

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CBT_RM-833_07.docx	Date of Report:	19-Jan-2012
Number of pages:	38	Customer's Contact person:	David Zhang
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FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-833 / Battery BL-5C / Headset WH-102 / AC-Charger AC-11E		
FCC ID:	QTLRM-833	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 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:			

Sami Lehtonen, System Specialist, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	11-Jan-2012
Testing completed	16-Jan-2012
The customer's contact person	David Zhang
Test Plan referred to	T:\Projects\RM-833\TestPlan\RS_testplan_RM-833.xls
Notes	-
Document name	T:\Projects\RM-833\EMC\FCC15CBT_RM-833_07.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/Bluetooth

The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-833	004402138010362	0202	-	ma20.11	16143
Battery	BL-5C	0670400382066S40305KA35084	-	-	-	16152
Headset	WH-102	06943231401B3104036	-	-	-	16151
AC-Charger	AC-11E	409049139797050950260675479	-	-	-	16149
Phone	RM-833	004402138010370	0202	-	ma20.11	16146
Battery	BL-5C	0670400382066S40305KA35243	-	-	-	16167
AC-Charger	AC-11E	409049139797050948460675479	-	-	-	16150
Headset	WH-102	06943231401B3104011	-	-	-	16148
Phone	RM-833	004402138010693	0202	-	ma20.11	16144

1.2. Summary of Test Results

Bluetooth:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8(0.4(2))	Conducted peak output power	PASSED
15.247(d), 15.205(b)	A8(0.5)	Band edge compliance of RF emissions	PASSED
15.247(d)	A8(0.5)	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8(0.5)	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(1)	A8(0.1(1))	20dB(bandwidth)	PASSED
15.247(a)(1)	A8(0.1(2))	Carrier frequency separation	PASSED
15.247(a)(1)(iii)	A8(0.1(4))	Number of hopping frequencies	PASSED
15.247(a)(1)(iii)	A8(0.1(4))	Time of occupancy	PASSED

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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11. Test Equipment 37

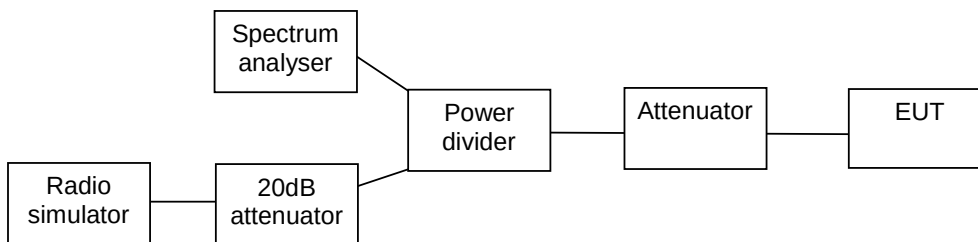
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2. Conducted peak output power (15.247(b)(1), RSS-210 A8.4 (2))

EUT with DUT number	RM-833, DUT 16144
Accessories with DUT numbers	BL-5C, DUT 16167 ; WH-102, DUT 16148 ; AC-11E, DUT 16150
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen

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.

Limits for conducted peak output power measurements

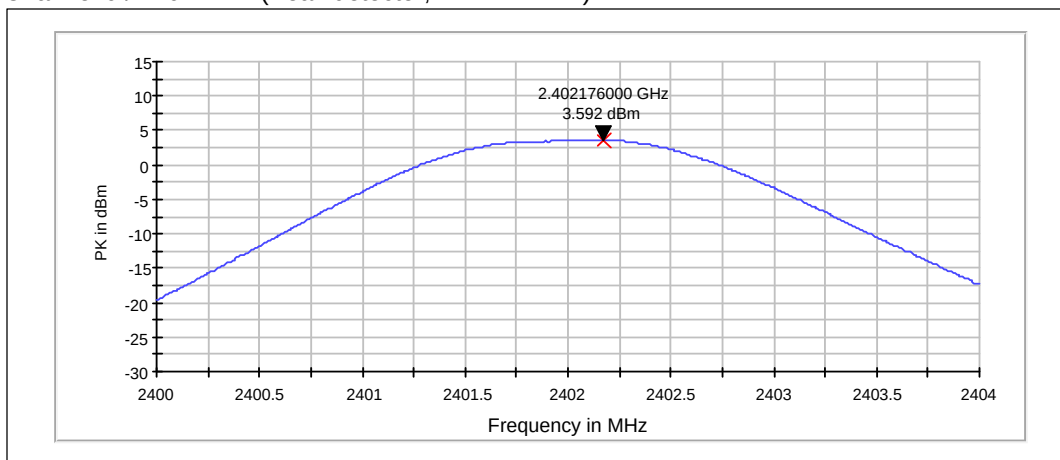
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	<= 1	<= 30

2.3. Bluetooth Test results

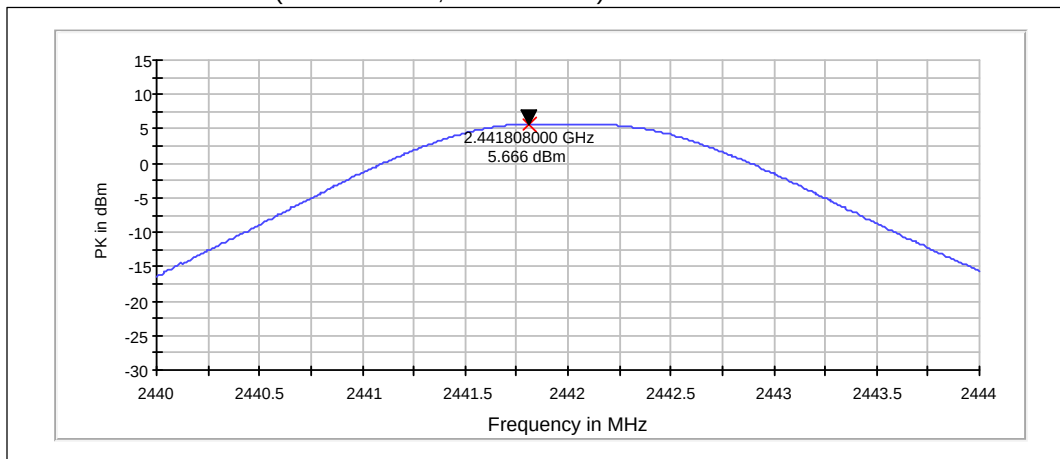
2.3.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	3.59	2.286	PASSED
40 / 2442	5.67	3.69	PASSED
78 / 2480	3.93	2.472	PASSED

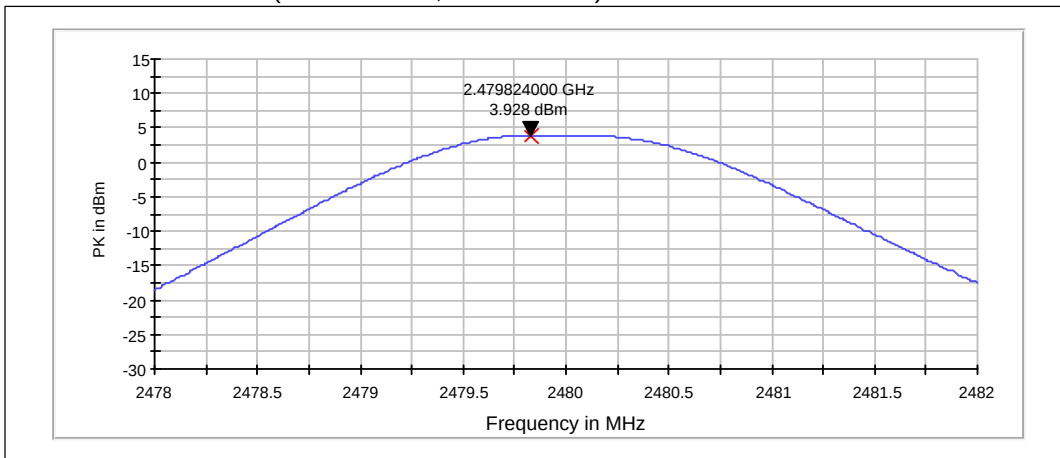
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



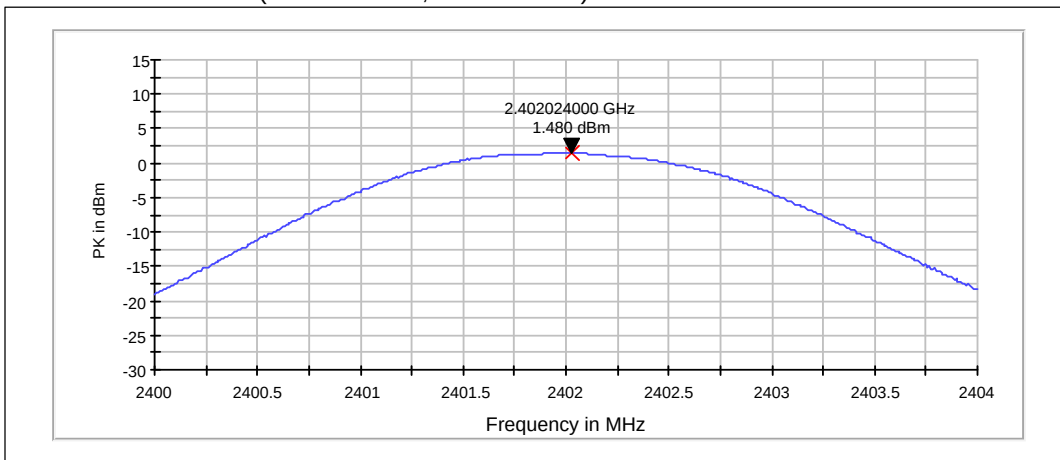
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



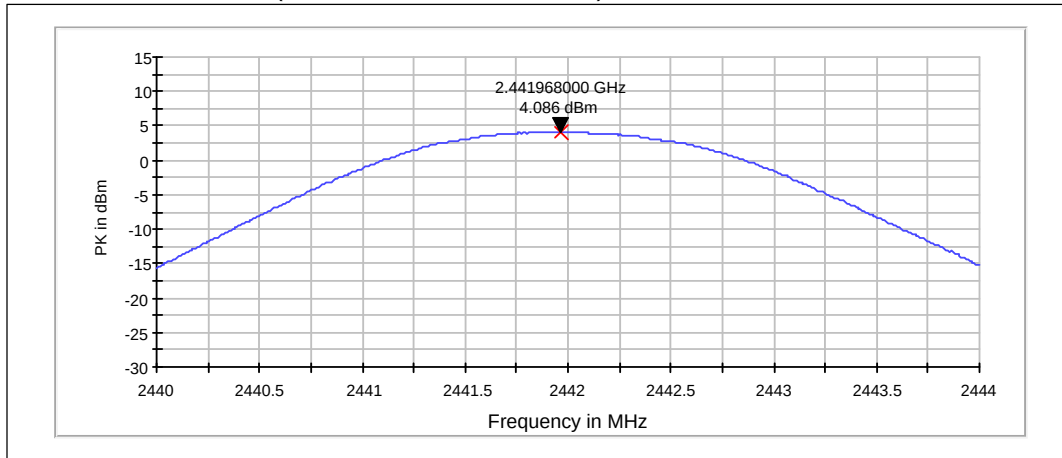
2.3.2 8DPSK modulation, PRBS packet type

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	1.48	1.406	PASSED
40 / 2442	4.09	2.564	PASSED
78 / 2480	1.74	1.493	PASSED

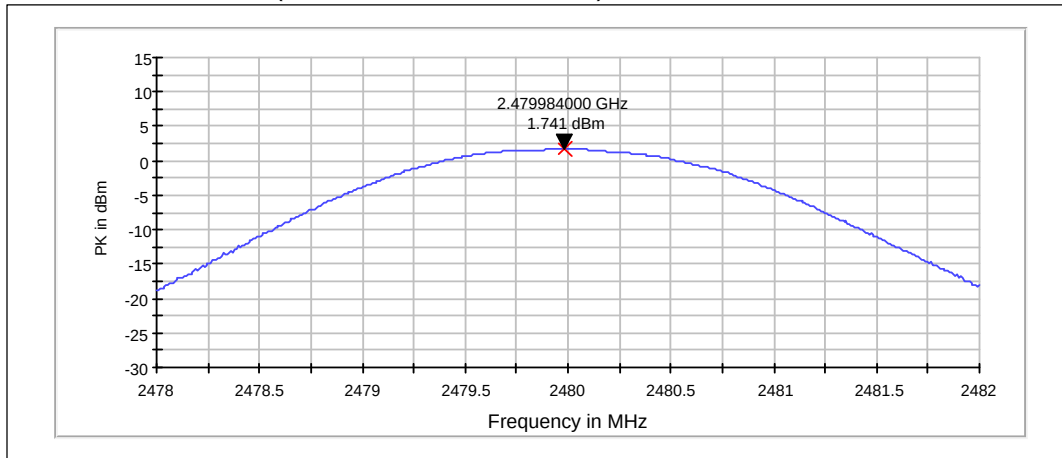
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



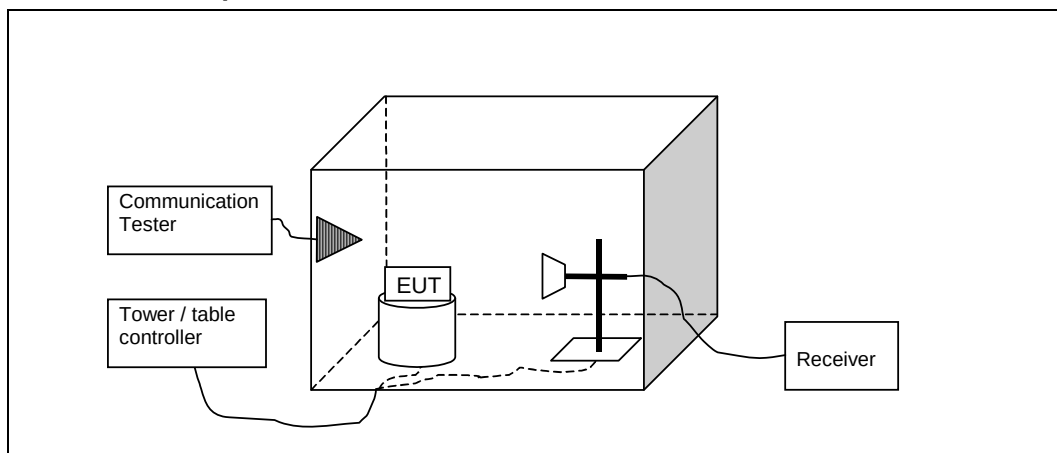
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



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

EUT with DUT number	RM-833, DUT 16143
Accessories with DUT numbers	BL-5C, DUT 16152 ; WH-102, DUT 16151 ; AC-11E, DUT 16149
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 35 / 102.1
Date of measurements	16-Jan-2012
Measured by	Sami Lehtonen / Jari Keto

3.1.1 Test Setup



3.2. Test method and limit

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

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

3.3. Bluetooth Test results

3.3.1 GFSK modulation, PRBS packet type

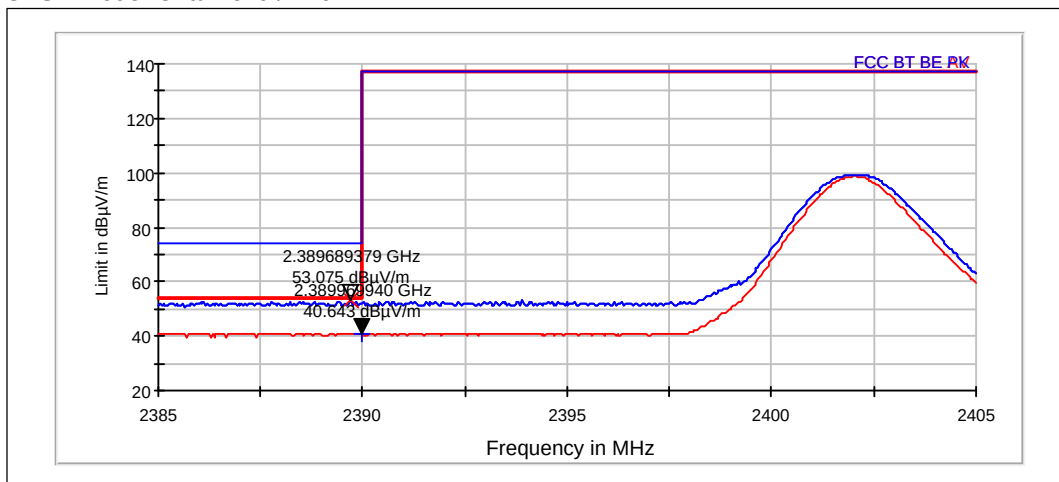
Average (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Result
0 / 2402	40.64	107.682	45.27	-4.63	PASSED
Hopping on, low end	42.09	127.21	46.72	-4.63	PASSED
78 / 2480	48.42	263.65	53.18	-4.76	PASSED
Hopping on, high end	48.74	273.415	53.5	-4.76	PASSED

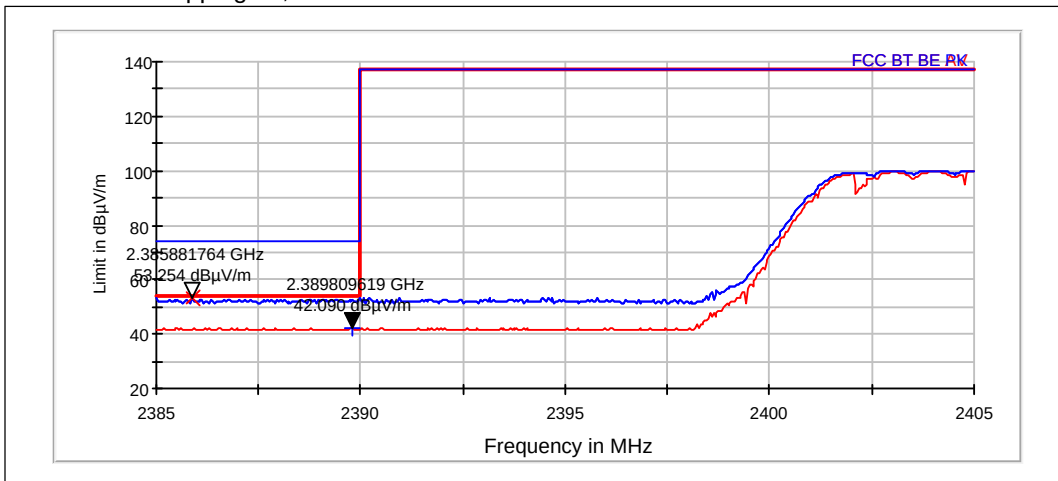
Peak (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Result
0 / 2402	53.07	450.533	57.7	-4.63	PASSED
Hopping on, low end	53.25	459.949	57.88	-4.63	PASSED
78 / 2480	55.32	583.213	60.08	-4.76	PASSED
Hopping on, high end	53.5	473.079	58.26	-4.76	PASSED

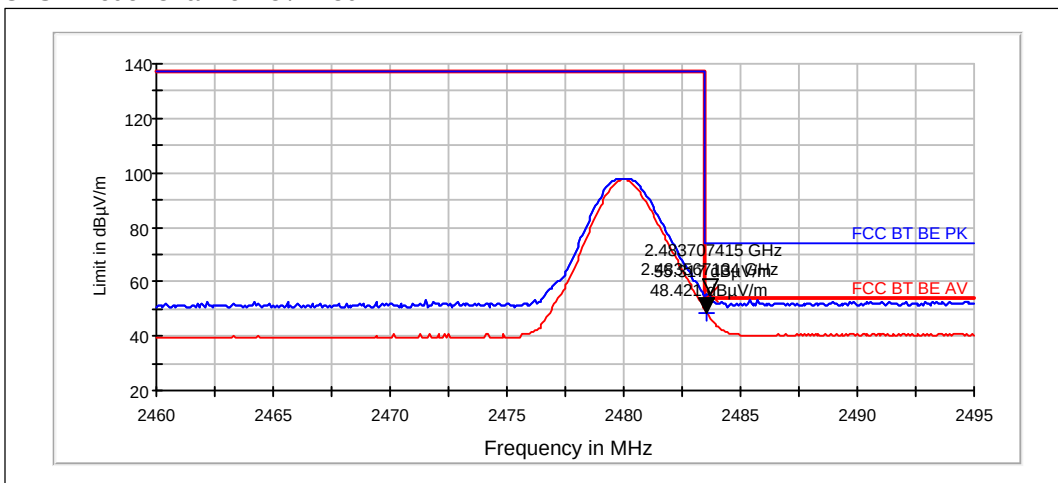
GFSK mode. Channel 0 / 2402 MHz



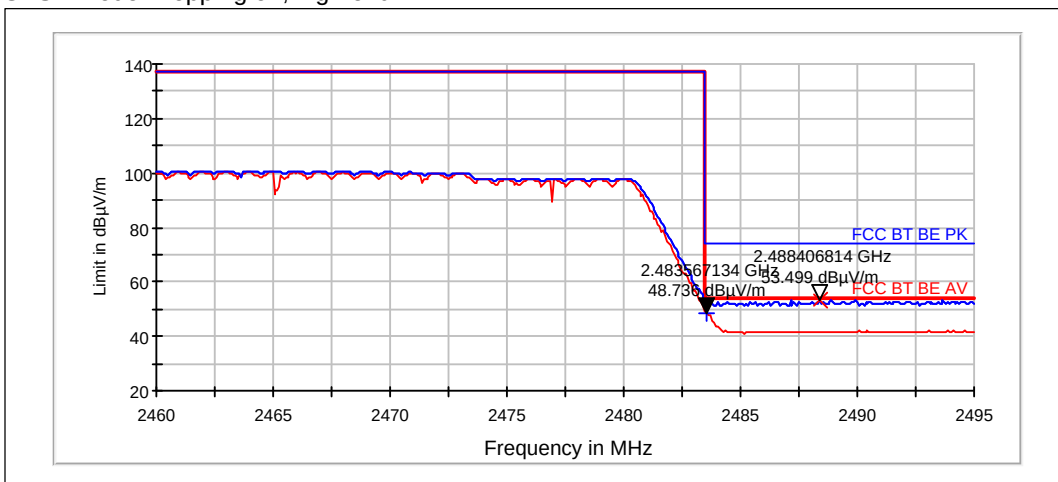
GFSK mode. Hopping on, low end



GFSK mode. Channel 78 / 2480 MHz



GFSK mode. Hopping on, high end



3.3.2 8DPSK modulation, PRBS packet type

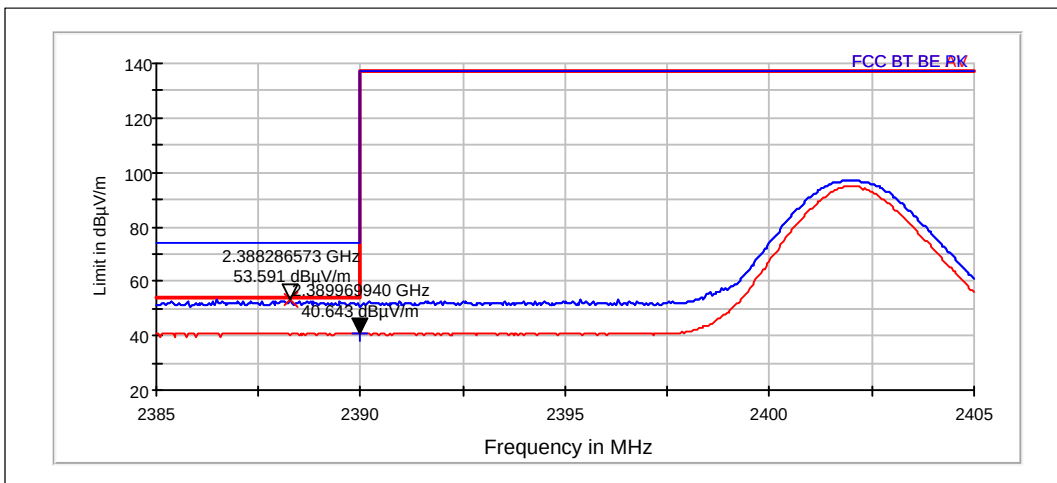
Average (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Result
0 / 2402	40.64	107.682	45.27	-4.63	PASSED
Hopping on, low end	42.09	127.146	46.72	-4.63	PASSED
78 / 2480	46.24	205.061	51	-4.76	PASSED
Hopping on, high end	46.64	214.826	51.4	-4.76	PASSED

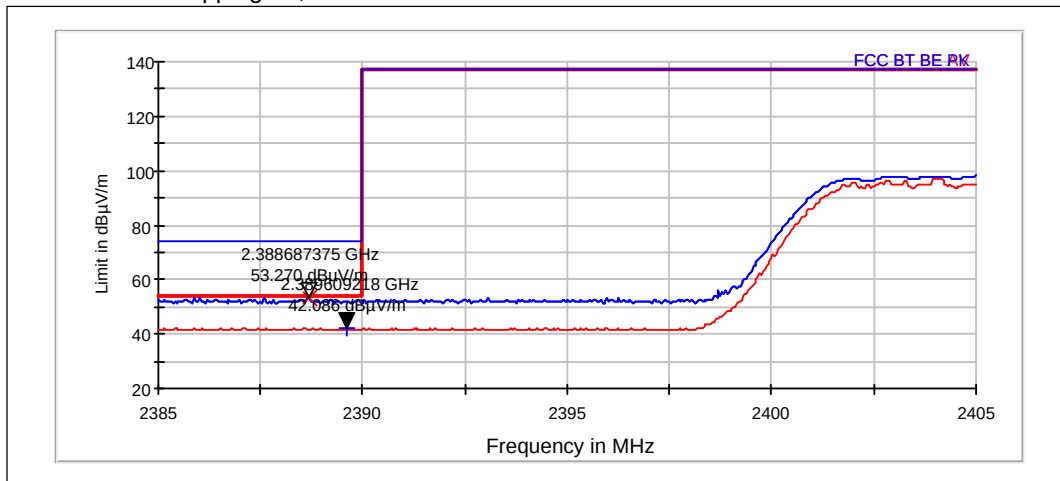
Peak (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Result
0 / 2402	53.59	478.143	58.22	-4.63	PASSED
Hopping on, low end	53.27	460.807	57.9	-4.63	PASSED
78 / 2480	53.39	467.299	58.15	-4.76	PASSED
Hopping on, high end	53.52	474.021	58.28	-4.76	PASSED

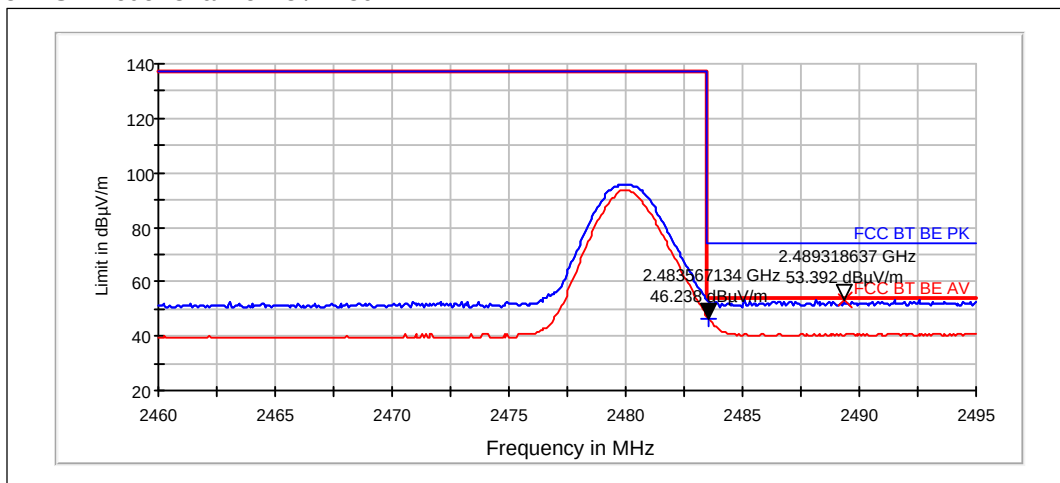
8DPSK mode. Channel 0 / 2402 MHz



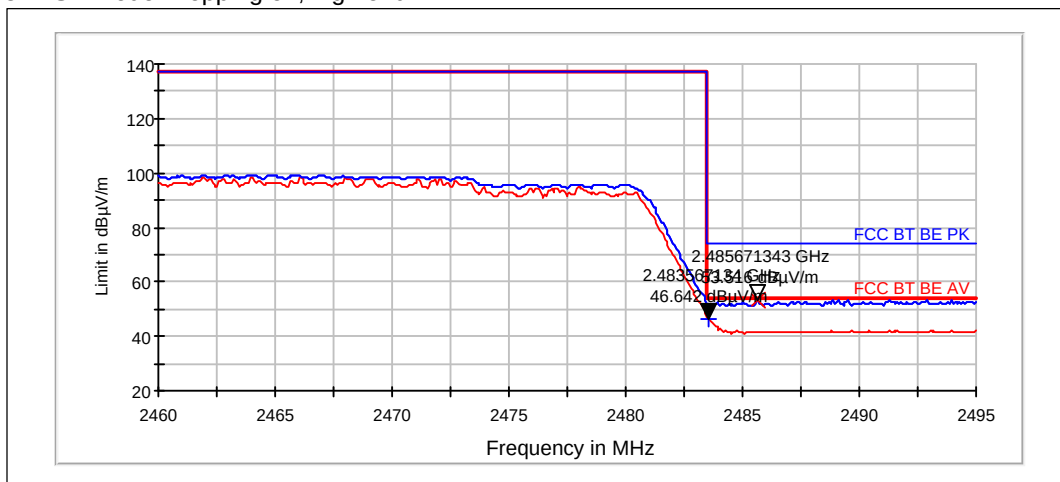
8DPSK mode. Hopping on, low end



8DPSK mode. Channel 78 / 2480 MHz



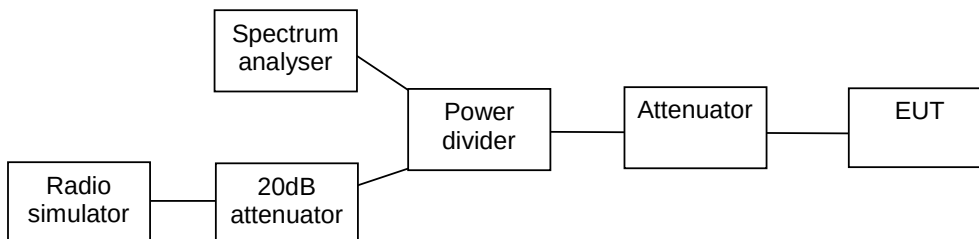
8DPSK mode. Hopping on, high end



4. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-833, DUT 16144
Accessories with DUT numbers	BL-5C, DUT 16167 ; WH-102, DUT 16148 ; AC-11E, DUT 16150
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen

4.1. Test Setup



4.2. Test method and limit

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

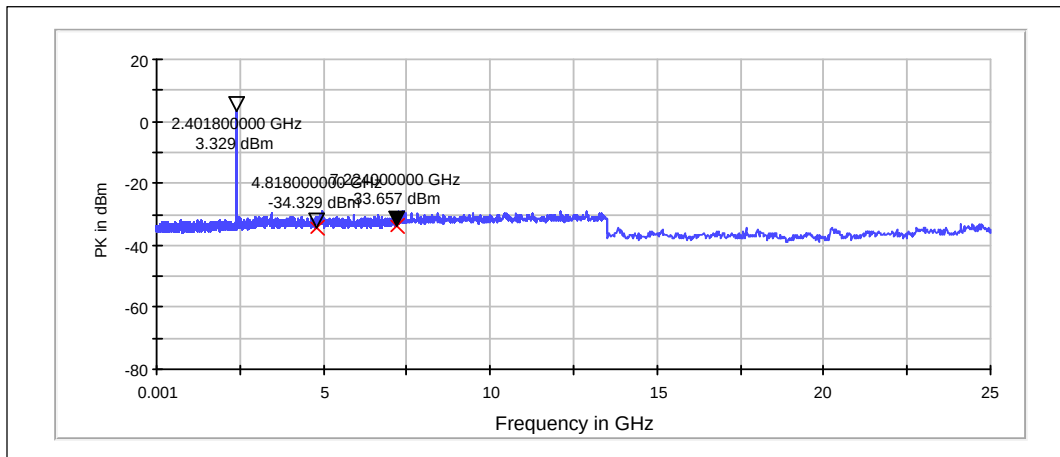
Limits for spurious RF conducted emissions measurements

Frequency range [MHz]	Limit [dBc]
1 – 25000	<= -20

4.3. Bluetooth Test results

4.3.1 GFSK modulation, PRBS packet type

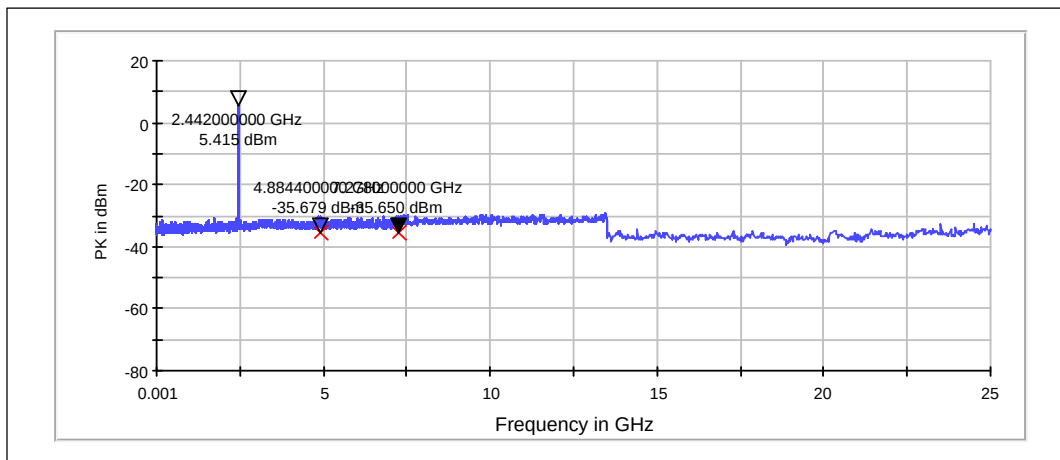
Channel 0 / 2402 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4818	-34.33	PASSED
7224	-33.66	PASSED

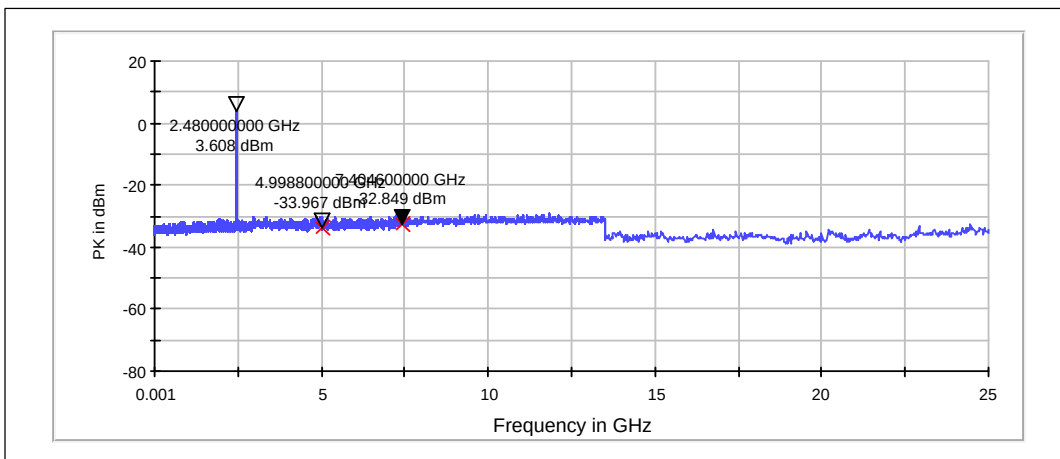
Channel 40 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4884.4	-35.68	PASSED
7278	-35.65	PASSED

Channel 78 / 2480 MHz

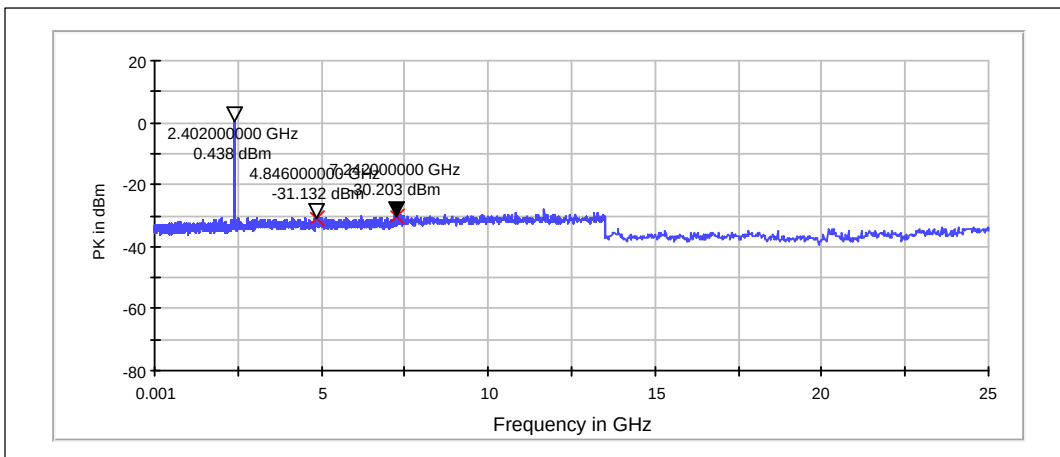


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4998.8	-33.97	PASSED
7404.6	-32.85	PASSED

4.3.2 8DPSK modulation, PRBS packet type

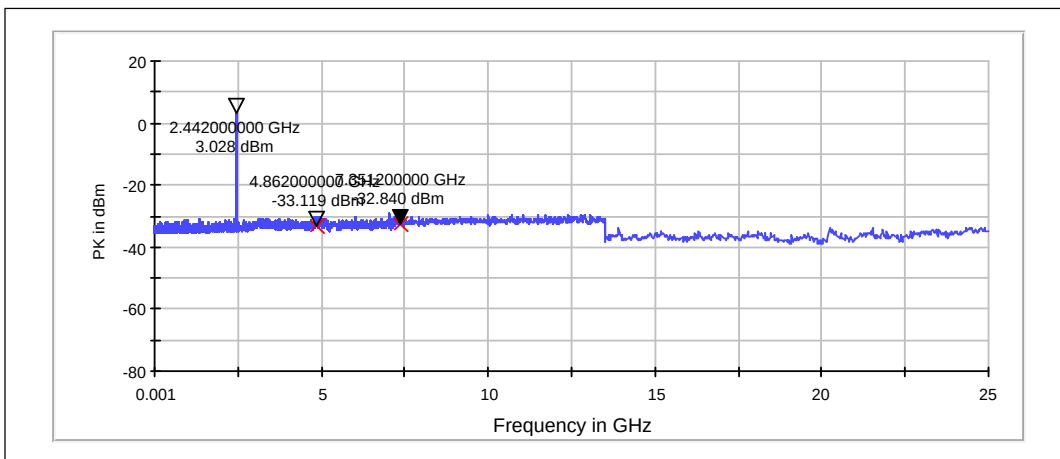
Channel 0 / 2402 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4846	-31.13	PASSED
7242	-30.2	PASSED

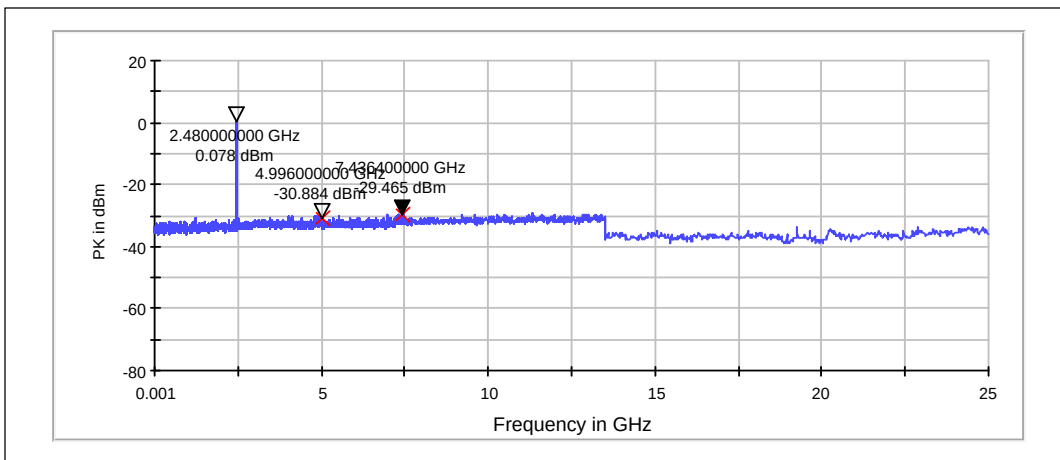
Channel 40 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4862	-33.12	PASSED
7351.2	-32.84	PASSED

Channel 78 / 2480 MHz



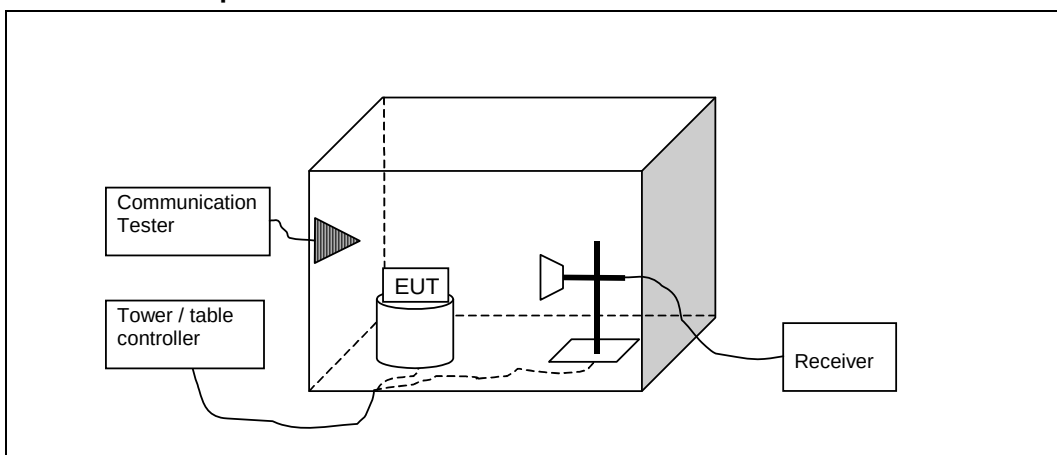
Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4996	-30.88	PASSED
7436.4	-29.47	PASSED

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

EUT with DUT number	RM-833, DUT 16143
Accessories with DUT numbers	BL-5C, DUT 16152 ; WH-102, DUT 16151 ; AC-11E, DUT 16149
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 32 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen / Jari Keto

5.1.1 Test Setup



5.2. 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.
The measurement results are obtained as described below:

$$E [\mu V/m] = U_R X + A_{TO} T$$

Where $U_R X$ is receiver reading and $A_{TO} T$ is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TO} T = L_{CABLE} S + A^F - G_{PREAMP} P$).

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

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [$\text{dB}\mu\text{V/m}$]	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

5.3. Bluetooth Test results

5.3.1 GFSK modulation, PRBS packet type

Channel 78 / 2480 MHz

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

Frequency [MHz]	E [$\text{dB}\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U_{RX} [$\text{dB}\mu\text{V}$]	A_{TOT} [dB]	Polarisation	Result
4958	46.11	202.092	50.92	-4.81	HORIZONTAL	PASSED
7438.9	44.98	177.46	44.01	0.97	VERTICAL	PASSED

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

Frequency [MHz]	E [$\text{dB}\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U_{RX} [$\text{dB}\mu\text{V}$]	A_{TOT} [dB]	Polarisation	Result
4958	26.8	21.865	31.61	-4.81	HORIZONTAL	PASSED
7438.9	32.26	41.039	31.29	0.97	VERTICAL	PASSED

Channel 0 / 2402 MHz

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

Frequency [MHz]	E [$\text{dB}\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U_{RX} [$\text{dB}\mu\text{V}$]	A_{TOT} [dB]	Polarisation	Result
4805.7	47.87	247.571	52.57	-4.7	HORIZONTAL	PASSED
7205.4	44.94	176.604	44.93	0.01	HORIZONTAL	PASSED

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

Frequency [MHz]	E [$\text{dB}\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U_{RX} [$\text{dB}\mu\text{V}$]	A_{TOT} [dB]	Polarisation	Result
4805.7	26.2	20.406	30.9	-4.7	HORIZONTAL	PASSED
7205.4	31.73	38.597	31.72	0.01	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.769	25.54	18.917	40	-14.46	VERTICAL	PASSED
37.826	25.59	19.033	40.08	-14.49	VERTICAL	PASSED
50.322	23.76	15.421	45.86	-22.1	VERTICAL	PASSED
50.421	24.91	17.595	47.08	-22.17	VERTICAL	PASSED
50.651	25.88	19.683	48.23	-22.35	VERTICAL	PASSED
50.663	26.88	22.075	49.24	-22.36	VERTICAL	PASSED
50.982	24.93	17.646	47.53	-22.6	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3926.751	37.42	74.268	44.42	-7	HORIZONTAL	PASSED
3928.056	37.16	72.069	44.16	-7	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
3926.751	24.65	17.075	31.65	-7	HORIZONTAL	PASSED
3928.056	24.69	17.149	31.69	-7	VERTICAL	PASSED

5.3.2 8DPSK modulation, PRBS packet type

Channel 78 / 2480 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4959.3	41.46	118.263	46.24	-4.78	HORIZONTAL	PASSED
7440.3	45.56	189.627	44.54	1.02	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
4959.3	26.7	21.627	31.48	-4.78	HORIZONTAL	PASSED
7440.3	32.3	41.2	31.28	1.02	VERTICAL	PASSED

Channel 0 / 2402 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4805.7	43.67	152.651	48.37	-4.7	VERTICAL	PASSED
7204.4	44.67	171.12	44.67	0	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
4805.7	26.13	20.242	30.83	-4.7	VERTICAL	PASSED
7204.4	31.77	38.757	31.77	0	HORIZONTAL	PASSED

Channel 40 / 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
37.356	25.42	18.664	39.64	-14.22	VERTICAL	PASSED
38.187	25.78	19.442	40.48	-14.7	VERTICAL	PASSED
50.442	23.52	14.999	45.71	-22.19	VERTICAL	PASSED
50.859	26.07	20.123	46.88	-20.81	HORIZONTAL	PASSED
50.863	26.43	20.965	48.94	-22.51	VERTICAL	PASSED
82.292	10.73	3.438	32.8	-22.07	VERTICAL	PASSED
112.892	12.82	4.377	32.96	-20.14	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
3913.729	37.48	74.826	44.54	-7.06	VERTICAL	PASSED
3936.672	38.06	80.02	45.06	-7	HORIZONTAL	PASSED

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

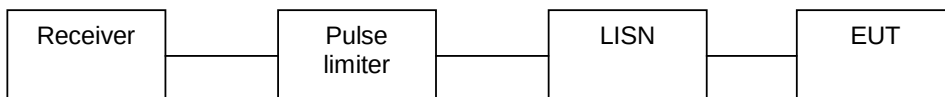
Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
3913.729	24.68	17.144	31.74	-7.06	VERTICAL	PASSED
3936.672	24.64	17.051	31.64	-7	HORIZONTAL	PASSED

6. AC powerline conducted emissions

FCC §15.207, RSS-GEN 7.2.2

EUT with DUT number	RM-833, DUT 16146
Accessories with DUT numbers	BL-5C, DUT 16167 ; AC-11E, DUT 16150 ; WH-102, DUT 16148
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 102.1
Date of measurements	17-Jan-2012
Measured by	Sami Lehtonen

6.1. Test Setup



6.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-GEN as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

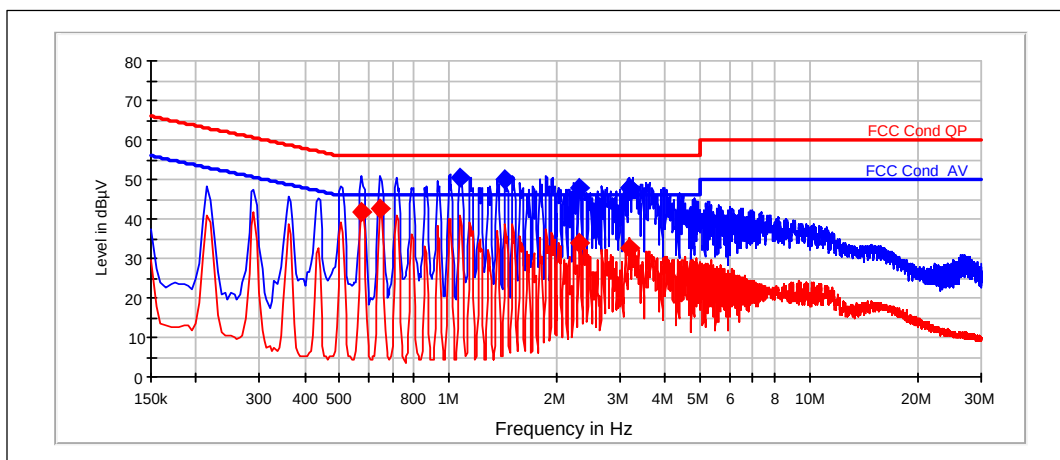
$$U [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

6.3. Test results



QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.08	50.62	L1	PASSED
1.44	50	N	PASSED
2.315	48.02	N	PASSED
3.17	47.81	L1	PASSED
3.175	47.93	N	PASSED

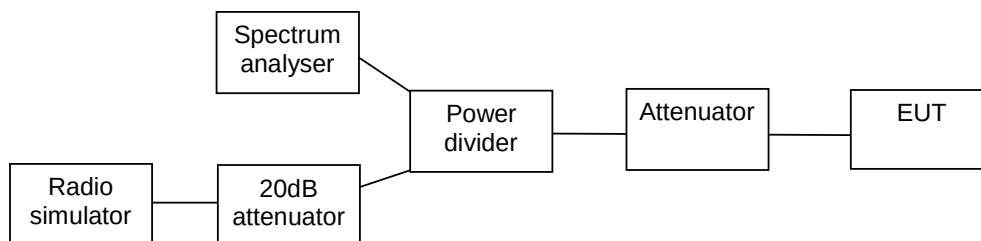
Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.575	41.68	N	PASSED
0.65	42.82	N	PASSED
2.31	33.95	L1	PASSED
3.18	32.81	N	PASSED

7. 20 dB bandwidth 15.247(a)(1), A8.1 (a)

EUT with DUT number	RM-833, DUT 16144
Accessories with DUT numbers	BL-5C, DUT 16167 ; WH-102, DUT 16148 ; AC-11E, DUT 16150
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen

7.1. Test Setup



7.2. Test method and limit

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

Limits for 20 dB bandwidth measurements

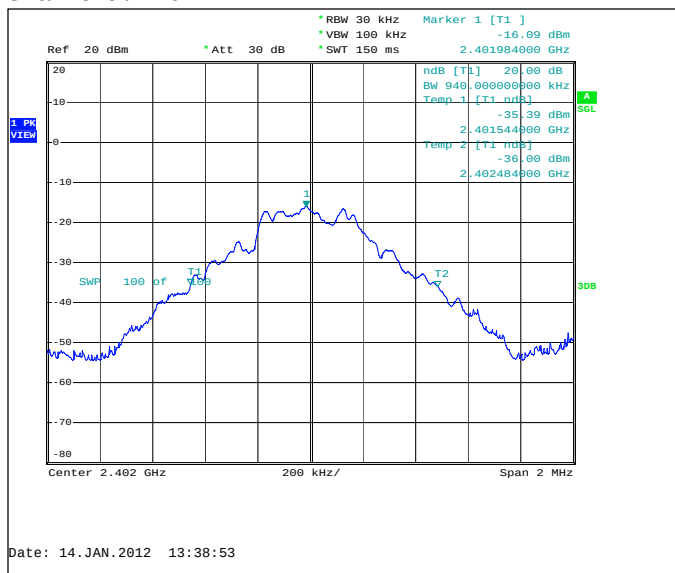
Limit [MHz]
N/A

7.3. Bluetooth Test results

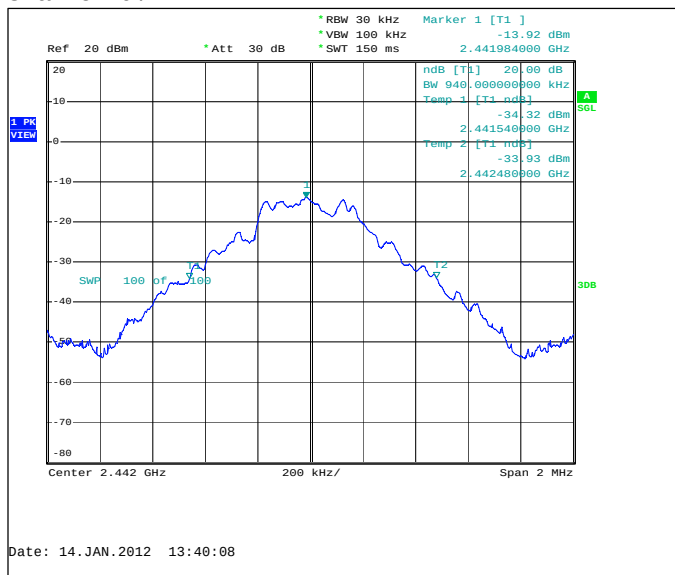
7.3.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]
0 / 2402	940
40 / 2442	940
78 / 2480	940

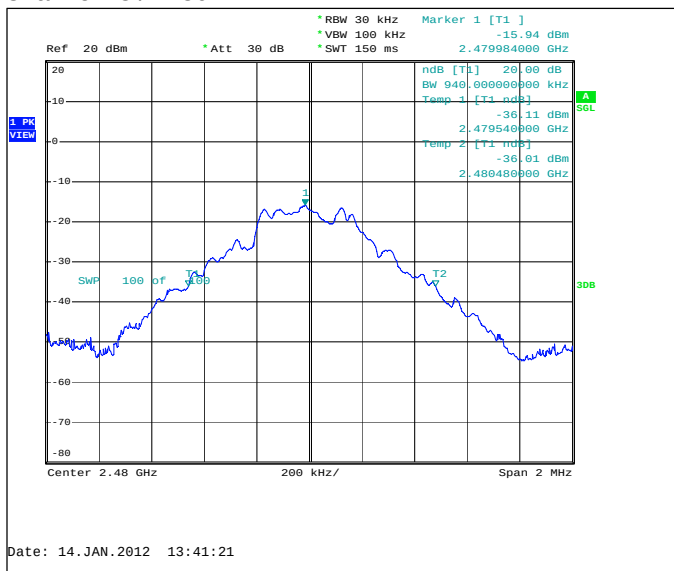
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



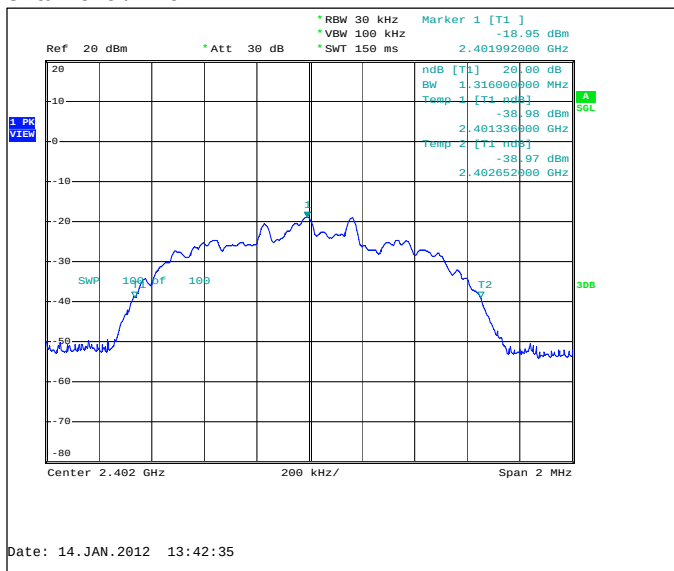
Channel 78 / 2480 MHz



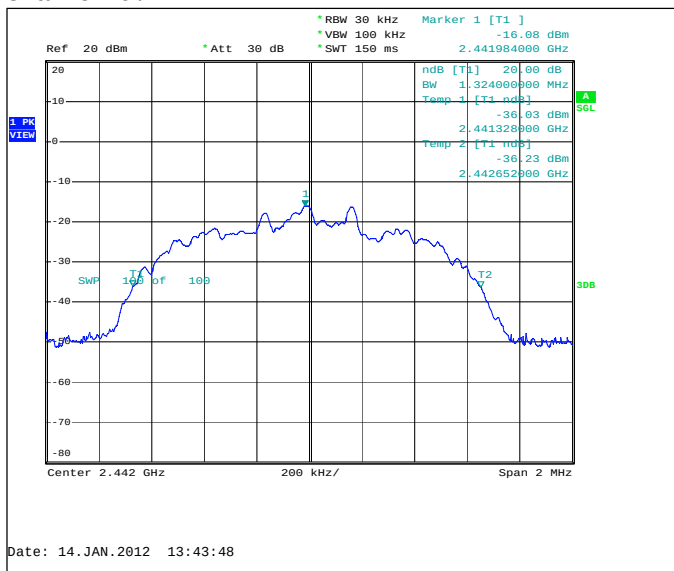
7.3.2 8DPSK modulation, PRBS packet type

Channel / f _c [MHz]	20 dB bandwidth [kHz]
0 / 2402	1316
40 / 2442	1324
78 / 2480	1324

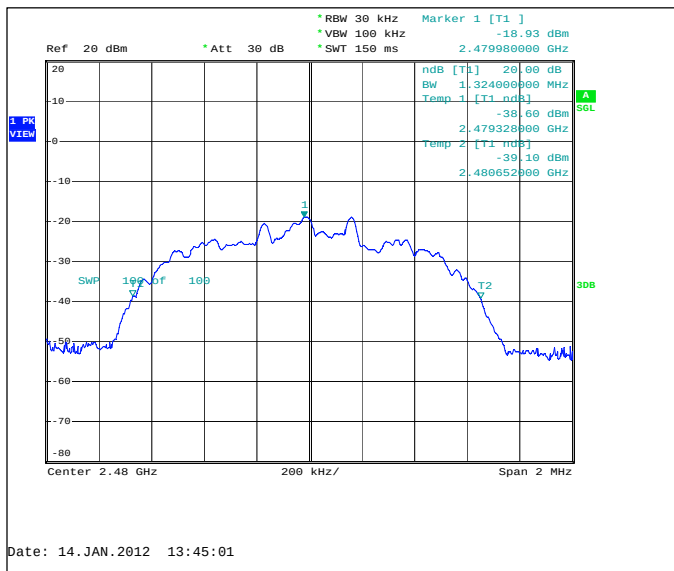
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz

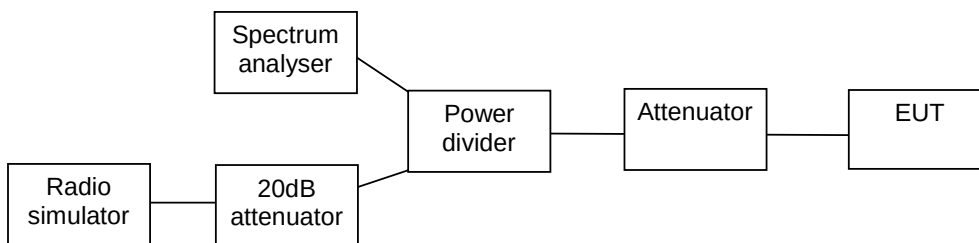


8. Carrier frequency separation

15.247(a)(1), A8.1 (b)

EUT with DUT number	RM-833, DUT 16144
Accessories with DUT numbers	BL-5C, DUT 16167 ; WH-102, DUT 16148 ; AC-11E, DUT 16150
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen

8.1. Test Setup



8.2. Test method and limit

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

Limits for carrier frequency separation measurements

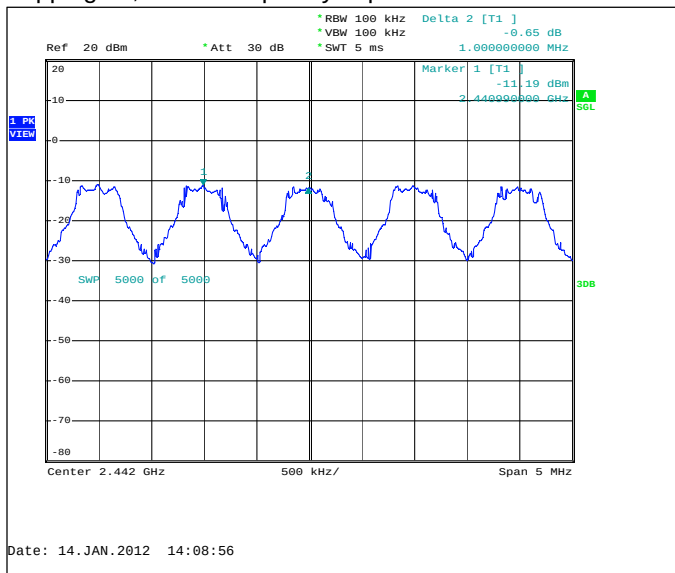
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

8.3. Bluetooth Test results

8.3.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1000	PASSED

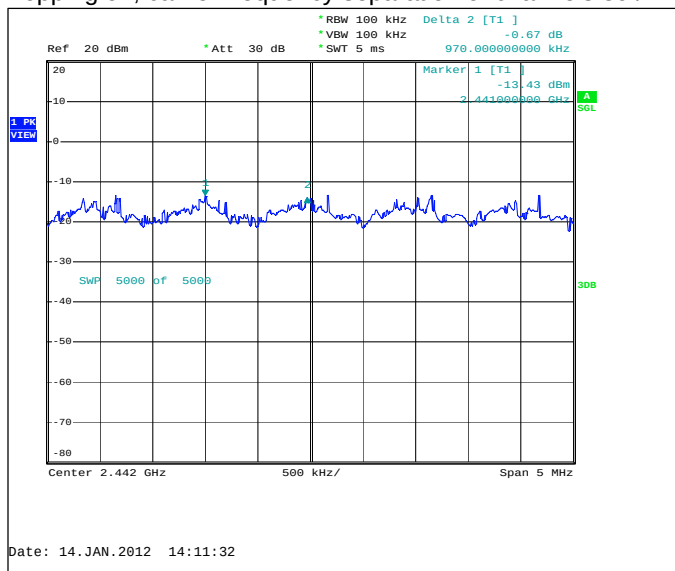
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



8.3.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
970	PASSED

Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz

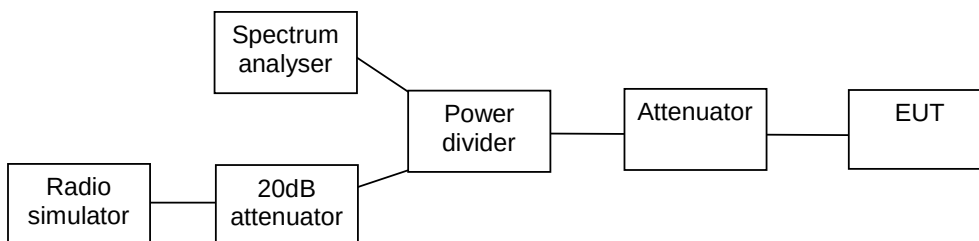


9. Number of hopping frequencies

15.247(a)(1)(iii), A8.1 (d)

EUT with DUT number	RM-833, DUT 16144
Accessories with DUT numbers	BL-5C, DUT 16167 ; WH-102, DUT 16148 ; AC-11E, DUT 16150
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen

9.1. Test Setup



9.2. Test method and limit

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

Limits for number of hopping frequencies measurements

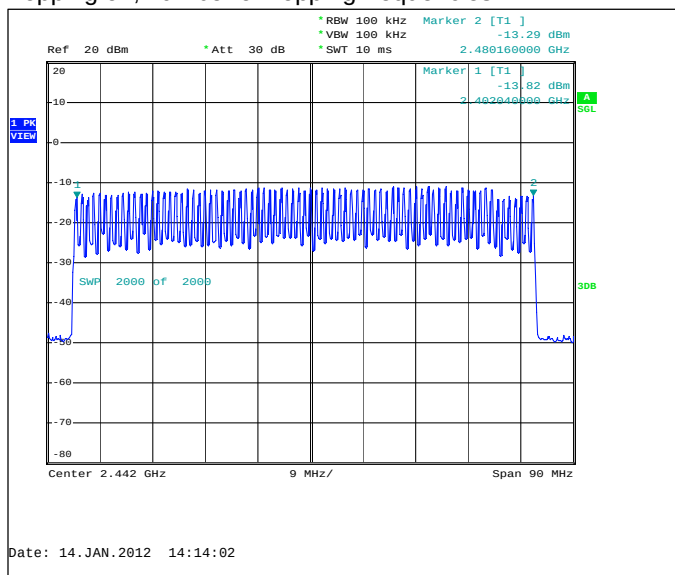
Limit [number]
>= 15

9.3. Bluetooth Test results

9.3.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
78	PASSED

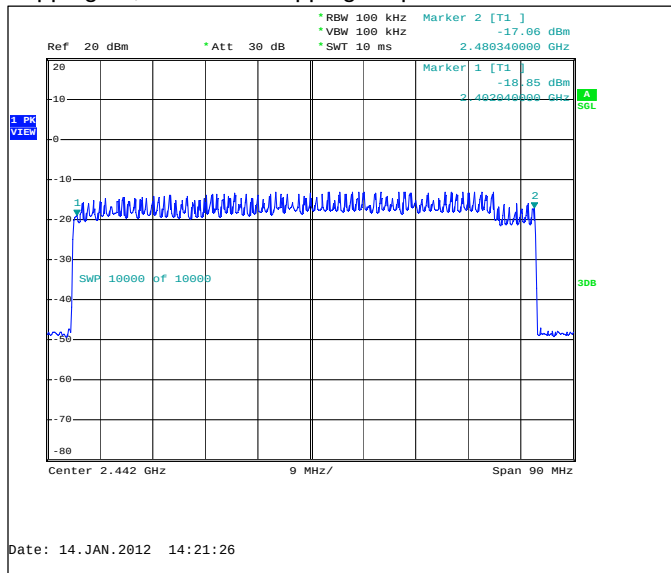
Hopping on, number of hopping frequencies



9.3.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
72	PASSED

Hopping on, number of hopping frequencies

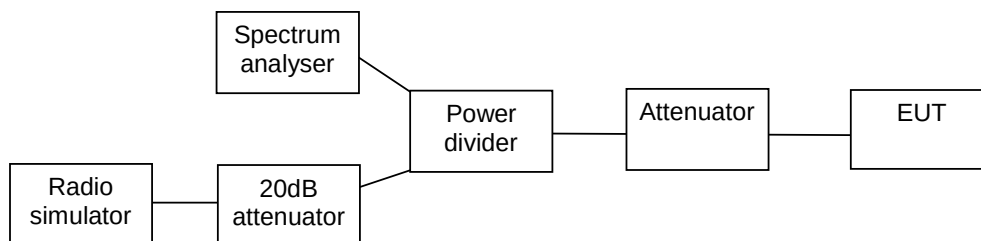


10. Time of occupancy

15.247(a)(1)(iii), A8.1 (d)

EUT with DUT number	RM-833, DUT 16144
Accessories with DUT numbers	BL-5C, DUT 16167 ; WH-102, DUT 16148 ; AC-11E, DUT 16150
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 39 / 100.1
Date of measurements	14-Jan-2012
Measured by	Sami Lehtonen

10.1. Test Setup



10.2. Test method and limit

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

The total time of occupancy is get by multiplying the measured number of transmissions occurred during 31.6 second period with the duration of one transmission.

Limits for time of occupancy measurements

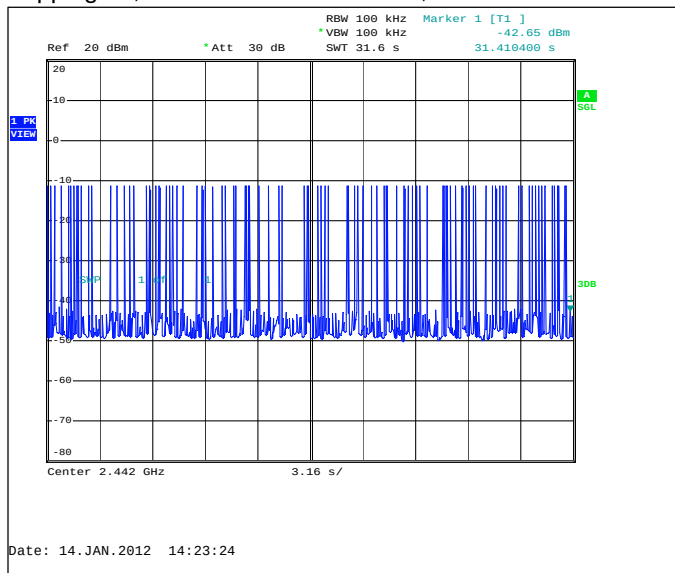
Limit [s]
<= 0.4

10.3. Bluetooth Test results

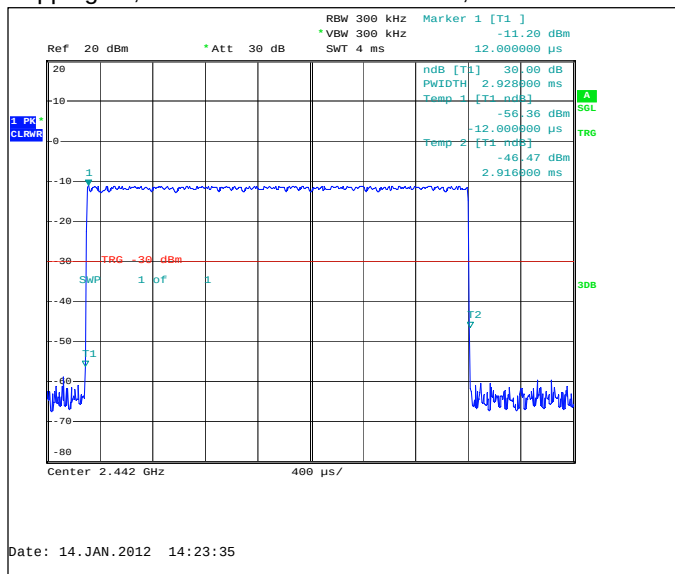
10.3.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [ms]	Time of occupancy [s]	Result
86	2.928	0.252	PASSED

Hopping on, number of transmissions, channel 40 / 2442 MHz



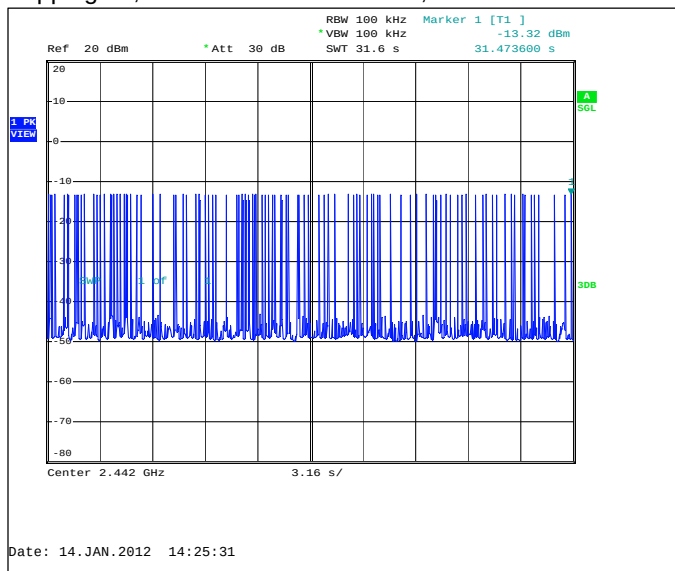
Hopping on, duration of one transmission, channel 40 / 2442 MHz



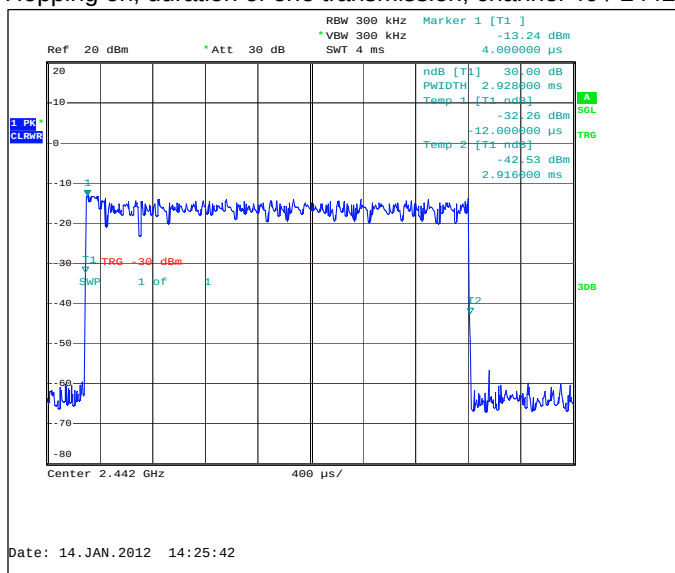
10.3.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [ms]	Time of occupancy [s]	Result
95	2.928	0.278	PASSED

Hopping on, number of transmissions, channel 40 / 2442 MHz



Hopping on, duration of one transmission, channel 40 / 2442 MHz



11. Test Equipment

11.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1916	Communication Tester	CMTA84	R&S	15B
1992	Signal Generator	83630B	Agilent	15C, 15B
1999	Receiver	ESIB26	R&S	22/24/27, 15C, 15B
2039	Power Supply	PL330QMD	Thurlby	15C, 15B
2060	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
2068	CDN	S1	NMP	15C, 15B
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2156	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2180	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2206	Signal Generator	SMX	R&S	15C, 15B
2347	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP-30	R&S	22/24/27, 15C
2359	Temperature Test Chamber	VT4002	Vötsch	22/24/27
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24/27
2362	Power Supply	NGPX 70/5	R&S	22/24/27
2388	Bluetooth Tester	CBT	R&S	15B
2389	Signal Generator	SMJ 100A	R&S	15B
2390	Directional Coupler	DC2600	AR	-
6009	GPS Antenna	SA-700	Chronos	15C
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	15C
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	15C
6012	CDN	CDN USB/c	Teseq	-
6015	Receiver	ESI	R&S	22/24, 15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B
6036	Data Logger	175-H2	Testo	22/24/27, 15C, 15B
6038	Data Logger	Testo 580	Testo	22/24/27, 15C, 15B
6039	USB Interface	5541765	Testo	22/24/27, 15C, 15B
2059	V-network	ESH3-Z6	R&S	-
6044	V-network	ESH3-Z6	R&S	-
6045	Power splitter	11667B	Agilent	22/24/27, 15C
6046	Attenuator 10dB	8493C	Agilent	22/24/27, 15C
6047	Attenuator 20dB	8493C	Agilent	22/24/27, 15C

11.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1917	Communication Tester	CMTA84	R&S	15B
1988	Antenna	HL562	R&S	22/24/27, 15C, 15B
1989	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2009	Signal Generator	SMP 22	R&S	22/24/27, 15C, 15B
2027	CDN	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	CDN	M3 (modified) DC2	MEB	22/24/27, 15C, 15B
2029	Power Supply	PL330	Thurlby	22/24/27, 15C
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22
2047	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24
2051	High Pass Filter	4HC1700-1-KK	R&S	22
2109	Power Supply	PL330QMD	Thurlby	22/24/27, 15C, 15B
2116	Controller	EMCO 2090	ETS	22/24/27, 15C, 15B
2135	CDN	CDN 801-M3	Lüthi	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
2150	High Pass Filter	F-15041	RLC	22/24/27, 15C
2156	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2176	CDN	CDN 801-M3	Lüthi	22/24/27, 15C, 15B
2180	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	Miteq	22/24/27, 15C, 15B
2347	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2348	Controller	G-1000DXC	Yaesu	22/24/27, 15C, 15B
2349	Computer Controller	GS-232B	Yaesu	22/24/27, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	Miteq	22/24/27, 15C, 15B
2353	Receiver	ESIB26	R&S	22/24/27, 15C, 15B
2357	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	15C
2361	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	Euroshield	22/24/27, 15C, 15B
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
2366	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22
2388	Bluetooth Tester	CBT	R&S	15B
2389	Signal Generator	SMJ 100A	R&S	15B
2391	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
6009	GPS Antenna	SA-700	Chronos	15C
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	15C
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	15C
6014	Substitute Calibration Cable	Sucoflex 104PB	Suhner	-
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B
-	RF immunity / Emission Software	EMC32	R&S	22/24/27, 15C, 15B
6037	Data Logger	175-H2	Testo	22/24/27, 15C, 15B
6038	Data Logger	Testo 580	Testo	22/24/27, 15C, 15B
6039	USB Interface	5541765	Testo	22/24/27, 15C, 15B