TCC Nokia

FINAS Finnish Accreditation Service T117 (EN ISO/IEC 17025)

FCC Part 15C Compliance Test Report

Test Report no.:	Cph_FCC_0610_02.doc	**Date of Report:**	27-03-2006
Number of pages:	44	**Customer's Contact person:**	Ernest Mayer
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Client:**	Nokia Corporation Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934
FCC listing no.: **IC recognition no.:**	99059 4820 and 4820-1		
Tested devices/ accessories:	**Phone; RM-145 (HW: 0415b), Battery; BP-6M, AC-Charger; AC-4E, Headset; HS-23, Multi Media Card; MU-25**		
FCC ID:	QTKRM-145	**IC:**	661AD-RM145
Supplement reports:			
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), IC standards RSS-GEN and RSS-210. 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:	Test Engineer	Digitally signed by Allan Franch Henriksen DN: cn=Allan Franch Henriksen, c=DK, o=Nokia, ou=CertMT, email=allan.f.henriksen@nokia.com Date: 2006.04.18 13:43:06 +02'00'	

Allan F. Henriksen, Engineer

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1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	03-03-2006
Testing completed	27-03-2006
The customer's contact person	Ernest Mayer
Test Plan referred to	T:\Projects\RM-145\TestPlan_RS\RS_Testplan_RM-145.xls
Notes	None
Document name	T:\Projects\RM-145\EMC\Results\FCC\Cph_FCC_0610_02.doc

1.1. EUT and Accessory Information

The EUT is a quadric band (GSM900/1800/1900 and WCDMA2100) mobile phone with GPRS, EGPRS and Bluetooth. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-145	004400/75/173956/4	0415b	-	03.12	28078
Phone	RM-145	004400/75/173903/6	0415b	-	03.12	28075
Phone	RM-145	004400/75/173954/9	0415b	-	03.12	28081
Battery	BP-6M	0670505393213M446110194104	-	-	-	28071
Battery	BP-6M	0670505393213M446110194101	-	-	-	28082
Battery	BP-6M	0670505393213M446110194104	-	-	-	28071
AC-Charger	AC-4E	399791515712110013 4;0675384	-	-	-	28406
AC-Charger	AC-4U	399791516412110016 5;0675379	-	-	-	28068
AC-Charger	AC-4E	399791515712110013 4;0675384	-	-	-	28406
Headset	HS-23	GM2750741D	0.6	1.2	0.2	28403
Headset	HS-23	FM2550741Q	-	-	-	28104
Headset	HS-23	GM2750741D	0.6	1.2	0.2	28403
Multi Media Card	MU-25	0525y12345CS SD-C64	-	-	-	28069
Multi Media Card	MU-25	0525y12345CS SD-C64	-	-	-	28070

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)	Peak output power	Passed
15.247(c)	A8.5	Band edge compliance of RF emissions	Passed
15.247(c)	A8.5	Spurious RF conducted emissions	Passed
15.247(c), 15.209	A8.5	Spurious radiated emissions	Passed
15.207	*7.2.2*	AC powerline conducted emissions	Passed
15.247(a)(1)	A8.1 (1)	20 dB bandwidth	Passed
15.247(a)(1)	A8.1 (2)	Carrier frequency separation	Passed
15.247(a)(1)(iii)	A8.1 (4)	Number of hopping frequencies	Passed
15.247(a)(1)(iii)	A8.1 (4)	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 Nokia Copenhagen Laboratory.

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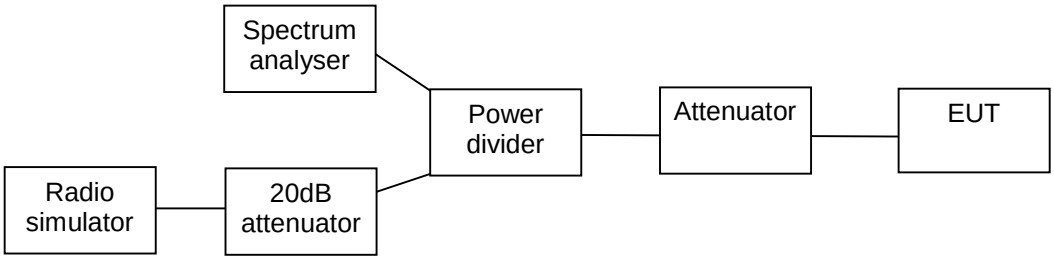
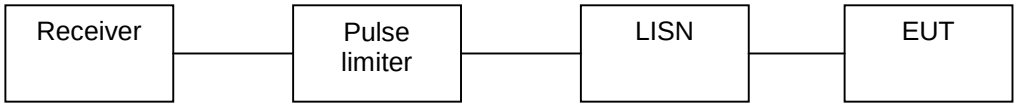
2. Test setups

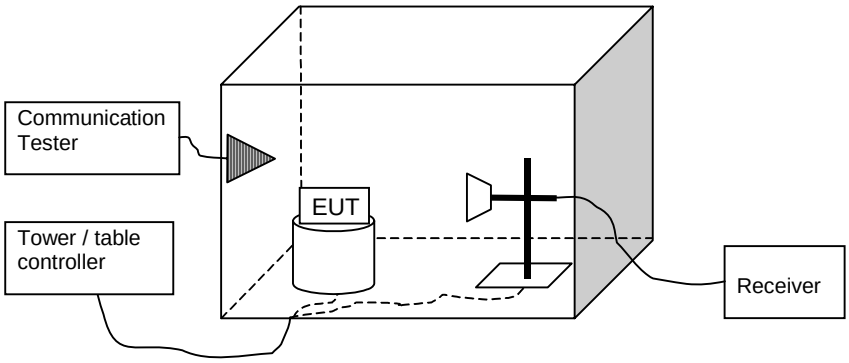
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



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3. Peak output power

(FCC §15.247(b)(1), RSS-210 A8.4 (2))

EUT with DUT number	RM-145 dut 28075, BP-6M dut 28082
Accessories with DUT numbers	HS-23 dut 28104, AC-4U dut 28068, MU-25 dut 28069
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.6 / 37.0 1018.9
Date of measurements	08-03-2006
Measured by	Jan Engelbrechtsen

3.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for peak output power measurements

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

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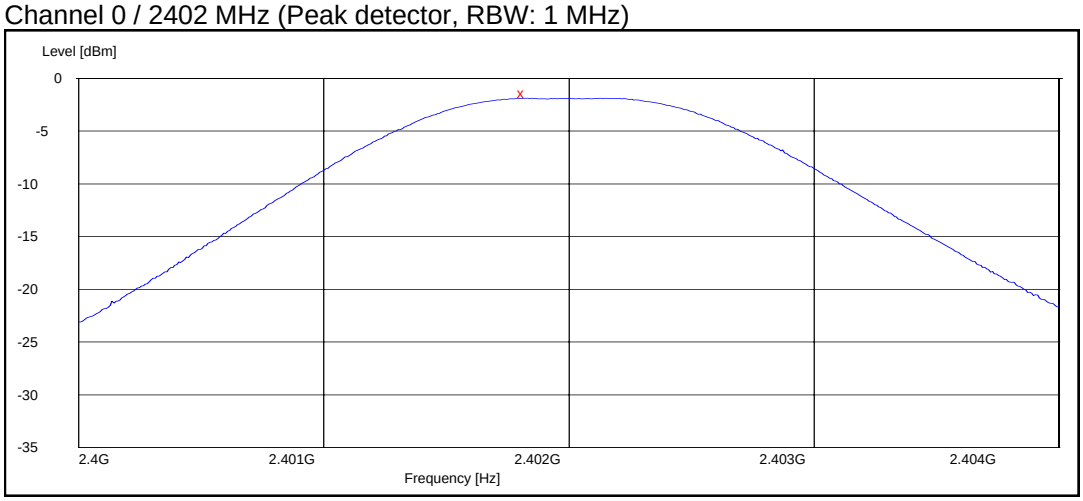
3.2. Bluetooth Test results

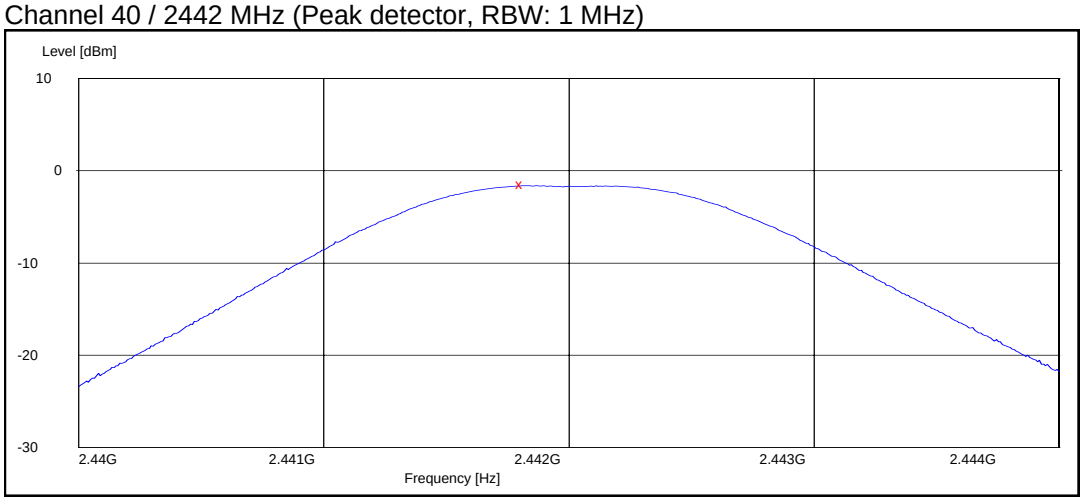
3.2.1 GSFK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.40	0.724	Passed
40 / 2442	-1.40	0.724	Passed
78 / 2480	-1.40	0.724	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)

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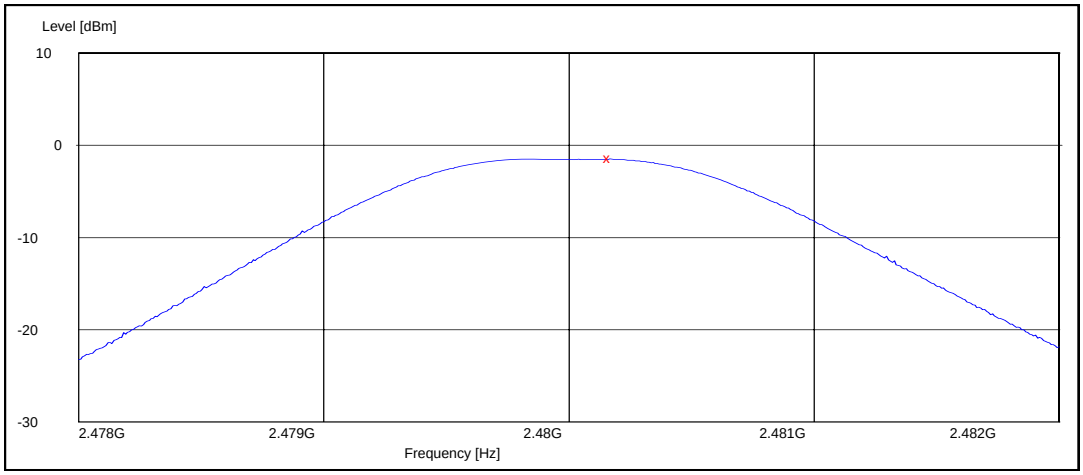
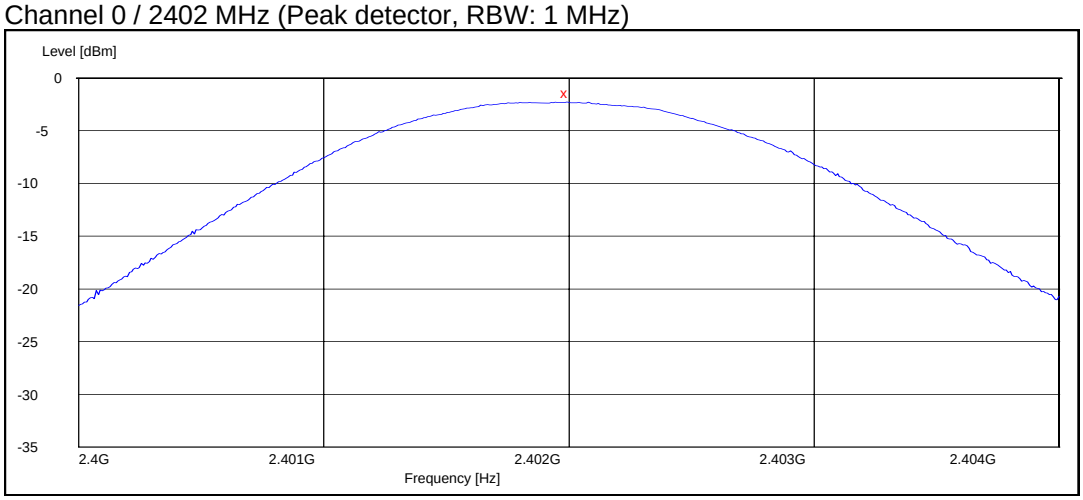


3.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.40	0.724	Passed
39 / 2441	-1.40	0.724	Passed
78 / 2480	-1.40	0.724	Passed

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



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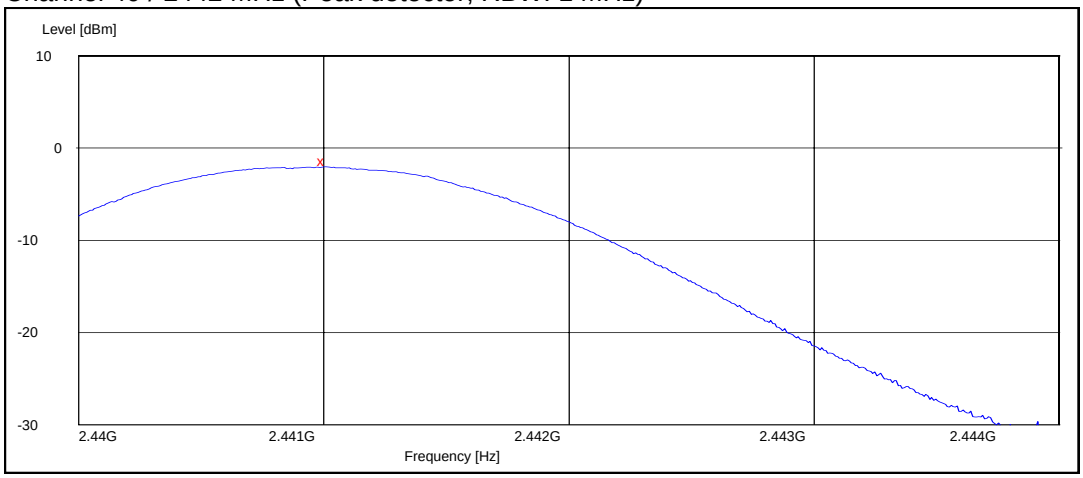
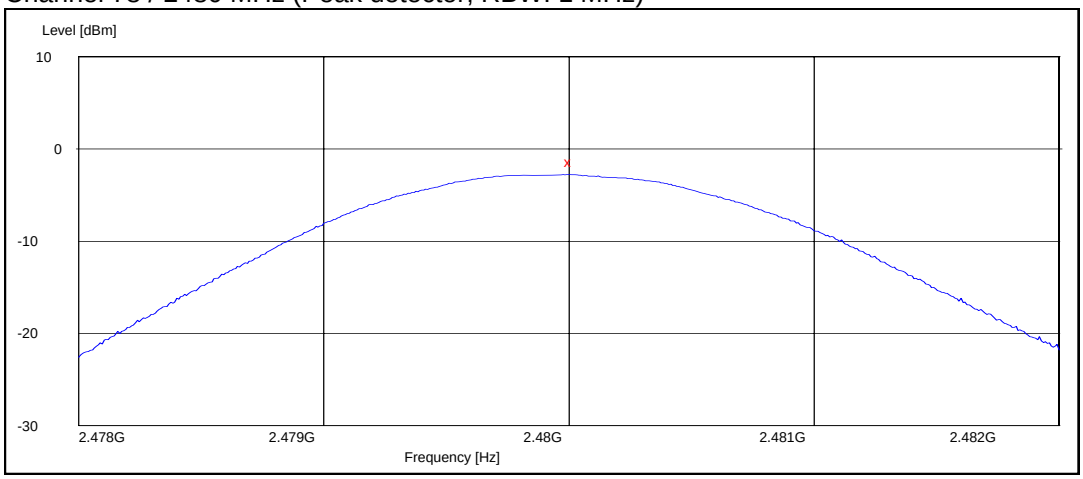
Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



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



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4. Band edge compliance of RF emissions

(FCC §15.247(c), RSS-210 A8.5)

EUT with DUT number	RM-145 #28081
Accessories with DUT numbers	BP-6M #28071, HS-23 #28403, AC-4 #28406
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.0 / 40.5 / 1011.6
Date of measurements	24.03.2006
Measured by	Juho Tuohino

4.1. Test method and limit

The measurement is made according to FCC rules part 15.247 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

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4.2. Bluetooth Test results

4.2.1 GFSK modulation, PRBS packet type

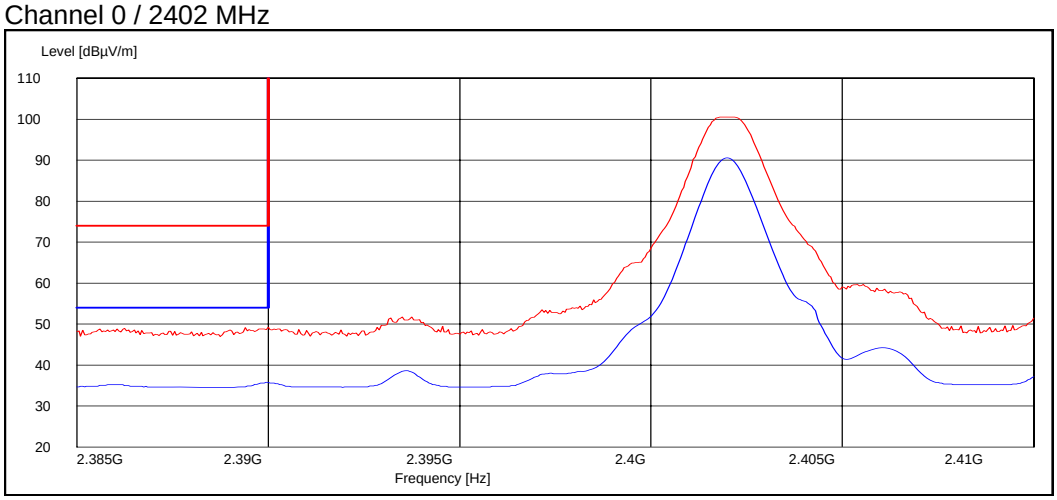
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	35.80	Passed
78 / 2480	44.11	Passed
Hopping on, low end	34.68	Passed
Hopping on, high end	35.85	Passed

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	49.28	Passed
78 / 2480	59.66	Passed
Hopping on, low end	49.32	Passed
Hopping on, high end	58.86	Passed

Channel 0 / 2402 MHz



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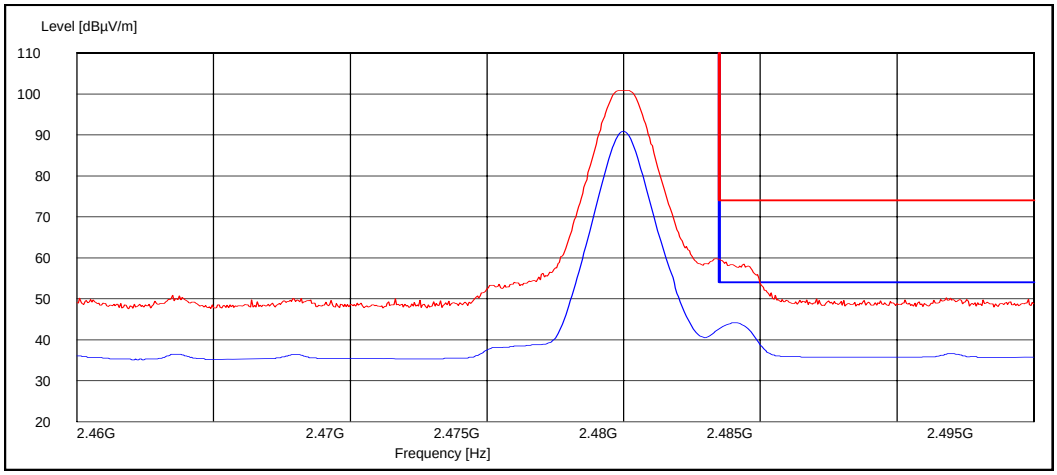
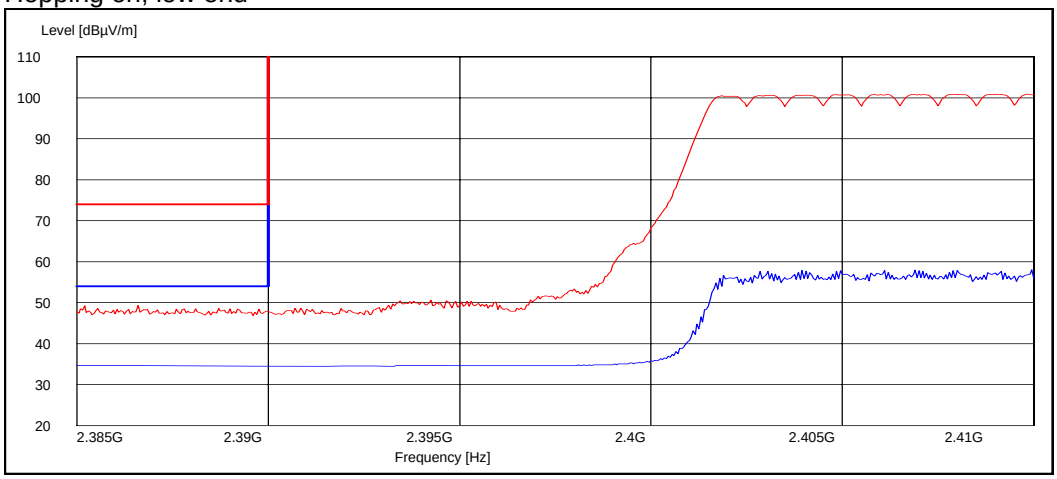
Channel 78 / 2480 MHz



Hopping on, low end



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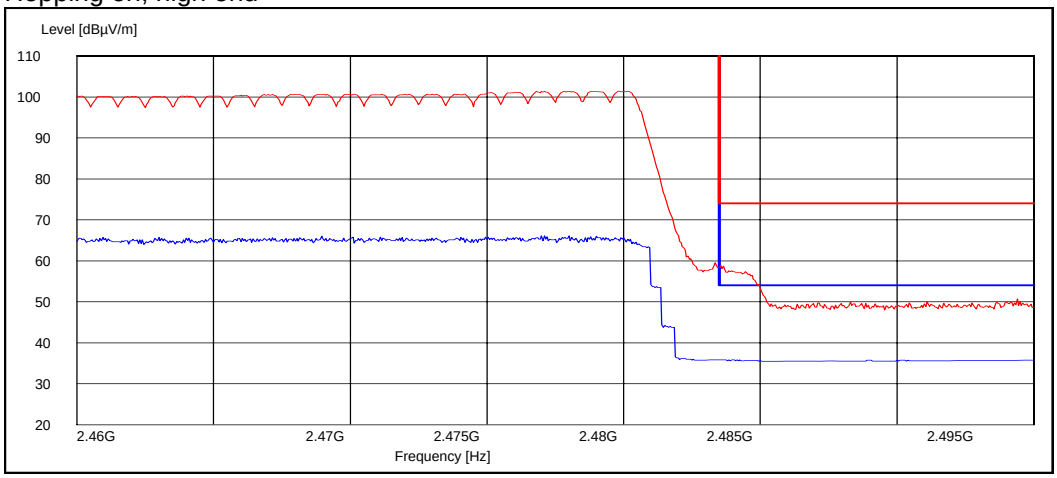
Hopping on, high end



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4.2.2 8DPSK modulation, PRBS packet type

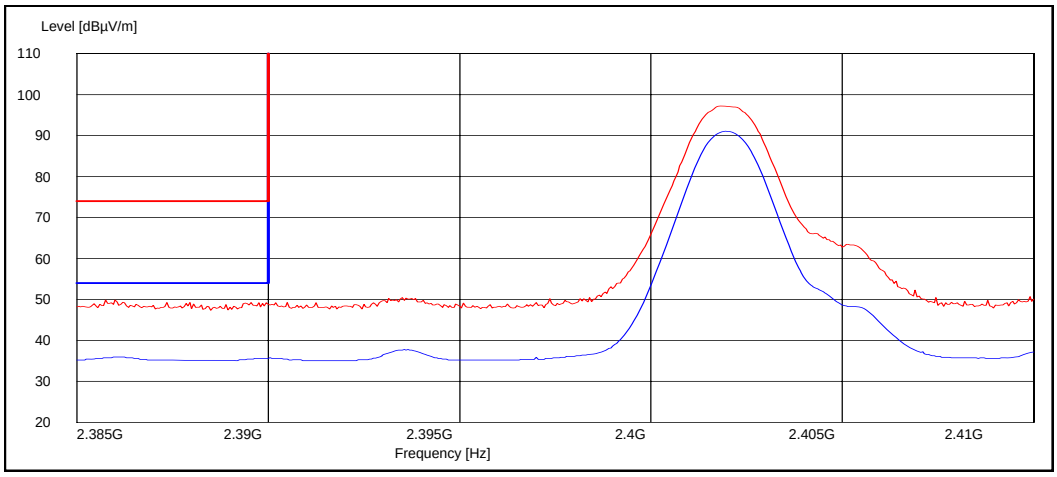
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	35.97	Passed
78 / 2480	49.10	Passed
Hopping on, low end	34.88	Passed
Hopping on, high end	36.40	Passed

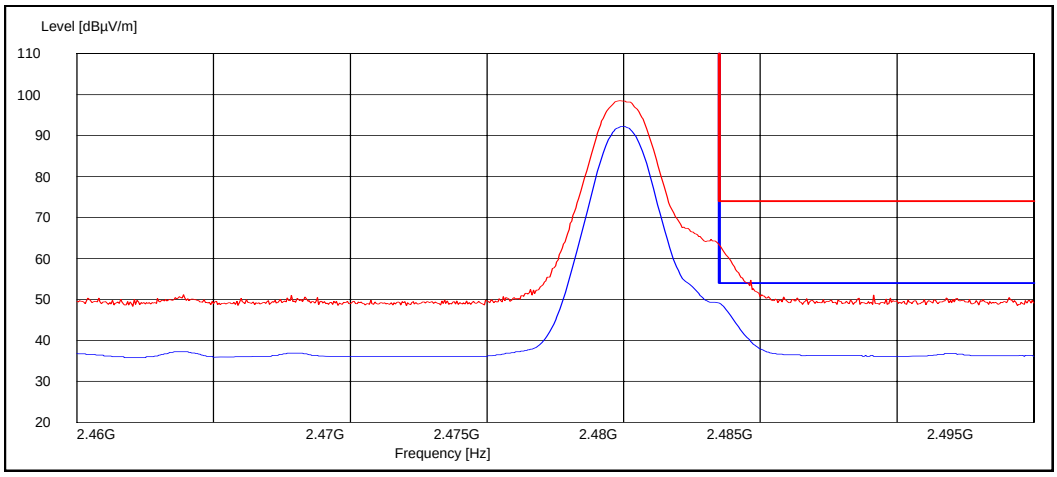
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	49.85	Passed
78 / 2480	63.22	Passed
Hopping on, low end	50.00	Passed
Hopping on, high end	62.16	Passed

Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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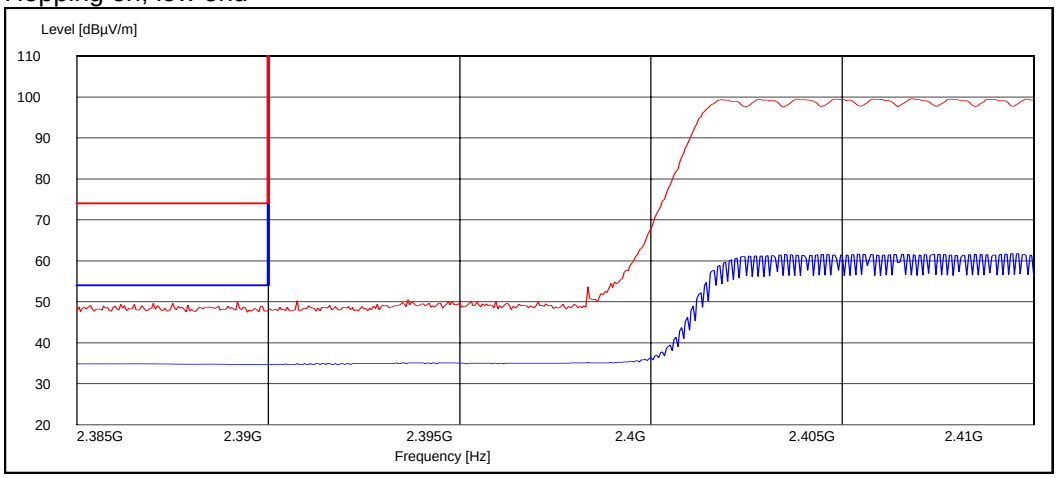
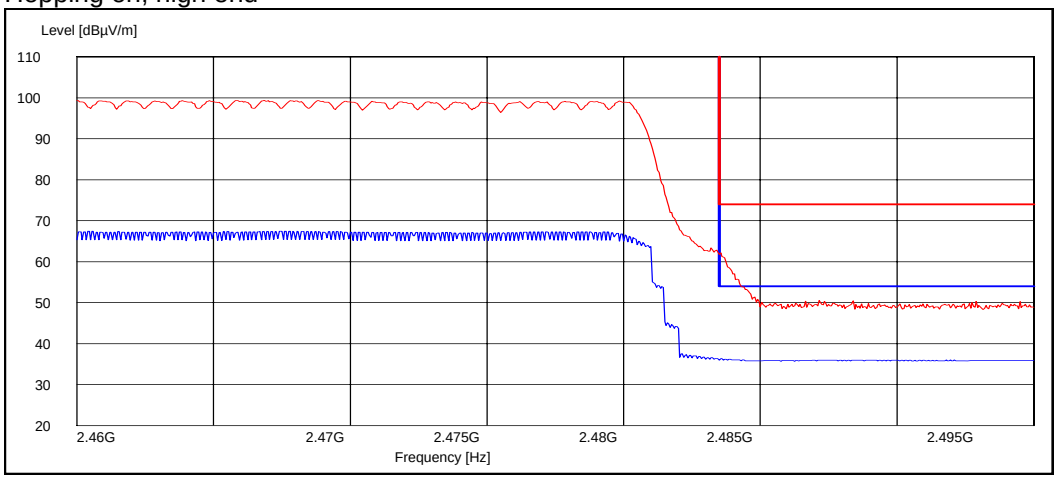
Hopping on, low end



Hopping on, high end



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5. Spurious RF conducted emissions

(FCC §15.247(c), RSS-A8.5)

EUT with DUT number	RM-145 dut 28075, BP-6M dut 28082
Accessories with DUT numbers	HS-23 dut 28104, AC-4U dut 28068, MU-25 dut 28069
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.6 / 37.0 1018.9
Date of measurements	08-03-2006
Measured by	Jan Engelbrechtsen

5.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for spurious RF conducted emissions measurements

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

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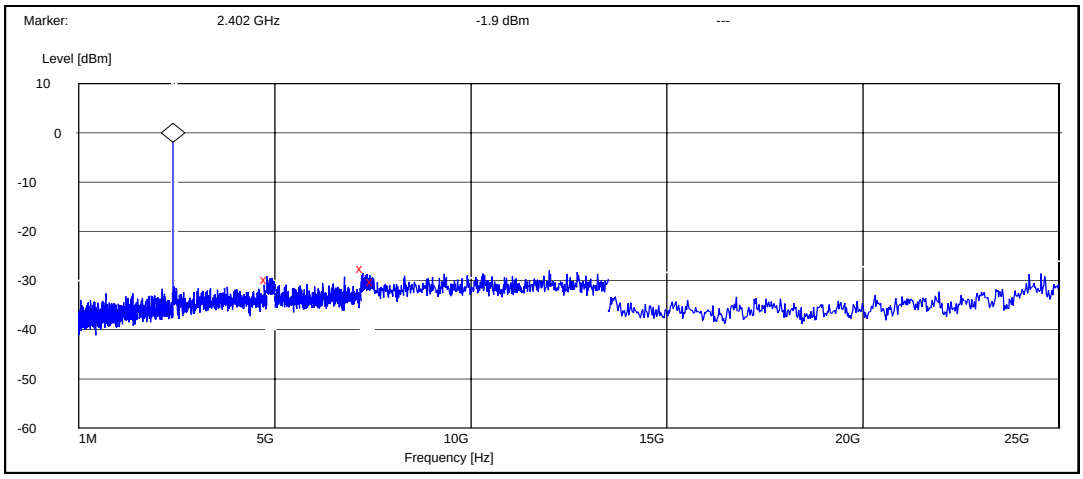
5.2. Bluetooth Test results

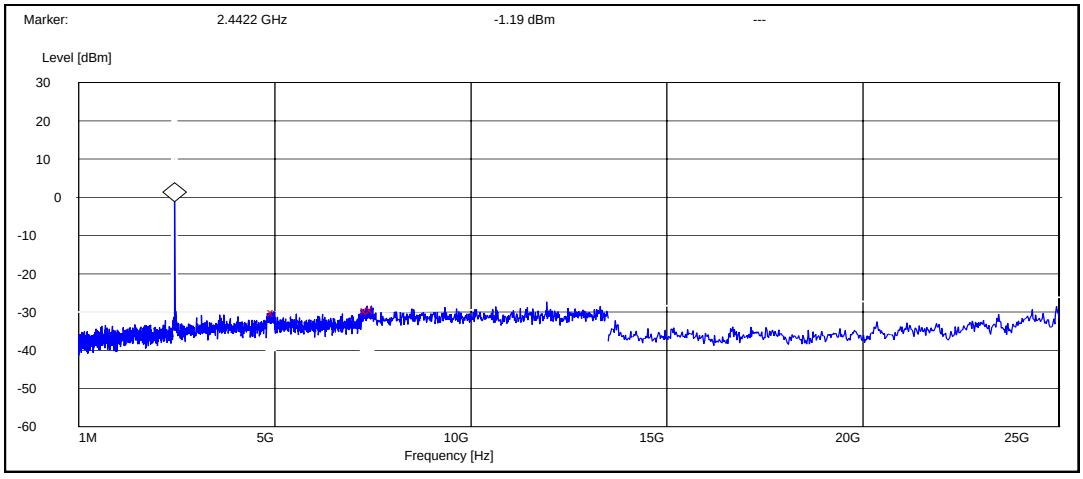
5.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4804.000000	-27.900110	Pass
7244.400000	-25.700110	Pass
7500.000000	-28.200110	Pass

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4975.600000	-28.907178	Pass
7349.400000	-28.507178	Pass
7500.000000	-28.007178	Pass

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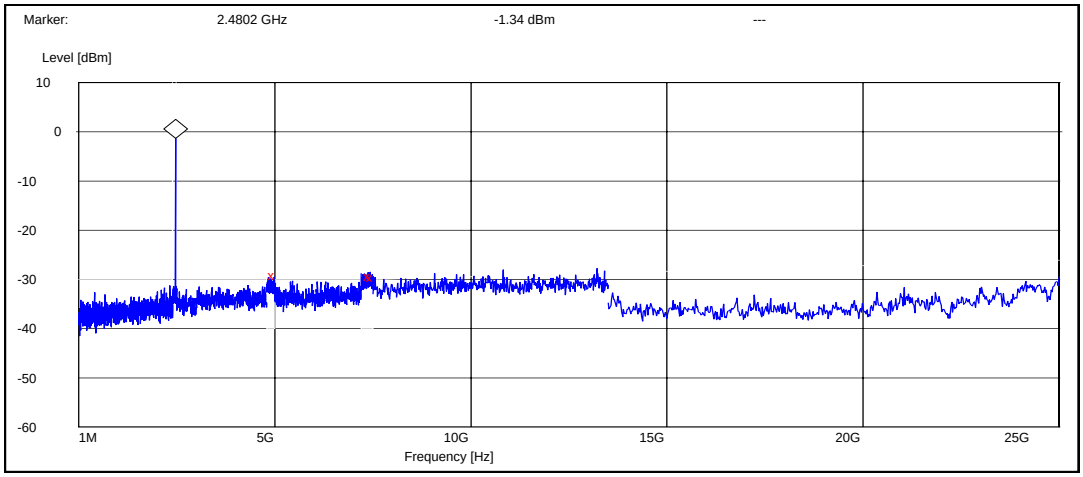
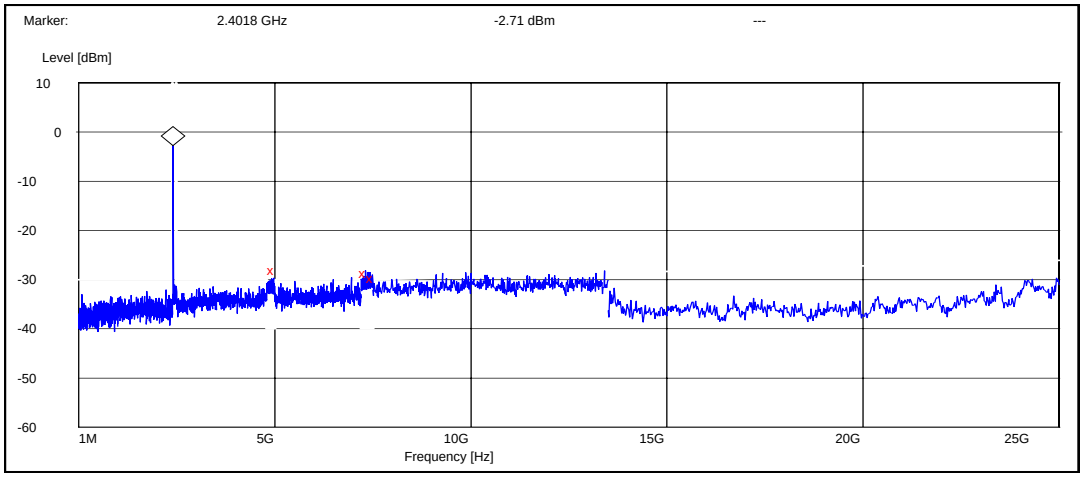
Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4991.600000	-27.855674	Pass
7434.000000	-27.955674	Pass
7500.000000	-28.155674	Pass

5.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4980.800000	-25.393103	Pass
7308.600000	-26.093103	Pass
7500.000000	-27.093103	Pass

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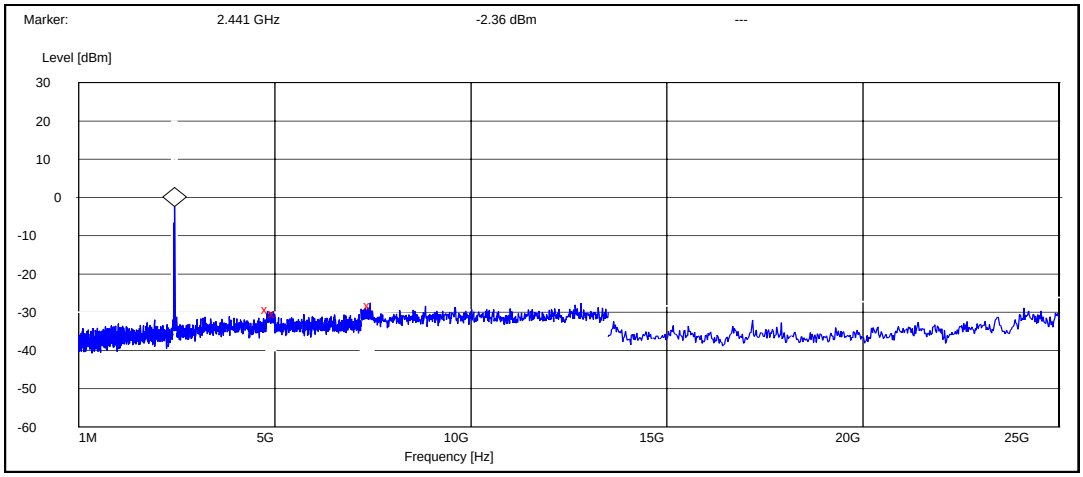
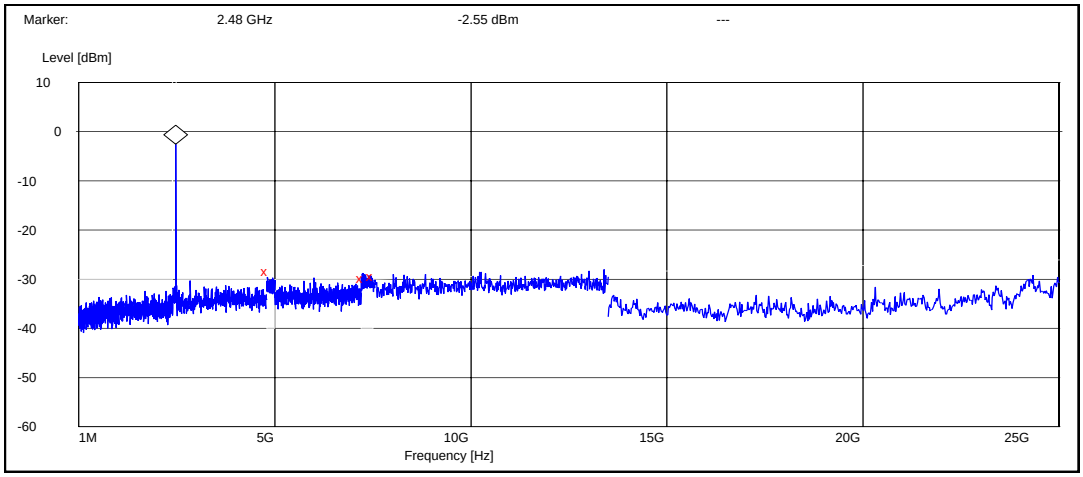
Channel 39 / 2441 MHz



Frequency [MHz]	P [dBc]	Result
4823.200000	-27.043729	Pass
5000.000000	-27.943729	Pass
7441.800000	-25.743729	Pass

Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4815.600000	-25.945274	Pass
7248.600000	-27.245274	Pass
7500.000000	-26.845274	Pass

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6. Spurious radiated emissions

(FCC §15.247(c), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-145 #28081
Accessories with DUT numbers	BP-6M #28071, HS-23 #28403, AC-4 #28406
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	QTKRM-145_ATCB003355. A numbers of BT frequencies were by a mistake mentioned in the previous FCC Test Report. *2402.0 MHz frequency is BT carrier signal and thus ignored. *2442.0 MHz frequency is BT carrier signal and thus ignored. *2480.0 MHz frequency is coming from communication tester and thus ignored.
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.0 / 40.5 / 1011.6
Date of measurements	24.03.2006
Measured by	Juho Tuohino

6.1. Test method and limit

The measurement is made according to FCC rules part 15.247 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 ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

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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

6.2. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

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	52.40	416.87	50.40	2.00	HORIZONTAL	Passed
7206.000000	47.50	237.14	38.90	8.60	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	43.20	144.54	41.20	2.00	HORIZONTAL	Passed
7206.000000	35.70	60.95	27.10	8.60	HORIZONTAL	Passed

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	23.70	15.31	39.40	-15.70	VERTICAL	Passed
73.708016	16.20	6.46	39.90	-23.70	HORIZONTAL	Passed
75.169940	22.60	13.49	46.10	-23.50	HORIZONTAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4884.269539	52.10	402.72	49.70	2.40	HORIZONTAL	Passed
7325.651303	47.90	248.31	39.30	8.60	HORIZONTAL	Passed
14491.481964	52.80	436.52	32.00	20.80	VERTICAL	Passed
14496.000000	52.80	436.52	31.90	20.90	HORIZONTAL	Passed
17478.949900	55.00	562.34	30.30	24.70	HORIZONTAL	Passed
17873.253507	62.00	1,258.93	31.10	30.90	HORIZONTAL	Passed

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Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4883.769539	41.30	116.14	38.90	2.40	HORIZONTAL	Passed
7325.651303	34.40	52.48	25.80	8.60	HORIZONTAL	Passed
14488.481964	39.90	98.86	19.10	20.80	VERTICAL	Passed
14501.500000	40.00	100.00	19.10	20.90	HORIZONTAL	Passed
17471.449900	42.10	127.35	17.50	24.60	HORIZONTAL	Passed
17878.753507	48.80	275.42	17.90	30.90	HORIZONTAL	Passed

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	51.40	371.54	49.00	2.40	HORIZONTAL	Passed
7440.000000	47.20	229.09	38.00	9.20	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	41.00	112.20	38.60	2.40	HORIZONTAL	Passed
7440.000000	34.60	53.70	25.40	9.20	HORIZONTAL	Passed

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6.2.2 8DPSK modulation, PRBS packet type

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	47.40	234.42	45.40	2.00	HORIZONTAL	Passed
7206.000000	42.40	131.83	33.80	8.60	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	47.40	234.42	45.40	2.00	HORIZONTAL	Passed
7206.000000	42.40	131.83	33.80	8.60	HORIZONTAL	Passed

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
38.176353	23.00	14.13	38.60	-15.60	VERTICAL	Passed
73.446092	21.50	11.89	45.30	-23.80	HORIZONTAL	Passed
74.269940	20.40	10.47	44.00	-23.60	HORIZONTAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4882.265531	45.90	197.24	43.60	2.30	HORIZONTAL	Passed
7319.643287	43.60	151.36	34.90	8.70	HORIZONTAL	Passed
7412.827655	44.20	162.18	35.00	9.20	HORIZONTAL	Passed
7418.831663	44.10	160.32	35.10	9.00	HORIZONTAL	Passed
14493.983968	53.20	457.09	32.40	20.80	HORIZONTAL	Passed
14499.000000	53.10	451.86	32.20	20.90	HORIZONTAL	Passed
17798.097194	61.50	1,188.50	30.90	30.60	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4882.265531	31.70	38.46	29.40	2.30	HORIZONTAL	Passed
7318.643287	30.90	35.08	22.20	8.70	HORIZONTAL	Passed
7414.327655	31.60	38.02	22.50	9.10	HORIZONTAL	Passed
7419.831663	31.50	37.58	22.50	9.00	HORIZONTAL	Passed
14493.983968	40.10	101.16	19.30	20.80	HORIZONTAL	Passed
14499.500000	40.10	101.16	19.20	20.90	HORIZONTAL	Passed
17800.597194	48.60	269.15	18.10	30.50	VERTICAL	Passed

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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	44.70	171.79	42.30	2.40	HORIZONTAL	Passed
7440.000000	43.70	153.11	34.50	9.20	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	30.40	33.11	28.00	2.40	HORIZONTAL	Passed
7440.000000	31.10	35.89	21.90	9.20	HORIZONTAL	Passed

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7. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-145 Dut # 28078
Accessories with DUT numbers	BP-6M Dut # 28071 + AC-4E Dut # 28406 + HS-23 Dut # 28403 + MU-25 Dut # 28070
Operation Voltage [V] / [Hz]	115 / 60
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	23.4 / 45.0 1015.5
Date of measurements	08-03-2006
Measured by	Allan F. Henriksen

7.1. Test method and limit

The measurement is made according to FCC rules part 15.247 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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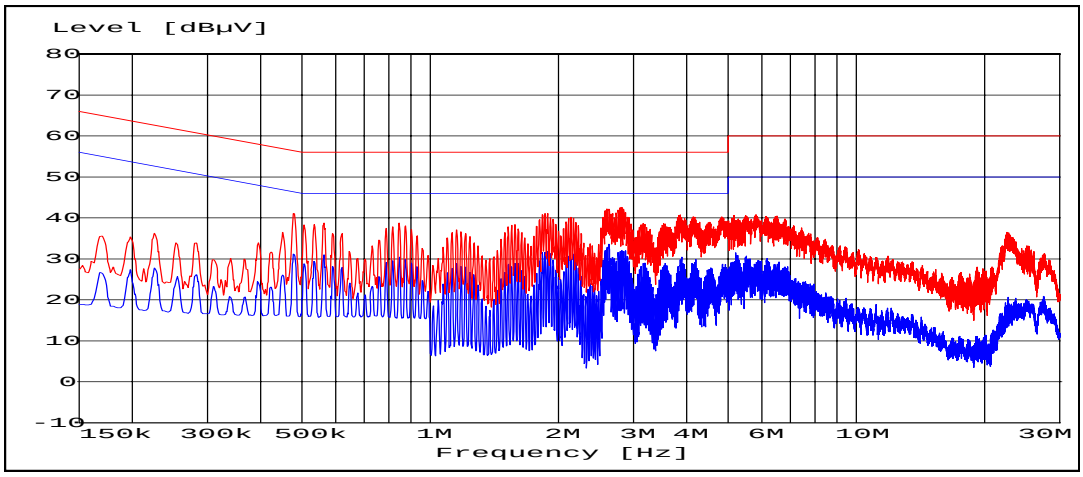
7.2. Bluetooth Test results

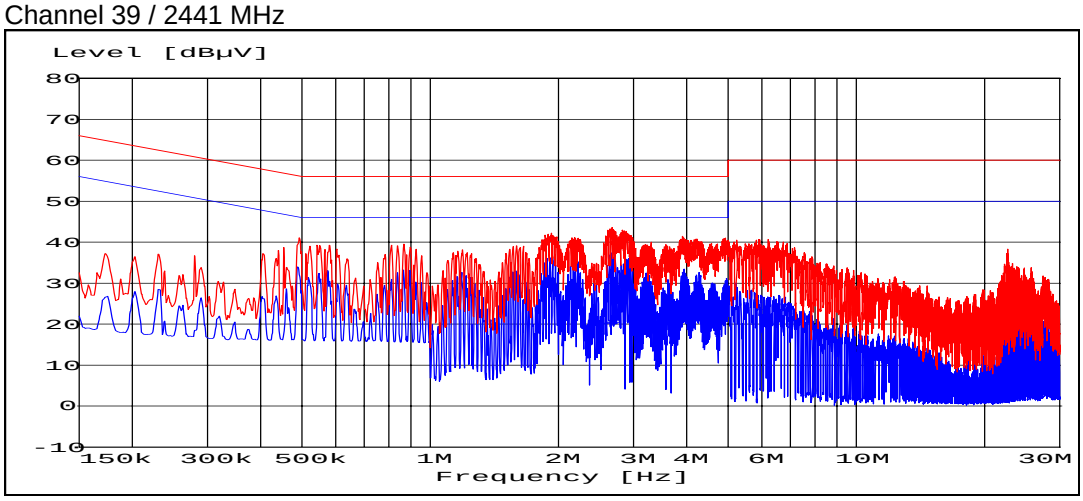
7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



7.2.2 8DPSK modulation, PRBS packet type

Channel 39 / 2441 MHz



Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
2.620000	20.10	N	Passed
2.652500	20.40	N	Passed

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8. 20 dB bandwidth

(FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-145 dut 28075, BP-6M dut 28082
Accessories with DUT numbers	HS-23 dut 28104, AC-4U dut 28068, MU-25 dut 28069
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.6 / 37.0 1018.9
Date of measurements	08-03-2006
Measured by	Jan Engelbrechtsen

8.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for 20 dB bandwidth measurements

Limit [MHz]
N/A

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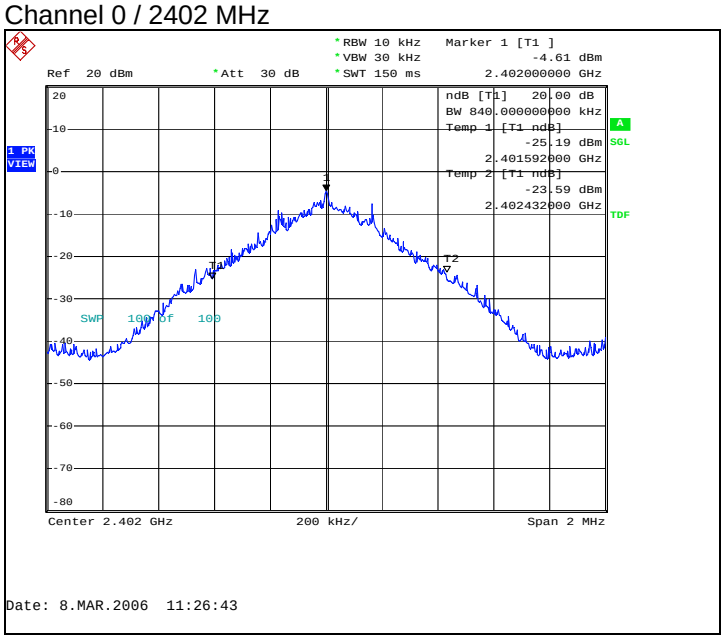
8.2. Bluetooth Test results

8.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	840.000	Pass
40 / 2442	816.000	Pass
78 / 2480	816.000	Pass

Channel 0 / 2402 MHz



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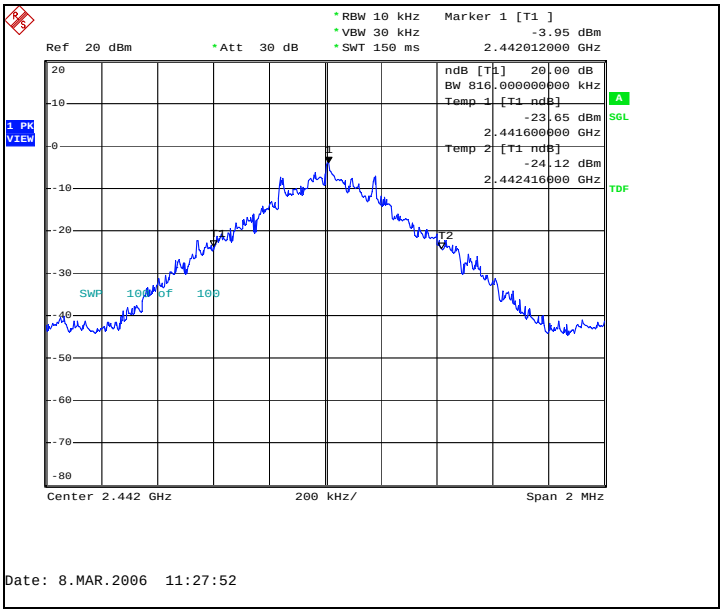
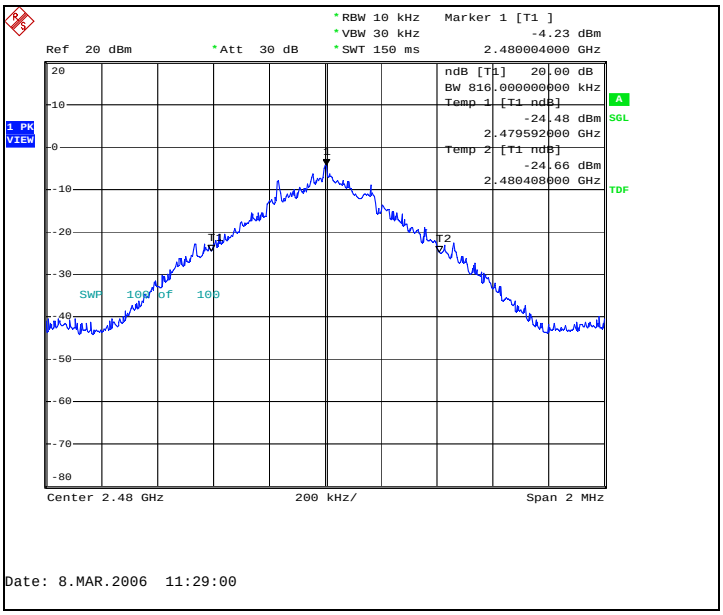
Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



8.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1132.000	Pass
39 / 2441	1160.000	Pass
78 / 2480	1116.000	Pass

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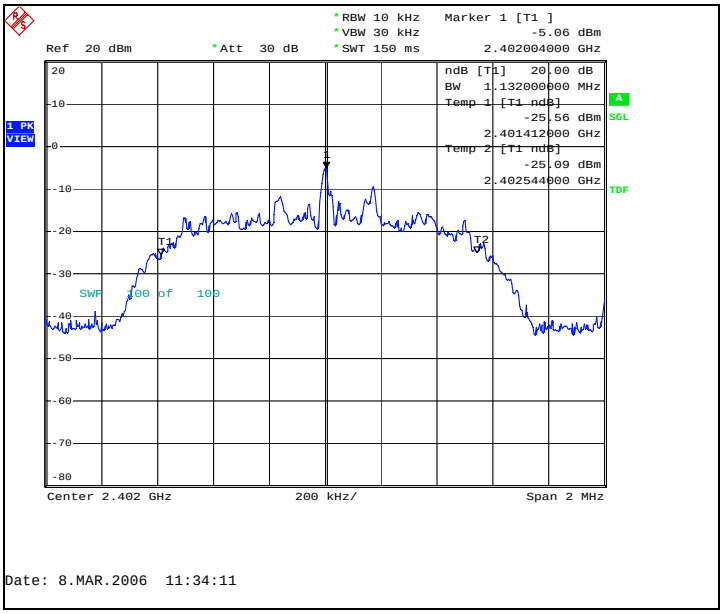
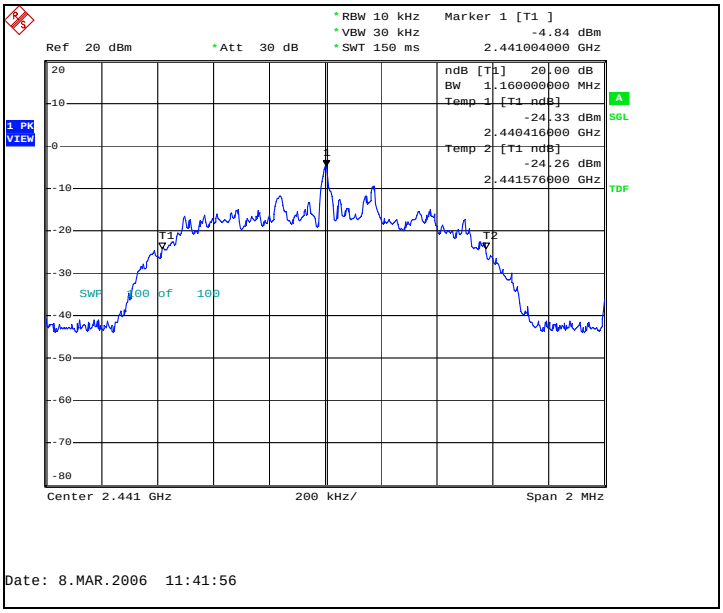
Channel 0 / 2402 MHz



Channel 39 / 2441 MHz



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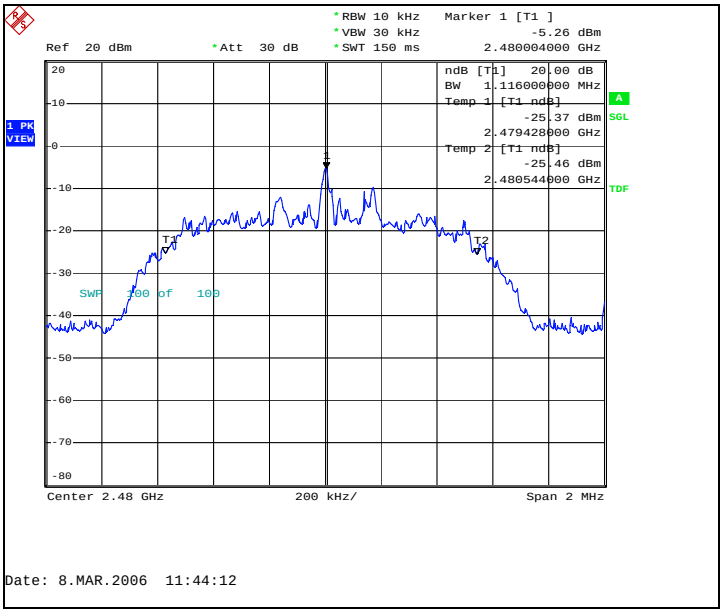
Channel 78 / 2480 MHz



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9. Carrier frequency separation

(FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-145 dut 28075, BP-6M dut 28082
Accessories with DUT numbers	HS-23 dut 28104, AC-4U dut 28068, MU-25 dut 28069
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.6 / 37.0 1018.9
Date of measurements	08-03-2006
Measured by	Jan Engelbrechtsen

9.1. Test method and limit

The measurement is made according to FCC rules part 15.247 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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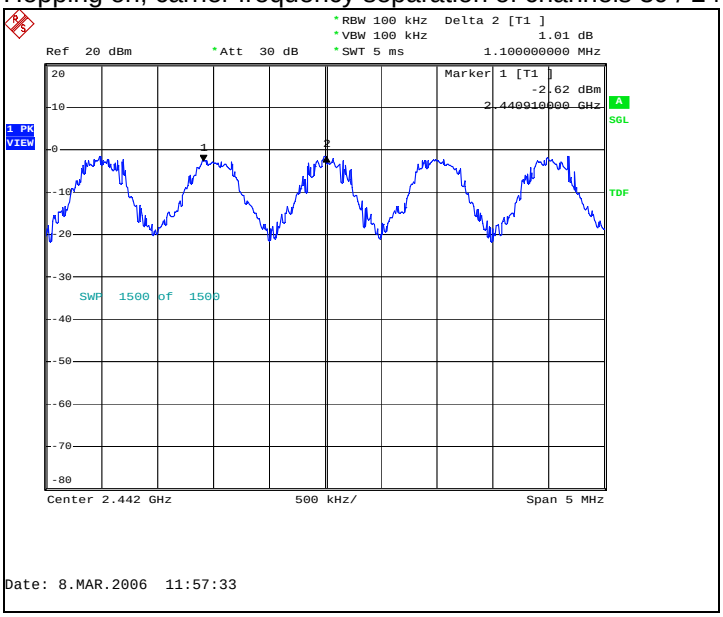
9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1100	Pass

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



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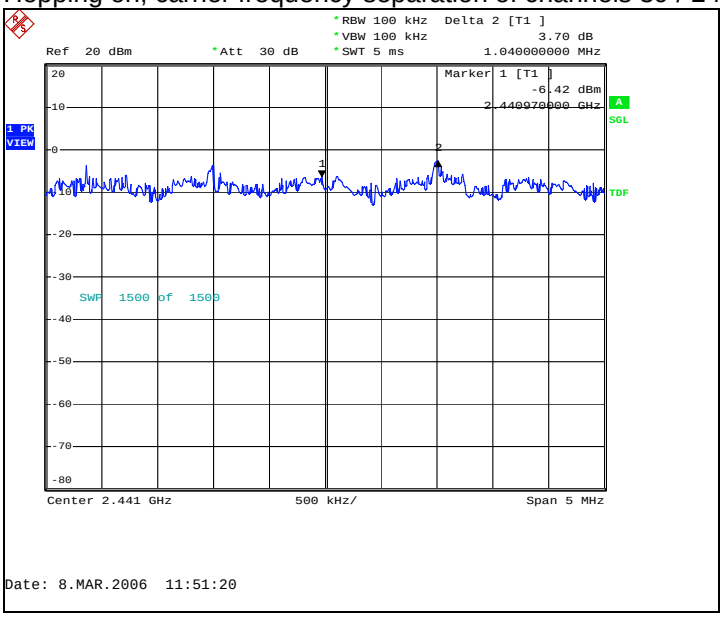
9.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1040	Pass

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



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10. Number of hopping frequencies

(FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-145 dut 28075, BP-6M dut 28082
Accessories with DUT numbers	HS-23 dut 28104, AC-4U dut 28068, MU-25 dut 28069
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.6 / 37.0 1018.9
Date of measurements	08-03-2006
Measured by	Jan Engelbrechtsen

10.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for number of hopping frequencies measurements

Limit [number]
≥ 15

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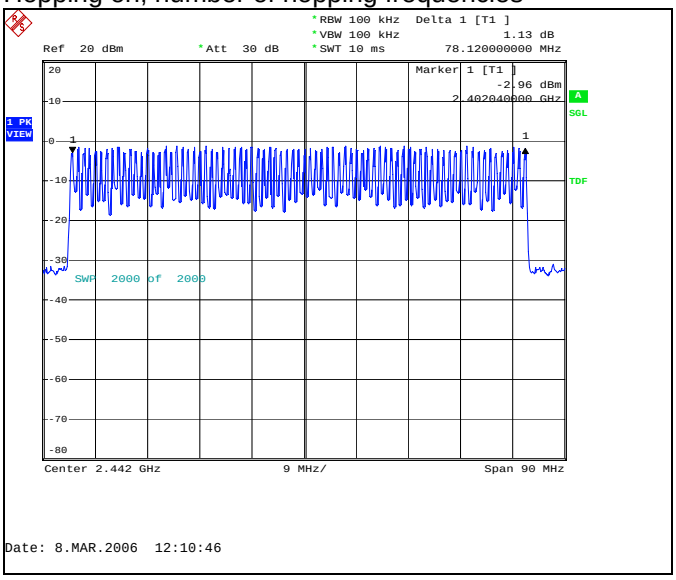
10.2. Bluetooth Test results

10.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	Passed

Hopping on, number of hopping frequencies



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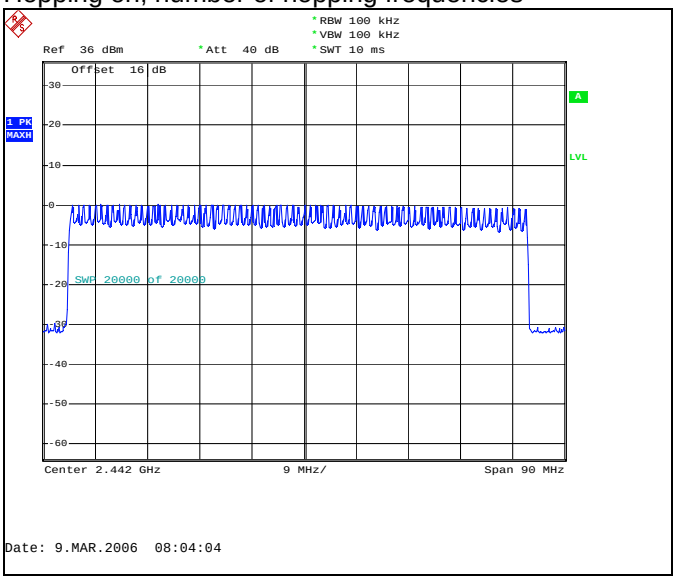
10.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	Passed

Hopping on, number of hopping frequencies



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11. Time of occupancy

(FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-145 dut 28075, BP-6M dut 28082
Accessories with DUT numbers	HS-23 dut 28104, AC-4U dut 28068, MU-25 dut 28069
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.0 / 37.0 1007.6
Date of measurements	09-03-2006
Measured by	Jan Engelbrechtsen

11.1. Test method and limit

The measurement is made according to FCC rules part 15.247 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

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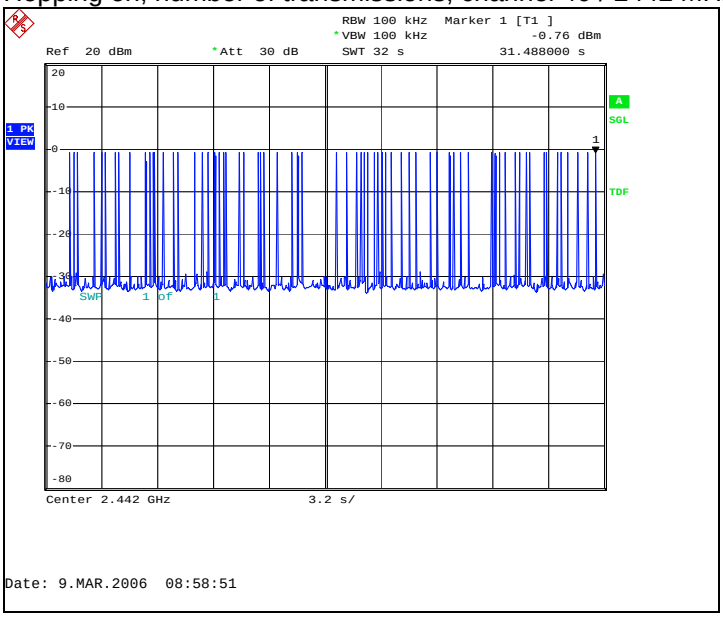
11.2. Bluetooth test results

11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
68	2968.000	0.201824	Pass

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



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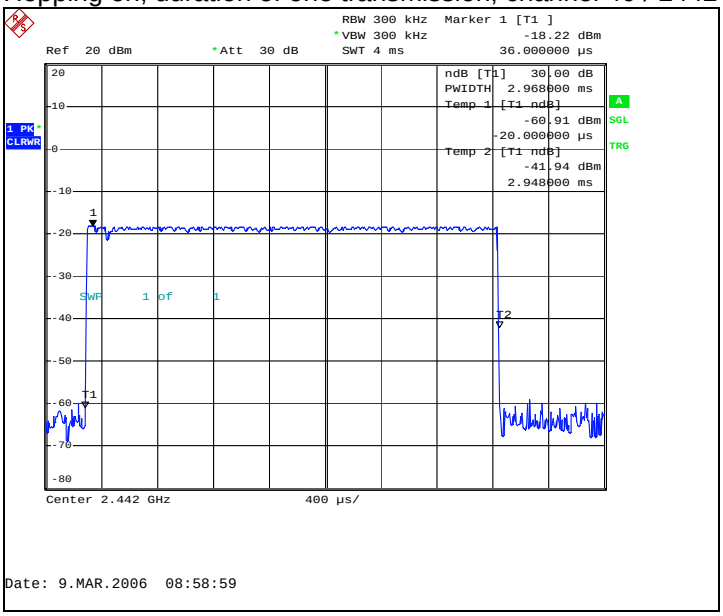
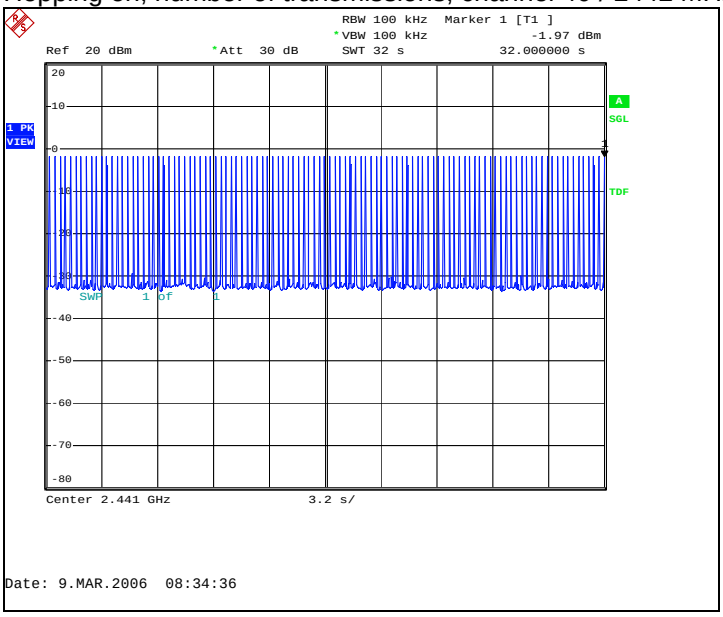
Hopping on, duration of one transmission, channel 40 / 2442 MHz



11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
109	2976.000	0.324384	Pass

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



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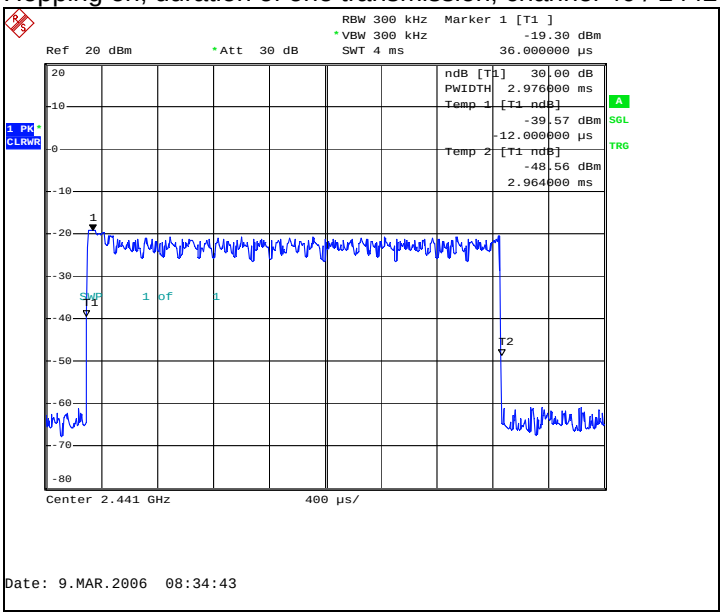
Hopping on, duration of one transmission, channel 40 / 2442 MHz



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12. Test Equipment

12.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15B,15C
13513	Pulse Limiter 9KHz-30MHz	ESH3Z2	Rohde&Schwarz	15B,15C
13666	EMI Test Reciever 9KHz-2,5GHz	ESPC	Rohde&Schwarz	15B,15C
13935	Two Lines Artificial Mains Network	ESH3-Z5	Rohde&Schwarz	15B,15C
16995	Directional Coupler 20dB 0,5-2,0 GHz SMA Conn.	1538RA-20	Weinschel	15B,15C
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15B,15C
19171	Universal Radio Communication Tester	CMU200	Rohde&Schwarz	15B,15C
11386	System DC Power Supply	HP6632A	Hewlett Packard	22.24
11487	Network analyzer 300KHz-3,0GHz	HP8753A	Hewlett Packard	22.24
11584	Spectrum analyzer 50Hz-6,5GHz	HP8561B	Hewlett Packard	22.24
13134	Tracking generator	HP85645A	Hewlett Packard	22.24
13302	Spectrum Analyzer 9KHz-12.8GHz	HP8596E	Hewlett Packard	22.24
13371	Temperature Chamber	S-1,2C	Thermotron	22.24
13524	Digital Radiocomm. Tester	CMD55	Rohde&Schwarz	22.24
14807	S - Parameter Test Set 300KHz-6GHz	HP85047A	Hewlett Packard	22.24
15859	Digital Radio Communication Test Set	4201S	Wavetek	22.24
17277	Multimeter Digital 6 1/2 Digit	AT34401A	Agilent Technologies	22.24
17796	Radio Communication Test Set	4400M	Wavetek	22.24
19374	Resonant Dipole Antenna 850MHz SMA m Conn.	-	NMP Cph	22.24
19375	Resonant Dipole Antenna 1900MHz SMA m Conn.	-	NMP Cph	22.24
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15B,15C

12.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
14020	Programmable Relay Switching System	-	Pickering	15B,15C,22,24
18792	Multi Device Controller	2090	ETS-EMCO	15B,15C,22,24
13829	Turntable Controller	4630-100	Comtest	15B,15C,22,24
14963	RF Preamplifier 100MHz-4GHz (Metal Chassis)	AFS3-00100400	Miteq/NMP Cph	15B,15C,22,24
13668	BiLog Antenna 30-2000MHz	BiLog-CBL6112A	Chase	15B,15C,22,24
18861	EMI Test Receiver 20Hz-26,5GHz	ESI	Rohde&Schwarz	15B,15C,22,24
12679	Dual Log Periodic Antenna 1-18 GHz	HL025	Rohde&Schwarz	15B,15C,22,24

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Eq. No	Equipment	Type	Manufacturer	Used in
18860	Ultra Broadband Antenna Ultralog 30-3000MHz	HL562	Rohde&Schwarz	15B,15C,22,24
18773	Shielded Chamber	RFD-100	ETS-Lindgren	15B,15C,22,24
18774	Shielded Chamber	RFSD-F/A-100	ETS-Lindgren	15B,15C,22,24
18324	High Pass Filter 3GHz SMA f Conn	WHJS3000-10SS	Wainwright	15B,15C,22,24
14114	Highpass Filter 1000MHz-4500MHz	WHK1000-12SS	Wainwright	15B,15C,22,24
13918	Highpass Filter 2000-4000MHz 50OHM SMA Conn	WHKS2000-10SS	Wainwright Instruments	15B,15C,22,24
13937	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright Instruments	15B,15C,22,24
13936	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	15B,15C,22,24
13917	Highpass Filter 1000-3000MHz 50OHM SMA Conn	WHKS1000-10SS	Wainwright Instruments	15B,15C,22,24
14188	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright	15B,15C,22,24
14187	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright	15B,15C,22,24
16633	Ultra Stable Notch Filter 1880,0MHz	WRCD1880.0-0.2/40-10SS	Wainwright	15B,15C,22,24
18323	Band reject filter 1947-1953MHz 40dB	WRCG1947/1953-1940/1960-40/6SS	Wainwright	15B,15C,22,24
15190	Infra Red Remote Control Unit	4630	Emco	22,24,15B,15C
14993	EMI Test Receiver 9KHz-2750MHz	ESCS30	Rohde&Schwarz	22,24,15B,15C
15191	Turntable Contoller Unit	G-800SDX	YAESU	22,24,15B,15C
14900	Antenna Controller	HD100	HD GmbH	22,24,15B,15C

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