



## 5.5 Band Edge

<b>Specifications:</b>	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53 RSS-130 4.6, RSS-132 5.5, RSS-133 6.5, RSS-139 6.6
<b>DUT Serial Number:</b>	S1: U3708475240103
<b>Test conditions:</b>	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
<b>Test Results:</b>	--

### Limit Level Construction:

**According to Part 22.917 (a)**, i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

**According to Part 24.238 (a)**, i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB, so the limit level is:  $P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13 \text{ dBm}$ .

### According to Part 27.53(h):

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

### According to Part 27.53(g):

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log_{10}(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

### According to RSS-130 4.6:

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

In addition to the limit outlined above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

- (i)  $76 + 10 \log_{10} p$  (watts), dB, for base and fixed equipment, and
- (ii)  $65 + 10 \log_{10} p$  (watts), dB, for mobile and portable equipment

**According to RSS-132 5.5:**

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

- (i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts).
- (ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts). If the measurement is performed

**According to RSS-133 6.5:**

Equipment shall comply with the limits in (i) and (ii) below.

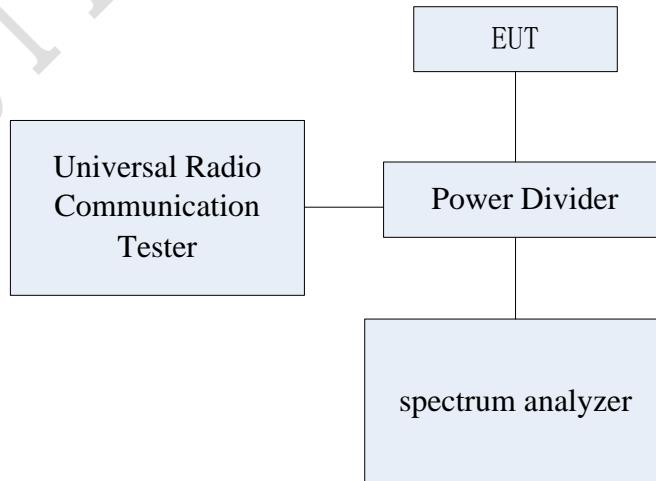
- (i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts).
- (ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

**According to RSS-139 6.6:**

- (i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least  $43 + 10 \log_{10} p$  (watts) dB.
- (ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least  $43 + 10 \log_{10} p$  (watts) dB.

**Test Setup:**

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.

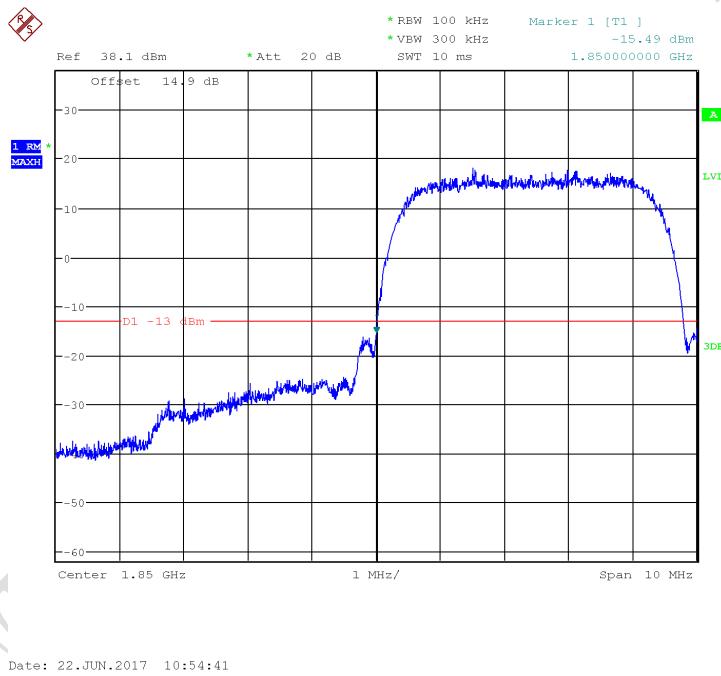


**Test Method:**

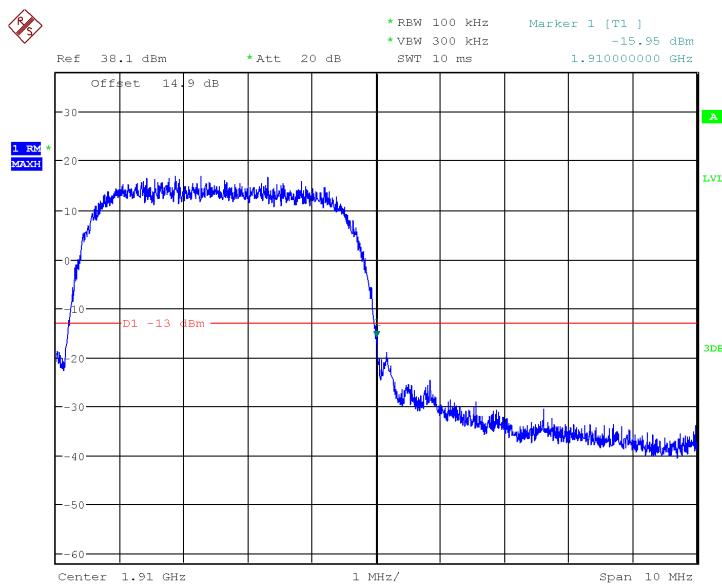
- 1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The loss of the cables the test system is calibrated to correct the readings.
- 2) The spectrum analyzer was set to Average Detector function and Maximum hold mode.
- 3) The resolution bandwidth of the spectrum analyzer was a little greater than 1% of the 26dB emission bandwidth.

**Note:** In the graphical result description (X, Y), X represents the number of RB, Y represents the RB offset.

### 5.5.1 WCDMA B2 Band Edge Results



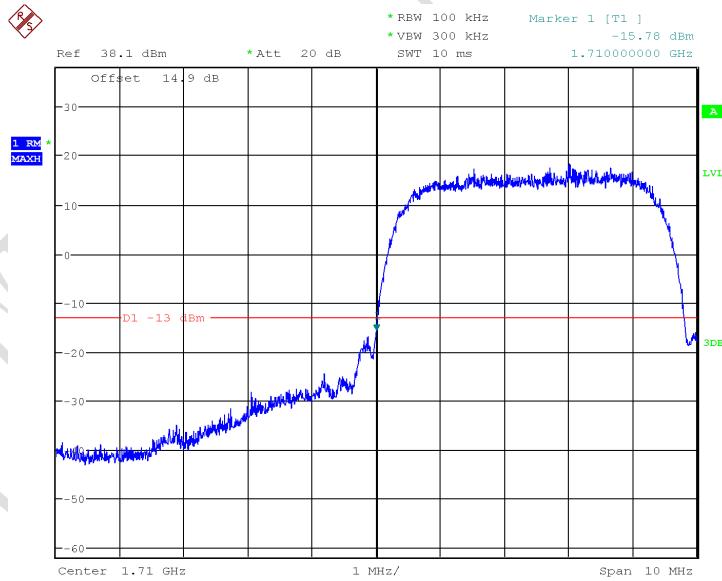
WCDMA Band 2 QPSK, Low Channel , Below 1850MHz



Date: 22.JUN.2017 10:56:12

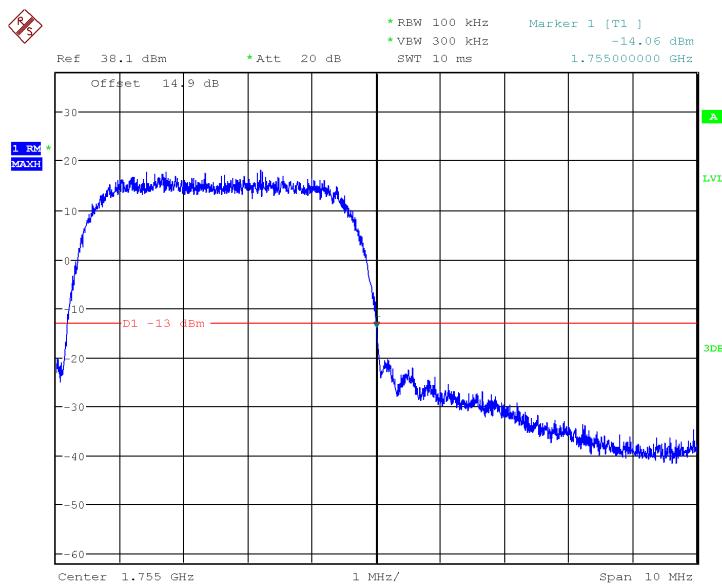
WCDMA Band 2 QPSK, High Channel , Above 1910MHz

### 5.5.2 WCDMA B4 Band Edge Results



Date: 22.JUN.2017 10:51:25

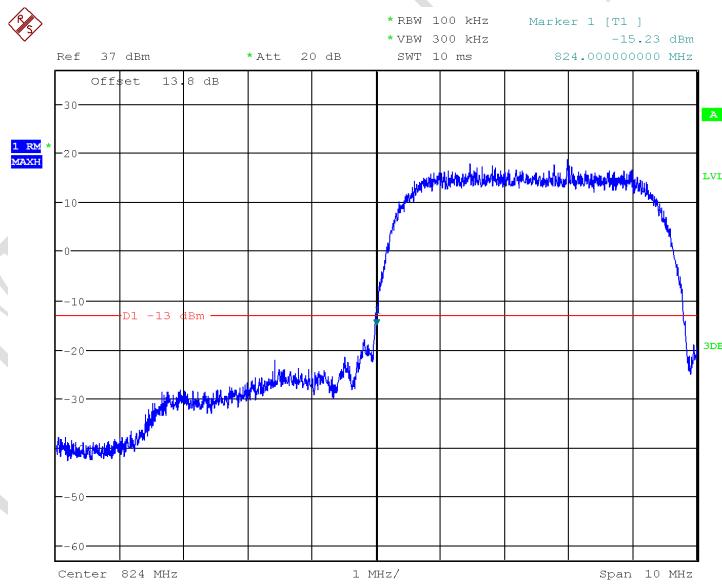
WCDMA Band 4 QPSK, Low Channel , Below 1710MHz



Date: 22.JUN.2017 10:52:30

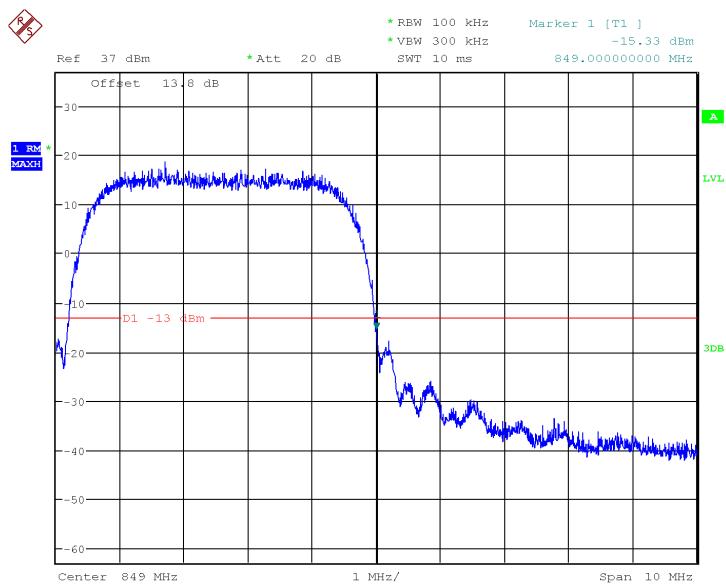
WCDMA Band 4 QPSK, High Channel , Above 1755MHz

### 5.5.3 WCDMA B5 Band Edge Results



Date: 22.JUN.2017 10:36:02

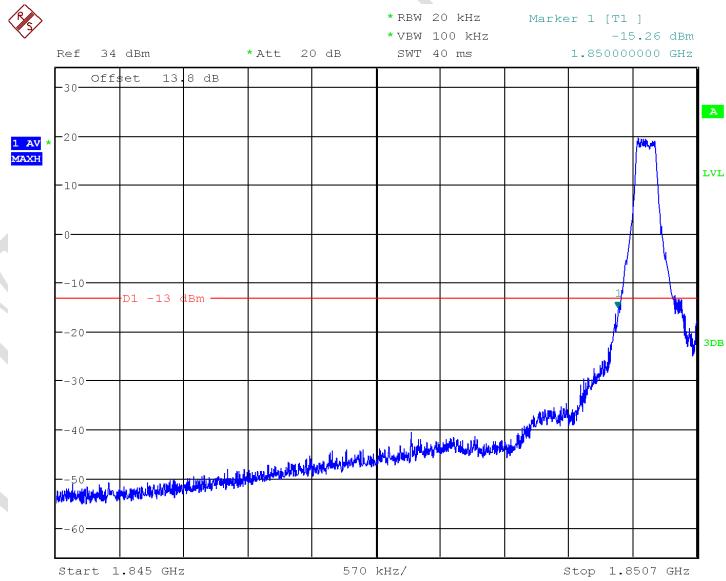
WCDMA Band 5 QPSK, Low Channel , Below 824MHz



Date: 22.JUN.2017 10:46:18

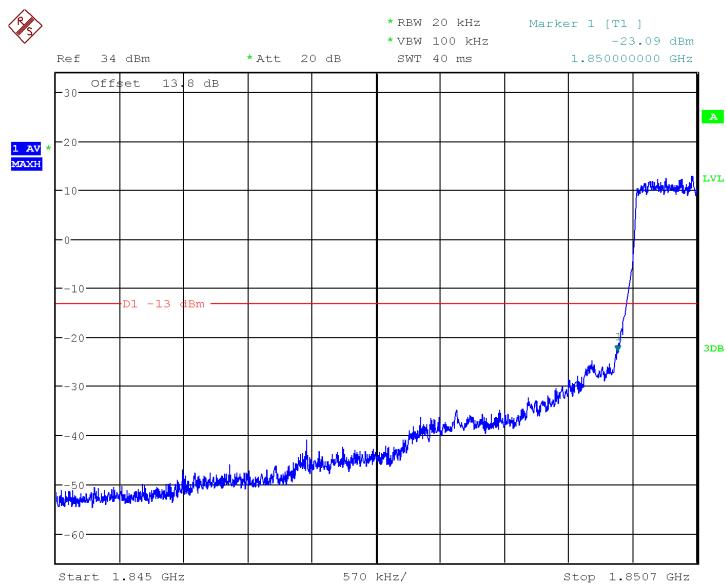
WCDMA Band 5 QPSK, High Channel , Above 849MHz

#### 5.5.4 LTE B2 Band Edge Results



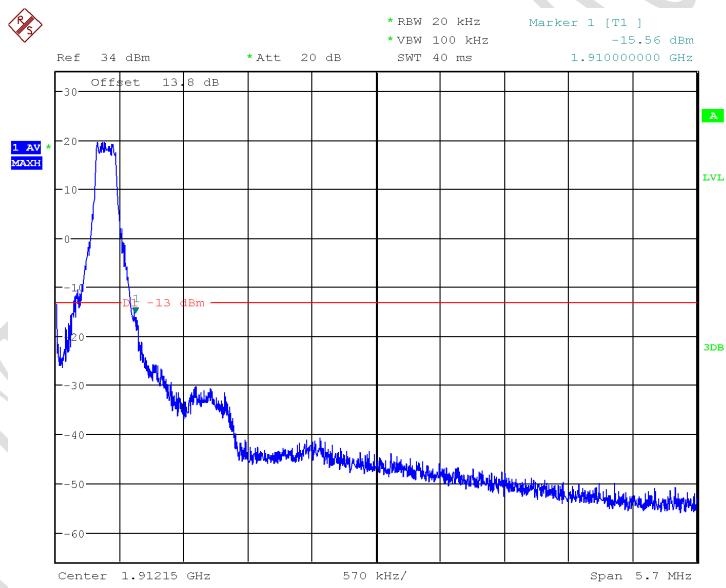
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LTE Band2, 1.4MHz bandwidth, QPSK,(1,0) Mode , Below 1850MHz



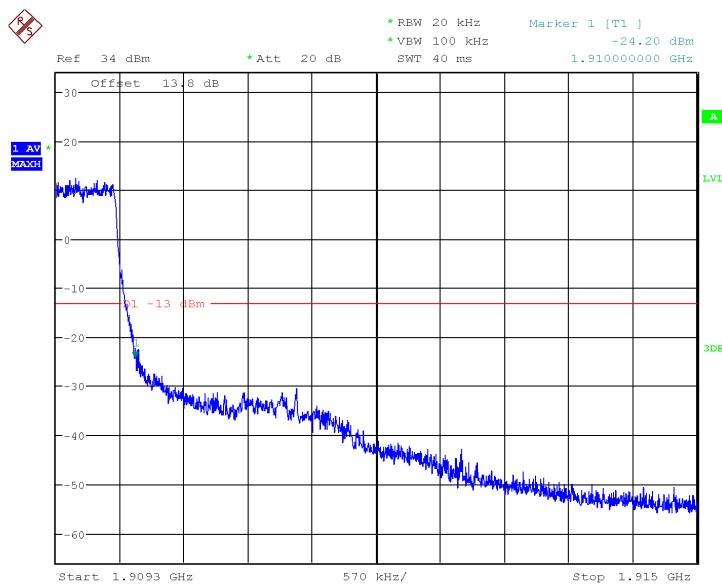
Date: 23.JUN.2017 17:19:08

## LTE Band2, 1.4MHz bandwidth, QPSK,(6,0) Mode , Below 1850MHz



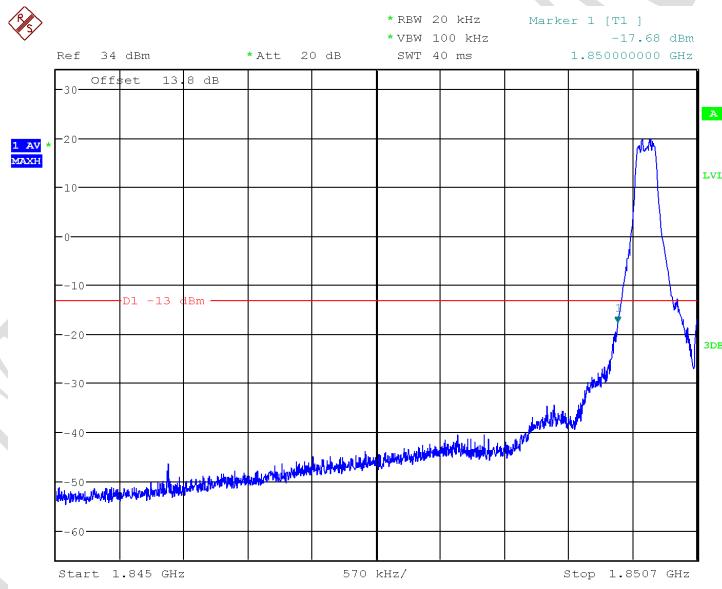
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## LTE Band2, 1.4MHz bandwidth, QPSK,(1,6) Mode, Above 1910MHz



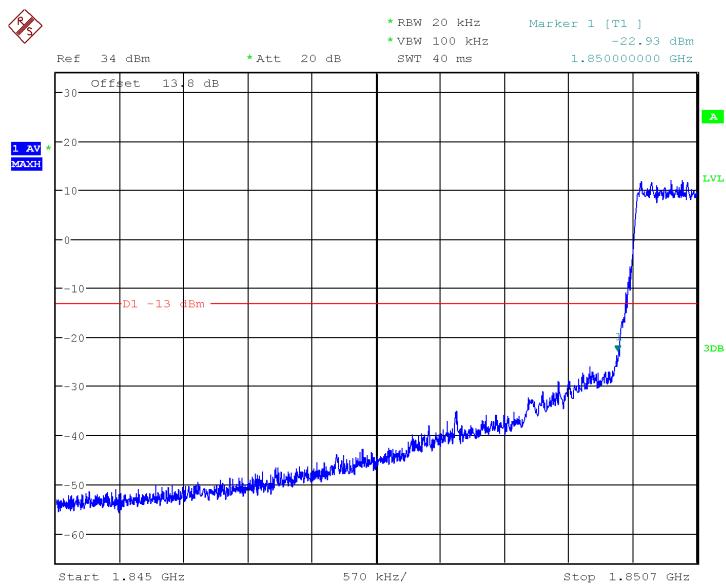
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## LTE Band2, 1.4MHz bandwidth, QPSK,(6,0) Mode, Above 1910MHz



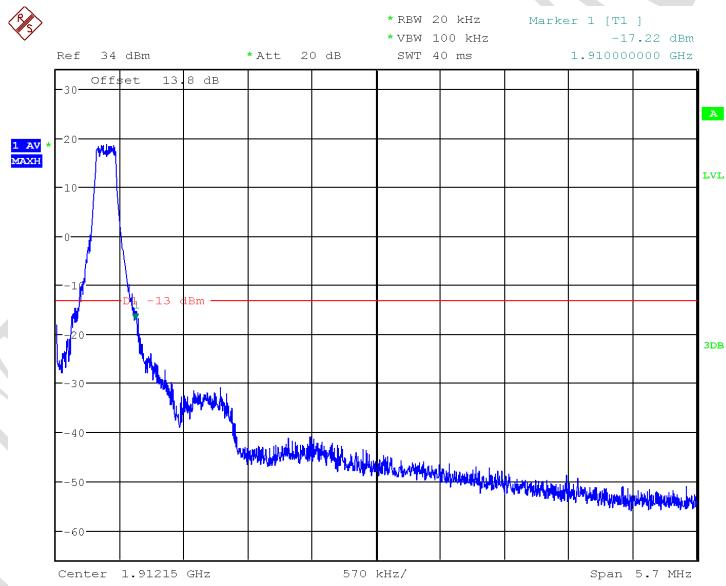
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## LTE Band2, 1.4MHz bandwidth, 16QAM,(1,0) Mode , Below 1850MHz



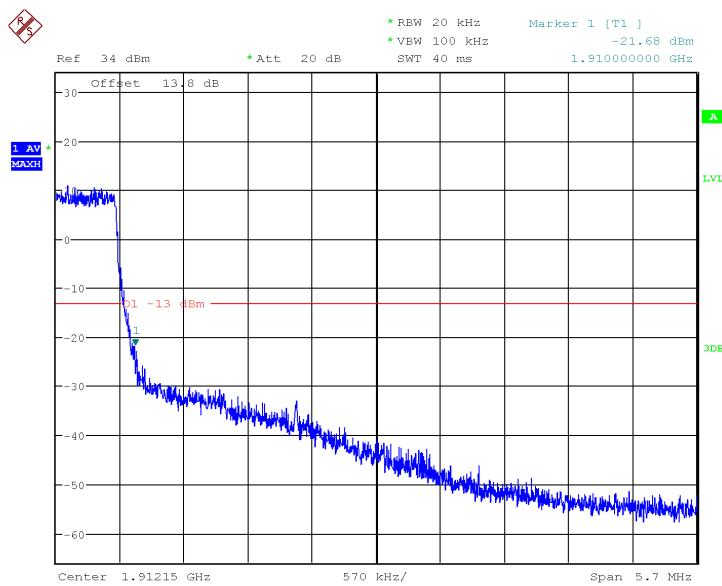
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## LTE Band2, 1.4MHz bandwidth, 16QAM,(6,0) Mode , Below 1850MHz



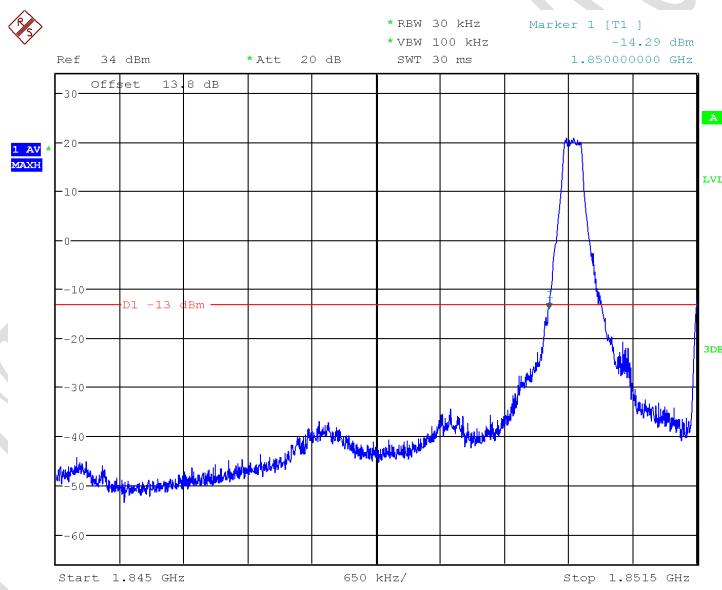
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## LTE Band2, 1.4MHz bandwidth, 16QAM,(1,6) Mode, Above 1910MHz



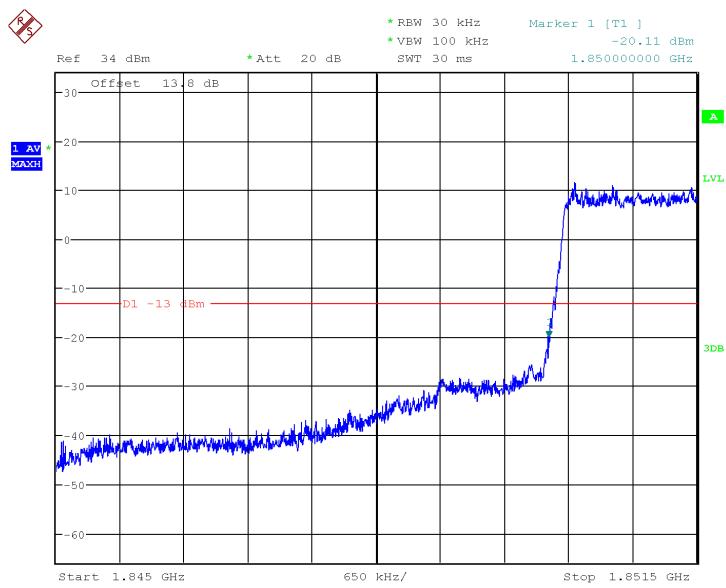
Date: 23.JUN.2017 17:22:13

## LTE Band2, 1.4MHz bandwidth, 16QAM,(6,0) Mode, Above 1910MHz



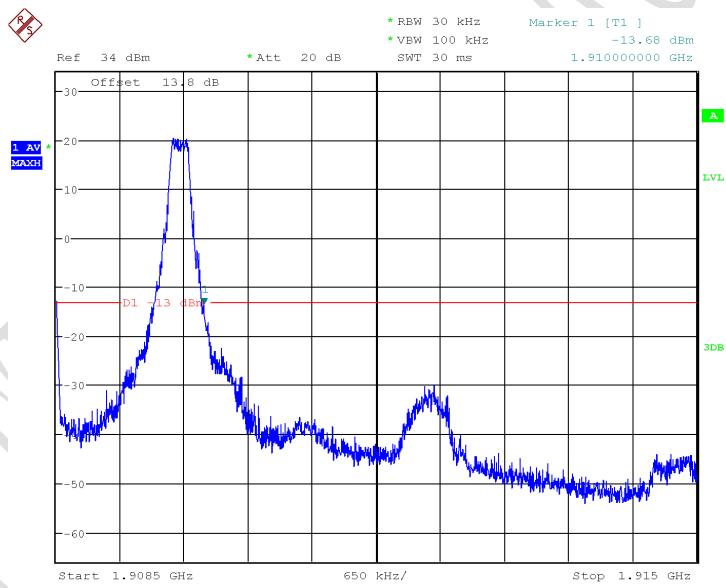
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## LTE Band2, 3MHz bandwidth, QPSK,(1,0) Mode , Below 1850MHz



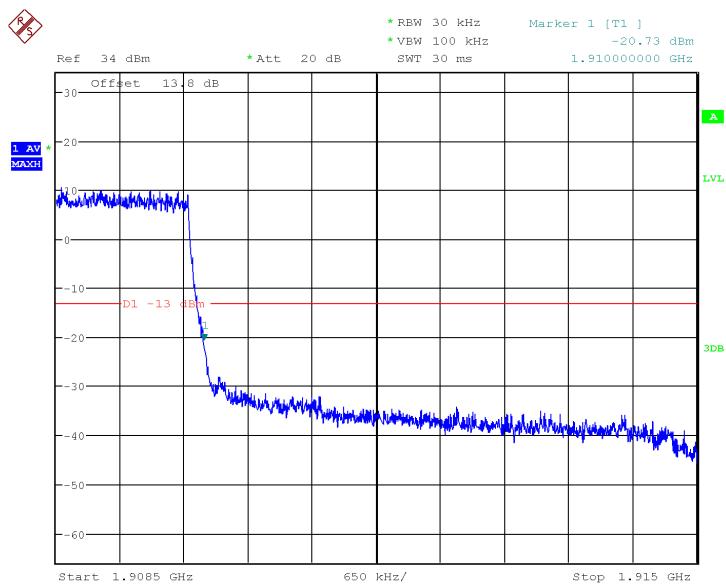
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## LTE Band2, 3MHz bandwidth, QPSK,(15,0) Mode , Below 1850MHz



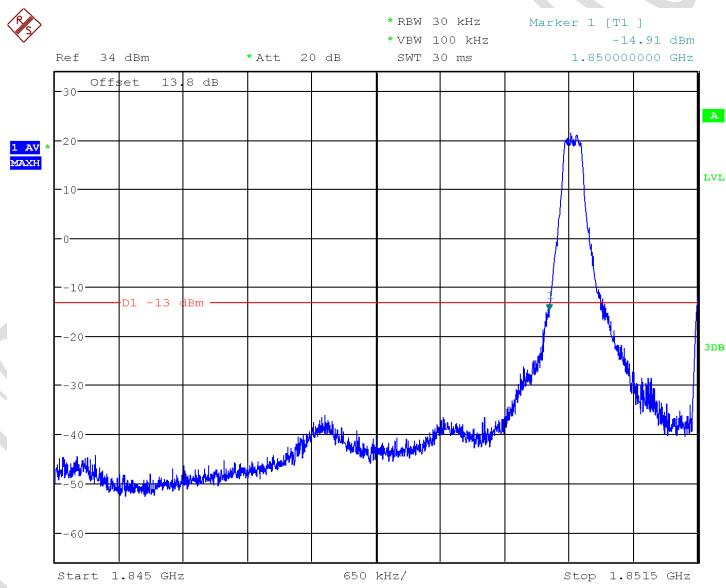
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## LTE Band2, 3MHz bandwidth, QPSK,(1,15) Mode, Above 1910MHz



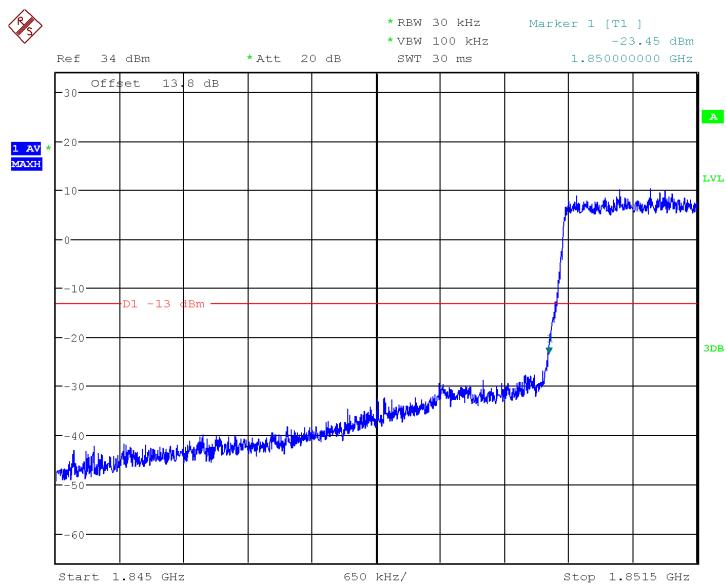
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LTE Band2, 3MHz bandwidth, QPSK,(15,0) Mode, Above 1910MHz



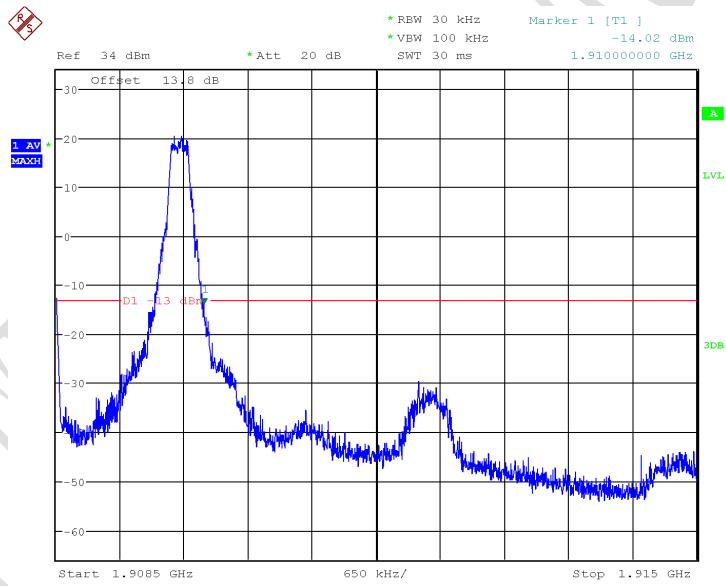
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LTE Band2, 3MHz bandwidth, 16QAM,(1,0) Mode , Below 1850MHz



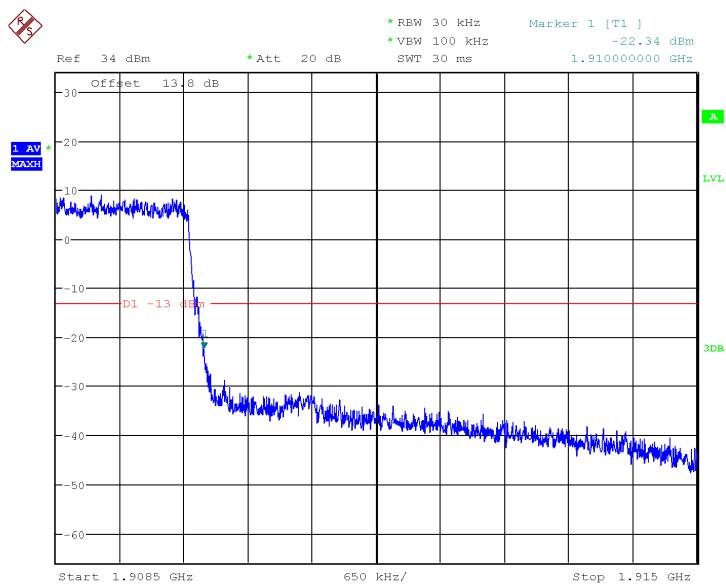
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## LTE Band2, 3MHz bandwidth, 16QAM,(15,0) Mode , Below 1850MHz



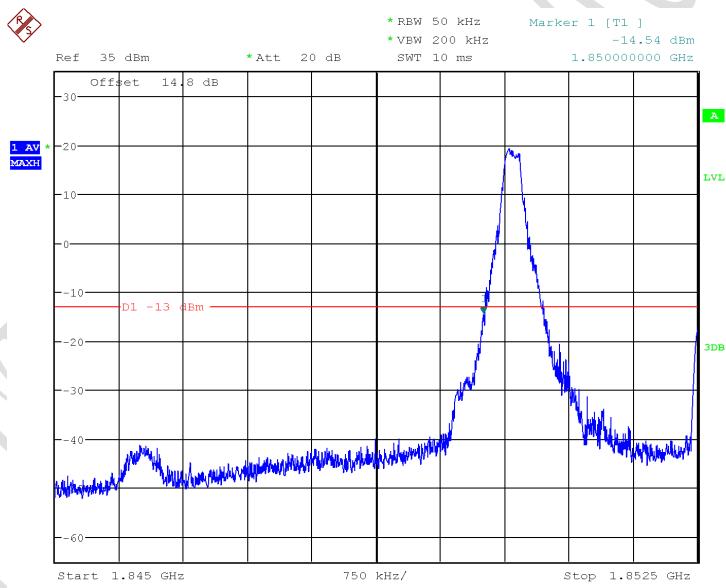
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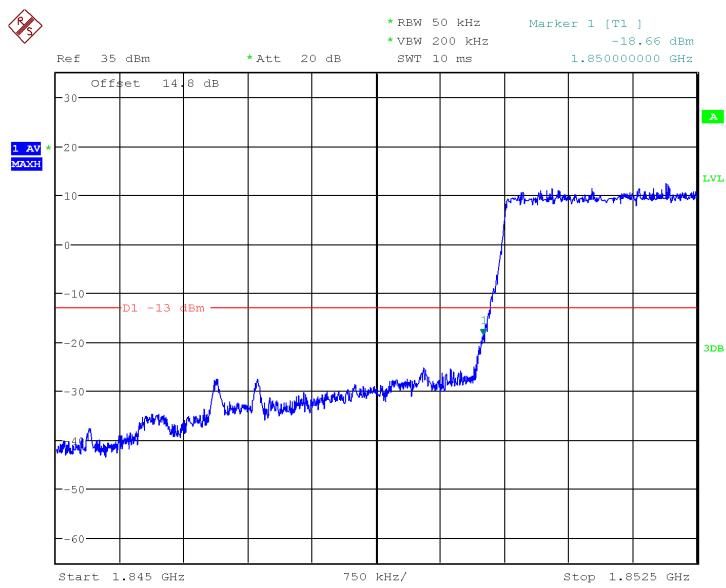
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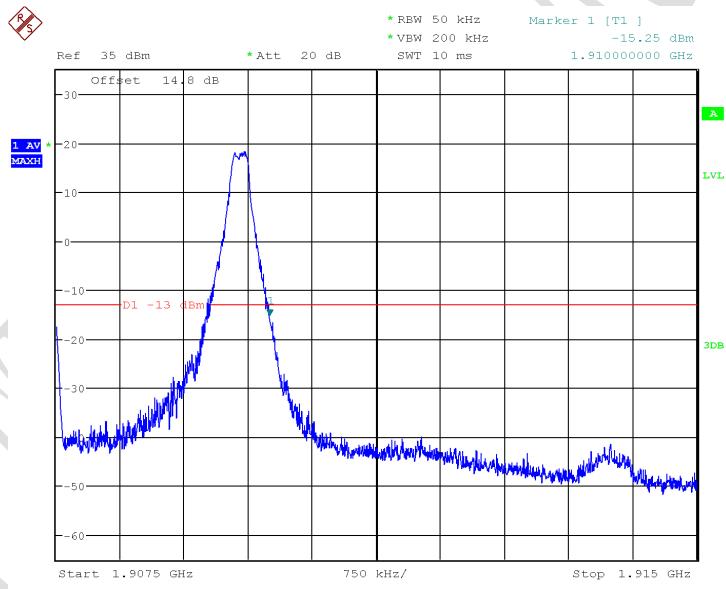
Date: 25.JUN.2017 14:02:13

## LTE Band2, 5MHz bandwidth, QPSK,(1,0) Mode , Below 1850MHz



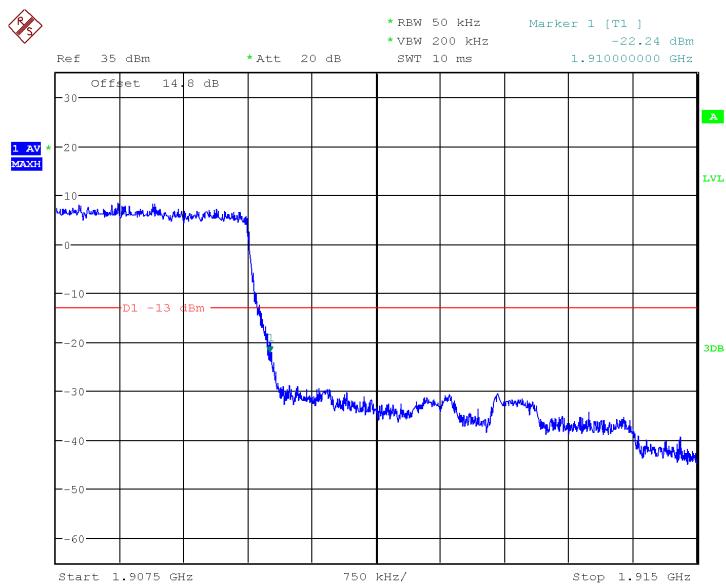
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## LTE Band2, 5MHz bandwidth, QPSK,(25,0) Mode , Below 1850MHz



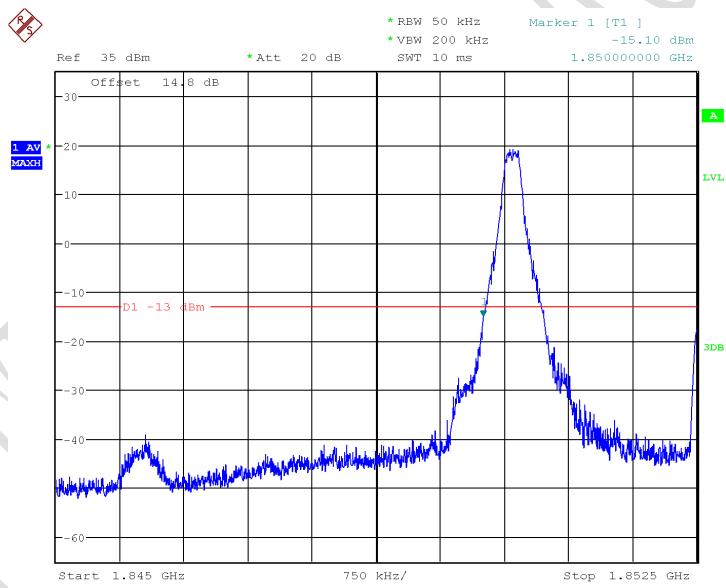
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## LTE Band2, 5MHz bandwidth, QPSK,(1,25) Mode, Above 1910MHz



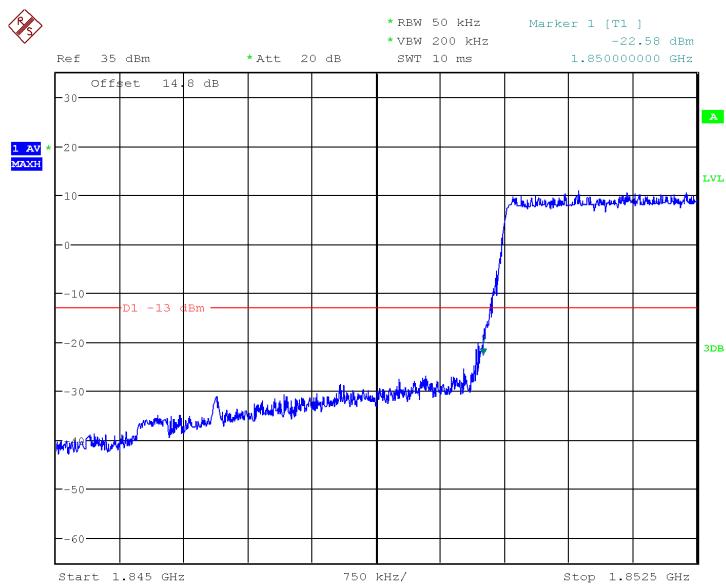
Date: 25.JUN.2017 14:12:26

## LTE Band2, 5MHz bandwidth, QPSK,(25,0) Mode, Above 1910MHz



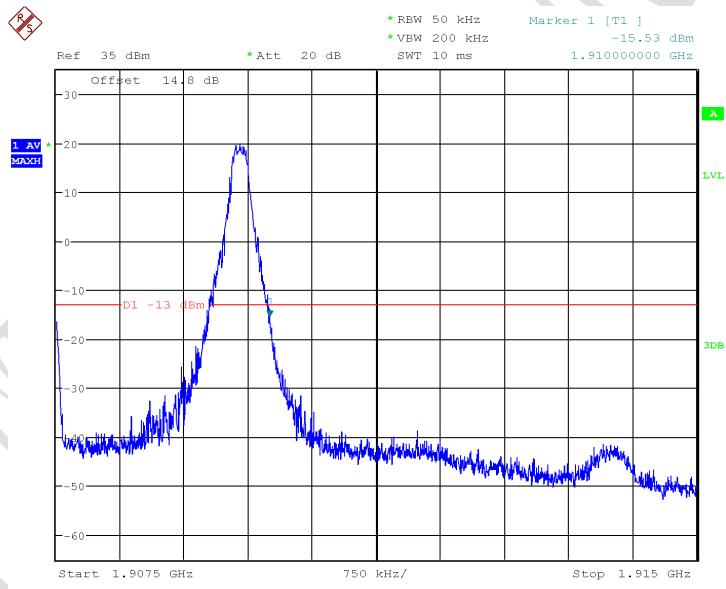
Date: 25.JUN.2017 14:02:28

## LTE Band2, 5MHz bandwidth, 16QAM,(1,0) Mode , Below 1850MHz



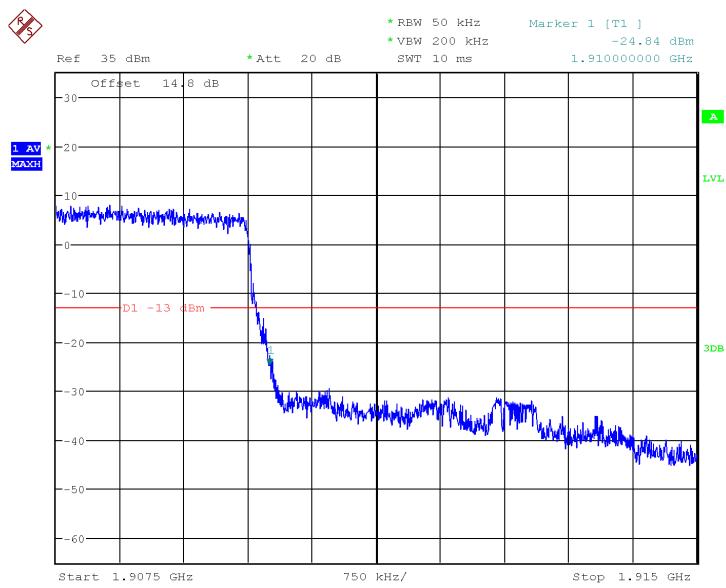
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#### LTE Band2, 5MHz bandwidth, 16QAM,(25,0) Mode , Below 1850MHz



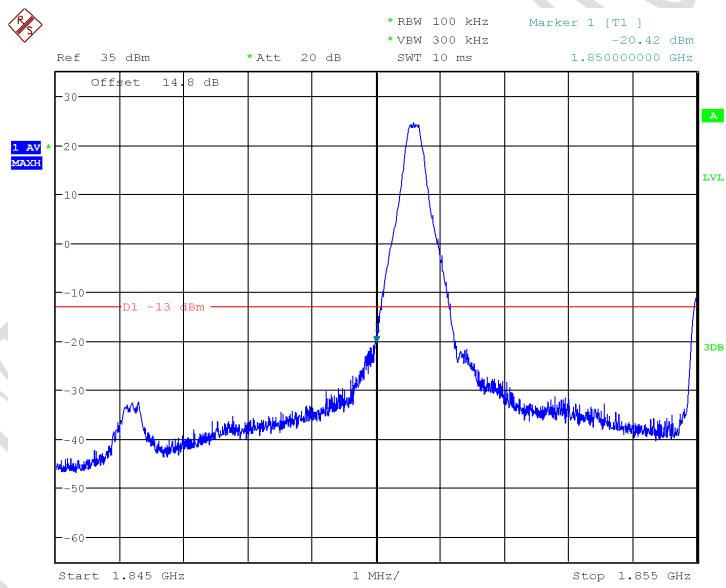
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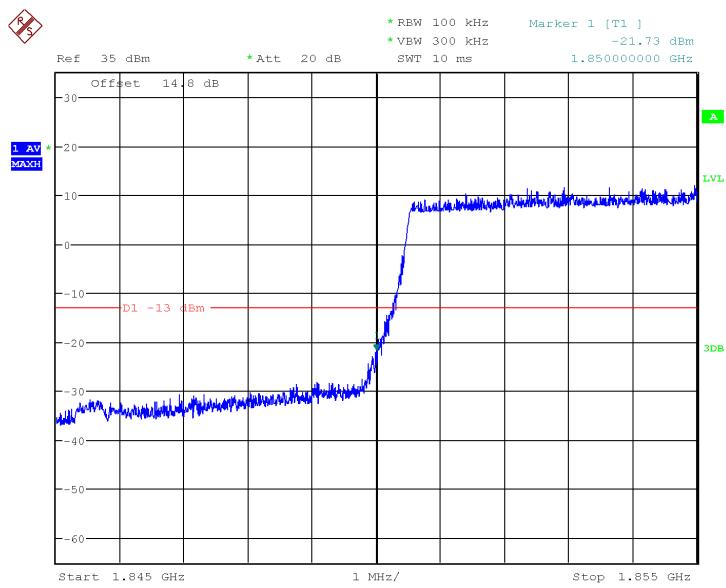
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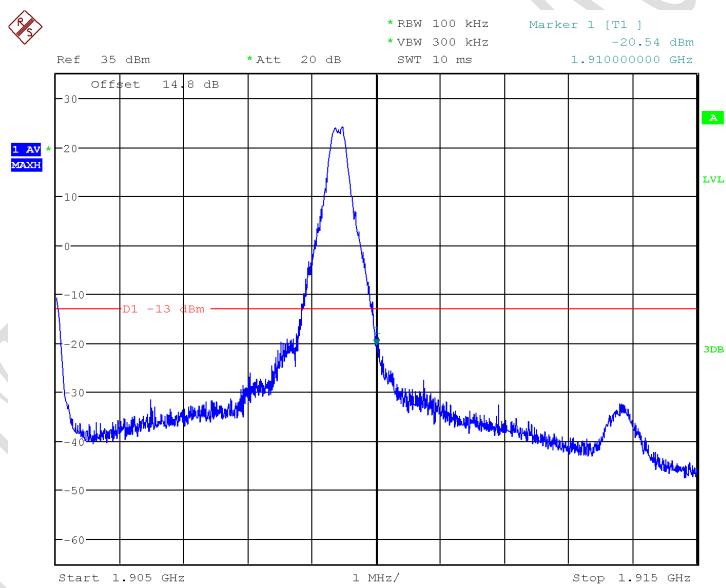
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## LTE Band2, 10MHz bandwidth, QPSK,(1,0) Mode , Below 1850MHz



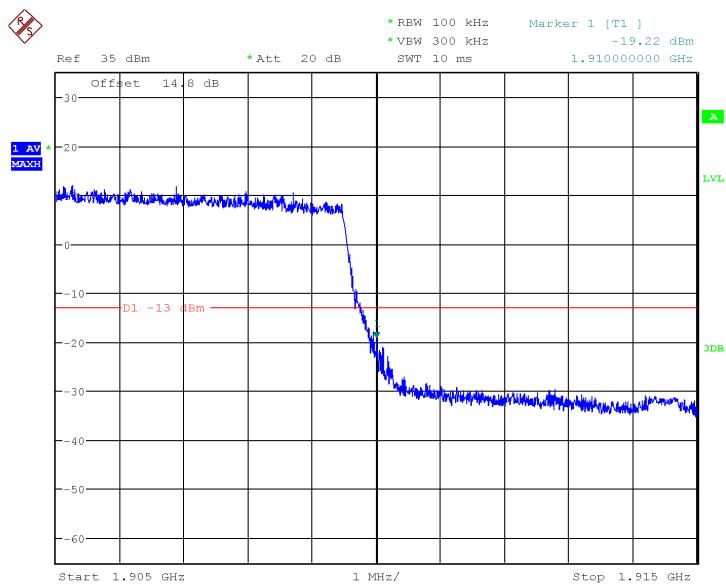
Date: 25.JUN.2017 14:27:03

## LTE Band2, 10MHz bandwidth, QPSK,(50,0) Mode , Below 1850MHz



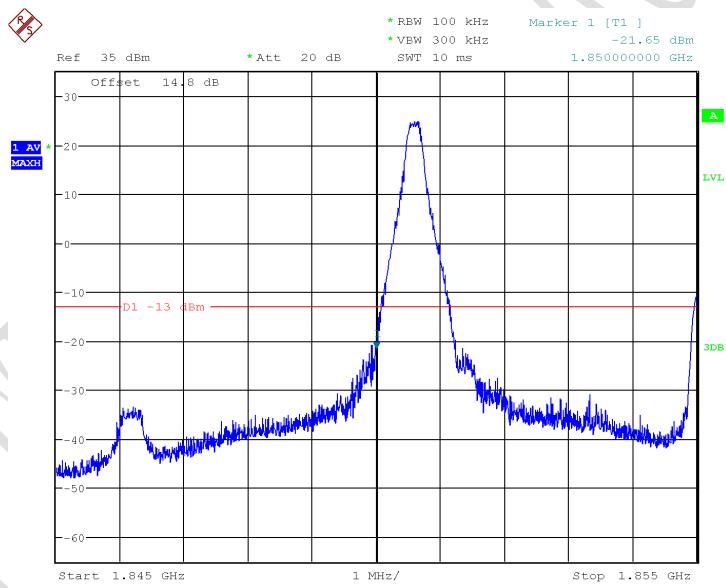
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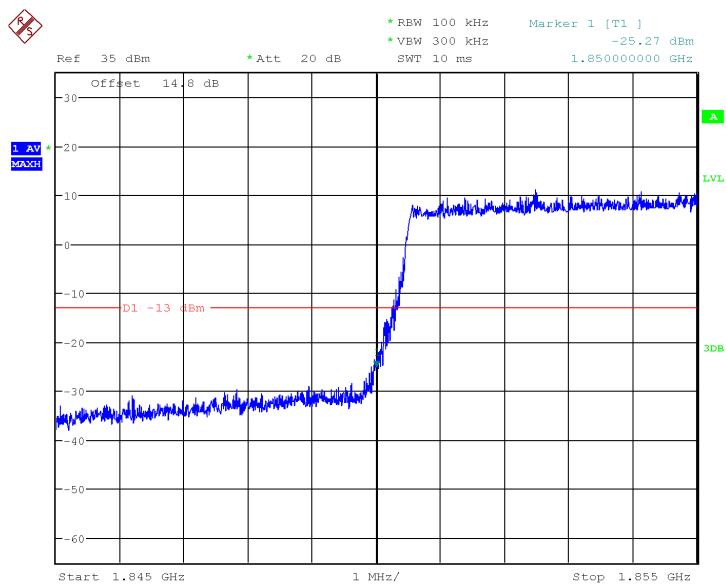
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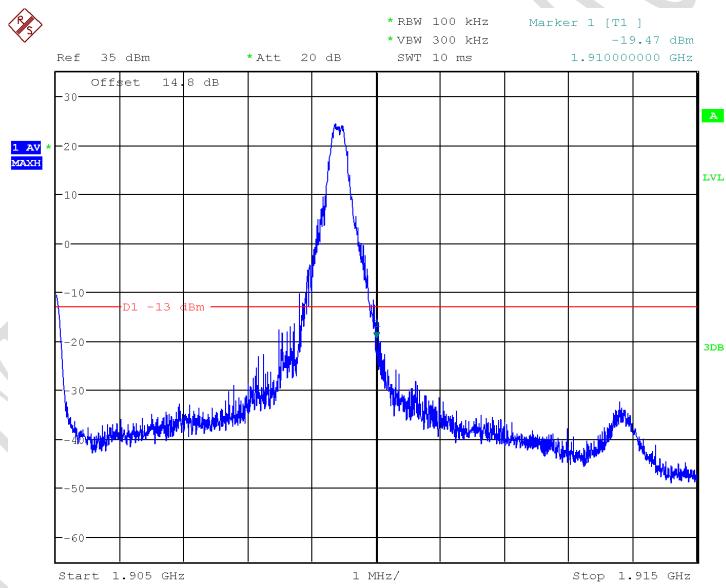
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## LTE Band2, 10MHz bandwidth, 16QAM,(1,0) Mode , Below 1850MHz



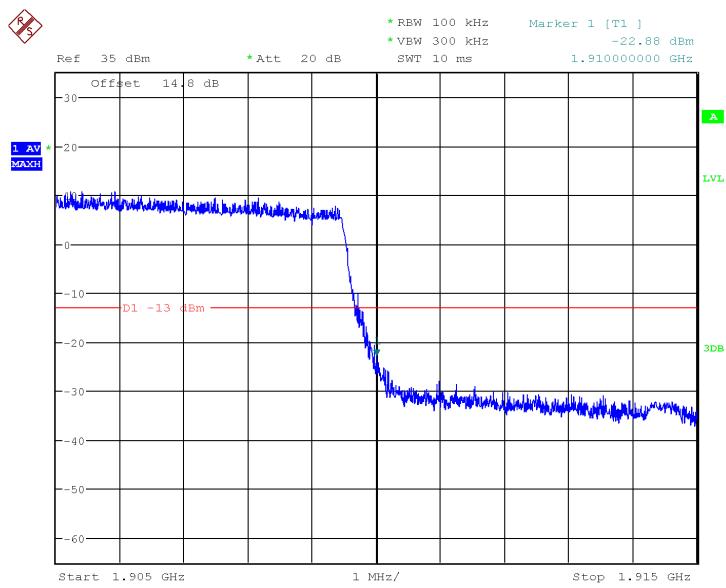
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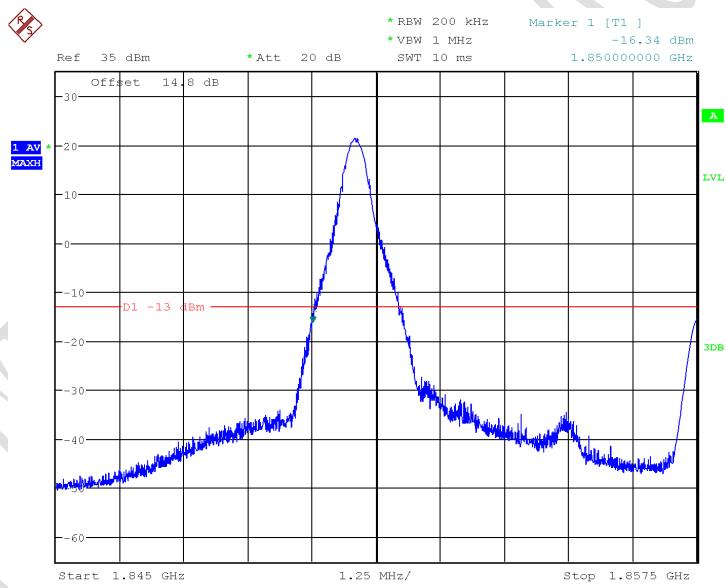
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## LTE Band2, 10MHz bandwidth, 16QAM,(1,50) Mode, Above 1910MHz



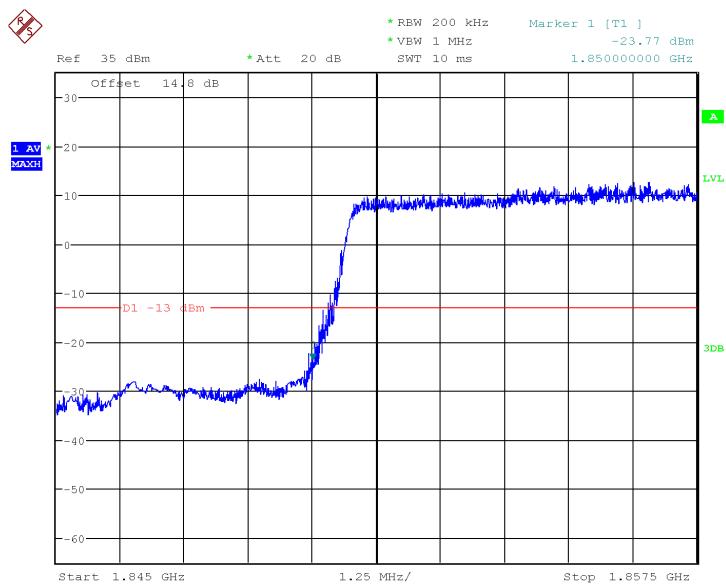
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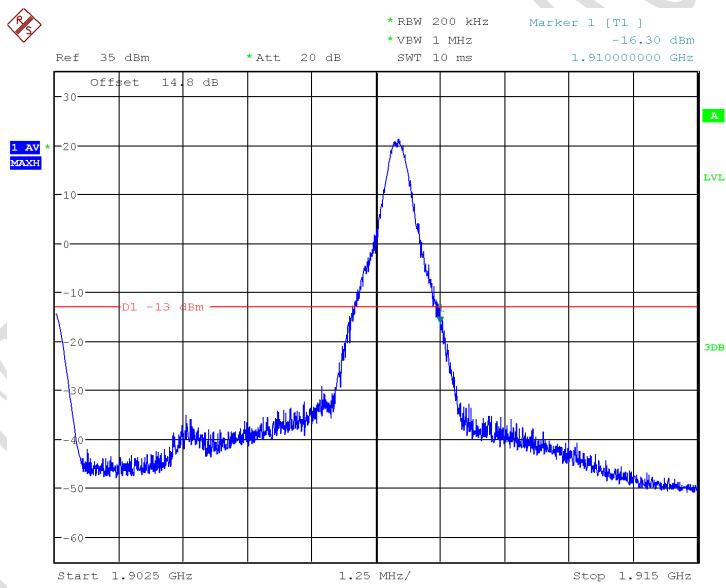
Date: 25.JUN.2017 14:30:15

## LTE Band2, 15MHz bandwidth, QPSK,(1,0) Mode , Below 1850MHz



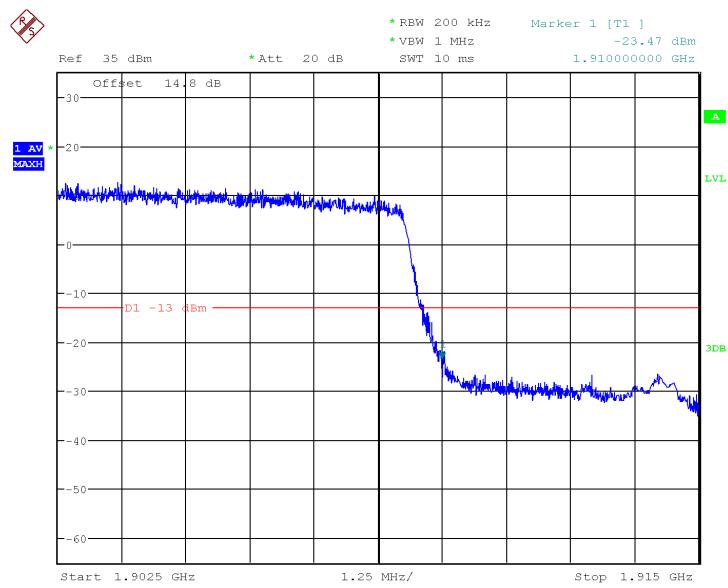
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## LTE Band2, 15MHz bandwidth, QPSK,(75,0) Mode , Below 1850MHz



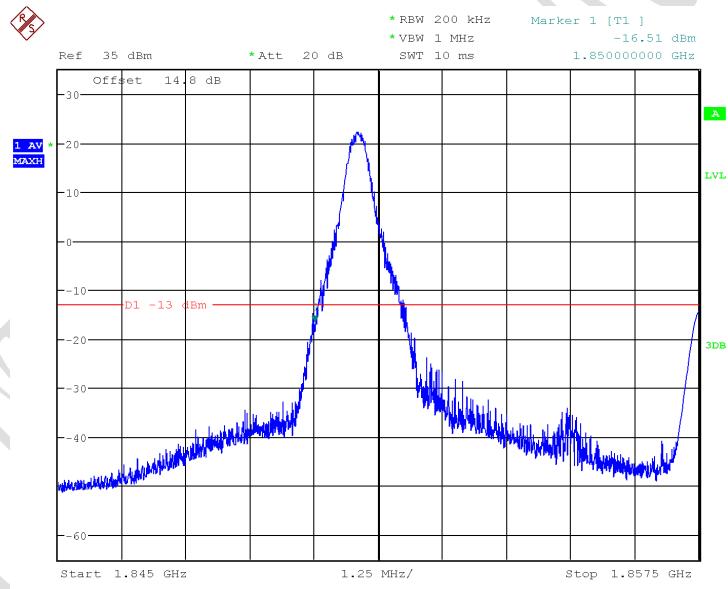
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## LTE Band2, 15MHz bandwidth, QPSK,(1,75) Mode, Above 1910MHz



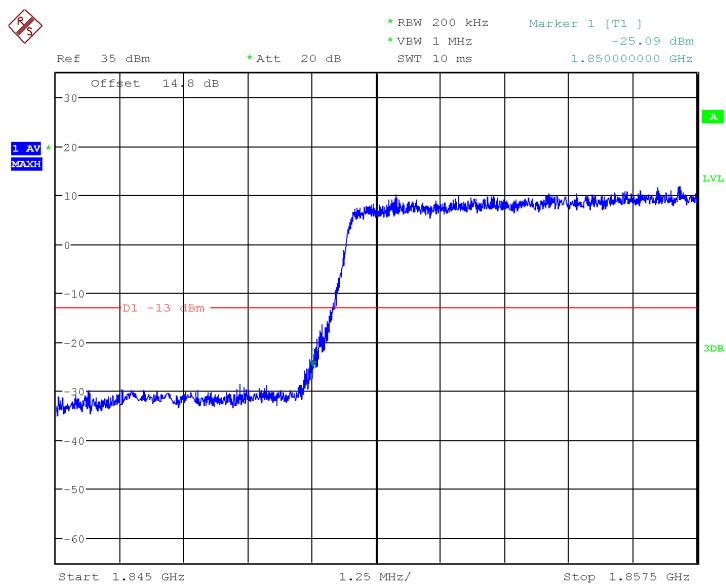
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#### LTE Band2, 15MHz bandwidth, QPSK,(75,0) Mode, Above 1910MHz



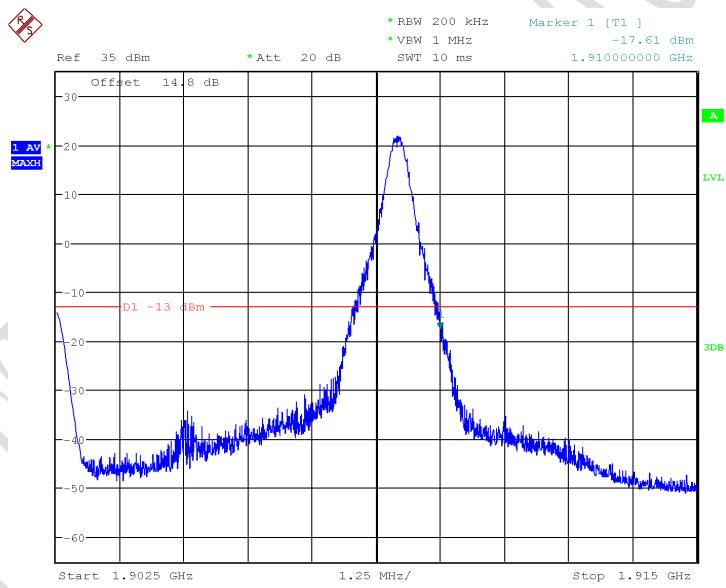
Date: 25.JUN.2017 14:30:27

#### LTE Band2, 15MHz bandwidth, 16QAM,(1,0) Mode , Below 1850MHz



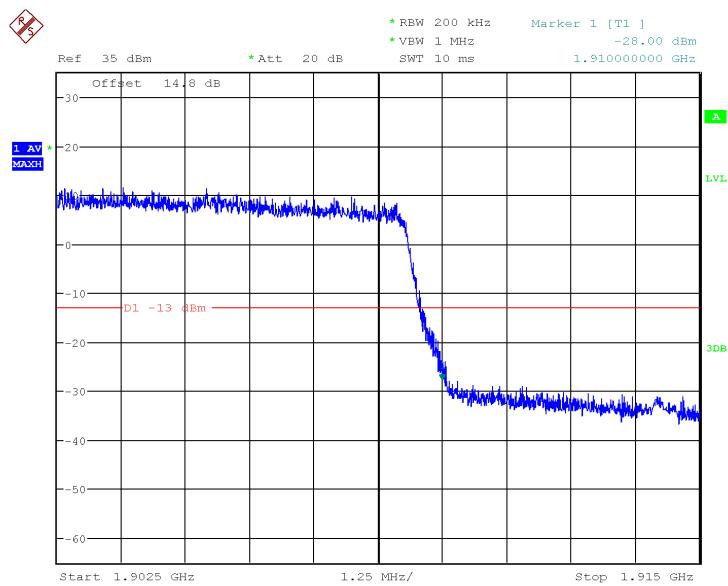
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## LTE Band2, 15MHz bandwidth, 16QAM,(75,0) Mode , Below 1850MHz



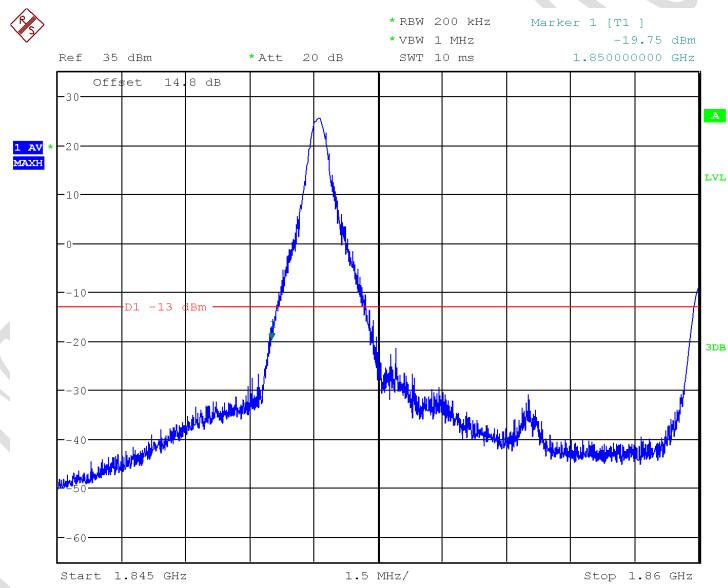
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## LTE Band2, 15MHz bandwidth, 16QAM,(1,75) Mode, Above 1910MHz



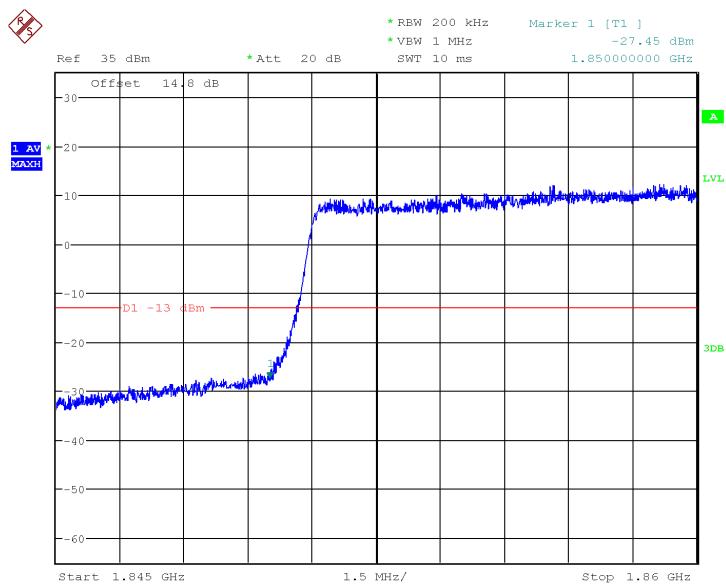
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## LTE Band2, 15MHz bandwidth, 16QAM,(75,0) Mode, Above 1910MHz



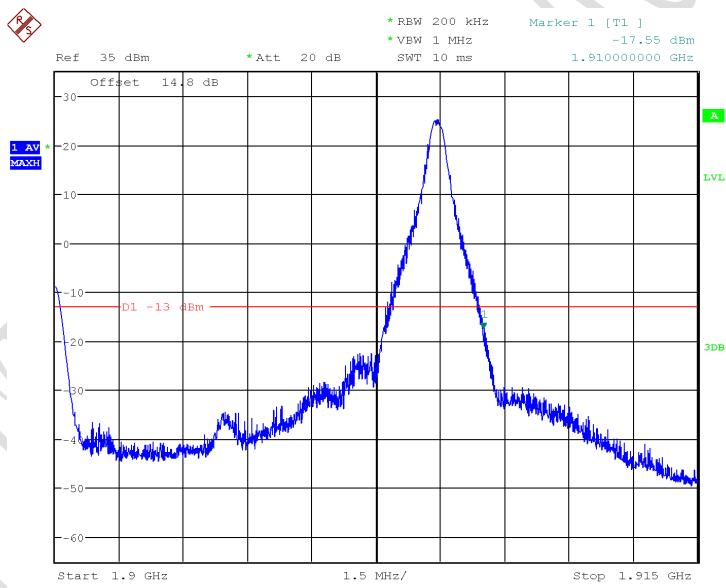
Date: 25.JUN.2017 14:40:58

## LTE Band2, 20MHz bandwidth, QPSK,(1,0) Mode , Below 1850MHz



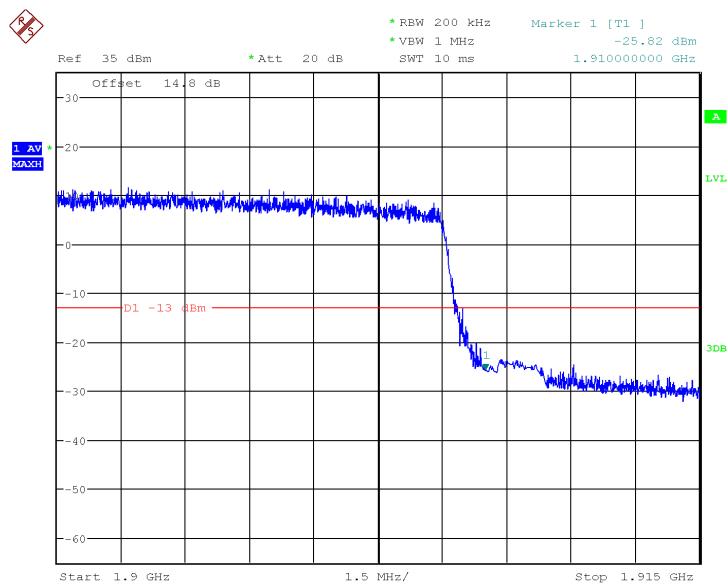
Date: 25.JUN.2017 14:39:55

## LTE Band2, 20MHz bandwidth, QPSK,(100,0) Mode , Below 1850MHz



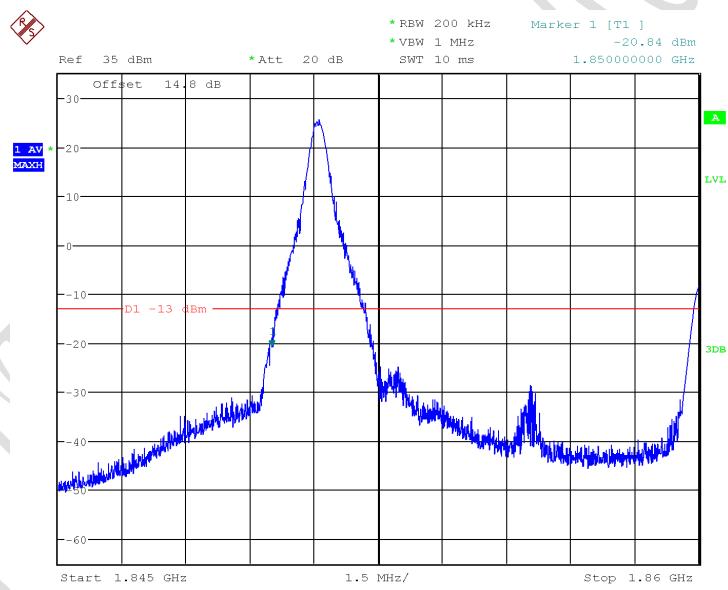
Date: 25.JUN.2017 14:37:21

## LTE Band2, 20MHz bandwidth, QPSK,(1,100) Mode, Above 1910MHz



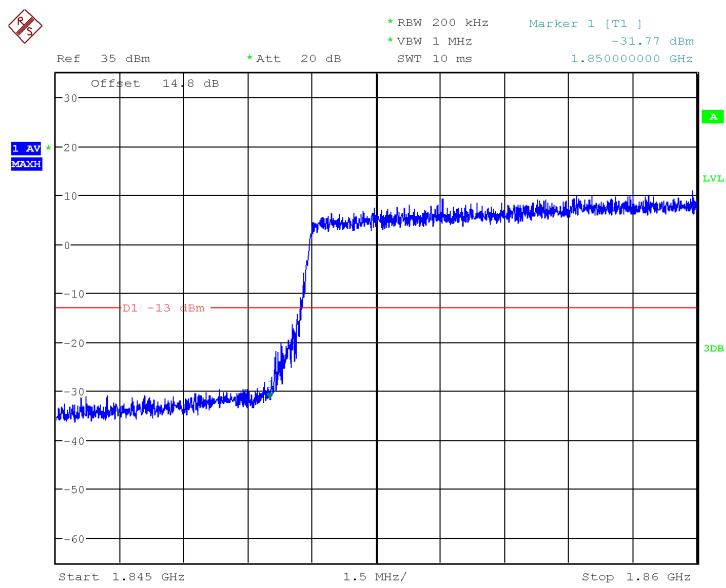
Date: 25.JUN.2017 14:38:24

## LTE Band2, 20MHz bandwidth, QPSK,(100,0) Mode, Above 1910MHz



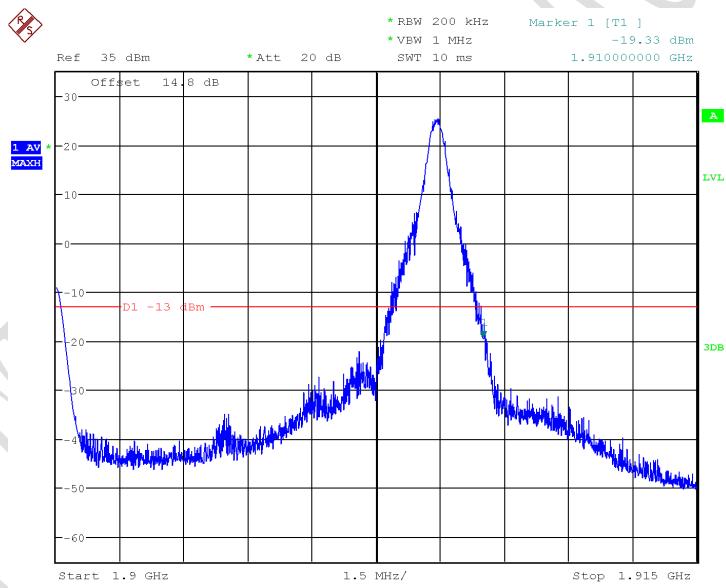
Date: 25.JUN.2017 14:40:34

## LTE Band2, 20MHz bandwidth, 16QAM,(1,0) Mode , Below 1850MHz



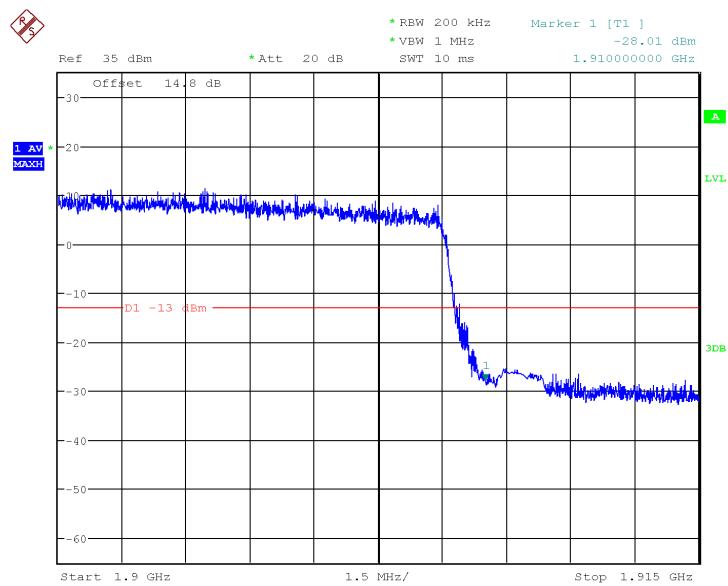
Date: 25.JUN.2017 14:40:07

## LTE Band2, 20MHz bandwidth, 16QAM,(100,0) Mode , Below 1850MHz



Date: 25.JUN.2017 14:37:41

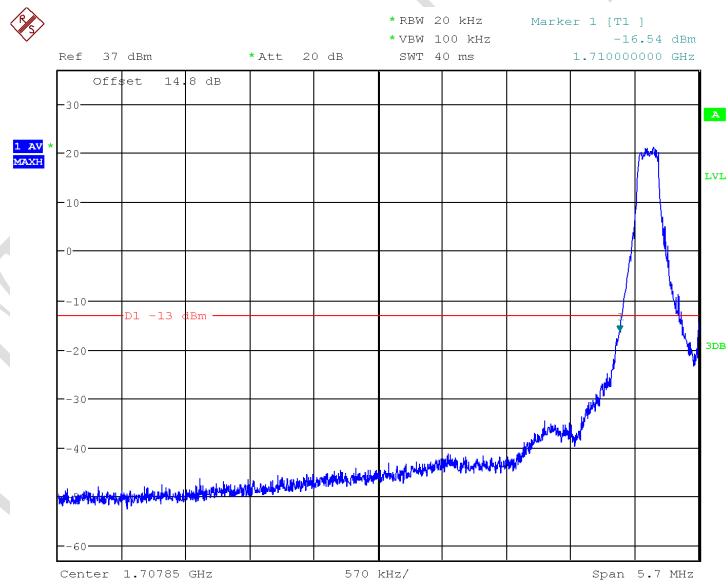
## LTE Band2, 20MHz bandwidth, 16QAM,(1,100) Mode, Above 1910MHz



Date: 25.JUN.2017 14:38:05

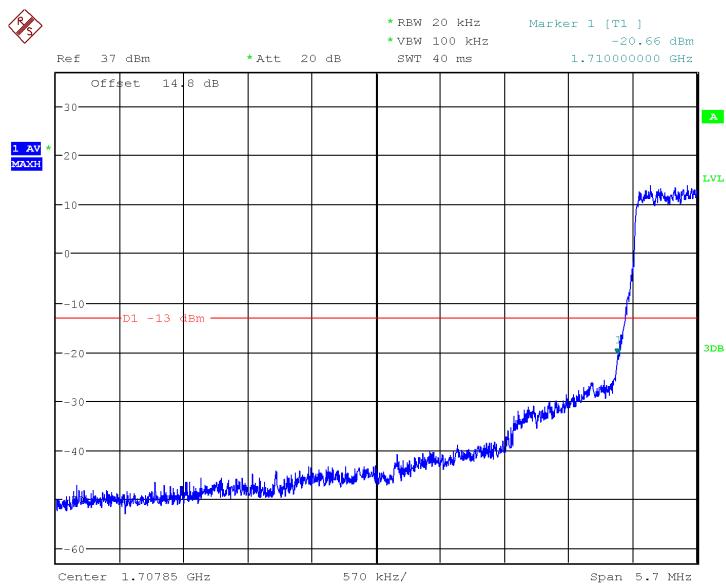
LTE Band2, 20MHz bandwidth, 16QAM,100,0 Mode, Above 1910MHz

### 5.5.5 LTE B4 Band Edge Results



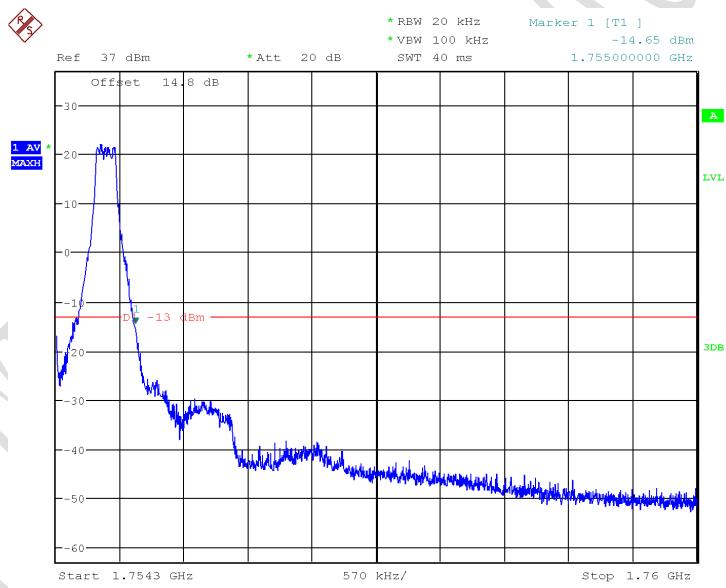
Date: 23.JUN.2017 15:15:18

LTE Band4, 1.4MHz bandwidth, QPSK,(1,0) Mode , Below 1710MHz



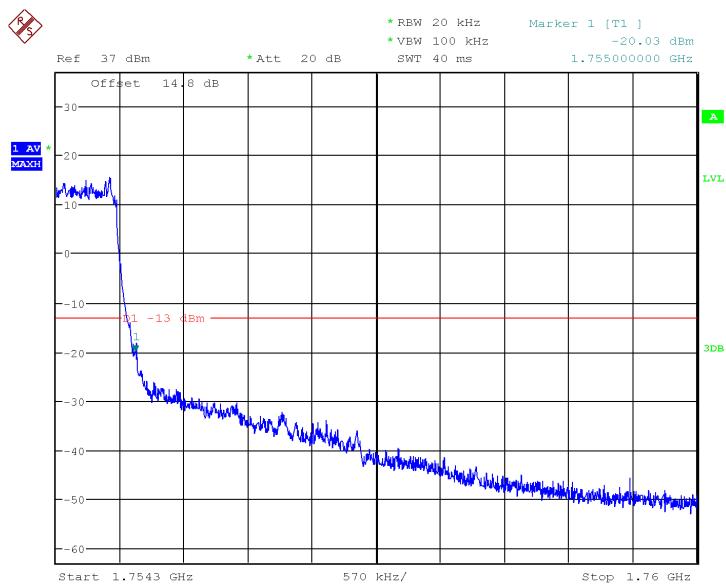
Date: 23.JUN.2017 15:16:28

## LTE Band4, 1.4MHz bandwidth, QPSK,(6,0) Mode , Below 1710MHz



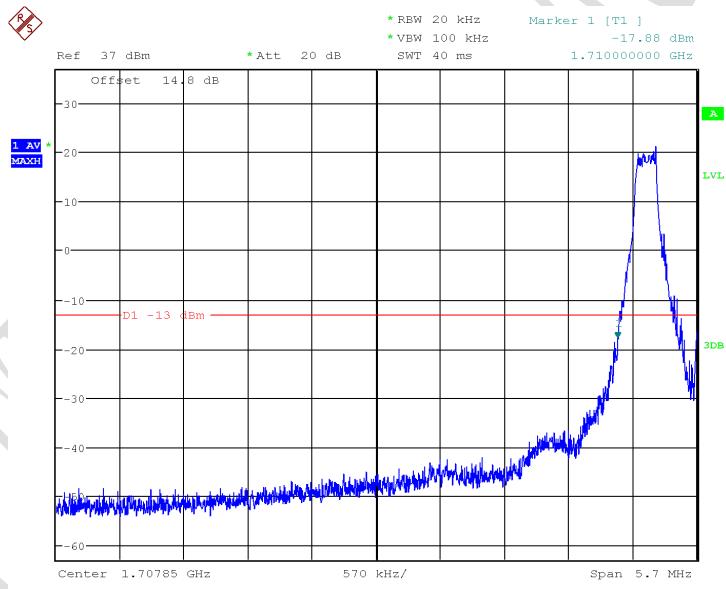
Date: 23.JUN.2017 15:21:50

## LTE Band4, 1.4MHz bandwidth, QPSK,(1,6) Mode, Above 1755MHz



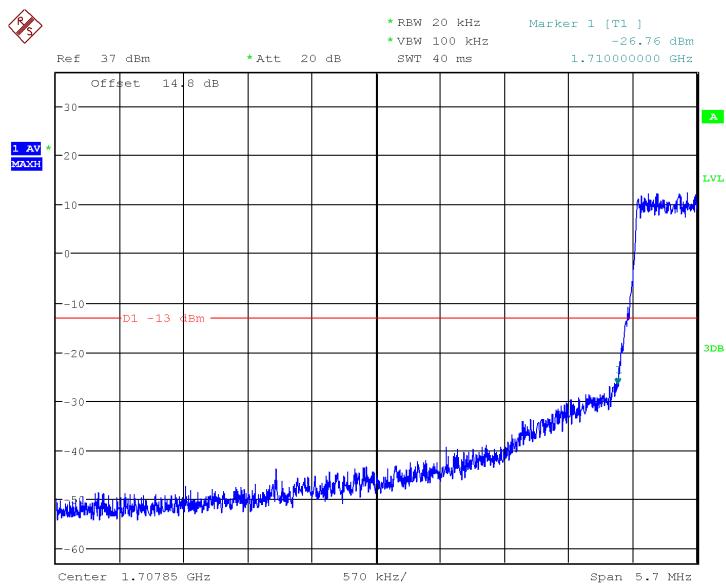
Date: 23.JUN.2017 15:20:21

## LTE Band4, 1.4MHz bandwidth, QPSK,(6,0) Mode, Above 1755MHz



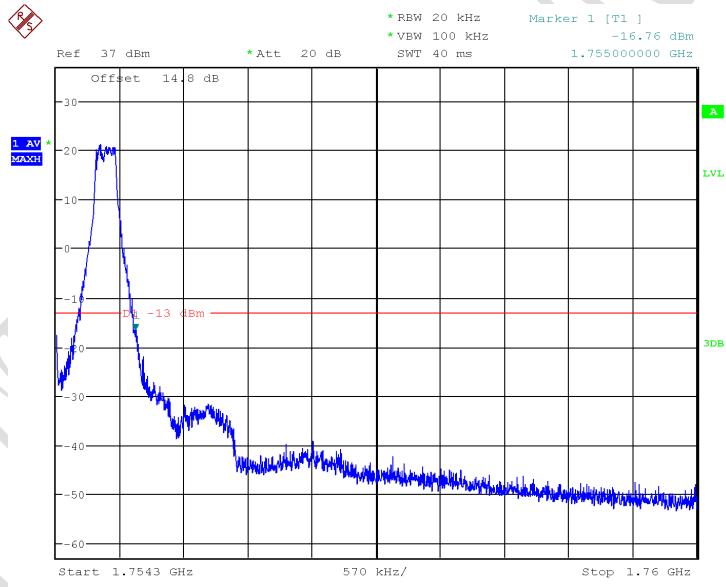
Date: 23.JUN.2017 15:15:34

## LTE Band4, 1.4MHz bandwidth, 16QAM,(1,0) Mode , Below 1710MHz



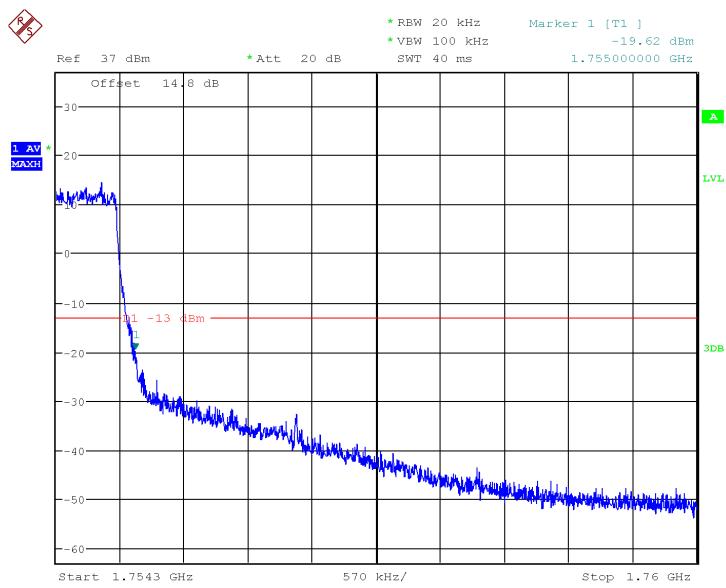
Date: 23.JUN.2017 15:15:54

## LTE Band4, 1.4MHz bandwidth, 16QAM,(6,0) Mode , Below 1710MHz



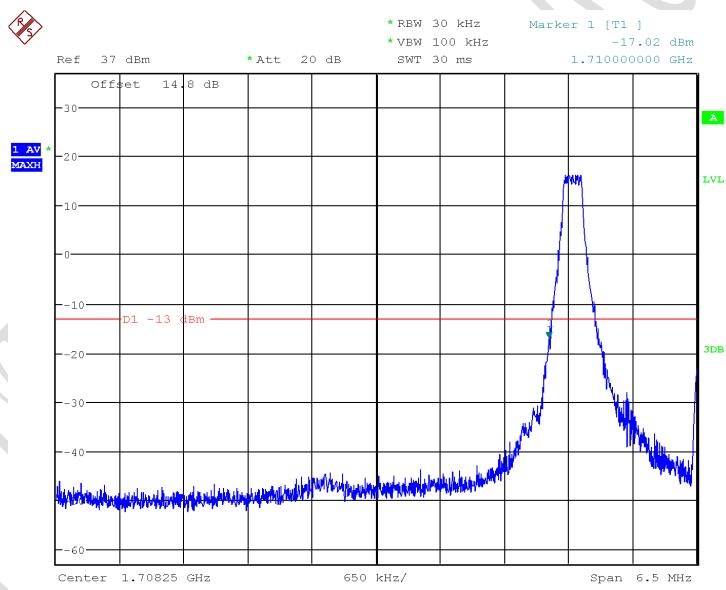
Date: 23.JUN.2017 15:21:11

## LTE Band4, 1.4MHz bandwidth, 16QAM,(1,6) Mode, Above 1755MHz



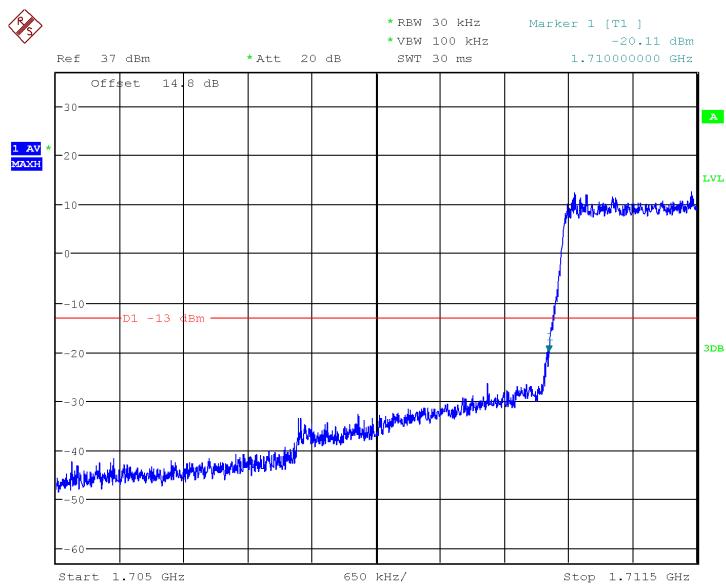
Date: 23.JUN.2017 15:20:45

## LTE Band4, 1.4MHz bandwidth, 16QAM,(6,0) Mode, Above 1755MHz



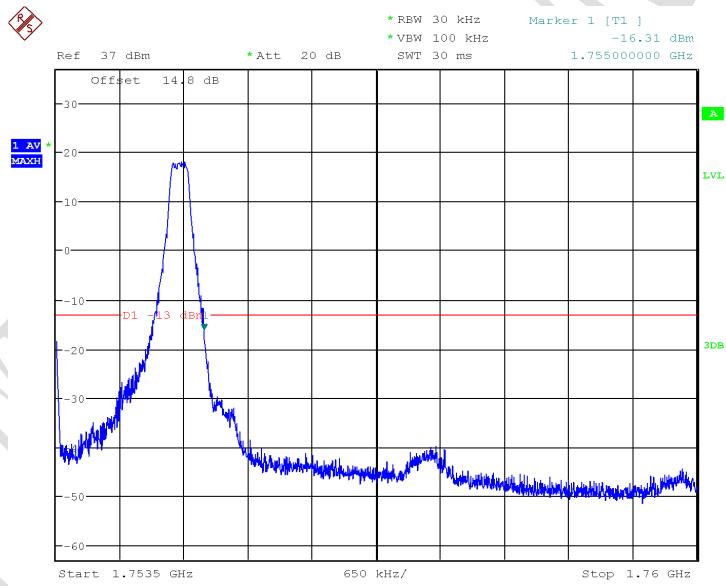
Date: 23.JUN.2017 15:25:30

## LTE Band4, 3MHz bandwidth, QPSK,(1,0) Mode , Below 1710MHz



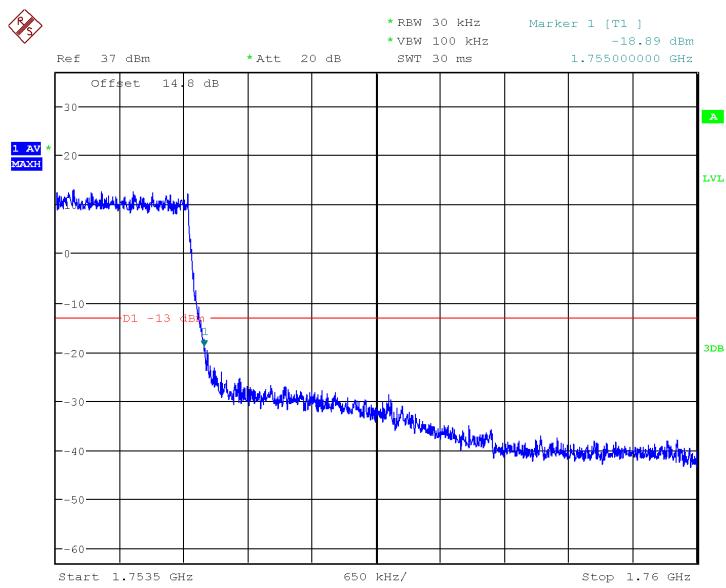
Date: 23.JUN.2017 15:27:54

## LTE Band4, 3MHz bandwidth, QPSK,(15,0) Mode , Below 1710MHz



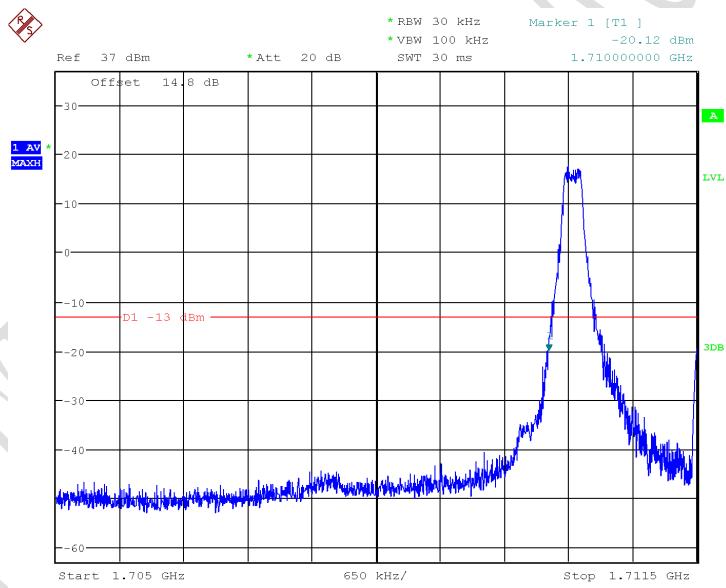
Date: 23.JUN.2017 15:32:09

## LTE Band4, 3MHz bandwidth, QPSK,(1,15) Mode, Above 1755MHz



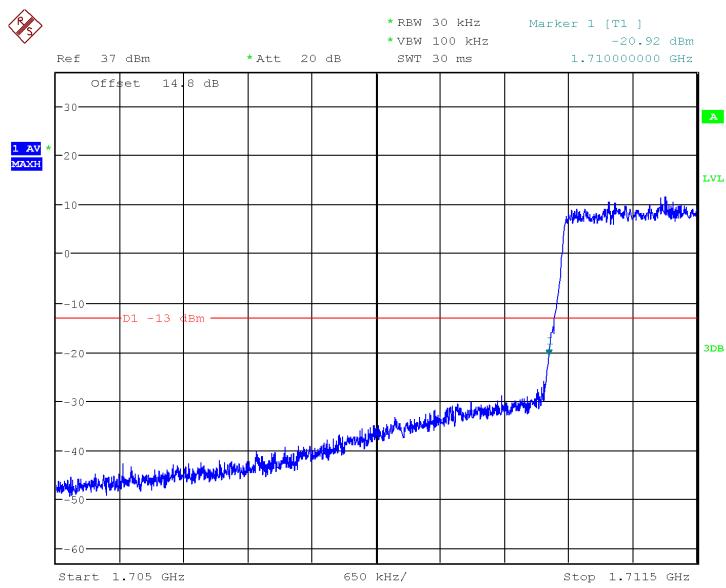
Date: 23.JUN.2017 15:28:56

## LTE Band4, 3MHz bandwidth, QPSK,(15,0) Mode, Above 1755MHz



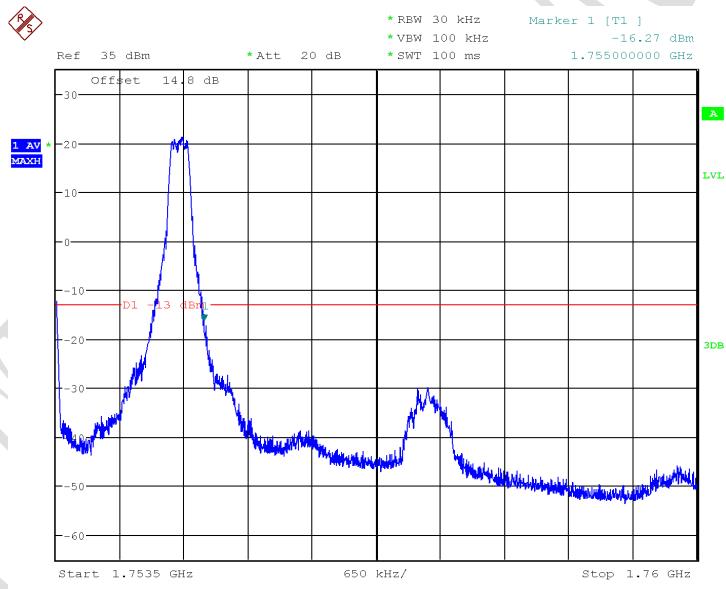
Date: 23.JUN.2017 15:26:16

## LTE Band4, 3MHz bandwidth, 16QAM,(1,0) Mode , Below 1710MHz



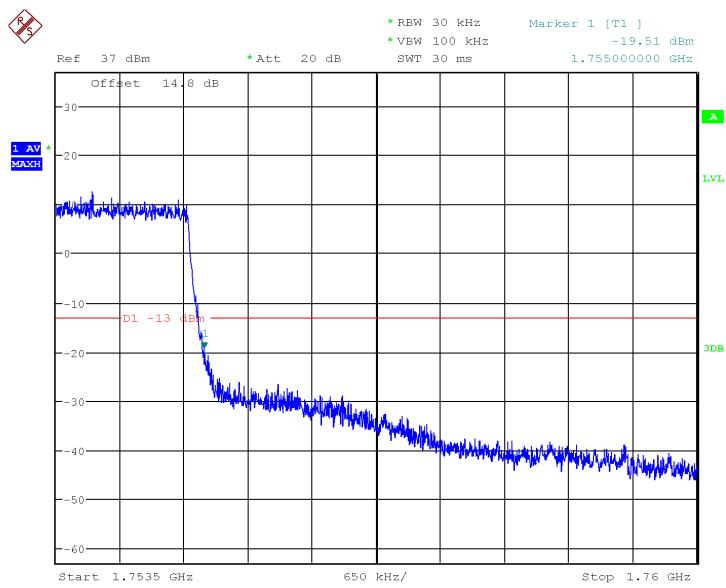
Date: 23.JUN.2017 15:27:32

## LTE Band4, 3MHz bandwidth, 16QAM,(15,0) Mode , Below 1710MHz



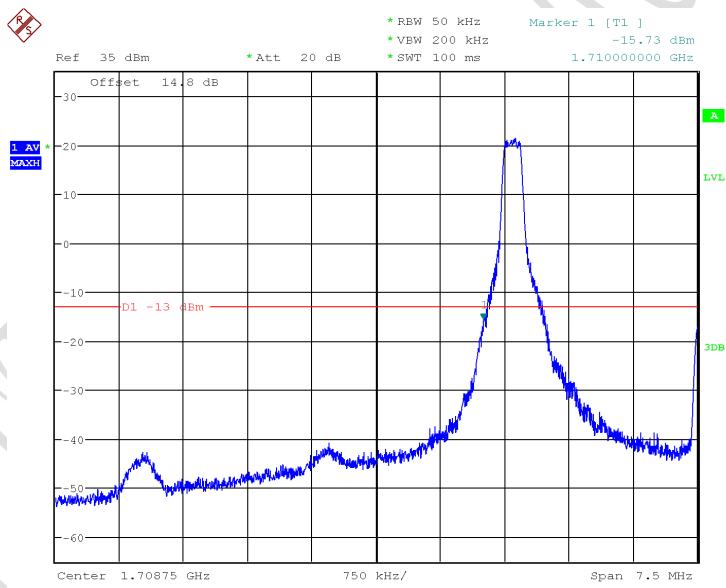
Date: 27.JUN.2017 09:49:16

## LTE Band4, 3MHz bandwidth, 16QAM,(1,15) Mode, Above 1755MHz



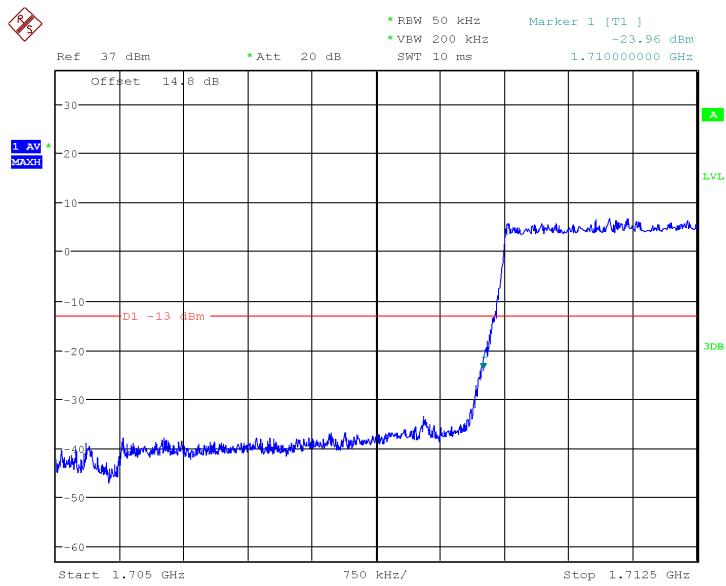
Date: 23.JUN.2017 15:29:10

## LTE Band4, 3MHz bandwidth, 16QAM,(15,0) Mode, Above 1755MHz



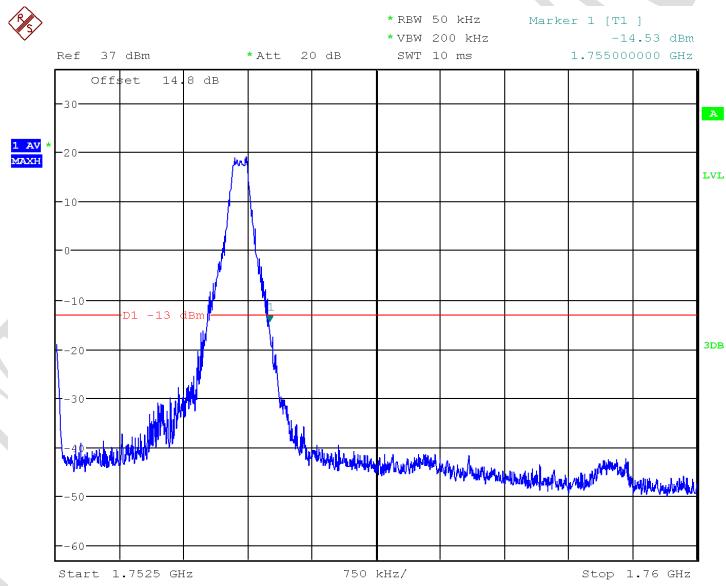
Date: 27.JUN.2017 09:55:15

## LTE Band4, 5MHz bandwidth, QPSK,(1,0) Mode , Below 1710MHz



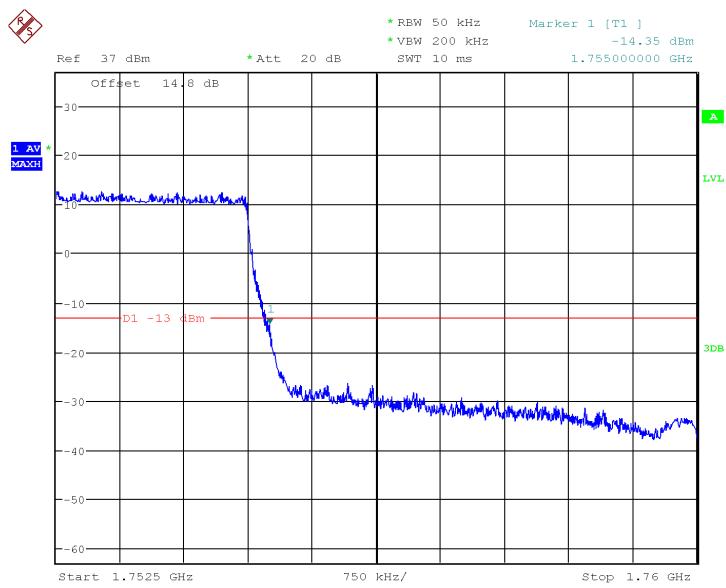
Date: 23.JUN.2017 15:38:25

## LTE Band4, 5MHz bandwidth, QPSK,(25,0) Mode , Below 1710MHz



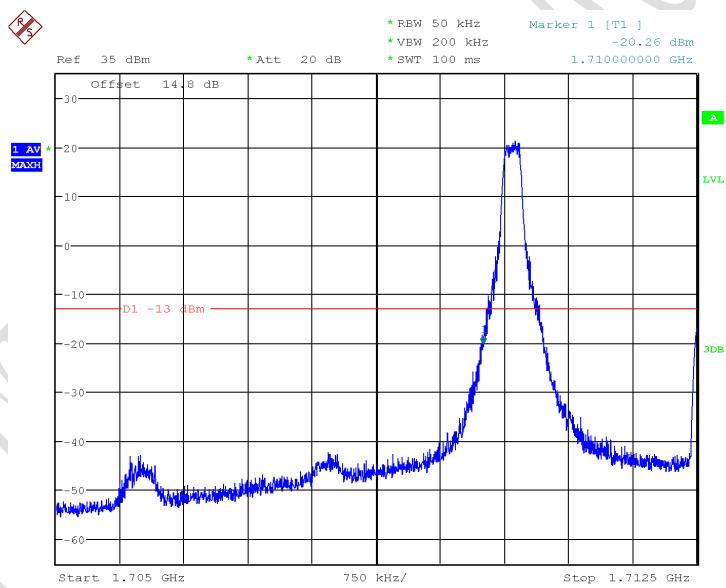
Date: 23.JUN.2017 15:42:54

## LTE Band4, 5MHz bandwidth, QPSK,(1,25) Mode, Above 1755MHz



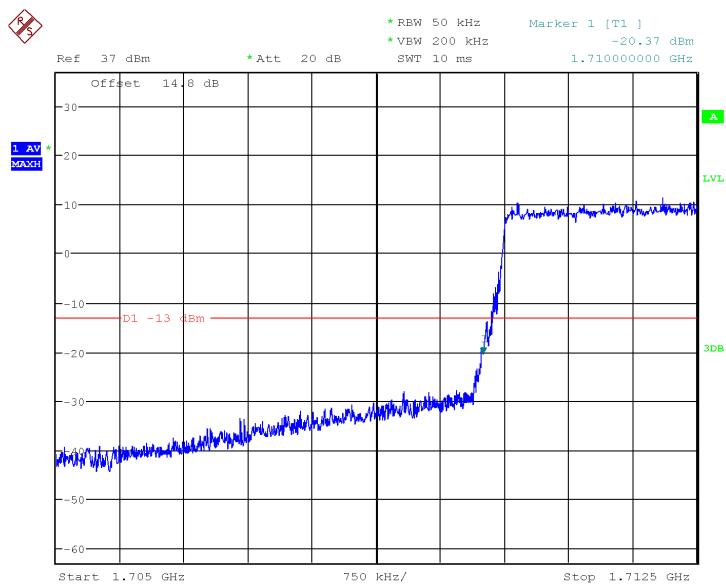
Date: 23.JUN.2017 15:41:19

## LTE Band4, 5MHz bandwidth, QPSK,(25,0) Mode, Above 1755MHz



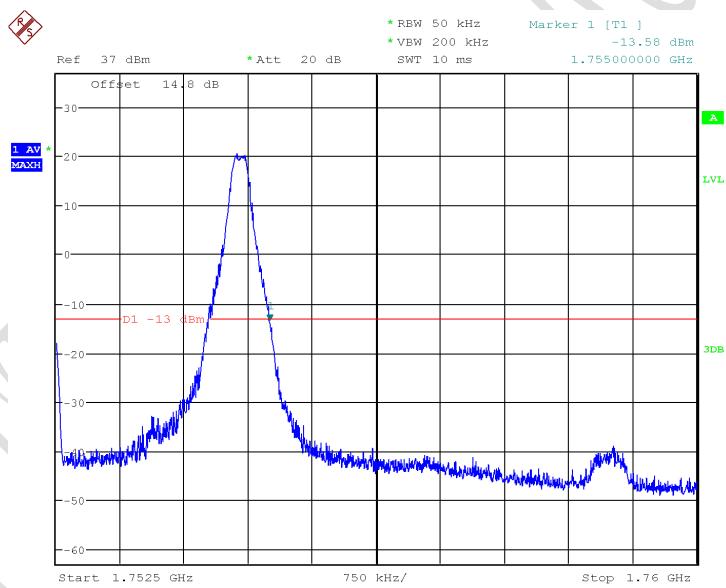
Date: 27.JUN.2017 09:56:08

## LTE Band4, 5MHz bandwidth, 16QAM,(1,0) Mode , Below 1710MHz



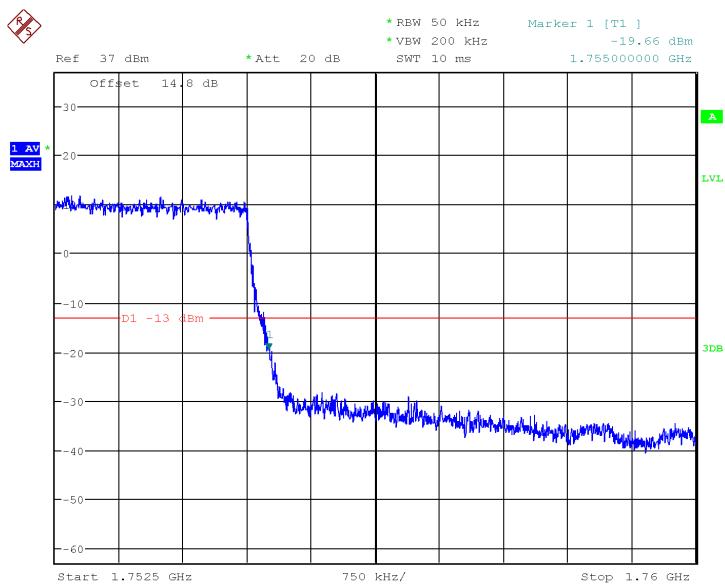
Date: 23.JUN.2017 15:38:56

## LTE Band4, 5MHz bandwidth, 16QAM,(25,0) Mode , Below 1710MHz



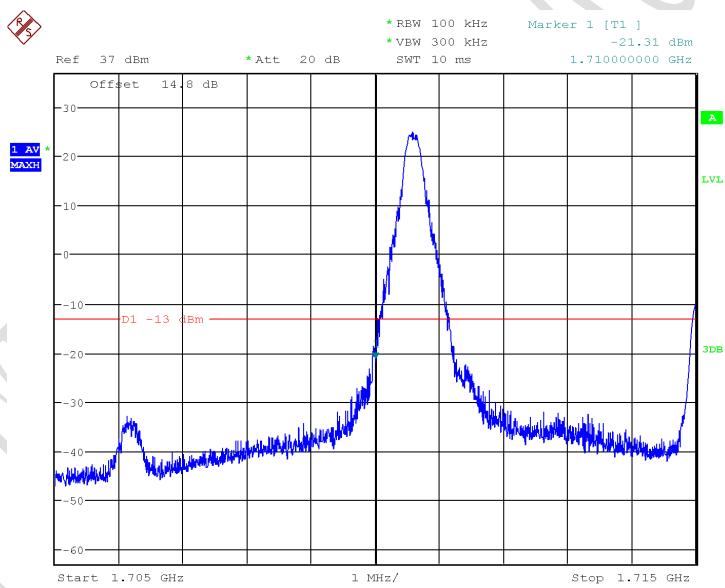
Date: 23.JUN.2017 15:42:35

## LTE Band4, 5MHz bandwidth, 16QAM,(1,25) Mode, Above 1755MHz



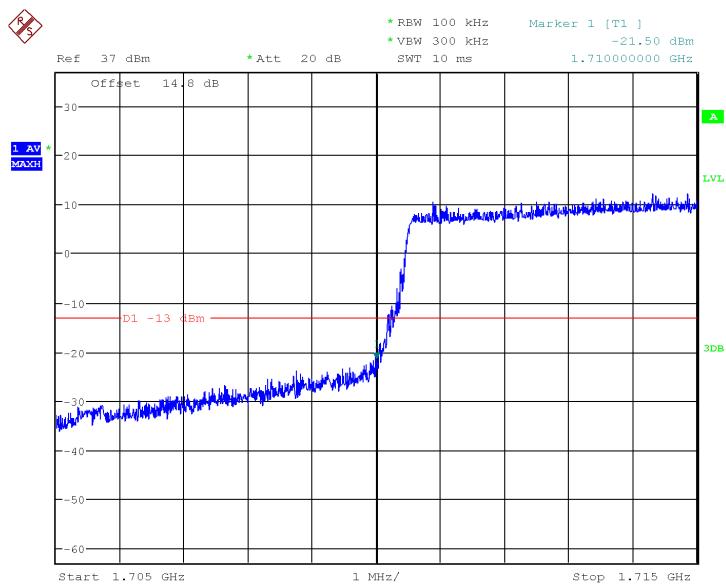
Date: 23.JUN.2017 15:41:31

## LTE Band4, 5MHz bandwidth, 16QAM,(25,0) Mode, Above 1755MHz



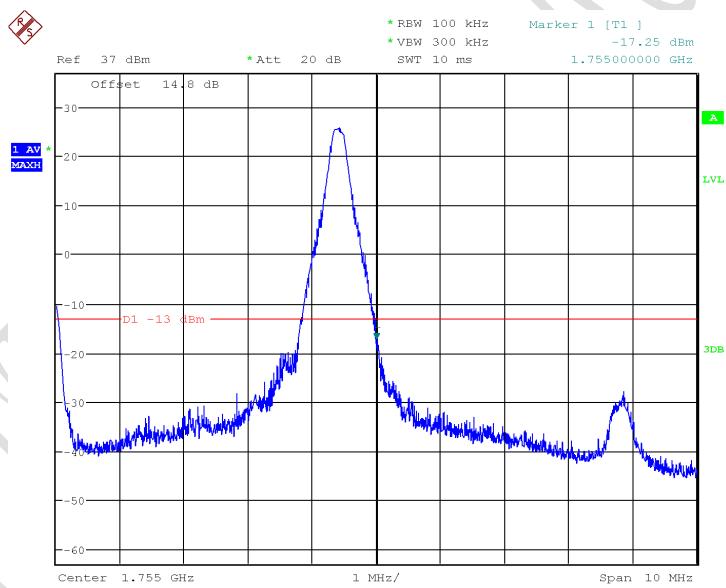
Date: 23.JUN.2017 15:45:52

## LTE Band4, 10MHz bandwidth, QPSK,(1,0) Mode , Below 1710MHz



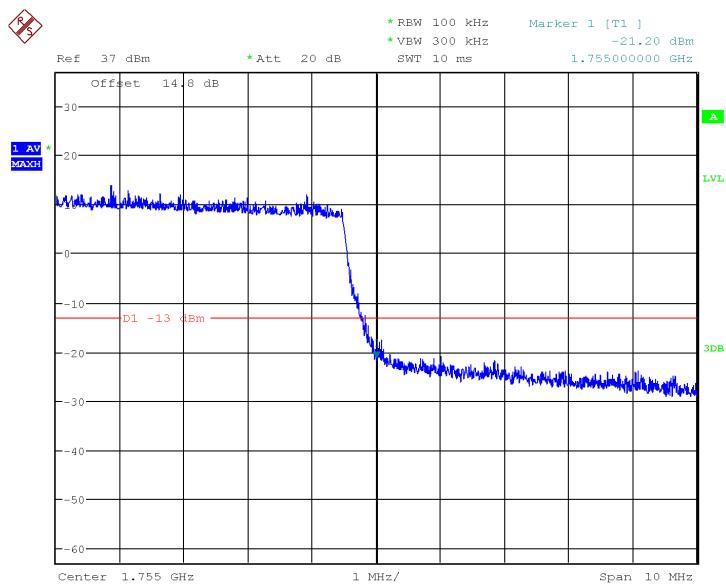
Date: 23.JUN.2017 15:45:33

## LTE Band4, 10MHz bandwidth, QPSK,(50,0) Mode , Below 1710MHz



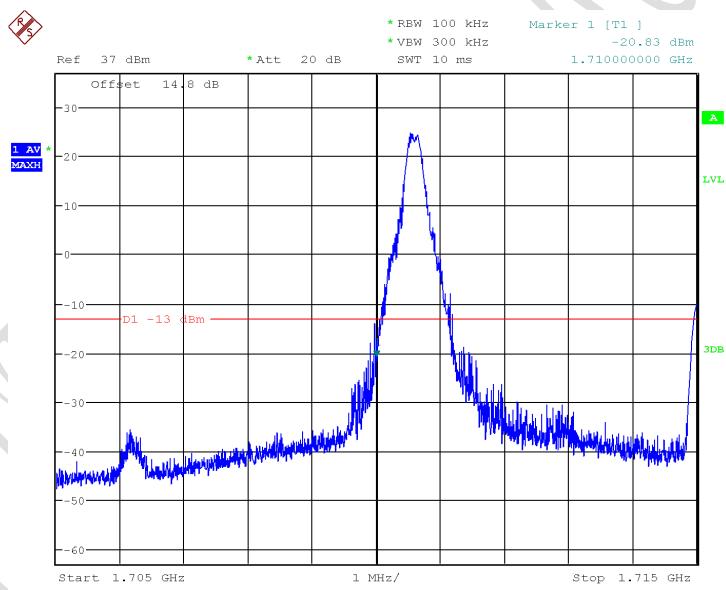
Date: 23.JUN.2017 15:50:01

## LTE Band4, 10MHz bandwidth, QPSK,(1,50) Mode, Above 1755MHz



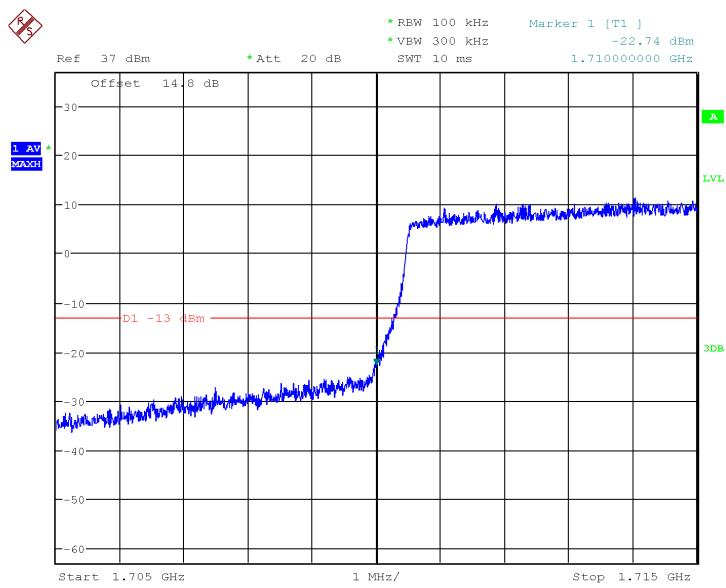
Date: 23.JUN.2017 15:49:07

## LTE Band4, 10MHz bandwidth, QPSK,(50,0) Mode, Above 1755MHz



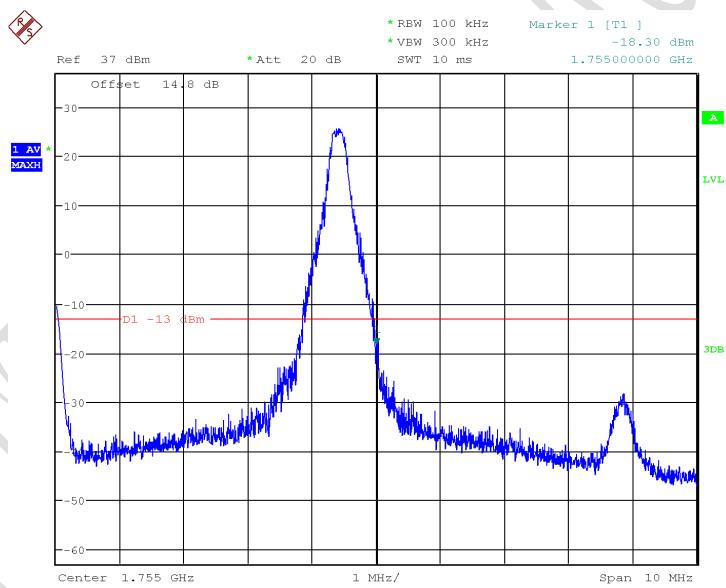
Date: 23.JUN.2017 15:46:09

## LTE Band4, 10MHz bandwidth, 16QAM,(1,0) Mode , Below 1710MHz



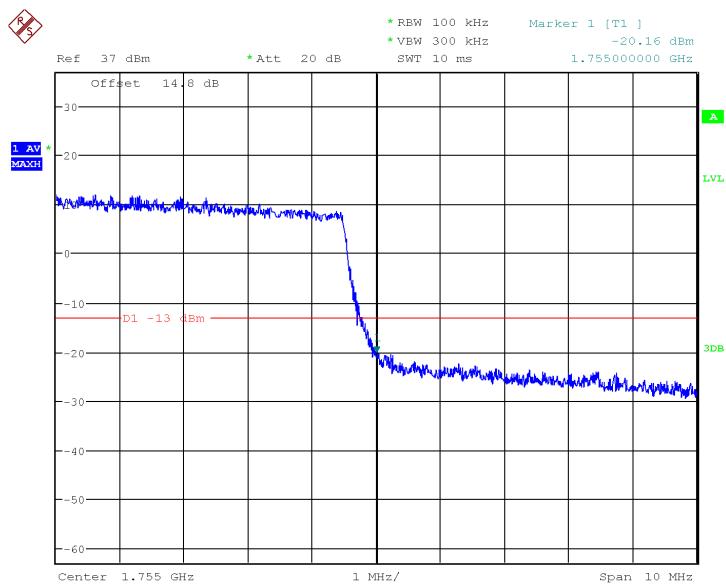
Date: 23.JUN.2017 15:45:15

## LTE Band4, 10MHz bandwidth, 16QAM,(50,0) Mode , Below 1710MHz



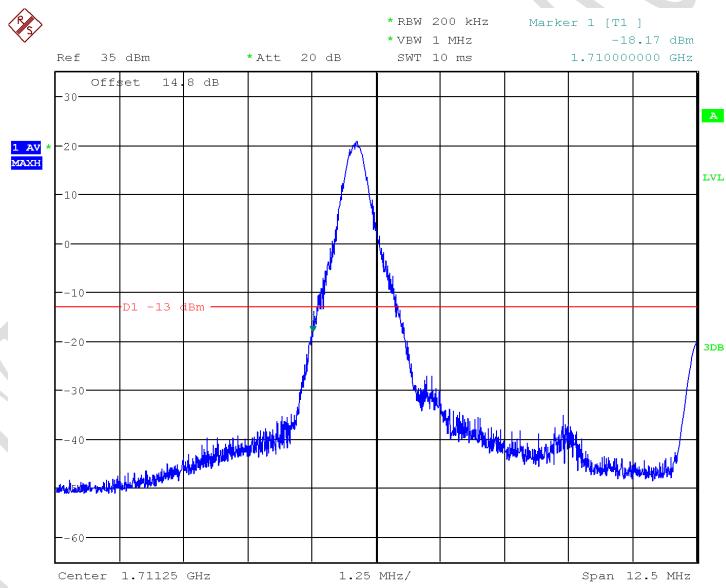
Date: 23.JUN.2017 15:50:16

## LTE Band4, 10MHz bandwidth, 16QAM,(1,50) Mode, Above 1755MHz



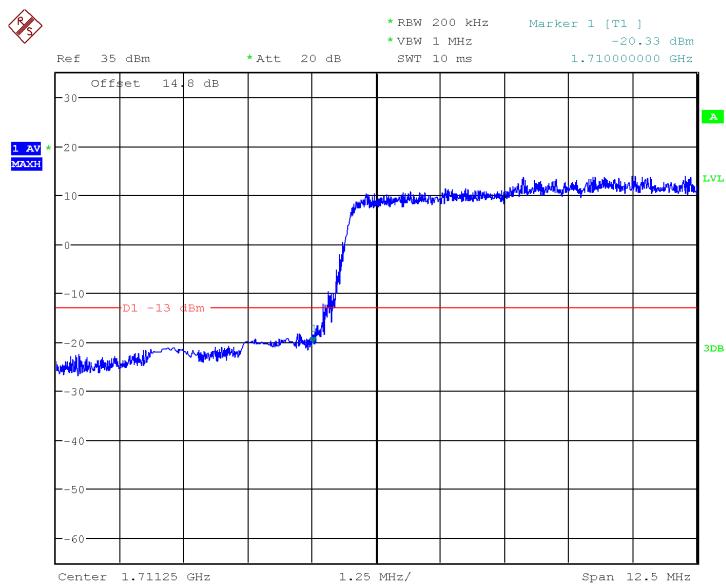
Date: 23.JUN.2017 15:48:40

## LTE Band4, 10MHz bandwidth, 16QAM,(50,0) Mode, Above 1755MHz



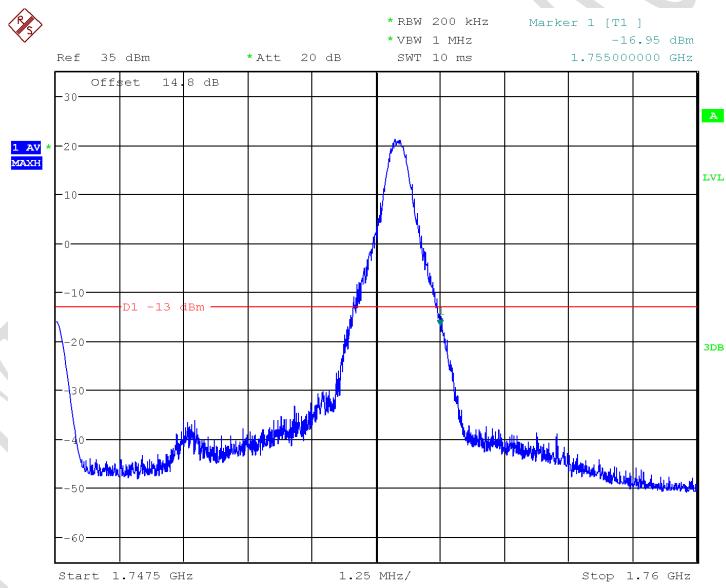
Date: 23.JUN.2017 15:55:52

## LTE Band4, 15MHz bandwidth, QPSK,(1,0) Mode , Below 1710MHz



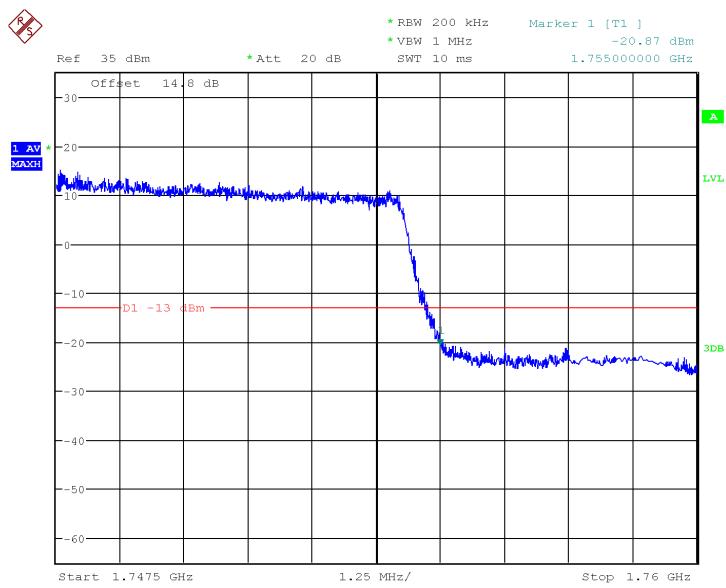
Date: 23.JUN.2017 15:54:43

## LTE Band4, 15MHz bandwidth, QPSK,(75,0) Mode , Below 1710MHz



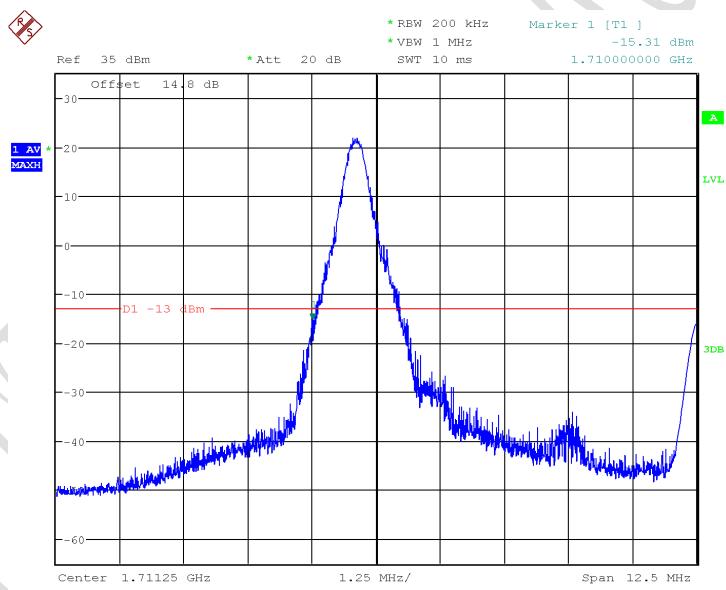
Date: 23.JUN.2017 16:04:44

## LTE Band4, 15MHz bandwidth, QPSK,(1,75) Mode, Above 1755MHz



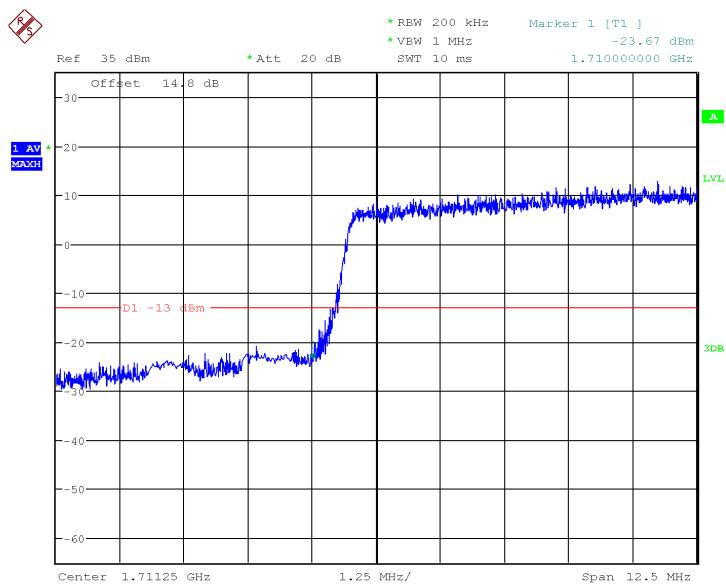
Date: 23.JUN.2017 16:01:04

## LTE Band4, 15MHz bandwidth, QPSK,(75,0) Mode, Above 1755MHz



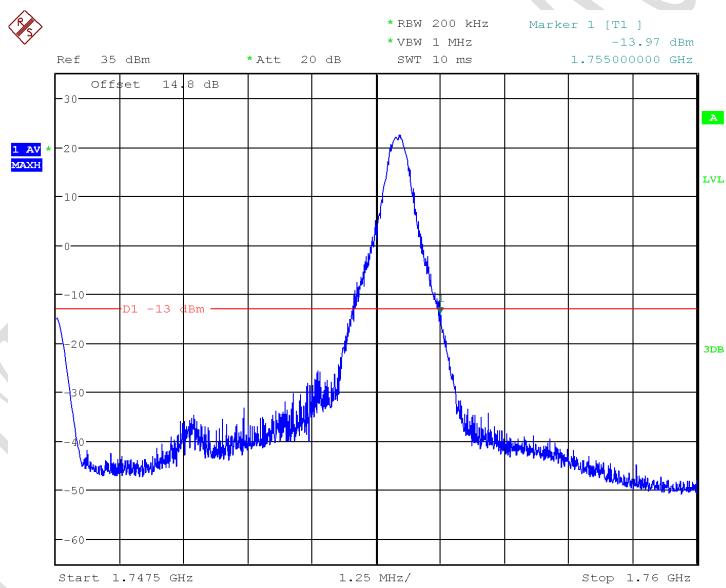
Date: 23.JUN.2017 15:55:33

## LTE Band4, 15MHz bandwidth, 16QAM,(1,0) Mode , Below 1710MHz



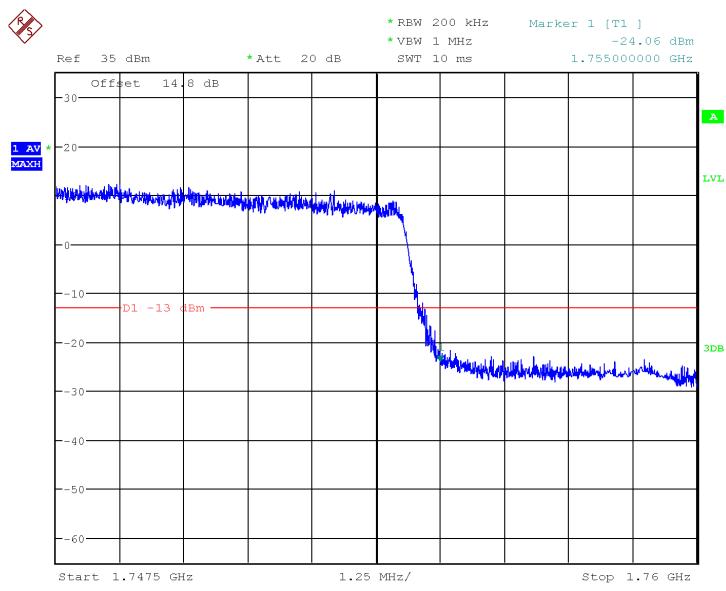
Date: 23.JUN.2017 15:54:59

## LTE Band4, 15MHz bandwidth, 16QAM,(75,0) Mode , Below 1710MHz



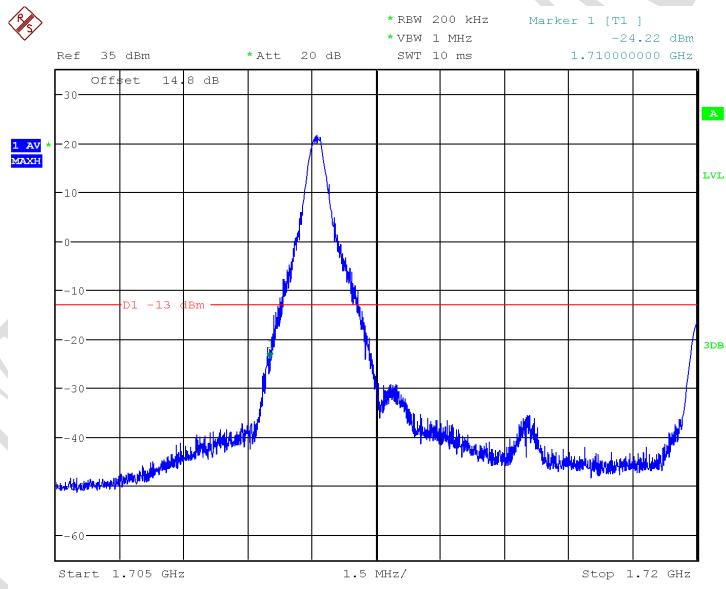
Date: 23.JUN.2017 16:02:42

## LTE Band4, 15MHz bandwidth, 16QAM,(1,75) Mode, Above 1755MHz



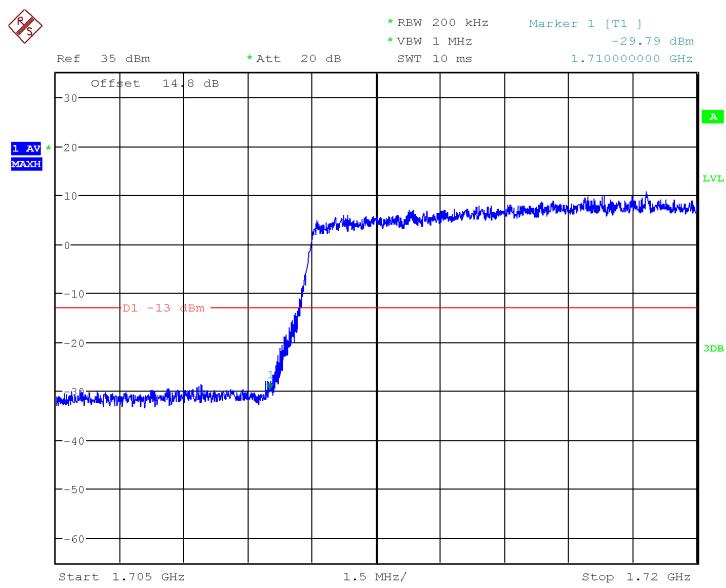
Date: 23.JUN.2017 16:01:21

## LTE Band4, 15MHz bandwidth, 16QAM,(75,0) Mode, Above 1755MHz



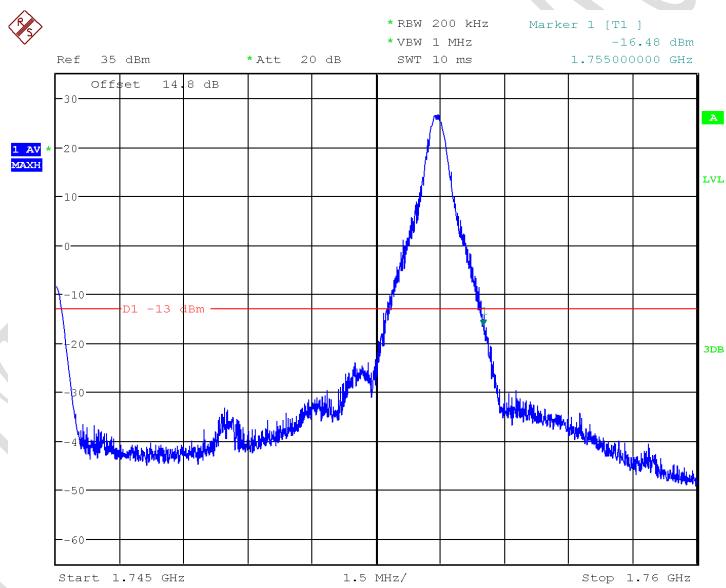
Date: 23.JUN.2017 16:09:14

## LTE Band4, 20MHz bandwidth, QPSK,(1,0) Mode , Below 1710MHz



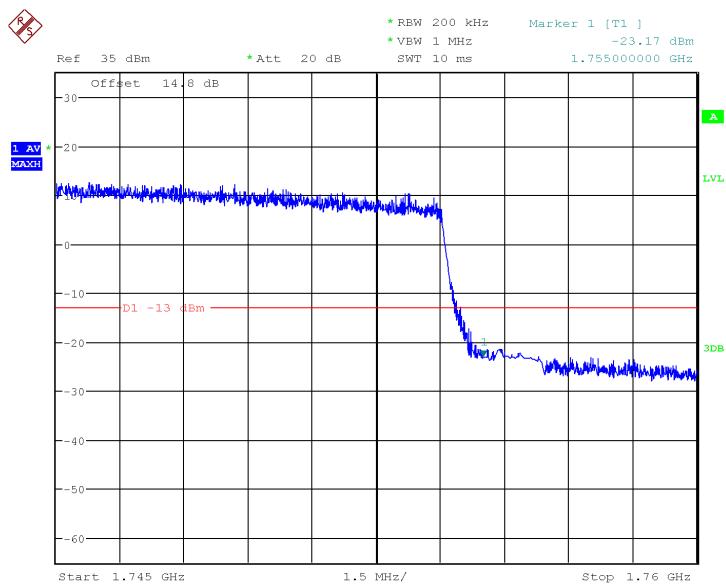
Date: 23.JUN.2017 16:08:13

## LTE Band4, 20MHz bandwidth, QPSK,(100,0) Mode , Below 1710MHz



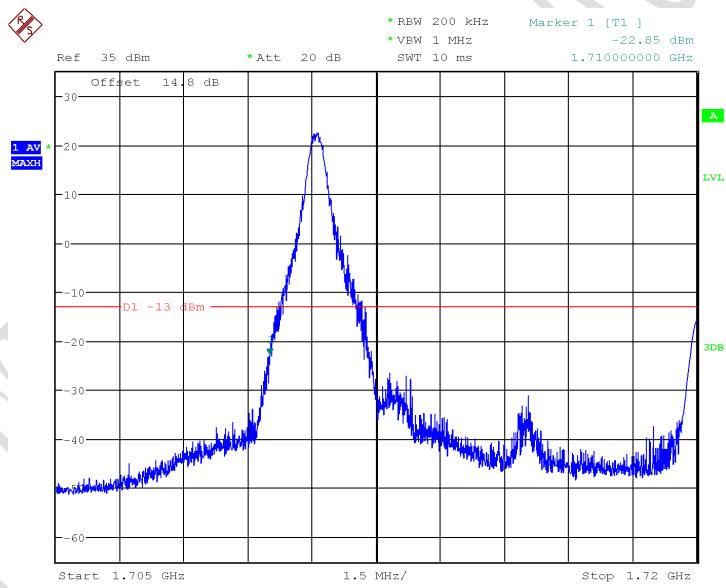
Date: 23.JUN.2017 16:12:04

## LTE Band4, 20MHz bandwidth, QPSK,(1,100) Mode, Above 1755MHz



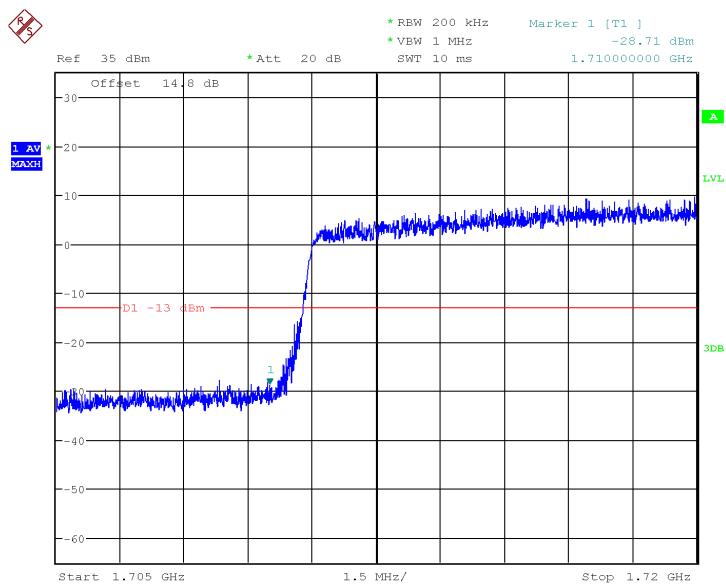
Date: 23.JUN.2017 16:10:42

## LTE Band4, 20MHz bandwidth, QPSK,(100,0) Mode, Above 1755MHz



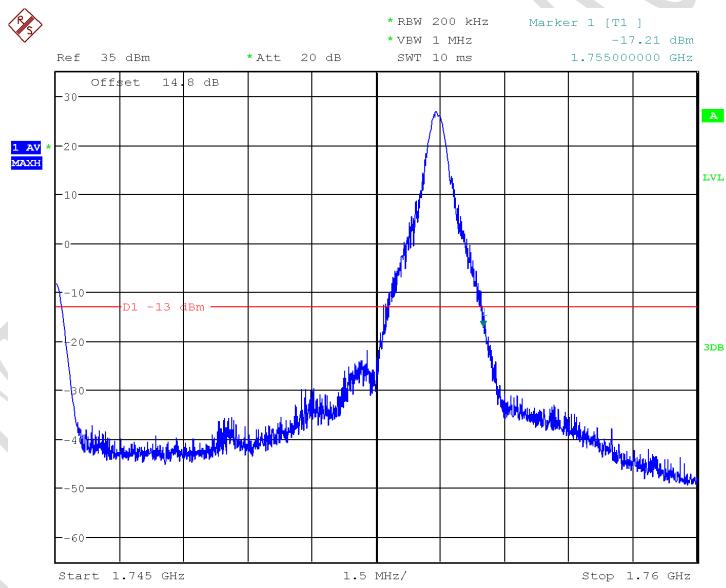
Date: 23.JUN.2017 16:08:49

## LTE Band4, 20MHz bandwidth, 16QAM,(1,0) Mode , Below 1710MHz



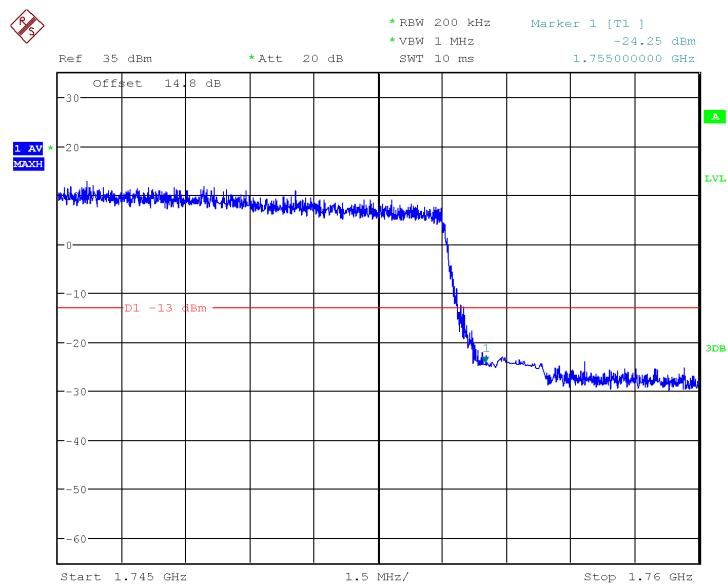
Date: 23.JUN.2017 16:08:24

## LTE Band4, 20MHz bandwidth, 16QAM,(100,0) Mode , Below 1710MHz



Date: 23.JUN.2017 16:11:32

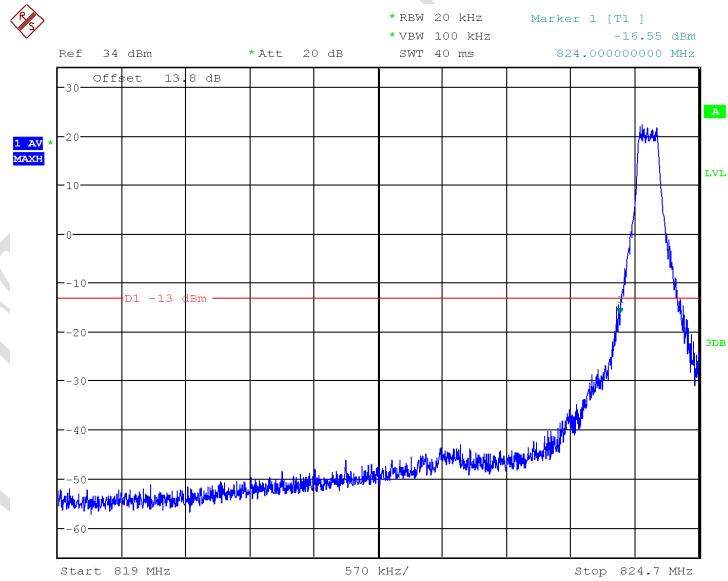
## LTE Band4, 20MHz bandwidth, 16QAM,(1,100) Mode, Above 1755MHz



Date: 23.JUN.2017 16:11:04

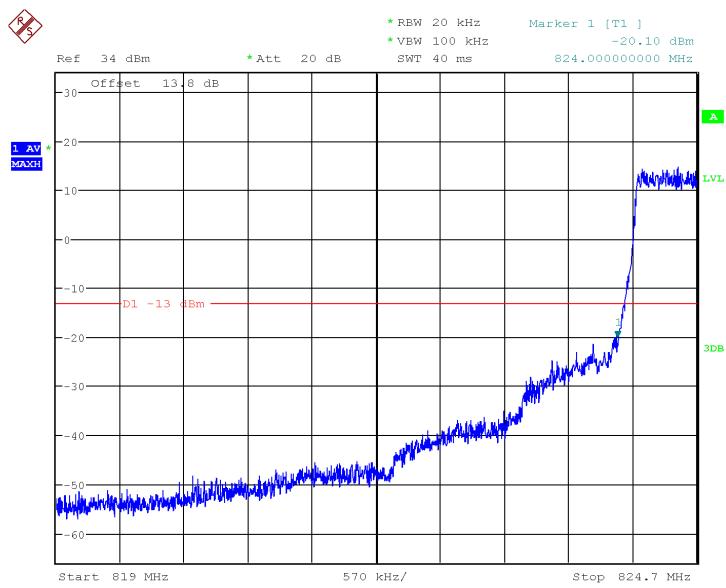
LTE Band4, 20MHz bandwidth, 16QAM,100,0 Mode, Above 1755MHz

### 5.5.6 LTE B5 Band Edge Results



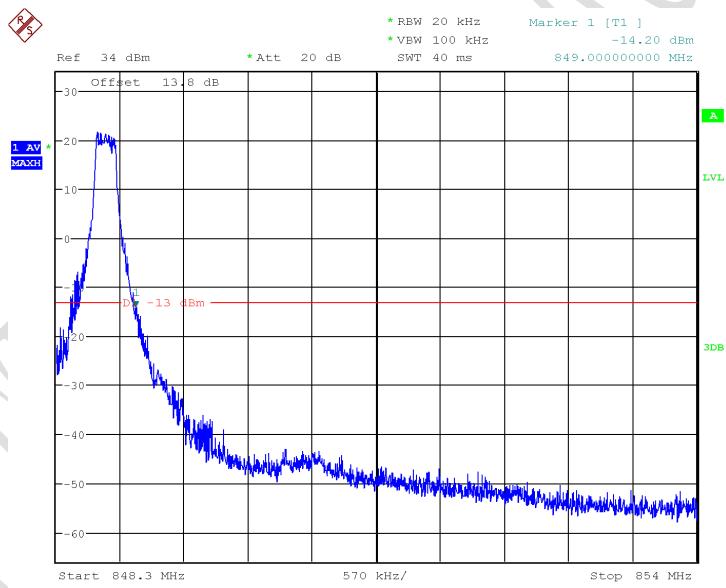
Date: 25.JUN.2017 14:48:57

LTE Band5, 1.4MHz bandwidth, QPSK,(1,0) Mode , Below 824MHz



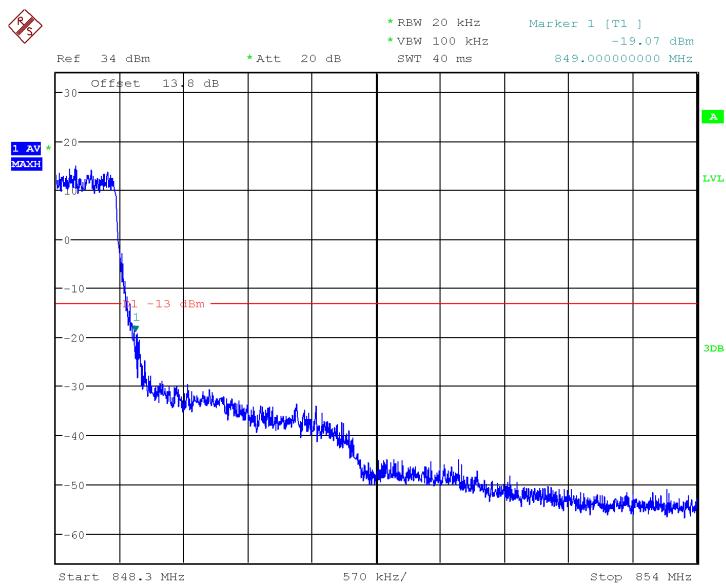
Date: 25.JUN.2017 14:49:14

## LTE Band5, 1.4MHz bandwidth, QPSK,(6,0) Mode , Below 824MHz



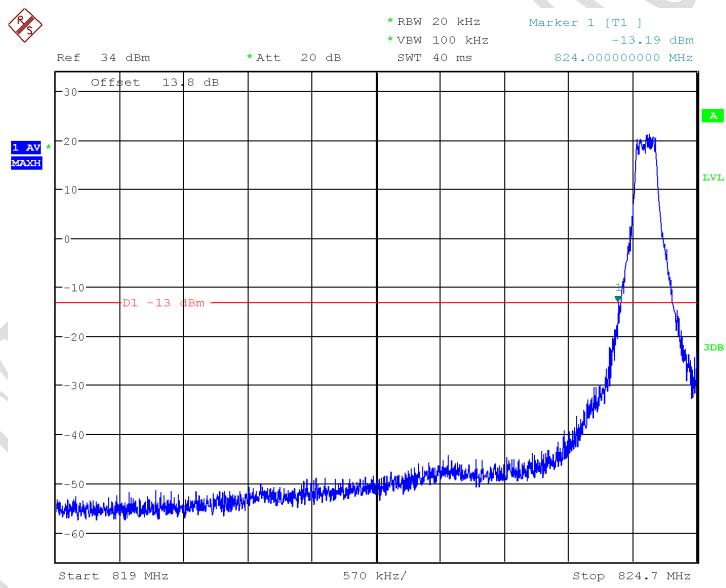
Date: 25.JUN.2017 14:51:38

## LTE Band5, 1.4MHz bandwidth, QPSK,(1,6) Mode, Above 849MHz



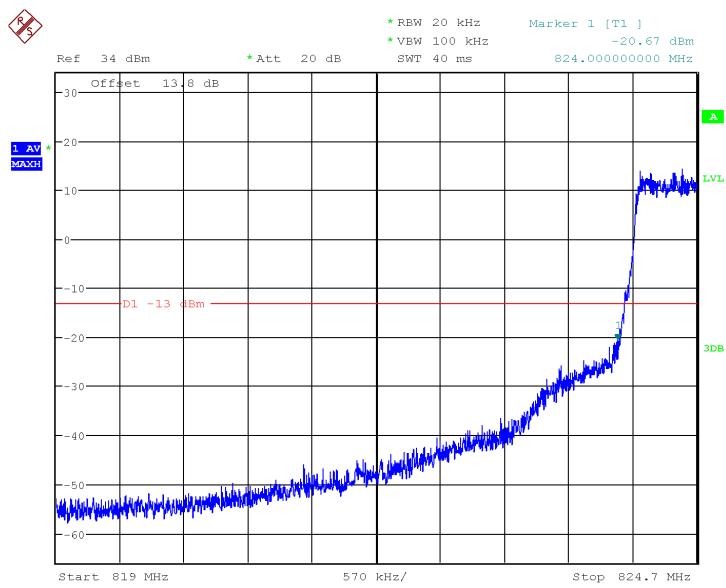
Date: 25.JUN.2017 14:51:09

## LTE Band5, 1.4MHz bandwidth, QPSK,(6,0) Mode, Above 849MHz



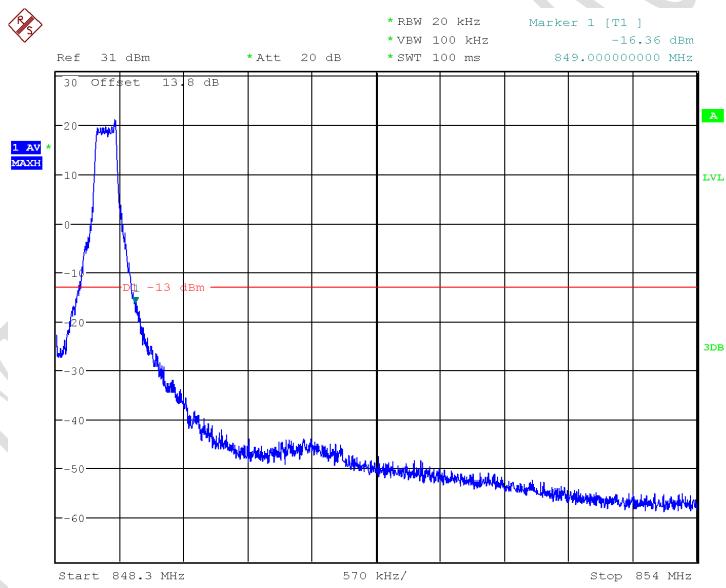
Date: 25.JUN.2017 14:48:42

## LTE Band5, 1.4MHz bandwidth, 16QAM,(1,0) Mode , Below 824MHz



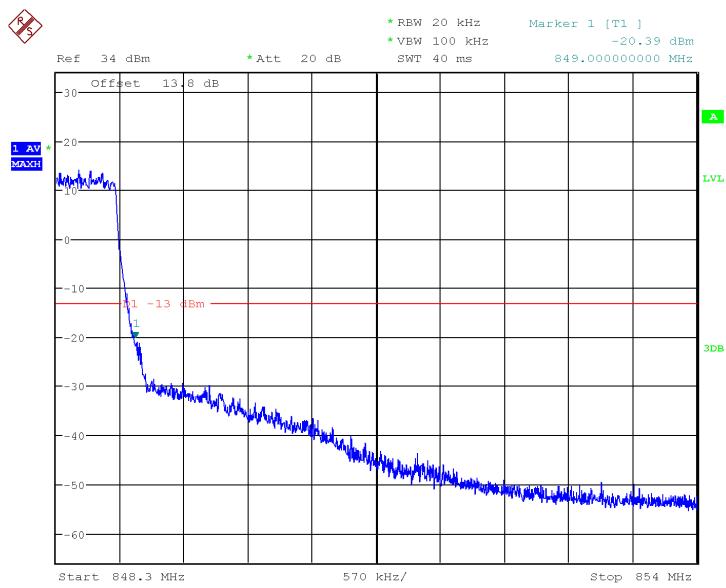
Date: 25.JUN.2017 14:49:26

## LTE Band5, 1.4MHz bandwidth, 16QAM,(6,0) Mode , Below 824MHz



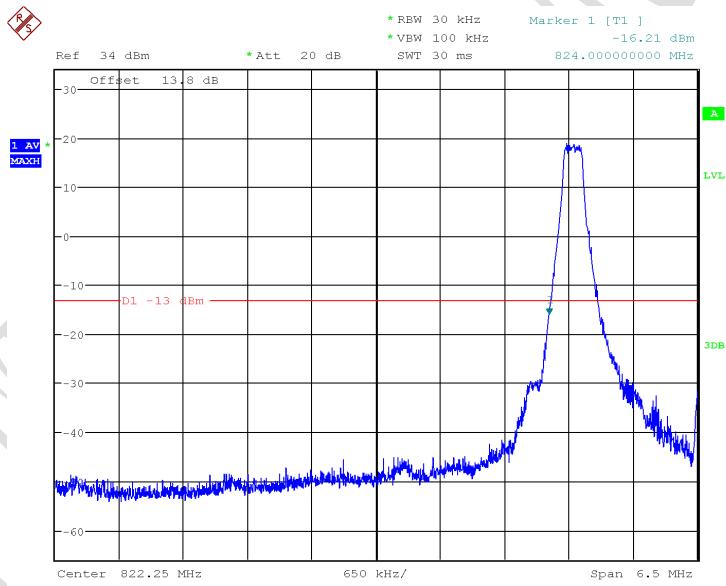
Date: 27.JUN.2017 10:02:02

## LTE Band5, 1.4MHz bandwidth, 16QAM,(1,6) Mode, Above 849MHz



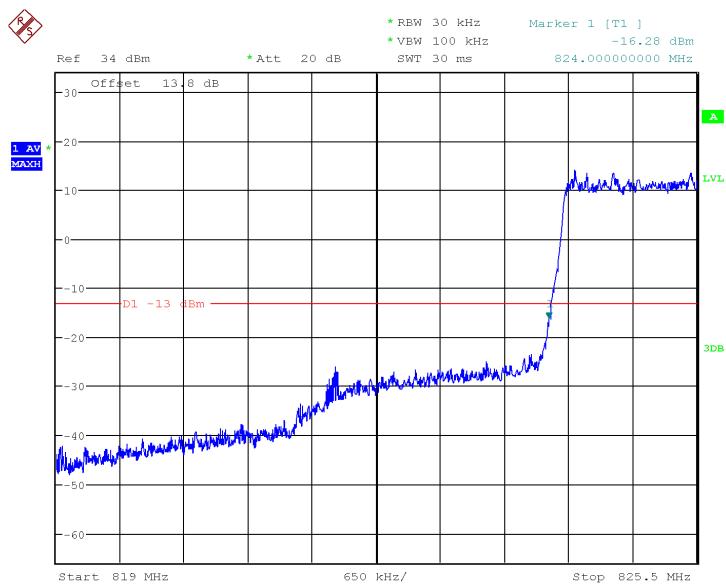
Date: 25.JUN.2017 14:50:53

## LTE Band5, 1.4MHz bandwidth, 16QAM,(6,0) Mode, Above 849MHz



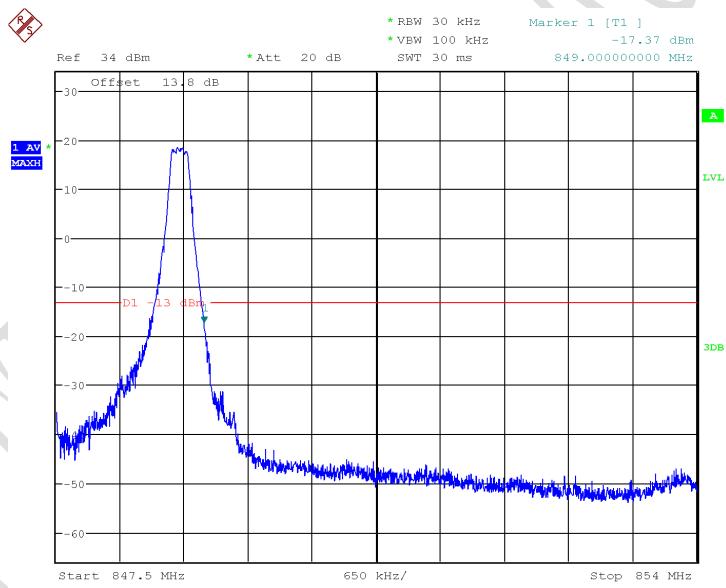
Date: 25.JUN.2017 14:56:37

## LTE Band5, 3MHz bandwidth, QPSK,(1,0) Mode , Below 824MHz



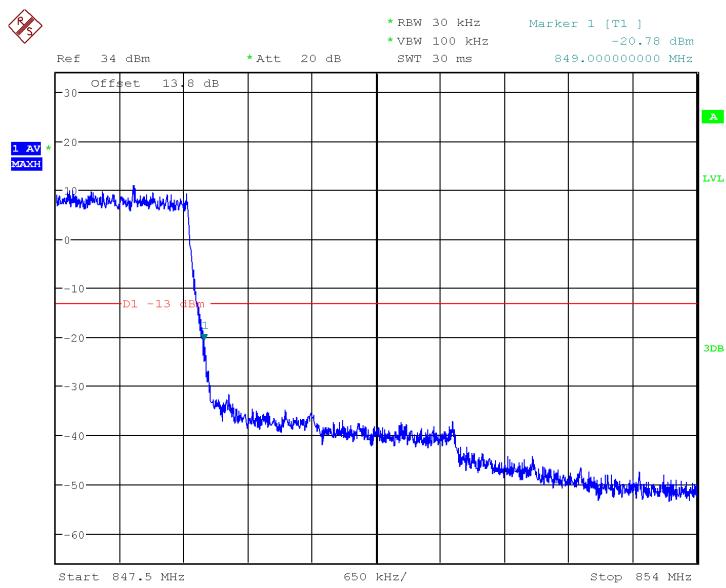
Date: 25.JUN.2017 14:54:35

#### LTE Band5, 3MHz bandwidth, QPSK,(15,0) Mode , Below 824MHz



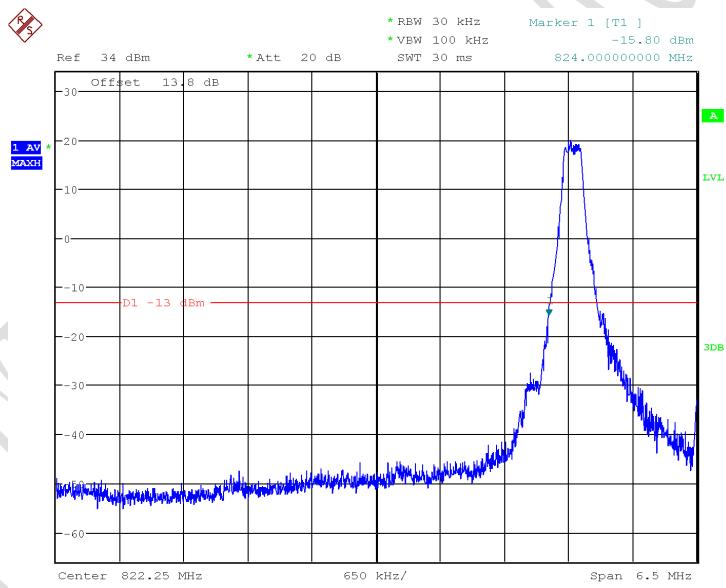
Date: 25.JUN.2017 14:58:36

#### LTE Band5, 3MHz bandwidth, QPSK,(1,15) Mode, Above 849MHz



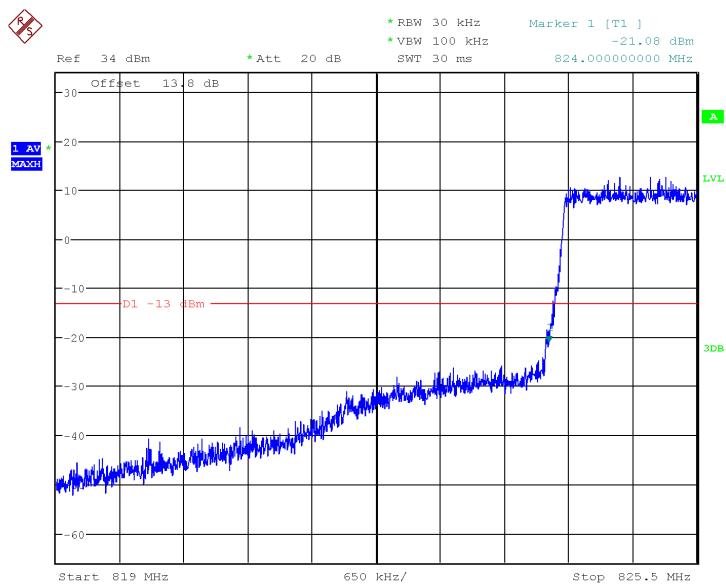
Date: 25.JUN.2017 14:59:54

## LTE Band5, 3MHz bandwidth, QPSK,(15,0) Mode, Above 849MHz



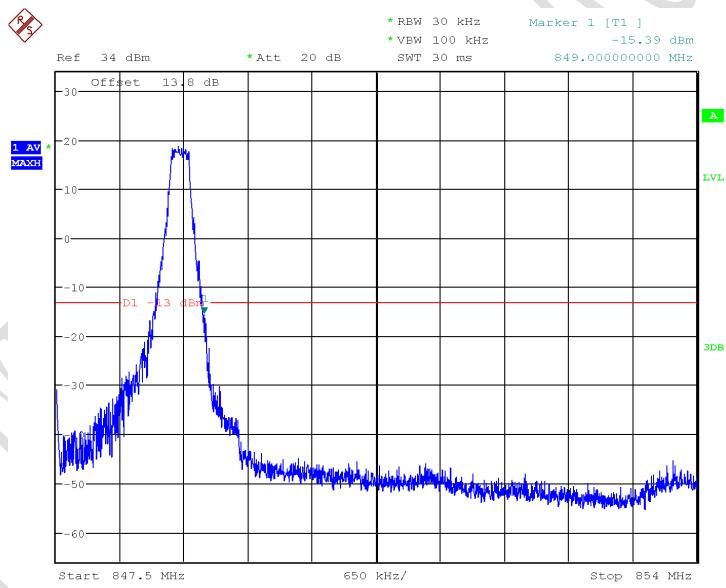
Date: 25.JUN.2017 14:56:09

## LTE Band5, 3MHz bandwidth, 16QAM,(1,0) Mode , Below 824MHz



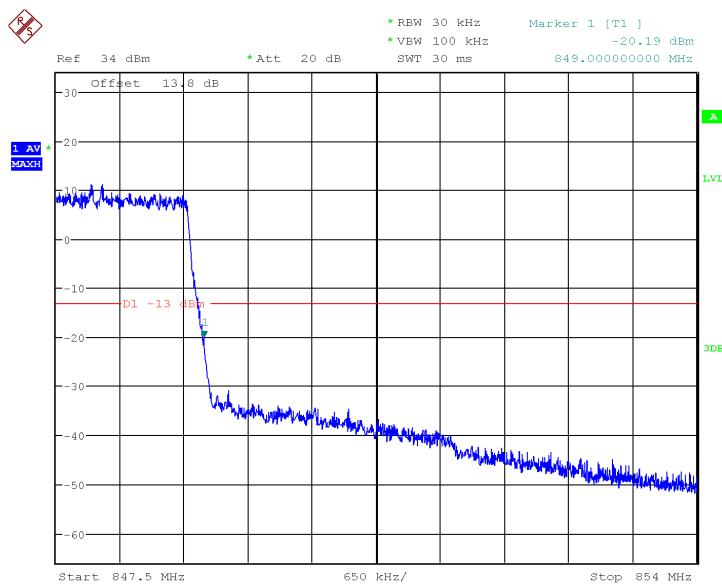
Date: 25.JUN.2017 14:54:49

LTE Band5, 3MHz bandwidth, 16QAM,(15,0) Mode , Below 824MHz



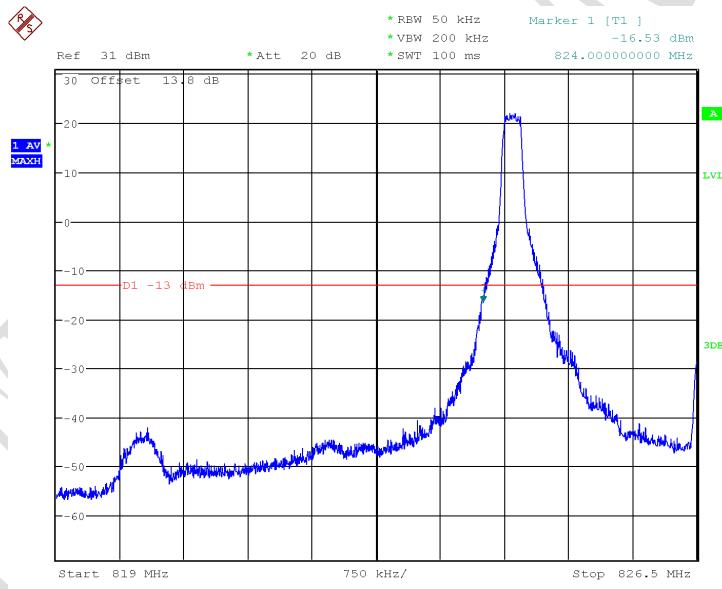
Date: 25.JUN.2017 14:58:49

LTE Band5, 3MHz bandwidth, 16QAM,(1,15) Mode, Above 849MHz



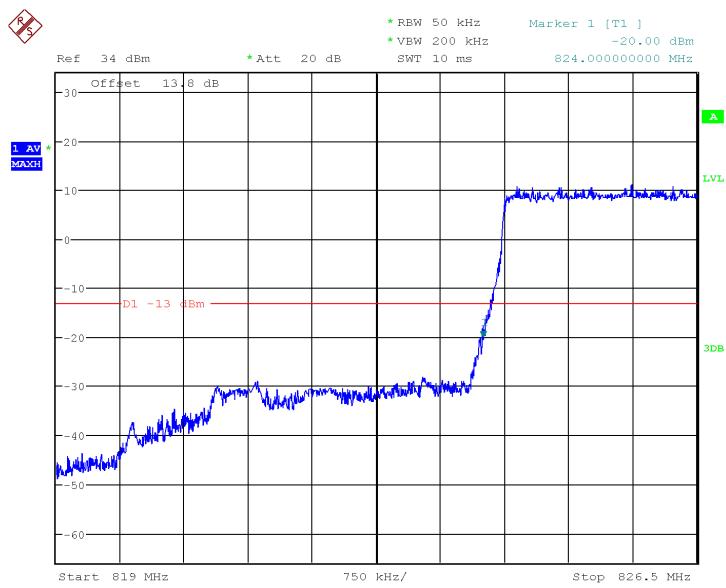
Date: 25.JUN.2017 14:59:27

## LTE Band5, 3MHz bandwidth, 16QAM,(15,0) Mode, Above 849MHz



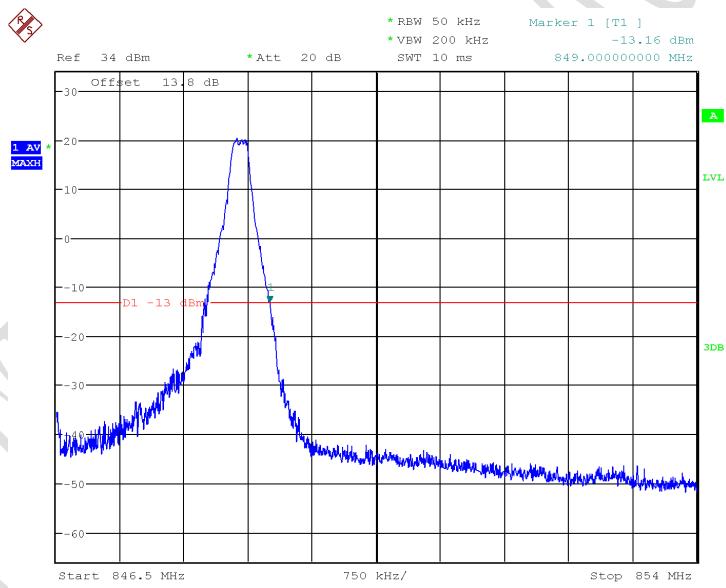
Date: 27.JUN.2017 10:10:39

## LTE Band5, 5MHz bandwidth, QPSK,(1,0) Mode , Below 824MHz



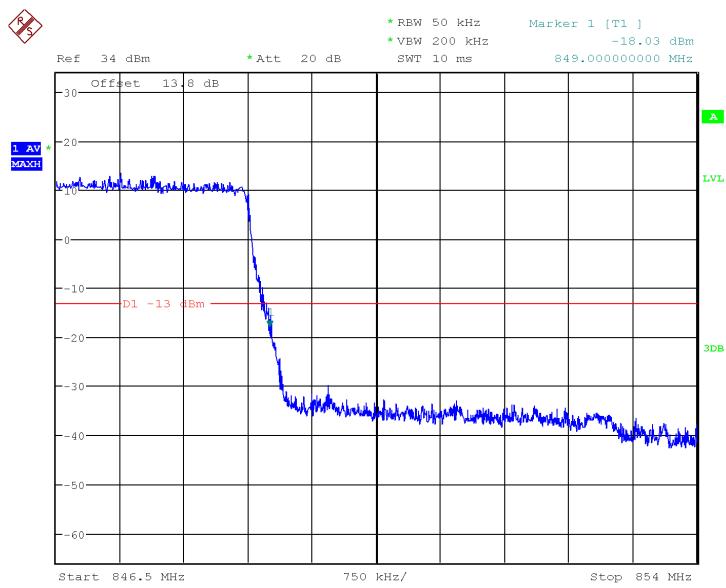
Date: 25.JUN.2017 15:07:03

#### LTE Band5, 5MHz bandwidth, QPSK,(25,0) Mode , Below 824MHz



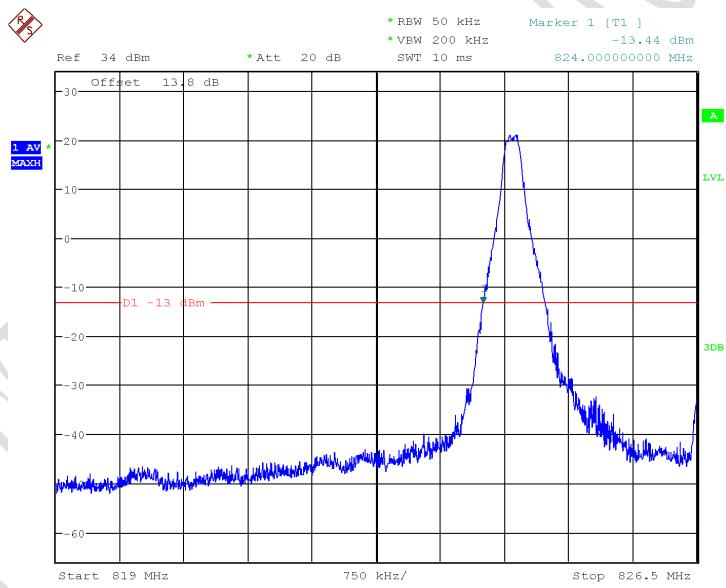
Date: 25.JUN.2017 15:04:31

#### LTE Band5, 5MHz bandwidth, QPSK,(1,25) Mode, Above 849MHz



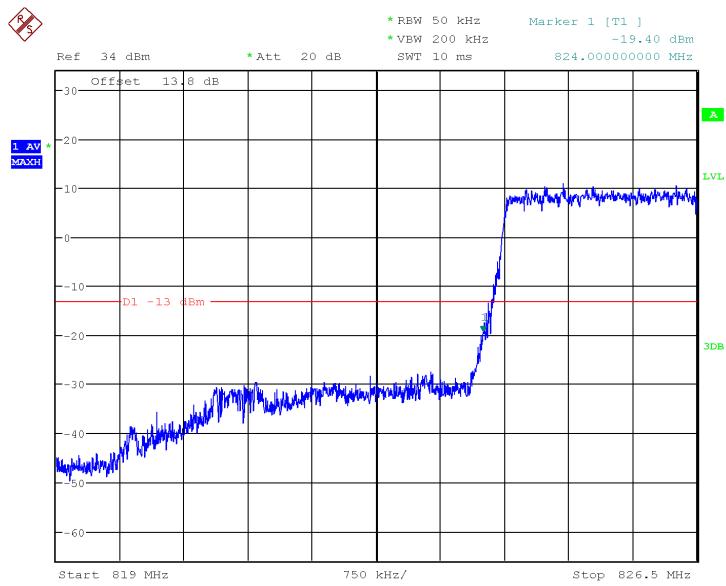
Date: 25.JUN.2017 15:02:50

## LTE Band5, 5MHz bandwidth, QPSK,(25,0) Mode, Above 849MHz



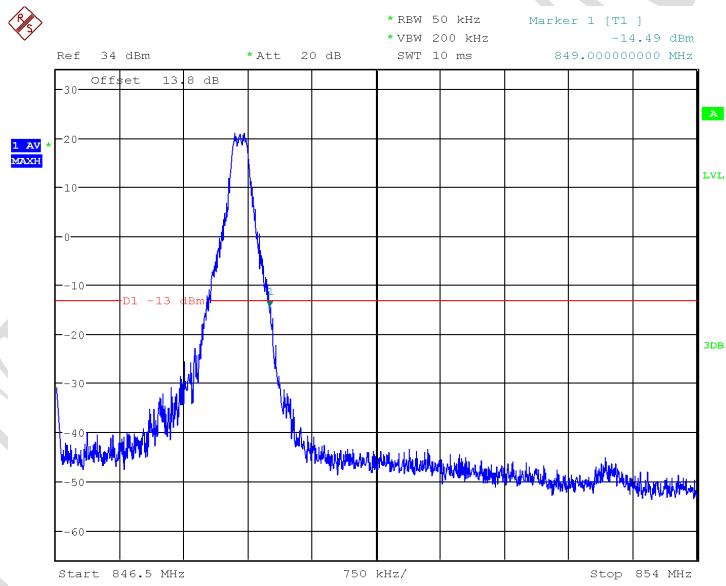
Date: 25.JUN.2017 15:06:20

## LTE Band5, 5MHz bandwidth, 16QAM,(1,0) Mode , Below 824MHz



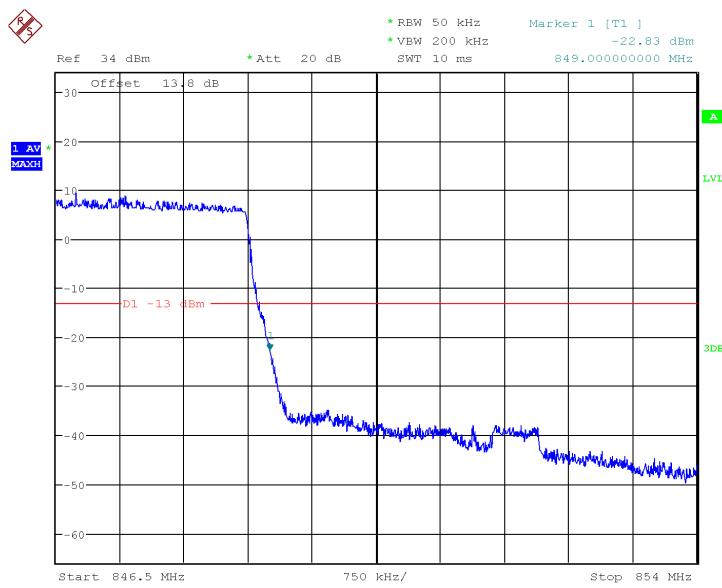
Date: 25.JUN.2017 15:07:15

LTE Band5, 5MHz bandwidth, 16QAM,(25,0) Mode , Below 824MHz



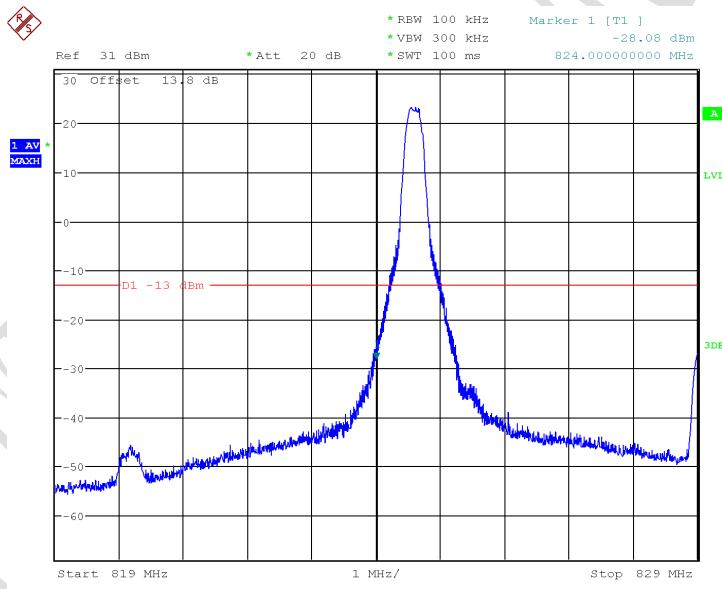
Date: 25.JUN.2017 15:04:43

LTE Band5, 5MHz bandwidth, 16QAM,(1,25) Mode, Above 849MHz



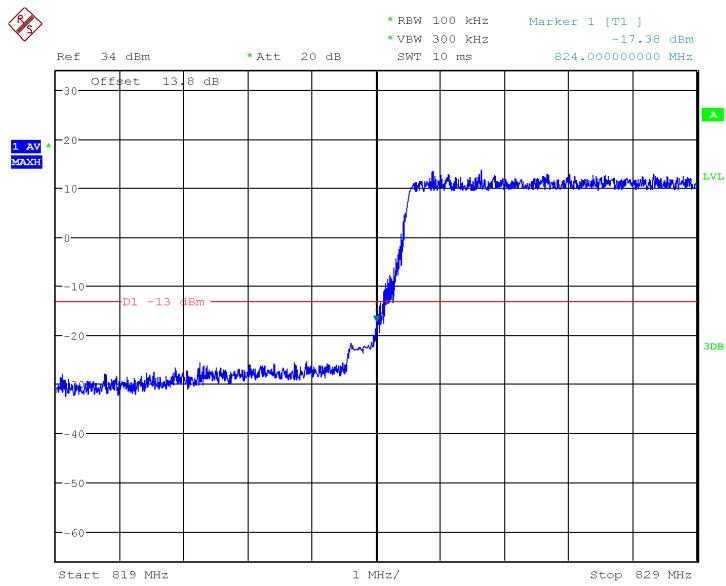
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## LTE Band5, 5MHz bandwidth, 16QAM,(25,0) Mode, Above 849MHz



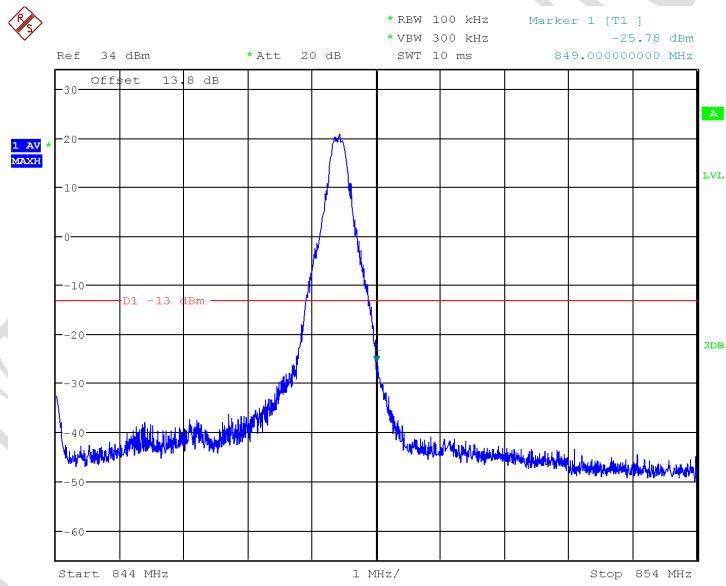
Date: 27.JUN.2017 10:13:27

## LTE Band5, 10MHz bandwidth, QPSK,(1,0) Mode , Below 824MHz



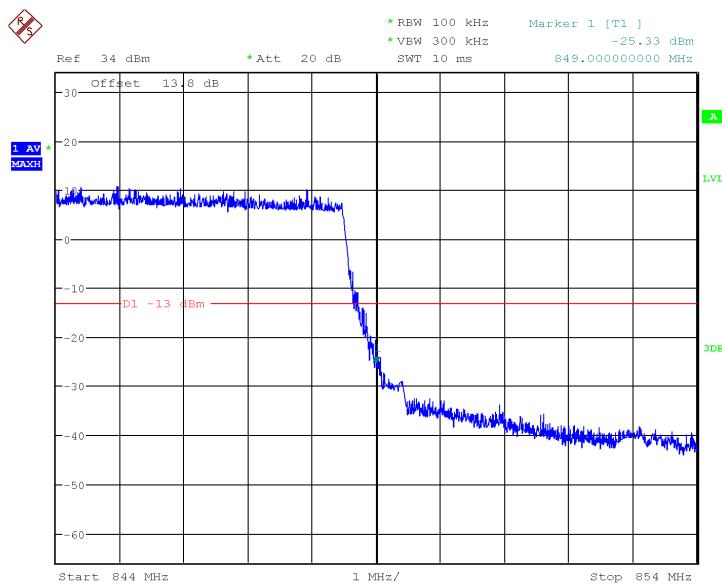
Date: 25.JUN.2017 15:14:24

#### LTE Band5, 10MHz bandwidth, QPSK,(50,0) Mode , Below 824MHz



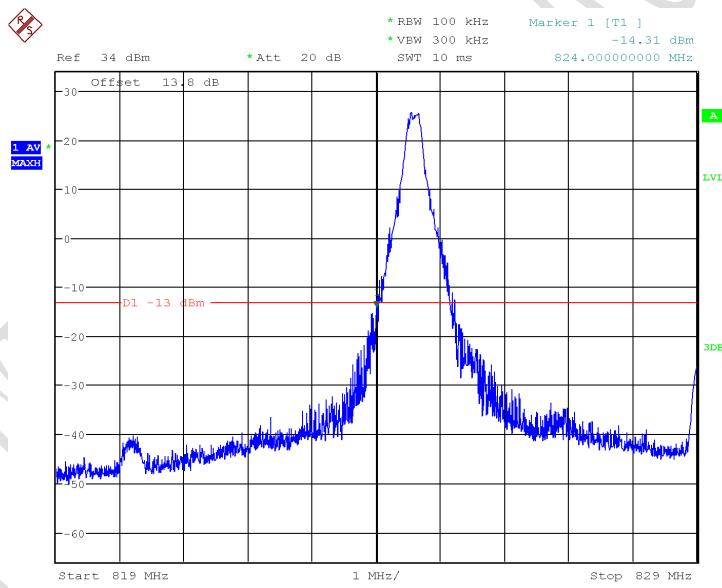
Date: 25.JUN.2017 15:17:27

#### LTE Band5, 10MHz bandwidth, QPSK,(1,50) Mode, Above 849MHz



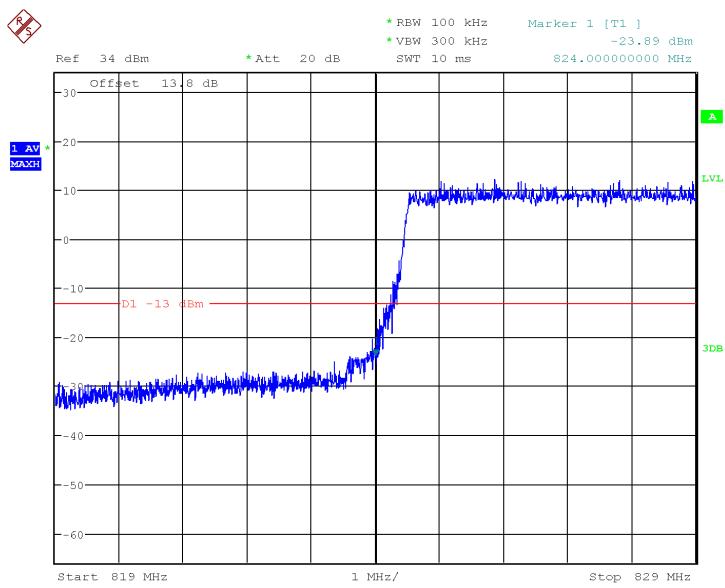
Date: 25.JUN.2017 15:18:25

LTE Band5, 10MHz bandwidth, QPSK,(50,0) Mode, Above 849MHz



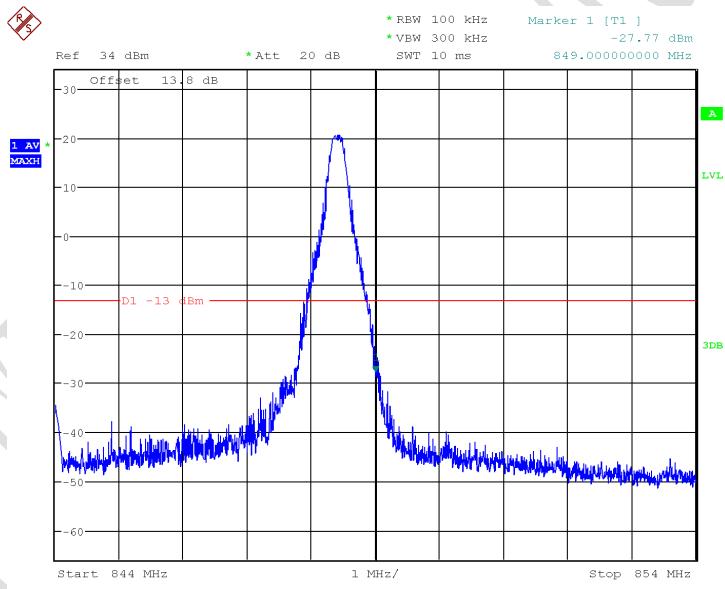
Date: 25.JUN.2017 15:14:58

LTE Band5, 10MHz bandwidth, 16QAM,(1,0) Mode , Below 824MHz



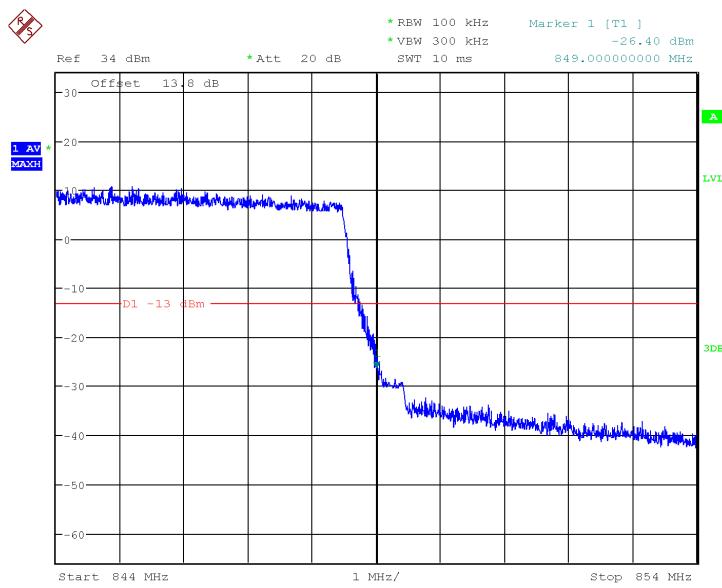
Date: 25.JUN.2017 15:14:34

## LTE Band5, 10MHz bandwidth, 16QAM,(50,0) Mode , Below 824MHz



Date: 25.JUN.2017 15:17:40

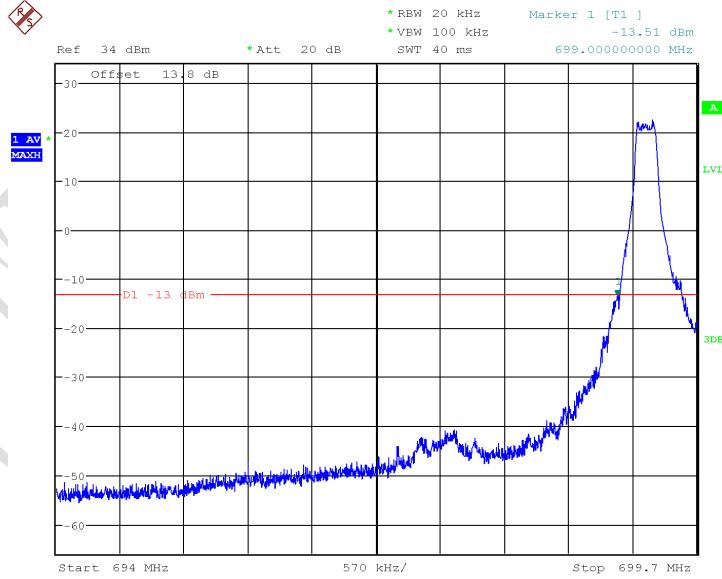
## LTE Band5, 10MHz bandwidth, 16QAM,(1,50) Mode, Above 849MHz



Date: 25.JUN.2017 15:18:08

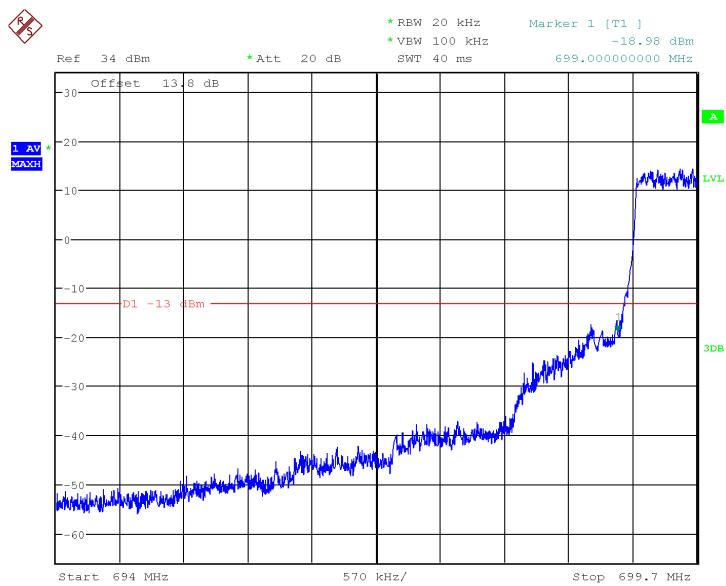
LTE Band5, 10MHz bandwidth, 16QAM,(50,0) Mode, Above 849MHz

### 5.5.7 LTE B12 Band Edge Results



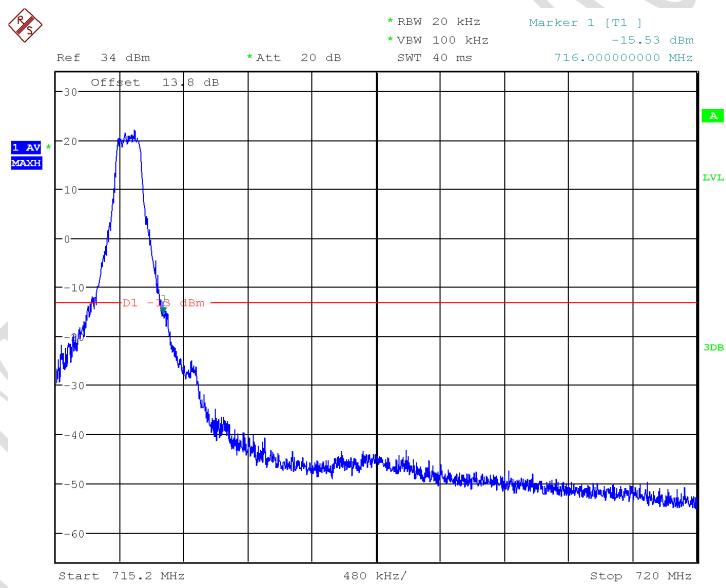
Date: 23.JUN.2017 16:32:36

LTE Band12, 1.4MHz bandwidth, QPSK,(1,0) Mode , Below 699MHz



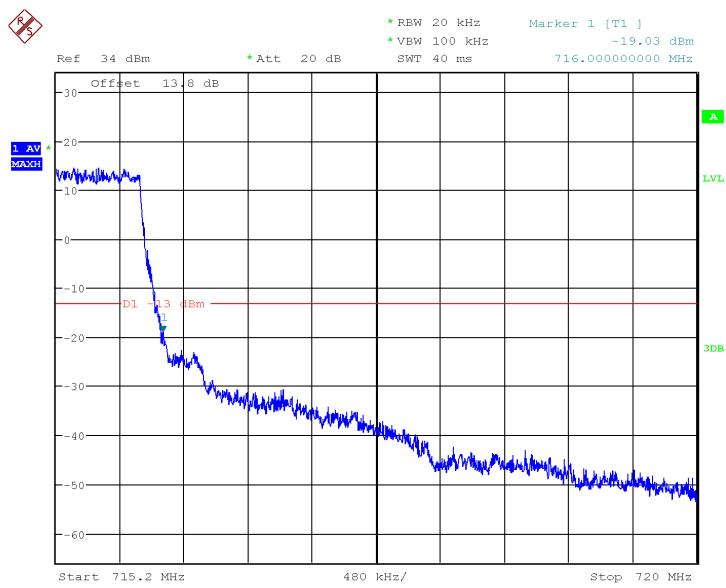
Date: 23.JUN.2017 16:35:49

## LTE Band12, 1.4MHz bandwidth, QPSK,(6,0) Mode , Below 699MHz



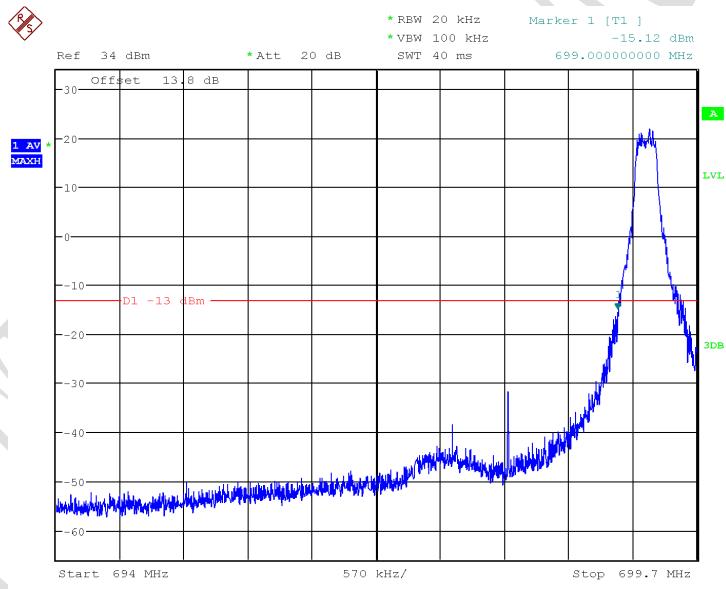
Date: 23.JUN.2017 16:38:06

## LTE Band12, 1.4MHz bandwidth, QPSK,(1,6) Mode, Above 716MHz



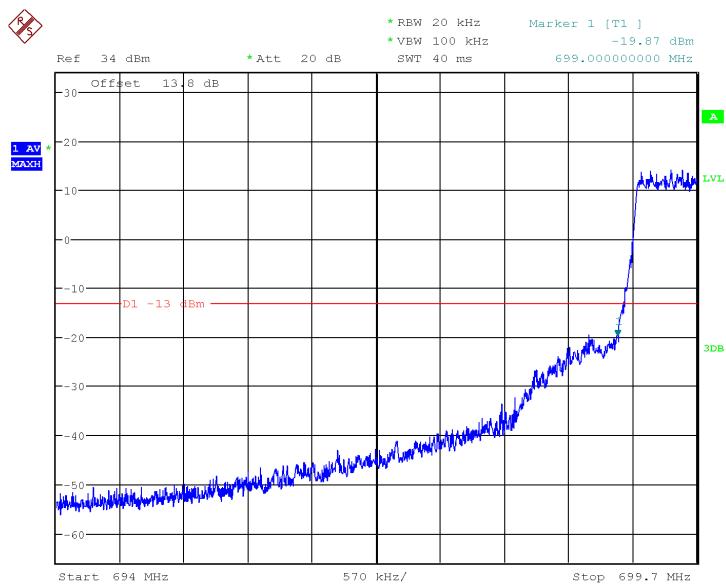
Date: 23.JUN.2017 16:37:02

## LTE Band12, 1.4MHz bandwidth, QPSK,(6,0) Mode, Above 716MHz



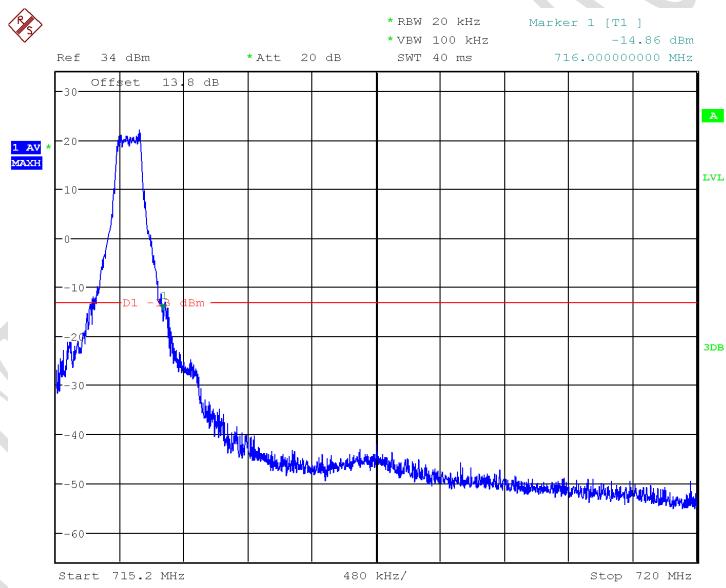
Date: 23.JUN.2017 16:34:57

## LTE Band12, 1.4MHz bandwidth, 16QAM,(1,0) Mode , Below 699MHz



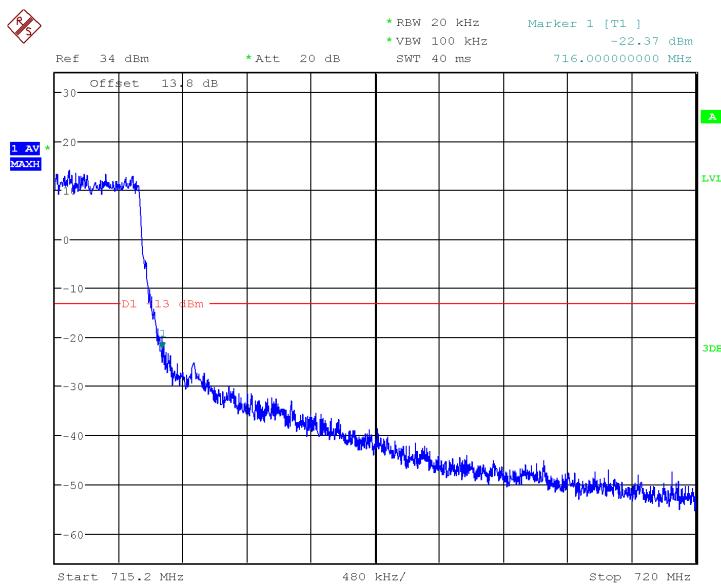
Date: 23.JUN.2017 16:35:29

## LTE Band12, 1.4MHz bandwidth, 16QAM,(6,0) Mode , Below 699MHz



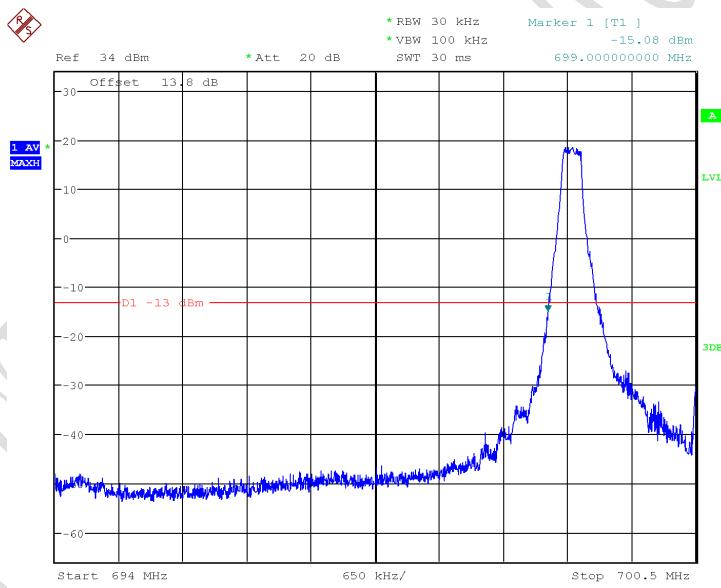
Date: 23.JUN.2017 16:37:44

## LTE Band12, 1.4MHz bandwidth, 16QAM,(1,6) Mode, Above 716MHz



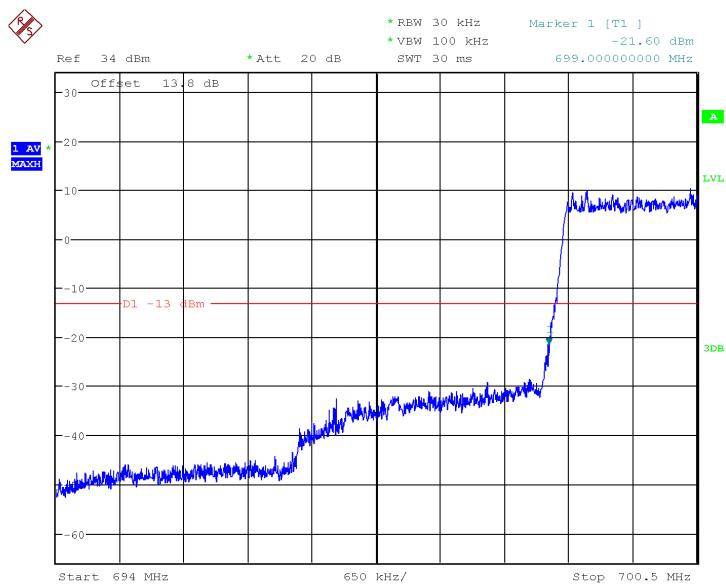
Date: 23.JUN.2017 16:37:17

## LTE Band12, 1.4MHz bandwidth, 16QAM,(6,0) Mode, Above 716MHz



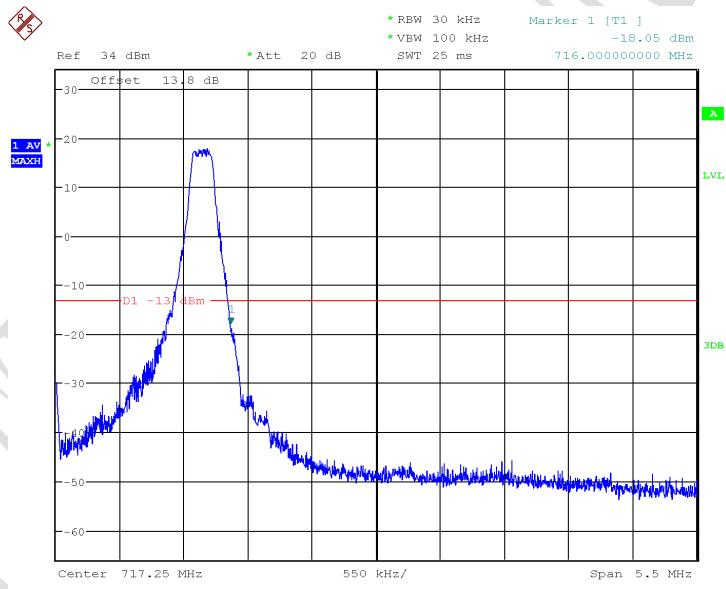
Date: 23.JUN.2017 16:41:07

## LTE Band12, 3MHz bandwidth, QPSK,(1,0) Mode , Below 699MHz



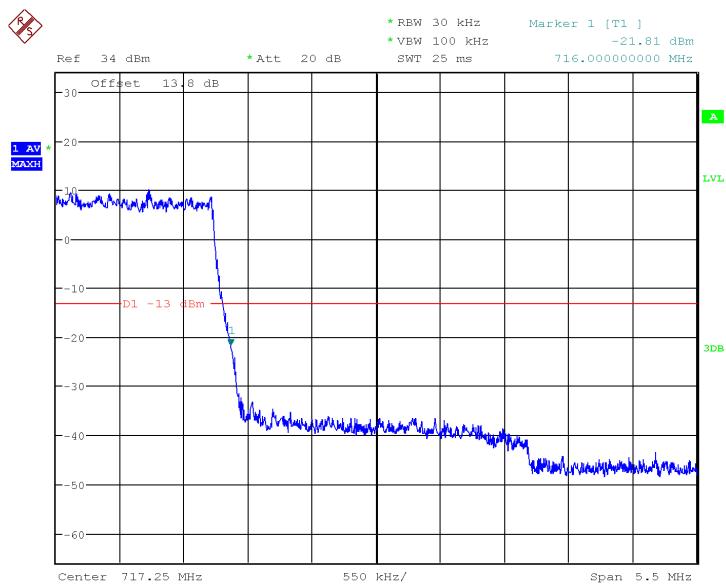
Date: 23.JUN.2017 16:42:17

## LTE Band12, 3MHz bandwidth, QPSK,(15,0) Mode , Below 699MHz



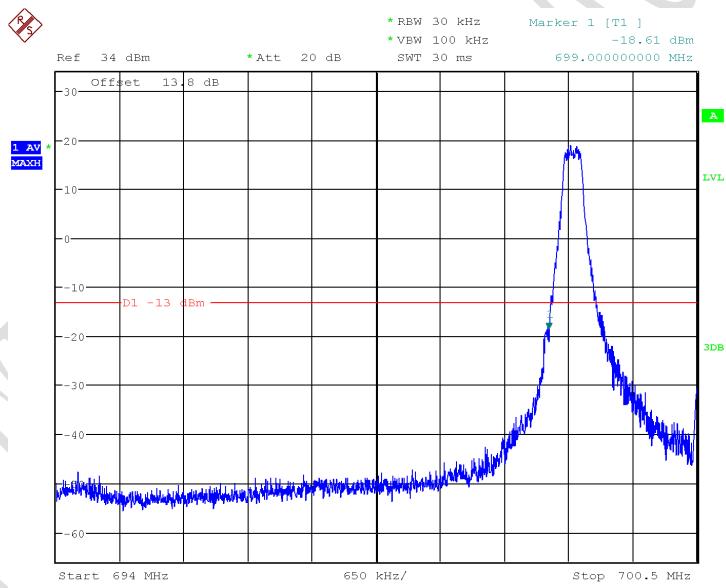
Date: 23.JUN.2017 16:45:54

## LTE Band12, 3MHz bandwidth, QPSK,(1,15) Mode, Above 716MHz



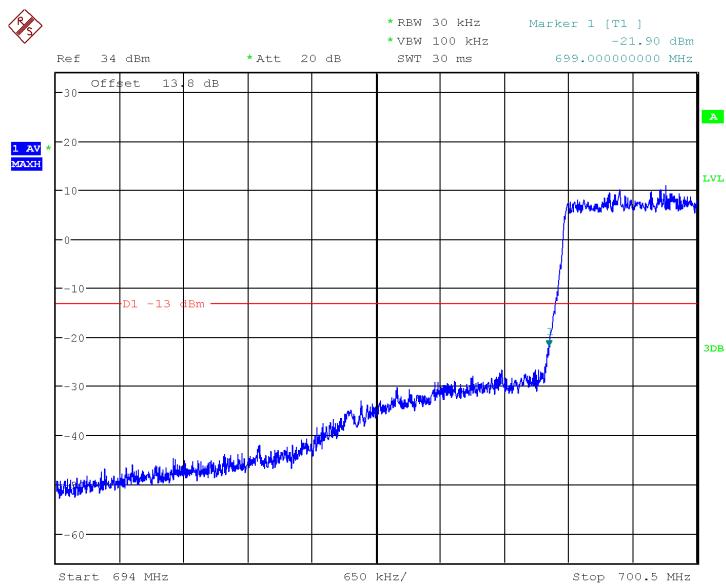
Date: 23.JUN.2017 16:44:24

LTE Band12, 3MHz bandwidth, QPSK,(15,0) Mode, Above 716MHz



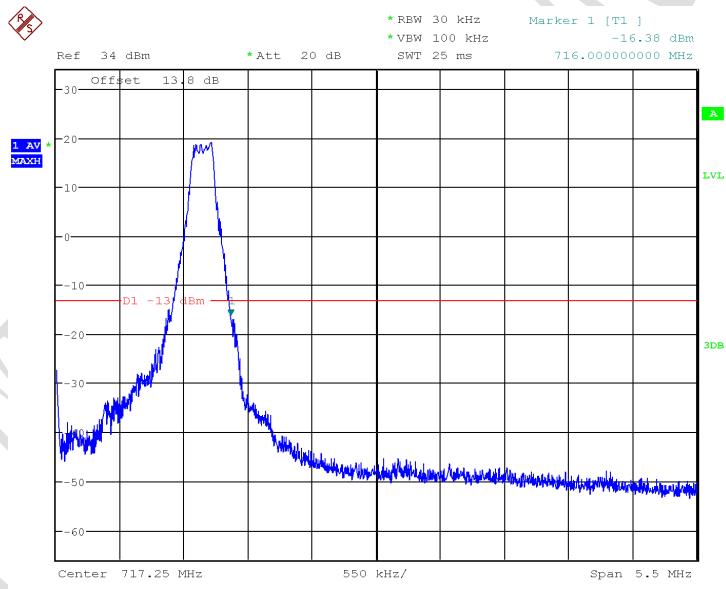
Date: 23.JUN.2017 16:41:24

LTE Band12, 3MHz bandwidth, 16QAM,(1,0) Mode , Below 699MHz



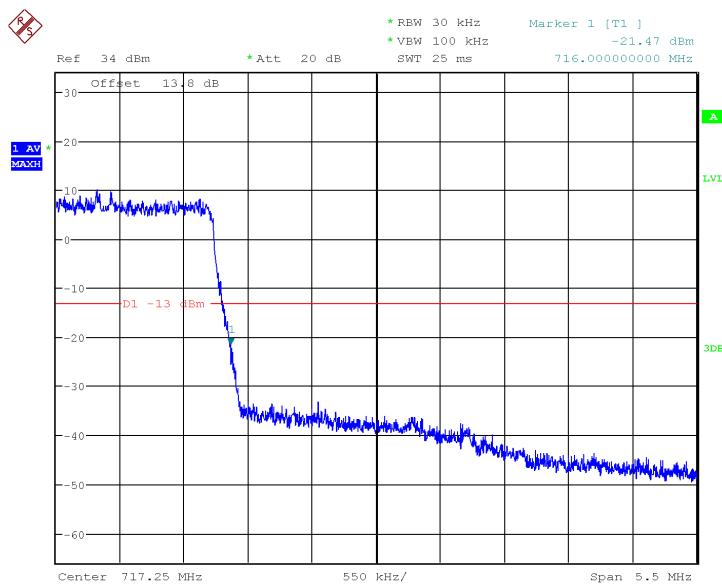
Date: 23.JUN.2017 16:41:53

## LTE Band12, 3MHz bandwidth, 16QAM,(15,0) Mode , Below 699MHz



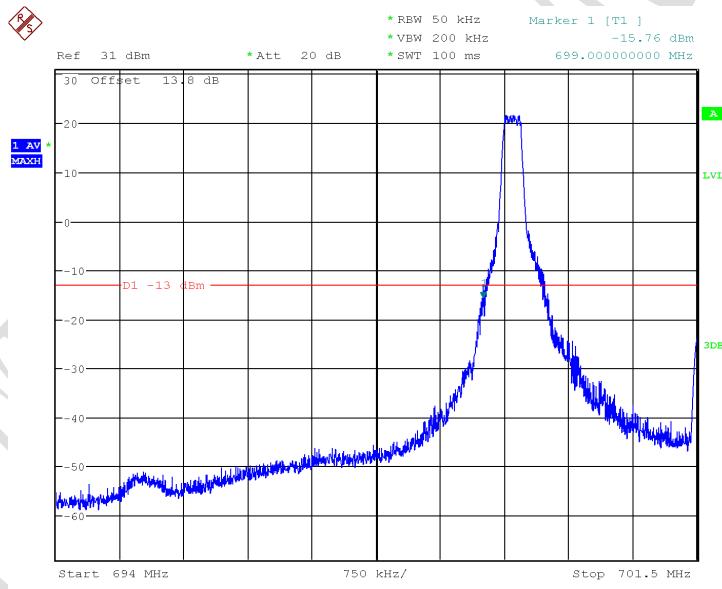
Date: 23.JUN.2017 16:45:30

## LTE Band12, 3MHz bandwidth, 16QAM,(1,15) Mode, Above 716MHz



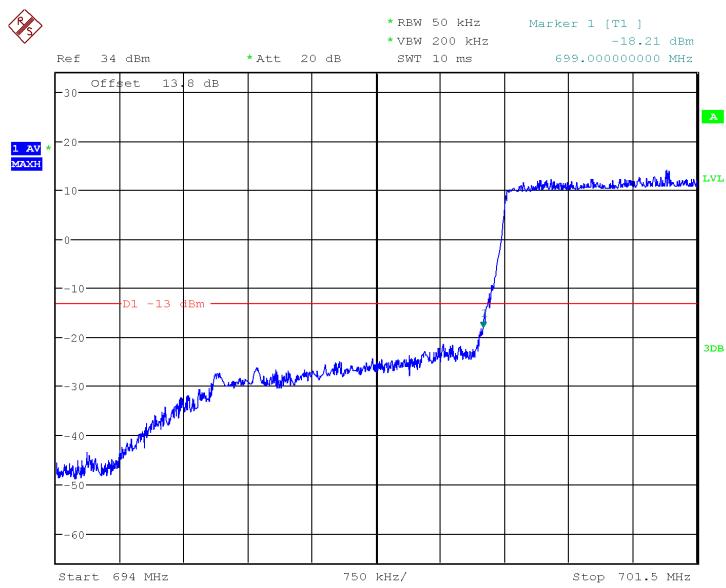
Date: 23.JUN.2017 16:44:46

## LTE Band12, 3MHz bandwidth, 16QAM,(15,0) Mode, Above 716MHz



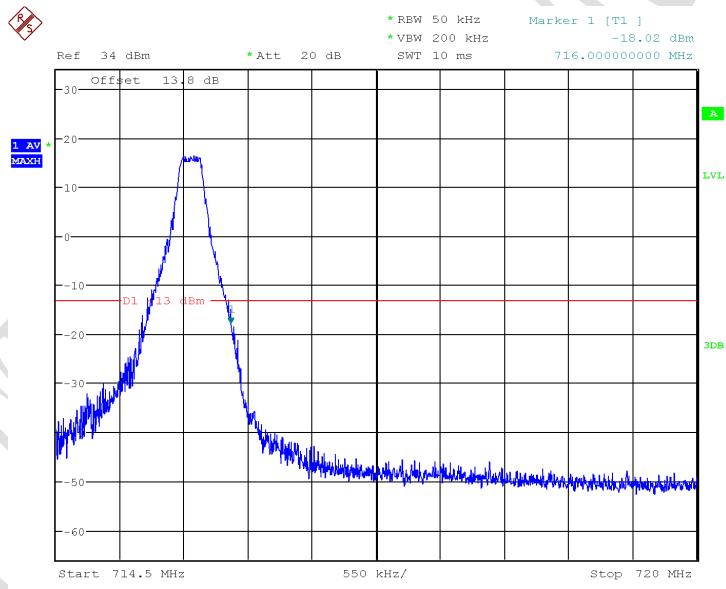
Date: 27.JUN.2017 10:20:00

## LTE Band12, 5MHz bandwidth, QPSK,(1,0) Mode , Below 699MHz



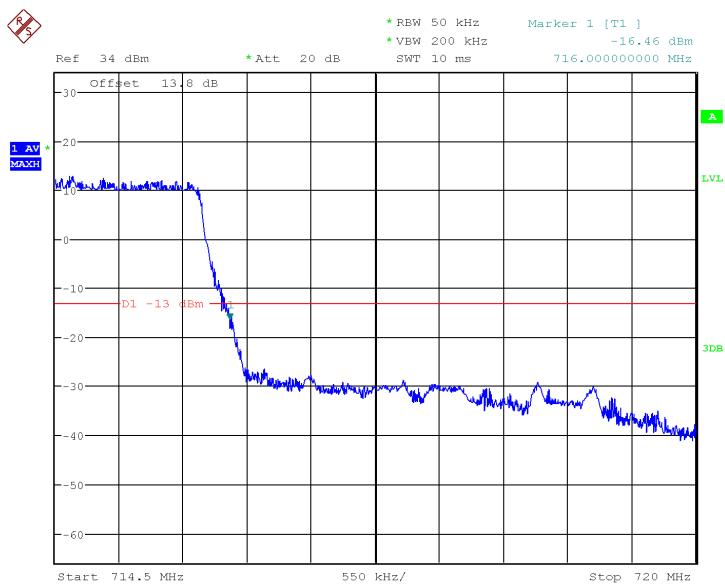
Date: 23.JUN.2017 16:50:10

## LTE Band12, 5MHz bandwidth, QPSK,(25,0) Mode , Below 699MHz



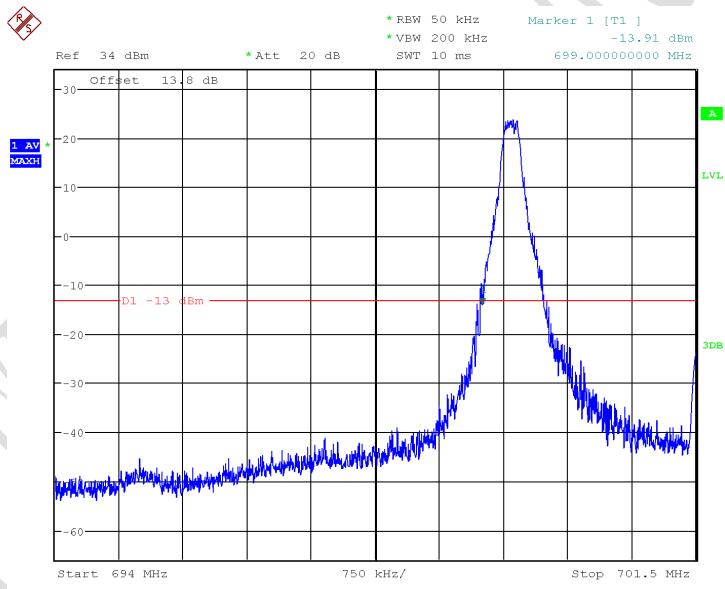
Date: 23.JUN.2017 16:52:52

## LTE Band12, 5MHz bandwidth, QPSK,(1,25) Mode, Above 716MHz



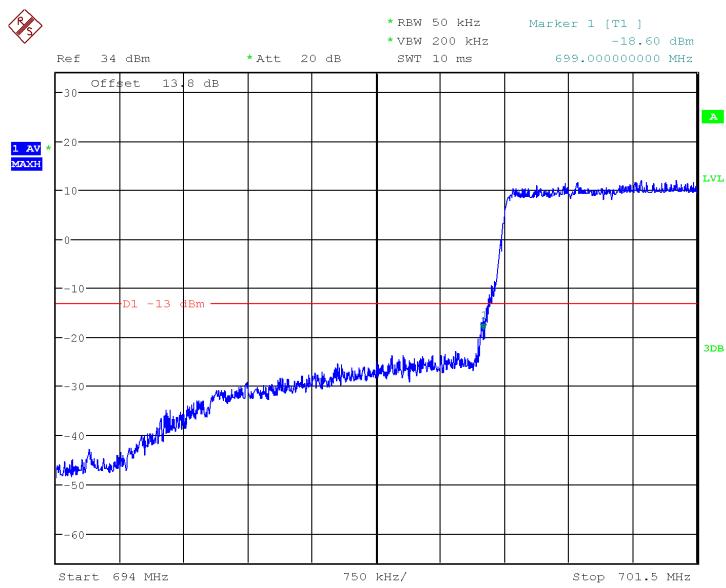
Date: 23.JUN.2017 16:51:28

## LTE Band12, 5MHz bandwidth, QPSK,(25,0) Mode, Above 716MHz



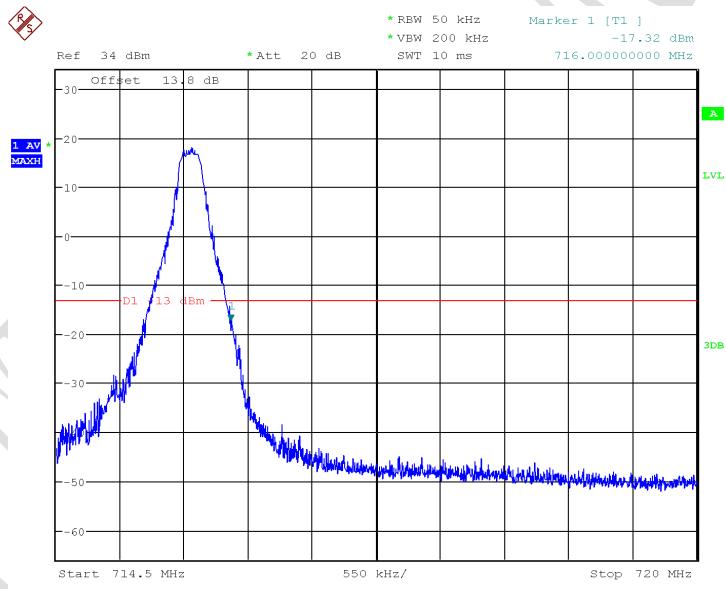
Date: 23.JUN.2017 16:49:07

## LTE Band12, 5MHz bandwidth, 16QAM,(1,0) Mode , Below 699MHz



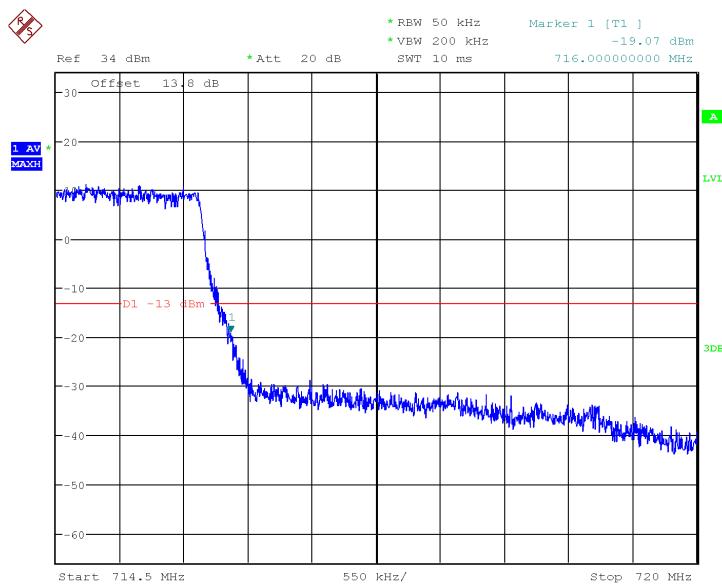
Date: 23.JUN.2017 16:49:33

## LTE Band12, 5MHz bandwidth, 16QAM,(25,0) Mode , Below 699MHz



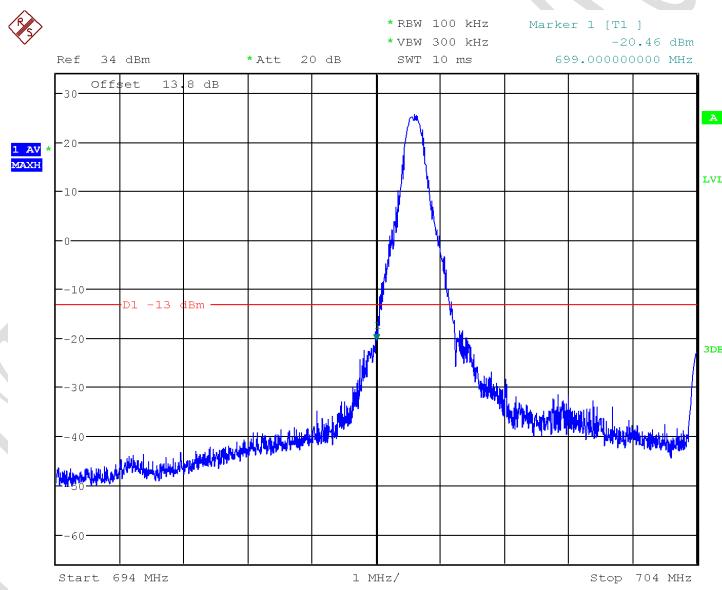
Date: 23.JUN.2017 16:52:35

## LTE Band12, 5MHz bandwidth, 16QAM,(1,25) Mode, Above 716MHz



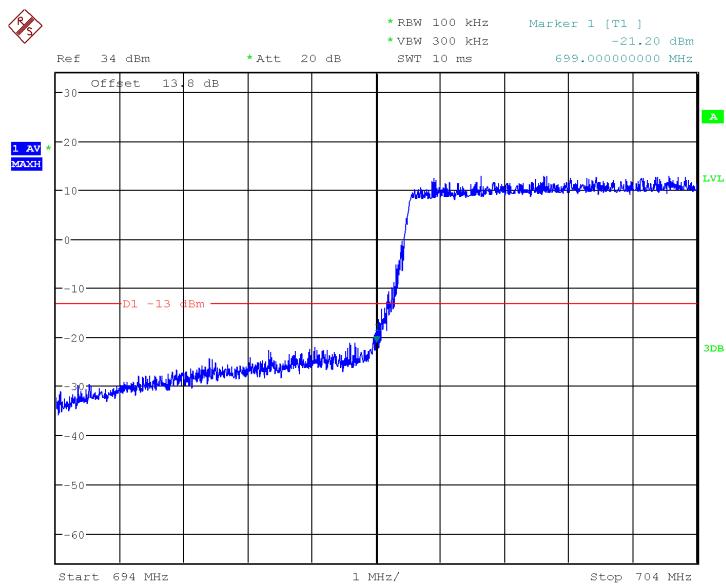
Date: 23.JUN.2017 16:51:42

## LTE Band12, 5MHz bandwidth, 16QAM,(25,0) Mode, Above 716MHz



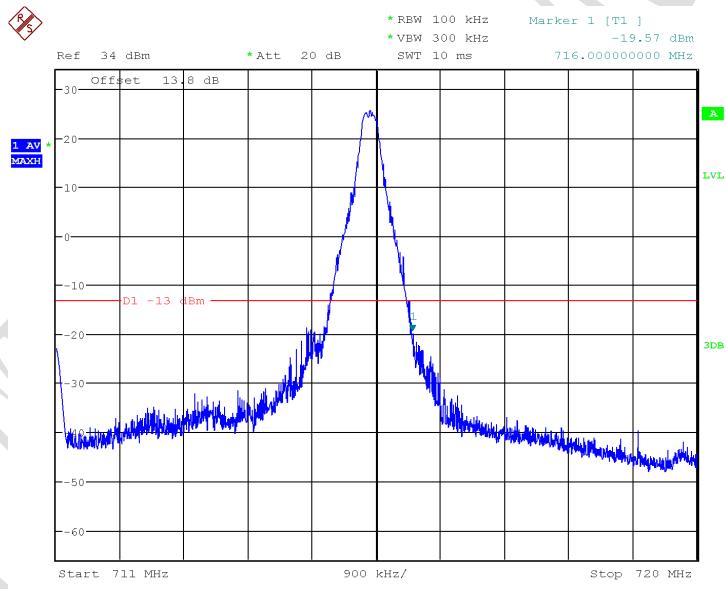
Date: 23.JUN.2017 16:58:16

## LTE Band12, 10MHz bandwidth, QPSK,(1,0) Mode , Below 699MHz



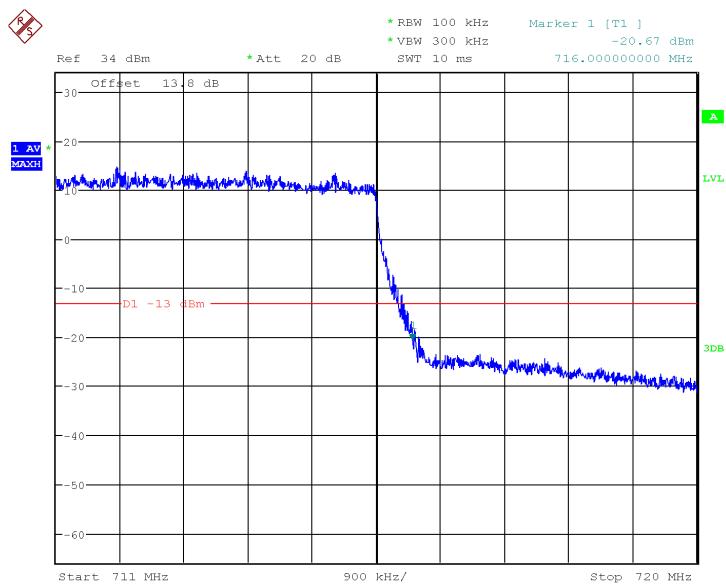
Date: 23.JUN.2017 16:59:20

#### LTE Band12, 10MHz bandwidth, QPSK,(50,0) Mode , Below 699MHz



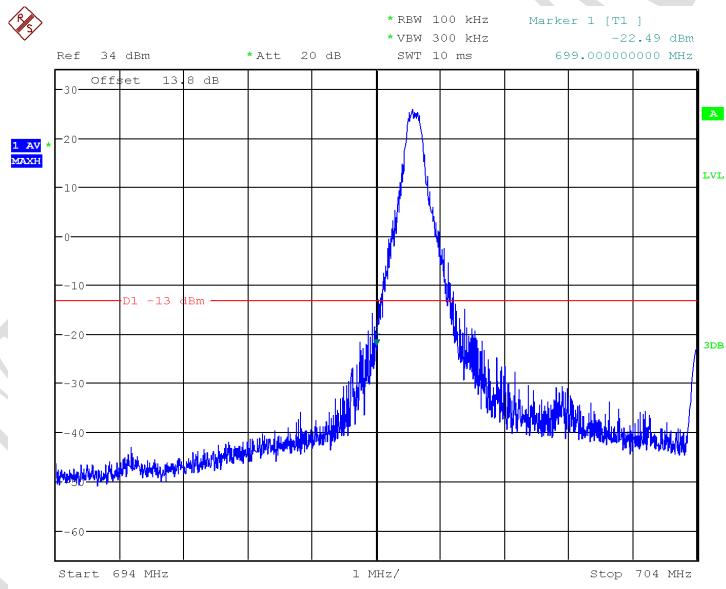
Date: 23.JUN.2017 17:02:23

#### LTE Band12, 10MHz bandwidth, QPSK,(1,50) Mode, Above 716MHz



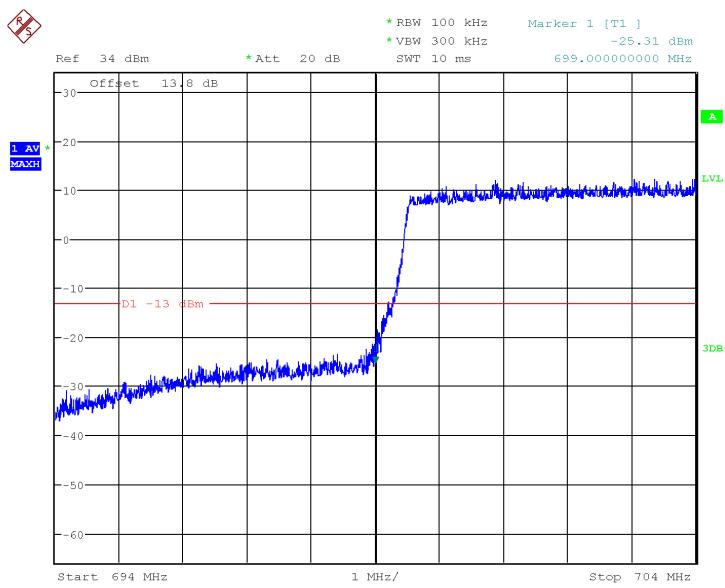
Date: 23.JUN.2017 17:00:44

## LTE Band12, 10MHz bandwidth, QPSK,(50,0) Mode, Above 716MHz



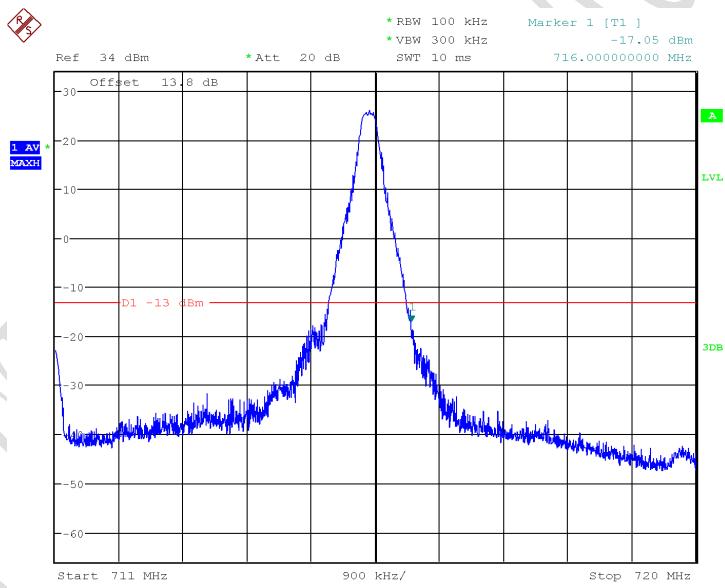
Date: 23.JUN.2017 16:58:30

## LTE Band12, 10MHz bandwidth, 16QAM,(1,0) Mode , Below 699MHz



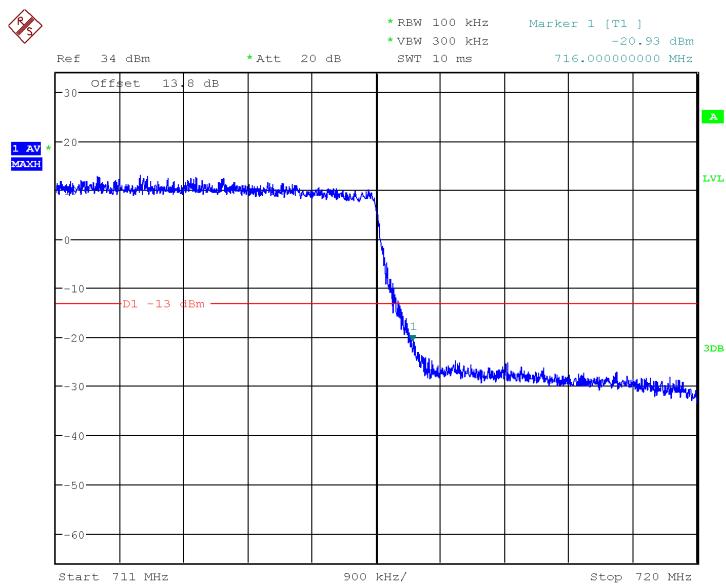
Date: 23.JUN.2017 16:58:59

## LTE Band12, 10MHz bandwidth, 16QAM,(50,0) Mode , Below 699MHz



Date: 23.JUN.2017 17:01:49

## LTE Band12, 10MHz bandwidth, 16QAM,(1,50) Mode, Above 716MHz



Date: 23.JUN.2017 17:01:12

LTE Band12, 10MHz bandwidth, 16QAM,(50,0) Mode, Above 716MHz



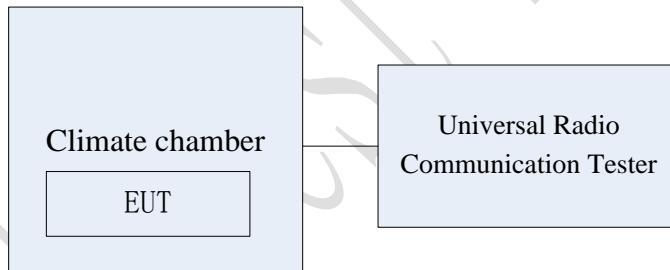
## 5.6 Frequency Stability over Temperature Variation

<b>Specifications:</b>	FCC Part 2.1055, 22.355, 24.235, 27.54 RSS-130 4.3, RSS-132 5.3, RSS-133 6.3, RSS-139 6.4
<b>DUT Serial Number:</b>	S1: U3708475240103
<b>Test conditions:</b>	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
<b>Test Results:</b>	--

Limit	
Frequency deviation [ppm]	±2.5

### Test Setup

The EUT was placed in a temperature chamber, demonstrated as figure T. The Wireless Telecommunications Test Set was used to set the Tx channel and power level, modulate the TX signal with different bit patterns and measure the frequency of Tx.



### Test Method

- 1、The EUT was turned off and placed in the temperature chamber.
- 2、The temperature of the chamber was set to -30°C and allowed to stabilize.
- 3、The EUT temperature was allowed to stabilize for 45 minutes.
- 4、The EUT was turned on and set to transmit with Wireless Telecommunications Test Set.
- 5、The maximum transmit frequency deviation during one minute period was measured by Wireless Communications Test Set.
- 6、The steps 3-5 were repeated for -30°C, -20°C, -10°C, 0°C, 10°C, 20°C, 30°C, 40°C and 50°C.

**5.6.1 WCDMA Band Frequency Stability over Temperature Variation Results**

Band	Offset	Temperature[°C]								
		-30	-20	-10	0	10	20	30	40	50
2	Hz	9.27	9.11	8.89	9.16	9.50	9.63	8.02	8.40	7.86
	ppm	0.0049	0.0048	0.0047	0.0049	0.0051	0.0051	0.0043	0.0045	0.0042
4	Hz	8.36	8.62	10.16	9.40	6.45	5.64	6.01	6.94	6.99
	ppm	0.0048	0.0050	0.0059	0.0054	0.0037	0.0033	0.0035	0.0040	0.0040
5	Hz	23.08	24.50	24.63	24.39	25.01	24.78	25.27	26.27	26.40
	ppm	0.0276	0.0293	0.0294	0.0292	0.0299	0.0296	0.0302	0.0314	0.0316

**5.6.2 LTE Band Frequency Stability over Temperature Variation Results**

Band	Offset	Temperature[°C]								
		-30	-20	-10	0	10	20	30	40	50
2	Hz	-1.82	-2.85	-3.12	-1.34	-2.68	-0.60	-1.02	-0.92	-0.31
	ppm	-0.0010	-0.0015	-0.0017	-0.0007	-0.0014	-0.0003	-0.0005	-0.0005	-0.0002
4	Hz	-2.65	-2.29	-2.20	-1.65	-1.77	-2.65	-3.12	-2.61	-3.60
	ppm	-0.0015	-0.0013	-0.0013	-0.0010	-0.0010	-0.0015	-0.0018	-0.0015	-0.0021
5	Hz	-1.02	-0.23	-0.41	-0.53	-0.11	-0.92	-0.66	-0.67	-0.69
	ppm	-0.0012	-0.0003	-0.0005	-0.0006	-0.0001	-0.0011	-0.0008	-0.0008	-0.0008
12	Hz	-1.24	-1.56	-0.23	-0.27	-0.36	-1.57	-2.02	-2.16	-2.06
	ppm	-0.0018	-0.0022	-0.0003	-0.0004	-0.0005	-0.0022	-0.0029	-0.0031	-0.0029



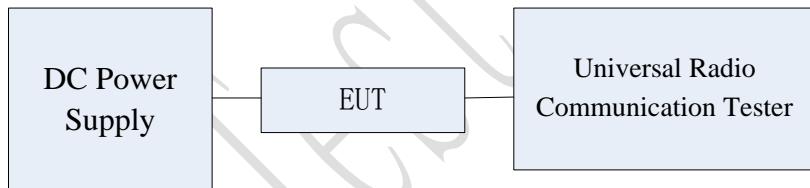
### 5.7 Frequency Stability over Voltage Variation

<b>Specifications:</b>	FCC Part 2.1055, 22.355, 24.235, 27.54 RSS-130 4.3, RSS-132 5.3, RSS-133 6.3, RSS-139 6.4
<b>DUT Serial Number:</b>	S1: U3708475240103
<b>Test conditions:</b>	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
<b>Test Results:</b>	--

Limit	
Frequency deviation [ppm]	±2.5

#### Test Setup

The EUT was placed in a shielding chamber and powered by an adjustable power supply, demonstrated as figure V. A Wireless Telecommunications Test Set was used to set the TX channel and power level, modulate the TX signal with different bit patterns and measure the frequency of TX.



#### Test Method

The EUT was powered by the adjustable power supply. The frequency stability is measured by the Wireless Telecommunications Test Set.

#### 5.7.1 WCDMA Band Frequency Stability over Voltage Variation Results

##### Test data:

Band	Offset	Voltage (V)		
		3.4	3.7	4.3
2	Hz	5.53	6.03	6.55
	ppm	0.0029	0.0032	0.0035
4	Hz	6.04	5.84	7.21
	ppm	0.0035	0.0034	0.0042
5	Hz	25.30	25.38	25.05
	ppm	0.0302	0.0303	0.0299

**5.7.2 LTE Band Frequency Stability over Voltage Variation Results****Test data:**

Band	Offset	Voltage (V)		
		3.4	3.7	4.3
2	<b>Hz</b>	-0.74	-0.76	-0.92
	<b>ppm</b>	-0.0004	-0.0004	-0.0005
4	<b>Hz</b>	-0.26	-0.87	-0.89
	<b>ppm</b>	-0.0002	-0.0005	-0.0005
5	<b>Hz</b>	-0.97	-0.11	-0.36
	<b>ppm</b>	-0.0012	-0.0001	-0.0004
12	<b>Hz</b>	-1.22	-1.03	-0.94
	<b>ppm</b>	-0.0017	-0.0015	-0.0013



### 5.8 Peak to Average Ratio

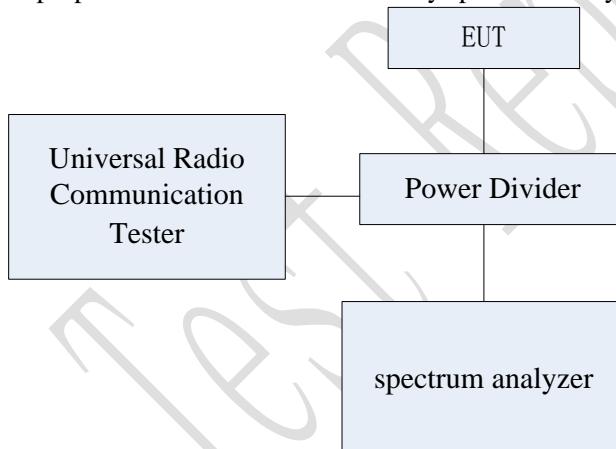
<b>Specifications:</b>	FCC Part 24.232, 27.50, RSS-130 4.4
<b>DUT Serial Number:</b>	S1: U3708475240103
<b>Test conditions:</b>	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
<b>Test Results:</b>	--

#### Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

#### Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



#### Test Method

The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each band on the Spectrum Analyzer.

##### 5.8.1 WCDMA B2 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
1880	9400	QPSK	2.95

##### 5.8.2 WCDMA B4 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
1732.4	1412	QPSK	3.05

**5.8.3 WCDMA B5 Peak to Average Ratio Results**

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
836.4	4182	QPSK	3.22

**5.8.4 LTE B2 Peak to Average Ratio Results**

Frequency (MHz)	EUT channel No.	bandwidth	Modulation	Peak to Average Ratio
1880MHz	18900	10MHz	QPSK	4.58
			16QAM	5.19

**5.8.5 LTE B4 Peak to Average Ratio Results**

Frequency (MHz)	EUT channel No.	bandwidth	Modulation	Peak to Average Ratio
1732.5MHz	20175	10MHz	QPSK	4.82
			16QAM	5.24

**5.8.6 LTE B5 Peak to Average Ratio Results**

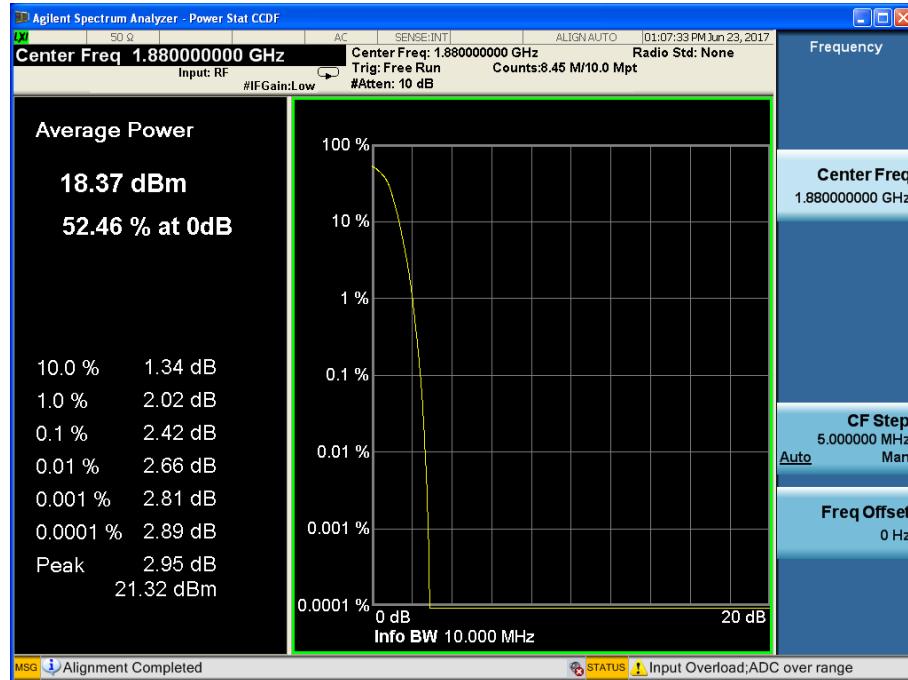
Frequency (MHz)	EUT channel No.	bandwidth	Modulation	Peak to Average Ratio
836.5MHz	23525	10MHz	QPSK	4.68
			16QAM	5.07

**5.8.7 LTE B12 Peak to Average Ratio Results**

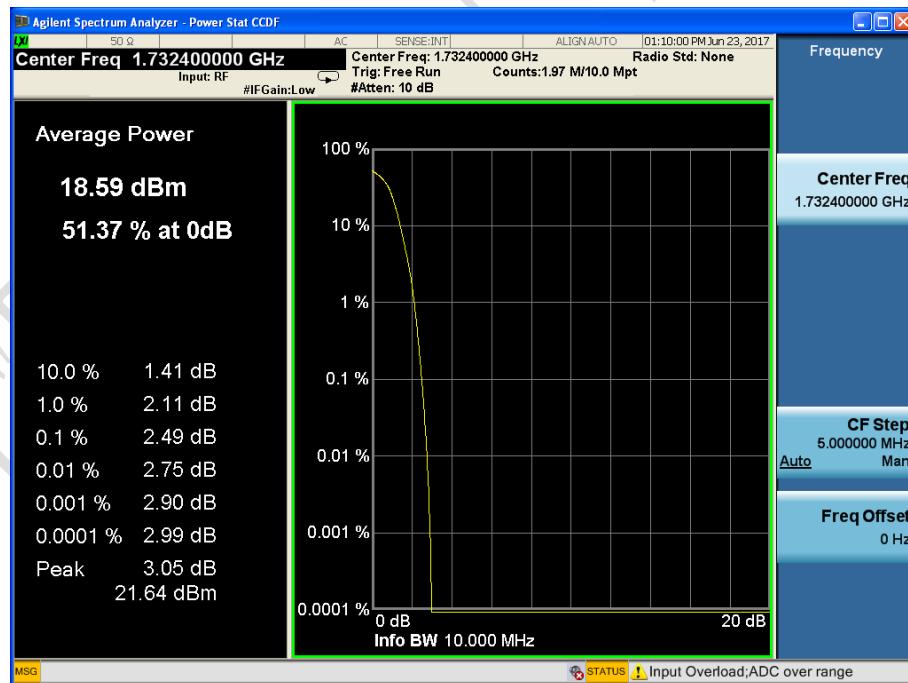
Frequency (MHz)	EUT channel No.	bandwidth	Modulation	Peak to Average Ratio
707.5MHz	23095	10MHz	QPSK	4.90
			16QAM	5.05



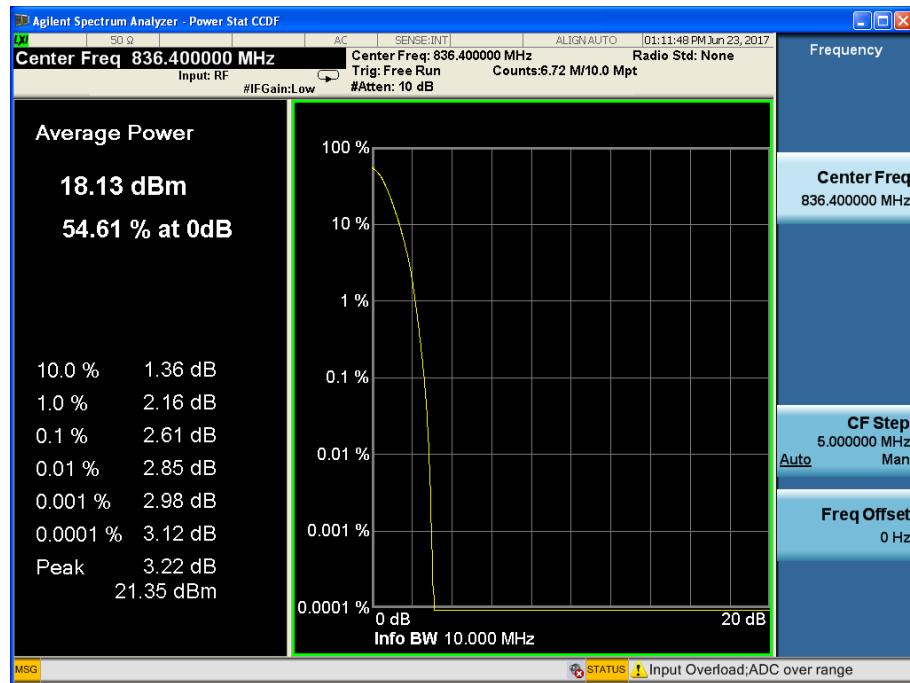
## Graphical for Peak to Average Ratio Results



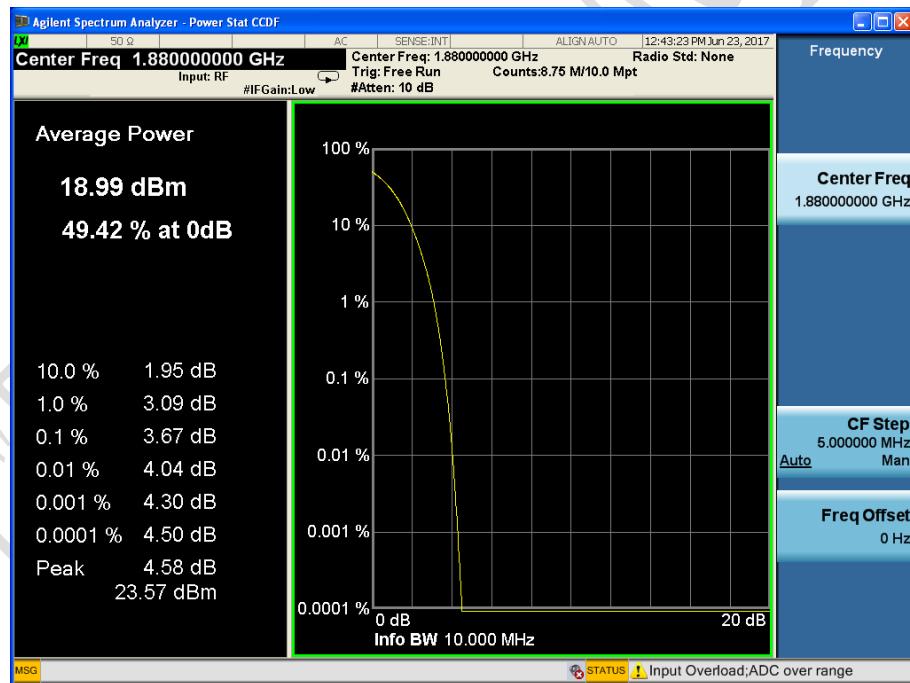
WCDMA Band2, QPSK



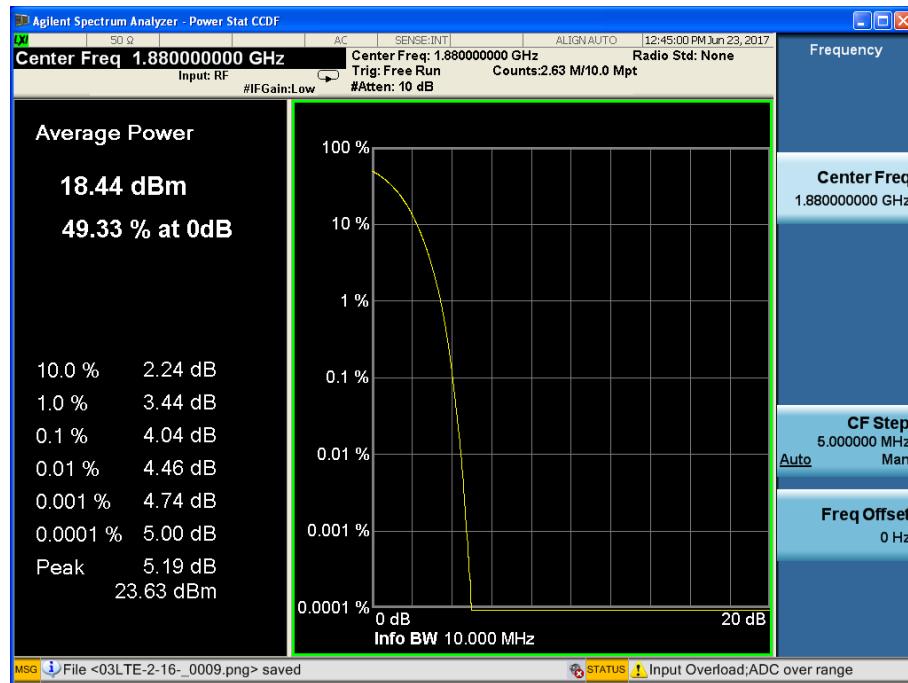
WCDMA Band4, QPSK



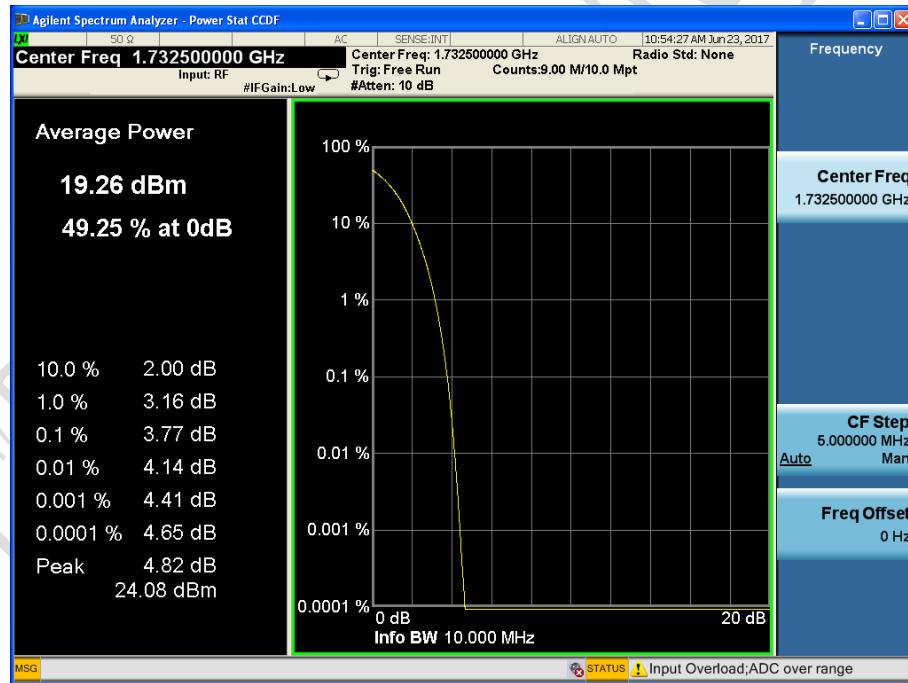
WCDMA Band5, QPSK



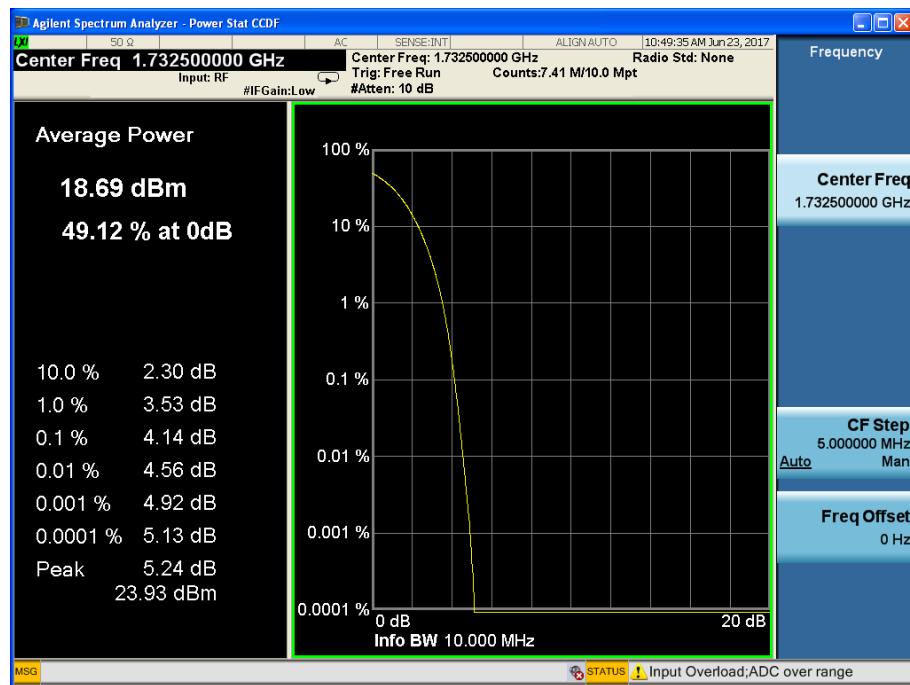
LTE Band2, QPSK



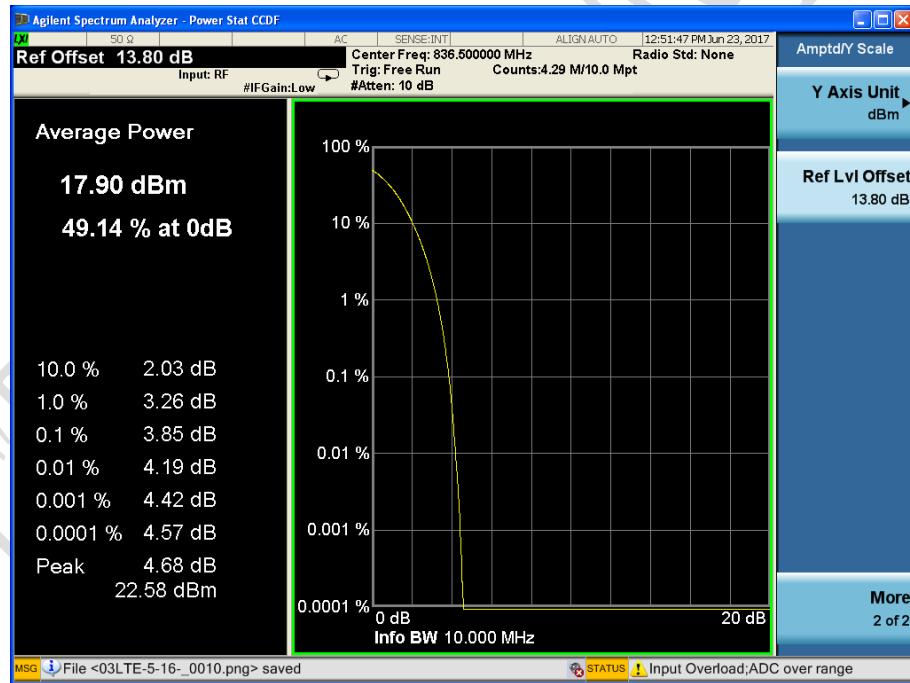
LTE Band2, 16QAM



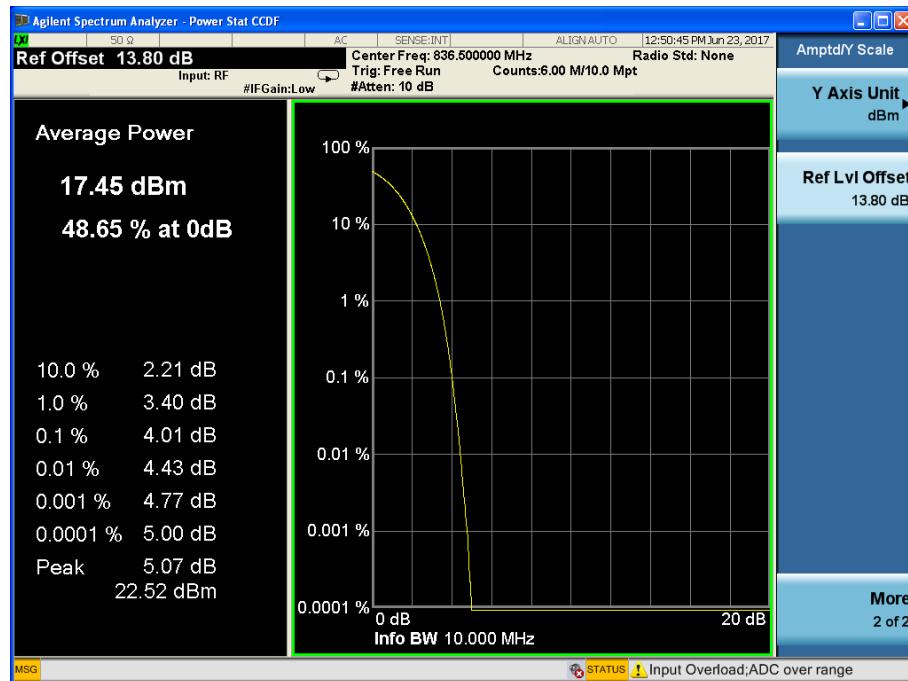
LTE Band4, QPSK



LTE Band4, 16QAM



LTE Band5, QPSK



LTE Band5, 16QAM



LTE Band12, QPSK



LTE Band12, 16QAM



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B17W00381-FCC-RF

## Annex A EUT Photos

See the document "WP7603-Internal Photos".

CITL Test Report



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B17W00381-FCC-RF

## **ANNEX B Deviations from Prescribed Test Methods**

No deviation from Prescribed Test Methods.

**\*\*\*End Of Report\*\*\***

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