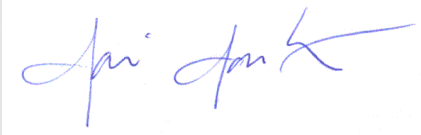
TCC Nokia

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

FCC Part 15C Compliance Test Report

Test Report no.:	Tre_FCC_0648_06.doc	**Date of Report:**	14.12.2006
Number of pages:	43	**Customer's Contact person:**	Pasi Tauriainen
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 P.O. Box 86 Joensuunkatu 7 FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 44277
FCC listing no.: **IC recognition no.:**	94436 3608		
Tested devices/ accessories:	**Bluetooth headset HS-78W / AC charger AC-3**		
FCC ID:	PYA1YH	**IC:**	661V-1YH
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 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:	 Digitally signed by Jari Jantunen Date: 2006.12.14 15:31:34 +02'00'		

Jari Jantunen, System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	30.11.2006
Testing completed	13.12.2006
The customer's contact person	Pasi Tauriainen
Test Plan referred to	\EMC\TESTPLAN\
Notes	-
Document name	T:\Projects\accessor\BT_Headset\Ikarus\EMC\Results\FCC\Tre_FCC_0648_06.doc

1.1. EUT and Accessory Information

The EUT is a Bluetooth device. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Bluetooth headset	HS-78W	822	B4.5	B3.3	RC4	**40891**
Bluetooth headset	HS-78W	803	B4.5	B3.3	RC4	**40888**
AC Charger	AC-3	-	1.3	1.1	-	**40890**

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(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 Tampere Laboratory.

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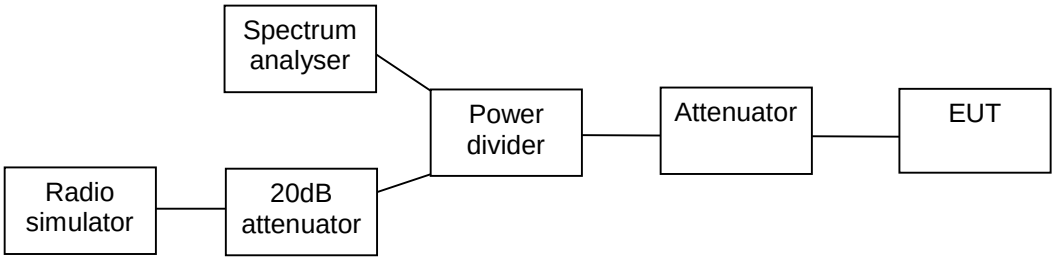
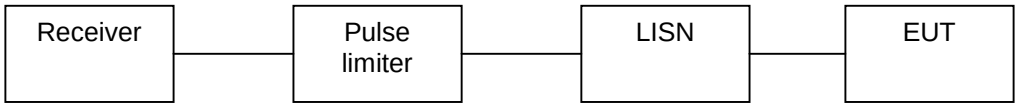
2. Test setups

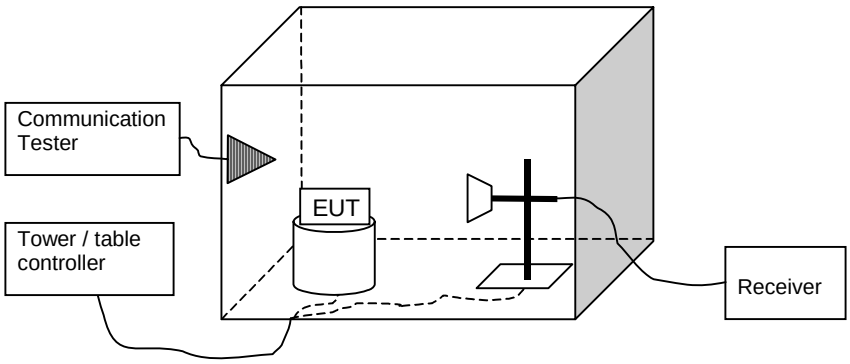
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



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

EUT with DUT number	HS-78W DUT 40888
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 101.1-101.3
Date of measurements	30.11-1.12.2006
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

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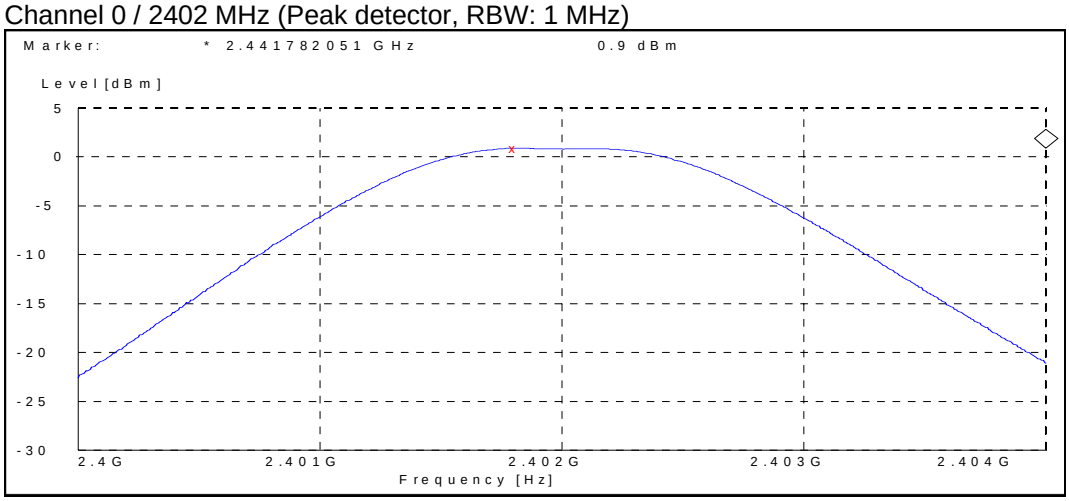
3.2. Bluetooth Test results

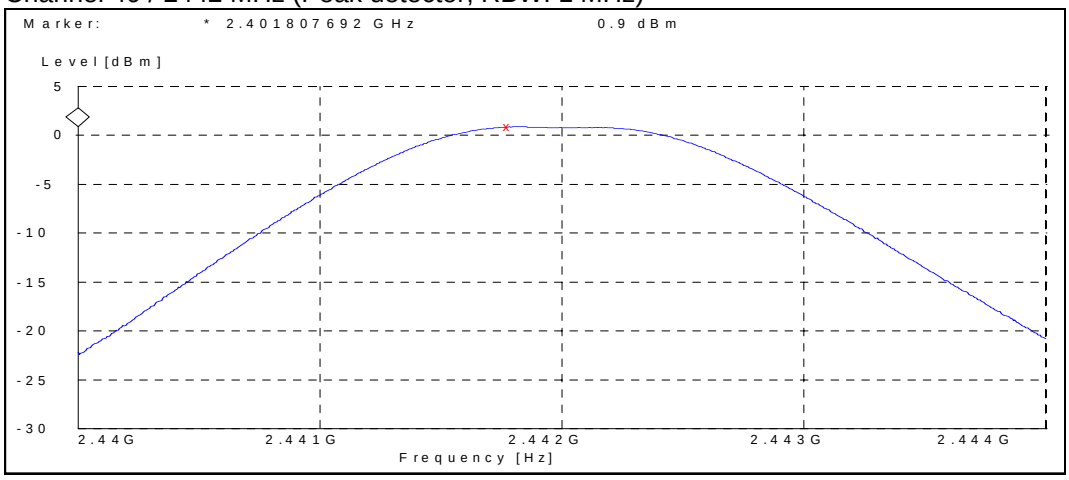
3.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	0.90	1.230	PASSED
40 / 2442	0.90	1.230	PASSED
78 / 2480	0.60	1.148	PASSED

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



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



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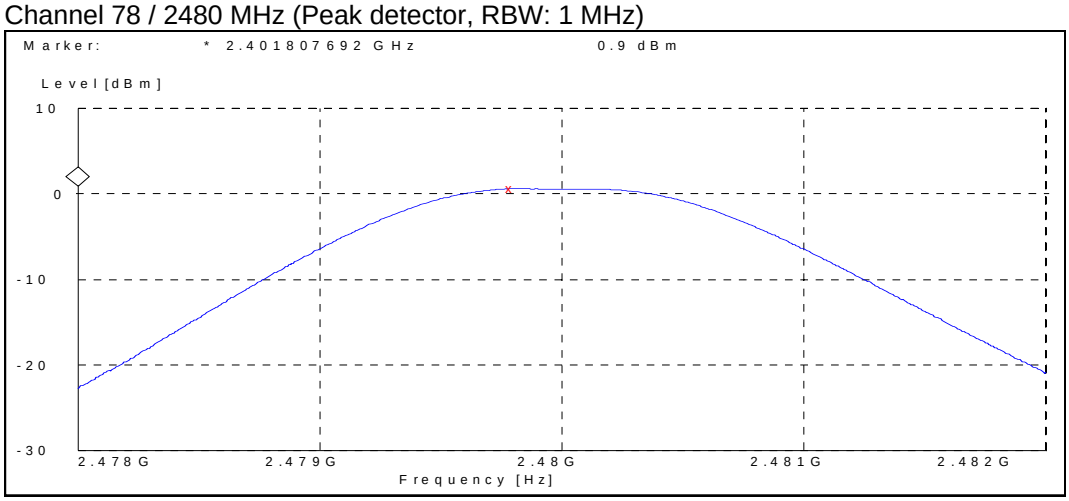
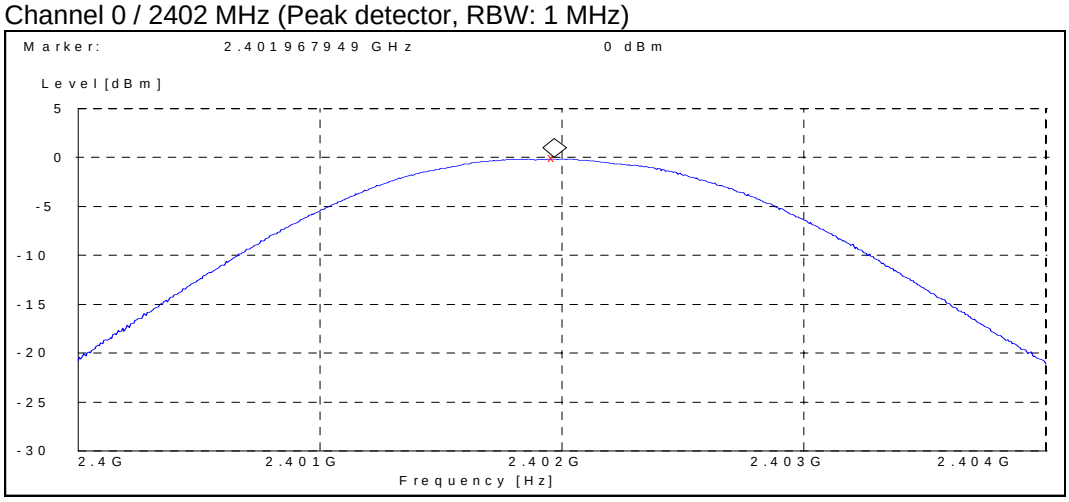
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



3.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	0.00	1.000	PASSED
40 / 2442	-0.20	0.955	PASSED
78 / 2480	-0.60	0.871	PASSED

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



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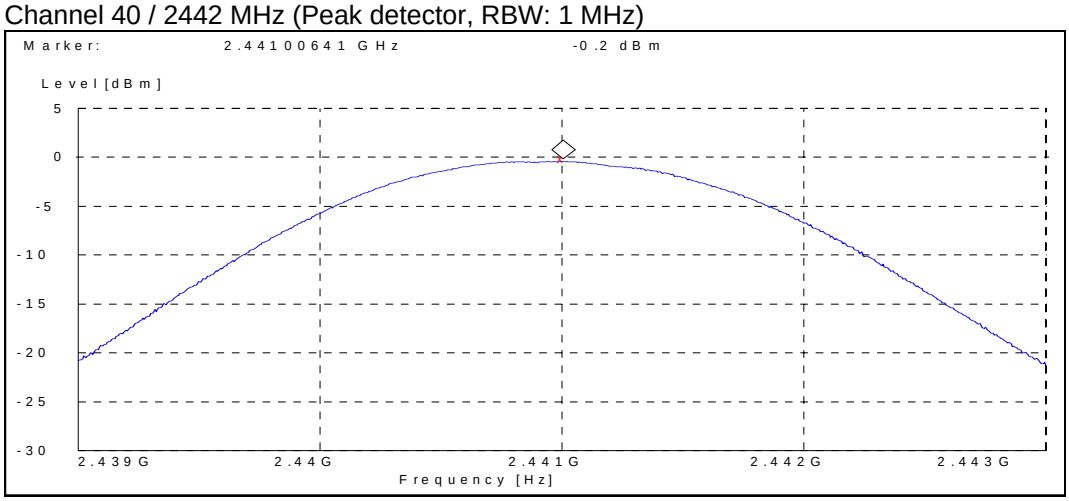
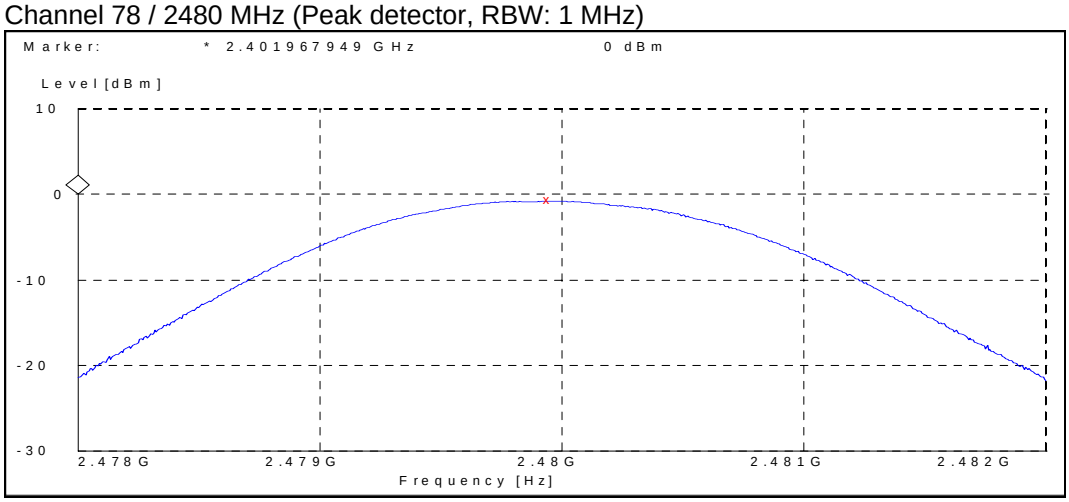
Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



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	HS-78W DUT 40891
Accessories with DUT numbers	AC-3E DUT 40890
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 47 / 100.1
Date of measurements	13.12.2006
Measured by	Jari Jantunen

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

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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	32.39	PASSED
78 / 2480	43.32	PASSED
Hopping on, low end	42.93	PASSED
Hopping on, high end	50.62	PASSED

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	47.96	PASSED
78 / 2480	59.06	PASSED
Hopping on, low end	50.00	PASSED
Hopping on, high end	57.23	PASSED

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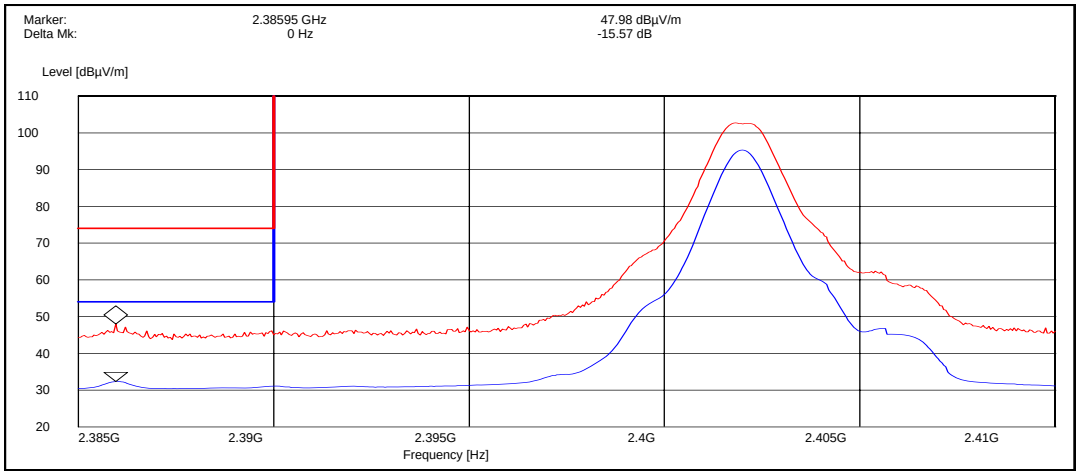
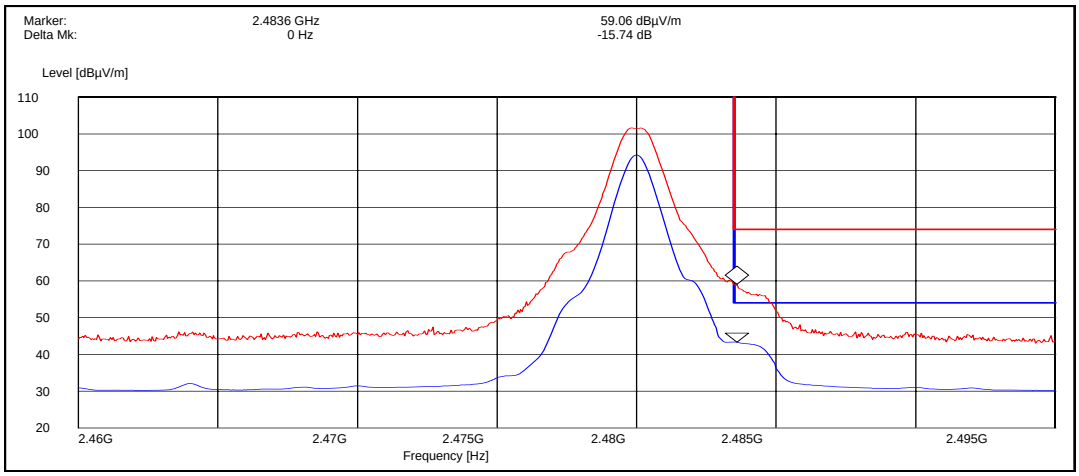
Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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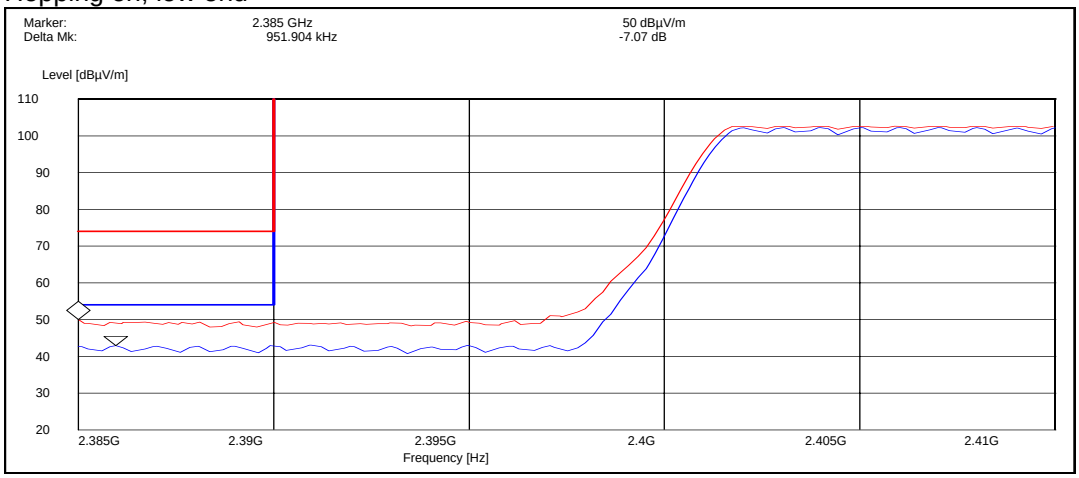
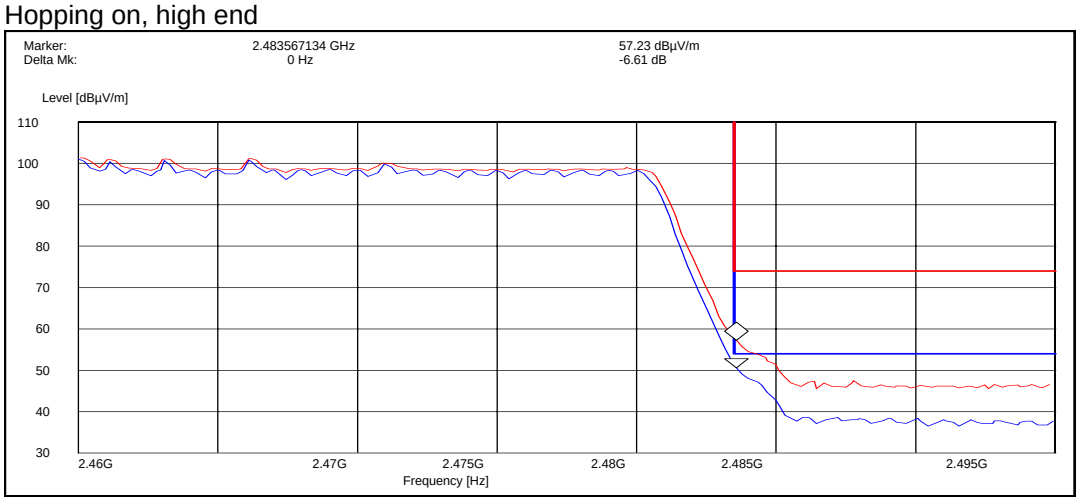
Hopping on, low end



Hopping on, high end



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4.2.2 8DPSK modulation, PRBS packet type

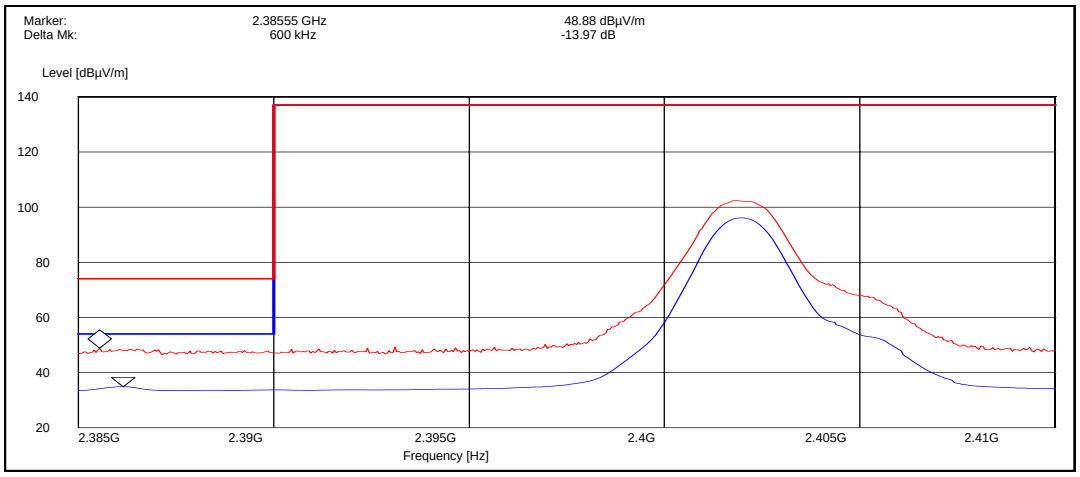
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	46.91	PASSED
78 / 2480	50.39	PASSED
Hopping on, low end	30.86	PASSED
Hopping on, high end	34.08	PASSED

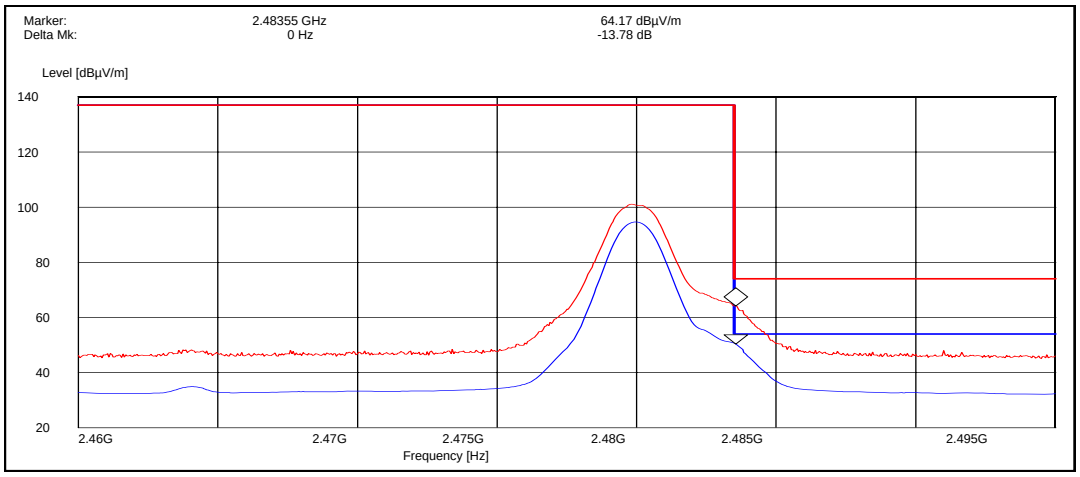
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	48.88	PASSED
78 / 2480	64.17	PASSED
Hopping on, low end	49.01	PASSED
Hopping on, high end	62.40	PASSED

Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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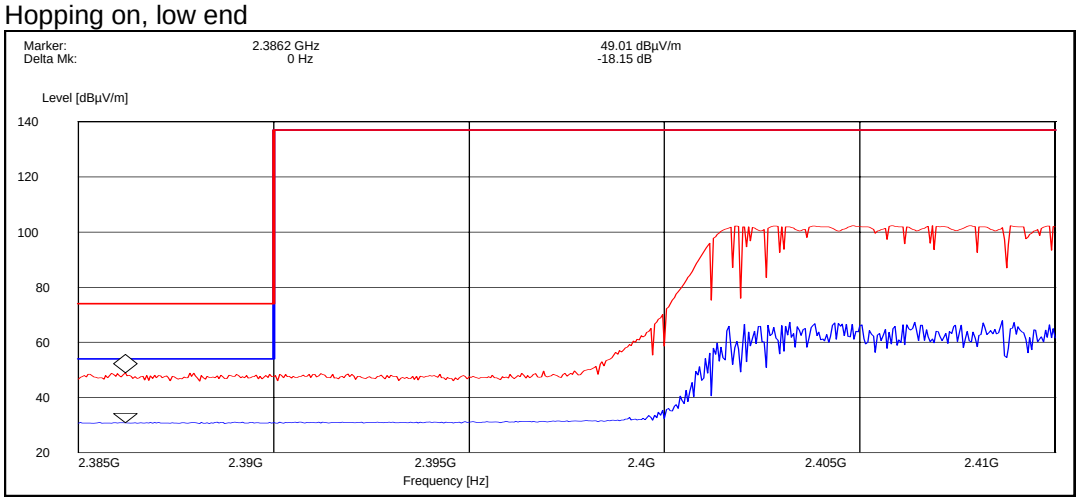
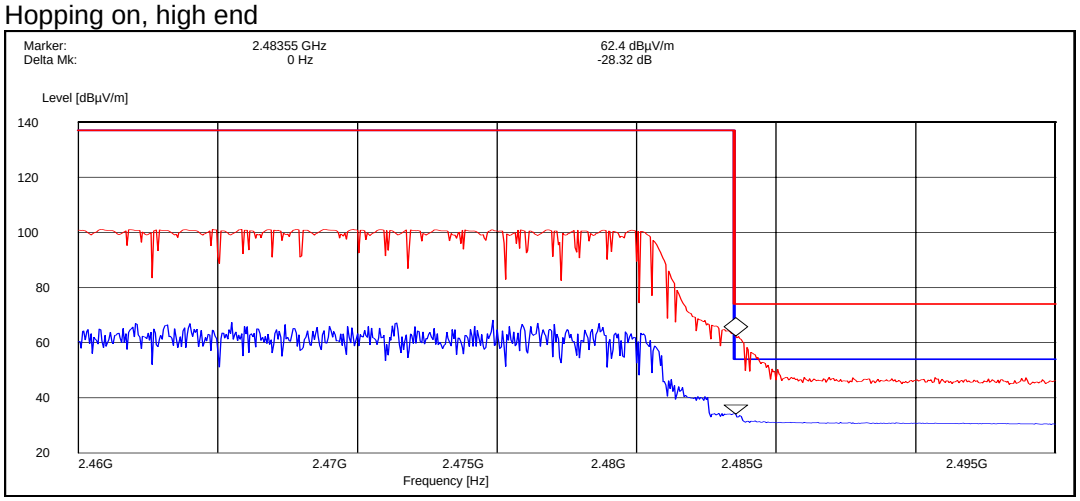
Hopping on, low end



Hopping on, high end



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5. Spurious RF conducted emissions

(FCC §15.247(c), RSS-A8.5)

EUT with DUT number	HS-78W DUT 40888
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 101.1-101.3
Date of measurements	30.11-1.12.2006
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

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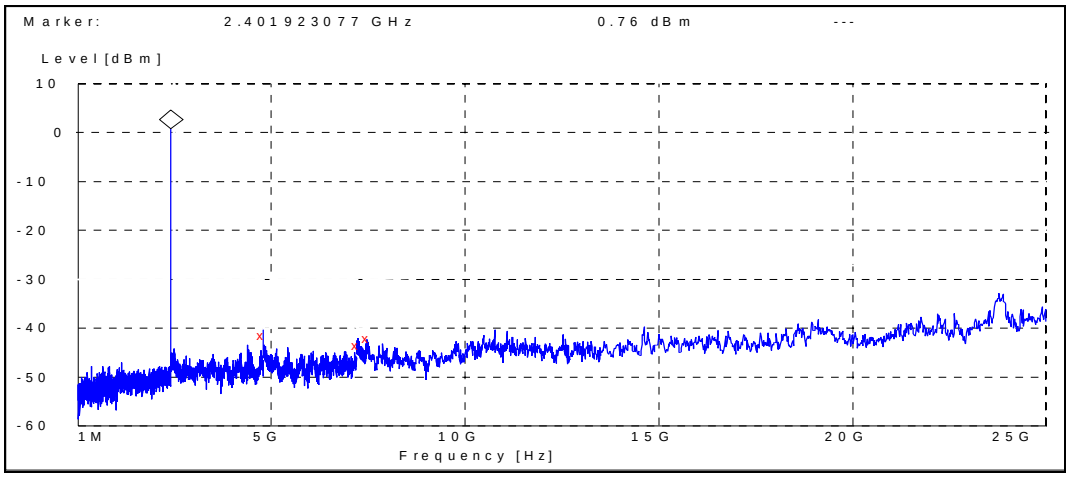
5.2. Bluetooth Test results

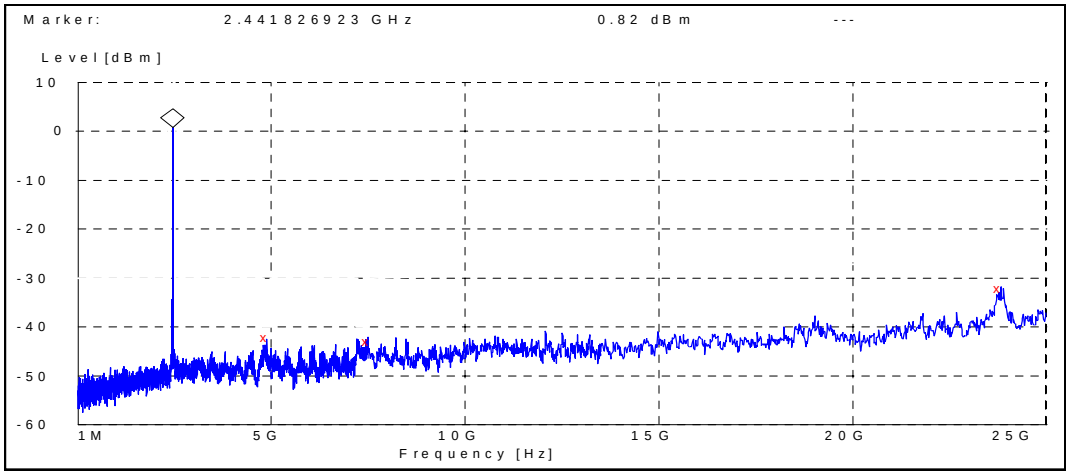
5.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4803.846154	-42.155783	PASSED
7236.538462	-44.355783	PASSED
7500.000000	-42.855783	PASSED

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4884.294872	-42.916825	PASSED
7492.307692	-43.816825	PASSED
23820.512821	-33.016825	PASSED

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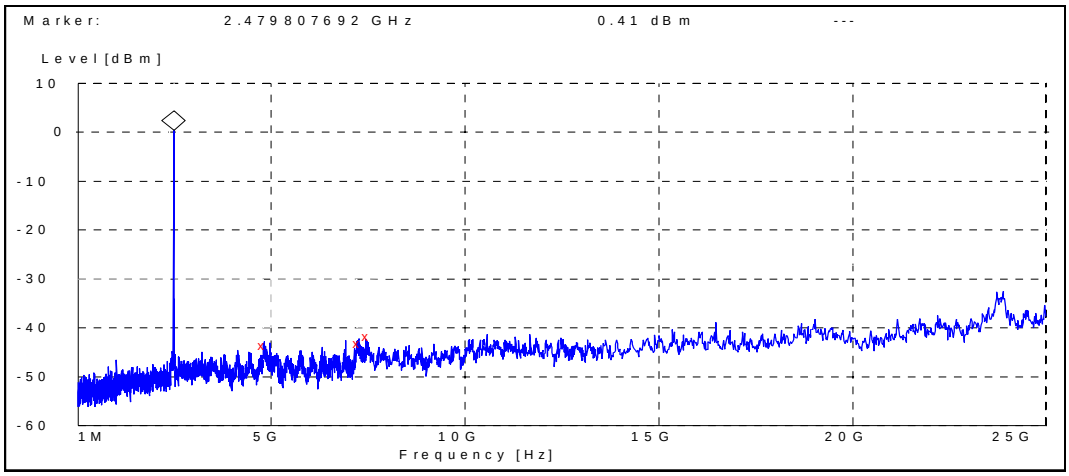
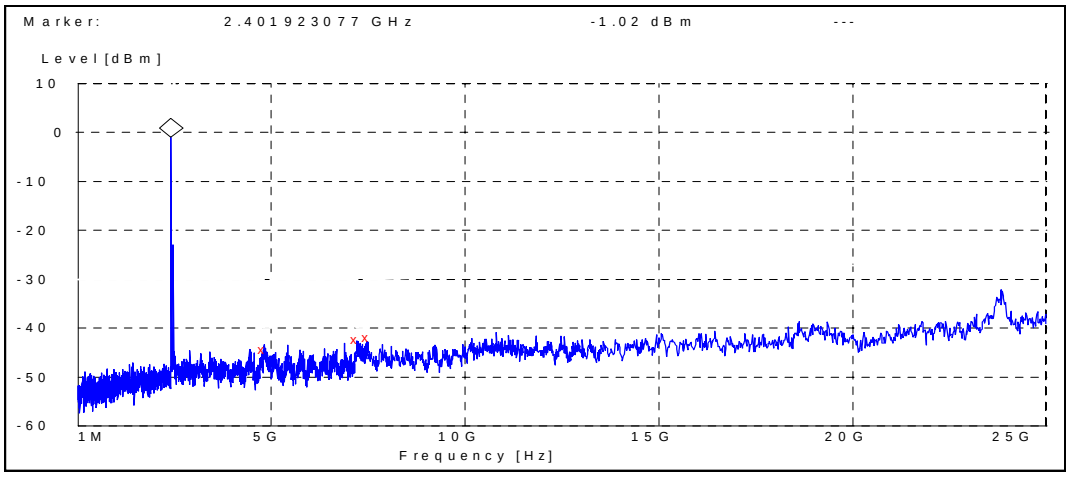
Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4808.974359	-43.907609	PASSED
7265.384615	-43.607609	PASSED
7500.000000	-42.207609	PASSED

5.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4825.641026	-43.378127	PASSED
7211.538462	-41.278127	PASSED
7500.000000	-40.778127	PASSED

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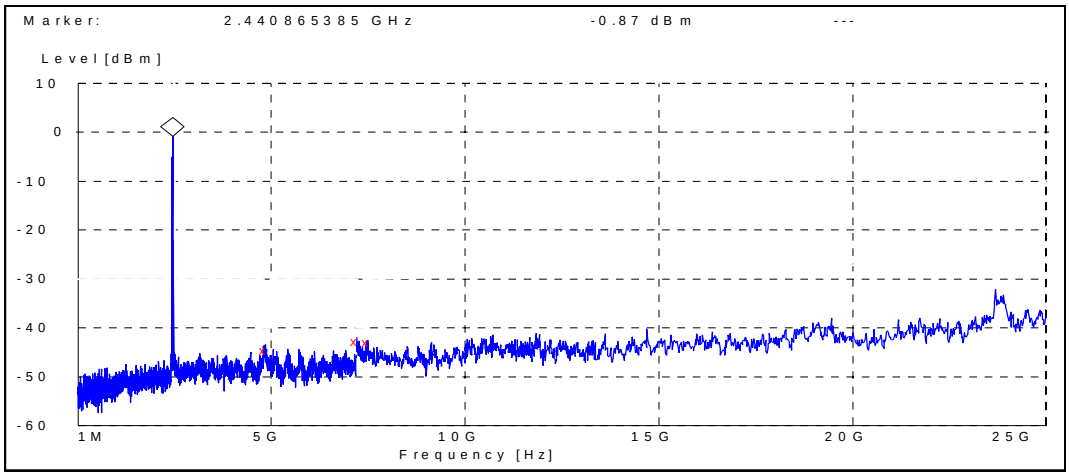
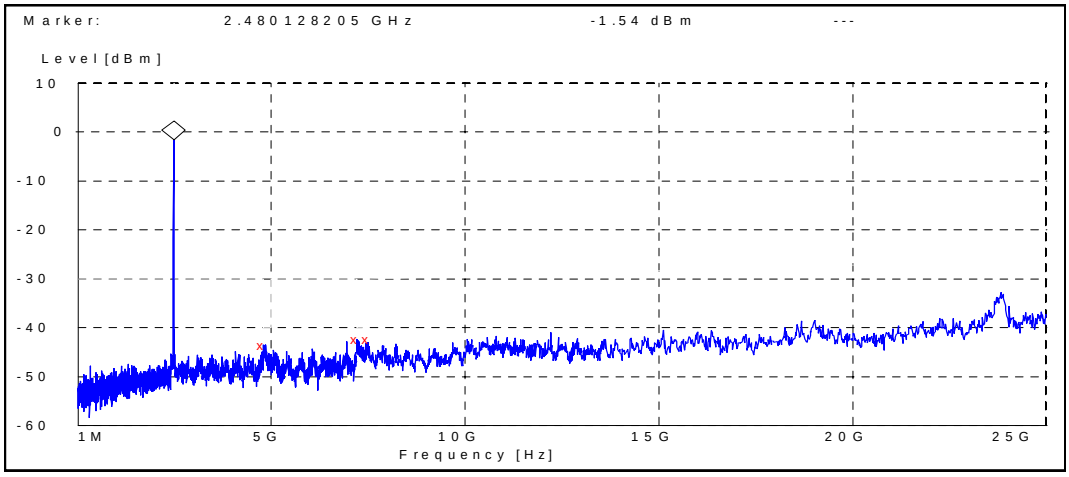
Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4849.038462	-43.632443	PASSED
7201.923077	-41.932443	PASSED
7500.000000	-42.032443	PASSED

Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4800.641026	-42.156443	PASSED
7210.096154	-40.856443	PASSED
7500.000000	-40.856443	PASSED

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6. Spurious radiated emissions

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

EUT with DUT number	HS-78W DUT 40891
Accessories with DUT numbers	AC-3E DUT 40890
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22-23 / 44-47 / 100.1-100.9
Date of measurements	12-13.12.2006
Measured by	Jari Jantunen

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 ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

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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	55.20	575.44	56.90	-1.70	HORIZONTAL	PASSED
7206.000000	41.90	124.45	40.20	1.70	HORIZONTAL	PASSED

Average (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	46.00	-1.70	HORIZONTAL	PASSED
7206.000000	29.50	29.85	27.80	1.70	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
30.400000	13.00	4.47	18.30	-5.30	VERTICAL	PASSED
38.135872	7.00	2.24	18.40	-11.40	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4883.767535	53.30	462.38	54.90	-1.60	HORIZONTAL	PASSED
4884.269539	54.00	501.19	55.60	-1.60	HORIZONTAL	PASSED
7279.063126	42.80	138.04	40.40	2.40	VERTICAL	PASSED

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7333.165331	43.80	154.88	41.50	2.30	VERTICAL	PASSED
7416.337675	42.90	139.64	40.10	2.80	VERTICAL	PASSED
7418.839679	42.80	138.04	40.00	2.80	VERTICAL	PASSED
17914.329659	55.00	562.34	33.90	21.10	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
4883.767535	47.10	226.46	48.70	-1.60	HORIZONTAL	PASSED
4883.769539	47.80	245.47	49.40	-1.60	HORIZONTAL	PASSED
7278.063126	30.00	31.62	27.60	2.40	VERTICAL	PASSED
7333.165331	29.60	30.20	27.30	2.30	VERTICAL	PASSED
7418.339679	30.10	31.99	27.30	2.80	VERTICAL	PASSED
7420.837675	30.00	31.62	27.20	2.80	VERTICAL	PASSED
17918.829659	42.10	127.35	21.00	21.10	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	55.50	595.66	56.70	-1.20	HORIZONTAL	PASSED
7440.000000	43.70	153.11	41.00	2.70	HORIZONTAL	PASSED

Average (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	45.90	-1.20	HORIZONTAL	PASSED
7440.000000	30.30	32.73	27.60	2.70	HORIZONTAL	PASSED

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	49.50	298.54	51.20	-1.70	HORIZONTAL	PASSED
7206.000000	41.40	117.49	39.70	1.70	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT}	Polarisation	Result

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[MHz]				[dB]		
4804.000000	34.30	51.88	36.00	-1.70	HORIZONTAL	PASSED
7206.000000	28.80	27.54	27.10	1.70	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
38.076353	7.40	2.34	18.80	-11.40	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
4883.767535	48.90	278.61	50.50	-1.60	HORIZONTAL	PASSED
7281.561122	42.50	133.35	40.10	2.40	VERTICAL	PASSED
7283.059118	42.80	138.04	40.40	2.40	HORIZONTAL	PASSED
7423.839679	42.80	138.04	40.00	2.80	VERTICAL	PASSED
17994.987976	55.30	582.10	34.00	21.30	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4883.767535	33.90	49.55	35.50	-1.60	HORIZONTAL	PASSED
7276.561122	30.00	31.62	27.60	2.40	VERTICAL	PASSED
7283.559118	29.90	31.26	27.50	2.40	HORIZONTAL	PASSED
7419.339679	30.10	31.99	27.30	2.80	VERTICAL	PASSED
17992.987976	42.50	133.35	21.20	21.30	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	48.90	278.61	50.10	-1.20	HORIZONTAL	PASSED
7440.000000	43.00	141.25	40.30	2.70	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	34.60	53.70	35.80	-1.20	HORIZONTAL	PASSED
7440.000000	29.90	31.26	27.20	2.70	VERTICAL	PASSED

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7. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	HS-78W DUT 40891
Accessories with DUT numbers	AC-3 DUT 40890
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 49 / 101.3
Date of measurements	1.12.2006
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

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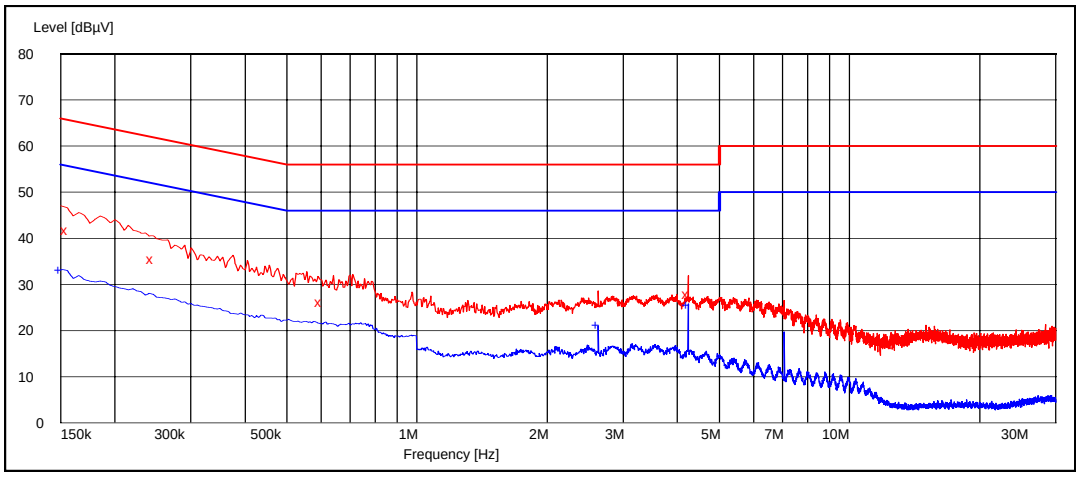
7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.155000	41.90	L1	PASSED
0.245000	35.40	L1	PASSED
0.600000	26.10	L1	PASSED
4.240000	27.80	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.150000	33.20	N	PASSED
2.625000	21.20	L1	PASSED
4.240000	25.50	L1	PASSED

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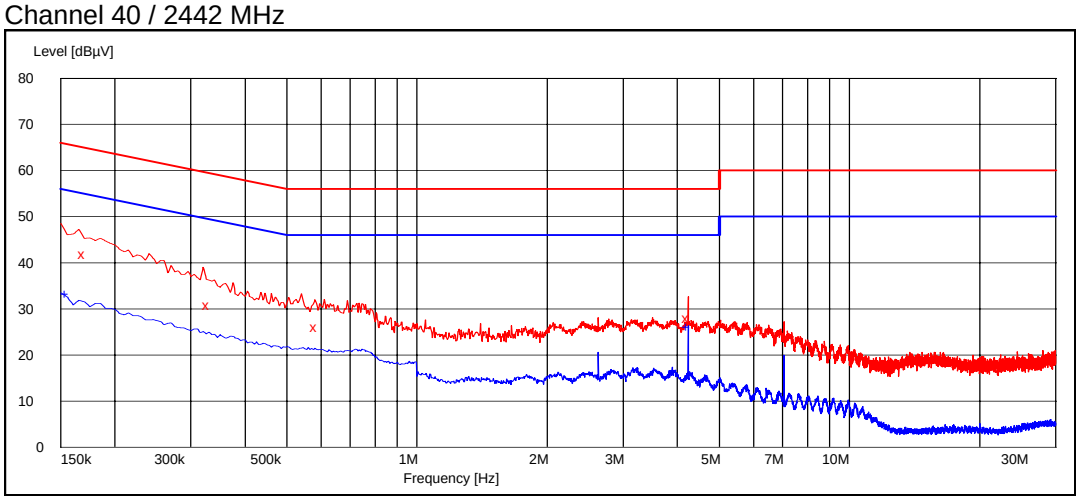
7.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.170000	41.90	N	PASSED
0.330000	30.90	L1	PASSED
0.585000	26.00	L1	PASSED
4.240000	28.10	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.155000	33.20	N	PASSED
4.240000	26.10	L1	PASSED

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8. 20 dB bandwidth

(FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	HS-78W
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 101.1-101.3
Date of measurements	30.11-1.12.2006
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

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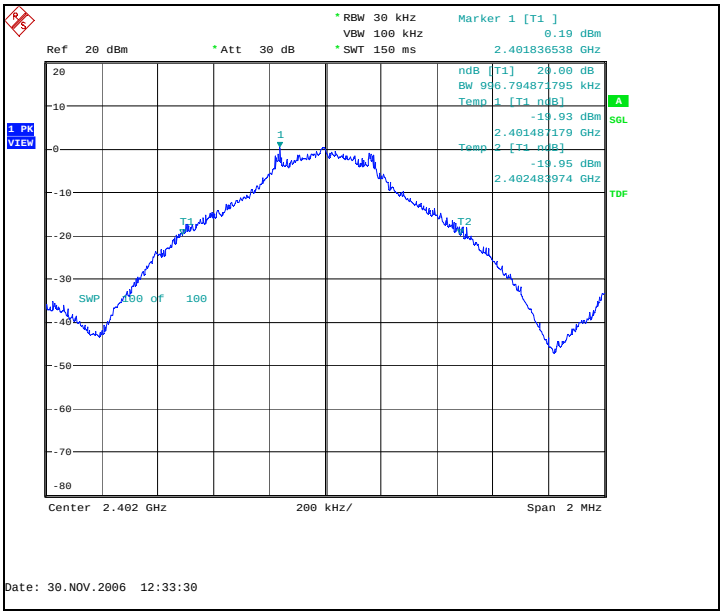
8.2. Bluetooth Test results

8.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	996.795	PASSED
40 / 2442	1000.000	PASSED
78 / 2480	1006.410	PASSED

Channel 0 / 2402 MHz



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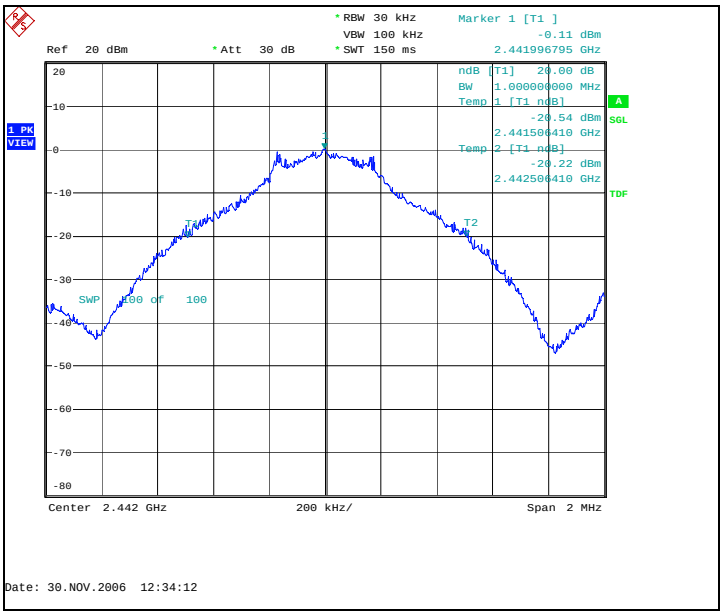
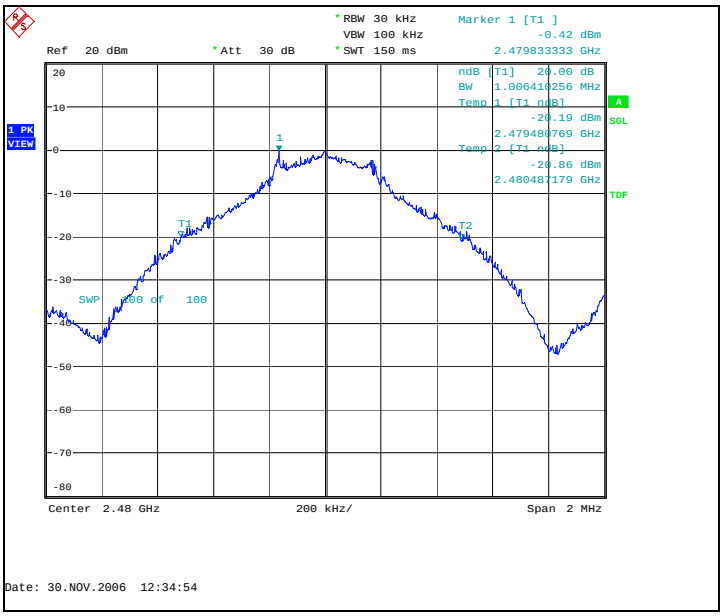
Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



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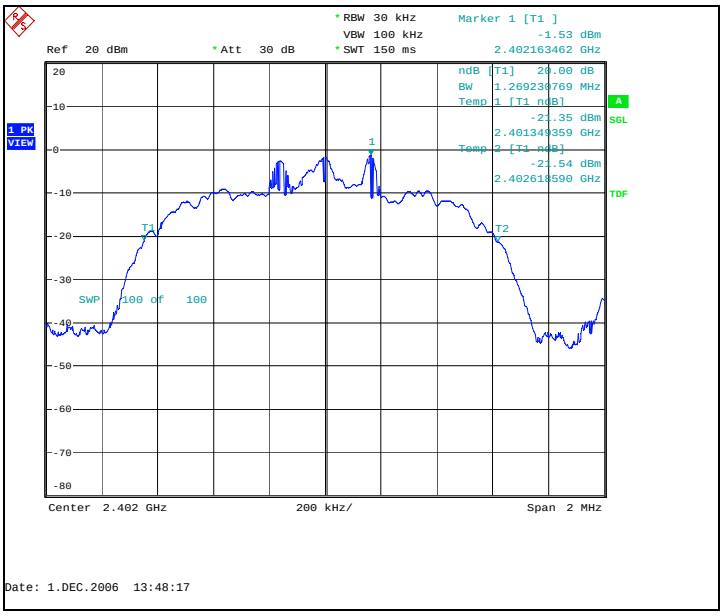
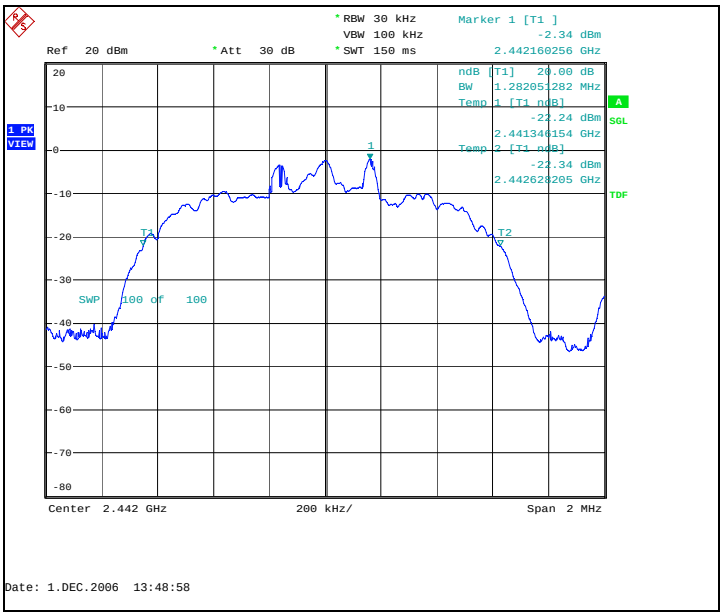
8.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1269.231	PASSED
40 / 2442	1282.051	PASSED
78 / 2480	1278.846	PASSED

Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



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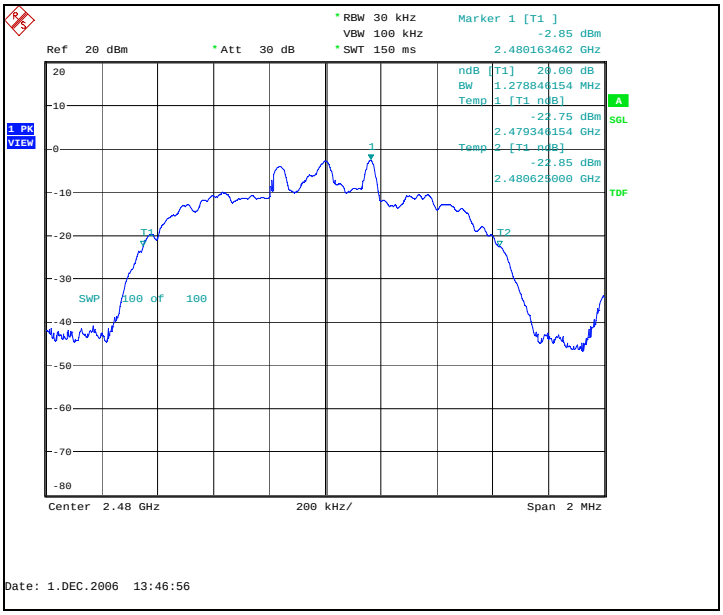
Channel 78 / 2480 MHz



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9. Carrier frequency separation

(FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	HS-78W
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 101.1-101.3
Date of measurements	30.11-1.12.2006
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

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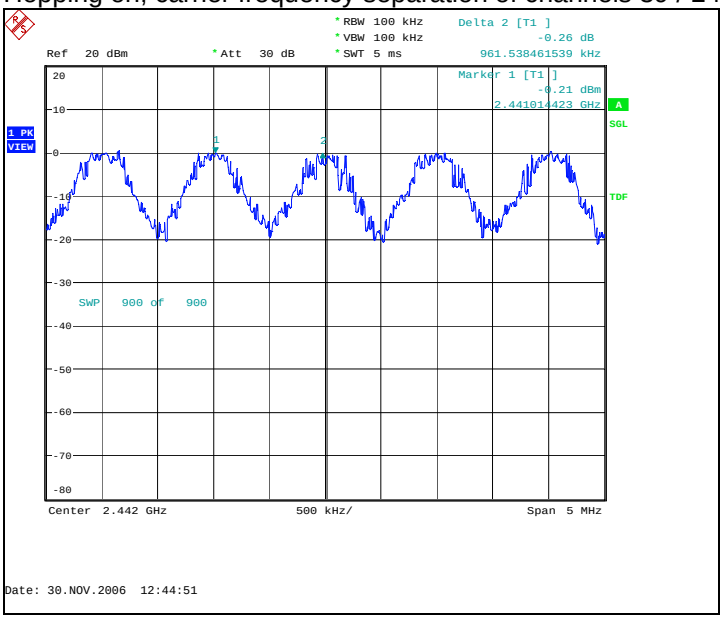
9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
961.538	PASSED

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



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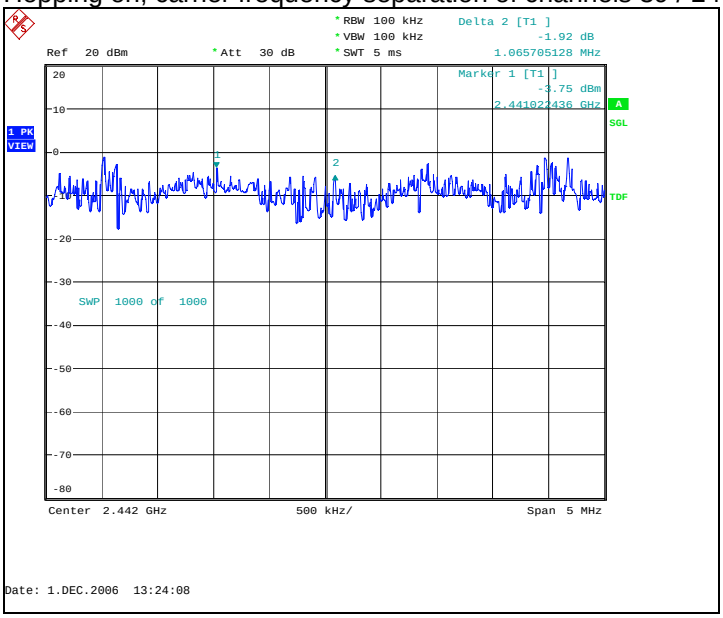
9.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1065.705	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	HS-78W
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 101.1-101.3
Date of measurements	30.11-1.12.2006
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

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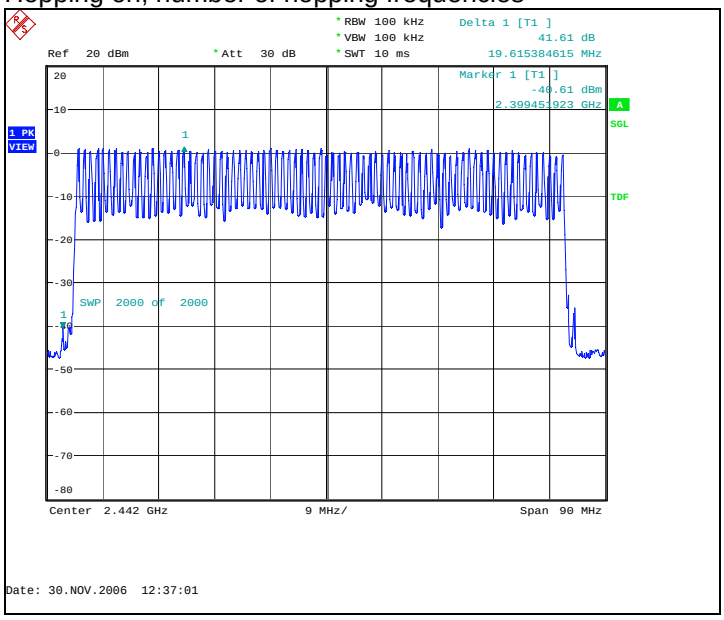
10.2. Bluetooth Test results

10.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
80.00	PASSED

Hopping on, number of hopping frequencies



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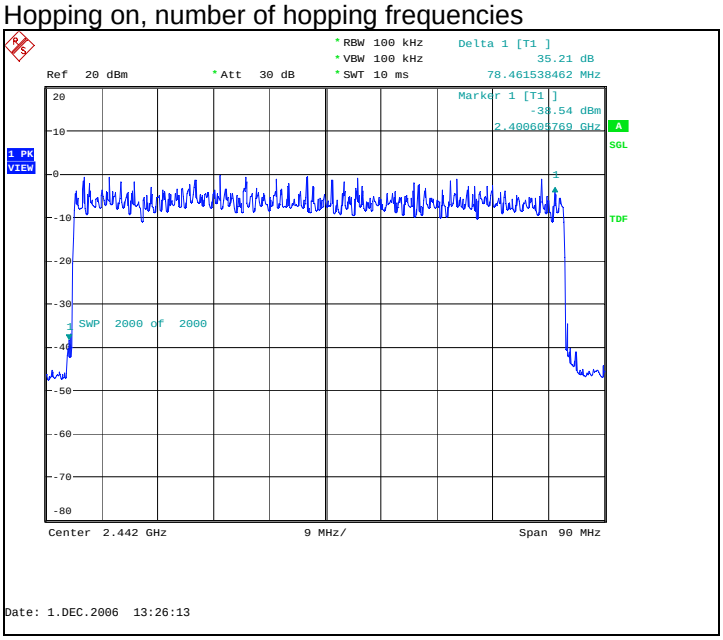
10.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
40.00	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	HS-78W
Accessories with DUT numbers	-
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 101.1-101.3
Date of measurements	30.11-1.12.2006
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

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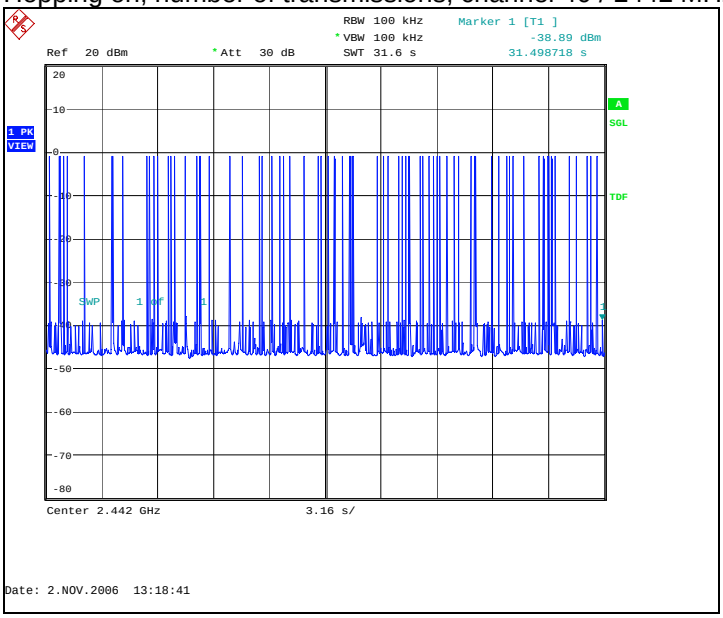
11.2. Bluetooth test results

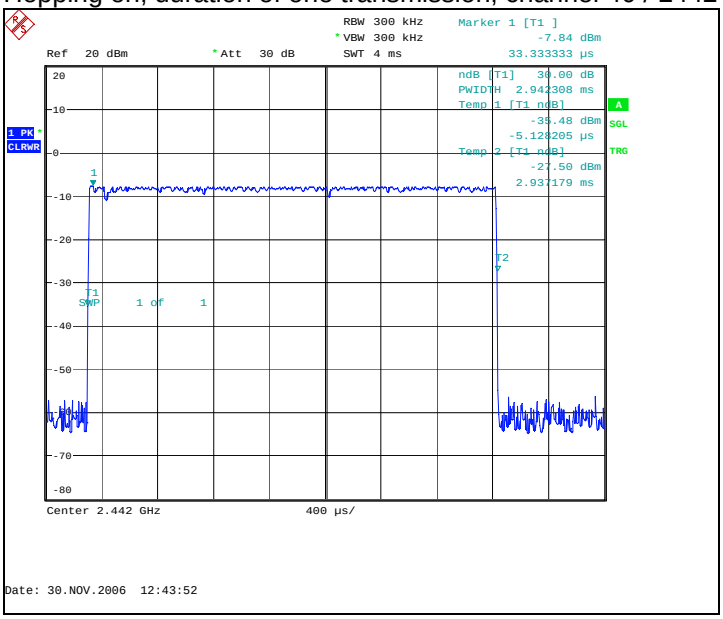
11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
70.00	2942	0.205962	PASSED

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



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



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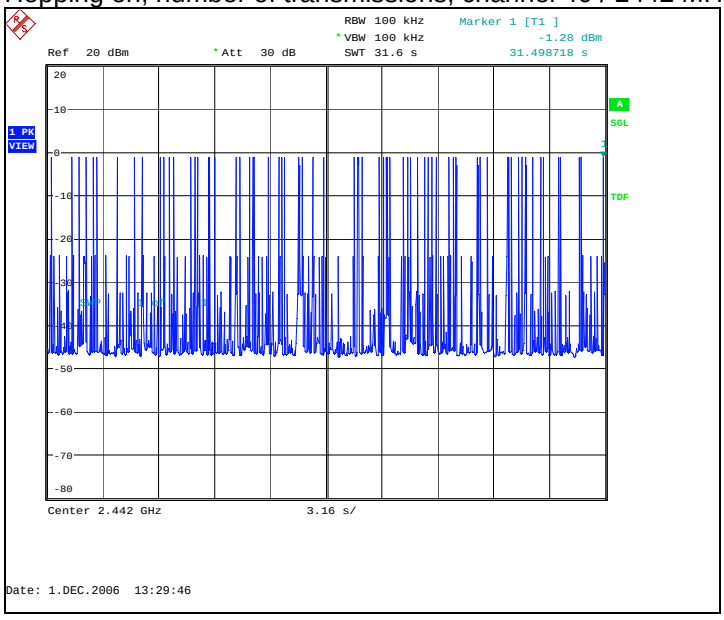
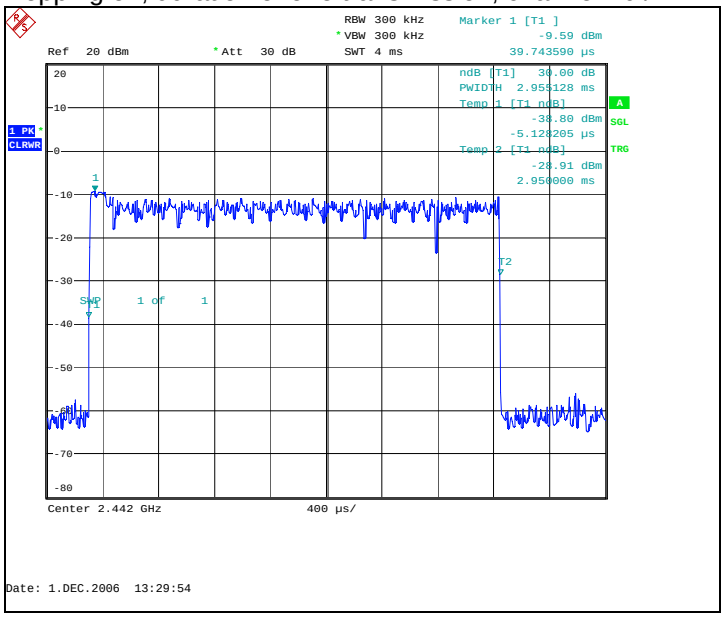
11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
68.00	2955	0.200949	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
TM37610	Spectrum analyzer	FSU	R&S	22/24, 15C
TM37678	Radio communication tester	CMU-200	R&S	22/24, 15C
	Attenuator 10 dB	6251.17.A	Huber+Suhner AG	22/24, 15C
TM37499	Power splitter	11667A	Agilent	22/24, 15C
	Temperature chamber	VT4002	Vötsch	22/24, 15C
TM38112	DC power supply	6632A	Agilent	22/24, 15C
TM38111	Multimeter	34401A	Agilent	22/24, 15C
	EMI Test receiver	ESPC	R&S	15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	15C, 15B
TM38631	Signal generator	83640L	Agilent	15C, 15B
TM38114	DC power supply	6632A	Agilent	15C, 15B
TM22835	Multimeter	87	Fluke	15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5/	R&S	15C, 15B
TM30636	LISN 50 µH	L2-16/	PMM	15C, 15B

12.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24
TM37502	Dipole antenna	3125-1880	EMCO	22/24
TM37773	Radio communication tester	CMU-200	R&S	22/24, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24, 15C, 15B
	High pass filter	WHK2010-10SS	Trilithic	22/24, 15C, 15B
	Low pass filter	WLK1750-10SS	Trilithic	22/24, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Turntable controller	HD-100	Deisel	22/24, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24, 15C, 15B
TM22835	Multimeter	87	Fluke	22/24, 15C, 15B

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