FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-1065_03	**Date of Report:**	11-Feb-2015
Number of pages:	20	**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-1065 / Battery BV-T4B / AC-Charger AC-20E / Headset WH-108**		
FCC ID:	PYAAAA	**IC:**	661X-AAA
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2009), CISPR 22 and IC standards, RSS-GEN (Issue 4, November 2014), RSS-132 (Issue 3, January 2013), RSS-133 (Issue 6, January 2013), RSS-139 (Issue 2, February 2009), RSS-199 (Issue 2, October 2014), RSS-130 (Issue 1, October 2013). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".**		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Microsoft.		
Test Results:	**The EUT complies with the requirements in respect of all parameters subject to the test.** The test results relate only to devices specified in this document		
Date and signature for the contents:	 Digitally signed by Lehtonen Sami.K DN: o=Nokia, ou=People, 0.9.2342.19200300.100.1.1=10019393, cn=Lehtonen Sami.K Date: 2015.02.11 08:12:12 +02'00'		

Sami Lehtonen, Engineer, EMC

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1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	07-Jan-2015
Testing completed	29-Jan-2015
The customer's contact person	Jari Rontu
Test Plan referred to	T:\Projects\RM-1065\TestPlan\RS_testplan_RM-1065.xlsm
Notes	Measured from antenna 1.
Document name	T:\Projects\RM-1065\EMC\FCC15B_RM-1065_03.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-1065	004402741070746;004402741070753	5201	-	02154.00000.14501.24000	18983
Battery	BV-T4B	4181574345C1010455900670764	-	-	-	18709
AC-Charger	AC-20E	409049415667071145500675628	-	-	-	18697
Headset	WH-108	4235VFA	-	-	-	18698

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	8.8	AC powerline conducted emissions	NP
15.109, a	6.1	Radiated emissions	PASSED

GSM 1900:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	8.8	AC powerline conducted emissions	NP
15.109, a	6.1	Radiated emissions	PASSED

WCDMA4:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	8.8	AC powerline conducted emissions	NP
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	8.8	AC powerline conducted emissions	NP
15.109, a	6.1	Radiated emissions	PASSED

LTE12:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	8.8	AC powerline conducted emissions	NP
15.109, a	6.1	Radiated emissions	PASSED

LTE28:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	8.8	AC powerline conducted emissions	NP
15.109, a	6.1	Radiated emissions	PASSED

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

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CONTENTS

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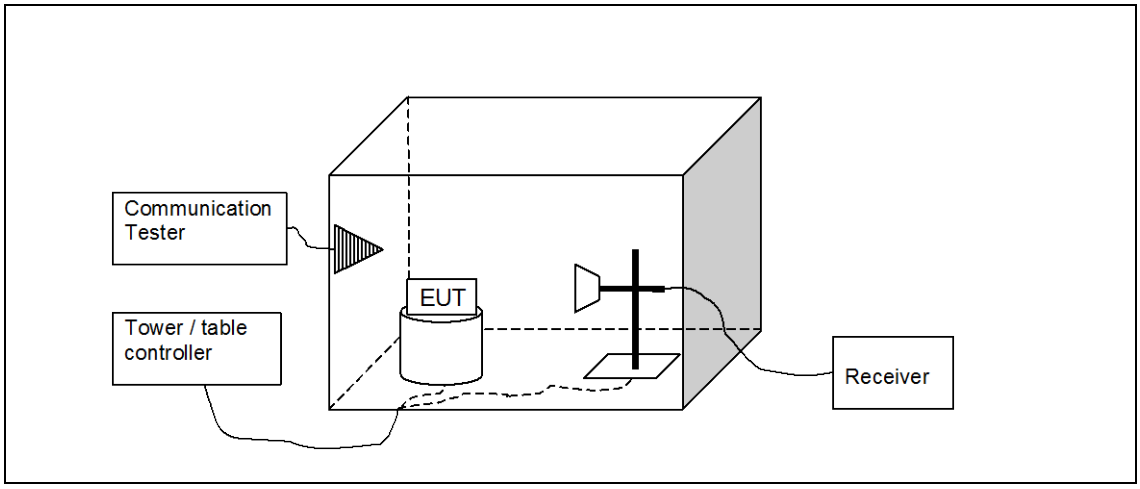
2. Radiated emissions

(FCC 15.109, a, RSS-132 6.1, RSS-133 6.1, RSS-139 6.1, RSS-199 6.1, RSS-130 6.1)

EUT with DUT number	RM-1065, DUT 18983
Accessories with DUT numbers	BV-T4B, DUT 18709 ; AC-20E, DUT 18697 ; WH-108, DUT 18698
Operation Voltage [V] / [Hz]	115/60
Results	PASSED
Remarks	Measured from antenna1.
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	21 / 40 / 99.3
Date of measurements	07-Jan-2015 - 29-Jan-2015
Measured by	Sami Lehtonen / Ville Mannermaa

2.1.1 Test setup



2.2. Test method and limit

The measurement is made according to ANSI C63.4-2009 as 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.

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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

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2.3. GSM 850 test results, FM-RADIO ON (98.0MHz)

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
3477.4	38.23	81.564	44.03	-5.8	74	35.77	PASSED
6953.3	47.27	230.94	44.97	2.3	74	26.73	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
3477.4	24.73	17.239	30.53	-5.8	54	29.27	PASSED
6953.3	34.35	52.18	32.05	2.3	54	19.65	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
38.455	26.93	22.208	40.43	-13.5	40	13.07	PASSED
40.685	27.76	24.434	42.66	-14.9	40	12.24	PASSED
76.259	19.04	8.954	41.74	-22.7	40	20.96	PASSED
643.207	24.65	17.08	38.75	-14.1	47	22.35	PASSED
649.619	25.61	19.077	39.61	-14	47	21.39	PASSED
652.796	24.23	16.274	38.13	-13.9	47	22.77	PASSED
659.209	26.46	21.038	40.16	-13.7	47	20.54	PASSED
665.601	25.89	19.702	39.79	-13.9	47	21.11	PASSED
668.798	24.93	17.64	38.83	-13.9	47	22.07	PASSED

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
7819.736	48.09	253.805	42.79	5.3	74	25.91	PASSED
7834.668	47.46	236.048	42.06	5.4	74	26.54	PASSED
7837.978	47.22	229.615	41.82	5.4	74	26.78	PASSED
7859.116	47.49	236.865	41.99	5.5	74	26.51	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
7819.736	34.34	52.119	29.04	5.3	54	19.66	PASSED
7834.668	34.4	52.481	29	5.4	54	19.6	PASSED
7837.978	34.37	52.3	28.97	5.4	54	19.63	PASSED
7859.116	34.3	51.88	28.8	5.5	54	19.7	PASSED

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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
3528.4	37.43	74.388	42.83	-5.4	74	36.57	PASSED
7051.6	45.42	186.638	42.42	3	74	28.58	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
3528.4	25.08	17.947	30.48	-5.4	54	28.92	PASSED
7051.6	32.85	43.904	29.85	3	54	21.15	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
3575.7	38.52	84.333	43.52	-5	74	35.48	PASSED
7150.5	46.84	219.786	43.14	3.7	74	27.16	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
3575.7	25.12	18.03	30.12	-5	54	28.88	PASSED
7150.5	33.73	48.585	30.03	3.7	54	20.27	PASSED

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2.4. GSM 1900 test results, FM-RADIO ON (98.0MHz)

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
3859	39.08	89.95	43.68	-4.6	74	34.92	PASSED
7721.9	46.71	216.521	41.81	4.9	74	27.29	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
3859	25.55	18.945	30.15	-4.6	54	28.45	PASSED
7721.9	34.26	51.642	29.36	4.9	54	19.74	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
38.486	28.29	25.972	41.79	-13.5	40	11.71	PASSED
42.446	25.62	19.099	41.72	-16.1	40	14.38	PASSED
74.78	19.51	9.451	42.41	-22.9	40	20.49	PASSED
75.872	19.33	9.258	42.13	-22.8	40	20.67	PASSED
649.589	25.44	18.707	39.44	-14	47	21.56	PASSED
652.796	26.46	21.038	40.36	-13.9	47	20.54	PASSED
659.209	26.73	21.702	40.43	-13.7	47	20.27	PASSED
662.385	26.68	21.577	40.48	-13.8	47	20.32	PASSED
665.591	27.34	23.281	41.24	-13.9	47	19.66	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
7816.634	47.23	229.879	41.93	5.3	74	26.77	PASSED
7832.862	47.2	229.087	41.8	5.4	74	26.8	PASSED
7843.784	47.5	237.137	42.1	5.4	74	26.5	PASSED
7849.299	47.04	224.905	41.64	5.4	74	26.96	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
7816.634	34.32	52	29.02	5.3	54	19.68	PASSED
7832.862	34.37	52.3	28.97	5.4	54	19.63	PASSED
7843.784	34.29	51.82	28.89	5.4	54	19.71	PASSED
7849.299	34.23	51.464	28.83	5.4	54	19.77	PASSED

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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
3919.6	39.34	92.683	43.54	-4.2	74	34.66	PASSED
7841.8	47.38	233.884	41.98	5.4	74	26.62	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
3919.6	25.78	19.454	29.98	-4.2	54	28.22	PASSED
7841.8	34.27	51.701	28.87	5.4	54	19.73	PASSED

RX mode, channel 810 / 1989.8 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
3979	38.3	82.224	42.6	-4.3	74	35.7	PASSED
7960.1	47.92	248.886	41.82	6.1	74	26.08	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
3979	25.42	18.664	29.72	-4.3	54	28.58	PASSED
7960.1	35.01	56.299	28.91	6.1	54	18.99	PASSED

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2.5. WCDMA4 test results, GPS ON

RX mode, channel 1537 / 2112.4 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
4226.5	38.09	80.26	41.99	-3.9	74	35.91	PASSED
6336.7	45.74	193.642	45.94	-0.2	74	28.26	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
4226.5	25.28	18.365	29.18	-3.9	54	28.72	PASSED
6336.7	32.34	41.4	32.54	-0.2	54	21.66	PASSED

RX mode, channel 1637 / 2132.4 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
38.296	25.65	19.165	39.05	-13.4	40	14.35	PASSED
40.724	24.93	17.64	39.83	-14.9	40	15.07	PASSED
76.073	18.47	8.385	41.27	-22.8	40	21.53	PASSED
76.52	20.63	10.752	43.33	-22.7	40	19.37	PASSED
656.002	27.61	24.016	41.41	-13.8	47	19.39	PASSED
659.209	27.9	24.831	41.6	-13.7	47	19.1	PASSED
662.385	24.16	16.144	37.96	-13.8	47	22.84	PASSED
665.591	27.03	22.465	40.93	-13.9	47	19.97	PASSED
668.798	27.67	24.182	41.57	-13.9	47	19.33	PASSED
694.419	27.07	22.568	40.57	-13.5	47	19.93	PASSED

RX mode, channel 1637 / 2132.4 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
7824.753	47.67	241.824	42.37	5.3	74	26.33	PASSED
7834.57	47.21	229.351	41.81	5.4	74	26.79	PASSED
7844.387	47.25	230.409	41.85	5.4	74	26.75	PASSED
7855.209	47.46	236.048	41.96	5.5	74	26.54	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
7824.753	34.38	52.36	29.08	5.3	54	19.62	PASSED
7834.57	34.37	52.3	28.97	5.4	54	19.63	PASSED
7844.387	34.17	51.109	28.77	5.4	54	19.83	PASSED
7855.209	34.18	51.168	28.68	5.5	54	19.82	PASSED

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RX mode, channel 1637 / 2132.4 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
4280.7	39.93	99.197	43.13	-3.2	74	34.07	PASSED
6421.7	45.16	181.134	45.06	0.1	74	28.84	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
4280.7	26.19	20.394	29.39	-3.2	54	27.81	PASSED
6421.7	32.27	41.068	32.17	0.1	54	21.73	PASSED

RX mode, channel 1738 / 2152.6 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
4305.2	39.15	90.678	41.95	-2.8	74	34.85	PASSED
6458.9	45.63	191.205	45.23	0.4	74	28.37	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
4305.2	26.55	21.257	29.35	-2.8	54	27.45	PASSED
6458.9	32.68	43.053	32.28	0.4	54	21.32	PASSED

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2.6. LTE7 test results, GPS ON

RX mode, channel 2775 / 2622.5 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
5246.5	43.37	147.401	44.87	-1.5	74	30.63	PASSED
7868.4	47.08	225.944	41.48	5.6	74	26.92	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
5246.5	29.94	31.405	31.44	-1.5	54	24.06	PASSED
7868.4	34.16	51.05	28.56	5.6	54	19.84	PASSED

RX mode, channel 3100 / 2655 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
38.396	26.26	20.559	39.66	-13.4	40	13.74	PASSED
40.675	26.78	21.827	41.68	-14.9	40	13.22	PASSED
76.66	19.88	9.863	42.58	-22.7	40	20.12	PASSED
76.772	20.32	10.375	43.02	-22.7	40	19.68	PASSED
304.018	26.2	20.417	46.3	-20.1	47	20.8	PASSED
313.607	25.88	19.679	45.88	-20	47	21.12	PASSED
316.793	25.37	18.557	45.27	-19.9	47	21.63	PASSED
323.196	25.81	19.521	45.51	-19.7	47	21.19	PASSED
662.415	24.46	16.711	38.26	-13.8	47	22.54	PASSED

RX mode, channel 3100 / 2655 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
7823.447	47.3	231.739	42	5.3	74	26.7	PASSED
7834.873	47.82	246.037	42.42	5.4	74	26.18	PASSED
7839.078	47.11	226.725	41.71	5.4	74	26.89	PASSED
7843.591	47.24	230.144	41.84	5.4	74	26.76	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
7823.447	34.38	52.36	29.08	5.3	54	19.62	PASSED
7834.873	34.37	52.3	28.97	5.4	54	19.63	PASSED
7839.078	34.33	52.06	28.93	5.4	54	19.67	PASSED
7843.591	34.28	51.761	28.88	5.4	54	19.72	PASSED

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RX mode, channel 3100 / 2655 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
5309.4	42.57	134.431	44.17	-1.6	74	31.43	PASSED
7963.7	48.06	252.93	41.96	6.1	74	25.94	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
5309.4	29.33	29.275	30.93	-1.6	54	24.67	PASSED
7963.7	35.01	56.299	28.91	6.1	54	18.99	PASSED

RX mode, channel 3425 / 2687.5 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
5373.8	43.06	142.233	44.46	-1.4	74	30.94	PASSED
8062.8	47.39	234.153	41.09	6.3	74	26.61	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
5373.8	30.15	32.174	31.55	-1.4	54	23.85	PASSED
8062.8	34.89	55.526	28.59	6.3	54	19.11	PASSED

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2.7. LTE12 test results, GPS ON

RX mode, channel 5035 / 731.5 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
730.01	45.45	187.284	52.45	-7	47	1.55	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
1462.5	36.03	63.314	42.83	-6.8	70	33.97	PASSED
1463.1	35.87	62.158	42.67	-6.8	70	34.13	PASSED
2194.2	40.13	101.508	42.93	-2.8	70	29.87	PASSED
2195.2	40.53	106.292	43.33	-2.8	70	29.47	PASSED
3002	38.37	82.89	43.07	-4.7	74	35.63	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
1462.5	23.01	14.142	29.81	-6.8	50	26.99	PASSED
1463.1	23	14.125	29.8	-6.8	50	27	PASSED
2194.2	27.41	23.469	30.21	-2.8	50	22.59	PASSED
2195.2	27.39	23.415	30.19	-2.8	50	22.61	PASSED
3002	24.95	17.681	29.65	-4.7	54	29.05	PASSED

RX mode, channel 5095 / 737.5 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
37.776	26.49	21.111	39.49	-13	40	13.51	PASSED
40.645	25.68	19.231	40.58	-14.9	40	14.32	PASSED
76.094	20.48	10.568	43.28	-22.8	40	19.52	PASSED
76.52	19.92	9.908	42.62	-22.7	40	20.08	PASSED
319.99	24.57	16.924	44.37	-19.8	47	22.43	PASSED
323.196	25.8	19.498	45.5	-19.7	47	21.2	PASSED
326.403	25.69	19.253	45.39	-19.7	47	21.31	PASSED
329.609	26	19.953	45.6	-19.6	47	21	PASSED
736.093	40.11	101.274	53.01	-12.9	47	6.89	PASSED

RX mode, channel 5095 / 737.5 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
7819.738	47.37	233.615	42.07	5.3	74	26.63	PASSED
7829.457	47.07	225.684	41.67	5.4	74	26.93	PASSED
7845.191	47.61	240.16	42.21	5.4	74	26.39	PASSED
7845.288	47.51	237.411	42.11	5.4	74	26.49	PASSED

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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
7819.738	34.36	52.24	29.06	5.3	54	19.64	PASSED
7829.457	34.43	52.662	29.03	5.4	54	19.57	PASSED
7845.191	34.26	51.642	28.86	5.4	54	19.74	PASSED
7845.288	34.26	51.642	28.86	5.4	54	19.74	PASSED

RX mode, channel 5095 / 737.5 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	35.74	61.235	42.84	-7.1	70	34.26	PASSED
1476	36.01	63.168	43.01	-7	70	33.99	PASSED
2212.1	40.27	103.157	43.07	-2.8	70	29.73	PASSED
2213.5	40.41	104.833	43.11	-2.7	70	29.59	PASSED
3000.7	38.01	79.524	42.71	-4.7	74	35.99	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	22.82	13.836	29.92	-7.1	50	27.18	PASSED
1476	22.77	13.756	29.77	-7	50	27.23	PASSED
2212.1	27.36	23.335	30.16	-2.8	50	22.64	PASSED
2213.5	27.38	23.388	30.08	-2.7	50	22.62	PASSED
3000.7	24.96	17.701	29.66	-4.7	54	29.04	PASSED

RX mode, channel 5155 / 743.5 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
1487.9	36.16	64.269	43.26	-7.1	70	33.84	PASSED
2230.4	41.01	112.331	43.31	-2.3	70	28.99	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
1487.9	22.72	13.677	29.82	-7.1	50	27.28	PASSED
2230.4	27.76	24.434	30.06	-2.3	50	22.24	PASSED

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2.8. LTE28 test results, GPS ON

RX mode, channel 9235 / 760.5 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
762.43	45.11	180.094	51.91	-6.8	47	1.89	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
1520.3	35.44	59.156	42.54	-7.1	70	34.56	PASSED
1521.8	35.43	59.088	42.53	-7.1	70	34.57	PASSED
2281	41.25	115.478	42.85	-1.6	70	28.75	PASSED
2282.8	41.55	119.536	43.15	-1.6	70	28.45	PASSED
3000.3	38.01	79.524	42.71	-4.7	74	35.99	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
1520.3	22.86	13.9	29.96	-7.1	50	27.14	PASSED
1521.8	22.85	13.884	29.95	-7.1	50	27.15	PASSED
2281	28.35	26.152	29.95	-1.6	50	21.65	PASSED
2282.8	28.4	26.303	30	-1.6	50	21.6	PASSED
3000.3	24.71	17.199	29.41	-4.7	54	29.29	PASSED

RX mode, channel 9435 / 780.5 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
37.956	25.11	18.009	38.31	-13.2	40	14.89	PASSED
40.684	25.88	19.679	40.78	-14.9	40	14.12	PASSED
76.442	19.83	9.806	42.53	-22.7	40	20.17	PASSED
76.619	19.49	9.43	42.19	-22.7	40	20.51	PASSED
781.399	41.6	120.226	54.4	-12.8	47	5.4	PASSED

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RX mode, channel 9435 / 780.5 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
7824.345	47.31	232.006	42.01	5.3	74	26.69	PASSED
7829.762	47.08	225.944	41.68	5.4	74	26.92	PASSED
7838.981	48.56	267.917	43.16	5.4	74	25.44	PASSED
7852.007	47.06	225.424	41.56	5.5	74	26.94	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
7824.345	34.33	52.06	29.03	5.3	54	19.67	PASSED
7829.762	34.4	52.481	29	5.4	54	19.6	PASSED
7838.981	34.35	52.18	28.95	5.4	54	19.65	PASSED
7852.007	34.2	51.286	28.7	5.5	54	19.8	PASSED

RX mode, channel 9435 / 780.5 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
1559.1	37.76	77.268	44.56	-6.8	70	32.24	PASSED
1561.7	37.13	71.862	43.93	-6.8	70	32.87	PASSED
2342.8	40.96	111.686	42.46	-1.5	70	29.04	PASSED
2343.2	41.2	114.815	42.7	-1.5	70	28.8	PASSED
3000.5	36.82	69.343	41.52	-4.7	74	37.18	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
1559.1	24.75	17.278	31.55	-6.8	50	25.25	PASSED
1561.7	24.38	16.558	31.18	-6.8	50	25.62	PASSED
2342.8	28.2	25.704	29.7	-1.5	50	21.8	PASSED
2343.2	28.21	25.734	29.71	-1.5	50	21.79	PASSED
3000.5	24.55	16.885	29.25	-4.7	54	29.45	PASSED

RX mode, channel 9635 / 800.5 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
1601.6	36.3	65.313	42.6	-6.3	70	33.7	PASSED
2403	40.54	106.414	42.14	-1.6	70	29.46	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
1601.6	23.78	15.453	30.08	-6.3	50	26.22	PASSED
2403	27.89	24.803	29.49	-1.6	50	22.11	PASSED

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3. Test Equipment

3.1. 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

3.2. 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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