

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15C_RM-645_04.doc	Date of Report:	04-Feb-2010
Number of pages:	39	Customer's Contact person:	Markku Porttila
Testing laboratory:	TCC Nokia Tampere Laboratory P.O. Box 68 Sinitaival 5 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880	Customer:	Nokia Corporation Nokia House Summit Avenue, Southwood FARNBOROUGH HAMPSHIRE GU14 0NG UK Tel. +44 1252 866000 Fax. +44 1252 866001
FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-645 / Battery BL-5CT, AC charger AC-8E, Headset WH-102		
FCC ID:	QFXRM-645	IC:	661Z-RM645
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-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document.		
Date and signature for the contents:			

Jari Jantunen, System Manager, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	21-Jan-2010
Testing completed	dd-Feb-2010
The customer's contact person	Markku Porttila
Test Plan referred to	T:\Projects\RM-645\TestPlan_RS\RS_Testplan_RM-645.xls
Notes	-
Document name	FCC15C_RM-645_04.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band I/VIII) mobile phone with GPRS, EGPRS and Bluetooth. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-645	004401109654273	2903	-	031.012.2	42158
Phone	RM-645	004401109654331	2903	-	031.012.2	42159
Battery	BL-5CT	3635639385050104361;0670555	-	-	-	42160
AC charger	AC-8E	4868679374320623693;0675387	-	-	-	42162
Headset	WH-102	06943239375c4101466	-	-	-	42163

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)	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	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(1)	A8.1 (a)	20 dB 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

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 Tampere Laboratory.

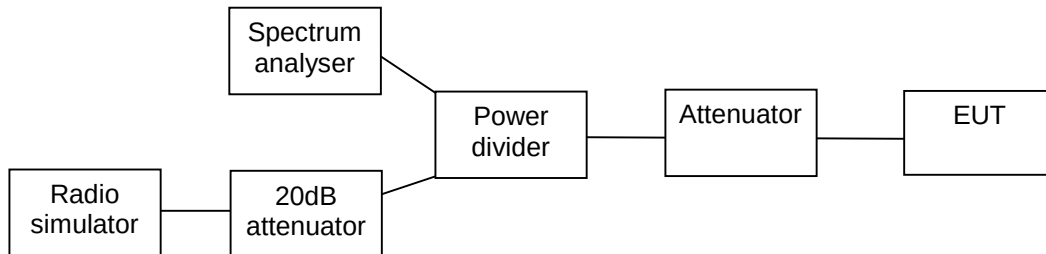
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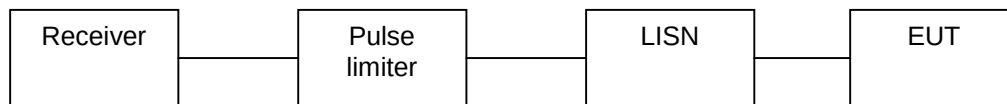
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2. Test setups

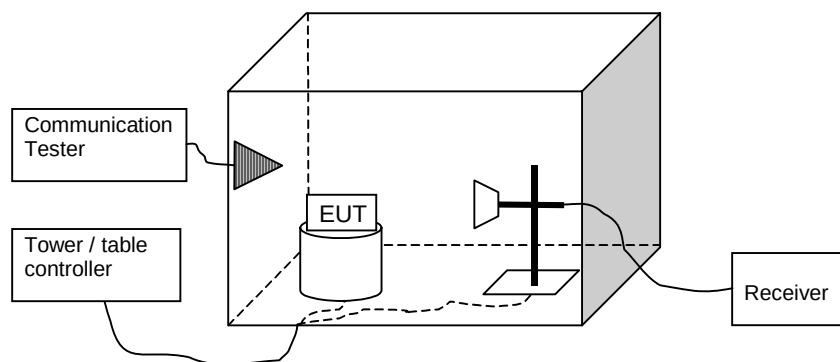
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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

EUT with DUT number	RM-645 DUT 42159
Accessories with DUT numbers	BL-5CT DUT 42160
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 45 97.3
Date of measurements	29-Jan-2010
Measured by	Jari Jantunen

3.1. 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

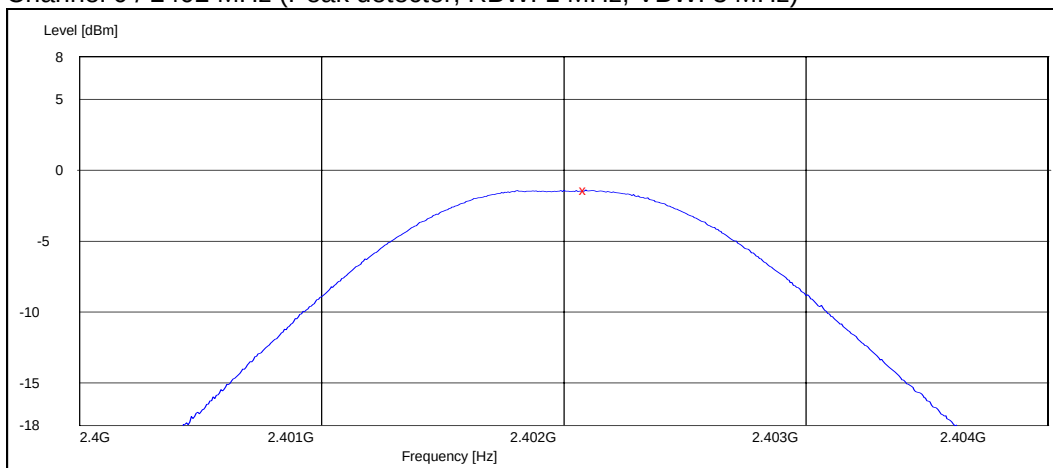
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

3.2. Bluetooth Test results

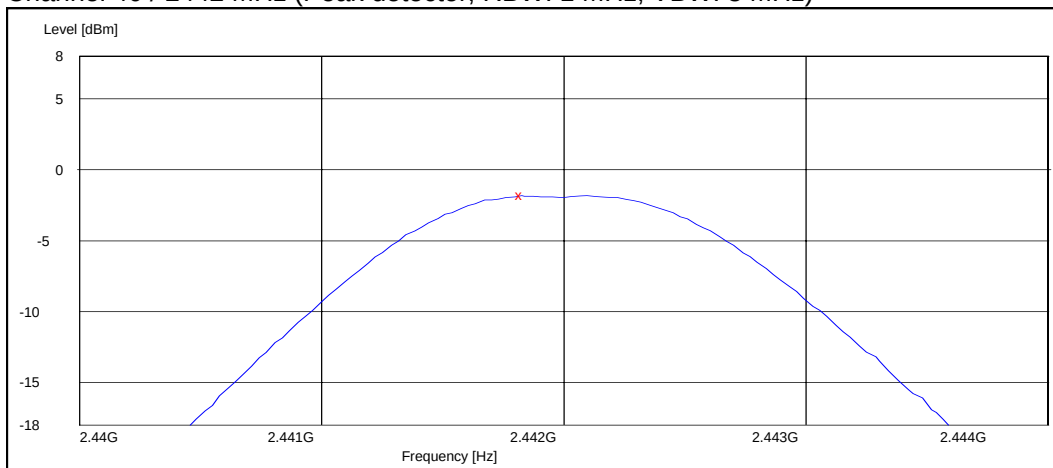
3.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.40	0.724	PASSED
40 / 2442	-1.80	0.661	PASSED
78 / 2480	-2.40	0.575	PASSED

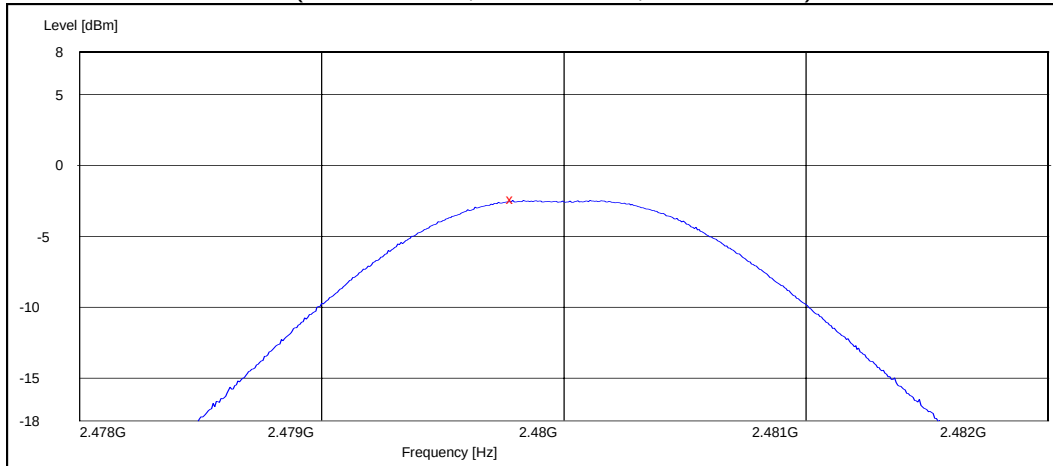
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



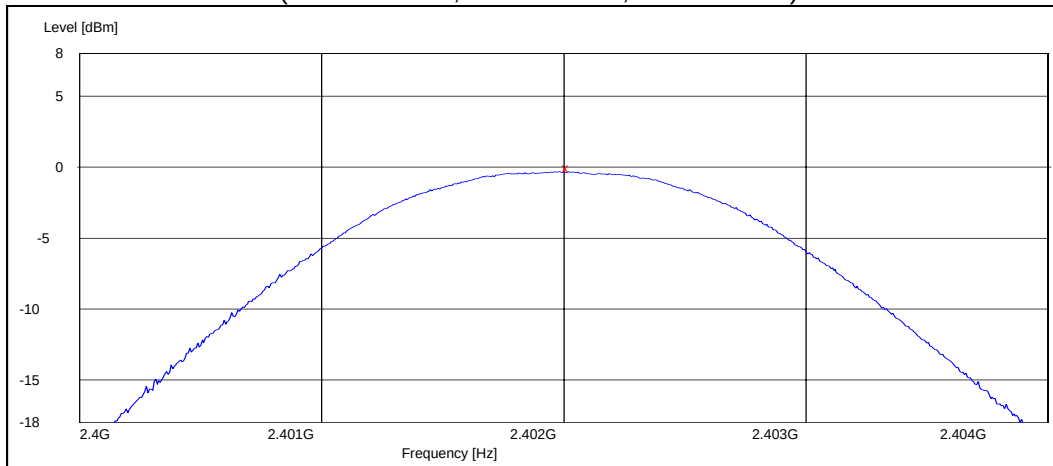
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



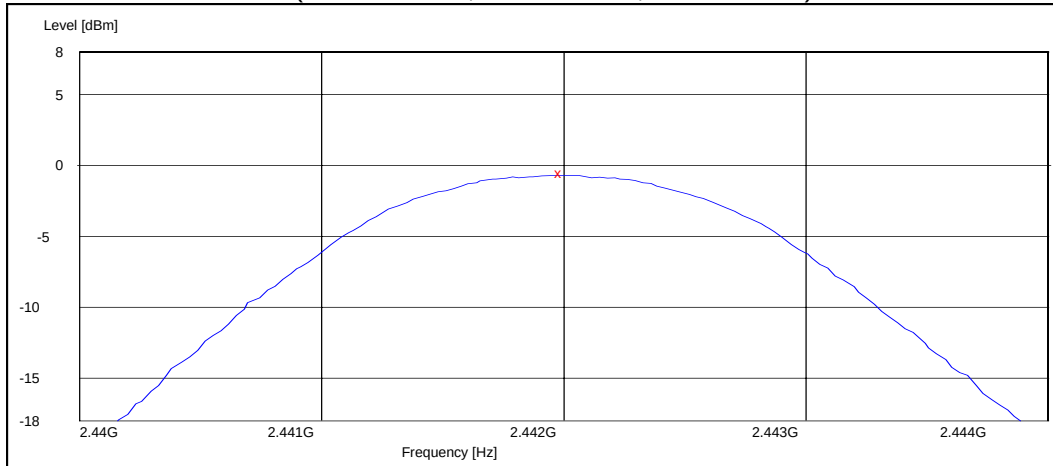
3.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-0.10	0.977	PASSED
40 / 2442	-0.50	0.891	PASSED
78 / 2480	-0.90	0.813	PASSED

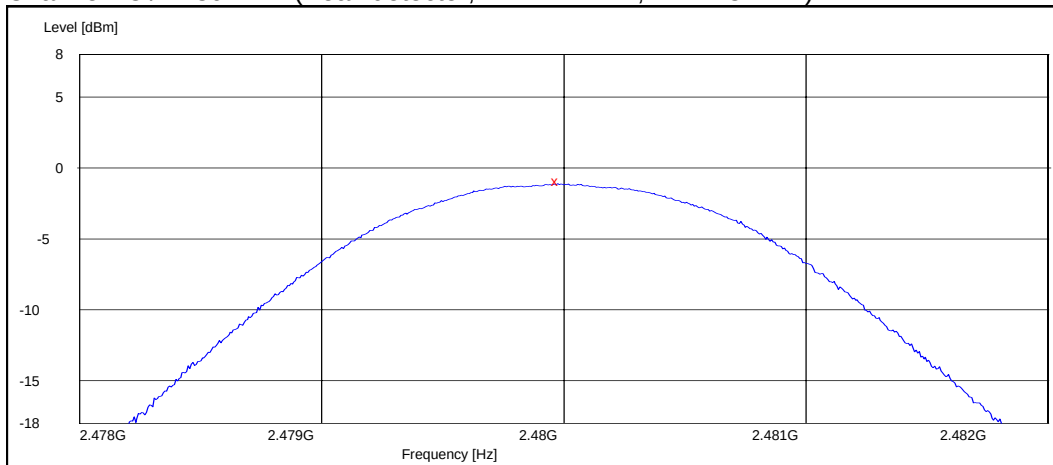
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



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

EUT with DUT number	RM-645 DUT 42158
Accessories with DUT numbers	BL-5CT DUT 42160, AC-8E DUT 42162, WH-102 DUT 42163
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 104.5
Date of measurements	22-Jan-2010
Measured by	Hannu Söderholm

4.1. Test method and limit

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

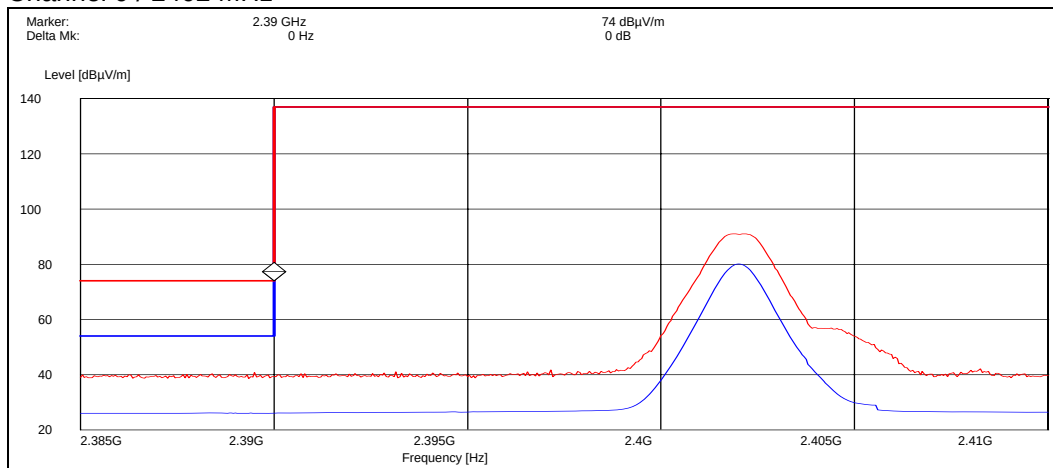
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

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

4.2. Bluetooth Test results

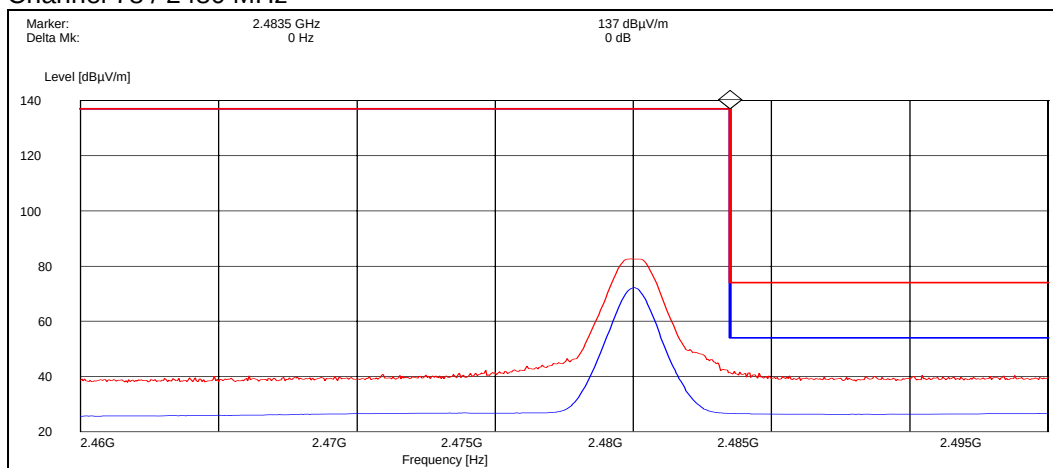
4.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



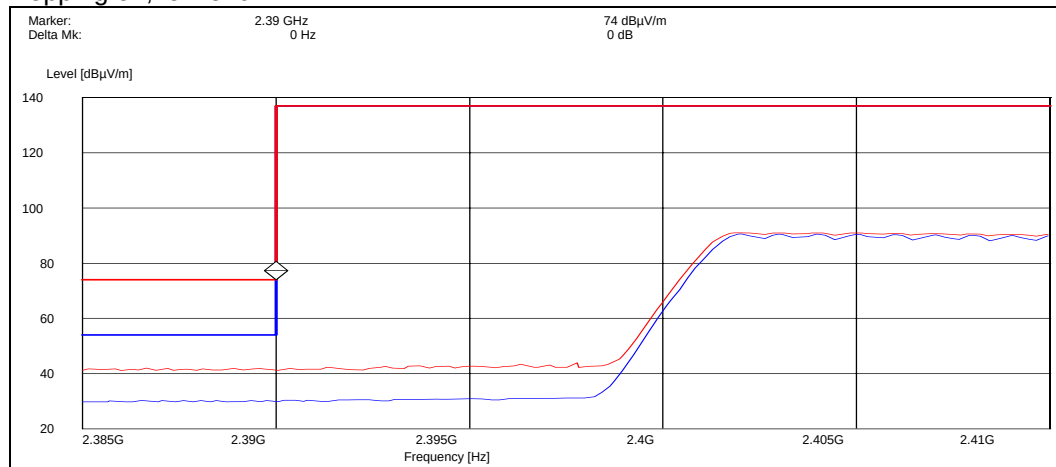
Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	40.80	PASSED
Average	26.10	PASSED

Channel 78 / 2480 MHz



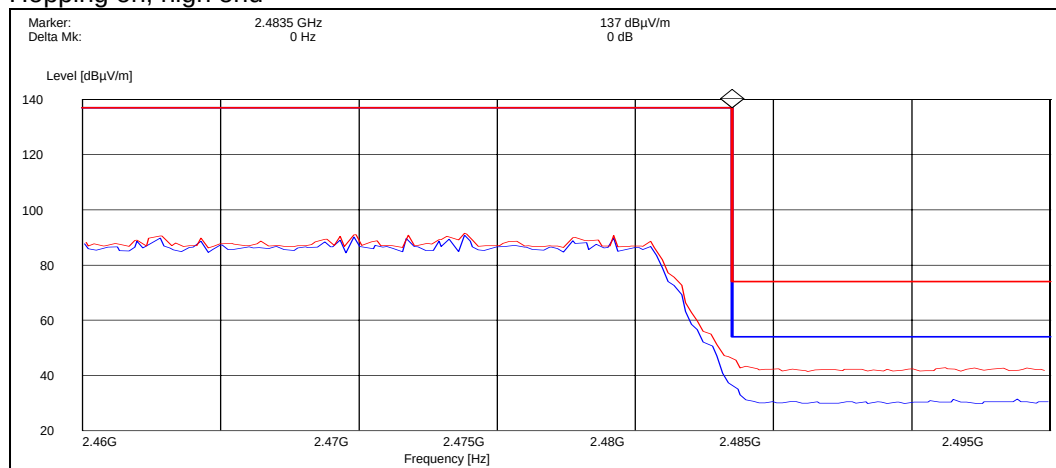
Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	41.90	PASSED
Average	26.70	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	42.00	PASSED
Average	30.30	PASSED

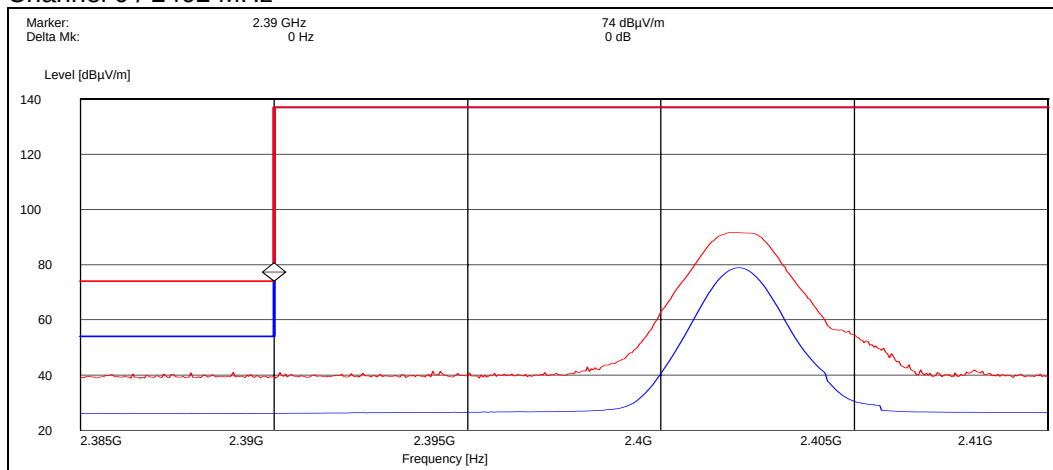
Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	45.60	PASSED
Average	37.30	PASSED

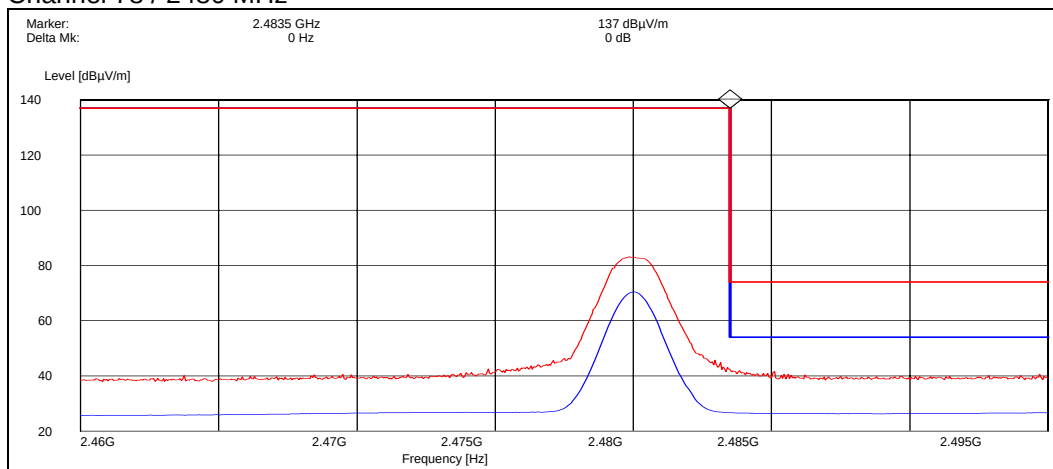
4.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



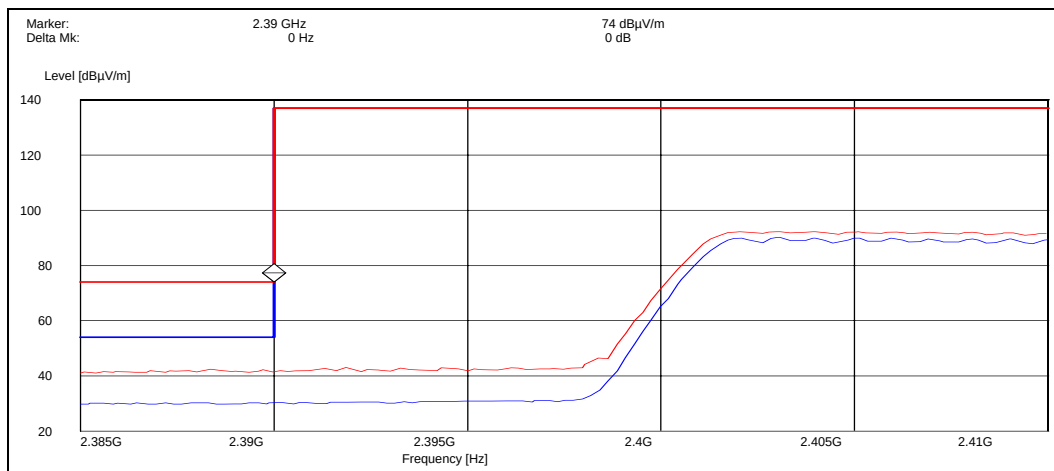
Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	41.00	PASSED
Average	26.10	PASSED

Channel 78 / 2480 MHz



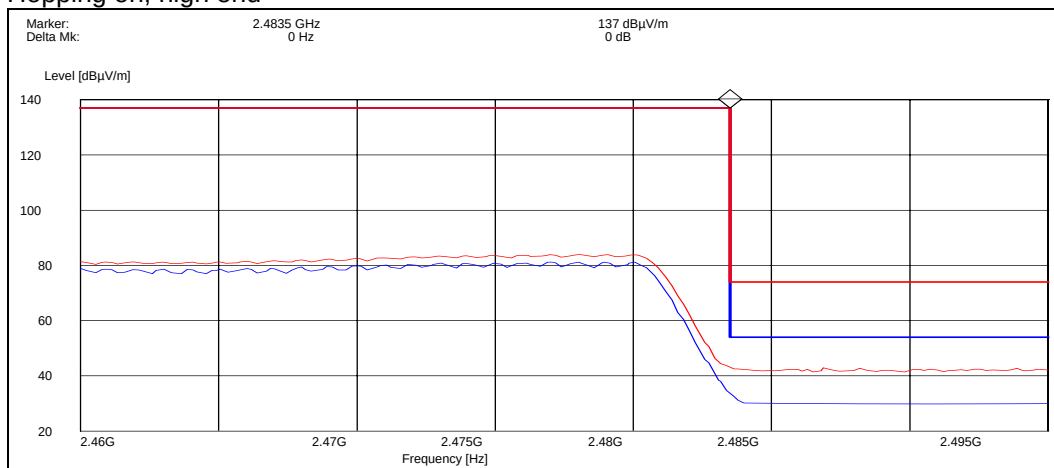
Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	42.30	PASSED
Average	26.70	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	42.40	PASSED
Average	30.30	PASSED

Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	42.90	PASSED
Average	32.60	PASSED

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

EUT with DUT number	RM-645 DUT 42159
Accessories with DUT numbers	BL-5CT DUT 42160
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 45 97.3
Date of measurements	29-Jan-2010
Measured by	Jari Jantunen

5.1. Test method and limit

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

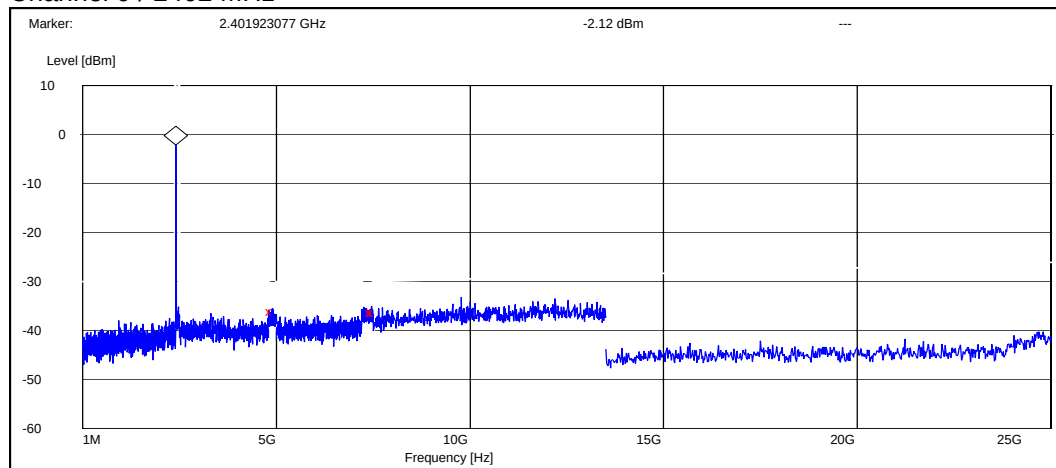
Limits for spurious RF conducted emissions measurements

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

5.2. Bluetooth Test results

5.2.1 GFSK modulation, PRBS packet type

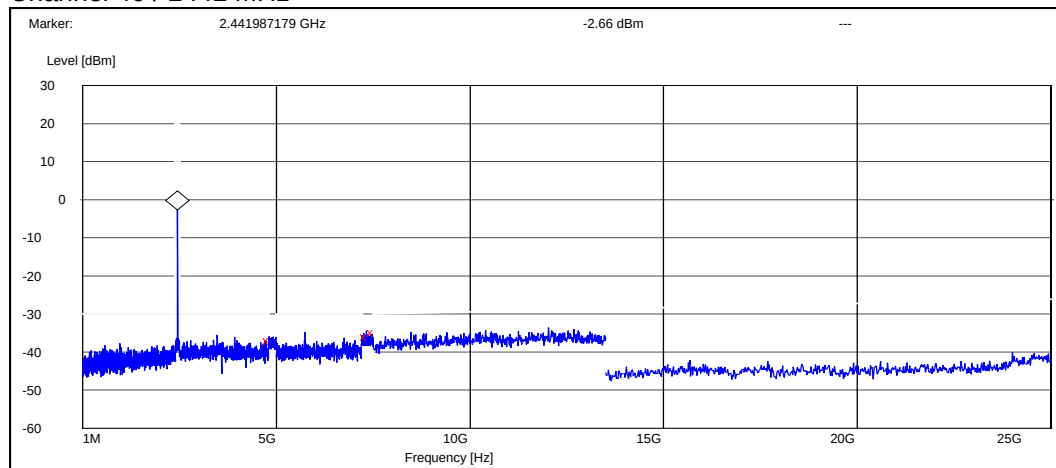
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4897.435897	-33.882793	PASSED
7457.211538	-34.182793	PASSED
7500.000000	-34.282793	PASSED

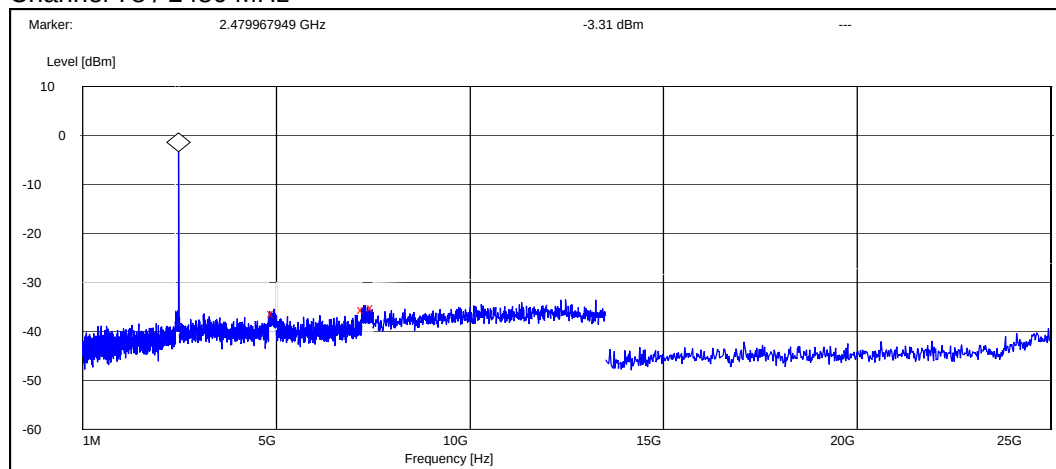
Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4816.025641	-34.444927	PASSED
7321.153846	-33.244927	PASSED
7500.000000	-32.044927	PASSED

Channel 78 / 2480 MHz

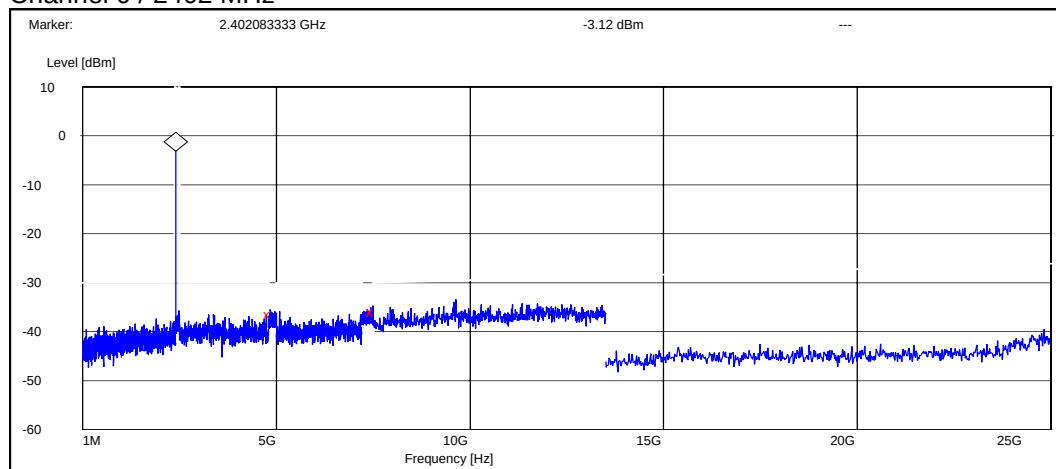


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4937.500000	-33.087447	PASSED
7258.653846	-32.287447	PASSED
7500.000000	-31.787447	PASSED

5.2.2 8DPSK modulation, PRBS packet type

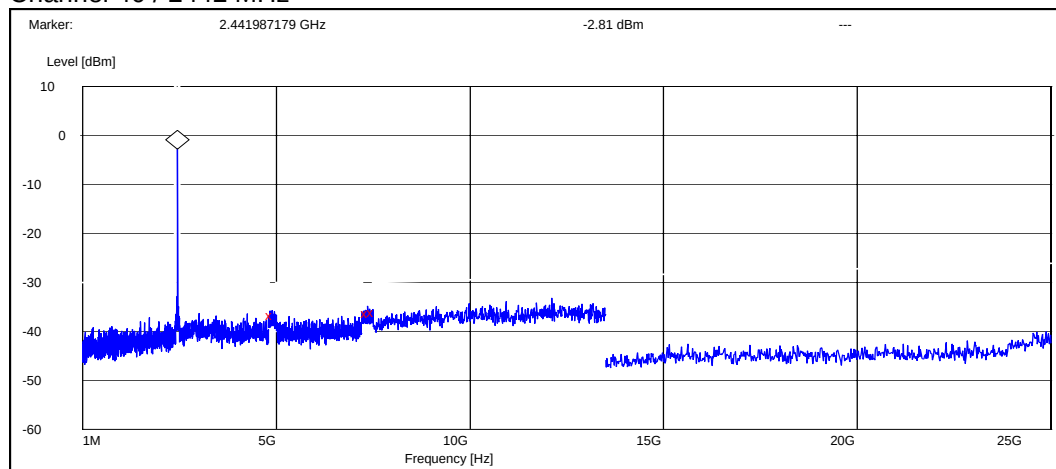
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4841.025641	-33.280732	PASSED
7489.903846	-32.680732	PASSED
7500.000000	-32.880732	PASSED

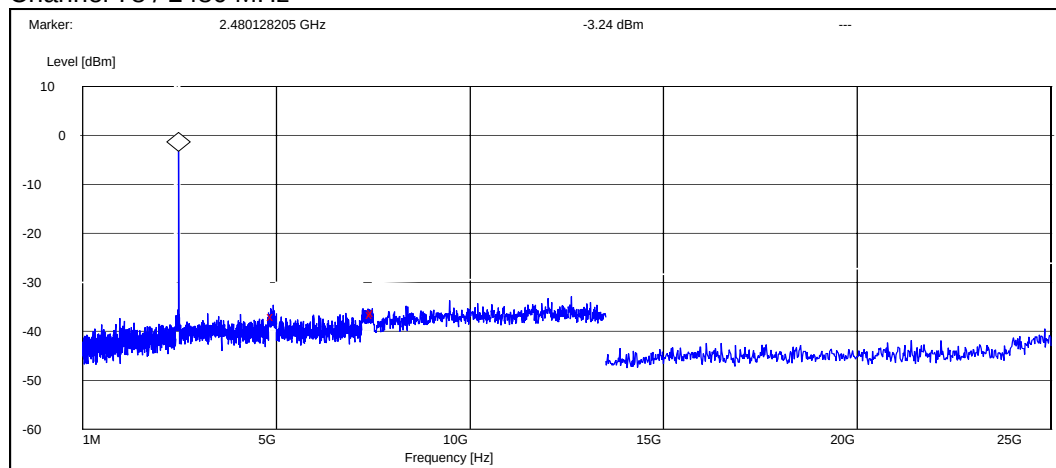
Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4893.269231	-33.889661	PASSED
7355.288462	-33.489661	PASSED
7500.000000	-33.289661	PASSED

Channel 78 / 2480 MHz



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

Frequency [MHz]	P [dBc]	Result
4922.756410	-33.662697	PASSED
7481.730769	-33.262697	PASSED
7500.000000	-32.962697	PASSED

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

EUT with DUT number	RM-645 DUT 42158
Accessories with DUT numbers	BL-5CT DUT 42160, AC-8E DUT 42162, WH-102 DUT 42163
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 104.5
Date of measurements	22-Jan-2010
Measured by	Hannu Söderholm

6.1. 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:

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

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

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

6.2. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	43.70	153.11	44.70	-1.0	VERTICAL	PASSED
7206.000000	43.10	142.89	40.70	2.4	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	31.20	36.31	32.20	-1.0	VERTICAL	PASSED
7206.000000	29.80	30.90	27.40	2.4	HORIZONTAL	PASSED

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
38.235872	13.90	4.95	28.10	-14.2	VERTICAL	PASSED
74.127054	14.50	5.31	38.10	-23.6	VERTICAL	PASSED
75.069940	13.10	4.52	36.60	-23.5	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
4883.769539	43.70	153.11	44.90	-1.2	VERTICAL	PASSED
4884.267535	43.90	156.68	45.10	-1.2	VERTICAL	PASSED
7311.621242	43.00	141.25	40.00	3.0	VERTICAL	PASSED
7312.631263	43.00	141.25	40.00	3.0	VERTICAL	PASSED
17445.883768	52.40	416.87	33.70	18.7	HORIZONTAL	PASSED
17782.571142	55.00	562.34	34.10	20.9	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4883.767535	30.20	32.36	31.40	-1.2	VERTICAL	PASSED
4884.269539	29.70	30.55	30.90	-1.2	VERTICAL	PASSED
7314.121242	30.40	33.11	27.40	3.0	VERTICAL	PASSED
7316.631263	30.40	33.11	27.30	3.1	VERTICAL	PASSED
17444.883768	39.00	89.13	20.30	18.7	HORIZONTAL	PASSED
17784.071142	42.10	127.35	21.20	20.9	VERTICAL	PASSED

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	43.50	149.62	44.00	-0.5	VERTICAL	PASSED
7440.000000	43.00	141.25	39.80	3.2	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	30.50	33.50	31.00	-0.5	VERTICAL	PASSED
7440.000000	29.60	30.20	26.40	3.2	HORIZONTAL	PASSED

6.2.2 8DPSK modulation, PRBS packet type

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	44.30	164.06	45.30	-1.0	VERTICAL	PASSED
7206.000000	42.60	134.90	40.20	2.4	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	33.90	49.55	34.90	-1.0	VERTICAL	PASSED
7206.000000	29.80	30.90	27.40	2.4	HORIZONTAL	PASSED

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
38.135872	22.00	12.59	36.20	-14.2	VERTICAL	PASSED
73.746092	15.30	5.82	38.90	-23.6	VERTICAL	PASSED
74.869940	13.60	4.79	37.10	-23.5	HORIZONTAL	PASSED
108.496794	6.70	2.16	28.70	-22.0	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
4883.767535	44.10	160.32	45.30	-1.2	VERTICAL	PASSED
4883.769539	44.00	158.49	45.20	-1.2	VERTICAL	PASSED
7290.075150	42.80	138.04	40.00	2.8	HORIZONTAL	PASSED
7313.631263	43.80	154.88	40.80	3.0	VERTICAL	PASSED
7371.245491	43.60	151.36	40.50	3.1	VERTICAL	PASSED
17474.945892	52.40	416.87	33.80	18.6	VERTICAL	PASSED
17888.273547	55.60	602.56	34.90	20.7	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4883.767535	32.60	42.66	33.80	-1.2	VERTICAL	PASSED
4883.769539	32.40	41.69	33.60	-1.2	VERTICAL	PASSED
7288.075150	30.00	31.62	27.20	2.8	HORIZONTAL	PASSED
7318.131263	30.20	32.36	27.10	3.1	VERTICAL	PASSED
7374.745491	30.20	32.36	27.10	3.1	VERTICAL	PASSED
17470.945892	39.40	93.33	20.80	18.6	VERTICAL	PASSED
17883.773547	41.70	121.62	21.00	20.7	VERTICAL	PASSED

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	44.60	169.82	45.10	-0.5	VERTICAL	PASSED
7440.000000	42.10	127.35	38.90	3.2	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	33.00	44.67	33.50	-0.5	VERTICAL	PASSED
7440.000000	29.40	29.51	26.20	3.2	VERTICAL	PASSED

7. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-645 DUT 42158
Accessories with DUT numbers	BL-5CT DUT 42160, AC-8E DUT 42162, WH-102 DUT 42163
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 47 / 102.4
Date of measurements	04-Feb-2010
Measured by	Jari Jantunen

7.1. 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:

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

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

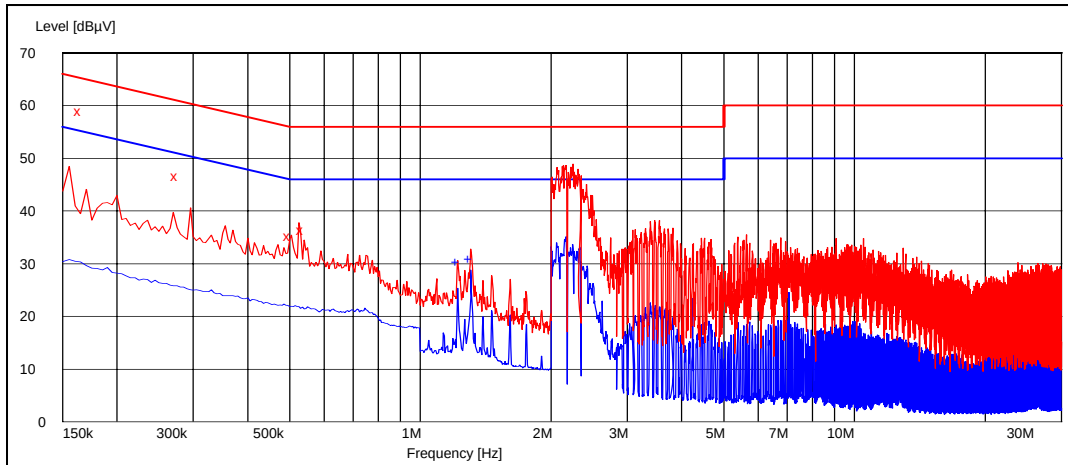
CISPR 22 Class B limits

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

7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.165000	58.90	N	PASSED
0.275000	46.60	N	PASSED
0.500000	35.20	N	PASSED
0.535000	36.40	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.220000	30.30	L1	PASSED
1.305000	31.00	L1	PASSED

8. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (a))

EUT with DUT number	RM-645 DUT 42159
Accessories with DUT numbers	BL-5CT DUT 42160
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 45 97.3
Date of measurements	29-Jan-2010
Measured by	Jari Jantunen

8.1. 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

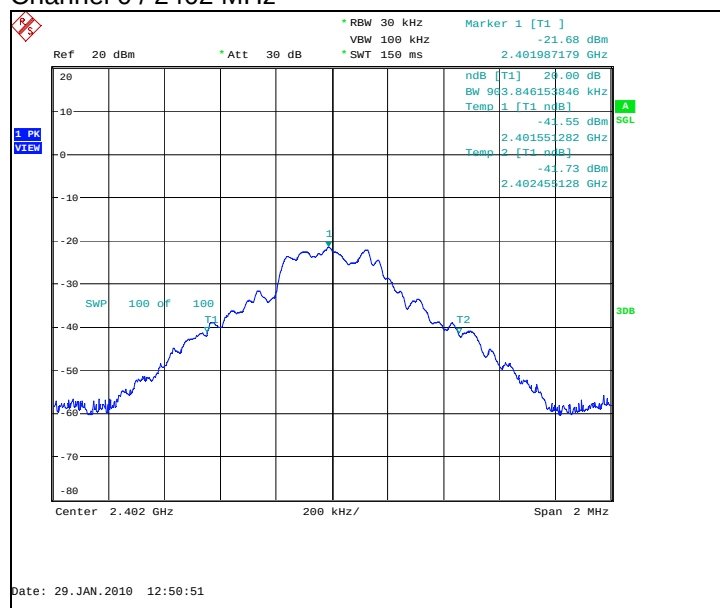
Limit [MHz]
N/A

8.2. Bluetooth Test results

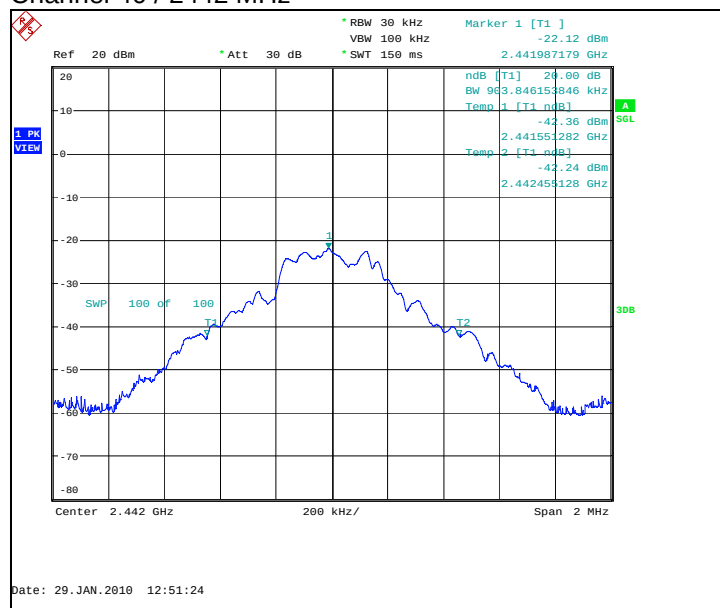
8.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	903.846	PASSED
40 / 2442	903.846	PASSED
78 / 2480	907.051	PASSED

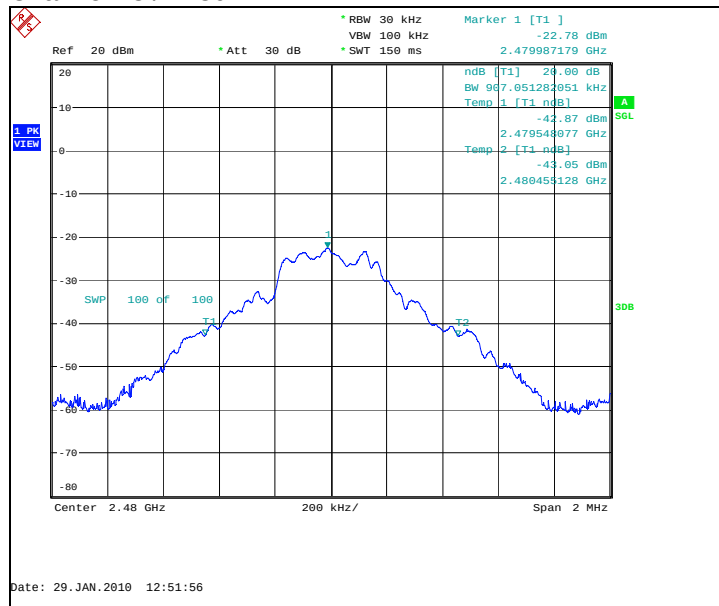
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



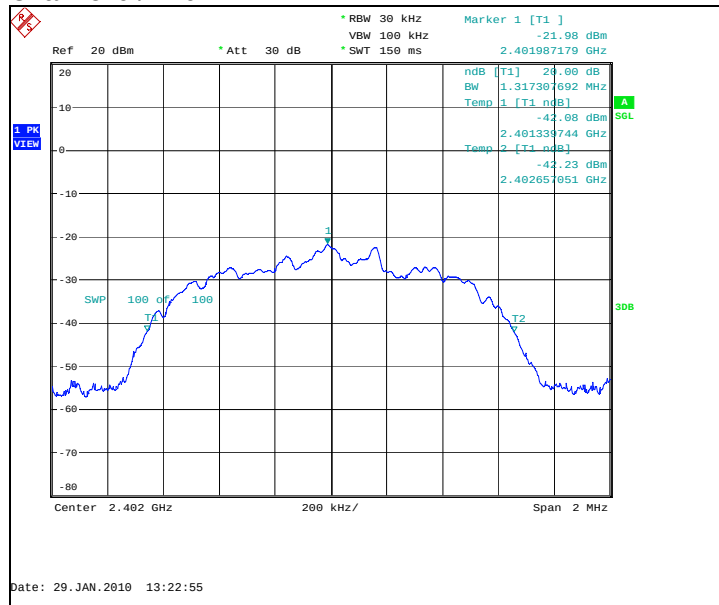
Channel 78 / 2480 MHz



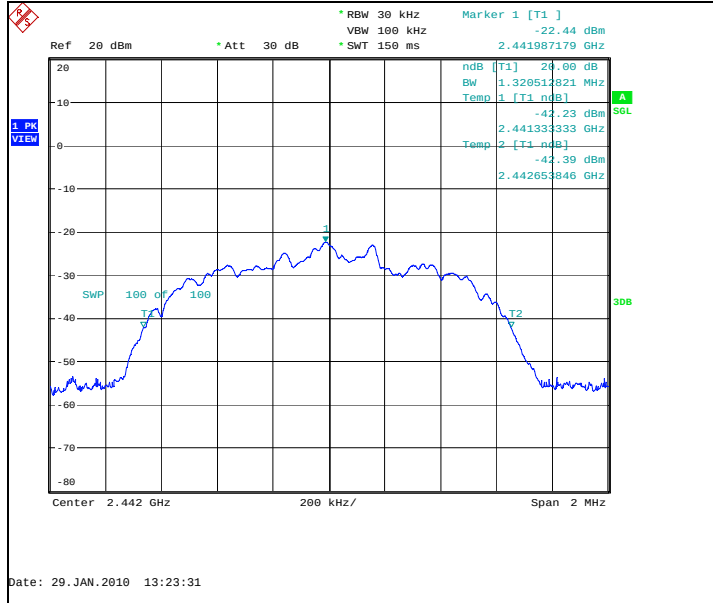
8.2.2 8DPSK modulation, PRBS packet type

Channel / f _c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1317.308	PASSED
40 / 2442	1320.513	PASSED
78 / 2480	1314.103	PASSED

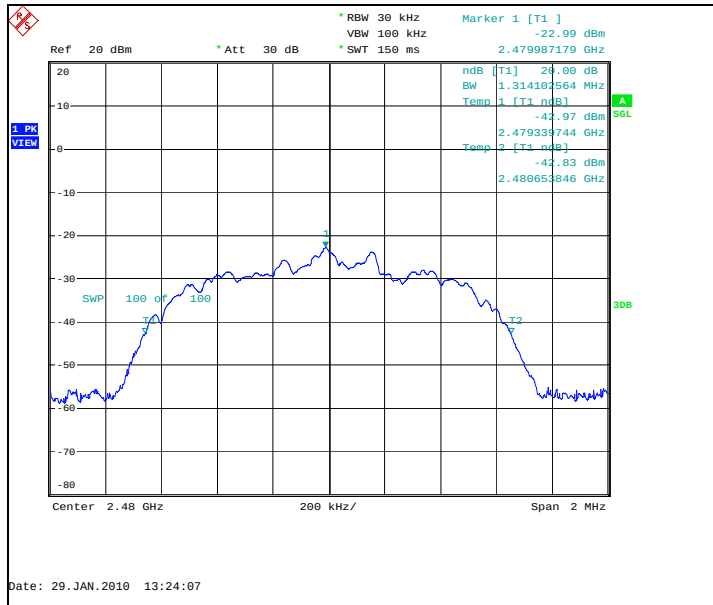
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



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

EUT with DUT number	RM-645 DUT 42159
Accessories with DUT numbers	BL-5CT DUT 42160
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 45 / 97.3
Date of measurements	29-Jan-2010
Measured by	Jari Jantunen

9.1. 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

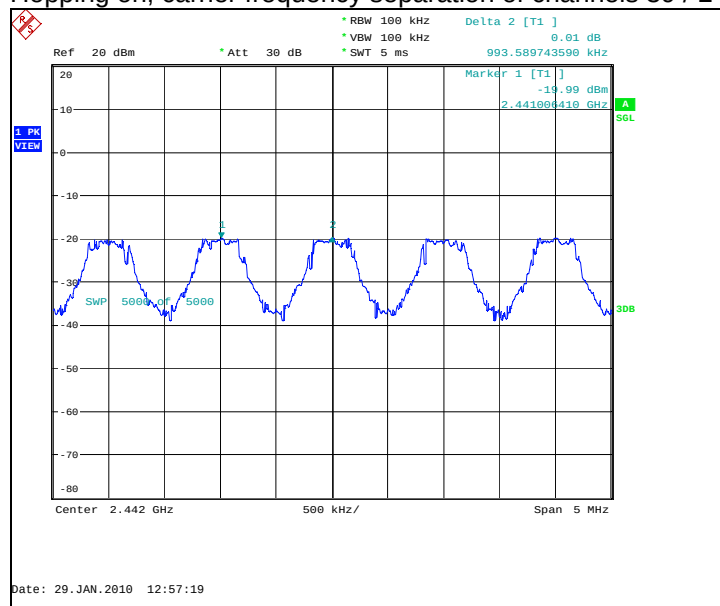
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
993.59	PASSED

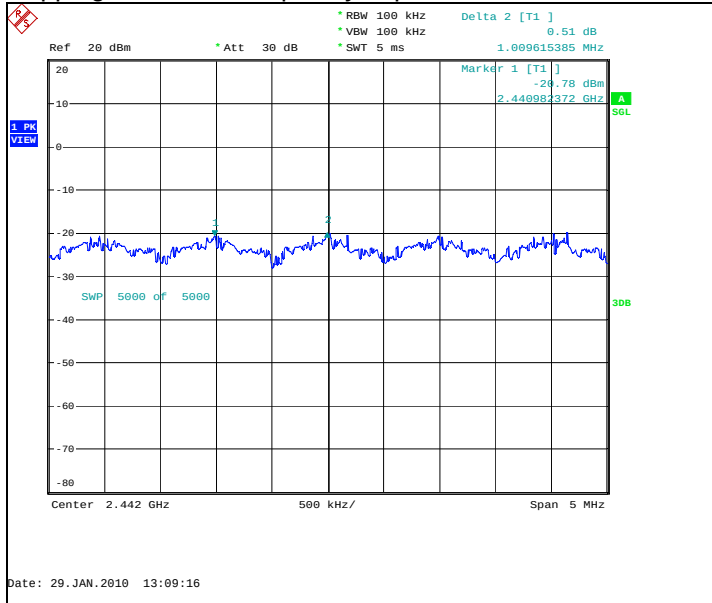
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



9.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1009.615	PASSED

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



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

EUT with DUT number	RM-645 DUT 42159
Accessories with DUT numbers	BL-5CT DUT 42160
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 45 / 97.3
Date of measurements	29-Jan-2010
Measured by	Jari Jantunen

10.1. 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

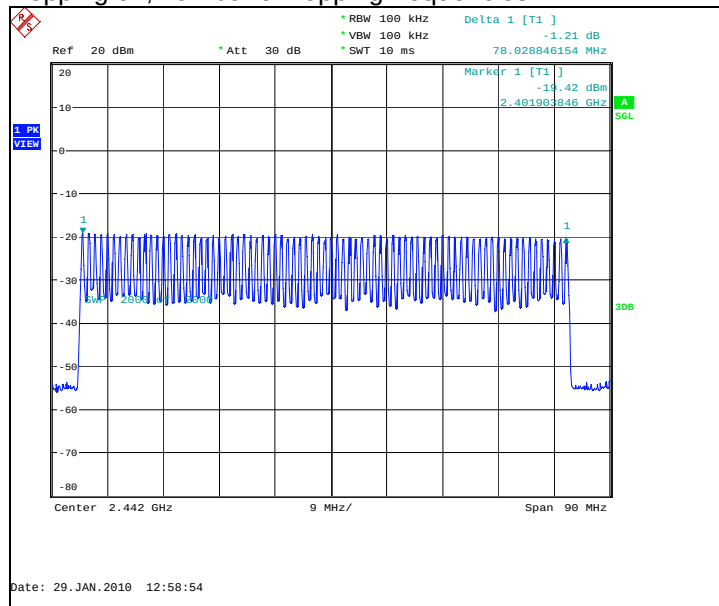
Limit [number]
≥ 15

10.2. Bluetooth Test results

10.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

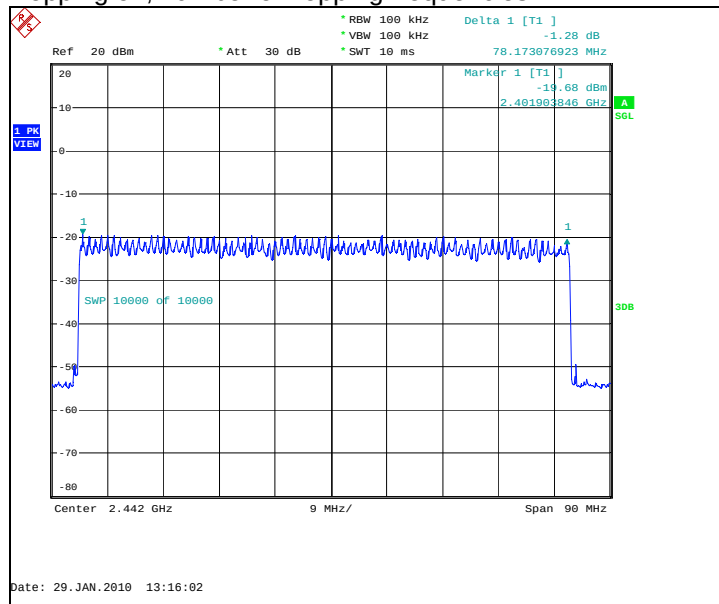
Hopping on, number of hopping frequencies



10.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
25	PASSED

Hopping on, number of hopping frequencies



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

EUT with DUT number	RM-645 DUT 42159
Accessories with DUT numbers	BL-5CT DUT 42160
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 45 / 97.3
Date of measurements	29-Jan-2010
Measured by	Jari Jantunen

11.1. Test method and limit

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

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

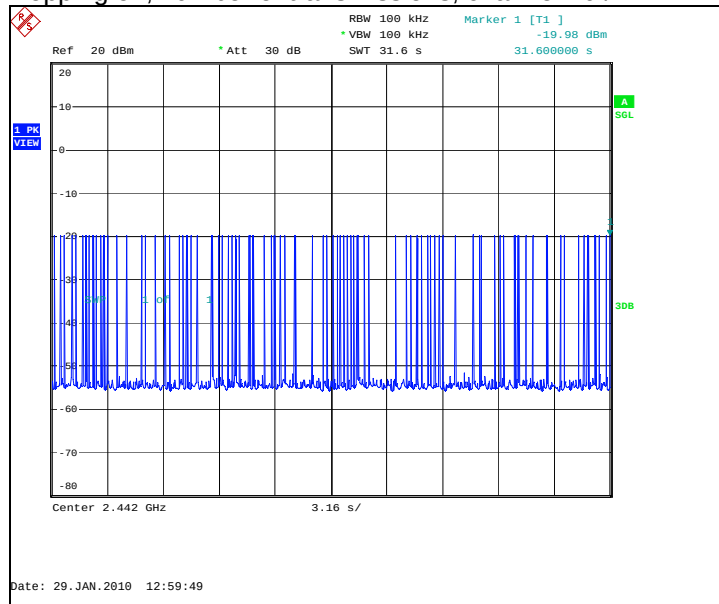
Limit [s]
≤ 0.4

11.2. Bluetooth test results

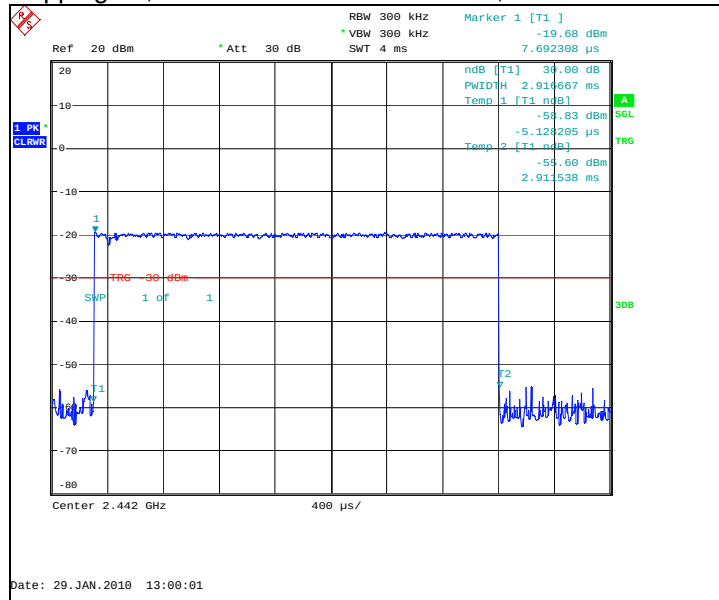
11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μs]	Time of occupancy [s]	Result
85	2 917	0.247917	PASSED

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



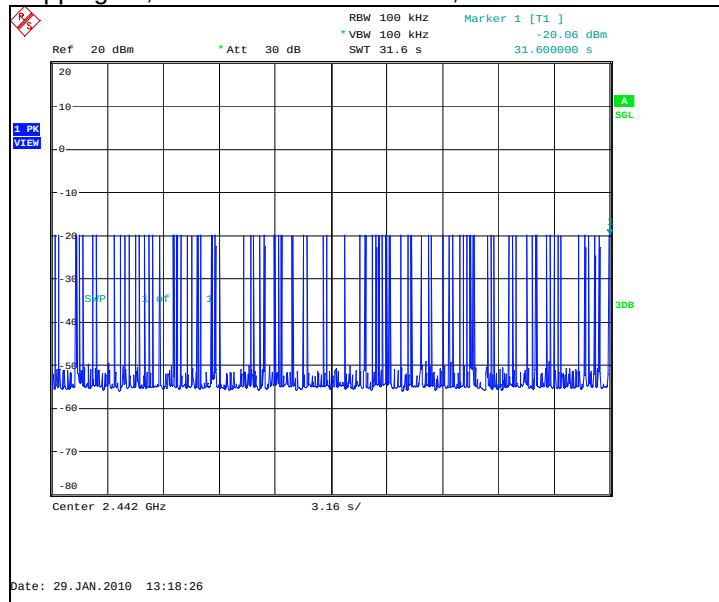
Hopping on, duration of one transmission, channel 40 / 2442 MHz



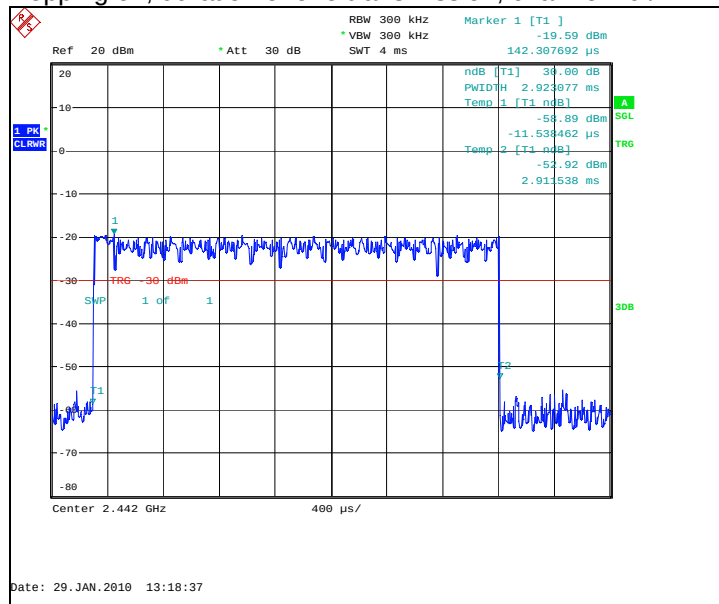
11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μs]	Time of occupancy [s]	Result
84	2 923	0.245538	PASSED

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



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



12. Test Equipment

12.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30597	Power splitter	11667A	Agilent	22/24/27, 15C
TM37499	Power splitter	11667A	Agilent	22/24/27, 15C
TM38111	Multimeter	34401A	Agilent	22/24/27, 15C
TM38112	DC power supply	6632A	Agilent	22/24/27, 15C
TM22901	Attenuator	8496A	Agilent	22/24/27, 15C
TM30636	Artificial mains net	L2-16	PMM	15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum analyzer	FSU	R&S	22/24/27, 15C
TM22835	Multimeter	87	Fluke	15C, 15B
TM37500	Microwave switch system	7116-MSW	Keithley	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transmatic	22/24/27, 15C, 15B
	Temperature chamber	VT4002	Vötsch	22/24/27, 15C
2058	EMI Test receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

12.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24/27, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24/27, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24/27, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24/27, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24/27, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24/27, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24/27
TM37502	Dipole antenna	3125-1880	EMCO	22/24/27
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24/27
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24/27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Mast/Turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24/27, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24/27, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transmatic	22/24/27, 15C, 15B
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B