

## FCC Part 22/24/27 Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                           |                                   |                                                                                                                                                                               |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | FCC_Cellular_RM-1041_02.docx                                                                                                                                                                                                                                                                                                                                                              | <b>Date of Report:</b>            | 16-Oct-2014                                                                                                                                                                   |
| <b>Number of pages:</b>                                 | 60                                                                                                                                                                                                                                                                                                                                                                                        | <b>Customer's Contact person:</b> | Helen Hu                                                                                                                                                                      |
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| <b>FCC listing no.:</b>                                 | 533467                                                                                                                                                                                                                                                                                                                                                                                    |                                   |                                                                                                                                                                               |
| <b>IC recognition no.:</b>                              | 661V-1                                                                                                                                                                                                                                                                                                                                                                                    |                                   |                                                                                                                                                                               |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-1041 / Battery BV-T5A / WLC Cover CC-3086 / AC-Charger AC-20E / Headset WH-108 / Dummy Battery SD-233R /</b>                                                                                                                                                                                                                                                                  |                                   |                                                                                                                                                                               |
| <b>FCC ID:</b>                                          | QTLRM-1041                                                                                                                                                                                                                                                                                                                                                                                | <b>IC:</b>                        | -                                                                                                                                                                             |
| <b>Supplement reports:</b>                              | -                                                                                                                                                                                                                                                                                                                                                                                         |                                   |                                                                                                                                                                               |
| <b>Testing has been carried out in accordance with:</b> | CFR 47, FCC rules Parts 22/24/27, 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), RSS-130 (Issue 1, October 2013). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit". |                                   |                                                                                                                                                                               |
| <b>Documentation:</b>                                   | 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 Microsoft.                                                                                                                                  |                                   |                                                                                                                                                                               |
| <b>Test Results:</b>                                    | <b>The EUT complies with the requirements in respect of all parameters subject to the test.</b><br>The test results relate only to devices specified in this document                                                                                                                                                                                                                     |                                   |                                                                                                                                                                               |
| <b>Date and signature for the contents:</b>             |                                                                                                                                                                                                                                                                                                                                                                                           |                                   |                                                                                                                                                                               |

Jari Keto, Specialist, EMC

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

|                               |                                                       |
|-------------------------------|-------------------------------------------------------|
| Date of receipt               | 26-Sep-2014                                           |
| Testing completed             | 16-Oct-2014                                           |
| The customer's contact person | Helen Hu                                              |
| Test Plan referred to         | T:\Projects\RM-1041\TestPlan\RS_testplan_RM-1041.xlsm |
| Notes                         | -                                                     |
| Document name                 | T:\Projects\RM-1041\EMC\FCC_Cellular_RM-1041_02.docx  |

### 1.1. EUT and Accessory Information

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

Devices under tests

| Product       | Type    | SN                          | HW   | MV | SW                      | DUT   |
|---------------|---------|-----------------------------|------|----|-------------------------|-------|
| Phone         | RM-1041 | 353067060029511             | 0364 | -  | 02042.00000.14372.27013 | 18673 |
| Battery       | BV-T5A  | 4175354295C1080102600670740 | -    | -  |                         | 18674 |
| WLC Cover     | CC-3086 | -                           | -    | -  |                         | 18675 |
| AC-Charger    | AC-20E  | 486867246144050013200675628 | -    | -  |                         | 18676 |
| Headset       | WH-108  | 2265171                     | -    | -  | -                       | 18677 |
| Phone         | RM-1041 | 353067060017250             | 0364 | -  | 02042.00000.14372.27013 | 18639 |
| Dummy Battery | SD-233R |                             | -    | -  | -                       | 18640 |
| Headset       | WH-108  | 2265171                     | -    | -  | -                       | 18641 |

### 1.2. Summary of Test Results

#### GSM 850:

| 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                    |        |
| §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     |        |

#### GSM 1900:

| 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                    |        |
| §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     |        |

#### CDMA 800:

| 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     |        |

#### CDMA 1900:

| 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     |        |

#### WCDMA2:

| 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     |        |

#### WCDMA5:

| 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                    |        |
| §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     |        |

#### LTE2:

| 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     |        |

#### LTE4:

| 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 | PASSED |
| §2.1055(d)         | 6.3                           | Frequency stability, voltage variation     | PASSED |

#### LTE13:

| Section in CFR 47            | Section in RSS-GEN or RSS-130 | Name of the test                           | Result |
|------------------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a)                   | 4.4                           | Conducted RF output power                  |        |
| §27.50(b)(10)                | 4.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)                   | 4.6.1                         | 99 % occupied bandwidth                    | PASSED |
| §27.53(c)(2)(4)              | 4.6                           | Band edge compliance                       | PASSED |
| §27.53(c)(2)(4),(f), §2.1051 | 4.6                           | Spurious emissions at antenna terminals    |        |
| §27.53(c)(2)(4),(f), §2.1053 | 4.6                           | Spurious radiated emissions                | PASSED |
| §2.1055(a)                   | 4.3 (a)                       | Frequency stability, temperature variation | PASSED |
| §2.1055(d)                   | 4.3 (a)                       | Frequency stability, voltage variation     | PASSED |

PASSED  
FAILED  
NP

The EUT complies with the essential requirements in the standard.  
The EUT does not comply with the essential requirements in the standard.  
The test was not performed by the TCC Microsoft Laboratory.

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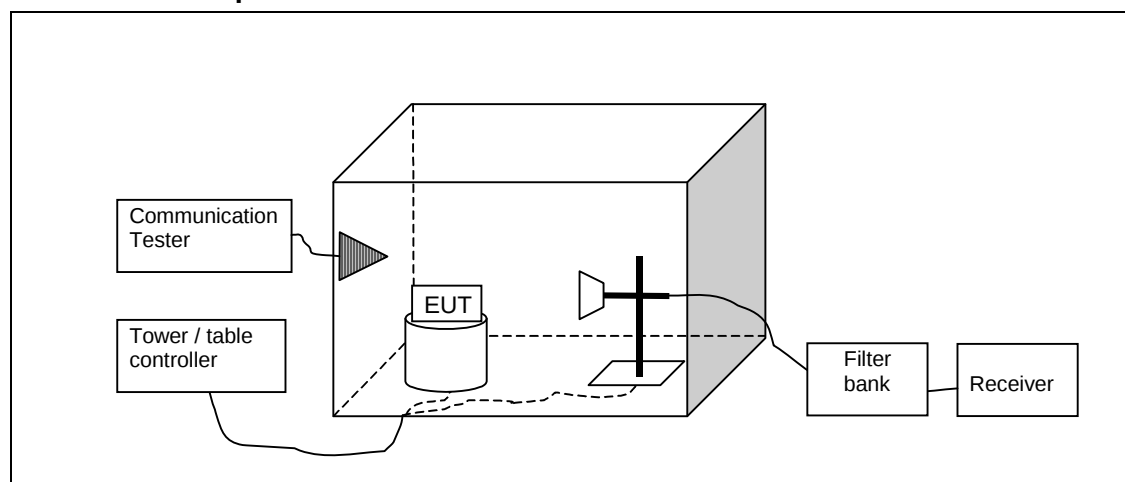
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## 2. Spurious radiated emissions

(FCC §22.917(a), §27.53(c)(2)(4),(f), §2.1053, §27.53(h), §2.1053, §22.917(a), §2.1053, §24.238(a), §2.1053, §2.1053, RSS-132 4.5, RSS-133 6.5, RSS-139 6.5, RSS-130 4.6)

|                                                        |                                                                                |
|--------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-1041, DUT 18673                                                             |
| <b>Accessories with DUT numbers</b>                    | BV-T5A, DUT 18674 ; CC-3086, DUT 18675 ; AC-20E, DUT 18676 ; WH-108, DUT 18677 |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal                                                                        |
| <b>Results</b>                                         | PASSED                                                                         |
| <b>Remarks</b>                                         | -                                                                              |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 17 / 45 / 101.4                                                                |
| <b>Date of measurements</b>                            | 04-Oct-2014                                                                    |
| <b>Measured by</b>                                     | Sami Lehtonen / Kalle Hannila                                                  |

### 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 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 measurement is made up to 10th harmonic of the EUT highest TX channel.

The substitution method is used.

The measurement results are obtained as described below:

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

Where  $P_{\text{SUBST TX}}$  is signal generator level, which produces the same receiver reading  $P_{\text{MEAS}}$  in dBm as EUT.  $G_{\text{SUBST TX ANT}}$  is substitution antenna gain and  $L_{\text{SUBST CABLE}}$  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]                                                                                      |
|----------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| GSM 850        | 30 - 8500                                                      | -13                                                                                              |
| GSM 1900       | 30 - 19100                                                     | -13                                                                                              |
| WCDMA4         | 30 - 17500                                                     | -13                                                                                              |
| CDMA 800       | 30 - 8500                                                      | -13                                                                                              |
| LTE2           | 30 - 19100                                                     | -13                                                                                              |
| LTE4           | 30 - 17500                                                     | -13                                                                                              |
| LTE13          | 30 – 8000<br>763-775 and 793-805<br>1559 – 1610<br>1559 – 1610 | -13 (RBW = 100 kHz, ERP)<br>-35 (RBW = 6.25 kHz, ERP)<br>-40 (RBW = 1 MHz)<br>-50 (RBW = 700 Hz) |

### 2.3. GSM 1900 E-GPRS (MSC9) test results

Channel 661 / 1880.0 MHz

Peak detector

| Frequency [MHz] | P [dBm] | P [μW]  | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|---------|-------------------------|-----------------------|--------------|---------|
| 3764.429        | -57.16  | 0.00192 | -63.46                  | 6.3                   | VERTICAL     | PASSED  |
| 5639.9          | -51.5   | 0.00708 | -61.9                   | 10.4                  | VERTICAL     | PASSED  |

### 2.4. GSM 850 E-GPRS (MSC9) test results

Channel 190 / 836.6 MHz

Peak detector

| Frequency [MHz] | P [dBm] | P [μW]  | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|---------|-------------------------|-----------------------|--------------|---------|
| 1673.1          | -51.19  | 0.0076  | -56.69                  | 5.5                   | HORIZONTAL   | PASSED  |
| 2510.822        | -52.35  | 0.00582 | -63.95                  | 11.6                  | VERTICAL     | PASSED  |

## 2.5. GSM 850 test results

Channel 190 / 836.6 MHz

Peak detector

| Frequency [MHz] | P [dBm] | P [μW]  | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|---------|-------------------------|-----------------------|--------------|---------|
| 1641.723        | -57.84  | 0.00164 | -63.74                  | 5.9                   | HORIZONTAL   | PASSED  |
| 1678.838        | -56.67  | 0.00215 | -63.27                  | 6.6                   | VERTICAL     | PASSED  |
| 1711.663        | -56.29  | 0.00235 | -62.69                  | 6.4                   | HORIZONTAL   | PASSED  |
| 2505.251        | -52.29  | 0.0059  | -63.79                  | 11.5                  | VERTICAL     | PASSED  |
| 2560.561        | -52.1   | 0.00617 | -64.5                   | 12.4                  | HORIZONTAL   | PASSED  |
| 3295.511        | -59.08  | 0.00124 | -62.58                  | 3.5                   | HORIZONTAL   | PASSED  |

## 2.6. GSM 1900 test results

Channel 661 / 1880.0 MHz

Peak detector

| Frequency [MHz] | P [dBm] | P [μW]  | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|---------|-------------------------|-----------------------|--------------|---------|
| 9103.046        | -44.92  | 0.03221 | -65.32                  | 20.4                  | HORIZONTAL   | PASSED  |
| 9590.942        | -44.25  | 0.03758 | -66.15                  | 21.9                  | VERTICAL     | PASSED  |
| 9668.417        | -43.56  | 0.04406 | -65.46                  | 21.9                  | VERTICAL     | PASSED  |
| 9802.405        | -43.09  | 0.04909 | -65.79                  | 22.7                  | HORIZONTAL   | PASSED  |
| 9855.271        | -44.1   | 0.0389  | -66.6                   | 22.5                  | HORIZONTAL   | PASSED  |
| 9933.667        | -43.21  | 0.04775 | -65.01                  | 21.8                  | VERTICAL     | PASSED  |

## 2.7. CDMA 800 test results

Channel 384 / 836.52 MHz

Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 817.913         | -38.45  | 0.14289      | -74.35                  | 35.9                  | VERTICAL     | PASSED  |
| 821.734         | -45.23  | 0.02999      | -80.83                  | 35.6                  | HORIZONTAL   | PASSED  |
| 822.453         | -42.59  | 0.05508      | -78.69                  | 36.1                  | VERTICAL     | PASSED  |
| 822.847         | -39.79  | 0.10495      | -75.89                  | 36.1                  | VERTICAL     | PASSED  |
| 823.664         | -43.73  | 0.04236      | -79.83                  | 36.1                  | VERTICAL     | PASSED  |
| 1670.415        | -56.51  | 0.00223      | -62.91                  | 6.4                   | VERTICAL     | PASSED  |
| 2499.86         | -51.84  | 0.00655      | -63.34                  | 11.5                  | VERTICAL     | PASSED  |
| 2501.324        | -52.19  | 0.00604      | -63.59                  | 11.4                  | VERTICAL     | PASSED  |
| 3345.98         | -52.87  | 0.00516      | -56.17                  | 3.3                   | VERTICAL     | PASSED  |

## 2.8. LTE2 test results

Channel 18900 / 1880.0 MHz

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

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 1842.38         | -63.59  | 0.00044      | -72.99                  | 9.4                   | HORIZONTAL   | PASSED  |
| 1892.992        | -60.12  | 0.00097      | -69.92                  | 9.8                   | HORIZONTAL   | PASSED  |
| 1894.018        | -60.45  | 0.0009       | -70.15                  | 9.7                   | HORIZONTAL   | PASSED  |
| 1902.149        | -61.3   | 0.00074      | -70.7                   | 9.4                   | HORIZONTAL   | PASSED  |
| 1902.956        | -61.51  | 0.00071      | -71.01                  | 9.5                   | HORIZONTAL   | PASSED  |
| 1914.985        | -63.1   | 0.00049      | -72.5                   | 9.4                   | HORIZONTAL   | PASSED  |
| 3760.421        | -54.12  | 0.00387      | -60.62                  | 6.5                   | HORIZONTAL   | PASSED  |
| 5648.958        | -61.87  | 0.00065      | -72.17                  | 10.3                  | HORIZONTAL   | PASSED  |
| 7520.862        | -55.77  | 0.00265      | -72.17                  | 16.4                  | HORIZONTAL   | PASSED  |

Channel 18900 / 1880.0 MHz

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

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 3760.421        | -54.84  | 0.00328      | -61.34                  | 6.5                   | HORIZONTAL   | PASSED  |
| 5644.709        | -62.24  | 0.0006       | -72.44                  | 10.2                  | HORIZONTAL   | PASSED  |
| 7520.661        | -55.51  | 0.00281      | -71.91                  | 16.4                  | HORIZONTAL   | PASSED  |

## 2.9. LTE4 test results

Channel 20175 / 1732.5 MHz

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

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 3465.341        | -60.54  | 0.00088      | -66.34                  | 5.8                   | HORIZONTAL   | PASSED  |
| 5198.161        | -60.73  | 0.00085      | -71.23                  | 10.5                  | VERTICAL     | PASSED  |
| 6930.862        | -56.36  | 0.00231      | -69.16                  | 12.8                  | HORIZONTAL   | PASSED  |
| 8663.522        | -56.47  | 0.00225      | -75.67                  | 19.2                  | HORIZONTAL   | PASSED  |
| 10385           | -53.4   | 0.00457      | -76.1                   | 22.7                  | VERTICAL     | PASSED  |

Channel 20175 / 1732.5 MHz

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

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 3465.341        | -60.95  | 0.0008       | -66.75                  | 5.8                   | HORIZONTAL   | PASSED  |
| 5198.121        | -61.21  | 0.00076      | -71.71                  | 10.5                  | VERTICAL     | PASSED  |
| 6930.741        | -56.75  | 0.00211      | -69.55                  | 12.8                  | HORIZONTAL   | PASSED  |
| 8669.614        | -56.8   | 0.00209      | -76.1                   | 19.3                  | HORIZONTAL   | PASSED  |
| 10385.04        | -53.82  | 0.00415      | -76.52                  | 22.7                  | VERTICAL     | PASSED  |

## 2.10. LTE13 test results

Channel 23230 / 782 MHz

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

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 752.705         | -49.45  | 0.01135      | -83.45                  | 34                    | VERTICAL     | PASSED  |
| 769.5           | -71.36  | 7E-05        | -106.96                 | 35.6                  | VERTICAL     | PASSED  |
| 800.048         | -72.48  | 6E-05        | -106.98                 | 34.5                  | VERTICAL     | PASSED  |
| 1564.341        | -65.46  | 0.00028      | -71.16                  | 5.7                   | HORIZONTAL   | PASSED  |
| 1600.02         | -67.6   | 0.00017      | -73.9                   | 6.3                   | HORIZONTAL   | PASSED  |
| 2346.14         | -71.53  | 7E-05        | -82.53                  | 11                    | HORIZONTAL   | PASSED  |
| 3128.621        | -76.19  | 2E-05        | -80.29                  | 4.1                   | HORIZONTAL   | PASSED  |
| 7971.323        | -67.26  | 0.00019      | -82.56                  | 15.3                  | HORIZONTAL   | PASSED  |

Channel 23230 / 782 MHz

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

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 752.625         | -49.46  | 0.01132      | -83.46                  | 34                    | VERTICAL     | PASSED  |
| 769.5           | -71.36  | 7E-05        | -106.96                 | 35.6                  | VERTICAL     | PASSED  |
| 800.001         | -72.49  | 6E-05        | -106.99                 | 34.5                  | VERTICAL     | PASSED  |
| 1564.501        | -65.94  | 0.00025      | -71.64                  | 5.7                   | HORIZONTAL   | PASSED  |
| 1600.02         | -67.6   | 0.00017      | -73.9                   | 6.3                   | HORIZONTAL   | PASSED  |
| 2346.301        | -71.53  | 7E-05        | -82.53                  | 11                    | HORIZONTAL   | PASSED  |
| 3128.661        | -75.55  | 3E-05        | -79.65                  | 4.1                   | HORIZONTAL   | PASSED  |
| 7975.01         | -66.85  | 0.00021      | -82.55                  | 15.7                  | VERTICAL     | PASSED  |

## 2.11. CDMA 1900 test results

Channel 600 / 1880 MHz

Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 1910.121        | -52.54  | 0.00557      | -62.44                  | 9.9                   | VERTICAL     | PASSED  |
| 1910.29         | -43.23  | 0.04753      | -52.73                  | 9.5                   | HORIZONTAL   | PASSED  |
| 3759.98         | -48.27  | 0.01489      | -54.77                  | 6.5                   | HORIZONTAL   | PASSED  |
| 5649.639        | -50.05  | 0.00989      | -60.65                  | 10.6                  | VERTICAL     | PASSED  |
| 9366.874        | -43.69  | 0.04276      | -65.29                  | 21.6                  | VERTICAL     | PASSED  |
| 9558.737        | -43.6   | 0.04365      | -65.2                   | 21.6                  | HORIZONTAL   | PASSED  |
| 9878.136        | -43.54  | 0.04426      | -65.34                  | 21.8                  | HORIZONTAL   | PASSED  |
| 9909.198        | -42.51  | 0.0561       | -64.71                  | 22.2                  | HORIZONTAL   | PASSED  |

## 2.12. WCDMA2 test results

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 3761.423        | -49.12  | 0.01225      | -55.62                  | 6.5                   | HORIZONTAL   | PASSED  |
| 5635.371        | -51.08  | 0.0078       | -61.38                  | 10.3                  | VERTICAL     | PASSED  |
| 7525.391        | -47.74  | 0.01683      | -64.24                  | 16.5                  | HORIZONTAL   | PASSED  |
| 9395.611        | -44.51  | 0.0354       | -65.51                  | 21                    | HORIZONTAL   | PASSED  |
| 9469.76         | -43.82  | 0.0415       | -65.42                  | 21.6                  | HORIZONTAL   | PASSED  |
| 9560.06         | -43.36  | 0.04613      | -64.96                  | 21.6                  | HORIZONTAL   | PASSED  |
| 9788.397        | -43.14  | 0.04853      | -65.44                  | 22.3                  | VERTICAL     | PASSED  |
| 9859.659        | -43.29  | 0.04688      | -65.69                  | 22.4                  | HORIZONTAL   | PASSED  |
| 9943.667        | -41.56  | 0.06982      | -63.76                  | 22.2                  | HORIZONTAL   | PASSED  |
| 9955.21         | -42.19  | 0.06039      | -64.39                  | 22.2                  | HORIZONTAL   | PASSED  |
| 11272.004       | -41.37  | 0.07295      | -64.87                  | 23.5                  | HORIZONTAL   | PASSED  |
| 13167.114       | -51.71  | 0.00675      | -68.41                  | 16.7                  | VERTICAL     | PASSED  |
| 15035.01        | -51.03  | 0.00789      | -71.73                  | 20.7                  | HORIZONTAL   | PASSED  |

|           |       |         |       |      |          |        |
|-----------|-------|---------|-------|------|----------|--------|
| 16928.798 | -49.4 | 0.01148 | -72.3 | 22.9 | VERTICAL | PASSED |
|-----------|-------|---------|-------|------|----------|--------|

## 2.13. WCDMA5 test results

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

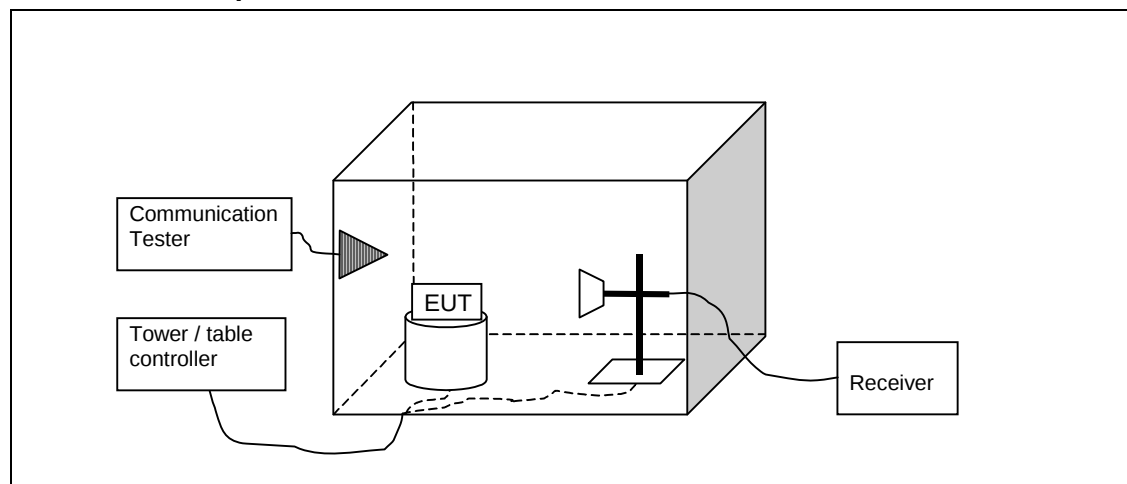
| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 821.338         | -44.41  | 0.03622      | -80.51                  | 36.1                  | VERTICAL     | PASSED  |
| 821.638         | -44.33  | 0.0369       | -80.43                  | 36.1                  | VERTICAL     | PASSED  |
| 848.462         | -44.37  | 0.03656      | -78.77                  | 34.4                  | HORIZONTAL   | PASSED  |
| 850.041         | -45.42  | 0.02871      | -79.92                  | 34.5                  | HORIZONTAL   | PASSED  |
| 993.069         | -40.44  | 0.09036      | -79.74                  | 39.3                  | VERTICAL     | PASSED  |
| 999.851         | -40.41  | 0.09099      | -79.71                  | 39.3                  | VERTICAL     | PASSED  |
| 1679.559        | -56.96  | 0.00201      | -63.56                  | 6.6                   | VERTICAL     | PASSED  |
| 2507.265        | -50.56  | 0.00879      | -62.46                  | 11.9                  | HORIZONTAL   | PASSED  |
| 3335.13         | -52.6   | 0.0055       | -55.9                   | 3.3                   | HORIZONTAL   | PASSED  |
| 4177.465        | -58.41  | 0.00144      | -63.81                  | 5.4                   | HORIZONTAL   | PASSED  |
| 5018.717        | -54.24  | 0.00377      | -62.74                  | 8.5                   | VERTICAL     | PASSED  |
| 5837.164        | -53.63  | 0.00434      | -61.93                  | 8.3                   | HORIZONTAL   | PASSED  |
| 6680.782        | -49.55  | 0.01109      | -59.95                  | 10.4                  | VERTICAL     | PASSED  |
| 7513.176        | -50.15  | 0.00966      | -63.95                  | 13.8                  | VERTICAL     | PASSED  |
| 8342.926        | -49.22  | 0.01197      | -64.82                  | 15.6                  | HORIZONTAL   | PASSED  |

### 3. Radiated RF output power

(FCC §22.913(a), §27.50(b)(10), §27.50(d)(4), §24.232(b), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4, RSS-130 4.4)

|                                                 |                               |
|-------------------------------------------------|-------------------------------|
| EUT with DUT number                             | RM-1041, DUT 18673            |
| Accessories with DUT numbers                    | BV-T5A, DUT 18674             |
| Operation Voltage [V] / [Hz]                    | Nominal                       |
| Results                                         | PASSED                        |
| Remarks                                         | -                             |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 17 / 45 / 101.4               |
| Date of measurements                            | 05-Oct-2014 – 13-Oct-2014     |
| Measured by                                     | Sami Lehtonen / Kalle Hannila |

#### 3.1.1 Test setup



#### 3.2. 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:

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

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

Limits for radiated RF output power measurements

| Frequency range [MHz] | Limit [W] | Limit [dBm] |
|-----------------------|-----------|-------------|
| 824 - 849             | 7 ERP     | 38.5        |
| 1850 - 1910           | 2 EIRP    | 33          |
| 777 - 787             | 3 ERP     | 34.8        |

### 3.3. GSM 850 test results

RMS detector

| Channel / f <sub>c</sub><br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST</sub> TX<br>[dBm] | P <sub>SUBST</sub> RX<br>[dBm] | G <sub>SUBST</sub> TX ANT<br>[dBd] | L <sub>SUBST</sub> CABLE<br>[dB] | Polarisation | Result |
|-----------------------------------|--------------|------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 128 / 824.2                       | 31.3         | 1.349      | -3.79                      | -10                            | -51.49                         | -2.7                               | 3.7                              | VERTICAL     | PASSED |
| 190 / 836.6                       | 30.88        | 1.225      | -3.3                       | -10                            | -50.68                         | -2.8                               | 3.7                              | VERTICAL     | PASSED |
| 251 / 848.8                       | 30.02        | 1.005      | -3.21                      | -10                            | -50.33                         | -3.4                               | 3.7                              | HORIZONTAL   | PASSED |

### 3.4. GSM 850 E-GPRS (MSC9) test results

RMS detector

| Channel / f <sub>c</sub><br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST</sub> TX<br>[dBm] | P <sub>SUBST</sub> RX<br>[dBm] | G <sub>SUBST</sub> TX ANT<br>[dBd] | L <sub>SUBST</sub> CABLE<br>[dB] | Polarisation | Result |
|-----------------------------------|--------------|------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 128 / 824.2                       | 27.91        | 0.618      | -7.18                      | -10                            | -51.49                         | -2.7                               | 3.7                              | VERTICAL     | PASSED |
| 190 / 836.6                       | 27.62        | 0.578      | -6.56                      | -10                            | -50.68                         | -2.8                               | 3.7                              | VERTICAL     | PASSED |
| 251 / 848.8                       | 27.9         | 0.617      | -5.33                      | -10                            | -50.33                         | -3.4                               | 3.7                              | VERTICAL     | PASSED |

### 3.5. GSM 1900 test results

RMS detector

| Channel / f <sub>c</sub><br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST</sub> TX<br>[dBm] | P <sub>SUBST</sub> RX<br>[dBm] | G <sub>SUBST</sub> TX ANT<br>[dBi] | L <sub>SUBST</sub> CABLE<br>[dB] | Polarisation | Result |
|-----------------------------------|---------------|-------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 512 / 1850.2                      | 29.26         | 0.843       | -13.59                     | -10                            | -50.35                         | 8.1                                | 5.6                              | VERTICAL     | PASSED |
| 661 / 1880                        | 28.62         | 0.728       | -14.12                     | -10                            | -50.34                         | 8                                  | 5.6                              | VERTICAL     | PASSED |
| 810 / 1909.8                      | 29.51         | 0.893       | -13.77                     | -10                            | -50.98                         | 8                                  | 5.7                              | VERTICAL     | PASSED |

### 3.6. GSM 1900 E-GPRS (MSC9) test results

RMS detector

| Channel / f <sub>c</sub><br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST</sub> TX<br>[dBm] | P <sub>SUBST</sub> RX<br>[dBm] | G <sub>SUBST</sub> TX ANT<br>[dBi] | L <sub>SUBST</sub> CABLE<br>[dB] | Polarisation | Result |
|-----------------------------------|---------------|-------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 512 / 1850.2                      | 24.75         | 0.299       | -18.1                      | -10                            | -50.35                         | 8.1                                | 5.6                              | VERTICAL     | PASSED |
| 661 / 1880                        | 24.48         | 0.281       | -18.26                     | -10                            | -50.34                         | 8                                  | 5.6                              | VERTICAL     | PASSED |
| 810 / 1909.8                      | 25.73         | 0.374       | -17.55                     | -10                            | -50.98                         | 8                                  | 5.7                              | VERTICAL     | PASSED |

### 3.7. CDMA 800 test results

RMS detector

| Channel / $f_c$<br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBd] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|--------------|------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 1013 / 824.7             | 22.2         | 0.166      | -12.67              | -10                      | -51.27                   | -2.7                          | 3.7                        | HORIZONTAL   | PASSED |
| 384 / 836.52             | 21           | 0.126      | -13.18              | -10                      | -50.68                   | -2.8                          | 3.7                        | HORIZONTAL   | PASSED |
| 777 / 848.31             | 21.43        | 0.139      | -12.72              | -10                      | -51.25                   | -3.4                          | 3.7                        | HORIZONTAL   | PASSED |

### 3.8. WCDMA2 test results

RMS detector

| Channel / $f_c$<br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBi] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|---------------|-------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 9262 / 1852.4            | 22.32         | 0.171       | -19.93              | -10                      | -49.75                   | 8.1                           | 5.6                        | HORIZONTAL   | PASSED |
| 9400 / 1880              | 22.02         | 0.159       | -20.32              | -10                      | -49.94                   | 8                             | 5.6                        | HORIZONTAL   | PASSED |
| 9538 / 1907.6            | 21.15         | 0.130       | -21.5               | -10                      | -50.35                   | 8                             | 5.7                        | HORIZONTAL   | PASSED |

### 3.9. WCDMA5 test results

RMS detector

| Channel / $f_c$<br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBd] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|--------------|------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 4132 / 826.4             | 22.28        | 0.169      | -12.8               | -10                      | -51.48                   | -2.7                          | 3.7                        | VERTICAL     | PASSED |
| 4183 / 836.6             | 21.88        | 0.154      | -12.43              | -10                      | -50.81                   | -2.8                          | 3.7                        | VERTICAL     | PASSED |
| 4233 / 846.6             | 20.81        | 0.121      | -12.29              | -10                      | -50.2                    | -3.3                          | 3.8                        | VERTICAL     | PASSED |

### 3.10. LTE2 test results

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

| Channel / $f_c$<br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBi] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|---------------|-------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 18625 / 1852.5           | 25            | 0.316228    | -19.45              | -10                      | -49.83                   | 10.22                         | 5.6                        | HORIZONTAL   | PASSED |

|                |       |          |        |     |       |       |     |            |        |
|----------------|-------|----------|--------|-----|-------|-------|-----|------------|--------|
| 18900 / 1880   | 24.17 | 0.261216 | -20.41 | -10 | -50   | 10.18 | 5.6 | HORIZONTAL | PASSED |
| 19175 / 1907.5 | 23.08 | 0.203236 | -21.7  | -10 | -50.3 | 10.18 | 5.7 | HORIZONTAL | PASSED |

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

| Channel / f <sub>c</sub><br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST TX</sub><br>[dBm] | P <sub>SUBST RX</sub><br>[dBm] | G <sub>SUBST TX ANT</sub><br>[dBi] | L <sub>SUBST CABLE</sub><br>[dB] | Polarisation | Result |
|-----------------------------------|---------------|-------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 18625 / 1852.5                    | 25.05         | 0.31989     | -19.4                      | -10                            | -49.83                         | 10.22                              | 5.6                              | HORIZONTAL   | PASSED |
| 18900 / 1880                      | 24.15         | 0.260016    | -20.43                     | -10                            | -50                            | 10.18                              | 5.6                              | HORIZONTAL   | PASSED |
| 19175 / 1907.5                    | 23.15         | 0.206538    | -21.63                     | -10                            | -50.3                          | 10.18                              | 5.7                              | HORIZONTAL   | PASSED |

### 3.11. LTE4 test results

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

| Channel / f <sub>c</sub><br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST TX</sub><br>[dBm] | P <sub>SUBST RX</sub><br>[dBm] | G <sub>SUBST TX ANT</sub><br>[dBi] | L <sub>SUBST CABLE</sub><br>[dB] | Polarisation | Result |
|-----------------------------------|---------------|-------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 19975 / 1712.5                    | 25.38         | 0.345144    | -18.52                     | -10                            | -49.25                         | 9.95                               | 5.3                              | HORIZONTAL   | PASSED |
| 20175 / 1732.5                    | 25.58         | 0.36141     | -18.17                     | -10                            | -49.2                          | 9.95                               | 5.4                              | HORIZONTAL   | PASSED |
| 20375 / 1752.5                    | 25.08         | 0.322107    | -18.97                     | -10                            | -49.5                          | 9.95                               | 5.4                              | HORIZONTAL   | PASSED |

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

| Channel / f <sub>c</sub><br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST TX</sub><br>[dBm] | P <sub>SUBST RX</sub><br>[dBm] | G <sub>SUBST TX ANT</sub><br>[dBi] | L <sub>SUBST CABLE</sub><br>[dB] | Polarisation | Result |
|-----------------------------------|---------------|-------------|----------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------------------|--------------|--------|
| 19975 / 1712.5                    | 25.48         | 0.353183    | -18.42                     | -10                            | -49.25                         | 9.95                               | 5.3                              | HORIZONTAL   | PASSED |
| 20175 / 1732.5                    | 25.57         | 0.360579    | -18.18                     | -10                            | -49.2                          | 9.95                               | 5.4                              | HORIZONTAL   | PASSED |
| 20375 / 1752.5                    | 25.18         | 0.32961     | -18.87                     | -10                            | -49.5                          | 9.95                               | 5.4                              | HORIZONTAL   | PASSED |

### 3.12. LTE13 test results

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

| Channel / $f_c$<br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBd] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|--------------|------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 23205 / 779.5            | 19.99        | 0.09977    | -15.06              | -10                      | -50.85                   | -2.2                          | 3.6                        | VERTICAL     | PASSED |
| 23230 / 782              | 20.35        | 0.108393   | -14.62              | -10                      | -50.77                   | -2.2                          | 3.6                        | VERTICAL     | PASSED |
| 23255 / 784.5            | 20.3         | 0.107152   | -14.8               | -10                      | -51                      | -2.3                          | 3.6                        | HORIZONTAL   | PASSED |

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

| Channel / $f_c$<br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBd] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|--------------|------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 23205 / 779.5            | 20.33        | 0.107895   | -14.72              | -10                      | -50.85                   | -2.2                          | 3.6                        | VERTICAL     | PASSED |
| 23230 / 782              | 20.46        | 0.111173   | -14.51              | -10                      | -50.77                   | -2.2                          | 3.6                        | VERTICAL     | PASSED |
| 23255 / 784.5            | 21.01        | 0.126183   | -14.09              | -10                      | -51                      | -2.3                          | 3.6                        | VERTICAL     | PASSED |

### 3.13. CDMA 1900 test results

RMS detector

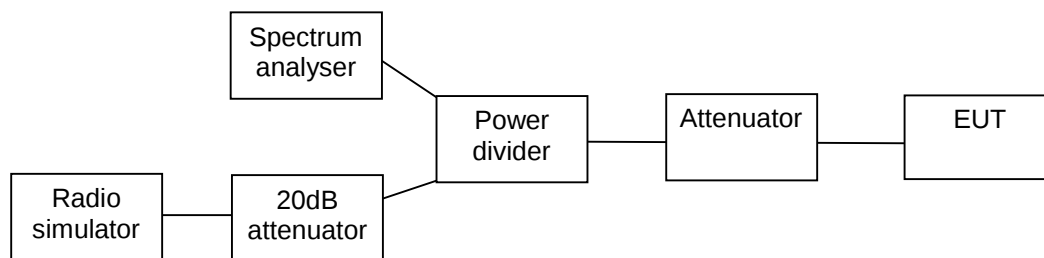
| Channel / $f_c$<br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBi] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|---------------|-------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 25 / 1851.25             | 22.6          | 0.182       | -19.71              | -10                      | -49.81                   | 8.1                           | 5.6                        | HORIZONTAL   | PASSED |
| 600 / 1880               | 20.92         | 0.124       | -20.93              | -10                      | -49.45                   | 8                             | 5.6                        | HORIZONTAL   | PASSED |
| 1175 / 1908.75           | 20.76         | 0.119       | -21.89              | -10                      | -50.35                   | 8                             | 5.7                        | HORIZONTAL   | PASSED |

#### 4. 99 % occupied bandwidth

(FCC §2.1049(h), RSS-132 4.6.1, RSS-133 4.6.1, RSS-130 4.6.1, RSS-139 4.6.1)

|                                                 |                                        |
|-------------------------------------------------|----------------------------------------|
| EUT with DUT number                             | RM-1041, DUT 18639                     |
| Accessories with DUT numbers                    | SD-233R, DUT 18640 ; WH-108, DUT 18641 |
| Operation Voltage [V] / [Hz]                    | Nominal                                |
| Results                                         | PASSED                                 |
| Remarks                                         | -                                      |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 45 / 103.4                        |
| Date of measurements                            | 01-Oct-2014                            |
| Measured by                                     | Jari Keto                              |

##### 4.1. Test Setup



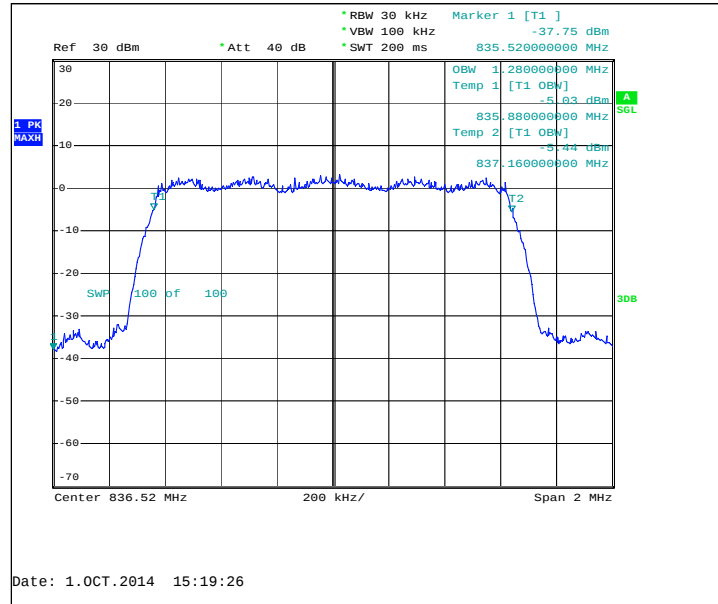
##### 4.2. Test method and limit

The measurement is made according to applicable FCC rule parts and IC standards.

### 4.3. CDMA 800 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|------------------------|------------------------------|
| CDMA                   | 1280                         |

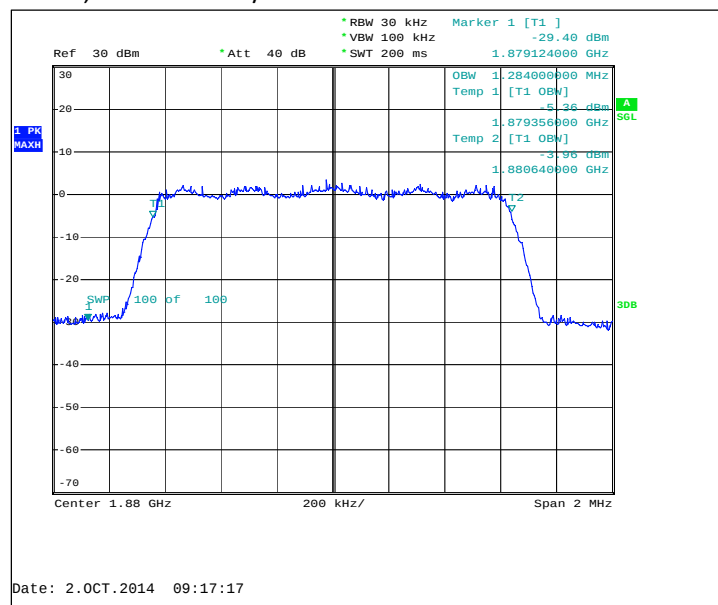
CDMA, Channel 384 / 836.52 MHz



### 4.4. CDMA 1900 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|------------------------|------------------------------|
| CDMA                   | 1284                         |

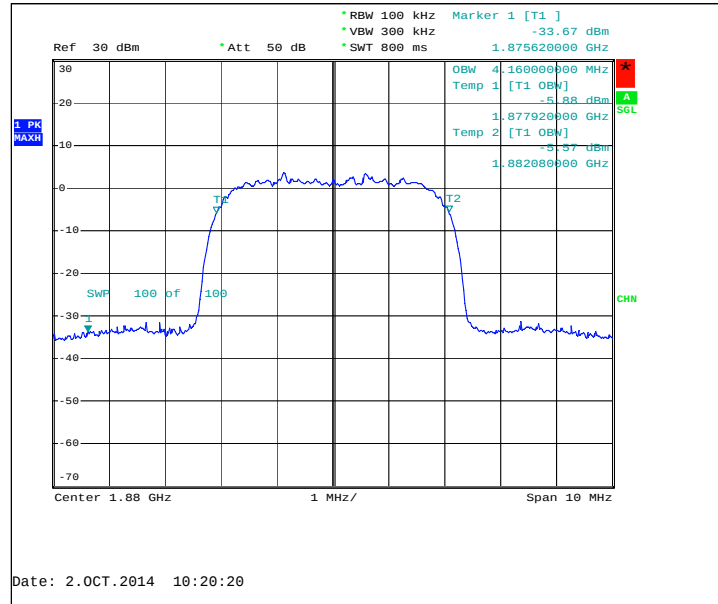
CDMA, Channel 600 / 1880.0 MHz



#### 4.5. WCDMA2 Test results

| Operation mode (TX on) | 99% Occupied bandwidth [kHz] |
|------------------------|------------------------------|
| FDD                    | 4160                         |

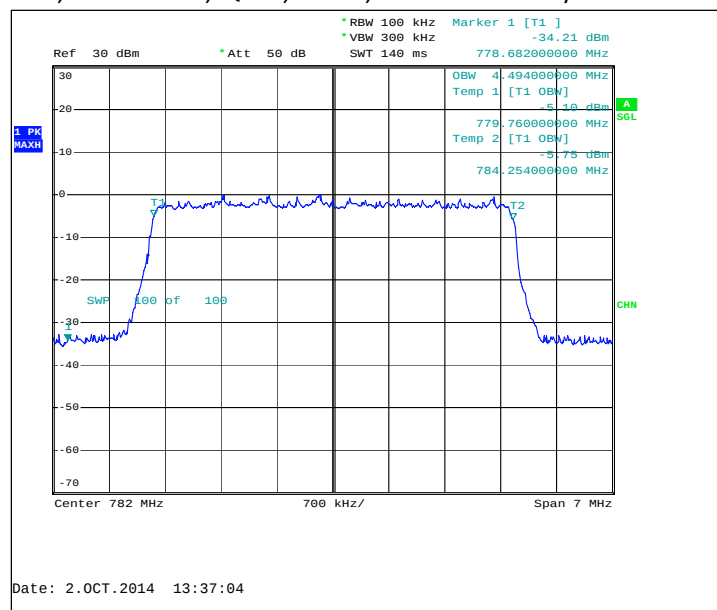
FDD, Channel 9400 / 1880.0 MHz



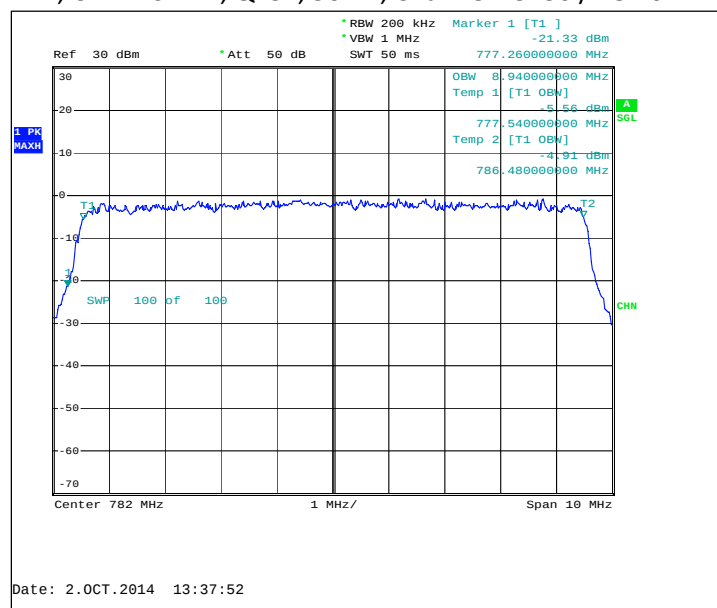
#### 4.6. LTE13 Test results

| Operation mode (TX on)       | 99% Occupied bandwidth [kHz] |
|------------------------------|------------------------------|
| FDD, CBW 5MHz, QPSK, 25 RB   | 4494                         |
| FDD, CBW 10MHz, QPSK, 50 RB  | 8940                         |
| FDD, CBW 5MHz, 16QAM, 25 RB  | 4494                         |
| FDD, CBW 10MHz, 16QAM, 50 RB | 8940                         |

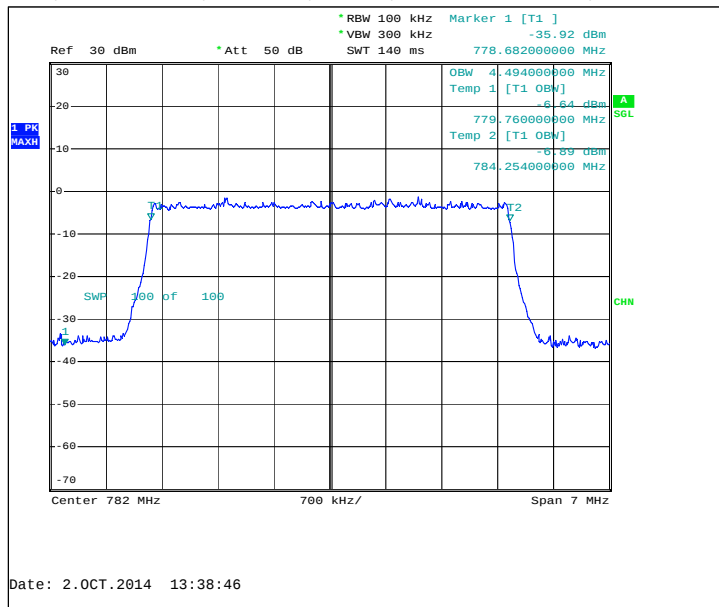
##### FDD, CBW 5MHz, QPSK, 25 RB, Channel 23230 / 782.0 MHz



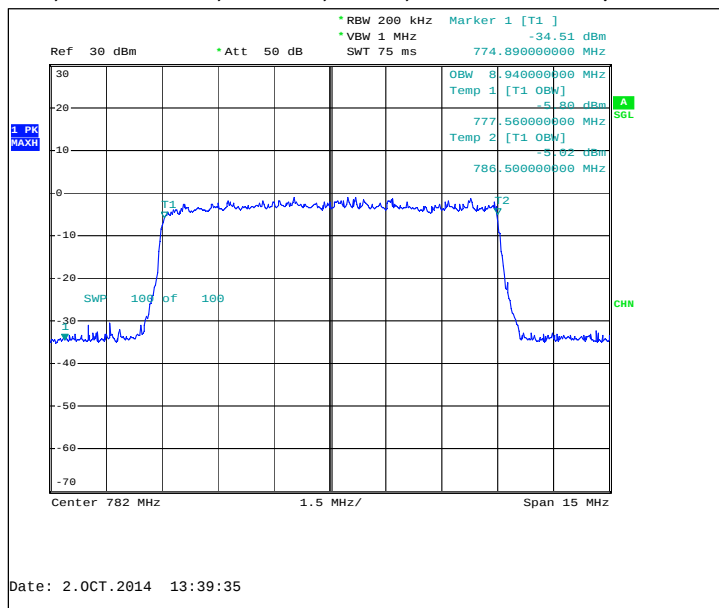
##### FDD, CBW 10MHz, QPSK, 50 RB, Channel 23230 / 782.0 MHz



FDD, CBW 5MHz, 16QAM, 25 RB, Channel 23230 / 782.0 MHz



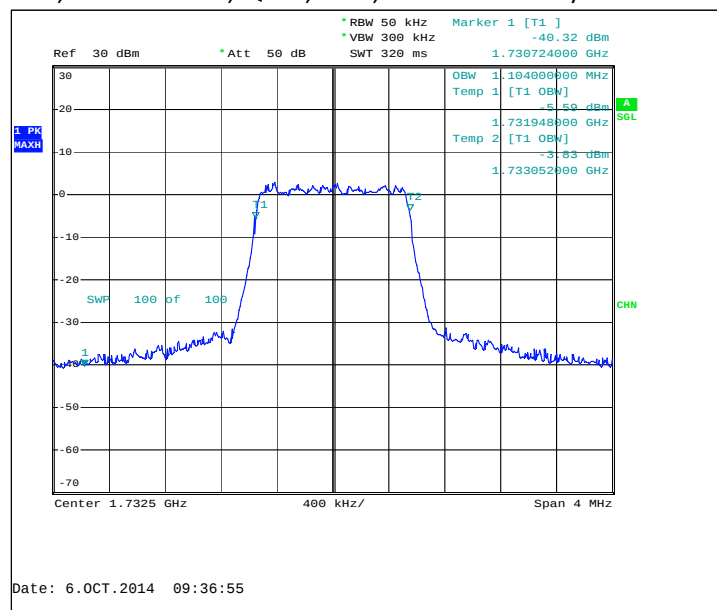
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 23230 / 782.0 MHz



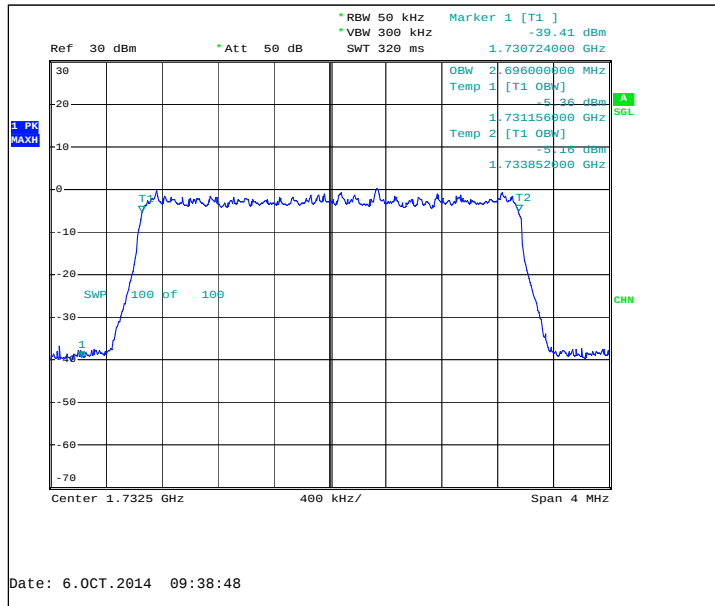
#### 4.7. LTE4 Test results

| Operation mode (TX on)        | 99% Occupied bandwidth [kHz] |
|-------------------------------|------------------------------|
| FDD, CBW 1.4MHz, QPSK, 6 RB   | 1104                         |
| FDD, CBW 3MHz, QPSK, 15 RB    | 2696                         |
| FDD, CBW 5MHz, QPSK, 25 RB    | 4508                         |
| FDD, CBW 10MHz, QPSK, 50 RB   | 8970                         |
| FDD, CBW 15MHz, QPSK, 75 RB   | 13400                        |
| FDD, CBW 20MHz, QPSK, 100 RB  | 17850                        |
| FDD, CBW 1.4MHz, 16QAM, 6 RB  | 1104                         |
| FDD, CBW 3MHz, 16QAM, 15 RB   | 2688                         |
| FDD, CBW 5MHz, 16QAM, 25 RB   | 4480                         |
| FDD, CBW 10MHz, 16QAM, 50 RB  | 8970                         |
| FDD, CBW 15MHz, 16QAM, 75 RB  | 13400                        |
| FDD, CBW 20MHz, 16QAM, 100 RB | 17900                        |

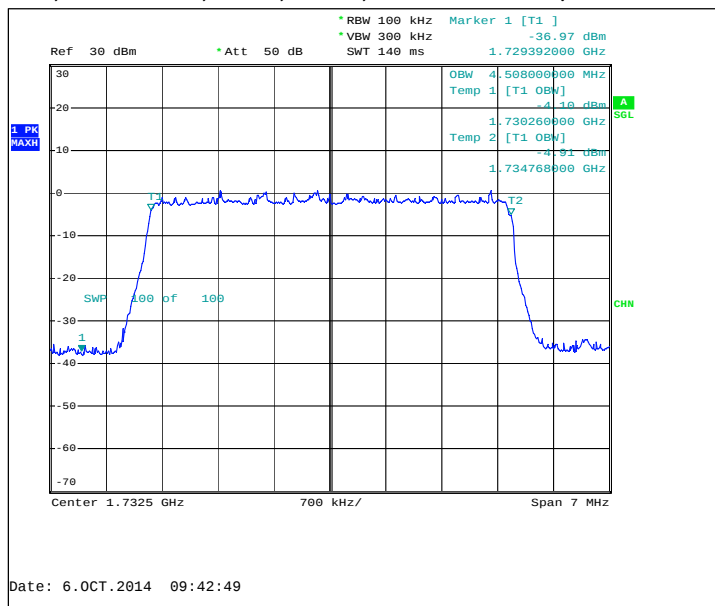
#### FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20175 / 1732.5 MHz



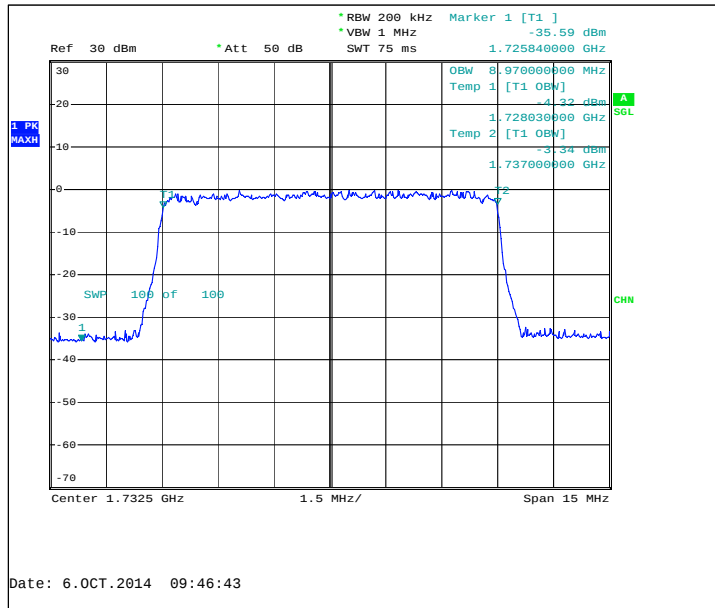
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20175 / 1732.5 MHz



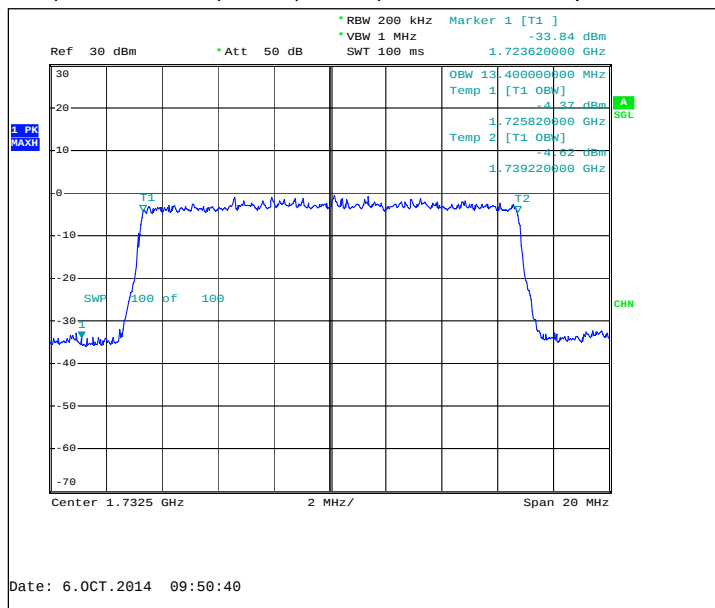
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20175 / 1732.5 MHz



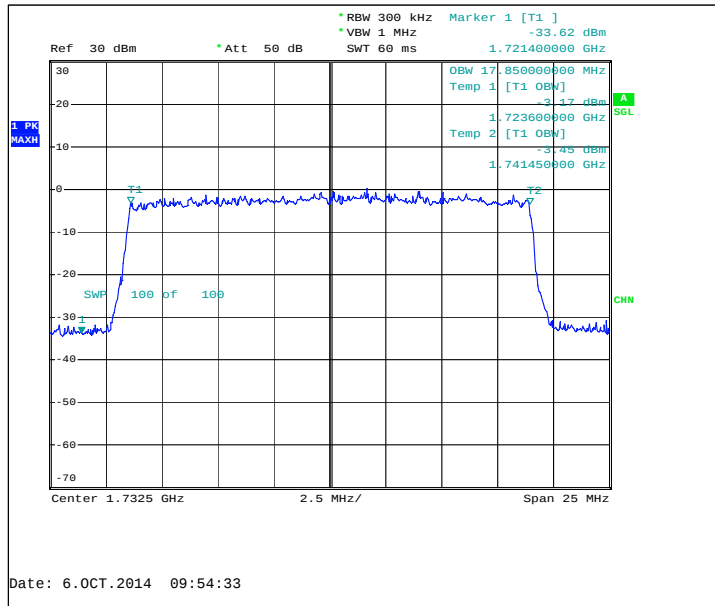
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20175 / 1732.5 MHz



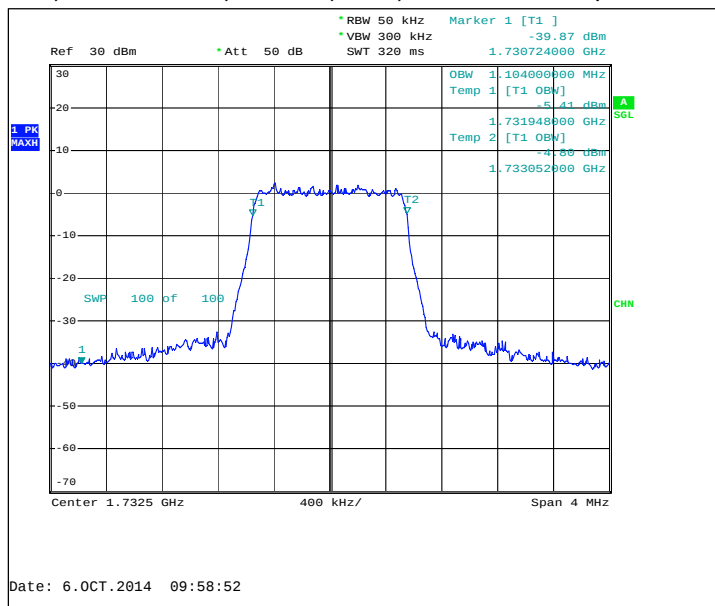
FDD, CBW 15MHz, QPSK, 75 RB, Channel 20175 / 1732.5 MHz



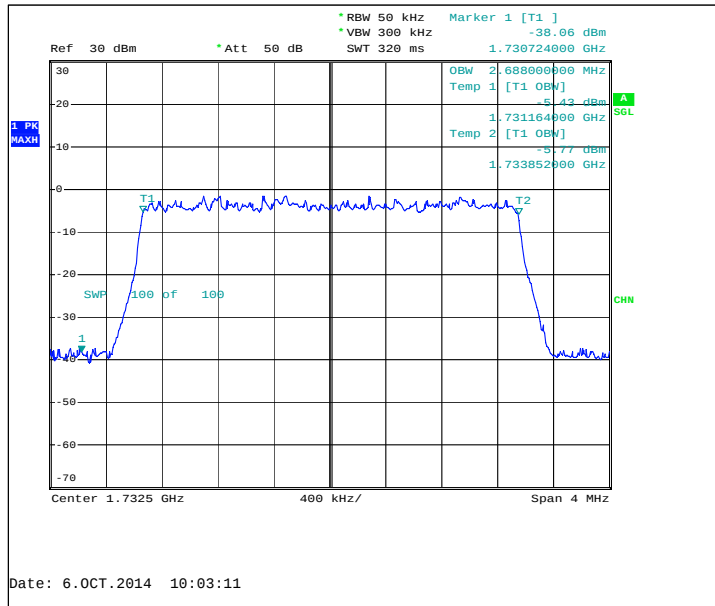
FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz



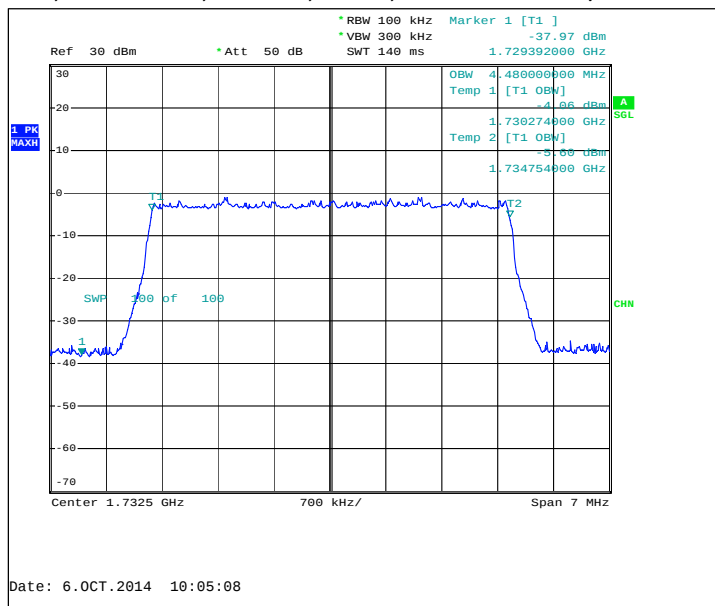
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20175 / 1732.5 MHz



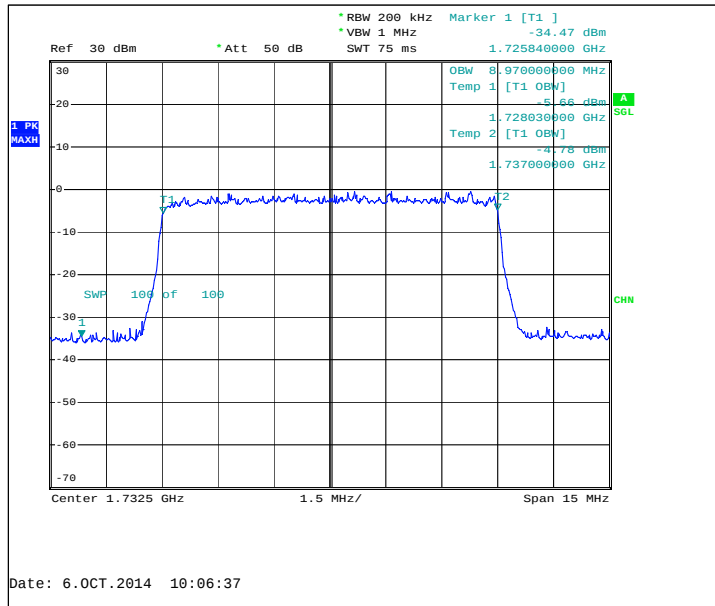
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20175 / 1732.5 MHz



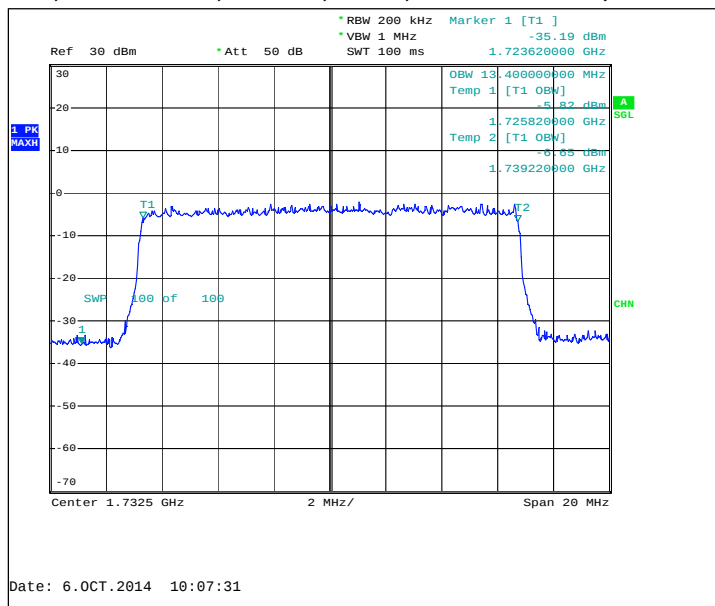
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20175 / 1732.5 MHz



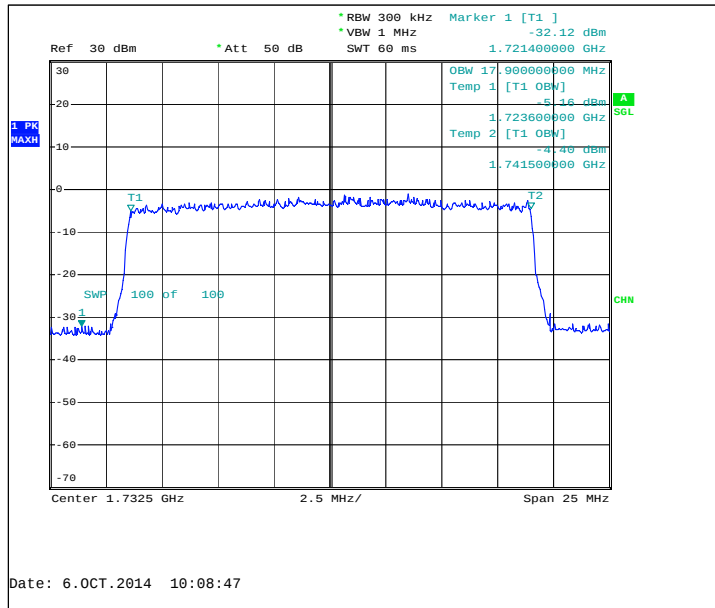
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20175 / 1732.5 MHz



FDD, CBW 15MHz, 16QAM, 75 RB, Channel 20175 / 1732.5 MHz



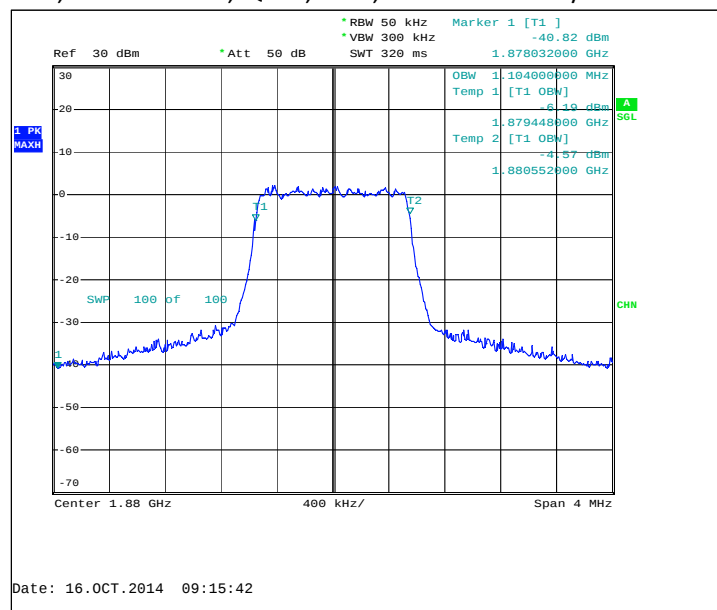
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 20175 / 1732.5 MHz



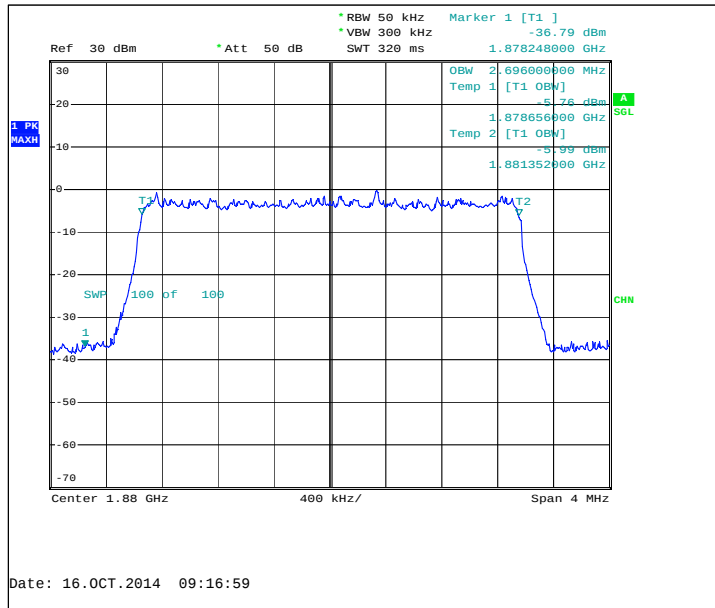
#### 4.8. LTE2 Test results

| Operation mode (TX on)        | 99% Occupied bandwidth [kHz] |
|-------------------------------|------------------------------|
| FDD, CBW 1.4MHz, QPSK, 6 RB   | 1104                         |
| FDD, CBW 3MHz, QPSK, 15 RB    | 2696                         |
| FDD, CBW 5MHz, QPSK, 25 RB    | 4494                         |
| FDD, CBW 10MHz, QPSK, 50 RB   | 8970                         |
| FDD, CBW 15MHz, QPSK, 75 RB   | 13440                        |
| FDD, CBW 20MHz, QPSK, 100 RB  | 17900                        |
| FDD, CBW 1.4MHz, 16QAM, 6 RB  | 1112                         |
| FDD, CBW 3MHz, 16QAM, 15 RB   | 2688                         |
| FDD, CBW 5MHz, 16QAM, 25 RB   | 4480                         |
| FDD, CBW 10MHz, 16QAM, 50 RB  | 8970                         |
| FDD, CBW 15MHz, 16QAM, 75 RB  | 13400                        |
| FDD, CBW 20MHz, 16QAM, 100 RB | 17900                        |

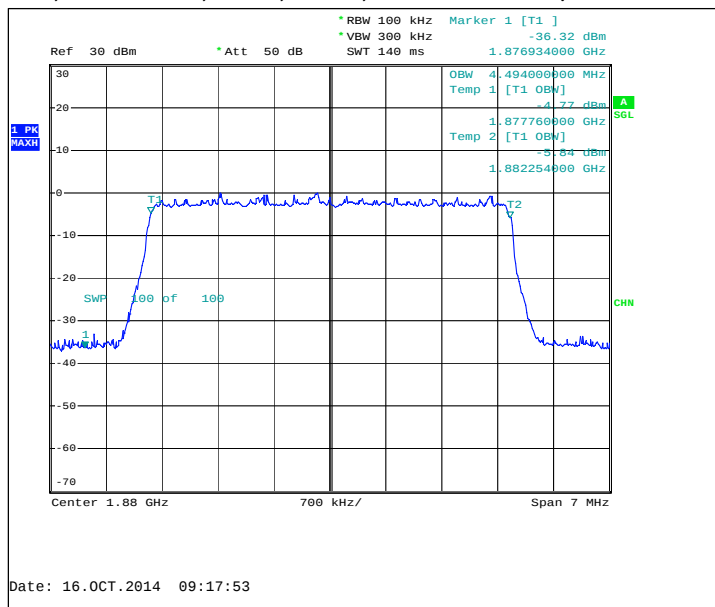
#### FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 18900 / 1880.0 MHz



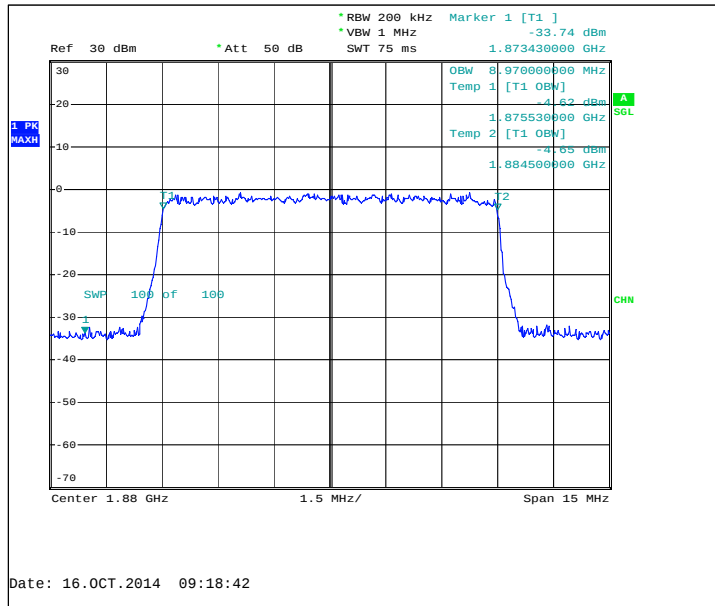
FDD, CBW 3MHz, QPSK, 15 RB, Channel 18900 / 1880.0 MHz



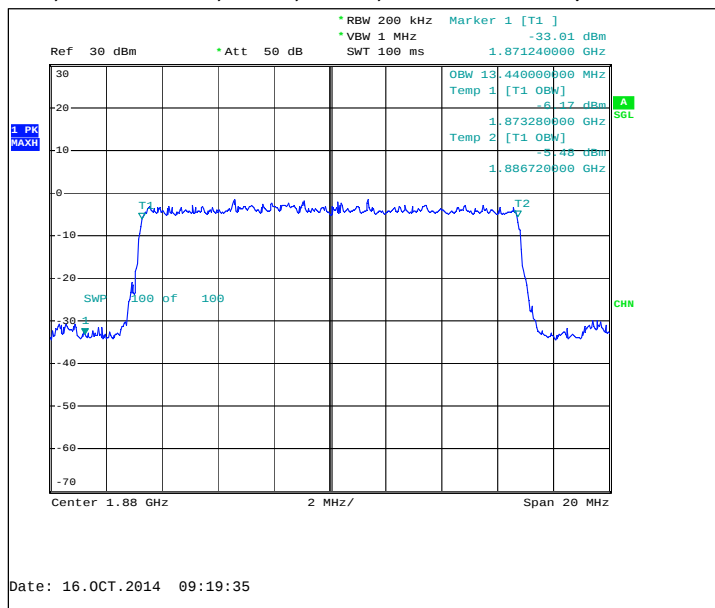
FDD, CBW 5MHz, QPSK, 25 RB, Channel 18900 / 1880.0 MHz



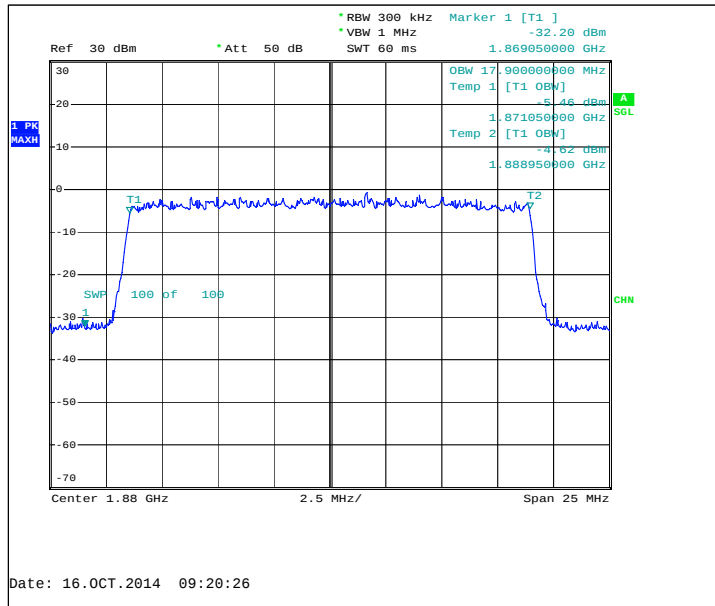
FDD, CBW 10MHz, QPSK, 50 RB, Channel 18900 / 1880.0 MHz



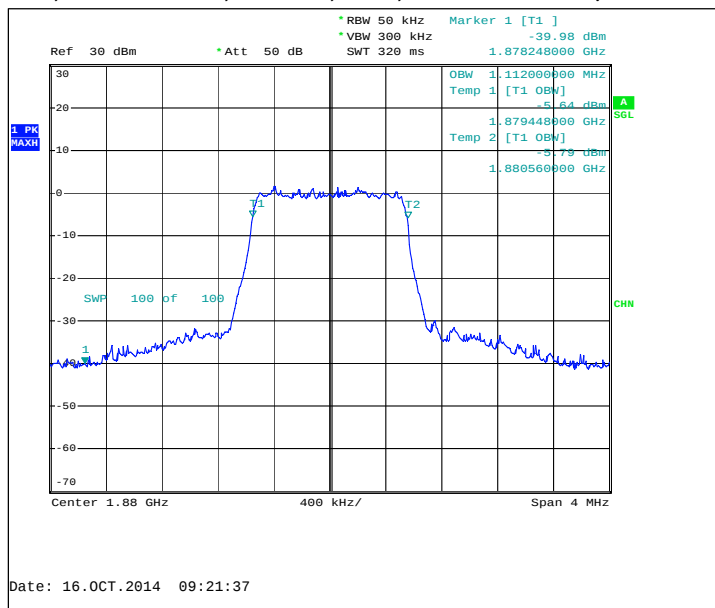
FDD, CBW 15MHz, QPSK, 75 RB, Channel 18900 / 1880.0 MHz



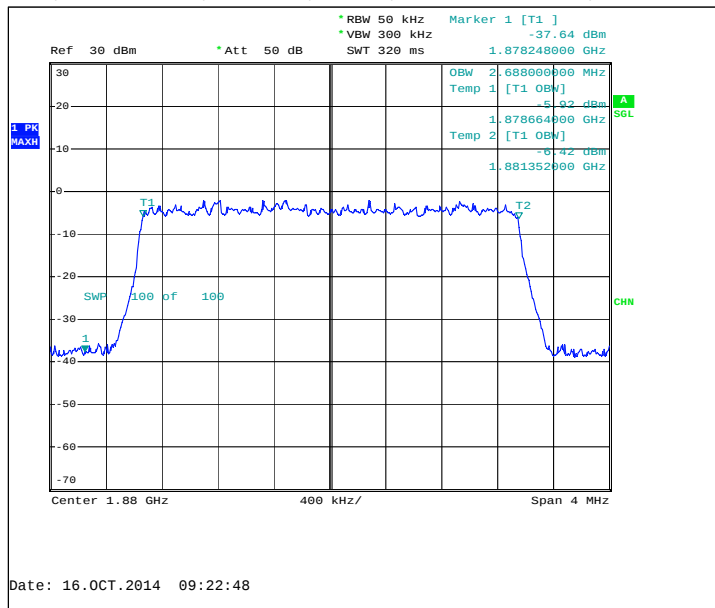
FDD, CBW 20MHz, QPSK, 100 RB, Channel 18900 / 1880.0 MHz



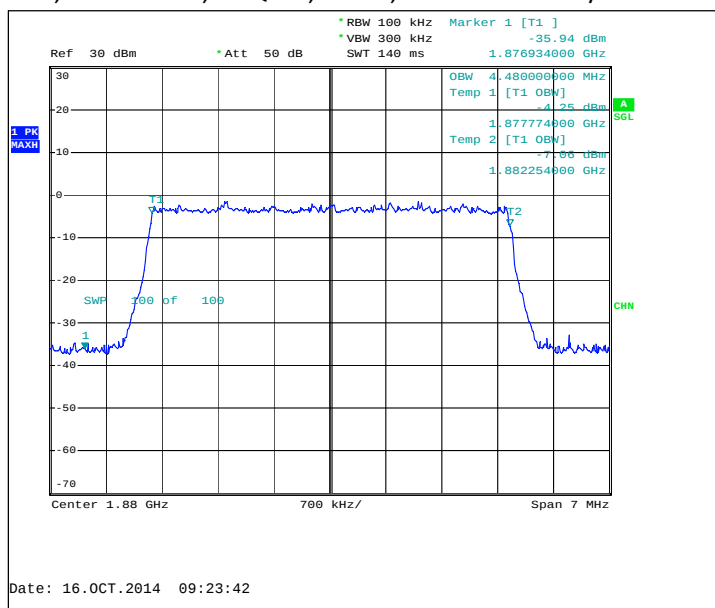
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 18900 / 1880.0 MHz



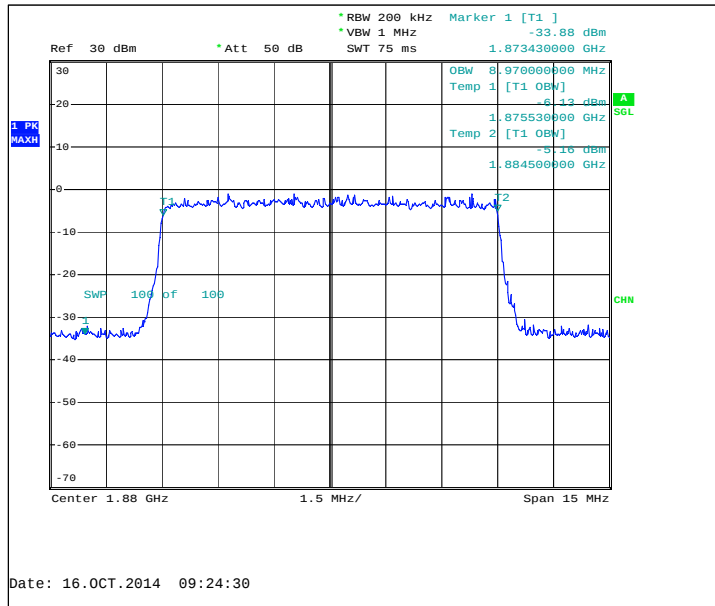
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 18900 / 1880.0 MHz



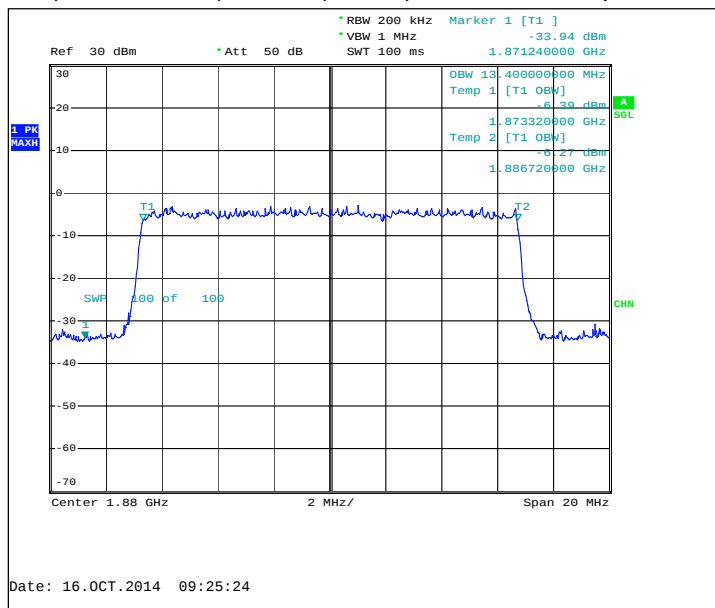
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 18900 / 1880.0 MHz



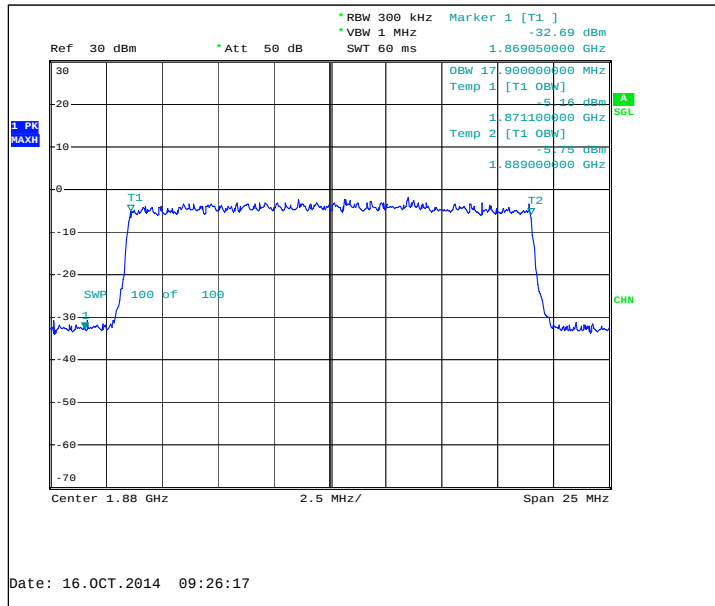
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 18900 / 1880.0 MHz



FDD, CBW 15MHz, 16QAM, 75 RB, Channel 18900 / 1880.0 MHz



FDD, CBW 20MHz, 16QAM, 100 RB, Channel 18900 / 1880.0 MHz

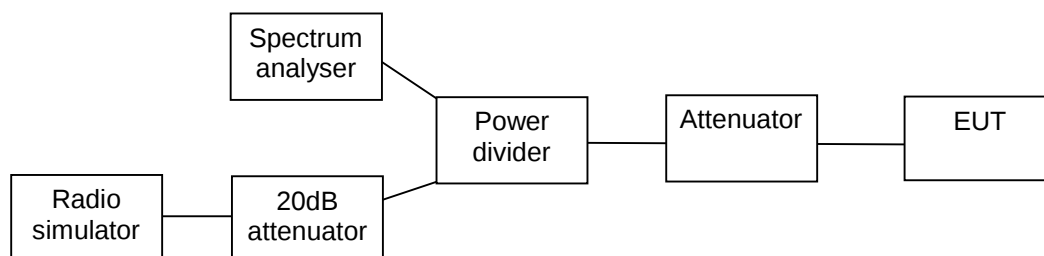


## 5. Band edge compliance

(FCC §22.917(a), §27.53(h), §27.53(c)(2)(4), §24.238(a), RSS-132 4.5, RSS-133 6.5, RSS-130 4.6, RSS-139 6.5)

|                                                        |                                        |
|--------------------------------------------------------|----------------------------------------|
| <b>EUT with DUT number</b>                             | RM-1041, DUT 18639                     |
| <b>Accessories with DUT numbers</b>                    | SD-233R, DUT 18640 ; WH-108, DUT 18641 |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal                                |
| <b>Results</b>                                         | PASSED                                 |
| <b>Remarks</b>                                         | -                                      |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 22 / 45 / 103.4                        |
| <b>Date of measurements</b>                            | 01-Oct-2014                            |
| <b>Measured by</b>                                     | Jari Keto                              |

### 5.1. Test Setup



### 5.2. Test method and limit

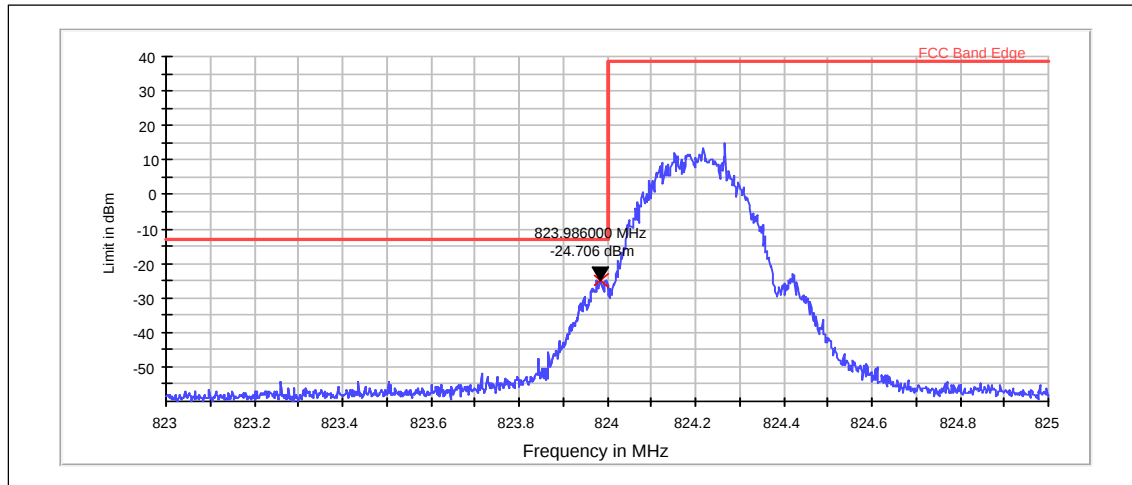
The measurement is made according to applicable FCC rule parts and IC standards.

Limits for band edge compliance measurements

| Operation band | Frequency range [MHz]                                                             | Limit [dBm]                                                                                                 |
|----------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| GSM 850        | Below 824 and above 849                                                           | -13                                                                                                         |
| WCDMA5         | Below 824 and above 849                                                           | -13                                                                                                         |
| CDMA 800       | Below 824 and above 849                                                           | -13                                                                                                         |
| CDMA 1900      | Below 1850 and above 1910                                                         | -13                                                                                                         |
| GSM 1900       | Below 1850 and above 1910                                                         | -13                                                                                                         |
| WCDMA2         | Below 1850 and above 1910                                                         | -13                                                                                                         |
| LTE13          | 776.9 - 777 and 787 - 787.1<br>Below 776.9 and above 787.1<br>763-775 and 793-805 | -13 (RBW = 30 kHz, VBW = 100 kHz)<br>-13 (RBW = 100 kHz, VBW = 300 kHz)<br>-35 (RBW = 10 kHz, VBW = 30 kHz) |
| LTE2           | Below 1850 and above 1910                                                         | -13                                                                                                         |
| LTE4           | Below 1710 and above 1755                                                         | -13                                                                                                         |

### 5.3. GSM 850 Test results

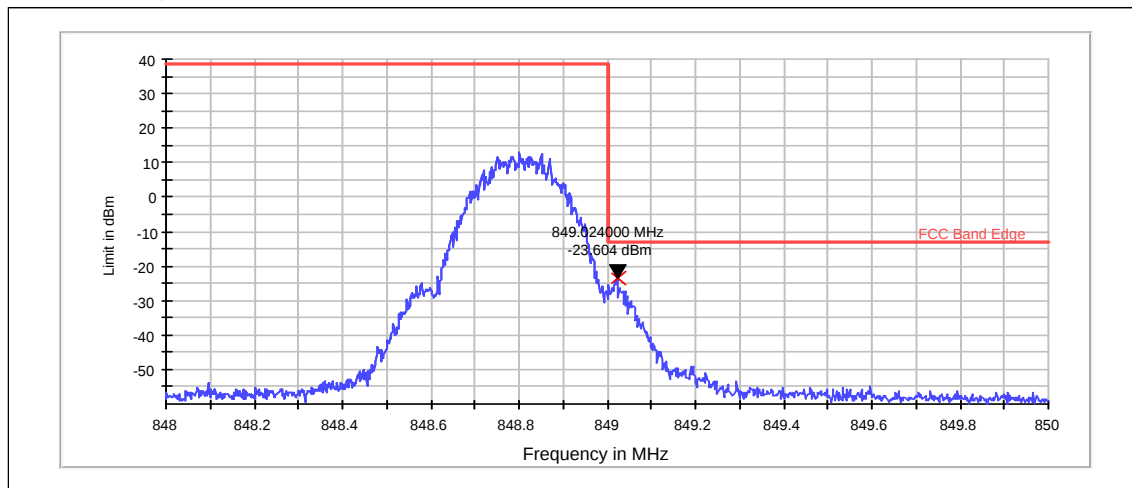
Channel 128 / 824.2 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 823.986         | -24.71      | PASSED |

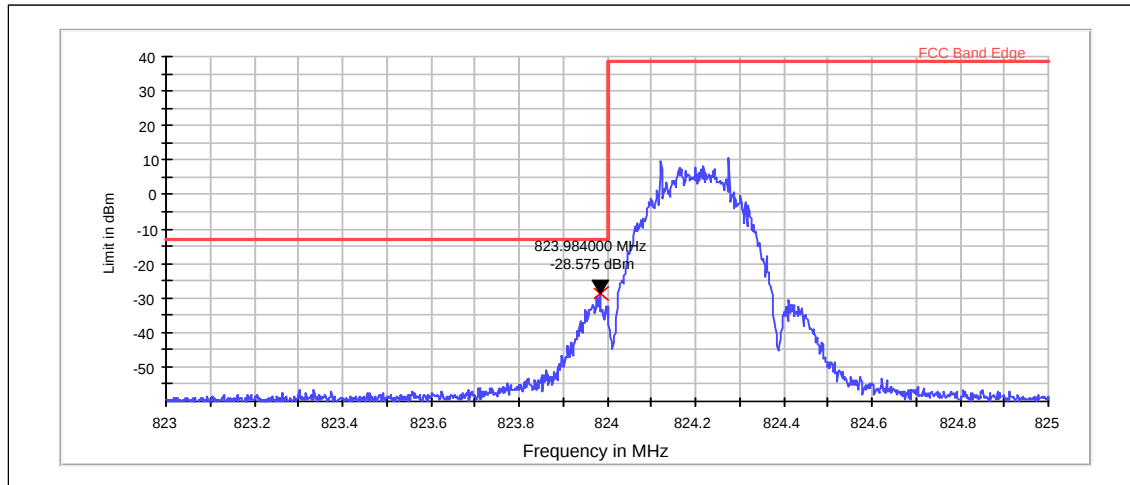
Channel 251 / 848.8 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 849.024         | -23.60      | PASSED |

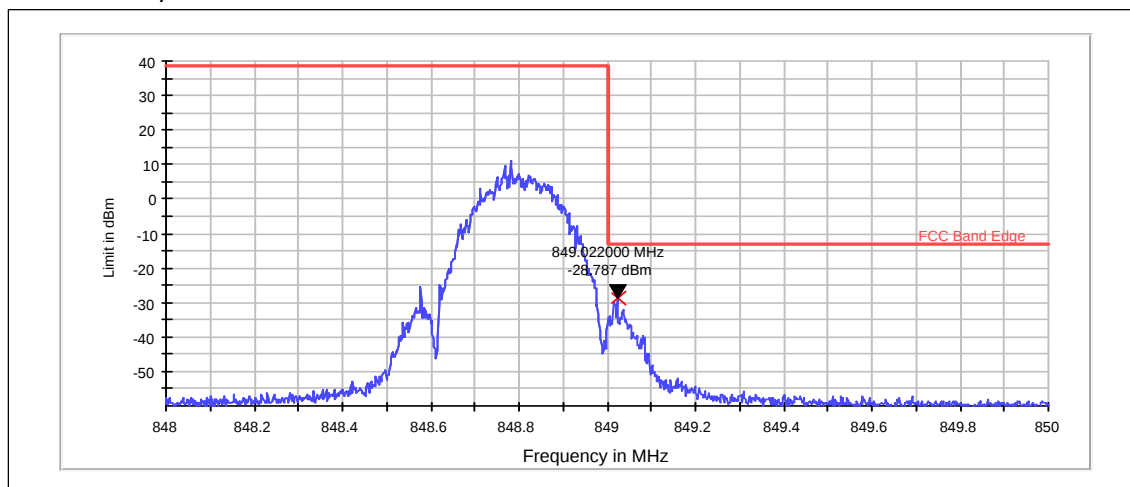
### Channel 128 / 824.2 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 823.984         | -28.57      | PASSED |

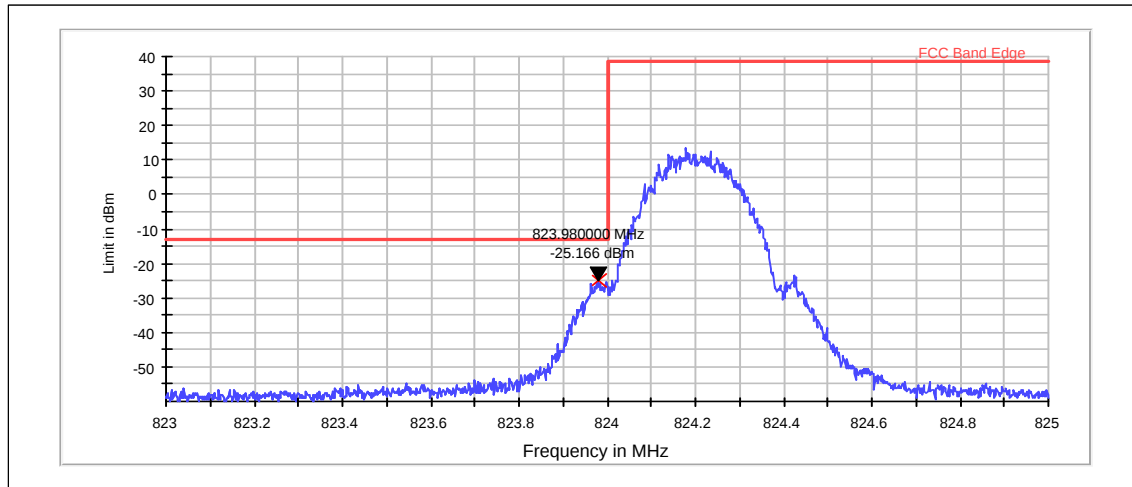
### Channel 251 / 848.8 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 849.022         | -28.79      | PASSED |

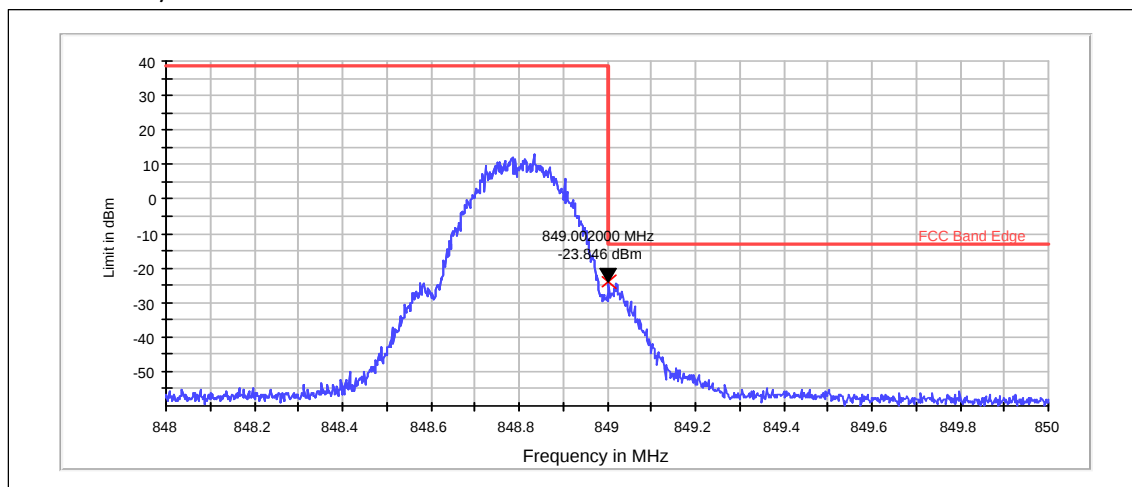
### Channel 128 / 824.2 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GPRS                   | 823.980         | -25.17      | PASSED |

### Channel 251 / 848.8 MHz

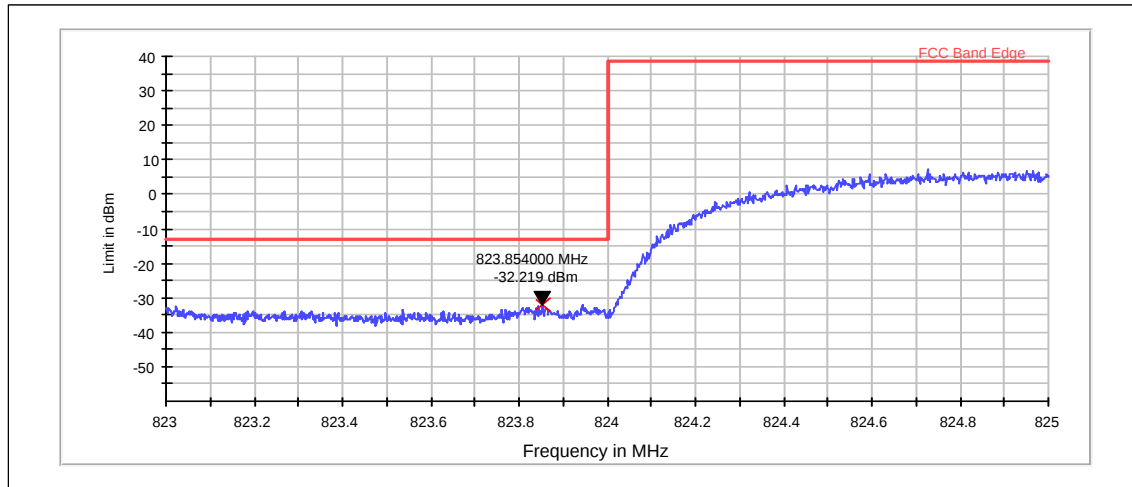


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GPRS                   | 849.002         | -23.85      | PASSED |

## 5.4. WCDMA5 Test results

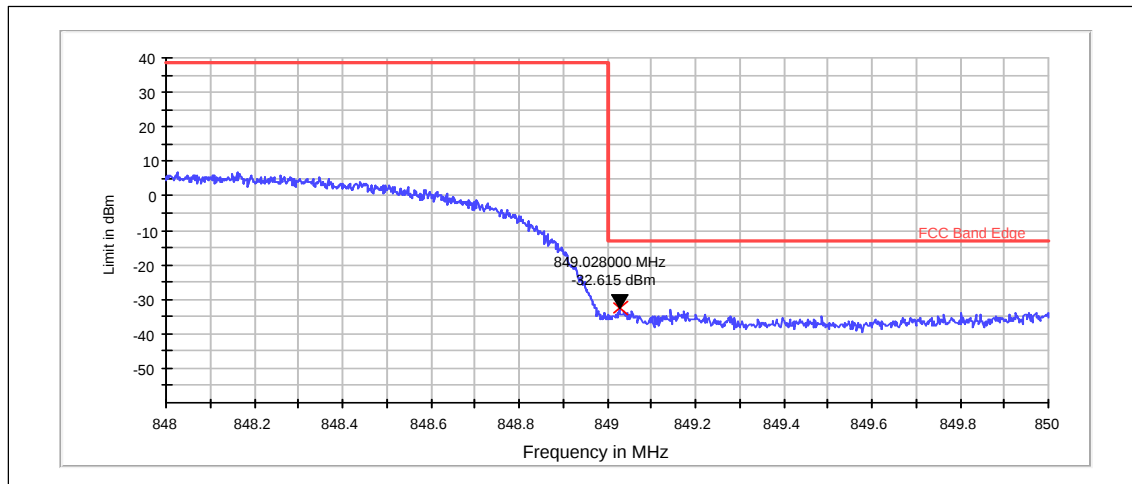
Channel 4132 / 826.4 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 823.854         | -32.22      | PASSED |

Channel 4233 / 846.6 MHz

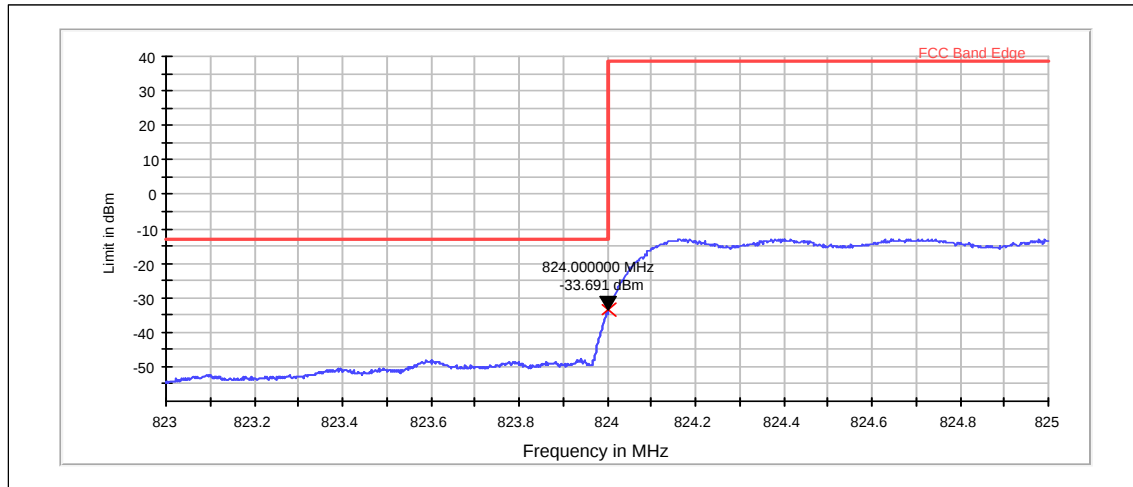


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 849.028         | -32.61      | PASSED |

## 5.5. CDMA 800 Test results

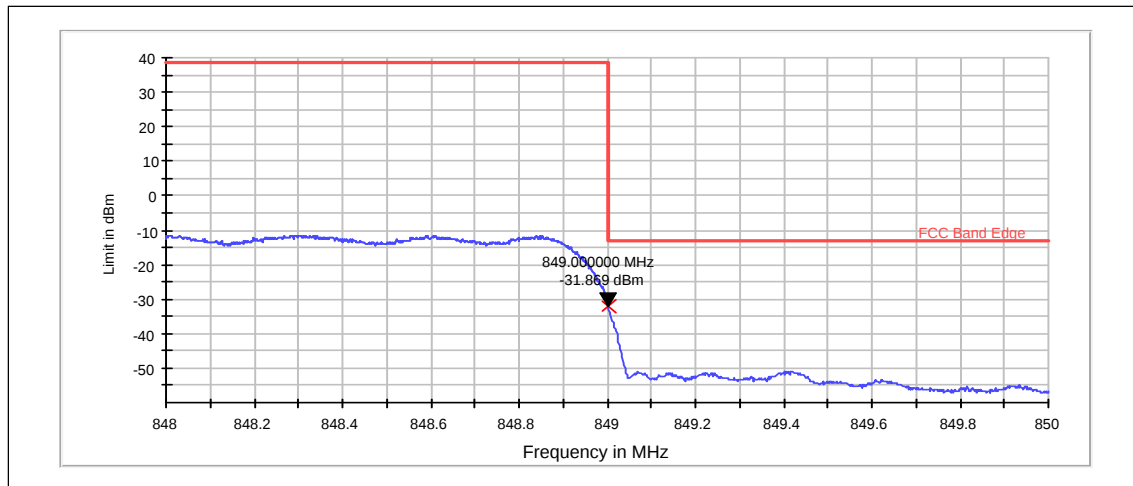
Channel 1013 / 824.7 MHz



RMS (RBW: 15 kHz, VBW: 30 kHz, video averaging)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| CDMA                   | 824.000         | -33.69      | PASSED |

Channel 777 / 848.31 MHz

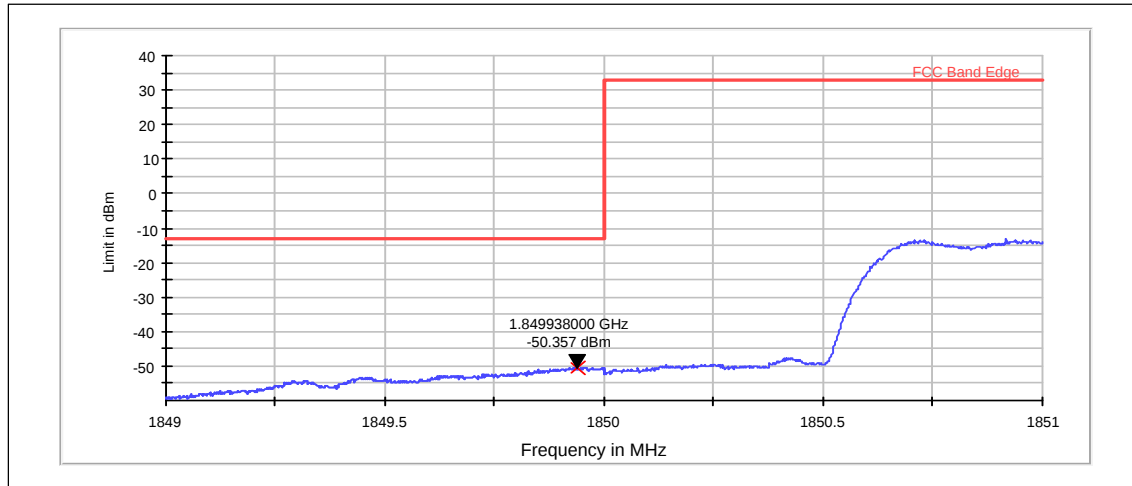


RMS (RBW: 15 kHz, VBW: 30 kHz, video averaging)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| CDMA                   | 849.000         | -31.87      | PASSED |

## 5.6. CDMA 1900 Test results

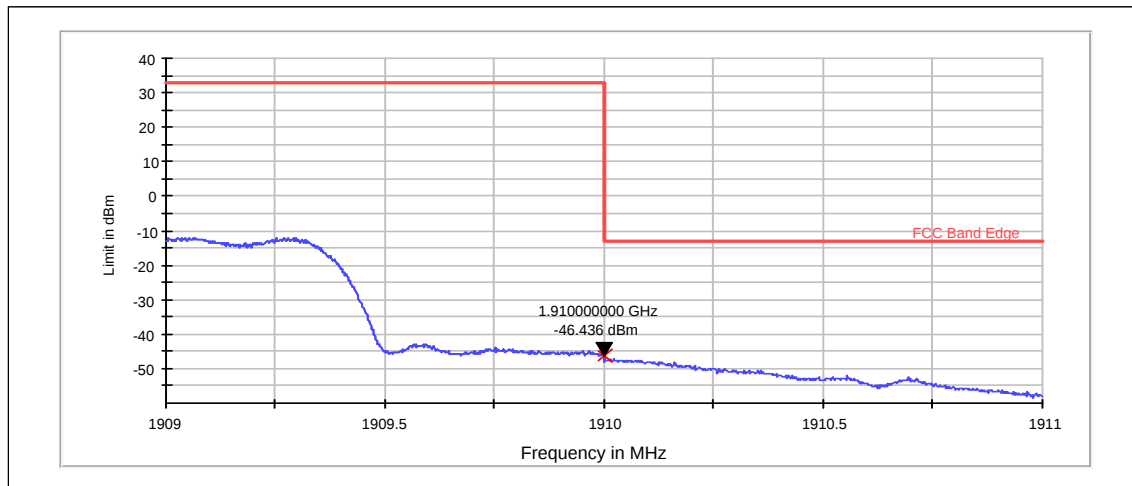
Channel 25 / 1851.25 MHz



RMS (RBW: 15 kHz, VBW: 30 kHz, video averaging)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| CDMA                   | 1849.938        | -50.36      | PASSED |

Channel 1175 / 1908.75 MHz

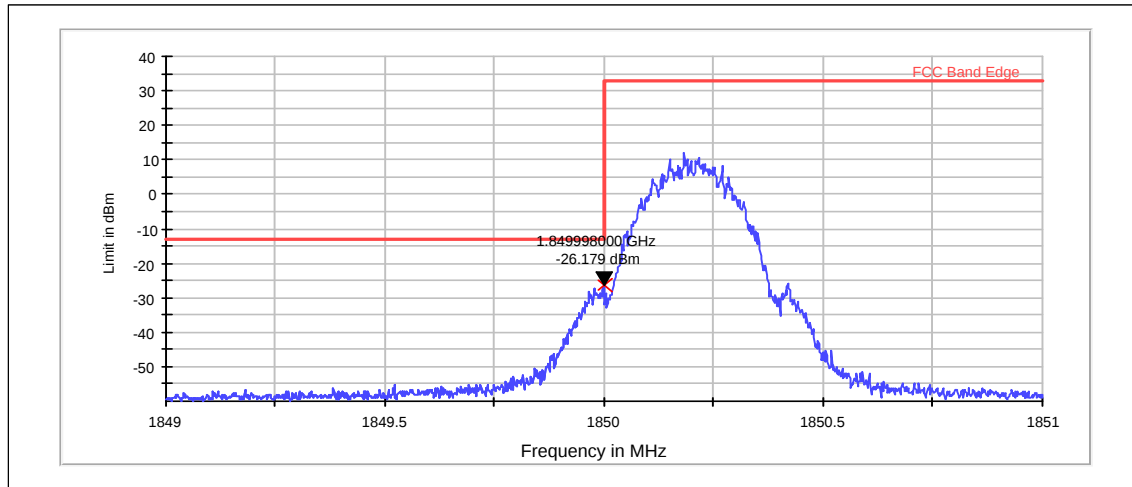


RMS (RBW: 15 kHz, VBW: 30 kHz, video averaging)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| CDMA                   | 1910.000        | -46.44      | PASSED |

## 5.7. GSM 1900 Test results

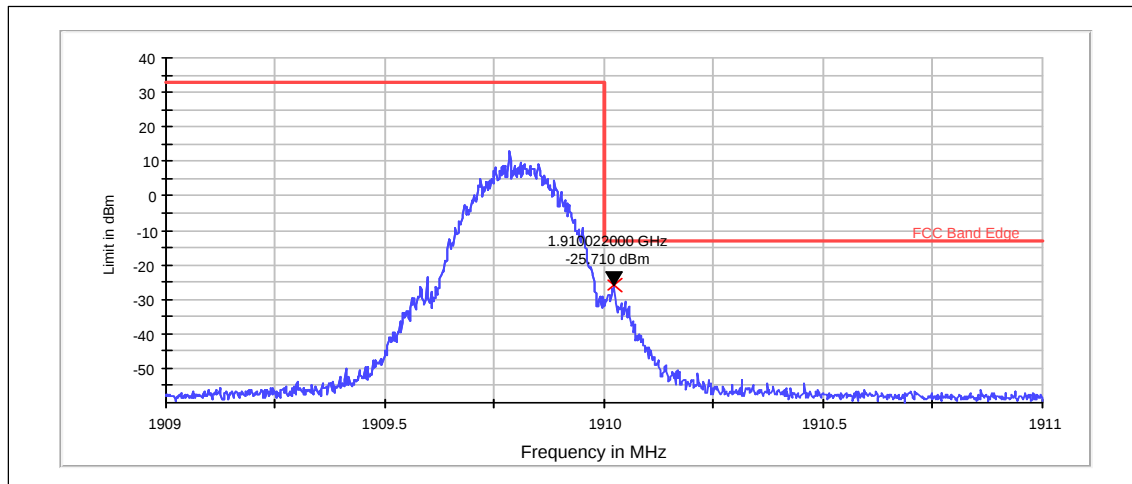
Channel 512 / 1850.2 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 1849.998        | -26.18      | PASSED |

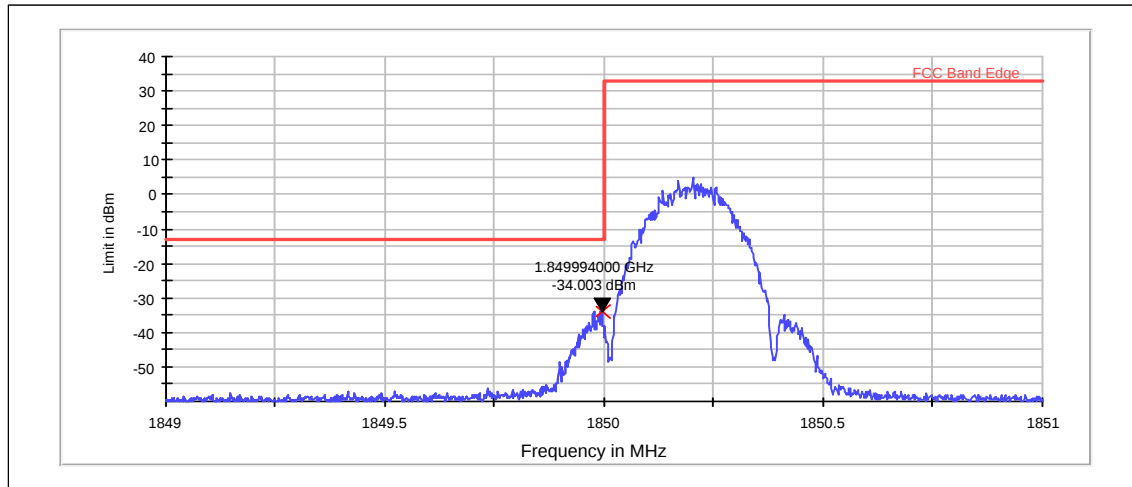
Channel 810 / 1909.8 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 1910.022        | -25.71      | PASSED |

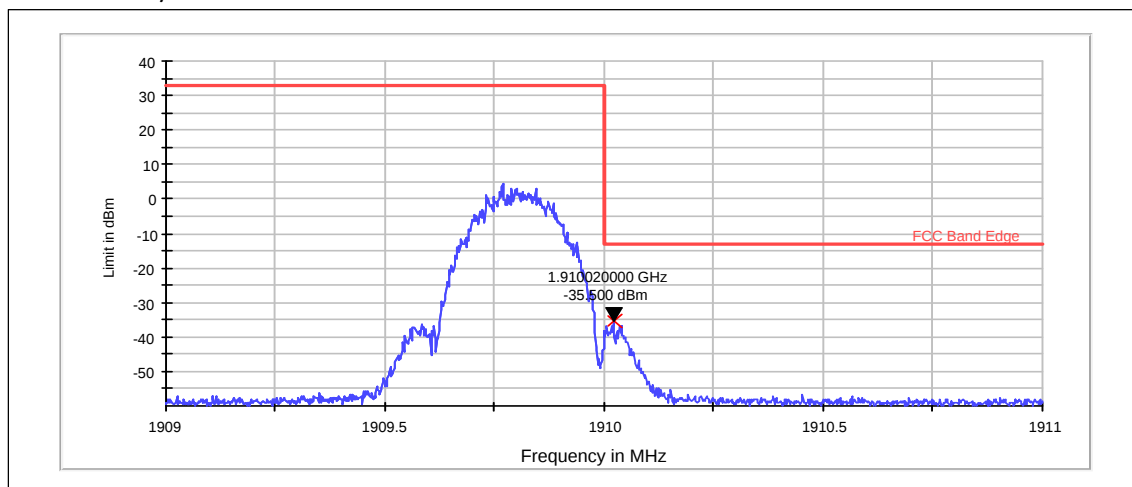
### Channel 512 / 1850.2 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 1849.994        | -34.00      | PASSED |

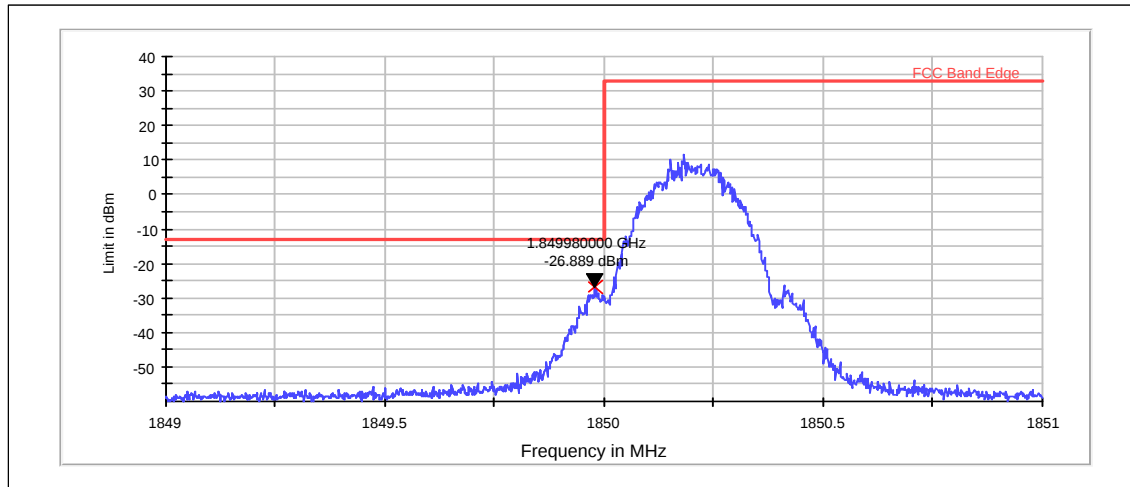
### Channel 810 / 1909.8 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 1910.020        | -35.50      | PASSED |

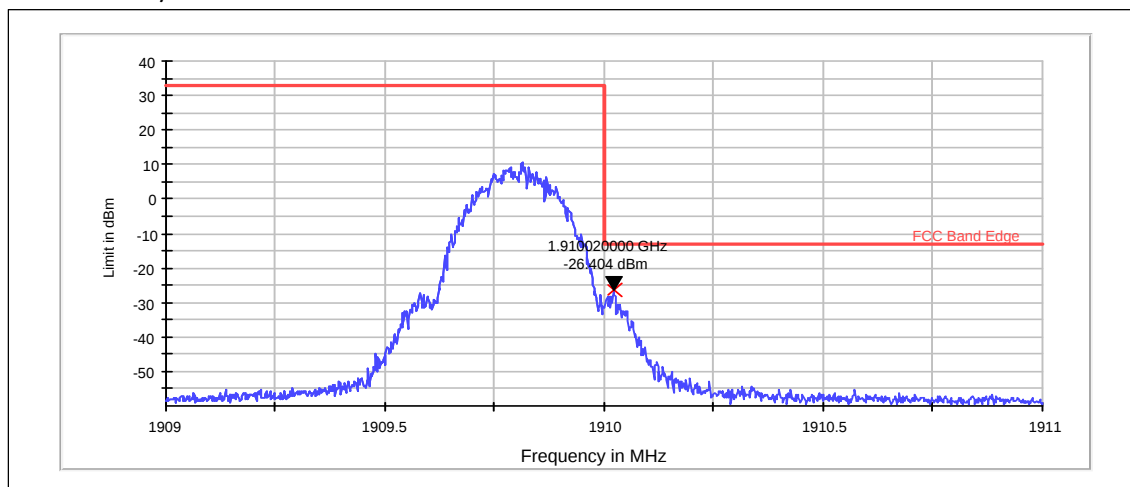
### Channel 512 / 1850.2 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GPRS                   | 1849.980        | -26.89      | PASSED |

### Channel 810 / 1909.8 MHz

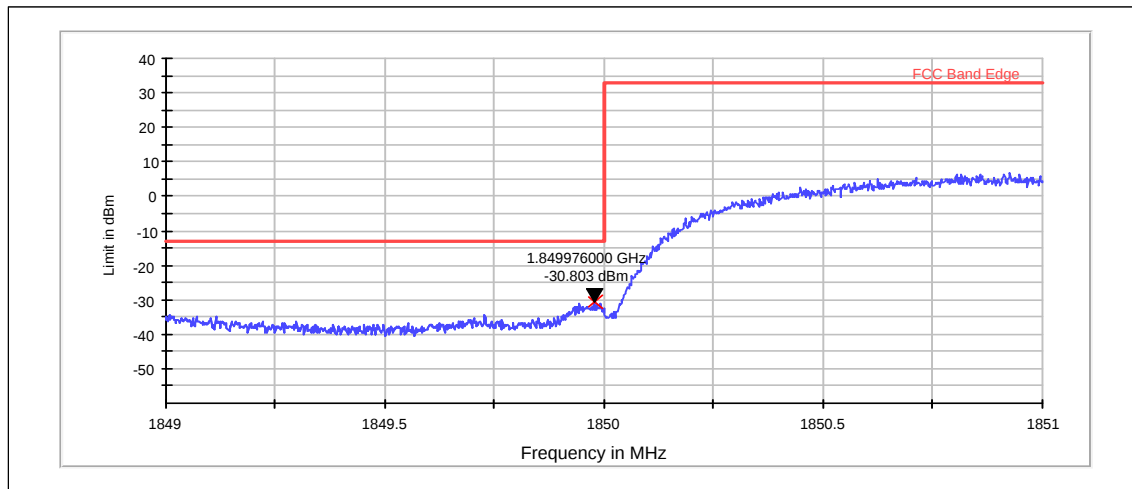


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GPRS                   | 1910.020        | -26.40      | PASSED |

## 5.8. WCDMA2 Test results

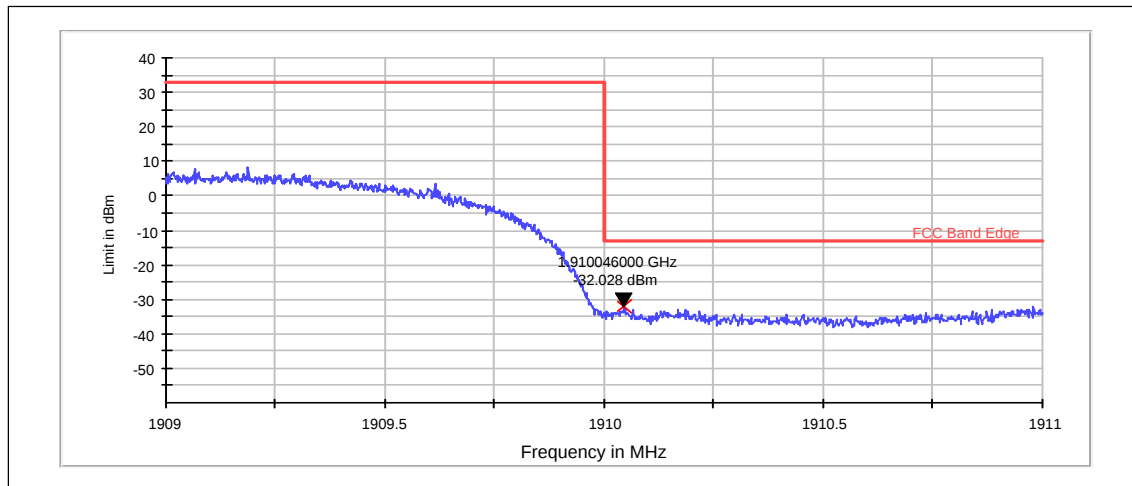
Channel 9262 / 1852.4 MHz



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

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 1849.976        | -30.80      | PASSED |

Channel 9538 / 1907.6 MHz

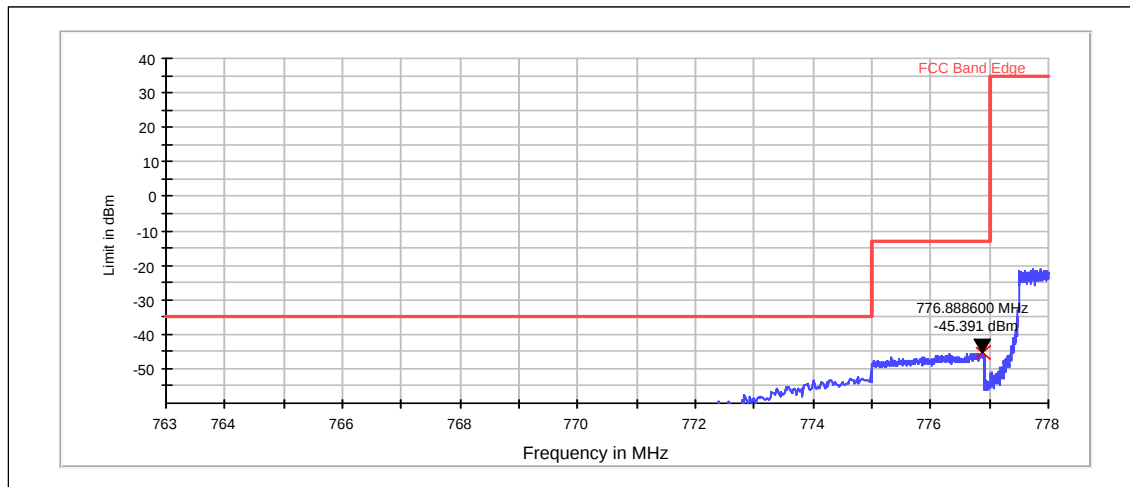


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 1910.046        | -32.03      | PASSED |

## 5.9. LTE13 Test results

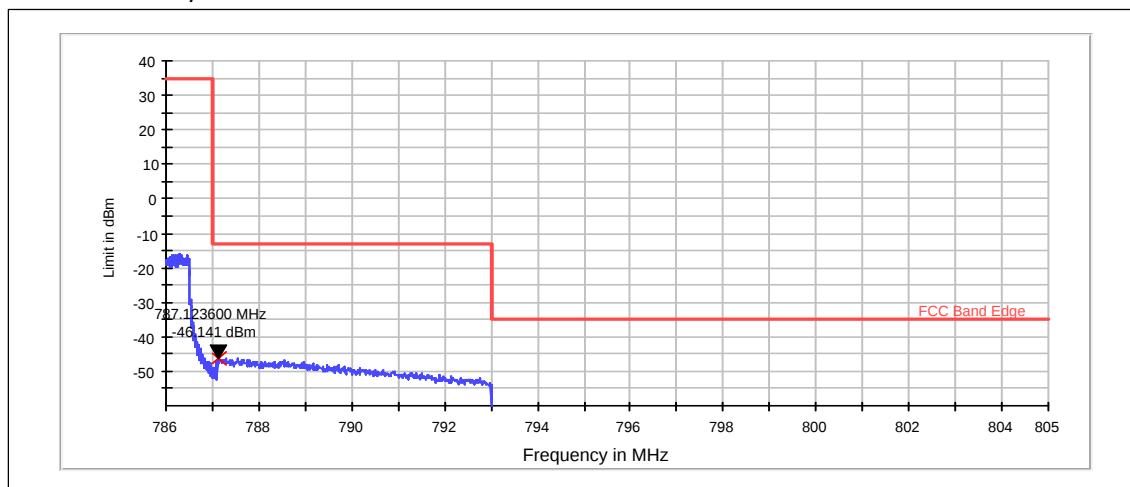
Channel 23230 / 782 MHz



RMS detector, Max hold

| Operation mode (TX on)      | Frequency [MHz] | Level [dBm] | Result |
|-----------------------------|-----------------|-------------|--------|
| FDD, CBW 10MHz, QPSK, 50 RB | 776.889         | -45.39      | PASSED |

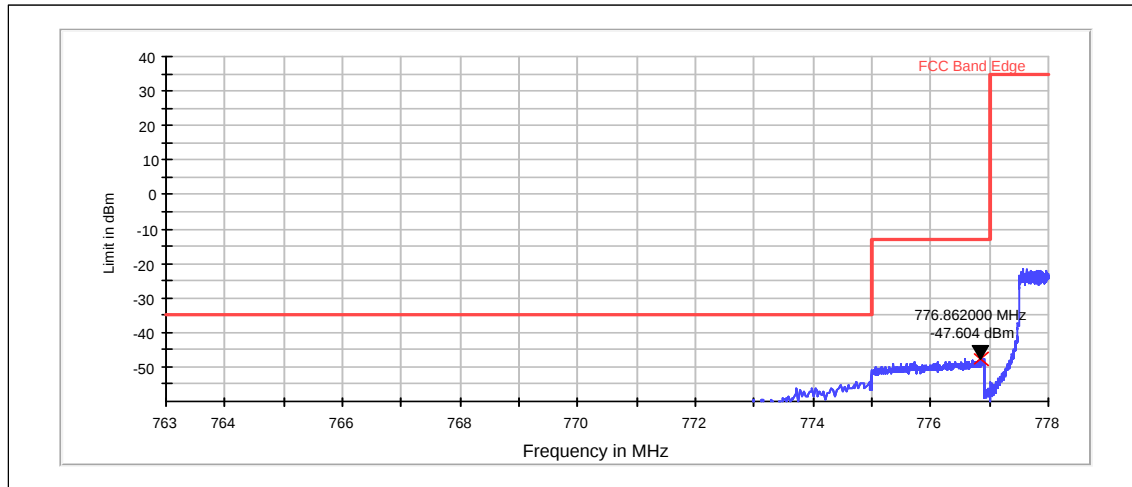
Channel 23230 / 782 MHz



RMS detector, Max hold

| Operation mode (TX on)      | Frequency [MHz] | Level [dBm] | Result |
|-----------------------------|-----------------|-------------|--------|
| FDD, CBW 10MHz, QPSK, 50 RB | 787.124         | -46.14      | PASSED |

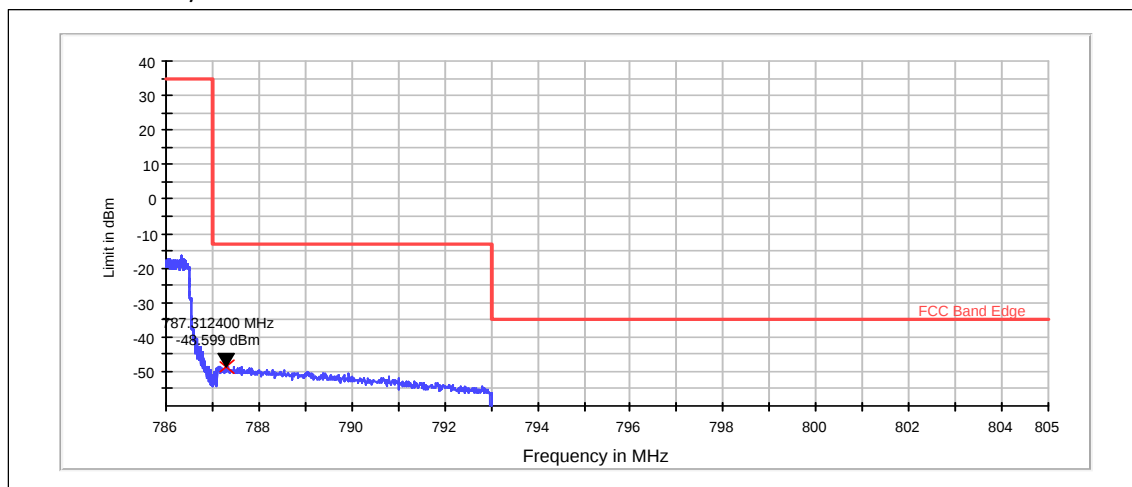
### Channel 23230 / 782 MHz



### RMS detector, Max hold

| Operation mode (TX on)       | Frequency [MHz] | Level [dBm] | Result |
|------------------------------|-----------------|-------------|--------|
| FDD, CBW 10MHz, 16QAM, 50 RB | 776.862         | -47.60      | PASSED |

### Channel 23230 / 782 MHz

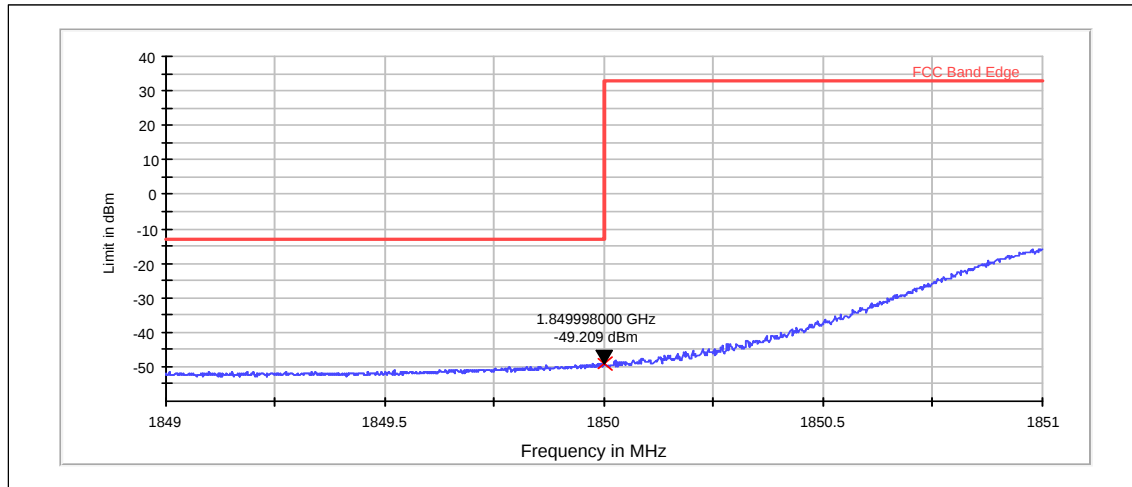


### RMS detector, Max hold

| Operation mode (TX on)       | Frequency [MHz] | Level [dBm] | Result |
|------------------------------|-----------------|-------------|--------|
| FDD, CBW 10MHz, 16QAM, 50 RB | 787.312         | -48.60      | PASSED |

## 5.10. LTE2 Test results

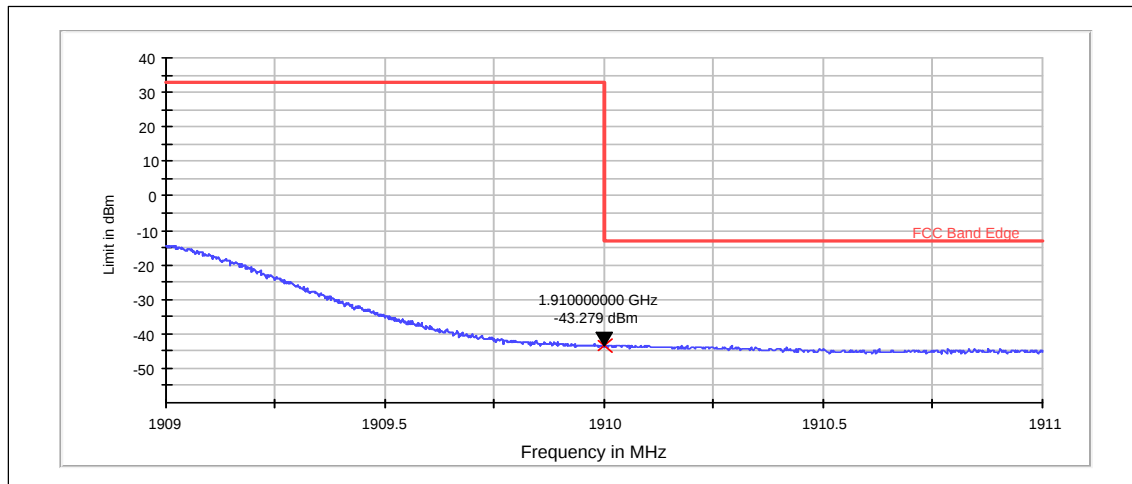
Channel 18700 / 1860 MHz



RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)       | Frequency [MHz] | Level [dBm] | Result |
|------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, QPSK, 100 RB | 1849.998        | -49.21      | PASSED |

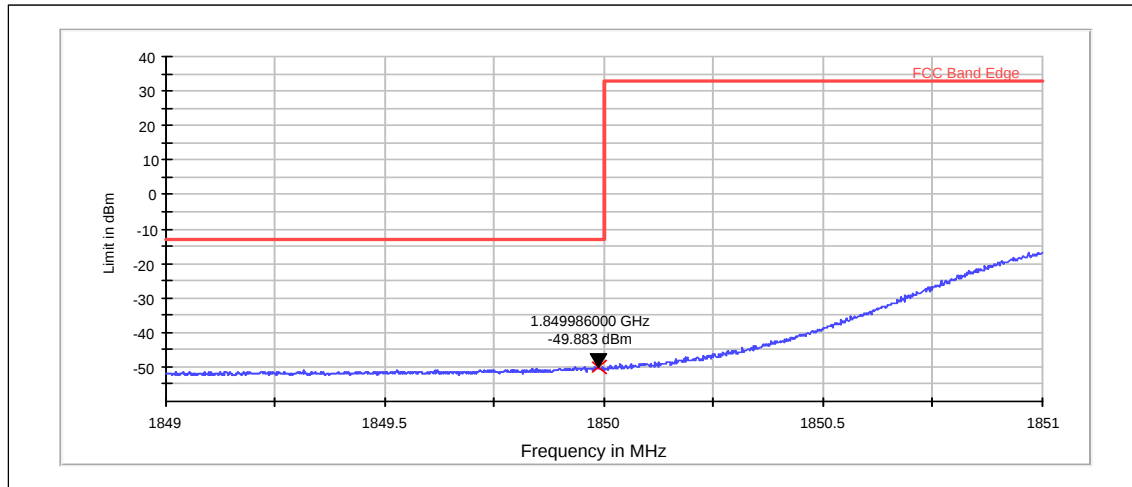
Channel 19100 / 1900 MHz



RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)       | Frequency [MHz] | Level [dBm] | Result |
|------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, QPSK, 100 RB | 1910.000        | -43.28      | PASSED |

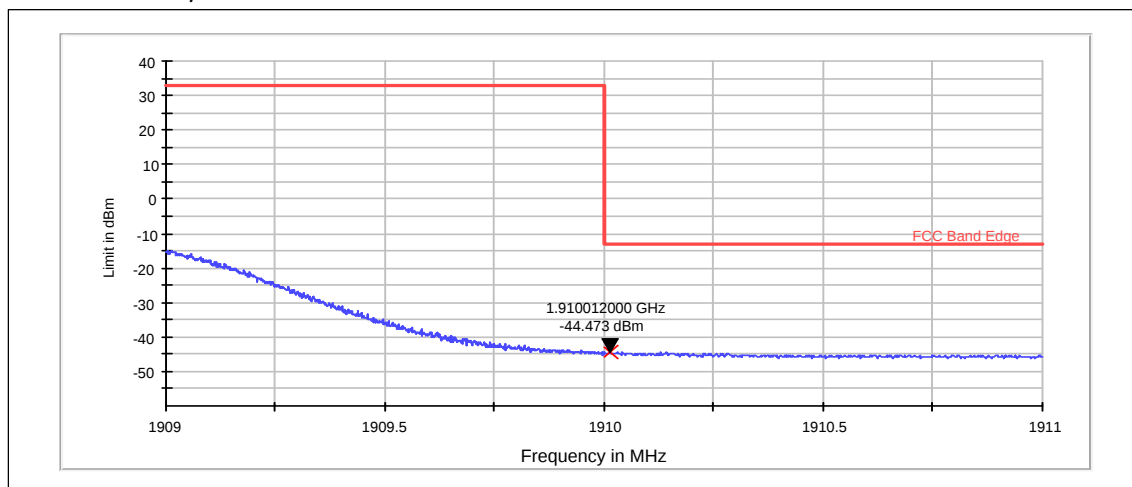
### Channel 18700 / 1860 MHz



RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)        | Frequency [MHz] | Level [dBm] | Result |
|-------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1849.986        | -49.88      | PASSED |

### Channel 19100 / 1900 MHz

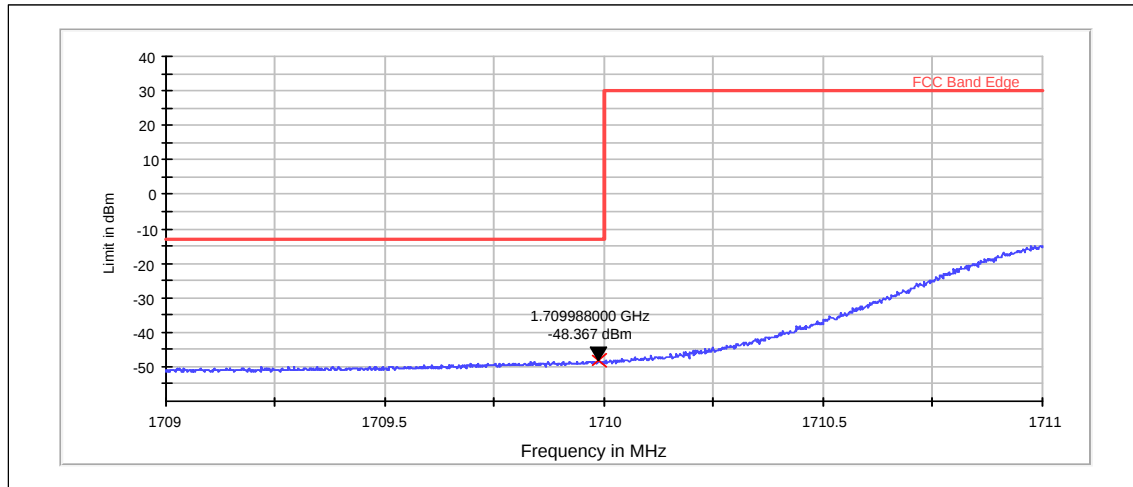


RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)        | Frequency [MHz] | Level [dBm] | Result |
|-------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1910.012        | -44.47      | PASSED |

## 5.11. LTE4 Test results

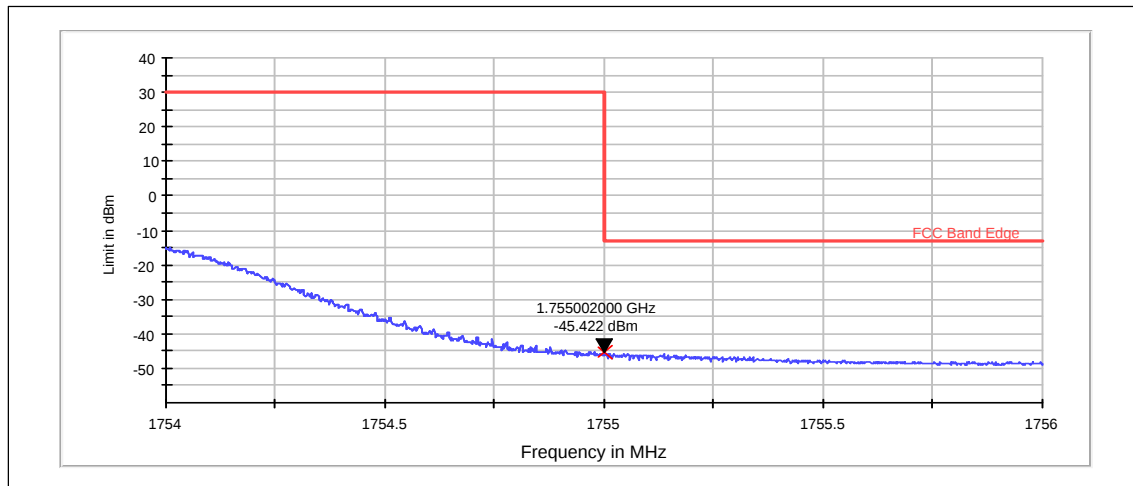
Channel 20050 / 1720 MHz



RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)       | Frequency [MHz] | Level [dBm] | Result |
|------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, QPSK, 100 RB | 1709.988        | -48.37      | PASSED |

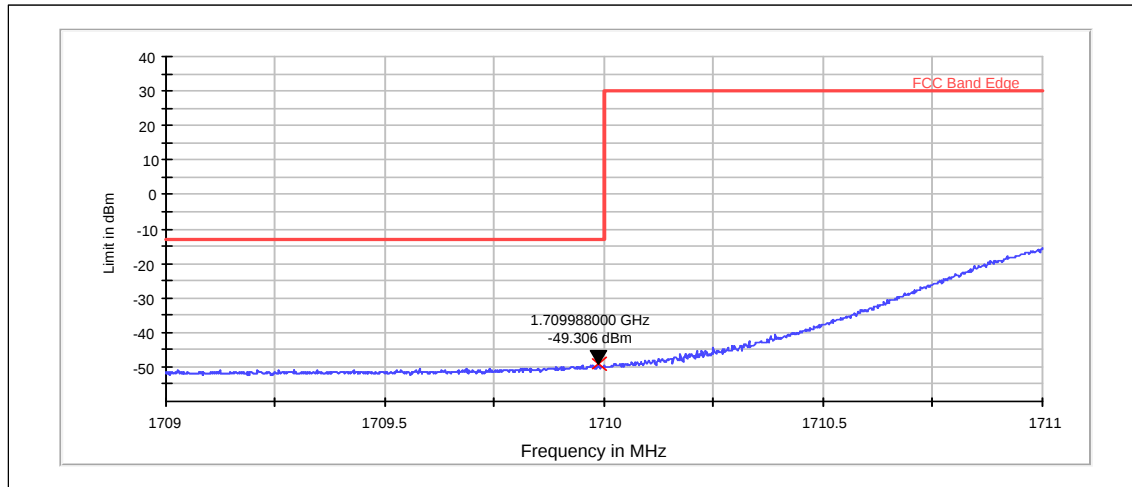
Channel 20300 / 1745 MHz



RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)       | Frequency [MHz] | Level [dBm] | Result |
|------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, QPSK, 100 RB | 1755.002        | -45.42      | PASSED |

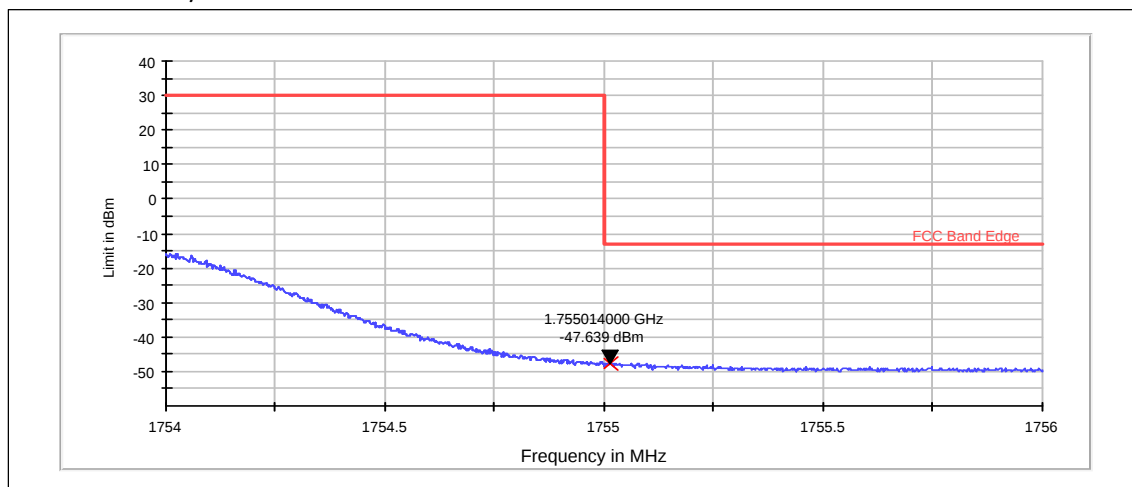
### Channel 20050 / 1720 MHz



RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)        | Frequency [MHz] | Level [dBm] | Result |
|-------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1709.988        | -49.31      | PASSED |

### Channel 20300 / 1745 MHz



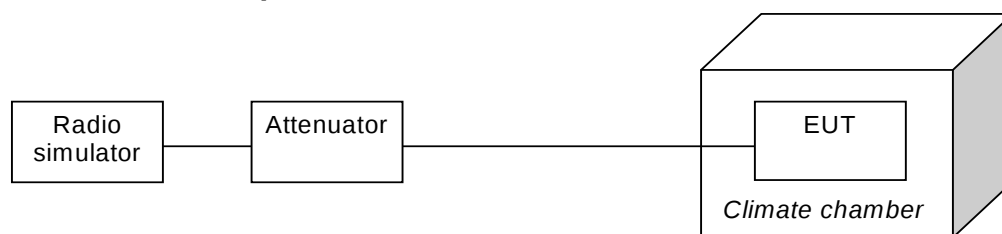
RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

| Operation mode (TX on)        | Frequency [MHz] | Level [dBm] | Result |
|-------------------------------|-----------------|-------------|--------|
| FDD, CBW 20MHz, 16QAM, 100 RB | 1755.014        | -47.64      | PASSED |

## 6. Frequency stability, temperature variation (FCC §2.1055(a), RSS-130 4.3 (a), RSS-139 6.3)

|                                                        |                                        |
|--------------------------------------------------------|----------------------------------------|
| <b>EUT with DUT number</b>                             | RM-1041, DUT 18639                     |
| <b>Accessories with DUT numbers</b>                    | SD-233R, DUT 18640 ; WH-108, DUT 18641 |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal                                |
| <b>Results</b>                                         | PASSED                                 |
| <b>Remarks</b>                                         | -                                      |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 22 / 45 / 103.4                        |
| <b>Date of measurements</b>                            | 02-Oct-2014                            |
| <b>Measured by</b>                                     | Jari Keto                              |

### 6.1. Test Setup



### 6.2. Test method and limit

The measurement is made according to applicable FCC rule parts and IC standards 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                   |

### 6.3. LTE13 Test results

FDD, CBW 10MHz, QPSK, 50 RB, Channel 23230 / 782.0 MHz

| Temperature [°C] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|------------------|-----------------|----------------|-----------------|--------|
| 50               | 782.00          | -2.04563       | -0.0026         | PASSED |
| 40               | 782.00          | -2.38895       | -0.0031         | PASSED |
| 30               | 782.00          | -1.91689       | -0.0025         | PASSED |
| 20               | 782.00          | -1.20163       | -0.0015         | PASSED |
| 10               | 782.00          | -1.70231       | -0.0022         | PASSED |
| 0                | 782.00          | -0.91553       | -0.0012         | PASSED |
| -10              | 782.00          | -0.31471       | -0.0004         | PASSED |
| -20              | 782.00          | -0.02861       | 0               | PASSED |
| -30              | 782.00          | -0.30041       | -0.0004         | PASSED |

### 6.4. LTE4 Test results

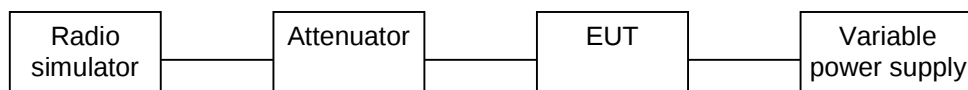
FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz

| Temperature [°C] | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|------------------|-----------------|----------------|-----------------|--------|
| 50               | 1732.50         | -1.40190       | -0.0008         | PASSED |
| 40               | 1732.50         | -0.24319       | -0.0001         | PASSED |
| 30               | 1732.50         | -1.13010       | -0.0007         | PASSED |
| 20               | 1732.50         | 0.55790        | 0.0003          | PASSED |
| 10               | 1732.50         | 0.92983        | 0.0005          | PASSED |
| 0                | 1732.50         | 1.54495        | 0.0009          | PASSED |
| -10              | 1732.50         | 2.70367        | 0.0016          | PASSED |
| -20              | 1732.50         | 3.96252        | 0.0023          | PASSED |
| -30              | 1732.50         | 2.77519        | 0.0016          | PASSED |

## 7. Frequency stability, voltage variation (FCC §2.1055(d), RSS-130 4.3 (a), RSS-139 6.3)

|                                                 |                                        |
|-------------------------------------------------|----------------------------------------|
| EUT with DUT number                             | RM-1041, DUT 18639                     |
| Accessories with DUT numbers                    | SD-233R, DUT 18640 ; WH-108, DUT 18641 |
| Operation Voltage [V] / [Hz]                    | Nominal                                |
| Results                                         | PASSED                                 |
| Remarks                                         | -                                      |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 45 / 103.4                        |
| Date of measurements                            | 02-Oct-2014                            |
| Measured by                                     | Jari Keto                              |

### 7.1. Test Setup



### 7.2. Test method and limit

The measurement is made according to applicable FCC rule parts and IC standards 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                   |

### 7.3. LTE13 Test results

FDD, CBW 10MHz, QPSK, 50 RB, Channel 23230 / 782.0 MHz

| Voltage level [V]           | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|-----------------------------|-----------------|----------------|-----------------|--------|
| Max / 4.2                   | 782.00          | -1.50204       | -0.0019         | PASSED |
| Battery cut-off point / 3.6 | 782.00          | -3.41892       | -0.0044         | PASSED |
| Nominal / 4.0               | 782.00          | -1.65939       | -0.0021         | PASSED |

### 7.4. LTE4 Test results

FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz

| Voltage level [V]           | Frequency [MHz] | Deviation [Hz] | Deviation [ppm] | Result |
|-----------------------------|-----------------|----------------|-----------------|--------|
| Max / 4.2                   | 1732.50         | 0.55790        | 0.0003          | PASSED |
| Battery cut-off point / 3.6 | 1732.50         | 3.11852        | 0.0018          | PASSED |
| Nominal / 4.0               | 1732.50         | 2.10285        | 0.0012          | PASSED |

## 8. Test Equipment

### 8.1. Conducted measurements

| Eq. No | Equipment                       | Type          | Manufacturer  | Used in            |
|--------|---------------------------------|---------------|---------------|--------------------|
| 6039   | USB Interface                   | 5541765       | Testo         | 22/24/27, 15C, 15B |
| 6044   | V-network                       | ESH3-Z6       | R&S           | -                  |
| 2059   | V-network                       | ESH3-Z6       | R&S           | -                  |
| 1759   | LISN 50 $\mu$ H                 | ESH3-Z5       | R&S           | 22/24/27, 15C, 15B |
| 2097   | Pulse Limiter                   | ESH3-Z2       | R&S           | 22/24/27, 15C, 15B |
| 1999   | Receiver                        | ESIB26        | R&S           | 22/24/27, 15C, 15B |
| 2180   | Communication Tester            | CMU200        | R&S           | 22/24/27, 15C, 15B |
| 2390   | Directional Coupler             | DC2600        | AR            | -                  |
| -      | RF immunity / Emission Software | EMC32         | R&S           | 22/24/27, 15C, 15B |
| 2060   | LISN 50 $\mu$ H                 | ESH3-Z5       | R&S           | 15C, 15B           |
| 1759   | LISN 50 $\mu$ H                 | ESH3-Z5       | R&S           | 15C, 15B           |
| 2039   | Power Supply                    | PL330QMD      | Thurlby       | 15C, 15B           |
| 6036   | Data Logger                     | 175-H2        | Testo         | 22/24/27, 15C, 15B |
| 2359   | Temperature Test Chamber        | VT4002        | Vötsch        | 22/24/27           |
| 2352   | Spectrum Analyzer               | FSP-30        | R&S           | 22/24/27, 15C      |
| 6109   | Communication Tester            | CMU200        | R&S           | 22/24/27, 15C      |
| 6246   | Power Supply                    | 66332A        | HP            | 22/24/27, 15C      |
| 1992   | Signal Generator                | 83630B        | Agilent       | 15C, 15B           |
| 6098   | Signal Generator                | 8648C         | Agilent       | -                  |
| 6046   | Attenuator 10dB                 | 8493C         | Agilent       | 22/24/27, 15C      |
| 6047   | Attenuator 20dB                 | 8493C         | Agilent       | 22/24/27, 15C      |
| 6045   | Power splitter                  | 11667B        | Agilent       | 22/24/27, 15C      |
| 6247   | Communication Tester            | CBT           | R&S           | 22/24/27, 15C 15B  |
| 6052   | Communication Tester            | CMU200        | R&S           | 22/24/27, 15C 15B  |
| 6248   | Power Supply                    | 6632B         | -             | 22/24/27, 15C 15B  |
| 6106   | Spectrum Analyzer               | FSP-30        | R&S           | 22/24/27, 15C 15B  |
| 6113   | Signal Generator                | SMF100A       | R&S           | 22/24/27, 15C 15B  |
| 6202   | Temperature Test Chamber        | VT4002        | Vötsch        | 22/24/27, 15C 15B  |
| 6122   | Power Splitter                  | 11667B        | Agilent       | 22/24/27, 15C 15B  |
| 6134   | Attenuator 10dB                 | BW-S10-2W263+ | Mini-Circuits | 22/24/27, 15C      |
| 6136   | Attenuator 20dB                 | BW-S20-2W263+ | Mini-Circuits | 22/24/27, 15C      |
| 6103   | Bluetooth tester                | CBT           | R&S           | 22/24/27, 15C 15B  |
| 6250   | Power Supply                    | 6651A         | Agilent       | 22/24/27, 15C 15B  |
| 6108   | Communication Tester            | CMU200        | R&S           | 22/24/27, 15C 15B  |
| 6105   | Spectrum Analyzer               | FSV-30        | R&S           | 22/24/27, 15C 15B  |
| 6251   | Temperature Test Chamber        | VT4002        | Vötsch        | 22/24/27, 15C 15B  |
| 6243   | Power Splitter                  | 1167B         | Agilent       | 22/24/27, 15C 15B  |
| 6245   | Attenuator 10dB                 | BW-S10-2W263+ | Mini-Circuits | 22/24/27, 15C 15B  |
| 6244   | Attenuator 20dB                 | BW-S20-2W263+ | Mini-Circuits | 22/24/27, 15C 15B  |

### 8.2. Radiated measurements

| Eq. No | Equipment                    | Type      | Manufacturer | Used in            |
|--------|------------------------------|-----------|--------------|--------------------|
| 2388   | Bluetooth Tester             | CBT       | R&S          | 15B                |
| 10479  | Communication Tester         | CMW500    | R&S          | 22/24/27, 15C, 15B |
| 2347   | Communication Tester         | CMU200    | R&S          | 22/24/27, 15C, 15B |
| 2009   | Signal Generator             | SMP 22    | R&S          | 22/24/27, 15C, 15B |
| 2348   | Controller                   | G-1000DXC | Yaesu        | 22/24/27, 15C, 15B |
| 2349   | Computer Controller          | g-1000DXC | Yaesu        | 22/24/27, 15C, 15B |
| 2116   | Controller                   | EMCO 2090 | ETS          | 22/24/27, 15C, 15B |
| 2109   | Power Supply                 | PL330QMD  | Thurlby      | 22/24/27, 15C, 15B |
| 2353   | Receiver                     | ESIB26    | R&S          | 22/24/27, 15C, 15B |
| 6115   | Open switch and control unit | OSP 130   | R&S          | 22/24/27, 15C 15B  |
| 6116   | Open switch and control unit | OSP 150   | R&S          | 22/24/27, 15C 15B  |

| Eq. No | Equipment                       | Type                                   | Manufacturer | Used in            |
|--------|---------------------------------|----------------------------------------|--------------|--------------------|
| 6117   | Open switch and control unit    | OSP 150                                | R&S          | 22/24/27, 15C, 15B |
| 6131   | Notch Filter                    | WRCT902.4-0.4/40-8SS                   | Wainwright   | 22/24/27, 15C, 15B |
| 6130   | Notch Filter                    | WRCD1880-1.1.25/50-10SS                | Wainwright   | 22/24/27           |
| 6159   | Band Reject Filter              | WRCD1747.8-0.4/40-5SS                  | Wainwright   | 22/24/27, 15C, 15B |
| 6158   | Band Reject Filter              | WRCT836.6-0.4/40-8SS                   | Wainwright   | 22/24/27, 15C, 15B |
| 6197   | Band Reject Filter              | WRCJV2531/2539-2523/2547-60/12SS       | Wainwright   | 22/24/27, 15C, 15B |
| 2231   | Band Reject Filter              | WRCG1947/1953-1940/1960-40/6SS         | Wainwright   | 22/24/27, 15C, 15B |
| 2391   | Band Reject Filter              | WRCG1729.4/1735.4-1722.4/1742.4-40/6SS | Wainwright   | 27                 |
| 2386   | Band Reject Filter              | WRCG1764.4/1770.4-1760.4/1774.4-40/6SS | Wainwright   | 22/24/27, 15C, 15B |
| 2385   | Band Reject Filter              | WRCG1744.4/1750.4-1740.4/1754.4-40/6SS | Wainwright   | 22/24/27, 15C, 15B |
| 2357   | Band Reject Filter              | WRCG2400/2483-2390/2493-35/10SS        | Wainwright   | 15C                |
| 2188   | Preamplifier                    | AFS4-00100300-20-23P-6                 | Miteq        | 22/24/27, 15C, 15B |
| 6195   | High Pass Filter                | -                                      | Wainwright   | 22/24/27, 15C, 15B |
| 2364   | Band Reject Filter              | WRCG1877/1883 - 1870/1890-40/6SS       | Wainwright   | 24                 |
| 2361   | Anechoic Chamber                | 3 m Semi / Full Anechoic Chamber       | Euroshield   | 22/24/27, 15C, 15B |
| 6212   | Antenna Array system            | -                                      | TCC          | 22/24/27, 15C, 15B |
| -      | RF immunity / Emission Software | EMC32                                  | R&S          | 22/24/27, 15C, 15B |
| 6089   | Antenna                         | HFH2-Z2                                | R&S          | 15C, 15B           |
| 2027   | CDN                             | M2 (modified) DC1                      | MEB          | 22/24/27, 15C, 15B |
| 2028   | CDN                             | M3 (modified) DC2                      | MEB          | 22/24/27, 15C, 15B |
| 2176   | CDN                             | CDN 801-M3                             | Lüthi        | 22/24/27, 15C, 15B |
| 2135   | CDN                             | CDN 801-M3                             | Lüthi        | 22/24/27, 15C, 15B |
| 2029   | Power Supply                    | PL330                                  | Thurlby      | 22/24/27, 15C      |
| 6038   | Data Logger                     | Testo 580                              | Testo        | 22/24/27, 15C, 15B |
| 6037   | Data Logger                     | 175-H2                                 | Testo        | 22/24/27, 15C, 15B |
| 6039   | USB Interface                   | 5541765                                | Testo        | 22/24/27, 15C, 15B |