

FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-975_07.docx	Date of Report:	28-Apr-2014
Number of pages:	20	Customer's Contact person:	Juha Paukku
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FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-975 / Battery BL-5H / Laptop T61p / Headset WH-108 / Data Cable CA-190CD		
FCC ID:	PDNRM-975	IC:	661R-RM975
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), CISPR 22, RSS-GEN (Issue 3, December 2010), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Kalle Hannila, System Manager, EMC

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	07-Apr-2014
Testing completed	16-Apr-2014
The customer's contact person	Juha Paukku
Test Plan referred to	T:\Projects\RM-975\TestPlan\RS_testplan_RM-975.xlsm
Notes	-
Document name	T:\Projects\RM-975\EMC\FCC15B_RM-975_07.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-975	004402478041290	2020	-	01061.00014.14112.00000	18156
Battery	BL-5H	495540349401010729060670699	-	-	-	18146
Laptop	T61p	4FIL44044	-	-	-	16517
Headset	WH-108	-	-	-	-	18149
Data Cable	CA-190CD	07304562475628	-	-	-	17378
Phone	RM-975	004402478049996	2020	-	010601.00014.14112.00000	18152
Battery	BL-5H	495540349401010256360670699	-	-	-	18153
Headset	WH-108	2376171	-	-	-	17990
AC-Charger	AC-20E	409049327155040250760675628	-	-	-	17995

1.2. Summary of Test Results

GSM850:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	
15.109, a	6.1	Radiated emissions	PASSED

GSM1900:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	PASSED
15.109, a	6.1	Radiated emissions	PASSED

WCDMA 1900 (Band II):

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	
15.109, a	6.1	Radiated emissions	

WCDMA 1700:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	
15.109, a	6.1	Radiated emissions	PASSED

LTE7:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	
15.109, a	6.1	Radiated emissions	PASSED

LTE700 Lower (Band 17):

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	
15.109, a	6.1	Radiated emissions	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.

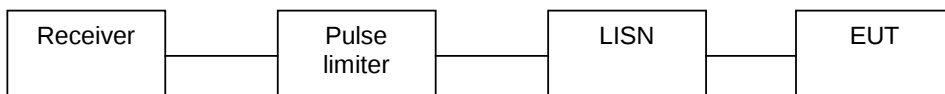
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2. AC powerline conducted emissions (FCC §15.107, RSS-GEN, section 7.2.4)

EUT with DUT number	RM-975, DUT 18156
Accessories with DUT numbers	BL-5H, DUT 18146 ; T61p, DUT 16517 ; WH-108, DUT 18149 ; CA-190CD, DUT 17378
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 37 / 102.6
Date of measurements	09-Apr-2014
Measured by	Jari Keto

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

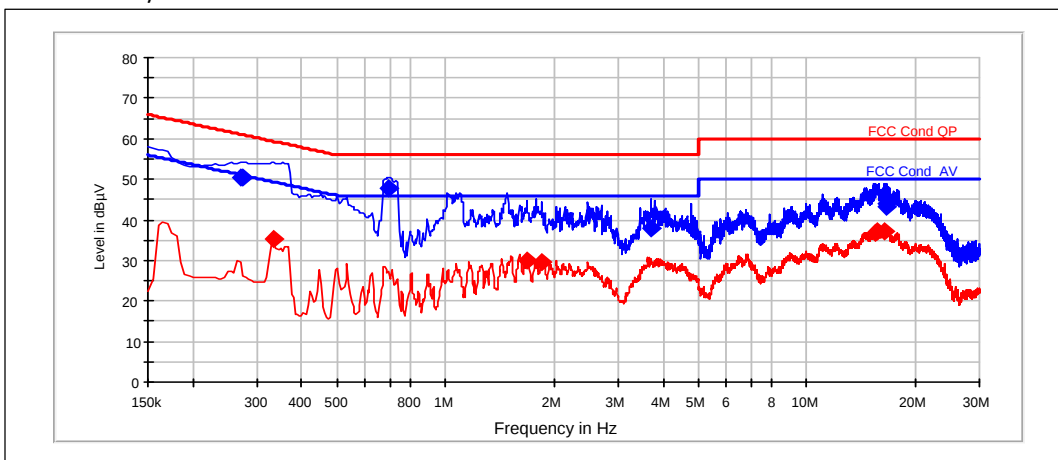
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

2.3. GSM 1900 Test results

Channel 661 / 1880.0 MHz



QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.27	50.43	N	PASSED
0.275	50.51	N	PASSED
0.695	47.96	L1	PASSED
3.71	37.83	N	PASSED
16.53	43.91	L1	PASSED
16.68	43.14	N	PASSED

Average (RBW: 9 kHz)

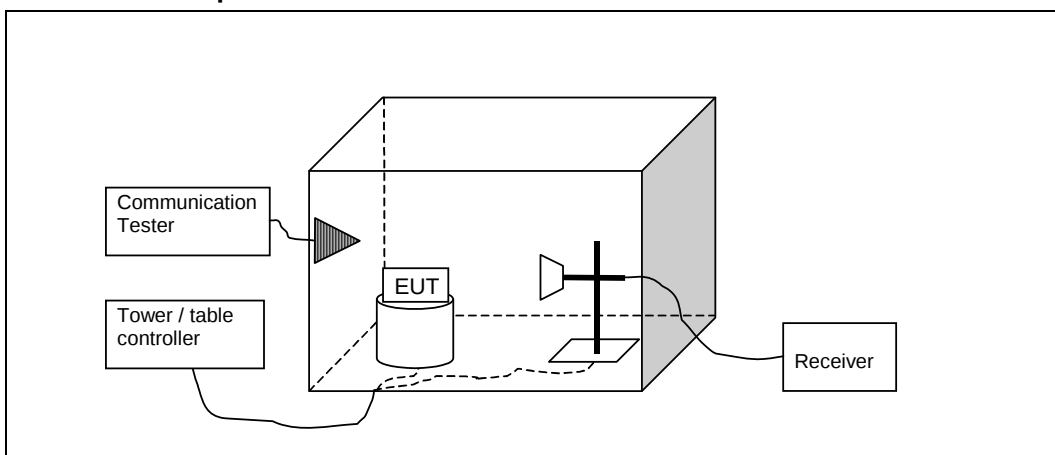
Frequency [MHz]	U [dBμV]	Line	Result
0.335	35.18	N	PASSED
1.69	30.11	L1	PASSED
1.855	29.76	L1	PASSED
15.56	36.93	N	PASSED
15.605	37.33	L1	PASSED
16.465	37.17	N	PASSED

3. Radiated emissions

(FCC §15.109, RSS-GEN, section 6.1, RSS-132 4.6, RSS-133 6.6)

EUT with DUT number	RM-975, DUT 18152
Accessories with DUT numbers	BL-5H, DUT 18153 ; WH-108, DUT 17990 ; AC-20E, DUT 17995
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.4
Date of measurements	09-Apr-2014
Measured by	Sami Lehtonen

3.1.1 Test setup



3.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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 results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBμV/m]	Average limit [dBμV/m]	Peak limit [dBμV/m]
30 - 230	40	-	-
230 – 1000	47	-	-
1000 - 3000	-	50	70
Above 3000	-	54	74

3.3. GSM 850 test results

RX mode, channel 190 / 881.6 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7820.645	46.53	212.08	41.63	4.9	74	27.47	PASSED
7821.34	46.53	212.08	41.63	4.9	74	27.47	PASSED
7836.974	47.15	227.772	42.15	5	74	26.85	PASSED
7848.5	47.33	232.541	42.33	5	74	26.67	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7820.645	33.81	49.034	28.91	4.9	54	20.19	PASSED
7821.34	33.8	48.978	28.9	4.9	54	20.2	PASSED
7836.974	33.82	49.091	28.82	5	54	20.18	PASSED
7848.5	33.69	48.362	28.69	5	54	20.31	PASSED

RX mode, channel 251 / 893.8 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3575.9	36.88	69.823	42.28	-5.4	74	37.12	PASSED
7151.7	45.85	196.11	42.55	3.3	74	28.15	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3575.9	23.88	15.631	29.28	-5.4	54	30.12	PASSED
7151.7	33.17	45.551	29.87	3.3	54	20.83	PASSED

RX mode, channel 128 / 869.2 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3478.2	38.33	82.509	44.53	-6.2	74	35.67	PASSED
6952.7	47.02	224.388	45.22	1.8	74	26.98	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3478.2	23.73	15.364	29.93	-6.2	54	30.27	PASSED
6952.7	33.38	46.666	31.58	1.8	54	20.62	PASSED

RX mode, channel 190 / 881.6 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
37.565	18.88	8.79	33.28	-14.4	40	21.12	PASSED
43.657	21.79	12.289	40.19	-18.4	40	18.21	PASSED
105.32	59.06	897.429	81.66	-22.6	40	-19.06	*PASSED

*105.3 MHz frequency is FM-Radio signal and thus ignored."

3.4. WCDMA 1700 test results

Channel 1312 / 1712.4 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
4223.2	38.51	84.236	42.91	-4.4	74	35.49	PASSED
6338.6	44.93	176.401	45.53	-0.6	74	29.07	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
4223.2	24.7	17.179	29.1	-4.4	54	29.3	PASSED
6338.6	31.69	38.415	32.29	-0.6	54	22.31	PASSED

Channel 1312 / 1712.4 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
36.154	17.95	7.898	31.45	-13.5	40	22.05	PASSED
43.725	21.52	11.912	39.92	-18.4	40	18.48	PASSED
80.574	15.12	5.702	38.42	-23.3	40	24.88	PASSED
105.22	71.26	3655.948	93.86	-22.6	40	-31.26	*PASSED
210.551	28.72	27.29	52.62	-23.9	40	11.28	PASSED
315.812	35.3	58.21	54.8	-19.5	47	11.7	PASSED
526.273	20.05	10.058	34.95	-14.9	47	26.95	PASSED

*105.3 MHz frequency is FM-Radio signal and thus ignored."

Channel 1450 / 1740.0 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7827.255	46.95	222.587	42.05	4.9	74	27.05	PASSED
7833.971	46.77	218.022	41.87	4.9	74	27.23	PASSED
7836.375	46.63	214.536	41.63	5	74	27.37	PASSED
7843.391	47.3	231.739	42.3	5	74	26.7	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7827.255	33.83	49.147	28.93	4.9	54	20.17	PASSED
7833.971	33.82	49.091	28.92	4.9	54	20.18	PASSED
7836.375	33.81	49.034	28.81	5	54	20.19	PASSED
7843.391	33.69	48.362	28.69	5	54	20.31	PASSED

Channel 1513 / 1752.6 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
4306.1	38.31	82.319	41.91	-3.6	74	35.69	PASSED
6456	44.53	168.461	44.73	-0.2	74	29.47	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
4306.1	25.34	18.493	28.94	-3.6	54	28.66	PASSED
6456	31.74	38.637	31.94	-0.2	54	22.26	PASSED

3.5. LTE7 test results

Channel 20775 / 2502. MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5245.9	42.48	133.045	44.28	-1.8	74	31.52	PASSED
7866.6	46.22	204.644	40.92	5.3	74	27.78	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5245.9	29.79	30.867	31.59	-1.8	54	24.21	PASSED
7866.6	33.8	48.978	28.5	5.3	54	20.2	PASSED

Channel 20775 / 2502. MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
38.187	24.69	17.159	39.49	-14.8	40	15.31	PASSED
43.084	23.02	14.158	41.02	-18	40	16.98	PASSED
77.127	16.19	6.449	39.79	-23.6	40	23.81	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
2656.113	69.16	2870.781	66.36	2.8	70	0.84	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
2656.113	55.01	562.989	52.21	2.8	50	-5.01	*PASSED

*2656.0 MHz frequency is coming from communication tester and thus ignored.

Channel 21100 / 2535.0 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7832.568	46.72	216.77	41.82	4.9	74	27.28	PASSED
7838.982	46.38	208.449	41.38	5	74	27.62	PASSED
7858.615	47.32	232.274	42.12	5.2	74	26.68	PASSED
7865.127	46.44	209.894	41.14	5.3	74	27.56	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7832.568	33.91	49.602	29.01	4.9	54	20.09	PASSED
7838.982	33.89	49.488	28.89	5	54	20.11	PASSED
7858.615	33.78	48.865	28.58	5.2	54	20.22	PASSED
7865.127	33.81	49.034	28.51	5.3	54	20.19	PASSED

Channel 21425 / 2567.6 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5373.4	42.53	133.814	44.43	-1.9	74	31.47	PASSED
8062.1	47.51	237.411	41.71	5.8	74	26.49	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5373.4	29.73	30.655	31.63	-1.9	54	24.27	PASSED
8062.1	34.41	52.541	28.61	5.8	54	19.59	PASSED

3.6. LTE700 Lower (Band 17) test results

Channel 23755 / 706.5 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
1473.2	37.28	73.114	42.38	-5.1	70	32.72	PASSED
2210.6	42.42	132.13	42.92	-0.5	70	27.58	PASSED
3001.7	38.17	81.003	43.37	-5.2	74	35.83	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
1473.2	24.78	17.338	29.88	-5.1	50	25.22	PASSED
2210.6	29.63	30.304	30.13	-0.5	50	20.37	PASSED
3001.7	25.05	17.885	30.25	-5.2	54	28.95	PASSED

Channel 23755 / 706.5 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
79.517	17.66	7.638	41.06	-23.4	40	22.34	PASSED

Channel 23755 / 706.5 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
37.927	21.84	12.359	36.44	-14.6	40	18.16	PASSED
39.563	20.33	10.387	36.03	-15.7	40	19.67	PASSED
79.687	15.81	6.173	39.11	-23.3	40	24.19	PASSED
736.092	58.07	800.756	69.67	-11.6	47	-11.07	*PASSED

*736.0 MHz frequency is coming from communication tester and thus ignored.

Channel 23790 / 710 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7815.532	47.55	238.506	42.75	4.8	74	26.45	PASSED
7827.355	46.95	222.587	42.05	4.9	74	27.05	PASSED
7829.863	48.55	267.609	43.65	4.9	74	25.45	PASSED
7847.493	47.07	225.684	42.07	5	74	26.93	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7815.532	33.87	49.374	29.07	4.8	54	20.13	PASSED
7827.355	34.04	50.35	29.14	4.9	54	19.96	PASSED
7829.863	34.03	50.292	29.13	4.9	54	19.97	PASSED
7847.493	33.85	49.261	28.85	5	54	20.15	PASSED

Channel 23825 / 713.5 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
1485.2	37.59	75.77	42.59	-5	70	32.41	PASSED
2230.4	42.95	140.443	43.05	-0.1	70	27.05	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

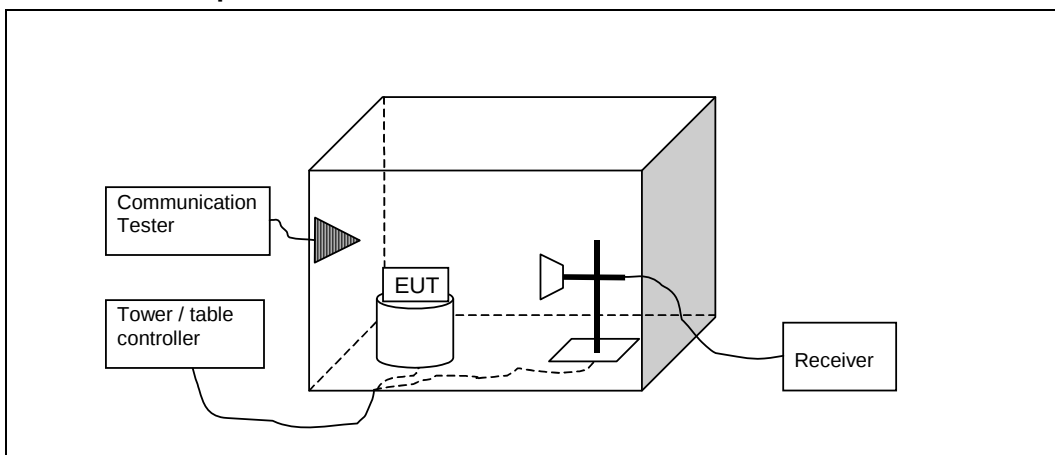
Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
1485.2	24.86	17.498	29.86	-5	50	25.14	PASSED
2230.4	29.92	31.333	30.02	-0.1	50	20.08	PASSED

4. Radiated emissions

(FCC §15.109, RSS-GEN, section 6.1, RSS-132 4.6, RSS-133 6.6)

EUT with DUT number	RM-975, DUT 18152
Accessories with DUT numbers	BL-5H, DUT 18153 ; WH-108, DUT 17990 ; AC-20E, DUT 17995 ; T61p, DUT 16517
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	*Continuous data transfer was active between the phone and the computer during the test."
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.4
Date of measurements	10-Apr-2014
Measured by	Sami Lehtonen

4.1.1 Test setup



4.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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 results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBμV/m]	Average limit [dBμV/m]	Peak limit [dBμV/m]
30 - 230	40	-	-
230 – 1000	47	-	-
1000 - 3000	-	50	70
Above 3000	-	54	74

4.3. GSM 1900 test results

RX mode, channel 512 / 1930.2 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3860.7	38.22	81.47	43.32	-5.1	74	35.78	PASSED
7720.2	46.74	217.27	42.34	4.4	74	27.26	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3860.7	24.93	17.64	30.03	-5.1	54	29.07	PASSED
7720.2	33.68	48.306	29.28	4.4	54	20.32	PASSED

RX mode, channel 661 / 1960.0 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
109.438	19.03	8.943	41.53	-22.5	40	20.97	PASSED
116.629	18.77	8.68	40.97	-22.2	40	21.23	PASSED
116.914	19.52	9.462	41.72	-22.2	40	20.48	PASSED
138.9	16.49	6.676	40.09	-23.6	40	23.51	PASSED
240.01	38.06	79.983	60.36	-22.3	47	8.94	PASSED
598.526	40.09	101.042	53.69	-13.6	47	6.91	PASSED
599.987	43.51	149.796	57.11	-13.6	47	3.49	PASSED
600.003	43.31	146.386	56.91	-13.6	47	3.69	PASSED
600.01	43.08	142.561	56.68	-13.6	47	3.92	PASSED
602.207	38.58	84.918	52.18	-13.6	47	8.42	PASSED

RX mode, channel 661 / 1960.0 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3735.975	52.1	402.717	57.5	-5.4	74	21.9	PASSED
7818.634	47.23	229.879	42.43	4.8	74	26.77	PASSED
7823.149	47.17	228.297	42.27	4.9	74	26.83	PASSED
7836.477	46.75	217.52	41.75	5	74	27.25	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3735.975	24.59	16.963	29.99	-5.4	54	29.41	PASSED
7818.634	33.9	49.545	29.1	4.8	54	20.1	PASSED
7823.149	33.85	49.261	28.95	4.9	54	20.15	PASSED
7836.477	34	50.119	29	5	54	20	PASSED

RX mode, channel 810 / 1989.8 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Limit [dB μ V/m]	Margin	Results
3981.7	40.36	104.232	45.26	-4.9	74	33.64	PASSED
7961.4	48.72	272.898	43.02	5.7	74	25.28	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Limit [dB μ V/m]	Margin	Results
3981.7	25.43	18.685	30.33	-4.9	54	28.57	PASSED
7961.4	34.58	53.58	28.88	5.7	54	19.42	PASSED

5. Test Equipment

5.1. 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

5.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
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
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

Eq. No	Equipment	Type	Manufacturer	Used in
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