TCC Nokia

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

FCC Part 15C Compliance Test Report

Test Report no.:	Cph_FCC_0634_03.doc	**Date of Report:**	13-09-2006
Number of pages:	46	**Customer's Contact person:**	Thomas Reitmayer
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Customer:**	Nokia Corporation Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.: **IC recognition no.:**	99059 4820 and 4820-1		
Tested devices/ accessories:	**Phone; RM-209 (HW: 0200), Battery; BL-4B, AC-Charger; AC-3E, Headset; HS-31, Multi Media Card; MU-26**		
FCC ID:	PPIRM-209	**IC:**	661U-RM209
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: 2006.09.13 10:49:26 +02'00'		

Allan F. Henriksen, Engineer

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	08-08-2006
Testing completed	13-09-2006
The customer's contact person	Thomas Reitmayer
Test Plan referred to	\EMC\TESTPLAN\
Notes	None
Document name	T:\Projects\RM-209\EMC\Results\FCC\Cph_FCC_0634_03.doc

1.1. EUT and Accessory Information

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

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-209	004400/91/164067/8	0200	-	3.11.1	27882
Phone	RM-209	004400/91/164050/4	0200	-	3.11.1	27878
Phone	RM-209	004400/91/164066/0	0200	-	3.11.1	27883
Battery	BL-4B	0670491363563N213110701794	-	-	-	27876
Battery	BL-4B	0670491363563N213110700060	-	-	-	27877
Battery	BL-4B	0670491363563N213110701790	-	-	-	27875
Headset	HS-31	402698603301	-	-	-	27874
AC Charger	AC-3E	1103336133141301734;0675370	-	-	-	27860
AC Charger	AC-3E	1103336133141301706;0675370	-	-	-	29076
Multi Media Card	MU-26	0545E10041NC128T	-	-	-	27861

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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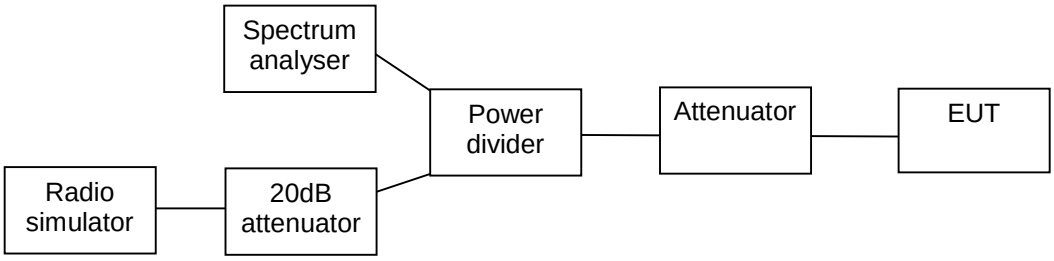
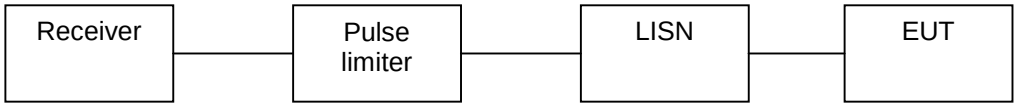
2. Test setups

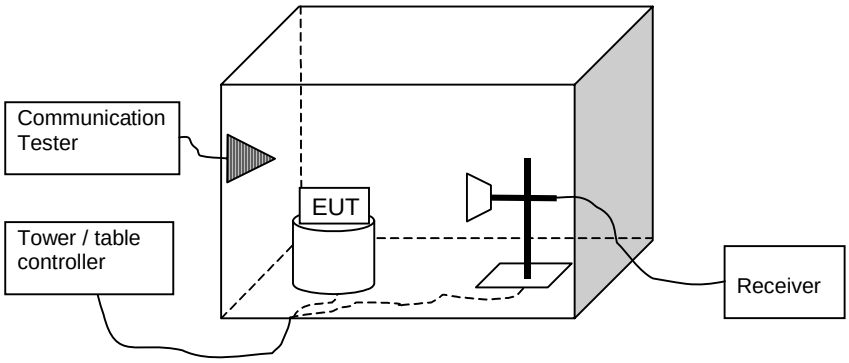
2.1. Conducted RF test setup



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-209 dut 27878, BL-4B dut 27877
Accessories with DUT numbers	MU-26 dut 27861, AC-3E dut 27860, HS-31 dut 27874
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	25.2 / 43.5 1002.7
Date of measurements	29-08-2006
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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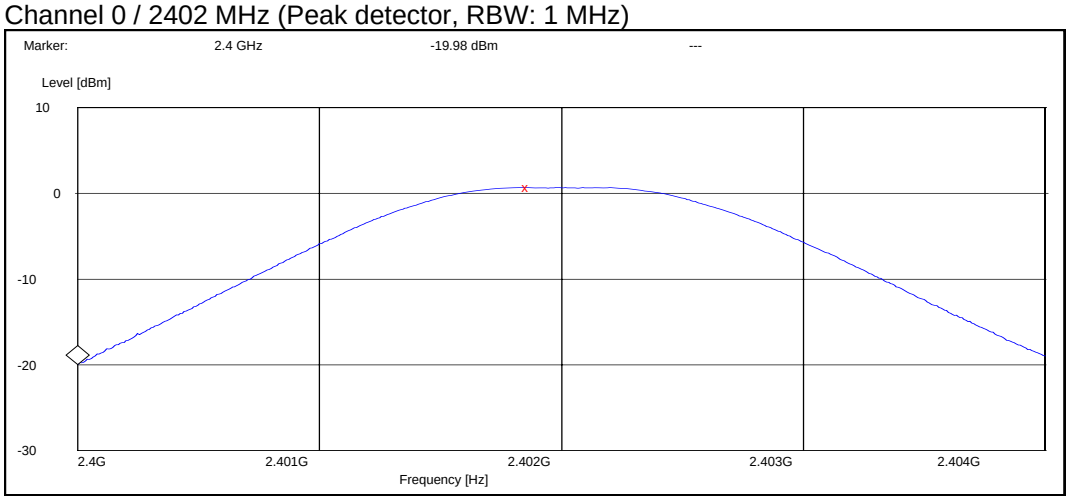
3.2. Bluetooth Test results

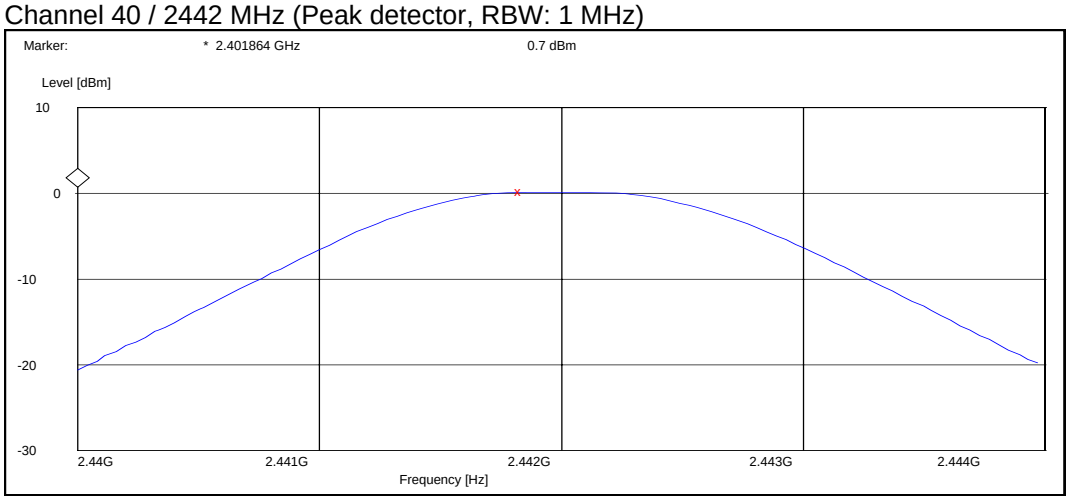
3.2.1 GSFK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	0.70	1.175	Passed
40 / 2442	0.20	1.047	Passed
78 / 2480	-1.60	0.692	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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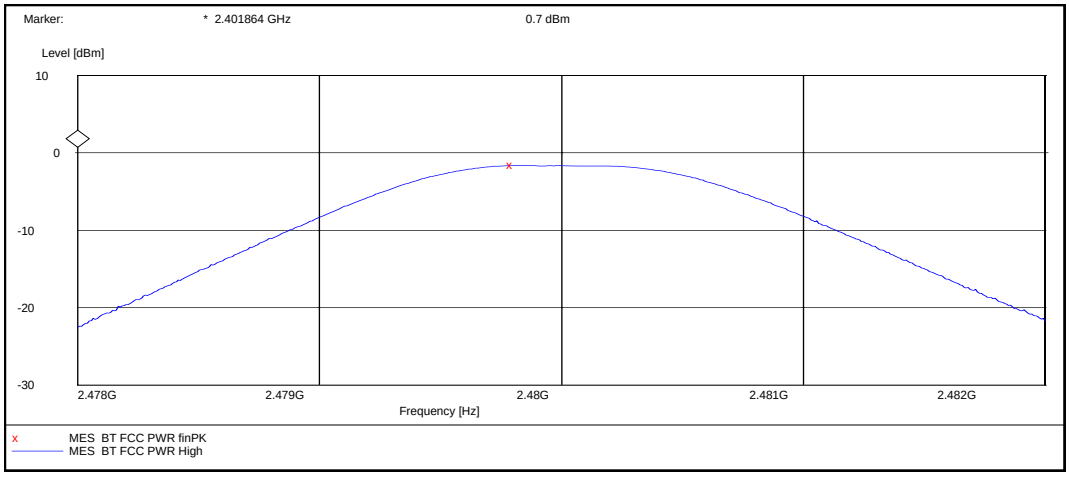
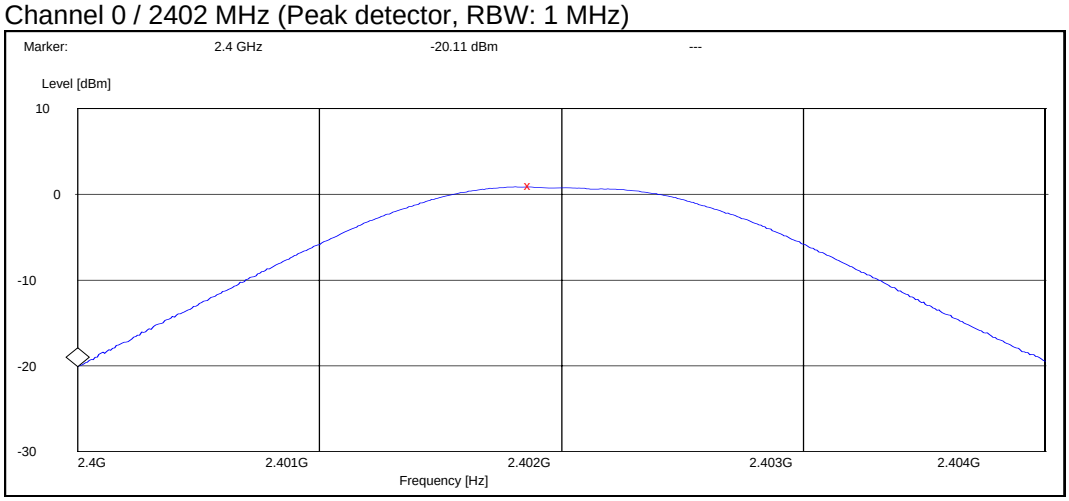


3.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	1.00	1.259	Passed
39 / 2441	0.00	1.000	Passed
78 / 2480	-2.20	0.603	Passed

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



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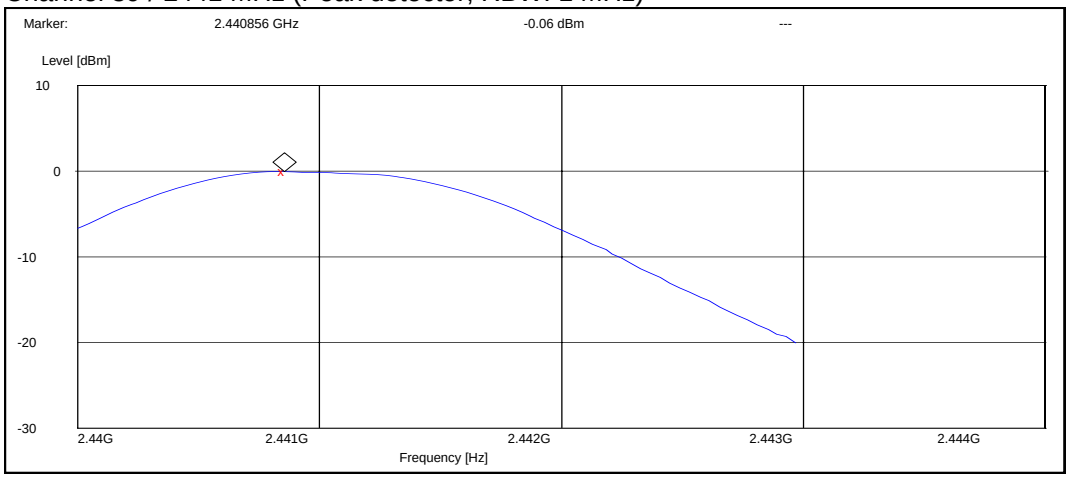
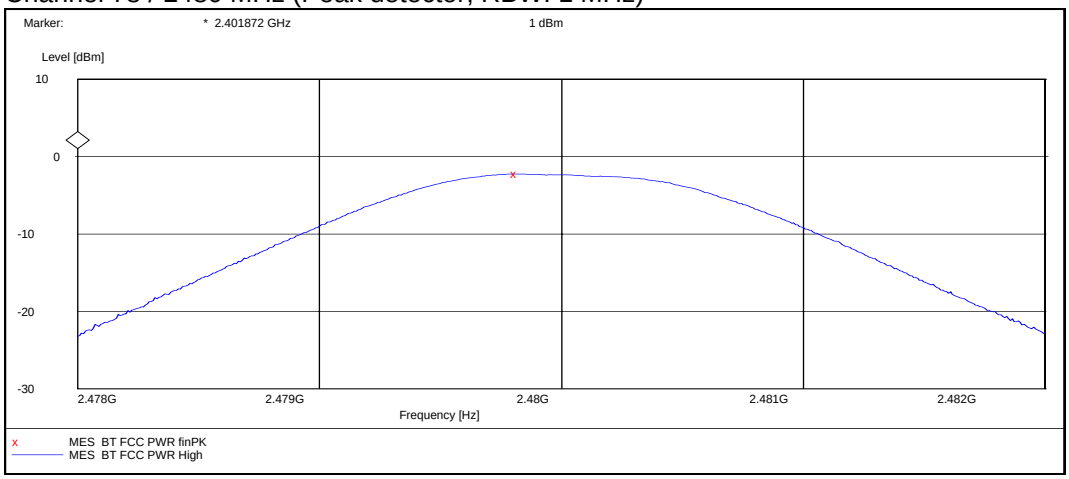
Channel 39 / 2441 MHz (Peak detector, RBW: 1 MHz)



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-209 Dut#27883
Accessories with DUT numbers	BL-4B Dut#27875, AC-3E Dut#27860 , HS-31 DUt#27874, MU-26 Dut#27861
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 53 / 1020
Date of measurements	13-09-2006
Measured by	Christian Andersen

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

4.2. Bluetooth Test results

4.2.1 GFSK modulation, PRBS packet type

4.2.1.1 Phone flip open

Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	32.71	Passed
78 / 2480	39.06	Passed
Hopping on, low end	30.92	Passed
Hopping on, high end	32.28	Passed

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	46.19	Passed
78 / 2480	54.11	Passed
Hopping on, low end	44.85	Passed
Hopping on, high end	53.33	Passed

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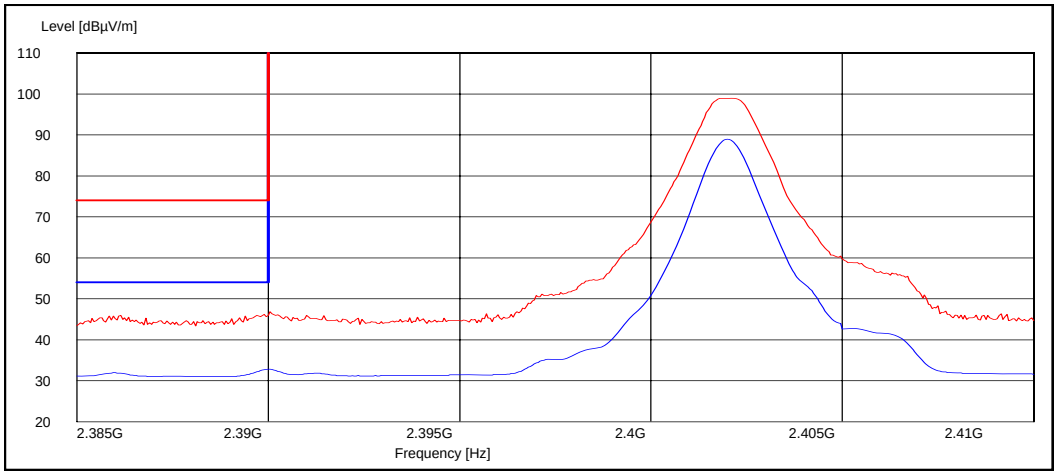
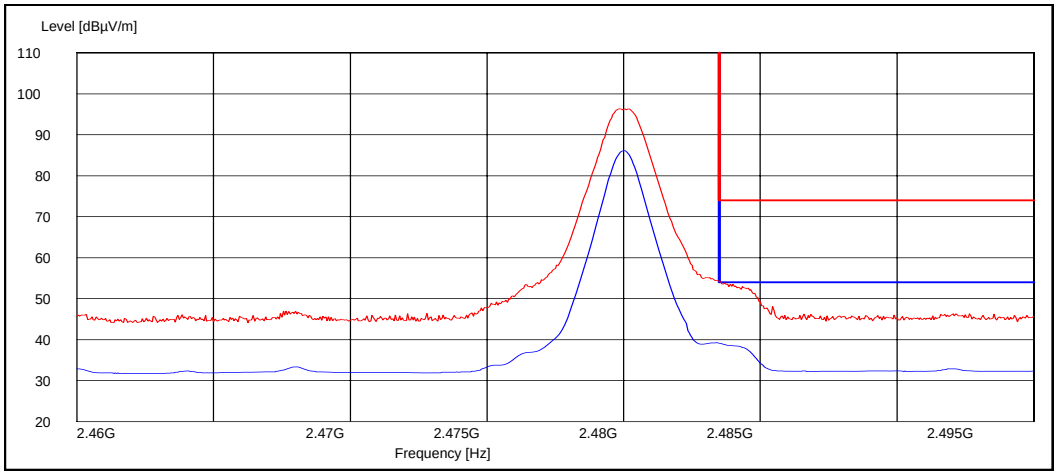
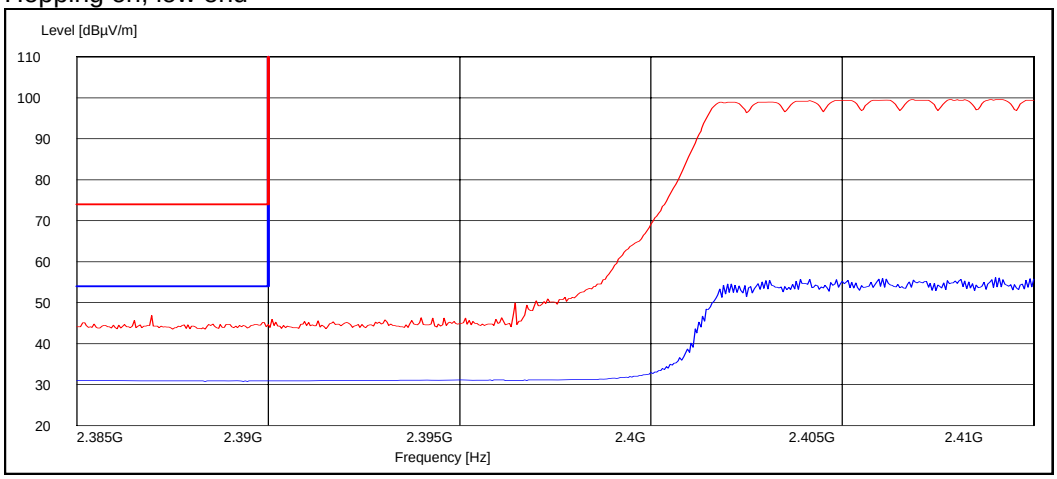
Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



Hopping on, low end



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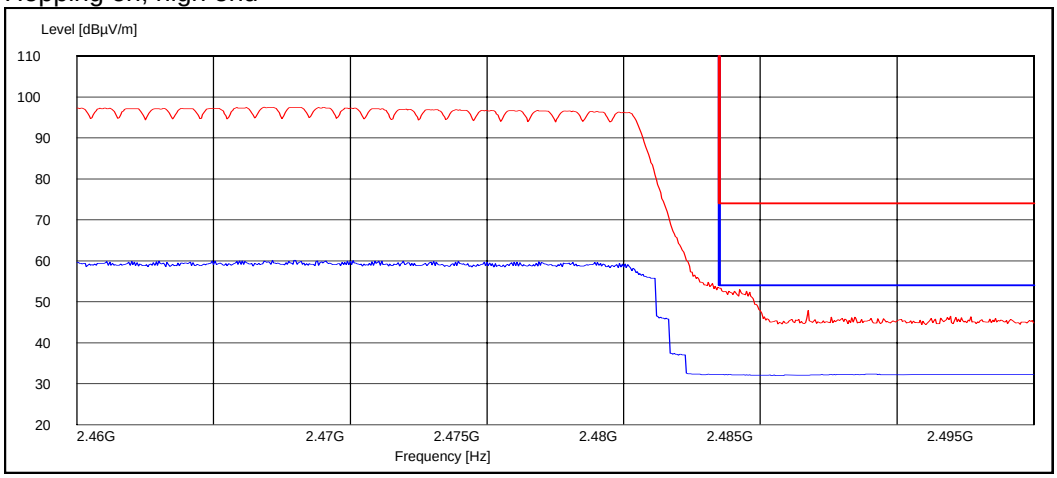
Hopping on, high end



4.2.1.2 Phone flip closed

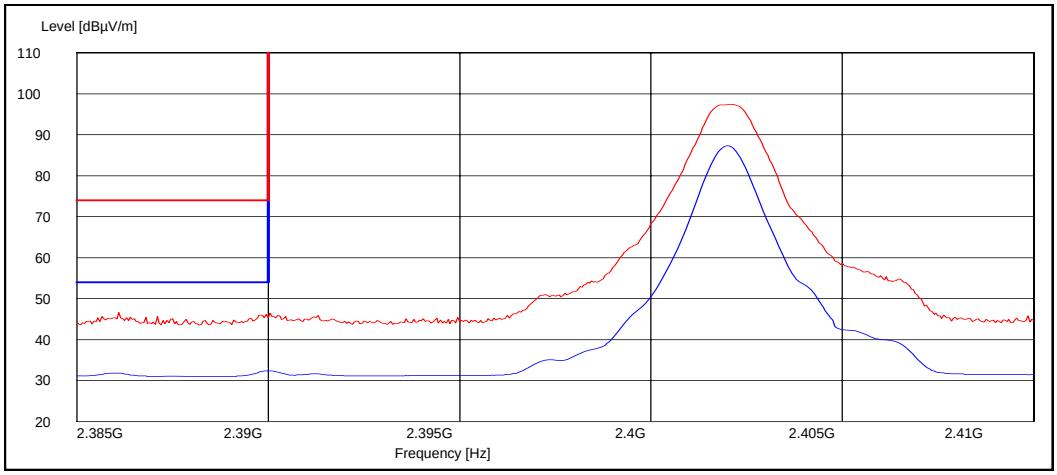
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	32.40	Passed
78 / 2480	38.54	Passed
Hopping on, low end	30.91	Passed
Hopping on, high end	32.28	Passed

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	46.19	Passed
78 / 2480	54.25	Passed
Hopping on, low end	45.80	Passed
Hopping on, high end	53.71	Passed

Channel 0 / 2402 MHz



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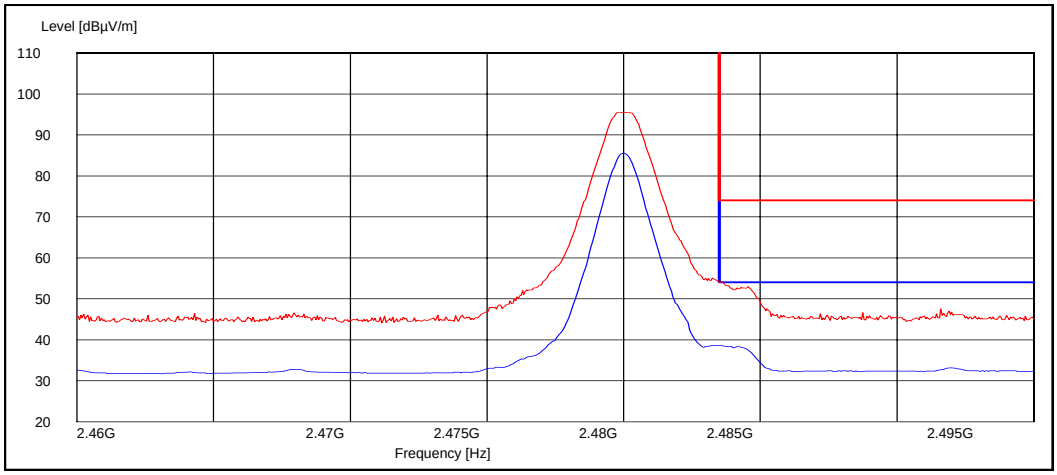
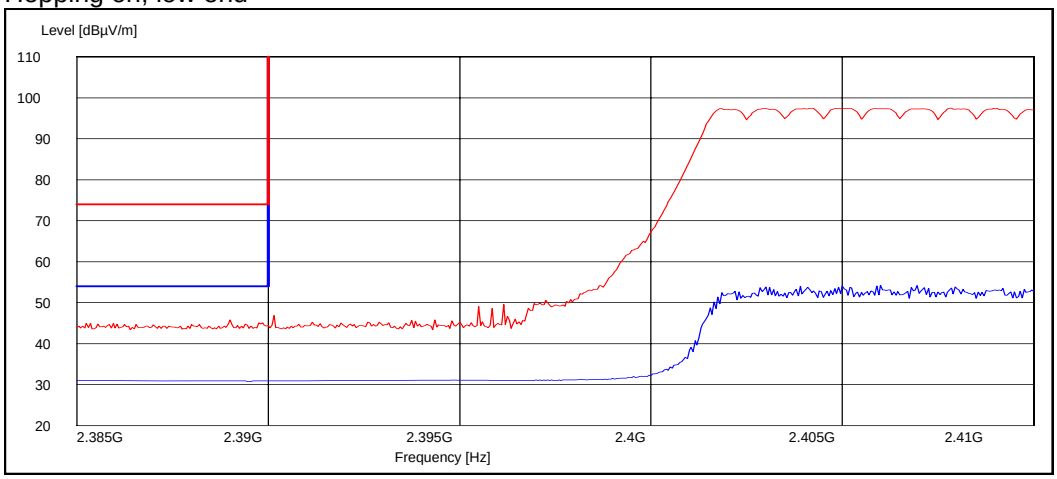
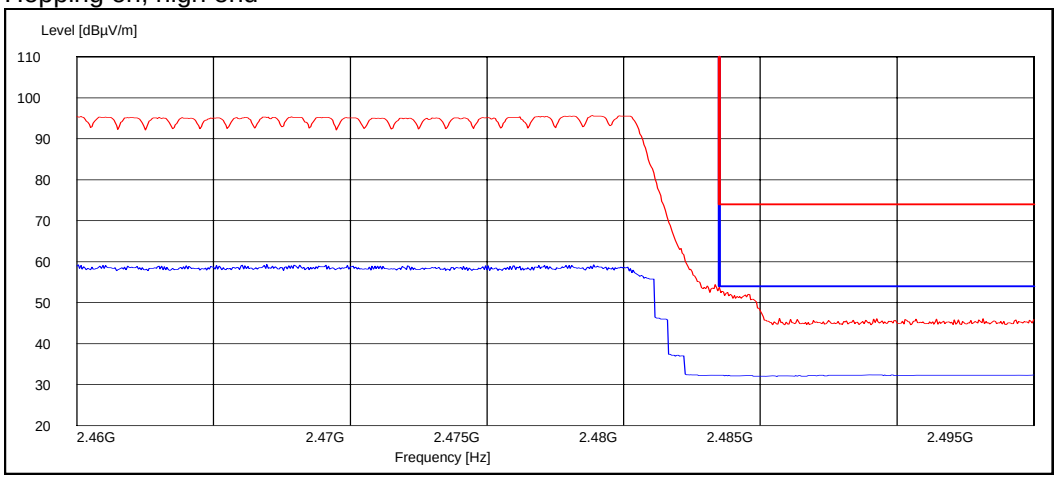
Channel 78 / 2480 MHz



Hopping on, low end



Hopping on, high end



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4.2.2 8DPSK modulation, PRBS packet type

4.2.2.1 Phone flip open

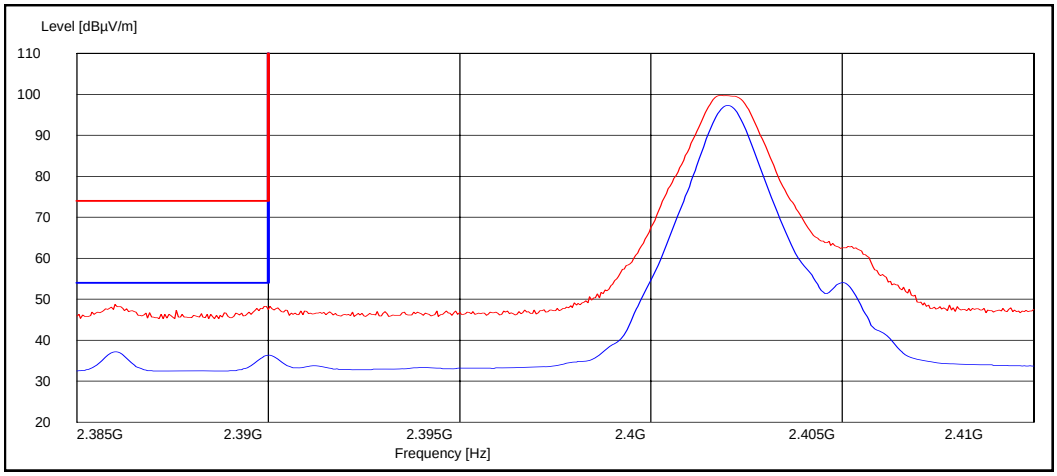
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	36.34	Passed
78 / 2480	42.29	Passed
Hopping on, low end	31.52	Passed
Hopping on, high end	32.52	Passed

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	48.31	Passed
78 / 2480	56.49	Passed
Hopping on, low end	47.20	Passed
Hopping on, high end	54.35	Passed

Channel 0 / 2402 MHz



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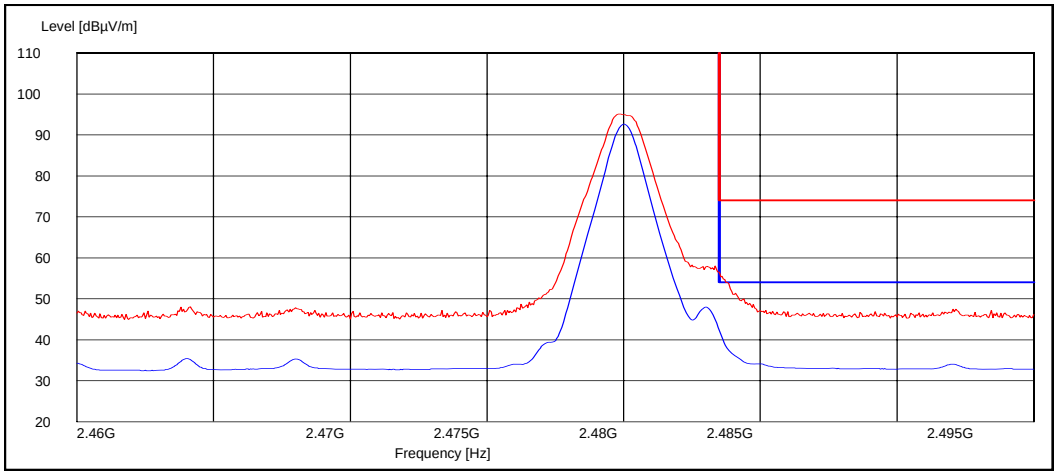
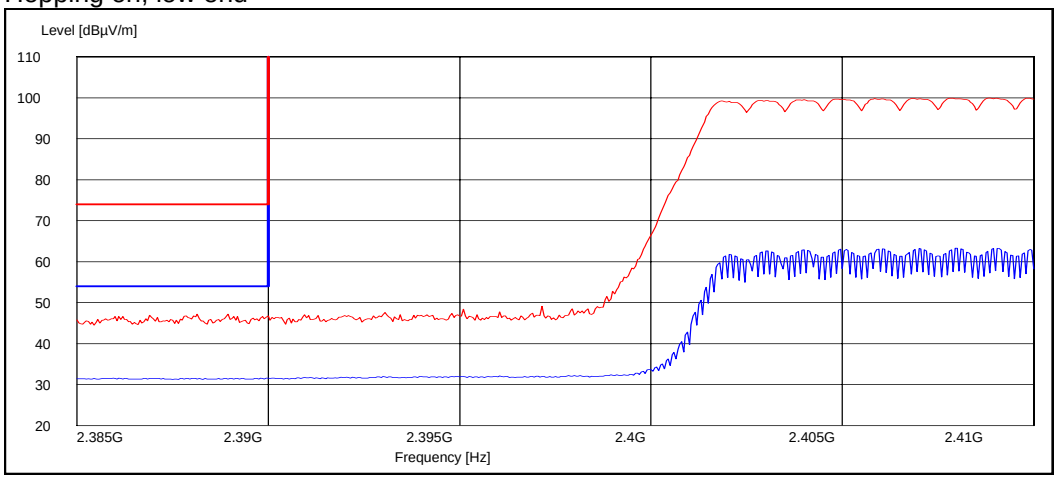
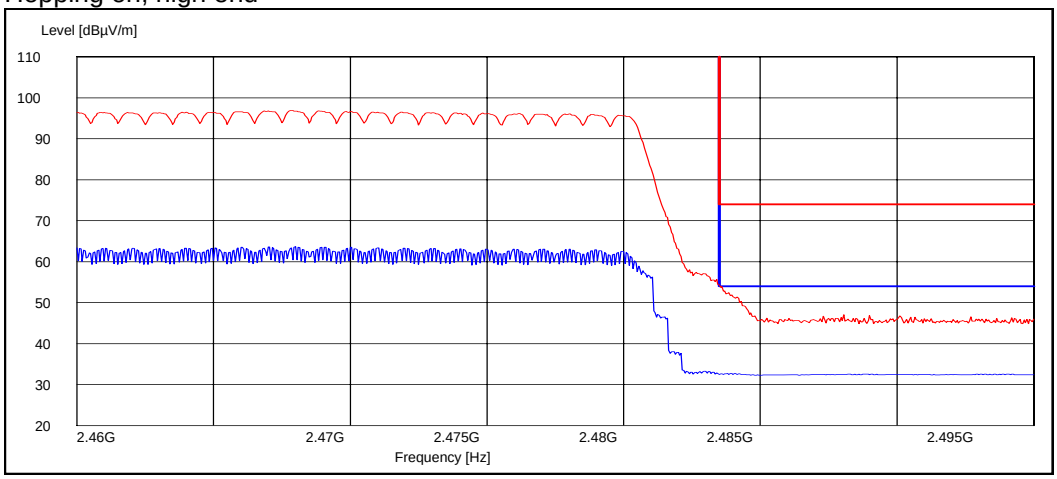
Channel 78 / 2480 MHz



Hopping on, low end



Hopping on, high end



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4.2.2.2 Phone flip closed

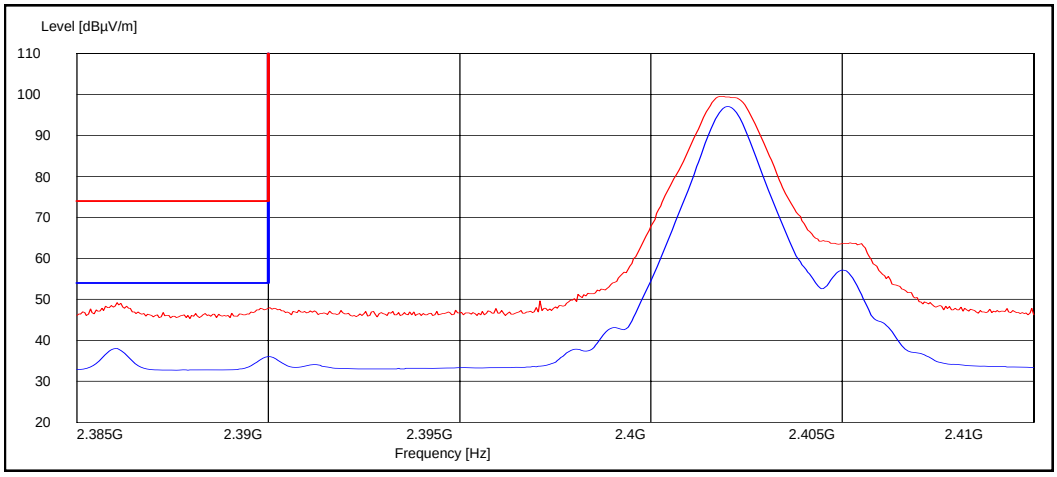
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	38.05	Passed
78 / 2480	41.23	Passed
Hopping on, low end	31.42	Passed
Hopping on, high end	32.64	Passed

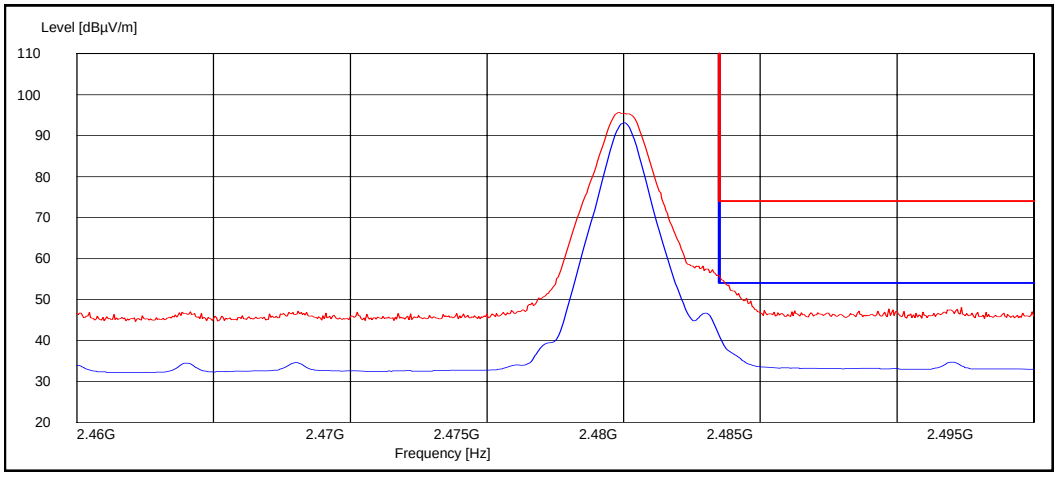
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	49.17	Passed
78 / 2480	55.82	Passed
Hopping on, low end	47.21	Passed
Hopping on, high end	53.94	Passed

Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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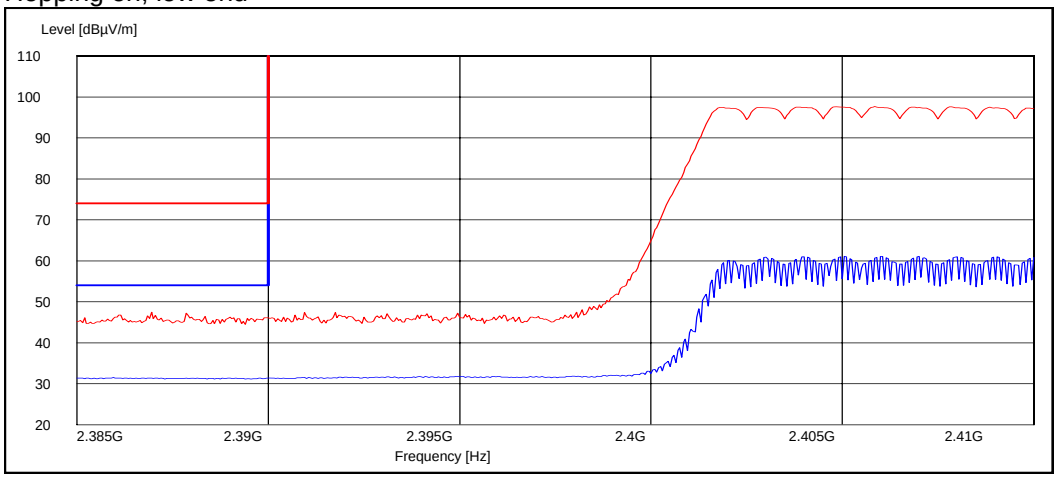
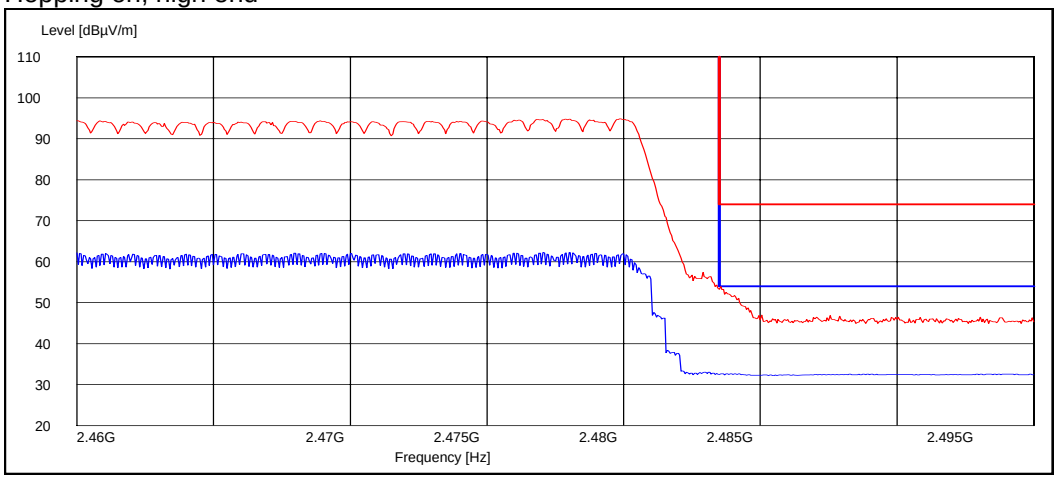
Hopping on, low end



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-209 dut 27878, BL-4B dut 27877
Accessories with DUT numbers	MU-26 dut 27861, AC-3E dut 27860, HS-31 dut 27874
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.1 / 46.0 1014.8
Date of measurements	24-08-2006
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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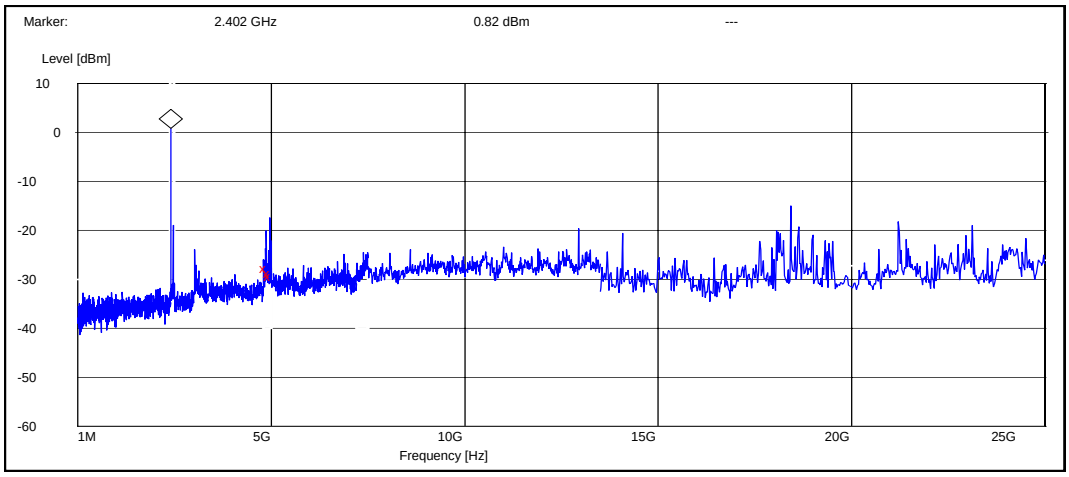
5.2. Bluetooth Test results

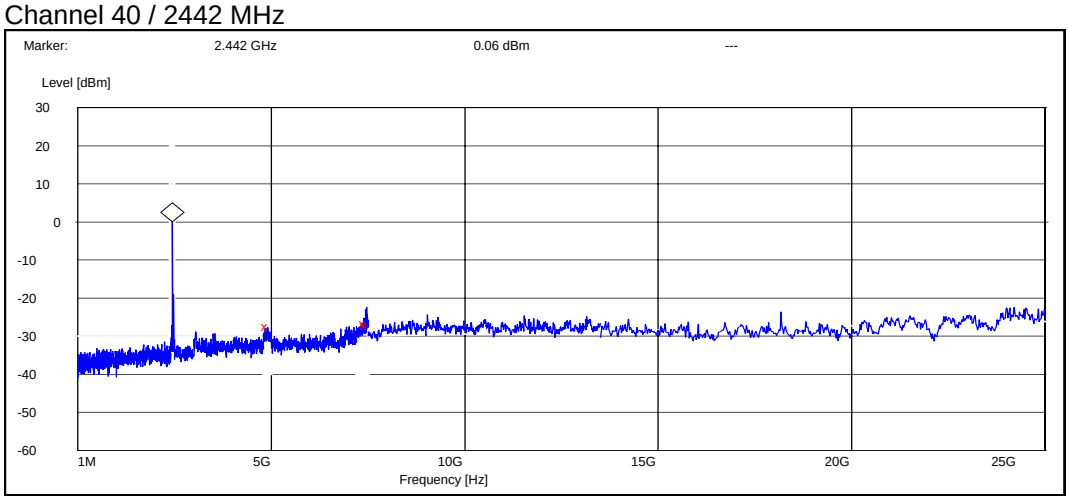
5.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4876.400000	-23.702054	Passed
7281.600000	-26.502054	Passed
7500.000000	-26.102054	Passed

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4906.800000	-27.458258	Passed
7432.200000	-26.658258	Passed
7467.600000	-27.258258	Passed

Channel 78 / 2480 MHz

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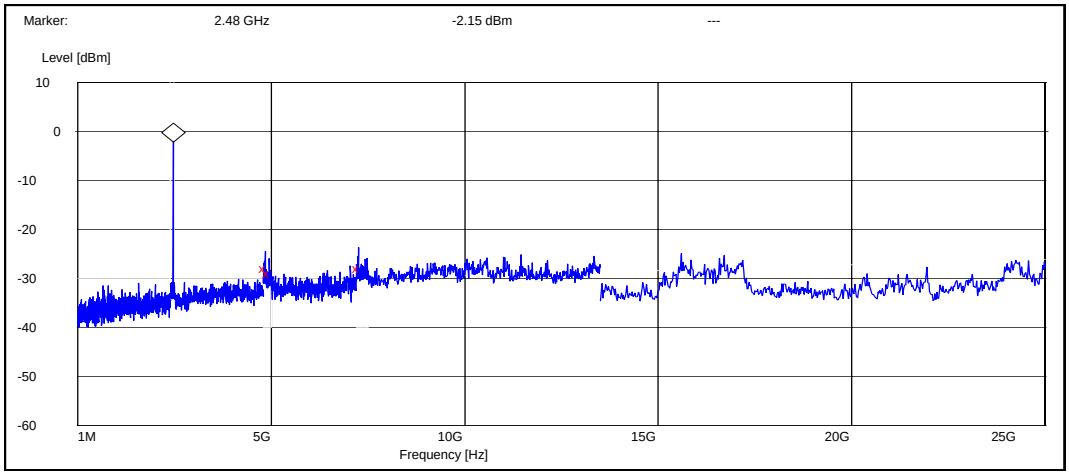
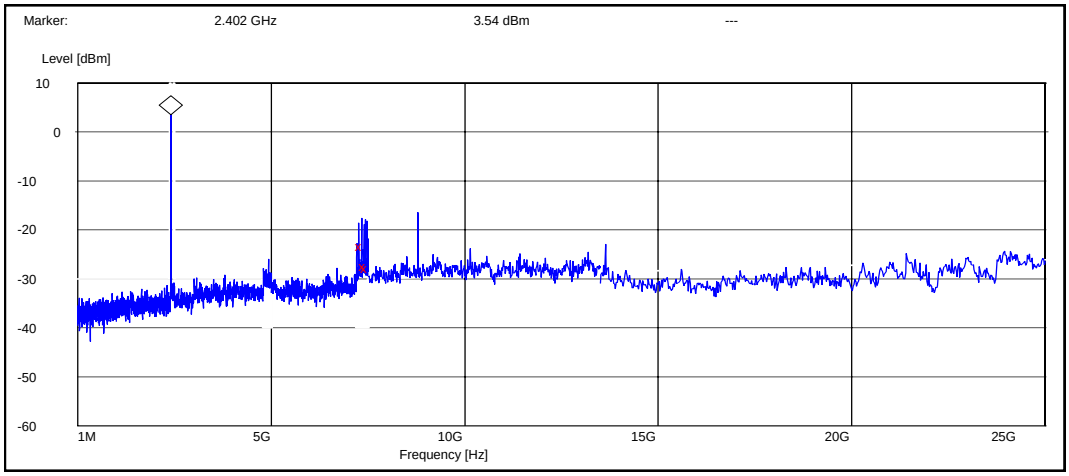


Frequency [MHz]	P [dBc]	Result
4876.400000	-23.702054	Passed
7281.600000	-26.502054	Passed
7500.000000	-26.102054	Passed

5.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
7346.400000	-26.838916	Passed
7438.800000	-30.938916	Passed
7478.400000	-31.438916	Passed

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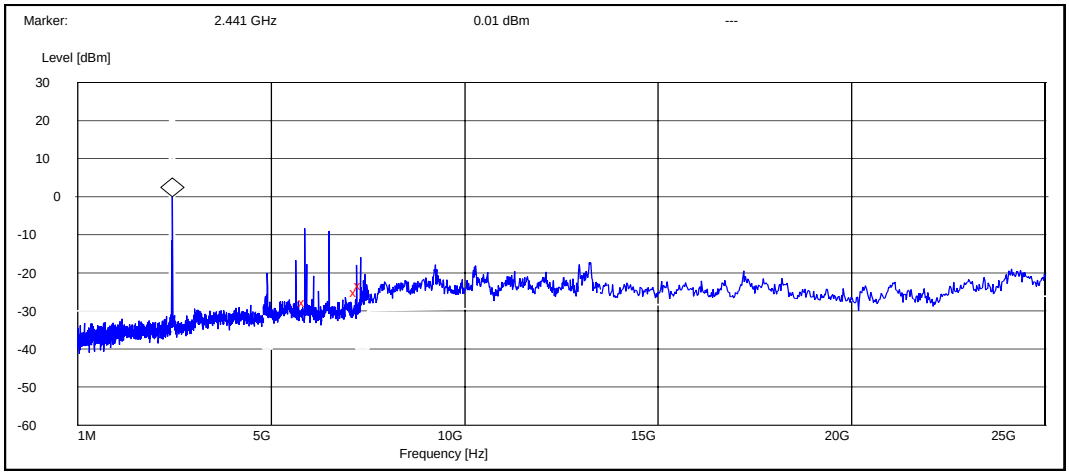
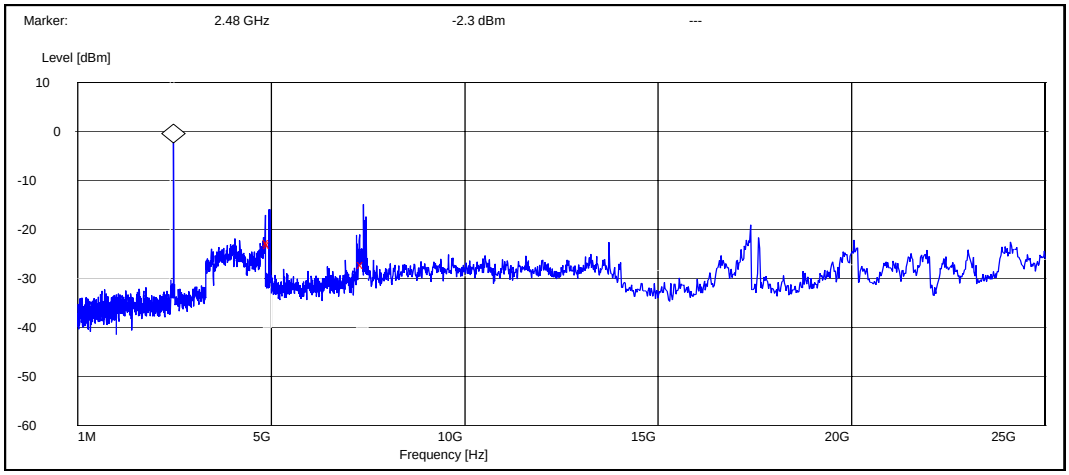
Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
5871.200000	-27.908551	Passed
7201.800000	-25.208551	Passed
7311.000000	-23.308551	Passed

Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4848.000000	-25.751037	Passed
4955.200000	-26.751037	Passed
7255.800000	-25.751037	Passed

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6. Spurious radiated emissions

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

EUT with DUT number	RM-209 Dut#27883
Accessories with DUT numbers	BL-4B Dut#27875, AC-3E Dut#27860 , HS-31 DUt#27874, MU-26 Dut#27861
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 53 / 1020
Date of measurements	12-09-2006
Measured by	Christian Andersen

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

6.2.1.1 Phone flip open

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	37.30	73.28	39.30	-2.00	HORIZONTAL	Passed
7206.000000	40.00	100.00	35.80	4.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	24.20	16.22	26.20	-2.00	VERTICAL	Passed
7206.000000	26.90	22.13	22.70	4.20	VERTICAL	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
30.800000	27.10	22.65	40.60	-13.50	VERTICAL	Passed
37.895391	18.60	8.51	36.60	-18.00	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4911.319639	38.20	81.28	39.90	-1.70	HORIZONTAL	Passed
4912.823647	38.70	86.10	40.40	-1.70	VERTICAL	Passed
7382.757515	41.80	123.03	37.00	4.80	VERTICAL	Passed
7421.335671	41.90	124.45	37.00	4.90	VERTICAL	Passed
17879.761523	58.20	812.83	32.80	25.40	VERTICAL	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
4911.819639	24.50	16.79	26.20	-1.70	HORIZONTAL	Passed
4915.323647	25.10	17.99	26.70	-1.60	VERTICAL	Passed
7375.757515	28.60	26.92	24.00	4.60	VERTICAL	Passed
7414.335671	29.10	28.51	24.00	5.10	VERTICAL	Passed
17877.261523	44.90	175.79	19.50	25.40	VERTICAL	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	37.70	76.74	39.30	-1.60	VERTICAL	Passed
7440.000000	41.40	117.49	36.50	4.90	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	25.30	18.41	26.90	-1.60	VERTICAL	Passed
7440.000000	28.20	25.70	23.30	4.90	VERTICAL	Passed

6.2.1.2 Phone flip closed

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	37.20	72.44	39.20	-2.00	VERTICAL	Passed
7206.000000	39.30	92.26	35.10	4.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	24.10	16.03	26.10	-2.00	VERTICAL	Passed
7206.000000	26.90	22.13	22.70	4.20	VERTICAL	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
30.700000	24.10	16.03	37.60	-13.50	VERTICAL	Passed
37.735872	10.30	3.27	28.20	-17.90	VERTICAL	Passed

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Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4921.835671	37.70	76.74	39.20	-1.50	VERTICAL	Passed
4964.921844	38.10	80.35	39.60	-1.50	VERTICAL	Passed
7419.339679	42.00	125.89	37.10	4.90	VERTICAL	Passed
17863.727455	58.40	831.76	33.20	25.20	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4918.835671	24.90	17.58	26.40	-1.50	VERTICAL	Passed
4957.421844	25.10	17.99	26.70	-1.60	VERTICAL	Passed
7423.839679	29.00	28.18	24.20	4.80	VERTICAL	Passed
17866.727455	44.90	175.79	19.60	25.30	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	38.30	82.22	39.90	-1.60	VERTICAL	Passed
7440.000000	40.70	108.39	35.80	4.90	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	25.20	18.20	26.80	-1.60	VERTICAL	Passed
7440.000000	28.20	25.70	23.30	4.90	VERTICAL	Passed

6.2.2 8DPSK modulation, PRBS packet type

6.2.2.1 Phone flip open

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	36.70	68.39	38.70	-2.00	HORIZONTAL	Passed
7206.000000	40.90	110.92	36.70	4.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	24.20	16.22	26.20	-2.00	VERTICAL	Passed
7206.000000	27.20	22.91	23.00	4.20	VERTICAL	Passed

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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
30.700000	22.50	13.34	36.00	-13.50	VERTICAL	Passed
37.695391	11.70	3.85	29.50	-17.80	VERTICAL	Passed
62.083968	15.20	5.75	45.70	-30.50	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4905.313627	37.50	74.99	39.30	-1.80	HORIZONTAL	Passed
4920.839679	37.60	75.86	39.10	-1.50	VERTICAL	Passed
7371.735471	42.70	136.46	38.10	4.60	VERTICAL	Passed
7412.331663	42.20	128.82	37.10	5.10	VERTICAL	Passed
17866.741483	58.00	794.33	32.70	25.30	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4907.313627	24.80	17.38	26.60	-1.80	HORIZONTAL	Passed
4921.339679	25.10	17.99	26.60	-1.50	VERTICAL	Passed
7370.735471	28.90	27.86	24.30	4.60	VERTICAL	Passed
7418.831663	29.50	29.85	24.50	5.00	VERTICAL	Passed
17874.741483	45.10	179.89	19.60	25.50	VERTICAL	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	37.90	78.52	39.50	-1.60	VERTICAL	Passed
7440.000000	41.40	117.49	36.50	4.90	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	25.60	19.05	27.20	-1.60	VERTICAL	Passed
7440.000000	28.50	26.61	23.60	4.90	VERTICAL	Passed

6.2.2.2 Phone flip closed

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	37.90	78.52	39.90	-2.00	VERTICAL	Passed
7206.000000	40.30	103.51	36.10	4.20	VERTICAL	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
4804.000000	24.50	16.79	26.50	-2.00	VERTICAL	Passed
7206.000000	27.20	22.91	23.00	4.20	VERTICAL	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
30.600000	24.70	17.18	38.10	-13.40	VERTICAL	Passed
37.976353	13.30	4.62	31.30	-18.00	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4963.923848	38.40	83.18	39.90	-1.50	VERTICAL	Passed
7338.171343	40.80	109.65	36.20	4.60	VERTICAL	Passed
7420.837675	42.20	128.82	37.30	4.90	VERTICAL	Passed
7432.367735	41.70	121.62	36.90	4.80	HORIZONTAL	Passed
17853.213427	57.80	776.25	32.90	24.90	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4965.423848	25.20	18.20	26.70	-1.50	VERTICAL	Passed
7338.671343	28.20	25.70	23.60	4.60	VERTICAL	Passed
7421.337675	29.30	29.17	24.40	4.90	VERTICAL	Passed
7430.867735	28.50	26.61	23.70	4.80	HORIZONTAL	Passed
17859.713427	44.90	175.79	19.80	25.10	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	38.20	81.28	39.80	-1.60	VERTICAL	Passed
7440.000000	41.40	117.49	36.50	4.90	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	25.60	19.05	27.20	-1.60	VERTICAL	Passed
7440.000000	28.40	26.30	23.50	4.90	VERTICAL	Passed

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7. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-209 Dut # 27882
Accessories with DUT numbers	BL-4B Dut # 27876 + AC-3E Dut # 29076 + HS-31 Dut # 27874 + MU-26 Dut # 27861
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	23.6 / 50.5 1007.9
Date of measurements	22-08-2006
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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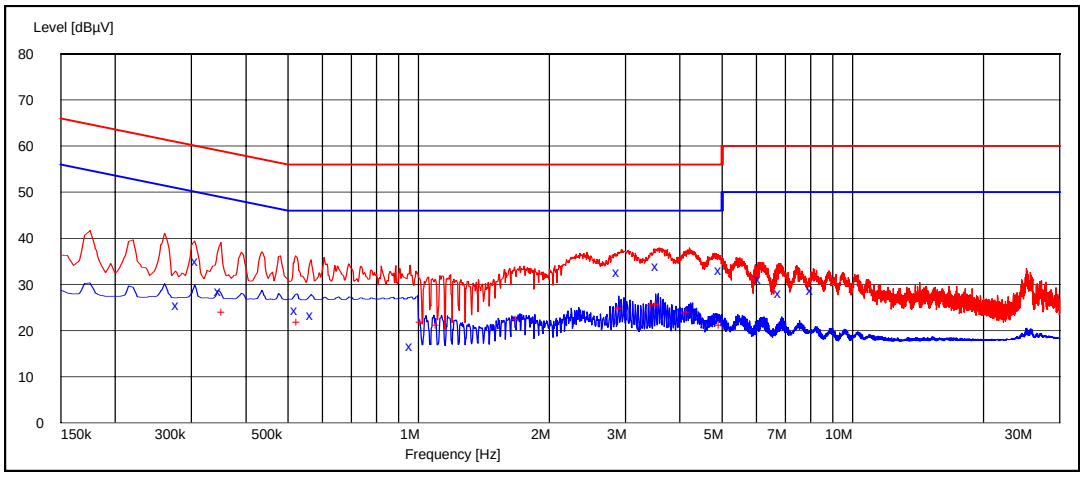
7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.280000	25.60	L1	Passed
0.310000	35.00	L1	Passed
0.350000	28.60	L1	Passed
0.525000	24.50	L1	Passed
0.570000	23.30	L1	Passed
0.965000	16.60	L1	Passed
2.900000	32.70	N	Passed
3.570000	33.90	L1	Passed
4.975000	33.20	N	Passed
6.140000	31.10	L1	Passed
6.830000	28.10	L1	Passed
8.100000	28.80	L1	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.355000	24.00	L1	Passed
0.530000	21.80	N	Passed
1.020000	21.90	N	Passed
1.110000	21.20	N	Passed
1.695000	22.40	N	Passed
2.920000	24.90	N	Passed
3.470000	25.50	N	Passed
3.565000	25.70	N	Passed
3.605000	25.60	N	Passed
4.200000	24.10	N	Passed
4.975000	21.20	N	Passed

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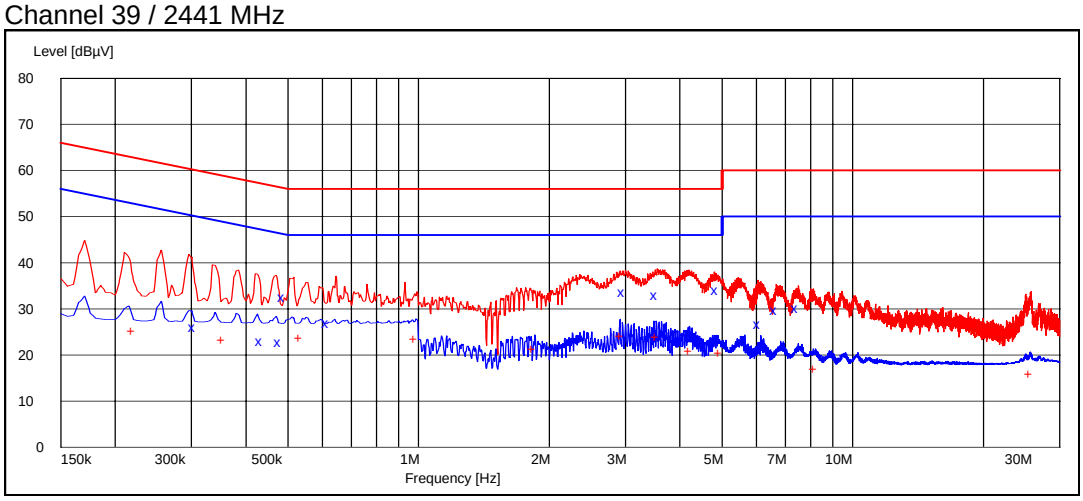
7.2.2 8DPSK modulation, PRBS packet type

Channel 39 / 2441 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.305000	26.10	L1	Passed
0.435000	23.00	N	Passed
0.480000	22.80	L1	Passed
0.490000	32.60	L1	Passed
0.620000	26.80	L1	Passed
2.975000	33.60	N	Passed
3.535000	33.00	N	Passed
4.885000	34.00	N	Passed
6.100000	26.70	L1	Passed
6.665000	29.80	L1	Passed
7.460000	30.20	L1	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.220000	25.30	L1	Passed
0.355000	23.20	L1	Passed
0.535000	23.60	N	Passed
0.985000	23.50	N	Passed
1.845000	21.20	N	Passed
2.940000	24.00	N	Passed
3.545000	23.90	N	Passed
4.235000	20.90	N	Passed
4.960000	20.30	N	Passed
8.215000	16.90	N	Passed
25.720000	15.80	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-209 dut 27878, BL-4B dut 27877
Accessories with DUT numbers	MU-26 dut 27861, AC-3E dut 27860, HS-31 dut 27874
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.1 / 46.0 1014.8
Date of measurements	24-08-2006
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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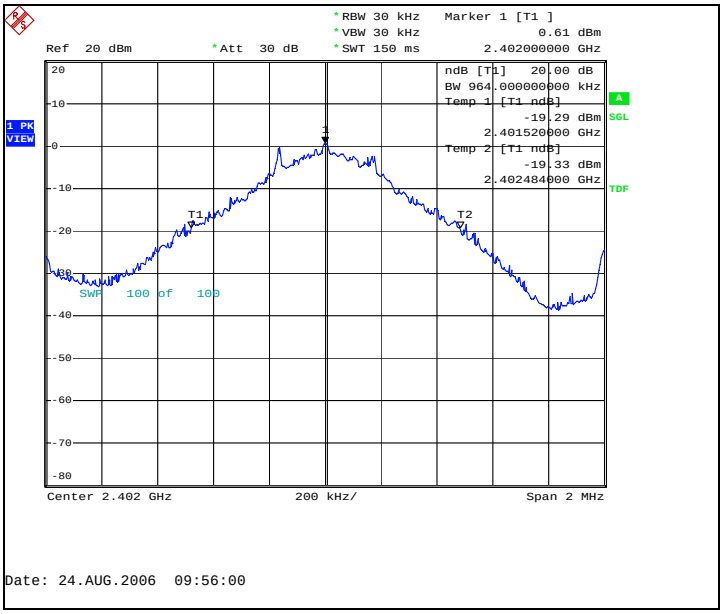
8.2. Bluetooth Test results

8.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	964.000	Passed
39 / 2441	936.000	Passed
78 / 2480	956.000	Passed

Channel 0 / 2402 MHz



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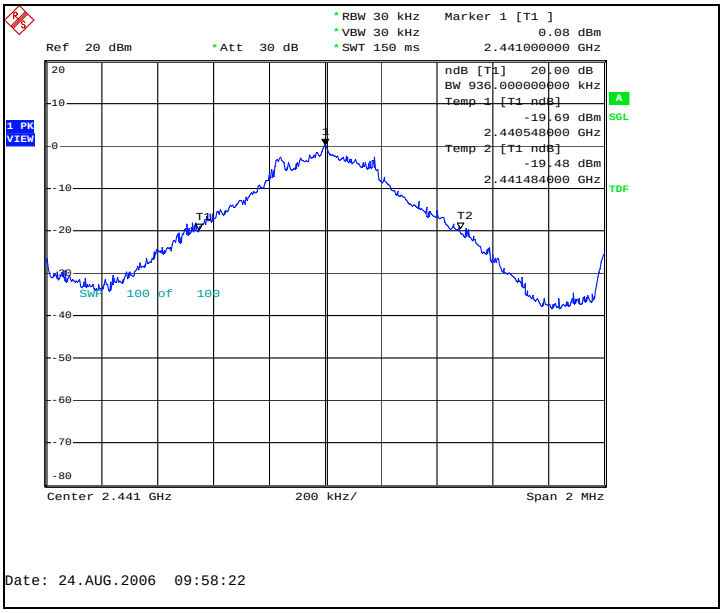
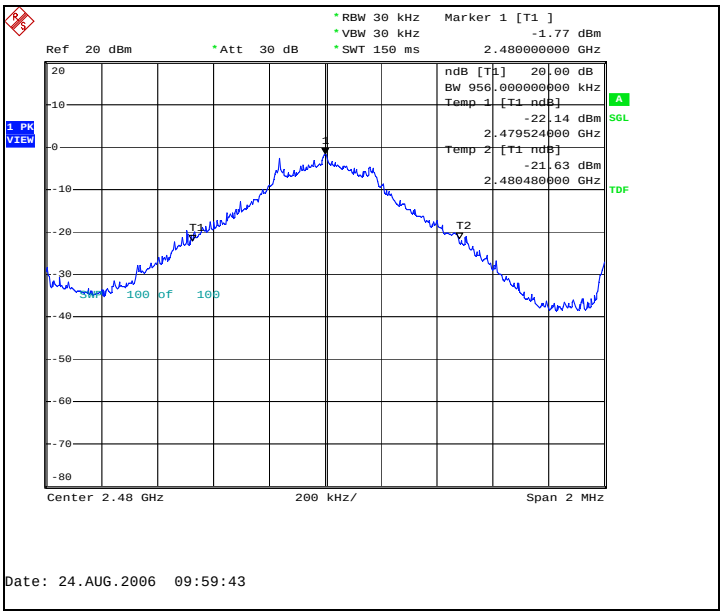
Channel 39 / 2441 MHz



Channel 78 / 2480 MHz



8.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	788.000	Passed
39 / 2441	636.000	Passed
78 / 2480	796.000	Passed

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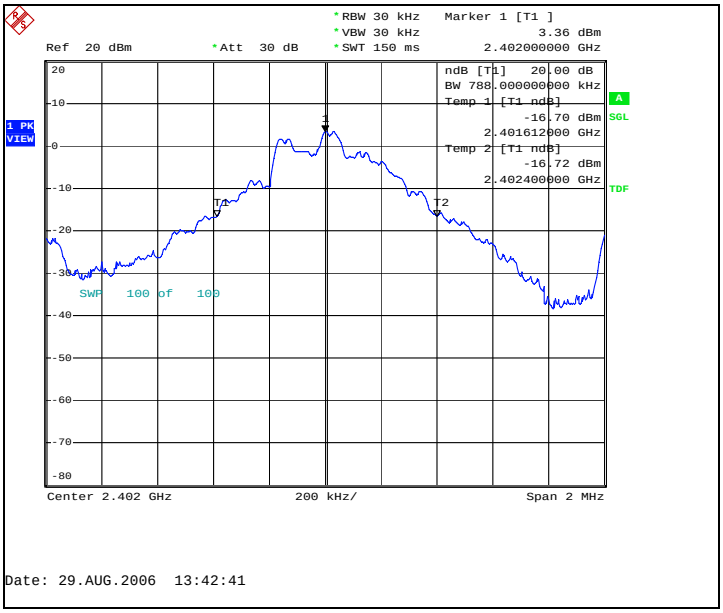
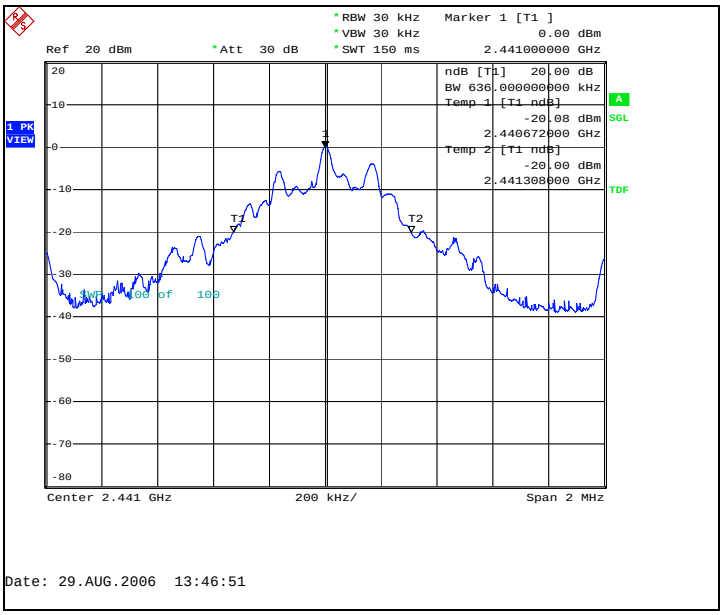
Channel 0 / 2402 MHz



Channel 39 / 2441 MHz



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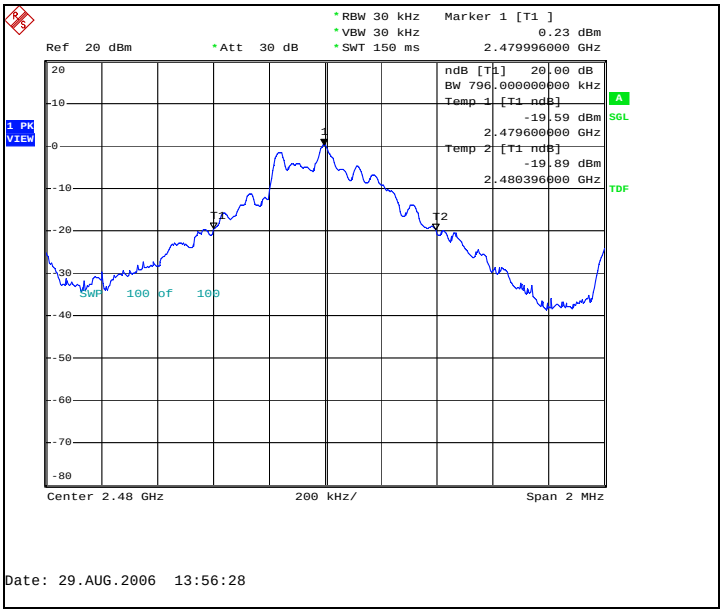
Channel 78 / 2480 MHz



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9. Carrier frequency separation

(FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-209 dut 27878, BL-4B dut 27877
Accessories with DUT numbers	MU-26 dut 27861, AC-3E dut 27860, HS-31 dut 27874
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.1 / 46.0 1014.8
Date of measurements	24-08-2006
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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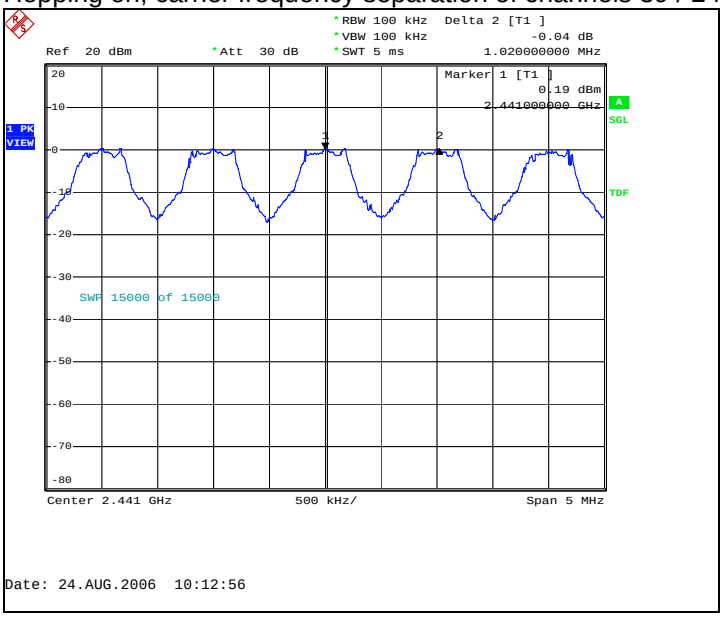
9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1020	Passed

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



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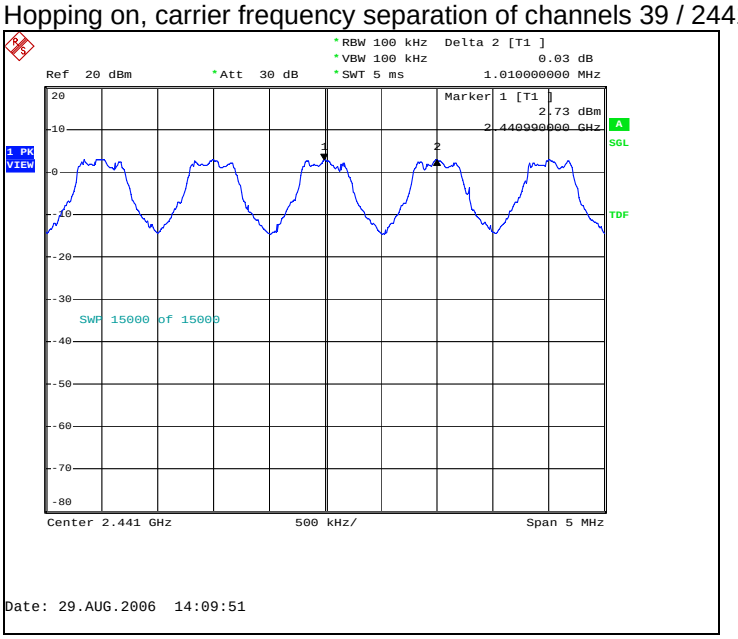
9.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1010	Passed

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-209 dut 27878, BL-4B dut 27877
Accessories with DUT numbers	MU-26 dut 27861, AC-3E dut 27860, HS-31 dut 27874
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.1 / 46.0 1014.8
Date of measurements	24-08-2006
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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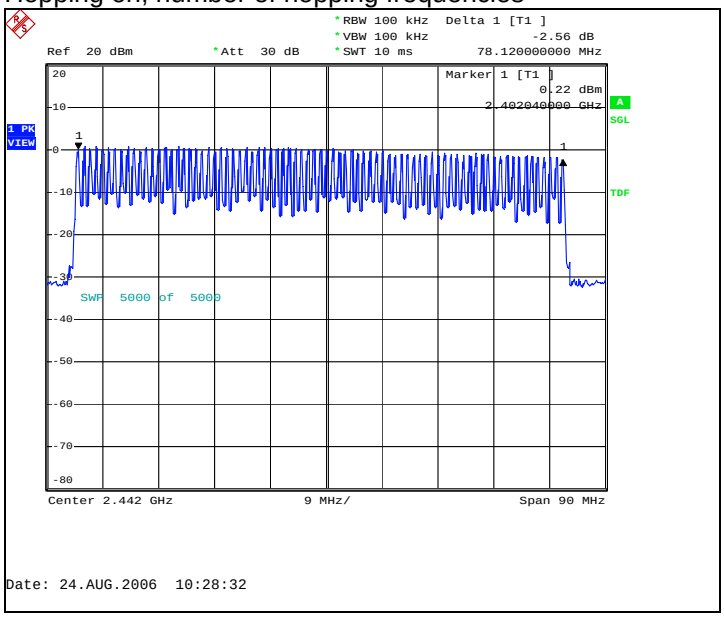
10.2. Bluetooth Test results

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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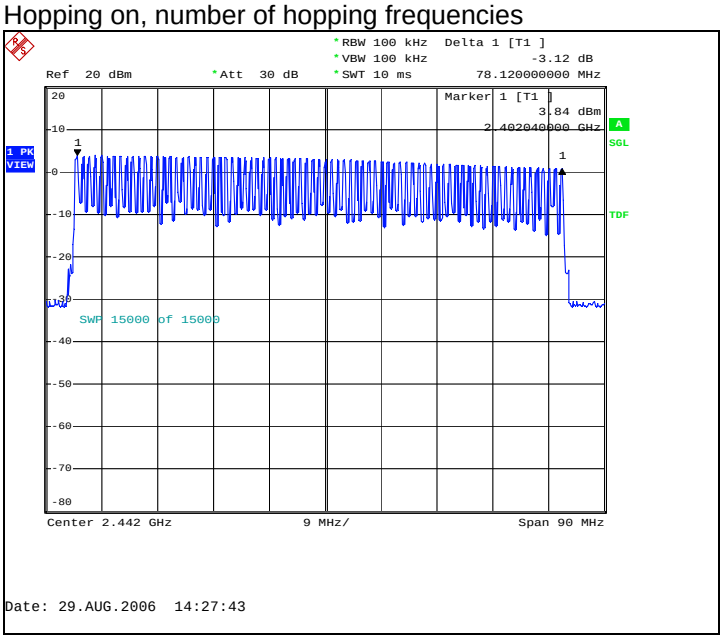
10.2.2 8DPSK modulation, PRBS packet type

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-209 dut 27878, BL-4B dut 27877
Accessories with DUT numbers	MU-26 dut 27861, AC-3E dut 27860, HS-31 dut 27874
Operation Voltage [V] / [Hz]	230/50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.1 / 46.0 1014.8
Date of measurements	24-08-2006
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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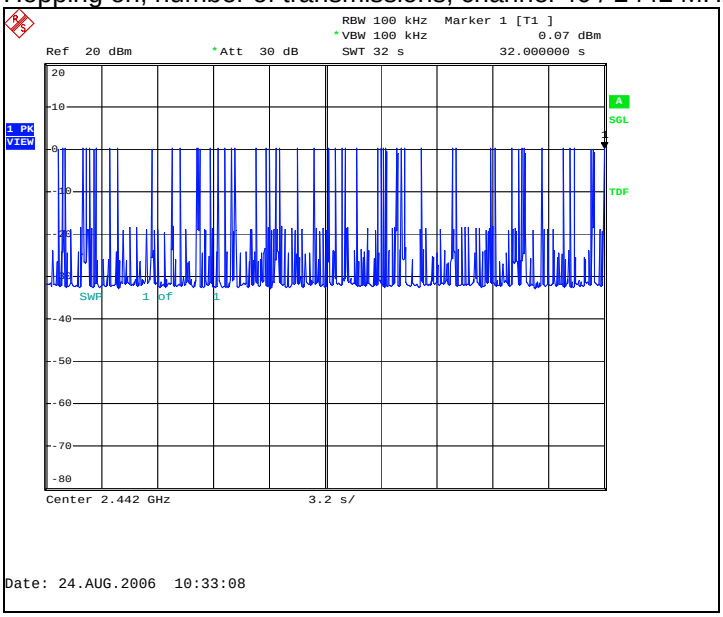
11.2. Bluetooth test results

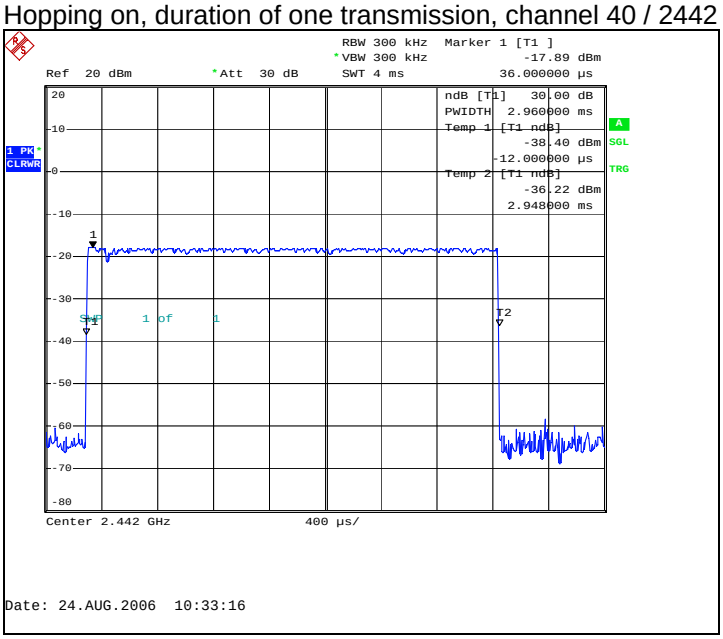
11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
56	2960.000	0.165760	Passed

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



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



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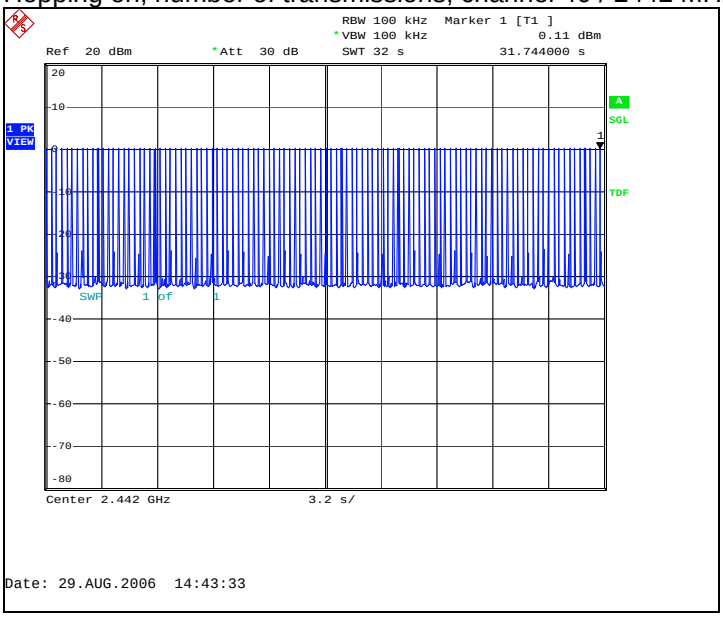
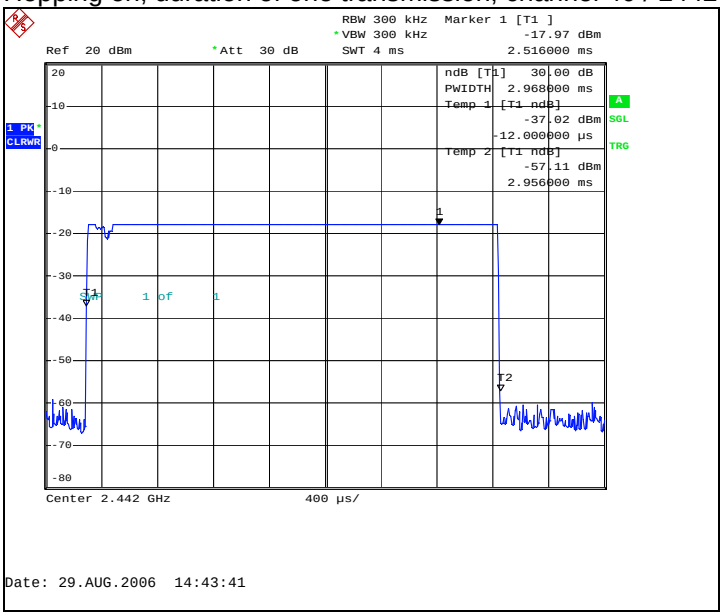
11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
108	2968.000	0.320544	Passed

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



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
18860	Ultra Broadband Antenna	HL562	Rohde&Schwarz	15B,15C,22,24

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Eq. No	Equipment	Type	Manufacturer	Used in
	Ultralog 30-3000MHz			
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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