FCC Part 22/24 Compliance Test Report

Test Report no.:	FCC_Cellular_RM-1066_01	**Date of Report:**	21-Nov-2014
Number of pages:	35	**Customer's Contact person:**	Jari Rontu
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(86) Joensuunkatu 7E FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 71 80 44122
FCC listing no.: **IC recognition no.:**	533467 661V-1		
Tested devices/ accessories:	**Phone RM-1066 / Dummy Battery SD-238R / Headset WH-108 / Battery BV-T4B / AC-Charger AC-20**		
FCC ID:	PYABBB	**IC:**	-
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Parts 22/24, TIA-603-C-2004 and IC standards, RSS-GEN (Issue 3, December 2010), RSS-133 (Issue 6, January 2013), RSS-132 (Issue 3, January 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:	 Lehtonen Sami.K 2014.11.21 12:36:49 +02'00'		

Sami Lehtonen, Specialist, EMC

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

Date of receipt	29-Oct-2014
Testing completed	03-Nov-2014
The customer's contact person	Jari Rontu
Test Plan referred to	T:\Projects\RM-1066\TestPlan\RS_testplan_RM-1066.xlsm
Notes	-
Document name	T:\Projects\RM-1066\EMC\FCC_Cellular_RM-1066_01.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-1066	004402479216800ö059W1C9	1150	-	02148.00000.14431.29000	18694
Dummy Battery	SD-238R		v.1	-	-	18686
Headset	WH-108	4235VFA	-	-	-	18690
Phone	RM-1066	004402479216628	1150	-	02148.00000.14431.29000	18695
Battery	BV-T4B	4181574345C10103846ö0670764	-	-	-	18696
Ac-Charger	AC-20E	40904941566707114550675628	-	-	-	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	NP
N/A	6.4	Peak to average power ratio	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§24.238(a)	6.5	Band edge compliance	PASSED
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

GSM 850:

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	NP
N/A	5.4	Peak to average power ratio	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	4.3	Frequency stability, voltage variation	PASSED

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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	NP
N/A	6.4	Peak to average power ratio	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§24.238(a)	6.5	Band edge compliance	PASSED
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

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	NP
N/A	5.4	Peak to average power ratio	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§22.917(a)	4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	PASSED

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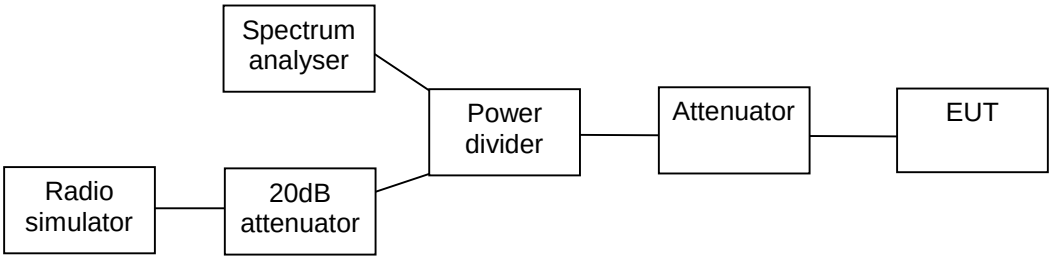
2. Peak to average power ratio
(FCC N/A, RSS-133 6.4, RSS-132 5.4)

EUT with DUT number	RM-1066, DUT 18694
Accessories with DUT numbers	SD-238R, DUT 18686 ; WH-108, DUT 18690
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 103.2
Date of measurements	31-Oct-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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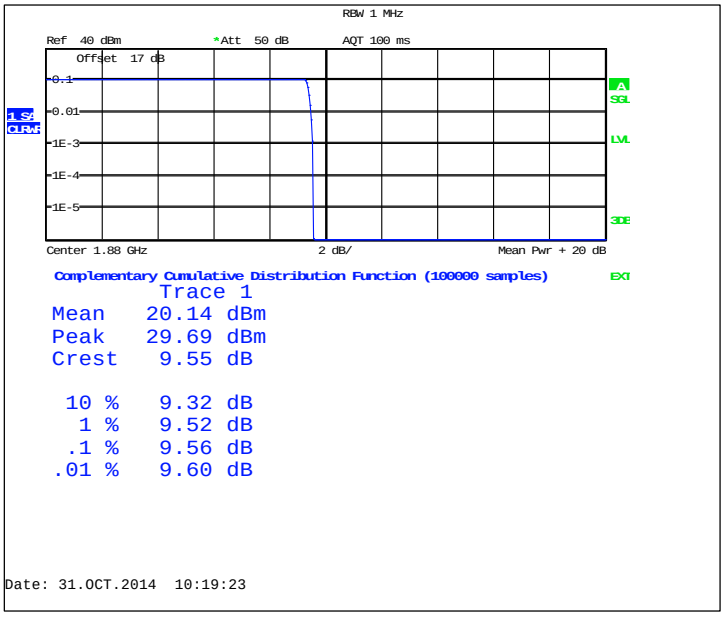
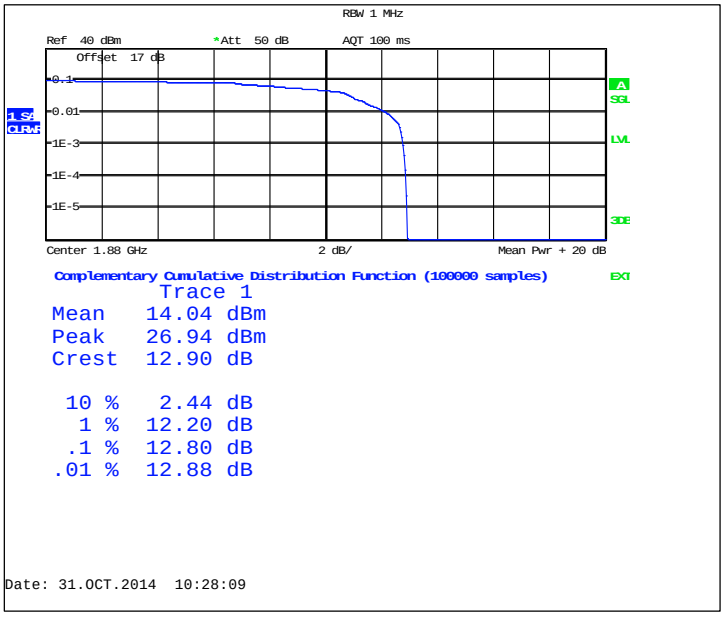
2.3. GSM 1900 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
GSM	661 / 1880.0	9.55	PASSED
EGPRS	661 / 1880.0	12.90	PASSED

GSM



EGPRS



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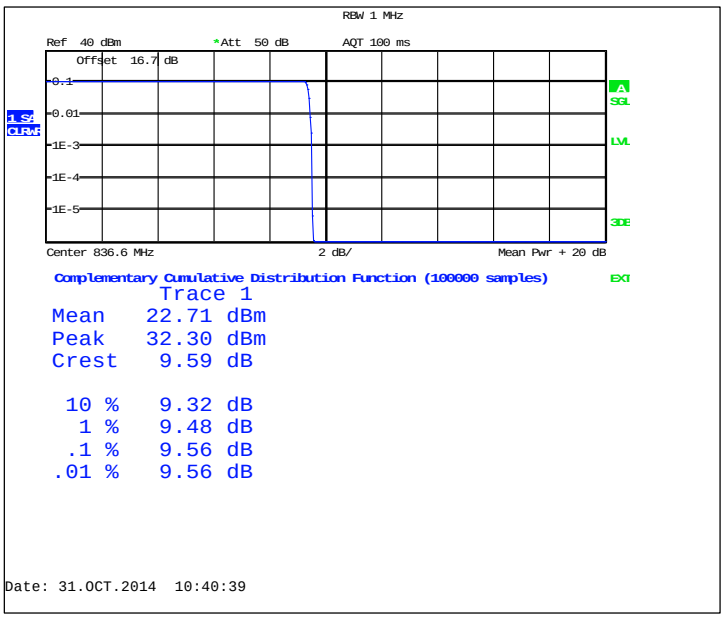
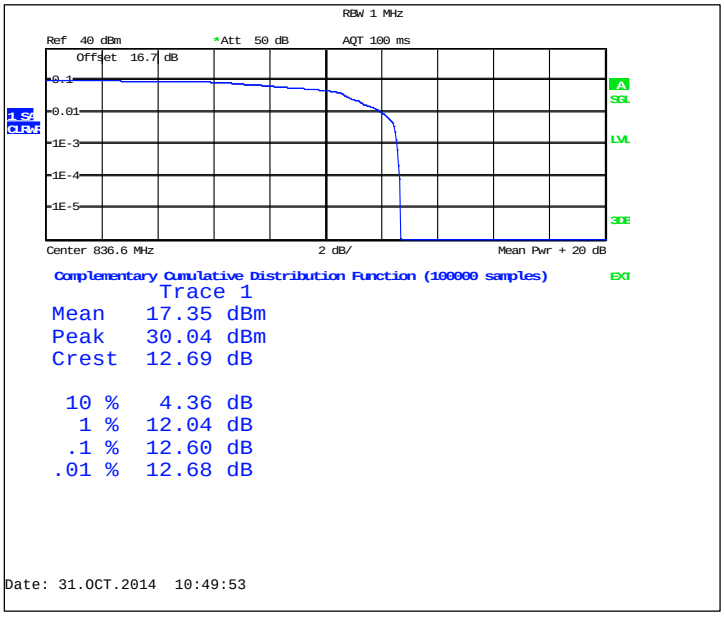
2.4. GSM 850 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
GSM	190 / 836.6	9.59	PASSED
EGPRS	190 / 836.6	12.69	PASSED

GSM



EGPRS



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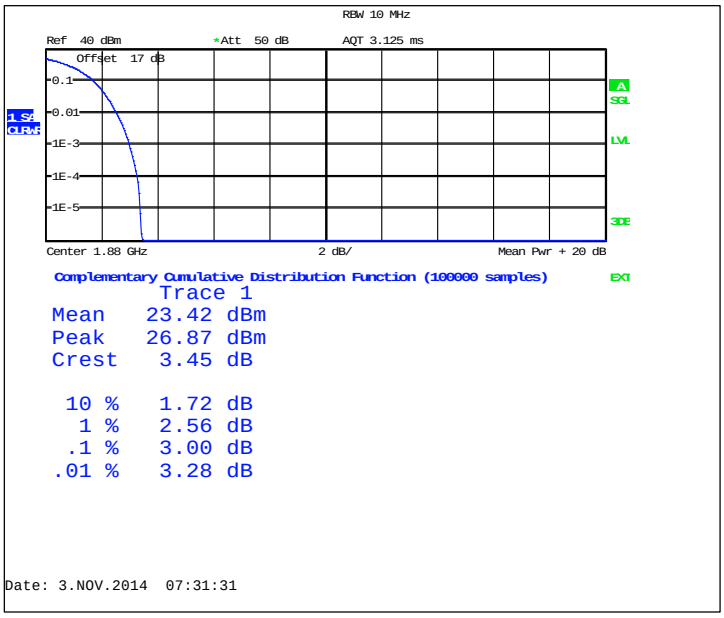
2.5. WCDMA2 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD	9400 / 1880.0	3.45	PASSED

FDD



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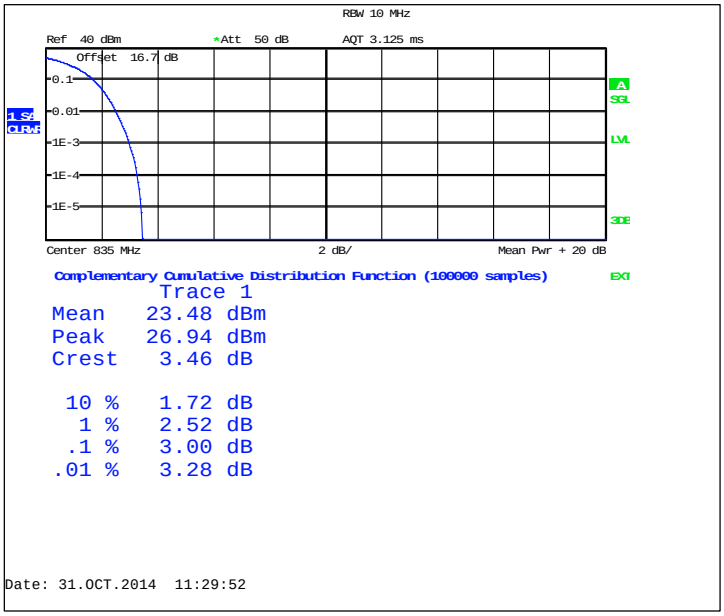
2.6. WCDMA5 Test results

Operation mode (TX on)	Channel / f_C [MHz]	Peak to average power ratio [dB]	Result
FDD	4175 / 835.0	3.46	PASSED

FDD



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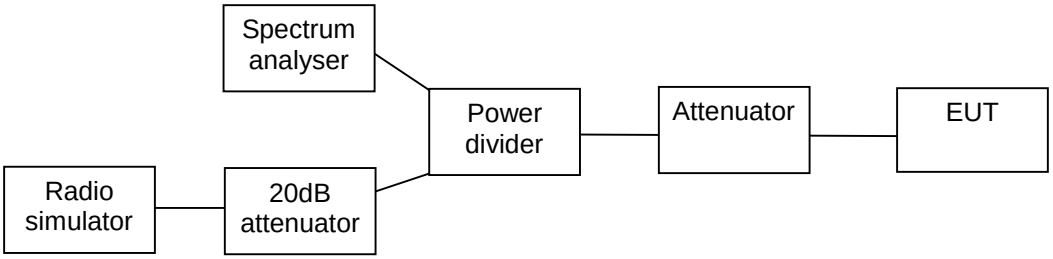
3. 99 % occupied bandwidth

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

EUT with DUT number	RM-1066, DUT 18694
Accessories with DUT numbers	SD-238R, DUT 18686 ; WH-108, DUT 18690
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 103.2
Date of measurements	31-Oct-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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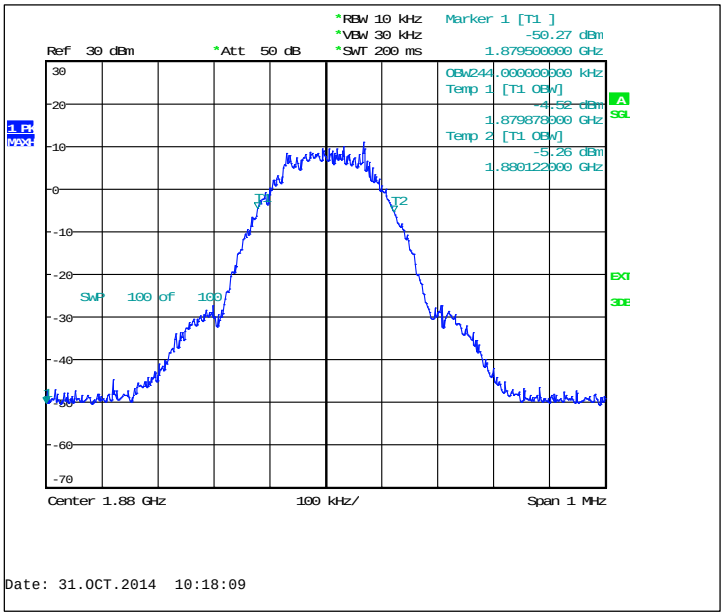
3.3. GSM 1900 Test results

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

GSM, Channel 661 / 1880.0 MHz



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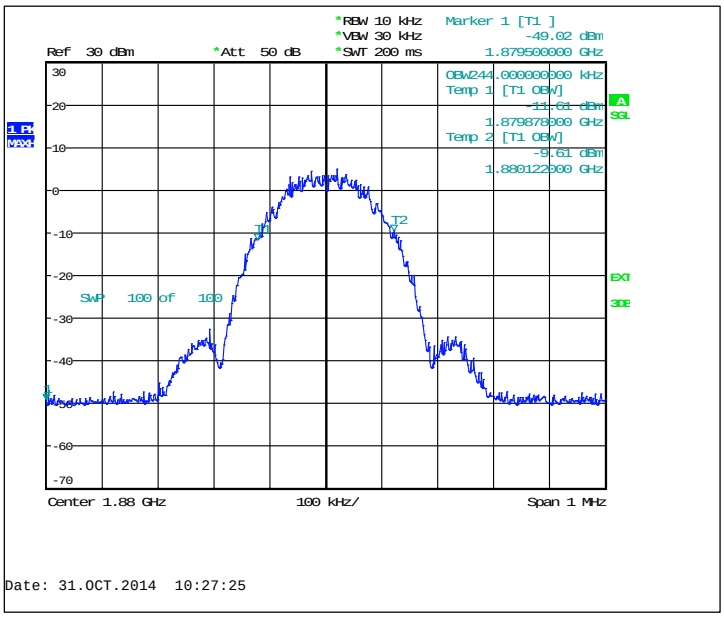
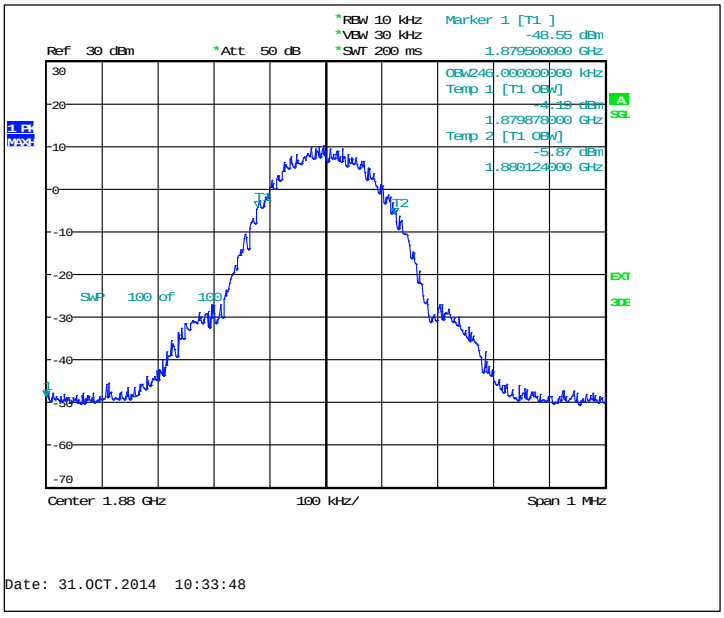
EGPRS, Channel 661 / 1880.0 MHz



GPRS, Channel 661 / 1880.0 MHz



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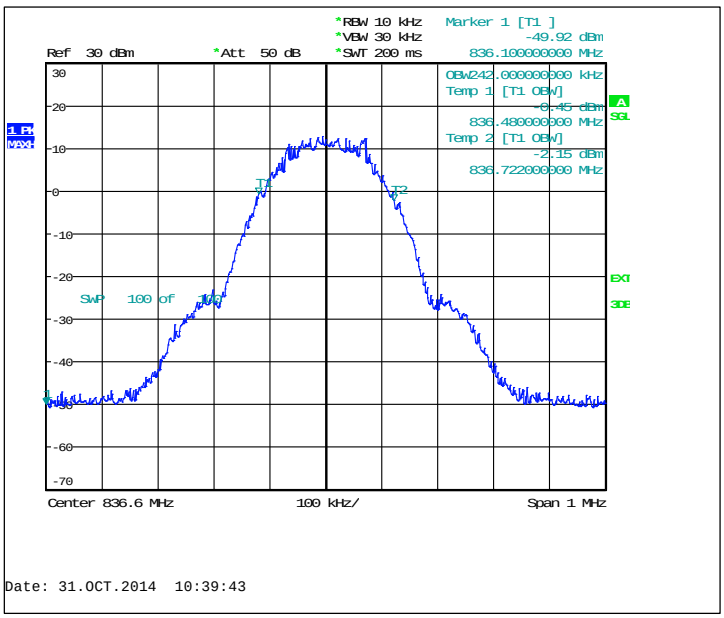
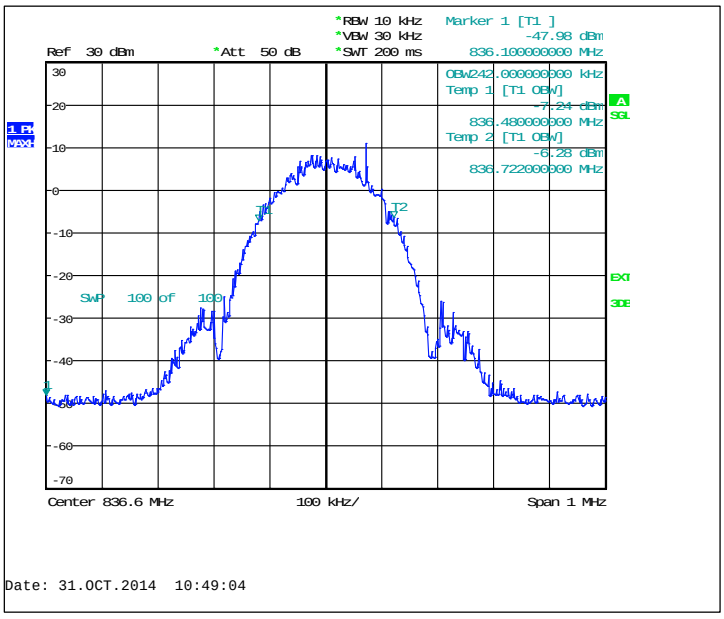
3.4. GSM 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	242
EGPRS	242
GPRS	244

GSM, Channel 190 / 836.6 MHz



EGPRS, Channel 190 / 836.6 MHz



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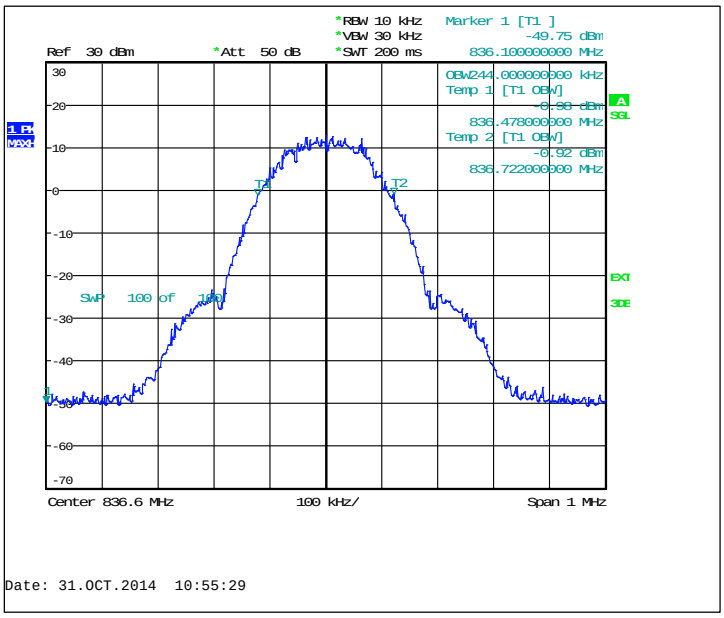
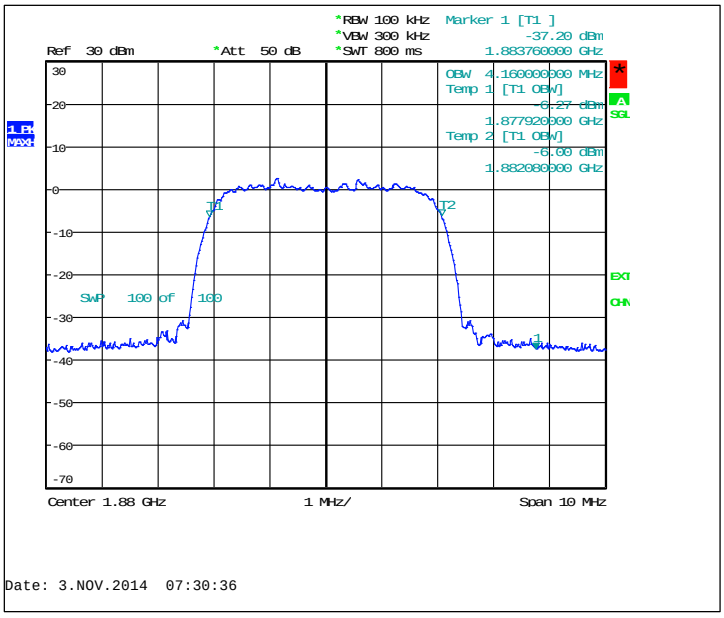
GPRS, Channel 190 / 836.6 MHz



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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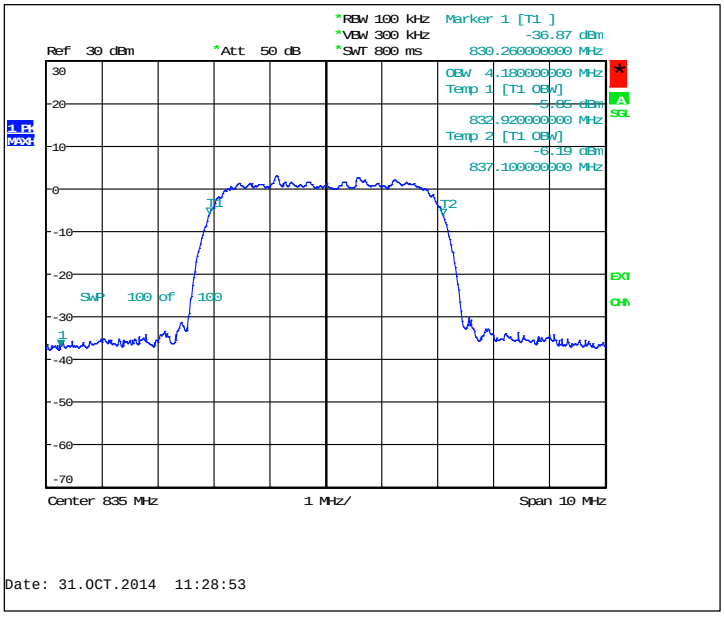
3.6. WCDMA5 Test results

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

FDD, Channel 4175 / 835.0 MHz



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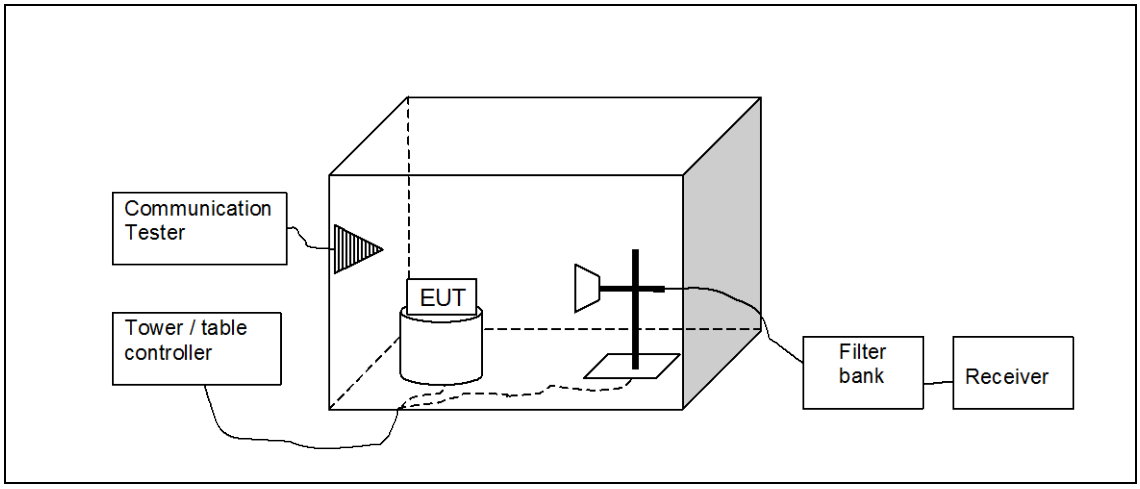
4. Spurious radiated emissions

(FCC §22.917(a), §24.238(a), §2.1053, §2.1053, RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-1066, DUT 18695
Accessories with DUT numbers	BV-T4B, DUT 18696 ; AC-20E, DUT 18697 ; WH-108, DUT 18698
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 99.9
Date of measurements	03-Nov-2014
Measured by	Sami Lehtonen

4.1.1 Test setup



4.2. 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]
GSM 850	30 - 8500	-13
GSM 1900	30 - 19100	-13

4.3. 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
1673.186	-43.05	0.04955	-48.55	5.5	HORIZONTAL	PASSED
1673.226	-42.99	0.05023	-48.49	5.5	HORIZONTAL	PASSED
2490.541	-52.48	0.00565	-64.28	11.8	HORIZONTAL	PASSED
2509.86	-49.29	0.01178	-61.19	11.9	HORIZONTAL	PASSED
3337.555	-60.42	0.00091	-63.72	3.3	HORIZONTAL	PASSED

4.4. 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
1673.22	-43.46	0.04508	-48.96	5.5	HORIZONTAL	PASSED
2509.7	-50.98	0.00798	-62.88	11.9	HORIZONTAL	PASSED

4.5. 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
9306.493	-44.59	0.03475	-66.69	22.1	HORIZONTAL	PASSED
9480.561	-44.99	0.0317	-66.79	21.8	HORIZONTAL	PASSED
9552.345	-44.27	0.03741	-65.97	21.7	HORIZONTAL	PASSED
9800.24	-44.73	0.03365	-67.03	22.3	VERTICAL	PASSED
9812.866	-43.98	0.03999	-66.58	22.6	HORIZONTAL	PASSED
9991.6	-44.1	0.0389	-66.4	22.3	VERTICAL	PASSED

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4.6. 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
3767.315	-56.63	0.00217	-63.23	6.6	HORIZONTAL	PASSED
5633.367	-52.18	0.00605	-62.48	10.3	VERTICAL	PASSED

4.7. 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
3761.543	-56.13	0.00244	-62.43	6.3	VERTICAL	PASSED
5642.305	-51.37	0.00729	-61.57	10.2	HORIZONTAL	PASSED
7529.399	-47.57	0.0175	-63.77	16.2	HORIZONTAL	PASSED
9317.535	-43.5	0.04467	-65.4	21.9	HORIZONTAL	PASSED
9391.443	-45.1	0.0309	-66.2	21.1	HORIZONTAL	PASSED
9454.168	-45.13	0.03069	-66.23	21.1	VERTICAL	PASSED
9585.15	-43.42	0.0455	-65.22	21.8	VERTICAL	PASSED
9630.24	-44.24	0.03767	-65.94	21.7	VERTICAL	PASSED
9799.98	-42.92	0.05105	-65.62	22.7	HORIZONTAL	PASSED
9952.645	-43.47	0.04498	-65.67	22.2	HORIZONTAL	PASSED
11288.717	-42.55	0.05559	-65.55	23	VERTICAL	PASSED
13166.232	-52.33	0.00585	-69.03	16.7	VERTICAL	PASSED
15039.98	-50.31	0.00931	-71.31	21	VERTICAL	PASSED
16924.389	-50.22	0.00951	-73.12	22.9	VERTICAL	PASSED

4.8. 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
853.437	-46.55	0.02213	-81.05	34.5	VERTICAL	PASSED
857.059	-45.75	0.02661	-80.35	34.6	HORIZONTAL	PASSED
879.559	-39.27	0.1183	-75.57	36.3	VERTICAL	PASSED
880.2	-38.84	0.13062	-75.24	36.4	VERTICAL	PASSED
997.985	-40.12	0.09727	-79.42	39.3	VERTICAL	PASSED
999.77	-40.44	0.09036	-79.74	39.3	VERTICAL	PASSED
1667.335	-51.03	0.00789	-57.33	6.3	VERTICAL	PASSED

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2510.311	-52.39	0.00577	-64.29	11.9	HORIZONTAL	PASSED
3330.401	-59.95	0.00101	-63.15	3.2	HORIZONTAL	PASSED
4171.974	-58.41	0.00144	-63.81	5.4	HORIZONTAL	PASSED
5003.808	-54.8	0.00331	-63.5	8.7	VERTICAL	PASSED
5835.16	-53.46	0.00451	-61.76	8.3	HORIZONTAL	PASSED
6677.214	-50.15	0.00966	-60.45	10.3	VERTICAL	PASSED
7514.459	-50.53	0.00885	-64.53	14	HORIZONTAL	PASSED
8345.17	-49.56	0.01107	-65.06	15.5	HORIZONTAL	PASSED

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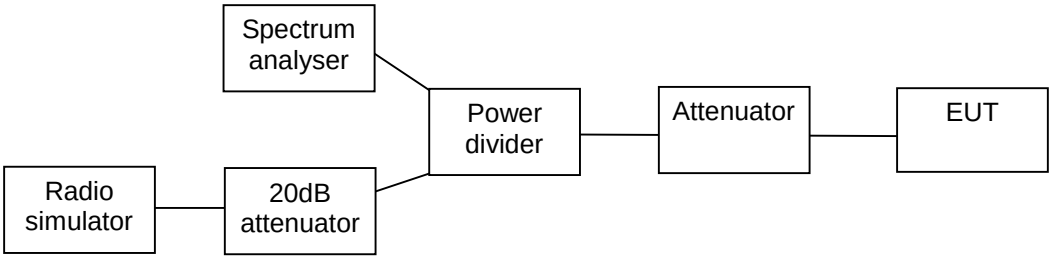
5. Band edge compliance

(FCC §24.238(a), §22.917(a), RSS-133 6.5, RSS-132 4.5)

EUT with DUT number	RM-1066, DUT 18694
Accessories with DUT numbers	SD-238R, DUT 18686 ; WH-108, DUT 18690
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 103.2
Date of measurements	31-Oct-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.

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
WCDMA5	Below 824 and above 849	-13

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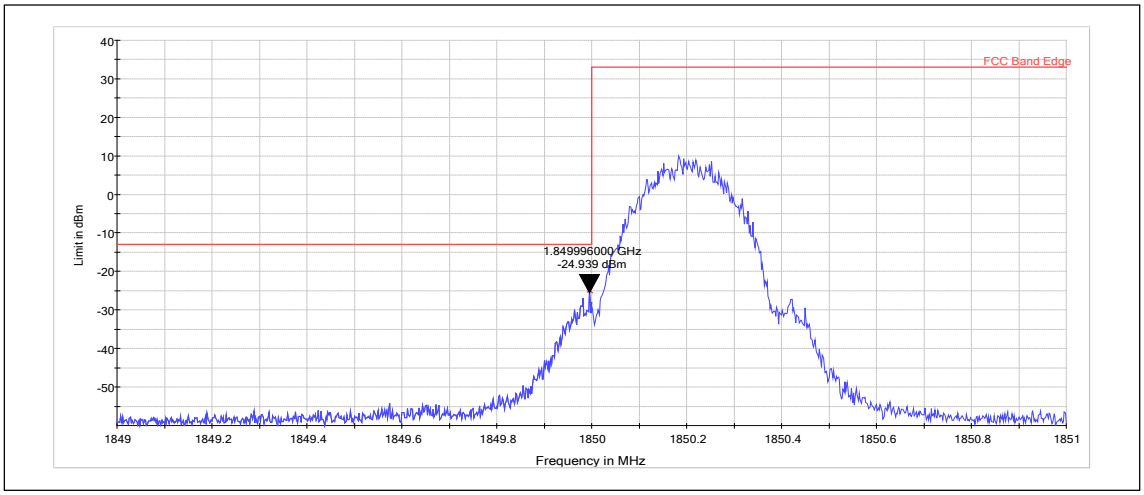
5.3. GSM 1900 Test results

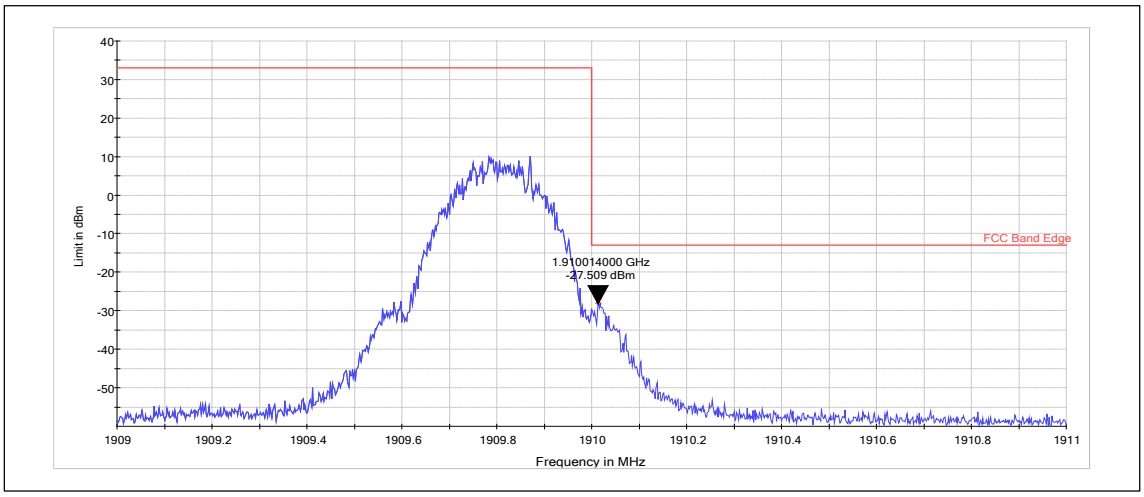
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	1849.996	-24.94	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	1910.014	-27.51	PASSED

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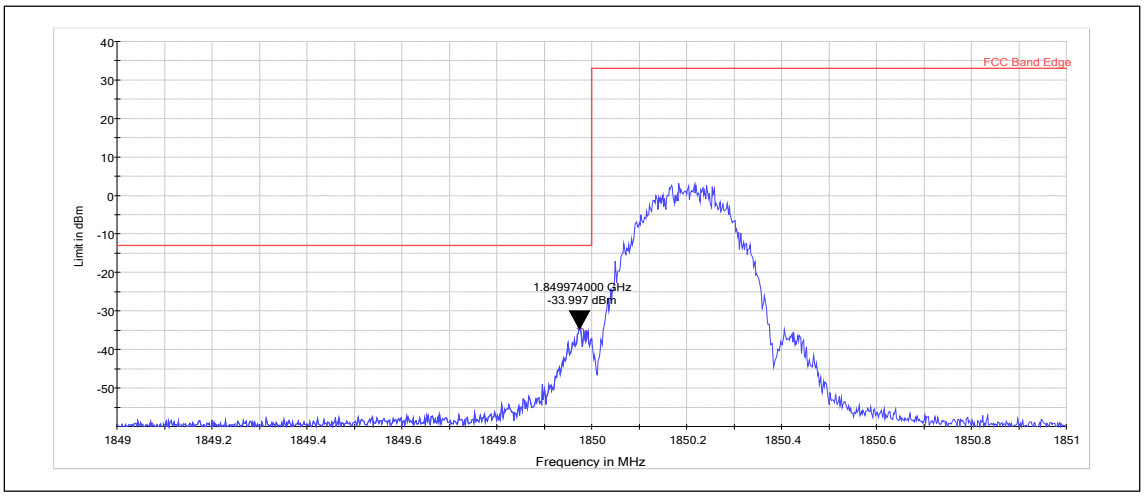
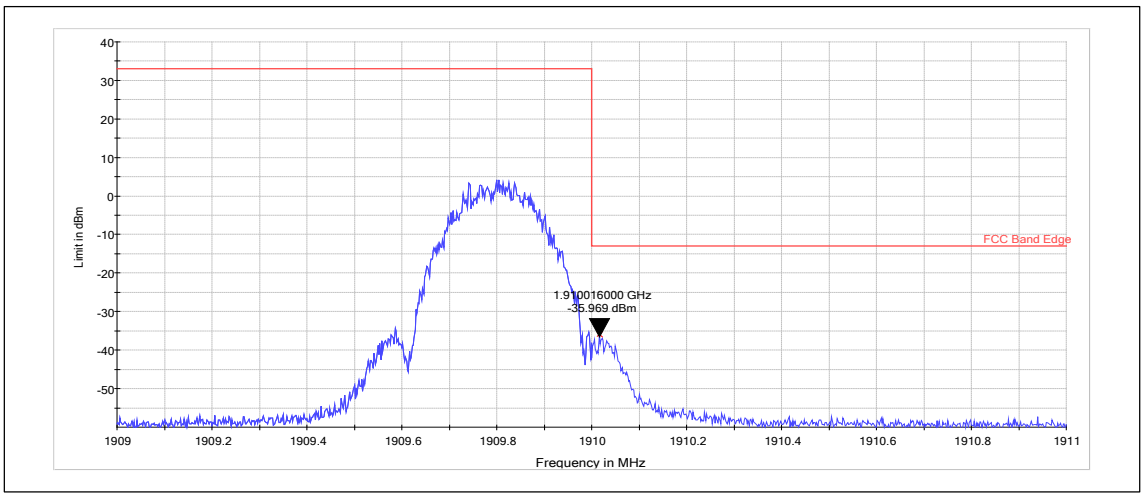
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	1849.974	-34.00	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	1910.016	-35.97	PASSED

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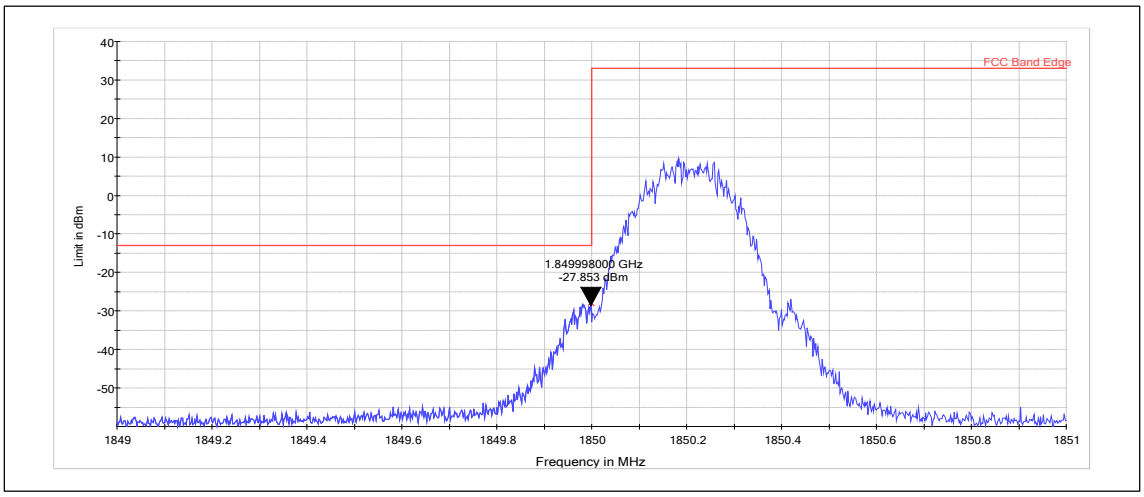
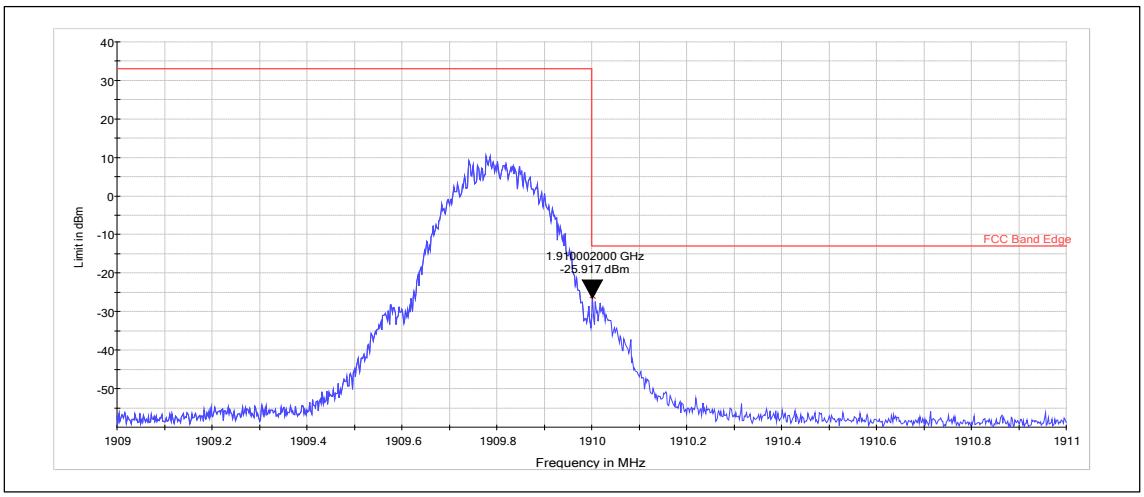
Channel 512 / 1850.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	1849.998	-27.85	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	1910.002	-25.92	PASSED

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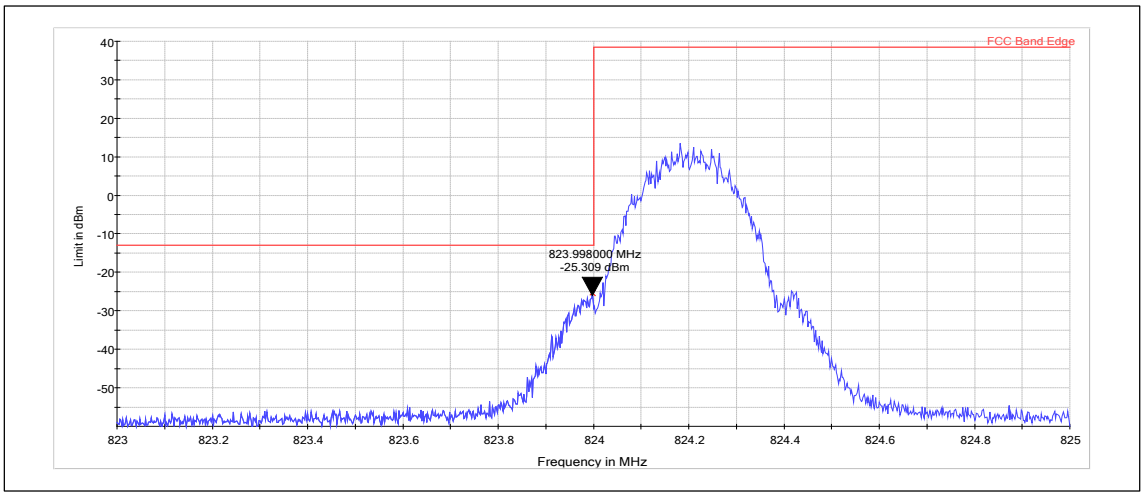
5.4. GSM 850 Test results

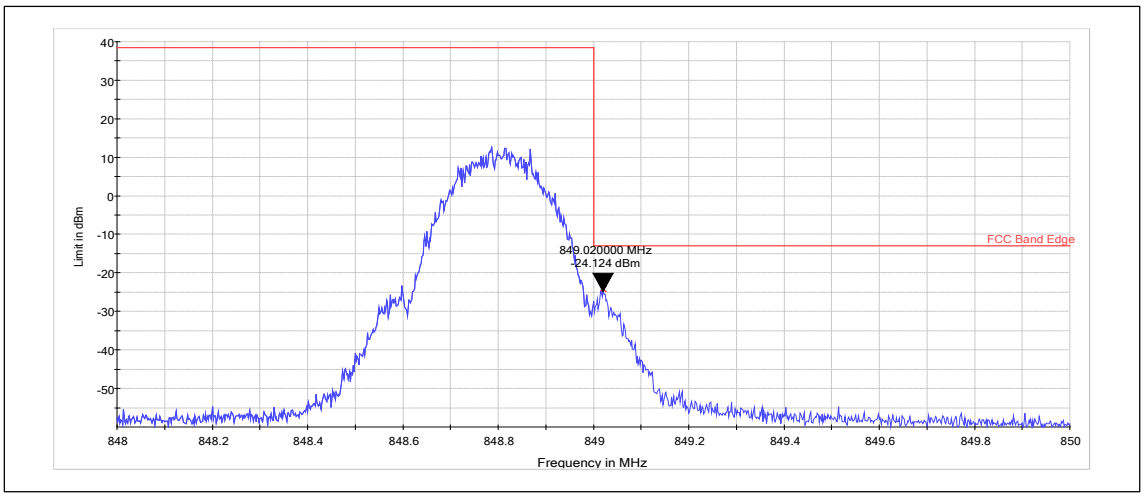
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GSM	823.998	-25.31	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	-24.12	PASSED

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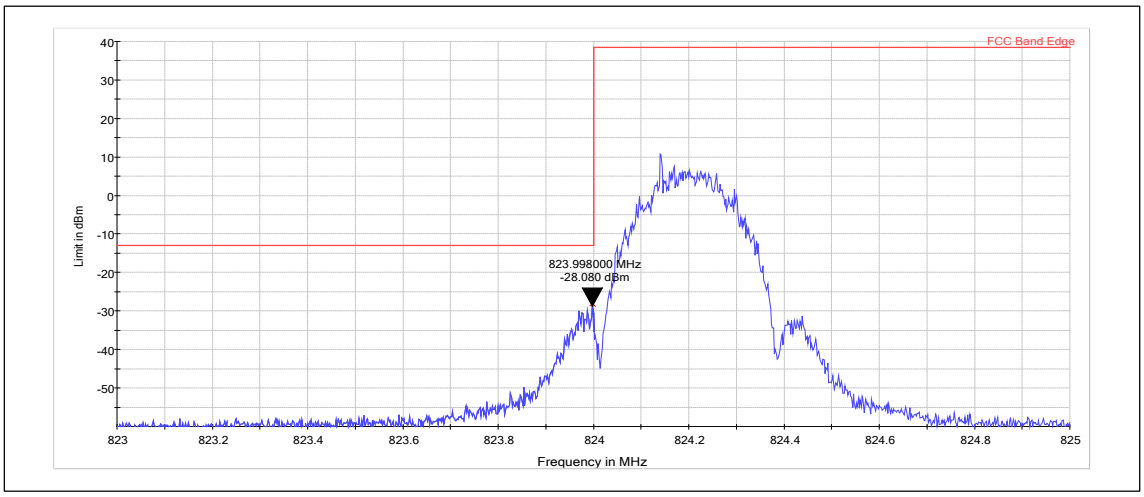
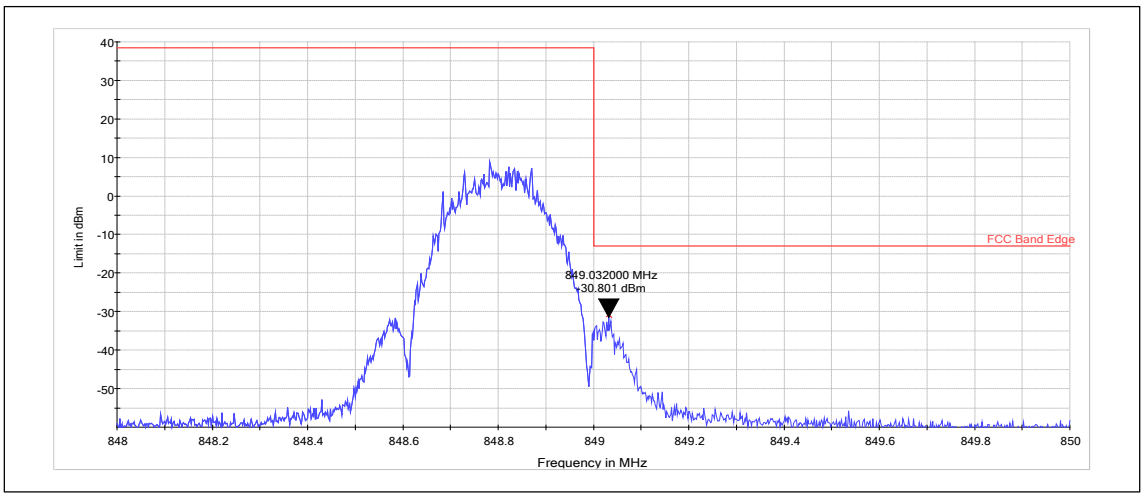
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	823.998	-28.08	PASSED

Channel 251 / 848.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
EGPRS	849.032	-30.80	PASSED

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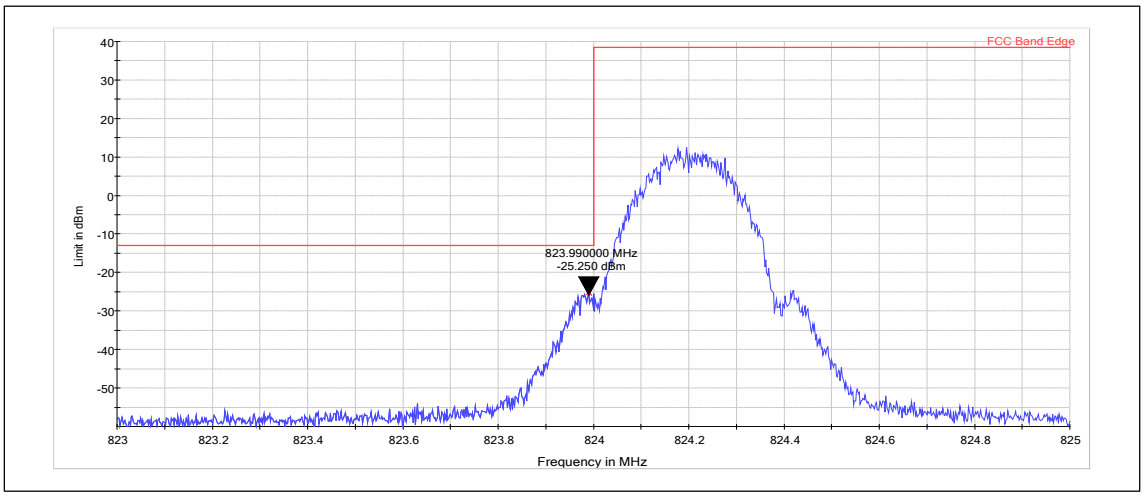
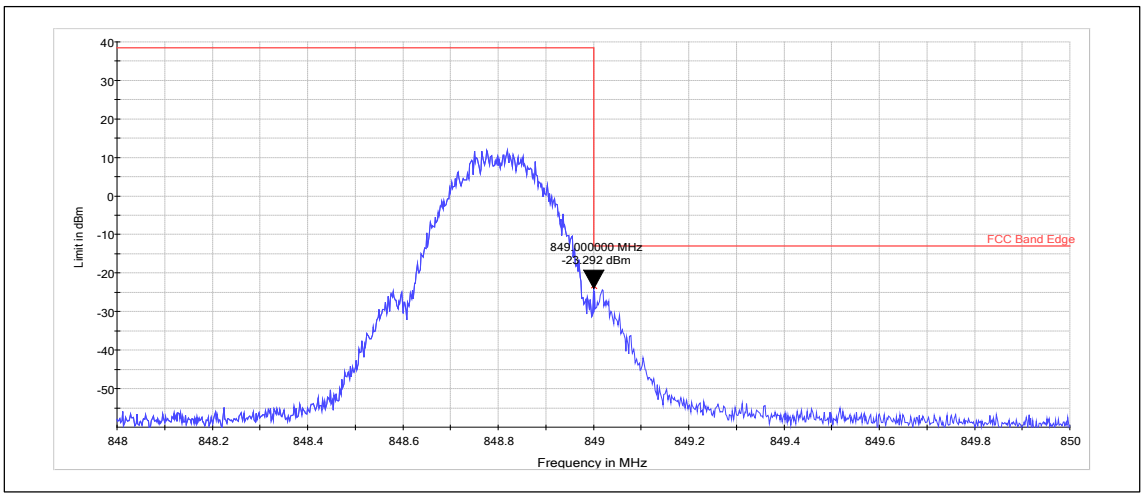
Channel 128 / 824.2 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	823.990	-25.25	PASSED

Channel 251 / 848.8 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
GPRS	849.000	-23.29	PASSED

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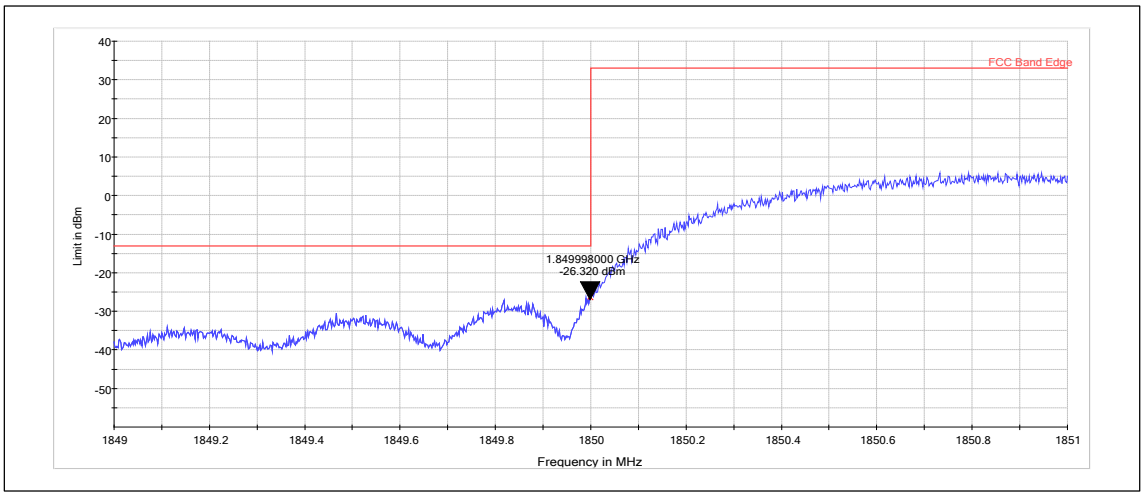
5.5. WCDMA2 Test results

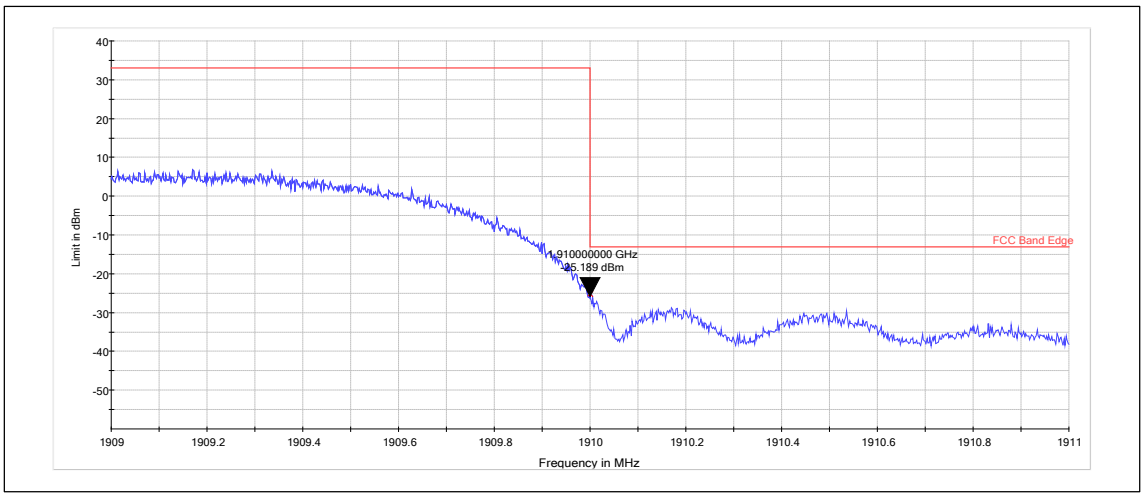
Channel 9262 / 1852.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1849.998	-26.32	PASSED

Channel 9538 / 1907.6 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	1910.000	-25.19	PASSED

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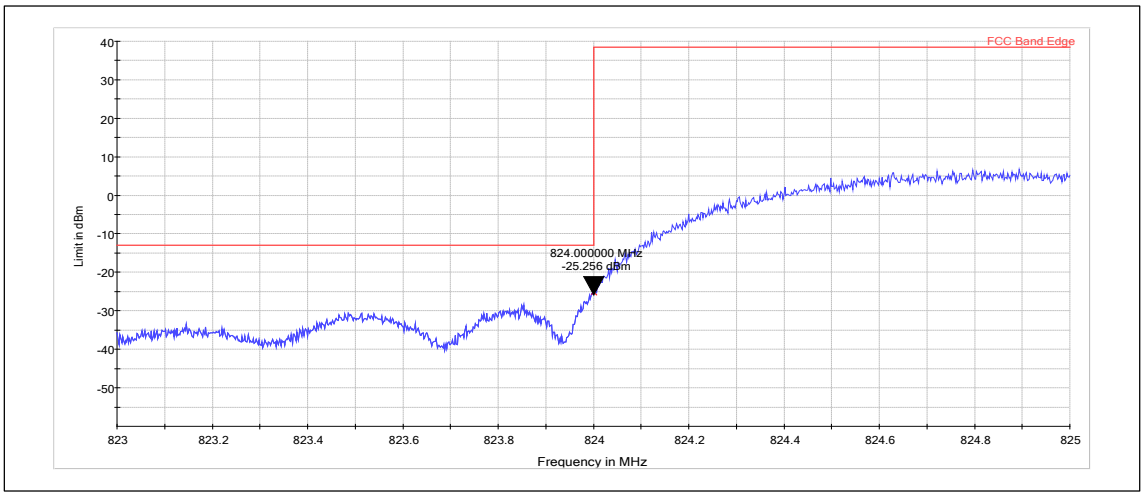
5.6. WCDMA5 Test results

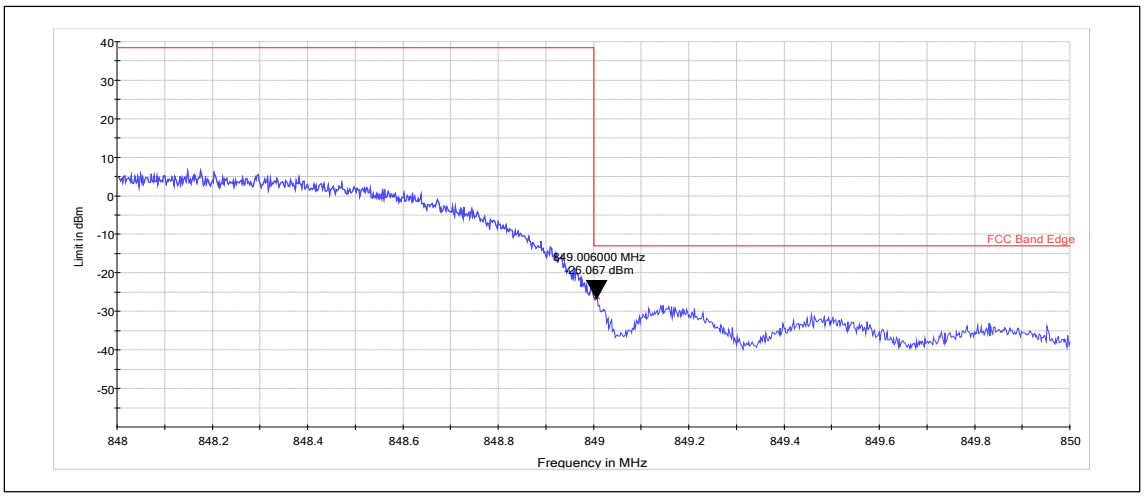
Channel 4132 / 826.4 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	824.000	-25.26	PASSED

Channel 4233 / 846.6 MHz



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

Operation mode (TX on)	Frequency [MHz]	Level [dBm]	Result
FDD	849.006	-26.07	PASSED

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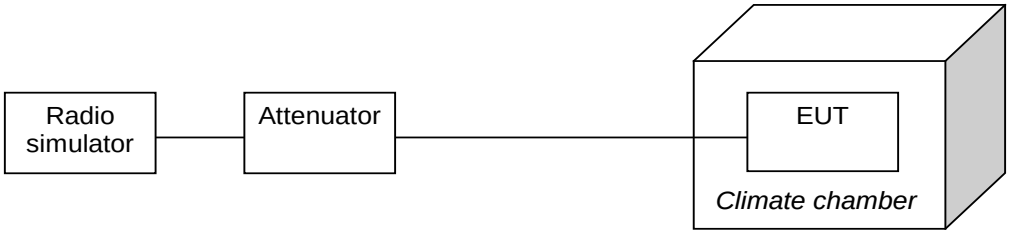
6. Frequency stability, temperature variation
(FCC §2.1055(a), RSS-133 6.3, RSS-132 4.3)

EUT with DUT number	RM-1066, DUT 18694
Accessories with DUT numbers	SD-238R, DUT 18686 ; WH-108, DUT 18690
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 103.2
Date of measurements	31-Oct-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 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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6.3. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

Temperature [ºC]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880.00	-3.29000	-0.0018	PASSED
40	1880.00	-3.55000	-0.0019	PASSED
30	1880.00	-17.18000	-0.0091	PASSED
20	1880.00	-14.66000	-0.0078	PASSED
10	1880.00	-18.92000	-0.0101	PASSED
0	1880.00	-20.86000	-0.0111	PASSED
-10	1880.00	-21.05000	-0.0112	PASSED
-20	1880.00	-11.36000	-0.006	PASSED
-30	1880.00	-1.23000	-0.0007	PASSED

6.4. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

Temperature [ºC]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	836.60	-14.72000	-0.0176	PASSED
40	836.60	-3.94000	-0.0047	PASSED
30	836.60	-13.56000	-0.0162	PASSED
20	836.60	-10.53000	-0.0126	PASSED
10	836.60	-12.91000	-0.0154	PASSED
0	836.60	-14.27000	-0.0171	PASSED
-10	836.60	-6.07000	-0.0073	PASSED
-20	836.60	-9.69000	-0.0116	PASSED
-30	836.60	-1.49000	-0.0018	PASSED

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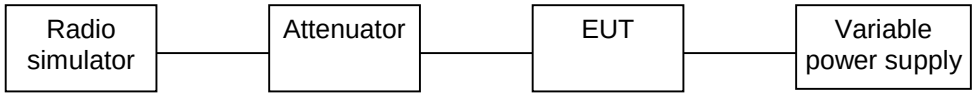
7. Frequency stability, voltage variation
(FCC §2.1055(d), RSS-133 6.3, RSS-132 4.3)

EUT with DUT number	RM-1066, DUT 18694
Accessories with DUT numbers	SD-238R, DUT 18686 ; WH-108, DUT 18690
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	22 / 53 / 103.2
Date of measurements	31-Oct-2014
Measured by	Jari Keto

7.1. Test Setup



7.2. 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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7.3. GSM 1900 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1880.00	-22.60000	-0.012	PASSED
Battery cut-off point / 3.6	1880.00	-17.89000	-0.0095	PASSED
Nominal / 3.8	1880.00	-14.79000	-0.0079	PASSED

7.4. GSM 850 Test results

GSM,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	836.60	-7.55000	-0.009	PASSED
Battery cut-off point / 3.6	836.60	-13.04000	-0.0156	PASSED
Nominal / 3.8	836.60	-11.24000	-0.0134	PASSED

7.5. WCDMA2 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	1880.00	-5.03540	-0.0027	PASSED
Battery cut-off point / 3.6	1880.00	-7.08008	-0.0038	PASSED
Nominal / 3.8	1880.00	-6.39343	-0.0034	PASSED

7.6. WCDMA5 Test results

FDD,

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.2	835.00	-0.12207	-0.0001	PASSED
Battery cut-off point / 3.6	835.00	2.12097	0.0025	PASSED
Nominal / 3.8	835.00	0.47302	0.0006	PASSED

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8. Test Equipment

8.1. 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

8.2. 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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