# FCC Part 22/24/27 Compliance Test Report

| | | | |
|---|---|---|---|
| **Test Report no.:** | FCC22&24&27_RM-877_01.docx | **Date of Report:** | 04-Apr-2013 |
| **Number of pages:** | 71 | **Customer's Contact person:** | Huhtala Tero |
| **Testing laboratory:** | TCC Nokia Tampere Laboratory<br>P.O. Box 68<br>Sinitaival 5<br>FIN-33720 TAMPERE, FINLAND<br>Tel. +358 (0) 7180 46800<br>Fax. +358 (0) 7180 46880 | **Customer:** | Nokia Corporation<br>P.O. Box 68<br>Sinitaival 5<br>FIN-33720 TAMPERE, FINLAND<br>Tel. +358 (0) 7180 46800<br>Fax. +358 (0) 7180 46880 |
| **FCC listing no.:**<br>**IC recognition no.:** | 94436<br>661AK-1 | | |
| **Tested devices/ accessories:** | **Phone RM-877 / Battery BV-5XW / AC charger AC-60U / Charging data cable CA-190CD / Headset WH-208** | | |
| **FCC ID:** | PDNB | **IC:** | 661R-B |
| **Supplement reports:** | - | | |
| **Testing has been carried out in accordance with:** | **CFR 47, FCC rules Parts 22/24/2, TIA-603-C-2004 and IC standards, RSS-GEN (Issue 3, December 2010), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009), RSS-139 (Issue 2, February 2009). 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 15 years at TCC Nokia. | | |
| **Test Results:** | **The EUT complies with the requirements in respect of all parameters subject to the test.**<br>The test results relate only to devices specified in this document | | |
| **Date and signature for the contents:** | Hannu Söderholm<br>2013.04.08<br>09:38:39 +03'00' | | |

**Hannu Söderholm, Specialist, EMC**




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# 1. Summary for FCC Part 22/24/27 Compliance Test Report

| | |
|---|---|
| **Date of receipt** | 06-Feb-2013 |
| **Testing completed** | 20-Feb-2013 |
| **The customer's contact person** | Huhtala Tero |
| **Test Plan referred to** | T:\Projects\RM-877\TestPlan\RS_testplan_RM-877.xlsm |
| **Notes** | - |
| **Document name** | T:\Projects\RM-877\EMC\FCC22&24&27_RM-877_01.docx |

## 1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:
GSM/WCDMA/WLAN/Bluetooth
The EUT is tested with maximum rated TX power.

Devices under tests

| Product | Type | SN | HW | MV | SW | DUT |
|---|---|---|---|---|---|---|
| Phone | RM.877 | 004402471263545 | 1000 | | 3012.0000.1304.10019 | 42970 |
| Phone | RM-877 | 00440247126557 | 1000 | - | 3012.0000.1304.10019 | 42979 |
| Battery | BV-5XW | | LG 2.3 | | | 42971 |
| AC charger | AC-60U | 409049304758020031 2;0675678 | B1.0 HW0.2 MW0.2 PV02 | - | - | 42973 |
| Charging data cable | CA-190CD | 0730456246628 | - | - | - | 42977 |
| Headset | WH-208 | 1411621 | - | - | - | 42831 |




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## 1.2. Summary of Test Results

**GSM850:**

| Section in CFR 47 | Section in RSS-GEN or RSS-132 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a), 22.913(a) | 4.4 | Conducted RF output power | - |
| §22.913(a) | 4.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §22.917(a) | 4.5 | Band edge compliance | PASSED |
| §22.917(a), §2.1051 | 4.5 | Spurious emissions at antenna terminals | - |
| §22.917(a), §2.1053 | 4.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 4.3 | Frequency stability, temperature variation | PASSED |
| §2.1055(d) | 4.3 | Frequency stability, voltage variation | PASSED |

**GSM1900:**

| Section in CFR 47 | Section in RSS-GEN or RSS-133 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a) | 6.4 | Conducted RF output power | - |
| §24.232(b) | 6.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §24.238(a) | 6.5 | Band edge compliance | PASSED |
| §24.238(a), §2.1051 | 6.5 | Spurious emissions at antenna terminals | - |
| §24.238(a), §2.1053 | 6.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 6.3 | Frequency stability, temperature variation | PASSED |
| §2.1055(d) | 6.3 | Frequency stability, voltage variation | PASSED |




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**WCDMA 1900 (Band II):**

| Section in CFR 47 | Section in RSS-GEN or RSS-133 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a) | 6.4 | Conducted RF output power | - |
| §24.232(b) | 6.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §24.238(a) | 6.5 | Band edge compliance | PASSED |
| §24.238(a), §2.1051 | 6.5 | Spurious emissions at antenna terminals | - |
| §24.238(a), §2.1053 | 6.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 6.3 | Frequency stability, temperature variation | - |
| §2.1055(d) | 6.3 | Frequency stability, voltage variation | - |

**WCDMA 1700 (Band IV):**

| Section in CFR 47 | Section in RSS-GEN or RSS-139 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a) | 6.4 | Conducted RF output power | - |
| §27.50(d)(2) | 6.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §27.53(g) | 6.5 | Band edge compliance | PASSED |
| §27.53(g), §2.1051 | 6.5 | Spurious emissions at antenna terminals | - |
| §24.238(a), §2.1053 | 6.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 6.3 | Frequency stability, temperature variation | PASSED |
| §2.1055(d) | 6.3 | Frequency stability, voltage variation | PASSED |

**WCDMA 850 (Band V):**

| Section in CFR 47 | Section in RSS-GEN or RSS-132 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a), 22.913(a) | 4.4 | Conducted RF output power | - |
| §22.913(a) | 4.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §22.917(a) | 4.5 | Band edge compliance | PASSED |
| §22.917(a), §2.1051 | 4.5 | Spurious emissions at antenna terminals | - |
| §22.917(a), §2.1053 | 4.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 4.3 | Frequency stability, temperature variation | - |
| §2.1055(d) | 4.3 | Frequency stability, voltage variation | - |




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**LTE 1900 (Band II):**

| Section in CFR 47 | Section in RSS-GEN or RSS-133 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a) | 6.4 | Conducted RF output power | - |
| §24.232(b) | 6.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §24.238(a) | 6.5 | Band edge compliance | PASSED |
| §24.238(a), §2.1051 | 6.5 | Spurious emissions at antenna terminals | - |
| §24.238(a), §2.1053 | 6.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 6.3 | Frequency stability, temperature variation | - |
| §2.1055(d) | 6.3 | Frequency stability, voltage variation | - |

**LTE1700 (Band 4):**

| Section in CFR 47 | Section in RSS-GEN or RSS-139 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a) | 6.4 | Conducted RF output power | - |
| §27.50(d)(4) | 6.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §27.53(h) | 6.5 | Band edge compliance | PASSED |
| §27.53(h), §2.1051 | 6.5 | Spurious emissions at antenna terminals | - |
| §27.53(h), §2.1053 | 6.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 6.3 | Frequency stability, temperature variation | - |
| §2.1055(d) | 6.3 | Frequency stability, voltage variation | - |
| N/A | N/A | Peak to average power ratio | - |

**LTE 850 (Band V):**

| Section in CFR 47 | Section in RSS-GEN or RSS-132 | Name of the test | Result |
|---|---|---|---|
| §2.1046(a), 22.913(a) | 4.4 | Conducted RF output power | - |
| §22.913(a) | 4.4 | Radiated RF output power | PASSED |
| §2.1049(h) | 4.6.1 | 99 % occupied bandwidth | PASSED |
| §22.917(a) | 4.5 | Band edge compliance | PASSED |
| §22.917(a), §2.1051 | 4.5 | Spurious emissions at antenna terminals | - |
| §22.917(a), §2.1053 | 4.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 4.3 | Frequency stability, temperature variation | - |
| §2.1055(d) | 4.3 | Frequency stability, voltage variation | - |

**LTE700 Lower (Band 17):**

| Section in CFR 47 | Section in RSS-GEN or RSS-133 | Name of the test | Result |
|---|---|---|---|
| §2.1046 (a) | N/A | Conducted RF output power | - |
| §27.50(c)(10) | N/A | Radiated RF output power | PASSED |
| §2.1049(h) | N/A | 99 % occupied bandwidth | PASSED |
| §27.53(g) | N/A | Band edge compliance | PASSED |
| §27.53(g), §2.1051 | N/A | Spurious emissions at antenna terminals | - |
| §27.53(g), §2.1051 | N/A | Spurious radiated emissions | PASSED |
| §2.1055(a) | N/A | Frequency stability, temperature variation | PASSED |
| §2.1055(d) | N/A | Frequency stability, voltage variation | PASSED |
| N/A | N/A | Peak to average power ratio | - |

PASSED The EUT complies with the essential requirements in the standard.
FAILED The EUT does not comply with the essential requirements in the standard.
NP The test was not performed by the TCC Nokia Laboratory.




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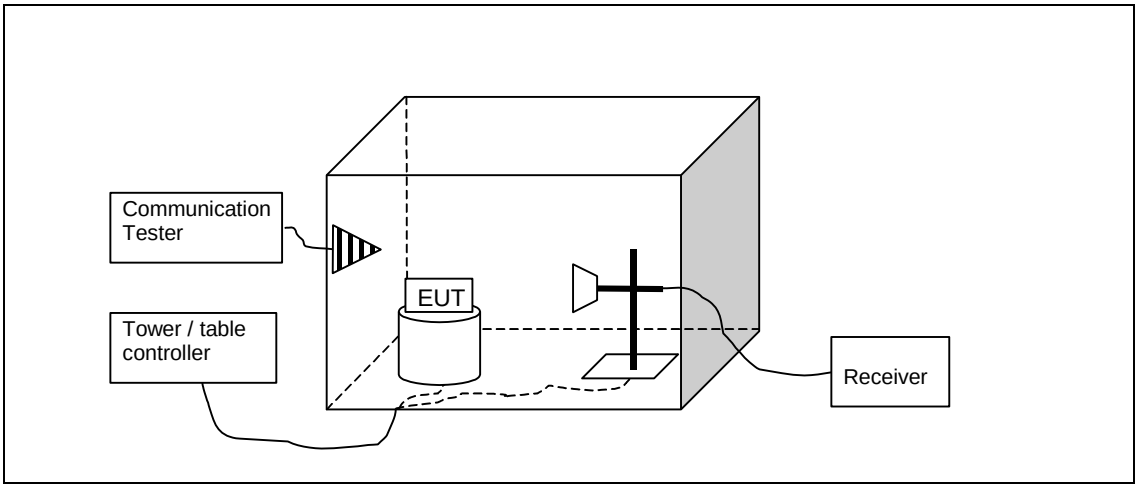
# 2. Radiated RF output power

**(FCC §22.913(a), §24.232(b), §27.50(d)(2), §27.53(h), §27.53(g), RSS-132 4.4, RSS-133 6.4)**

| | |
|---|---|
| **EUT with DUT number** | RM-877, DUT 42979 |
| **Accessories with DUT numbers** | - |
| **Operation Voltage [V] / [Hz]** | 115 / 60 |
| **Results** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 25 / 50 / 102.8 |
| **Date of measurements** | 20-Feb-2013 |
| **Measured by** | Hannu Söderholm |

### 2.1.1 Test setup




## 2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used.The measurement results are obtained as described below:

$P[dBm] = P_{SUBST\ TX} + P_{MEAS} - P_{SUBST\ RX} - L_{SUBST\ CABLES} + G_{SUBST\ TX\ ANT}$

Where $P_{SUBST\ TX}$ is signal generator level. $P_{MEAS}$ is measured power level from the EUT. $P_{SUBST\ RX}$ is measured power level in substitute measurement. $L_{SUBST\ CABLE}$ is the loss of the cable between the signal generator and the substitution antenna and $G_{SUBST\ TX\ ANT}$ is substitution antenna gain.

Limits for radiated RF output power measurements

| Frequency range [MHz] | Limit [W] | Limit [dBm] |
|---|---|---|
| 704 - 716 | 3 ERP | 34.8 |
| 824 - 849 | 7 ERP | 38.5 |
| 1710 - 1755 | 1 EIRP | 30 |
| 1850 - 1910 | 2 EIRP | 33 |



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## 1.1 GSM850 TX Test results

GSM mode

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 128 / 824.2 | 27.98 | 0.628 | -5.01 | 10 | -29.81 | -3.42 | 3.4 | HORIZONTAL | PASSED |
| 190 / 836.6 | 28.07 | 0.641 | -4.17 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 251 / 848.8 | 27.2 | 0.525 | -5.36 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |

EGPRS mode, 1 TX Slot

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 128 / 824.2 | 25.21 | 0.332 | -7.78 | 10 | -29.81 | -3.42 | 3.4 | HORIZONTAL | PASSED |
| 190 / 836.6 | 24.69 | 0.294 | -7.55 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 251 / 848.8 | 24.14 | 0.259 | -8.42 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |

## 1.2 GSM1900 TX Test results

GSM mode

| Channel / $f_C$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBi] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 512 / 1850.2 | 30.61 | 1.151 | -13.71 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 661 / 1880 | 31.02 | 1.265 | -13.17 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 810 / 1909.8 | 31.45 | 1.396 | -12.66 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |

EGPRS mode, 1 TX Slot

| Channel / $f_C$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBi] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 512 / 1850.2 | 27.54 | 0.568 | -16.78 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 661 / 1880 | 27.97 | 0.627 | -16.22 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 810 / 1909.8 | 28.06 | 0.640 | -16.05 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |




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## 1.3 WCDMA 1900 (Band II) TX Test results

Peak Detector

| Channel / $f_C$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBi] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 9262 / 1852.4 | 27.14 | 0.518 | -17.18 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 9400 / 1880 | 27.86 | 0.611 | -16.33 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 9538 / 1907.6 | 28.04 | 0.637 | -16.07 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |

RMS Detector

| Channel / $f_C$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBi] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 9262 / 1852.4 | 23.33 | 0.215 | -20.99 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 9400 / 1880 | 24.1 | 0.257 | -20.09 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 9538 / 1907.6 | 24 | 0.251 | -20.11 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |

## 1.4 WCDMA 1700 (Band IV) TX Test results

Peak Detector

| Channel / $f_C$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBi] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1392 / 1712.4 | 28.06 | 0.640 | -14.97 | 10 | -28.01 | 9.82 | 4.8 | HORIZONTAL | PASSED |
| 1420 / 1740 | 28.28 | 0.673 | -14.57 | 10 | -27.75 | 10 | 4.9 | HORIZONTAL | PASSED |
| 1432 / 1752.6 | 28.78 | 0.755 | -14.43 | 10 | -28.11 | 10 | 4.9 | HORIZONTAL | PASSED |

RMS Detector

| Channel / $f_C$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBi] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1392 / 1712.4 | 24.29 | 0.269 | -18.74 | 10 | -28.01 | 9.82 | 4.8 | HORIZONTAL | PASSED |
| 1420 / 1740 | 24.58 | 0.287 | -18.27 | 10 | -27.75 | 10 | 4.9 | HORIZONTAL | PASSED |
| 1432 / 1752.6 | 25.12 | 0.325 | -18.09 | 10 | -28.11 | 10 | 4.9 | HORIZONTAL | PASSED |

## 1.5 WCDMA 850 (Band V) TX Test results

PeakDetector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 4132 / 826.4 | 22.98 | 0.199 | -10.01 | 10 | -29.81 | -3.42 | 3.4 | HORIZONTAL | PASSED |
| 4183 / 836.6 | 22.66 | 0.185 | -9.58 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 4233 / 846.6 | 22.92 | 0.196 | -9.58 | 10 | -29.39 | -3.49 | 3.4 | HORIZONTAL | PASSED |

RMS Detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 4132 / 826.4 | 19.25 | 0.084 | -13.74 | 10 | -29.81 | -3.42 | 3.4 | HORIZONTAL | PASSED |
| 4183 / 836.6 | 19.02 | 0.080 | -13.22 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 4233 / 846.6 | 19.04 | 0.080 | -13.52 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |



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## 2.3. LTE 1900 (Band II) test results

FDD, CBW 5MHz, QPSK, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 9262 / 1850.7 | 28.96 | 0.787 | -15.36 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 9400 / 1880 | 29.03 | 0.800 | -15.16 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 9538 / 1909.3 | 27.94 | 0.622 | -16.17 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |

FDD, CBW 5MHz, QPSK, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 9262 / 1850.7 | 25.08 | 0.322 | -19.24 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 9400 / 1880 | 25.38 | 0.345 | -18.81 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 9538 / 1909.3 | 25.28 | 0.337 | -18.83 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 9262 / 1850.7 | 28.7 | 0.741 | -15.62 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 9400 / 1880 | 29.29 | 0.849 | -14.9 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 9538 / 1909.3 | 27.94 | 0.622 | -16.17 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 9262 / 1850.7 | 24.78 | 0.301 | -19.54 | 10 | -29.19 | 10.13 | 5 | HORIZONTAL | PASSED |
| 9400 / 1880 | 24.9 | 0.309 | -19.29 | 10 | -29.01 | 10.28 | 5.1 | HORIZONTAL | PASSED |
| 9538 / 1909.3 | 25.24 | 0.334 | -18.87 | 10 | -29.07 | 10.14 | 5.1 | HORIZONTAL | PASSED |




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## 2.4. LTE 1700 (Band IV) test results

FDD, CBW 5MHz, QPSK, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1392 / 1712.4 | 29.99 | 0.998 | -13.84 | 10 | -28.81 | 9.82 | 4.8 | HORIZONTAL | PASSED |
| 1420 / 1740 | 29.81 | 0.957 | -13.04 | 10 | -27.75 | 10 | 4.9 | HORIZONTAL | PASSED |
| 1432 / 1752.6 | 29.5 | 0.891 | -13.71 | 10 | -28.11 | 10 | 4.9 | HORIZONTAL | PASSED |

FDD, CBW 5MHz, QPSK, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1392 / 1712.4 | 26.32 | 0.429 | -17.51 | 10 | -28.81 | 9.82 | 4.8 | HORIZONTAL | PASSED |
| 1420 / 1740 | 25.49 | 0.354 | -17.36 | 10 | -27.75 | 10 | 4.9 | HORIZONTAL | PASSED |
| 1432 / 1752.6 | 25.98 | 0.396 | -17.23 | 10 | -28.11 | 10 | 4.9 | HORIZONTAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 19957 / 1710.7 | 29.92 | 0.982 | -13.91 | 10 | -28.81 | 9.82 | 4.8 | HORIZONTAL | PASSED |
| 20175 / 1732.5 | 29.74 | 0.942 | -13.11 | 10 | -27.75 | 10 | 4.9 | HORIZONTAL | PASSED |
| 20175 / 1754.3 | 28.97 | 0.789 | -14.24 | 10 | -28.11 | 10 | 4.9 | HORIZONTAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 19957 / 1710.7 | 26.21 | 0.418 | -17.62 | 10 | -28.81 | 9.82 | 4.8 | HORIZONTAL | PASSED |
| 20175 / 1732.5 | 25.27 | 0.337 | -17.58 | 10 | -27.75 | 10 | 4.9 | HORIZONTAL | PASSED |
| 20175 / 1754.3 | 26.2 | 0.417 | -17.01 | 10 | -28.11 | 10 | 4.9 | HORIZONTAL | PASSED |




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## 2.5. LTE 850 (Band V) test results

FDD, CBW 5MHz, QPSK, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 20407 / 824.7 | 23.92 | 0.247 | -9.07 | 10 | -29.81 | -3.42 | 3.4 | HORIZONTAL | PASSED |
| 20525 / 836.5 | 26.02 | 0.400 | -6.22 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 20643 / 848.3 | 25.41 | 0.348 | -7.15 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |

FDD, CBW 5MHz, QPSK, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 20407 / 824.7 | 20.18 | 0.104 | -13.1 | 10 | -30.1 | -3.42 | 3.4 | VERTICAL | PASSED |
| 20525 / 836.5 | 20.63 | 0.116 | -11.61 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 20643 / 848.3 | 19.8 | 0.095 | -12.76 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 20407 / 824.7 | 24.01 | 0.252 | -9.27 | 10 | -30.1 | -3.42 | 3.4 | VERTICAL | PASSED |
| 20525 / 836.5 | 25.95 | 0.394 | -6.29 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 20643 / 848.3 | 24.91 | 0.310 | -7.65 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 20407 / 824.7 | 20.02 | 0.100 | -13.26 | 10 | -30.1 | -3.42 | 3.4 | VERTICAL | PASSED |
| 20525 / 836.5 | 20.04 | 0.101 | -12.2 | 10 | -29.41 | -3.77 | 3.4 | HORIZONTAL | PASSED |
| 20643 / 848.3 | 19.63 | 0.092 | -12.93 | 10 | -29.45 | -3.49 | 3.4 | VERTICAL | PASSED |




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## 2.6. LTE700 Lower (Band 17) test results

FDD, CBW 5MHz, QPSK, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23755 / 706.5 | 25.17 | 0.329 | -6.82 | 10 | -28.11 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 24.23 | 0.265 | -7.28 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23825 / 713.5 | 24.04 | 0.254 | -7.28 | 10 | -27.27 | -2.85 | 3.1 | VERTICAL | PASSED |

FDD, CBW 5MHz, 16QAM, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23755 / 706.5 | 24.72 | 0.296 | -7.27 | 10 | -28.11 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 24.42 | 0.277 | -7.09 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23825 / 713.5 | 24.04 | 0.254 | -7.28 | 10 | -27.27 | -2.85 | 3.1 | VERTICAL | PASSED |

FDD, CBW 5MHz, QPSK, 25RB low, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23755 / 706.5 | 25.38 | 0.345 | -6.61 | 10 | -28.11 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 25.1 | 0.324 | -6.41 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23825 / 713.5 | 24.78 | 0.301 | -6.54 | 10 | -27.27 | -2.85 | 3.1 | VERTICAL | PASSED |

FDD, CBW 5MHz, 16QAM, 25RB low, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23755 / 706.5 | 25.59 | 0.362 | -6.4 | 10 | -28.11 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 24.91 | 0.310 | -6.6 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23825 / 713.5 | 24.53 | 0.284 | -6.79 | 10 | -27.27 | -2.85 | 3.1 | VERTICAL | PASSED |




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FDD, CBW 10MHz, QPSK, 50RB low, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23780 / 709 | 21.48 | 0.141 | -9.96 | 10 | -27.56 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 21.88 | 0.154 | -9.63 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23800 / 711 | 21.79 | 0.151 | -9.82 | 10 | -27.56 | -2.85 | 3.1 | VERTICAL | PASSED |

FDD, CBW 10MHz, QPSK, 50RB low, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23780 / 709 | 16.3 | 0.043 | -15.14 | 10 | -27.56 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 16.11 | 0.041 | -15.4 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23800 / 711 | 16.11 | 0.041 | -15.5 | 10 | -27.56 | -2.85 | 3.1 | VERTICAL | PASSED |

FDD, CBW 10MHz, 16QAM, 1RB mid, Peak detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23755 / 706.5 | 24.84 | 0.305 | -7.15 | 10 | -28.11 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 24.36 | 0.273 | -7.15 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23825 / 713.5 | 23.98 | 0.250 | -7.34 | 10 | -27.27 | -2.85 | 3.1 | VERTICAL | PASSED |

FDD, CBW 10MHz, 16QAM, 1RB mid, RMS detector

| Channel / $f_C$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $P_{SUBST\ TX}$ [dBm] | $P_{SUBST\ RX}$ [dBm] | $G_{SUBST\ TX\ ANT}$ [dBd] | $L_{SUBST\ CABLE}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|---|---|---|
| 23755 / 706.5 | 21.21 | 0.132 | -10.78 | 10 | -28.11 | -3.02 | 3.1 | VERTICAL | PASSED |
| 23790 / 710 | 20.53 | 0.113 | -10.98 | 10 | -27.56 | -2.95 | 3.1 | VERTICAL | PASSED |
| 23825 / 713.5 | 20.33 | 0.108 | -10.99 | 10 | -27.27 | -2.85 | 3.1 | VERTICAL | PASSED |




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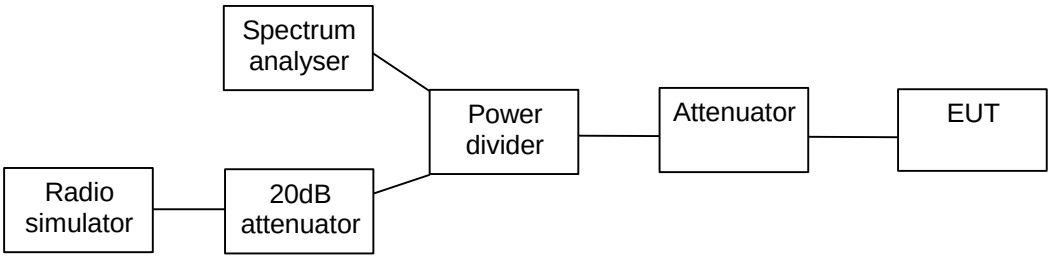
# 3. 99% occupied bandwidth
**(FCC §2.1049(h), RSS-GEN 4.6.1)**

| | |
|---|---|
| **EUT with DUT number** | RM-877, DUT 42970 |
| **Accessories with DUT numbers** | BV-5XW, DUT 42971; AC-60U, DUT 42973; CA-190CD, DUT42977; WH-208, DUT 42831 |
| **Operation Voltage [V] / [Hz]** | Nominal |
| **Results** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 21 / 37 / 99 |
| **Date of measurements** | 06-Feb-2013 |
| **Measured by** | Timo Raiskio |

## 3.1. Test Setup




## 3.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24, 27 and IC standard RSS-GEN.

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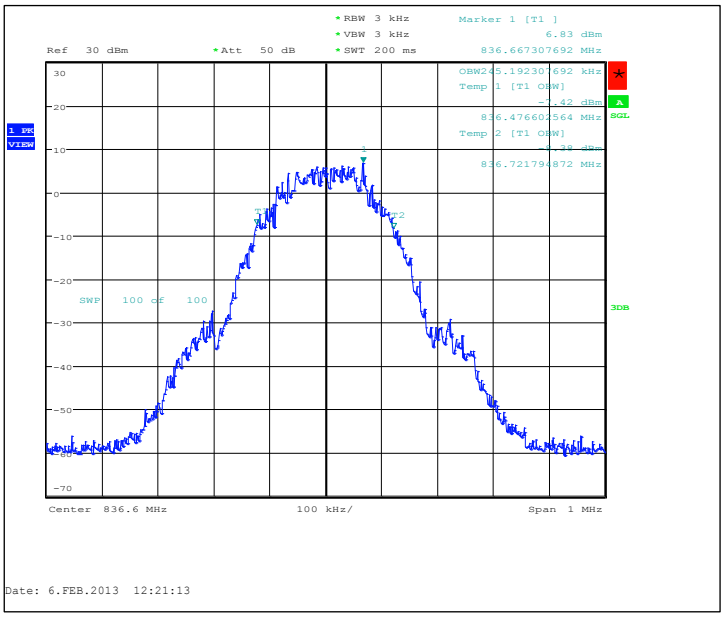
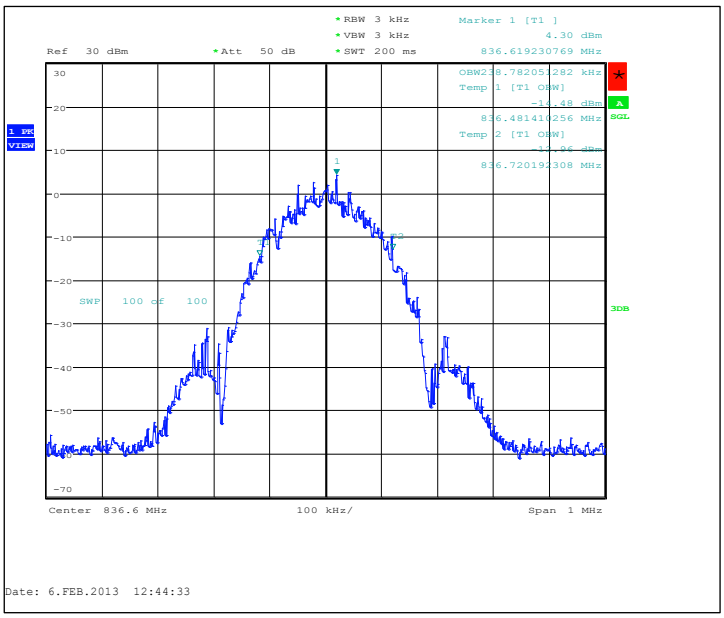
## 3.3. GSM 850 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| GSM | 245.2 |
| EGPRS | 238.8 |

GSM, Channel 190 / 836.6 MHz




EGPRS, Channel 190 / 836.6 MHz







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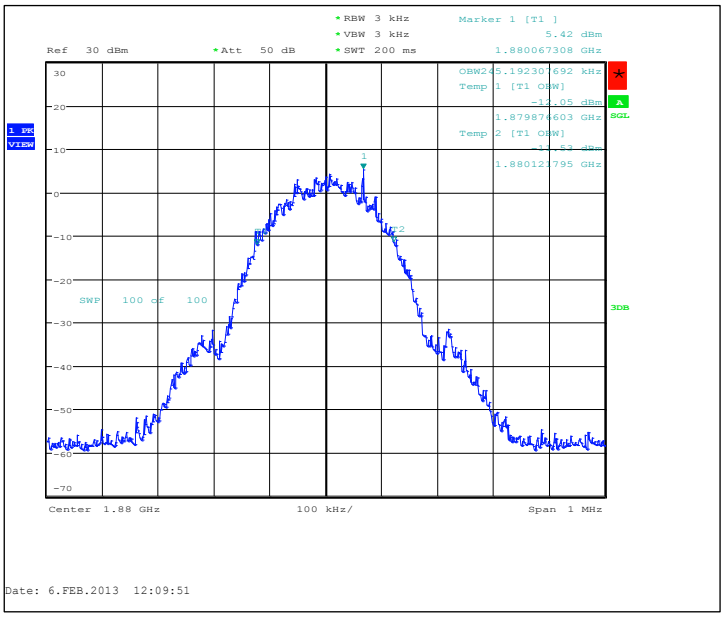
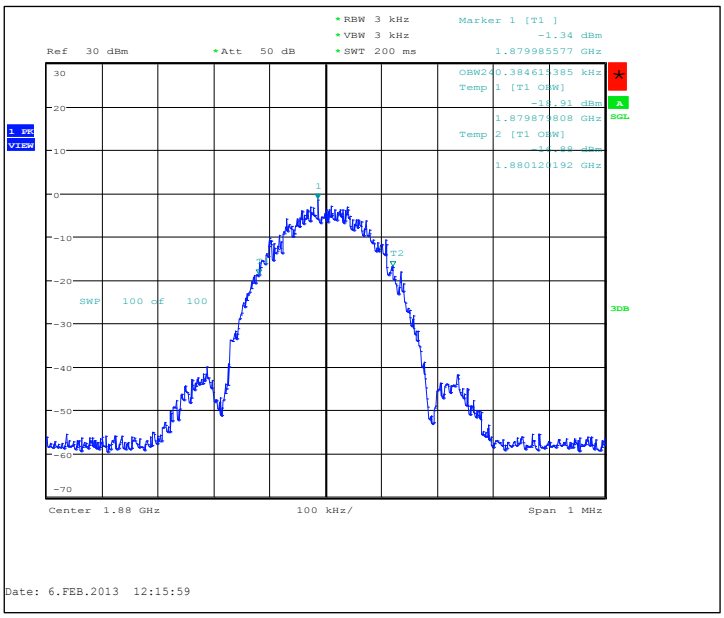
## 3.4. GSM 1900 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| GSM | 245.2 |
| EGPRS | 240.4 |

GSM, Channel 661 / 1880.0 MHz




EGPRS, Channel 661 / 1880.0 MHz







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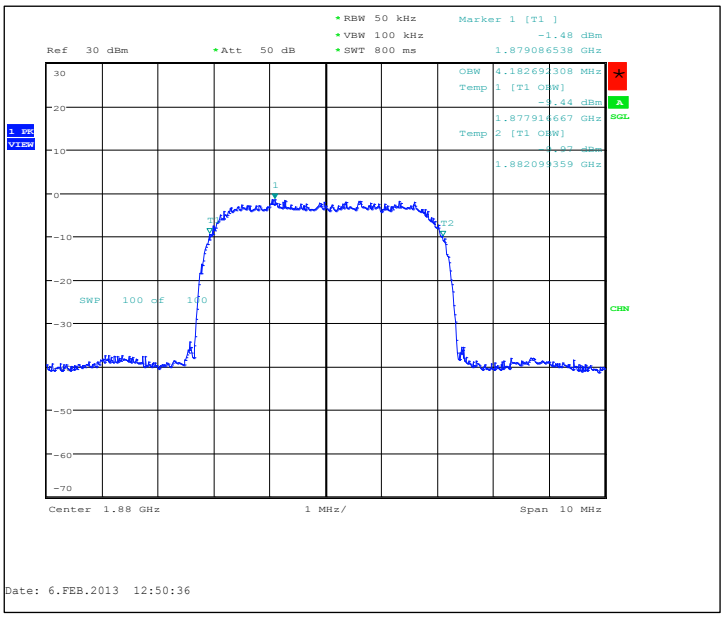
## 3.5. WCDMA 1900 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD | 4182.7 |

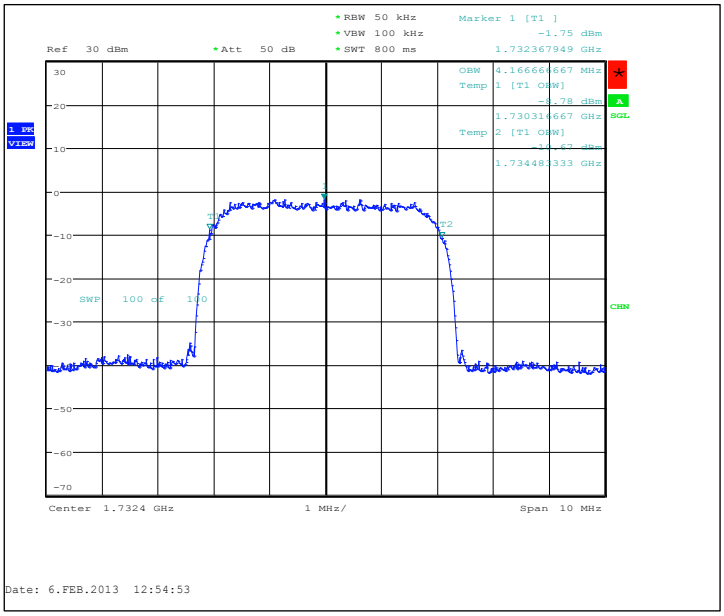
FDD, Channel 9400 / 1880.0 MHz




## 3.6. WCDMA 1700 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD | 4166.7 |

FDD, Channel 1412 / 1732.4 MHz







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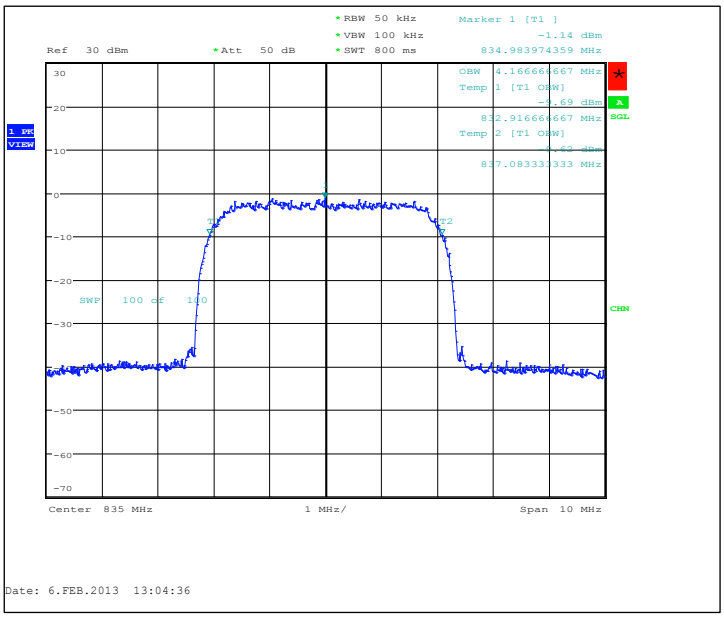
## 3.7. WCDMA 850 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD | 4166.7 |

FDD, Channel 4175 / 835.0 MHz







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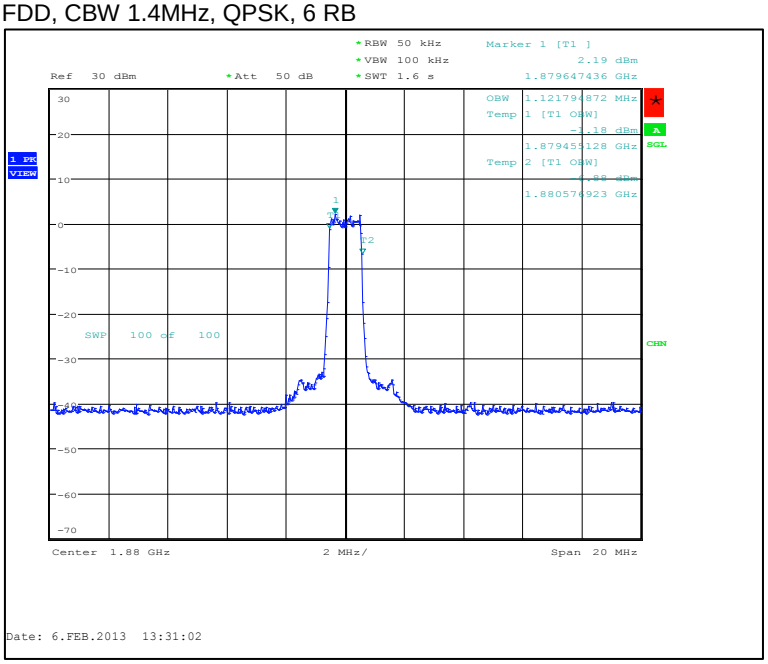
## 3.8. LTE1900 (Band 2) Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD, CBW 1.4MHz, QPSK, 6 RB | 1121.8 |
| FDD, CBW 3MHz, QPSK, 15 RB | 2724.4 |
| FDD, CBW 5MHz, QPSK, 25 RB | 4487.2 |
| FDD, CBW 10MHz, QPSK, 50 RB | 8910.3 |
| FDD, CBW 15MHz, QPSK, 75 RB | 13365.4 |
| FDD, CBW 20MHz, QPSK, 100 RB | 17852.6 |
| FDD, CBW 1.4MHz, 16QAM, 6 RB | 1121.8 |
| FDD, CBW 3MHz, 16QAM, 15 RB | 2692.3 |
| FDD, CBW 5MHz, 16QAM, 25 RB | 4487.2 |
| FDD, CBW 10MHz, 16QAM, 50 RB | 8942.3 |
| FDD, CBW 15MHz, 16QAM, 75 RB | 13397.4 |
| FDD, CBW 20MHz, 16QAM, 100 RB | 17852.6 |

FDD, CBW 1.4MHz, QPSK, 6 RB



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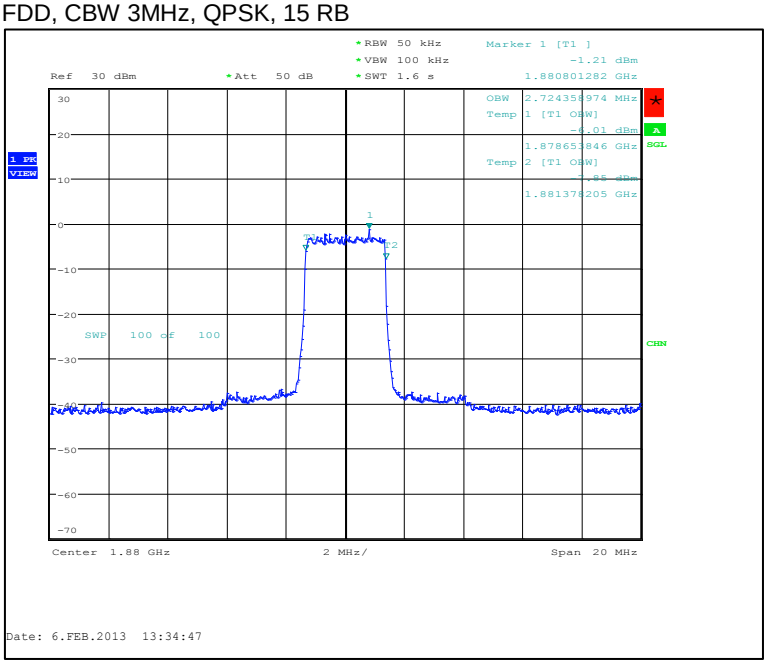
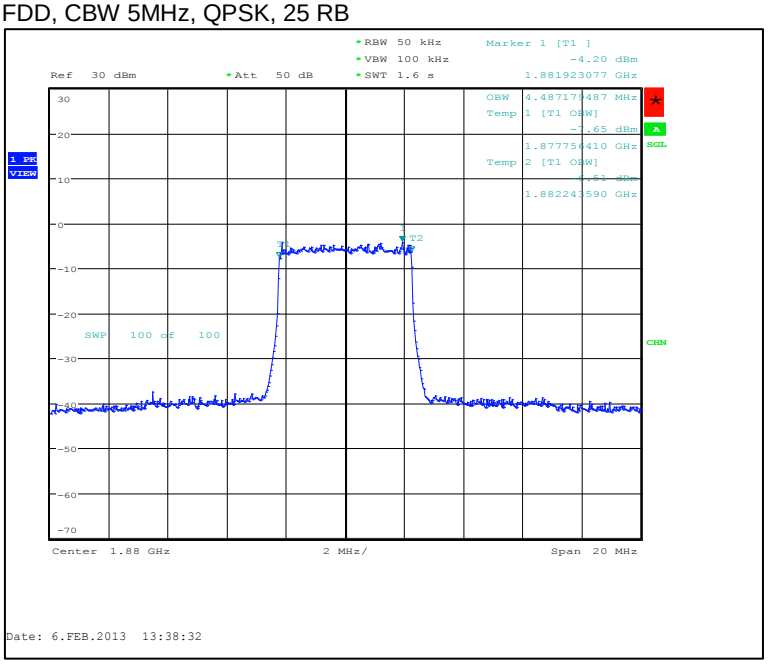
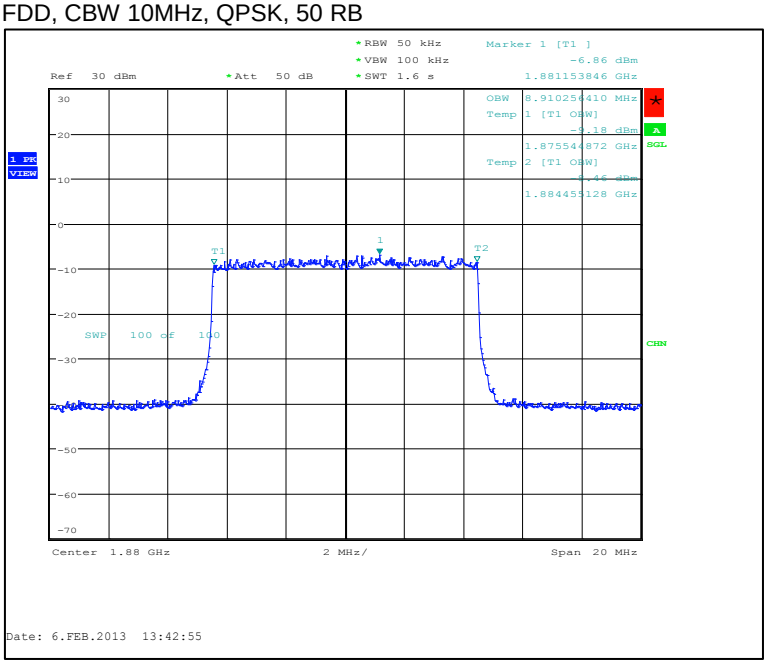
FDD, CBW 3MHz, QPSK, 15 RB



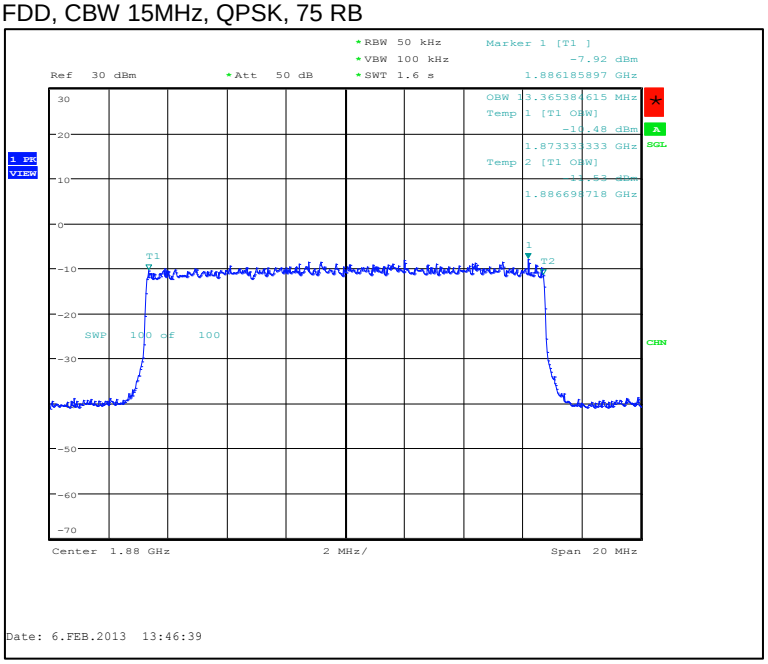

FDD, CBW 5MHz, QPSK, 25 RB



FDD, CBW 10MHz, QPSK, 50 RB




FDD, CBW 15MHz, QPSK, 75 RB







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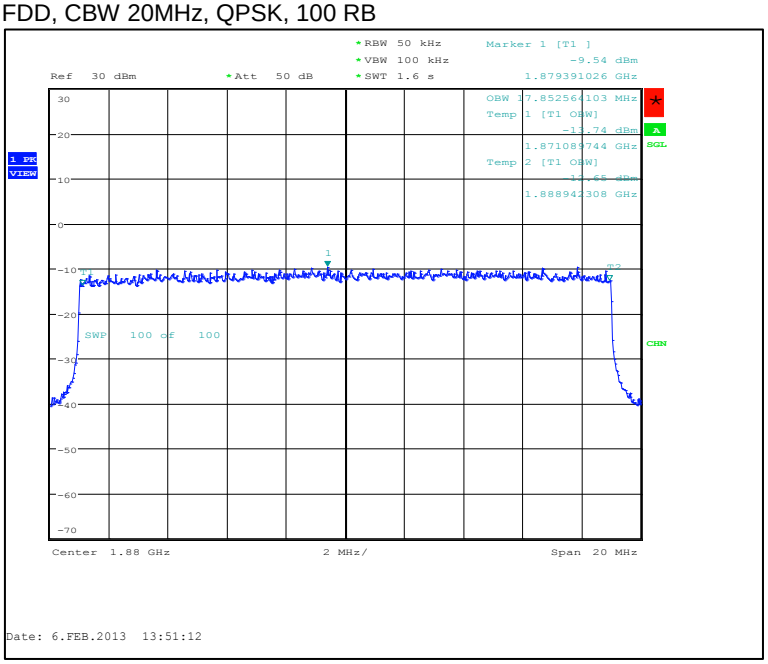
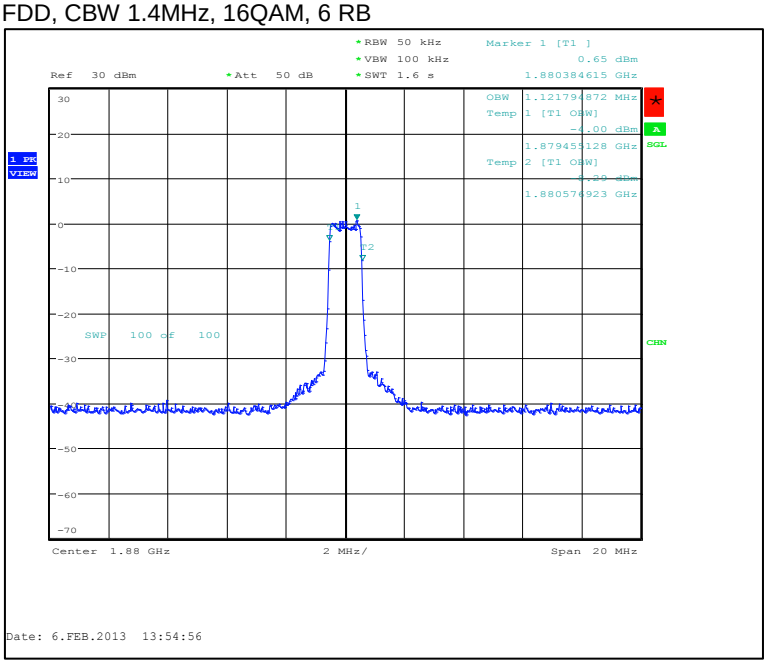
FDD, CBW 20MHz, QPSK, 100 RB




FDD, CBW 1.4MHz, 16QAM, 6 RB







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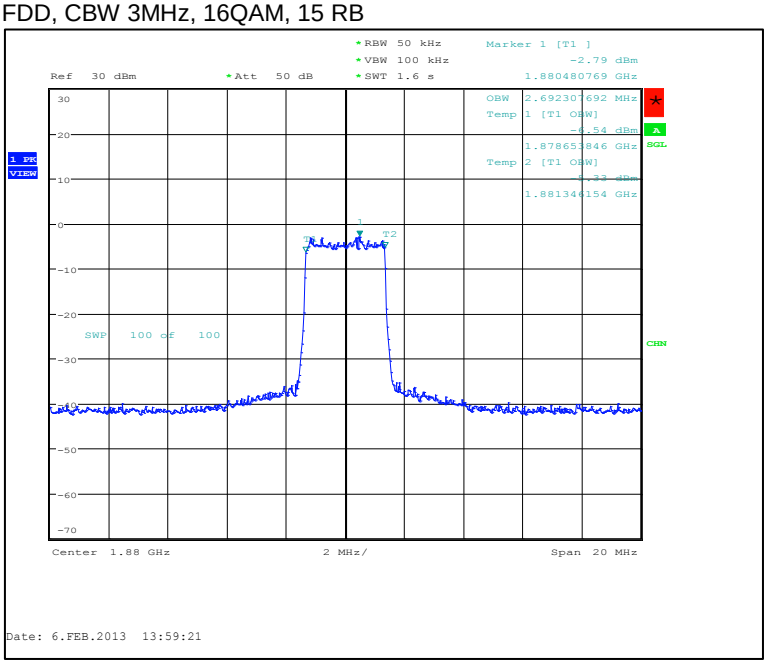
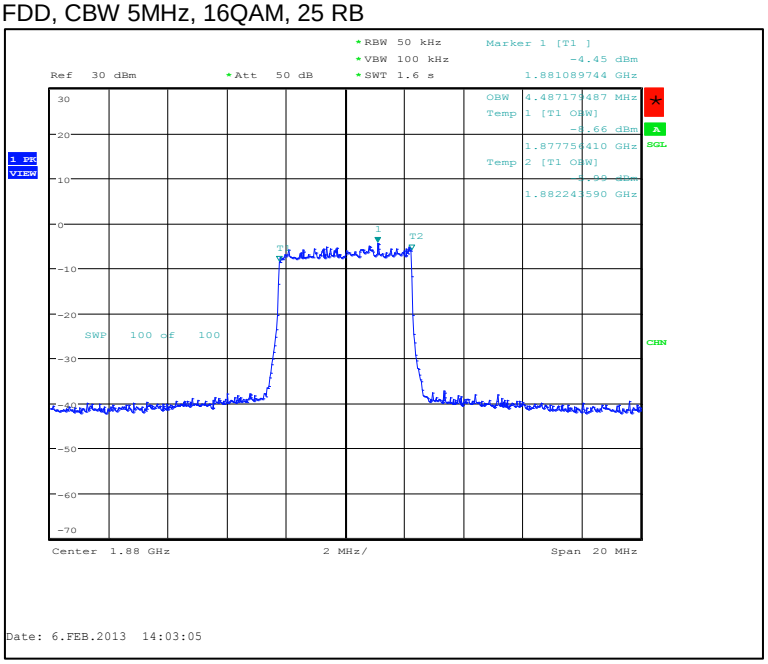
FDD, CBW 3MHz, 16QAM, 15 RB




FDD, CBW 5MHz, 16QAM, 25 RB







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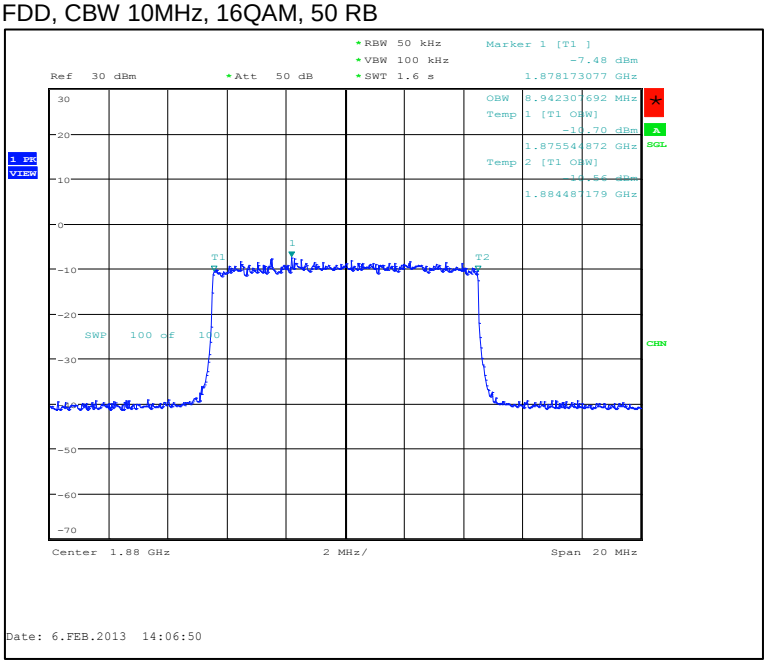
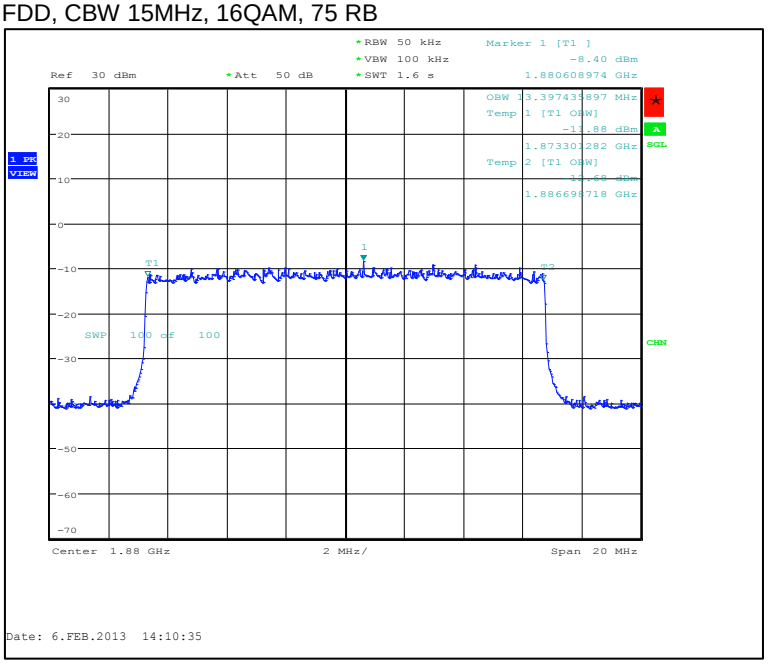
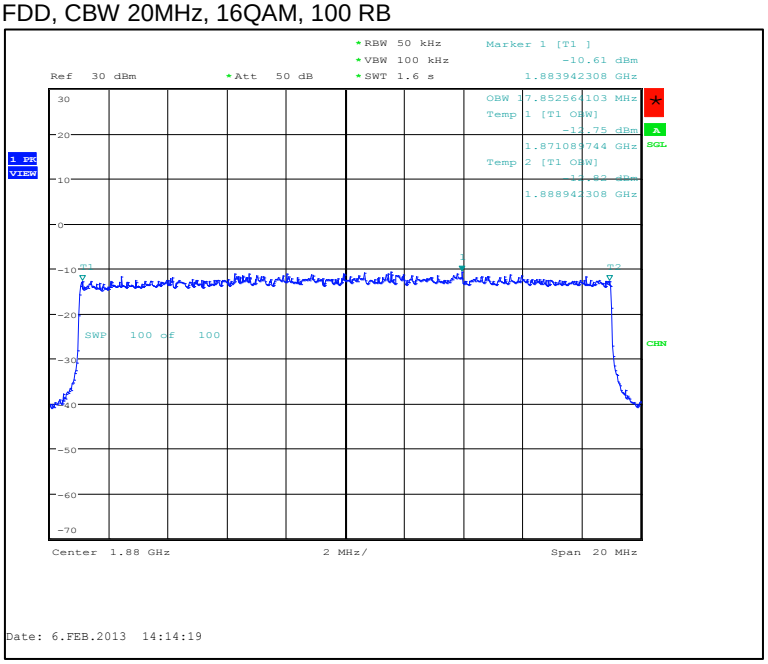
FDD, CBW 10MHz, 16QAM, 50 RB




FDD, CBW 15MHz, 16QAM, 75 RB



FDD, CBW 20MHz, 16QAM, 100 RB







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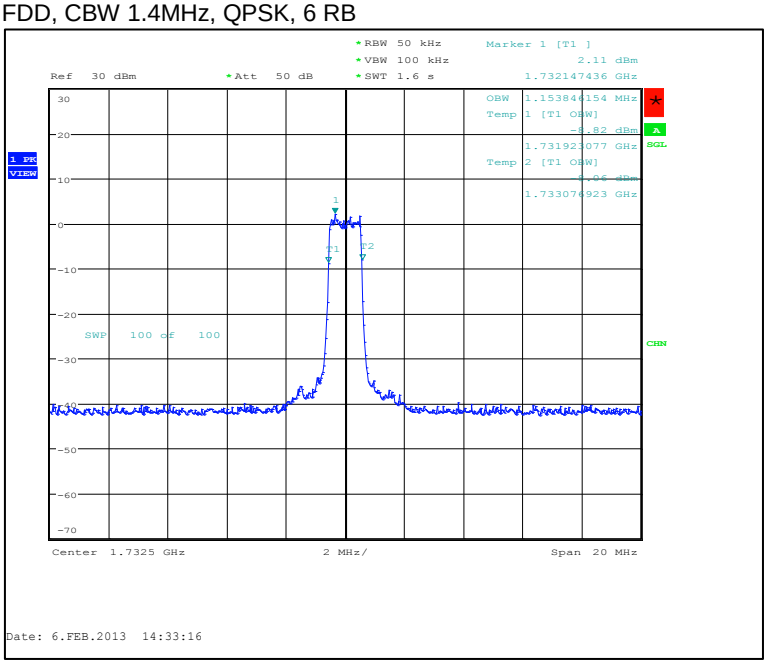
## 3.9. LTE1700 (Band 4) Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD, CBW 1.4MHz, QPSK, 6 RB | 1153.8 |
| FDD, CBW 3MHz, QPSK, 6 RB | 2724.4 |
| FDD, CBW 5MHz, QPSK, 15 RB | 4487.2 |
| FDD, CBW 10MHz, QPSK, 25 RB | 8942.3 |
| FDD, CBW 15MHz, QPSK, 75 RB | 13365.4 |
| FDD, CBW 20MHz, QPSK, 75 RB | 17852.6 |
| FDD, CBW 1.4MHz, 16QAM, INV RB | 1121.8 |
| FDD, CBW 3MHz, 16QAM, 6 RB | 2692.3 |
| FDD, CBW 5MHz, 16QAM, 15 RB | 4487.2 |
| FDD, CBW 10MHz, 16QAM, 25 RB | 8974.4 |
| FDD, CBW 15MHz, 16QAM, 50 RB | 13429.5 |
| FDD, CBW 20MHz, 16QAM, INV RB | 17852.6 |

FDD, CBW 1.4MHz, QPSK, 6 RB







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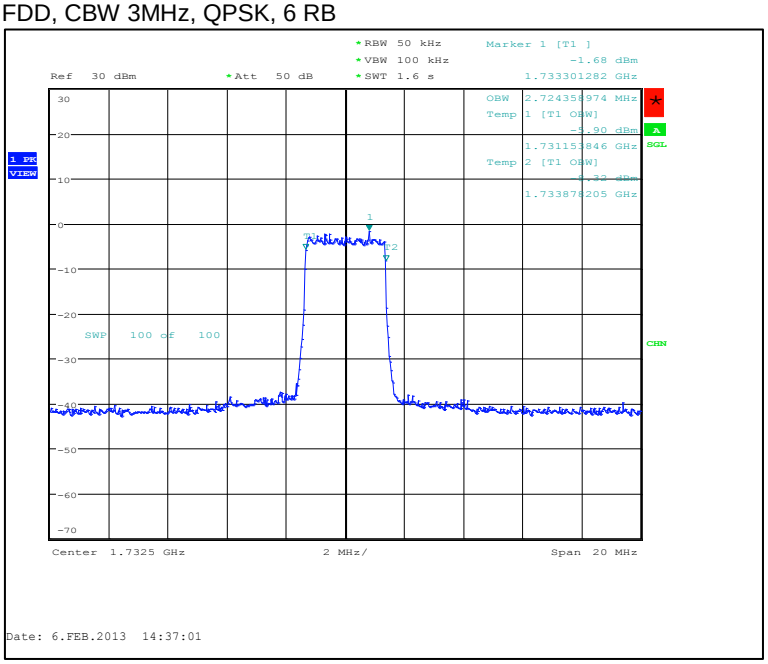
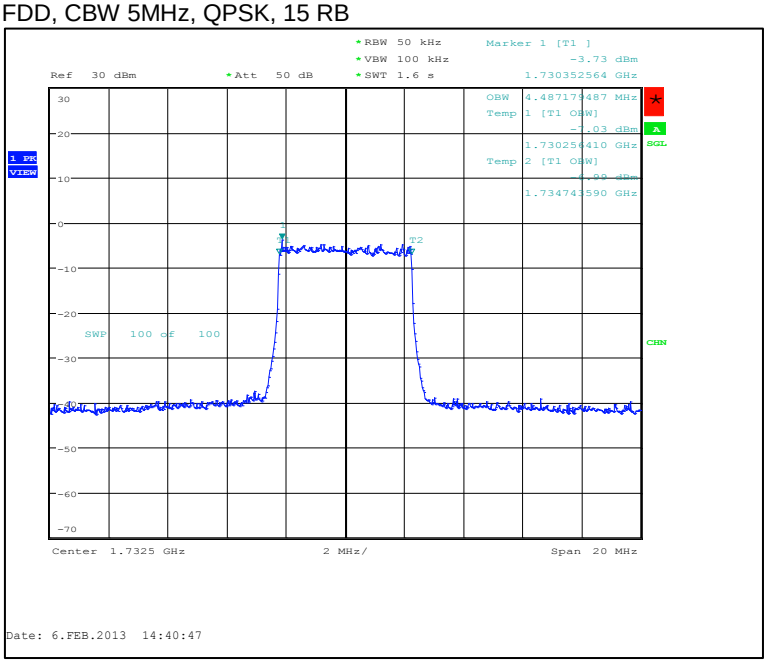
FDD, CBW 3MHz, QPSK, 6 RB




FDD, CBW 5MHz, QPSK, 15 RB







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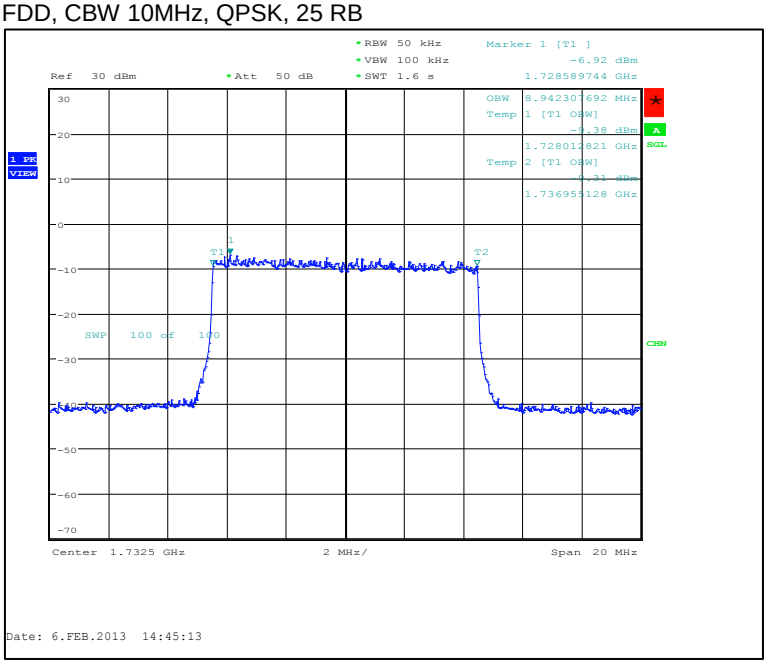
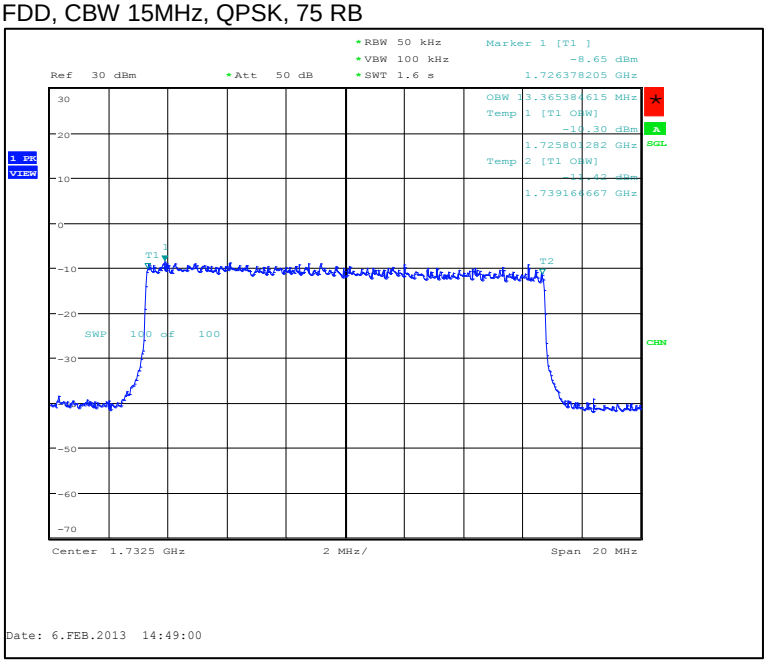
FDD, CBW 10MHz, QPSK, 25 RB




FDD, CBW 15MHz, QPSK, 75 RB









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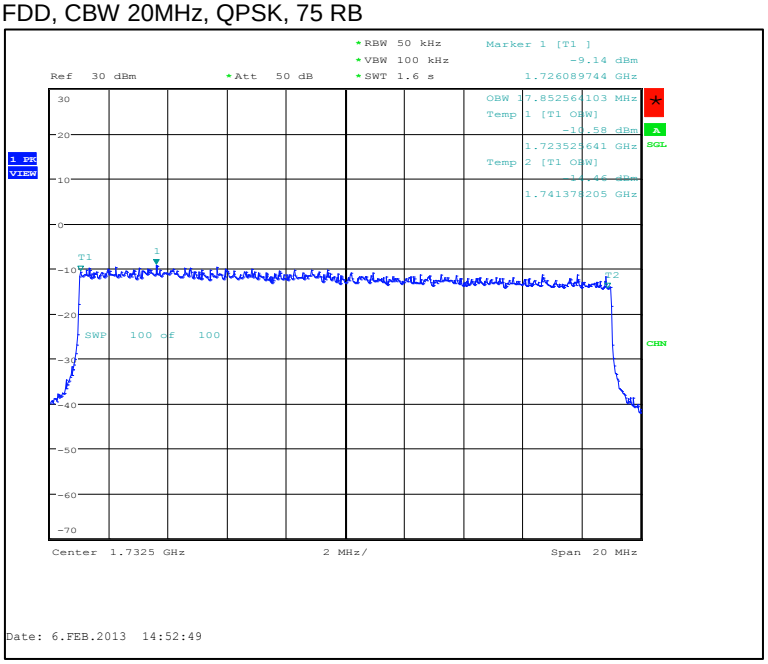
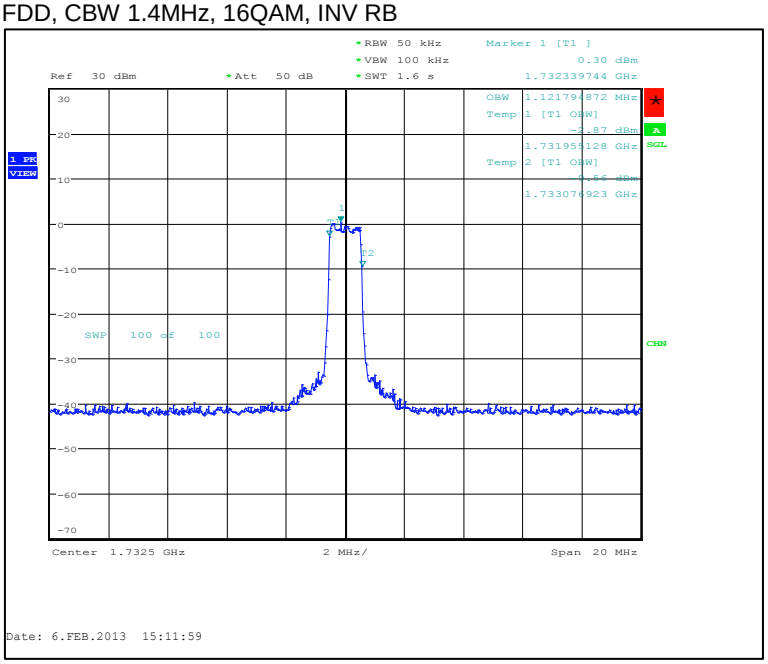
FDD, CBW 20MHz, QPSK, 75 RB




FDD, CBW 1.4MHz, 16QAM, INV RB







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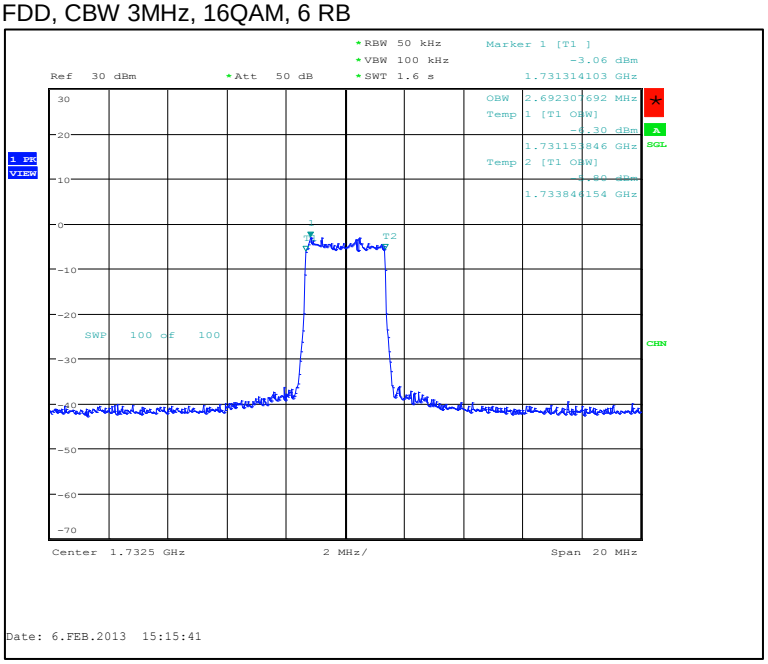
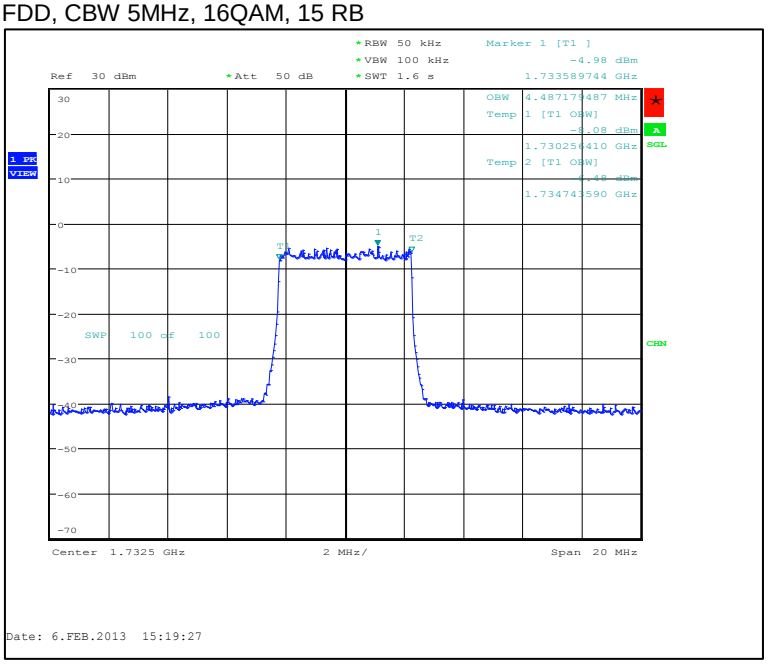
FDD, CBW 3MHz, 16QAM, 6 RB




FDD, CBW 5MHz, 16QAM, 15 RB







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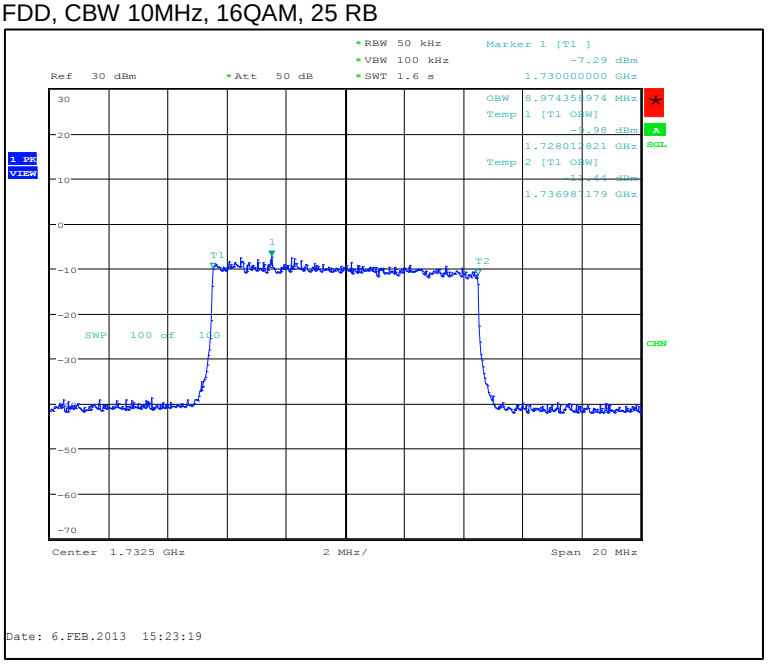
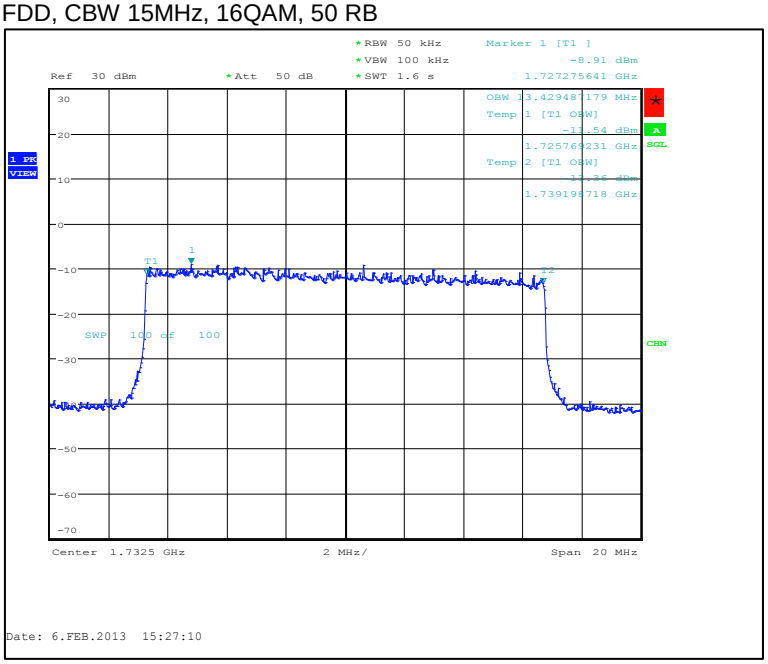
FDD, CBW 10MHz, 16QAM, 25 RB




FDD, CBW 15MHz, 16QAM, 50 RB







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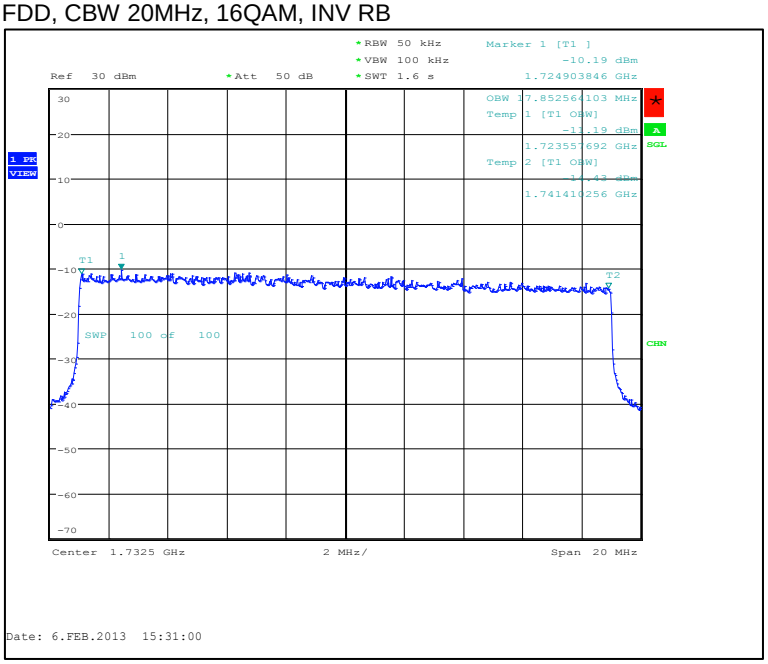
FDD, CBW 20MHz, 16QAM, INV RB







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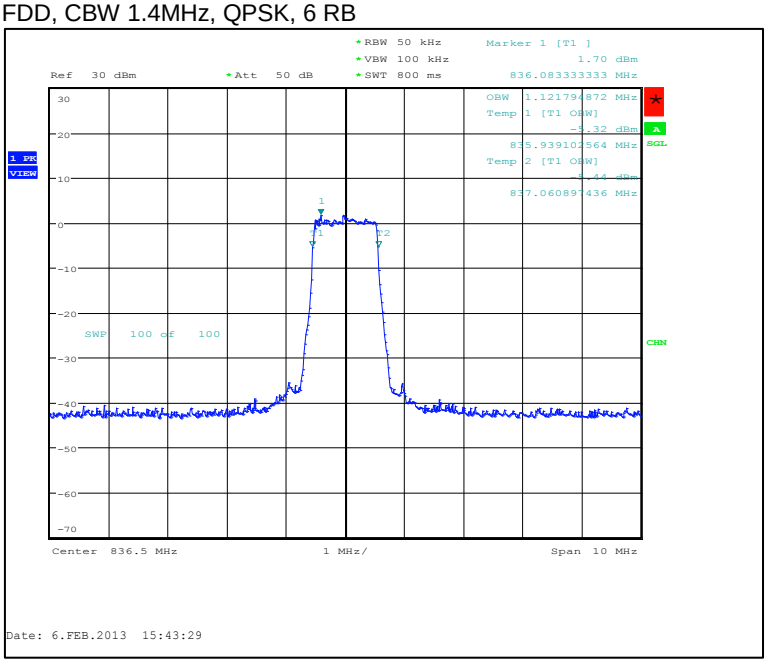
## 3.10. LTE850 (Band 5) Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD, CBW 1.4MHz, QPSK, 6 RB | 1121.8 |
| FDD, CBW 3MHz, QPSK, 6 RB | 2692.3 |
| FDD, CBW 5MHz, QPSK, 15 RB | 4487.2 |
| FDD, CBW 10MHz, QPSK, 25 RB | 8910.3 |
| FDD, CBW 1.4MHz, 16QAM, INV RB | 1121.8 |
| FDD, CBW 3MHz, 16QAM, 6 RB | 2692.3 |
| FDD, CBW 5MHz, 16QAM, 15 RB | 4471.2 |
| FDD, CBW 10MHz, 16QAM, 25 RB | 8926.3 |

FDD, CBW 1.4MHz, QPSK, 6 RB







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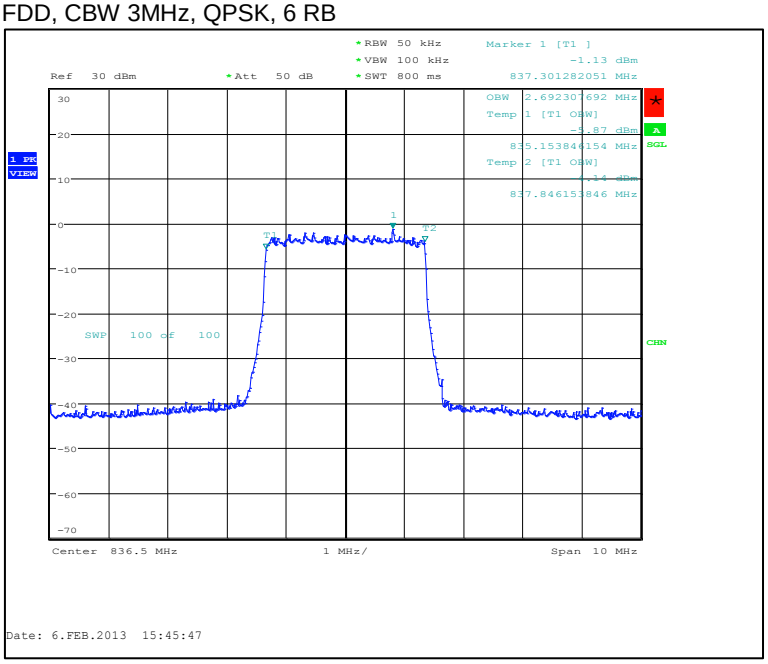
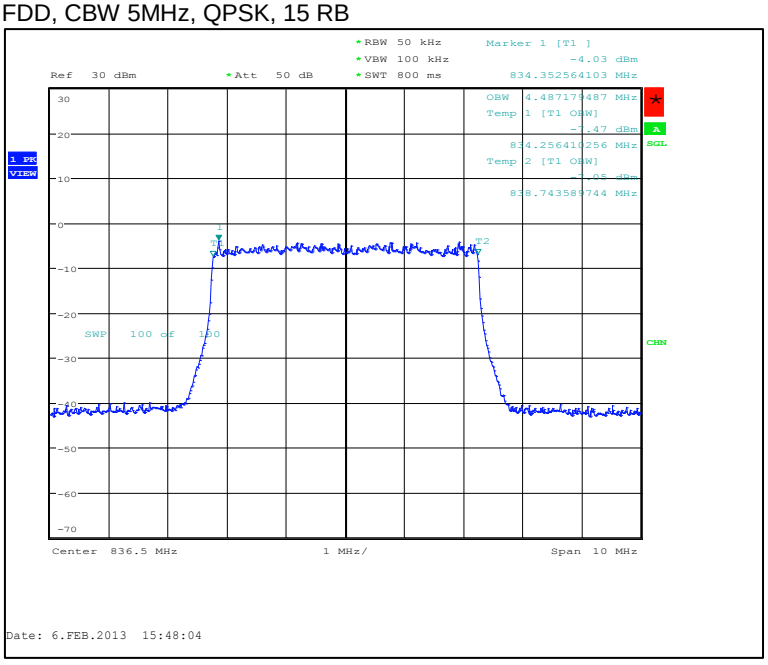
FDD, CBW 3MHz, QPSK, 6 RB




FDD, CBW 5MHz, QPSK, 15 RB







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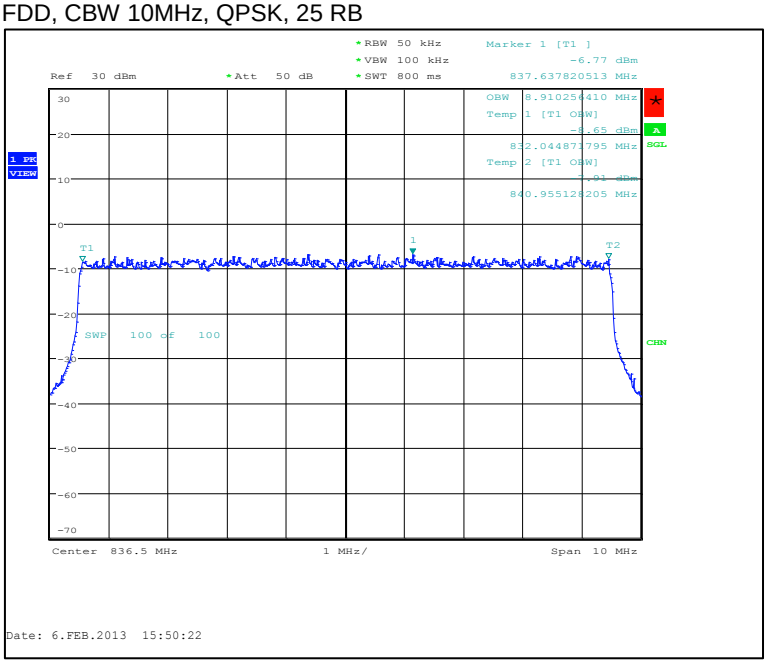
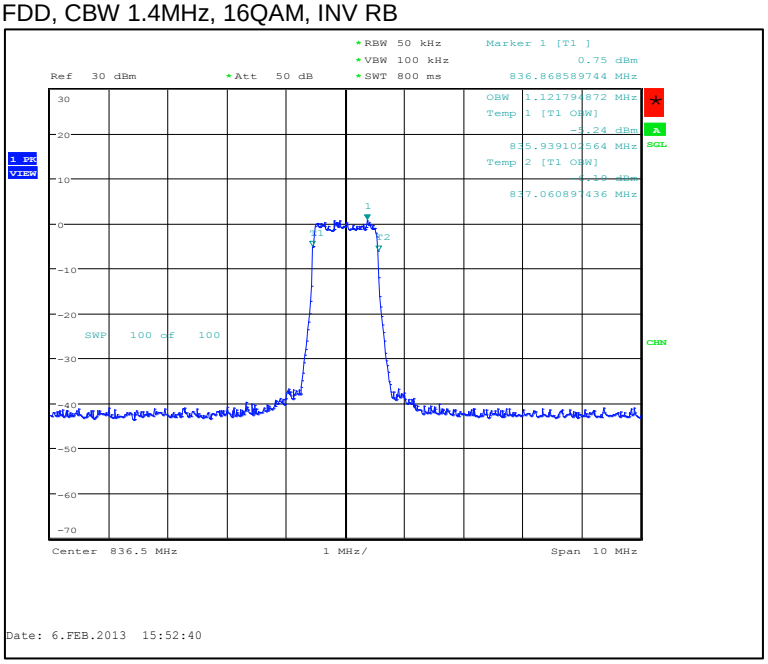
FDD, CBW 10MHz, QPSK, 25 RB




FDD, CBW 1.4MHz, 16QAM, INV RB







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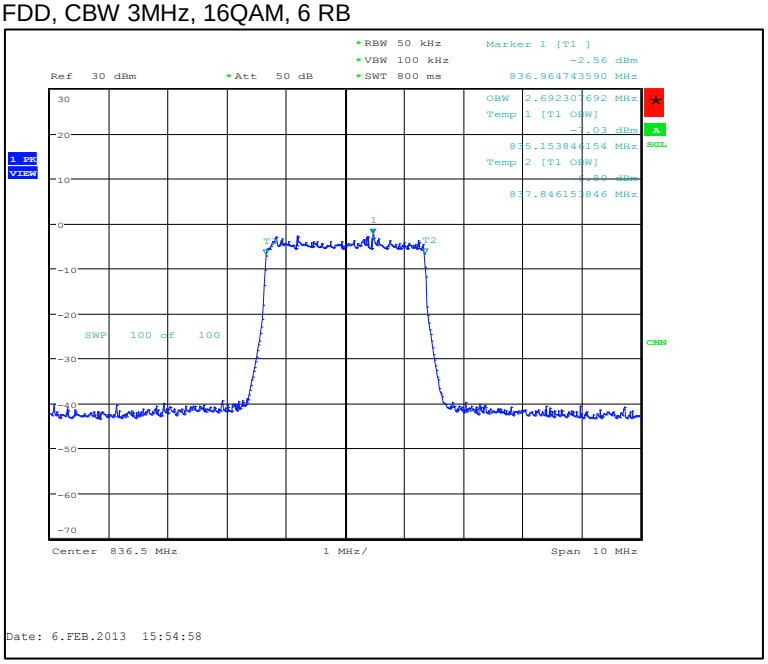
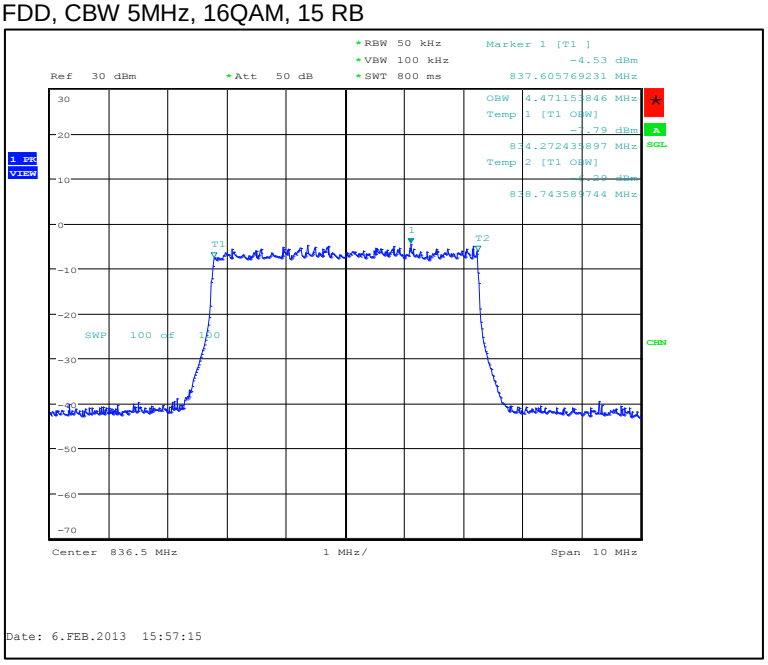
FDD, CBW 3MHz, 16QAM, 6 RB




FDD, CBW 5MHz, 16QAM, 15 RB







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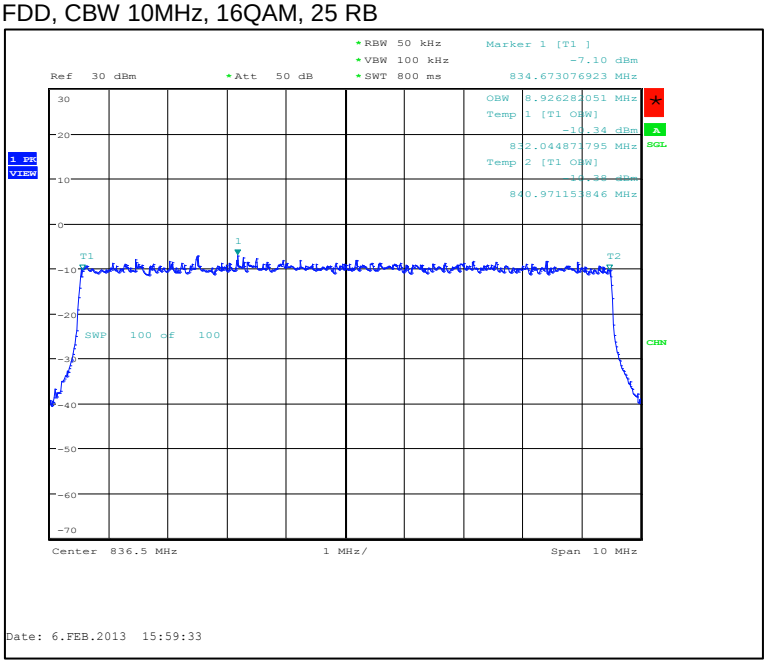
FDD, CBW 10MHz, 16QAM, 25 RB







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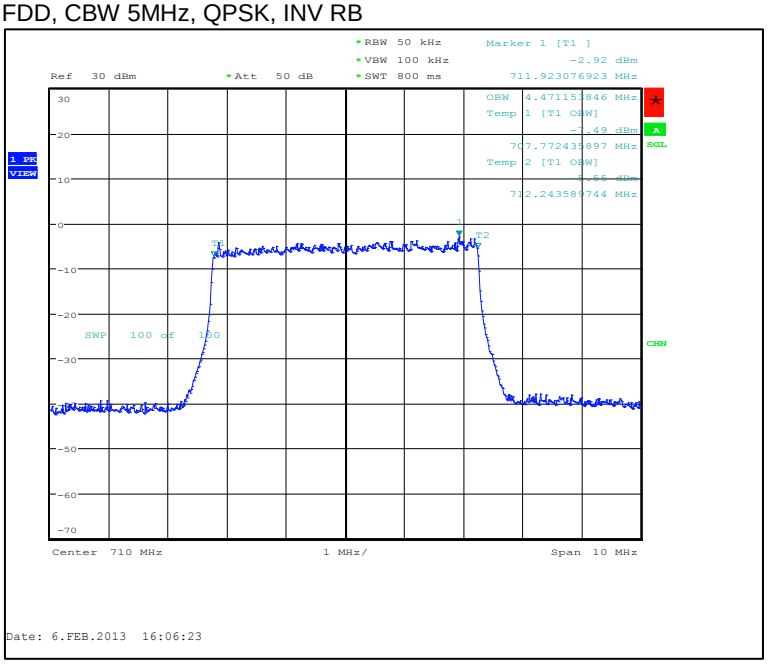
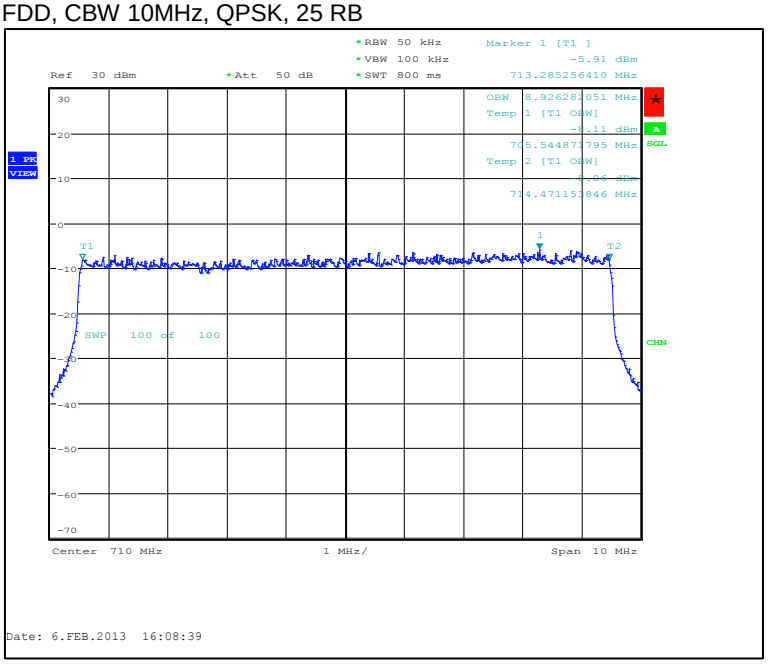
## 3.11. LTE700 Lower (Band 17) Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|---|---|
| FDD, CBW 5MHz, QPSK, INV RB | 4471.2 |
| FDD, CBW 10MHz, QPSK, 25 RB | 8926.3 |
| FDD, CBW 5MHz, 16QAM, INV RB | 4471.2 |
| FDD, CBW 10MHz, 16QAM, 25 RB | 8926.3 |

FDD, CBW 5MHz, QPSK, INV RB




FDD, CBW 10MHz, QPSK, 25 RB







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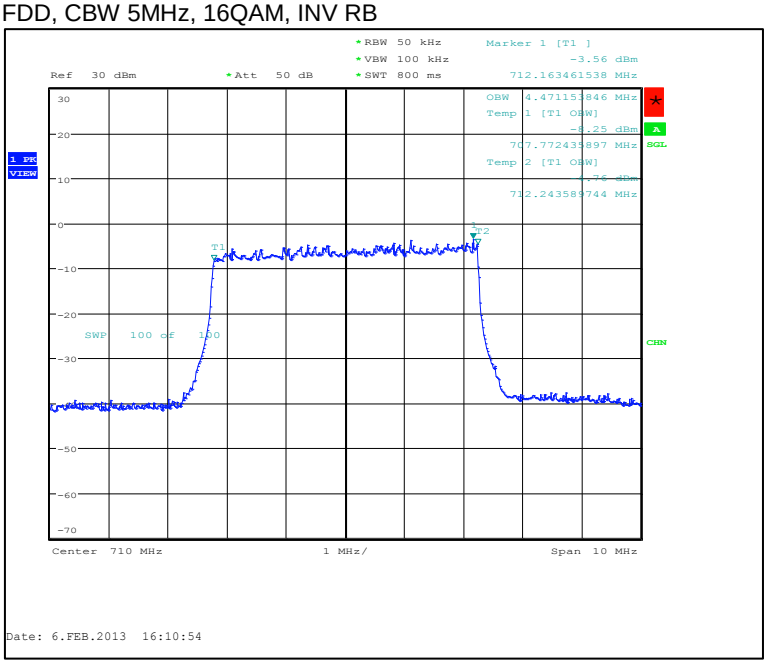
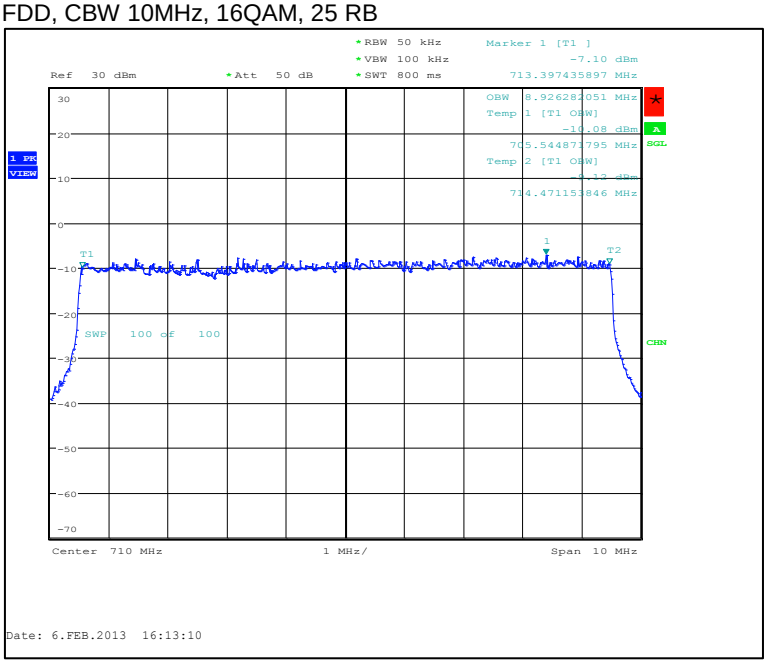
FDD, CBW 5MHz, 16QAM, INV RB




FDD, CBW 10MHz, 16QAM, 25 RB







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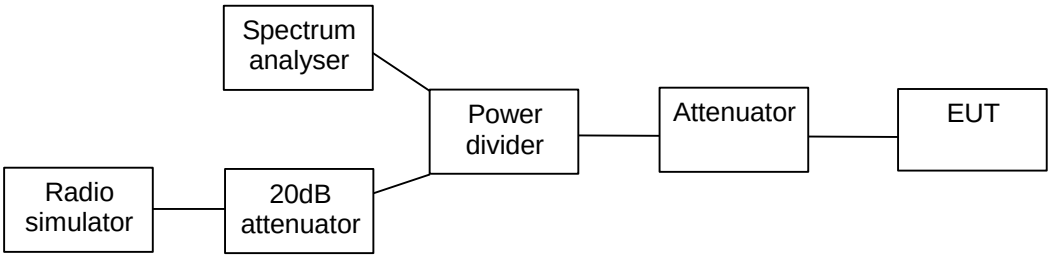
# 4. Band edge compliance

**(FCC §22.917(a), §24.238(a), §27.53(g), §27.53(h), §27.53(c)(2)(4), §27.53(g), RSS-132 4.5, RSS-133 6.5, RSS-139 6.5)**

| | |
|---|---|
| **EUT with DUT number** | RM-877, DUT 42970 |
| **Accessories with DUT numbers** | BV-5XW, DUT 42971; AC-60U, DUT 42973; CA-190CD, DUT42977; WH-208, DUT 42831 |
| **Operation Voltage [V] / [Hz]** | Nominal |
| **Results** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 21 / 37 / 99 |
| **Date of measurements** | 06-Feb-2013 |
| **Measured by** | Timo Raiskio |

## 4.1. Test Setup




## 4.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24, 27 and IC standards , RSS-132, RSS-133, RSS-139.

Limits for band edge compliance measurements

| Operation band | Frequency range [MHz] | Limit [dBm] |
|---|---|---|
| LTE 700 Lower | 703.9 – 704 and 716 – 716.1<br>Below 703.9 and above 716.1 | -13 (RBW = 30 kHz, ERP)<br>-13 (RBW = 30 kHz, ERP) |
| GSM850 / WCDMA850 / LTE850 | Below 824 and above 849 | -13 |
| WCDMA1700 / LTE1700 | Below 1710 and above 1755 | -13 |
| GSM1900 / LTE1900 / WCDMA1900 | Below 1850 and above 1910 | -13 |

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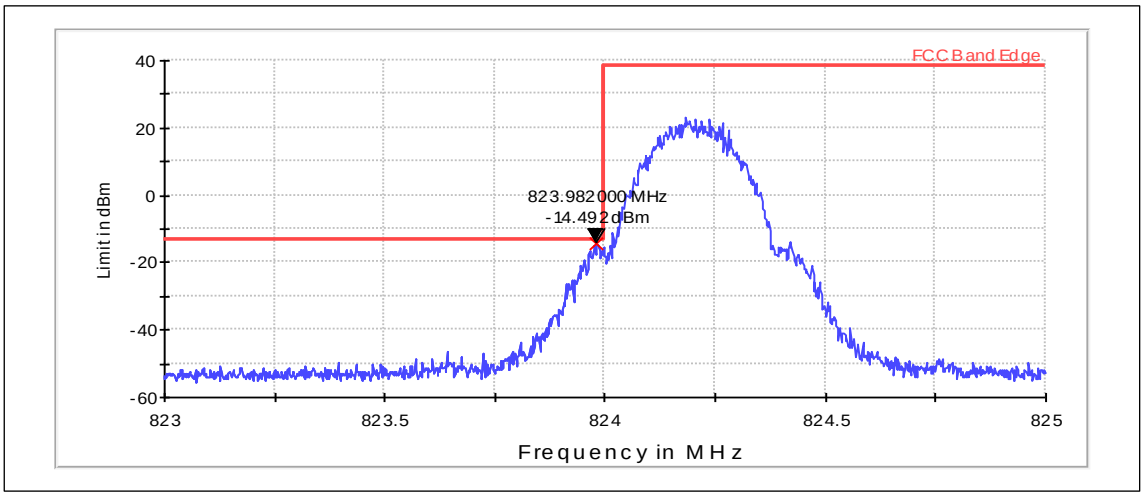
## 4.3. GSM 850 Test results

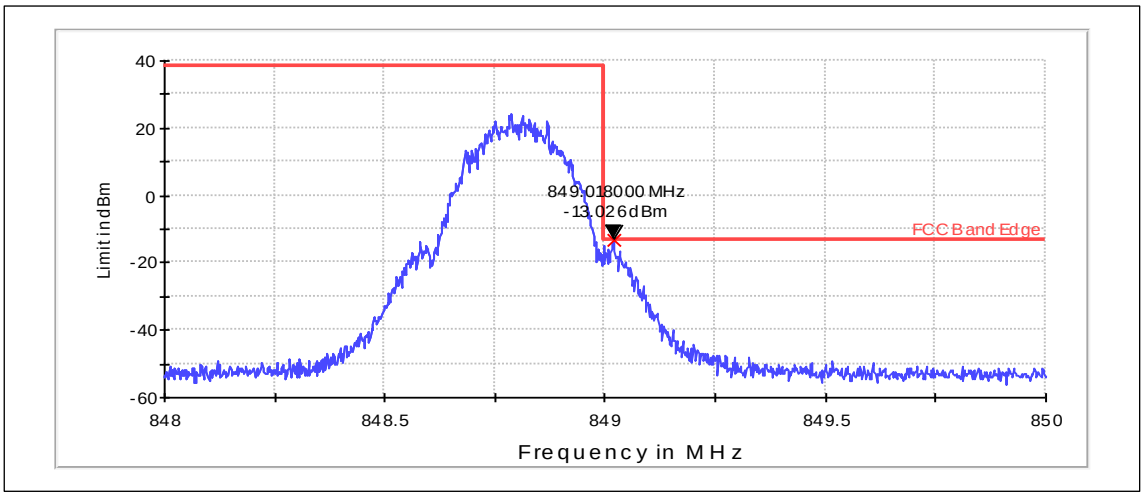
Channel 128 / 824.2 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| GSM | 823.982 | -14.49 | PASSED |

Channel 251 / 848.8 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| GSM | 849.018 | -13.03 | PASSED |

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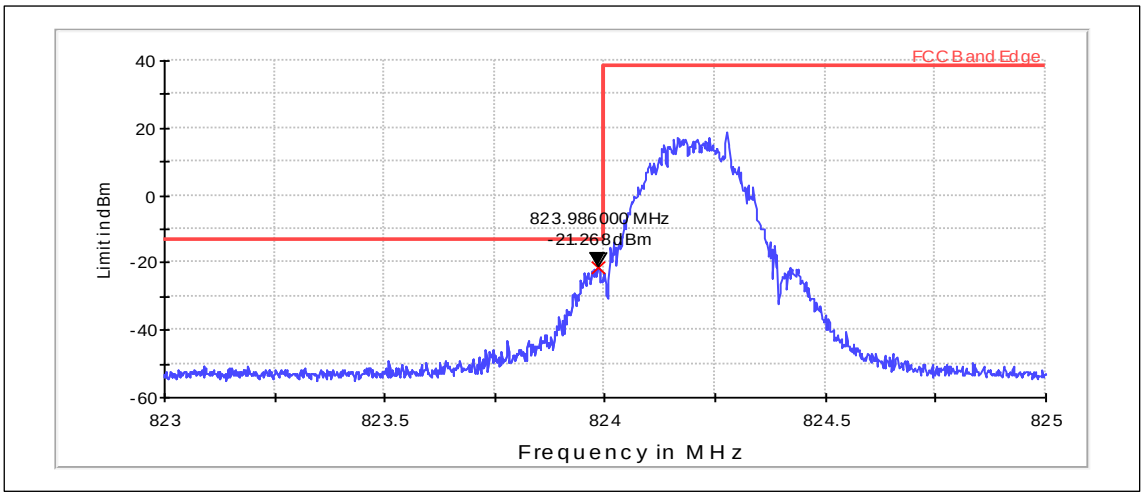
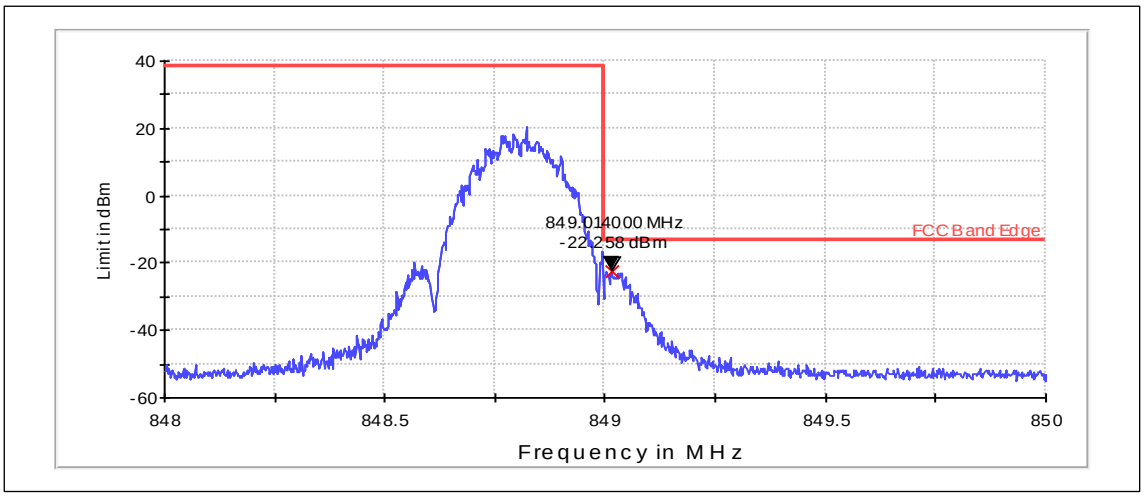
Channel 128 / 824.2 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| EGPRS | 823.986 | -21.27 | PASSED |

Channel 251 / 848.8 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| EGPRS | 849.014 | -22.26 | PASSED |

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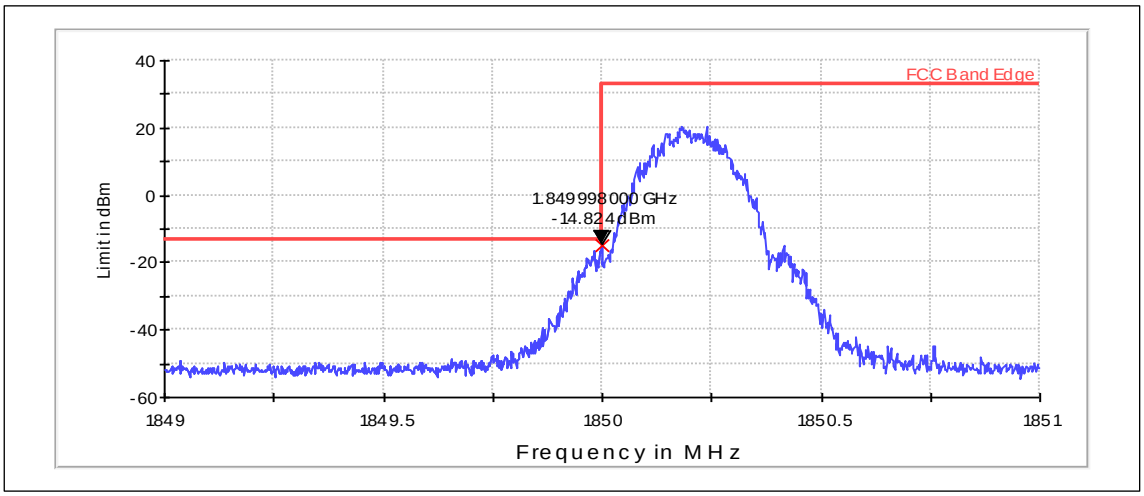
## 4.4. GSM 1900 Test results

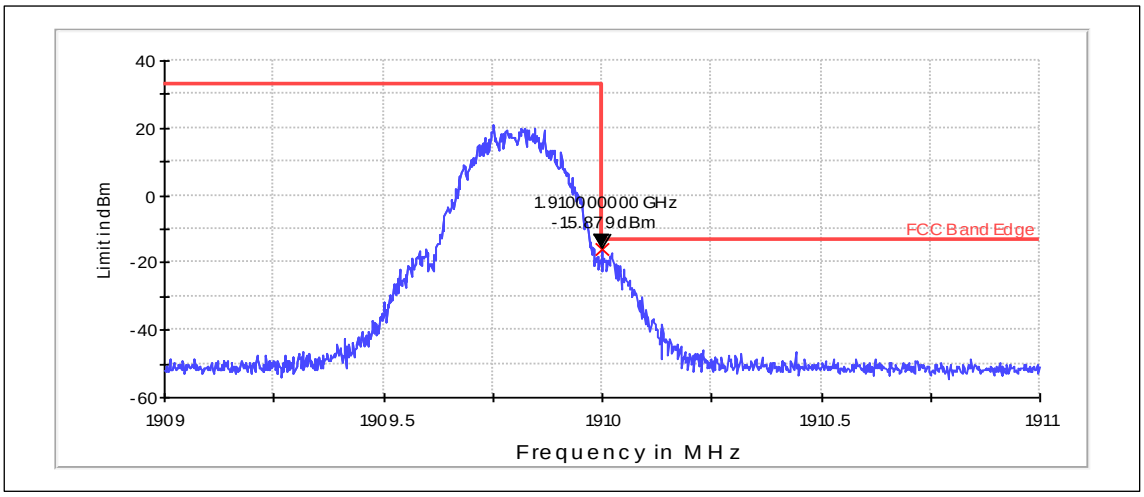
Channel 512 / 1850.2 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| GSM | 1849.998 | -14.82 | PASSED |

Channel 810 / 1909.8 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| GSM | 1910.000 | -15.88 | PASSED |

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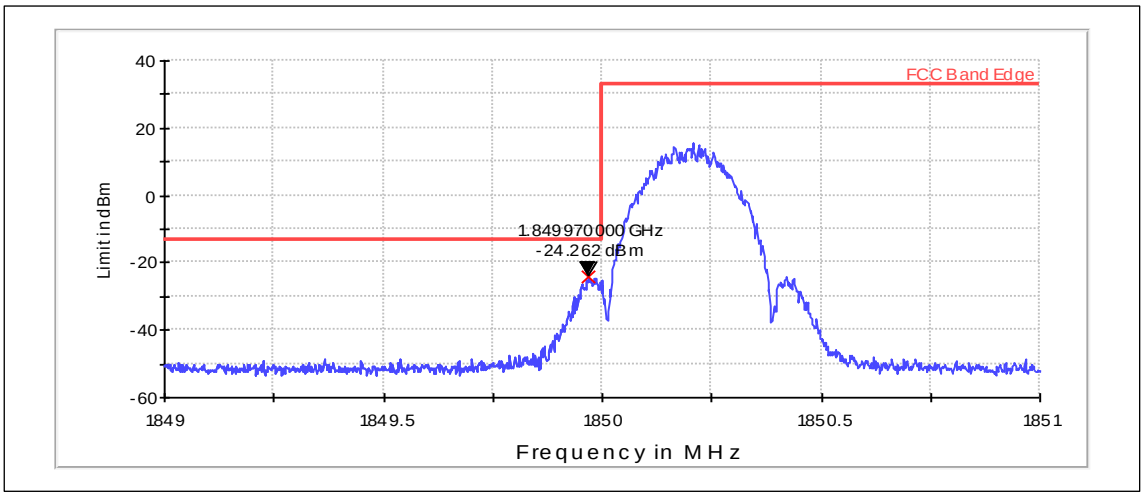
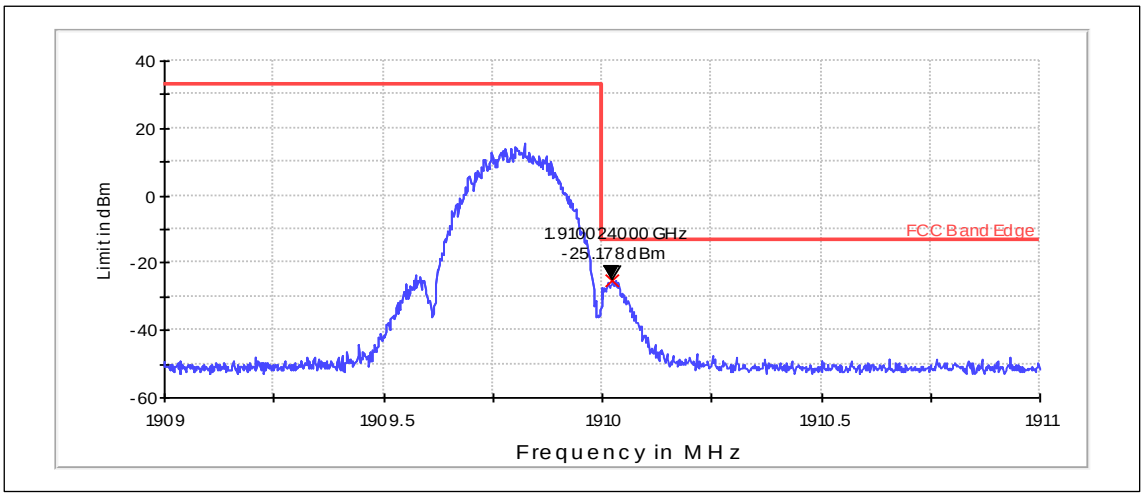
Channel 512 / 1850.2 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| EGPRS | 1849.970 | -24.26 | PASSED |

Channel 810 / 1909.8 MHz




Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| EGPRS | 1910.024 | -25.18 | PASSED |

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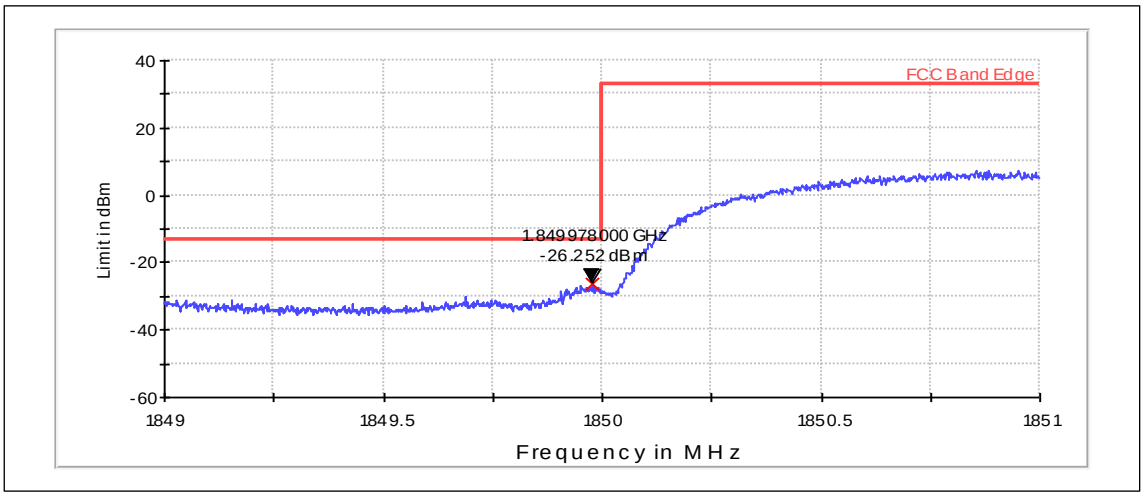
## 4.5. WCDMA 1900 Test results

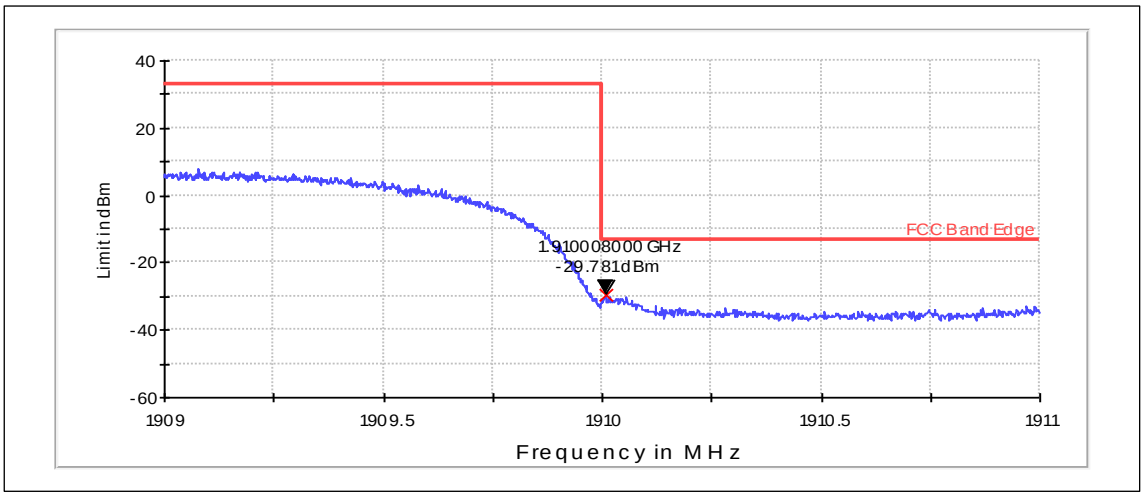
Channel 9262 / 1852.4 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD | 1849.978 | -26.25 | PASSED |

Channel 9538 / 1907.6 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD | 1910.008 | -29.78 | PASSED |

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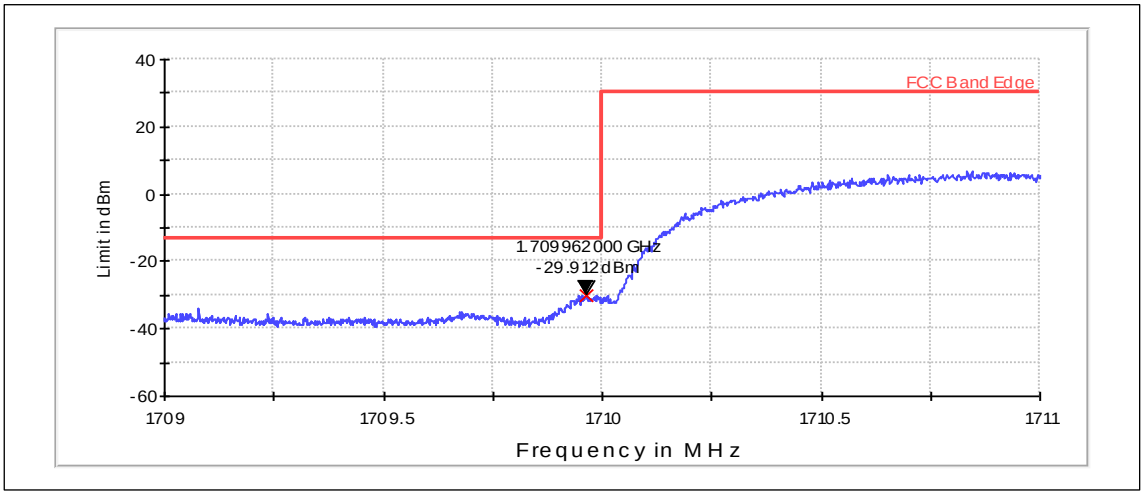
## 4.6. WCDMA 1700 Test results

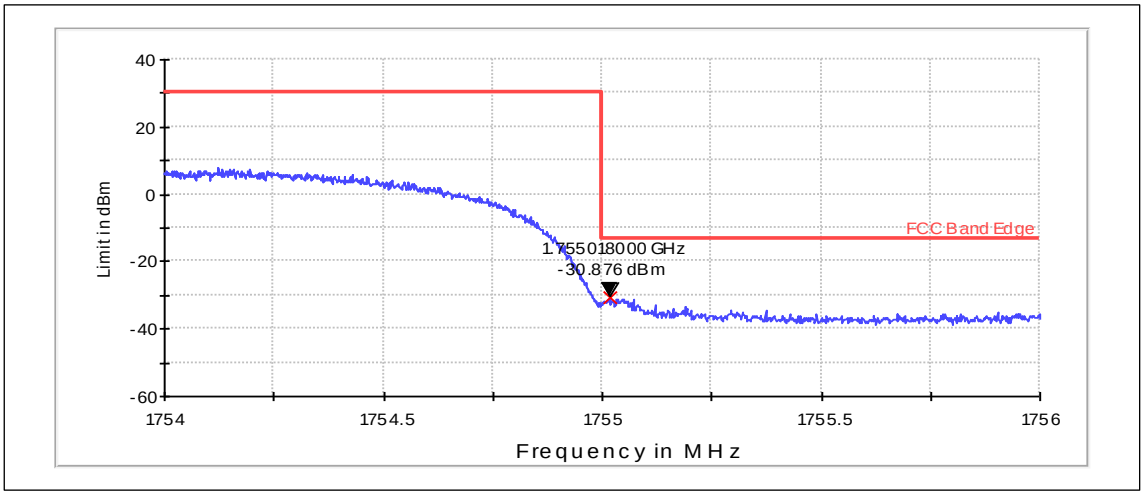
Channel 1312 / 1712.4 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD | 1709.962 | -29.91 | PASSED |

Channel 1513 / 1752.6 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD | 1755.018 | -30.88 | PASSED |

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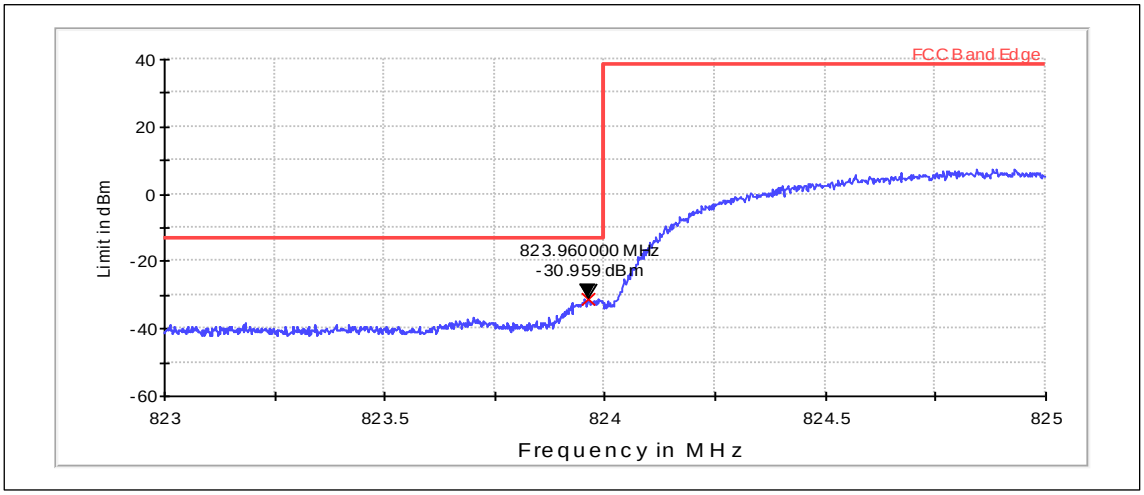
## 4.7. WCDMA 850 Test results

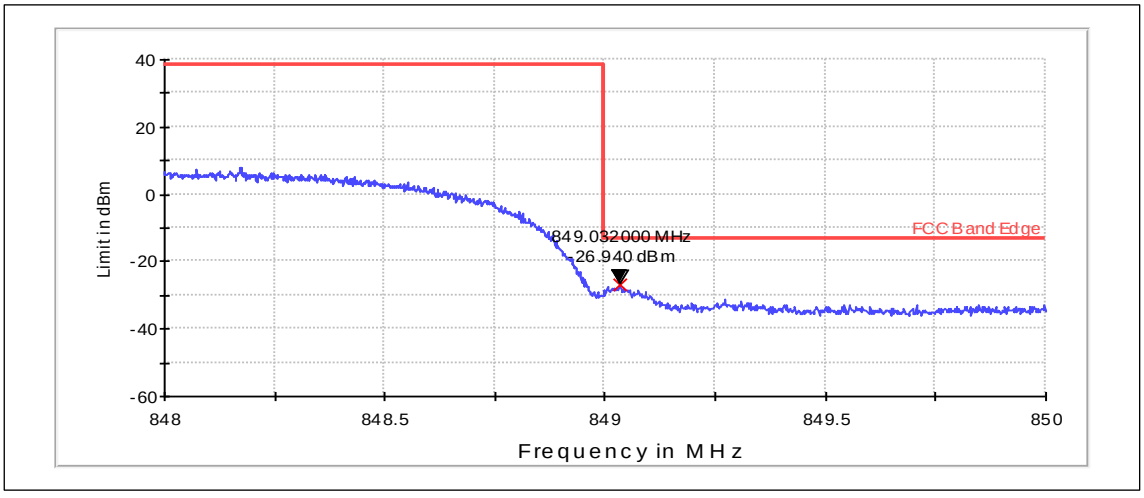
Channel 4132 / 826.4 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD | 823.960 | -30.96 | PASSED |

Channel 4233 / 846.6 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD | 849.032 | -26.94 | PASSED |

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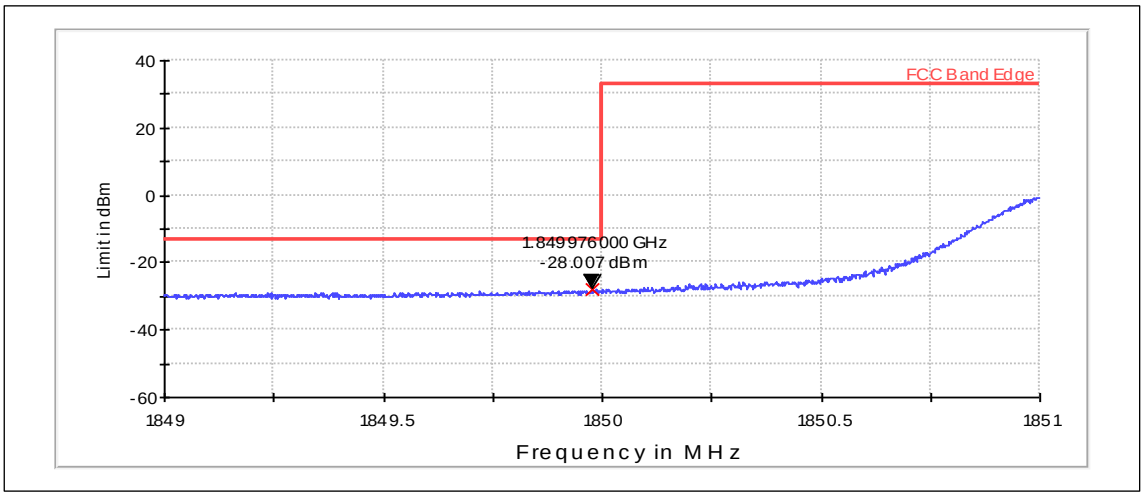
## 4.8. LTE1900 (Band 2) Test results

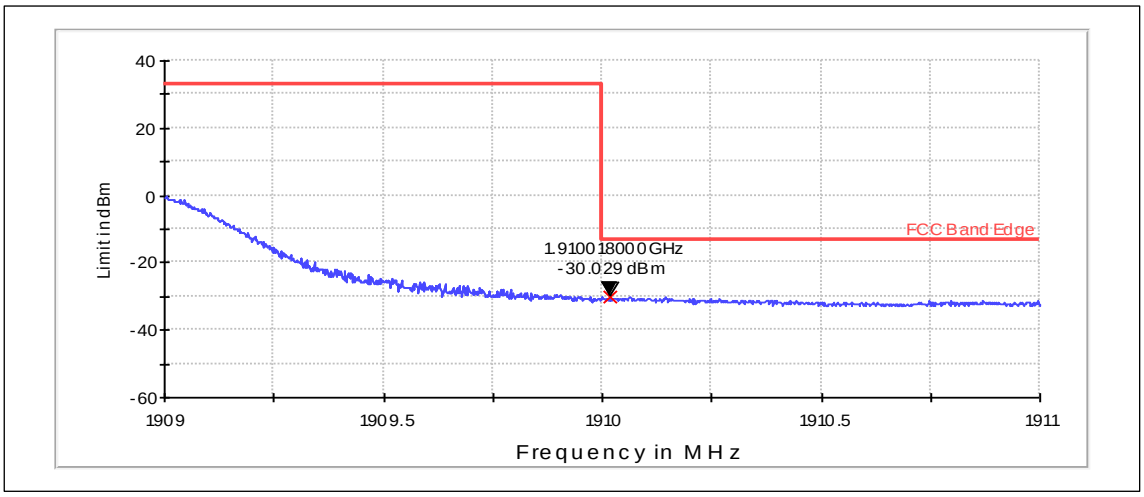
Channel 18700 / 1860 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, QPSK, 100 RB | 1849.976 | -28.01 | PASSED |

Channel 19100 / 1900 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, QPSK, 100 RB | 1910.018 | -30.03 | PASSED |

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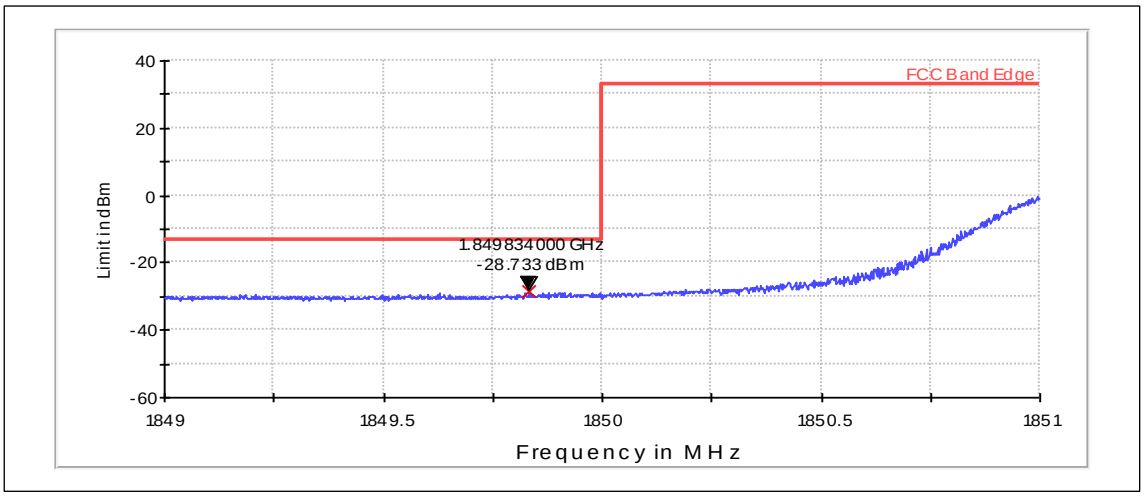
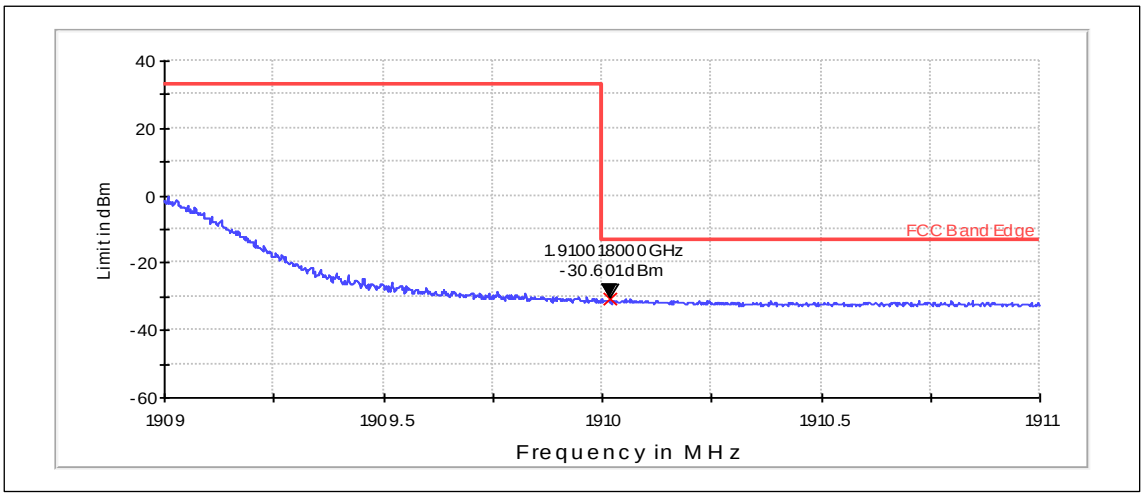
Channel 18700 / 1860 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1849.834 | -28.73 | PASSED |

Channel 19100 / 1900 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1910.018 | -30.60 | PASSED |

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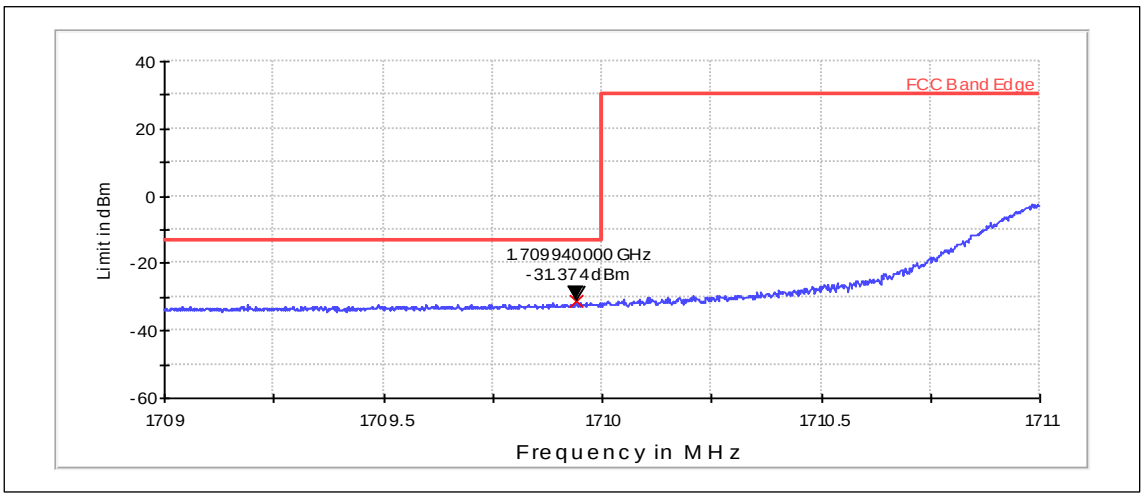
## 4.9. LTE1700 (Band 4) Test results

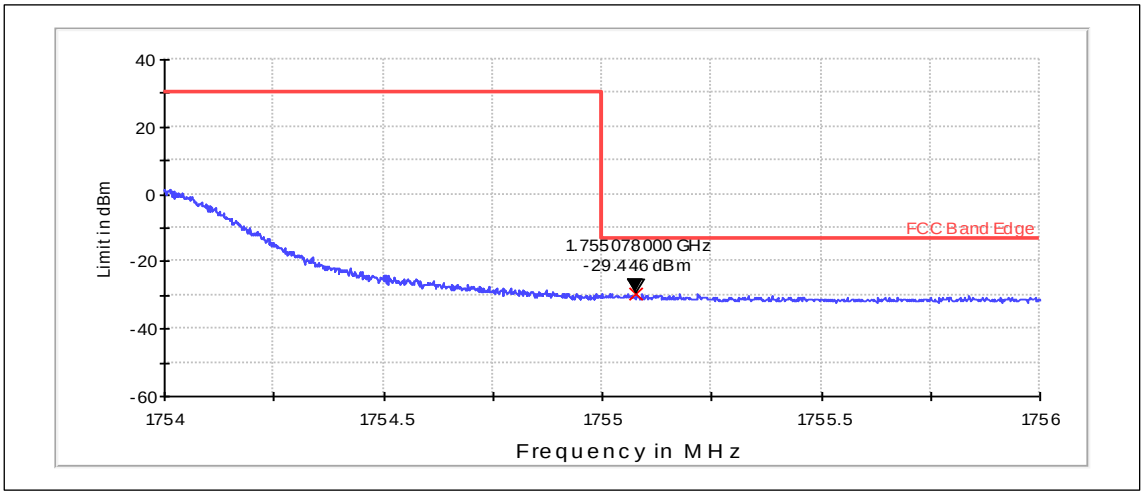
Channel 20050 / 1720 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, QPSK, 100 RB | 1709.940 | -31.37 | PASSED |

Channel 20300 / 1745 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, QPSK, 100 RB | 1755.078 | -29.45 | PASSED |

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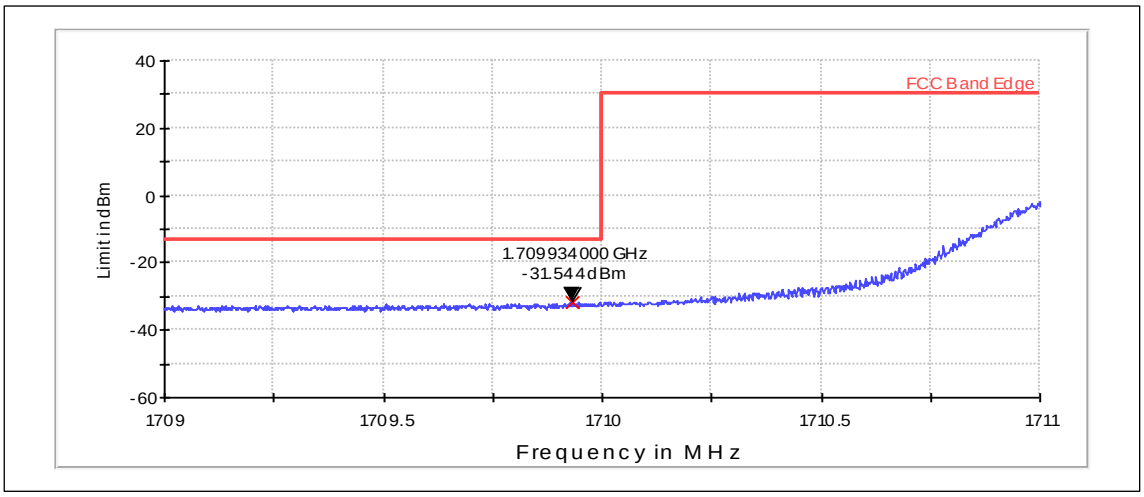
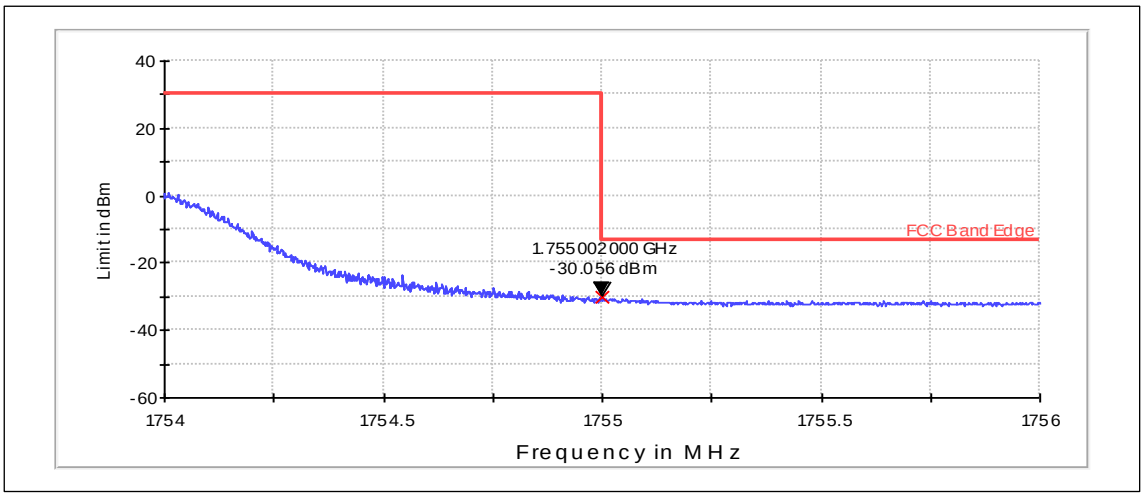
Channel 20050 / 1720 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1709.934 | -31.54 | PASSED |

Channel 20300 / 1745 MHz




RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1755.002 | -30.06 | PASSED |

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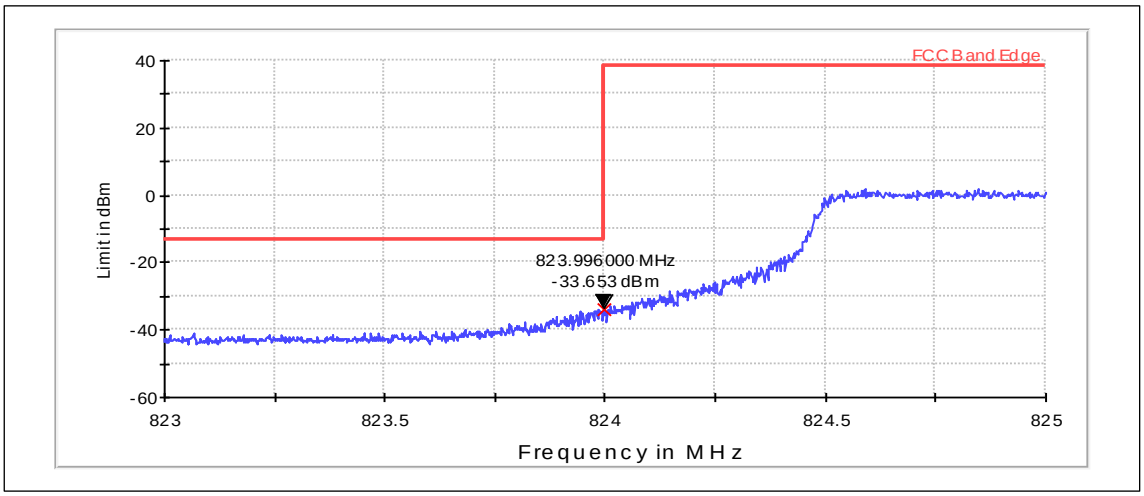
## 4.10. LTE850 (Band 5) Test results

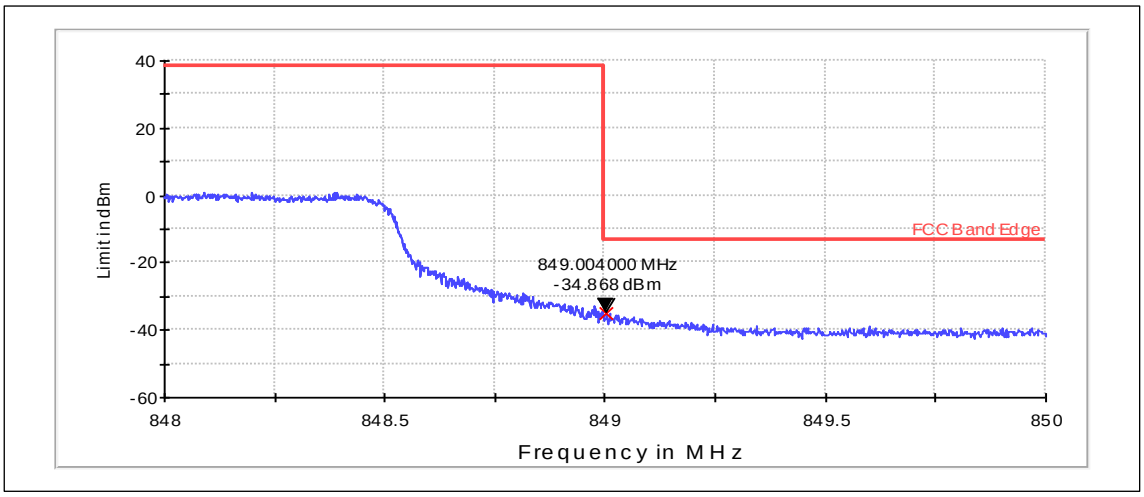
Channel 20450 / 829 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, QPSK, 50 RB | 823.996 | -33.65 | PASSED |

Channel 20600 / 844 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, QPSK, 50 RB | 849.004 | -34.87 | PASSED |

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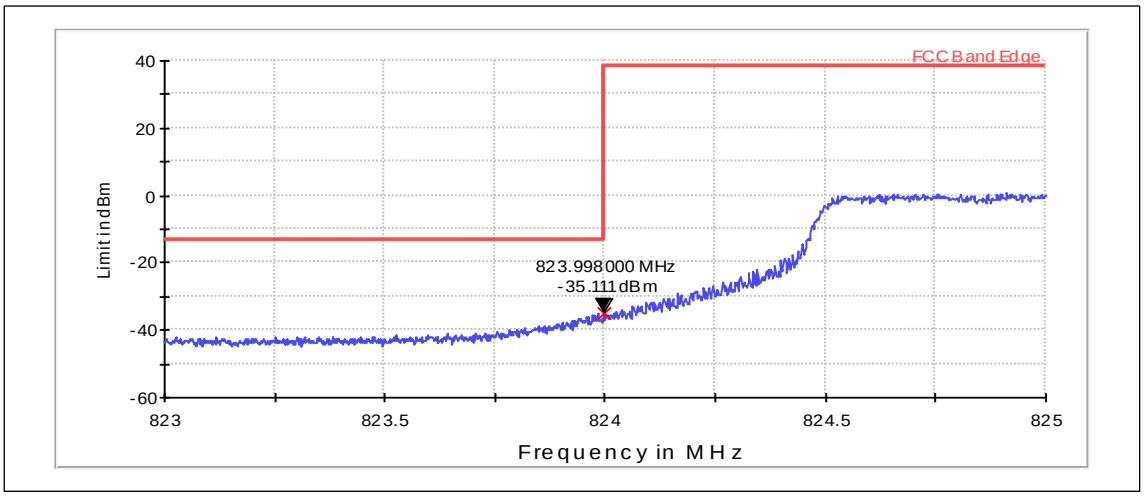
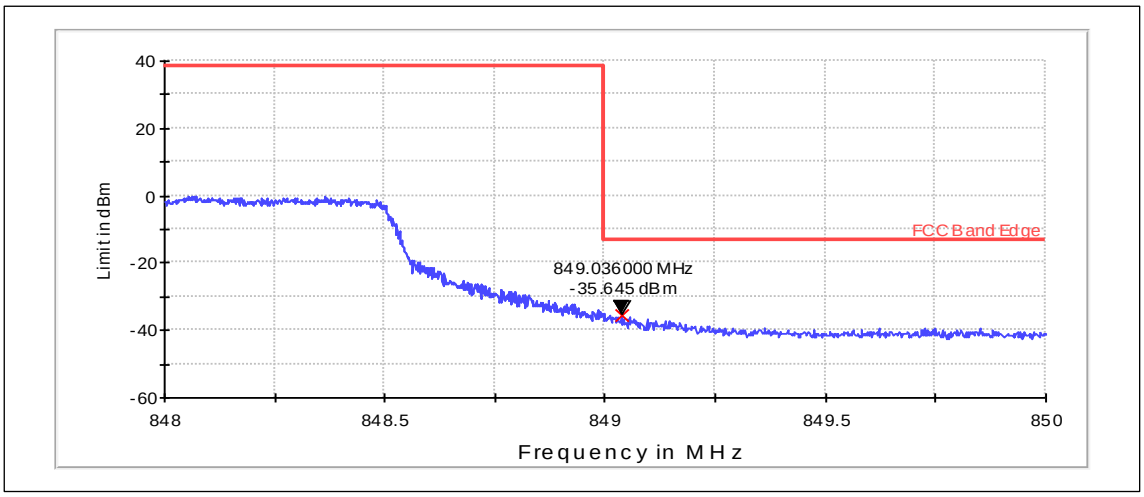
Channel 20450 / 829 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, 16QAM, 50 RB | 823.998 | -35.11 | PASSED |

Channel 20600 / 844 MHz




RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, 16QAM, 50 RB | 849.036 | -35.65 | PASSED |

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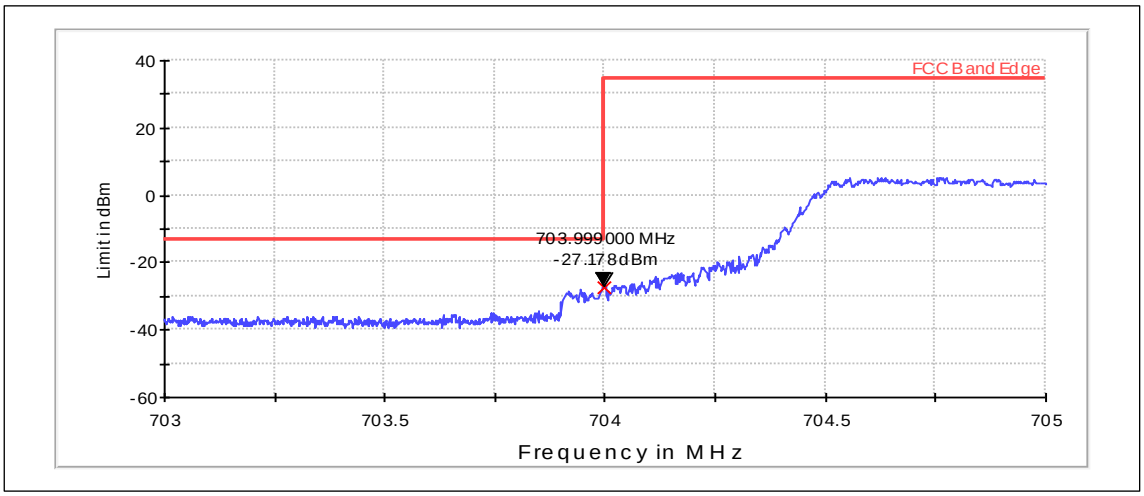
## 4.11. LTE700 Lower (Band 17) Test results

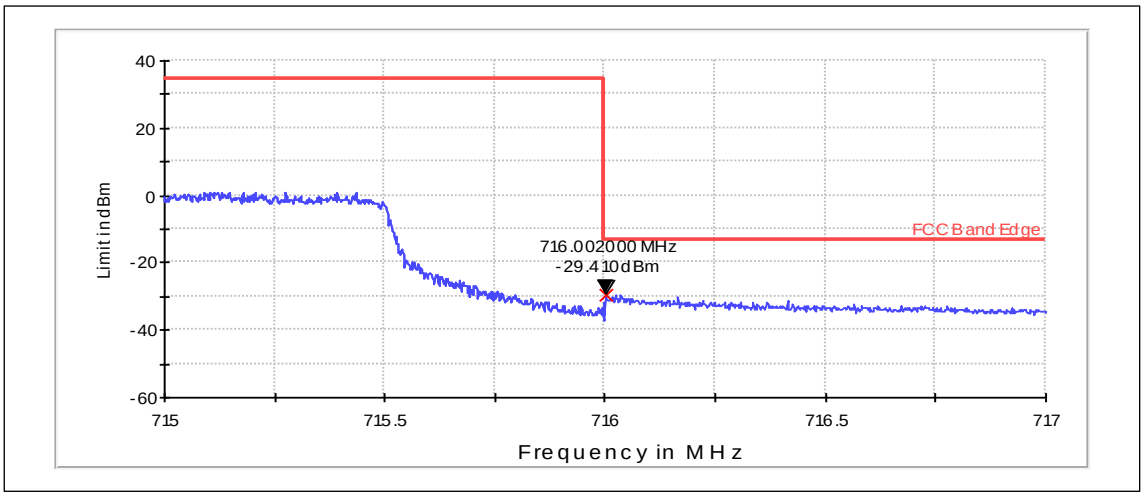
Channel 23780 / 709 MHz




RMS detector

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, QPSK, 50 RB | 703.999 | -27.18 | PASSED |

Channel 23800 / 711 MHz




RMS detector

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, QPSK, 50 RB | 716.002 | -29.41 | PASSED |

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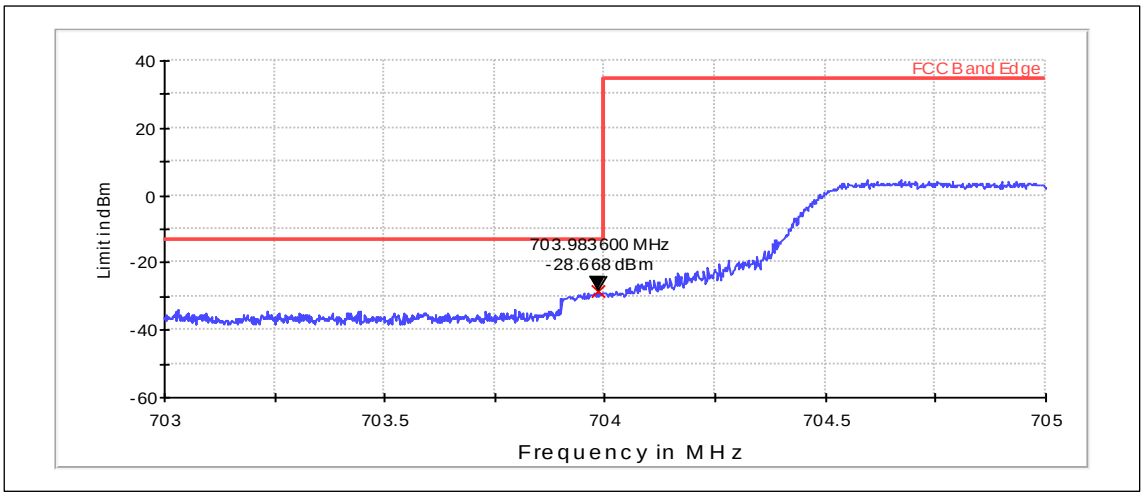
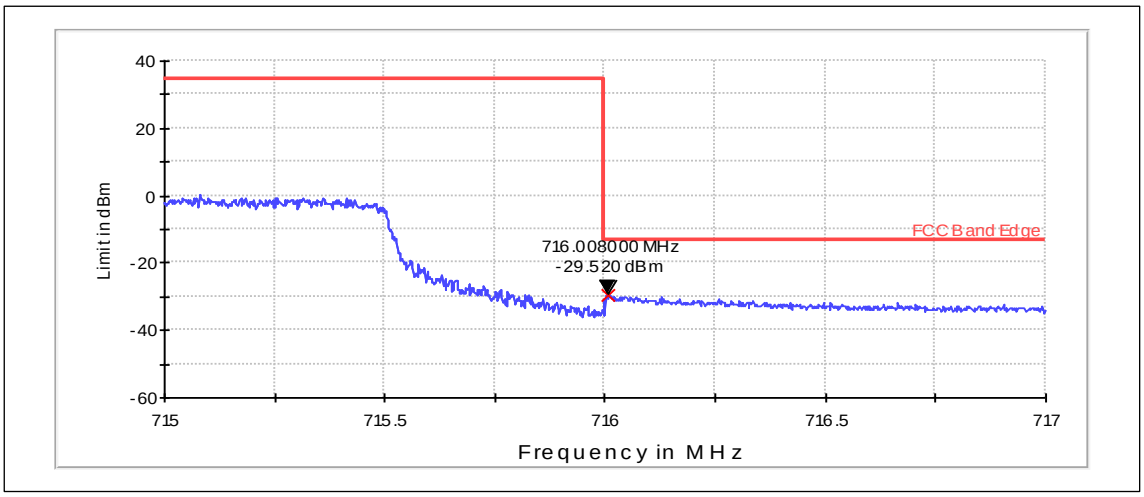
Channel 23780 / 709 MHz




RMS detector

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, 16QAM, 50 RB | 703.984 | -28.67 | PASSED |

Channel 23800 / 711 MHz




RMS detector

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|---|---|---|---|
| FDD, CBW 10MHz, 16QAM, 50 RB | 716.008 | -29.52 | PASSED |

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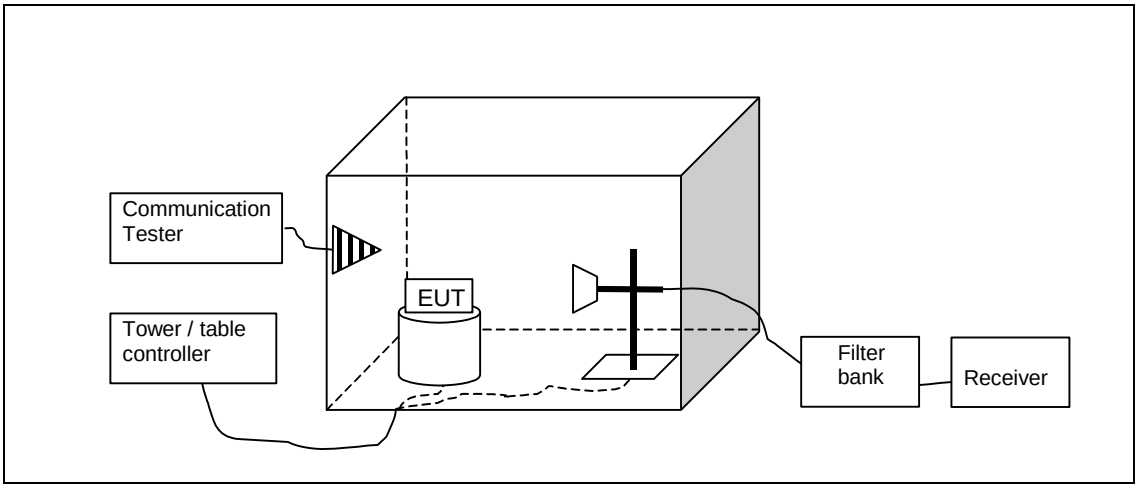
# 5. Spurious radiated emissions

**(FCC §22.917(a), §2.1053, §24.238(a), §2.1053, §27.53(g), §2.1053, §27.53(h), §27.53(g), RSS-132 4.5, RSS-133 6.5)**

| | |
|---|---|
| **EUT with DUT number** | RM-877, DUT 42979 |
| **Accessories with DUT numbers** | AC-60U, DUT 42973 ; CA-190CD, DUT 42977 ; WH-208, DUT 42831 ; BV-5XW, DUT 42971 |
| **Operation Voltage [V] / [Hz]** | 115 / 60 |
| **Results** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 25 / 50 / 103 |
| **Date of measurements** | 13-Feb-2013 |
| **Measured by** | Jari Jantunen |

### 5.1.1 Test setup





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## 5.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:
The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The substitution method is used.

The measurement results are obtained as described below:

$P\ [dBm] = P_{SUBST\ TX} + G_{SUBST\ TX\ ANT} - L_{SUBST\ CABLE}$

Where $P_{SUBST\ TX}$ is signal generator level, which produces the same receiver reading $P_{MEAS}$ in dBm as EUT. $G_{SUBST\ TX\ ANT}$ is substitution antenna gain and $L_{SUBST\ CABLE}$ is the loss of the cable between the signal generator and the substitution antenna.

Limits for spurious radiated emissions measurements

| Operation band | Frequency range [MHz] | Limit [dBm] |
|---|---|---|
| LTE 700 Lower | 30 - 7200 | -13 (RBW = 100 kHz, ERP) |
| GSM850 / WCDMA850 / LTE850 | 30 - 8500 | -13 |
| WCDMA1700 / LTE1700 / / GSM1900 / WCDMA1900 / LTE1900 | 30 - 18000 | -13 |




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## 5.3. GSM850 TX test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1673.066 | -53.55 | 0.00441 | -47.4 | -6.15 | HORIZONTAL | PASSED |
| 1673.146 | -51.81 | 0.0066 | -45.66 | -6.15 | HORIZONTAL | PASSED |
| 1712.866 | -59.27 | 0.00118 | -53.21 | -6.06 | VERTICAL | PASSED |
| 2509.579 | -52.12 | 0.00614 | -53.88 | 1.76 | HORIZONTAL | PASSED |
| 2554.389 | -53.93 | 0.00405 | -55.93 | 2 | HORIZONTAL | PASSED |
| 3318.918 | -57.92 | 0.00161 | -62.61 | 4.69 | VERTICAL | PASSED |

## 5.4. GSM850-E1 TX test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1673.086 | -55.92 | 0.00256 | -49.82 | -6.1 | VERTICAL | PASSED |
| 1673.086 | -53.34 | 0.00464 | -47.19 | -6.15 | HORIZONTAL | PASSED |
| 1673.246 | -55.72 | 0.00268 | -49.58 | -6.14 | HORIZONTAL | PASSED |
| 2511.804 | -54.21 | 0.00379 | -56 | 1.79 | HORIZONTAL | PASSED |
| 2520.701 | -53.13 | 0.00487 | -55.12 | 1.99 | HORIZONTAL | PASSED |
| 3330.24 | -57.93 | 0.00161 | -62.63 | 4.7 | VERTICAL | PASSED |

## 5.5. GSM1900 TX test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 3760.04 | -46.02 | 0.02503 | -54.41 | 8.39 | VERTICAL | PASSED |
| 3760.2 | -49.02 | 0.01254 | -57.41 | 8.39 | VERTICAL | PASSED |
| 5639.92 | -48.26 | 0.01494 | -59.16 | 10.9 | HORIZONTAL | PASSED |
| 7545.972 | -50.2 | 0.00955 | -64.34 | 14.14 | VERTICAL | PASSED |
| 8889.259 | -47.28 | 0.01872 | -65.04 | 17.76 | HORIZONTAL | PASSED |
| 9937.188 | -46.1 | 0.02454 | -65.54 | 19.44 | VERTICAL | PASSED |




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## 5.6. GSM1900-E1 TX test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 3759.94 | -54.5 | 0.00355 | -62.89 | 8.39 | VERTICAL | PASSED |
| 3761.263 | -54.14 | 0.00386 | -62.52 | 8.38 | VERTICAL | PASSED |
| 5629.399 | -50.76 | 0.00839 | -61.23 | 10.47 | HORIZONTAL | PASSED |
| 7500.782 | -50.29 | 0.00935 | -64.27 | 13.98 | VERTICAL | PASSED |
| 8889.158 | -47.51 | 0.01773 | -65.27 | 17.76 | HORIZONTAL | PASSED |
| 9966.874 | -46.12 | 0.02444 | -65.78 | 19.66 | VERTICAL | PASSED |

## 5.7. WCDMA 1900 (Band II) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 3749.198 | -53.05 | 0.00496 | -61.53 | 8.48 | VERTICAL | PASSED |
| 5637.495 | -42.86 | 0.05172 | -53.66 | 10.8 | HORIZONTAL | PASSED |
| 7525.351 | -49.28 | 0.0118 | -63.48 | 14.2 | VERTICAL | PASSED |

## 5.8. WCDMA 1700 (Band IV) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 1412 / 1732.4 MHz

FDD mode, Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1714.9 | -35.81 | 0.26242 | -32.65 | -3.16 | HORIZONTAL | PASSED |
| 1755.22 | -41.22 | 0.07544 | -37.58 | -3.64 | HORIZONTAL | PASSED |
| 3760.822 | -53.69 | 0.00427 | -62.07 | 8.38 | VERTICAL | PASSED |
| 5637.856 | -50.05 | 0.00988 | -61.11 | 11.06 | VERTICAL | PASSED |
| 7518.096 | -49.9 | 0.01023 | -63.85 | 13.95 | HORIZONTAL | PASSED |




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## 5.9. WCDMA 850 (Band V) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 847.7 | -48.86 | 0.01301 | -81.25 | 32.39 | HORIZONTAL | PASSED |
| 850.335 | -48.71 | 0.01347 | -81.16 | 32.45 | HORIZONTAL | PASSED |
| 856.002 | -48.62 | 0.01373 | -81.63 | 33.01 | HORIZONTAL | PASSED |
| 1007.976 | -62.76 | 0.00053 | -53.26 | -9.5 | VERTICAL | PASSED |
| 1668.517 | -46.07 | 0.0247 | -39.69 | -6.38 | HORIZONTAL | PASSED |
| 1671.443 | -46.71 | 0.02133 | -40.44 | -6.27 | HORIZONTAL | PASSED |

## 5.10. LTE 1900 (Band II) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 18900 / 1880.0 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1959.133 | -37.38 | 0.18285 | -35.37 | -2.01 | VERTICAL | PASSED |
| 3760.381 | -55.29 | 0.00296 | -63.68 | 8.39 | VERTICAL | PASSED |
| 5644.87 | -61.02 | 0.00079 | -71.68 | 10.66 | HORIZONTAL | PASSED |
| 7520.301 | -60.4 | 0.00091 | -74.61 | 14.21 | VERTICAL | PASSED |

Channel 18900 / 1880.0 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1960.915 | -37.5 | 0.17766 | -35.51 | -1.99 | VERTICAL | PASSED |
| 3760.341 | -56.34 | 0.00233 | -64.73 | 8.39 | VERTICAL | PASSED |
| 5634.329 | -60.51 | 0.00089 | -71.44 | 10.93 | VERTICAL | PASSED |
| 7523.226 | -60.41 | 0.00091 | -74.61 | 14.2 | VERTICAL | PASSED |




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## 5.11. LTE 1700 (Band IV) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 20175 / 1732.5 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 3465.22 | -62.39 | 0.00058 | -69.31 | 6.92 | VERTICAL | PASSED |
| 5207.5 | -60.83 | 0.00083 | -71.93 | 11.1 | VERTICAL | PASSED |
| 6937.194 | -57.67 | 0.00171 | -70.53 | 12.86 | VERTICAL | PASSED |
| 8652.54 | -57.84 | 0.00164 | -74.26 | 16.42 | VERTICAL | PASSED |
| 10394.379 | -56.61 | 0.00218 | -75.33 | 18.72 | VERTICAL | PASSED |

Channel 20175 / 1732.5 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 3465.301 | -62.98 | 0.0005 | -69.9 | 6.92 | VERTICAL | PASSED |
| 5207.5 | -60.83 | 0.00083 | -71.93 | 11.1 | VERTICAL | PASSED |
| 6937.515 | -57.88 | 0.00163 | -70.74 | 12.86 | VERTICAL | PASSED |
| 8652.66 | -58.43 | 0.00143 | -74.6 | 16.17 | HORIZONTAL | PASSED |
| 10394.379 | -56.61 | 0.00218 | -75.33 | 18.72 | VERTICAL | PASSED |




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## 5.12. LTE 850 (Band V) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 20525 / 836.5 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 857.599 | -59.43 | 0.00114 | -93.02 | 33.59 | VERTICAL | PASSED |
| 881.635 | -44.31 | 0.03703 | -79.04 | 34.73 | VERTICAL | PASSED |
| 882.957 | -44.54 | 0.03516 | -79.04 | 34.5 | VERTICAL | PASSED |
| 1673.461 | -53.89 | 0.00409 | -47.75 | -6.14 | HORIZONTAL | PASSED |
| 2507.276 | -73.26 | 5E-05 | -74.96 | 1.7 | VERTICAL | PASSED |
| 3342.212 | -76.31 | 2E-05 | -80.99 | 4.68 | VERTICAL | PASSED |

Channel 20525 / 836.5 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 857.418 | -59.45 | 0.00114 | -93.03 | 33.58 | VERTICAL | PASSED |
| 880.593 | -44.32 | 0.03697 | -79.04 | 34.72 | VERTICAL | PASSED |
| 880.672 | -44.31 | 0.03708 | -79.05 | 34.74 | VERTICAL | PASSED |
| 1673.301 | -53.53 | 0.00444 | -47.39 | -6.14 | HORIZONTAL | PASSED |
| 2504.069 | -73.24 | 5E-05 | -74.96 | 1.72 | VERTICAL | PASSED |
| 3355.639 | -76.96 | 2E-05 | -81.74 | 4.78 | VERTICAL | PASSED |

## 5.13. LTE700 Lower (Band 17) test results

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

Channel 23790 / 710 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1420.421 | -73.87 | 4E-05 | -65.92 | -7.95 | VERTICAL | PASSED |
| 2139.92 | -75.16 | 3E-05 | -73.32 | -1.84 | VERTICAL | PASSED |
| 2840.782 | -68.81 | 0.00013 | -72.46 | 3.65 | VERTICAL | PASSED |

Channel 23790 / 710 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarization | Results |
|---|---|---|---|---|---|---|
| 1420.461 | -75.31 | 3E-05 | -67.76 | -7.55 | HORIZONTAL | PASSED |
| 2138.958 | -74.92 | 3E-05 | -73.02 | -1.9 | VERTICAL | PASSED |
| 2840.822 | -69.09 | 0.00012 | -72.74 | 3.65 | VERTICAL | PASSED |



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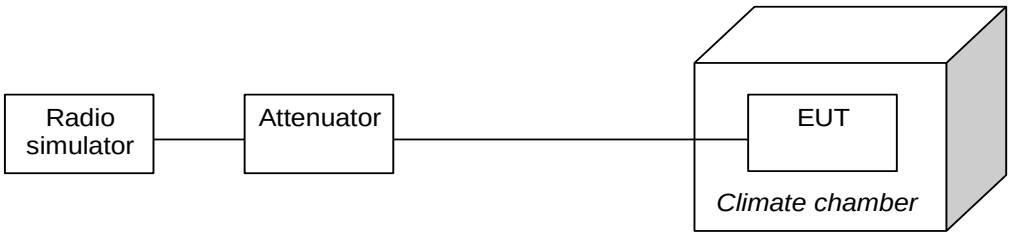
# 6. Frequency stability, temperature variation
**(FCC §2.1055(a), RSS-132 4.3, RSS-133 6.3, RSS-139 6.3)**

| | |
|---|---|
| **EUT with DUT number** | RM-877, DUT 42970 |
| **Accessories with DUT numbers** | BV-5XW, DUT 42971; AC-60U, DUT 42973; CA-190CD, DUT42977; WH-208, DUT 42831 |
| **Operation Voltage [V] / [Hz]** | Nominal |
| **Results** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 21 / 37 / 99.8 |
| **Date of measurements** | 07-Feb-2013 |
| **Measured by** | Timo Raiskio |

## 6.1. Test Setup




## 6.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24, 27 and IC standard RSS-132, RSS-133 and RSS-139
as follows:

The climate chamber temperature is set to the maximum value and the temperature is allowed to stabilize.
The EUT is placed in the chamber.
The EUT is set in idle mode for 15 minutes.
The EUT is set to transmit.
The transmit frequency error was measured immediately.
The steps c - e were repeated for each temperature.Limits for frequency stability, temperature variation measurements

| **Frequency deviation [ppm]** |
|---|
| +\- 2.5 |

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## 6.3. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

| Temperature [°C] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| 50 | 836.60 | -6.20000 | -0.0074 | PASSED |
| 40 | 836.60 | -20.66000 | -0.0247 | PASSED |
| 30 | 836.60 | -13.37000 | -0.016 | PASSED |
| 20 | 836.60 | -9.56000 | -0.0114 | PASSED |
| 10 | 836.60 | -5.04000 | -0.006 | PASSED |
| 0 | 836.60 | -2.13000 | -0.0025 | PASSED |
| -10 | 836.60 | -4.13000 | -0.0049 | PASSED |
| -20 | 836.60 | -1.61000 | -0.0019 | PASSED |
| -30 | 836.60 | -9.30000 | -0.0111 | PASSED |

## 6.4. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

| Temperature [°C] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| 50 | 1880.00 | -20.40000 | -0.0109 | PASSED |
| 40 | 1880.00 | -25.51000 | -0.0136 | PASSED |
| 30 | 1880.00 | -18.21000 | -0.0097 | PASSED |
| 20 | 1880.00 | -26.09000 | -0.0139 | PASSED |
| 10 | 1880.00 | -20.15000 | -0.0107 | PASSED |
| 0 | 1880.00 | -26.28000 | -0.014 | PASSED |
| -10 | 1880.00 | -24.60000 | -0.0131 | PASSED |
| -20 | 1880.00 | -18.79000 | -0.01 | PASSED |
| -30 | 1880.00 | -17.43000 | -0.0093 | PASSED |




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## 6.5. WCDMA 1700 Test results

FDD, Channel 1412 / 1732.4 MHz

| Temperature [°C] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| 50 | 1732.40 | -5.88989 | -0.0034 | PASSED |
| 40 | 1732.40 | -2.05994 | -0.0012 | PASSED |
| 30 | 1732.40 | -6.72913 | -0.0039 | PASSED |
| 20 | 1732.40 | -2.65503 | -0.0015 | PASSED |
| 10 | 1732.40 | -3.03650 | -0.0018 | PASSED |
| 0 | 1732.40 | -4.07410 | -0.0023 | PASSED |
| -10 | 1732.40 | -4.22669 | -0.0024 | PASSED |
| -20 | 1732.40 | -4.24194 | -0.0024 | PASSED |
| -30 | 1732.40 | 1.19019 | 0.0007 | PASSED |

## 6.6. LTE700 Lower (Band 17) Test results

FDD, CBW 1MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz

| Temperature [°C] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| 50 | 710.00 | -0.74387 | -0.001 | PASSED |
| 40 | 710.00 | -0.80109 | -0.0011 | PASSED |
| 30 | 710.00 | -0.94414 | -0.0013 | PASSED |
| 20 | 710.00 | -1.00000 | -0.0014 | PASSED |
| 10 | 710.00 | -0.28610 | -0.0004 | PASSED |
| 0 | 710.00 | 0.72956 | 0.001 | PASSED |
| -10 | 710.00 | 0.08583 | 0.0001 | PASSED |
| -20 | 710.00 | -0.82970 | -0.0012 | PASSED |
| -30 | 710.00 | 0.61512 | 0.0009 | PASSED |




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# 7. Frequency stability, voltage variation

**(FCC §2.1055(d), RSS-132 4.3, RSS-133 6.3, RSS-139 6.3)**

| | |
|---|---|
| **EUT with DUT number** | RM-877, DUT 42970 |
| **Accessories with DUT numbers** | Dummy Battery |
| **Operation Voltage [V] / [Hz]** | 3.5V / 4.1V / 4.2V |
| **Results** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 21 / 37 / 100.1 |
| **Date of measurements** | 08-Feb-2013 |
| **Measured by** | Timo Raiskio |

## 7.1. Test Setup


## 7.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24, 27 and IC standard RSS-132, RSS-133 and RSS-139
as follows:

The EUT battery was replaced with an adjustable power supply. The frequency stability was measured at nominal voltage and at the battery cut-off point.
Limits for frequency stability, voltage variation measurements

| Frequency deviation [ppm] |
|---|
| +\- 2.5 |




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## 7.3. GSM 850 Test results

GSM,

| Voltage level [V] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| Max / 4.2 | 836.60 | -8.59000 | -0.0103 | PASSED |
| Nominal / 4.1 | 836.60 | -13.11000 | -0.0157 | PASSED |
| Battery cut-off point / 3.5 | 836.60 | -8.01000 | -0.0096 | PASSED |

## 7.4. GSM 1900 Test results

GSM,

| Voltage level [V] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| Max / 4.2 | 1880.00 | -16.34000 | -0.0087 | PASSED |
| Nominal / 4.1 | 1880.00 | -20.34000 | -0.0108 | PASSED |
| Battery cut-off point / 3.5 | 1880.00 | -15.43000 | -0.0082 | PASSED |

## 7.5. WCDMA 1700 Test results

FDD,

| Voltage level [V] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| Max / 4.2 | 1732.40 | -2.34985 | -0.0014 | PASSED |
| Nominal / 4.1 | 1732.40 | -3.46375 | -0.002 | PASSED |
| Battery cut-off point / 3.5 | 1732.40 | -4.28772 | -0.0025 | PASSED |

## 7.6. LTE700 Lower (Band 17) Test results

FDD, CBW 1MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz

| Voltage level [V] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|---|---|---|---|---|
| Max / 4.2 | 710.00 | -1.77383 | -0.0025 | PASSED |
| Nominal / 4.1 | 710.00 | -1.55926 | -0.0022 | PASSED |
| Battery cut-off point / 3.5 | 710.00 | -1.35899 | -0.0019 | PASSED |




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# 8. Test Equipment

## 8.1. Conducted measurements

| Eq. No | Equipment | Type | Manufacturer | Used in |
|---|---|---|---|---|
| TM38112 | Power supply | 6632A | Agilent | 22/24/27, 15C, 15E |
| TM38631 | Signal Generator | 83640L | Agilent | 22/24/27, 15C, 15E, 15B |
| TM37678 | Communication Tester | CMU200 | R&S | 15C, 15B |
| TM30600 | Impulse limiter | ESH3-Z2 | R&S | 15C, 15B |
| TM26490 | LISN 50 µH | ESH3-Z5 | R&S | 15C, 15B |
| TM26491 | LISN 50 µH | ESH3-Z5 | R&S | 15C, 15B |
| TM37610 | Spectrum Analyzer | FSU26 | R&S | 22/24/27, 15C, 15E |
| TM23007 | Oscilloscope | TDS684B | Tektronix | 15E |
| TM22806 | Battery | BAT 20/E | Fiskars | 15C, 15B |
| TM22805 | UPS | PS 20/1.2 | Fiskars | 15C, 15B |
| - | Temperature and humidity logger | 175-H2 | Testo | 15C, 15B |
| - | Temperature and humidity logger | 175-H2 | Testo | 22/24/27, 15C |
| - | Air pressure and temperature logger | 635-2 | Testo | 22/24/27, 15C, 15B |
| - | Air pressure sensor | 0638-1835 | Testo | 22/24/27, 15C, 15B |
| - | Temperature test chamber | VT 4002 | Vötsch | 22/24/27 |
| 2058 | Receiver | ESPC | R&S | 15C, 15B |
| 2001 | Bluetooth tester | CBT | R&S | 15C, 15B |
| 2002 | Communication Tester | CMU200 | R&S | 22/24/27, 15C |
| 2009 | LISN 50 µH | ENV216 | R&S | 15C, 15B |
| 2010 | LISN 50 µH | ENV216 | R&S | 15C, 15B |
| 2012 | Power splitter | 11667B | Agilent | 22/24/27, 15C |
| 2013 | Attenuator | 8493C | Agilent | 22/24/27, 15C |
| 2014 | Attenuator | 8493C | Agilent | 22/24/27, 15C |
| 2019 | Power splitter | ZN2PD-9G-S+ | Mini-Circuits | 15E |
| 2020 | Power splitter | ZN2PD-9G-S+ | Mini-Circuits | 15E |
| 2021 | Communication Tester | CMW500 | R&S | 22/24/27 |
| 2023 | Spectrum Analyzer | ESMI-RF | R&S | 15B/15C |
| 2024 | Analyzer display unit | ESAI-D | R&S | 15B/15C |



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## 8.2. Radiated measurements

| Eq. No | Equipment | Type | Manufacturer | Used in |
|---|---|---|---|---|
| TM38114 | Power supply | 6632A | Agilent | 22/24/27, 15C, 15B |
| TM38631 | Signal Generator | 83640L | Agilent | 22/24/27, 15C, 15E, 15B |
| - | Antenna | BBHA 9120 D | Schwarzbeck | 22/24/27, 15C |
| TM26497 | Antenna | 3115 | Emco | 22/24/27, 15C, 15B |
| TM37773 | Communication Tester | CMU200 | R&S | 22/24/27, 15B |
| TM38845 | Receiver | ESIB 26 | R&S | 22/24/27, 15C, 15E, 15B |
| - | Antenna | HL562 | R&S | 22/24/27, 15C, 15E, 15B |
| - | Turntable | 2188 | EMCO | 22/24/27, 15C, 15E, 15B |
| - | Turntable controller | 2090 | EMCO | 22/24/27, 15C, 15E, 15B |
| - | RF system panel | TS-RSP | R&S | 22/24/27, 15C, 15E, 15B |
| - | RF system panel | TS-RSP | R&S | 22/24/27, 15C, 15E, 15B |
| - | Mini mast | 2075-2 | ETS Lindgren | 22/24/27, 15C, 15B |
| TM38843 | Mini mast | 2075 | Emco | 22/24/27, 15C, 15B |
| TM38842 | Antenna mast controller | 2090 | Emco | 22/24/27, 15C, 15B |
| TM30643 | LISN 50 µH | LISN-5-20-2 | FCC | 22/24/27, 15C, 15B |
| TM30644 | LISN 50 µH | LISN-5-20-2 | FCC | 22/24/27, 15C, 15B |
| - | Temperature and humidity logger | 175-H2 | Testo | 22/24/27, 15C, 15B |
| - | Air pressure and temperature logger | 635-2 | Testo | 22/24/27, 15C, 15B |
| - | Air pressure sensor | 0638-1835 | Testo | 22/24/27, 15C, 15B |
| TM37523 | Preamplifier | AMF-4D-10M-3G-25-20P | Miteq | 22/24/27, 15C, 15B |
| TM37498 | Preamplifier | AMF-5D-020180-26-10P | Miteq | 22/24/27, 15C, 15B |
| TM30599 | Semi anechoic chambre | UNKNOWN | TDK | 22/24/27, 15C, 15B |
| TM22638 | Power supply | OL63743-901 | - | 22/24/27, 15C, 15E, 15B |
| TM38066 | High pass filter | WHKX3.0/18G-12SS | Wainwright | 22/24/27, 15C, 15E, 15B |
| 2028 | High pass filter | WHKX 1.0/15G-12SS | Wainwright | 22/24/27, 15C,15E, 15B |
| TM37545 | Tunable notch filter | 800.0/960.0-0.2/40-8SSK | Wainwright | 22 |
| TM26512 | Tunable notch filter | WRCD1850/1910-0.2/40-10SSK | Wainwright | 24 |
| - | Band reject filter | WRCG1877/1883-1870/1890-40/6EE | Wainwright | 24 |
| - | Band reject filter | WRCG1729.4/1735.4-1722.4/1742.4-40/6SS | Wainwright | 27 |
| - | Band reject filter | WRCG832/838-825/848-40/5SS | Wainwright | 22 |
| TM23892 | Controller | G-1000SDX | Yaesu | 22/24/27 |
| 2001 | Bluetooth tester | CBT | R&S | 15C, 15B |
| 6023 | Antenna | VUBA 9117 | Schwarzbeck | 22/24/27 |
| 2021 | Communication Tester | CMW500 | R&S | 22/24/27 |
| 2025 | Antenna | HFH2-Z2 | R&S | 15C |



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