# Test Report for FCC 47 CFR part 22(H) and 24(E)

| | | | |
|---|---|---|---|
| **Test Report no.:** | 20153885300-Ver 2.00 | **Date of Report:** | Sept 30th. 2015 |
| **Number of pages:** | Page 1 of 69 | **Contact person:** | Amir Amininejad |
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| **Tested device(s):** | IP-68 mobile phone TechNet EX-SM14<br>Build number: EX0150_20141106_M312_SP<br>BB ver.: MOLY.WR8.W1248.MD.WG.MP.V28.P1<br>(Detailed information for each device is listed in section 1). | | |
| **Testing has been carried out in accordance with:** | CFR 47, FCC rules Parts 22 and 24, ANSI/TIA-603-C-2004. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under “Test method and limit” | | |
| **Documentation:** | The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Telefication Netherland. | | |
| **Test Results:** | The results of the inspection are described on the following pages, where "conformity" in the Summary List means that test specification test purposes were verified and the tested device conforms to the applied standards. In cases where "declaration" is printed the required documents are available in the customer's documentation.<br>This test result relates only to those tested devices mentioned in this document. | | |
| **Accreditation:** | Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The registration number is: 282250 | | |
| **Date of Signature:** | 30-09-2015 | | |

**RF Test Laboratory Manager**
Amir Amininejad

# 1 Revision record sheet

| VERSION | DATE | REMARKS | BY |
|---|---|---|---|
| 2.00 | 2015 09 28 | Added large plots in chapter 5.5 | R,van Barneveld |
| 1.50 | 2015 09 22 | Full revision | R,van Barneveld |
| 1.00 | 2015 09 10 | Version for first release. | A. Amininejad |
| 0.50 | 2015 06 17 | Draft release for peer review | A. Amininejad |
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## Summary of test results

| FCC Rule | IC RSS GEN | IC RSS 132 | IC RSS 133 | Description | Limit | Verdict | Report ref. |
|---|---|---|---|---|---|---|---|
| §2.1046 (a) | -- | 5.4 | 6.4 | Conducted Output Power | Reporting Only | PASS | 5.1 |
| §24.232(d) | -- | -- | -- | Peak-to-Average Ratio | < 13 dB | PASS | 5.2 |
| §22.913(a)(2) | -- | 5.4 | 6.4 | Effective Radiated Power | <7 Watts | PASS | 5.1.6 |
| §24.232(c) | -- | 5.4 | 6.4 | Equivalent Isotropic Radiated Power | <2 Watts | PASS | 5.1.6 |
| §2.1049(h)<br>§22.917(b)<br>§24.238(b) | 6.6 | -- | -- | Occupied Bandwidth/ 26 dB Bandwidth | Reporting Only | PASS | 5.3 |
| §2.1051<br>§22.917(a)<br>§24.238(a) | -- | 5.5 | 6.5 | Spurious / Band edge Emission | <43+10 $\log_{10}$(P[Watts]) | PASS | 5.5 |
| 2.1055(a), 2.1055( (d)<br>§22.355<br>§24.235 | -- | 5.3 | 6.3 | Frequency Stability for Temperature & Voltage | <2,5 [ppm] | PASS | 5.4 |

# 2 General Description

## 2.1 Applicant

TechNed Benelux, Veersteeg 15, 4212 LR Spijk, The Netherlands

## 2.2 Manufacturer

TechNed Benelux, Veersteeg 15, 4212 LR Spijk, The Netherlands

## 2.3 Equipment under Test (EUT)

| | |
|---|---|
| Device type: | Mobile Phone |
| Brand Name | Rough Pro |
| Model Name | EX0150_20141106_M312_SP EX-SM14 |
| FCC ID | 2AD2CEX-SM14 |
| EUT support Radio applications | GSM850, PCS1900,GPRS,WCDMA BII and B V, WLAN 2,4GHz IEEE802.11b,g,N HT20, Bluetooth3,0, Bluetooth LE v. 4.0 |
| DUT no.: | DUT#0005 |
| Device type: | Mobile Phone IP-68 EX-SM14 |
| SN/ IMEI number: | 860636000507855 and 860636000607853 |
| Hardware version / build number: | *EX0150_20141106_M312_SP*<br>*EX0150_20141106_M312_SP* |
| Software version: | Android 4.2.2 |
| Test software / firmware | *EX0150_20141106_M312_SP* |
| Date of receipt: | June 3rd. 2015 |
| Date of tests started: | May 22nd. 2015 |
| Date of tests ended: | Jun 16th. 2015 |

## 2.4 References

a) Antenna location diagram.
b) Tune-up table

## 2.5 Product Specification subjective to this standard

| | |
|---|---|
| **Tx Frequencies** | GSM850: 824.2 MHz ˜ 848.8 MHz<br>GSM1900: 1850.2 MHz ˜ 1909.8 MHz<br>WCDMA Band II: 1852.4 MHz ˜ 1907.6 MHz<br>WCDMA Band V: 826.4 MHz ˜ 846.6 MHz |
| **Rx Frequency** | GSM850: 869.2 MHz ˜ 893.8 MHz<br>GSM1900: 1930.2 MHz ˜ 1989.8 MHz<br>WCDMA Band II: 1852.4 MHz ˜ 1907.6 MHz<br>WCDMA Band V: 826.4 MHz ˜ 846.6 MHz |
| **Maximum Output power to Antenna** | GSM/GPRS: 31 dBm<br>GSM1900: 28 dBm<br>WCDMA Band II: 22.5 dBm<br>WCDMA Band V: 23 dBm |
| **Antenna Type** | Integrated antenna: Monopole FPC;<br>Antenna Gain: GSM and WCDMA see report J5_report0910.pdf |
| **Type of Modulation** | GSM/GPRS: GMSK<br>EDGE: GMSK/8PSK<br>WCDMA: QPSK (UL)<br>HSUPA: QPSK (UL) |

## 2.6 Modification of the EUT

**In order to be able to do the conducted tests, EUT is being modified by:**

**a) Soldering 50 Ohm impedance matched coaxial cable to the antenna pads of the device, disconnecting the integrated antenna terminals. A SMA female connector is added to the other end of the RF coaxial cable (pigtail).**

**b) Battery terminal taken out from the EUT for variations of Supply voltage.**

**The modification is done following Device manufacturing instructions. The task of modification is performed using external company Techniveau:**

Techniveau
Bijsterhuizen 2414
6604 LL Wijchen
Tel. +31 (0)6 21 551 223
www.techniveau.nl
info@techniveau.nl

## 2.7 Testing Location

| | |
|---|---|
| Test Site | Telefication BV |
| Test Site location | Edisonstraat 12a<br>6902 PK Zevenaar<br>The Netherlands<br><br>Tel. +31 316583180<br>Fax. +31 316583189 |
| Test Site FCC Registration No. | 282250 |

## 2.8 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), 2014 01-10 edition
- ANSI/ TIA/EIA-603-C-2004
- FCC KDB 971168 D01 Power meas. License Digital Systems V02r02

## 2.9 Observations and remarks:

1) All tested items were verified and recorded according to the standards and no deviations were identified during the test.
2) The Industry Canada number for the Open Area Test Site of Telefication is: 4173A-1.
3) The contents of this test report, if reproduced, shall be copied in full, unless special consent in writing for reproduction in part is granted by Telefication. Copyright of this test report is reserved to Telefication B.V.
4) The antenna gain can be found in J5_report0910.pdf

## 2.10 Conclusions

The sample of the product showed **NO NON-COMPLIANCES** to the specifications stated in paragraph 2.8 of this report.

The results of the tests as stated in this report, are exclusively applicable to the product item as identified in this report. Telefication accepts no responsibility for any stated properties of product items in this test report, which are not supported by the tests as specified in paragraph 2.8 *"Applicable Standards".*

All conducted tests are performed by:

Name : A. Amininejad

Review of test methods and report by:

Name : ing. P.A. Suringa

The above conclusions have been verified by the following signatory:

Date : 30 September 2015

Name : A. Amininejad

Function : Operational Manager Radio Laboratory

Signature :

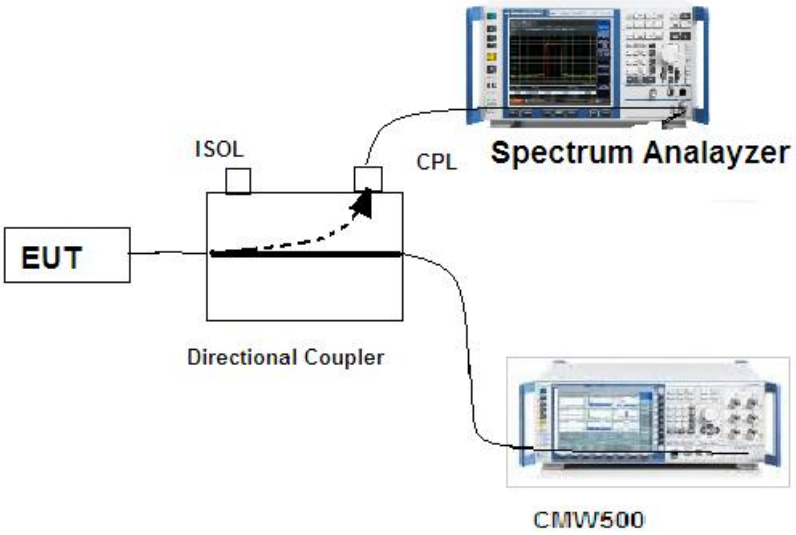
# 3 Test Configuration of the EUT (Equipment under Test)

## 3.1 Test mode

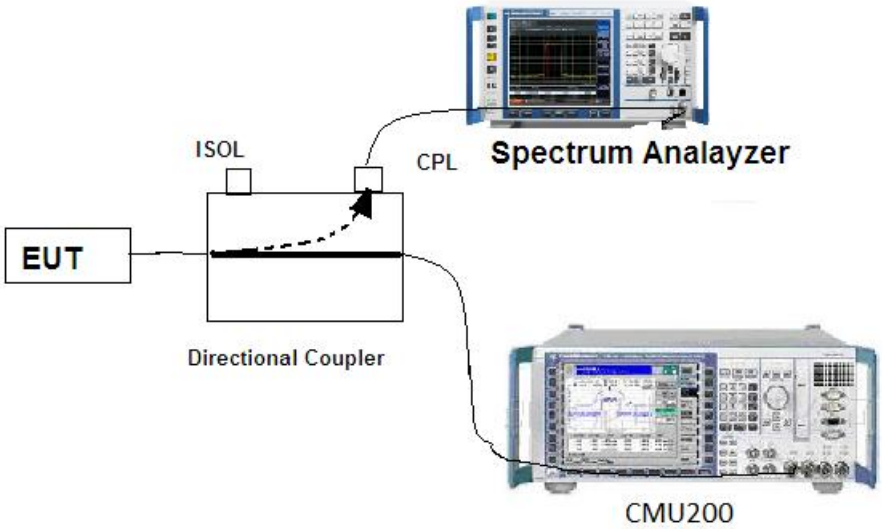
Antenna port conducted and radiated test cases were performed according to KDB971168 D01 Power Meas. Licensed Digital Systems V02r02. The EUT is configured to transmit at its maximum power. Frequency range from 30 MHz up to 10th Harmonic of the Fundamental Frequencies at low, mid and high channel where examined. Radiated emission where tested by establishing the GSM and RMC 12.2 Kbps link for GSM850MHz, GSM1900MHz and WCDMA respectively.

## 3.2 Conducted Test setup diagram

**WCDMA test setup**

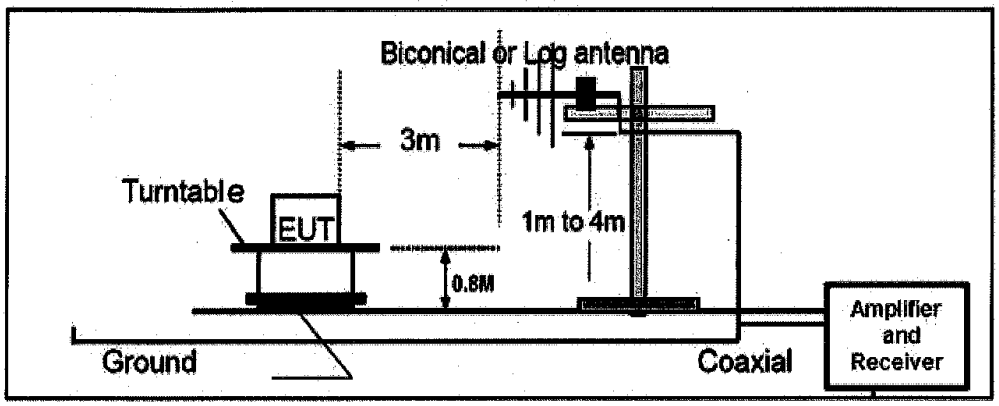



**GSM/PCS test setup**

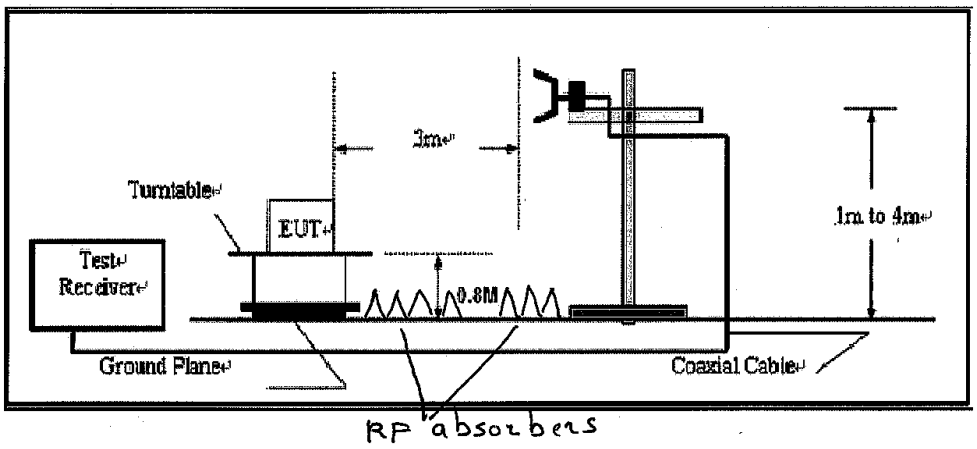


## 3.3 Radiated Test setup within a Semi Anechoic Chamber (SAC)

RADIATED EMISSION TEST SETUP 30MHz-1000MHz




RADIATED EMISSION TEST SETUP ABOVE 1000MHz



## 3.4 Equipment used in test configuration

| | |
|---|---|
| **No 1:** | CMW500 Wideband Radio Communication Tester |
| **Manufacturer:** | Rohde & Schwarz |
| **Serial number:** | 1201.0002K50 |
| **TE number:** | TE 01286 |
| **No 2:** | CMU200 Universal Radio Communication Tester |
| **Manufacturer:** | Rohde & Schwarz |
| **Serial Number:** | 1100.0008.02 |
| **TE number:** | TE 01166 |
| **No 3:** | HMP2020 Programmable Power Supply |
| **Manufacturer:** | Rohde & Schwarz |
| **TE number:** | TE 01270 |
| **No 4:** | Signal generator 10 MHz – 50 GHz |
| **Manufacturer:** | Hewlett Packard |
| **Model** | 83650B |
| **TE number:** | TE 00487 |
| **No 5:** | Signal analyzer 10Hz- 40 GHz |
| **Manufacturer:** | Rohde & Schwarz |
| **Model:** | FSV |
| **TE number:** | TE 01269 |
| **No 6:** | VT4002 EMC Climate Chamber |
| **Manufacturer:** | Vötsch Industrietechnik GmbH |
| **Serial number:** | 56600930 |
| **TE number:** | TE 01288 |
| **No 7:** | Low insertion loss and VSWR DC – 40 GHz Directional Coupler |
| **Manufacturer:** | Marki |
| **Serial number:** | CA-40 1443 |
| **TE number:** | TE 01278 |
| **No 9:** | USB to RS232 converter |
| **Manufacturer:** | Targus |
| **Serial number:** | PA088 |
| **TE number:** | -- |
| **No 10:** | USB to GPIB interface adopter |
| **Manufacturer:** | National Instruments |
| **TE number:** | TE 01283 |

| | |
|---|---|
| **No 11:** | Spectrum analyzer 9 kHz- 40 GHz |
| **Manufacturer:** | Rohde & Schwarz |
| **Model:** | FSP 40 |
| **TE number:** | TE 11125 |
| **No 12:** | Horn antenna |
| **Manufacturer:** | EMCO The Electro-Mechanics Co. |
| **Model:** | 3115 |
| **Serial number:** | 9412-4377 |
| **TE number:** | TE 00531 |
| **No 13:** | Biconilog antenna |
| **Manufacturer:** | Chase |
| **Model:** | CBL 6112A |
| **TE number:** | TE 00967 |
| **No 14:** | Pre-amplifier |
| **Manufacturer:** | Miteq |
| **Model:** | AFS42-041001800-28-10 |
| **TE number** | TE 11132 |
| **No 15:** | High pass filter |
| **Manufacturer:** | Wainwright |
| **Model:** | WHK 3.0/18G-10EF |
| **TE number** | TE 01140 |
| **No 16:** | High pass filter |
| **Manufacturer:** | Wainwright |
| **Model:** | WHK 1.1/15G-10EF |
| **TE number** | TE 01139 |
| **No 17:** | Pre-amplifier |
| **Manufacturer:** | Miteq |
| **Model:** | JS4-18004000-30-8P-A1 |
| **TE number** | TE 11131 |

## 3.5 Explanation of the Measurement results for all conducted test Items:

The Path loss between the DUT and the Spectrum Analyser at the frequency range of 30 MHz up to 40 GHz is measured and is stored in a transducer table. This transducer table is used for a level offset of the spectrum analyser. With this level offset, the spectrum analyser's reading will exactly be the RF output.

# 4 Tested Channels

## 4.1 WCDMA Channels

| UMTS Band | | $F_{Low}$ | $F_{Mid}$ | $F_{High}$ |
|---|---|---|---|---|
| II | Ch. | 9263 | 9400 | 9538 |
| | F [MHz] | 1852,6 | 1880 | 1907,6 |
| V | Ch. | 4132 | 4182 | 4233 |
| | F [MHz] | 826,4 | 836,4 | 846,6 |

## 4.2 Tested GSM Channels

| | | $F_{Low}$ | $F_{Mid}$ | $F_{High}$ |
|---|---|---|---|---|
| GSM 850 MHz | Ch. | 128 | 162 | 251 |
| | F [MHz] | 824,2 | 836,6 | 848,8 |
| GSM 1900 MHz | Ch. | 512 | 661 | 810 |
| | F [MHz] | 1851,8 | 1880,0 | 1909,8 |

# 5 Test results

## 5.1 Conducted Output Power Measurement

### 5.1.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the Maximum power. The measured power at the radio frequency on the transmitter's output terminal shall be reported.

### 5.1.2 Limit

The ERP of mobile transmitters must not exceed 7 W (38.45 dBm). Rule part §22.913(a)(2).
The EIRP of mobile transmitters must not exceed 2 W (33 dBm). Rule part §24.232(c).

### 5.1.3 Measuring instruments

The measuring instruments are listed in chapter 3.4 of this report.

### 5.1.4 Test setup

As shown in chapter 3.2 of this report.

### 5.1.5 Test procedure

1) The transmitter output port was connected to the system simulator.
2) Through System simulator EUT is forced to transmit at its maximum power.
3) Low, middle and high channel on each band were selected by different modulation.
4) Maximum burst average power for GSM and Maximum average power other modulation type were measured,

### 5.1.6 Test results of conducted and radiated Output power

| Cellular Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Modes** | **GSM 850 MHz** | | | **GPRS 850 MHz** | | | **WCDMA Band V (RMC 12.2 Kbps)** | | |
| **Channel** | **Low** | **Mid** | **High** | **Low** | **Mid** | **High** | **Low** | **Mid** | **High** |
| | **128** | **162** | **251** | **128** | **162** | **251** | **4132** | **4182** | **4233** |
| **Frequency [MHz]** | **824,2** | **836,6** | **848,8** | **824,2** | **836,6** | **848,8** | **826,4** | **836,4** | **846,6** |
| **Conducted output power [dBm]** | 32,24 | 32,21 | 32,21 | 25,8 | 25,65 | 25,69 | 20,02 | 20,33 | 20,46 |
| **ERP [dBm]** | 27.59 | 27.56 | 27.56 | 21.25 | 21.15 | 21.04 | 15.07 | 15.38 | 15.51 |
| **Conducted output power [Watts]** | 1,68 | 1,66 | 1,66 | 0,38 | 0,37 | 0,37 | 0,10 | 0,11 | 0,11 |

| PCS Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Modes** | **PCS1900 MHz** | | | **GPRS PCS1900** | | | **WCDMA Band II (RMC 12.2 Kbps)** | | |
| **Channel** | **Low** | **Mid** | **High** | **Low** | **Mid** | **High** | **Low** | **Mid** | **High** |
| | **512** | **661** | **810** | **512** | **661** | **810** | **9263** | **9400** | **9538** |
| **Frequency [MHz]** | **1850,2** | **1880** | **1909,8** | **1850,2** | **1880** | **1909,8** | **1852,4** | **1880** | **1907,6** |
| **Conducted output power [dBm]** | 29,26 | 29,24 | 29,22 | 20,67 | 20,62 | 20,48 | 21,84 | 22,16 | 22,12 |
| **EIRP [dBm]** | 25.86 | 25.84 | 25.82 | 17.27 | 17.22 | 17.08 | 17.54 | 17.86 | 17.82 |
| **Conducted output power [Watts]** | 0,84 | 0,84 | 0,84 | 0,12 | 0,12 | 0,11 | 0,15 | 0,16 | 0,15 |

**Note:** For low channels of the WCDMA the method of measurement is the Peak power is selected. GSM and PCS measurements are based on Burst average while GPRS measurement is based on the Max average.

### 5.1.7 Measurement uncertainties

Within the 95% confidence level the uncertainties are calculated as ±1.78 dB

## 5.2 Peak to Average Ratio

### 5.2.1 Limit

The Peak-to-Average-Ratio (PAR) of the transmission may not exceed 13 dB.

### 5.2.2 Measuring instruments

The measuring instruments are listed in chapter 3.4 of this report.

### 5.2.3 Test setup

As shown in chapter 3.2 of this report.

### 5.2.4 Test procedure

1) The EUT is connected to a system simulator and a Spectrum analyser via a directional coupler.
2) Set the CCDF (Complementary Cumulative Distribution Function) option on the Spectrum analyser. The highest powers were measured and recorder the maximum PAPR level associated with an uncertainty of 0.1%.
3) Recorded the deviation as Peak to Average ratio.

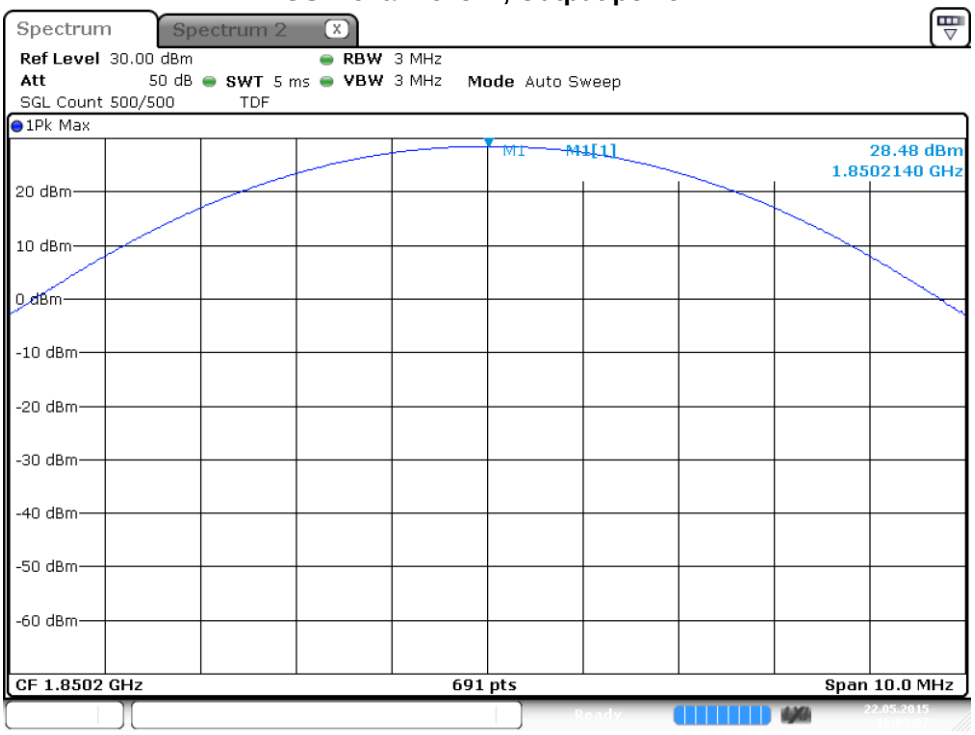
### 5.2.5 Results of Peak to Average Ratio

| Modes | GSM 850 MHz | | | WCDMA Band V (RMC 12.2 Kbps) | | |
|---|---|---|---|---|---|---|
| Channel | Low | Mid | High | Low | Mid | High |
| | 128 | 162 | 251 | 4132 | 4182 | 4233 |
| Frequency [MHz] | 824,2 | 836,6 | 848,8 | 826,4 | 836,4 | 846,6 |
| Conducted output power [dBm] | 31,45 | 31,42 | 31,31 | 20,02 | 20,33 | 20,46 |
| Conducted output power [Watts] | 1,40 | 1,39 | 1,35 | 0,10 | 0,11 | 0,11 |
| Burst Average [dBm] | 31,33 | 31,30 | 31,20 | NA | NA | NA |
| Cres [dB]; Peak to Avg. | 0,12 | 0,12 | 0,11 | 3,51 | 3,38 | 3,44 |

| Modes | PCS 1900 MHz | | | WCDMA Band II (RMC 12.2 Kbps) | | |
|---|---|---|---|---|---|---|
| Channel | Low | Mid | High | Low | Mid | High |
| | 512 | 661 | 810 | 9263 | 9400 | 9538 |
| Frequency [MHz] | 1850,2 | 1880 | 1909,8 | 1852,6 | 1880 | 1907,6 |
| Conducted output power [dBm] | 28,48 | 28,45 | 28,44 | 21,84 | 22,12 | 21,80 |
| Conducted output power [Watts] | 0,7 | 0,7 | 0,7 | 0,15 | 0,16 | 0,15 |
| Burst Average [dBm] | 28,36 | 28,34 | 28,32 | NA | NA | NA |
| Cres [dB]; Peak to Average | 0,12 | 0,11 | 0,12 | 3,17 | 3,26 | 3,49 |

## 5.2.6 Test results GSM

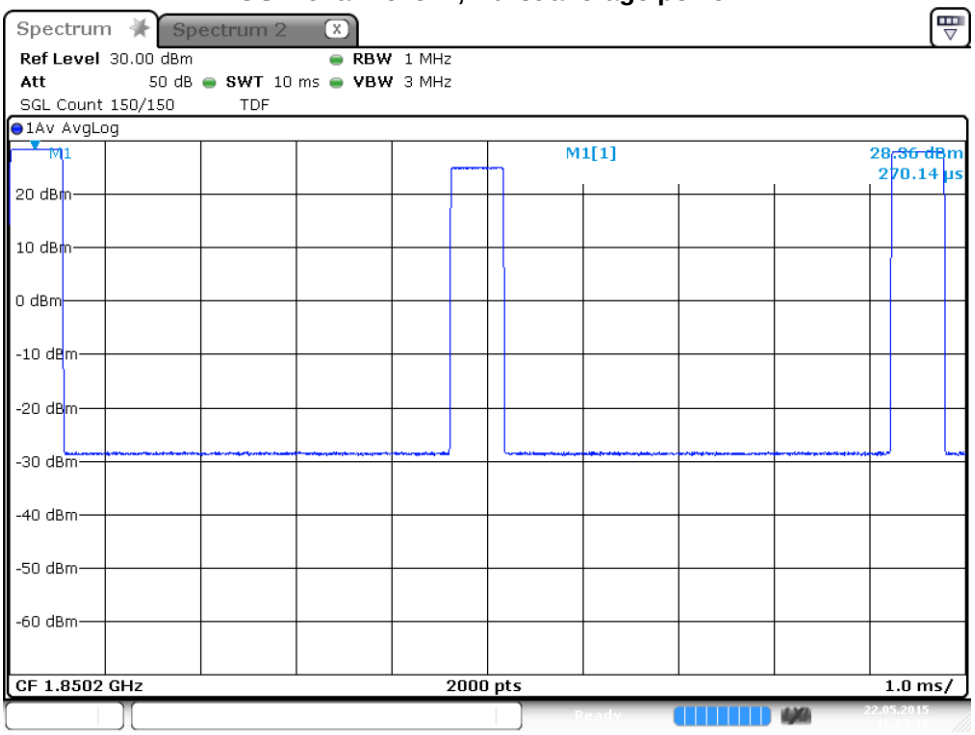
**GSM channel 512, Output power**




Gsm Channel: 512 : Measure DUT output power

Date: 22.MAY.2015 16:03:07

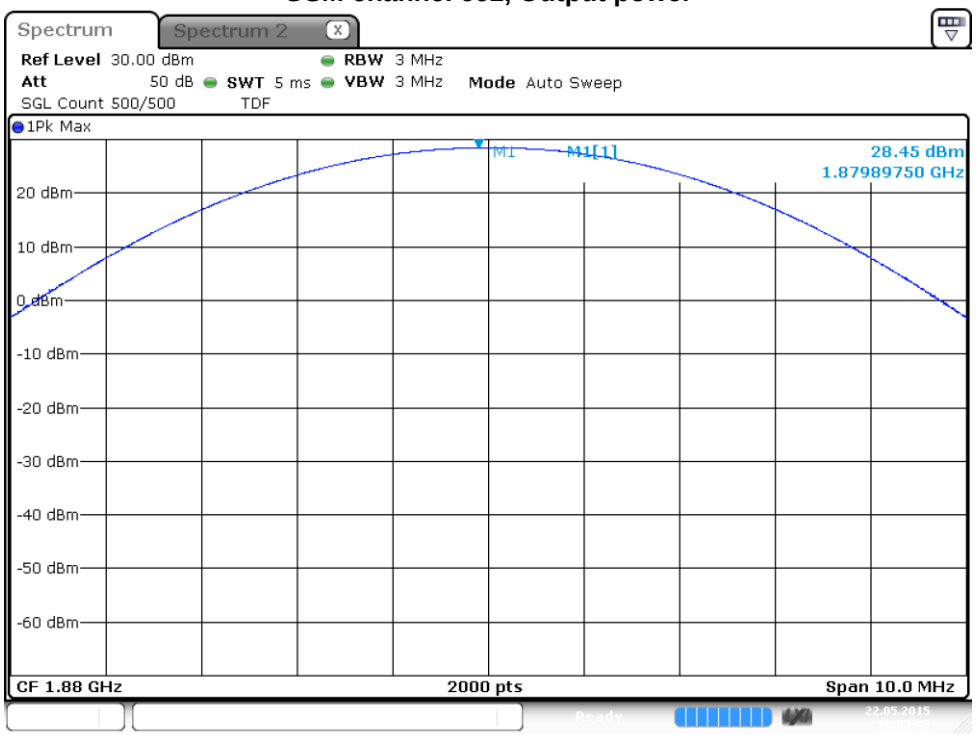
**GSM channel 512, Burst average power**




Measure GSM Burst average power

Date: 22.MAY.2015 16:03:16

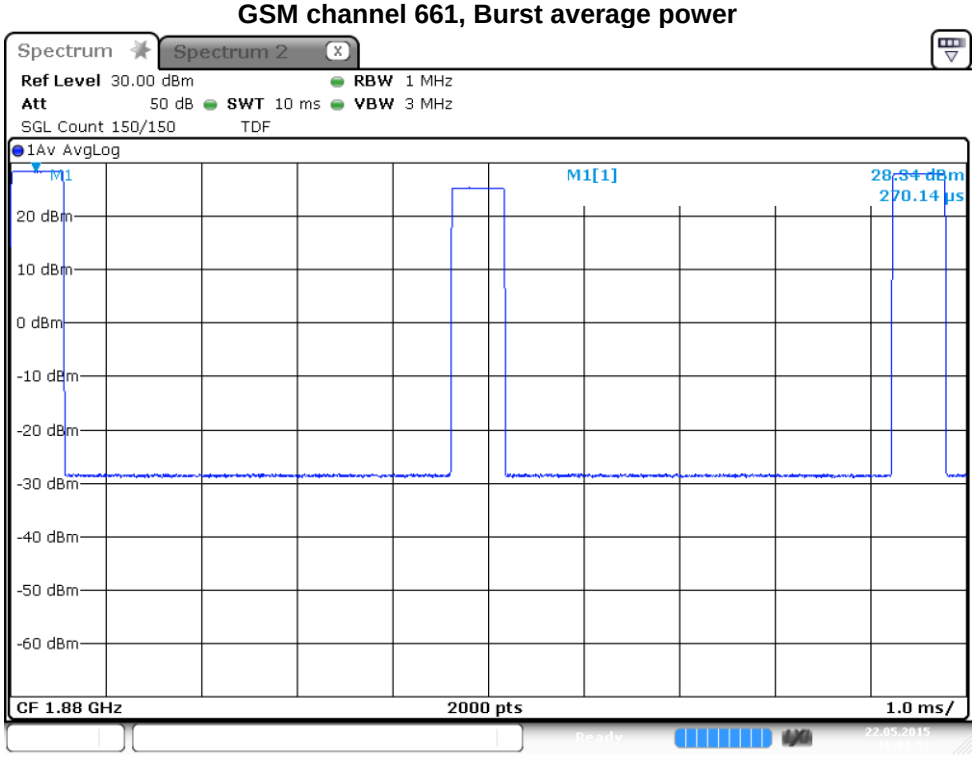
**GSM channel 661, Output power**




Gsm Channel: 661 : Measure DUT output power

Date: 22.MAY.2015 16:03:44

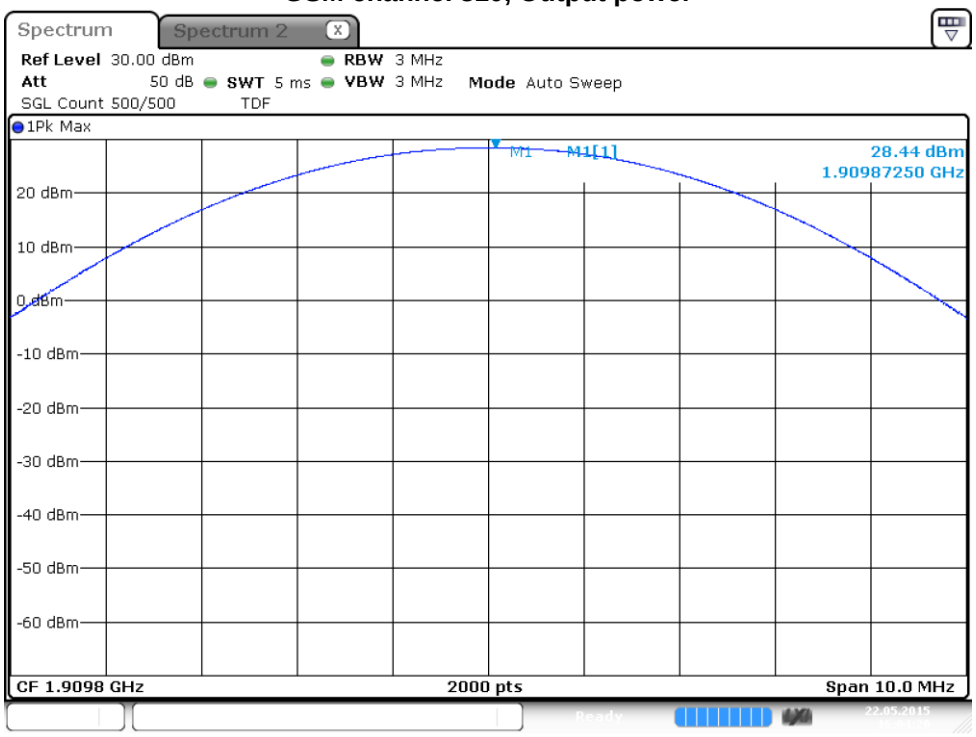
**GSM channel 661, Burst average power**




Measure GSM Burst average power

Date: 22.MAY.2015 16:03:52

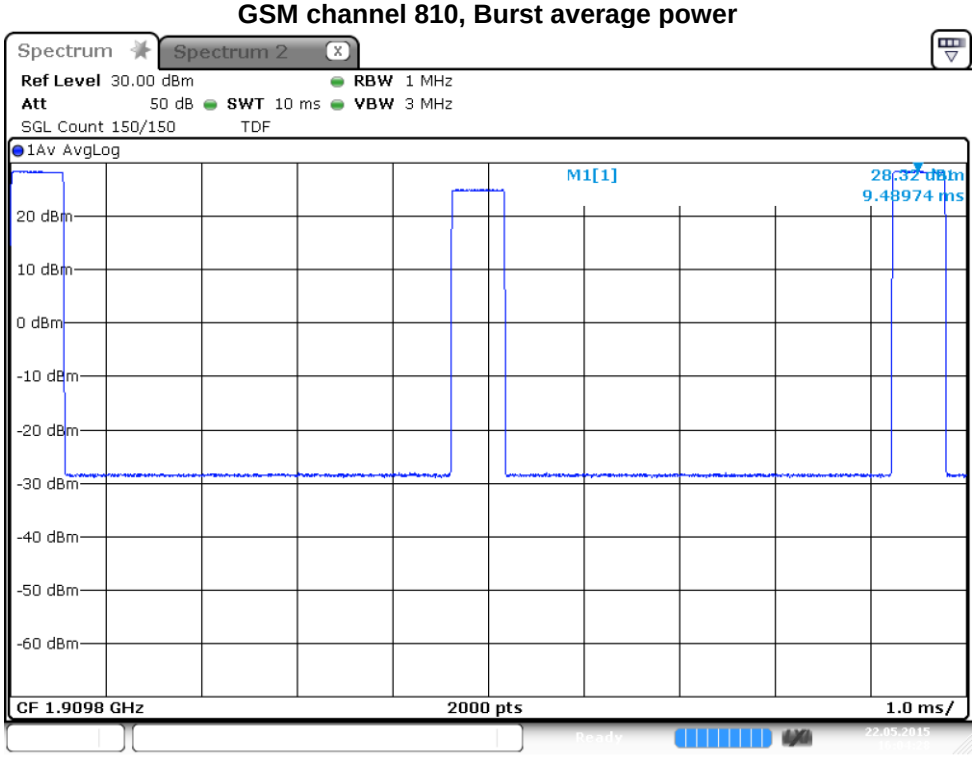
**GSM channel 810, Output power**




Gsm Channel: 810 : Measure DUT output power

Date: 22.MAY.2015 16:04:20

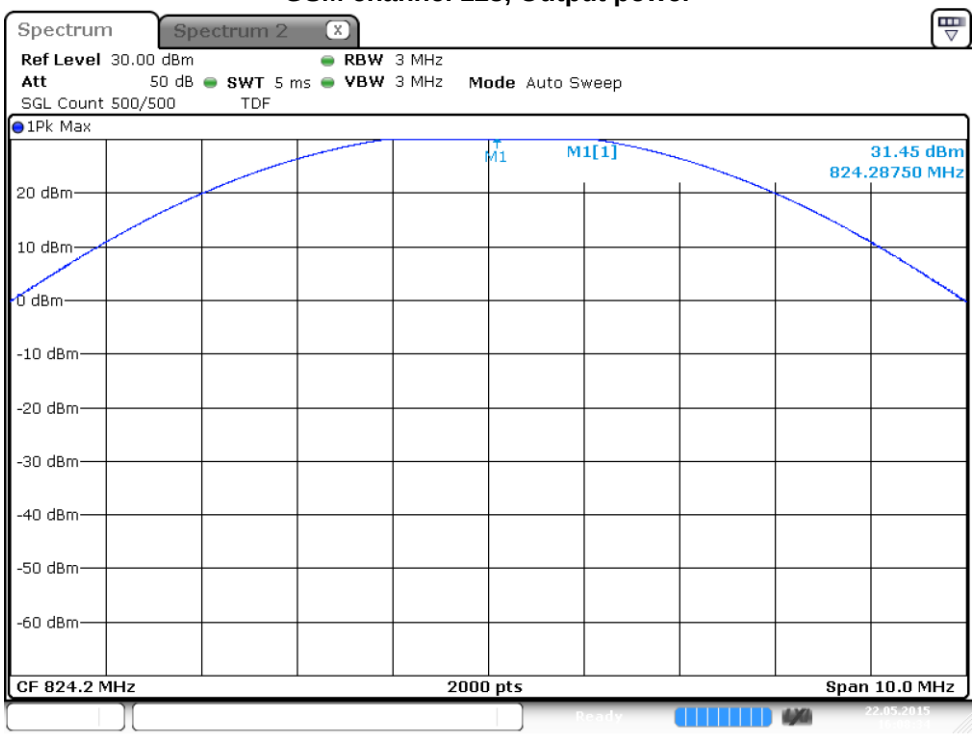
**GSM channel 810, Burst average power**




Measure GSM Burst average power

Date: 22.MAY.2015 16:04:28

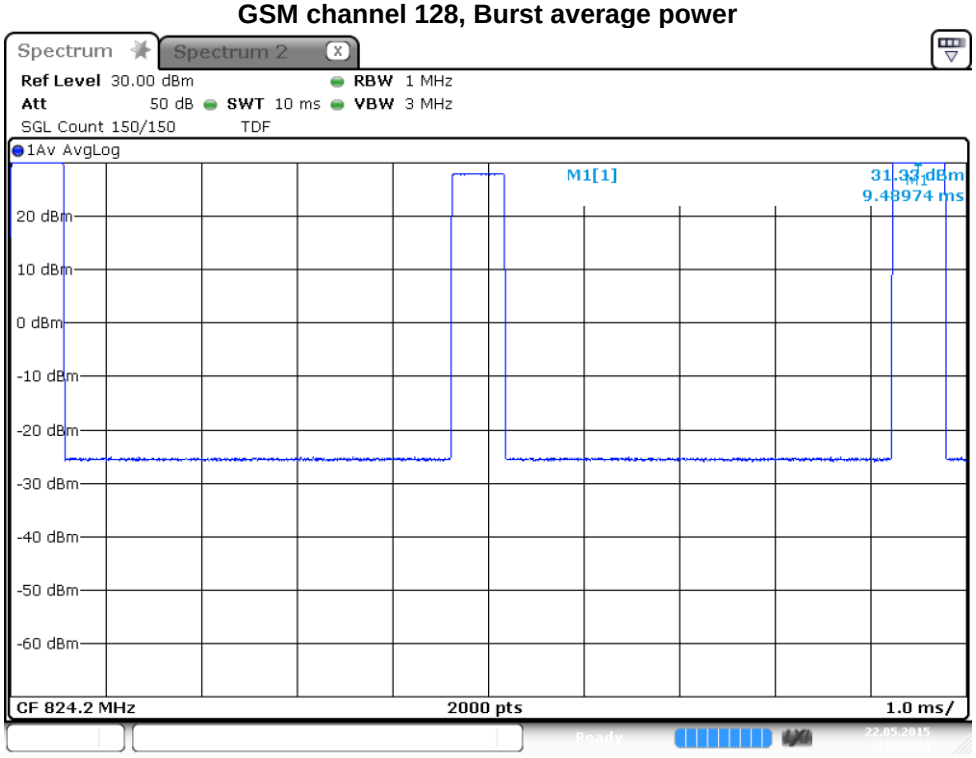
**GSM channel 128, Output power**




Gsm Channel: 128 : Measure DUT output power

Date: 22.MAY.2015 16:08:35

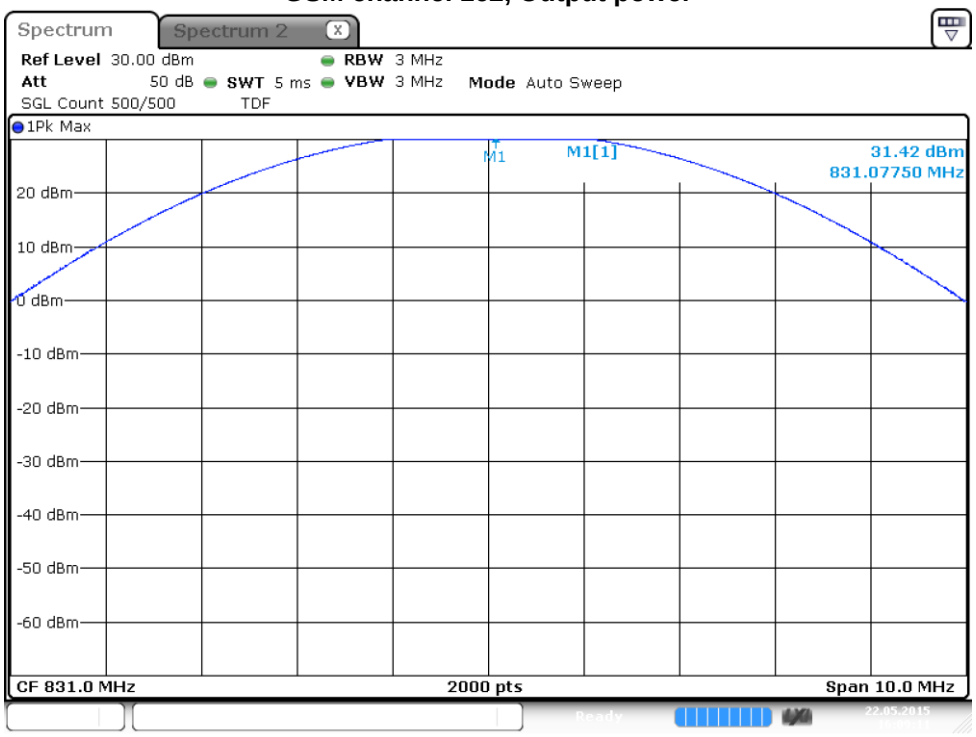
**GSM channel 128, Burst average power**




Measure GSM Burst average power

Date: 22.MAY.2015 16:08:43

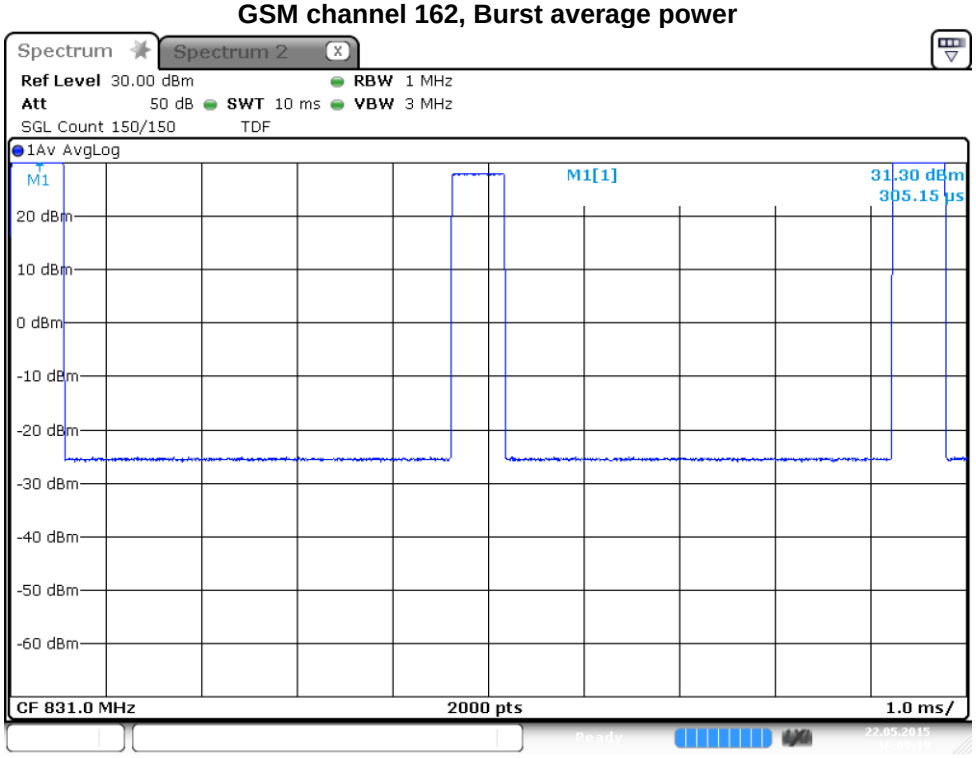
**GSM channel 162, Output power**




Gsm Channel: 162 : Measure DUT output power

Date: 22.MAY.2015 16:09:11

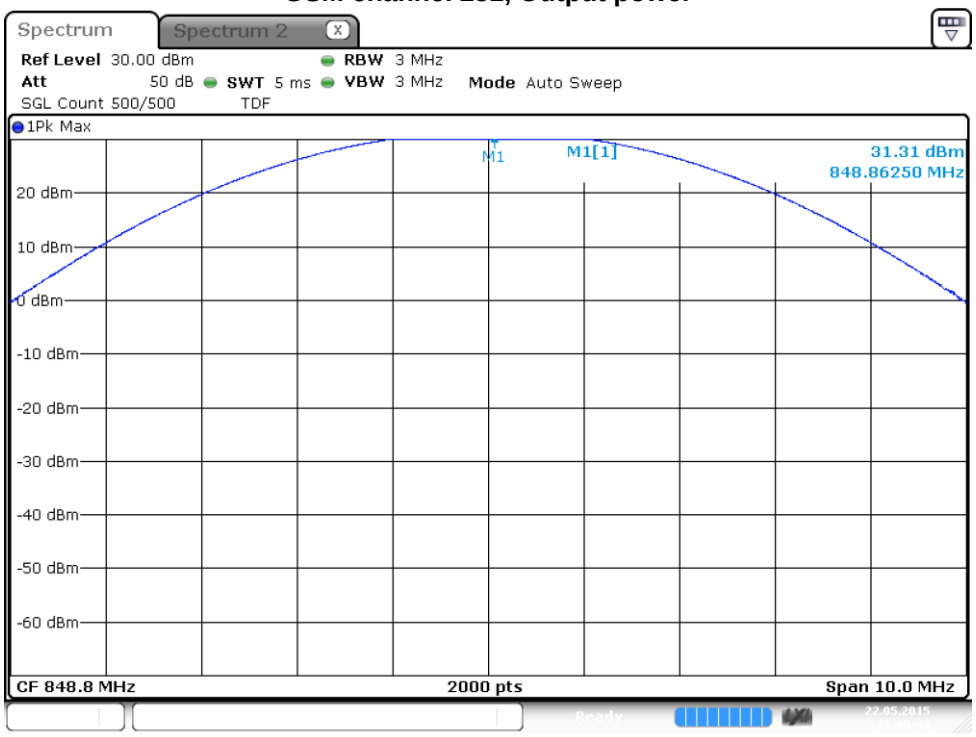
**GSM channel 162, Burst average power**




Measure GSM Burst average power

Date: 22.MAY.2015 16:09:20

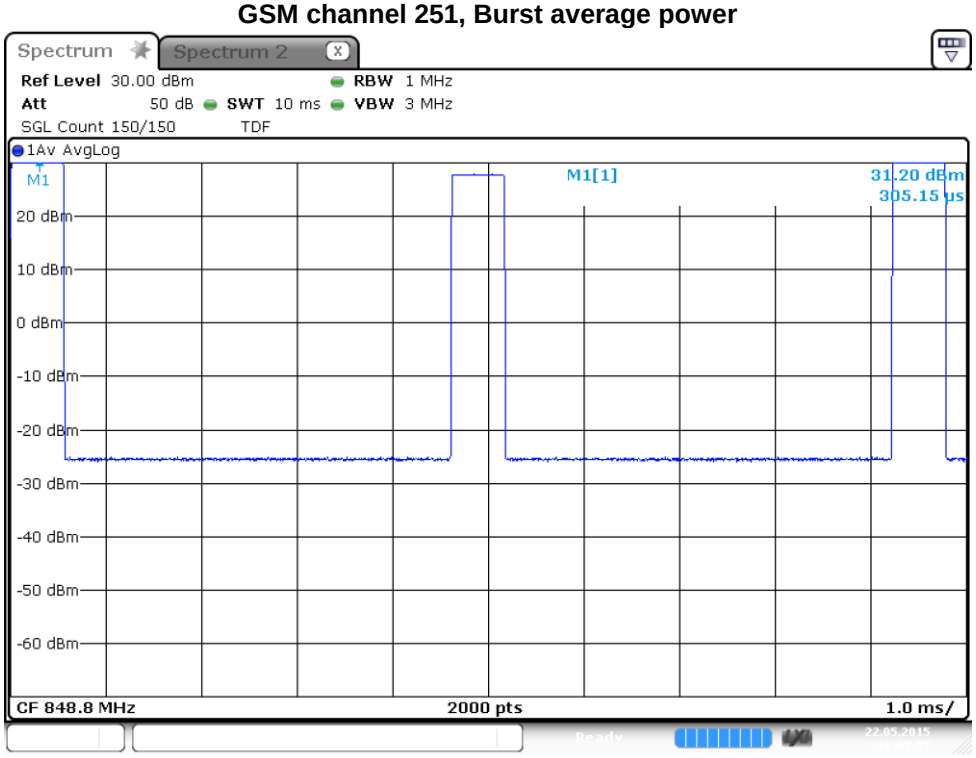
**GSM channel 251, Output power**




Gsm Channel: 251 : Measure DUT output power

Date: 22.MAY.2015 16:09:48

**GSM channel 251, Burst average power**

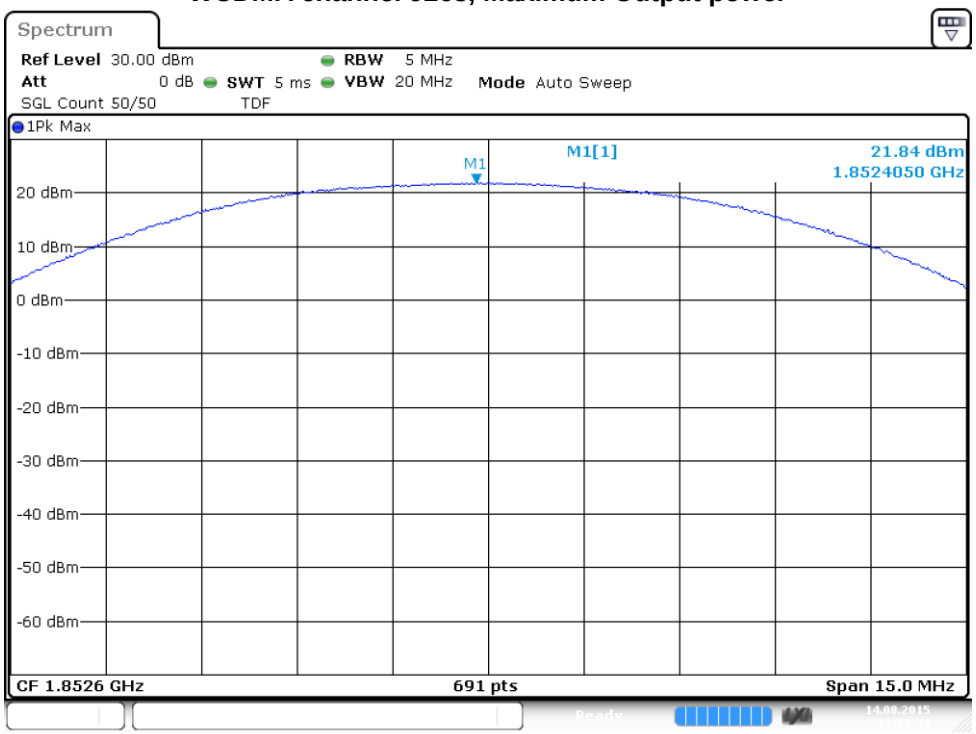



Measure GSM Burst average power

Date: 22.MAY.2015 16:09:57

### 5.2.7 Test results WCDMA

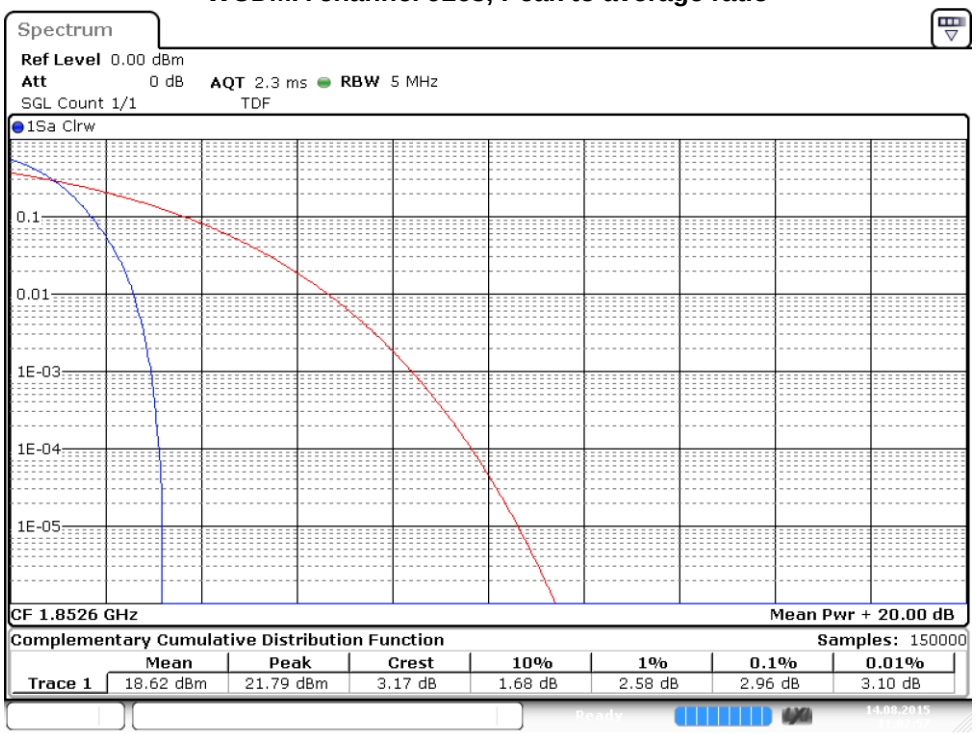
**WCDMA channel 9263, Maximum Output power**




Wcdma Channel: 9263 : Maximum conducted output power

Date: 14.AUG.2015 11:02:44

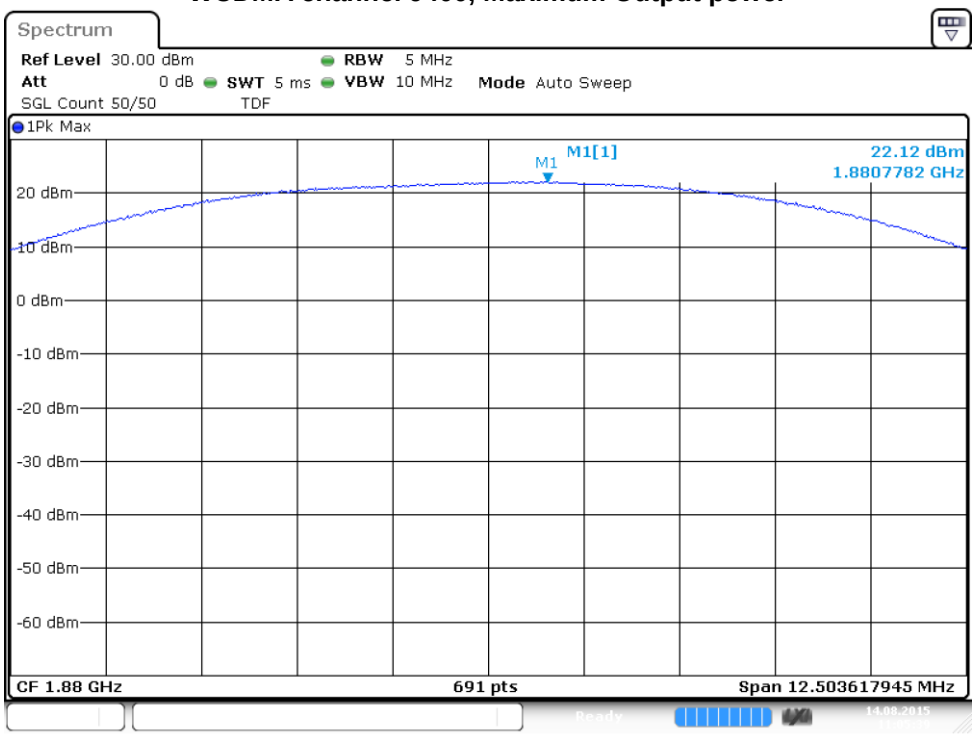
**WCDMA channel 9263, Peak to average ratio**




Wcdma Channel: 9263 : Measure Peak To Average Ratio

Date: 14.AUG.2015 11:02:57

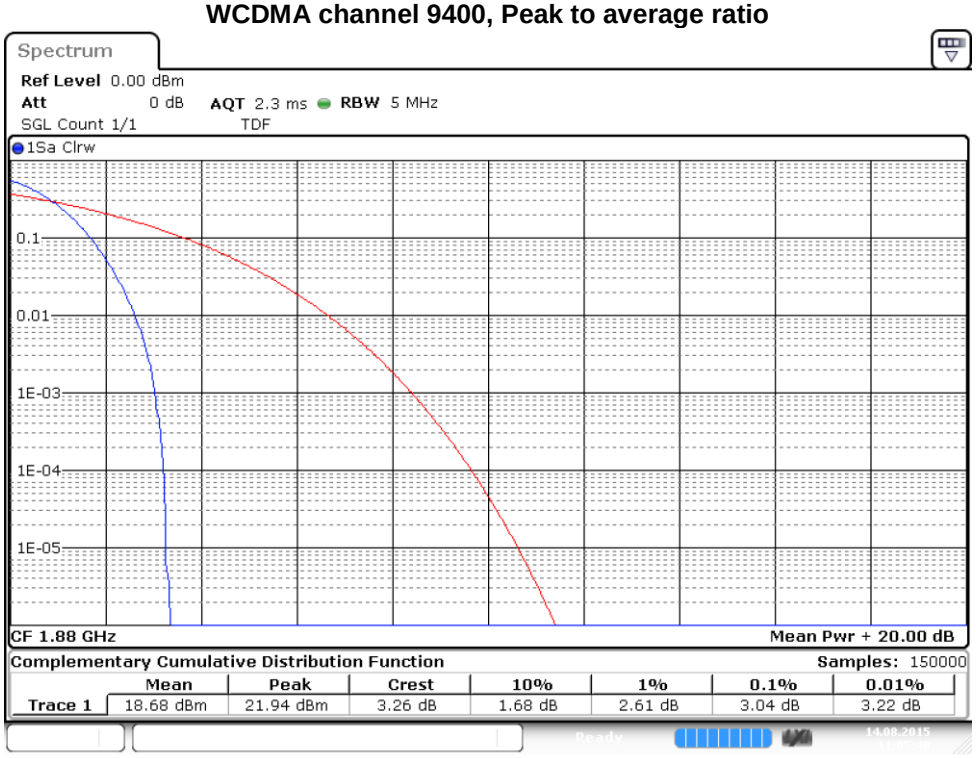
### WCDMA channel 9400, Maximum Output power




Wcdma Channel: 9400 : Maximum conducted output power

Date: 14.AUG.2015 11:05:39

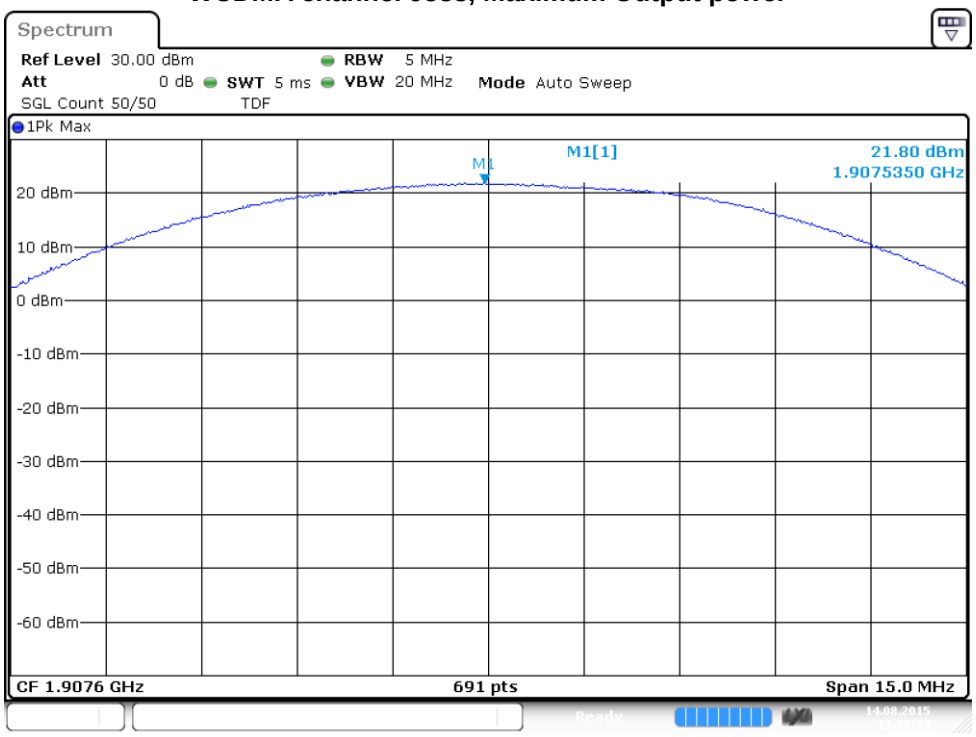
### WCDMA channel 9400, Peak to average ratio




Wcdma Channel: 9400 : Measure Peak To Average Ratio

Date: 14.AUG.2015 11:05:41

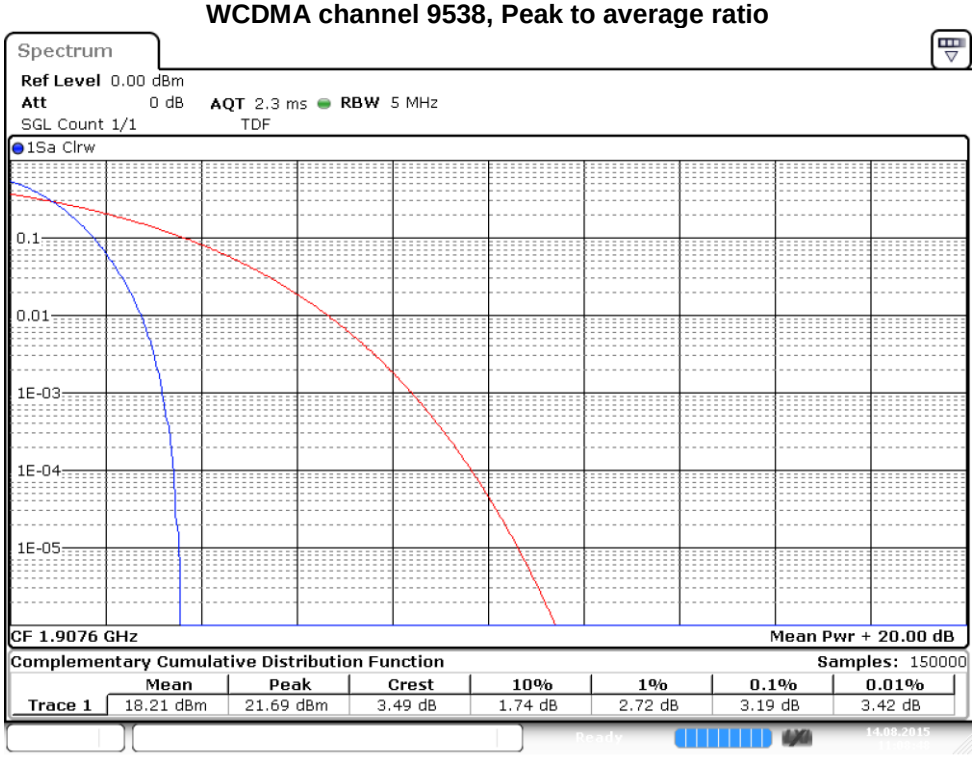
### WCDMA channel 9538, Maximum Output power




Wcdma Channel: 9538 : Maximum conducted output power

Date: 14.AUG.2015 11:08:34

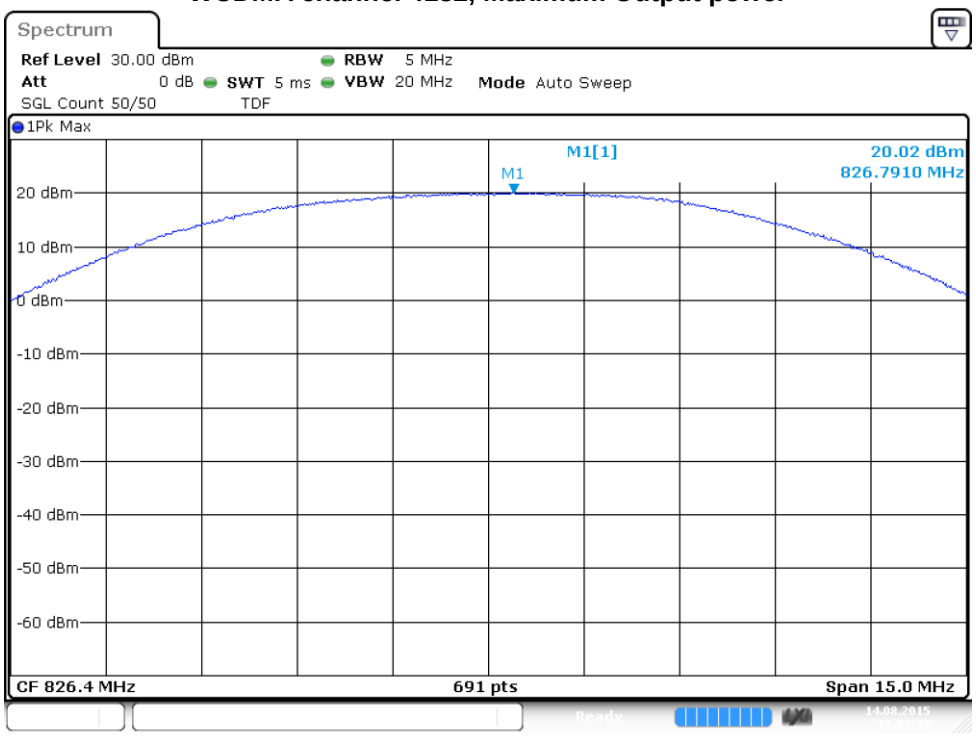
### WCDMA channel 9538, Peak to average ratio




Wcdma Channel: 9538 : Measure Peak To Average Ratio

Date: 14.AUG.2015 11:08:48

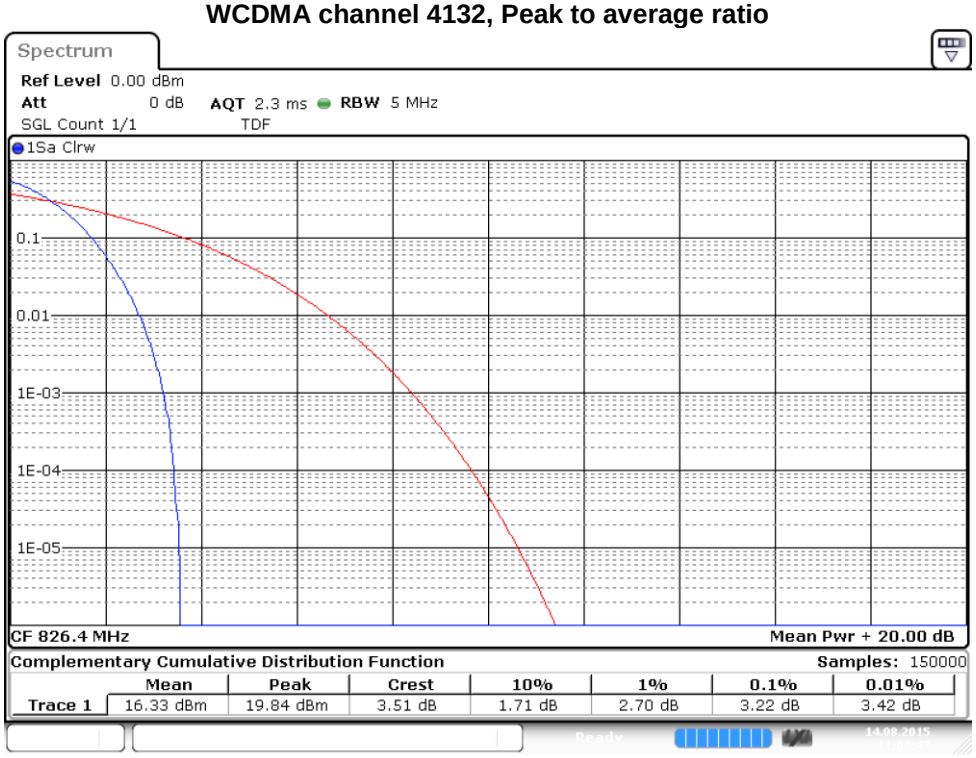
### WCDMA channel 4132, Maximum Output power




Wcdma Channel: 4132 : Maximum conducted output power

Date: 14.AUG.2015 11:03:33

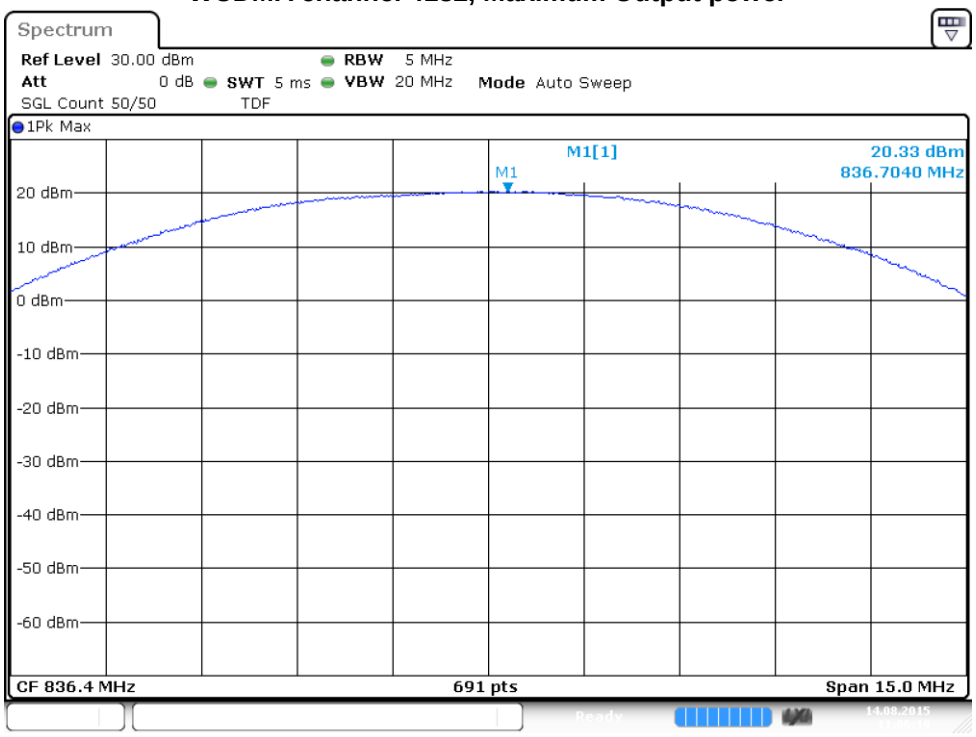
### WCDMA channel 4132, Peak to average ratio




Wcdma Channel: 4132 : Measure Peak To Average Ratio

Date: 14.AUG.2015 11:03:47

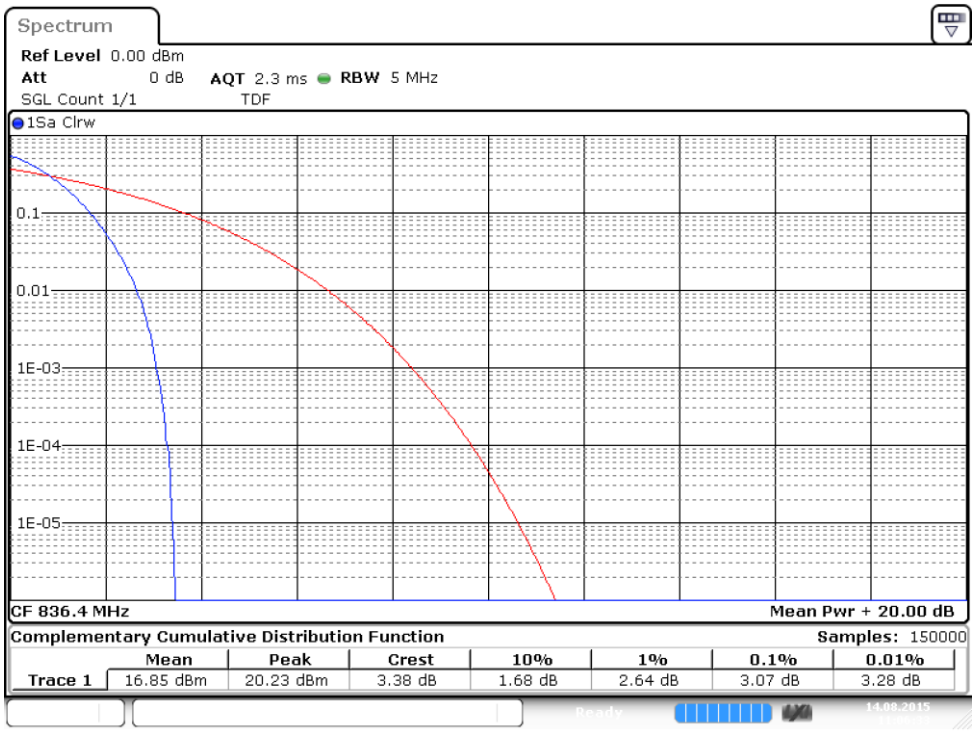
### WCDMA channel 4182, Maximum Output power




Wcdma Channel: 4182 : Maximum conducted output power

Date: 14.AUG.2015 11:06:19

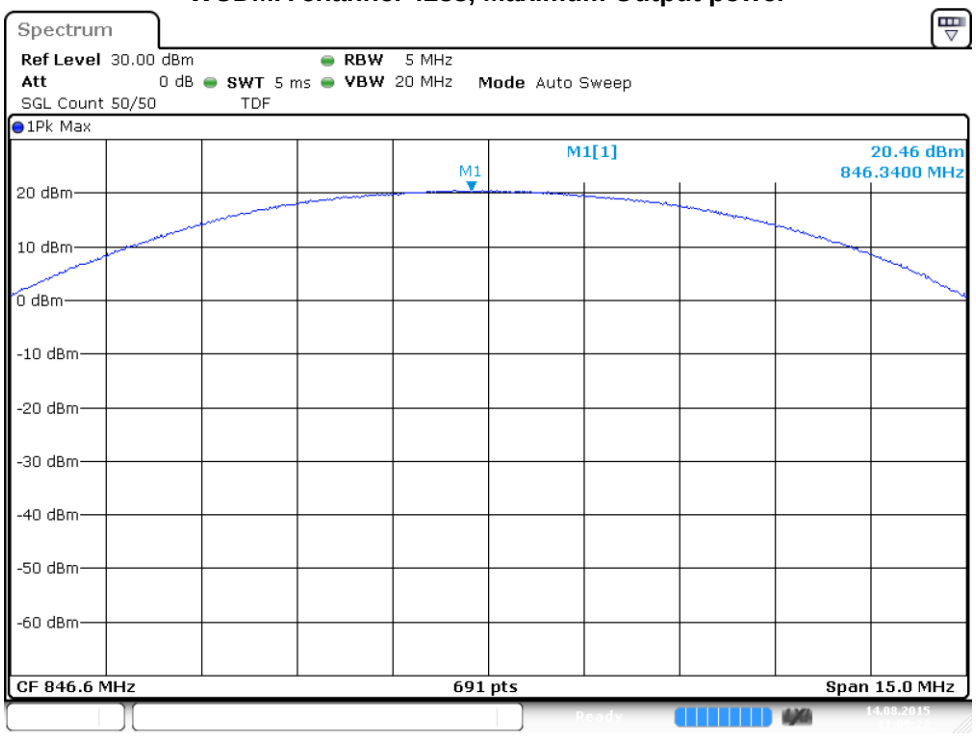
### WCDMA channel 4182, Peak to average ratio




Wcdma Channel: 4182 : Measure Peak To Average Ratio

Date: 14.AUG.2015 11:06:33

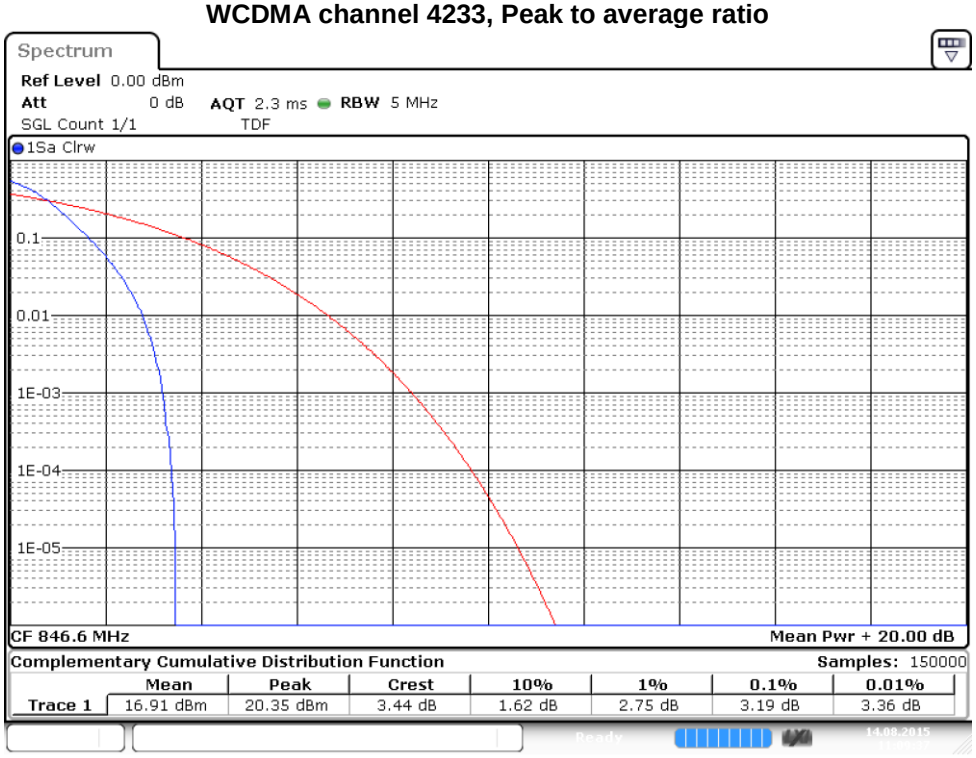
**WCDMA channel 4233, Maximum Output power**




Wcdma Channel: 4233 : Maximum conducted output power

Date: 14.AUG.2015 11:09:23

**WCDMA channel 4233, Peak to average ratio**




Wcdma Channel: 4233 : Measure Peak To Average Ratio

Date: 14.AUG.2015 11:09:36

## 5.2.8 Measurement uncertainties

Uncertainty values are not available, because a statistic approach CCDA method has been used.

## 5.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

### 5.3.1 Description of the 99% Bandwidth and 26 dB Bandwidth Measurement

The 99% occupied bandwidth is the width of a frequency band such that below the lower and above the upper frequency limits, the mean power emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.
The emission Bandwidth is defined as the width of the signal between two points, located at two side of the carrier frequency, outside of which all emissions are attenuated at least by 26 dB below the transmitter power.

### 5.3.2 Measuring instruments

The measuring instruments are listed in chapter 3.4 of this report.

### 5.3.3 Test setup

As shown in chapter 3.2 of this report.

### 5.3.4 Test procedure

1) The EUT is connected to a system simulator and a Spectrum analyser via a directional coupler.
2) The path loss is compensated for each measurement. This is done through the initial path compensation procedure starting from 30 MHz up to the $10^{th}$ harmonics of the fundamental transmitter frequency.
3) 99% Occupied bandwidth was measured with the following spectrum analyser settings:

   RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
4) The 26 dB Bandwidth was measured by setting RBW= 1% of Emission Bandwidth (26 dB Bandwidth. VBW=3*RBW, Detector = Peak, Trace = Max hold.

### 5.3.5 The results of Occupied Bandwidth and 26 dB Bandwidth

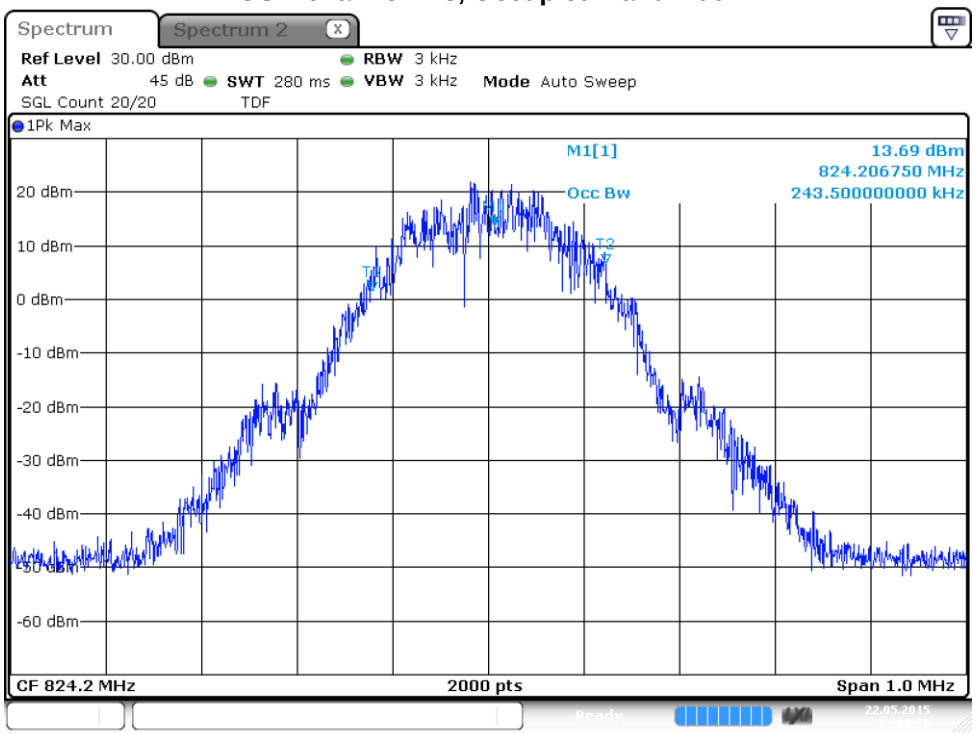
| Modes | GSM 850 MHz | | |
|---|---|---|---|
| Channel | Low | Mid | High |
| | 128 | 162 | 251 |
| Frequency [MHz] | 824,2 | 836,6 | 848,8 |
| 99% OBW [kHz] | 243,5 | 247,5 | 246 |
| 26 dB BW [kHz] | 306,3 | 312,4 | 309,3 |
| Uncertainty | ± 1,3 kHz | | |

| Modes | PCS1900 MHz | | |
|---|---|---|---|
| Channel | Low | Mid | High |
| | 512 | 661 | 810 |
| Frequency [MHz] | 1850,2 | 1880 | 1909,8 |
| 99% OBW [kHz] | 241,5 | 243 | 246,0 |
| 26 dB BW [kHz] | 312,1 | 312,4 | 304,8 |
| Uncertainty | ± 1,3 kHz | | |

| Modes | WCDMA Band V (RMC 12.2 Kbps) | | | WCDMA Band II (RMC 12.2 Kbps) | | |
|---|---|---|---|---|---|---|
| Channel | Low | Mid | High | Low | Mid | High |
| | 4132 | 4182 | 4233 | 9263 | 9400 | 9538 |
| Frequency [MHz] | 826,4 | 836,4 | 846,6 | 1852,6 | 1880 | 1907,6 |
| 99% OBW [kHz] | 4196,82 | 4167,87 | 4138,93 | 4138,93 | 4167,87 | 4138,93 |
| 26 dB BW [kHz] | 4631,69 | 4633,14 | 4601,30 | 4617,22 | 4615,77 | 4615,77 |
| Uncertainty | ±55,5 kHz | | | | | |

### 5.3.6 Test results GSM

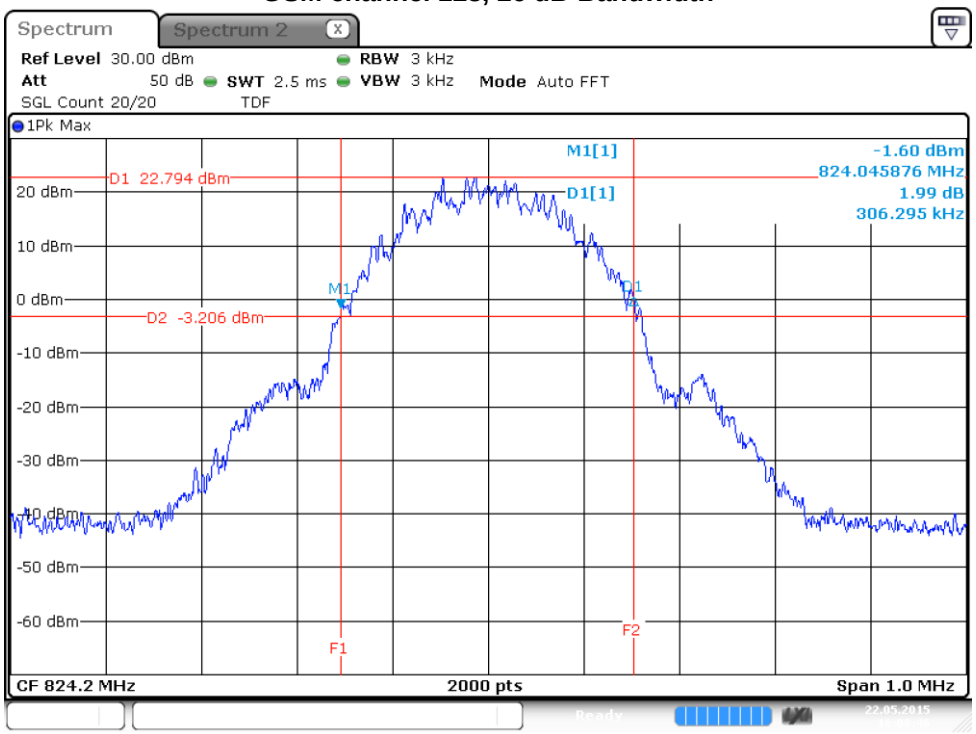
**GSM channel 128, Occupied Bandwidth**




Gsm Channel: 128 : Measure Occupied Bandwidth

Date: 22.MAY.2015 16:08:56

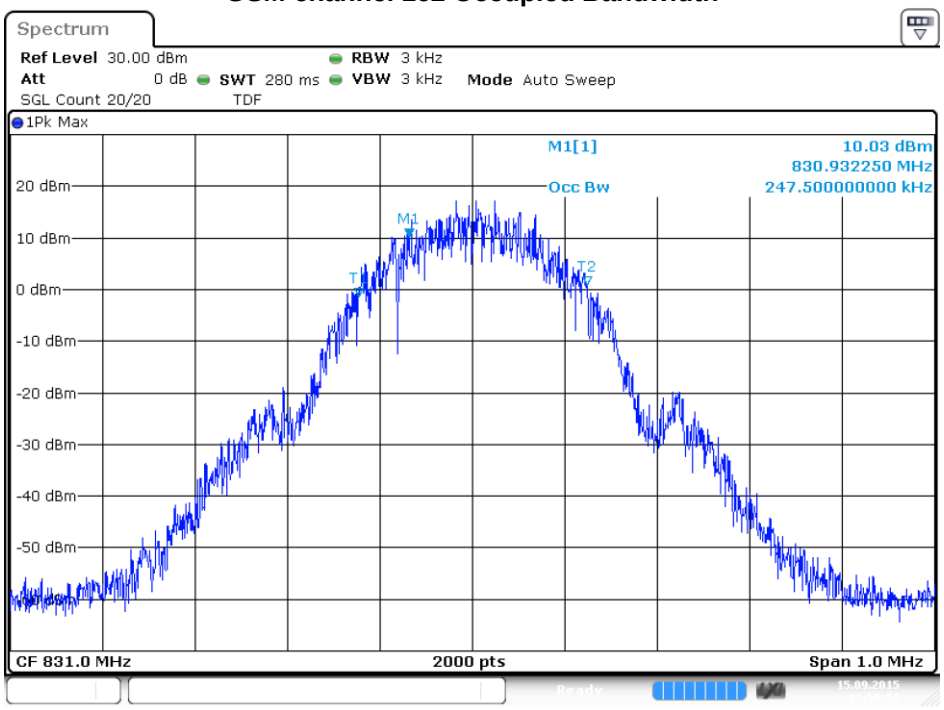
**GSM channel 128, 26 dB Bandwidth**




Gsm,128 : Measure bandwidth 26dB

Date: 22.MAY.2015 16:08:46

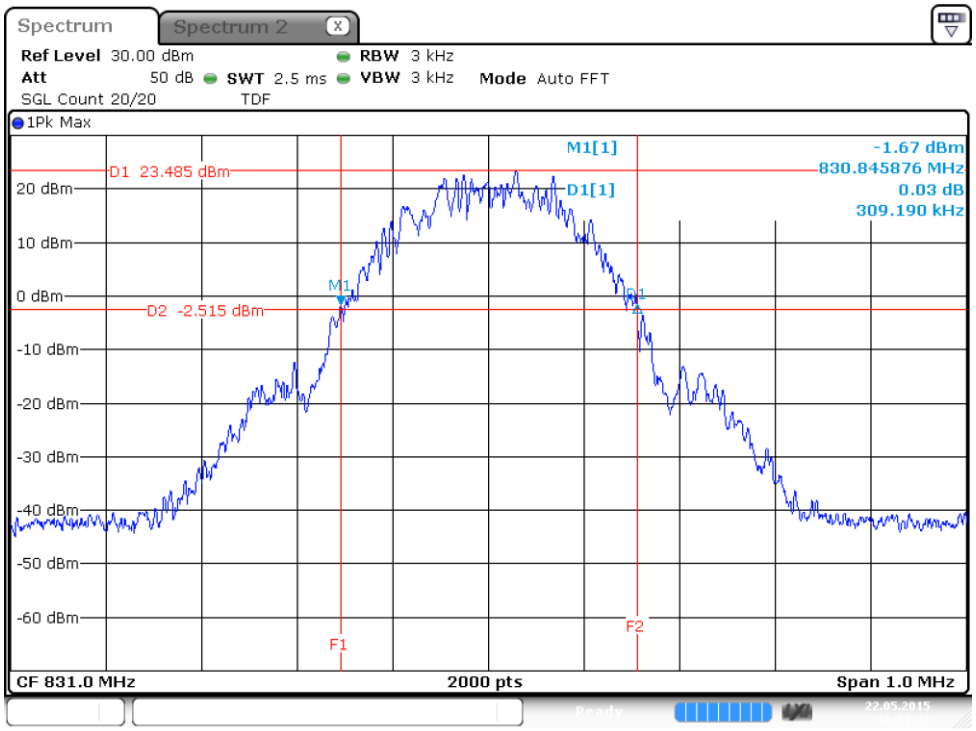
### GSM channel 162 Occupied Bandwidth




Gsm Channel: 162 : Measure Occupied Bandwidth

Date: 15.SEP.2015 12:50:58

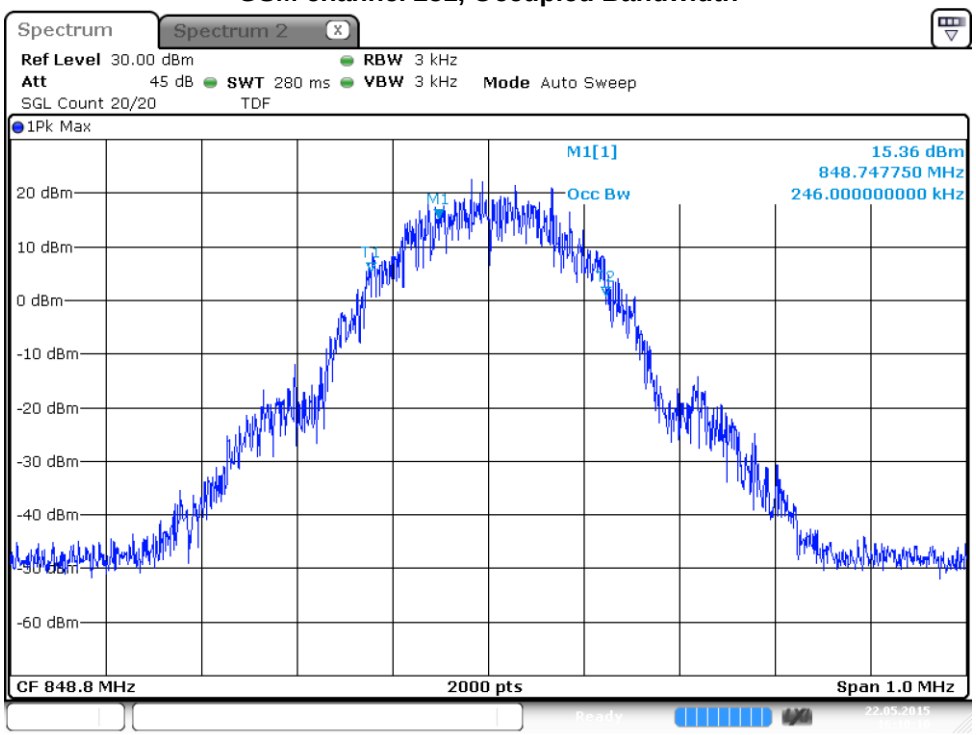
### GSM channel 162, 26dB Bandwidth




Gsm,162 : Measure bandwidth 26dB

Date: 22.MAY.2015 16:09:22

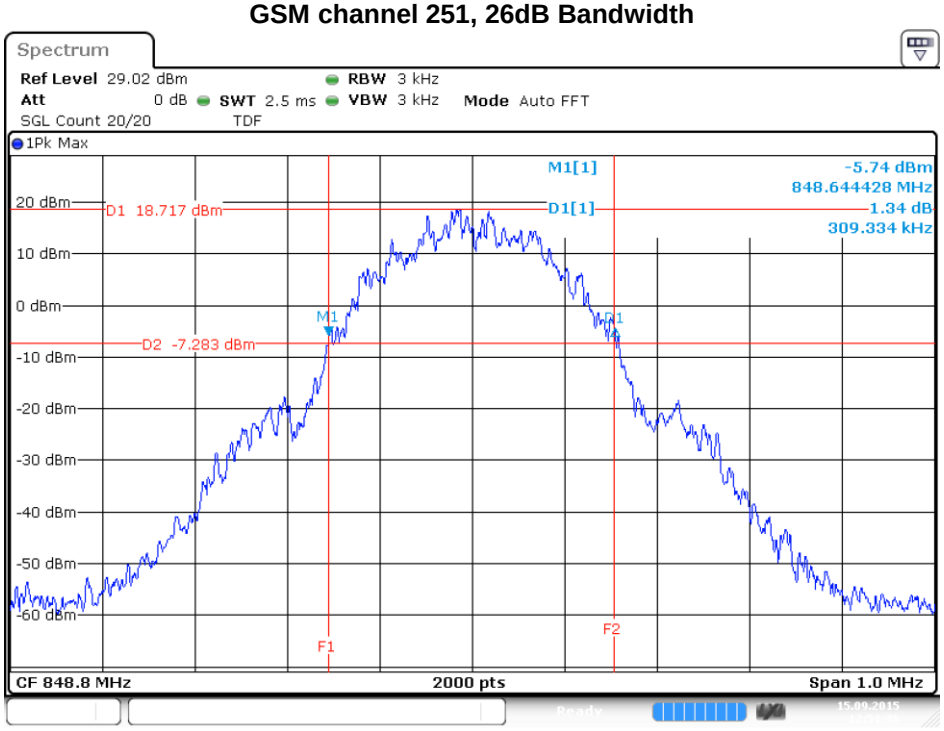
**GSM channel 251, Occupied Bandwidth**




Gsm Channel: 251 : Measure Occupied Bandwidth

Date: 22.MAY.2015 16:10:10

**GSM channel 251, 26dB Bandwidth**




Gsm,251 : Measure bandwidth 26dB

Date: 15.SEP.2015 12:51:37