FCC Part 15C Compliance Test Report

Test Report no.:	FCC15C_RM-627_19.docx	**Date of Report:**	2-July-2010
Number of pages:	15	**Customer's Contact person:**	Mohammad El-Haj
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Customer:**	Nokia Corporation Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934
FCC listing no.: **IC recognition no.:**	99059 661AL-1		
Tested devices/ accessories:	**Phone RM-627 / Battery BL-5F / AC-Charger AC-6E / Headset WH-102**		
FCC ID:	QTKRM-627	**IC:**	
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards, RSS-210 (Issue 7, June 2007). 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:		Digitally signed by Ruben Hansen DN: cn=Ruben Hansen, o=TCC NOKIA, ou=EMC, email=ruben.hansen@nokia.com, c=DK Date: 2010.07.07 07:51:56 +02'00'	

Ruben Hansen, System Manager, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	03-Jun-2010
Testing completed	30-June-2010
The customer's contact person	Mohammad El-Haj
Test Plan referred to	T:\Projects\RM-627\TestPlan\RS_testplan_RM-627_CR_HW0300.xls
Notes	-
Document name	\\satcc01nmp\tcc_salo\Projects\RM-627\EMC\FCC15C_RM-627_02.docx

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900) and WCDMA Band (I/II(1900)/VIII) mobile phone with GPRS, EGPRS, HSDPA, HSUPA and WLAN and Bluetooth. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-627	352713/04/000906/2	0300	-	041.017	24229
Battery	BL-5F	363563936631160873 4;0670498	-	-	-	24375
AC-Charger	AC-6E	394349940114121012 5;0675590	-	-	-	24385
Headset	WH-102	06947869453I1R00419	-	-	-	24377

1.2. Summary of Test Results

WLAN:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8(0.4(4))	Conducted peak output power	NP
15.247(d)	A8(0.5)	Band edge compliance of RF emissions	PASSED
15.247(d)	A8(0.5)	Spurious RF conducted emissions	NP
15.247(d), 15.209	A8(0.5)	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	NP
15.247(a)(2)	A8(0.1(1))	6dB(bandwidth)	NP
		Power spectral density	NP

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 Nokia Laboratory.

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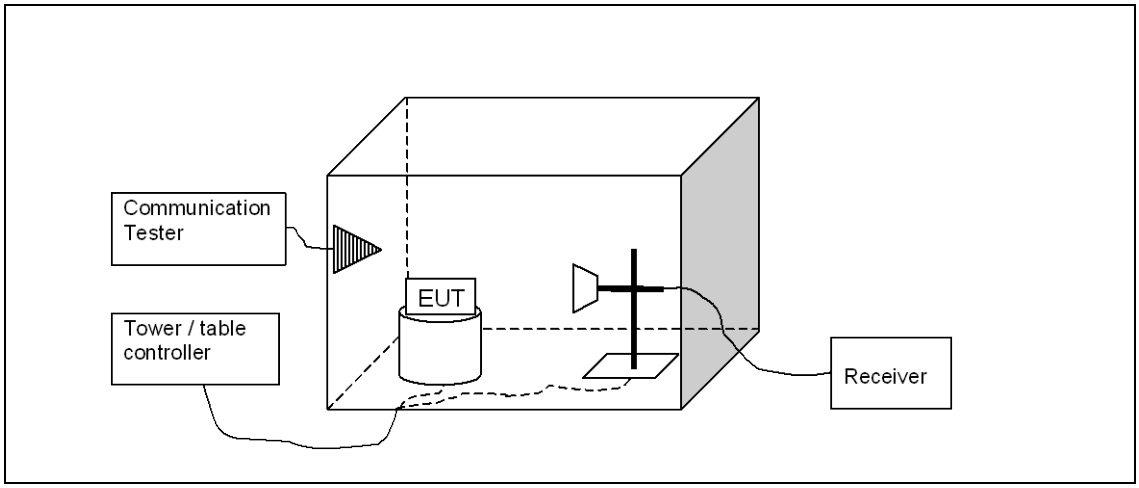
2. Band edge compliance of RF emissions
(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-627, DUT 24229
Accessories with DUT numbers	BL-5F, DUT 24375 ; AC-6E, DUT 24385 ; WH-102, DUT 24377
Operation Voltage [V] / [Hz]	-
Results	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] /	23 / 45
Date of measurements	29-Jun-2010
Measured by	Ruben Hansen

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

The measurement results are obtained as described below:

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

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

Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit Average [dBµV/m]	Limit Peak [dBµV/m]
Below 2390 and above 2483.5	<=54	<=74

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2.3. WLAN Test results

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

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412 (OFDM,6)	49.9	PASSED
11 / 2462 (OFDM,6)	47.26	PASSED
1 / 2412 (DSS, QPSK, 11MB)	46.24	PASSED
11 / 2462 (DSSS, QPSK, 11MB)	46.84	PASSED

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

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412 (OFDM,6)	67.22	PASSED
11 / 2462 (OFDM,6)	61.65	PASSED
1 / 2412 (DSS, QPSK, 11MB)	58.07	PASSED
11 / 2462 (DSSS, QPSK, 11MB)	58.49	PASSED

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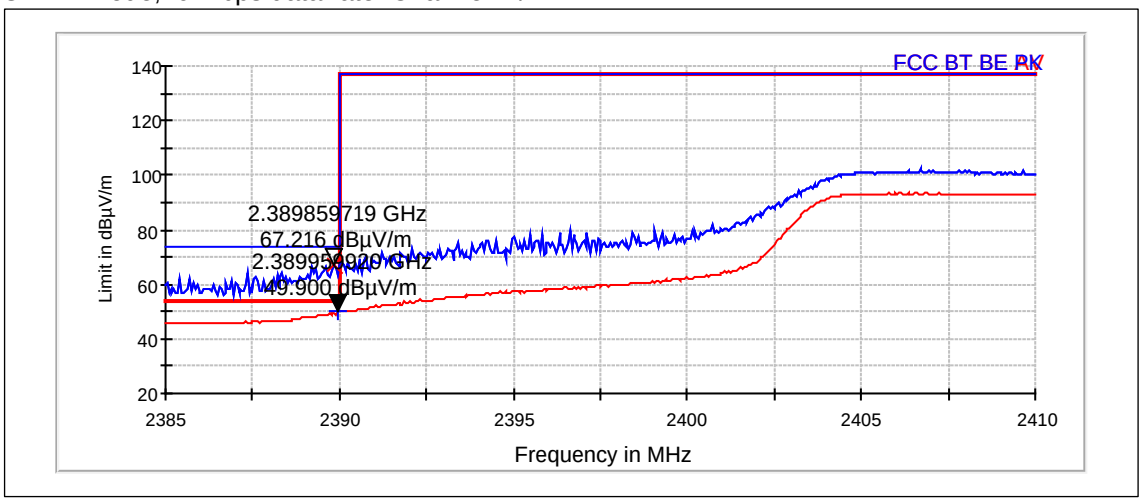
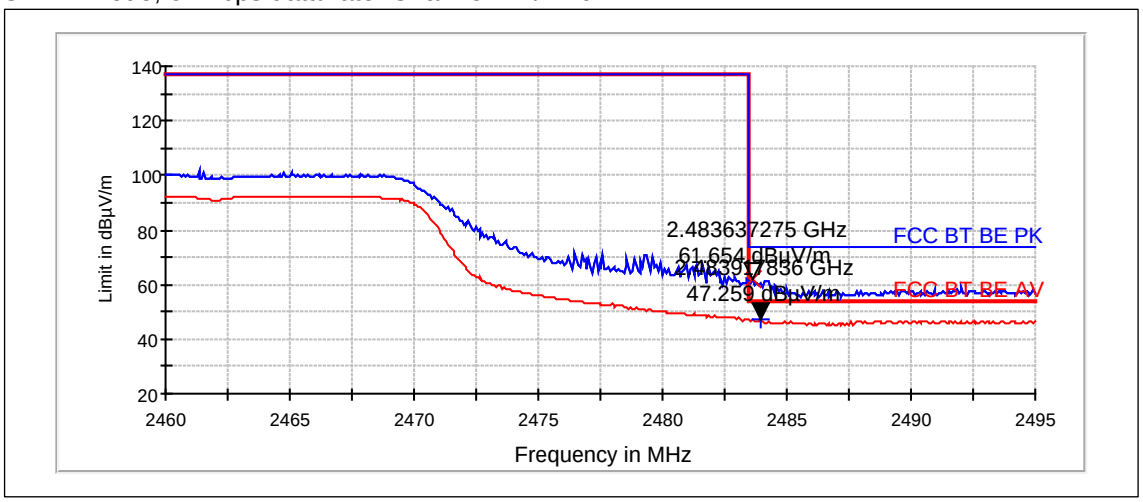
OFDM mode, 6 Mbps data rate. Channel 1 / 2412 MHz



OFDM mode, 6 Mbps data rate. Channel 11 / 2462 MHz



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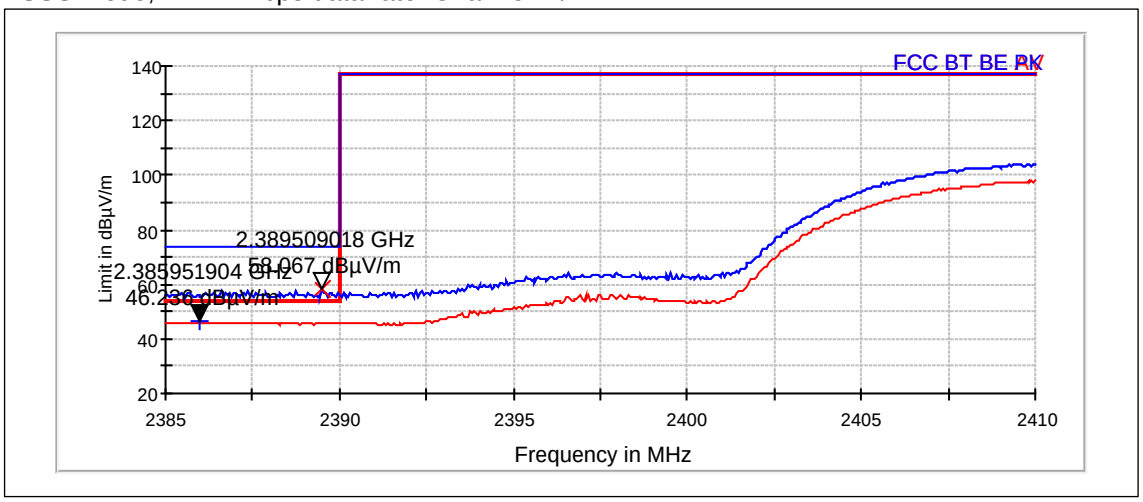
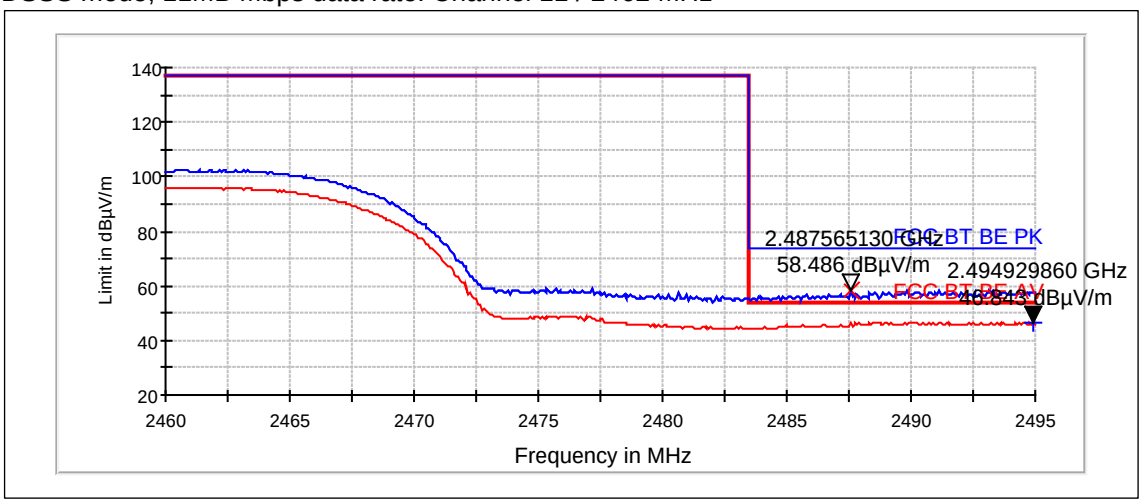
DSSS mode, 11MB Mbps data rate. Channel 1 / 2412 MHz



DSSS mode, 11MB Mbps data rate. Channel 11 / 2462 MHz



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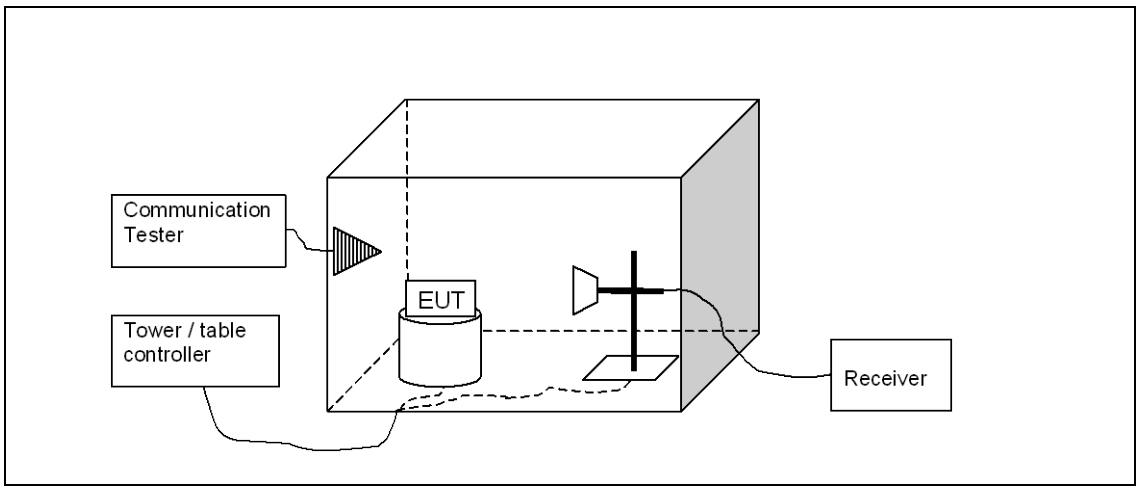
3. Spurious radiated emissions

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

EUT with DUT number	RM-627, DUT 24229
Accessories with DUT numbers	BL-5F, DUT 24375 ; AC-6E, DUT 24385 ; WH-102, DUT 24377
Operation Voltage [V] / [Hz]	-
Results	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] /	23 / 50
Date of measurements	29-Jun-2010
Measured by	Ruben Hansen

3.1. Test Setup



3.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210 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.

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The measurement results are obtained as described below:

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

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

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [µV/m]	Limit [dBµV/m]	Detector
30 - 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
Above 1000	500	54	Average
Above 1000	5000	74	Peak

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3.3. WLAN Test results

3.3.1 6 Mbps OFDM_mode

Channel 1 / 2412 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4825	28.1	25.404	26.54	1.56	HORIZONTAL	Passed
7238	34.33	52.06	24.37	9.96	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4825	41.04	112.746	39.48	1.56	HORIZONTAL	Passed
7238	46.98	223.254	37.02	9.96	VERTICAL	Passed

Channel 7 / 2442 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2384.7	36.64	67.881	36.14	0.5	VERTICAL	Passed
2496.967	36.71	68.462	34.72	1.99	VERTICAL	Passed
3908.316	25.07	17.923	26.15	-1.08	VERTICAL	Passed
11418.74	42.52	133.644	24.42	18.1	VERTICAL	Passed
17999.9	56.02	632.63	24.26	31.76	VERTICAL	Passed

Quasi peak (RBW: 100 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
44.299	30.26	32.58	44.79	-14.53	VERTICAL	Passed
44.371	30.3	32.715	44.88	-14.58	VERTICAL	Passed
44.45	30.45	33.289	45.08	-14.63	VERTICAL	Passed
44.499	30.44	33.258	45.1	-14.66	VERTICAL	Passed
44.591	30.51	33.547	45.24	-14.73	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2384.7	49.65	303.599	49.15	0.5	VERTICAL	Passed
2496.967	49.95	314.413	47.96	1.99	VERTICAL	Passed
3908.316	38.15	80.854	39.23	-1.08	VERTICAL	Passed
11418.74	55.12	570.361	37.02	18.1	VERTICAL	Passed
17999.9	69.05	2834.654	37.29	31.76	VERTICAL	Passed

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Channel 11 / 2462 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4923.9	30.29	32.708	27.93	2.36	VERTICAL	Passed
7388	36.2	64.588	24.23	11.97	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4923.9	43.21	144.627	40.85	2.36	VERTICAL	Passed
7388	49.66	304.194	37.69	11.97	VERTICAL	Passed

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3.3.2 11 Mbps DSSS mode

Channel 1 / 2412 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4825	28.1	25.404	26.54	1.56	HORIZONTAL	Passed
7238	34.33	52.06	24.37	9.96	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4825	41.04	112.746	39.48	1.56	HORIZONTAL	Passed
7238	46.98	223.254	37.02	9.96	VERTICAL	Passed

Channel 7 / 2442 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2382.856	37.04	71.113	36.73	0.31	VERTICAL	Passed
2495.034	38.41	83.263	36.11	2.3	VERTICAL	Passed
3914.527	24.17	16.162	25.26	-1.09	VERTICAL	Passed
17909.22	56.33	655.39	25.54	30.79	VERTICAL	Passed

Quasi peak (RBW: 100 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
31.444	26.35	20.775	32.36	-6.01	VERTICAL	Passed
37.679	26.32	20.69	36.48	-10.16	VERTICAL	Passed
39.017	27.53	23.788	38.57	-11.04	VERTICAL	Passed
44.218	28.54	26.742	43.02	-14.48	VERTICAL	Passed
44.649	28.51	26.638	43.27	-14.76	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2382.856	50.6	339	50.29	0.31	VERTICAL	Passed
2495.034	51.32	368.044	49.02	2.3	VERTICAL	Passed
3914.527	37.39	74.012	38.48	-1.09	VERTICAL	Passed
17909.22	68.75	2738.42	37.96	30.79	VERTICAL	Passed

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Channel 11 / 2462 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4923.9	30.29	32.708	27.93	2.36	VERTICAL	Passed
7388	36.2	64.588	24.23	11.97	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4923.9	43.21	144.627	40.85	2.36	VERTICAL	Passed
7388	49.66	304.194	37.69	11.97	VERTICAL	Passed

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4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15C, 15B
13513	Pulse Limiter	ESH3Z2	Rohde&Schwarz	15C, 15B
13666	Receiver	ESPC	Rohde&Schwarz	15C, 15B
13935	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
16995	Directional Coupler 20dB 0,5-2,0 GHz SMA Conn.	1538RA-20	Weinschel	15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
19171	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B
11386	DC Power Supply	HP6632A	Hewlett Packard	22/24/27, 15C, 15B
19678	Spectrum Analyzer	FSP	Rohde&Schwarz	22/24/27, 15C, 15B
16601	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
19625	Climatic Chamber	VT4002EMC	Vötsch	22/24/27, 15C, 15B
13357	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
19116	Power splitter	-	various	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
18792	Mast/turntable controller	2090	ETS-EMCO	22/24/27, 15C, 15B
18416	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
13077	Power Supply	EA-3016	-	22/24/27, 15C, 15B
15742	Programmable Relay Switching System	----------	Pickering	22/24/27, 15C, 15B
20078	Relay 2x6 Chnl µWave Mux	10-785B-522	Pickering	22/24/27, 15C, 15B
14021	Relay Dual 6 Chnl µWave Mux	10-785-522	-	22/24/27, 15C, 15B
-	Relay Dual 6 Chnl µWave Mux	10-785-522	-	22/24/27, 15C, 15B
17644	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
16948	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
16949	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
18861	Receiver	EMI Test Receiver 20Hz-26,5GHz ESI	Rohde&Schwarz	22/24/27, 15C, 15B
18860	Antenna	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
18773	Anechoic chamber	RFD-100	ETS-Lindgren	22/24/27, 15C, 15B
18774	Anechoic chamber	RFSD-F/A-100	ETS-Lindgren	22/24/27, 15C, 15B
19151	High Pass Filter	WHJS3000-10SS	Wainwright	22/24/27, 15C, 15B
13937	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright Instruments	22/24/27, 15C, 15B
13936	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	22/24/27, 15C, 15B
14114	Highpass Filter	WHK1000-12SS	Wainwright Instruments	22/24/27, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
14188	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright	22/24/27, 15C, 15B
14187	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B
16633	Band reject filter	WRCD1880.0-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B
19587	Band reject filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	22/24/27, 15C, 15B
20115	Band reject filter	-	Wainwright	22/24/27, 15C, 15B
20114	Band reject filter	WRCG1737/1743-1733/1747-40/6SS	Wainwright	22/24/27, 15C, 15B
20116	Band reject filter	WRCG832/83/-825/845-40/5SS	Wainwright	22/24/27, 15C, 15B
20698	Antenna	BBHA 9120 D	SCHWARZBECK	22/24/27, 15C, 15B
19966	Antenna	HFH2-Z2	Rohde&Schwarz	15C, 15B
13799	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
15191	Turntable Contoller Unit	G-800SDX	YAESU	22/24/27, 15C, 15B
14900	Antenna Controller	HD100	HD GmbH	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B

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