

FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RM-824_32	Date of Report:	29-Aug-2012
Number of pages:	12	Customer's Contact person:	Melava Tia
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-824 / Battery BP-5T / Wireless charging back cover for RM-824 CC-3041 / Wireless charger DT-900 / AC charger AC-301E / Charger cable NN		
FCC ID:	PYARM-824	IC:	661V-RM824
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Parts 22/24/27 , 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 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:			

Hannu Söderholm, Senior Engineer, EMC

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

Date of receipt	24-Aug-2012
Testing completed	27-Aug-2012
The customer's contact person	Melava Tia
Test Plan referred to	T:\Projects\RM-824\TestPlan\RS_testplan_RM-824.xlsm
Notes	-
Document name	T:\Projects\RM-824\EMC\FCC22&24&27_RM-824_32.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-824	004402139761492	2210		1230.0015.8441.9735.241	42857
Battery	BP-5T	3932132224140100127;0670665	-	-	-	42846
Wireless charging back cover for RM-824	CC-3041	1234567890	NA	-	-	42859
Wireless charger	DT-900	0677091226400W00006	5.0	1.2	DSP: 2.3.1.5064	42860
AC charger	AC-301E	4090492282580300002;0675638	B4.3	-	-	42861
Charger cable	NN	-	-	-	-	42862
Phone	RM-824	004402139761153	2210		1230.0015.8441.9735.241	42877

1.2. Summary of Test Results

GSM850:

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	-
§22.913(a)	4.4	Radiated RF output power	-
§2.1049(h)	4.6.1	99 % occupied bandwidth	-
§22.917(a)	4.5	Band edge compliance	-
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	-
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	-
§2.1055(d)	4.3	Frequency stability, voltage variation	-

WCDMA 850 (Band V):

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

LTE 850 (Band V):

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

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	-
§24.232(b)	6.4	Radiated RF output power	-
§2.1049(h)	4.6.1	99 % occupied bandwidth	-
§24.238(a)	6.5	Band edge compliance	-
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	-
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	-
§2.1055(d)	6.3	Frequency stability, voltage variation	-

WCDMA 1900 (Band II):

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	-
§24.232(b)	6.4	Radiated RF output power	-
§2.1049(h)	4.6.1	99 % occupied bandwidth	-
§24.238(a)	6.5	Band edge compliance	-
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	-
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	-
§2.1055(d)	6.3	Frequency stability, voltage variation	-

LTE 1900 (Band II):

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	-
§24.232(b)	6.4	Radiated RF output power	-
§2.1049(h)	4.6.1	99 % occupied bandwidth	-
§24.238(a)	6.5	Band edge compliance	-
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	-
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	-
§2.1055(d)	6.3	Frequency stability, voltage variation	-

LTE1700 (Band 4):

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	-
§27.50(d)(4)	6.4	Radiated RF output power	-
§2.1049(h)	4.6.1	99 % occupied bandwidth	-
§27.53(h)	6.5	Band edge compliance	-
§27.53(h), §2.1051	6.5	Spurious emissions at antenna terminals	-
§27.53(h), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	-
§2.1055(d)	6.3	Frequency stability, voltage variation	-

LTE700 Lower (Band 17):

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046 (a)	N/A	Conducted RF output power	-
§27.50(c)(10)	N/A	Radiated RF output power	-
§2.1049(h)	N/A	99 % occupied bandwidth	-
§27.53(g)	N/A	Band edge compliance	-
§27.53(g), §2.1051	N/A	Spurious emissions at antenna terminals	-
§27.53(g), §2.1051	N/A	Spurious radiated emissions	PASSED
§2.1055(a)	N/A	Frequency stability, temperature variation	-
§2.1055(d)	N/A	Frequency stability, voltage variation	-

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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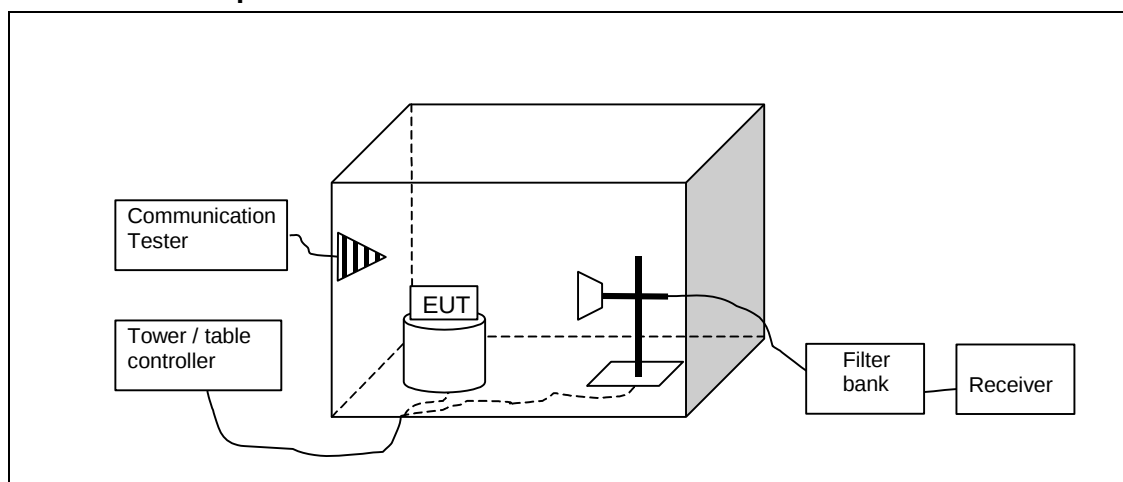
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2. Spurious radiated emissions

(FCC §22.917(a), §2.1053, §24.238(a), §2.1053, §27.53(h), §27.53(g), RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-824, DUT 42857
Accessories with DUT numbers	BP-5T, DUT 42846 ; CC-3041, DUT 42859 ; DT-900, DUT 42860 ; AC-301E, DUT 42861 ; NN, DUT 42862
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 48 / 100.0
Date of measurements	27-Aug-2012
Measured by	Timo Raiskio

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:

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

Where $P_{\text{SUBST TX}}$ is signal generator level, which produces the same receiver reading P_{MEAS} in dBm as EUT. $G_{\text{SUBST TX ANT}}$ is substitution antenna gain and $L_{\text{SUBST CABLE}}$ 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]
LTE 700 Lower	30 - 7200	-13 (RBW = 100 kHz, ERP)
GSM 850 / WCDMA 850	30 - 8500	-13
GSM 1900 / WCDMA 1900 WCDMA 1700 / LTE 1700	30 - 18000	-13

2.3. GSM850 TX Test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
1646.413	-58.66	0.00136	-53.1	-5.56	H	PASSED
1655.952	-58.89	0.00129	-53.28	-5.61	V	PASSED
1723.327	-58.72	0.00134	-52.97	-5.75	V	PASSED
2545.812	-53.57	0.0044	-55.67	2.1	H	PASSED
2547.214	-53.64	0.00432	-55.63	1.99	V	PASSED
3326.132	-58.74	0.00134	-61.67	2.93	H	PASSED

2.4. GSM850-E1 TX Test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
1656.653	-57.28	0.00187	-51.66	-5.62	V	PASSED
1668.637	-59.39	0.00115	-53.47	-5.92	V	PASSED
1673.046	-56.55	0.00221	-50.76	-5.79	H	PASSED
2509.639	-53.93	0.00405	-55.72	1.79	V	PASSED
2517.776	-54.02	0.00396	-56.05	2.03	H	PASSED
3327.715	-59.21	0.0012	-62.17	2.96	H	PASSED

2.5. GSM1900 TX Test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
3760.08	-51.22	0.00755	-58.71	7.49	H	PASSED
5679.639	-51.85	0.00654	-61.73	9.88	V	PASSED
7523.206	-50.75	0.00841	-64.73	13.98	H	PASSED

2.6. GSM1900-E1 TX Test results

Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
3759.579	-54.9	0.00324	-62.38	7.48	H	PASSED
3761.824	-55.44	0.00286	-62.92	7.48	H	PASSED
5651.924	-51.58	0.00695	-61.21	9.63	H	PASSED
7532.325	-50.79	0.00834	-64.52	13.73	V	PASSED

2.7. WCDMA 1900 (Band II) Test results

Channel 9400 / 1880.0 MHz
FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
3762.465	-48.32	0.01472	-56.21	7.89	V	PASSED
3762.665	-50.75	0.00841	-58.64	7.89	V	PASSED
5636.974	-49.85	0.01034	-59.79	9.94	V	PASSED
7517.535	-49.76	0.01057	-63.55	13.79	V	PASSED

2.8. WCDMA 850 (Band V) Test results

Channel 4175 / 835.0 MHz
FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
847.569	-48.86	0.01301	-81.68	32.82	V	PASSED
855.656	-48.66	0.0136	-81.91	33.25	V	PASSED
1009.319	-62.6	0.00055	-53.11	-9.49	V	PASSED
2508.036	-48.55	0.01395	-50.36	1.81	V	PASSED
2508.437	-48.23	0.01504	-50.03	1.8	V	PASSED
3335.13	-48.02	0.01577	-51.27	3.25	V	PASSED

2.9. WCDMA 1700 (Band IV) test results

Channel 1412 / 1732.4 MHz
FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
3757.054	-53.62	0.00435	-61.47	7.85	VERTICAL	PASSED
5648.397	-51.26	0.00748	-61.04	9.78	VERTICAL	PASSED
7536.293	-49.26	0.01186	-63.13	13.87	HORIZONTAL	PASSED
14316.413	-44.58	0.03484	-66.57	21.99	VERTICAL	PASSED

2.10. LTE 1700 (Band IV) Test results

Channel 20175 / 1732.5 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
3465.621	-65.69	0.00027	-71.2	5.51	H	PASSED
5198.241	-61.67	0.00068	-71.44	9.77	V	PASSED
6921.002	-58.35	0.00146	-70.74	12.39	V	PASSED
8663.682	-56.99	0.002	-72.2	15.21	H	PASSED
10385.842	-58.52	0.00141	-75.33	16.81	H	PASSED

2.11. LTE 1900 (Band II) Test results

Channel 18900 / 1880.0 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
1958.831	-35.27	0.29717	-33.31	-1.96	H	PASSED
3760.301	-60.5	0.00089	-68.42	7.92	V	PASSED
5640.581	-61.3	0.00074	-71.2	9.9	V	PASSED
7528.317	-60.86	0.00082	-74.61	13.75	V	PASSED

2.12. LTE700 Lower (Band 17) Test results

Channel 23790 / 710 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
1420.461	-76.73	2E-05	-69.31	-7.42	H	PASSED
2130.581	-67.58	0.00017	-65.42	-2.16	V	PASSED
2846.313	-69.96	0.0001	-74.27	4.31	V	PASSED

2.13. LTE 850 (Band V) Test results

Channel 20525 / 836.5 MHz

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

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
857.939	-59.61	0.00109	-93.02	33.41	V	PASSED
879.901	-40.6	0.08706	-74.61	34.01	H	PASSED
880.553	-37	0.19971	-71.44	34.44	V	PASSED
1673.461	-66.74	0.00021	-61.06	-5.68	V	PASSED
2505.913	-72.77	5E-05	-74.6	1.83	V	PASSED
3346.782	-59.75	0.00106	-63.01	3.26	V	PASSED

3. Test Equipment

3.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15B
OM06312	Signal Generator	E4422B	Agilent	22/24
TM37678	Communication Tester	CMU200	R&S	15C, 15B
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C
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
2058	Receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Communication Tester	CMU200	R&S	22/24/27, 15C
2009	LISN 50 μ H	ENV216	R&S	15C, 15B
2010	LISN 50 μ H	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
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C

3.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM26497	Antenna	3115	Emco	22/24/27, 15C, 15B
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15B
-	RF system panel	TS-RSP	R&S	22/24/27, 15C, 15B
-	RF system panel	TS-RSP	R&S	22/24/27, 15C, 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 μ H	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 μ H	LISN-5-20-2	FCC	22/24/27, 15C, 15B
-	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
TM39180	Laser distance meter	Disto Pro	Leica	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 chambre	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C, 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
-	Band reject filter	WRCG832/838-825/848-40/5SS	Wainwright	22
TM23892	Controller	G-1000SDX	Yaesu	22/24/27
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27, 15C
2025	Antenna	HFH2-Z2	R&S	15C