

FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RM-860_01.docx	Date of Report:	14-Feb-2013
Number of pages:	50	Customer's Contact person:	Thomas Mary
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FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-860 / Headset WH-902 / AC- Charger AC-50		
FCC ID:	QMNRM-860	IC:	661X-RM860
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:			

Sami Lehtonen, Specialist, EMC

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

Date of receipt	26-Nov-2012
Testing completed	03-Jan-2013
The customer's contact person	Thomas Mary
Test Plan referred to	T:\Projects\RM-860\TestPlan\RS_testplan_RM-860_EMC_FCC_SAR_HAC.xlsm
Notes	-
Document name	T:\Projects\RM-860\EMC\FCC22&24&27_RM-860_01.docx

1.1. EUT and Accessory Information

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

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-860	354106050003398	0102	-	1532.5701.9200.10205.56	16892
Phone	RM-860	35410650003968	0102	-	1532.5701.9200.10205.56	17227
Headset	WH-902	209E2R	-	-	-	16564
Phone	RM-860	354106050009015	0103	-	1532.5701.9200.10205.56	17007
Headset	WH-902	06949721245B2R	-	-	-	17006
AC-Charger	AC-50U	409049215427050145100675620	860	-	-	17005

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	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	PASSED
§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

CDMA800:

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	PASSED
§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 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	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	PASSED
§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

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	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§24.238(a)	6.5	Band edge compliance	PASSED
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	PASSED
§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

CDMA1900:

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

WCDMA 1900 (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	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§24.238(a)	6.5	Band edge compliance	PASSED
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	PASSED
§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

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	PASSED
§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	PASSED

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	PASSED
§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	PASSED

PASSED
FAILED
NP

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

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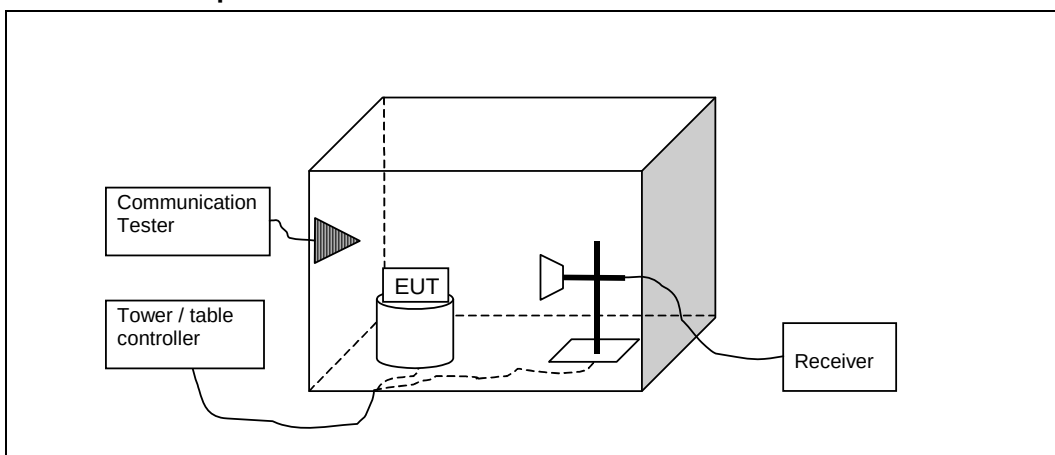
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2. Radiated RF output power

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

EUT with DUT number	RM-860, DUT 17028
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 43 / 100.1
Date of measurements	03-Jan-2013
Measured by	Kalle Hannila

2.1.1 Test setup



2.2. Test method and limit

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

The measurement is 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]
777 - 787	3 ERP	34.8
824 - 849	7 ERP	38.5
1710 - 1755	1 EIRP	30
1850 - 1910	2 EIRP	33

2.3. LTE 1700 (Band IV) test results

FDD, CBW 5MHz, QPSK, 1 RB, Peak 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	29.56	0.904	-14.85	-10	-49.9	9.91	5.4	Horizontal	PASSED
20175 / 1732.5	28.15	0.653	-16.02	-10	-49.68	9.89	5.4	Horizontal	PASSED
20375 / 1752.5	28.1	0.646	-16.44	-10	-49.99	9.95	5.4	Horizontal	PASSED

FDD, CBW 5MHz, QPSK, 1 RB, 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	25.36	0.344	-19.05	-10	-49.9	9.91	5.4	Horizontal	PASSED
20175 / 1732.5	24.27	0.267	-19.9	-10	-49.68	9.89	5.4	Horizontal	PASSED
20375 / 1752.5	23.91	0.246	-20.63	-10	-49.99	9.95	5.4	Horizontal	PASSED

FDD, CBW 5MHz, 16QAM, 1 RB, Peak 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	29.42	0.875	-14.99	-10	-49.9	9.91	5.4	Horizontal	PASSED
20175 / 1732.5	27.86	0.611	-16.31	-10	-49.68	9.89	5.4	Horizontal	PASSED
20375 / 1752.5	27.96	0.625	-16.58	-10	-49.99	9.95	5.4	Horizontal	PASSED

FDD, CBW 5MHz, 16QAM, 1 RB, 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	25.22	0.333	-19.19	-10	-49.9	9.91	5.4	Horizontal	PASSED
20175 / 1732.5	22.01	0.159	-22.16	-10	-49.68	9.89	5.4	Horizontal	PASSED
20375 / 1752.5	23.61	0.230	-20.93	-10	-49.99	9.95	5.4	Horizontal	PASSED

2.4. LTE700 Upper (Band 13) test results

FDD, CBW 5MHz, QPSK, 1RB mid, Peak 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
23205 / 779.5	24.21	0.264	-7.68	-10	-50.85	-3.56	5.4	Horizontal	PASSED
23230 / 782	23.88	0.244	-7.93	-10	-50.77	-3.56	5.4	Horizontal	PASSED
23255 / 784.5	24.47	0.280	-7.55	-10	-51	-3.58	5.4	Horizontal	PASSED

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
23205 / 779.5	19.07	0.081	-12.82	-10	-50.85	-3.56	5.4	Horizontal	PASSED
23230 / 782	19.34	0.086	-12.47	-10	-50.77	-3.56	5.4	Horizontal	PASSED
23255 / 784.5	19.86	0.097	-12.16	-10	-51	-3.58	5.4	Horizontal	PASSED

FDD, CBW 5MHz, 16QAM, 1RB mid, Peak 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
23205 / 779.5	23.83	0.242	-8.06	-10	-50.85	-3.56	5.4	Horizontal	PASSED
23230 / 782	24.13	0.259	-7.68	-10	-50.77	-3.56	5.4	Horizontal	PASSED
23255 / 784.5	24.59	0.288	-7.43	-10	-51	-3.58	5.4	Horizontal	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
23205 / 779.5	19.94	0.099	-11.95	-10	-50.85	-3.56	5.4	Horizontal	PASSED
23230 / 782	19.82	0.096	-11.99	-10	-50.77	-3.56	5.4	Horizontal	PASSED
23255 / 784.5	19.91	0.098	-12.11	-10	-51	-3.58	5.4	Horizontal	PASSED

2.5. CDMA800 TX test results

Peak 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
1013 / 824.7	25.25	0.335	-8.9	-10	-51.27	-3.42	3.7	HORIZONTAL	PASSED
384 / 836.52	25.4	0.347	-7.81	-10	-50.68	-3.77	3.7	HORIZONTAL	PASSED
777 / 848.31	25.41	0.348	-8.65	-10	-51.25	-3.49	3.7	HORIZONTAL	PASSED

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
1013 / 824.7	24.22	0.264	-10.93	-10	-52.27	-3.42	3.7	HORIZONTAL	PASSED
384 / 836.52	22.53	0.179	-11.68	-10	-51.68	-3.77	3.7	HORIZONTAL	PASSED
777 / 848.31	21.62	0.145	-12.44	-10	-51.25	-3.49	3.7	HORIZONTAL	PASSED

2.6. CDMA1900 TX test results

Peak 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
25 / 1851.25	28.47	0.703	-16.25	-10	-50.18	10.14	5.6	HORIZONTAL	PASSED
600 / 1880	28.11	0.647	-16.64	-10	-50.34	10.11	5.7	HORIZONTAL	PASSED
1175 / 1908.75	27.68	0.586	-17.8	-10	-50.92	10.26	5.7	HORIZONTAL	PASSED

RMS detector

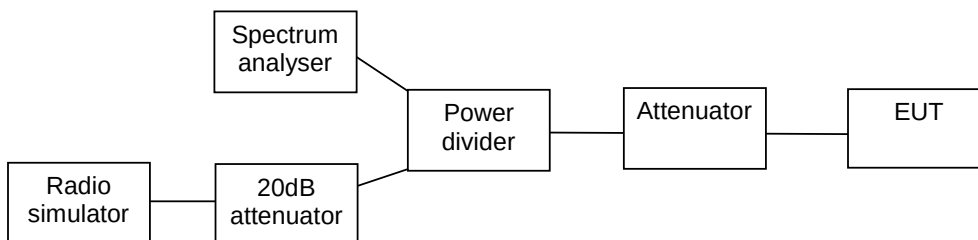
Channel / f _c [MHz]	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	P _{SUBST} TX [dBm]	P _{SUBST} RX [dBm]	G _{SUBST} TX ANT [dBi]	L _{SUBST} CABLE [dB]	Polarisation	Result
25 / 1851.25	24.46	0.279	-20.26	-10	-50.18	10.14	5.6	HORIZONTAL	PASSED
600 / 1880	23.81	0.240	-20.94	-10	-50.34	10.11	5.7	HORIZONTAL	PASSED
1175 / 1908.75	23.74	0.237	-21.74	-10	-50.92	10.26	5.7	HORIZONTAL	PASSED

3. 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	RM-860, DUT 16892; RM-860, DUT 17227
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 40 / 101.5
Date of measurements	12-Dec-2012
Measured by	Sami Lehtonen

3.1. Test Setup



3.2. Test method and limit

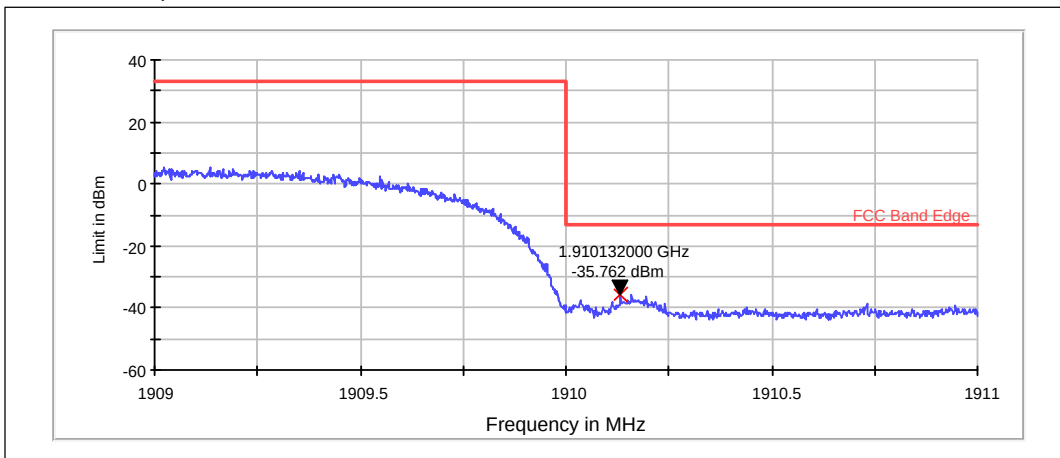
The measurement is made according to FCC rules parts 22, 24, 27 and IC standards , RSS-132, RSS-133, RSS-139.

Limits for band edge compliance measurements

Operation band	Frequency range [MHz]	Limit [dBm]
LTE 700 Upper	776.9 - 777 and 787 - 787.1 Below 776.9 and above 787.1 763-775 and 793-805	-13 (RBW = 30 kHz, ERP) -13 (RBW = 100 kHz, ERP) -35 (RBW = 6.25 kHz, ERP)
CDMA800 / GSM850 / WCDMA850	Below 824 and above 849	-13
LTE1700	Below 1710 and above 1755	-13
CDMA1900 / GSM1900 / / WCDMA1900	Below 1850 and above 1910	-13

3.3. WCDMA 1900 Test results

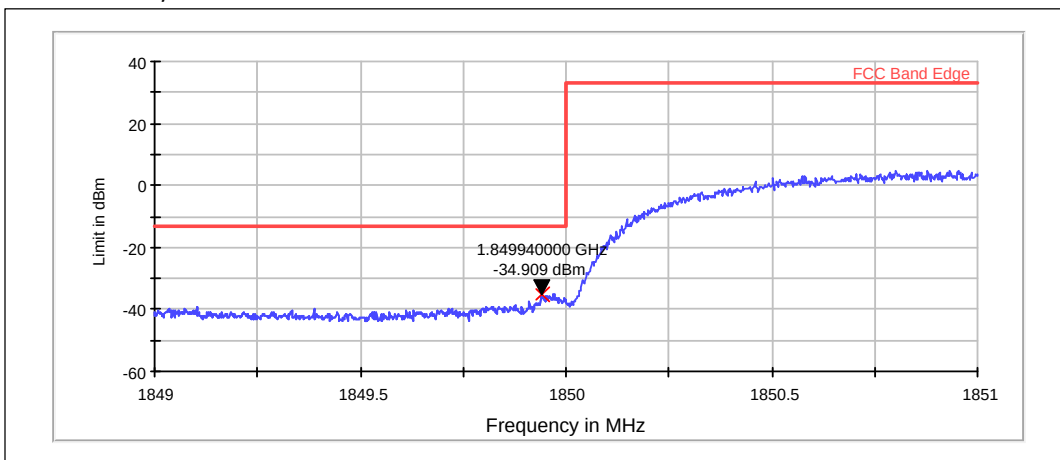
Channel 9538 / 1907.6 MHz



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

Frequency [MHz]	Level [dBm]	Result
1910.132	-35.76	PASSED

Channel 9262 / 1852.4 MHz

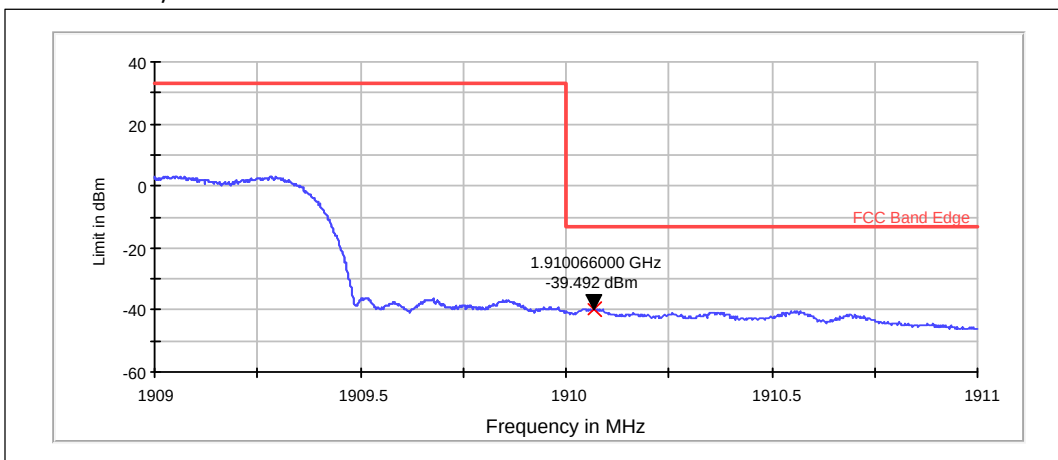


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Frequency [MHz]	Level [dBm]	Result
1849.940	-34.91	PASSED

3.4. CDMA 1900 Test results

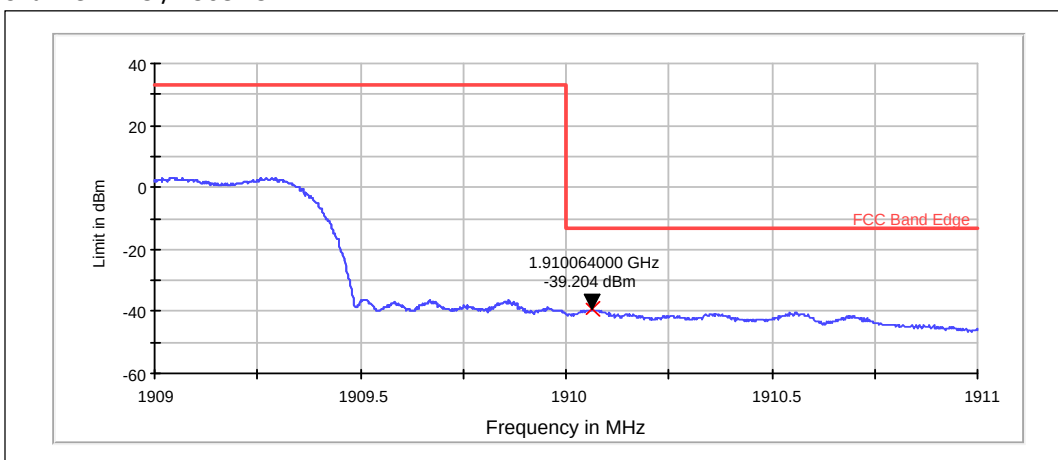
Channel 1175 / 1908.75 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
CDMA	1910.066	-39.49	PASSED

Channel 1175 / 1908.75 MHz

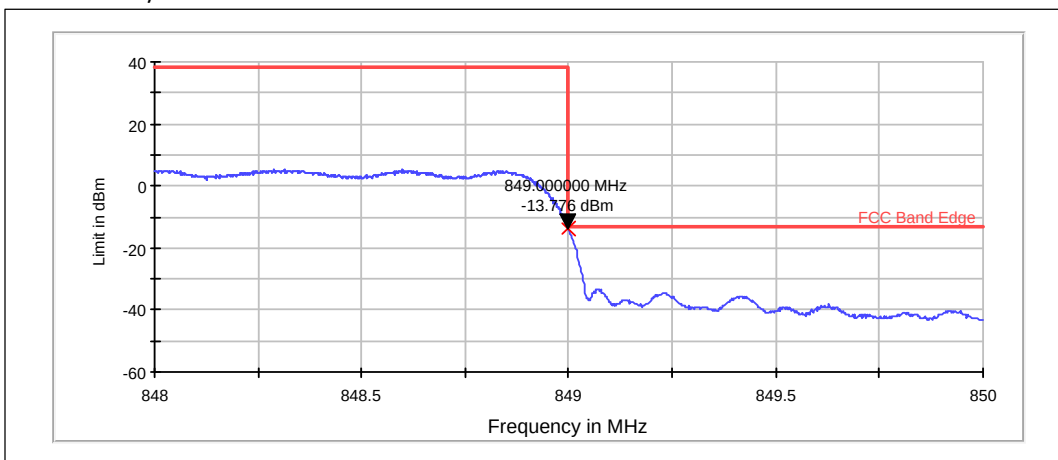


RMS (RBW: 15 kHz, VBW: 30 kHz, video averaging)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
CDMA	1910.064	-39.20	PASSED

3.5. CDMA 800 Test results

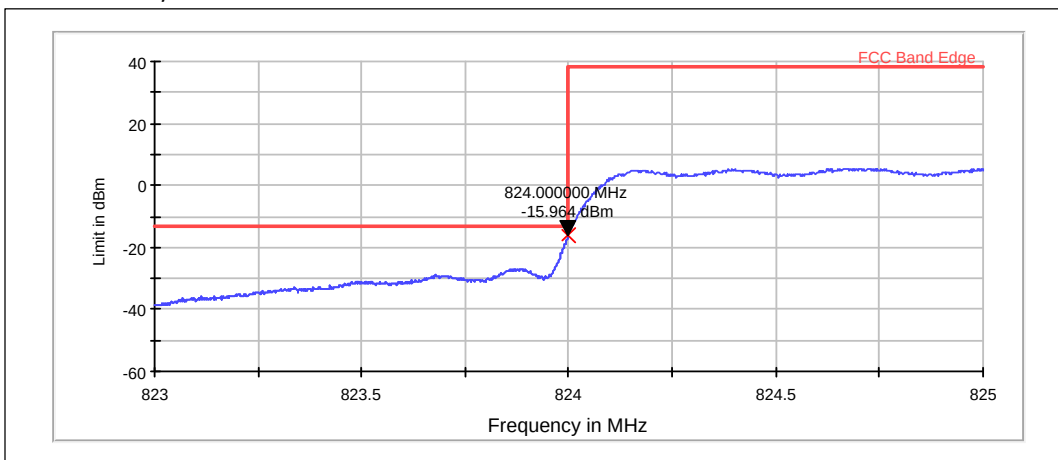
Channel 777 / 848.31 MHz



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

Frequency [MHz]	Level [dBm]	Result
849.000	-13.78	PASSED

Channel 1013 / 824.7 MHz

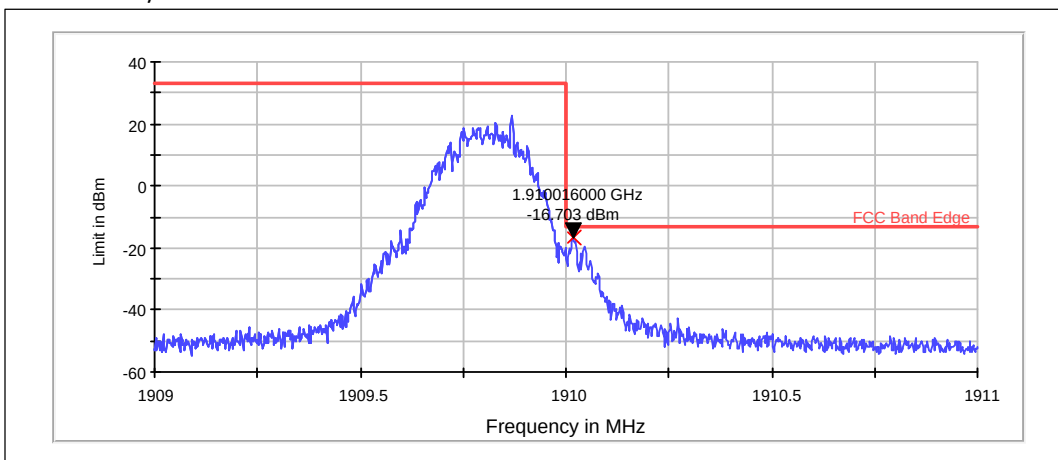


RMS (RBW: 15 kHz, VBW: 30 kHz, video averaging)

Frequency [MHz]	Level [dBm]	Result
824.000	-15.96	PASSED

3.6. GSM 1900 Test results

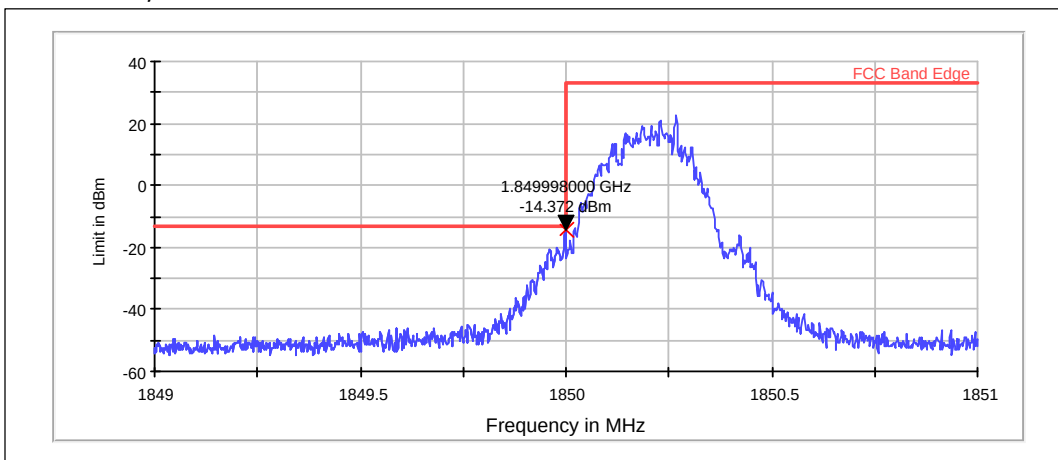
Channel 810 / 1909.8 MHz



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

Frequency [MHz]	Level [dBm]	Result
1910.016	-16.70	PASSED

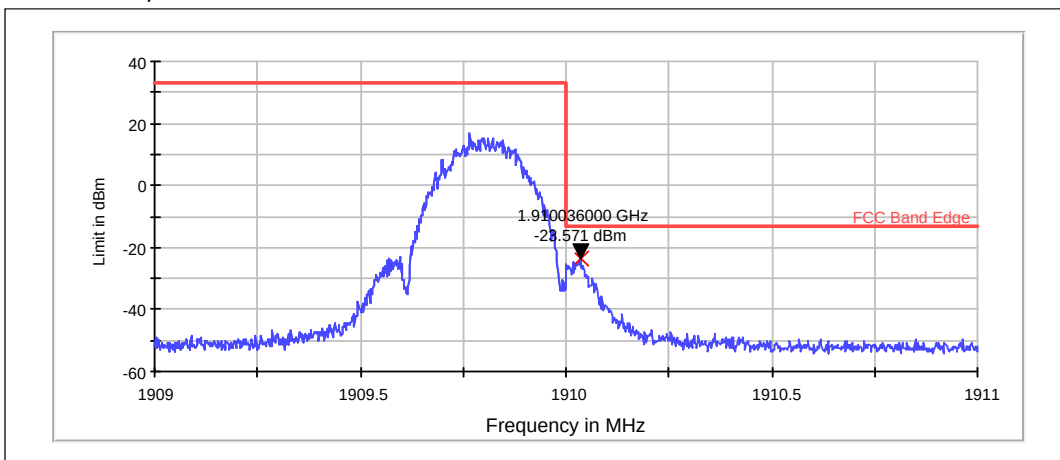
Channel 512 / 1850.2 MHz



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

Frequency [MHz]	Level [dBm]	Result
1849.998	-14.37	PASSED

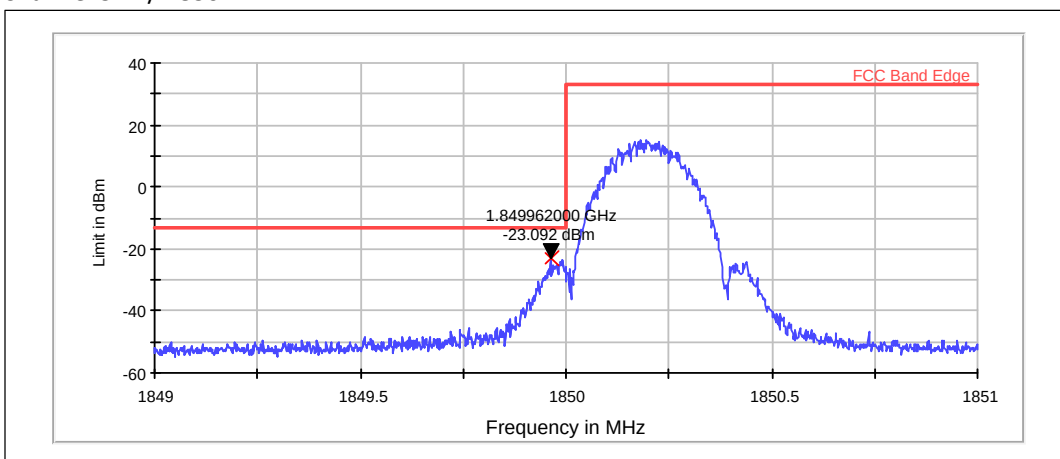
Channel 810 / 1909.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1910.036	-23.57	PASSED

Channel 512 / 1850.2 MHz

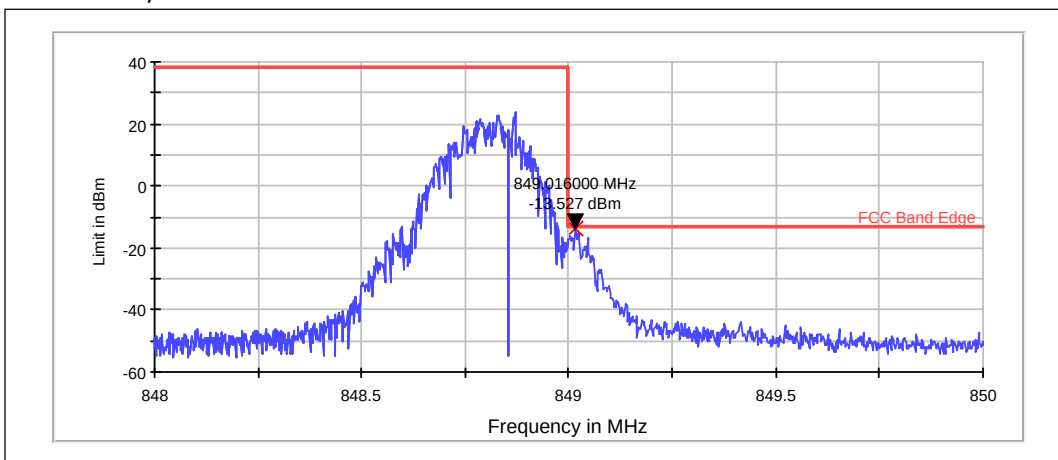


Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1849.962	-23.09	PASSED

3.7. GSM 850 Test results

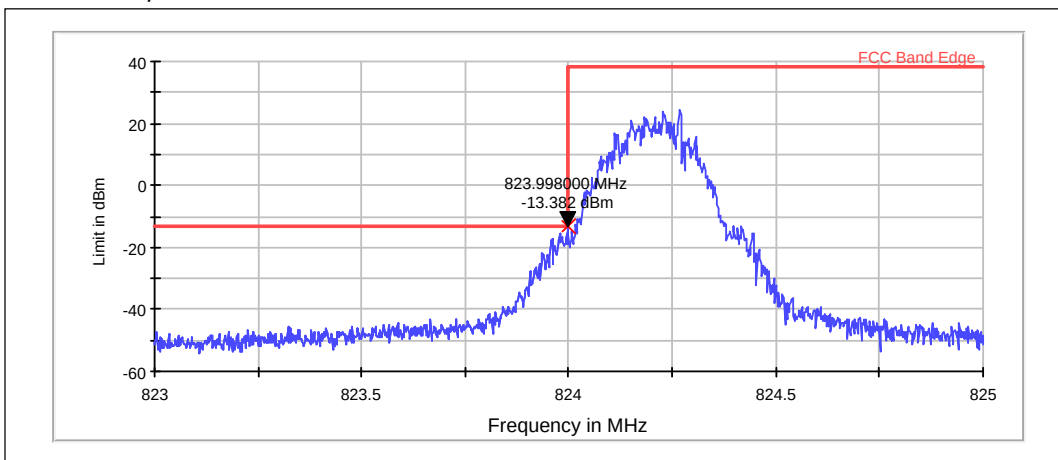
Channel 251 / 848.8 MHz



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

Frequency [MHz]	Level [dBm]	Result
849.016	-13.53	PASSED

Channel 128 / 824.2 MHz

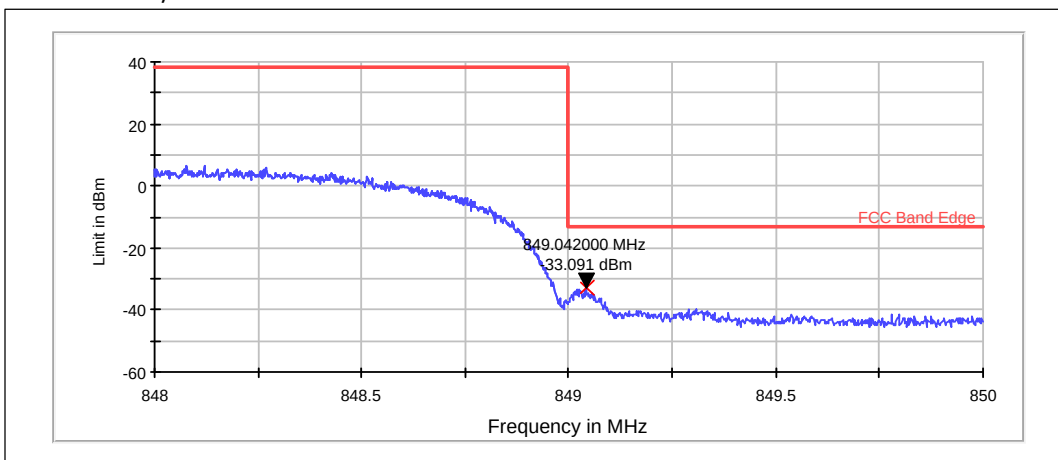


Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Frequency [MHz]	Level [dBm]	Result
823.998	-13.38	PASSED

3.8. WCDMA 850 Test results

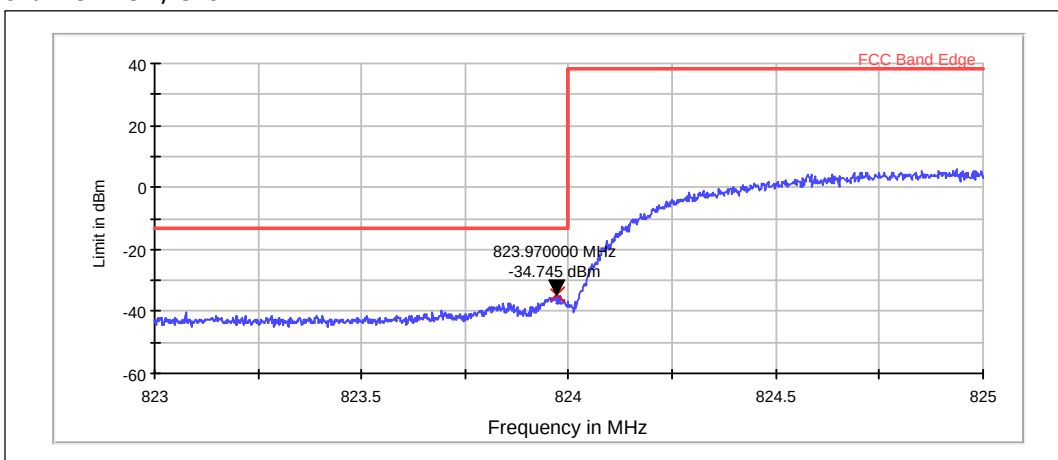
Channel 4233 / 846.6 MHz



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

Frequency [MHz]	Level [dBm]	Result
849.042	-33.09	PASSED

Channel 4132 / 826.4 MHz

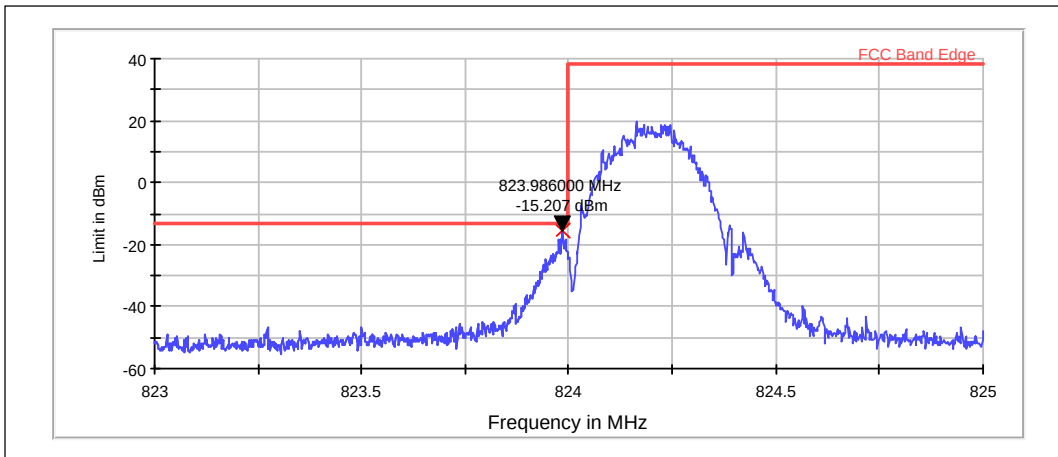


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

Frequency [MHz]	Level [dBm]	Result
823.970	-34.74	PASSED

3.9. GSM 850 Test results

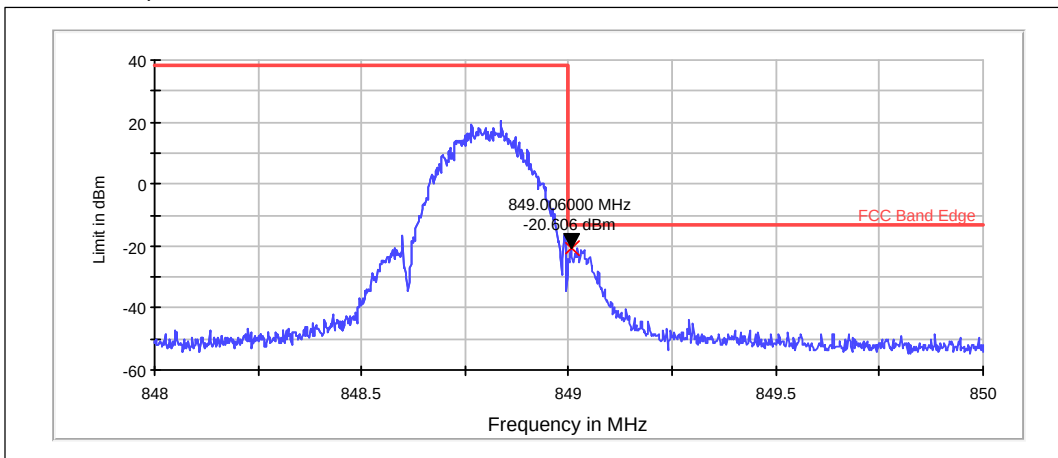
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	823.986	-15.21	PASSED

Channel 251 / 848.8 MHz

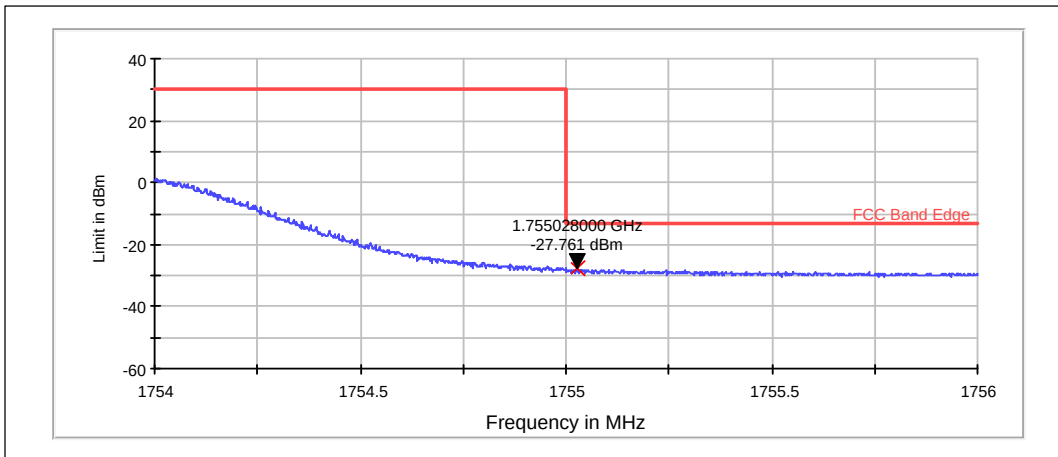


Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	849.006	-20.61	PASSED

3.10. LTE1700 (Band 4) Test results

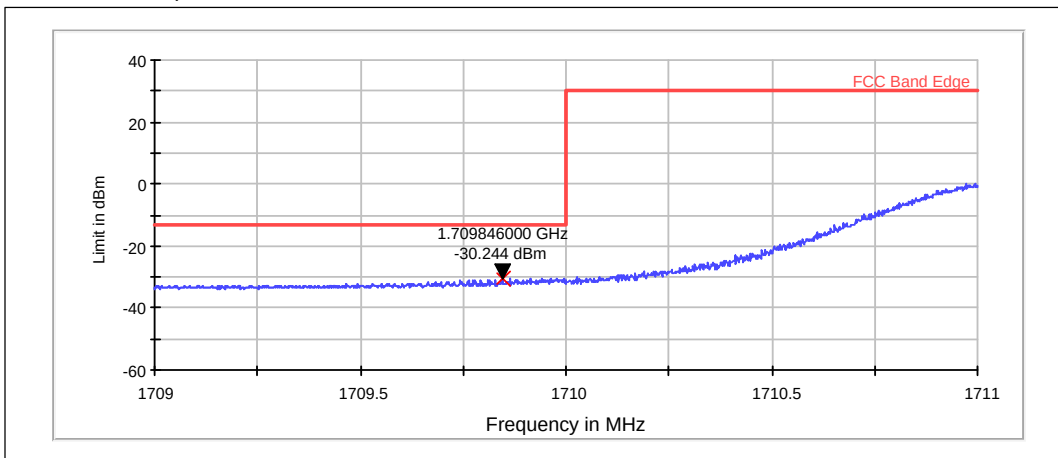
Channel 20300 / 1745 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1755.028	-27.76	PASSED

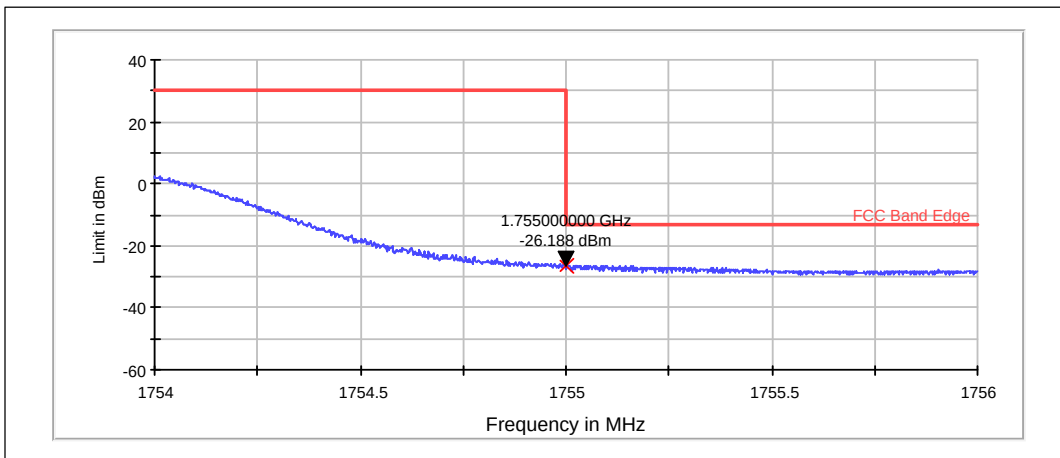
Channel 20050 / 1720 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, 16QAM, 100 RB	1709.846	-30.24	PASSED

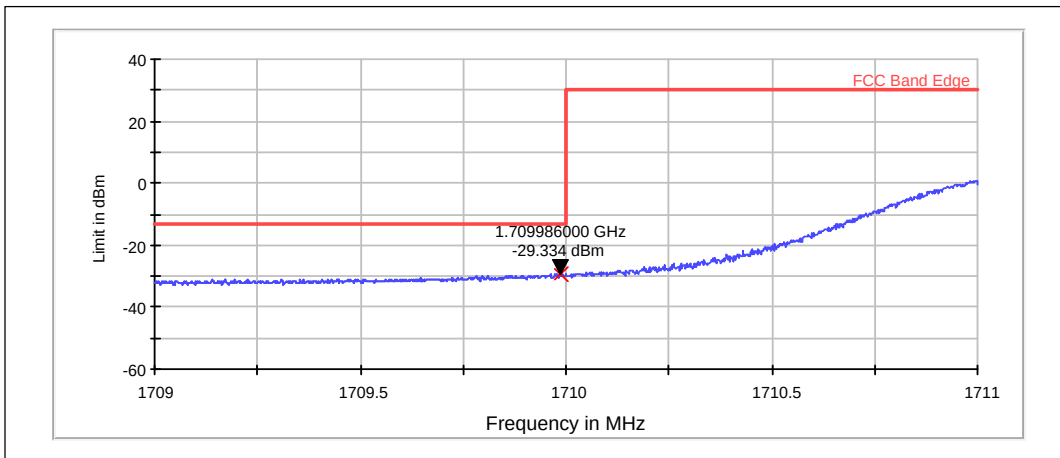
Channel 20300 / 1745 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1755.000	-26.19	PASSED

Channel 20050 / 1720 MHz

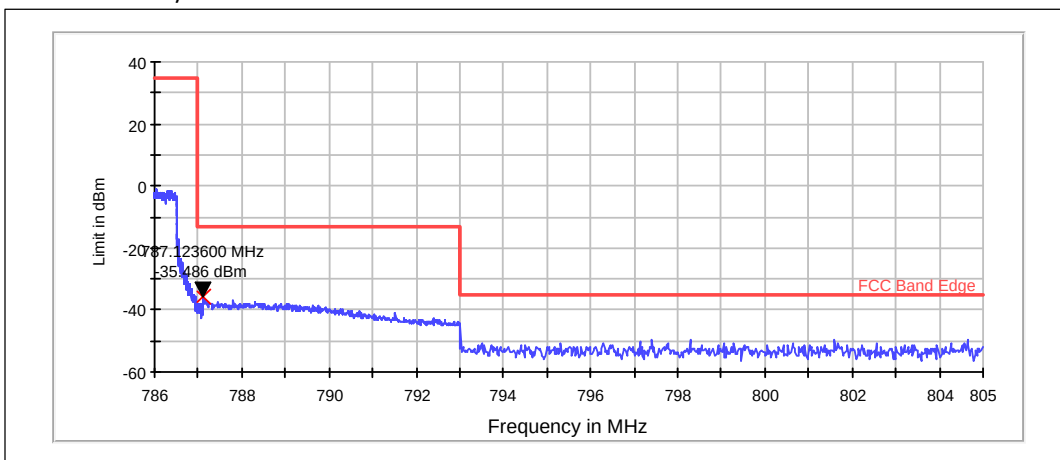


RMS (RBW: 200 kHz, VBW: 200 kHz, Max hold)

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 20MHz, QPSK, 100 RB	1709.986	-29.33	PASSED

3.11. LTE700 Upper (Band 13) Test results

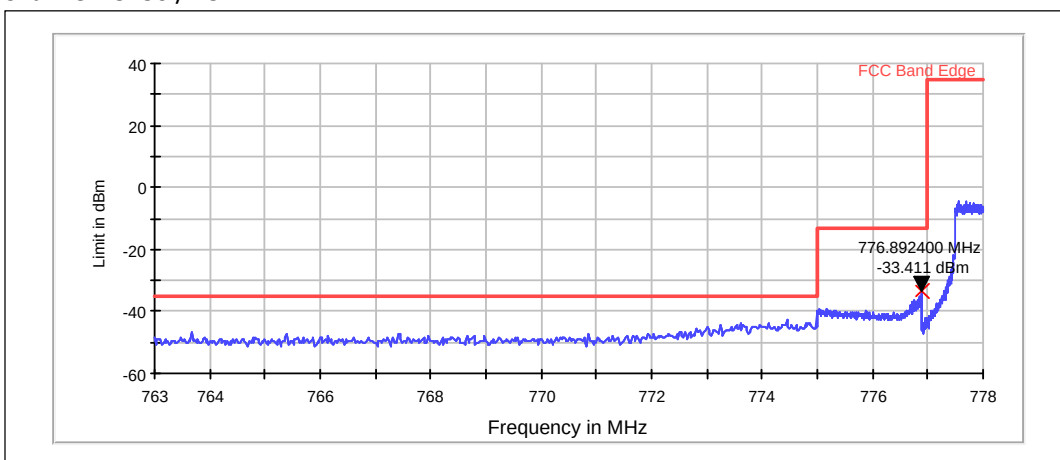
Channel 23230 / 782 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	787.124	-35.49	PASSED

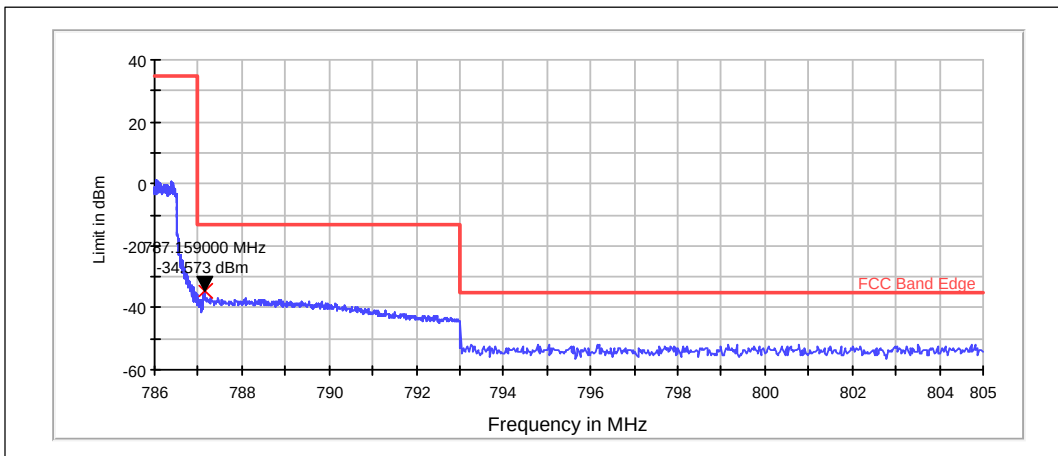
Channel 23230 / 782 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, 16QAM, 50 RB	776.892	-33.41	PASSED

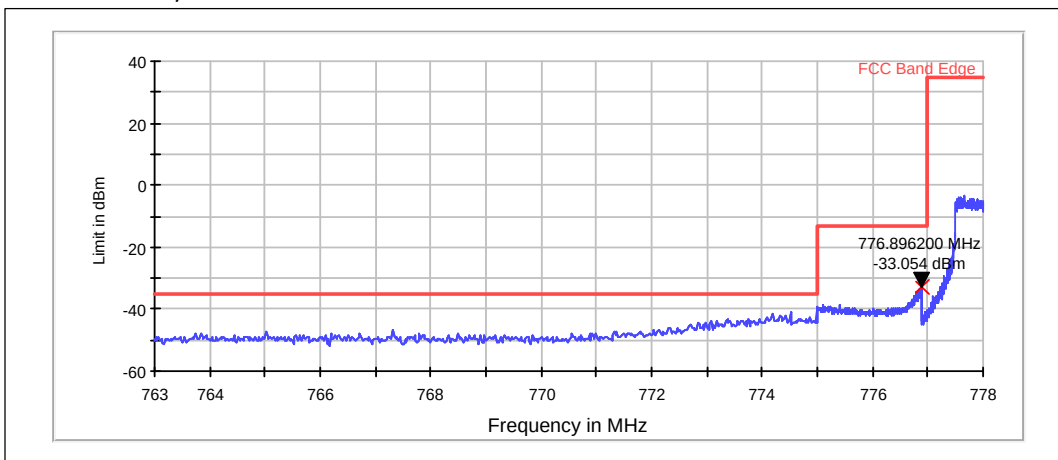
Channel 23230 / 782 MHz



RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	787.159	-34.57	PASSED

Channel 23230 / 782 MHz



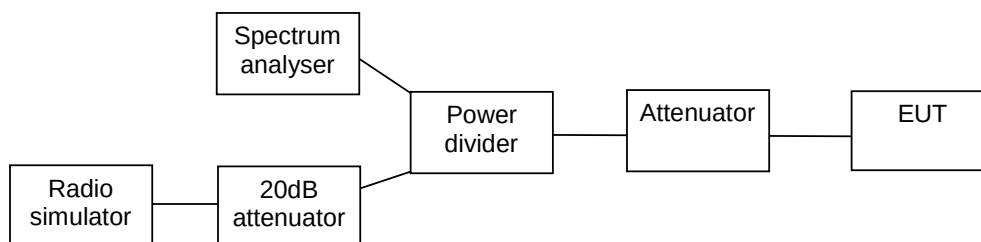
RMS detector

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD, CBW 10MHz, QPSK, 50 RB	776.896	-33.05	PASSED

4. 99% occupied bandwidth (FCC §2.1049(h), RSS-GEN 4.6.1)

EUT with DUT number	RM-860, DUT 16892
Accessories with DUT numbers	WH-902, DUT 16564
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 40 / 101.5
Date of measurements	30-Nov-2012
Measured by	Sami Lehtonen

4.1. Test Setup



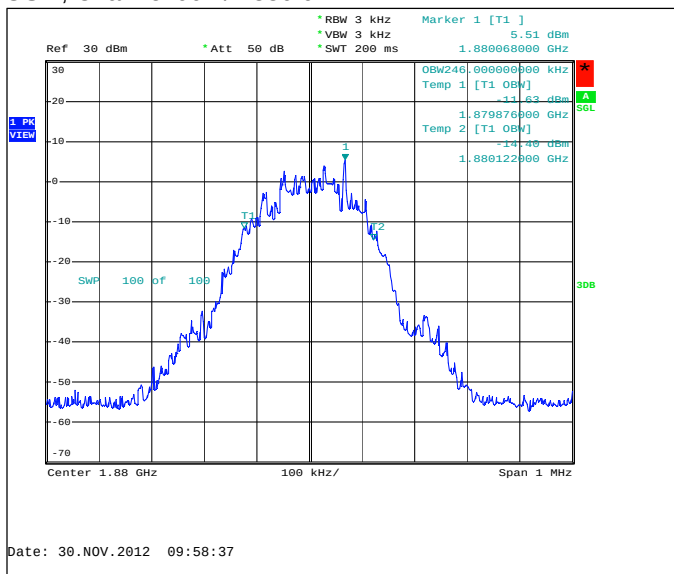
4.2. Test method and limit

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

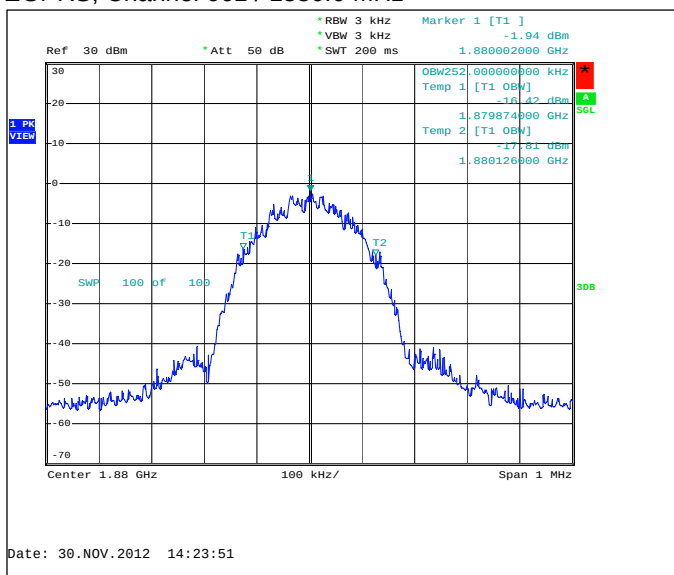
4.3. GSM 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	246
EGPRS	252

GSM, Channel 661 / 1880.0 MHz



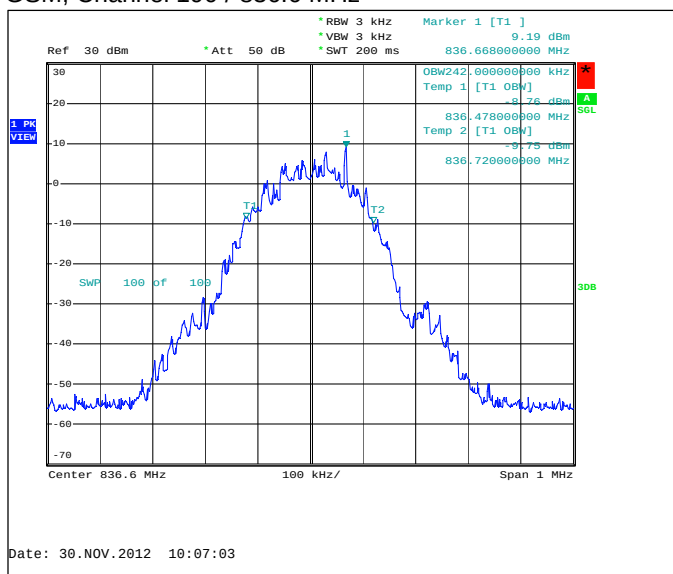
EGPRS, Channel 661 / 1880.0 MHz



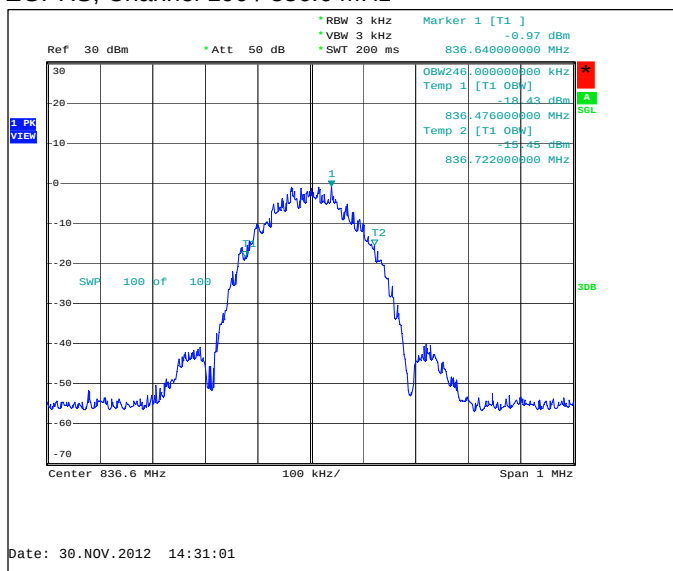
4.4. GSM 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	242
EGPRS	246

GSM, Channel 190 / 836.6 MHz



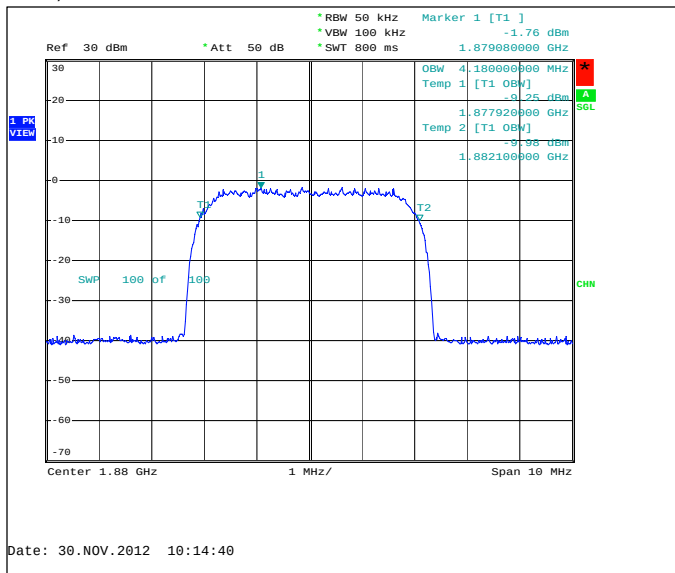
EGPRS, Channel 190 / 836.6 MHz



4.5. WCDMA 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD	4180

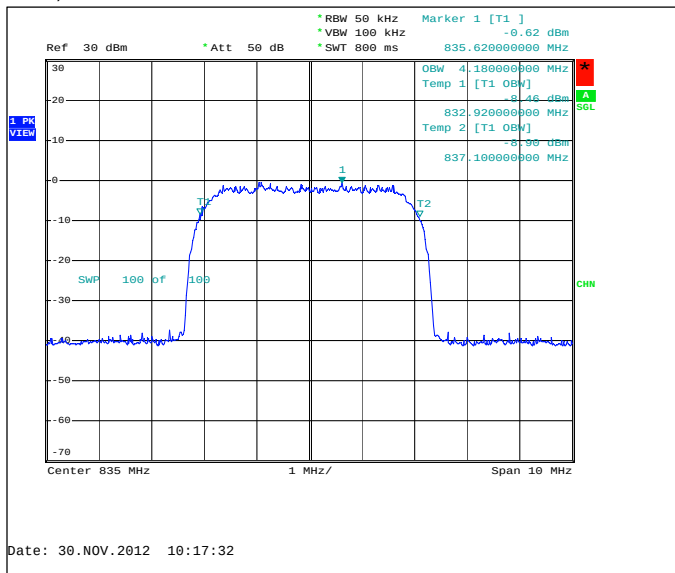
FDD, Channel 9400 / 1880.0 MHz



4.6. WCDMA 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD	4180

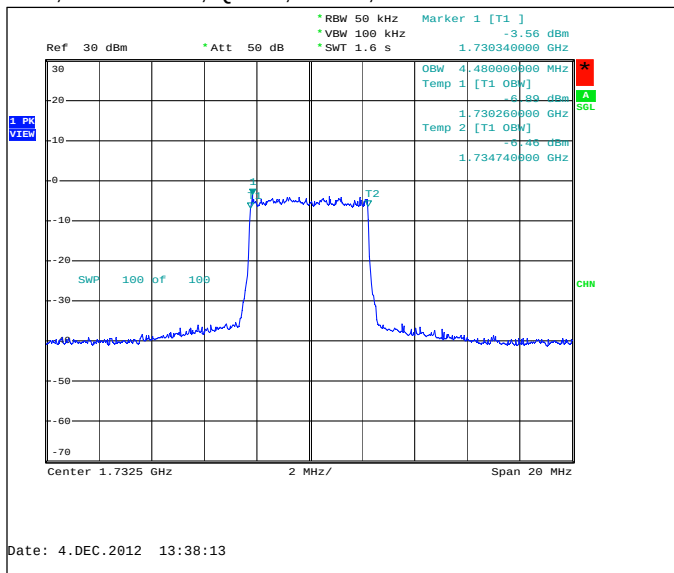
FDD, Channel 4175 / 835.0 MHz



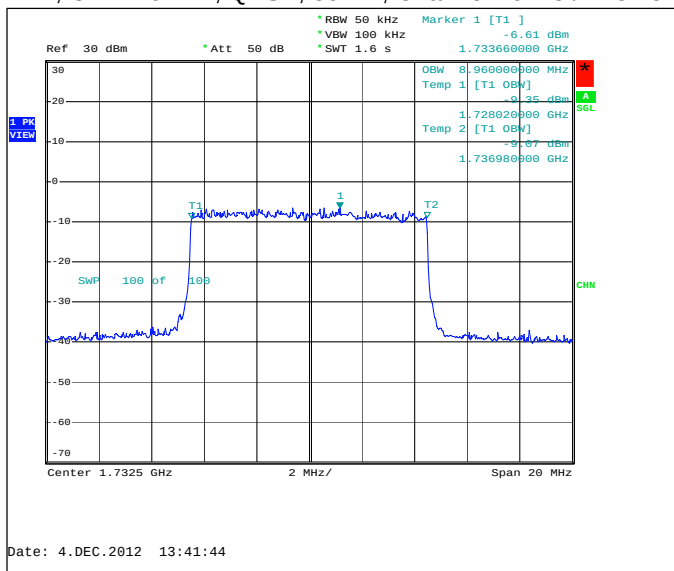
4.7. LTE1700 (Band 4) Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
FDD, CBW 5MHz, QPSK, 25 RB	4480
FDD, CBW 10MHz, QPSK, 50 RB	8960
FDD, CBW 15MHz, QPSK, 75 RB	13440
FDD, CBW 20MHz, QPSK, 100 RB	17880
FDD, CBW 5MHz, 16QAM, 25 RB	4480
FDD, CBW 10MHz, 16QAM, 50 RB	8960
FDD, CBW 15MHz, 16QAM, 75 RB	13400
FDD, CBW 20MHz, 16QAM, 100 RB	17880

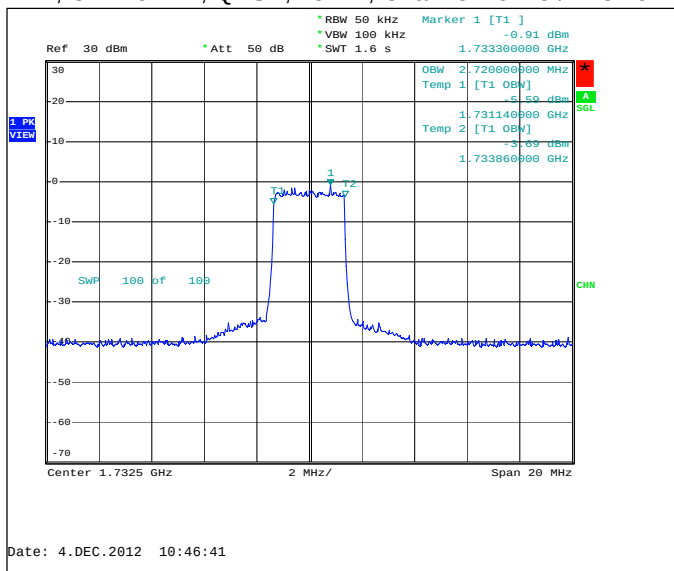
FDD, CBW 5MHz, QPSK, 25 RB, Channel 20175 / 1732.5 MHz



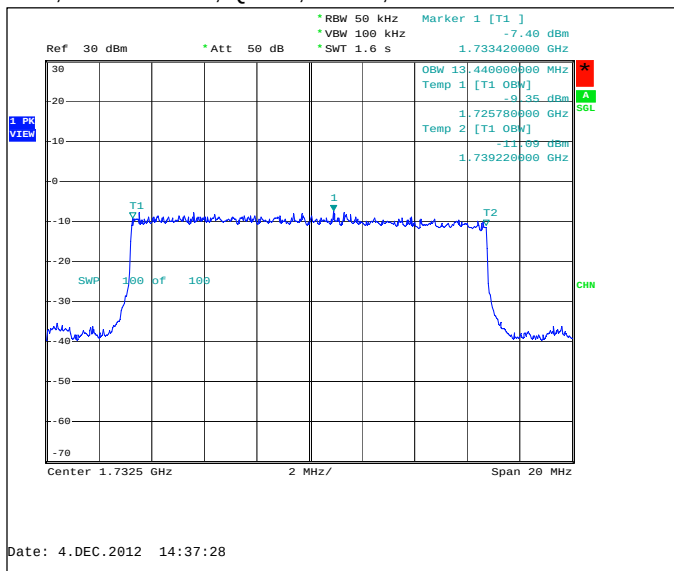
FDD, CBW 10MHz, QPSK, 50 RB, Channel 20175 / 1732.5 MHz



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



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



1 RBW 50 kHz
 1 VBW 100 kHz
 1 SWT 1.6 s

Marker 1 [T1]
 -8.54 dBm
 1.726100000 GHz

Ref 30 dBm
 Att 50 dB

OBW 17.88000000 MHz
 Temp 1 [T1 OBW]
 1.723540000 GHz
 Temp 2 [T1 OBW]
 1.741420000 GHz

1 PR VIEW

Center 1.7325 GHz
 Span 20 MHz
 2 MHz/

SWP 100 of 100

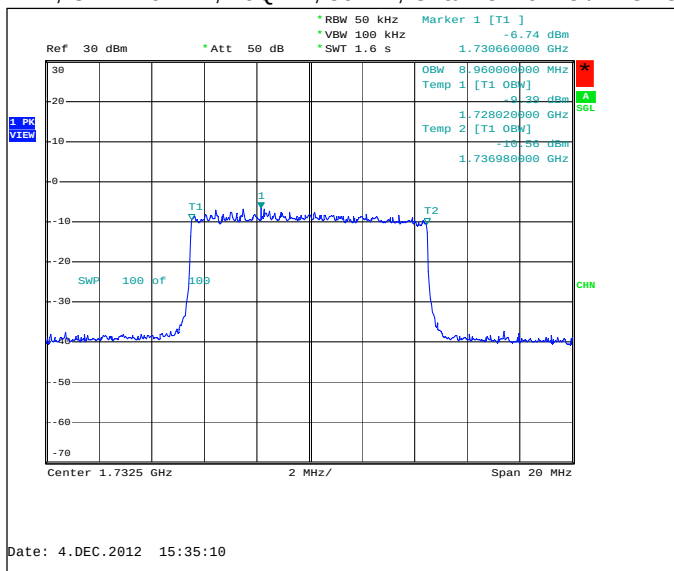
CHN

Date: 4.DEC.2012 14:50:59

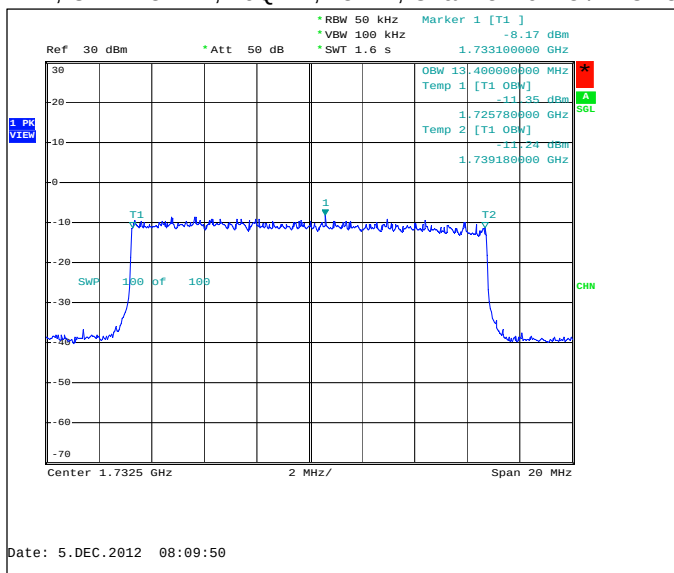
The screenshot shows a Spectrum Analyzer interface with the following details:

- Top Panel:**
 - RBW 50 kHz, VBW 100 kHz, SWT 1.6 s
 - Marker 1 [T1] at 1.733620000 GHz, -4.16 dBm
 - Ref 30 dBm, Att 50 dB
- Left Panel:**
 - 1 PR VIEW (blue button)
- Right Panel:**
 - OBW 4.480000000 MHz
 - Temp 1 [T1 OBW] -7.48 dBm
 - Temp 2 [T1 OBW] 1.730260000 GHz
 - 1.7355 dBm
 - 1.734740000 GHz
 - CH1 (green label)
- Plot Area:**
 - Y-axis: Power in dBm, ranging from -70 to 30.
 - X-axis: Frequency in GHz, ranging from 1.7325 to 1.7345.
 - Grid: 2 MHz/div, Span 20 MHz.
 - Signal: A blue trace showing a signal with two markers, T1 and T2, and a peak marker.
 - Annotations: SWP 100, 0f 100.
- Bottom Panel:**
 - Center 1.7325 GHz
 - 2 MHz/
 - Span 20 MHz
- Date:** 4.DEC.2012 15:29:14

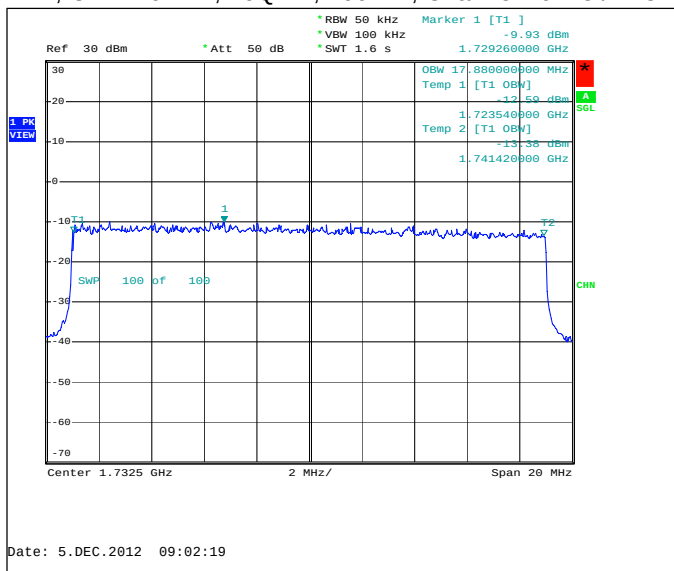
FDD, CBW 10MHz, 16QAM, 50 RB, Channel 20175 / 1732.5 MHz



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



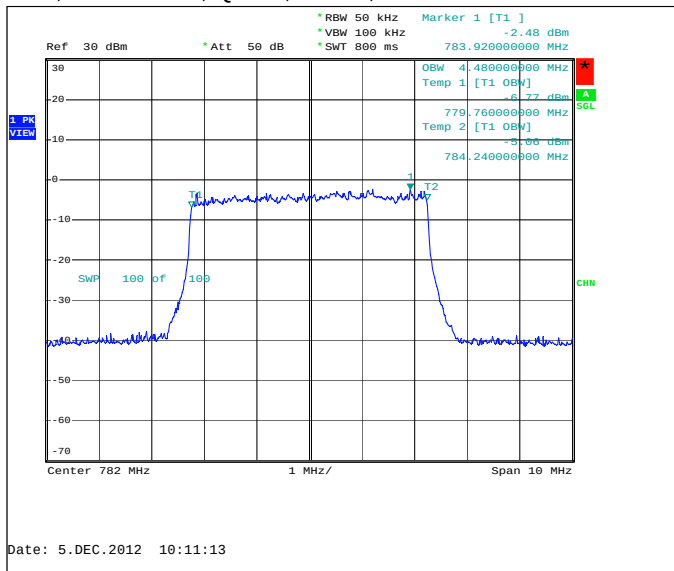
FDD, CBW 20MHz, 16QAM, 100 RB, Channel 20175 / 1732.5 MHz



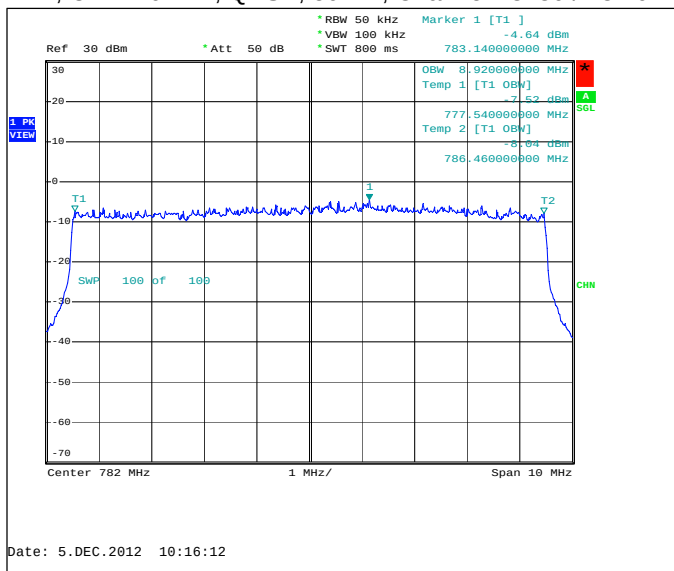
4.8. LTE700 Upper (Band 13) Test results

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

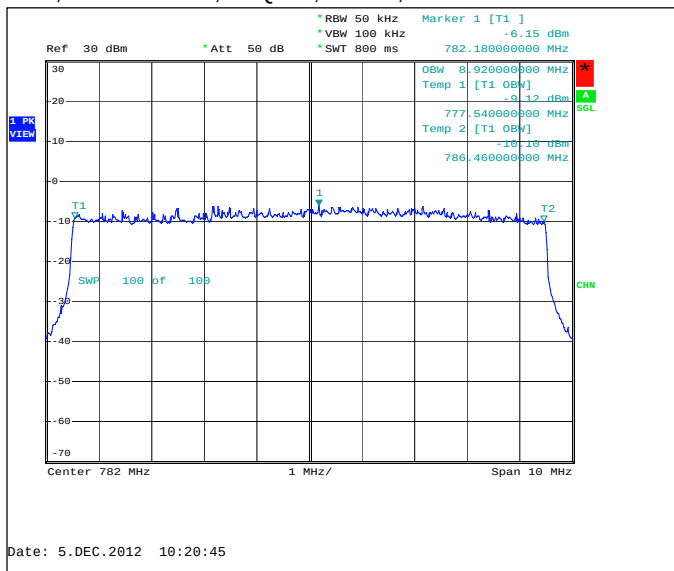
FDD, CBW 5MHz, QPSK, 25 RB, Channel 23230 / 782.0 MHz



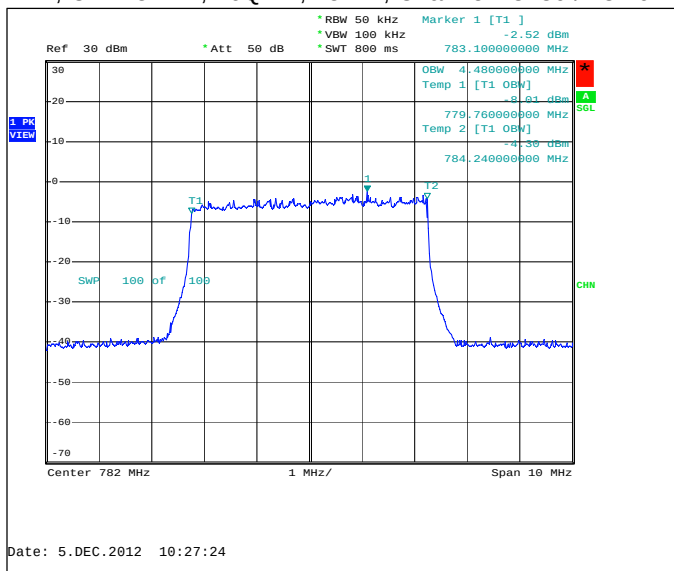
FDD, CBW 10MHz, QPSK, 50 RB, Channel 23230 / 782.0 MHz



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



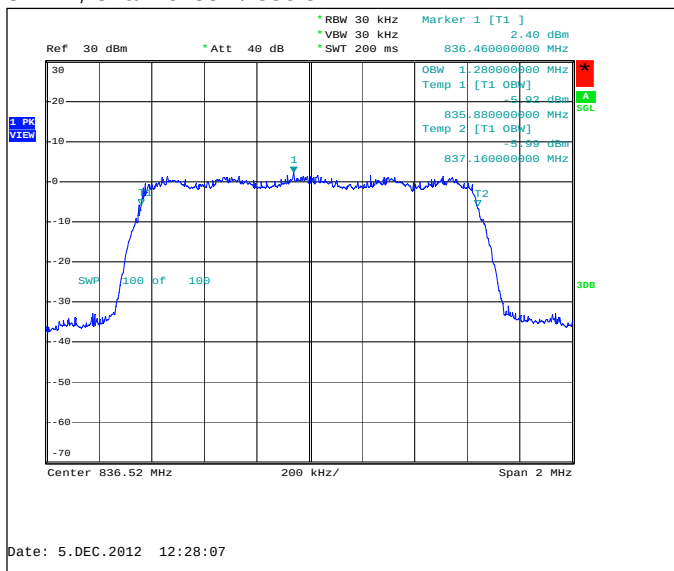
FDD, CBW 5MHz, 16QAM, 25 RB, Channel 23230 / 782.0 MHz



4.9. CDMA 800 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
CDMA	PASSED

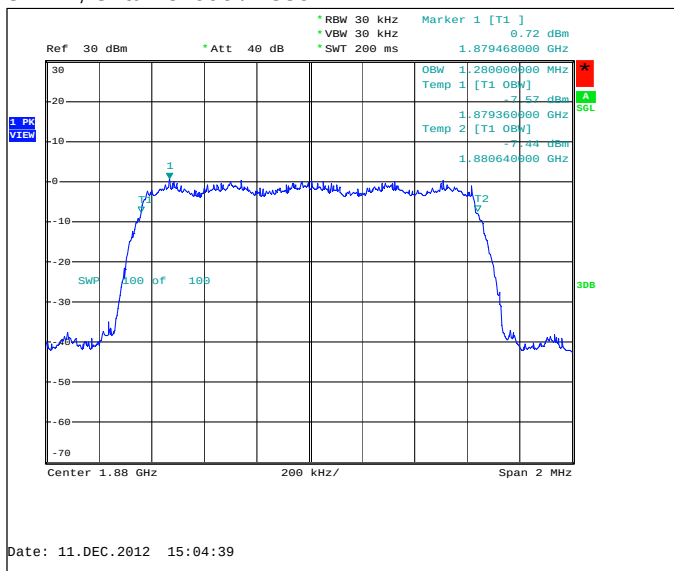
CDMA, Channel 384 / 836.52 MHz



4.10. CDMA 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
CDMA	PASSED

CDMA, Channel 600 / 1880 MHz

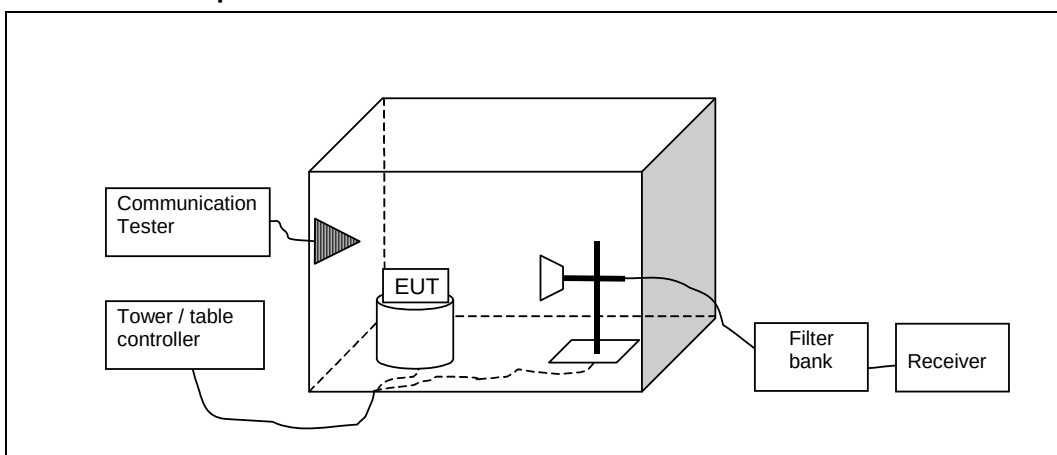


5. Spurious radiated emissions

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

EUT with DUT number	RM-860, DUT 17007
Accessories with DUT numbers	WH-902, DUT 17006 ; AC-50U, DUT 17005
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101.4
Date of measurements	10-Dec-2012
Measured by	Kalle Hannila

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 Upper	30 – 8000	-13 (RBW = 100 kHz, ERP)
	763-775 and 793-805	-35 (RBW = 6.25 kHz, ERP)
	1559 – 1610	-40 (RBW = 1 MHz)
	1559 – 1610	-50 (RBW = 700 Hz)
CDMA800 / GSM850 / WCDMA850	30 - 8500	-13
LTE1700 / CDMA1900 / GSM1900 / WCDMA1900	30 - 18000	-13

5.3. GSM850 TX test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
848.6	-55.56	0.00278	-54.12	-1.44	VERTICAL	PASSED
848.62	-54.54	0.00352	-52.76	-1.78	HORIZONTAL	PASSED
848.664	-54.92	0.00322	-53.47	-1.45	VERTICAL	PASSED
848.682	-55.88	0.00258	-54.1	-1.78	HORIZONTAL	PASSED
848.803	-55.28	0.00296	-53.48	-1.8	HORIZONTAL	PASSED
2509.659	-52.08	0.00619	-63.71	11.63	HORIZONTAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.4. GSM1900 TX test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
9697.876	-40.41	0.09097	-66.03	25.62	HORIZONTAL	PASSED
9704.93	-40.81	0.08308	-66.51	25.7	VERTICAL	PASSED
9843.046	-40.11	0.09752	-65.41	25.3	VERTICAL	PASSED
9944.689	-40.04	0.09913	-65.9	25.86	HORIZONTAL	PASSED
9948.697	-40.57	0.0878	-66.06	25.49	VERTICAL	PASSED
10014.709	-39.67	0.10794	-65.34	25.67	VERTICAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.5. WCDMA 1900 (Band II) test results

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
9336.974	-40.45	0.09012	-65.68	25.23	HORIZONTAL	PASSED
9852.365	-39.52	0.11161	-64.51	24.99	HORIZONTAL	PASSED
9888.717	-39.07	0.12399	-64.11	25.04	VERTICAL	PASSED
9948.998	-38.84	0.13056	-64.82	25.98	HORIZONTAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.6. WCDMA 850 (Band V) test results

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
847.68	-45.53	0.02797	-80.19	34.66	HORIZONTAL	PASSED
848.309	-45.68	0.02706	-80.28	34.6	HORIZONTAL	PASSED
2433.687	-52.48	0.00565	-63.04	10.56	HORIZONTAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.7. GSM850-E1 TX test results

Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
848.6	-64.81	0.00033	-63.04	-1.77	HORIZONTAL	PASSED
848.678	-64.9	0.00032	-63.12	-1.78	HORIZONTAL	PASSED
848.749	-64.62	0.00035	-63.16	-1.46	VERTICAL	PASSED
848.981	-65.32	0.00029	-63.82	-1.5	VERTICAL	PASSED
849.076	-65.11	0.00031	-63.26	-1.85	HORIZONTAL	PASSED
2495.651	-52.81	0.00523	-64.28	11.47	HORIZONTAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.8. GSM1900-E1 TX test results

Peak detector

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
9728.397	-41.09	0.07784	-66.64	25.55	HORIZONTAL	PASSED
9733.327	-40.28	0.0938	-65.84	25.56	VERTICAL	PASSED
9832.886	-41.35	0.07337	-66.79	25.44	VERTICAL	PASSED
9910.561	-39.62	0.10919	-64.96	25.34	VERTICAL	PASSED
9952.725	-39.53	0.11143	-65.43	25.9	HORIZONTAL	PASSED
10003.908	-39.37	0.11574	-65.33	25.96	VERTICAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.9. CDMA800 TX test results

Channel 384 / 836.52 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
1672.525	-53.04	0.00497	-59.13	6.09	VERTICAL	PASSED
1672.926	-52.26	0.00594	-58.36	6.1	VERTICAL	PASSED
1673.848	-54.44	0.0036	-60.55	6.11	VERTICAL	PASSED
2497.735	-52.45	0.00568	-63.8	11.35	HORIZONTAL	PASSED
3343.066	-58.35	0.00146	-65.32	6.97	VERTICAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.10. CDMA1900 TX test results

Channel 600 / 1880 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
9336.934	-40.33	0.09264	-65.33	25	VERTICAL	PASSED
9438.617	-40.08	0.09808	-64.88	24.8	HORIZONTAL	PASSED
9739.98	-39.9	0.10226	-65.46	25.56	VERTICAL	PASSED
9903.387	-40.01	0.0997	-65.27	25.26	VERTICAL	PASSED
9996.172	-39.16	0.12131	-64.91	25.75	VERTICAL	PASSED
10003.948	-38.99	0.12615	-65.15	26.16	HORIZONTAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

5.11. 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	-58	0.00159	-67.6	9.6	HORIZONTAL	PASSED
5198.081	-43.32	0.0466	-55.76	12.44	HORIZONTAL	PASSED
6930.942	-54.16	0.00384	-73.32	19.16	VERTICAL	PASSED
8652.5	-53.66	0.0043	-76.54	22.88	HORIZONTAL	PASSED
10394.379	-49.69	0.01074	-76.55	26.86	HORIZONTAL	PASSED

Channel 20175 / 1732.5 MHz

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

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
3465.381	-57.12	0.00194	-66.72	9.6	HORIZONTAL	PASSED
5198.041	-44.88	0.03253	-57.32	12.44	HORIZONTAL	PASSED
6940	-54.17	0.00383	-73.63	19.46	VERTICAL	PASSED
8652.5	-53.66	0.0043	-76.54	22.88	HORIZONTAL	PASSED
10405	-49.61	0.01094	-76.54	26.93	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
750.541	-38.13	0.15389	-72.74	34.61	VERTICAL	PASSED
769.418	-71.04	8E-05	-107	35.96	VERTICAL	PASSED
804.976	-70.86	8E-05	-107	36.14	HORIZONTAL	PASSED
1564.341	-66.29	0.00023	-71.68	5.39	HORIZONTAL	PASSED
1575.531	-64.95	0.00032	-70.1	5.15	HORIZONTAL	PASSED
2352.874	-72.6	5E-05	-82.56	9.96	VERTICAL	PASSED
2984.95	-68.62	0.00014	-83.48	14.86	VERTICAL	PASSED
3118.721	-77.21	2E-05	-84.5	7.29	HORIZONTAL	PASSED
7988.517	-64.28	0.00037	-84.51	20.23	HORIZONTAL	PASSED

Channel 23230 / 782 MHz

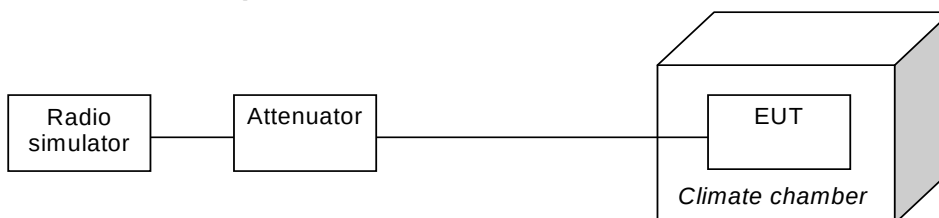
FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
751.984	-38.55	0.13954	-73.32	34.77	VERTICAL	PASSED
769.32	-71.05	8E-05	-107.01	35.96	VERTICAL	PASSED
804.976	-70.86	8E-05	-107	36.14	HORIZONTAL	PASSED
1564.982	-66.52	0.00022	-71.93	5.41	HORIZONTAL	PASSED
1575.731	-65.37	0.00029	-70.53	5.16	HORIZONTAL	PASSED
2352.232	-72.59	6E-05	-82.56	9.97	VERTICAL	PASSED
2985.03	-68.62	0.00014	-83.49	14.87	VERTICAL	PASSED
3127.739	-77.33	2E-05	-84.5	7.17	HORIZONTAL	PASSED
7978.657	-63.23	0.00048	-83.48	20.25	VERTICAL	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	RM-860, DUT 16892
Accessories with DUT numbers	WH-902, DUT 16564
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 40 / 101.5
Date of measurements	30-Nov-2012
Measured by	Sami Lehtonen

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. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880.00	-13.82000	-0.0074	PASSED
40	1880.00	-28.41000	-0.0151	PASSED
30	1880.00	-33.45000	-0.0178	PASSED
20	1880.00	-27.06000	-0.0144	PASSED
10	1880.00	-37.00000	-0.0197	PASSED
0	1880.00	-30.48000	-0.0162	PASSED
-10	1880.00	-12.79000	-0.0068	PASSED
-20	1880.00	-1.00000	-0.0005	PASSED
-30	1880.00	-1.00000	-0.0005	PASSED

6.4. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	836.60	-7.23000	-0.0086	PASSED
40	836.60	-8.72000	-0.0104	PASSED
30	836.60	-19.76000	-0.0236	PASSED
20	836.60	-20.66000	-0.0247	PASSED
10	836.60	1.74000	0.0021	PASSED
0	836.60	-20.73000	-0.0248	PASSED
-10	836.60	-4.97000	-0.0059	PASSED
-20	836.60	-14.53000	-0.0174	PASSED
-30	836.60	8.14000	0.0097	PASSED

6.5. WCDMA 1900 Test results

FDD, Channel 9400 / 1880.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880.00	-3.02124	-0.0016	PASSED
40	1880.00	-2.09045	-0.0011	PASSED
30	1880.00	-6.45447	-0.0034	PASSED
20	1880.00	-8.08716	-0.0043	PASSED
10	1880.00	-10.02502	-0.0053	PASSED
0	1880.00	-4.63867	-0.0025	PASSED
-10	1880.00	-5.38635	-0.0029	PASSED
-20	1880.00	-3.44849	-0.0018	PASSED
-30	1880.00	-5.34058	-0.0028	PASSED

6.6. WCDMA 850 Test results

FDD, Channel 4175 / 835.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	835.00	0.04578	0.0001	PASSED
40	835.00	1.99890	0.0024	PASSED
30	835.00	0.62561	0.0008	PASSED

20	835.00	-1.37329	-0.0016	PASSED
10	835.00	-0.91553	-0.0011	PASSED
0	835.00	-2.94495	-0.0035	PASSED
-10	835.00	-1.55640	-0.0019	PASSED
-20	835.00	0.06104	0.0001	PASSED
-30	835.00	0.24414	0.0003	PASSED

6.7. LTE700 Upper (Band 13) Test results

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

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	782.00	-1.55926	-0.002	PASSED
40	782.00	-3.08991	-0.004	PASSED
30	782.00	-1.05858	-0.0014	PASSED
20	782.00	-2.24590	-0.0029	PASSED
10	782.00	-0.67234	-0.0009	PASSED
0	782.00	-1.57356	-0.002	PASSED
-10	782.00	1.00136	0.0013	PASSED
-20	782.00	0.70095	0.0009	PASSED
-30	782.00	0.42915	0.0005	PASSED

6.8. LTE1700 (Band 4) Test results

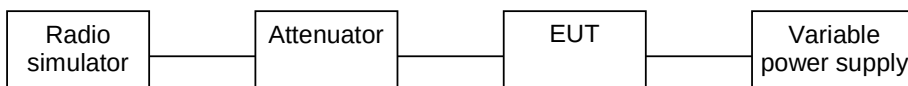
FDD, CBW 20MHz, QPSK, 100 RB, Channel 20175 / 1732.5 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1732.50	0.60081	0.0003	PASSED
40	1732.50	0.87261	0.0005	PASSED
30	1732.50	-1.00000	-0.0006	PASSED
20	1732.50	-1.00000	-0.0006	PASSED
10	1732.50	-1.00000	-0.0006	PASSED
0	1732.50	-1.00000	-0.0006	PASSED
-10	1732.50	-1.00000	-0.0006	PASSED
-20	1732.50	-1.00000	-0.0006	PASSED
-30	1732.50	-1.00000	-0.0006	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	RM-860, DUT 16892
Accessories with DUT numbers	WH-902, DUT 16564
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 40 / 101.5
Date of measurements	02-Dec-2012
Measured by	Sami Lehtonen

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. LTE1700 (Band 4) Test results

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

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1732.50	2.86102	0.0017	PASSED
Nominal / 3.8	1732.50	1.60217	0.0009	PASSED
Battery cut-off point / 3.6	1732.50	0.60081	0.0003	PASSED

7.4. LTE700 Upper (Band 13) Test results

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

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	782.00	-1.41621	-0.0018	PASSED
Nominal / 3.8	782.00	-2.94685	-0.0038	PASSED
Battery cut-off point / 3.6	782.00	-2.44618	-0.0031	PASSED

7.5. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1880.00	-7.23000	-0.0038	PASSED
Nominal / 3.8	1880.00	-28.09000	-0.0149	PASSED
Battery cut-off point / 3.6	1880.00	-13.75000	-0.0073	PASSED

7.6. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	836.60	-24.34000	-0.0291	PASSED
Nominal / 3.8	836.60	-28.73000	-0.0343	PASSED
Battery cut-off point / 3.6	836.60	-23.44000	-0.028	PASSED

8. Test Equipment

8.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
6038	Data Logger	Testo 580	Testo	-
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	-
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	-
2389	Signal Generator	SMJ 100A	R&S	-
6009	GPS Antenna	SA-700	Chronos	-
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	-
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	-
6015	Receiver	ESI	R&S	-
2059	V-network	ESH3-Z6	R&S	-
6044	V-network	ESH3-Z6	R&S	-
1759	LISN 50 µH	ESH3-Z5	R&S	-
2390	Directional Coupler	DC2600	AR	-
1916	Communication Tester	CMTA84	R&S	-
6012	CDN	CDN USB/c	Teseq	-
2388	Bluetooth Tester	CBT	R&S	-
6046	Attenuator 10dB	8493C	Agilent	-
6047	Attenuator 20dB	8493C	Agilent	-
6036	Data Logger	175-H2	Testo	-
6045	Power Splitter	11667B	Agilent	-
6039	USB Interface	5541765	Testo	-
10479	Communication Tester	CMW500	R&S	-
6094	Communication Tester	CMW500	R&S	-
6096	EMC Analyzer	E7405A	HP	-
6098	Signal Generator	8648C	Agilent	-
6103	Bluetooth tester	CBT	R&S	-
6113	Signal Generator	SMF100A	R&S	-
6120	Thermal Chamber	WT 20/40	Weiss	-
6121	Power Splitter	HP11667B	Agilent	-
6122	Power Splitter	HP11667B	Agilent	-
6134	Attenuator 10dB	BW-S10-2W263+	Mini-Circuits	-
6136	Attenuator 20dB	BW-S20-2W263+	Mini-Circuits	-
2359	Temperature Test Chamber	VT4002	Vötsch	-
2347	Communication Tester	CMU200	R&S	-
2180	Communication Tester	CMU200	R&S	-
2156	Communication Tester	CMU200	R&S	-
1999	Receiver	ESIB26	R&S	-
2352	Spectrum Analyzer	FSP-30	R&S	-
2097	Pulse Limiter	ESH3-Z2	R&S	-
2039	Power Supply	PL330QMD	Thurlby	-
1992	Signal Generator	83630B	Agilent	-
2206	Signal Generator	SMX	R&S	-

8.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
2391	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
6038	Data Logger	Testo 580	Testo	-
6014	Substitute Calibration Cable	Sucoflex 104PB	Suhner	-
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	-
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	-
2389	Signal Generator	SMJ 100A	R&S	-
6009	GPS Antenna	SA-700	Chronos	-

Eq. No	Equipment	Type	Manufacturer	Used in
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	-
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	-
-	RF immunity / Emission Software	EMC32	R&S	-
1917	Communication Tester	CMTA84	R&S	-
2388	Bluetooth Tester	CBT	R&S	-
6037	Data Logger	175-H2	Testo	-
6039	USB Interface	5541765	Testo	-
6087	Antenna	BBHA 9120D	Scharzbeck	-
6088	Antenna	VUBA 9117	Scharzbeck	-
6089	Antenna	HFH2-Z2	R&S	-
10479	Communication Tester	CMW500	R&S	-
6094	Communication Tester	CMW500	R&S	-
6103	Bluetooth tester	CBT	R&S	-
6113	Signal Generator	SMF100A	R&S	-
6115	Open switch and control unit	OSP 130	R&S	-
6116	Open switch and control unit	OSP 150	R&S	-
6130	Notch Filter	WRCD1880-1.1.25/50-10SS	Wainwright	-
6131	Notch Filter	WRCT902.4-0.4/40-8SS	Wainwright	-
6135	Notch Filter	WRCJV2531/2539-2523/2547-60/12SS	Wainwright	-
2140	Antenna	EMCO93110B	EMCO	-
2142	Antenna	3146	EMCO	-
2357	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	-
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22
2347	Communication Tester	CMU200	R&S	-
2180	Communication Tester	CMU200	R&S	-
2156	Communication Tester	CMU200	R&S	-
2176	CDN	CDN 801-M3	Lüthi	-
2027	CDN	M2 (modified) DC1	MEB	-
2028	CDN	M3 (modified) DC2	MEB	-
1984	Antenna	BBHA 9120 D	Schwarzbeck	-
6017	Antenna	SBA 9113	Schwarzbeck	-
2009	Signal Generator	SMP 22	R&S	-
2029	Power Supply	PL330	Thurlby	-
2361	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	Euroshield	-
2353	Receiver	ESIB26	R&S	-
2135	CDN	CDN 801-M3	Lüthi	-