

FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RM-779_04.docx	Date of Report:	16-Aug-2011
Number of pages:	24	Customer's Contact person:	Jyrki Juvani
Testing laboratory:	TCC Nokia Salo Laboratory P.O.Box(86) Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220	Customer:	Nokia Corporation P.O. Box 300 Yrtypellontie 6 FIN-90230 OULU, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 58300
FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-779 / Battery BP-3L		
FCC ID:	LJPRM-779	IC:	661E-RM779
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Parts 22, 24 and 27, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009) and RSS-139 (Issue 2, February 2009). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Kalle Hannila, Engineer, EMC

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

Date of receipt	27-Jul-2011
Testing completed	13-Sep-2011
The customer's contact person	Jyrki Juvani
Test Plan referred to	T:\Projects\RM-779\TestPlan\RS_TestPlan_RM-779.xls
Notes	-
Document name	T:\Projects\RM-779\EMC\FCC22&24&27_RM-779_04.docx

1.1. EUT and Accessory Information

The EUT is a 9-band (GSM850/900/1800/1900 and WCDMA Band I/II(1900)/IV(1700)/V(850)/VIII) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-779	004402135684813	0503	-	111.010.0705	15791
Phone	RM-779	004402135684698	0503	-	111.010.0705	15921
Battery	BP-3L	3932131235140111384;0670635	-	-	-	15762

1.2. Summary of Test Results

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
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	NP
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

GSM 1900:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	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	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

WCDMA 850 (Band V):

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP

2 (24)

§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	NP
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

WCDMA 1700 (Band IV):

Section in CFR 47	Section in RSS-GEN or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§27.50(d)(2)	6.4	Radiated RF output power	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§27.53(g)	6.5	Band edge compliance	PASSED
§27.53(g), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§27.53(g), §2.1053	6.5	Spurious radiated emissions	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

WCDMA 1900 (Band II):

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	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	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

The test was not performed by the TCC Nokia Laboratory.

CONTENTS

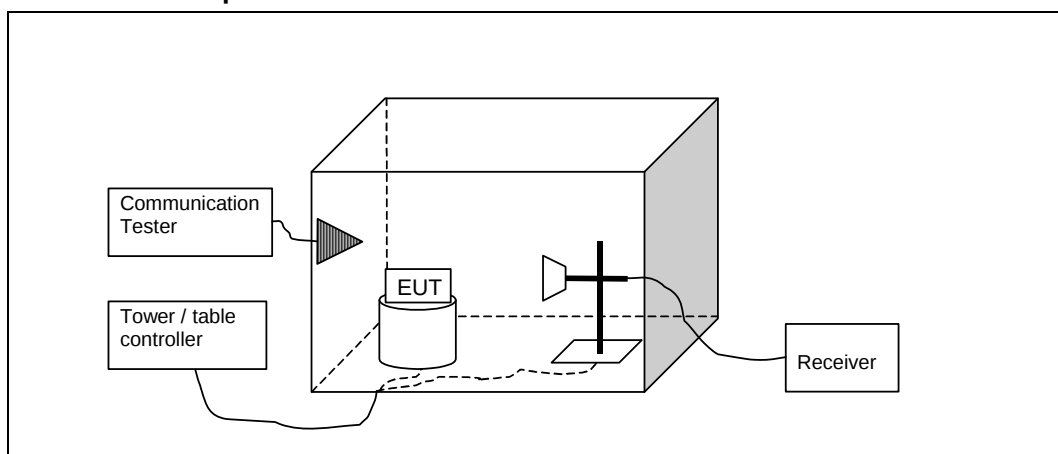
1. Summary for FCC Part 22/24/27 Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Radiated RF output power	
(FCC §22.913(a), §24.232(b), §27.50(d)(2), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4)	5
2.2. Test method and limit	5
1.1 GSM850 TX Test results	6
1.2 GSM1900 TX Test results	6
1.3 WCDMA 1900 (Band II) TX Test results	6
1.4 WCDMA 1700 (Band IV) TX Test results	7
1.5 WCDMA 850 (Band V) TX Test results	7
2.3. WCDMA 1700 (Band IV) TX Test results	7
3. Band edge compliance	
(FCC §22.917(a), 24.238(a), §27.53(g), RSS-132 4.5, RSS-133 6.5, RSS-139 6.5)	8
3.2. Test method and limit	8
3.3. GSM850 Test results	9
3.4. GSM1900 Test results	13
3.5. Test method and limit	19
3.6. WCDMA 1900 (Band II) Test results	19
3.7. WCDMA 1700 (Band IV) Test results	21
3.8. WCDMA 850 (Band V) Test results	23

2. Radiated RF output power

(FCC §22.913(a), §24.232(b), §27.50(d)(2), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4)

EUT with DUT number	RM-779, DUT 15791, DUT 15921
Accessories with DUT numbers	BP-3L, DUT 15762
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 55 / 101.6
Date of measurements	12-Sep-2011
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. Substitution values at each frequencies are measured beforehand and saved to the test software.

The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST_TX} - P_{SUBST_RX} - L_{SUBST_CABLES} + G_{SUBST_TX_ANT}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain. P_{SUBST_TX} is signal generator level, P_{SUBST_RX} is receiver level, L_{SUBST_CABLES} is cable losses including both TX and RX cables and $G_{SUBST_TX_ANT}$ is substitution antenna gain.

The measurement results are obtained as described below:

$$P [dBm] = P_{MEAS} + A_{TOT}$$

Where P_{MEAS} is receiver reading in dBm and A_{TOT} is total correction factor including cable loss and substitution correction ($A_{TOT} = L_{CABLES} + A_{SUBST}$).

Limits for radiated RF output power measurements

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

1.1 GSM850 TX Test results

GSM mode

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	29.45	0.881	-5.66	-10	-52.1	-3.39	3.6	HORIZONTAL	PASSED
190 / 836.6	29.76	0.946	-4.53	-10	-51.53	-3.54	3.7	HORIZONTAL	PASSED
251 / 848.8	29.48	0.887	-3.76	-10	-50.56	-3.62	3.7	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

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	29.91	0.979	-5.2	-10	-52.1	-3.39	3.6	HORIZONTAL	PASSED
190 / 836.6	27.86	0.611	-6.43	-10	-51.53	-3.54	3.7	HORIZONTAL	PASSED
251 / 848.8	26.81	0.480	-6.43	-10	-50.56	-3.62	3.7	HORIZONTAL	PASSED

1.2 GSM1900 TX Test results

GSM mode

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	30.03	1.007	-16.07	-10	-51.3	10.4	5.6	HORIZONTAL	PASSED
661 / 1880	30.47	1.114	-15.66	-10	-51.43	10.4	5.7	HORIZONTAL	PASSED
810 / 1909.8	29.51	0.893	-16.73	-10	-51.54	10.4	5.7	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

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	30.16	1.038	-15.94	-10	-51.3	10.4	5.6	HORIZONTAL	PASSED
661 / 1880	29.37	0.865	-16.76	-10	-51.43	10.4	5.7	HORIZONTAL	PASSED
810 / 1909.8	28.51	0.710	-17.73	-10	-51.54	10.4	5.7	HORIZONTAL	PASSED

1.3 WCDMA 1900 (Band II) 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
-----------------------	------------	----------	------------------	----------------------	----------------------	--------------------------	------------------------	--------------	--------

9262 / 1852.4	24.68	0.294	-21.26	-10	-51.5	10.04	5.6	HORIZONTAL	PASSED
9400 / 1880	25.62	0.365	-20.15	-10	-51.43	10.04	5.7	HORIZONTAL	PASSED
9538 / 1907.6	24.07	0.255	-21.84	-10	-51.57	10.04	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
9262 / 1852.4	20.99	0.126	-24.95	-10	-51.5	10.04	5.6	HORIZONTAL	PASSED
9400 / 1880	22.14	0.164	-23.63	-10	-51.43	10.04	5.7	HORIZONTAL	PASSED
9538 / 1907.6	20.8	0.120	-25.11	-10	-51.57	10.04	5.7	HORIZONTAL	PASSED

1.4 WCDMA 1700 (Band IV) 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
1392 / 1712.4	26.37	0.434	-19.4	-10	-51.1	9.97	5.3	HORIZONTAL	PASSED
1420 / 1740	26.73	0.471	-19.71	-10	-51.9	9.94	5.4	HORIZONTAL	PASSED
1432 / 1752.6	27.75	0.596	-18.45	-10	-51.84	9.86	5.5	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
1392 / 1712.4	23.02	0.200	-22.75	-10	-51.1	9.97	5.3	HORIZONTAL	PASSED
1420 / 1740	23.57	0.228	-22.87	-10	-51.9	9.94	5.4	HORIZONTAL	PASSED
1432 / 1752.6	24.33	0.271	-21.87	-10	-51.84	9.86	5.5	HORIZONTAL	PASSED

1.5 WCDMA 850 (Band V) 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
4132 / 826.4	23.59	0.229	-11.08	-10	-51.67	-3.4	3.6	VERTICAL	PASSED
4183 / 836.6	23.6	0.229	-10.28	-10	-51.08	-3.5	3.7	VERTICAL	PASSED
4233 / 846.6	23.8	0.240	-9.45	-10	-50.45	-3.5	3.7	VERTICAL	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
4132 / 826.4	20.21	0.105	-14.46	-10	-51.67	-3.4	3.6	VERTICAL	PASSED
4183 / 836.6	20.35	0.108	-13.53	-10	-51.08	-3.5	3.7	VERTICAL	PASSED
4233 / 846.6	19.97	0.099	-13.28	-10	-50.45	-3.5	3.7	VERTICAL	PASSED

2.3. WCDMA 1700 (Band IV) TX Test results

Peak Detector

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
1392 / 1712.4	26.09	0.406	-19.4	45.49	HORIZONTAL	PASSED
1420 / 1740	25.08	0.322	-19.71	44.79	HORIZONTAL	PASSED
1432 / 1752.6	26.58	0.455	-18.45	45.03	HORIZONTAL	PASSED

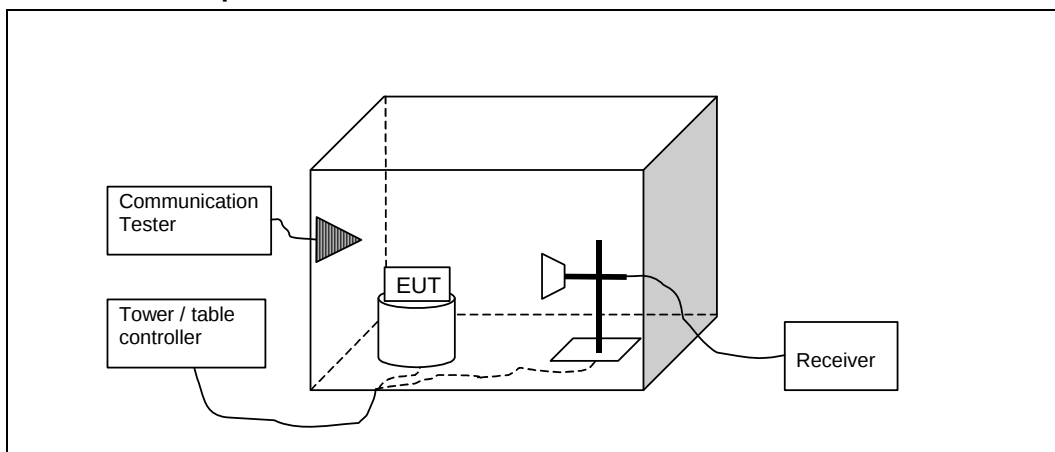
RMS Detector

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
1392 / 1712.4	22.74	0.188	-22.75	45.49	HORIZONTAL	PASSED
1420 / 1740	21.92	0.156	-22.87	44.79	HORIZONTAL	PASSED
1432 / 1752.6	23.16	0.207	-21.87	45.03	HORIZONTAL	PASSED

3. Band edge compliance (FCC §22.917(a), 24.238(a), §27.53(g), RSS-132 4.5, RSS-133 6.5, RSS-139 6.5)

EUT with DUT number	RM-779, DUT 15791
Accessories with DUT numbers	BP-3L, DUT 15762
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 55 / 101.6
Date of measurements	12-Sep-2011
Measured by	Kalle Hannila

3.1.1 Test Setup



3.2. Test method and limit

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

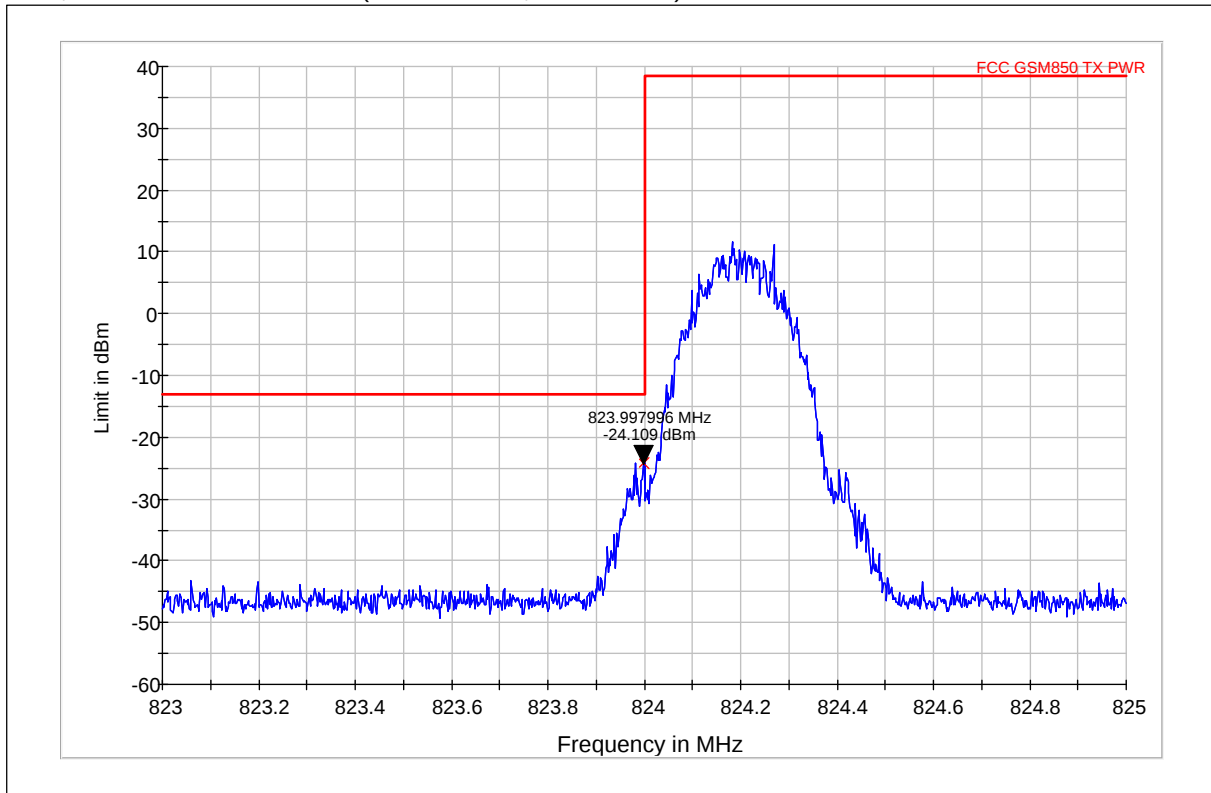
Limits for band edge compliance measurements

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

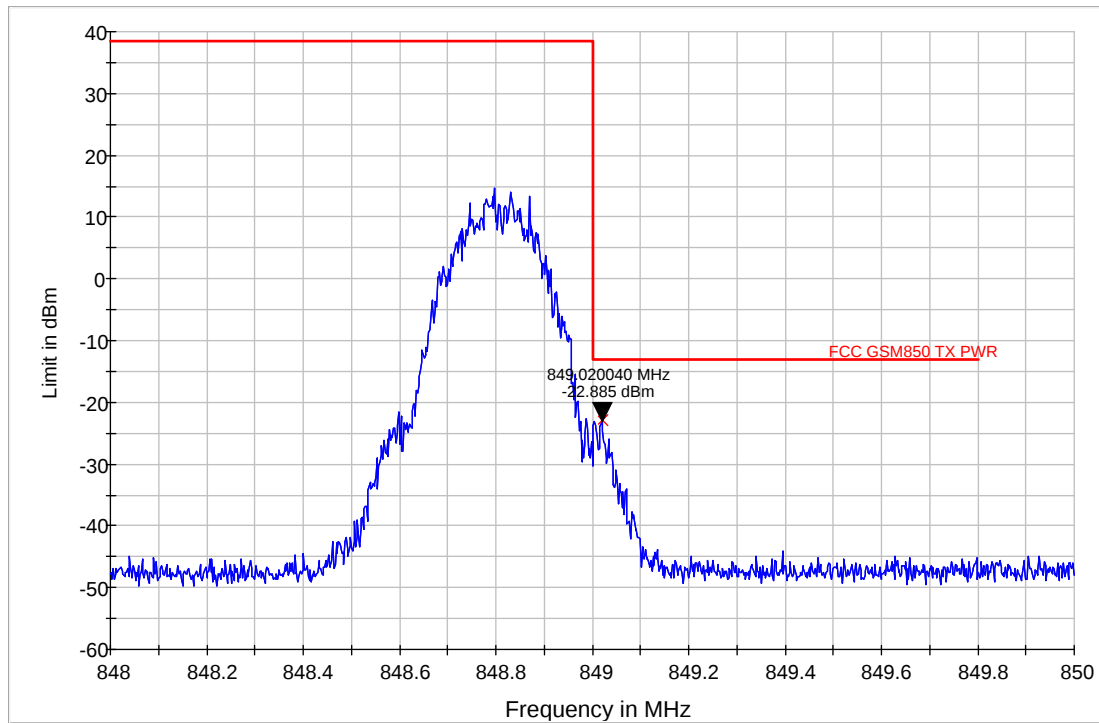
3.3. GSM850 Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]	Result
GSM	128 / 824.2	-24.11	PASSED
GSM	251 / 848.8	-22.88	PASSED
EGPRS	128 / 824.2	-21.347	PASSED
EGPRS	251 / 848.8	-23.197	PASSED

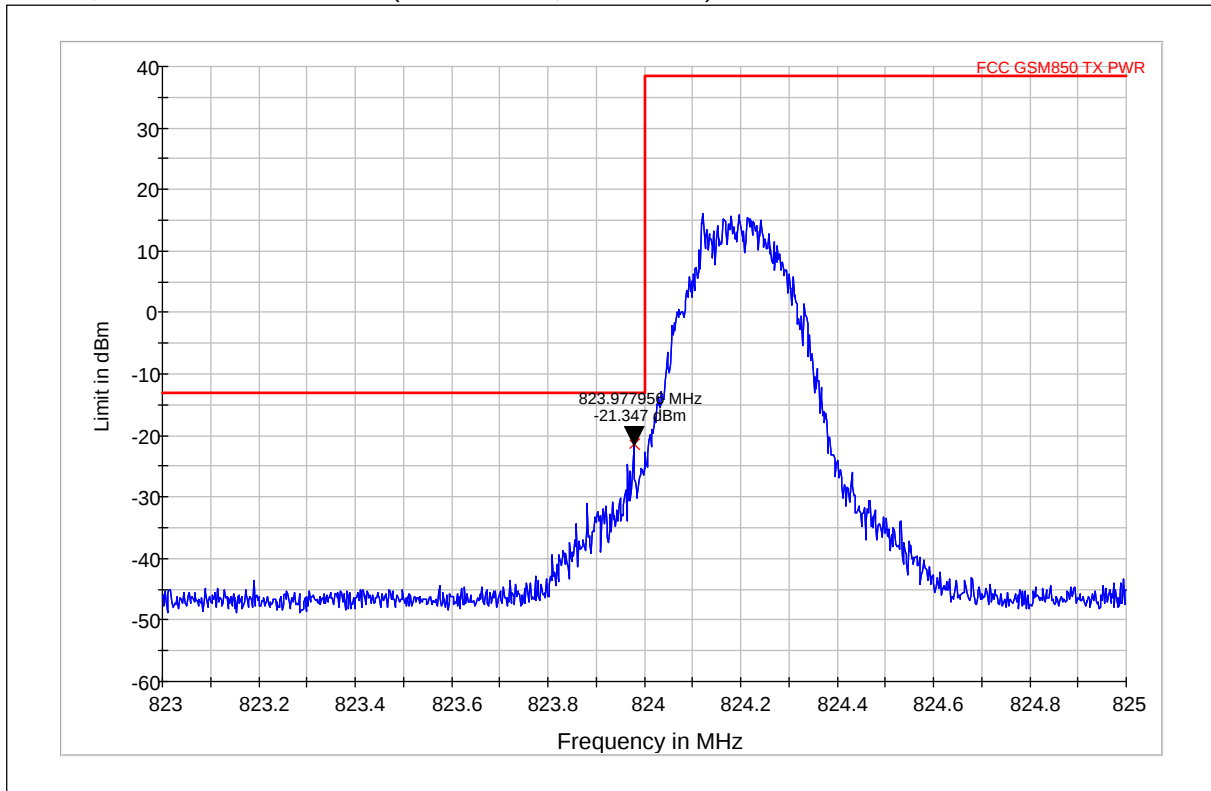
GSM, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



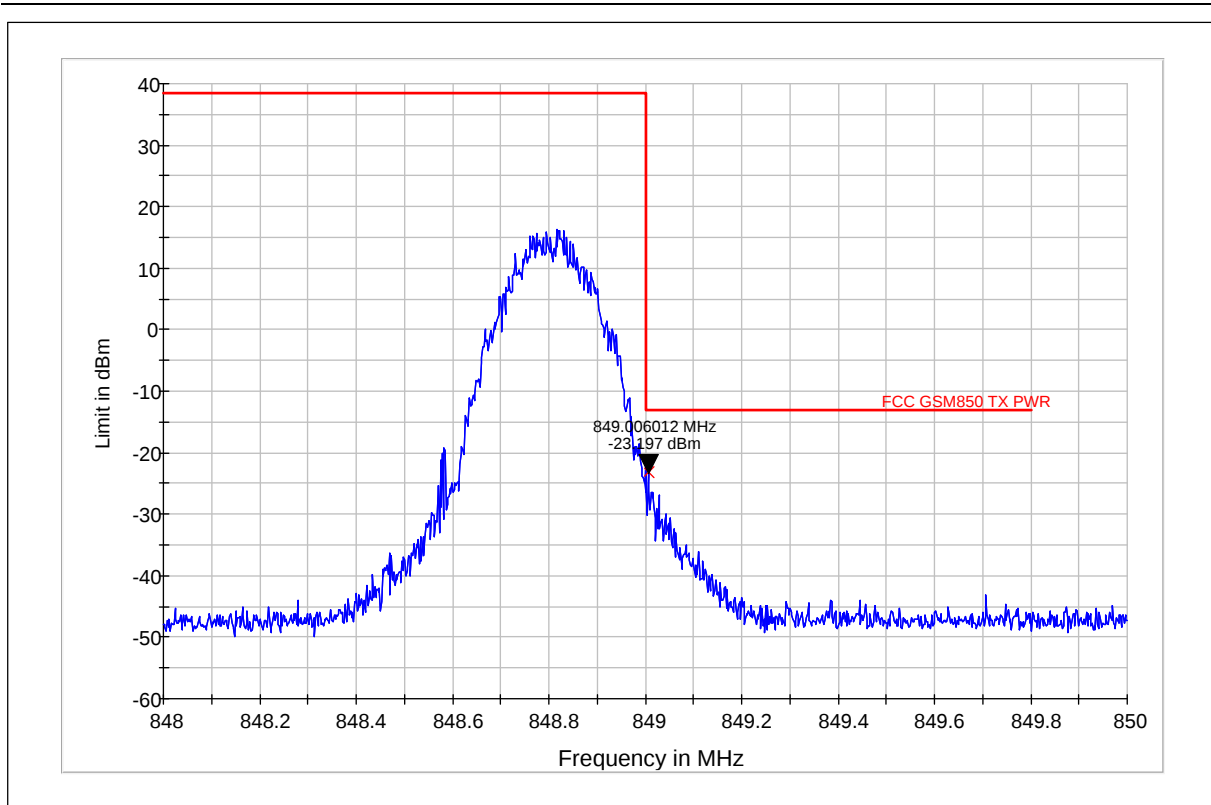
GSM, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



EGPRS, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



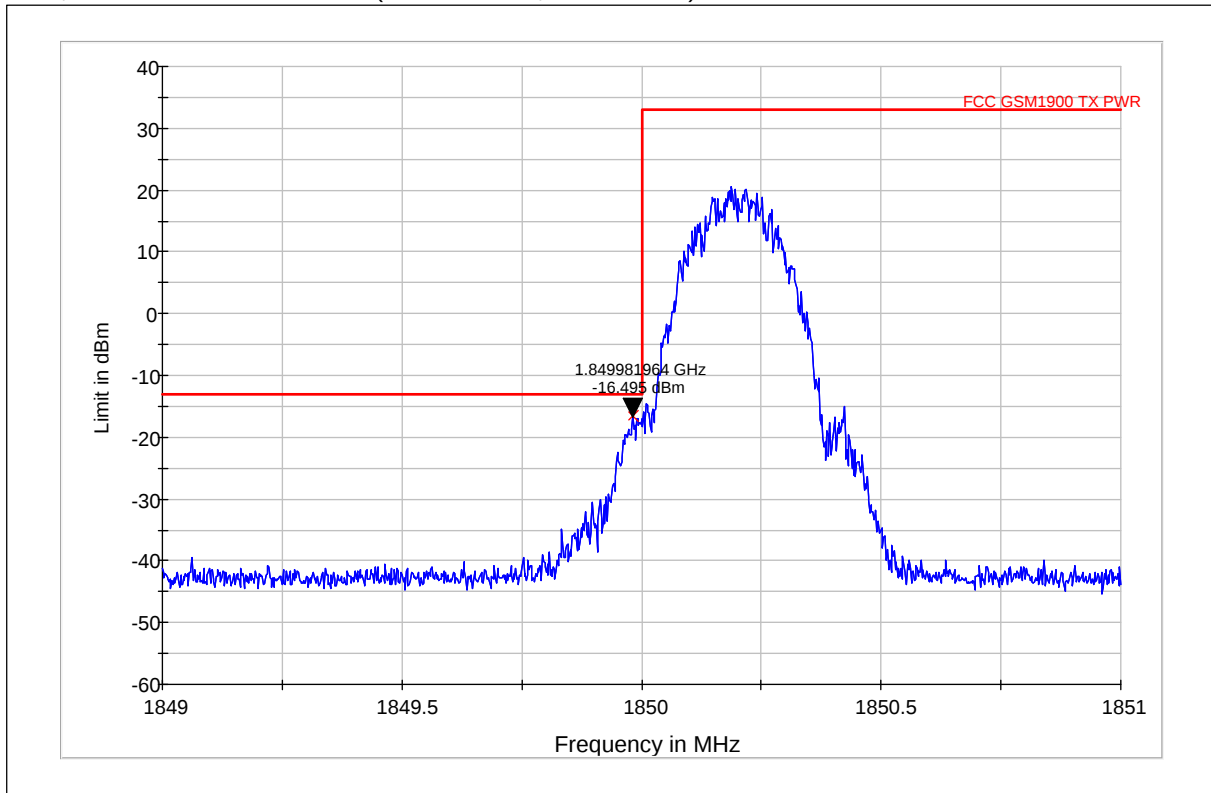
EGPRS, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



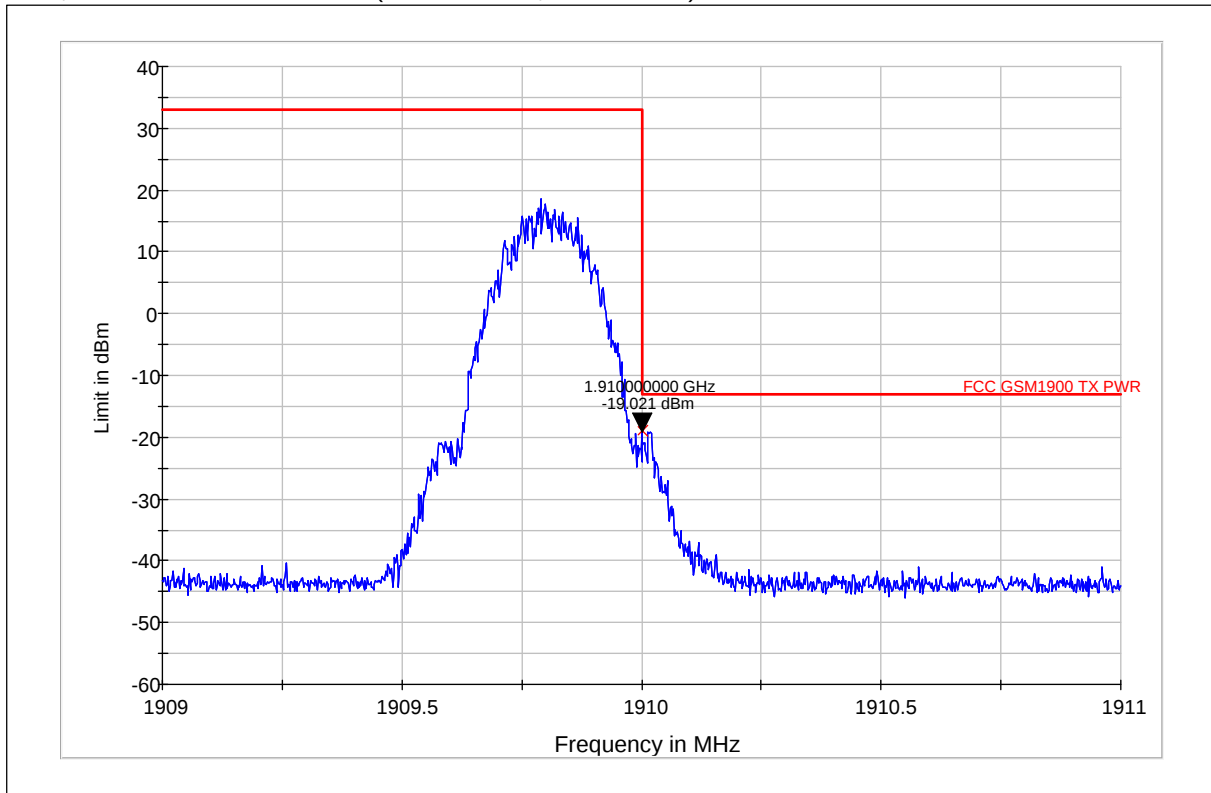
3.4. GSM1900 Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]	Result
GSM	512 / 1850.2	-16.49	PASSED
GSM	810 / 1909.8	-19.02	PASSED
EGPRS	512 / 1850.2	-32.02	PASSED
EGPRS	810 / 1909.8	-26.43	PASSED

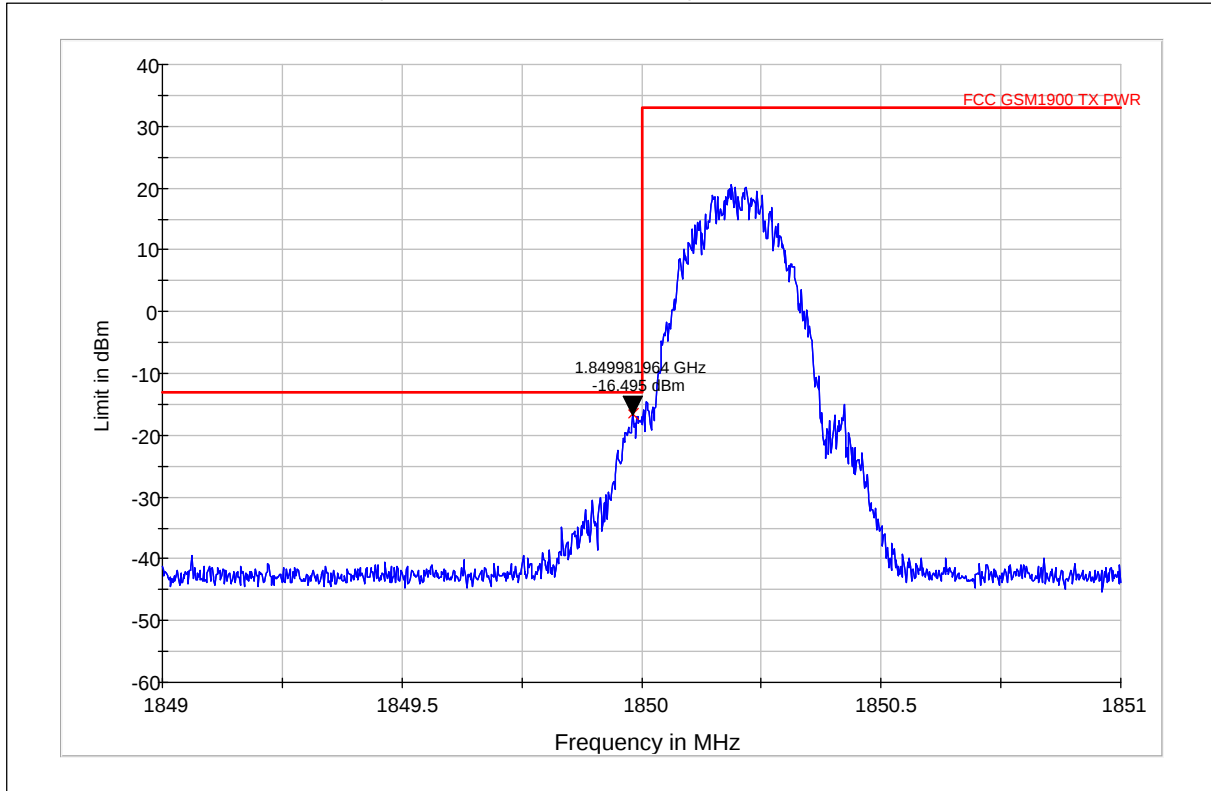
GSM, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



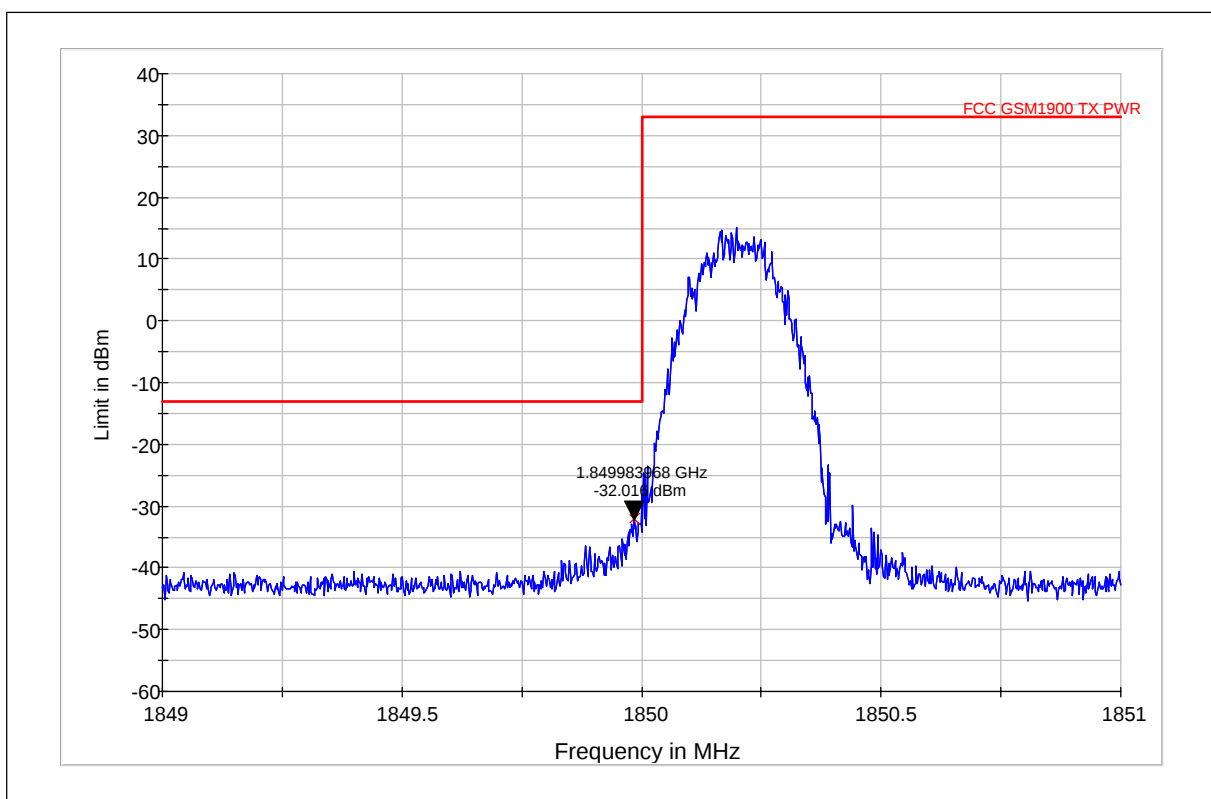
GSM, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)



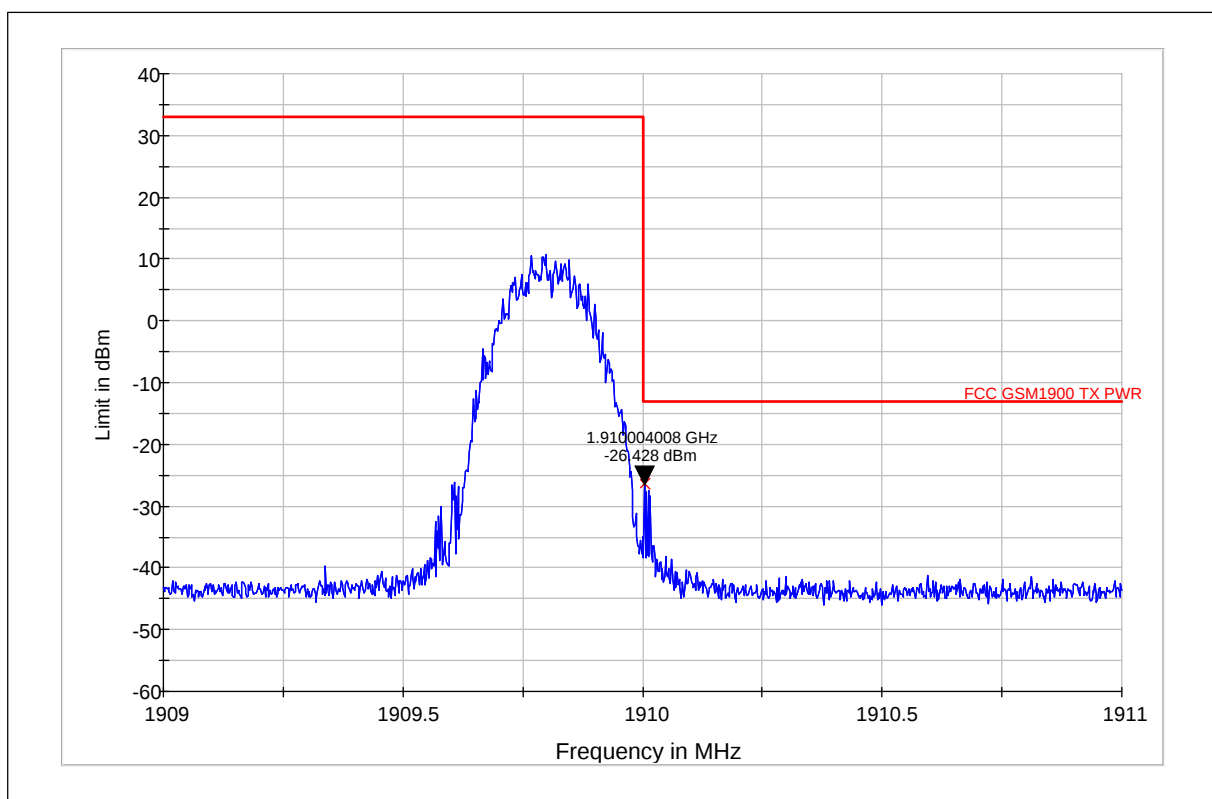
GSM, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



EGPRS, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



EGPRS, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)

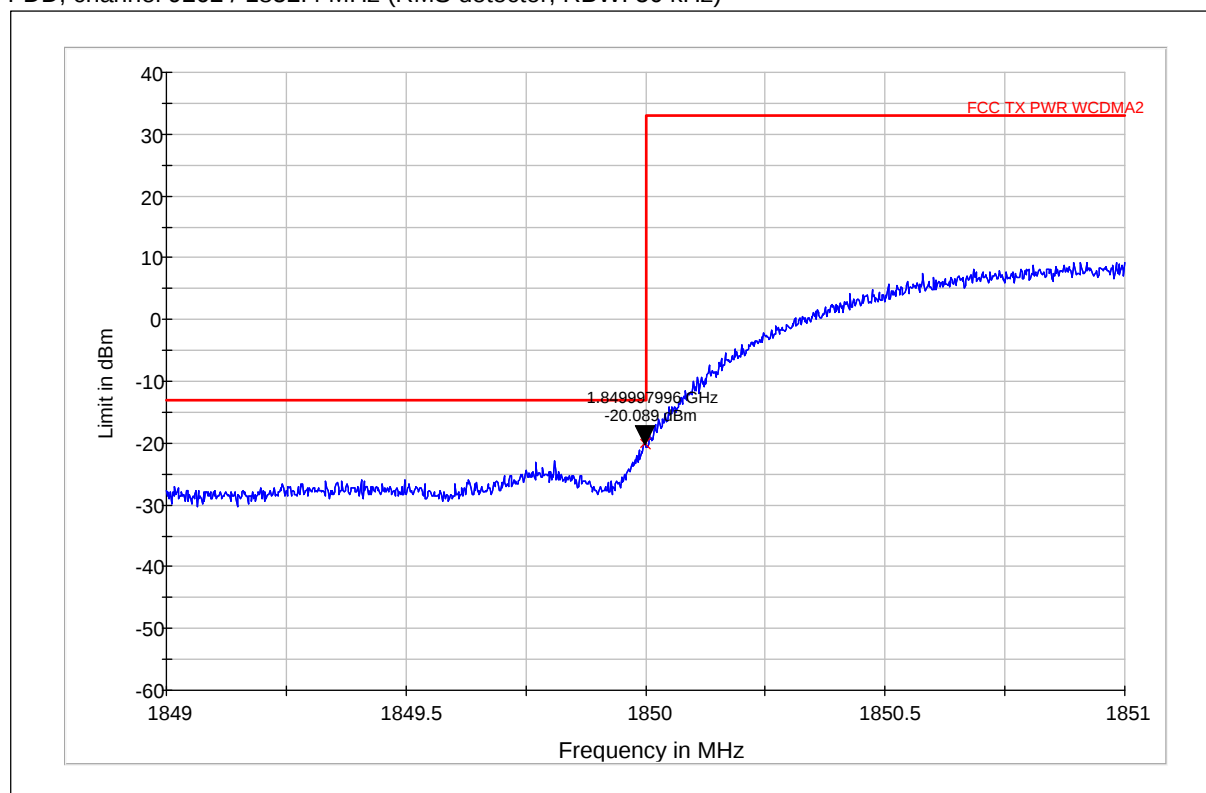


3.5. Test method and limit

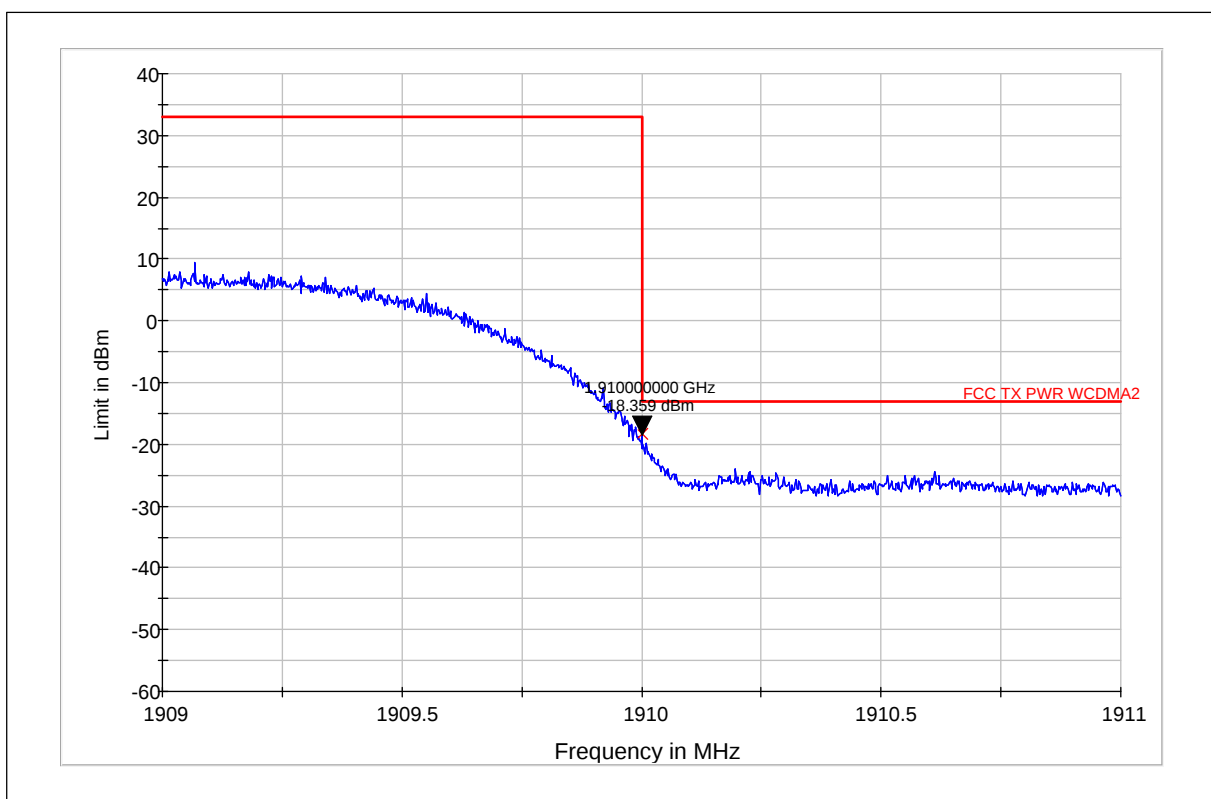
3.6. WCDMA 1900 (Band II) Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]	Result
FDD	9262 / 1852.4	-20.09	PASSED
FDD	9538 / 1907.6	-18.36	PASSED

FDD, channel 9262 / 1852.4 MHz (RMS detector, RBW: 50 kHz)



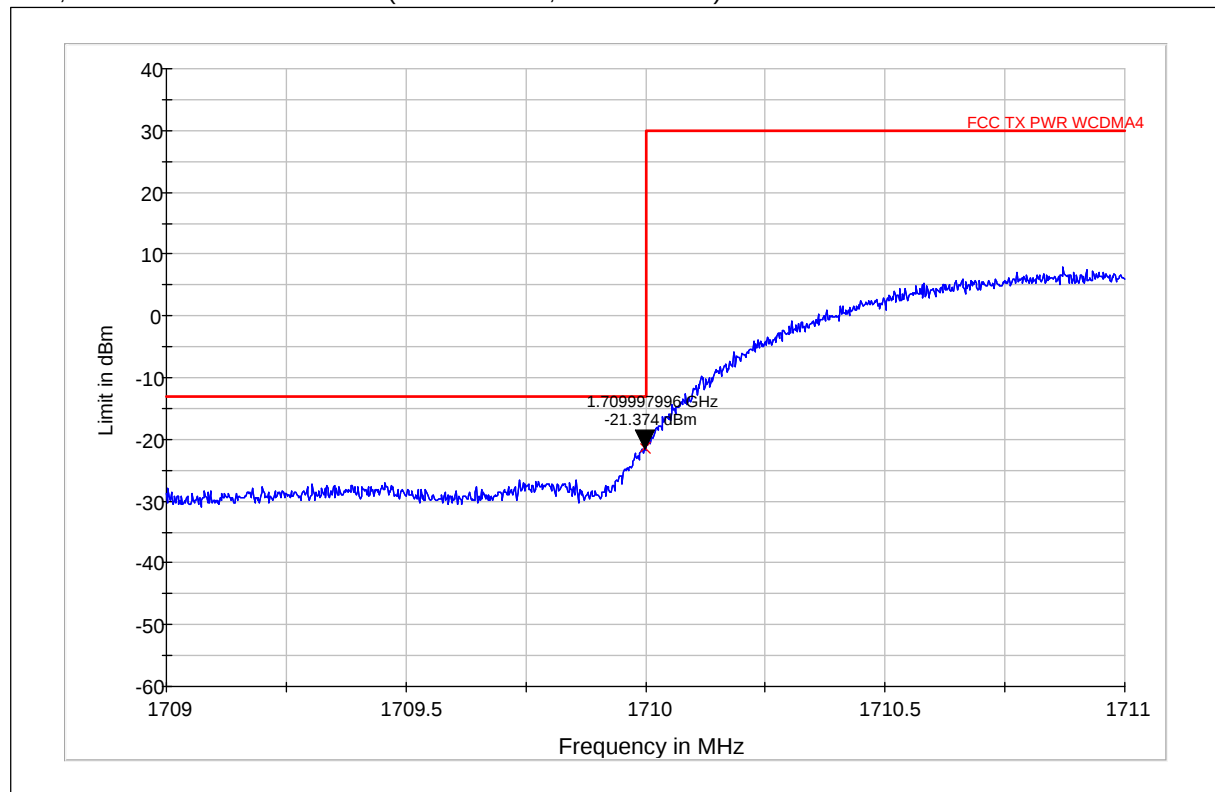
FDD, channel 9538 / 1907.6 MHz (RMS detector, RBW: 50 kHz)



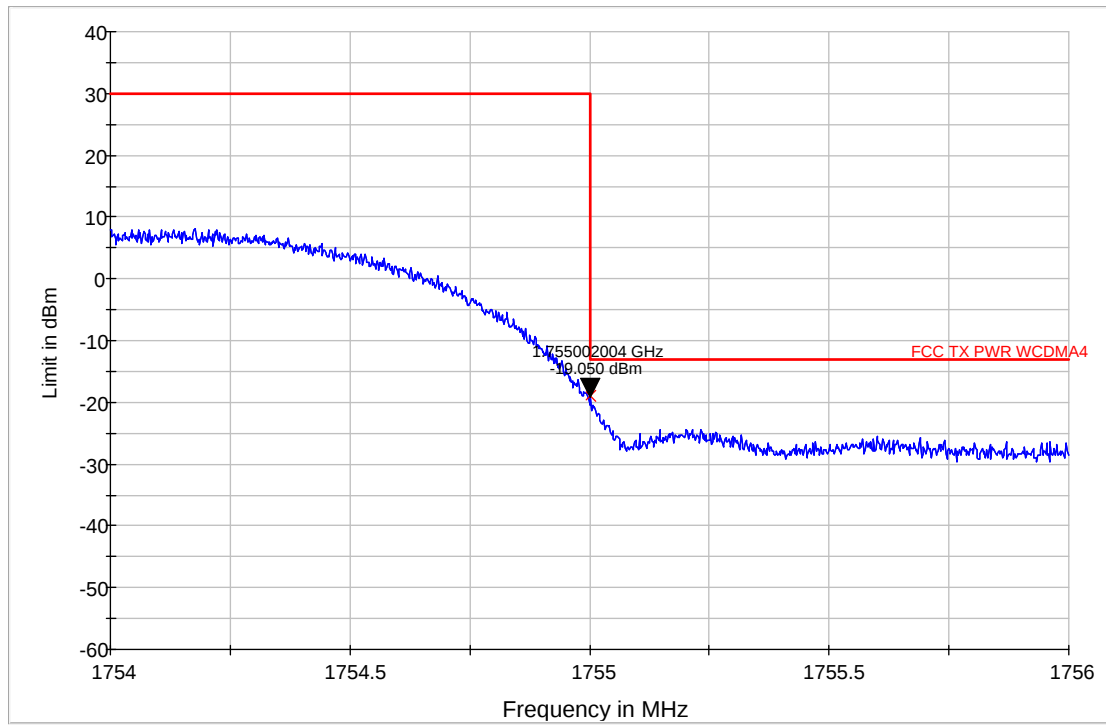
3.7. WCDMA 1700 (Band IV) Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]	Result
FDD	1312 / 1712.4	-21.37	PASSED
FDD	1513 / 1752.6	-19.05	PASSED

FDD, channel 1312 / 1712.4 MHz (RMS detector, RBW: 50 kHz)



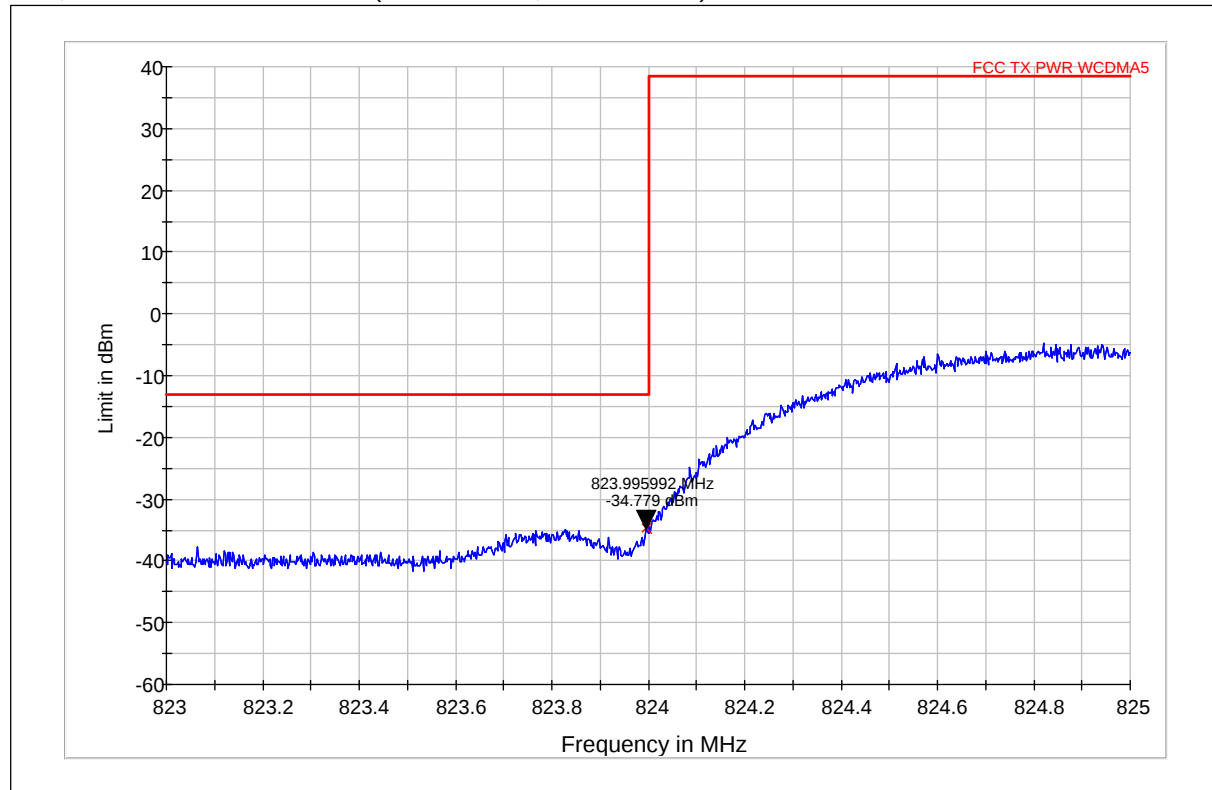
FDD, channel 1513 / 1752.6 MHz (RMS detector, RBW: 50 kHz)



3.8. WCDMA 850 (Band V) Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]	Result
FDD	4132 / 826.4	-34.78	PASSED
FDD	4233 / 846.6	-31.09	PASSED

FDD, channel 4132 / 826.4 MHz (RMS detector, RBW: 50 kHz)



FDD, channel 4233 / 846.6 MHz (RMS detector, RBW: 50 kHz)

