

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CWLAN_RM-775_04.docx	Date of Report:	06-May-2011
Number of pages:	16	Customer's Contact person:	Cremer Tobias
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FCC listing no.:	99059		
IC recognition no.:	661AL-1		
Tested devices/ accessories:	Phone RM-775 / Battery BL-4S / AC-Charger AC-8E / Headset WH-102		
FCC ID:	PPIRM-775	IC:	661U-RM775
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 8, December 2010). 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:			

Christian Andersen, System Specialist, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	27-Apr-2011
Testing completed	05-May-2011
The customer's contact person	Cremer Tobias
Test Plan referred to	T:\Projects\RM-775\TestPlan\RS_testplan_RM-775.xls
Notes	-
Document name	T:\Projects\RM-775\EMC\FCC15CWLAN_RM-775_04.docx

1.1. EUT and Accessory Information

The EUT is a 8-band (GSM850/900/1800/1900) and WCDMA Band (I/II(1900)/V(850)/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-775	004402/13/442394/0	0100	-	lei6.33	23685
Battery	BL-4S	3820660282225706517;0670577	-	-	-	23711
AC-Charger	AC-8E	4090498425930401604;0675387	-	-	-	23727
Headset	WH-102	06947860025N1R06950	-	-	-	23707

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)	A8.4 (4)	Conducted peak output power	NP
15.247(d)	A8.5	Band edge compliance of RF emissions	Passed
15.247(d)	A8.5	Spurious RF conducted emissions	NP
15.247(d), 15.209	A8.5	Spurious radiated emissions	Passed
15.207	7.2.2	AC powerline conducted emissions	NP
15.247(a)(2)	A8.2 (a)	6dB(bandwidth)	NP
15.247(e)	A8.2 (b)	Power spectral density	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 Nokia Laboratory.

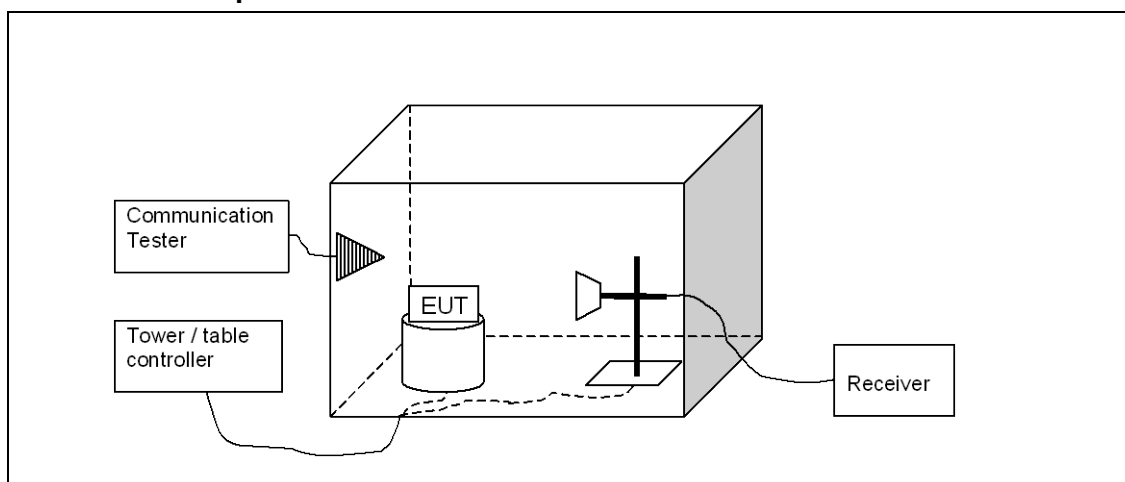
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2. Band edge compliance of RF emissions (FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-775, DUT 23685
Accessories with DUT numbers	BL-4S, DUT 23711 ; AC-8E, DUT 23727 ; WH-102, DUT 23707
Operation Voltage [V] / [Hz]	115 / 60
Results	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 44 / 99
Date of measurements	05-May-2011
Measured by	Bo Moltved Christiansen

2.1.1 Test Setup



2.2. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

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

2.3. WLAN Test results

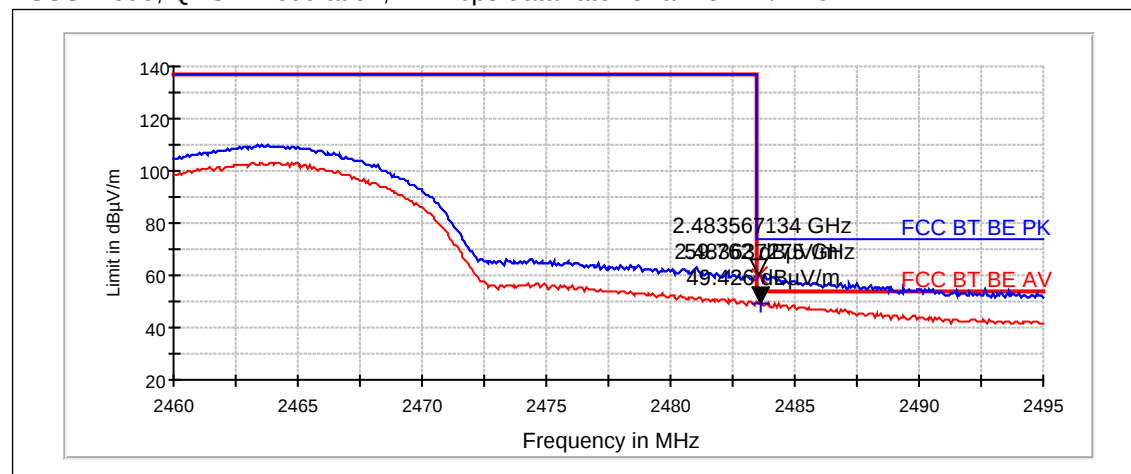
Average (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
11 / 2462 (DSSS)	49.43	Passed
1 / 2412 (DSSS)	46.58	Passed
1 / 2412 (OFDM)	50.24	Passed
11 / 2462 (OFDM)	50.52	Passed
1 / 2412 (n-mode)	50.76	Passed
11 / 2462 (n-mode)	50.67	Passed

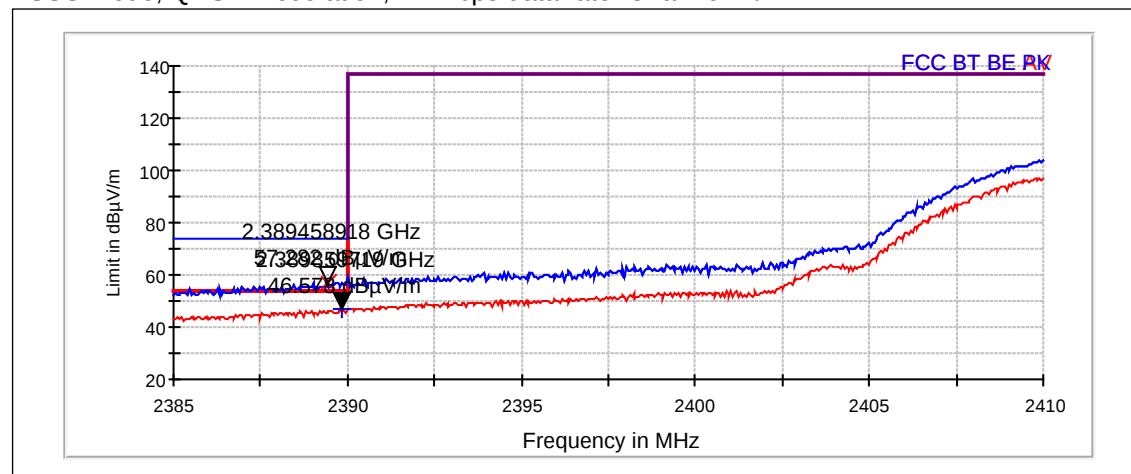
Peak (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
11 / 2462 (DSSS)	59.76	Passed
1 / 2412 (DSSS)	57.28	Passed
1 / 2412 (OFDM)	64.1	Passed
11 / 2462 (OFDM)	61.96	Passed
1 / 2412 (n-mode)	68.69	Passed
11 / 2462 (n-mode)	66.56	Passed

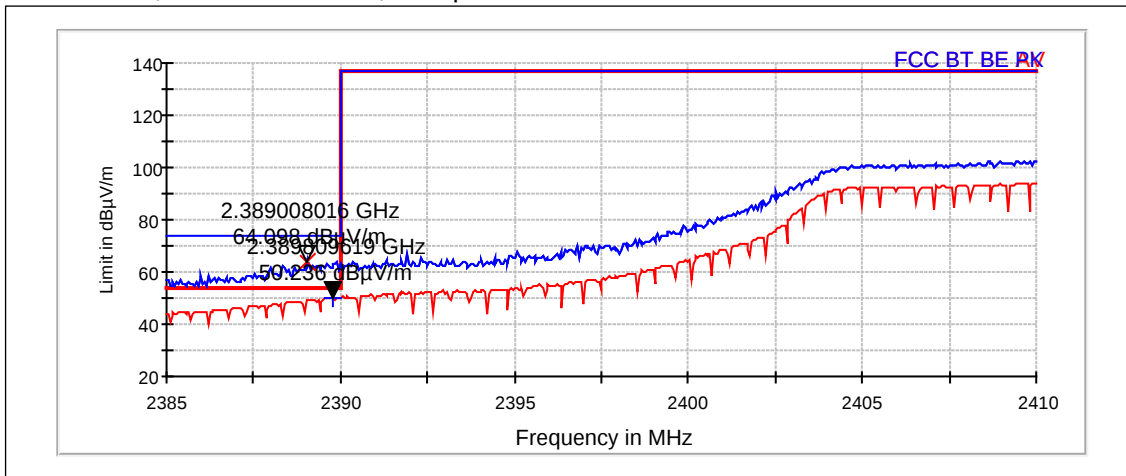
DSSS mode, QPSK modulation, 11 Mbps data rate. Channel 11 / 2462 MHz



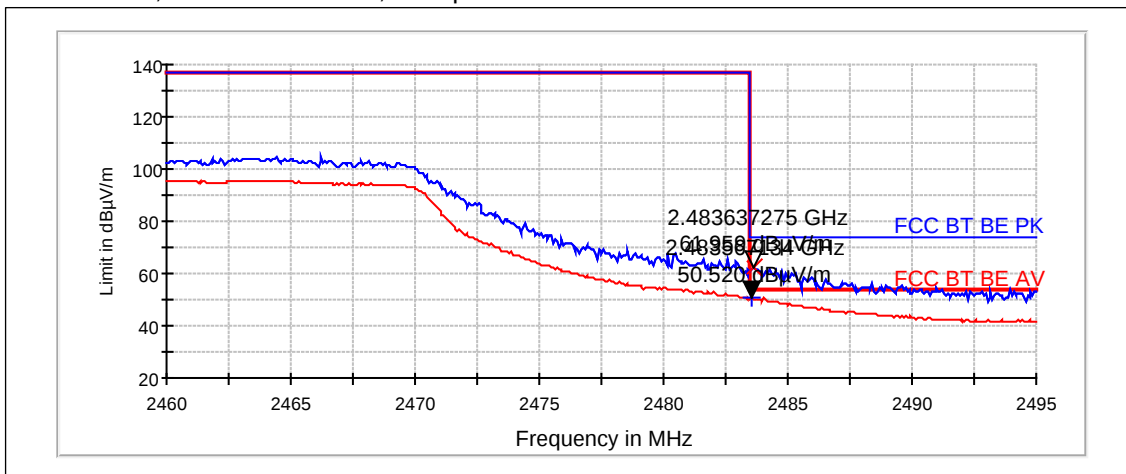
DSSS mode, QPSK modulation, 11 Mbps data rate. Channel 1 / 2412 MHz



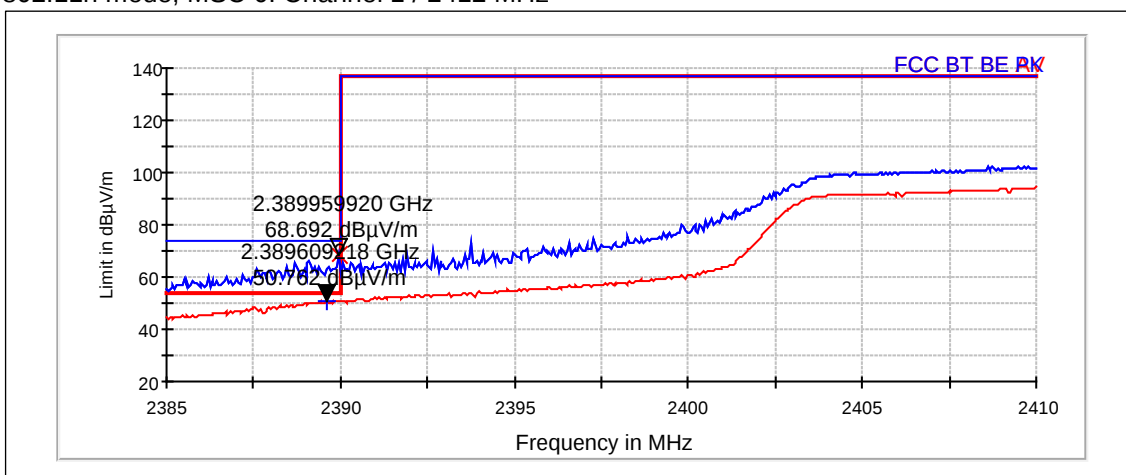
OFDM mode, BPSK modulation, 6 Mbps data rate. Channel 1 / 2412 MHz



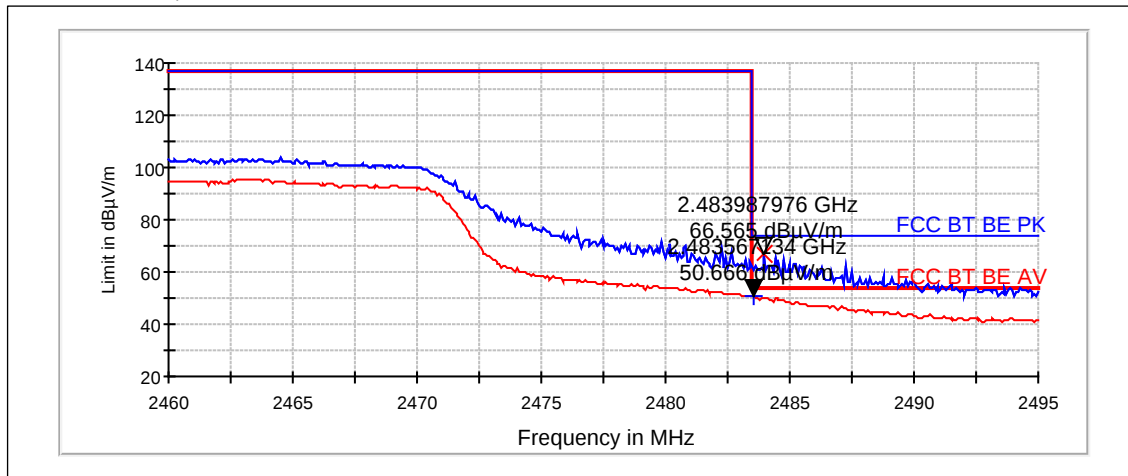
OFDM mode, BPSK modulation, 6 Mbps data rate. Channel 11 / 2462 MHz



802.11n mode, MSC 0. Channel 1 / 2412 MHz



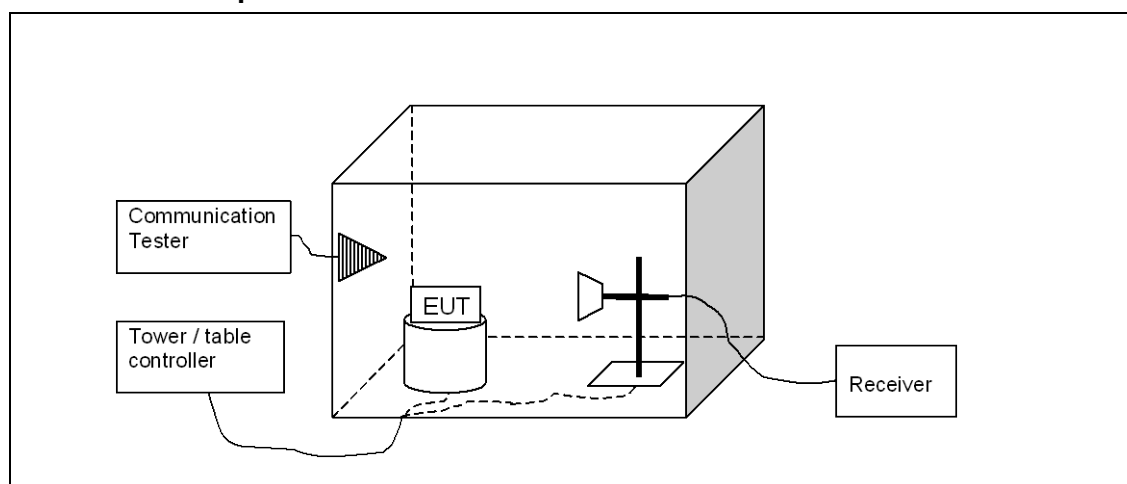
802.11n mode, MSC 0. Channel 11 / 2462 MHz



3. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-775, DUT 23685
Accessories with DUT numbers	BL-4S, DUT 23711 ; AC-8E, DUT 23727 ; WH-102, DUT 23707
Operation Voltage [V] / [Hz]	115 / 60
Results	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 43 / 99.8
Date of measurements	03-May-2011
Measured by	Bo Moltved Christiansen

3.1.1 Test Setup



3.2. Test method and limit

The measurement is made according to DTS procedures KDB 558074 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.

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 [$\mu V/m$]	Limit [dB $\mu V/m$]	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

3.3. WLAN Test results

3.3.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 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]	Polarisation	Result
4826	41.29	116.051	39.4	1.89	VERTICAL	Passed
7237.8	51.35	369.53	40.9	10.45	HORIZONTAL	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]	Polarisation	Result
4826	28.73	27.315	26.84	1.89	VERTICAL	Passed
7237.8	35.25	57.876	24.8	10.45	HORIZONTAL	Passed

Channel 7 / 2442 MHz

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

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
43.858	33.4	46.747	48.84	-15.44	VERTICAL	Passed
43.959	33.47	47.136	48.98	-15.51	VERTICAL	Passed
44.086	33.44	46.979	49.03	-15.59	VERTICAL	Passed
44.1	33.57	47.682	49.16	-15.59	VERTICAL	Passed
44.209	33.55	47.577	49.21	-15.66	VERTICAL	Passed
44.277	33.39	46.714	49.1	-15.71	VERTICAL	Passed
44.377	32.85	43.909	48.62	-15.77	VERTICAL	Passed

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]	Polarisation	Result
3926.854	39.25	91.749	40.13	-0.88	HORIZONTAL	Passed
7330.362	52.33	413.333	41.03	11.3	HORIZONTAL	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]	Polarisation	Result
3926.854	26.11	20.212	26.99	-0.88	HORIZONTAL	Passed
7330.362	36.42	66.229	25.12	11.3	HORIZONTAL	Passed

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4925.7	43.8	154.899	41.28	2.52	HORIZONTAL	Passed
7387.2	49.1	285.2	37.06	12.04	VERTICAL	Passed

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4925.7	30.89	35.039	28.37	2.52	HORIZONTAL	Passed
7387.2	36.22	64.707	24.18	12.04	VERTICAL	Passed

3.3.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4822	41.67	121.157	39.77	1.9	HORIZONTAL	Passed
7236.5	47.74	243.837	37.33	10.41	HORIZONTAL	Passed

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4822	28.64	27.024	26.74	1.9	HORIZONTAL	Passed
7236.5	34.83	55.138	24.42	10.41	HORIZONTAL	Passed

Channel 7 / 2442MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
43.627	23.07	14.231	38.37	-15.3	VERTICAL	Passed
43.829	34.61	53.734	50.03	-15.42	VERTICAL	Passed
43.888	34.45	52.772	49.91	-15.46	VERTICAL	Passed
43.977	34.59	53.629	50.11	-15.52	VERTICAL	Passed
44.049	34.5	53.101	50.06	-15.56	VERTICAL	Passed
44.15	24.24	16.295	39.87	-15.63	VERTICAL	Passed
44.199	24.15	16.127	39.81	-15.66	VERTICAL	Passed

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]	Polarisation	Result
3899.302	39.13	90.459	40.01	-0.88	VERTICAL	Passed
3941.579	38.63	85.359	39.53	-0.9	HORIZONTAL	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]	Polarisation	Result
3899.302	25.77	19.427	26.65	-0.88	VERTICAL	Passed
3941.579	25.65	19.16	26.55	-0.9	HORIZONTAL	Passed

Channel 11 / 2462 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]	Polarisation	Result
4922	43.49	149.434	41.03	2.46	HORIZONTAL	Passed
7385.3	49.17	287.541	37.19	11.98	HORIZONTAL	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]	Polarisation	Result
4922	30.74	34.435	28.28	2.46	HORIZONTAL	Passed
7385.3	36.18	64.417	24.2	11.98	HORIZONTAL	Passed

3.3.3 802.11n mode, MSC 0

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4822.5	41.78	122.786	39.88	1.9	VERTICAL	Passed
7235.1	48.02	251.826	37.59	10.43	HORIZONTAL	Passed

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4822.5	28.64	27.052	26.74	1.9	VERTICAL	Passed
7235.1	34.87	55.386	24.44	10.43	HORIZONTAL	Passed

Channel 7 / 2442MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
39.89	13.99	5.006	25.34	-11.35	HORIZONTAL	Passed
44.851	18.96	8.876	33.68	-14.72	HORIZONTAL	Passed
44.87	18.71	8.618	33.44	-14.73	HORIZONTAL	Passed
45.249	18.22	8.145	33.19	-14.97	HORIZONTAL	Passed
48.987	15.6	6.022	32.84	-17.24	HORIZONTAL	Passed
53.506	15.52	5.972	34.83	-19.31	HORIZONTAL	Passed
64.156	13.92	4.965	35.73	-21.81	HORIZONTAL	Passed

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3897.793	38.88	87.872	39.77	-0.89	HORIZONTAL	Passed
3901.805	38.65	85.595	39.52	-0.87	HORIZONTAL	Passed

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3897.793	25.77	19.422	26.66	-0.89	HORIZONTAL	Passed
3901.805	25.79	19.485	26.66	-0.87	HORIZONTAL	Passed

Channel 11 / 2462 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]	Polarisation	Result
4923.5	43.75	154.028	41.28	2.47	VERTICAL	Passed
7387.5	48.98	281.158	36.93	12.05	HORIZONTAL	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]	Polarisation	Result
4923.5	30.73	34.376	28.26	2.47	VERTICAL	Passed
7387.5	36.21	64.603	24.16	12.05	HORIZONTAL	Passed

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15C, 15B
13357	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 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
20682	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
16601	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 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
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
19116	Power splitter	-	various	22/24/27, 15C, 15B
19171	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B
19625	Climatic Chamber	VT4002EMC	Vötsch	22/24/27, 15C, 15B
19678	Spectrum Analyzer	FSP	Rohde&Schwarz	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20739	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13077	Power Supply	EA-3016	-	22/24/27, 15C, 15B
13799	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
13936	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	22/24/27, 15C, 15B
13937	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright Instruments	22/24/27, 15C, 15B
14021	Relay Dual 6 Chnl μ Wave Mux	10-785-522	-	22/24/27, 15C, 15B
14114	Highpass Filter	WHK1000-12SS	Wainwright Instruments	22/24/27, 15C, 15B
14187	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B
14188	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright	22/24/27, 15C, 15B
14900	Antenna Controller	HD100	HD GmbH	22/24/27, 15C, 15B
15191	Turntable Contoller Unit	G-800SDX	YAESU	22/24/27, 15C, 15B
15742	Programmable Relay Switching System	-----	Pickering	22/24/27, 15C, 15B
16633	Band reject filter	WRCD1880.0-0.2/40-10SS	Wainwright	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
17644	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
18416	Communication Tester	CMU200	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

Eq. No	Equipment	Type	Manufacturer	Used in
18792	Mast/turntable controller	2090	ETS-EMCO	22/24/27, 15C, 15B
18860	Antenna	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
19151	High Pass Filter	WHJS3000-10SS	Wainwright	22/24/27, 15C, 15B
19587	Band reject filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	22/24/27, 15C, 15B
19966	Antenna	HFH2-Z2	Rohde&Schwarz	15C, 15B
20078	Relay 2x6 Chnl μ Wave Mux	10-785B-522	Pickering	22/24/27, 15C, 15B
20114	Band reject filter	WRCG1737/1743-1733/1747-40/6SS	Wainwright	22/24/27, 15C, 15B
20115	Band reject filter	-	Wainwright	22/24/27, 15C, 15B
20116	Band reject filter	WRCG832/83/-825/845-40/5SS	Wainwright	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20698	Antenna	BBHA 9120 D	SCHWARZBECK	22/24/27, 15C, 15B
-	Relay Dual 6 Chnl μ Wave Mux	10-785-522	-	22/24/27, 15C, 15B