



# FCC RF Test Report

APPLICANT : TCT Mobile Limited  
EQUIPMENT : LTE USB Modem/4G AP  
BRAND NAME : ALCATEL  
onetouch  
MODEL NAME : ONE TOUCH Y85000  
MARKETING NAME : ALCATEL ONETOUCH LINK Y850  
FCC ID : RAD522  
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27  
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Jul. 08, 2014 and testing was completed on Oct. 09, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



## TABLE OF CONTENTS

|                                                                                       |            |
|---------------------------------------------------------------------------------------|------------|
| REVISION HISTORY.....                                                                 | 3          |
| SUMMARY OF TEST RESULT .....                                                          | 4          |
| <b>1 GENERAL DESCRIPTION .....</b>                                                    | <b>6</b>   |
| 1.1 Applicant.....                                                                    | 6          |
| 1.2 Manufacturer.....                                                                 | 6          |
| 1.3 Product Feature of Equipment Under Test.....                                      | 6          |
| 1.4 Product Specification subjective to this standard .....                           | 7          |
| 1.5 Modification of EUT .....                                                         | 7          |
| 1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator .....        | 8          |
| 1.7 Testing Location .....                                                            | 10         |
| 1.8 Applicable Standards.....                                                         | 10         |
| <b>2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST .....</b>                             | <b>11</b>  |
| 2.1 Test Mode.....                                                                    | 11         |
| 2.2 Connection Diagram of Test System.....                                            | 13         |
| 2.3 Support Unit used in test configuration and system .....                          | 13         |
| 2.4 Measurement Results Explanation Example.....                                      | 14         |
| <b>3 TEST RESULT .....</b>                                                            | <b>15</b>  |
| 3.1 Conducted Output Power Measurement .....                                          | 15         |
| 3.2 Peak-to-Average Ratio .....                                                       | 27         |
| 3.3 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement..... | 44         |
| 3.4 Occupied Bandwidth.....                                                           | 51         |
| 3.5 Conducted Band Edge Measurement .....                                             | 184        |
| 3.6 Conducted Spurious Emission Measurement .....                                     | 275        |
| 3.7 Radiated Spurious Emission Measurement .....                                      | 343        |
| 3.8 Frequency Stability Measurement.....                                              | 412        |
| <b>4 LIST OF MEASURING EQUIPMENT .....</b>                                            | <b>417</b> |
| <b>5 UNCERTAINTY OF EVALUATION .....</b>                                              | <b>418</b> |
| <b>APPENDIX A. SETUP PHOTOGRAPHS</b>                                                  |            |



## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION                                                        | ISSUED DATE   |
|------------|---------|--------------------------------------------------------------------|---------------|
| FG493052B  | Rev. 01 | Initial issue of report                                            | Oct. 14, 2014 |
| FG493052B  | Rev. 02 | Revise the description of LTE Band 7 table title in section 3.3.5. | Oct. 17, 2014 |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |
|            |         |                                                                    |               |



## SUMMARY OF TEST RESULT

| Report Section | FCC Rule                                                                      | Description                                                                         | Limit                 | Result | Remark |
|----------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------|--------|--------|
| 3.1            | §2.1046                                                                       | Conducted Output Power                                                              | Reporting Only        | PASS   | -      |
| 3.2            | §24.232(d)                                                                    | Peak-to-Average Ratio                                                               | <13 dB                | PASS   | -      |
| 3.3            | §22.913(a)(2)                                                                 | Effective Radiated Power<br>(Band 5)                                                | ERP < 7 Watt          | PASS   | -      |
|                | §27.50(c)(10)                                                                 | Effective Radiated Power<br>(Band 17)                                               | ERP < 3 Watt          |        |        |
|                | §24.232(c)<br>§27.50(h)(2)                                                    | Equivalent Isotropic Radiated Power<br>(Band 2) (Band 7)                            | EIRP < 2Watt          |        |        |
|                | §27.50(d)(4)                                                                  | Equivalent Isotropic Radiated Power<br>(Band 4)                                     | EIRP < 1Watt          |        |        |
| 3.4            | §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   | -      |
| 3.5            | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)<br>§27.53(m)(4) | Conducted Band Edge Measurement<br>(Band 2) (Band 4) (Band 5)<br>(Band 17) (Band 7) | < 43+10log10(P[Watt]) | PASS   | -      |



| Report Section | FCC Rule                                                      | Description                                                            | Limit                                 | Result | Remark                                     |
|----------------|---------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------|--------|--------------------------------------------|
| 3.6            | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h) | Conducted Spurious Emission<br>(Band 2) (Band 4)<br>(Band 5) (Band 17) | $< 43 + 10\log_{10}(P[\text{Watts}])$ | PASS   | -                                          |
|                | §2.1051<br>§27.53(m)(4)                                       | Conducted Spurious Emission<br>(Band 7)                                | $< 55 + 10\log_{10}(P[\text{Watts}])$ | PASS   | -                                          |
| 3.7            | §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h) | Radiated Spurious Emission<br>(Band 2) (Band 4)<br>(Band 5) (Band 17)  | $< 43 + 10\log_{10}(P[\text{Watts}])$ | PASS   | Under limit<br>3.03 dB at<br>12504.000 MHz |
|                | §2.1053<br>§27.53(m)(4)                                       | Radiated Spurious Emission<br>(Band 7)                                 | $< 55 + 10\log_{10}(P[\text{Watts}])$ | PASS   |                                            |
| 3.8            | §2.1055<br>§22.355                                            | Frequency Stability<br>Temperature & Voltage                           | $< 2.5 \text{ ppm}$                   | PASS   | -                                          |
|                | §2.1055<br>§24.235<br>§27.54                                  |                                                                        | within authorized band                |        |                                            |



# 1 General Description

## 1.1 Applicant

**TCT Mobile Limited**

5F, C building, No. 232, Liang Jing Road, ZhangJiang High-Tech Park, Pudong Area, Shanghai, P.R. China. 201203

## 1.2 Manufacturer

**TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED**

70 Huifeng 4rd,ZhongKai Hi-tech Development District ,Huizhou,Guangdong 516006 P.R.China (TCL Mobile Communication Co.,LTD.Huizhou)

## 1.3 Product Feature of Equipment Under Test

| Product Feature                 |                                                      |
|---------------------------------|------------------------------------------------------|
| Equipment                       | LTE USB Modem/4G AP                                  |
| Brand Name                      | ALCATEL<br>onetouch                                  |
| Model Name                      | ONE TOUCH Y850O0                                     |
| Marketing Name                  | ALCATEL ONETOUCH LINK Y850                           |
| FCC ID                          | RAD522                                               |
| EUT supports Radios application | GSM/EGPRS/WCDMA/HSPA/LTE<br>WLAN 11a/b/g/n HT20/HT40 |
| HW Version                      | V4.0                                                 |
| SW Version                      | Y850V_00_01.13_15_20140626                           |
| EUT Stage                       | Identical Prototype                                  |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification subjective to this standard

| Product Specification subjective to this standard |                                                                                                                                                                                                                                                |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tx Frequency</b>                               | LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5 : 824.7 MHz ~ 848.3 MHz<br>LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz<br>LTE Band 17 : 706.5 MHz ~ 713.5 MHz                                              |
| <b>Rx Frequency</b>                               | LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz<br>LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz<br>LTE Band 5 : 869.7 MHz ~ 893.3 MHz<br>LTE Band 7 : 2622.5MHz ~ 2687.5 MHz<br>LTE Band 17 : 736.5 MHz ~ 743.5 MHz                                               |
| <b>Bandwidth</b>                                  | 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<br>LTE Band 17 : 5MHz / 10MHz |
| <b>Maximum Output Power to Antenna</b>            | LTE Band 2 : 22.59 dBm<br>LTE Band 4 : 21.26 dBm<br>LTE Band 5 : 22.83 dBm<br>LTE Band 7 : 22.62 dBm<br>LTE Band 17 : 22.77 dBm                                                                                                                |
| <b>Antenna Type</b>                               | Loop Antenna                                                                                                                                                                                                                                   |
| <b>Type of Modulation</b>                         | QPSK / 16QAM                                                                                                                                                                                                                                   |

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.



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

| FCC Rule | System     | Type of Modulation | BW      | Emission Designator | Frequency Tolerance (ppm) | Maximum ERP/EIRP |
|----------|------------|--------------------|---------|---------------------|---------------------------|------------------|
| Part 22  | LTE Band 5 | QPSK               | 1.4 MHz | 1M10G7D             | -                         | 0.011 W          |
| Part 22  | LTE Band 5 | 16QAM              | 1.4 MHz | 1M90W7D             | -                         | 0.009 W          |
| Part 22  | LTE Band 5 | QPSK               | 3 MHz   | 2M73G7D             | -                         | -                |
| Part 22  | LTE Band 5 | 16QAM              | 3 MHz   | 2M72W7D             | -                         | -                |
| Part 22  | LTE Band 5 | QPSK               | 5 MHz   | 4M49G7D             | -                         | -                |
| Part 22  | LTE Band 5 | 16QAM              | 5 MHz   | 4M49W7D             | -                         | -                |
| Part 22  | LTE Band 5 | QPSK               | 10 MHz  | 9M09G7D             | 0.0012 ppm                | 0.011 W          |
| Part 22  | LTE Band 5 | 16QAM              | 10 MHz  | 9M01W7D             | -                         | 0.009 W          |
| Part 24  | LTE Band 2 | QPSK               | 1.4 MHz | 1M11G7D             | -                         | 0.030 W          |
| Part 24  | LTE Band 2 | 16QAM              | 1.4 MHz | 1M10W7D             | -                         | 0.025 W          |
| Part 24  | LTE Band 2 | QPSK               | 3 MHz   | 2M75G7D             | -                         | -                |
| Part 24  | LTE Band 2 | 16QAM              | 3 MHz   | 2M73W7D             | -                         | -                |
| Part 24  | LTE Band 2 | QPSK               | 5 MHz   | 4M55G7D             | -                         | -                |
| Part 24  | LTE Band 2 | 16QAM              | 5 MHz   | 4M50W7D             | -                         | -                |
| Part 24  | LTE Band 2 | QPSK               | 10 MHz  | 9M09G7D             | 0.0176 ppm                | -                |
| Part 24  | LTE Band 2 | 16QAM              | 10 MHz  | 9M01W7D             | -                         | -                |
| Part 24  | LTE Band 2 | QPSK               | 15 MHz  | 13M5G7D             | -                         | -                |
| Part 24  | LTE Band 2 | 16QAM              | 15 MHz  | 13M5W7D             | -                         | -                |
| Part 24  | LTE Band 2 | QPSK               | 20 MHz  | 18M3G7D             | -                         | 0.029 W          |
| Part 24  | LTE Band 2 | 16QAM              | 20 MHz  | 18M3W7D             | -                         | 0.023 W          |



| FCC Rule | System      | Type of Modulation | BW      | Emission Designator | Frequency Tolerance (ppm) | Maximum ERP/EIRP |
|----------|-------------|--------------------|---------|---------------------|---------------------------|------------------|
| Part 27  | LTE Band 4  | QPSK               | 1.4 MHz | 1M10G7D             | -                         | 0.059 W          |
| Part 27  | LTE Band 4  | 16QAM              | 1.4 MHz | 1M10W7D             | -                         | 0.047 W          |
| Part 27  | LTE Band 4  | QPSK               | 3 MHz   | 2M73G7D             | -                         | -                |
| Part 27  | LTE Band 4  | 16QAM              | 3 MHz   | 2M73W7D             | -                         | -                |
| Part 27  | LTE Band 4  | QPSK               | 5MHz    | 4M51G7D             | -                         | -                |
| Part 27  | LTE Band 4  | 16QAM              | 5MHz    | 4M50W7D             | -                         | -                |
| Part 27  | LTE Band 4  | QPSK               | 10MHz   | 9M07G7D             | 0.0029 ppm                | -                |
| Part 27  | LTE Band 4  | 16QAM              | 10MHz   | 9M01W7D             | -                         | -                |
| Part 27  | LTE Band 4  | QPSK               | 15MHz   | 13M5G7D             | -                         | -                |
| Part 27  | LTE Band 4  | 16QAM              | 15MHz   | 13M5W7D             | -                         | -                |
| Part 27  | LTE Band 4  | QPSK               | 20MHz   | 18M4G7D             | -                         | 0.058 W          |
| Part 27  | LTE Band 4  | 16QAM              | 20MHz   | 18M3W7D             | -                         | 0.048 W          |
| Part 27  | LTE Band 17 | QPSK               | 5MHz    | 4M52G7D             | -                         | 0.010 W          |
| Part 27  | LTE Band 17 | 16QAM              | 5MHz    | 4M51W7D             | -                         | 0.009 W          |
| Part 27  | LTE Band 17 | QPSK               | 10MHz   | 9M07G7D             | 0.0155 ppm                | 0.010 W          |
| Part 27  | LTE Band 17 | 16QAM              | 10MHz   | 9M01W7D             | -                         | 0.008 W          |
| Part 27  | LTE Band 7  | QPSK               | 5MHz    | 4M51G7D             | -                         | 0.048 W          |
| Part 27  | LTE Band 7  | 16QAM              | 5MHz    | 4M50W7D             | -                         | 0.039 W          |
| Part 27  | LTE Band 7  | QPSK               | 10MHz   | 9M07G7D             | 0.0158 ppm                | -                |
| Part 27  | LTE Band 7  | 16QAM              | 10MHz   | 9M05W7D             | -                         | -                |
| Part 27  | LTE Band 7  | QPSK               | 15MHz   | 13M5G7D             | -                         | -                |
| Part 27  | LTE Band 7  | 16QAM              | 15MHz   | 13M5W7D             | -                         | -                |
| Part 27  | LTE Band 7  | QPSK               | 20MHz   | 18M5G7D             | -                         | 0.046 W          |
| Part 27  | LTE Band 7  | 16QAM              | 20MHz   | 18M4W7D             | -                         | 0.037 W          |

## 1.7 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

|                    |                                                                                                                  |
|--------------------|------------------------------------------------------------------------------------------------------------------|
| Test Site          | SPORTON INTERNATIONAL (KUNSHAN) INC.                                                                             |
| Test Site Location | No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.<br>TEL: +86-0512-5790-0158<br>FAX: +86-0512-5790-0958 |
| Test Site No.      | Sporton Site No. :<br>TH01-KS                                                                                    |

|                    |                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site          | SPORTON INTERNATIONAL INC.                                                                                                                                      |
| Test Site Location | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |
| Test Site No.      | Sporton Site No. :<br>03CH07-HY                                                                                                                                 |

## 1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 22(H), 24(E), 27
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

### 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.



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

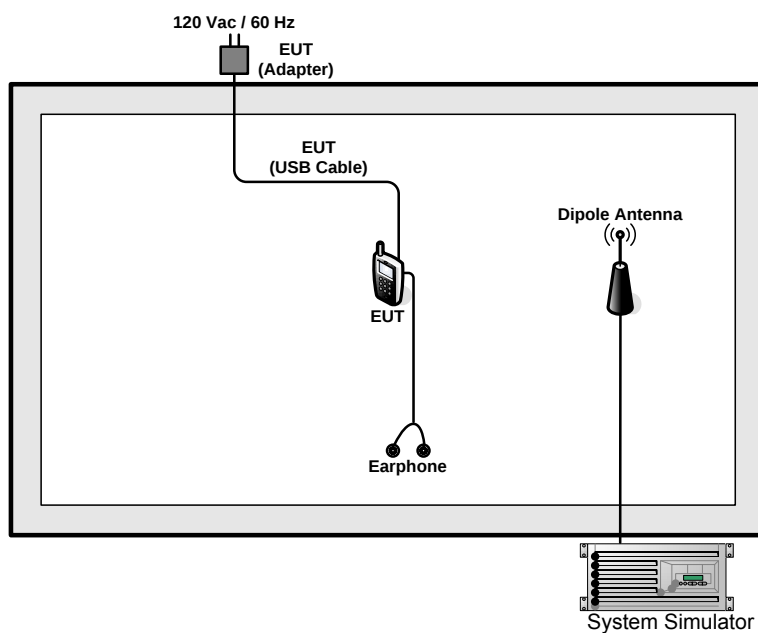
Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

| 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    | -               | - | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    | ✓    | ✓    | ✓            | ✓ | ✓ |
|                        | 17   | -               | - | ✓ | ✓  | -  | -  | ✓          | ✓     | ✓    | ✓    | ✓    | ✓            | ✓ | ✓ |
| Peak-to-Average Ratio  | 2    |                 |   |   |    |    | ✓  |            | ✓     | ✓    |      | ✓    | ✓            | ✓ | ✓ |
|                        | 4    |                 |   |   |    |    | ✓  |            | ✓     | ✓    |      | ✓    | ✓            | ✓ | ✓ |
|                        | 5    |                 |   |   | ✓  | -  | -  |            | ✓     | ✓    |      | ✓    | ✓            | ✓ | ✓ |
|                        | 7    | -               | - |   |    |    | ✓  |            | ✓     | ✓    |      | ✓    | ✓            | ✓ | ✓ |
|                        | 17   | -               | - |   | ✓  | -  | -  |            | ✓     | ✓    |      | ✓    | ✓            | ✓ | ✓ |
| 26dB and 99% Bandwidth | 2    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     |      |      | ✓    | ✓            | ✓ | ✓ |
|                        | 4    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     |      |      | ✓    | ✓            | ✓ | ✓ |
|                        | 5    | ✓               | ✓ | ✓ | ✓  | -  | -  | ✓          | ✓     |      |      | ✓    | ✓            | ✓ | ✓ |
|                        | 7    | -               | - | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     |      |      | ✓    | ✓            | ✓ | ✓ |
|                        | 17   | -               | - | ✓ | ✓  | -  | -  | ✓          | ✓     |      |      | ✓    | ✓            | ✓ | ✓ |
| Conducted Band Edge    | 2    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    |      | ✓    | ✓            |   | ✓ |
|                        | 4    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    |      | ✓    | ✓            |   | ✓ |
|                        | 5    | ✓               | ✓ | ✓ | ✓  | -  | -  | ✓          | ✓     | ✓    |      | ✓    | ✓            |   | ✓ |
|                        | 7    | -               | - | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    |      | ✓    | ✓            |   | ✓ |
|                        | 17   | -               | - | ✓ | ✓  | -  | -  | ✓          | ✓     | ✓    |      | ✓    | ✓            |   | ✓ |



| Test Items                        | Band                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Bandwidth (MHz) |   |   |    |    |    | Modulation |       | RB # |      |      | Test Channel |   |   |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|---|----|----|----|------------|-------|------|------|------|--------------|---|---|
|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 1    | Half | Full | L            | M | H |
| Conducted<br>Spurious<br>Emission | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               | ✓ | ✓ | ✓  | -  | -  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -               | - | ✓ | ✓  | ✓  | ✓  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | ✓ | ✓  | -  | -  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
| Frequency<br>Stability            | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |   |   | ✓  |    |    | ✓          |       |      |      | ✓    |              | ✓ |   |
|                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |   |   | ✓  |    |    | ✓          |       |      |      | ✓    |              | ✓ |   |
|                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |   |   | ✓  | -  | -  | ✓          |       |      |      | ✓    |              | ✓ |   |
|                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -               | - |   | ✓  |    |    | ✓          |       |      |      | ✓    |              | ✓ |   |
|                                   | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -               | - |   | ✓  | -  | -  | ✓          |       |      |      | ✓    |              | ✓ |   |
| E.R.P./ E.I.R.P.                  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               |   |   |    |    | ✓  | ✓          | ✓     | ✓    | ✓    |      | ✓            | ✓ | ✓ |
|                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               |   |   |    |    | ✓  | ✓          | ✓     | ✓    | ✓    |      | ✓            | ✓ | ✓ |
|                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               |   |   | ✓  | -  | -  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -               | - | ✓ |    |    | ✓  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | ✓ | ✓  | -  | -  | ✓          | ✓     | ✓    |      |      | ✓            | ✓ | ✓ |
| Radiated<br>Spurious<br>Emission  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          |       | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               | ✓ | ✓ | ✓  | ✓  | ✓  | ✓          |       | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ✓               | ✓ | ✓ | ✓  | -  | -  | ✓          |       | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -               | - | ✓ | ✓  | ✓  | ✓  | ✓          |       | ✓    |      |      | ✓            | ✓ | ✓ |
|                                   | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | ✓ | ✓  | -  | -  | ✓          |       | ✓    |      |      | ✓            | ✓ | ✓ |
| Note                              | <p>1. The mark “✓” means that this configuration is chosen for testing</p> <p>2. The mark “-” means that this bandwidth is not supported.</p> <p>3. For E.R.P./E.I.R.P. measurement, the widest bandwidth of each band is chosen for testing due to highest conducted power. Besides, the lowest bandwidth of each band is also measured for reporting only.</p> <p>4. 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.</p> |                 |   |   |    |    |    |            |       |      |      |      |              |   |   |

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

| Item | Equipment        | Trade Name | Model No. | FCC ID | Data Cable | Power Cord        |
|------|------------------|------------|-----------|--------|------------|-------------------|
| 1.   | System Simulator | Anritsu    | MT8820C   | N/A    | N/A        | Unshielded, 1.8 m |



## 2.4 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 4.2 dB and 10dB attenuator.

Example :

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

### 3 Test Result

#### 3.1 Conducted Output Power Measurement

##### 3.1.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

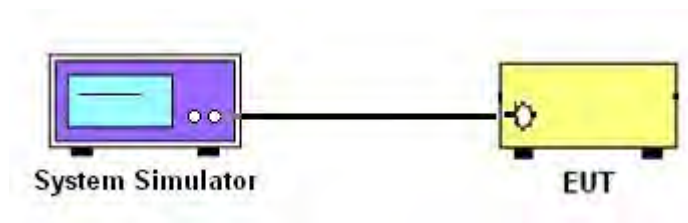
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the 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.

##### 3.1.4 Test Setup





## 3.1.5 Test Result of Conducted Output Power

## &lt;LTE Band 5 Conducted Power&gt;

| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 20450                             | 20525                                | 20600                              |
| Frequency (MHz) |            |         |           | 829                               | 836.5                                | 844                                |
| 10              | QPSK       | 1       | 0         | 22.80                             | 22.44                                | 22.83                              |
| 10              | QPSK       | 1       | 24        | 22.25                             | 22.31                                | 22.52                              |
| 10              | QPSK       | 1       | 49        | 22.20                             | 22.43                                | 22.60                              |
| 10              | QPSK       | 25      | 0         | 21.37                             | 21.10                                | 21.55                              |
| 10              | QPSK       | 25      | 12        | 21.39                             | 21.34                                | 21.69                              |
| 10              | QPSK       | 25      | 24        | 21.32                             | 21.33                                | 21.67                              |
| 10              | QPSK       | 50      | 0         | 21.22                             | 21.16                                | 21.66                              |
| 10              | 16QAM      | 1       | 0         | 21.53                             | 20.81                                | 21.77                              |
| 10              | 16QAM      | 1       | 24        | 21.10                             | 20.95                                | 21.27                              |
| 10              | 16QAM      | 1       | 49        | 21.23                             | 21.28                                | 21.68                              |
| 10              | 16QAM      | 25      | 0         | 20.47                             | 20.78                                | 21.23                              |
| 10              | 16QAM      | 25      | 12        | 20.18                             | 20.83                                | 21.32                              |
| 10              | 16QAM      | 25      | 24        | 20.16                             | 20.79                                | 21.41                              |
| 10              | 16QAM      | 50      | 0         | 20.29                             | 20.15                                | 20.72                              |
| Channel         |            |         |           | 20425                             | 20525                                | 20625                              |
| Frequency (MHz) |            |         |           | 826.5                             | 836.5                                | 846.5                              |
| 5               | QPSK       | 1       | 0         | 22.73                             | 22.32                                | 22.75                              |
| 5               | QPSK       | 1       | 12        | 22.44                             | 22.31                                | 22.71                              |
| 5               | QPSK       | 1       | 24        | 22.16                             | 22.28                                | 22.62                              |
| 5               | QPSK       | 12      | 0         | 21.50                             | 21.16                                | 21.52                              |
| 5               | QPSK       | 12      | 6         | 21.52                             | 21.07                                | 21.62                              |
| 5               | QPSK       | 12      | 11        | 21.30                             | 21.14                                | 22.04                              |
| 5               | QPSK       | 25      | 0         | 21.42                             | 21.09                                | 22.02                              |
| 5               | 16QAM      | 1       | 0         | 22.08                             | 21.56                                | 22.30                              |
| 5               | 16QAM      | 1       | 12        | 21.90                             | 21.41                                | 22.22                              |
| 5               | 16QAM      | 1       | 24        | 21.54                             | 21.49                                | 22.24                              |
| 5               | 16QAM      | 12      | 0         | 20.75                             | 20.74                                | 21.33                              |
| 5               | 16QAM      | 12      | 6         | 20.49                             | 20.71                                | 21.43                              |
| 5               | 16QAM      | 12      | 11        | 20.39                             | 20.75                                | 21.34                              |
| 5               | 16QAM      | 25      | 0         | 20.51                             | 20.14                                | 20.93                              |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 20415                             | 20525                                | 20635                              |
| Frequency (MHz) |            |         |           | 825.5                             | 836.5                                | 847.5                              |
| 3               | QPSK       | 1       | 0         | 22.71                             | 22.26                                | 22.79                              |
| 3               | QPSK       | 1       | 7         | 22.56                             | 22.17                                | 22.76                              |
| 3               | QPSK       | 1       | 14        | 22.46                             | 22.20                                | 22.69                              |
| 3               | QPSK       | 8       | 0         | 21.96                             | 21.08                                | 21.67                              |
| 3               | QPSK       | 8       | 4         | 21.53                             | 21.29                                | 21.73                              |
| 3               | QPSK       | 8       | 7         | 21.51                             | 21.21                                | 22.06                              |
| 3               | QPSK       | 15      | 0         | 21.54                             | 21.24                                | 22.05                              |
| 3               | 16QAM      | 1       | 0         | 22.19                             | 21.34                                | 22.23                              |
| 3               | 16QAM      | 1       | 7         | 21.59                             | 21.25                                | 22.21                              |
| 3               | 16QAM      | 1       | 14        | 21.85                             | 21.29                                | 22.15                              |
| 3               | 16QAM      | 8       | 0         | 20.74                             | 20.57                                | 21.32                              |
| 3               | 16QAM      | 8       | 4         | 20.61                             | 20.68                                | 21.29                              |
| 3               | 16QAM      | 8       | 7         | 20.39                             | 20.59                                | 21.43                              |
| 3               | 16QAM      | 15      | 0         | 20.62                             | 20.12                                | 21.01                              |
| Channel         |            |         |           | 20407                             | 20525                                | 20643                              |
| Frequency (MHz) |            |         |           | 824.7                             | 836.5                                | 848.3                              |
| 1.4             | QPSK       | 1       | 0         | 22.77                             | 22.28                                | 22.74                              |
| 1.4             | QPSK       | 1       | 2         | 22.76                             | 22.27                                | 22.72                              |
| 1.4             | QPSK       | 1       | 5         | 22.73                             | 22.25                                | 22.71                              |
| 1.4             | QPSK       | 3       | 0         | 22.76                             | 22.26                                | 22.69                              |
| 1.4             | QPSK       | 3       | 1         | 22.71                             | 22.27                                | 22.69                              |
| 1.4             | QPSK       | 3       | 2         | 22.71                             | 22.23                                | 22.72                              |
| 1.4             | QPSK       | 6       | 0         | 21.65                             | 21.22                                | 21.85                              |
| 1.4             | 16QAM      | 1       | 0         | 21.97                             | 21.34                                | 21.91                              |
| 1.4             | 16QAM      | 1       | 2         | 21.88                             | 21.04                                | 21.83                              |
| 1.4             | 16QAM      | 1       | 5         | 21.90                             | 21.11                                | 21.89                              |
| 1.4             | 16QAM      | 3       | 0         | 21.88                             | 21.22                                | 21.89                              |
| 1.4             | 16QAM      | 3       | 1         | 21.81                             | 21.33                                | 21.75                              |
| 1.4             | 16QAM      | 3       | 2         | 21.83                             | 21.30                                | 21.79                              |
| 1.4             | 16QAM      | 6       | 0         | 20.82                             | 20.34                                | 20.90                              |



## &lt;LTE Band 2 Conducted Power&gt;

| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 18700                             | 18900                                | 19100                              |
| Frequency (MHz) |            |         |           | 1860                              | 1880                                 | 1900                               |
| 20              | QPSK       | 1       | 0         | 22.44                             | 22.57                                | 22.43                              |
| 20              | QPSK       | 1       | 49        | 22.42                             | 22.54                                | 22.30                              |
| 20              | QPSK       | 1       | 99        | 22.43                             | 22.48                                | 22.30                              |
| 20              | QPSK       | 50      | 0         | 21.45                             | 21.44                                | 21.25                              |
| 20              | QPSK       | 50      | 24        | 21.62                             | 21.49                                | 21.35                              |
| 20              | QPSK       | 50      | 49        | 21.36                             | 21.32                                | 21.18                              |
| 20              | QPSK       | 100     | 0         | 21.39                             | 21.42                                | 21.22                              |
| 20              | 16QAM      | 1       | 0         | 21.16                             | 21.73                                | 21.08                              |
| 20              | 16QAM      | 1       | 49        | 21.12                             | 21.67                                | 21.02                              |
| 20              | 16QAM      | 1       | 99        | 21.15                             | 21.70                                | 20.97                              |
| 20              | 16QAM      | 50      | 0         | 20.34                             | 20.53                                | 20.23                              |
| 20              | 16QAM      | 50      | 24        | 20.36                             | 20.57                                | 20.34                              |
| 20              | 16QAM      | 50      | 49        | 20.30                             | 20.56                                | 20.15                              |
| 20              | 16QAM      | 100     | 0         | 20.38                             | 20.50                                | 20.29                              |
| Channel         |            |         |           | 18675                             | 18900                                | 19125                              |
| Frequency (MHz) |            |         |           | 1857.5                            | 1880                                 | 1902.5                             |
| 15              | QPSK       | 1       | 0         | 22.20                             | 22.53                                | 22.43                              |
| 15              | QPSK       | 1       | 37        | 22.17                             | 22.46                                | 22.35                              |
| 15              | QPSK       | 1       | 74        | 22.13                             | 22.51                                | 22.41                              |
| 15              | QPSK       | 36      | 0         | 21.66                             | 21.58                                | 21.23                              |
| 15              | QPSK       | 36      | 18        | 21.69                             | 21.63                                | 21.16                              |
| 15              | QPSK       | 36      | 37        | 21.60                             | 21.36                                | 21.04                              |
| 15              | QPSK       | 75      | 0         | 21.32                             | 21.44                                | 21.27                              |
| 15              | 16QAM      | 1       | 0         | 21.43                             | 21.46                                | 21.41                              |
| 15              | 16QAM      | 1       | 37        | 21.34                             | 21.43                                | 21.34                              |
| 15              | 16QAM      | 1       | 74        | 21.38                             | 21.27                                | 21.36                              |
| 15              | 16QAM      | 36      | 0         | 20.40                             | 20.65                                | 20.37                              |
| 15              | 16QAM      | 36      | 18        | 20.41                             | 20.43                                | 20.18                              |
| 15              | 16QAM      | 36      | 37        | 20.40                             | 20.40                                | 20.16                              |
| 15              | 16QAM      | 75      | 0         | 20.32                             | 20.45                                | 20.19                              |



| BW<br>[MHz]     | Modulation | RB<br>Size | RB<br>Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|------------|--------------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |            |              | 18650                             | 18900                                | 19150                              |
| Frequency (MHz) |            |            |              | 1855                              | 1880                                 | 1905                               |
| 10              | QPSK       | 1          | 0            | 22.44                             | 22.52                                | 22.39                              |
| 10              | QPSK       | 1          | 24           | 22.41                             | 22.48                                | 21.98                              |
| 10              | QPSK       | 1          | 49           | 22.38                             | 22.44                                | 22.35                              |
| 10              | QPSK       | 25         | 0            | 21.58                             | 21.49                                | 21.25                              |
| 10              | QPSK       | 25         | 12           | 21.59                             | 21.44                                | 21.22                              |
| 10              | QPSK       | 25         | 24           | 21.53                             | 21.39                                | 21.19                              |
| 10              | QPSK       | 50         | 0            | 21.53                             | 21.44                                | 21.18                              |
| 10              | 16QAM      | 1          | 0            | 21.30                             | 21.68                                | 21.42                              |
| 10              | 16QAM      | 1          | 24           | 21.27                             | 21.60                                | 21.24                              |
| 10              | 16QAM      | 1          | 49           | 21.05                             | 21.15                                | 21.41                              |
| 10              | 16QAM      | 25         | 0            | 20.51                             | 20.47                                | 20.15                              |
| 10              | 16QAM      | 25         | 12           | 20.54                             | 20.40                                | 20.10                              |
| 10              | 16QAM      | 25         | 24           | 20.47                             | 20.38                                | 20.09                              |
| 10              | 16QAM      | 50         | 0            | 20.20                             | 20.48                                | 20.15                              |
| Channel         |            |            |              | 18625                             | 18900                                | 19175                              |
| Frequency (MHz) |            |            |              | 1852.5                            | 1880                                 | 1907.5                             |
| 5               | QPSK       | 1          | 0            | 22.47                             | 22.47                                | 22.27                              |
| 5               | QPSK       | 1          | 12           | 22.42                             | 22.43                                | 22.21                              |
| 5               | QPSK       | 1          | 24           | 22.39                             | 22.40                                | 22.19                              |
| 5               | QPSK       | 12         | 0            | 21.35                             | 21.58                                | 21.27                              |
| 5               | QPSK       | 12         | 6            | 21.59                             | 21.50                                | 21.28                              |
| 5               | QPSK       | 12         | 11           | 21.55                             | 21.41                                | 21.27                              |
| 5               | QPSK       | 25         | 0            | 21.66                             | 21.45                                | 21.22                              |
| 5               | 16QAM      | 1          | 0            | 21.49                             | 21.74                                | 21.63                              |
| 5               | 16QAM      | 1          | 12           | 21.41                             | 21.70                                | 21.50                              |
| 5               | 16QAM      | 1          | 24           | 21.43                             | 21.69                                | 21.61                              |
| 5               | 16QAM      | 12         | 0            | 20.32                             | 20.66                                | 20.15                              |
| 5               | 16QAM      | 12         | 6            | 20.52                             | 20.65                                | 20.16                              |
| 5               | 16QAM      | 12         | 11           | 20.49                             | 20.52                                | 20.05                              |
| 5               | 16QAM      | 25         | 0            | 20.43                             | 20.52                                | 20.16                              |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 18615                             | 18900                                | 19185                              |
| Frequency (MHz) |            |         |           | 1851.5                            | 1880                                 | 1908.5                             |
| 3               | QPSK       | 1       | 0         | 22.24                             | 22.56                                | 22.43                              |
| 3               | QPSK       | 1       | 7         | 22.17                             | 22.50                                | 22.28                              |
| 3               | QPSK       | 1       | 14        | 22.19                             | 22.52                                | 22.35                              |
| 3               | QPSK       | 8       | 0         | 21.31                             | 21.58                                | 21.44                              |
| 3               | QPSK       | 8       | 4         | 21.33                             | 21.49                                | 21.26                              |
| 3               | QPSK       | 8       | 7         | 21.31                             | 21.44                                | 21.51                              |
| 3               | QPSK       | 15      | 0         | 21.25                             | 21.50                                | 21.32                              |
| 3               | 16QAM      | 1       | 0         | 21.17                             | 21.45                                | 21.53                              |
| 3               | 16QAM      | 1       | 7         | 21.08                             | 21.39                                | 21.46                              |
| 3               | 16QAM      | 1       | 14        | 20.81                             | 21.41                                | 21.48                              |
| 3               | 16QAM      | 8       | 0         | 20.41                             | 20.60                                | 20.20                              |
| 3               | 16QAM      | 8       | 4         | 20.42                             | 20.60                                | 20.39                              |
| 3               | 16QAM      | 8       | 7         | 20.41                             | 20.47                                | 20.34                              |
| 3               | 16QAM      | 15      | 0         | 20.38                             | 20.55                                | 20.43                              |
| Channel         |            |         |           | 18607                             | 18900                                | 19193                              |
| Frequency (MHz) |            |         |           | 1850.7                            | 1880                                 | 1909.3                             |
| 1.4             | QPSK       | 1       | 0         | 22.43                             | 22.59                                | 22.44                              |
| 1.4             | QPSK       | 1       | 2         | 22.30                             | 22.49                                | 22.42                              |
| 1.4             | QPSK       | 1       | 5         | 22.37                             | 22.54                                | 22.42                              |
| 1.4             | QPSK       | 3       | 0         | 22.32                             | 22.53                                | 22.39                              |
| 1.4             | QPSK       | 3       | 1         | 22.35                             | 22.49                                | 22.40                              |
| 1.4             | QPSK       | 3       | 2         | 22.34                             | 22.54                                | 22.40                              |
| 1.4             | QPSK       | 6       | 0         | 21.25                             | 21.55                                | 21.45                              |
| 1.4             | 16QAM      | 1       | 0         | 21.43                             | 21.55                                | 21.28                              |
| 1.4             | 16QAM      | 1       | 2         | 21.24                             | 21.38                                | 21.41                              |
| 1.4             | 16QAM      | 1       | 5         | 21.31                             | 21.32                                | 21.43                              |
| 1.4             | 16QAM      | 3       | 0         | 21.41                             | 21.54                                | 21.56                              |
| 1.4             | 16QAM      | 3       | 1         | 21.41                             | 21.52                                | 21.58                              |
| 1.4             | 16QAM      | 3       | 2         | 21.42                             | 21.53                                | 21.54                              |
| 1.4             | 16QAM      | 6       | 0         | 20.29                             | 20.51                                | 20.34                              |



## &lt;LTE Band 4 Conducted Power&gt;

| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 20050                             | 20175                                | 20300                              |
| Frequency (MHz) |            |         |           | 1720                              | 1732.5                               | 1745                               |
| 20              | QPSK       | 1       | 0         | 21.26                             | 20.98                                | 20.62                              |
| 20              | QPSK       | 1       | 49        | 21.23                             | 20.80                                | 20.52                              |
| 20              | QPSK       | 1       | 99        | 21.05                             | 20.69                                | 20.39                              |
| 20              | QPSK       | 50      | 0         | 20.16                             | 19.94                                | 19.89                              |
| 20              | QPSK       | 50      | 24        | 20.04                             | 19.89                                | 19.71                              |
| 20              | QPSK       | 50      | 49        | 19.91                             | 19.79                                | 19.50                              |
| 20              | QPSK       | 100     | 0         | 20.04                             | 19.88                                | 19.75                              |
| 20              | 16QAM      | 1       | 0         | 20.25                             | 20.07                                | 19.62                              |
| 20              | 16QAM      | 1       | 49        | 20.23                             | 19.84                                | 19.60                              |
| 20              | 16QAM      | 1       | 99        | 20.06                             | 19.83                                | 19.52                              |
| 20              | 16QAM      | 50      | 0         | 19.03                             | 19.19                                | 18.72                              |
| 20              | 16QAM      | 50      | 24        | 18.96                             | 18.94                                | 18.72                              |
| 20              | 16QAM      | 50      | 49        | 18.81                             | 18.77                                | 18.50                              |
| 20              | 16QAM      | 100     | 0         | 18.99                             | 18.84                                | 18.88                              |
| Channel         |            |         |           | 20025                             | 20175                                | 20325                              |
| Frequency (MHz) |            |         |           | 1717.5                            | 1732.5                               | 1747.5                             |
| 15              | QPSK       | 1       | 0         | 21.00                             | 21.03                                | 20.93                              |
| 15              | QPSK       | 1       | 37        | 21.05                             | 20.86                                | 20.76                              |
| 15              | QPSK       | 1       | 74        | 21.14                             | 20.76                                | 20.39                              |
| 15              | QPSK       | 36      | 0         | 20.04                             | 20.04                                | 19.60                              |
| 15              | QPSK       | 36      | 18        | 20.10                             | 19.83                                | 19.78                              |
| 15              | QPSK       | 36      | 37        | 20.04                             | 19.78                                | 19.59                              |
| 15              | QPSK       | 75      | 0         | 19.91                             | 19.83                                | 19.71                              |
| 15              | 16QAM      | 1       | 0         | 20.14                             | 20.19                                | 20.12                              |
| 15              | 16QAM      | 1       | 37        | 19.99                             | 19.96                                | 19.98                              |
| 15              | 16QAM      | 1       | 74        | 20.22                             | 19.98                                | 19.67                              |
| 15              | 16QAM      | 36      | 0         | 19.08                             | 19.04                                | 18.69                              |
| 15              | 16QAM      | 36      | 18        | 19.01                             | 19.10                                | 18.73                              |
| 15              | 16QAM      | 36      | 37        | 19.12                             | 18.99                                | 18.55                              |
| 15              | 16QAM      | 75      | 0         | 19.21                             | 18.92                                | 18.73                              |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 20000                             | 20175                                | 20350                              |
| Frequency (MHz) |            |         |           | 1715                              | 1732.5                               | 1750                               |
| 10              | QPSK       | 1       | 0         | 21.01                             | 20.93                                | 20.53                              |
| 10              | QPSK       | 1       | 24        | 21.15                             | 20.78                                | 20.45                              |
| 10              | QPSK       | 1       | 49        | 21.01                             | 20.80                                | 20.61                              |
| 10              | QPSK       | 25      | 0         | 20.19                             | 19.98                                | 19.66                              |
| 10              | QPSK       | 25      | 12        | 20.07                             | 19.91                                | 19.47                              |
| 10              | QPSK       | 25      | 24        | 19.93                             | 19.82                                | 19.46                              |
| 10              | QPSK       | 50      | 0         | 19.98                             | 19.89                                | 19.47                              |
| 10              | 16QAM      | 1       | 0         | 20.11                             | 19.96                                | 19.56                              |
| 10              | 16QAM      | 1       | 24        | 20.04                             | 19.87                                | 19.44                              |
| 10              | 16QAM      | 1       | 49        | 20.23                             | 19.73                                | 19.89                              |
| 10              | 16QAM      | 25      | 0         | 19.08                             | 18.86                                | 18.50                              |
| 10              | 16QAM      | 25      | 12        | 18.96                             | 18.87                                | 18.47                              |
| 10              | 16QAM      | 25      | 24        | 19.00                             | 18.72                                | 18.38                              |
| 10              | 16QAM      | 50      | 0         | 19.15                             | 18.90                                | 18.51                              |
| Channel         |            |         |           | 19975                             | 20175                                | 20375                              |
| Frequency (MHz) |            |         |           | 1712.5                            | 1732.5                               | 1752.5                             |
| 5               | QPSK       | 1       | 0         | 20.88                             | 20.91                                | 20.56                              |
| 5               | QPSK       | 1       | 12        | 21.14                             | 20.80                                | 20.45                              |
| 5               | QPSK       | 1       | 24        | 20.95                             | 20.80                                | 20.70                              |
| 5               | QPSK       | 12      | 0         | 20.01                             | 19.93                                | 19.59                              |
| 5               | QPSK       | 12      | 6         | 20.06                             | 19.88                                | 19.49                              |
| 5               | QPSK       | 12      | 11        | 20.07                             | 19.78                                | 19.51                              |
| 5               | QPSK       | 25      | 0         | 19.96                             | 19.94                                | 19.42                              |
| 5               | 16QAM      | 1       | 0         | 20.13                             | 20.26                                | 19.78                              |
| 5               | 16QAM      | 1       | 12        | 20.39                             | 19.92                                | 19.93                              |
| 5               | 16QAM      | 1       | 24        | 20.41                             | 20.18                                | 19.90                              |
| 5               | 16QAM      | 12      | 0         | 18.94                             | 18.93                                | 18.55                              |
| 5               | 16QAM      | 12      | 6         | 19.00                             | 18.89                                | 18.69                              |
| 5               | 16QAM      | 12      | 11        | 19.15                             | 18.80                                | 18.39                              |
| 5               | 16QAM      | 25      | 0         | 19.07                             | 18.95                                | 18.42                              |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 19965                             | 20175                                | 20385                              |
| Frequency (MHz) |            |         |           | 1711.5                            | 1732.5                               | 1753.5                             |
| 3               | QPSK       | 1       | 0         | 20.92                             | 20.89                                | 20.44                              |
| 3               | QPSK       | 1       | 7         | 21.03                             | 20.74                                | 20.54                              |
| 3               | QPSK       | 1       | 14        | 21.19                             | 20.79                                | 20.68                              |
| 3               | QPSK       | 8       | 0         | 20.08                             | 19.96                                | 19.60                              |
| 3               | QPSK       | 8       | 4         | 20.08                             | 19.98                                | 19.64                              |
| 3               | QPSK       | 8       | 7         | 20.06                             | 19.79                                | 19.63                              |
| 3               | QPSK       | 15      | 0         | 20.02                             | 19.93                                | 19.61                              |
| 3               | 16QAM      | 1       | 0         | 19.82                             | 19.62                                | 19.32                              |
| 3               | 16QAM      | 1       | 7         | 19.77                             | 19.58                                | 19.56                              |
| 3               | 16QAM      | 1       | 14        | 19.76                             | 19.56                                | 19.61                              |
| 3               | 16QAM      | 8       | 0         | 19.07                             | 18.91                                | 18.52                              |
| 3               | 16QAM      | 8       | 4         | 18.96                             | 18.86                                | 18.84                              |
| 3               | 16QAM      | 8       | 7         | 19.04                             | 18.84                                | 18.52                              |
| 3               | 16QAM      | 15      | 0         | 19.16                             | 18.98                                | 18.51                              |
| Channel         |            |         |           | 19957                             | 20175                                | 20393                              |
| Frequency (MHz) |            |         |           | 1710.7                            | 1732.5                               | 1754.3                             |
| 1.4             | QPSK       | 1       | 0         | 20.96                             | 20.91                                | 20.84                              |
| 1.4             | QPSK       | 1       | 2         | 21.02                             | 20.93                                | 20.66                              |
| 1.4             | QPSK       | 1       | 5         | 21.07                             | 20.93                                | 20.81                              |
| 1.4             | QPSK       | 3       | 0         | 20.93                             | 20.97                                | 20.41                              |
| 1.4             | QPSK       | 3       | 1         | 20.95                             | 20.92                                | 20.60                              |
| 1.4             | QPSK       | 3       | 2         | 20.95                             | 20.90                                | 20.60                              |
| 1.4             | QPSK       | 6       | 0         | 19.99                             | 20.05                                | 19.57                              |
| 1.4             | 16QAM      | 1       | 0         | 20.11                             | 20.16                                | 19.64                              |
| 1.4             | 16QAM      | 1       | 2         | 20.13                             | 20.08                                | 19.71                              |
| 1.4             | 16QAM      | 1       | 5         | 20.03                             | 19.86                                | 19.97                              |
| 1.4             | 16QAM      | 3       | 0         | 19.99                             | 20.12                                | 19.60                              |
| 1.4             | 16QAM      | 3       | 1         | 19.98                             | 20.11                                | 19.75                              |
| 1.4             | 16QAM      | 3       | 2         | 19.98                             | 20.01                                | 19.74                              |
| 1.4             | 16QAM      | 6       | 0         | 18.99                             | 19.13                                | 18.76                              |

**<LTE Band 17 Conducted Power>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 23780                             | 23790                                | 23800                              |
| Frequency (MHz) |            |         |           | 709                               | 710                                  | 711                                |
| 10              | QPSK       | 1       | 0         | 22.66                             | 22.77                                | 22.59                              |
| 10              | QPSK       | 1       | 24        | 22.49                             | 22.72                                | 22.47                              |
| 10              | QPSK       | 1       | 49        | 22.59                             | 22.55                                | 22.44                              |
| 10              | QPSK       | 25      | 0         | 21.62                             | 21.65                                | 21.54                              |
| 10              | QPSK       | 25      | 12        | 21.52                             | 21.57                                | 21.52                              |
| 10              | QPSK       | 25      | 24        | 21.46                             | 21.53                                | 21.53                              |
| 10              | QPSK       | 50      | 0         | 21.51                             | 21.42                                | 21.55                              |
| 10              | 16QAM      | 1       | 0         | 21.62                             | 21.66                                | 21.47                              |
| 10              | 16QAM      | 1       | 24        | 21.55                             | 21.49                                | 21.42                              |
| 10              | 16QAM      | 1       | 49        | 21.39                             | 21.61                                | 21.40                              |
| 10              | 16QAM      | 25      | 0         | 20.42                             | 20.66                                | 20.56                              |
| 10              | 16QAM      | 25      | 12        | 20.47                             | 20.67                                | 20.51                              |
| 10              | 16QAM      | 25      | 24        | 20.41                             | 20.52                                | 20.72                              |
| 10              | 16QAM      | 50      | 0         | 20.53                             | 20.62                                | 20.59                              |
| Channel         |            |         |           | 23755                             | 23790                                | 23825                              |
| Frequency (MHz) |            |         |           | 706.5                             | 710                                  | 713.5                              |
| 5               | QPSK       | 1       | 0         | 22.67                             | 22.75                                | 22.68                              |
| 5               | QPSK       | 1       | 12        | 22.64                             | 22.50                                | 22.55                              |
| 5               | QPSK       | 1       | 24        | 22.64                             | 22.71                                | 22.62                              |
| 5               | QPSK       | 12      | 0         | 21.57                             | 21.67                                | 21.61                              |
| 5               | QPSK       | 12      | 6         | 21.69                             | 21.51                                | 21.48                              |
| 5               | QPSK       | 12      | 11        | 21.66                             | 21.61                                | 21.63                              |
| 5               | QPSK       | 25      | 0         | 21.65                             | 21.57                                | 21.53                              |
| 5               | 16QAM      | 1       | 0         | 21.91                             | 21.81                                | 21.84                              |
| 5               | 16QAM      | 1       | 12        | 21.89                             | 21.77                                | 21.77                              |
| 5               | 16QAM      | 1       | 24        | 21.72                             | 21.80                                | 21.79                              |
| 5               | 16QAM      | 12      | 0         | 20.73                             | 20.59                                | 20.62                              |
| 5               | 16QAM      | 12      | 6         | 20.74                             | 20.61                                | 20.60                              |
| 5               | 16QAM      | 12      | 11        | 20.81                             | 20.51                                | 20.65                              |
| 5               | 16QAM      | 25      | 0         | 20.64                             | 20.49                                | 20.47                              |

**<LTE Band 7 Conducted Power>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 20850                             | 21100                                | 21350                              |
| Frequency (MHz) |            |         |           | 2510                              | 2535                                 | 2560                               |
| 20              | QPSK       | 1       | 0         | 21.94                             | 22.26                                | 21.93                              |
| 20              | QPSK       | 1       | 49        | 22.07                             | 22.35                                | 22.09                              |
| 20              | QPSK       | 1       | 99        | 22.26                             | 22.62                                | 22.11                              |
| 20              | QPSK       | 50      | 0         | 21.06                             | 21.28                                | 21.16                              |
| 20              | QPSK       | 50      | 24        | 21.22                             | 21.21                                | 21.10                              |
| 20              | QPSK       | 50      | 49        | 21.25                             | 21.31                                | 21.17                              |
| 20              | QPSK       | 100     | 0         | 21.24                             | 21.26                                | 21.15                              |
| 20              | 16QAM      | 1       | 0         | 20.98                             | 21.32                                | 21.22                              |
| 20              | 16QAM      | 1       | 49        | 21.23                             | 21.31                                | 21.23                              |
| 20              | 16QAM      | 1       | 99        | 21.48                             | 21.58                                | 21.25                              |
| 20              | 16QAM      | 50      | 0         | 20.04                             | 20.43                                | 20.30                              |
| 20              | 16QAM      | 50      | 24        | 20.17                             | 20.35                                | 20.25                              |
| 20              | 16QAM      | 50      | 49        | 20.30                             | 20.20                                | 20.29                              |
| 20              | 16QAM      | 100     | 0         | 20.26                             | 20.31                                | 20.27                              |
| Channel         |            |         |           | 20825                             | 21100                                | 21375                              |
| Frequency (MHz) |            |         |           | 2507.5                            | 2535.0                               | 2562.5                             |
| 15              | QPSK       | 1       | 0         | 21.92                             | 22.22                                | 22.16                              |
| 15              | QPSK       | 1       | 37        | 22.08                             | 22.31                                | 22.06                              |
| 15              | QPSK       | 1       | 74        | 22.18                             | 22.42                                | 22.30                              |
| 15              | QPSK       | 36      | 0         | 21.15                             | 21.31                                | 21.05                              |
| 15              | QPSK       | 36      | 18        | 21.13                             | 21.28                                | 21.07                              |
| 15              | QPSK       | 36      | 37        | 21.16                             | 21.27                                | 21.12                              |
| 15              | QPSK       | 75      | 0         | 21.08                             | 21.25                                | 21.05                              |
| 15              | 16QAM      | 1       | 0         | 21.04                             | 21.41                                | 21.13                              |
| 15              | 16QAM      | 1       | 37        | 21.19                             | 21.42                                | 21.41                              |
| 15              | 16QAM      | 1       | 74        | 21.36                             | 21.43                                | 21.44                              |
| 15              | 16QAM      | 36      | 0         | 20.06                             | 20.33                                | 20.27                              |
| 15              | 16QAM      | 36      | 18        | 20.11                             | 20.39                                | 20.28                              |
| 15              | 16QAM      | 36      | 37        | 20.08                             | 20.14                                | 20.18                              |
| 15              | 16QAM      | 75      | 0         | 19.96                             | 20.27                                | 20.12                              |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| Channel         |            |         |           | 20800                             | 21100                                | 21400                              |
| Frequency (MHz) |            |         |           | 2505.0                            | 2535.0                               | 2565.0                             |
| 10              | QPSK       | 1       | 0         | 21.91                             | 22.25                                | 22.00                              |
| 10              | QPSK       | 1       | 24        | 22.01                             | 22.22                                | 22.10                              |
| 10              | QPSK       | 1       | 49        | 22.08                             | 22.29                                | 22.20                              |
| 10              | QPSK       | 25      | 0         | 21.03                             | 21.30                                | 21.06                              |
| 10              | QPSK       | 25      | 12        | 21.03                             | 21.24                                | 21.08                              |
| 10              | QPSK       | 25      | 24        | 20.97                             | 21.26                                | 21.07                              |
| 10              | QPSK       | 50      | 0         | 20.92                             | 21.28                                | 21.01                              |
| 10              | 16QAM      | 1       | 0         | 20.79                             | 21.07                                | 20.93                              |
| 10              | 16QAM      | 1       | 24        | 20.95                             | 21.11                                | 20.99                              |
| 10              | 16QAM      | 1       | 49        | 20.96                             | 21.19                                | 21.00                              |
| 10              | 16QAM      | 25      | 0         | 19.98                             | 20.30                                | 20.13                              |
| 10              | 16QAM      | 25      | 12        | 20.09                             | 20.25                                | 20.01                              |
| 10              | 16QAM      | 25      | 24        | 19.98                             | 20.34                                | 20.14                              |
| 10              | 16QAM      | 50      | 0         | 19.85                             | 20.25                                | 20.05                              |
| Channel         |            |         |           | 20775                             | 21100                                | 21425                              |
| Frequency (MHz) |            |         |           | 2502.5                            | 2535.0                               | 2567.5                             |
| 5               | QPSK       | 1       | 0         | 21.95                             | 22.22                                | 22.08                              |
| 5               | QPSK       | 1       | 12        | 21.92                             | 22.27                                | 22.06                              |
| 5               | QPSK       | 1       | 24        | 22.08                             | 22.33                                | 22.21                              |
| 5               | QPSK       | 12      | 0         | 20.97                             | 21.36                                | 21.18                              |
| 5               | QPSK       | 12      | 6         | 21.00                             | 21.33                                | 21.08                              |
| 5               | QPSK       | 12      | 11        | 21.01                             | 21.32                                | 21.09                              |
| 5               | QPSK       | 25      | 0         | 20.94                             | 21.24                                | 21.14                              |
| 5               | 16QAM      | 1       | 0         | 21.11                             | 21.44                                | 21.41                              |
| 5               | 16QAM      | 1       | 12        | 21.26                             | 21.46                                | 21.36                              |
| 5               | 16QAM      | 1       | 24        | 21.31                             | 21.66                                | 21.42                              |
| 5               | 16QAM      | 12      | 0         | 19.99                             | 20.37                                | 20.27                              |
| 5               | 16QAM      | 12      | 6         | 20.06                             | 20.33                                | 20.17                              |
| 5               | 16QAM      | 12      | 11        | 20.13                             | 20.25                                | 20.30                              |
| 5               | 16QAM      | 25      | 0         | 20.09                             | 20.26                                | 20.21                              |

**Note:** maximum average power for LTE.

## **3.2 Peak-to-Average Ratio**

### **3.2.1 Description of the PAR Measurement**

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.

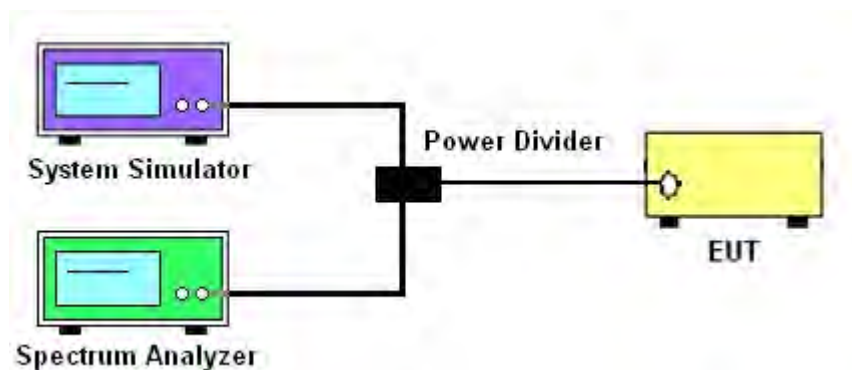
### **3.2.2 Measuring Instruments**

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

### **3.2.3 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.

### **3.2.4 Test Setup**



### 3.2.5 Test Result of Peak-to-Average Ratio

| LTE Band 5      |            |         |           |                                   |                                      |                                    |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
| Channel         |            |         |           | 20450                             | 20525                                | 20600                              |
| Frequency (MHz) |            |         |           | 829                               | 836.5                                | 844                                |
| 10              | 16QAM      | 1       | 0         | 6.20                              | 5.28                                 | 5.65                               |
| 10              | 16QAM      | 50      | 0         | 5.68                              | 5.42                                 | 5.33                               |

| LTE Band 2      |            |         |           |                                   |                                      |                                    |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
| Channel         |            |         |           | 18700                             | 18900                                | 19100                              |
| Frequency (MHz) |            |         |           | 1860                              | 1880                                 | 1900                               |
| 20              | 16QAM      | 1       | 0         | 5.83                              | 6.00                                 | 6.23                               |
| 20              | 16QAM      | 100     | 0         | 5.42                              | 5.45                                 | 5.59                               |

| LTE Band 4      |            |         |           |                                   |                                      |                                    |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
| Channel         |            |         |           | 20050                             | 20175                                | 20300                              |
| Frequency (MHz) |            |         |           | 1720                              | 1732.5                               | 1745                               |
| 20              | 16QAM      | 1       | 0         | 5.04                              | 4.93                                 | 5.62                               |
| 20              | 16QAM      | 100     | 0         | 5.16                              | 5.33                                 | 5.54                               |

| LTE Band 17     |            |         |           |                                   |                                      |                                    |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
| Channel         |            |         |           | 23780                             | 23790                                | 23800                              |
| Frequency (MHz) |            |         |           | 709                               | 710                                  | 711                                |
| 10              | 16QAM      | 1       | 0         | 5.88                              | 6.26                                 | 5.51                               |
| 10              | 16QAM      | 50      | 0         | 6.38                              | 6.23                                 | 6.14                               |

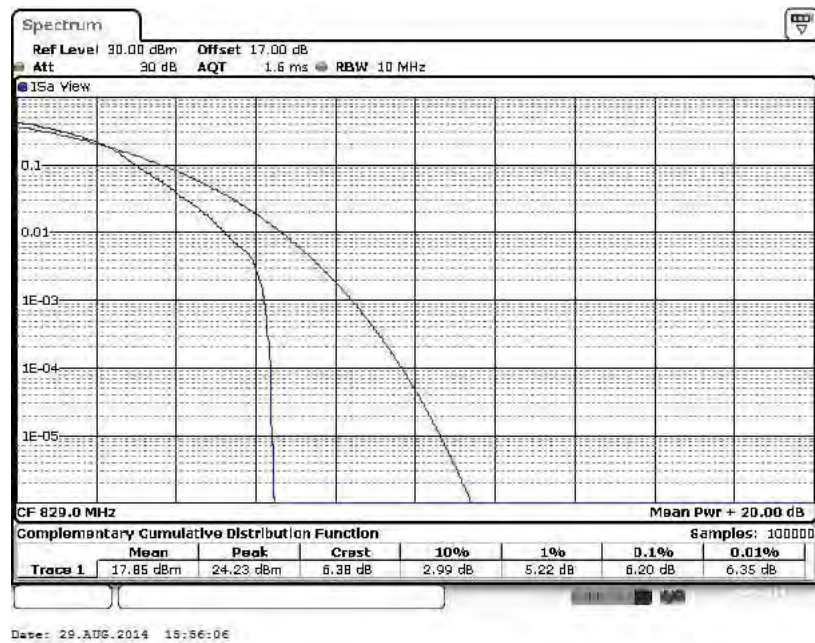
  

| LTE Band 7      |            |         |           |                                   |                                      |                                    |
|-----------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| BW [MHz]        | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
| Channel         |            |         |           | 20850                             | 21100                                | 21350                              |
| Frequency (MHz) |            |         |           | 2510.0                            | 2535.0                               | 2560.0                             |
| 20              | 16QAM      | 1       | 0         | 6.03                              | 6.20                                 | 6.64                               |
| 20              | 16QAM      | 100     | 0         | 6.09                              | 6.03                                 | 5.94                               |

### 3.2.6 Peak to Average Power Ratio

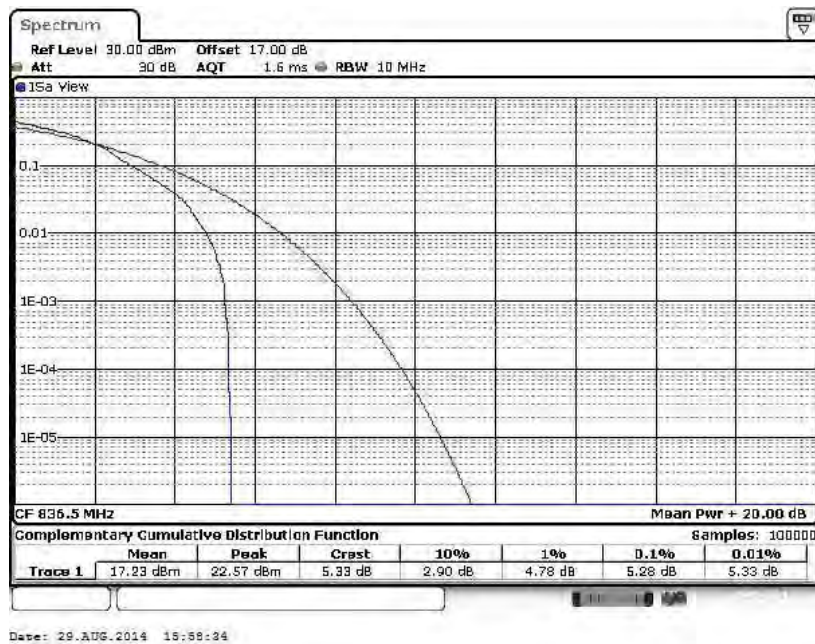
Peak-to-Average Ratio on LTE Band 5

10MHz / 16QAM in Ch. 20450 (1RB Size)



Peak-to-Average Ratio on LTE Band 5

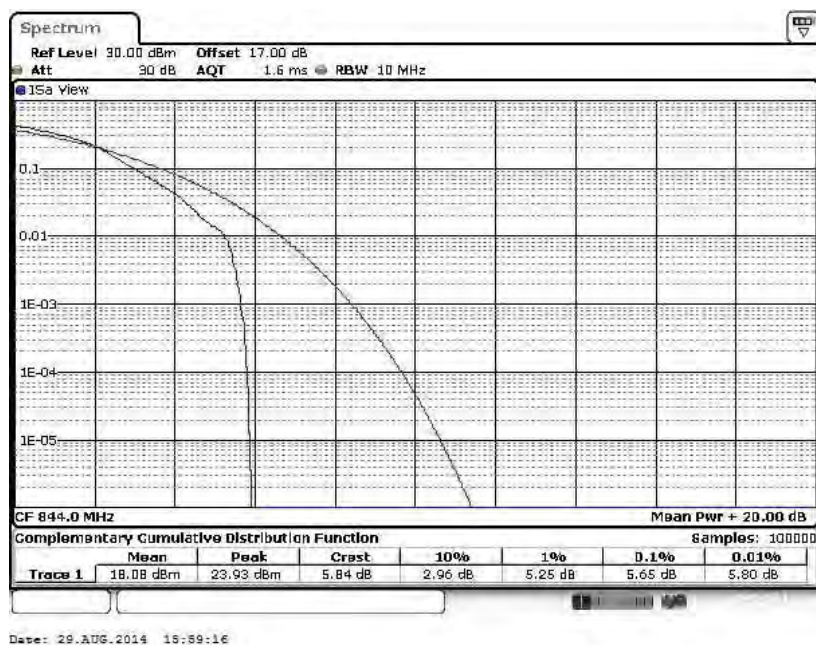
10MHz / 16QAM in Ch. 20525 (1RB Size)





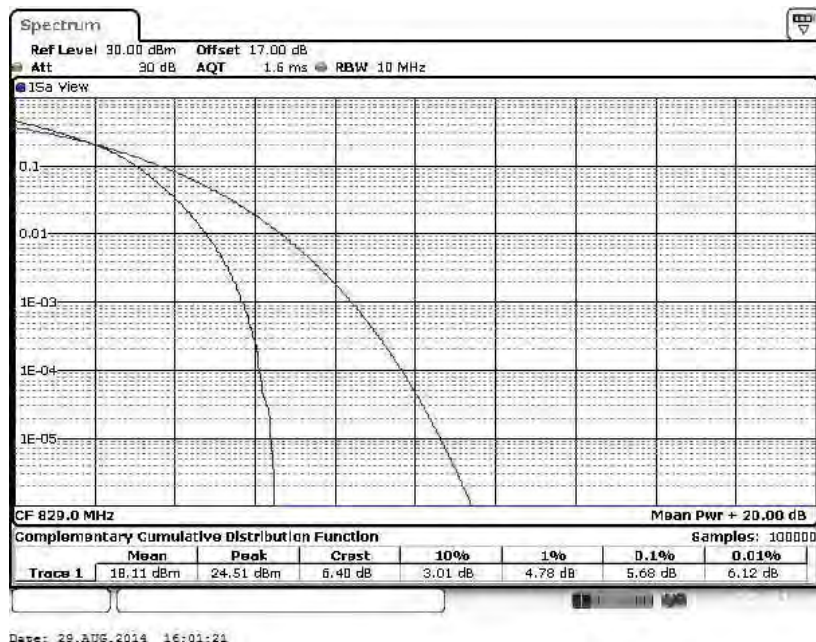
## Peak-to-Average Ratio on LTE Band 5

10MHz / 16QAM in Ch. 20600 (1RB Size)

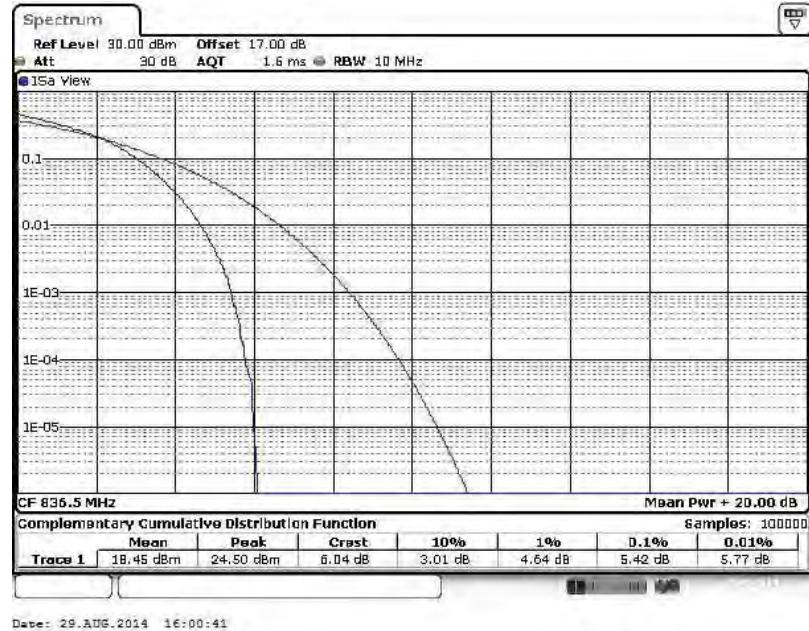


## Peak-to-Average Ratio on LTE Band 5

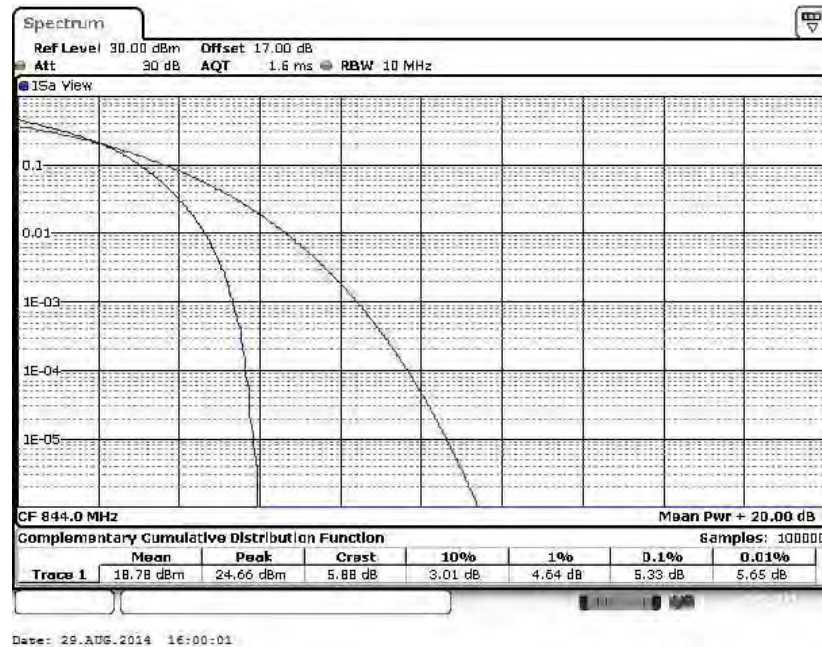
10MHz / 16QAM in Ch. 20450 (50RB Size)



**Peak-to-Average Ratio on LTE Band 5**  
**10MHz / 16QAM in Ch. 20525 (50RB Size)**

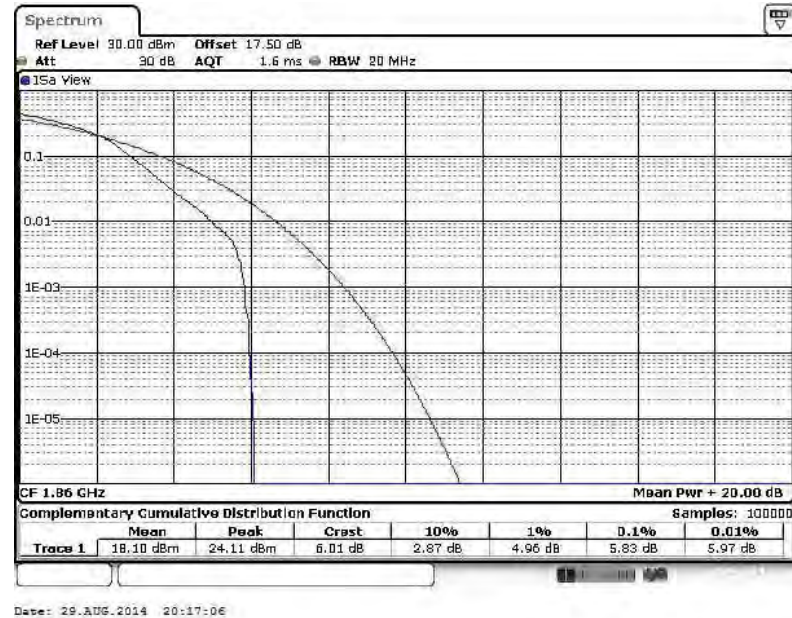


**Peak-to-Average Ratio on LTE Band 5**  
**10MHz / 16QAM in Ch. 20600 (50RB Size)**

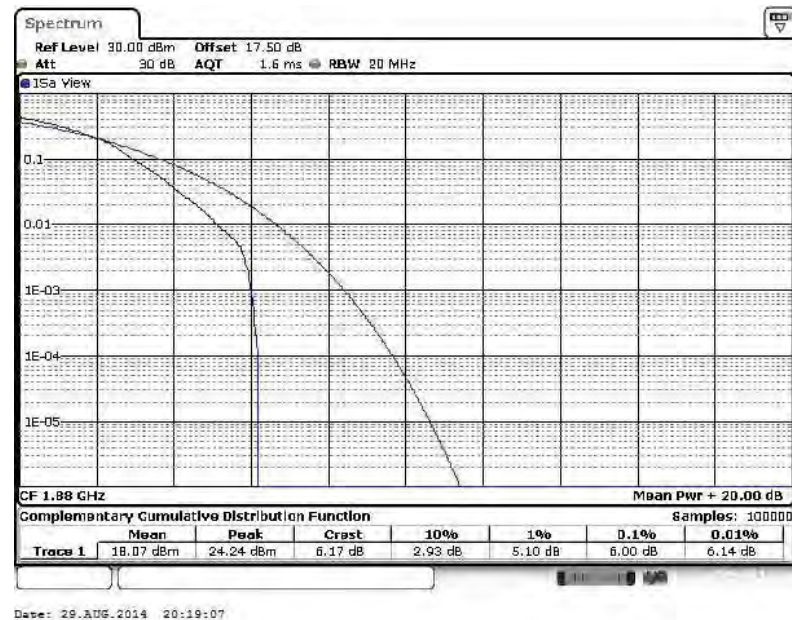




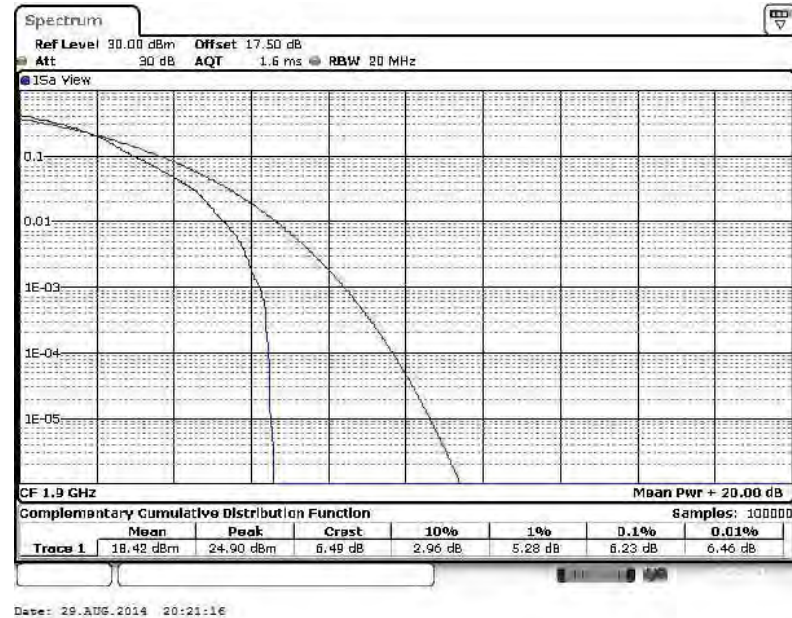
Peak-to-Average Ratio on LTE Band 2  
20MHz / 16QAM in Ch. 18700 (1RB Size)



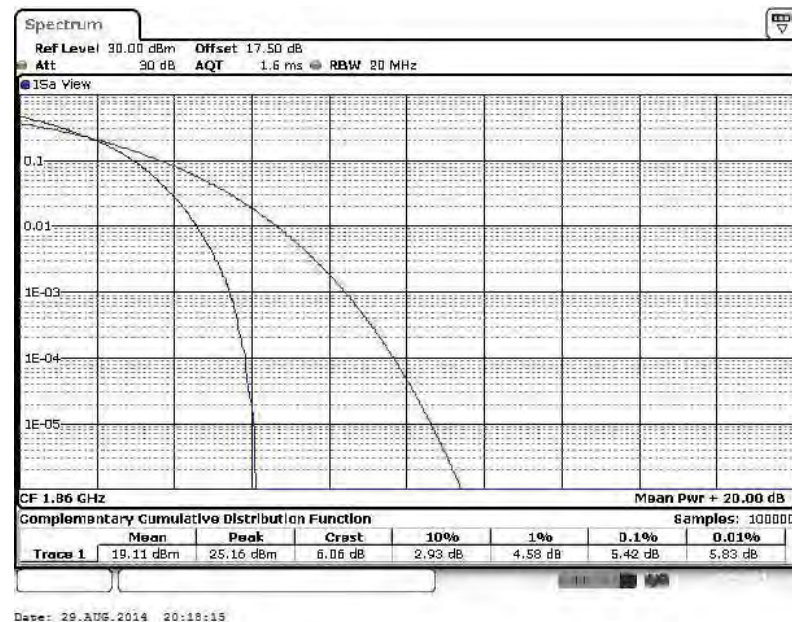
Peak-to-Average Ratio on LTE Band 2  
20MHz / 16QAM in Ch. 18900 (1RB Size)



**Peak-to-Average Ratio on LTE Band 2**  
**20MHz / 16QAM in Ch. 19100 (1RB Size)**

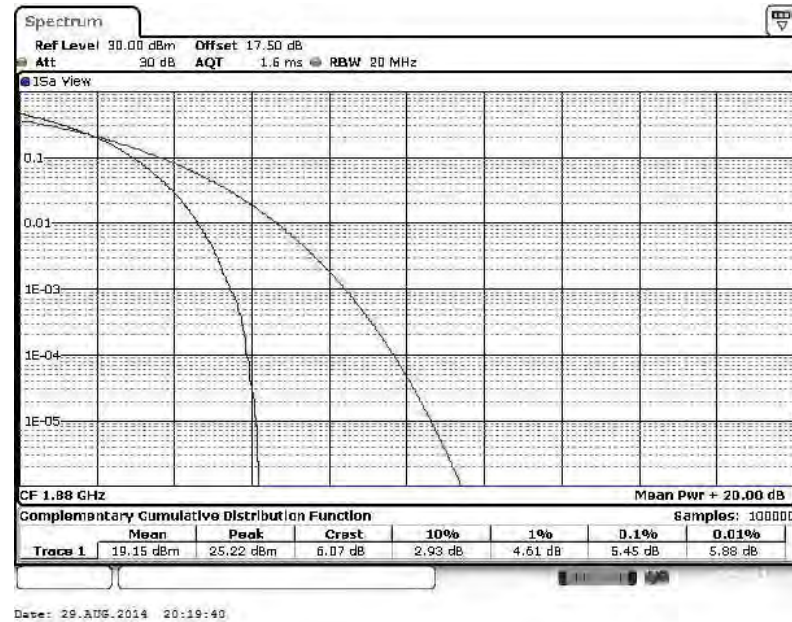


**Peak-to-Average Ratio on LTE Band 2**  
**20MHz / 16QAM in Ch. 18700 (100RB Size)**

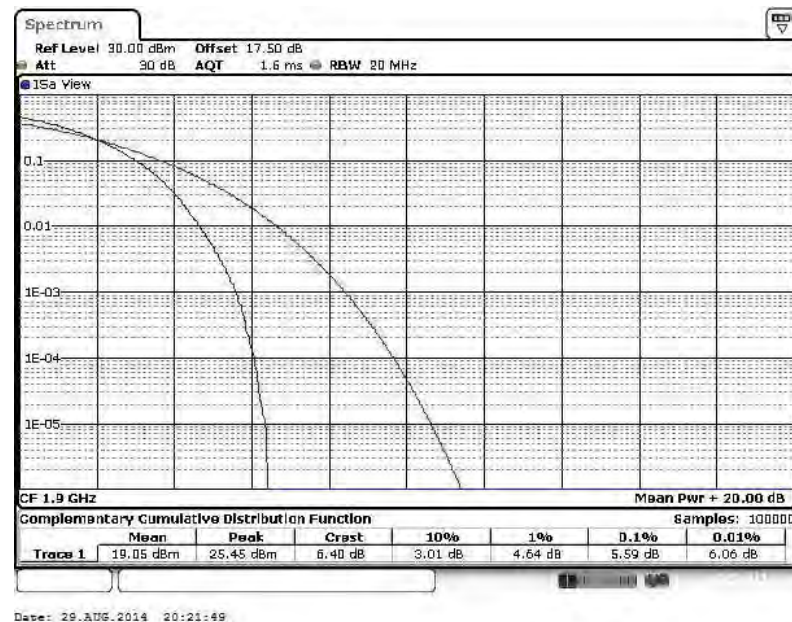




Peak-to-Average Ratio on LTE Band 2  
20MHz / 16QAM in Ch. 18900 (100RB Size)

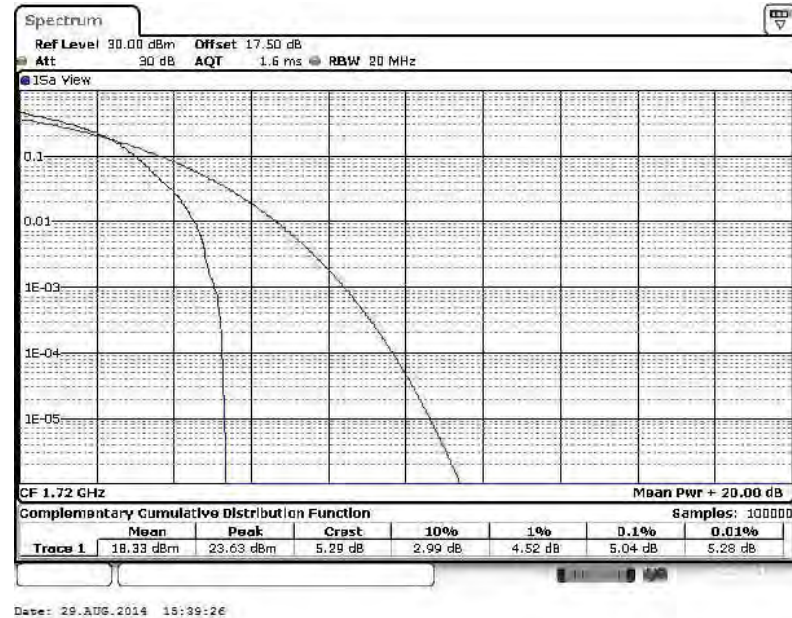


Peak-to-Average Ratio on LTE Band 2  
20MHz / 16QAM in Ch. 19100 (100RB Size)

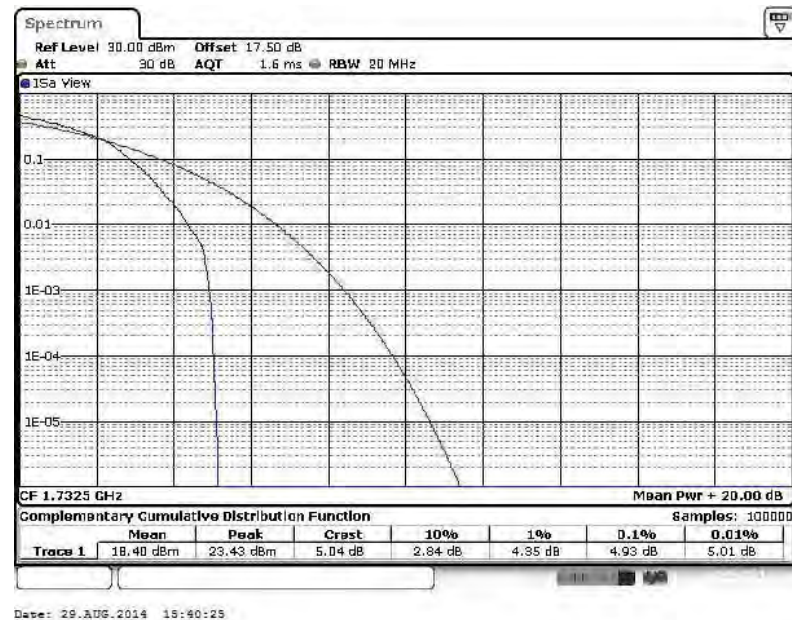




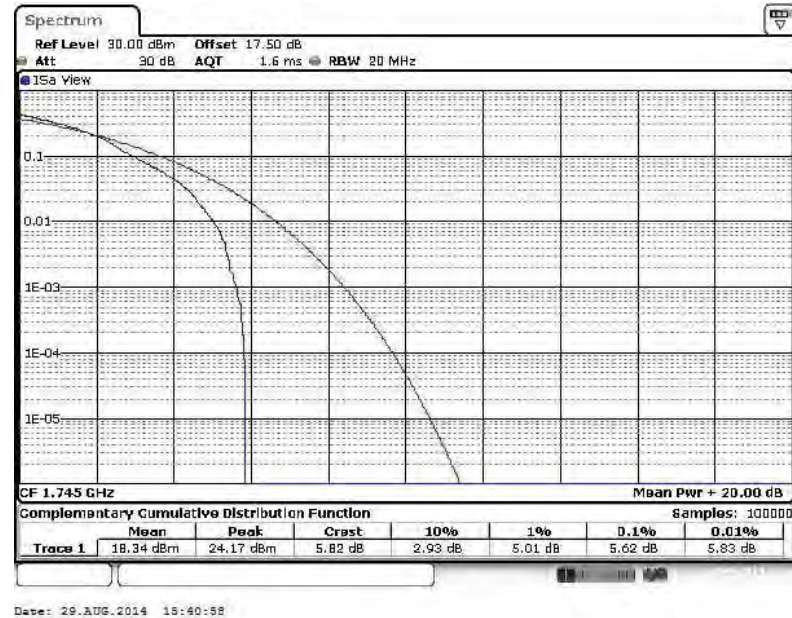
Peak-to-Average Ratio on LTE Band 4  
20MHz / 16QAM in Ch. 20050 (1RB Size)



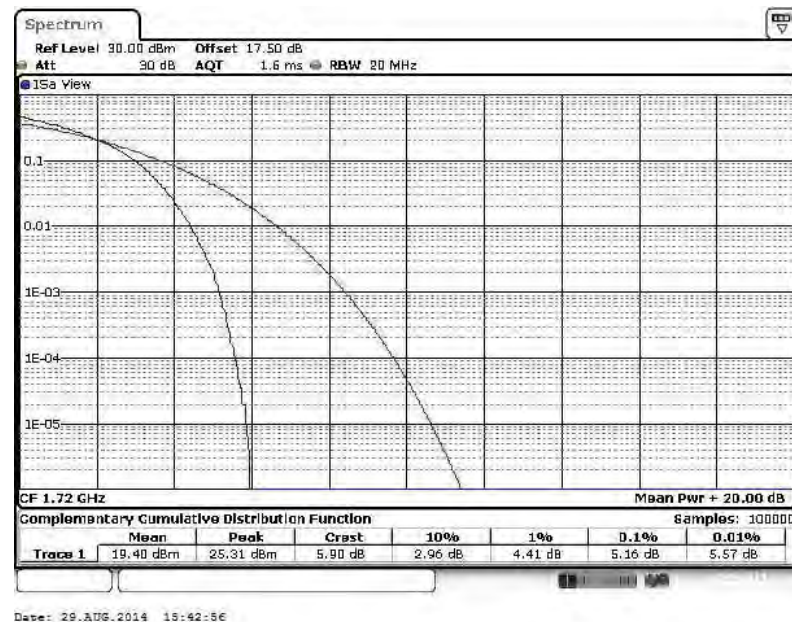
Peak-to-Average Ratio on LTE Band 4  
20MHz / 16QAM in Ch. 20175 (1RB Size)



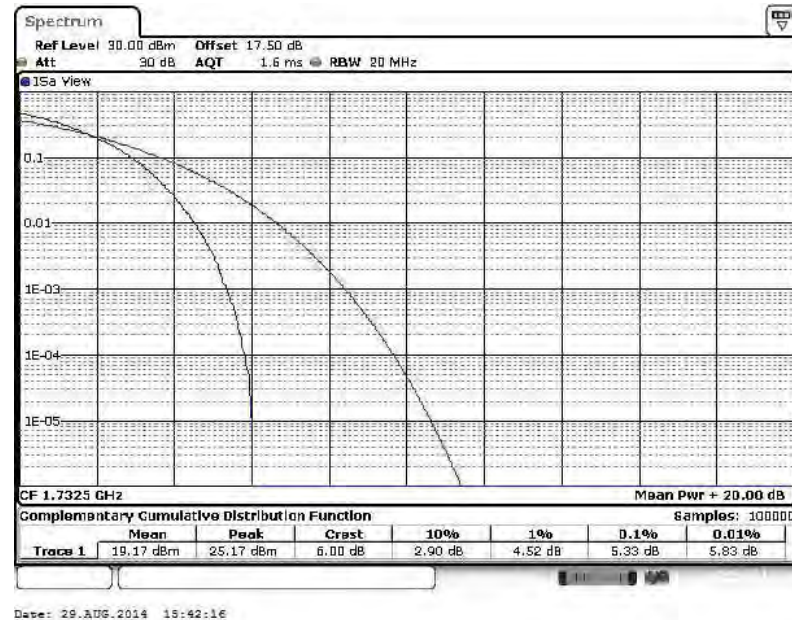
**Peak-to-Average Ratio on LTE Band 4**  
**20MHz / 16QAM in Ch. 20300 (1RB Size)**



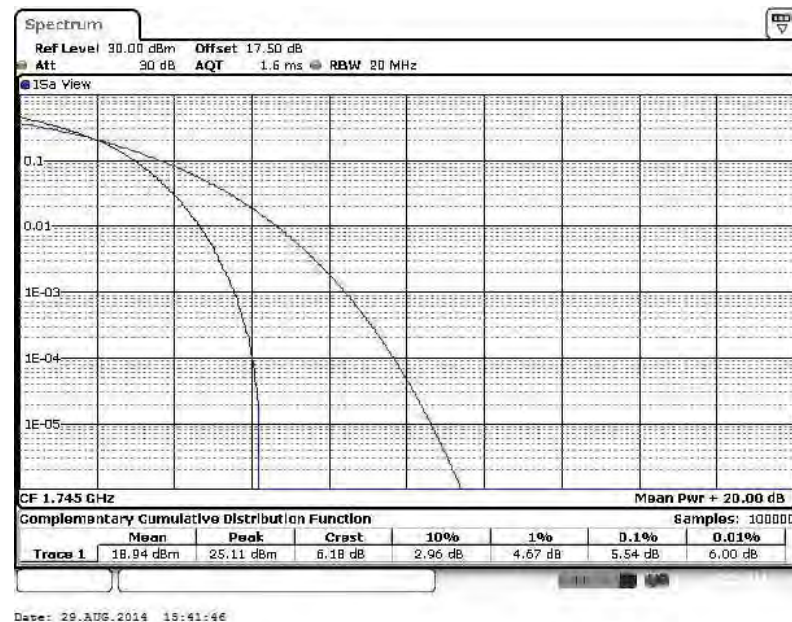
**Peak-to-Average Ratio on LTE Band 4**  
**20MHz / 16QAM in Ch. 20500 (100RB Size)**



**Peak-to-Average Ratio on LTE Band 4**  
**20MHz / 16QAM in Ch. 20175 (100RB Size)**



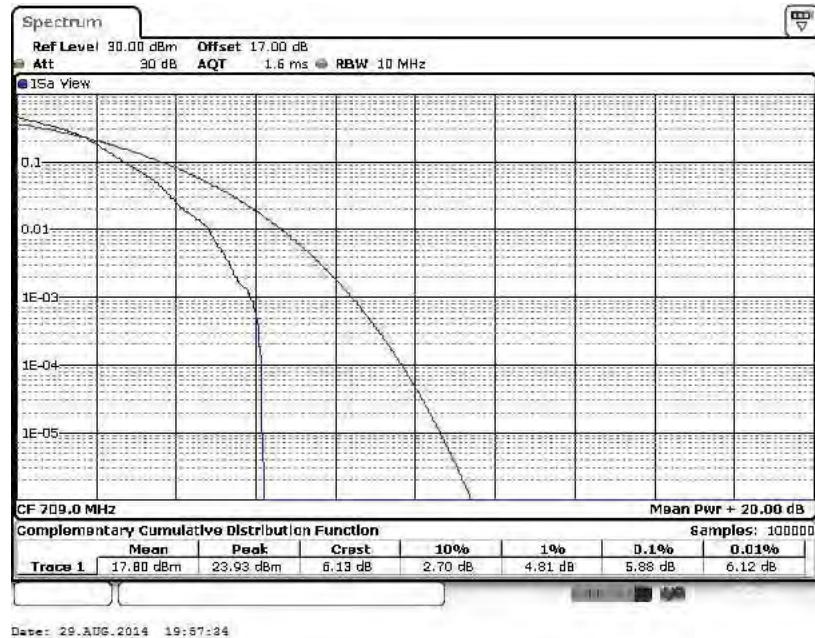
**Peak-to-Average Ratio on LTE Band 4**  
**20MHz / 16QAM in Ch. 20300 (100RB Size)**





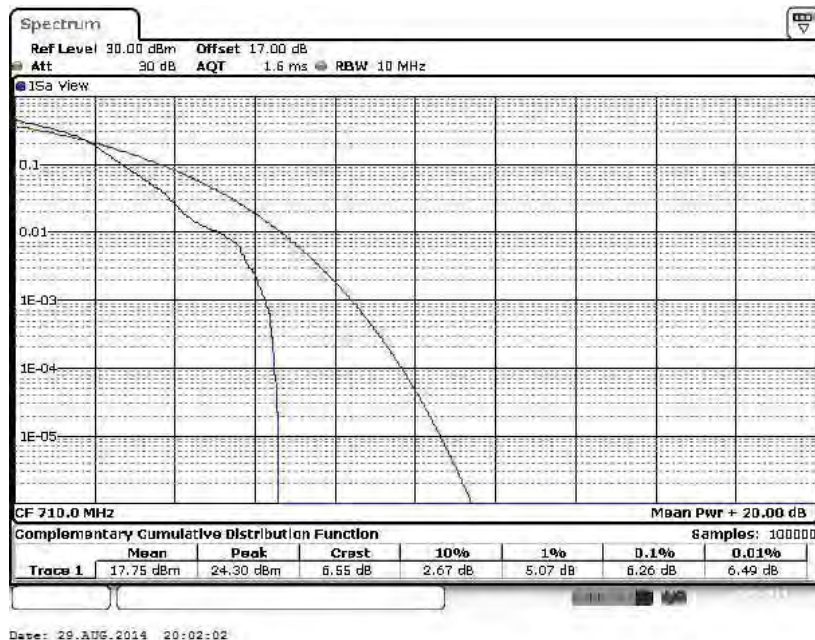
Peak-to-Average Ratio on LTE Band 17

10MHz / 16QAM in Ch. 23780 (1RB Size)



Peak-to-Average Ratio on LTE Band 17

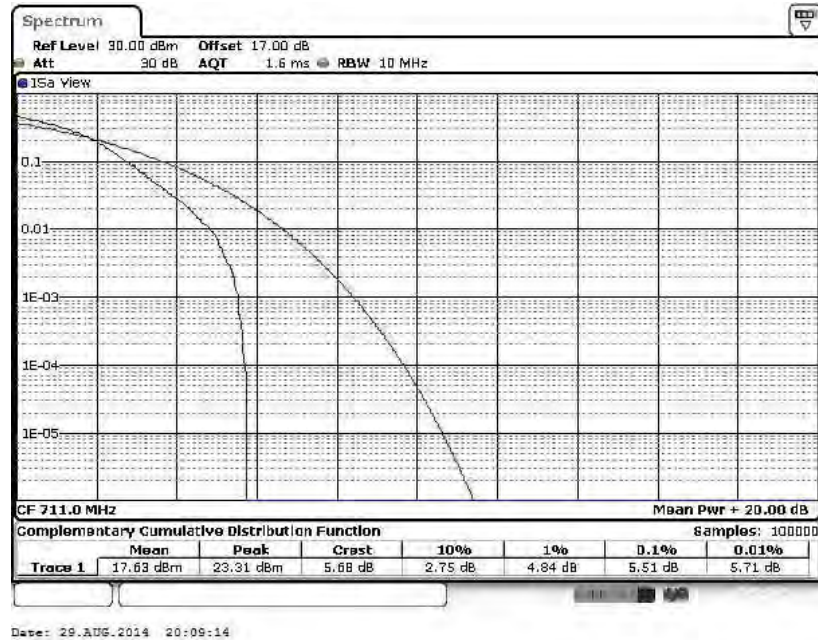
10MHz / 16QAM in Ch. 23790 (1RB Size)





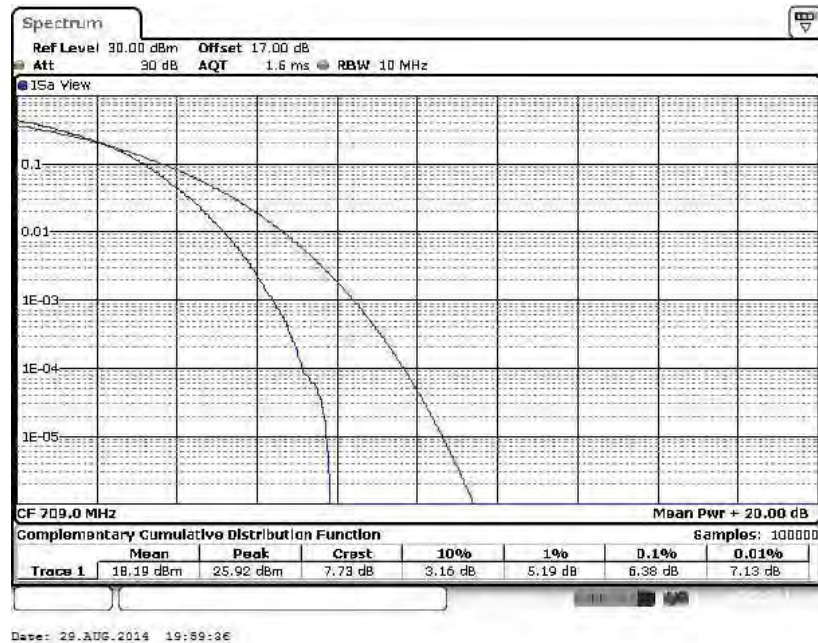
Peak-to-Average Ratio on LTE Band 17

10MHz / 16QAM in Ch. 23800 (1RB Size)

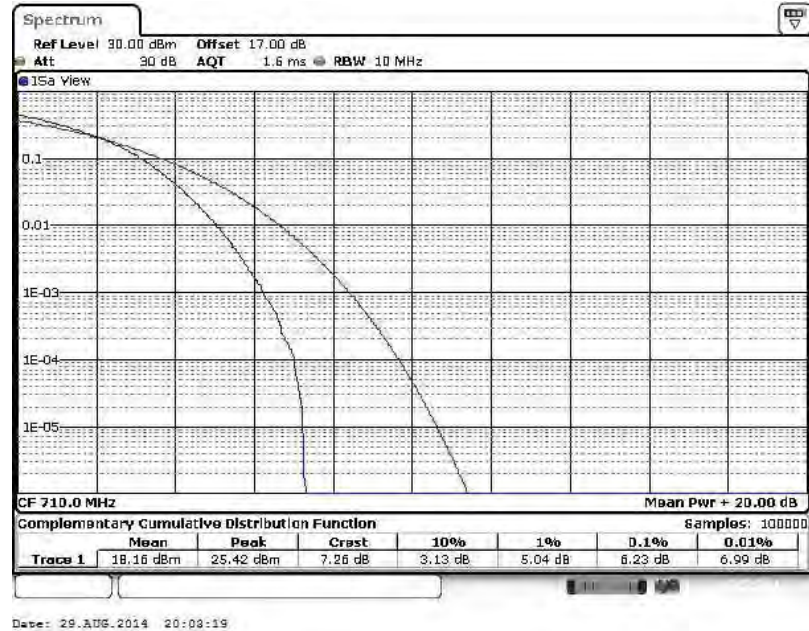


Peak-to-Average Ratio on LTE Band 17

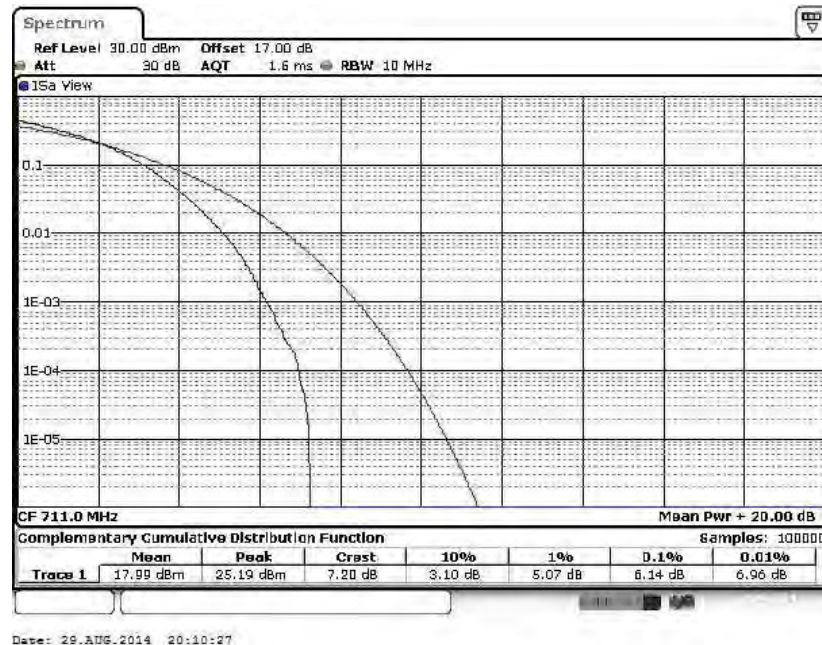
10MHz / 16QAM in Ch. 23780 (50RB Size)



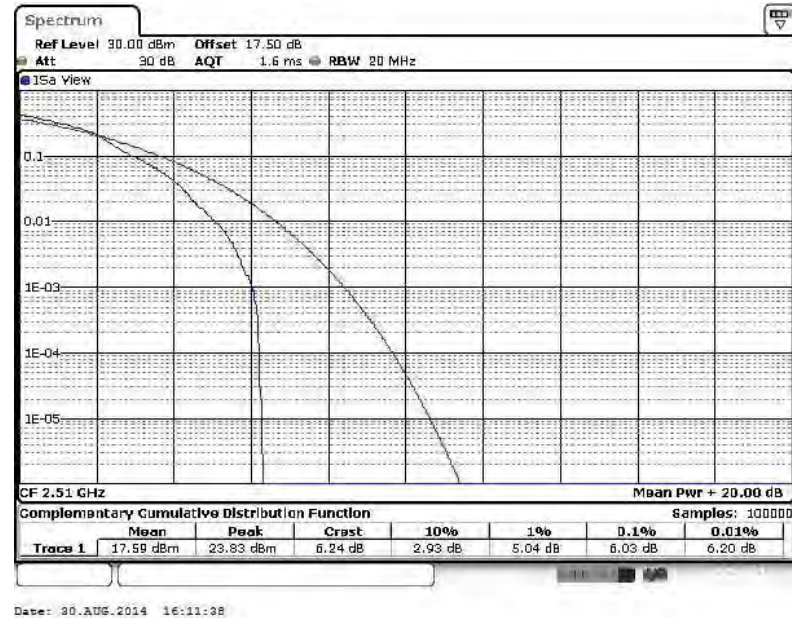
**Peak-to-Average Ratio on LTE Band 17**  
**10MHz / 16QAM in Ch. 23790 (50RB Size)**



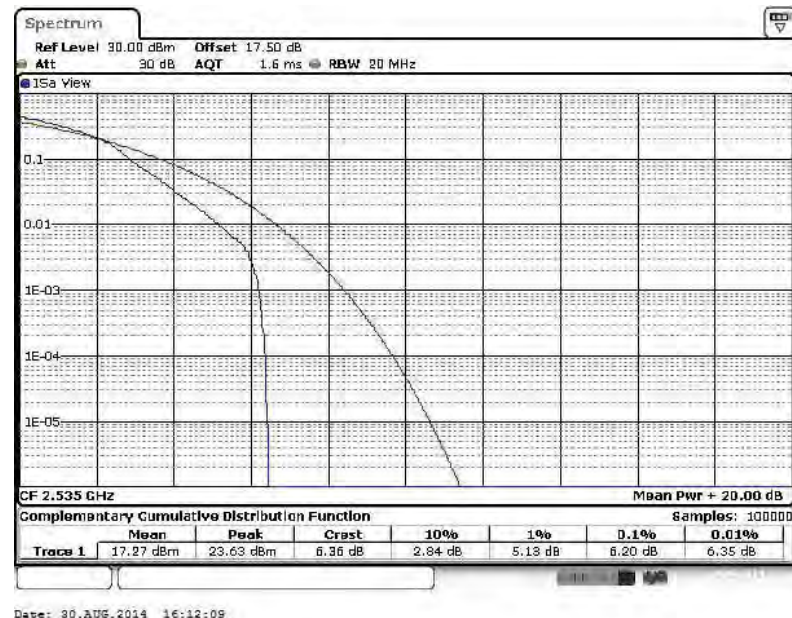
**Peak-to-Average Ratio on LTE Band 17**  
**10MHz / 16QAM in Ch. 23800 (50RB Size)**



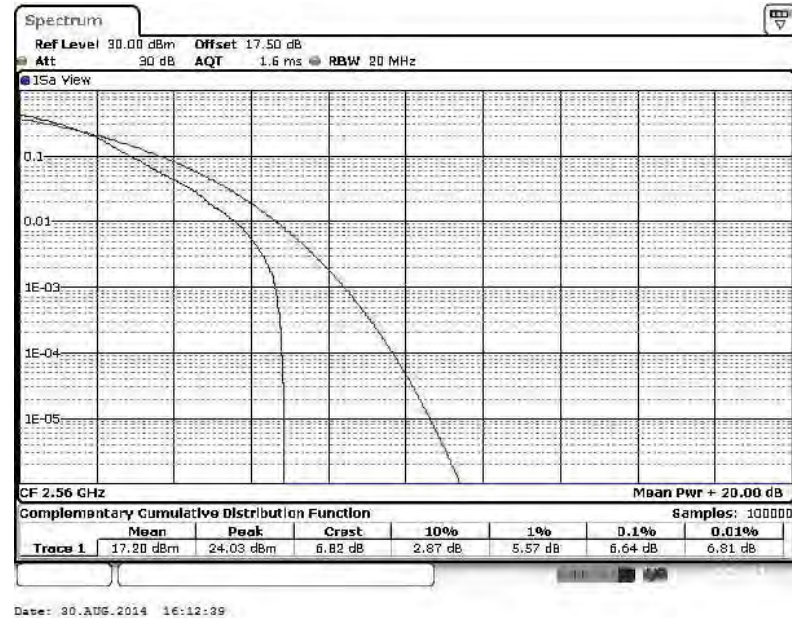
**Peak-to-Average Ratio on LTE Band 7**  
**20MHz / 16QAM in Ch. 20850 (1RB Size)**



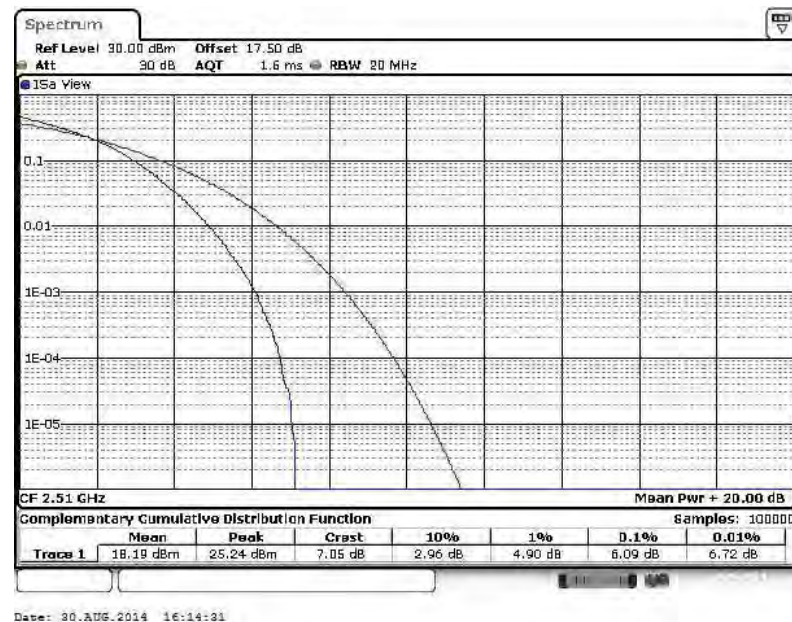
**Peak-to-Average Ratio on LTE Band 7**  
**20MHz / 16QAM in Ch. 21100 (1RB Size)**



**Peak-to-Average Ratio on LTE Band 7**  
**20MHz / 16QAM in Ch. 21350 (1RB Size)**

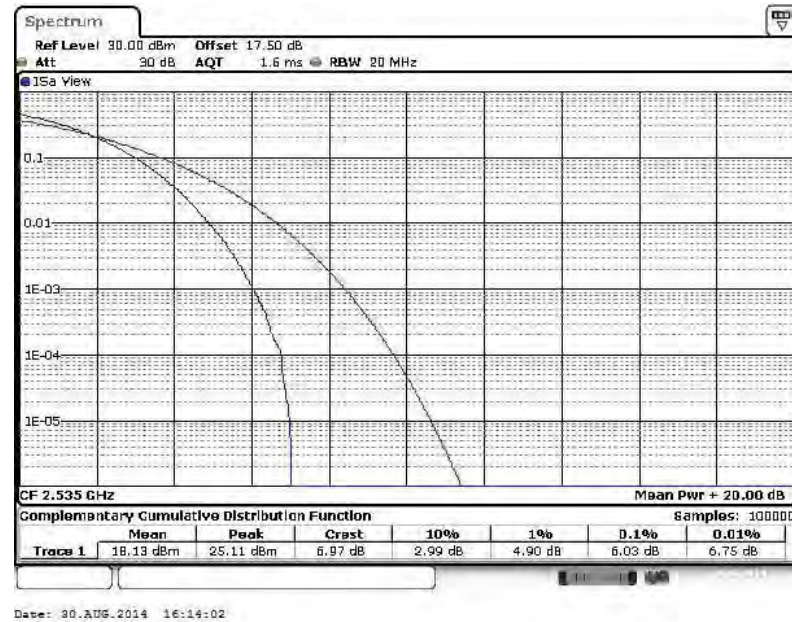


**Peak-to-Average Ratio on LTE Band 7**  
**20MHz / 16QAM in Ch. 20850 (100RB Size)**

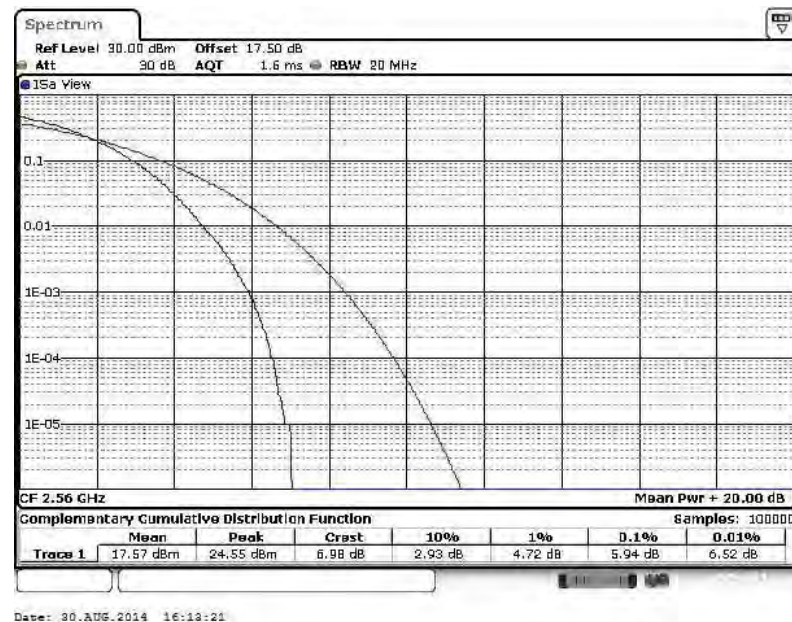




Peak-to-Average Ratio on LTE Band 7  
20MHz / 16QAM in Ch. 21100 (100RB Size)



Peak-to-Average Ratio on LTE Band 7  
20MHz / 16QAM in Ch. 21350 (100RB Size)





### **3.3 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement**

#### **3.3.1 Description of the ERP/EIRP Measurement**

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5 and 3 watts with LTE band 17.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 / 7 and 1 watt with LTE band 4.

#### **3.3.2 Measuring Instruments**

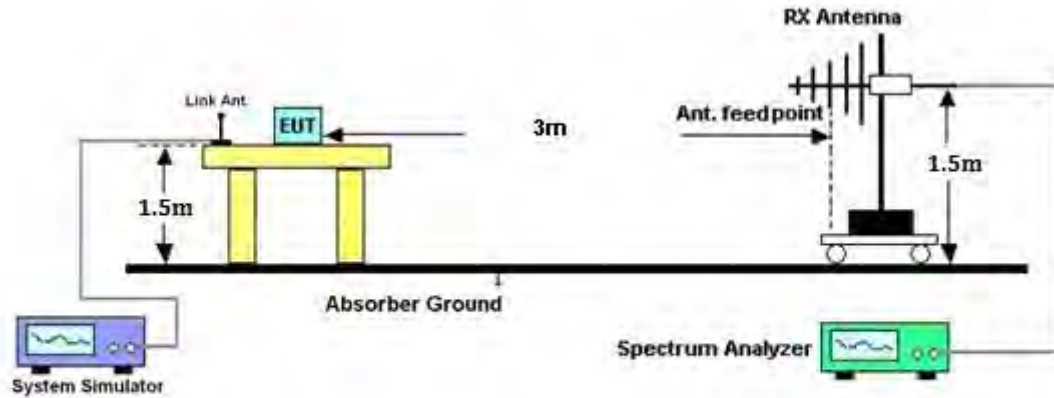
The measuring equipment is listed in the section 4 of this test report.

#### **3.3.3 Test Procedures**

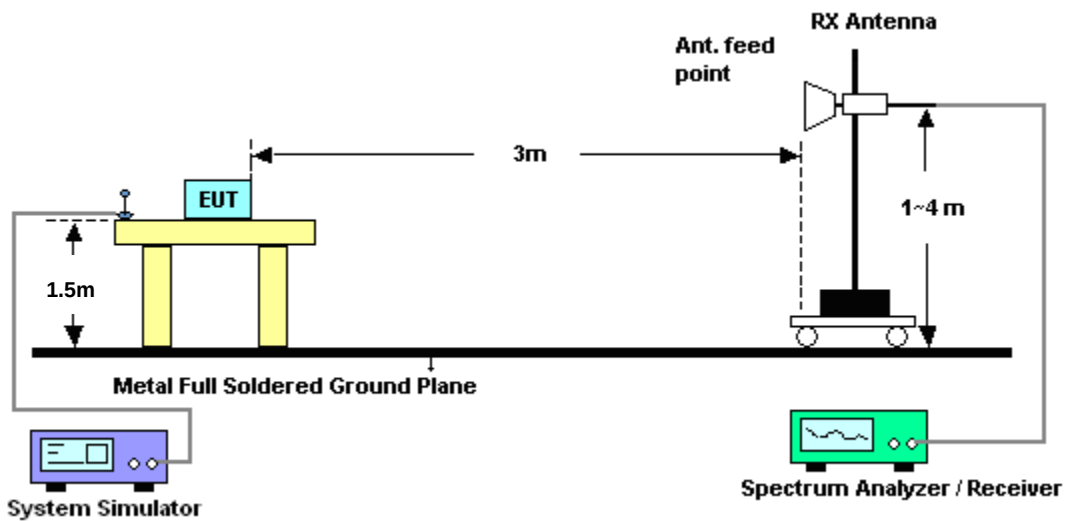
1. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
2. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$ .

### 3.3.4 Test Setup

For Effective Radiated Power



For Equivalent Isotropic Radiated Power



**3.3.5 Test Result of ERP/EIRP**

| LTE Band 2 Radiated Power EIRP |                  |            |                  |           |             |            |          |     |
|--------------------------------|------------------|------------|------------------|-----------|-------------|------------|----------|-----|
| LTE Band                       | Channel BW (MHz) | Modulation | RB Configuration |           | Freq. (MHz) | EIRP (dBm) | EIRP (W) | H/V |
|                                |                  |            | RB Size          | RB Offset |             |            |          |     |
| 2                              | 1.4              | QPSK       | 1                | 0         | 1850.7      | 14.78      | 0.030    | H   |
| 2                              | 1.4              | QPSK       | 1                | 0         | 1880        | 14.14      | 0.026    | H   |
| 2                              | 1.4              | QPSK       | 1                | 0         | 1909.3      | 14.14      | 0.026    | H   |
| 2                              | 1.4              | QPSK       | 1                | 0         | 1850.7      | 8.27       | 0.007    | V   |
| 2                              | 1.4              | QPSK       | 1                | 0         | 1880        | 8.98       | 0.008    | V   |
| 2                              | 1.4              | QPSK       | 1                | 0         | 1909.3      | 8.98       | 0.008    | V   |
| 2                              | 1.4              | 16QAM      | 1                | 0         | 1850.7      | 13.94      | 0.025    | H   |
| 2                              | 1.4              | 16QAM      | 1                | 0         | 1880        | 13.16      | 0.021    | H   |
| 2                              | 1.4              | 16QAM      | 3                | 1         | 1909.3      | 13.25      | 0.021    | H   |
| 2                              | 1.4              | 16QAM      | 1                | 0         | 1850.7      | 7.28       | 0.005    | V   |
| 2                              | 1.4              | 16QAM      | 1                | 0         | 1880        | 8.00       | 0.006    | V   |
| 2                              | 1.4              | 16QAM      | 3                | 1         | 1909.3      | 8.86       | 0.008    | V   |
| 2                              | 20               | QPSK       | 1                | 0         | 1860        | 14.66      | 0.029    | H   |
| 2                              | 20               | QPSK       | 1                | 0         | 1880        | 13.95      | 0.025    | H   |
| 2                              | 20               | QPSK       | 1                | 0         | 1900        | 13.97      | 0.025    | H   |
| 2                              | 20               | QPSK       | 1                | 0         | 1860        | 8.22       | 0.007    | V   |
| 2                              | 20               | QPSK       | 1                | 0         | 1880        | 8.44       | 0.007    | V   |
| 2                              | 20               | QPSK       | 1                | 0         | 1900        | 9.10       | 0.008    | V   |
| 2                              | 20               | 16QAM      | 1                | 0         | 1860        | 13.63      | 0.023    | H   |
| 2                              | 20               | 16QAM      | 1                | 0         | 1880        | 12.99      | 0.020    | H   |
| 2                              | 20               | 16QAM      | 1                | 0         | 1900        | 12.97      | 0.020    | H   |
| 2                              | 20               | 16QAM      | 1                | 0         | 1860        | 7.06       | 0.005    | V   |
| 2                              | 20               | 16QAM      | 1                | 0         | 1880        | 7.35       | 0.005    | V   |
| 2                              | 20               | 16QAM      | 1                | 0         | 1900        | 7.97       | 0.006    | V   |



| LTE Band 4 Radiated Power EIRP |                  |            |                  |           |             |            |          |     |
|--------------------------------|------------------|------------|------------------|-----------|-------------|------------|----------|-----|
| LTE Band                       | Channel BW (MHz) | Modulation | RB Configuration |           | Freq. (MHz) | EIRP (dBm) | EIRP (W) | H/V |
|                                |                  |            | RB Size          | RB Offset |             |            |          |     |
| 4                              | 1.4              | QPSK       | 1                | 5         | 1710.7      | 17.72      | 0.059    | H   |
| 4                              | 1.4              | QPSK       | 3                | 0         | 1732.5      | 17.49      | 0.056    | H   |
| 4                              | 1.4              | QPSK       | 1                | 0         | 1754.3      | 16.83      | 0.048    | H   |
| 4                              | 1.4              | QPSK       | 1                | 5         | 1710.7      | 7.79       | 0.006    | V   |
| 4                              | 1.4              | QPSK       | 3                | 0         | 1732.5      | 8.60       | 0.007    | V   |
| 4                              | 1.4              | QPSK       | 1                | 0         | 1754.3      | 8.87       | 0.008    | V   |
| 4                              | 1.4              | 16QAM      | 1                | 2         | 1710.7      | 16.69      | 0.047    | H   |
| 4                              | 1.4              | 16QAM      | 1                | 0         | 1732.5      | 16.54      | 0.045    | H   |
| 4                              | 1.4              | 16QAM      | 1                | 5         | 1754.3      | 16.00      | 0.040    | H   |
| 4                              | 1.4              | 16QAM      | 1                | 2         | 1710.7      | 6.58       | 0.005    | V   |
| 4                              | 1.4              | 16QAM      | 1                | 0         | 1732.5      | 7.57       | 0.006    | V   |
| 4                              | 1.4              | 16QAM      | 1                | 5         | 1754.3      | 8.11       | 0.007    | V   |
| 4                              | 20               | QPSK       | 1                | 0         | 1720        | 17.66      | 0.058    | H   |
| 4                              | 20               | QPSK       | 1                | 0         | 1732.5      | 17.64      | 0.058    | H   |
| 4                              | 20               | QPSK       | 1                | 0         | 1745        | 17.26      | 0.053    | H   |
| 4                              | 20               | QPSK       | 1                | 0         | 1720        | 7.85       | 0.006    | V   |
| 4                              | 20               | QPSK       | 1                | 0         | 1732.5      | 8.34       | 0.007    | V   |
| 4                              | 20               | QPSK       | 1                | 0         | 1745        | 8.49       | 0.007    | V   |
| 4                              | 20               | 16QAM      | 1                | 0         | 1720        | 16.65      | 0.046    | H   |
| 4                              | 20               | 16QAM      | 1                | 0         | 1732.5      | 16.77      | 0.048    | H   |
| 4                              | 20               | 16QAM      | 1                | 0         | 1745        | 16.42      | 0.044    | H   |
| 4                              | 20               | 16QAM      | 1                | 0         | 1720        | 6.70       | 0.005    | V   |
| 4                              | 20               | 16QAM      | 1                | 0         | 1732.5      | 7.31       | 0.005    | V   |
| 4                              | 20               | 16QAM      | 1                | 0         | 1745        | 7.55       | 0.006    | V   |



| LTE Band 5 Radiated Power ERP |                  |            |                  |           |             |           |         |     |
|-------------------------------|------------------|------------|------------------|-----------|-------------|-----------|---------|-----|
| LTE Band                      | Channel BW (MHz) | Modulation | RB Configuration |           | Freq. (MHz) | ERP (dBm) | ERP (W) | H/V |
|                               |                  |            | RB Size          | RB Offset |             |           |         |     |
| 5                             | 1.4              | QPSK       | 1                | 0         | 824.7       | 10.45     | 0.011   | H   |
| 5                             | 1.4              | QPSK       | 1                | 0         | 836.5       | 9.33      | 0.009   | H   |
| 5                             | 1.4              | QPSK       | 1                | 0         | 848.3       | 9.49      | 0.009   | H   |
| 5                             | 1.4              | QPSK       | 1                | 0         | 824.7       | 10.35     | 0.011   | V   |
| 5                             | 1.4              | QPSK       | 1                | 0         | 836.5       | 9.21      | 0.008   | V   |
| 5                             | 1.4              | QPSK       | 1                | 0         | 848.3       | 9.41      | 0.009   | V   |
| 5                             | 1.4              | 16QAM      | 1                | 0         | 824.7       | 9.53      | 0.009   | H   |
| 5                             | 1.4              | 16QAM      | 1                | 0         | 836.5       | 8.29      | 0.007   | H   |
| 5                             | 1.4              | 16QAM      | 1                | 0         | 848.3       | 8.53      | 0.007   | H   |
| 5                             | 1.4              | 16QAM      | 1                | 0         | 824.7       | 9.50      | 0.009   | V   |
| 5                             | 1.4              | 16QAM      | 1                | 0         | 836.5       | 8.00      | 0.006   | V   |
| 5                             | 1.4              | 16QAM      | 1                | 0         | 848.3       | 8.52      | 0.007   | V   |
| 5                             | 10               | QPSK       | 1                | 0         | 829         | 10.38     | 0.011   | H   |
| 5                             | 10               | QPSK       | 1                | 0         | 836.5       | 9.32      | 0.009   | H   |
| 5                             | 10               | QPSK       | 1                | 0         | 844         | 9.26      | 0.008   | H   |
| 5                             | 10               | QPSK       | 1                | 0         | 829         | 10.18     | 0.010   | V   |
| 5                             | 10               | QPSK       | 1                | 0         | 836.5       | 9.14      | 0.008   | V   |
| 5                             | 10               | QPSK       | 1                | 0         | 844         | 9.04      | 0.008   | V   |
| 5                             | 10               | 16QAM      | 1                | 0         | 829         | 9.40      | 0.009   | H   |
| 5                             | 10               | 16QAM      | 1                | 0         | 836.5       | 8.33      | 0.007   | H   |
| 5                             | 10               | 16QAM      | 1                | 0         | 844         | 8.37      | 0.007   | H   |
| 5                             | 10               | 16QAM      | 1                | 0         | 829         | 9.18      | 0.008   | V   |
| 5                             | 10               | 16QAM      | 1                | 0         | 836.5       | 8.21      | 0.007   | V   |
| 5                             | 10               | 16QAM      | 1                | 0         | 844         | 8.10      | 0.007   | V   |



| LTE Band 7 Radiated Power EIRP |                  |            |                  |           |             |            |          |     |
|--------------------------------|------------------|------------|------------------|-----------|-------------|------------|----------|-----|
| LTE Band                       | Channel BW (MHz) | Modulation | RB Configuration |           | Freq. (MHz) | EIRP (dBm) | EIRP (W) | H/V |
|                                |                  |            | RB Size          | RB Offset |             |            |          |     |
| 7                              | 5                | QPSK       | 1                | 24        | 2502.5      | 16.81      | 0.048    | H   |
| 7                              | 5                | QPSK       | 1                | 24        | 2535        | 16.64      | 0.046    | H   |
| 7                              | 5                | QPSK       | 1                | 24        | 2567.5      | 15.40      | 0.035    | H   |
| 7                              | 5                | QPSK       | 1                | 24        | 2502.5      | 16.73      | 0.047    | V   |
| 7                              | 5                | QPSK       | 1                | 24        | 2535        | 16.53      | 0.045    | V   |
| 7                              | 5                | QPSK       | 1                | 24        | 2567.5      | 14.43      | 0.028    | V   |
| 7                              | 5                | 16QAM      | 1                | 24        | 2502.5      | 15.83      | 0.038    | H   |
| 7                              | 5                | 16QAM      | 1                | 24        | 2535        | 15.86      | 0.039    | H   |
| 7                              | 5                | 16QAM      | 1                | 24        | 2567.5      | 15.04      | 0.032    | H   |
| 7                              | 5                | 16QAM      | 1                | 24        | 2502.5      | 15.88      | 0.039    | V   |
| 7                              | 5                | 16QAM      | 1                | 24        | 2535        | 15.72      | 0.037    | V   |
| 7                              | 5                | 16QAM      | 1                | 24        | 2567.5      | 13.95      | 0.025    | V   |
| 7                              | 20               | QPSK       | 1                | 99        | 2510        | 16.61      | 0.046    | H   |
| 7                              | 20               | QPSK       | 1                | 99        | 2535        | 13.88      | 0.024    | H   |
| 7                              | 20               | QPSK       | 1                | 99        | 2560        | 14.79      | 0.030    | H   |
| 7                              | 20               | QPSK       | 1                | 99        | 2510        | 16.44      | 0.044    | V   |
| 7                              | 20               | QPSK       | 1                | 99        | 2535        | 13.84      | 0.024    | V   |
| 7                              | 20               | QPSK       | 1                | 99        | 2560        | 13.53      | 0.023    | V   |
| 7                              | 20               | 16QAM      | 1                | 99        | 2510        | 15.65      | 0.037    | H   |
| 7                              | 20               | 16QAM      | 1                | 99        | 2535        | 12.98      | 0.020    | H   |
| 7                              | 20               | 16QAM      | 1                | 99        | 2560        | 14.47      | 0.028    | H   |
| 7                              | 20               | 16QAM      | 1                | 99        | 2510        | 15.48      | 0.035    | V   |
| 7                              | 20               | 16QAM      | 1                | 99        | 2535        | 12.82      | 0.019    | V   |
| 7                              | 20               | 16QAM      | 1                | 99        | 2560        | 13.23      | 0.021    | V   |



| LTE Band 17 Radiated Power ERP |                  |            |                  |           |             |           |         |     |
|--------------------------------|------------------|------------|------------------|-----------|-------------|-----------|---------|-----|
| LTE Band                       | Channel BW (MHz) | Modulation | RB Configuration |           | Freq. (MHz) | ERP (dBm) | ERP (W) | H/V |
|                                |                  |            | RB Size          | RB Offset |             |           |         |     |
| 17                             | 5                | QPSK       | 1                | 0         | 706.5       | 8.95      | 0.008   | H   |
| 17                             | 5                | QPSK       | 1                | 0         | 710         | 9.25      | 0.008   | H   |
| 17                             | 5                | QPSK       | 1                | 0         | 713.5       | 9.50      | 0.009   | H   |
| 17                             | 5                | QPSK       | 1                | 0         | 706.5       | 9.53      | 0.009   | V   |
| 17                             | 5                | QPSK       | 1                | 0         | 710         | 10.01     | 0.010   | V   |
| 17                             | 5                | QPSK       | 1                | 0         | 713.5       | 10.10     | 0.010   | V   |
| 17                             | 5                | 16QAM      | 1                | 0         | 706.5       | 7.94      | 0.006   | H   |
| 17                             | 5                | 16QAM      | 1                | 0         | 710         | 8.35      | 0.007   | H   |
| 17                             | 5                | 16QAM      | 1                | 0         | 713.5       | 8.65      | 0.007   | H   |
| 17                             | 5                | 16QAM      | 1                | 0         | 706.5       | 8.60      | 0.007   | V   |
| 17                             | 5                | 16QAM      | 1                | 0         | 710         | 9.19      | 0.008   | V   |
| 17                             | 5                | 16QAM      | 1                | 0         | 713.5       | 9.30      | 0.009   | V   |
| 17                             | 10               | QPSK       | 1                | 0         | 709         | 8.89      | 0.008   | H   |
| 17                             | 10               | QPSK       | 1                | 0         | 710         | 8.76      | 0.008   | H   |
| 17                             | 10               | QPSK       | 1                | 0         | 711         | 9.08      | 0.008   | H   |
| 17                             | 10               | QPSK       | 1                | 0         | 709         | 9.57      | 0.009   | V   |
| 17                             | 10               | QPSK       | 1                | 0         | 710         | 9.46      | 0.009   | V   |
| 17                             | 10               | QPSK       | 1                | 0         | 711         | 9.85      | 0.010   | V   |
| 17                             | 10               | 16QAM      | 1                | 0         | 709         | 7.99      | 0.006   | H   |
| 17                             | 10               | 16QAM      | 1                | 0         | 710         | 7.99      | 0.006   | H   |
| 17                             | 10               | 16QAM      | 1                | 0         | 711         | 8.08      | 0.006   | H   |
| 17                             | 10               | 16QAM      | 1                | 0         | 709         | 8.68      | 0.007   | V   |
| 17                             | 10               | 16QAM      | 1                | 0         | 710         | 8.65      | 0.007   | V   |
| 17                             | 10               | 16QAM      | 1                | 0         | 711         | 8.91      | 0.008   | V   |

## 3.4 Occupied Bandwidth

### 3.4.1 Description of Occupied Bandwidth Measurement

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.

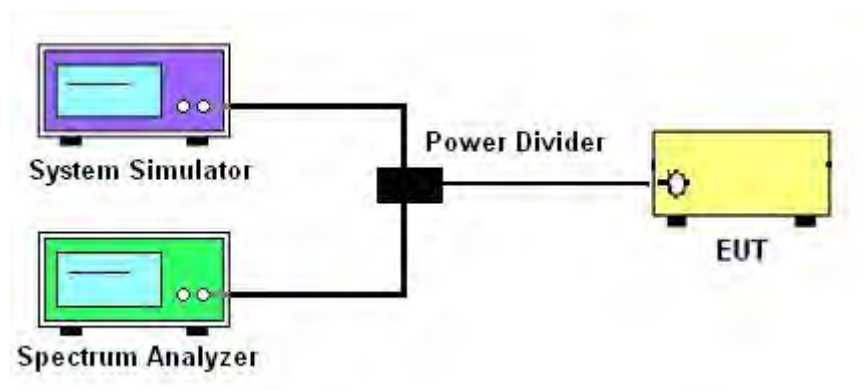
### 3.4.2 Measuring Instruments

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

### 3.4.3 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.

### 3.4.4 Test Setup

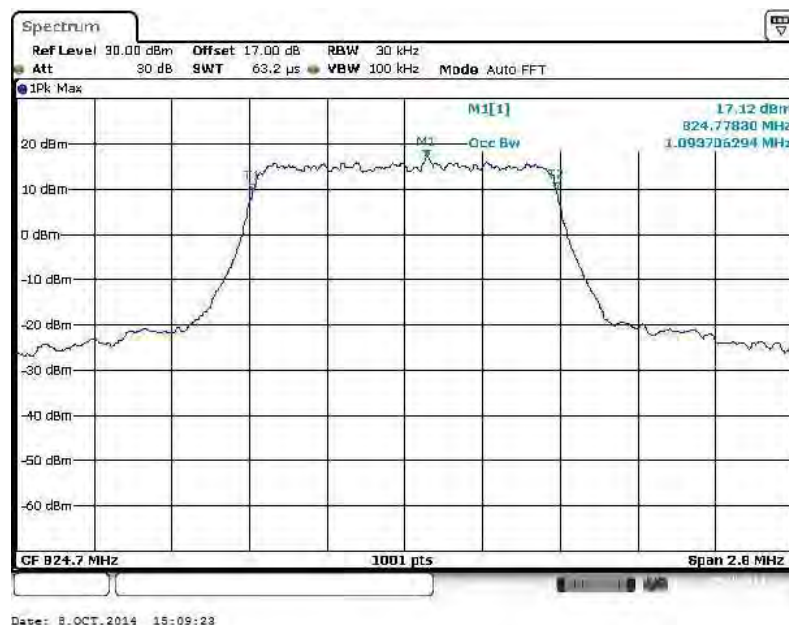




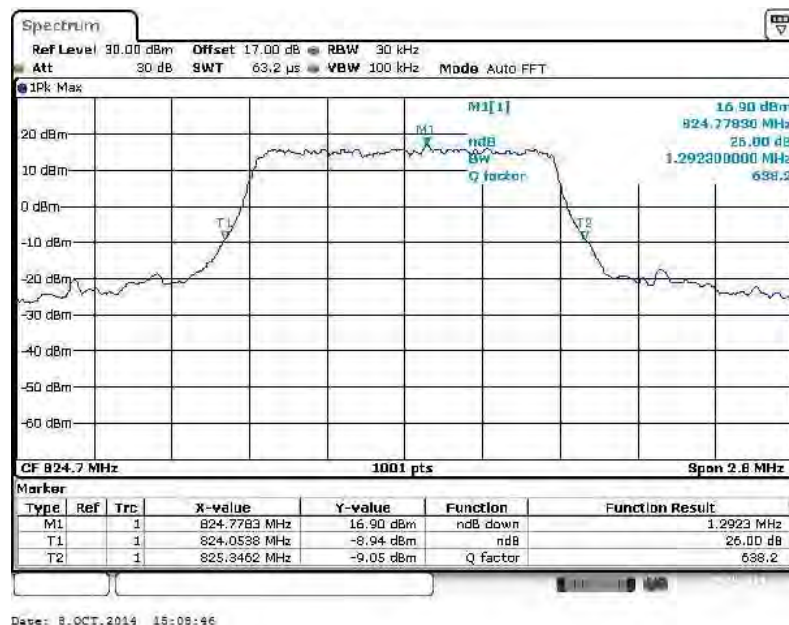
## 3.4.5 Test Result (Plots) of Occupied Bandwidth

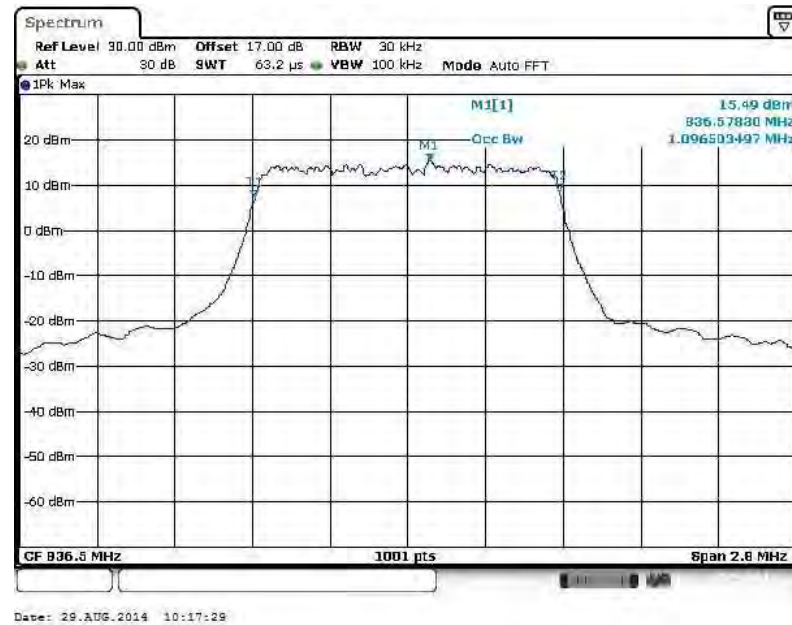
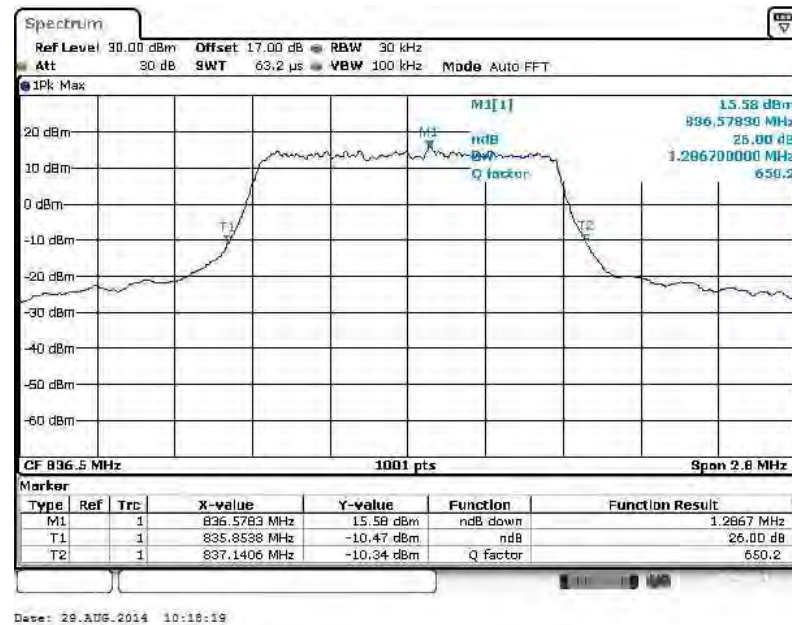
|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 5 | BW / Mod. : | 1.4MHz / QPSK |
|--------|------------|-------------|---------------|

99% Occupied Bandwidth Plot on Channel 20407



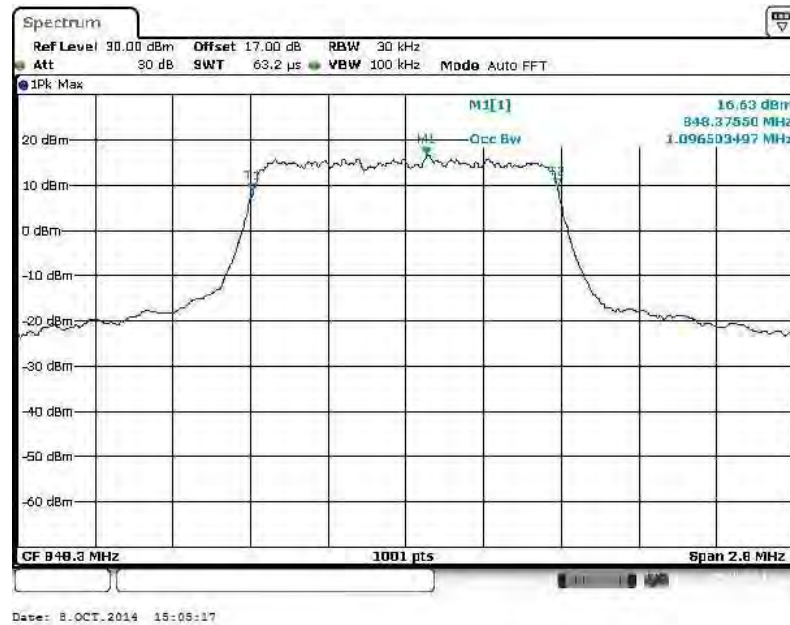
26dB Bandwidth Plot on Channel 20407



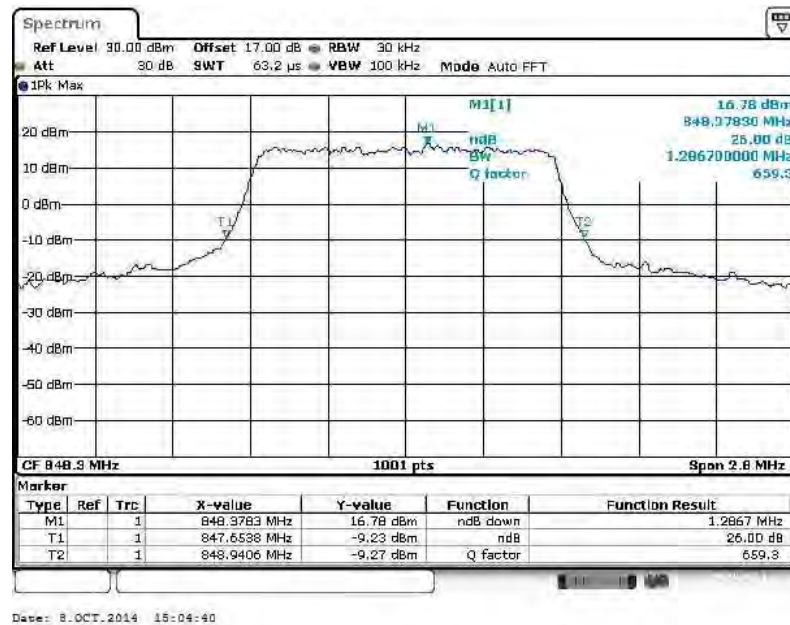
**99% Occupied Bandwidth Plot on Channel 20525**

**26dB Bandwidth Plot on Channel 20525**




## 99% Occupied Bandwidth Plot on Channel 20643



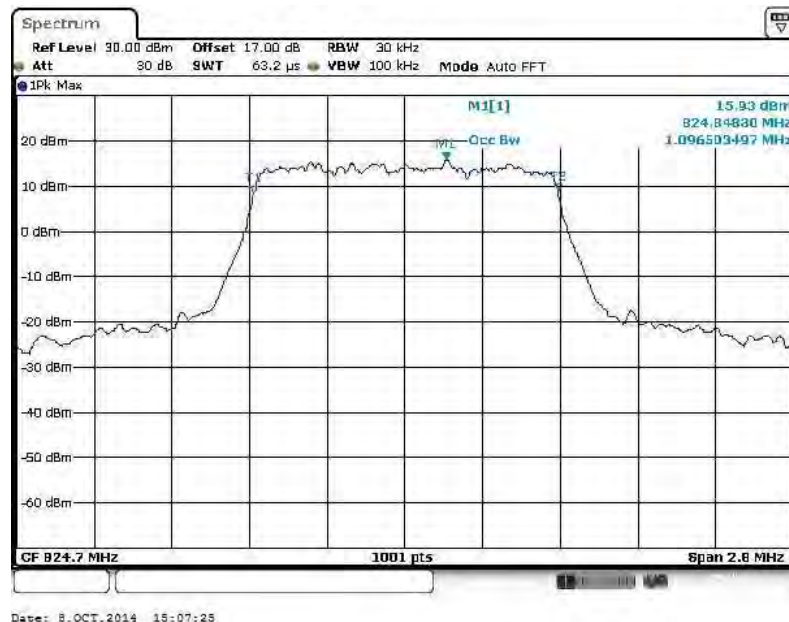
## 26dB Bandwidth Plot on Channel 20643



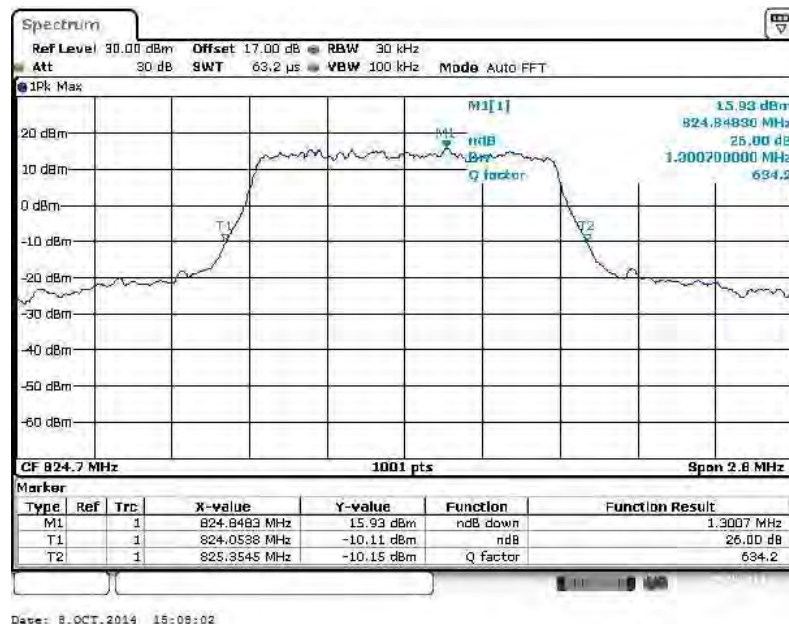


|        |            |             |                |
|--------|------------|-------------|----------------|
| Band : | LTE Band 5 | BW / Mod. : | 1.4MHz / 16QAM |
|--------|------------|-------------|----------------|

## 99% Occupied Bandwidth Plot on Channel 20407

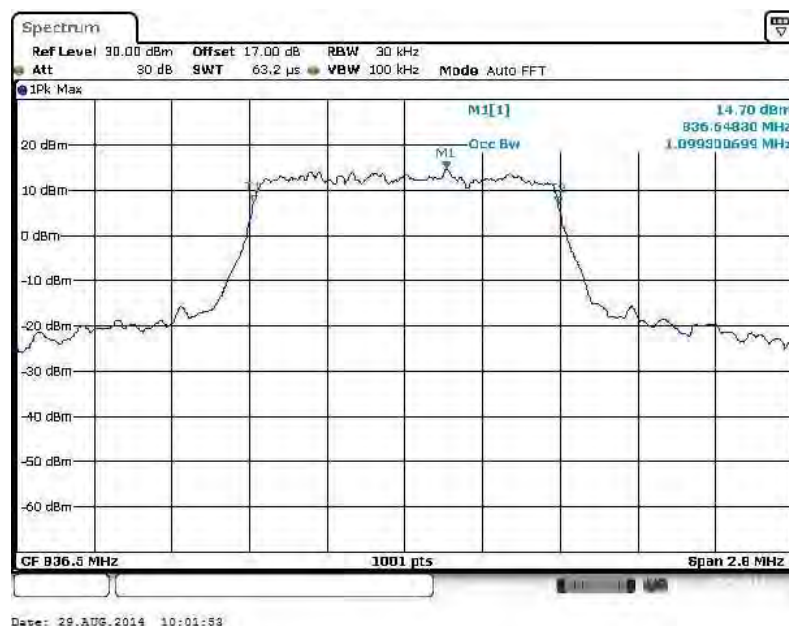


## 26dB Bandwidth Plot on Channel 20407

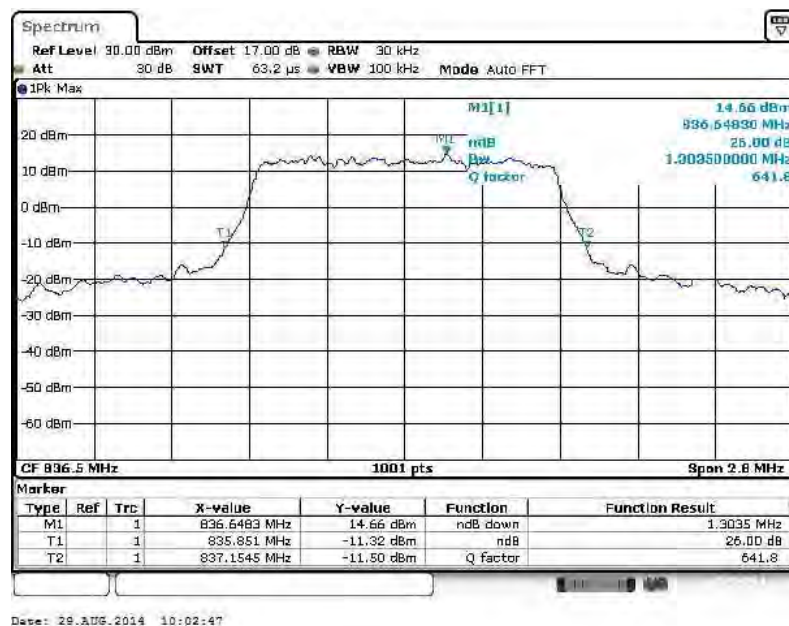




## 99% Occupied Bandwidth Plot on Channel 20525

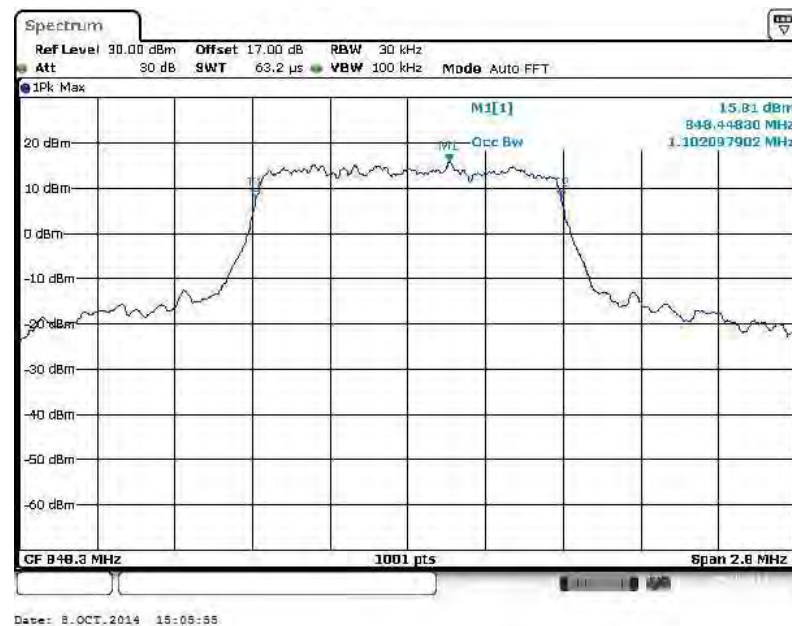


## 26dB Bandwidth Plot on Channel 20525

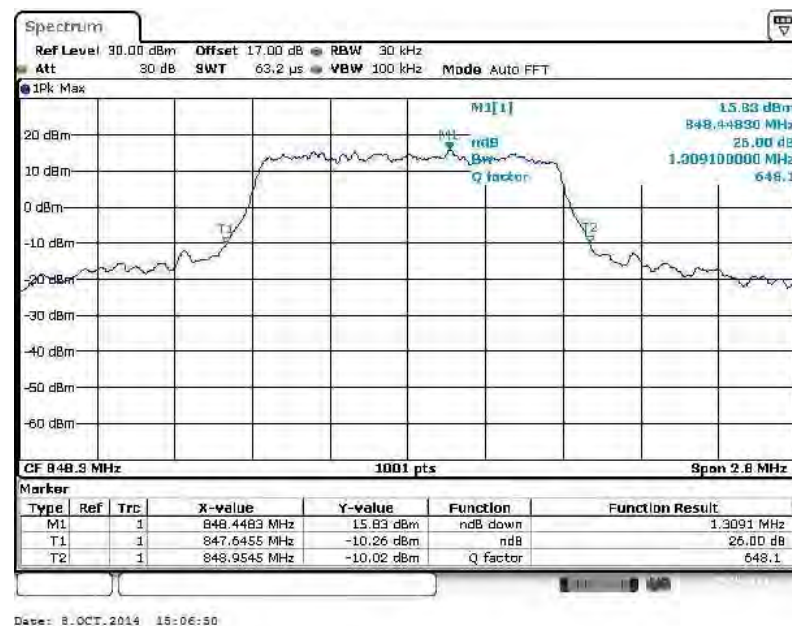




## 99% Occupied Bandwidth Plot on Channel 20643



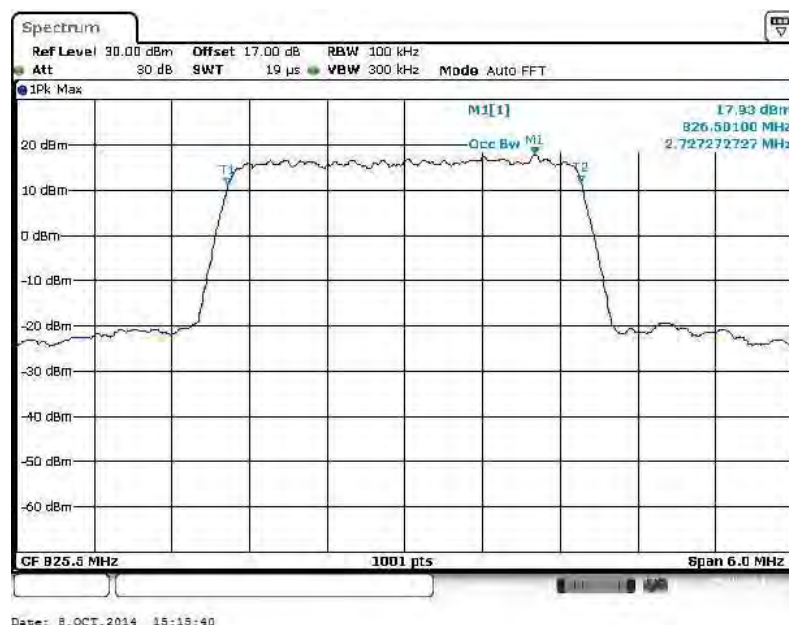
## 26dB Bandwidth Plot on Channel 20643



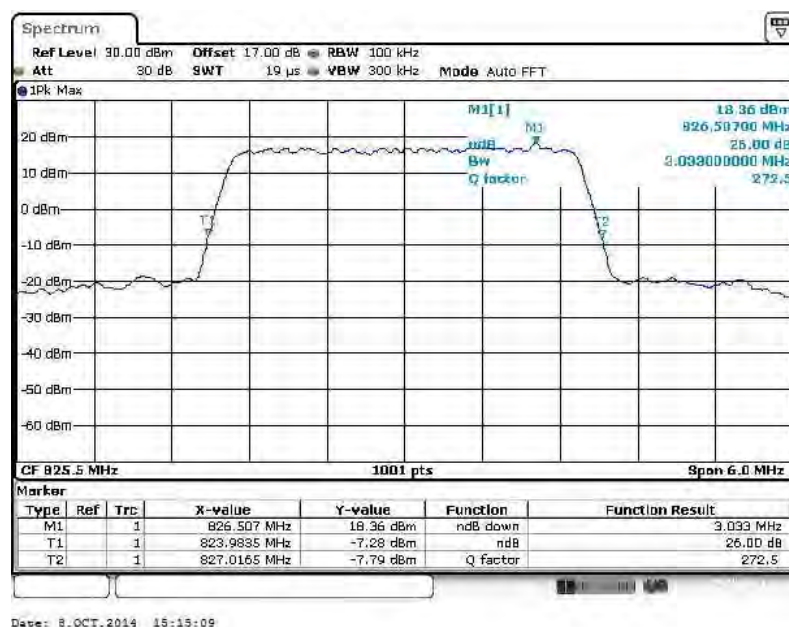


|        |            |             |             |
|--------|------------|-------------|-------------|
| Band : | LTE Band 5 | BW / Mod. : | 3MHz / QPSK |
|--------|------------|-------------|-------------|

## 99% Occupied Bandwidth Plot on Channel 20415

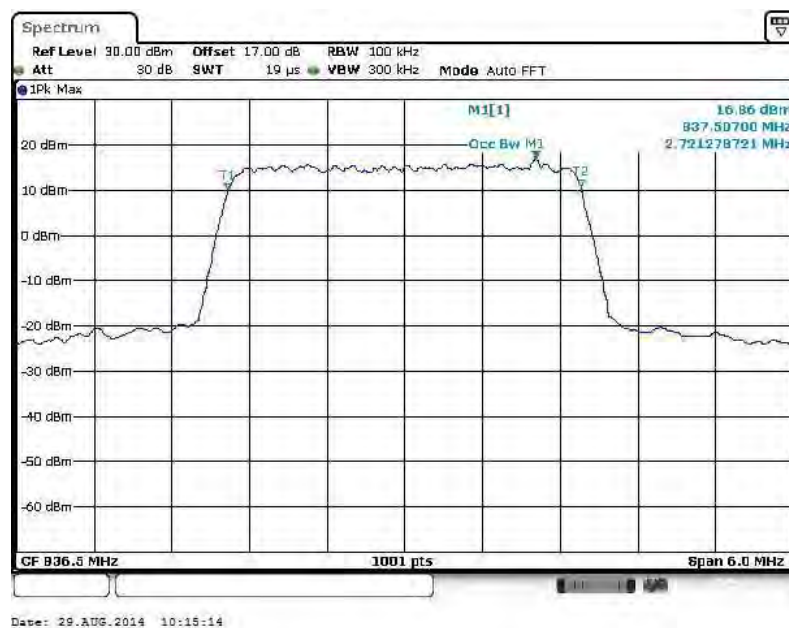


## 26dB Bandwidth Plot on Channel 20415

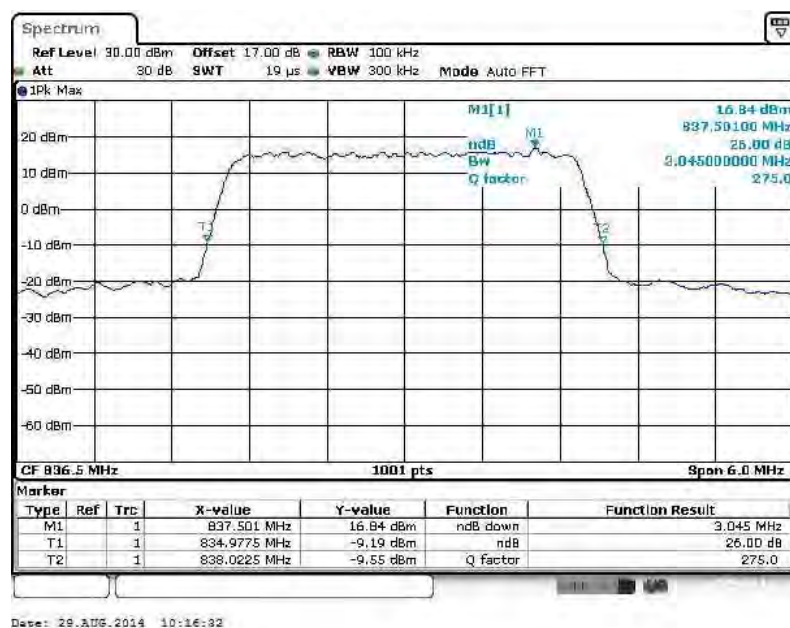




## 99% Occupied Bandwidth Plot on Channel 20525

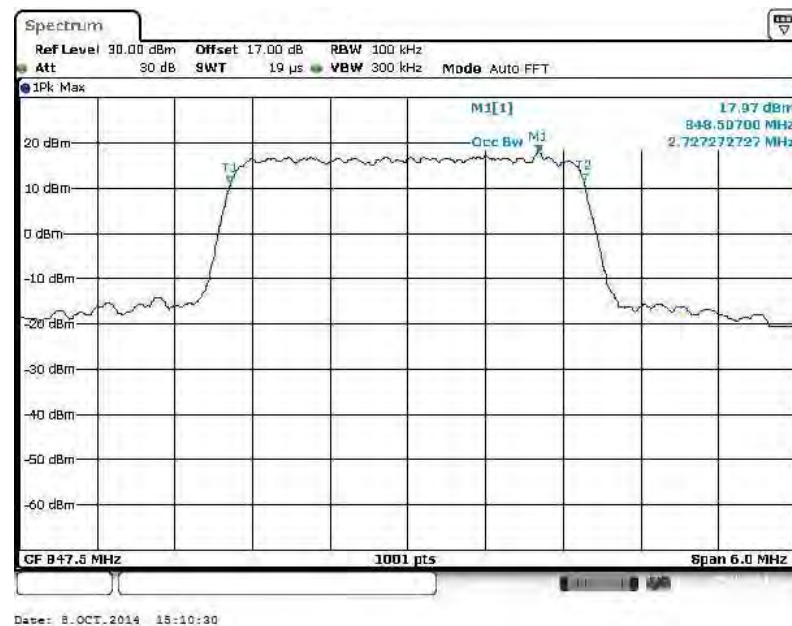


## 26dB Bandwidth Plot on Channel 20525

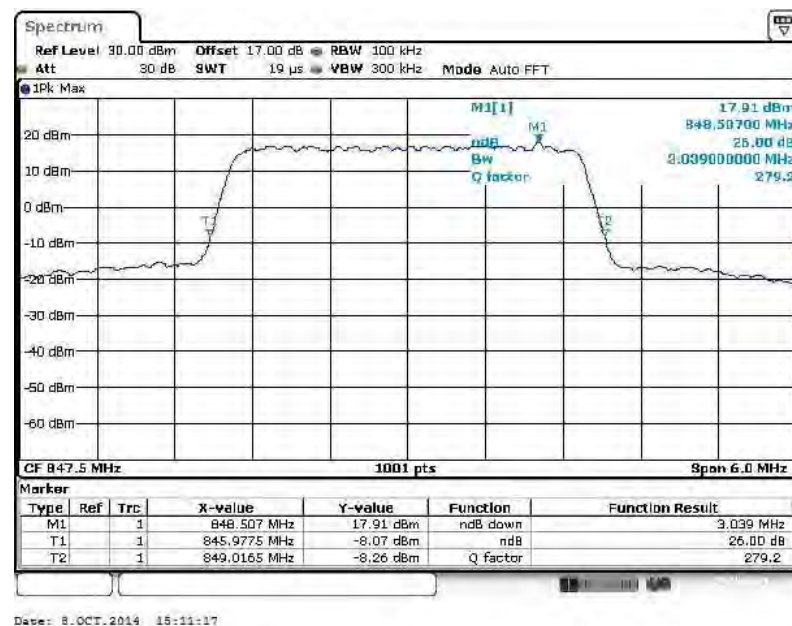




### 99% Occupied Bandwidth Plot on Channel 20635



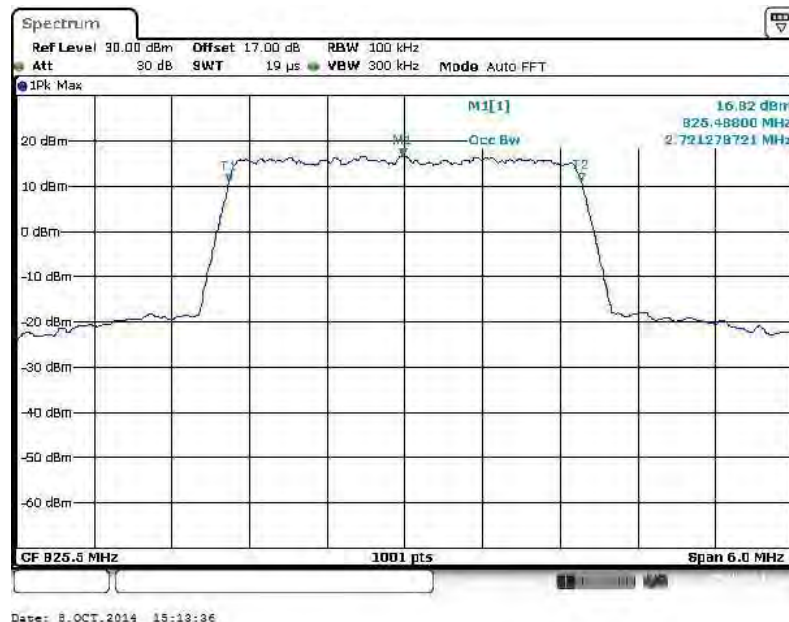
### 26dB Bandwidth Plot on Channel 20635



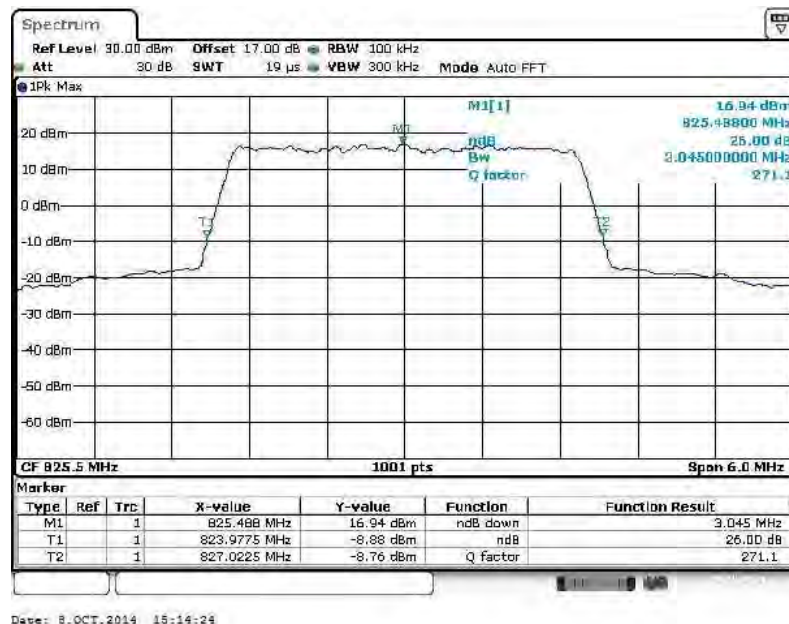


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 5 | BW / Mod. : | 3MHz / 16QAM |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 20415

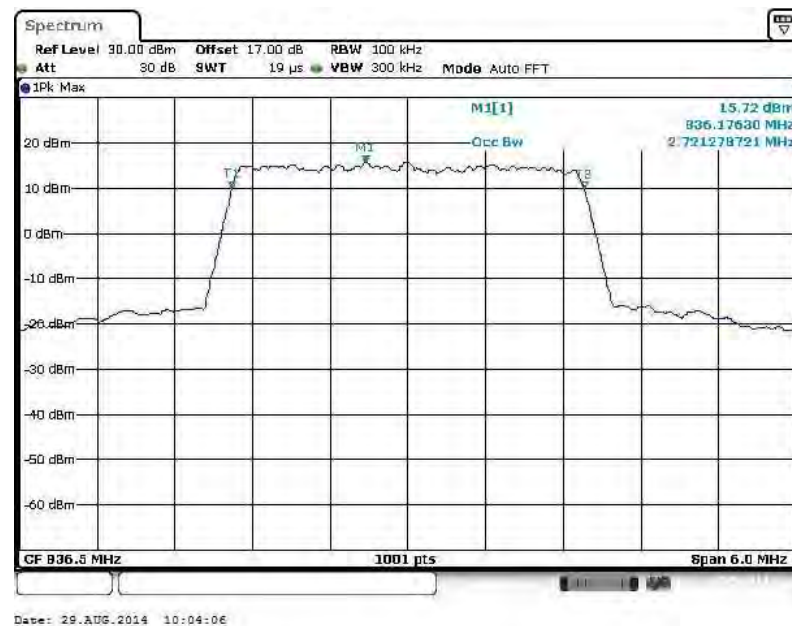


## 26dB Bandwidth Plot on Channel 20415

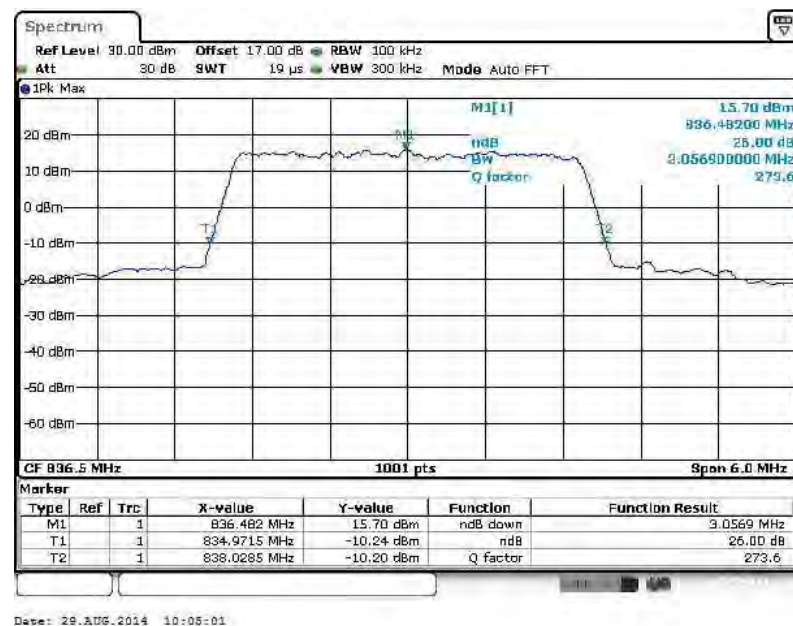




## 99% Occupied Bandwidth Plot on Channel 20525

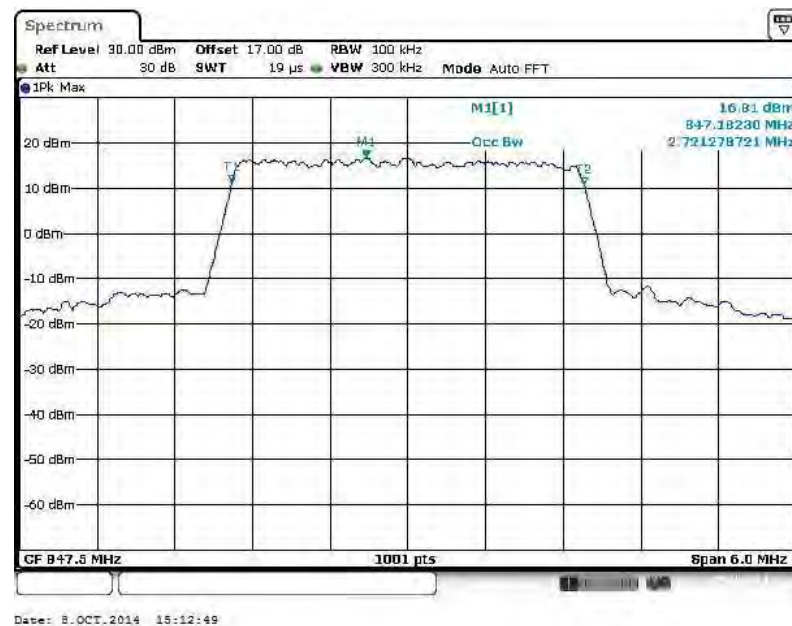


## 26dB Bandwidth Plot on Channel 20525

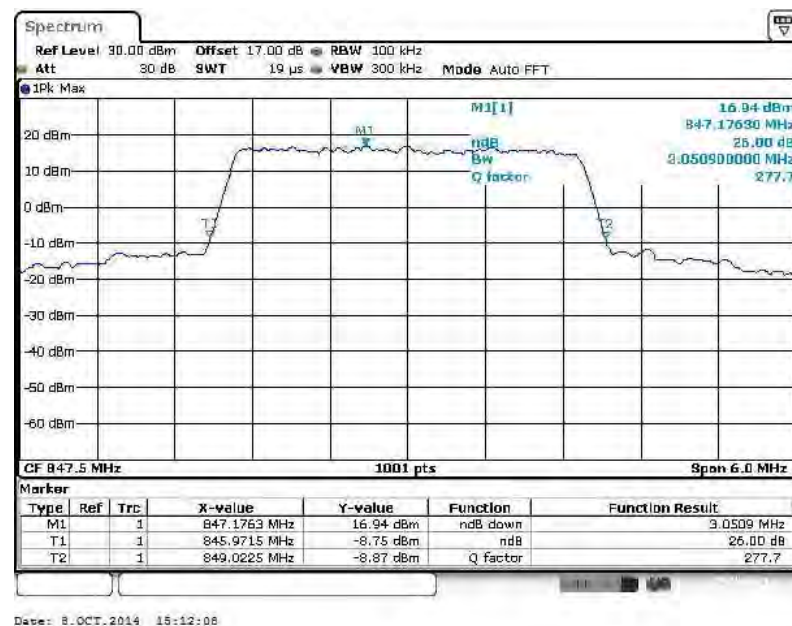




## 99% Occupied Bandwidth Plot on Channel 20635



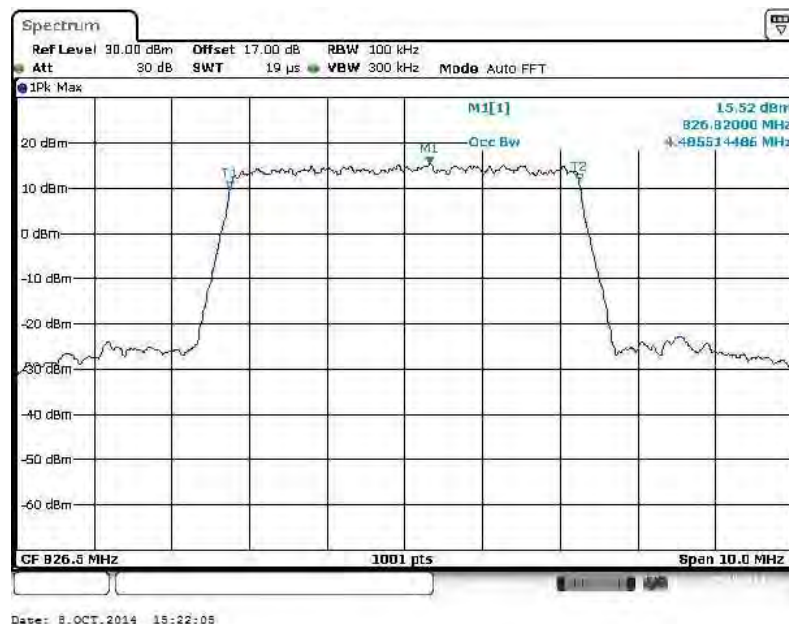
## 26dB Bandwidth Plot on Channel 20635



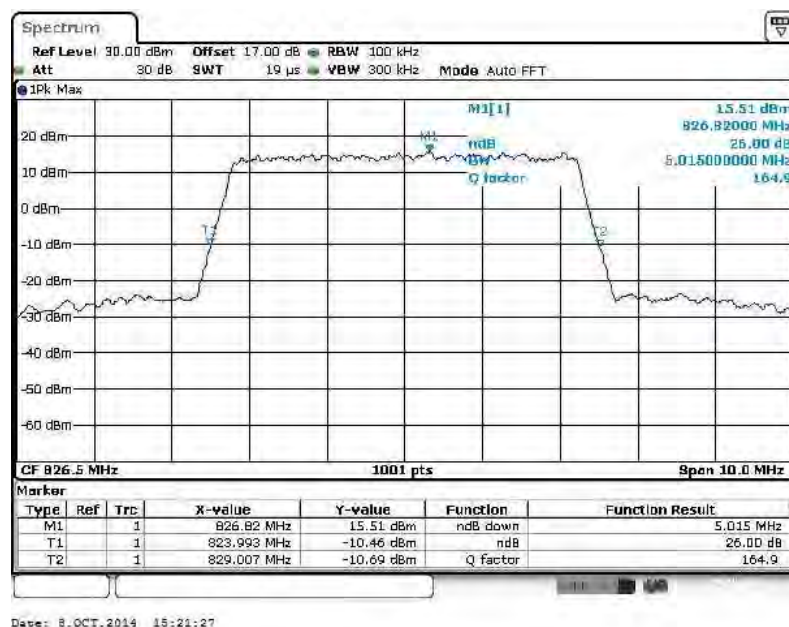


|        |            |             |             |
|--------|------------|-------------|-------------|
| Band : | LTE Band 5 | BW / Mod. : | 5MHz / QPSK |
|--------|------------|-------------|-------------|

## 99% Occupied Bandwidth Plot on Channel 20425

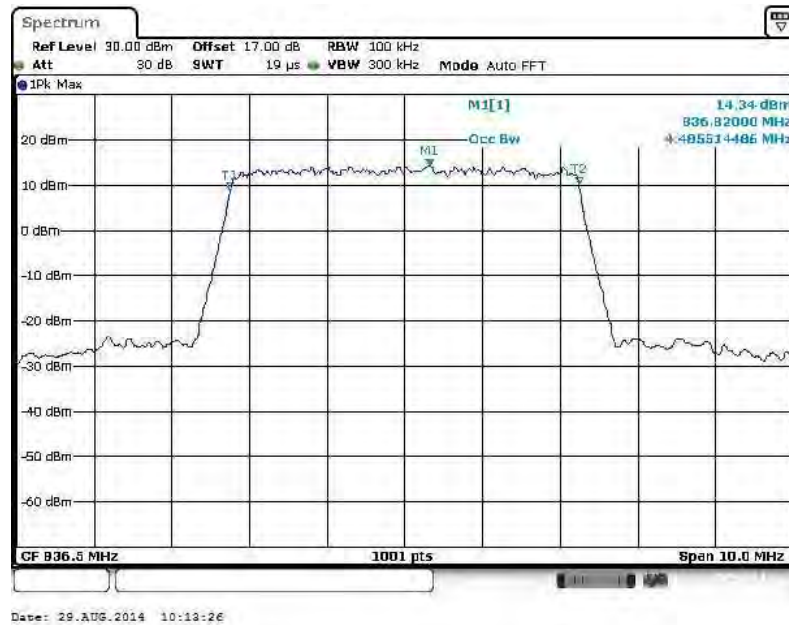


## 26dB Bandwidth Plot on Channel 20425

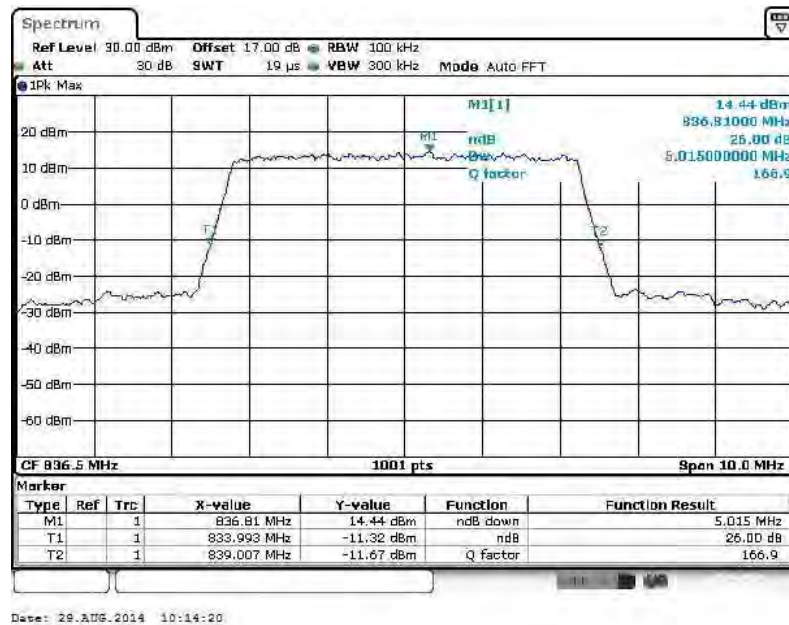




99% Occupied Bandwidth Plot on Channel 20525

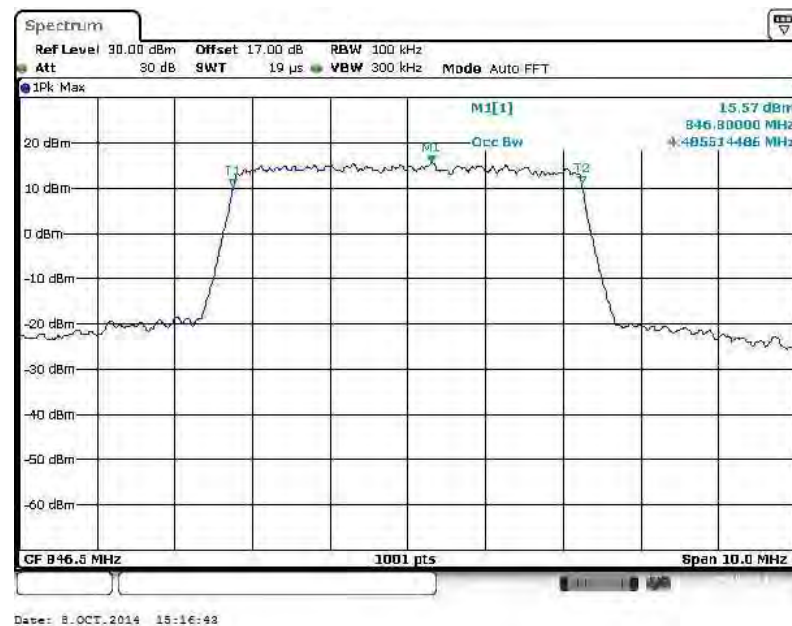


26dB Bandwidth Plot on Channel 20525

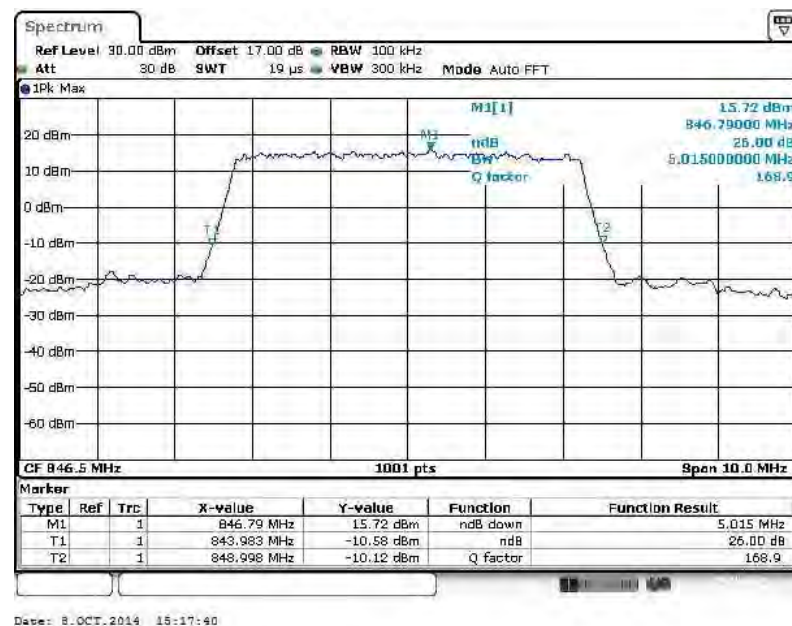




## 99% Occupied Bandwidth Plot on Channel 20625



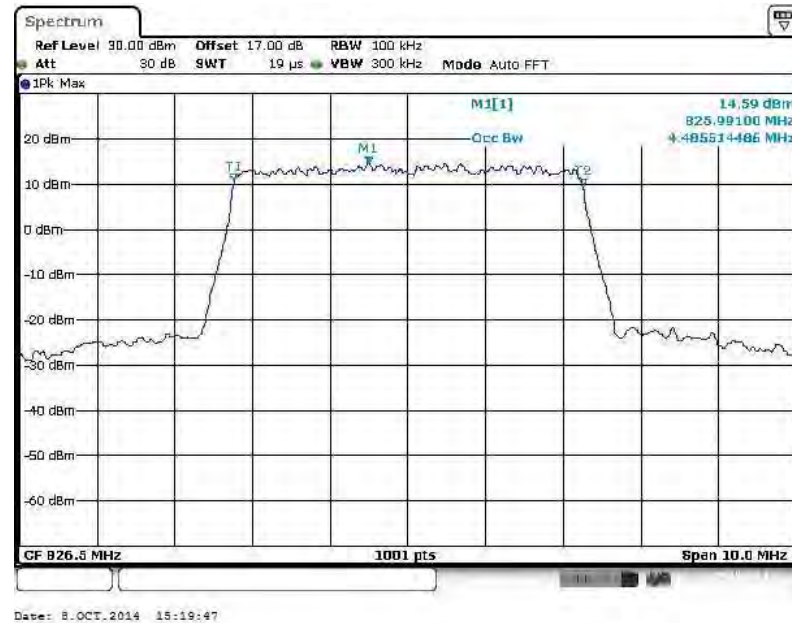
## 26dB Bandwidth Plot on Channel 20625



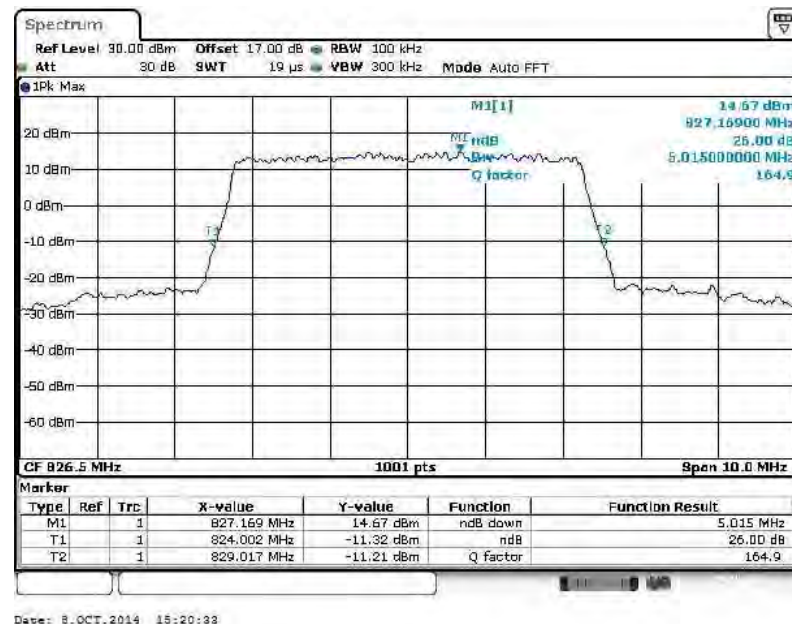


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 5 | BW / Mod. : | 5MHz / 16QAM |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 20425

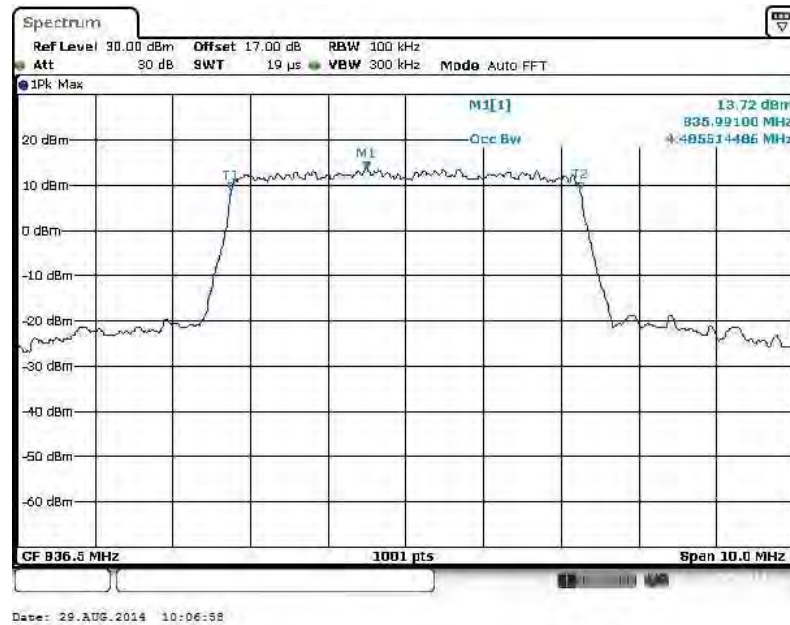


## 26dB Bandwidth Plot on Channel 20425

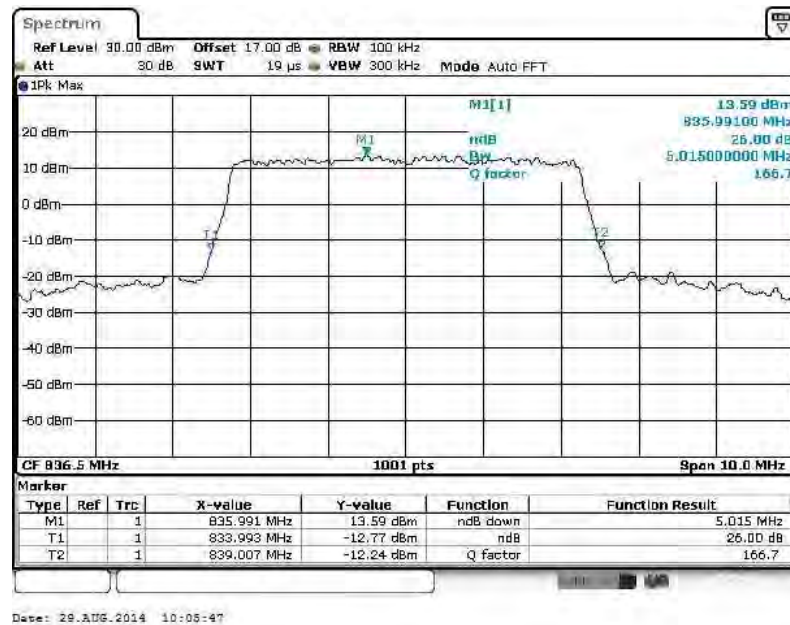




### 99% Occupied Bandwidth Plot on Channel 20525

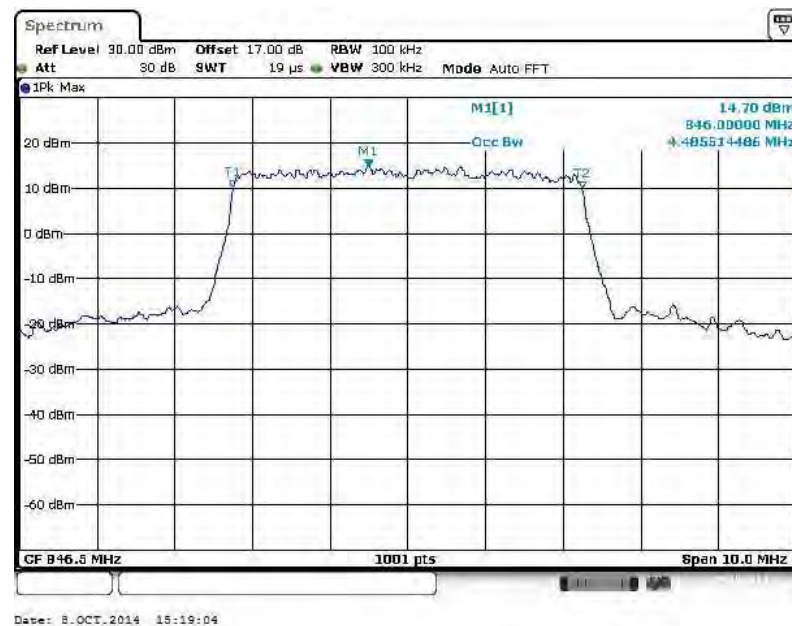


### 26dB Bandwidth Plot on Channel 20525

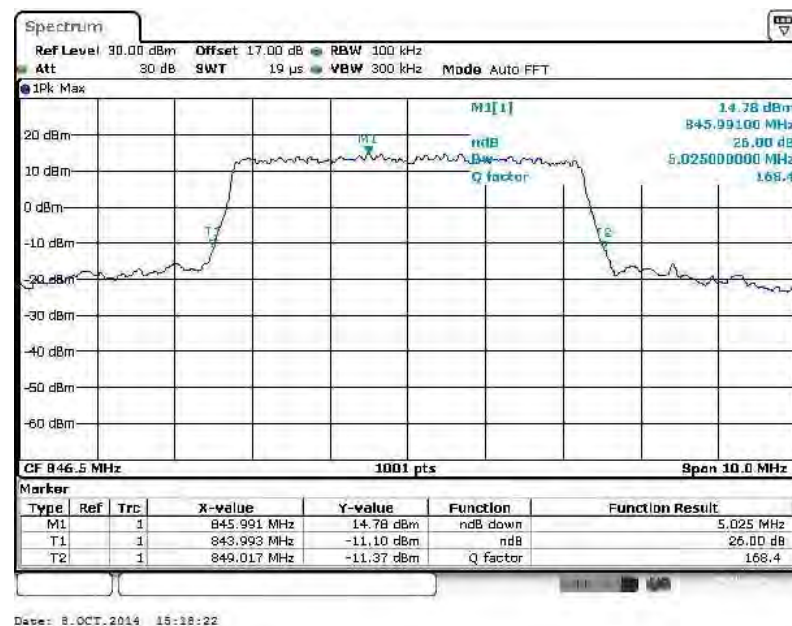




## 99% Occupied Bandwidth Plot on Channel 20625



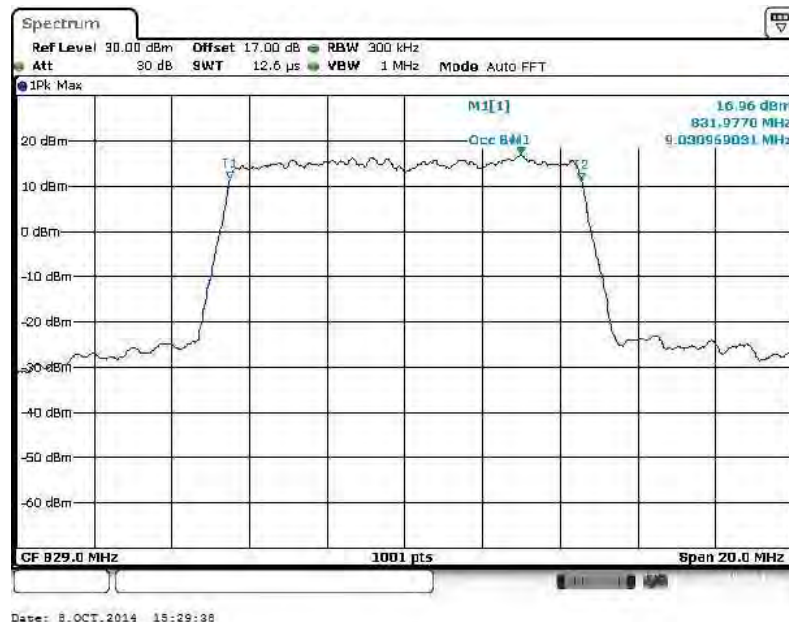
## 26dB Bandwidth Plot on Channel 20625



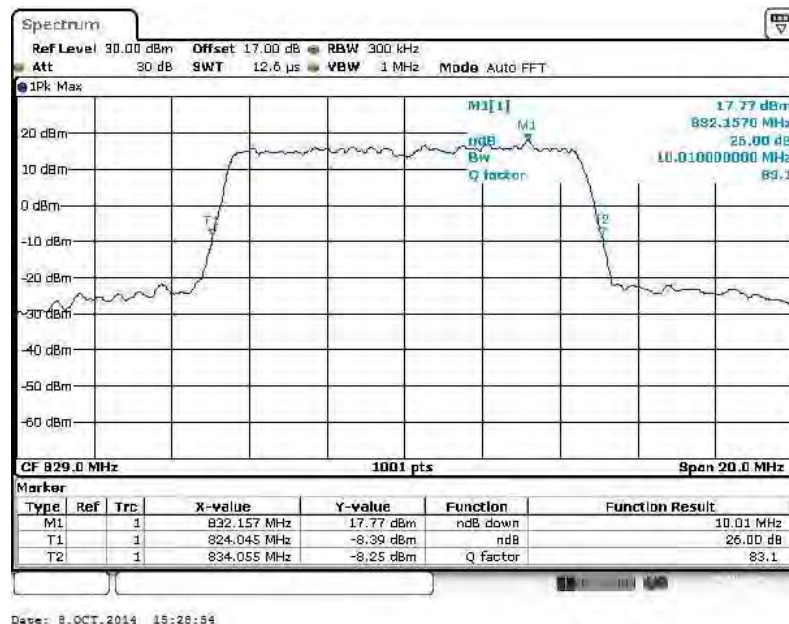


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 5 | BW / Mod. : | 10MHz / QPSK |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 20450

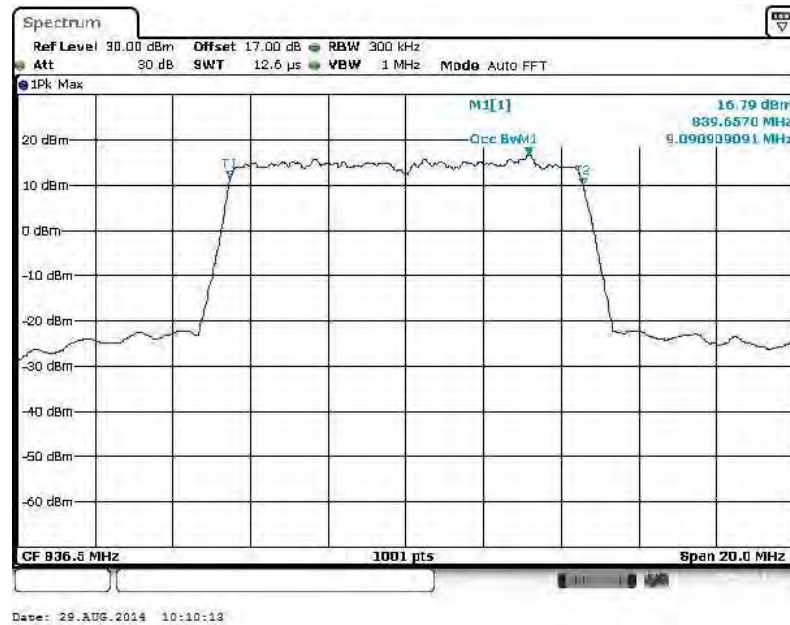


## 26dB Bandwidth Plot on Channel 20450

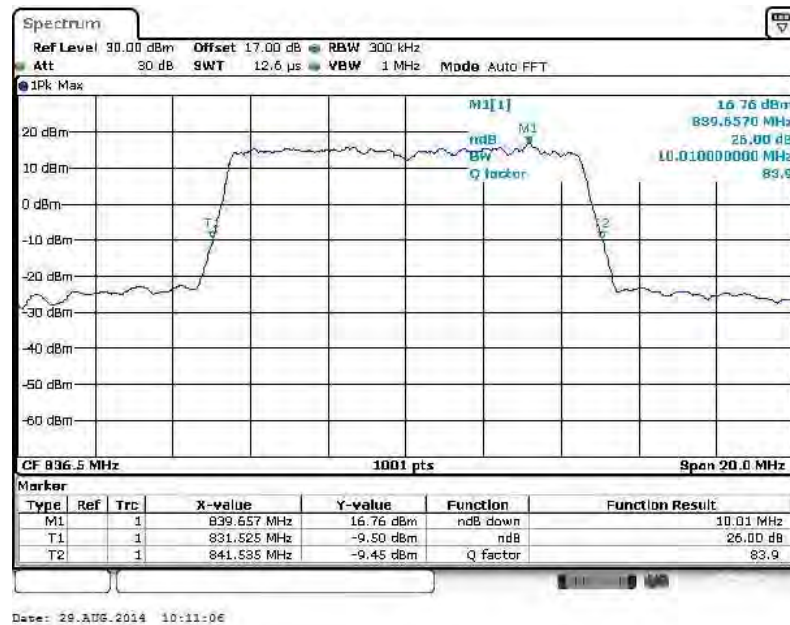




99% Occupied Bandwidth Plot on Channel 20525

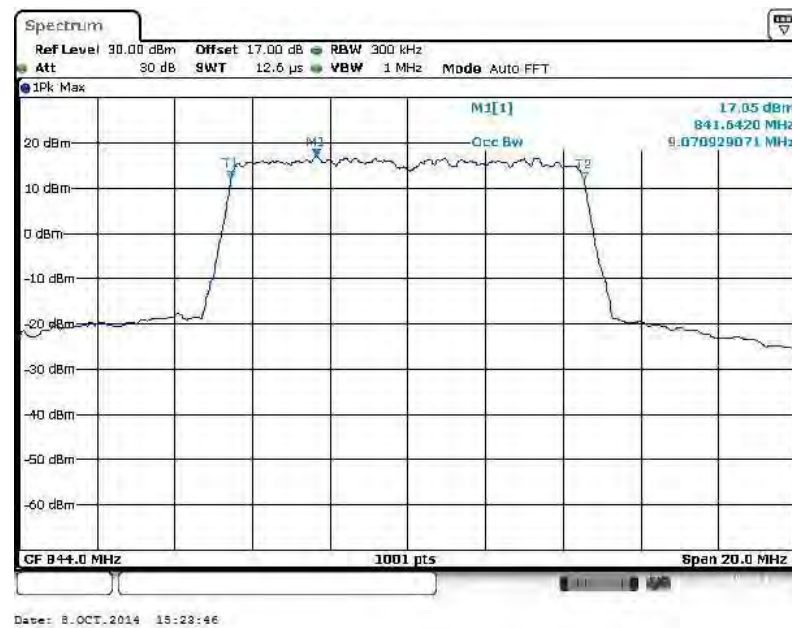


26dB Bandwidth Plot on Channel 20525

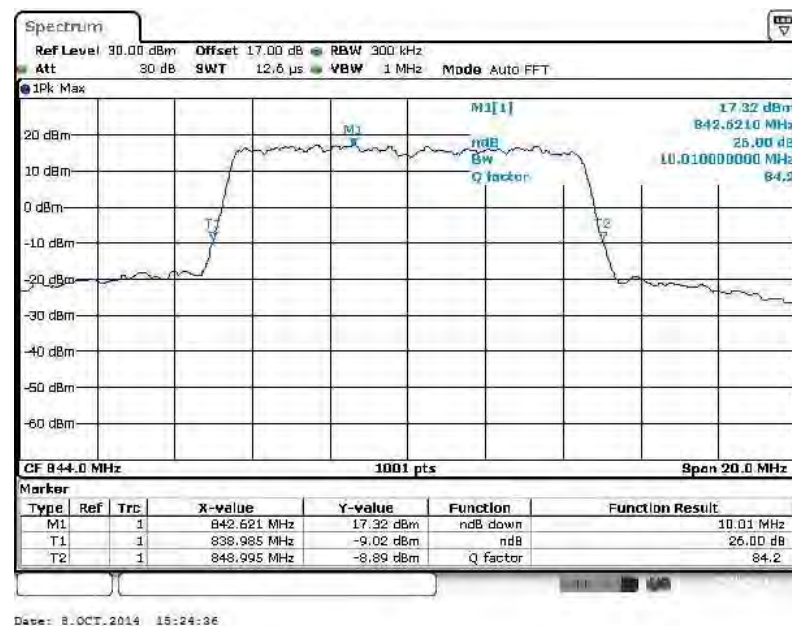




## 99% Occupied Bandwidth Plot on Channel 20600



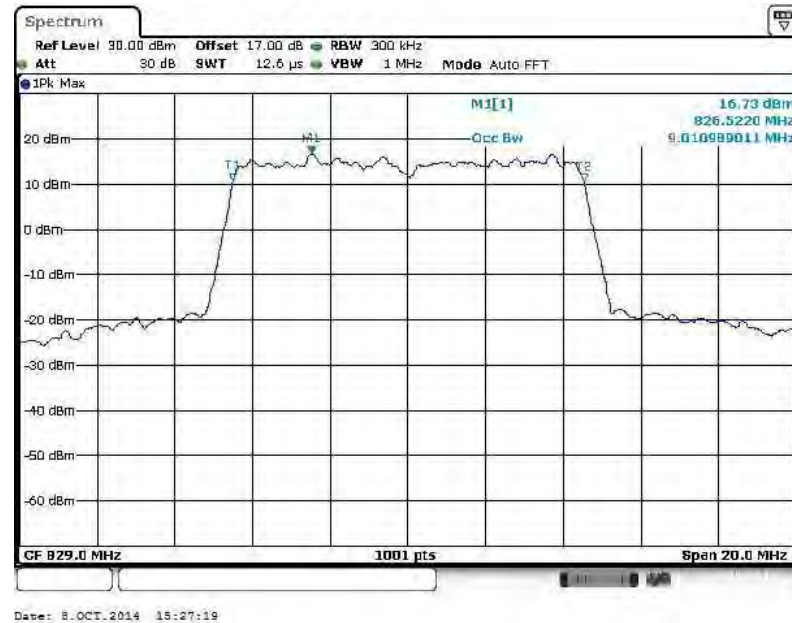
## 26dB Bandwidth Plot on Channel 20600



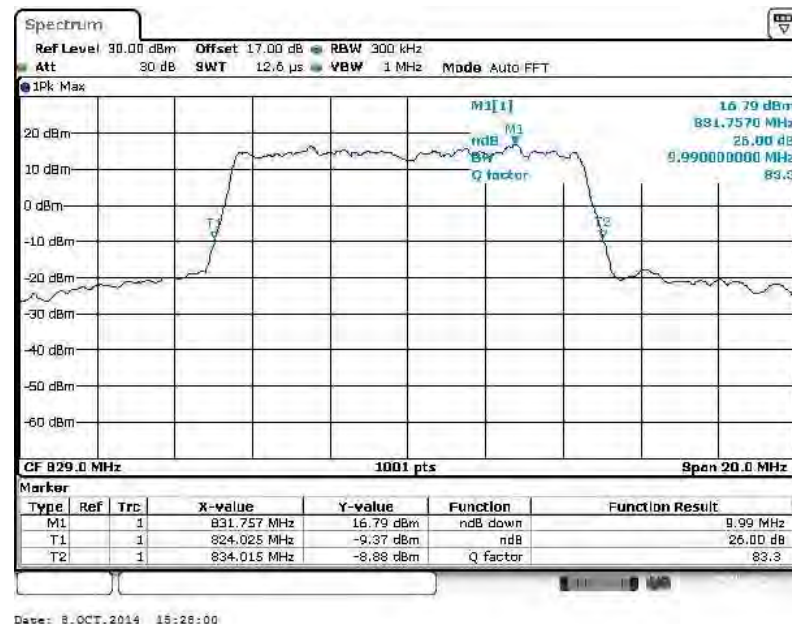


|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 5 | BW / Mod. : | 10MHz / 16QAM |
|--------|------------|-------------|---------------|

99% Occupied Bandwidth Plot on Channel 20450

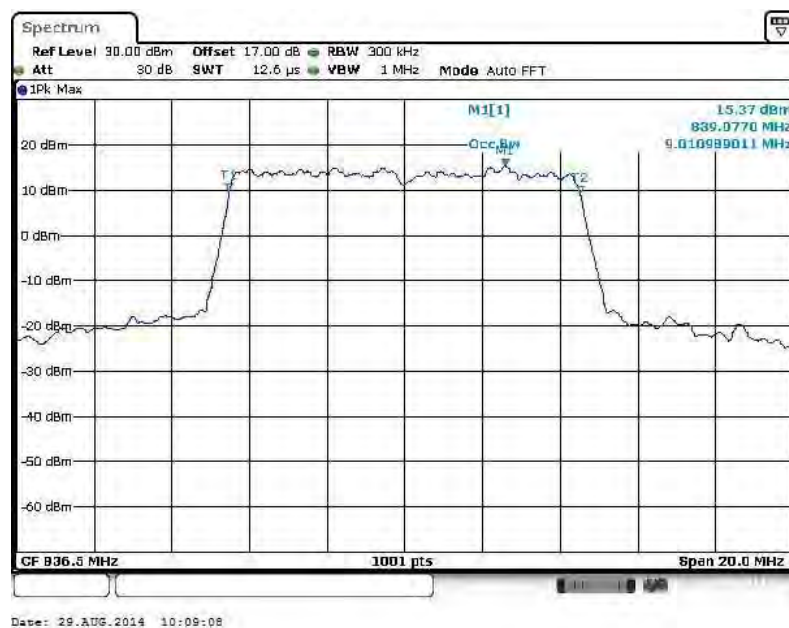


26dB Bandwidth Plot on Channel 20450

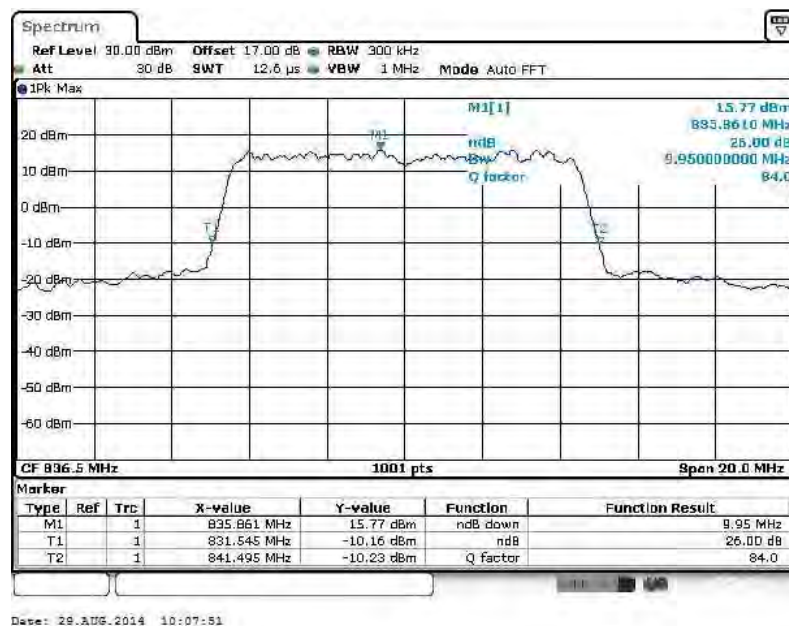




## 99% Occupied Bandwidth Plot on Channel 20525

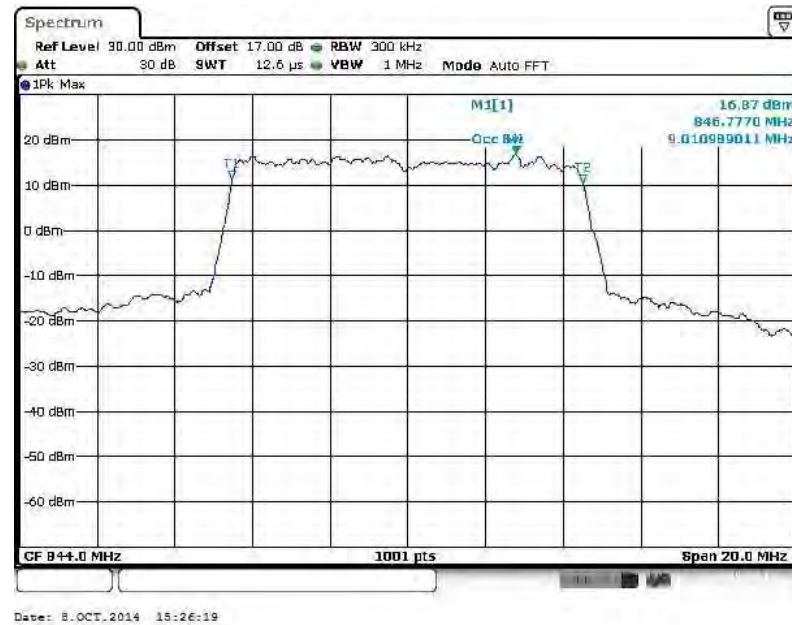


## 26dB Bandwidth Plot on Channel 20525

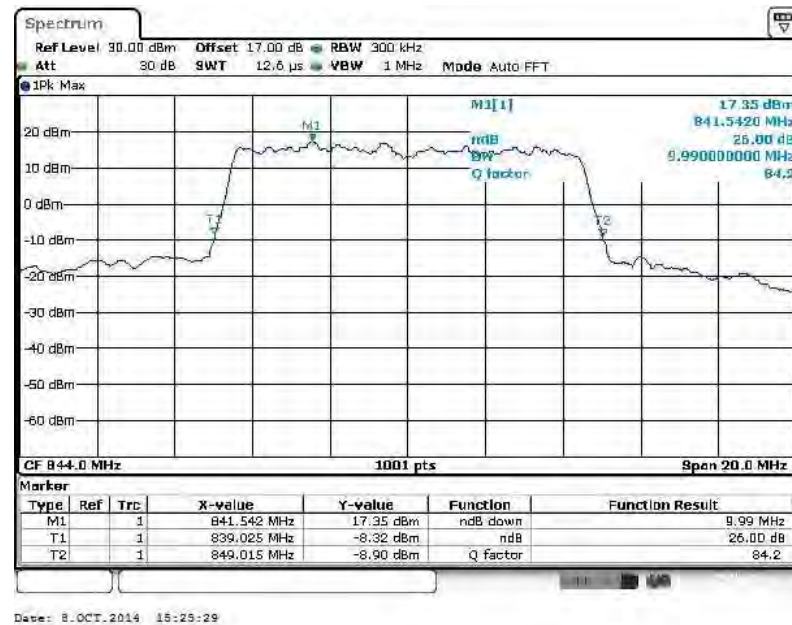




### 99% Occupied Bandwidth Plot on Channel 20600



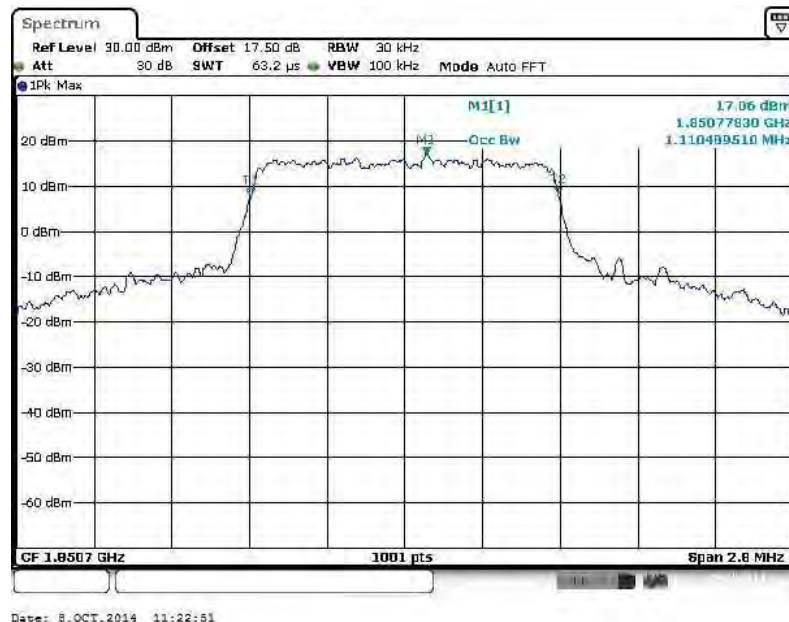
### 26dB Bandwidth Plot on Channel 20600



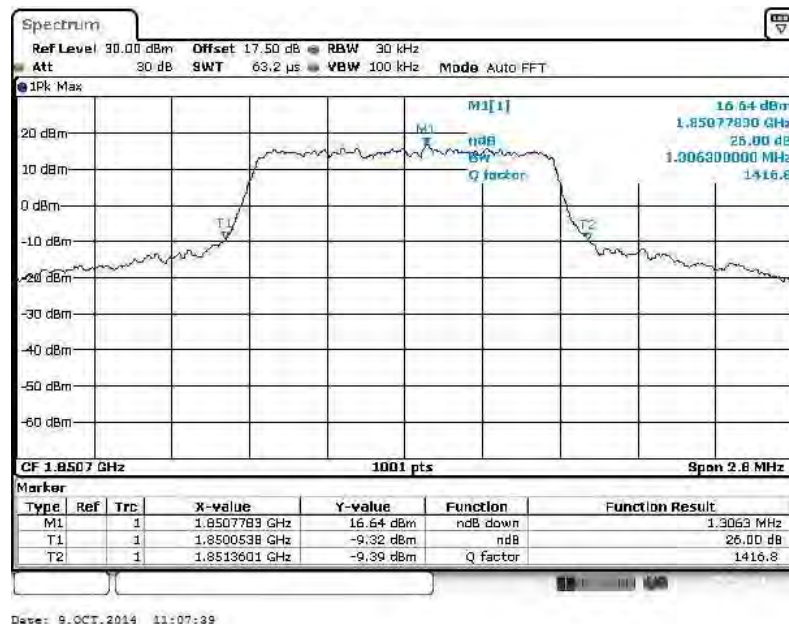


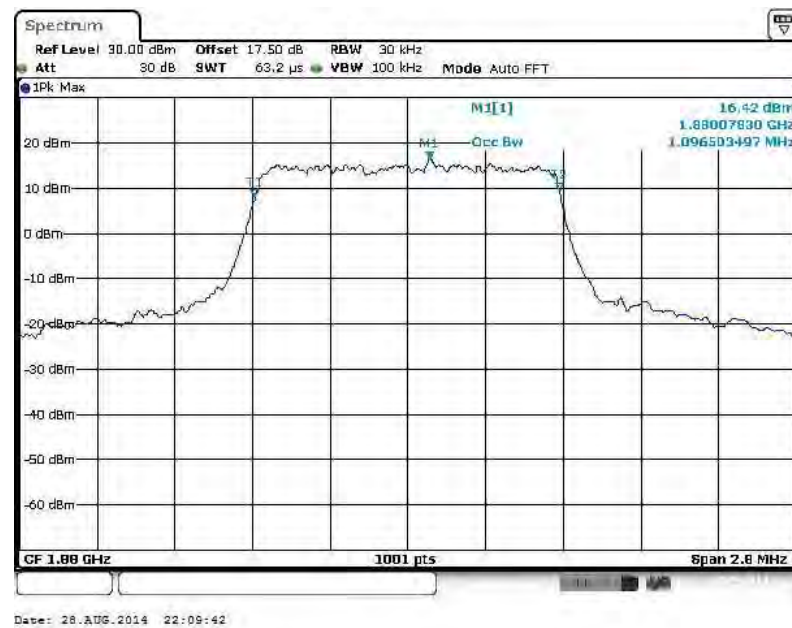
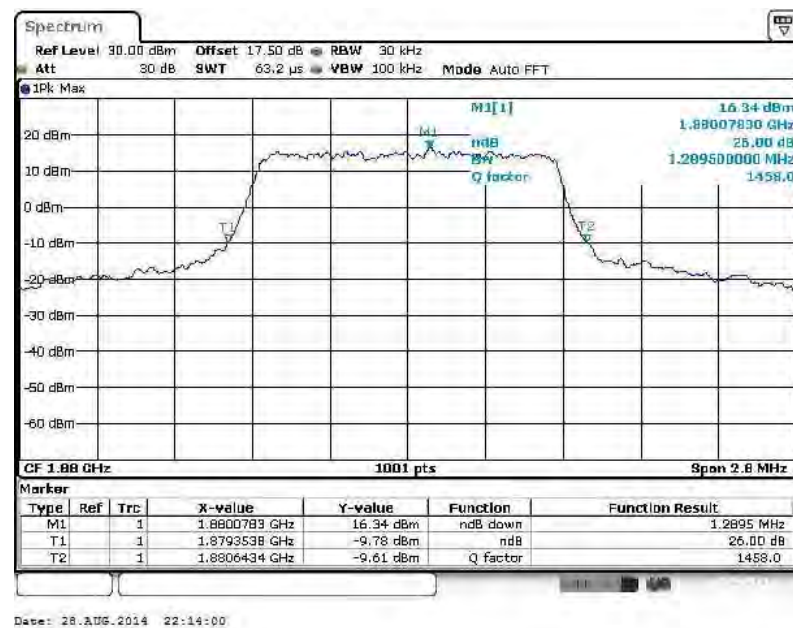
|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 2 | BW / Mod. : | 1.4MHz / QPSK |
|--------|------------|-------------|---------------|

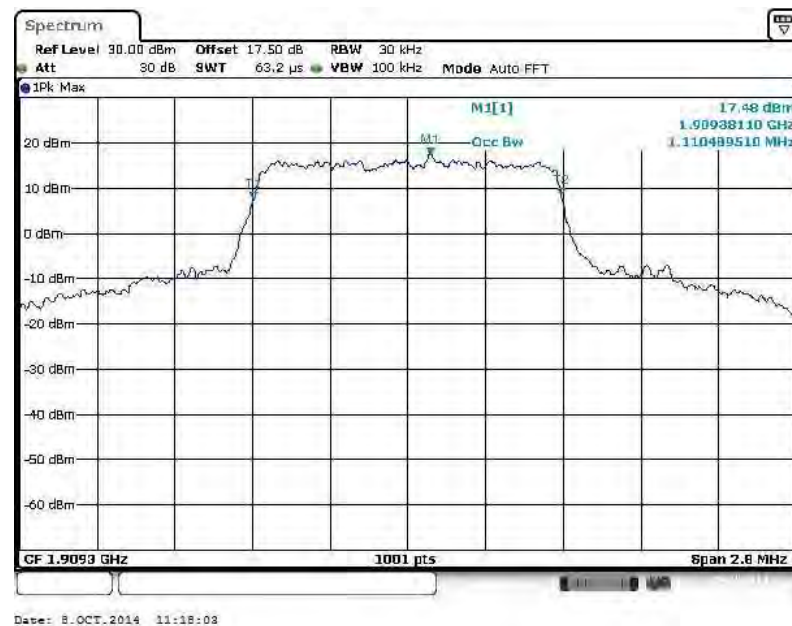
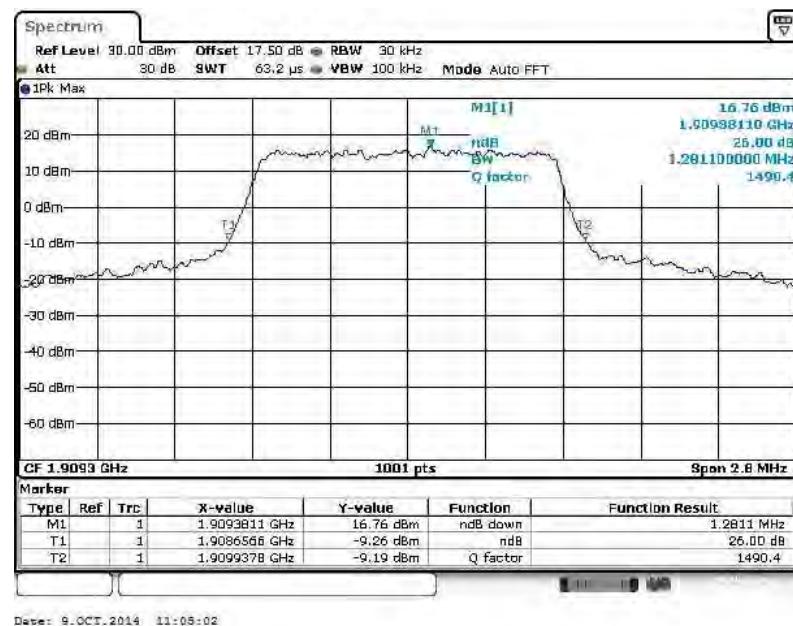
## 99% Occupied Bandwidth Plot on Channel 18607



## 26dB Bandwidth Plot on Channel 18607



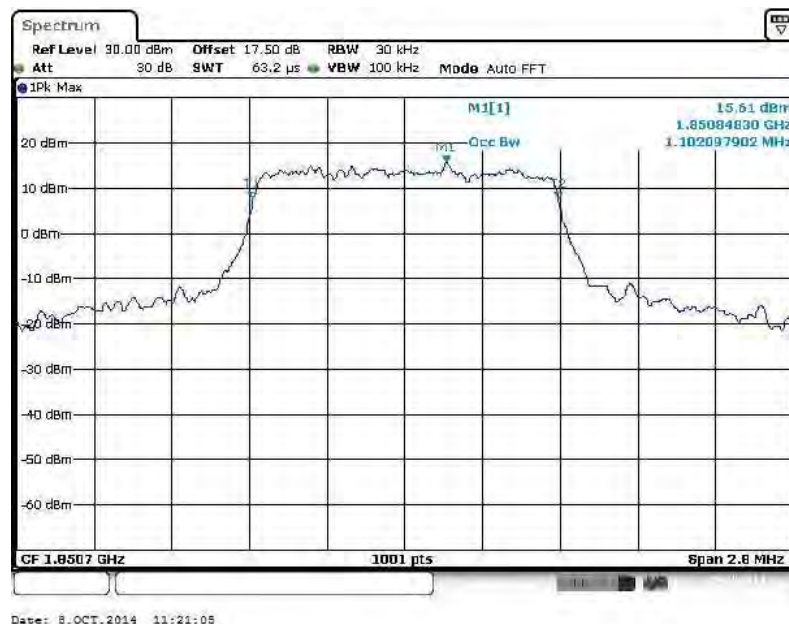
**99% Occupied Bandwidth Plot on Channel 18900**

**26dB Bandwidth Plot on Channel 18900**


**99% Occupied Bandwidth Plot on Channel 19193**

**26dB Bandwidth Plot on Channel 19193**


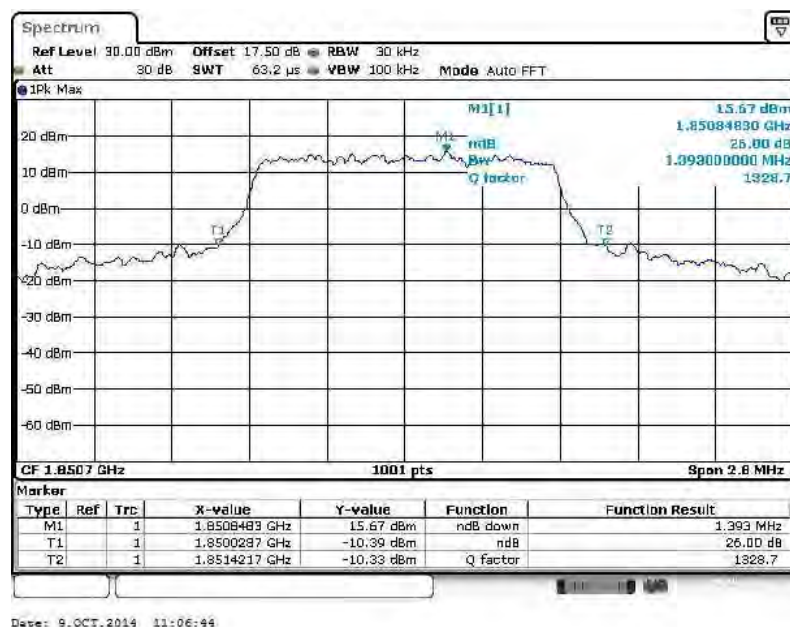


|        |            |             |                |
|--------|------------|-------------|----------------|
| Band : | LTE Band 2 | BW / Mod. : | 1.4MHz / 16QAM |
|--------|------------|-------------|----------------|

## 99% Occupied Bandwidth Plot on Channel 18607

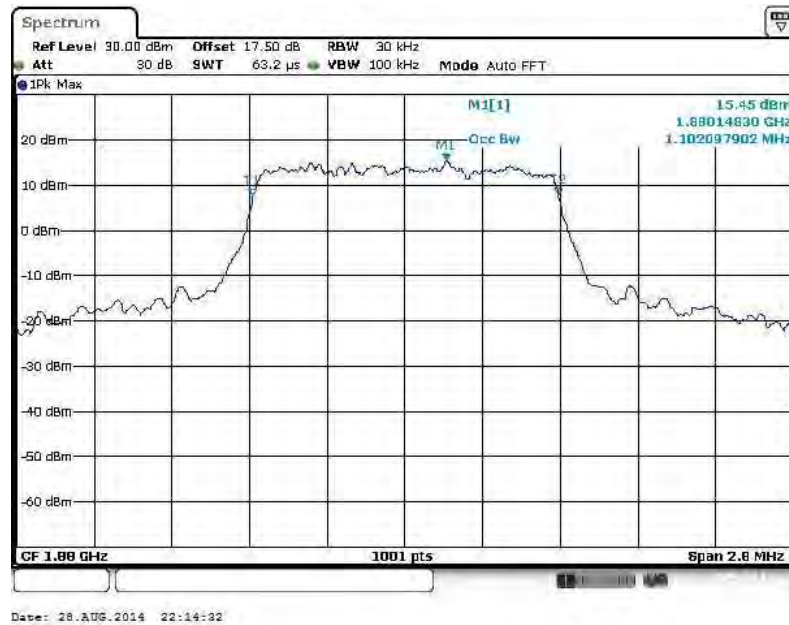


## 26dB Bandwidth Plot on Channel 18607

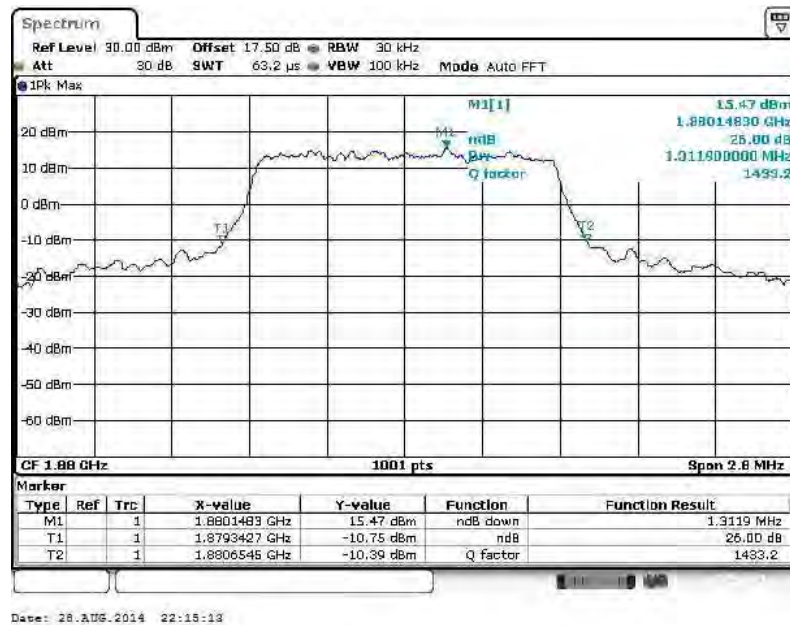




## 99% Occupied Bandwidth Plot on Channel 18900



## 26dB Bandwidth Plot on Channel 18900

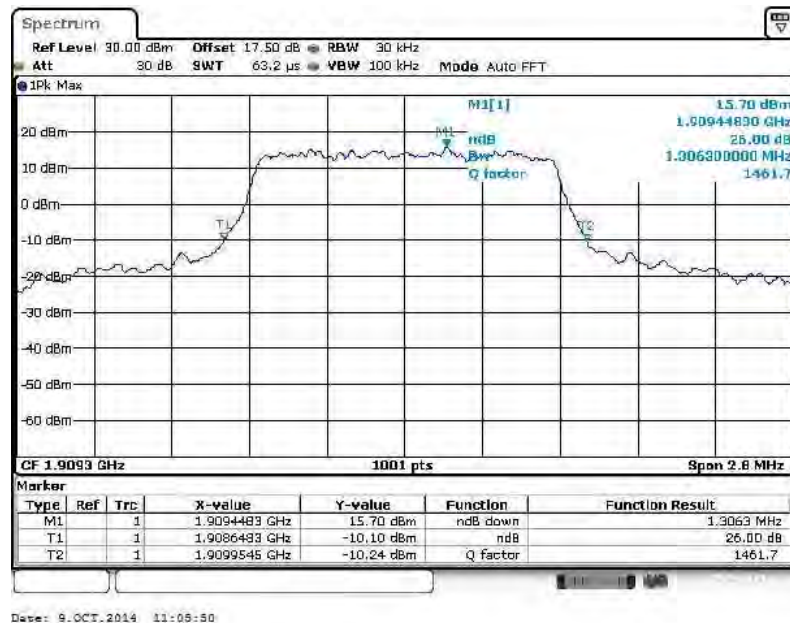




## 99% Occupied Bandwidth Plot on Channel 19193



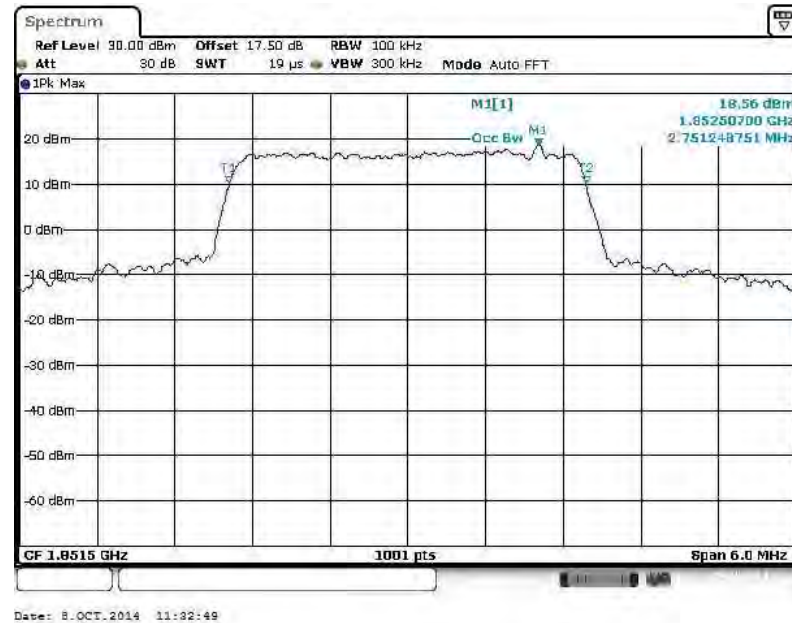
## 26dB Bandwidth Plot on Channel 19193



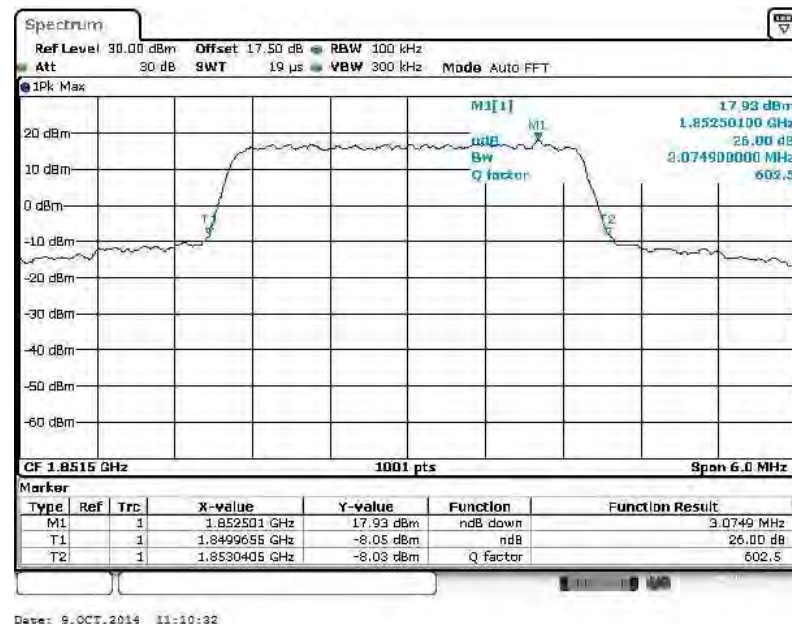


|        |            |             |             |
|--------|------------|-------------|-------------|
| Band : | LTE Band 2 | BW / Mod. : | 3MHz / QPSK |
|--------|------------|-------------|-------------|

## 99% Occupied Bandwidth Plot on Channel 18615

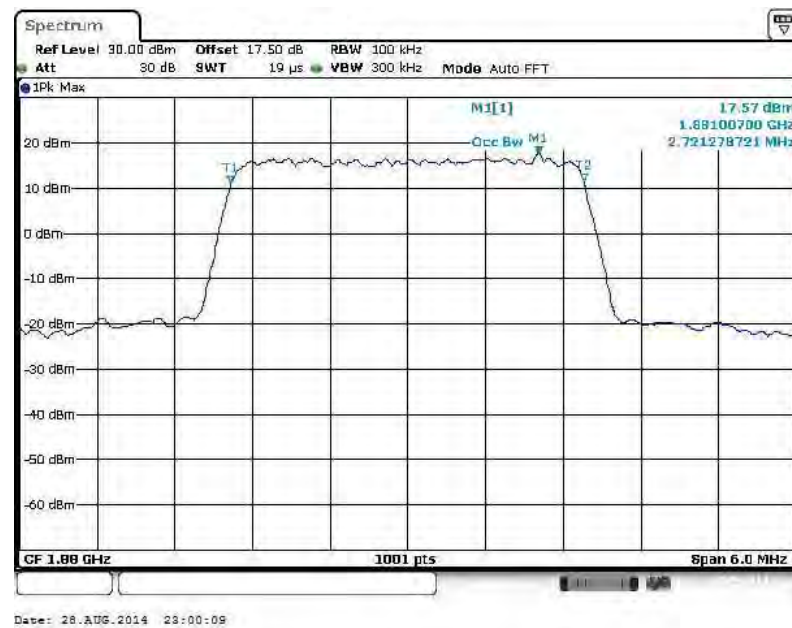


## 26dB Bandwidth Plot on Channel 18615

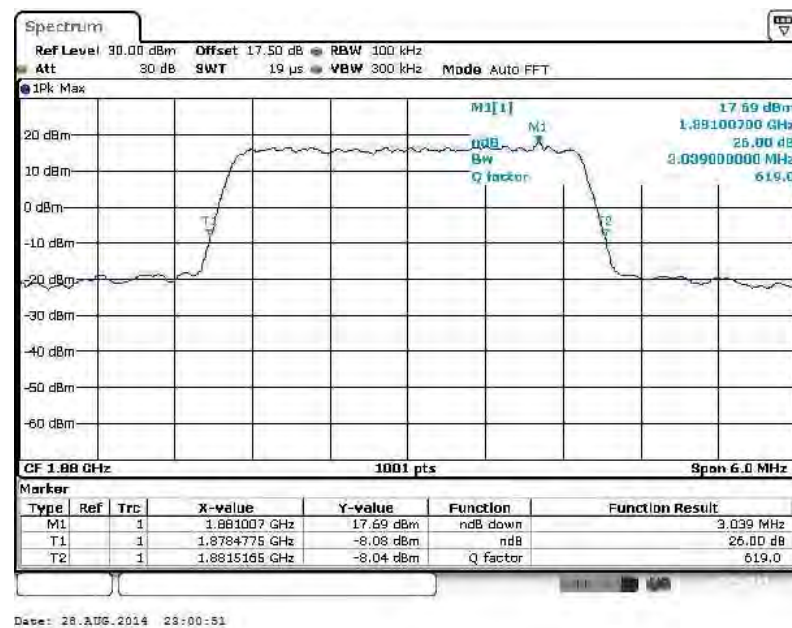




## 99% Occupied Bandwidth Plot on Channel 18900

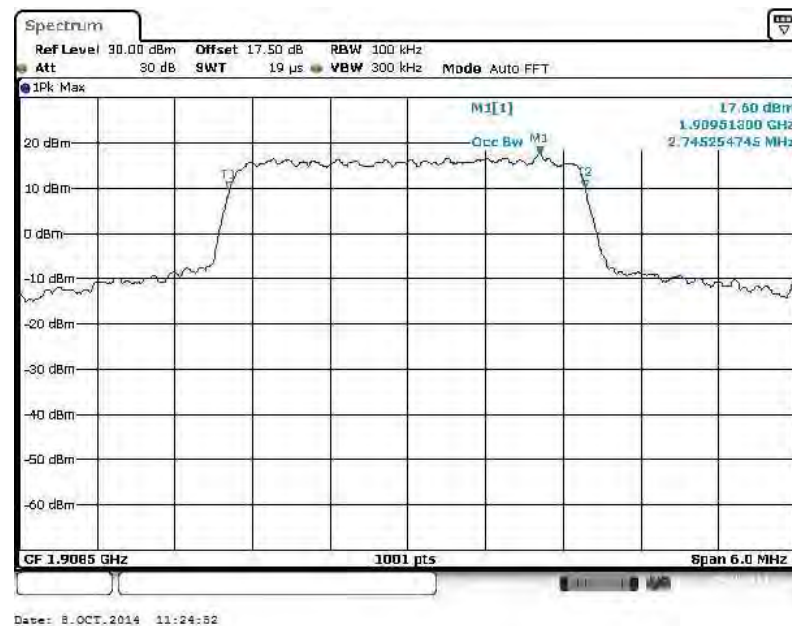


## 26dB Bandwidth Plot on Channel 18900

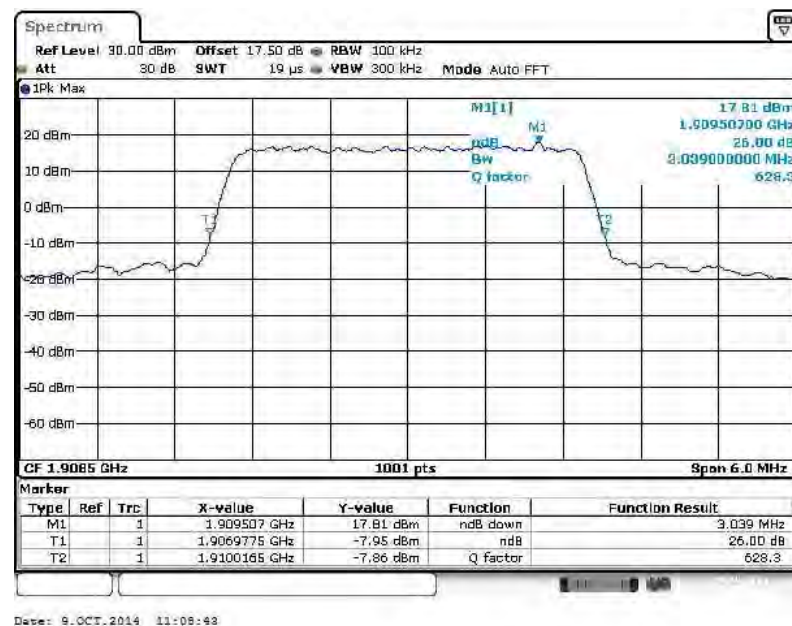




99% Occupied Bandwidth Plot on Channel 19185



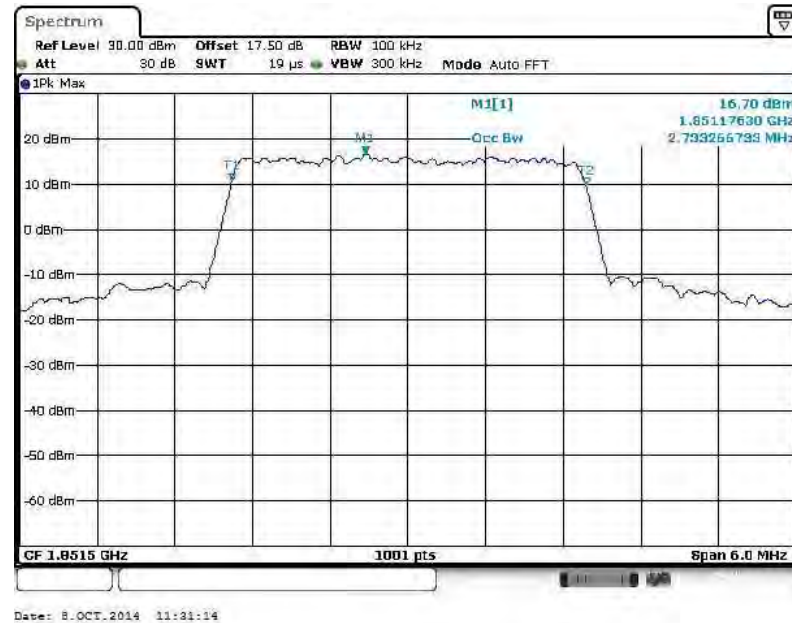
26dB Bandwidth Plot on Channel 19185



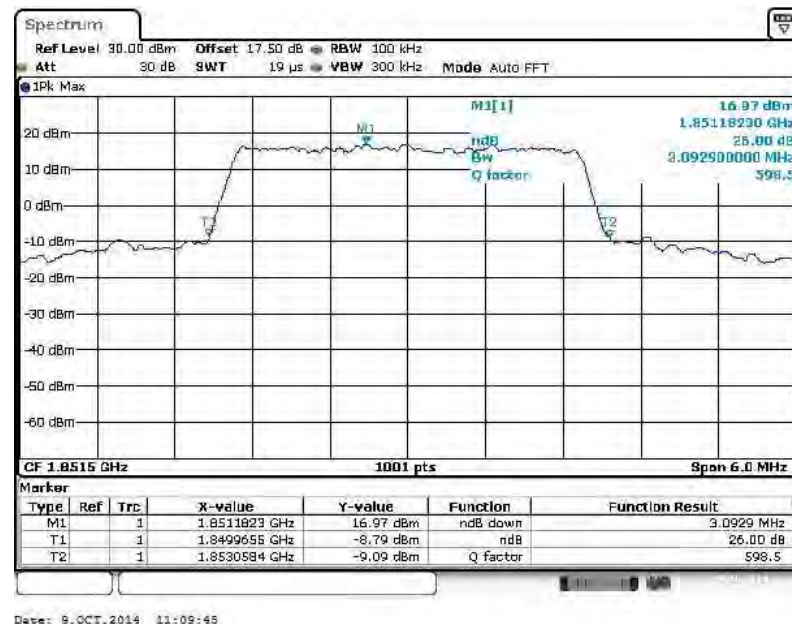


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 2 | BW / Mod. : | 3MHz / 16QAM |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 18615

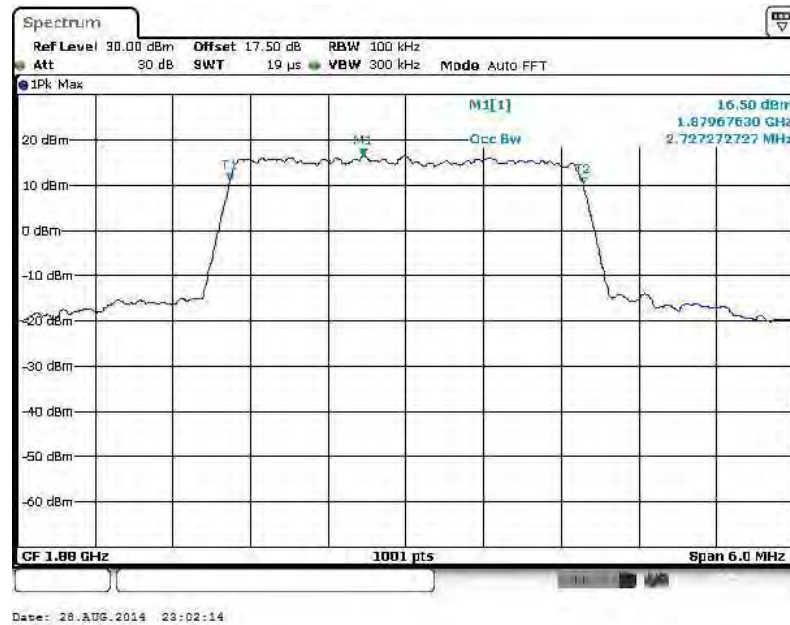


## 26dB Bandwidth Plot on Channel 18615

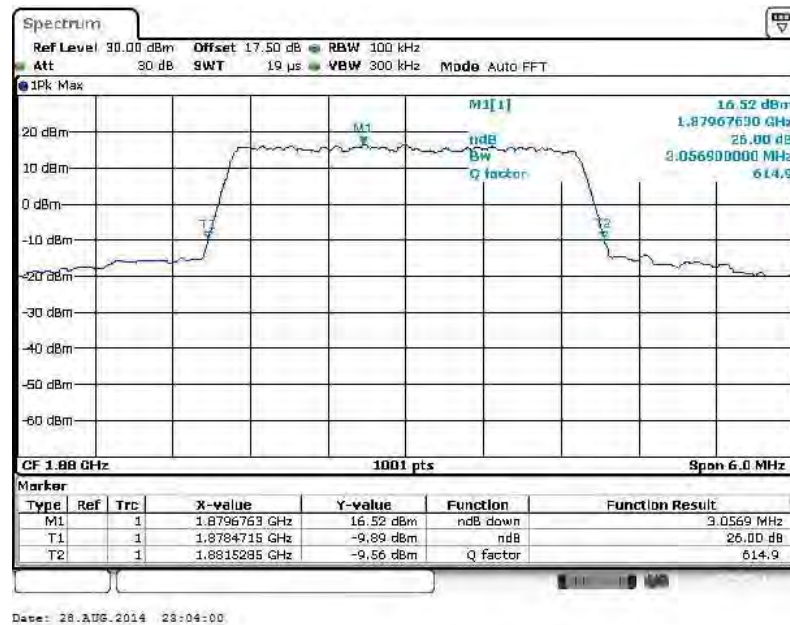




## 99% Occupied Bandwidth Plot on Channel 18900

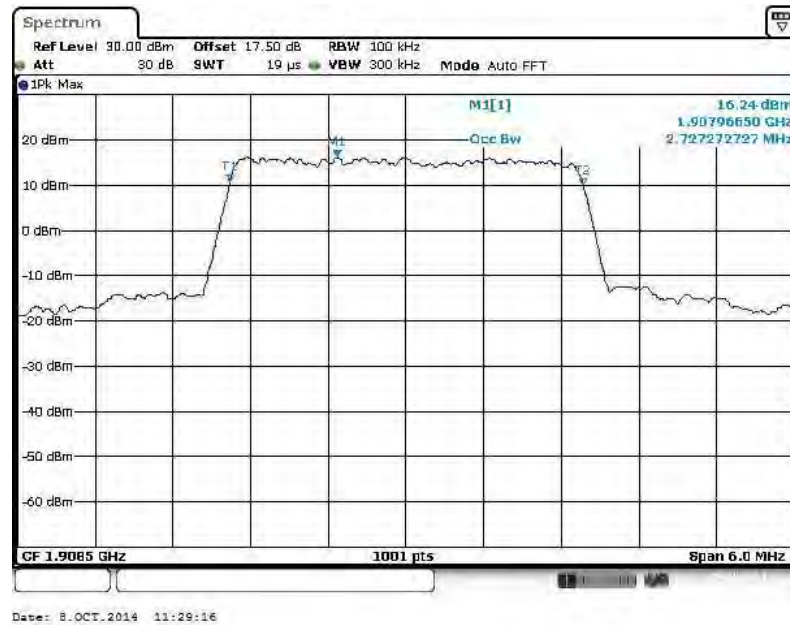


## 26dB Bandwidth Plot on Channel 18900

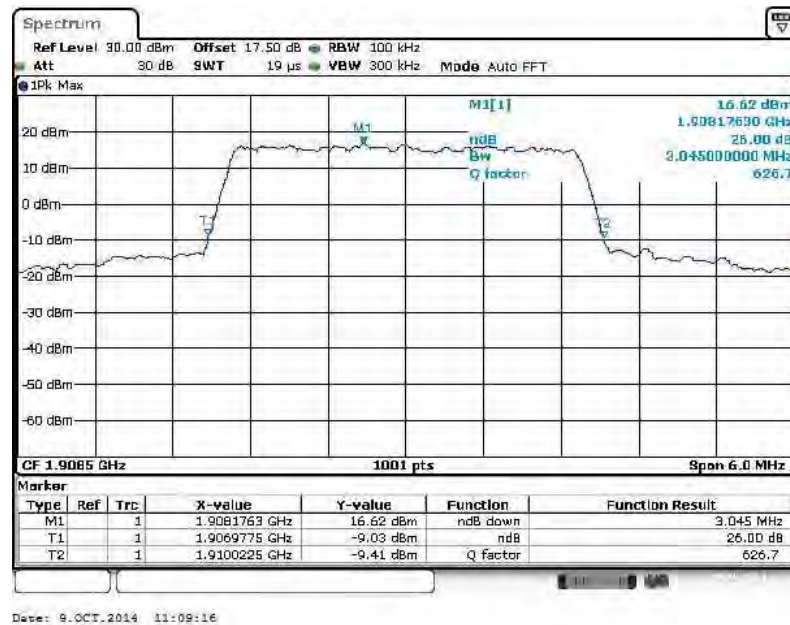




## 99% Occupied Bandwidth Plot on Channel 19185



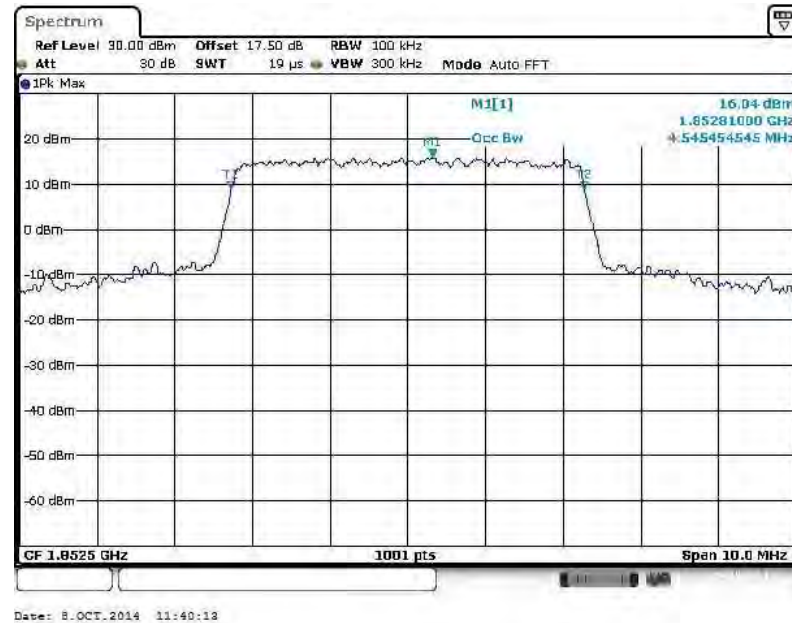
## 26dB Bandwidth Plot on Channel 19185



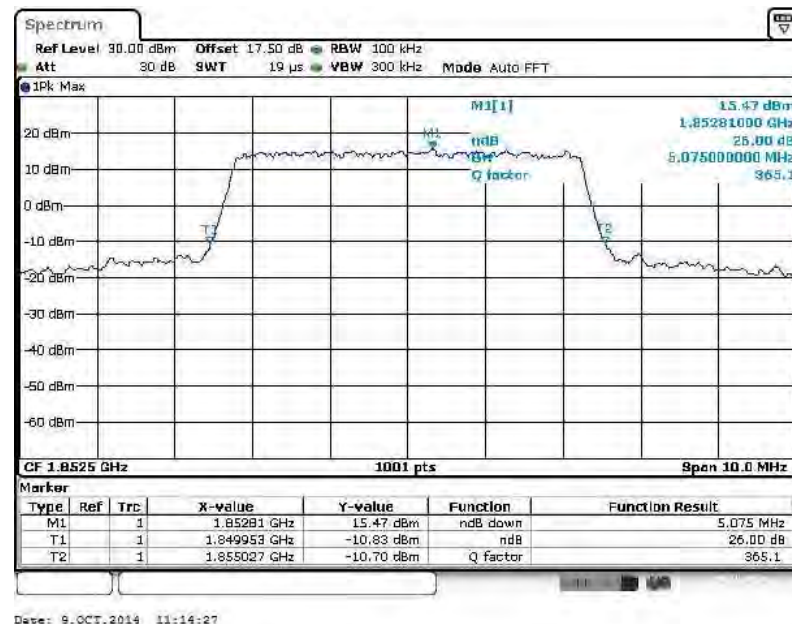


|        |            |             |             |
|--------|------------|-------------|-------------|
| Band : | LTE Band 2 | BW / Mod. : | 5MHz / QPSK |
|--------|------------|-------------|-------------|

## 99% Occupied Bandwidth Plot on Channel 18625

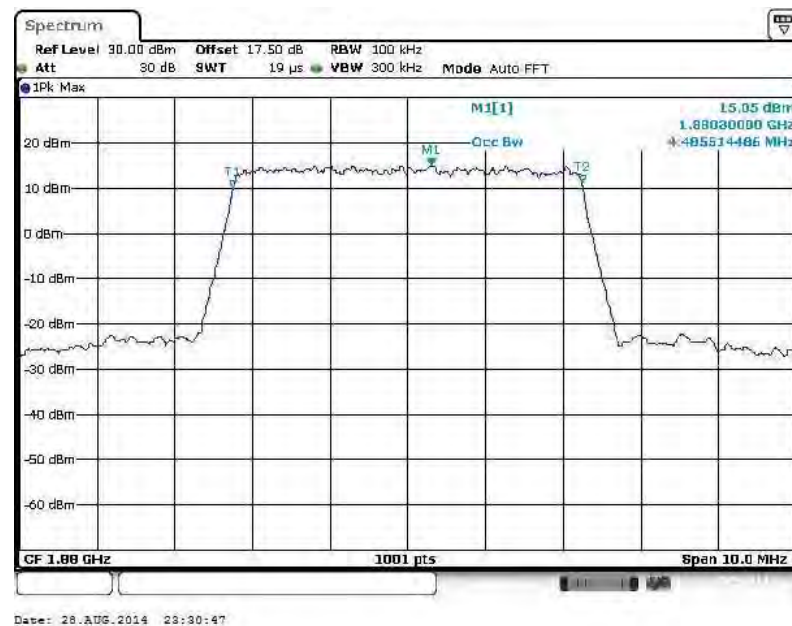


## 26dB Bandwidth Plot on Channel 18625

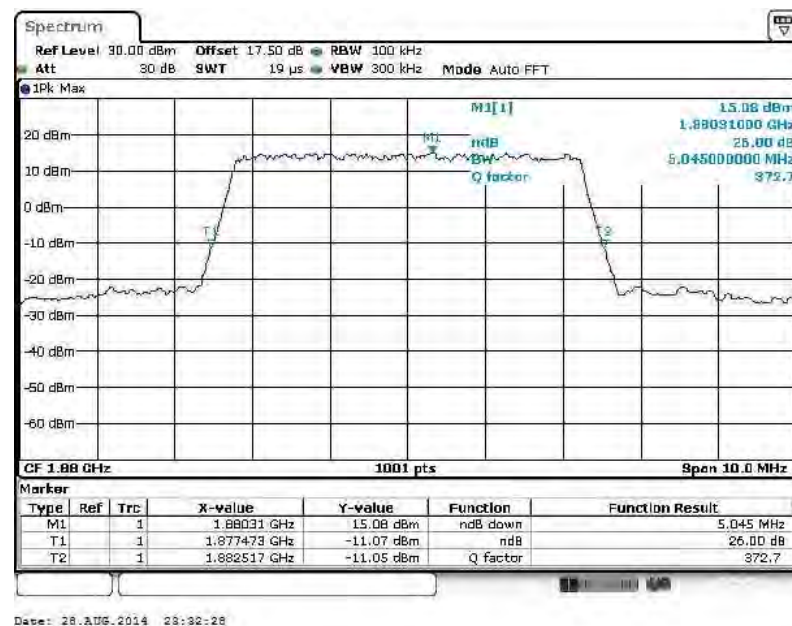




## 99% Occupied Bandwidth Plot on Channel 18900

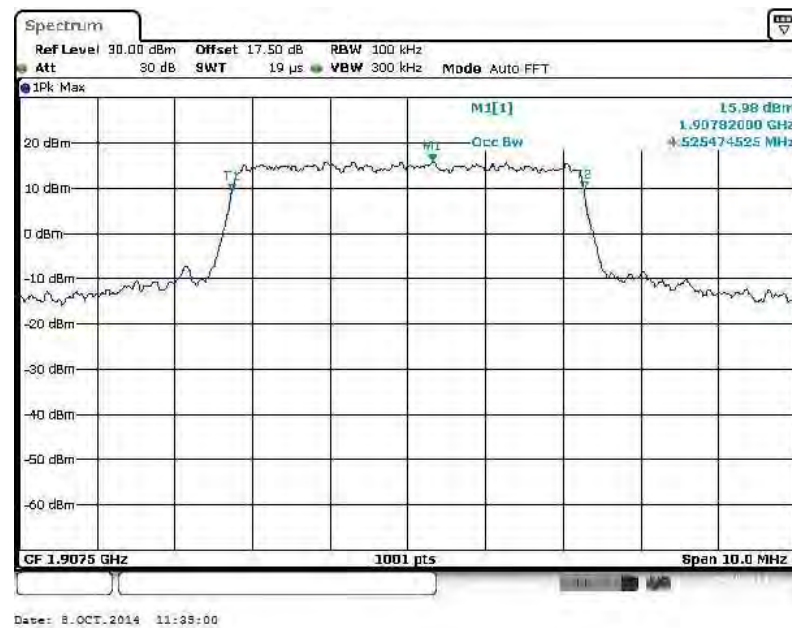


## 26dB Bandwidth Plot on Channel 18900

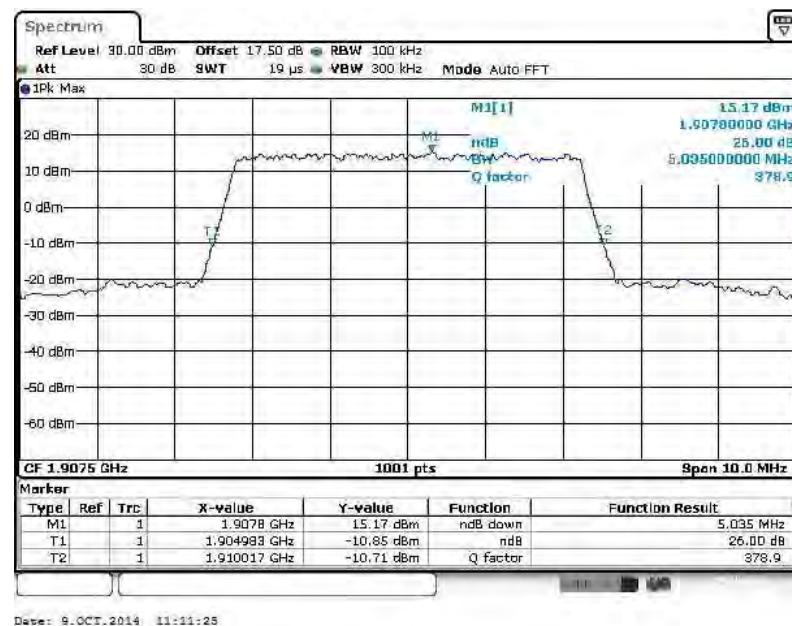




### 99% Occupied Bandwidth Plot on Channel 19175



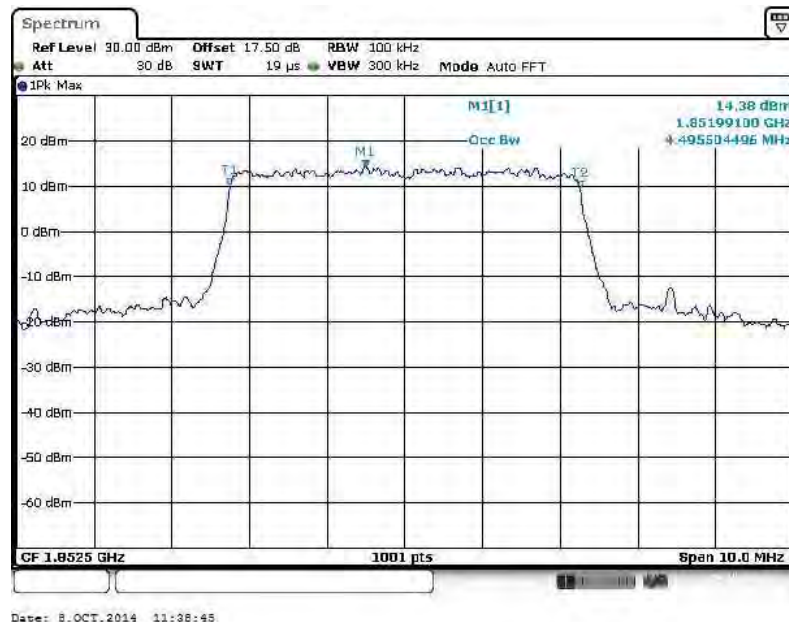
### 26dB Bandwidth Plot on Channel 19175



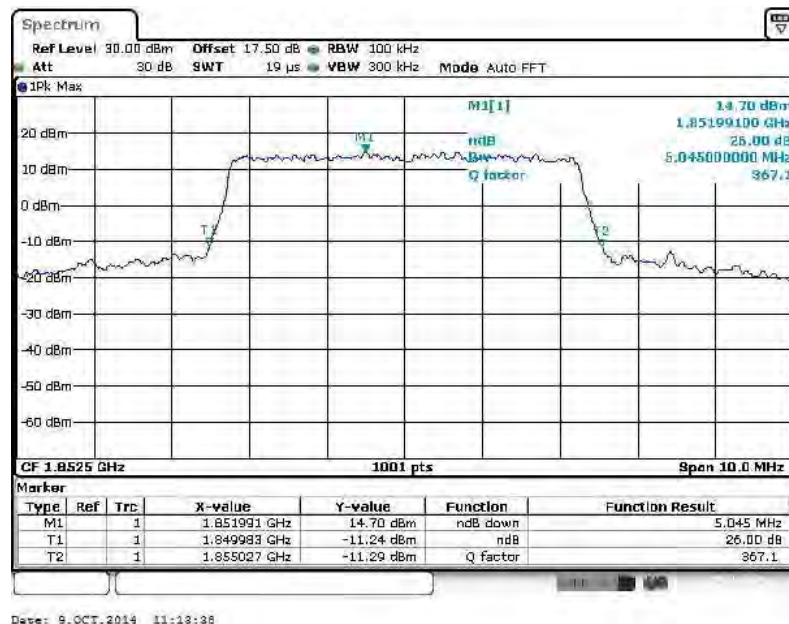


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 2 | BW / Mod. : | 5MHz / 16QAM |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 18625

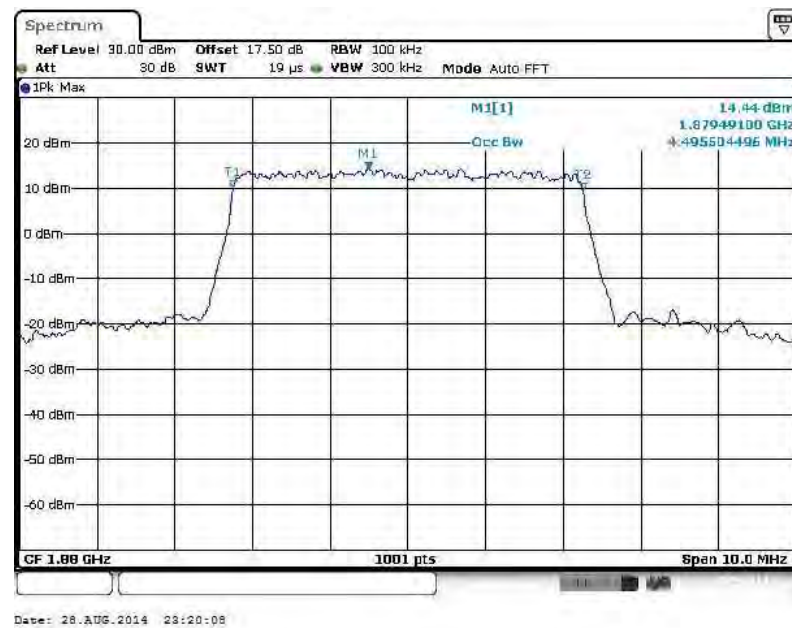


## 26dB Bandwidth Plot on Channel 18625

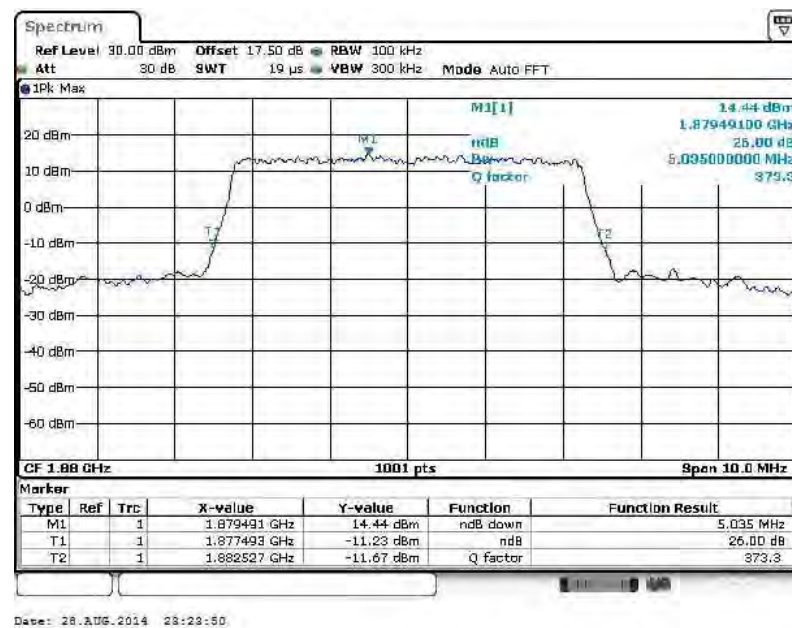




## 99% Occupied Bandwidth Plot on Channel 18900

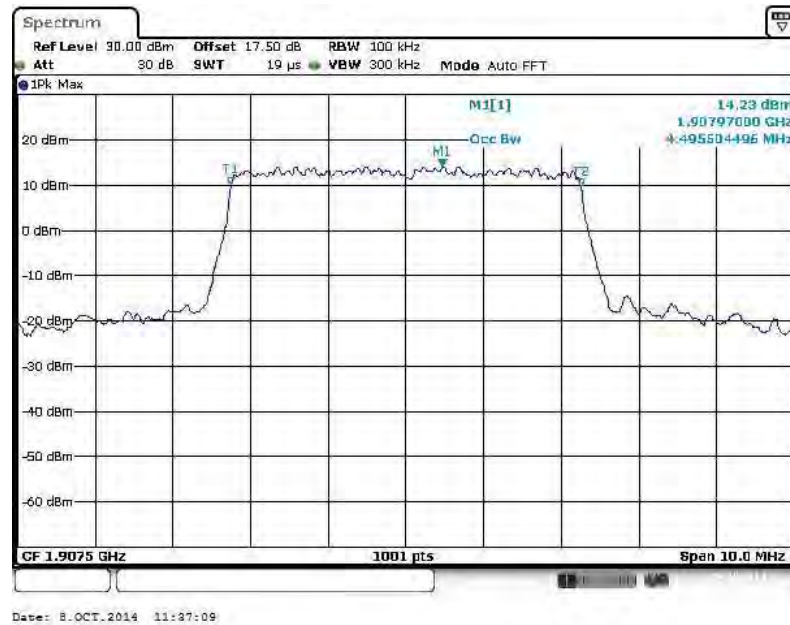


## 26dB Bandwidth Plot on Channel 18900

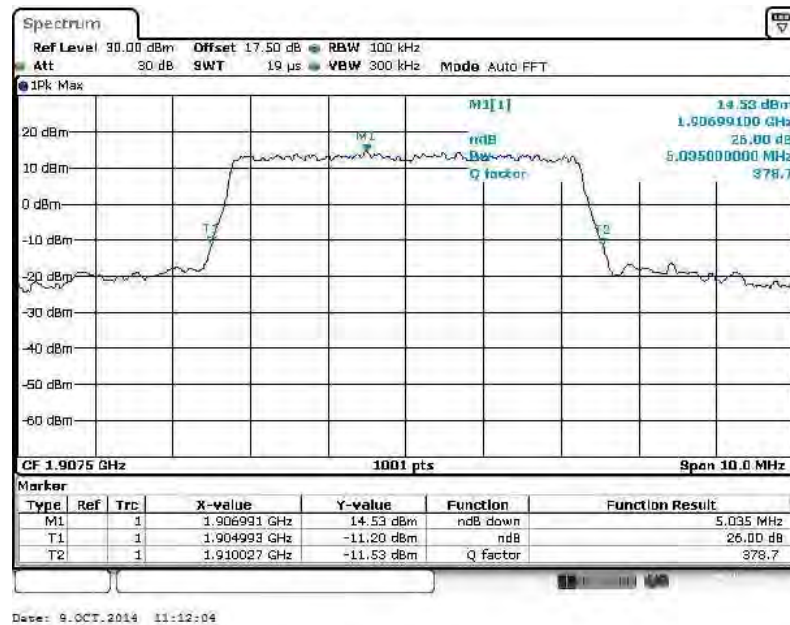




## 99% Occupied Bandwidth Plot on Channel 19175



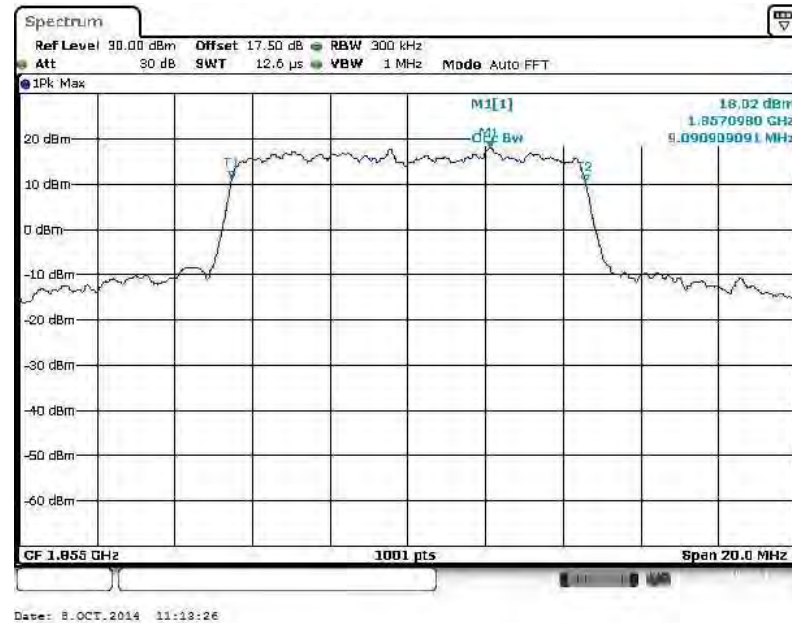
## 26dB Bandwidth Plot on Channel 19175



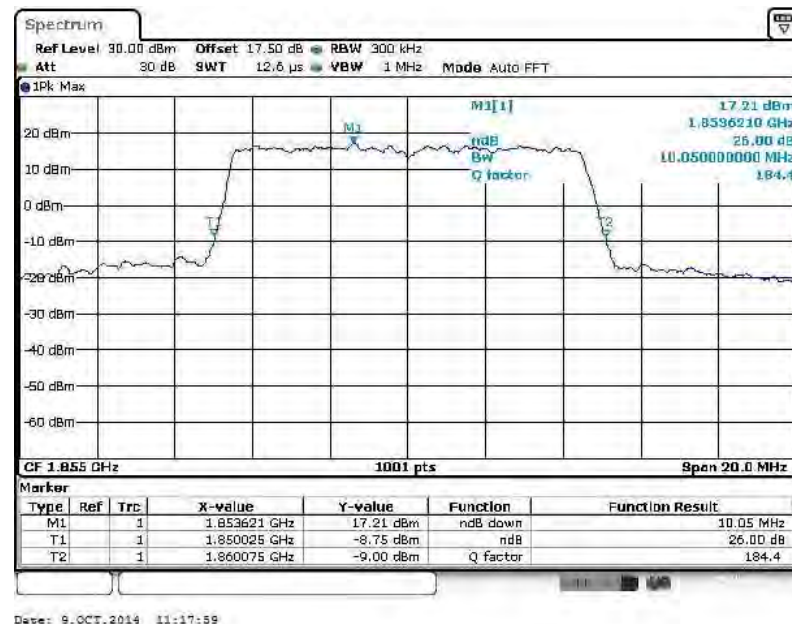


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 2 | BW / Mod. : | 10MHz / QPSK |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 18650

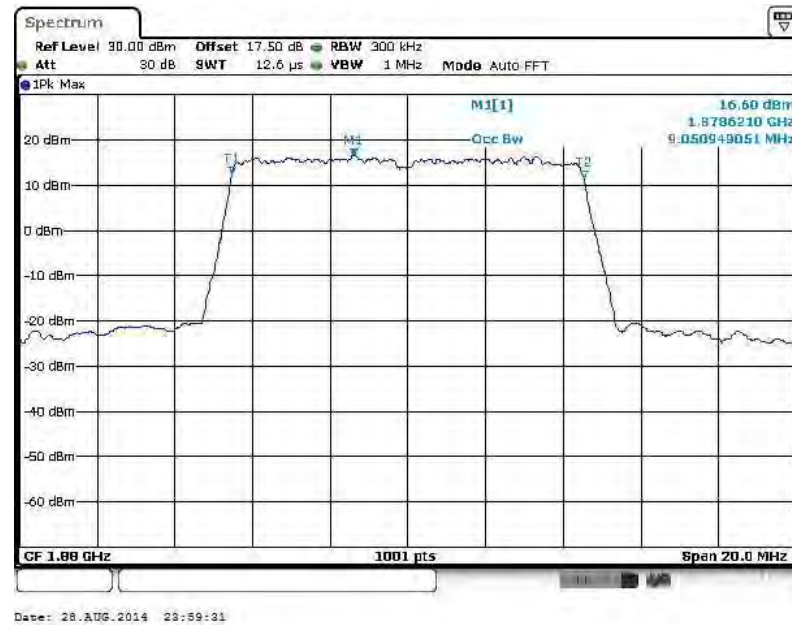


## 26dB Bandwidth Plot on Channel 18650

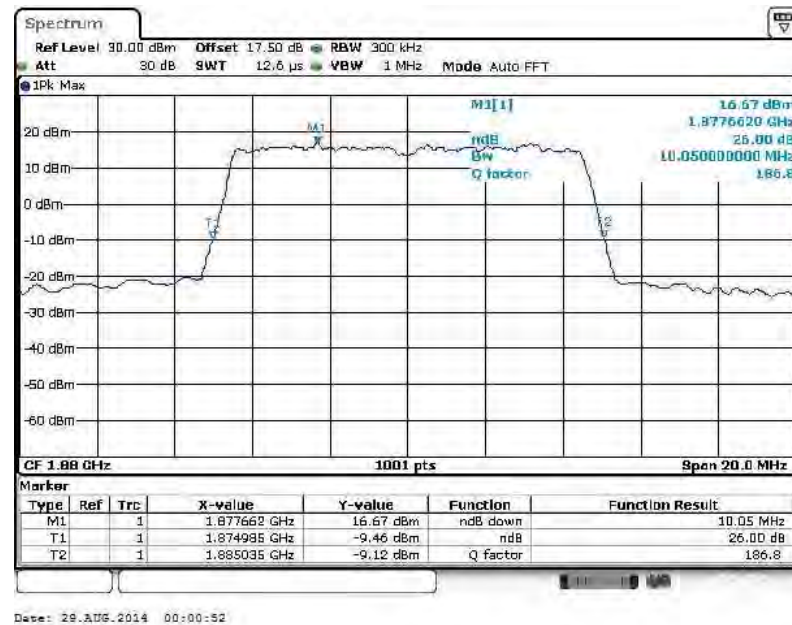




## 99% Occupied Bandwidth Plot on Channel 18900

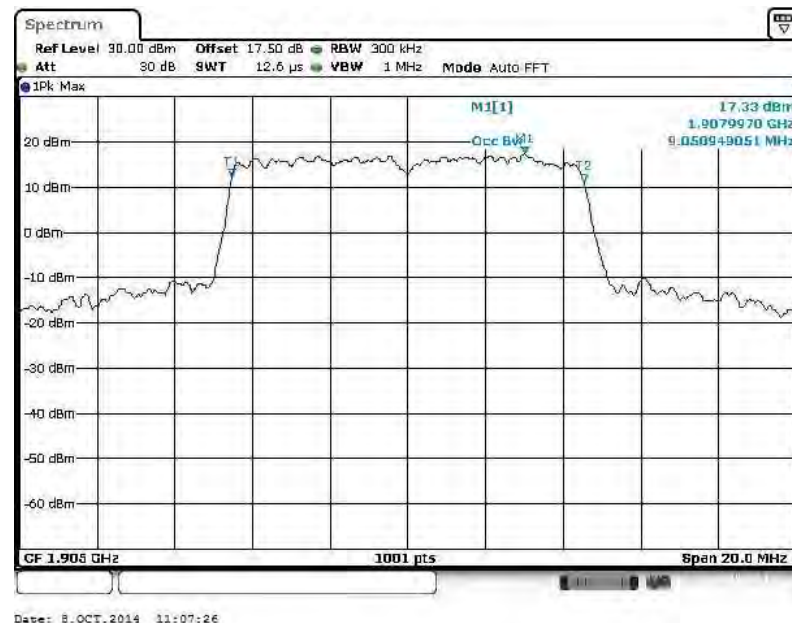


## 26dB Bandwidth Plot on Channel 18900

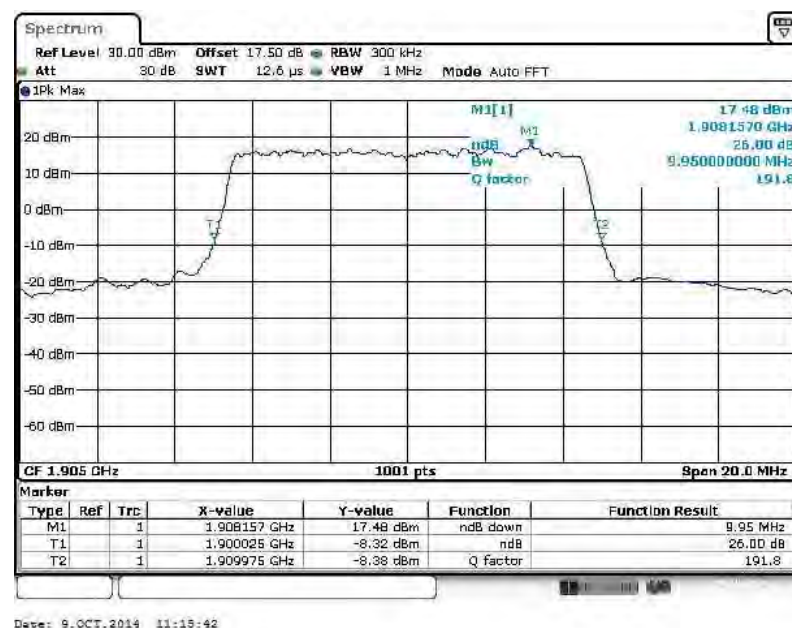




## 99% Occupied Bandwidth Plot on Channel 19150



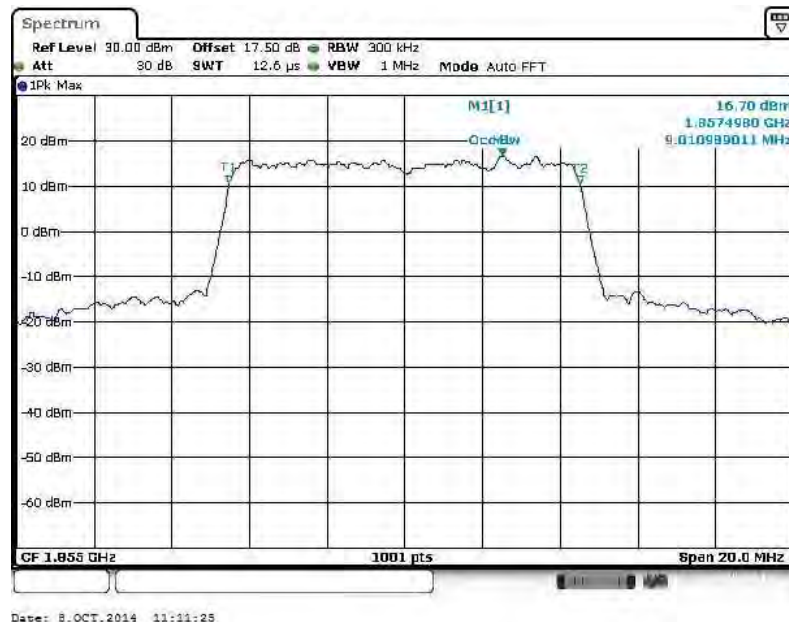
## 26dB Bandwidth Plot on Channel 19150



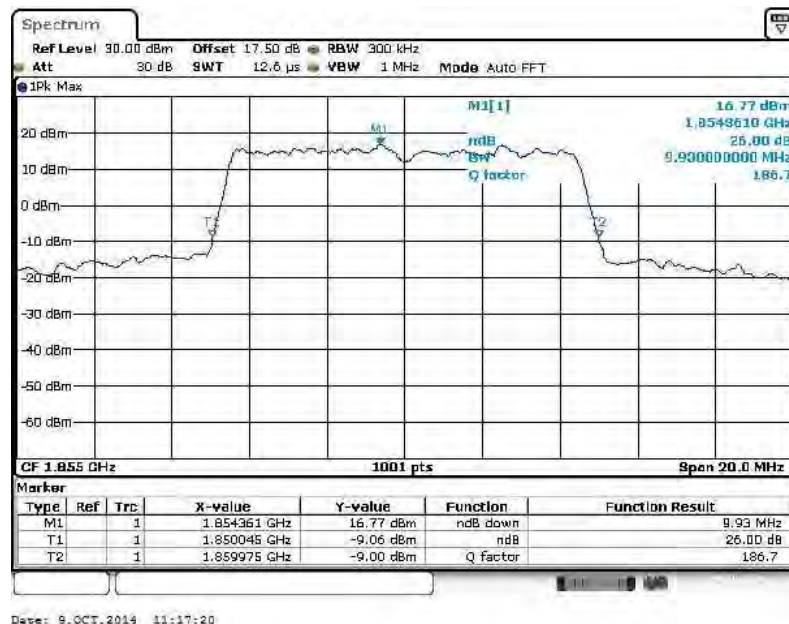


|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 2 | BW / Mod. : | 10MHz / 16QAM |
|--------|------------|-------------|---------------|

## 99% Occupied Bandwidth Plot on Channel 18650

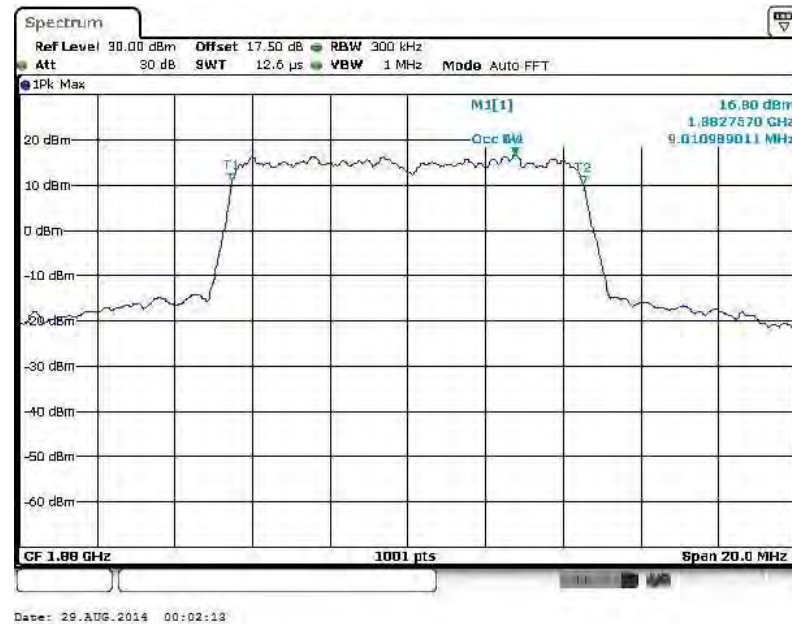


## 26dB Bandwidth Plot on Channel 18650

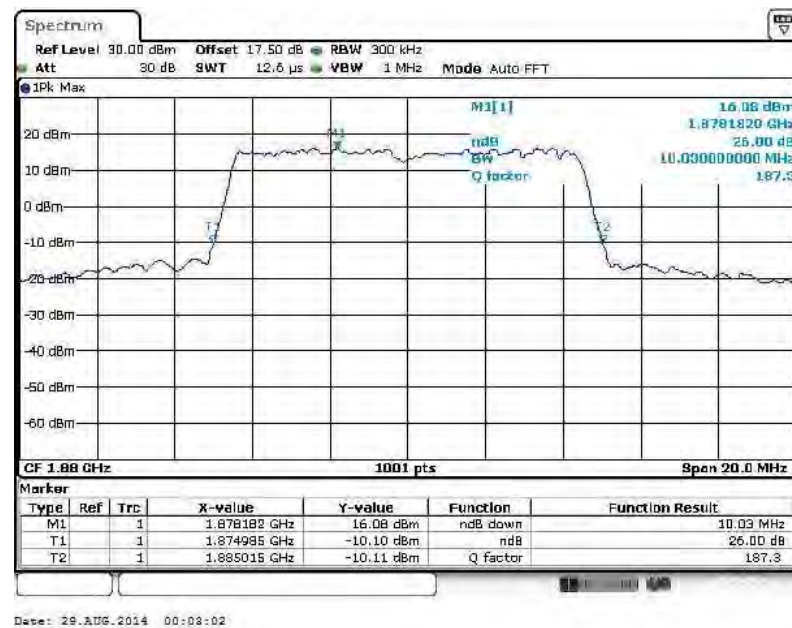




99% Occupied Bandwidth Plot on Channel 18900

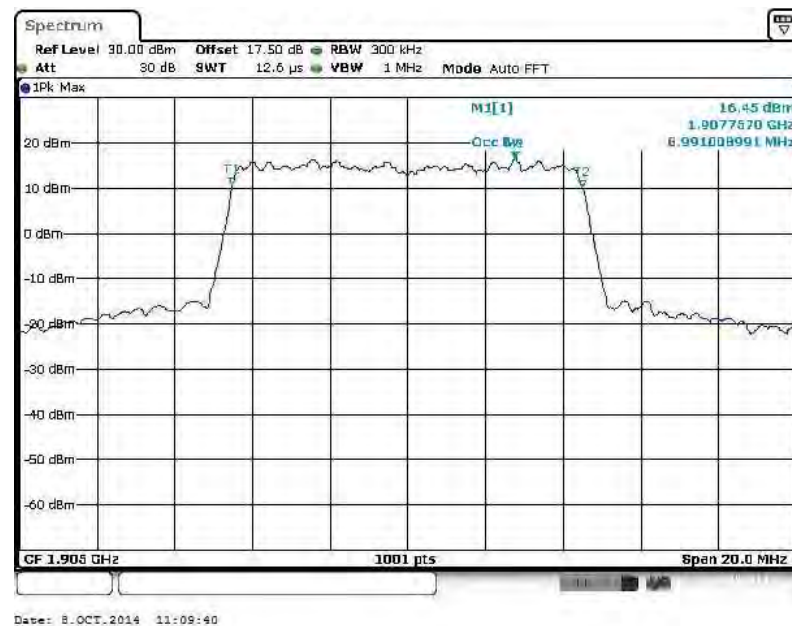


26dB Bandwidth Plot on Channel 18900

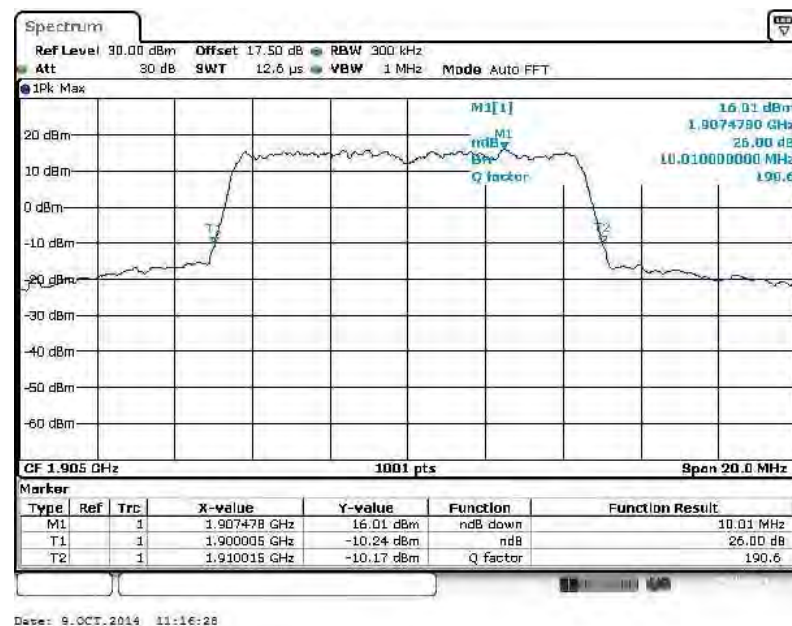




## 99% Occupied Bandwidth Plot on Channel 19150



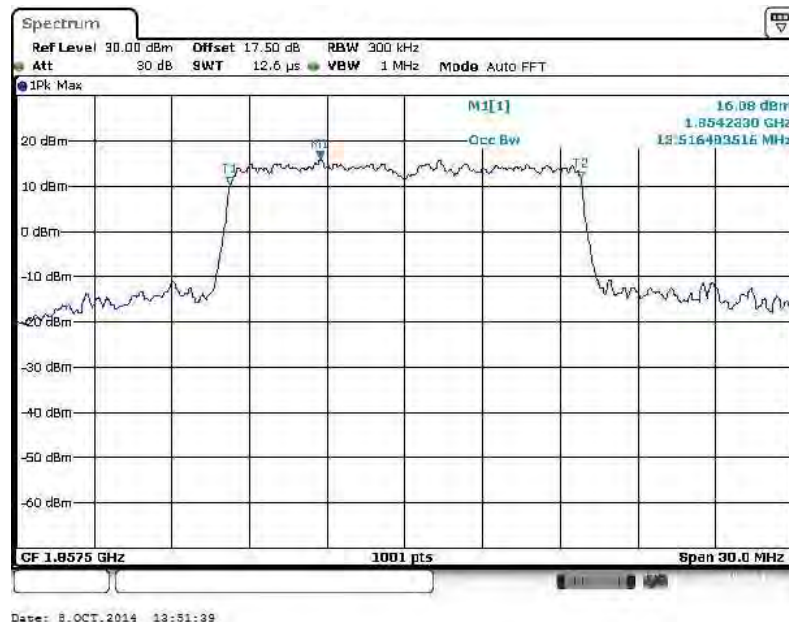
## 26dB Bandwidth Plot on Channel 19150



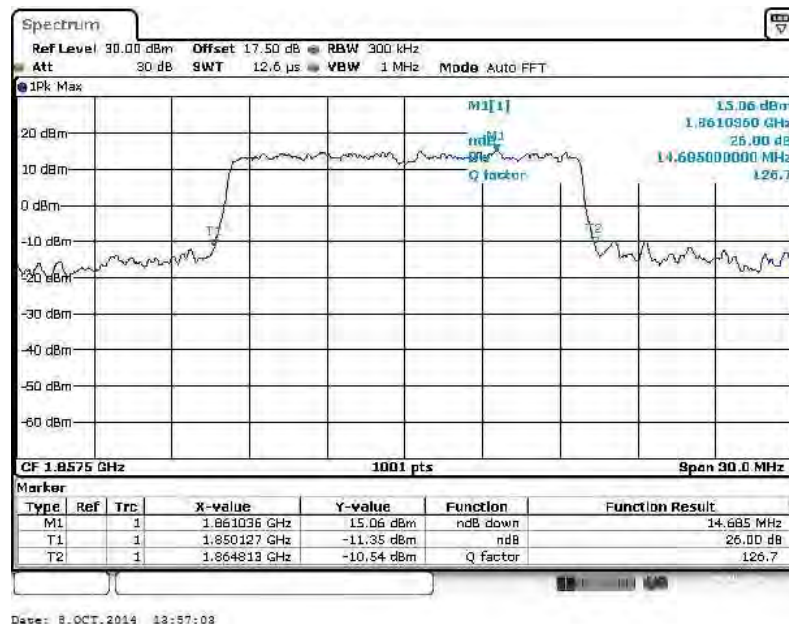


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 2 | BW / Mod. : | 15MHz / QPSK |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 18675

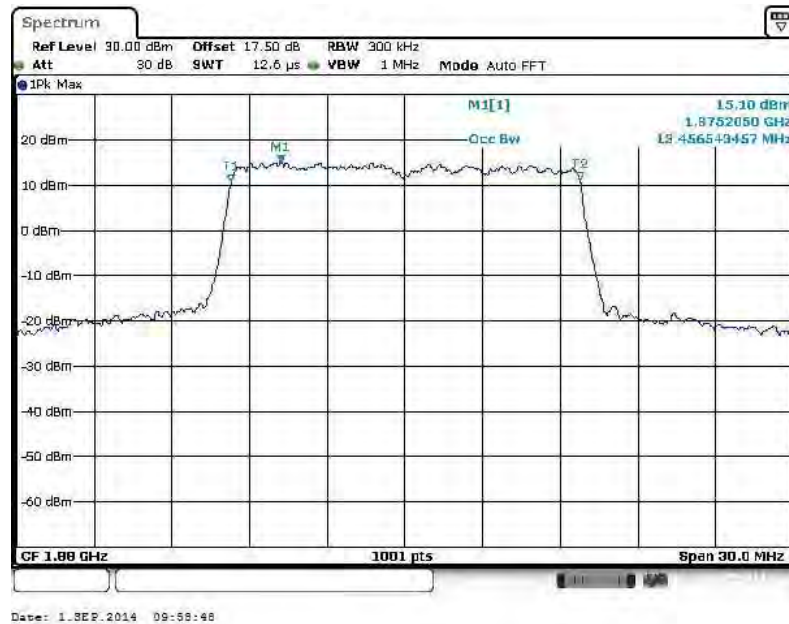


## 26dB Bandwidth Plot on Channel 18675

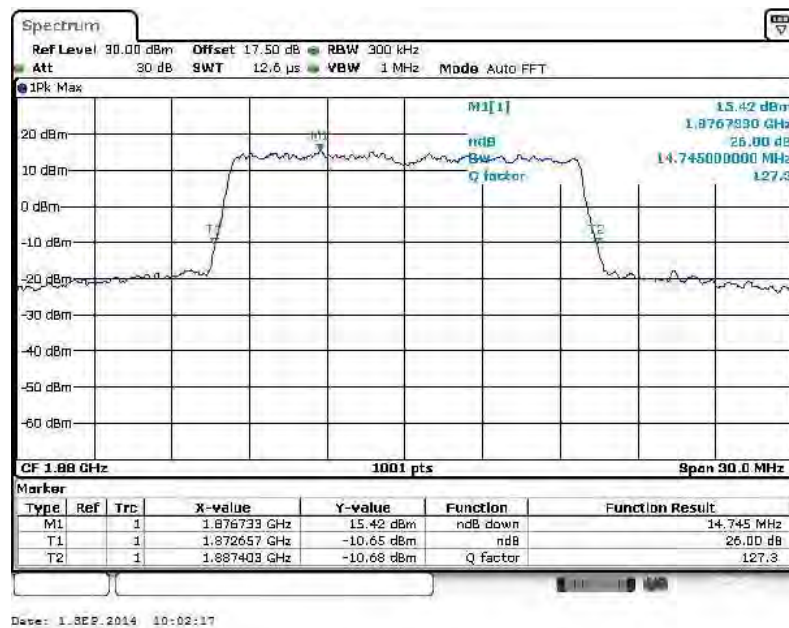




## 99% Occupied Bandwidth Plot on Channel 18900

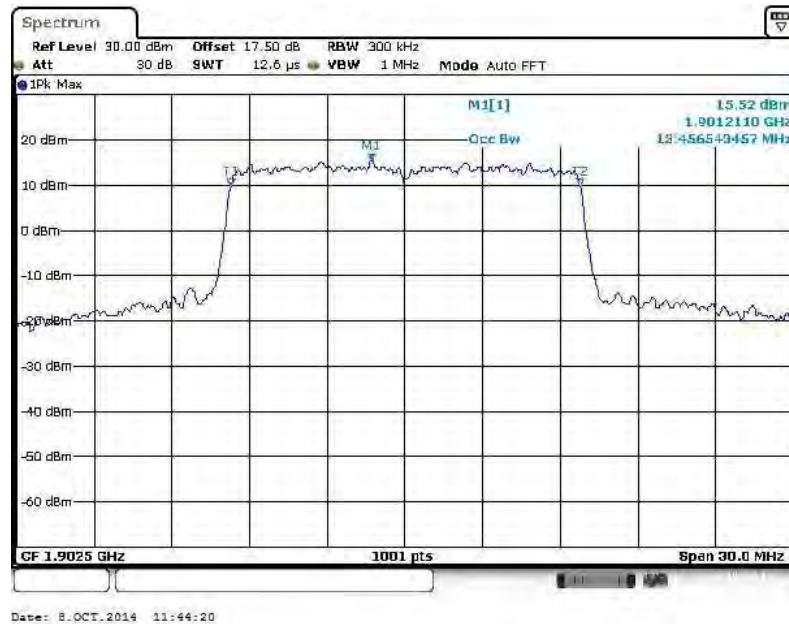


## 26dB Bandwidth Plot on Channel 18900

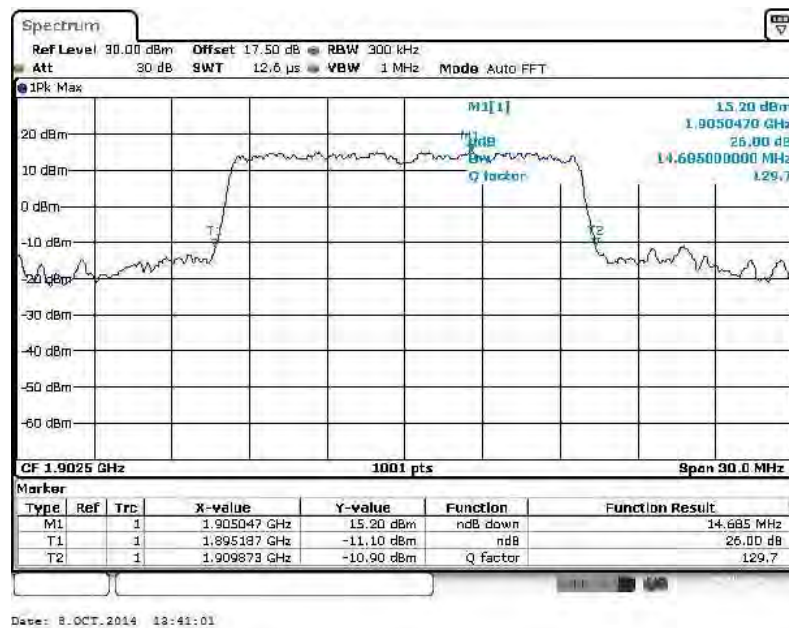




### 99% Occupied Bandwidth Plot on Channel 19125

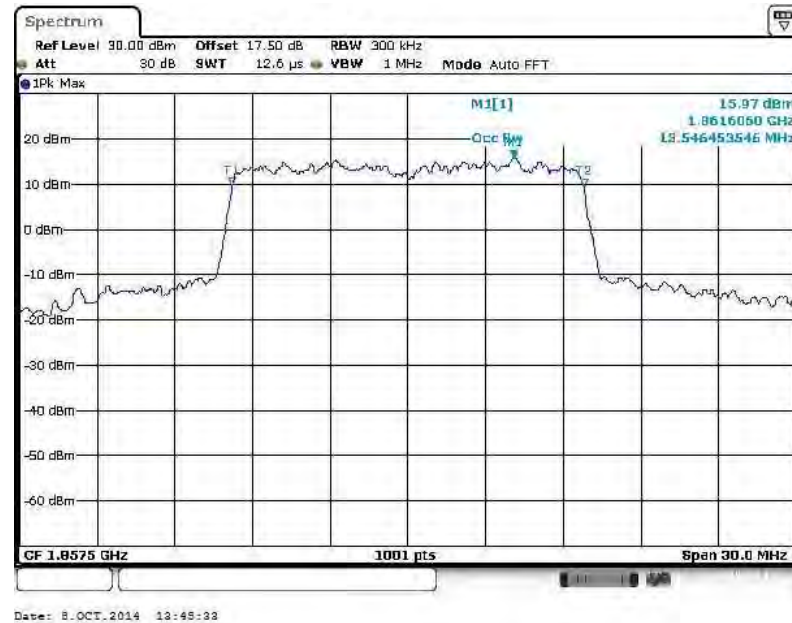


### 26dB Bandwidth Plot on Channel 19125

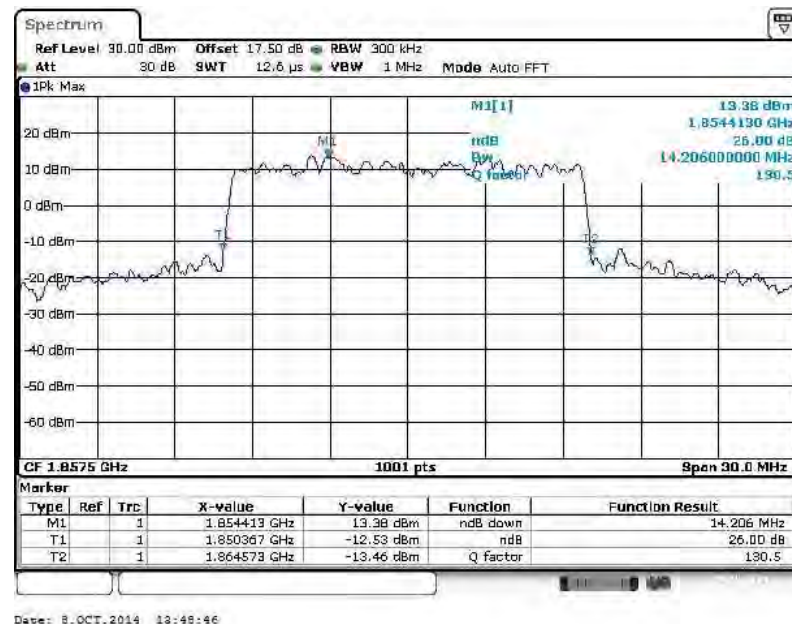


|               |            |                    |               |
|---------------|------------|--------------------|---------------|
| <b>Band :</b> | LTE Band 2 | <b>BW / Mod. :</b> | 15MHz / 16QAM |
|---------------|------------|--------------------|---------------|

### 99% Occupied Bandwidth Plot on Channel 18675

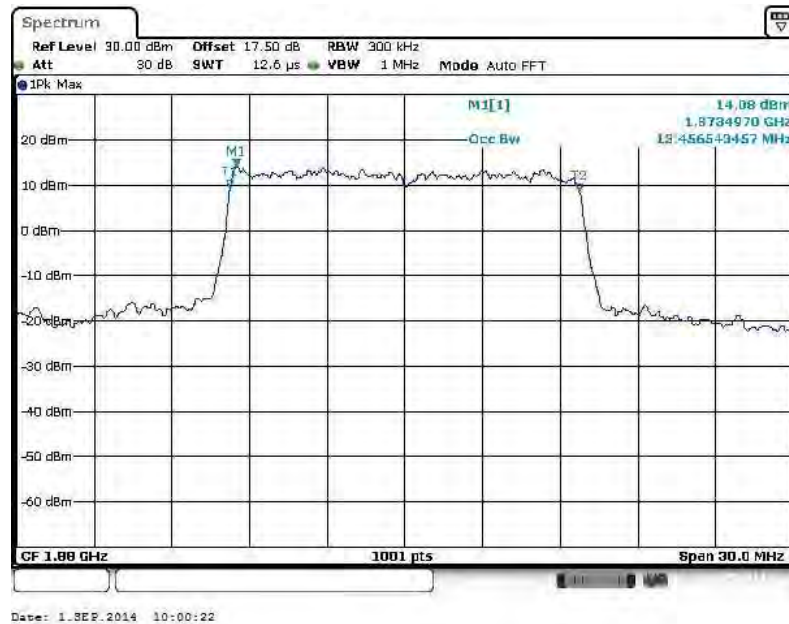


### 26dB Bandwidth Plot on Channel 18675

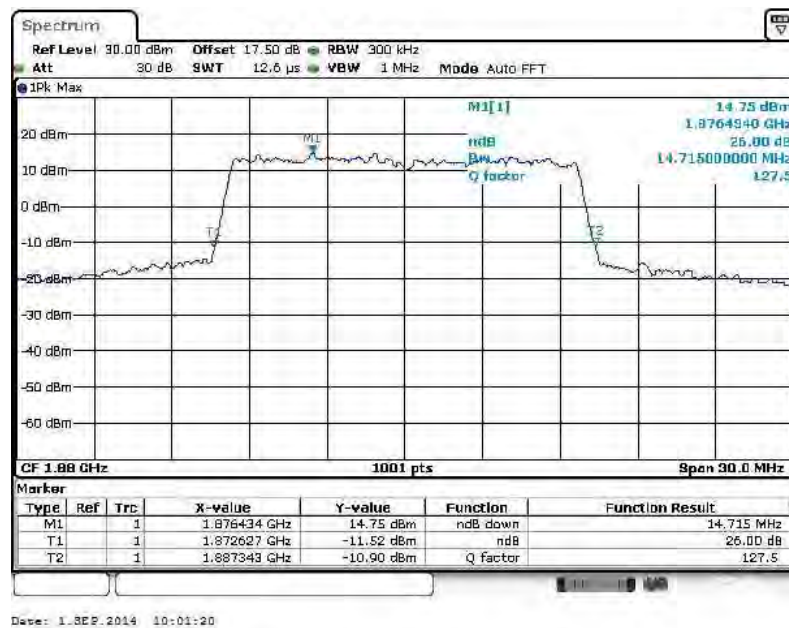




## 99% Occupied Bandwidth Plot on Channel 18900

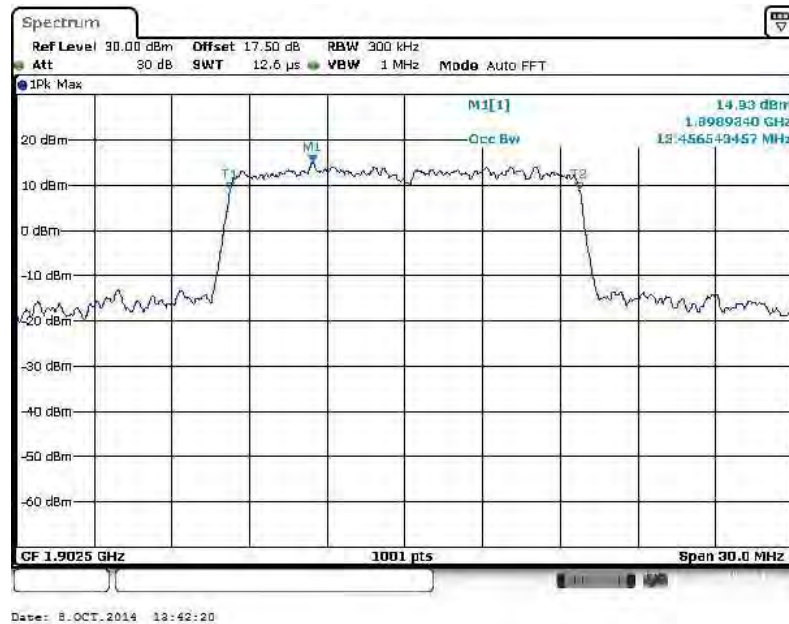


## 26dB Bandwidth Plot on Channel 18900

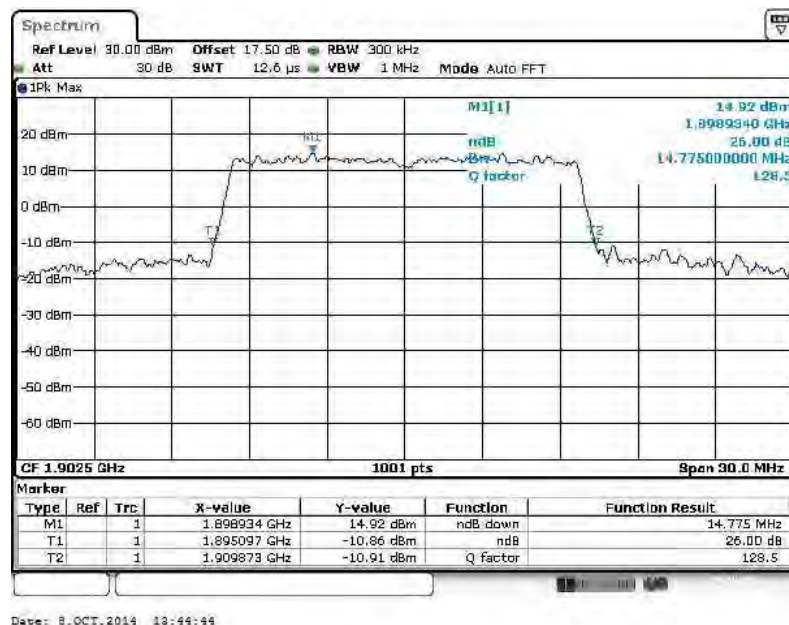




### 99% Occupied Bandwidth Plot on Channel 19125



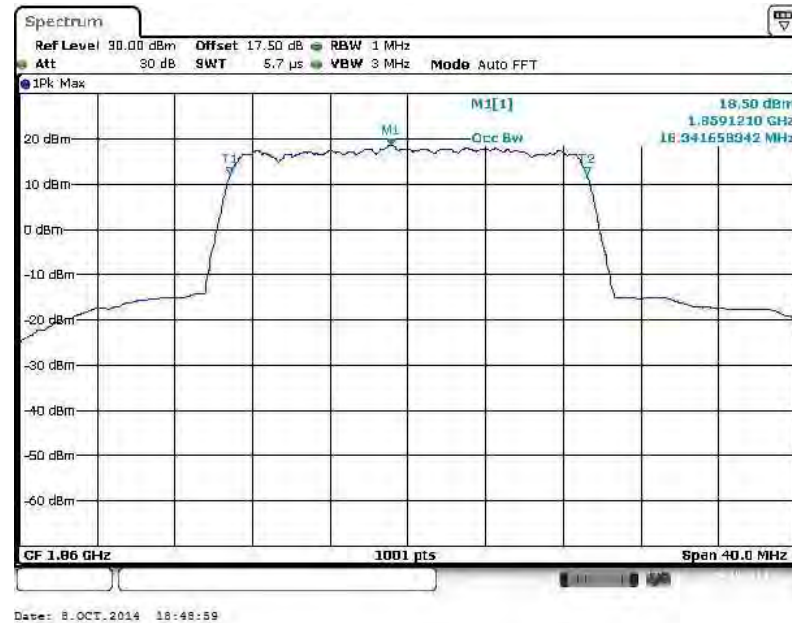
### 26dB Bandwidth Plot on Channel 19125



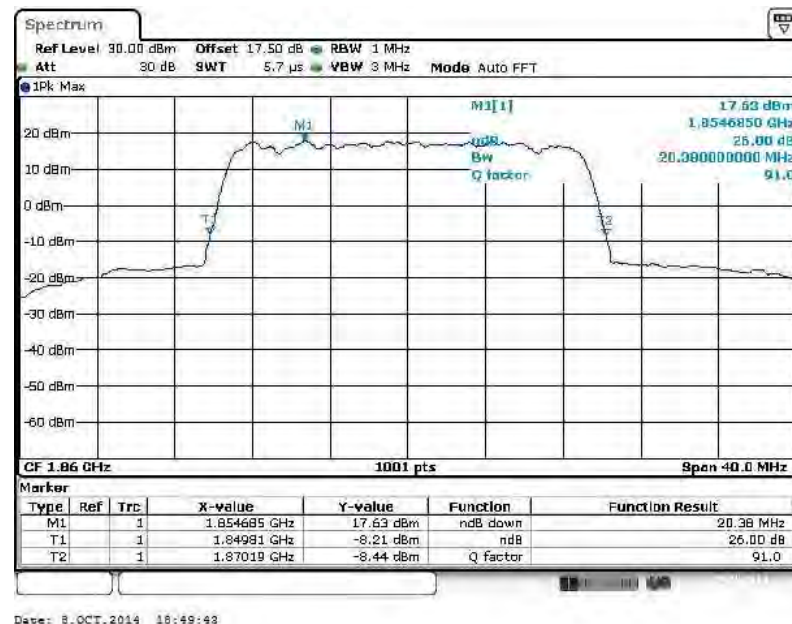


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 2 | BW / Mod. : | 20MHz / QPSK |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 18700

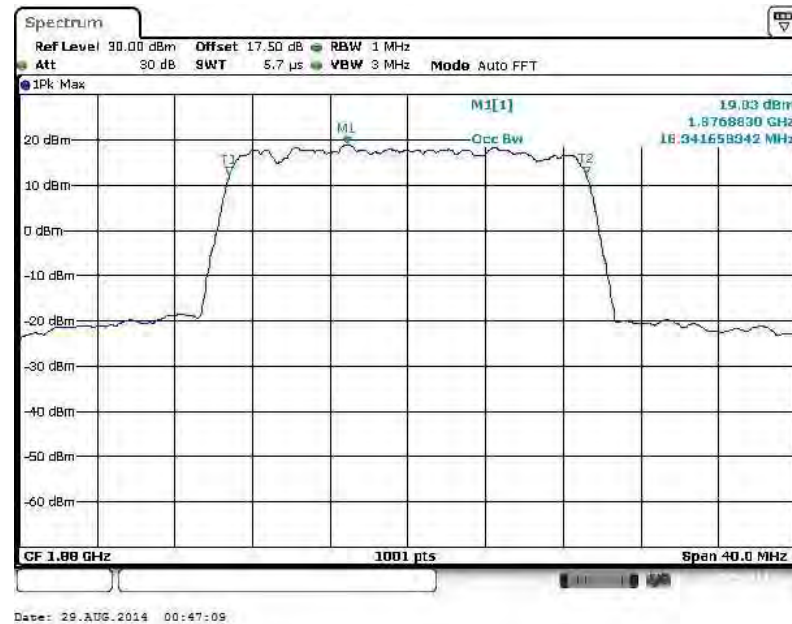


## 26dB Bandwidth Plot on Channel 18700

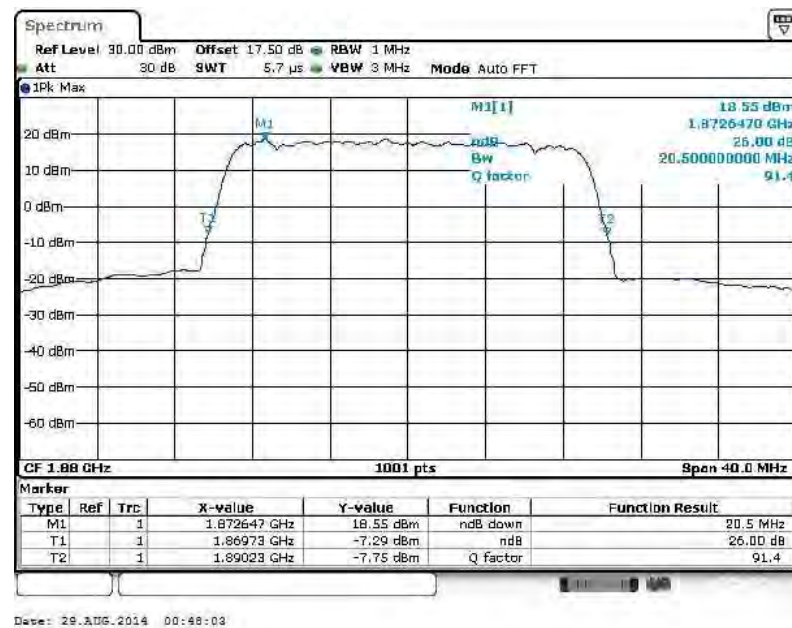




99% Occupied Bandwidth Plot on Channel 18900

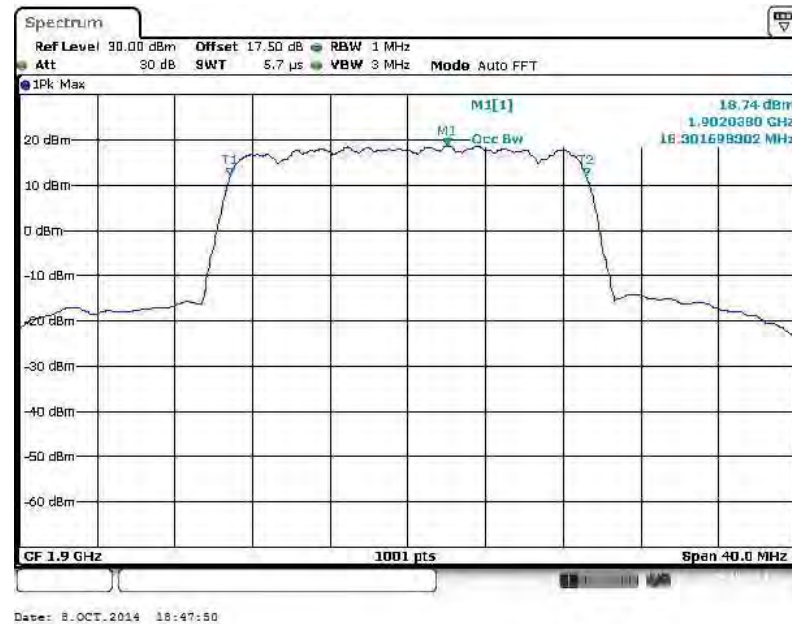


26dB Bandwidth Plot on Channel 18900

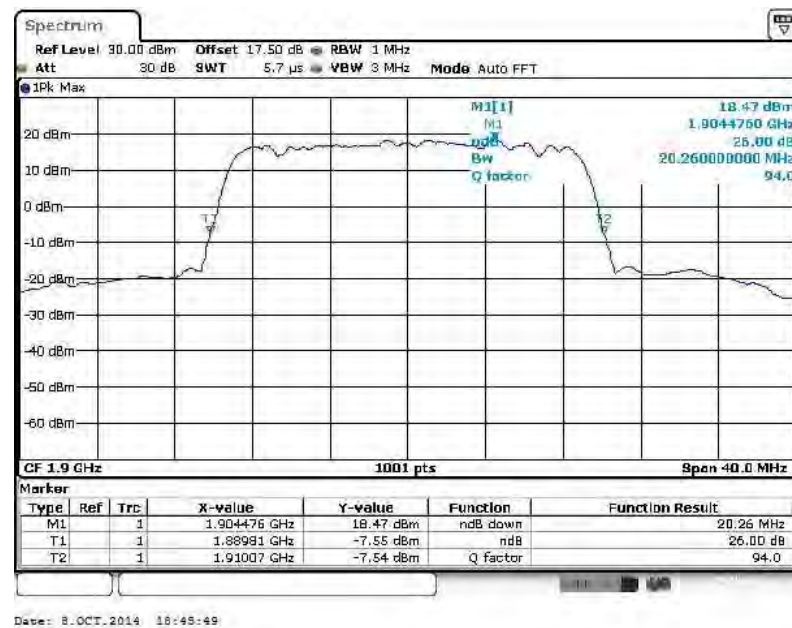




99% Occupied Bandwidth Plot on Channel 19100



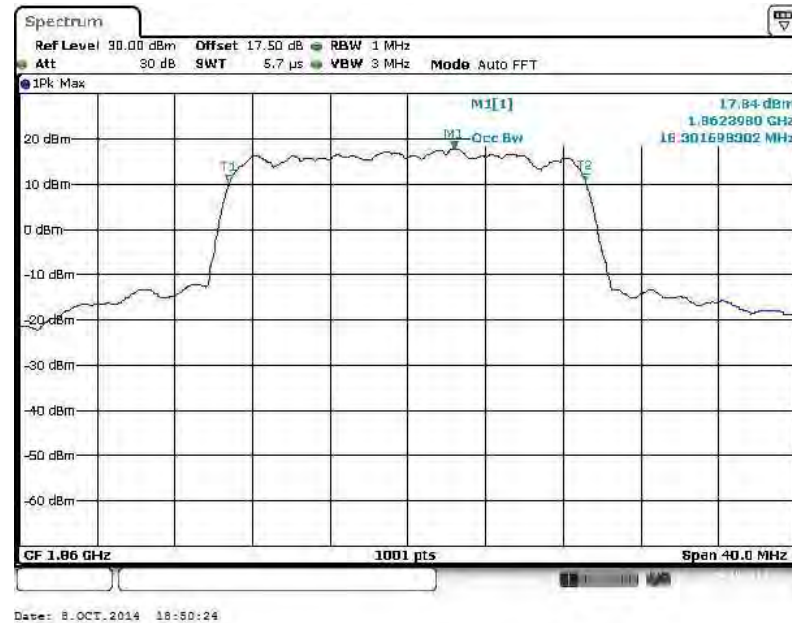
26dB Bandwidth Plot on Channel 19100



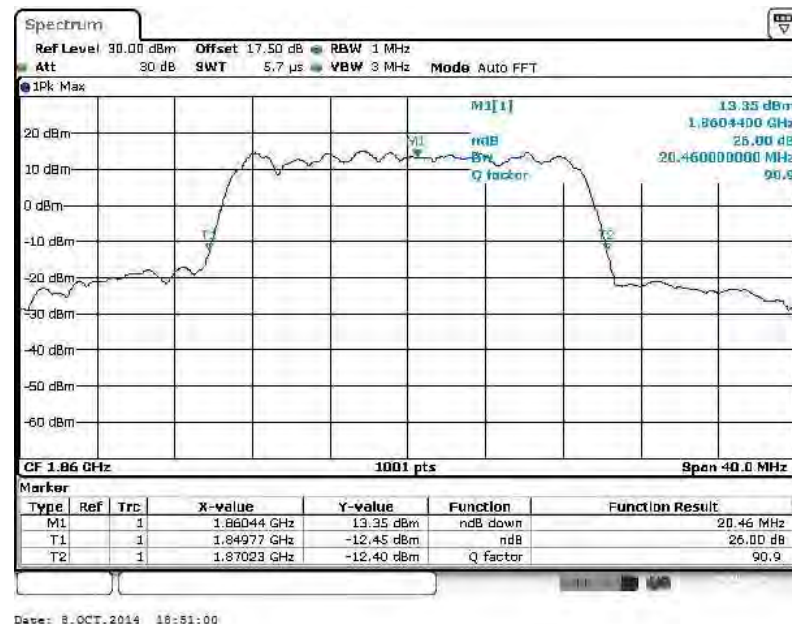


|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 2 | BW / Mod. : | 20MHz / 16QAM |
|--------|------------|-------------|---------------|

## 99% Occupied Bandwidth Plot on Channel 18700

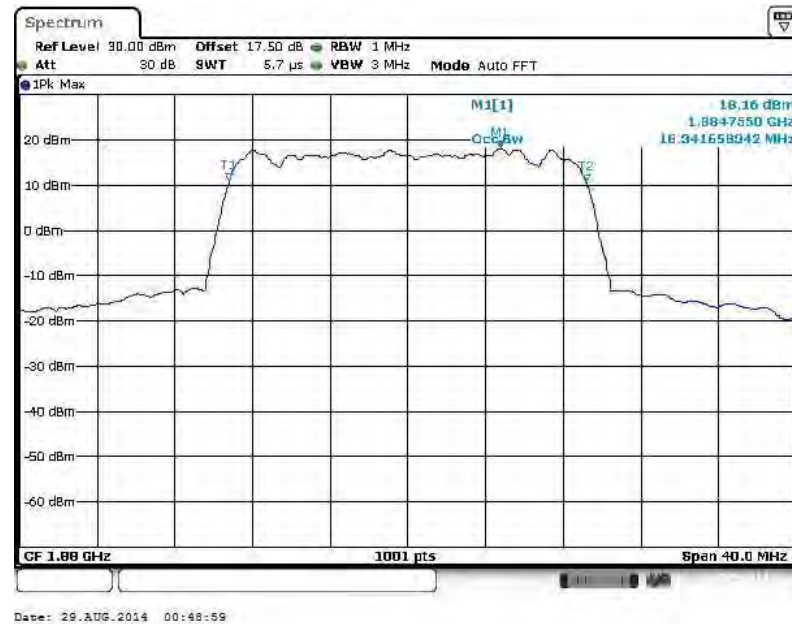


## 26dB Bandwidth Plot on Channel 18700

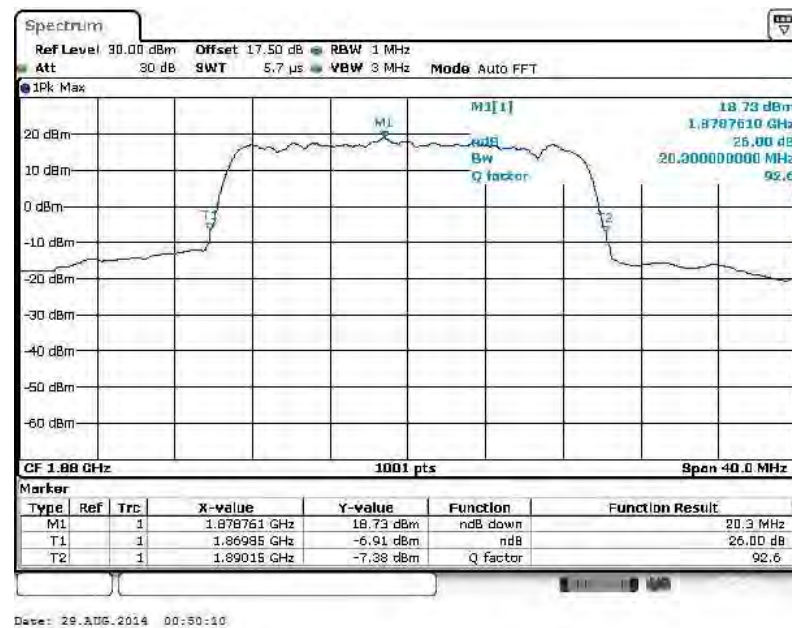




## 99% Occupied Bandwidth Plot on Channel 18900

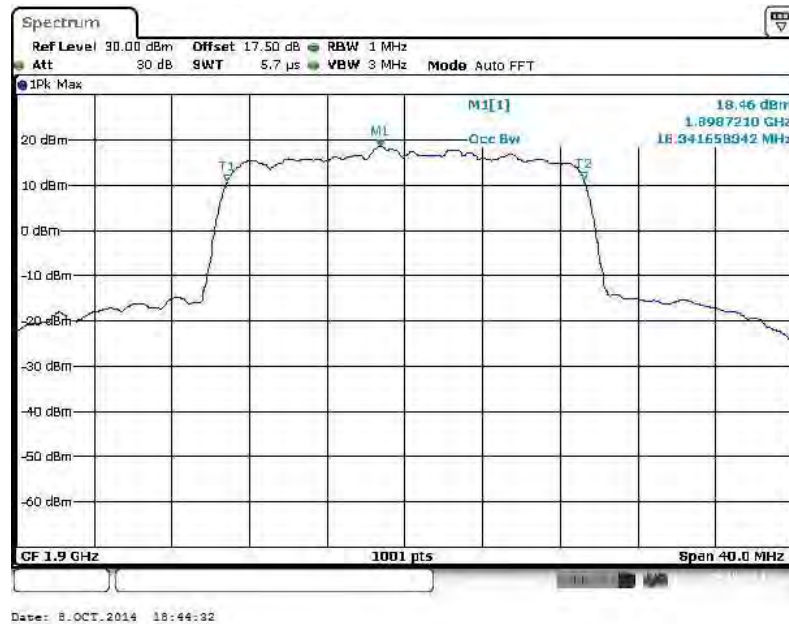


## 26dB Bandwidth Plot on Channel 18900

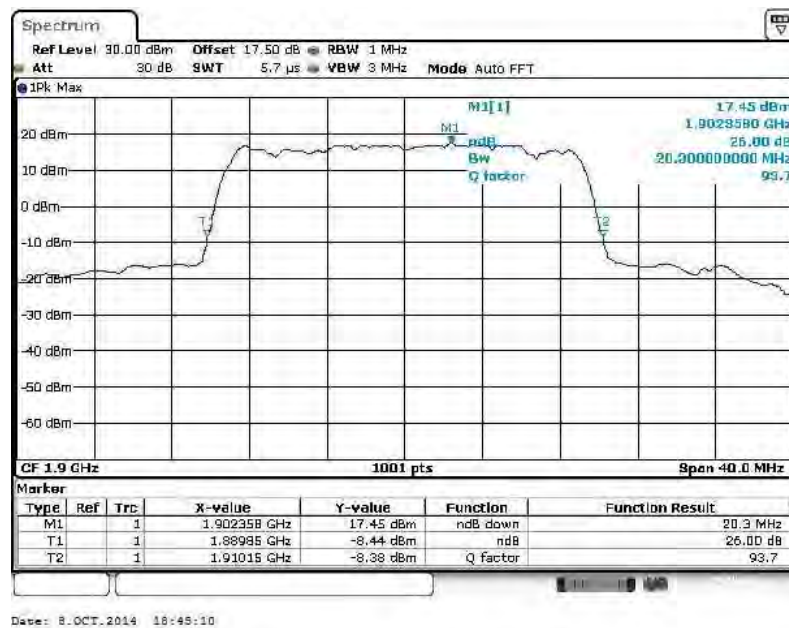




99% Occupied Bandwidth Plot on Channel 19100



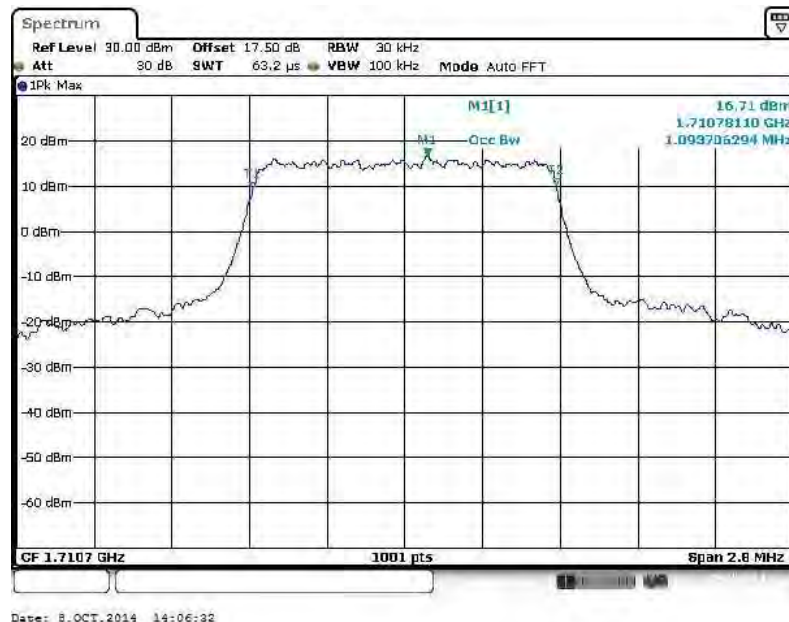
26dB Bandwidth Plot on Channel 19100



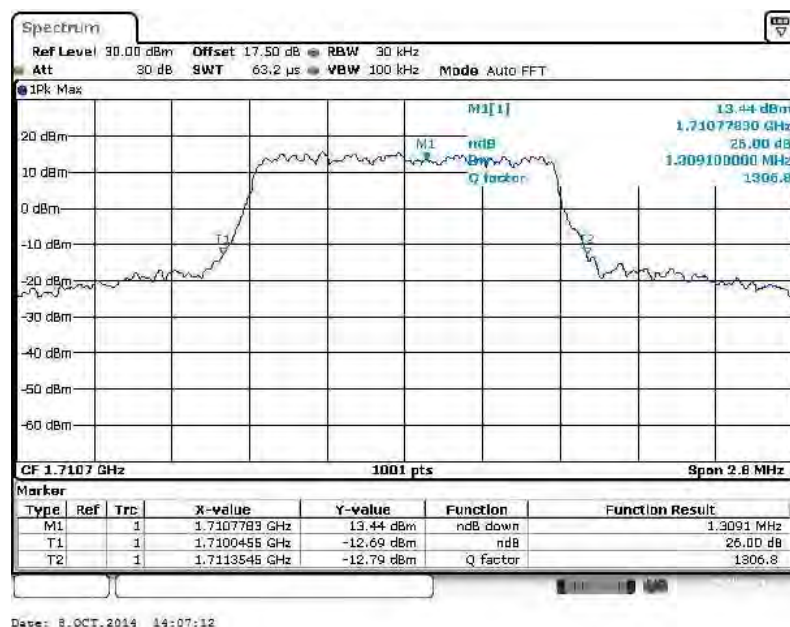


|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 4 | BW / Mod. : | 1.4MHz / QPSK |
|--------|------------|-------------|---------------|

## 99% Occupied Bandwidth Plot on Channel 19957

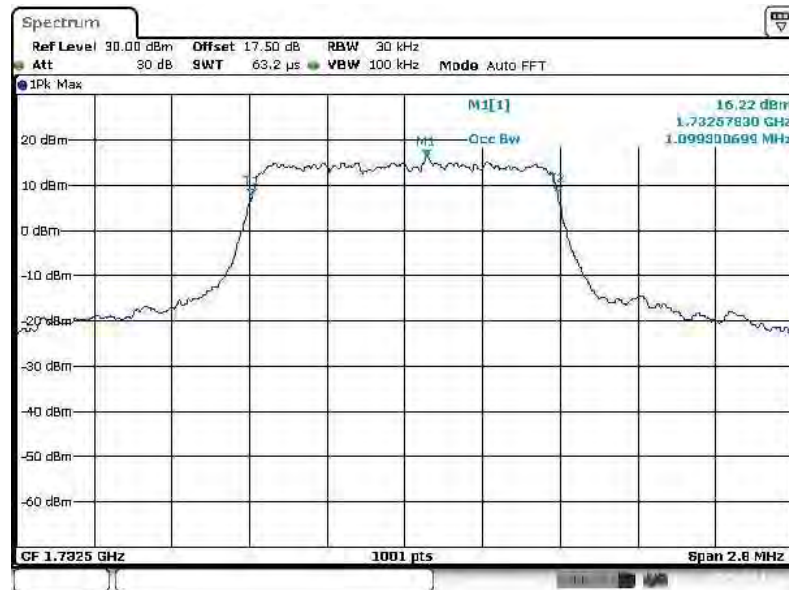


## 26dB Bandwidth Plot on Channel 19957



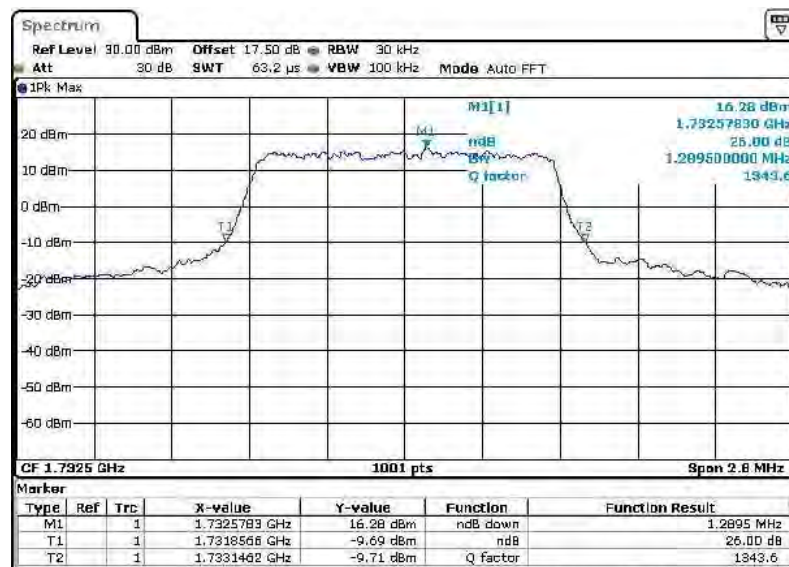


### 99% Occupied Bandwidth Plot on Channel 20175



Date: 29.AUG.2014 14:20:31

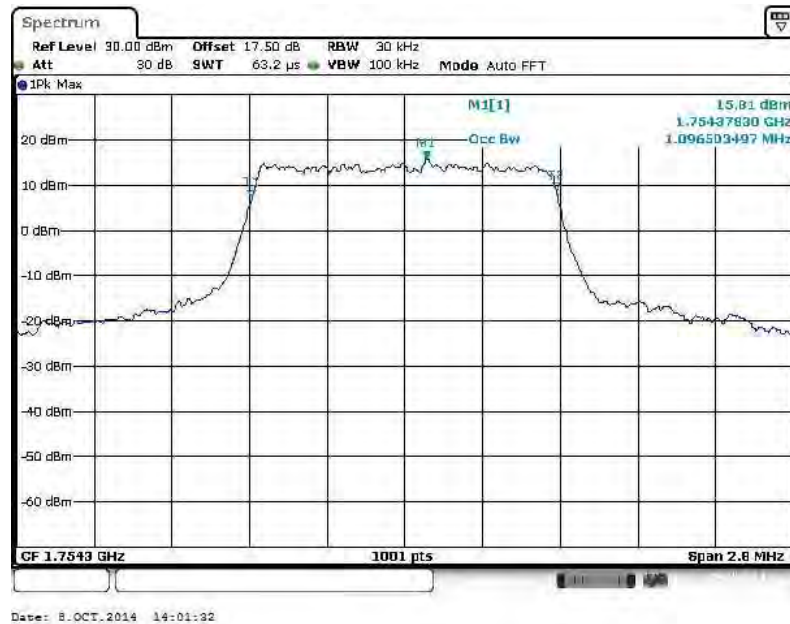
### 26dB Bandwidth Plot on Channel 20175



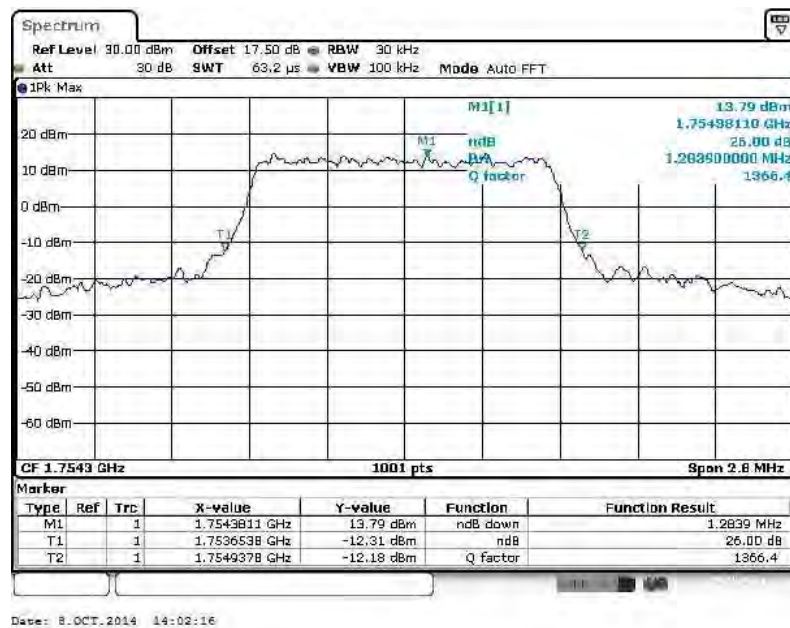
Date: 29.AUG.2014 14:21:04



99% Occupied Bandwidth Plot on Channel 20393



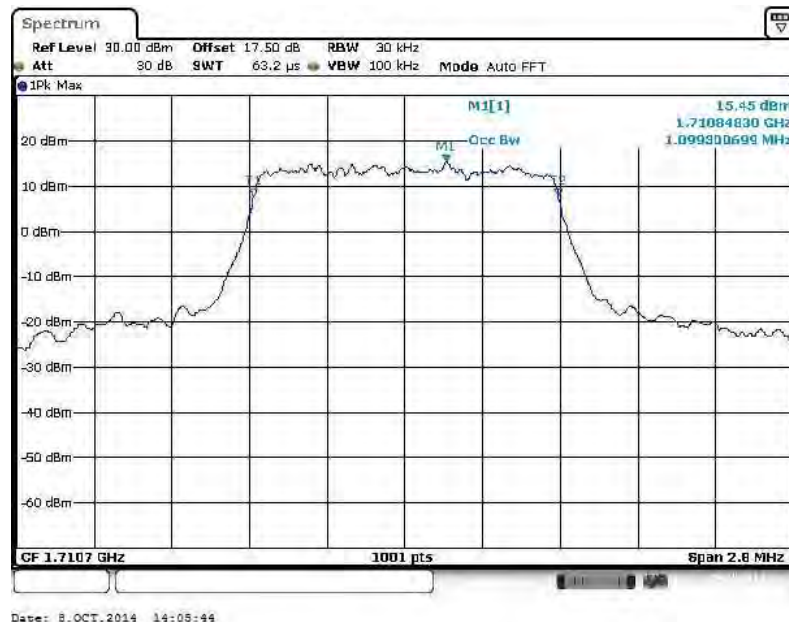
26dB Bandwidth Plot on Channel 20393



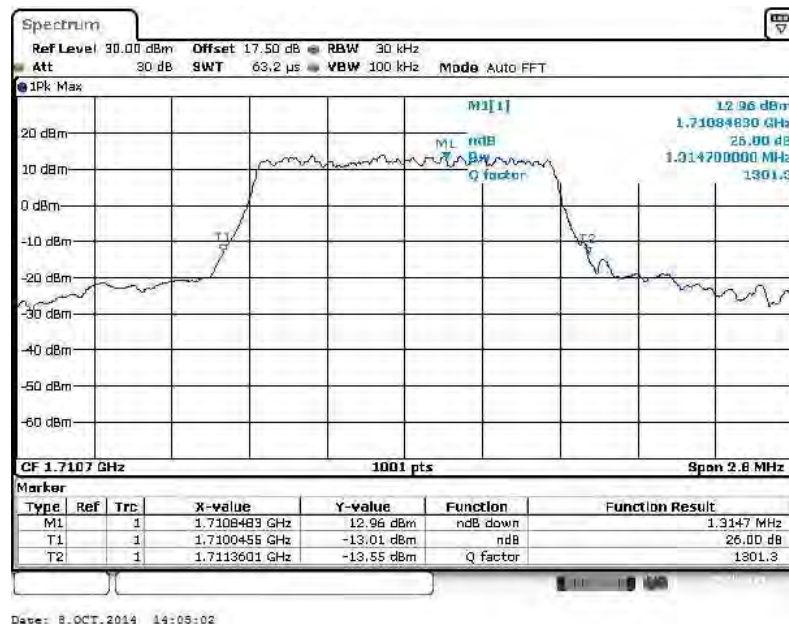


|        |            |             |                |
|--------|------------|-------------|----------------|
| Band : | LTE Band 4 | BW / Mod. : | 1.4MHz / 16QAM |
|--------|------------|-------------|----------------|

## 99% Occupied Bandwidth Plot on Channel 19957



## 26dB Bandwidth Plot on Channel 19957

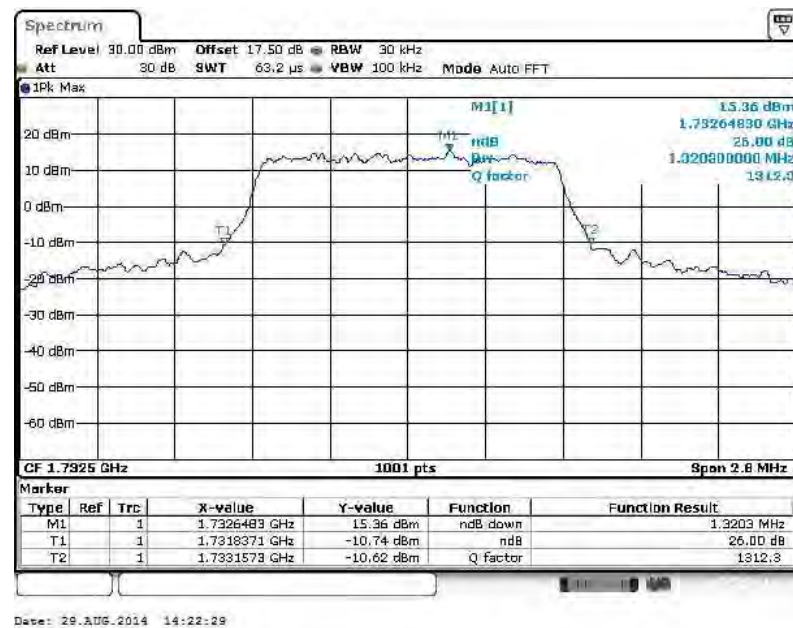




### 99% Occupied Bandwidth Plot on Channel 20175

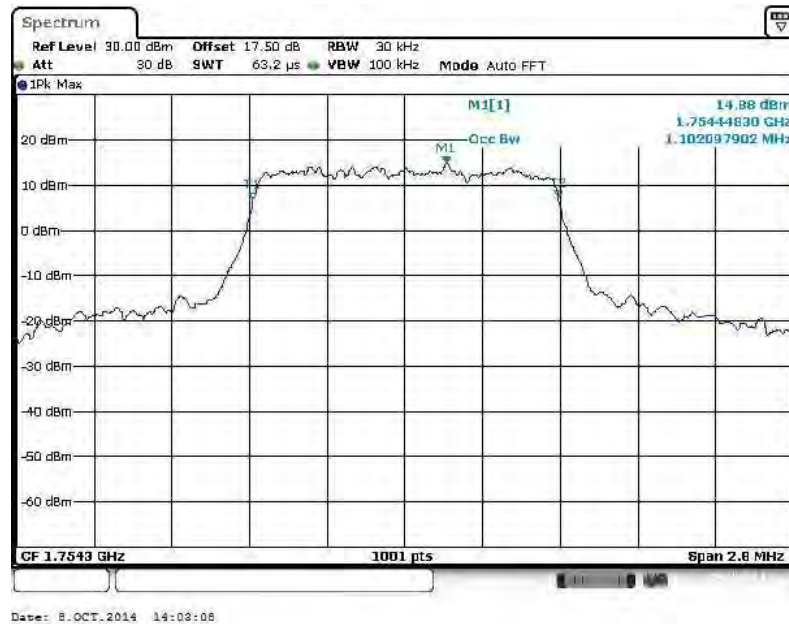


### 26dB Bandwidth Plot on Channel 20175

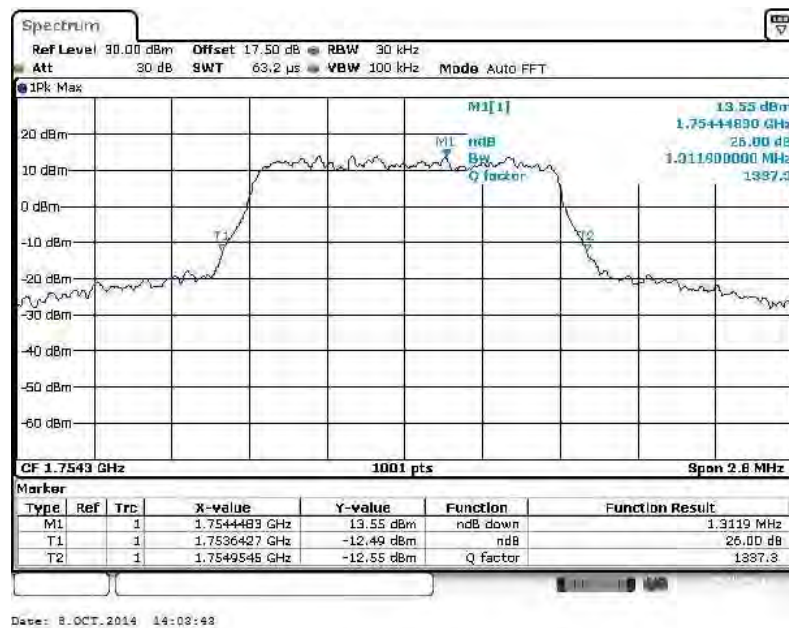




## 99% Occupied Bandwidth Plot on Channel 20393



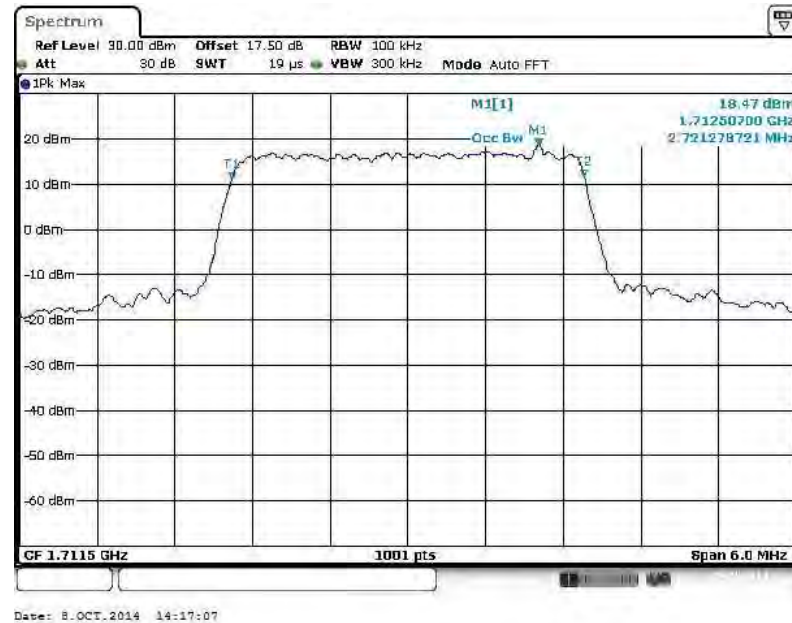
## 26dB Bandwidth Plot on Channel 20393



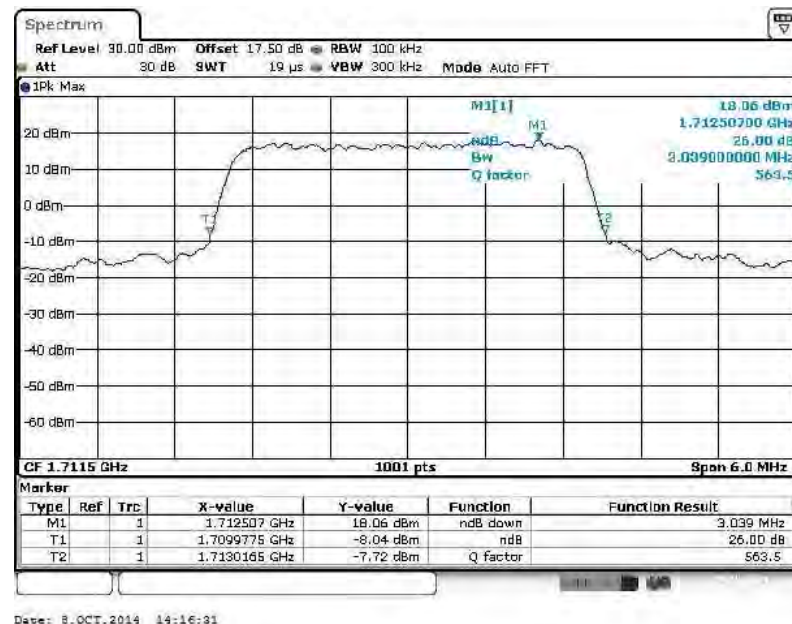


|        |            |             |             |
|--------|------------|-------------|-------------|
| Band : | LTE Band 4 | BW / Mod. : | 3MHz / QPSK |
|--------|------------|-------------|-------------|

## 99% Occupied Bandwidth Plot on Channel 19965

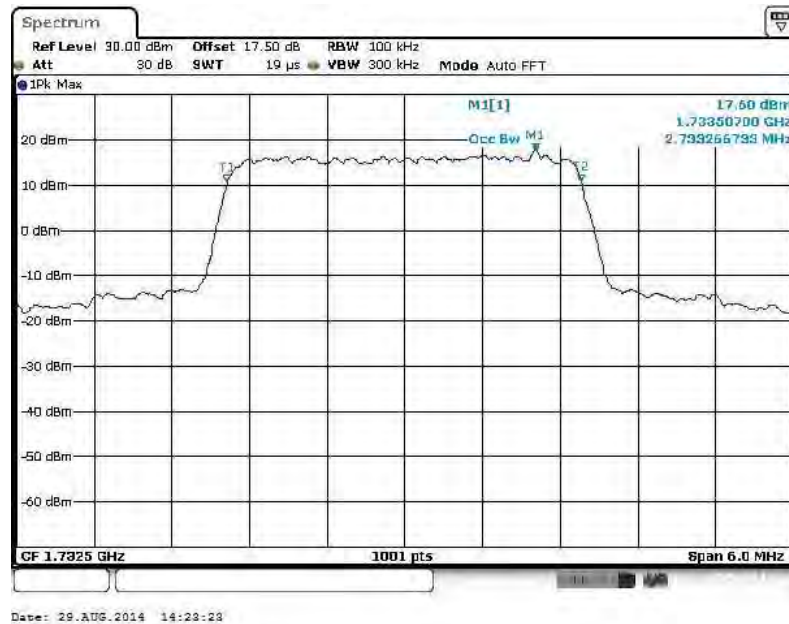


## 26dB Bandwidth Plot on Channel 19965

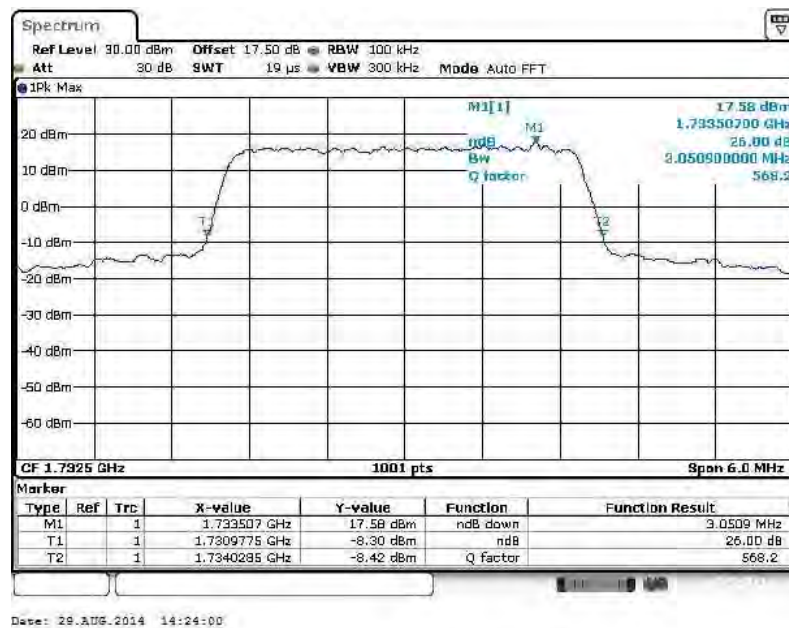




99% Occupied Bandwidth Plot on Channel 20175

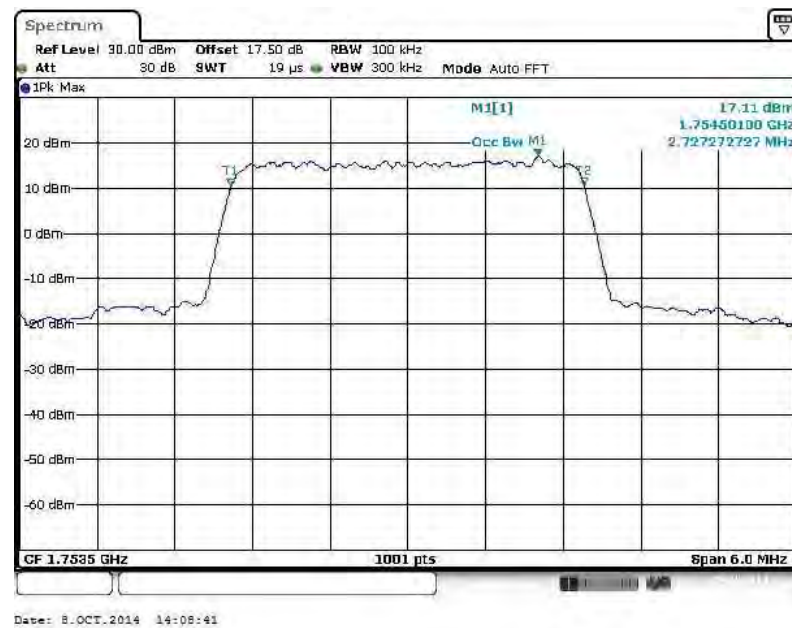


26dB Bandwidth Plot on Channel 20175

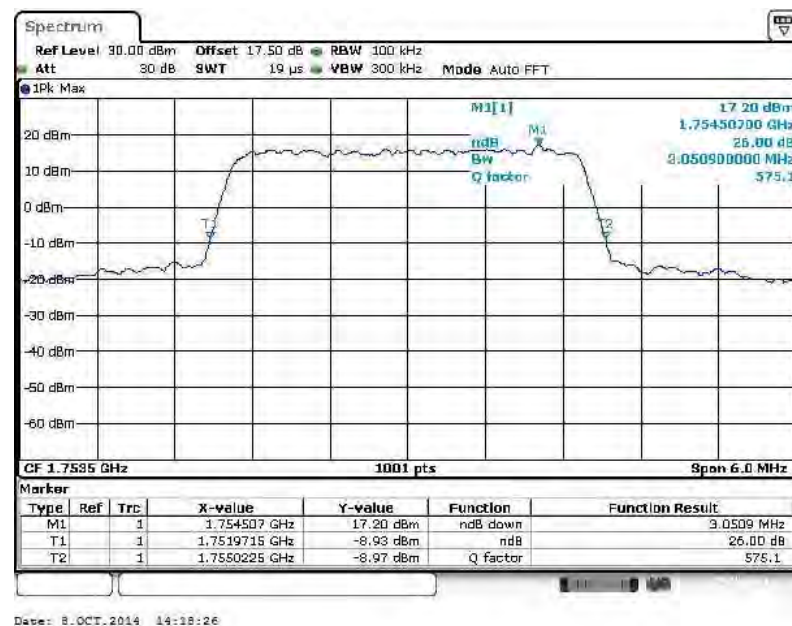




### 99% Occupied Bandwidth Plot on Channel 20385



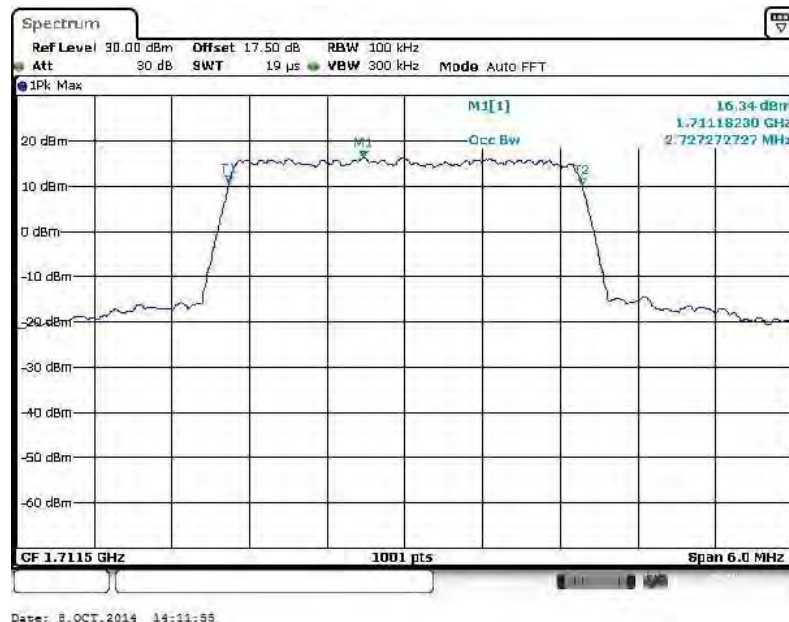
### 26dB Bandwidth Plot on Channel 20385



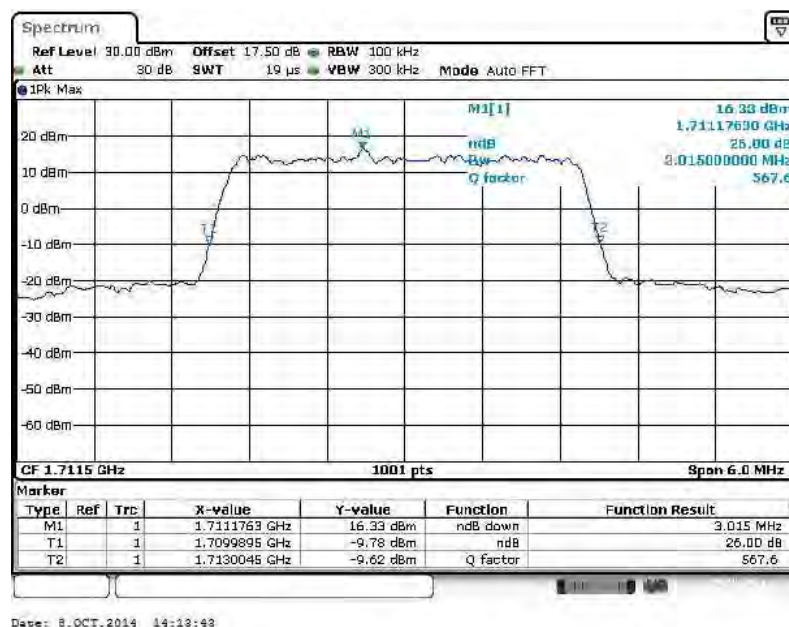


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 4 | BW / Mod. : | 3MHz / 16QAM |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 19965

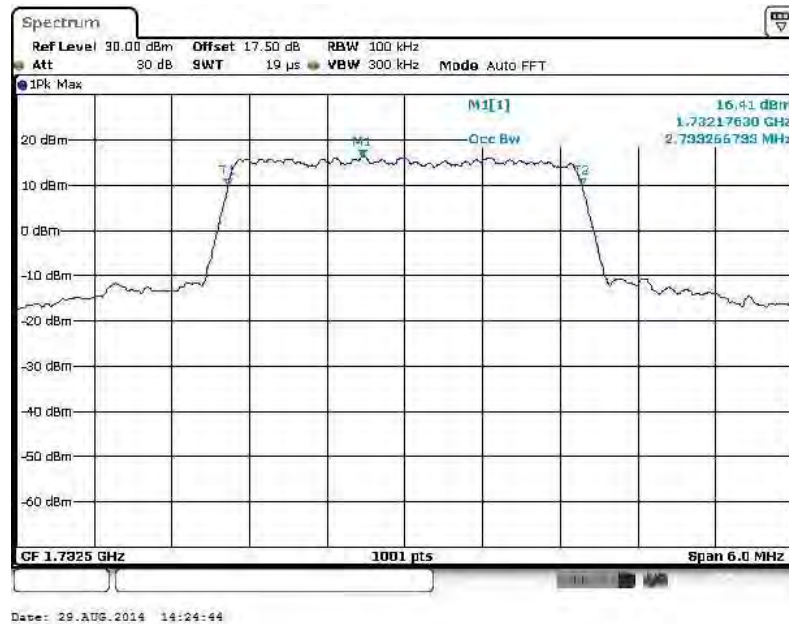


## 26dB Bandwidth Plot on Channel 19965

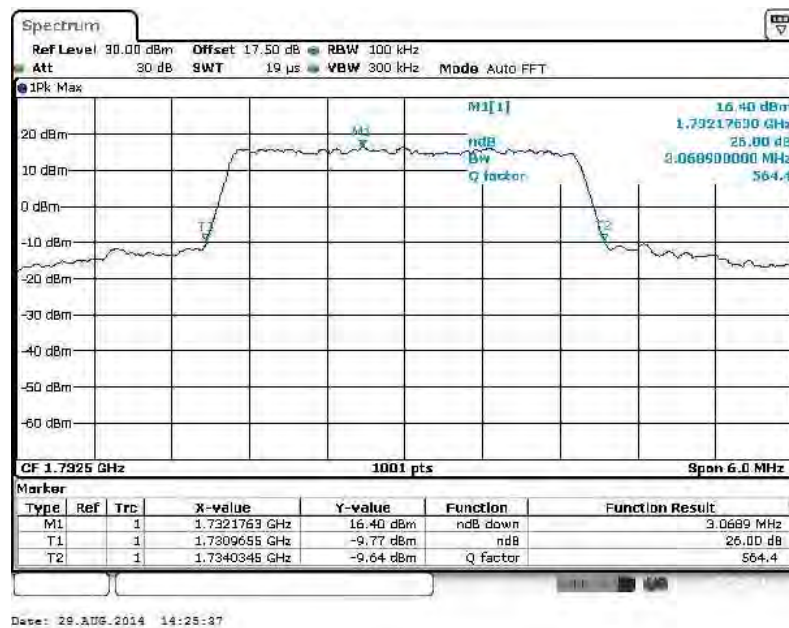




## 99% Occupied Bandwidth Plot on Channel 20175

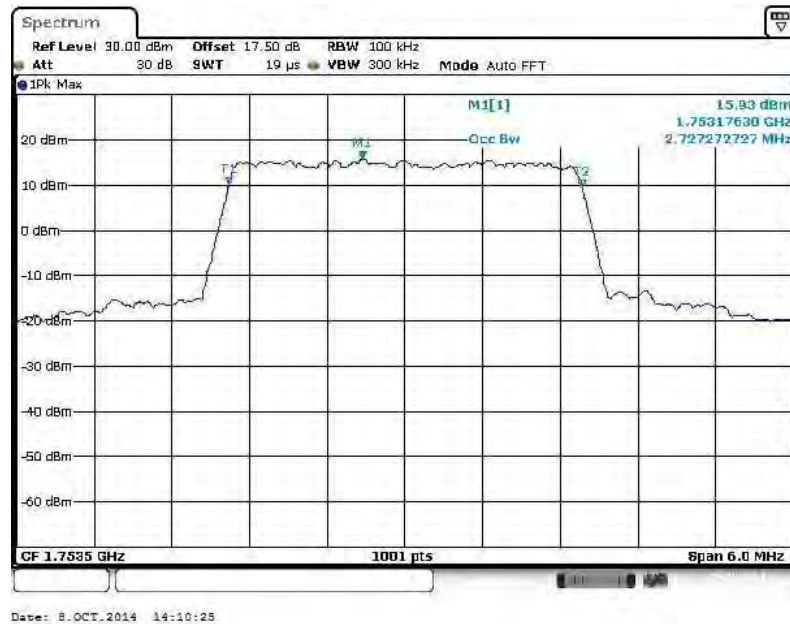


## 26dB Bandwidth Plot on Channel 20175

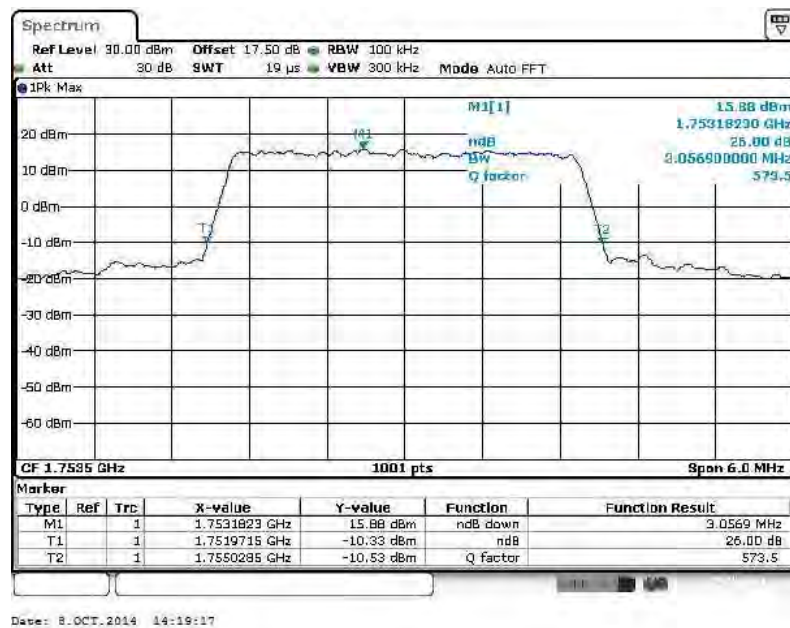




99% Occupied Bandwidth Plot on Channel 20385



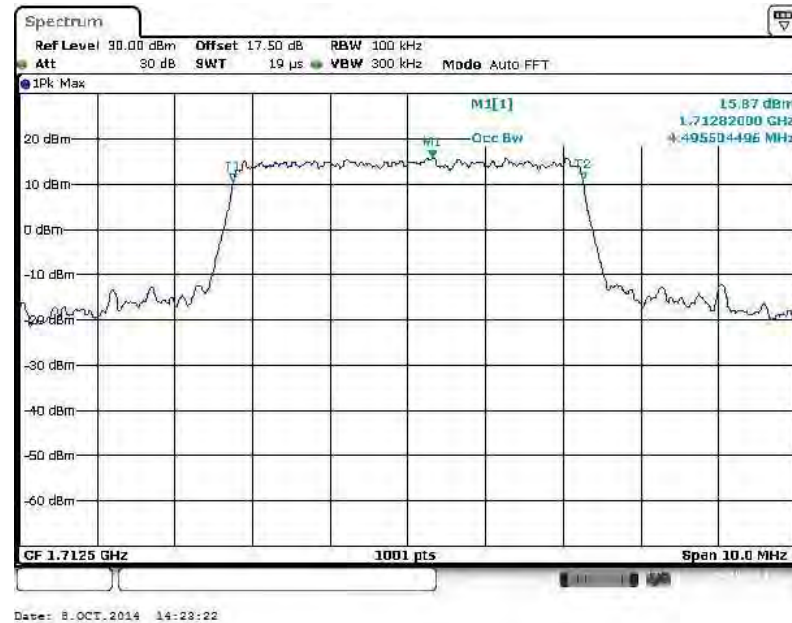
26dB Bandwidth Plot on Channel 20385



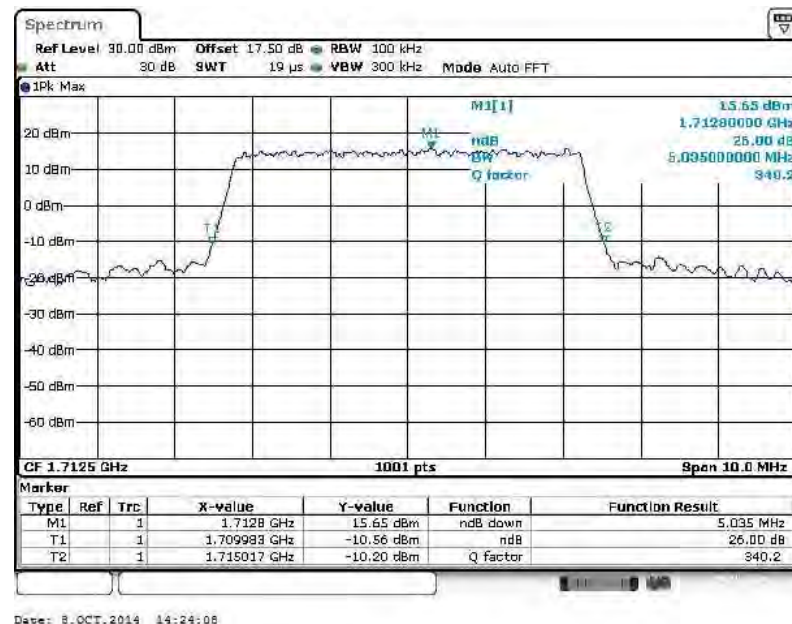


|        |            |             |             |
|--------|------------|-------------|-------------|
| Band : | LTE Band 4 | BW / Mod. : | 5MHz / QPSK |
|--------|------------|-------------|-------------|

## 99% Occupied Bandwidth Plot on Channel 19975

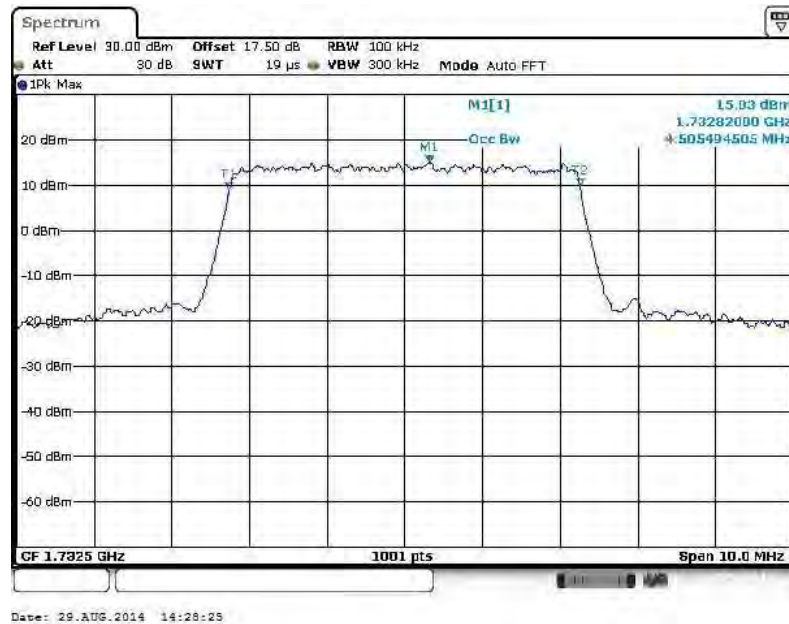


## 26dB Bandwidth Plot on Channel 19975

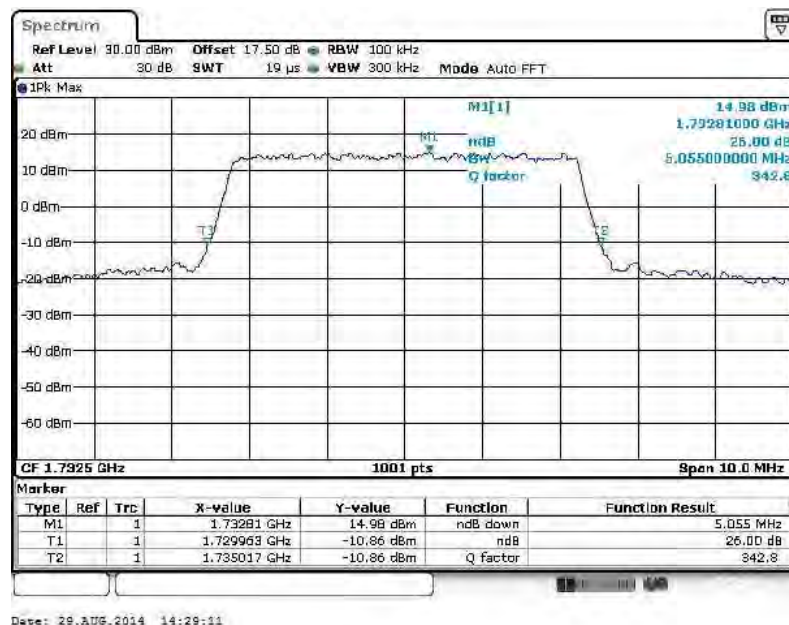




## 99% Occupied Bandwidth Plot on Channel 20175

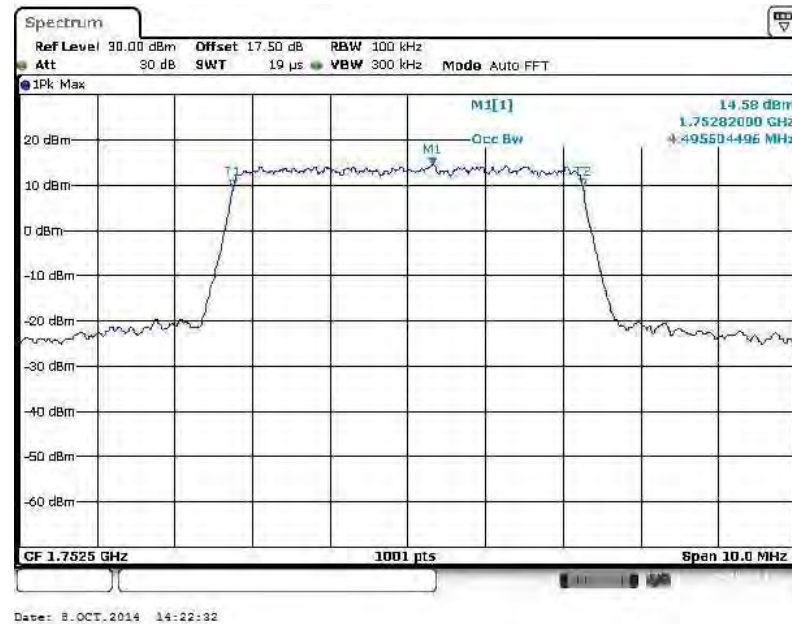


## 26dB Bandwidth Plot on Channel 20175

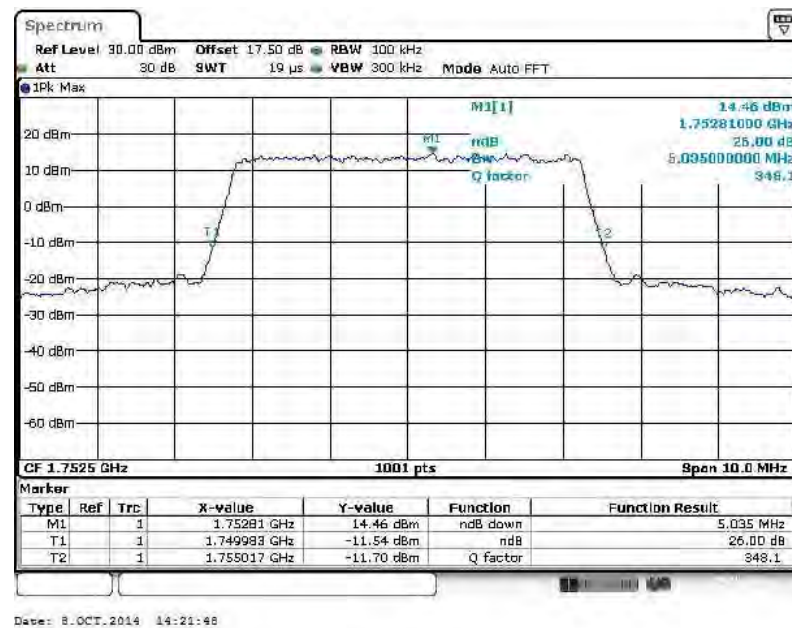




99% Occupied Bandwidth Plot on Channel 20375



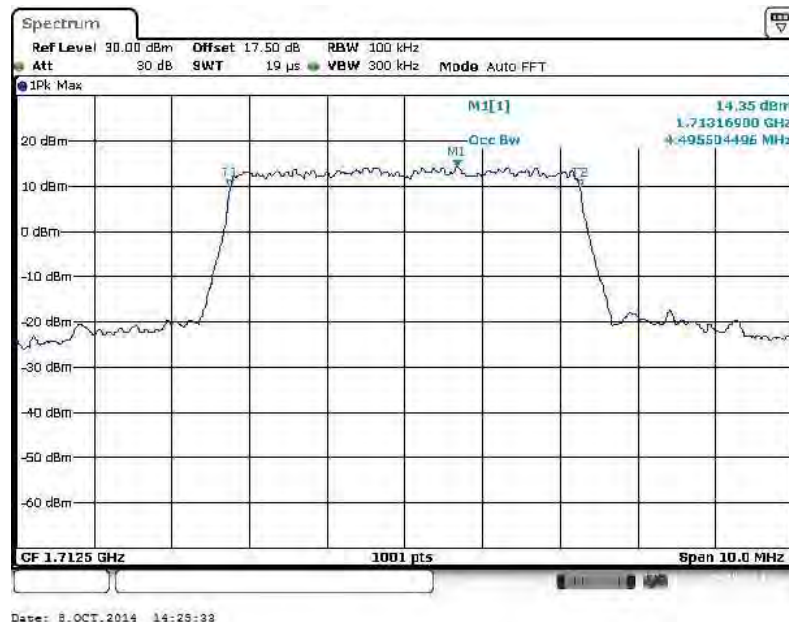
26dB Bandwidth Plot on Channel 20375



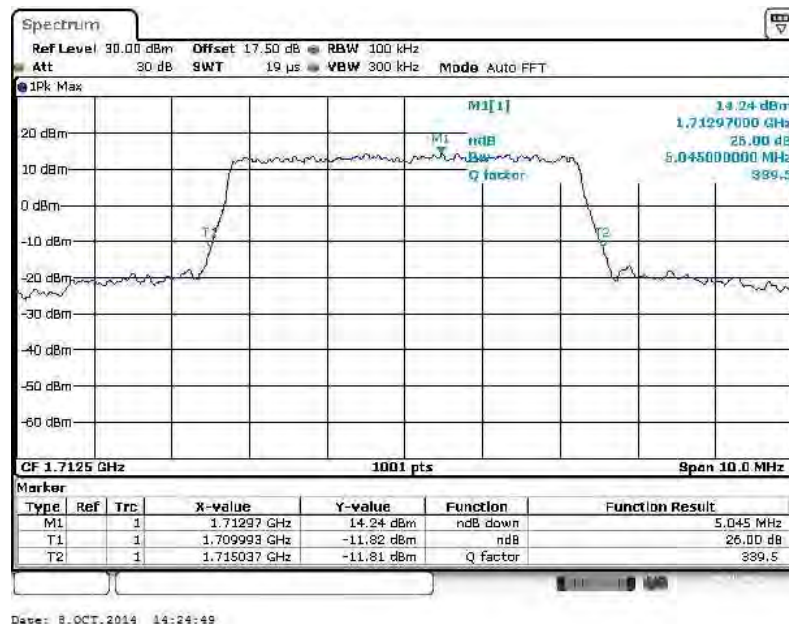


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 4 | BW / Mod. : | 5MHz / 16QAM |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 19975

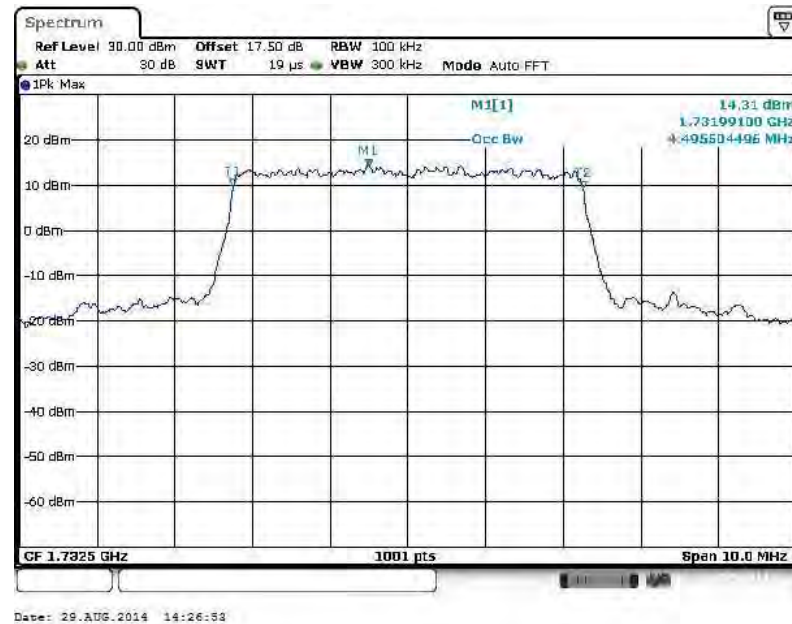


## 26dB Bandwidth Plot on Channel 19975

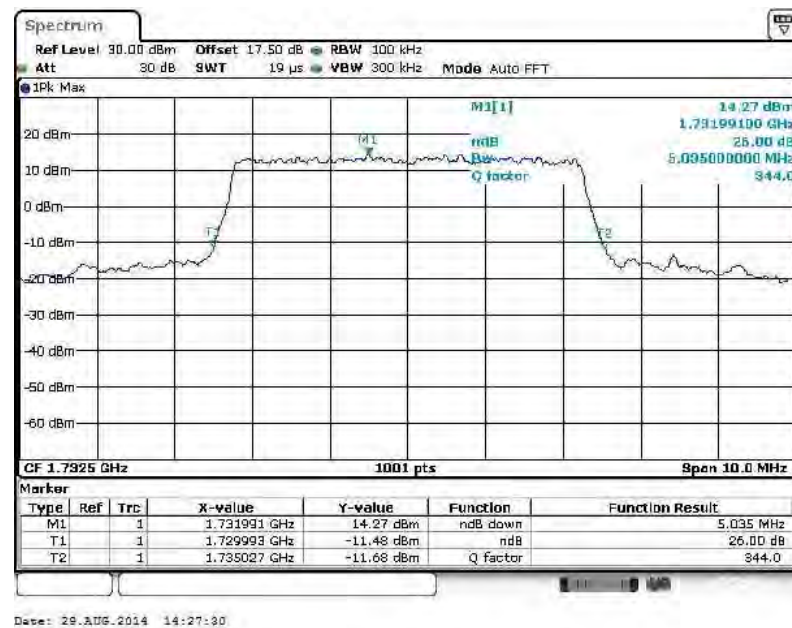




99% Occupied Bandwidth Plot on Channel 20175

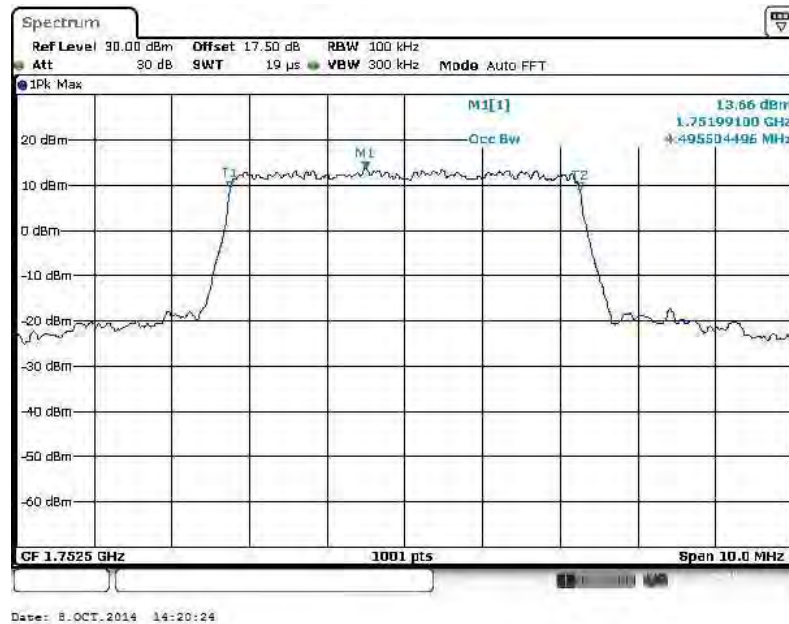


26dB Bandwidth Plot on Channel 20175

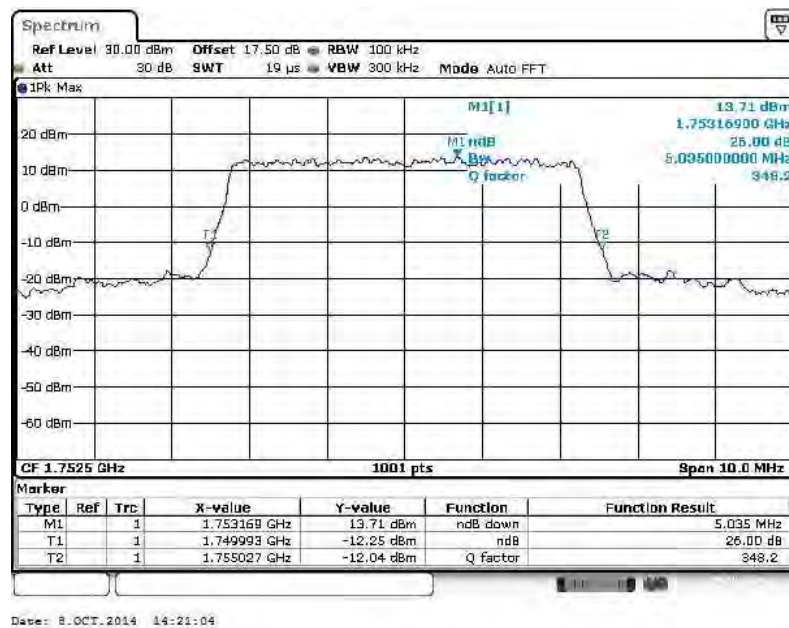




99% Occupied Bandwidth Plot on Channel 20375



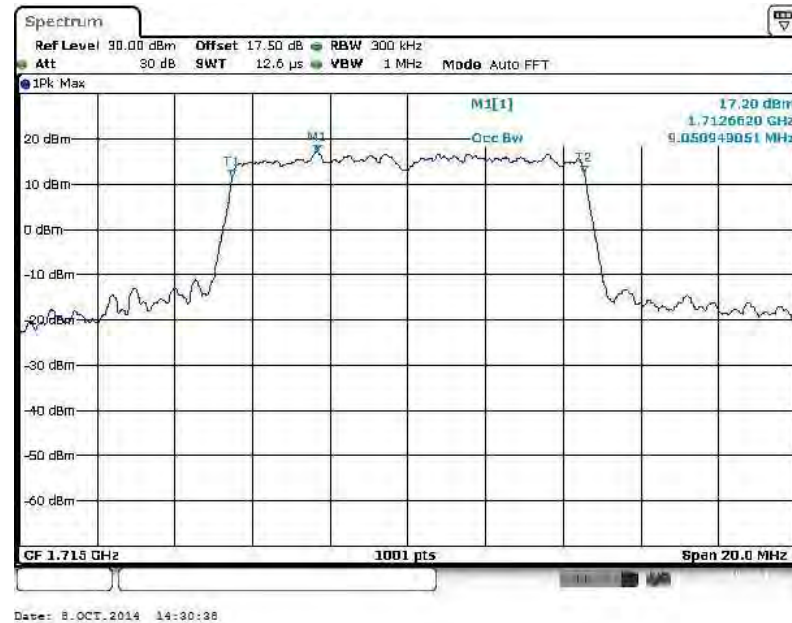
26dB Bandwidth Plot on Channel 20375



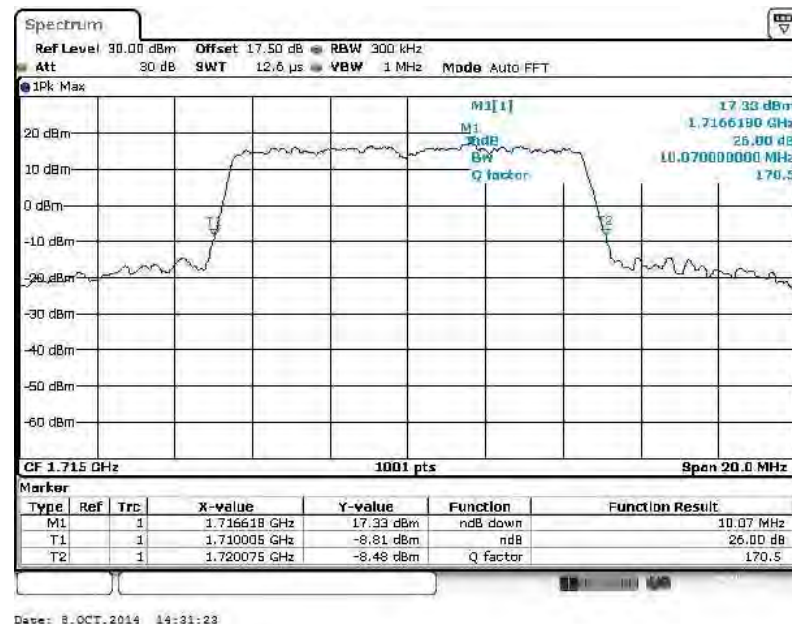


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 4 | BW / Mod. : | 10MHz / QPSK |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 20000

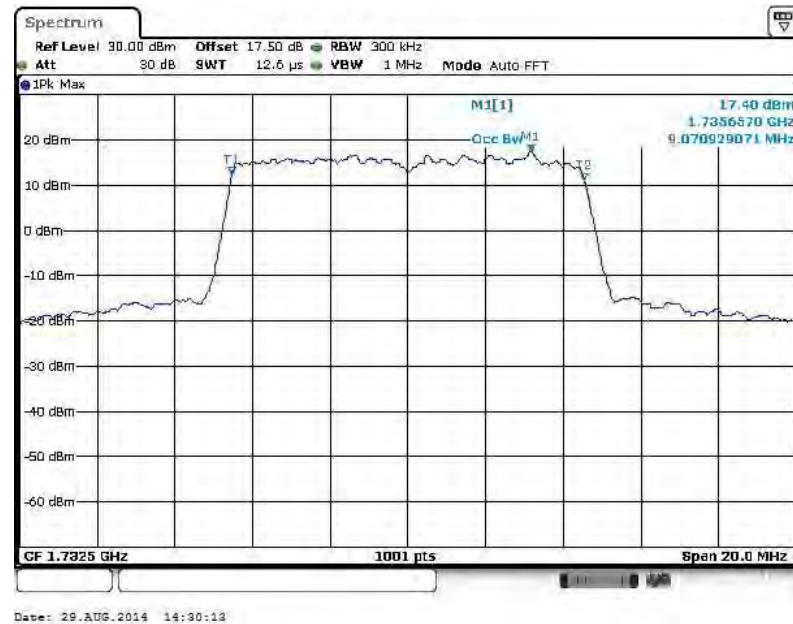


## 26dB Bandwidth Plot on Channel 20000

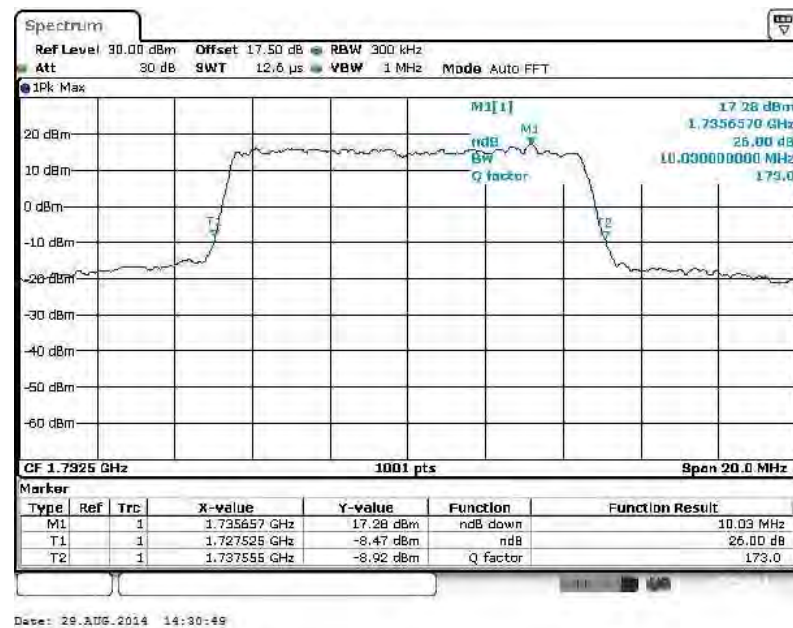




### 99% Occupied Bandwidth Plot on Channel 20175

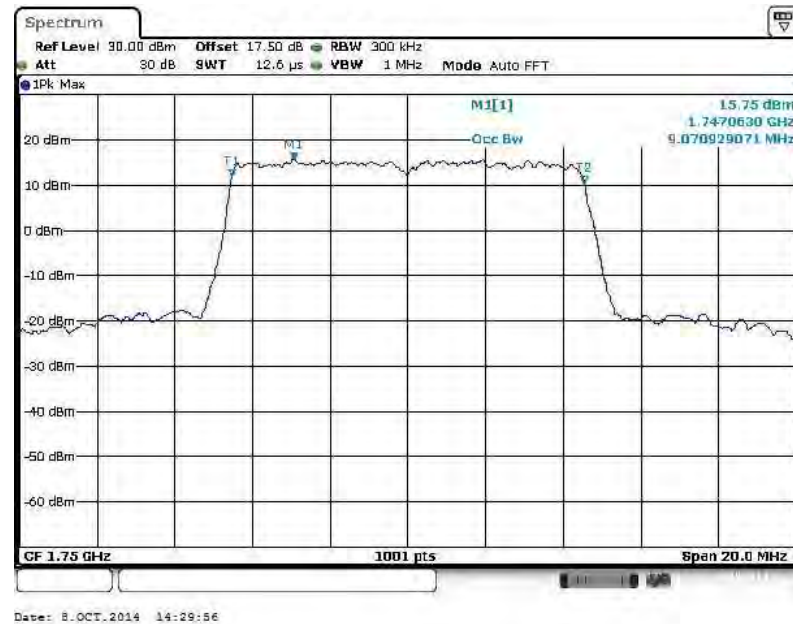


### 26dB Bandwidth Plot on Channel 20175

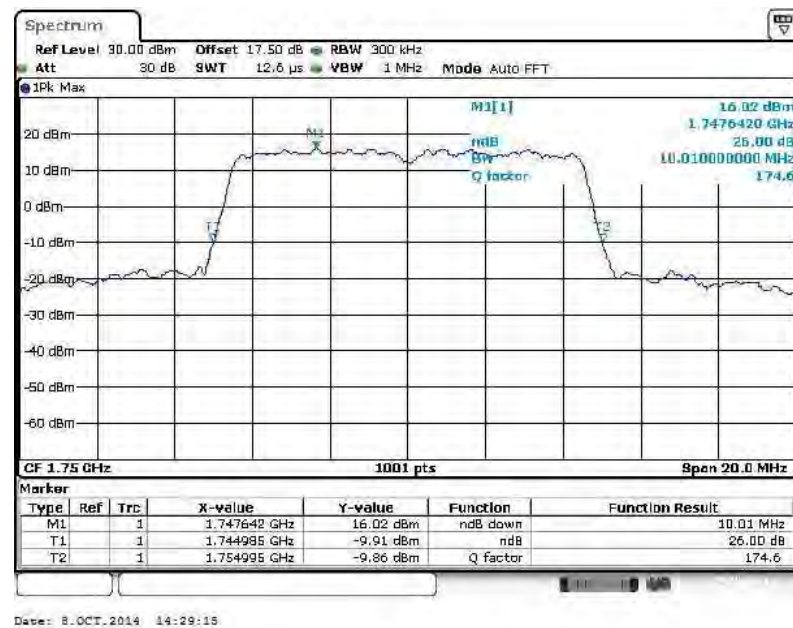




### 99% Occupied Bandwidth Plot on Channel 20350



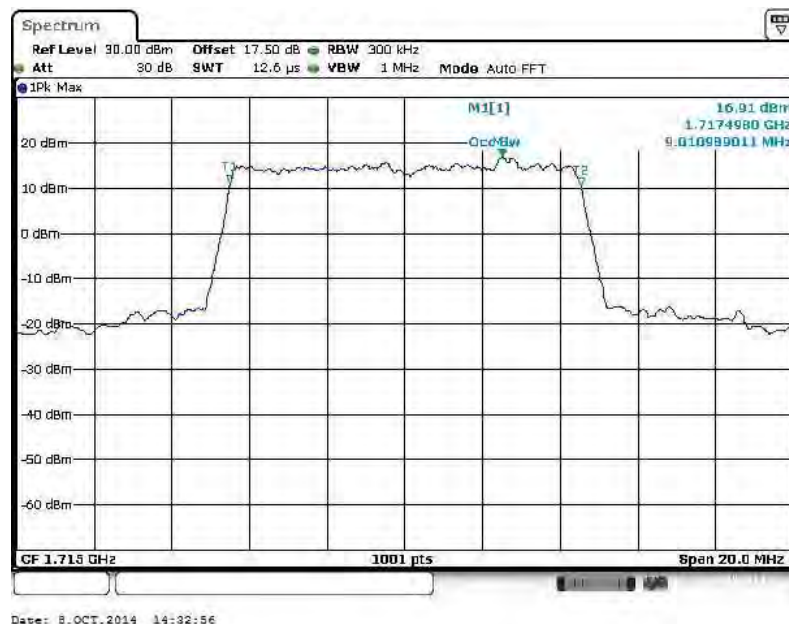
### 26dB Bandwidth Plot on Channel 20350



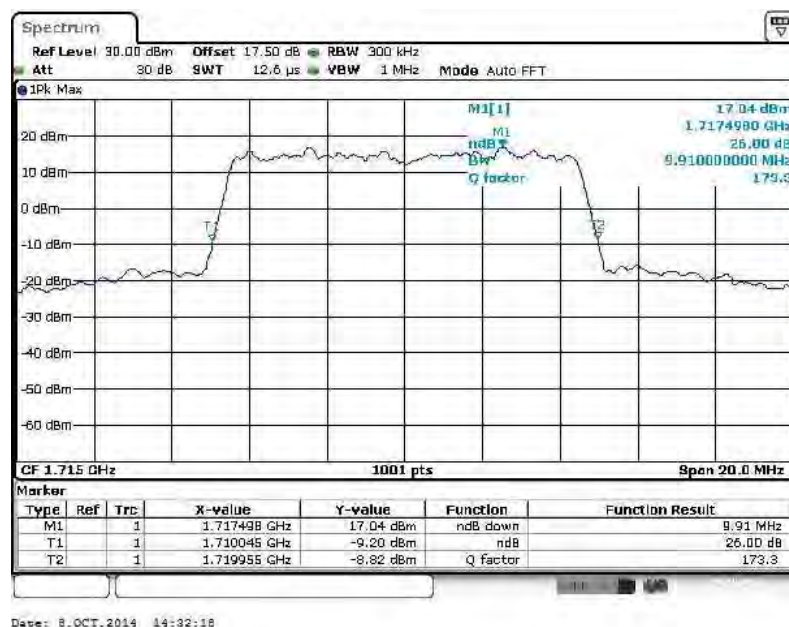


|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 4 | BW / Mod. : | 10MHz / 16QAM |
|--------|------------|-------------|---------------|

## 99% Occupied Bandwidth Plot on Channel 20000

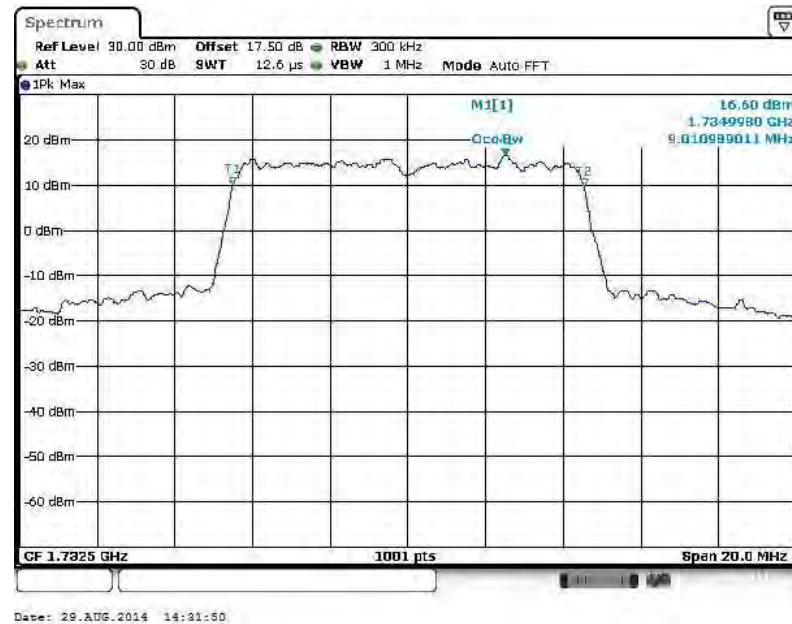


## 26dB Bandwidth Plot on Channel 20000

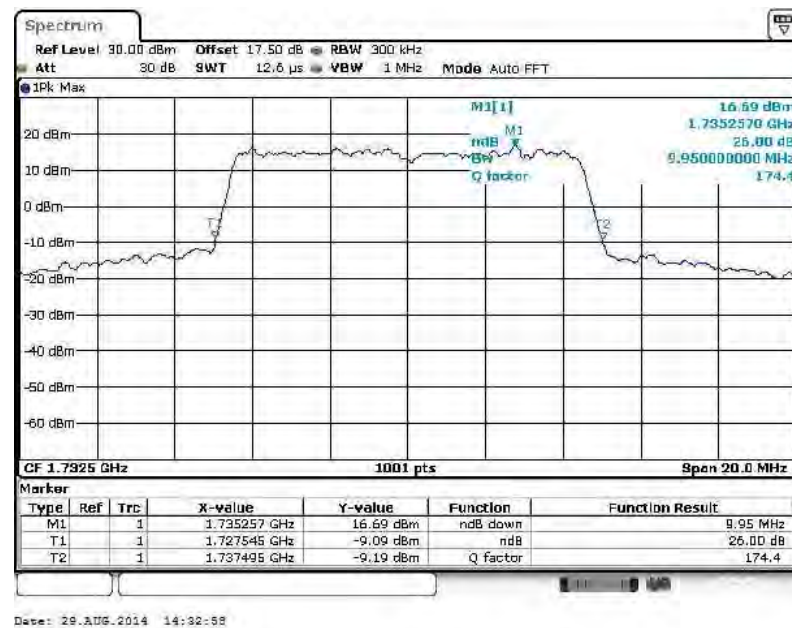




99% Occupied Bandwidth Plot on Channel 20175

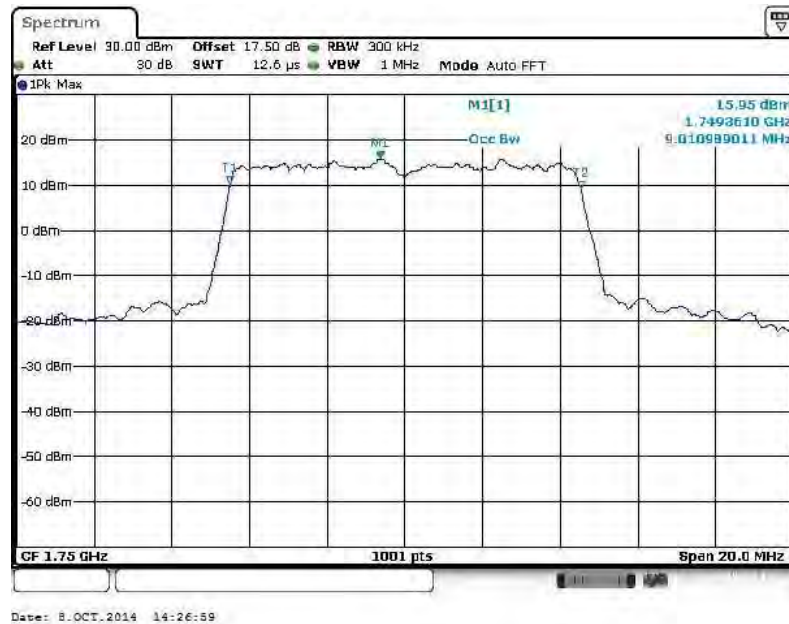


26dB Bandwidth Plot on Channel 20175

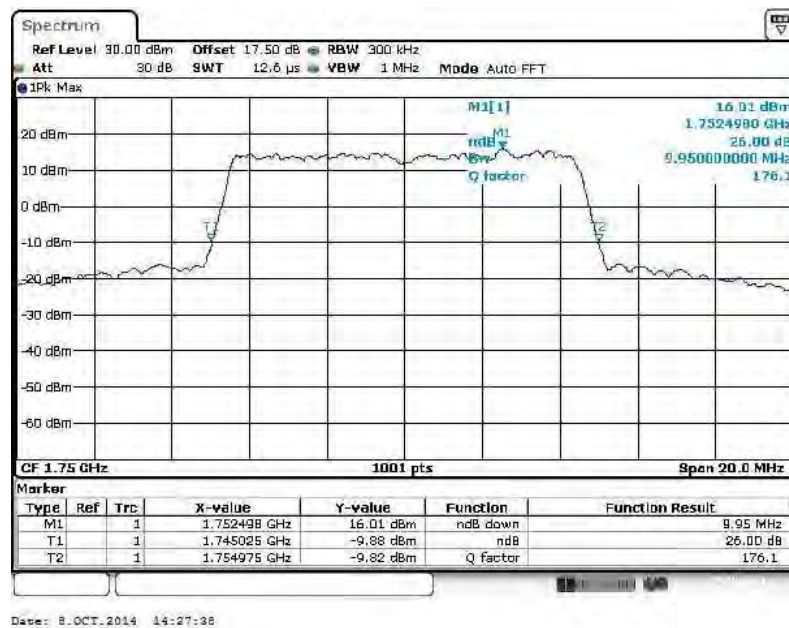




### 99% Occupied Bandwidth Plot on Channel 20350



### 26dB Bandwidth Plot on Channel 20350

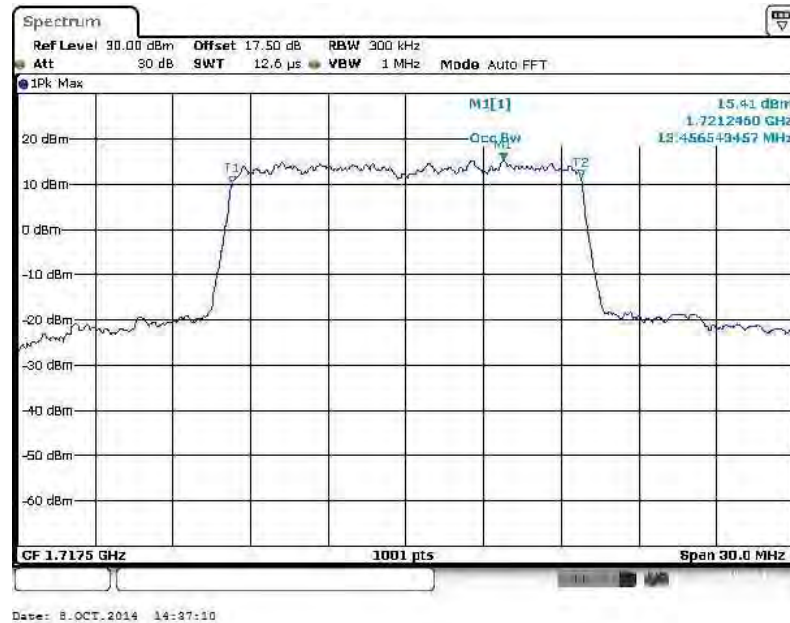




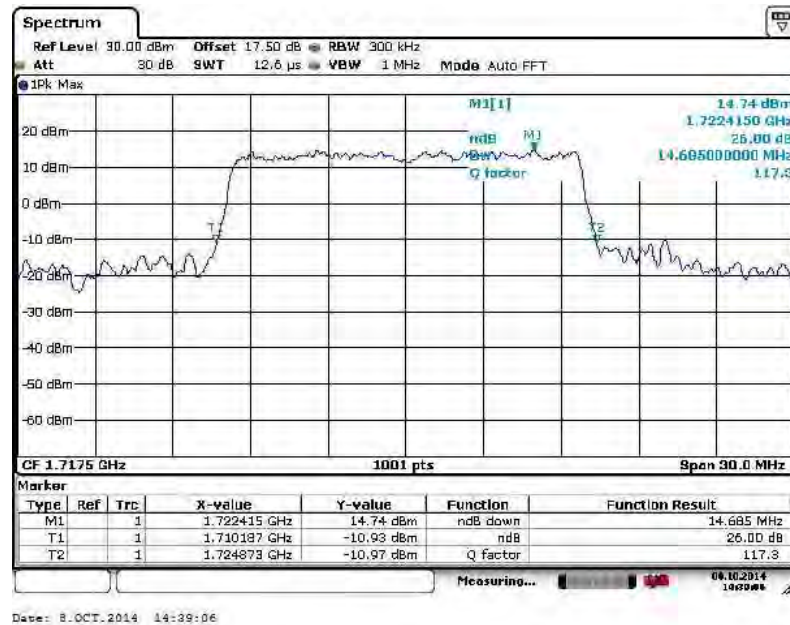
Band : LTE Band 4

BW / Mod. : 15MHz / QPSK

## 99% Occupied Bandwidth Plot on Channel 20025

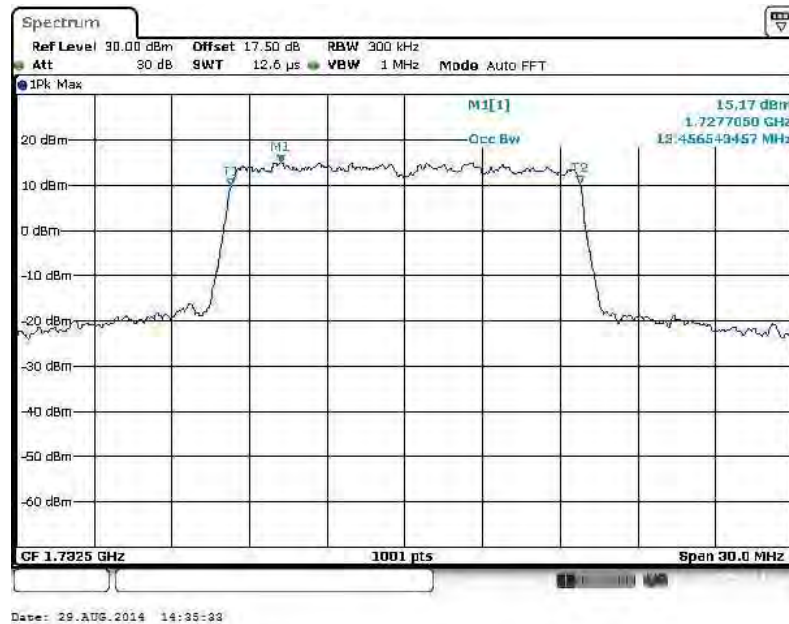


## 26dB Bandwidth Plot on Channel 20025

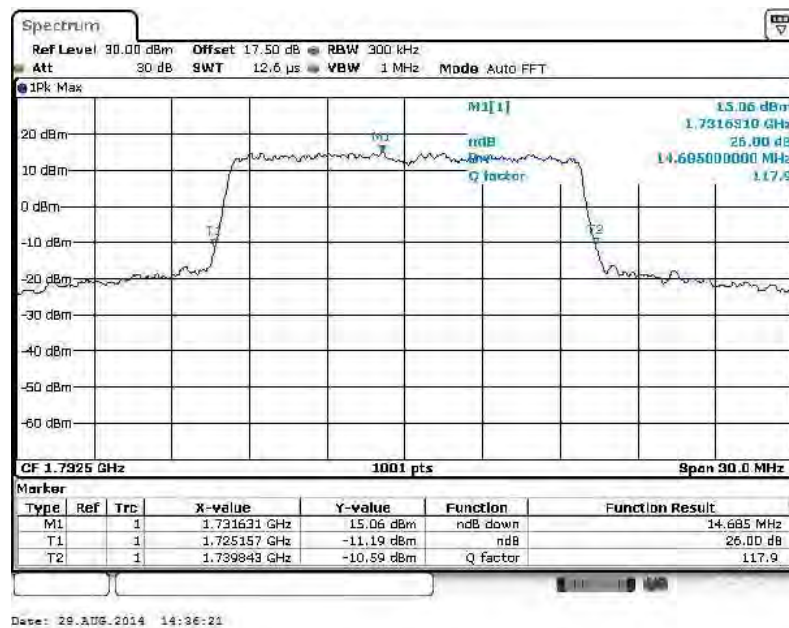




## 99% Occupied Bandwidth Plot on Channel 20175

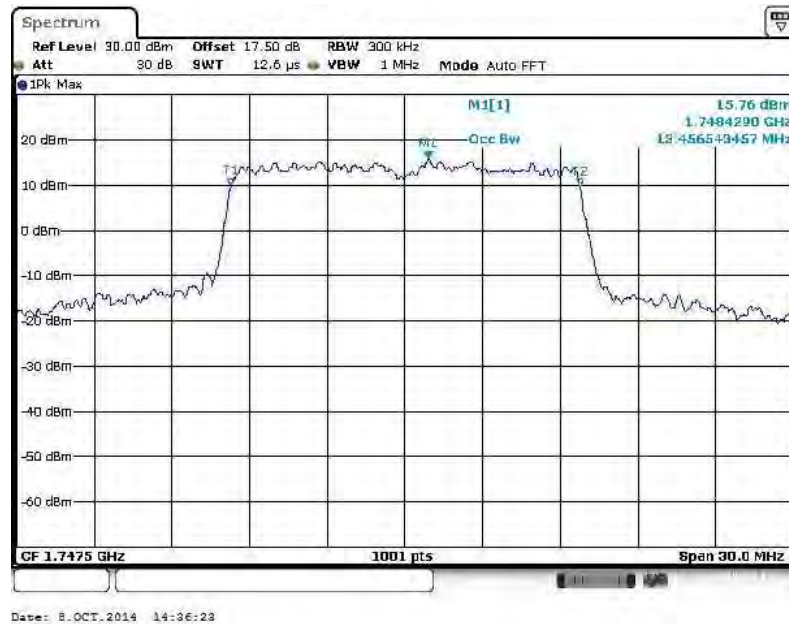


## 26dB Bandwidth Plot on Channel 20175

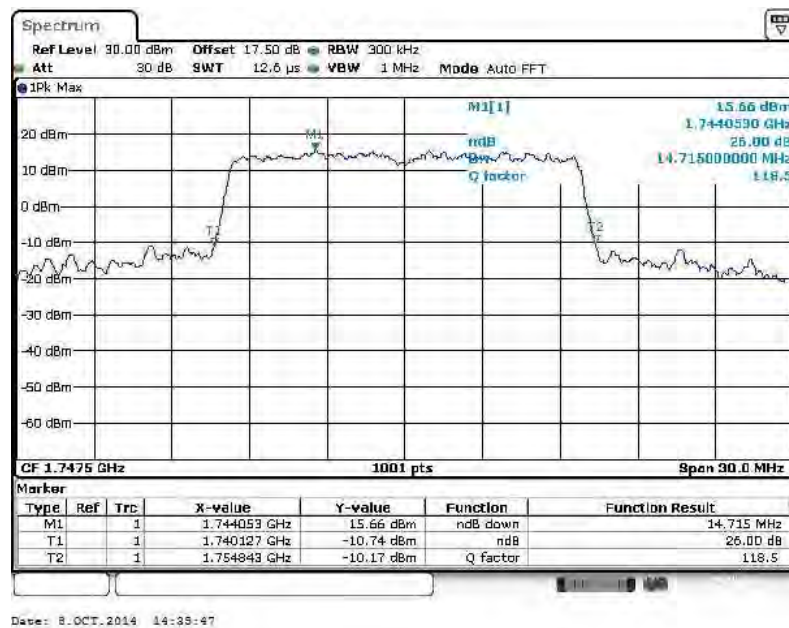




99% Occupied Bandwidth Plot on Channel 20325



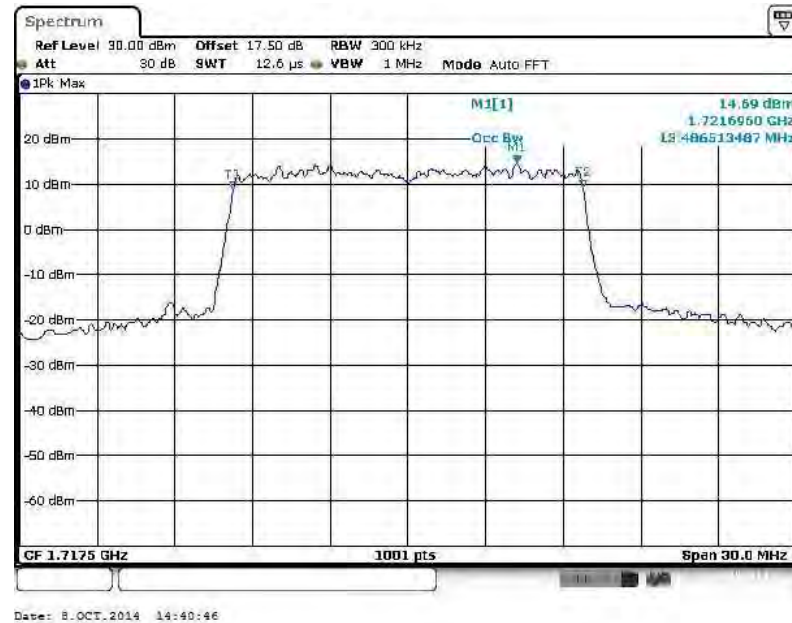
26dB Bandwidth Plot on Channel 20325



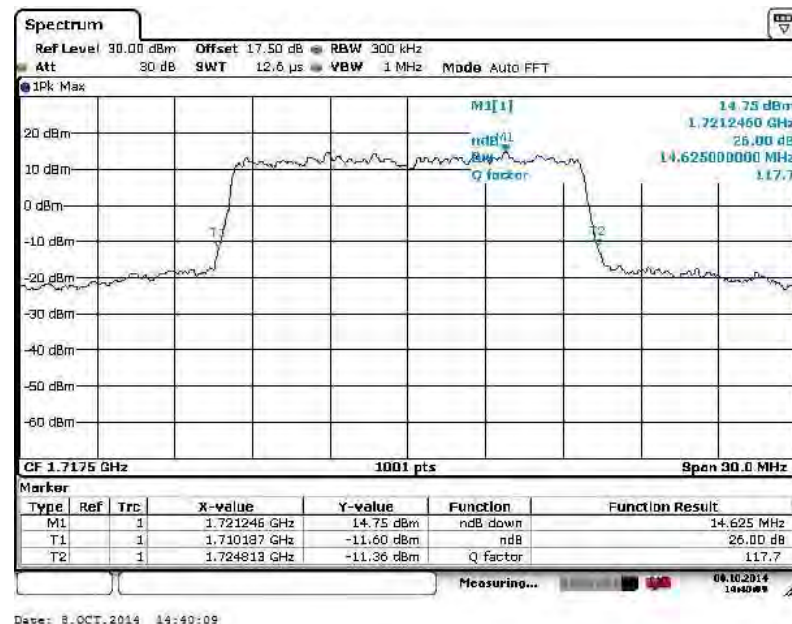


|        |            |             |               |
|--------|------------|-------------|---------------|
| Band : | LTE Band 4 | BW / Mod. : | 15MHz / 16QAM |
|--------|------------|-------------|---------------|

## 99% Occupied Bandwidth Plot on Channel 20025

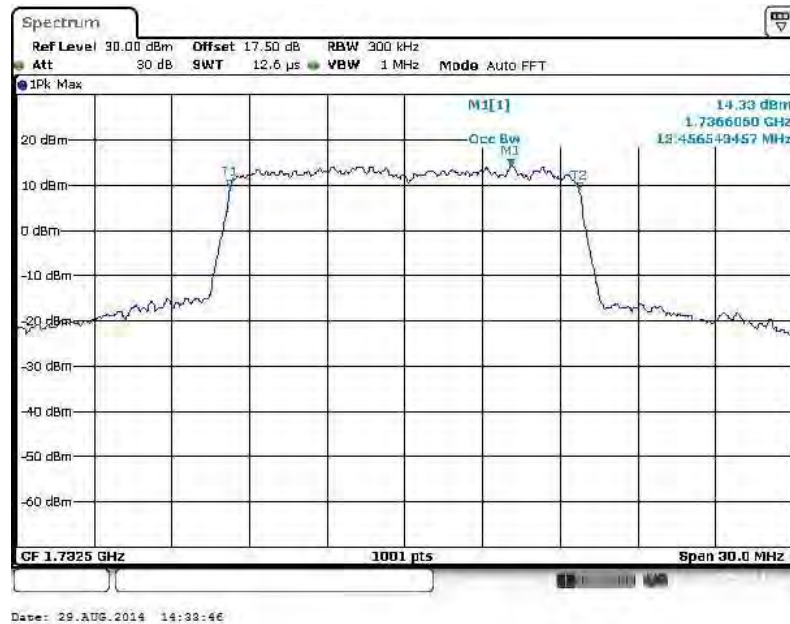


## 26dB Bandwidth Plot on Channel 20025

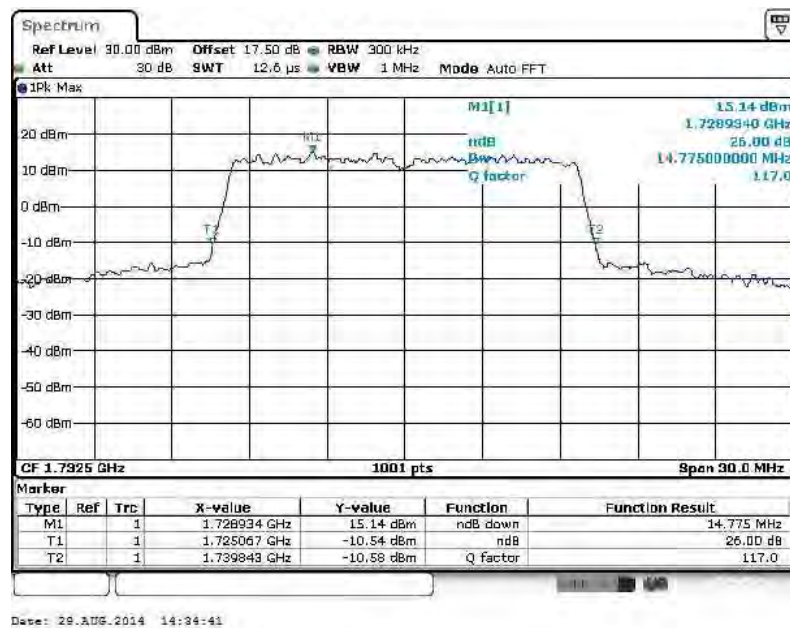




## 99% Occupied Bandwidth Plot on Channel 20175

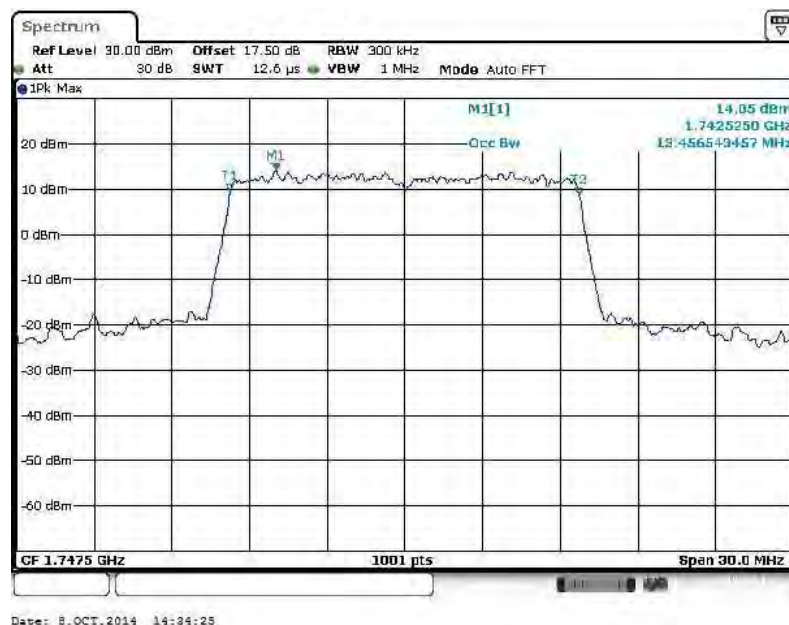


## 26dB Bandwidth Plot on Channel 20175

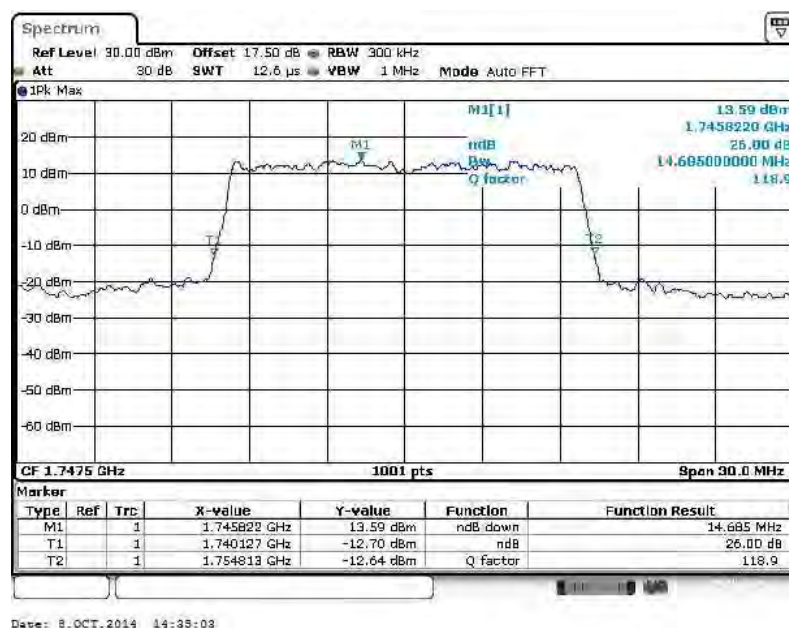




## 99% Occupied Bandwidth Plot on Channel 20325



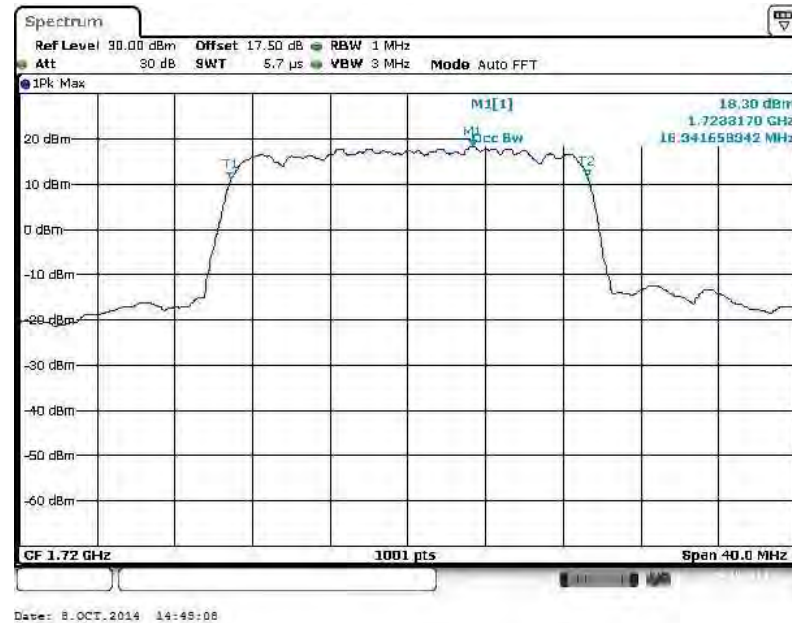
## 26dB Bandwidth Plot on Channel 20325



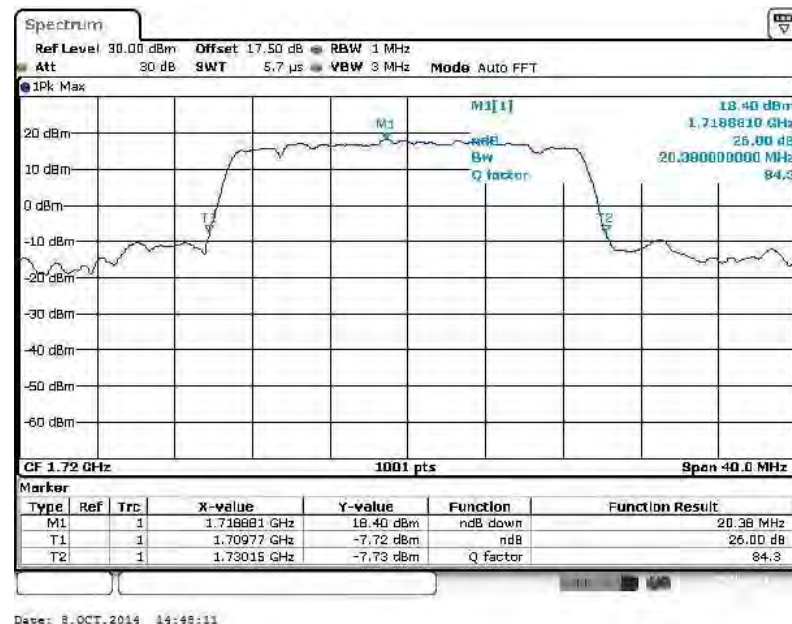


|        |            |             |              |
|--------|------------|-------------|--------------|
| Band : | LTE Band 4 | BW / Mod. : | 20MHz / QPSK |
|--------|------------|-------------|--------------|

## 99% Occupied Bandwidth Plot on Channel 20050

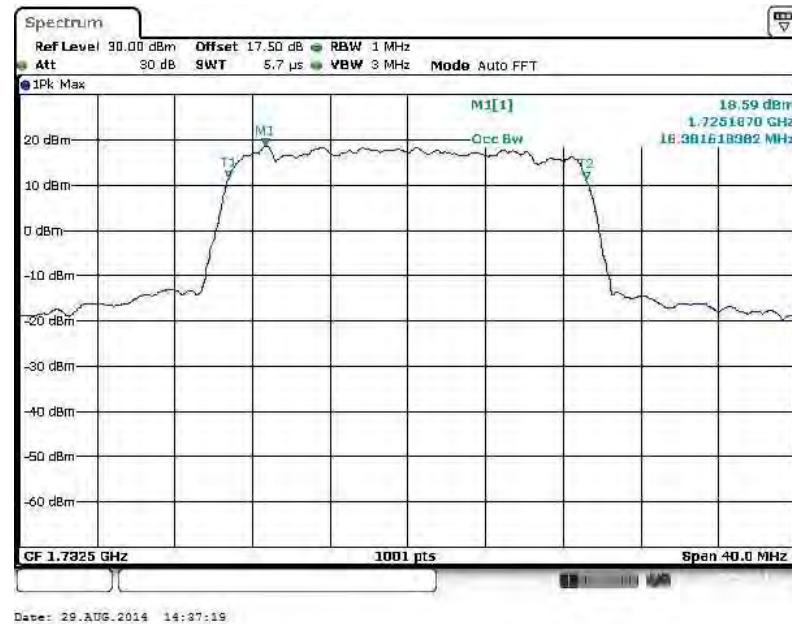


## 26dB Bandwidth Plot on Channel 20050

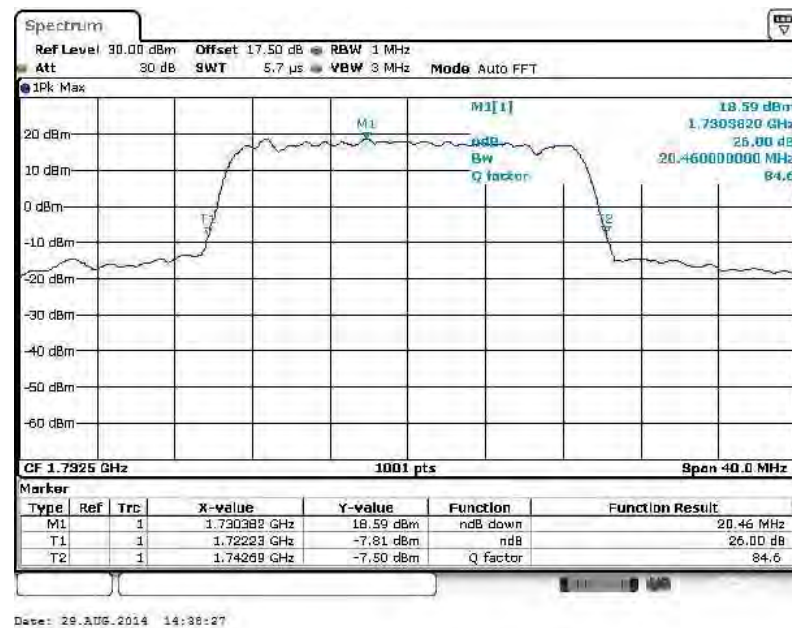




99% Occupied Bandwidth Plot on Channel 20175

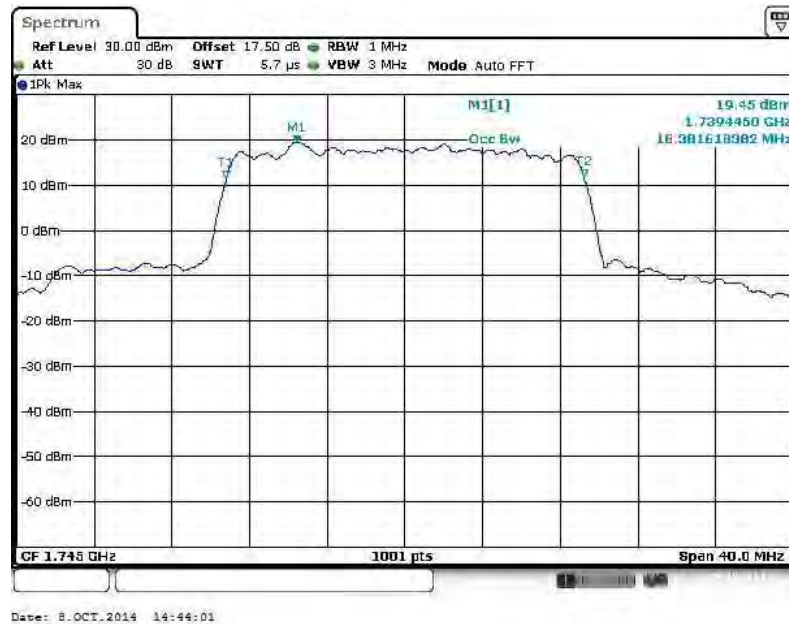


26dB Bandwidth Plot on Channel 20175

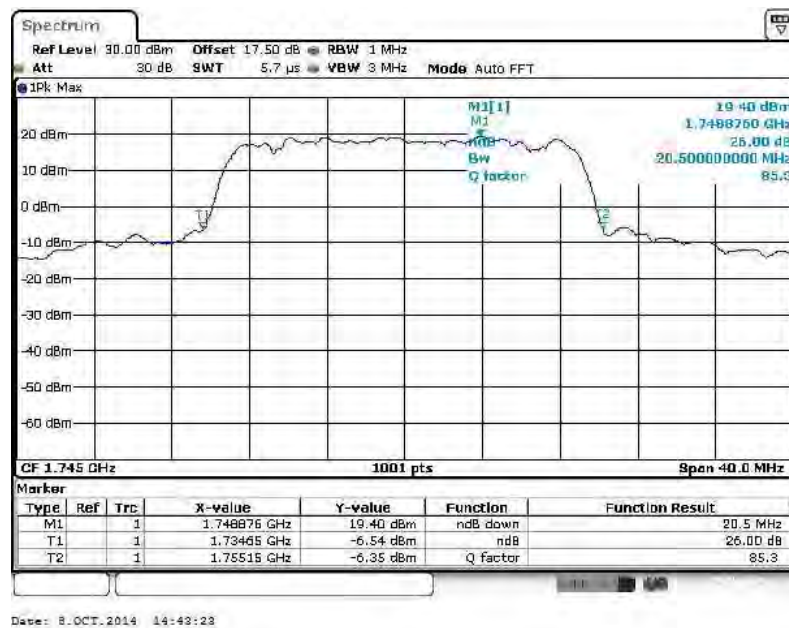




99% Occupied Bandwidth Plot on Channel 20300



26dB Bandwidth Plot on Channel 20300

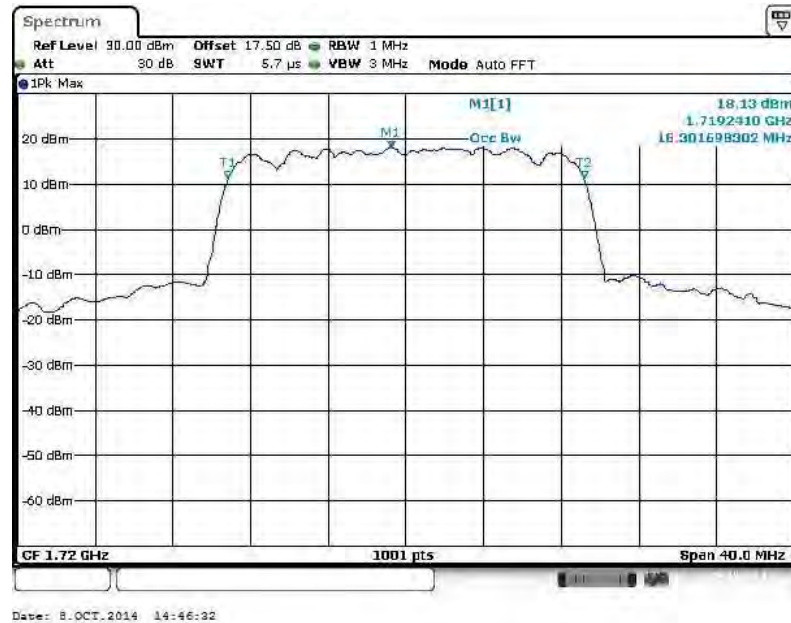




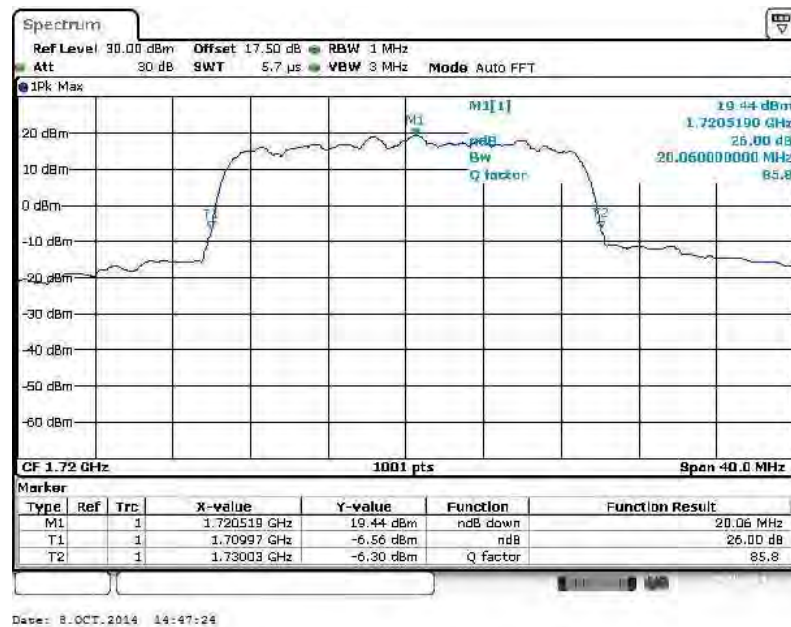
Band : LTE Band 4

BW / Mod. : 20MHz / 16QAM

## 99% Occupied Bandwidth Plot on Channel 20050

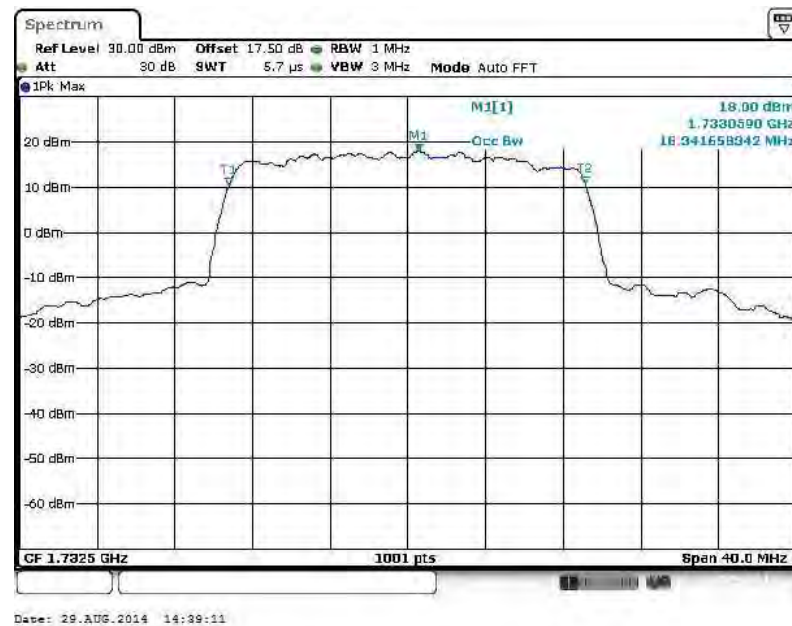


## 26dB Bandwidth Plot on Channel 20050

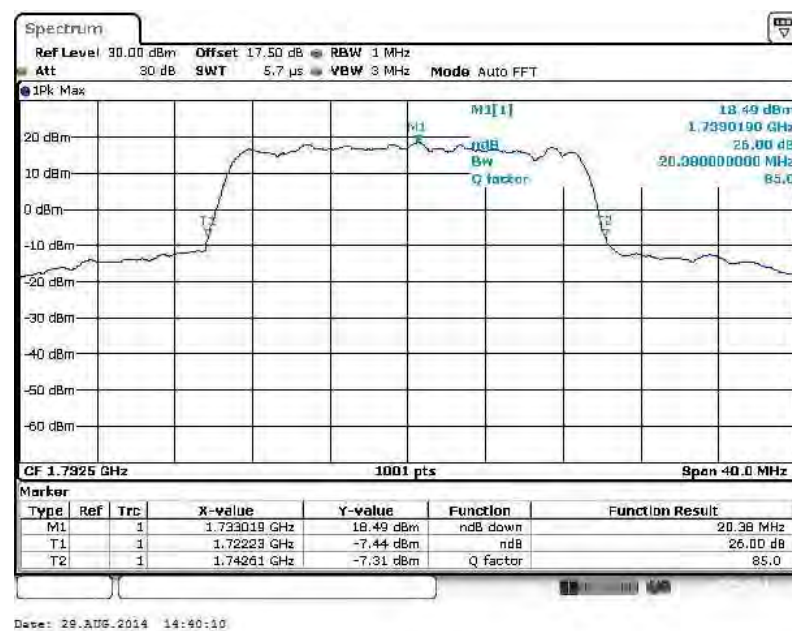




## 99% Occupied Bandwidth Plot on Channel 20175

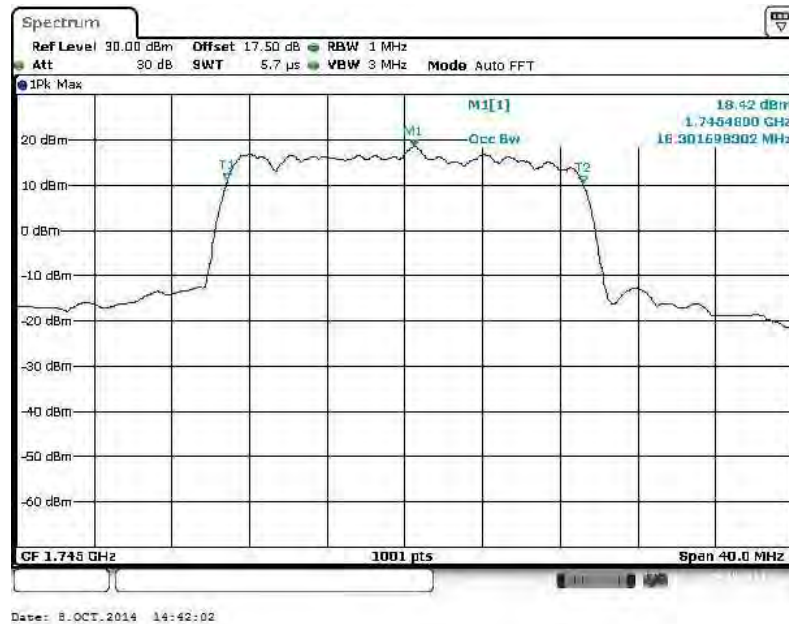


## 26dB Bandwidth Plot on Channel 20175





### 99% Occupied Bandwidth Plot on Channel 20300



### 26dB Bandwidth Plot on Channel 20300

