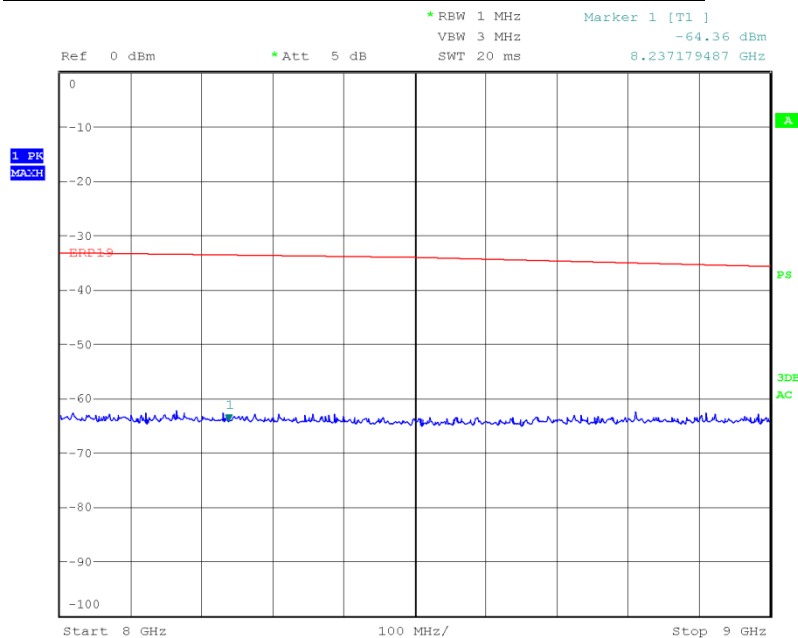
Product Service

LTE FDD 5, 836.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results



Date: 2.MAY.2015 02:22:29

LTE FDD 5, 836.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

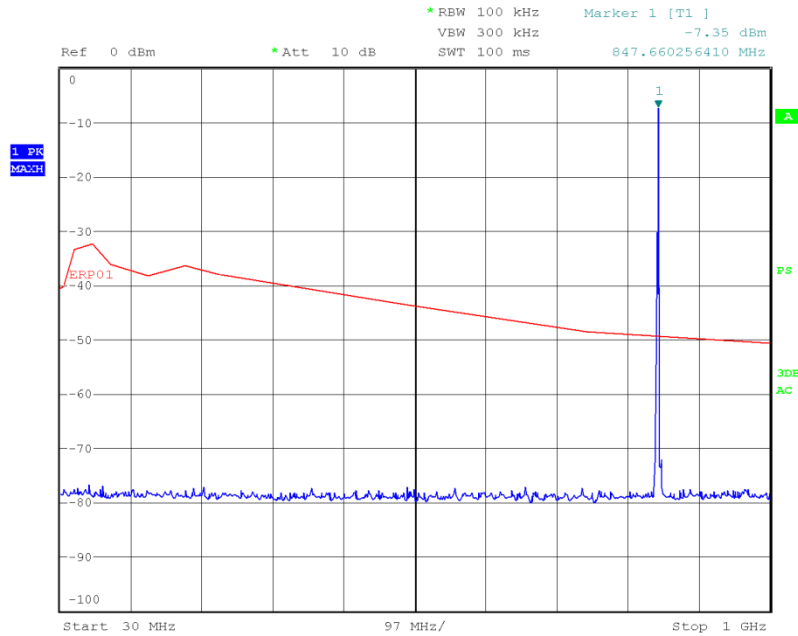


Date: 3.MAY.2015 03:13:31



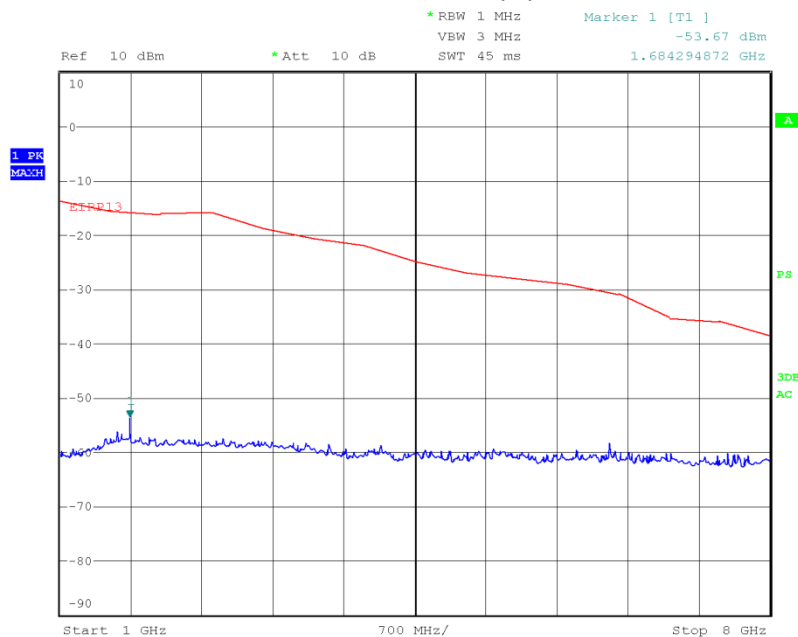
Product Service

LTE FDD 5, 846.5 MHz, 1 Resource Block – Mid, 5.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 1.MAY.2015 01:17:03

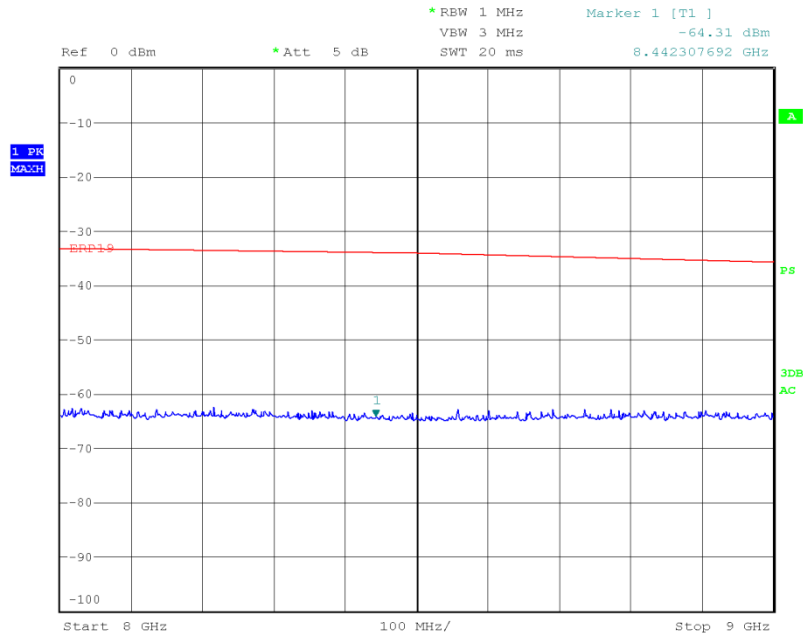
LTE FDD 5, 846.5 MHz, 1 Resource Block – Mid, 5.0 MHz Bandwidth, QPSK, 1 GHz to 8GHz, Emission Limitations for Cellular Equipment Results



Date: 2.MAY.2015 02:29:56

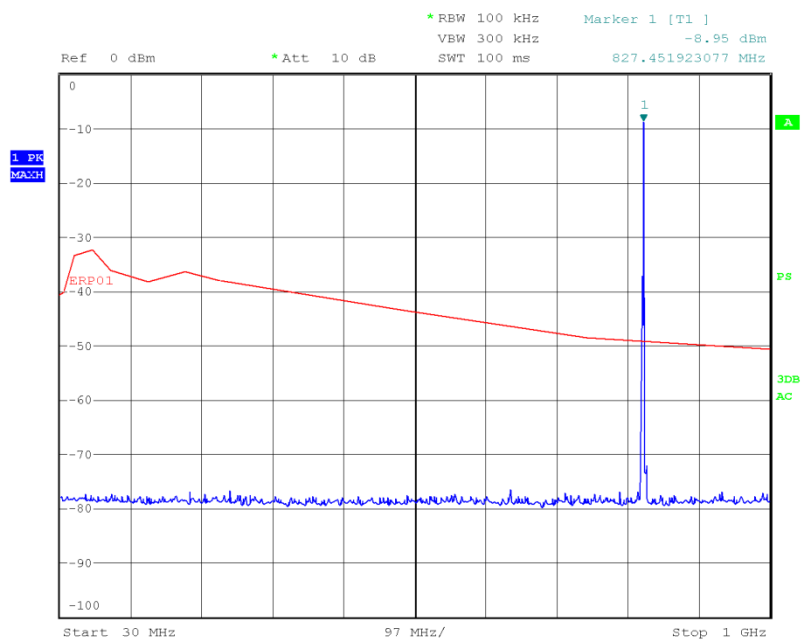


LTE FDD 5, 846.5 MHz, 1 Resource Block – Mid, 5.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 02:59:22

LTE FDD 5, 826.5 MHz, 1 Resource Block – Mid, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results

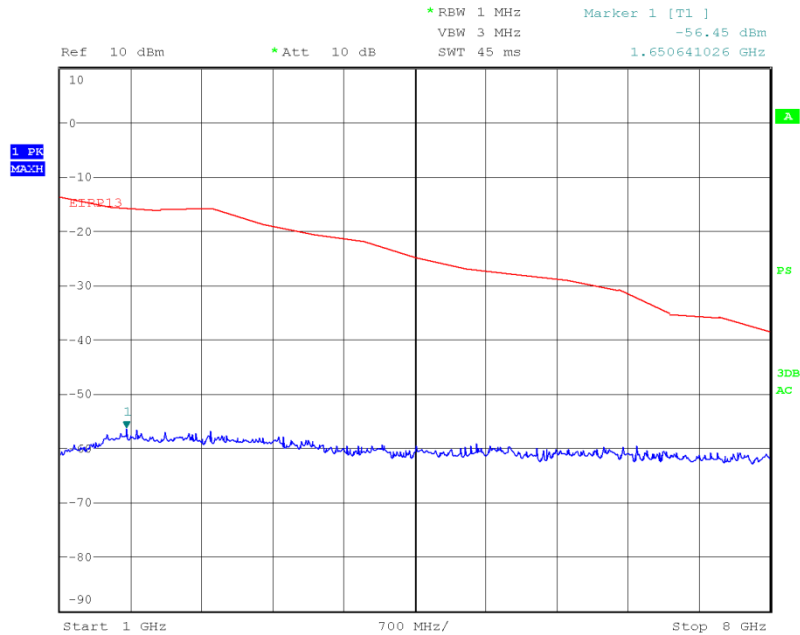


Date: 1.MAY.2015 01:36:00



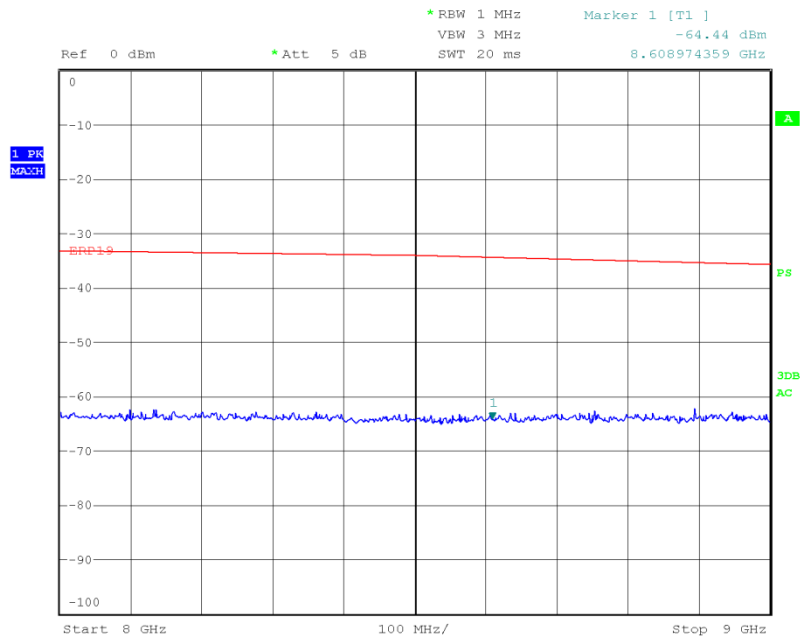
Product Service

LTE FDD 5, 826.5 MHz, 1 Resource Block – Mid, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results



Date: 2.MAY.2015 02:43:10

LTE FDD 5, 826.5 MHz, 1 Resource Block – Mid, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

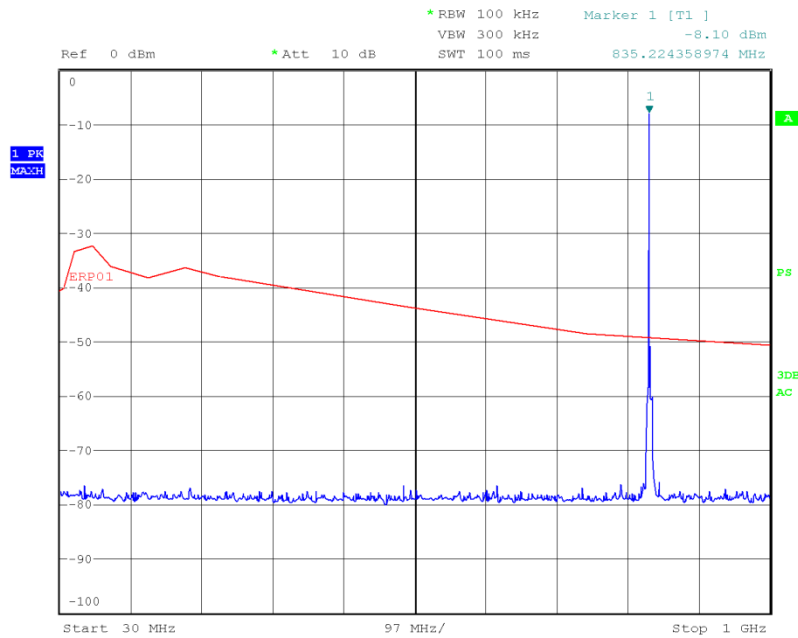


Date: 3.MAY.2015 03:07:33



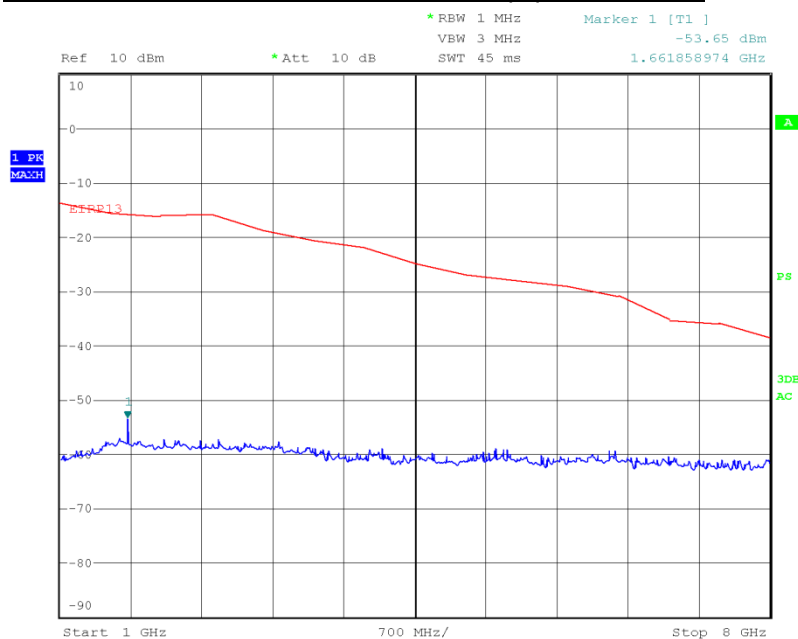
Product Service

LTE FDD 5, 836.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 1.MAY.2015 01:38:33

LTE FDD 5, 836.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

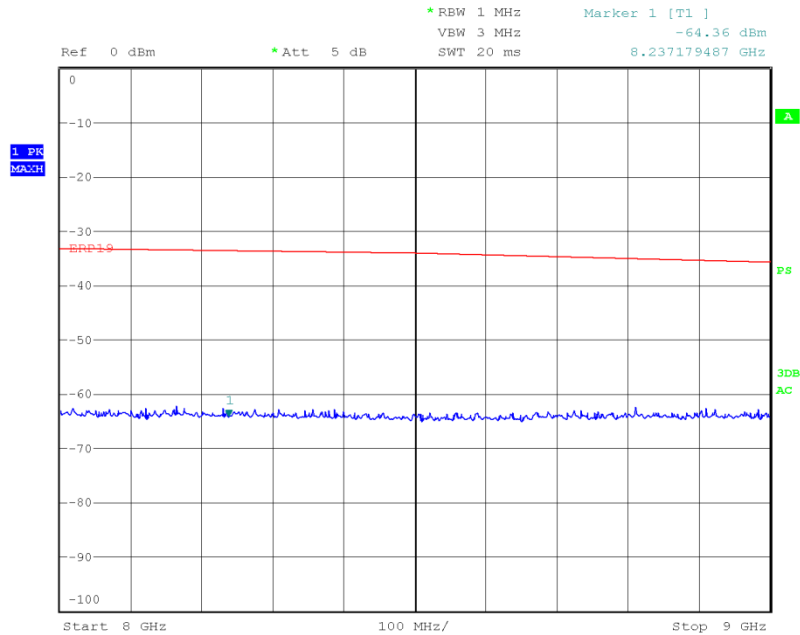


Date: 2.MAY.2015 02:47:19



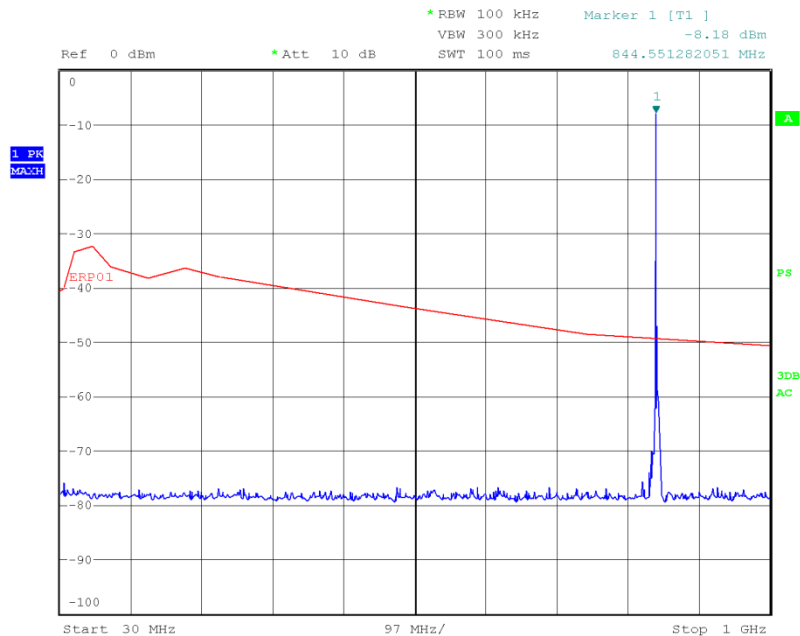
Product Service

LTE FDD 5, 836.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 03:13:31

LTE FDD 5, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results

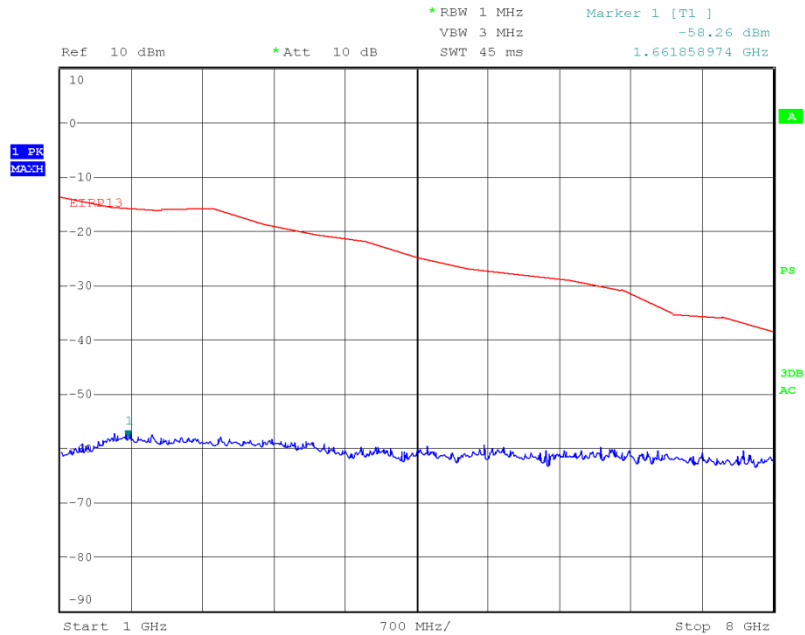


Date: 1.MAY.2015 01:43:56



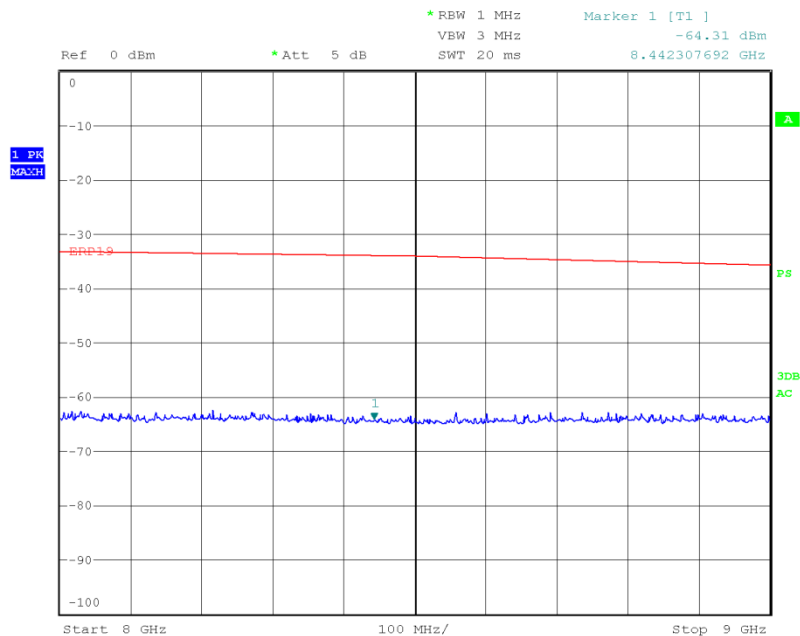
Product Service

LTE FDD 5, 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: 2.MAY.2015 02:49:22

LTE FDD 5, 846.5 MHz, 1 Resource Block – Low, 5.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

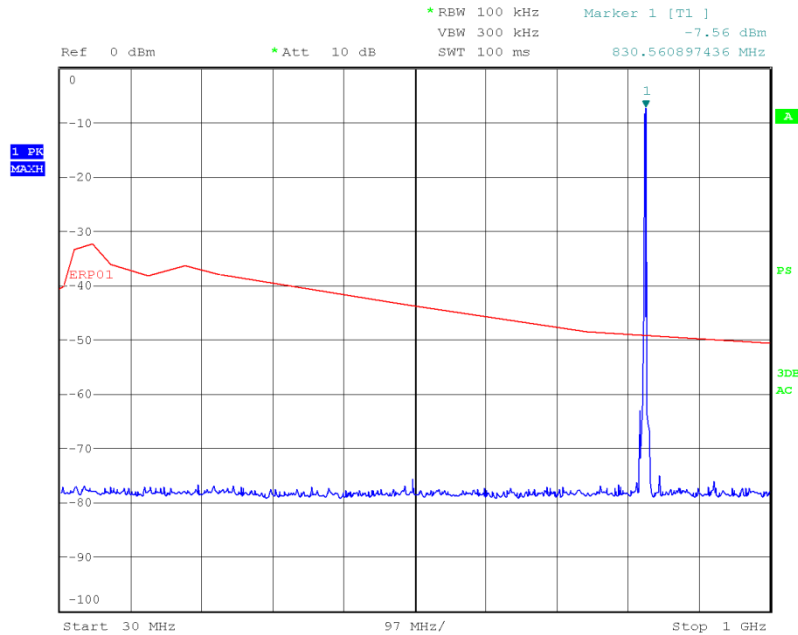


Date: 3.MAY.2015 02:59:22



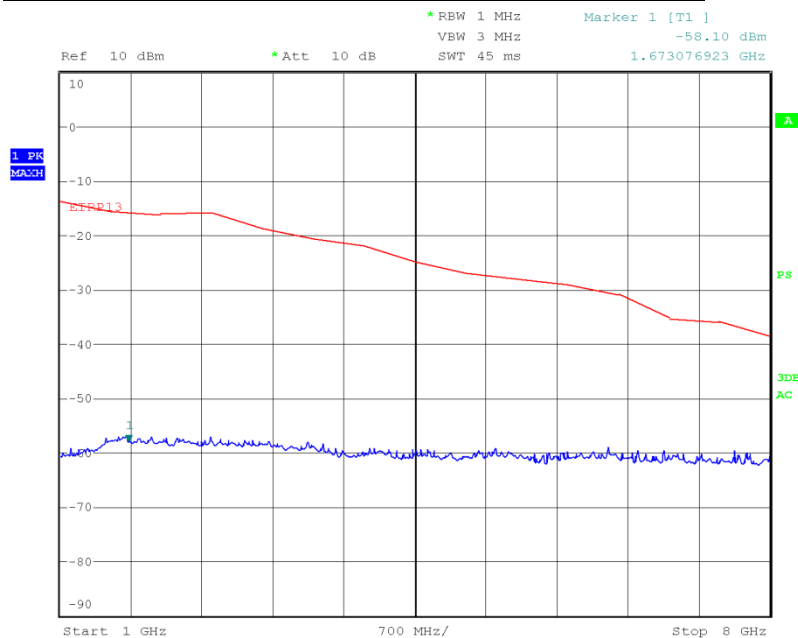
Product Service

LTE FDD 5, 829.0 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 1.MAY.2015 02:08:00

LTE FDD 5, 829.0 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

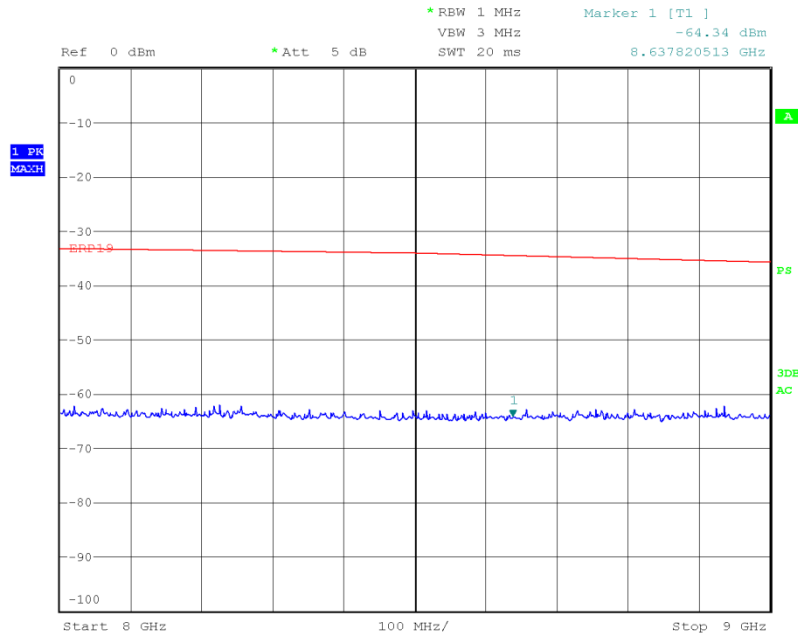


Date: 2.MAY.2015 03:10:45



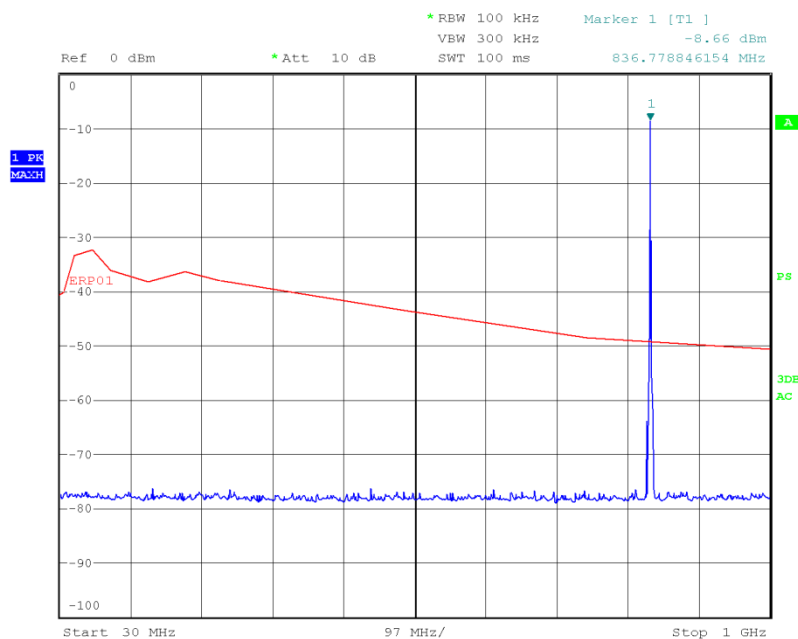
Product Service

LTE FDD 5, 829.0 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 03:26:53

LTE FDD 5, 836.5 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results

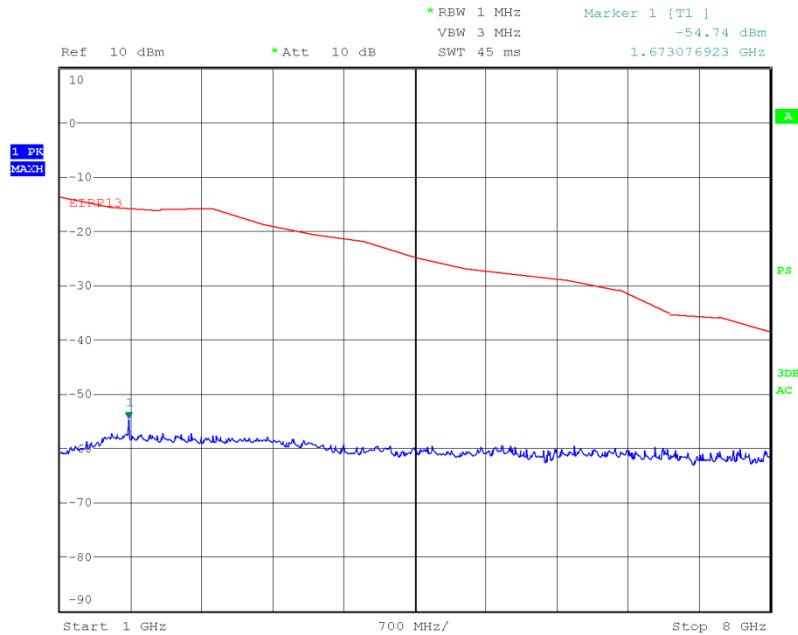


Date: 1.MAY.2015 02:00:46



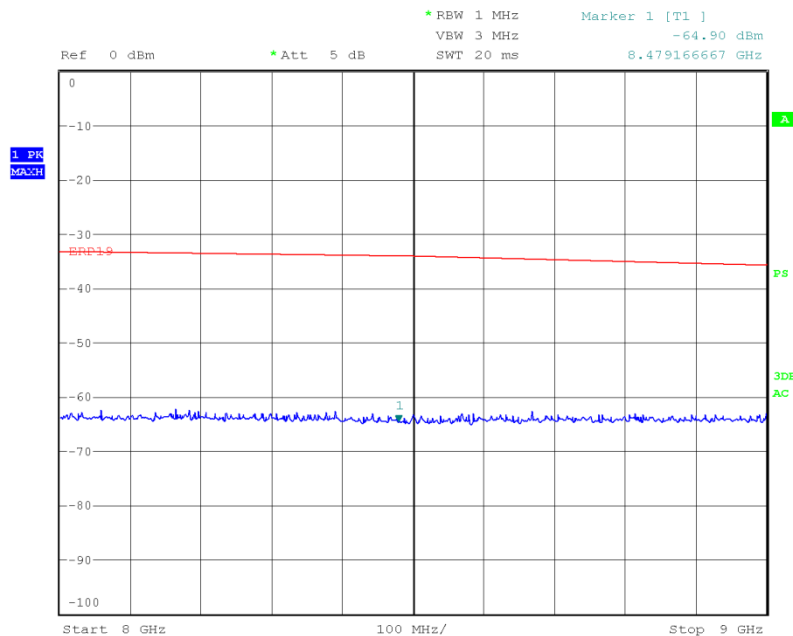
Product Service

LTE FDD 5, 836.5 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results



Date: 2.MAY.2015 02:56:31

LTE FDD 5, 836.5 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

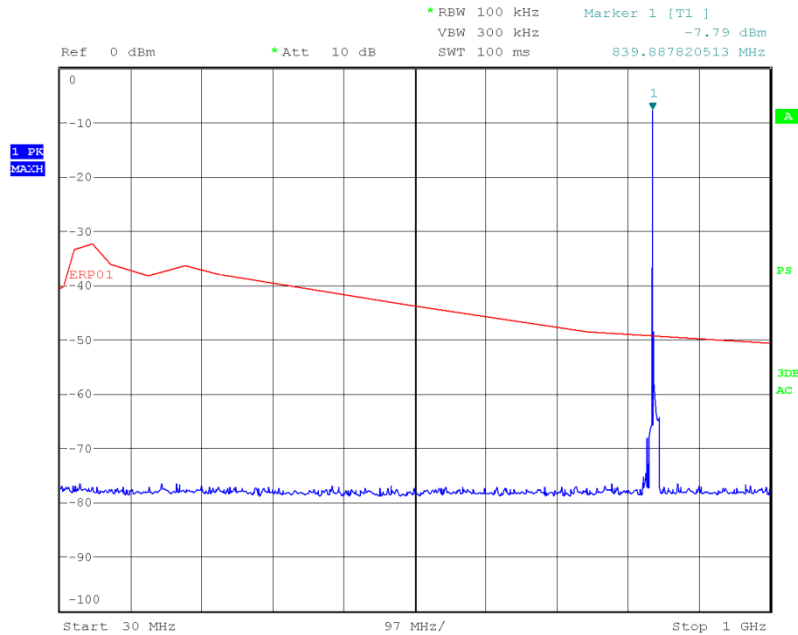


Date: 3.MAY.2015 03:20:49



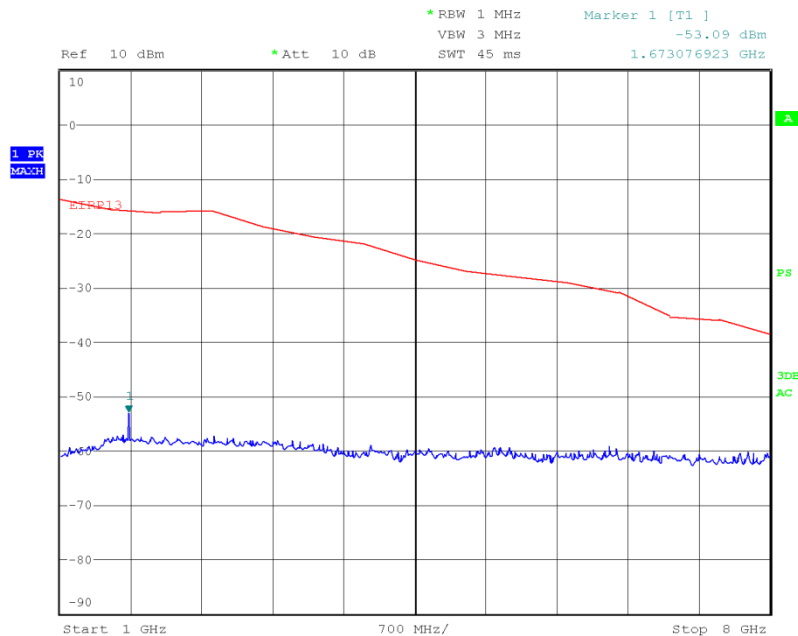
Product Service

LTE FDD 5, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results



Date: 1.MAY.2015 02:21:29

LTE FDD 5, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results

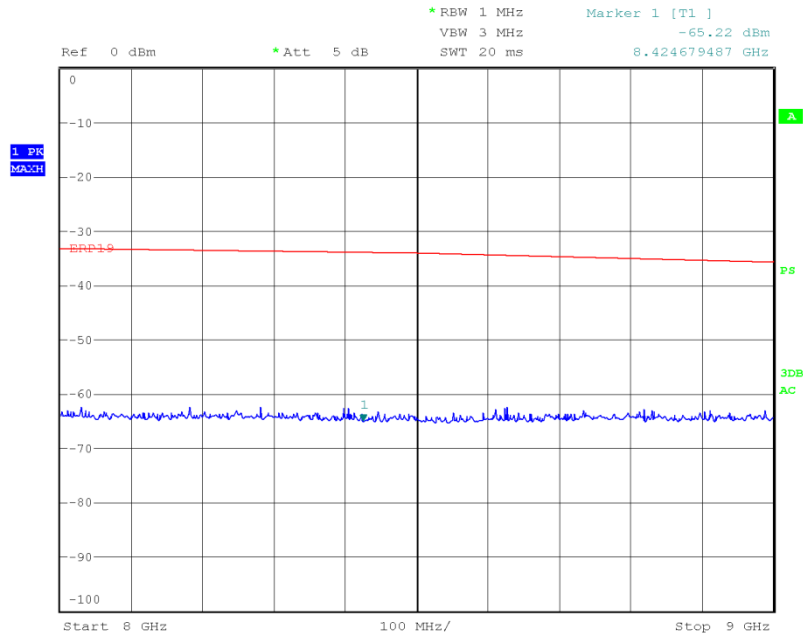


Date: 2.MAY.2015 03:17:37



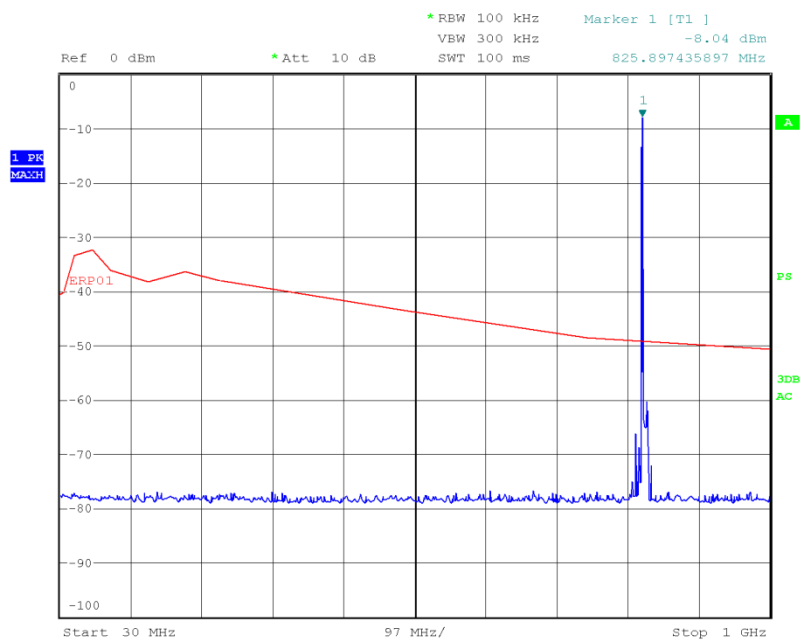
Product Service

LTE FDD 5, 844.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, QPSK, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 03:29:52

LTE FDD 5, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results

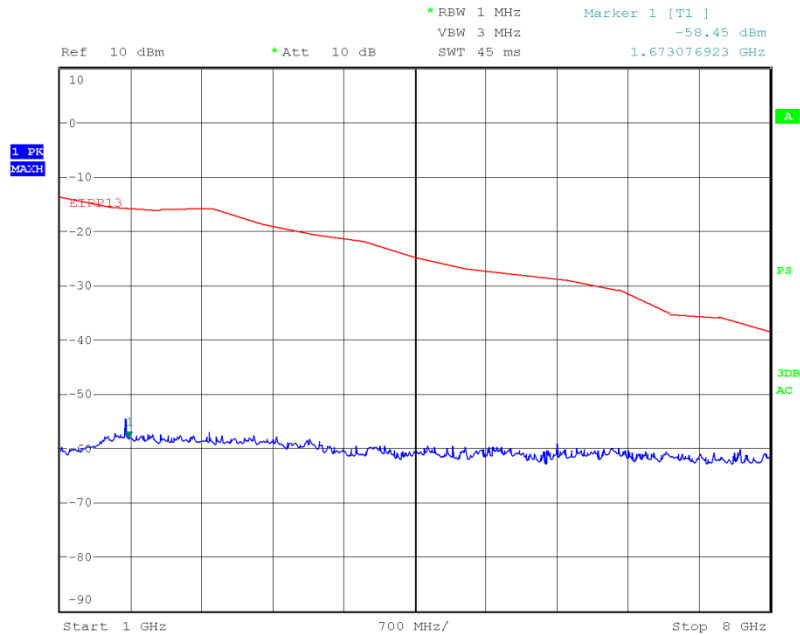


Date: 1.MAY.2015 02:45:52



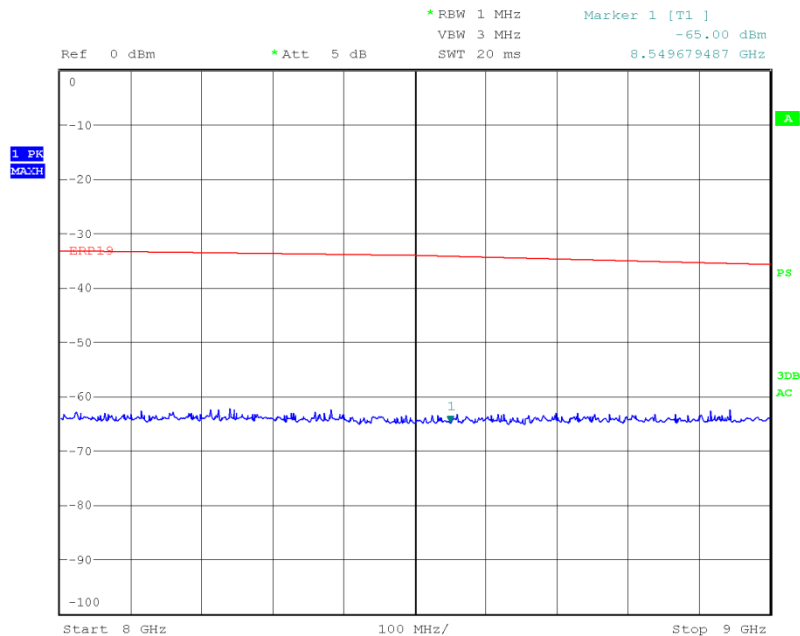
Product Service

LTE FDD 5, 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: 2.MAY.2015 03:32:01

LTE FDD 5, 829.0 MHz, 1 Resource Block – Low, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results

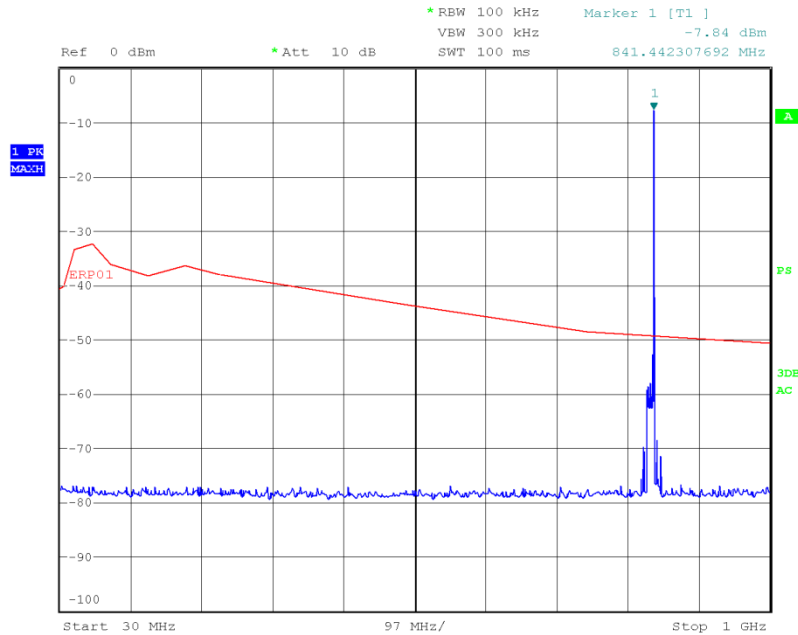


Date: 3.MAY.2015 03:43:34



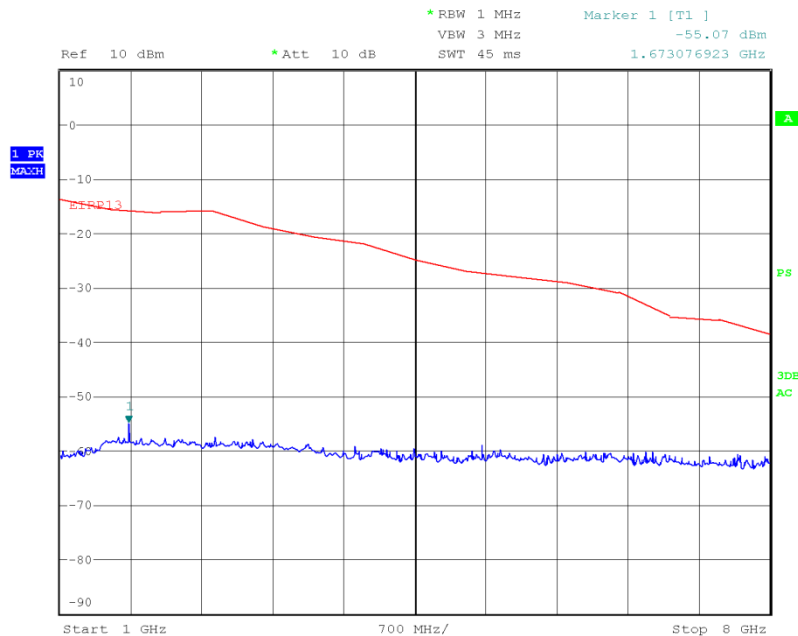
Product Service

LTE FDD 5, 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: 1.MAY.2015 02:36:13

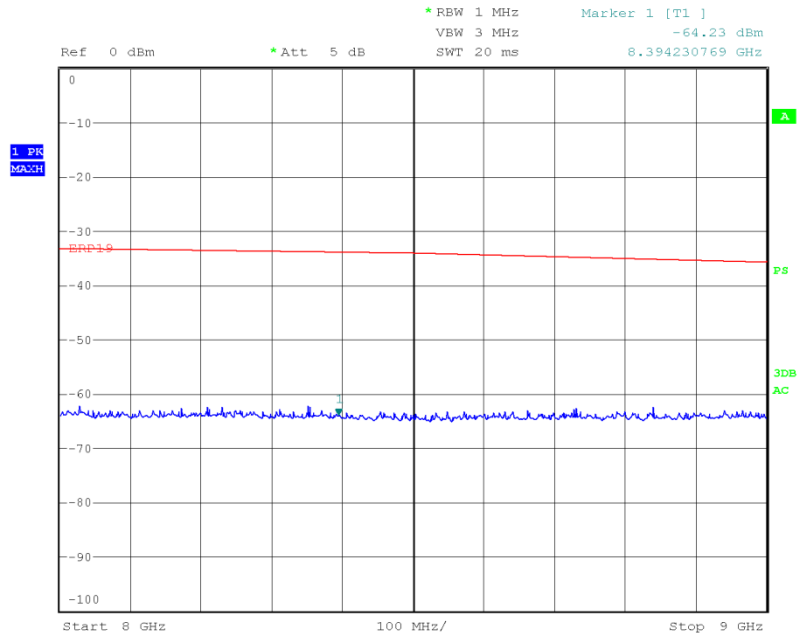
LTE FDD 5, 836.5 MHz, 1 Resource Block – High, 10.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results



Date: 2.MAY.2015 03:27:51

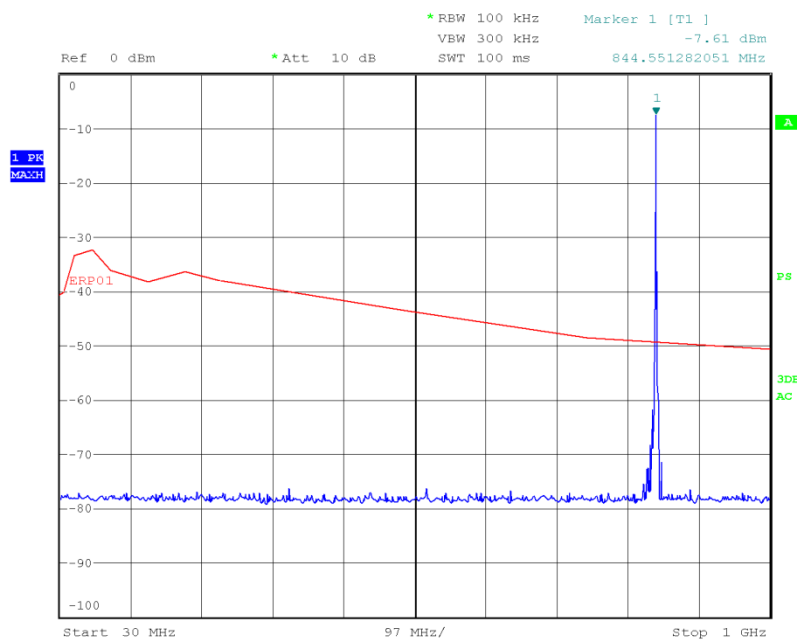


LTE FDD 5, 836.5 MHz, 1 Resource Block – High, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 03:39:19

LTE FDD 5, 844.0 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, 16-QAM, 30 MHz to 1 GHz, Emission Limitations for Cellular Equipment Results

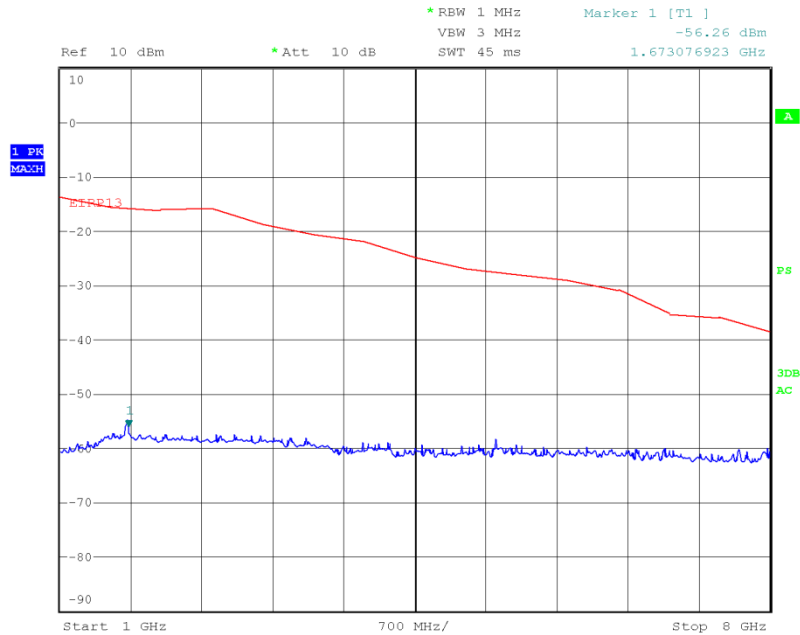


Date: 1.MAY.2015 02:30:09



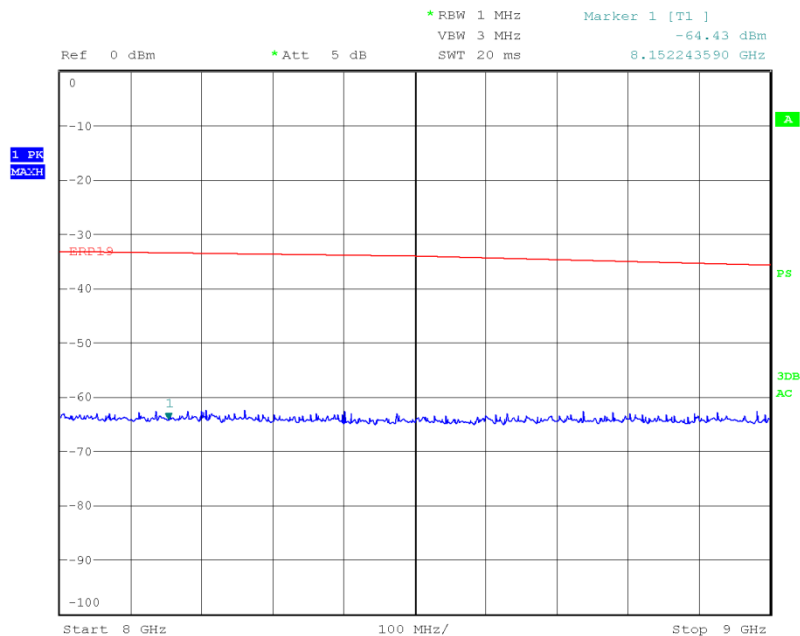
Product Service

LTE FDD 5, 844.0 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, 16-QAM, 1 GHz to 8 GHz, Emission Limitations for Cellular Equipment Results



Date: 2.MAY.2015 03:25:20

LTE FDD 5, 844.0 MHz, 1 Resource Block – Mid, 10.0 MHz Bandwidth, 16-QAM, 8 GHz to 9 GHz, Emission Limitations for Cellular Equipment Results



Date: 3.MAY.2015 03:34:13

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

SHV32 S/N: IMEI 004401115406494 - Modification State 0

2.6.3 Date of Test

28 April 2015 & 29 April 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	23.3 - 24.1°C
Relative Humidity	21.8 - 34.8%



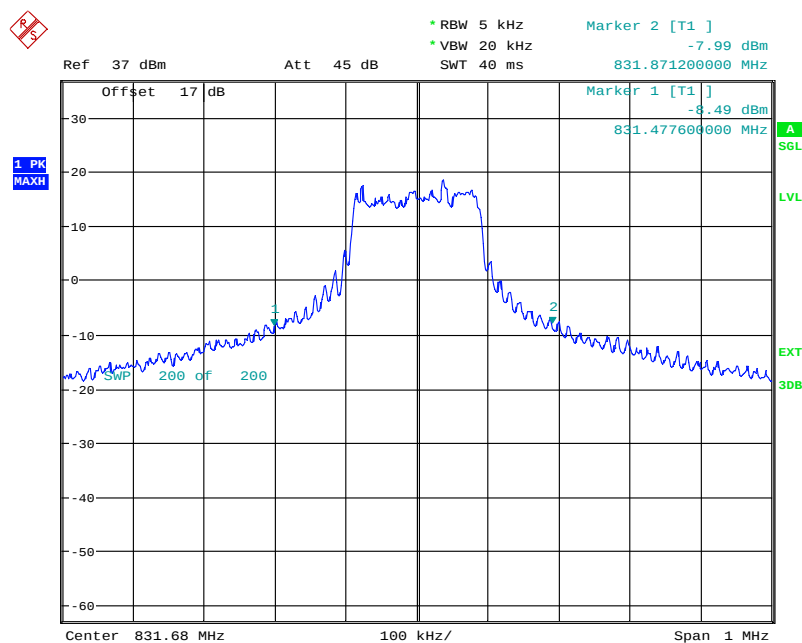
2.6.7 Test Results

4.0 V DC Supply

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

26 dB Bandwidth (kHz)							
831.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High	
N/T	393.6	N/T	14736.0	N/T	401.6	N/T	14640.0

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

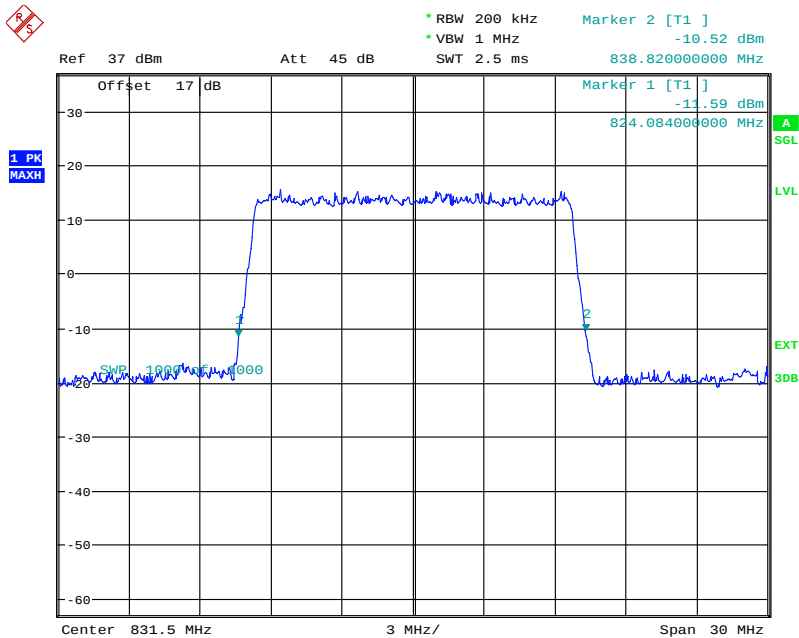


Date: 27.APR.2015 14:17:43



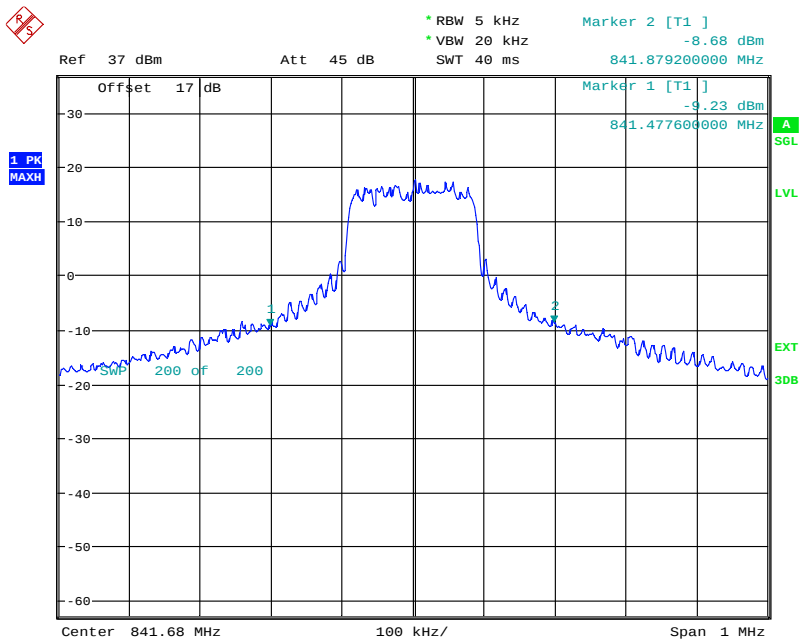
Product Service

LTE FDD 26, 831.5 MHz, All Resource Blocks, 15.0 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 27.APR.2015 14:21:56

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

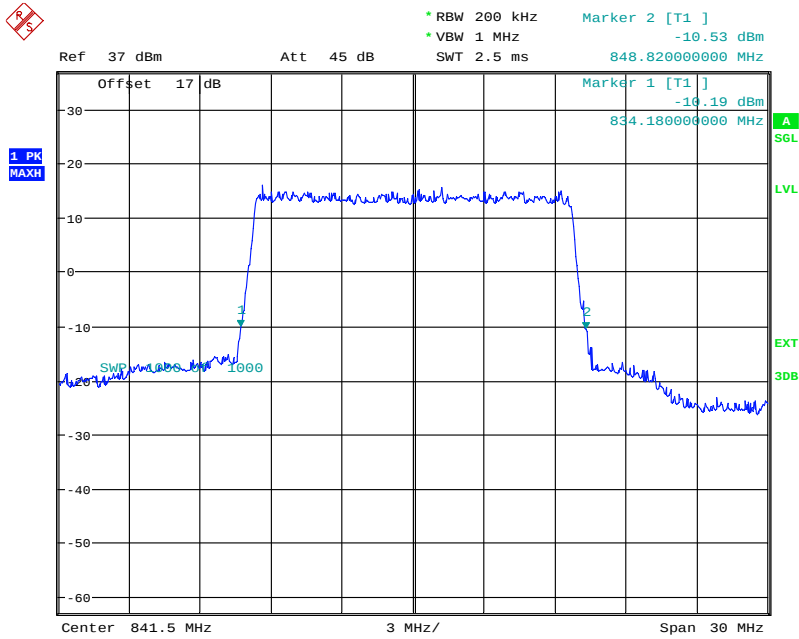


Date: 27.APR.2015 14:04:35



Product Service

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



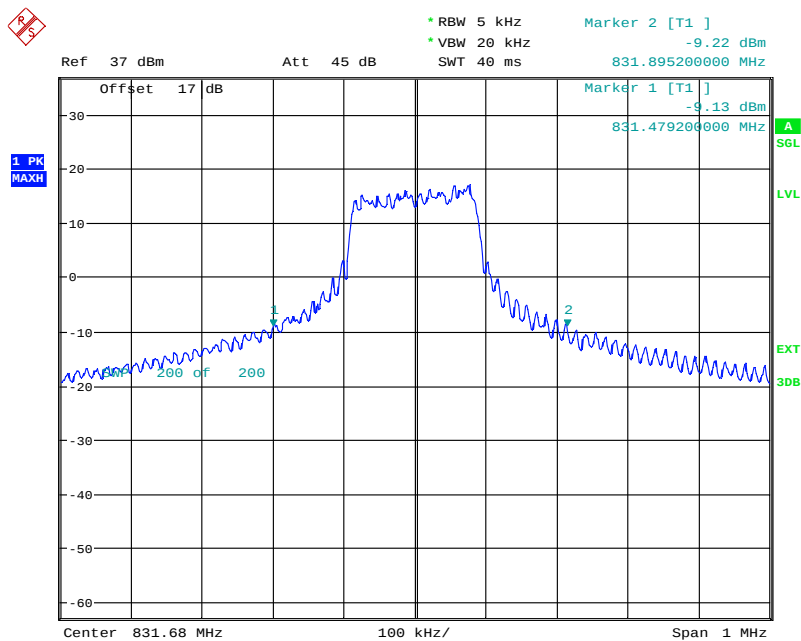
Date: 27.APR.2015 14:01:01



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

26 dB Bandwidth (kHz)							
831.5 MHz				841.5 MHz			
1 Resource Block			All Resource Blocks	1 Resource Block			All Resource Blocks
Low	Mid	High		Low	Mid	High	
N/T	416.0	N/T	14688.0	N/T	388.8	N/T	14688.0

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

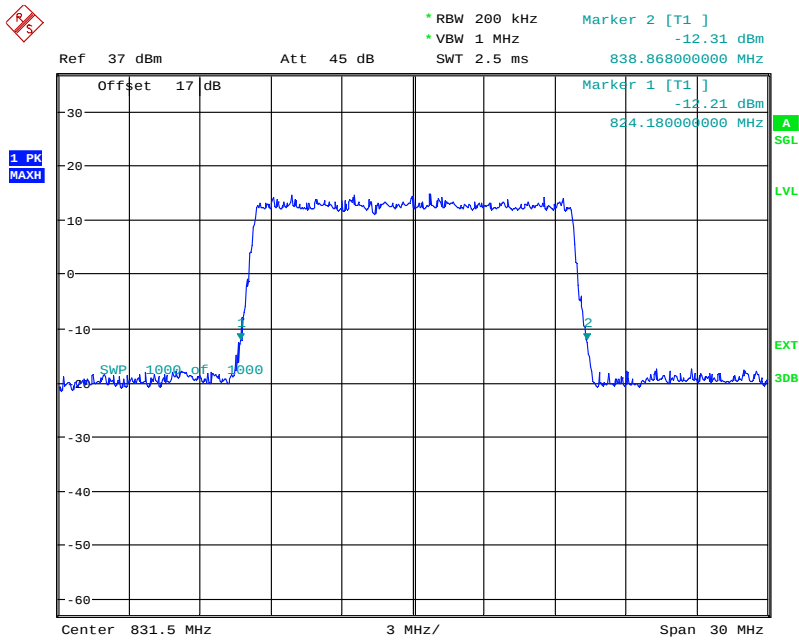


Date: 27.APR.2015 14:15:09



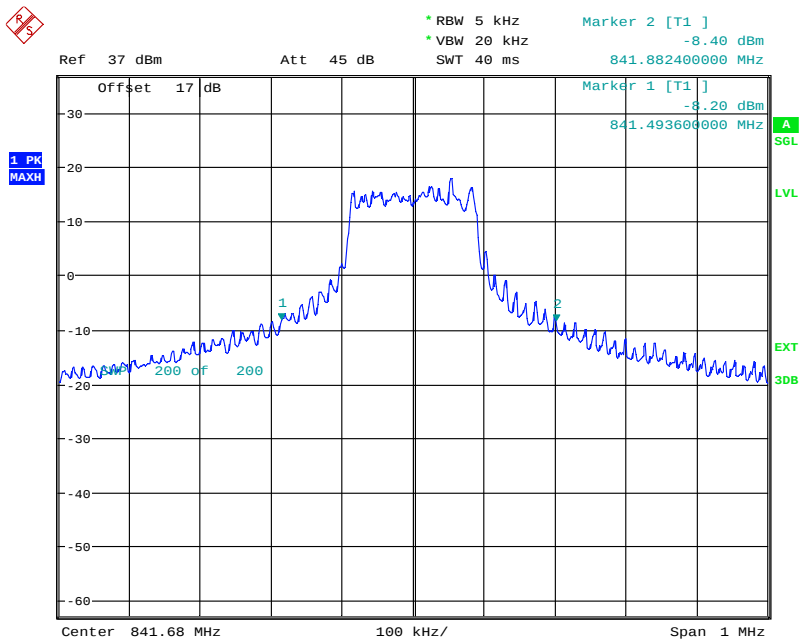
Product Service

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



Date: 27.APR.2015 14:26:57

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

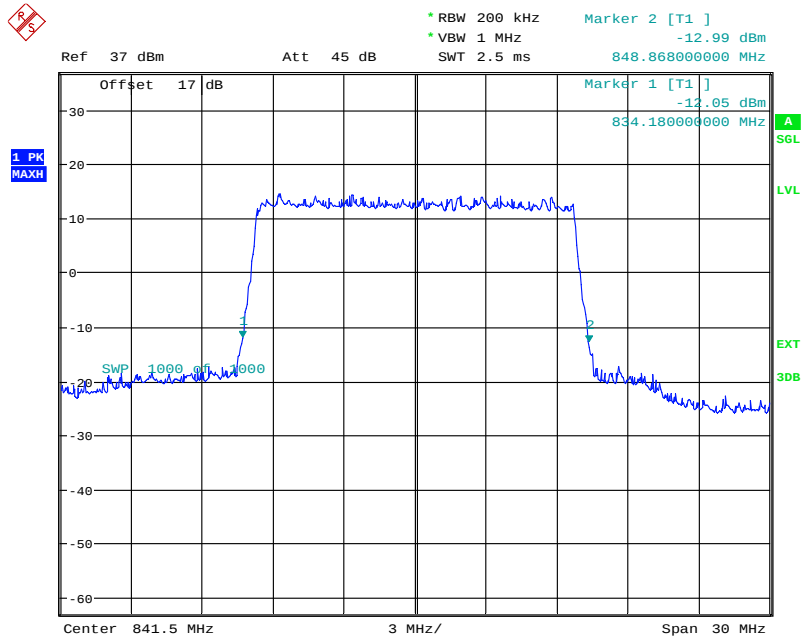


Date: 27.APR.2015 14:06:46



Product Service

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



Date: 27.APR.2015 13:56:50

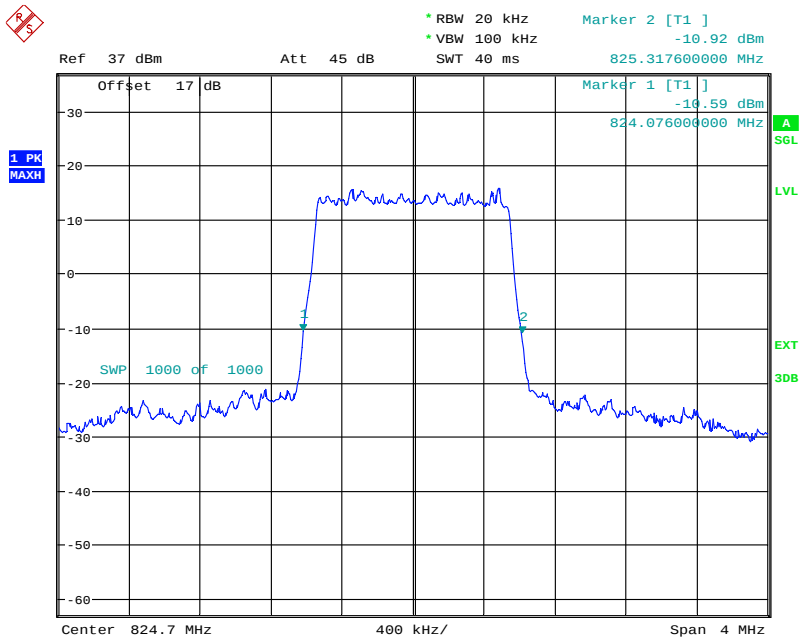
FCC 47 CFR Part 22, Limit Clause

None specified.



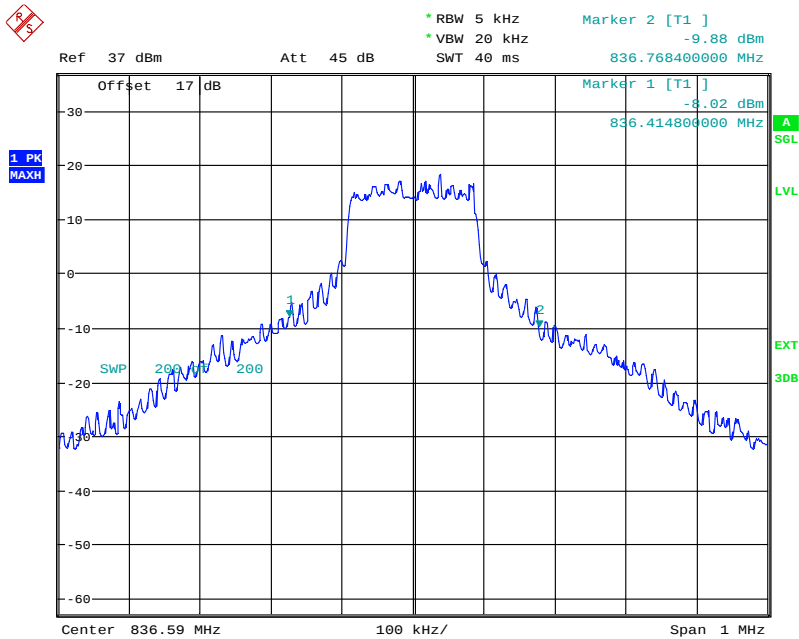
Product Service

LTE FDD 5, 824.7 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 29.APR.2015 16:20:46

LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

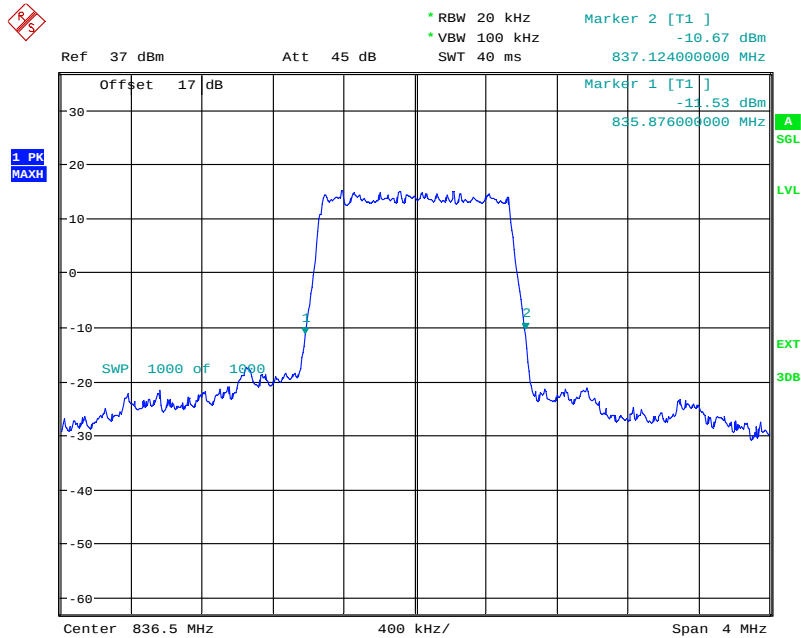


Date: 29.APR.2015 16:10:50



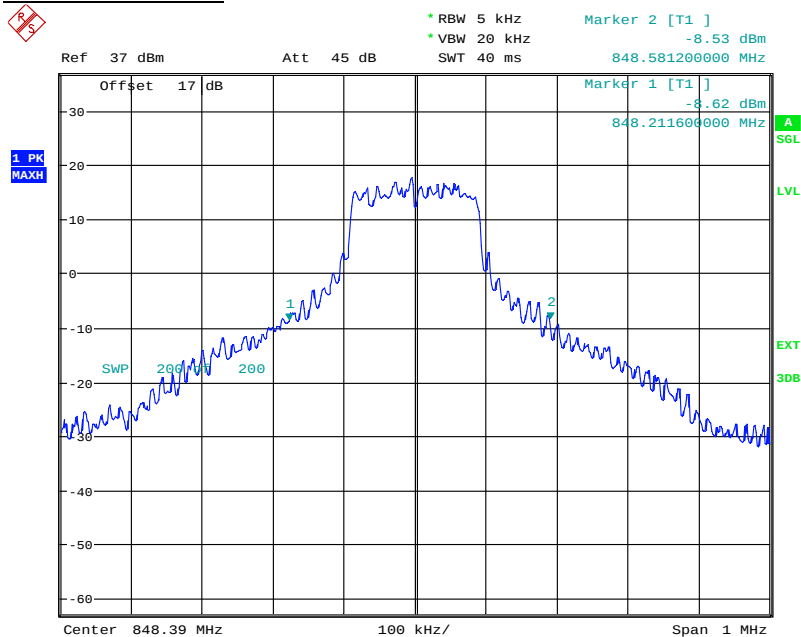
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results



Date: 29.APR.2015 16:18:10

LTE FDD 5, 848.3 MHz, 1 Resource Block - Middle, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth Results

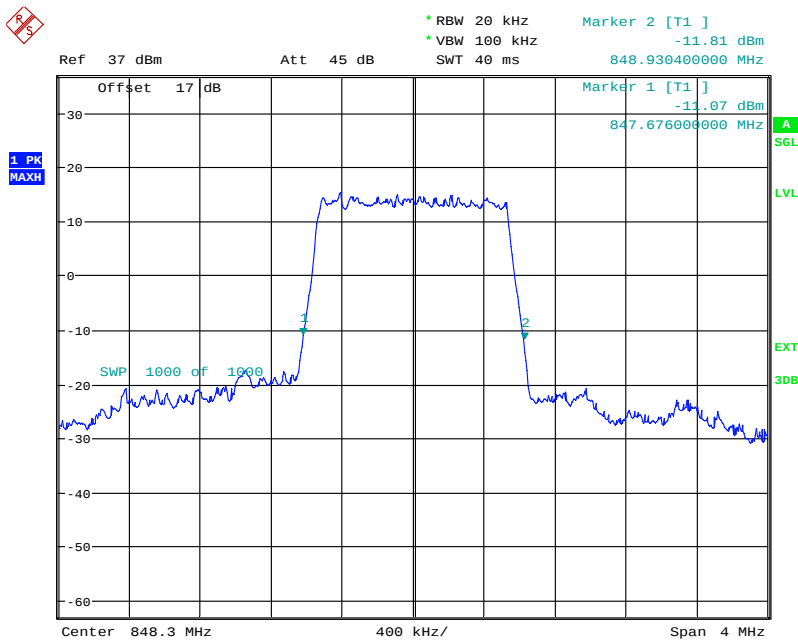


Date: 29.APR.2015 15:59:28



Product Service

LTE FDD 5, 848.3 MHz, All Resource Blocks, 1.4 MHz Bandwidth, QPSK, 26 dB Bandwidth
Results



Date: 29.APR.2015 15:21:27

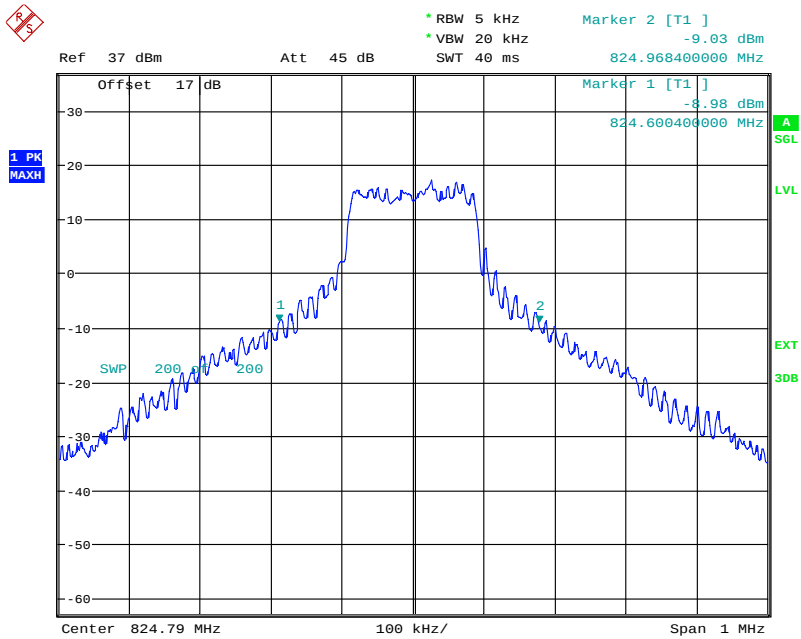


Product Service

LTE FDD 5, 1.4 MHz Bandwidth, 16-QAM, 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	368.0	N/T	1248.0	N/T	384.0	N/T	1235.2	N/T	385.6	N/T	1235.2

LTE FDD 5, 824.7 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

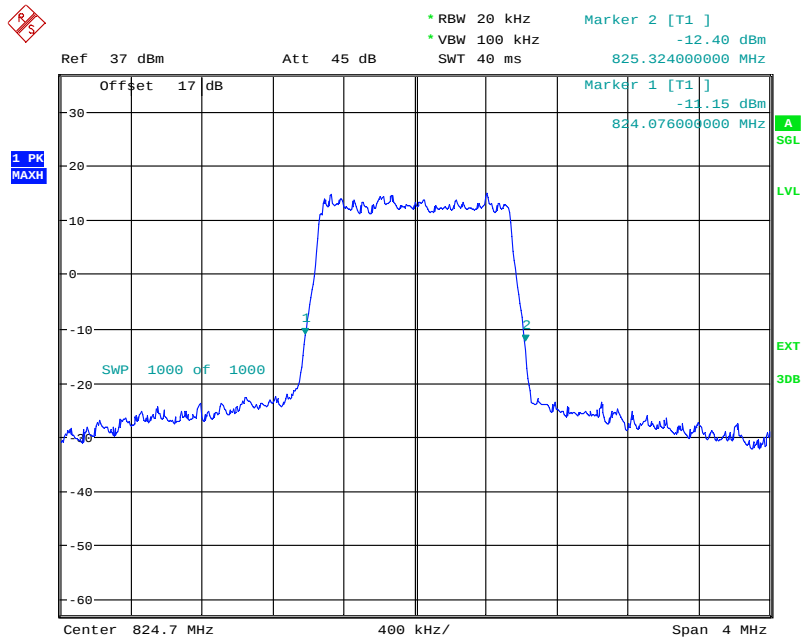


Date: 29.APR.2015 16:32:43



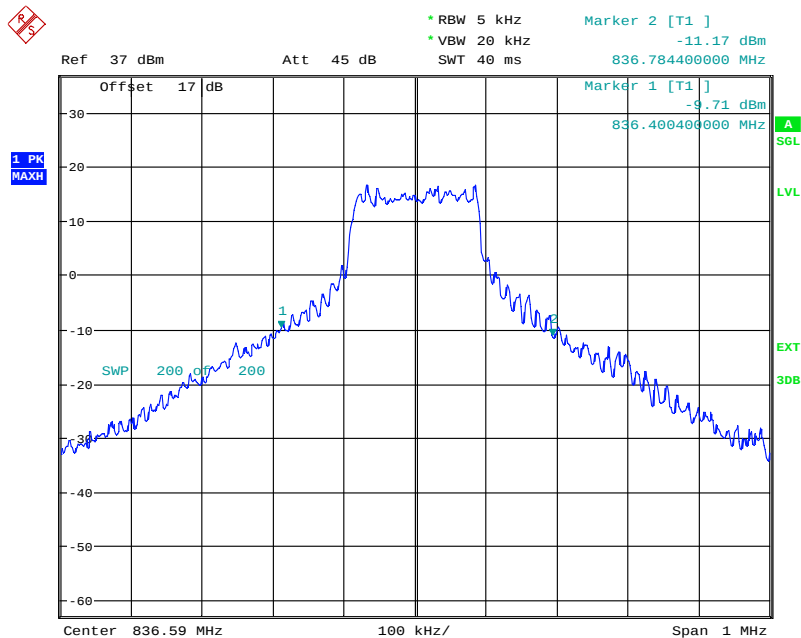
Product Service

LTE FDD 5, 824.7 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 16:23:41

LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

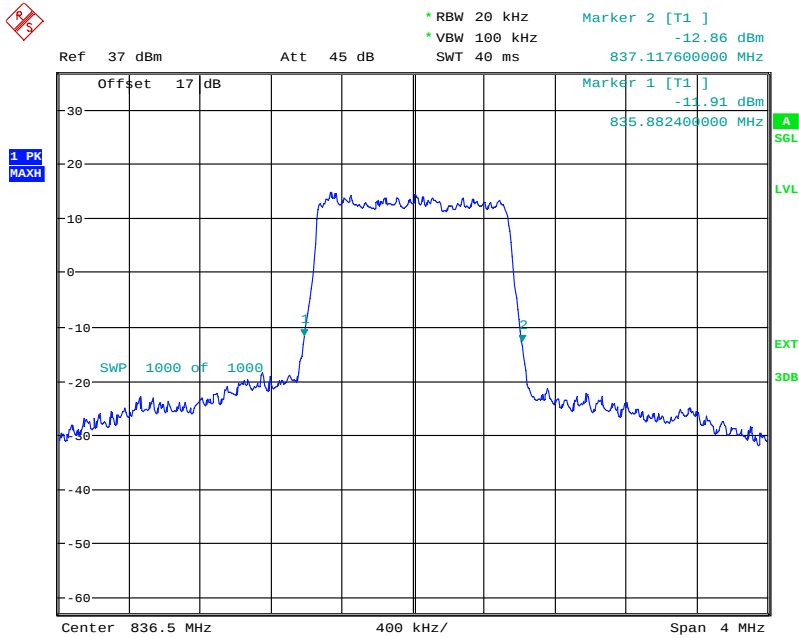


Date: 29.APR.2015 16:12:41



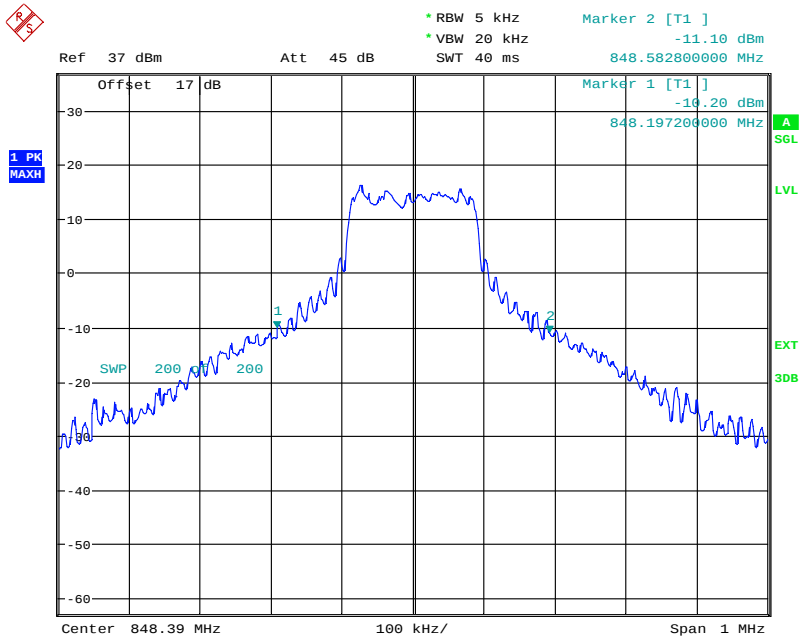
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 16:15:34

LTE FDD 5, 848.3 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

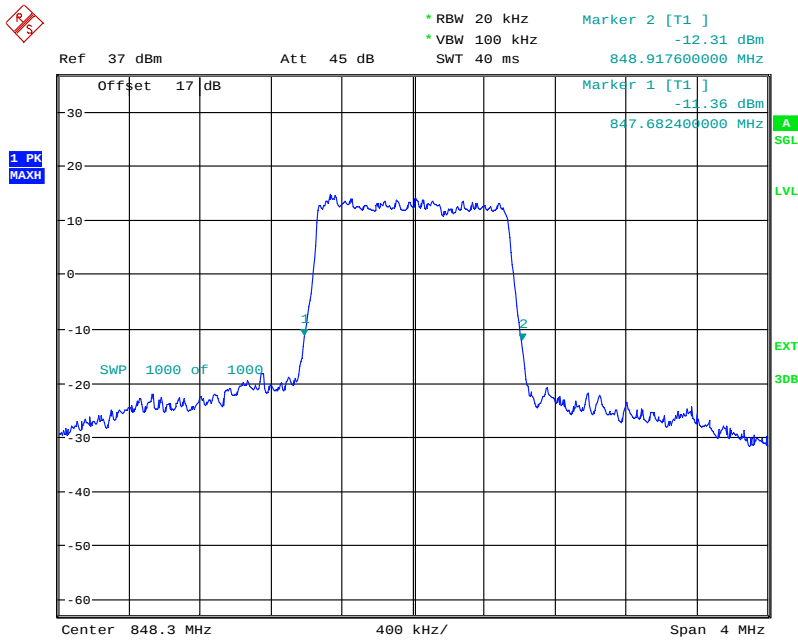


Date: 29.APR.2015 16:02:12



Product Service

LTE FDD 5, 848.3 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 15:24:34

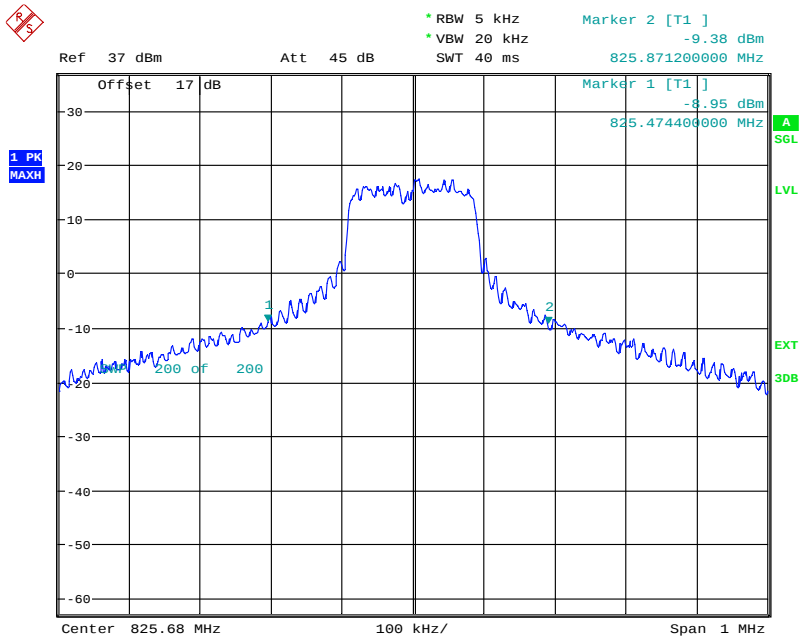


Product Service

LTE FDD 5, 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	396.8	N/T	2976.0	N/T	380.8	N/T	2976.0	N/T	444.8	N/T	2976.0

LTE FDD 5, 825.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

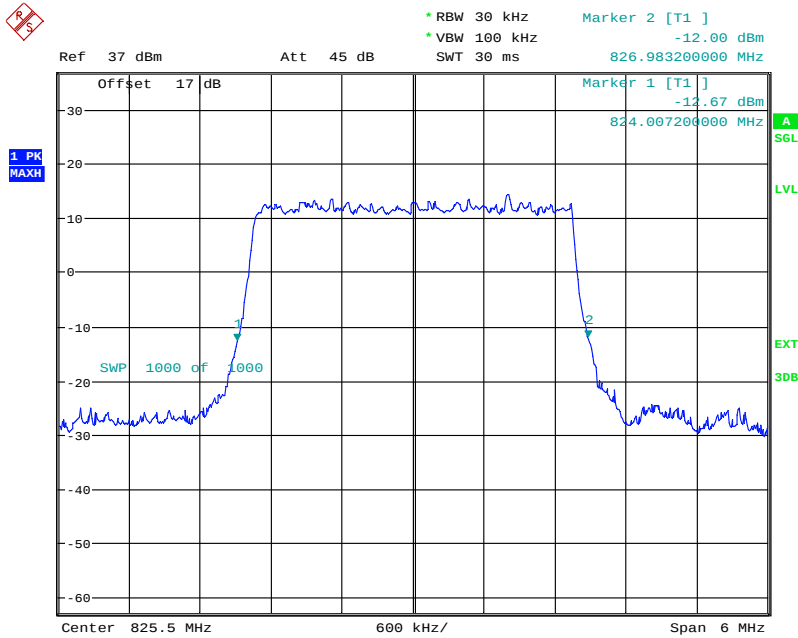


Date: 29.APR.2015 14:23:06



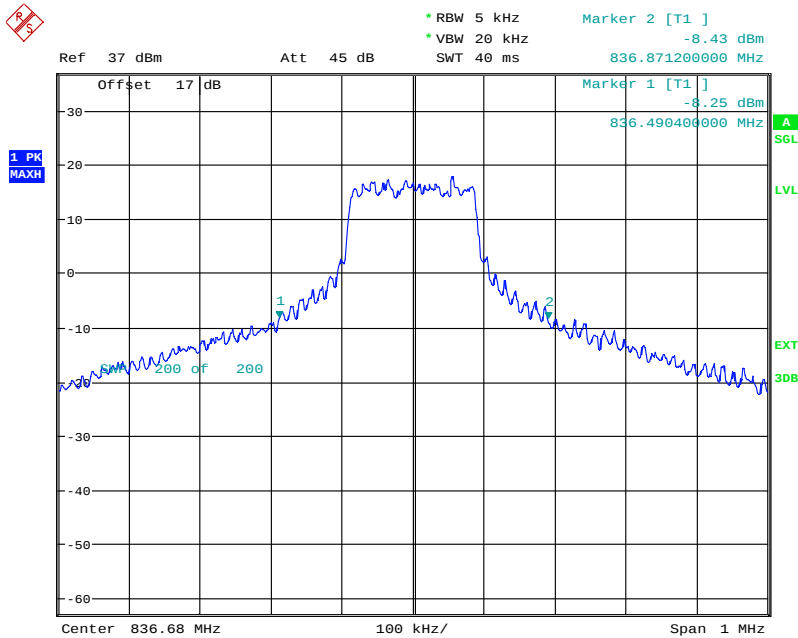
Product Service

LTE FDD 5, 825.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 14:37:00

LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

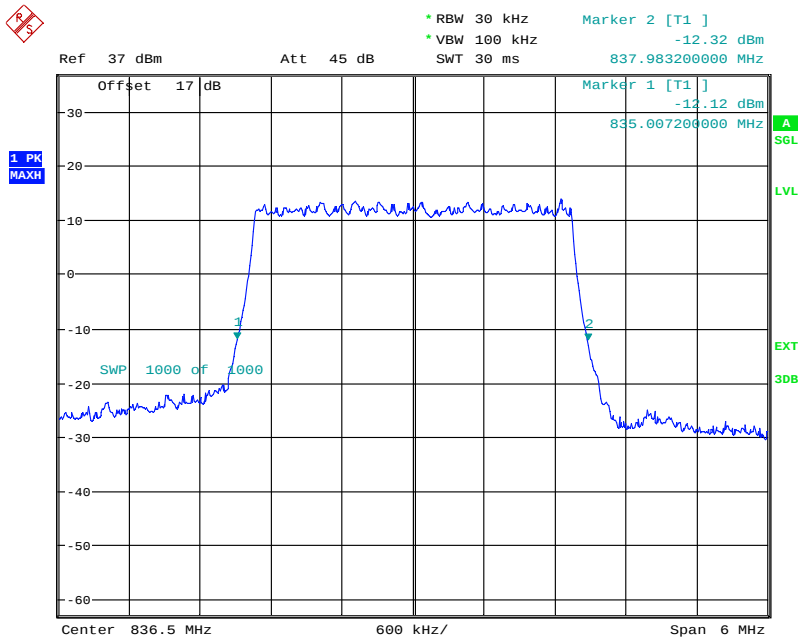


Date: 29.APR.2015 14:48:52



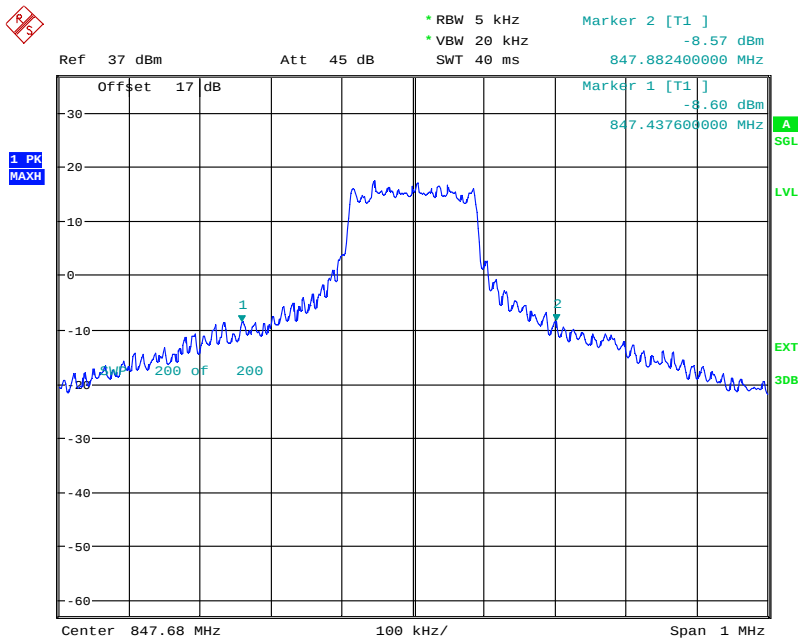
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 14:41:26

LTE FDD 5, 847.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

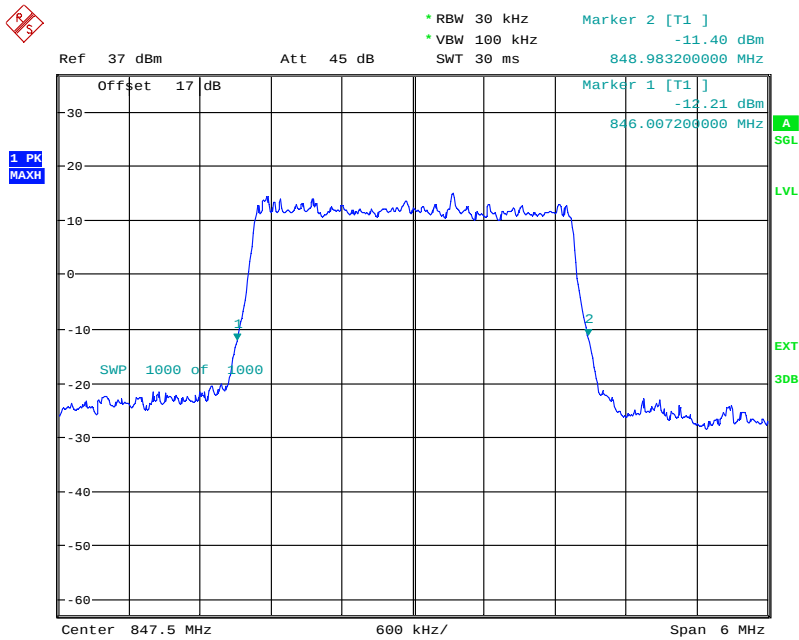


Date: 29.APR.2015 15:06:29



Product Service

LTE FDD 5, 847.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 15:16:06

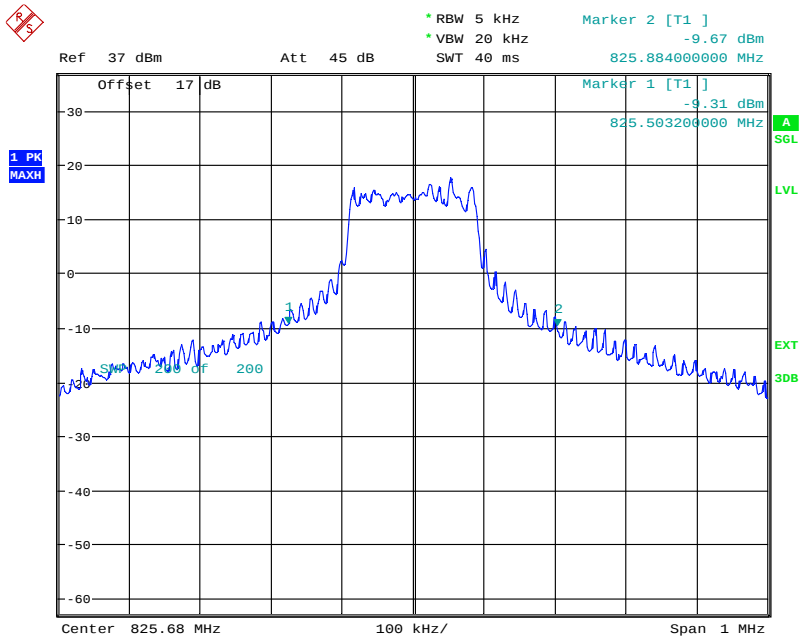


Product Service

LTE FDD 5, 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	380.8	N/T	2976.0	N/T	404.8	N/T	2976.0	N/T	411.2	N/T	2995.2

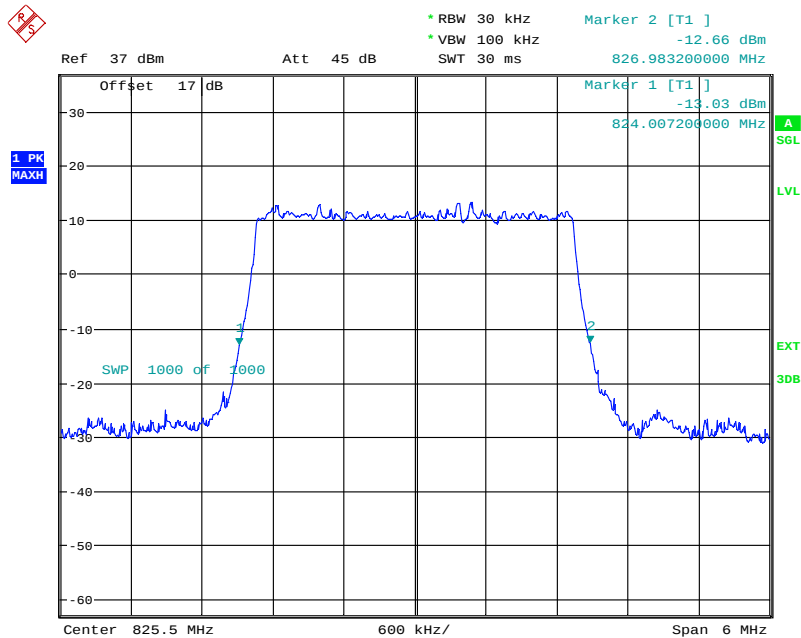
LTE FDD 5, 825.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results



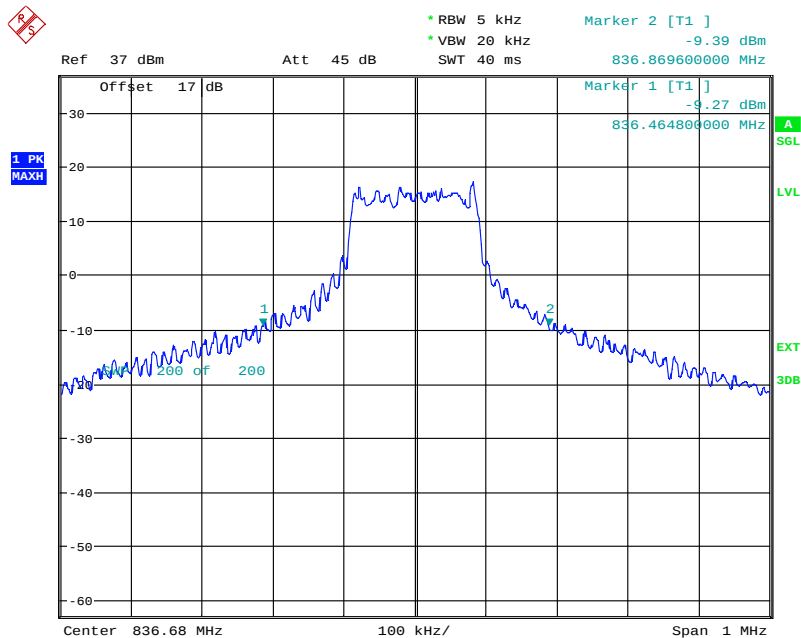
Date: 29.APR.2015 14:21:13



Product Service

LTE FDD 5, 825.5 MHz, All Resource Blocks, 26 dB Bandwidth Results

Date: 29.APR.2015 14:29:57

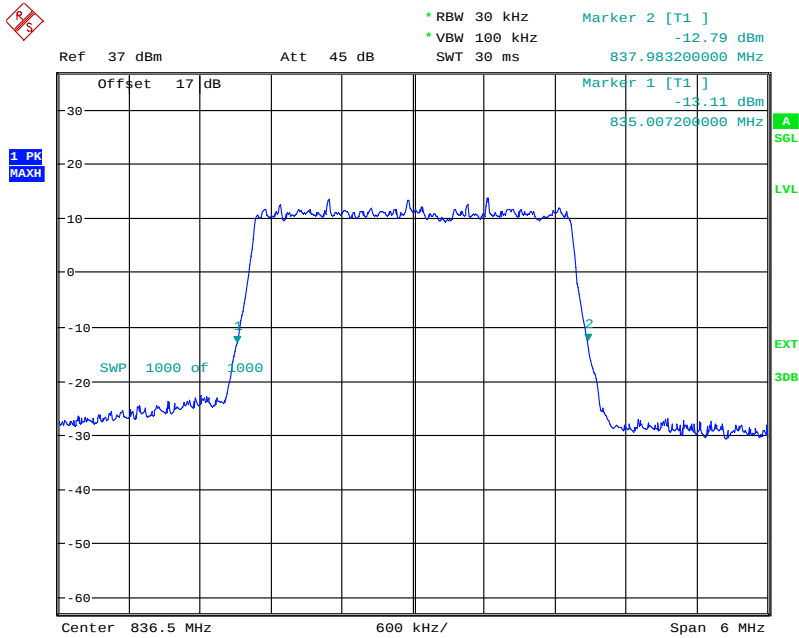
LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

Date: 29.APR.2015 14:47:04



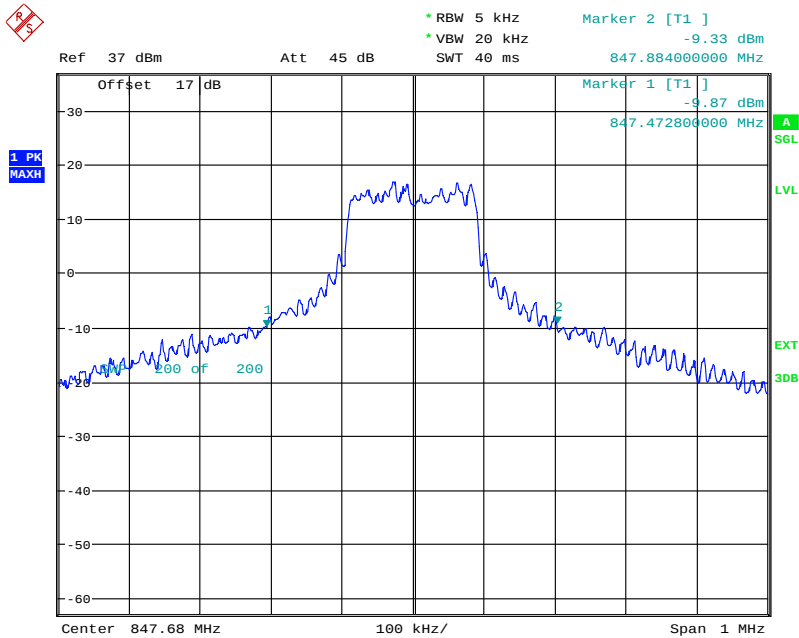
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 14:44:21

LTE FDD 5, 847.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

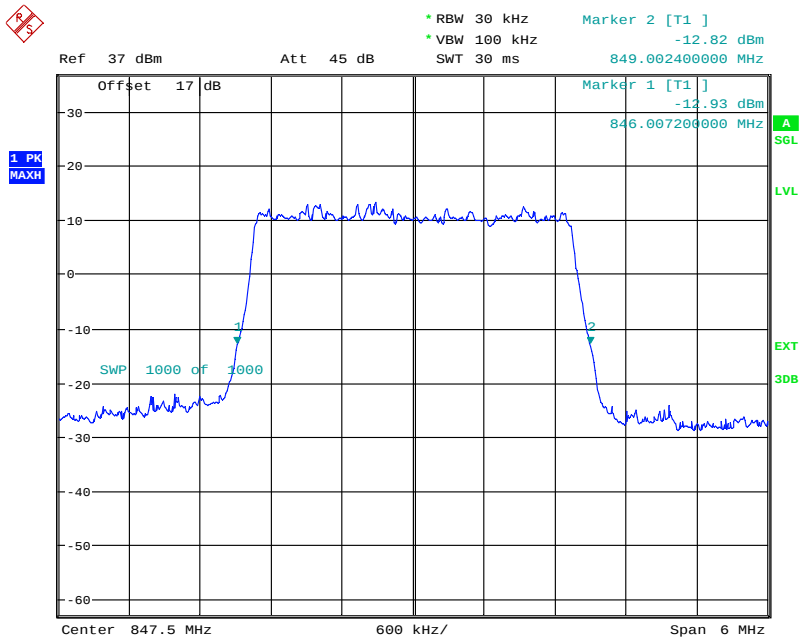


Date: 29.APR.2015 14:56:54



Product Service

LTE FDD 5, 847.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 15:13:15

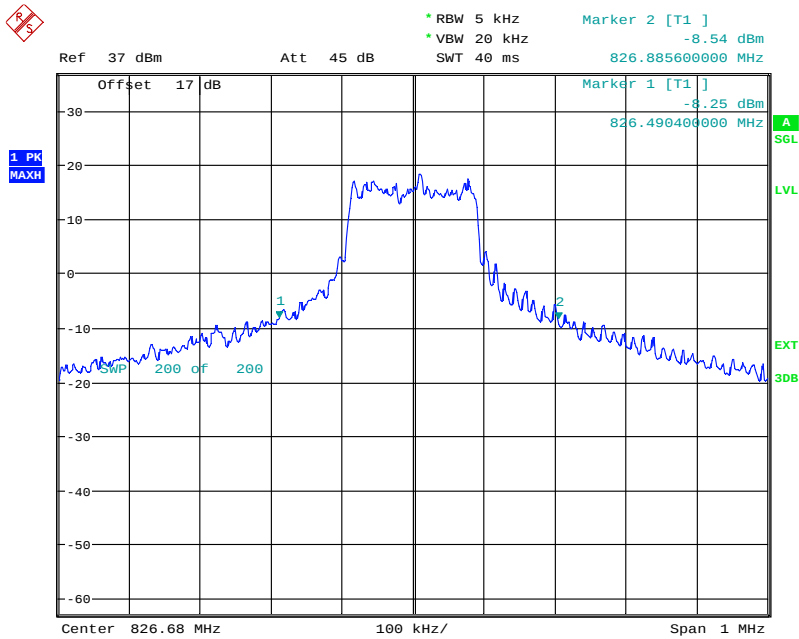


Product Service

LTE FDD 5, 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	395.2	N/T	4912.0	N/T	404.8	N/T	4944.0	N/T	417.6	N/T	4896.0

LTE FDD 5, 826.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

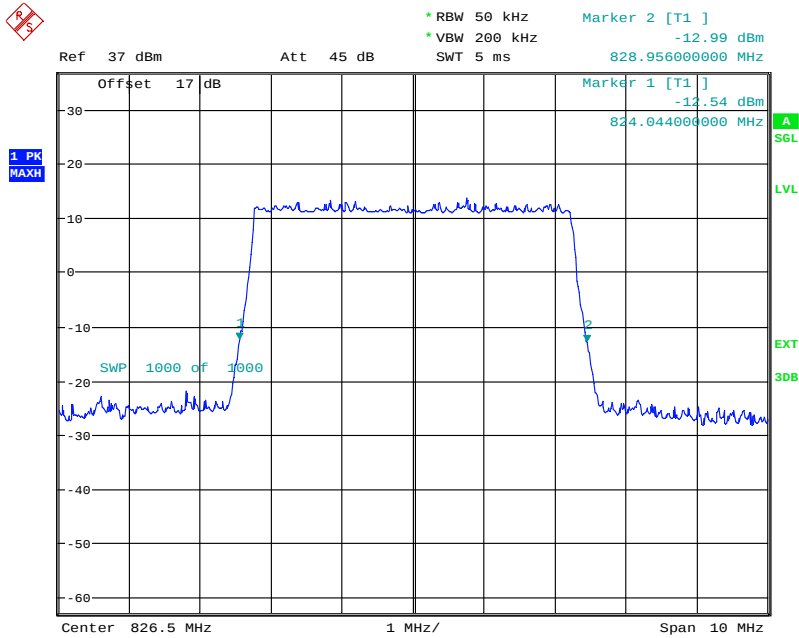


Date: 29.APR.2015 14:11:42



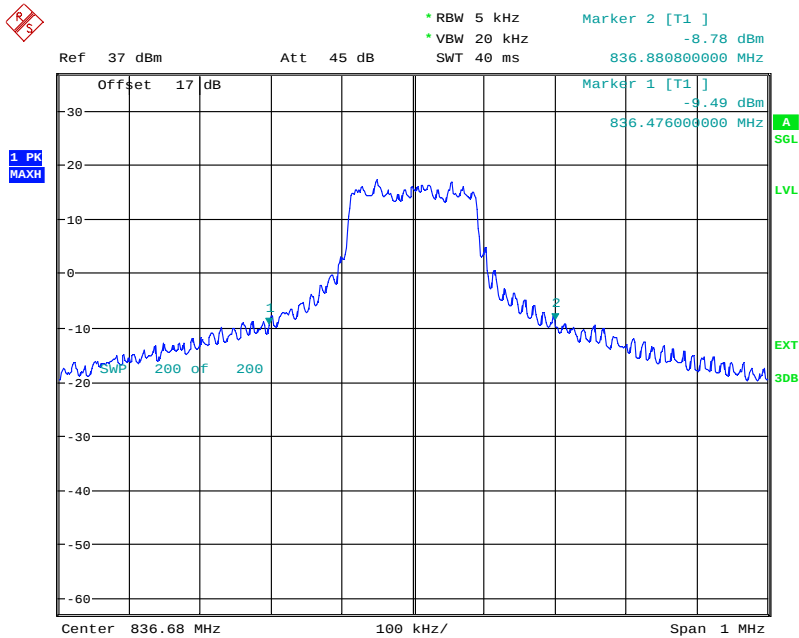
Product Service

LTE FDD 5, 826.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 14:01:36

LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

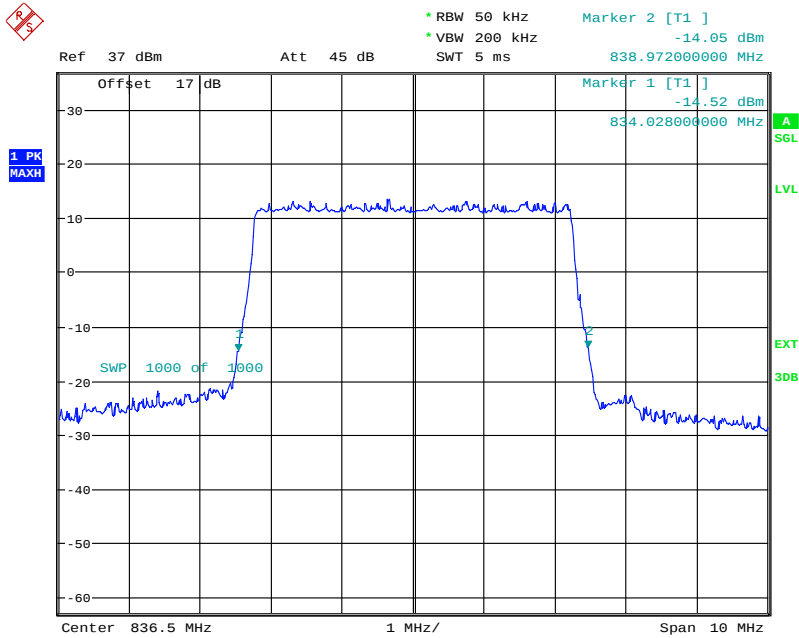


Date: 29.APR.2015 13:51:54



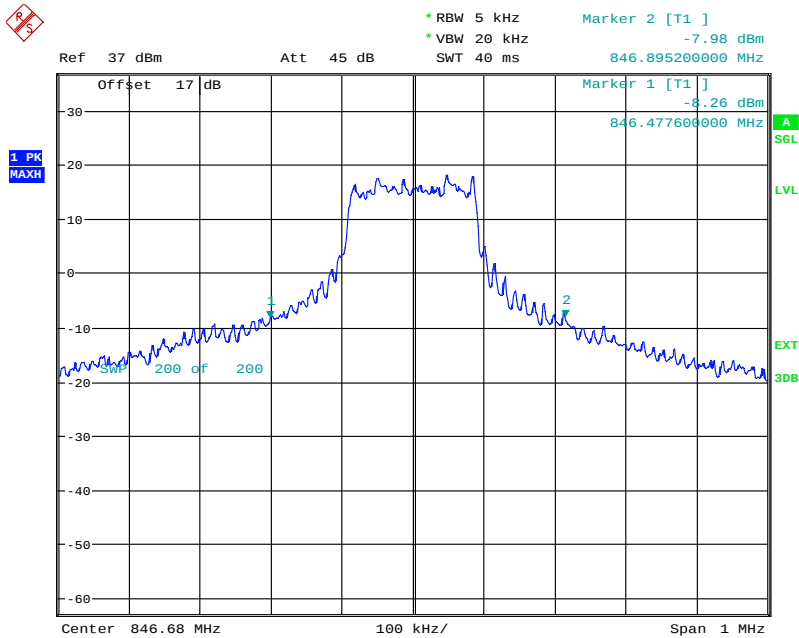
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 13:59:01

LTE FDD 5, 846.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

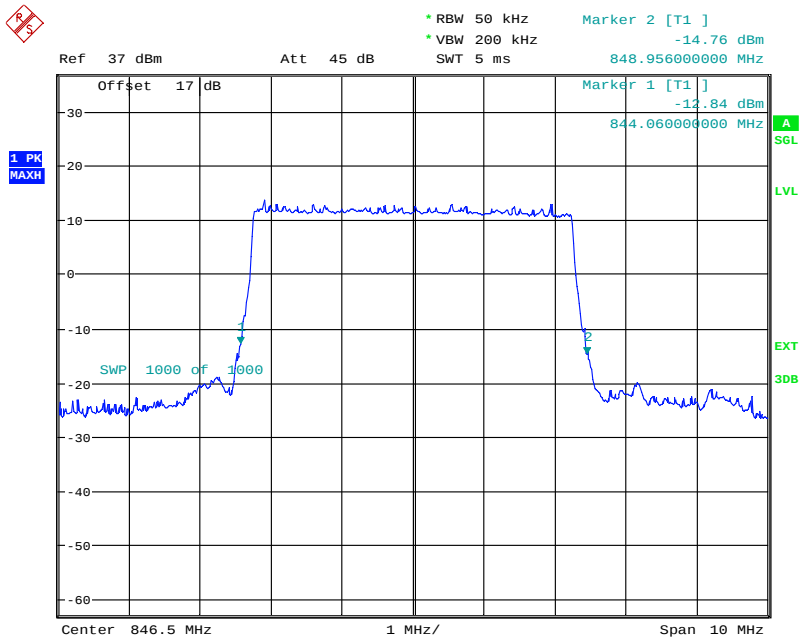


Date: 29.APR.2015 13:40:01



Product Service

LTE FDD 5, 846.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 13:25:22

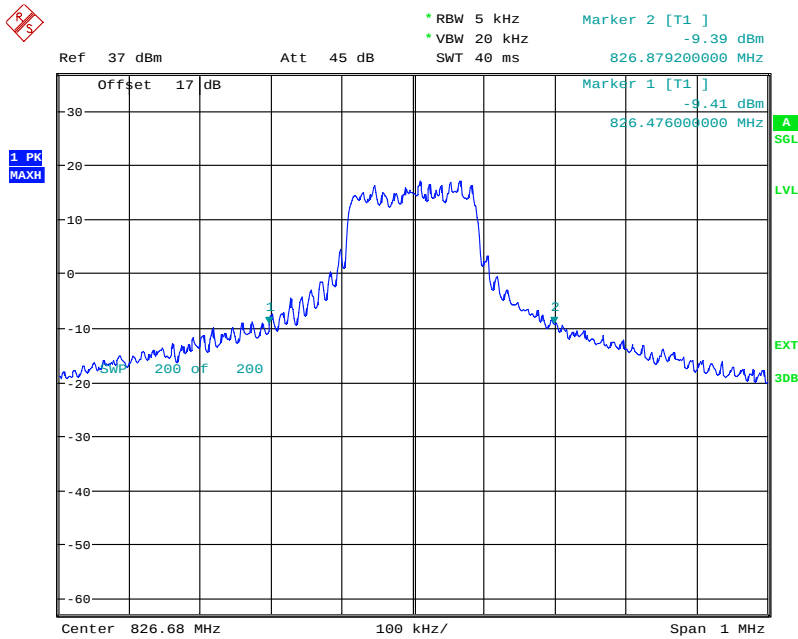


Product Service

LTE FDD 5, 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	403.2	N/T	4896.0	N/T	414.4	N/T	4960.0	N/T	419.2	N/T	4912.0

LTE FDD 5, 826.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

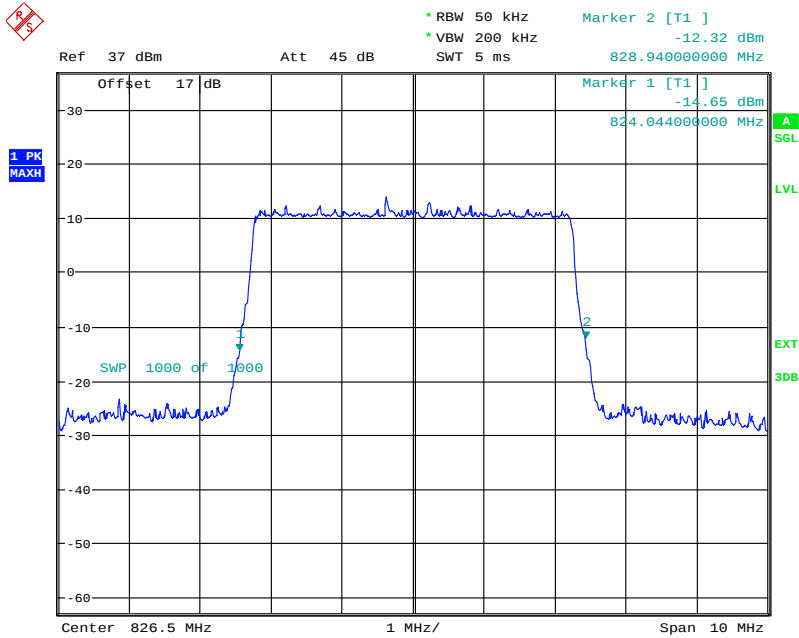


Date: 29.APR.2015 14:14:05



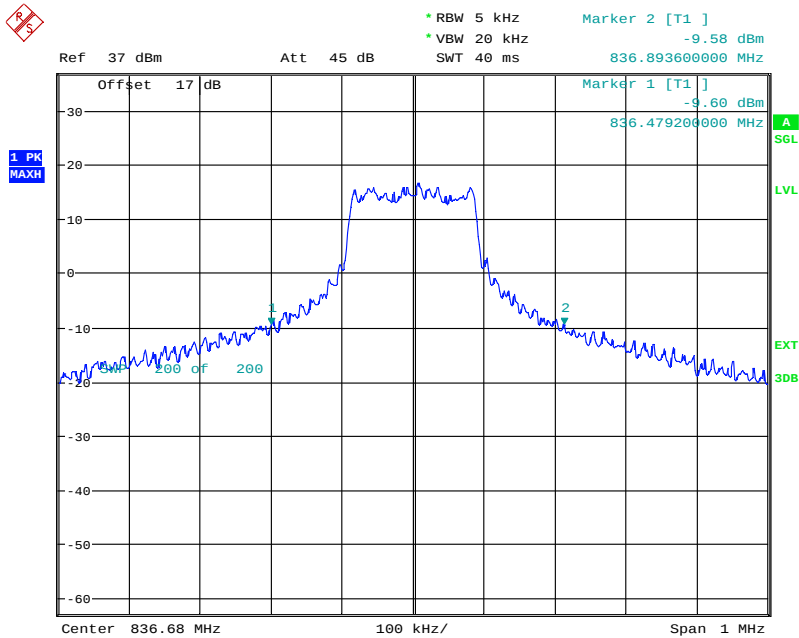
Product Service

LTE FDD 5, 826.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 14:04:28

LTE FDD 5, 836.5 MHz - 1 Resource Block - Middle, 26 dB Bandwidth Results

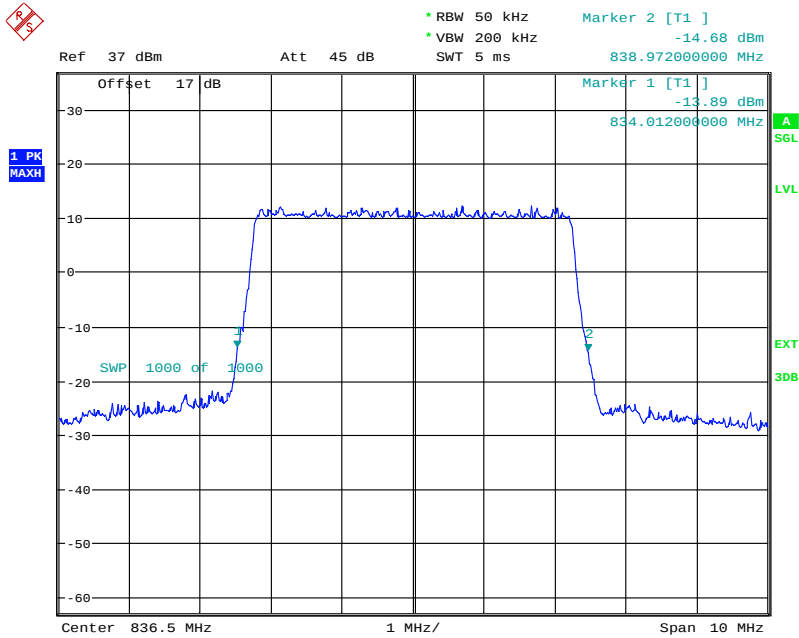


Date: 29.APR.2015 13:53:52



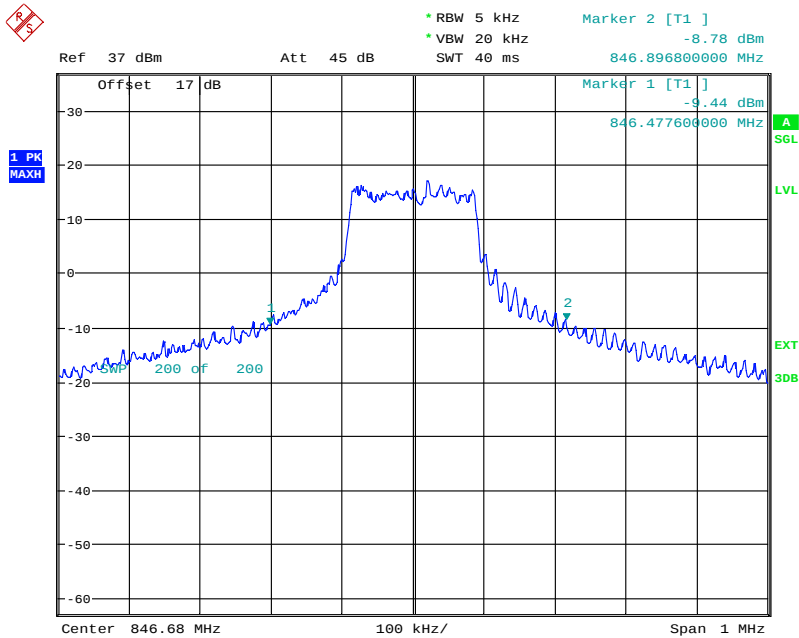
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 13:56:28

LTE FDD 5, 846.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

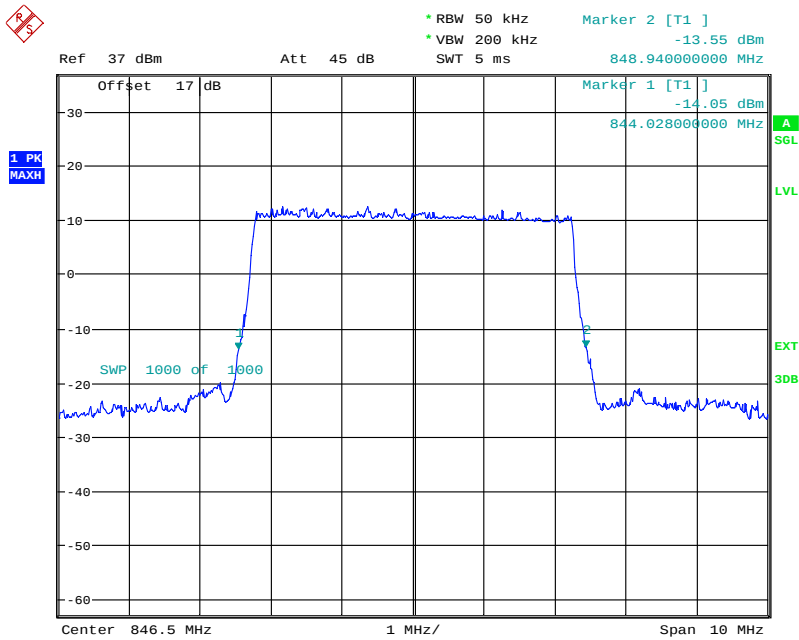


Date: 29.APR.2015 13:41:58



Product Service

LTE FDD 5, 846.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 13:28:12

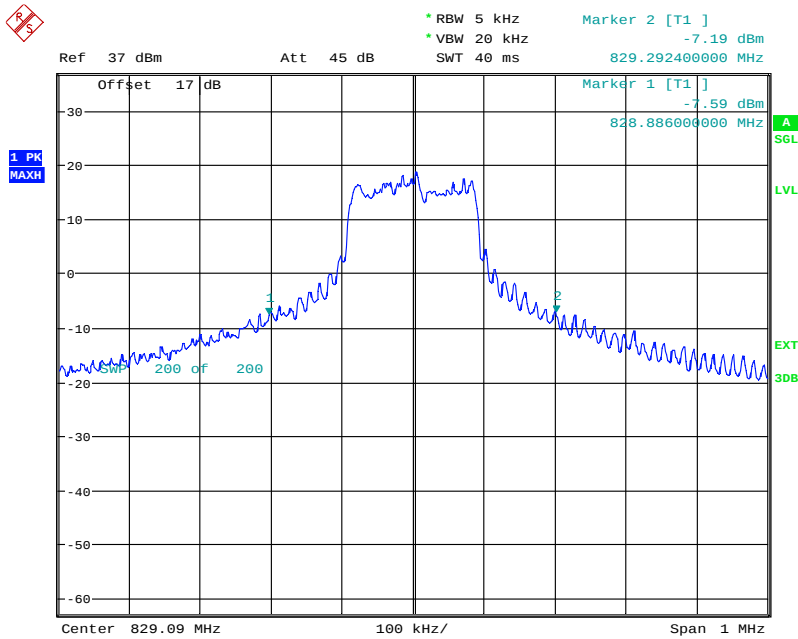


Product Service

LTE FDD 5, 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	406.4	N/T	9824.0	N/T	392.0	N/T	9728.0	N/T	404.8	N/T	9728.0

LTE FDD 5, 829 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

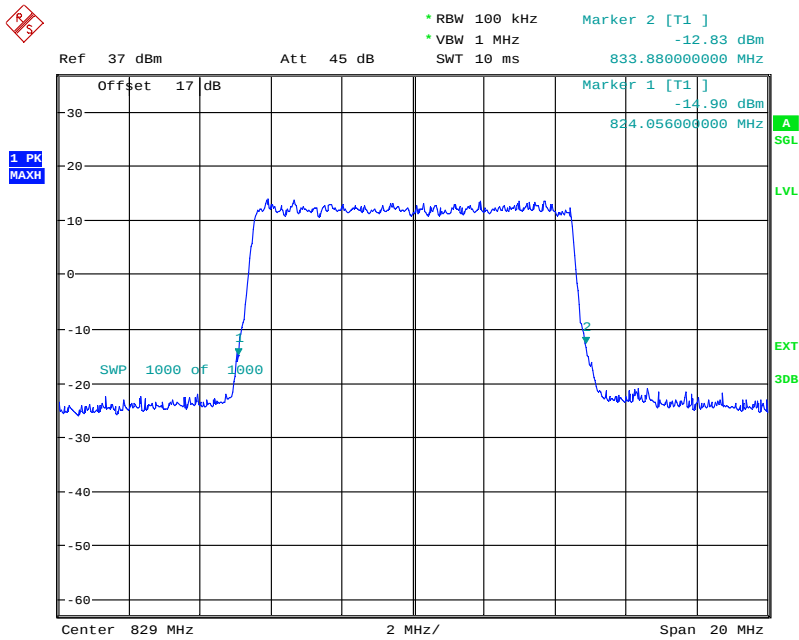


Date: 29.APR.2015 11:25:33



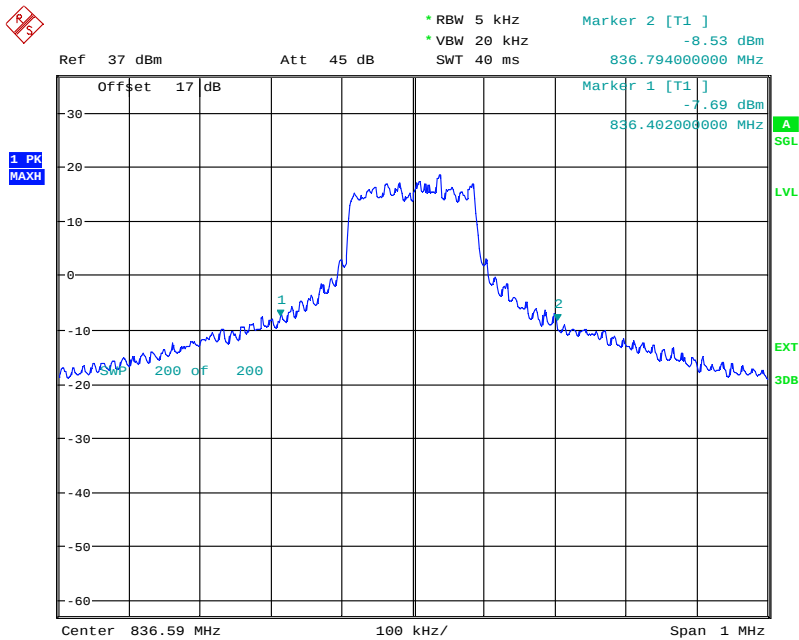
Product Service

LTE FDD 5, 829 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 11:12:15

LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

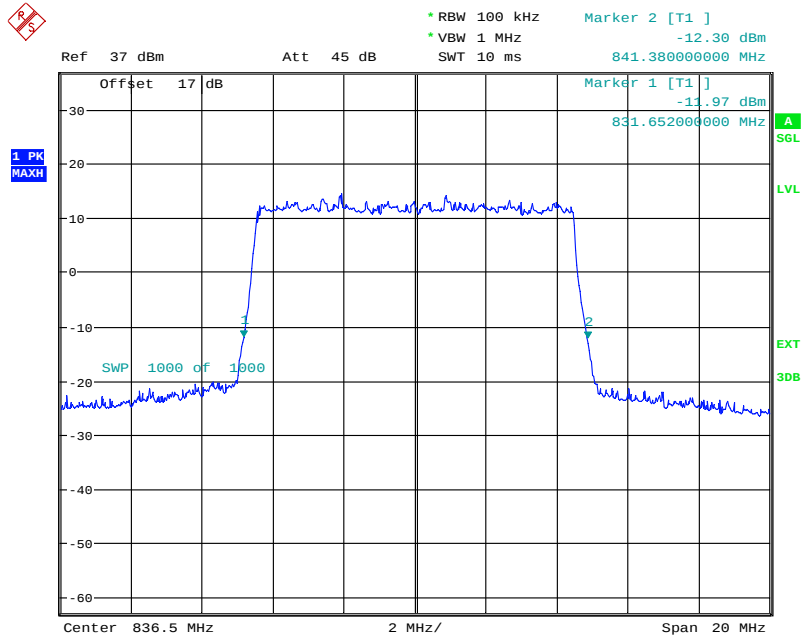


Date: 29.APR.2015 11:35:19



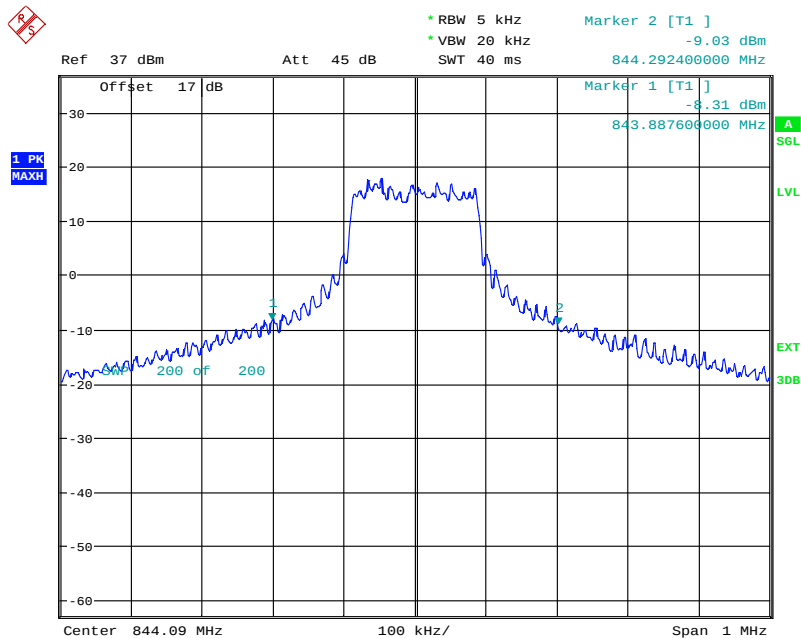
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 11:43:46

LTE FDD 5, 844 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

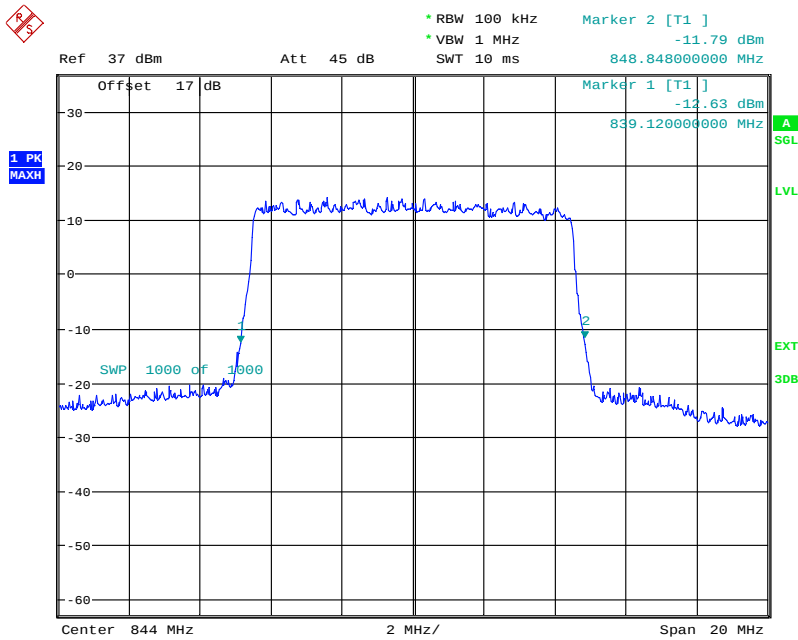


Date: 29.APR.2015 11:58:49



Product Service

LTE FDD 5, 844 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 11:47:48

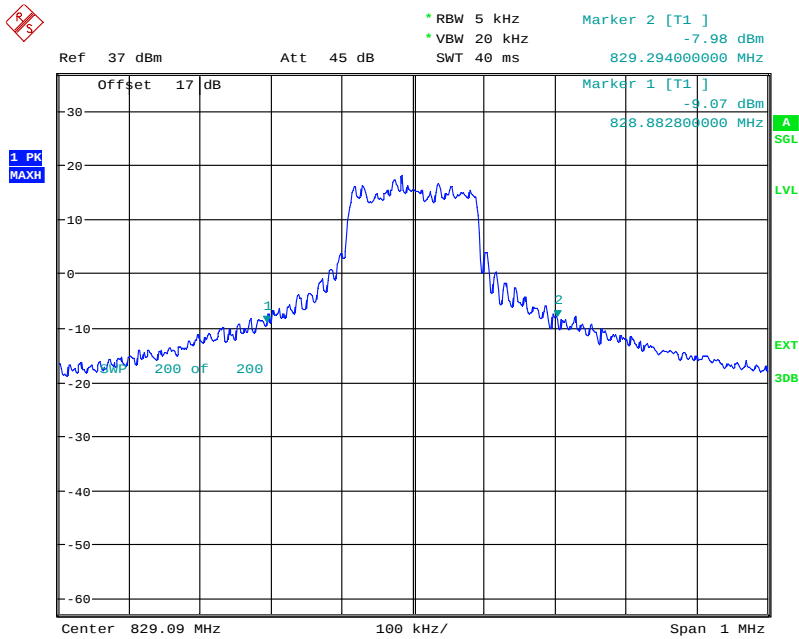


Product Service

LTE FDD 5, 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	411.2	N/T	9664.0	N/T	499.2	N/T	9728.0	N/T	432.0	N/T	9728.0

LTE FDD 5, 829 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

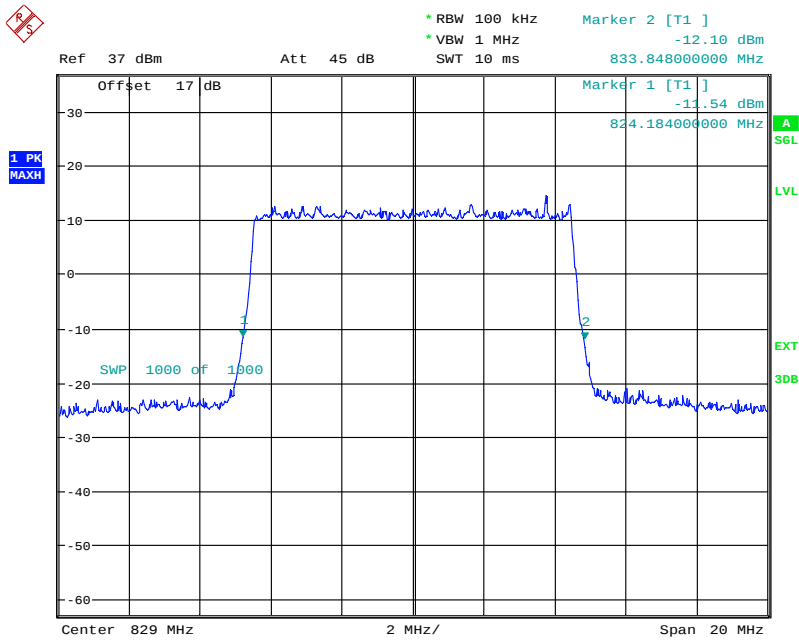


Date: 29.APR.2015 11:27:32



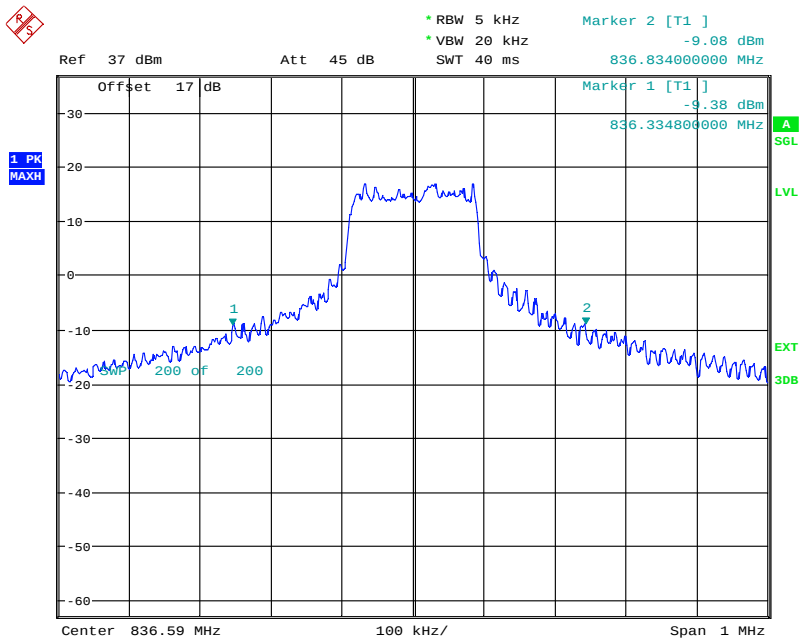
Product Service

LTE FDD 5, 829 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 11:15:39

LTE FDD 5, 836.5 MHz, 1 Resource Block - Middle

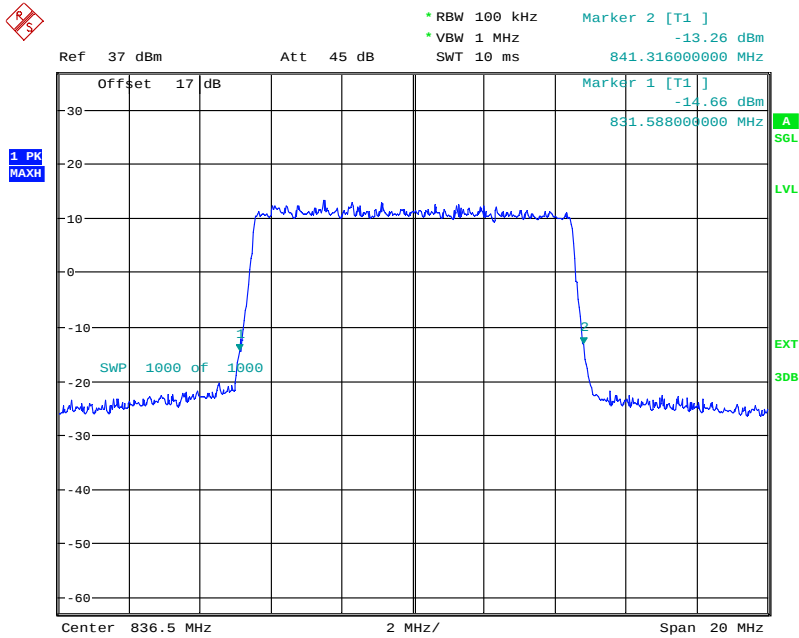


Date: 29.APR.2015 11:37:06



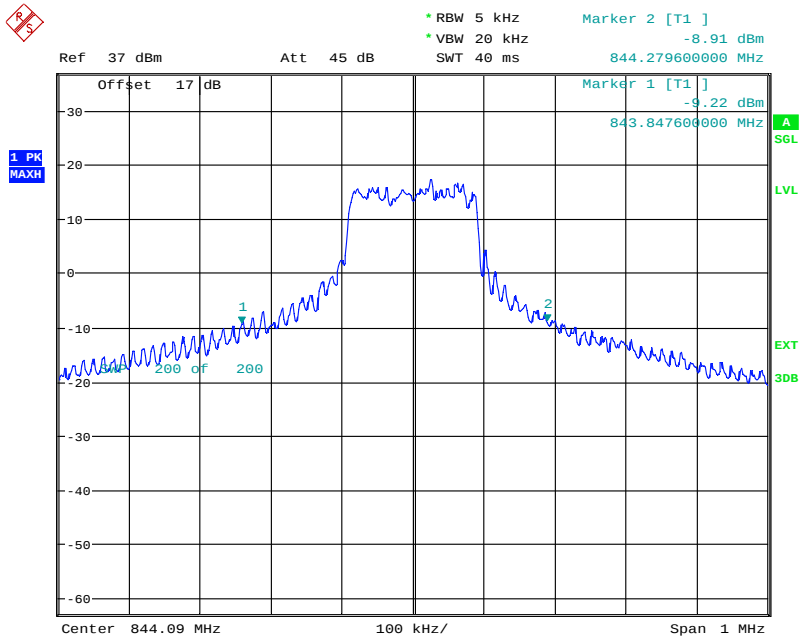
Product Service

LTE FDD 5, 836.5 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 11:39:58

LTE FDD 5, 844 MHz, 1 Resource Block - Middle, 26 dB Bandwidth Results

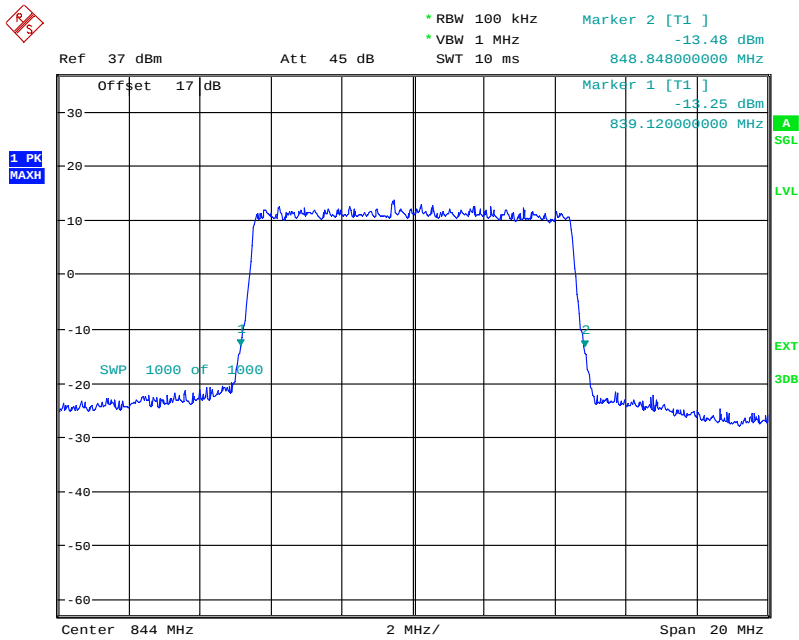


Date: 29.APR.2015 12:00:46



Product Service

LTE FDD 5, 844 MHz, All Resource Blocks, 26 dB Bandwidth Results



Date: 29.APR.2015 11:51:27

FCC 47 CFR Part 22, Limit Clause

None specified.



2.7 MODULATION CHARACTERISTICS

2.7.1 Specification Reference

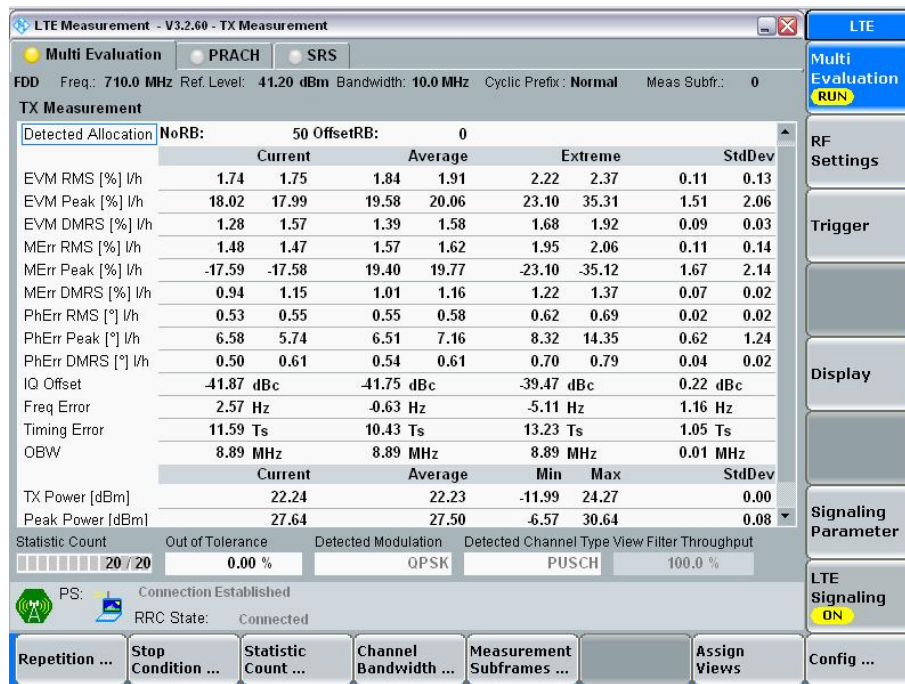
FCC 47 CFR Part 2, Clause 2.1047 (d)

2.7.2 Equipment Under Test

SHV32

2.7.3 Test Results

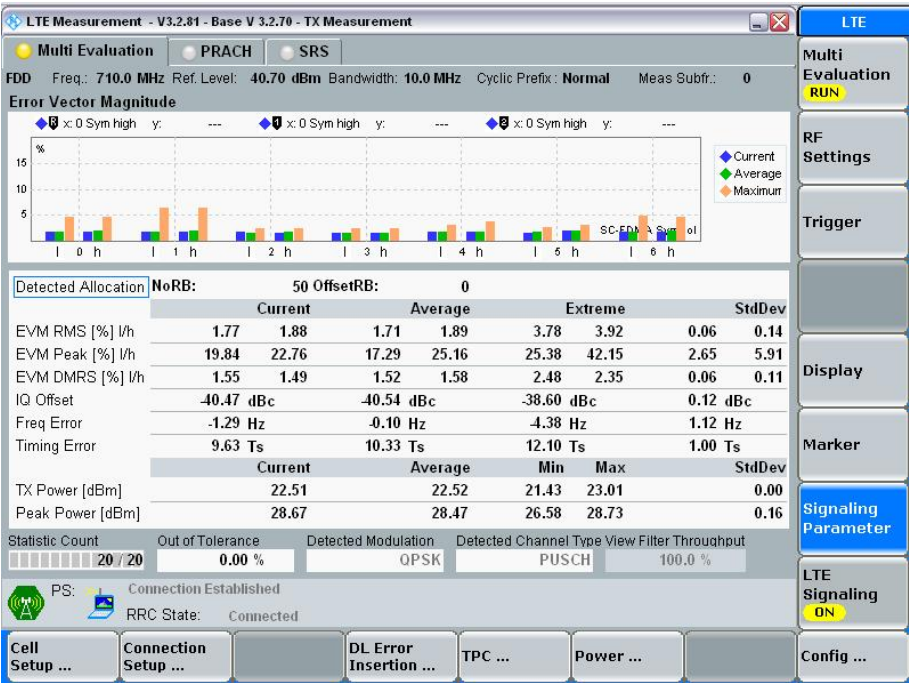
LTE FDD 26, 10.0 MHz Bandwidth – QPSK, Transmitter Summary, Modulation Characteristics, Plot



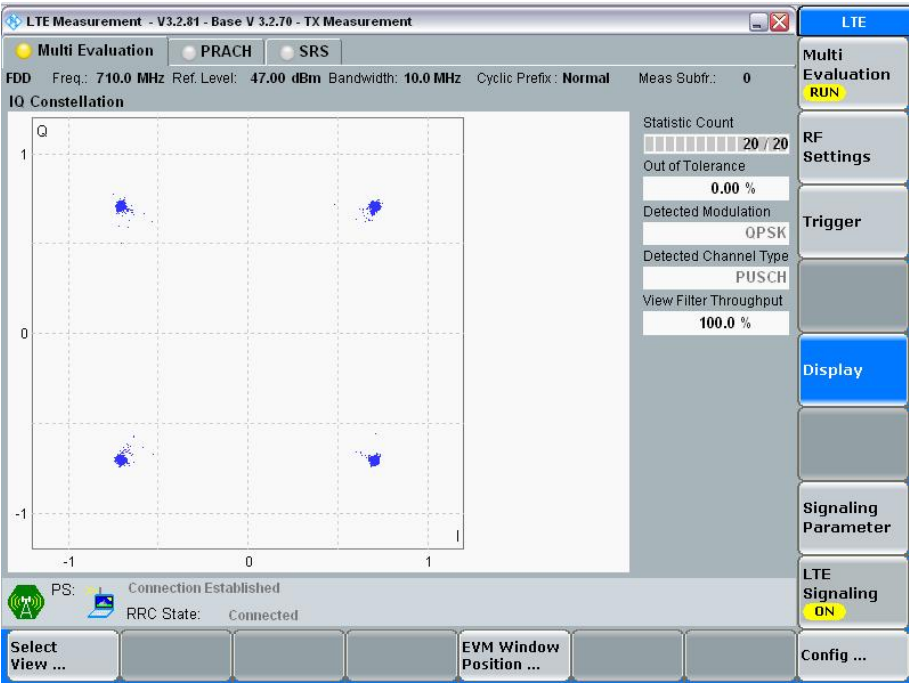


Product Service

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

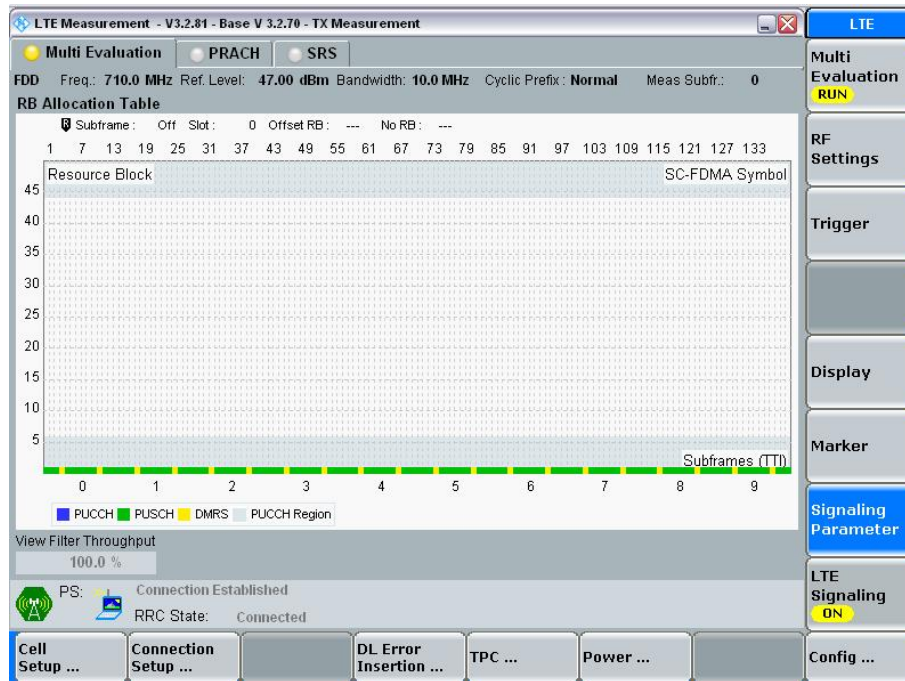


LTE FDD 26, 10.0 MHz Bandwidth – QPSK, IQ Constellation, Modulation Characteristics Plot

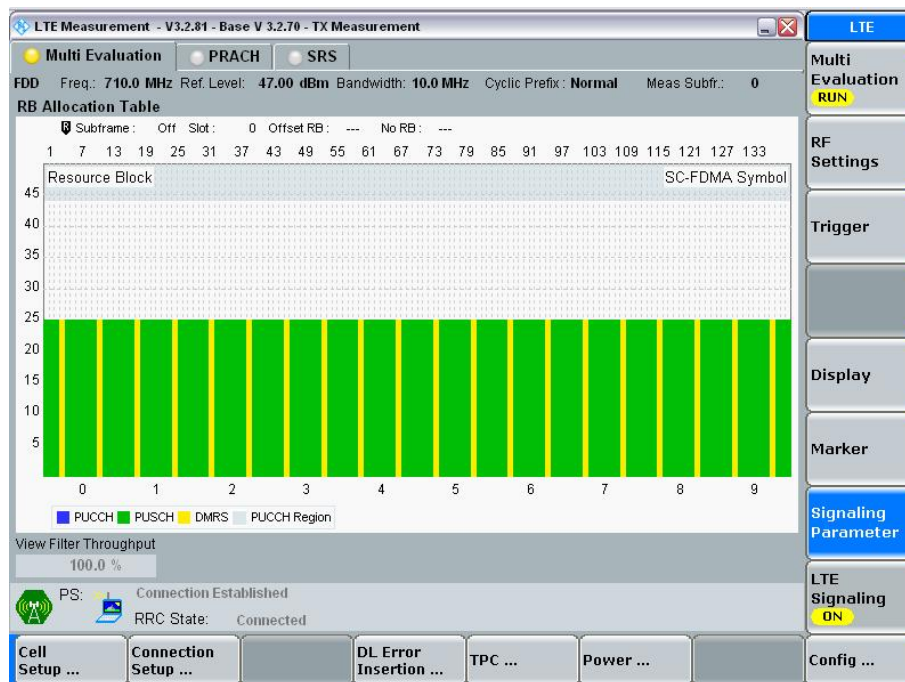




LTE FDD 26, 10.0 MHz Bandwidth – QPSK, 1 Resource Block Allocation, Modulation Characteristics Plot



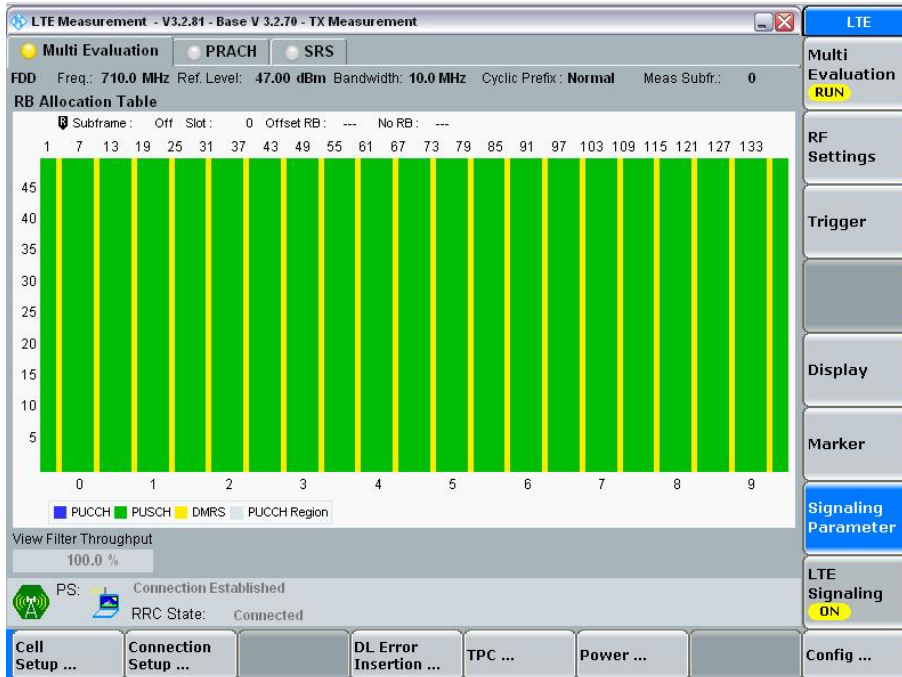
LTE FDD 26, 10.0 MHz Bandwidth – QPSK, 25 Resource Block Allocation, Modulation Characteristics Plot



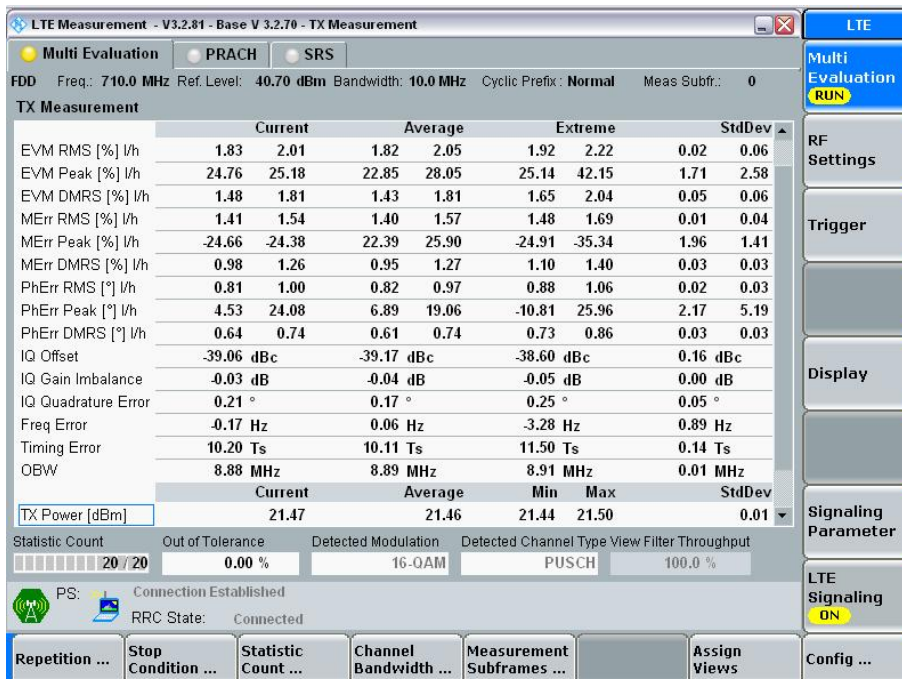


Product Service

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



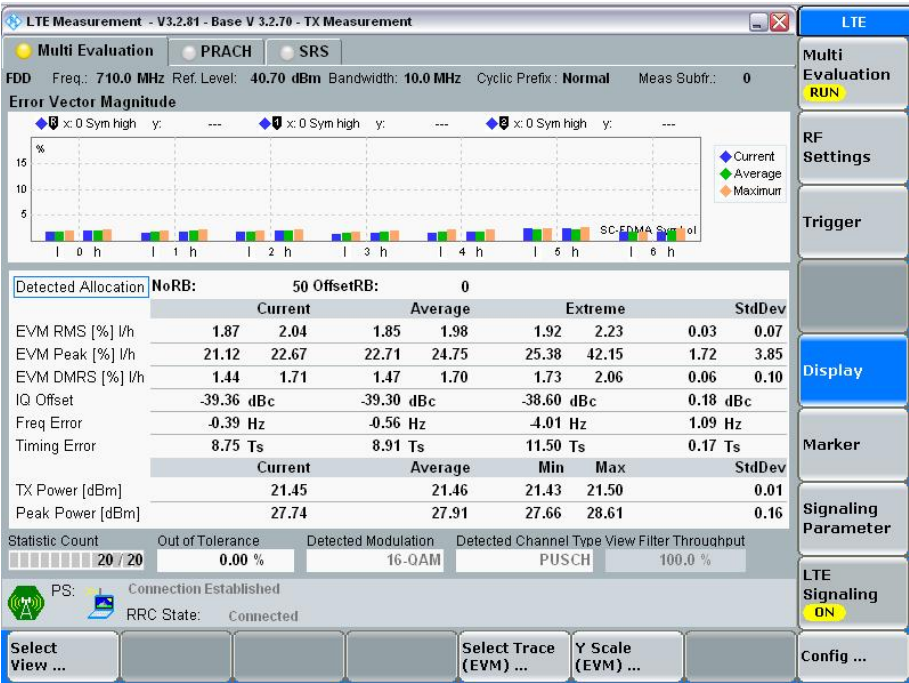
LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, Transmitter Summary, Modulation Characteristics Plot



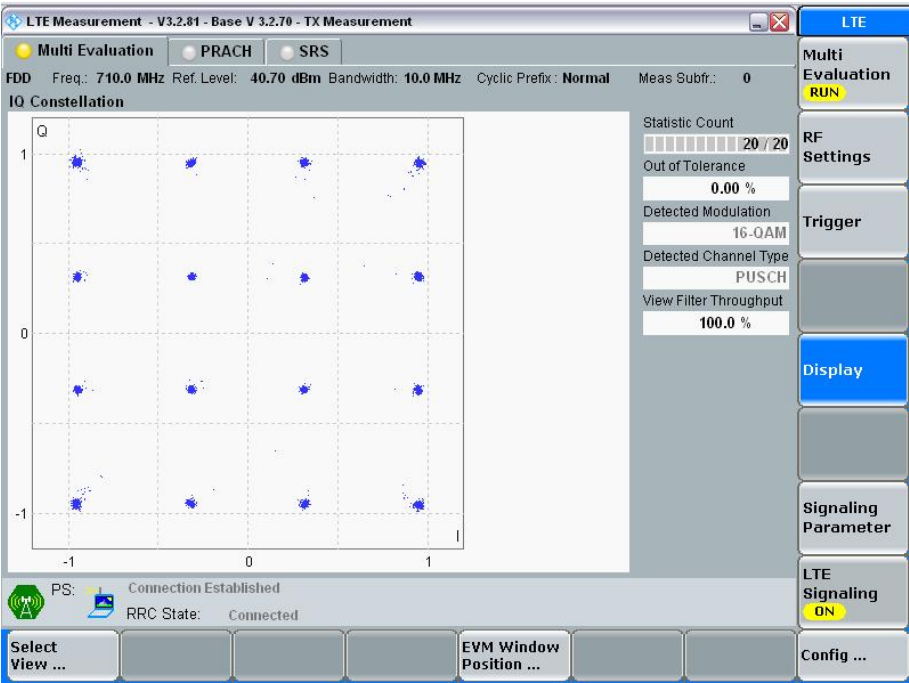


Product Service

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

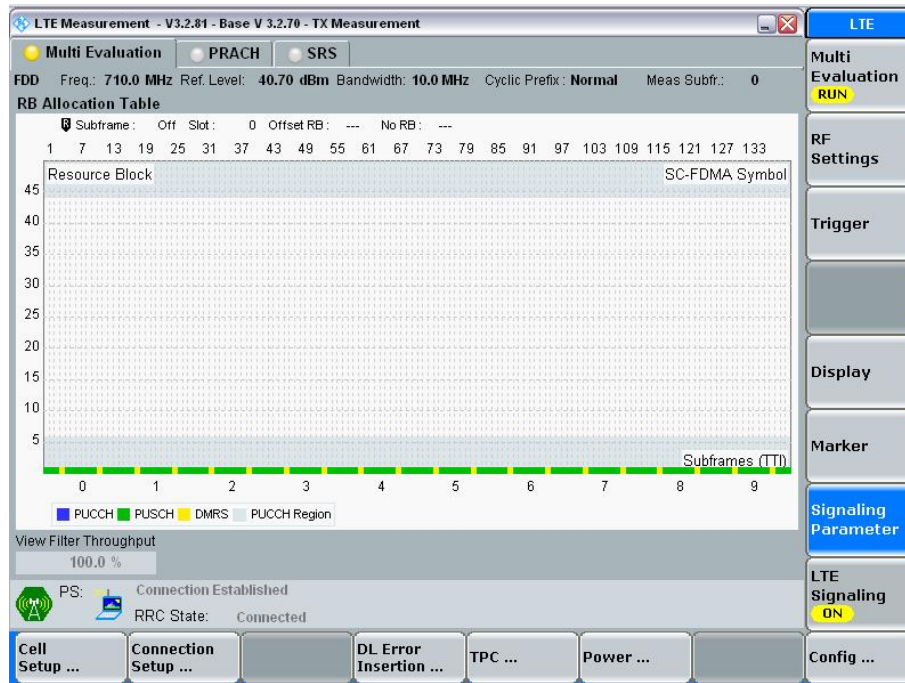


LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, IQ Constellation, Modulation Characteristics Plot

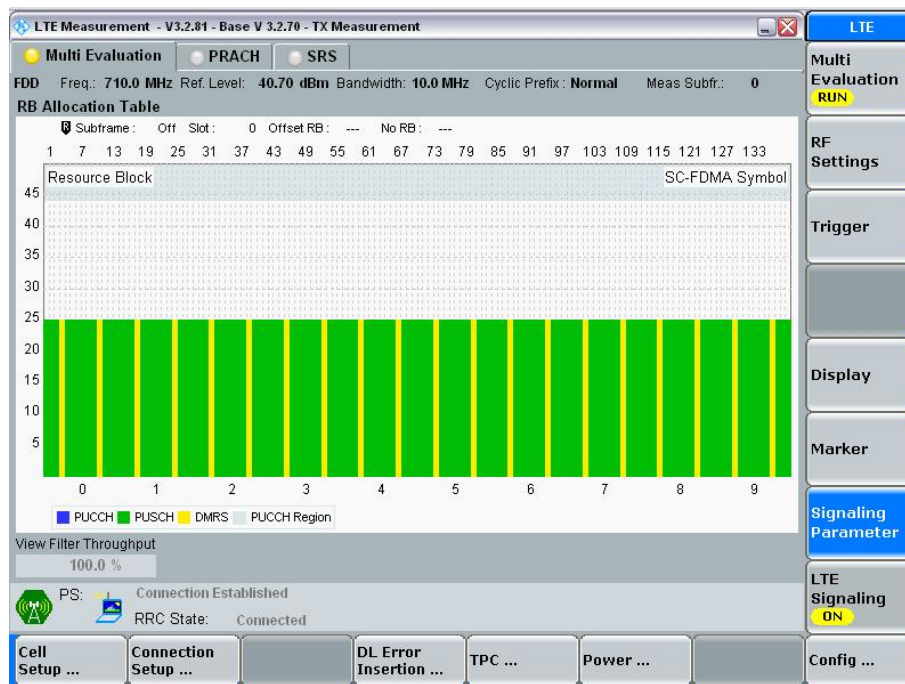




LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, 1 Resource Block Allocation, Modulation Characteristics Plot



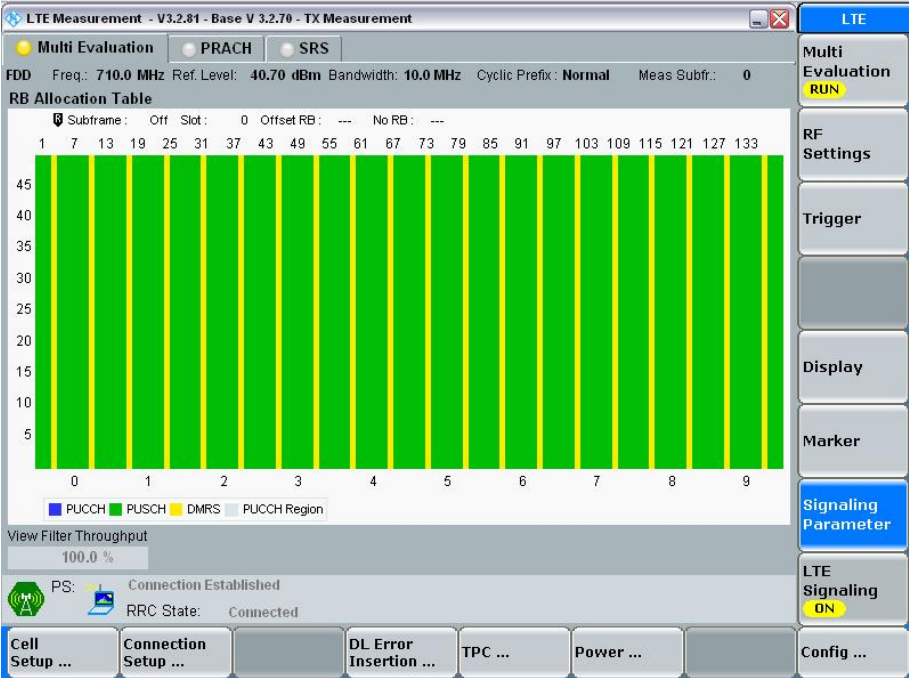
LTE FDD 26, 10.0 MHz Bandwidth - 16-QAM, 25 Resource Block Allocation, Modulation Characteristics Plot





Product Service

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



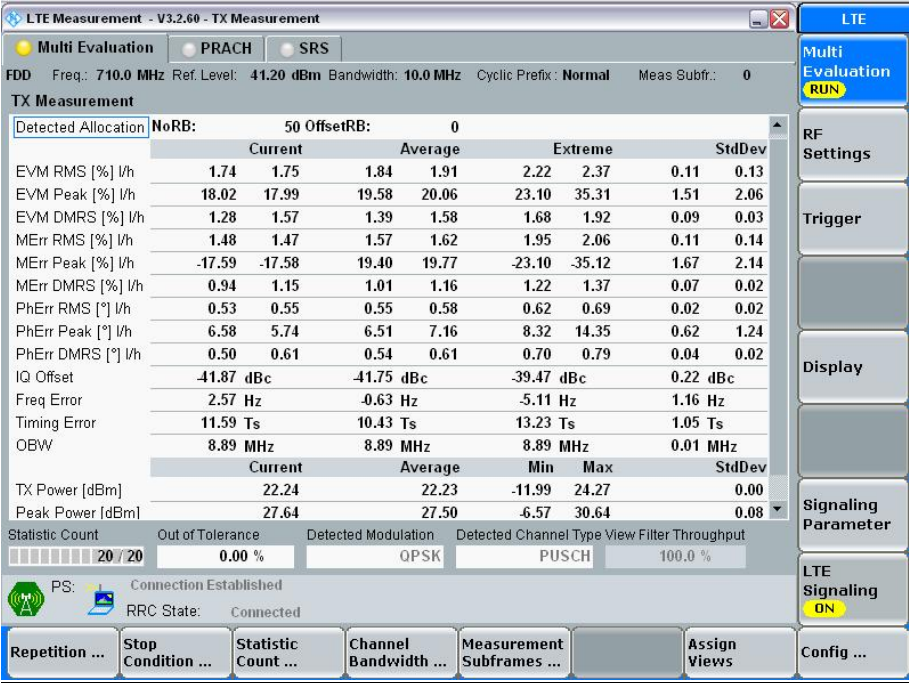
FCC 47 CFR Part 2, Limit Clause 2.1047 (d)

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

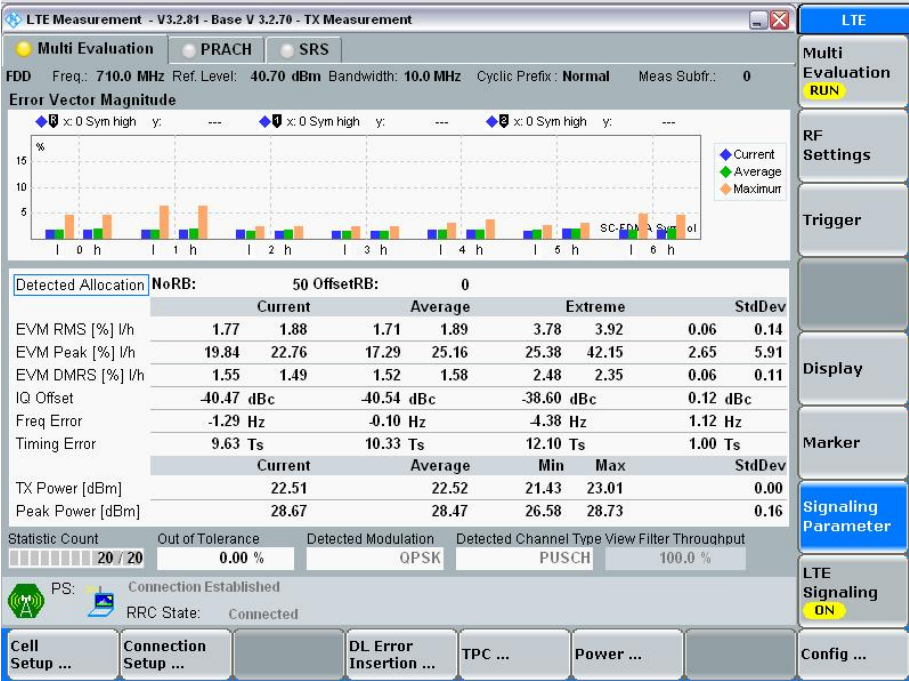
LTE FDD 5, 10.0 MHz Bandwidth – QPSK, Transmitter Summary, Modulation Characteristics, Plot



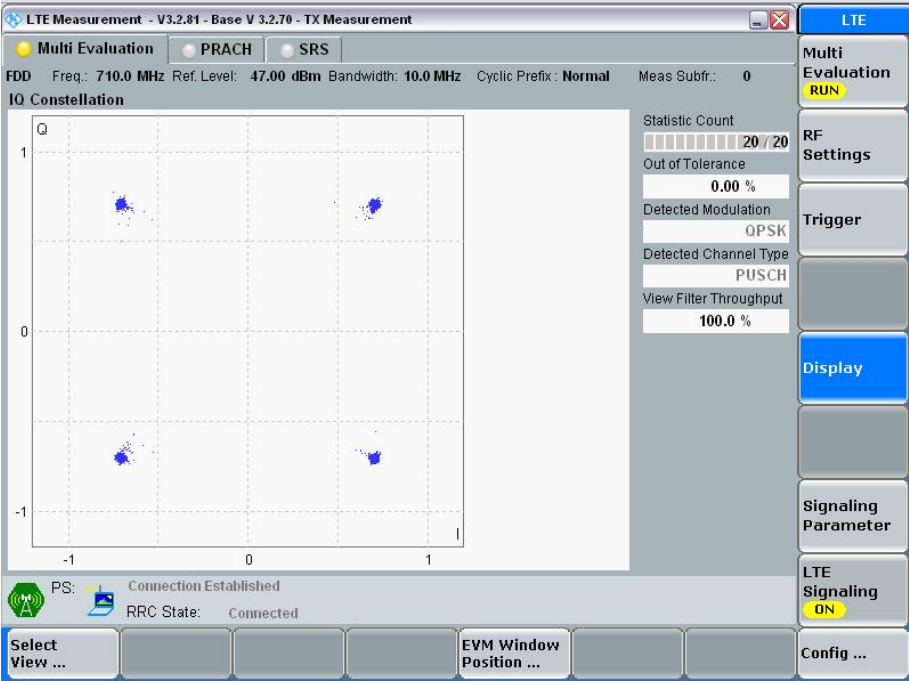


Product Service

LTE FDD 5, 10.0 MHz Bandwidth – QPSK, EVM, Modulation Characteristics Plot

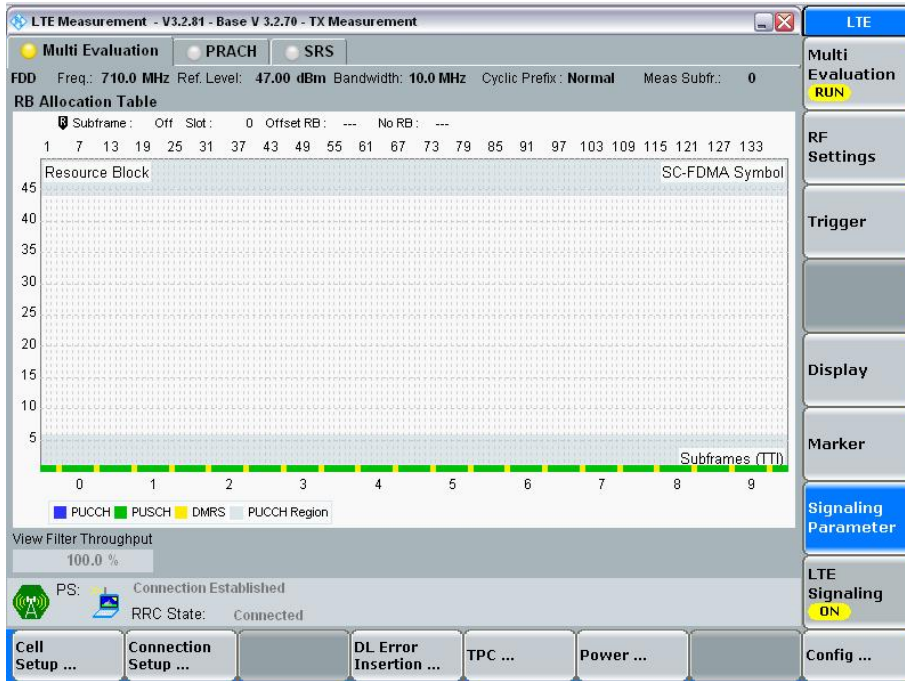


LTE FDD 5, 10.0 MHz Bandwidth – QPSK, IQ Constellation, Modulation Characteristics Plot

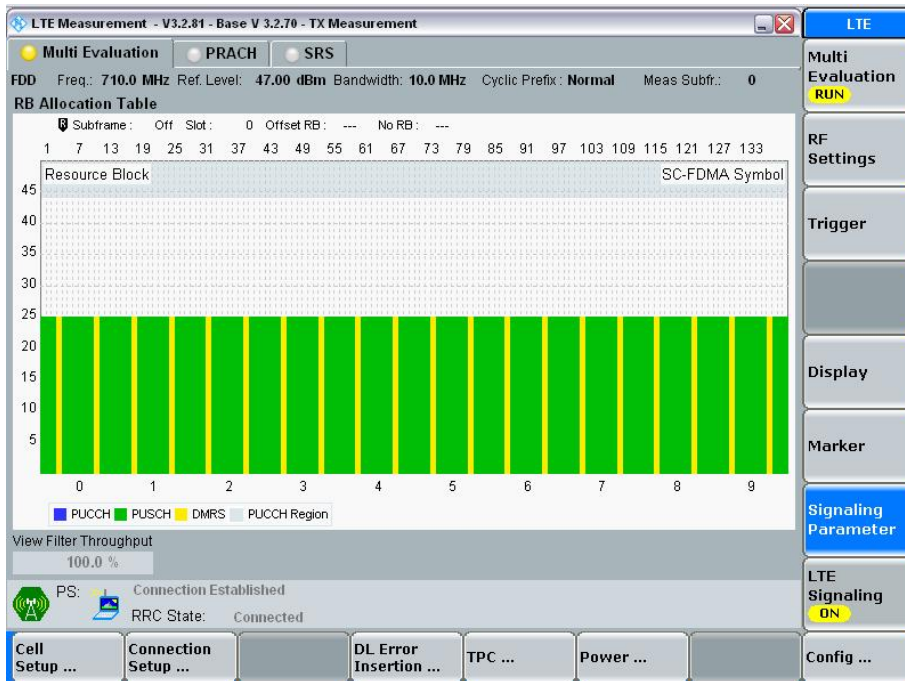




LTE FDD 5, 10.0 MHz Bandwidth – QPSK, 1 Resource Block Allocation, Modulation Characteristics Plot

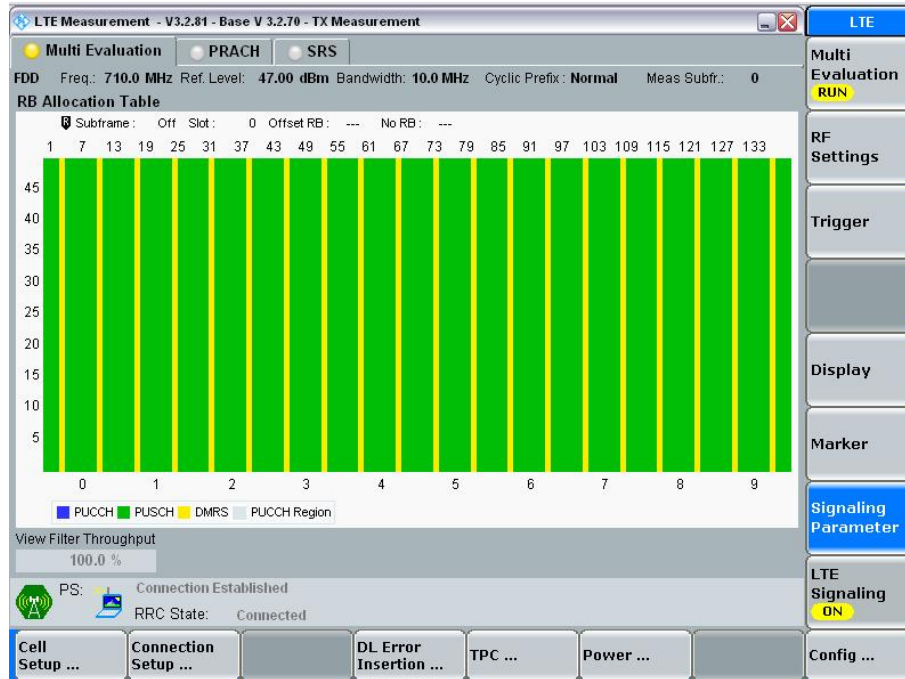


LTE FDD 5, 10.0 MHz Bandwidth – QPSK, 25 Resource Block Allocation, Modulation Characteristics Plot

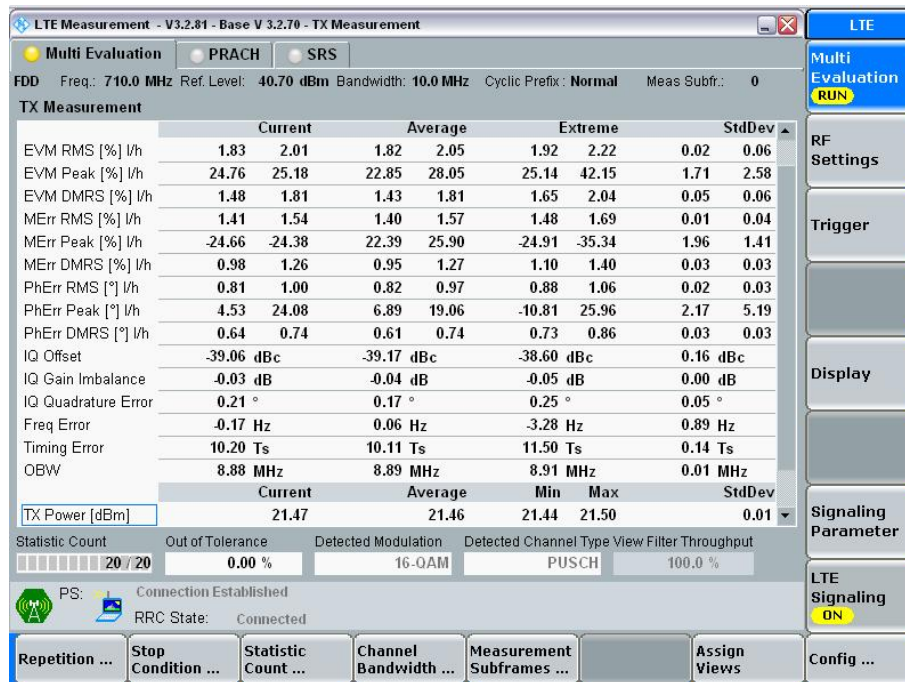




LTE FDD 5, 10.0 MHz Bandwidth – QPSK, 50 Resource Block Allocation, Modulation Characteristics Plot



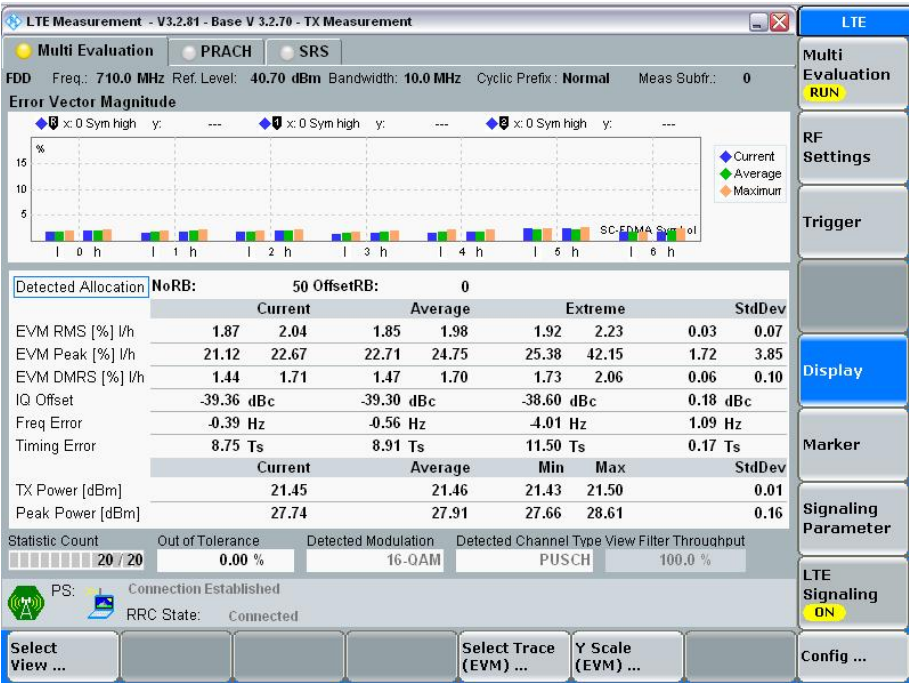
LTE FDD 5, 10.0 MHz Bandwidth - 16-QAM, Transmitter Summary, Modulation Characteristics Plot



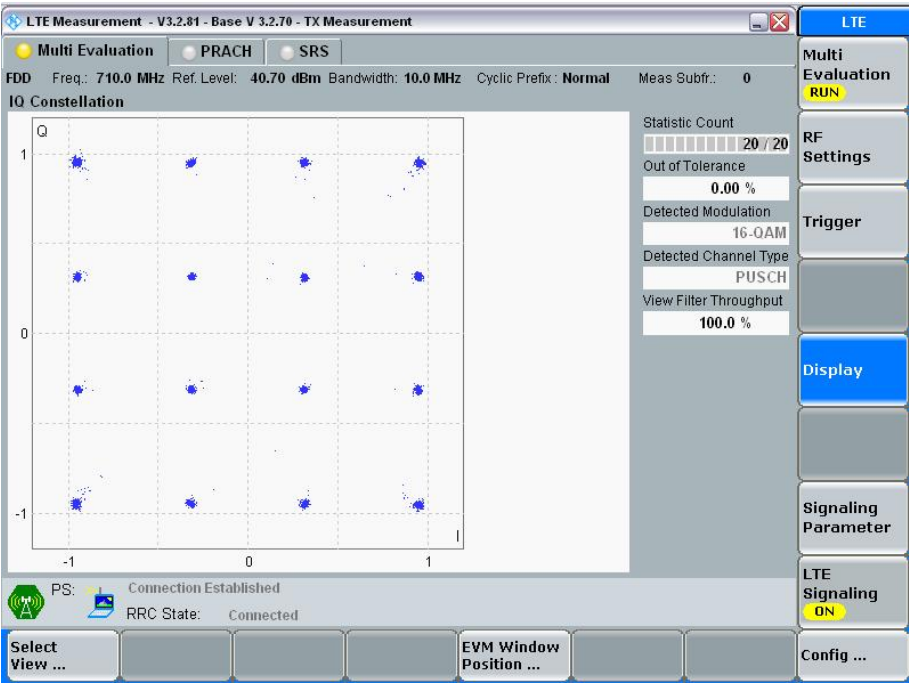


Product Service

LTE FDD 5, 10.0 MHz Bandwidth - 16-QAM, EVM, Modulation Characteristics Plot

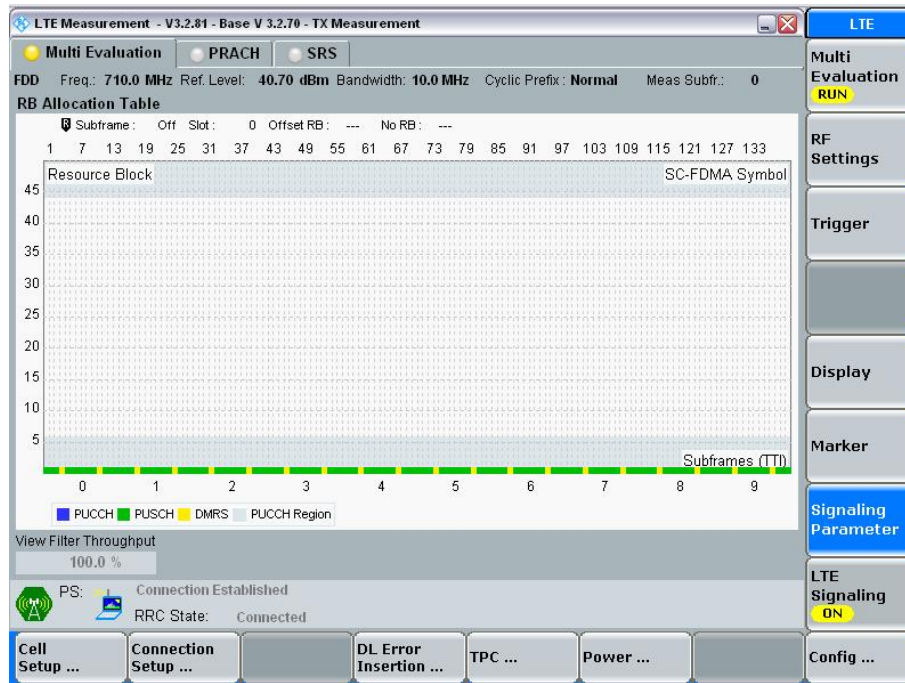


LTE FDD 5, 10.0 MHz Bandwidth - 16-QAM, IQ Constellation, Modulation Characteristics Plot

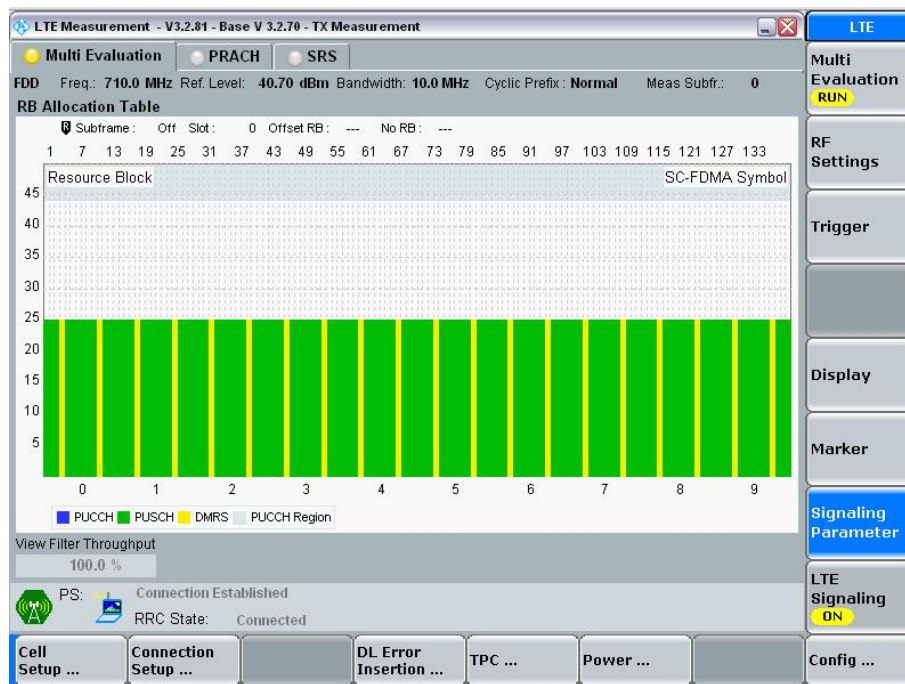




LTE FDD 5, 10.0 MHz Bandwidth - 16-QAM, 1 Resource Block Allocation, Modulation Characteristics Plot



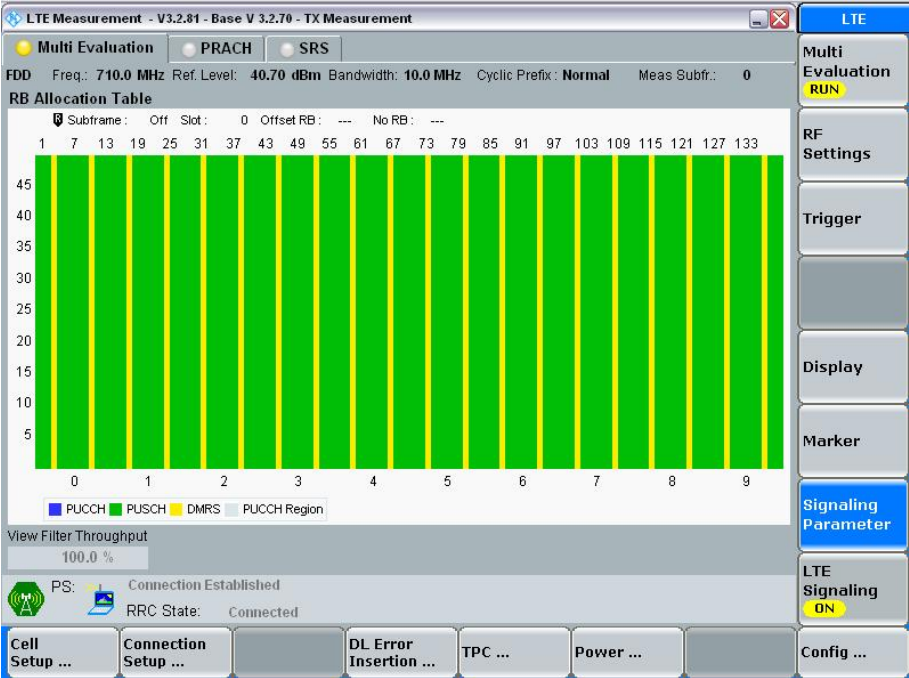
LTE FDD 5, 10.0 MHz Bandwidth - 16-QAM, 25 Resource Block Allocation, Modulation Characteristics Plot





Product Service

LTE FDD 5, 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
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-2015
Thermocouple Thermometer	Fluke	51	3174	12	4-Dec-2015
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
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
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
1 metre N-Type Cable	IW Microwave	NPS-1806LC-394-NPS	4505	12	26-Feb-2016
1 metre N-Type Cable	IW Microwave	NPS-1806LC-394-NPS	4506	12	26-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4522	12	29-Jan-2016
Section 2.2 - Spurious Emissions at Band Edge					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-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	Suhner	6810.17.A	3965	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
1 metre N-Type Cable	IW Microwave	NPS-1806LC-394-NPS	4504	12	26-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4522	12	29-Jan-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 2.3 – Maximum Conducted Output Power					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
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	Suhner	6810.17.A	3965	12	22-Oct-2015
P-Series Power Meter	Agilent Technologies	N1911A	3980	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3982	12	22-Sep-2015
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
1 metre N-Type Cable	IW Microwave	NPS-1806LC-394-NPS	4504	12	26-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4522	12	29-Jan-2016
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	23-Jan-2016
Section 2.4 – Peak to Average Ratio					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
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	Suhner	6810.17.A	3965	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
1 metre N-Type Cable	IW Microwave	NPS-1806LC-394-NPS	4504	12	26-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4522	12	29-Jan-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
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	24-Feb-2016
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
Hygrometer	Rotronic	A1	2138	12	3-Dec-2015
Multimeter	Iso-tech	IDM101	2418	12	26-Sep-2015
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	6-Nov-2015
Dual Power Supply (0-30V, 0-2A)	Farnell	LT30-2	3333	-	TU
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	mature GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	mature GmbH	NCD	3917	-	TU
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4412	12	24-Mar-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 2.6- 26 dB Bandwidth					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	28-Jul-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	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
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	28-Jul-2015
1 metre N-Type Cable	IW Microwave	NPS-1806LC-394-NPS	4504	12	26-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4522	12	29-Jan-2016
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
Frequency Tolerance	± 46.70 Hz
Maximum Conducted Output Power	± 0.70 dB
Peak to Average Ratio	± 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	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB
26 dB Bandwidth	± 16.74 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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