

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CWLAN_RM-878_05.docx	Date of Report:	24-Sep-2012
Number of pages:	15	Customer's Contact person:	Jerry Williams
Testing laboratory:	TCC Nokia San Diego Laboratory 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +1 858 831 5000 Fax. +1 858 831 6500	Customer:	Nokia, Inc. 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +1 858 831 5000 Fax. +1 858 385 1598
FCC listing no.:	586140		
IC recognition no.:	10162A-1		
Tested devices/ accessories:	Phone RM-878 / Battery BP-4W / Charger AC-50U / Micro USB cable CA-190CD / Headset WH-208		
FCC ID:	QMNRM-878	IC:	661X-RM878
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), 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:			

Feng You, Senior Specialist

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	23-Aug-2012
Testing completed	14-Sep-2012
The customer's contact person	Jerry Williams
Test Plan referred to	T:\Projects\RM-878\TestPlan\RS_testplan_RM-878_EMC_FCC_SAR.xlsm
Notes	-
Document name	T:\Projects\RM-878\EMC\FCC15CWLAN_RM-878_05.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-878	004402471091631	0205	060	1530.0035.8516.9754.12312	30627
Battery	BP-4W	3932132274140101601;0670672	-	-	-	30588
Charger	AC-50U	4090492185270514505;0675620	NA	NA	NA	30619
Micro USB cable	CA-190CD	NA	NA	NA	NA	30620
Headset	WH-208	NA	NA	NA	NA	30621

1.2. Summary of Test Results

WLAN 2.4GHz:

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), 15.205(b)	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.

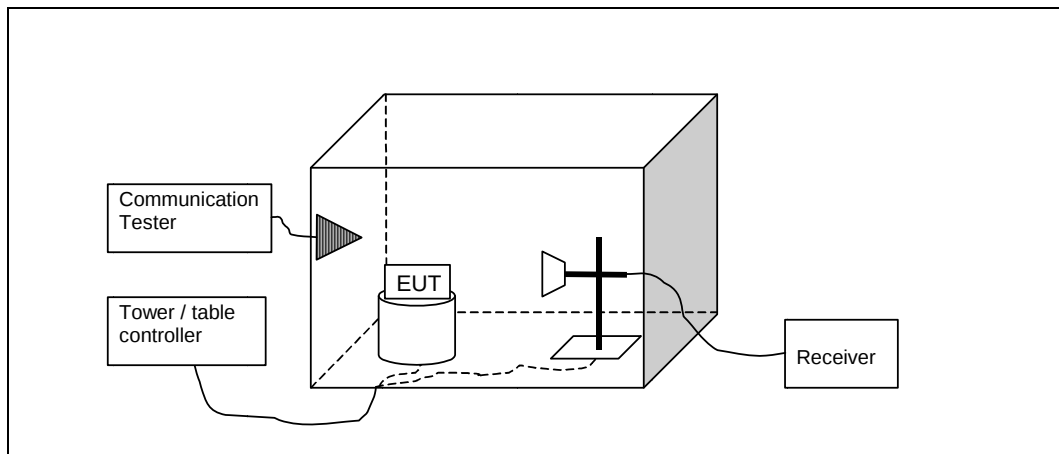
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2. Band edge compliance of RF emissions (FCC §15.247(d), 15.205(b), RSS-210 A8.5)

EUT with DUT number	RM-878, DUT 30627
Accessories with DUT numbers	BP-4W, DUT 30588 ; AC-50U, DUT 30619 ; CA-190CD, DUT 30620 ; WH-208, DUT 30621
Operation Voltage [V] / [Hz]	115V / 60Hz
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19.5 / 47.7
Date of measurements	14-Sep-2012
Measured by	Feng You

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.

The measurement results are obtained as described below:

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

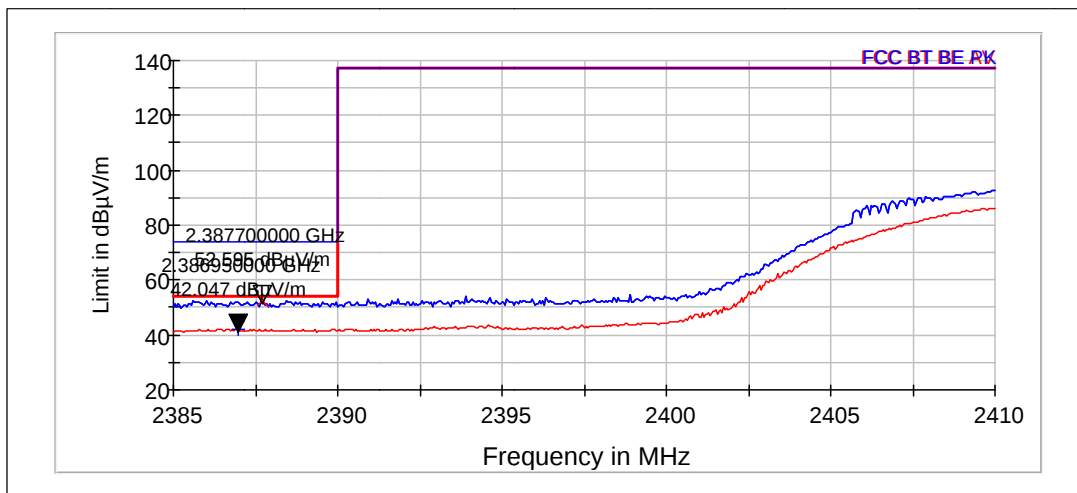
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

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

Frequency range [MHz]	Limit
Below 2390 and above 2483.5	54 dBuV/m (avg) and 74 dBuV/m (pk)

2.3. WLAN 2.4GHz test results

802.11b Channel 1 / 2412 MHz



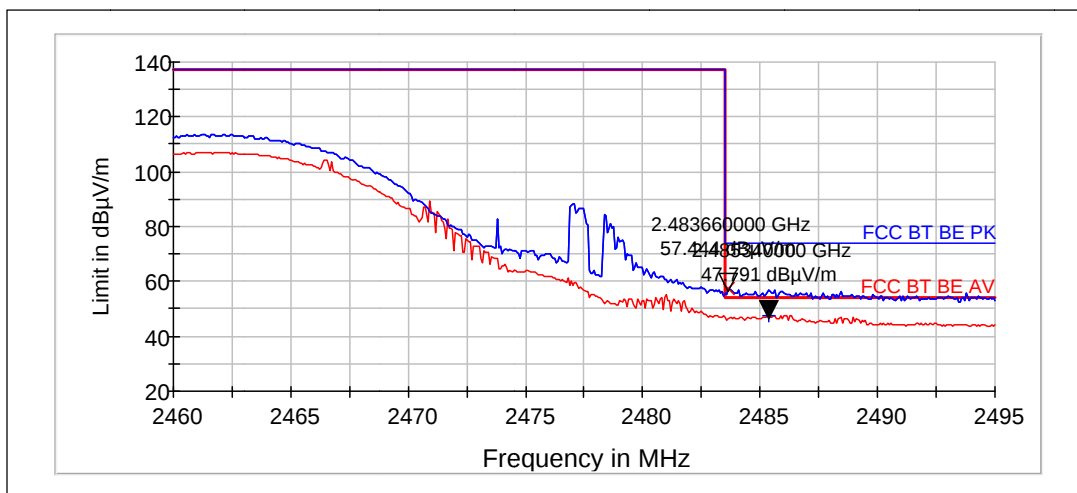
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2387.7	52.6	426.334	-2335.1	2387.7	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2386.95	42.05	126.576	-2344.9	2386.95	PASSED

802.11b Channel 11 / 2462 MHz



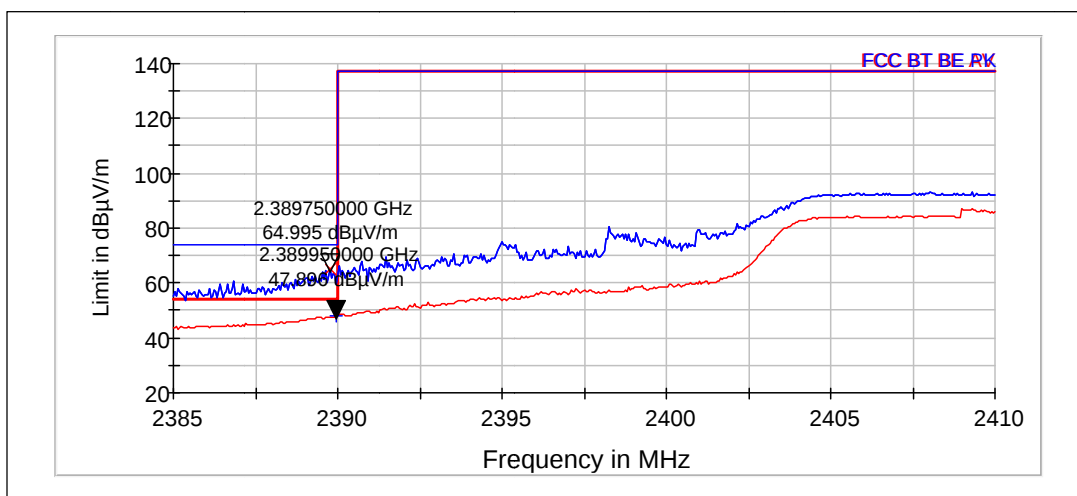
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2483.66	57.44	745.075	-2426.22	2483.66	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2485.34	47.79	245.217	-2437.55	2485.34	PASSED

802.11g Channel 1 / 2412 MHz



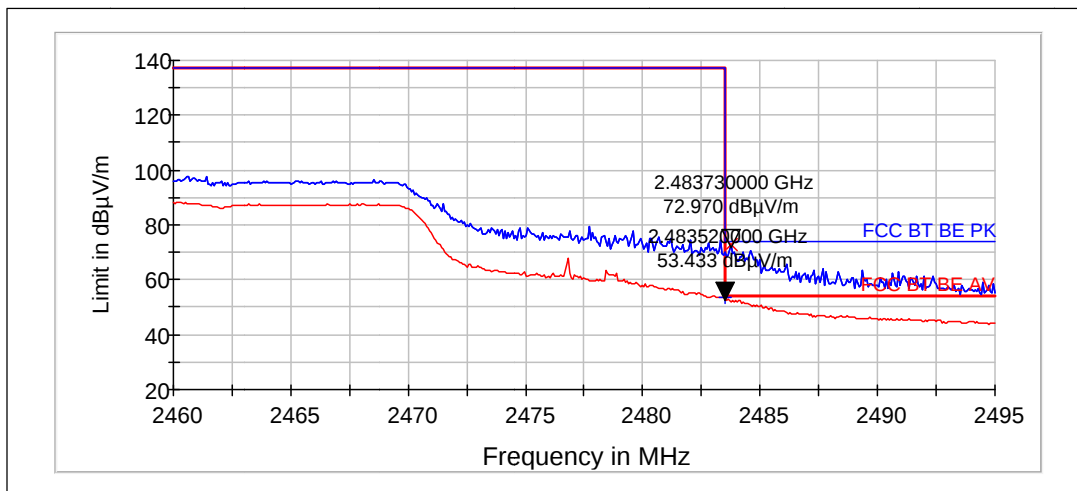
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2389.75	65	1777.256	-2324.75	2389.75	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2389.95	47.9	248.199	-2342.05	2389.95	PASSED

802.11g Channel 11 / 2462 MHz



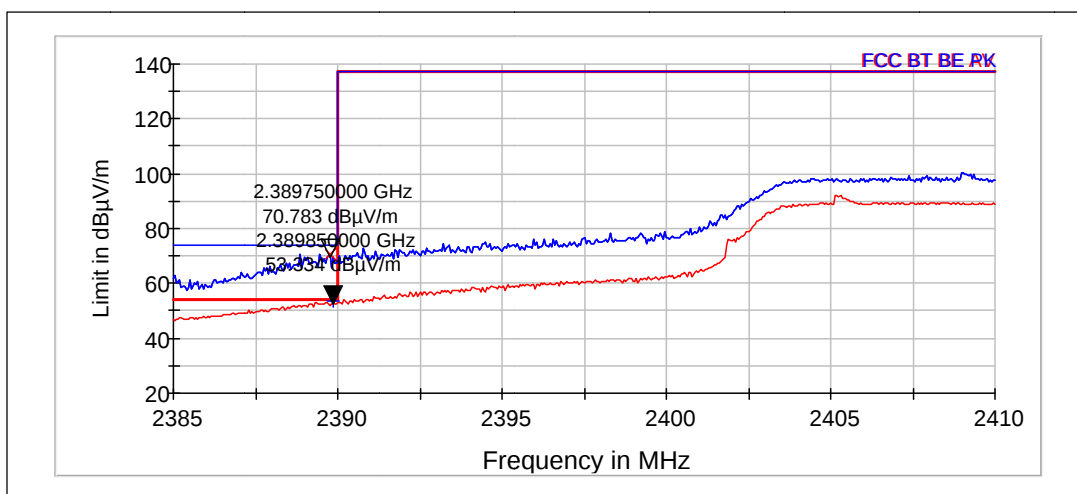
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2483.73	72.97	4451.435	-2410.76	2483.73	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2483.52	53.43	469.516	-2430.09	2483.52	PASSED

802.11n 20MHz Channel 1 / 2412 MHz



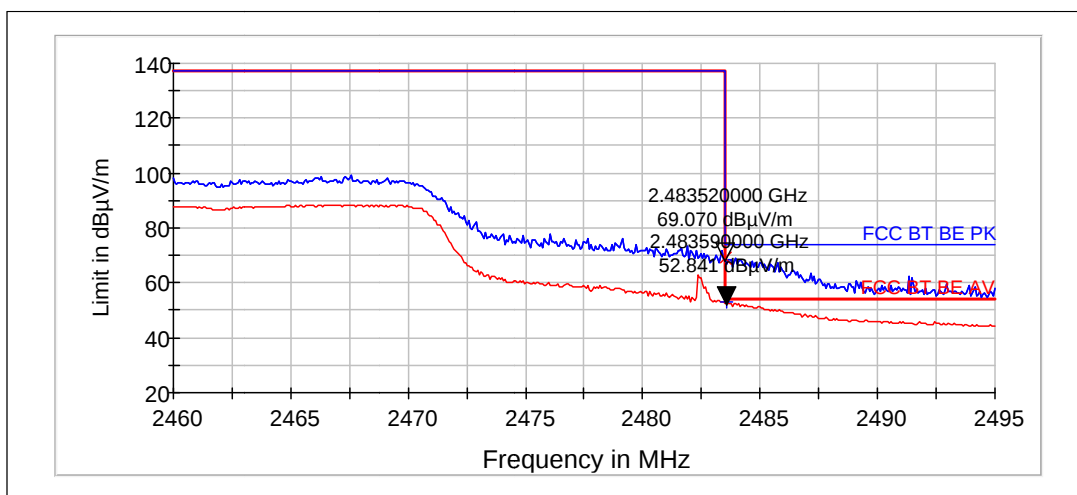
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2389.75	70.78	3460.589	-2318.97	2389.75	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2389.85	53.33	464.195	-2336.52	2389.85	PASSED

802.11n 20MHz 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]	Results
2483.52	69.07	2841.188	-2414.45	2483.52	PASSED

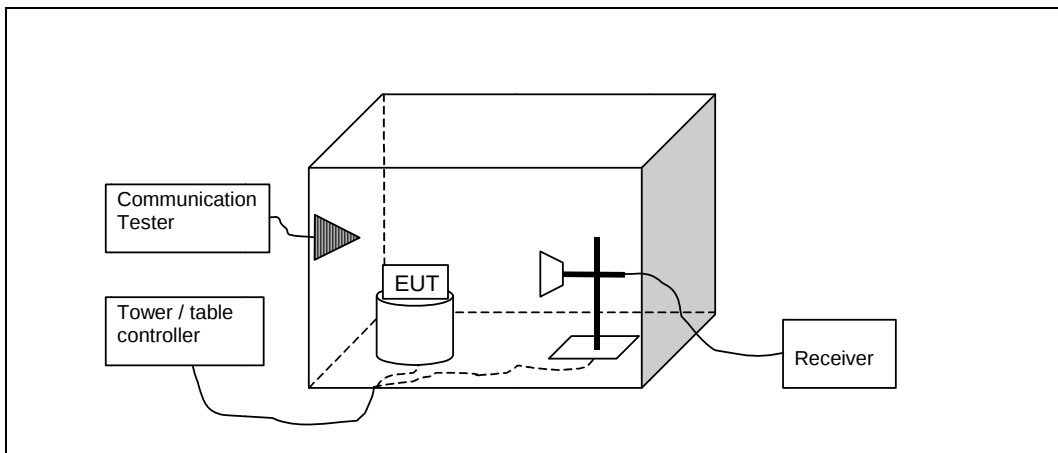
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2483.59	52.84	438.581	-2430.75	2483.59	PASSED

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

EUT with DUT number	RM-878, DUT 30627
Accessories with DUT numbers	BP-4W, DUT 30588 ; AC-50U, DUT 30619 ; CA-190CD, DUT 30620 ; WH-208, DUT 30621
Operation Voltage [V] / [Hz]	115V / 60Hz
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19.5 / 47.7
Date of measurements	13-Sep-2012
Measured by	Feng You

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:

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

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

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 2.4GHz test results

802.11b Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4824.3	52.57	425.305	42.31	10.27	21.4	74	PASSED
7236.9	54.3	518.8	40.6	13.7	---	---	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4824.3	40.06	100.705	29.8	10.27	13.9	54	PASSED
7236.9	41.22	115.027	27.52	13.7	---	---	PASSED

802.11b Channel 7 / 2442 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
2493.1	89.36	29386.645	36.4	52.96	-15.4	74	*PASSED
4884.016	53.86	493.003	44.05	9.81	20.1	74	PASSED
12287.514	59.66	961.059	40.19	19.47	14.3	74	PASSED

*2493.1 MHz frequency is coming from BT/WLAN Band Reject Filter Loss calculated back by test software and thus ignored.

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.06	29.25	29.003	33.45	-4.2	10.8	40	PASSED
34.329	26.76	21.767	33.03	-6.27	13.2	40	PASSED
40.597	20.38	10.446	29.93	-9.55	19.6	40	PASSED
48.876	17.66	7.636	32.13	-14.47	22.3	40	PASSED
503.193	17.38	7.398	21.36	-3.98	28.6	46	PASSED
629.917	20	9.995	21.59	-1.59	26	46	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
2493.1	76.77	6896.044	23.81	52.96	-22.8	54	*PASSED
4884.016	40.5	105.974	30.69	9.81	13.5	54	PASSED
12287.514	46.94	222.203	27.47	19.47	7.1	54	PASSED

*2493.1 MHz frequency is coming from BT/WLAN Band Reject Filter Loss calculated back by test software and thus ignored.

802.11b Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4924	53.31	462.914	43.5	9.81	20.7	74	PASSED

7387.3	54.12	507.925	40.25	13.87	19.9	74	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]	Margin	Limit [dBμV/m]	Results
4924	40.15	101.789	30.34	9.81	13.8	54	PASSED
7387.3	41.26	115.571	27.39	13.87	12.7	54	PASSED

802.11g Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4825.6	52.06	400.682	41.71	10.35	21.9	74	PASSED
7235.5	54.61	537.774	41.03	13.58	---	---	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4825.6	37.85	78.109	27.5	10.35	16.1	54	PASSED
7235.5	41.1	113.449	27.52	13.58	---	---	PASSED

802.11g Channel 7 / 2442 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
2493	89.81	30945.678	36.55	53.26	-15.8	74	*PASSED
4879.019	51.38	370.851	41.64	9.74	22.6	74	PASSED
11785.814	59.17	908.762	39.84	19.33	14.8	74	PASSED

*2493 MHz frequency is coming from BT/WLAN Band Reject Filter Loss calculated back by test software and thus ignored.

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.09	28.68	27.152	32.92	-4.24	11.3	40	PASSED
34.329	26.27	20.573	32.54	-6.27	13.7	40	PASSED
49.806	18.31	8.23	33.37	-15.06	21.7	40	PASSED
472.509	17.49	7.489	22.08	-4.59	28.5	46	PASSED
502.833	17.42	7.431	21.4	-3.98	28.6	46	PASSED
628.657	19.93	9.914	21.55	-1.62	26.1	46	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
2493	77.08	7144.963	23.82	53.26	-23.1	54	*PASSED
4879.019	37.61	75.928	27.87	9.74	16.4	54	PASSED
11785.814	46.72	216.671	27.39	19.33	7.3	54	PASSED

*2493 MHz frequency is coming from BT/WLAN Band Reject Filter Loss calculated back by test software and thus ignored.

802.11g Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4923.9	50.87	349.462	41.06	9.81	23.1	74	PASSED
7387.4	54	501.072	40.03	13.97	20	74	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4923.9	37.68	76.577	27.87	9.81	16.3	54	PASSED
7387.4	41.37	117.058	27.4	13.97	12.6	54	PASSED

802.11n 20MHz Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4824.3	50.64	340.33	40.29	10.36	23.4	74	PASSED
7235.4	54.56	534.749	40.98	13.58	---	---	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4824.3	37.68	76.516	27.33	10.36	16.3	54	PASSED
7235.4	41.1	113.527	27.52	13.58	---	---	PASSED

802.11n 20MHz Channel 7 / 2442 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
2493.1	89.71	30573.841	36.75	52.96	-15.7	74	*PASSED
12106.043	60.04	1004.963	40.46	19.58	14	74	PASSED
12250.2	59.77	973.756	40.23	19.55	14.2	74	PASSED

*2493.1 MHz frequency is coming from BT/WLAN Band Reject Filter Loss calculated back by test software and thus ignored.

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30	25.75	19.384	29.87	-4.12	14.3	40	PASSED
35.529	23.78	15.451	30.63	-6.85	16.2	40	PASSED
250.015	32.04	39.971	43.41	-11.37	14	46	PASSED
502.413	17.42	7.431	21.41	-3.99	28.6	46	PASSED
629.737	20	9.997	21.6	-1.6	26	46	PASSED
754.691	22.07	12.694	21.61	0.46	23.9	46	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
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2493.1	76.77	6896.838	23.81	52.96	-22.8	54	*PASSED
12106.043	47.17	228.297	27.59	19.58	6.8	54	PASSED
12250.2	47.1	226.36	27.56	19.55	6.9	54	PASSED

*2493.1 MHz frequency is coming from BT/WLAN Band Reject Filter Loss calculated back by test software and thus ignored.

802.11n 20MHz Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4925.5	50.17	322.292	40.21	9.96	23.8	74	PASSED
7387.9	54.36	522.456	40.48	13.88	19.6	74	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4925.5	37.2	72.46	27.24	9.96	16.8	54	PASSED
7387.9	41.27	115.718	27.39	13.88	12.7	54	PASSED

4. Test Equipment

4.1. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
N/A	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
7984	Data Logger	Testo175H1	Testo	-
3397	Signal Generator	83630B	Agilent	-
7591	Antenna	HL562	R&S	-
N/A	RF immunity / Emission Software	EMC32	R&S	-
7459	Open switch and control unit	TS-RSP	R&S	-
5729	Open switch and control unit	TS-RSP	R&S	-
N/A	Notch Filter	GSM1900	TTE	24
N/A	Notch Filter	GSM850	Trilithic	22
7572	Antenna	3117	EMCO	-
5730	Preamplifier/Switch Box	TS-ANA	R&S	-
N/A	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	-
N/A	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
N/A	Band Reject Filter	WRC824/849-0,2-6SS	Wainwright	22
4406	Communication Tester	CMU200	R&S	-
7646	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	ETS-Lindgren	-
7451	EMI Receiver	ESU-26	R&S	-
3406	Mast/Turntable Controller	SC99V	Sunol	-