

FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RM-975_01.docx	Date of Report:	14-May-2014
Number of pages:	64	Customer's Contact person:	Juha Paukku
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FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-975 / Dummy Battery SD-128 / Battery BL-5H / AC-Charger AC-20 / Headset WH-108		
FCC ID:	PDNRM-975	IC:	661R-RM975
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Parts 22/24/27, TIA-603-C-2004 and IC standards, RSS-GEN (Issue 3, December 2010), RSS-130 (Issue 1, October 2013), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Sami Lehtonen, System Specialist, EMC

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

Date of receipt	4-Apr-2014
Testing completed	06-Apr-2014
The customer's contact person	Juha Paukku
Test Plan referred to	T:\Projects\RM-975\TestPlan\RS_testplan_RM-975.xlsm
Notes	All results from Antenna 1
Document name	T:\Projects\RM-975\EMC\FCC22&24&27_RM-975_01.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WCDMA/WLAN/Bluetooth

The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-975	004402478041738	2020	-	01961.00014.14112.00000	18144
Dummy Battery	SD-128	-	0.1	-	-	18012
Headset	WH-108	-	-	-	-	18149
Phone	RM-975	004402478041779	2020	-	01961.00014.14112.00000	18143
Dummy Battery	SD-128	-	0.1	-	-	18151
Phone	RM-975	004402478049996	2020	-	010601.00014.14112.00000	18152
Battery	BL-5H	495540349401010256300670699	-	-	-	18153
Headset	WH-108	2376171	-	-	-	17990
AC-Charger	AC-20E	409049327155040250700675628	-	-	-	17995

1.2. Summary of Test Results

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	NP
§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	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

WCDMA 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	NP
§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	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

WCDMA 1700:

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	NP
§27.50(d)(2)	6.4	Radiated RF output power	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§27.53(g)	6.5	Band edge compliance	PASSED
§27.53(g), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

WCDMA 850:

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	NP
§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	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

LTE1900 (Band 2):

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	NP
§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	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

LTE1700 (Band 4):

Section in CFR 47	Section in RSS-GEN or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§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	NP
§27.53(h), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

LTE850 (Band 5):

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	NP
§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	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

LTE700 Lower (Band 17):

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	NP
§27.50(c)(10)	4.4	Radiated RF output power	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§27.53(g)	4.6	Band edge compliance	PASSED
§27.53(g), §2.1051	4.6	Spurious emissions at antenna terminals	NP
§27.53(g), §2.1051	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 Nokia Laboratory.

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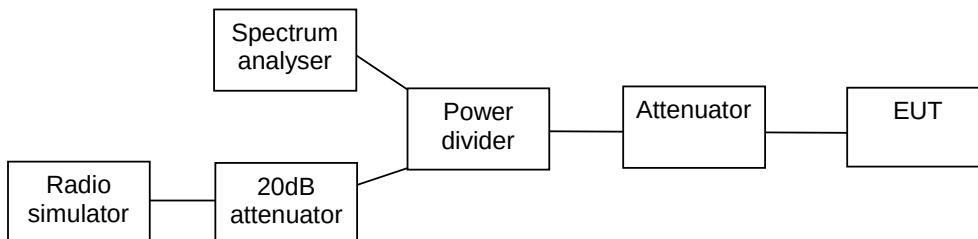
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2. 99 % occupied bandwidth (FCC §2.1049(h), RSS-133 4.6.1, RSS-139 4.6.1, RSS-132 4.6.1)

EUT with DUT number	RM-975, DUT 18144; RM-975, DUT 18143
Accessories with DUT numbers	SD-128, DUT 18012 ; WH-108, DUT 18149; SD-128, DUT 18151
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Antenna 1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 101.8
Date of measurements	02-Apr-2014 ... 04-Apr-2014
Measured by	Jari Keto / Kalle Hannila

2.1. Test Setup



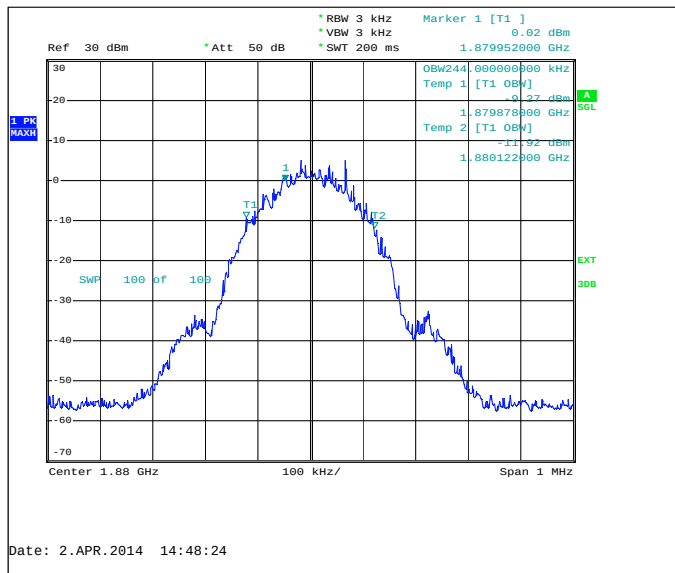
2.2. Test method and limit

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

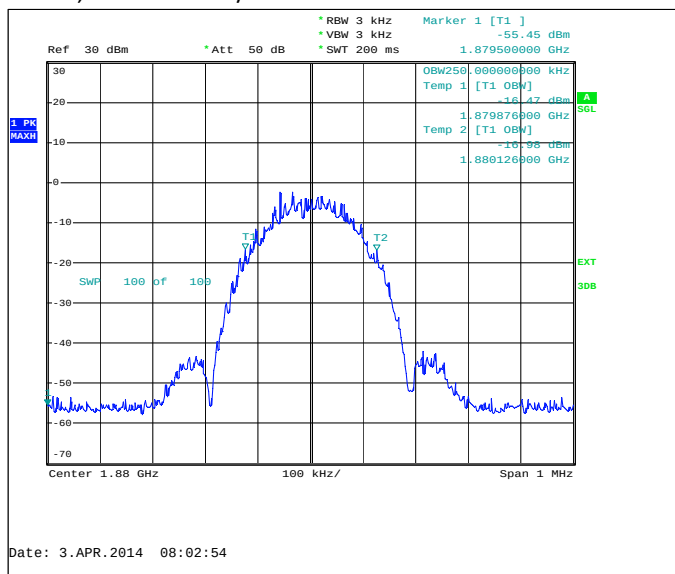
2.3. GSM 1900 Test results antenna1

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	244
EGPRS	250
GPRS	246

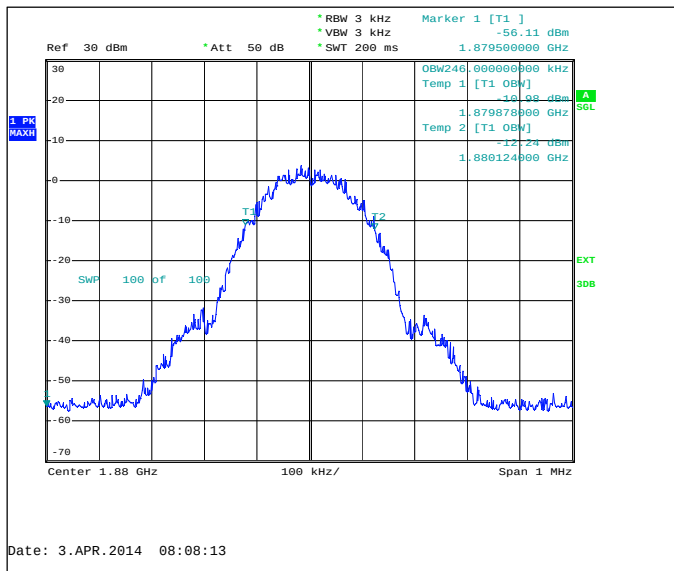
GSM, Channel 661 / 1880.0 MHz



EGPRS, Channel 661 / 1880.0 MHz

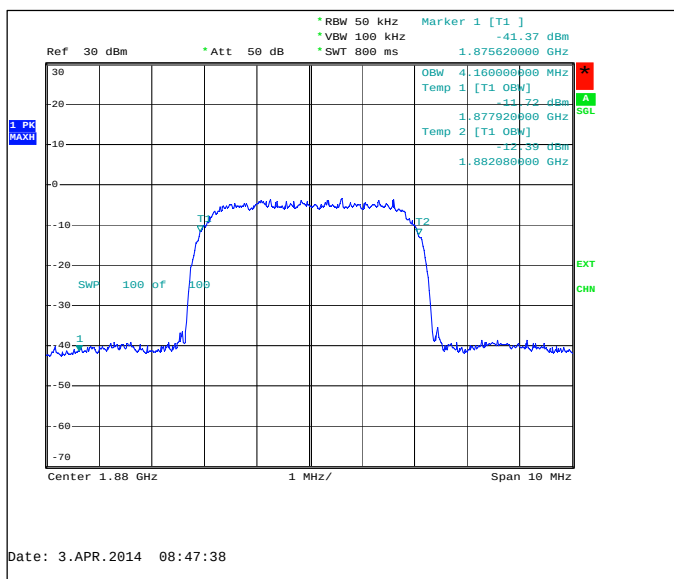


GPRS, Channel 661 / 1880.0 MHz



2.4. WCDMA 1900 Test results

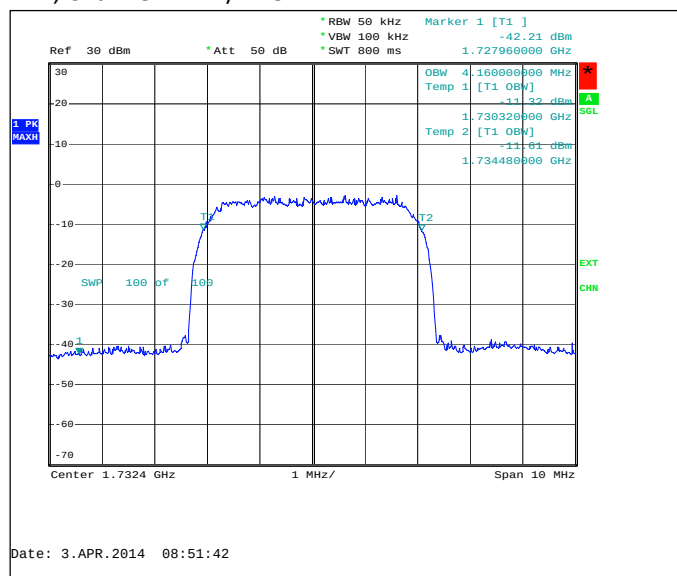
FDD, Channel 9400 / 1880.0 MHz	99% Occupied bandwidth [kHz]
FDD	4160



2.5. WCDMA 1700 Test results

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

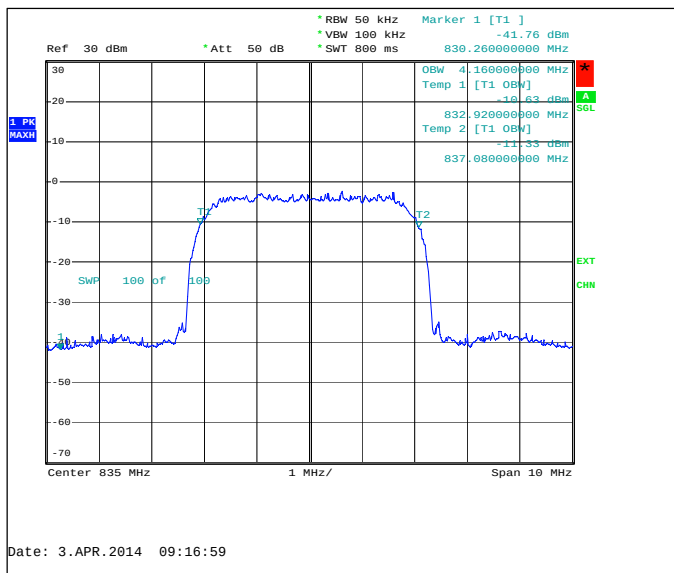
FDD, Channel 1412 / 1732.4 MHz



2.6. WCDMA 850 Test results

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

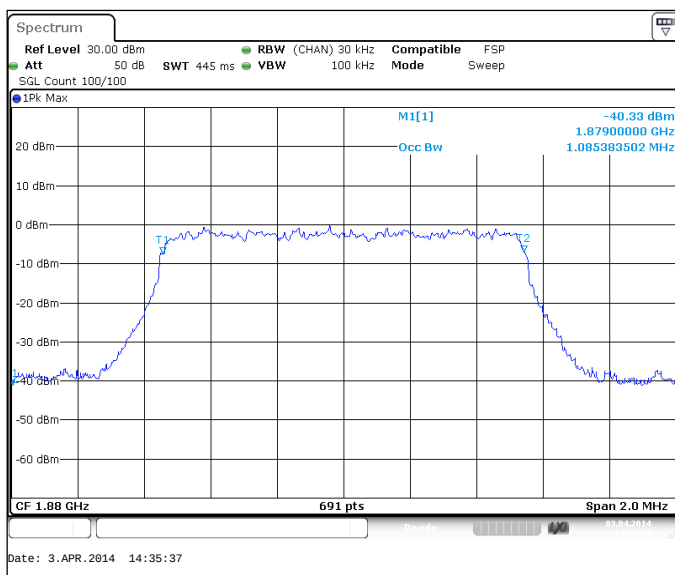
FDD, Channel 4175 / 835.0 MHz



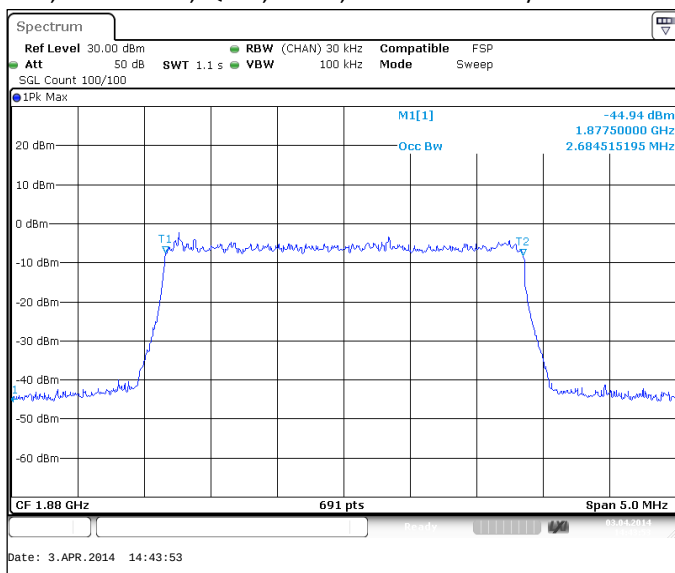
2.7. LTE1900 (Band 2) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1085.4
FDD, CBW 3MHz, QPSK, 15 RB	999
FDD, CBW 5MHz, QPSK, 25 RB	4467.4
FDD, CBW 10MHz, QPSK, 50 RB	8921.9
FDD, CBW 15MHz, QPSK, 75 RB	13429.8
FDD, CBW 20MHz, QPSK, 100 RB	17872.6
FDD, CBW 1.4MHz, 16QAM, 6 RB	1085.4
FDD, CBW 3MHz, 16QAM, 15 RB	2677.3
FDD, CBW 5MHz, 16QAM, 25 RB	4457.3
FDD, CBW 10MHz, 16QAM, 50 RB	8921.9
FDD, CBW 15MHz, 16QAM, 75 RB	13400.9
FDD, CBW 20MHz, 16QAM, 100 RB	17836.5

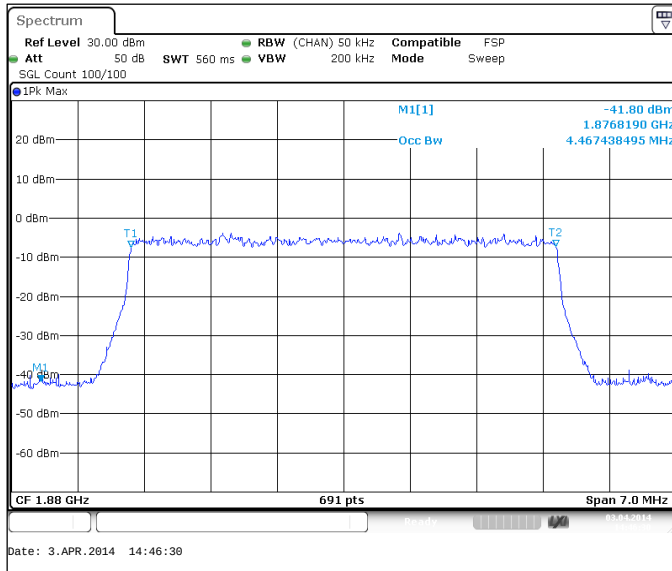
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 18900 / 1880.0 MHz



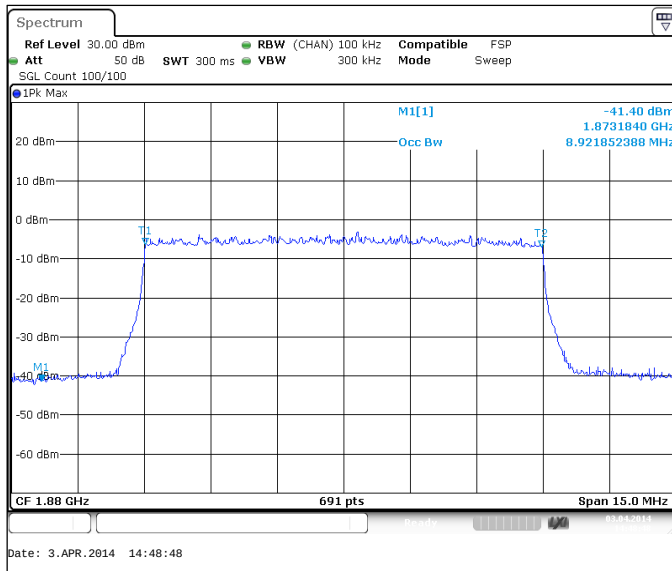
FDD, CBW 3MHz, QPSK, 15 RB, Channel 18900 / 1880.0 MHz



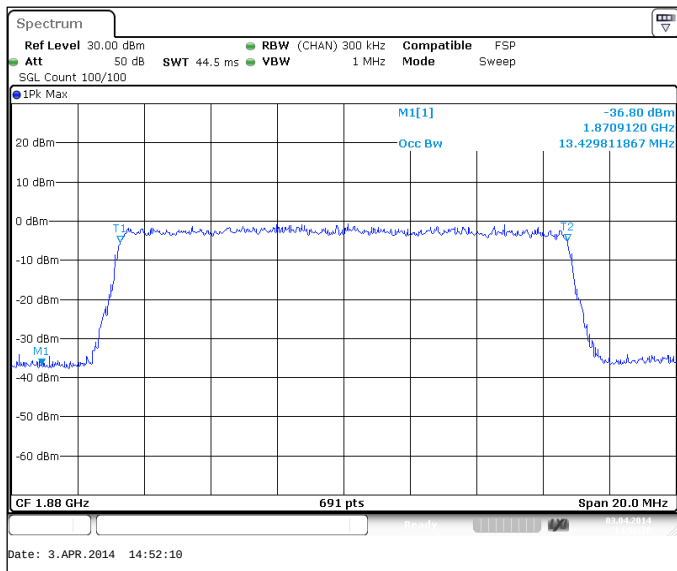
FDD, CBW 5MHz, QPSK, 25 RB, Channel 18900 / 1880.0 MHz



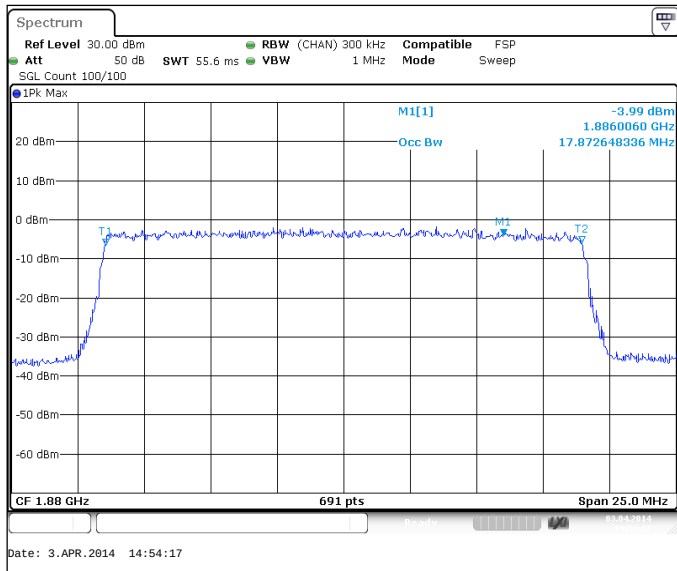
FDD, CBW 10MHz, QPSK, 50 RB, Channel 18900 / 1880.0 MHz



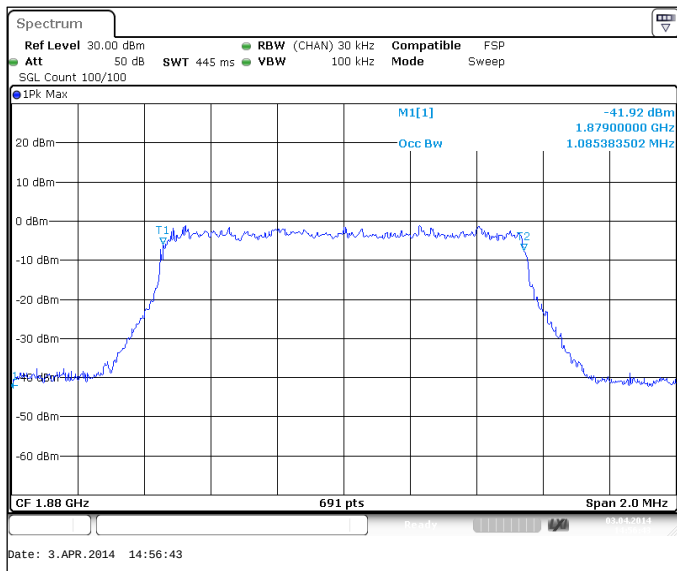
FDD, CBW 15MHz, QPSK, 75 RB, Channel 18900 / 1880.0 MHz



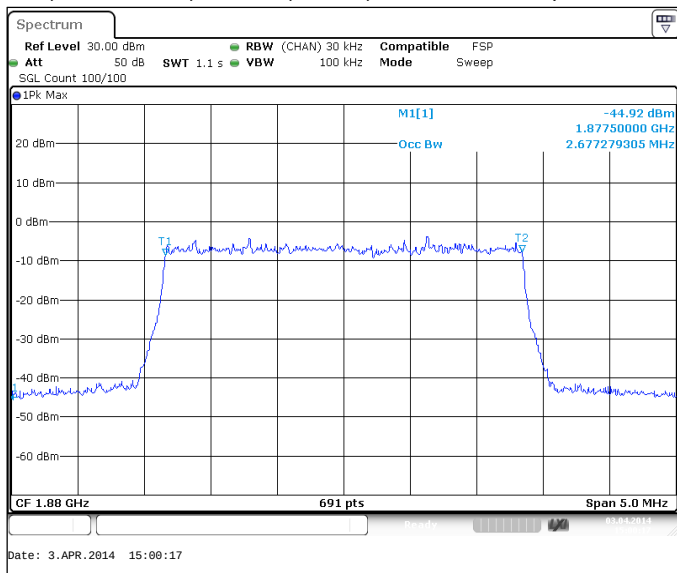
FDD, CBW 20MHz, QPSK, 100 RB, Channel 18900 / 1880.0 MHz



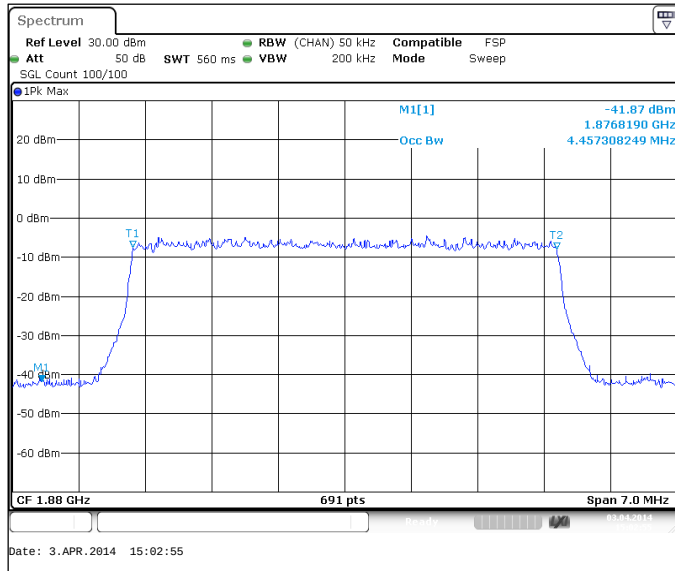
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 18900 / 1880.0 MHz



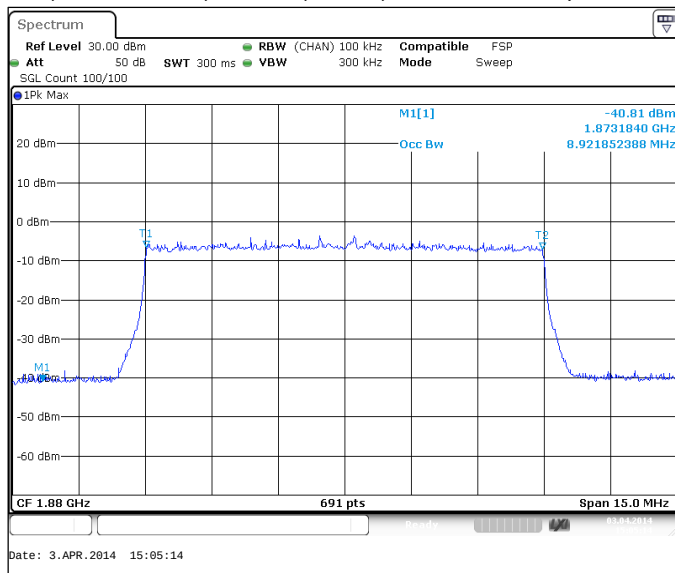
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 18900 / 1880.0 MHz



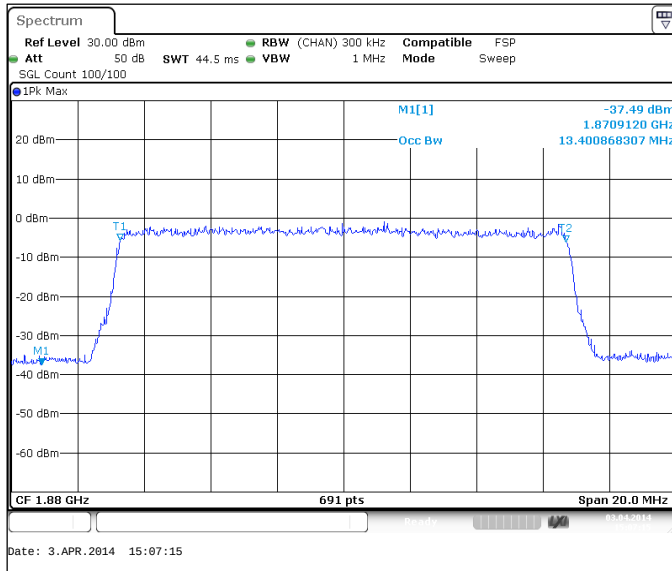
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 18900 / 1880.0 MHz



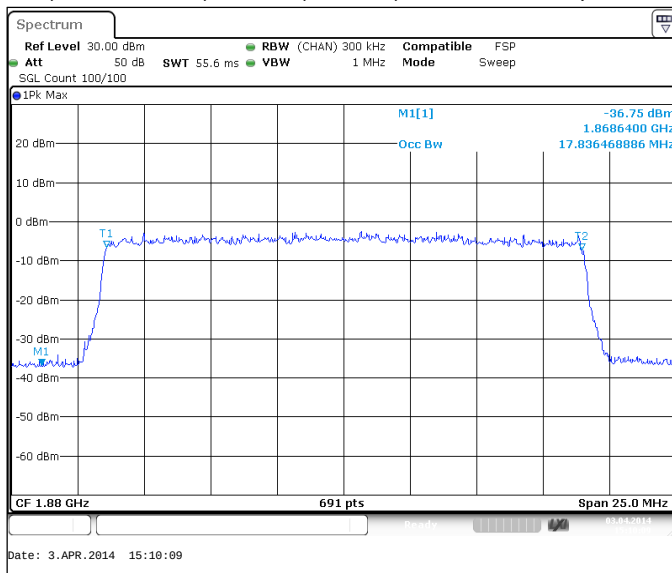
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 18900 / 1880.0 MHz



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



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

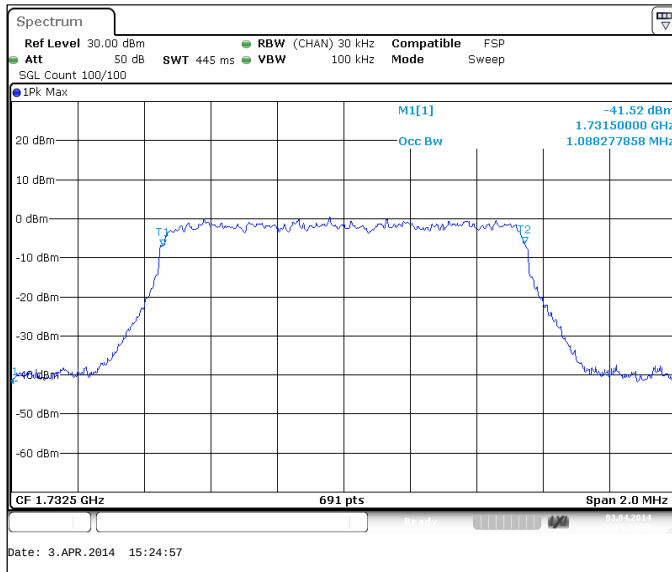


2.8. LTE1700 (Band 4) Test results

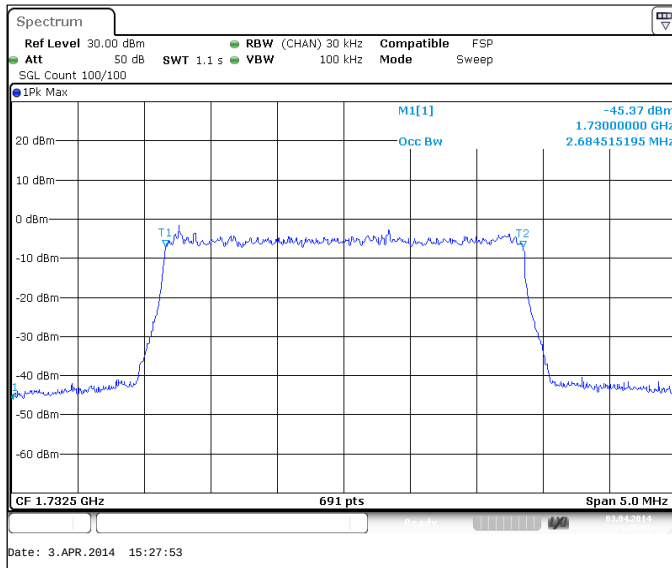
Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1088.3
FDD, CBW 3MHz, QPSK, 15 RB	2684.5
FDD, CBW 5MHz, QPSK, 25 RB	4467.4
FDD, CBW 10MHz, QPSK, 50 RB	8921.9
FDD, CBW 15MHz, QPSK, 75 RB	13400.9

FDD, CBW 20MHz, QPSK, 100 RB	17836.5
FDD, CBW 1.4MHz, 16QAM, 6 RB	1088.3
FDD, CBW 3MHz, 16QAM, 15 RB	2677.3
FDD, CBW 5MHz, 16QAM, 25 RB	4457.3
FDD, CBW 10MHz, 16QAM, 50 RB	8900.1
FDD, CBW 15MHz, 16QAM, 75 RB	13400.9
FDD, CBW 20MHz, 16QAM, 100 RB	17836.5

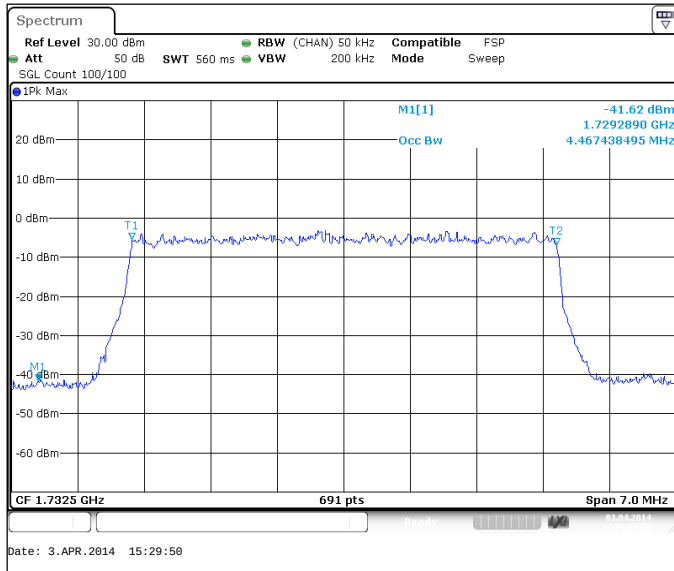
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20175 / 1732.5 MHz



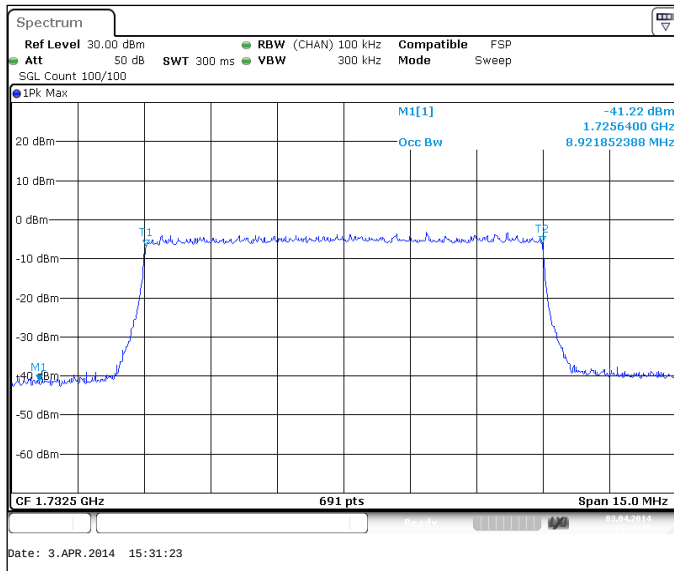
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20175 / 1732.5 MHz



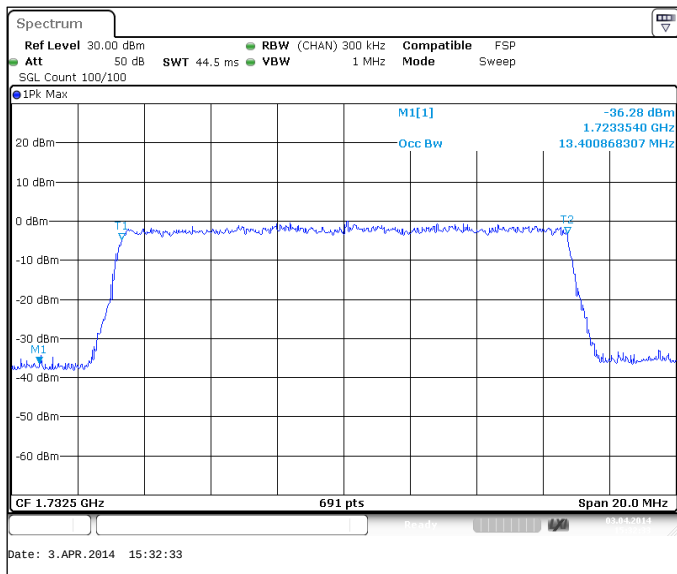
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20175 / 1732.5 MHz



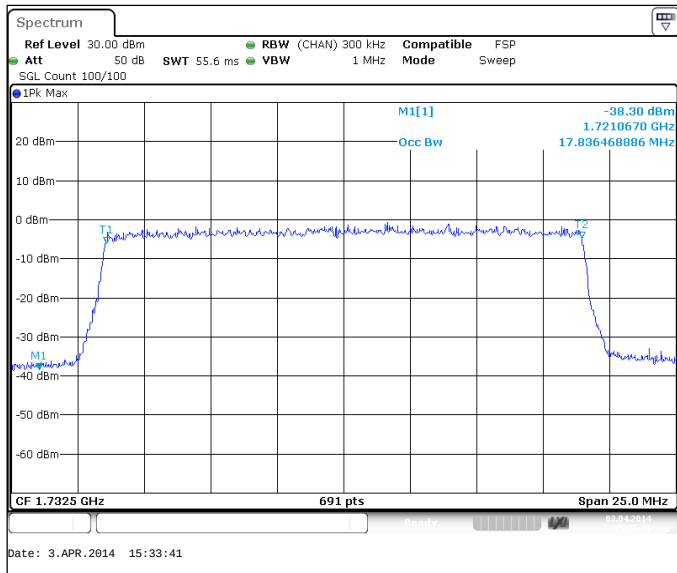
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20175 / 1732.5 MHz



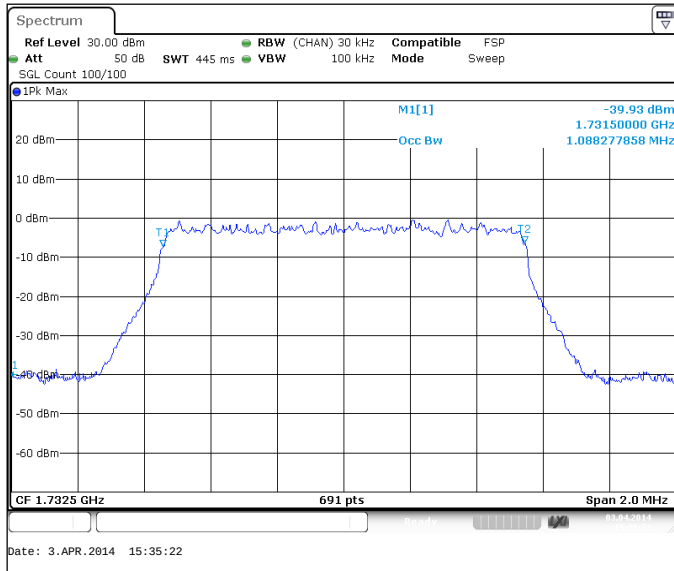
FDD, CBW 15MHz, QPSK, 75 RB, Channel 20175 / 1732.5 MHz



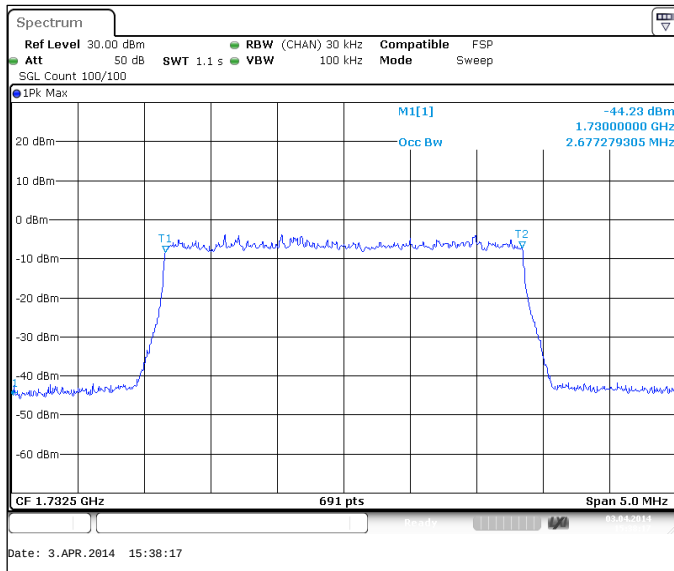
FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz



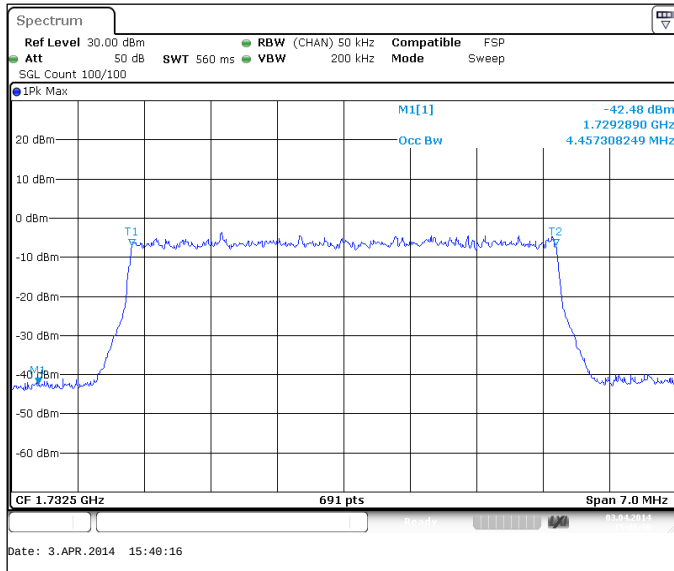
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20175 / 1732.5 MHz



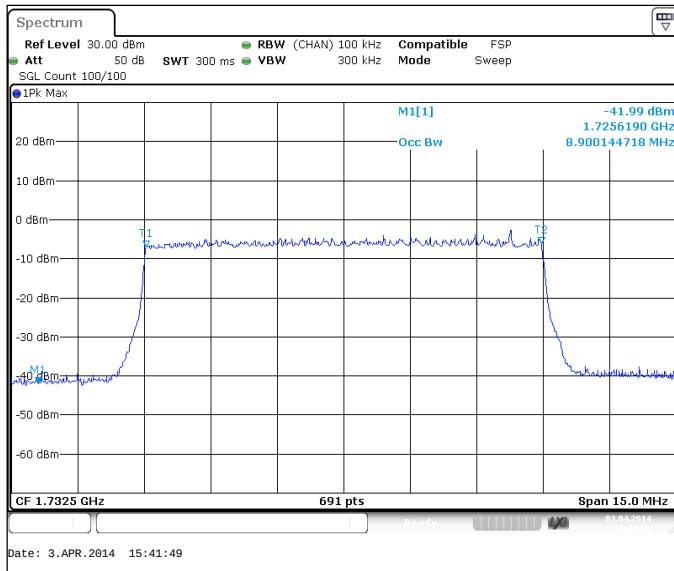
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20175 / 1732.5 MHz



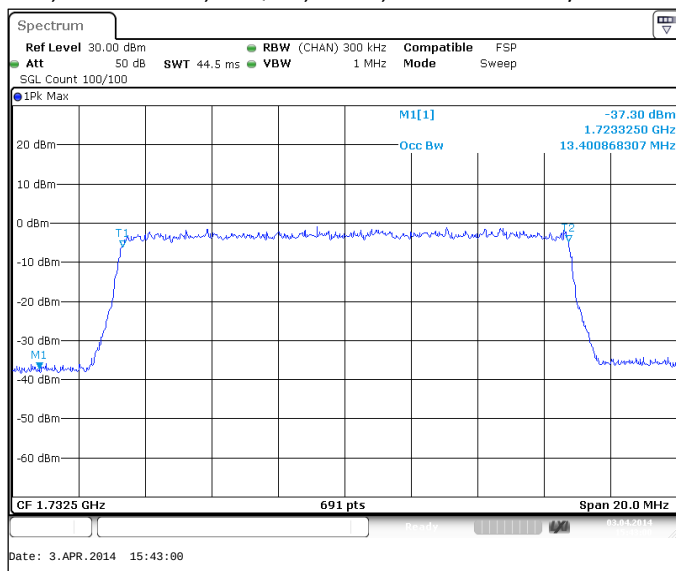
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20175 / 1732.5 MHz



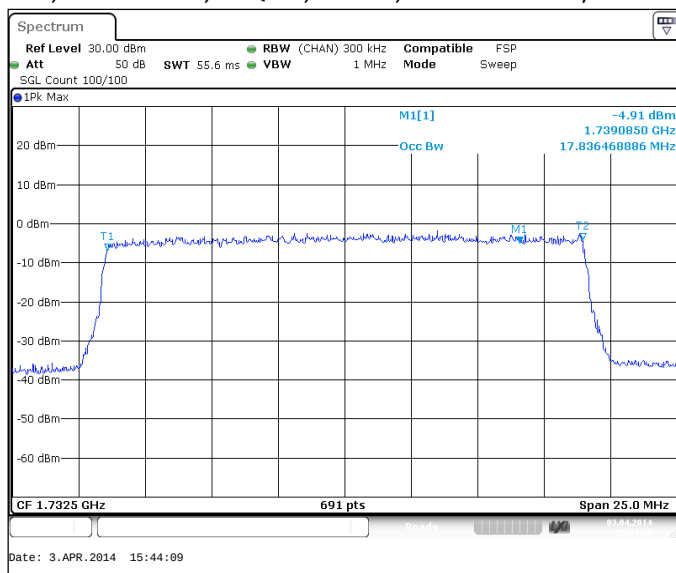
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20175 / 1732.5 MHz



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



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

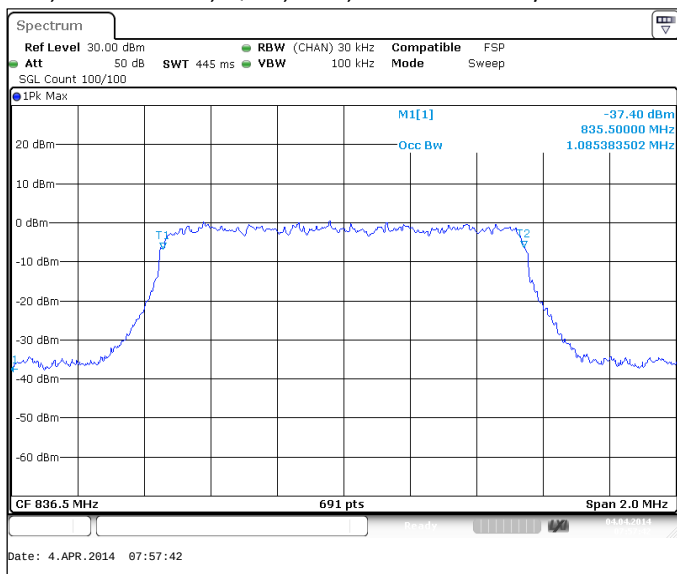


2.9. LTE850 (Band 5) Test results

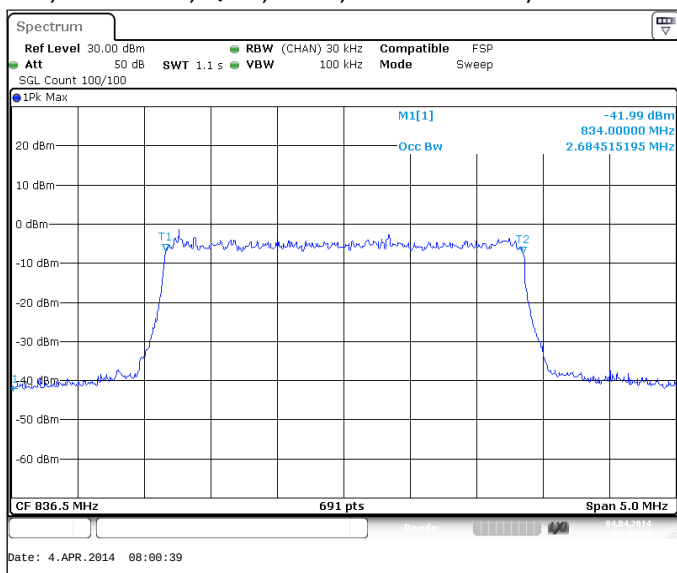
Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1085.4
FDD, CBW 3MHz, QPSK, 15 RB	2684.5
FDD, CBW 5MHz, QPSK, 25 RB	4477.6
FDD, CBW 10MHz, QPSK, 50 RB	8943.6
FDD, CBW 1.4MHz, 16QAM, 6 RB	1088.3

FDD, CBW 3MHz, 16QAM, 15 RB	2677.3
FDD, CBW 5MHz, 16QAM, 25 RB	4457.3
FDD, CBW 10MHz, 16QAM, 50 RB	8943.6

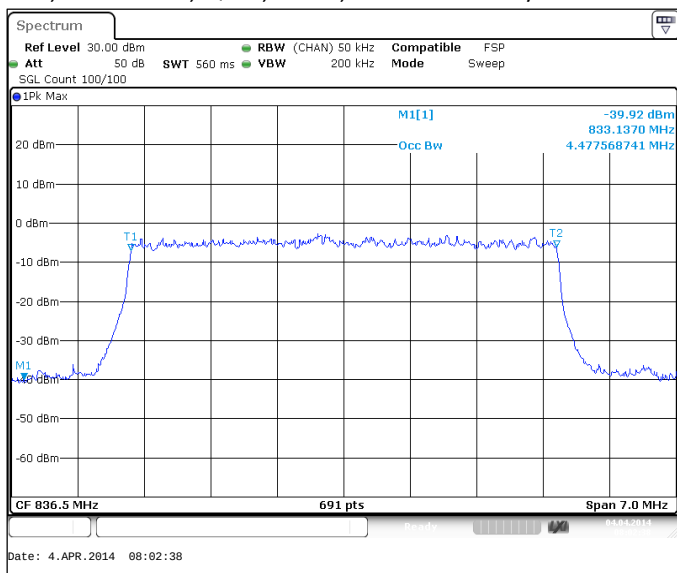
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20525 / 836.5 MHz



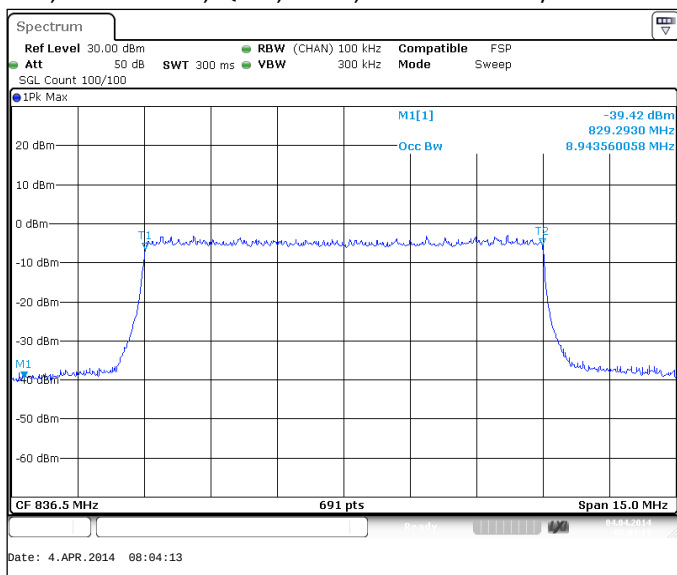
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20525 / 836.5 MHz



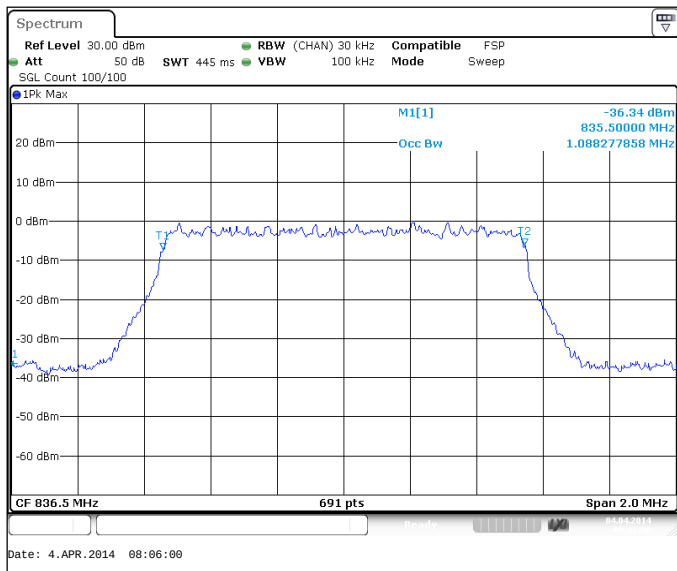
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20525 / 836.5 MHz



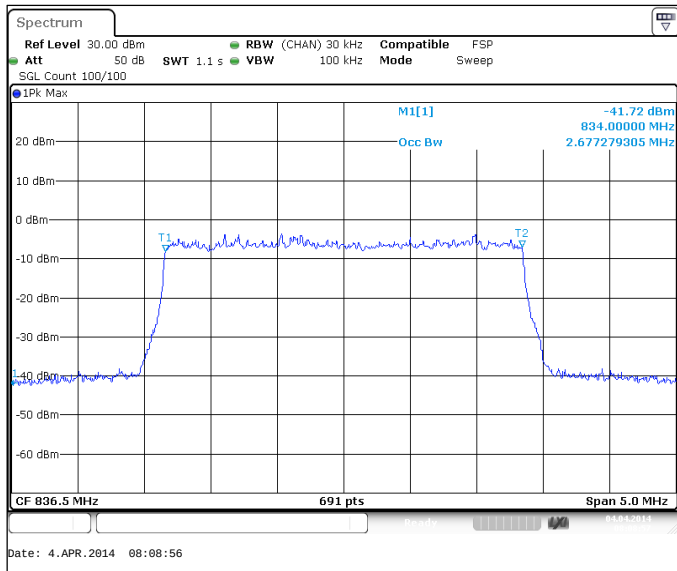
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20525 / 836.5 MHz



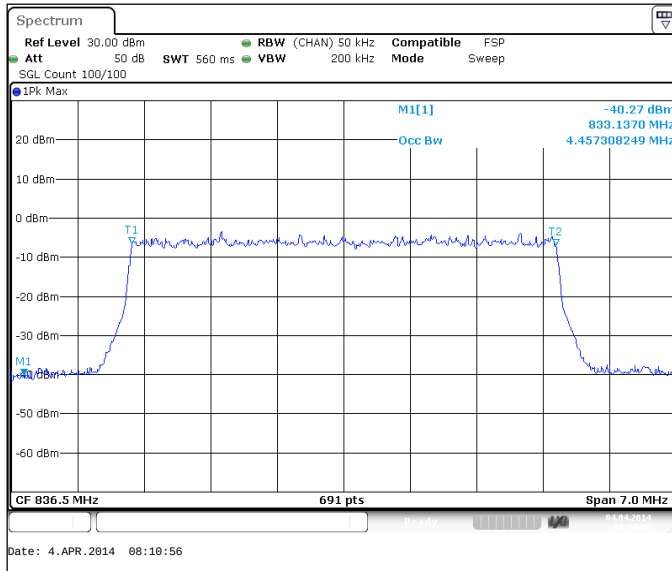
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20525 / 836.5 MHz



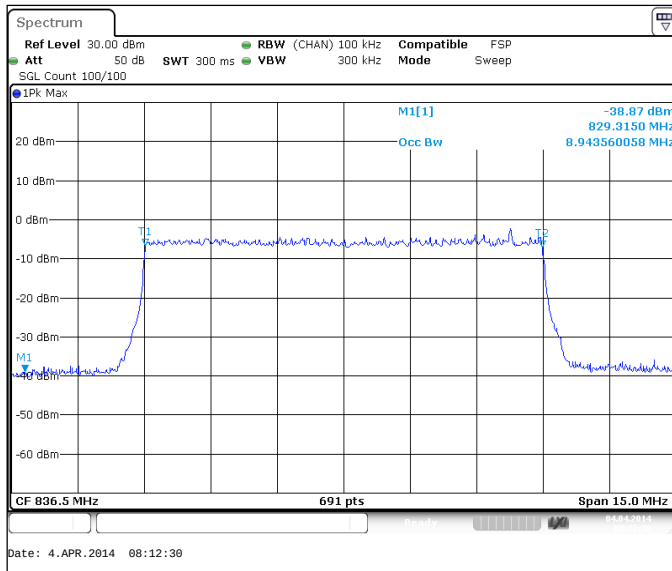
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20525 / 836.5 MHz



FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20525 / 836.5 MHz



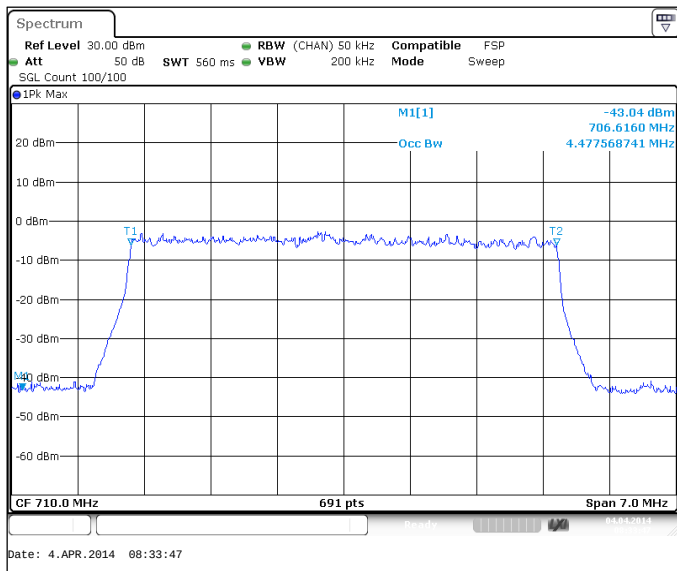
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20525 / 836.5 MHz



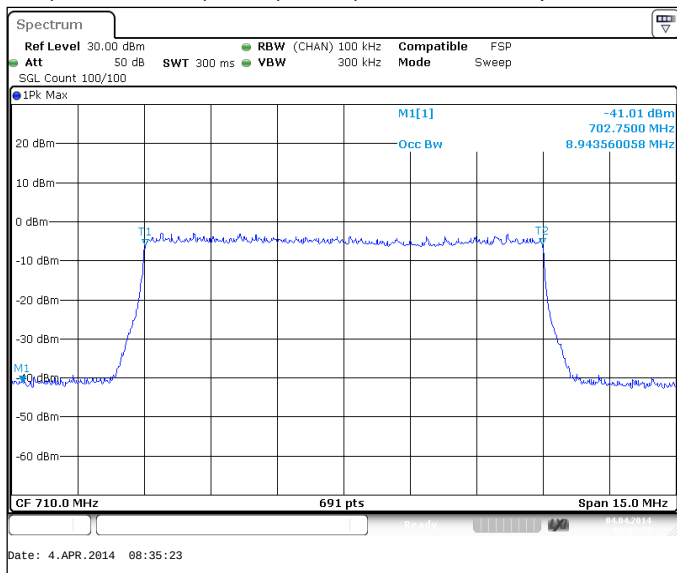
2.10. LTE700 Lower (Band 17) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 5MHz, QPSK, 25 RB	4477.6
FDD, CBW 10MHz, QPSK, 50 RB	8943.6
FDD, CBW 5MHz, 16QAM, 25 RB	4467.4
FDD, CBW 10MHz, 16QAM, 50 RB	8921.9

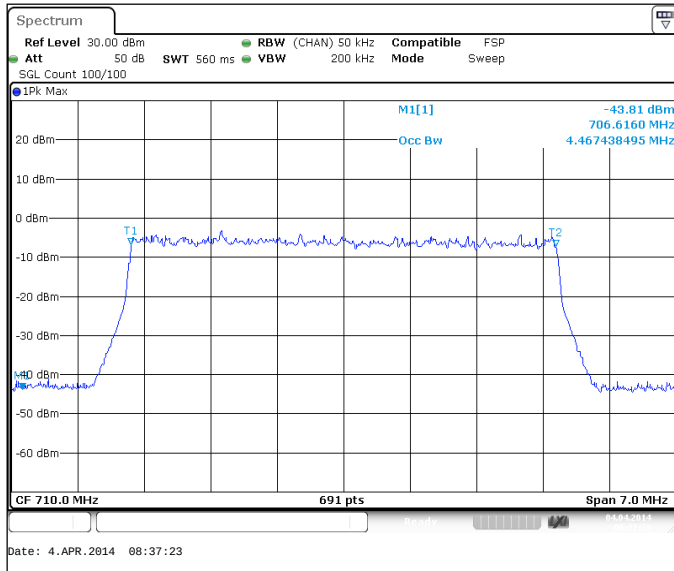
FDD, CBW 5MHz, QPSK, 25 RB, Channel 23790 / 710.0 MHz



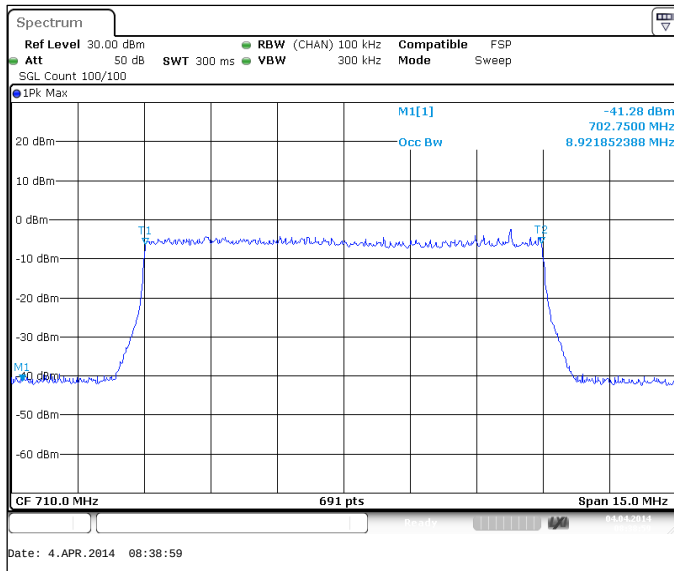
FDD, CBW 10MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz



FDD, CBW 5MHz, 16QAM, 25 RB, Channel 23790 / 710.0 MHz



FDD, CBW 10MHz, 16QAM, 50 RB, Channel 23790 / 710.0 MHz

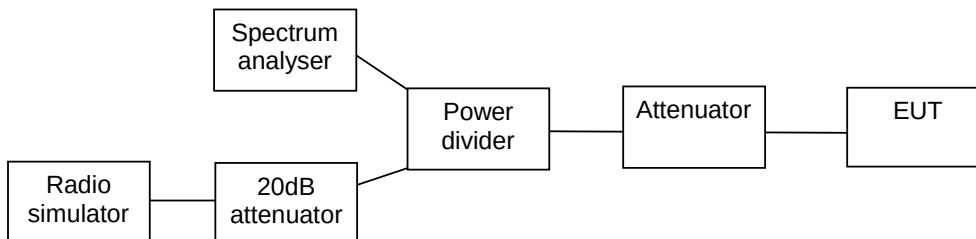


3. Band edge compliance

(FCC §24.238(a), §22.917(a), §27.53(g), RSS-133 6.5, RSS-139 6.5, RSS-132 4.5)

EUT with DUT number	RM-975, DUT 18144; RM-975, DUT 18143
Accessories with DUT numbers	SD-128, DUT 18012 ; WH-108, DUT 18149; SD-128, DUT 18151
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Antenna 1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 101.8
Date of measurements	02-Apr-2014 ... 04-Apr-2014
Measured by	Jari Keto / Kalle Hannila

3.1. Test Setup



3.2. Test method and limit

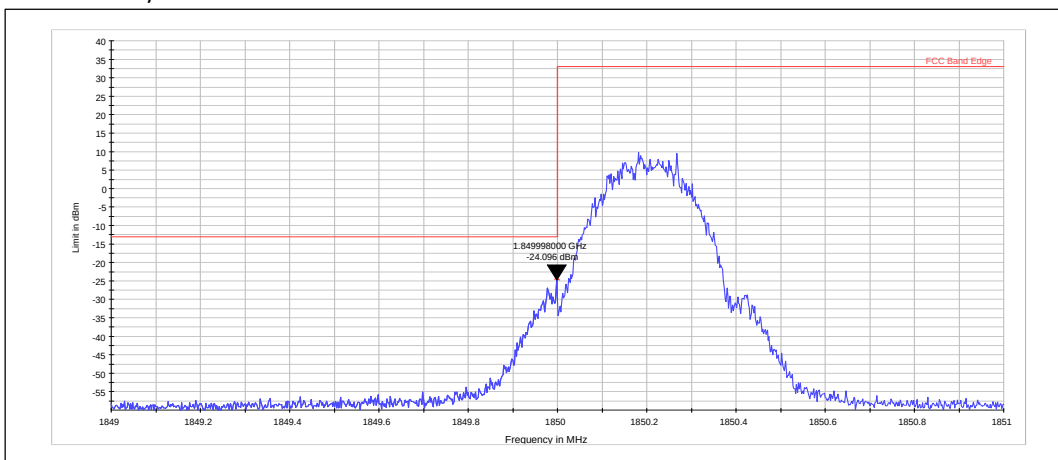
The measurement is made according to applicable FCC rule parts and IC standards.

Limits for band edge compliance measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM 1900	Below 1850 and above 1910	-13
WCDMA 1900	Below 1850 and above 1910	-13
WCDMA 1700	Below 1710 and above 1755	-13
WCDMA 850	Below 824 and above 849	-13

3.3. GSM 1900 Test results

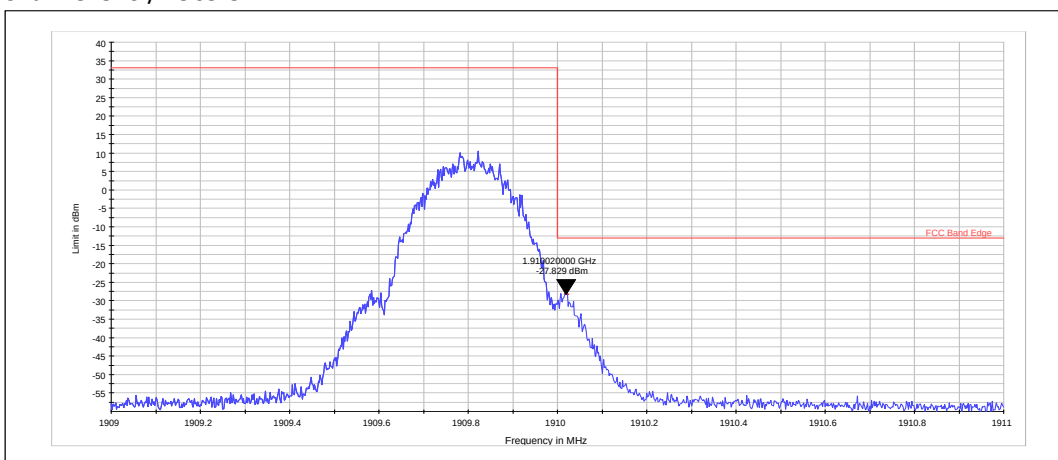
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	1849.998	-24.10	PASSED

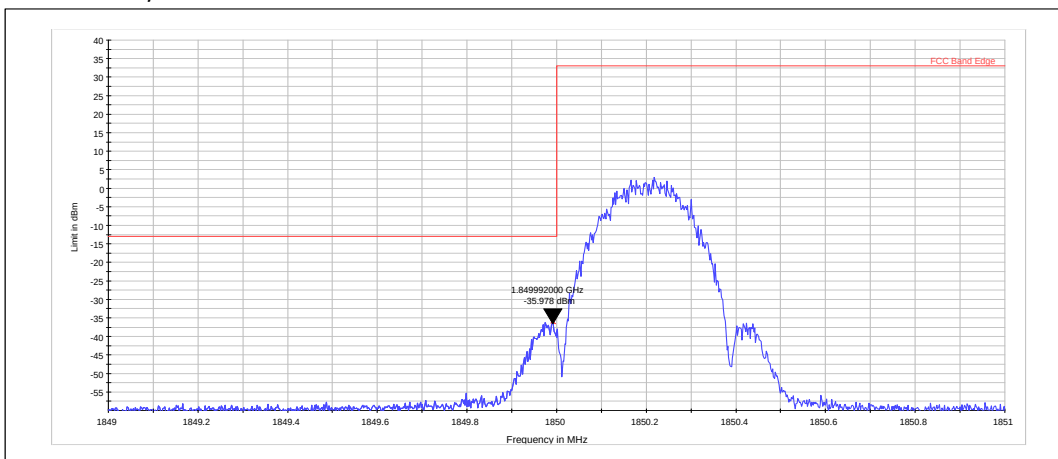
Channel 810 / 1909.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	1910.020	-27.83	PASSED

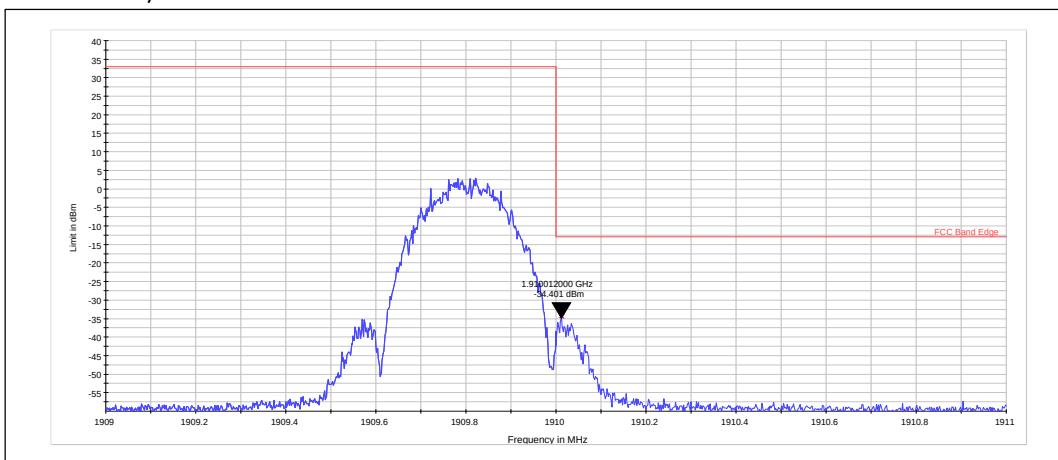
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1849.992	-35.98	PASSED

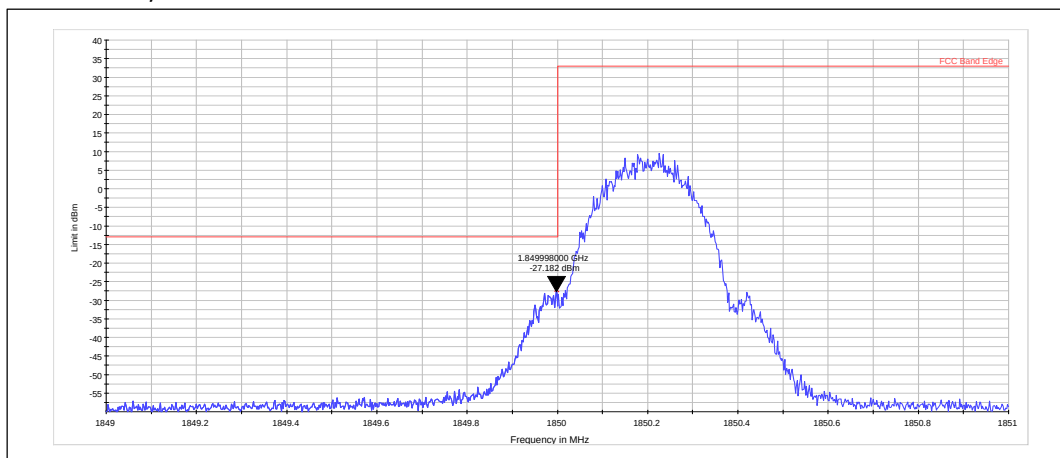
Channel 810 / 1909.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1910.012	-34.40	PASSED

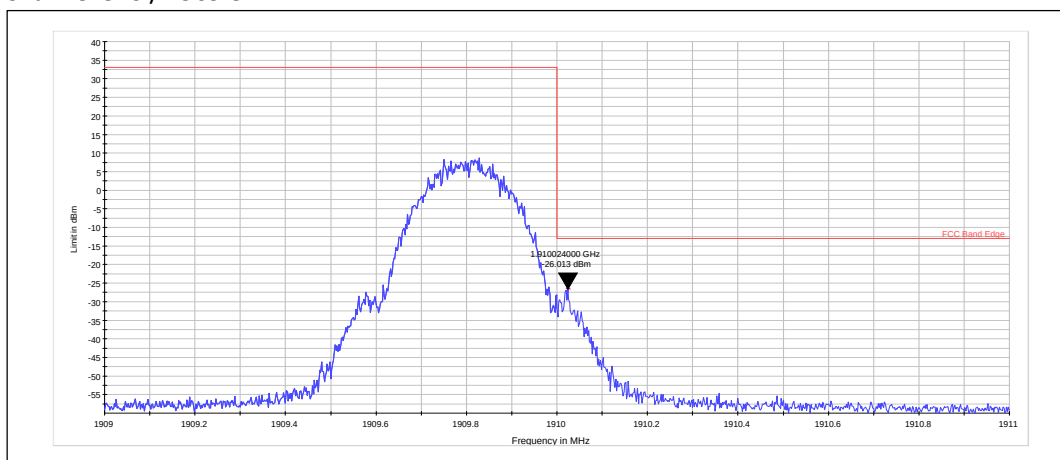
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1849.998	-27.18	PASSED

Channel 810 / 1909.8 MHz

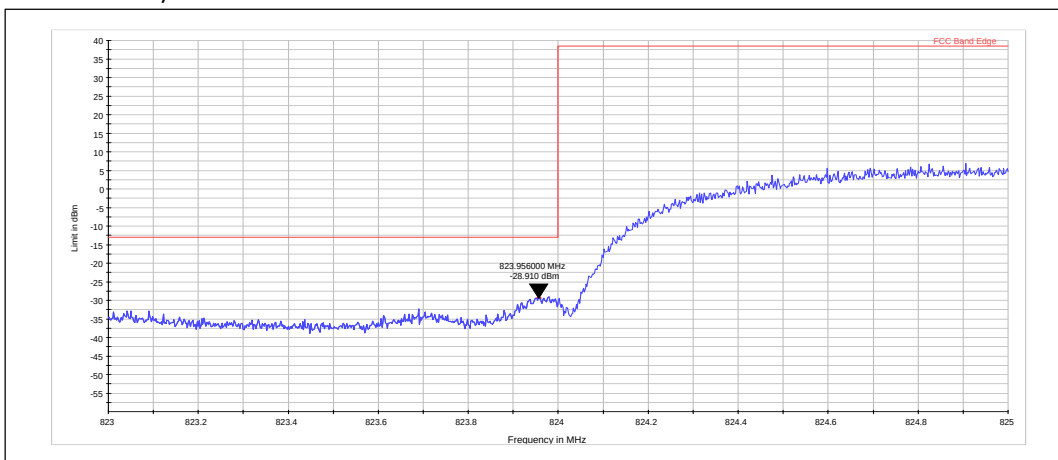


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1910.024	-26.01	PASSED

3.4. WCDMA 850 Test results

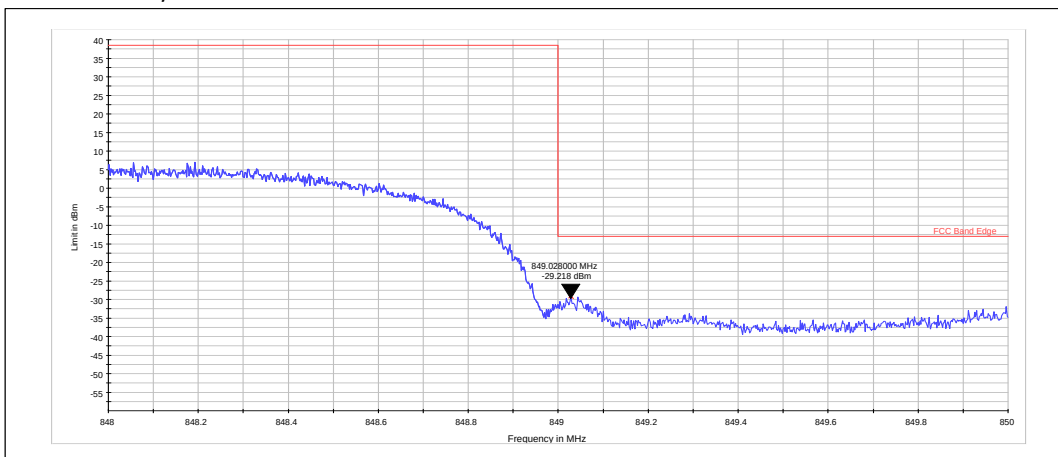
Channel 4132 / 826.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	823.956	-28.91	PASSED

Channel 4233 / 846.6 MHz

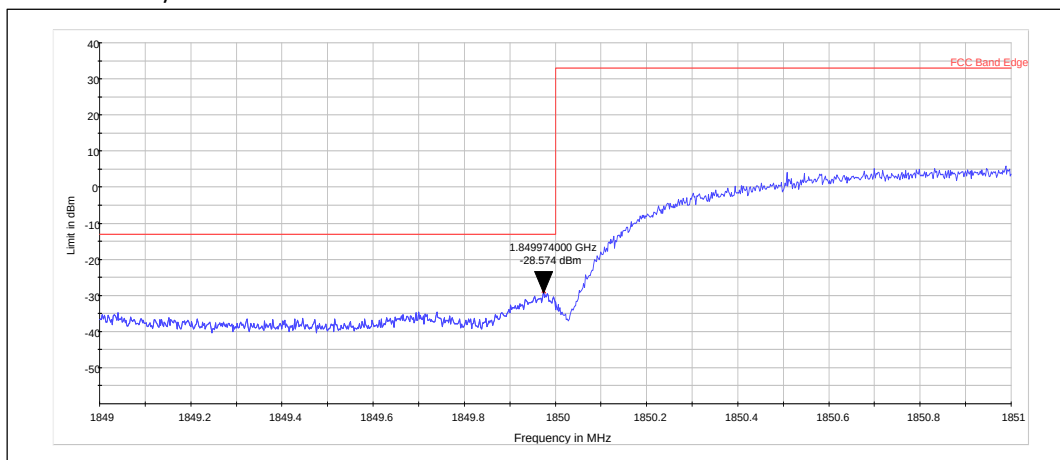


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	849.028	-29.22	PASSED

3.5. WCDMA 1900 Test results

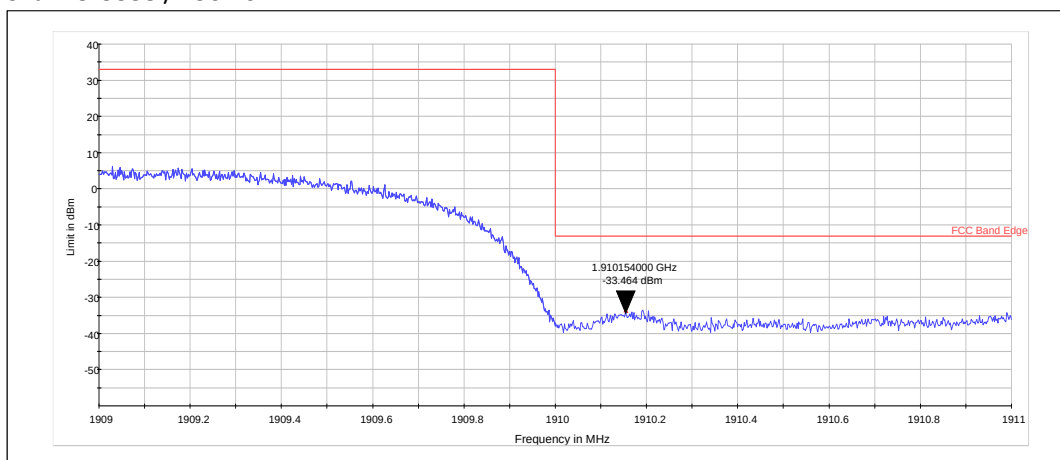
Channel 9262 / 1852.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1849.974	-28.57	PASSED

Channel 9538 / 1907.6 MHz

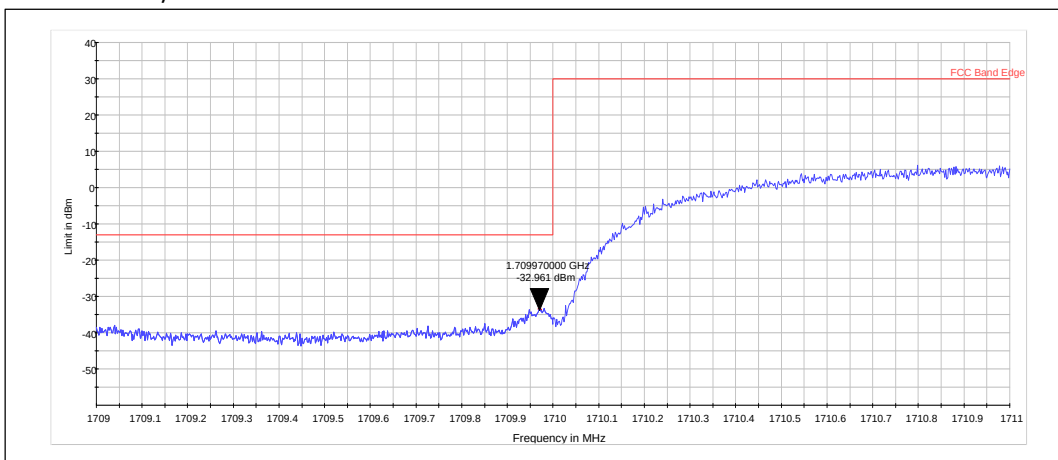


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1910.154	-33.46	PASSED

3.6. WCDMA 1700 Test results

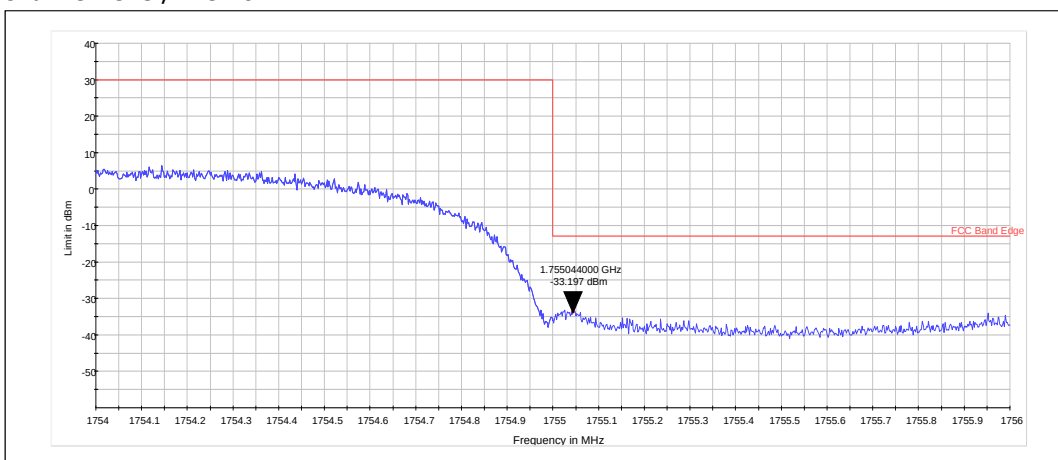
Channel 1312 / 1712.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1709.970	-32.96	PASSED

Channel 1513 / 1752.6 MHz

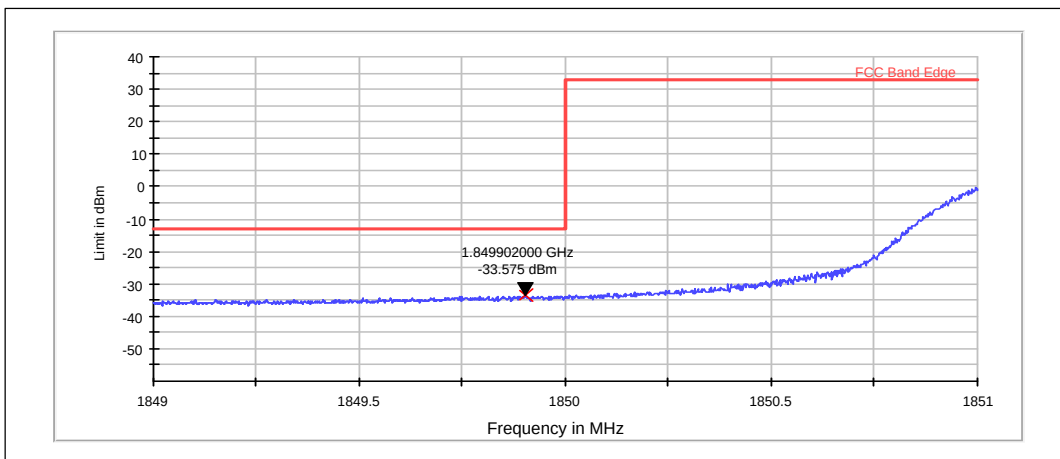


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1755.044	-33.20	PASSED

3.7. LTE1900 (Band 2) Test results

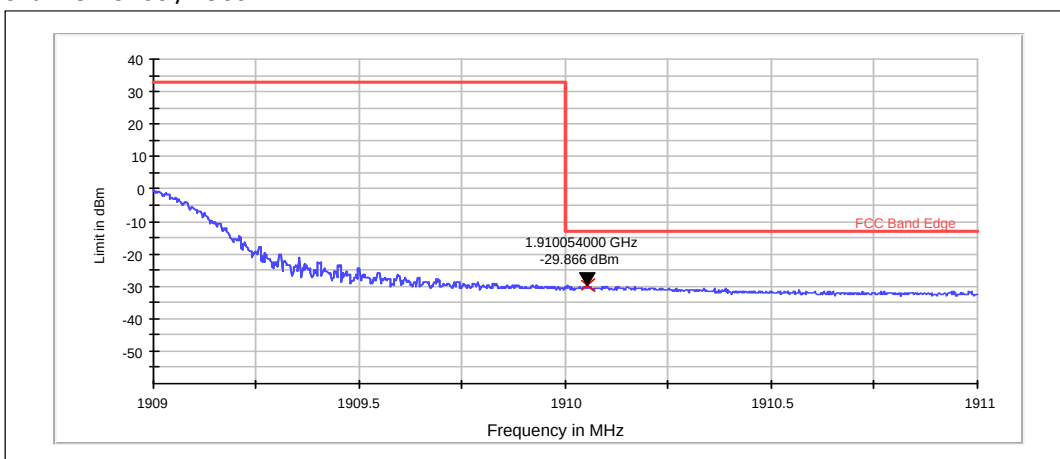
Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1849.902	-33.57	PASSED

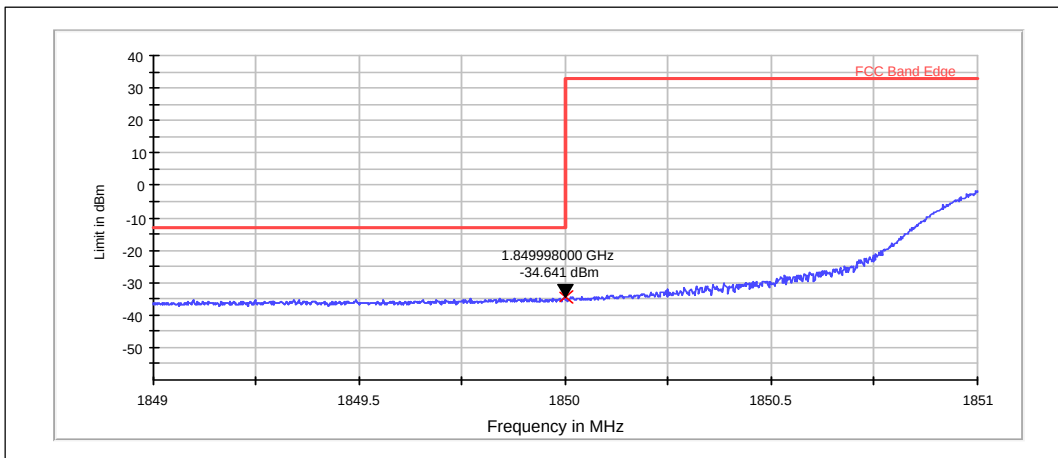
Channel 19100 / 1900 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1910.054	-29.87	PASSED

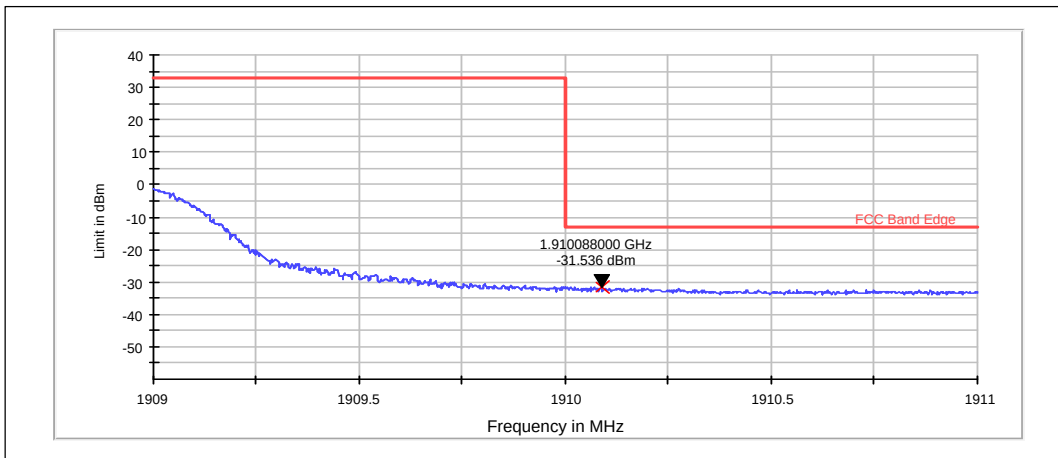
Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1849.998	-34.64	PASSED

Channel 19100 / 1900 MHz

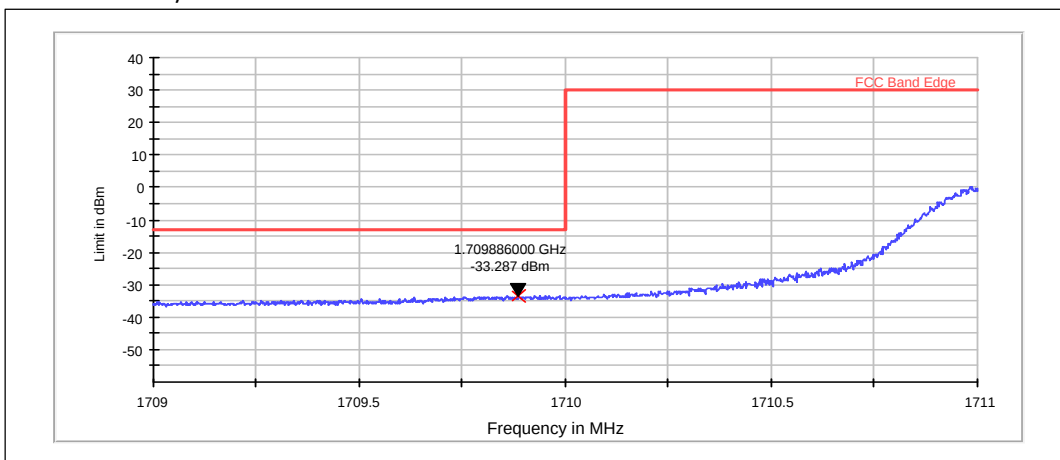


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1910.088	-31.54	PASSED

3.8. LTE1700 (Band 4) Test results

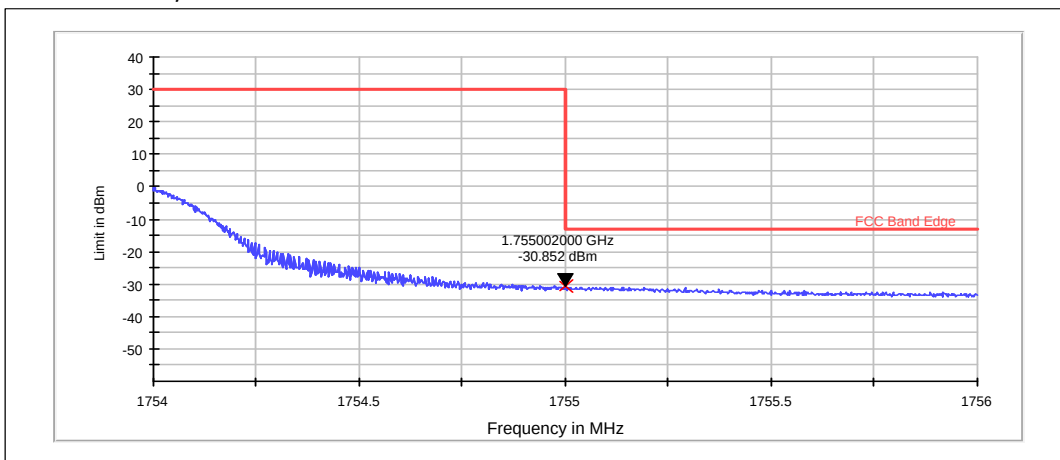
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1709.886	-33.29	PASSED

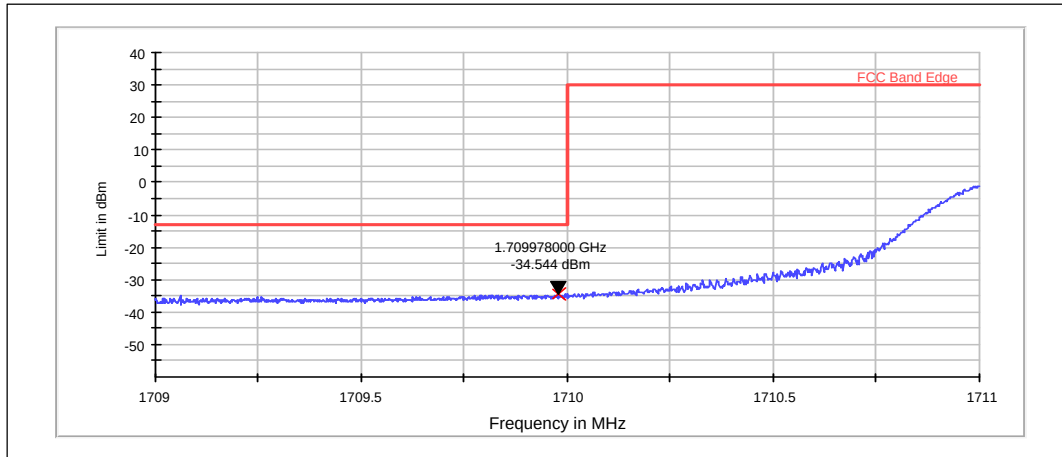
Channel 20300 / 1745 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1755.002	-30.85	PASSED

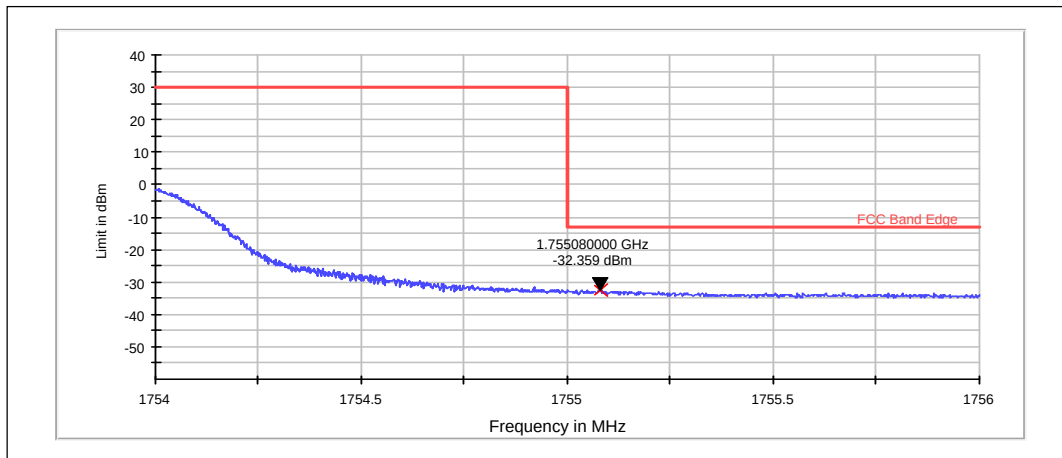
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1709.978	-34.54	PASSED

Channel 20300 / 1745 MHz

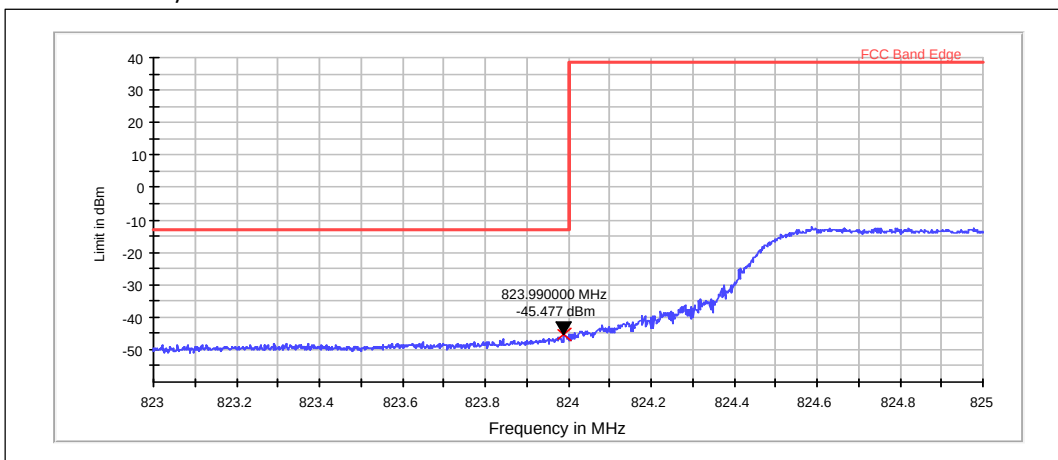


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1755.080	-32.36	PASSED

3.9. LTE850 (Band 5) Test results

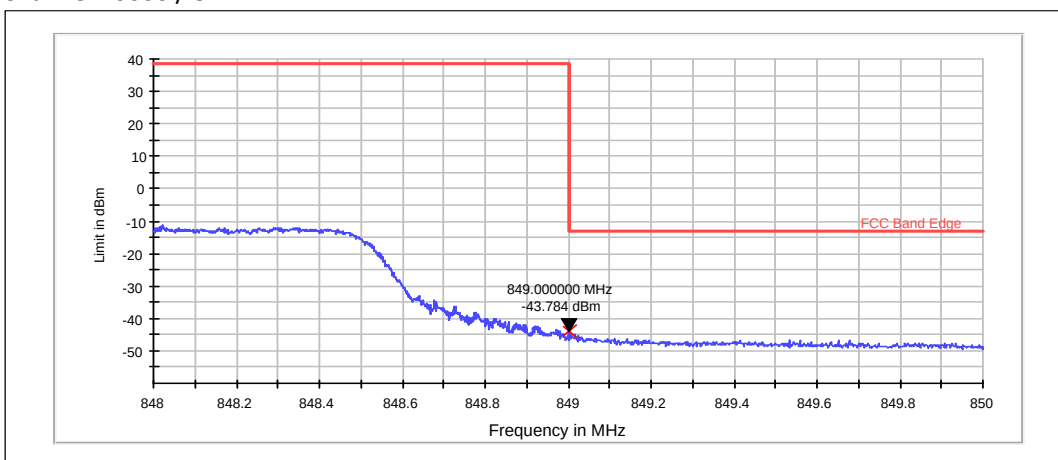
Channel 20450 / 829 MHz



RMS (RBW: 100 kHz, VBW: 100 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	823.990	-45.48	PASSED

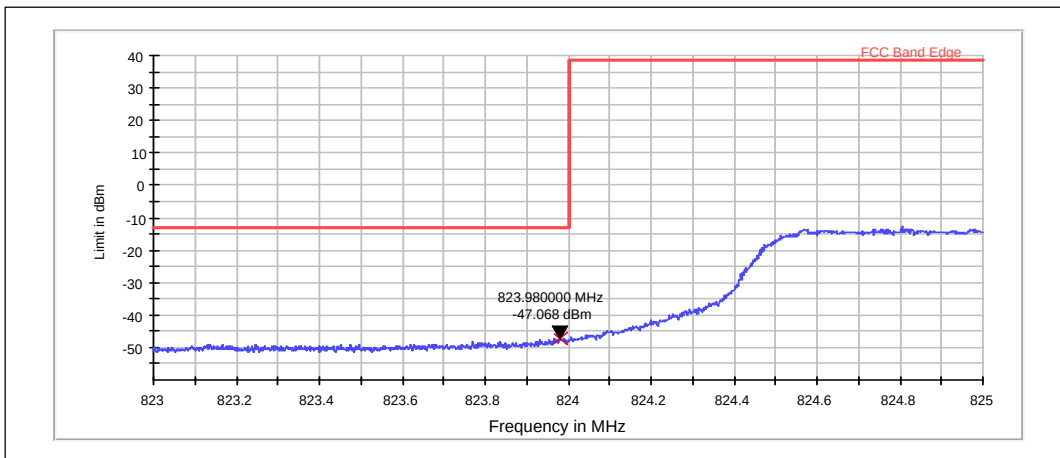
Channel 20600 / 844 MHz



RMS (RBW: 100 kHz, VBW: 100 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	849.000	-43.78	PASSED

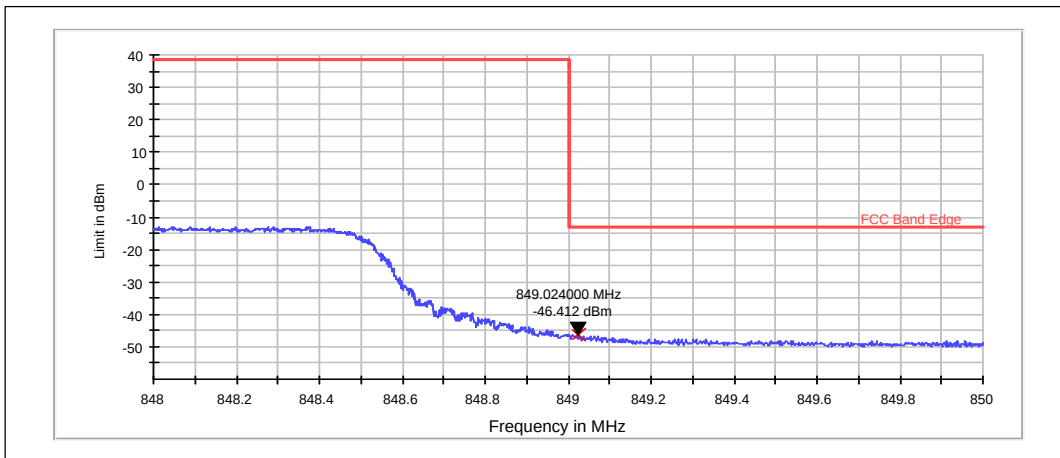
Channel 20450 / 829 MHz



RMS (RBW: 100 kHz, VBW: 100 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	823.980	-47.07	PASSED

Channel 20600 / 844 MHz

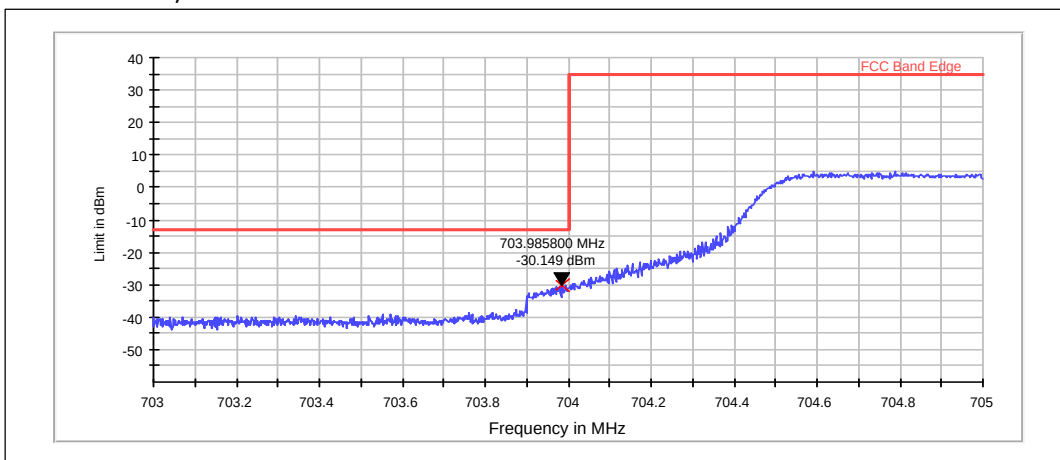


RMS (RBW: 100 kHz, VBW: 100 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	849.024	-46.41	PASSED

3.10. LTE700 Lower (Band 17) Test results

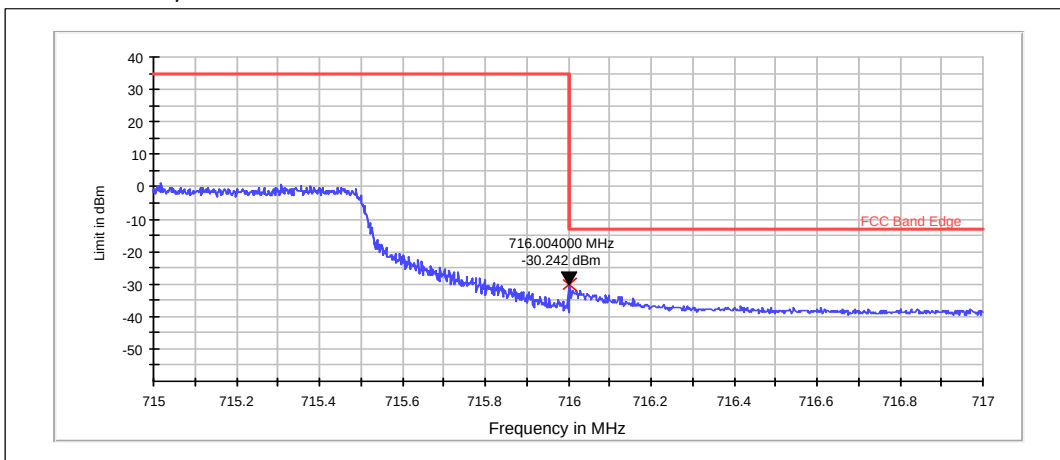
Channel 23780 / 709 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	703.986	-30.15	PASSED

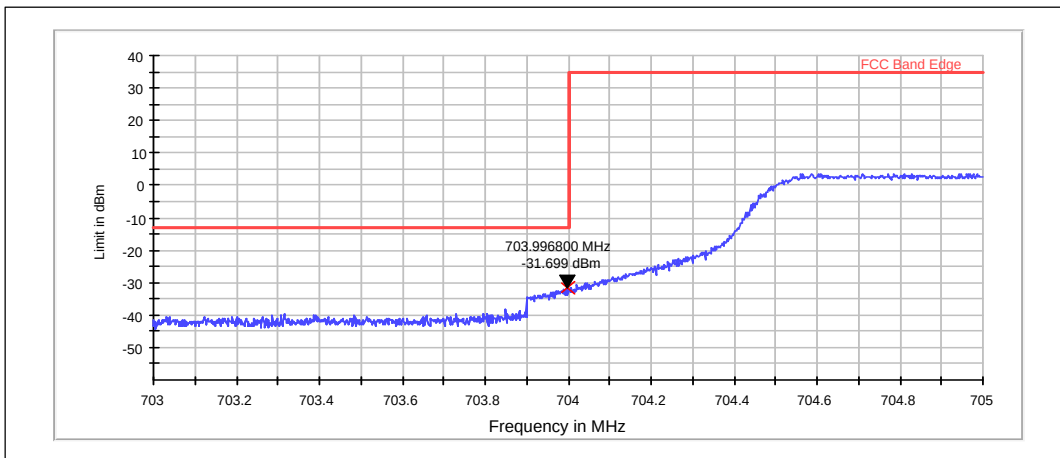
Channel 23800 / 711 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	716.004	-30.24	PASSED

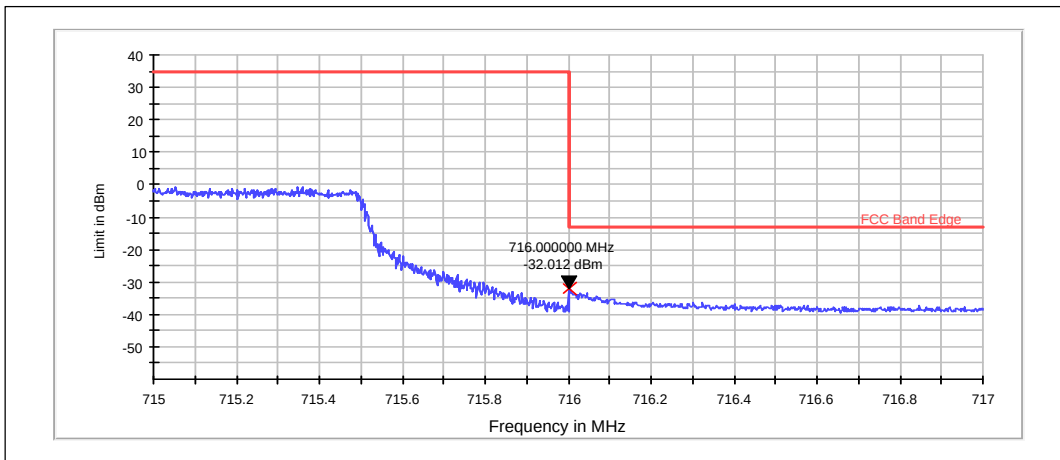
Channel 23780 / 709 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	703.997	-31.70	PASSED

Channel 23800 / 711 MHz



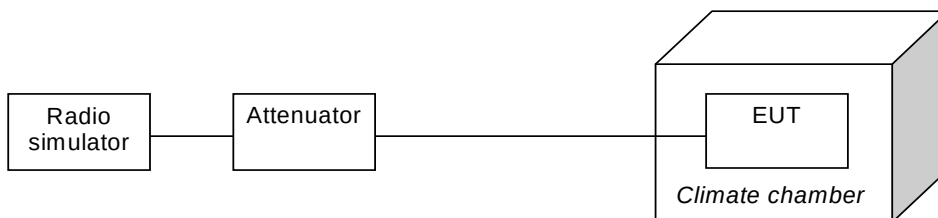
RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	716.000	-32.01	PASSED

4. Frequency stability, temperature variation (FCC §2.1055(a), RSS-133 6.3, RSS-139 6.3)

EUT with DUT number	RM-975, DUT 18144; RM-975, DUT 18143
Accessories with DUT numbers	SD-128, DUT 18012 ; WH-108, DUT 18149; SD-128, DUT 18151
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Antenna 1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 101.8
Date of measurements	03-Apr-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 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

4.3. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880.00	45.14000	0.024	PASSED
40	1880.00	47.33000	0.0252	PASSED
30	1880.00	45.01000	0.0239	PASSED
20	1880.00	42.75000	0.0227	PASSED
10	1880.00	45.39000	0.0241	PASSED
0	1880.00	43.13000	0.0229	PASSED
-10	1880.00	50.56000	0.0269	PASSED
-20	1880.00	54.24000	0.0289	PASSED

4.4. WCDMA 1700 Test results

FDD, Channel 1412 / 1732.4 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1732.40	-1.64795	-0.001	PASSED
40	1732.40	-5.38635	-0.0031	PASSED
30	1732.40	1.23596	0.0007	PASSED
20	1732.40	-1.38855	-0.0008	PASSED
10	1732.40	6.88171	0.004	PASSED
0	1732.40	-3.02124	-0.0017	PASSED
-11	1732.40	1.09863	0.0006	PASSED
-20	1732.40	3.15857	0.0018	PASSED

4.5. LTE700 Lower (Band 17) Test results

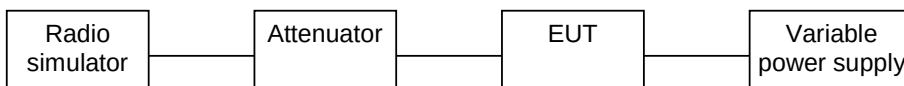
FDD, CBW 10MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	710.00	-0.62943	-0.0009	PASSED
40	710.00	-0.07153	-0.0001	PASSED
30	710.00	-0.22888	-0.0003	PASSED
20	710.00	0.85831	0.0012	PASSED
10	710.00	0.51498	0.0007	PASSED
0	710.00	0.42915	0.0006	PASSED
-10	710.00	0.91553	0.0013	PASSED
-20	710.00	1.27316	0.0018	PASSED

5. Frequency stability, voltage variation (FCC §2.1055(d), RSS-133 6.3, RSS-139 6.3)

EUT with DUT number	RM-975, DUT 18144
Accessories with DUT numbers	SD-128, DUT 18012 ; WH-108, DUT 18149
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Antenna 1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 101.8
Date of measurements	02-Apr-2014
Measured by	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 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

5.3. GSM 1900 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1880.00	43.65000	0.0232	PASSED
Battery cut-off point / 3.5	1880.00	42.81000	0.0228	PASSED
Nominal / 3.7	1880.00	40.74000	0.0217	PASSED

5.4. WCDMA 1700 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1732.40	-2.57874	-0.0015	PASSED
Battery cut-off point / 3.5	1732.40	3.78418	0.0022	PASSED
Nominal / 3.7	1732.40	2.88391	0.0017	PASSED

5.5. LTE700 Lower (Band 17) Test results

FDD, CBW 10MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz

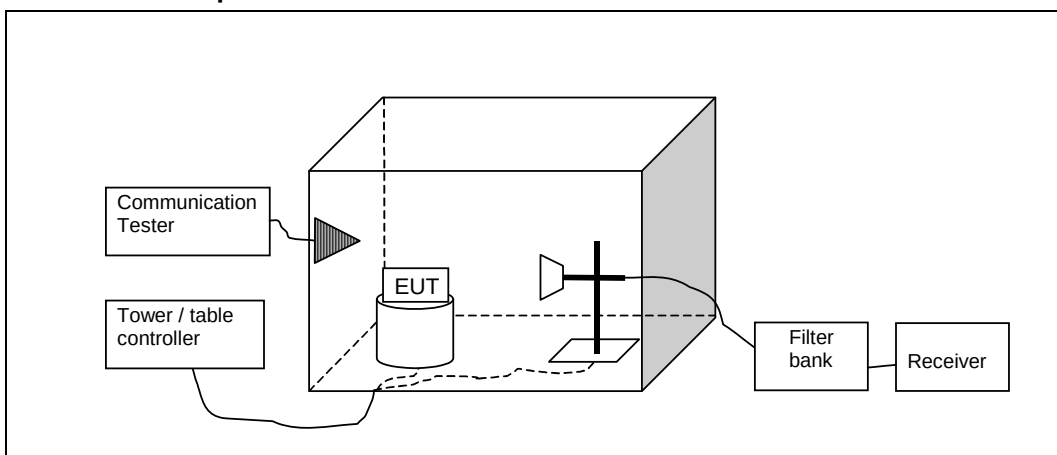
Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	710.00	0.20027	0.0003	PASSED
Battery cut-off point / 3.5	710.00	0.27180	0.0004	PASSED
Nominal / 3.7	710.00	-0.15736	-0.0002	PASSED

6. Spurious radiated emissions

(FCC §22.917(a), §2.1053, §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-975, DUT 18152
Accessories with DUT numbers	BL-5H, DUT 18153 ; WH-108, DUT 17990 ; AC-20E, DUT 17995
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Measured from Antenna 1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.4
Date of measurements	04-Apr-2014
Measured by	Kalle Hannila

6.1.1 Test setup



6.2. Test method and limit

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

The measurement is divided into the Preliminary Measurement and the Final Measurement.

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

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

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

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

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

The substitution method is used.

The measurement results are obtained as described below:

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

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

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM 1900	30 - 19100	-13
WCDMA 1900	30 - 19100	-13
WCDMA 1700	30 - 17500	-13
WCDMA 850	30 - 8500	-13
LTE1900 (Band 2)	30 - 19100	-13
LTE1700 (Band 4)	30 - 17500	-13
LTE850 (Band 5)	30 - 8500	-13
LTE700 Lower (Band 17)	30 - 7200	-13 (RBW = 100 kHz, ERP)

6.3. GSM 1900 EDGE test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3759.9	-56.87	0.00206	-63.37	6.5	HORIZONTAL	PASSED
5640.14	-49.84	0.01038	-59.94	10.1	HORIZONTAL	PASSED

6.4. GSM 1900 test results

Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
9268.297	-45.43	0.02864	-66.63	21.2	HORIZONTAL	PASSED
9333.667	-43.01	0.05	-65.51	22.5	VERTICAL	PASSED
9515.431	-43.57	0.04395	-65.57	22	VERTICAL	PASSED
9738.076	-43.2	0.04786	-65.5	22.3	VERTICAL	PASSED
9750.741	-43.15	0.04842	-65.55	22.4	VERTICAL	PASSED
9919.439	-43.62	0.04345	-66.22	22.6	VERTICAL	PASSED

6.5. WCDMA 1900 test results

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3762.305	-50.37	0.00918	-56.87	6.5	HORIZONTAL	PASSED
5648.196	-49.95	0.01012	-60.45	10.5	HORIZONTAL	PASSED
7525.912	-46.36	0.02312	-62.36	16	HORIZONTAL	PASSED
9260.862	-44.09	0.03899	-65.59	21.5	VERTICAL	PASSED
9299.018	-43.08	0.0492	-65.48	22.4	VERTICAL	PASSED
9335.251	-42.91	0.05117	-65.41	22.5	VERTICAL	PASSED
9390.321	-42.88	0.05152	-64.18	21.3	VERTICAL	PASSED
9501.463	-43.68	0.04285	-65.08	21.4	HORIZONTAL	PASSED
9749.479	-42.91	0.05117	-65.31	22.4	VERTICAL	PASSED
9903.106	-41.81	0.06592	-64.61	22.8	VERTICAL	PASSED
11277.856	-40.4	0.0912	-63.8	23.4	HORIZONTAL	PASSED
13151.804	-51.09	0.00778	-68.29	17.2	VERTICAL	PASSED
15032.325	-49.65	0.01084	-71.45	21.8	VERTICAL	PASSED
16910.281	-46.48	0.02249	-71.98	25.5	VERTICAL	PASSED

6.6. WCDMA 1700 test results

Channel 1412 / 1732.4 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3463.177	-48.45	0.01429	-54.35	5.9	HORIZONTAL	PASSED
5193.252	-51.46	0.00714	-61.76	10.3	HORIZONTAL	PASSED
6931.985	-46.66	0.02158	-60.46	13.8	HORIZONTAL	PASSED
8670.236	-44.98	0.03177	-64.08	19.1	HORIZONTAL	PASSED
9507.916	-43.15	0.04842	-65.25	22.1	VERTICAL	PASSED
9737.735	-43.27	0.0471	-65.57	22.3	VERTICAL	PASSED
9751.603	-43.79	0.04178	-66.19	22.4	VERTICAL	PASSED
9883.667	-43.11	0.04887	-65.81	22.7	VERTICAL	PASSED
10386.244	-42.7	0.0537	-65	22.3	HORIZONTAL	PASSED
11973.567	-41.53	0.07031	-64.23	22.7	HORIZONTAL	PASSED
12078.257	-41.41	0.07228	-64.21	22.8	VERTICAL	PASSED
12132.231	-42.12	0.06138	-64.42	22.3	VERTICAL	PASSED
13852.567	-51.15	0.00767	-69.45	18.3	HORIZONTAL	PASSED
15601.36	-46.73	0.02123	-71.63	24.9	VERTICAL	PASSED
17321.936	-44.06	0.03926	-71.26	27.2	VERTICAL	PASSED

6.7. WCDMA 850 test results

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
848.382	-45.67	0.0271	-80.17	34.5	HORIZONTAL	PASSED
853.691	-46.09	0.0246	-80.79	34.7	VERTICAL	PASSED
855.867	-45.95	0.02541	-80.75	34.8	VERTICAL	PASSED
955.321	-41.01	0.07925	-80.81	39.8	HORIZONTAL	PASSED
959.775	-38.57	0.139	-78.87	40.3	HORIZONTAL	PASSED
962.685	-39	0.12589	-79	40	HORIZONTAL	PASSED
1661.563	-56.25	0.00237	-62.45	6.2	VERTICAL	PASSED
2507.064	-51.69	0.00678	-63.69	12	HORIZONTAL	PASSED
3344.028	-58.64	0.00137	-62.34	3.7	HORIZONTAL	PASSED
4169.369	-58.13	0.00154	-63.53	5.4	HORIZONTAL	PASSED
5011.984	-54.15	0.00385	-62.95	8.8	HORIZONTAL	PASSED
5836.643	-53.39	0.00458	-61.89	8.5	VERTICAL	PASSED
6679.739	-49.28	0.0118	-59.88	10.6	VERTICAL	PASSED
7506.643	-49.04	0.01247	-63.44	14.4	VERTICAL	PASSED
8352.906	-49.11	0.01227	-65.21	16.1	VERTICAL	PASSED

6.8. LTE1900 (Band 2) test results

Channel 18900 / 1880.0 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1910.106	-63.6	0.00044	-73	9.4	HORIZONTAL	PASSED
3760.381	-57.25	0.00188	-63.75	6.5	HORIZONTAL	PASSED
5640.461	-59.78	0.00105	-69.88	10.1	HORIZONTAL	PASSED
7524.028	-58.55	0.0014	-74.65	16.1	HORIZONTAL	PASSED

Channel 18900 / 1880.0 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3760.381	-56.67	0.00215	-63.17	6.5	HORIZONTAL	PASSED
5640.501	-61.56	0.0007	-71.66	10.1	HORIZONTAL	PASSED
7522.104	-58.53	0.0014	-74.63	16.1	HORIZONTAL	PASSED

6.9. LTE1700 (Band 4) test results

Channel 20175 / 1732.5 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3465.381	-51.38	0.00728	-57.28	5.9	HORIZONTAL	PASSED
5197.801	-62.27	0.00059	-72.47	10.2	HORIZONTAL	PASSED
6929.579	-58.33	0.00147	-72.23	13.9	VERTICAL	PASSED
8671.298	-57.01	0.00199	-76.11	19.1	HORIZONTAL	PASSED
10385	-53.69	0.00428	-76.09	22.4	VERTICAL	PASSED

Channel 20175 / 1732.5 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3465.421	-52.18	0.00605	-58.08	5.9	HORIZONTAL	PASSED
5198.121	-62.55	0.00056	-72.75	10.2	HORIZONTAL	PASSED
6930.782	-57.85	0.00164	-71.65	13.8	HORIZONTAL	PASSED
8672.46	-57.36	0.00184	-76.16	18.8	VERTICAL	PASSED
10385	-53.69	0.00428	-76.09	22.4	VERTICAL	PASSED

6.10. LTE850 (Band 5) test results

Channel 20525 / 836.5 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
850.144	-58.75	0.00133	-93.05	34.3	HORIZONTAL	PASSED
880.518	-52.91	0.00512	-88.61	35.7	HORIZONTAL	PASSED
962.276	-50.52	0.00887	-90.52	40	HORIZONTAL	PASSED
1673.301	-66.05	0.00025	-71.45	5.4	HORIZONTAL	PASSED
2510.161	-61.68	0.00068	-73.58	11.9	HORIZONTAL	PASSED
3346.621	-76.65	2E-05	-80.25	3.6	HORIZONTAL	PASSED

Channel 20525 / 836.5 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
856.256	-56.26	0.00237	-90.56	34.3	HORIZONTAL	PASSED
880.969	-51.34	0.00735	-87.04	35.7	HORIZONTAL	PASSED
957.637	-50.47	0.00897	-90.57	40.1	HORIZONTAL	PASSED
1673.22	-67.64	0.00017	-73.04	5.4	HORIZONTAL	PASSED
2509.961	-60.25	0.00094	-72.15	11.9	HORIZONTAL	PASSED
3346.501	-77.34	2E-05	-80.94	3.6	HORIZONTAL	PASSED

6.11. LTE700 Lower (Band 17) test results

Channel 23790 / 710 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1420.421	-61.95	0.00064	-66.45	4.5	HORIZONTAL	PASSED
2130.581	-70.09	0.0001	-79.69	9.6	HORIZONTAL	PASSED
2844.749	-68.5	0.00014	-82.6	14.1	HORIZONTAL	PASSED

Channel 23790 / 710 MHz

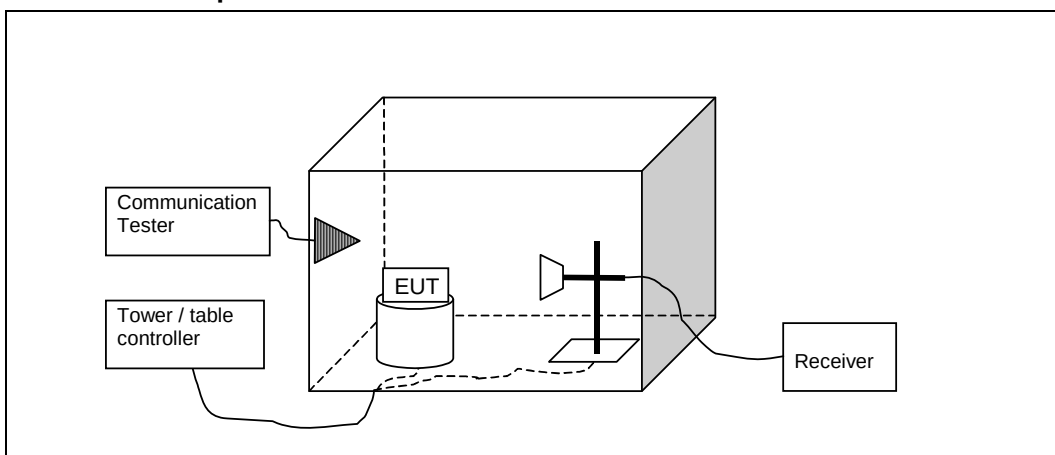
FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1420.301	-62.81	0.00052	-67.31	4.5	HORIZONTAL	PASSED
2130.461	-70.73	8E-05	-80.33	9.6	HORIZONTAL	PASSED
2843.747	-68.52	0.00014	-82.52	14	HORIZONTAL	PASSED

7. Radiated RF output power (FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4)

EUT with DUT number	RM-975, DUT 18152
Accessories with DUT numbers	BL-5H, DUT 18153
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Antenna 1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.4
Date of measurements	08-Apr-2014
Measured by	Sami Lehtonen

7.1.1 Test setup



7.2. Test method and limit

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

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

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

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

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

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

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
824 - 849	7 ERP	38.5
1850 - 1910	2 EIRP	33

7.3. GSM 1900 test results

RMS detector

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
512 / 1850.2	30.85	1.217	-13.61	44.46	HORIZONTAL	PASSED
661 / 1880	32.66	1.843	-12.35	45.01	HORIZONTAL	PASSED
810 / 1909.8	31.77	1.505	-13.66	45.43	HORIZONTAL	PASSED

7.4. GSM 1900-E1 test results

RMS detector

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
512 / 1850.2	26.66	0.463	-17.8	44.46	HORIZONTAL	PASSED
661 / 1880	28.55	0.716	-16.46	45.01	HORIZONTAL	PASSED
810 / 1909.8	27.4	0.549	-18.03	45.43	HORIZONTAL	PASSED

7.5. WCDMA 1900 test results

RMS detector

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
9262 / 1852.4	23.46	0.222	-21.1	44.56	HORIZONTAL	PASSED
9400 / 1880	25.36	0.343	-19.65	45.01	HORIZONTAL	PASSED
9538 / 1907.6	24.43	0.277	-21.04	45.47	HORIZONTAL	PASSED

7.6. WCDMA 1700 test results

RMS detector

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1312 / 1712.4	22.92	0.196	-21.32	44.24	HORIZONTAL	PASSED
1412 / 1732.4	23.27	0.212	-20.74	44.01	HORIZONTAL	PASSED
1513 / 1752.6	23.87	0.244	-20.32	44.19	HORIZONTAL	PASSED

7.7. WCDMA 850 test results

RMS detector

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
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4132 / 826.4	20.47	0.111	-15.85	36.32	HORIZONTAL	PASSED
4175 / 835	20.41	0.11	-15.47	35.88	HORIZONTAL	PASSED
4233 / 846.6	19.42	0.087	-15.55	34.97	VERTICAL	PASSED

7.8. LTE1900 (Band 2) test results

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

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
18625 / 1852.5	23.63	0.231	-20.94	44.57	HORIZONTAL	PASSED
18900 / 1880	26.45	0.442	-18.56	45.01	HORIZONTAL	PASSED
19175 / 1907.5	25.56	0.36	-19.91	45.47	HORIZONTAL	PASSED

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

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
18625 / 1852.5	23.47	0.222	-21.1	44.57	HORIZONTAL	PASSED
18900 / 1880	26.47	0.443	-18.54	45.01	HORIZONTAL	PASSED
19175 / 1907.5	25.56	0.36	-19.91	45.47	HORIZONTAL	PASSED

7.9. LTE1700 (Band 4) test results

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

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
19975 / 1712.5	23.78	0.239	-20.46	44.24	HORIZONTAL	PASSED
20175 / 1732.5	23.96	0.249	-20.05	44.01	HORIZONTAL	PASSED
20375 / 1752.5	24.43	0.277	-19.76	44.19	HORIZONTAL	PASSED

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

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
19975 / 1712.5	23.68	0.233	-20.56	44.24	HORIZONTAL	PASSED
20175 / 1732.5	24	0.251	-20.01	44.01	HORIZONTAL	PASSED
20375 / 1752.5	24.34	0.272	-19.85	44.19	HORIZONTAL	PASSED

7.10. LTE850 (Band 5) test results

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

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
20425 / 826.5	21.57	0.144	-14.74	36.31	HORIZONTAL	PASSED
20525 / 836.5	21.22	0.132	-14.62	35.84	VERTICAL	PASSED
20625 / 846.5	20.63	0.116	-14.35	34.98	VERTICAL	PASSED

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

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
20425 / 826.5	21.74	0.149	-14.57	36.31	HORIZONTAL	PASSED
20525 / 836.5	21.01	0.126	-14.83	35.84	VERTICAL	PASSED
20625 / 846.5	20.18	0.104	-14.8	34.98	VERTICAL	PASSED

7.11. LTE700 Lower (Band 17) test results

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

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
23755 / 706.5	14.56	0.029	-17.33	31.89	HORIZONTAL	PASSED
23790 / 710	14.33	0.027	-18.55	32.88	VERTICAL	PASSED
23825 / 713.5	14.47	0.028	-18.83	33.3	VERTICAL	PASSED

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

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
23755 / 706.5	14.69	0.029	-17.96	32.65	VERTICAL	PASSED
23790 / 710	14.38	0.027	-17.57	31.95	HORIZONTAL	PASSED
23825 / 713.5	14.23	0.027	-17.86	32.09	HORIZONTAL	PASSED

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

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
23755 / 706.5	14.35	0.027	-18.3	32.65	VERTICAL	PASSED
23790 / 710	14.27	0.027	-17.68	31.95	HORIZONTAL	PASSED
23825 / 713.5	14.34	0.027	-17.75	32.09	HORIZONTAL	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 µH	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 µH	ESH3-Z5	R&S	15C, 15B
1759	LISN 50 µH	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