

FCC Part 22/24 Compliance Test Report

Test Report no.:	FCC22&24_RM-1039_20.docx	Date of Report:	04-Sep-2014
Number of pages:	10	Customer's Contact person:	Hu Helen
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-1039 / Battery BV-T5A / Charger AC-301E / Wireless charger DT-900 / WLC cover CC-3086		
FCC ID:	QTLRM-1039	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-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 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:			

Jari Jantunen, System Manager, EMC

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

Date of receipt	09-Jul-2014
Testing completed	6.8.2014
The customer's contact person	Hu Helen
Test Plan referred to	T:\Projects\RM-1039\TestPlan\RS_Testplan_RM-1039.xlsm
Notes	-
Document name	T:\Projects\RM-1039\EMC\Temp\Jan\FCC22&24_RM-1039_20.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-1039	004402479477972	0241	-	02032.00000.14271.24000	43203
Battery	BV-T5A	417534224c10101093;0670738	Proto_V5	-	-	43205
Charger	AC-301E	4090492355020302324;0675638	CE	-	-	43196
Wireless charger	DT-900	0677090246236800395	CE	-	-	43197
WLC cover	CC-3086	-	CE	-	-	43209

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	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	NP
§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	NP

GSM1900:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§24.238(a)	6.5	Band edge compliance	NP
§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	NP

WCDMA 1700:

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	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§27.53(g)	6.5	Band edge compliance	NP
§27.53(g), §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	NP

LTE7:

Section in CFR 47	Section in RSS-GEN or RSS-199	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(h)(2)	4.4	Radiated RF output power	NP
§2.1049(h)	4.2	99 % occupied bandwidth	NP
§27.53(l)	4.5(b)	Band edge compliance	NP
§27.53(h), §2.1051	4.5(b)	Spurious emissions at antenna terminals	NP
§27.53(l), §2.1053	4.5(b)	Spurious radiated emissions	PASSED
§27.54	4.3	Frequency stability, temperature variation	NP
§27.54	4.3	Frequency stability, voltage variation	NP

LTE700 Lower (Band 17):

Section in CFR 47	Section in RSS-GEN or RSS-130	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(c)(10)	4.4	Radiated RF output power	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§27.53(g)	4.6	Band edge compliance	NP
§27.53(g), §2.1051	4.6	Spurious emissions at antenna terminals	NP
§27.53(g), §2.1051	4.6	Spurious radiated emissions	PASSED
§2.1055(a)	4.3 (a)	Frequency stability, temperature variation	NP
§2.1055(d)	4.3 (a)	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 Microsoft Laboratory.

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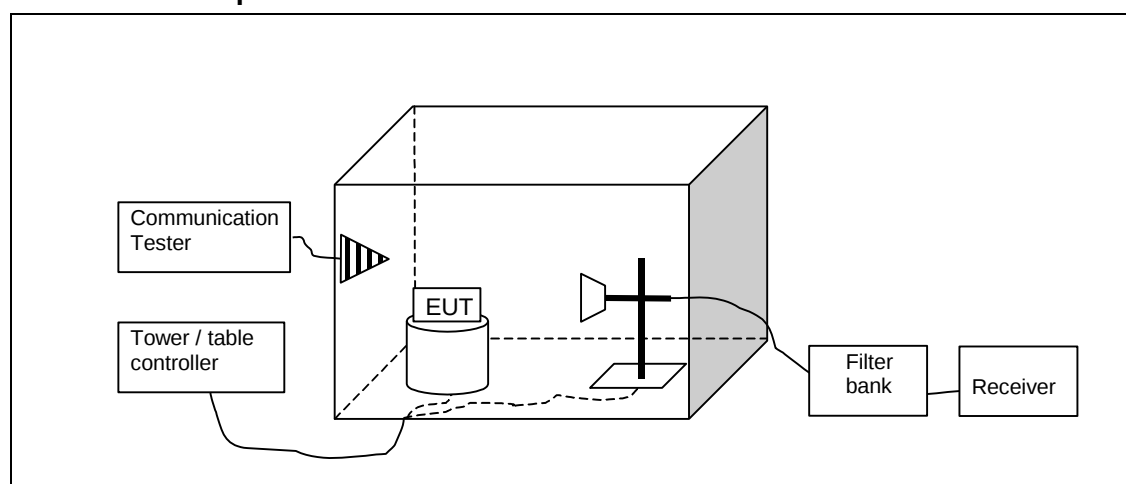
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2. Spurious radiated emissions

(FCC §22.917(a), §27.53(g), §2.1051, §27.53(l), §2.1053, §24.238(a), §2.1053, §2.1053, RSS-132 4.5, RSS-139 6.5, RSS-199 4.5(b), RSS-130 4.6)

EUT with DUT number	RM-1039, DUT 43203
Accessories with DUT numbers	BV-T5A, DUT 43205 ; AC-301E, DUT 43196 ; DT-900, DUT 43197 ; CC-3086, DUT 43209
Operation Voltage [V] / [Hz]	115/60
Results	PASSED
Remarks	Ant1=swap antenna 1, Ant2= swap antenna 2
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 54 / 98-101
Date of measurements	05-Aug-2014, 22-Aug-2014,
Measured by	Jan-Erik Lilja

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 divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The substitution method is used.

The measurement results are obtained as described below:

$$P [dBm] = P_{SUBST\ TX} + G_{SUBST\ TX\ ANT} - L_{SUBST\ CABLE}$$

Where $P_{SUBST\ TX}$ is signal generator level, which produces the same receiver reading P_{MEAS} in dBm as EUT. $G_{SUBST\ TX\ ANT}$ is substitution antenna gain and $L_{SUBST\ CABLE}$ is the loss of the cable between the signal generator and the substitution antenna.

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM 850	30 - 8500	-13
GSM1900	30 - 18000	-13
WCDMA 1700	30 - 17500	-13
LTE7	30 - 25700	-13
LTE700 Lower (Band 17)	30 - 7200	-13 (RBW = 100 kHz, ERP)

2.3. GSM 850 test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1634.509	-59.95	0.00101	-53.35	-6.6	VERTICAL	PASSED
1687.295	-60.22	0.00095	-53.32	-6.9	HORIZONTAL	PASSED
2529.299	-54.38	0.00365	-55.18	0.8	HORIZONTAL	PASSED
2536.914	-53.75	0.00422	-54.55	0.8	VERTICAL	PASSED
3314.549	-59.53	0.00111	-59.63	0.1	VERTICAL	PASSED
3392.786	-59.23	0.00119	-59.53	0.3	VERTICAL	PASSED

2.4. GSM 1900 test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
3737.916	-56.39	0.00230	-60.18	3.8	VERTICAL	PASSED
3759.800	-55.41	0.00288	-59.50	4.1	HORIZONTAL	PASSED
5640.401	-52.63	0.00546	-60.32	7.7	HORIZONTAL	PASSED
7520.080	-50.10	0.00977	-63.79	13.7	VERTICAL	PASSED
10158.457	-46.56	0.02208	-62.75	16.2	VERTICAL	PASSED

2.5. WCDMA 1700 test results, ant1

Channel 1412 / 1732.4 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1715	-42.54	0.05572	-37.84	-4.7	HORIZONTAL	PASSED
2133.537	-36.17	0.24155	-34.87	-1.3	HORIZONTAL	PASSED
3463.377	-51.21	0.00757	-54.61	3.4	HORIZONTAL	PASSED
3746.072	-55.62	0.00274	-59.52	3.9	VERTICAL	PASSED
3752.725	-55.74	0.00267	-59.74	4	VERTICAL	PASSED
5193.974	-51.72	0.00673	-59.12	7.4	HORIZONTAL	PASSED
6930.101	-47.74	0.01683	-58.84	11.1	VERTICAL	PASSED
7529.719	-48.68	0.01355	-62.48	13.8	VERTICAL	PASSED
8654.164	-46.63	0.02173	-63.23	16.6	HORIZONTAL	PASSED
9330.521	-44.71	0.03381	-62.91	18.2	VERTICAL	PASSED
10388.729	-45.46	0.02844	-62.76	17.3	VERTICAL	PASSED
12129.906	-46.29	0.0235	-64.29	18	VERTICAL	PASSED
13866.715	-51.26	0.00748	-62.96	11.7	HORIZONTAL	PASSED
15598.554	-49.98	0.01005	-65.98	16	VERTICAL	PASSED
17322.377	-48.75	0.01334	-66.95	18.2	VERTICAL	PASSED

2.6. WCDMA 1700 test results, ant2

Channel 1412 / 1732.4 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
2133.517	-36.69	0.21429	-35.39	-1.3	HORIZONTAL	PASSED
3466.263	-51.58	0.00695	-54.98	3.4	HORIZONTAL	PASSED
3761.022	-55.97	0.00253	-60.07	4.1	VERTICAL	PASSED
5193.933	-51.19	0.0076	-58.59	7.4	HORIZONTAL	PASSED
5635.731	-51.86	0.00652	-59.56	7.7	HORIZONTAL	PASSED

6924.169	-48.09	0.01552	-59.19	11.1	HORIZONTAL	PASSED
7530.12	-49.07	0.01239	-62.77	13.7	HORIZONTAL	PASSED
8653.002	-46.54	0.02218	-63.04	16.5	VERTICAL	PASSED
9315.571	-44.67	0.03412	-63.17	18.5	VERTICAL	PASSED
9736.293	-46.58	0.02198	-63.98	17.4	VERTICAL	PASSED
10387.967	-45.54	0.02793	-62.94	17.4	HORIZONTAL	PASSED
12131.429	-45.74	0.02667	-63.74	18	VERTICAL	PASSED
13861.224	-52.07	0.00621	-63.47	11.4	VERTICAL	PASSED
15589.335	-50.88	0.00817	-66.18	15.3	HORIZONTAL	PASSED
17316.926	-48.59	0.01384	-66.89	18.3	VERTICAL	PASSED

2.7. LTE7 test results, ant1

Channel 21100 / 2535.0 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
5070.301	-52.55	0.00556	-60.45	7.9	VERTICAL	PASSED
7605.621	-51.86	0.00652	-65.46	13.6	HORIZONTAL	PASSED
10141.343	-56.38	0.0023	-72.48	16.1	HORIZONTAL	PASSED
12670.491	-56.47	0.00225	-73.97	17.5	HORIZONTAL	PASSED

2.8. LTE7 test results, ant2

Channel 21100 / 2535.0 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
5070.421	-46.45	0.02265	-54.35	7.9	HORIZONTAL	PASSED
7605.461	-51.99	0.00632	-65.59	13.6	HORIZONTAL	PASSED
10140.581	-55.13	0.00307	-71.23	16.1	HORIZONTAL	PASSED
12665.24	-56.49	0.00224	-73.89	17.4	HORIZONTAL	PASSED

2.9. LTE700 Lower (Band 17) test results, ant1

Channel 23790 / 710 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1420.301	-71.19	8E-05	-62.39	-8.8	VERTICAL	PASSED
2130.621	-71.16	8E-05	-67.96	-3.2	HORIZONTAL	PASSED
2840.782	-69.86	0.0001	-72.46	2.6	VERTICAL	PASSED

2.10. LTE700 Lower (Band 17) test results, ant2

Channel 23790 / 710 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Results
1420.341	-63.05	0.0005	-54.45	-8.6	HORIZONTAL	PASSED
2130.621	-73.14	5E-05	-69.94	-3.2	HORIZONTAL	PASSED
2840.741	-68.83	0.00013	-71.43	2.6	VERTICAL	PASSED

3. Test Equipment

3.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15B
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C, 15E
TM23007	Oscilloscope	TDS684B	Tektronix	15E
TM22806	Battery	BAT 20/E	Fiskars	15C, 15B
TM22805	UPS	PS 20/1.2	Fiskars	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
-	Temperature test chamber	VT 4002	Vötsch	22/24/27
2001	Bluetooth tester	CBT	R&S	15C, 15B
2009	LISN 50 µH	ENV216	R&S	15C, 15B
2010	LISN 50 µH	ENV216	R&S	15C, 15B
2012	Power splitter	11667B	Agilent	22/24/27, 15C
2013	Attenuator	8493C	Agilent	22/24/27, 15C
2014	Attenuator	8493C	Agilent	22/24/27, 15C
2019	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2020	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2021	Communication Tester	CMW500	R&S	22/24/27
2022	Communication Tester	CMU200	R&S	22/24/27
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
-	Bluetooth tester	CBT	R&S	15C, 15B

3.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	OSP130	R&S	22/24/27, 15C, 15E, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	Emco	22/24/27, 15C, 15B
TM30643	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C, 15B
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chamber	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15E, 15B
TM38066	High pass filter	WHKX3.0/18G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
TM37545	Tunable notch filter	800.0/960.0-0.2/40-8SSK	Wainwright	22
TM26512	Tunable notch filter	WRCD1850/1910-0.2/40-10SSK	Wainwright	24
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	24
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
TM23892	Controller	G-1000SDX	Yaesu	22/24/27, 15C, 15E
2001	Bluetooth tester	CBT	R&S	15C, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
2021	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
2052	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B, 15E
-	Antenna	QSH18S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Bluetooth tester	CBT	R&S	15C, 15B