FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC_Cellular_RM-1073_02_Ant1.docx	**Date of Report:**	11-Feb-2015
Number of pages:	94	**Customer's Contact person:**	Juha Paukku
Testing laboratory:	TCC Microsoft Salo Laboratory P.O.Box(86) Joensuunkatu 7E FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 71 80 44122	**Customer:**	Microsoft P.O. Box 403 Visiokatu 4 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880
FCC listing no.: **IC recognition no.:**	533467 661V-1		
Tested devices/ accessories:	**Phone RM-1073 / Dummy battery SD-131 / Headset WH-108 /AC-Charger AC-20E / Battery BV-T5C**		
FCC ID:	PYARM-1073	**IC:**	661X-RM1073
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 4, November 2014), RSS-133 (Issue 6, January 2013), RSS-132 (Issue 3, January 2013), RSS-139 (Issue 2, February 2009), RSS-130 (Issue 1, October 2013). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".**		
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:	Digitally signed by Hannila Kalle.T Date: 2015.02.11 15:00:10 +02'00'		

Kalle Hannila, System Manager, EMC

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

Date of receipt	26-Nov-2014
Testing completed	06-Jan-2015
The customer's contact person	Juha Paukku
Test Plan referred to	T:\Projects\RM-1073\TestPlan\RS_TestPlan_RM-1073.xlsm
Notes	-
Document name	Y:\Projects\RM-1073\EMC\FCC_Cellular_RM-1073_02_Ant1.docx

1.1. EUT and Accessory Information

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

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-1073	004402740501139	1540	-	02149.00000.14441.39000	18901
Dummy battery	SD-131		v.1	-	-	18902
Headset	WH-108	2265171	-	-	-	18677
Phone	RM-1073	004402740502103	1540	-	02149.00000.14441.39000	18897
Battery	BV-T5C	LGC?BV+T5C?Phone Program?v4.0?05186	-	-	-	18898
Ac-Charger	AC-20E	409049415667071145500675628	-	-	-	18697
Headset	WH-108	4235VFA	-	-	-	18698

1.2. Summary of Test Results

GSM 1900:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	PASSED
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§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

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	PASSED
N/A	5.4	Peak to average power ratio	PASSED
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	PASSED

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§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

WCDMA2:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	PASSED
§2.1049(h)	6.6	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

WCDMA4:

Section in CFR 47	Section in RSS-GEN or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§27.50(d)(2)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	PASSED
§2.1049(h)	6.6	99 % occupied bandwidth	PASSED
§27.53(g)	6.5	Band edge compliance	PASSED
§27.53(g), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

WCDMA5:

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	PASSED
N/A	5.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	PASSED
§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

LTE2:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	PASSED
§2.1049(h)	6.6	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

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

LTE4:

Section in CFR 47	Section in RSS-GEN or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§27.50(d)(4)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	PASSED
§27.53(h)	6.5	Band edge compliance	PASSED
§27.53(h), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§27.53(h), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

LTE5:

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
N/A	5.4	Peak to average power ratio	PASSED
§2.1049(h)	6.6	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

LTE12:

Section in CFR 47	Section in RSS-GEN or RSS-130	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(c)10	4.4	Radiated RF output power	PASSED
N/A	N/A	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	PASSED
§27.53(f)	4.6	Band edge compliance	PASSED
§27.53(f)	4.6	Spurious emissions at antenna terminals	NP
§27.53(f)	4.6	Spurious radiated emissions	PASSED
§27.54	4.3	Frequency stability, temperature variation	PASSED
§27.54	4.3	Frequency stability, voltage variation	PASSED

LTE17:

Section in CFR 47	Section in RSS-GEN or RSS-130	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(c)(10)	4.4	Radiated RF output power	PASSED
N/A	N/A	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	PASSED
§27.53(g)	4.6	Band edge compliance	PASSED
§27.53(g), §2.1051	4.6	Spurious emissions at antenna terminals	NP
§27.53(g), §2.1051	4.6	Spurious radiated emissions	PASSED
§2.1055(a)	4.3 (a)	Frequency stability, temperature variation	PASSED
§2.1055(d)	4.3 (a)	Frequency stability, voltage variation	PASSED

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

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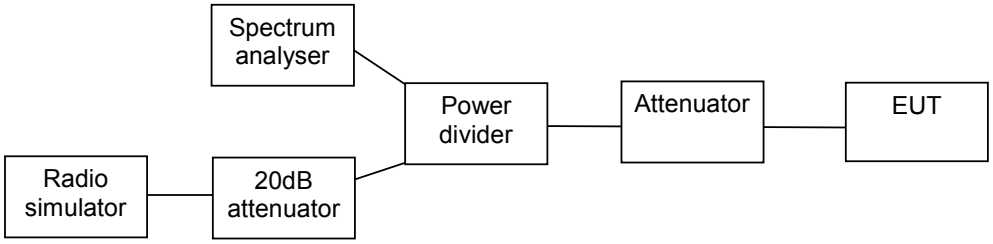
2. Peak to average power ratio
(FCC N/A, RSS-133 6.4, RSS-132 5.4, RSS-139 6.4)

EUT with DUT number	RM-1073, DUT 18901
Accessories with DUT numbers	SD-131, DUT 18902 ; WH-108, DUT 18677
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Measured from Antenna1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 100
Date of measurements	26-Nov-2014
Measured by	Jari Keto

2.1. Test Setup



2.2. Test method and limit

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

Limits for Peak to average power ratio measurements

Peak to average power ratio [dB]
≤ 13

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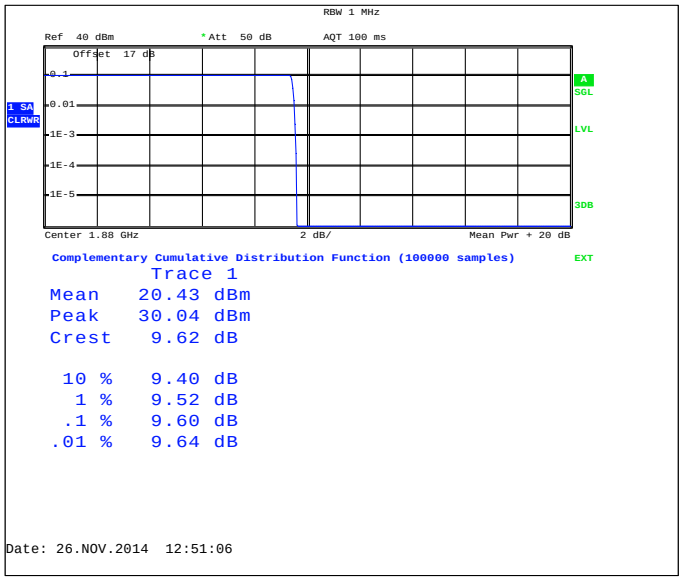
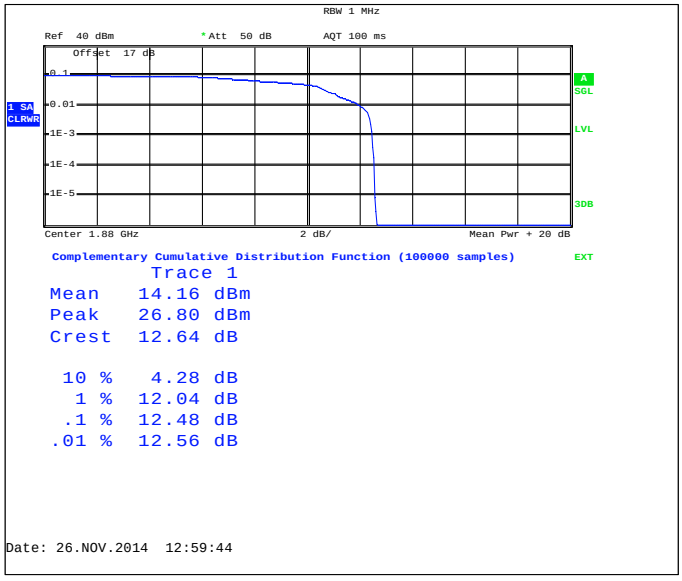
2.3. GSM 1900 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
GSM	661 / 1880.0	9.62	PASSED
EGPRS	661 / 1880.0	12.64	PASSED

GSM



EGPRS



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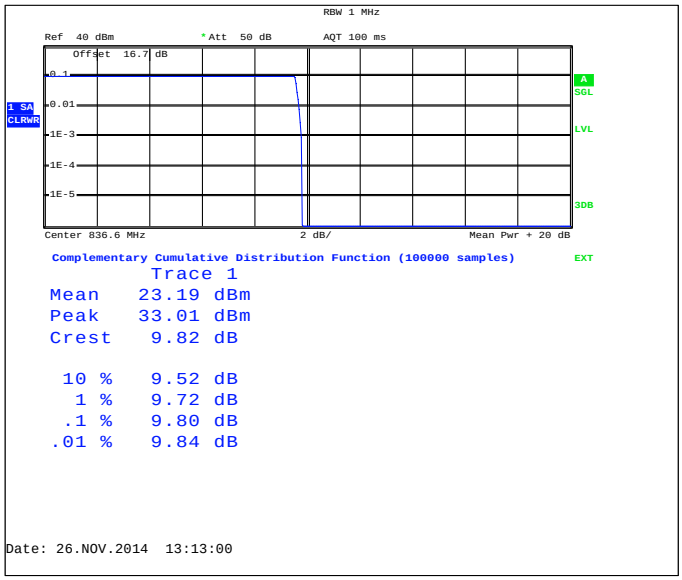
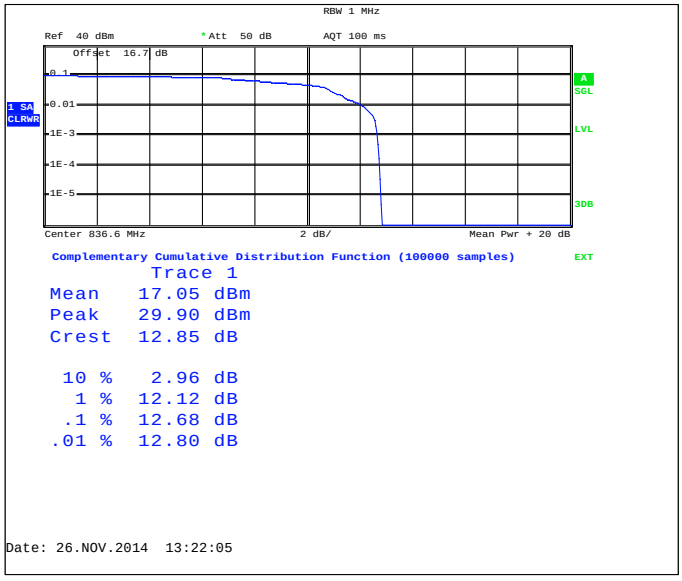
2.4. GSM 850 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
GSM	190 / 836.6	9.82	PASSED
EGPRS	190 / 836.6	12.85	PASSED

GSM



EGPRS



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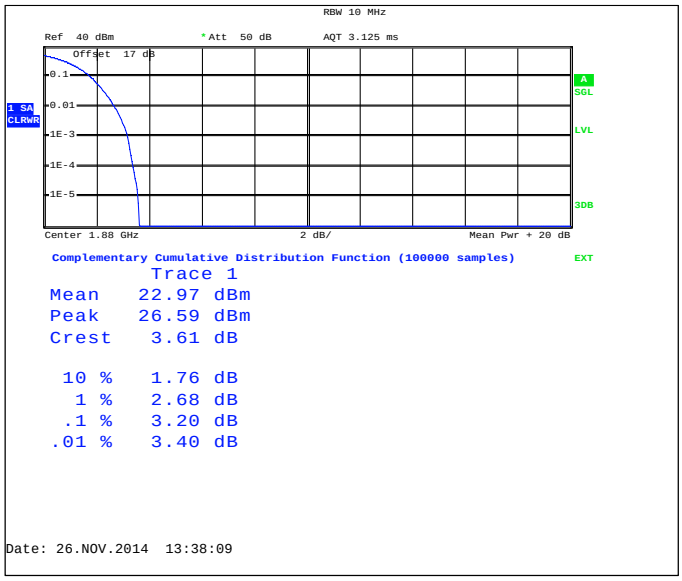
2.5. WCDMA2 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD	9400 / 1880.0	3.61	PASSED

FDD



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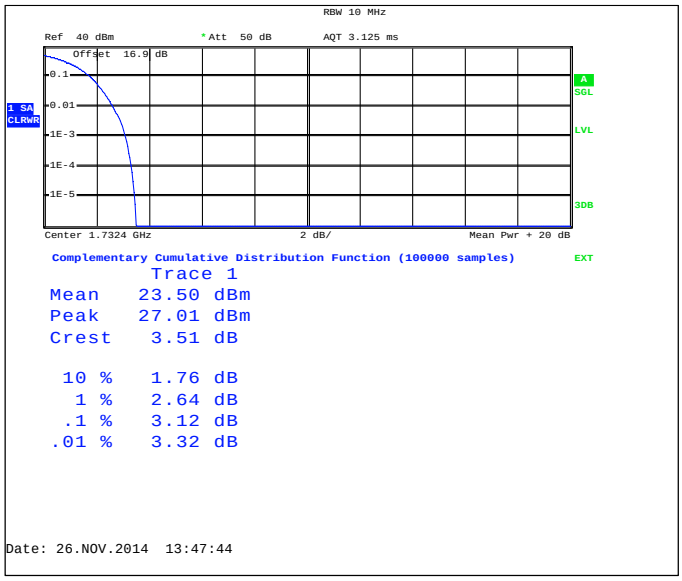
2.6. WCDMA4 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD	1412 / 1732.4	3.51	PASSED

FDD



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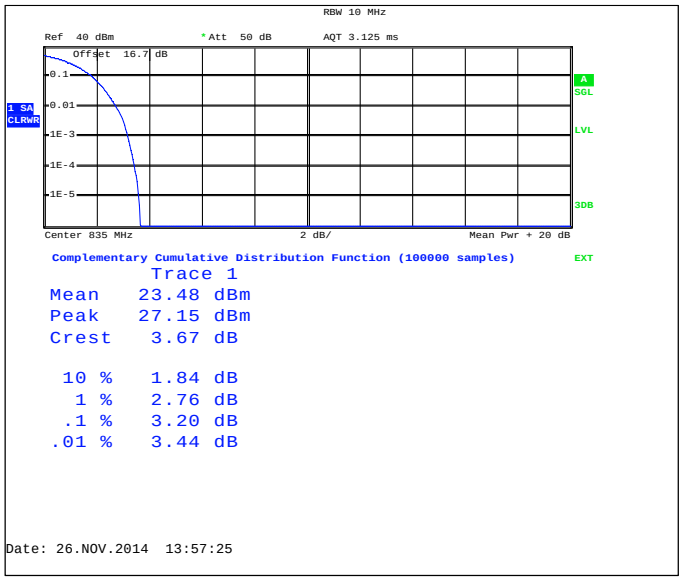
2.7. WCDMA5 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD	4175 / 835.0	3.67	PASSED

FDD



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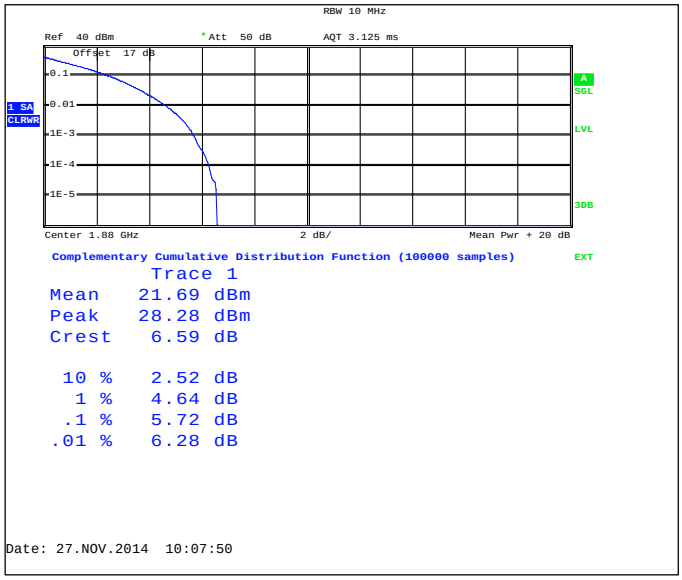
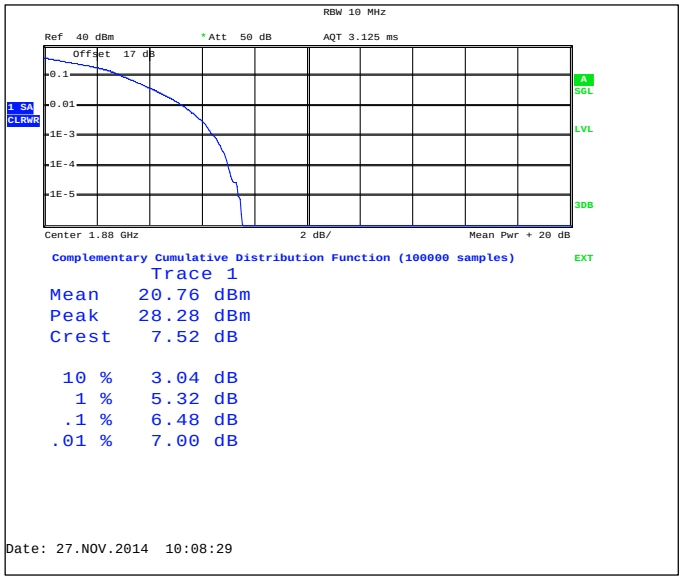
2.8. LTE2 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD, CBW 5MHz, QPSK, 25 RB	18900 / 1880.0	6.59	PASSED
FDD, CBW 5MHz, 16QAM, 25 RB	18900 / 1880.0	7.52	PASSED

FDD, CBW 5MHz, QPSK, 25 RB



FDD, CBW 5MHz, 16QAM, 25 RB



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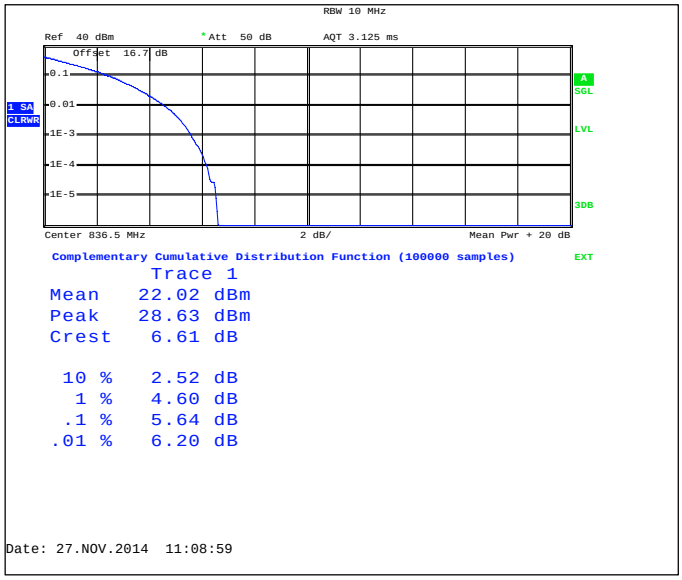
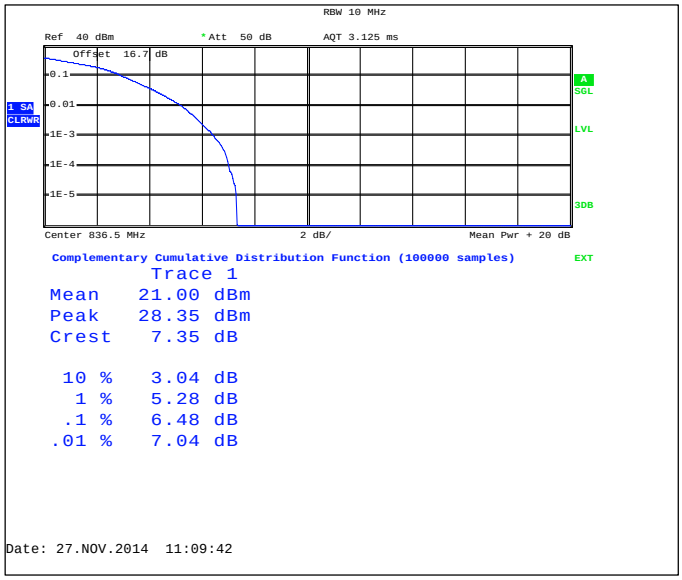
2.9. LTE5 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD, CBW 5MHz, QPSK, 25 RB	20525 / 836.5	6.61	PASSED
FDD, CBW 5MHz, 16QAM, 25 RB	20525 / 836.5	7.35	PASSED

FDD, CBW 5MHz, QPSK, 25 RB



FDD, CBW 5MHz, 16QAM, 25 RB



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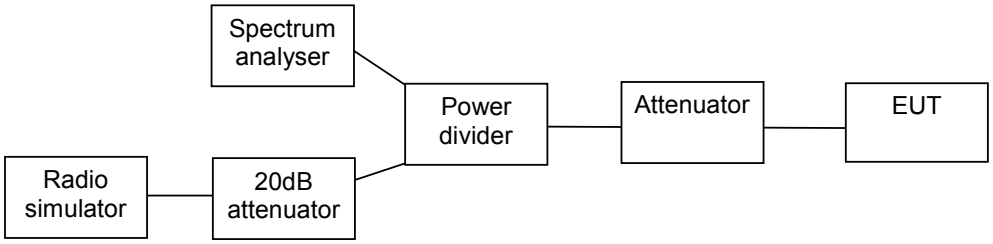
3. 99 % occupied bandwidth

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

EUT with DUT number	RM-1073, DUT 18901
Accessories with DUT numbers	SD-131, DUT 18902 ; WH-108, DUT 18677
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Measured from Antenna1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 100
Date of measurements	26-Nov-2014
Measured by	Jari Keto

3.1. Test Setup



3.2. Test method and limit

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

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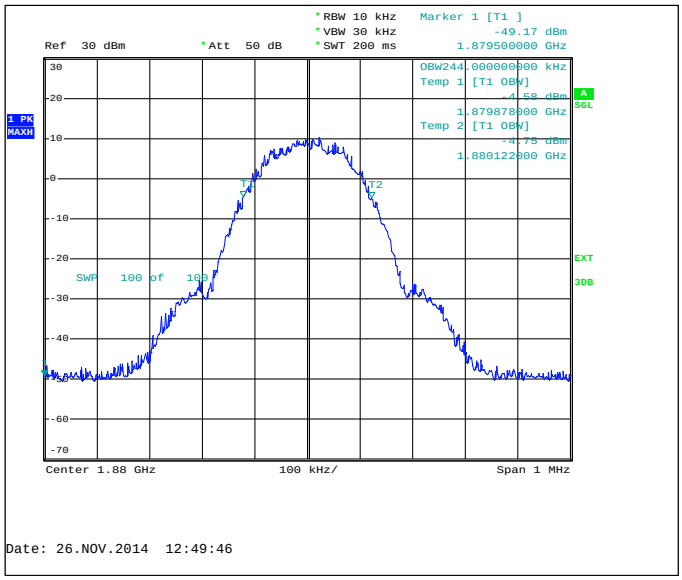
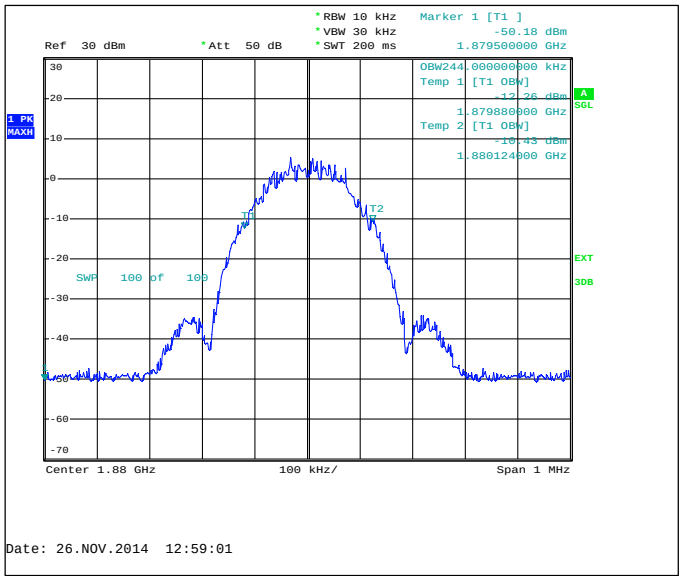
3.3. GSM 1900 Test results

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

GSM, Channel 661 / 1880.0 MHz



EGPRS, Channel 661 / 1880.0 MHz



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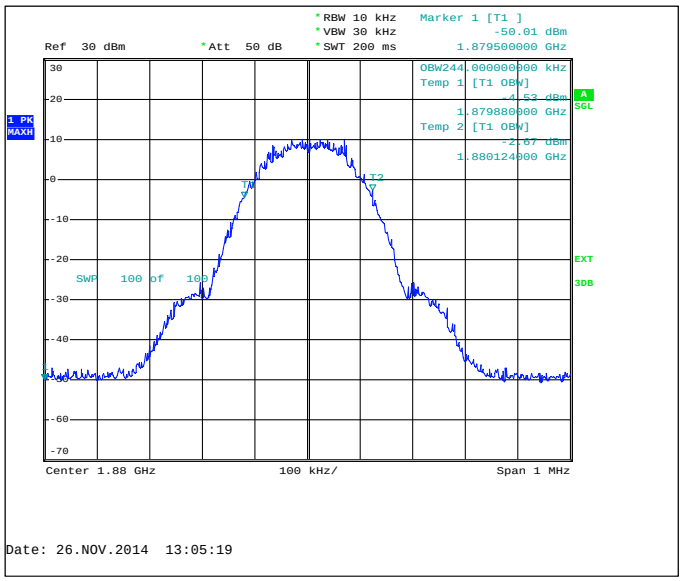
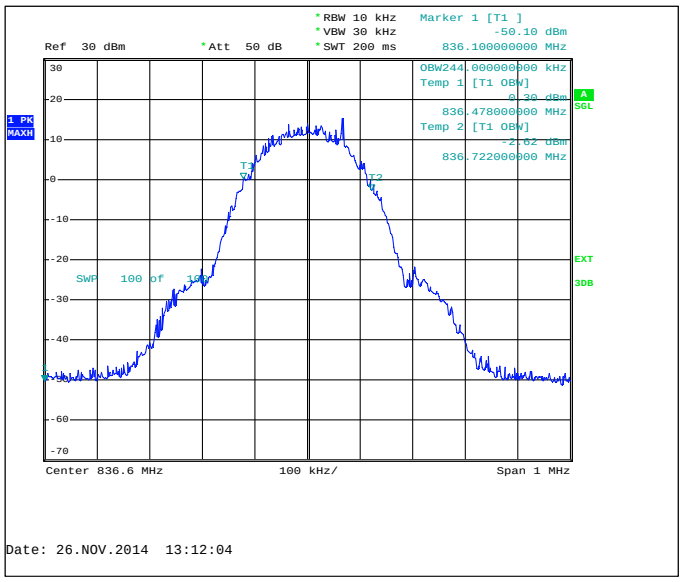
GPRS, Channel 661 / 1880.0 MHz



3.4. GSM 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	244
EGPRS	240
GPRS	246

GSM, Channel 190 / 836.6 MHz



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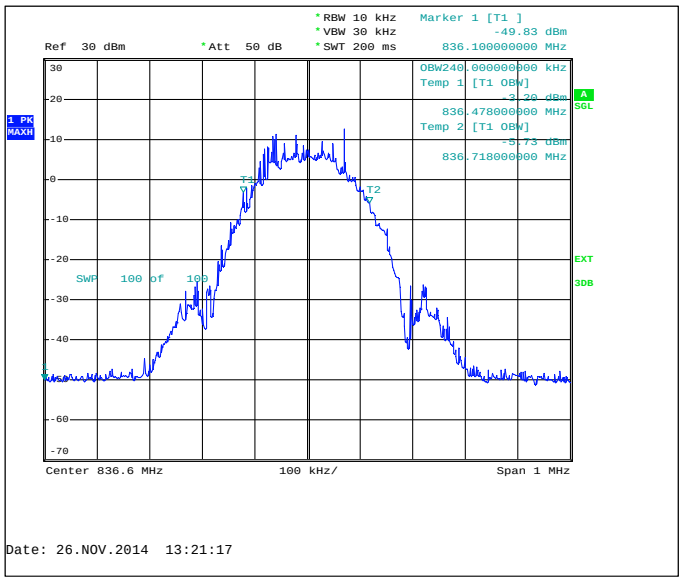
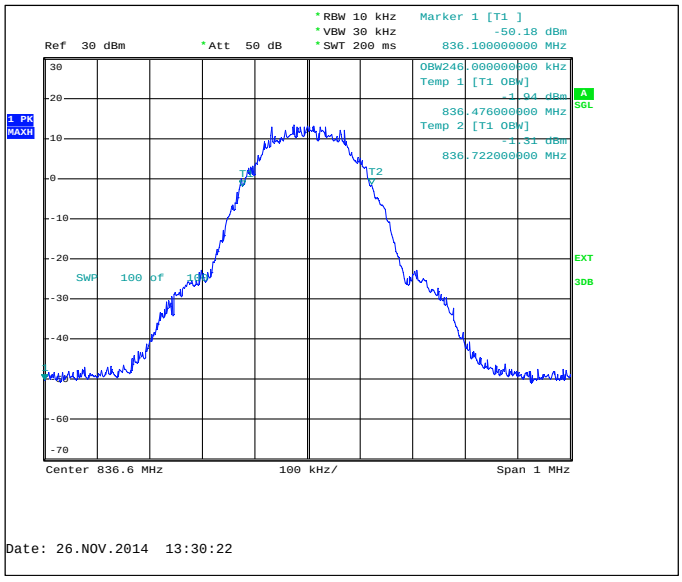
EGPRS, Channel 190 / 836.6 MHz



GPRS, Channel 190 / 836.6 MHz



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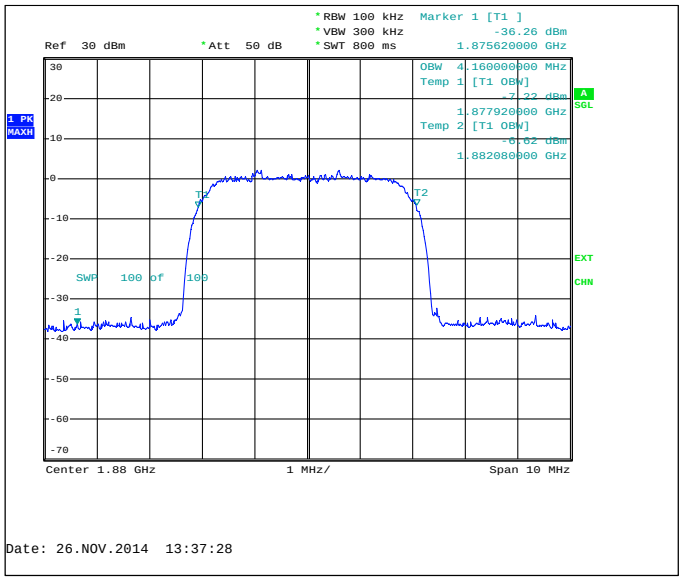
3.5. WCDMA2 Test results

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

FDD, Channel 9400 / 1880.0 MHz



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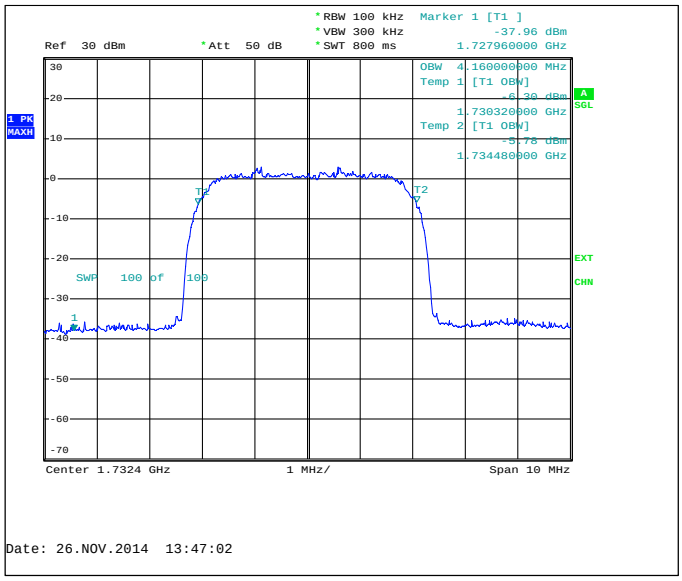
3.6. WCDMA4 Test results

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

FDD, Channel 1412 / 1732.4 MHz



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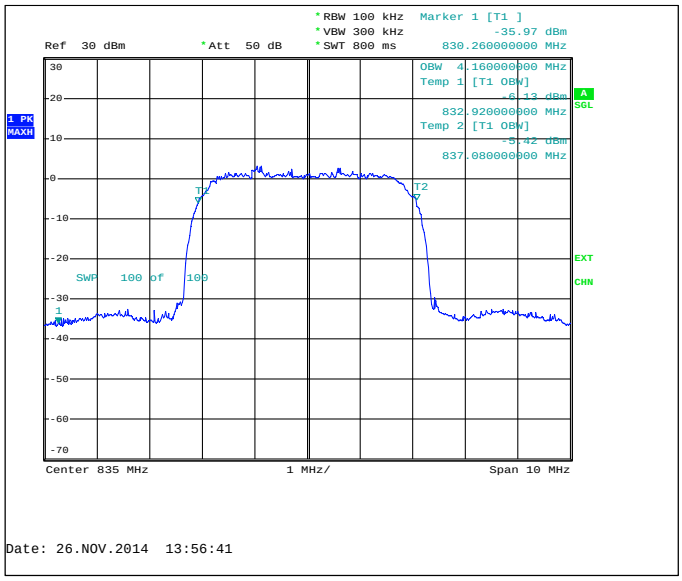
3.7. WCDMA5 Test results

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

FDD, Channel 4175 / 835.0 MHz



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3.8. LTE2 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1104
FDD, CBW 3MHz, QPSK, 15 RB	2696
FDD, CBW 5MHz, QPSK, 25 RB	4494
FDD, CBW 10MHz, QPSK, 50 RB	8970
FDD, CBW 15MHz, QPSK, 75 RB	13440
FDD, CBW 20MHz, QPSK, 100 RB	17900
FDD, CBW 1.4MHz, 16QAM, 6 RB	1112
FDD, CBW 3MHz, 16QAM, 15 RB	2688
FDD, CBW 5MHz, 16QAM, 25 RB	4494
FDD, CBW 10MHz, 16QAM, 50 RB	8970
FDD, CBW 15MHz, 16QAM, 75 RB	13400
FDD, CBW 20MHz, 16QAM, 100 RB	17850

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

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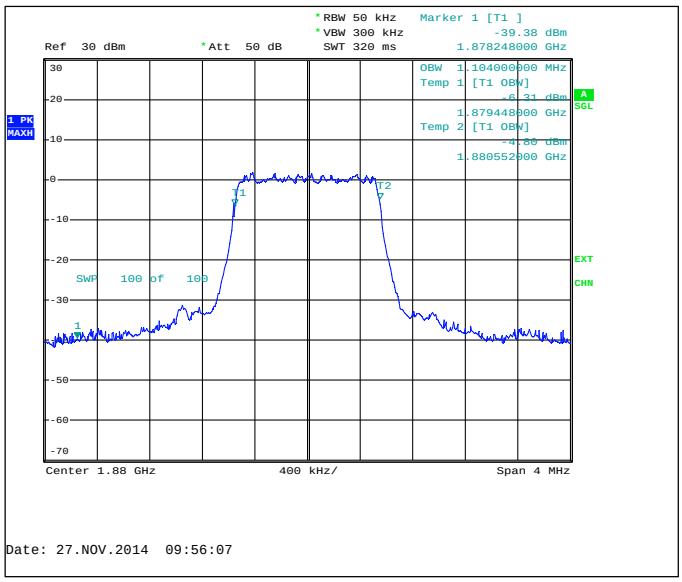
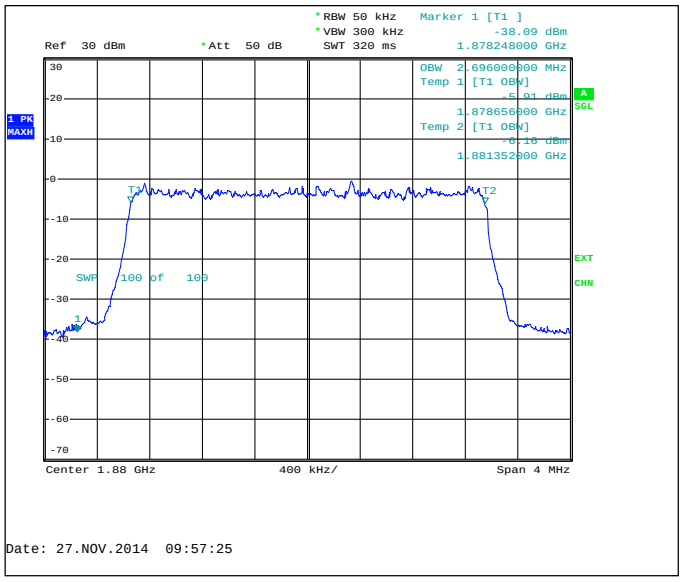


FDD, CBW 3MHz, QPSK, 15 RB, Channel 18900 / 1880.0 MHz



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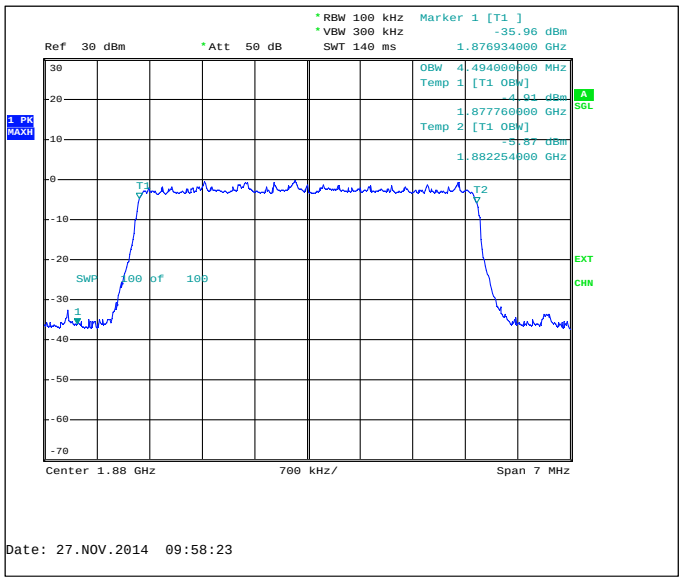
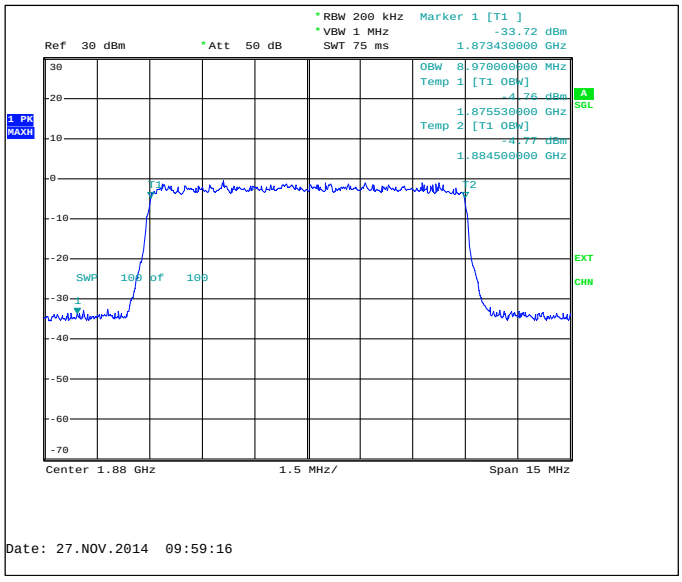
FDD, CBW 5MHz, QPSK, 25 RB, Channel 18900 / 1880.0 MHz



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



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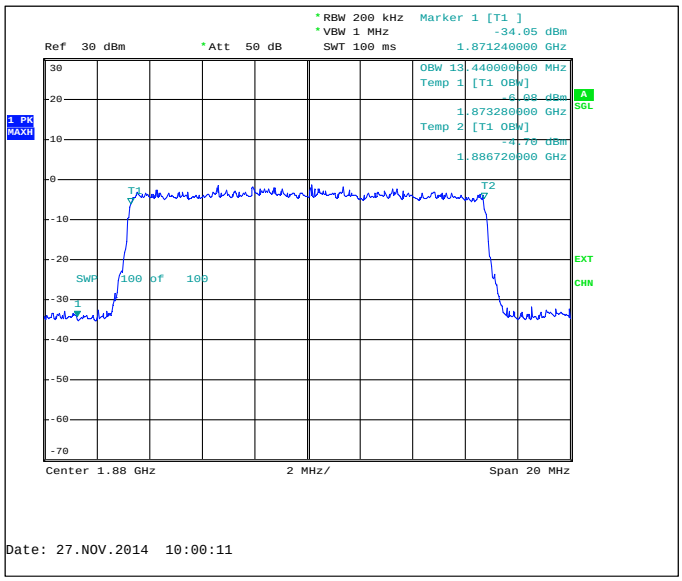
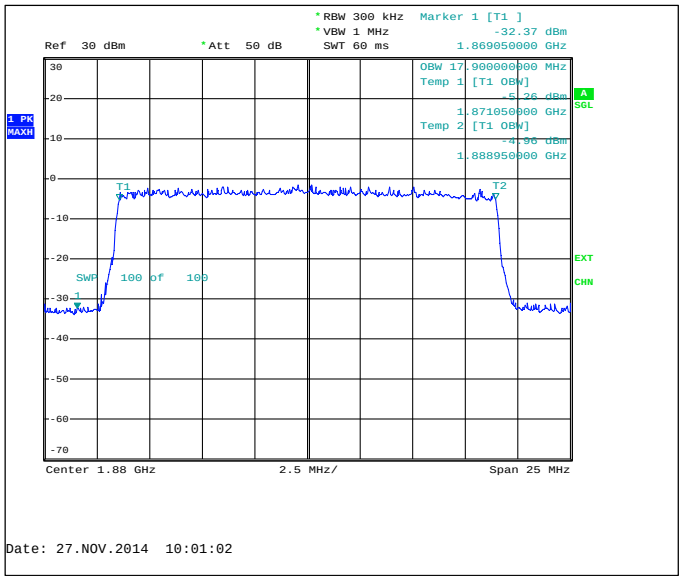
FDD, CBW 15MHz, QPSK, 75 RB, Channel 18900 / 1880.0 MHz



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



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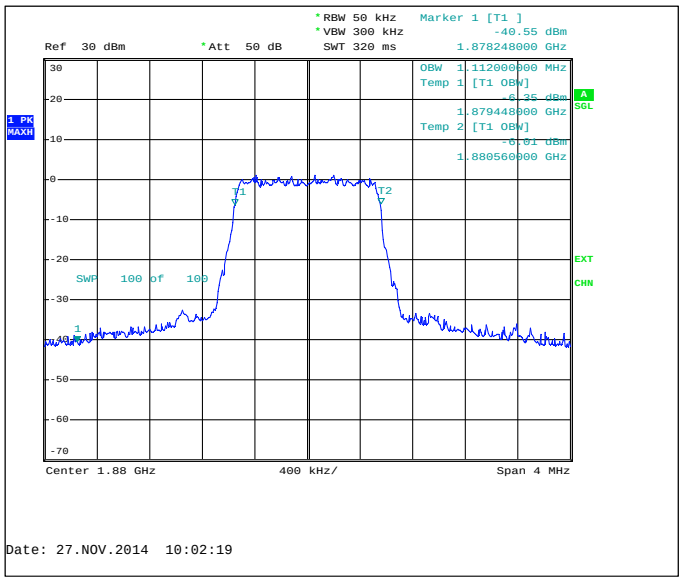
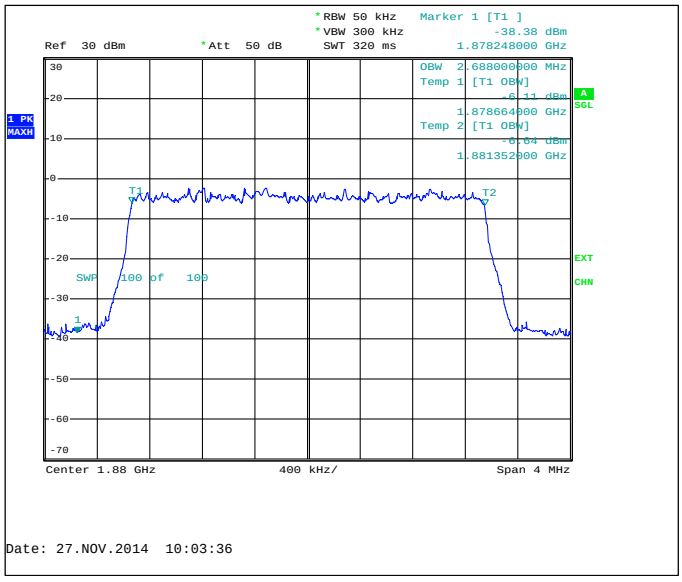
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 18900 / 1880.0 MHz



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



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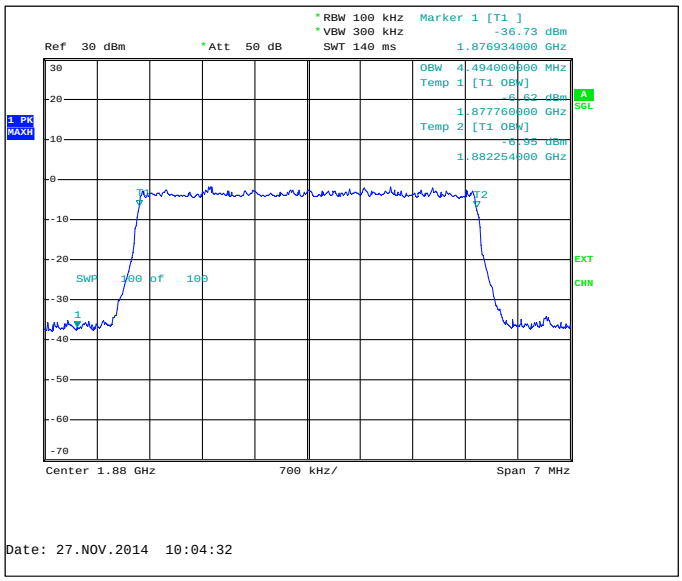
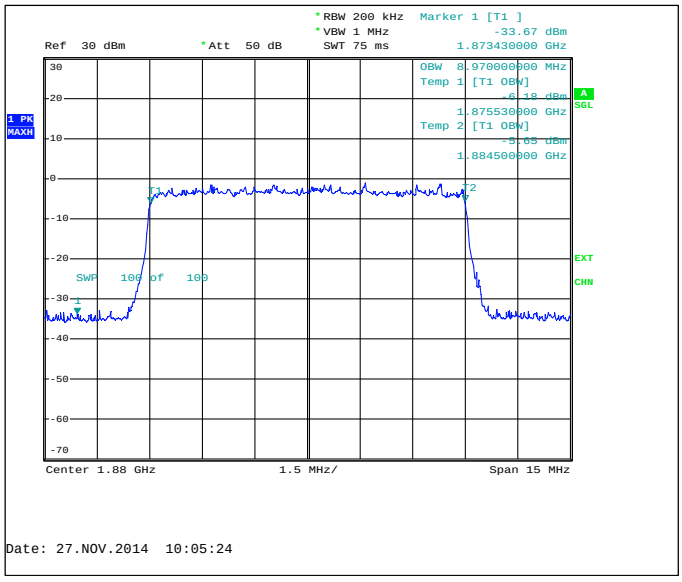
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 18900 / 1880.0 MHz



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



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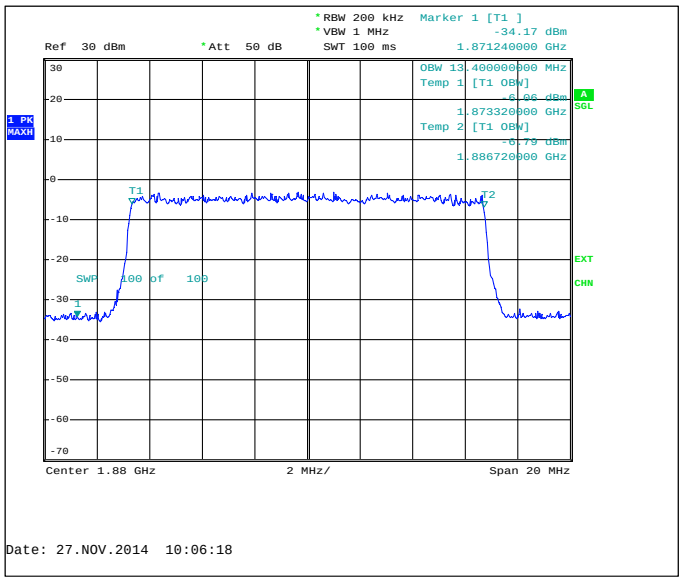
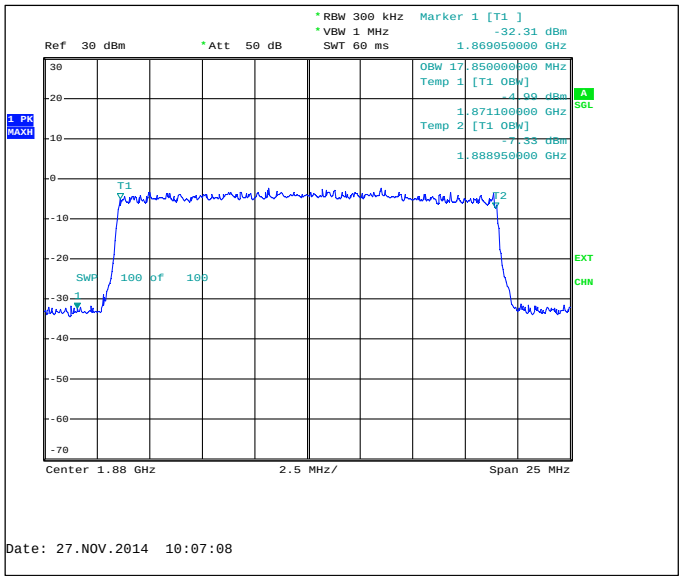
FDD, CBW 15MHz, 16QAM, 75 RB, Channel 18900 / 1880.0 MHz



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



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3.9. LTE4 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1104
FDD, CBW 3MHz, QPSK, 15 RB	2696
FDD, CBW 5MHz, QPSK, 25 RB	4494
FDD, CBW 10MHz, QPSK, 50 RB	8970
FDD, CBW 15MHz, QPSK, 75 RB	13400
FDD, CBW 20MHz, QPSK, 100 RB	17900
FDD, CBW 1.4MHz, 16QAM, 6 RB	1104
FDD, CBW 3MHz, 16QAM, 15 RB	2688
FDD, CBW 5MHz, 16QAM, 25 RB	4494
FDD, CBW 10MHz, 16QAM, 50 RB	8970
FDD, CBW 15MHz, 16QAM, 75 RB	13400
FDD, CBW 20MHz, 16QAM, 100 RB	17850

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

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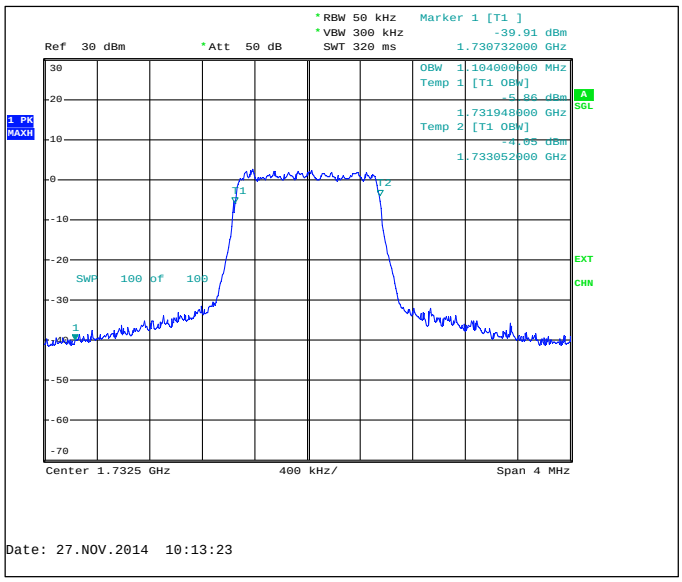
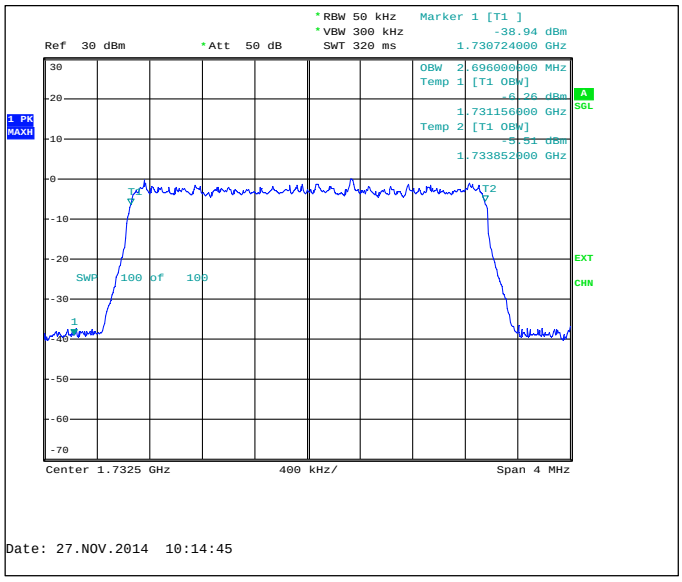


FDD, CBW 3MHz, QPSK, 15 RB, Channel 20175 / 1732.5 MHz



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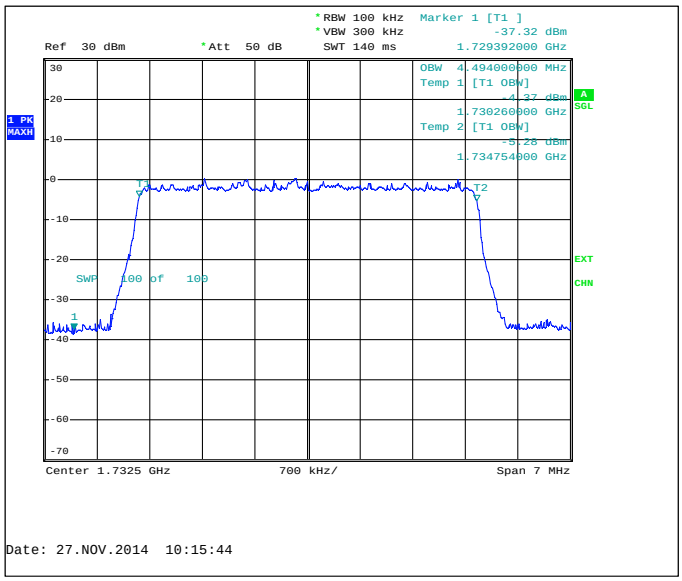
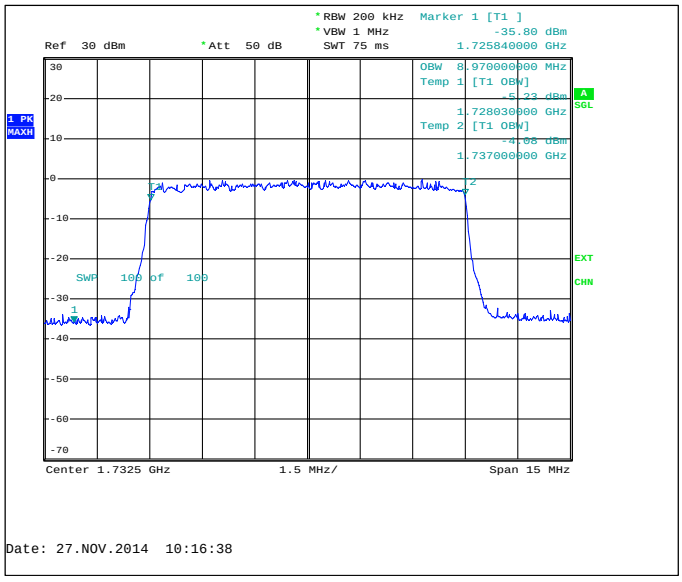
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20175 / 1732.5 MHz



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



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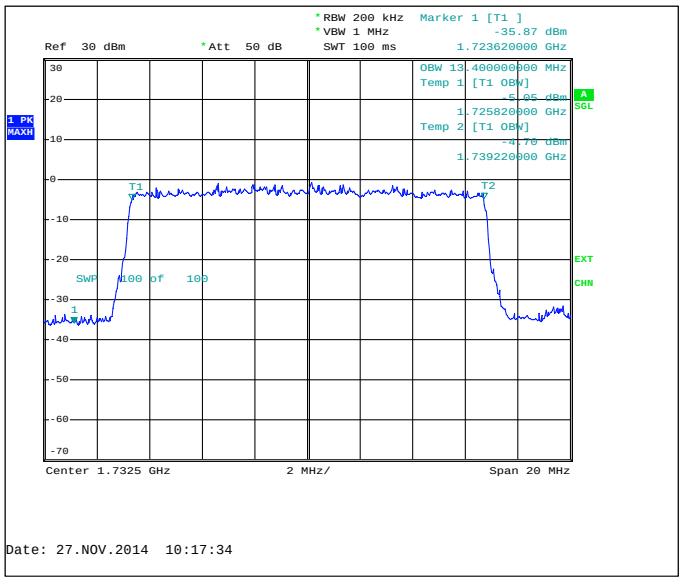
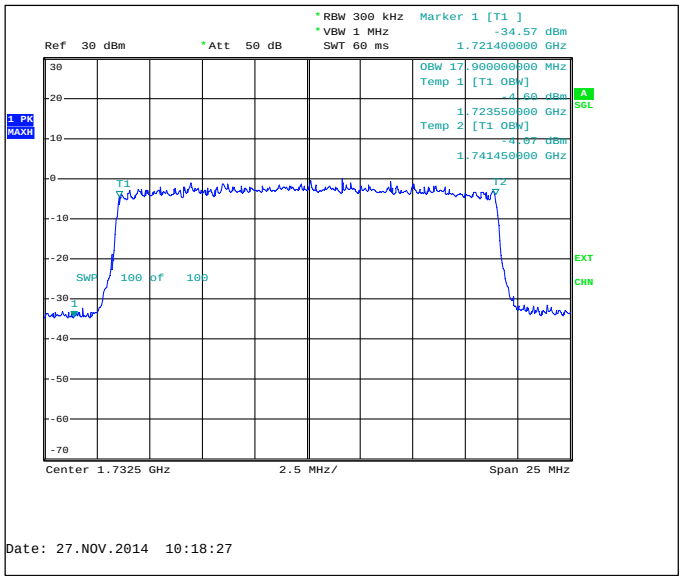
FDD, CBW 15MHz, QPSK, 75 RB, Channel 20175 / 1732.5 MHz



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



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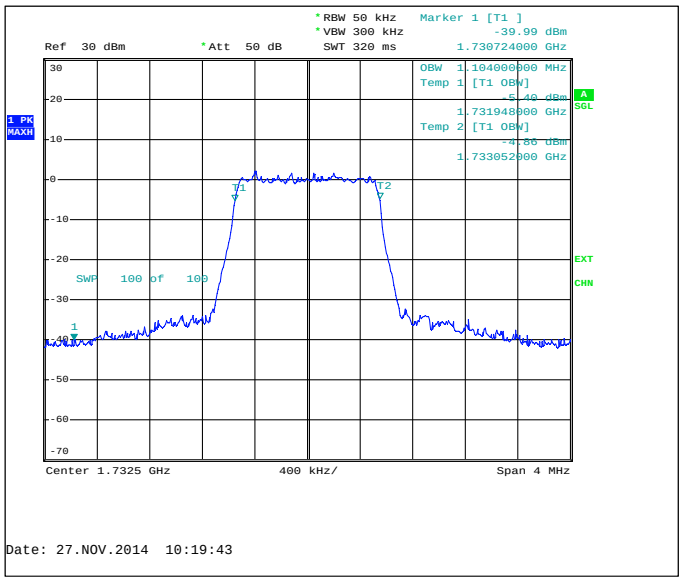
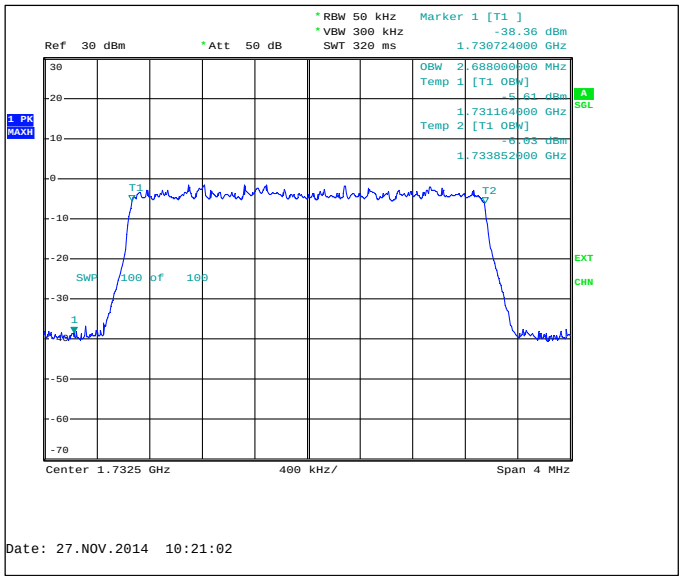
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20175 / 1732.5 MHz



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



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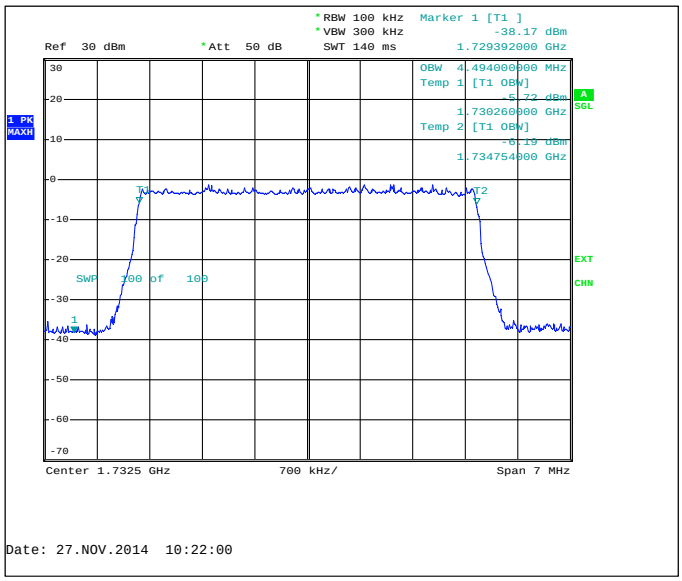
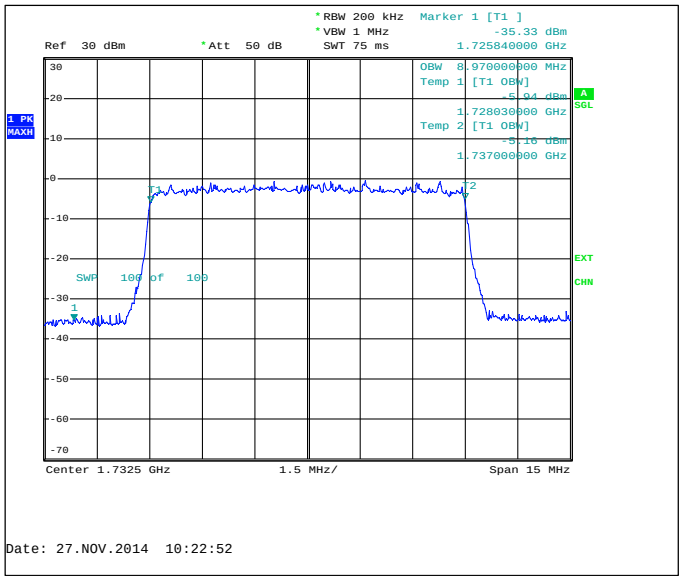
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20175 / 1732.5 MHz



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



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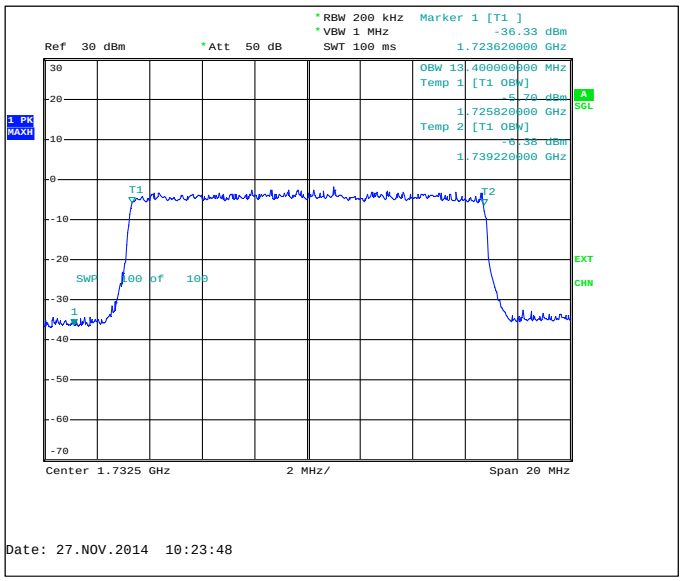
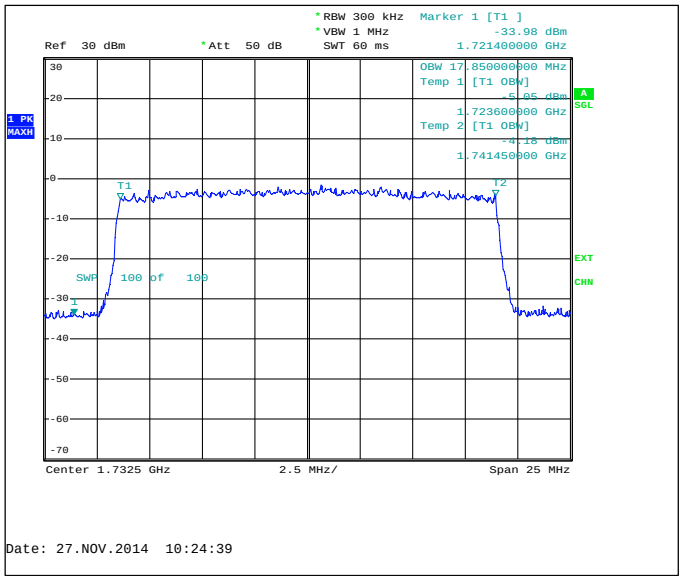
FDD, CBW 15MHz, 16QAM, 75 RB, Channel 20175 / 1732.5 MHz



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



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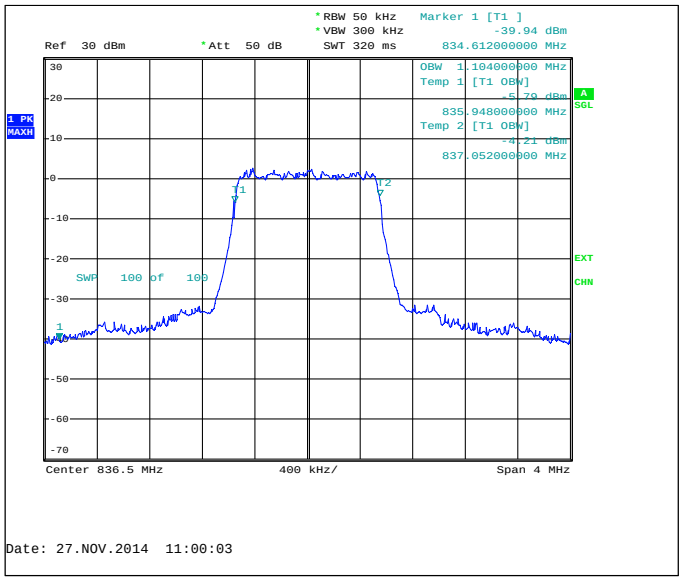
3.10. LTE5 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1104
FDD, CBW 3MHz, QPSK, 15 RB	2696
FDD, CBW 5MHz, QPSK, 25 RB	4494
FDD, CBW 10MHz, QPSK, 50 RB	9000
FDD, CBW 1.4MHz, 16QAM, 6 RB	1104
FDD, CBW 3MHz, 16QAM, 15 RB	2680
FDD, CBW 5MHz, 16QAM, 25 RB	4494
FDD, CBW 10MHz, 16QAM, 50 RB	8970

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



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

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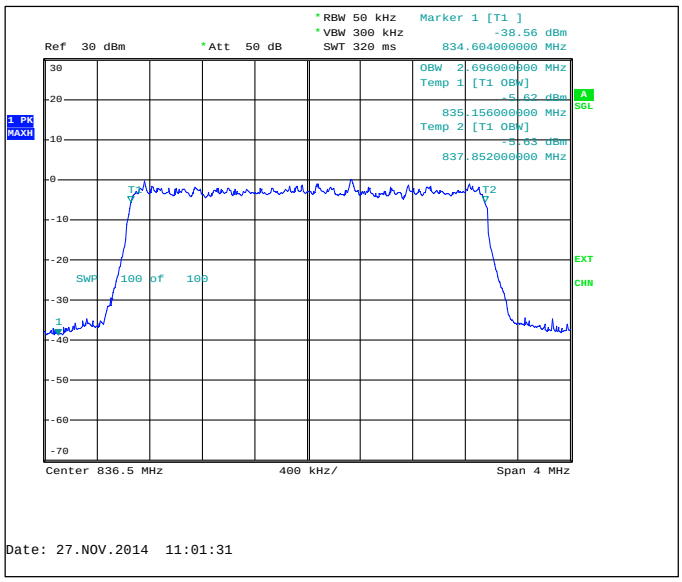

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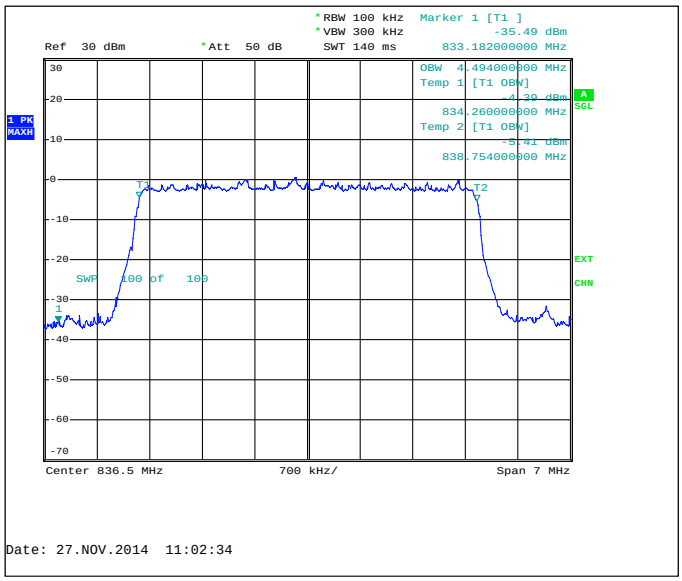
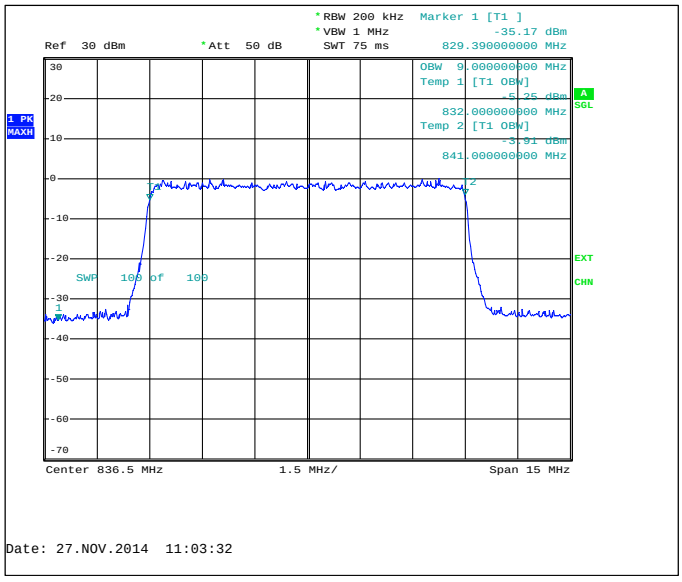
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20525 / 836.5 MHz



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



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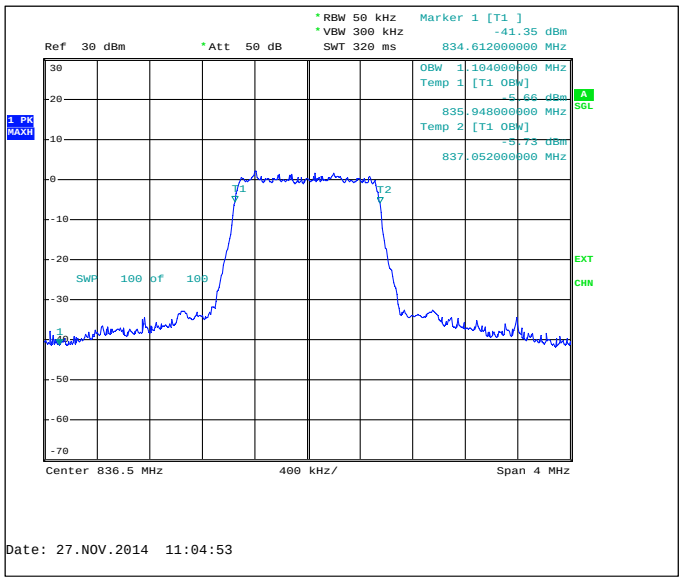
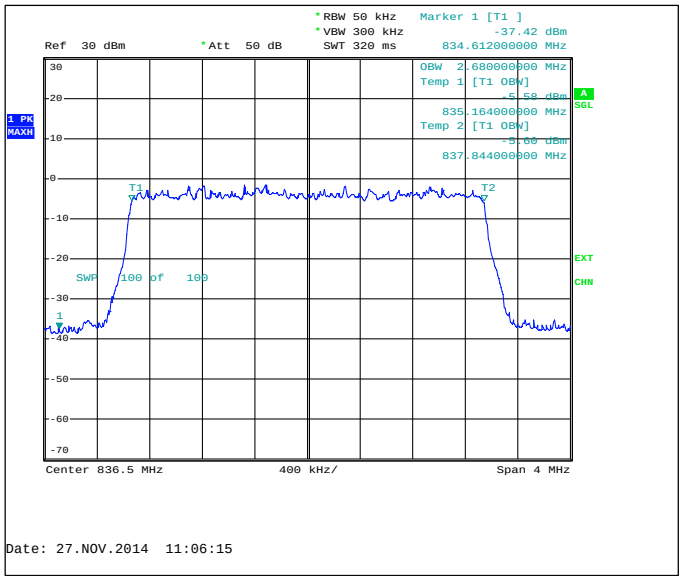
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 20525 / 836.5 MHz



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



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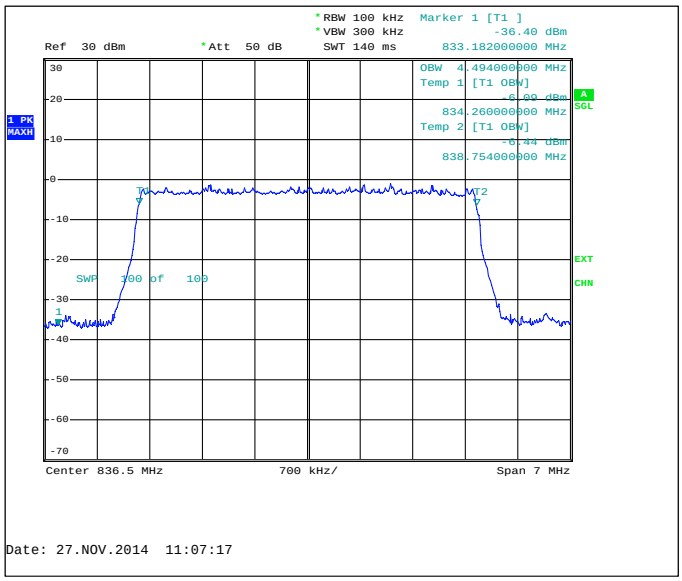
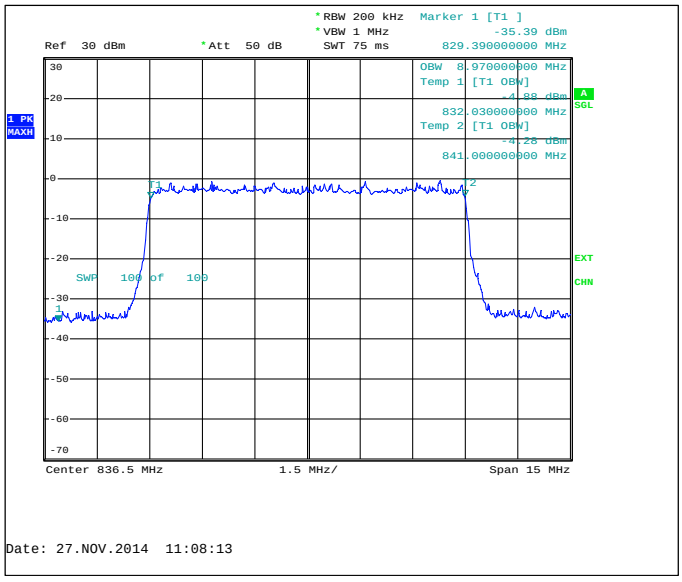
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 20525 / 836.5 MHz



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



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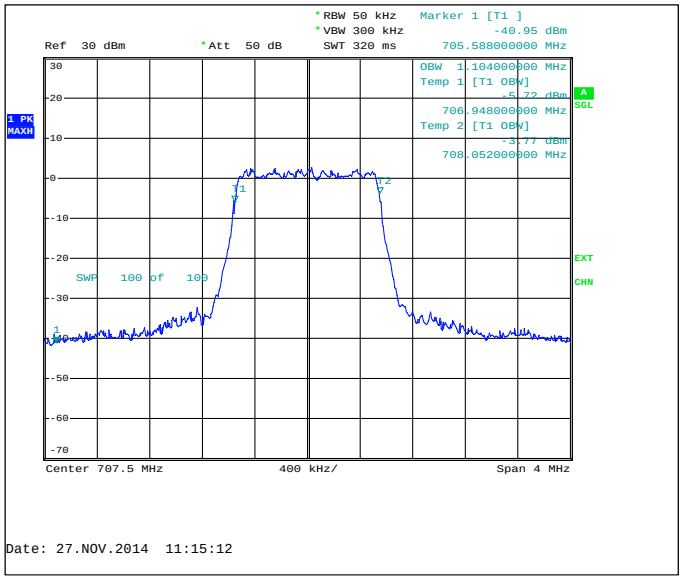
3.11. LTE12 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 1.4MHz, QPSK, 6 RB	1104
FDD, CBW 3MHz, QPSK, 15 RB	2696
FDD, CBW 5MHz, QPSK, 25 RB	4508
FDD, CBW 10MHz, QPSK, 50 RB	8970
FDD, CBW 1.4MHz, 16QAM, 6 RB	1112
FDD, CBW 3MHz, 16QAM, 15 RB	2688
FDD, CBW 5MHz, 16QAM, 25 RB	4494
FDD, CBW 10MHz, 16QAM, 50 RB	8970

FDD, CBW 1.4MHz, QPSK, 6 RB, Channel 23095 / 707.5 MHz



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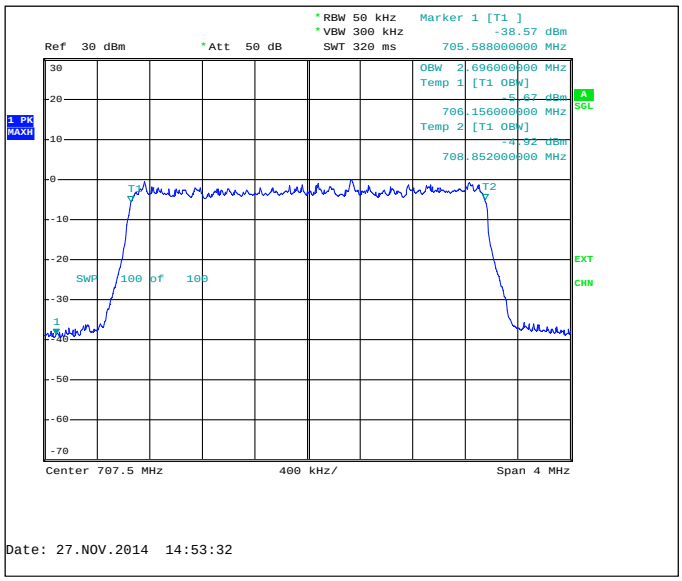
FDD, CBW 3MHz, QPSK, 15 RB, Channel 23095 / 707.5 MHz



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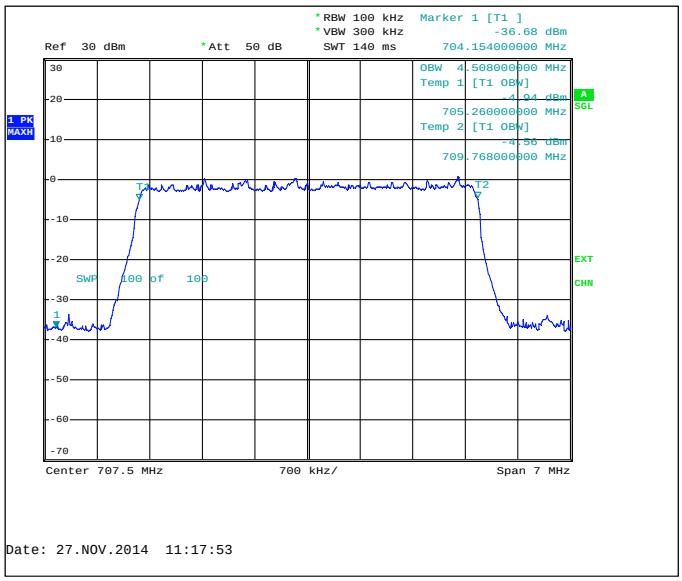
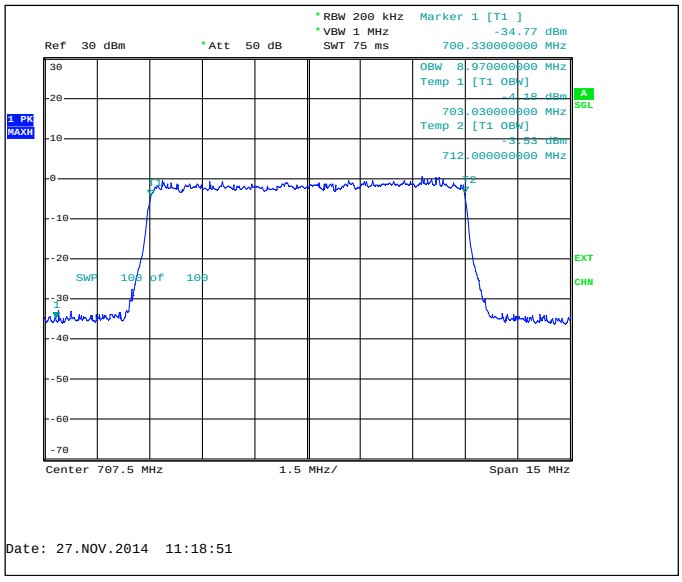
FDD, CBW 5MHz, QPSK, 25 RB, Channel 23095 / 707.5 MHz



FDD, CBW 10MHz, QPSK, 50 RB, Channel 23095 / 707.5 MHz



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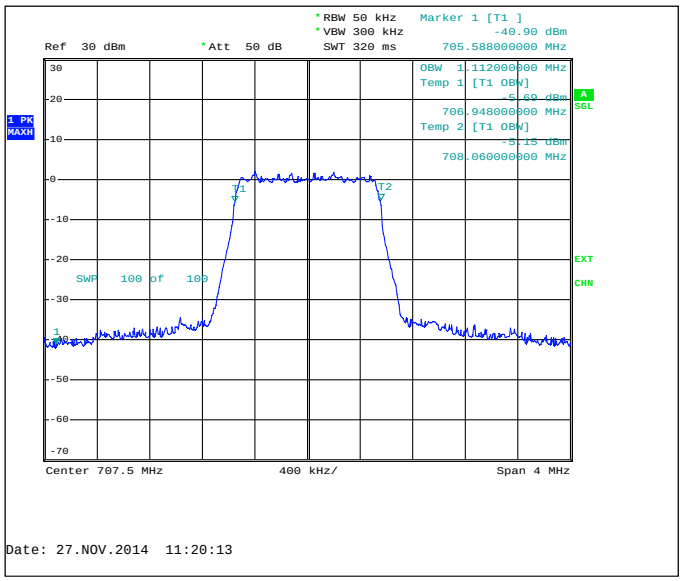
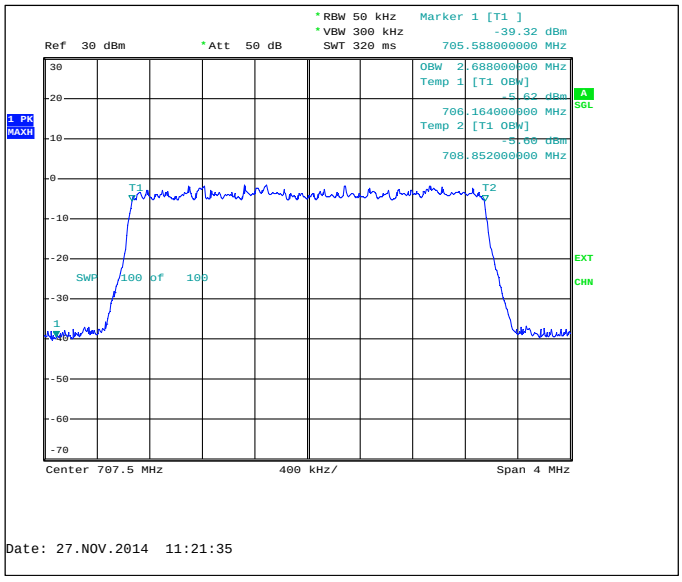
FDD, CBW 1.4MHz, 16QAM, 6 RB, Channel 23095 / 707.5 MHz



FDD, CBW 3MHz, 16QAM, 15 RB, Channel 23095 / 707.5 MHz



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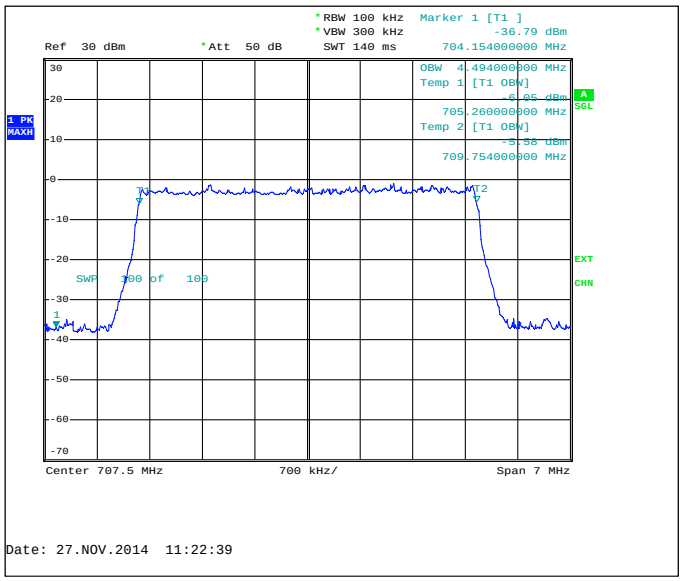
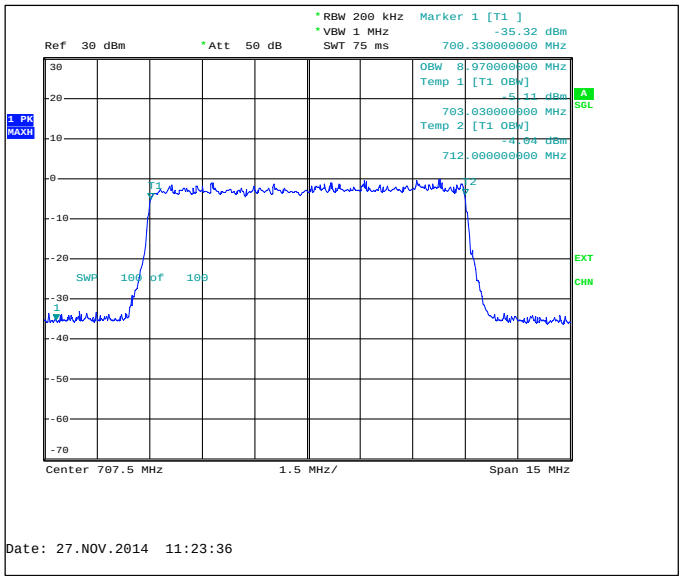
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 23095 / 707.5 MHz



FDD, CBW 10MHz, 16QAM, 50 RB, Channel 23095 / 707.5 MHz



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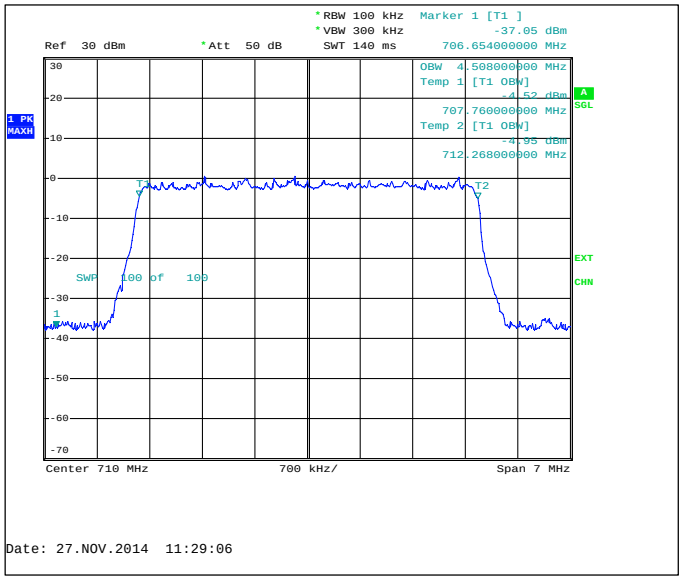
3.12. LTE17 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 5MHz, QPSK, 25 RB	4508
FDD, CBW 10MHz, QPSK, 50 RB	8970
FDD, CBW 5MHz, 16QAM, 25 RB	4494
FDD, CBW 10MHz, 16QAM, 50 RB	8970

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



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

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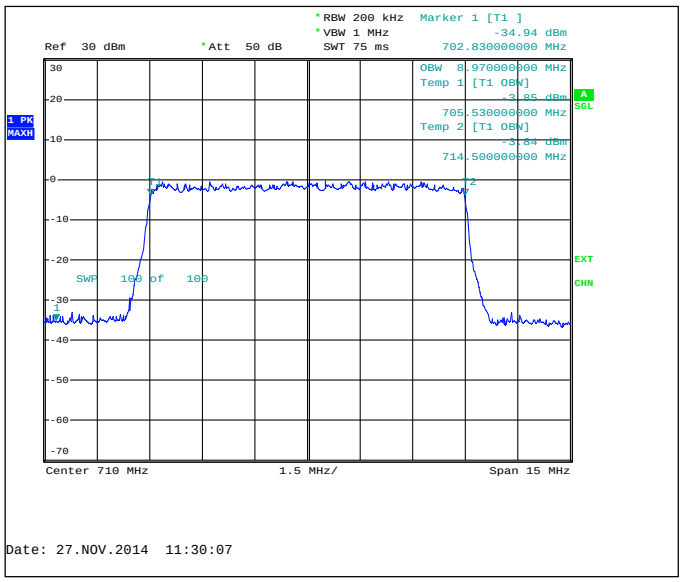

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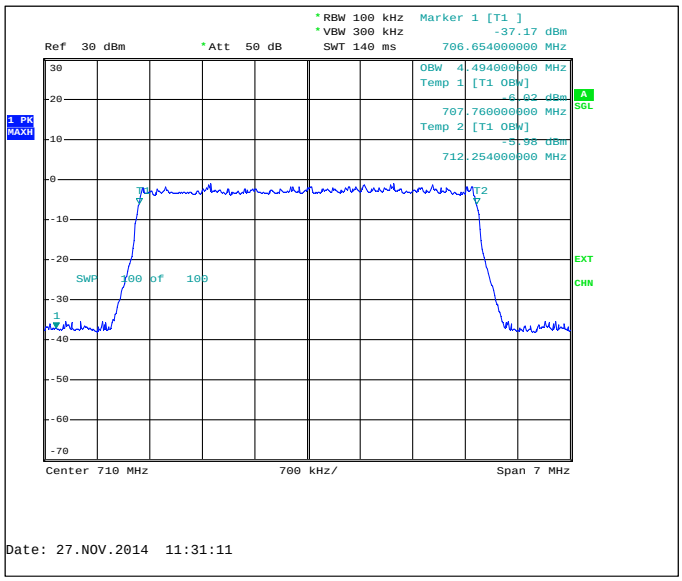
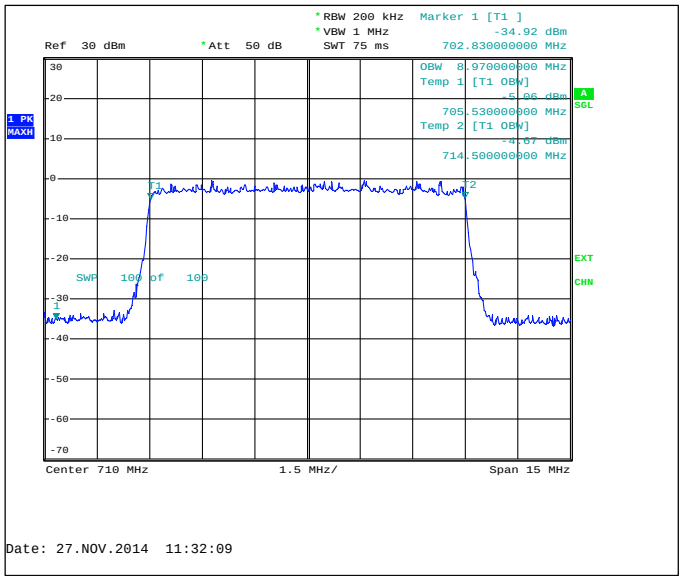
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 23790 / 710.0 MHz



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



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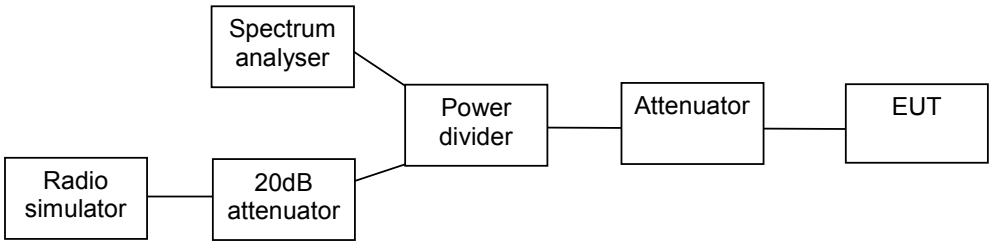
4. Band edge compliance

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

EUT with DUT number	RM-1073, DUT 18901
Accessories with DUT numbers	SD-131, DUT 18902 ; WH-108, DUT 18677
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Measured from Antenna1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 100
Date of measurements	26-Nov-2014
Measured by	Jari Keto

4.1. Test Setup



4.2. Test method and limit

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

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
WCDMA2	Below 1850 and above 1910	-13
WCDMA4	Below 1710 and above 1755	-13
WCDMA5	Below 824 and above 849	-13
LTE2	Below 1850 and above 1910	-13
LTE4	Below 1710 and above 1755	-13
LTE5	Below 824 and above 849	-13
LTE12	698.9 – 699.0 and 716.0 – 716.1 Below 698.9 and above 716.1	-13 (RBW = 30 kHz, VBW = 100 kHz) -13 (RBW = 100 kHz, VBW = 300 kHz)
LTE17	703.9 – 704 and 716 – 716.1 Below 703.9 and above 716.1	-13 (RBW = 30 kHz, VBW = 100 kHz) -13 (RBW = 30 kHz, VBW = 100 kHz)

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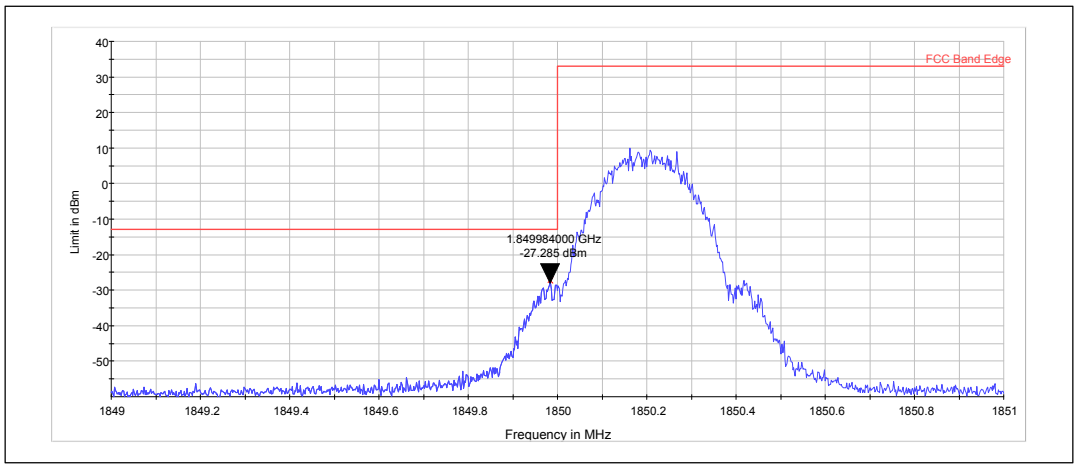
4.3. GSM 1900 Test results

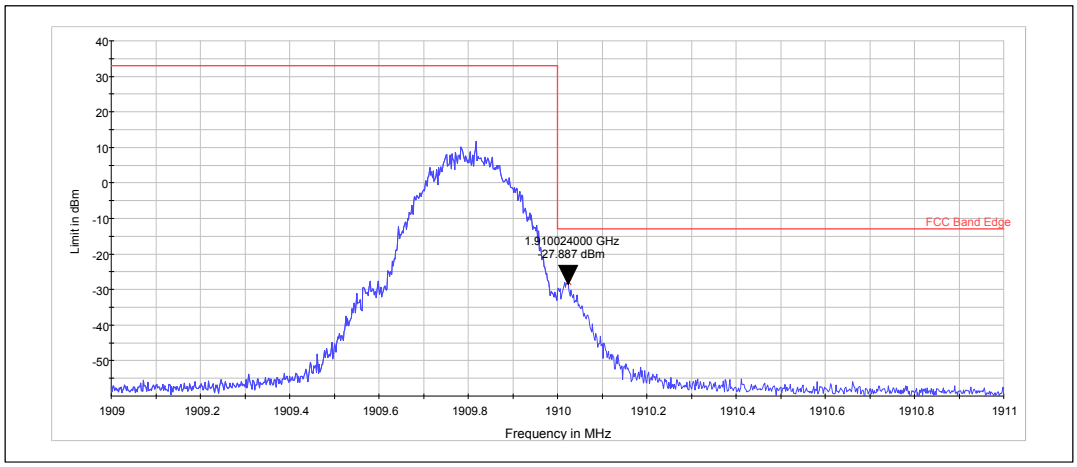
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	1849.984	-27.28	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	1910.024	-27.89	PASSED

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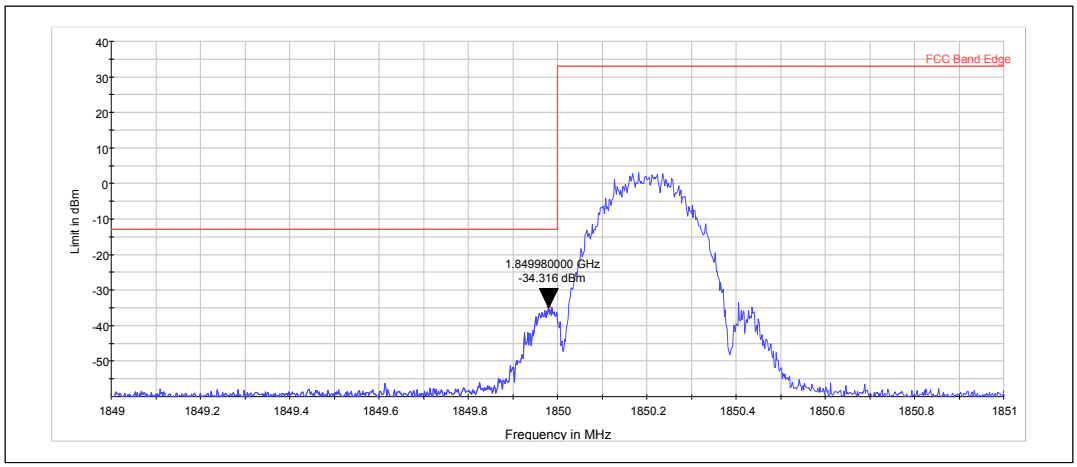
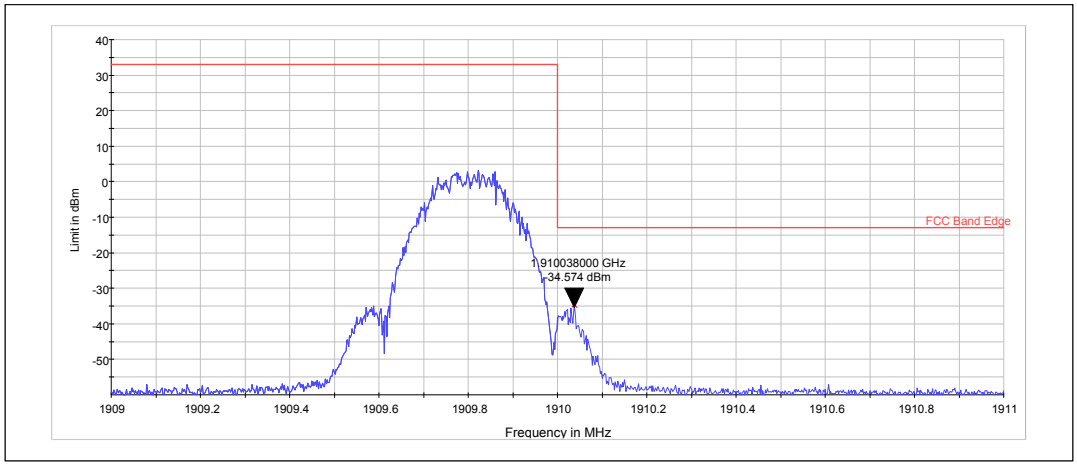
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1849.980	-34.32	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	1910.038	-34.57	PASSED

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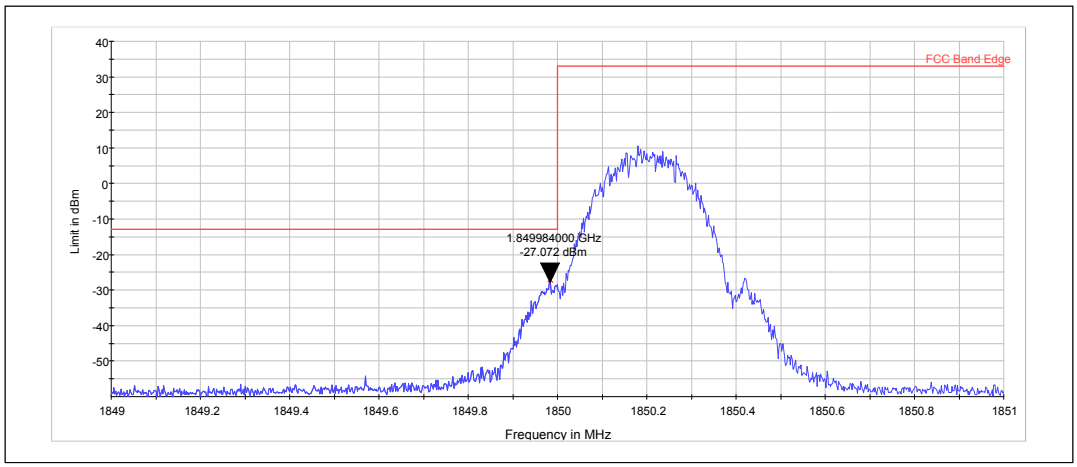
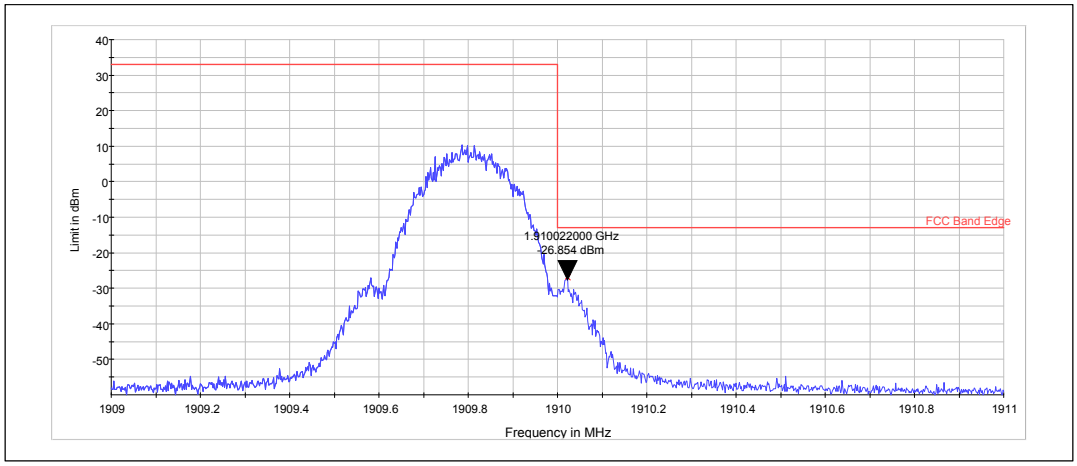
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1849.984	-27.07	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	1910.022	-26.85	PASSED

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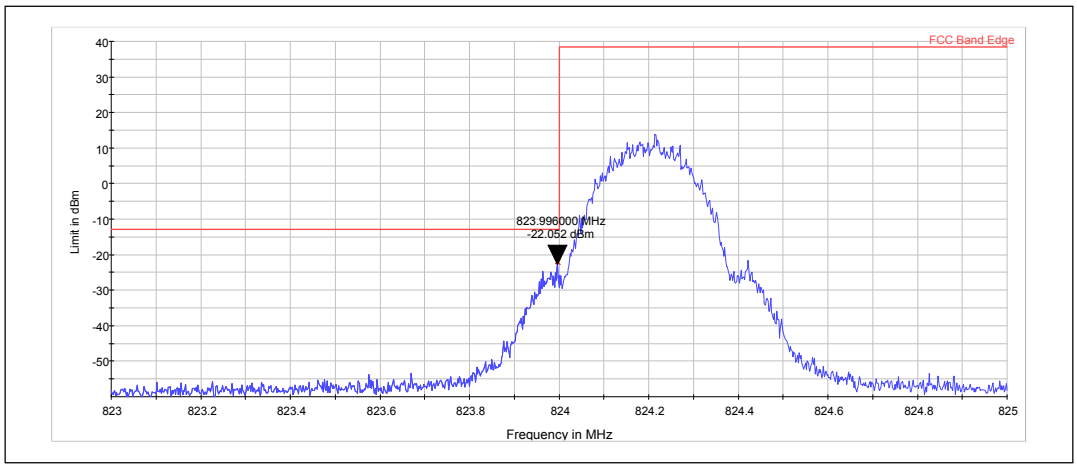
4.4. GSM 850 Test results

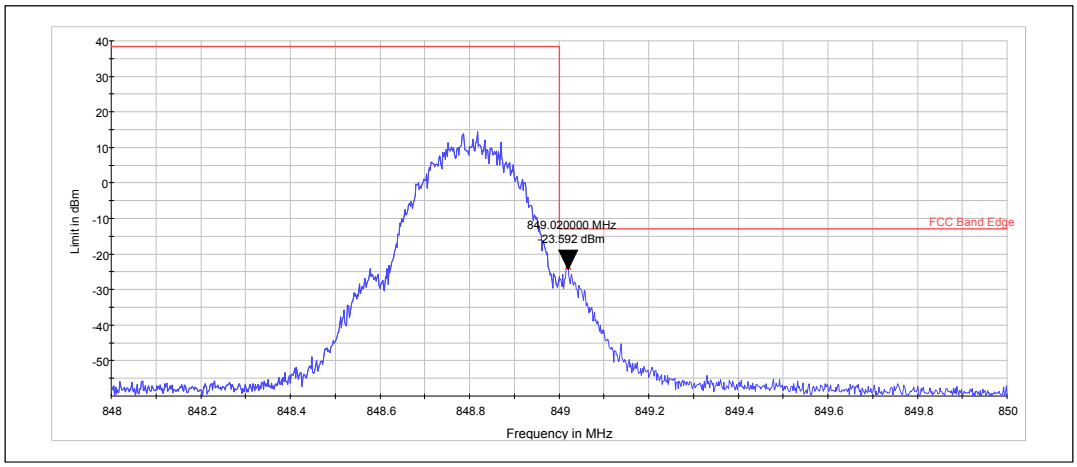
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	823.996	-22.05	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	849.020	-23.59	PASSED

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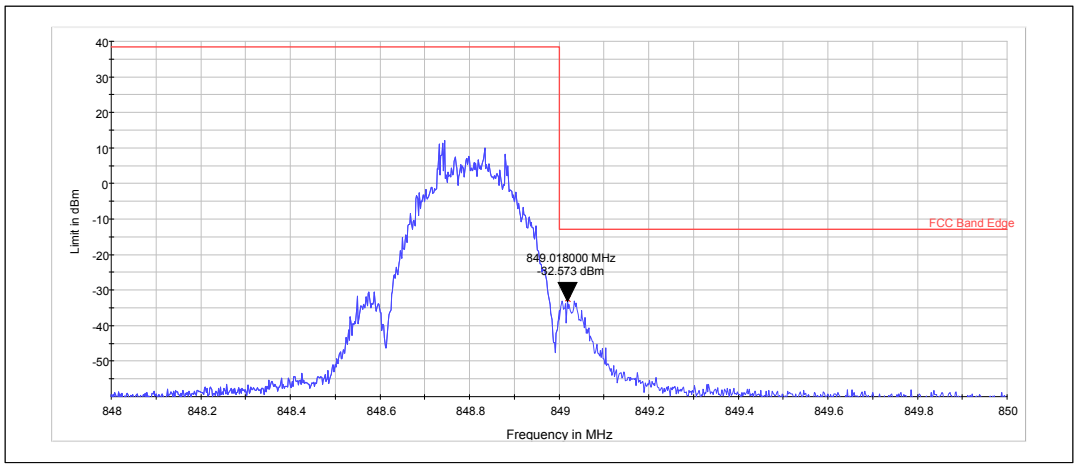
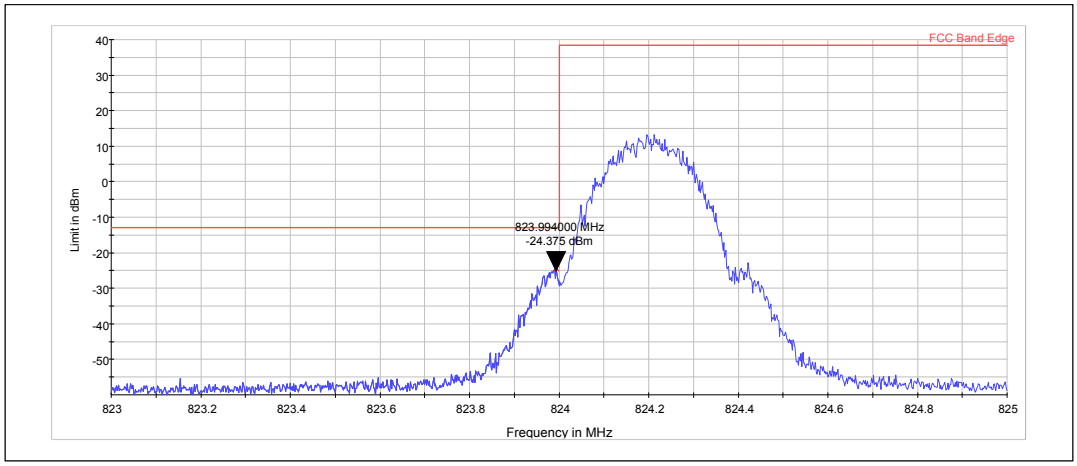
Channel 251 / 848.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	849.018	-32.57	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	823.994	-24.38	PASSED

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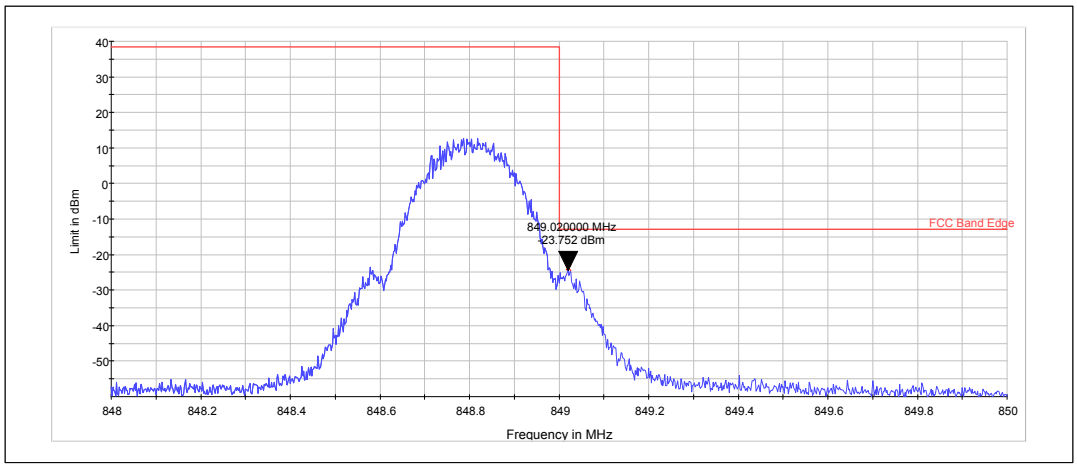
Channel 251 / 848.8 MHz

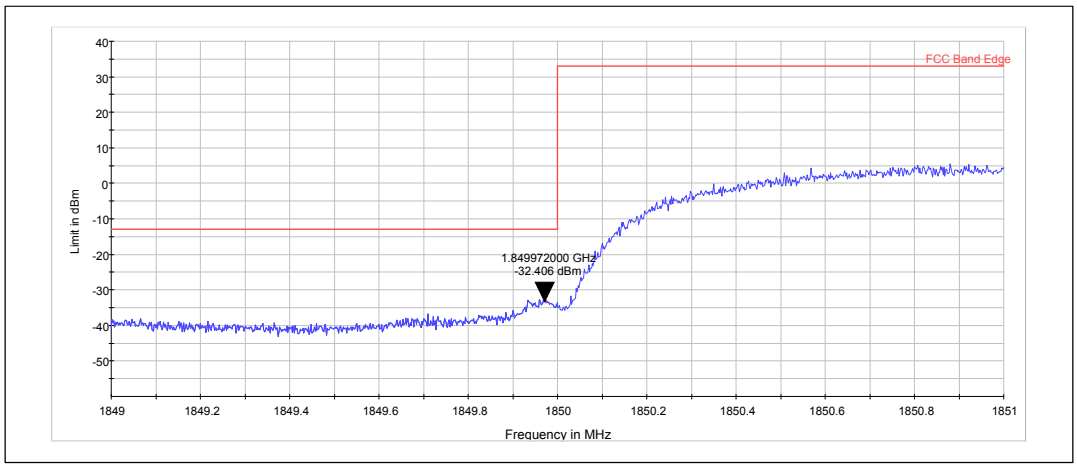


RMS (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	849.020	-23.75	PASSED

4.5. WCDMA2 Test results

Channel 9262 / 1852.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1849.972	-32.41	PASSED

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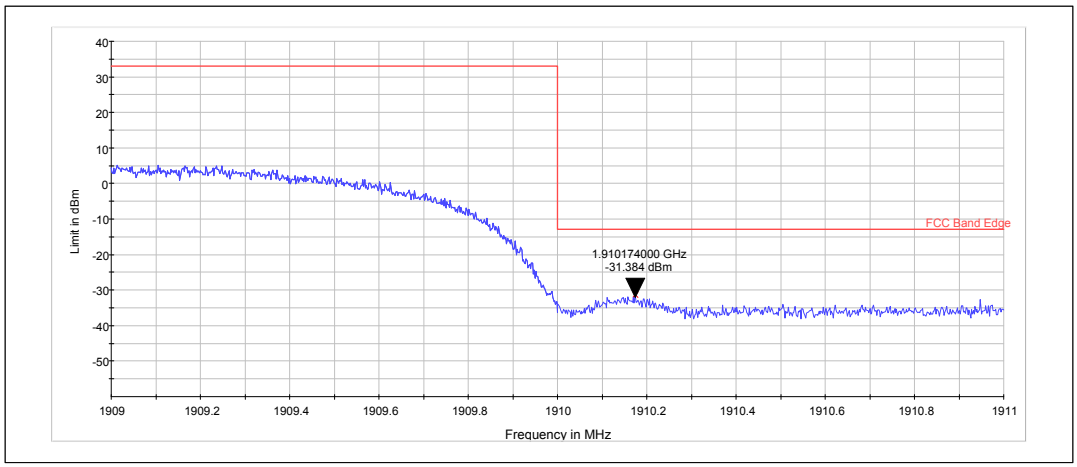
Channel 9538 / 1907.6 MHz

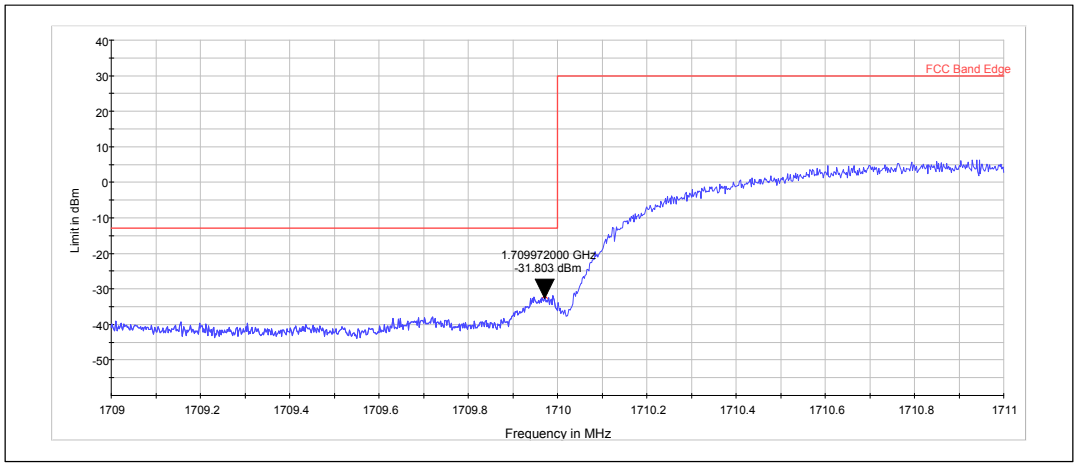


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1910.174	-31.38	PASSED

4.6. WCDMA4 Test results

Channel 1312 / 1712.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1709.972	-31.80	PASSED

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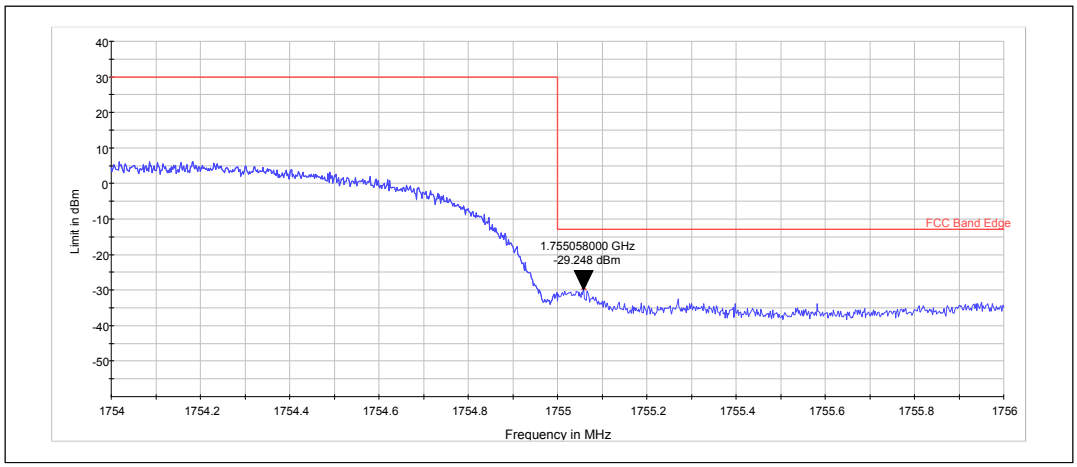
Channel 1513 / 1752.6 MHz

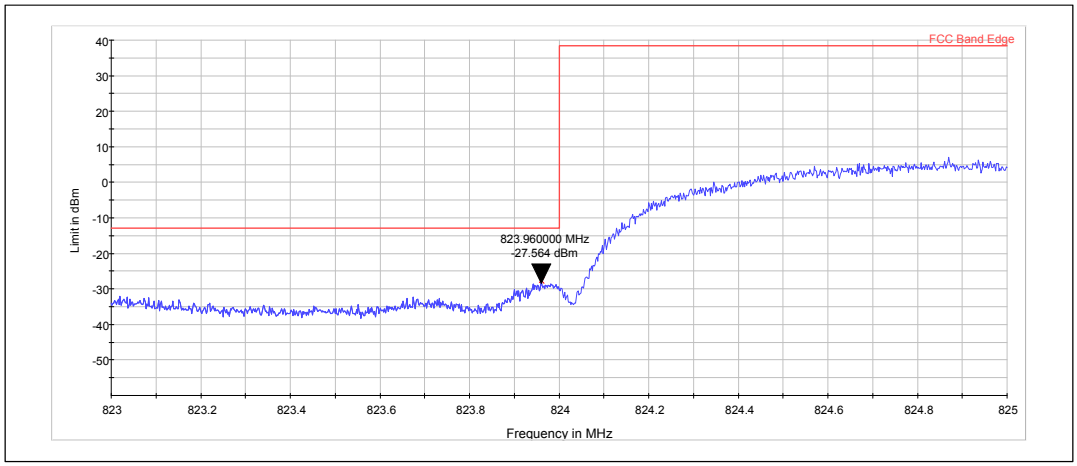


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1755.058	-29.25	PASSED

4.7. WCDMA5 Test results

Channel 4132 / 826.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	823.960	-27.56	PASSED

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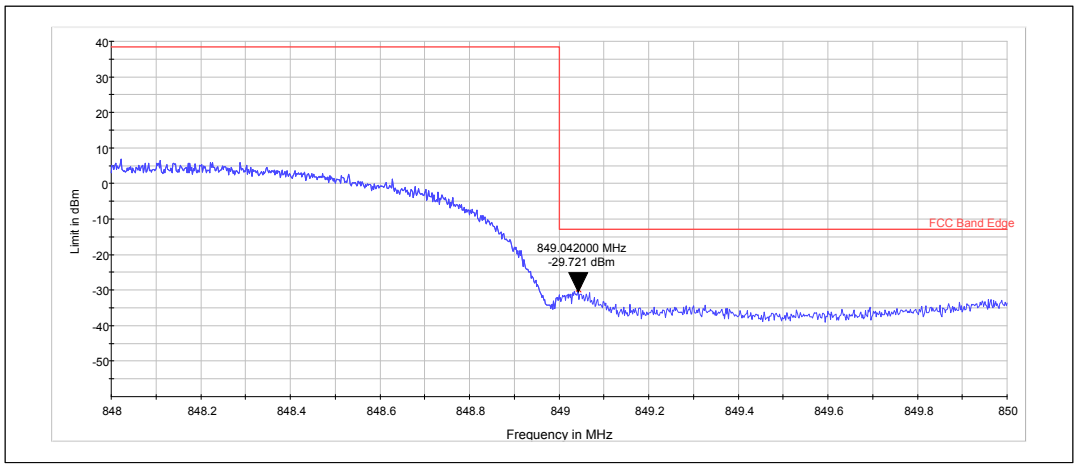
Channel 4233 / 846.6 MHz

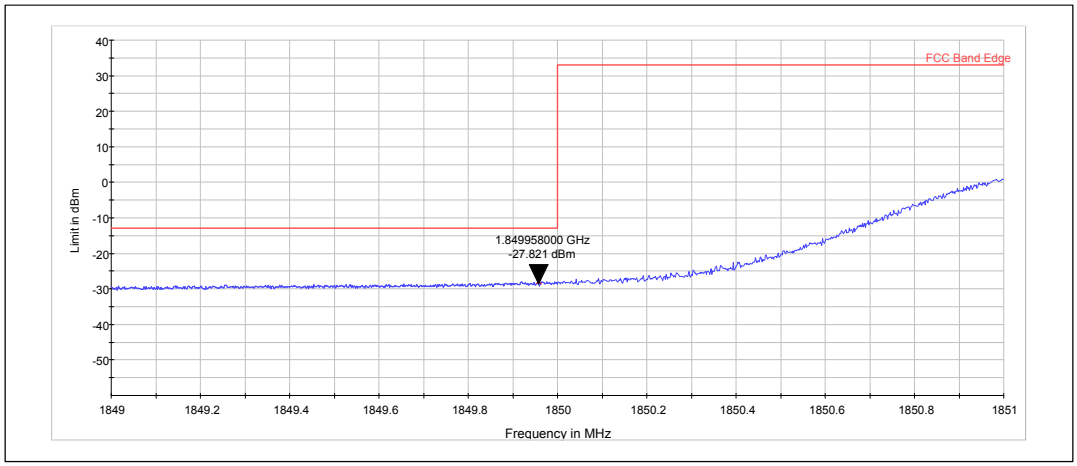


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	849.042	-29.72	PASSED

4.8. LTE2 Test results

Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1849.958	-27.82	PASSED

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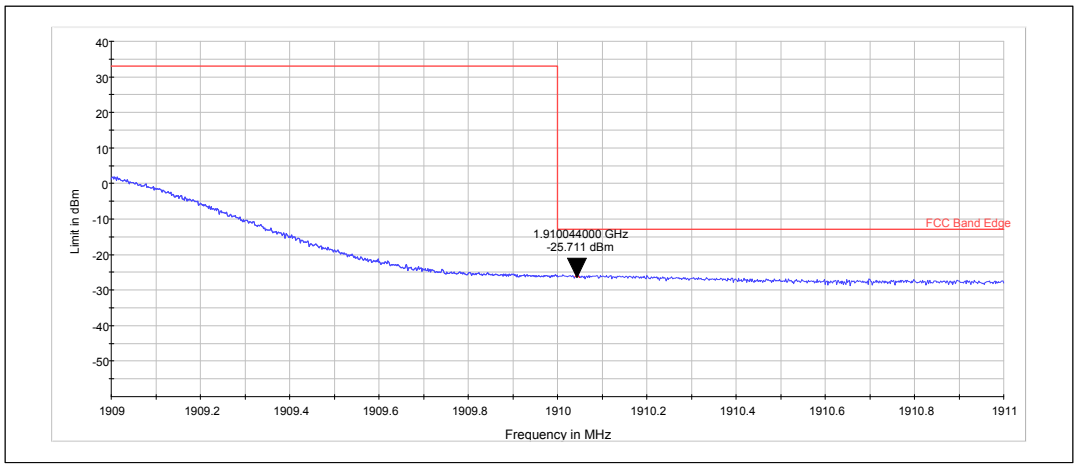
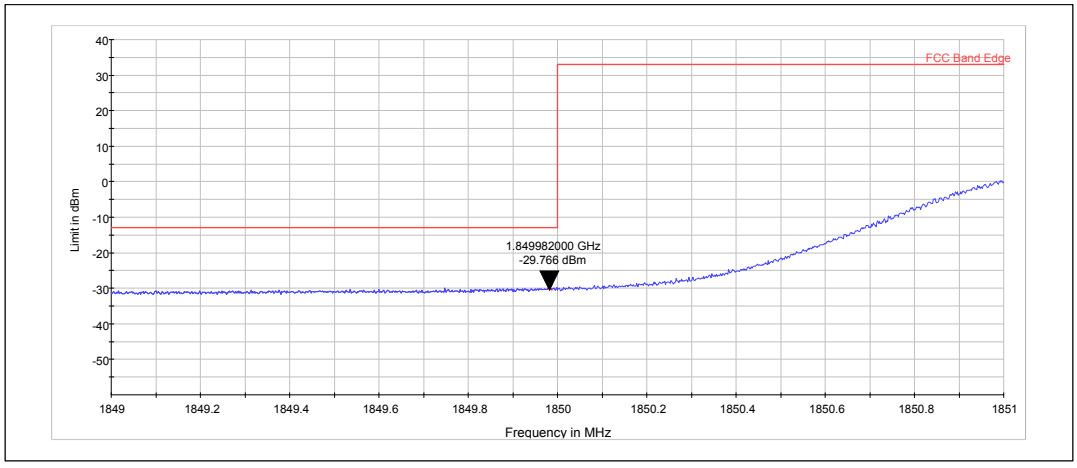
Channel 19100 / 1900 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1910.044	-25.71	PASSED

Channel 18700 / 1860 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1849.982	-29.77	PASSED

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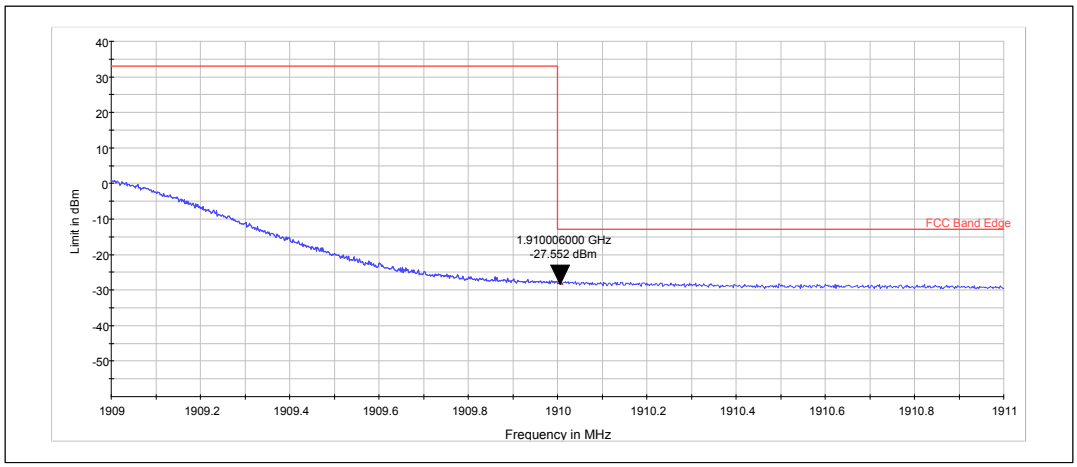
Channel 19100 / 1900 MHz

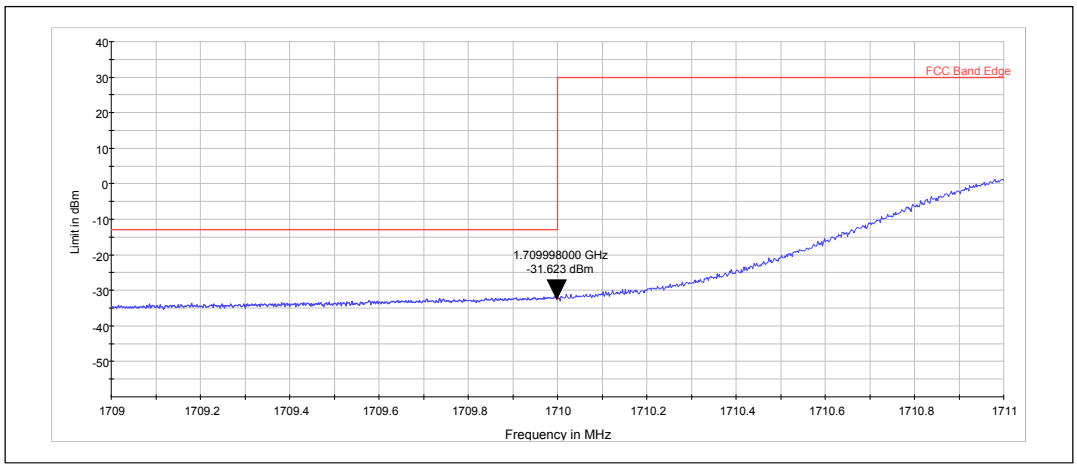


RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1910.006	-27.55	PASSED

4.9. LTE4 Test results

Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1709.998	-31.62	PASSED

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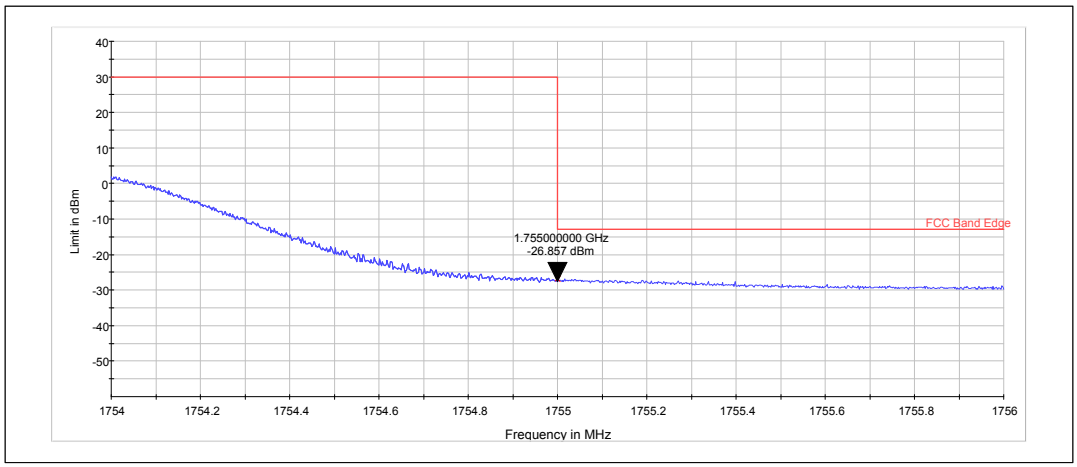
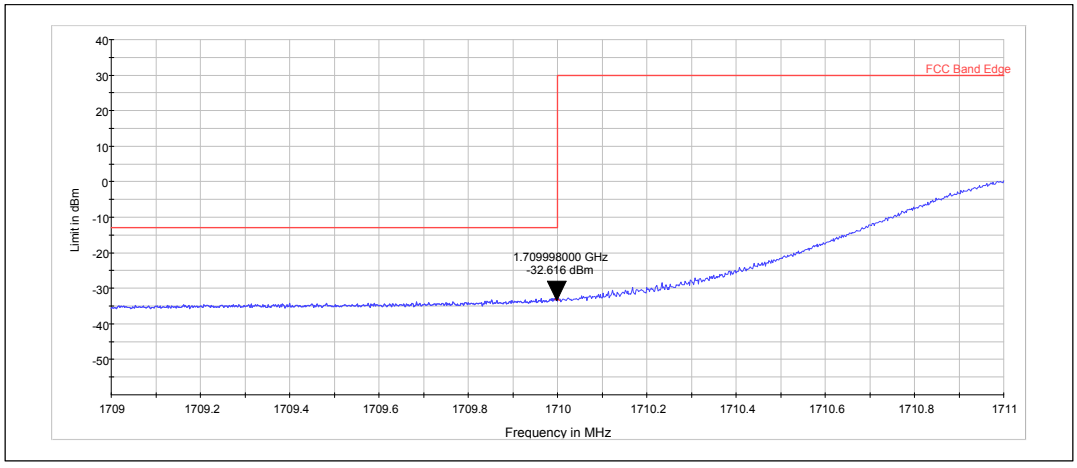
Channel 20300 / 1745 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1755.000	-26.86	PASSED

Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1709.998	-32.62	PASSED

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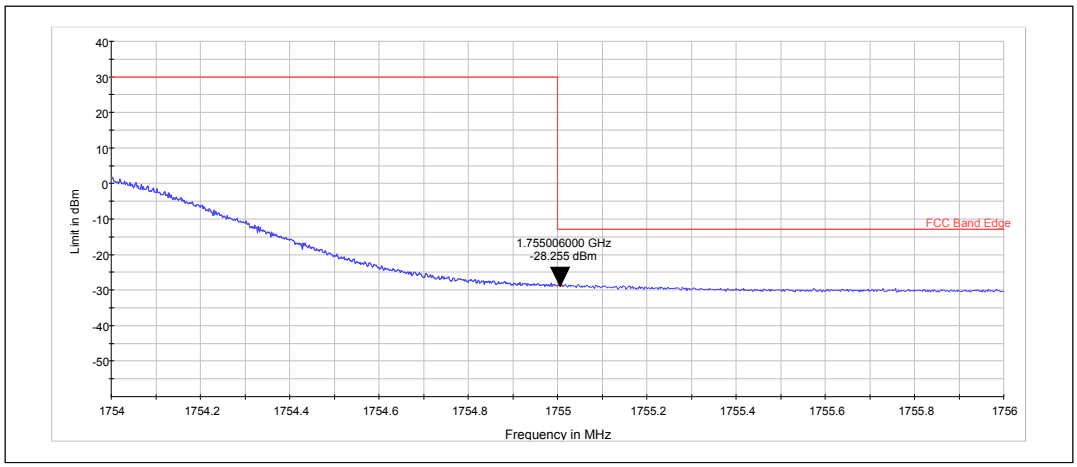
Channel 20300 / 1745 MHz

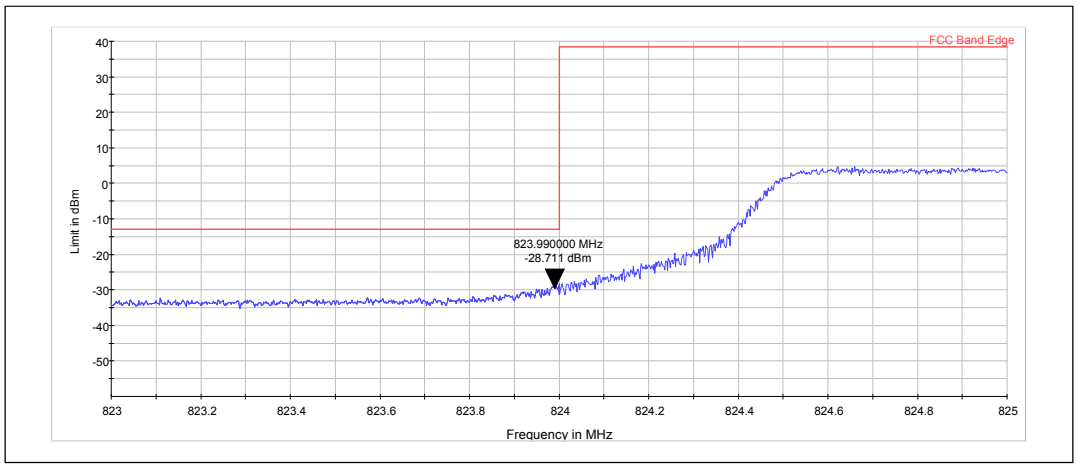


RMS (RBW: 200 kHz, VBW: 1 MHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1755.006	-28.26	PASSED

4.10. LTE5 Test results

Channel 20450 / 829 MHz



RMS (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	823.990	-28.71	PASSED

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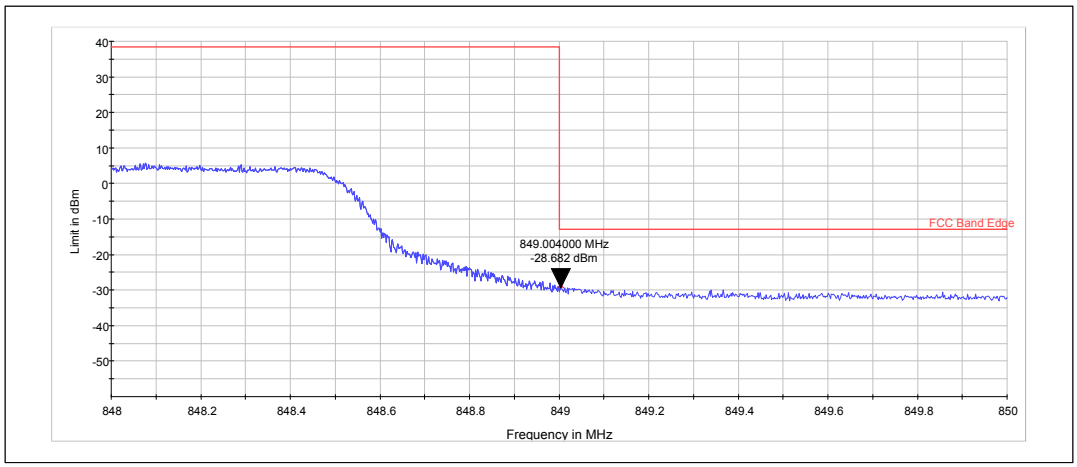
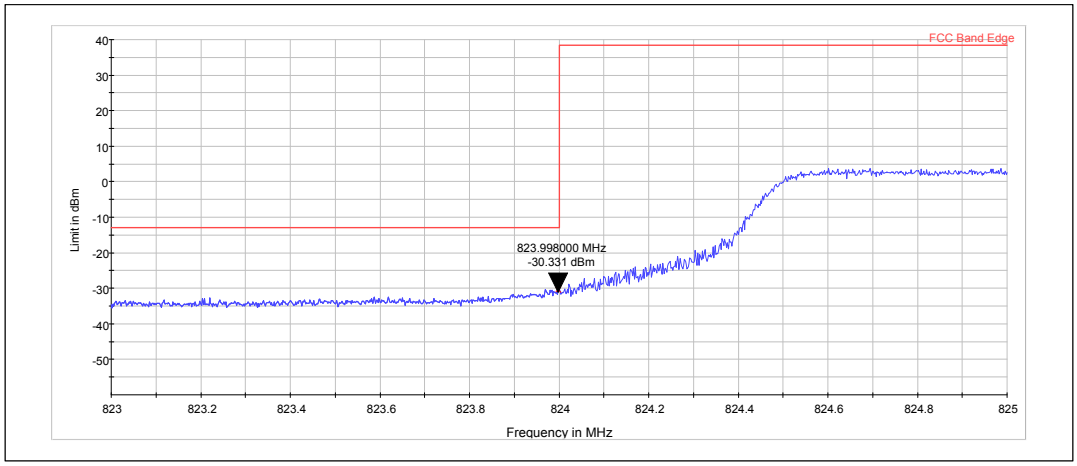
Channel 20600 / 844 MHz



RMS (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	849.004	-28.68	PASSED

Channel 20450 / 829 MHz



RMS (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	823.998	-30.33	PASSED

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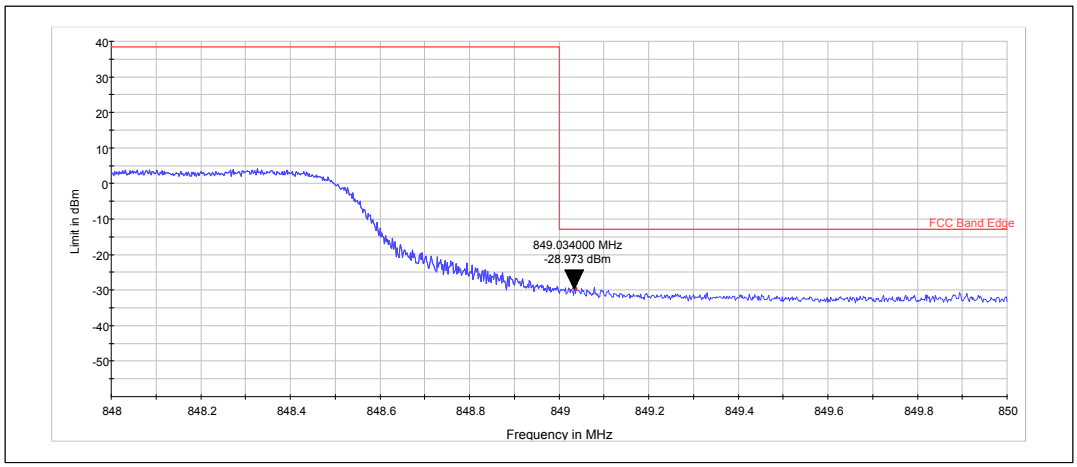
Channel 20600 / 844 MHz

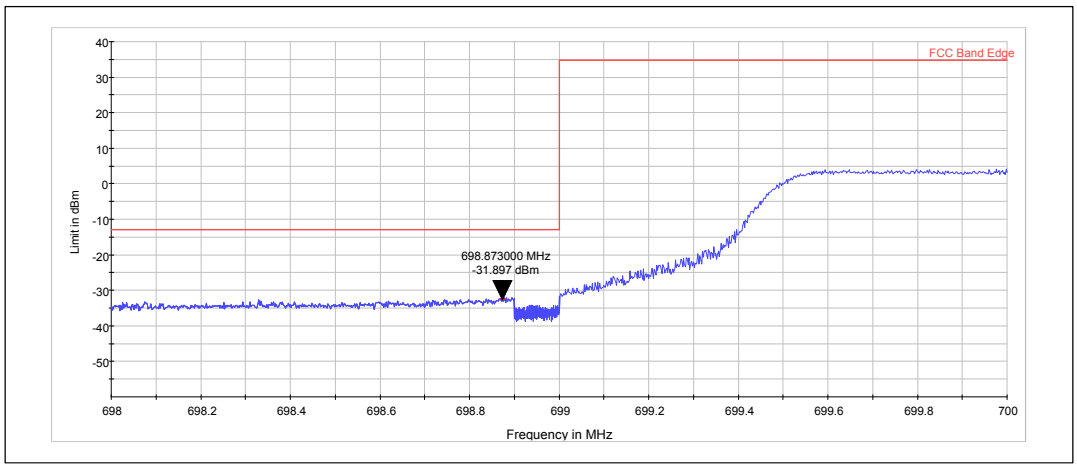


RMS (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	849.034	-28.97	PASSED

4.11. LTE12 Test results

Channel 23060 / 704 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	698.873	-31.90	PASSED

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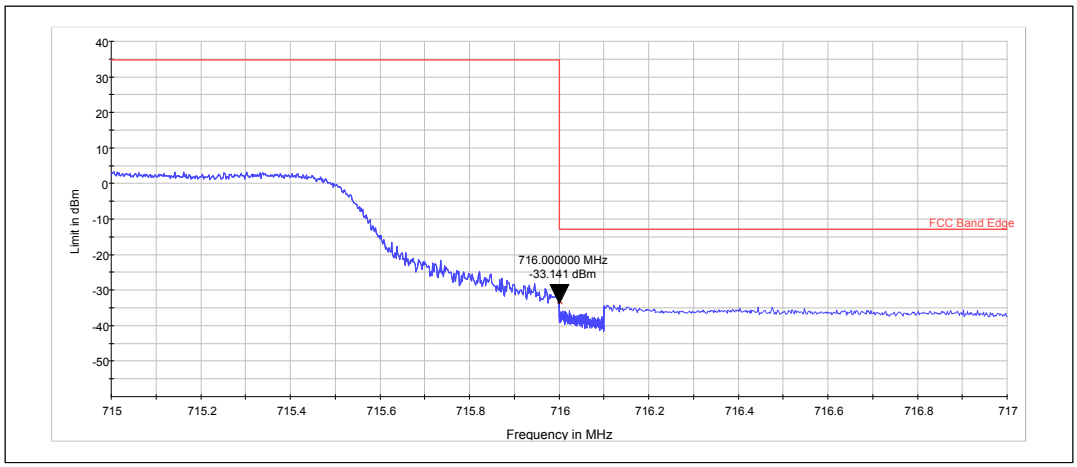
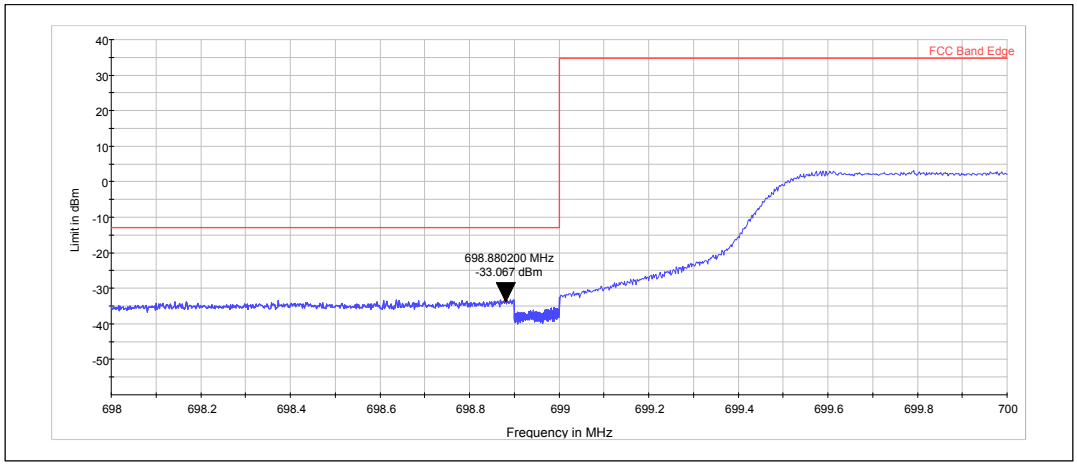
Channel 23130 / 711 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	716.000	-33.14	PASSED

Channel 23060 / 704 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	698.880	-33.07	PASSED

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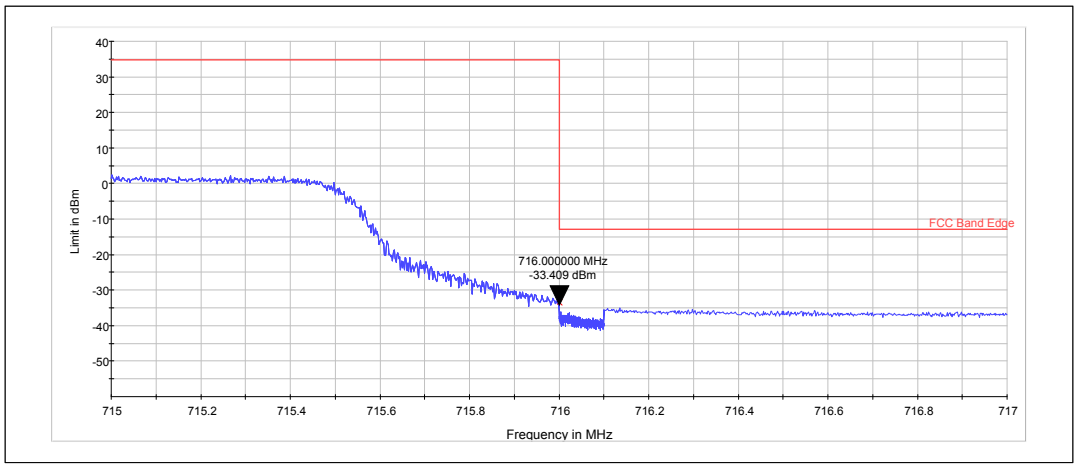
Channel 23130 / 711 MHz

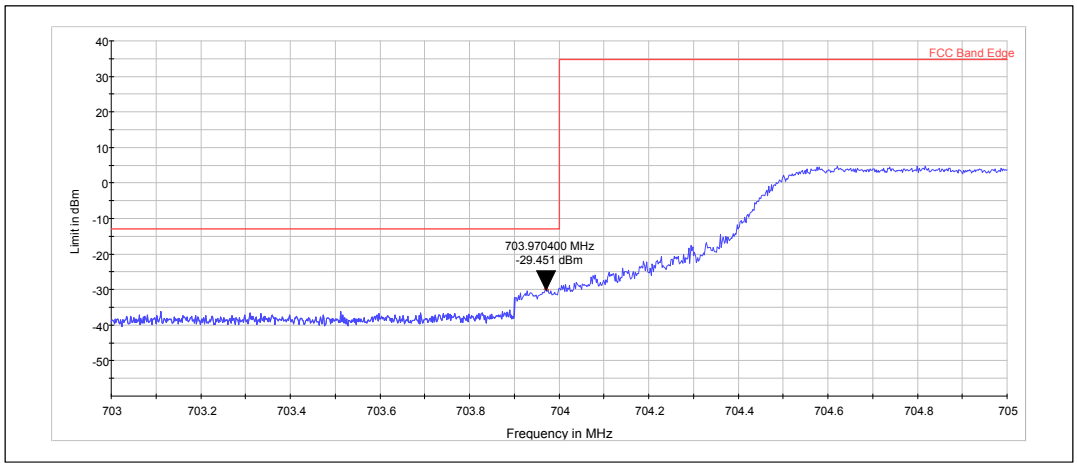


RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	716.000	-33.41	PASSED

4.12. LTE17 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	703.970	-29.45	PASSED

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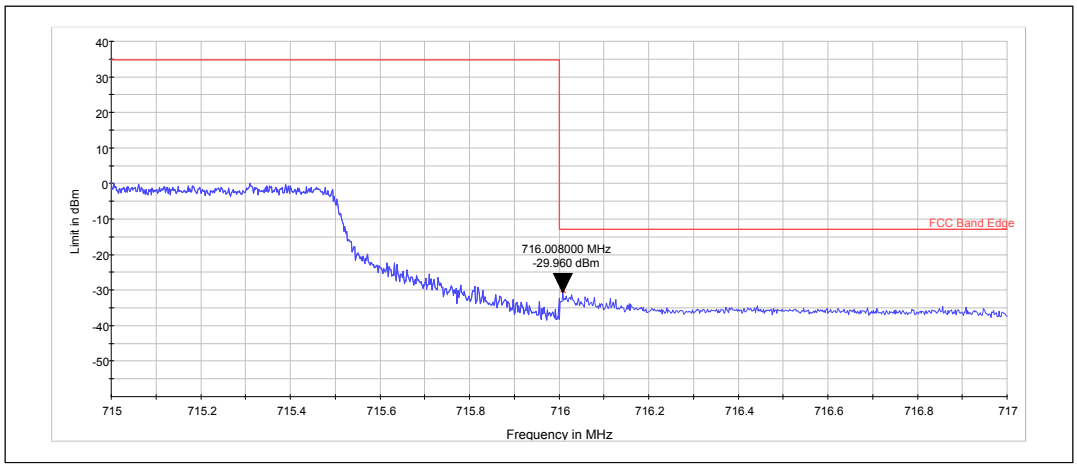
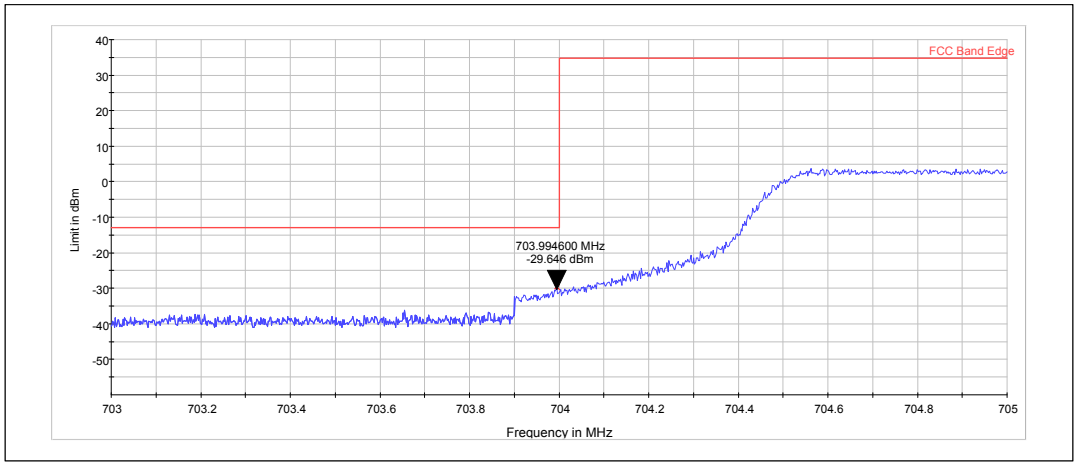
Channel 23800 / 711 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	716.008	-29.96	PASSED

Channel 23780 / 709 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	703.995	-29.65	PASSED

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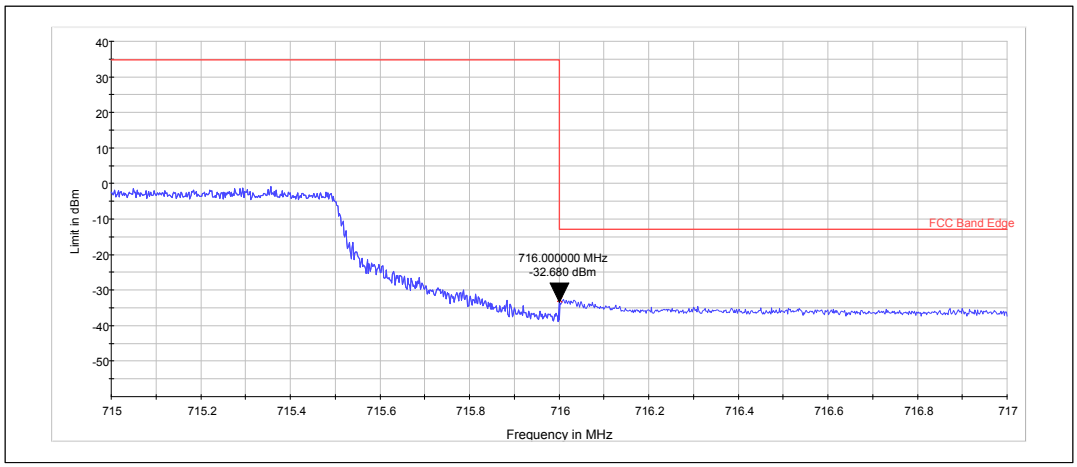
Channel 23800 / 711 MHz



RMS detector, Max hold

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	716.000	-32.68	PASSED

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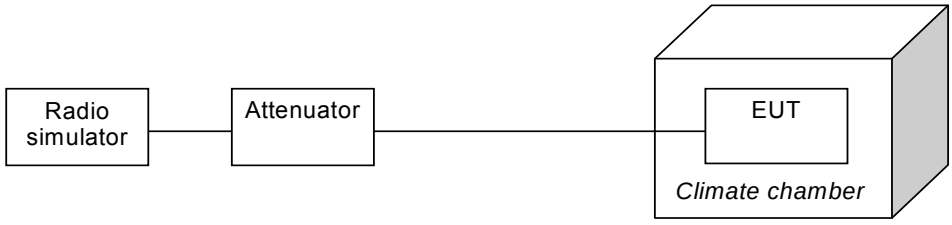
5. Frequency stability, temperature variation

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

EUT with DUT number	RM-1073, DUT 18901
Accessories with DUT numbers	SD-131, DUT 18902 ; WH-108, DUT 18677
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Measured from Antenna1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 100
Date of measurements	26-Nov-2014
Measured by	Jari Keto

5.1. Test Setup



5.2. Test method and limit

The measurement is made according to applicable FCC rule parts and IC standards as follows:

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

Frequency deviation [ppm]
+\- 2.5

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5.3. WCDMA4 Test results

FDD, Channel 1412 / 1732.4 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1732.40	-1.83106	-0.0011	PASSED
40	1732.40	-2.96021	-0.0017	PASSED
30	1732.40	-5.61523	-0.0032	PASSED
20	1732.40	2.01416	0.0012	PASSED
10	1732.40	-0.18311	-0.0001	PASSED
0	1732.40	3.50952	0.002	PASSED
-10	1732.40	-4.42505	-0.0026	PASSED
-20	1732.40	2.99072	0.0017	PASSED
-30	1732.40	-1.83106	-0.0011	PASSED

5.4. LTE12 Test results

FDD, CBW 10MHz, QPSK, 50 RB, Channel 23095 / 707.5 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	707.50	-1.17302	-0.0017	PASSED
40	707.50	-1.58787	-0.0022	PASSED
30	707.50	-1.53065	-0.0022	PASSED
20	707.50	-1.61648	-0.0023	PASSED
10	707.50	-2.01702	-0.0029	PASSED
0	707.50	0.08583	0.0001	PASSED
-10	707.50	-1.50204	-0.0021	PASSED
-20	707.50	-0.30041	-0.0004	PASSED
-30	707.50	0.05722	0.0001	PASSED

5.5. LTE17 Test results

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

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result

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50	710.00	-0.98705	-0.0014	PASSED
40	710.00	0.55790	0.0008	PASSED
30	710.00	0.32902	0.0005	PASSED
20	710.00	-1.10149	-0.0015	PASSED
10	710.00	1.55926	0.0022	PASSED
0	710.00	-0.21458	-0.0003	PASSED
-10	710.00	0.94414	0.0013	PASSED
-20	710.00	1.67370	0.0024	PASSED
-30	710.00	1.07288	0.0015	PASSED

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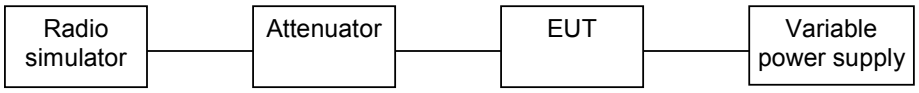
6. Frequency stability, voltage variation

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

EUT with DUT number	RM-1073, DUT 18901
Accessories with DUT numbers	SD-131, DUT 18902 ; WH-108, DUT 18677
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Measured from Antenna1
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 100
Date of measurements	26-Nov-2014
Measured by	Jari Keto

6.1. Test Setup



6.2. Test method and limit

The measurement is made according to applicable FCC rule parts and IC standards as follows:

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

Frequency deviation [ppm]
+\- 2.5

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6.3. GSM 1900 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.4	1880.00	39.78000	0.0212	PASSED
Battery cut-off point / 3.4	1880.00	42.10000	0.0224	PASSED
Nominal / 3.8	1880.00	45.78000	0.0244	PASSED

6.4. GSM 850 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.4	836.60	3.49000	0.0042	PASSED
Battery cut-off point / 3.4	836.60	2.45000	0.0029	PASSED
Nominal / 3.8	836.60	11.75000	0.014	PASSED

6.5. WCDMA2 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.4	1880.00	1.23596	0.0007	PASSED
Battery cut-off point / 3.4	1880.00	2.48718	0.0013	PASSED
Nominal / 3.8	1880.00	2.38037	0.0013	PASSED

6.6. WCDMA4 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.3	1732.40	0.59509	0.0003	PASSED
Battery cut-off point / 3.4	1732.40	-1.70898	-0.001	PASSED
Nominal / 3.8	1732.40	1.60217	0.0009	PASSED

6.7. WCDMA5 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.3	835.00	-1.37329	-0.0016	PASSED
Battery cut-off point / 3.4	835.00	-6.11877	-0.0073	PASSED
Nominal / 3.8	835.00	0.30518	0.0004	PASSED

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6.8. LTE12 Test results

FDD, CBW 10MHz, QPSK, 50 RB, Channel 23095 / 707.5 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.3	707.50	-2.07424	-0.0029	PASSED
Battery cut-off point / 3.4	707.50	-1.50204	-0.0021	PASSED
Nominal / 3.8	707.50	-0.54359	-0.0008	PASSED

6.9. LTE17 Test results

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

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.3	710.00	-0.54359	-0.0008	PASSED
Battery cut-off point / 3.4	710.00	-0.27180	-0.0004	PASSED
Nominal / 3.8	710.00	-0.31471	-0.0004	PASSED

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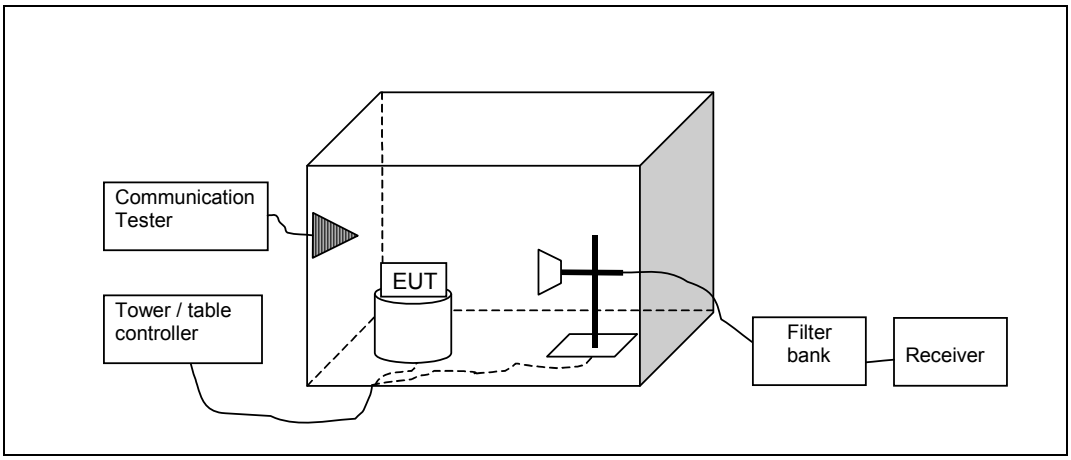
7. Spurious radiated emissions

(FCC §24.238(a), §27.53(g), §2.1051, §27.53(f), §24.238(a), §2.1053, §22.917(a), §2.1053, §27.53(h), §2.1053, §2.1053, RSS-133 6.5, RSS-139 6.5, RSS-132 4.5, RSS-130 4.6)

EUT with DUT number	RM-1073, DUT 18897
Accessories with DUT numbers	BV-T5C, DUT 18898 ; AC-20E, DUT 18697 ; WH-108, DUT 18698
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	Measured antenna 1.
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 102.0
Date of measurements	24-Nov-2014
Measured by	Sami Lehtonen

7.1.1 Test setup



7.2. Test method and limit

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

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

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

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

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

The emissions less than 20 dB below the permissible value are reported.
The measurement is made up to 10th harmonic of the EUT highest TX channel.

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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]
LTE2	30 - 19100	-13
LTE4	30 - 17500	-13
LTE5	30 - 8500	-13
GSM 850	30 - 8500	-13
GSM 1900	30 - 19100	-13
WCDMA2	30 - 19100	-13
WCDMA4	30 - 17500	-13
WCDMA5	30 - 8500	-13
LTE12	30 - 7200	-13
LTE17	30 - 7200	-13 (RBW = 100 kHz, ERP)
LTE28	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)

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7.3. LTE2 test results

Channel 18900 / 1880.0 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
2420.446	-61.64	0.00069	-74.64	13	HORIZONTAL	PASSED
2430.741	-61.72	0.00067	-74.62	12.9	HORIZONTAL	PASSED
2452.881	-61.21	0.00076	-74.31	13.1	HORIZONTAL	PASSED
2460.436	-61.13	0.00077	-74.23	13.1	HORIZONTAL	PASSED
3769.479	-67.32	0.00019	-73.92	6.6	HORIZONTAL	PASSED
5640.621	-61.56	0.0007	-71.66	10.1	HORIZONTAL	PASSED
7523.988	-58.12	0.00154	-74.62	16.5	HORIZONTAL	PASSED

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	Results
1859.038	-63.22	0.00048	-72.22	9	HORIZONTAL	PASSED
1893.975	-61.31	0.00074	-71.01	9.7	HORIZONTAL	PASSED
1902.846	-62.23	0.0006	-71.73	9.5	HORIZONTAL	PASSED
3769.639	-67	0.0002	-73.6	6.6	HORIZONTAL	PASSED
5640.421	-61.56	0.0007	-71.66	10.1	HORIZONTAL	PASSED
7517.976	-58.33	0.00147	-74.63	16.3	HORIZONTAL	PASSED

7.4. LTE4 test results

Channel 20175 / 1732.5 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
3465.381	-61.5	0.00071	-67.3	5.8	VERTICAL	PASSED
5200.125	-62.8	0.00052	-73.3	10.5	VERTICAL	PASSED
6920	-58.23	0.0015	-71.73	13.5	VERTICAL	PASSED
8672.34	-56.76	0.00211	-76.16	19.4	HORIZONTAL	PASSED
10403.196	-53.37	0.0046	-76.17	22.8	HORIZONTAL	PASSED

Channel 20175 / 1732.5 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
3465.381	-61.8	0.00066	-67.6	5.8	VERTICAL	PASSED
5200.005	-62.81	0.00052	-73.01	10.2	HORIZONTAL	PASSED
6920	-58.23	0.0015	-71.73	13.5	VERTICAL	PASSED
8671.698	-56.37	0.00231	-75.77	19.4	HORIZONTAL	PASSED
10386.122	-53.4	0.00457	-76.1	22.7	VERTICAL	PASSED

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7.5. LTE5 test results

Channel 20525 / 836.5 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
822.577	-57.52	0.00177	-93.02	35.5	HORIZONTAL	PASSED
850.032	-58.51	0.00141	-93.01	34.5	HORIZONTAL	PASSED
855.072	-55.9	0.00257	-90.5	34.6	HORIZONTAL	PASSED
860.669	-58.48	0.00142	-92.98	34.5	HORIZONTAL	PASSED
861.341	-55.96	0.00254	-90.56	34.6	HORIZONTAL	PASSED
864.522	-58.39	0.00145	-92.99	34.6	HORIZONTAL	PASSED
1675.385	-76.15	2E-05	-81.75	5.6	HORIZONTAL	PASSED
2510.121	-65.53	0.00028	-77.43	11.9	HORIZONTAL	PASSED
3346.661	-73.26	5E-05	-76.56	3.3	HORIZONTAL	PASSED

Channel 20525 / 836.5 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
857.437	-55.95	0.00254	-90.55	34.6	HORIZONTAL	PASSED
859.415	-55.99	0.00252	-90.49	34.5	HORIZONTAL	PASSED
880.521	-52.88	0.00515	-88.58	35.7	HORIZONTAL	PASSED
881.505	-52.72	0.00535	-88.62	35.9	HORIZONTAL	PASSED
1672.98	-76.25	2E-05	-81.75	5.5	HORIZONTAL	PASSED
2510.081	-64.19	0.00038	-76.09	11.9	HORIZONTAL	PASSED
3346.782	-72.05	6E-05	-75.35	3.3	HORIZONTAL	PASSED

7.6. LTE12 test results

Channel 23095 / 707.5 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
1420.431	-72.8	5E-05	-77.5	4.7	VERTICAL	PASSED
2130.576	-61.4	0.00072	-71.4	10	HORIZONTAL	PASSED
2830.501	-67.95	0.00016	-82.55	14.6	VERTICAL	PASSED

Channel 23095 / 707.5 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
1405	-77.37	2E-05	-82.57	5.2	HORIZONTAL	PASSED
2130.536	-64.22	0.00038	-74.22	10	HORIZONTAL	PASSED
2824.97	-68.19	0.00015	-82.59	14.4	HORIZONTAL	PASSED

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7.7. LTE17 test results

Channel 23790 / 710 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
1420.421	-72.8	5E-05	-77.5	4.7	VERTICAL	PASSED
2130.501	-64.94	0.00032	-74.24	9.3	VERTICAL	PASSED
2840.822	-67.07	0.0002	-81.77	14.7	VERTICAL	PASSED

Channel 23790 / 710 MHz

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

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
1425.03	-77.45	2E-05	-82.55	5.1	HORIZONTAL	PASSED
2130.501	-63.58	0.00044	-73.58	10	HORIZONTAL	PASSED
2840.782	-65.62	0.00027	-80.32	14.7	VERTICAL	PASSED

7.8. GSM 850 test results

Channel 190 / 836.6 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
1673.267	-49.02	0.01253	-55.62	6.6	VERTICAL	PASSED
1717.956	-57.27	0.00187	-63.67	6.4	HORIZONTAL	PASSED
2509.86	-37.35	0.18408	-49.25	11.9	HORIZONTAL	PASSED
3348.016	-59.33	0.00117	-62.63	3.3	VERTICAL	PASSED

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7.9. GSM 850 E-GPRS (MSC9) test results

Channel 190 / 836.6 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
1673.18	-51.45	0.00716	-58.05	6.6	VERTICAL	PASSED
2509.82	-43.53	0.04436	-55.43	11.9	HORIZONTAL	PASSED

7.10. GSM 1900 test results

Channel 661 / 1880.0 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
8855.311	-45.97	0.02529	-66.07	20.1	HORIZONTAL	PASSED
8974.148	-44.87	0.03258	-65.17	20.3	VERTICAL	PASSED
9371.583	-44.02	0.03963	-65.72	21.7	VERTICAL	PASSED
9599.92	-43.85	0.04121	-66.05	22.2	HORIZONTAL	PASSED
9970.421	-43.31	0.04667	-65.61	22.3	HORIZONTAL	PASSED
11391.904	-41.99	0.06324	-65.79	23.8	HORIZONTAL	PASSED

7.11. GSM 1900 E-GPRS (MSC9) test results

Channel 661 / 1880.0 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
3760.02	-54.7	0.00339	-61.2	6.5	HORIZONTAL	PASSED
5639.94	-49.78	0.01052	-59.88	10.1	HORIZONTAL	PASSED

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7.12. WCDMA2 test results

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
3756.533	-56.67	0.00215	-63.27	6.6	HORIZONTAL	PASSED
5643.667	-51.12	0.00773	-61.62	10.5	VERTICAL	PASSED
7514.77	-47.98	0.01592	-63.88	15.9	VERTICAL	PASSED
9368.517	-43.77	0.04198	-65.47	21.7	VERTICAL	PASSED
9395.291	-44.52	0.03532	-65.52	21	HORIZONTAL	PASSED
9673.447	-43.23	0.04753	-65.33	22.1	HORIZONTAL	PASSED
9756.333	-43.81	0.04159	-65.41	21.6	VERTICAL	PASSED
9791.964	-43.08	0.0492	-65.68	22.6	HORIZONTAL	PASSED
9899.98	-42.81	0.05236	-64.91	22.1	VERTICAL	PASSED
9990.855	-42.37	0.05794	-64.77	22.4	HORIZONTAL	PASSED
11289.96	-41.69	0.06776	-64.69	23	VERTICAL	PASSED
13160.421	-50.6	0.00871	-67.4	16.8	VERTICAL	PASSED
15045.711	-50.75	0.00841	-71.55	20.8	HORIZONTAL	PASSED
16923.747	-49.92	0.01019	-72.82	22.9	VERTICAL	PASSED

7.13. WCDMA4 test results

Channel 1412 / 1732.4 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
3466.143	-53.27	0.00471	-59.07	5.8	HORIZONTAL	PASSED
5200.306	-52.17	0.00607	-62.37	10.2	HORIZONTAL	PASSED
6924.851	-47.91	0.01618	-61.31	13.4	VERTICAL	PASSED
8657.09	-45.94	0.02547	-65.14	19.2	HORIZONTAL	PASSED
9383.347	-43.53	0.04436	-64.93	21.4	VERTICAL	PASSED
9507.916	-43.7	0.04266	-65.4	21.7	HORIZONTAL	PASSED
9793.928	-42.91	0.05117	-65.21	22.3	VERTICAL	PASSED
9865.391	-43.61	0.04355	-65.71	22.1	HORIZONTAL	PASSED
9897.054	-43.33	0.04645	-65.63	22.3	HORIZONTAL	PASSED
9938.617	-42.57	0.05534	-64.37	21.8	VERTICAL	PASSED
10392.897	-40.97	0.07998	-63.57	22.6	HORIZONTAL	PASSED
12128.223	-41.95	0.06383	-64.25	22.3	VERTICAL	PASSED
13868.038	-51.6	0.00692	-69.7	18.1	HORIZONTAL	PASSED
15585.327	-48.42	0.01439	-71.72	23.3	VERTICAL	PASSED
17327.788	-48.4	0.01445	-72.1	23.7	VERTICAL	PASSED

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7.14. WCDMA5 test results

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [µW]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Results
851.012	-45.3	0.02951	-79.8	34.5	HORIZONTAL	PASSED
857.039	-45.57	0.02773	-80.17	34.6	HORIZONTAL	PASSED
990.11	-40.38	0.09162	-79.58	39.2	VERTICAL	PASSED
994.706	-40.31	0.09311	-79.71	39.4	VERTICAL	PASSED
1000.04	-57.56	0.00175	-63.26	5.7	VERTICAL	PASSED
1672.625	-55.97	0.00253	-62.47	6.5	VERTICAL	PASSED
2441.984	-52.31	0.00587	-63.31	11	VERTICAL	PASSED
2507.505	-51.73	0.00671	-63.63	11.9	HORIZONTAL	PASSED
3337.134	-59.55	0.00111	-62.85	3.3	VERTICAL	PASSED
4176.062	-58.27	0.00149	-63.67	5.4	HORIZONTAL	PASSED
5014.669	-53.95	0.00403	-62.55	8.6	VERTICAL	PASSED
5854.679	-53.43	0.00454	-61.93	8.5	VERTICAL	PASSED
6671.723	-49.59	0.01099	-59.89	10.3	VERTICAL	PASSED
7522.074	-49.75	0.01059	-64.05	14.3	HORIZONTAL	PASSED
8350.461	-49.34	0.01164	-64.84	15.5	VERTICAL	PASSED

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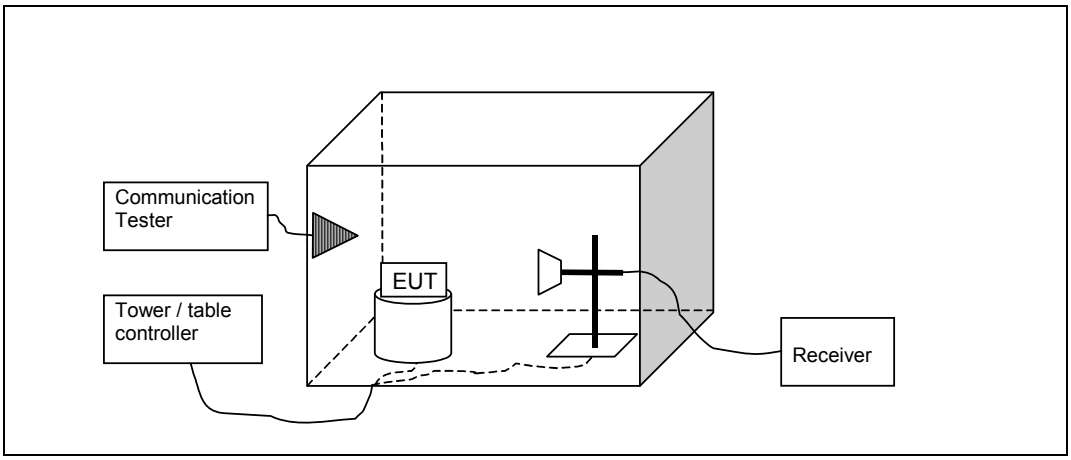
8. Radiated RF output power

(FCC §22.913(a), §27.50(h)(2), §27.50(c)(10), §27.50(c)10, §27.50(d)(4), §27.50(d)(2), §24.232(b), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4, RSS-130 4.4, RSS-199 4.4)

EUT with DUT number	RM-1073, DUT 18897
Accessories with DUT numbers	BV-T5C, DUT 18898
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Tests were made by using antenna 1 (passthrough)
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 100
Date of measurements	27-Nov-2014
Measured by	Sami Lehtonen

8.1.1 Test setup



8.2. Test method and limit

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

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

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

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

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

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

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
824 - 849	7 ERP	38.5
1850 - 1910	2 EiRP	33
1710 - 1755	1 EiRP	30

699 - 712	2 ERP	33
704 - 716	3 ERP	34.8
2502.5 - 2567.5	2 EiRP	33

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8.3. GSM 850 test results

RMS detector

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
128 / 824.2	27.04	0.506	-8.03	-10	-52.07	-2.7	4.3	VERTICAL	PASSED
190 / 836.6	26.62	0.459	-7.51	-10	-51.33	-2.8	4.4	VERTICAL	PASSED
251 / 848.8	25.89	0.388	-7.43	-10	-51.12	-3.4	4.4	VERTICAL	PASSED

8.4. GSM 850 E-GPRS (MSC9) test results

RMS detector

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
128 / 824.2	21.58	0.144	-13.49	-10	-52.07	-2.7	4.3	VERTICAL	PASSED
190 / 836.6	22.07	0.161	-12.06	-10	-51.33	-2.8	4.4	VERTICAL	PASSED
251 / 848.8	24.52	0.283	-8.8	-10	-51.12	-3.4	4.4	VERTICAL	PASSED

8.5. GSM 1900 test results

RMS detector

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
512 / 1850.2	30.22	1.052	-14	-10	-51.01	8.1	6.9	HORIZONTAL	PASSED
661 / 1880	30.35	1.084	-13.91	-10	-50.94	8	6.9	HORIZONTAL	PASSED
810 / 1909.8	29.46	0.883	-15.33	-10	-51.47	8	6.9	HORIZONTAL	PASSED

8.6. GSM 1900 E-GPRS (MSC9) test results

RMS detector

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
512 / 1850.2	26.06	0.404	-18.16	-10	-51.01	8.1	6.9	HORIZONTAL	PASSED
661 / 1880	26.29	0.426	-17.97	-10	-50.94	8	6.9	HORIZONTAL	PASSED
810 / 1909.8	26.06	0.404	-18.73	-10	-51.47	8	6.9	HORIZONTAL	PASSED

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8.7. WCDMA2 test results

RMS detector

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
9262 / 1852.4	22.7	0.186	-21.51	-10	-51	8.1	6.9	HORIZONTAL	PASSED
9400 / 1880	23.69	0.234	-20.57	-10	-50.94	8	6.9	HORIZONTAL	PASSED
9538 / 1907.6	22.05	0.160	-22.85	-10	-51.58	8	6.9	HORIZONTAL	PASSED

8.8. WCDMA4 test results

RMS detector

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
1392 / 1712.4	22.03	0.160	-21.34	-10	-50.02	7.8	6.6	HORIZONTAL	PASSED
1420 / 1740	22.27	0.169	-21.42	-10	-50.2	7.9	6.6	HORIZONTAL	PASSED
1432 / 1752.6	22.22	0.167	-21.45	-10	-50.28	7.9	6.7	HORIZONTAL	PASSED

8.9. WCDMA5 test results

RMS detector

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
4132 / 826.4	17.43	0.055	-17.46	-10	-51.89	-2.7	4.3	VERTICAL	PASSED
4183 / 836.6	17.63	0.058	-16.46	-10	-51.29	-2.8	4.4	VERTICAL	PASSED
4233 / 846.6	17.79	0.060	-15.63	-10	-51.12	-3.3	4.4	VERTICAL	PASSED

8.10. LTE2 test results

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

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result

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18625 / 1852.5	24.08	0.255859	-20.26	-10	-51.02	10.22	6.9	HORIZONTAL	PASSED
18900 / 1880	24.63	0.290402	-19.59	-10	-50.94	10.18	6.9	HORIZONTAL	PASSED
19175 / 1907.5	23.02	0.200447	-21.84	-10	-51.58	10.18	6.9	HORIZONTAL	PASSED

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

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
18625 / 1852.5	24.13	0.258821	-20.21	-10	-51.02	10.22	6.9	HORIZONTAL	PASSED
18900 / 1880	24.29	0.268534	-19.93	-10	-50.94	10.18	6.9	HORIZONTAL	PASSED
19175 / 1907.5	22.86	0.193197	-22	-10	-51.58	10.18	6.9	HORIZONTAL	PASSED

8.11. LTE4 test results

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

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
19975 / 1712.5	23.63	0.230675	-19.77	-10	-50.05	9.95	6.6	HORIZONTAL	PASSED
20175 / 1732.5	23.38	0.217771	-20.27	-10	-50.16	9.95	6.6	HORIZONTAL	PASSED
20375 / 1752.5	23.42	0.219786	-20.29	-10	-50.32	9.95	6.7	HORIZONTAL	PASSED

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

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBi]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
19975 / 1712.5	23.66	0.232274	-19.74	-10	-50.05	9.95	6.6	HORIZONTAL	PASSED
20175 / 1732.5	23.44	0.2208	-20.21	-10	-50.16	9.95	6.6	HORIZONTAL	PASSED
20375 / 1752.5	23.86	0.24322	-19.85	-10	-50.32	9.95	6.7	HORIZONTAL	PASSED

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8.12. LTE5 test results

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
20425 / 826.5	18.31	0.067764	-16.58	-10	-51.89	-2.7	4.3	VERTICAL	PASSED
20525 / 836.5	18.68	0.07379	-15.43	-10	-51.31	-2.8	4.4	VERTICAL	PASSED
20625 / 846.5	18.48	0.070469	-14.92	-10	-51.1	-3.3	4.4	VERTICAL	PASSED

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

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
20425 / 826.5	18.68	0.07379	-16.21	-10	-51.89	-2.7	4.3	VERTICAL	PASSED
20525 / 836.5	20.01	0.100231	-14.1	-10	-51.31	-2.8	4.4	VERTICAL	PASSED
20625 / 846.5	17.81	0.060395	-15.59	-10	-51.1	-3.3	4.4	HORIZONTAL	PASSED

8.13. LTE12 test results

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

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
23035 / 701.5	17.32	0.053951	-14.72	-10	-48.74	-2.7	4	VERTICAL	PASSED
23095 / 707.5	17.64	0.058076	-14.29	-10	-48.73	-2.8	4	VERTICAL	PASSED
23155 / 713.5	17	0.050119	-14.19	-10	-48.49	-3.3	4	VERTICAL	PASSED

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

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
23035 / 701.5	17.9	0.06166	-14.14	-10	-48.74	-2.7	4	HORIZONTAL	PASSED
23095 / 707.5	17.65	0.05821	-14.28	-10	-48.73	-2.8	4	HORIZONTAL	PASSED
23155 / 713.5	17.49	0.056105	-13.7	-10	-48.49	-3.3	4	VERTICAL	PASSED

8.14. LTE17 test results

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

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
23755 / 706.5	17.6	0.057544	-14.47	-10	-48.67	-2.6	4	VERTICAL	PASSED
23790 / 710	17.99	0.062951	-14.18	-10	-48.77	-2.6	4	VERTICAL	PASSED
23825 / 713.5	17.91	0.061802	-13.97	-10	-48.48	-2.6	4	VERTICAL	PASSED

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

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	$P_{SUBST\ TX}$ [dBm]	$P_{SUBST\ RX}$ [dBm]	$G_{SUBST\ TX\ ANT}$ [dBd]	$L_{SUBST\ CABLE}$ [dB]	Polarisation	Result
23755 / 706.5	17.04	0.050582	-14.26	-10	-47.9	-2.6	4	VERTICAL	PASSED
23790 / 710	16.68	0.046559	-14.89	-10	-48.17	-2.6	4	VERTICAL	PASSED
23825 / 713.5	17.38	0.054702	-14.32	-10	-48.3	-2.6	4	VERTICAL	PASSED

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9. Test Equipment

9.1. Conducted measurements

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

9.2. Radiated measurements

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

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

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