FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CBT_RM-1072_04.docx	**Date of Report:**	28-Jan-2015
Number of pages:	44	**Customer's Contact person:**	Juha Paukku
Testing laboratory:	TCC Microsoft Tampere Laboratory P.O.Box 403 Visiokatu 3 FIN-33101 TAMPERE, FINLAND Tel. +358 71 800 8000 Fax. +358 71 804 6880	**Customer:**	Microsoft P.O.Box 403 Visiokatu 4 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880
FCC listing no.: **IC recognition no.:**	94436 661AK-1		
Tested devices/ accessories:	**Phone RM-1072 / Battery BV-T5C / AC charger AC-20E / Headset WH-108**		
FCC ID:	PYARM-1072	**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 Microsoft.		
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 Timo Raiskio DN: cn=Timo Raiskio, o, ou, email=timo.raiskio@microsoft.com, c=FI Date: 2015.01.28 15:48:49 +02'00'		

Timo Raiskio, Specialist, EMC & SAR

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	17-Nov-2014
Testing completed	12-Dec-2014
The customer's contact person	Juha Paukku
Test Plan referred to	T:\Projects\RM-1072\TestPlan\RS_testplan_RM-1072.xlsm
Notes	-
Document name	T:\Projects\RM-1072\EMC\FCC15CBT_RM-1072_04.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-1072	004402740483304	1500	-	02148.00000.14431.29000	43231
Battery	BV-T5C	-	LG HW3.0	-	-	43232
AC charger	AC-20E	486867341135112686 5;0675628	-	-	-	43140
Headset	WH-108	4163271	-	-	-	43213
Phone	RM-1072	004402740484534	1500	-	02148.00000.14431.29000	43238
Battery	BV-T5C		LG HW3.0			43235
AC charger	AC-20E	409049415667071180 1;0675628	-	-	-	43229
Headset	WH-108	4235VFA	-	-	-	43230

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)	A8.4(2)	Conducted peak output power	PASSED
15.247(d), 15.205(b)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(d)	A8.5	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	7.2.4	AC powerline conducted emissions	PASSED
15.247(a)(1)	A8.1(a)	20dB(bandwidth)	PASSED
15.247(a)(1)	A8.1(b)	Carrier frequency separation	PASSED
15.247(a)(1)(iii)	A8.1(d)	Number of hopping frequencies	PASSED
15.247(a)(1)(iii)	A8.1(d)	Time of occupancy	PASSED

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 Microsoft Laboratory.

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

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TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

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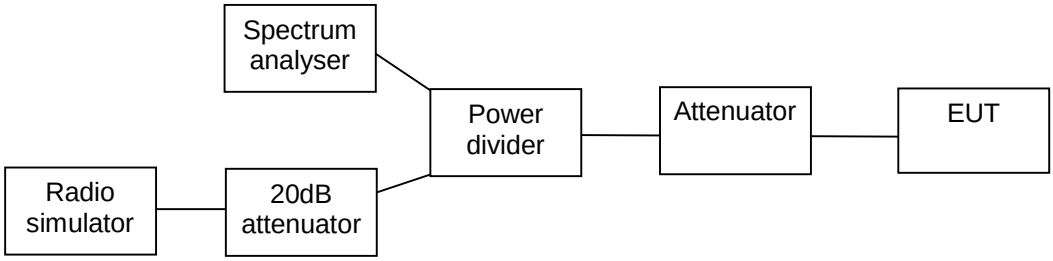
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

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

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 103.7
Date of measurements	20-Nov-2014
Measured by	Hannu Söderholm

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 5725 - 5850	<= 1	<= 30

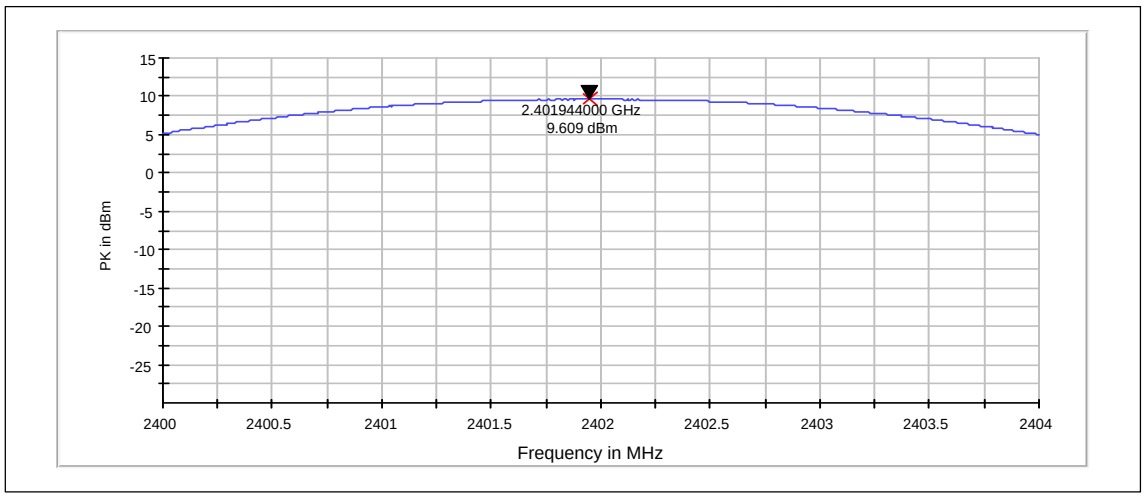
TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

2.3. Bluetooth Test results

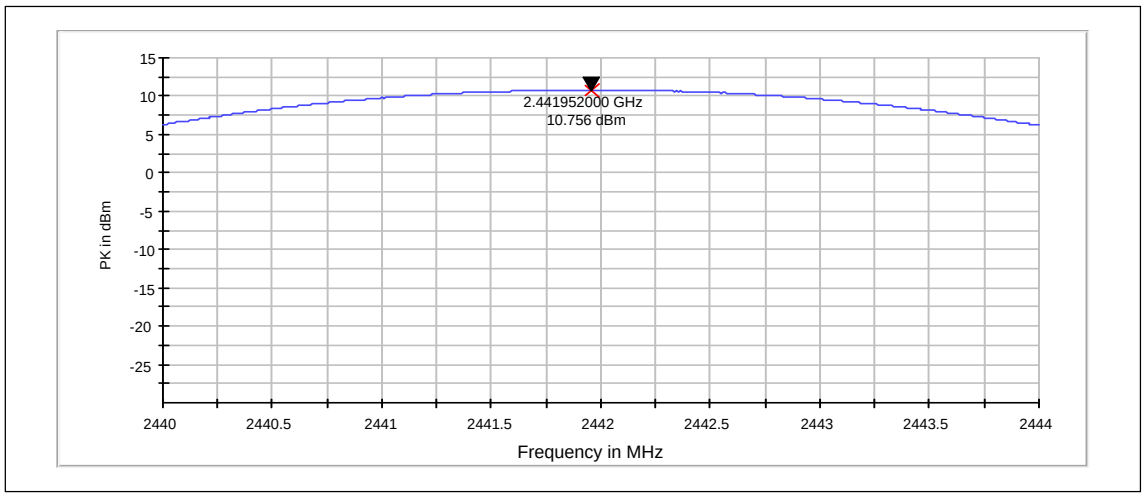
2.3.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	9.61	9.141	PASSED
40 / 2442	10.76	11.912	PASSED
78 / 2480	8.1	6.457	PASSED

Channel 0 / 2402 MHz (Peak detector, RBW: 3 MHz, VBW: 3 MHz)

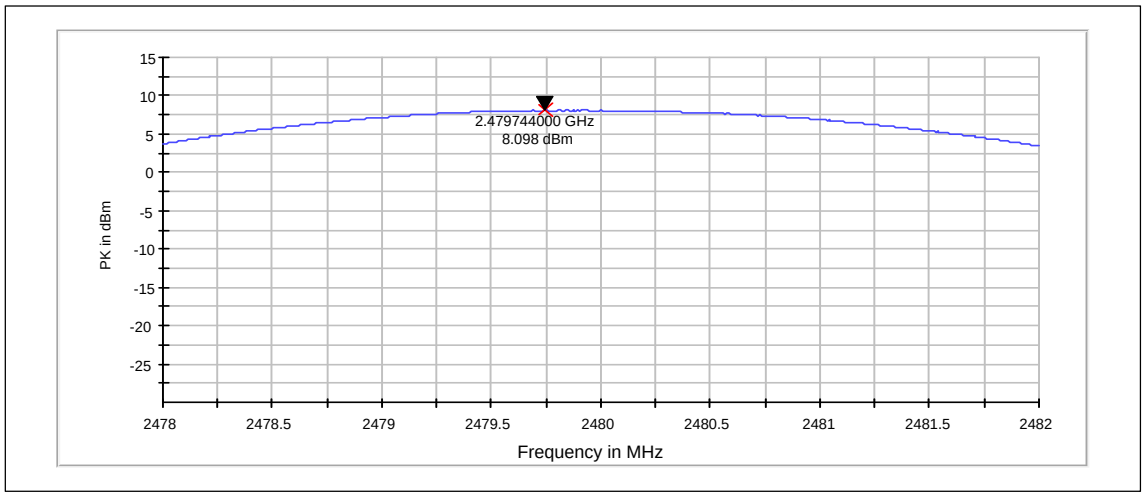


Channel 40 / 2442 MHz (Peak detector, RBW: 3 MHz, VBW: 3 MHz)



TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

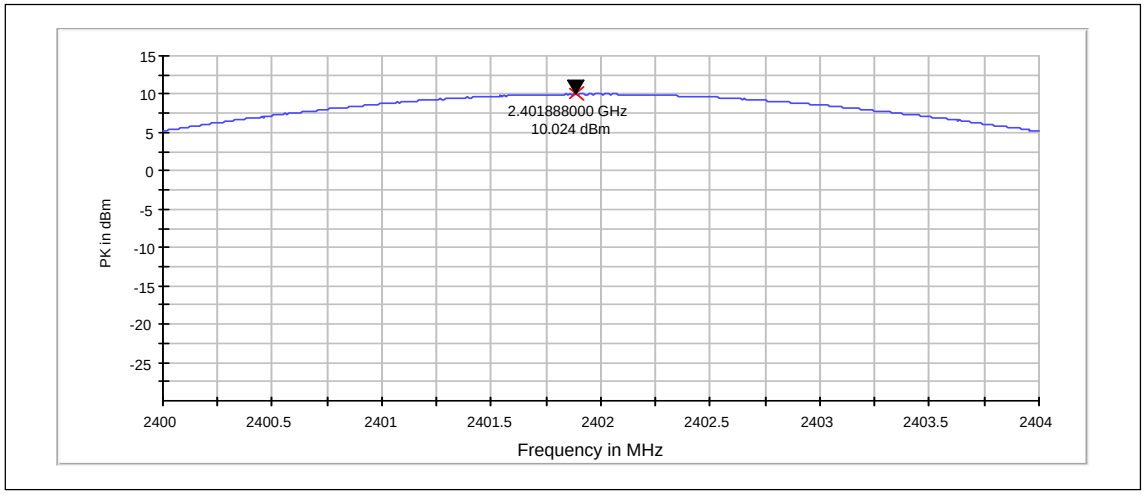
Channel 78 / 2480 MHz (Peak detector, RBW: 3 MHz, VBW: 3 MHz)



2.3.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	10.02	10.046	PASSED
40 / 2442	11.16	13.062	PASSED
78 / 2480	8.45	6.998	PASSED

Channel 0 / 2402 MHz (Peak detector, RBW: 3 MHz, VBW: 3 MHz)



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P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
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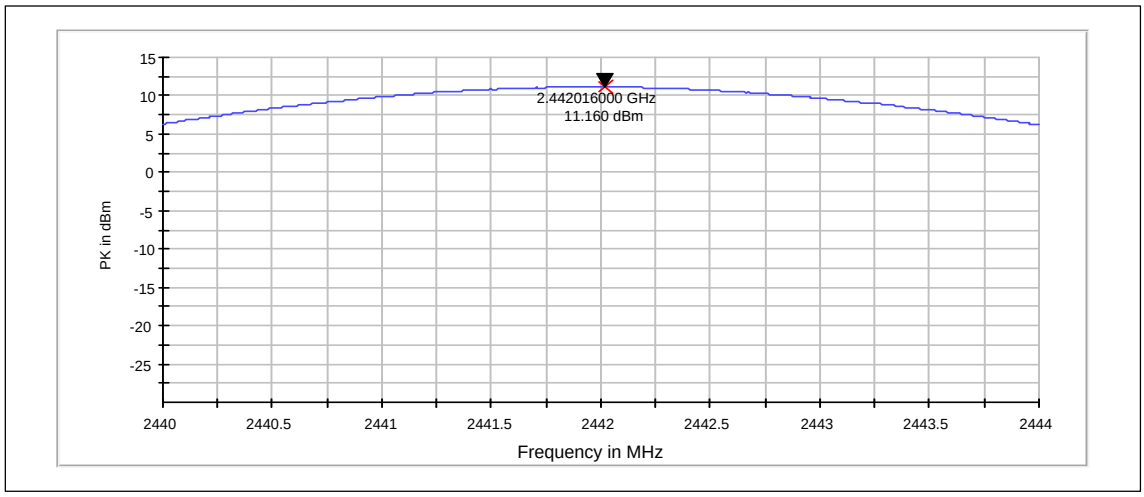
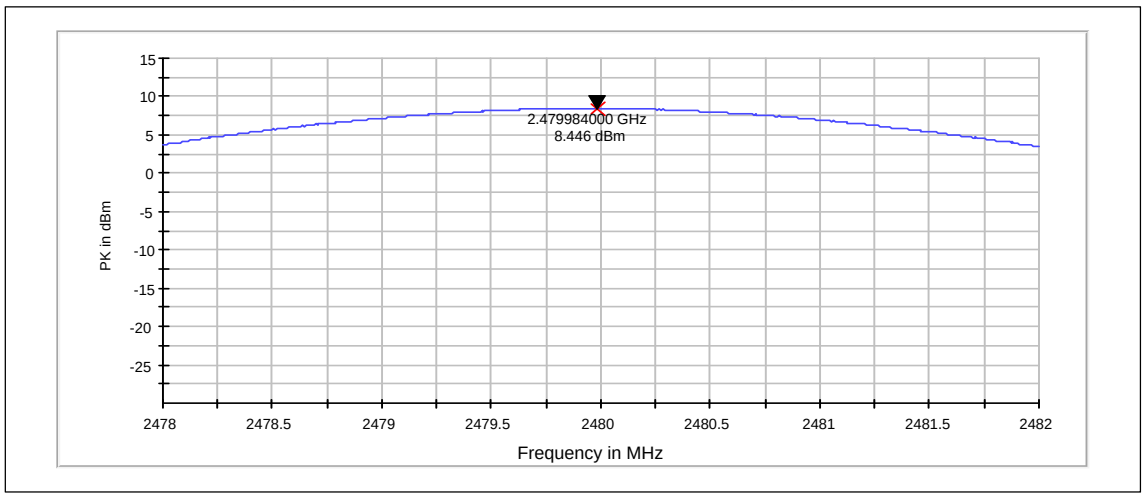
Channel 40 / 2442 MHz (Peak detector, RBW: 3 MHz, VBW: 3 MHz)



Channel 78 / 2480 MHz (Peak detector, RBW: 3 MHz, VBW: 3 MHz)



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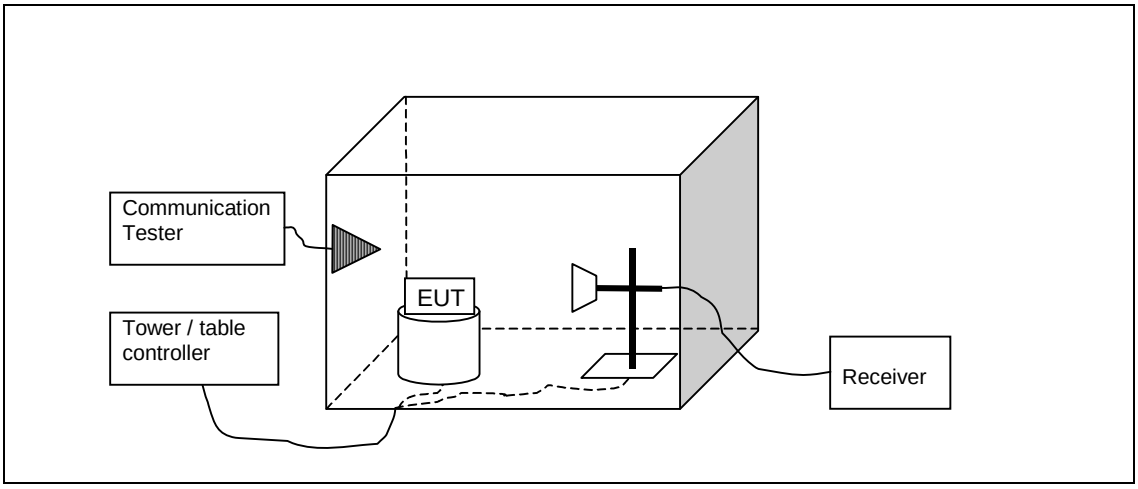
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

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

EUT with DUT number	RM-1072, DUT 43238
Accessories with DUT numbers	BV-T5C, DUT 43235 ; AC-20E, DUT 43229 ; WH-108, DUT 43230
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102.4
Date of measurements	26-Nov-2014
Measured by	Jari Jantunen

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:

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

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)

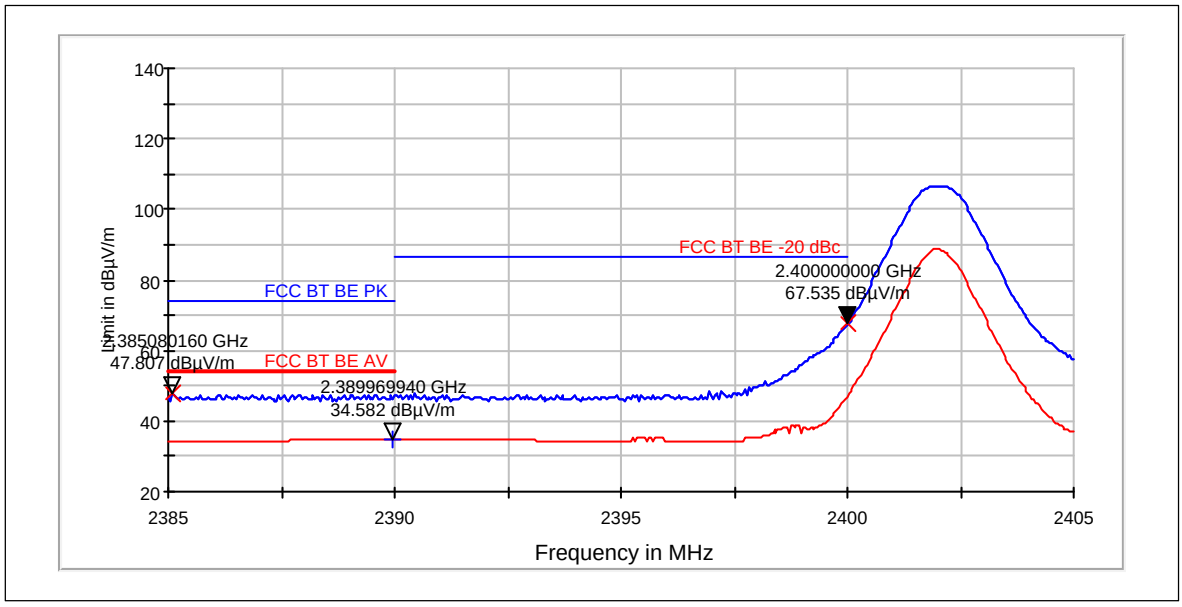
Frequency range [MHz]	Limit
Below 2390 and above 2483.5	54 dBuV/m (avg) and 74 dBuV/m (pk)
2390 - 2400	-20 dBc (pk)

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

3.3. Bluetooth test results

3.3.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



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

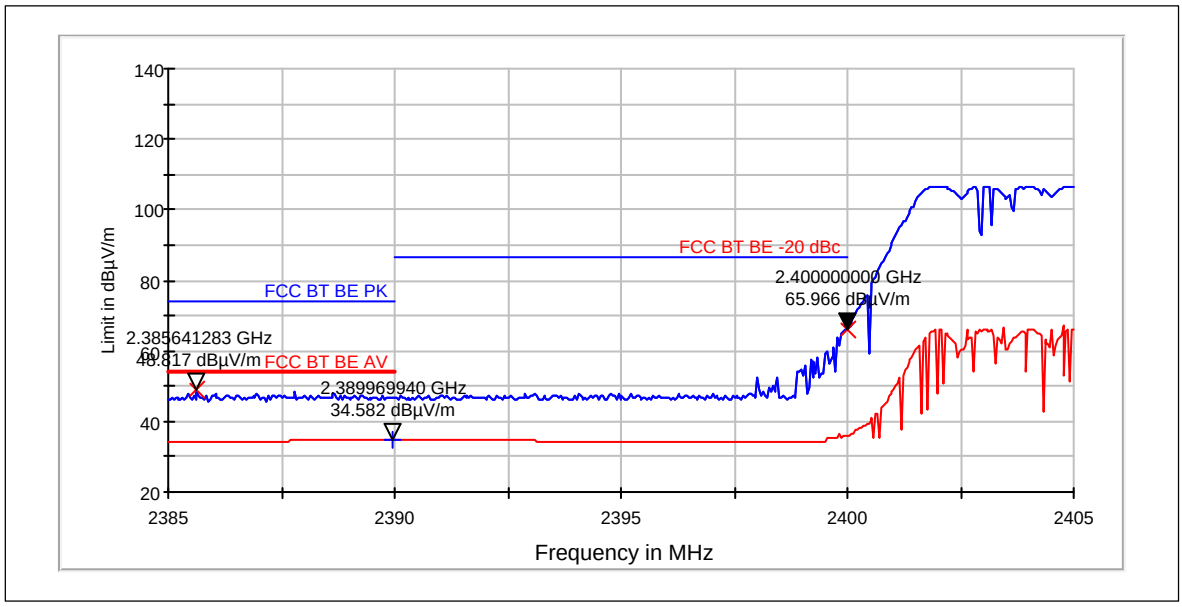
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2385	47.81	245.669	57.82	-10.01	PASSED
2400	67.54	2380.948	0.01	67.54	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2390	34.58	53.592	44.59	-10.01	PASSED

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

Hopping on. Low end.



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2386	48.82	275.962	58.83	-10.01	PASSED
2400	65.97	1987.467	0	65.97	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2390	34.58	53.592	44.59	-10.01	PASSED

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P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
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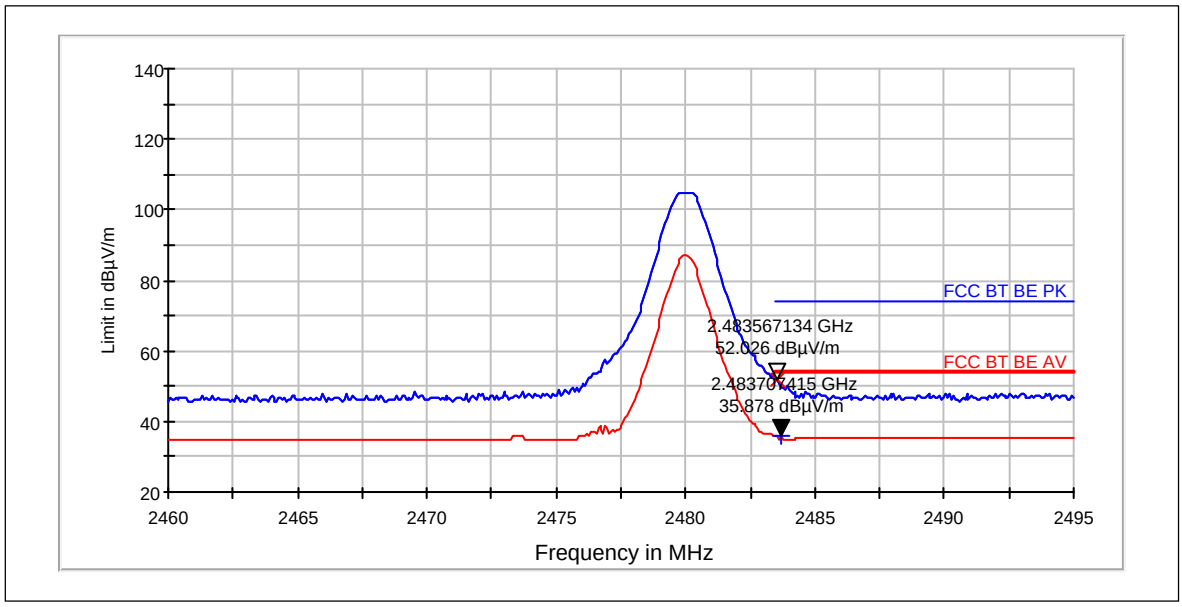
Channel 78 / 2480 MHz



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	52.03	399.301	61.54	-9.51	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	35.88	62.216	45.39	-9.51	PASSED

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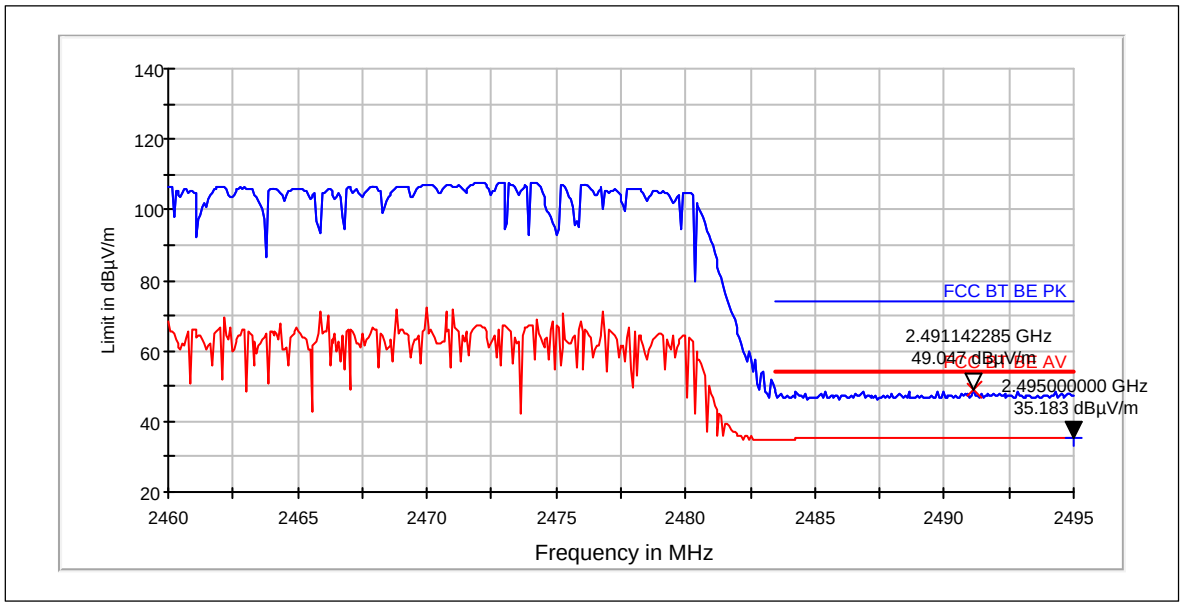
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

Hopping on. High end.



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2491	49.05	283.367	58.56	-9.51	PASSED

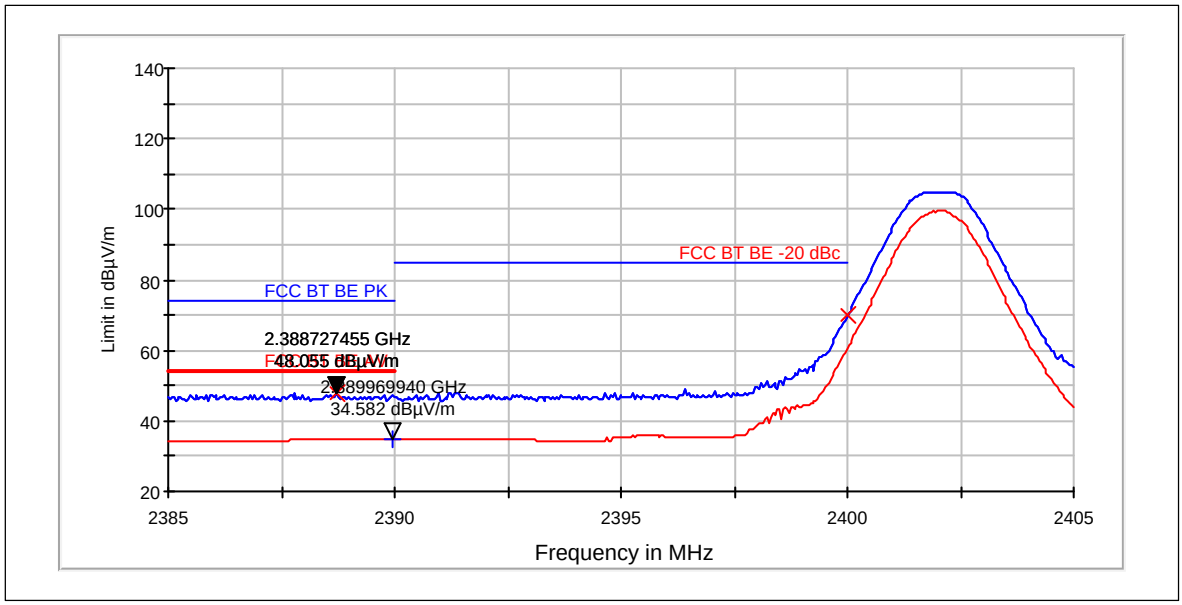
Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2495	35.18	57.431	44.69	-9.51	PASSED

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

3.3.2 8DPSK modulation, PRBS packet type

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]	Results
2389	48.06	252.784	58.07	-10.01	PASSED
2400	69.86	3111.358	0	69.86	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2390	34.58	53.592	44.59	-10.01	PASSED

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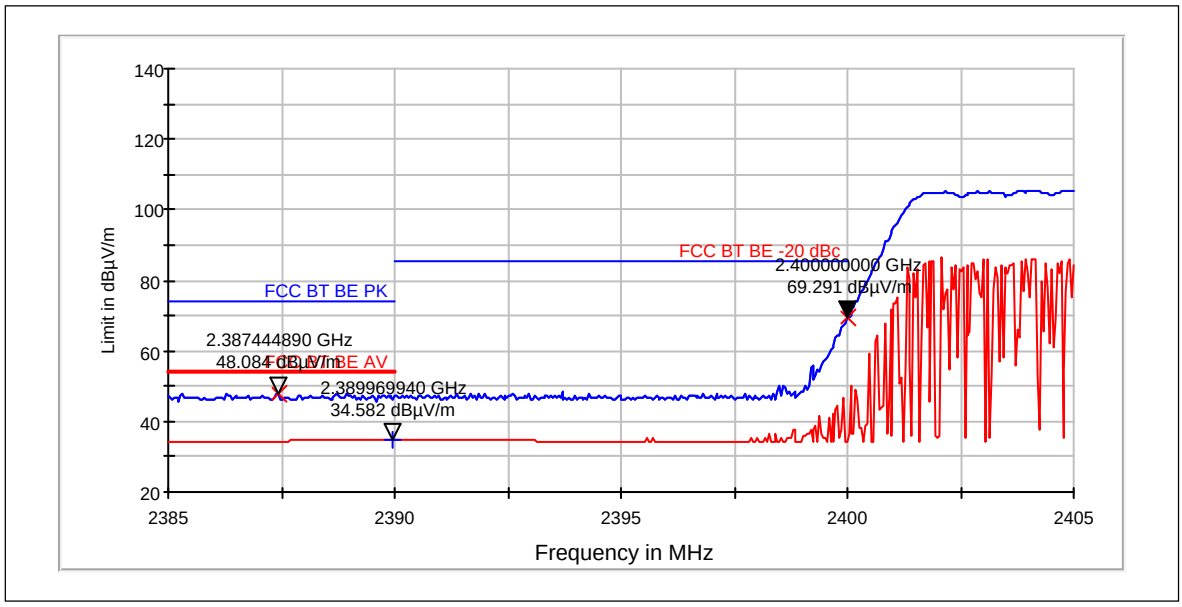
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

Hopping on. Low end.



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2387	48.08	253.63	58.09	-10.01	PASSED
2400	69.29	2914.406	79.3	-10.01	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2390	34.58	53.592	44.59	-10.01	PASSED

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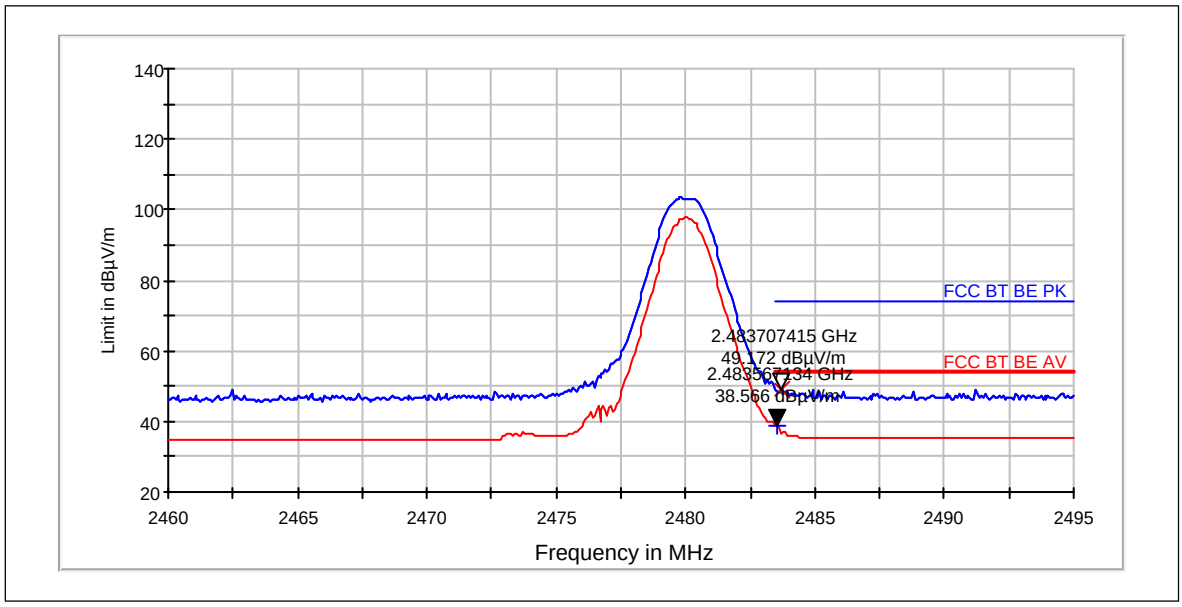
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

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]	Results
2484	49.17	287.475	58.68	-9.51	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	38.57	84.781	48.08	-9.51	PASSED

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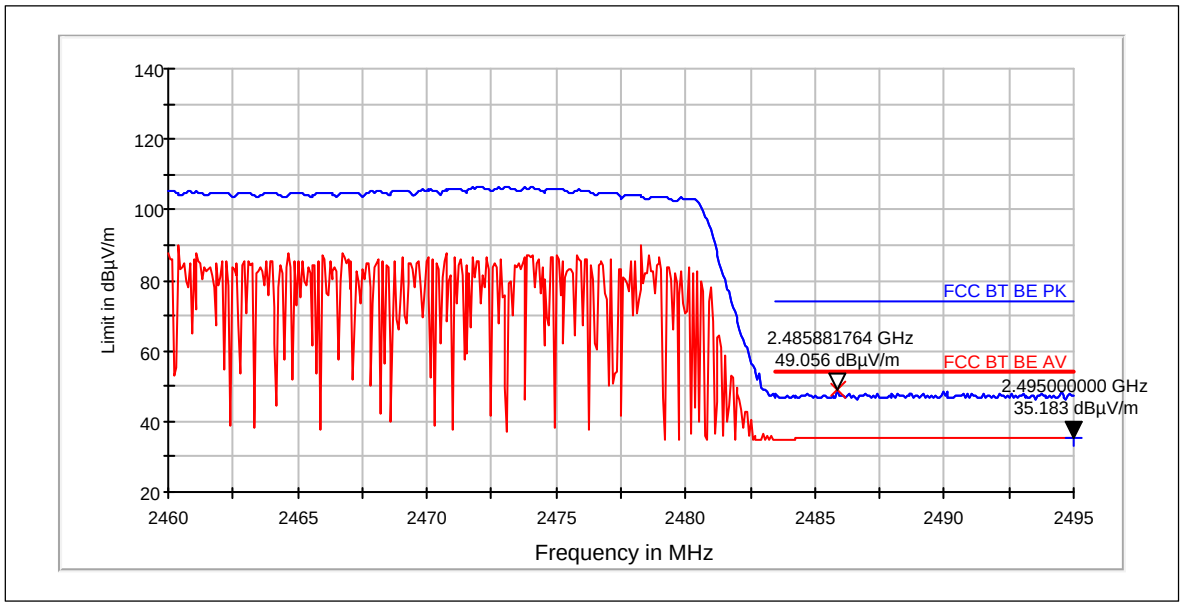
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

Hopping on. High end.



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2486	49.06	283.661	58.57	-9.51	PASSED

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

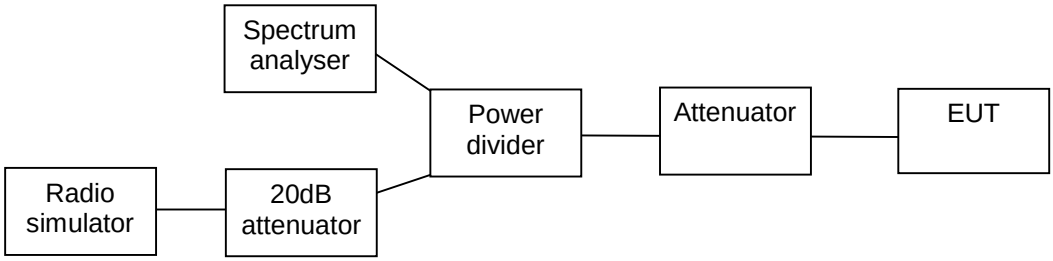
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2495	35.18	57.431	44.69	-9.51	PASSED

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

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

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 103.7
Date of measurements	20-Nov-2014
Measured by	Hannu Söderholm

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

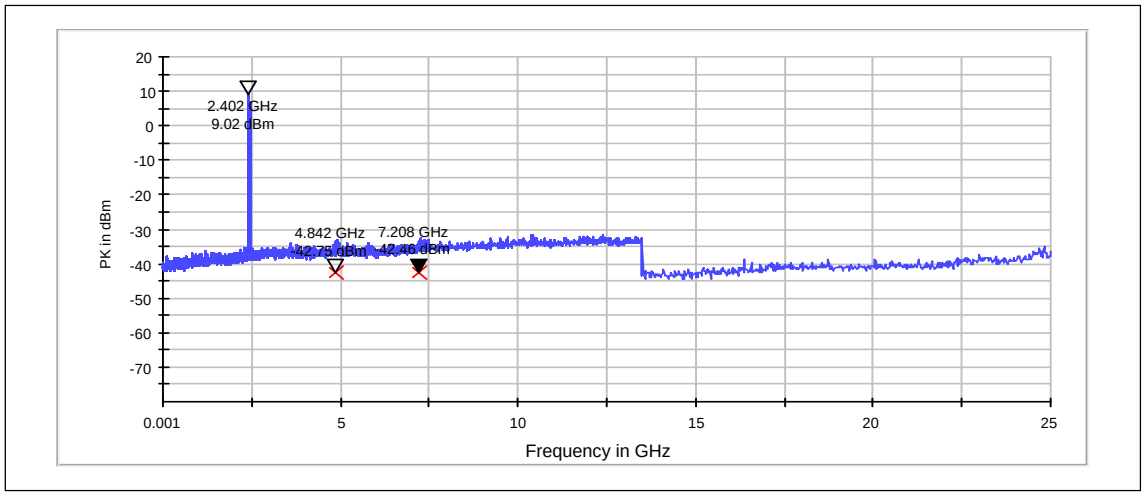
Frequency range [MHz]	Limit [dBc]
1 – 25000	<= -20

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

4.3. Bluetooth Test results

4.3.1 GFSK modulation, PRBS packet type

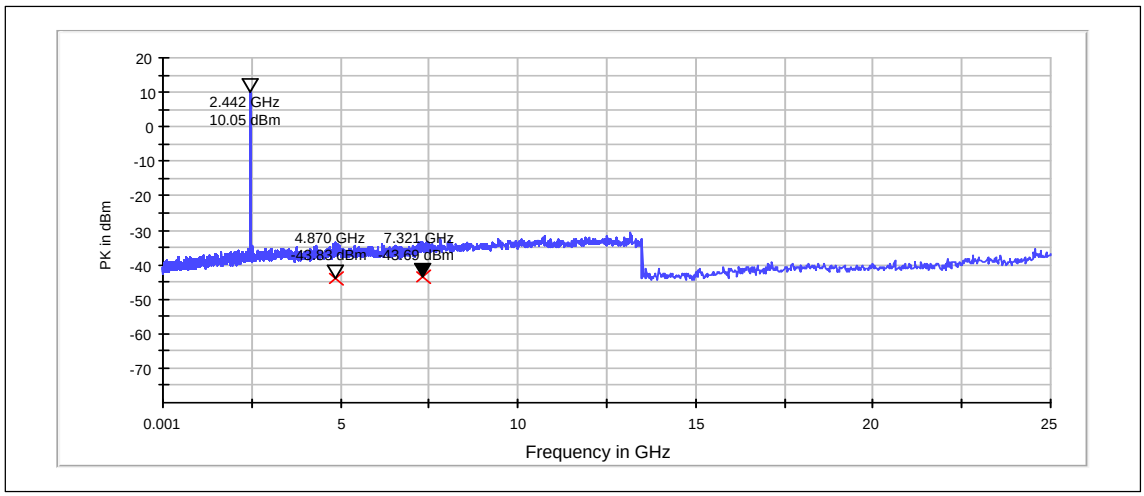
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4842.400	-42.75	PASSED
7208.400	-42.46	PASSED

Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4870.000	-43.83	PASSED
7320.600	-43.69	PASSED

TCC Microsoft Tampere Laboratory
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
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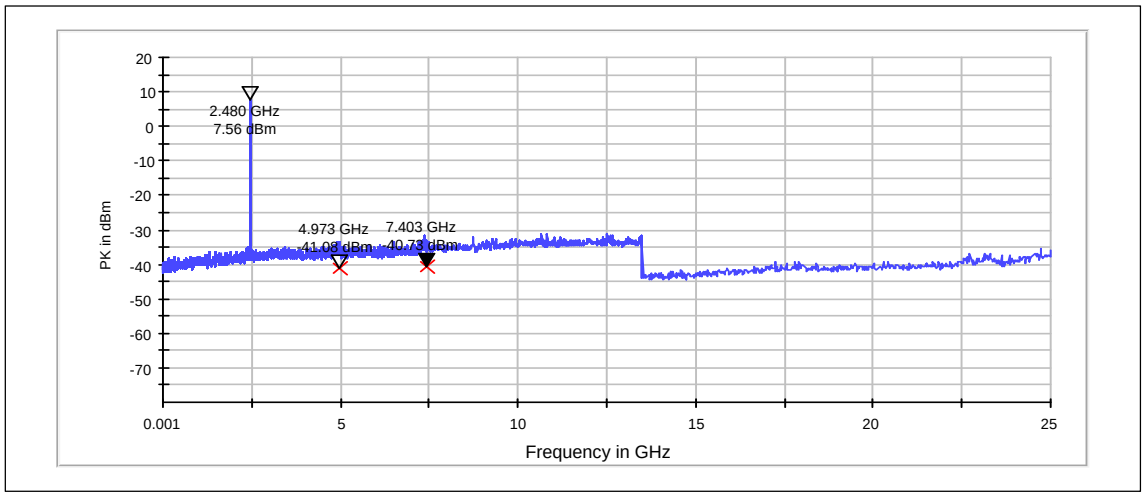
Channel 78 / 2480 MHz



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

Frequency [MHz]	P [dBc]	Result
4973.200	-41.08	PASSED
7402.800	-40.73	PASSED

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P.O. Box 403
Visiokatu 3
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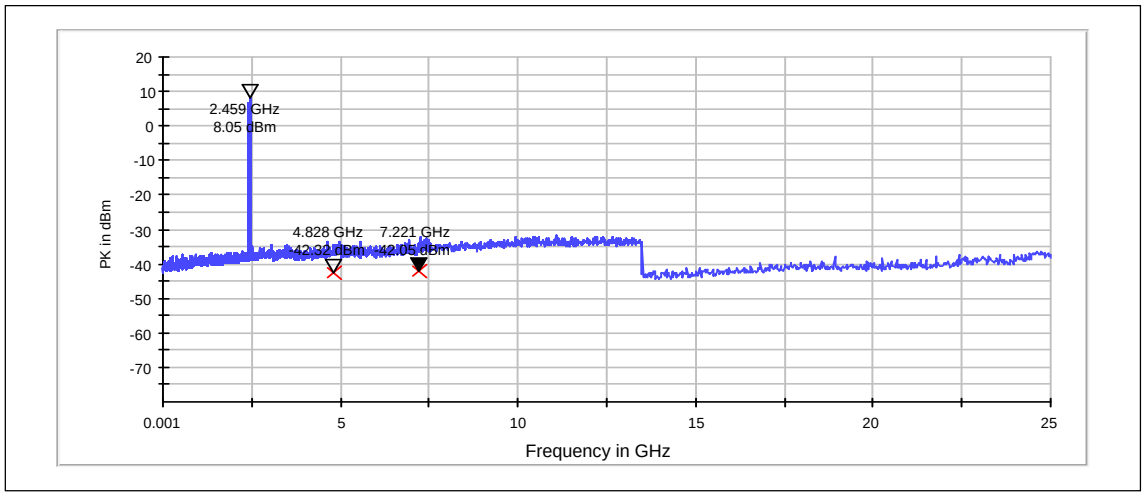
4.3.2 8DPSK modulation, PRBS packet type

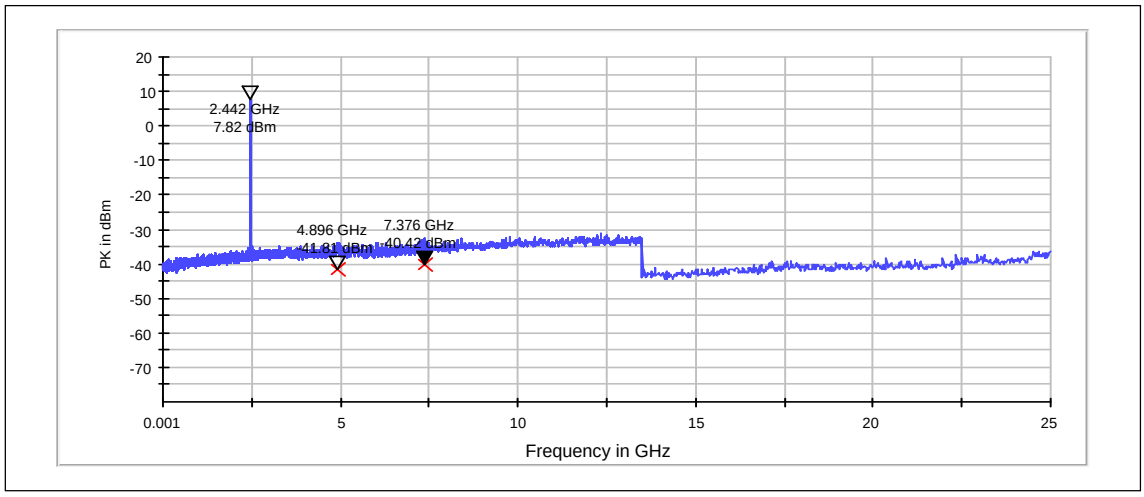
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4827.600	-42.32	PASSED
7221.000	-42.05	PASSED

Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4896.000	-41.81	PASSED
7375.800	-40.42	PASSED

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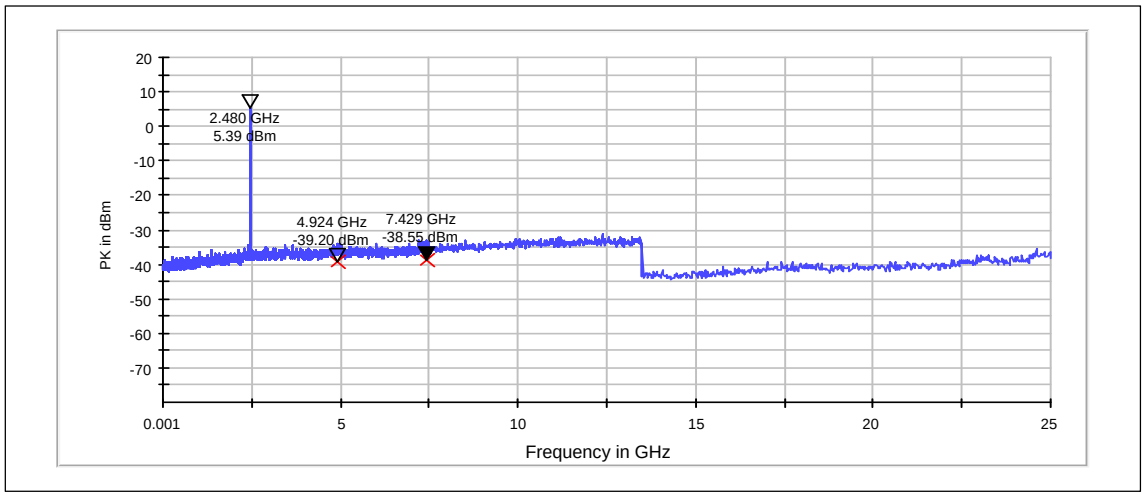
Channel 78 / 2480 MHz



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

Frequency [MHz]	P [dBc]	Result
4924.400	-39.20	PASSED
7428.600	-38.55	PASSED

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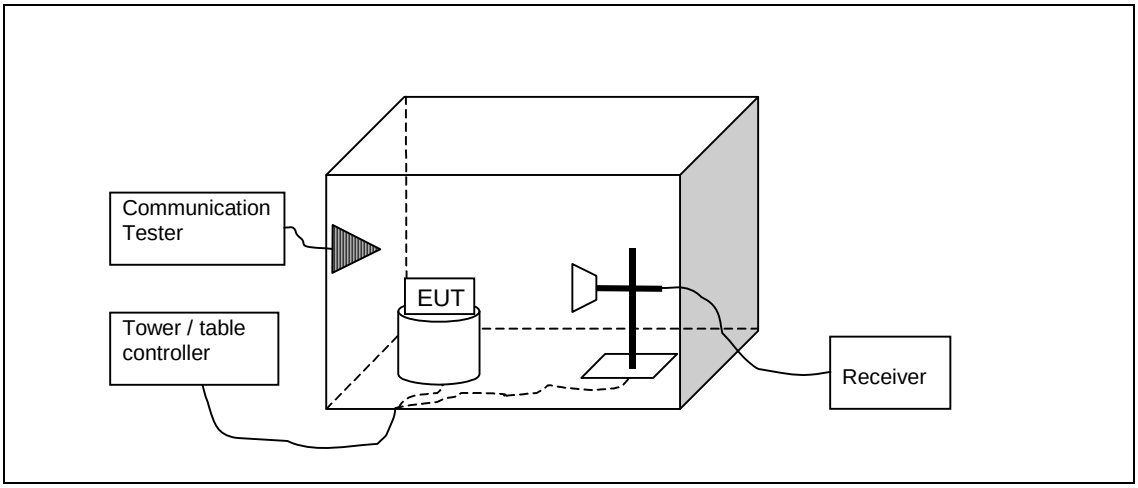
5. Spurious radiated emissions
(FCC 15.247(d), 15.209, RSS-210 A8.5)

EUT with DUT number	RM-1072, DUT 43238
Accessories with DUT numbers	BV-T5C, DUT 43235 ; AC-20E, DUT 43229 ; WH-108, DUT 43230
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102.4
Date of measurements	26-Nov-2014
Measured by	Timo Raiskio

5.1. Test setup



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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 is made up to 10th harmonic of the EUT highest TX channel.

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 [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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5.3. Bluetooth test results

5.3.1 GFSK modulation, PRBS packet type

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]	Limit [dBµV/m]	Margin	Results
4804.3	46.41	209.17	51.01	-4.6	74	27.57	PASSED
7206.1	52.87	440.048	51.87	1	95	42.36	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4804.3	32.45	41.928	37.05	-4.6	54	21.53	PASSED
7206.1	38.3	82.224	37.3	1	---	---	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]	Limit [dBµV/m]	Margin	Results
30.09	25.02	17.824	45.62	-20.6	40	14.98	PASSED
35.632	29.57	30.095	52.57	-23	40	10.43	PASSED
36.736	28.27	25.912	51.67	-23.4	40	11.73	PASSED
306.786	19	8.913	45.9	-26.9	46	27.02	PASSED
323.207	15.58	6.012	42.08	-26.5	46	30.44	PASSED
345.55	13.16	4.55	38.96	-25.8	46	32.86	PASSED
346.144	12.58	4.256	38.38	-25.8	46	33.44	PASSED
350.031	15.57	6.005	41.27	-25.7	46	30.45	PASSED
948.839	22.1	12.735	37.5	-15.4	46	23.92	PASSED

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]	Limit [dBµV/m]	Margin	Results
4960.4	43.17	144.046	47.17	-4	74	30.81	PASSED
7440.1	46.98	223.357	45.08	1.9	74	27	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4960.4	29.17	28.741	33.17	-4	54	24.81	PASSED
7440.1	33.33	46.398	31.43	1.9	54	20.65	PASSED

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5.3.2 8DPSK modulation, PRBS packet type

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]	Limit [dBµV/m]	Margin	Results
4804.1	44.84	174.582	49.44	-4.6	74	29.14	PASSED
7206.1	50.23	324.713	49.23	1	95	45	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4804.1	31.72	38.548	36.32	-4.6	54	22.26	PASSED
7206.1	35.43	59.088	34.43	1	---	---	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]	Limit [dBµV/m]	Margin	Results
30	25.41	18.642	46.01	-20.6	40	14.59	PASSED
30.39	23.45	14.876	44.25	-20.8	40	16.55	PASSED
35.806	28.59	26.884	51.59	-23	40	11.41	PASSED
35.872	27.53	23.796	50.63	-23.1	40	12.47	PASSED
35.878	27.14	22.751	50.24	-23.1	40	12.86	PASSED
38.859	26.59	21.355	50.79	-24.2	40	13.41	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
3915.032	38.01	79.524	45.01	-7	74	35.97	PASSED
9768.035	52.91	442.079	46.71	6.2	95	42.32	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
3915.032	25.24	18.281	32.24	-7	54	28.74	PASSED
9768.035	42.24	129.42	36.04	6.2	---	---	PASSED

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]	Limit [dBµV/m]	Margin	Results
4959.6	41.06	112.98	45.16	-4.1	74	32.92	PASSED
7440.4	44.43	166.533	42.53	1.9	74	29.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4959.6	27.89	24.803	31.99	-4.1	54	26.09	PASSED
7440.4	31.88	39.264	29.98	1.9	54	22.1	PASSED

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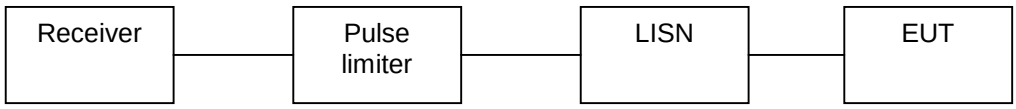
6. AC powerline conducted emissions
(FCC §15.207, RSS-210 7.2.4)

EUT with DUT number	RM-1072, DUT 43238
Accessories with DUT numbers	BV-T5C, DUT 43235 ; AC-20E, DUT 43229 ; WH-108, DUT 43230
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 40 / 99.4
Date of measurements	12-Dec-2014
Measured by	Timo Raiskio

6.1. Test Setup



6.2. Test method and limit

The measurement is made according to procedure KDB 558074 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:

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

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

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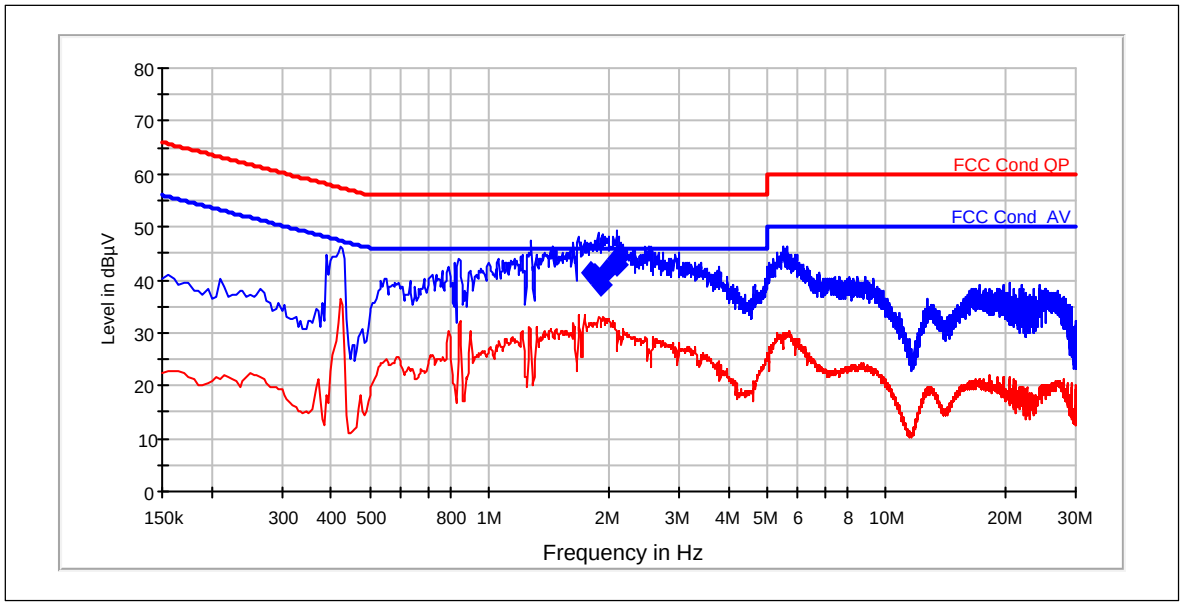
6.3. Bluetooth Test results

6.3.1 GFSK modulation, PRBS packet type



QuasiPeak

Frequency [MHz]	U [dBµV]	Line	Results
1.81	41.42	L1	PASSED
1.85	40.95	L1	PASSED
1.905	39.07	N	PASSED
1.975	41.87	L1	PASSED
2.085	42.8	L1	PASSED
2.1	44.12	L1	PASSED

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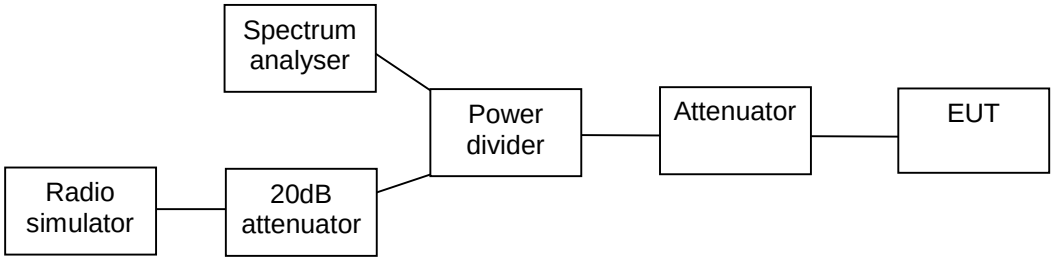
7. 20dB(bandwidth)

(FCC §15.247(a)(1), RSS-210 A8.1(a))

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 103.7
Date of measurements	20-Nov-2014
Measured by	Hannu Söderholm

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

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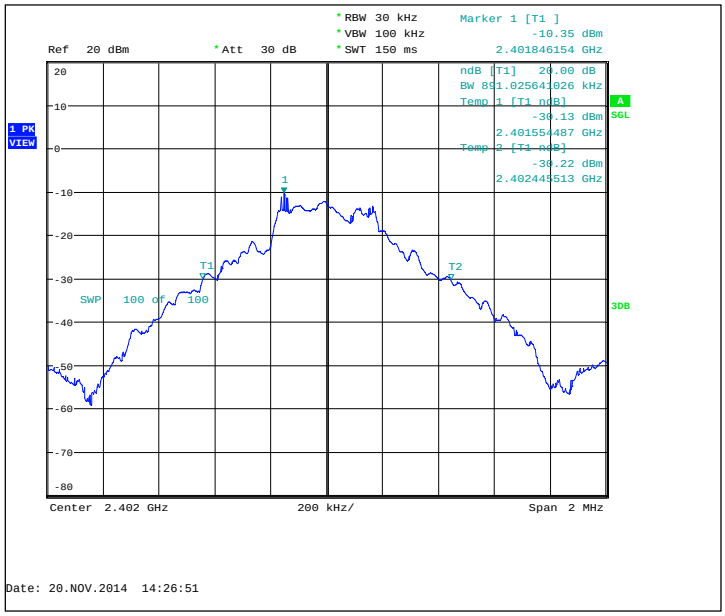
7.3. Bluetooth Test results

7.3.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]
0 / 2402	891
40 / 2442	942.3
78 / 2480	842.9

0 / 2402



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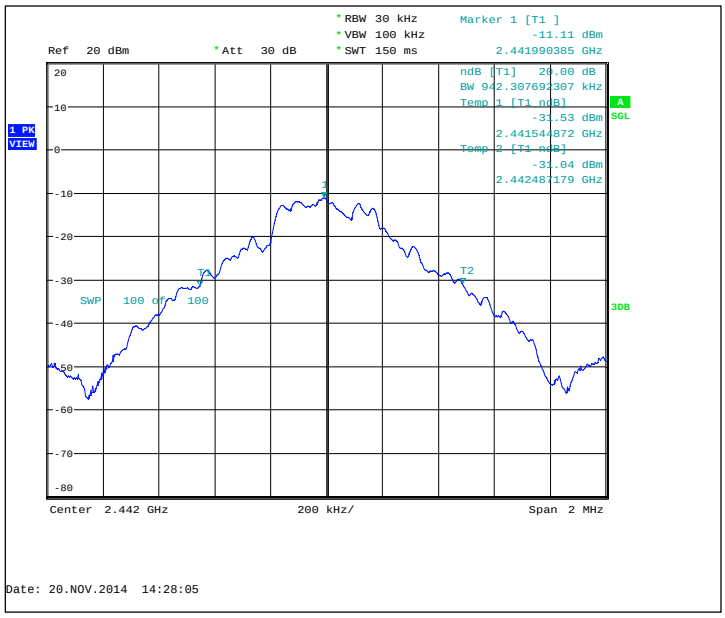
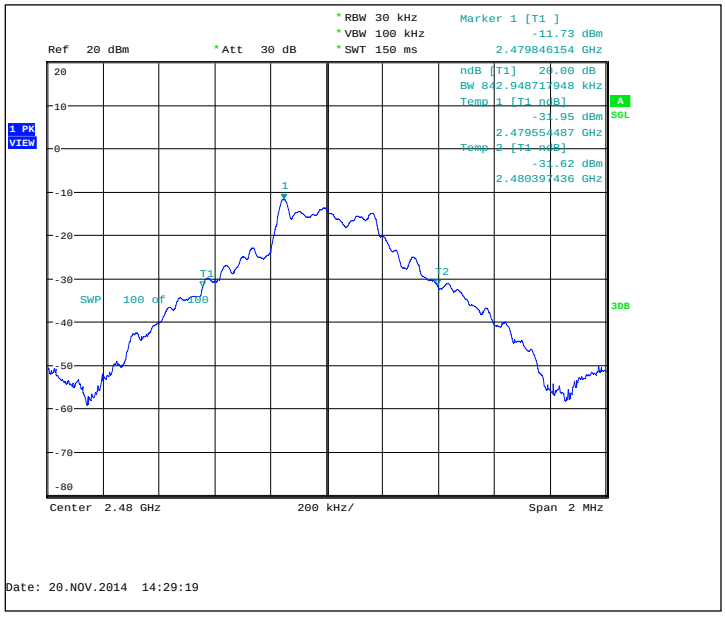
40 / 2442



78 / 2480



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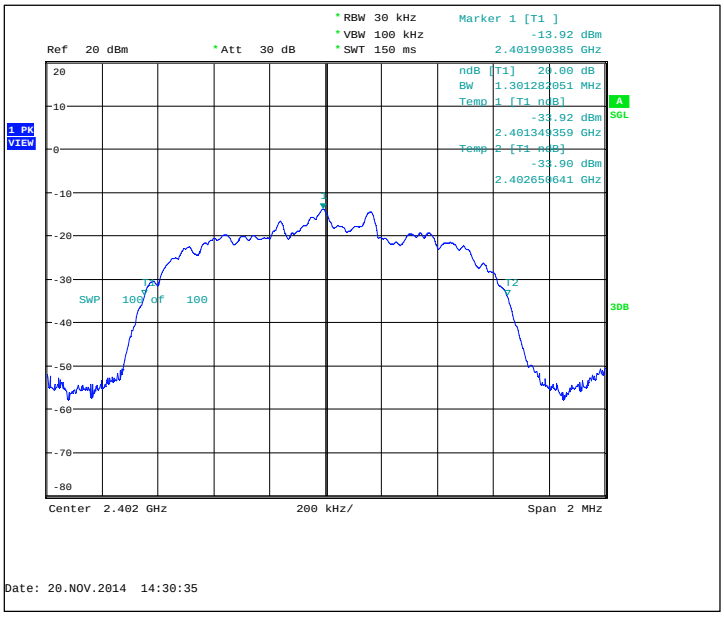
7.3.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]
0 / 2402	1301.3
40 / 2442	1307.7
78 / 2480	1304.5

0 / 2402



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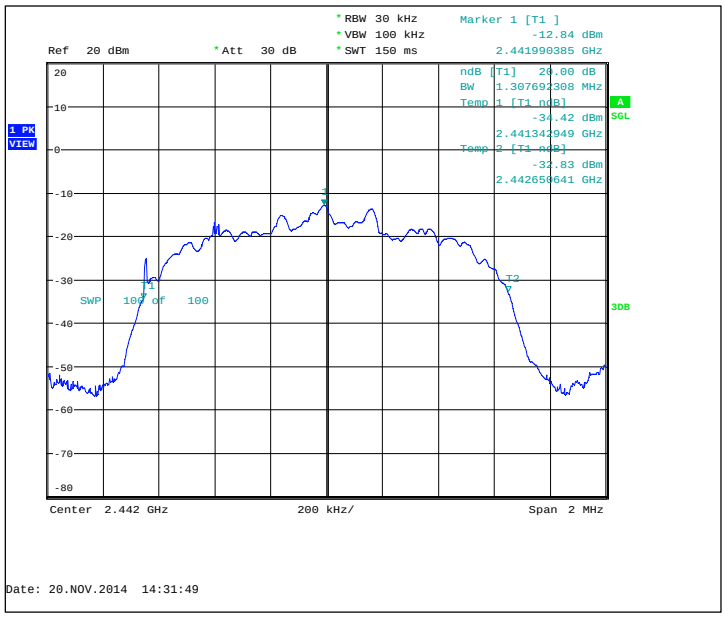
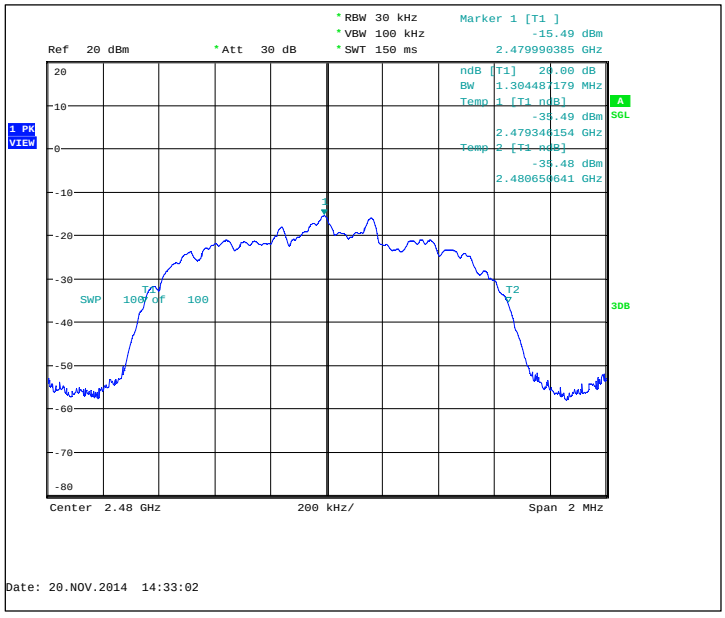
40 / 2442



78 / 2480



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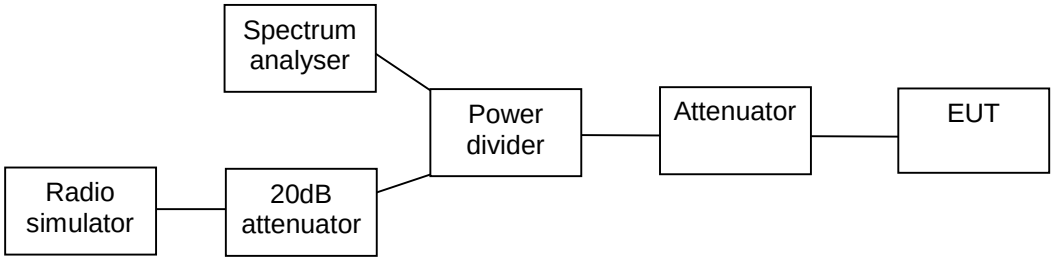
8. Carrier frequency separation
(FCC §15.247(a)(1), RSS-210 A8.1(b))

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 103.7
Date of measurements	20-Nov-2014
Measured by	Hannu Söderholm

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

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Visiokatu 3
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Tel. +358 71 800 8000
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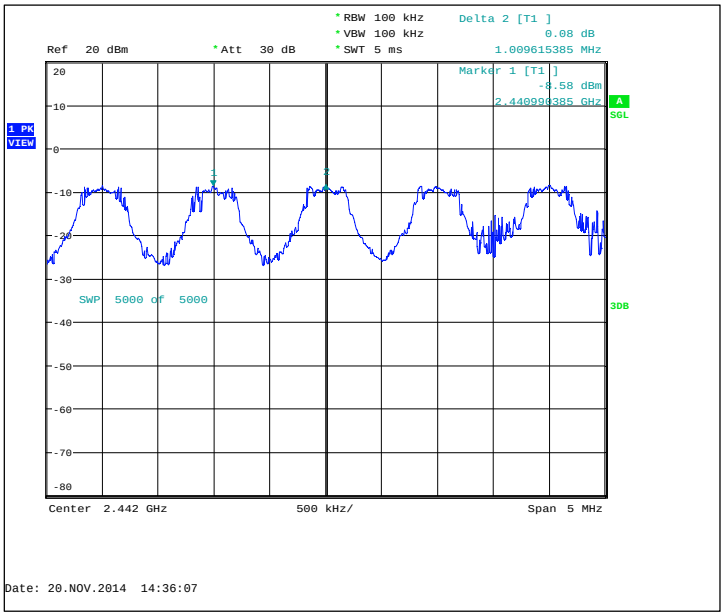
8.3. Bluetooth Test results

8.3.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1009.6	PASSED

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



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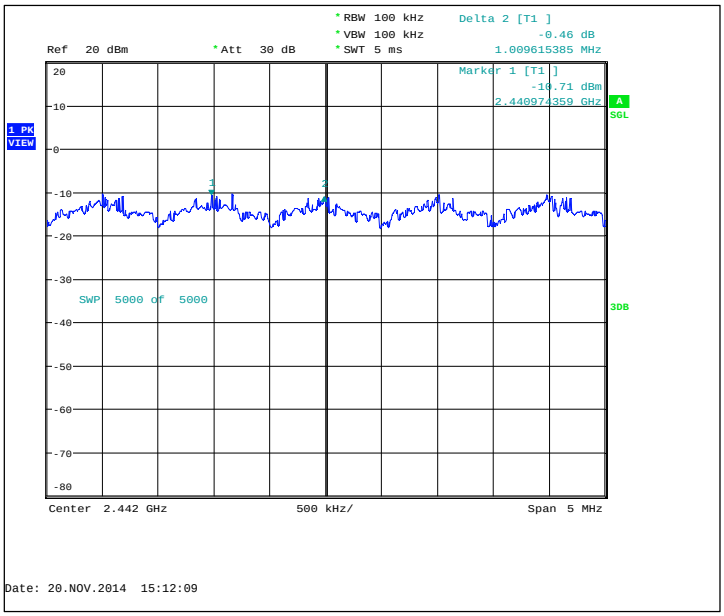
8.3.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1009.6	PASSED

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



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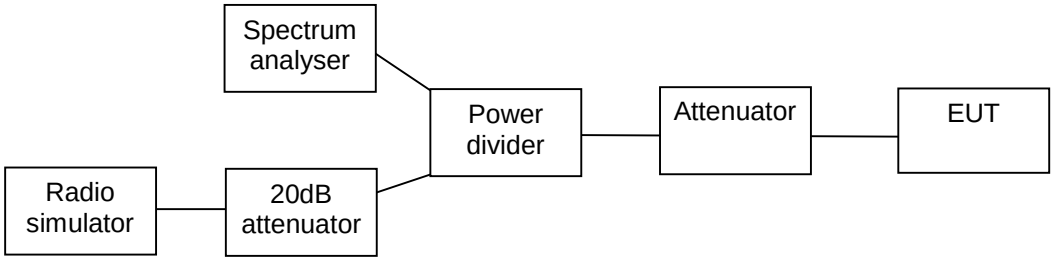
9. Number of hopping frequencies
(FCC §15.247(a)(1)(iii), RSS-210 A8.1(d))

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 103.7
Date of measurements	20-Nov-2014
Measured by	Hannu Söderholm

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

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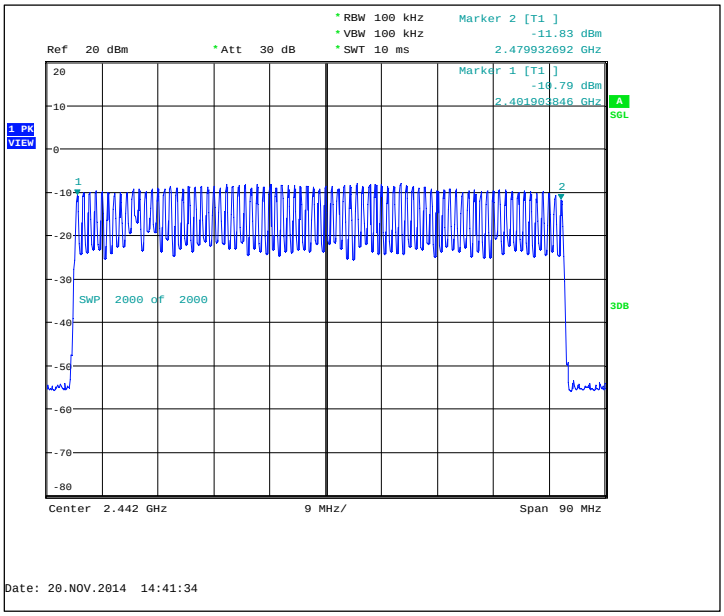
9.3. Bluetooth Test results

9.3.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
78	PASSED

Hopping on, number of hopping frequencies



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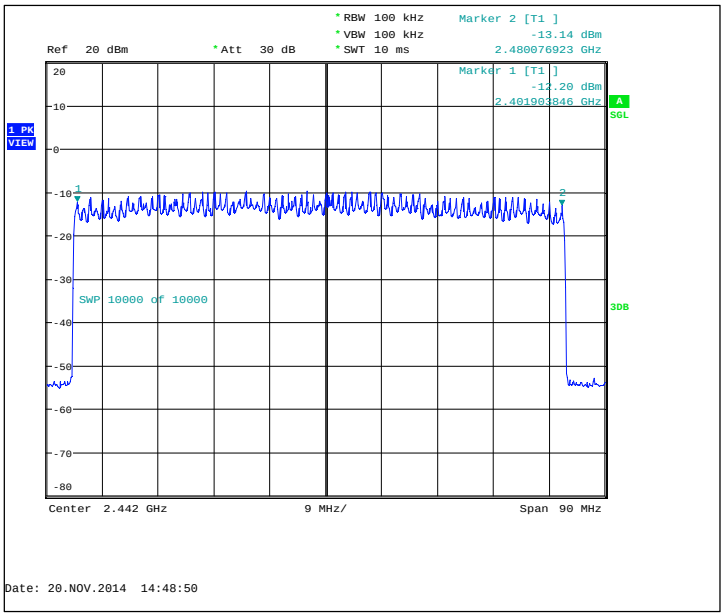
9.3.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
78	PASSED

Hopping on, number of hopping frequencies



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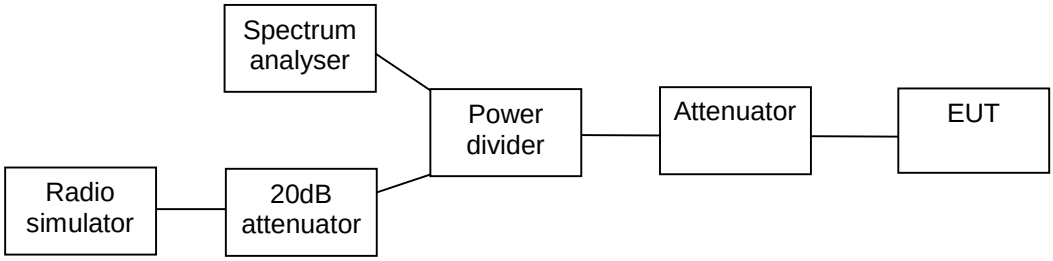
10. Time of occupancy
(FCC §15.247(a)(1)(iii), RSS-210 A8.1(d))

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 103.7
Date of measurements	20-Nov-2014
Measured by	Hannu Söderholm

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

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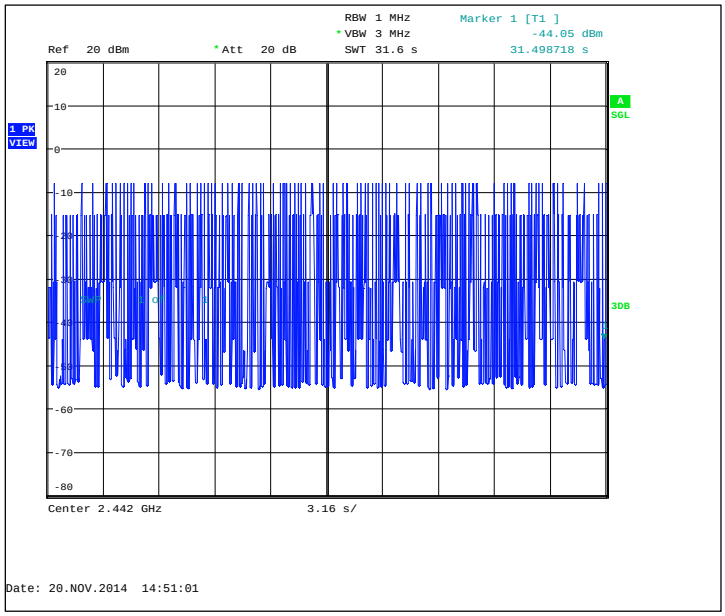
Fax. +358 71 804 6880

10.3. Bluetooth Test results

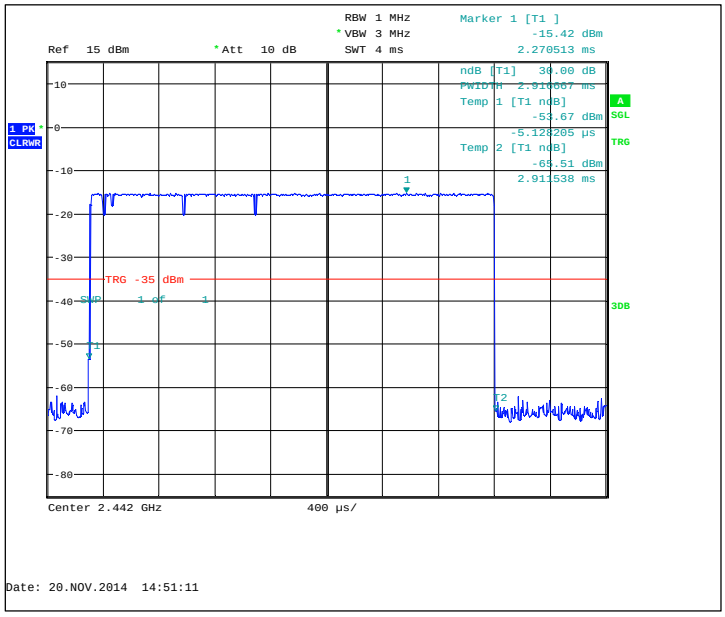
10.3.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [ms]	Time of occupancy [s]	Result
95	2.917	0.277	PASSED

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



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



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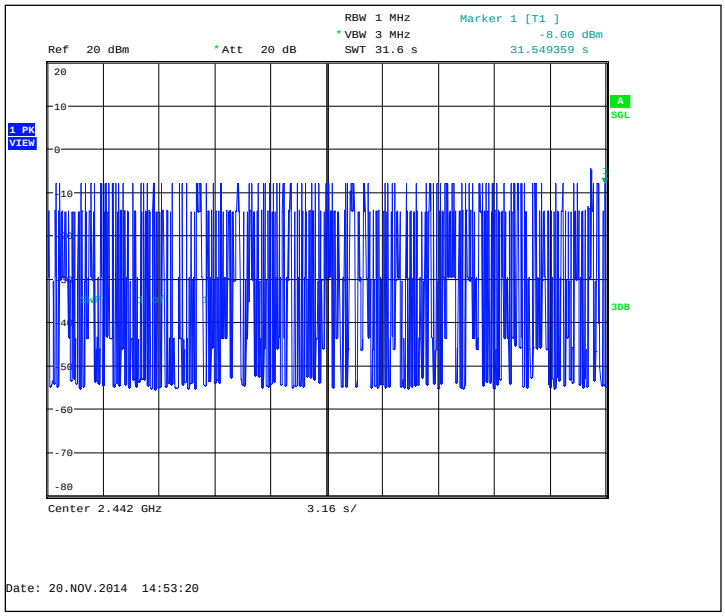
P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

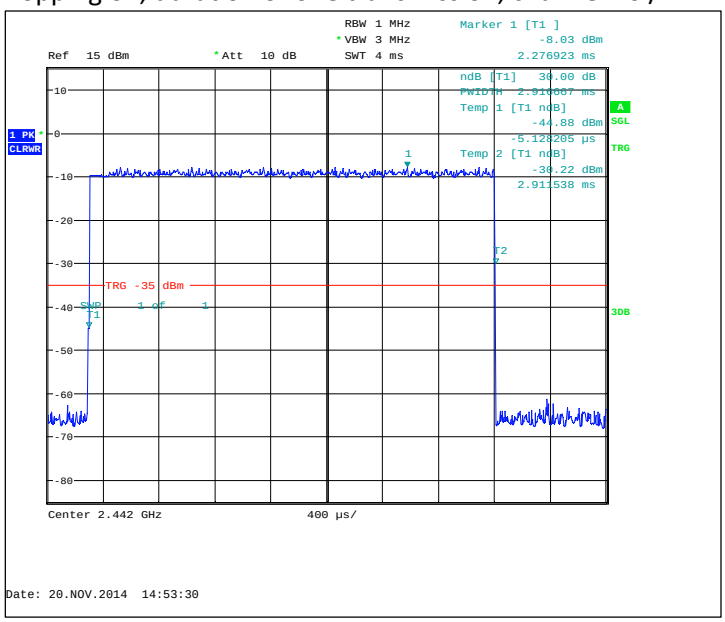
10.3.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [ms]	Time of occupancy [s]	Result
97	2.917	0.283	PASSED

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



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



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P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

11. Test Equipment

11.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15B
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C, 15E
TM23007	Oscilloscope	TDS684B	Tektronix	15E
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	22/24/27
2001	Bluetooth tester	CBT	R&S	15C, 15B
2009	LISN 50 µH	ENV216	R&S	15C, 15B
2010	LISN 50 µH	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
2021	Communication Tester	CMW500	R&S	22/24/27
2022	Communication Tester	CMU200	R&S	22/24/27
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
-	Bluetooth tester	CBT	R&S	15C, 15B

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P.O. Box 403
Visiokatu 3
FIN-33101 TAMPERE, FINLAND
Tel. +358 71 800 8000
Fax. +358 71 804 6880

11.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	OSP130	R&S	22/24/27, 15C, 15E, 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 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 µH	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
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 chamber	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15E, 15B
TM38066	High pass filter	WHKX3.0/18G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C,15E, 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
TM23892	Controller	G-1000SDX	Yaesu	22/24/27, 15C, 15E
2001	Bluetooth tester	CBT	R&S	15C, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
2021	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
2052	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B, 15E
-	Antenna	QSH18S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Bluetooth tester	CBT	R&S	15C, 15B

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Visiokatu 3
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