

FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RX-114_02.docx	Date of Report:	19-Sep-2013
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Device RX-114 / Battery BC-3S / AC-Charger AC-300 / Headset WH-208		
FCC ID:	QMNA	IC:	661X-A
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-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009), RSS-139 (Issue 2, February 2009). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Kalle Hannila, System Manager, EMC

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

Date of receipt	03-Sep-2012
Testing completed	12-Sep-2012
The customer's contact person	Jamie Lee
Test Plan referred to	T:\Projects\RX-114\TestPlan\RS_testplan_RX-114.xlsm
Notes	-
Document name	T:\Projects\RX-114\EMC\FCC22&24&27_RX-114_02.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
Device	RX-114	004402473513822	0108	-	9471 1032 1332 v1.2.2	43079
Device	RX-114	004402473514887	0108	-	9471 1032 1332 v1.2.2	43066
Battery	BC-3S	GC02001XN10LG10136S02E9	B1.0	-	-	43090
AC charger	AC-300	1332000058	2.0	-	-	43068
Headset	WH-208	-	-	-	-	43035

1.2. Summary of Test Results

GSM850:

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	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

GSM1900:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	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 850 (Band V):

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	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	PASSED
§2.1055(d)	4.3	Frequency stability, voltage variation	PASSED

WCDMA 1900 (Band II):

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	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

LTE 1900 (Band II):

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	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	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED
N/A	N/A	Peak to average power ratio	NP

LTE 850 (Band V):

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	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 Upper (Band 13):

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046 (a)	N/A	Conducted RF output power	NP
§27.50(b)(10)	N/A	Radiated RF output power	PASSED
§2.1049(h)	N/A	99 % occupied bandwidth	PASSED
§27.53(c)(2)(4)	N/A	Band edge compliance	PASSED
§27.53(c)(2)(4),(f), §2.1051	N/A	Spurious emissions at antenna terminals	NP
§27.53(c)(2)(4),(f), §2.1053	N/A	Spurious radiated emissions	PASSED
§2.1055(a)	N/A	Frequency stability, temperature variation	PASSED
§2.1055(d)	N/A	Frequency stability, voltage variation	PASSED
N/A	N/A	Peak to average power ratio	NP

LTE700 Lower (Band 17):

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

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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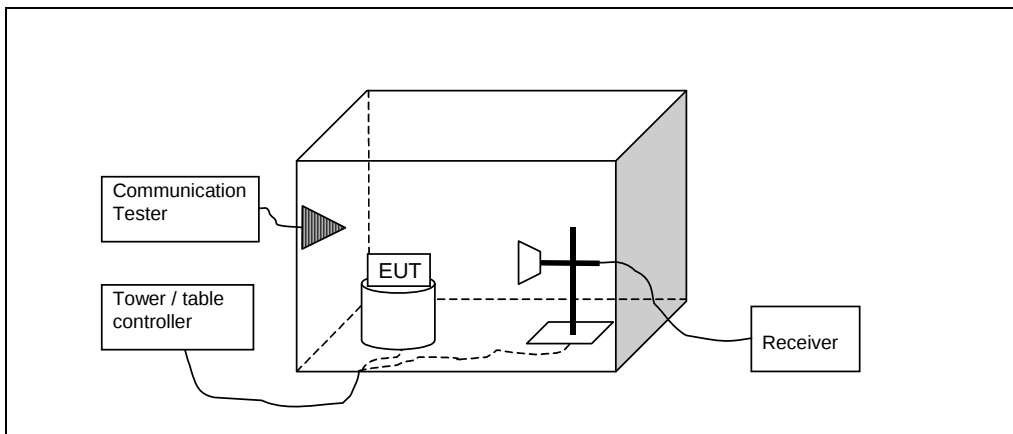
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2. Radiated RF output power

(FCC §22.913(a), §24.232(b), §27.50(d)(2), §27.53(h), §27.53(c)(2)(4), §27.53(g), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4)

EUT with DUT number	RX-114, DUT 43079
Accessories with DUT numbers	BC-3S, DUT 43090
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 55 / 102.5
Date of measurements	24-Aug-2013
Measured by	Timo Raisio

2.1.1 Test setup



2.2. Test method and limit

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

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

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

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

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

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

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
704 - 716	3 ERP	34.8
777 - 787	3 ERP	34.8
824 - 849	7 ERP	38.5
1710 - 1755	1 EIRP	30
1850 - 1910	2 EIRP	33

2.3. GSM850-E1 TX Test results

EGPRS mode, 1 TX Slot

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128 / 824.2	24.15	0.26	-9.18	33.33	HORIZONTAL	PASSED
190 / 836.6	22.77	0.189	-9.69	32.46	VERTICAL	PASSED
251 / 848.8	25.16	0.328	-7.32	32.48	HORIZONTAL	PASSED

2.4. GSM850-G1 TX Test results

GPRS mode, 1 TX Slot

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128 / 824.2	23.96	0.249	-9.48	33.44	VERTICAL	PASSED
190 / 836.6	23.02	0.2	-9.44	32.46	VERTICAL	PASSED
251 / 848.8	21.92	0.156	-10.81	32.73	VERTICAL	PASSED

2.5. GSM1900-E1 TX Test results

EGPRS mode, 1 TX Slot

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512 / 1850.2	26.76	0.474	-17.36	44.12	HORIZONTAL	PASSED
661 / 1880	27.31	0.538	-16.72	44.03	HORIZONTAL	PASSED
810 / 1909.8	25.84	0.384	-18.13	43.97	HORIZONTAL	PASSED

2.6. GSM1900-G1 TX Test results

GPRS mode, 1 TX Slot

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512 / 1850.2	31.67	1.469	-12.45	44.12	HORIZONTAL	PASSED
661 / 1880	31.55	1.429	-12.48	44.03	HORIZONTAL	PASSED
810 / 1909.8	30.39	1.094	-13.58	43.97	HORIZONTAL	PASSED

2.7. WCDMA 850 (Band V) TX Test results

RMS Detector

Channel / f _c [MHz]	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
4132 / 826.4	17.64	0.058	-15.49	33.13	VERTICAL	PASSED
4183 / 836.6	16.55	0.045	-15.91	32.46	HORIZONTAL	PASSED
4233 / 846.6	17.03	0.05	-15.27	32.3	HORIZONTAL	PASSED

2.8. WCDMA 1900 (Band II) TX Test results

RMS Detector

Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
9262 / 1852.4	24.32	0.27	-19.86	44.18	HORIZONTAL	PASSED
9400 / 1880	24.57	0.286	-19.46	44.03	HORIZONTAL	PASSED
9538 / 1907.6	24.07	0.255	-19.89	43.96	HORIZONTAL	PASSED

2.9. LTE 1900 (Band II) 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
0 / 1850.7	25.98	0.396	-18.15	44.13	HORIZONTAL	PASSED
18900 / 1880	26.18	0.415	-17.85	44.03	HORIZONTAL	PASSED
18900 / 1909.3	24.93	0.311	-19.03	43.96	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
0 / 1850.7	26.11	0.408	-18.02	44.13	HORIZONTAL	PASSED
18900 / 1880	26.42	0.438	-17.61	44.03	HORIZONTAL	PASSED
18900 / 1909.3	24.9	0.309	-19.06	43.96	HORIZONTAL	PASSED

2.10. LTE 1700 (Band IV) 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
0 / 1710.7	24.84	0.305	-18.12	42.96	HORIZONTAL	PASSED
20175 / 1732.5	24.53	0.284	-18.35	42.88	HORIZONTAL	PASSED
20175 / 1754.3	24.93	0.311	-18.15	43.08	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
0 / 1710.7	25.27	0.336	-17.69	42.96	HORIZONTAL	PASSED
20175 / 1732.5	24.52	0.283	-18.36	42.88	HORIZONTAL	PASSED
20175 / 1754.3	25.2	0.331	-17.88	43.08	HORIZONTAL	PASSED

2.11. LTE 850 (Band V) 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
0 / 824.7	19.52	0.089	-13.85	33.37	VERTICAL	PASSED
20525 / 836.5	18.56	0.072	-13.9	32.46	VERTICAL	PASSED
20525 / 848.3	18.53	0.071	-14.16	32.69	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
0 / 824.7	19.34	0.086	-14.03	33.37	VERTICAL	PASSED
20525 / 836.5	17.95	0.062	-14.51	32.46	VERTICAL	PASSED
20525 / 848.3	18.03	0.064	-14.41	32.44	HORIZONTAL	PASSED

2.12. LTE700 Upper (Band 13) 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
23205 / 779.5	20.31	0.107	-12.68	32.99	HORIZONTAL	PASSED
23230 / 782	19.78	0.095	-12.85	32.63	HORIZONTAL	PASSED
23255 / 784.5	19.56	0.09	-12.77	32.33	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
23205 / 779.5	20.11	0.103	-12.88	32.99	HORIZONTAL	PASSED
23230 / 782	19.66	0.093	-12.97	32.63	HORIZONTAL	PASSED
23255 / 784.5	19.1	0.081	-13.23	32.33	HORIZONTAL	PASSED

2.13. LTE700 Lower (Band 17) TX Test results

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

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
23755 / 706.5	20.18	0.104	-10.97	31.15	HORIZONTAL	PASSED
23790 / 710	19.75	0.094	-11.49	31.24	HORIZONTAL	PASSED
23825 / 713.5	20.18	0.104	-11.2	31.38	HORIZONTAL	PASSED

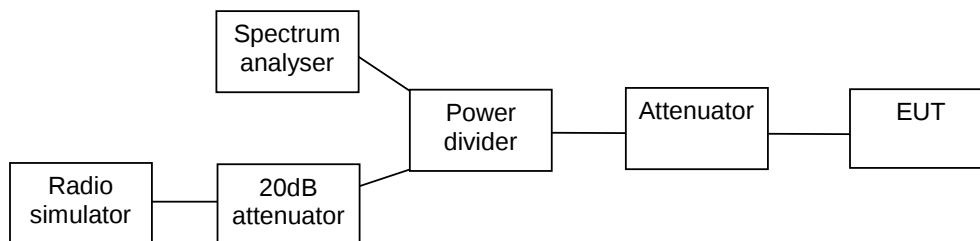
FDD, CBW 5MHz, 16QAM, 1 RB, RMS Detector

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
23755 / 706.5	19.42	0.087	-11.73	31.15	HORIZONTAL	PASSED
23790 / 710	19.34	0.086	-11.9	31.24	HORIZONTAL	PASSED
23825 / 713.5	19.93	0.098	-11.45	31.38	HORIZONTAL	PASSED

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

EUT with DUT number	RX-114 DUT 43066
Accessories with DUT numbers	BC-3S, DUT 43090 ; AC-300, DUT 43068 ; WH-208, DUT 43035
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 58 / 101.7
Date of measurements	20-Aug-2013
Measured by	Jari Jantunen

3.1. Test Setup



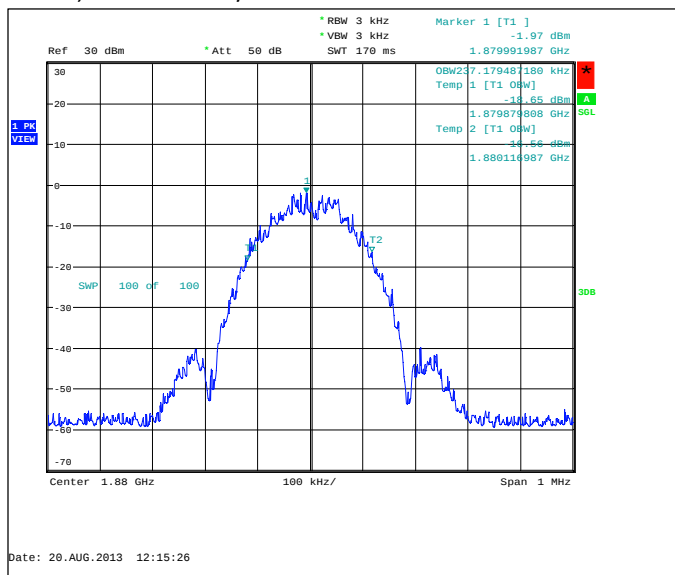
3.2. Test method and limit

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

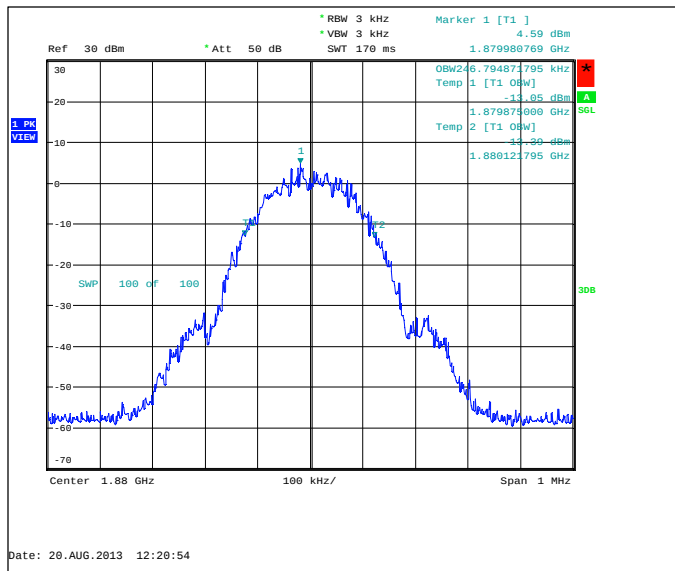
3.3. GSM 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
EGPRS	237.2
GPRS	246.8

EGPRS, Channel 661 / 1880.0 MHz



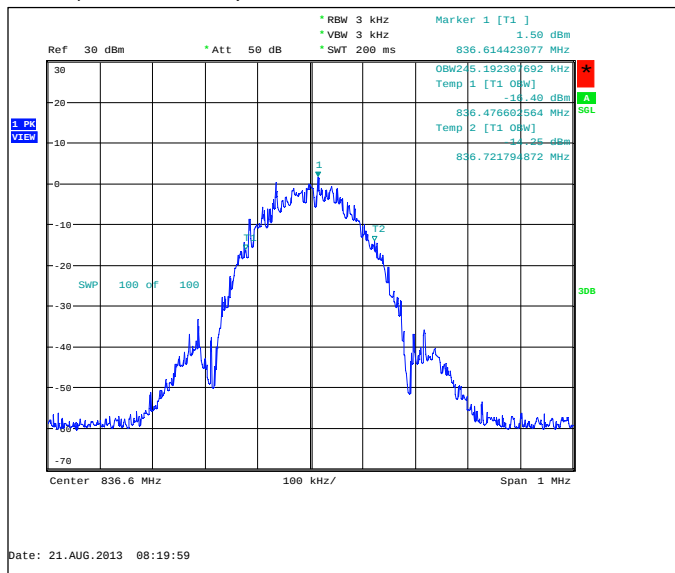
GPRS, Channel 661 / 1880.0 MHz



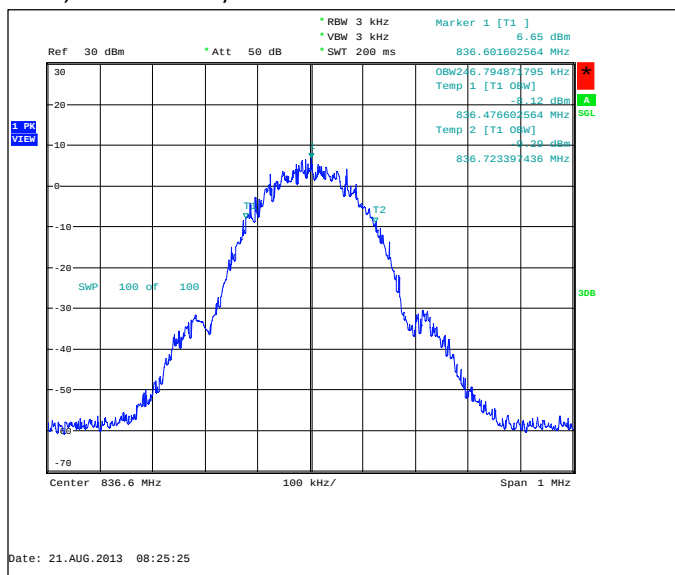
3.4. GSM 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
EGPRS	245.2
GPRS	246.8

EGPRS, Channel 190 / 836.6 MHz



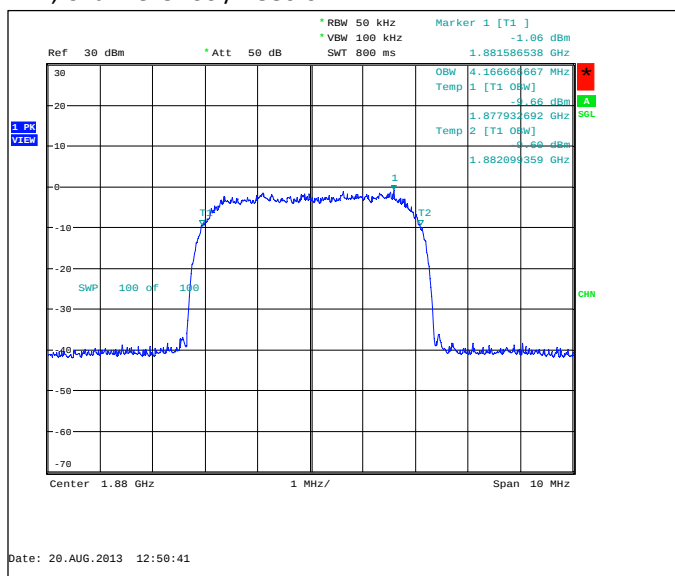
GPRS, Channel 190 / 836.6 MHz



3.5. WCDMA 1900 Test results

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

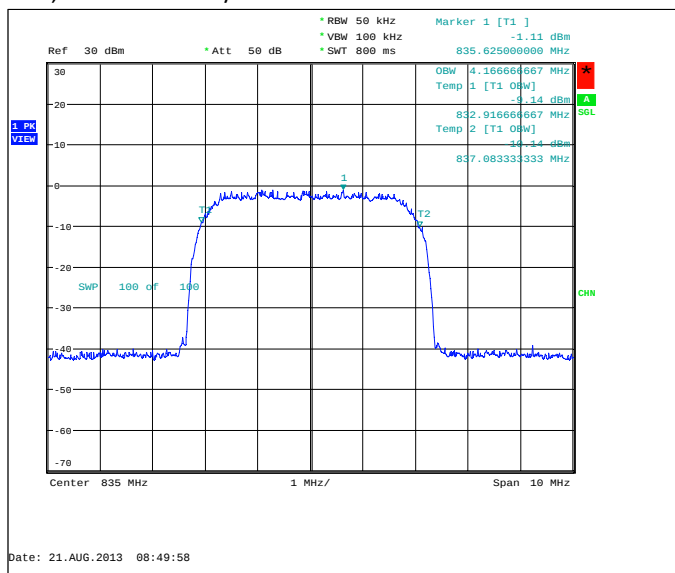
FDD, Channel 9400 / 1880.0 MHz



3.6. WCDMA 850 Test results

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

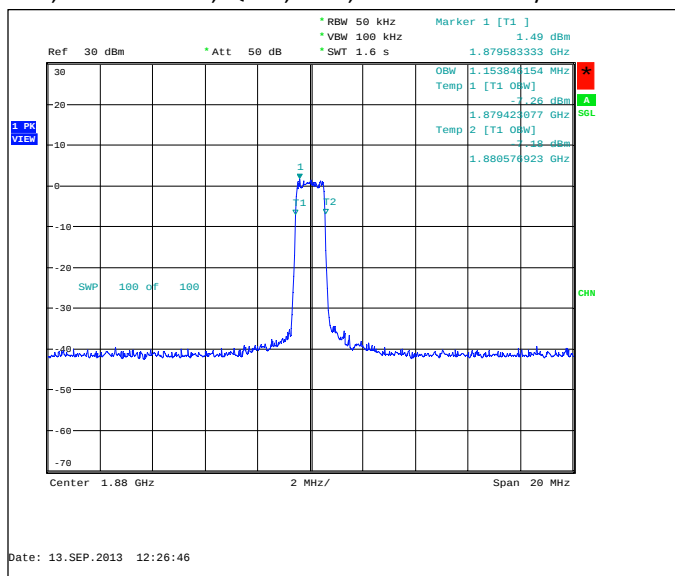
FDD, Channel 4175 / 835.0 MHz



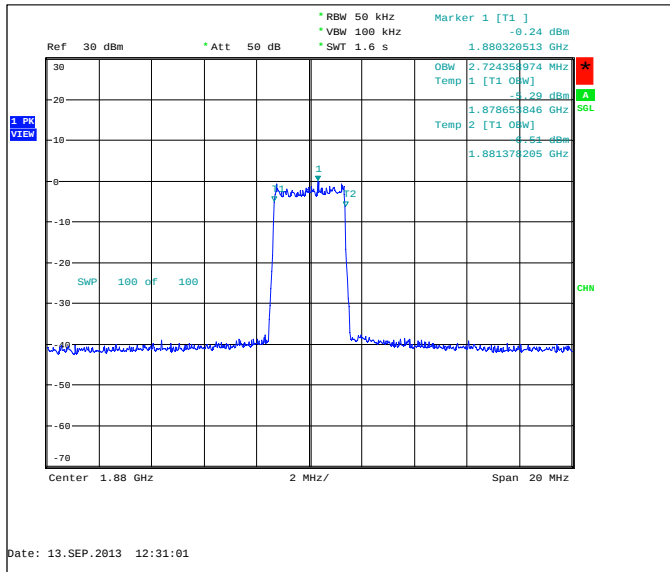
3.7. LTE1900 (Band 2) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1153.8
FDD, CBW 3MHz, QPSK, 15 RB	2724.4
FDD, CBW 5MHz, QPSK, 25 RB	4487.2
FDD, CBW 10MHz, QPSK, 50 RB	8942.3
FDD, CBW 15MHz, QPSK, 75 RB	13365.4
FDD, CBW 20MHz, QPSK, 100 RB	17788.5
FDD, CBW 1.4MHz, 16QAM, 6 RB	1153.8
FDD, CBW 3MHz, 16QAM, 15 RB	2692.3
FDD, CBW 5MHz, 16QAM, 25 RB	4487.2
FDD, CBW 10MHz, 16QAM, 50 RB	8942.3
FDD, CBW 15MHz, 16QAM, 75 RB	13365.4
FDD, CBW 20MHz, 16QAM, 100 RB	17820.5

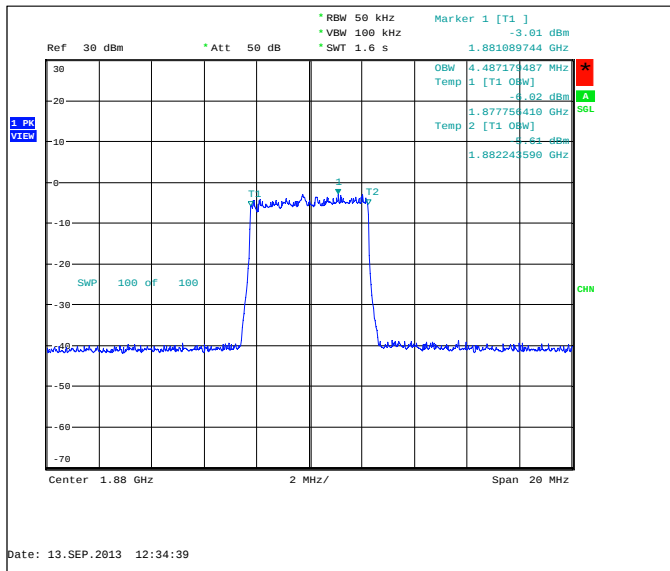
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 18900 / 1880.0 MHz



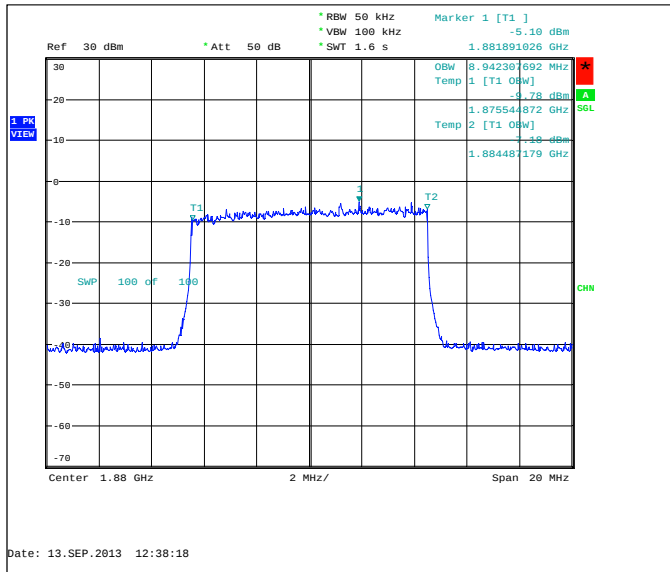
FDD, CBW 3MHz, QPSK, 15 RB, Channel 18900 / 1880.0 MHz



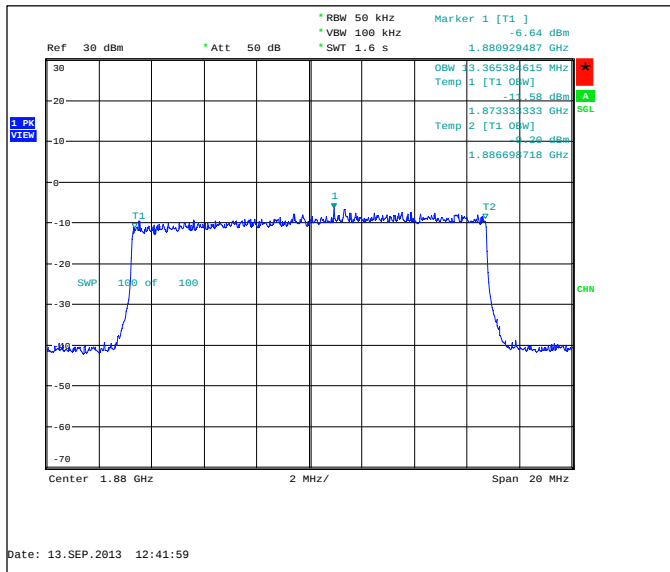
FDD, CBW 5MHz, QPSK, 25 RB, Channel 18900 / 1880.0 MHz



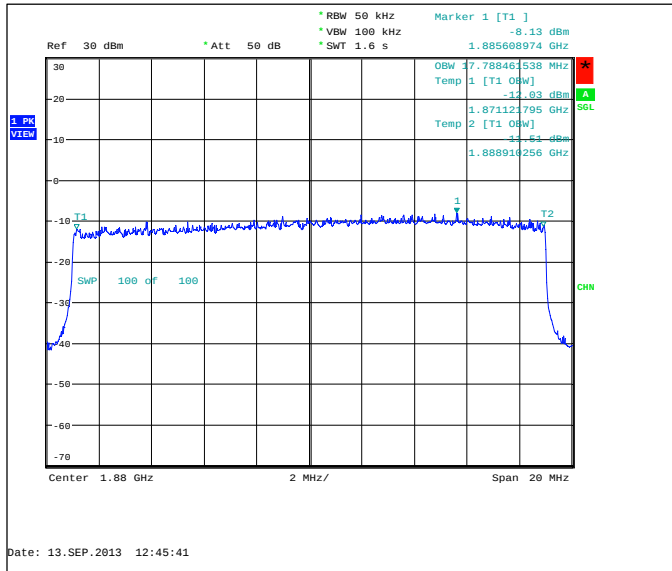
FDD, CBW 10MHz, QPSK, 50 RB, Channel 18900 / 1880.0 MHz



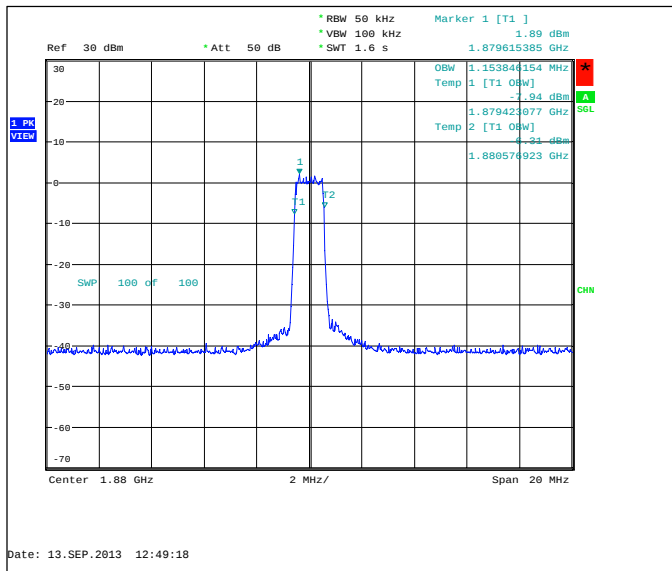
FDD, CBW 15MHz, QPSK, 75 RB, Channel 18900 / 1880.0 MHz



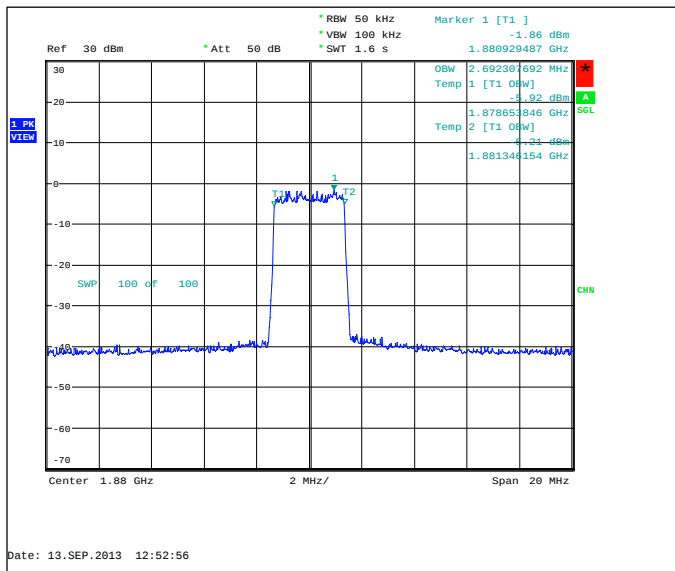
FDD, CBW 20MHz, QPSK, 100 RB, Channel 18900 / 1880.0 MHz



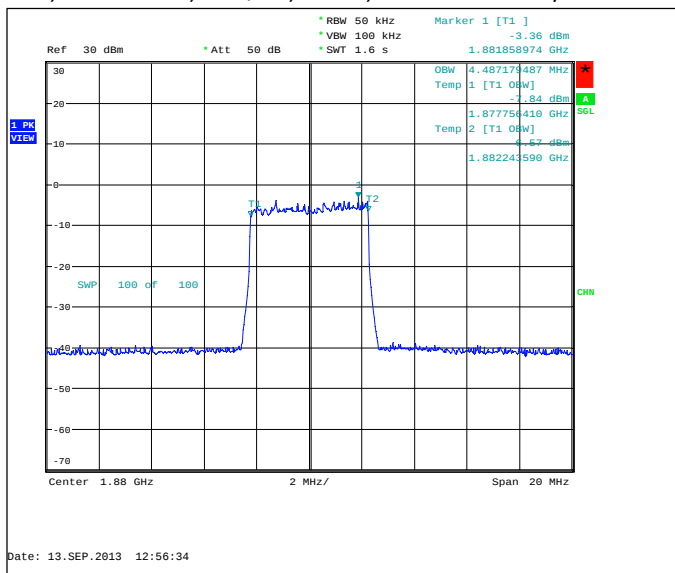
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 18900 / 1880.0 MHz



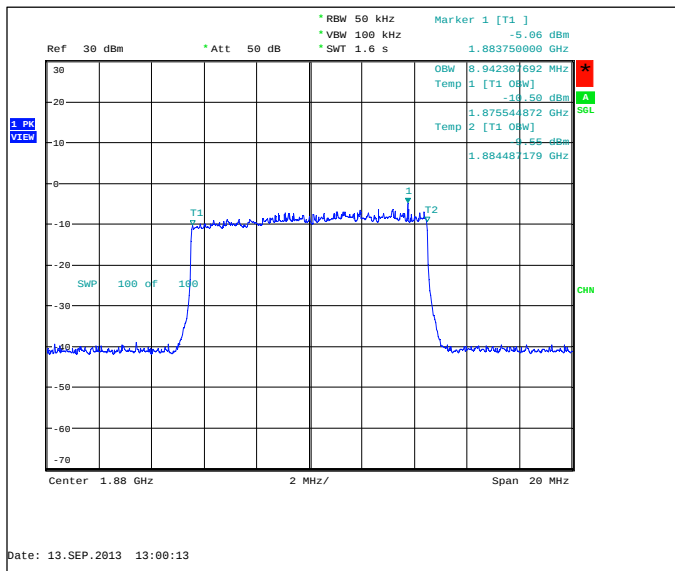
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 18900 / 1880.0 MHz



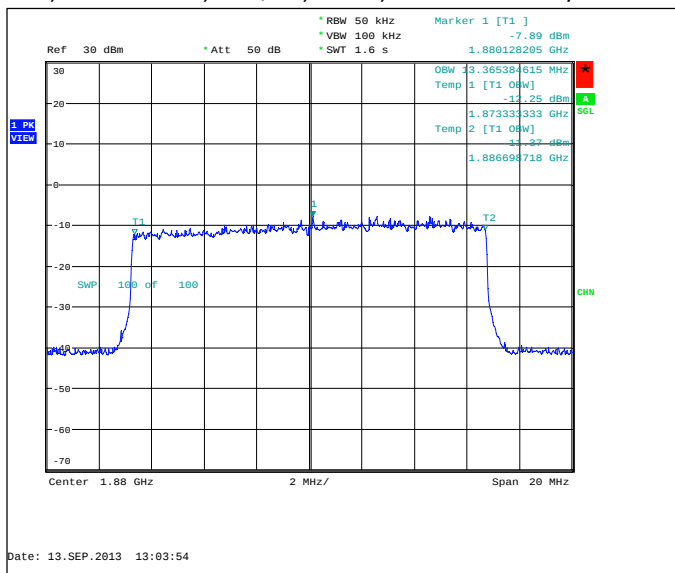
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 18900 / 1880.0 MHz



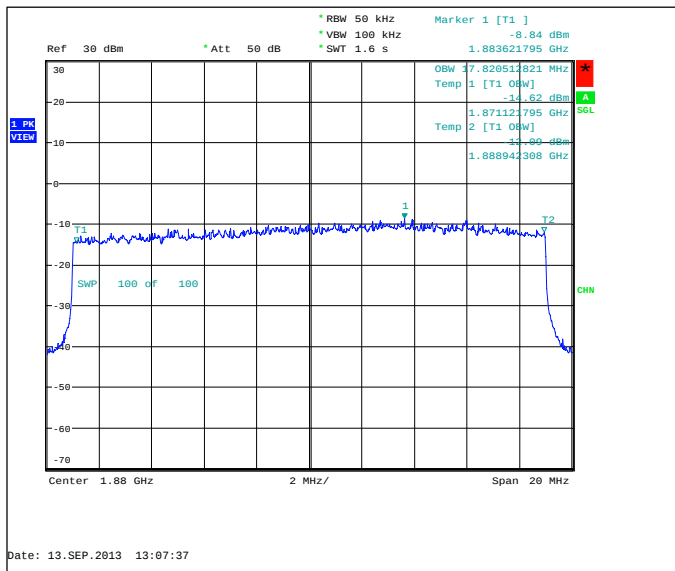
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 18900 / 1880.0 MHz



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



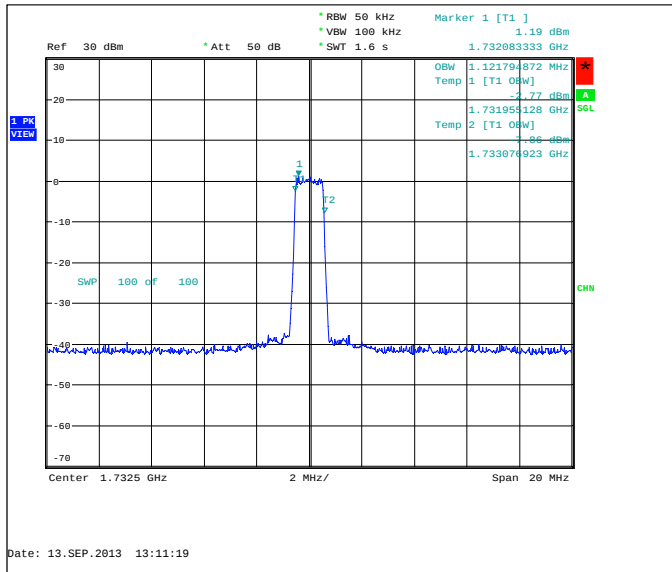
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 18900 / 1880.0 MHz



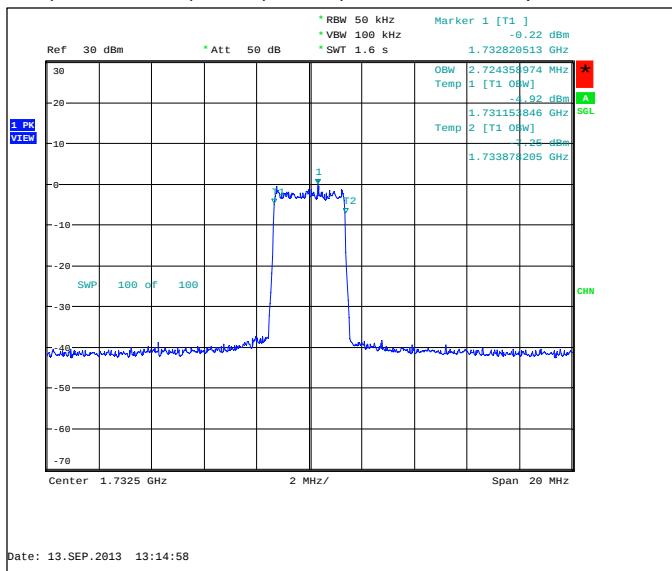
3.8. LTE1700 (Band 4) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1121.8
FDD, CBW 3MHz, QPSK, 15 RB	2724.4
FDD, CBW 5MHz, QPSK, 25 RB	4487.2
FDD, CBW 10MHz, QPSK, 50 RB	8974.4
FDD, CBW 15MHz, QPSK, 75 RB	13397.4
FDD, CBW 20MHz, QPSK, 100 RB	17852.6
FDD, CBW 1.4MHz, 16QAM, 6 RB	1153.8
FDD, CBW 3MHz, 16QAM, 15 RB	2692.3
FDD, CBW 5MHz, 16QAM, 25 RB	4487.2
FDD, CBW 10MHz, 16QAM, 50 RB	8910.3
FDD, CBW 15MHz, 16QAM, 75 RB	13397.4
FDD, CBW 20MHz, 16QAM, 100 RB	17852.6

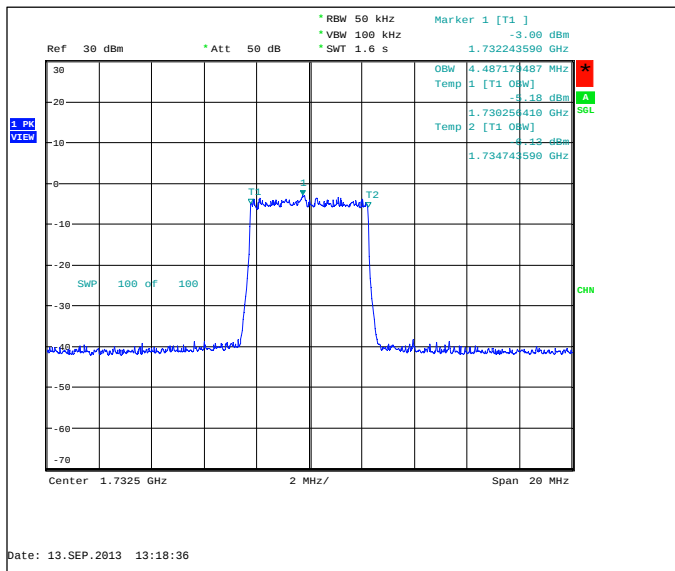
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20175 / 1732.5 MHz



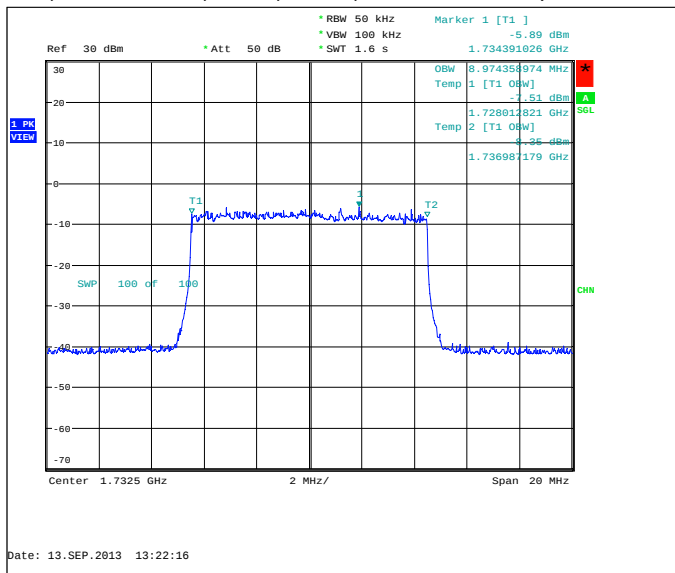
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20175 / 1732.5 MHz



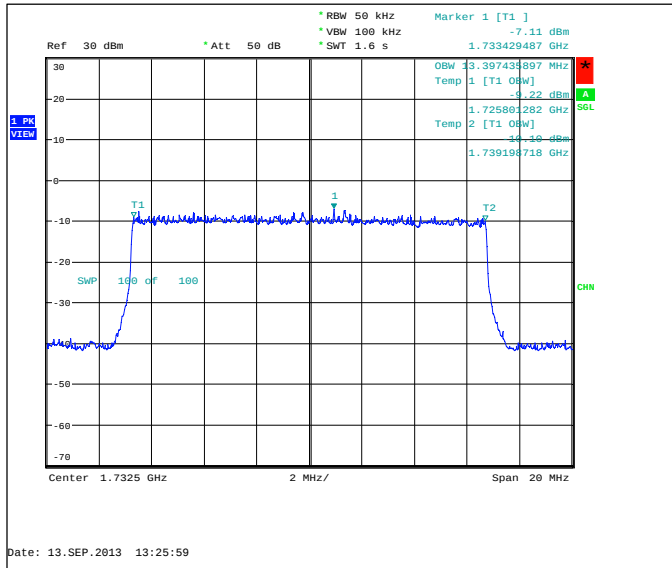
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20175 / 1732.5 MHz



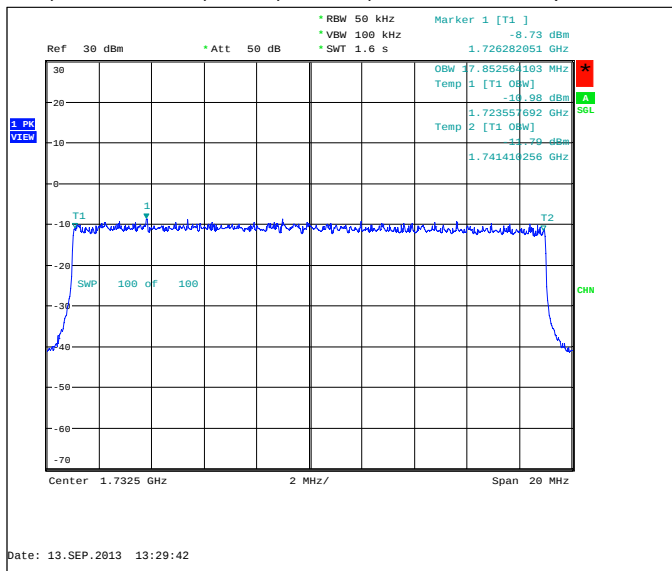
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20175 / 1732.5 MHz



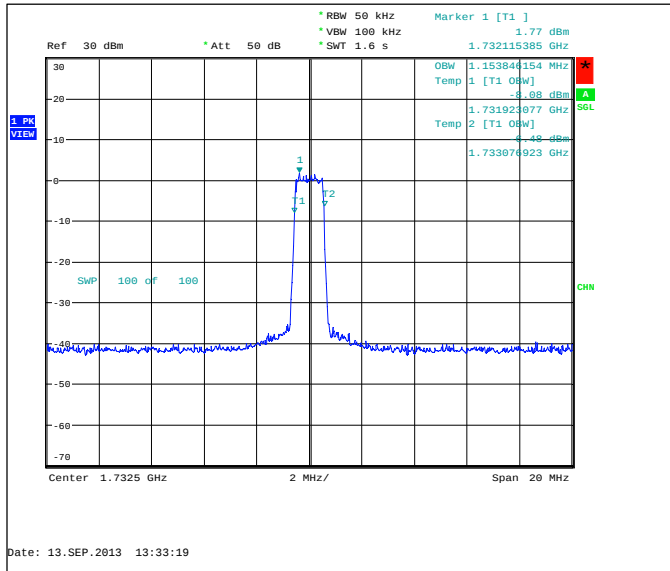
FDD, CBW 15MHz, QPSK, 75 RB, Channel 20175 / 1732.5 MHz



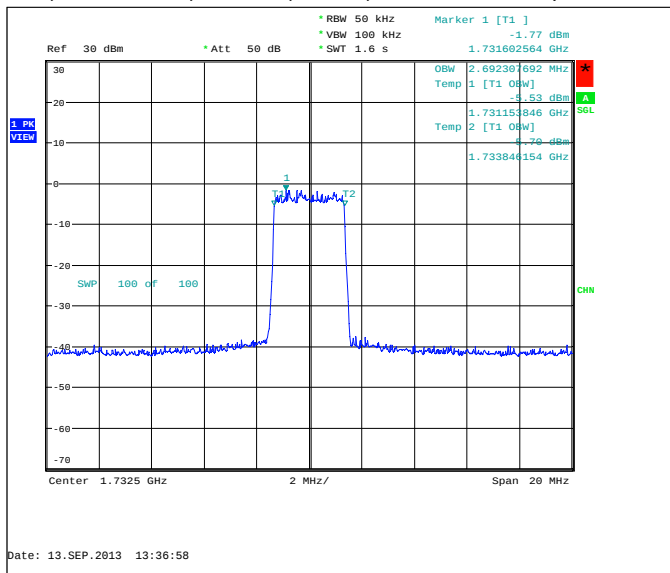
FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz



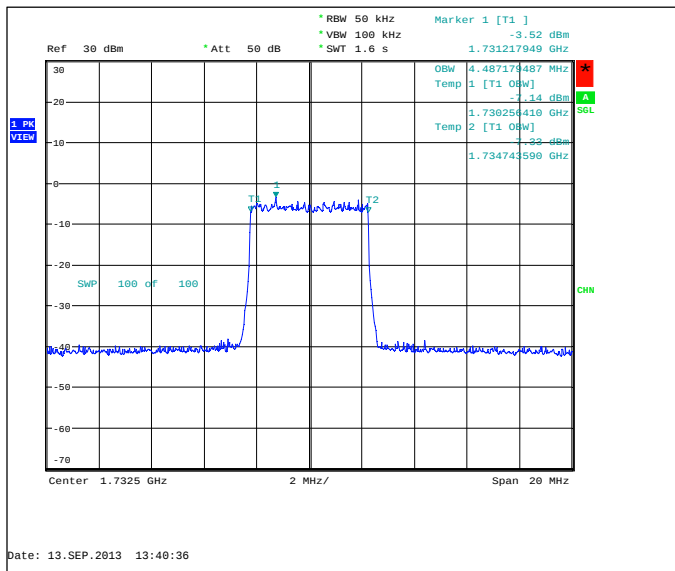
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20175 / 1732.5 MHz



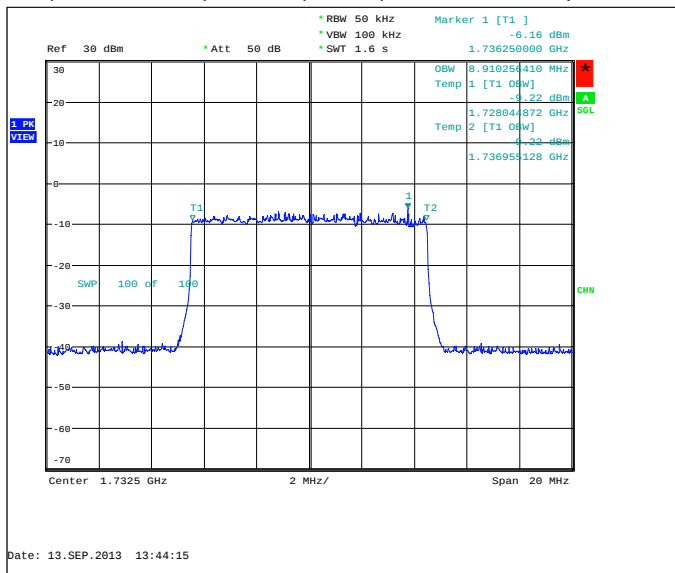
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20175 / 1732.5 MHz



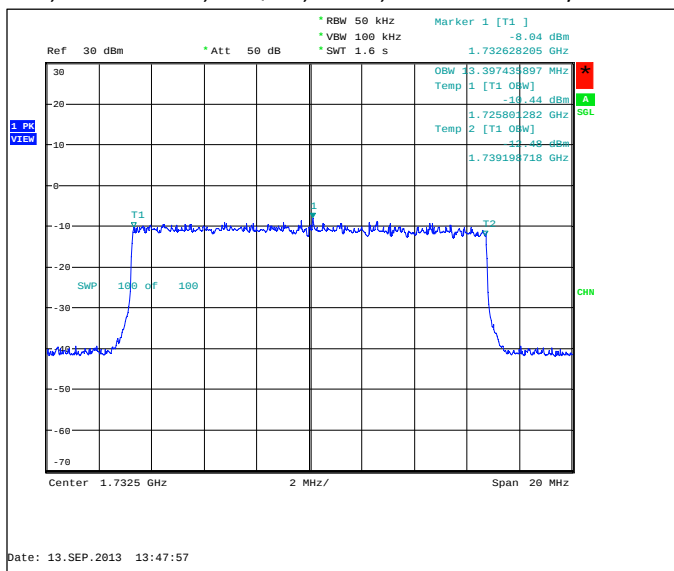
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20175 / 1732.5 MHz



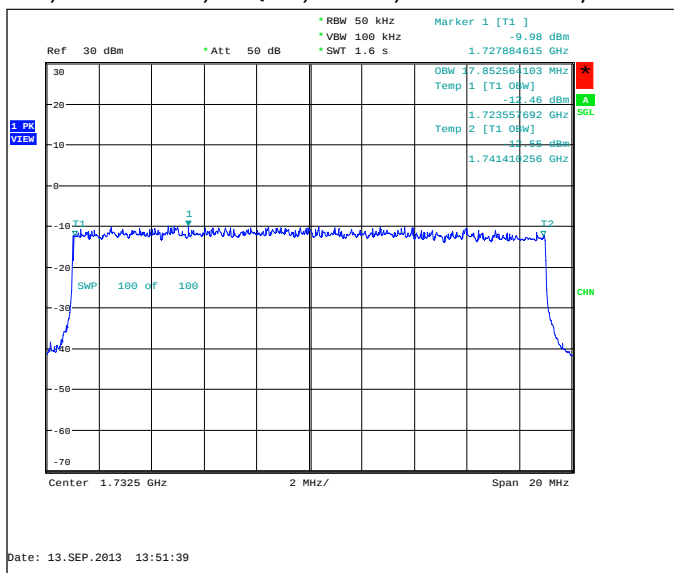
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20175 / 1732.5 MHz



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



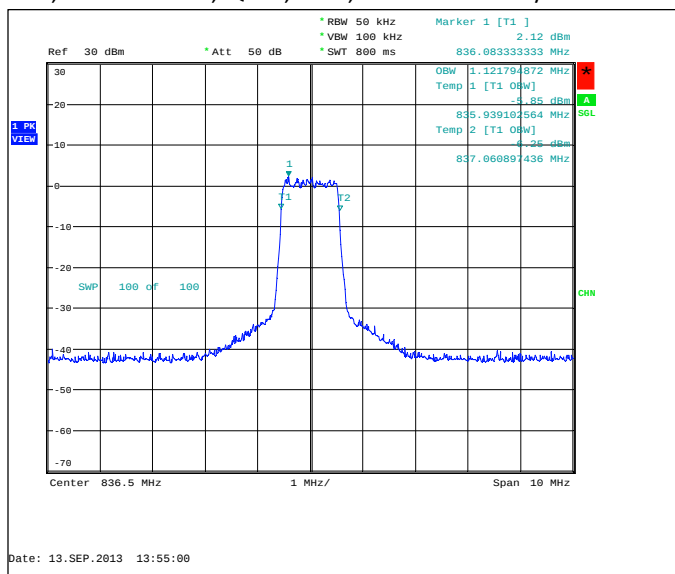
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 20175 / 1732.5 MHz



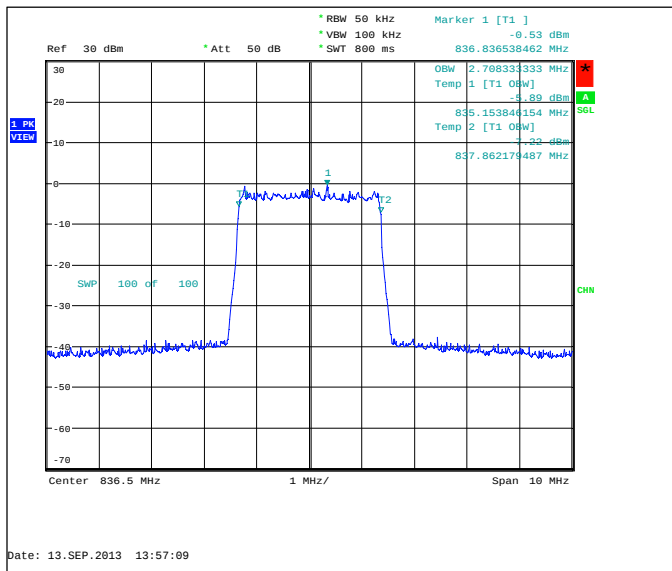
3.9. LTE850 (Band 5) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1121.8
FDD, CBW 3MHz, QPSK, 15 RB	2708.3
FDD, CBW 5MHz, QPSK, 25 RB	4487.2
FDD, CBW 10MHz, QPSK, 50 RB	8942.3
FDD, CBW 1.4MHz, 16QAM, 6 RB	1121.8
FDD, CBW 3MHz, 16QAM, 15 RB	2692.3
FDD, CBW 5MHz, 16QAM, 25 RB	4487.2
FDD, CBW 10MHz, 16QAM, 50 RB	8910.3

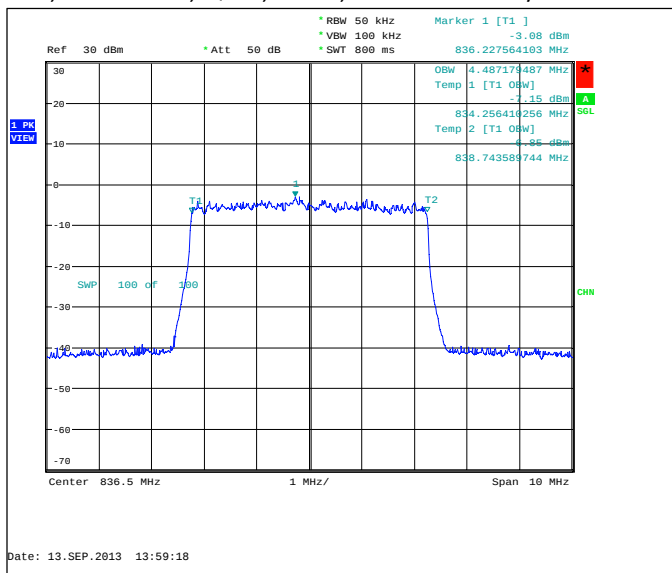
FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 20525 / 836.5 MHz



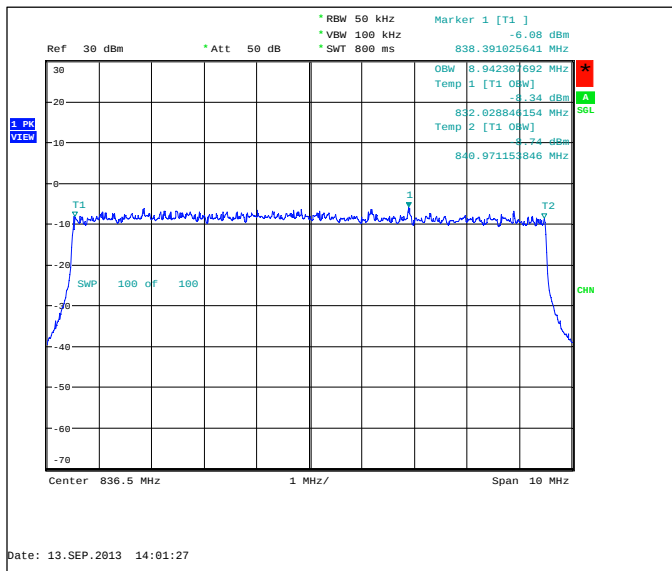
FDD, CBW 3MHz, QPSK, 15 RB, Channel 20525 / 836.5 MHz



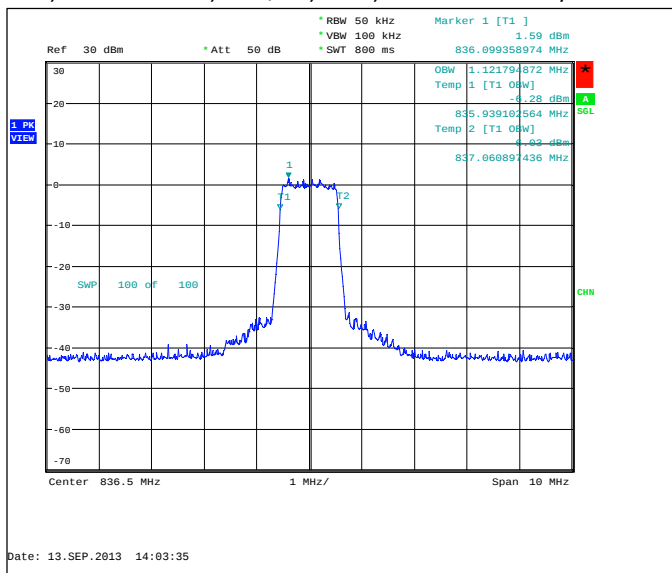
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20525 / 836.5 MHz



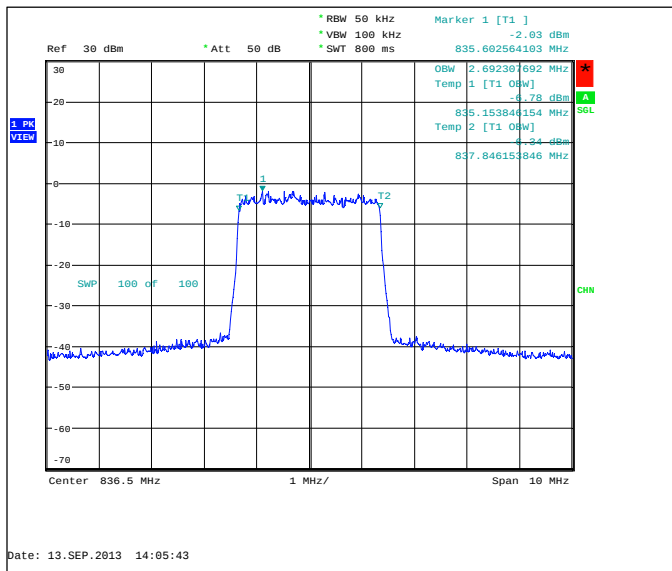
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20525 / 836.5 MHz



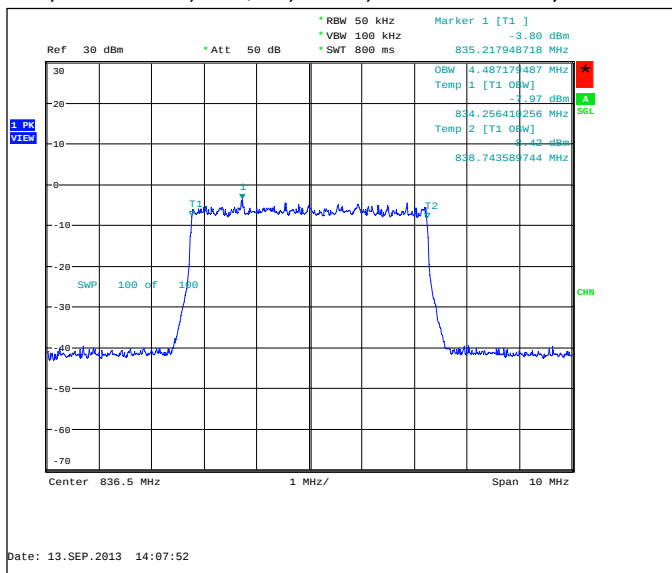
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20525 / 836.5 MHz



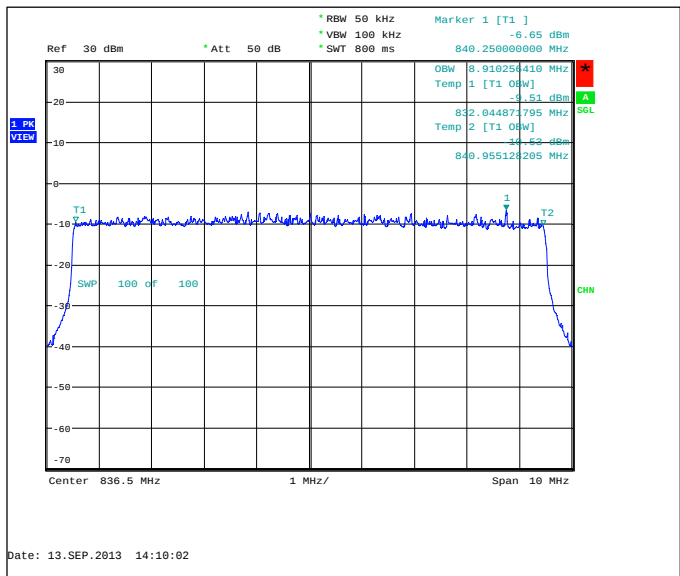
FDD, CBW 3MHz, 16QAM, 15 RB, Channel 20525 / 836.5 MHz



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



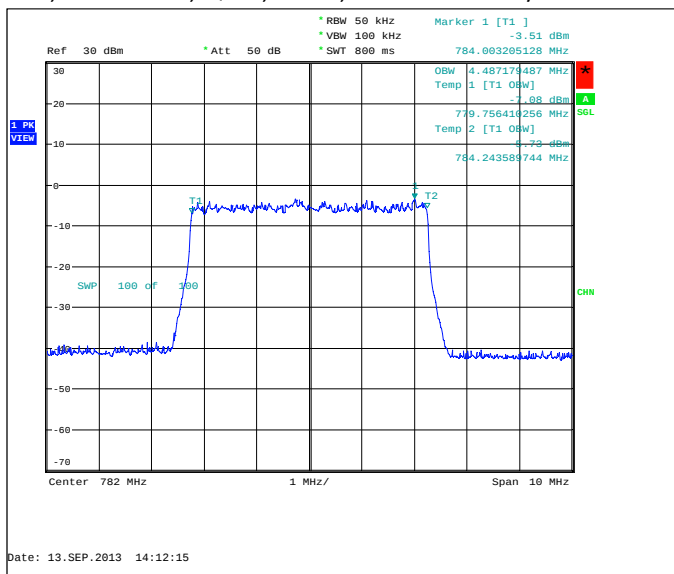
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20525 / 836.5 MHz



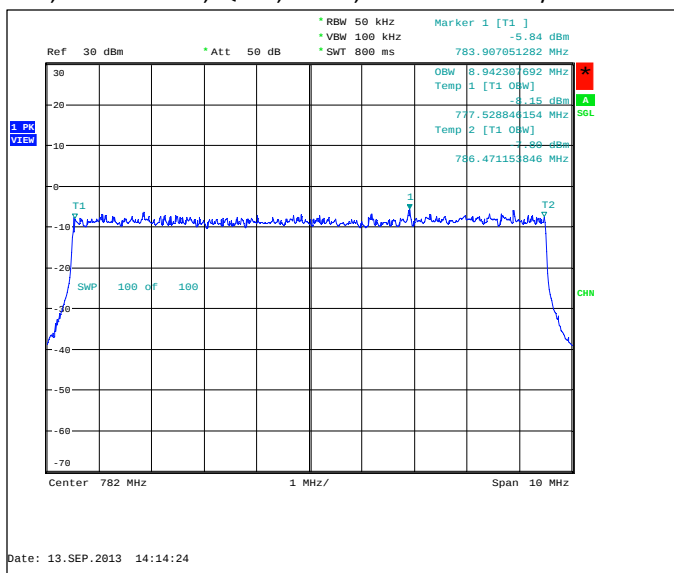
3.10. LTE700 Upper (Band 13) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 5MHz, QPSK, 25 RB	4487.2
FDD, CBW 10MHz, QPSK, 50 RB	8942.3
FDD, CBW 5MHz, 16QAM, 25 RB	4487.2
FDD, CBW 10MHz, 16QAM, 50 RB	8926.3

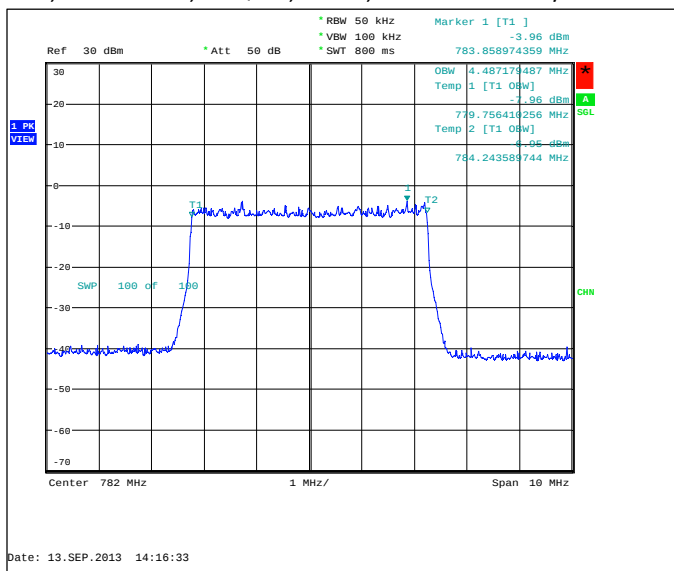
FDD, CBW 5MHz, QPSK, 25 RB, Channel 23230 / 782.0 MHz



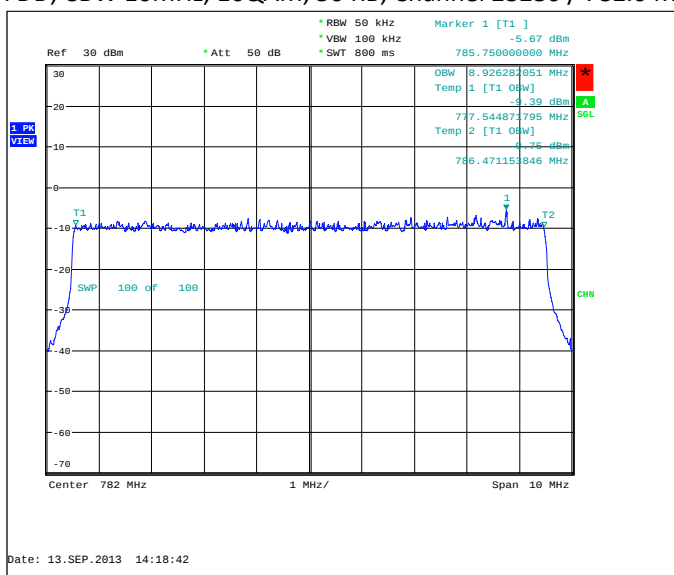
FDD, CBW 10MHz, QPSK, 50 RB, Channel 23230 / 782.0 MHz



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



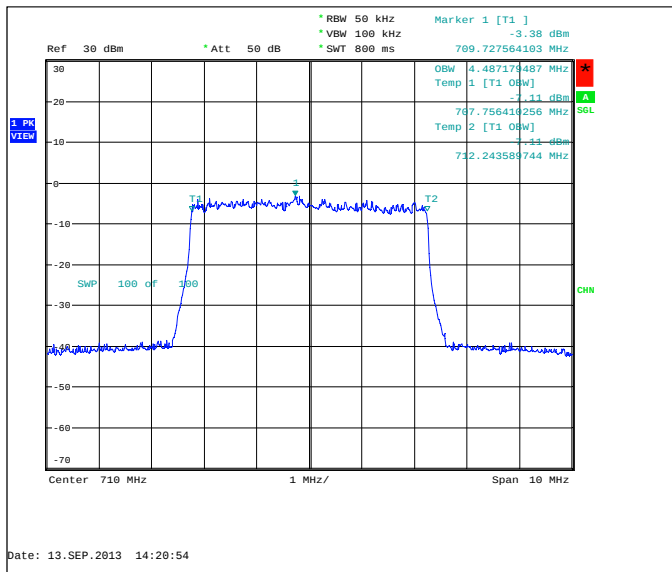
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 23230 / 782.0 MHz



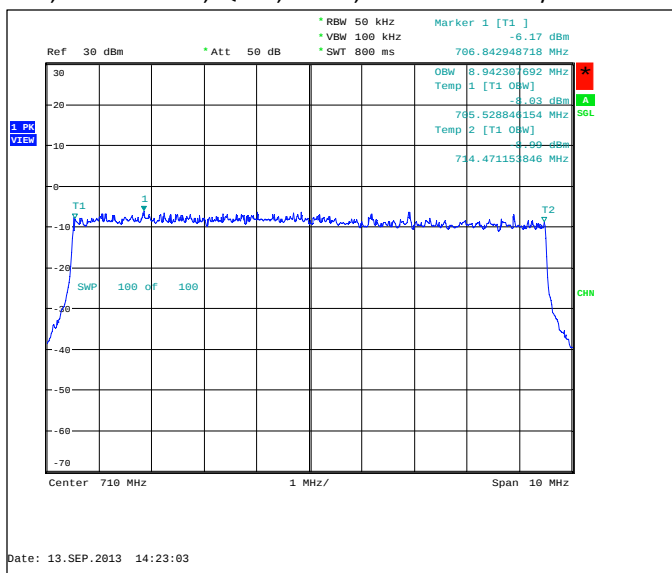
3.11. LTE700 Lower (Band 17) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 5MHz, QPSK, 25 RB	4487.2
FDD, CBW 10MHz, QPSK, 50 RB	8942.3
FDD, CBW 5MHz, 16QAM, 25 RB	4487.2
FDD, CBW 10MHz, 16QAM, 50 RB	8910.3

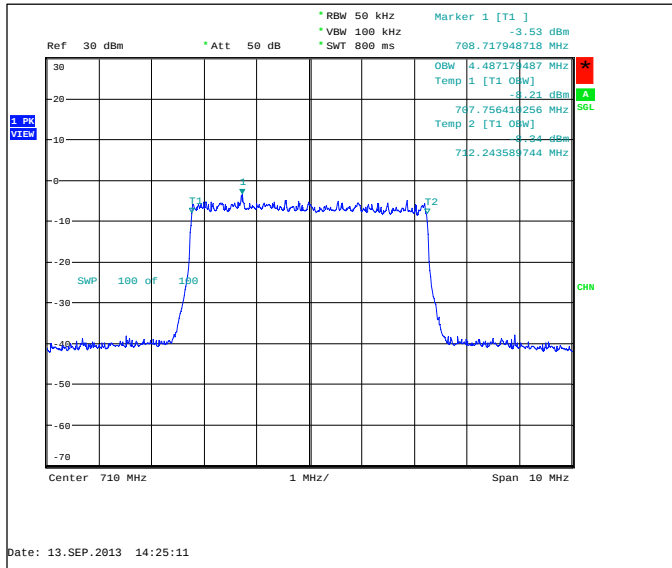
FDD, CBW 5MHz, QPSK, 25 RB, Channel 23790 / 710.0 MHz



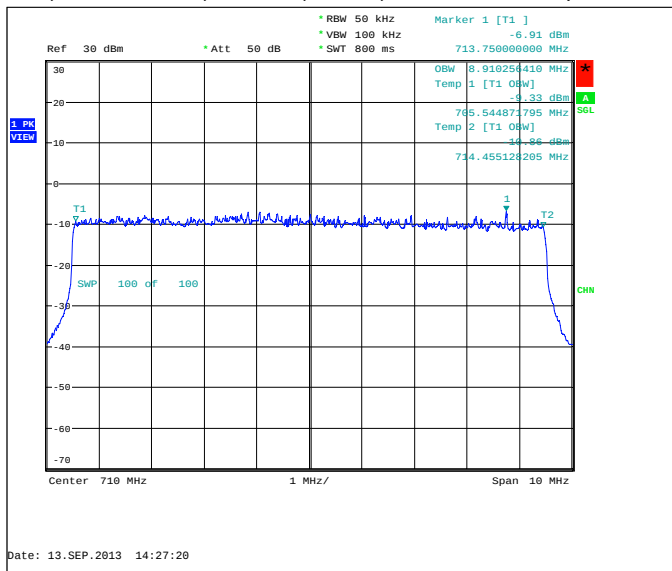
FDD, CBW 10MHz, QPSK, 50 RB, Channel 23790 / 710.0 MHz



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



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

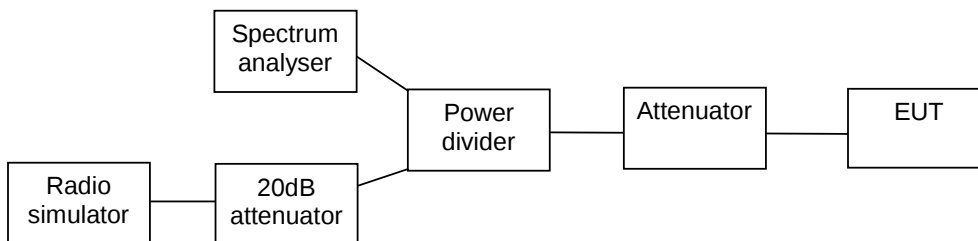


4. Band edge compliance

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

EUT with DUT number	RX-114, DUT 43066
Accessories with DUT numbers	BC-3S, DUT 43090 ; AC-300, DUT 43068 ; WH-208, DUT 43035
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 58 / 101.7
Date of measurements	20-Aug-2013
Measured by	Jari Jantunen

4.1. Test Setup



4.2. Test method and limit

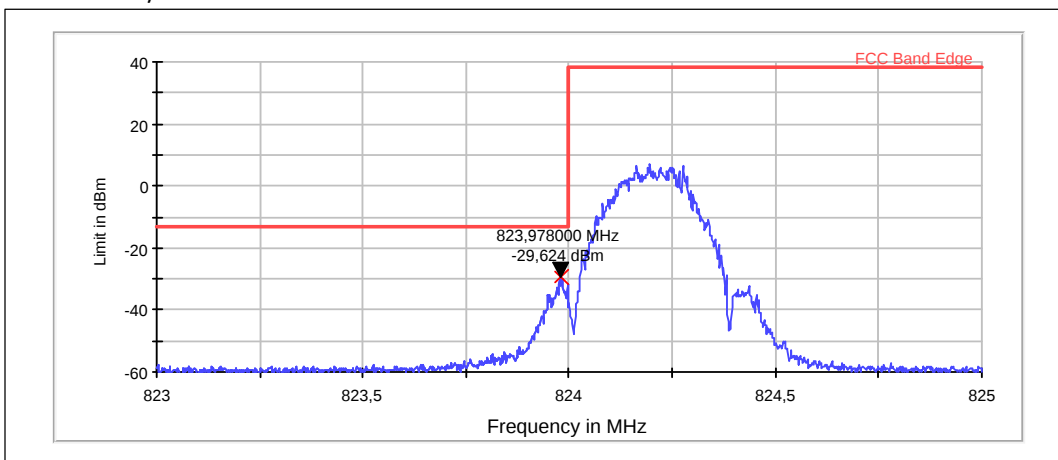
The measurement is made according to FCC rules parts 22, 24, 27 and IC standards , RSS-132, RSS-133, RSS-139.

Limits for band edge compliance measurements

Operation band	Frequency range [MHz]	Limit [dBm]
LTE 700 Lower	703.9 – 704 and 716 – 716.1	-13 (RBW = 30 kHz, ERP)
	Below 703.9 and above 716.1	-13 (RBW = 30 kHz, ERP)
LTE 700 Upper	776.9 -777 and 787 - 787.1	-13 (RBW = 30 kHz, ERP)
	Below 776.9 and above 787.1	-13 (RBW = 100 kHz, ERP)
	763-775 and 793-805	-35 (RBW = 6.25 kHz, ERP)
GSM850 / WCDMA850 / LTE850	Below 824 and above 849	-13
WCDMA1700 / LTE1700	Below 1710 and above 1755	-13
GSM1900 / LTE1900 / WCDMA1900	Below 1850 and above 1910	-13

4.3. GSM 850 Test results

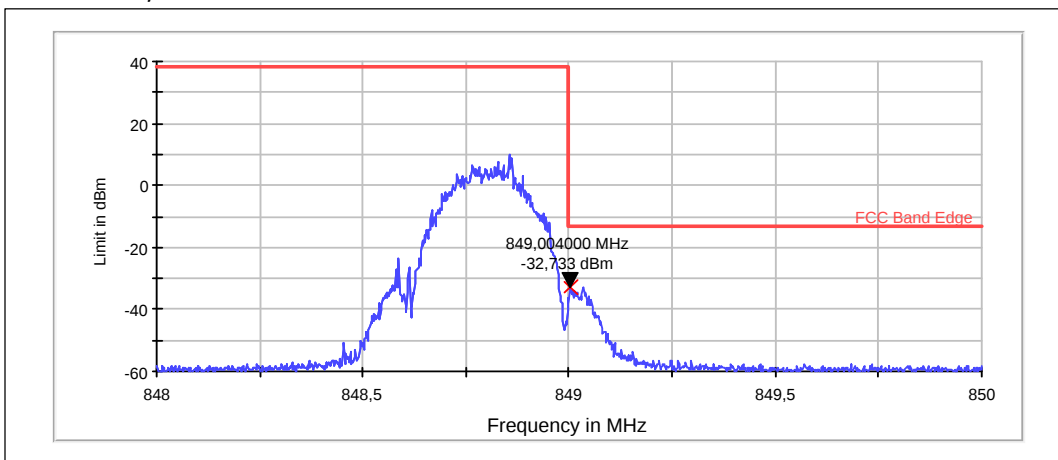
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	823.978	-29.62	PASSED

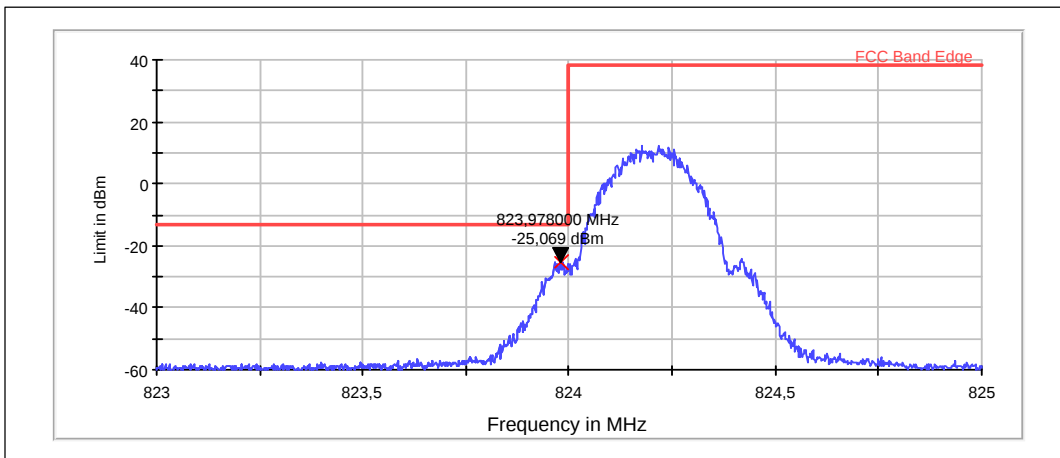
Channel 251 / 848.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	849.004	-32.73	PASSED

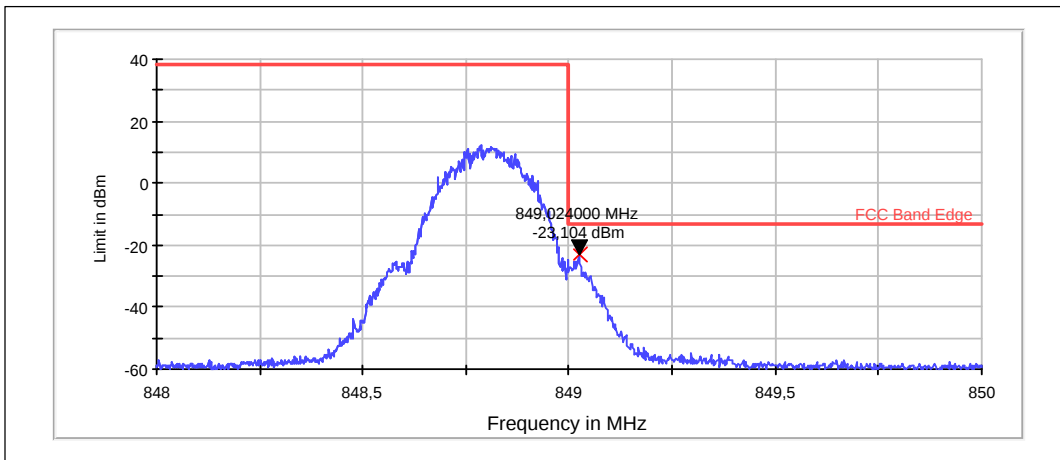
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	823.978	-25.069	PASSED

Channel 251 / 848.8 MHz

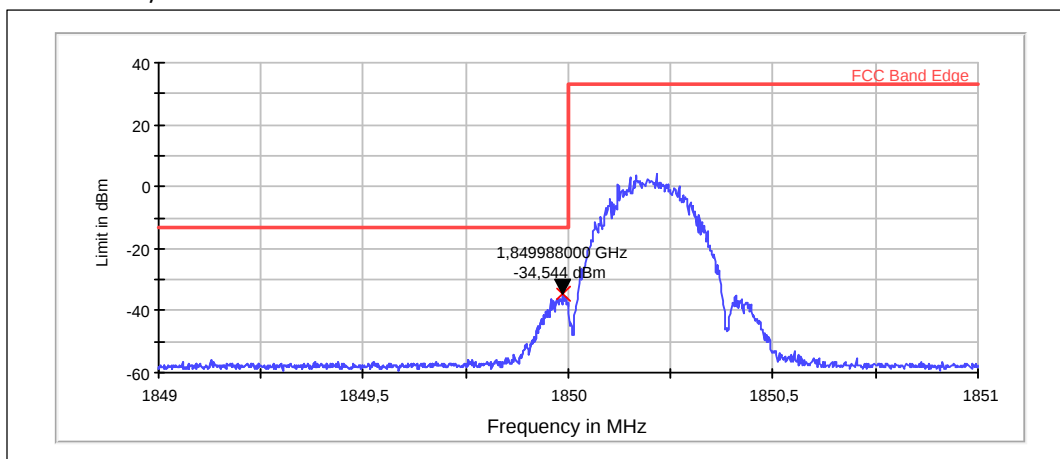


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	849.024	-23.10	PASSED

4.4. GSM 1900 Test results

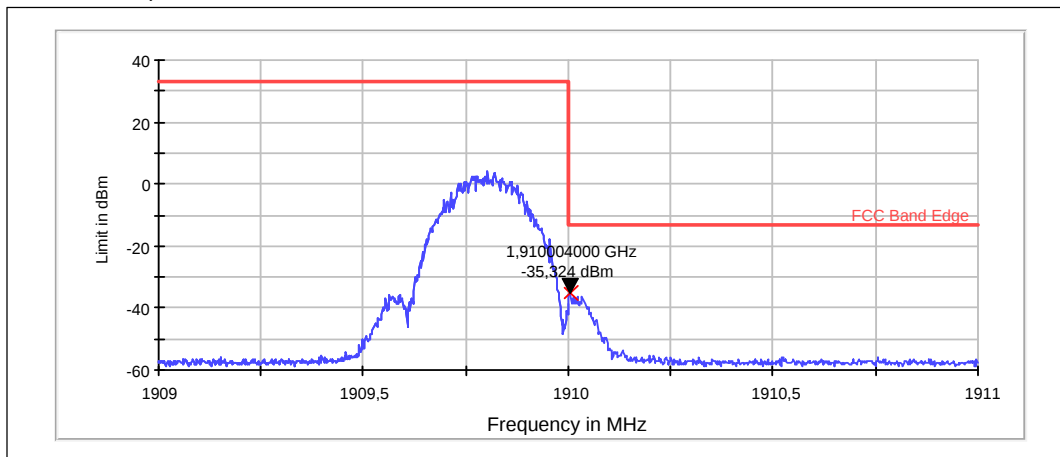
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1849.988	-34.54	PASSED

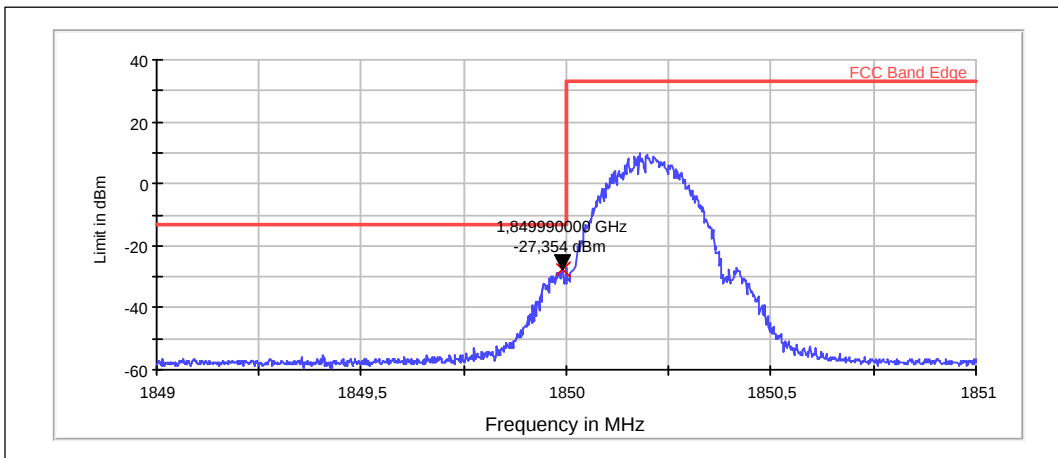
Channel 810 / 1909.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1910.004	-35.32	PASSED

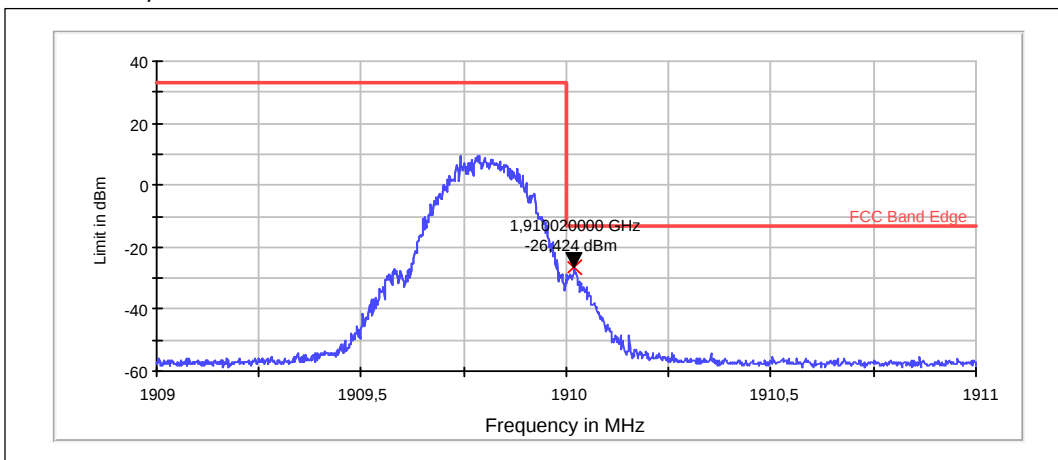
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1849.990	-27.35	PASSED

Channel 810 / 1909.8 MHz

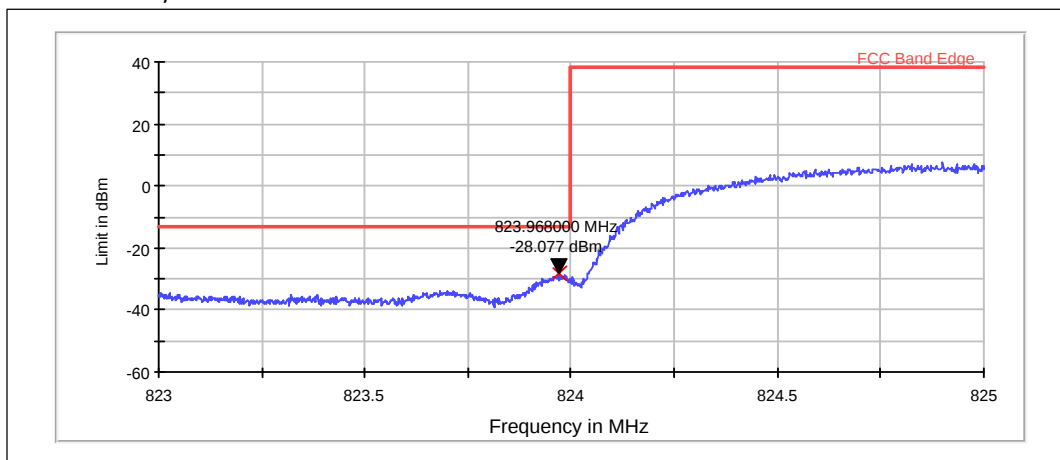


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1910.020	-26.42	PASSED

4.5. WCDMA 850 Test results

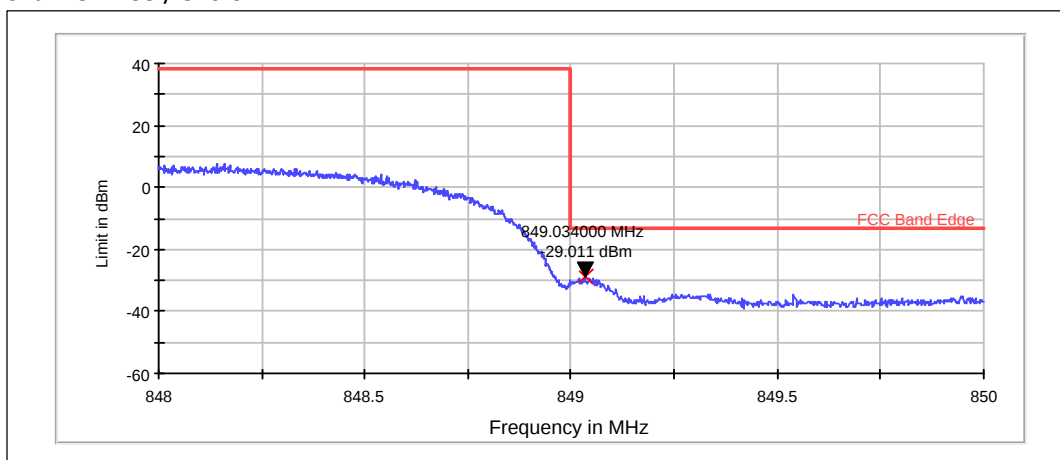
Channel 4132 / 826.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	823.968	-28.08	PASSED

Channel 4233 / 846.6 MHz

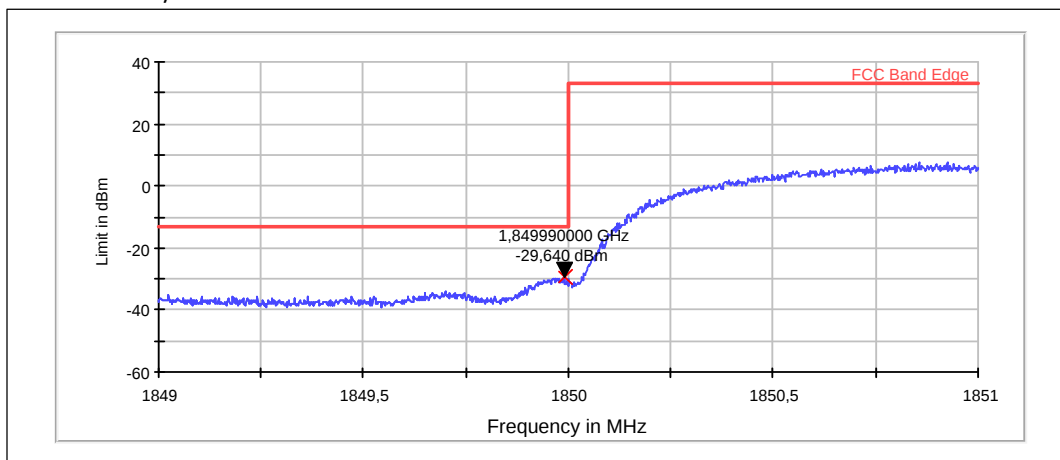


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	849.034	-29.01	PASSED

4.6. WCDMA 1900 Test results

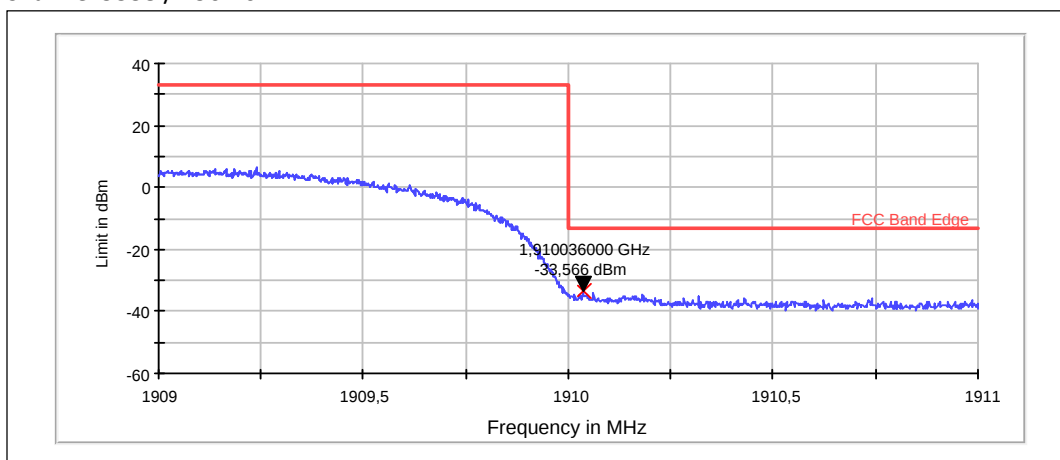
Channel 9262 / 1852.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1.849990000000E+3	-29.64	PASSED

Channel 9538 / 1907.6 MHz

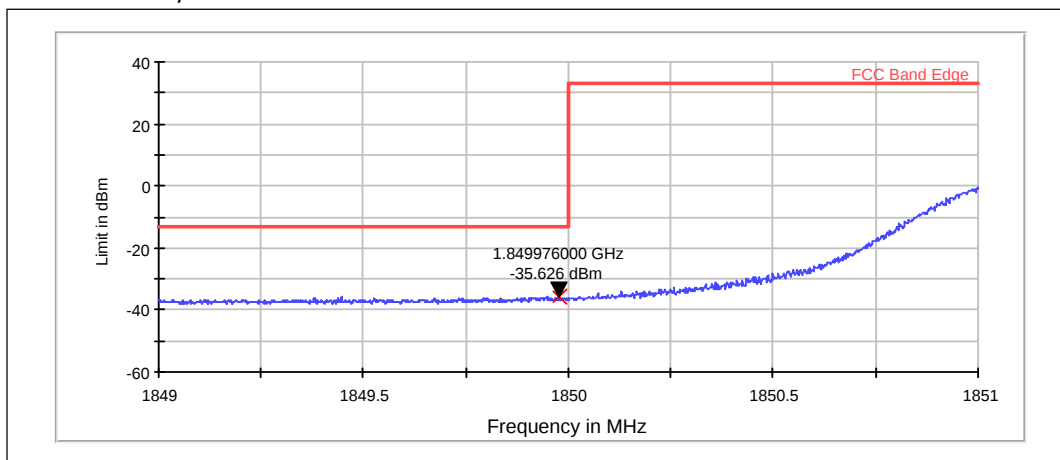


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1.910036000000E+3	-33.57	PASSED

4.7. LTE1900 (Band 2) Test results

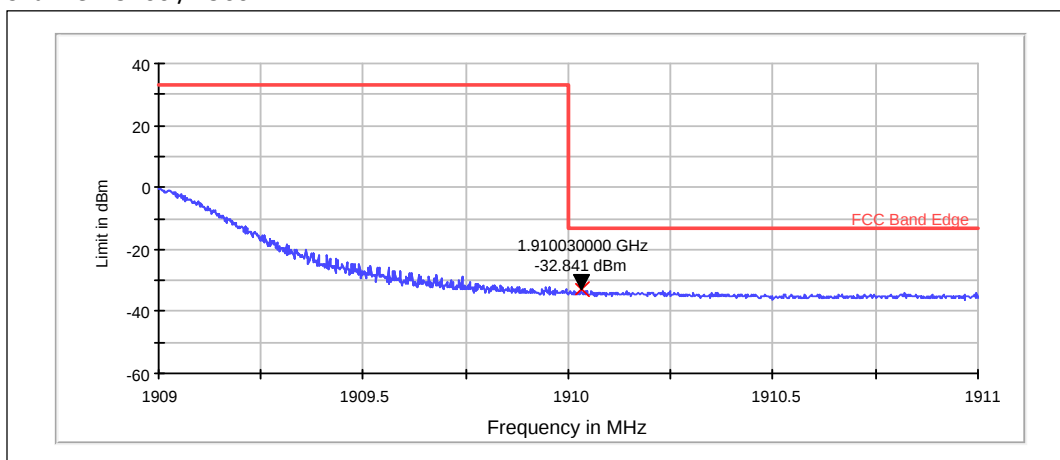
Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1849.976	-35.63	PASSED

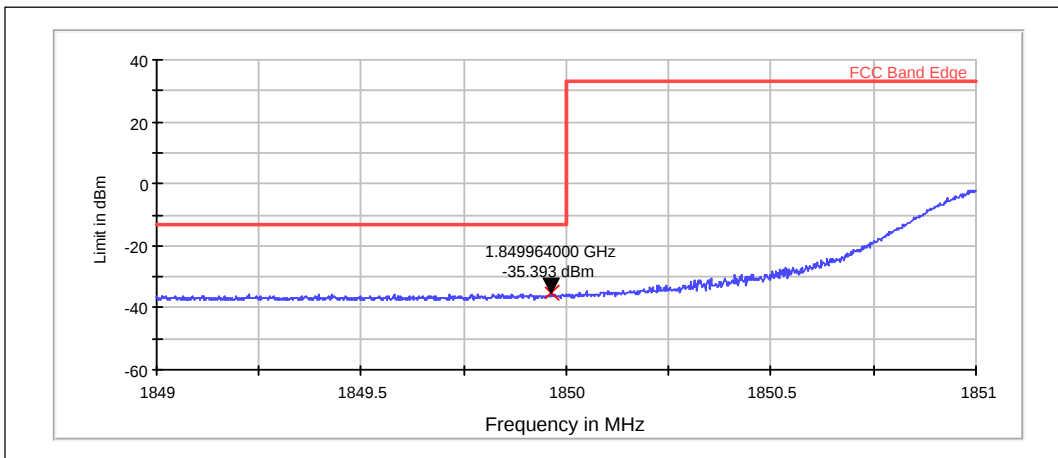
Channel 19100 / 1900 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1910.030	-32.84	PASSED

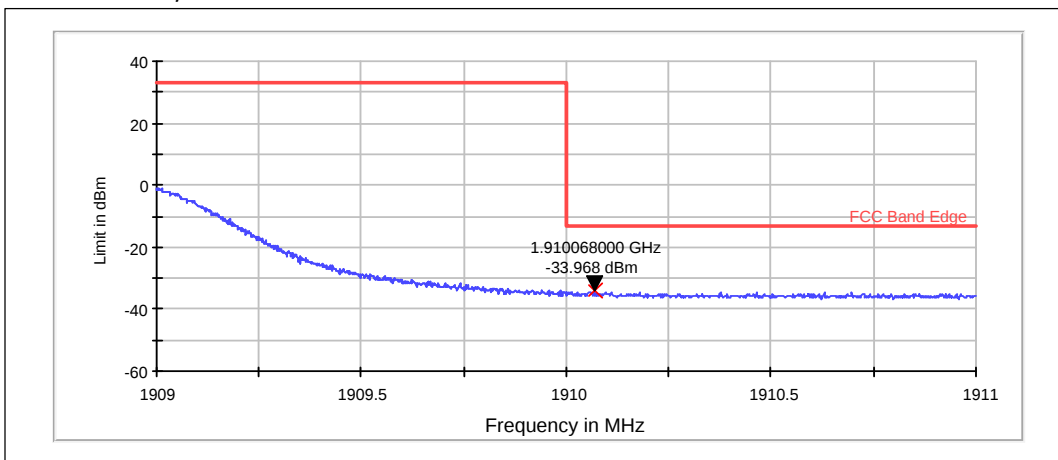
Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1849.964	-35.39	PASSED

Channel 19100 / 1900 MHz

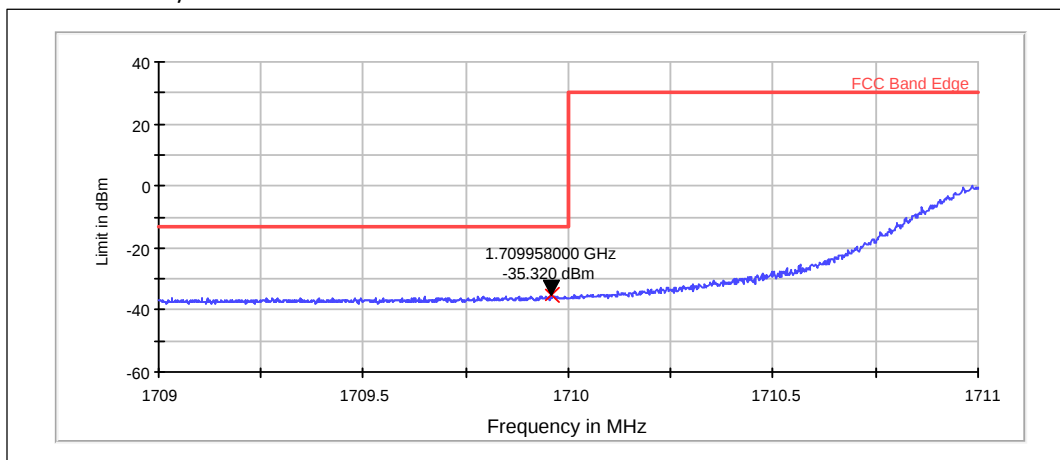


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1910.068	-33.97	PASSED

4.8. LTE1700 (Band 4) Test results

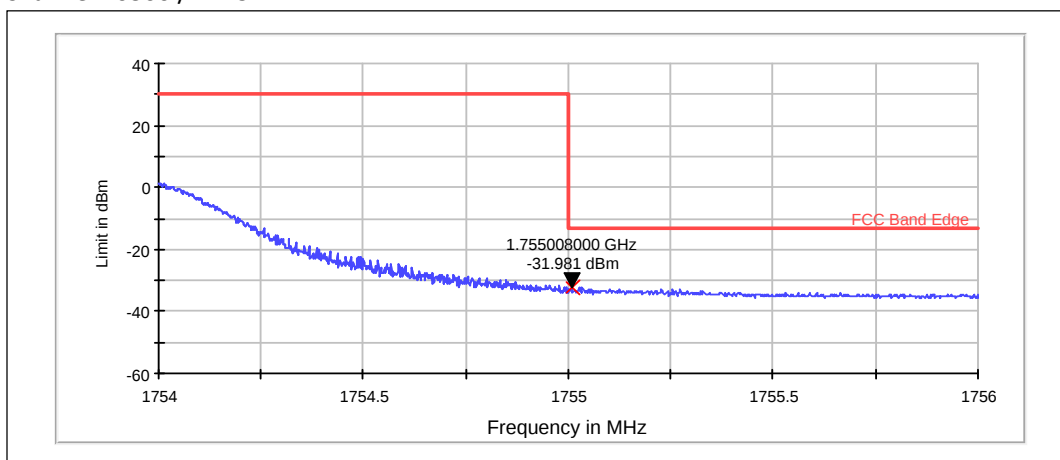
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1709.958	-35.32	PASSED

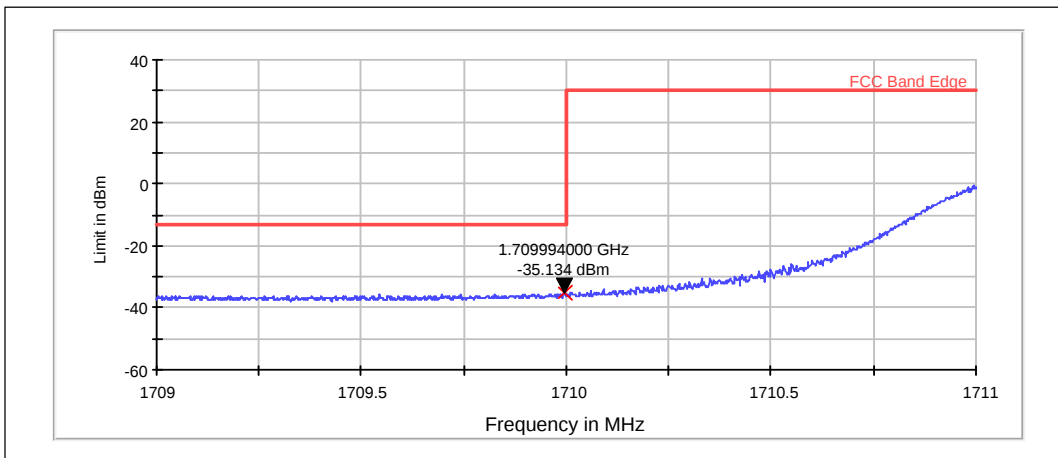
Channel 20300 / 1745 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1755.008	-31.98	PASSED

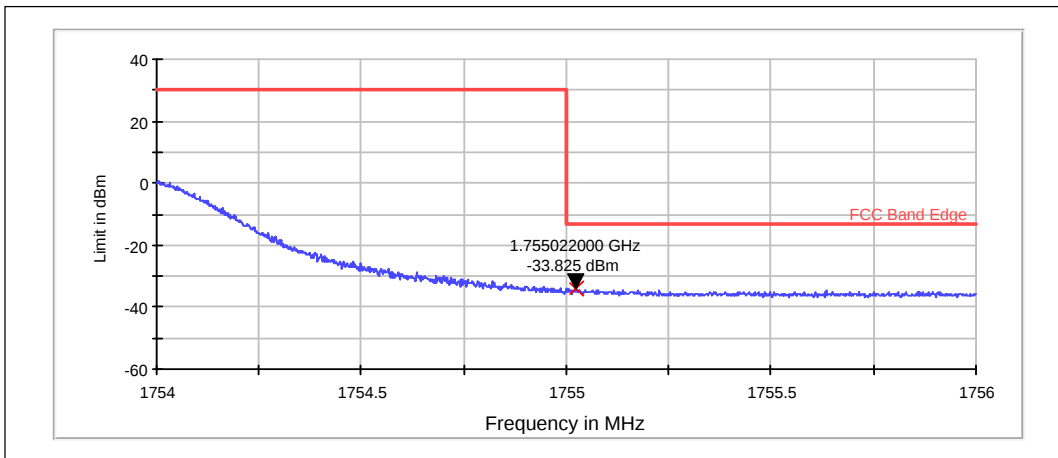
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1709.994	-35.13	PASSED

Channel 20300 / 1745 MHz

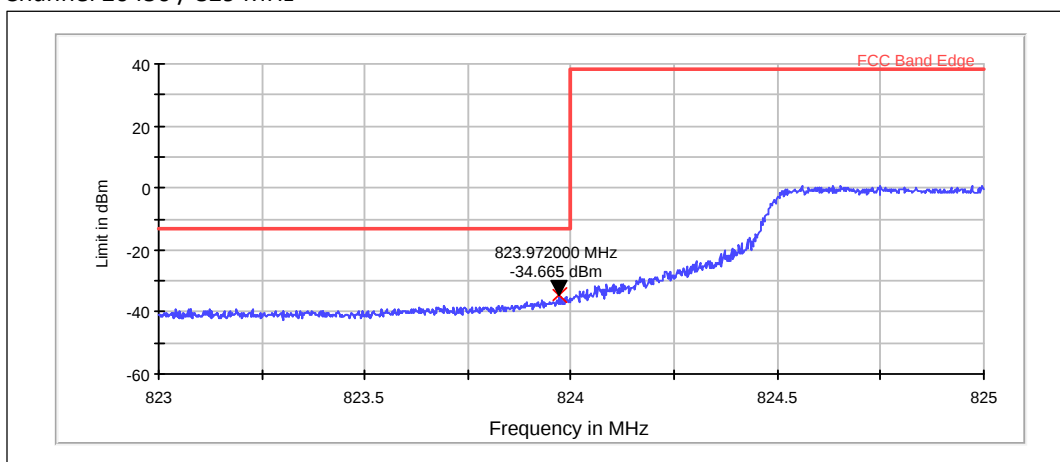


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1755.022	-33.83	PASSED

4.9. LTE850 (Band 5) Test results

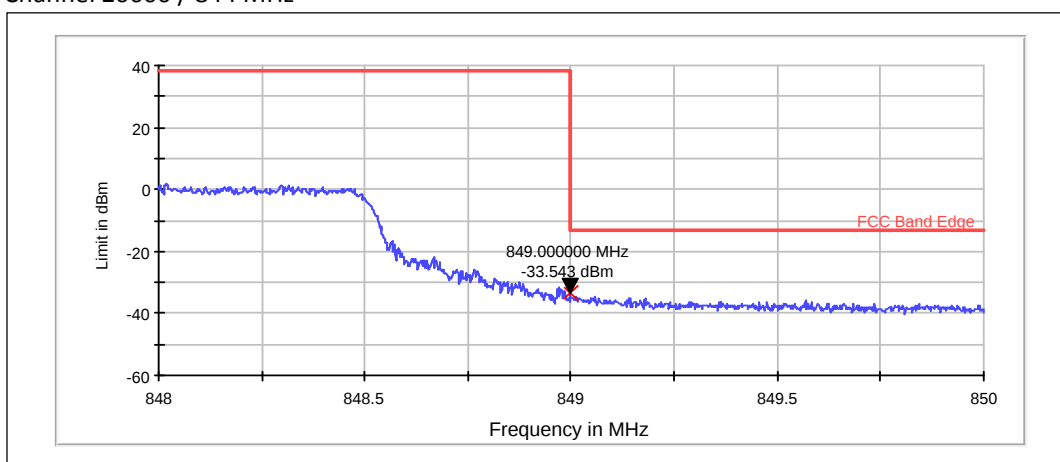
Channel 20450 / 829 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	823.972	-34.66	PASSED

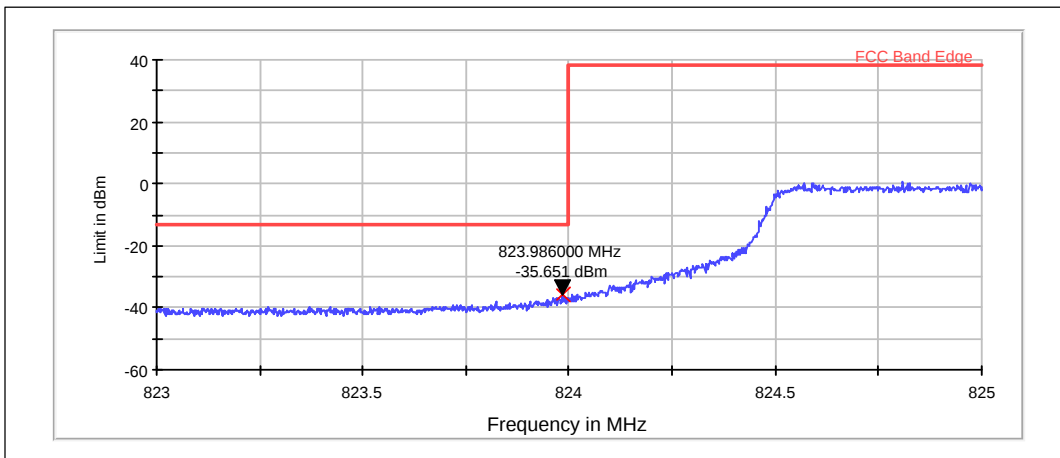
Channel 20600 / 844 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	849.000	-33.54	PASSED

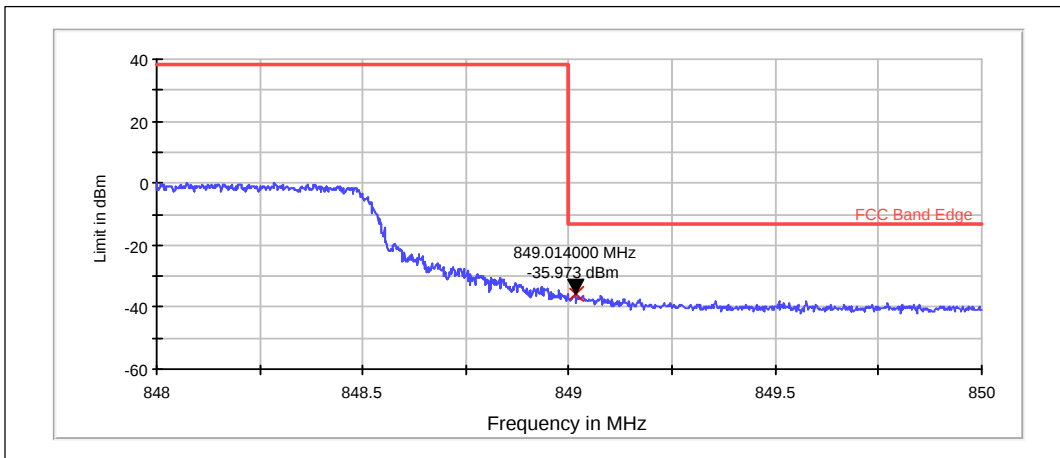
Channel 20450 / 829 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	823.986	-35.65	PASSED

Channel 20600 / 844 MHz

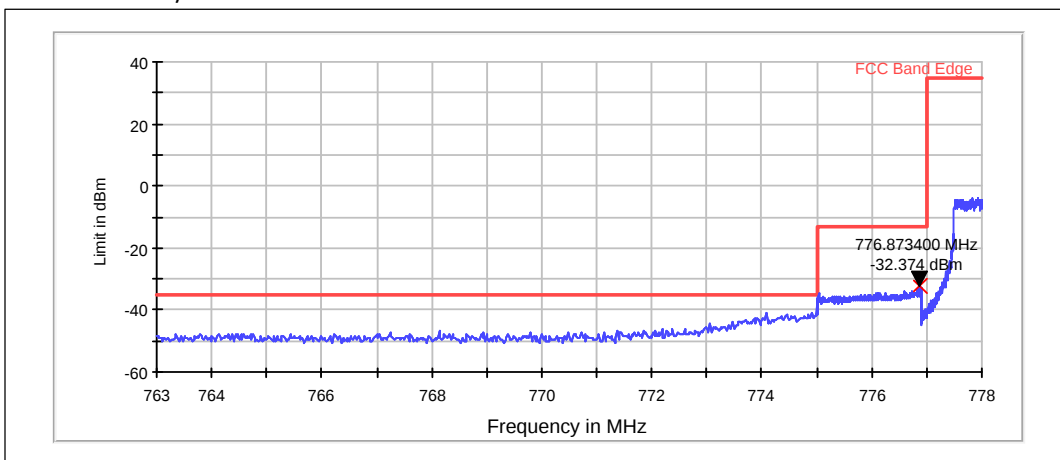


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	849.014	-35.97	PASSED

4.10. LTE700 Upper (Band 13) Test results

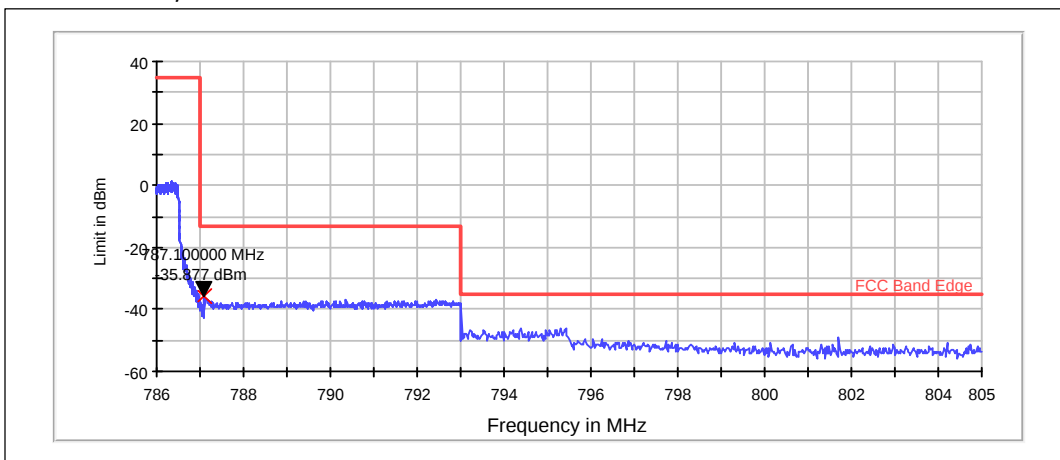
Channel 23230 / 782 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	776.873	-32.37	PASSED

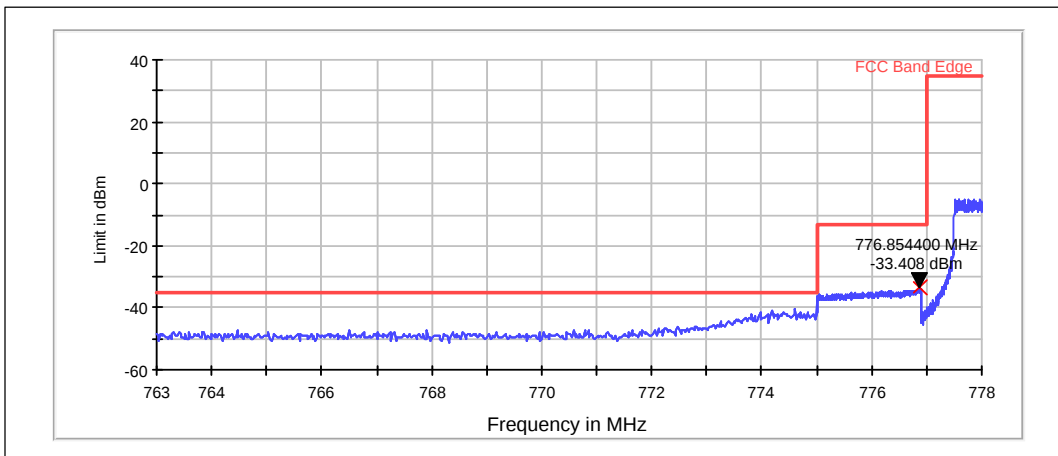
Channel 23230 / 782 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	787.100	-35.88	PASSED

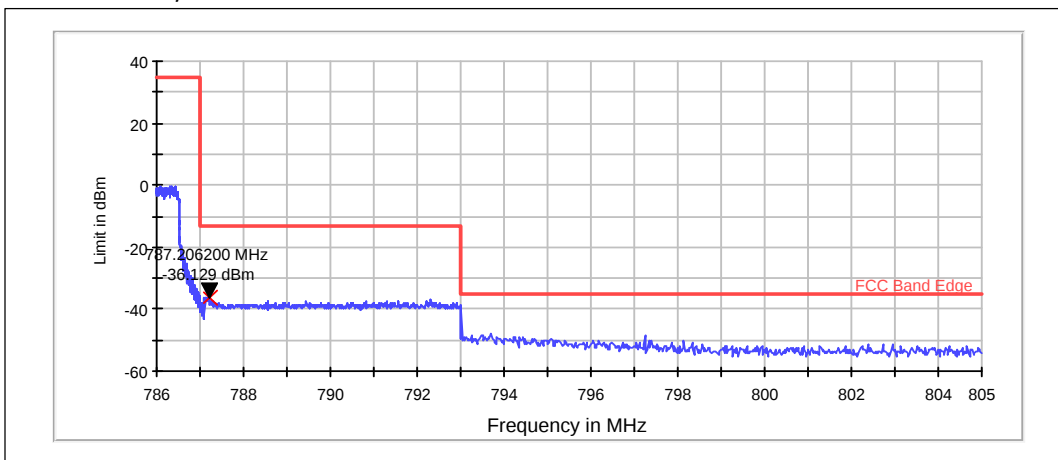
Channel 23230 / 782 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	776.854	-33.41	PASSED

Channel 23230 / 782 MHz

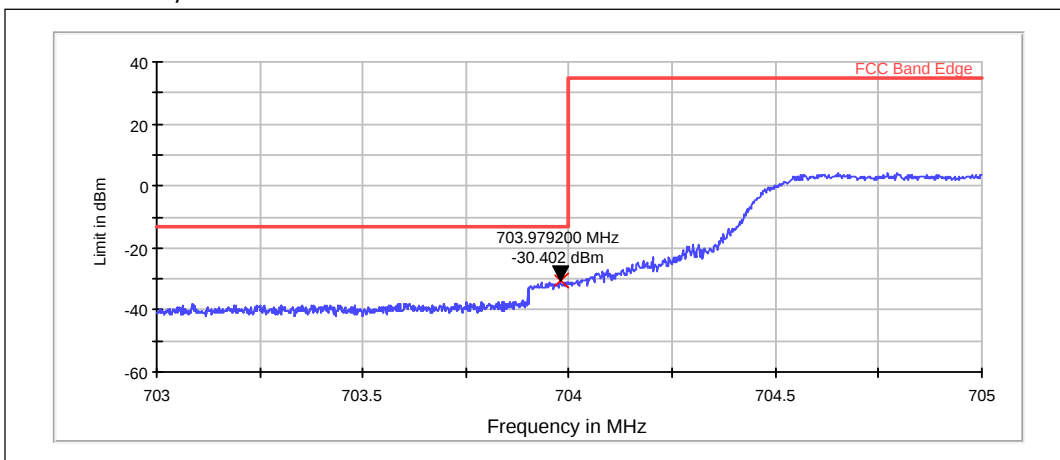


RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	787.206	-36.13	PASSED

4.11. LTE700 Lower (Band 17) Test results

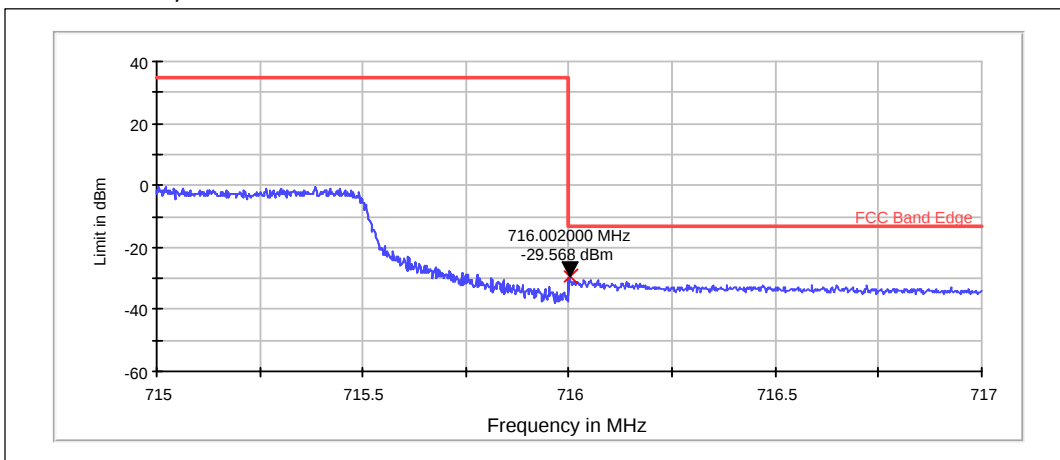
Channel 23780 / 709 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	703.979	-30.40	PASSED

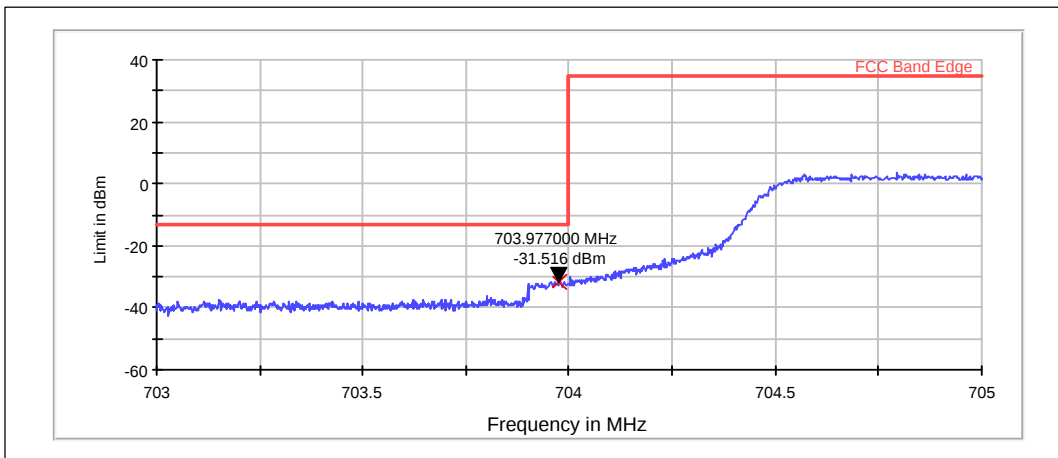
Channel 23800 / 711 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	716.002	-29.57	PASSED

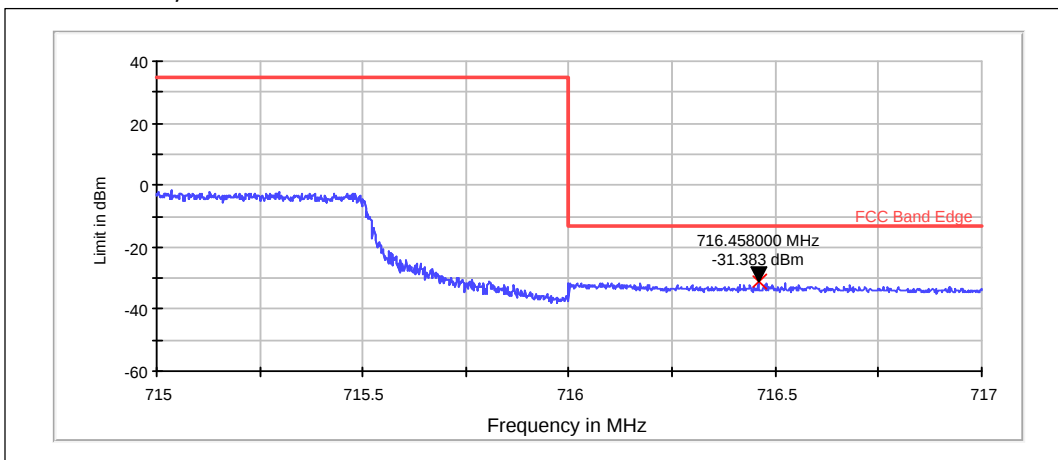
Channel 23780 / 709 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	703.977	-31.52	PASSED

Channel 23800 / 711 MHz



RMS detector

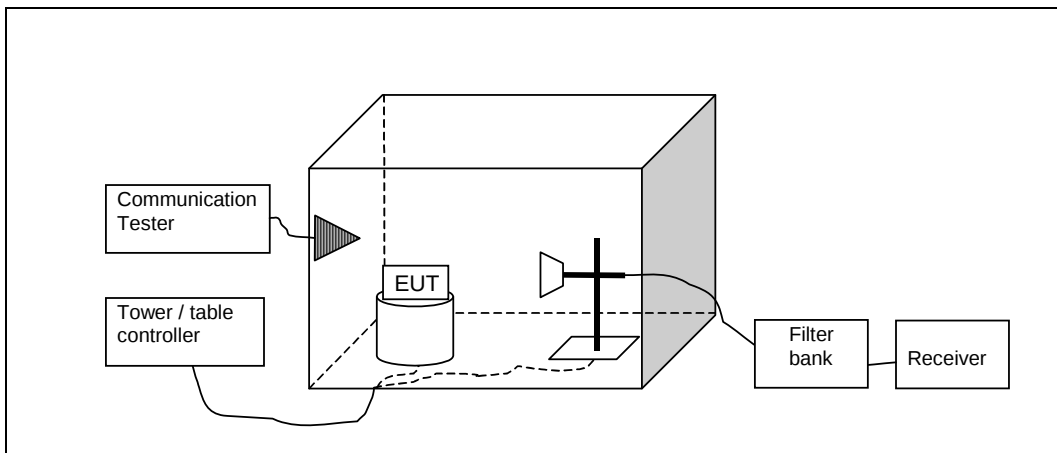
Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	716.458	-31.38	PASSED

5. Spurious radiated emissions

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

EUT with DUT number	RX-114, DUT 43079
Accessories with DUT numbers	BC-3S, DUT 43090 ; AC-300, DUT 43068 ; WH-208, DUT 43035
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 55 / 102.5
Date of measurements	24-Aug-2013
Measured by	Timo Raisio

5.1.1 Test setup



5.2. Test method and limit

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

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

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

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

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

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

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

The substitution method is used.

The measurement results are obtained as described below:

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

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

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
LTE 700 Lower	30 - 7200	-13 (RBW = 100 kHz, ERP)
LTE 700 Upper	30 – 8000 763-775 and 793-805 1559 – 1610 1559 – 1610	-13 (RBW = 100 kHz, ERP) -35 (RBW = 6.25 kHz, ERP) -40 (RBW = 1 MHz) -50 (RBW = 700 Hz)
GSM850 / WCDMA850 / LTE850	30 - 8500	-13
WCDMA1700 / LTE1700 / / GSM1900 / WCDMA1900 / LTE1900	30 - 18000	-13

5.3. GSM850-E1 TX Test results

EGPRS mode, Channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1673.1	-51.99	0.00632	-45.84	-6.15	HORIZONTAL	PASSED
2509.78	-51.9	0.00646	-53.67	1.77	HORIZONTAL	PASSED

5.4. GSM850-G1 TX Test results

GSM mode, Channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1673.38	-49.79	0.0105	-43.69	-6.1	VERTICAL	PASSED
2509.82	-41.57	0.06966	-43.29	1.72	VERTICAL	PASSED

5.5. GSM1900-E1 TX Test results

EGPRS mode, Channel 661 / 1880.0 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
3760.261	-52.29	0.0059	-60.68	8.39	VERTICAL	PASSED
5640.06	-50.07	0.00984	-61.21	11.14	VERTICAL	PASSED

5.6. GSM1900-G1 TX Test results

GSM mode, Channel 661 / 1880.0 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
3759.94	-44.68	0.03404	-53.07	8.39	VERTICAL	PASSED
5639.98	-41.86	0.06516	-53	11.14	VERTICAL	PASSED

5.7. WCDMA 1900 (Band II) TX Test results

FDD mode, Channel 9400 / 1880.0 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
3758.537	-33.81	0.41591	-41.88	8.07	HORIZONTAL	PASSED
3758.577	-32.07	0.62087	-40.14	8.07	HORIZONTAL	PASSED
5643.467	-43.98	0.03999	-54.96	10.98	VERTICAL	PASSED
7527.675	-49.6	0.01096	-63.82	14.22	VERTICAL	PASSED

5.8. WCDMA 850 (Band V) TX Test results

FDD mode, Channel 4175 / 835.0 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
848.041	-48.45	0.01429	-80.87	32.42	HORIZONTAL	PASSED
848.239	-46.99	0.02	-79.43	32.44	HORIZONTAL	PASSED
1007.976	-61.41	0.00072	-51.91	-9.5	VERTICAL	PASSED
1672.565	-56.43	0.00228	-50.3	-6.13	VERTICAL	PASSED
2501.222	-43.11	0.04887	-44.86	1.75	HORIZONTAL	PASSED
2508.116	-49.59	0.01099	-51.31	1.72	HORIZONTAL	PASSED

5.9. LTE 1900 (Band II) TX Test results

Channel 18900 / 1880.0 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1841.141	-59.96	0.00101	-57.08	-2.88	HORIZONTAL	PASSED
1913.729	-60.19	0.00096	-57.7	-2.49	VERTICAL	PASSED
1914.576	-62.53	0.00056	-60.02	-2.51	VERTICAL	PASSED
1960.274	-29.26	1.18577	-27.26	-2	VERTICAL	PASSED
3760.461	-49.17	0.01211	-57.56	8.39	VERTICAL	PASSED
5640.822	-58.6	0.00138	-69.7	11.1	VERTICAL	PASSED
7520.982	-58.53	0.0014	-72.74	14.21	VERTICAL	PASSED

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1850.46	-57	0.002	-54.24	-2.76	VERTICAL	PASSED
1914.39	-59.27	0.00118	-56.77	-2.5	VERTICAL	PASSED
1960.314	-30.91	0.81096	-28.91	-2	VERTICAL	PASSED
3760.301	-47.65	0.01718	-56.04	8.39	VERTICAL	PASSED
5640.541	-59.63	0.00109	-70.74	11.11	VERTICAL	PASSED
7528.838	-60.37	0.00092	-74.6	14.23	VERTICAL	PASSED

5.10. LTE 1700 (Band IV) 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]	Polarization	Results
3465.381	-48.96	0.0127	-55.87	6.91	VERTICAL	PASSED
5198.001	-58.91	0.00129	-69.9	10.99	HORIZONTAL	PASSED
6930.862	-56.72	0.00213	-69.5	12.78	VERTICAL	PASSED
8663.482	-57.95	0.0016	-73.93	15.98	HORIZONTAL	PASSED
10393.577	-56.61	0.00218	-75.33	18.72	VERTICAL	PASSED

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
3465.341	-49.12	0.01225	-56.03	6.91	VERTICAL	PASSED
5198.001	-57.43	0.00181	-68.42	10.99	HORIZONTAL	PASSED
6930.862	-57.11	0.00195	-69.89	12.78	VERTICAL	PASSED
8663.562	-53.58	0.00439	-69.69	16.11	VERTICAL	PASSED
10393.337	-56.61	0.00218	-75.33	18.72	VERTICAL	PASSED

5.11. LTE 850 (Band V) test results

Channel 20525 / 836.5 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
857.759	-59.42	0.00114	-93.03	33.61	VERTICAL	PASSED
880.978	-35.74	0.26669	-70.53	34.79	VERTICAL	PASSED
881.815	-36.49	0.22449	-71.2	34.71	VERTICAL	PASSED
1673.421	-64.75	0.00033	-58.64	-6.11	VERTICAL	PASSED
2510.041	-60.91	0.00081	-62.66	1.75	HORIZONTAL	PASSED
3351.07	-76.94	2E-05	-81.74	4.8	VERTICAL	PASSED

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
823.558	-59.62	0.00109	-93.02	33.4	VERTICAL	PASSED
849.17	-60.31	0.00093	-93.03	32.72	VERTICAL	PASSED
849.212	-60.31	0.00093	-93.03	32.72	VERTICAL	PASSED
850.585	-60.26	0.00094	-93.03	32.77	VERTICAL	PASSED
879.884	-35.91	0.25639	-70.52	34.61	VERTICAL	PASSED
881.716	-35.38	0.28987	-70.1	34.72	VERTICAL	PASSED
1673.22	-69.2	0.00012	-63.1	-6.1	VERTICAL	PASSED
2510.001	-67.38	0.00018	-69.13	1.75	HORIZONTAL	PASSED
3351.752	-76.19	2E-05	-80.99	4.8	VERTICAL	PASSED

5.12. LTE700 Upper (Band 13) test results

Channel 23230 / 782 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
751.423	-36.16	0.24233	-68.94	32.78	VERTICAL	PASSED
769.386	-73.85	4E-05	-107	33.15	HORIZONTAL	PASSED
804.891	-74.85	3E-05	-107	32.15	HORIZONTAL	PASSED
1564.349	-61.17	0.00076	-54.33	-6.84	HORIZONTAL	PASSED
1564.381	-61.59	0.00069	-54.75	-6.84	HORIZONTAL	PASSED
2346.513	-42.2	0.06021	-42.2	0	VERTICAL	PASSED
2346.541	-40.05	0.09886	-40.05	0	VERTICAL	PASSED
3129.102	-76.55	2E-05	-80.98	4.43	HORIZONTAL	PASSED
7000.18	-71.62	7E-05	-82.57	10.95	VERTICAL	PASSED

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
750.22	-36.4	0.22914	-69.13	32.73	VERTICAL	PASSED
769.5	-73.85	4E-05	-107	33.15	HORIZONTAL	PASSED
804.4	-74.88	3E-05	-107.01	32.13	HORIZONTAL	PASSED
1564.381	-62.06	0.00062	-55.22	-6.84	HORIZONTAL	PASSED
1564.389	-61.69	0.00068	-54.85	-6.84	HORIZONTAL	PASSED
2346.513	-42.3	0.05895	-42.3	0	VERTICAL	PASSED
2346.581	-42.36	0.05805	-42.37	0.01	VERTICAL	PASSED
3128.782	-74.31	4E-05	-79.05	4.74	VERTICAL	PASSED
7000	-64.77	0.00033	-75.72	10.95	VERTICAL	PASSED

5.13. 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]	Polarization	Results
1420.381	-72.39	6E-05	-64.83	-7.56	HORIZONTAL	PASSED
2139.359	-74.9	3E-05	-73.02	-1.88	VERTICAL	PASSED
2840.782	-70.76	8E-05	-74.27	3.51	HORIZONTAL	PASSED

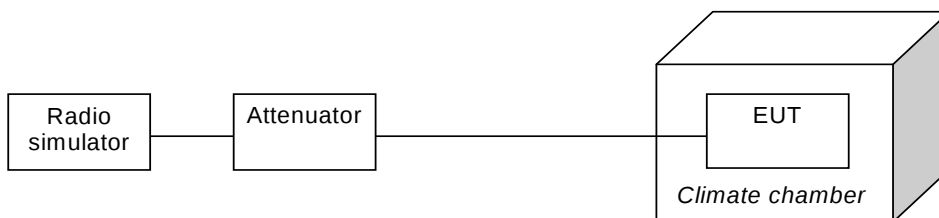
FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1420.301	-66.55	0.00022	-58.99	-7.56	HORIZONTAL	PASSED
2130.541	-55.67	0.00271	-53.5	-2.17	VERTICAL	PASSED
2840.902	-70.11	0.0001	-73.62	3.51	HORIZONTAL	PASSED

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

EUT with DUT number	RX-114, DUT 43066
Accessories with DUT numbers	BC-3S, DUT 43090 ; AC-300, DUT 43068 ; WH-208, DUT 43035
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 60 / 102.3
Date of measurements	23-Aug-2013
Measured by	Jari Jantunen

6.1. Test Setup



6.2. Test method and limit

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

The climate chamber temperature is set to the maximum value and the temperature is allowed to stabilize.

The EUT is placed in the chamber.

The EUT is set in idle mode for 15 minutes.

The EUT is set to transmit.

The transmit frequency error was measured immediately.

The steps c - e were repeated for each temperature. Limits for frequency stability, temperature variation measurements

Frequency deviation [ppm]
+/- 2.5

6.3. WCDMA 850 Test results

FDD, Channel 4175 / 835.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	835.00	-2.67029	-0.0032	PASSED
40	835.00	1.12915	0.0014	PASSED
30	835.00	-0.27466	-0.0003	PASSED
20	835.00	-1.49536	-0.0018	PASSED
10	835.00	-1.17493	-0.0014	PASSED
0	835.00	-2.10571	-0.0025	PASSED
-10	835.00	0.56458	0.0007	PASSED
-20	835.00	-1.58691	-0.0019	PASSED
-30	835.00	-0.50354	-0.0006	PASSED

6.4. WCDMA 1900 Test results

FDD, Channel 9400 / 1880.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880.00	-4.04358	-0.0021	PASSED
40	1880.00	-5.46265	-0.0029	PASSED
30	1880.00	-3.55530	-0.0019	PASSED
20	1880.00	-9.24683	-0.0049	PASSED
10	1880.00	-5.20325	-0.0028	PASSED
0	1880.00	-8.80432	-0.0047	PASSED
-10	1880.00	-4.76074	-0.0025	PASSED
-20	1880.00	-1.80054	-0.001	PASSED
-30	1880.00	-2.38037	-0.0013	PASSED

6.5. LTE1700 (Band 4) Test results

FDD, CBW 20MHz, ,INV, INV RB, Channel 20175 / 1732.5 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1732.50	0.74387	0.0004	PASSED
40	1732.50	-0.75817	-0.0004	PASSED
30	1732.50	-1.44482	-0.0008	PASSED
20	1732.50	0.35763	0.0002	PASSED
10	1732.50	4.06265	0.0023	PASSED
0	1732.50	1.30177	0.0008	PASSED
-10	1732.50	2.10285	0.0012	PASSED
-20	1732.50	2.77519	0.0016	PASSED
-30	1732.50	2.36034	0.0014	PASSED

6.6. LTE700 Upper (Band 13) Test results

FDD, CBW 10MHz, ,INV, INV RB, Channel 23230 / 782.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	782.00	-2.05994	-0.0026	PASSED
40	782.00	-3.49045	-0.0045	PASSED
30	782.00	0.87261	0.0011	PASSED
20	782.00	-0.34332	-0.0004	PASSED
10	782.00	-1.83106	-0.0023	PASSED
0	782.00	1.15871	0.0015	PASSED
-10	782.00	-0.04292	-0.0001	PASSED
-20	782.00	0.57220	0.0007	PASSED
-30	782.00	-2.24590	-0.0029	PASSED

6.7. LTE700 Lower (Band 17) Test results

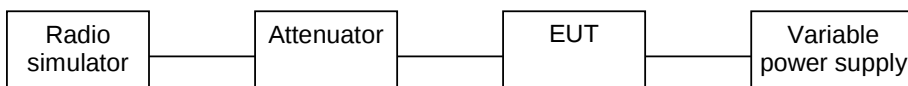
FDD, CBW 10MHz, ,INV, INV RB, Channel 23790 / 710.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	710.00	-1.85967	-0.0026	PASSED
40	710.00	-3.59058	-0.0051	PASSED
30	710.00	-2.70367	-0.0038	PASSED
20	710.00	-0.62943	-0.0009	PASSED
10	710.00	0.11444	0.0002	PASSED
0	710.00	0.65804	0.0009	PASSED
-10	710.00	1.45912	0.0021	PASSED
-20	710.00	-2.63214	-0.0037	PASSED
-30	710.00	-2.11716	-0.003	PASSED

7. Frequency stability, voltage variation (FCC §2.1055(d), RSS-132 4.3, RSS-133 6.3, RSS-139 6.3)

EUT with DUT number	RX-114 DUT 43066
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	12.4 VDC, 14.8 VDC and 16.8 VDC
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 62 / 99.8
Date of measurements	11-Sep-2013
Measured by	Jari Jantunen

7.1. Test Setup



7.2. Test method and limit

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

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

Limits for frequency stability, voltage variation measurements

Frequency deviation [ppm]
+/- 2.5

7.3. WCDMA 1900 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Nominal / 14.8	1880.00	-3.78418	-0.002	PASSED
Battery cut-off point / 12.4	1880.00	-6.08826	-0.0032	PASSED
Max / 16.8	1880.00	-4.69971	-0.0025	PASSED

7.4. WCDMA 850 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Nominal / 14.8	835.00	-0.36621	-0.0004	PASSED
Battery cut-off point / 12.4	835.00	-1.83106	-0.0022	PASSED
Max / 16.8	835.00	0.59509	0.0007	PASSED

7.5. 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
Nominal / 14.8	1732.50	3.01838	0.0017	PASSED
Battery cut-off point / 12.4	1732.50	0.57220	0.0003	PASSED
Max / 16.8	1732.50	0.58651	0.0003	PASSED

7.6. LTE700 Upper (Band 13) Test results

, CBW 0MHz, , RB, Channel 23230 / 782.0 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Nominal / 14.8	782.00	-1.70231	-0.0022	PASSED
Battery cut-off point / 12.4	782.00	0.50068	0.0006	PASSED
Max / 16.8	782.00	-0.65804	-0.0008	PASSED

7.7. 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
Nominal / 14.8	710.00	0.31471	0.0004	PASSED
Battery cut-off point / 12.4	710.00	-0.58651	-0.0008	PASSED
Max / 16.8	710.00	-1.60217	-0.0023	PASSED

8. Test Equipment

8.1. Conducted measurements

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

8.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15E, 15B
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM26497	Antenna	3115	Emco	22/24/27, 15C, 15B
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	TS-RSP	R&S	22/24/27, 15C, 15E, 15B

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