

FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RM-985_01.docx	Date of Report:	19-Aug-2014
Number of pages:	64	Customer's Contact person:	Victoria Abadilla
Testing laboratory:	TCC Microsoft San Diego Laboratory 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +16193313765	Customer:	Microsoft San Diego 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +1 858 831 5000 Fax. +1 858 385 1598
FCC listing no.:	586140		
IC recognition no.:	10162A-1		
Tested devices/ accessories:	Phone RM-985 / Dummy Battery SD-240R		
FCC ID:	QMNRM-985	IC:	661X-RM985
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 3, January 2013), RSS-133 (Issue 6, January 2013), RSS-199 (Issue 1, January 2010). 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 Microsoft.		
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, Specialist, EMC

1. Summary for FCC Part 27 Compliance Test Report

Date of receipt	15-Jul-2014
Testing completed	21-Jul-14
The customer's contact person	Victoria Abadilla
Test Plan referred to	T:\Projects\RM-985\TestPlan\RS_TestPlan_RM-985.xlsm
Notes	-
Document name	T:\Projects\RM-985\EMC\FCC22&24&27_RM-985_01.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-985	00440247815287	0200	-	02032.00000.14271.24000	30818
Dummy Battery	SD-240R	03618	V1.0	-	-	30819

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	NP
§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	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

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	NP
§22.913(a)	4.4	Radiated RF output power	NP
§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	NP
§2.1055(a)	4.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	4.3	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	NP
§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	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

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	NP
§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	NP
§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	NP
§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	NP
§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	NP
§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	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

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	NP
§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	NP
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

LTE7:

Section in CFR 47	Section in RSS-GEN or RSS-199	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(h)(2)	4.4	Radiated RF output power	NP
§2.1049(h)	4.2	99 % occupied bandwidth	PASSED
§27.53(l)	4.5(b)	Band edge compliance	PASSED
§27.53(h), §2.1051	4.5(b)	Spurious emissions at antenna terminals	NP
§27.53(l), §2.1053	4.5(b)	Spurious radiated emissions	NP
§27.54	4.3	Frequency stability, temperature variation	PASSED
§27.54	4.3"	Frequency stability, voltage variation	PASSED

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	NP
§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	NP
§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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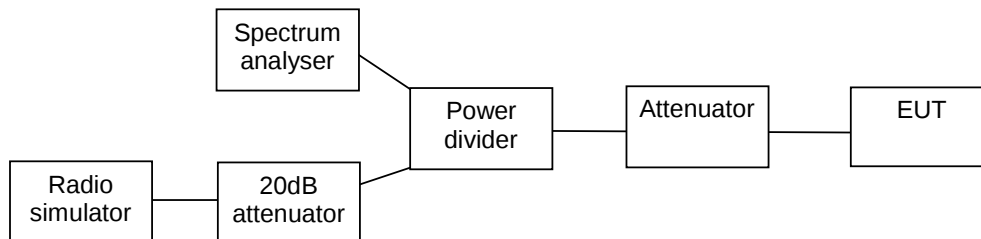
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2. 99 % occupied bandwidth

(FCC §2.1049(h), RSS-133 4.6.1, RSS-132 4.6.1, RSS-139 4.6.1, RSS-199 4.2, RSS-130 4.6.1)

EUT with DUT number	RM-985, DUT 30818
Accessories with DUT numbers	SD-240R, DUT 30819
Operation Voltage [V] / [Hz]	3.8V DC
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.8 / 46.4 / 1050
Date of measurements	15-Jul-2014
Measured by	Feng You

2.1. Test Setup



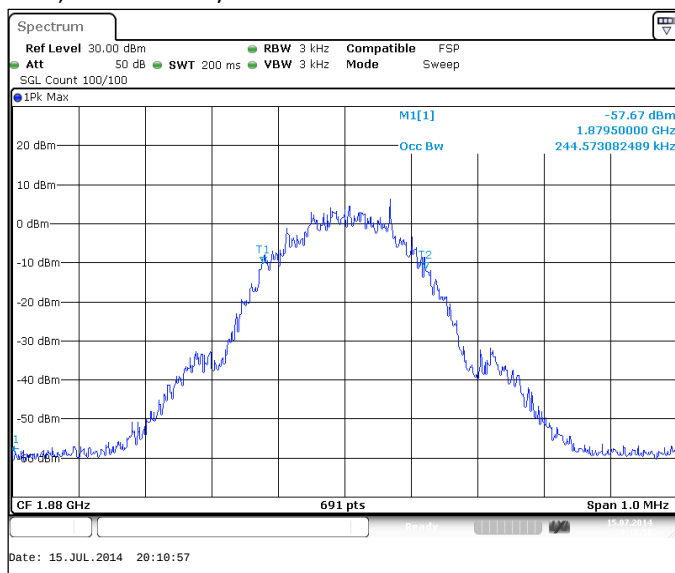
2.2. Test method and limit

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

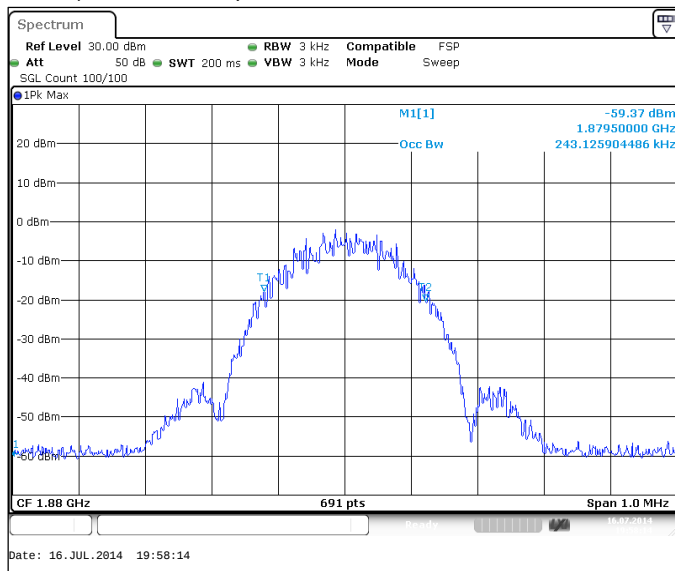
2.3. GSM 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	244.6
EGPRS	243.1
GPRS	246

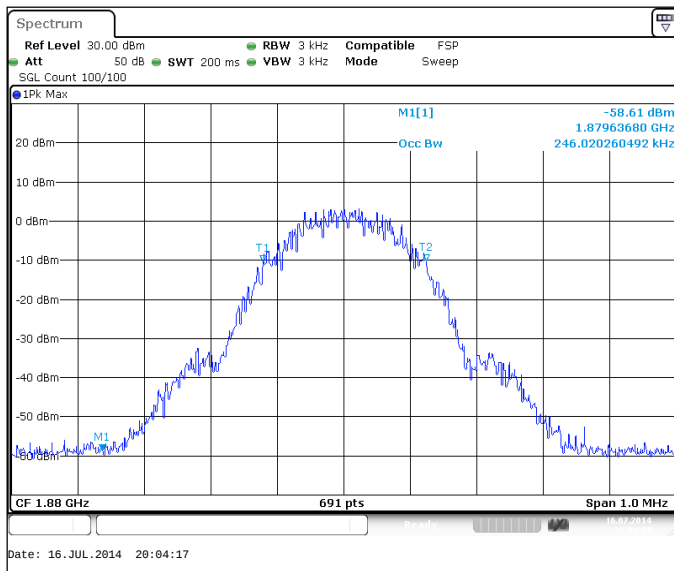
GSM, Channel 661 / 1880.0 MHz



EGPRS, Channel 661 / 1880.0 MHz



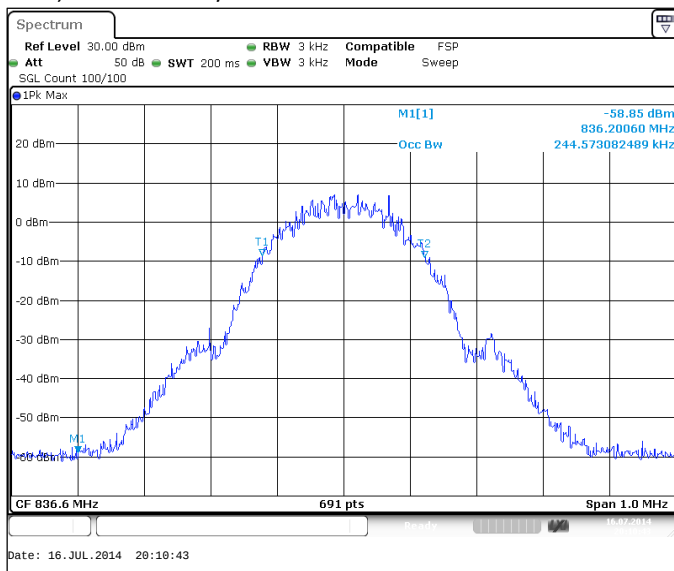
GPRS, Channel 661 / 1880.0 MHz



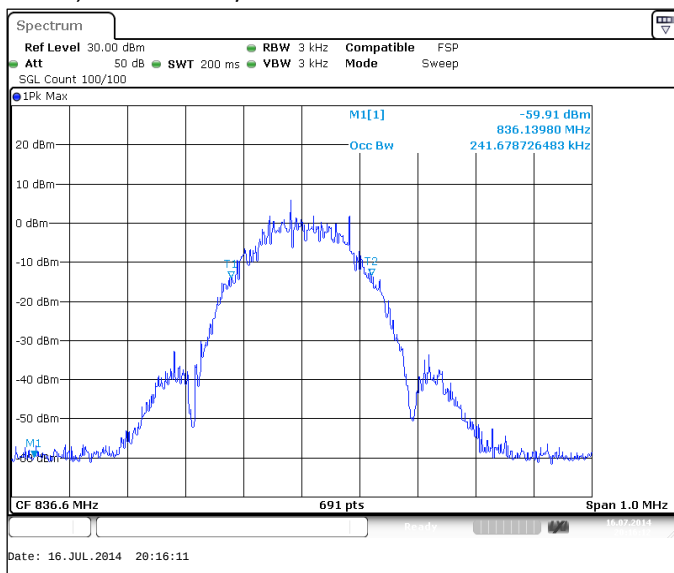
2.4. GSM 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	244.6
EGPRS	241.7
GPRS	244.6

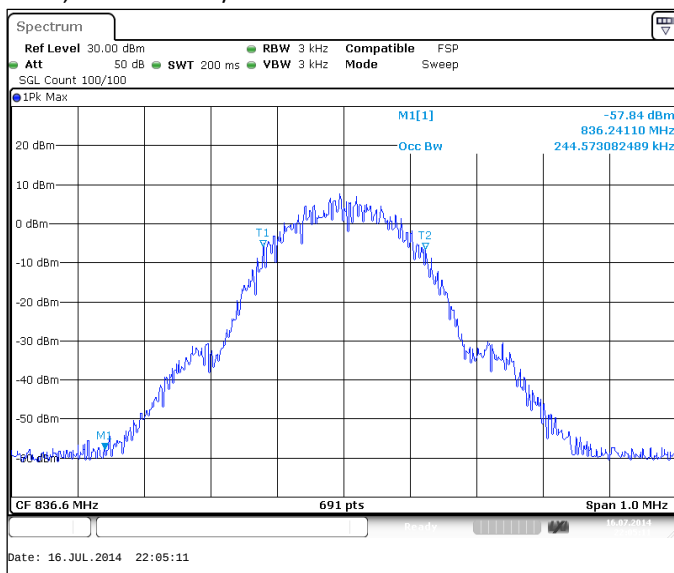
GSM, Channel 190 / 836.6 MHz



EGPRS, Channel 190 / 836.6 MHz



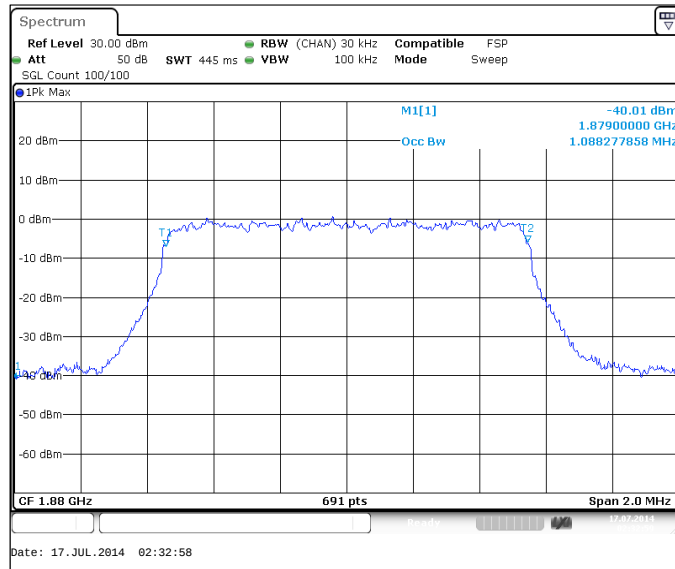
GPRS, Channel 190 / 836.6 MHz



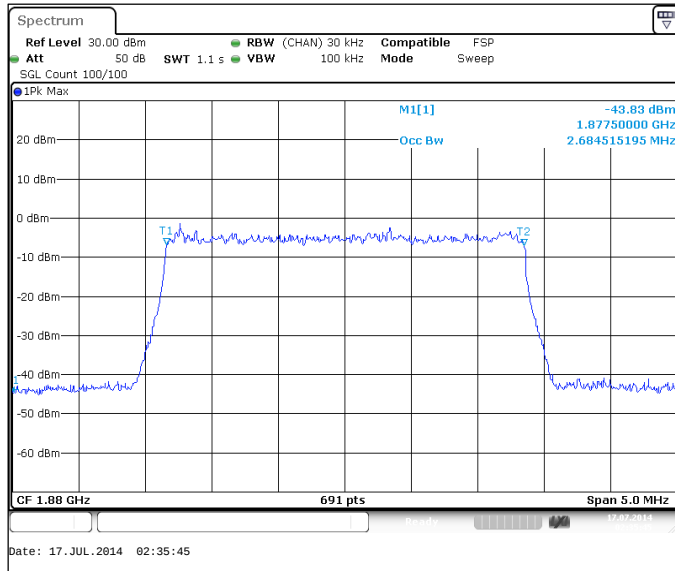
2.5. LTE1900 (Band 2) Test results

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	8943.6
FDD, CBW 15MHz, QPSK, 75 RB	13429.8
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	8921.9
FDD, CBW 15MHz, 16QAM, 75 RB	13400.9
FDD, CBW 20MHz, 16QAM, 100 RB	17836.5

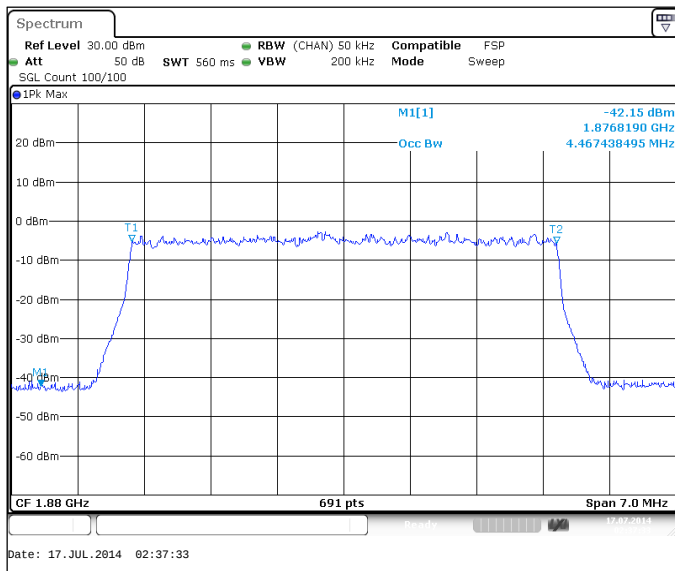
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 18900 / 1880.0 MHz



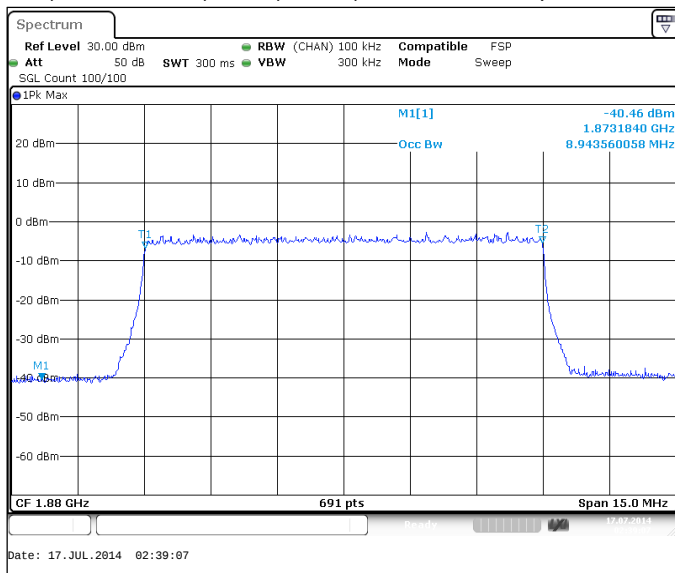
FDD, CBW 3MHz, QPSK, 15 RB, Channel 18900 / 1880.0 MHz



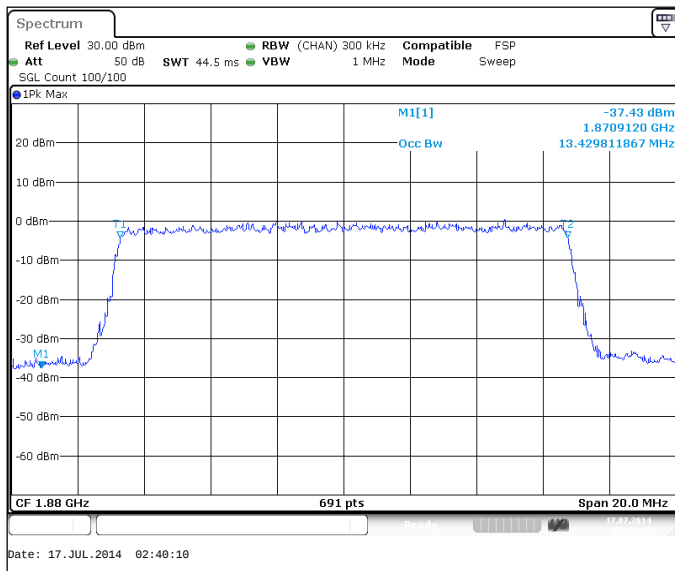
FDD, CBW 5MHz, QPSK, 25 RB, Channel 18900 / 1880.0 MHz



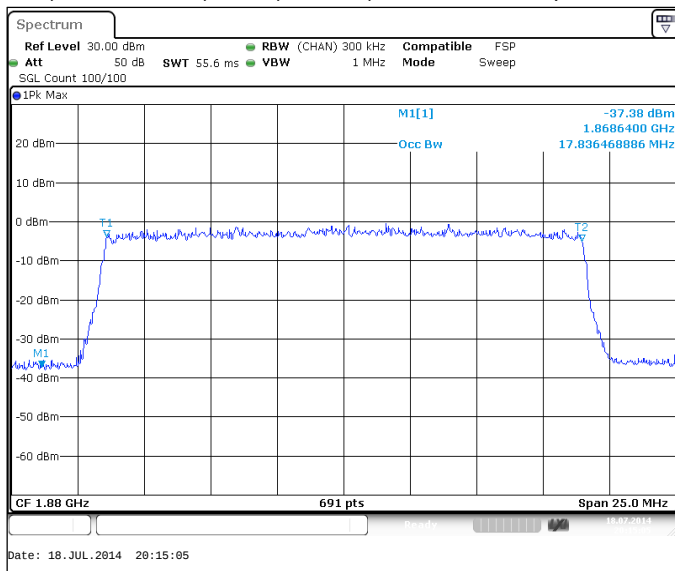
FDD, CBW 10MHz, QPSK, 50 RB, Channel 18900 / 1880.0 MHz



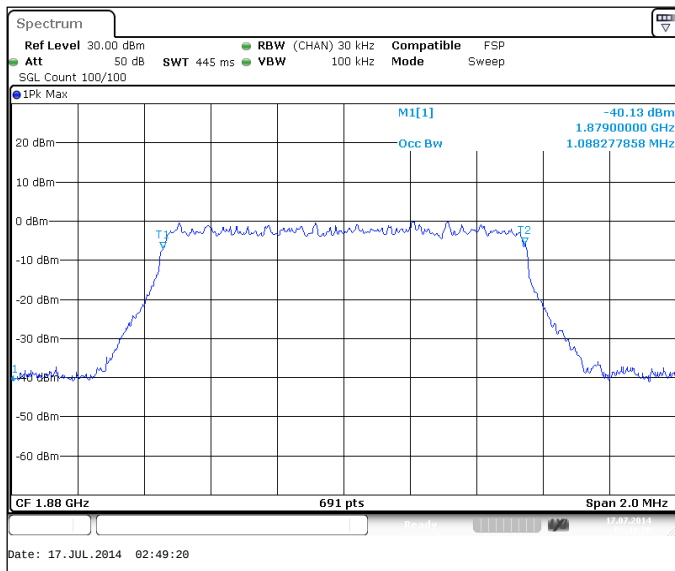
FDD, CBW 15MHz, QPSK, 75 RB, Channel 18900 / 1880.0 MHz



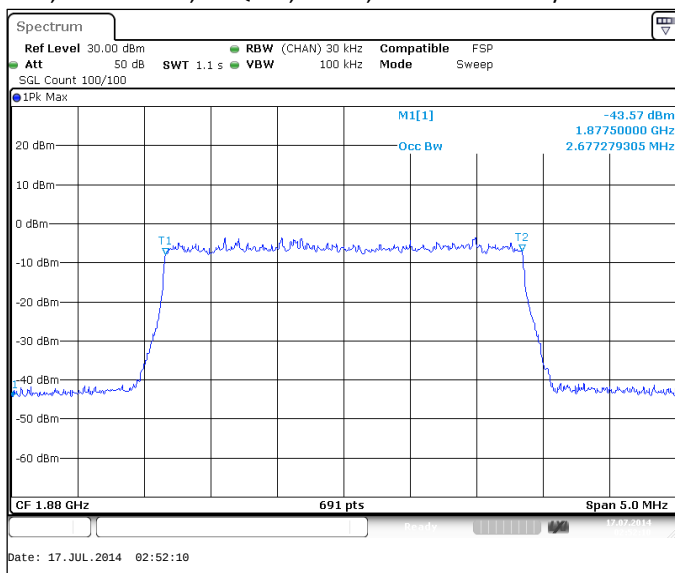
FDD, CBW 20MHz, QPSK, 100 RB, Channel 18900 / 1880.0 MHz



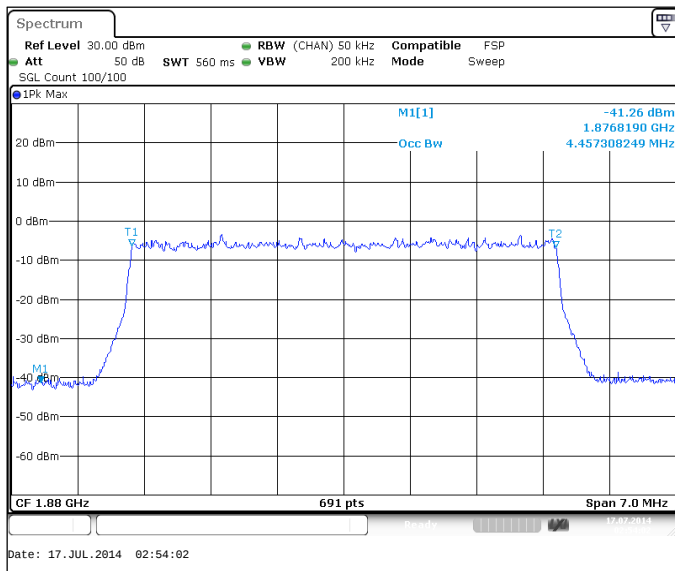
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 18900 / 1880.0 MHz



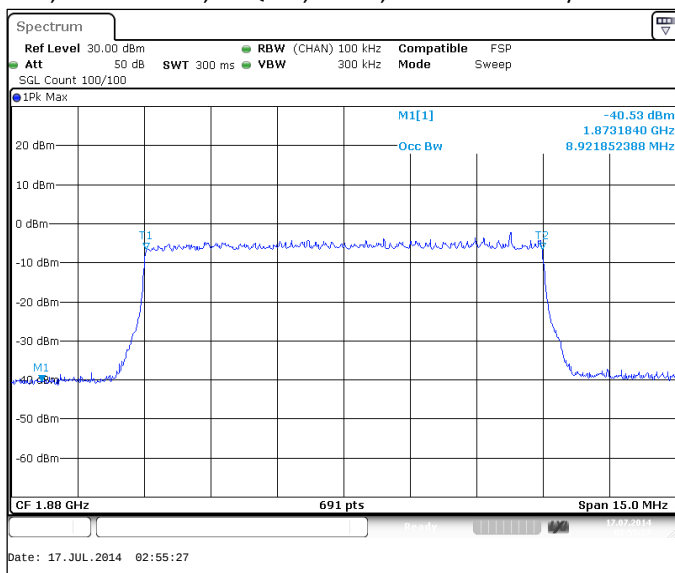
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 18900 / 1880.0 MHz



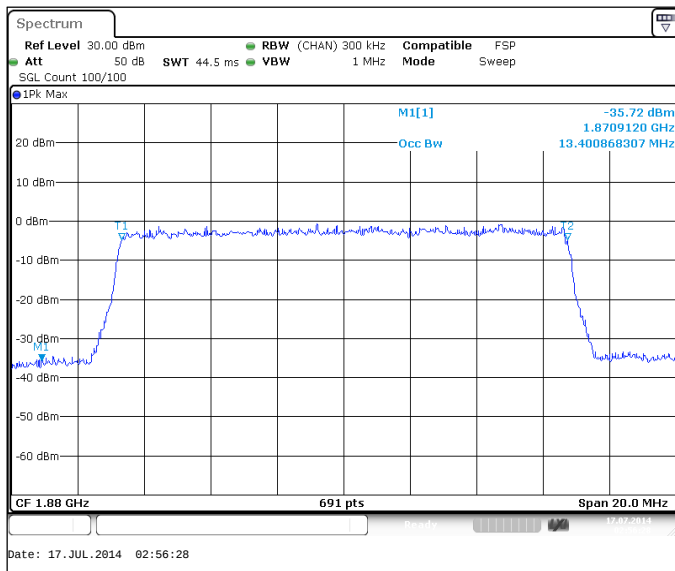
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 18900 / 1880.0 MHz



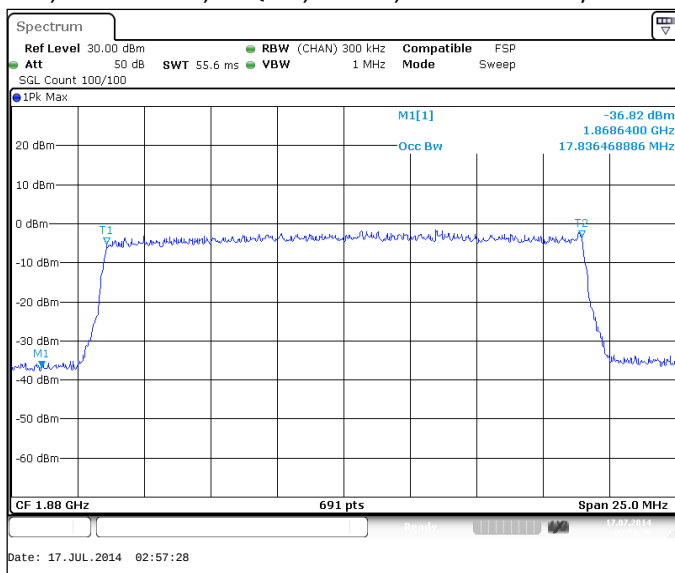
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 18900 / 1880.0 MHz



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



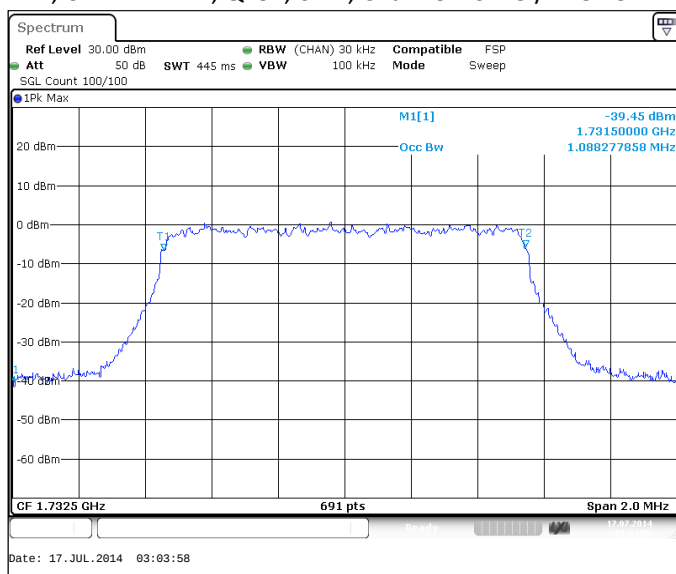
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 18900 / 1880.0 MHz



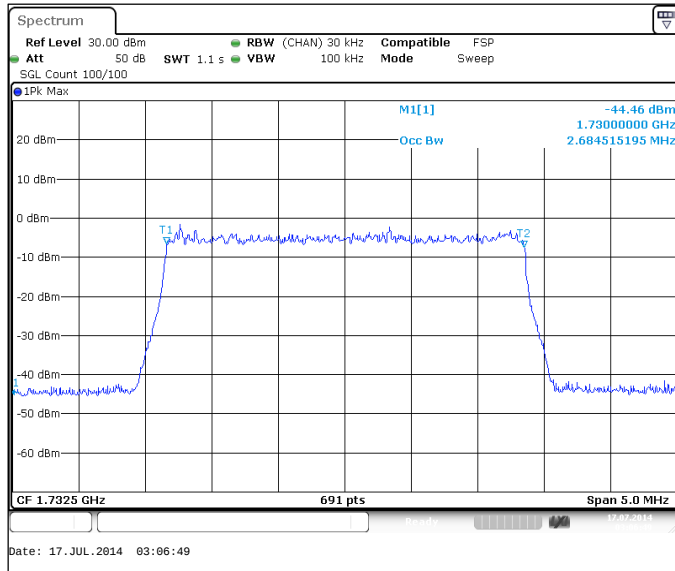
2.6. LTE1700 (Band 4) Test results

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	17800.3
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	13371.9
FDD, CBW 20MHz, 16QAM, 100 RB	17836.5

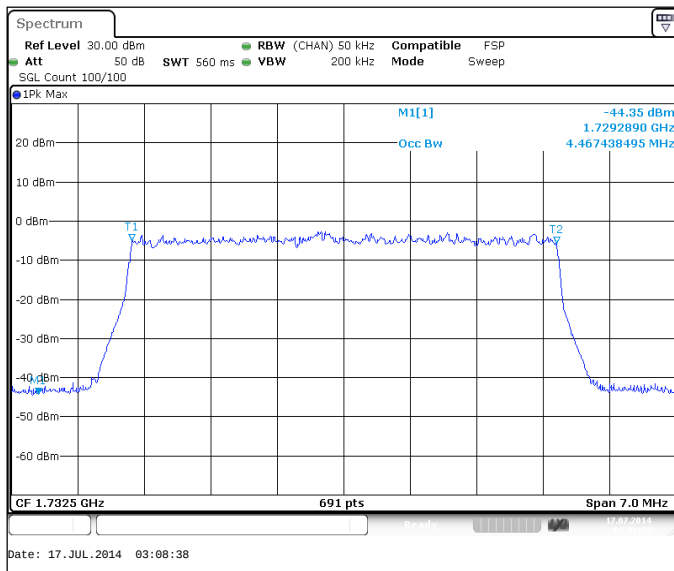
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20175 / 1732.5 MHz



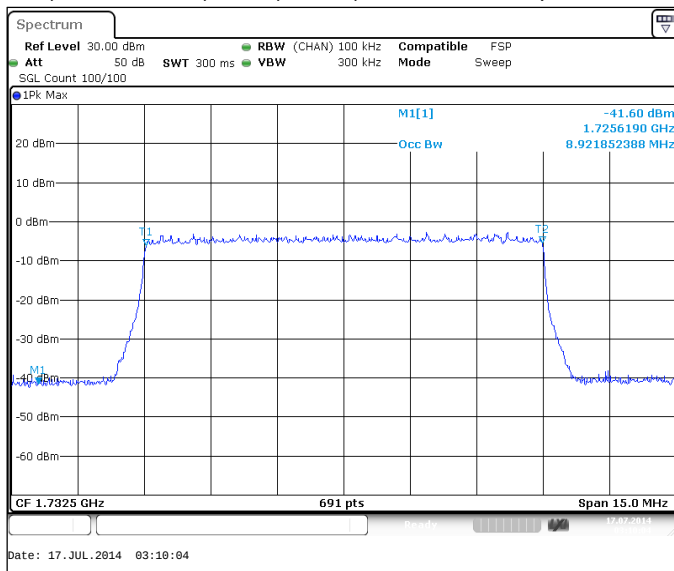
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20175 / 1732.5 MHz



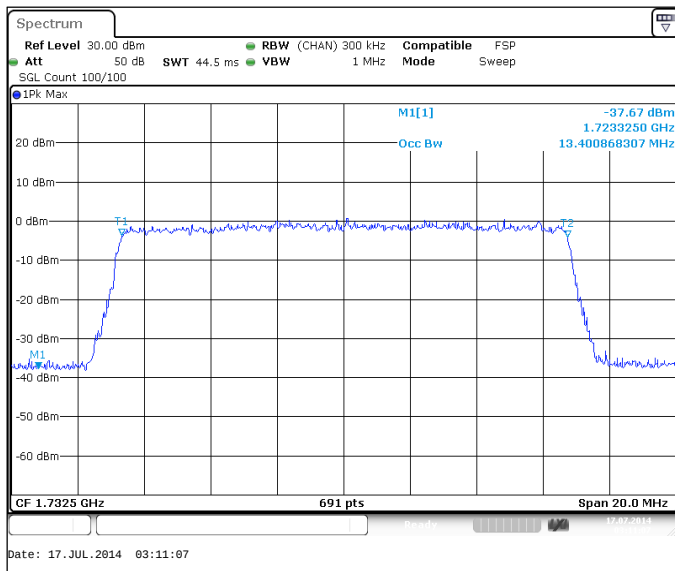
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20175 / 1732.5 MHz



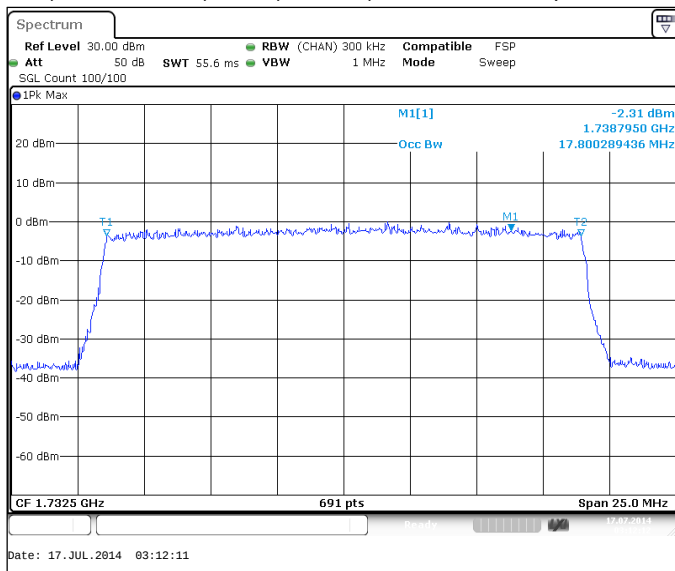
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20175 / 1732.5 MHz



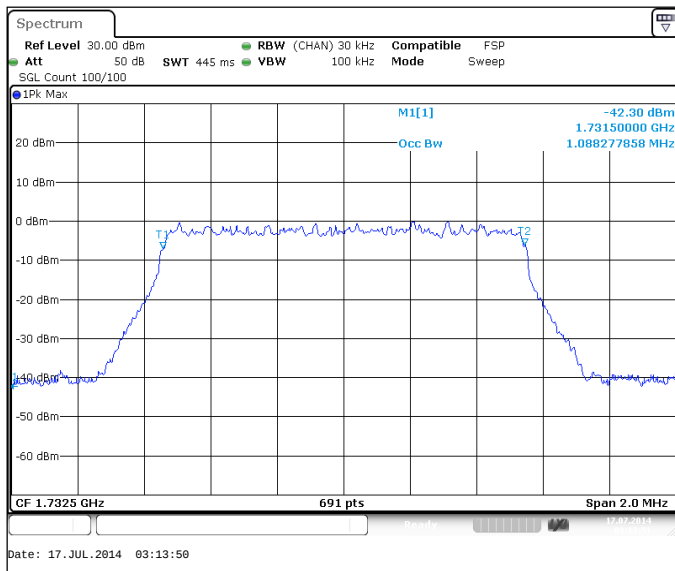
FDD, CBW 15MHz, QPSK, 75 RB, Channel 20175 / 1732.5 MHz



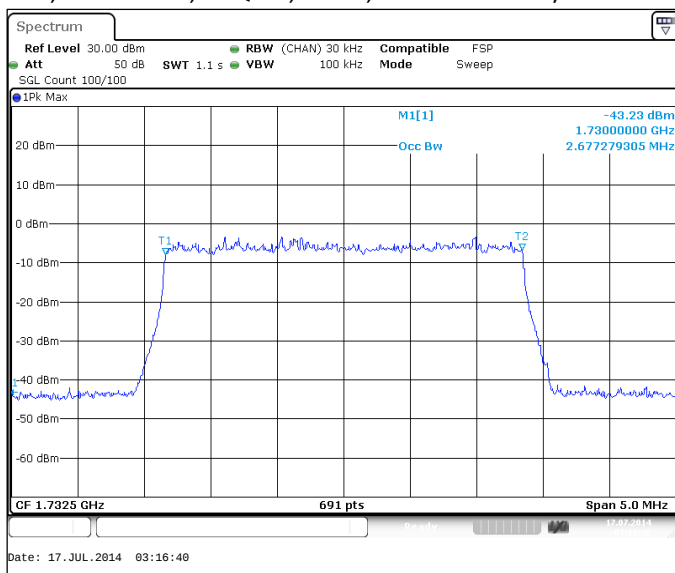
FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz



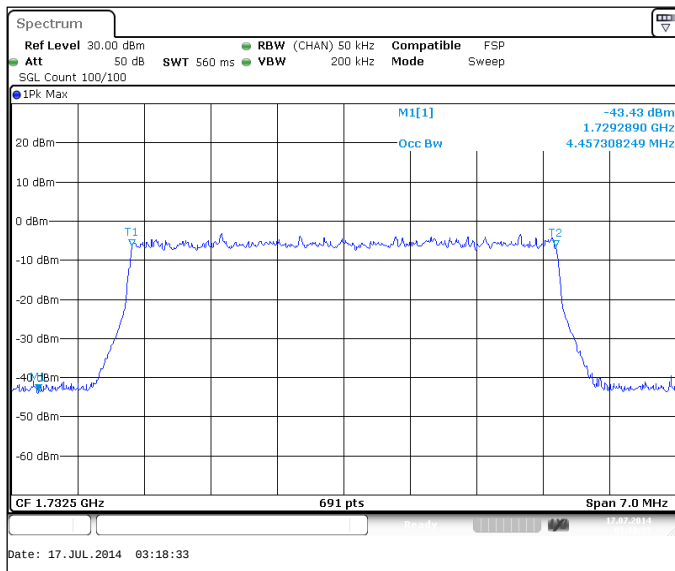
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20175 / 1732.5 MHz



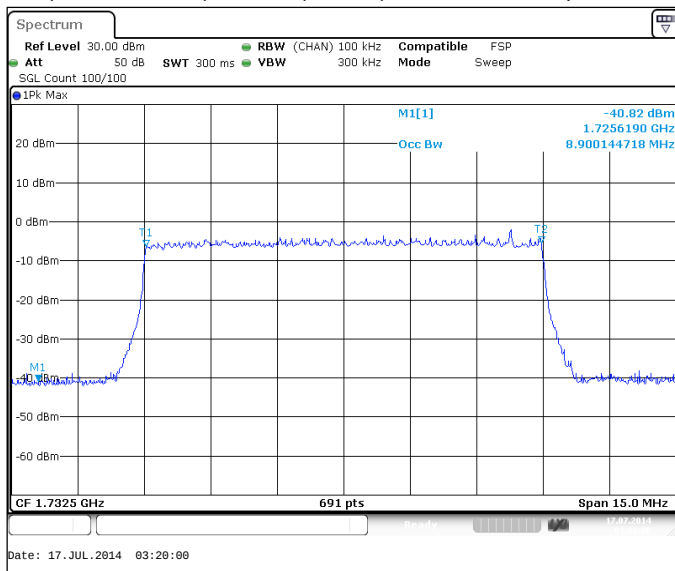
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20175 / 1732.5 MHz



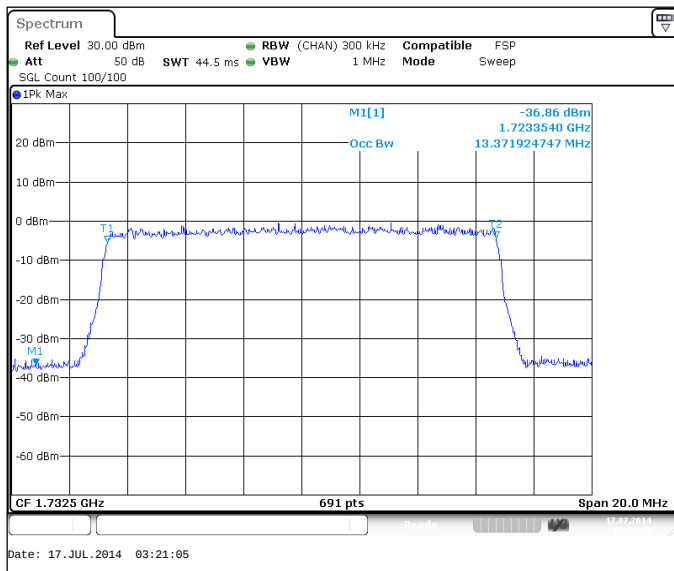
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20175 / 1732.5 MHz



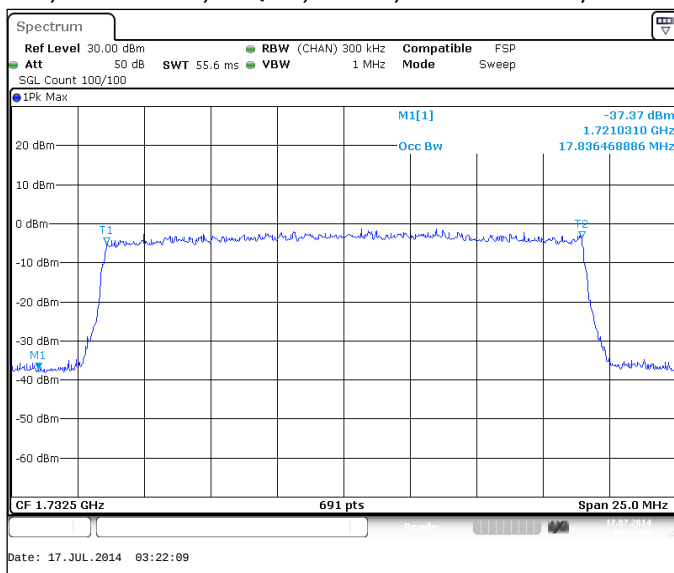
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20175 / 1732.5 MHz



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



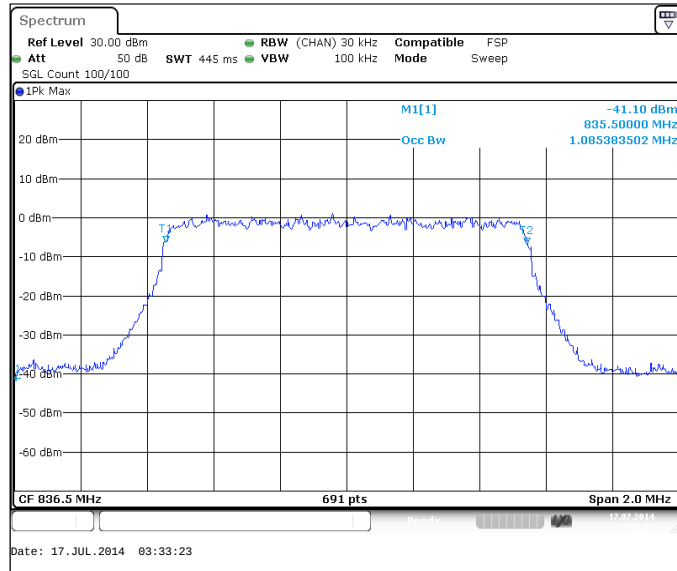
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 20175 / 1732.5 MHz



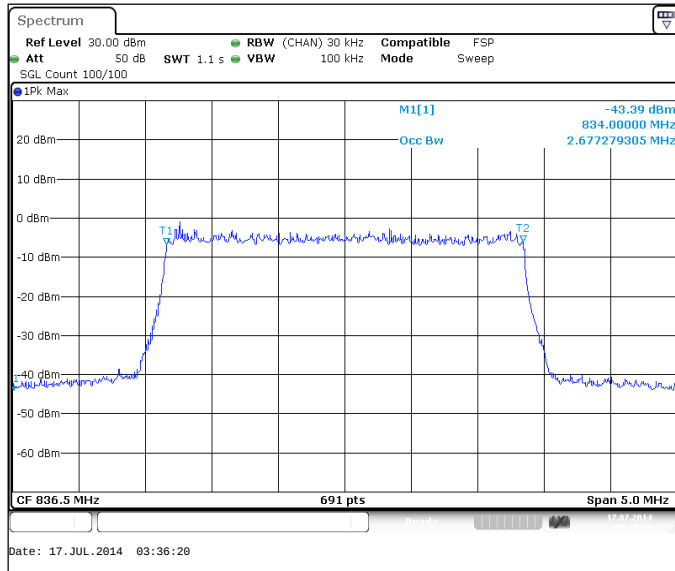
2.7. LTE850 (Band 5) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	999
FDD, CBW 3MHz, QPSK, 15 RB	2677.3
FDD, CBW 5MHz, QPSK, 25 RB	4467.4
FDD, CBW 10MHz, QPSK, 50 RB	8921.9
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	8921.9

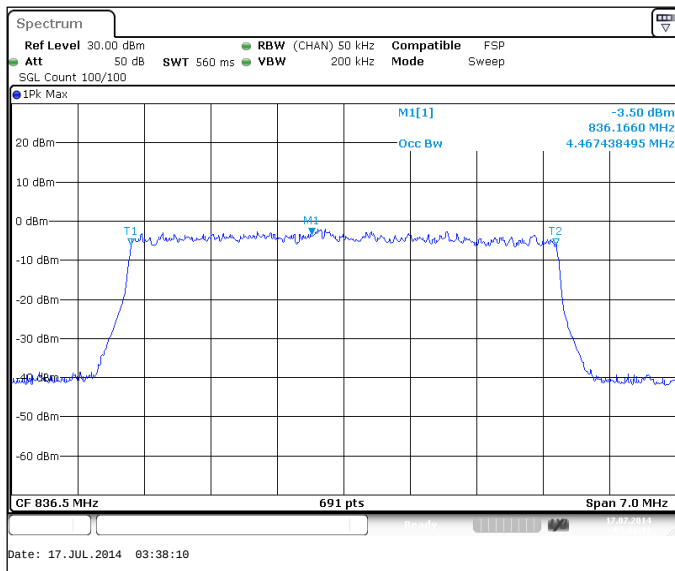
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20525 / 836.5 MHz



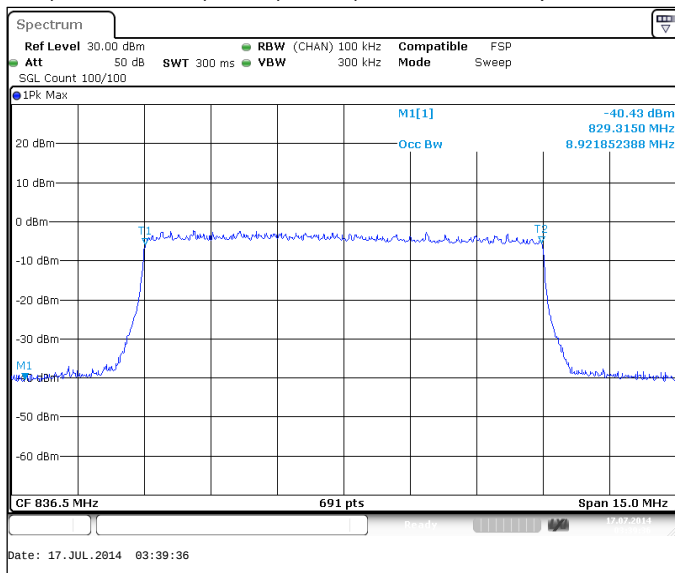
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20525 / 836.5 MHz



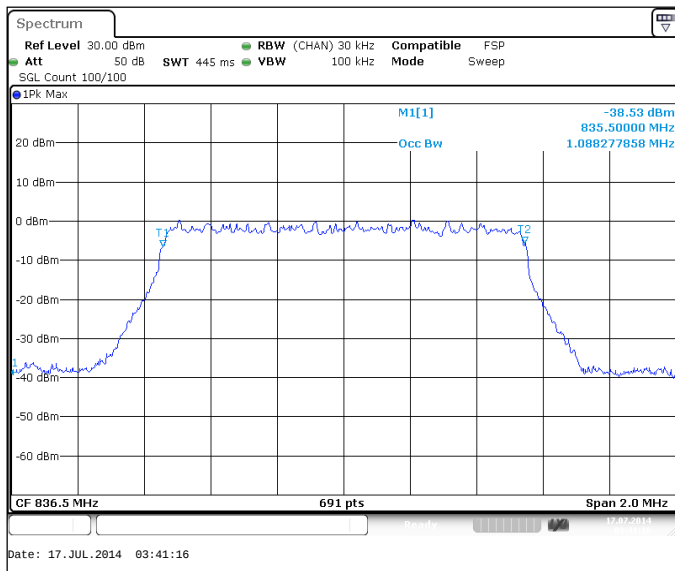
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20525 / 836.5 MHz



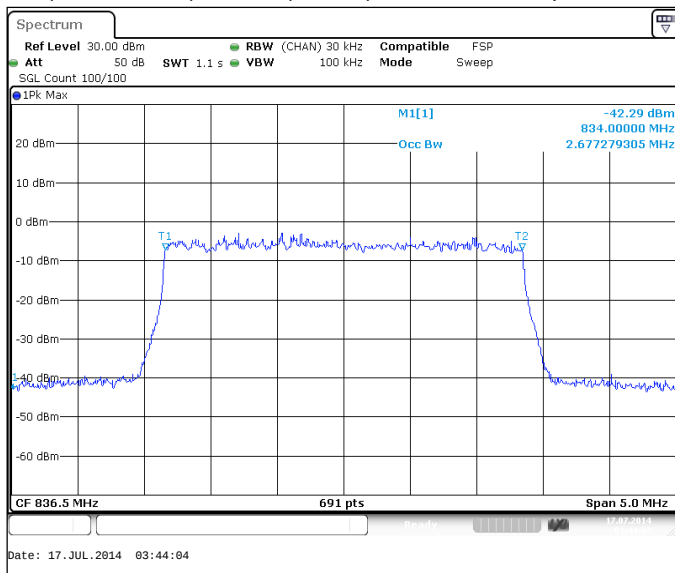
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20525 / 836.5 MHz



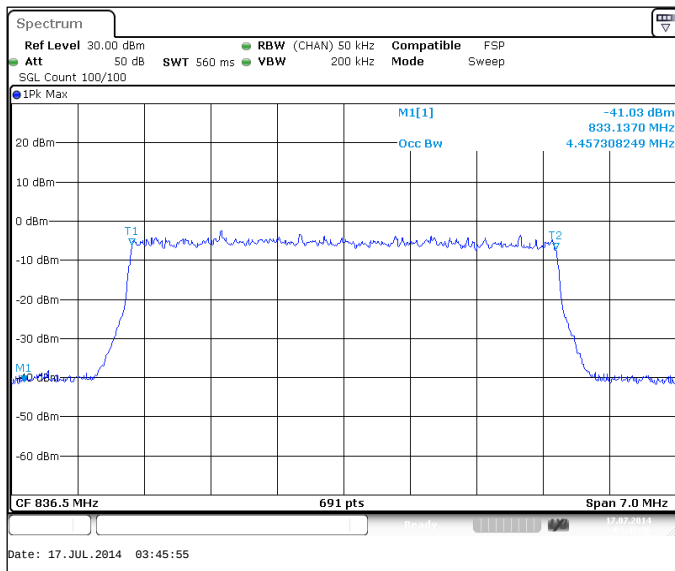
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20525 / 836.5 MHz



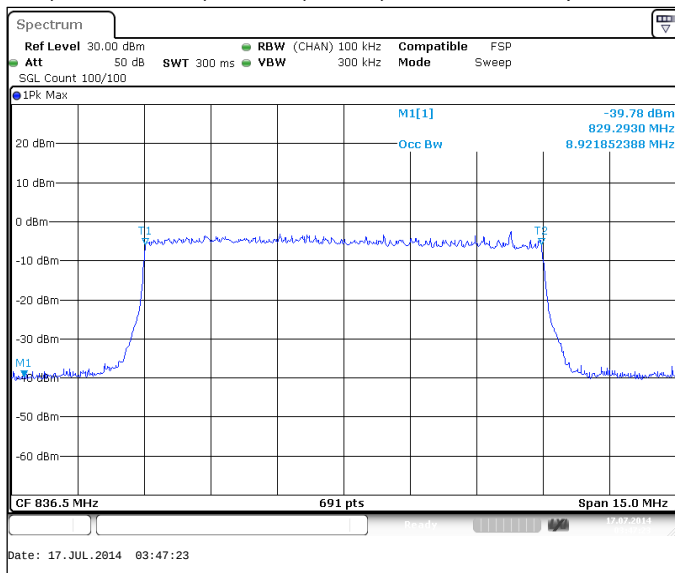
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20525 / 836.5 MHz



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



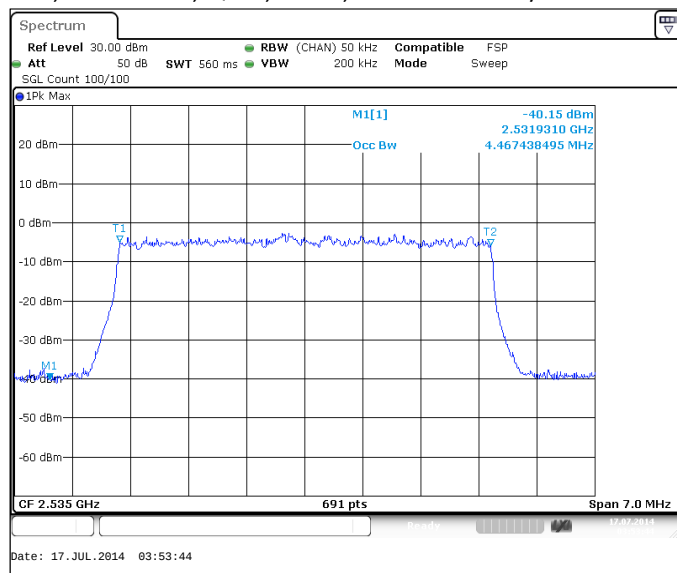
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20525 / 836.5 MHz



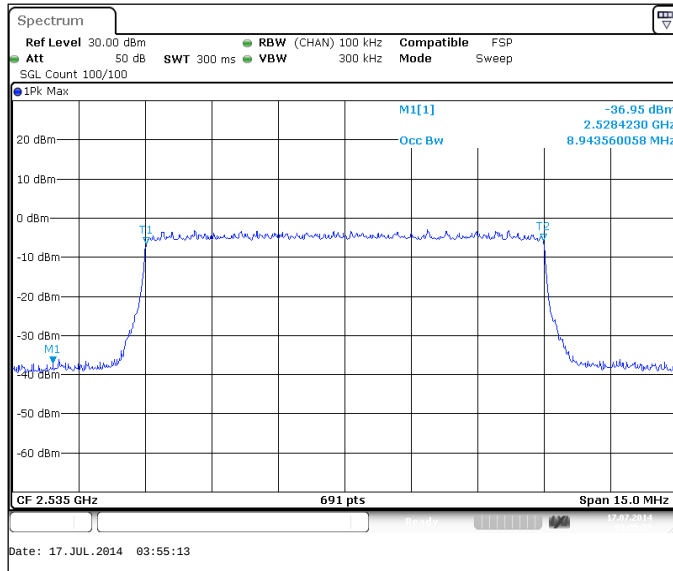
2.8. LTE7 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 5MHz, QPSK, 25 RB	4467.4
FDD, CBW 10MHz, QPSK, 50 RB	8943.6
FDD, CBW 15MHz, QPSK, 75 RB	13429.8
FDD, CBW 20MHz, QPSK, 100 RB	17800.3
FDD, CBW 5MHz, 16QAM, 25 RB	4457.3
FDD, CBW 10MHz, 16QAM, 50 RB	8900.1
FDD, CBW 15MHz, 16QAM, 75 RB	13371.9
FDD, CBW 20MHz, 16QAM, 100 RB	17836.5

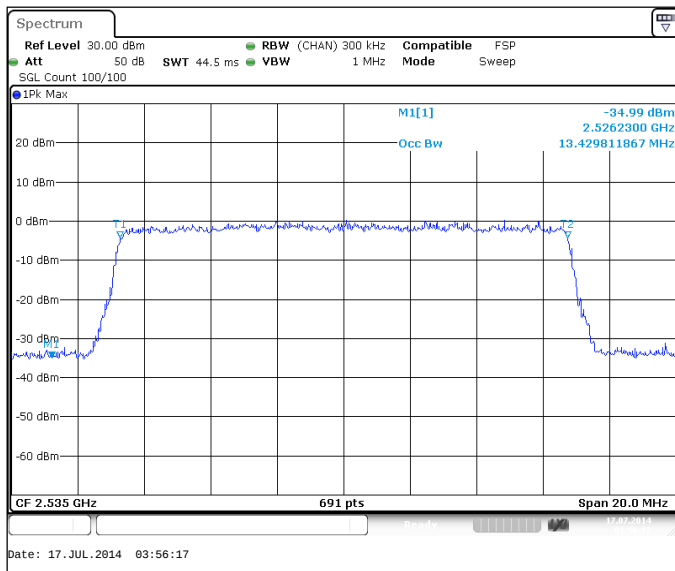
FDD, CBW 5MHz, QPSK, 25 RB, Channel 21100 / 2535.0 MHz



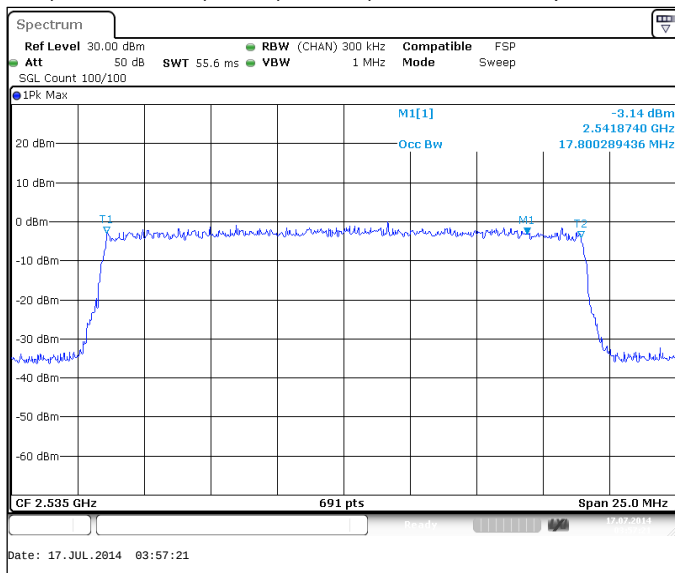
FDD, CBW 10MHz, QPSK, 50 RB, Channel 21100 / 2535.0 MHz



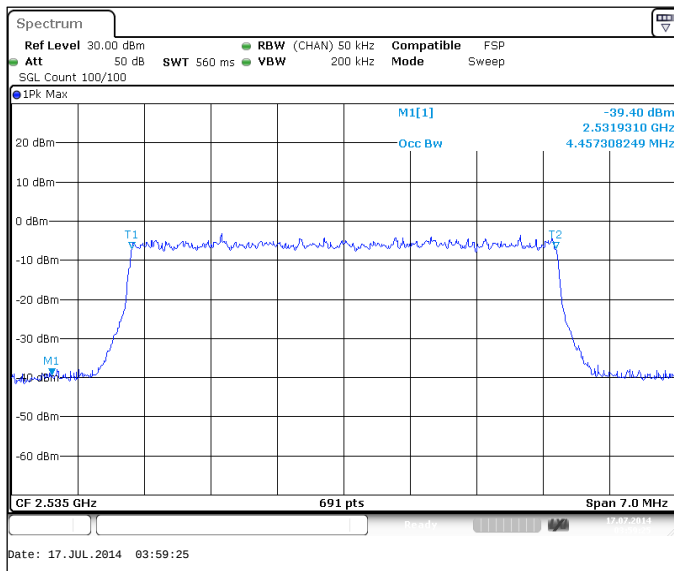
FDD, CBW 15MHz, QPSK, 75 RB, Channel 21100 / 2535.0 MHz



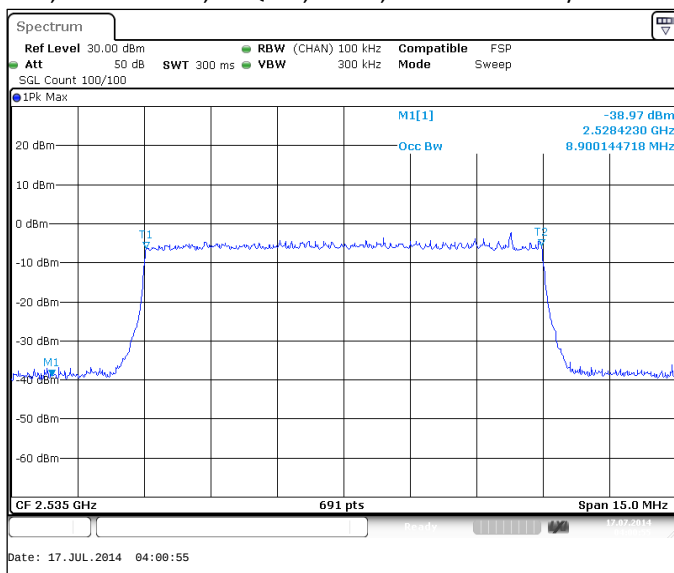
FDD, CBW 20MHz, QPSK, 100 RB, Channel 21100 / 2535.0 MHz



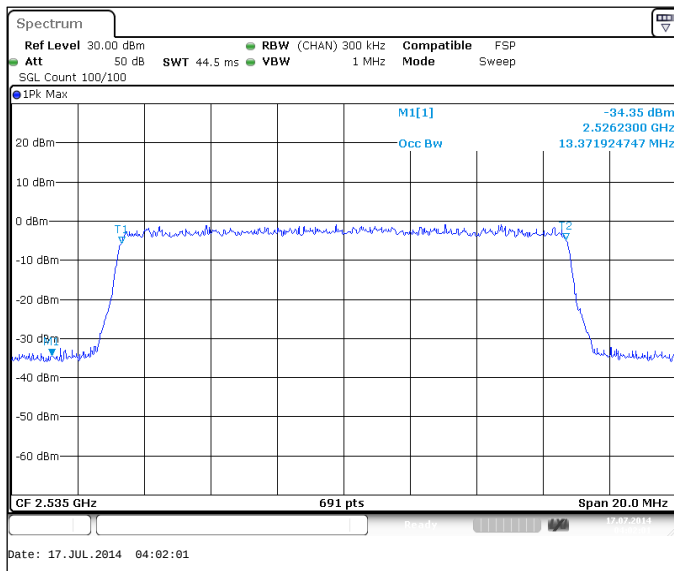
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 21100 / 2535.0 MHz



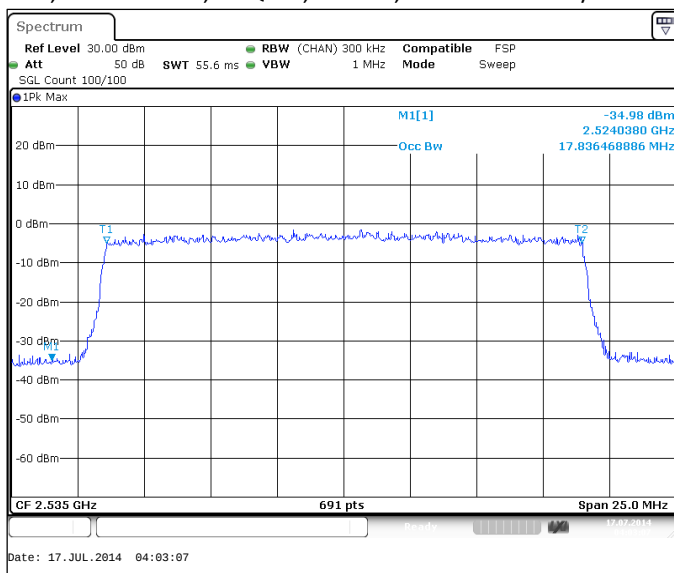
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 21100 / 2535.0 MHz



FDD, CBW 15MHz, 16QAM, 75 RB, Channel 21100 / 2535.0 MHz



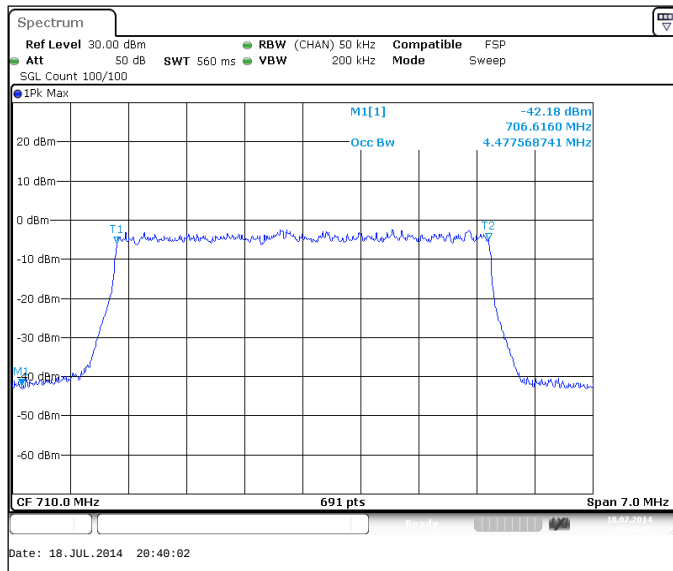
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 21100 / 2535.0 MHz



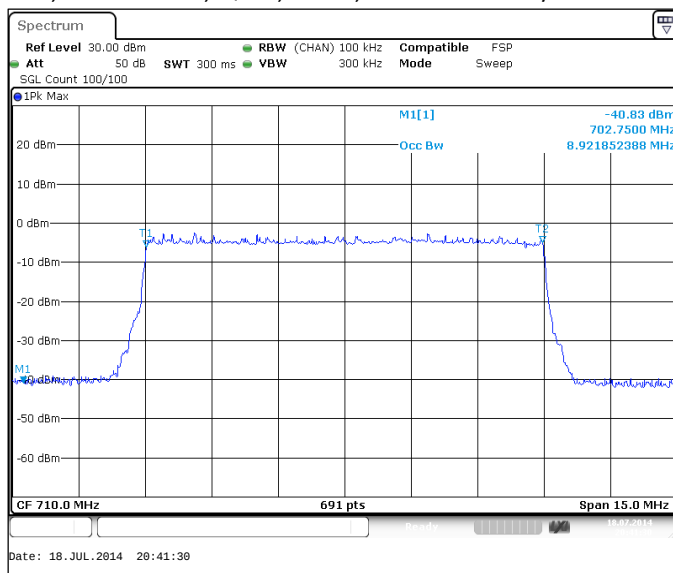
2.9. LTE700 Lower (Band 17) Test results

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

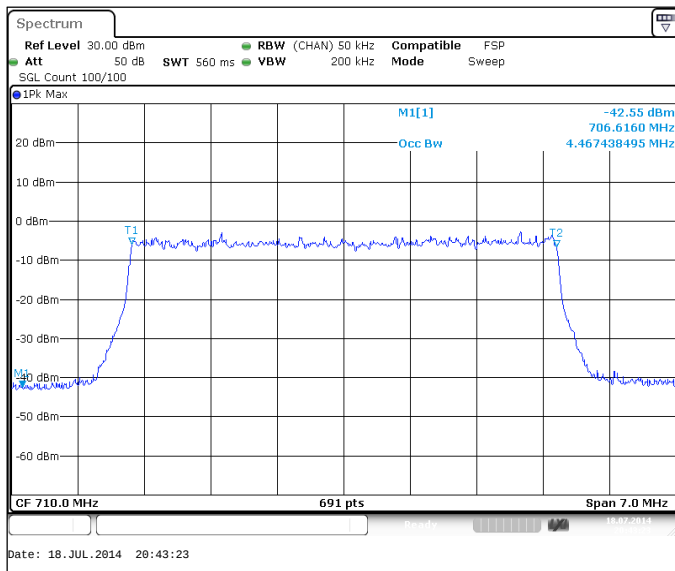
FDD, CBW 5MHz, QPSK, 25 RB, Channel 23790 / 710.0 MHz



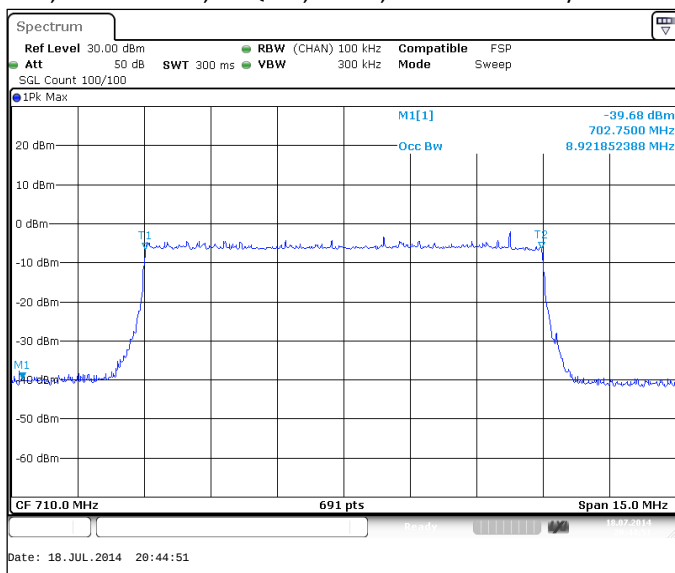
FDD, CBW 10MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz



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



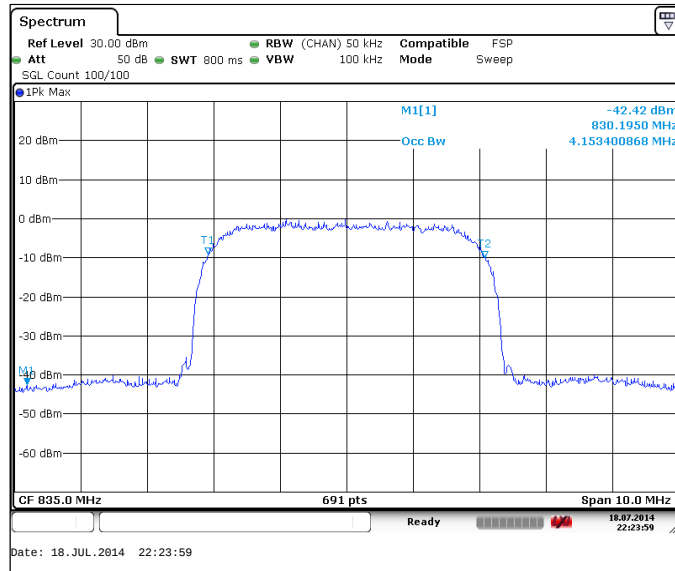
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 23790 / 710.0 MHz



2.10. WCDMA 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD	4153.4

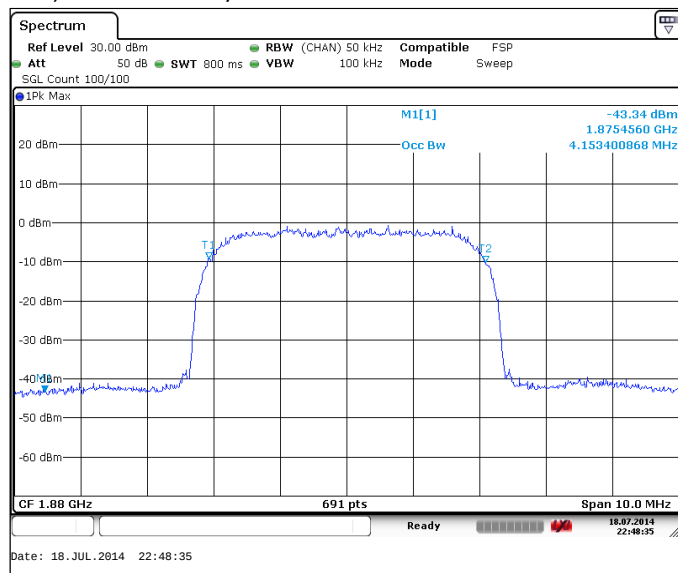
FDD, Channel 4175 / 835.0 MHz



2.11. WCDMA 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD	4138.9

FDD, Channel 9400 / 1880.0 MHz

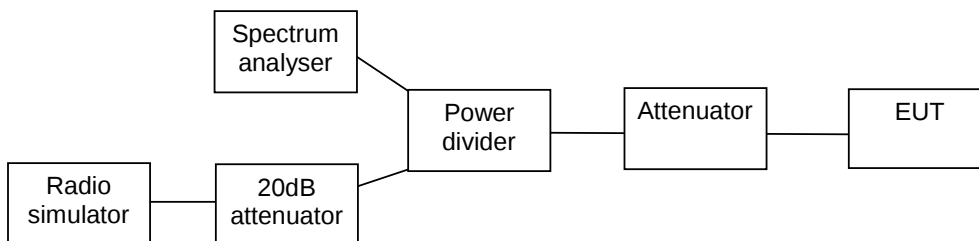


3. Band edge compliance

(FCC §24.238(a), §27.53(g), §27.53(l), §27.53(h), §22.917(a), RSS-133 6.5, RSS-132 4.5, RSS-139 6.5, RSS-199 4.5(b), RSS-130 4.6)

EUT with DUT number	RM-985, DUT 30818
Accessories with DUT numbers	SD-240R, DUT 30819
Operation Voltage [V] / [Hz]	3.8V DC
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.8 / 46.4 / 1050
Date of measurements	15-Jul-2014
Measured by	Feng You

3.1. Test Setup



3.2. Test method and limit

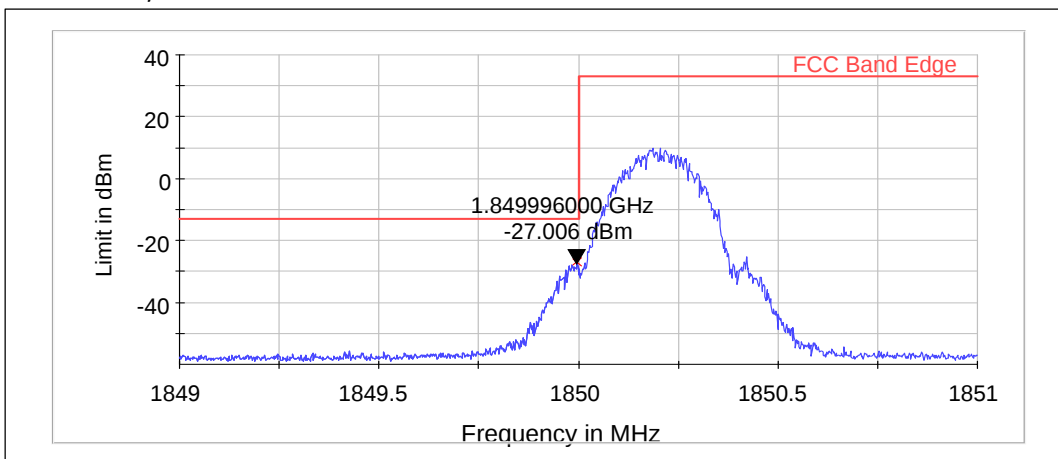
The measurement is made according to applicable FCC rule parts and IC standards.

Limits for band edge compliance measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM 1900	Below 1850 and above 1910	-13
GSM 850	Below 824 and above 849	-13
WCDMA 1900	Below 1850 and above 1910	-13
WCDMA 850	Below 824 and above 849	-13
LTE1900 (Band 2)	Below 1850 and above 1910	-13
LTE1700 (Band 4)	Below 1710 and above 1755	-13
LTE850 (Band 5)	Below 824 and above 849	-13
LTE7	Below 2494.5	-25 (RBW = 1 MHz, EIRP)
	2494.5 - 2499	-13 (RBW = 1 MHz, EIRP)
	2499 - 2500	-13 (RBW = 200 kHz, EIRP)
	2570 - 2571	-13 (RBW = 200 kHz, EIRP)
	2571 - 2575.5	-13 (RBW = 1 MHz, EIRP)
	Above 2575.5	-25 (RBW = 1 MHz, EIRP)
LTE700 Lower (Band 17)	703.9 - 704 and 716 - 716.1	-13 (RBW = 30 kHz, ERP)
	Below 703.9 and above 716.1	-13 (RBW = 30 kHz, ERP)

3.3. GSM 1900 Test results

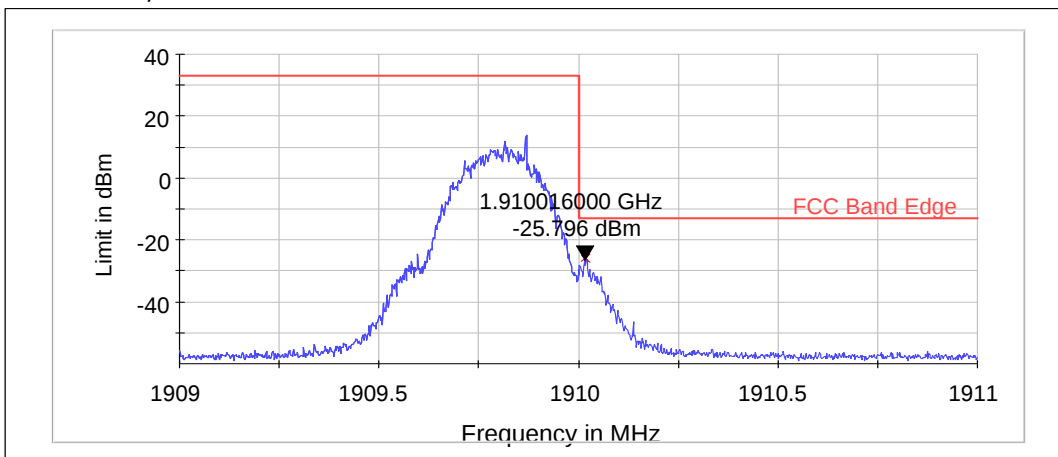
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	1849.996	-27.01	PASSED

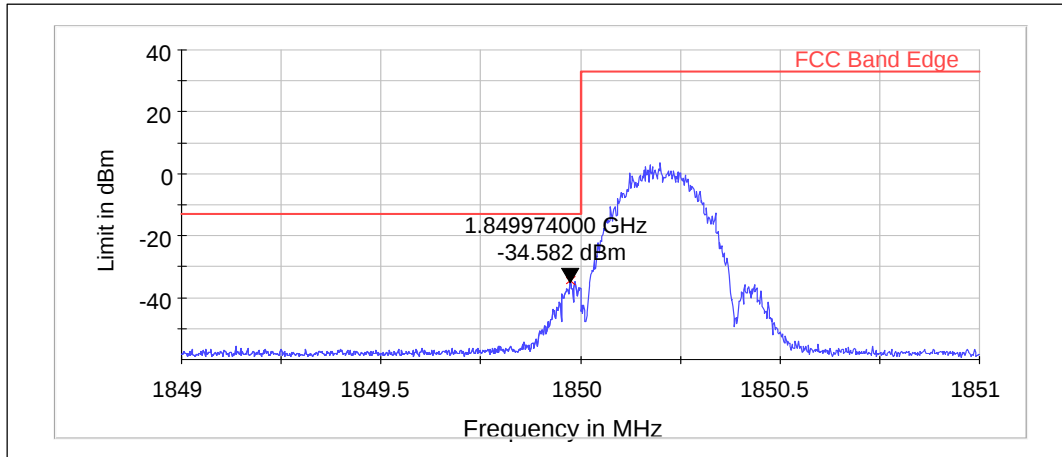
Channel 810 / 1909.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	1910.016	-25.80	PASSED

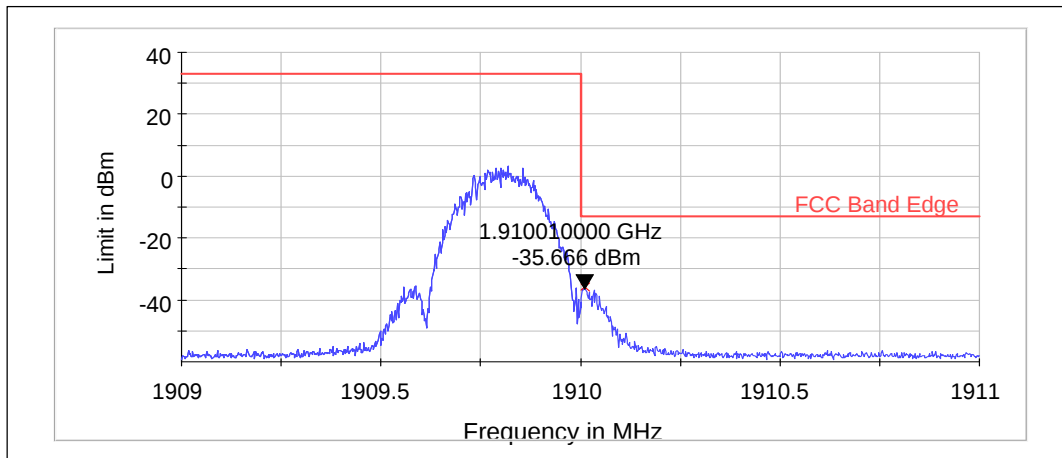
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1849.974	-34.58	PASSED

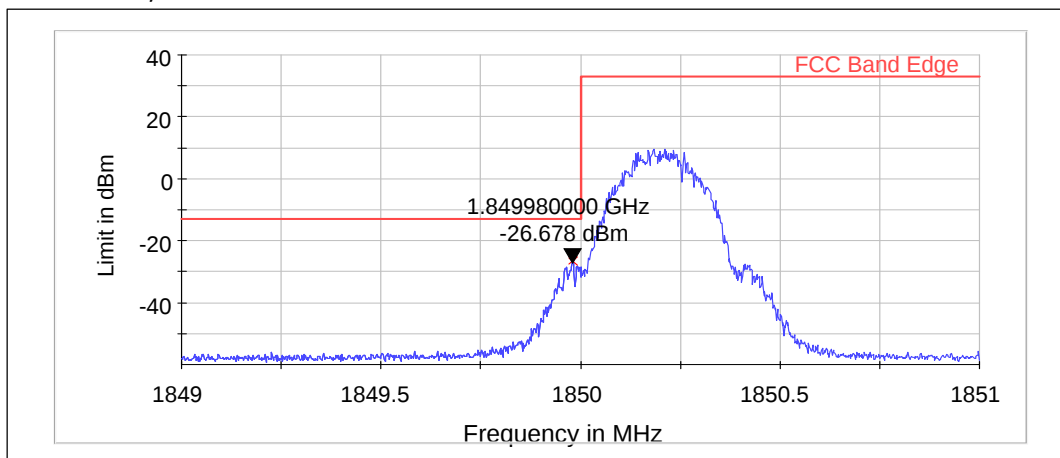
Channel 810 / 1909.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1910.010	-35.67	PASSED

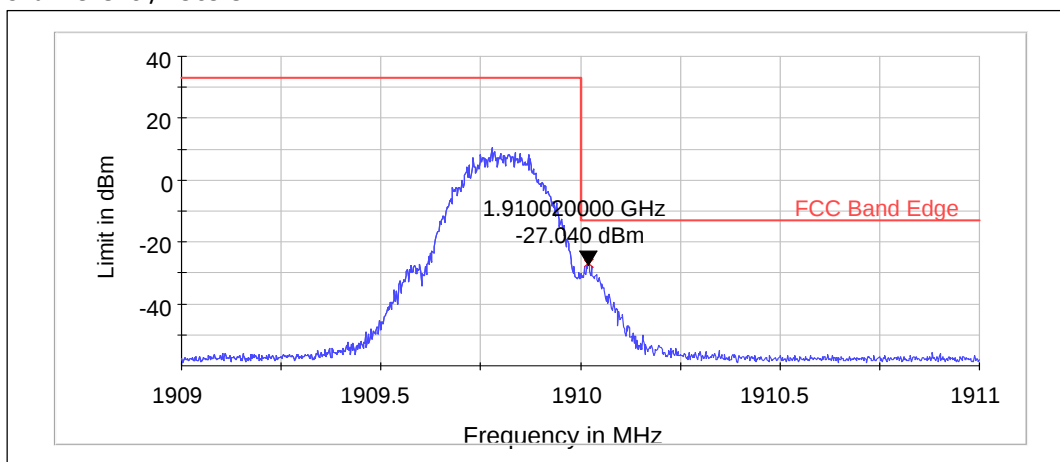
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1849.980	-26.68	PASSED

Channel 810 / 1909.8 MHz

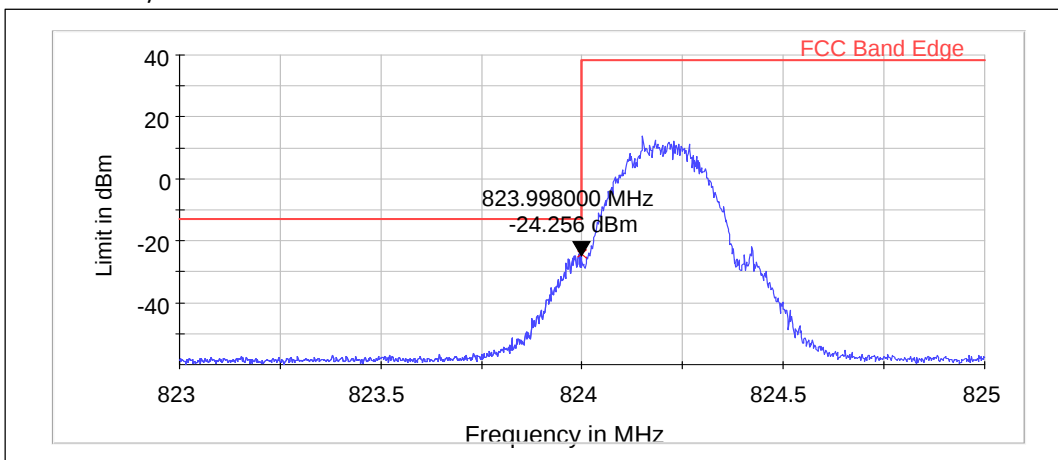


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1910.020	-27.04	PASSED

3.4. GSM 850 Test results

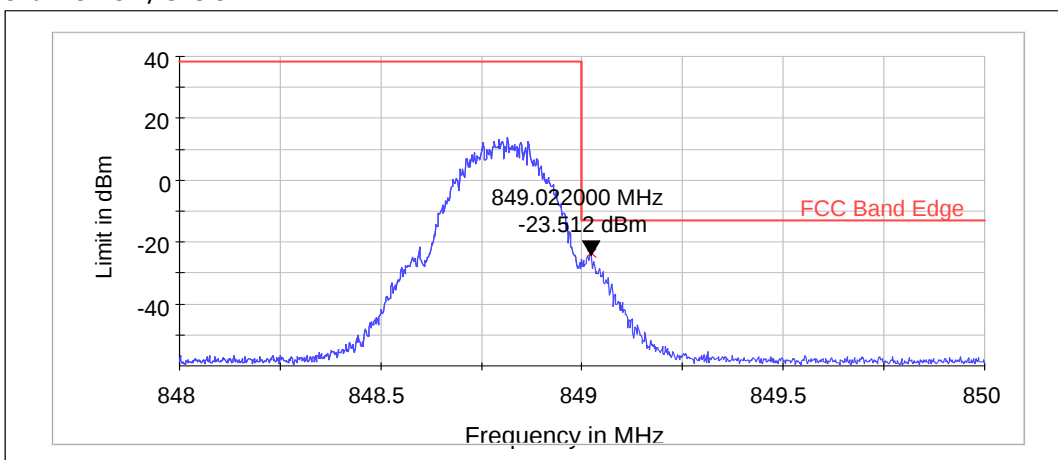
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	823.998	-24.26	PASSED

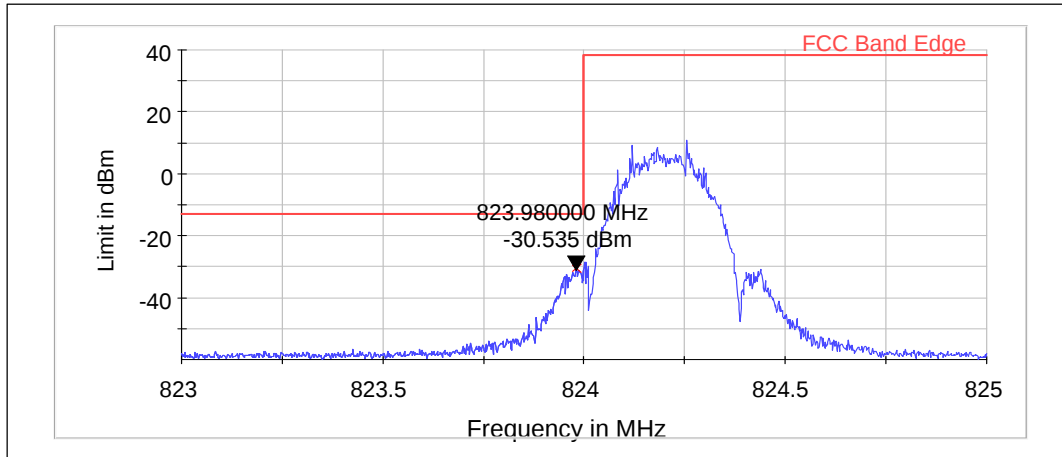
Channel 251 / 848.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	849.022	-23.51	PASSED

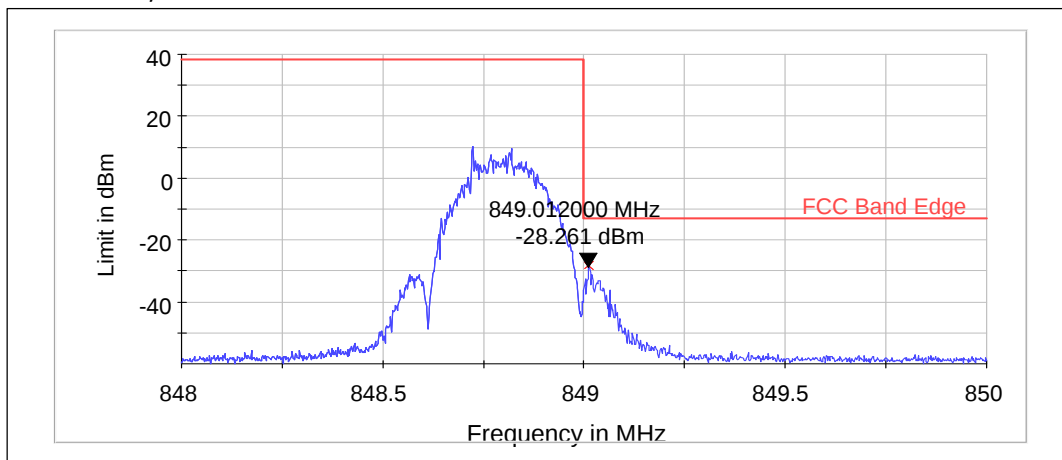
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	823.980	-30.53	PASSED

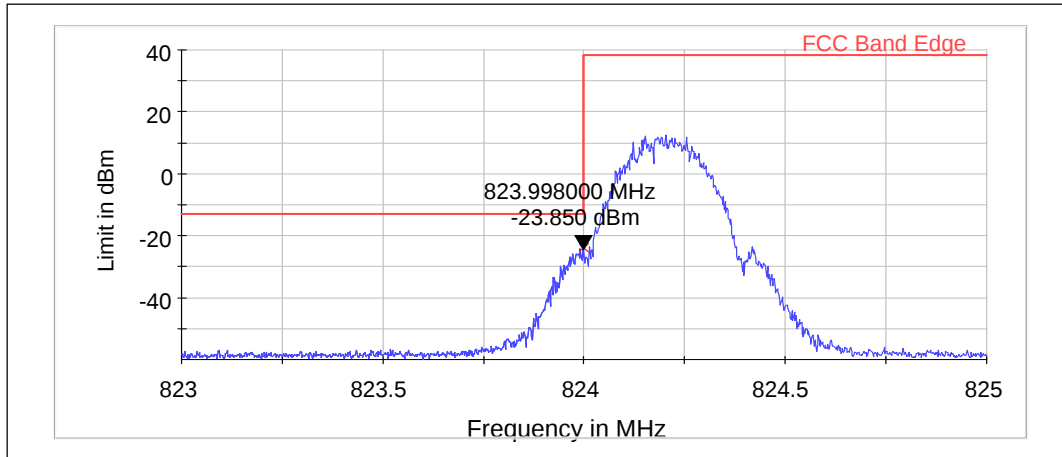
Channel 251 / 848.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	849.012	-28.26	PASSED

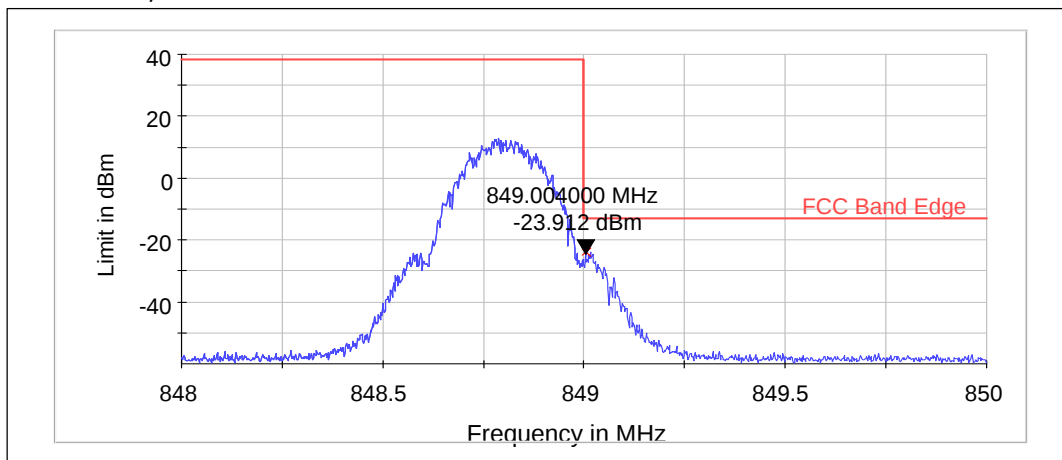
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	823.998	-23.85	PASSED

Channel 251 / 848.8 MHz

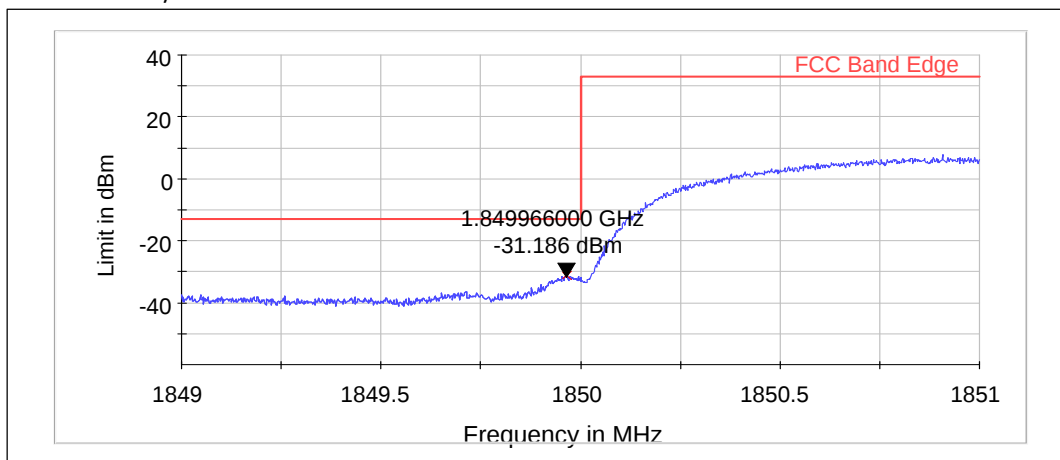


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	849.004	-23.91	PASSED

3.5. WCDMA 1900 Test results

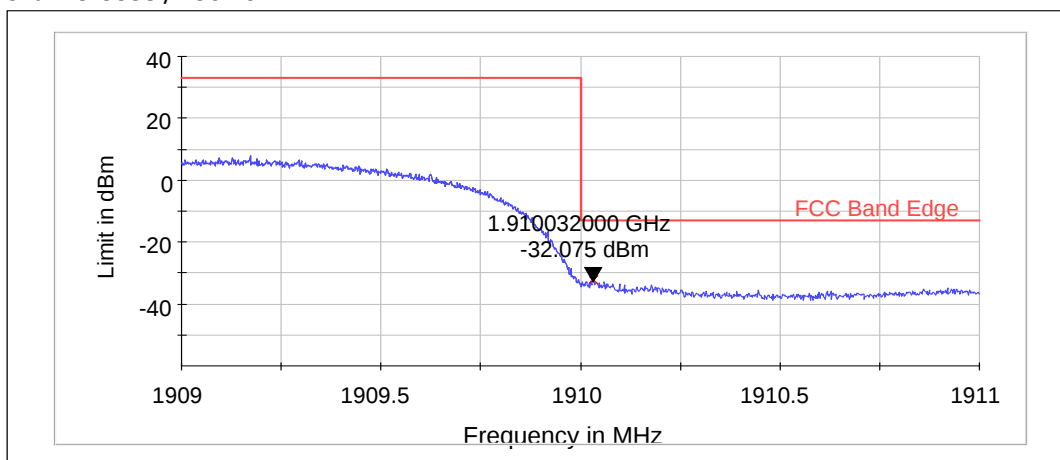
Channel 9262 / 1852.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1849.966	-31.19	PASSED

Channel 9538 / 1907.6 MHz

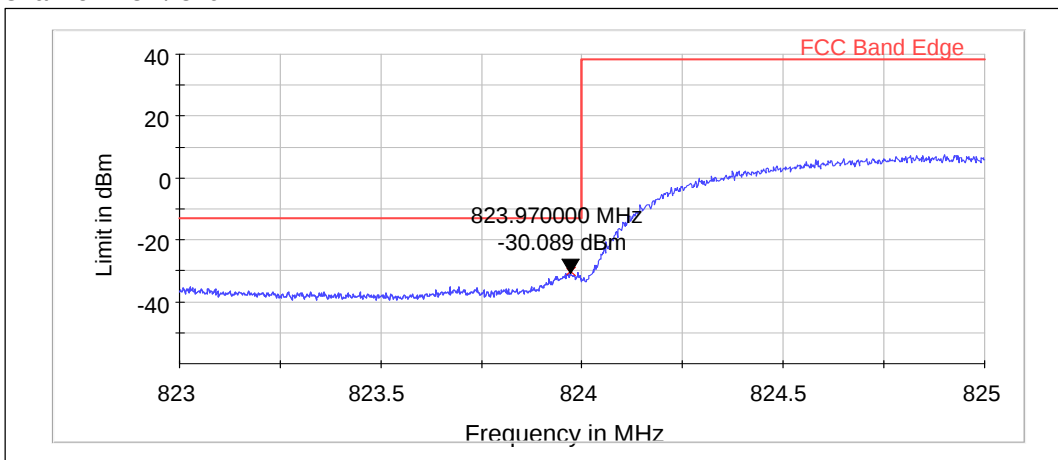


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1910.032	-32.07	PASSED

3.6. WCDMA 850 Test results

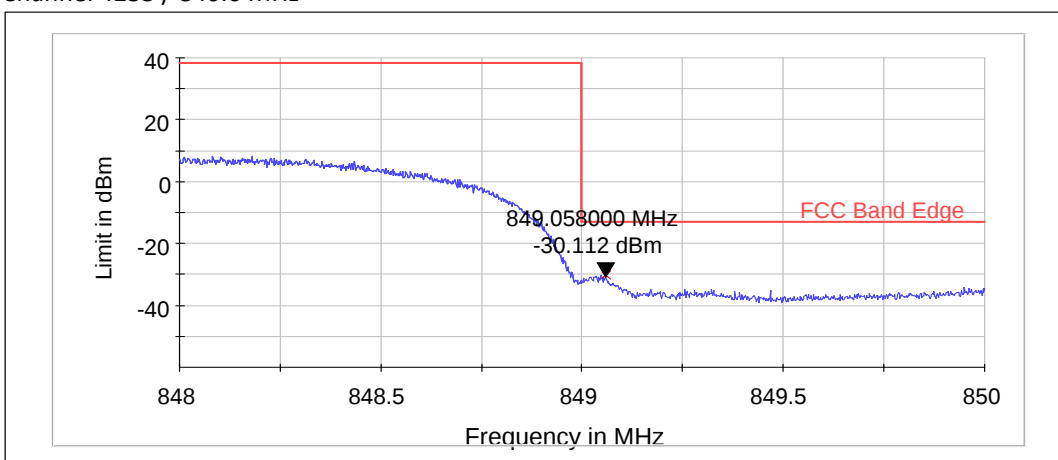
Channel 4132 / 826.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	823.970	-30.09	PASSED

Channel 4233 / 846.6 MHz

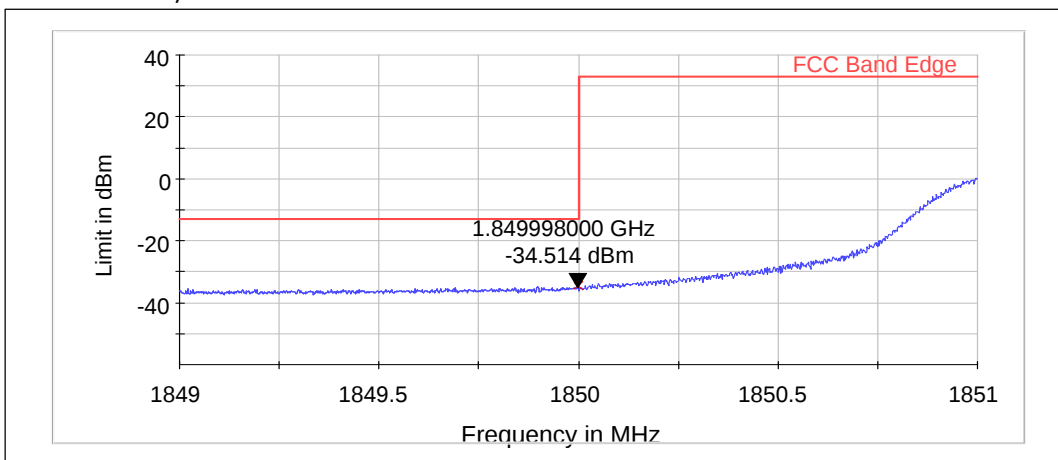


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	849.058	-30.11	PASSED

3.7. LTE1900 (Band 2) Test results

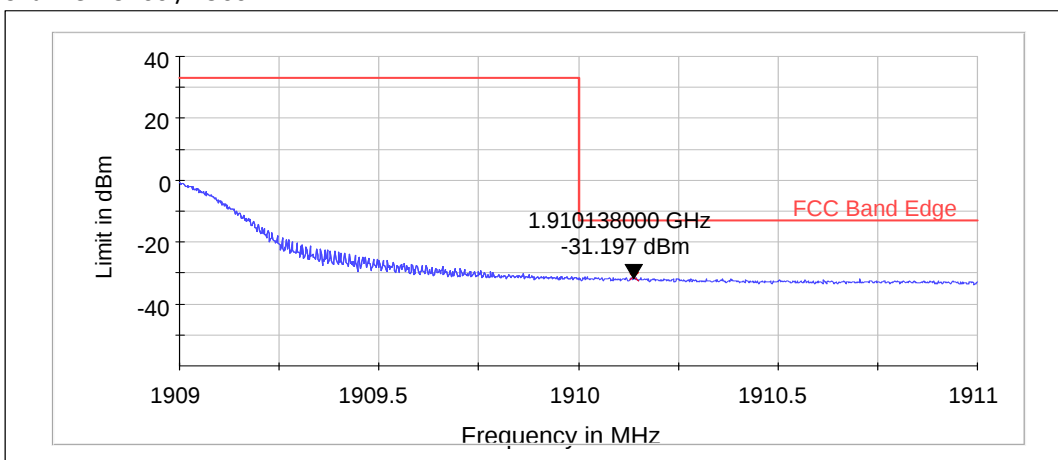
Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1849.998	-34.51	PASSED

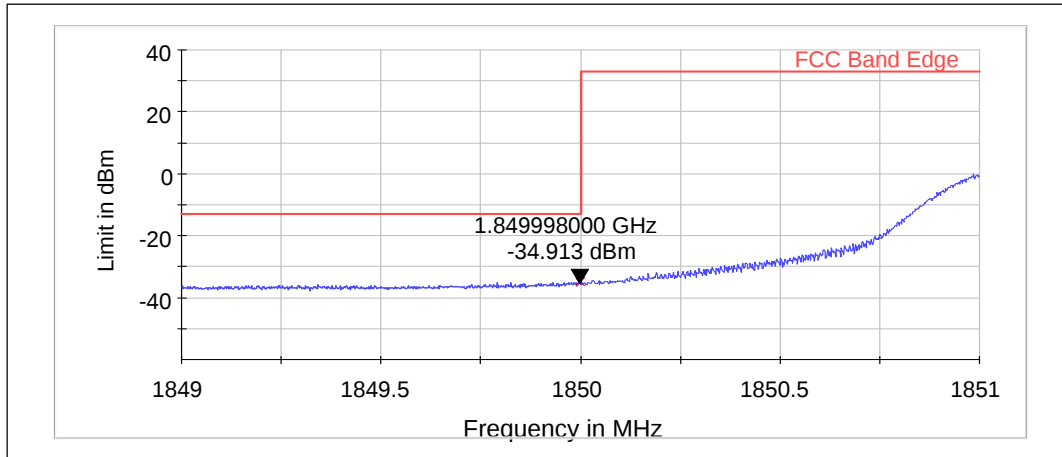
Channel 19100 / 1900 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1910.138	-31.20	PASSED

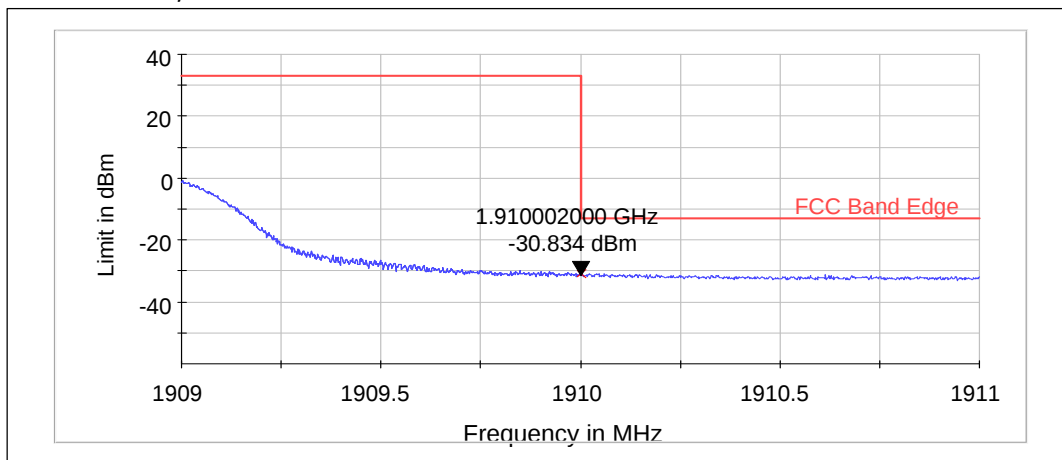
Channel 18700 / 1860 MHz



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	-34.91	PASSED

Channel 19100 / 1900 MHz

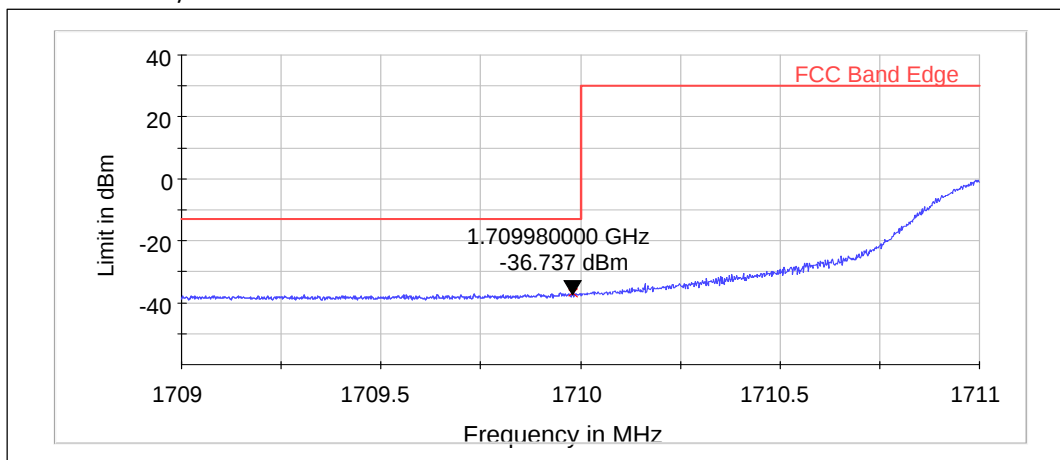


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1910.002	-30.83	PASSED

3.8. LTE1700 (Band 4) Test results

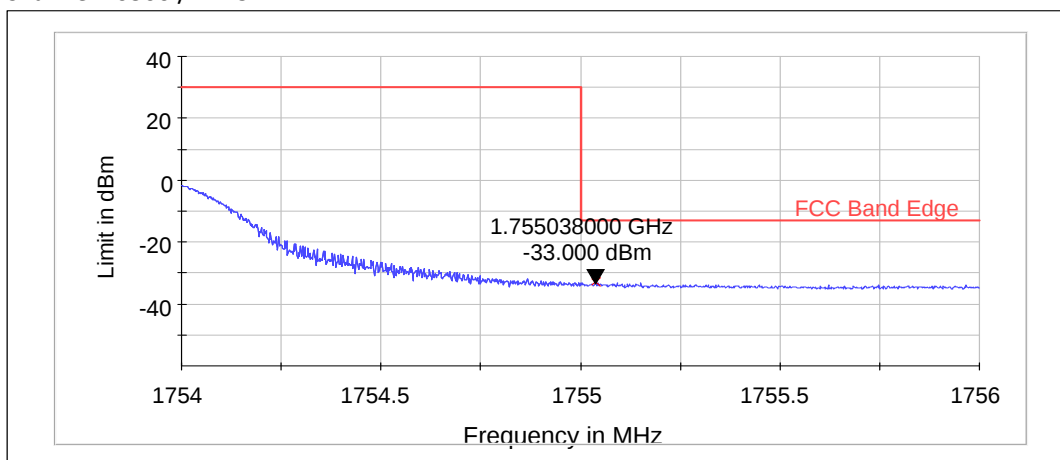
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1709.980	-36.74	PASSED

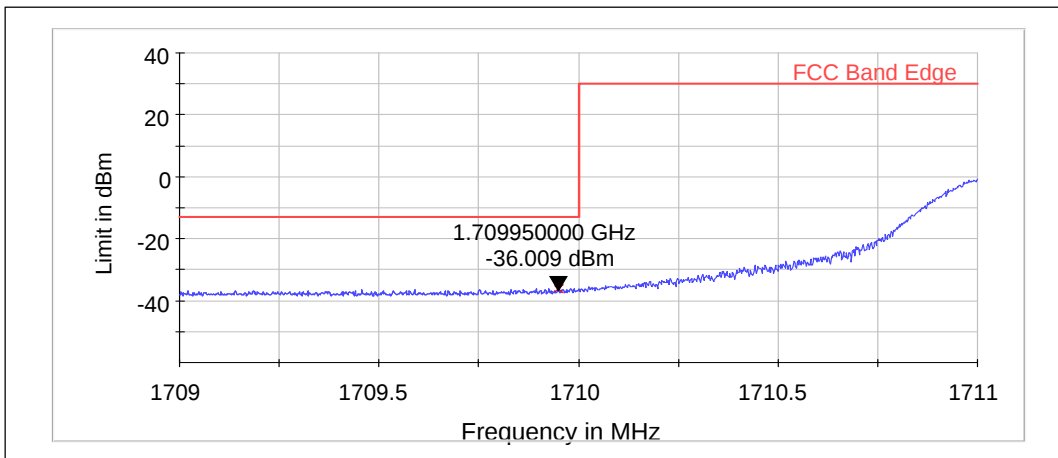
Channel 20300 / 1745 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1755.038	-33.00	PASSED

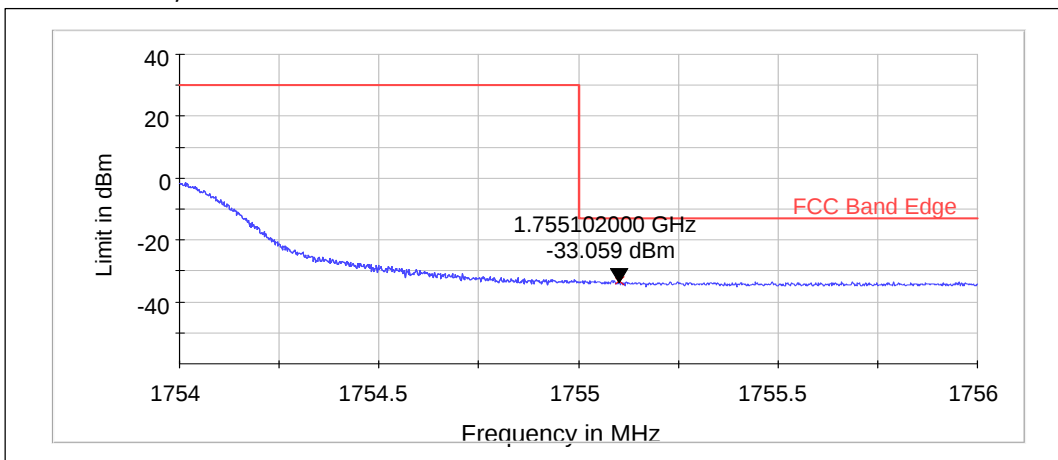
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1709.950	-36.01	PASSED

Channel 20300 / 1745 MHz

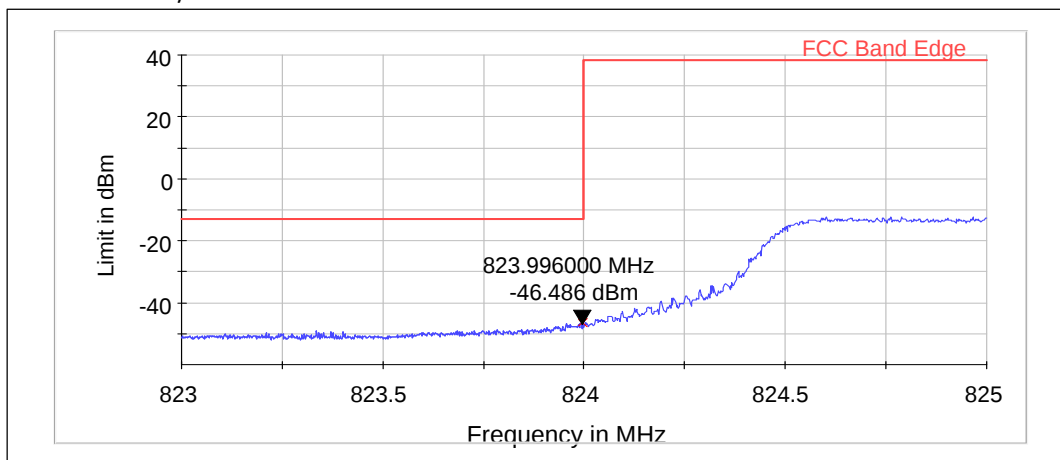


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1755.102	-33.06	PASSED

3.9. LTE850 (Band 5) Test results

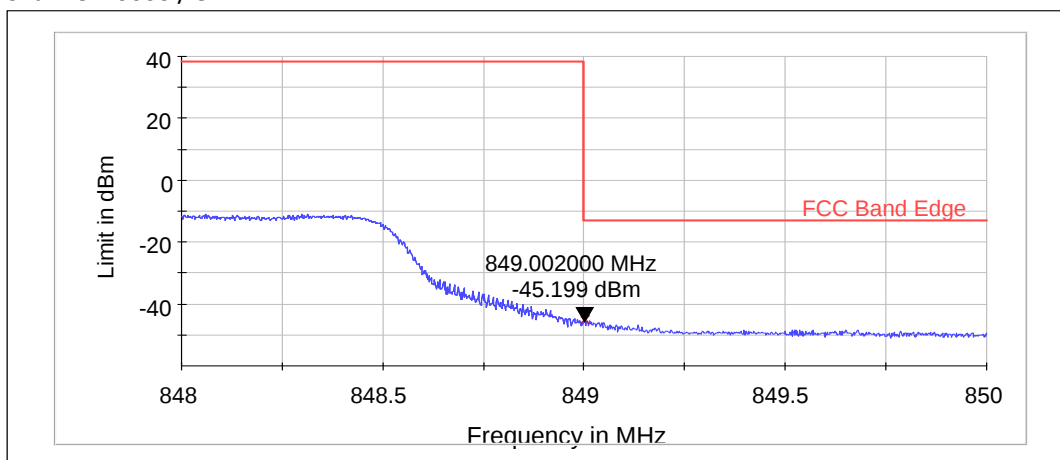
Channel 20450 / 829 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	823.996	-46.49	PASSED

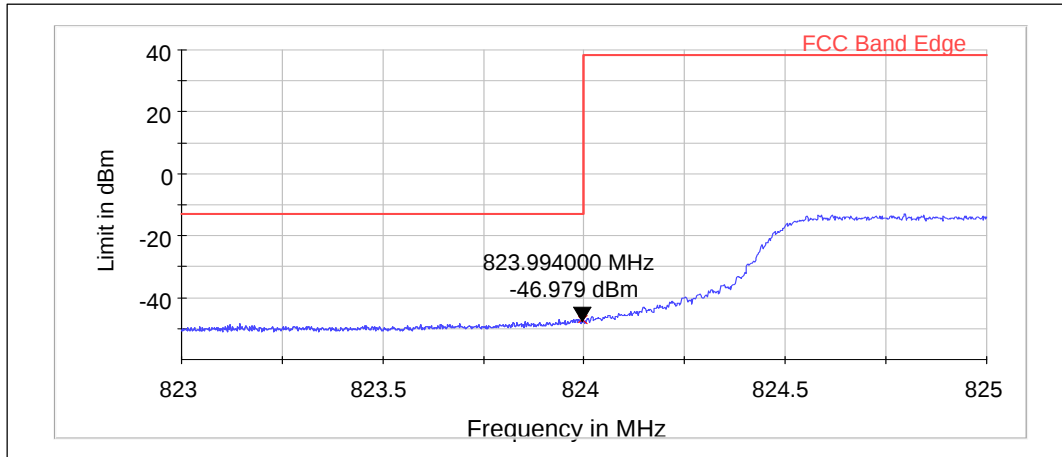
Channel 20600 / 844 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	849.002	-45.20	PASSED

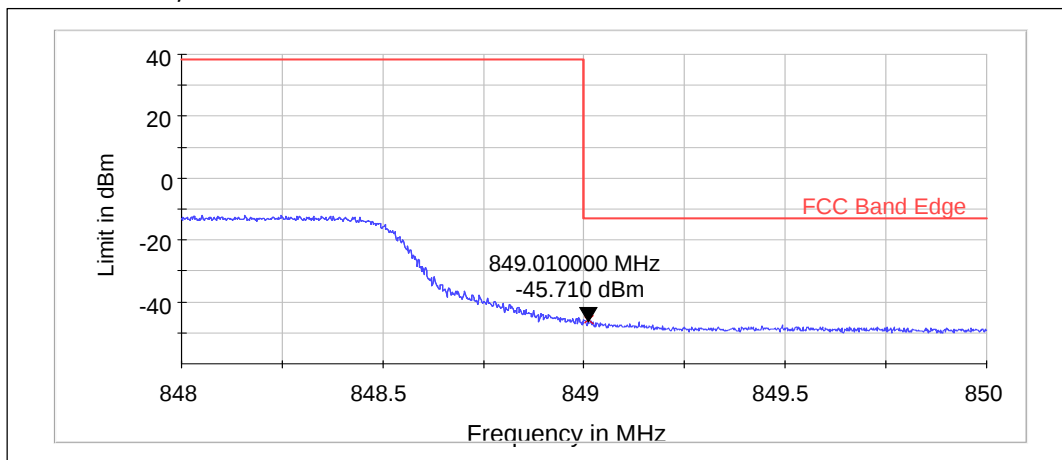
Channel 20450 / 829 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	823.994	-46.98	PASSED

Channel 20600 / 844 MHz

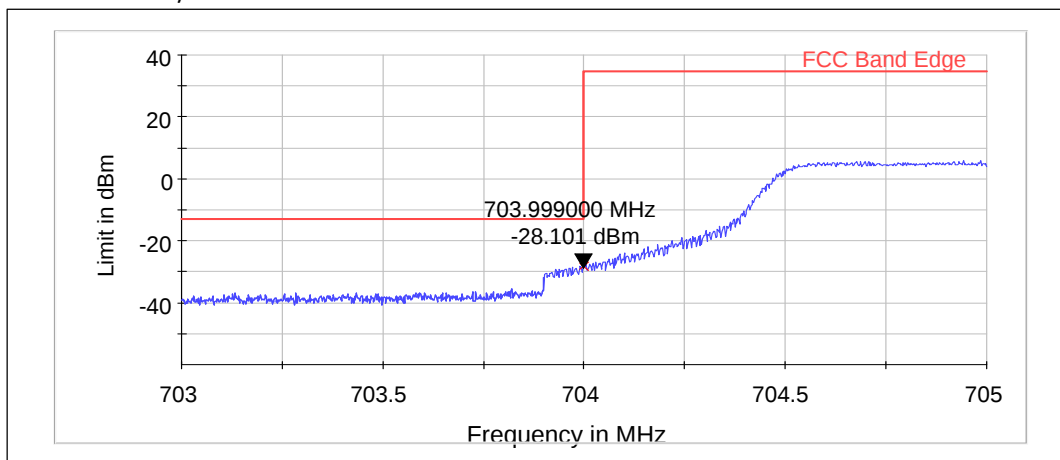


RMS (RBW: 100 kHz, VBW: 100 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	849.010	-45.71	PASSED

3.10. LTE700 Lower (Band 17) Test results

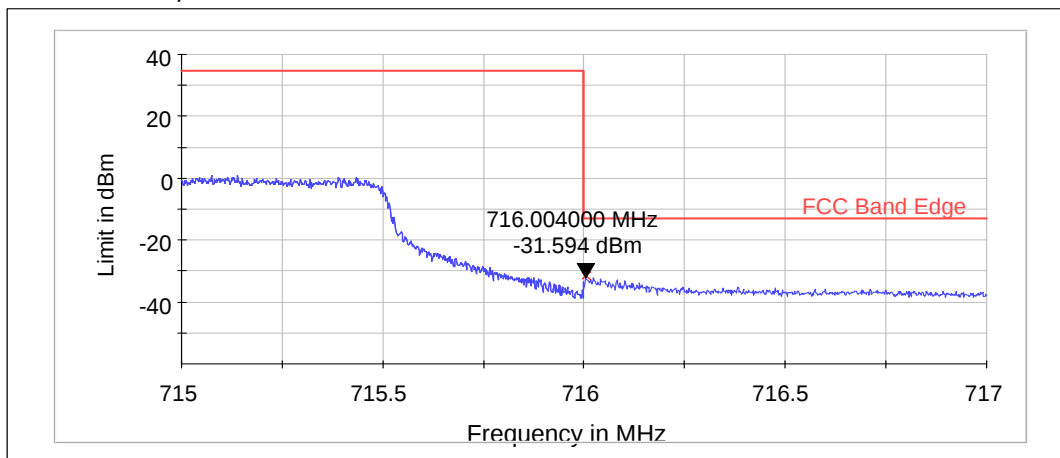
Channel 23780 / 709 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	703.999	-28.10	PASSED

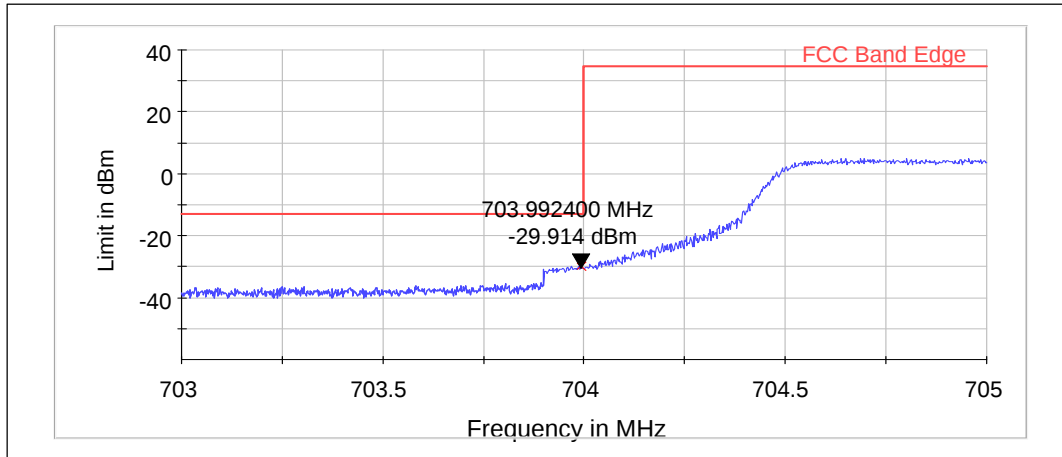
Channel 23800 / 711 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	716.004	-31.59	PASSED

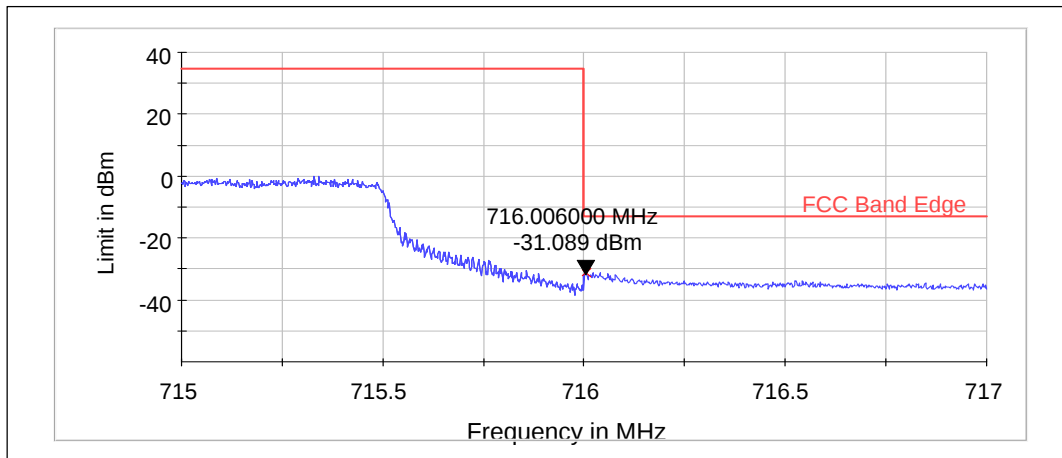
Channel 23780 / 709 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	703.992	-29.91	PASSED

Channel 23800 / 711 MHz

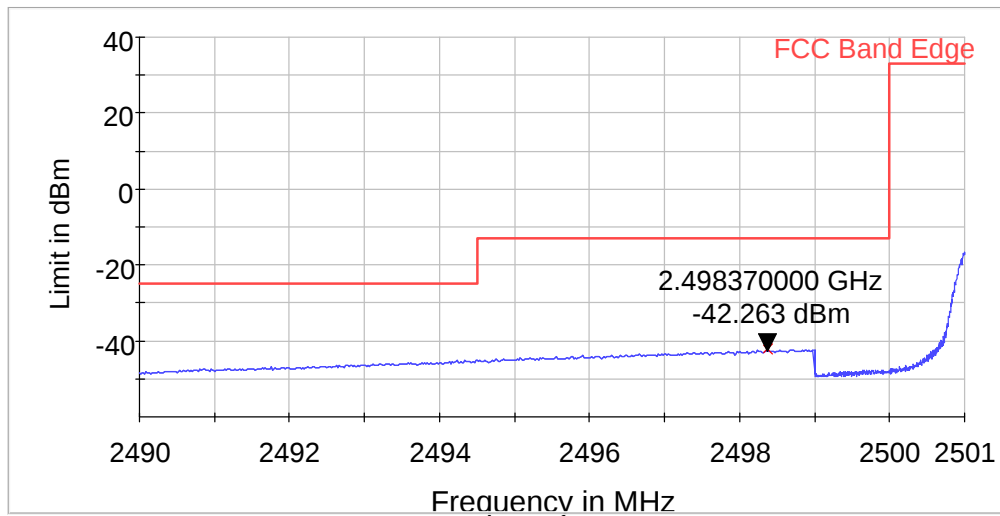


RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	716.006	-31.09	PASSED

3.11. LTE7 Test results

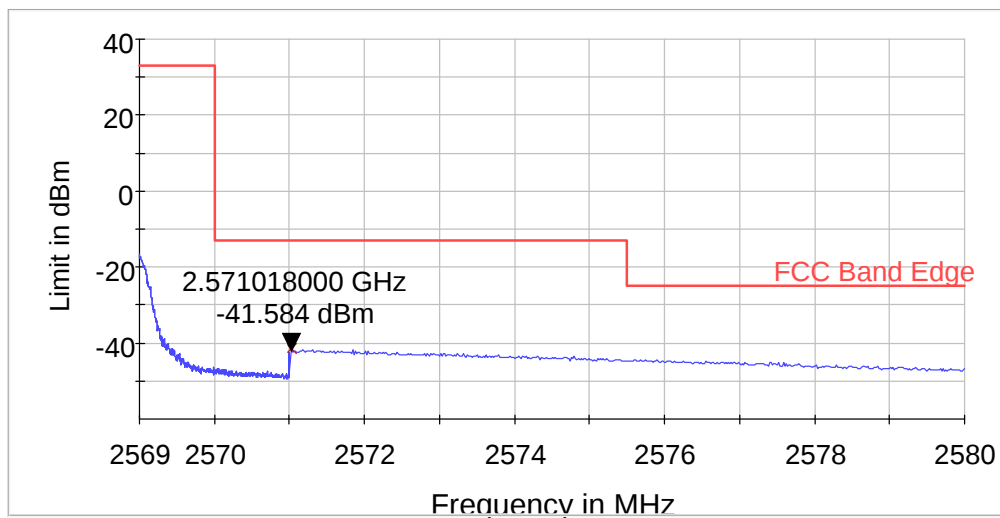
Channel 20850 / 2510 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	2498.586	-42.64	PASSED

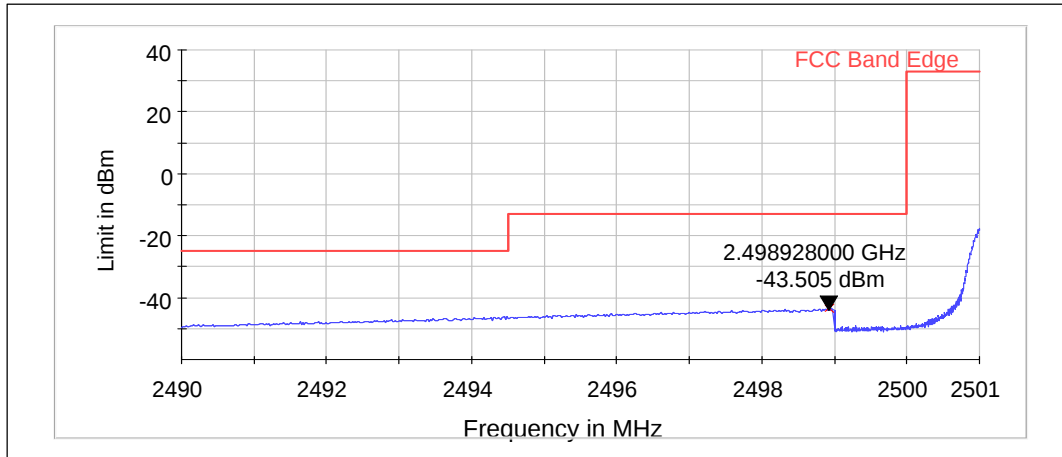
Channel 21350 / 2560 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	2571.018	-41.58	PASSED

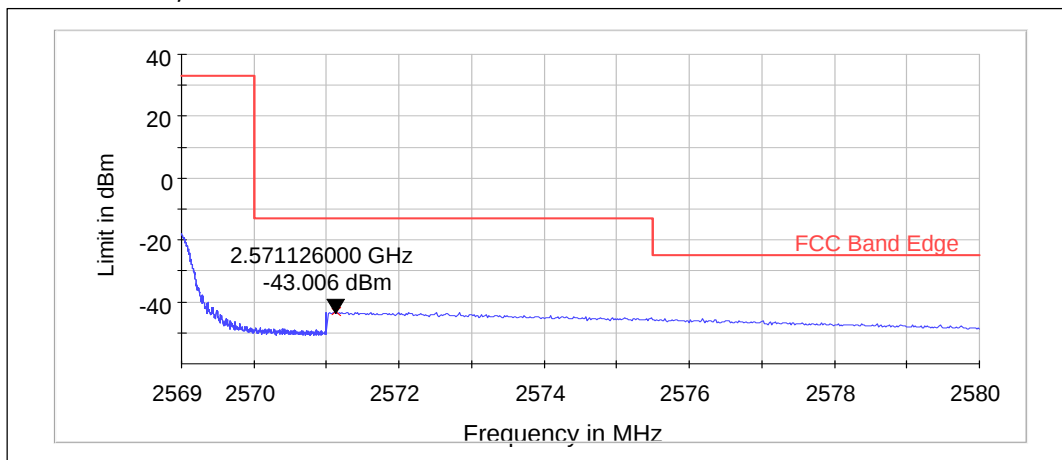
Channel 20850 / 2510 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	2498.928	-43.50	PASSED

Channel 21350 / 2560 MHz



RMS detector, Max hold

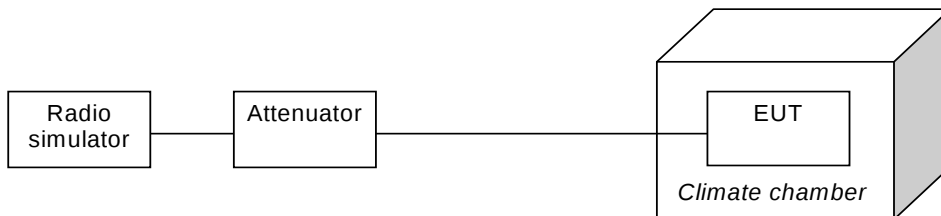
Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	2571.126	-43.01	PASSED

4. Frequency stability, temperature variation

(FCC §2.1055(a), §27.54, RSS-133 6.3, RSS-132 4.3, RSS-139 6.3, RSS-199 4.3, RSS-130 4.3 (a))

EUT with DUT number	RM-985, DUT 30818
Accessories with DUT numbers	SD-240R, DUT 30819
Operation Voltage [V] / [Hz]	3.8V DC
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.8 / 46.4 / 1050
Date of measurements	16-Jul-2014
Measured by	Feng You

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	53.01000	0.0282	PASSED
40	1880.00	46.10000	0.0245	PASSED
30	1880.00	47.27000	0.0251	PASSED
20	1880.00	47.46000	0.0252	PASSED
10	1880.00	45.01000	0.0239	PASSED
0	1880.00	49.01000	0.0261	PASSED
-10	1880.00	45.33000	0.0241	PASSED
-20	1880.00	50.04000	0.0266	PASSED
-30	1880.00	45.65000	0.0243	PASSED

4.4. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	836.60	12.79000	0.0153	PASSED
40	836.60	10.20000	0.0122	PASSED
30	836.60	10.07000	0.012	PASSED
20	836.60	6.97000	0.0083	PASSED
10	836.60	4.52000	0.0054	PASSED
0	836.60	0.19000	0.0002	PASSED
-10	836.60	-1.42000	-0.0017	PASSED
-20	836.60	-2.58000	-0.0031	PASSED
-30	836.60	-3.49000	-0.0042	PASSED

4.5. LTE1700 (Band 4) 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	0.22888	0.0001	PASSED
40	1732.50	2.30312	0.0013	PASSED
30	1732.50	-0.11444	-0.0001	PASSED
20	1732.50	1.85967	0.0011	PASSED
10	1732.50	0.12875	0.0001	PASSED
0	1732.50	1.98841	0.0011	PASSED
-10	1732.50	0.61512	0.0004	PASSED
-20	1732.50	2.74658	0.0016	PASSED
-30	1732.50	1.50204	0.0009	PASSED

4.6. LTE7 Test results

FDD, CBW 20MHz, QPSK, 100 RB, Channel 21100 / 2535.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	2535.00	-1.17302	-0.0005	PASSED
40	2535.00	6.43730	0.0025	PASSED
30	2535.00	7.59602	0.003	PASSED
20	2535.00	-2.78950	-0.0011	PASSED
10	2535.00	1.54495	0.0006	PASSED
0	2535.00	7.29561	0.0029	PASSED
-10	2535.00	8.15392	0.0032	PASSED
-20	2535.00	-0.08583	0	PASSED
-30	2535.00	3.87669	0.0015	PASSED

4.7. LTE700 Lower (Band 17) Test results

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

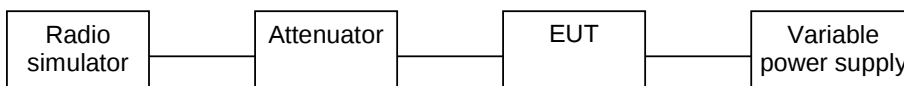
Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	710.00	-0.18597	-0.0003	PASSED
40	710.00	-0.47207	-0.0007	PASSED
30	710.00	0.34332	0.0005	PASSED
20	710.00	0.50068	0.0007	PASSED
10	710.00	1.23024	0.0017	PASSED
0	710.00	-0.57220	-0.0008	PASSED
-10	710.00	1.75953	0.0025	PASSED
-20	710.00	1.15871	0.0016	PASSED
-30	710.00	0.28610	0.0004	PASSED

5. Frequency stability, voltage variation

(FCC §2.1055(d), §27.54, RSS-133 6.3, RSS-132 4.3, RSS-139 6.3, RSS-199 4.3", RSS-130 4.3 (a))

EUT with DUT number	RM-985, DUT 30818
Accessories with DUT numbers	SD-240R, DUT 30819
Operation Voltage [V] / [Hz]	4.2/3.8/3.6V DC
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.8 / 46.4 / 1050
Date of measurements	15-Jul-2014
Measured by	Feng You

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 850 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	836.60	8.27000	0.0099	PASSED
Battery cut-off point / 3.6	836.60	6.52000	0.0078	PASSED
Nominal / 3.6	836.60	5.36000	0.0064	PASSED

5.4. GSM 1900 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1880.00	45.26000	0.0241	PASSED
Battery cut-off point / 3.6	1880.00	45.78000	0.0244	PASSED
Nominal / 3.6	1880.00	47.40000	0.0252	PASSED

5.5. LTE1700 (Band 4) 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	1.11580	0.0006	PASSED
Battery cut-off point / 3.6	1732.50	2.60353	0.0015	PASSED
Nominal / 3.6	1732.50	1.15871	0.0007	PASSED

5.6. LTE7 Test results

FDD, CBW 20MHz, QPSK, 100 RB, Channel 21100 / 2535.0 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	2535.00	-6.76632	-0.0027	PASSED
Battery cut-off point / 3.6	2535.00	-0.41485	-0.0002	PASSED
Nominal / 3.6	2535.00	-1.31607	-0.0005	PASSED

5.7. 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	1.61648	0.0023	PASSED
Battery cut-off point / 3.6	710.00	1.51634	0.0021	PASSED
Nominal / 3.6	710.00	0.87261	0.0012	PASSED

6. Test Equipment

6.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
4406	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
7602	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
7151	Bluetooth Tester	CBT	R&S	15B
-	GPS RX Antenna w/AMP	L1A-PM-NF	GPS Source	15C
-	GPS Inline amplifier	A11M-V-NF-NM	GPS Source	15C
-	GPS signal Splitter	S12-P110/5-NF	GPS Source	15C
-	GPS TX Antenna	L1P-PV-NF	GPS Source	15C
7912	Spectrum Analyzer	FSV-30	R&S	22/24/27, 15C
-	Thermal Chamber	VT-4002	Vötsch	22/24/27, 15C
-	Power splitter	11667B	Agilent	22/24/27, 15C
3396	EMC Analyzer	E7405A	HP	-
7451	EMI Receiver	ESU-26	R&S	22/24/27, 15C, 15B
4188	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
6981	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
-	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
7582	Signal Generator	SMB100A	R&S	15C, 15B

6.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
7646	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	ETS-Lindgren	22/24/27, 15C, 15B
-	RF immunity / Emission Software	EMC32	R&S	22/24/27, 15C, 15B
7591	Antenna	HL562	R&S	22/24/27, 15C, 15B
7572	Double Ridge Horn Antenna	3117	ETS-Lindgren	22/24/27, 15C
7607	Standard Gain Horn Antenna	SAS 586	A.H. System	22/24/27, 15C
7624	Standard Gain Horn Antenna	SAS 587	A.H. System	22/24/27, 15C
7561	Antenna	HFH2-Z2	R&S	15C, 15B
5715	Antenna	MBA-3030	EMC Automation	22/24/27, 15C
5712	Antenna	PLP3003	EMC Automation	22/24/27, 15C
7457	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
7459	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
5729	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
5728	EMI Receiver	ESIB26	R&S	22/24/27, 15C, 15B
4406	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
7602	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
7151	Bluetooth Tester	CBT	R&S	15B
3406	Controller	Sc99V	Sunol	22/24/27, 15C, 15B
-	Controller	G-1000DXC	Yaesu	22/24/27, 15C, 15B
-	Computer Controller	GS-232B	Yaesu	22/24/27, 15C, 15B
7040	Preamplifier	TS-PR3	R&S	22/24/27, 15C, 15B
-	Preamplifier	AMF-6D-020180-29-20P	Miteq	22/24/27, 15C, 15B
-	Preamplifier	AMF-4D-01000800-30-29P	Miteq	22/24/27, 15C, 15B
-	Preamplifier	AMF-5F-18002650-25-10P	Miteq	22/24/27, 15C, 15B
-	High Pass Filter	4HC1700-1-KK	R&S	22
-	High Pass Filter	F-15041	RLC	22/24/27, 15C
-	Band Reject Filter	WRCA824/849-0.2-6SS	Wainwright	22
-	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24
-	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	15C

Eq. No	Equipment	Type	Manufacturer	Used in
-	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22
-	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
-	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
-	Notch Filter	WRCD1880-1.1.25/50-10SS	Wainwright	22/24/27
-	Notch Filter	WRCT902.4-0.4/40-8SS	Wainwright	-
Planned	Notch Filter	WRCJV2531/2539-2523/2547-60/12SS	Wainwright	22/24/27
-	GPS RX Antenna w/AMP	L1A-PM-NF	GPS Source	15C
-	GPS Inline amplifier	A11M-V-NF-NM	GPS Source	15C
-	GPS signal Splitter	S12-P110/5-NF	GPS Source	15C
-	GPS TX Antenna	L1P-PV-NF	GPS Source	15C