# RF TEST REPORT

**Report No.:** SET2016-09370

**Product:** LTE/WCDMA/GSM Multi-Mode Digital Mobile Phone

**FCC ID:** SRQ-ZTEV6PLUS

**Model No.:** ZTE BLADE V7 LITE;ZTE BLADE V0720;Blade V6 Plus; ZTE Blade V6 Plus

**Applicant:** ZTE Corporation

**Address:** ZTE Plaza, Keji Road South, Shenzhen, China

**Dates of Testing:** 05/07/2016 — 10/02/2016

**Issued by:** CCIC-SET

**Lab Location:** Electronic Testing Building, Shahe Road, Xili Town, Shenzhen, 518055, China

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# Test Report

**Product .....:** LTE/WCDMA/GSM Multi-Mode Digital Mobile Phone

**Brand Name.....:** ZTE

**Trade Name .....:** ZTE

**Applicant .....:** ZTE Corporation

**Applicant Address .....:** ZTE Plaza, Keji Road South, Shenzhen, China

**Manufacturer .....:** ZTE Corporation

**Manufacturer Address.....:** ZTE Plaza, Keji Road South, Shenzhen, China

**Test Standards .....:** 47 CFR Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
47 CFR FCC Part 22(H): Cellular Radiotelephone Service
47 CFR Part 24(E): Personal Communications Services
47 CFR Part 27(L) 27(H) 27(M): Miscellaneous wireless communications services

**Test Result……:** PASS

**Tested by ……:** 2016.10.02

Chris You，Test Engineer

**Reviewed by……:** 2016.10.02

Zhu Qi, Senior Egineer

**Approved by……:** 2016.10.02

Wu Li'an，Manager

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| Change History | | |
|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | 2016.10.02 | First edition |
| | | |
| | | |

# 1. GENERAL INFORMATION

## 1.1 EUT Description

| | |
|---|---|
| EUT Type | LTE/WCDMA/GSM Multi-Mode Digital Mobile Phone |
| Hardware Version | ue4A |
| Software Version | ZTE_LA_P635A32V0.0.0B02 |
| EUT supports Radios application | GSM/GPRS/EDGE/WCDMA/HSPA/LTE<br>WLAN2.4GHz 802.11b/g/n (HT20)<br>Bluetooth V3.0+EDR / Bluetooth V4.0LE |
| Frequency Range | LTE Band 2<br>Tx: 1850.7MHz~1909.3MHz<br>Rx: 1930.7MHz~1989.3MHz<br>LTE Band 4<br>Tx: 1710.7MHz~1754.3MHz<br>Rx: 2110.7MHz~2154.3MHz<br>LTE Band 5<br>Tx: 824.7MHz~848.3MHz<br>Rx: 869.7MHz~893.3MHz<br>LTE Band 7<br>Tx: 2502.5MHz~2567.5MHz<br>Rx: 2622.5MHz~2687.5MHz |
| Maximum Output Power to Antenna | LTE Band 2：23.49dBm<br>LTE Band 4：22.26dBm<br>LTE Band 5：23.69dBm<br>LTE Band 7：22.46dBm |
| Bandwidth | LTE Band 2：1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz<br>LTE Band 4：1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz<br>LTE Band 5：1.4MHz/3MHz/5MHz/10MHz<br>LTE Band 7：5MHz/10MHz/15MHz/20MHz |
| Modulation Type | QPSK/16QAM |
| Antenna Type | Internal Antenna |

Note: The EUT is a Mobile Phone，it contains 4 models，they are ZTE BLADE V7 LITE;ZTE BLADE V0720; Blade V6 Plus; ZTE Blade V6 Plus. They have the same size, appearance and internal structure, and the only difference is the model number.

## 1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

| FCC Rule | System | Type of Modulation | BW (MHz) | Emission Designator | Frequency Tolerance (ppm) | Maximum ERP/EIRP(W) |
|---|---|---|---|---|---|---|
| Part 24 | LTE Band 2 | QPSK | 1.4 | 1M10G7D | — | 0.176 |
| Part 24 | LTE Band 2 | 16QAM | 1.4 | 1M10W7D | — | 0.142 |
| Part 24 | LTE Band 2 | QPSK | 3 | 2M74G7D | — | 0.177 |
| Part 24 | LTE Band 2 | 16QAM | 3 | 2M74W7D | — | 0.143 |
| Part 24 | LTE Band 2 | QPSK | 5 | 4M54G7D | — | 0.177 |
| Part 24 | LTE Band 2 | 16QAM | 5 | 4M54W7D | — | 0.144 |
| Part 24 | LTE Band 2 | QPSK | 10 | 9M00G7D | 0.03 | 0.179 |
| Part 24 | LTE Band 2 | 16QAM | 10 | 8M96W7D | 0.03 | 0.145 |
| Part 24 | LTE Band 2 | QPSK | 15 | 13M6G7D | — | 0.180 |
| Part 24 | LTE Band 2 | 16QAM | 15 | 13M5W7D | — | 0.144 |
| Part 24 | LTE Band 2 | QPSK | 20 | 18M6G7D | — | 0.182 |
| Part 24 | LTE Band 2 | 16QAM | 20 | 18M7W7D | — | 0.146 |
| Part 27 | LTE Band 4 | QPSK | 1.4 | 1M10G7D | — | 0.164 |
| Part 27 | LTE Band 4 | 16QAM | 1.4 | 1M10W7D | — | 0.132 |
| Part 27 | LTE Band 4 | QPSK | 3 | 2M75G7D | — | 0.165 |
| Part 27 | LTE Band 4 | 16QAM | 3 | 2M75W7D | — | 0.133 |
| Part 27 | LTE Band 4 | QPSK | 5 | 4M54G7D | — | 0.166 |
| Part 27 | LTE Band 4 | 16QAM | 5 | 4M56W7D | — | 0.132 |
| Part 27 | LTE Band 4 | QPSK | 10 | 8M96G7D | 0.03 | 0.166 |
| Part 27 | LTE Band 4 | 16QAM | 10 | 8M96W7D | 0.03 | 0.133 |
| Part 27 | LTE Band 4 | QPSK | 15 | 13M6G7D | — | 0.168 |
| Part 27 | LTE Band 4 | 16QAM | 15 | 13M6W7D | — | 0.134 |
| Part 27 | LTE Band 4 | QPSK | 20 | 18M6G7D | — | 0.169 |
| Part 27 | LTE Band 4 | 16QAM | 20 | 18M7W7D | — | 0.135 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Part 22 | LTE Band 5 | QPSK | 1.4 | 1M10G7D | — | 0.187 |
| Part 22 | LTE Band 5 | 16QAM | 1.4 | 1M10W7D | — | 0.150 |
| Part 22 | LTE Band 5 | QPSK | 3 | 2M74G7D | — | 0.187 |
| Part 22 | LTE Band 5 | 16QAM | 3 | 2M74W7D | — | 0.150 |
| Part 22 | LTE Band 5 | QPSK | 5 | 4M52G7D | — | 0.188 |
| Part 22 | LTE Band 5 | 16QAM | 5 | 4M52W7D | — | 0.151 |
| Part 22 | LTE Band 5 | QPSK | 10 | 8M94G7D | 0.04 | 0.189 |
| Part 22 | LTE Band 5 | 16QAM | 10 | 8M93W7D | 0.04 | 0.152 |
| Part 27 | LTE Band 7 | QPSK | 5 | 4M54G7D | — | 0.144 |
| Part 27 | LTE Band 7 | 16QAM | 5 | 4M52W7D | — | 0.117 |
| Part 27 | LTE Band 7 | QPSK | 10 | 8M96G7D | 0.02 | 0.158 |
| Part 27 | LTE Band 7 | 16QAM | 10 | 8M96W7D | 0.02 | 0.116 |
| Part 27 | LTE Band 7 | QPSK | 15 | 13M6G7D | — | 0.156 |
| Part 27 | LTE Band 7 | 16QAM | 15 | 13M5W7D | — | 0.116 |
| Part 27 | LTE Band 7 | QPSK | 20 | 18M6G7D | — | 0.159 |
| Part 27 | LTE Band 7 | 16QAM | 20 | 18M6W7D | — | 0.117 |

## 1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24, and Part27 for the EUT FCC ID Certification:

1.47 CFR Part 2, 24(E), 27(L), 27(H), 27(M)

2. ANSI/TIA/EIA-603-D-2010

3. FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

Test detailed items/section required by FCC rules and results are as below:

| No. | Section | Description | Limit | Result |
|---|---|---|---|---|
| 1 | 2.1046 | Conducted RF Output Power | Reporting Only | PASS |
| 2 | 24.232(d)<br>27.50(d)(5) | Peak to Average Radio | ＜13dB | PASS |
| 3 | 27.50(h)(2)<br>24.232(c) | Effective Radiated Power(Band 2/7) | EIRP＜2Watt | PASS<br>PASS |
| | 27.50(d)(4) | Effective Radiated Power(Band 4) | EIRP＜1Watt | PASS |
| | 22.913(a)(2) | Effective Radiated Power(Band 5) | EIRP＜7Watt | PASS |
| 4 | 2.1049<br>22.917(b)<br>24.238(b)<br>27.53(h)(3)<br>27.53(m)(6) | Occupied Bandwidth | Reporting Only | PASS |
| 5 | 2.1051<br>22.917(a)<br>24.238(b)<br>27.53(g)<br>27.53(h) | Conducted Band Edge(Band 2/4/5) | ＜<br>43+10log10(P[watt]) | PASS |
| | 2.1051<br>27.53(m)(4) | Conducted Band Edge(Band 7) | ＜5.5MHz: -13dBm<br>≥5.5MHz: -25dBm | PASS |

| | | | | |
|---|---|---|---|---|
| 6 | 2.1051<br>22.917(a)<br>24.238(a)<br>27.53(g)<br>27.53(h) | Conducted Spurious Emission<br>(Band 2/4/5) | ＜<br>43+10log10(P[watt]) | PASS |
| | 2.1051<br>27.53(m)(4) | Conducted Spurious Emission<br>(Band 7) | ＜<br>55+10log10(P[watt]) | PASS |
| 7 | 2.1053<br>22.917(a)<br>24.238(a)<br>27.53(g)<br>27.53(h) | Radiated Spurious Emission<br>(Band 2/4/5) | ＜<br>43+10log10(P[watt]) | PASS |
| | 2.1053<br>27.53(m)(4) | Radiated Spurious Emission<br>(Band 7) | ＜<br>55+10log10(P[watt]) | PASS |
| 8 | 2.1055<br>22.355<br>24.235<br>27.54 | Frequency Stability | ＜2.5ppm | PASS |

Remark：

1. All test items were verified and recorded according to the standards and without any deviation during the test.

2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 1.4 Test Configuration of Equipment Under Test

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

| Test Items | Band | Bandwidth(MHz) | | | | | | Modulation | | RB# | | | Test Channel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.4 | 3 | 5 | 10 | 15 | 20 | QPSK | 16QAM | 1 | Half | Full | L | M | H |
| Max. Output Power | 2 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | 4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | 5 | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ | √ | √ |
| | 7 | | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Peak-to-Average Ratio | 2 | | | | | | √ | | √ | √ | | √ | √ | √ | √ |
| | 4 | | | | | | √ | | √ | √ | | √ | √ | √ | √ |
| | 5 | | | | √ | | | | √ | √ | | √ | √ | √ | √ |
| | 7 | | | | | | √ | | √ | √ | | √ | √ | √ | √ |
| 26dB and 99% Bandwidth | 2 | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | | √ | |
| | 4 | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | | √ | |
| | 5 | √ | √ | √ | √ | | | √ | √ | | | √ | | √ | |
| | 7 | | | √ | √ | √ | √ | √ | √ | | | √ | | √ | |
| Conducted Band Edge | 2 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | √ |
| | 4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | √ |
| | 5 | √ | √ | √ | √ | | | √ | √ | √ | | √ | √ | | √ |
| | 7 | | | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | √ |
| Conducted Spurious Emission | 2 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ |
| | 5 | √ | √ | √ | √ | | | √ | √ | √ | | | √ | √ | √ |
| | 4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ |
| | 7 | | | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ |
| Frequency Stability | 2 | √ | √ | √ | √ | √ | √ | √ | | | | √ | | √ | |
| | 4 | √ | √ | √ | √ | √ | √ | √ | | | | √ | | √ | |
| | 5 | √ | √ | √ | √ | | | √ | | | | √ | | √ | |
| | 7 | | | √ | √ | √ | √ | √ | | | | √ | | √ | |
| ERP/EIRP | 2 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ |
| | 4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ |
| | 5 | √ | √ | √ | √ | | | √ | √ | √ | | | √ | √ | √ |
| | 7 | | | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ |
| Radiated Spurious Emission | 2 | √ | √ | √ | √ | √ | √ | √ | | √ | | | √ | √ | √ |
| | 4 | √ | √ | √ | √ | √ | √ | √ | | √ | | | √ | √ | √ |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **5** | √ | √ | √ | √ | | | √ | | √ | | | √ | √ | √ |
| | **7** | | | √ | √ | √ | √ | √ | | √ | | | √ | √ | √ |
| **Note** | **1. The mark “ √ ” means that this configuration is chosen for testing.**<br>**2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.**<br>**3. For E.R.P/E.I.R.P. measurement, the widest bandwidth and the bandwidth with the highest conducted power of each band is chosen for testing. Besides, the lowest bandwidth of each band is also measured for reporting only.** | | | | | | | | | | | | | | |

## 1.5 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 7.5dB and 10dB attenuator.

Example:

Offset (dB) = RF cable loss(dB) + attenuator factor(dB).
= 7 + 10 = 17 (dB)

## 1.6 Facilities and Accreditations

### 1.6.1 Test Facilities

**CNAS-Lab Code: L1659**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

**FCC-Registration No.: 406086**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 406086, valid time is until October 28, 2017.

**IC-Registration No.: 11185A-1**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on July. 15, 2013, valid time is until July. 15, 2016.

### 1.6.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature (°C): | 15℃- 35℃ |
| Relative Humidity (%): | 30% -60% |
| Atmospheric Pressure (kPa): | 86KPa-106KPa |

# 2. 47 CFR PART 2, PART 27H REQUIREMENTS

## 2.1 Conducted RF Output Power

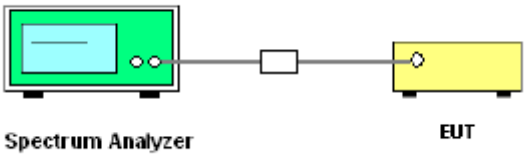
### 2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

### 2.1.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.1.3 Test Setup




### 2.1.4 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.
5. Test date: 2016-05-15~2016-05-17

### 2.1.5 Test Results

1. LTE Band 2 Conducted Power Test Verdict:

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 18700 | 18900 | 19100 |
| Frequency(MHz) | | | | 1860 | 1880 | 1900 |
| 20 | QPSK | 1 | 0 | 23.42 | 23.45 | **23.49** |
| 20 | | 1 | 49 | 23.41 | 23.37 | 23.42 |
| 20 | | 1 | 99 | 23.35 | 23.38 | 23.35 |
| 20 | | 50 | 0 | 22.64 | 22.60 | 22.62 |
| 20 | | 50 | 24 | 22.56 | 22.58 | 22.60 |
| 20 | | 50 | 49 | 22.51 | 22.53 | 22.47 |
| 20 | | 100 | 0 | 22.45 | 22.44 | 22.50 |
| 20 | 16QAM | 1 | 0 | 22.12 | 22.15 | 22.14 |
| 20 | | 1 | 49 | 22.07 | 22.12 | 22.13 |
| 20 | | 1 | 99 | 22.12 | 22.14 | 22.09 |
| 20 | | 50 | 0 | 21.65 | 21.78 | 21.74 |
| 20 | | 50 | 24 | 21.51 | 21.59 | 21.65 |
| 20 | | 50 | 49 | 21.55 | 21.52 | 21.54 |
| 20 | | 100 | 0 | 21.51 | 21.52 | 21.52 |
| Channel | | | | 18675 | 18900 | 19125 |
| Frequency(MHz) | | | | 1857.5 | 1880 | 1902.5 |
| 15 | QPSK | 1 | 0 | **23.35** | 23.31 | 23.34 |
| 15 | | 1 | 37 | 23.31 | 23.30 | 23.31 |
| 15 | | 1 | 74 | 23.30 | 23.33 | 23.32 |
| 15 | | 36 | 0 | 22.62 | 22.65 | 22.63 |
| 15 | | 36 | 18 | 22.58 | 22.63 | 22.59 |
| 15 | | 36 | 37 | 22.53 | 22.57 | 22.61 |
| 15 | | 75 | 0 | 22.56 | 22.59 | 22.63 |
| 15 | 16QAM | 1 | 0 | 22.09 | 22.05 | 22.04 |
| 15 | | 1 | 37 | 22.13 | 22.10 | 22.09 |
| 15 | | 1 | 74 | 22.05 | 22.07 | 22.11 |
| 15 | | 36 | 0 | 21.63 | 21.71 | 21.62 |
| 15 | | 36 | 18 | 21.65 | 21.62 | 21.59 |
| 15 | | 36 | 37 | 21.61 | 21.64 | 21.71 |
| 15 | | 75 | 0 | 21.57 | 21.52 | 21.58 |

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 18650 | 18900 | 19150 |
| Frequency(MHz) | | | | 1855 | 1880 | 1905 |
| 10 | QPSK | 1 | 0 | 23.31 | **23.34** | 23.30 |
| 10 | | 1 | 24 | 23.25 | 23.29 | 23.31 |
| 10 | | 1 | 49 | 23.30 | 23.27 | 23.28 |
| 10 | | 25 | 0 | 22.71 | 22.61 | 22.63 |
| 10 | | 25 | 12 | 22.62 | 22.68 | 22.65 |
| 10 | | 25 | 24 | 22.69 | 22.60 | 22.64 |
| 10 | | 50 | 0 | 22.51 | 22.55 | 22.56 |
| 10 | 16QAM | 1 | 0 | 22.07 | 22.11 | 22.10 |
| 10 | | 1 | 24 | 22.06 | 22.09 | 22.11 |
| 10 | | 1 | 49 | 22.05 | 22.12 | 22.08 |
| 10 | | 25 | 0 | 21.72 | 21.75 | 21.74 |
| 10 | | 25 | 12 | 21.65 | 21.68 | 21.72 |
| 10 | | 25 | 24 | 21.59 | 21.56 | 21.62 |
| 10 | | 50 | 0 | 21.51 | 21.52 | 21.52 |
| Channel | | | | 18625 | 18900 | 19175 |
| Frequency(MHz) | | | | 1852.5 | 1880 | 1907.5 |
| 5 | QPSK | 1 | 0 | 23.38 | 23.41 | **23.42** |
| 5 | | 1 | 12 | 23.37 | 23.37 | 23.35 |
| 5 | | 1 | 24 | 23.34 | 23.35 | 23.30 |
| 5 | | 12 | 0 | 22.71 | 22.69 | 22.62 |
| 5 | | 12 | 6 | 22.62 | 22.64 | 22.59 |
| 5 | | 12 | 11 | 22.61 | 22.58 | 22.57 |
| 5 | | 25 | 0 | 22.54 | 22.51 | 22.52 |
| 5 | 16QAM | 1 | 0 | 22.15 | 22.12 | 22.14 |
| 5 | | 1 | 12 | 22.12 | 22.11 | 22.08 |
| 5 | | 1 | 24 | 22.05 | 22.10 | 22.09 |
| 5 | | 12 | 0 | 21.66 | 21.64 | 21.61 |
| 5 | | 12 | 6 | 21.57 | 21.55 | 21.53 |
| 5 | | 12 | 11 | 21.54 | 21.51 | 21.55 |
| 5 | | 25 | 0 | 21.50 | 21.55 | 21.47 |

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 18615 | 18900 | 19185 |
| Frequency(MHz) | | | | 1851.5 | 1880 | 1908.5 |
| 3 | QPSK | 1 | 0 | **23.33** | 23.29 | 23.27 |
| 3 | | 1 | 7 | 23.27 | 23.31 | 23.25 |
| 3 | | 1 | 14 | 23.30 | 23.27 | 23.32 |
| 3 | | 8 | 0 | 22.75 | 22.72 | 22.70 |
| 3 | | 8 | 4 | 22.68 | 22.71 | 22.73 |
| 3 | | 8 | 7 | 22.64 | 22.68 | 22.65 |
| 3 | | 15 | 0 | 22.71 | 22.69 | 22.63 |
| 3 | 16QAM | 1 | 0 | 22.16 | 22.14 | 22.12 |
| 3 | | 1 | 7 | 22.12 | 22.07 | 22.10 |
| 3 | | 1 | 14 | 22.04 | 22.08 | 22.11 |
| 3 | | 8 | 0 | 21.52 | 21.51 | 21.55 |
| 3 | | 8 | 4 | 21.55 | 21.57 | 21.52 |
| 3 | | 8 | 7 | 21.44 | 21.39 | 21.44 |
| 3 | | 15 | 0 | 21.47 | 21.42 | 21.40 |
| Channel | | | | 18607 | 18900 | 19193 |
| Frequency(MHz) | | | | 1850.7 | 1732.5 | 1909.3 |
| 1.4 | QPSK | 1 | 0 | 23.20 | **23.28** | 23.27 |
| 1.4 | | 1 | 2 | 23.23 | 23.22 | 23.26 |
| 1.4 | | 1 | 5 | 23.21 | 23.26 | 23.19 |
| 1.4 | | 3 | 0 | 22.70 | 22.69 | 22.72 |
| 1.4 | | 3 | 1 | 22.74 | 22.68 | 22.73 |
| 1.4 | | 3 | 2 | 22.64 | 22.57 | 22.61 |
| 1.4 | | 6 | 0 | 22.58 | 22.56 | 22.53 |
| 1.4 | 16QAM | 1 | 0 | 22.03 | 22.07 | 22.05 |
| 1.4 | | 1 | 2 | 22.05 | 22.10 | 22.04 |
| 1.4 | | 1 | 5 | 22.07 | 22.12 | 22.04 |
| 1.4 | | 3 | 0 | 21.55 | 21.51 | 21.47 |
| 1.4 | | 3 | 1 | 21.54 | 21.48 | 21.55 |
| 1.4 | | 3 | 2 | 21.50 | 21.47 | 21.43 |
| 1.4 | | 6 | 0 | 21.48 | 21.41 | 21.44 |

2. LTE Band 4 Conducted Power Test Verdict:

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 20050 | 20175 | 20300 |
| Frequency(MHz) | | | | 1720 | 1732.5 | 1745 |
| 20 | QPSK | 1 | 0 | 22.21 | **22.26** | 22.25 |
| 20 | | 1 | 49 | 22.19 | 22.15 | 22.19 |
| 20 | | 1 | 99 | 22.18 | 22.17 | 22.15 |
| 20 | | 50 | 0 | 21.52 | 21.54 | 21.57 |
| 20 | | 50 | 24 | 21.61 | 21.55 | 21.61 |
| 20 | | 50 | 49 | 21.58 | 21.62 | 21.55 |
| 20 | | 100 | 0 | 21.61 | 21.56 | 21.57 |
| 20 | 16QAM | 1 | 0 | 21.32 | 21.28 | 21.24 |
| 20 | | 1 | 49 | 21.20 | 21.25 | 21.23 |
| 20 | | 1 | 99 | 21.14 | 21.15 | 21.17 |
| 20 | | 50 | 0 | 20.57 | 20.49 | 20.52 |
| 20 | | 50 | 24 | 20.49 | 20.47 | 20.50 |
| 20 | | 50 | 49 | 20.51 | 20.55 | 20.46 |
| 20 | | 100 | 0 | 20.54 | 20.55 | 20.41 |
| Channel | | | | 20025 | 20175 | 20325 |
| Frequency(MHz) | | | | 1717.5 | 1732.5 | 1747.5 |
| 15 | QPSK | 1 | 0 | **22.20** | 22.16 | 22.18 |
| 15 | | 1 | 37 | 22.16 | 22.11 | 22.12 |
| 15 | | 1 | 74 | 22.10 | 22.17 | 22.13 |
| 15 | | 36 | 0 | 21.65 | 21.57 | 21.59 |
| 15 | | 36 | 18 | 21.58 | 21.56 | 21.57 |
| 15 | | 36 | 37 | 21.56 | 21.50 | 21.54 |
| 15 | | 75 | 0 | 21.58 | 21.56 | 21.62 |
| 15 | 16QAM | 1 | 0 | 21.27 | 21.19 | 21.23 |
| 15 | | 1 | 37 | 21.24 | 21.25 | 21.21 |
| 15 | | 1 | 74 | 21.19 | 21.15 | 21.18 |
| 15 | | 36 | 0 | 20.56 | 20.53 | 20.58 |
| 15 | | 36 | 18 | 20.59 | 20.63 | 20.60 |
| 15 | | 36 | 37 | 20.41 | 20.51 | 20.43 |
| 15 | | 75 | 0 | 20.52 | 20.54 | 20.51 |

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 20000 | 20175 | 20350 |
| Frequency(MHz) | | | | 1715 | 1732.5 | 1750 |
| 10 | QPSK | 1 | 0 | 22.12 | **22.19** | 22.15 |
| 10 | | 1 | 24 | 22.15 | 22.14 | 22.11 |
| 10 | | 1 | 49 | 22.12 | 22.09 | 22.05 |
| 10 | | 25 | 0 | 21.64 | 21.66 | 21.68 |
| 10 | | 25 | 12 | 21.62 | 21.65 | 21.67 |
| 10 | | 25 | 24 | 21.57 | 21.60 | 21.55 |
| 10 | | 50 | 0 | 21.55 | 21.62 | 21.58 |
| 10 | 16QAM | 1 | 0 | 21.23 | 21.17 | 21.24 |
| 10 | | 1 | 24 | 21.21 | 21. 22 | 21.15 |
| 10 | | 1 | 49 | 21.18 | 21.14 | 21.16 |
| 10 | | 25 | 0 | 20.65 | 20.63 | 20.70 |
| 10 | | 25 | 12 | 20.58 | 20.60 | 20.62 |
| 10 | | 25 | 24 | 20.62 | 20.68 | 20.64 |
| 10 | | 50 | 0 | 20.59 | 20.64 | 20.53 |
| Channel | | | | 19975 | 20175 | 20375 |
| Frequency(MHz) | | | | 1712.5 | 1732.5 | 1752.5 |
| 5 | QPSK | 1 | 0 | **22.24** | 22.21 | 22.17 |
| 5 | | 1 | 12 | 22.15 | 22.22 | 22.13 |
| 5 | | 1 | 24 | 22.11 | 22.13 | 22.15 |
| 5 | | 12 | 0 | 21.62 | 21.57 | 21.62 |
| 5 | | 12 | 6 | 21.57 | 21.60 | 21.58 |
| 5 | | 12 | 11 | 21.55 | 21.53 | 21.67 |
| 5 | | 25 | 0 | 21.63 | 21.58 | 21.59 |
| 5 | 16QAM | 1 | 0 | 21.17 | 21.26 | 21.10 |
| 5 | | 1 | 12 | 21.21 | 21.17 | 21.12 |
| 5 | | 1 | 24 | 21.19 | 21.21 | 21.15 |
| 5 | | 12 | 0 | 20.65 | 20.71 | 20.68 |
| 5 | | 12 | 6 | 20.56 | 20.62 | 20.65 |
| 5 | | 12 | 11 | 20.65 | 20.64 | 20.62 |
| 5 | | 25 | 0 | 20.53 | 20.58 | 20.50 |

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 19965 | 20175 | 20385 |
| Frequency(MHz) | | | | 1711.5 | 1732.5 | 1753.5 |
| 3 | QPSK | 1 | 0 | 22.16 | 22.14 | **22.18** |
| 3 | | 1 | 7 | 22.11 | 22.10 | 22.13 |
| 3 | | 1 | 14 | 22.09 | 22.15 | 22.17 |
| 3 | | 8 | 0 | 21.67 | 21.61 | 21.56 |
| 3 | | 8 | 4 | 21.60 | 21.55 | 21.58 |
| 3 | | 8 | 7 | 21.58 | 21.62 | 21.65 |
| 3 | | 15 | 0 | 21.55 | 21.59 | 21.61 |
| 3 | 16QAM | 1 | 0 | 21.21 | 21.12 | 21.15 |
| 3 | | 1 | 7 | 21.17 | 21.15 | 21.13 |
| 3 | | 1 | 14 | 21.12 | 21.10 | 21.06 |
| 3 | | 8 | 0 | 20.63 | 20.65 | 20.72 |
| 3 | | 8 | 4 | 20.54 | 20.58 | 20.55 |
| 3 | | 8 | 7 | 20.63 | 20.68 | 20.65 |
| 3 | | 15 | 0 | 20.62 | 20.66 | 20.58 |
| Channel | | | | 19957 | 20175 | 20393 |
| Frequency(MHz) | | | | 1710.7 | 1732.5 | 1754.3 |
| 1.4 | QPSK | 1 | 0 | **22.21** | 22.11 | 22.17 |
| 1.4 | | 1 | 2 | 22.11 | 22.15 | 22.09 |
| 1.4 | | 1 | 5 | 22.15 | 22.09 | 22.13 |
| 1.4 | | 3 | 0 | 21.61 | 21.58 | 21.55 |
| 1.4 | | 3 | 1 | 21.57 | 21.63 | 21.58 |
| 1.4 | | 3 | 2 | 21.56 | 21.57 | 21.61 |
| 1.4 | | 6 | 0 | 21.55 | 21.56 | 21.59 |
| 1.4 | 16QAM | 1 | 0 | 21.22 | 21.17 | 21.19 |
| 1.4 | | 1 | 2 | 21.13 | 21.14 | 21.21 |
| 1.4 | | 1 | 5 | 21.21 | 21.12 | 21.14 |
| 1.4 | | 3 | 0 | 20.65 | 20.71 | 20.67 |
| 1.4 | | 3 | 1 | 20.59 | 20.63 | 20.67 |
| 1.4 | | 3 | 2 | 20.60 | 20.58 | 20.57 |
| 1.4 | | 6 | 0 | 20.69 | 20.62 | 20.63 |

3. LTE Band 5 Conducted Power Test Verdict:

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 20450 | 20525 | 20600 |
| Frequency(MHz) | | | | 829 | 836.5 | 844 |
| 10 | QPSK | 1 | 0 | 23.62 | **23.69** | 23.65 |
| 10 | | 1 | 24 | 23.65 | 23.62 | 23.63 |
| 10 | | 1 | 49 | 23.62 | 23.61 | 23.60 |
| 10 | | 25 | 0 | 22.81 | 22.89 | 22.84 |
| 10 | | 25 | 12 | 22.82 | 22.86 | 22.80 |
| 10 | | 25 | 24 | 22.87 | 22.80 | 22.85 |
| 10 | | 50 | 0 | 22.85 | 22.82 | 22.78 |
| 10 | 16QAM | 1 | 0 | 22.53 | 22.45 | 22.54 |
| 10 | | 1 | 24 | 22.41 | 22.42 | 22.45 |
| 10 | | 1 | 49 | 22.48 | 22.49 | 22.46 |
| 10 | | 25 | 0 | 21.85 | 21.93 | 21.90 |
| 10 | | 25 | 12 | 21.88 | 21.80 | 21.82 |
| 10 | | 25 | 24 | 21.82 | 21.88 | 21.84 |
| 10 | | 50 | 0 | 21.80 | 21.84 | 21.83 |
| Channel | | | | 20425 | 20525 | 20625 |
| Frequency(MHz) | | | | 826.5 | 836.5 | 846.5 |
| 5 | QPSK | 1 | 0 | 23.58 | **23.66** | 23.60 |
| 5 | | 1 | 12 | 23.65 | 23.62 | 23.61 |
| 5 | | 1 | 24 | 23.65 | 23.59 | 23.50 |
| 5 | | 12 | 0 | 22.84 | 22.86 | 22.82 |
| 5 | | 12 | 6 | 22.85 | 22.83 | 22.81 |
| 5 | | 12 | 11 | 22.84 | 22.78 | 22.85 |
| 5 | | 25 | 0 | 22.81 | 22.79 | 22.77 |
| 5 | 16QAM | 1 | 0 | 22.59 | 22.51 | 22.52 |
| 5 | | 1 | 12 | 22.52 | 22.49 | 22.50 |
| 5 | | 1 | 24 | 22.53 | 22.47 | 22.48 |
| 5 | | 12 | 0 | 21.85 | 21.83 | 21.74 |
| 5 | | 12 | 6 | 21.88 | 21.80 | 21.72 |
| 5 | | 12 | 11 | 21.81 | 21.78 | 21.71 |
| 5 | | 25 | 0 | 21.77 | 21.74 | 21.79 |

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 20415 | 20525 | 20635 |
| Frequency(MHz) | | | | 825.5 | 836.5 | 847.5 |
| 3 | QPSK | 1 | 0 | 23.62 | **23.65** | 23.63 |
| 3 | | 1 | 7 | 23.64 | 23.62 | 23.61 |
| 3 | | 1 | 14 | 23.56 | 23.54 | 23.57 |
| 3 | | 8 | 0 | 22.87 | 22.91 | 22.86 |
| 3 | | 8 | 4 | 22.80 | 22.85 | 22.88 |
| 3 | | 8 | 7 | 22.78 | 22.82 | 22.85 |
| 3 | | 15 | 0 | 22.77 | 22.84 | 22.81 |
| 3 | 16QAM | 1 | 0 | 22.51 | 22.52 | 22.55 |
| 3 | | 1 | 7 | 22.47 | 22.48 | 22.53 |
| 3 | | 1 | 14 | 22.42 | 22.50 | 22.46 |
| 3 | | 8 | 0 | 21.83 | 21.85 | 21.80 |
| 3 | | 8 | 4 | 21.74 | 21.78 | 21.79 |
| 3 | | 8 | 7 | 21.73 | 21.76 | 21.75 |
| 3 | | 15 | 0 | 21.72 | 21.76 | 21.78 |
| Channel | | | | 20407 | 20525 | 20643 |
| Frequency(MHz) | | | | 824.7 | 836.5 | 848.3 |
| 1.4 | QPSK | 1 | 0 | 23.61 | **23.63** | 23.58 |
| 1.4 | | 1 | 2 | 23.56 | 23.57 | 23.61 |
| 1.4 | | 1 | 5 | 23.59 | 23.56 | 23.53 |
| 1.4 | | 3 | 0 | 22.81 | 22.88 | 22.82 |
| 1.4 | | 3 | 1 | 22.77 | 22.83 | 22.78 |
| 1.4 | | 3 | 2 | 22.76 | 22.77 | 22.81 |
| 1.4 | | 6 | 0 | 22.77 | 22.80 | 22.83 |
| 1.4 | 16QAM | 1 | 0 | 22.52 | 22.57 | 22.59 |
| 1.4 | | 1 | 2 | 22.53 | 22.54 | 22.51 |
| 1.4 | | 1 | 5 | 22.54 | 22.52 | 22.46 |
| 1.4 | | 3 | 0 | 21.85 | 21.84 | 21.85 |
| 1.4 | | 3 | 1 | 21.79 | 21.73 | 21.75 |
| 1.4 | | 3 | 2 | 21.80 | 21.78 | 21.77 |
| 1.4 | | 6 | 0 | 21.78 | 21.72 | 21.73 |

4. LTE Band 7 Conducted Power Test Verdict:

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 20850 | 21100 | 21350 |
| Frequency(MHz) | | | | 2510 | 2535 | 2560 |
| 20 | QPSK | 1 | 0 | 22.42 | **22.46** | 22.44 |
| 20 | | 1 | 49 | 22.38 | 22.37 | 22.43 |
| 20 | | 1 | 99 | 22.31 | 22.42 | 22.35 |
| 20 | | 50 | 0 | 21.72 | 21.74 | 21.77 |
| 20 | | 50 | 24 | 21.77 | 21.75 | 21.71 |
| 20 | | 50 | 49 | 21.68 | 21.69 | 21.65 |
| 20 | | 100 | 0 | 21.65 | 21.60 | 21.63 |
| 20 | 16QAM | 1 | 0 | 21.40 | 21.41 | 21.35 |
| 20 | | 1 | 49 | 21.34 | 21.32 | 21.33 |
| 20 | | 1 | 99 | 21.28 | 21.27 | 21.31 |
| 20 | | 50 | 0 | 20.77 | 20.75 | 20.72 |
| 20 | | 50 | 24 | 20.69 | 20.67 | 20.70 |
| 20 | | 50 | 49 | 20.64 | 20.61 | 20.66 |
| 20 | | 100 | 0 | 20.70 | 20.65 | 20.71 |
| Channel | | | | 20825 | 21100 | 21375 |
| Frequency(MHz) | | | | 2507.5 | 2535 | 2562.5 |
| 15 | QPSK | 1 | 0 | 22.40 | **22.42** | 22.41 |
| 15 | | 1 | 37 | 22.37 | 22.35 | 22.38 |
| 15 | | 1 | 74 | 22.36 | 22.38 | 22.37 |
| 15 | | 36 | 0 | 21.75 | 21.73 | 21.76 |
| 15 | | 36 | 18 | 21.72 | 21.71 | 21.72 |
| 15 | | 36 | 37 | 21.65 | 21.67 | 21.66 |
| 15 | | 75 | 0 | 21.64 | 21.63 | 21.65 |
| 15 | 16QAM | 1 | 0 | 21.22 | 21.25 | 21.19 |
| 15 | | 1 | 37 | 21.24 | 21.22 | 21.15 |
| 15 | | 1 | 74 | 21.17 | 21.15 | 21.14 |
| 15 | | 36 | 0 | 20.75 | 20.74 | 20.79 |
| 15 | | 36 | 18 | 20.69 | 20.68 | 20.72 |
| 15 | | 36 | 37 | 20.65 | 20.66 | 20.64 |
| 15 | | 75 | 0 | 20.71 | 20.65 | 20.67 |

| BW(MHz) | Modulation | RB Size | RB Offset | Power(dBm) Low Ch./Freq. | Power(dBm) Middle Ch./Freq. | Power(dBm) High Ch./Freq. |
|---|---|---|---|---|---|---|
| Channel | | | | 20800 | 21100 | 21400 |
| Frequency(MHz) | | | | 2505 | 2535 | 2565 |
| 10 | QPSK | 1 | 0 | 22.27 | **22.32** | 22.28 |
| 10 | | 1 | 24 | 22.31 | 22.27 | 22.23 |
| 10 | | 1 | 49 | 22.30 | 22.23 | 22.21 |
| 10 | | 25 | 0 | 21.74 | 21.70 | 21.75 |
| 10 | | 25 | 12 | 21.72 | 21.74 | 21.72 |
| 10 | | 25 | 24 | 21.65 | 21.67 | 21.68 |
| 10 | | 50 | 0 | 21.63 | 21.62 | 21.65 |
| 10 | 16QAM | 1 | 0 | 21.13 | 21.20 | 21.15 |
| 10 | | 1 | 24 | 21.20 | 21.12 | 21.21 |
| 10 | | 1 | 49 | 21.15 | 21.10 | 21.15 |
| 10 | | 25 | 0 | 20.70 | 20.64 | 20.63 |
| 10 | | 25 | 12 | 20.61 | 20.65 | 20.64 |
| 10 | | 25 | 24 | 20.55 | 20.50 | 20.55 |
| 10 | | 50 | 0 | 20.50 | 20.55 | 20.53 |
| Channel | | | | 20775 | 21100 | 21425 |
| Frequency(MHz) | | | | 2502.5 | 2535 | 2567.5 |
| 5 | QPSK | 1 | 0 | 22.28 | **22.29** | 22.25 |
| 5 | | 1 | 12 | 22.26 | 22.27 | 22.21 |
| 5 | | 1 | 24 | 22.24 | 22.16 | 22.19 |
| 5 | | 12 | 0 | 21.75 | 21.75 | 21.72 |
| 5 | | 12 | 6 | 21.74 | 21.75 | 21.70 |
| 5 | | 12 | 11 | 21.63 | 21.65 | 21.60 |
| 5 | | 25 | 0 | 21.62 | 21.60 | 21.62 |
| 5 | 16QAM | 1 | 0 | 21.20 | 21.24 | 21.23 |
| 5 | | 1 | 12 | 21.25 | 21.22 | 21.20 |
| 5 | | 1 | 24 | 21.19 | 21.14 | 21.18 |
| 5 | | 12 | 0 | 20.74 | 20.70 | 20.72 |
| 5 | | 12 | 6 | 20.65 | 20.61 | 20.70 |
| 5 | | 12 | 11 | 20.65 | 20.66 | 20.60 |
| 5 | | 25 | 0 | 20.59 | 20.60 | 20.67 |

## 2.2 Peak to Average Radio

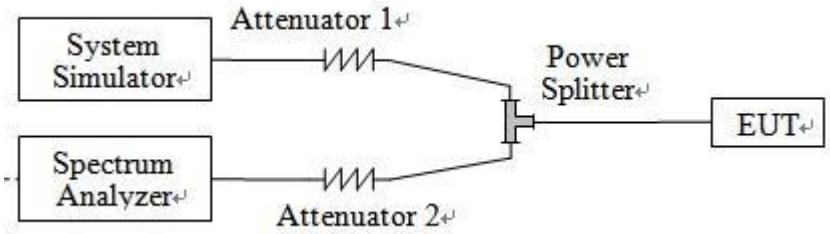
### 2.2.1 Definition

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 2.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 2.2.3 Test Description




### 2.2.4 Test Procedures

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.
5. Test date: 2016-05-18~2016-05-19

### 2.2.5 Test Results of Peak-to-Average Ratio

1. Test Result of LTE Band 2 Peak-to-Average Ratio:

| BW (MHz) | Modulation | Channel | Frequency (MHz) | RB Size | RB Offset | Peak to Average radio | | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | dB | Refer to Plot | dB | |
| 20 | 16QAM | 18700 | 1860 | 1 | 0 | 4.66 | Plot A1 to A6 | 13 | PASS |
| | | | | 100 | 0 | 6.24 | | | |
| | 16QAM | 18900 | 1880 | 1 | 0 | 5.30 | | | PASS |
| | | | | 100 | 0 | 6.12 | | | |
| | 16QAM | 19100 | 1900 | 1 | 0 | 5.12 | | | PASS |
| | | | | 100 | 0 | 6.08 | | | |

2. Test Result of LTE Band 4 Peak-to-Average Ratio:

| BW (MHz) | Modulation | Channel | Frequency (MHz) | RB Size | RB Offset | Peak to Average radio | | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | dB | Refer to Plot | dB | |
| 20 | 16QAM | 20050 | 1720 | 1 | 0 | 6.48 | Plot B1 to B6 | 13 | PASS |
| | | | | 100 | 0 | 6.86 | | | |
| | 16QAM | 20175 | 1732.5 | 1 | 0 | 6.60 | | | PASS |
| | | | | 100 | 0 | 6.76 | | | |
| | 16QAM | 20300 | 1745 | 1 | 0 | 6.64 | | | PASS |
| | | | | 100 | 0 | 6.76 | | | |

3. Test Result of LTE Band 5 Peak-to-Average Ratio:

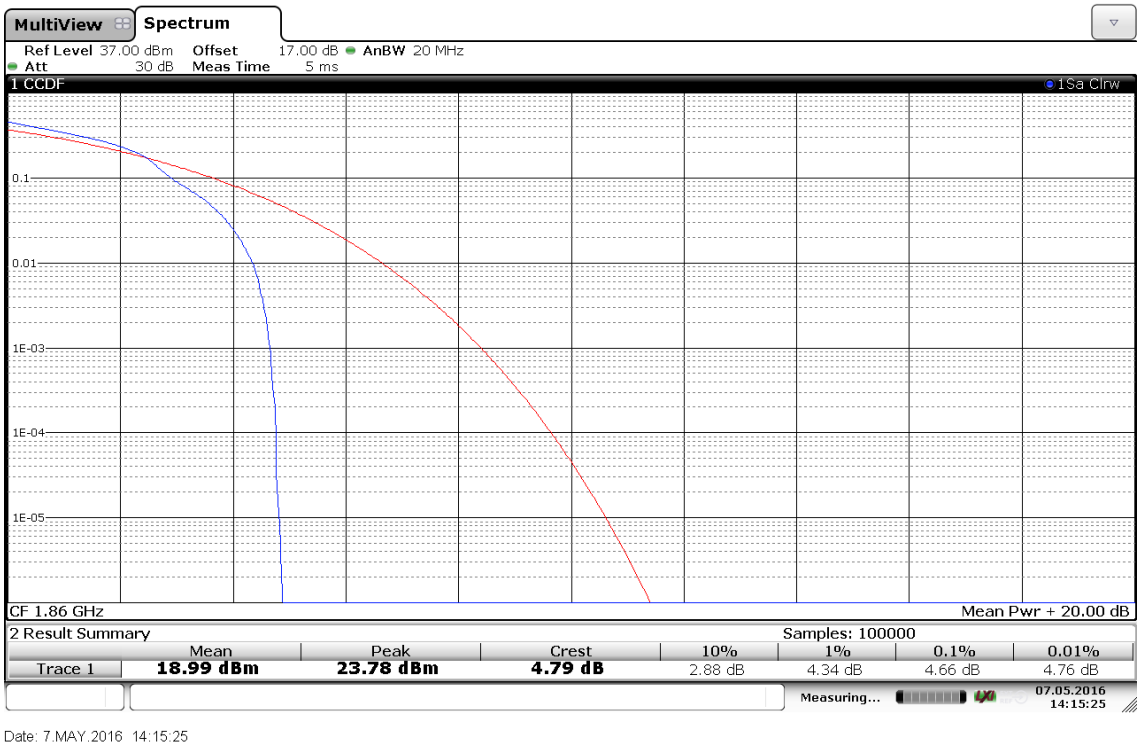
| BW (MHz) | Modulation | Channel | Frequency (MHz) | RB Size | RB Offset | Peak to Average radio | | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | dB | Refer to Plot | dB | |
| 10 | 16QAM | 20450 | 829 | 1 | 0 | 4.09 | Plot C1 to C6 | 13 | PASS |
| | | | | 50 | 0 | 6.02 | | | |
| | 16QAM | 20525 | 836.5 | 1 | 0 | 4.44 | | | PASS |
| | | | | 50 | 0 | 5.65 | | | |
| | 16QAM | 20600 | 844 | 1 | 0 | 3.96 | | | PASS |
| | | | | 50 | 0 | 6.08 | | | |

4. Test Result of LTE Band 7 Peak-to-Average Ratio:

| BW (MHz) | Modulation | Channel | Frequency (MHz) | RB Size | RB Offset | Peak to Average radio | | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | dB | Refer to Plot | dB | |
| 20 | 16QAM | 20850 | 2510 | 1 | 0 | 3.84 | Plot D1 to D6 | 13 | PASS |
| | | | | 100 | 0 | 5.88 | | | |
| | 16QAM | 21100 | 2535 | 1 | 0 | 5.42 | | | PASS |
| | | | | 100 | 0 | 5.94 | | | |
| | 16QAM | 21350 | 2560 | 1 | 0 | 4.74 | | | PASS |
| | | | | 100 | 0 | 5.94 | | | |

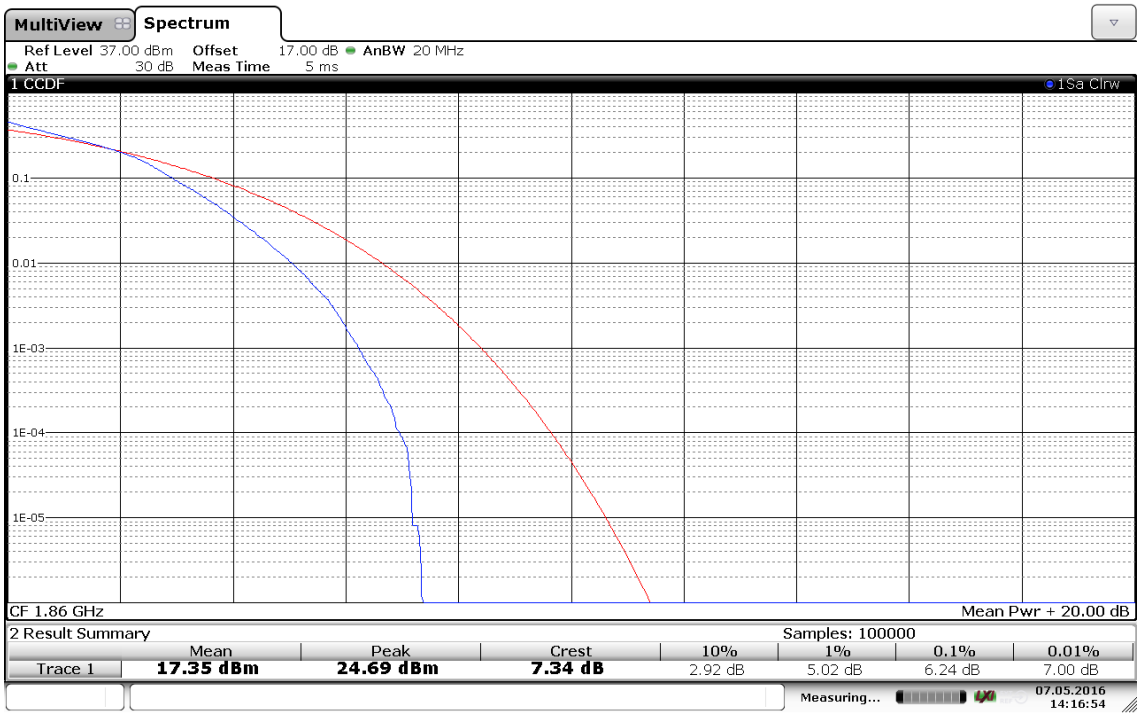
Note: both QPSK/16QAM modulation modes were tested, only provide worst-case mode (16QAM) test plots here.

## 2.2.6 Test Results (Plots) of Peak-to-Average Ratio



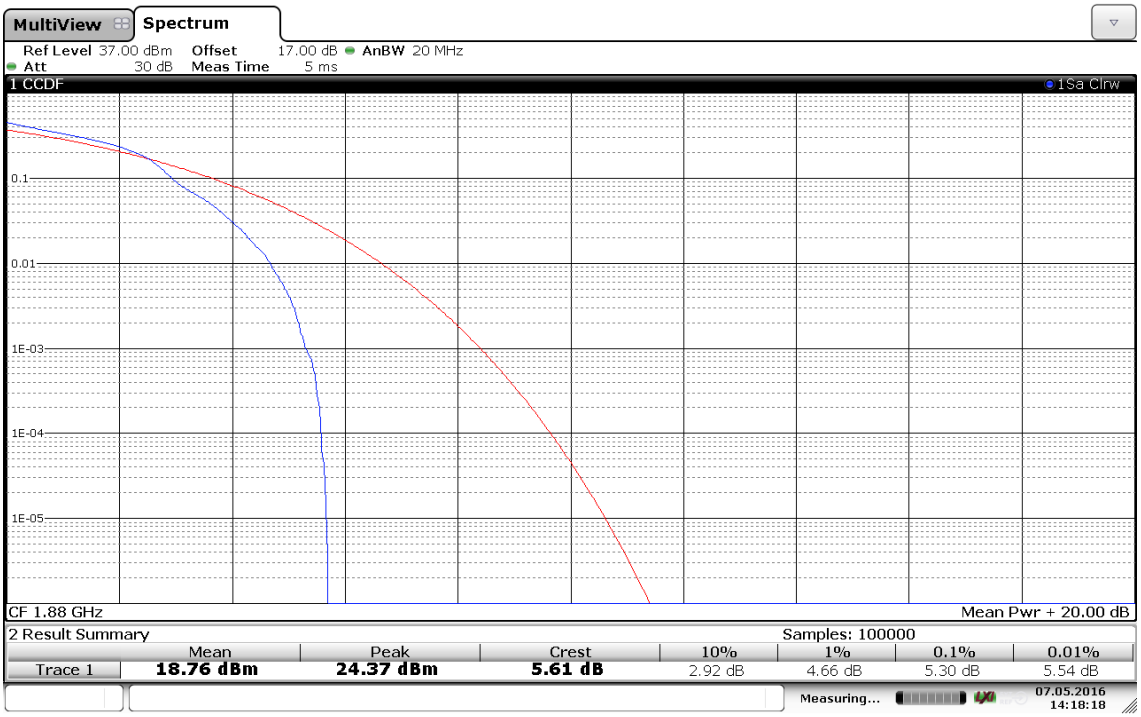

Date: 7.MAY.2016 14:15:25

(Plot A1: Band 2/20MHz/16QAM in L Ch 1RB Size)



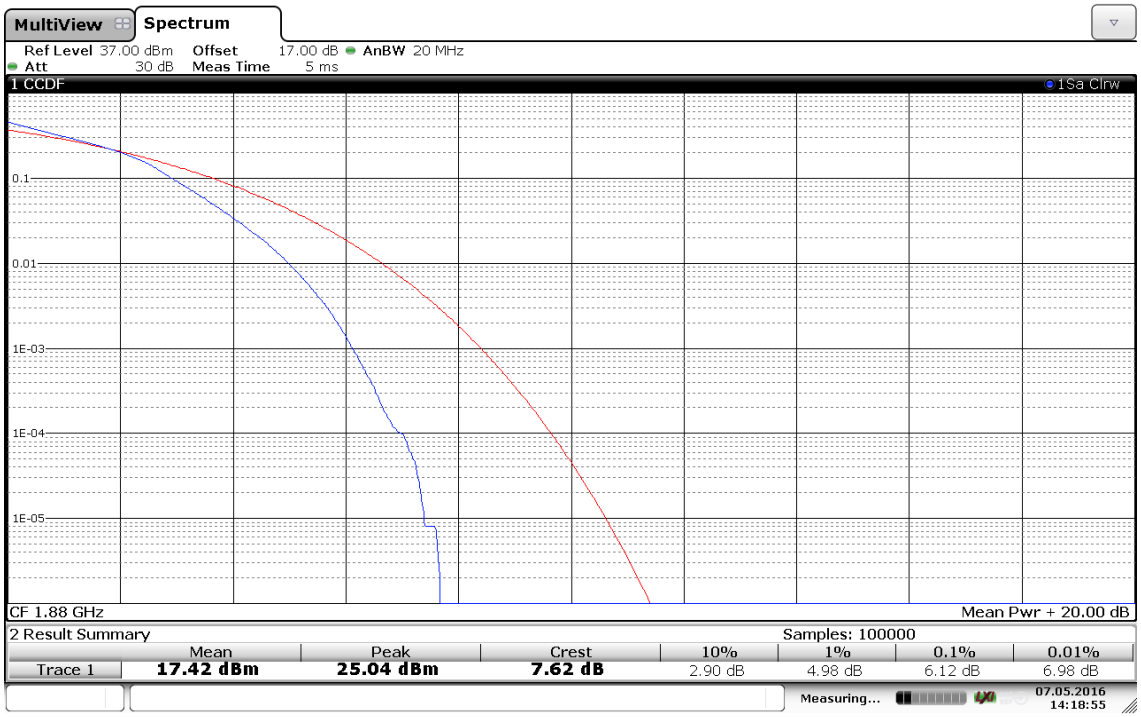

Date: 7.MAY.2016 14:16:53

(Plot A2: Band 2/20MHz/16QAM in L Ch 100RB Size)



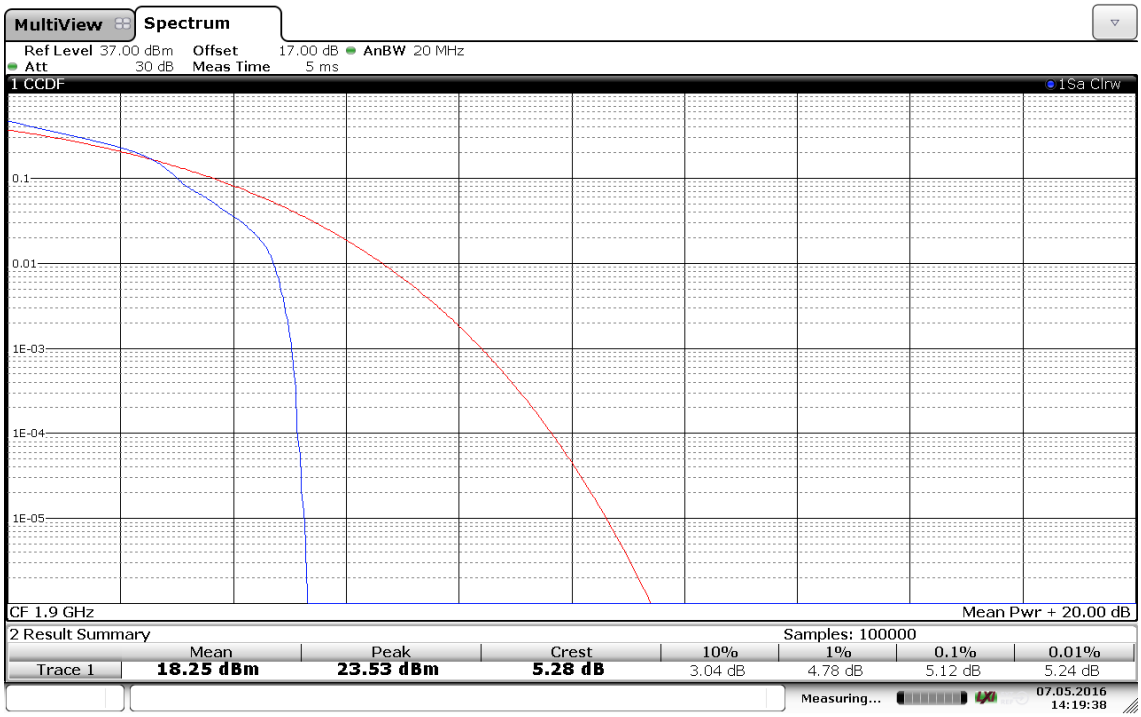

Date: 7.MAY.2016 14:18:18

(Plot A3: Band 2/20MHz/16QAM in M Ch 1RB Size)



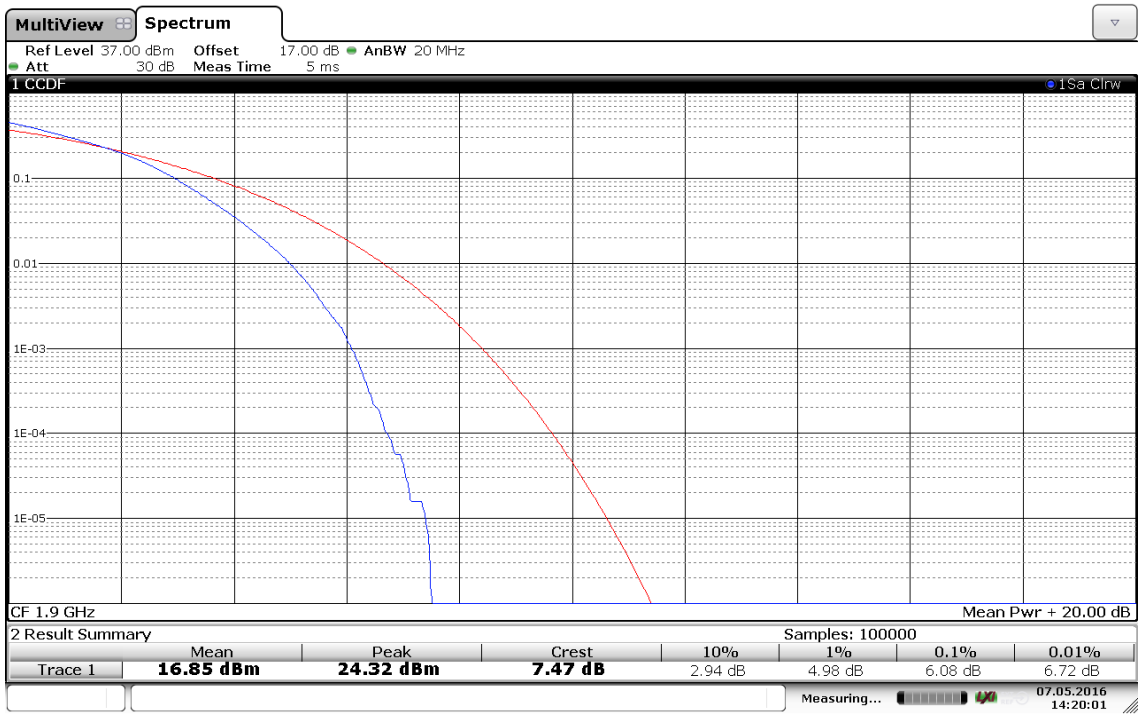

Date: 7.MAY.2016 14:18:55

(Plot A4: Band 2/20MHz/16QAM in M Ch 100RB Size)



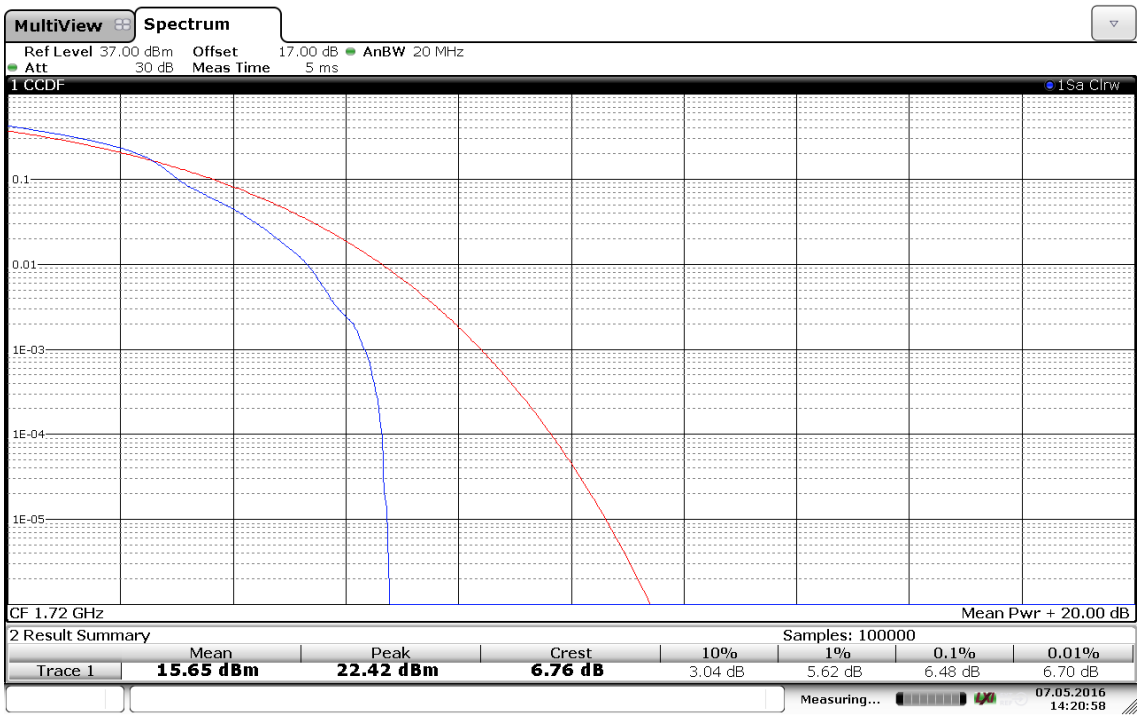

Date: 7.MAY.2016 14:19:38

(Plot A5: Band 2/20MHz/16QAM in H Ch 1RB Size)



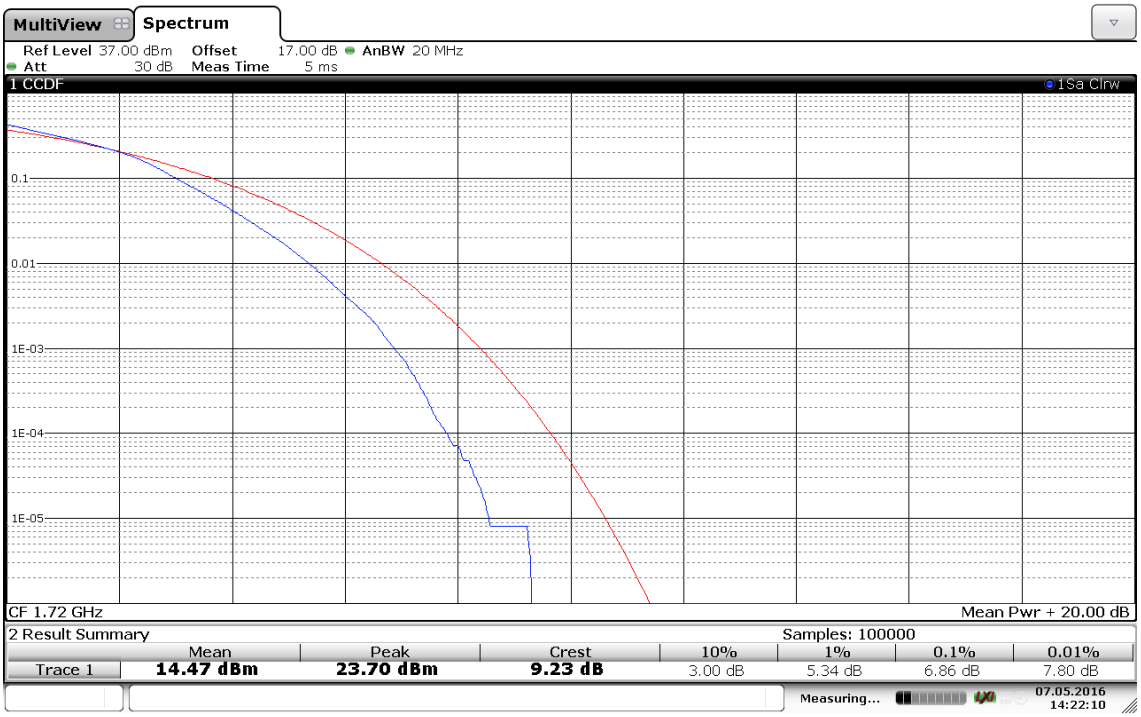

Date: 7.MAY.2016 14:20:01

(Plot A6: Band 2/20MHz/16QAM in H Ch 100RB Size)



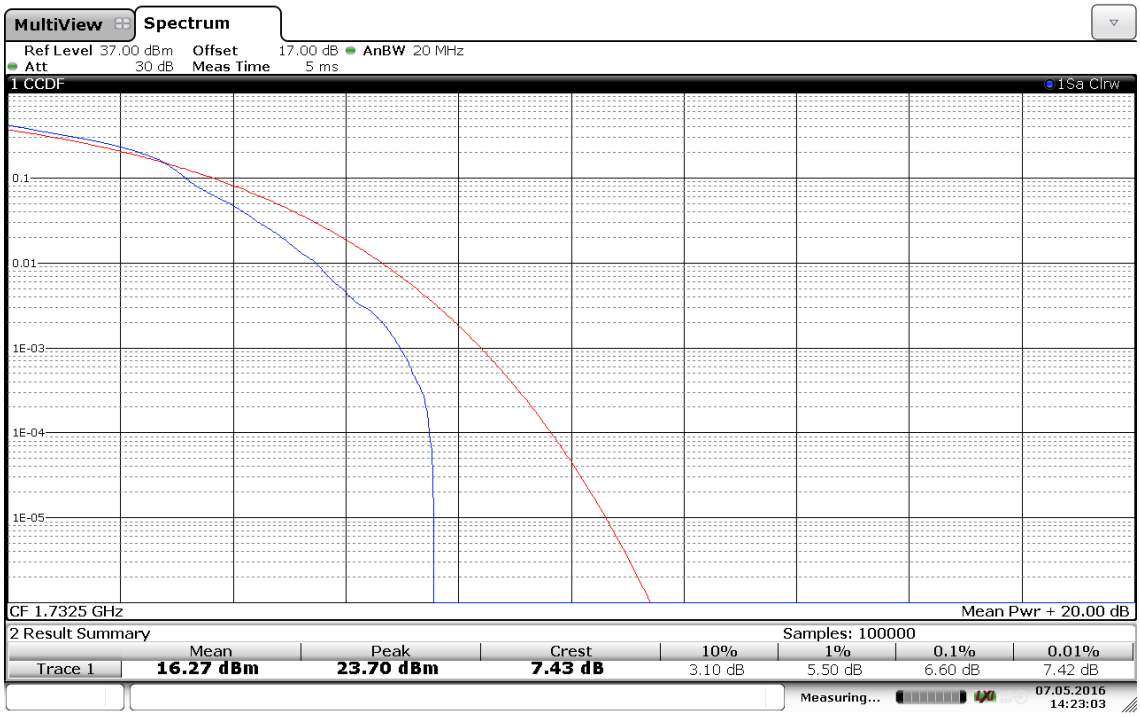

Date: 7.MAY.2016 14:20:58

(Plot B1: Band 4/20MHz/16QAM in L Ch 1RB Size)



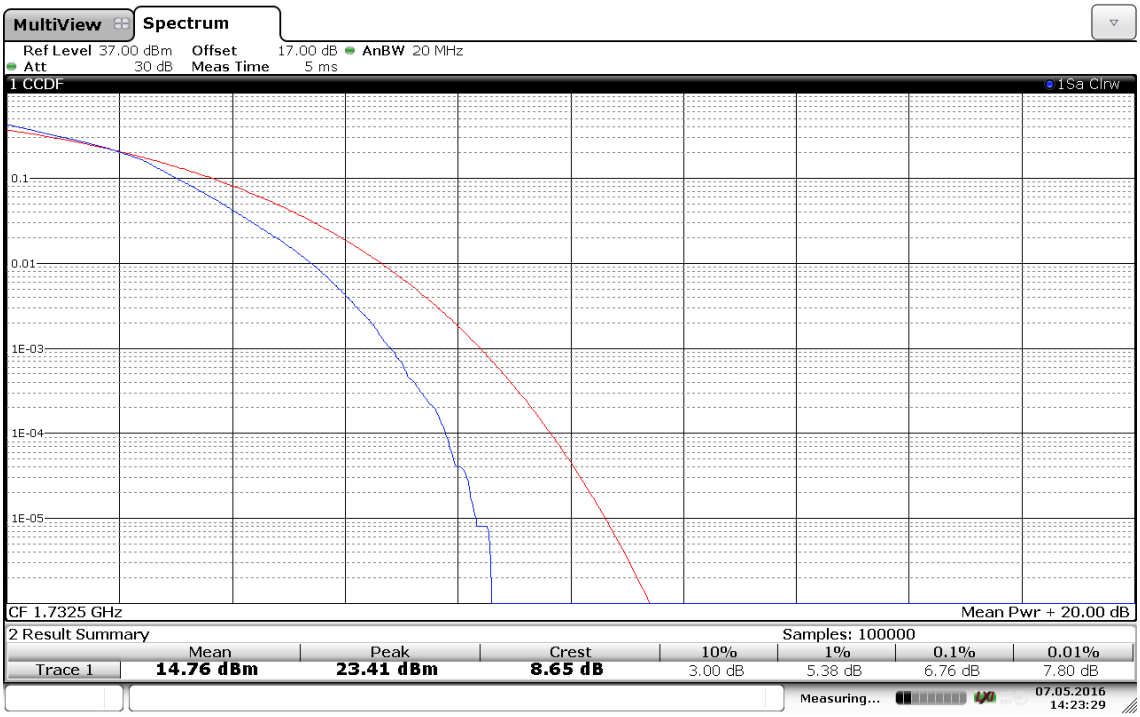

Date: 7.MAY.2016 14:22:10

(Plot B2: Band 4/20MHz/16QAM in L Ch 100RB Size)



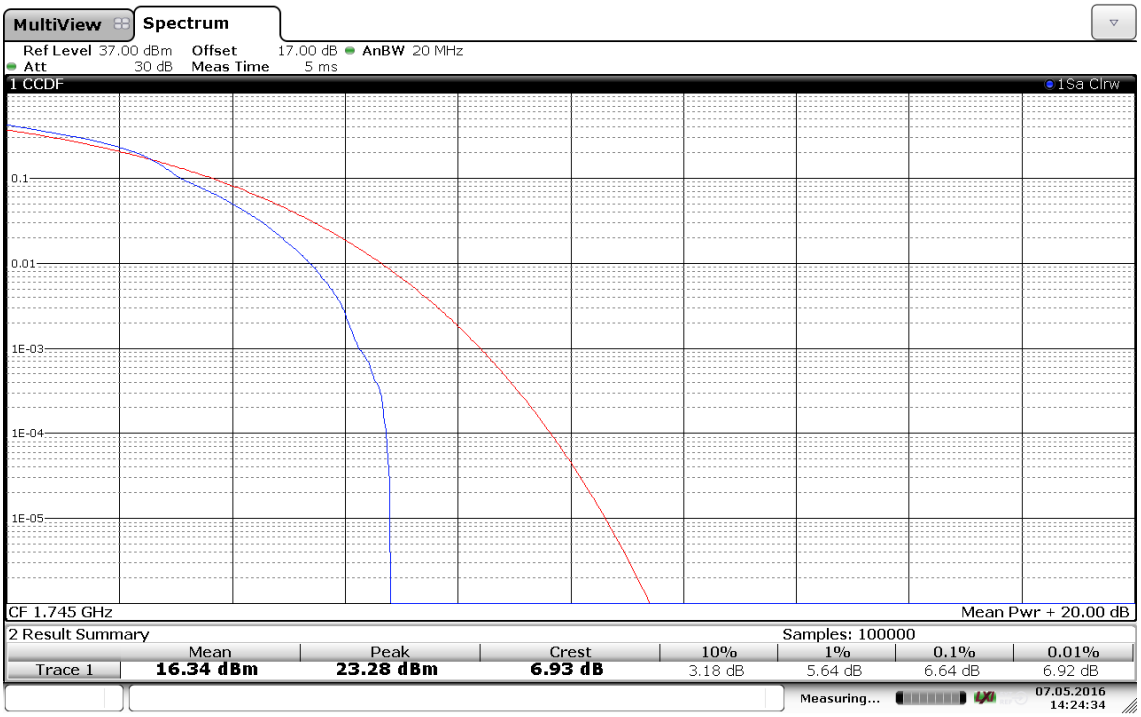

Date: 7.MAY.2016 14:23:03

(Plot B3: Band 4/20MHz/16QAM in M Ch 1RB Size)



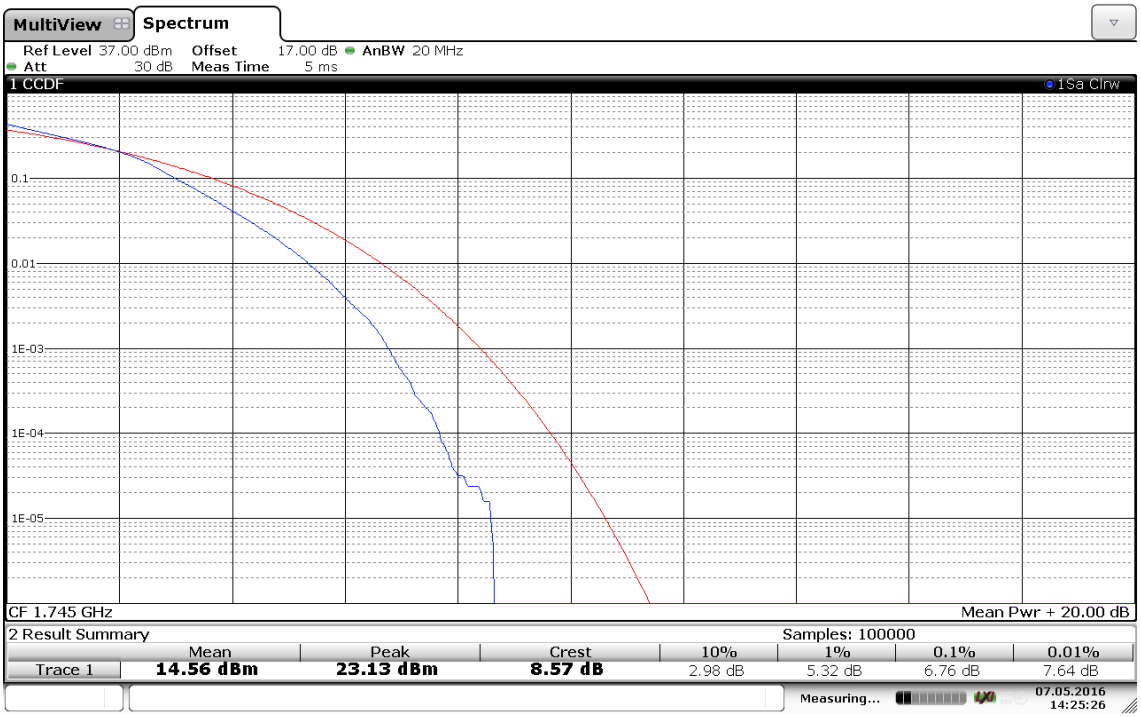

Date: 7.MAY.2016 14:23:29

(Plot B4: Band 4/20MHz/16QAM in M Ch 100RB Size)



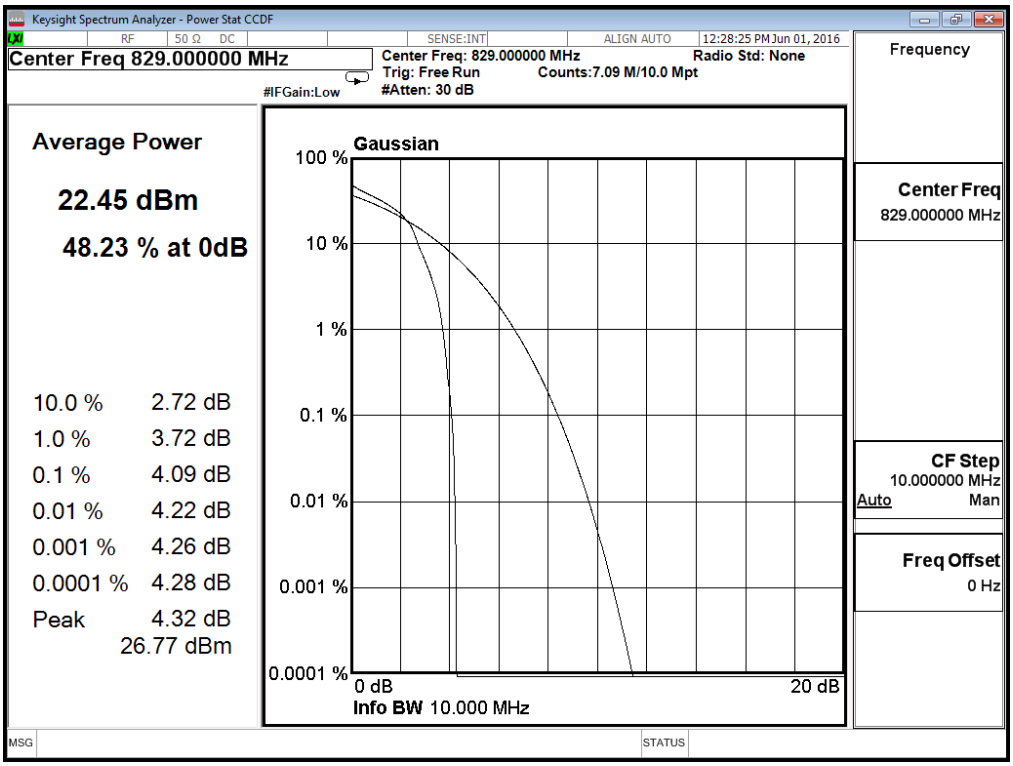

Date: 7.MAY.2016 14:24:34

(Plot B5: Band 4/20MHz/16QAM in H Ch 1RB Size)

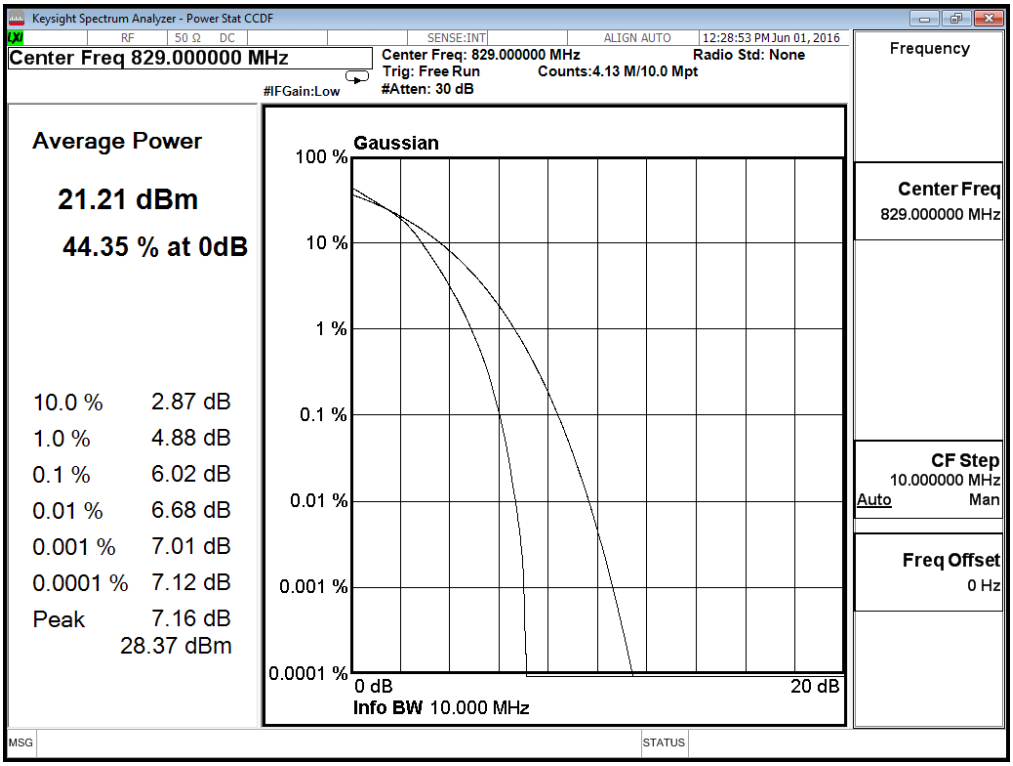



Date: 7.MAY.2016 14:25:25

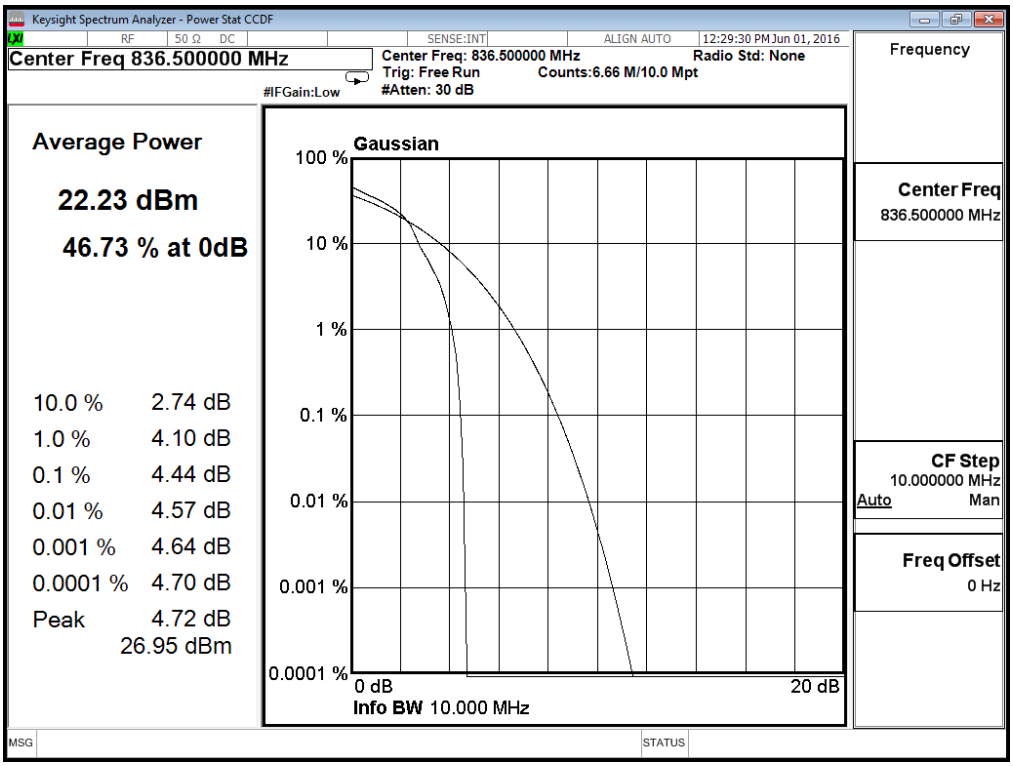
(Plot B6: Band 4/20MHz/16QAM in H Ch 100RB Size)



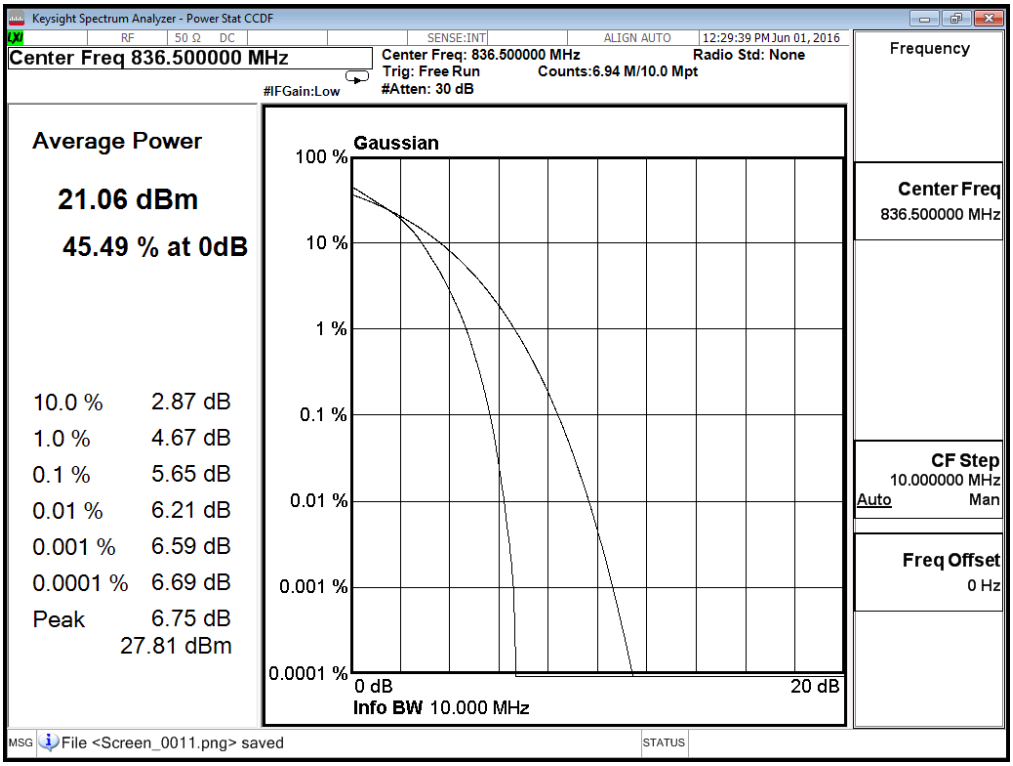

(Plot C1: Band 5/10MHz/16QAM in L Ch 1RB Size )



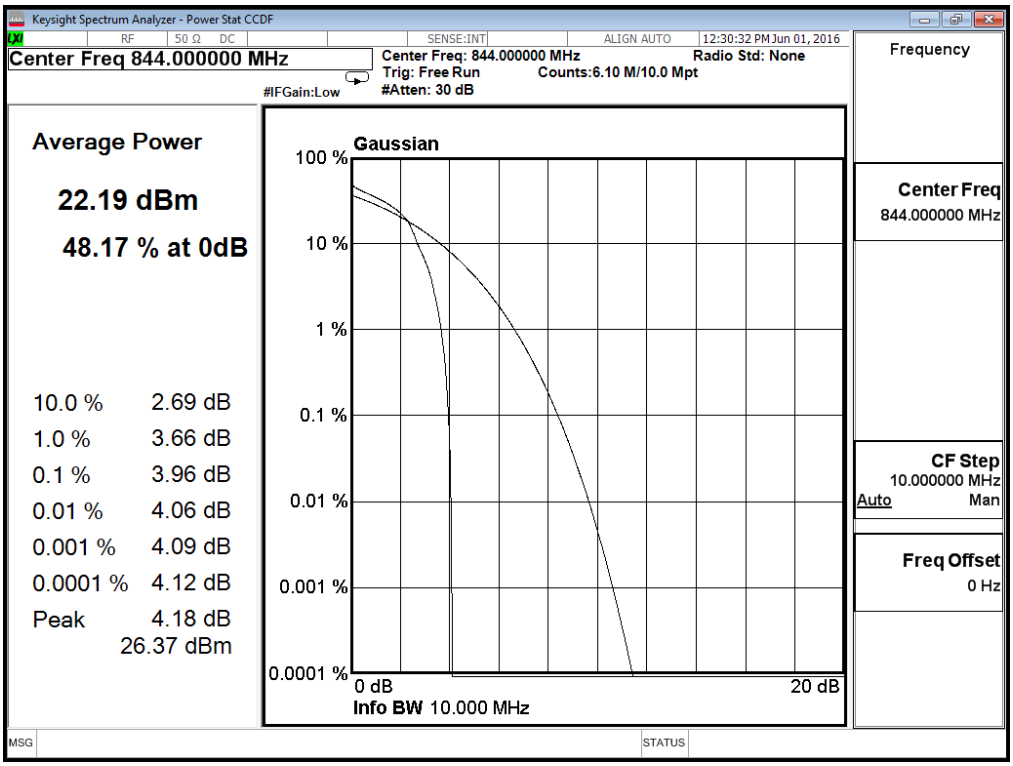

(Plot C2: Band 5/10MHz/16QAM in L Ch 50RB Size)



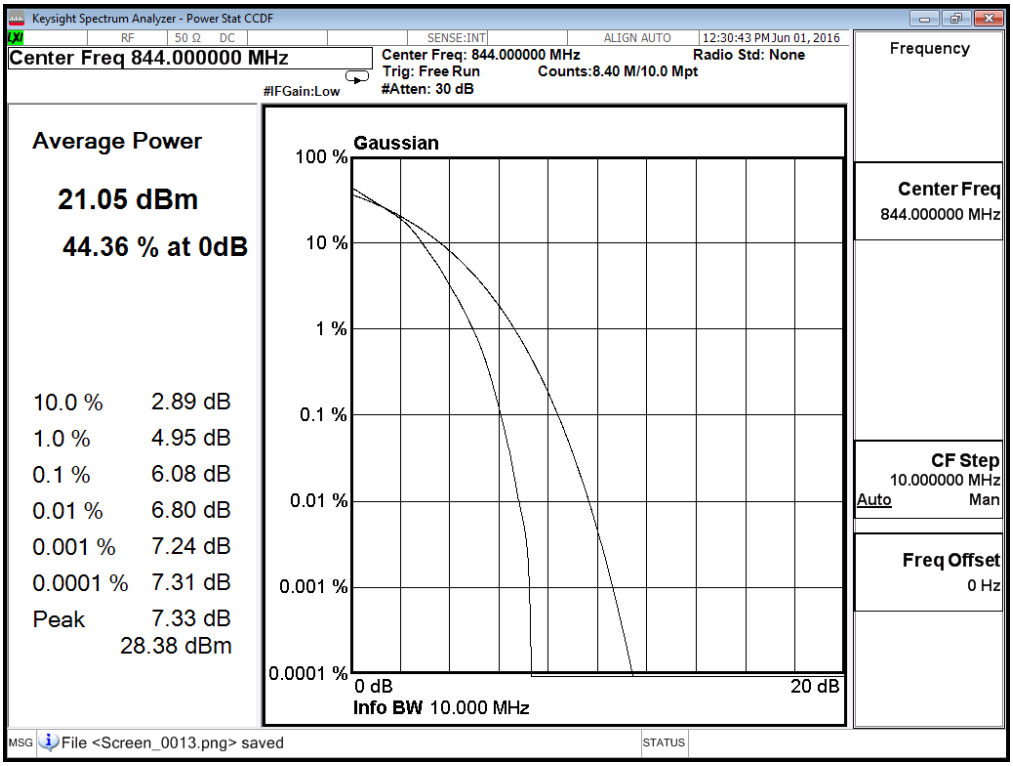

(Plot C3: Band 5/10MHz/16QAM in M Ch 1RB Size)



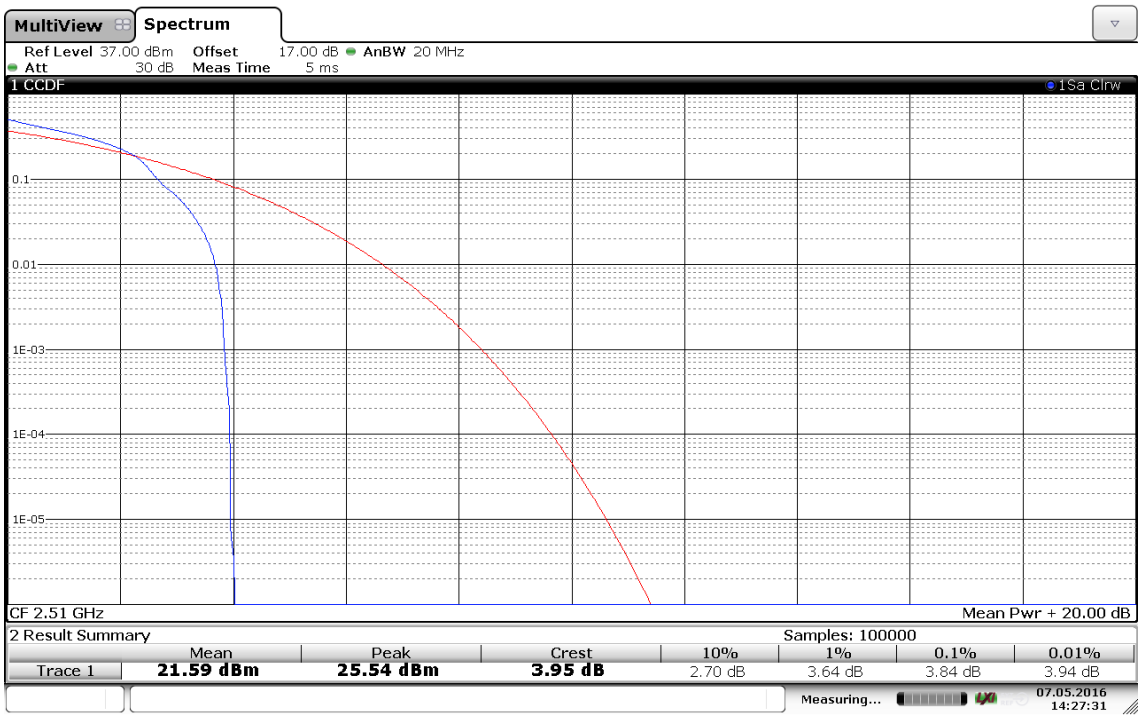

(Plot C4: Band 5/10MHz/16QAM in M Ch 50RB Size)




(Plot C5: Band 5/10MHz/16QAM in H Ch 1RB Size)

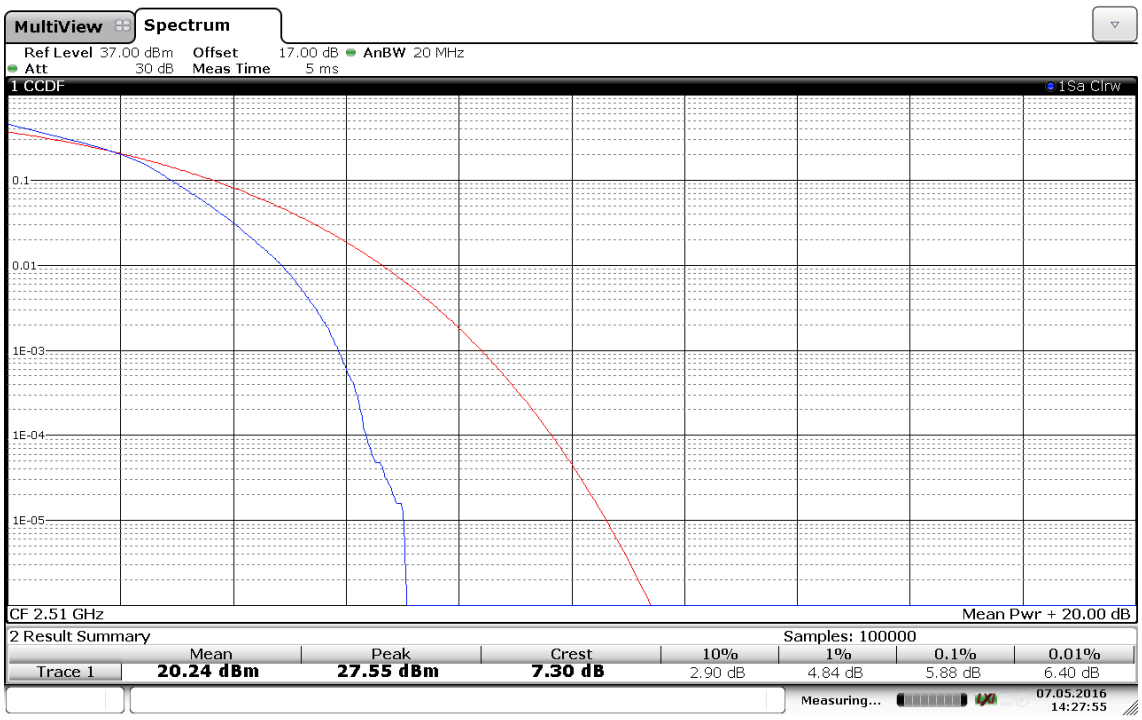



(Plot C6: Band 5/10MHz/16QAM in H Ch 50RB Size)



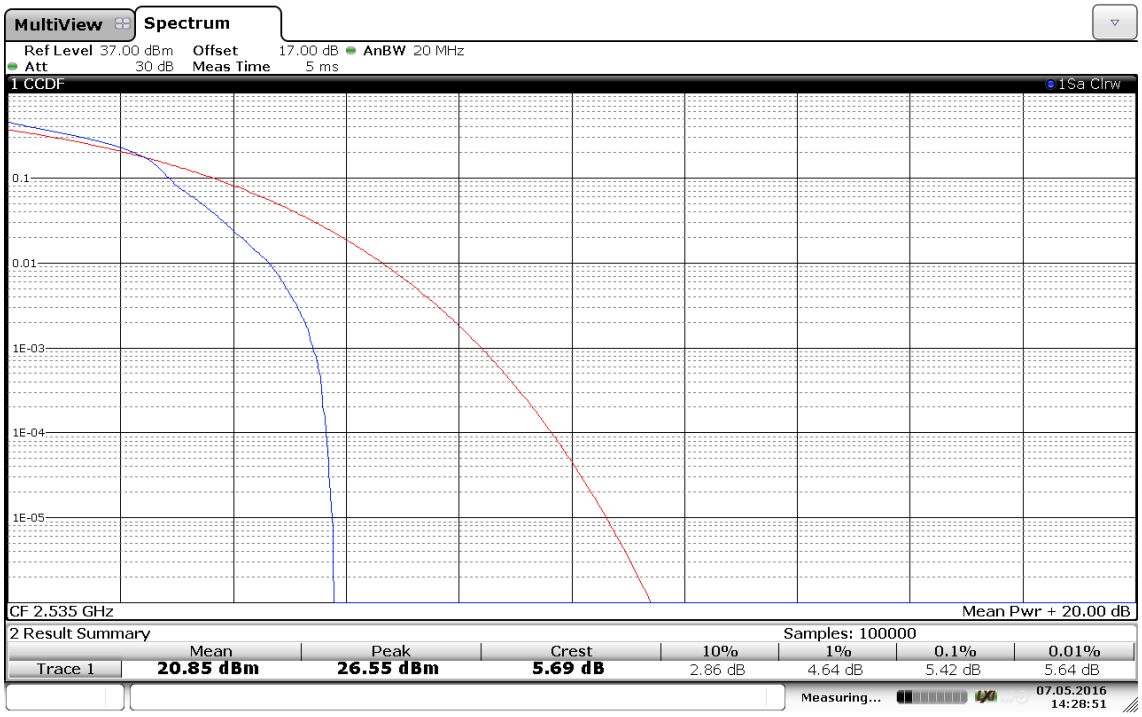

Date: 7.MAY.2016 14:27:31

(Plot D1: Band 7/20MHz/16QAM in L Ch 1RB Size )



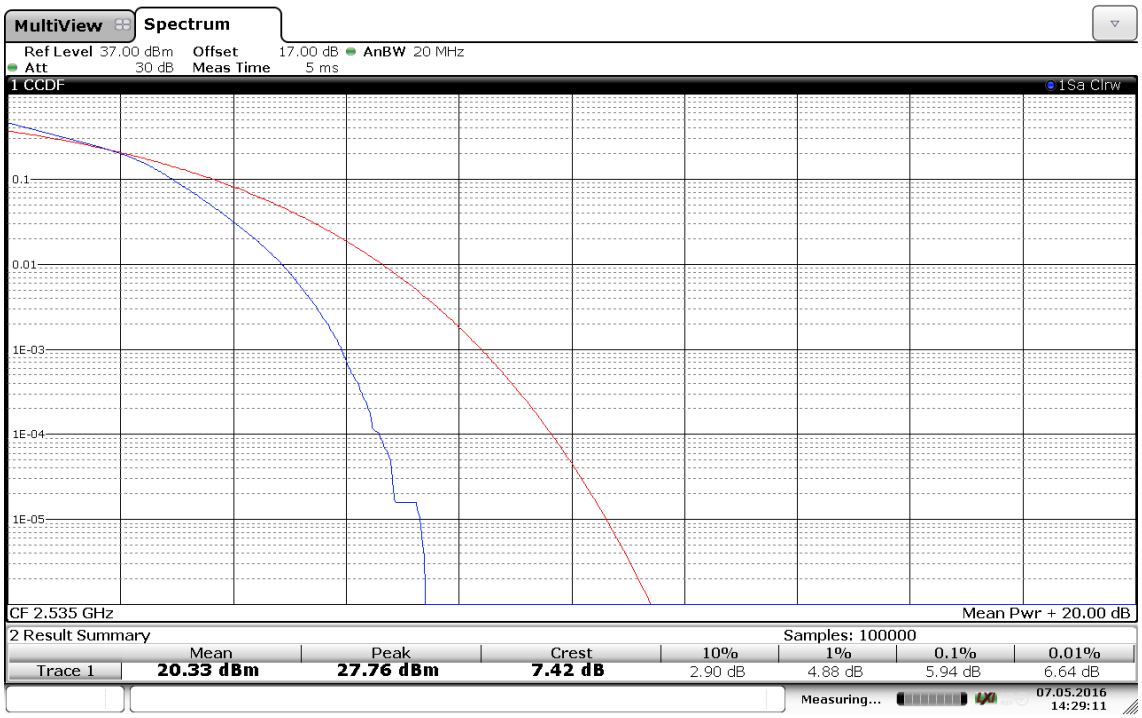

Date: 7.MAY.2016 14:27:54

(Plot D2: Band 7/20MHz/16QAM in L Ch 100RB Size)



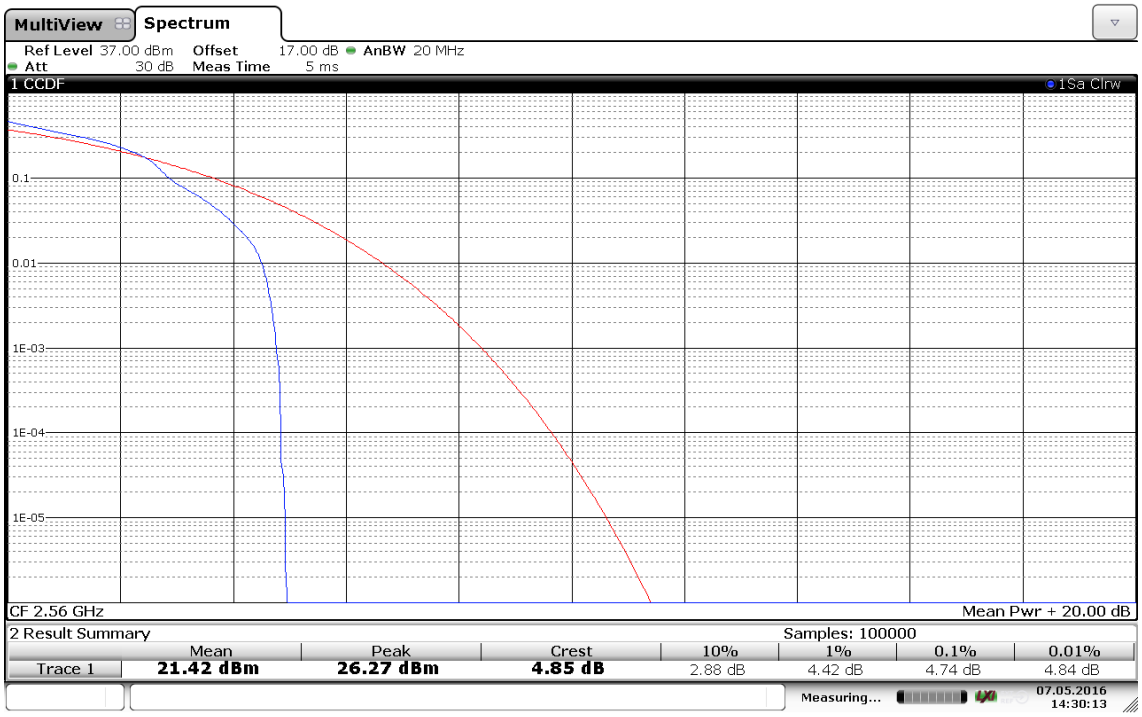

Date: 7.MAY.2016 14:28:50

(Plot D3: Band 7/20MHz/16QAM in M Ch 1RB Size)



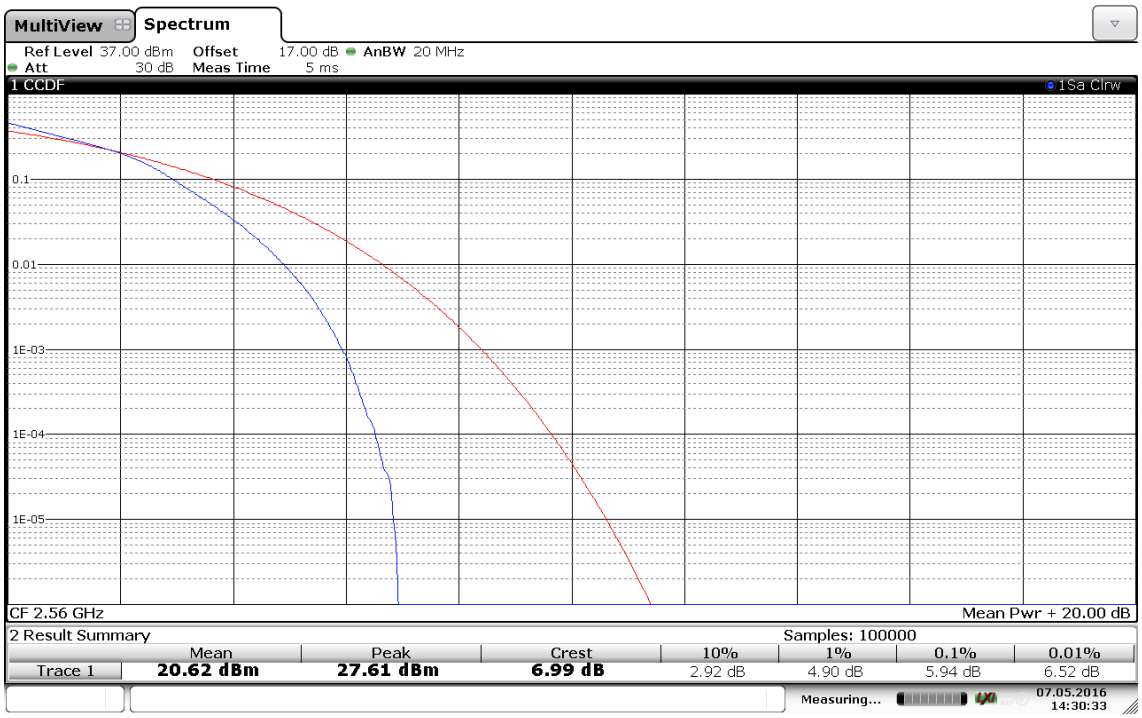

Date: 7.MAY.2016 14:29:11

(Plot D4: Band 7/20MHz/16QAM in M Ch 100RB Size)




Date: 7.MAY.2016 14:30:12

(Plot D5: Band 7/20MHz/16QAM in H Ch 1RB Size)




Date: 7.MAY.2016 14:30:33

(Plot D6: Band 7/20MHz/16QAM in H Ch 100RB Size)

## 2.3 99% Occupied Bandwidth and 26dB Bandwidth

### 2.3.1 Definition

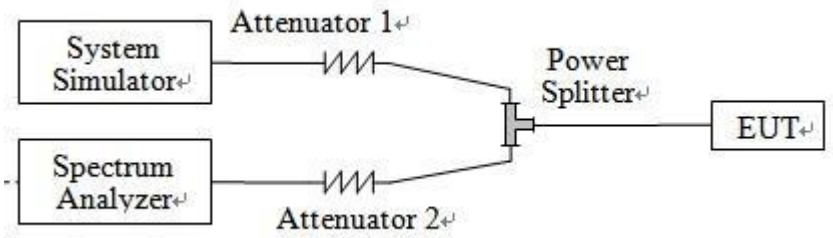
According to FCC section 2.1049, the occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

### 2.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 2.3.3 Test Setup




### 2.3.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

### 2.3.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| BW (MHz) | Channel | Frequency (MHz) | Mode | 99% Occupied Bandwidth(MHz) | 26dBBandwidth (MHz) |
| 1.4 | 18900 | 1880 | QPSK | 1.10 | 1.27 |
| | | | 16QAM | 1.10 | 1.27 |
| 3 | 18900 | 1880 | QPSK | 2.74 | 3.04 |
| | | | 16QAM | 2.74 | 3.02 |
| 5 | 18900 | 1880 | QPSK | 4.54 | 5.02 |
| | | | 16QAM | 4.54 | 5.10 |
| 10 | 18900 | 1880 | QPSK | 9.00 | 9.76 |
| | | | 16QAM | 8.96 | 9.76 |
| 15 | 18900 | 1880 | QPSK | 13.62 | 14.88 |
| | | | 16QAM | 13.50 | 15.00 |
| 20 | 18900 | 1880 | QPSK | 18.64 | 21.36 |
| | | | 16QAM | 18.72 | 21.28 |

| LTE Band 4 | | | | | |
|---|---|---|---|---|---|
| BW (MHz) | Channel | Frequency (MHz) | Mode | 99% Occupied Bandwidth(MHz) | 26dBBandwidth (MHz) |
| 1.4 | 20175 | 1732.5 | QPSK | 1.10 | 1.28 |
| | | | 16QAM | 1.10 | 1.29 |
| 3 | 20175 | 1732.5 | QPSK | 2.75 | 3.04 |
| | | | 16QAM | 2.75 | 3.04 |
| 5 | 20175 | 1732.5 | QPSK | 4.54 | 5.04 |
| | | | 16QAM | 4.56 | 5.04 |
| 10 | 20175 | 1732.5 | QPSK | 8.96 | 9.60 |
| | | | 16QAM | 8.96 | 9.72 |
| 15 | 20175 | 1732.5 | QPSK | 13.62 | 15.00 |
| | | | 16QAM | 13.56 | 15.00 |
| 20 | 20175 | 1732.5 | QPSK | 18.64 | 21.36 |
| | | | 16QAM | 18.72 | 21.44 |

| LTE Band 5 | | | | | |
|---|---|---|---|---|---|
| BW (MHz) | Channel | Frequency (MHz) | Mode | 99% Occupied Bandwidth(MHz) | 26dBBandwidth (MHz) |
| 1.4 | 20525 | 836.5 | QPSK | 1.10 | 1.30 |
| | | | 16QAM | 1.10 | 1.28 |
| 3 | 20525 | 836.5 | QPSK | 2.74 | 3.05 |
| | | | 16QAM | 2.74 | 3.02 |
| 5 | 20525 | 836.5 | QPSK | 4.52 | 5.06 |
| | | | 16QAM | 4.52 | 5.08 |
| 10 | 20525 | 836.5 | QPSK | 8.94 | 9.76 |
| | | | 16QAM | 8.93 | 9.67 |

| LTE Band 7 | | | | | |
|---|---|---|---|---|---|
| BW (MHz) | Channel | Frequency (MHz) | Mode | 99% Occupied Bandwidth(MHz) | 26dBBandwidth (MHz) |
| 5 | 21100 | 2535 | QPSK | 4.54 | 5.10 |
| | | | 16QAM | 4.52 | 5.08 |
| 10 | 21100 | 2535 | QPSK | 8.96 | 9.76 |
| | | | 16QAM | 8.96 | 9.60 |
| 15 | 21100 | 2535 | QPSK | 13.56 | 15.00 |
| | | | 16QAM | 13.50 | 15.06 |
| 20 | 21100 | 2535 | QPSK | 18.64 | 21.36 |
| | | | 16QAM | 18.64 | 21.44 |

Note: The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

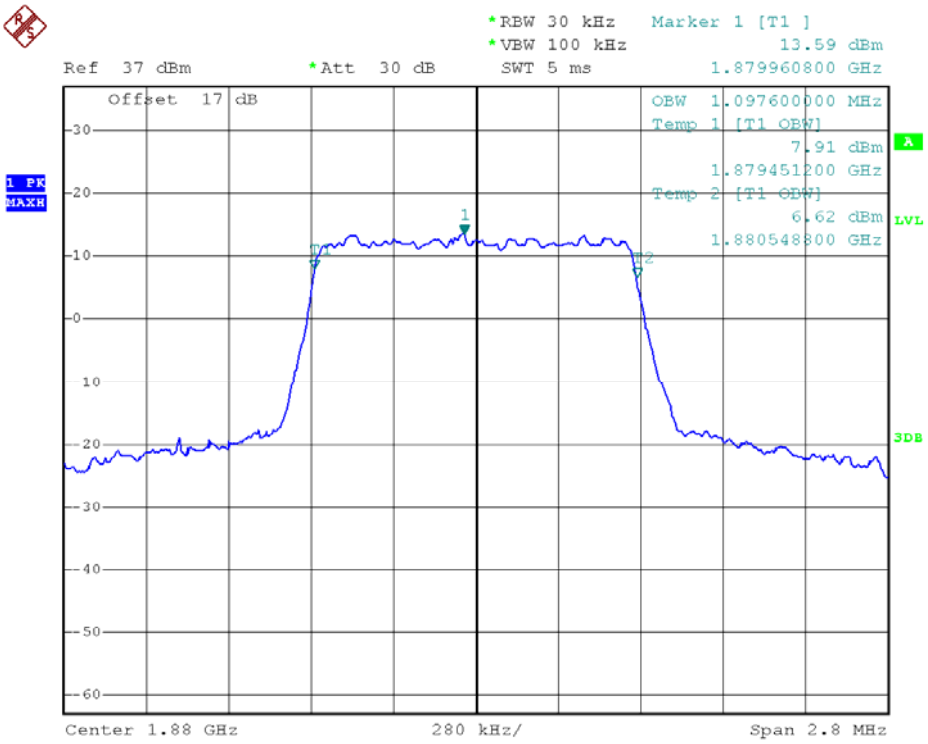
BW1.4MHz RB setting: RB Size 6,RB Offset 0 BW3MHz RB setting: RB Size 15,RB Offset 0

BW5MHz RB setting: RB Size 25,RB Offset 0 BW10MHz RB setting: RB Size 50,RB Offset 0

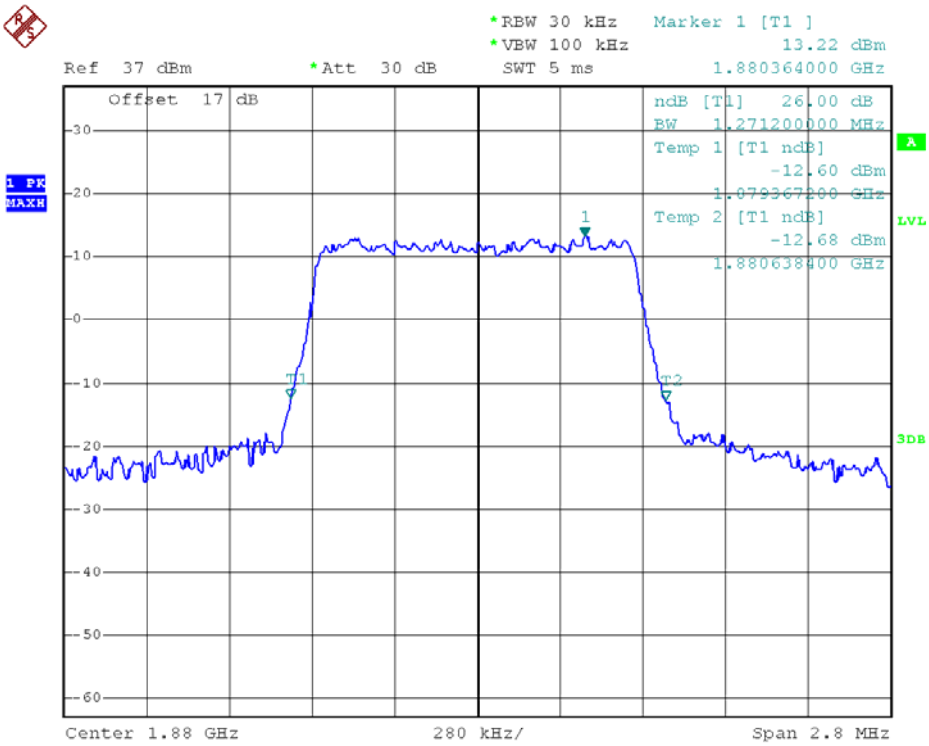
BW15MHz RB setting: RB Size 75,RB Offset 0 BW20MHz RB setting: RB Size 100,RB Offset 0

Test date: 2016-05-28~2016-06-01

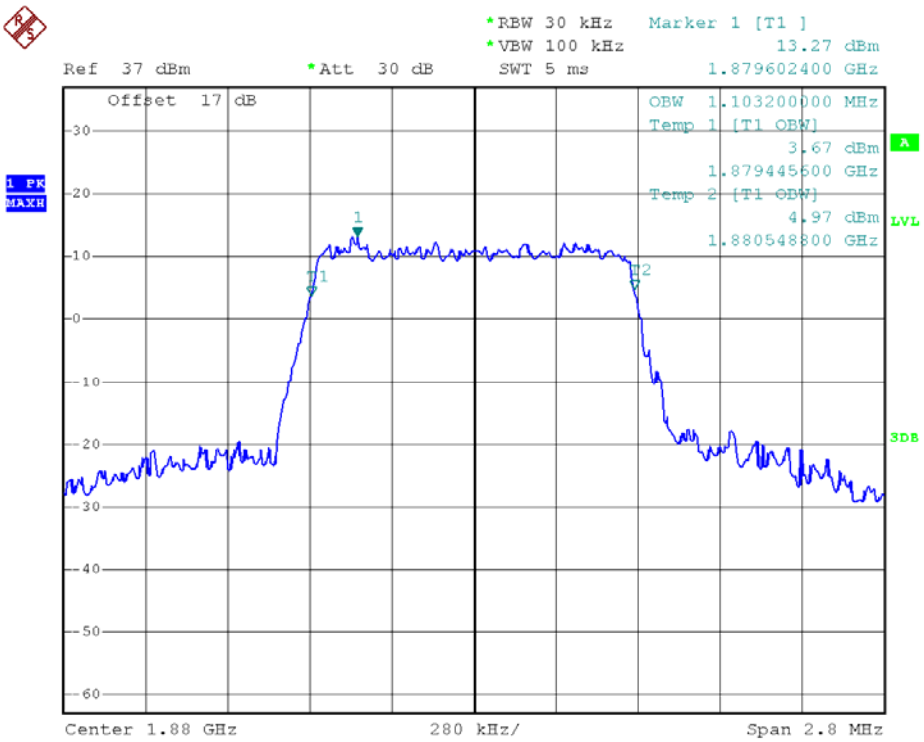
### 2.3.6 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth



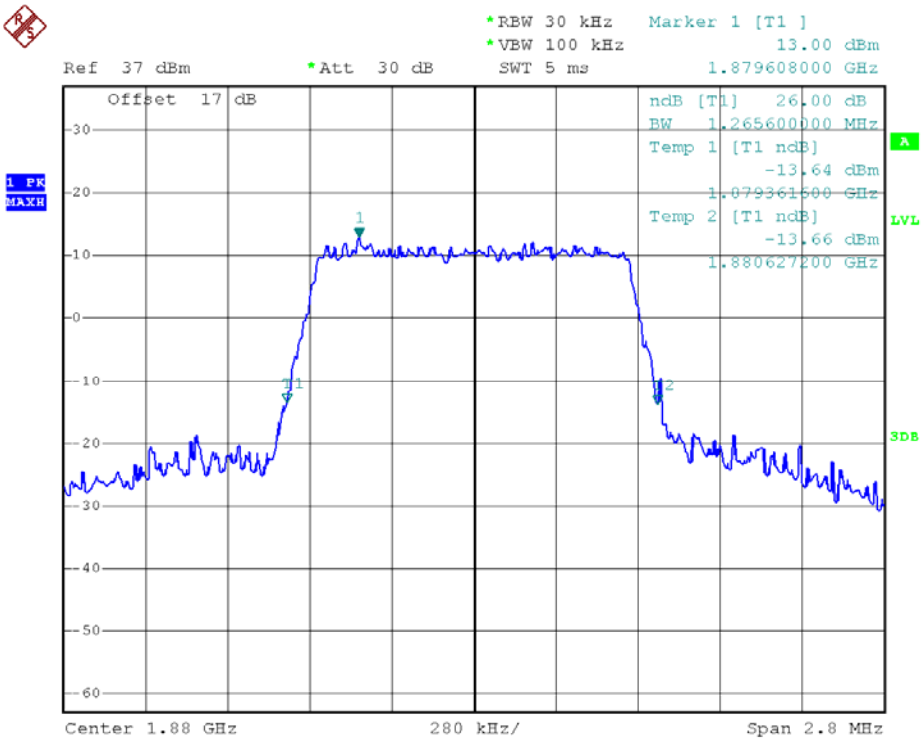

99% Occupied Bandwidth LTE Band 2 1.4MHz/QPSK



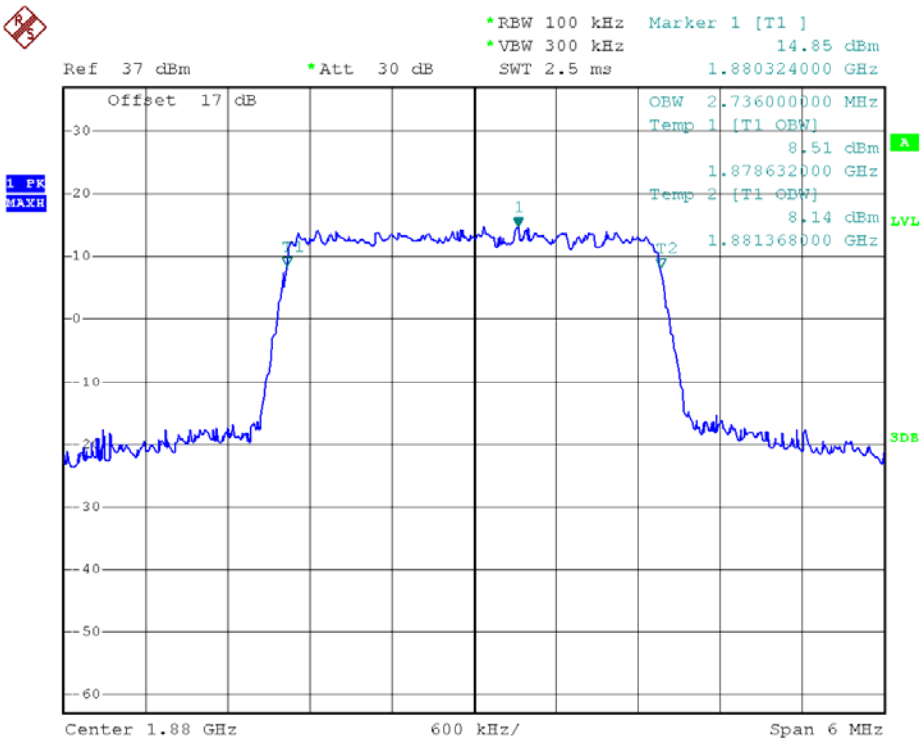

26dB Bandwidth LTE Band 2 1.4MHz/QPSK



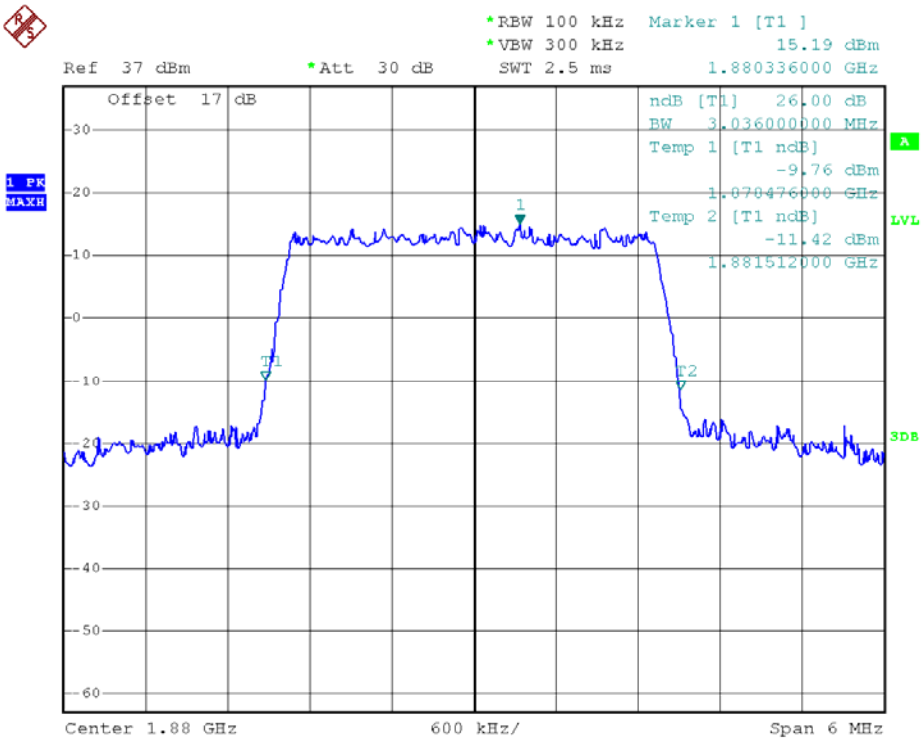

99% Occupied Bandwidth LTE Band 2 1.4MHz/16QAM



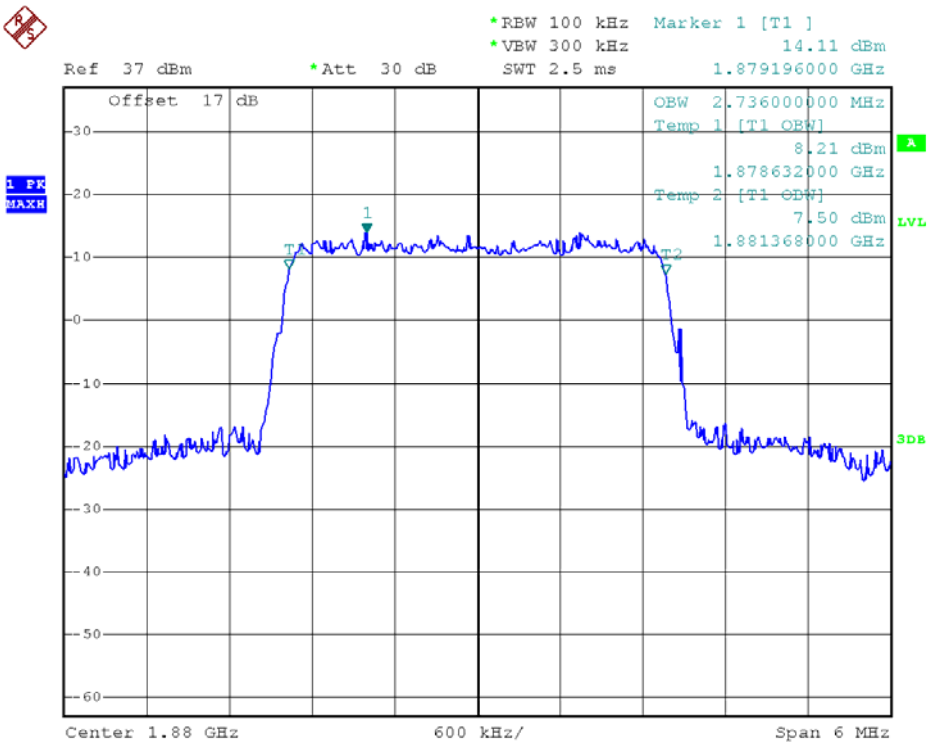

26dB Bandwidth LTE Band 2 1.4MHz/16QAM



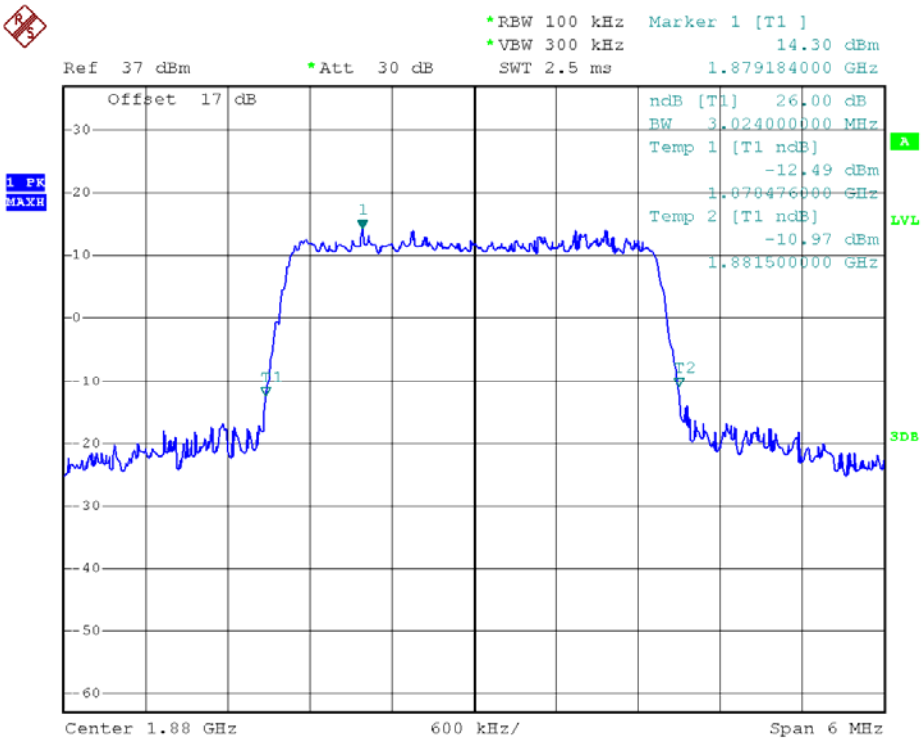

99% Occupied Bandwidth LTE Band 2/3MHz/QPSK



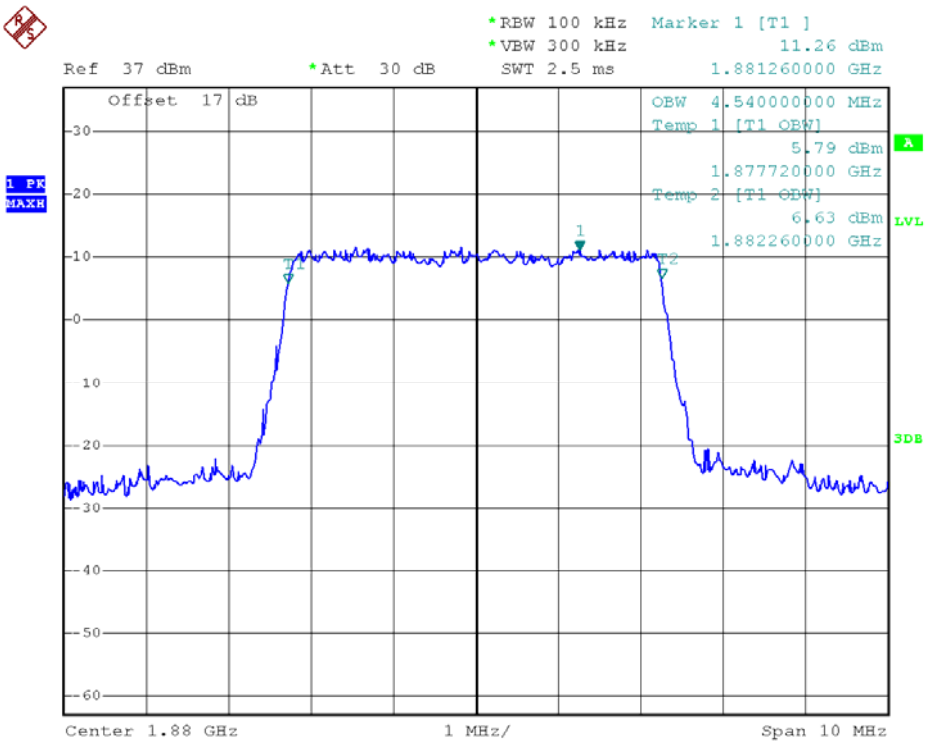

26dB Bandwidth LTE Band 2/3MHz/QPSK



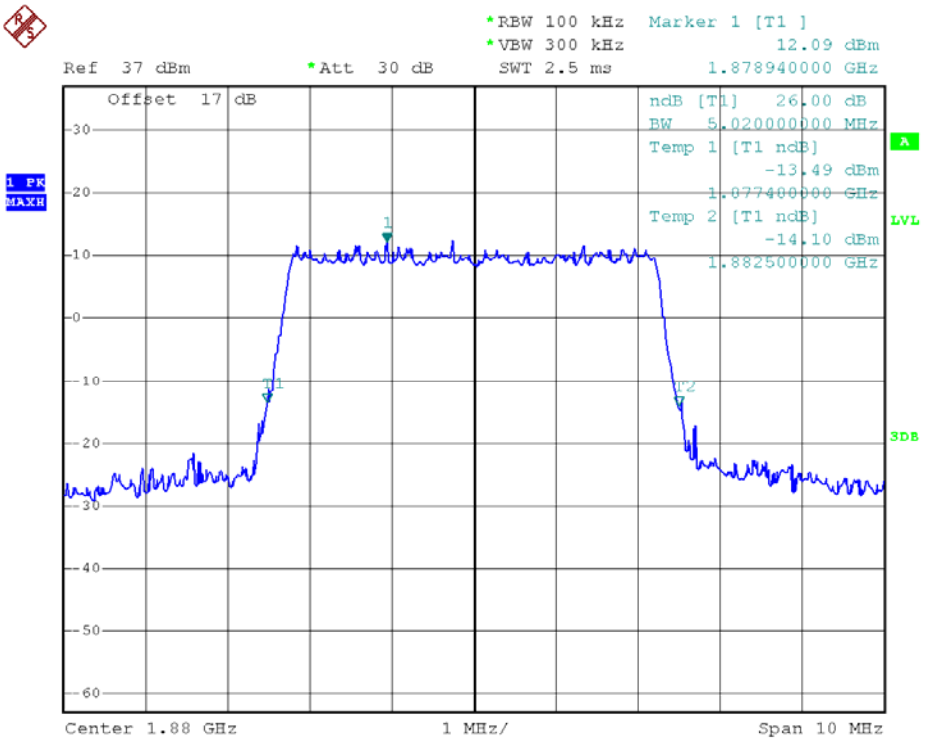

99% Occupied Bandwidth LTE Band 2/3MHz/16QAM



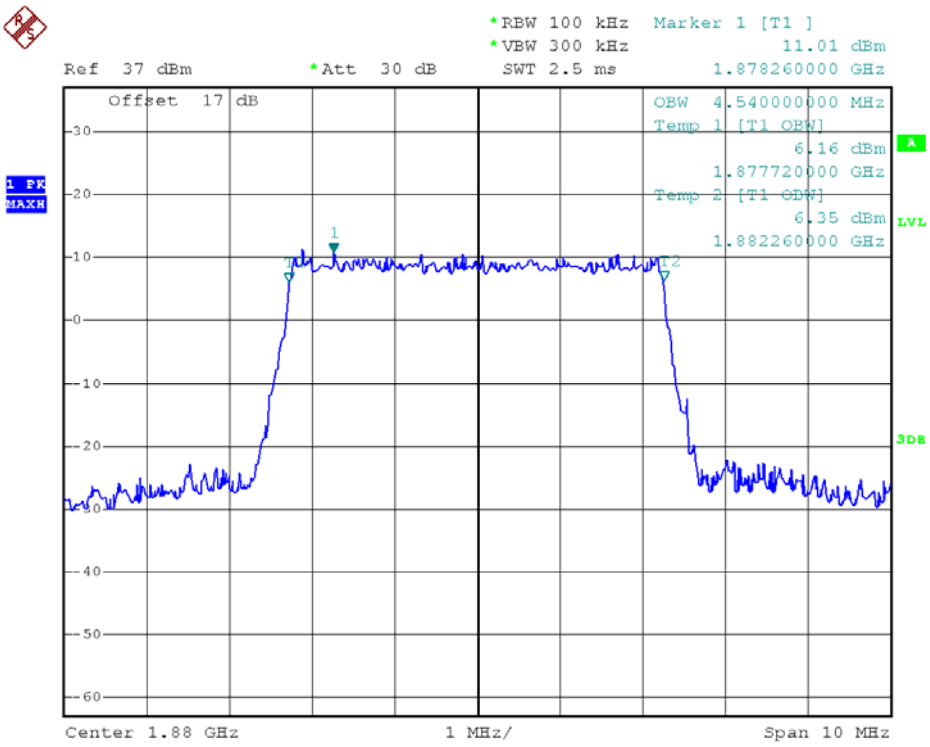

26dB Bandwidth LTE Band 2/3MHz/16QAM



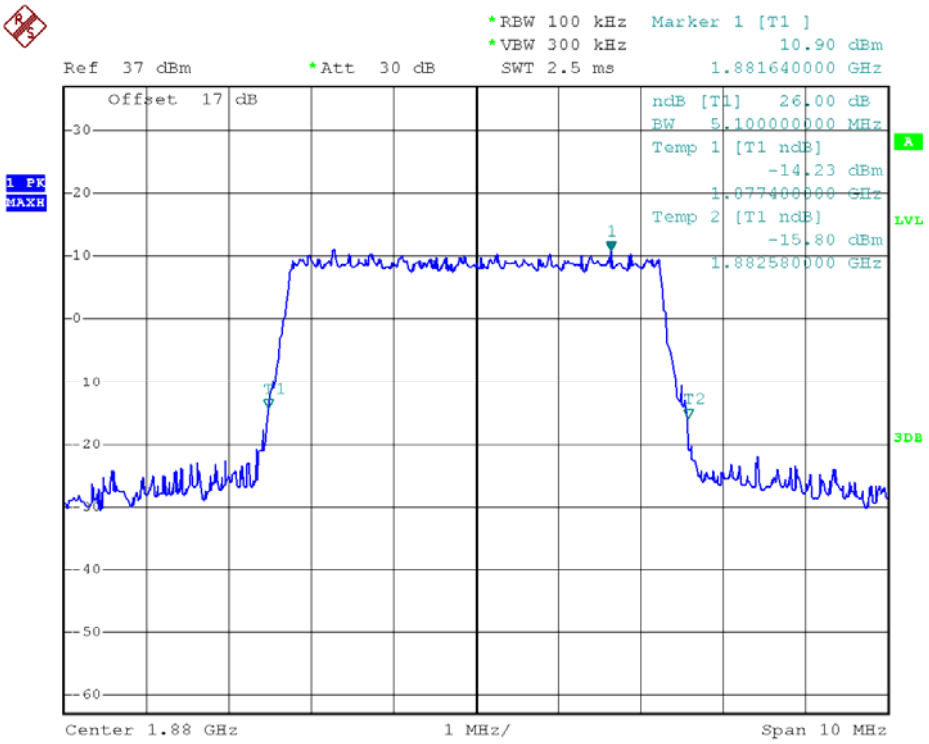

99% Occupied Bandwidth LTE Band 2/5MHz/QPSK



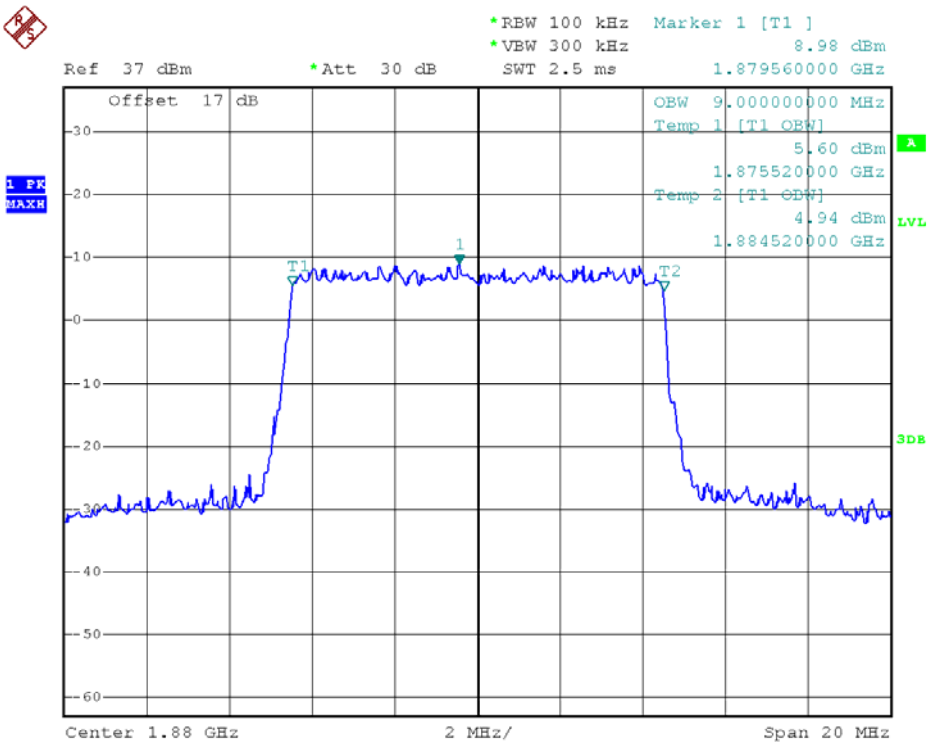

26dB Bandwidth LTE Band 2/5MHz/QPSK



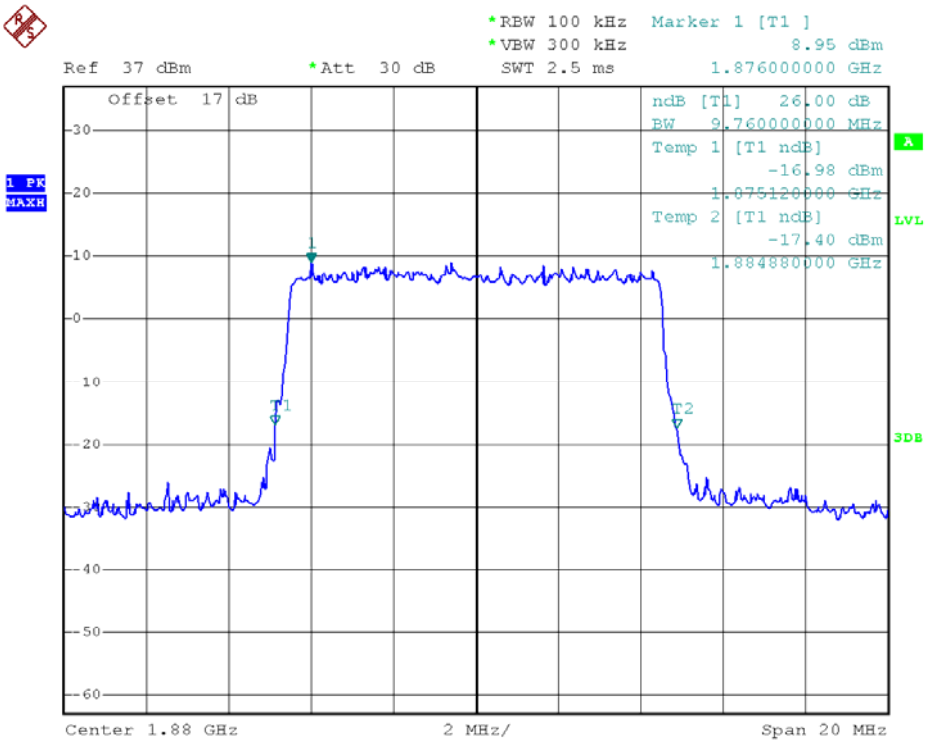

99% Occupied Bandwidth LTE Band 2/5MHz/16QAM



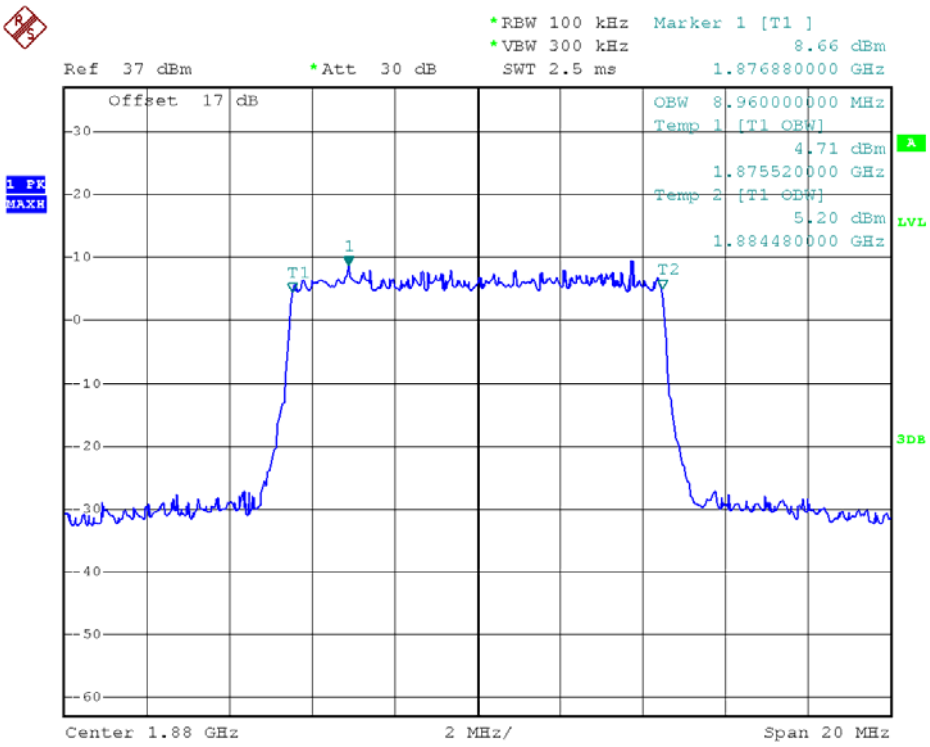

26dB Bandwidth LTE Band 2/5MHz/16QAM



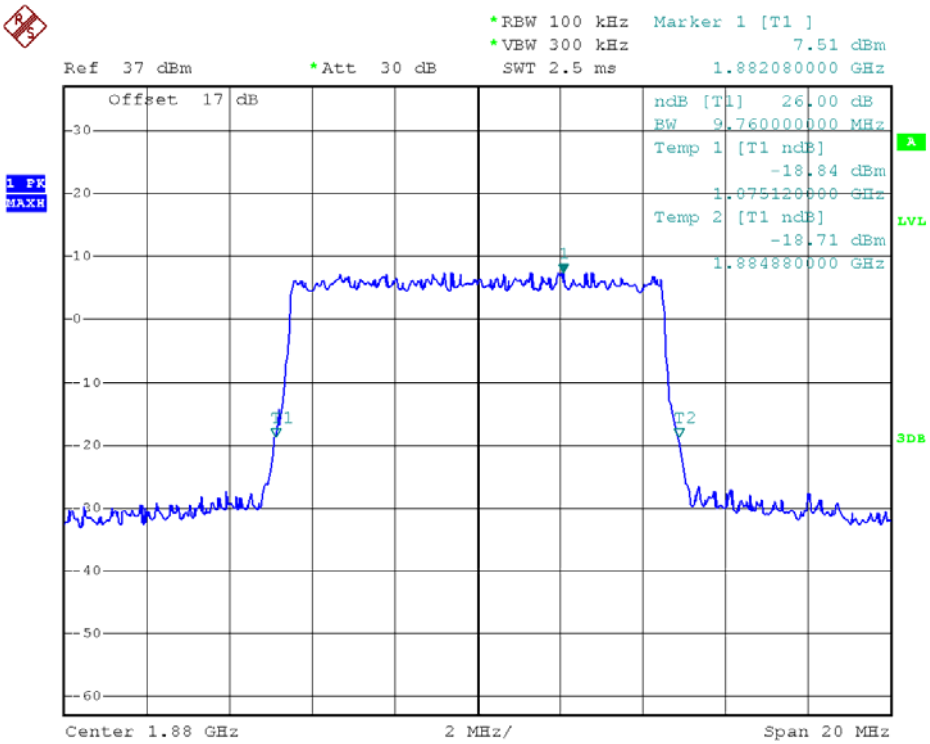

99% Occupied Bandwidth LTE Band 2/10MHz/QPSK



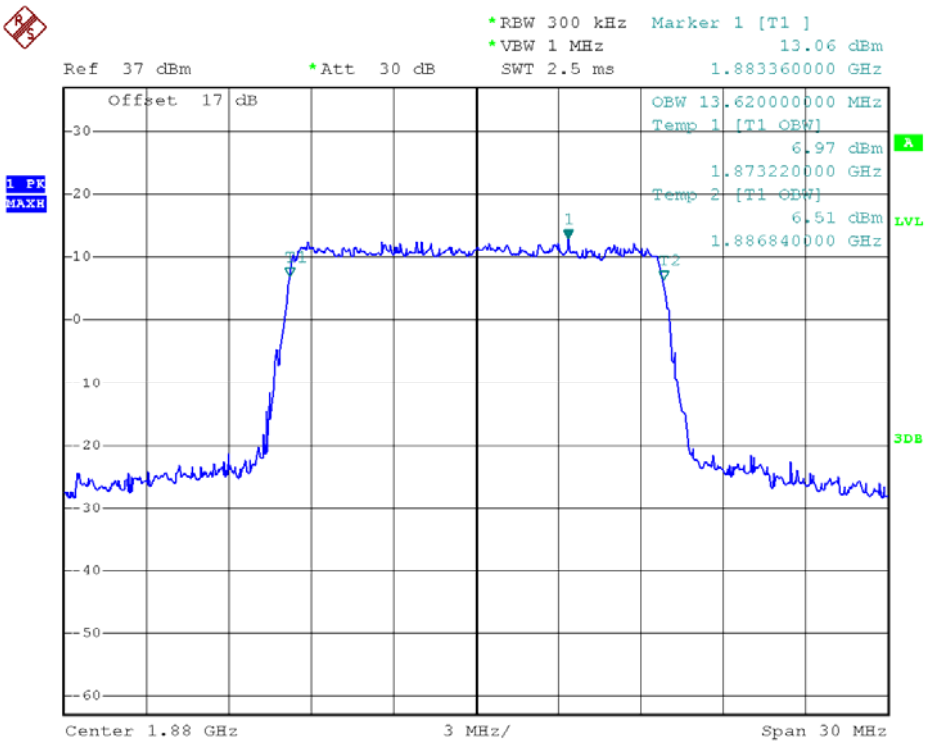

26dB Bandwidth LTE Band 2/10MHz/QPSK



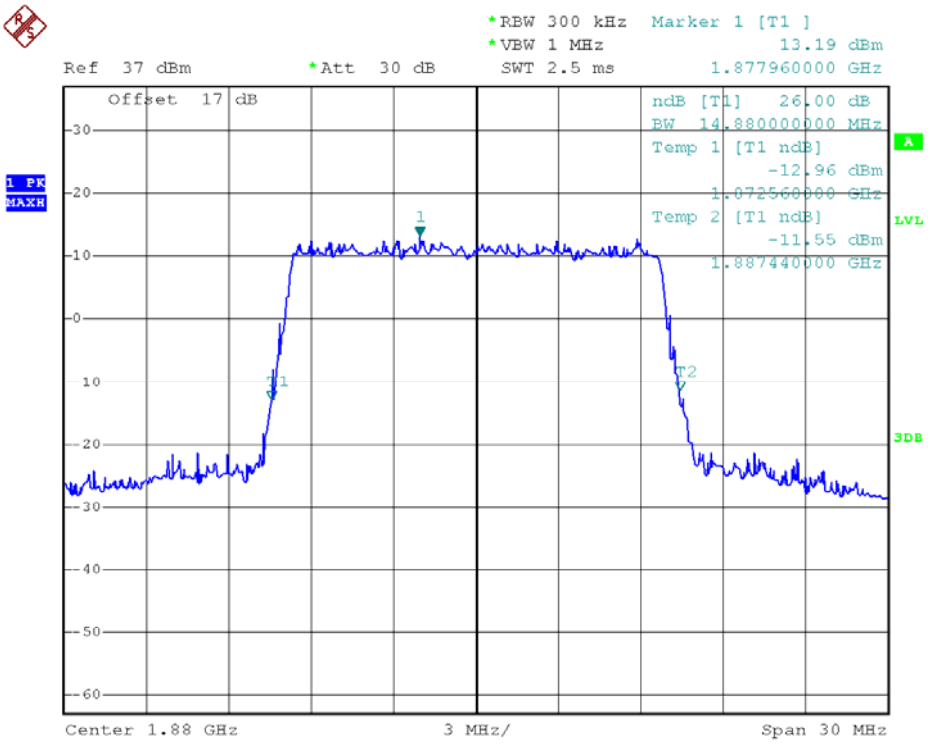

99% Occupied Bandwidth LTE Band 2/10MHz/16QAM



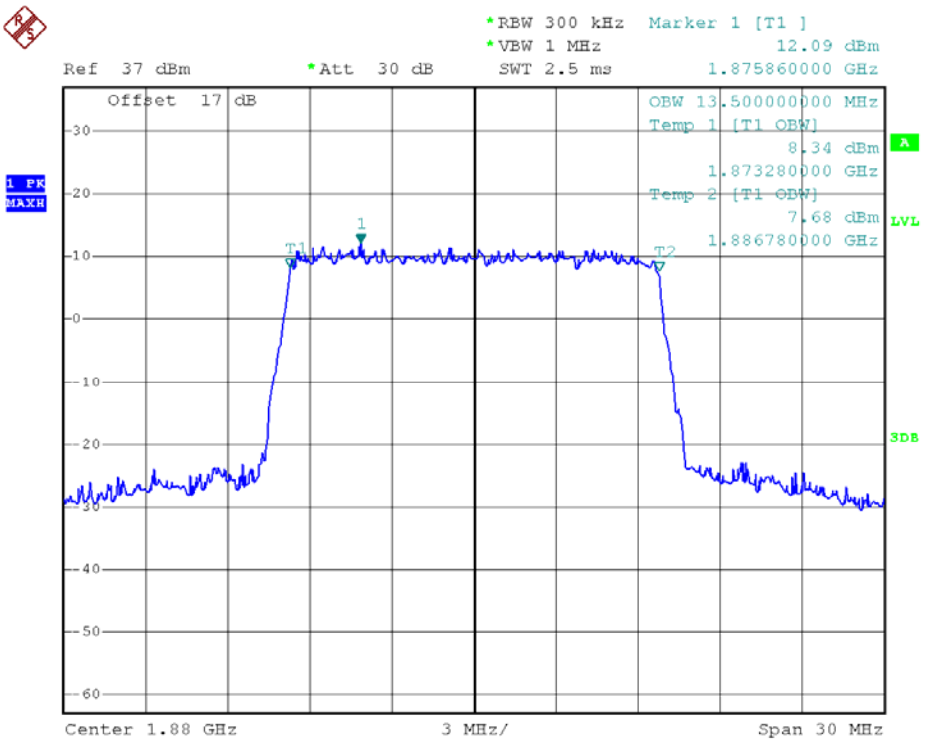

26dB Bandwidth LTE Band 2/10MHz/16QAM



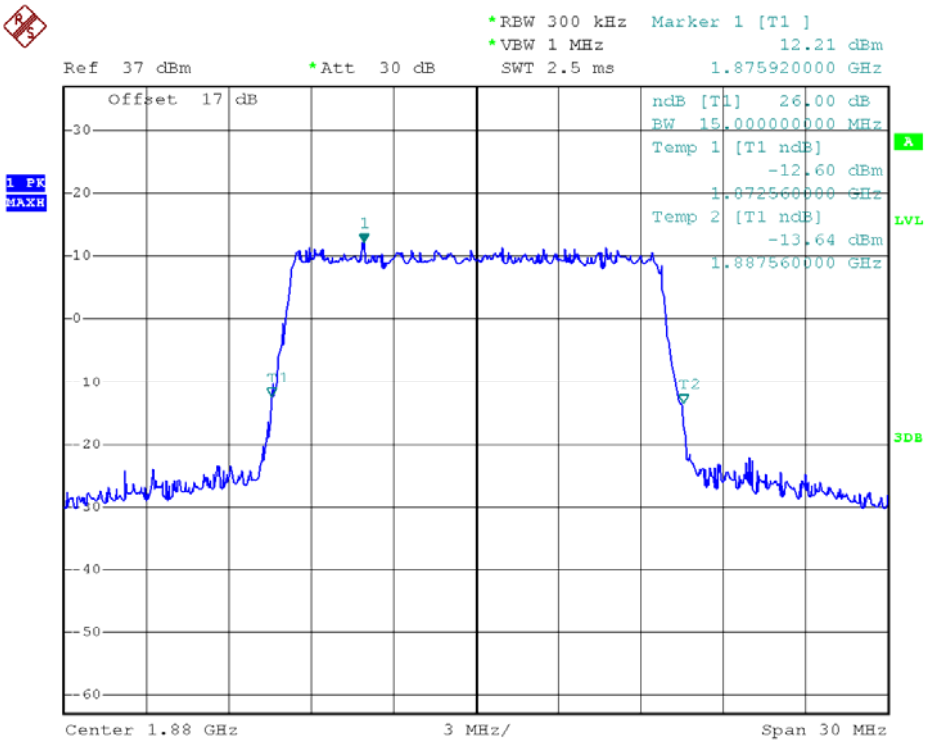

99% Occupied Bandwidth LTE Band 2/15MHz/QPSK



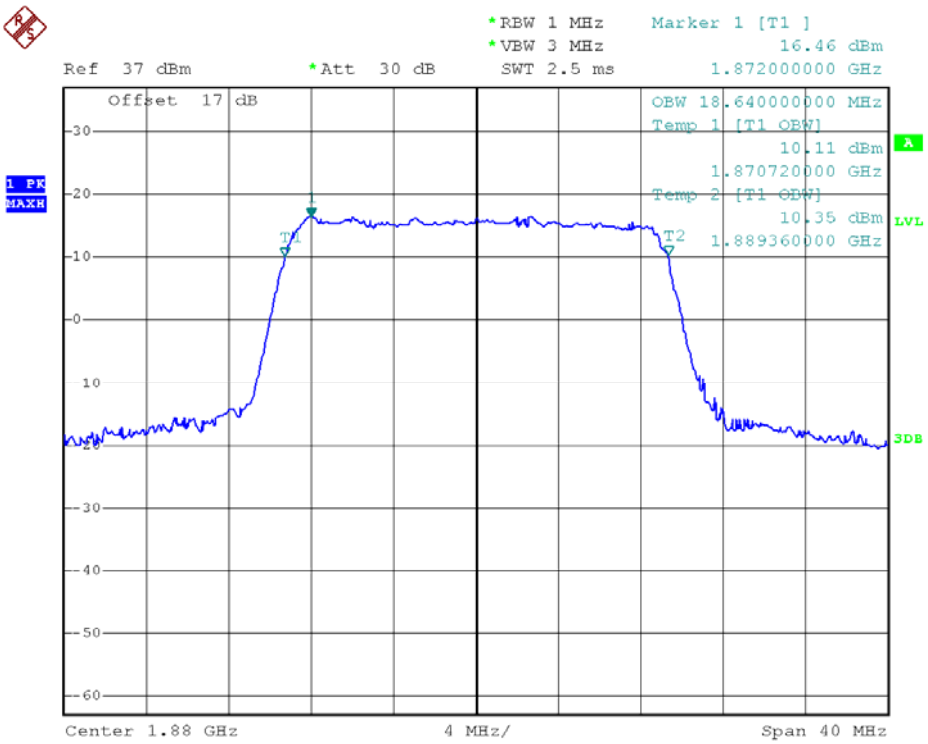

26dB Bandwidth LTE Band 2/15MHz/QPSK




99% Occupied Bandwidth LTE Band 2/15MHz/16QAM




26dB Bandwidth LTE Band 2/15MHz/16QAM

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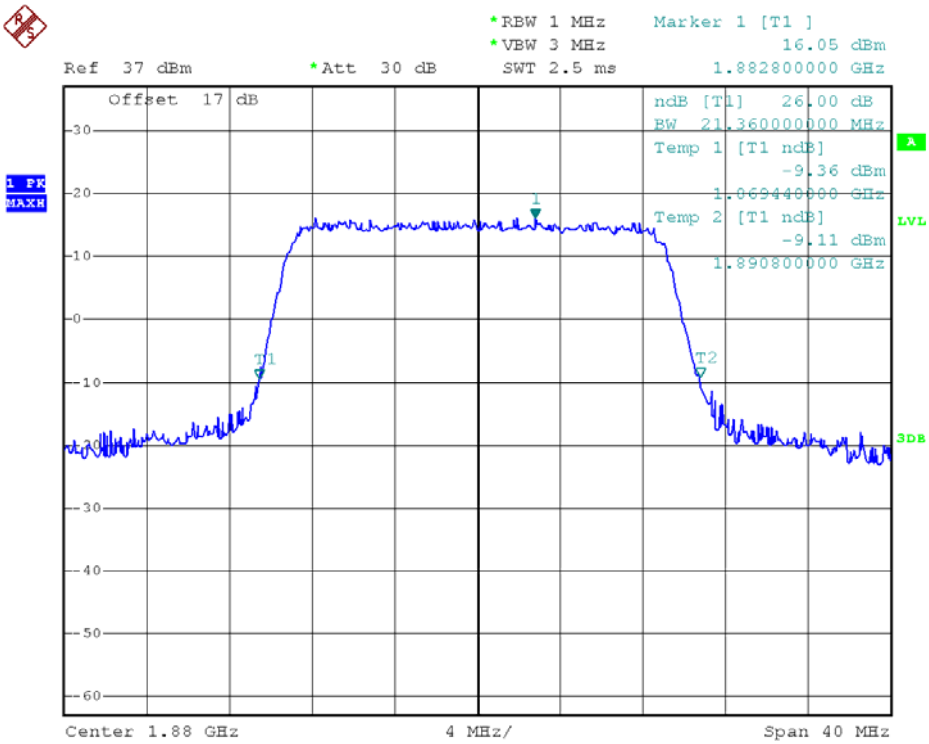
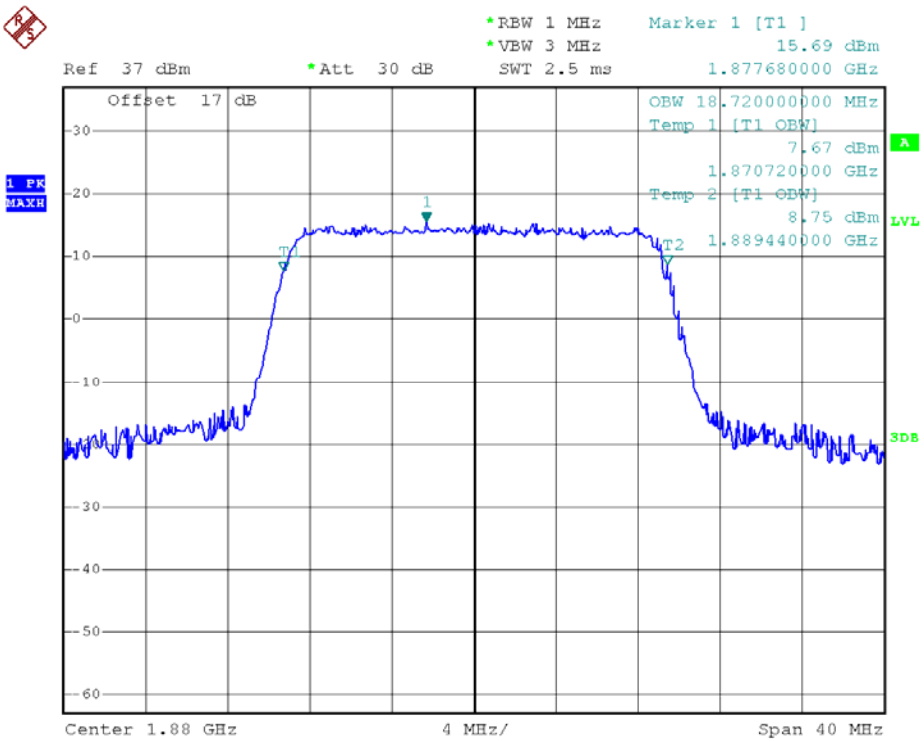



26dB Bandwidth LTE Band 2/20MHz/QPSK

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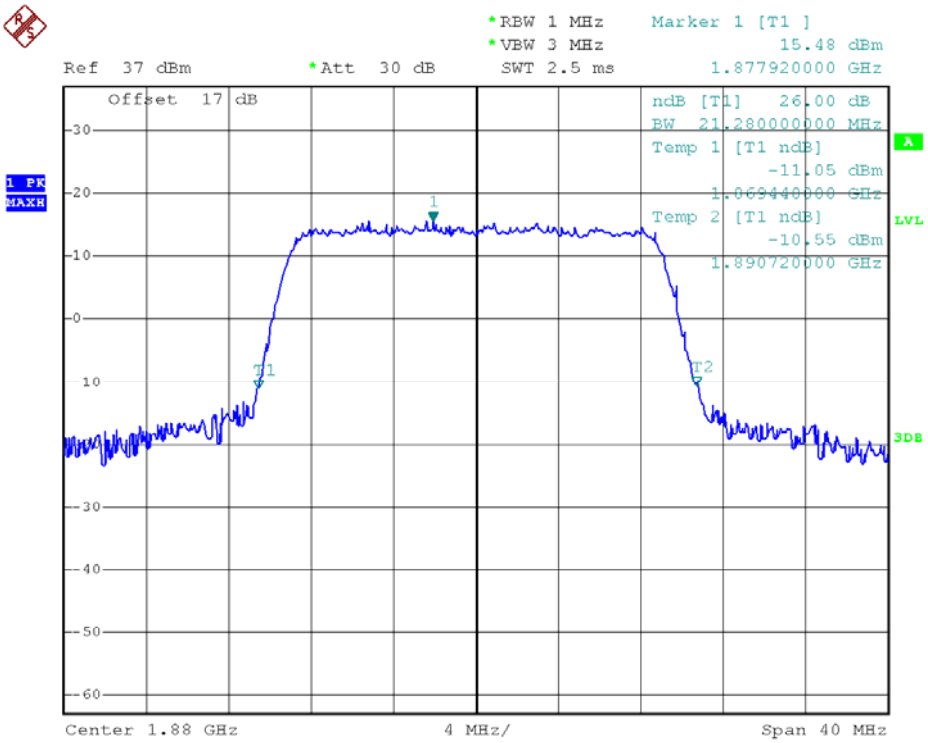


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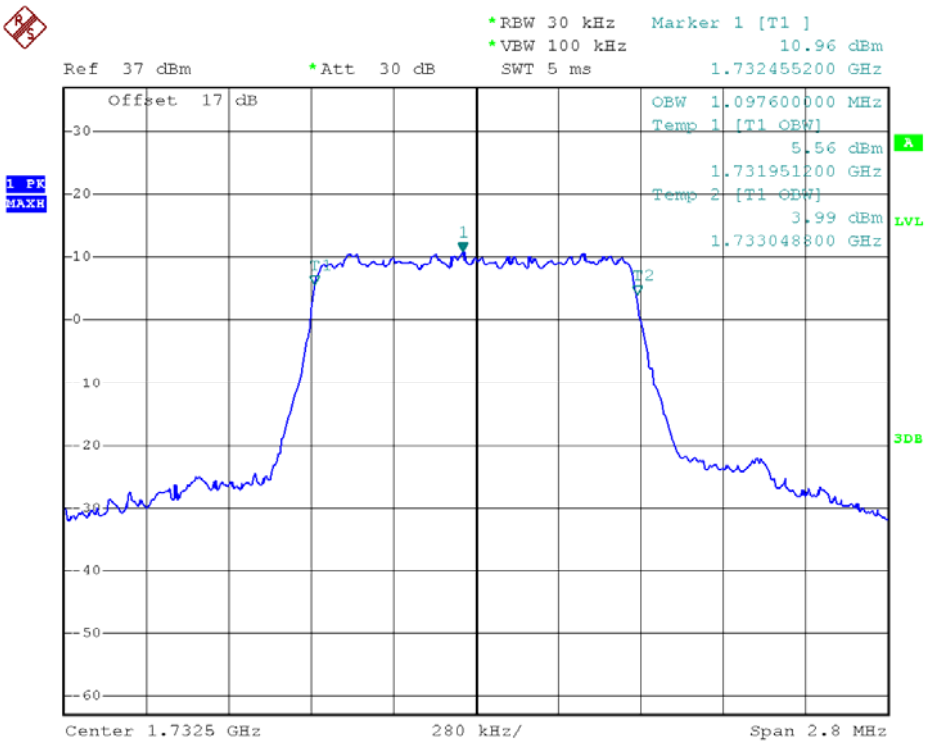


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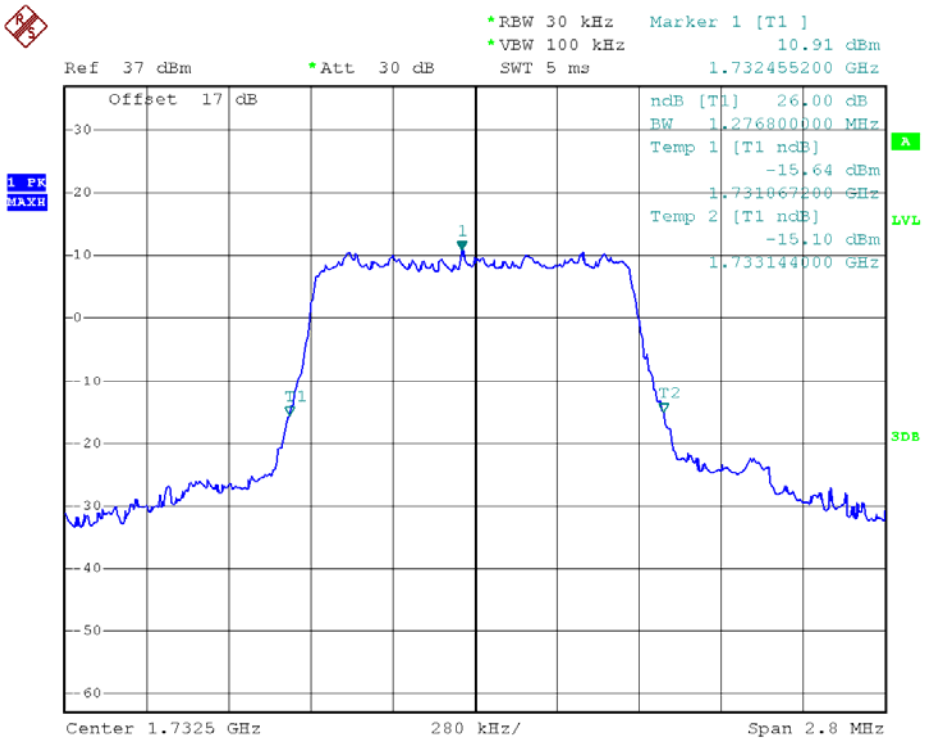
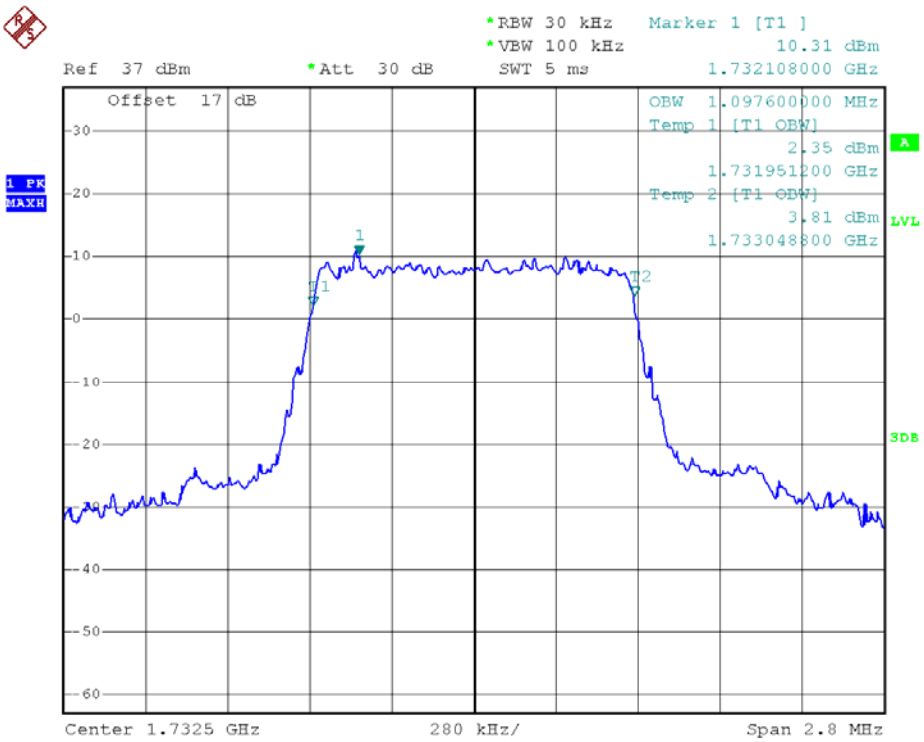



26dB Bandwidth LTE Band 4/1.4MHz/QPSK

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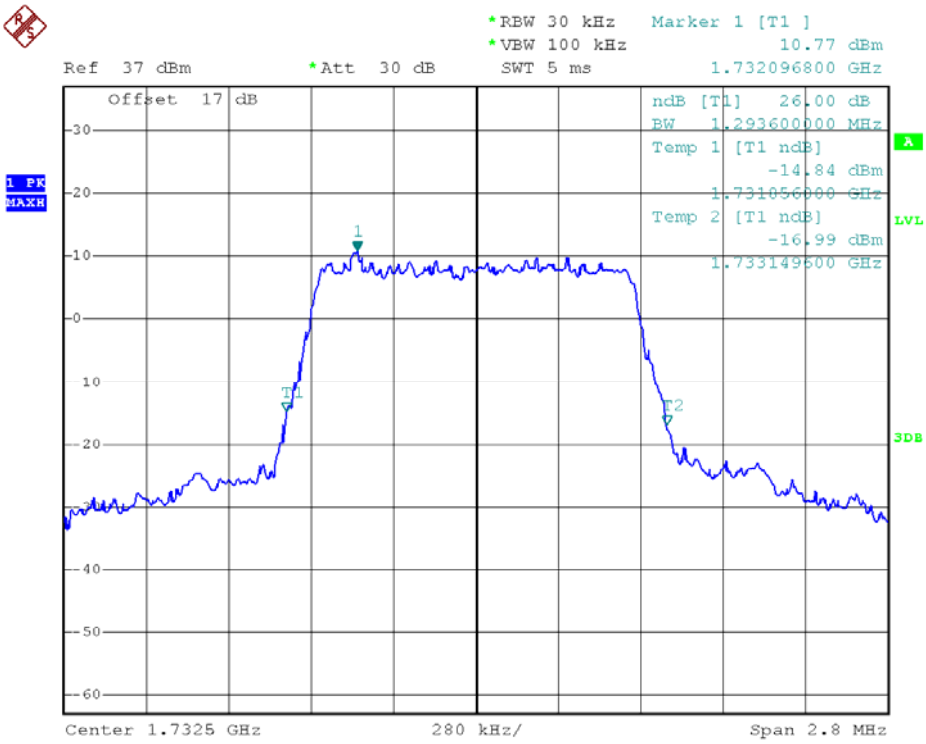
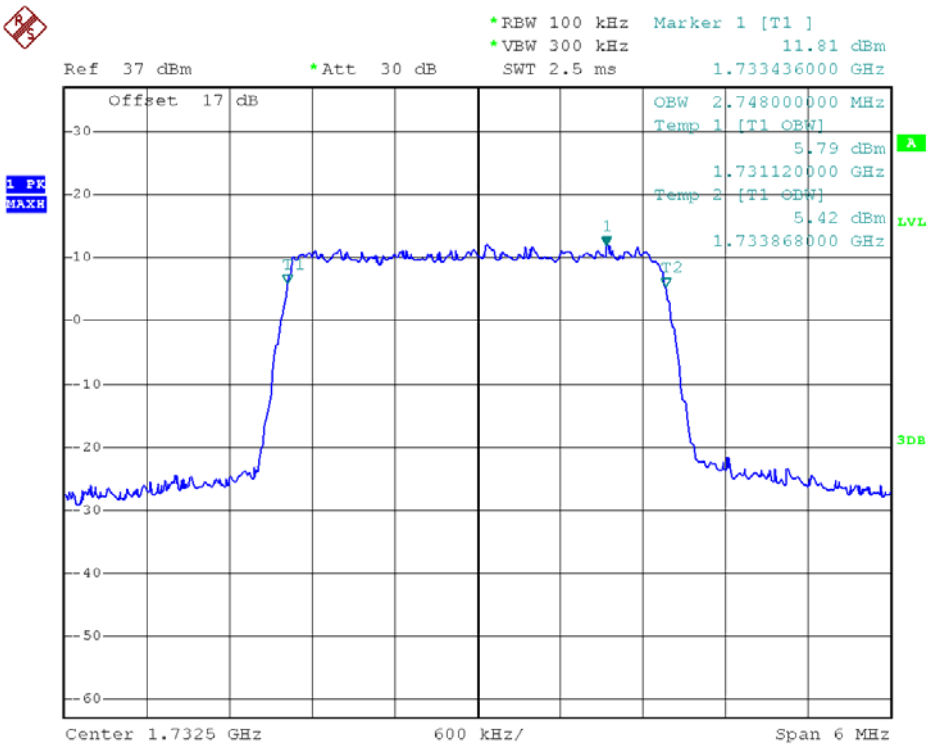



26dB Bandwidth LTE Band 4/1.4MHz/16QAM

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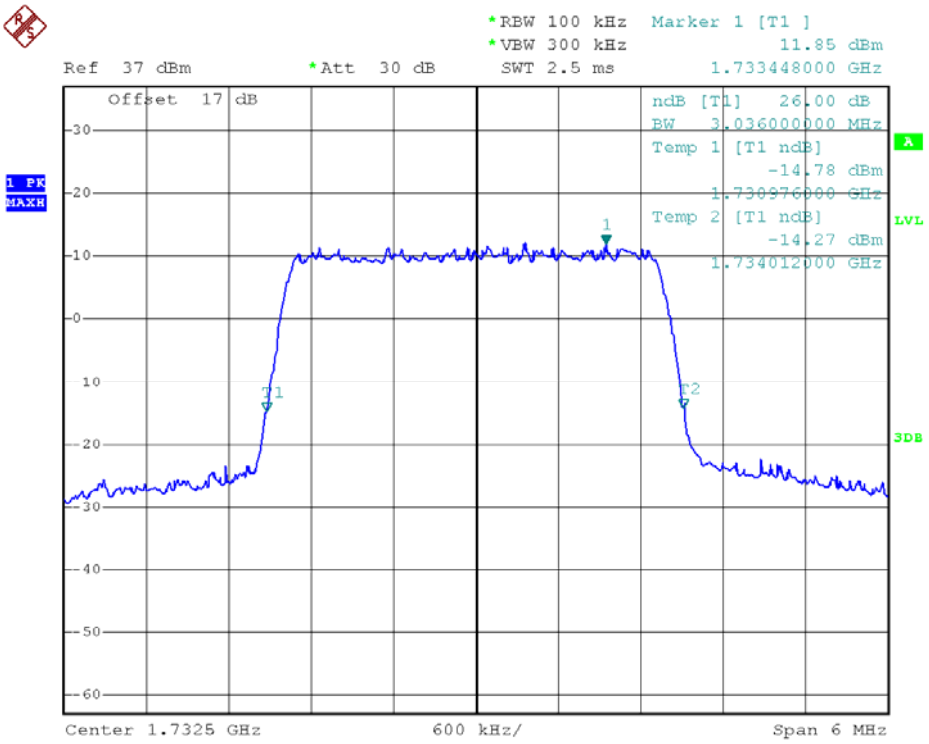
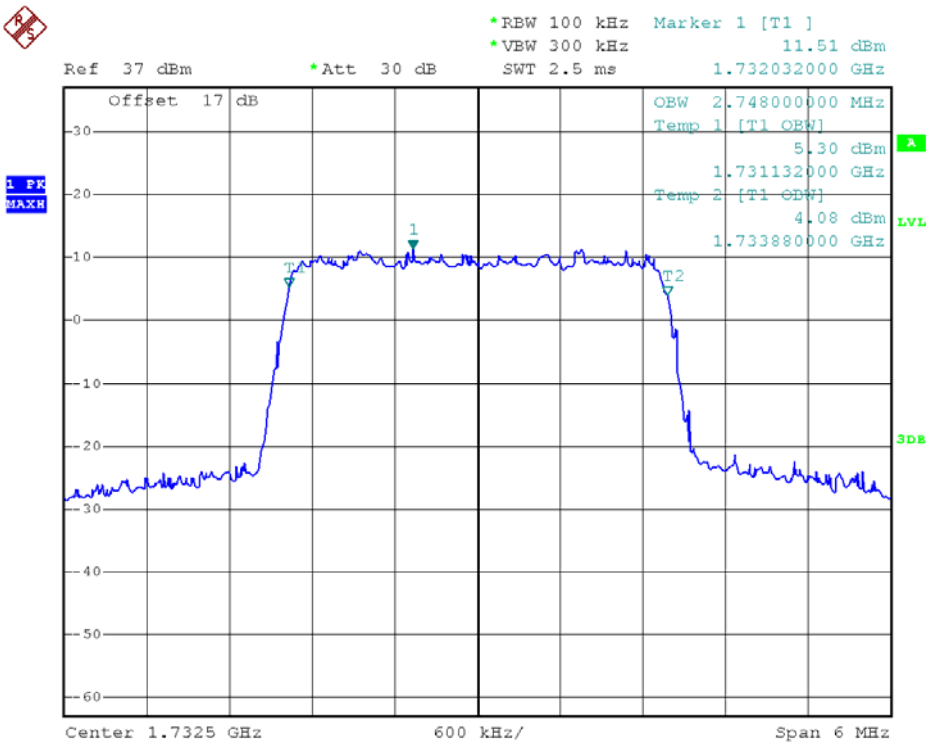



26dB Bandwidth LTE Band 4/3MHz/QPSK

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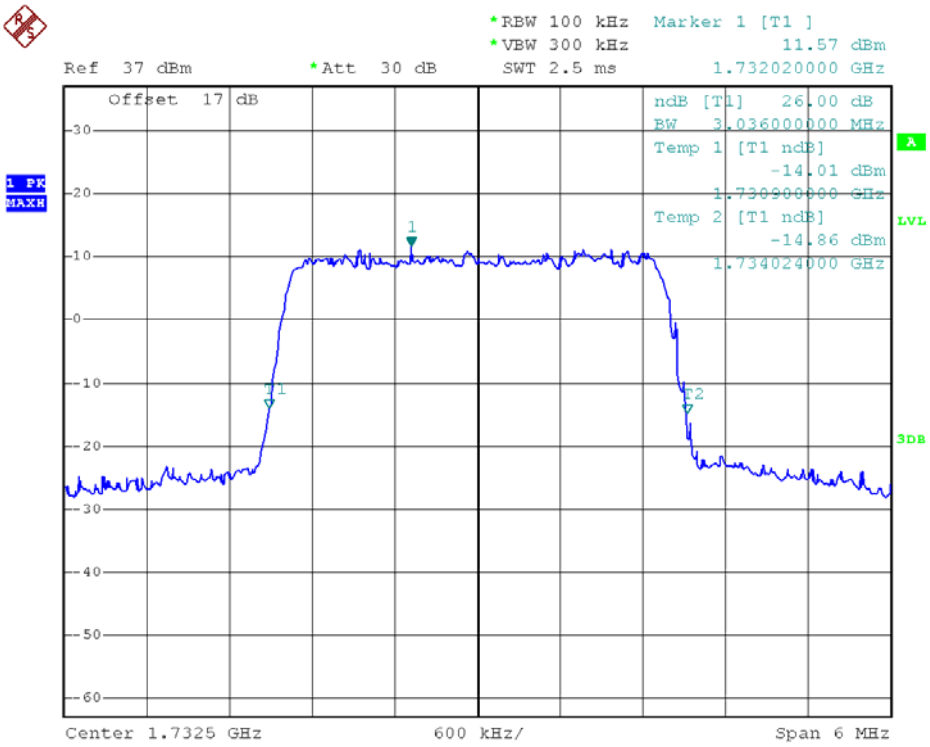
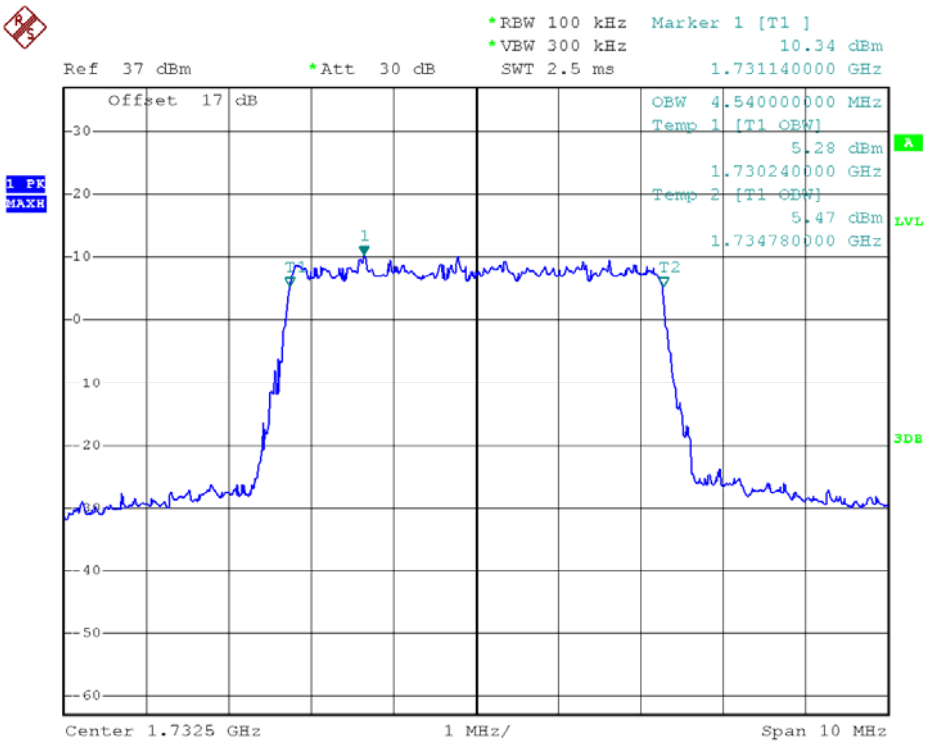
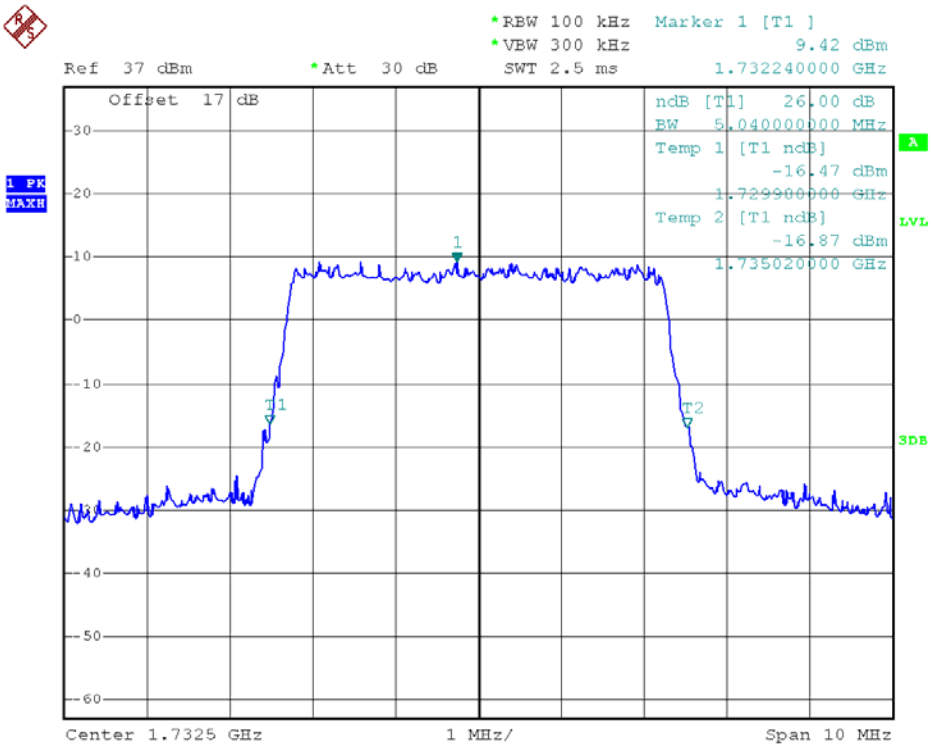


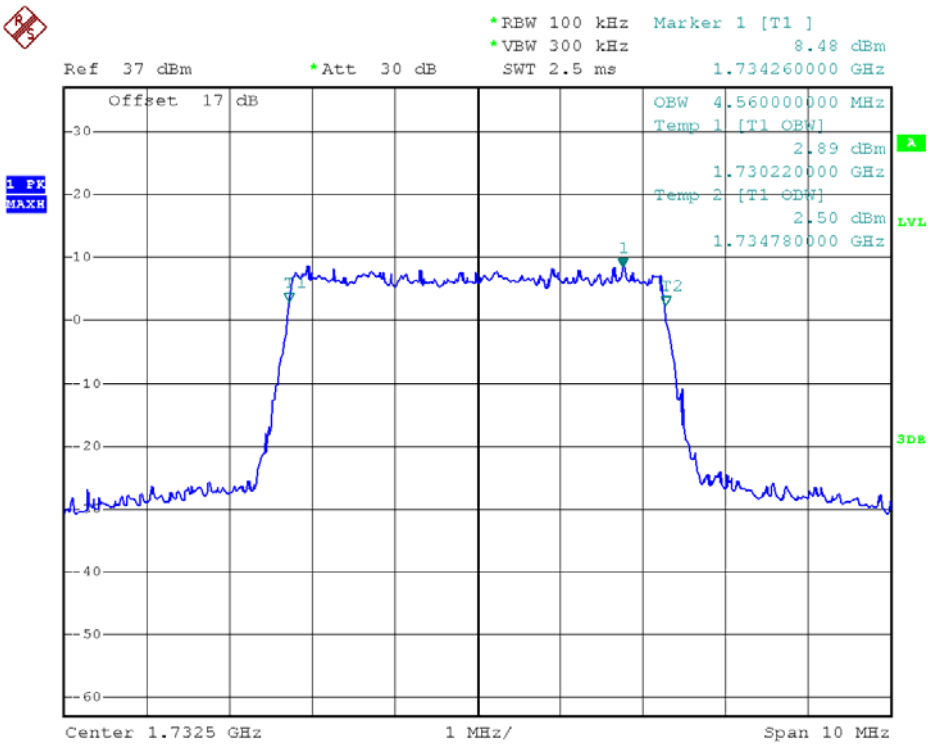

26dB Bandwidth LTE Band 4/3MHz/16QAM



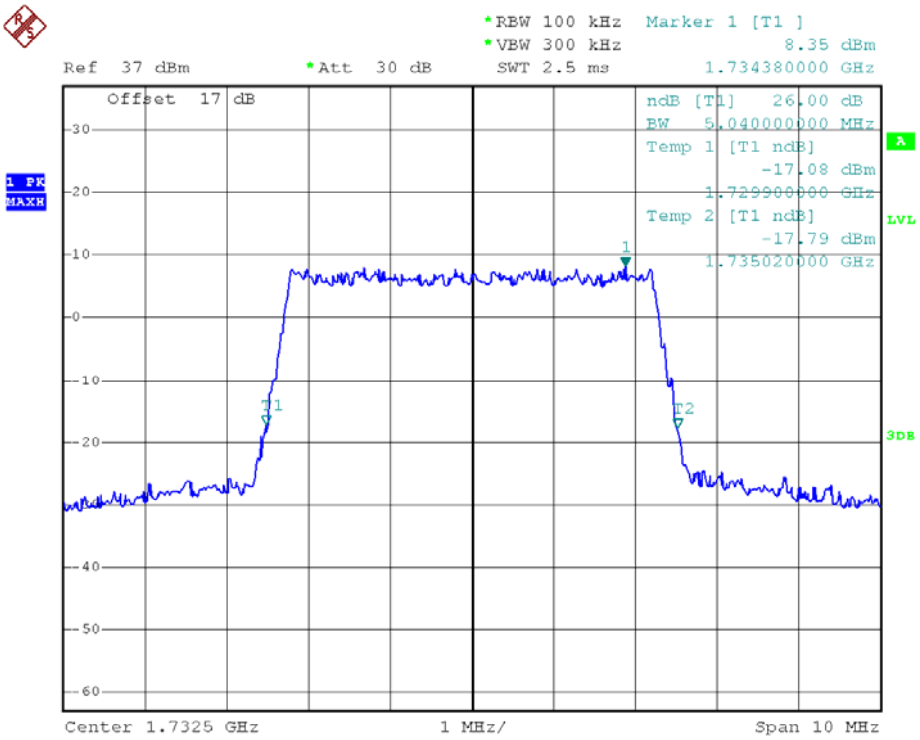

99% Occupied Bandwidth LTE Band 4/5MHz/QPSK



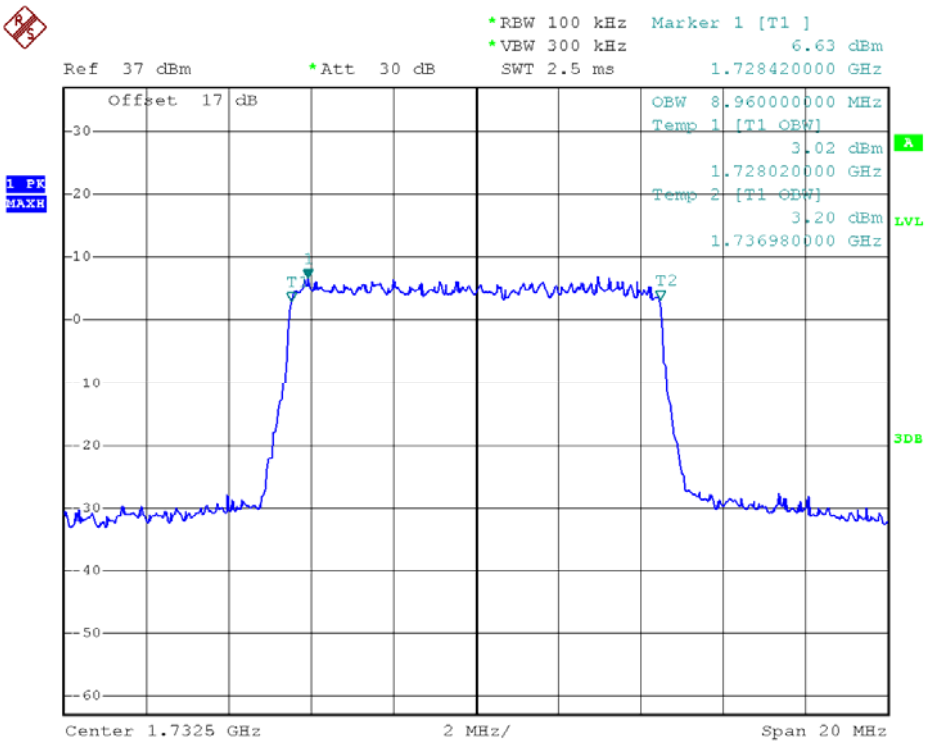

26dB Bandwidth LTE Band 4/5MHz/QPSK



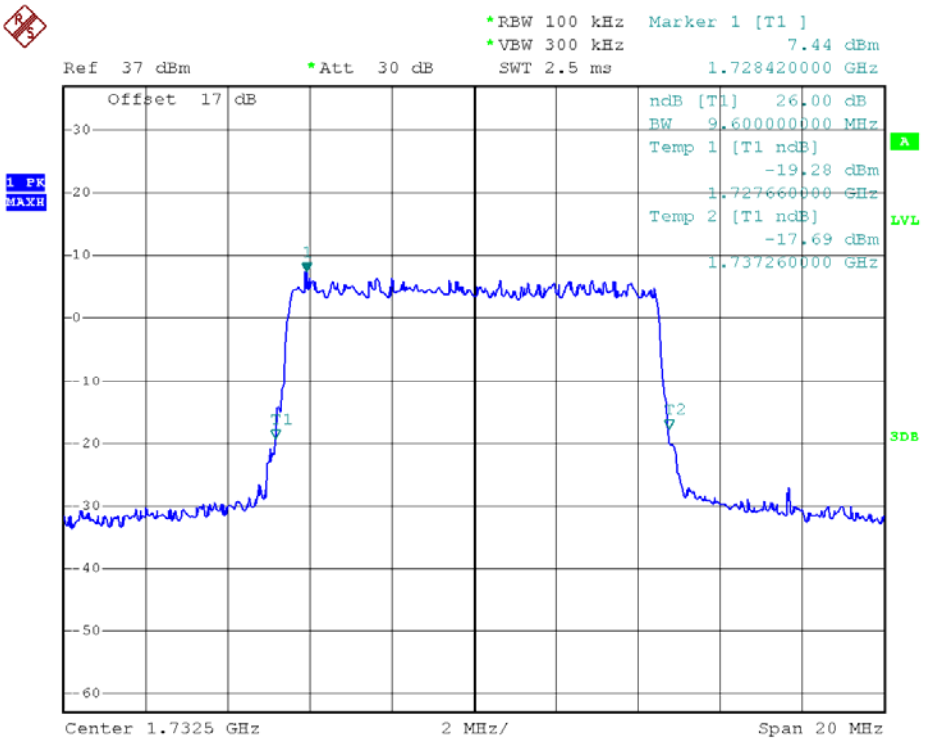

99% Occupied Bandwidth LTE Band 4/5MHz/16QAM



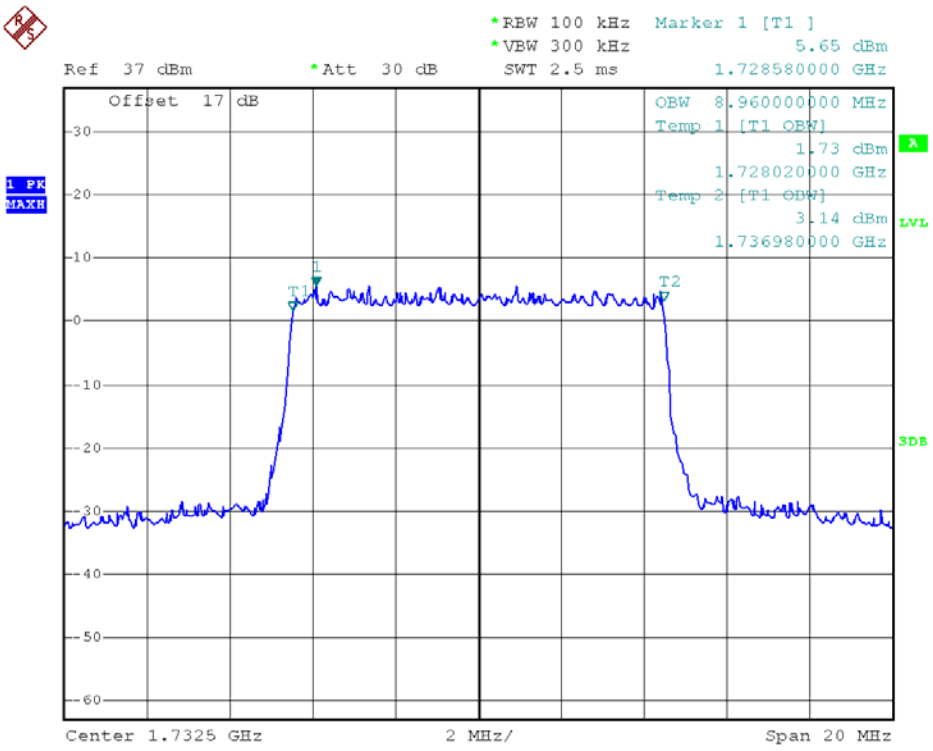

26dB Bandwidth LTE Band 4/5MHz/16QAM




99% Occupied Bandwidth LTE Band 4/10MHz/QPSK




26dB Bandwidth LTE Band 4/10MHz/QPSK

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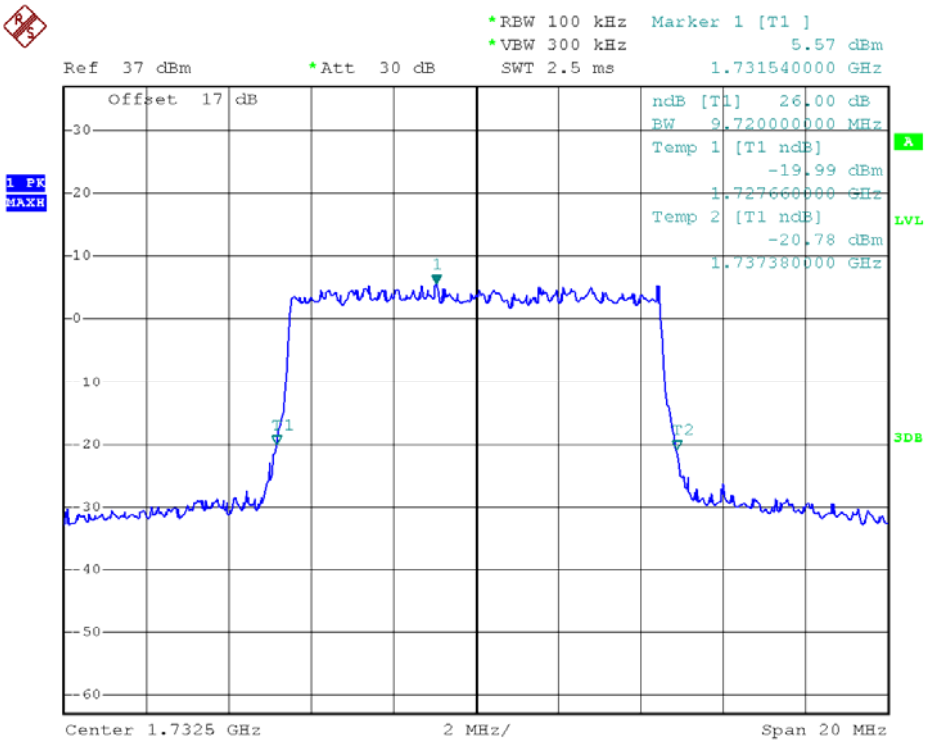
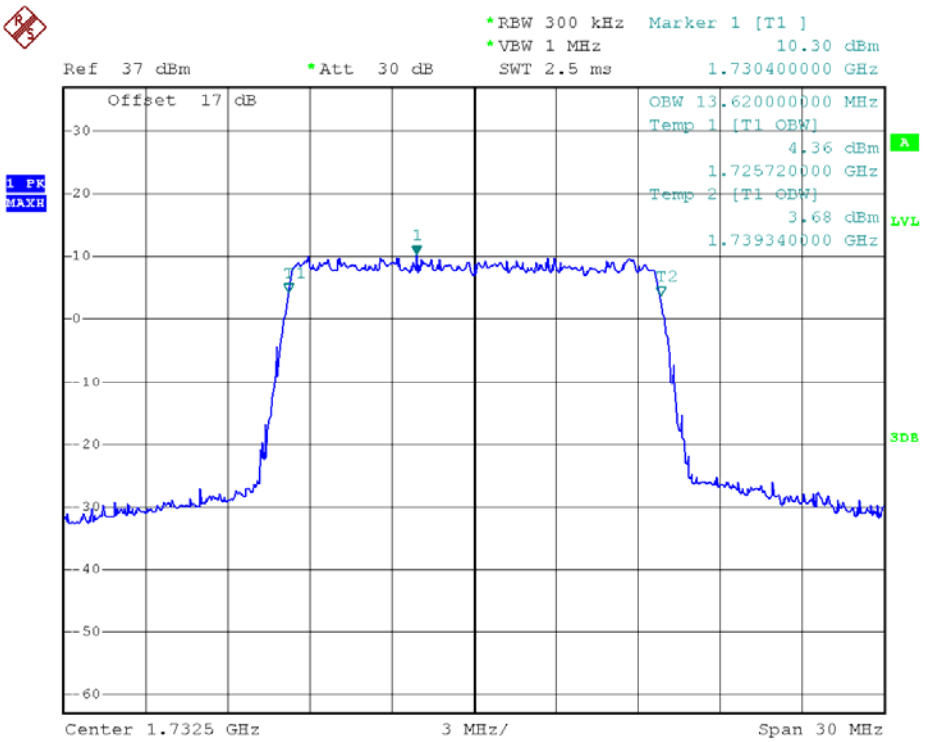



26dB Bandwidth LTE Band 4/10MHz/16QAM

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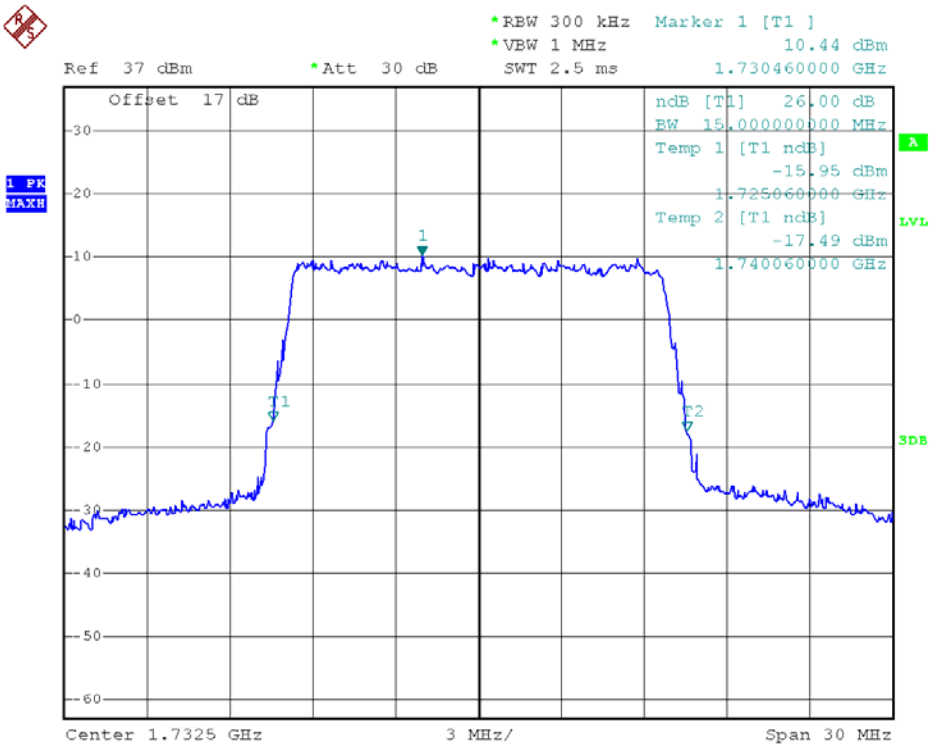
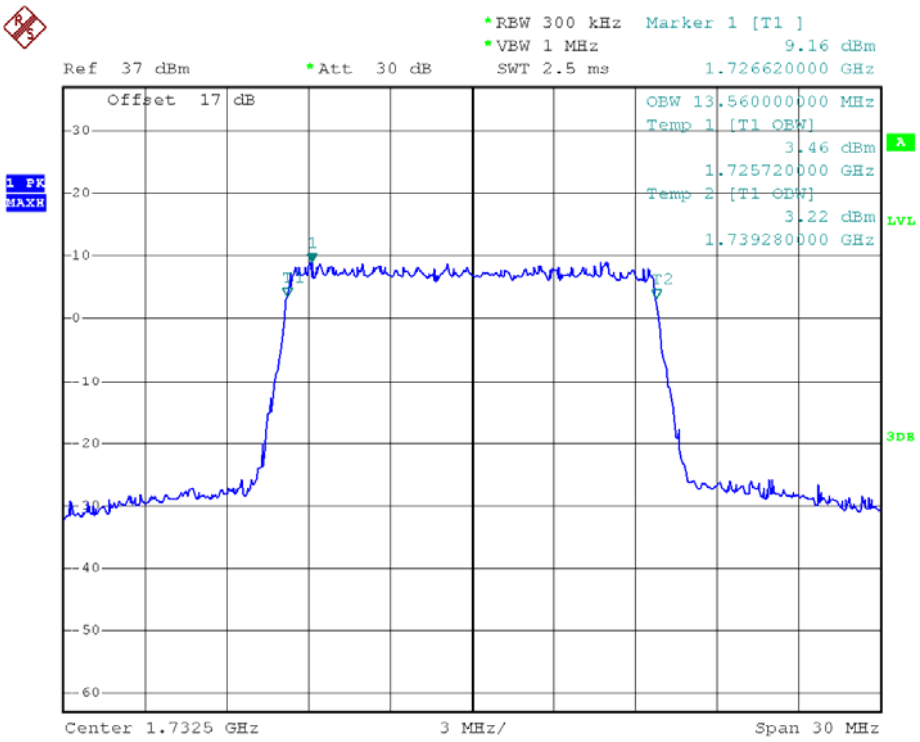
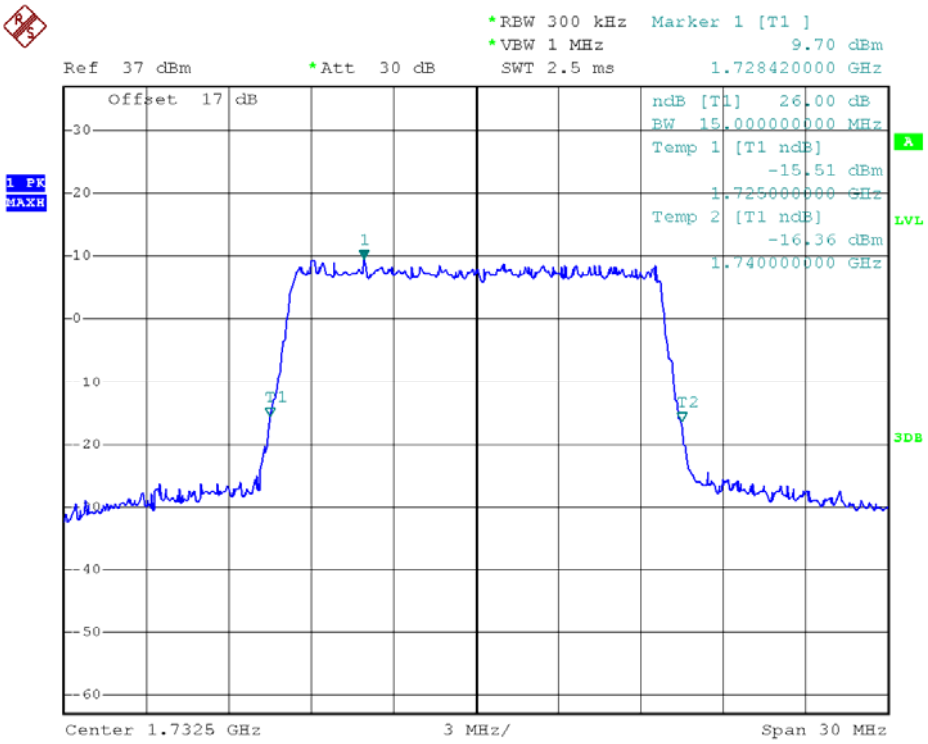


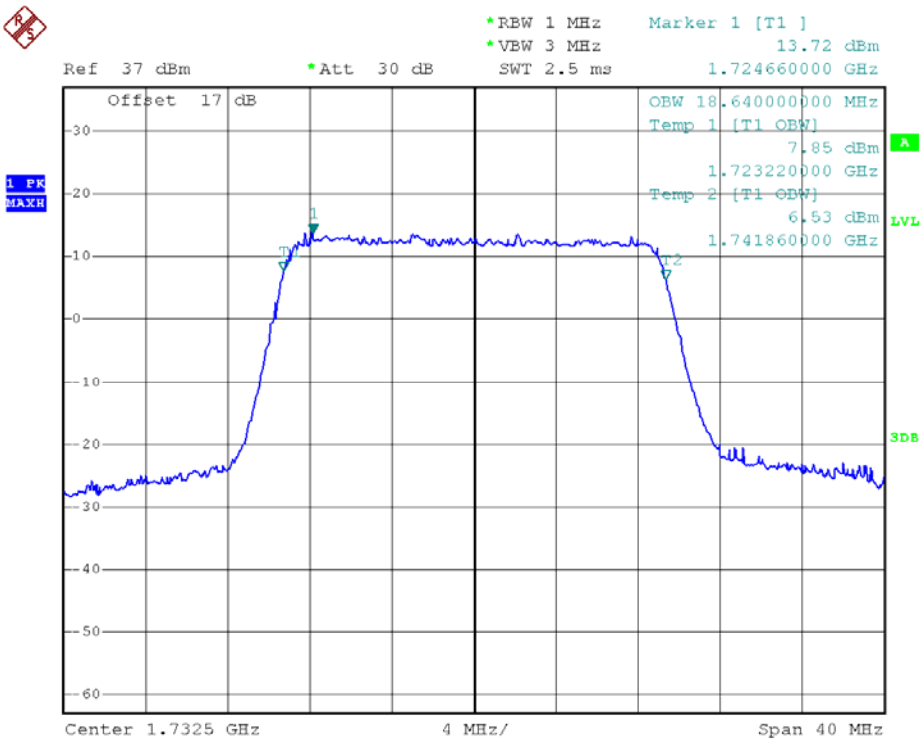

26dB Bandwidth LTE Band 4/15MHz/QPSK



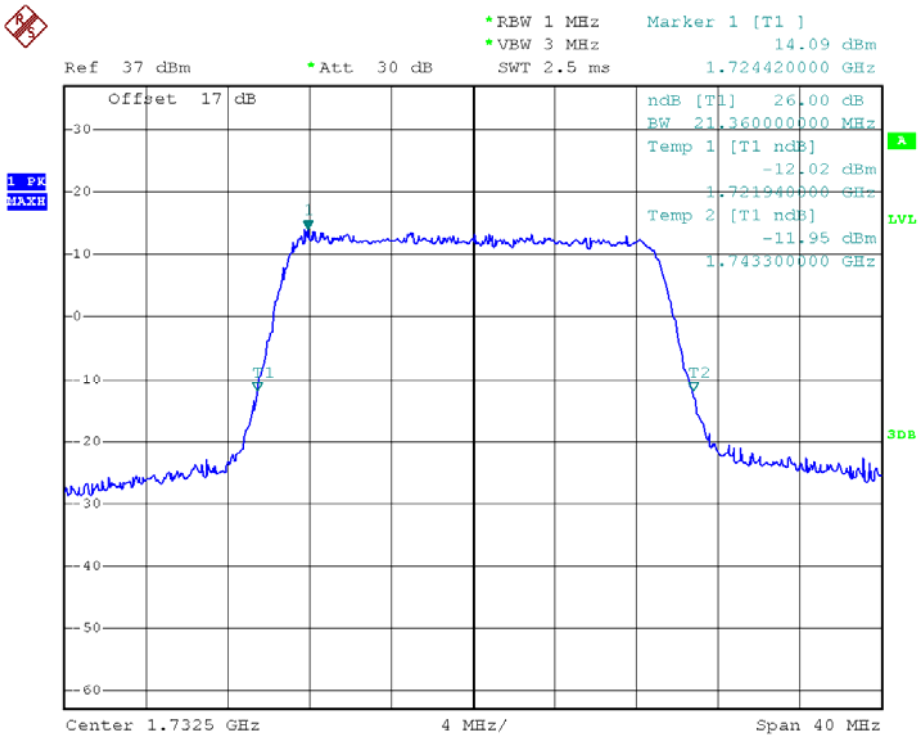

99% Occupied Bandwidth LTE Band 4/15MHz/16QAM



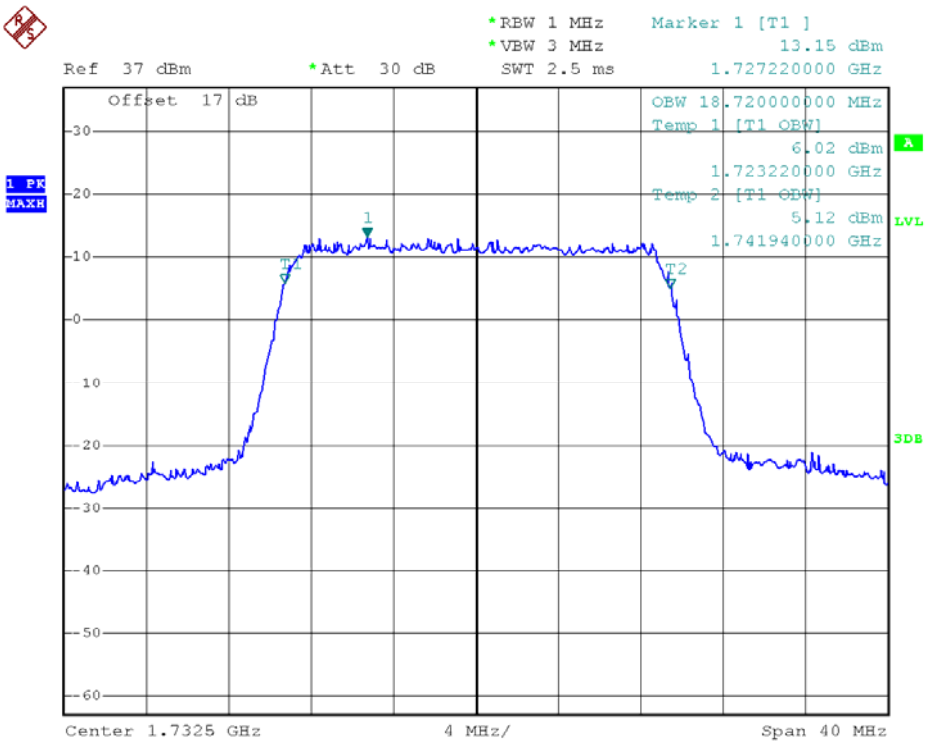

26dB Bandwidth LTE Band 4/15MHz/16QAM




99% Occupied Bandwidth LTE Band 4/20MHz/QPSK




26dB Bandwidth LTE Band 4/20MHz/QPSK

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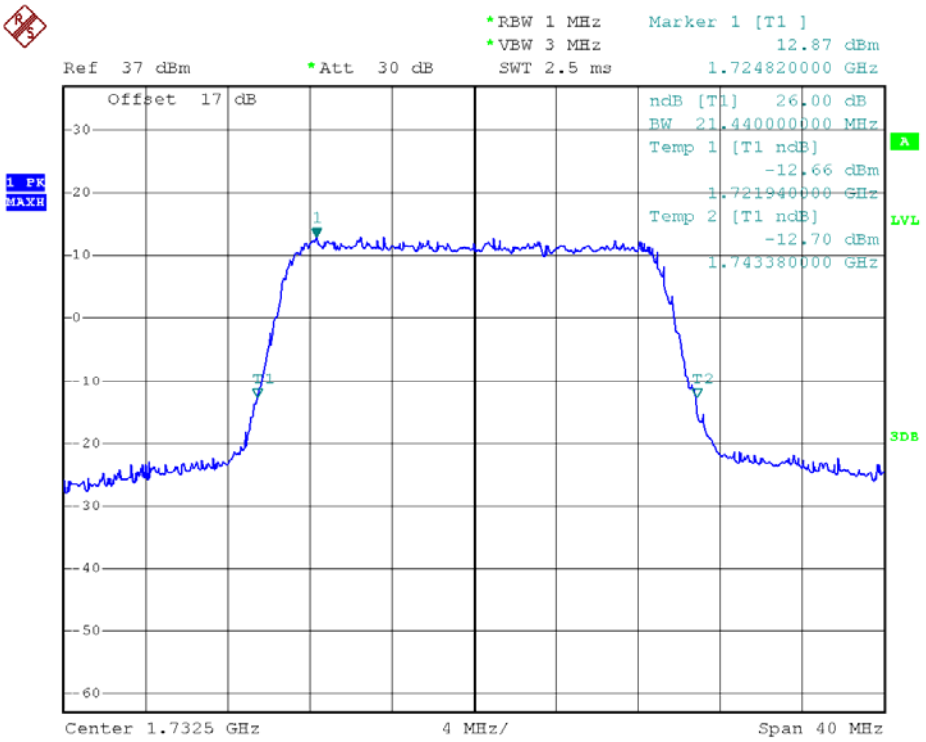
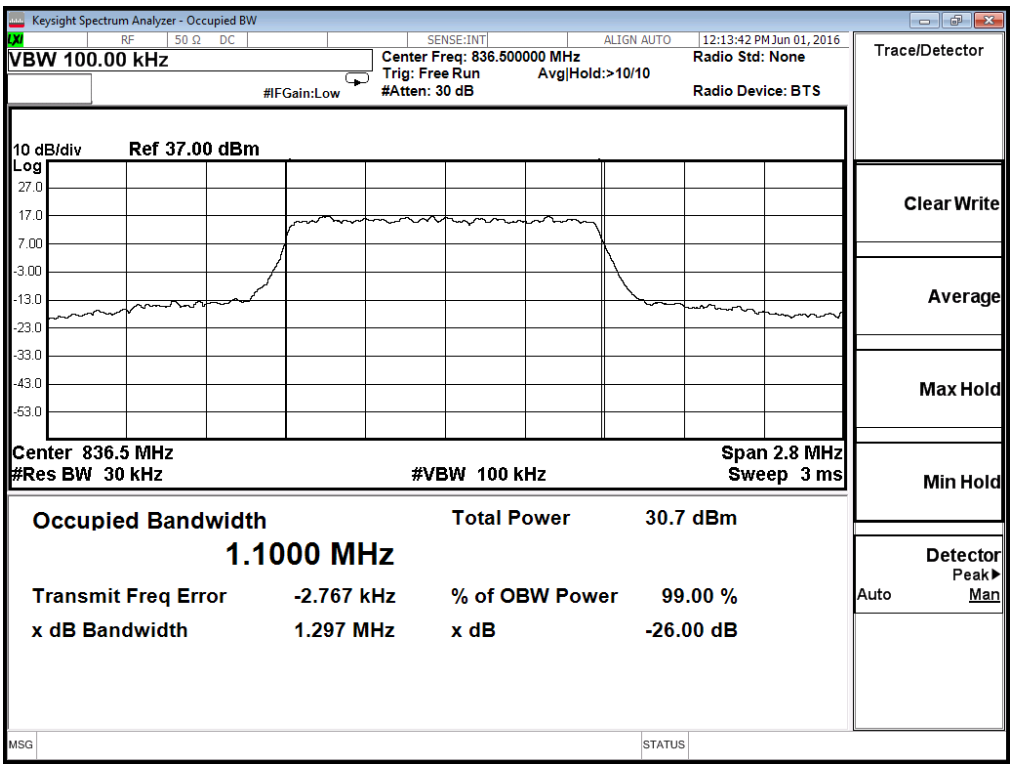
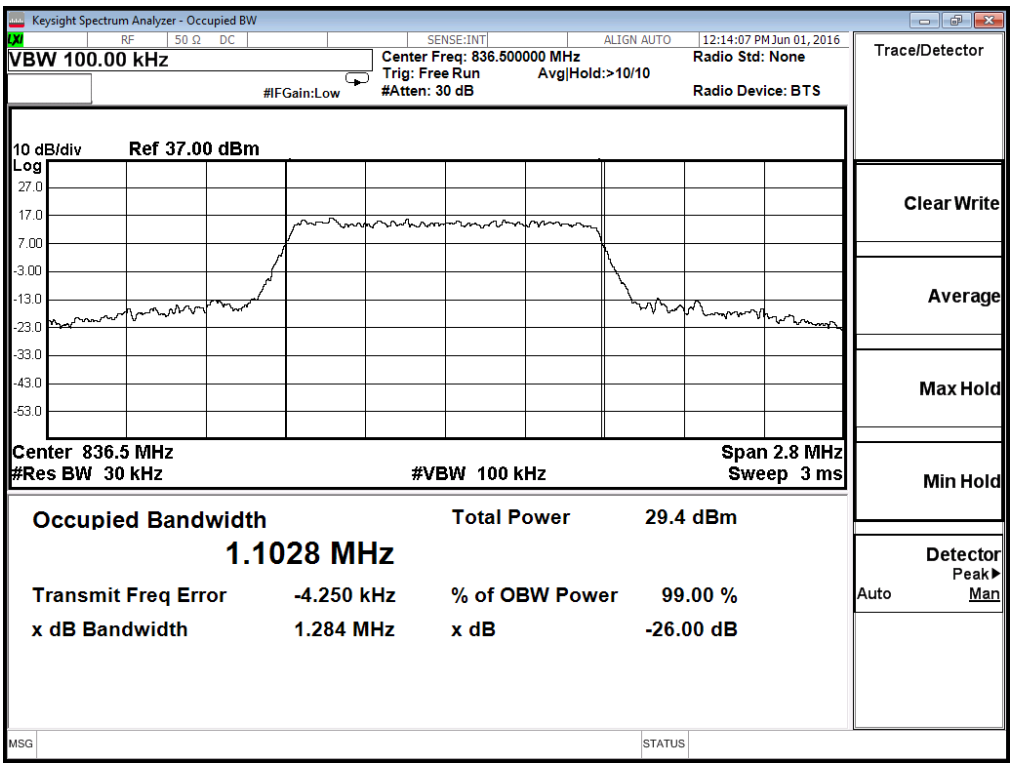



26dB Bandwidth LTE Band 4/20MHz/16QAM




Occupied Bandwidth LTE Band 5/1.4MHz/QPSK

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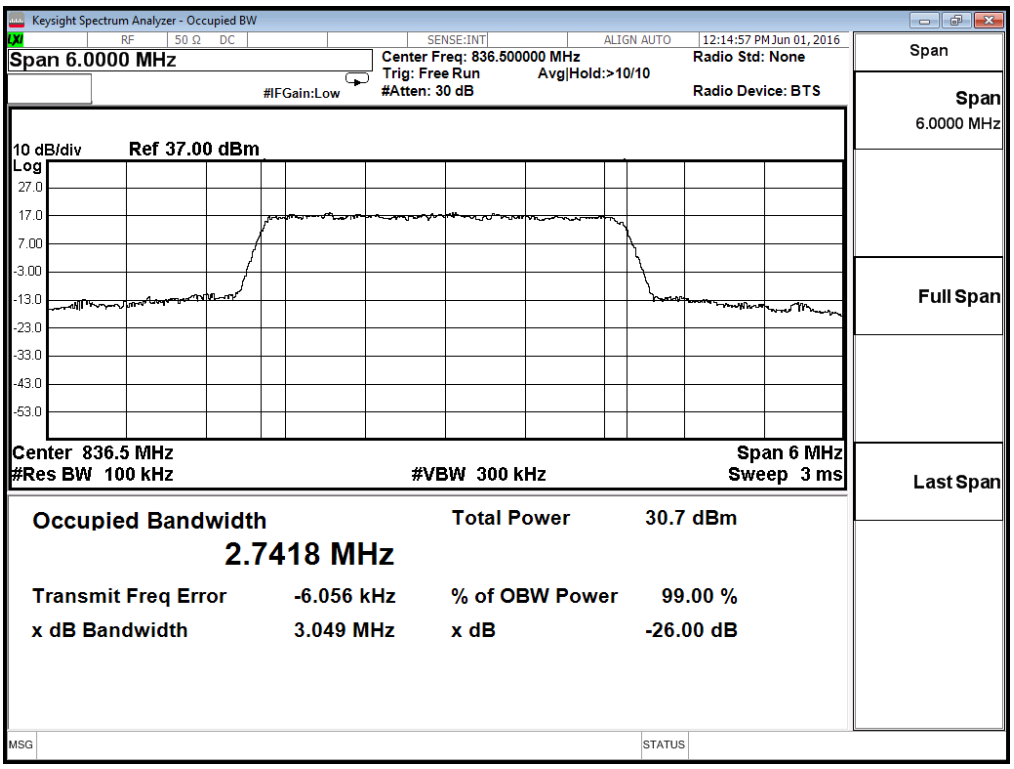


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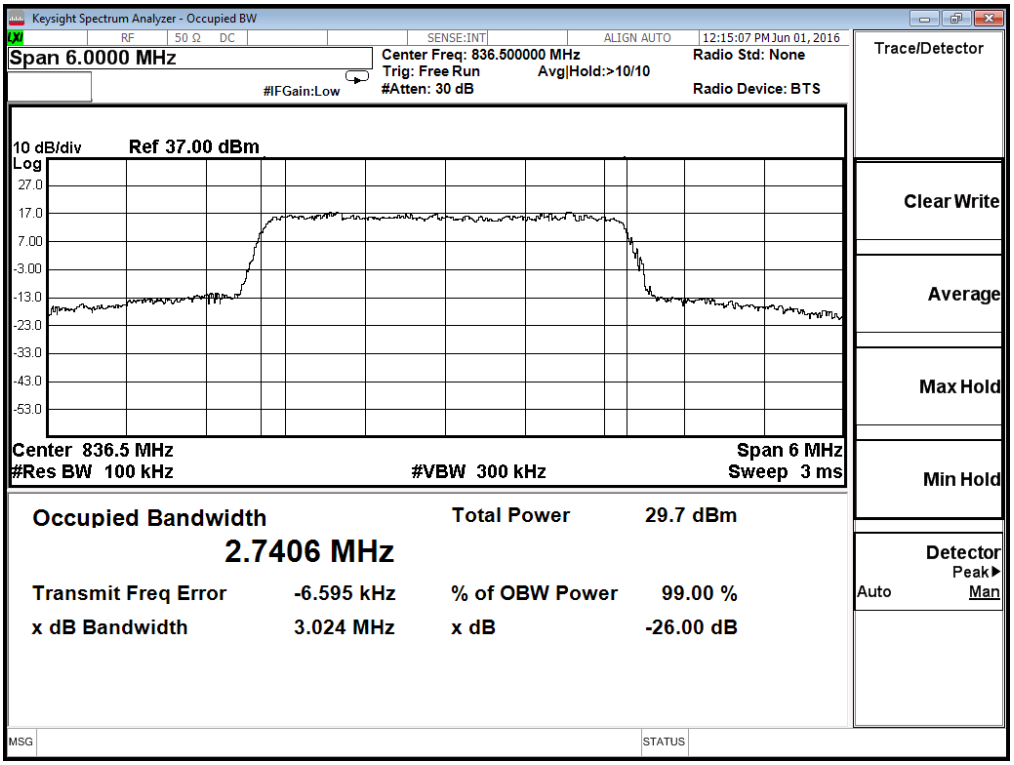


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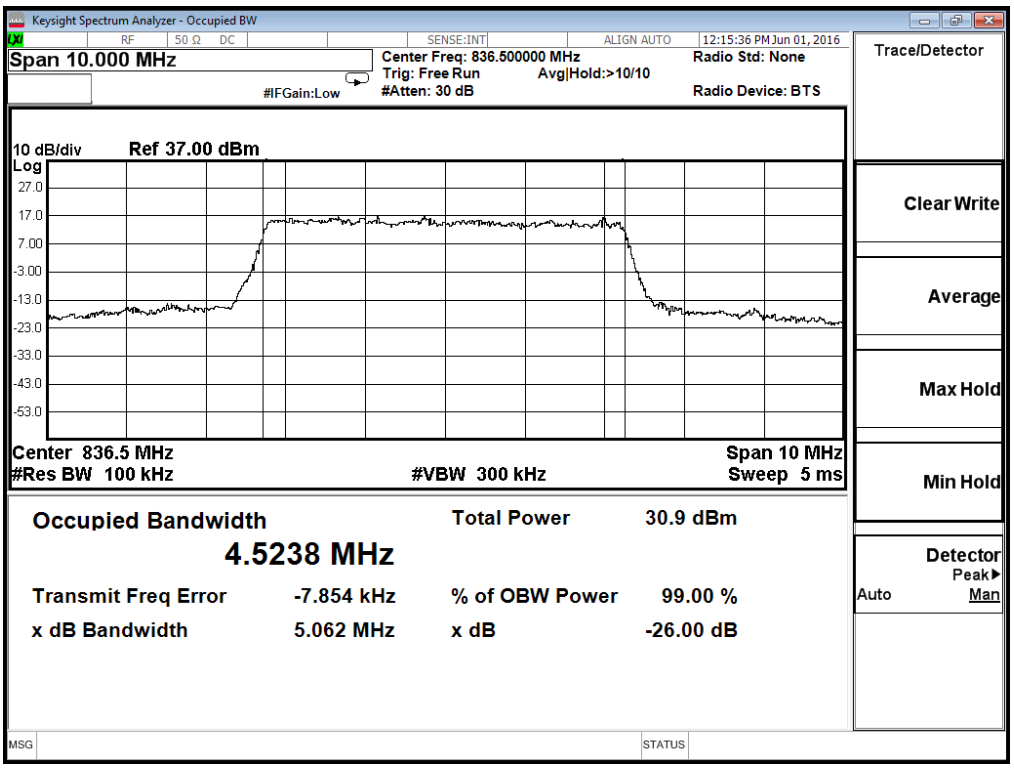
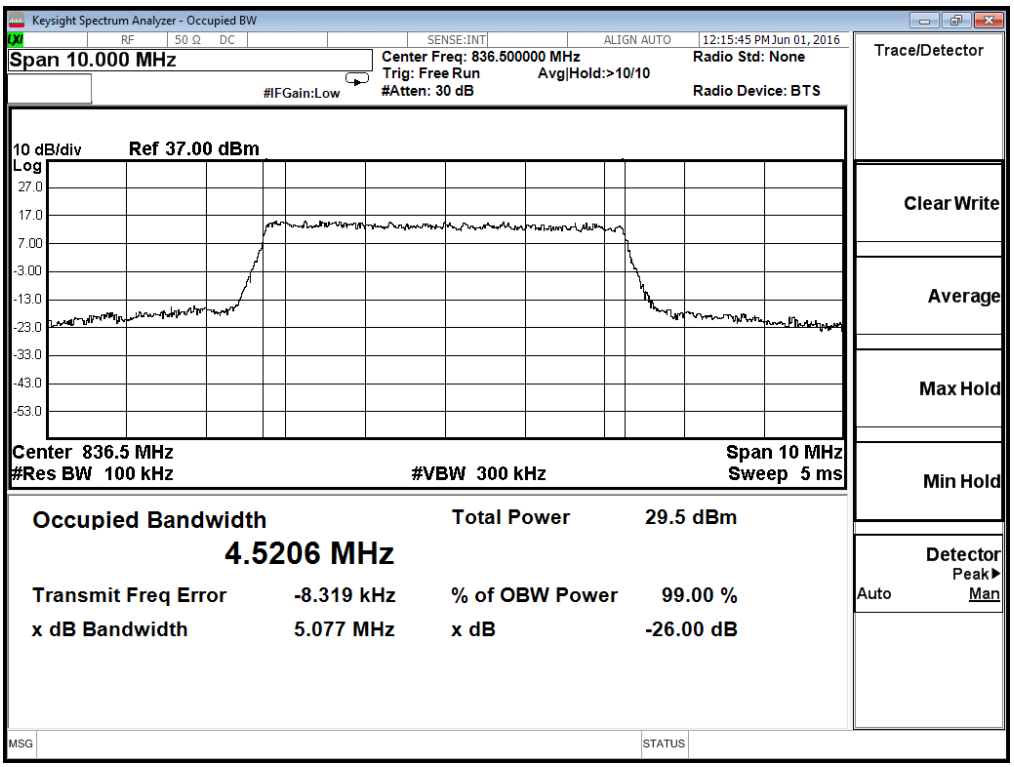
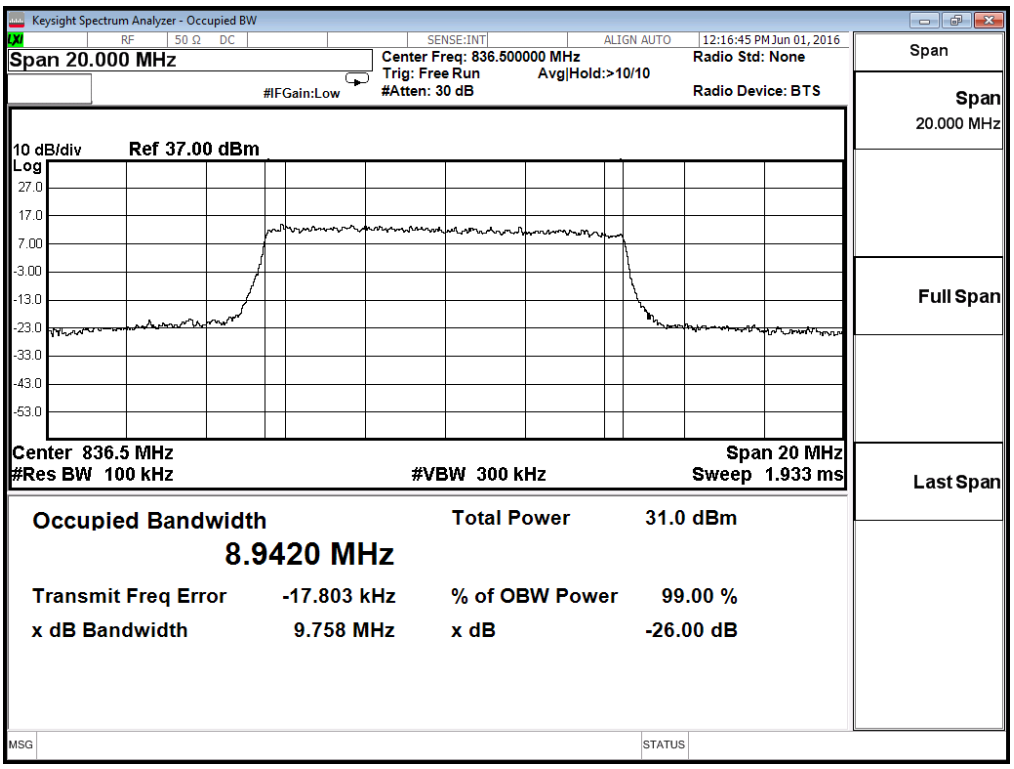



Occupied Bandwidth LTE Band 5/5MHz/QPSK




Occupied Bandwidth LTE Band 5/5MHz/16QAM

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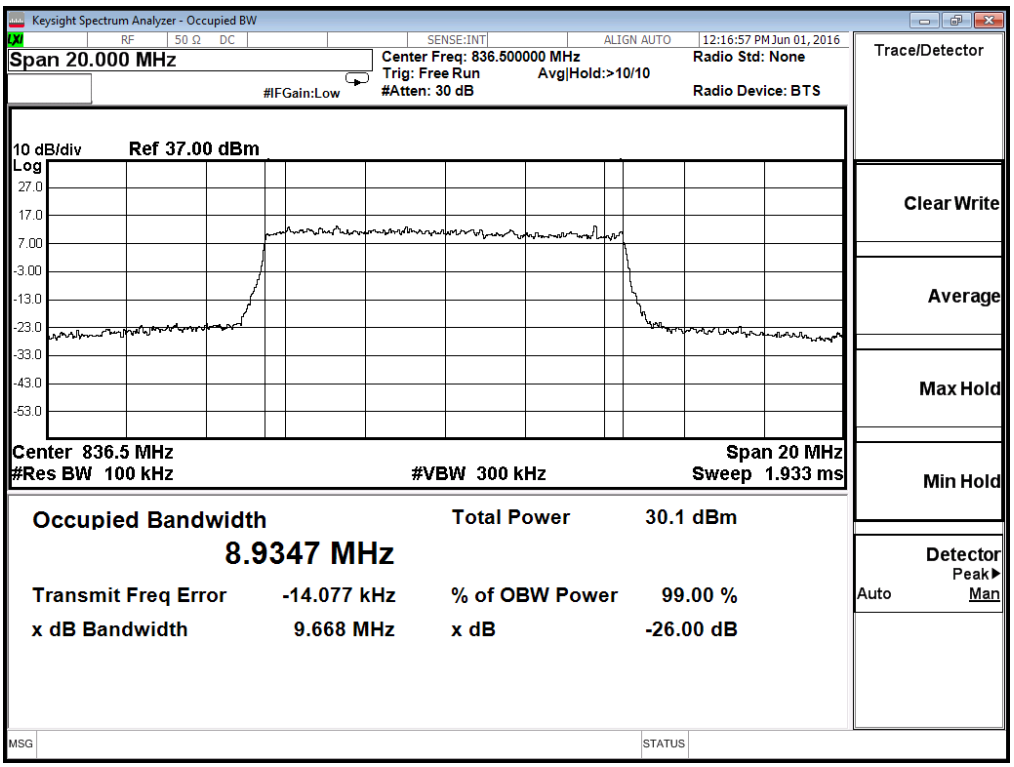


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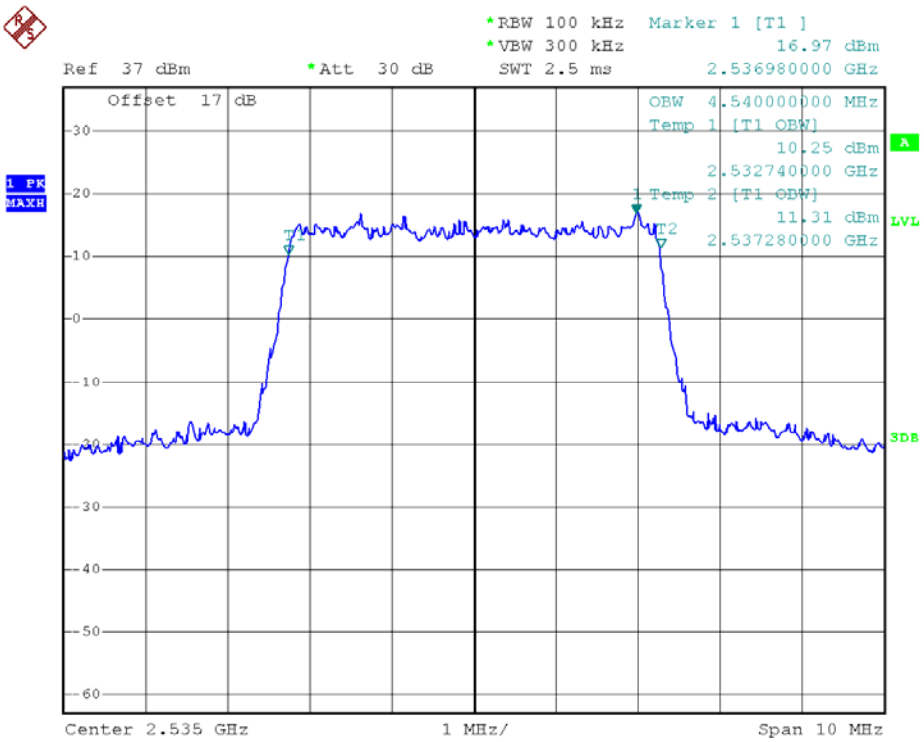
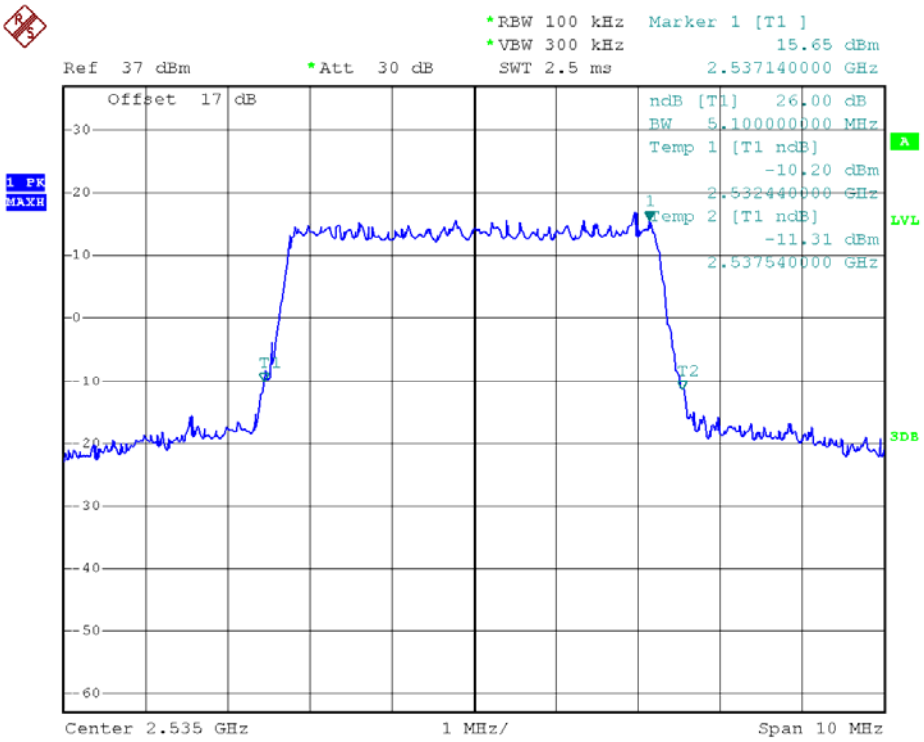
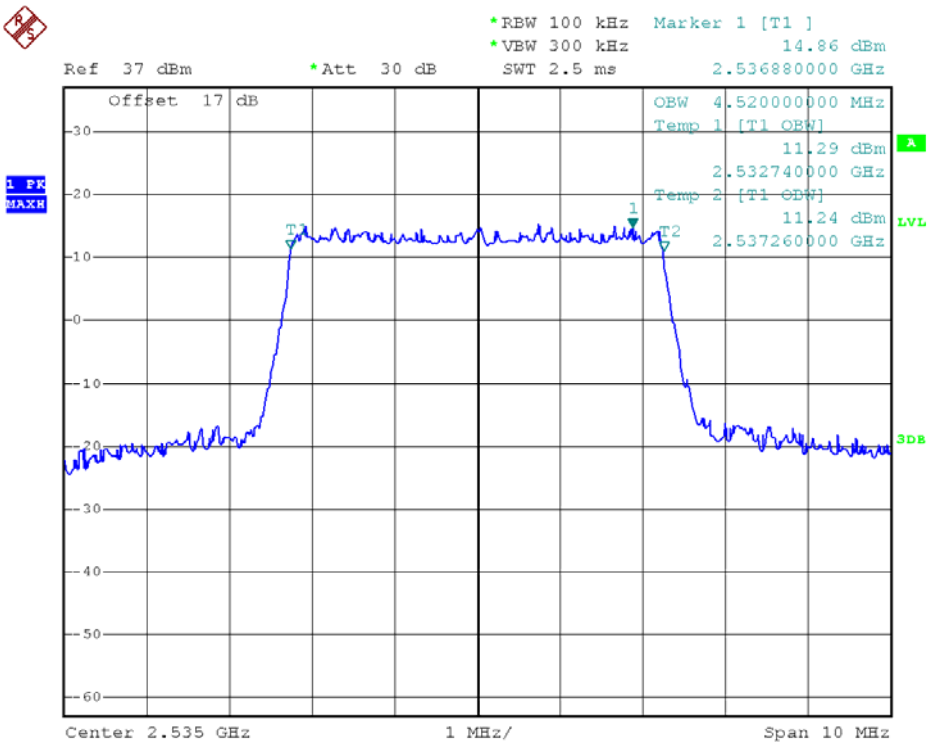



99% Occupied Bandwidth LTE Band 7/5MHz/QPSK




26dB Bandwidth LTE Band 7/5MHz/QPSK

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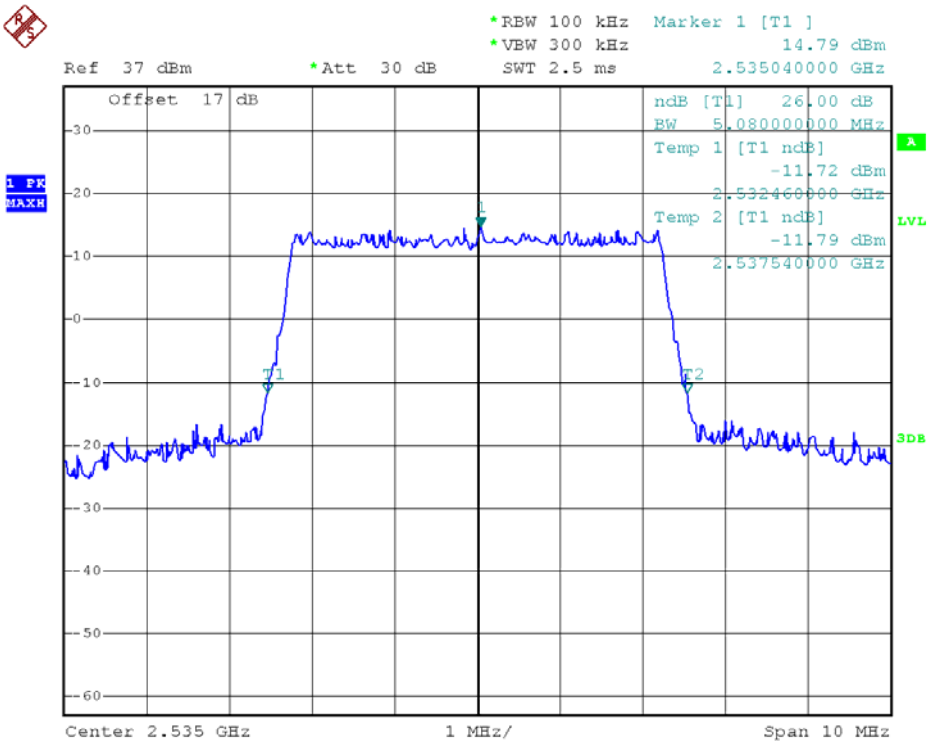
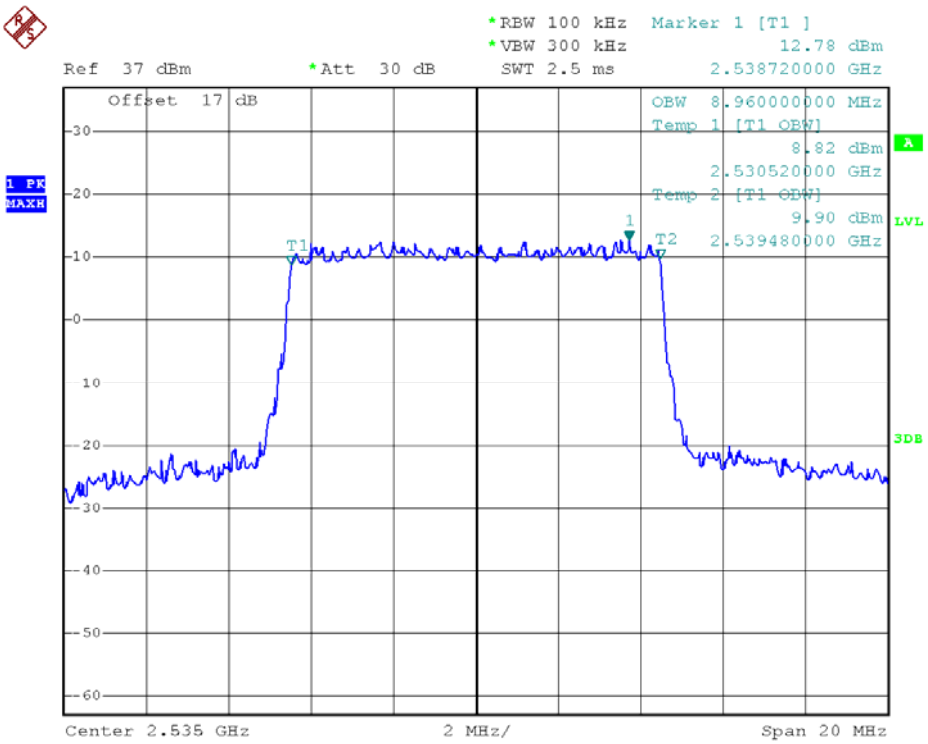
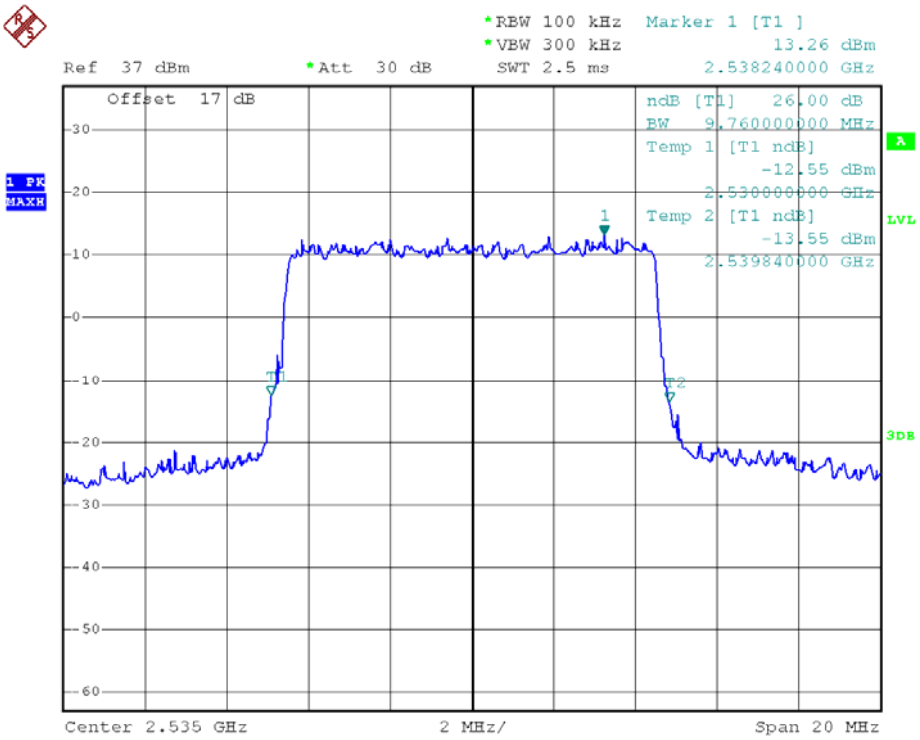


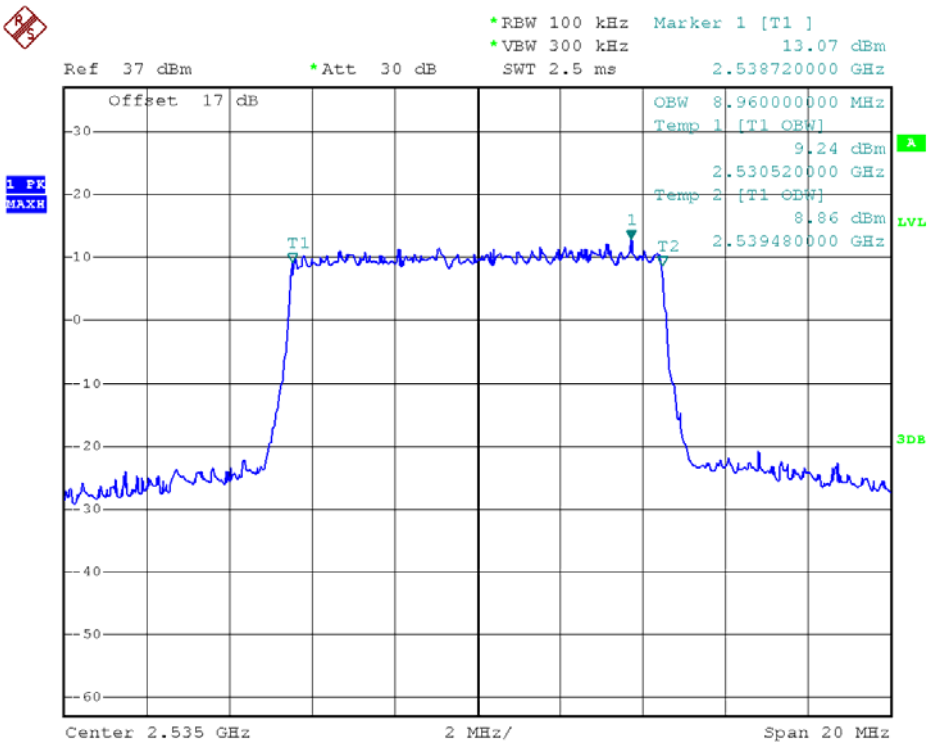

26dB Bandwidth LTE Band 7/5MHz/16QAM



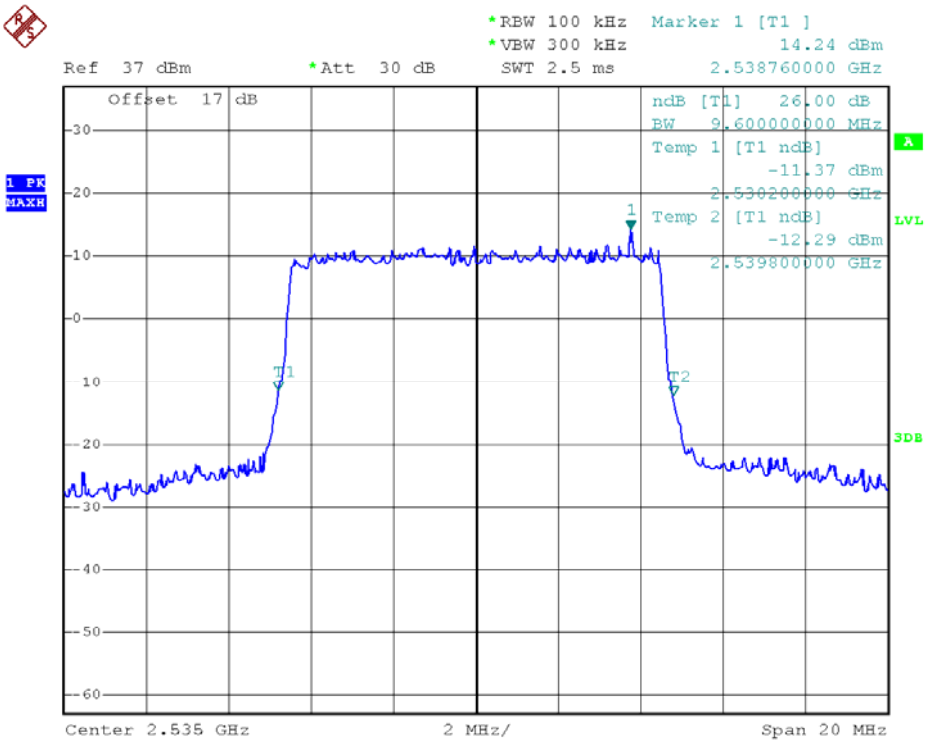

99% Occupied Bandwidth LTE Band 7/10MHz/QPSK



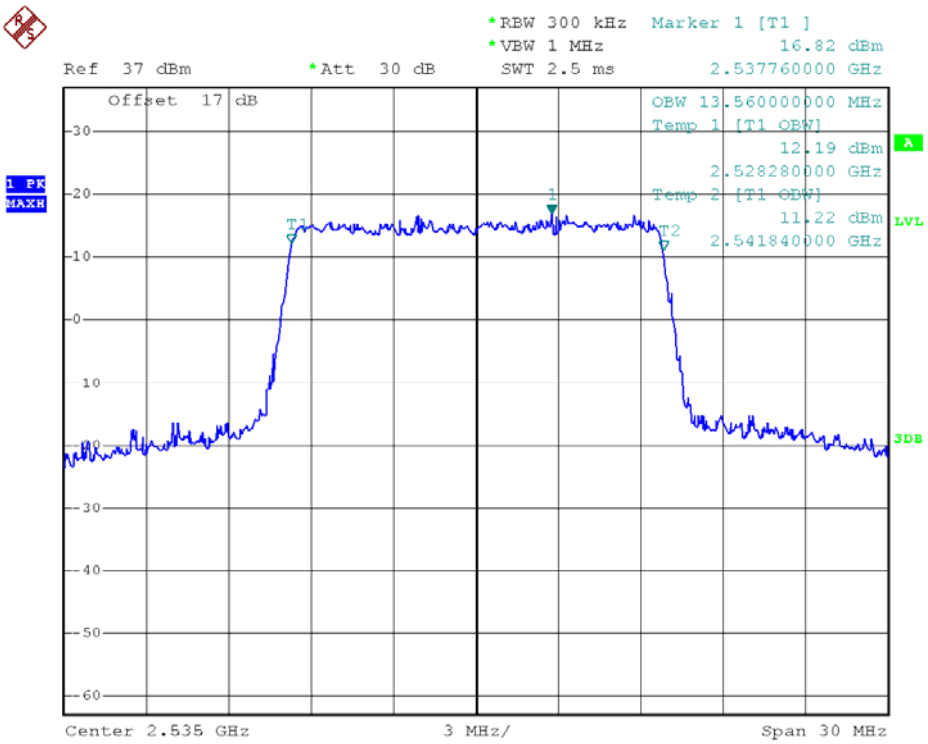

26dB Bandwidth LTE Band 7/10MHz/QPSK




99% Occupied Bandwidth LTE Band 7/10MHz/16QAM




26dB Bandwidth LTE Band 7/10MHz/16QAM

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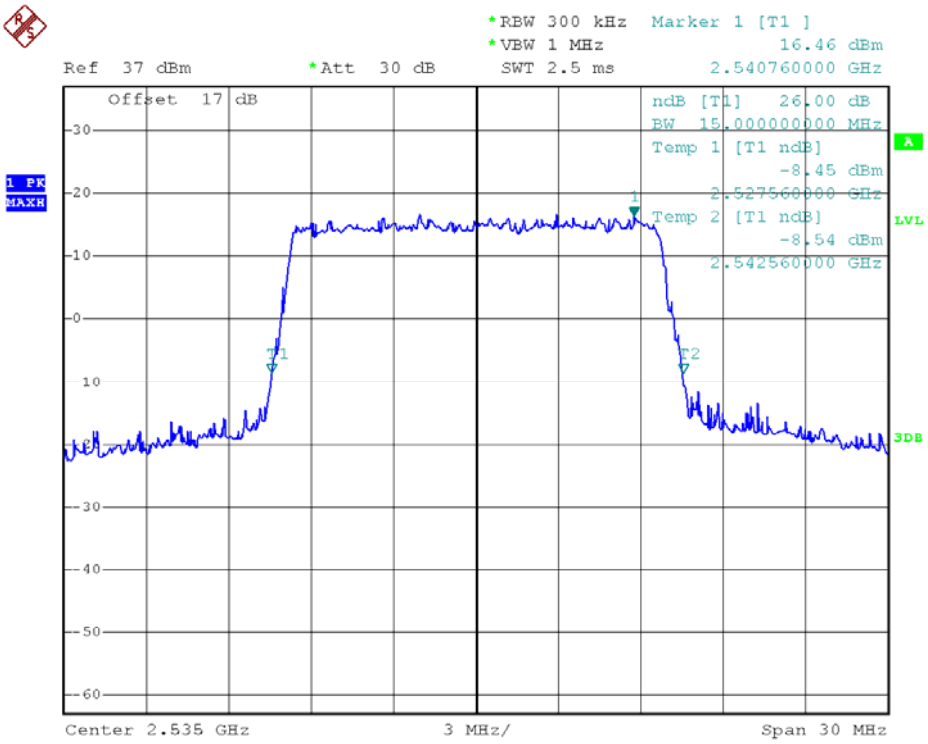
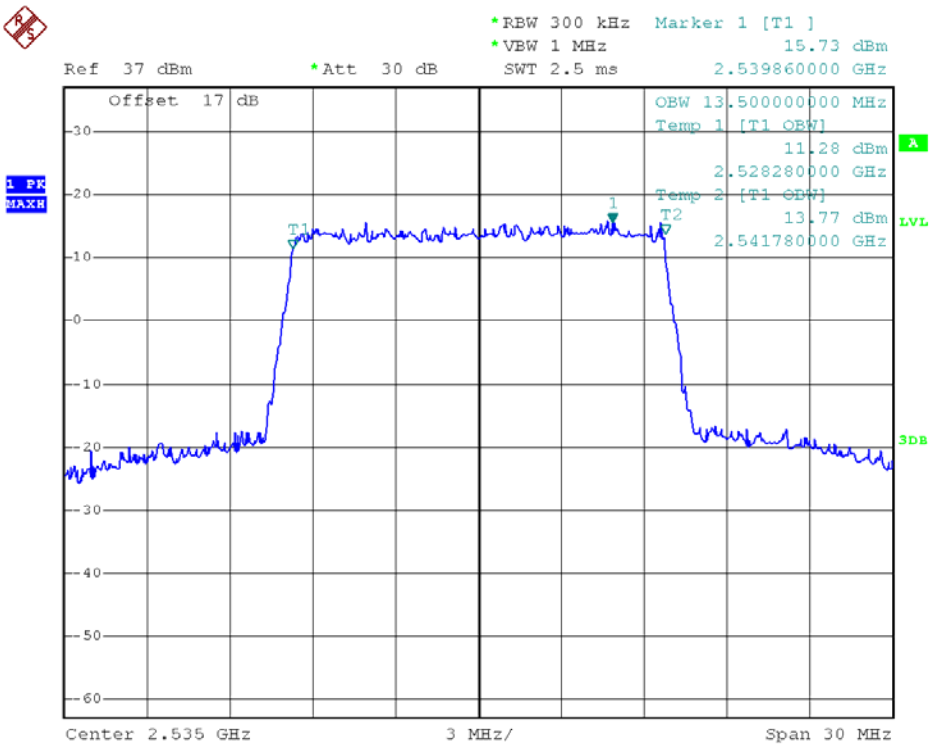
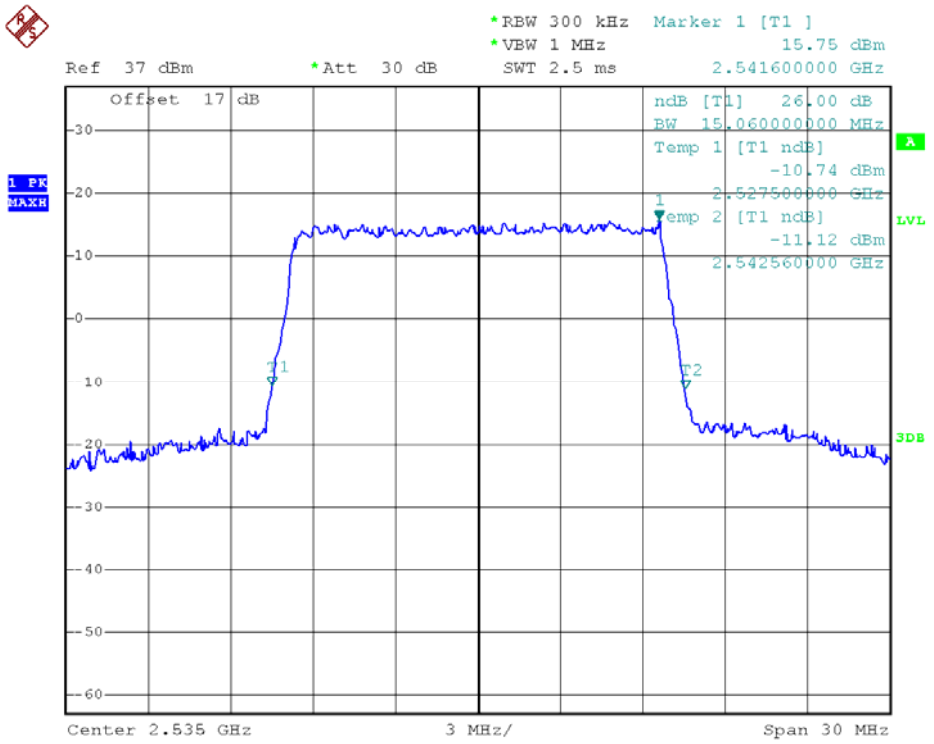


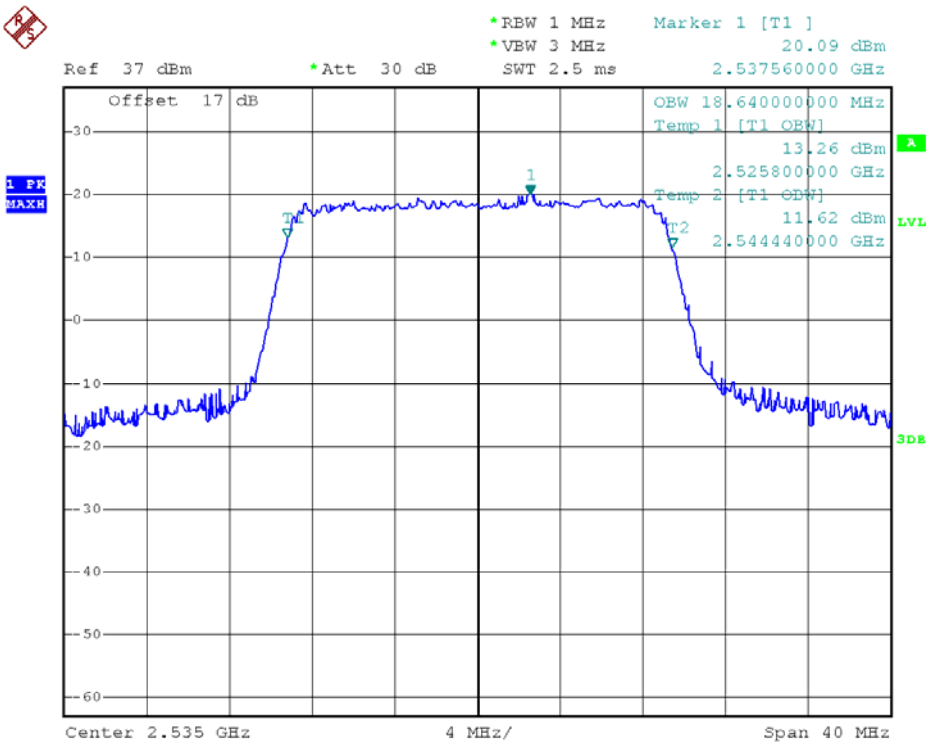

26dB Bandwidth LTE Band 7/15MHz/QPSK



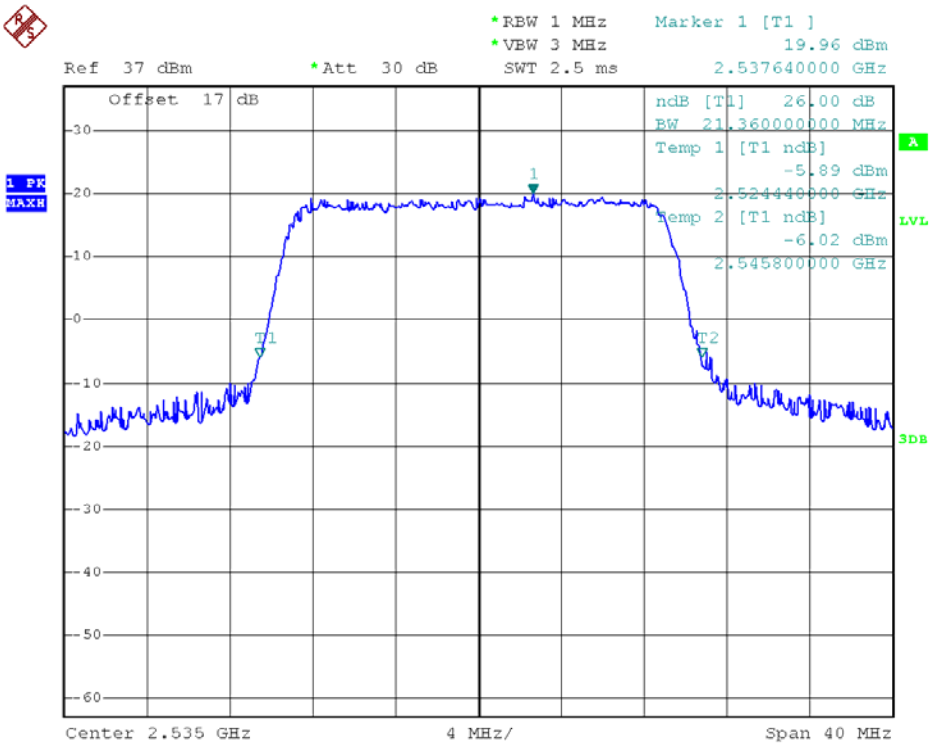

99% Occupied Bandwidth LTE Band 7/15MHz/16QAM



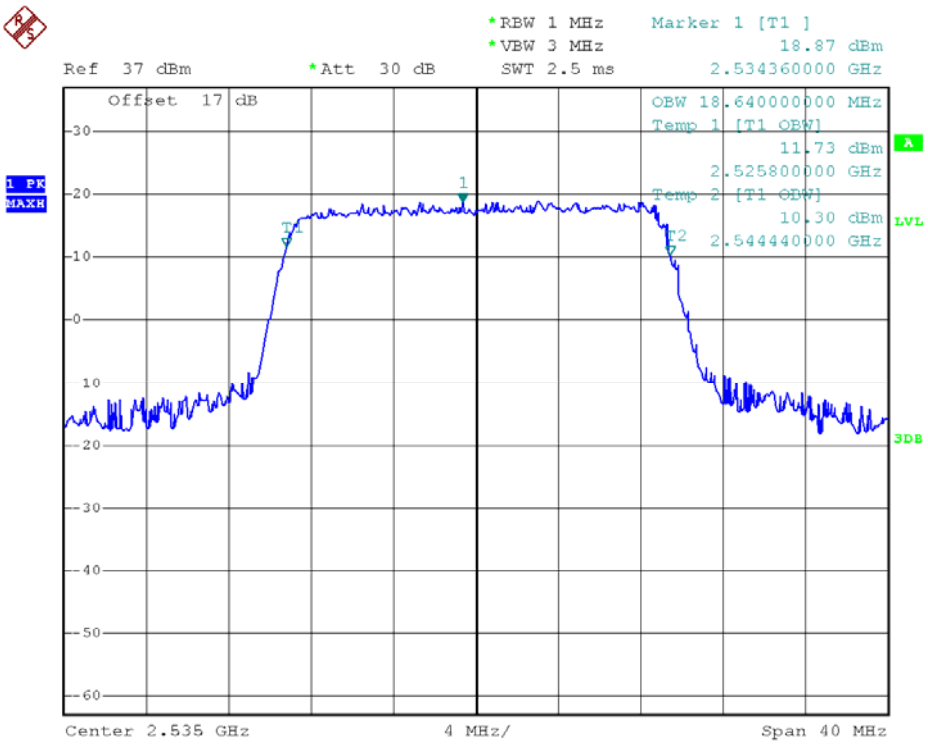

26dB Bandwidth LTE Band 7/15MHz/16QAM



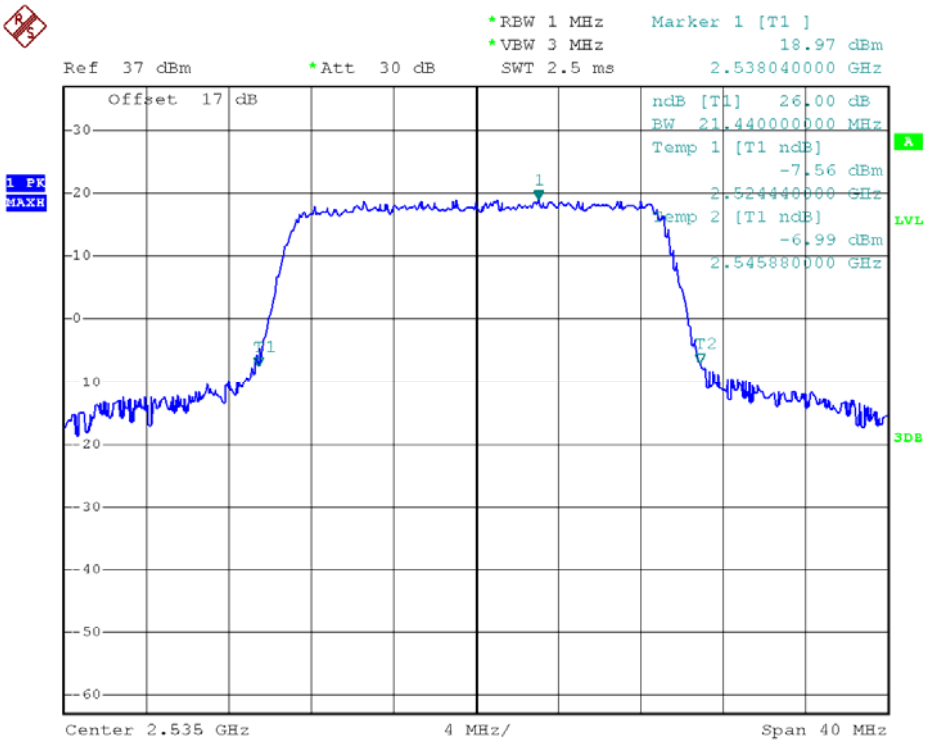

99% Occupied Bandwidth LTE Band 7/20MHz/QPSK




26dB Bandwidth LTE Band 7/20MHz/QPSK




99% Occupied Bandwidth LTE Band 7/20MHz/16QAM




26dB Bandwidth LTE Band 7/20MHz/16QAM

## 2.4 Frequency Stability

### 2.4.1 Requirement

According to FCC section 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency. According to FCC section 2.1055, the test conditions are:

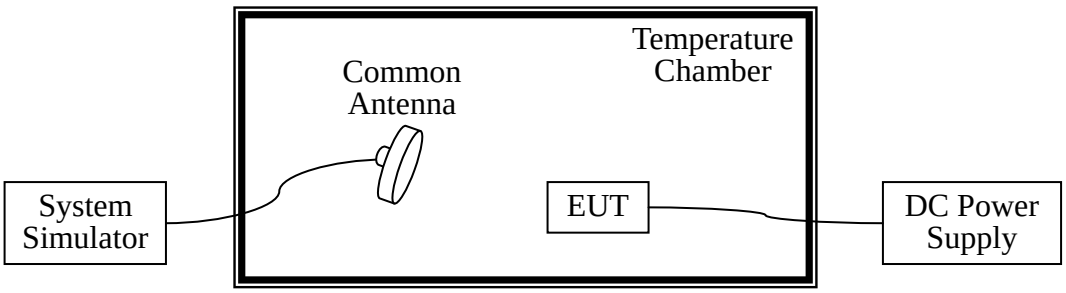
(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

### 2.4.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.4.3 Test Setup




### 2.4.4 Test Procedures

1. The EUT was set up in the thermal chamber and connected with the system simulator.

2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized

before testing. Power was applied and the maximum change in frequency was recorded within one minute.

3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. The nominal, highest and lowest extreme voltages were tested, which are specified by the applicant; the normal temperature here used is 25°C.
5. The variation in frequency was measured for the worst case.
6. Test date: 2016-05-17~2016-05-20

### 2.4.5 Test Result of Frequency Stability

1. LTE Band 2, QPSK, BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 1880MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 34 | 0.02 | 2.5 |
| | -20 | 20 | 0.01 | |
| | -10 | 54 | 0.03 | |
| | 0 | 38 | 0.02 | |
| | +10 | 16 | 0.01 | |
| | +20 | 58 | 0.03 | |
| | +30 | 24 | 0.01 | |
| | +40 | 18 | 0.01 | |
| | +55 | 49 | 0.03 | |
| 4.2 | +25 | 35 | 0.02 | |
| 3.5 | +25 | 22 | 0.01 | |

2. LTE Band 2, 16QAM, BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 1880MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 21 | 0.01 | 2.5 |
| | -20 | 29 | 0.02 | |
| | -10 | 52 | 0.03 | |
| | 0 | 32 | 0.02 | |
| | +10 | 22 | 0.01 | |
| | +20 | 23 | 0.01 | |
| | +30 | 52 | 0.03 | |
| | +40 | 17 | 0.01 | |
| | +55 | 32 | 0.02 | |
| 4.2 | +25 | 41 | 0.02 | |
| 3.5 | +25 | 49 | 0.03 | |

3. LTE Band 4, QPSK ,BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 1732.5MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 26 | 0.02 | 2.5 |
| | -20 | 48 | 0.03 | |
| | -10 | 19 | 0.01 | |
| | 0 | 36 | 0.02 | |
| | +10 | 18 | 0.01 | |
| | +20 | 19 | 0.01 | |
| | +30 | 21 | 0.01 | |
| | +40 | 51 | 0.03 | |
| | +55 | 27 | 0.02 | |
| 4.2 | +25 | 32 | 0.02 | |
| 3.5 | +25 | 23 | 0.01 | |

4. LTE Band 4, 16QAM ,BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 1732.5MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 18 | 0.01 | 2.5 |
| | -20 | 52 | 0.03 | |
| | -10 | 34 | 0.02 | |
| | 0 | 21 | 0.02 | |
| | +10 | 33 | 0.02 | |
| | +20 | 15 | 0.01 | |
| | +30 | 33 | 0.02 | |
| | +40 | 23 | 0.01 | |
| | +55 | 17 | 0.01 | |
| 4.2 | +25 | 54 | 0.03 | |
| 3.5 | +25 | 33 | 0.02 | |

5. LTE Band 5, QPSK ,BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 836.5MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 26 | 0.03 | 2.5 |
| | -20 | 18 | 0.02 | |
| | -10 | 19 | 0.02 | |
| | 0 | 36 | 0.04 | |
| | +10 | 18 | 0.02 | |
| | +20 | 9 | 0.01 | |
| | +30 | 21 | 0.02 | |
| | +40 | 38 | 0.04 | |
| | +55 | 27 | 0.03 | |
| 4.2 | +25 | 24 | 0.03 | |
| 3.5 | +25 | 33 | 0.04 | |

6. LTE Band 5, 16QAM ,BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 836.5MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 18 | 0.02 | 2.5 |
| | -20 | 32 | 0.04 | |
| | -10 | 24 | 0.03 | |
| | 0 | 21 | 0.02 | |
| | +10 | 11 | 0.01 | |
| | +20 | 16 | 0.02 | |
| | +30 | 10 | 0.01 | |
| | +40 | 23 | 0.03 | |
| | +55 | 17 | 0.02 | |
| 4.2 | +25 | 31 | 0.04 | |
| 3.5 | +25 | 23 | 0.03 | |

7. LTE Band 7, QPSK ,BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 2535MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 19 | 0.01 | 2.5 |
| | -20 | 53 | 0.02 | |
| | -10 | 41 | 0.02 | |
| | 0 | 22 | 0.01 | |
| | +10 | 23 | 0.01 | |
| | +20 | 35 | 0.01 | |
| | +30 | 31 | 0.01 | |
| | +40 | 23 | 0.01 | |
| | +55 | 22 | 0.01 | |
| 4.2 | +25 | 59 | 0.02 | |
| 3.5 | +25 | 50 | 0.02 | |

8. LTE Band 7,16QAM ,BW 10MHz

| Test Conditions | | Frequency Deviation BW 10MHz Middle Channel 2535MHz | | |
|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Frequency Error | Frequency Error | Limit |
| | | Hz | ppm | ppm |
| 3.7 | -30 | 26 | 0.01 | 2.5 |
| | -20 | 48 | 0.02 | |
| | -10 | 25 | 0.01 | |
| | 0 | 22 | 0.01 | |
| | +10 | 23 | 0.01 | |
| | +20 | 49 | 0.02 | |
| | +30 | 27 | 0.01 | |
| | +40 | 23 | 0.01 | |
| | +55 | 23 | 0.01 | |
| 4.2 | +25 | 55 | 0.02 | |
| 3.5 | +25 | 24 | 0.01 | |

## 2.5 Conducted Out of Band Emissions

### 2.5.1 Requirement

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. This calculated to be -13dBm.

For Band 7:

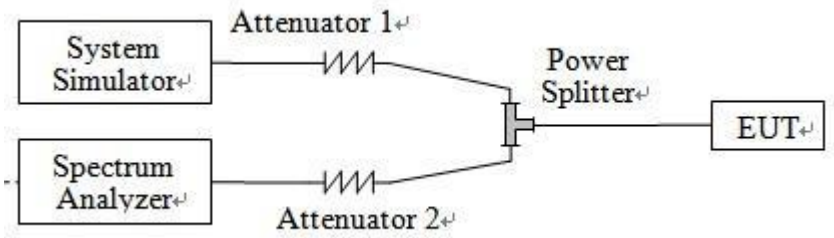
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power(P) by a factor of at least 55+10 log(P) dB. This calculated to be -25dBm.

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10th harmonic.

### 2.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 2.5.3 Test Setup




### 2.5.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was

measured.

4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [43 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

   = -13dBm.
8. For Band 7

   The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [55 + 10log(P)] (dB)

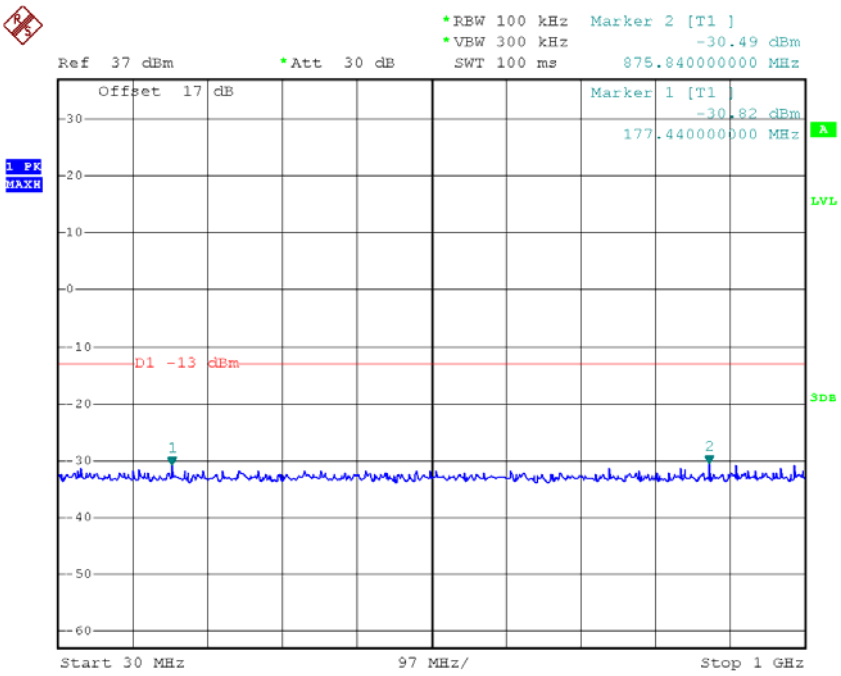
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)

   = -25dBm.
9. For 9KHz to 30MHz: the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
10. Test date: 2016-05-28~2016-06-01

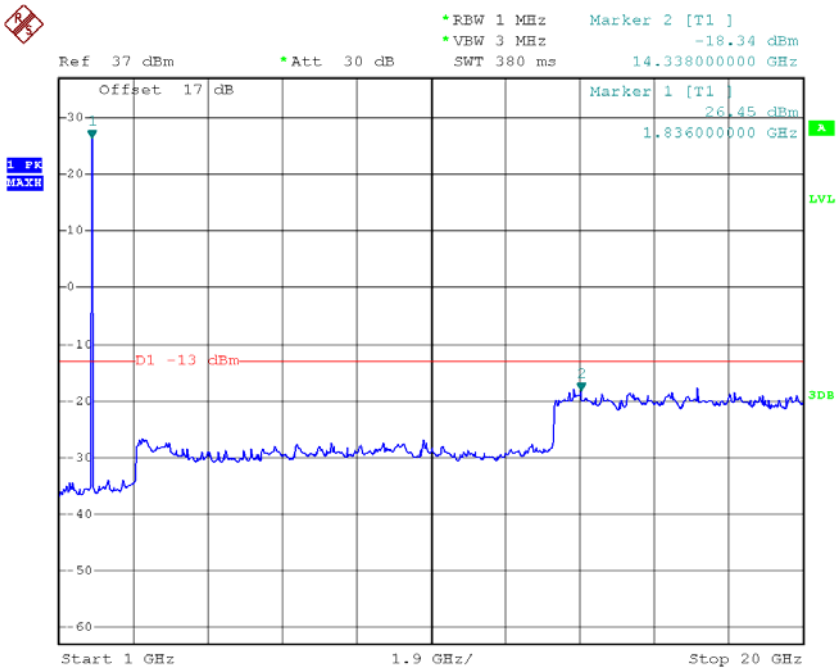
### 2.5.5 Test Result of Conducted Spurious Emission

Note: For 9 KHz to 30MHz: the amplitude of spurious emissions is attenuated by more than 20dB below the permissible value, so we not provide the test result here

| Band | LTE Band 2 | Channel | Low |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

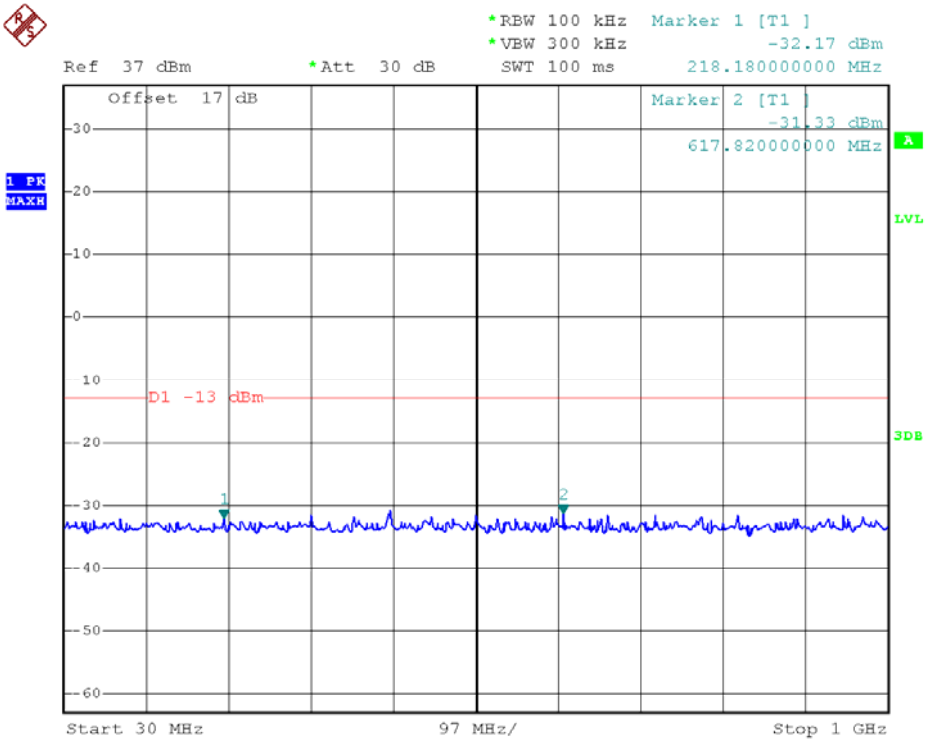



RB Size 1, RB Offset 0 30MHz to 1GHz

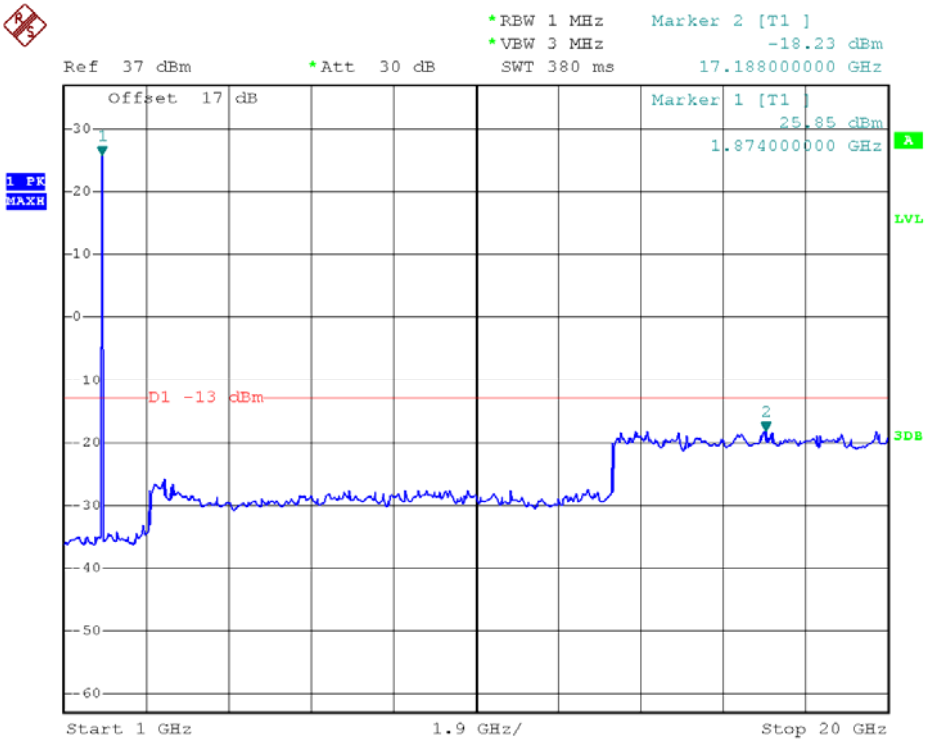



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

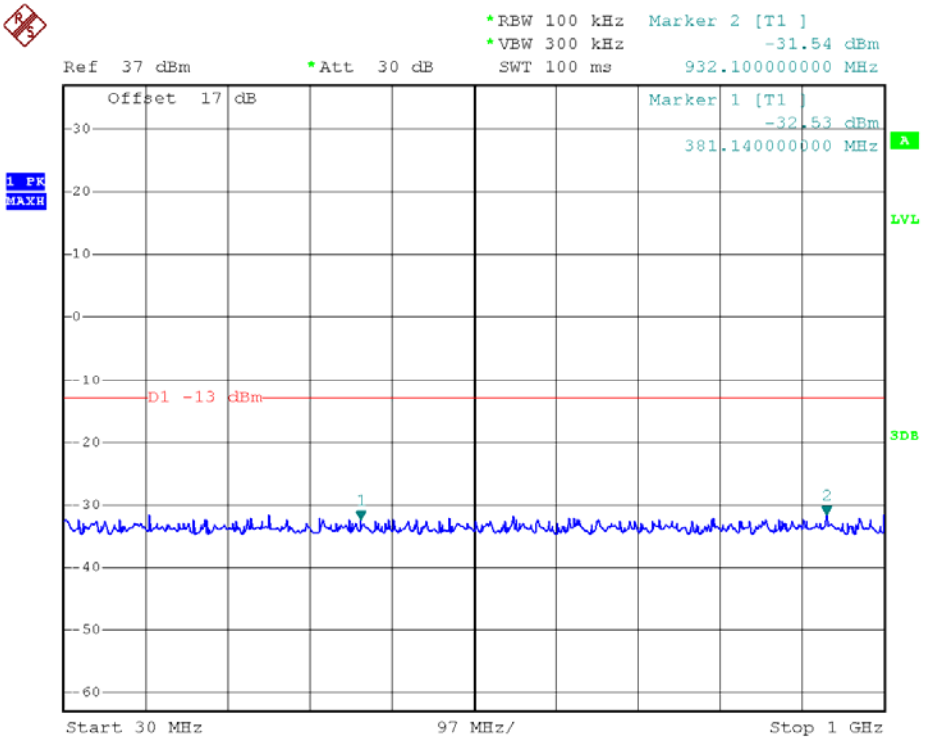



RB Size 1, RB Offset 0 30MHz to 1GHz

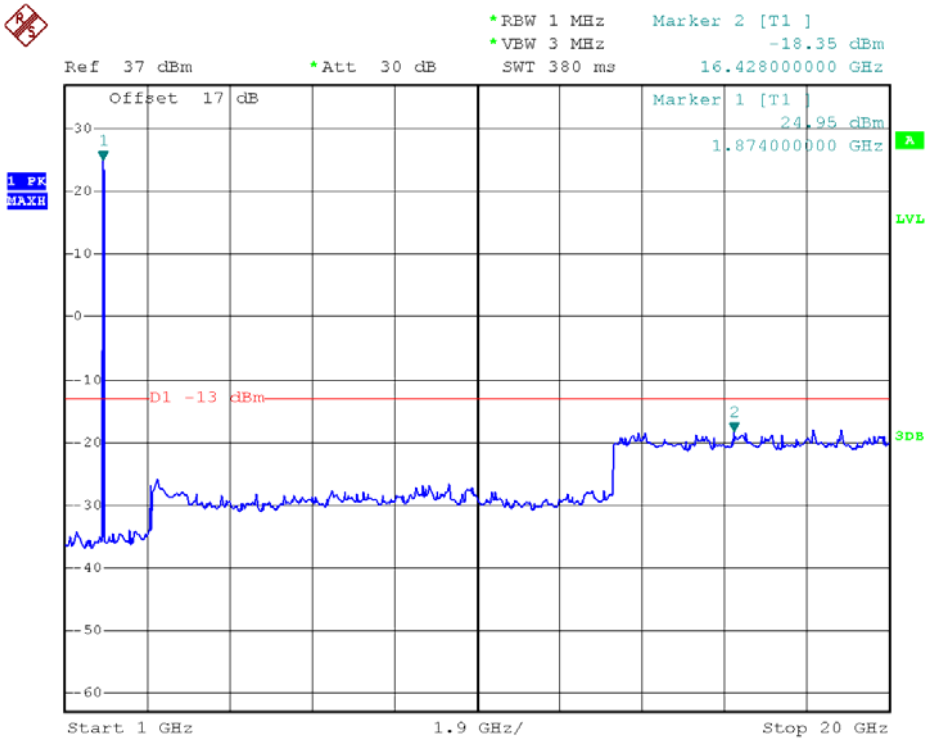



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | High |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

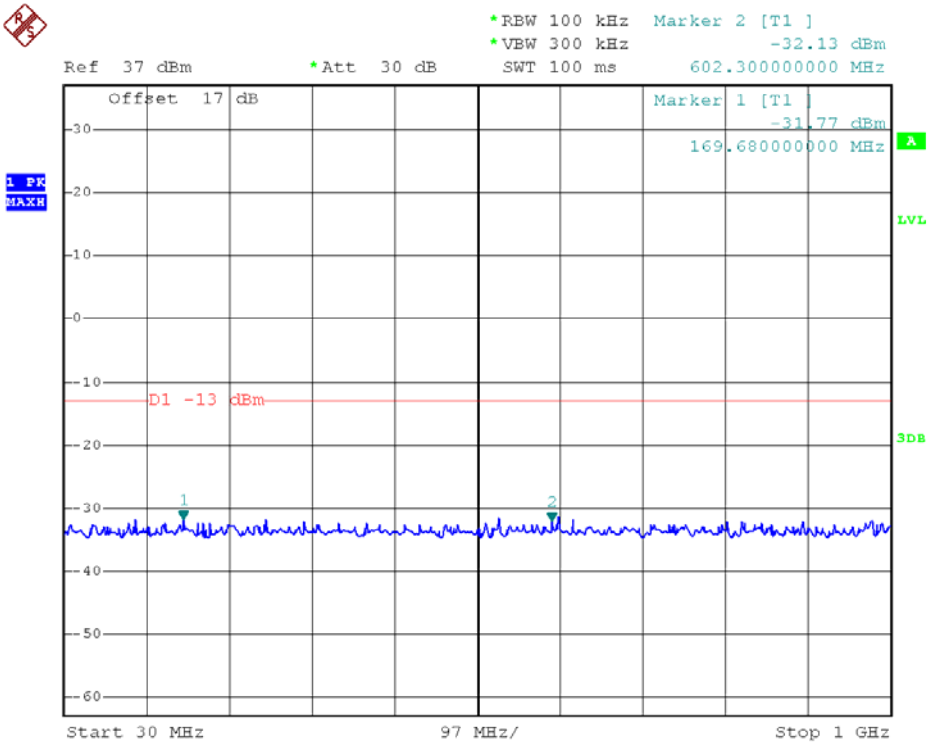



RB Size 1, RB Offset 0 30MHz to 1GHz

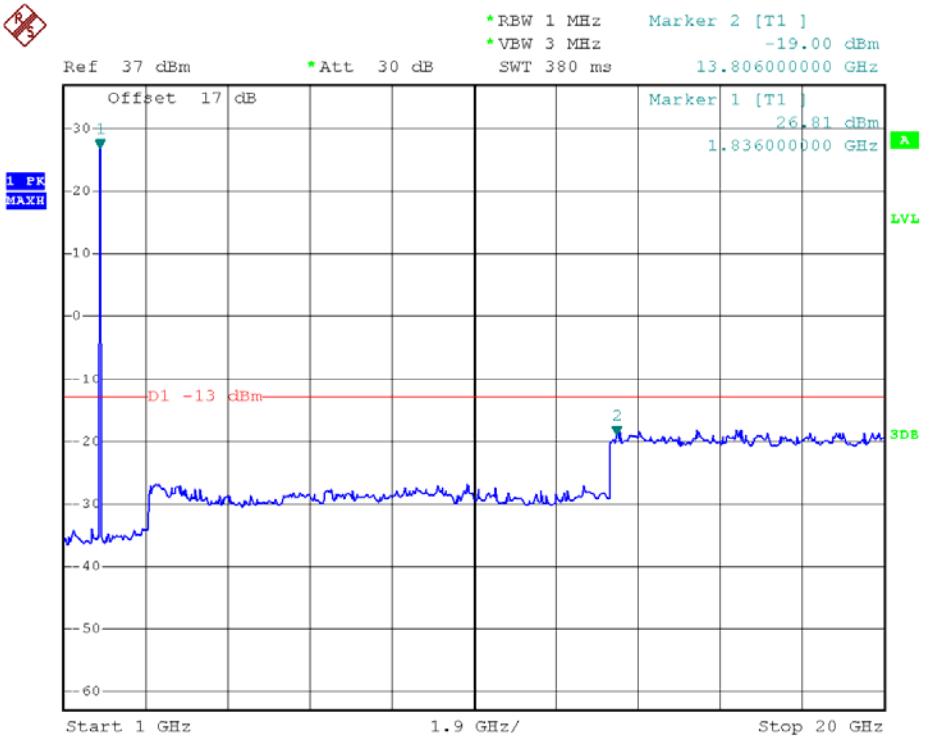



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Low |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

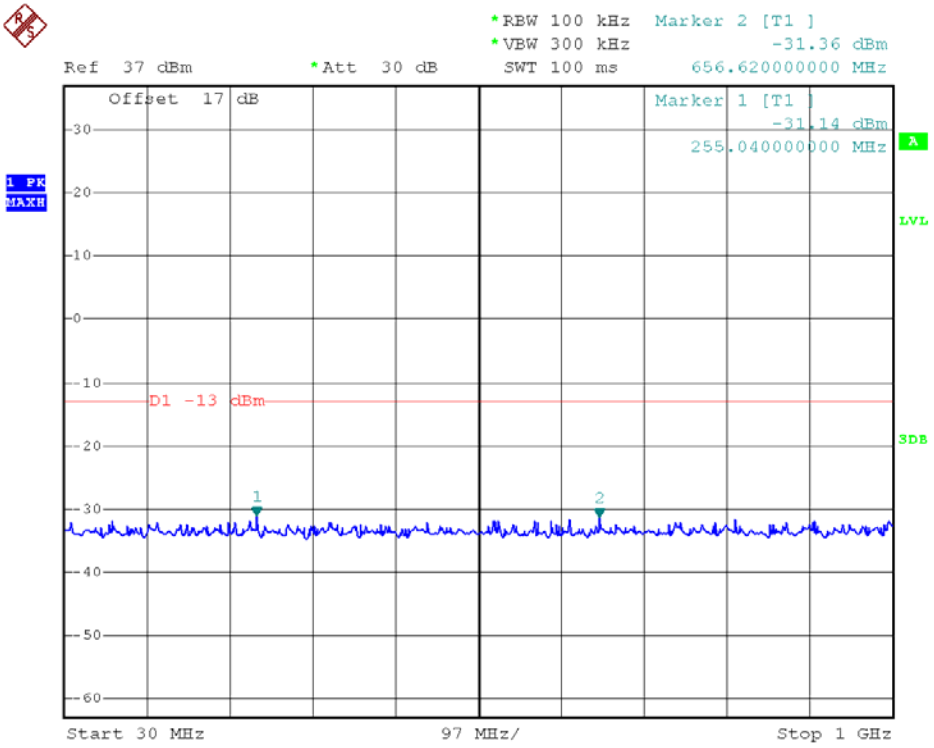



RB Size 1, RB Offset 0 30MHz to 1GHz

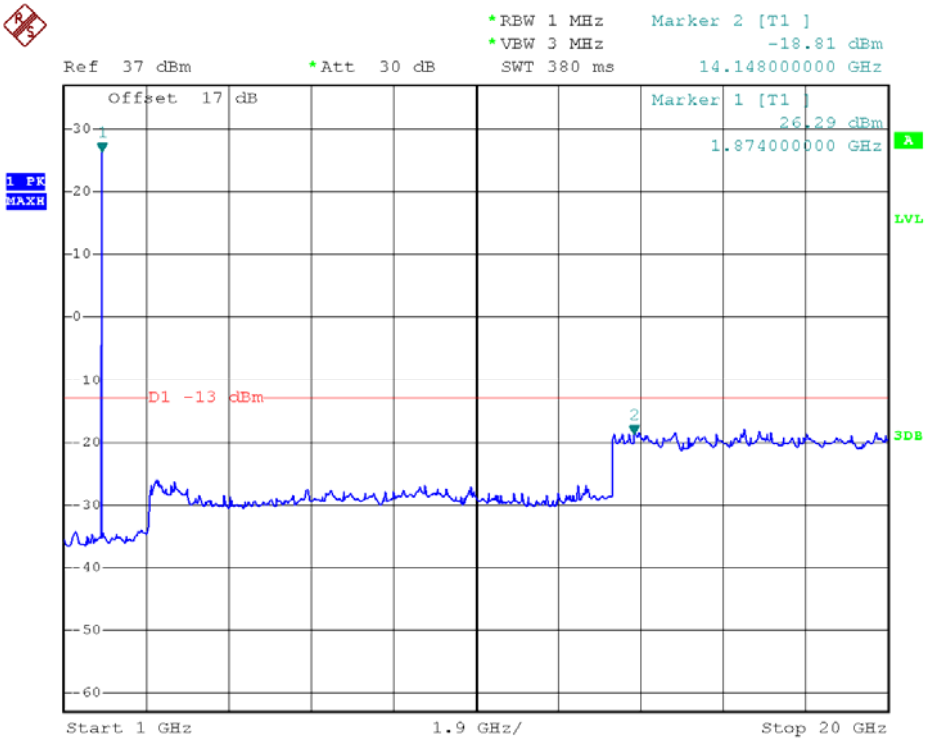



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

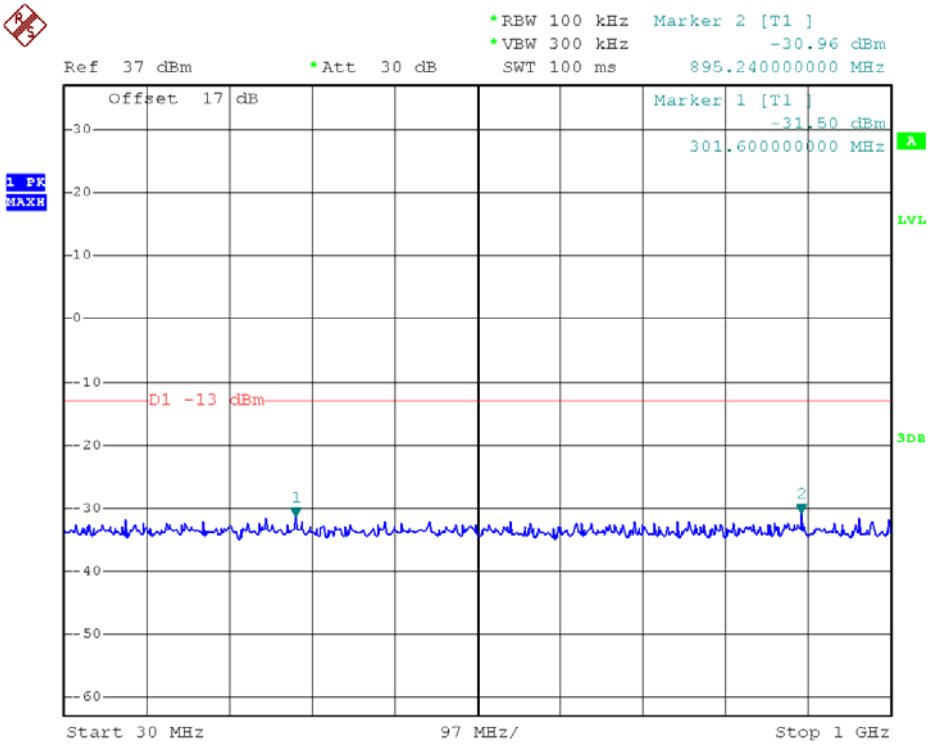



RB Size 1, RB Offset 0 30MHz to 1GHz

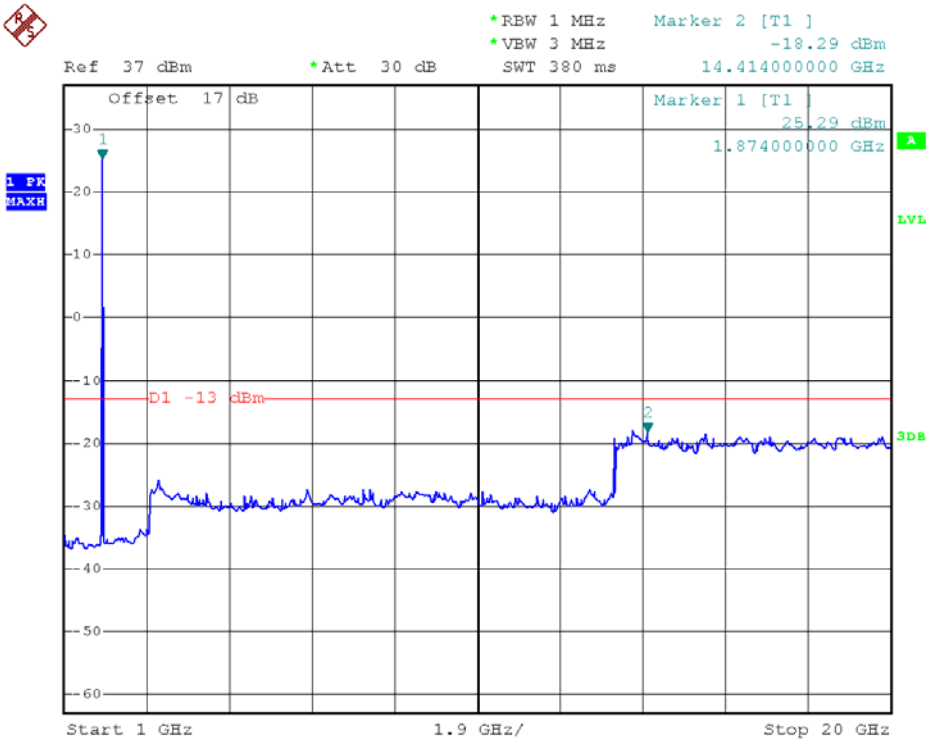



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | High |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

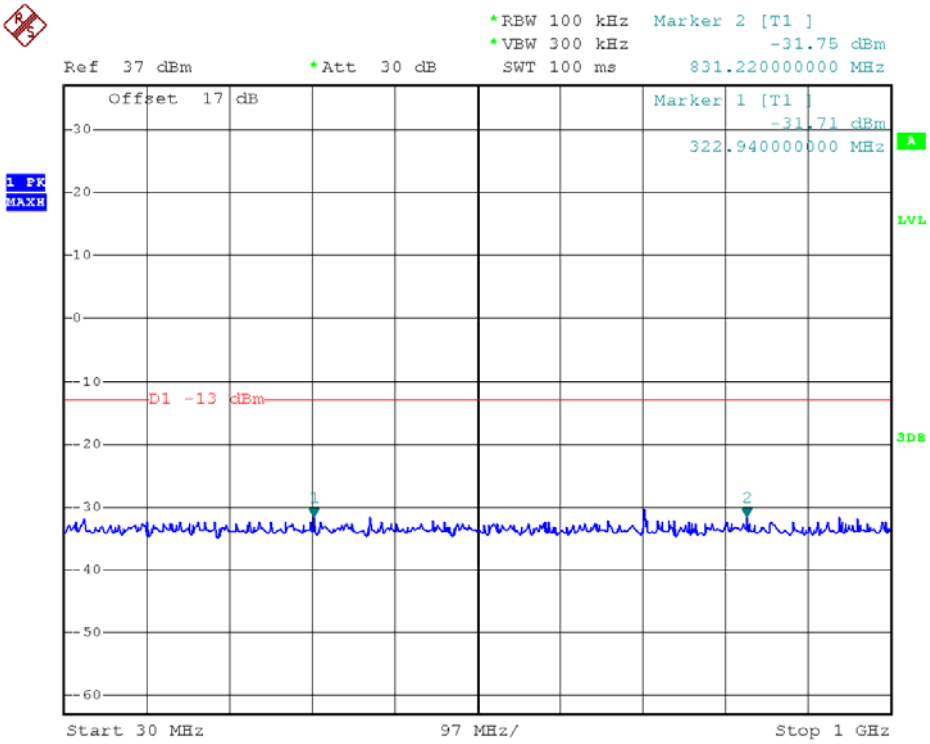



RB Size 1, RB Offset 0 30MHz to 1GHz

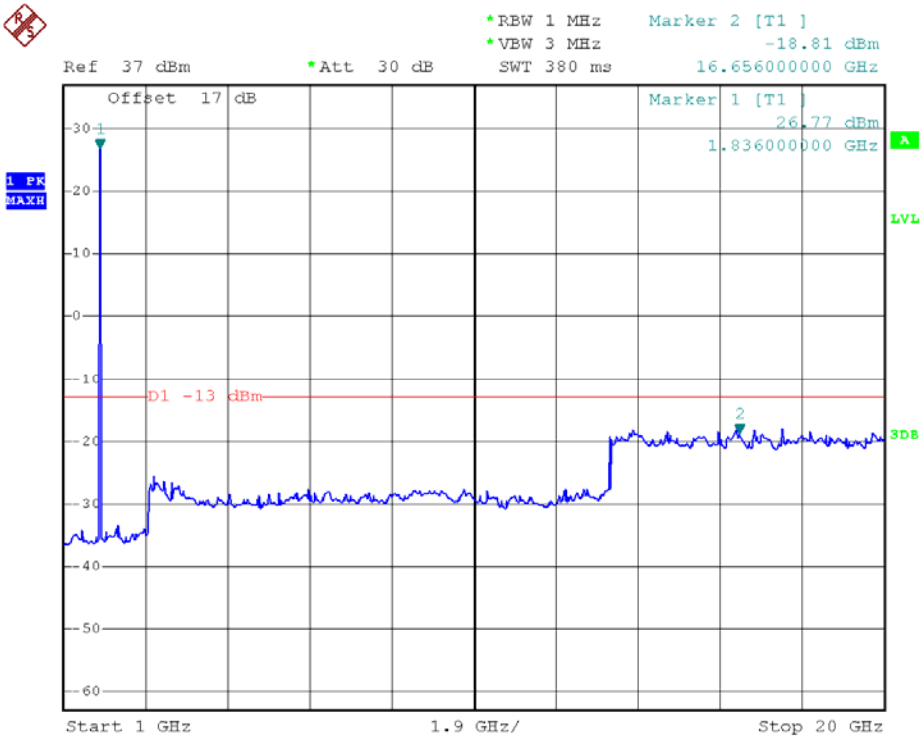



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Low |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

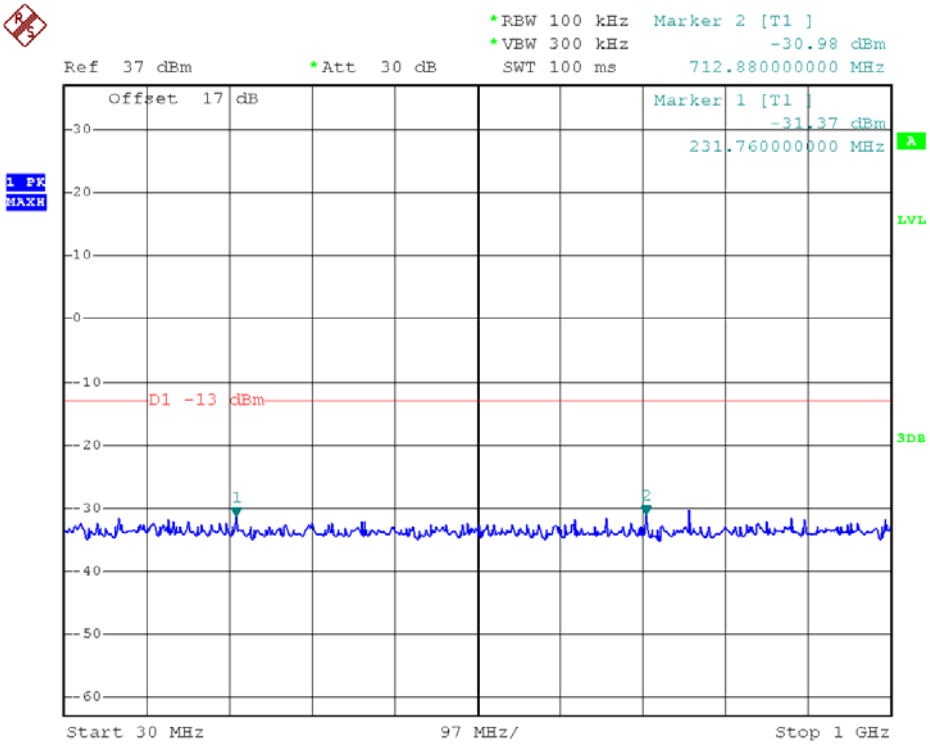



RB Size 1, RB Offset 0 30MHz to 1GHz

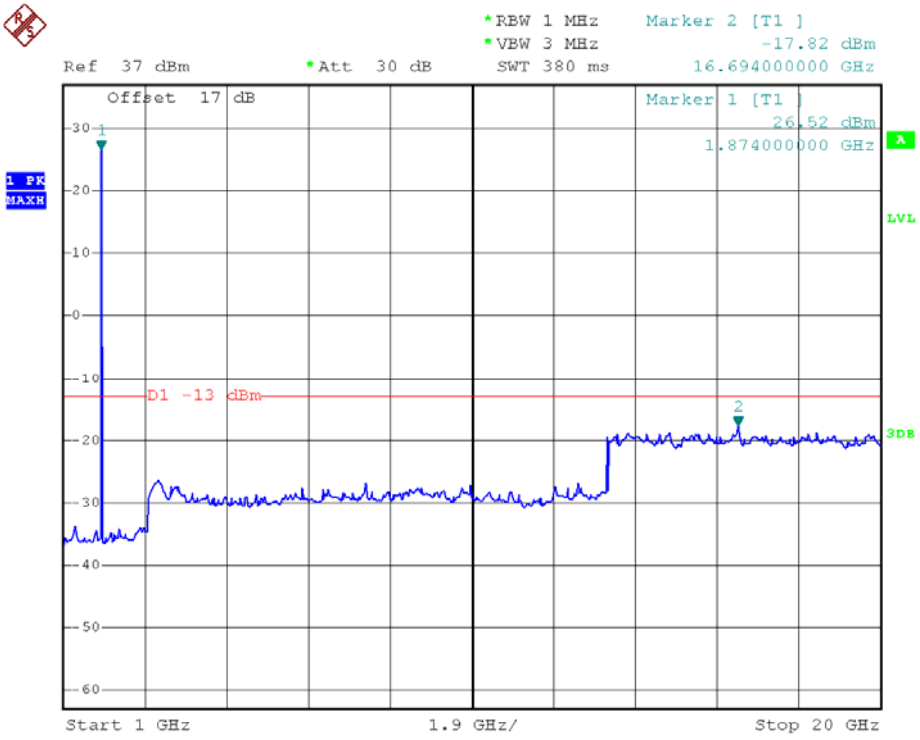



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

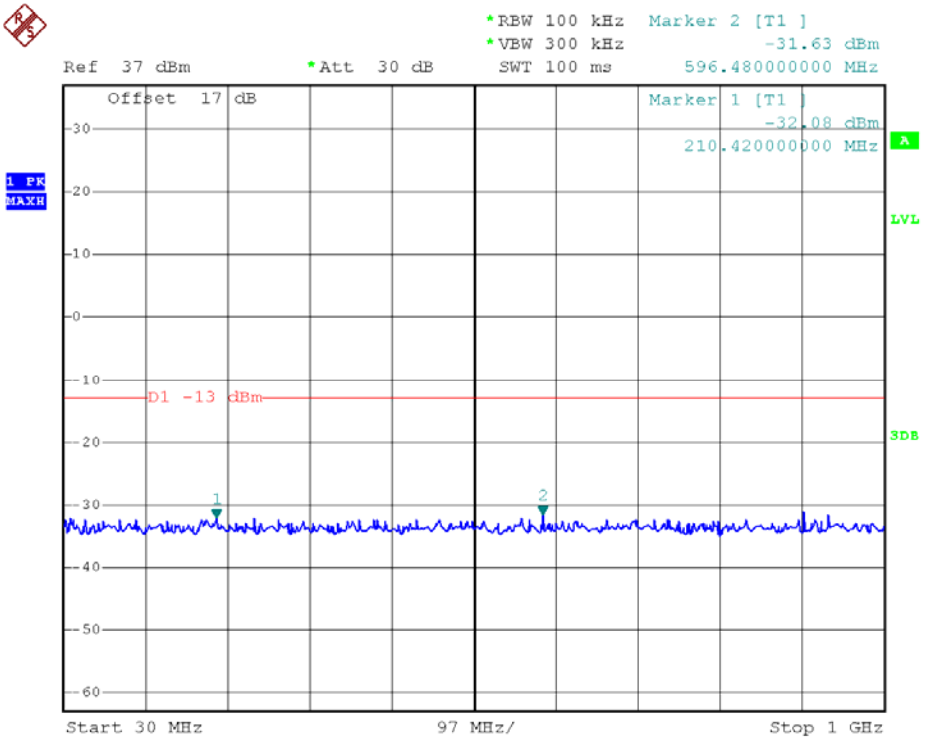



RB Size 1, RB Offset 0 30MHz to 1GHz

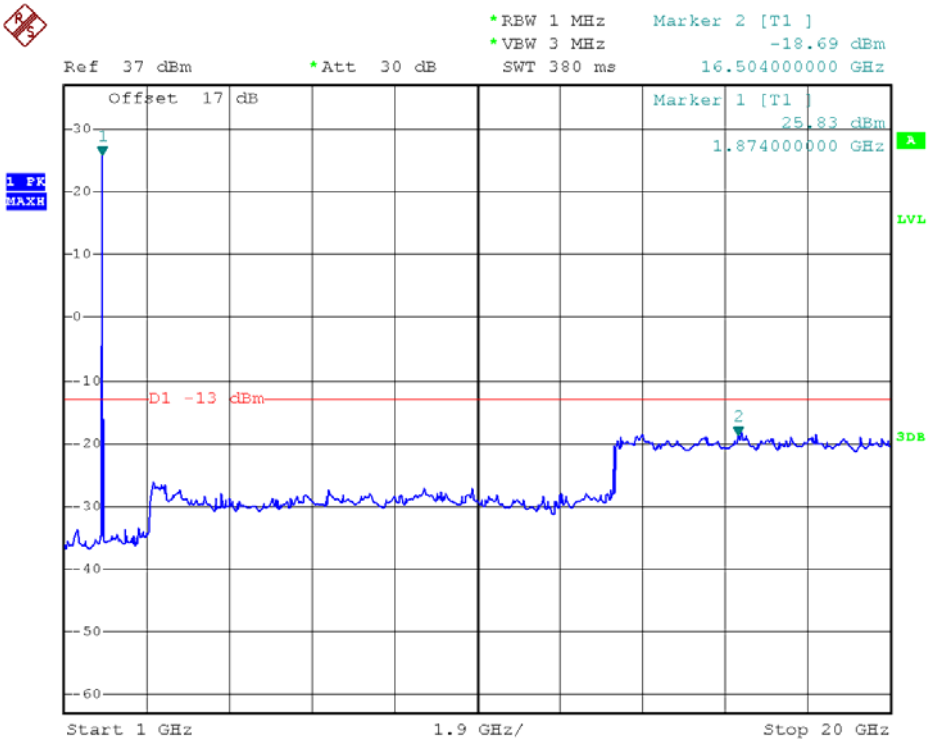



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | High |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

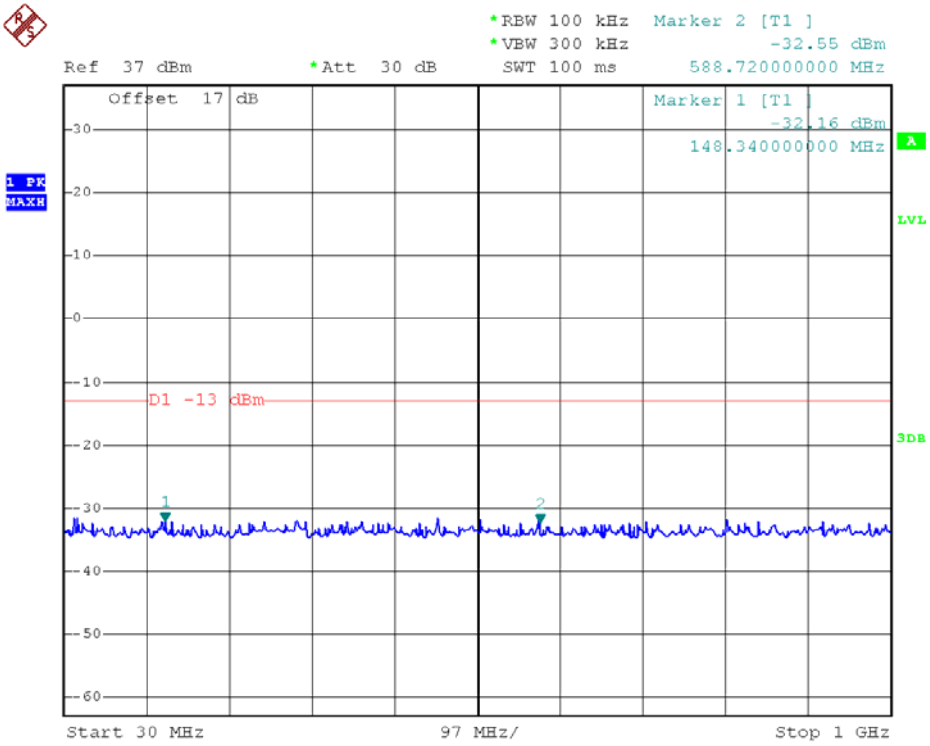



RB Size 1, RB Offset 0 30MHz to 1GHz

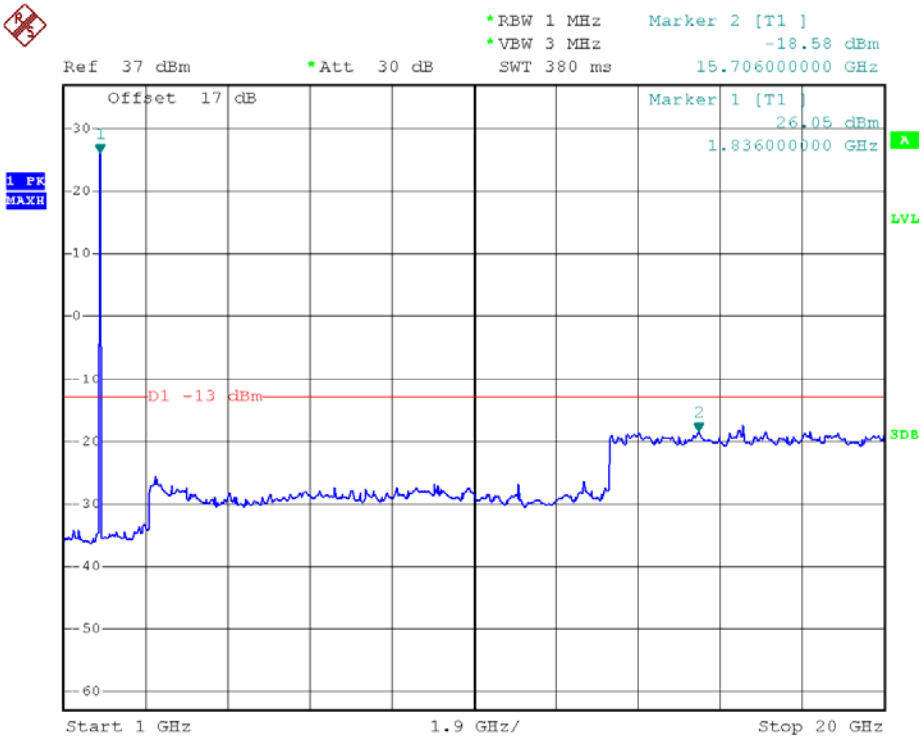



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Low |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

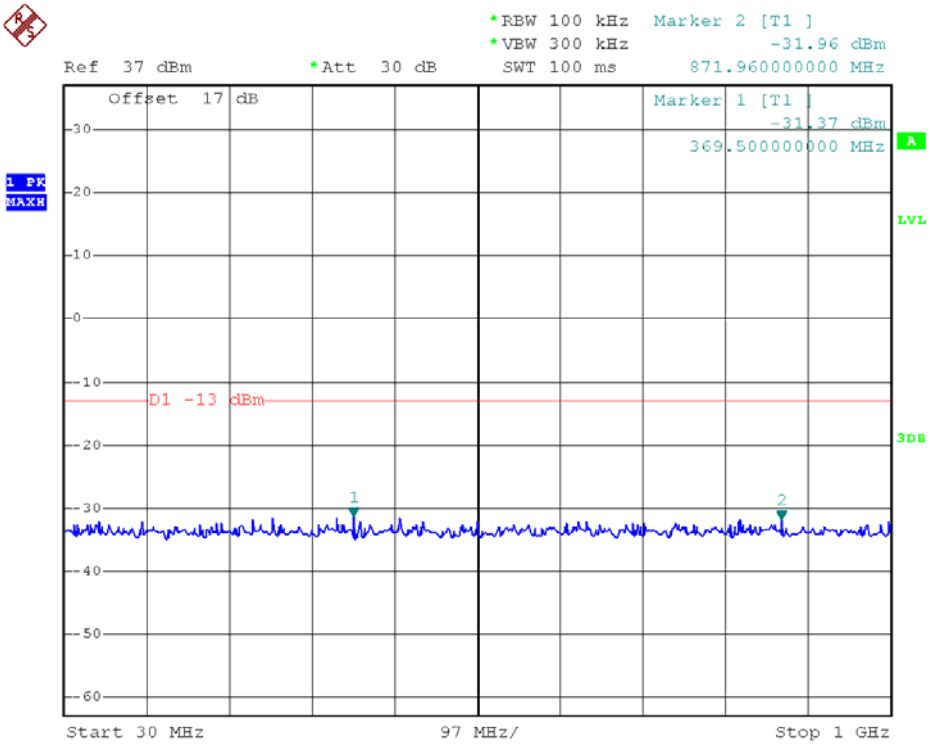



RB Size 1, RB Offset 0 30MHz to 1GHz

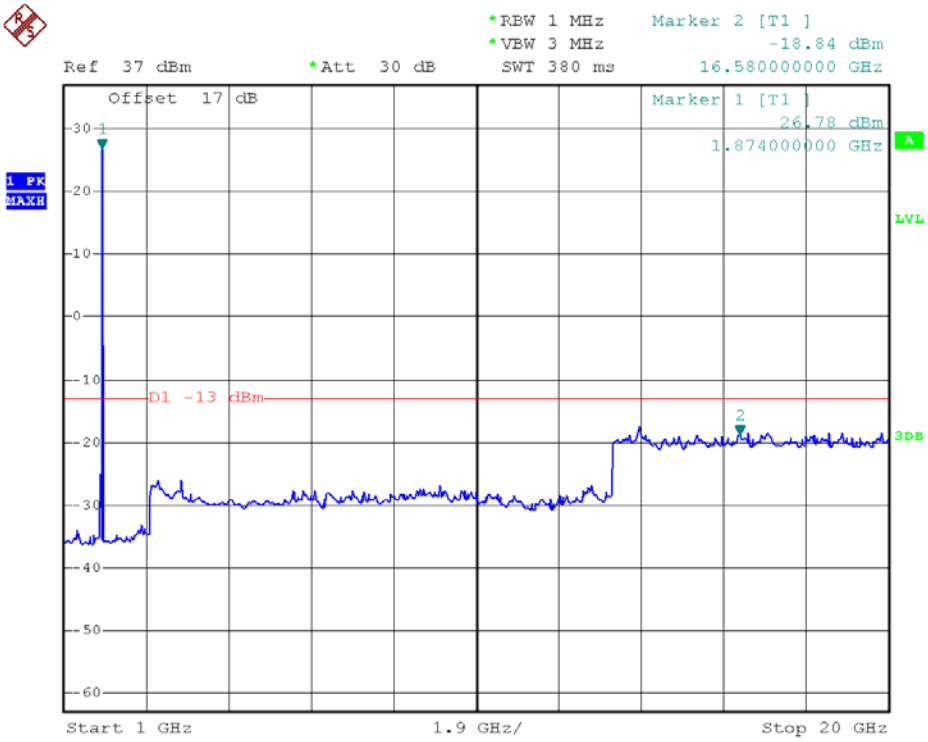



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

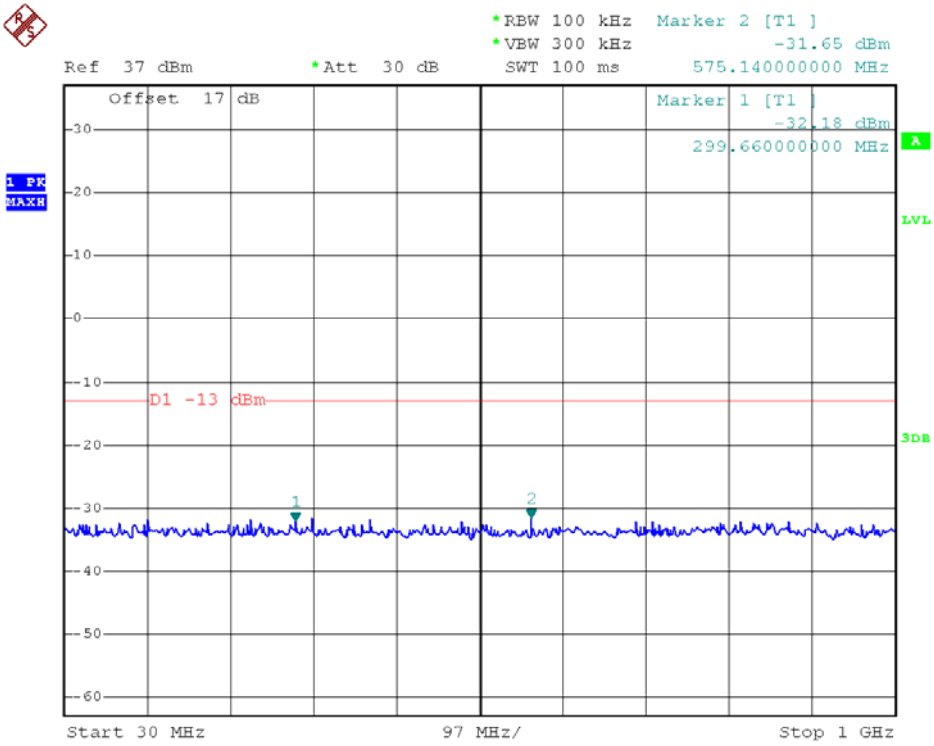



RB Size 1, RB Offset 0 30MHz to 1GHz

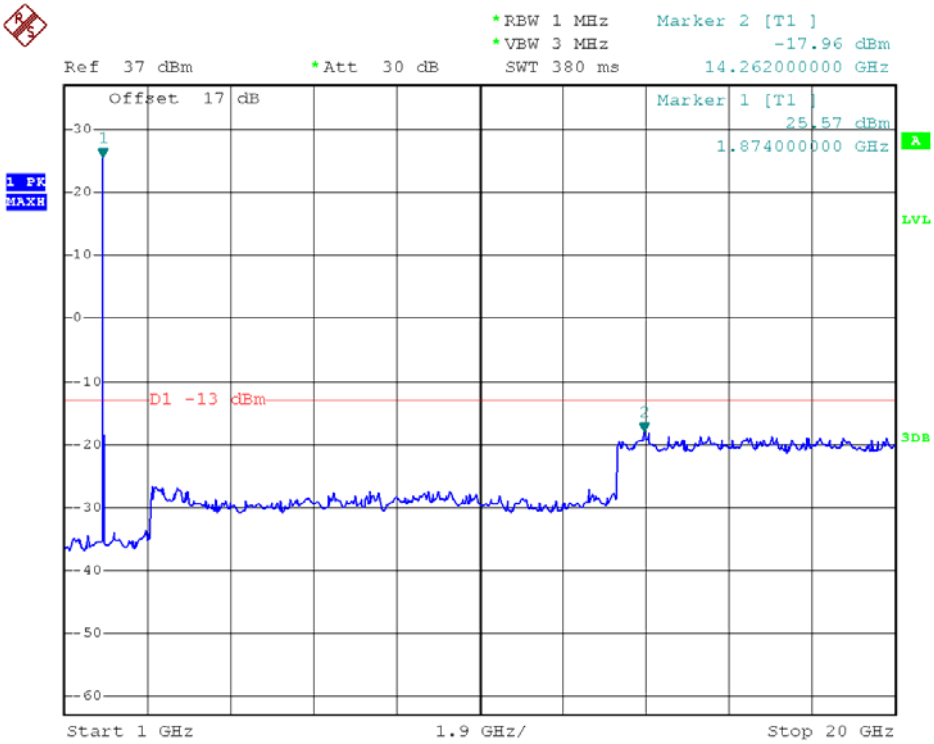



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | High |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

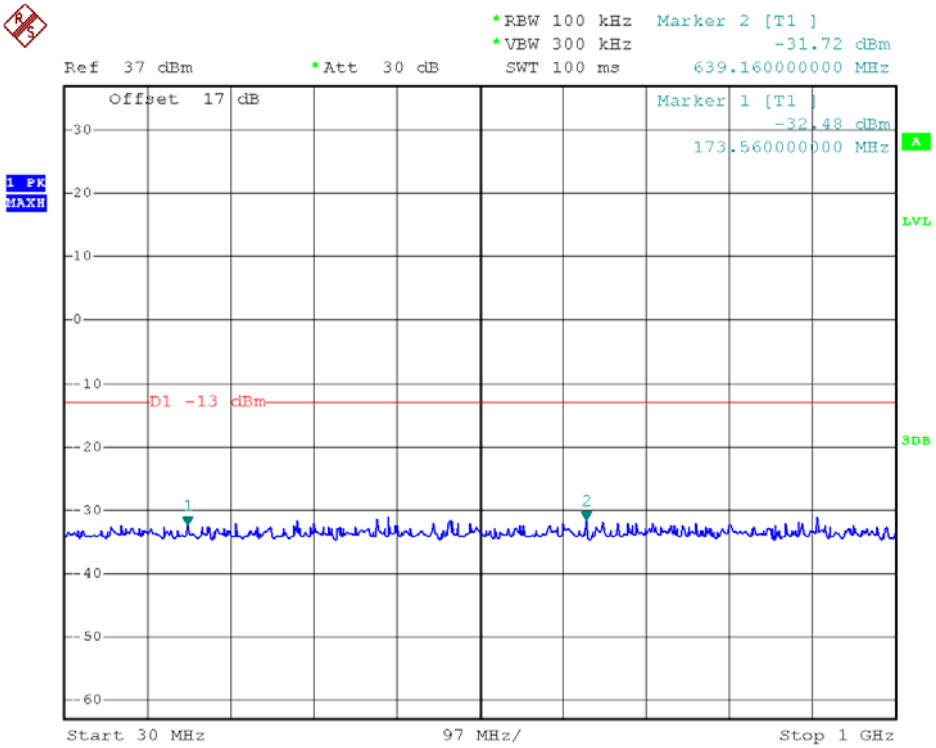



RB Size 1, RB Offset 0 30MHz to 1GHz

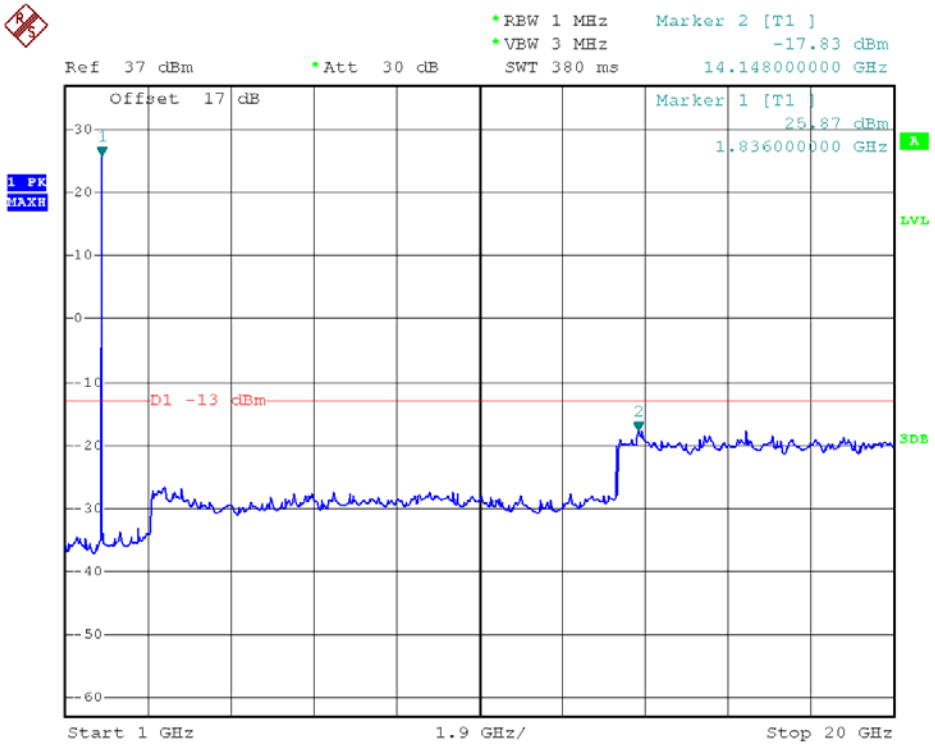



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Low |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

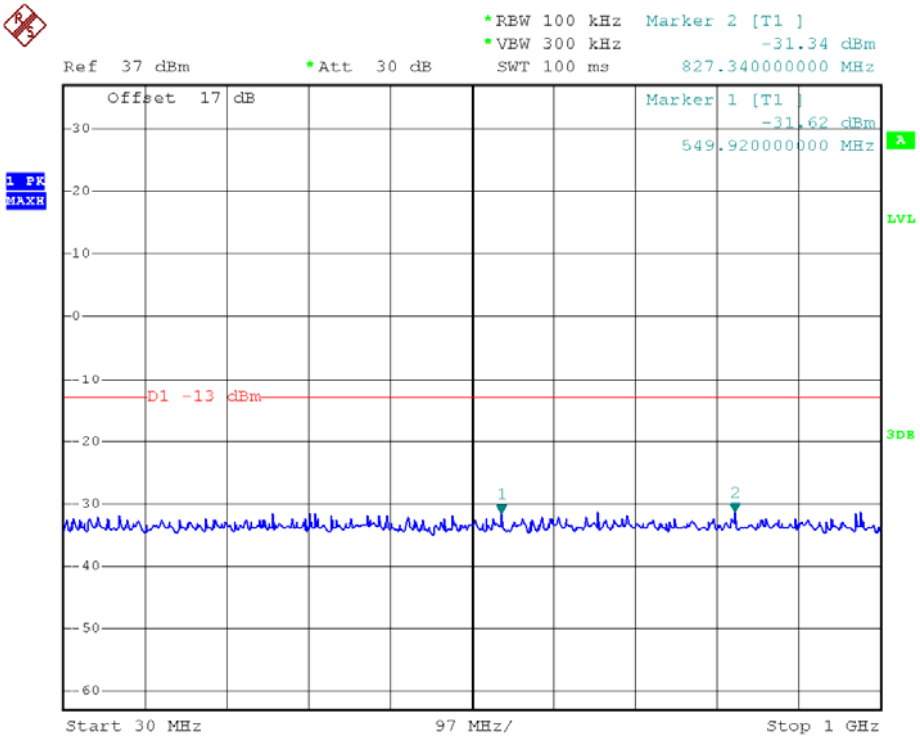



RB Size 1, RB Offset 0 30MHz to 1GHz

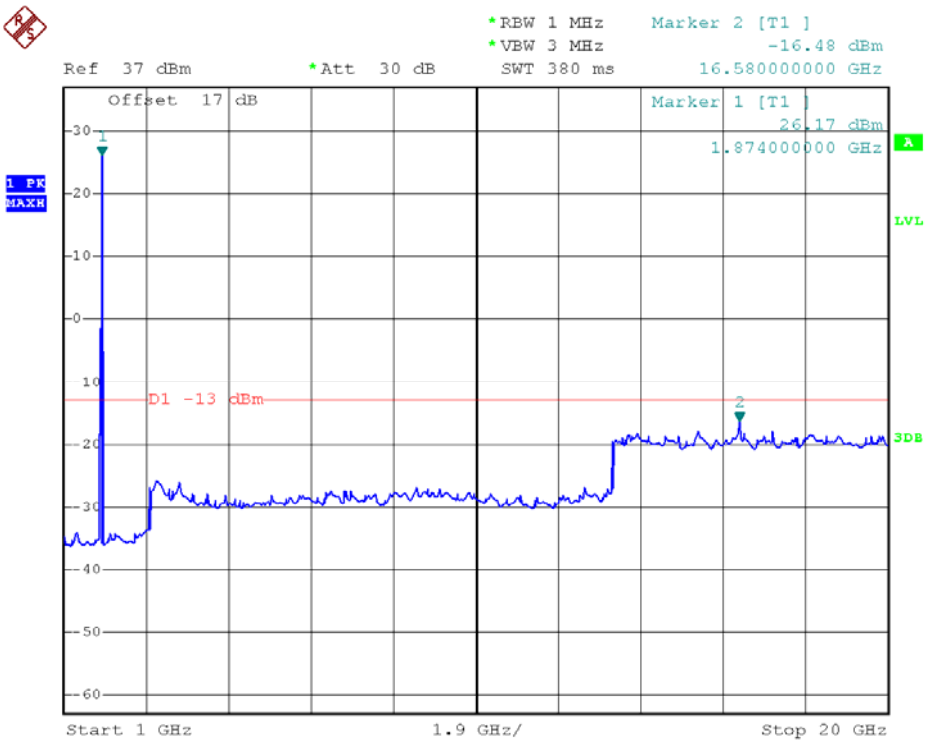



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

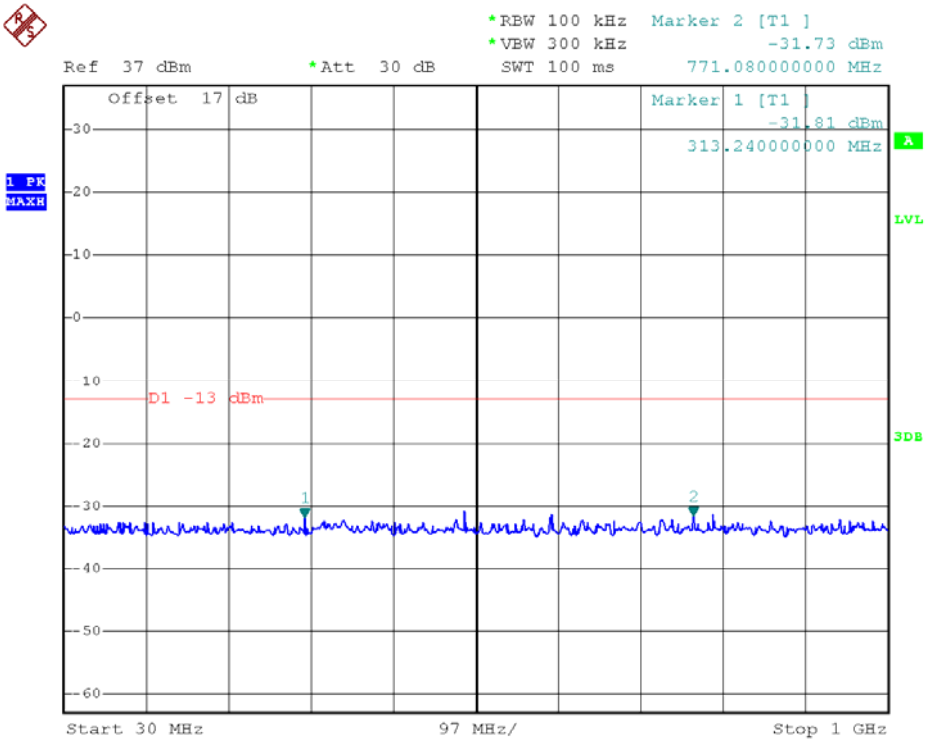



RB Size 1, RB Offset 0 30MHz to 1GHz

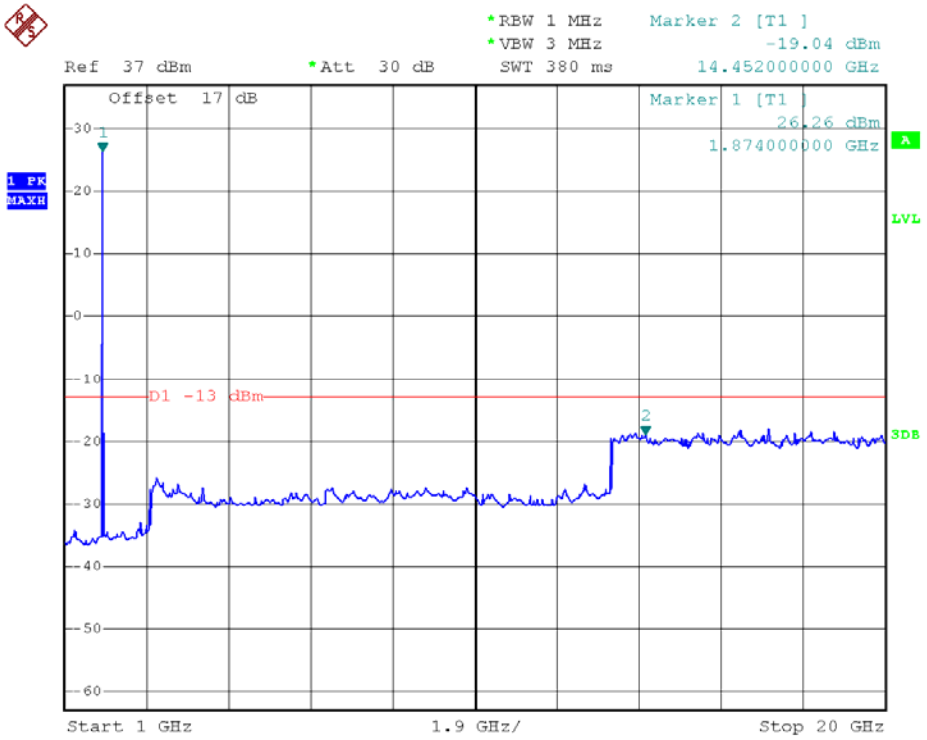



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | High |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

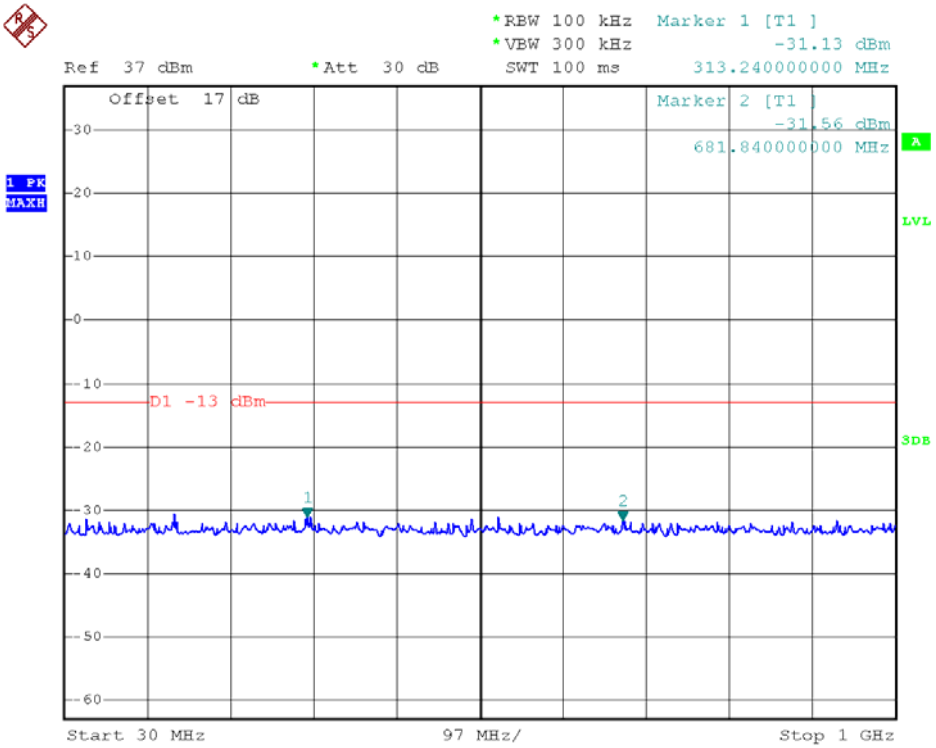



RB Size 1, RB Offset 0 30MHz to 1GHz

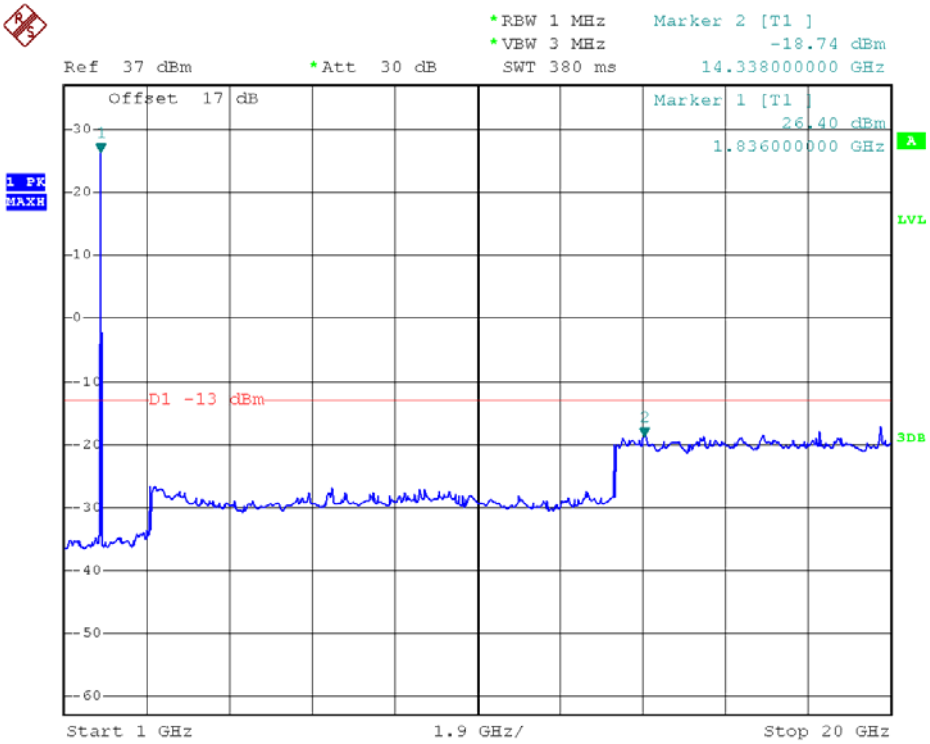



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Low |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

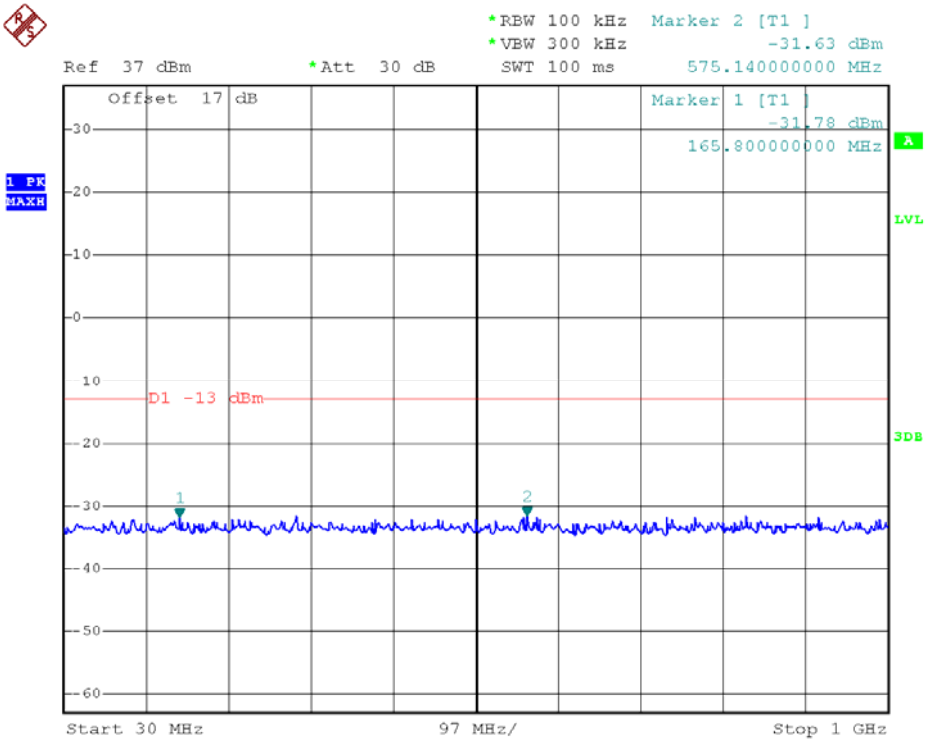



RB Size 1, RB Offset 0 30MHz to 1GHz

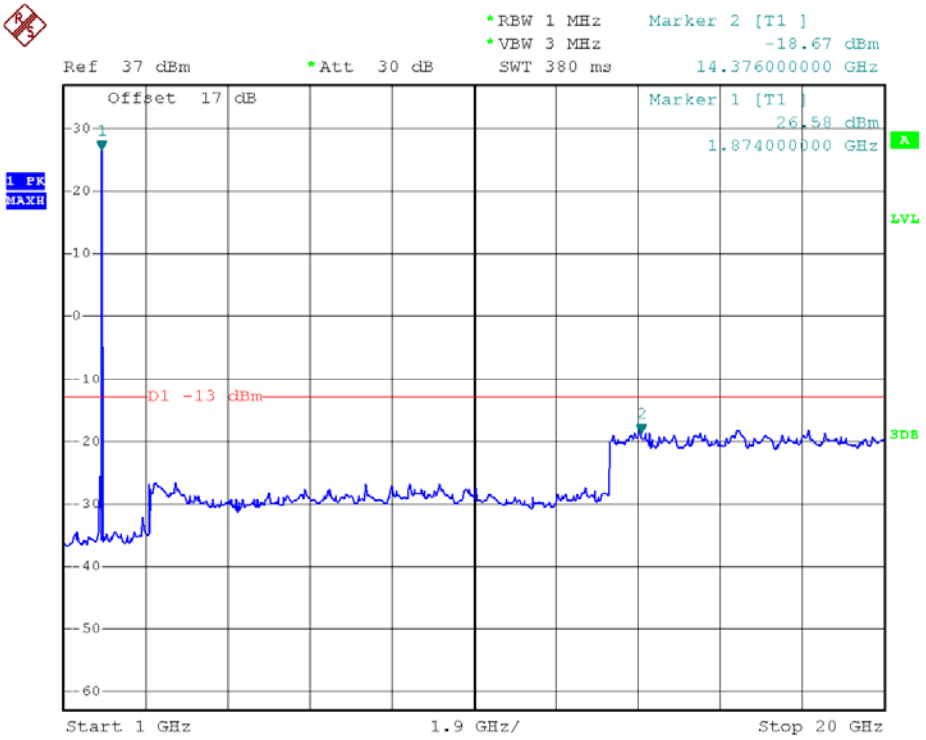



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

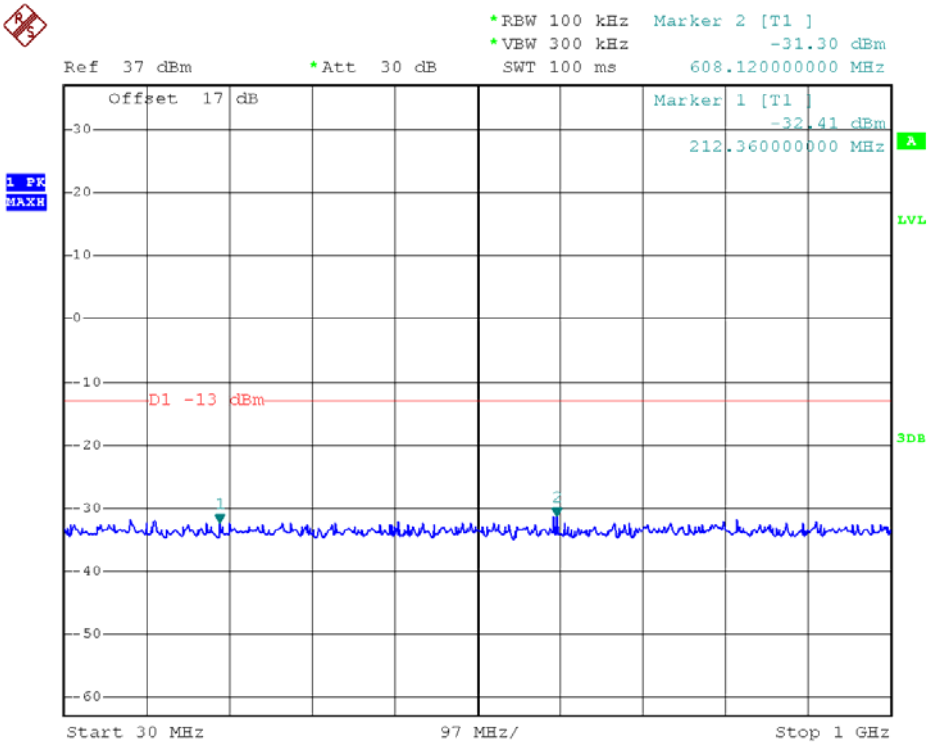



RB Size 1, RB Offset 0 30MHz to 1GHz

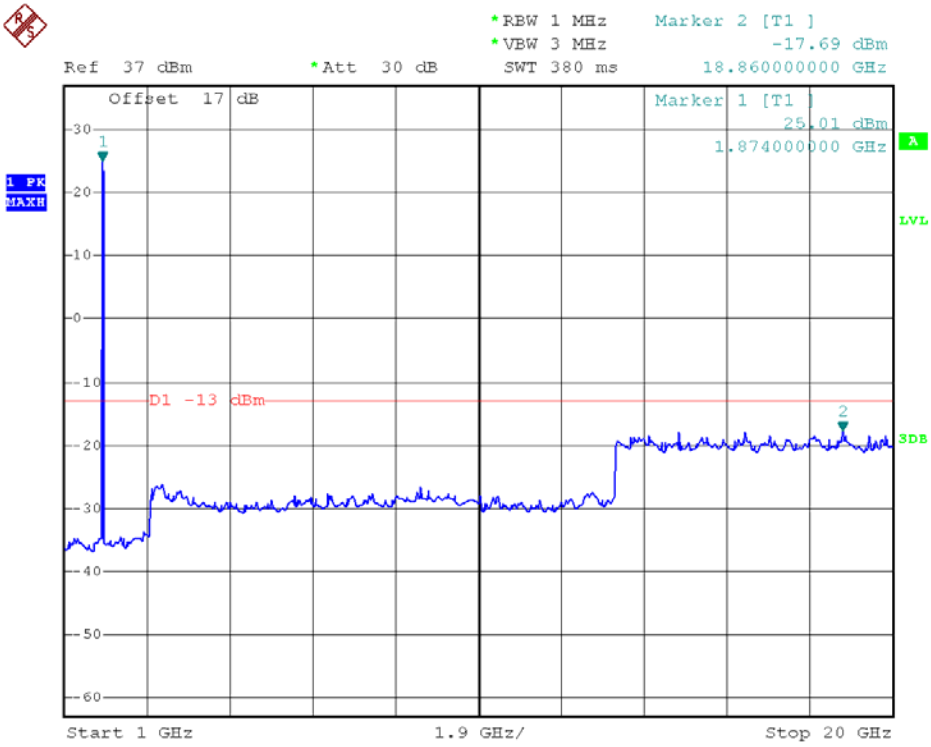



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 2 | Channel | High |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

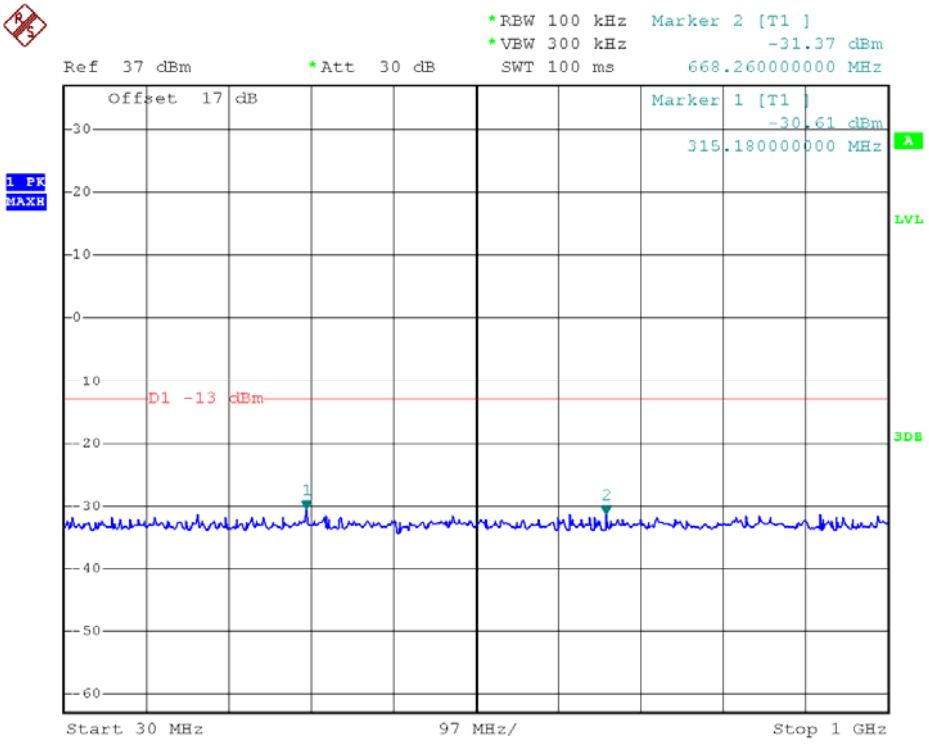



RB Size 1, RB Offset 0 30MHz to 1GHz

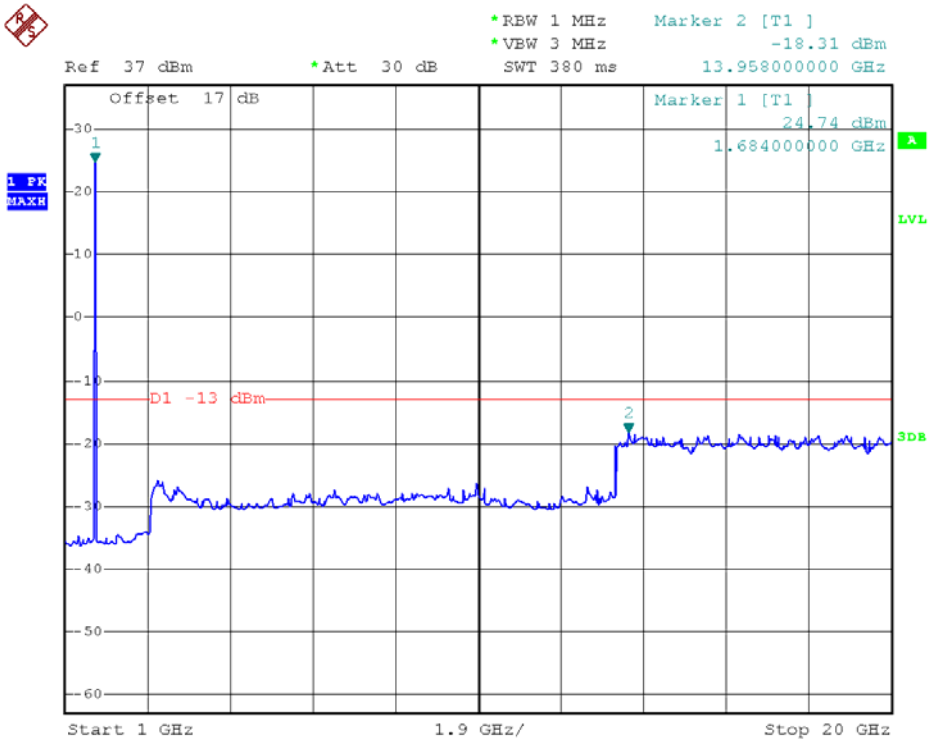



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Low |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

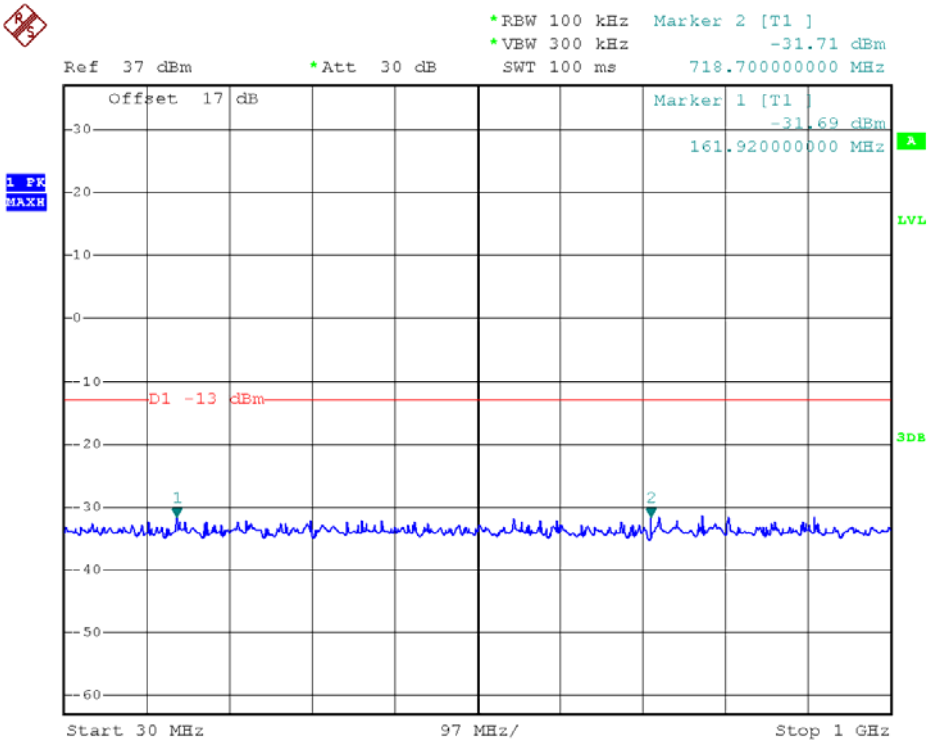



RB Size 1, RB Offset 0 30MHz to 1GHz

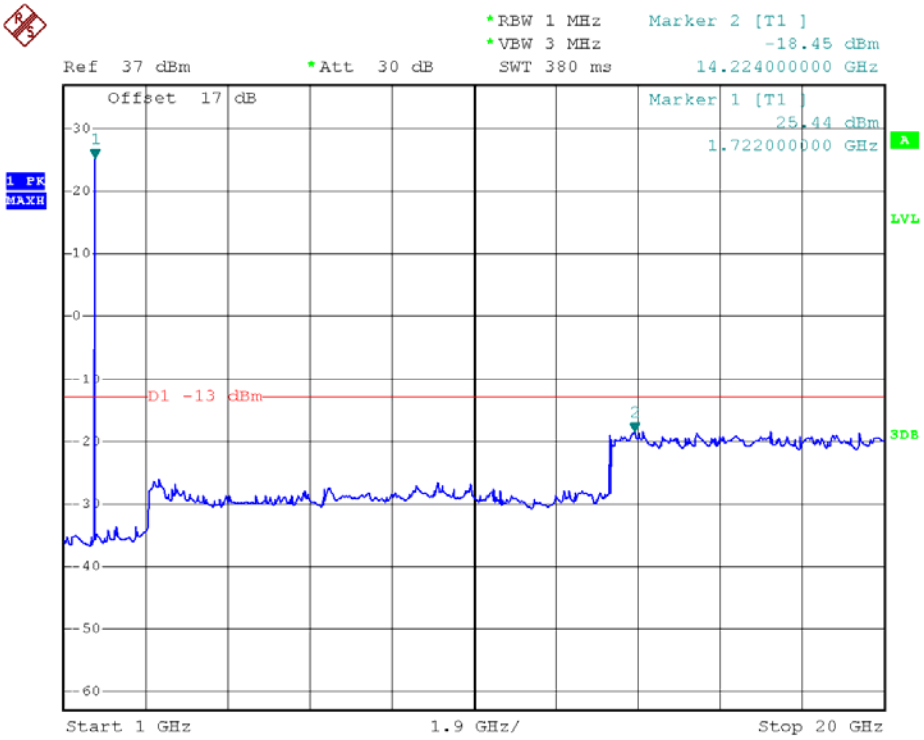



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

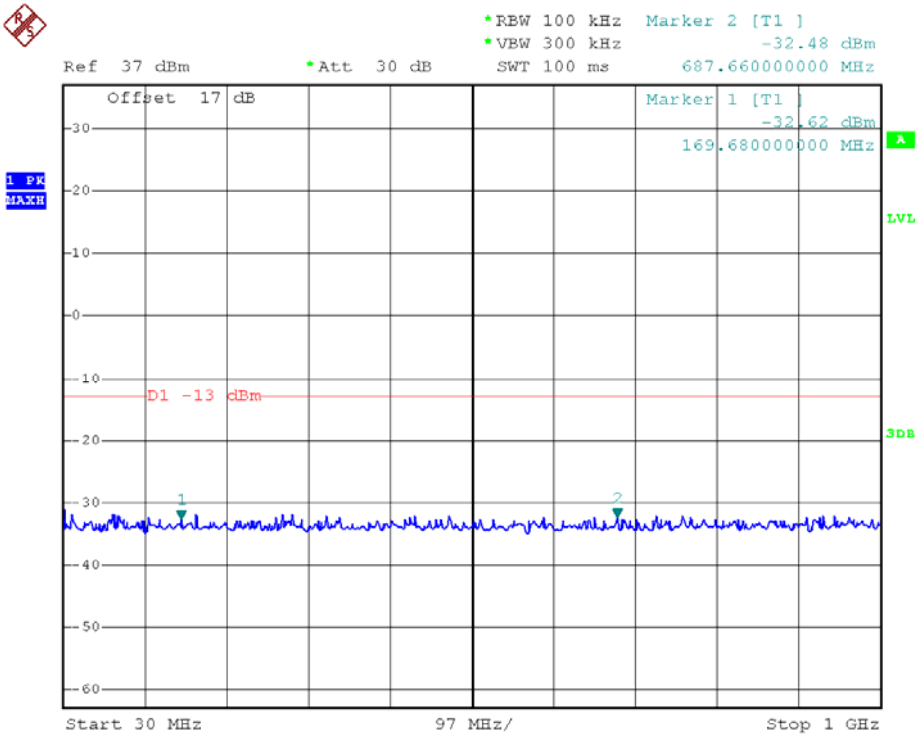



RB Size 1, RB Offset 0 30MHz to 1GHz

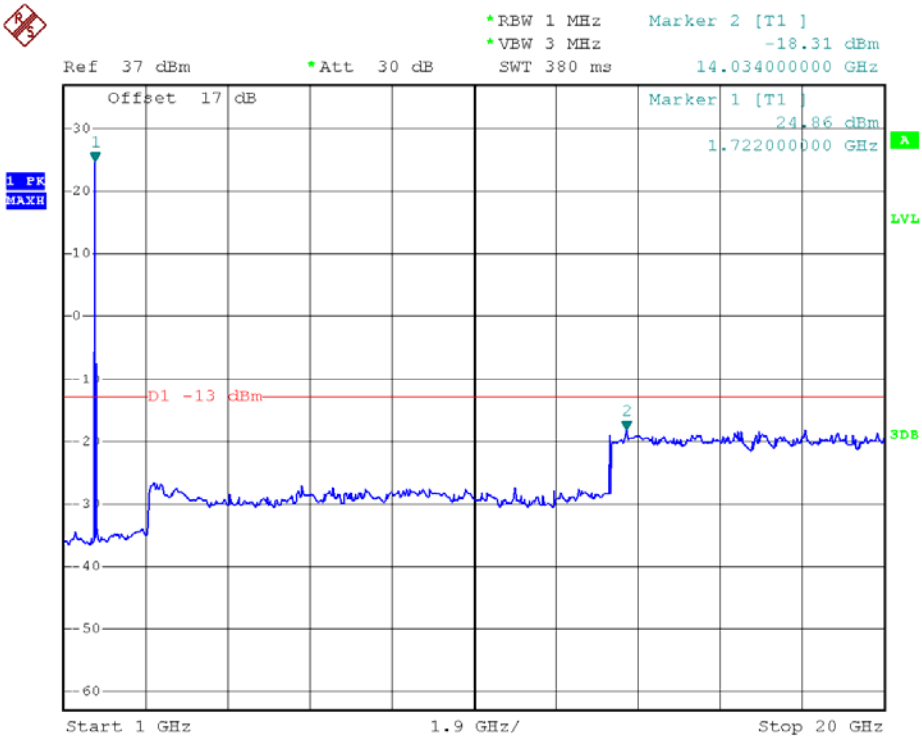



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | High |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

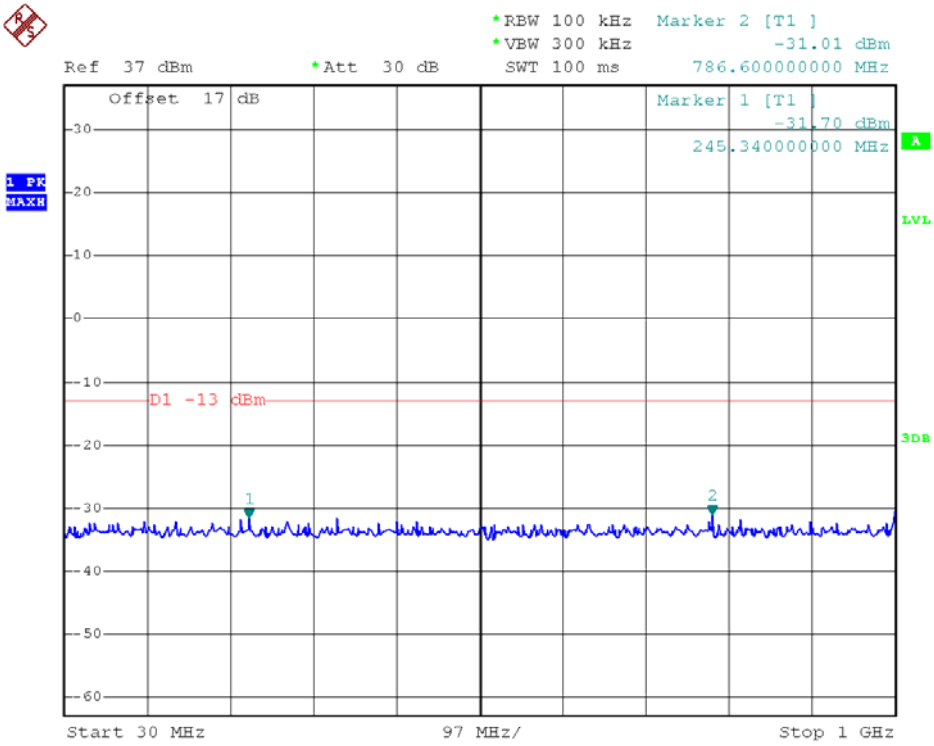



RB Size 1, RB Offset 0 30MHz to 1GHz

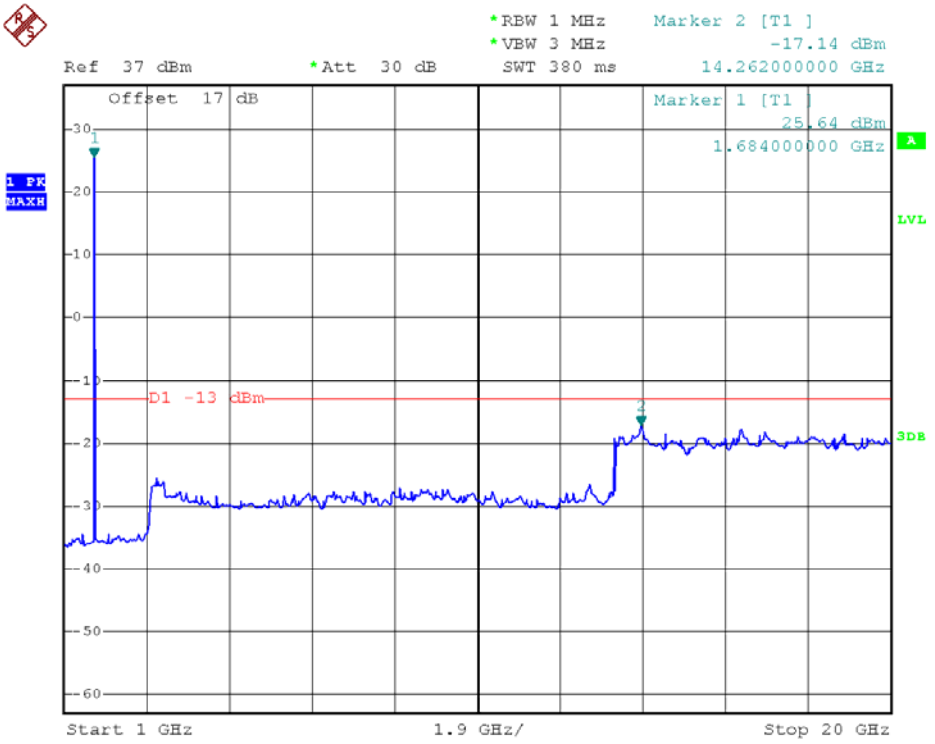



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Low |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

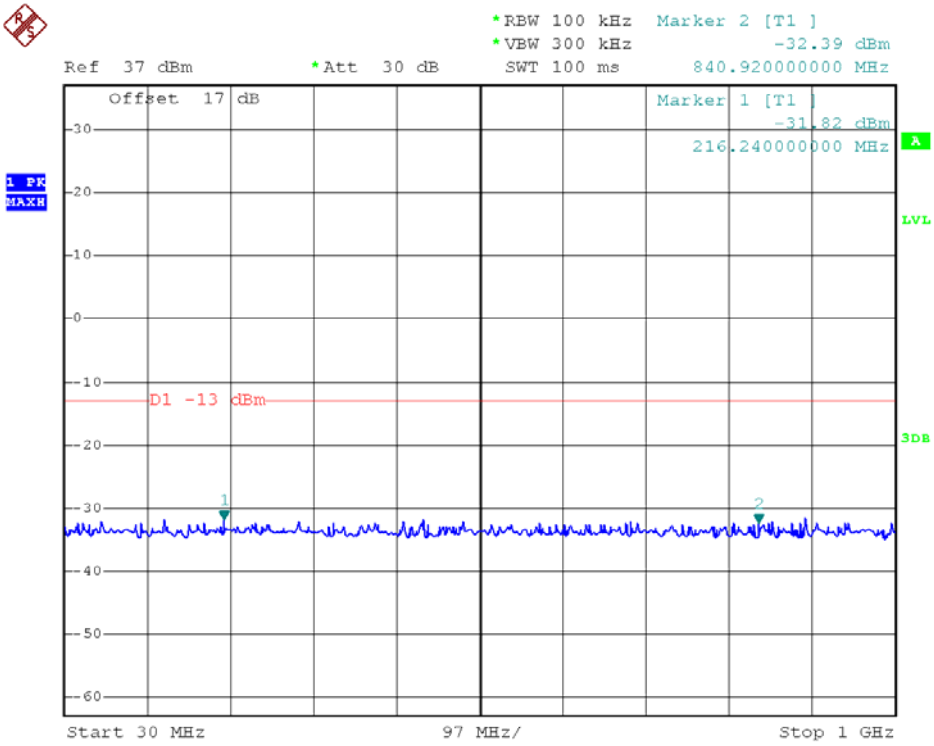



RB Size 1, RB Offset 0 30MHz to 1GHz

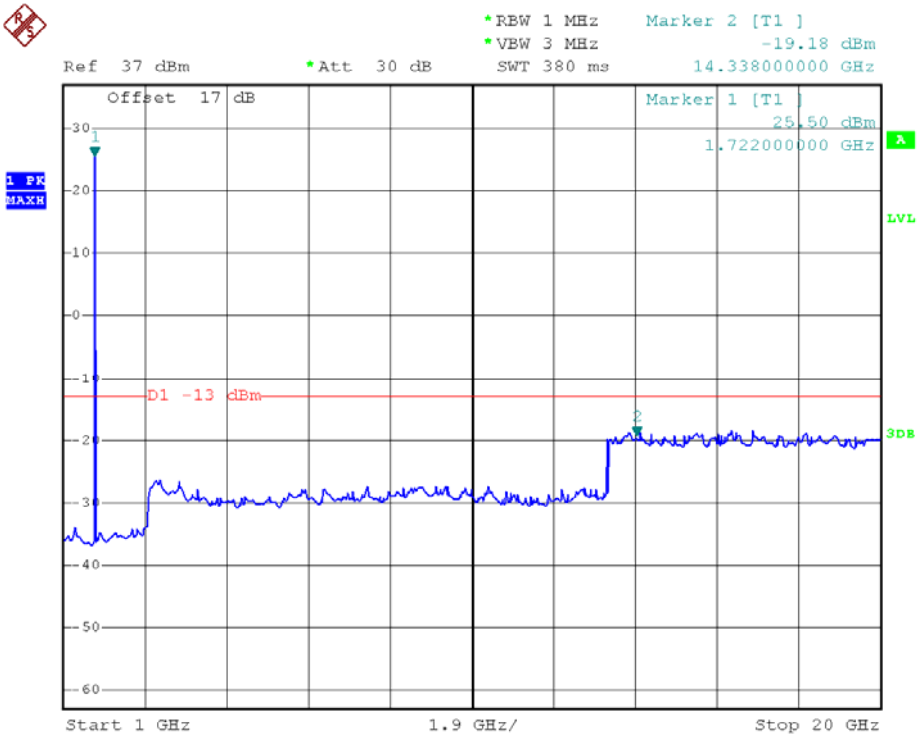



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

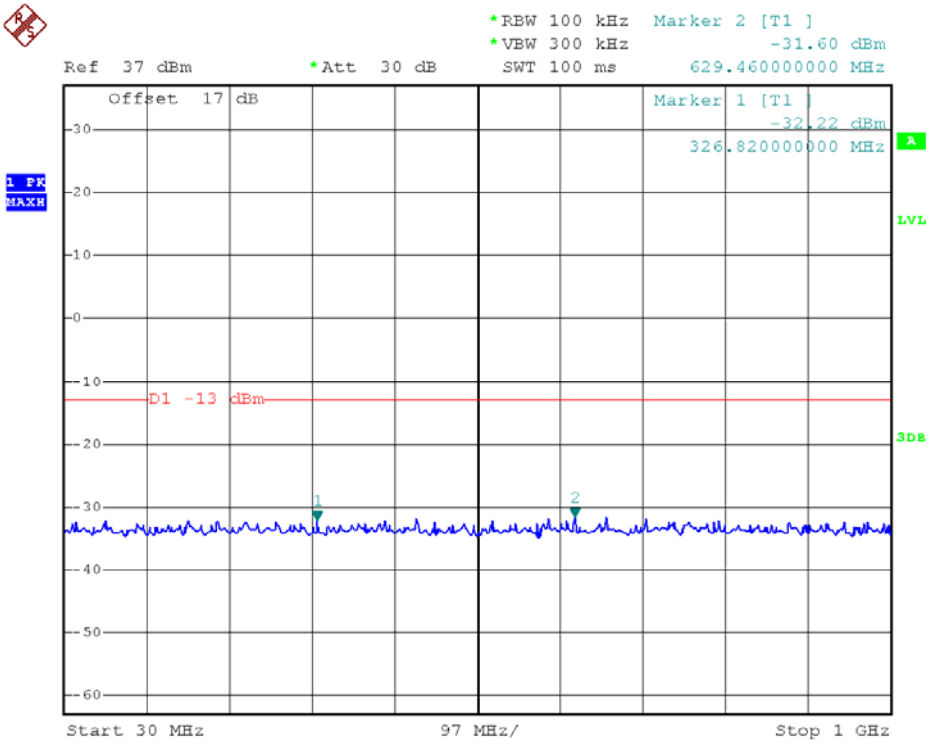



RB Size 1, RB Offset 0 30MHz to 1GHz

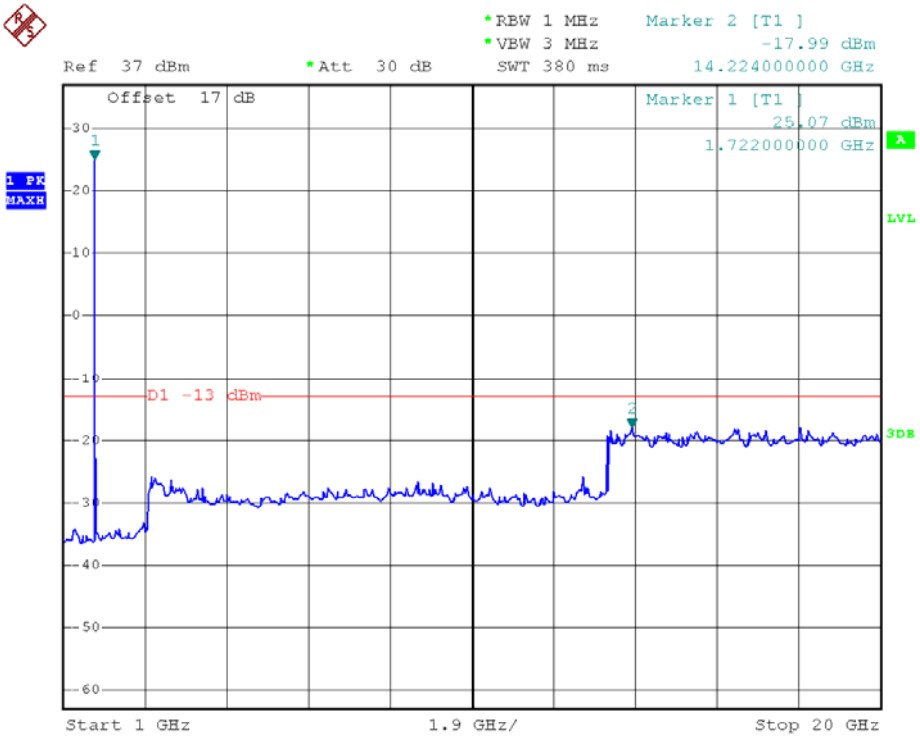



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | High |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

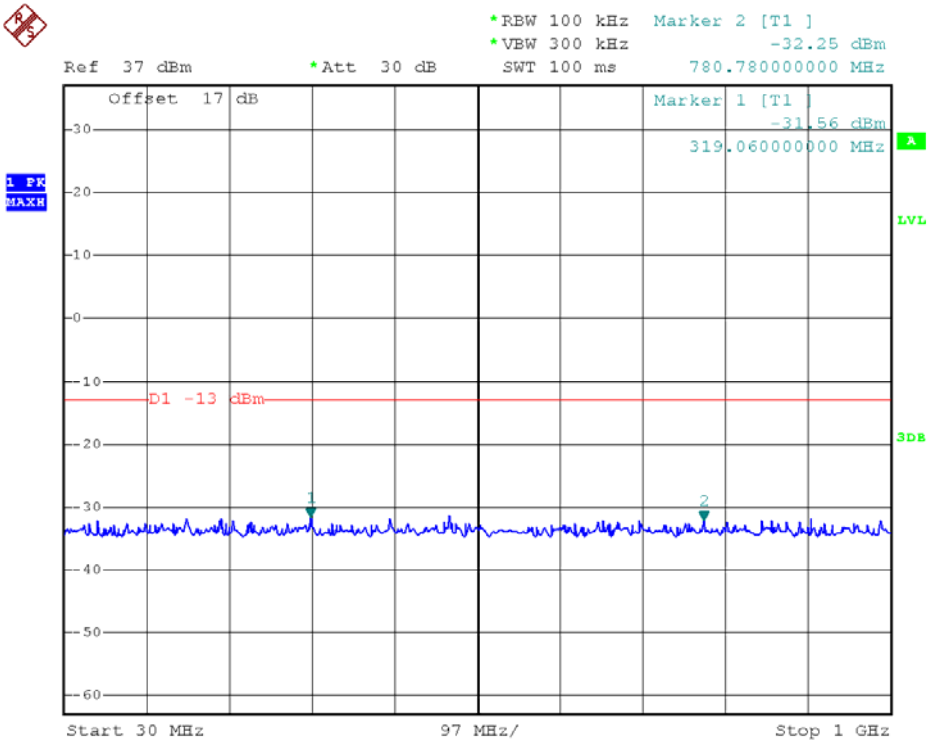



RB Size 1, RB Offset 0 30MHz to 1GHz

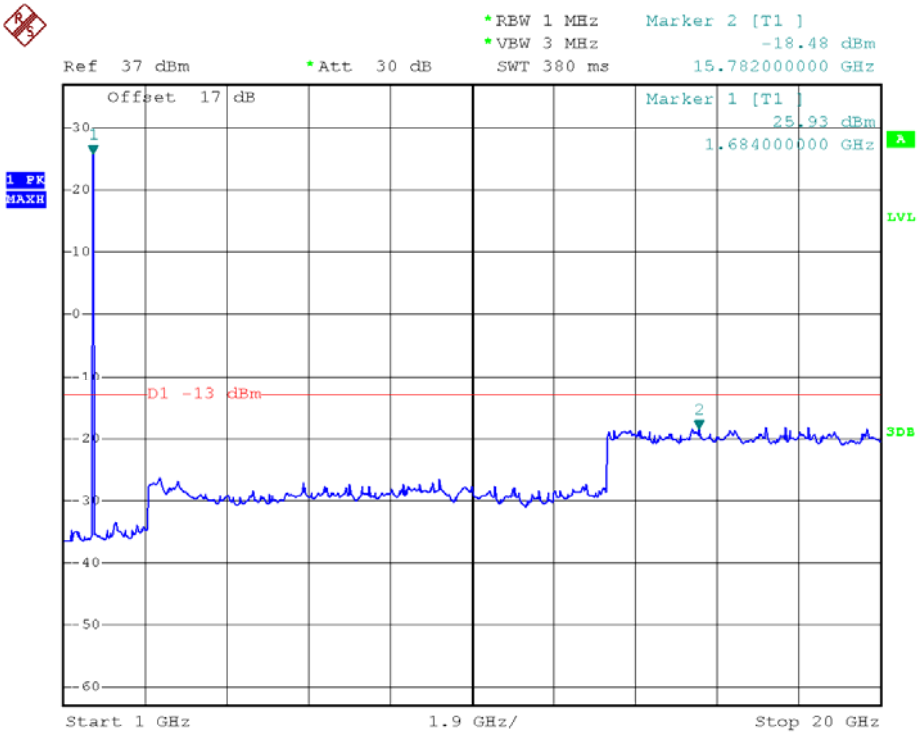



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Low |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

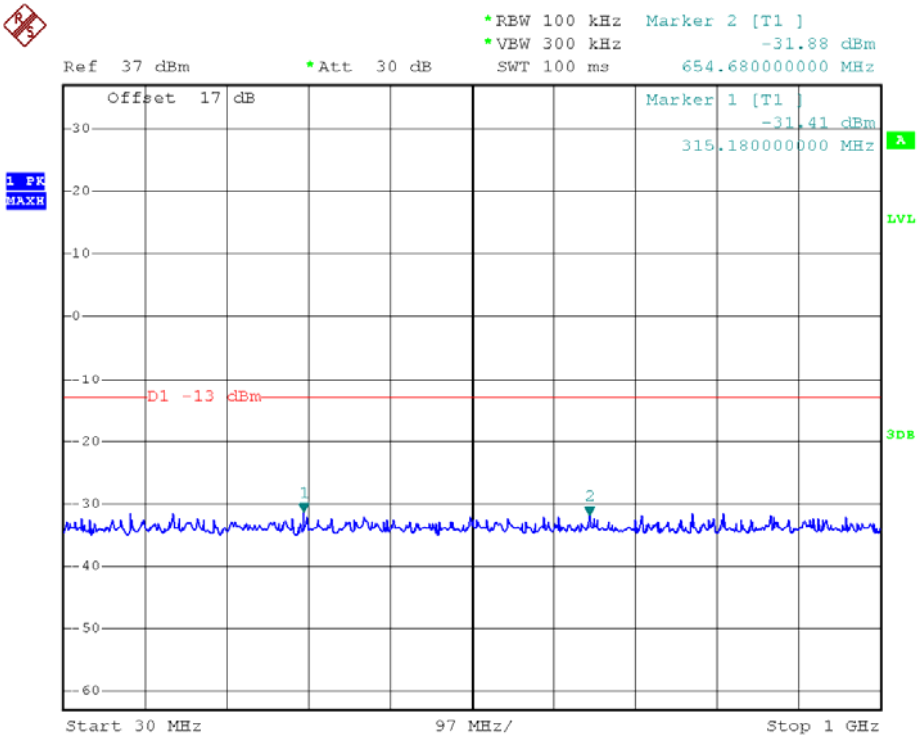



RB Size 1, RB Offset 0 30MHz to 1GHz

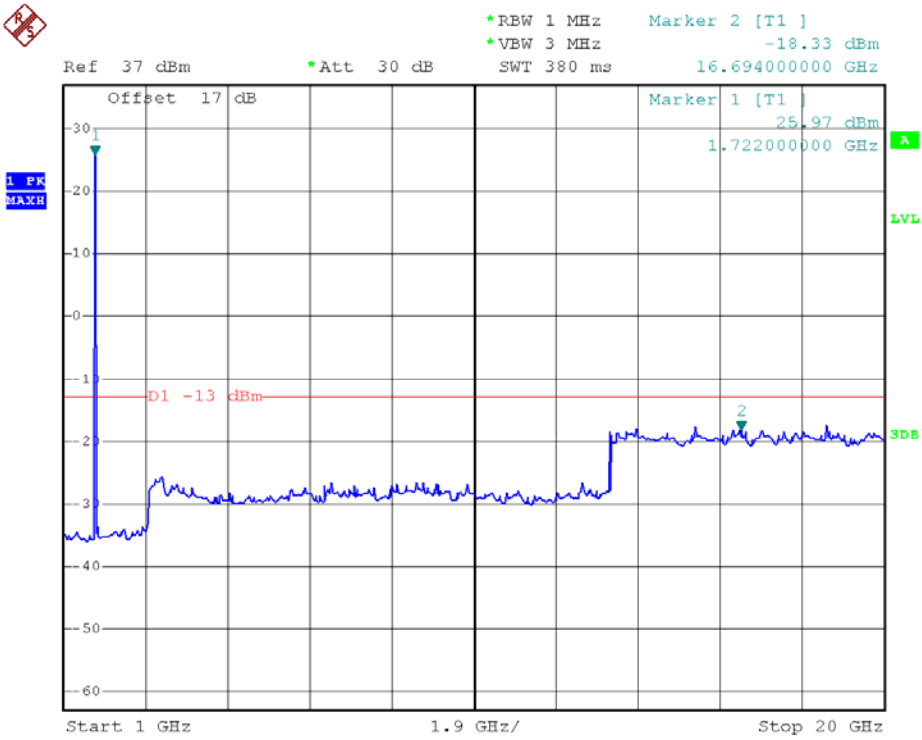



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

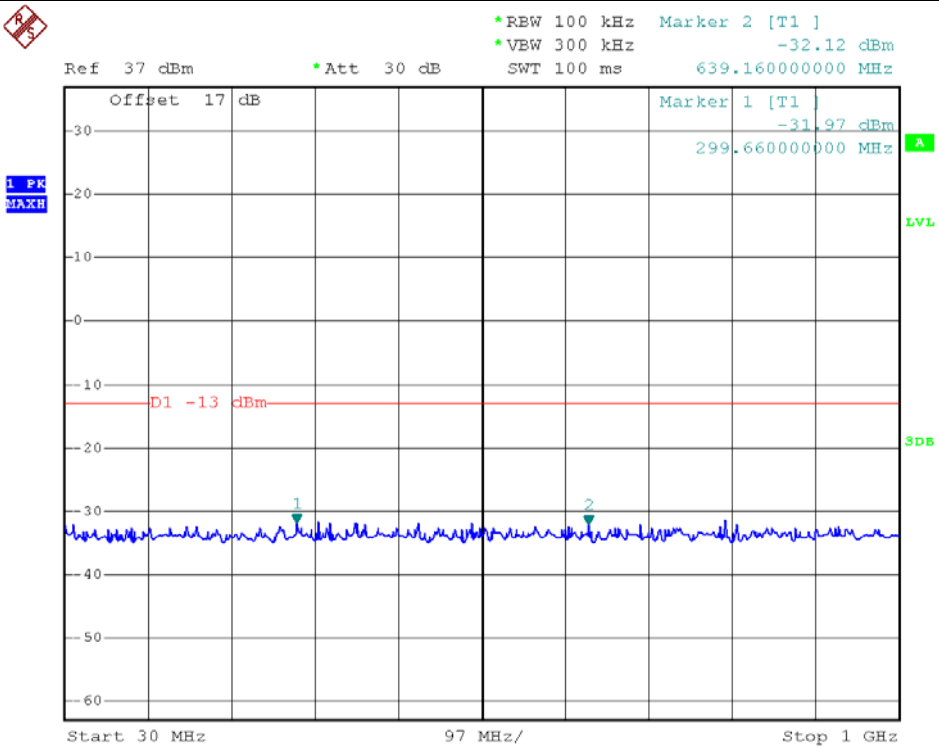



RB Size 1, RB Offset 0 30MHz to 1GHz

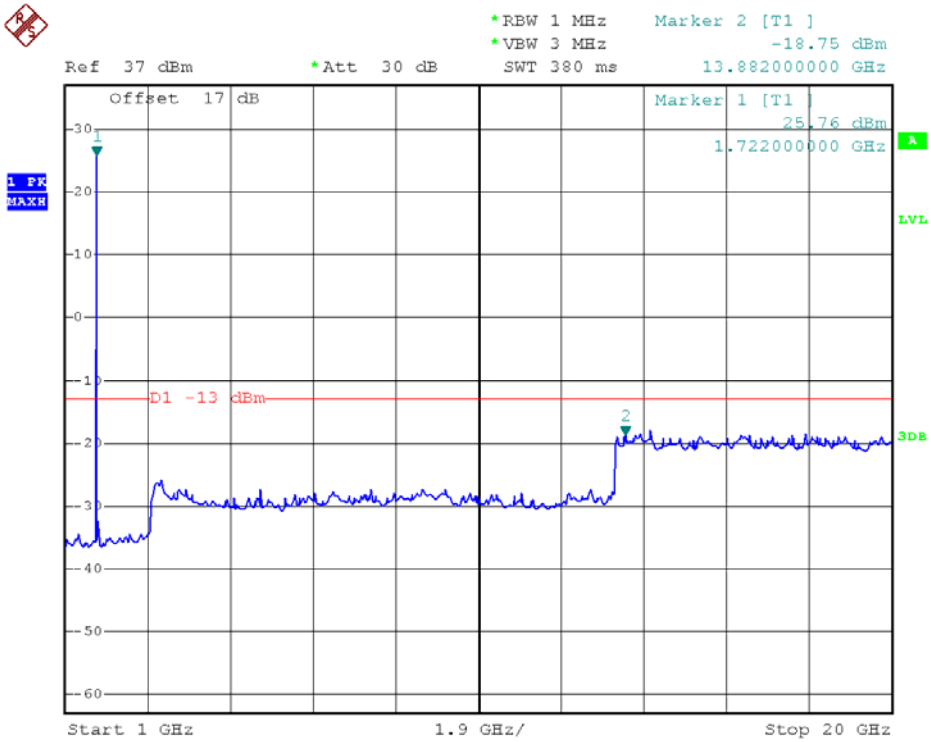



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | High |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

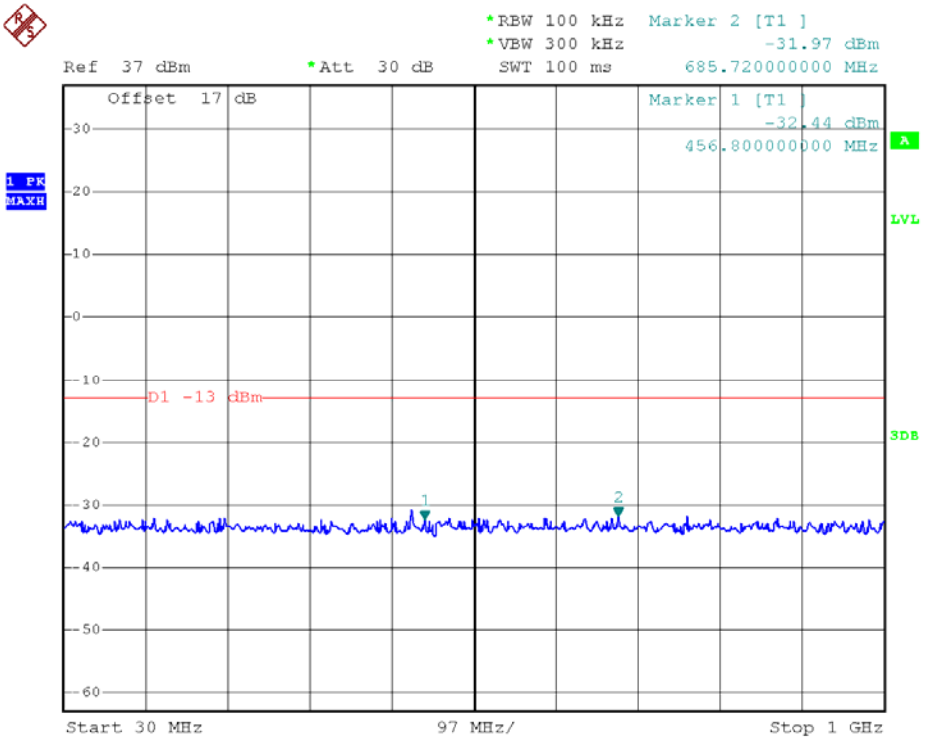



RB Size 1, RB Offset 0 30MHz to 1GHz

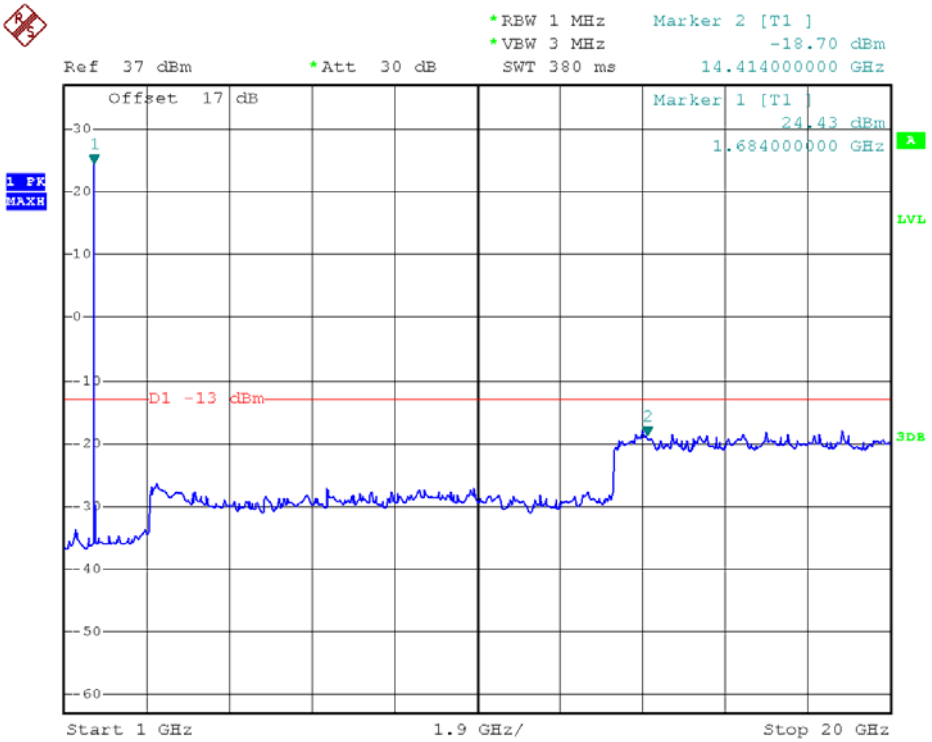



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Low |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

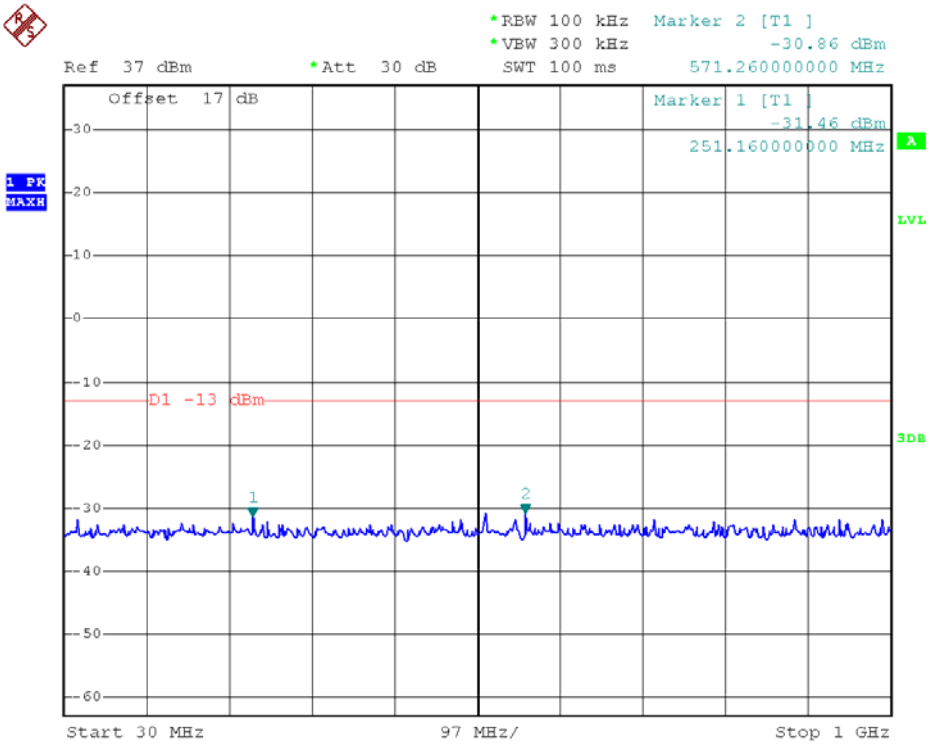



RB Size 1, RB Offset 0 30MHz to 1GHz

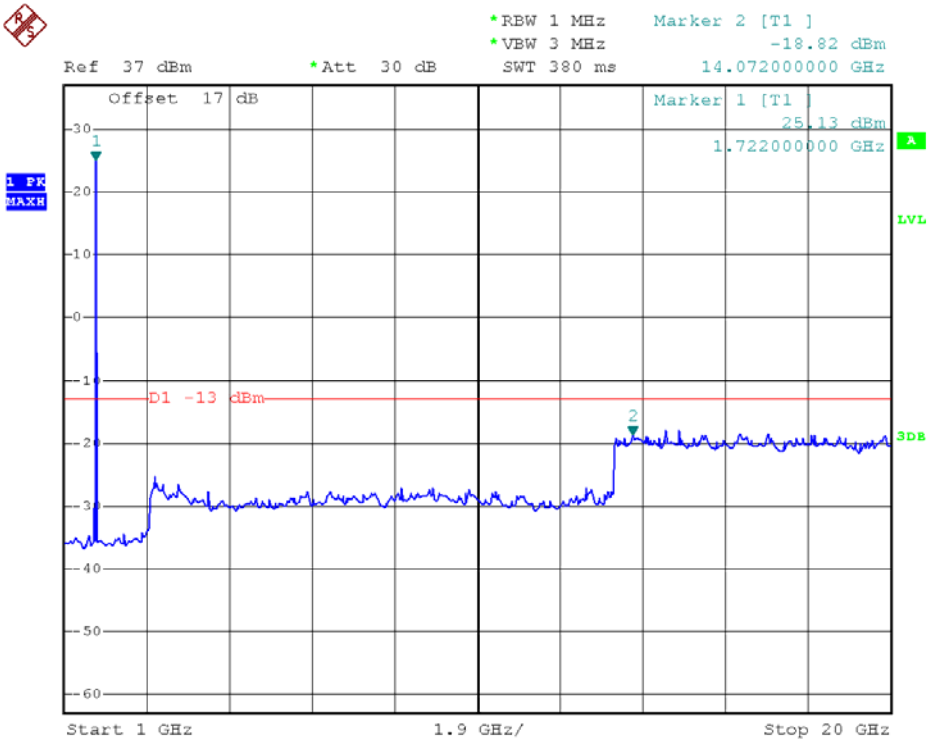



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

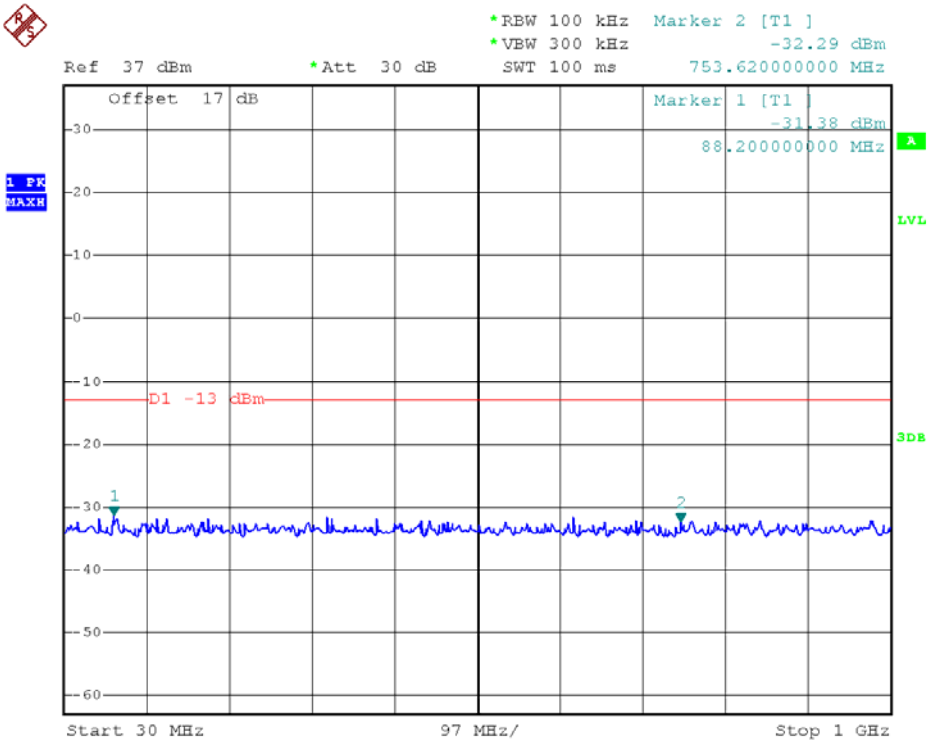



RB Size 1, RB Offset 0 30MHz to 1GHz

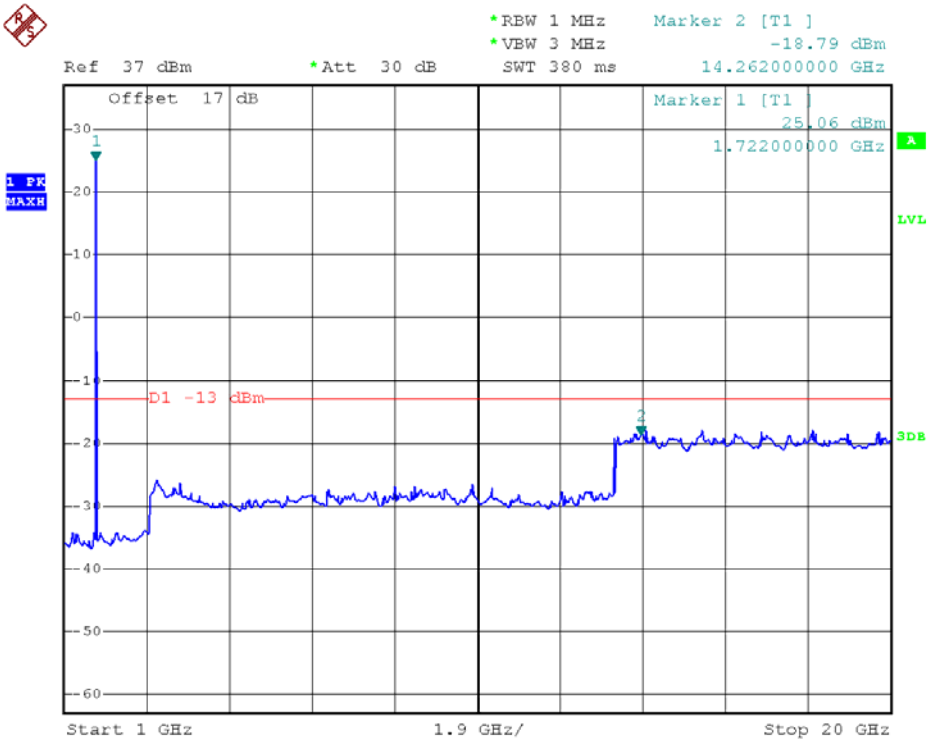



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | High |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

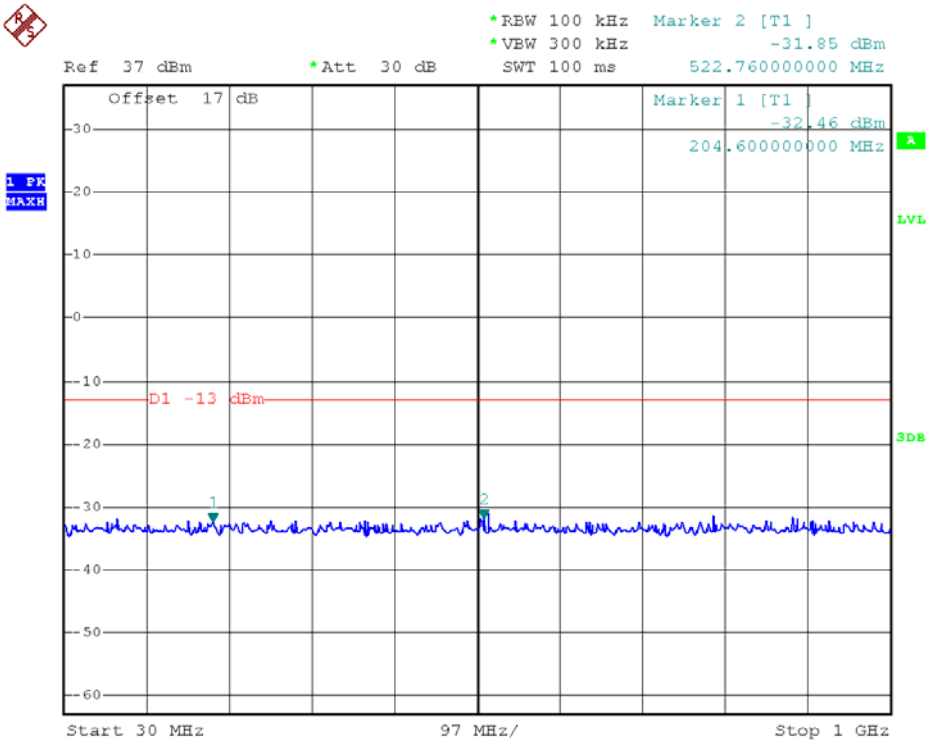



RB Size 1, RB Offset 0 30MHz to 1GHz

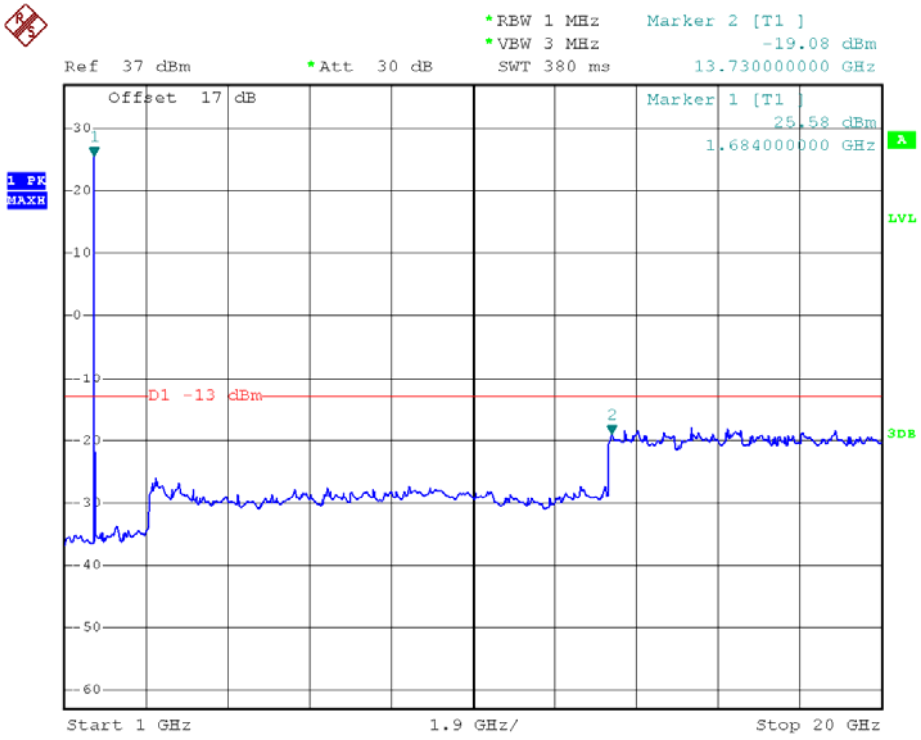



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Low |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

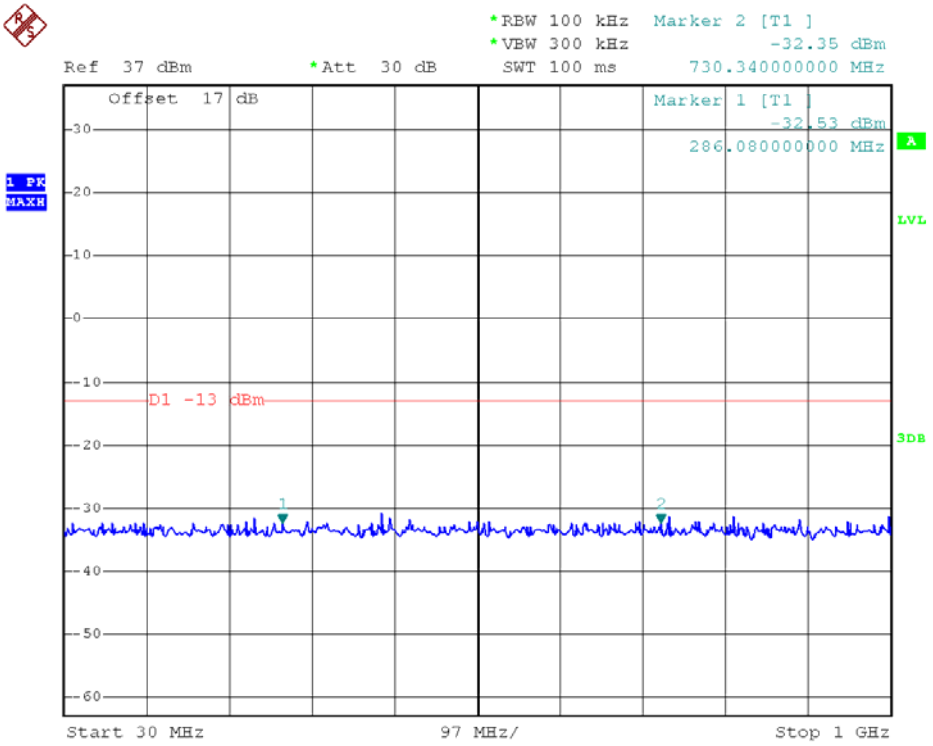



RB Size 1, RB Offset 0 30MHz to 1GHz

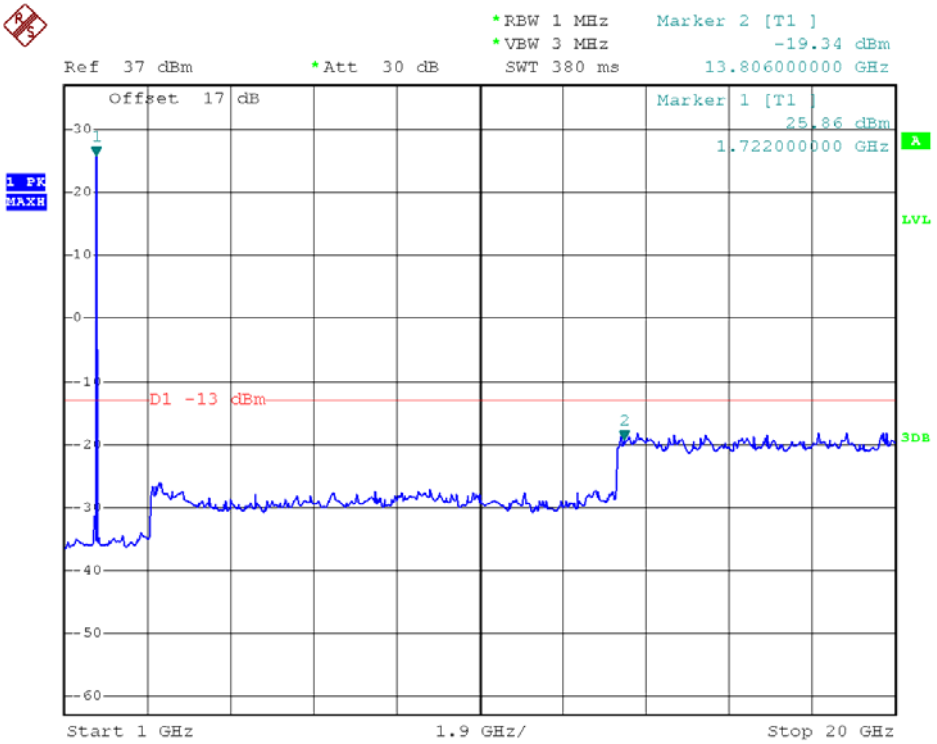



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

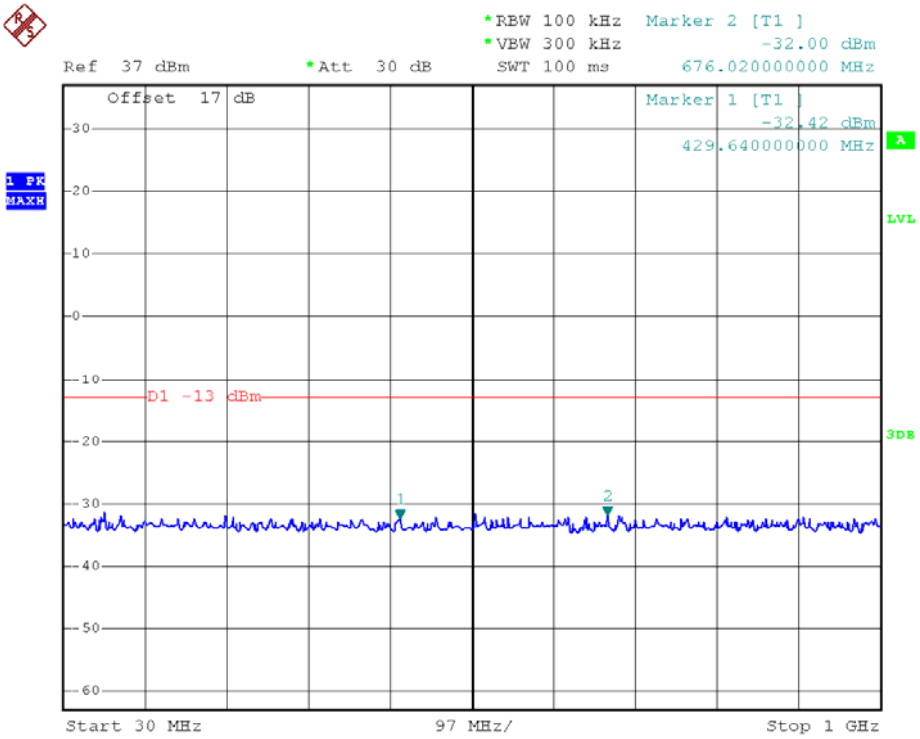



RB Size 1, RB Offset 0 30MHz to 1GHz

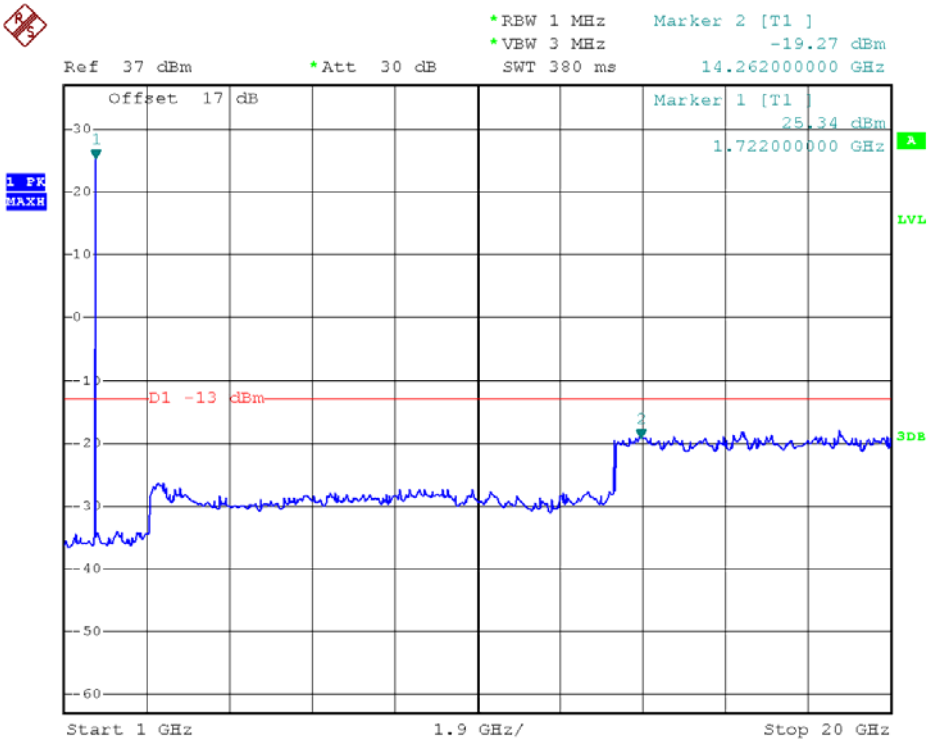



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | High |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

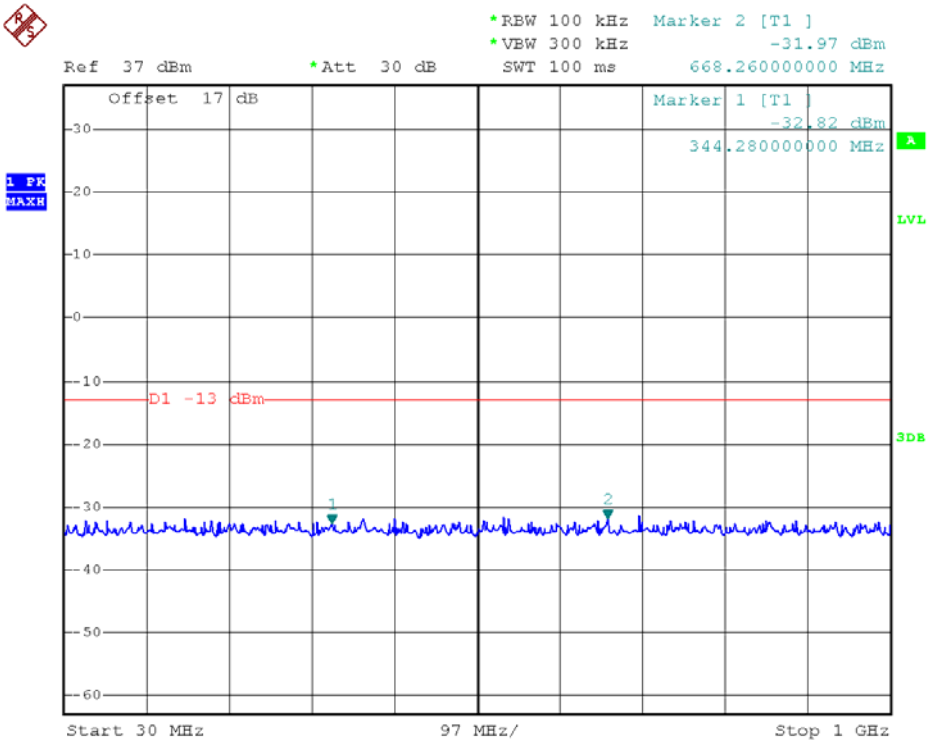



RB Size 1, RB Offset 0 30MHz to 1GHz

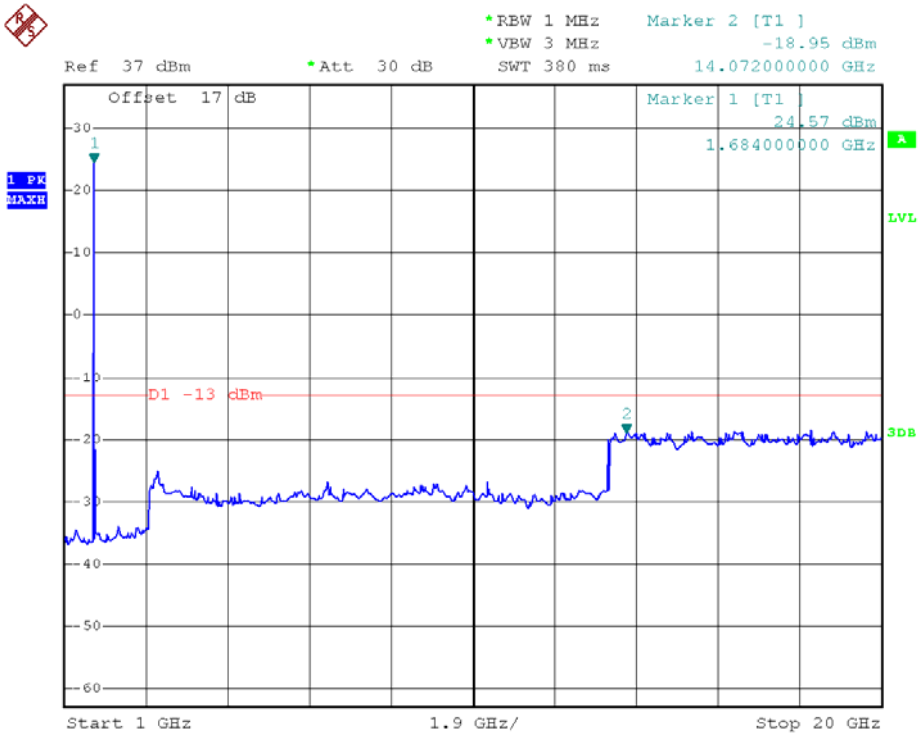



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Low |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

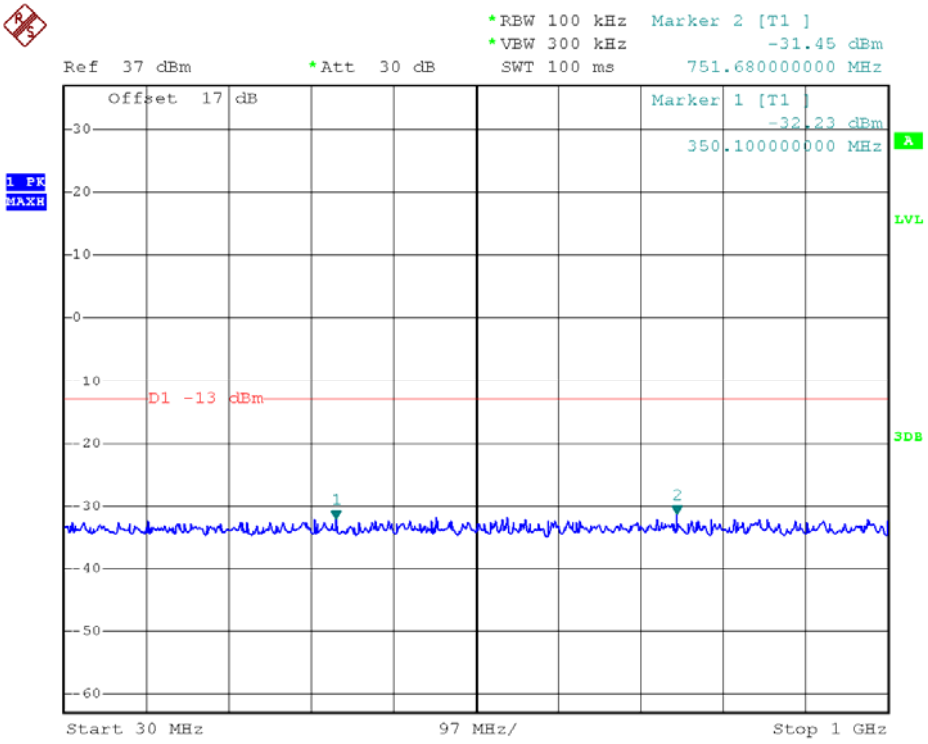



RB Size 1, RB Offset 0 30MHz to 1GHz

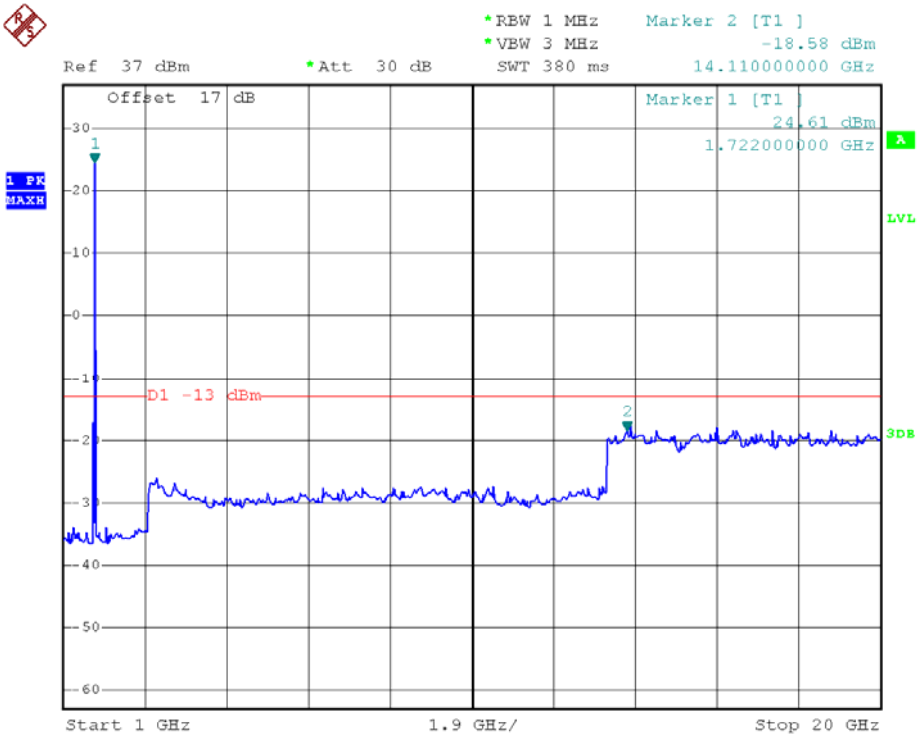



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

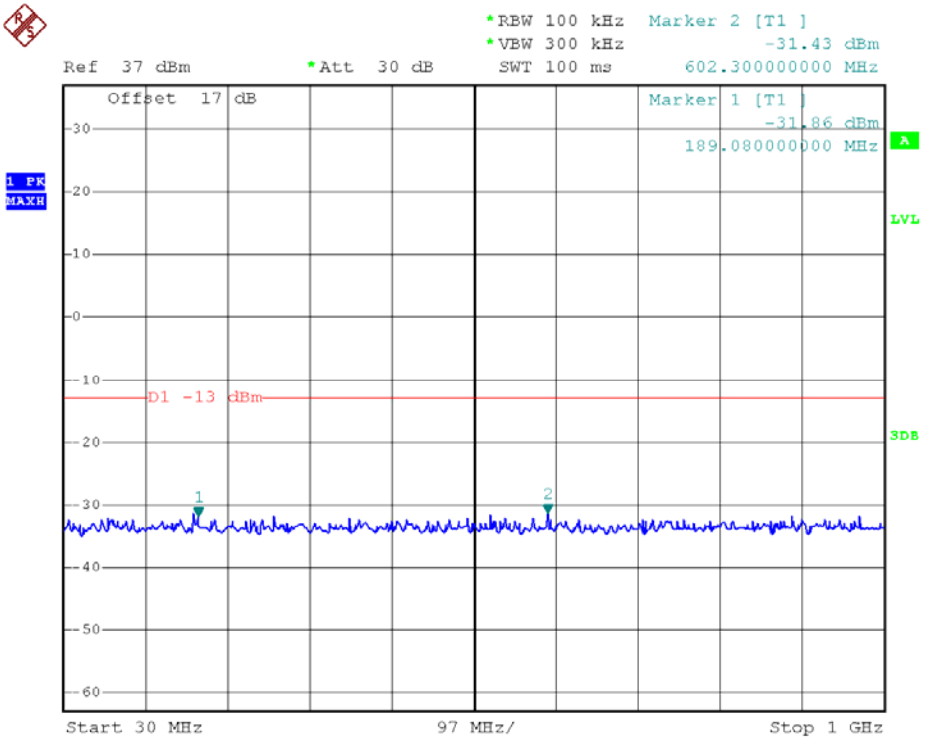



RB Size 1, RB Offset 0 30MHz to 1GHz

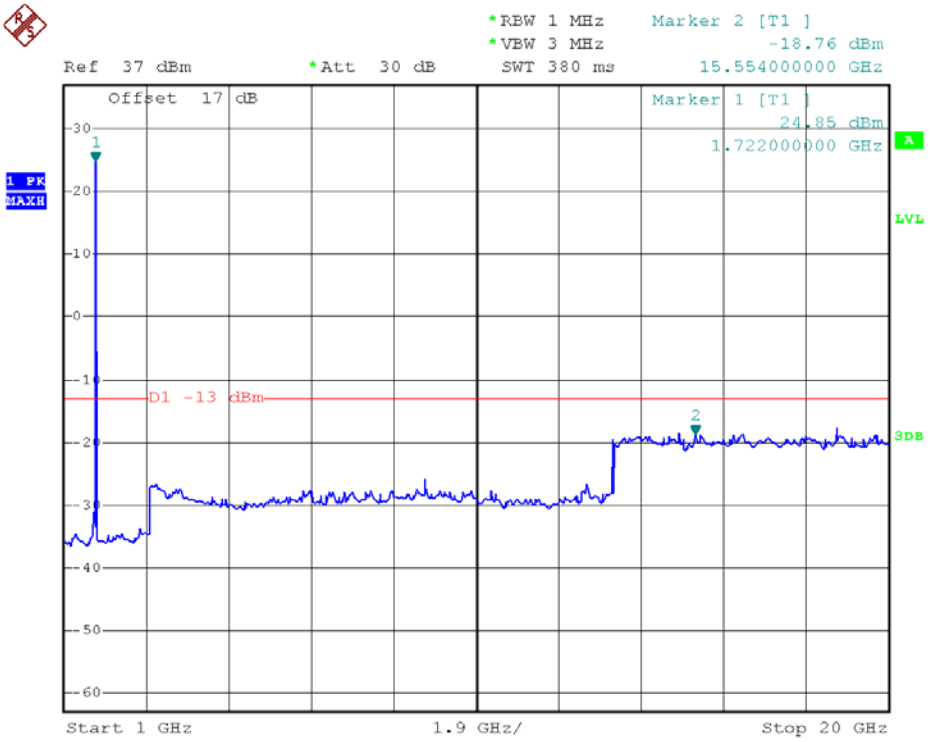



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 4 | Channel | High |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

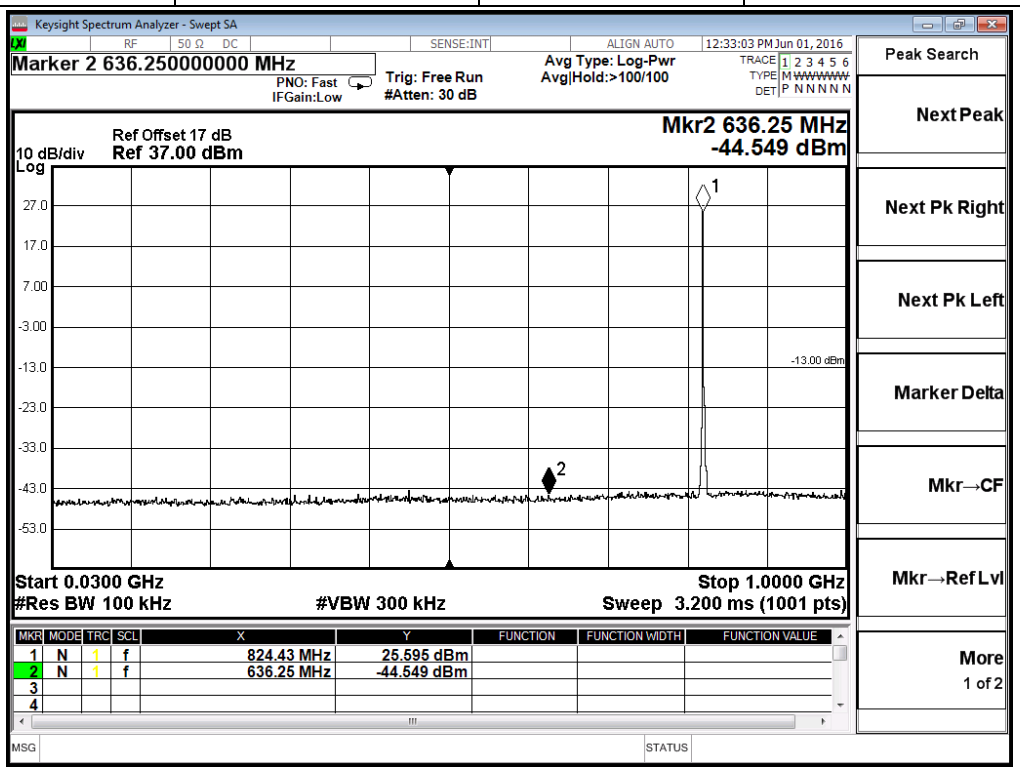



RB Size 1, RB Offset 0 30MHz to 1GHz

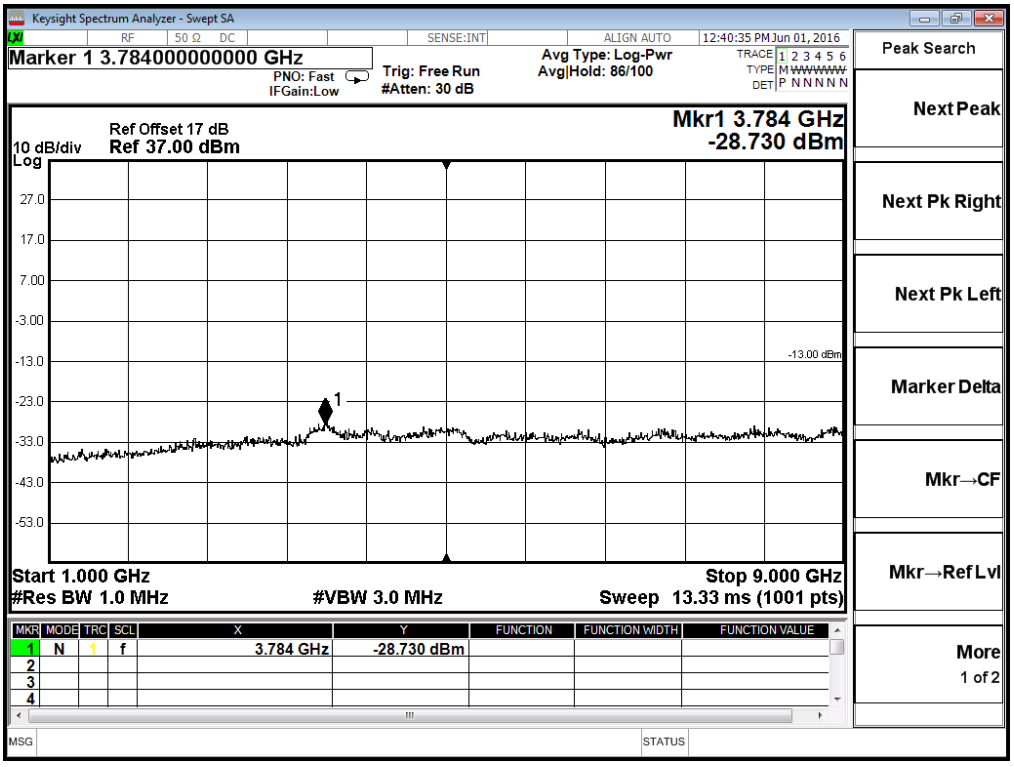



RB Size 1, RB Offset 0 1GHz to 20GHz

| Band | LTE Band 5 | Channel | Low |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

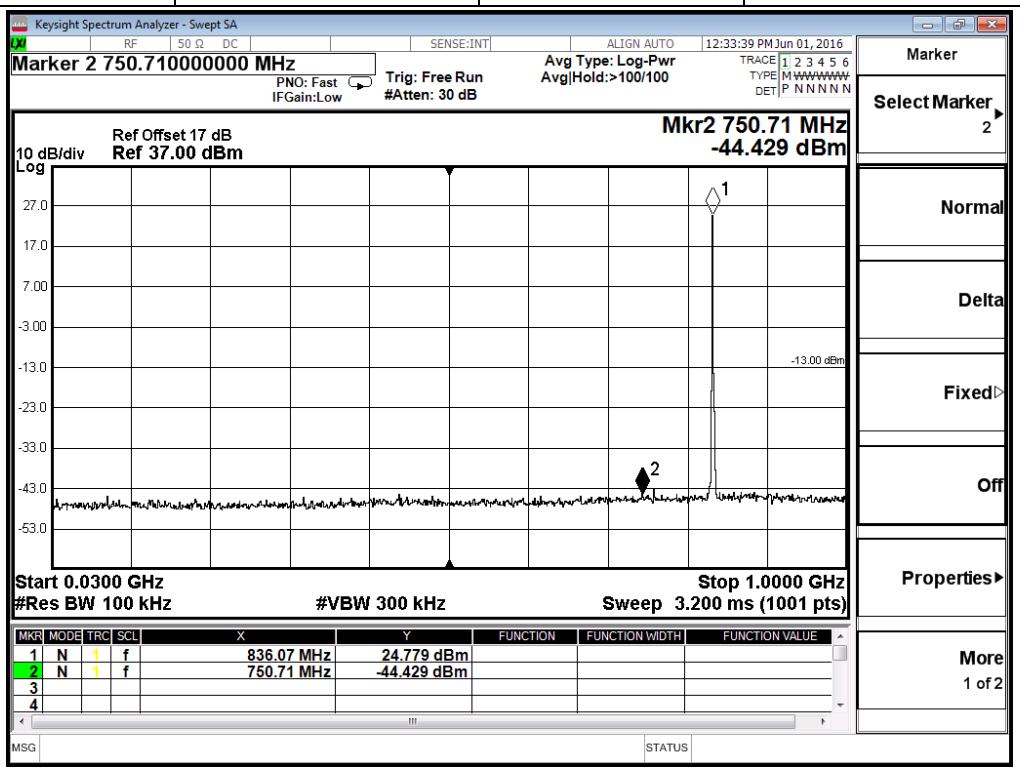



RB Size 1, RB Offset 0 30MHz to 1GHz

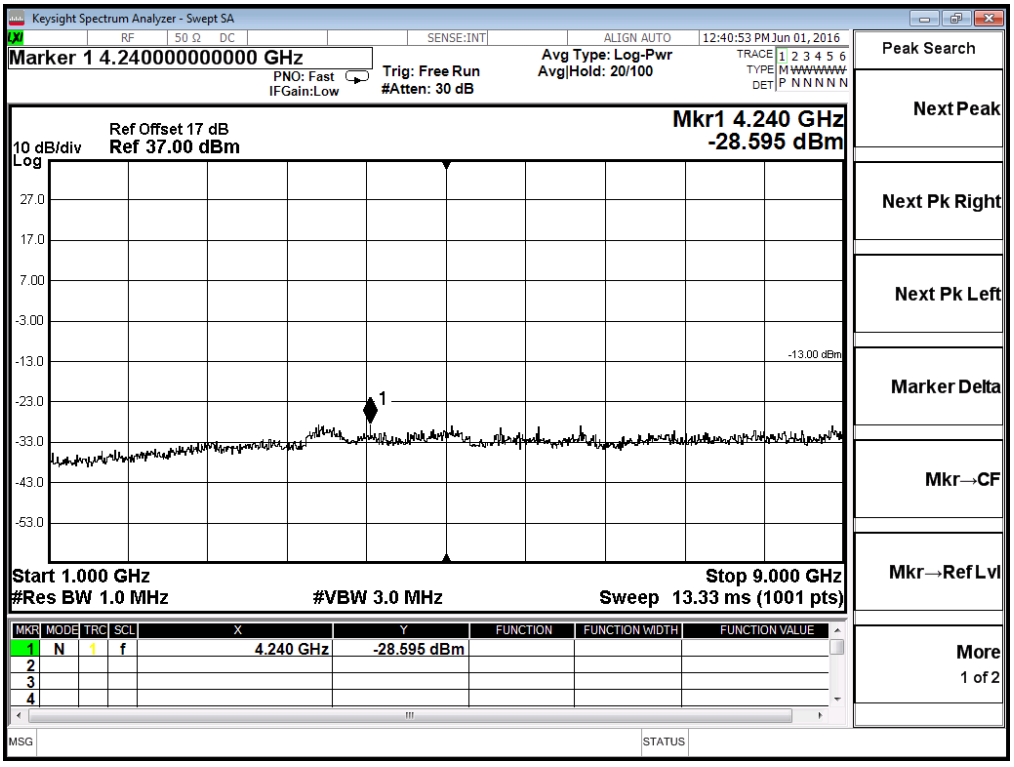



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | Middle |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

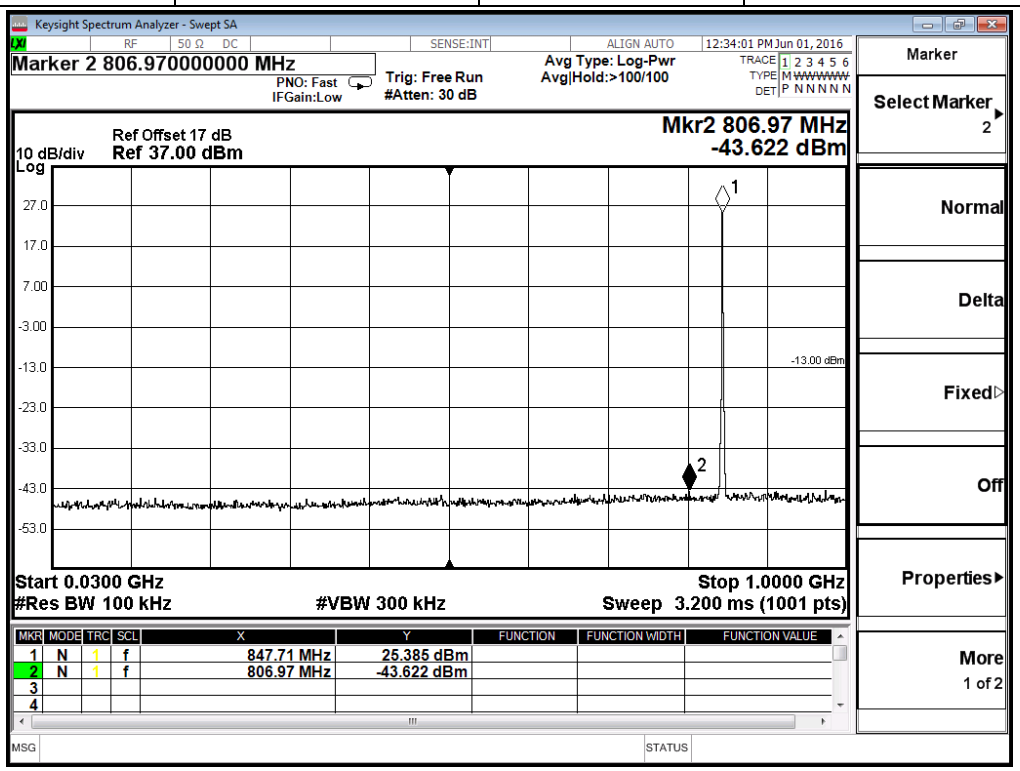



RB Size 1, RB Offset 0 30MHz to 1GHz

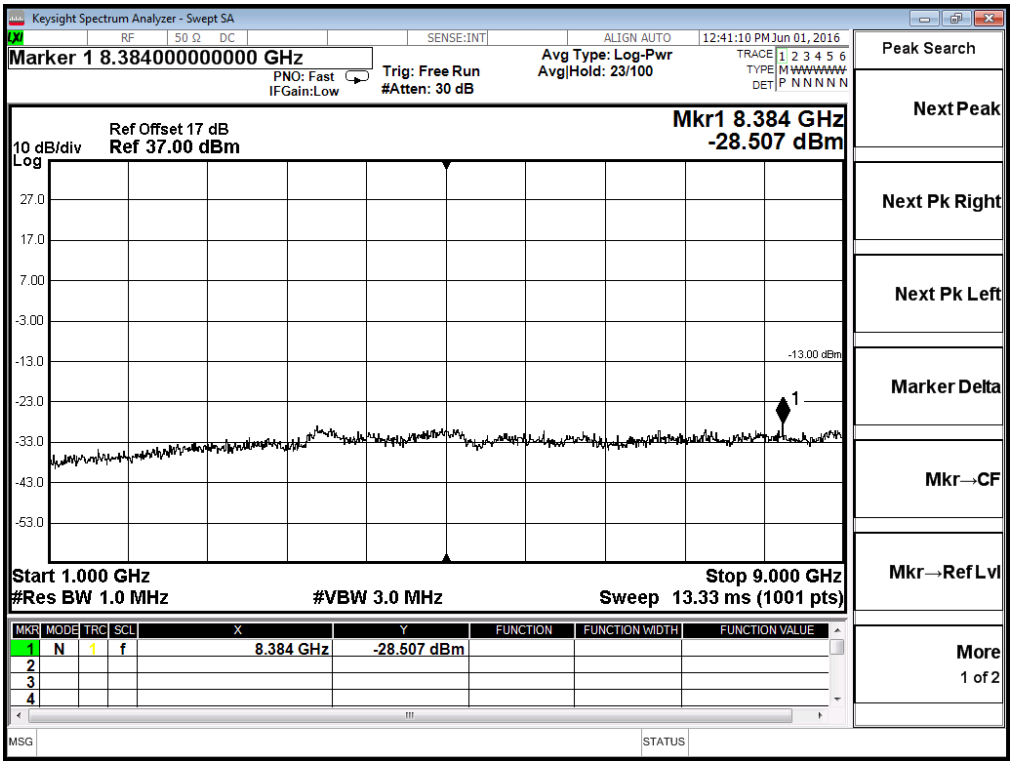



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | High |
|---|---|---|---|
| Bandwidth | 1.4MHz | Modulation | QPSK |

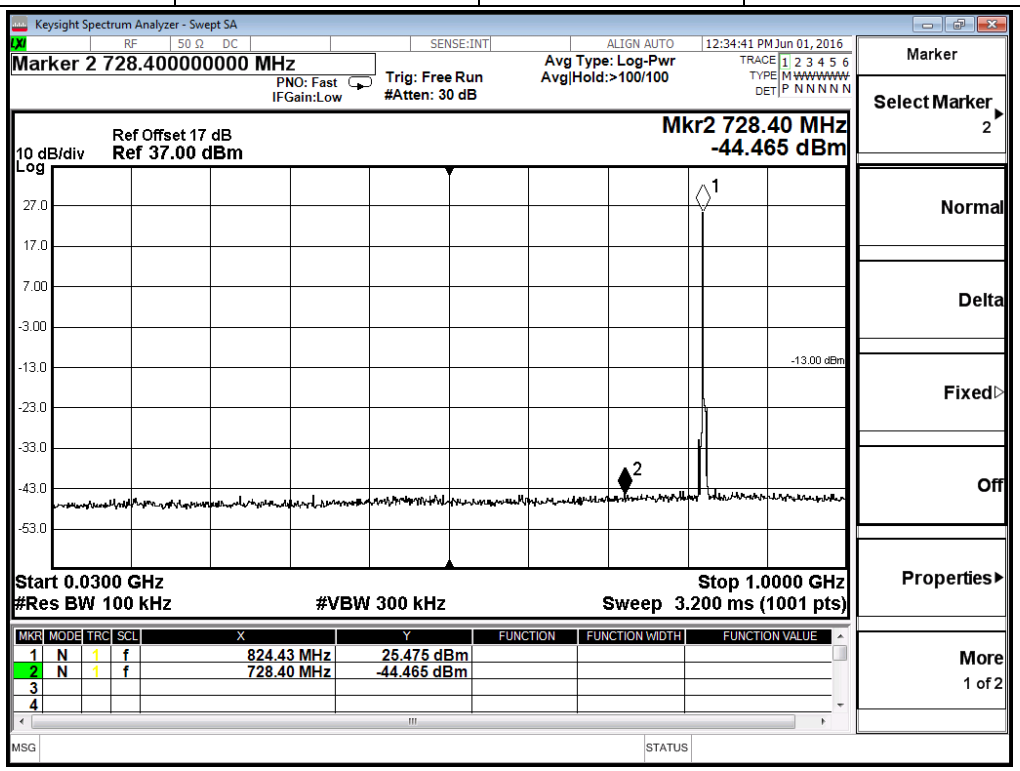



RB Size 1, RB Offset 0 30MHz to 1GHz

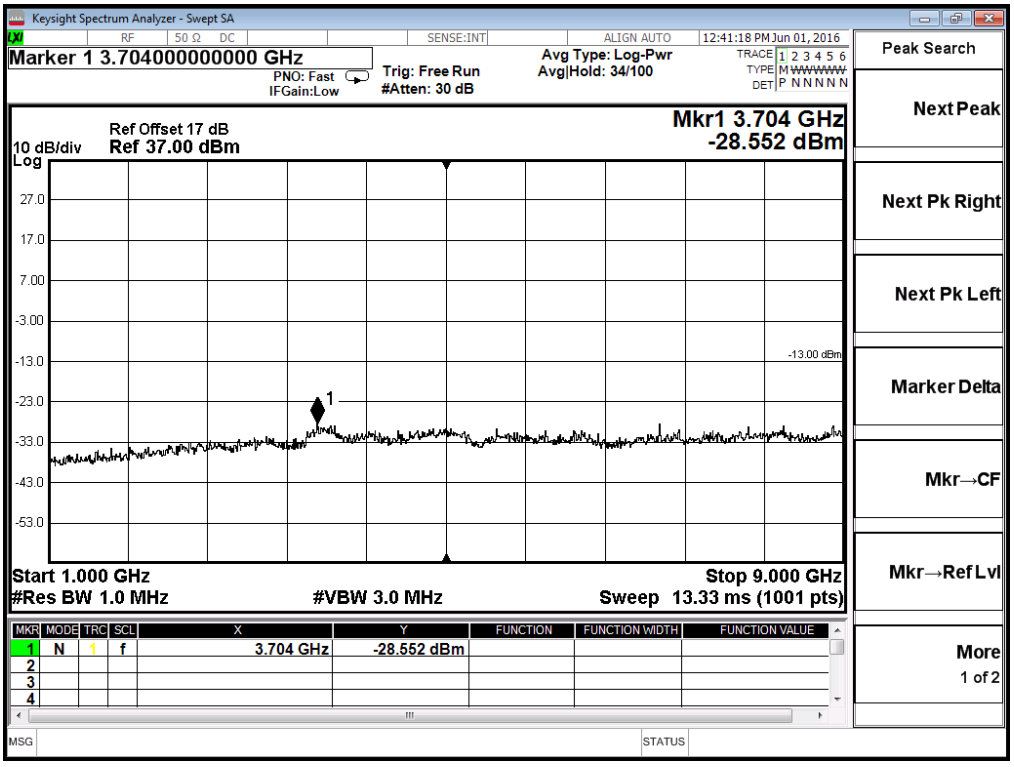



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel | Low |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

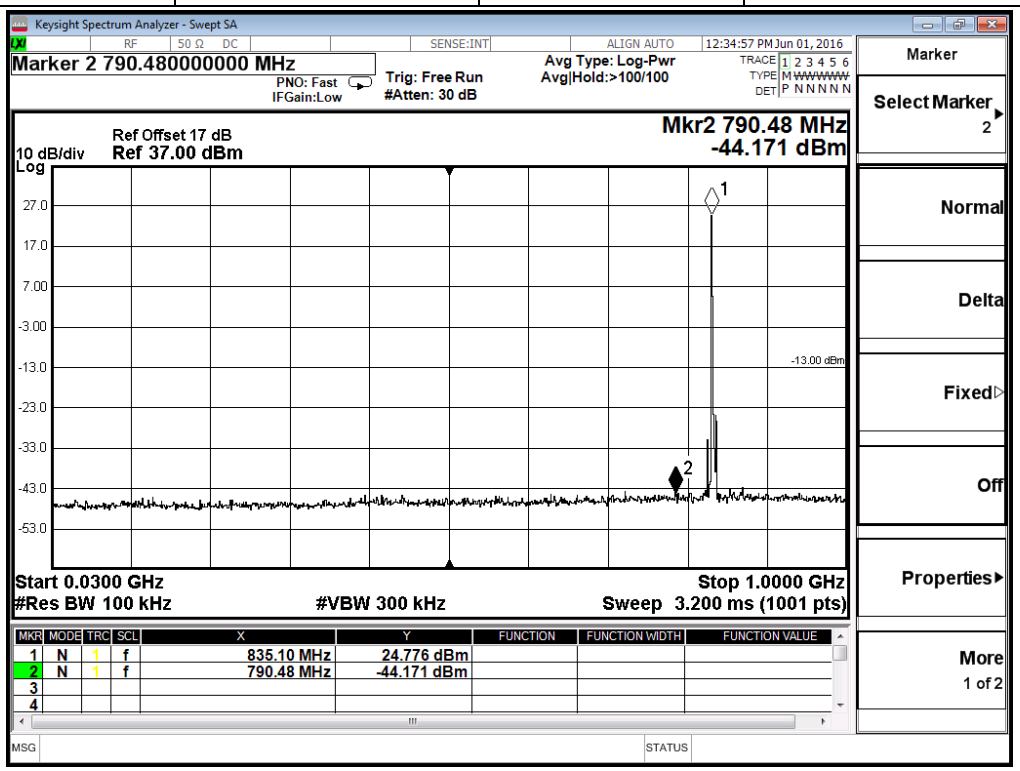



RB Size 1, RB Offset 0 30MHz to 1GHz

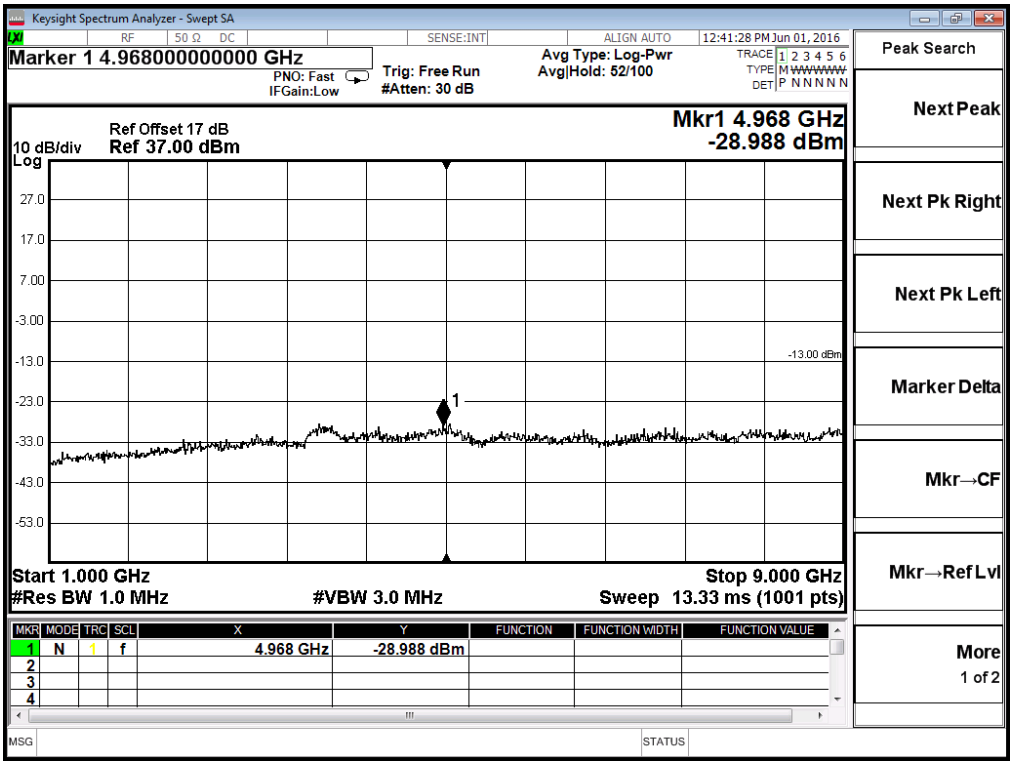



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | Middle |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

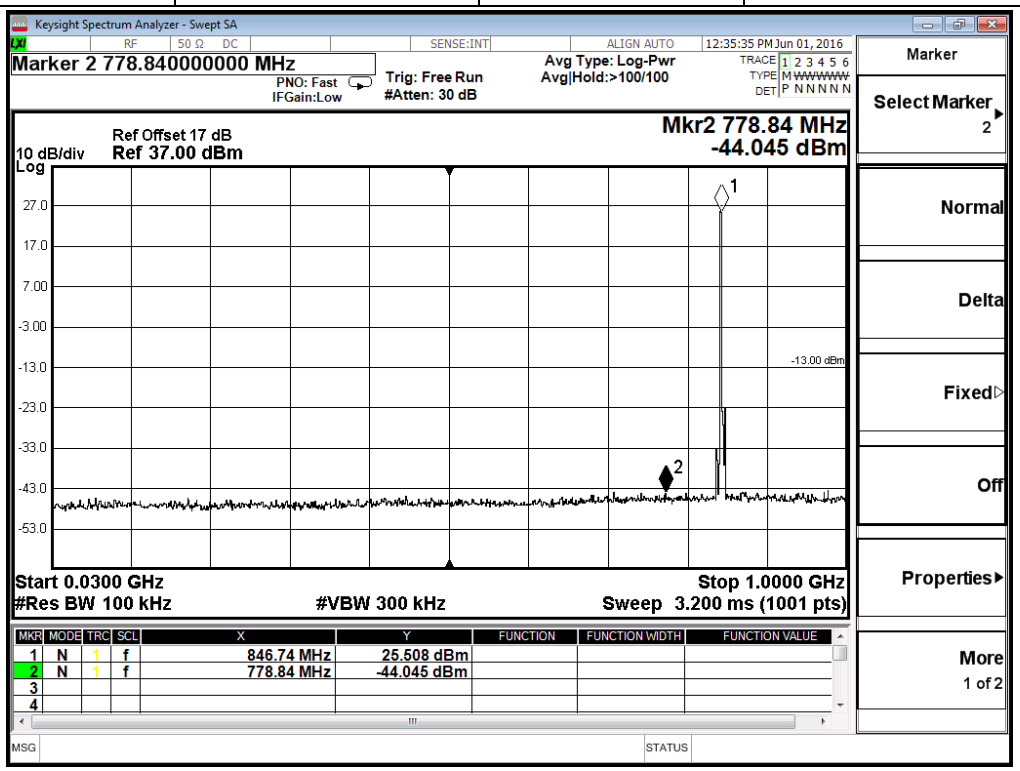



RB Size 1, RB Offset 0 30MHz to 1GHz

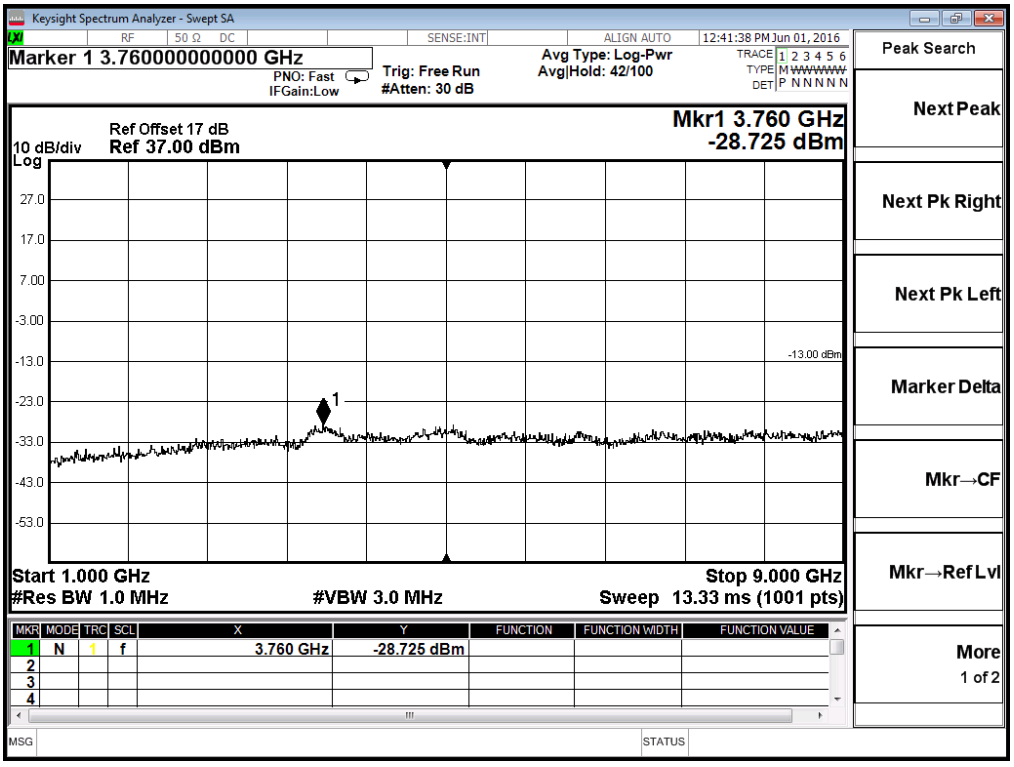



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | High |
|---|---|---|---|
| Bandwidth | 3MHz | Modulation | QPSK |

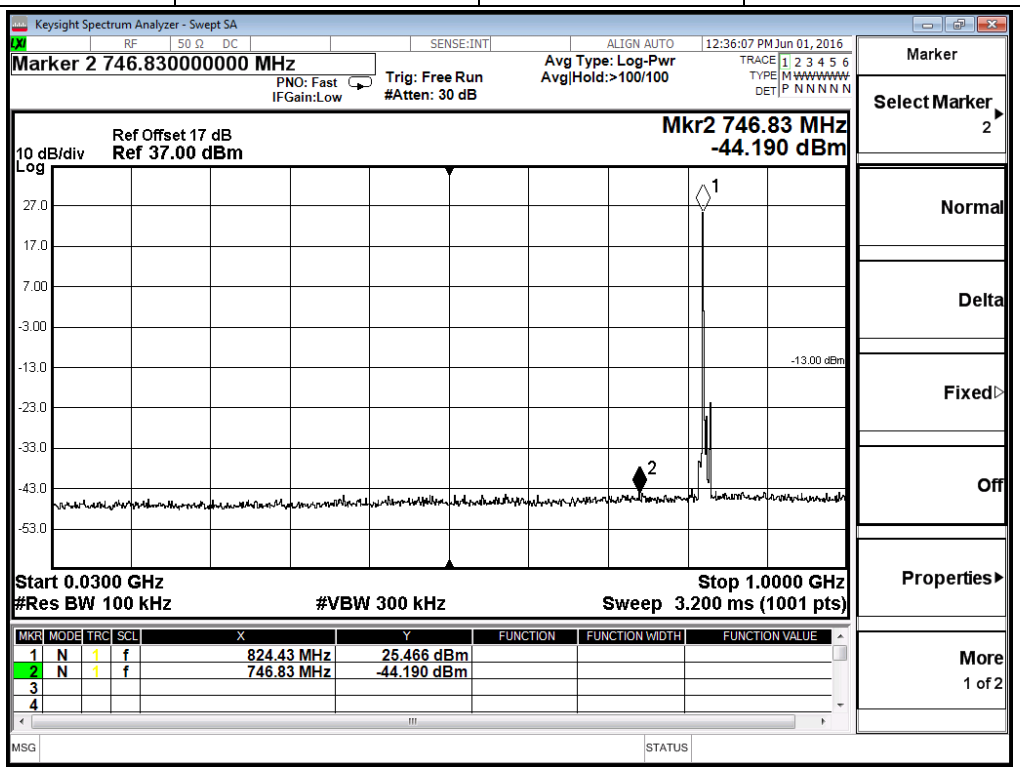



RB Size 1, RB Offset 0 30MHz to 1GHz

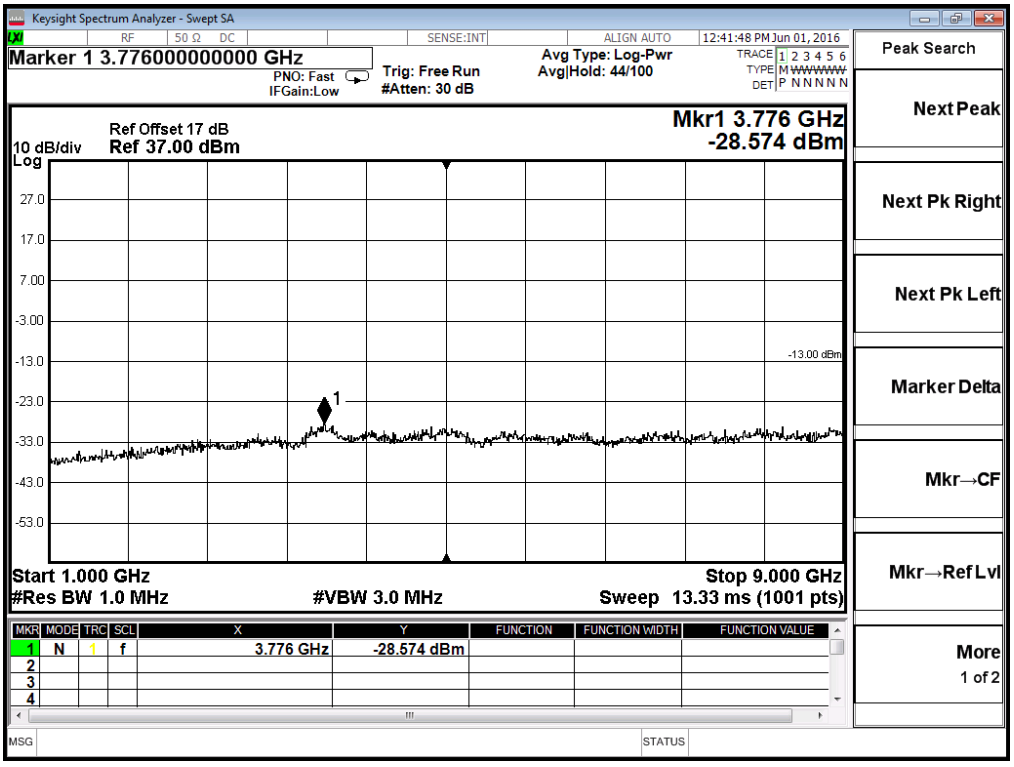



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel | Low |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

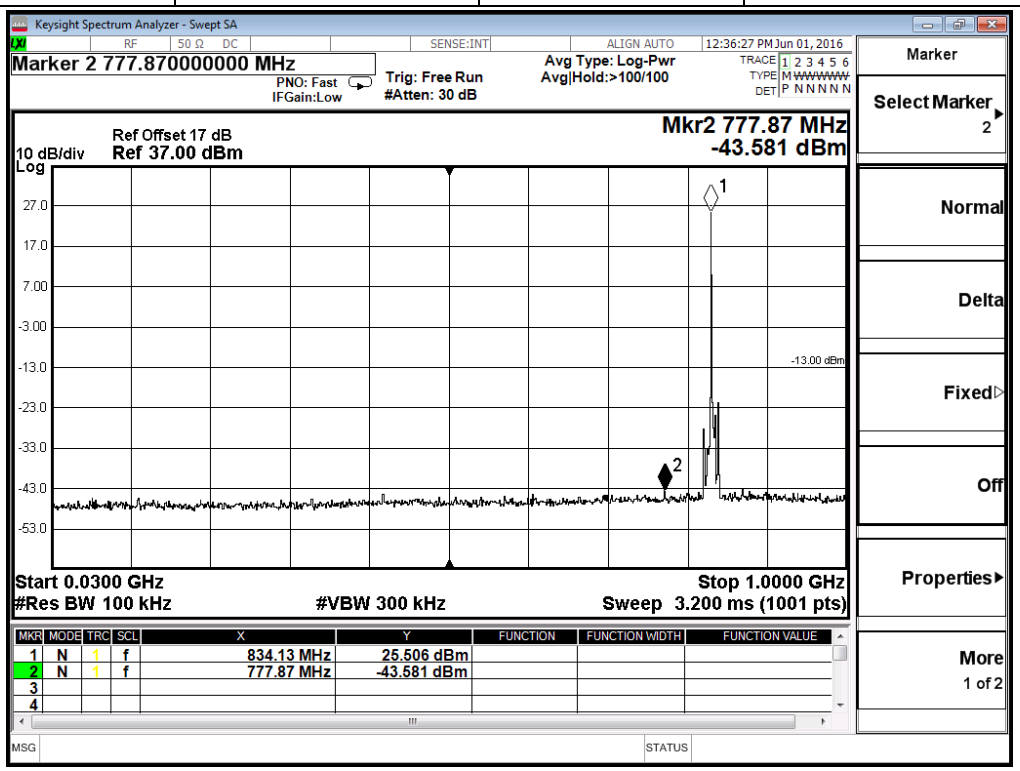



RB Size 1, RB Offset 0 30MHz to 1GHz

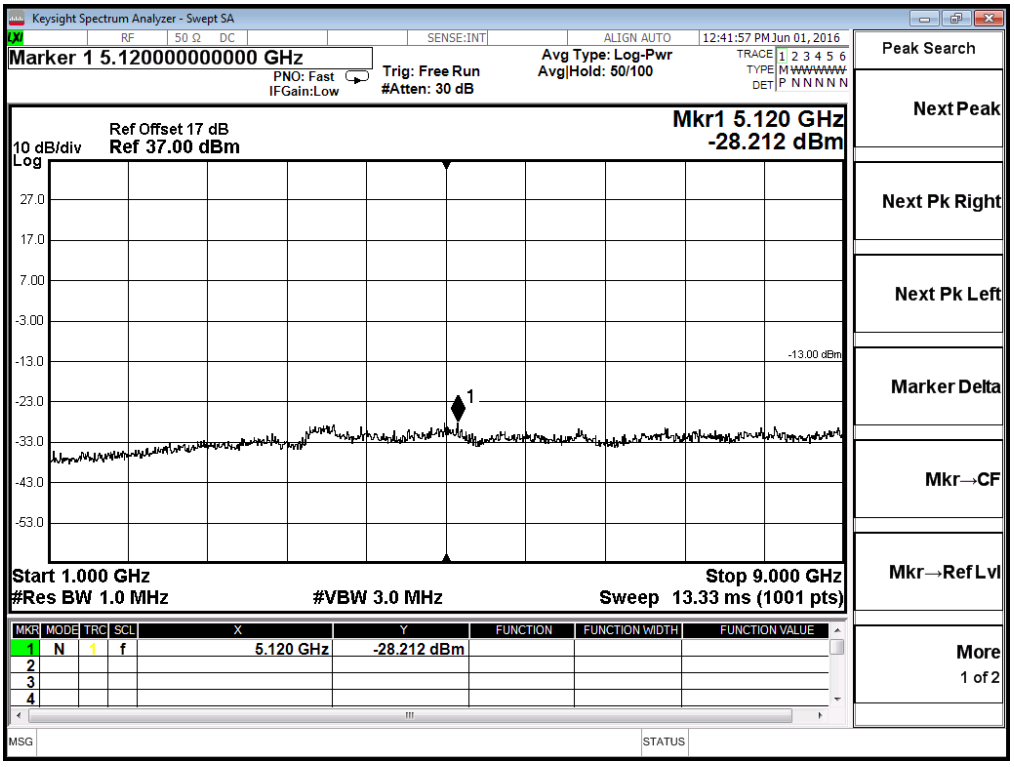



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | Middle |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

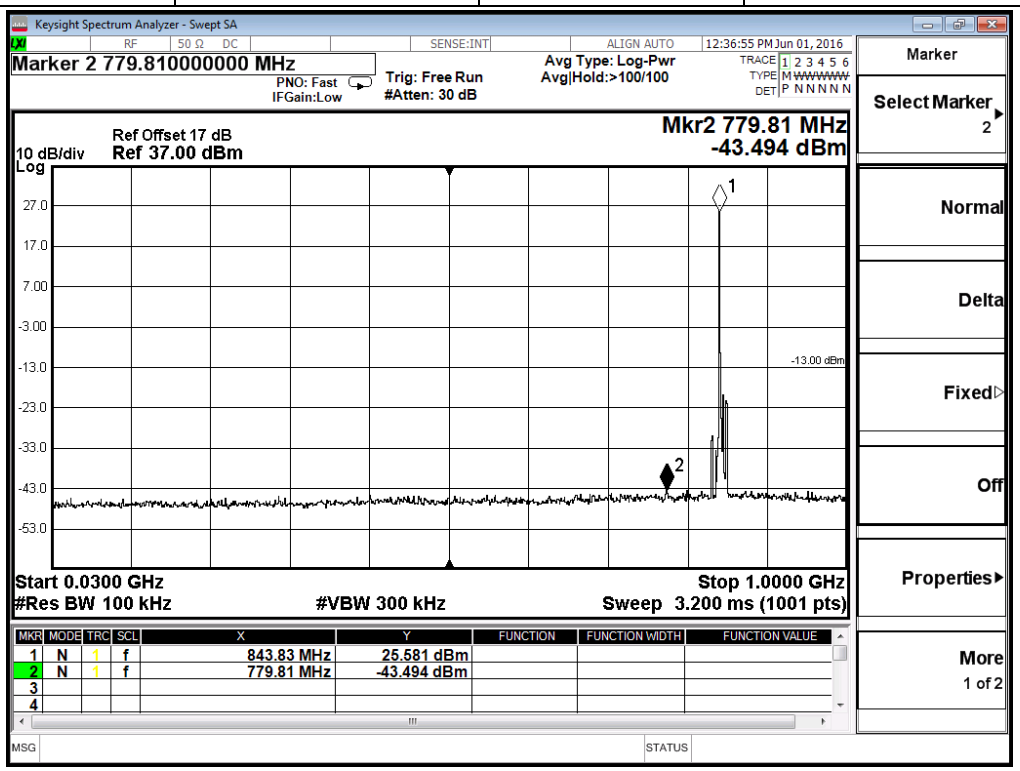



RB Size 1, RB Offset 0 30MHz to 1GHz

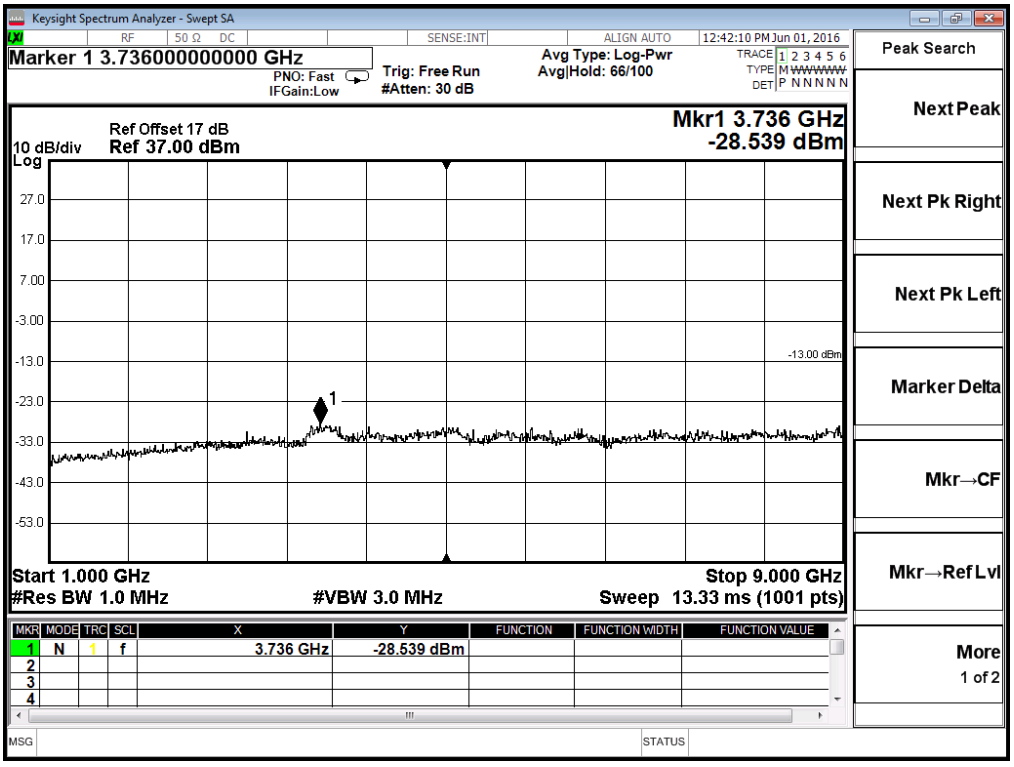



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | High |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

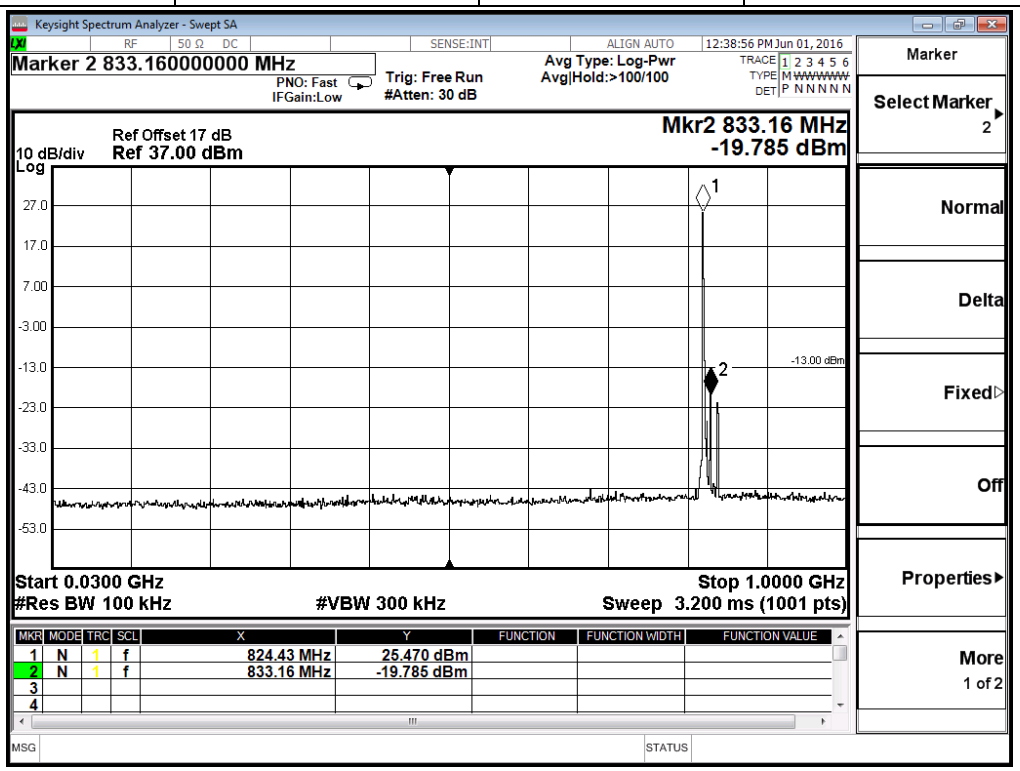



RB Size 1, RB Offset 0 30MHz to 1GHz

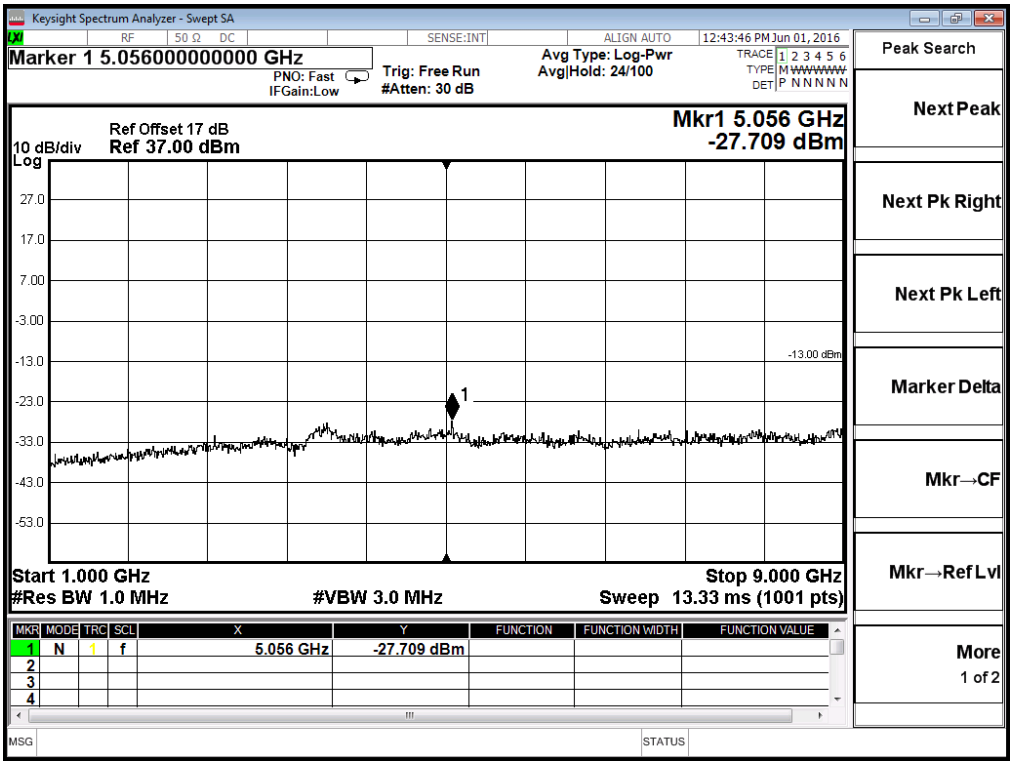



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel | Low |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

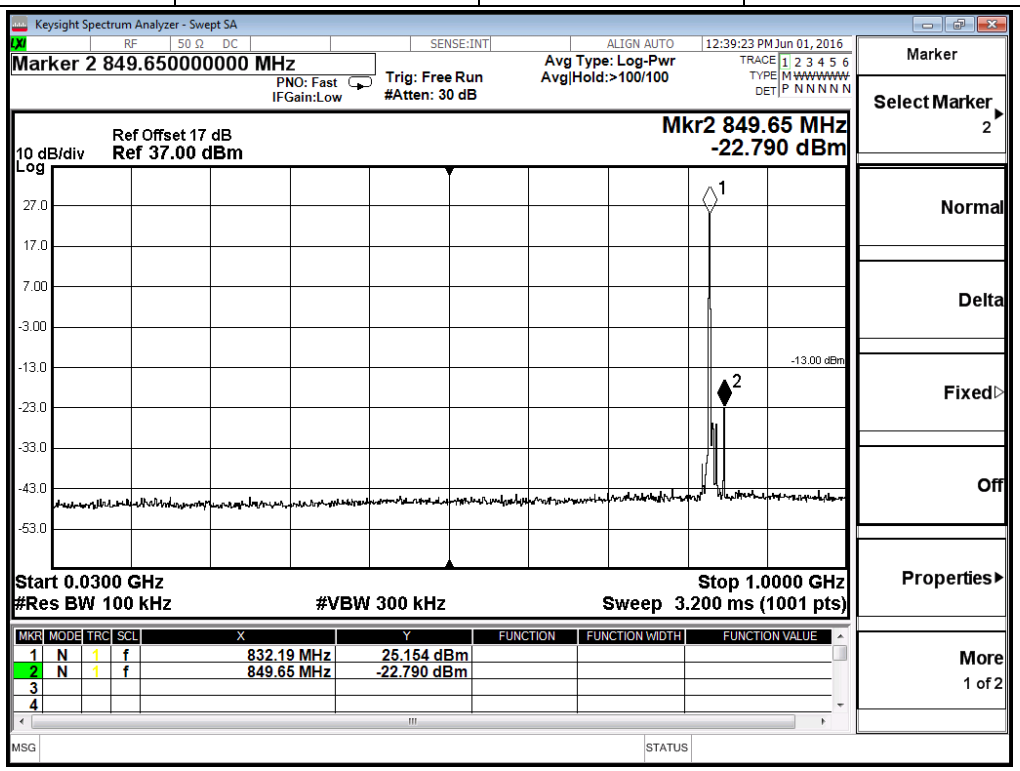



RB Size 1, RB Offset 0 30MHz to 1GHz

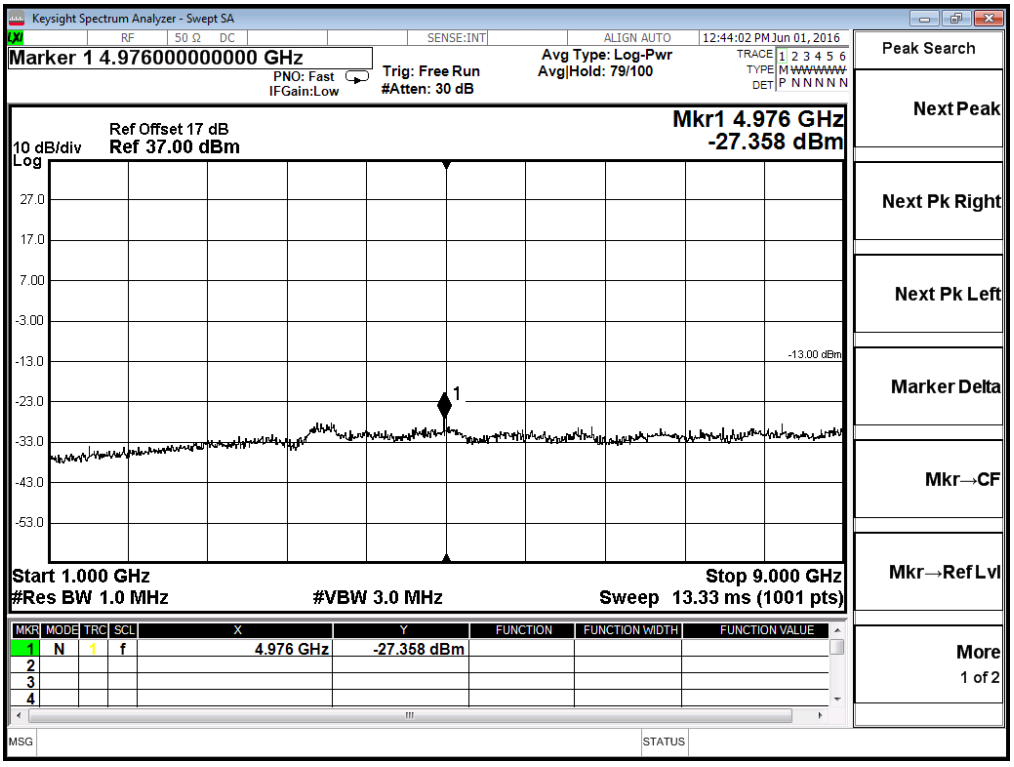



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | Middle |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

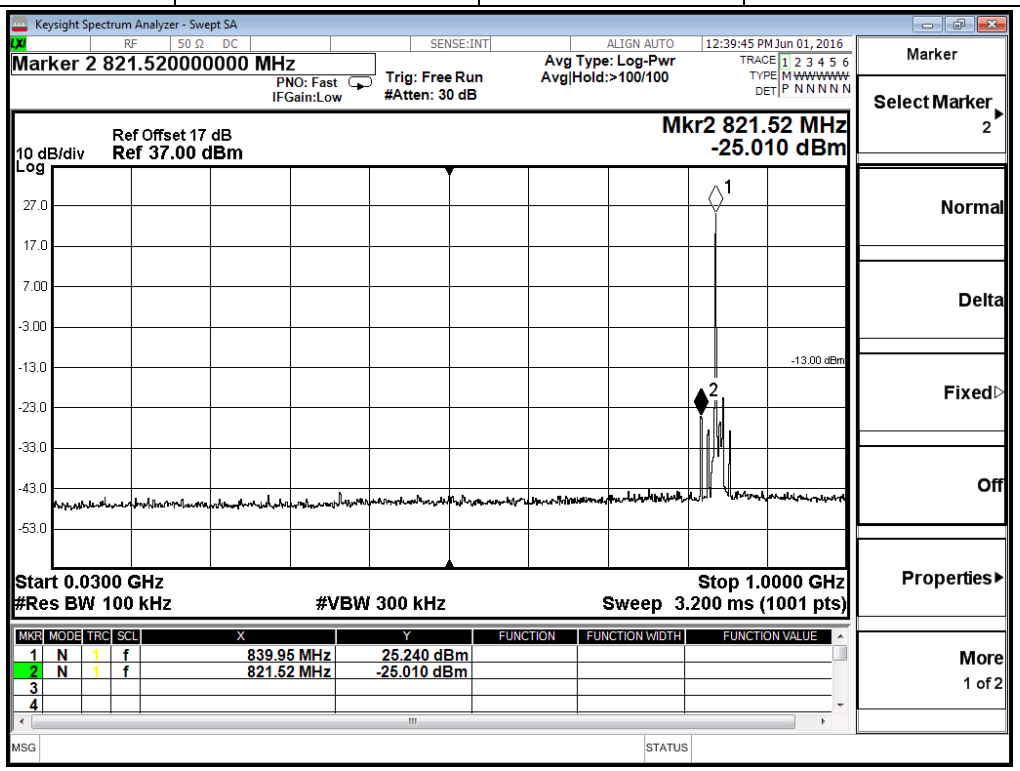



RB Size 1, RB Offset 0 30MHz to 1GHz

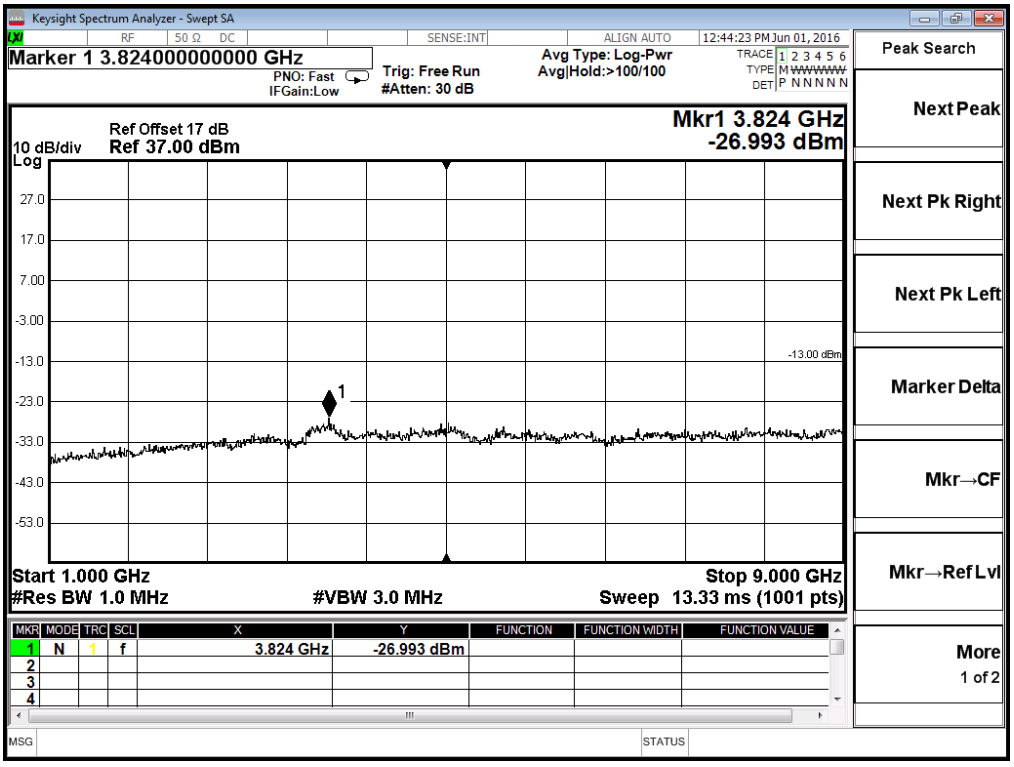



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 5 | Channel: | High |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

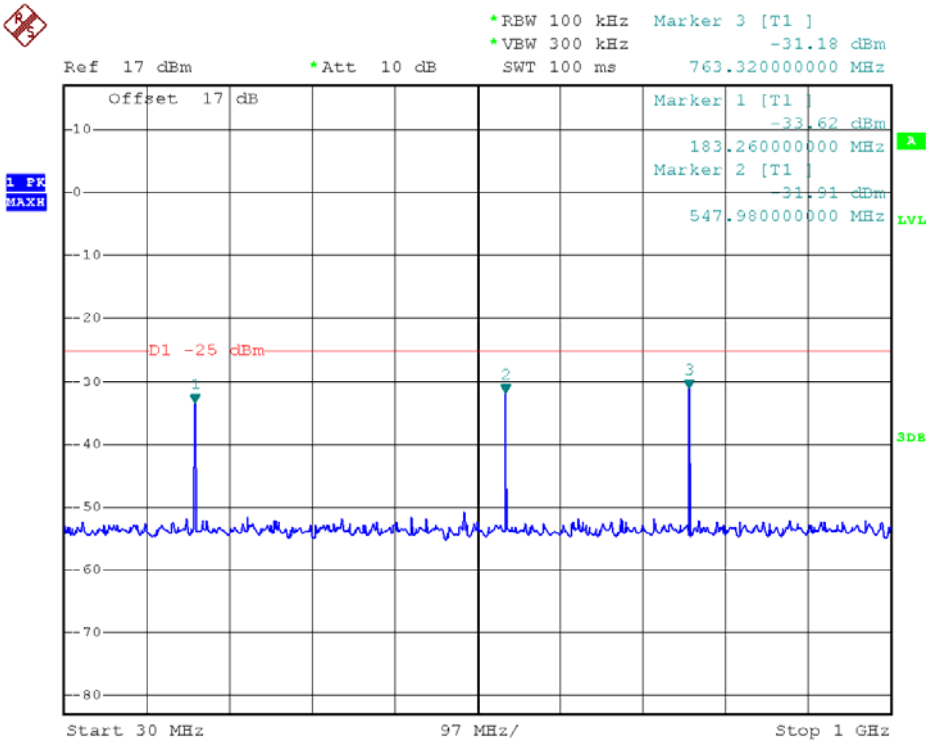



RB Size 1, RB Offset 0 30MHz to 1GHz

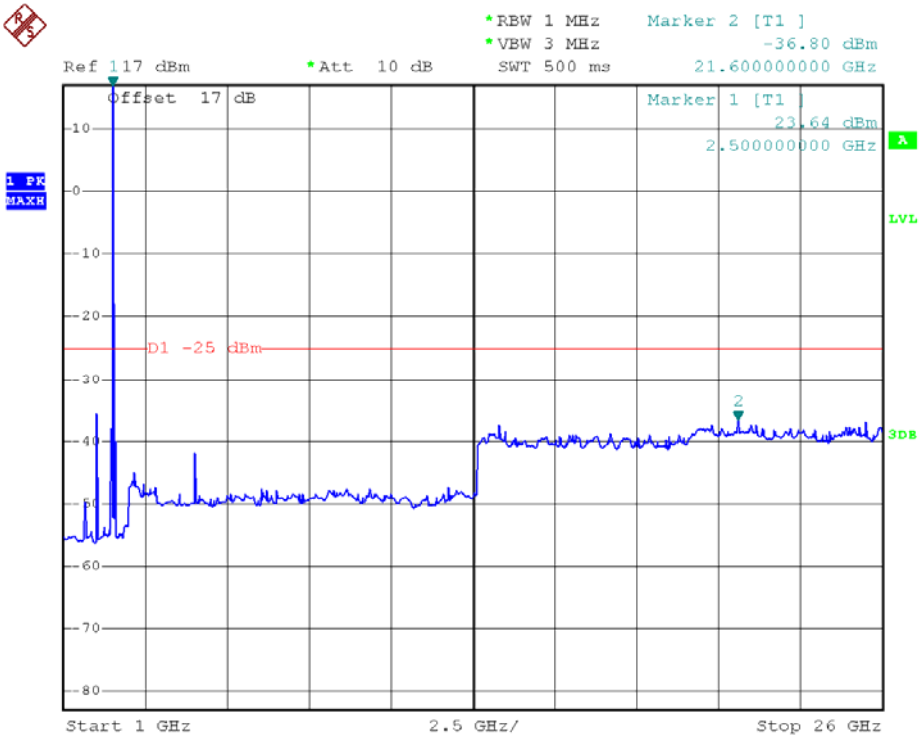



RB Size 1, RB Offset 0 1GHz to 9GHz

| Band | LTE Band 7 | Channel | Low |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

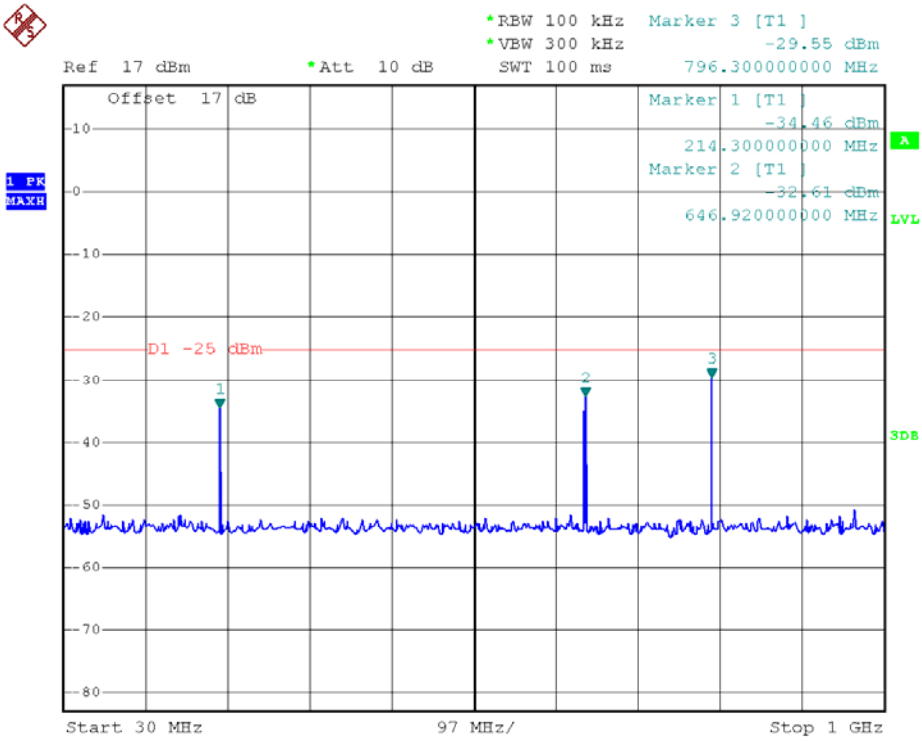



RB Size 1, RB Offset 0 30MHz to 1GHz

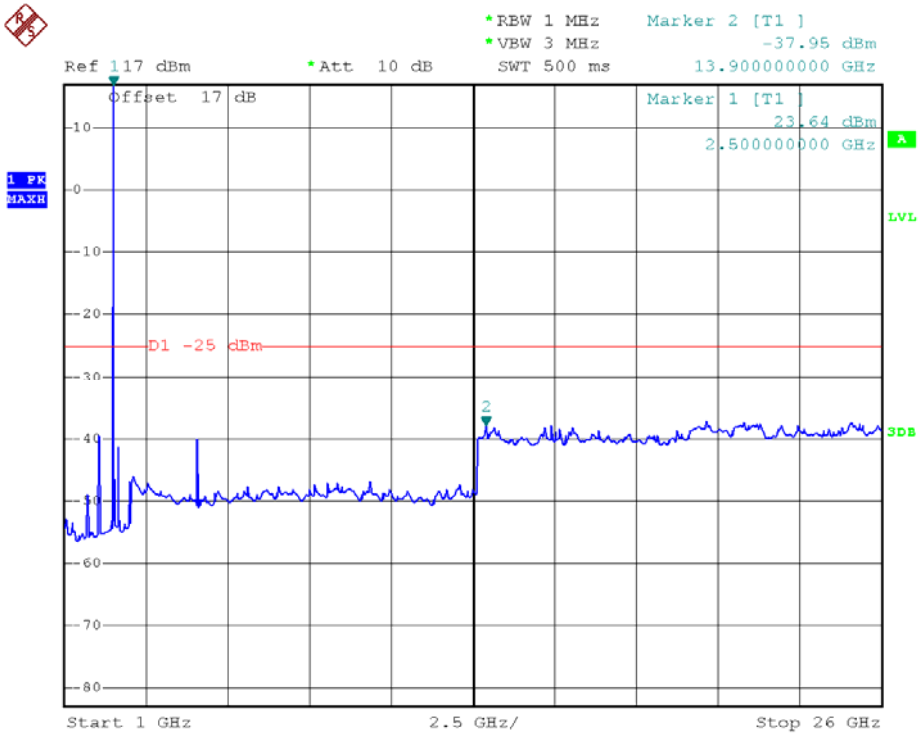



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel: | Middle |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

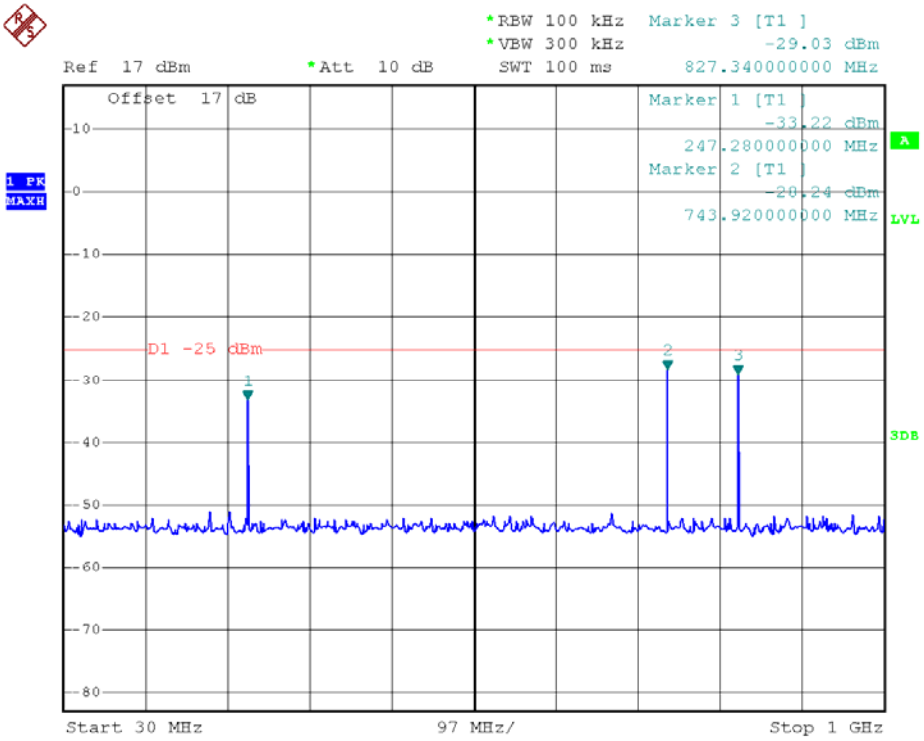



RB Size 1, RB Offset 0 30MHz to 1GHz

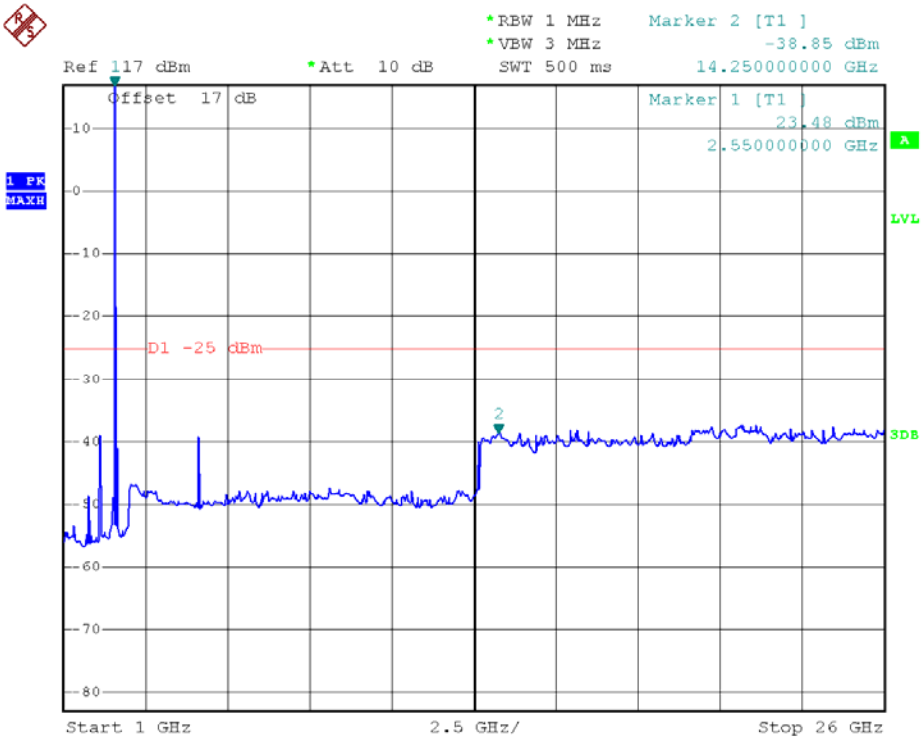



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel: | High |
|---|---|---|---|
| Bandwidth | 5MHz | Modulation | QPSK |

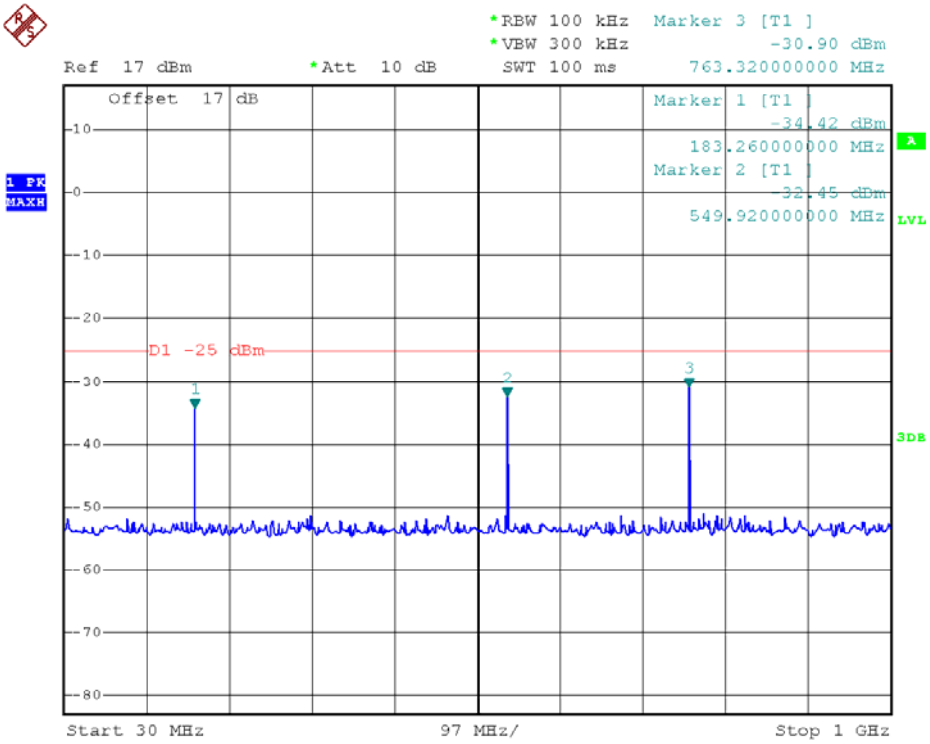



RB Size 1, RB Offset 0 30MHz to 1GHz

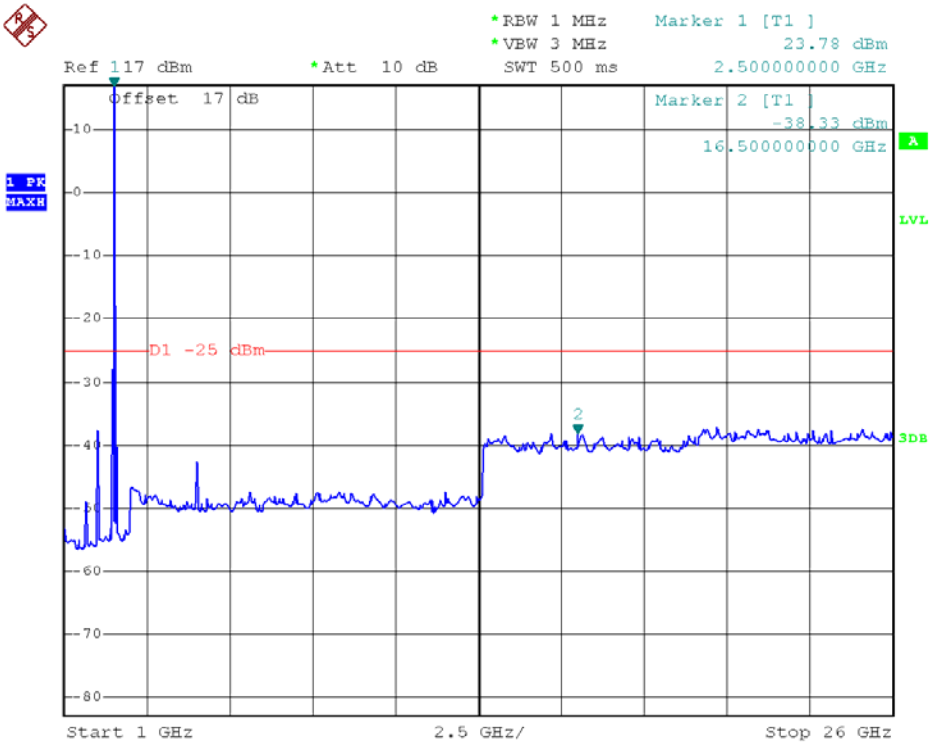



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel: | Low |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

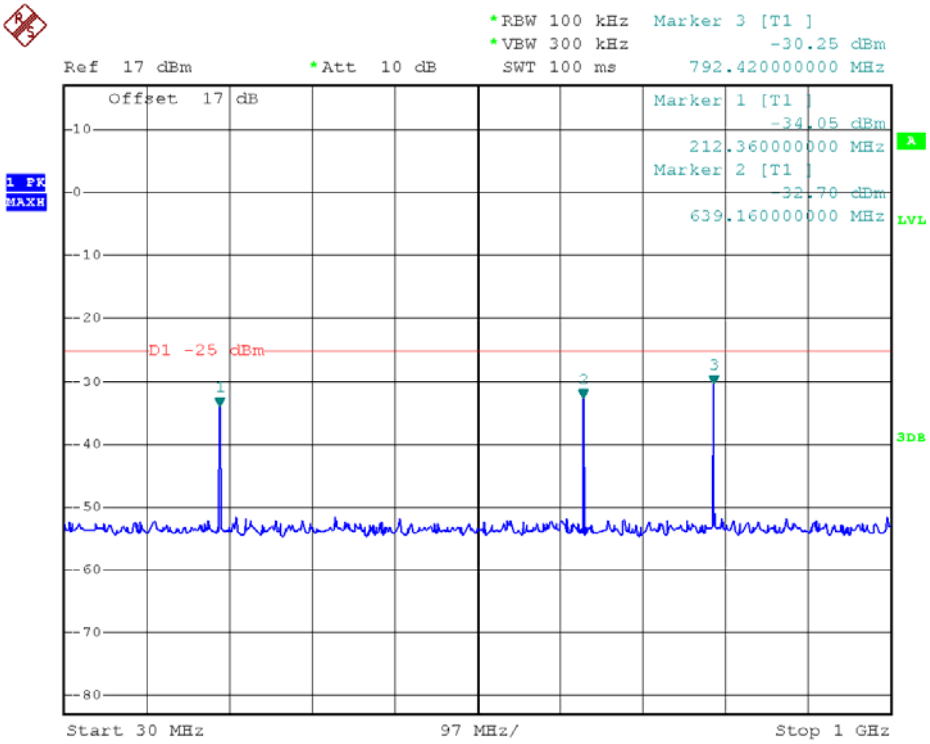



RB Size 1, RB Offset 0 30MHz to 1GHz

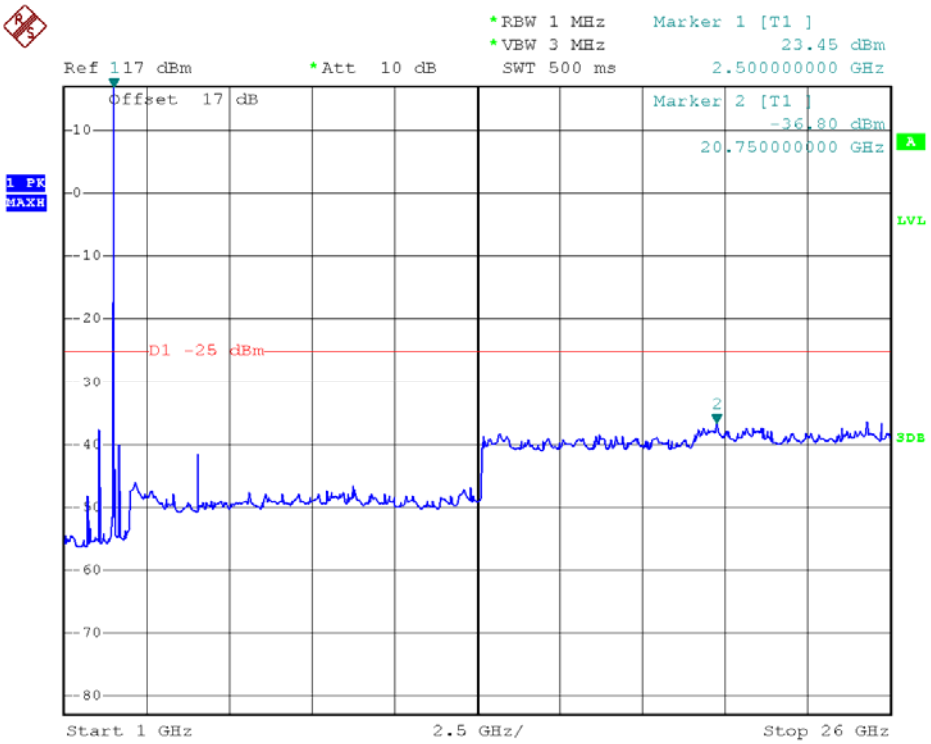



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

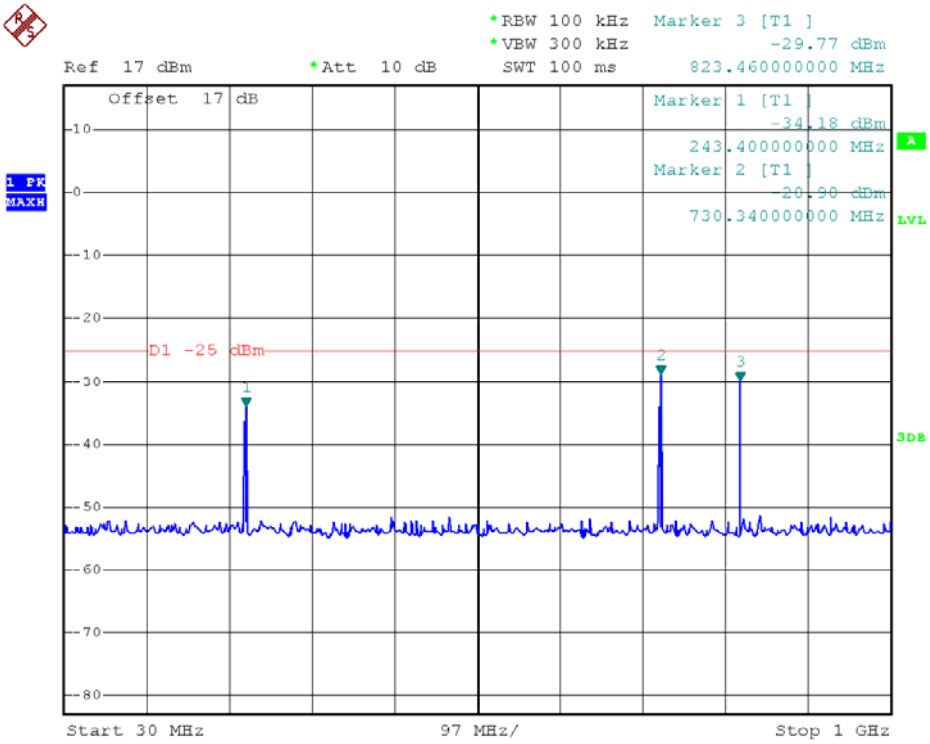



RB Size 1, RB Offset 0 30MHz to 1GHz

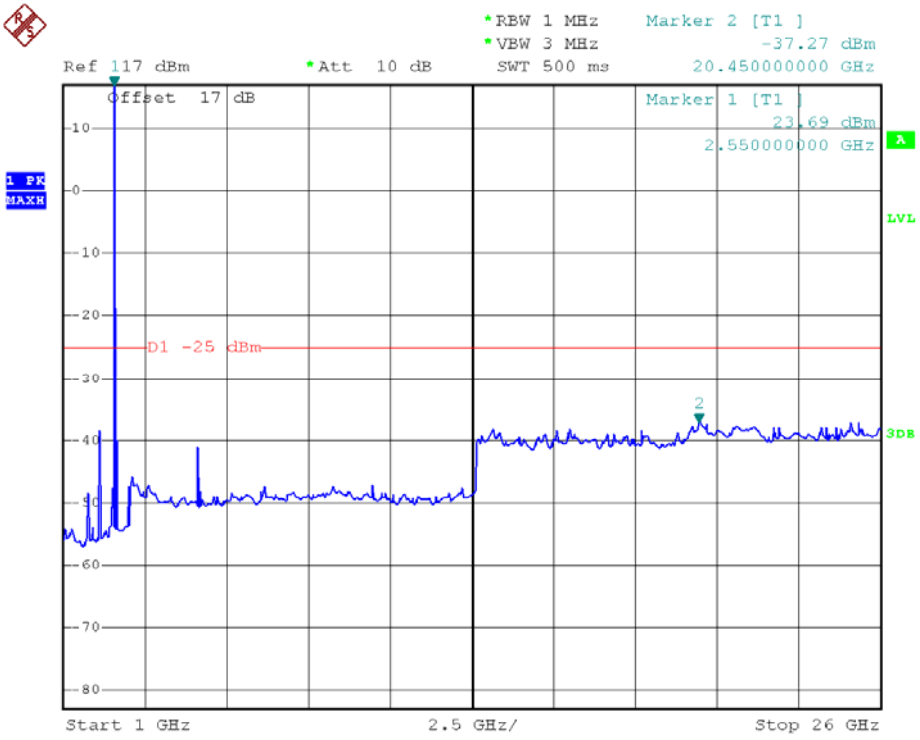



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel | High |
|---|---|---|---|
| Bandwidth | 10MHz | Modulation | QPSK |

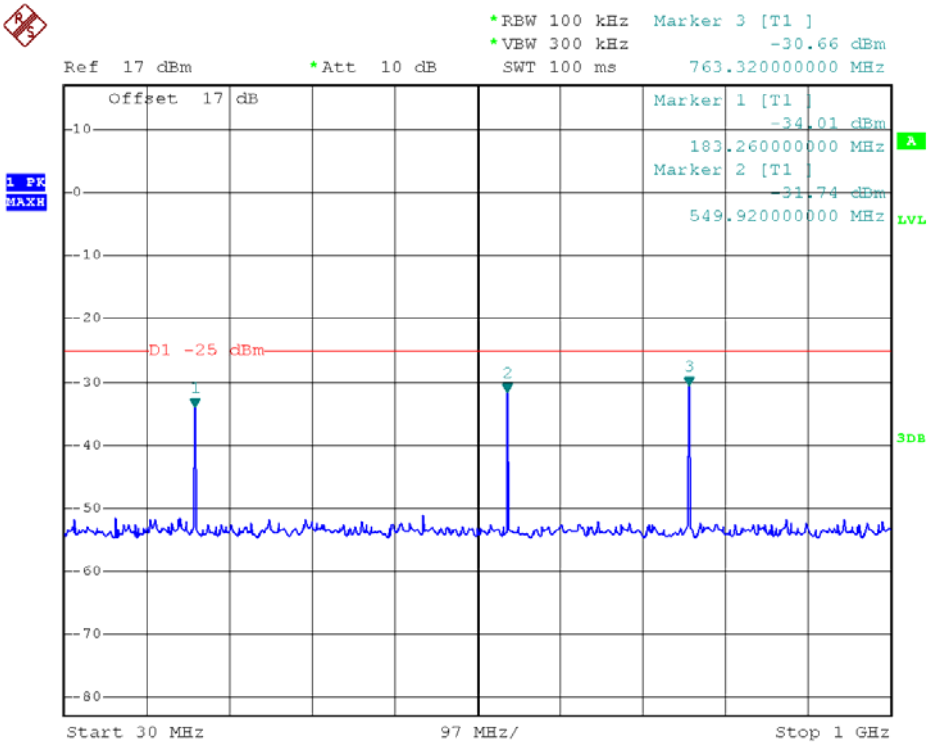



RB Size 1, RB Offset 0 30MHz to 1GHz

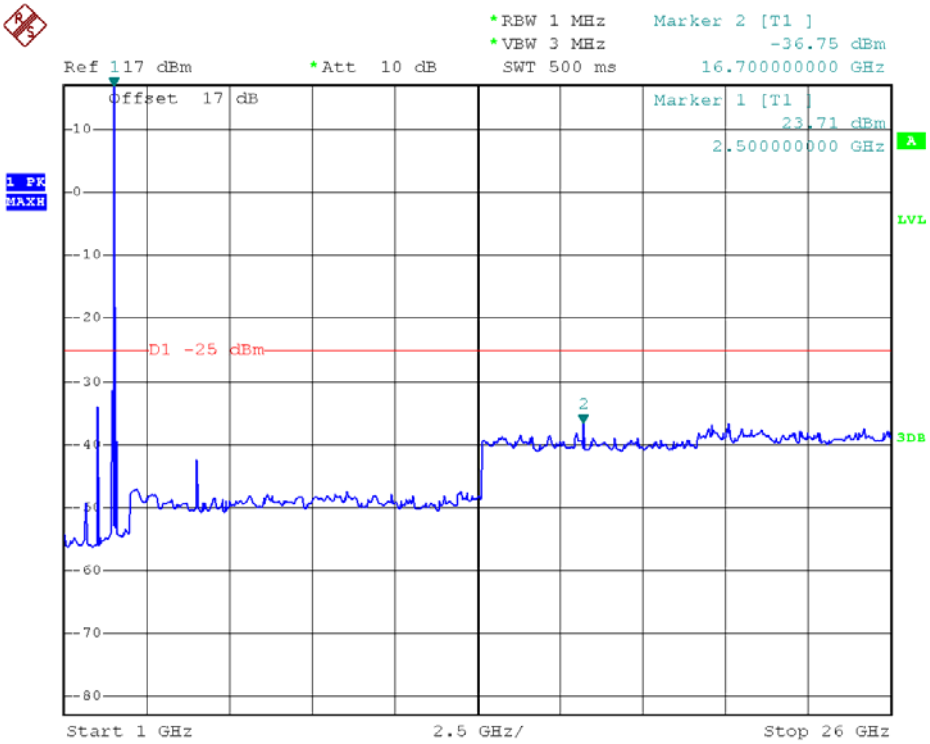



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel | Low |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

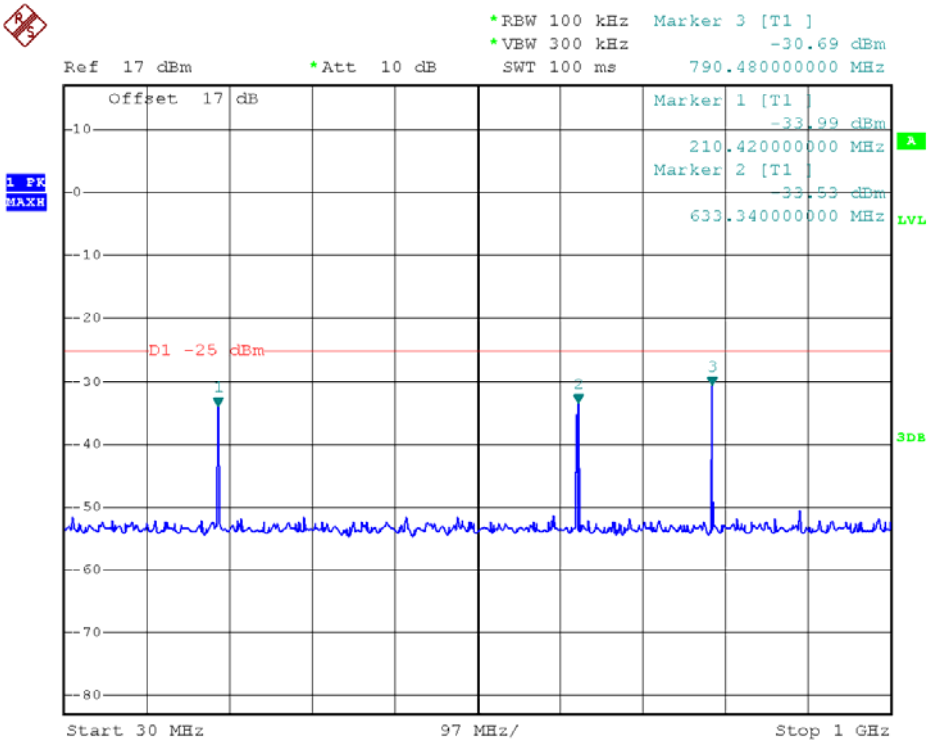



RB Size 1, RB Offset 0 30MHz to 1GHz

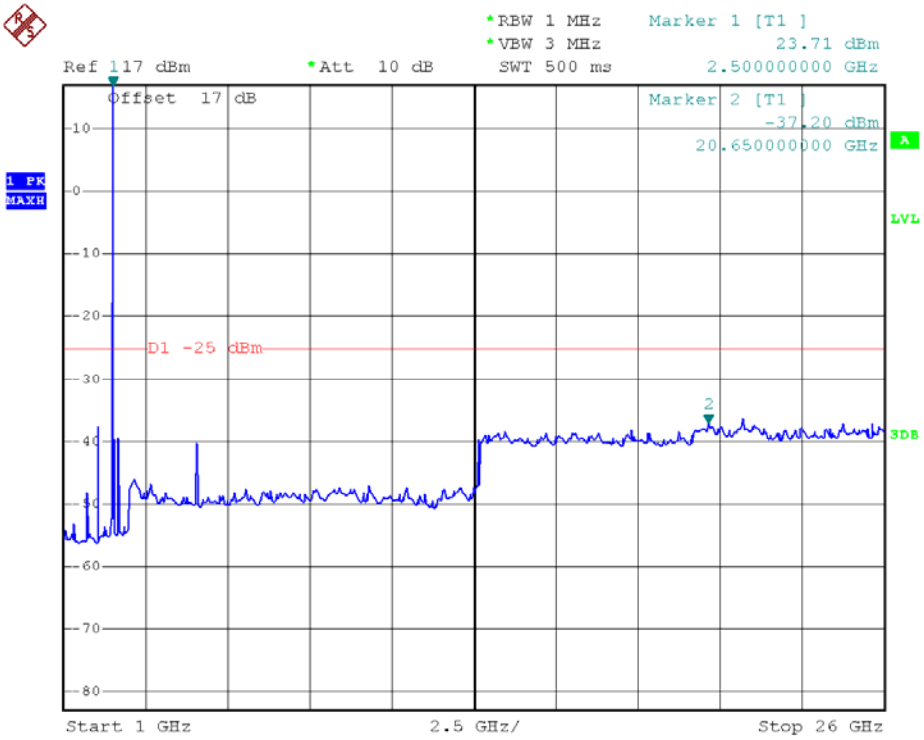



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel: | Middle |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

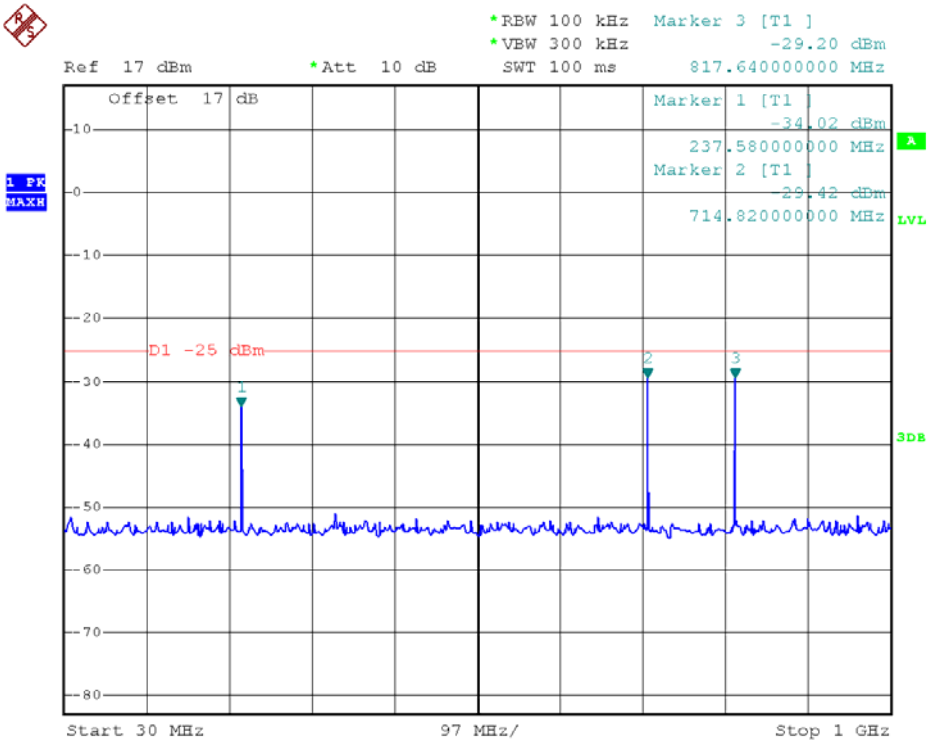



RB Size 1, RB Offset 0 30MHz to 1GHz

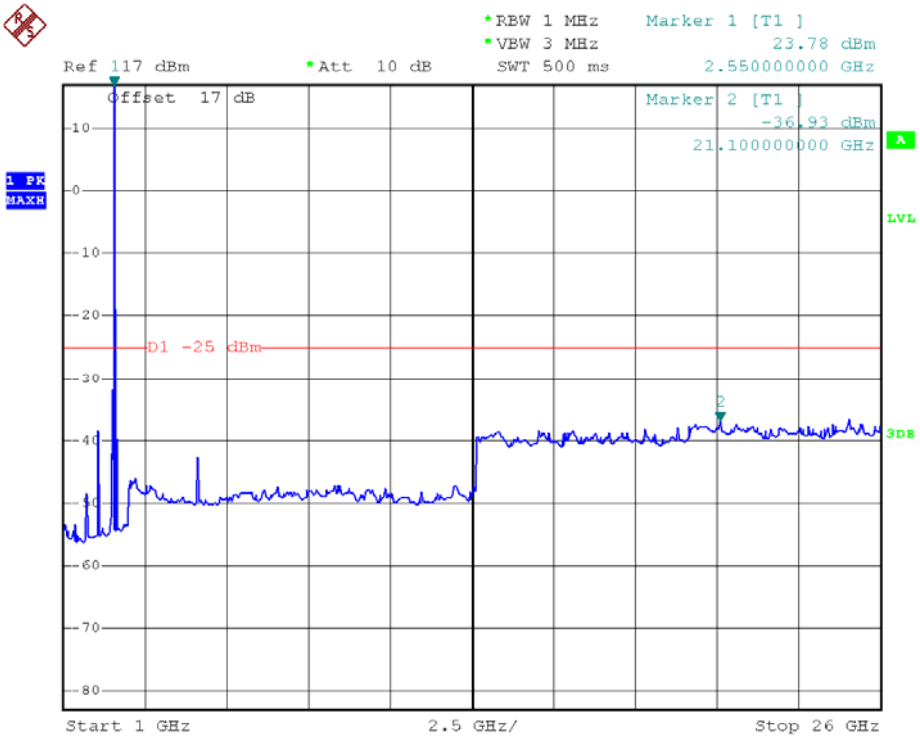



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel: | High |
|---|---|---|---|
| Bandwidth | 15MHz | Modulation | QPSK |

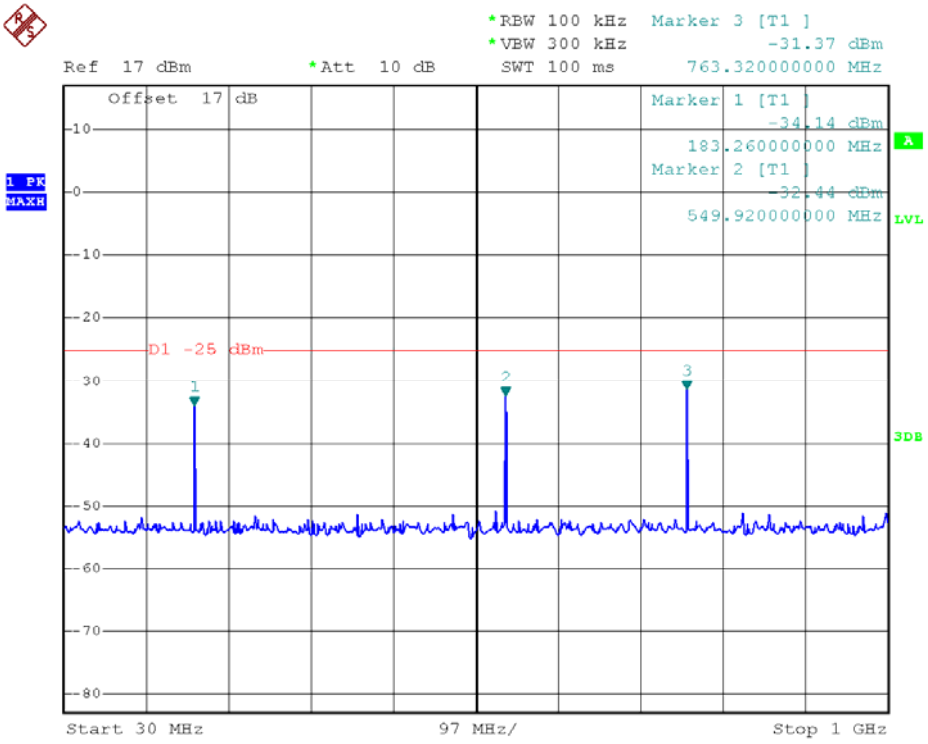



RB Size 1, RB Offset 0 30MHz to 1GHz

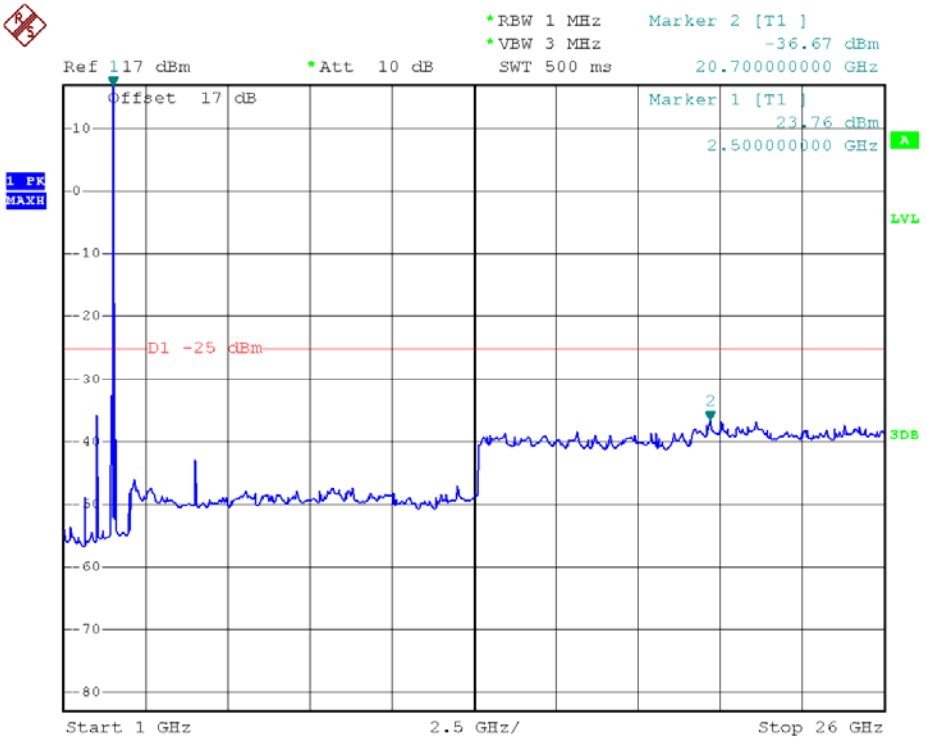



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel: | Low |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

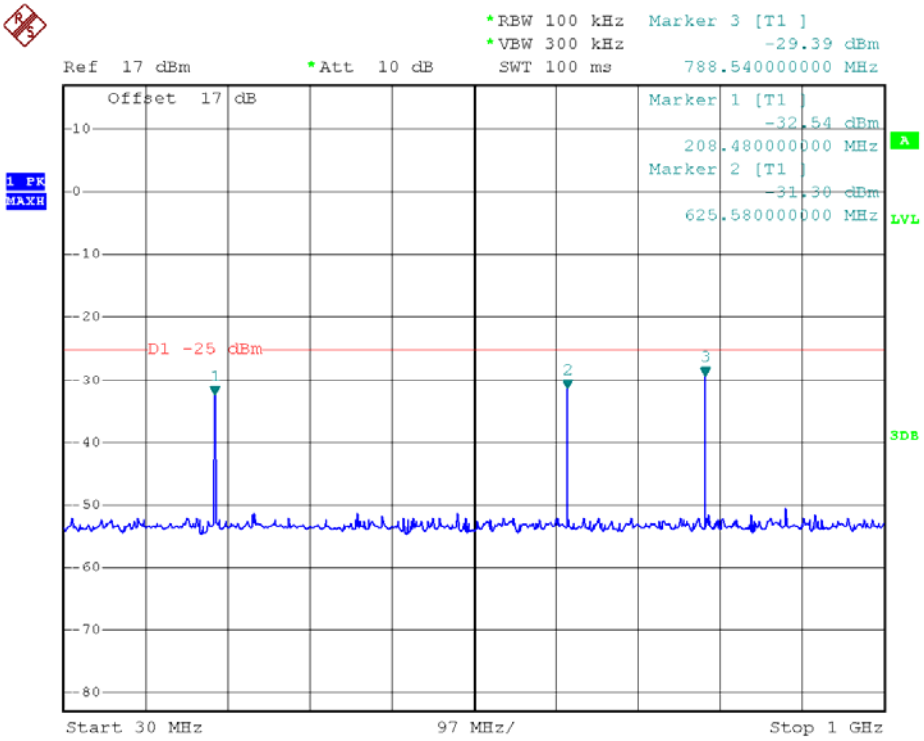



RB Size 1, RB Offset 0 30MHz to 1GHz

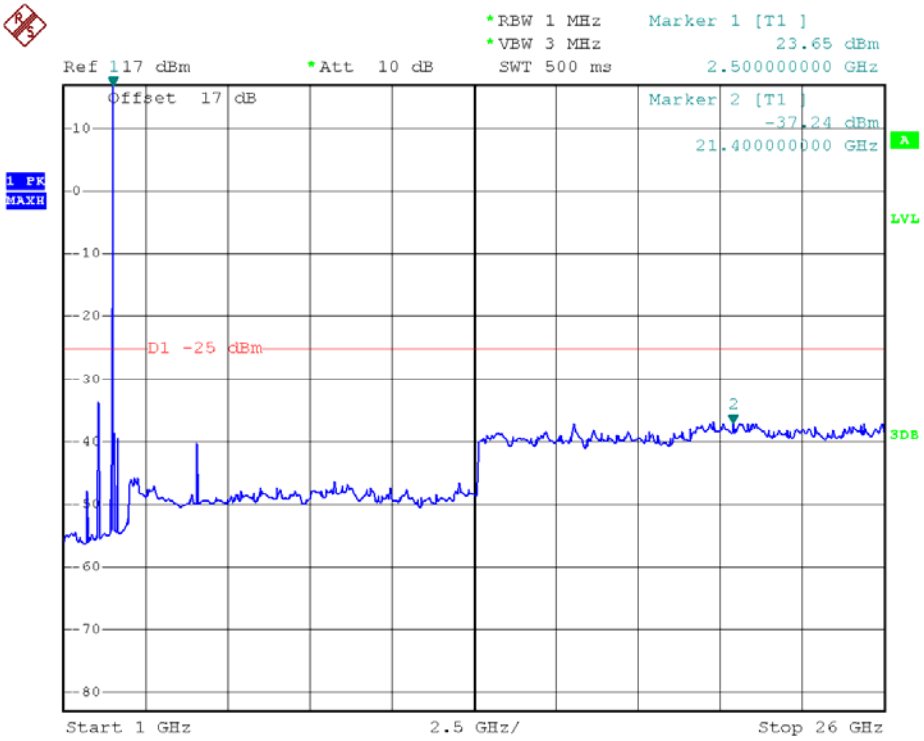



RB Size 1, RB Offset 0 1GHz to 26GHz

| Band | LTE Band 7 | Channel | Middle |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |

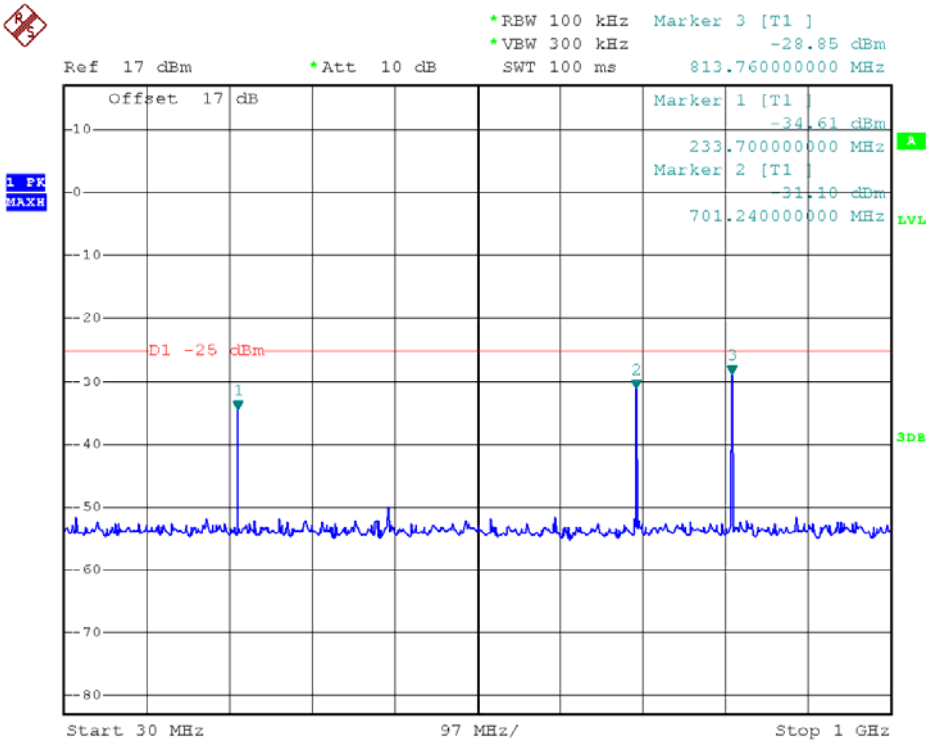



RB Size 1, RB Offset 0　　30MHz to 1GHz

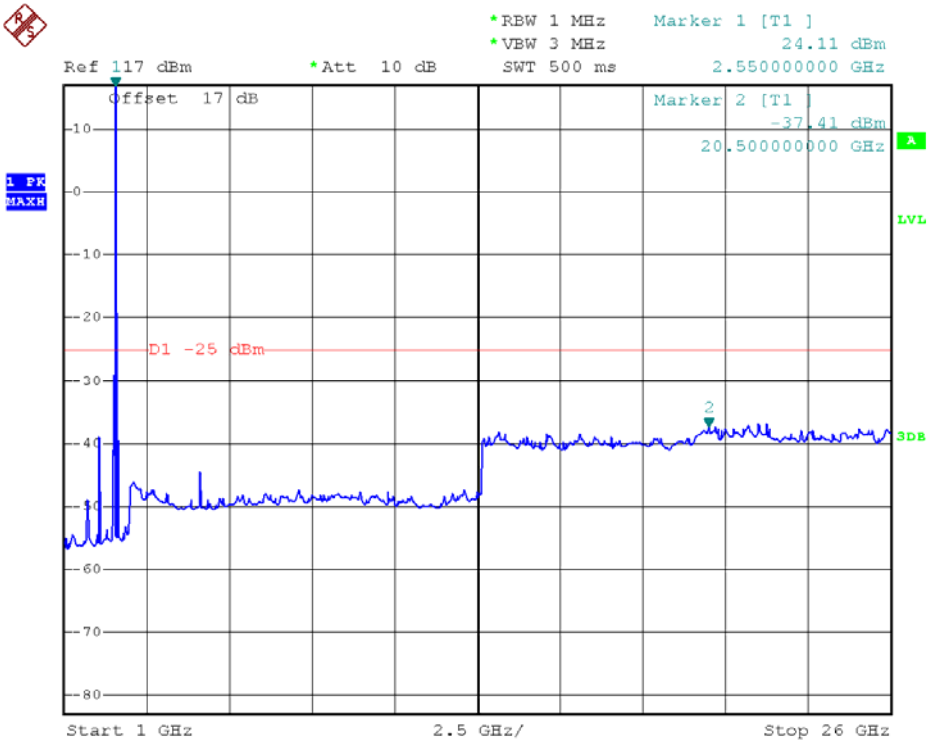



RB Size 1, RB Offset 0　　1GHz to 26GHz

| Band | LTE Band 7 | Channel | High |
|---|---|---|---|
| Bandwidth | 20MHz | Modulation | QPSK |




RB Size 1, RB Offset 0 30MHz to 1GHz




RB Size 1, RB Offset 0 1GHz to 26GHz

## 2.6 Conducted Band Edge

### 2.6.1 Description of Conducted Band Edge Measurement

22.917(a) for Band 5

For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

24.238(a) for Band 2

For operations in the 1850 -1910 MHz band, the FCC limit is 43 + 10log10 (P [Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53(h) for Band 4

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

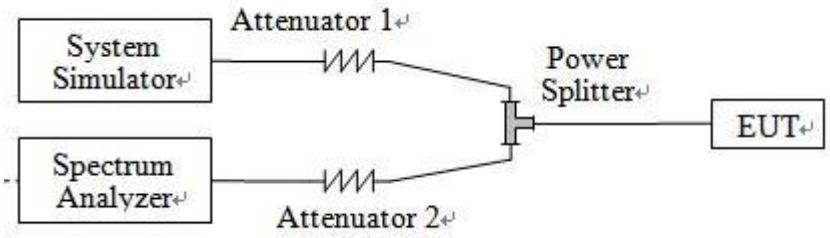
27.53 (m)(4) for Band 7

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

### 2.6.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.6.3 Test Setup

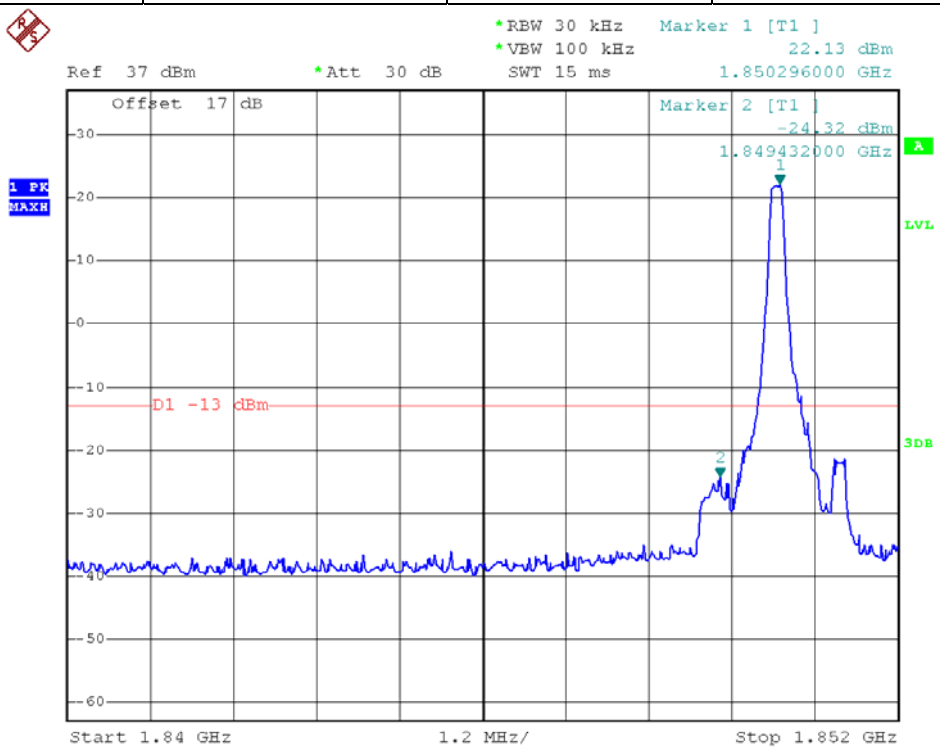



### 2.6.4 Test Procedures

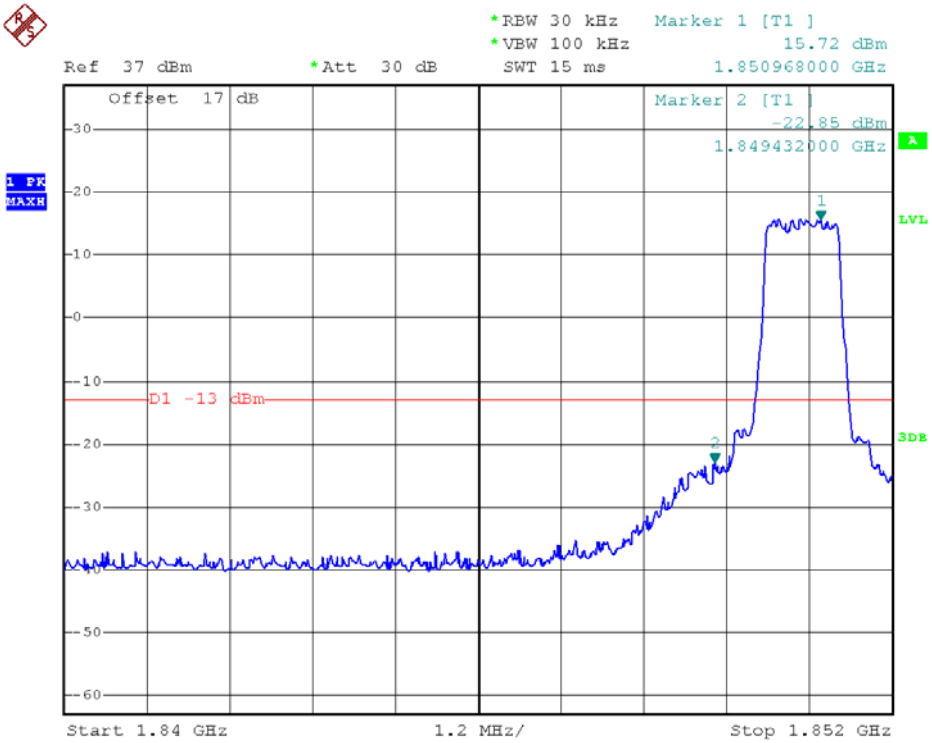
1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW>= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 43 + 10log (P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log (P)] (dBm) - [43 + 10log (P)] (dB)
   = -13dBm.
   <For Band 7>
   The limit line is derived from 55+ 10log (P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log (P)] (dBm) - [55 + 10log (P)] (dB)
   = -25dBm.
   6. Test date: 2016-05-27~2016-06-01

### 2.6.5 Test Result of Conducted Band Edge

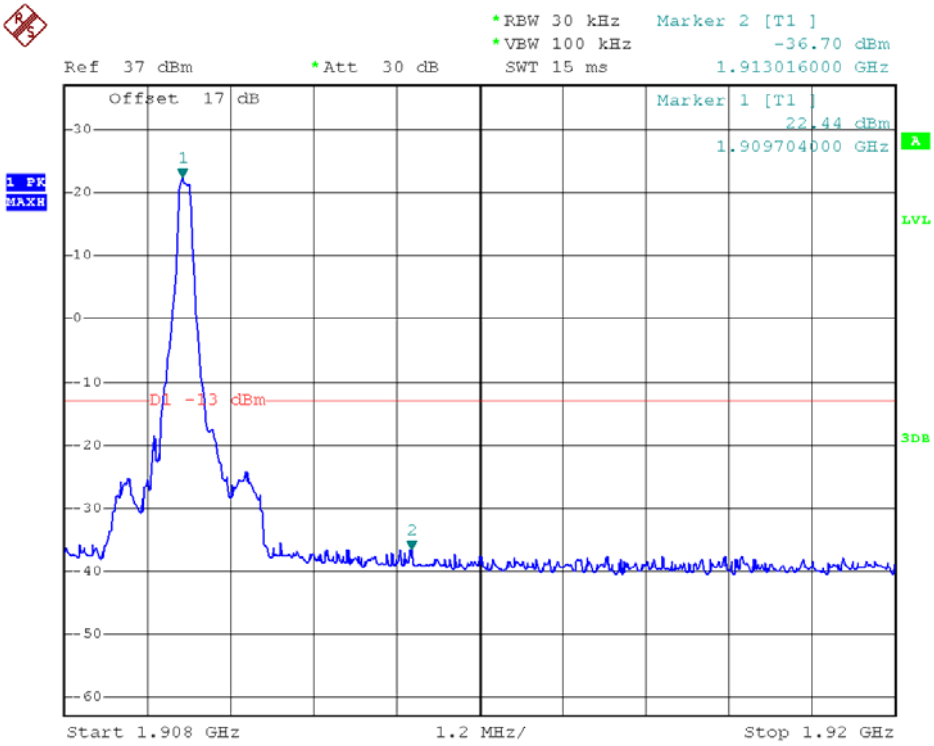
| Band | LTE Band 2 | Modulation | QPSK |
|---|---|---|---|
| Bandwidth | 1.4MHz | | |



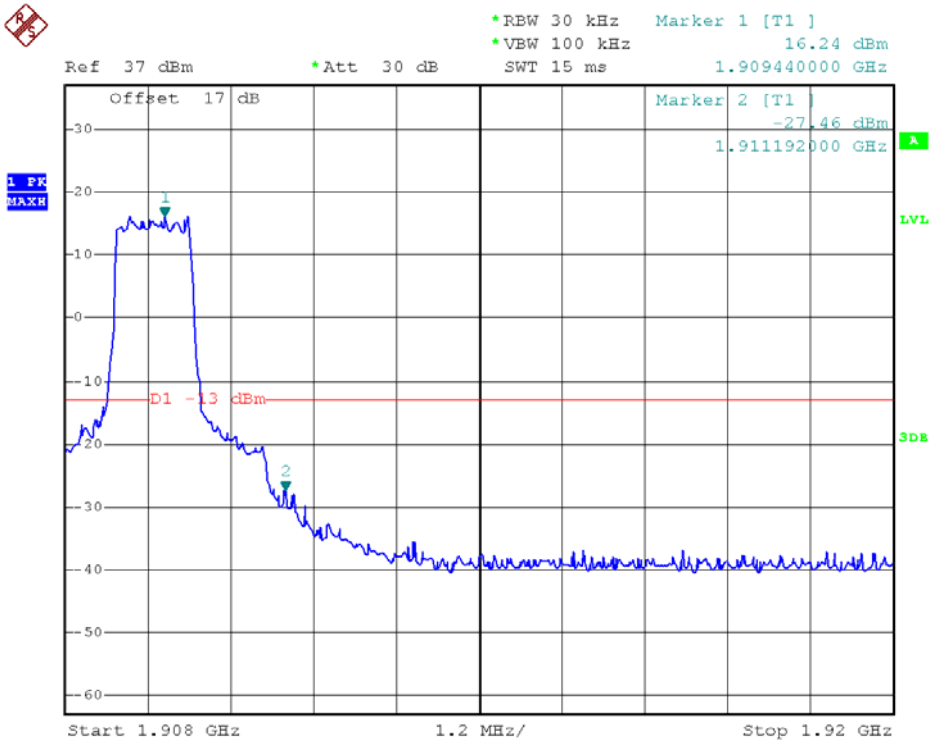

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0




Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0

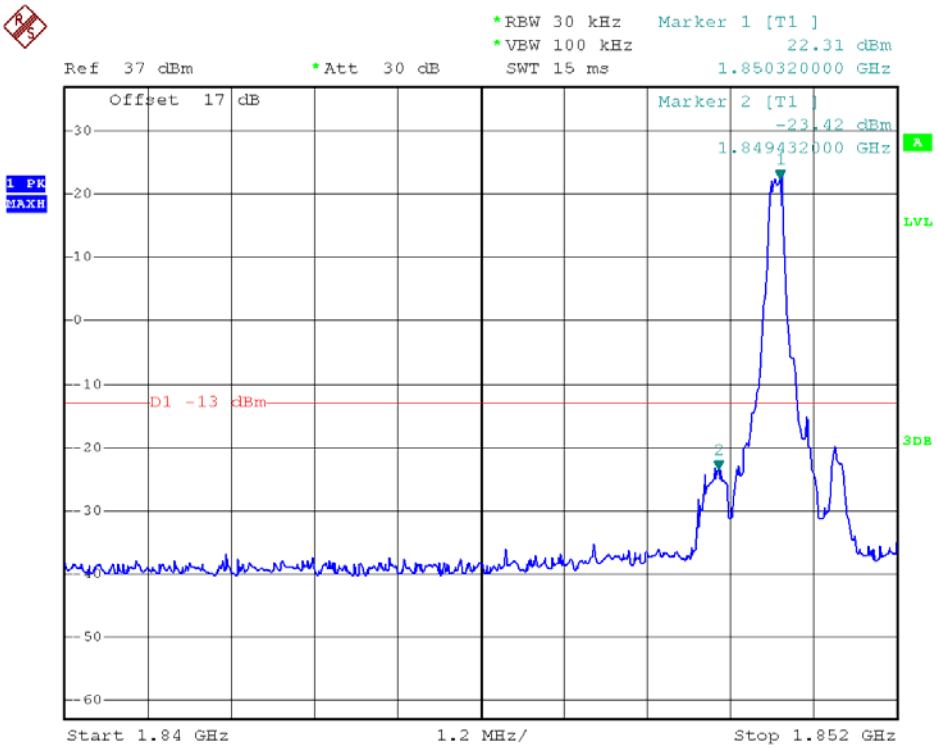



Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5

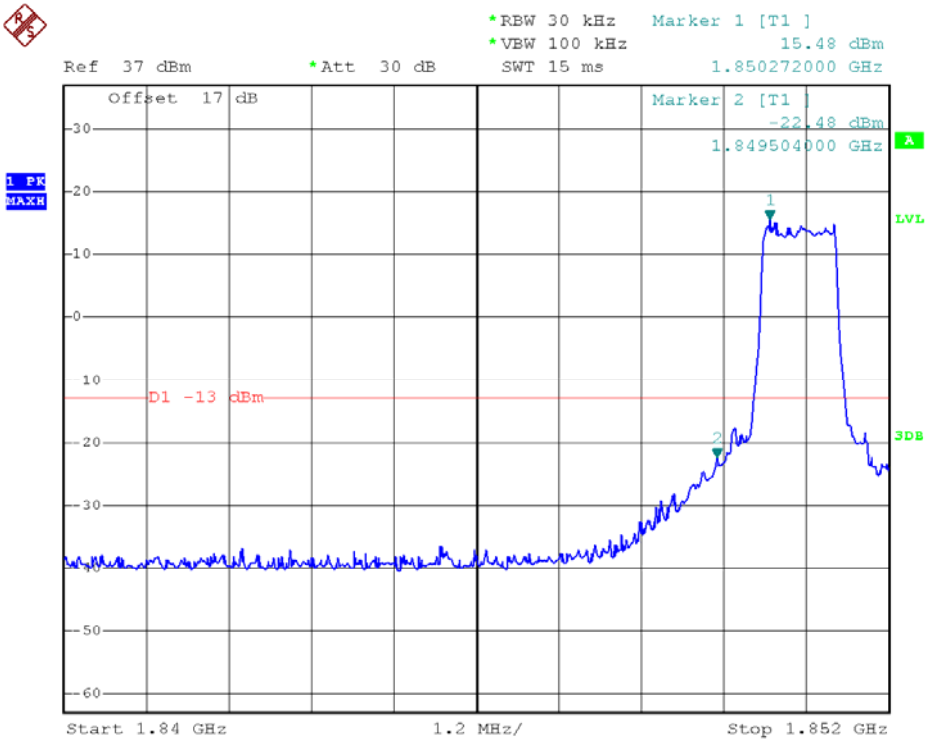



Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

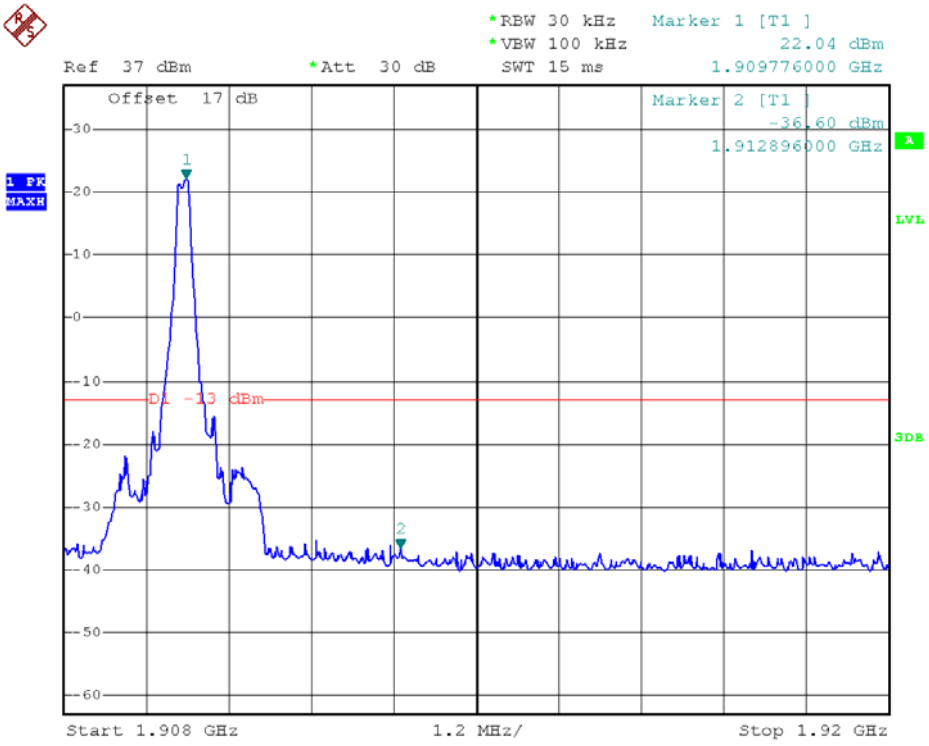
| Band | LTE Band 2 | Modulation | 16QAM |
|---|---|---|---|
| Bandwidth | 1.4MHz | | |



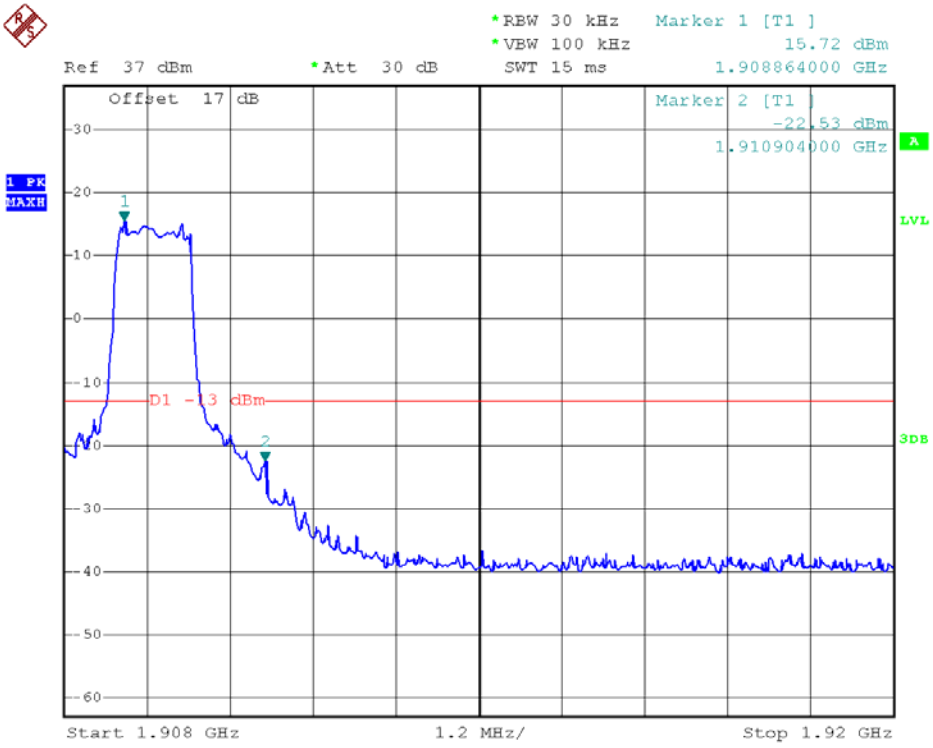

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0




Lower Band Edge Plot for 16QAM-RB Size 6, RB Offset 0

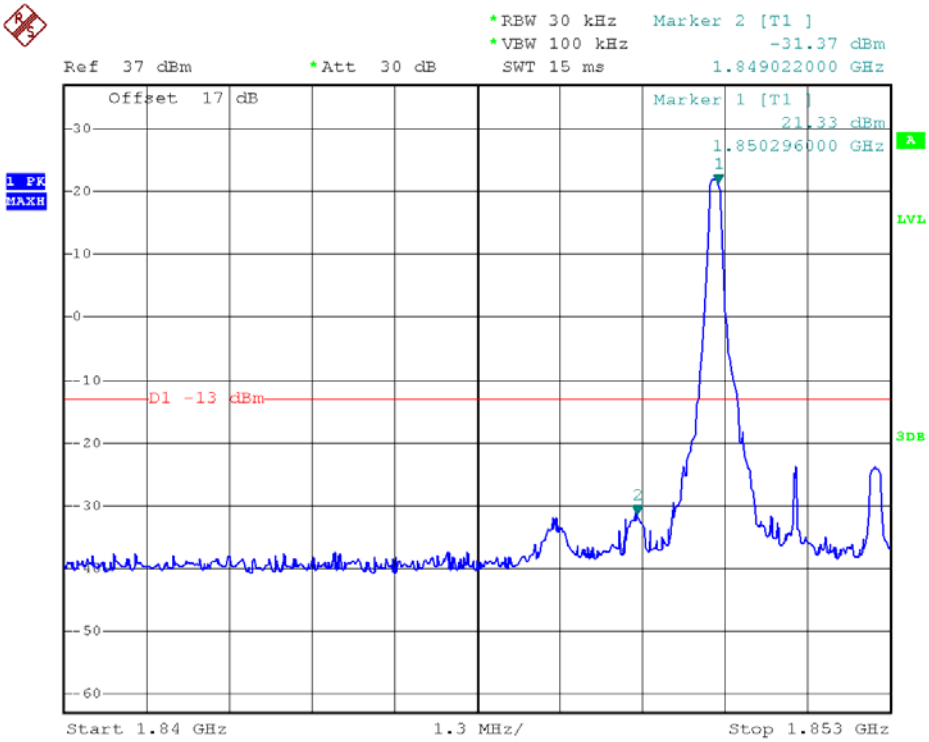



Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 5

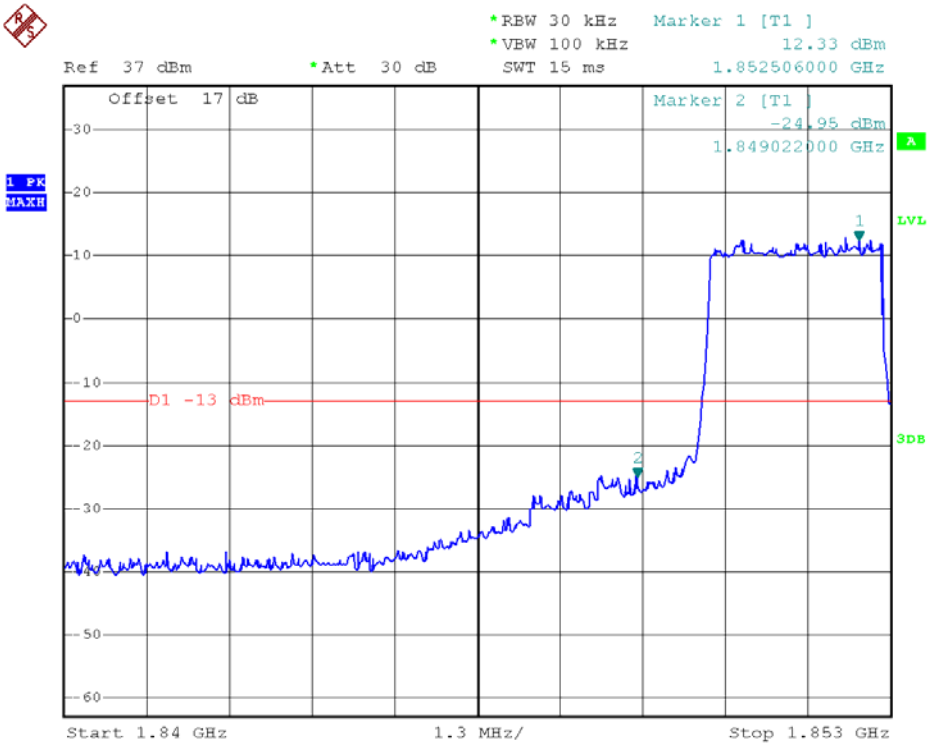



Higher Band Edge Plot for 16QAM-RB Size 6, RB Offset 0

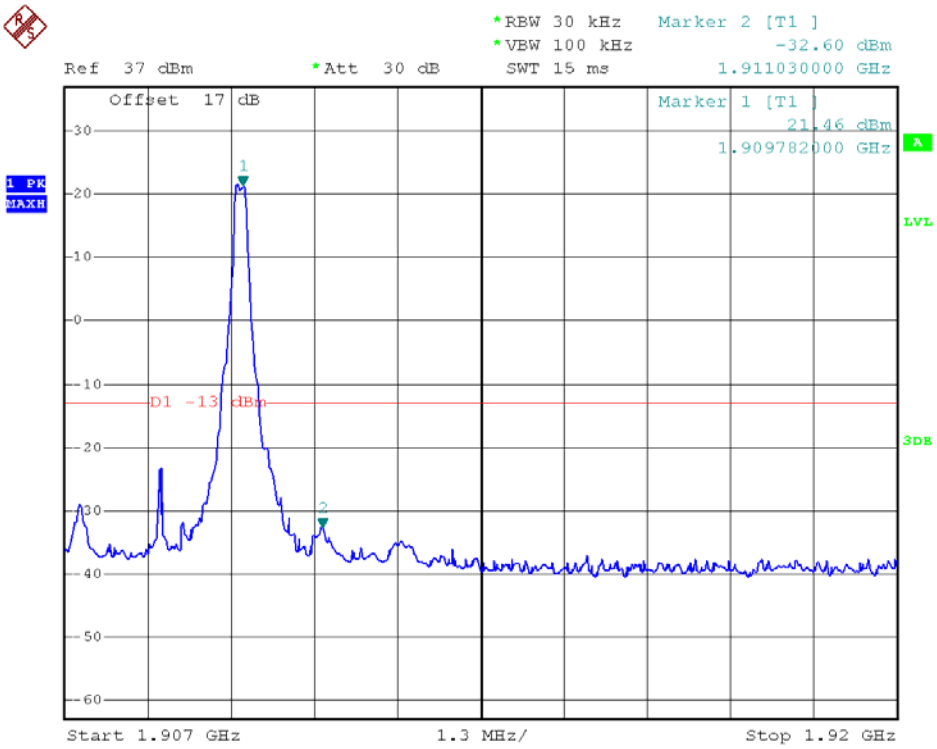
| Band | LTE Band 2 | Modulation | QPSK |
|---|---|---|---|
| Bandwidth | 3MHz | | |



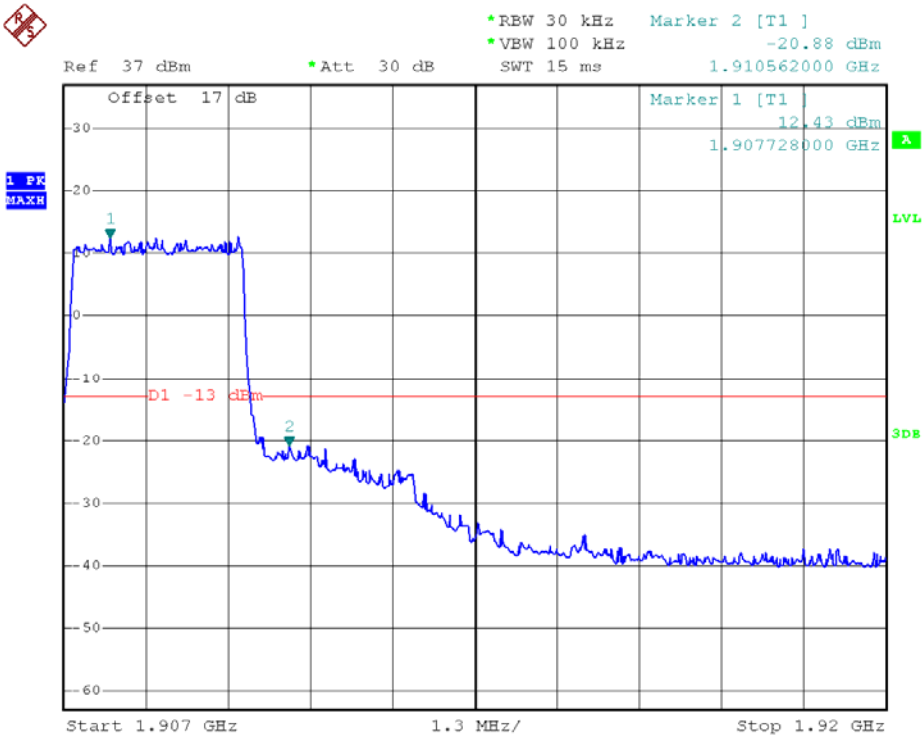

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0




Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14




Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0