Test Report Cover Sheet

COMPANY NUMBER: 661AD
MODEL NUMBER: RH-12
MANUFACTURER: Nokia Corporation

TESTED TO RADIO STANDARDS SPECIFICATION (RSS) NO. : RSS-210
OPEN AREA TEST SITE INDUSTRY CANADA NUMBER: 4820 & 4820-1
FREQUENCY RANGE (or fixed frequency): 2402 – 2480 MHz
R.F. POWER IN WATTS: 0.0010814 conducted
FIELD STRENGTH (at what distance): NA
OCCUPIED BANDWIDTH (20dB BW): 853.7 kHz
TYPE OF MODULATION: FHSS
EMISSION DESIGNATOR (TRC-43): 1M00FXD
TRANSMITTER SPURIOUS (worst case): 46.96 dBμV/m
RECEIVER SPURIOUS (worst case): NA

ATTESTATION: I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned departmental standard(s), and that the radio equipment identified in this application has been subject to all the applicable test conditions specified in the departmental standards and all of the requirements of the standards have been met.

Signature: R. Hansen

Date: 07/12/2004

NAME AND TITLE (Please print or type):
Ruben Hansen, EMC Team Leader

Note: This form must be completed and provided with the submission.

TCC
Nokia

T117 (EN ISO/IEC 17025)

BT Transmitter Compliance Test Report for RH-12

Test Report no.:	DTX11180-EN	**Date of Report:**	07/12/2004
Number of pages:	41	**Customer's Contact person:**	Anders Sv. Nielsen
		Responsible Test engineer:	Ruben Hansen
Testing laboratory:	TCC Copenhagen 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
Tested devices/ accessories:	**Phone; RH-12 and Battery; BL- 5C**		
Supplement reports:			
Testing has been carried out in accordance with:	The tests listed in this report have been done to demonstrate compliance with the applicable requirements in FCC rules Part 15.247 and IC standard RSS-210		
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 Copenhagen.		
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(s) for the contents:

07/12/2004

R. Hansen

Ruben Hansen
Team Leader

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Summary of test RESULTS

Rule part in CFR 47	Section in RSS-210		Result
15.247, a1	6.2.2 (o), a1	Carrier frequency separation	PASS
15.247, a1ii	6.2.2 (o), a3	Number of hopping frequencies	PASS
15.247, a1ii, 15.247, f	6.2.2 (o), a3	Time of occupancy	PASS
15.247, a	6.2.2 (o), a1	20dB bandwidth	PASS
15.247, b1	6.2.2 (o), a3	Peak output power	PASS
15.247, c	6.2.2 (o), e1	Band-edge compliance of RF emissions	PASS
15.207	6.6	AC powerline conducted emissions	PASS
15.247, c	6.2.2 (o), e1	Spurious RF conducted emissions	PASS
15.247, c	6.2.2 (o), e1	Spurious radiated emissions	PASS

PASS Pass
FAIL Fail
X Measured, but there is no applicable performance criteria
- Not done

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1. EUT Information

Product	Type	SN	HW	MV	SW	DUT
Phone	RH-12	KKH595028	01-2		4.15	233927
Phone	RH-12	KKH595046	01-2		4.15	234090
Battery	BL-5C	067040063563352111	6.0			233530
MMC card	DTS-128	MC1DU128NAVA-OMBNO Y8F270G349				233747

1.1. EUT description

The EUT is a triple band (900MHz/1800MHz/1900MHz) E-GPRS (EDGE) GSM cellular phone with Bluetooth functionality.
The EUT was not modified during the tests.

2. EUT TEST SETUP

For each test the EUT was exercised to find out the worst case of operation modes and device configuration.
The EUT was equipped with an external antenna connector for conductive measurements.
The Bluetooth simulator was used to control the following:
- set the EUT channel (0 – 78)
- set the number of EUT TX slots (1, 3, 5)
- set the EUT to TX, RX and TX/RX mode
- enable/disable frequency hopping
- select between several different test modulation patterns

In tests, where absolute level reporting were required, the results were corrected with all applicable factors as detailed in the result section of each measurement.

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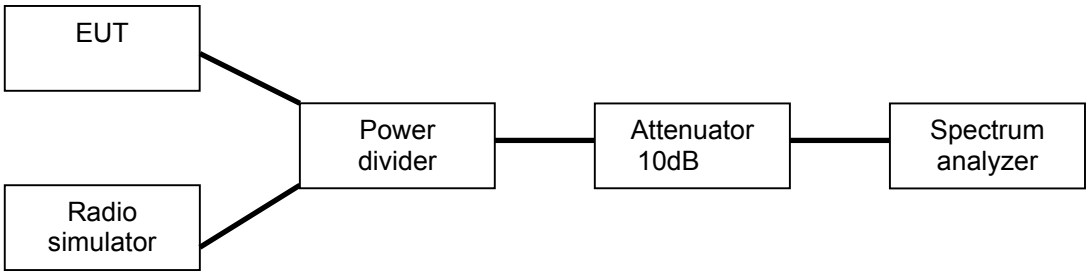
3. Carrier Frequency Separation

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.9 ºC / 50.5 RH%
Date of measurement	24-06-2004
	§15.247 (a) (1)
	6.2.2 (o), a1
	Jesper Nielsen

3.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



3.1.1 Measuring Equipment Set-up

Frequency Range	2437.5 MHz – 2442.5 MHz (Center Freq.= 2440 MHz)
Sweep Mode	Continously, Max hold
Sweep time	Coupled
Res.BW / VBW	100 kHz / 100 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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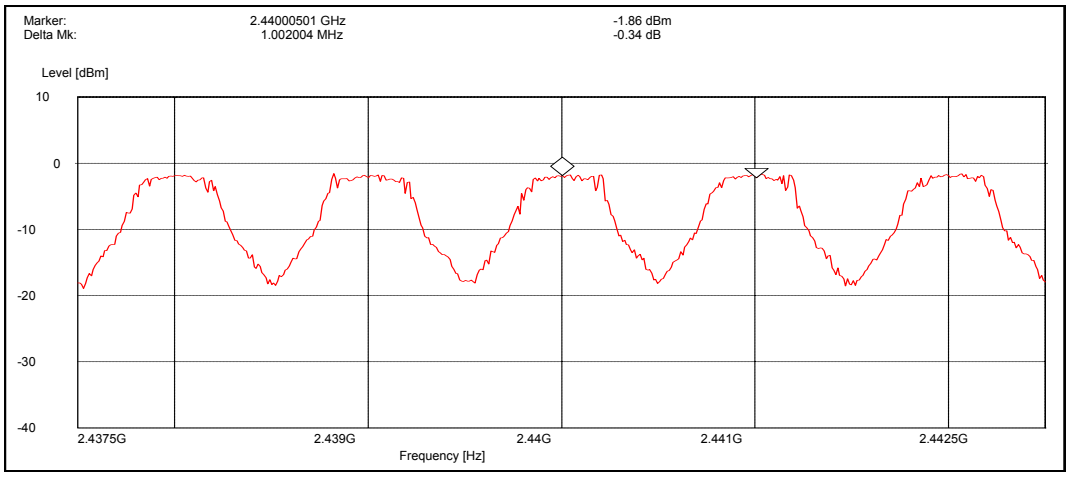
3.1.2 EUT Operational Mode

Transmission Parameters	Connection, Static PRBS, DH5 packet type
Bluetooth channel	Hopping (US / Eur scheme)
EUT Tx power level	Nominal

3.1.3 Graph



3.1.4 Test Results

Limit [MHz]	Measured [MHz]	Result
≥ 0.025 or 20dB BW	1.002	Passed

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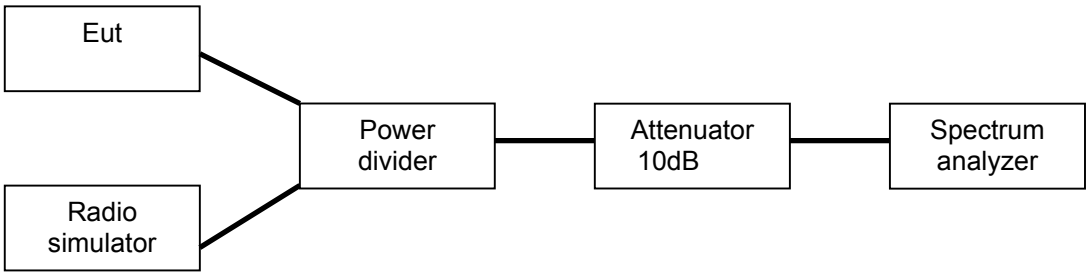
4. Number of Hopping Frequencies

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.9 ºC / 50.5 RH%
	24-06-2004
	§15.247 (a) (2)
	6.2.2 (o), a3
	Jesper Nielsen

4.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



4.1.1 Measuring Equipment Set-up

Frequency Range	2395 MHz – 2485 MHz
Sweep Mode	Continously, Max hold
Sweep time	Coupled
Res.BW / VBW	100 kHz / 100 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

4.1.2 EUT Operational Mode

Transmission Parameters	Connection, Static PRBS, DH5 packet type
Bluetooth channel	Hopping (US / Eur scheme)
EUT Tx power level	Nominal

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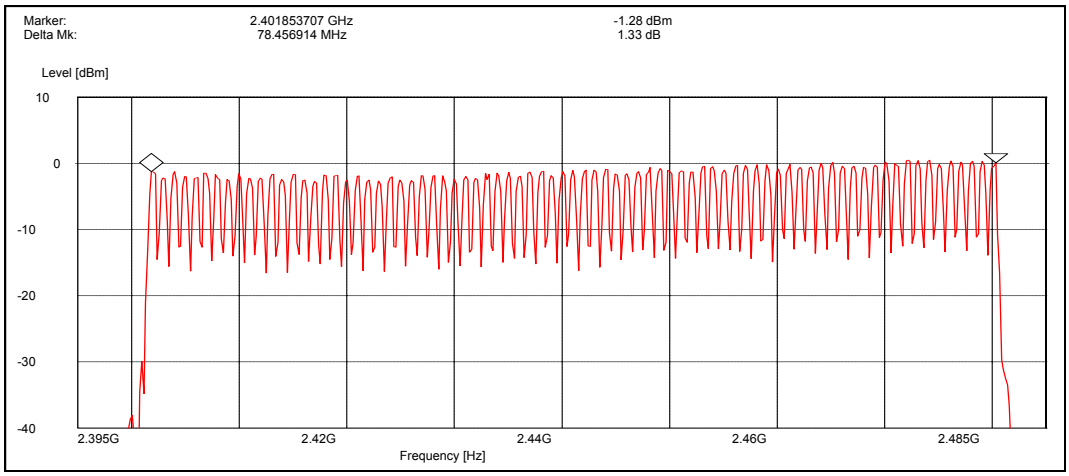
4.1.3 Graph



4.1.4 Test Results

Required number	Actual Number	Result
≥ 75	79	Passed

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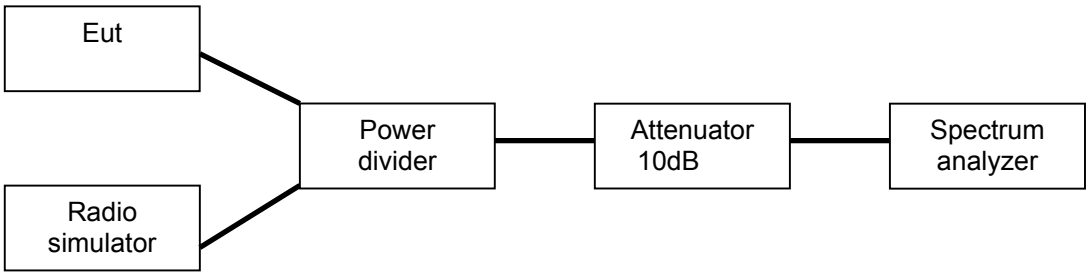
5. Time of occupancy

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.2 ºC / 50.1 RH%
	30-06-2004
	§15.247 (a) (3)
	6.2.2 (o), a3
	Jesper Nielsen

5.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



5.2. Page mode

5.2.1 EUT Operational Mode

EUT operation mode	Page
Bluetooth channel	Hopping (US / Eur scheme)
EUT Tx power level	Nominal

5.2.2 Limits and results

Limit (s)	Measured value (s)
≤ 0.4	0.01644

The complete paging cycle took 1.202 s, during which the transmitter operated at every 10.02 ms. The duration of one transmission was 137.074 µs. (1.202 s / 0.01002 s) * 0.137074 ms =16.44ms

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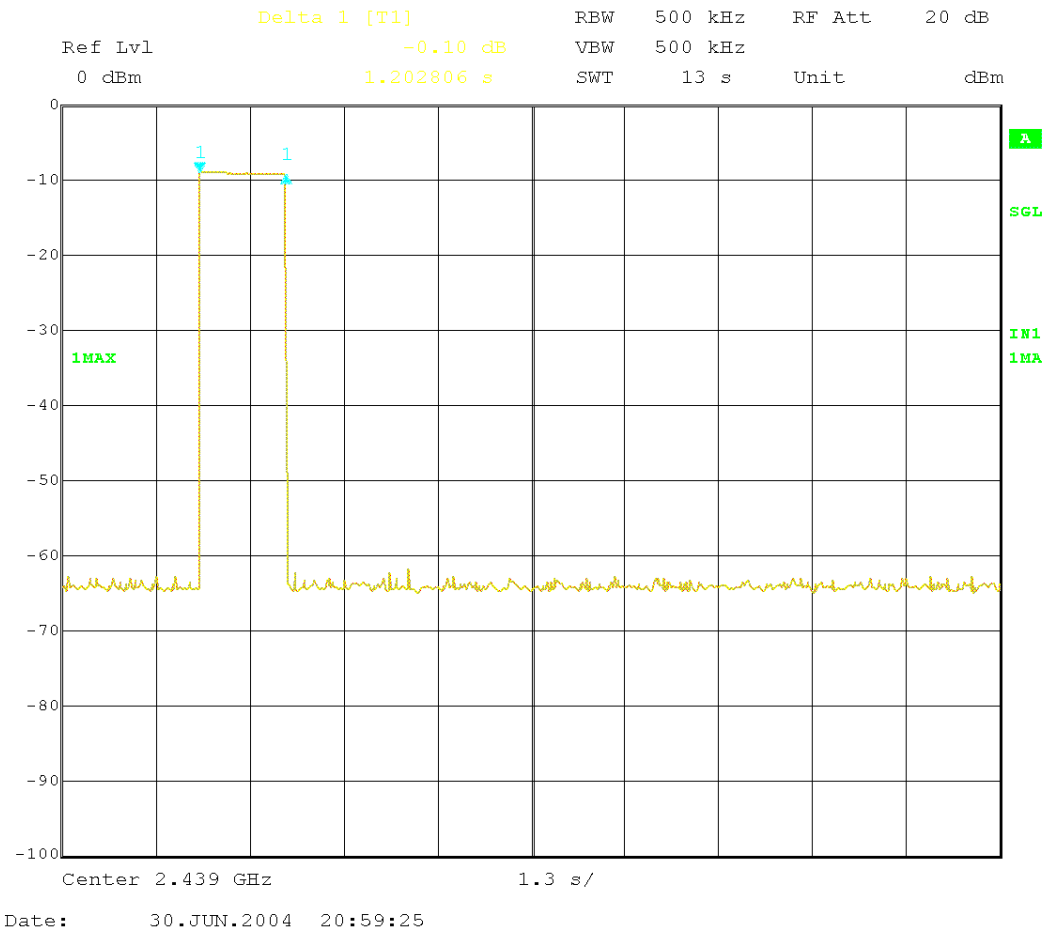
5.2.3 Complete paging cycle

Frequency Range	2439 MHz, zero span
Sweep Mode	Single sweep
Sweep time	13 sec
Res.BW / VBW	500 kHz / 500 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

5.2.3.1 Graph



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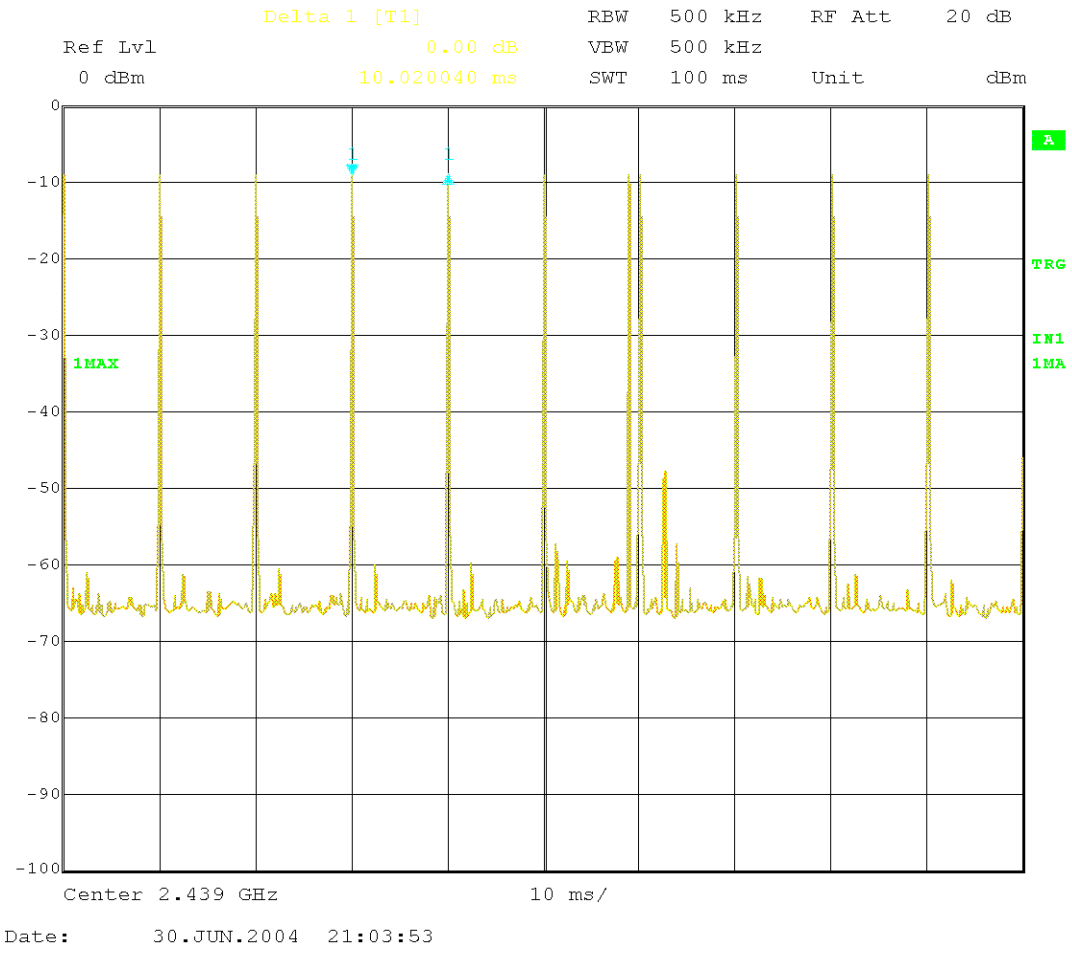
5.2.4 Paging repetition frequency

Frequency Range	2439 MHz, zero span
Sweep Mode	Single sweep
Sweep time	100 msec
Res.BW / VBW	500 kHz / 500 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

5.2.4.1 Graph



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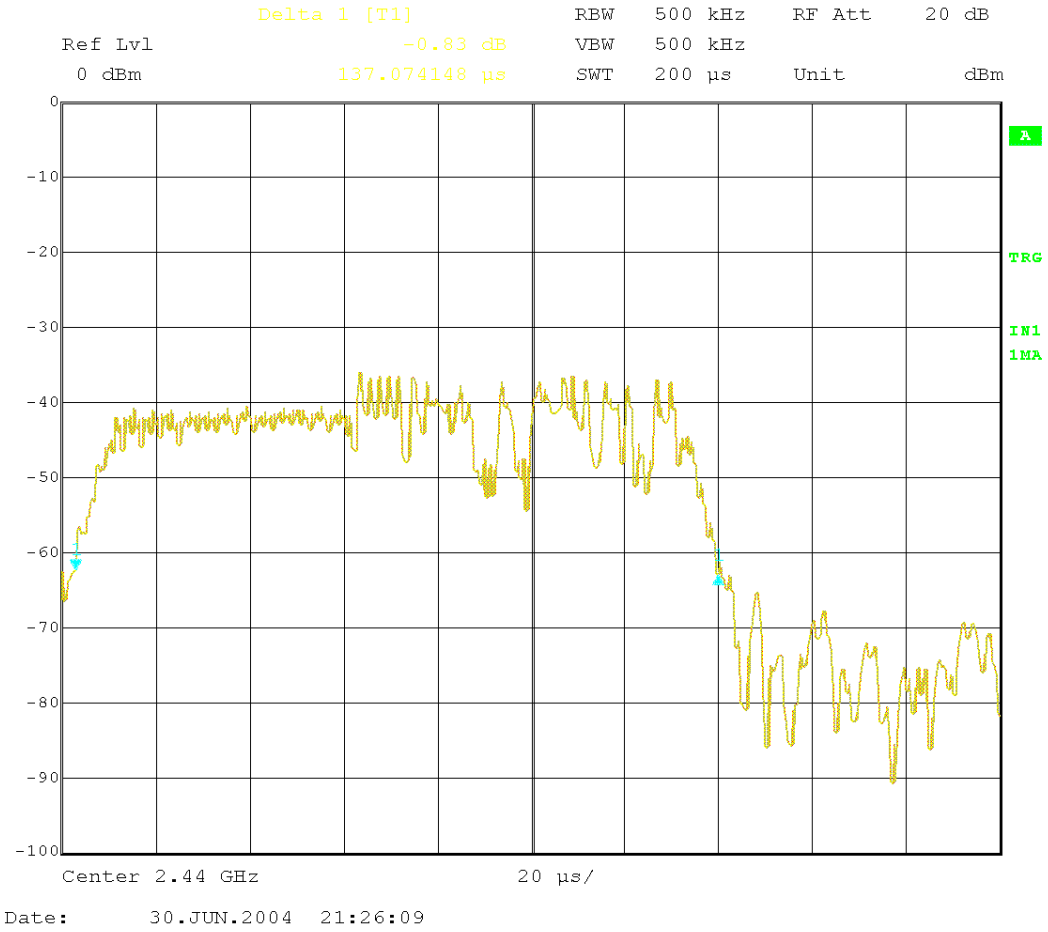
5.2.5 Duration of one transmission

Frequency Range	2440 MHz, zero span
Sweep Mode	Single sweep
Sweep time	200 usec
Res.BW / VBW	500 kHz / 500 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

5.2.5.1 Graph



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5.3. Enquiry mode

5.3.1 EUT Operational Mode

EUT operation mode	Enquiry
Bluetooth channel	Hopping (US / Eur scheme)
EUT Tx power level	Nominal

5.3.2 Limits and results

Limit (s)	Measured value (s)
≤ 0.4	0.07245

The complete enquiry cycle took 5.53 s, during which the transmitter operated at every 10.02 ms. The duration of one transmission was 131.272 µs. (5.53 s / 0.01002 s) * 0.131272 ms = 72.45ms

5.3.3 Complete enquiry cycle

Frequency Range	2439 MHz, zero span
Sweep Mode	Single sweep
Sweep time	13 sec
Res.BW / VBW	500 kHz / 500 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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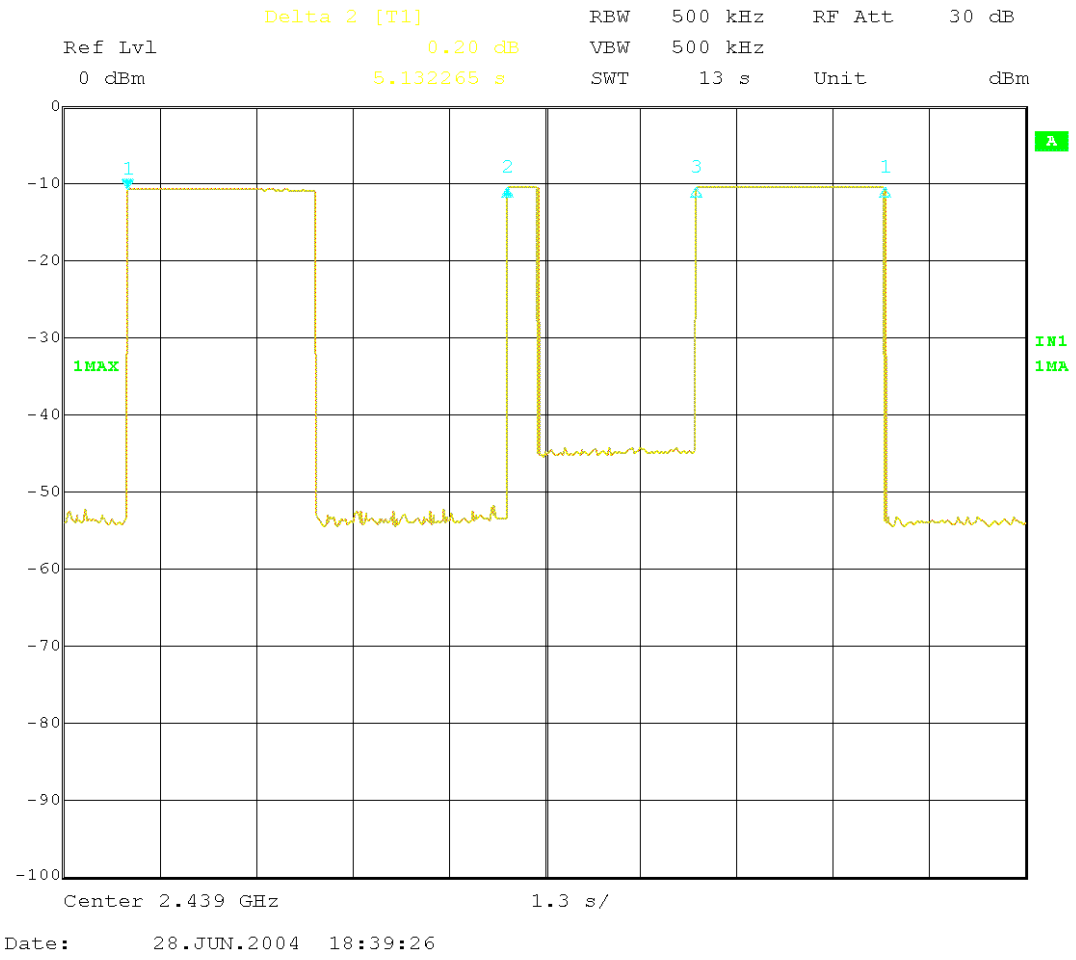
5.3.3.1 Graph



5.3.4 Repetition frequency

Frequency Range	2439 MHz, zero span
Sweep Mode	Single sweep
Sweep time	100 msec
Res.BW / VBW	500 kHz / 500 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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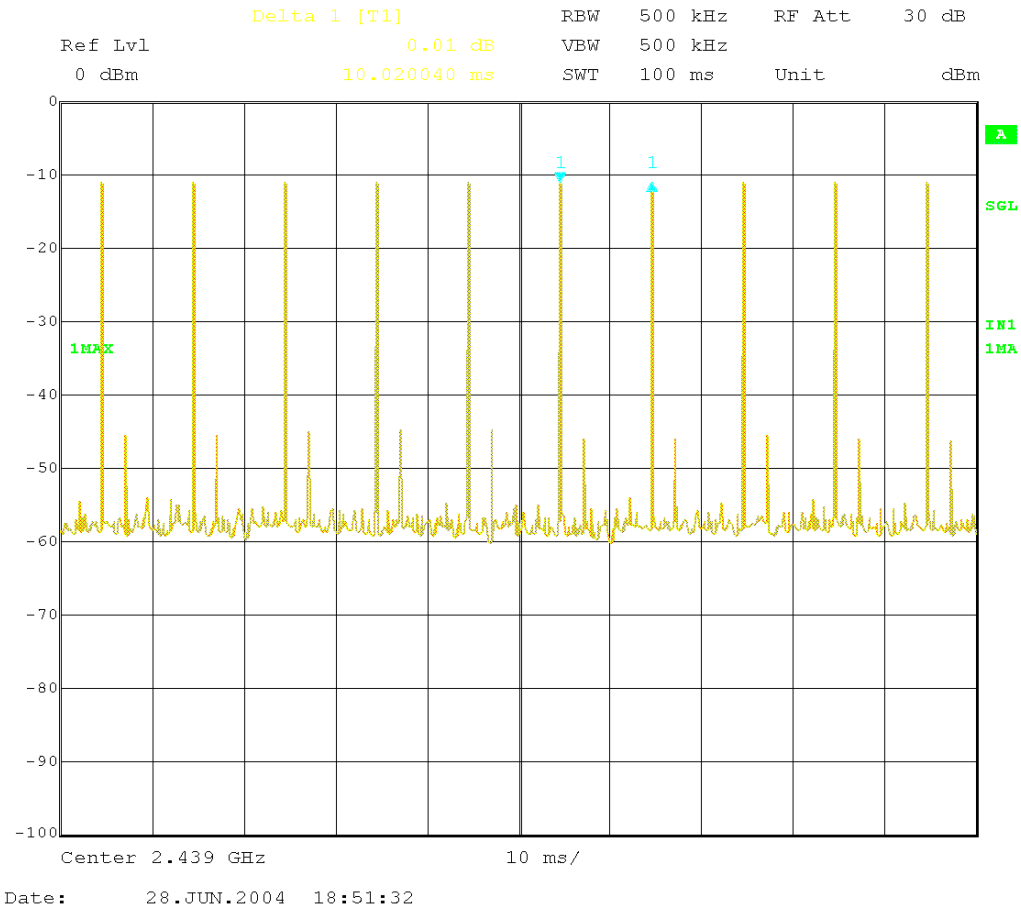
5.3.4.1 Graph



5.3.5 Duration of one transmission

Frequency Range	2440 MHz, zero span
Sweep Mode	Single sweep
Sweep time	200 usec
Res.BW / VBW	500 kHz / 500 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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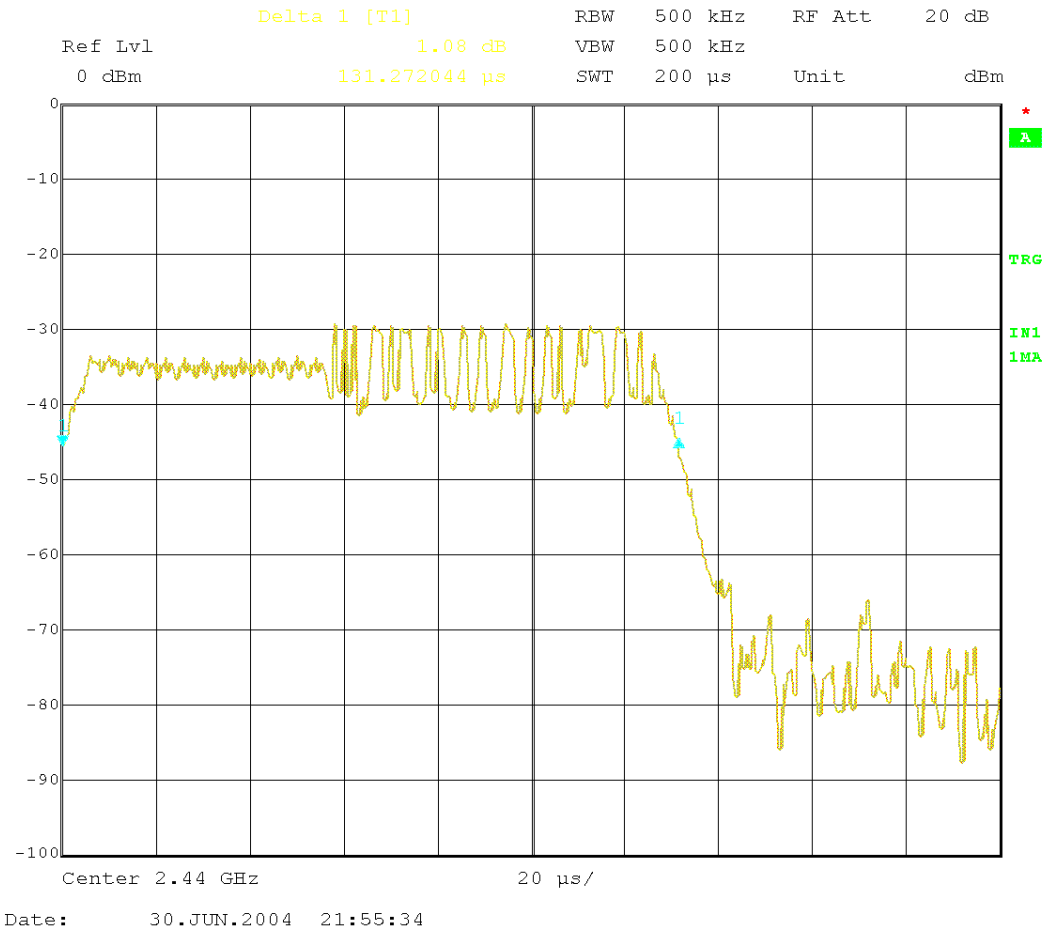
5.3.5.1 Graph



5.4. Connection mode

5.4.1 EUT Operational Mode

EUT operation mode	Connetction, Static PRBS, DH5 packet type
Bluetooth channel	Hopping (US / Eur scheme)
EUT Tx power level	Nominal

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5.4.2 Limits and results

Limit (s)	Measured value (s)
≤ 0.4	0.22473

During the measurement time of 32 s, a total of 76 transmissions occurred. The duration of one transmission was 2.957 ms. The total duration was 76 * 2.957 = 224.73 ms.

5.4.3 Number of transmissions

Frequency Range	2440 MHz, zero span
Sweep Mode	Single sweep
Sweep time	32 sec
Res.BW / VBW	100 kHz / 100 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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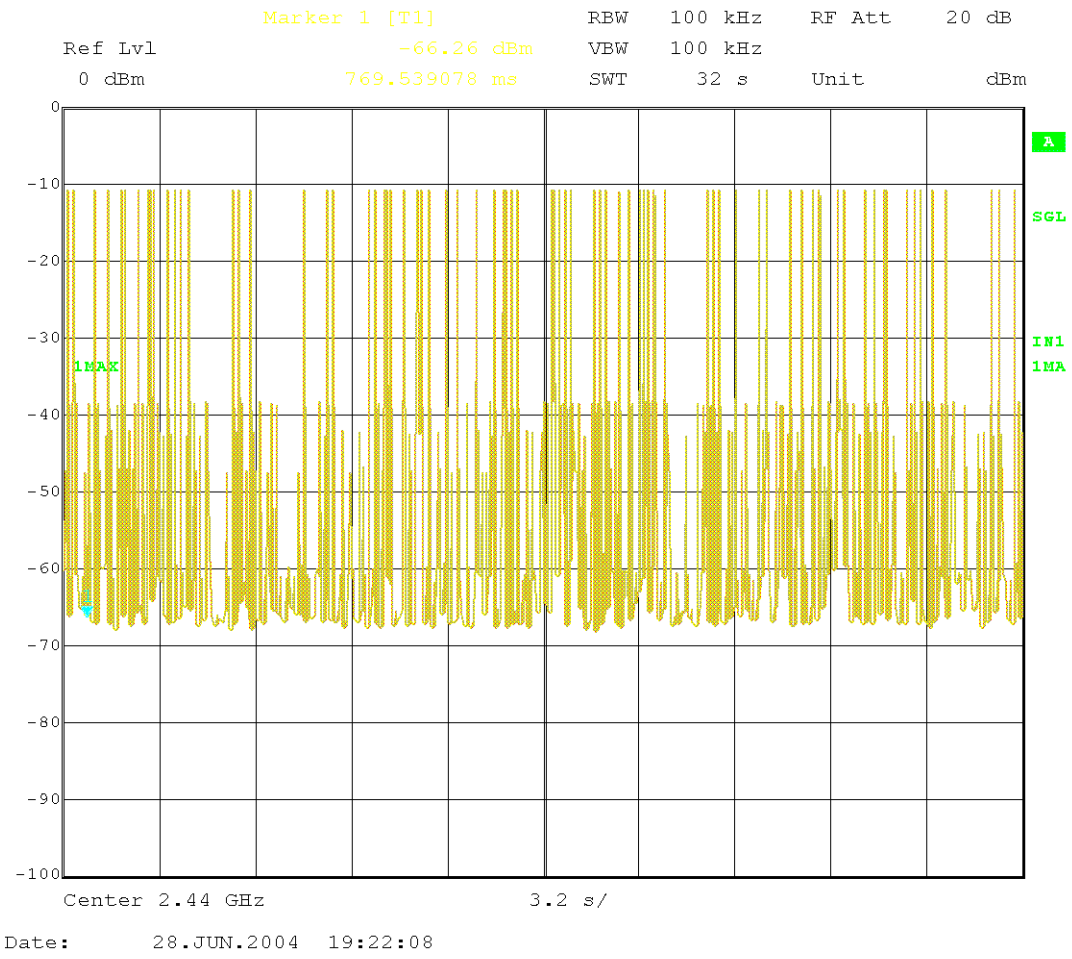
5.4.3.1 Graph



5.4.4 Duration of one transmision

Frequency Range	2440 MHz, zero span
Sweep Mode	Single sweep
Sweep time	5 msec
Res.BW / VBW	100 kHz / 100 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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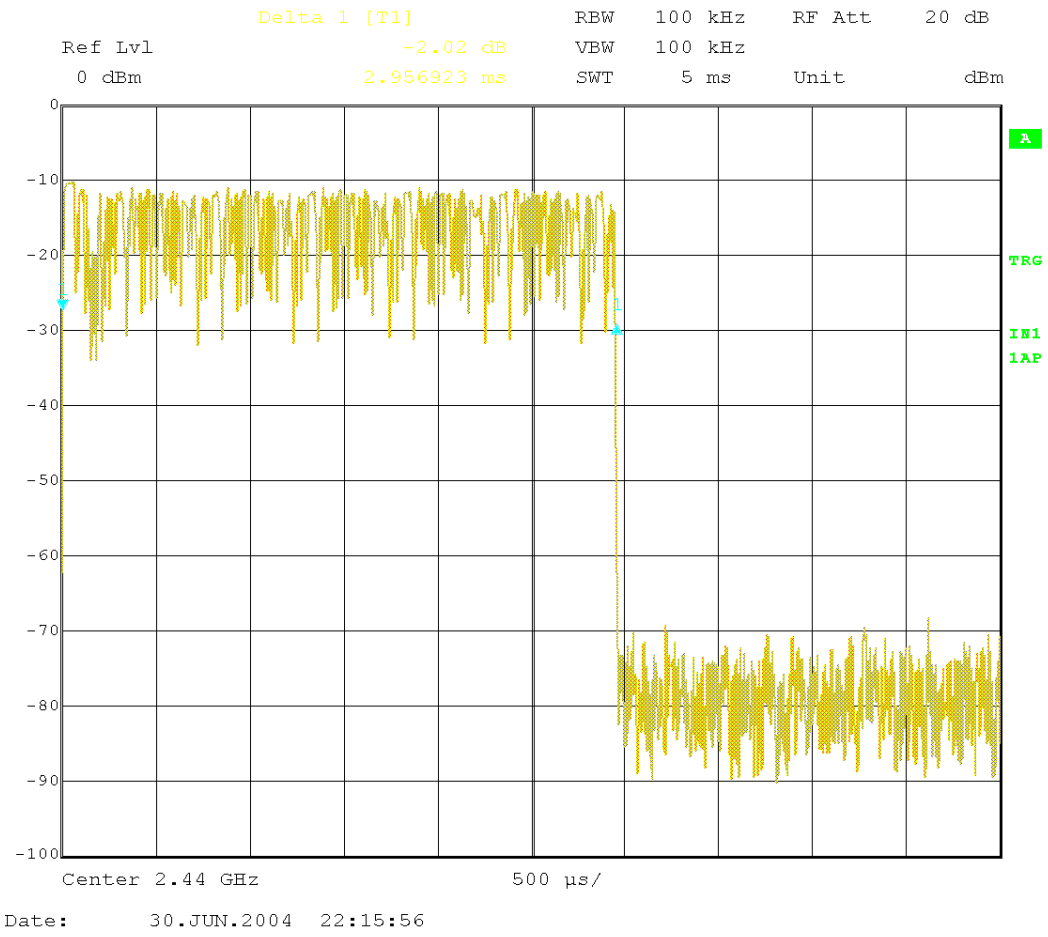
5.4.4.1 Graph



6. 20dB Bandwidth

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.9 ºC / 50.5 RH%
Date of measurement	24-06-2004
FCC rule part	§15.247 (a) (1)
RSS-210 section	6.2.2 (o), a3
Measured by	Jesper Nielsen

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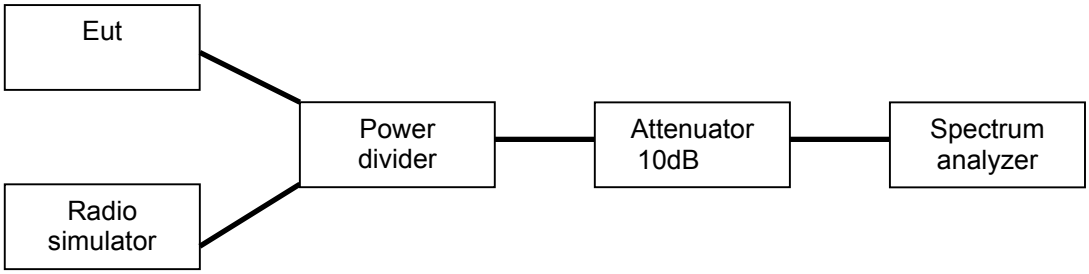
6.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



6.1.1 Measuring Equipment Set-up

Frequency Range	2400.5 MHz – 2403.5 MHz, 2438.5 MHz – 2441.5 MHz, 2478.5 MHz - 2481.5 MHz
Sweep Mode	Continously, Max hold
Sweep time	Coupled
Res.BW / VBW	10 kHz / 10 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

6.1.2 EUT Operational Mode

Transmission Parameters	Connection, Static PRBS, DH5 packet type
Bluetooth channel	Single freq.
EUT Tx power level	Nominal

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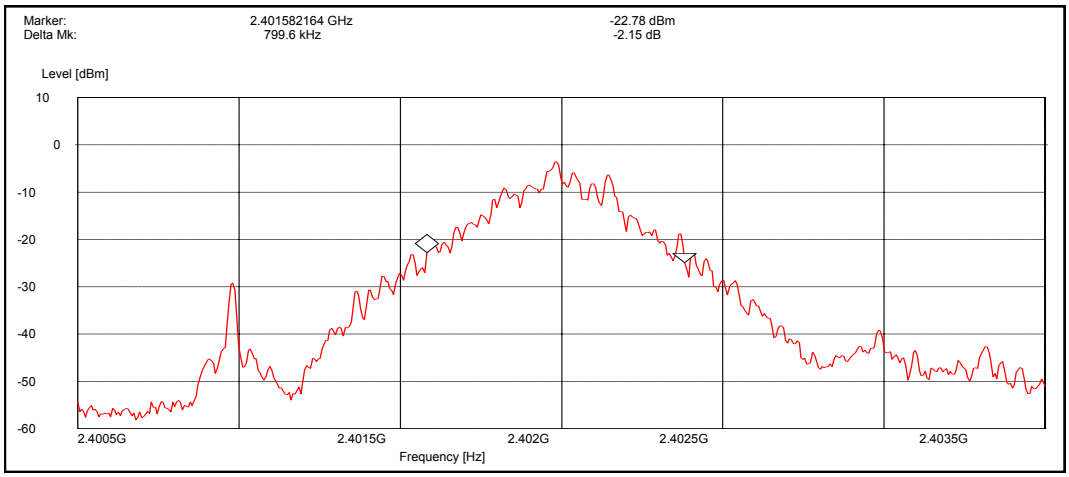
6.1.3 Graph – Channel 0 (2402 MHz)

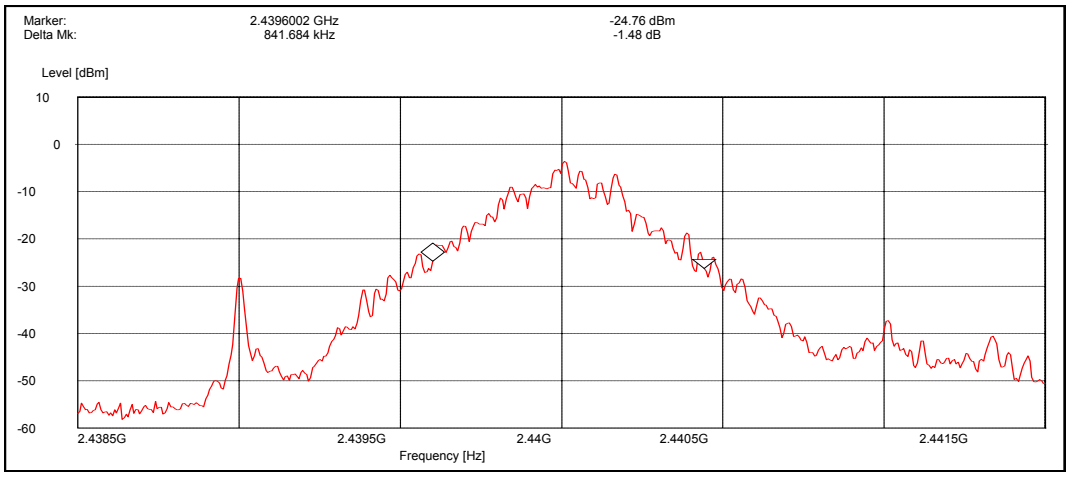


Frequency peak = -3.55 dBM

6.1.4 Test Result – Channel 0

Limit [MHz]	Measured Value [MHz]	Result
≥ 1.0	0.7996	Passed

6.1.5 Graph – Channel 38 (2440 MHz)



Frequency peak = -3.63

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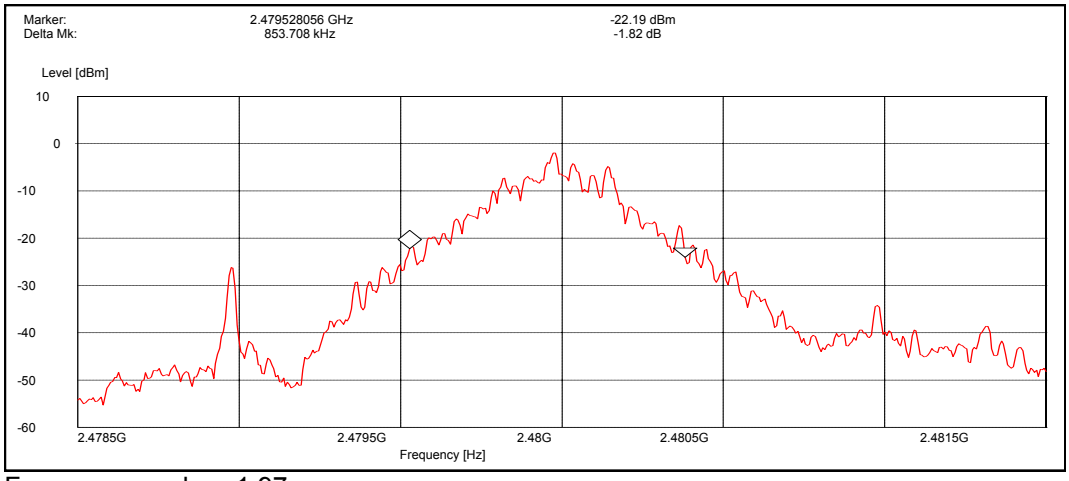
6.1.6 Test Result – Channel 38

Limit [MHz]	Measured Value [MHz]	Result
≥ 1.0	0.8417	Passed

6.1.7 Graph – Channel 78 (2480 MHz)



Frequency peak = -1.97

6.1.8 Test Result – Channel 78

Limit [MHz]	Measured Value [MHz]	Result
≥ 1.0	0.8537	Passed

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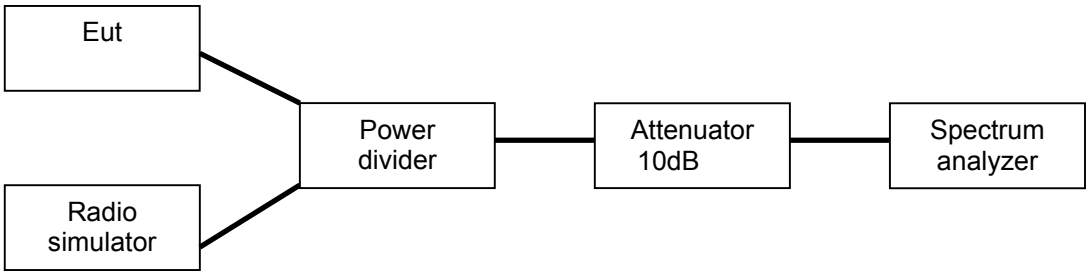
7. Peak Output Power

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.9 ºC / 50.5 RH%
	24-06-2004
	§15.247 (b) (1)
	6.2.2 (o), a3
	Jesper Nielsen

7.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



7.1.1 Measuring Equipment Set-up

Frequency Range	2400.5 MHz – 2403.5 MHz, 2438.5 MHz – 2441.5 MHz, 2478.5 MHz - 2481.5 MHz
Sweep Mode	Continously, Max hold
Sweep time	50 ms
Res.BW / VBW	1 MHz / 1 MHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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7.1.2 EUT Operational Mode

Transmission Parameters	Connection, Static PRBS, DH5 packet type
Bluetooth channel	Single freq.
EUT Tx power level	Nominal

7.1.3 Limits and results

EUT Channel	Limit (W)	Test result (W)	Result
0	≤ 1	0.0007533	Passed
38		0.00077804	Passed
78		0.0010814	Passed

The measured power values were corrected with the attenuation of the cables, attenuator and power divider using the formula:

$$P[W] = \frac{10^{(P_{Meas[dBm]} + L_{Cables[dB]} + L_{Attenuator[dB]} + L_{Divider[dB]})/10}}{1000}$$

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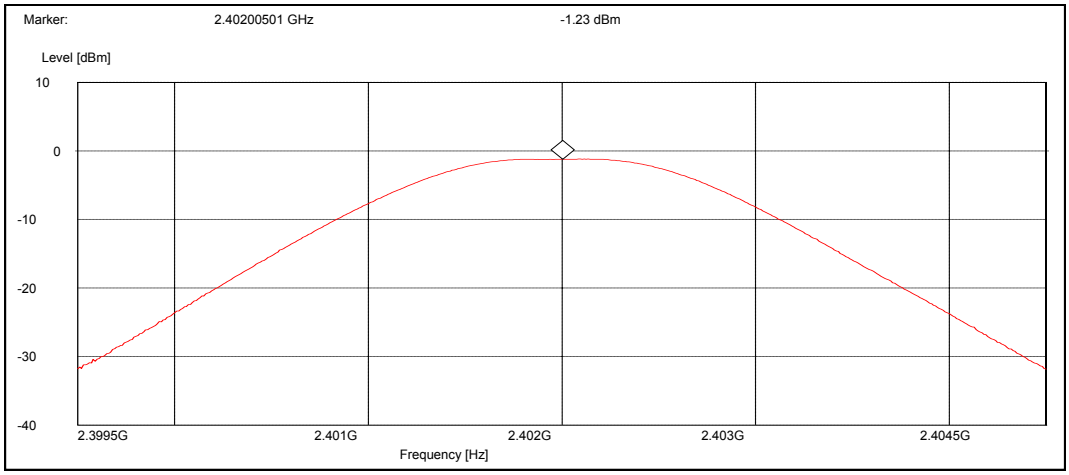
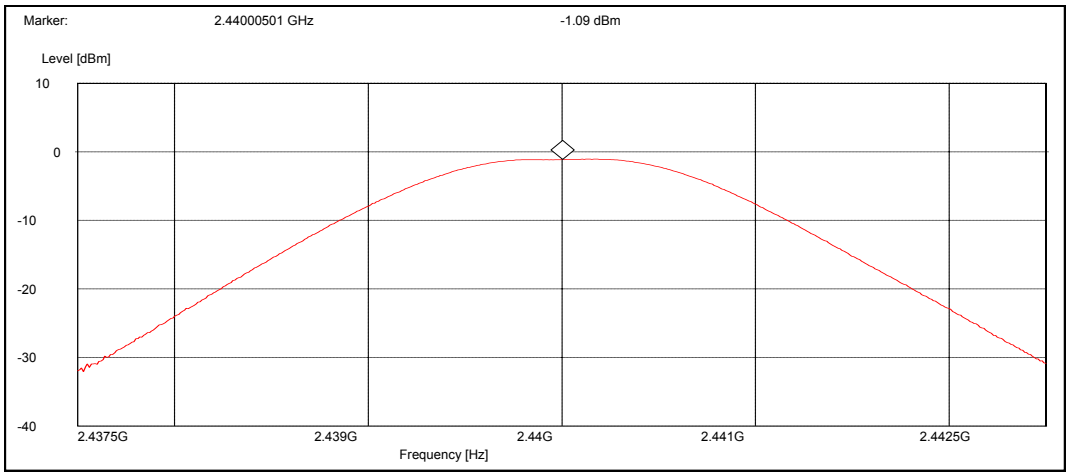
7.1.4 Graph – Channel 0 (2402 MHz)



7.1.5 Test Result – Channel 0

EUT channel	Raw Signal [dBm]	Signal Path Loss [dB]	Peak Output Pwr [dBm]	Peak Output Pwr [W]
0	-17.80	16.57	-1.23	0.0007533

7.1.6 Graph – Channel 38 (2440 MHz)



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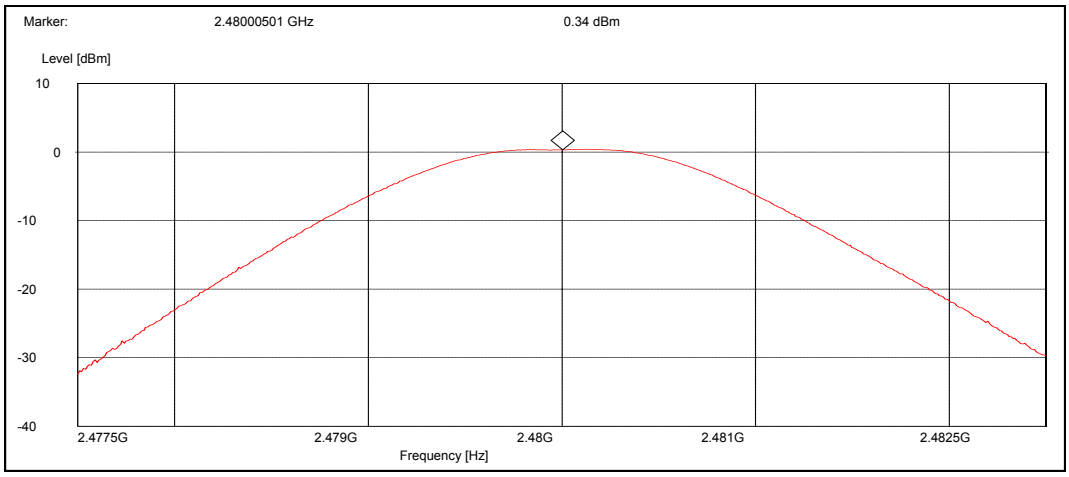
7.1.7 Test Result – Channel 38

EUT channel	Raw Signal [dBm]	Signal Path Loss [dB]	Peak Output Pwr [dBm]	Peak Output Pwr [W]
38	-17.69	16.60	-1.09	0.00077804

7.1.8 Graph – Channel 78 (2480 MHz)



7.1.9 Test Result – Channel 78

EUT channel	Raw Signal [dBm]	Signal Path Loss [dB]	Peak Output Pwr [dBm]	Peak Output Pwr [W]
78	-17.73	18.07	0.34	0.0010814

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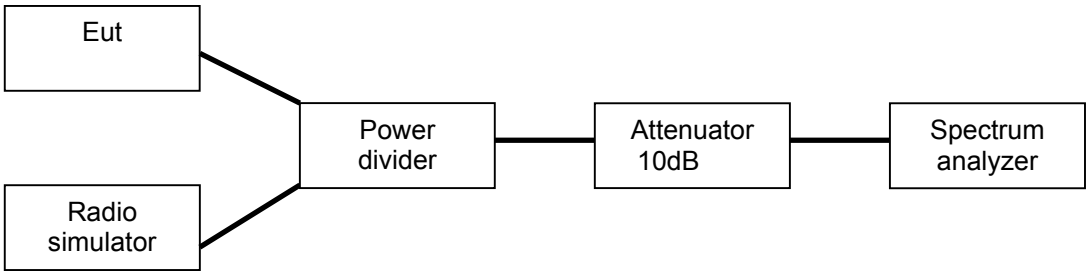
8. Band Edge Compliance

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.9 ºC / 50.5 RH%
	24-06-2004
	§15.247 (c) (1)
	6.2.2 (o), e1
	Jesper Nielsen

8.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



8.1.1 Measuring Equipment Set-up

Frequency Range	2395 MHz – 2405 MHz and 2478.5 MHz – 2488.5 MHz
Sweep Mode	Continously, Max hold
Sweep time	Coupled
Res.BW / VBW	100 kHz / 100 kHz
Detector	Peak
Attenuation	20 dB internal / 10 dB external
Ref. Level	0 dBm

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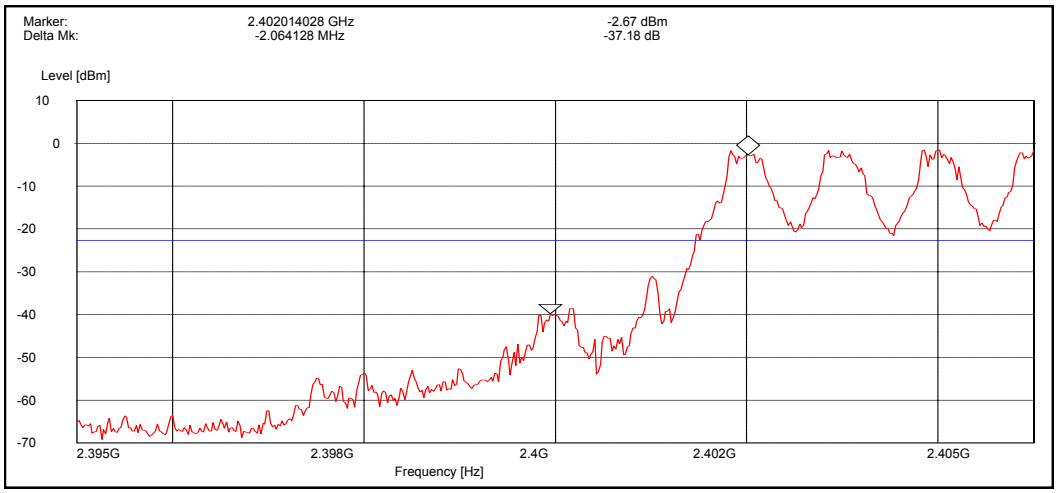
8.1.2 EUT Operational Mode

Transmission Parameters	Connection, Static PRBS, DH5 packet type
Bluetooth channel	Single freq. & Hopping
EUT Tx power level	Nominal

8.1.3 Graph – Hopping Mode / Low Band Edge



8.1.4 Test Result – Hopping Mode / Low Band Edge

EUT channel	Signal peak [dBm]	Limit (Signal Peak – 20 dB) [dBm]	Max. level below 2400 MHz [dBm]	Status
0	-2.67	-22.67	-37.18	Passed

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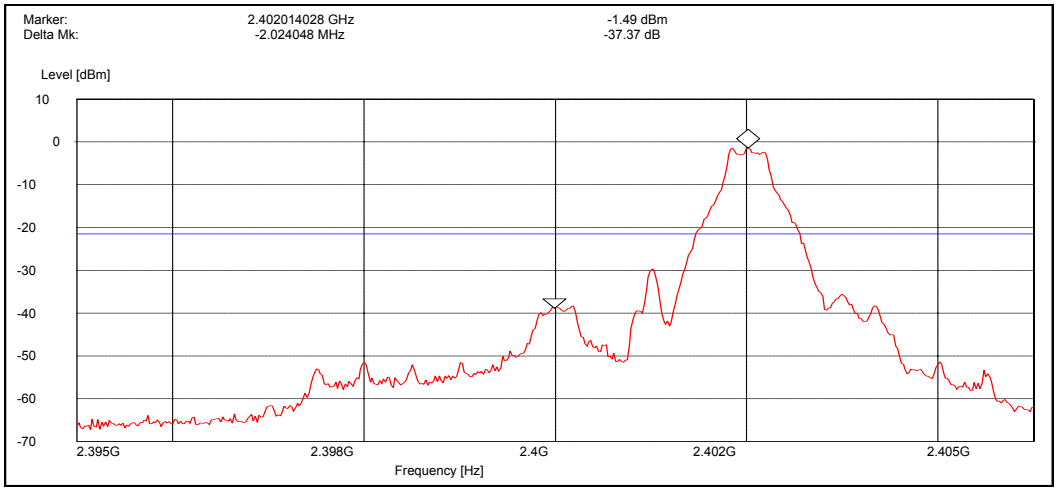
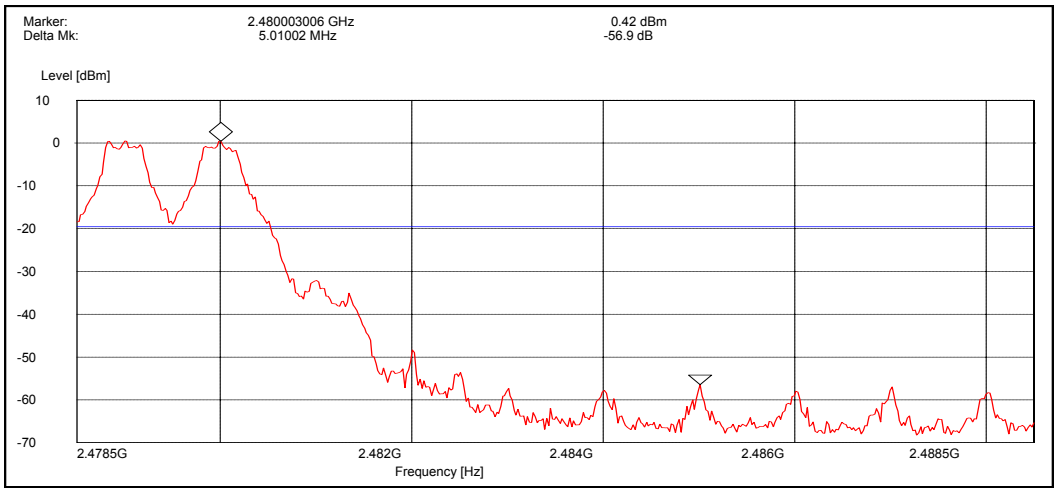
8.1.5 Graph – Single Channel (Ch 0) / Low Band Edge



8.1.6 Test Result – Single Channel (Ch 0) / Low Band Edge

EUT channel	Signal peak [dBm]	Limit (Signal Peak – 20 dB) [dBm]	Max. level below 2400 MHz [dBm]	Status
0	-1.49	-21.49	-37.37	Passed

8.1.7 Graph – Hopping Mode / High Band Edge



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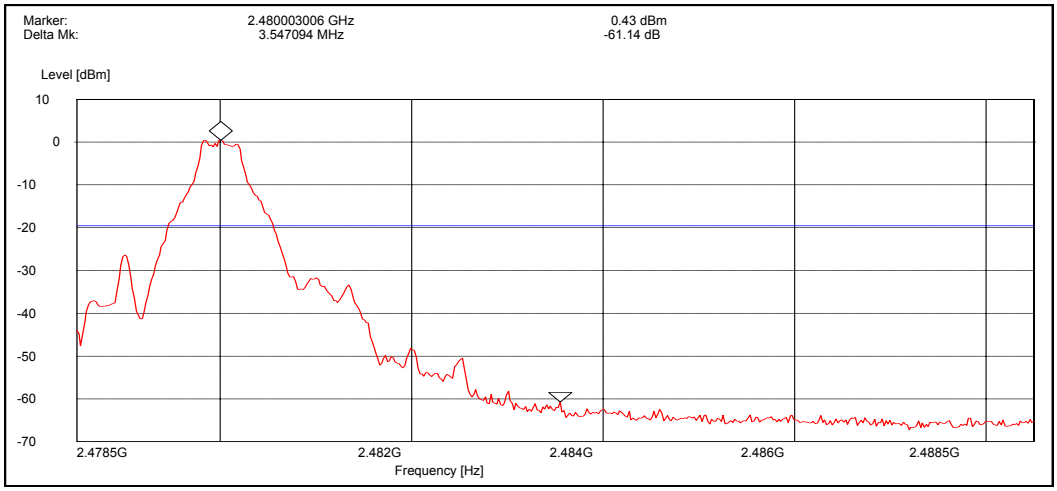
8.1.8 Test Result – Hopping Mode / High Band Edge

EUT channel	Signal peak [dBm]	Limit (Signal Peak – 20 dB) [dBm]	Max. level above 2483.5 MHz [dBm]	Status
79	0.42	-19.58	-56.9	Passed

8.1.9 Graph – Single Channel (Ch 78) / High Band Edge



8.1.10 Test Result – Single Channel (Ch 78) / High Band Edge

EUT channel	Signal peak [dBm]	Limit (Signal Peak – 20 dB) [dBm]	Max. level above 2483.5 MHz [dBm]	Status
78	0.43	-19.57	-61.14	Passed

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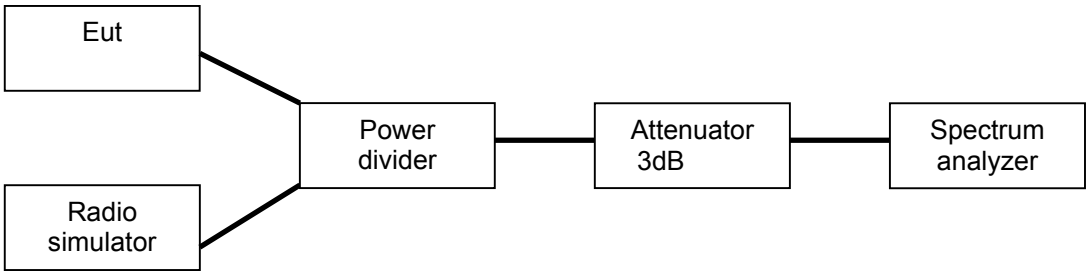
9. Spurious RF Conducted Emission

EUT	RH-12 dut#233927
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	21.9 ºC / 50.5 RH%
	24-06-2004
	§15.247 (c) (2)
	6.2.2 (o), e1
	Jesper Nielsen

9.1. Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



9.1.1 Measuring Equipment Set-up

Frequency Range	1 MHz – 25000 MHz
Sweep Mode	Continously, Max hold
Sweep time	Coupled
Res.BW / VBW	100 kHz / 100 kHz
Detector	Peak
Attenuation	20 dB internal / 3 dB external
Ref. Level	0 dBm

9.1.2 EUT Operational Mode

Transmission Parameters	Connection, Static PRBS, DH5 packet type
Bluetooth channel	Single freq. & Hopping
EUT Tx power level	Nominal

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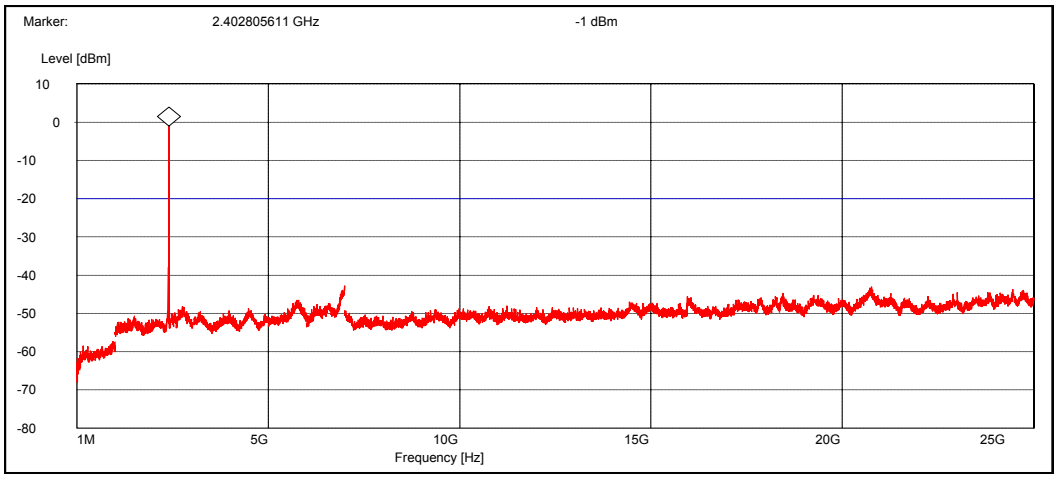
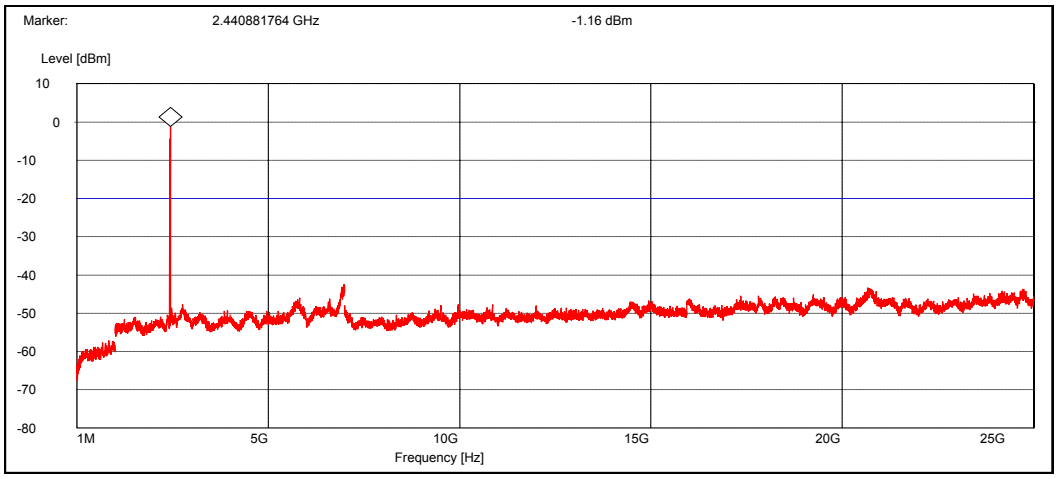
9.1.3 Graph – Channel 0 (2402 MHz)



9.1.4 Graph – Channel 38 (2440 MHz)



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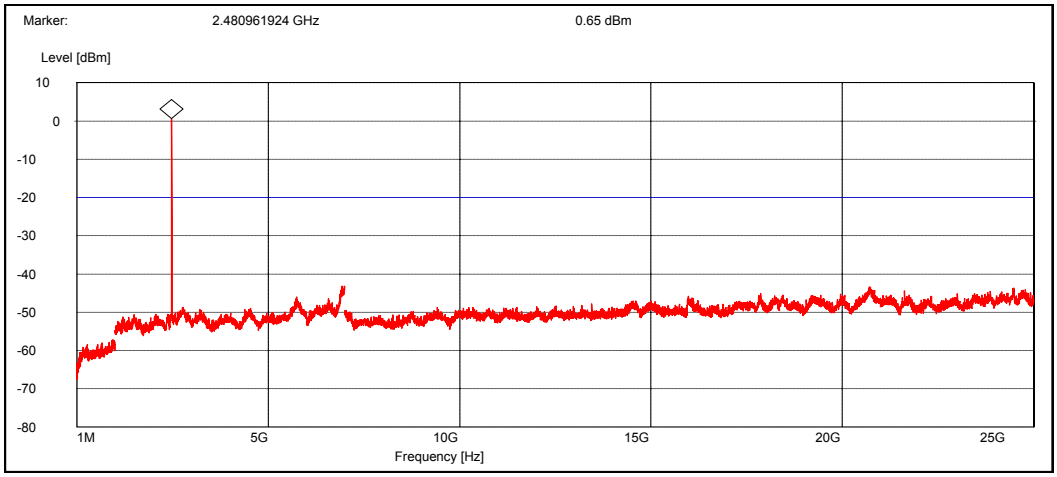
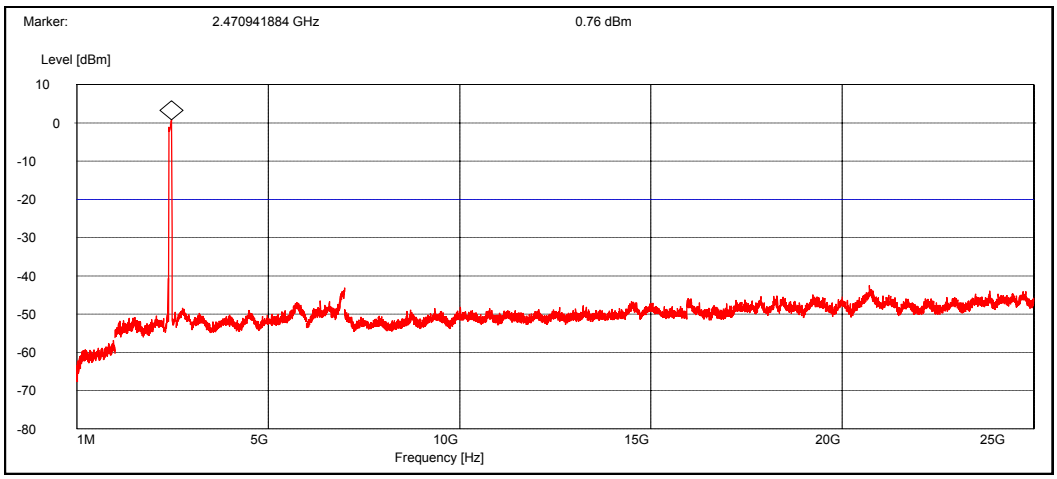
9.1.5 Graph – Channel 88 (2480 MHz)



9.1.6 Graph – Hopping Mode



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9.1.7 Test Results

EUT channel	Highest spurious peak [dBm]	Limit [dBm]	Status
0	-42.5	-20	Passed
38	-42.4	-20	Passed
78	-42.1	-20	Passed
Hopping	-42.6	-20	Passed

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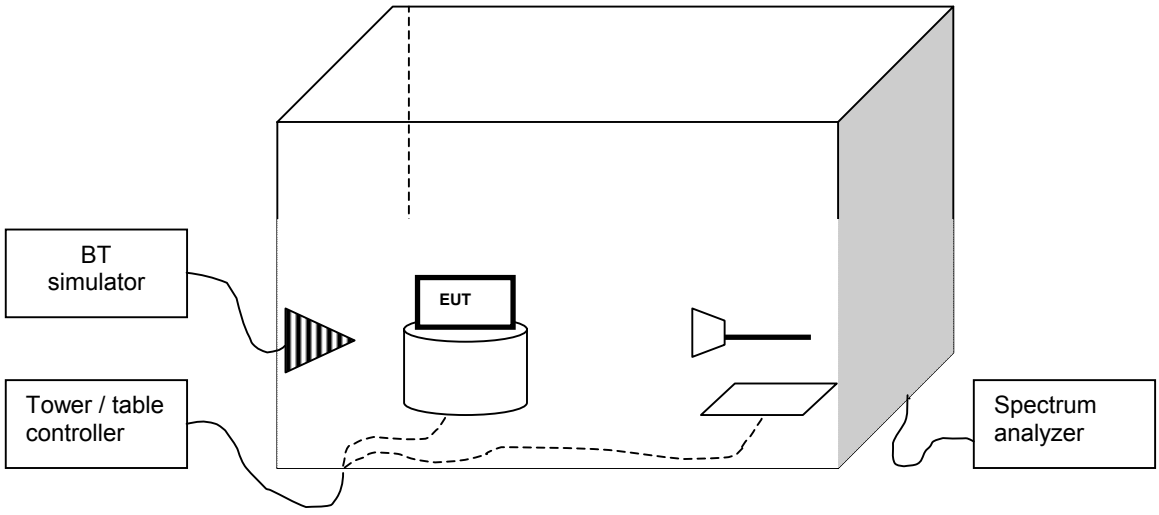
10. Spurious radiated emissions

EUT	RH-12 dut#234090
Accessories	BL-5C dut#233530, DTS-128 dut#233747
Temp, Humidity, Air Pressure	22.7 ºC / 54.0 RH%
Date of measurement	09-07-2004
FCC rule part	§15.247 (c) (1)
RSS-210 section	6.2.2 (o), e1
Measured by	Jesper Nielsen

10.1. Test setup

The EUT was set on a non-conductive turn table in a semi anechoic chamber. In the corner of the chamber there was a communication antenna, which was connected to the BT simulator located outside the chamber. The radiated power from the EUT was measured with an antenna fixed to a antenna tower. The tower and turn table were remotely controlled to turn the EUT and change the antenna polarization. The measured signal was routed from the measuring antenna to the spectrum analyzer. The Bluetooth simulator was used to the same as in conducted measurements.

In tests, where absolute level reporting were required, the results were corrected with all applicable factors as detailed in the result section of each measurement.



10.2. Measurement method

a) The spectrum analyzer with peak detector was used to find all the emissions generated by the EUT.

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b) All suspicious frequencies with emission levels were recorded.

c) For each frequency detected in (b), the emissions were maximized by moving the turn table and measuring antenna and manipulating the EUT.

d) The maximized emissions were measured and reported.

10.3. EUT operation mode

EUT operation mode	BT Connection, Static PRBS, DH5 packet type
EUT channel	0, 38 and 78
EUT TX power level	Nominal
EUT operation voltage	Battery

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10.4. Limits, 3m measuring distance

Frequency band (MHz)	Limit (µV/m)	Limit (dBµV/m)	Detector
30 – 88	100	40	QP
88 -216	150	43.5	QP
216 - 960	200	46	QP
960 - 1000	500	54.0	QP
1000 - 25000	500	54.0	Av
1000 - 25000	5000	74.0	Pk

As default, all emissions were compared against the general limits. If any emission exceeded that limit, it was further checked, if it was outside the restricted band thus complying with the -20dBc requirement.

10.5. Results

The results were corrected with the cable and filter losses, preamplifier gain, antenna factor and measurement distance.

The measurement results were obtained as described below.

$$E[uV/m] = U_{RX} + A_{CABLE} + AF - G_{PREAMP} - C_{DISTANCE}$$

Where

U_{RX} receiver reading

A_{CABLE} Attenuation of the cable

AF Antenna factor

G_{PREAMP} Gain of the preamplifier

$C_{DISTANCE}$ Conversion factor from 3m to 1.6 m measurement distance

PK 1MHz/ 3MHz RBW/VBW

AV 1MHz/10Hz RBW/VBW

Measuring Distance 1.6 meter

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Table 1 Emission levels, TX on channel 0

Freq. [MHz]	U_{RX} dBuV	Pol.	Det.	A_{CABLE} (dB)	G_{PREAMP} (dB)	AF (dB)	Limit [dBuV/m]	$C_{DISTANCE}$	Result [dBuV/m]
4804	35,07	V	PK	6.50	29,26	35.5	74	5.46	42,35
4804	20.77	V	AV	6.50	29,26	35.5	54	5.46	28,05
7206	33.76	V	PK	7.29	29,58	39.0	74	5.46	45,01
7206	19,86	V	AV	7.29	29,58	39.0	54	5.46	31.11

Table 2 Emission levels, TX on channel 38

Freq. [MHz]	U_{RX} dBuV	Pol.	Det.	A_{CABLE} (dB)	G_{PREAMP} (dB)	AF (dB)	Limit [dBuV/m]	$C_{DISTANCE}$	Result [dBuV/m]
4880	35,01	V	PK	6.58	29,51	35,2	74	5.46	41,82
4880	20,98	V	AV	6.58	29,51	35,2	54	5.46	27,79
7320	33,29	V	PK	7.37	29,48	39,2	74	5.46	44,92
7320	19,95	V	AV	7.37	29,48	39,2	54	5.46	31,58

Table 3 Emission levels, TX on channel 78

Freq. [MHz]	U_{RX} dBuV	Pol.	Det.	A_{CABLE} (dB)	G_{PREAMP} (dB)	AF (dB)	Limit [dBuV/m]	$C_{DISTANCE}$	Result [dBuV/m]
4960	35,12	V	PK	6.62	29,39	35,5	74	5.46	42,39
4960	20,66	V	AV	6.62	29,39	35,5	54	5.46	27,93
7440	34,29	V	PK	7.39	29,26	40.0	74	5.46	46,96
7440	19,83	V	AV	7.39	29,26	40.0	54	5,46	32,50

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11. Test equipment

Each test equipment is calibrated once a year, except antennas which are calibrated every second year.

11.1. Conducted and radiated measurements

Equipment #	Equipment	Type	Serial #	Manufacturer
13799	Signal Generator	SMP 02	1035.5005.02	Rohde & Schwarz
18861	Spectrum Analyzer 20Hz-26.6GHz	ESI	1088.7490.26	Rohde&Schwarz
18416	BS Simulator	CMU-200	1100.0008.02	Rohde & Schwartz
-	RF Attenuator	6603.19.AA		Suhner
-	RF Attenuator	MOD 768-10		Narda
19087	Power Divider	11636B	52228	Agilent

11.2. Radiated measurements

Equipment #	Equipment	Type	Serial #	Manufacturer
18774	3m Semi-anechoic Chamber	RSFD-F/A-100	2425	ETS-Lindgren
18861	Spectrum Analyzer 20Hz-26.6GHz	ESI	1088.7490.26	Rohde&Schwarz
18416	BS Simulator	CMU-200	1100.0008.02	Rohde & Schwartz
18792	Turntable and Antenna Contoller	MDC-2090	1606	ETS-EMCO
	EUT fixture Controller	G-1000 DXC	3D240011	Yaesu
	RF Preamplifier 3GHz-26.5GHz (Metal Chassis)	JS4-01002600-36-5P	681866	Miteq/NMP Cph
16878	Dual Log Periodic Antenna 1-26.5 GHz	HL025		Rohde&Schwarz
14507	Broad Band MW Antenna	BBHA 9120 LFA	103	Schwarzbeck
14508	Broad Band MW Antenna	BBHA 9120 LFA	104	Schwarzbeck
19151	High Pass Filter >3GHz	WHK3.0/18G-10SS	121	Wainwright

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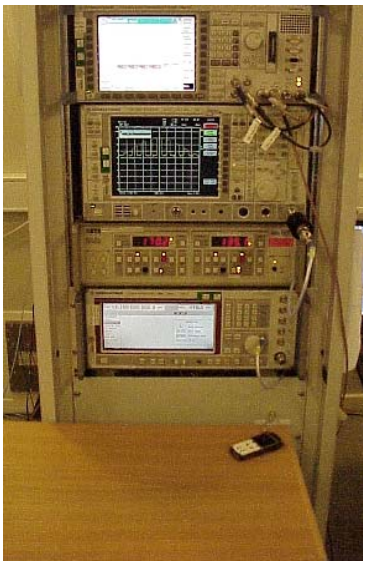
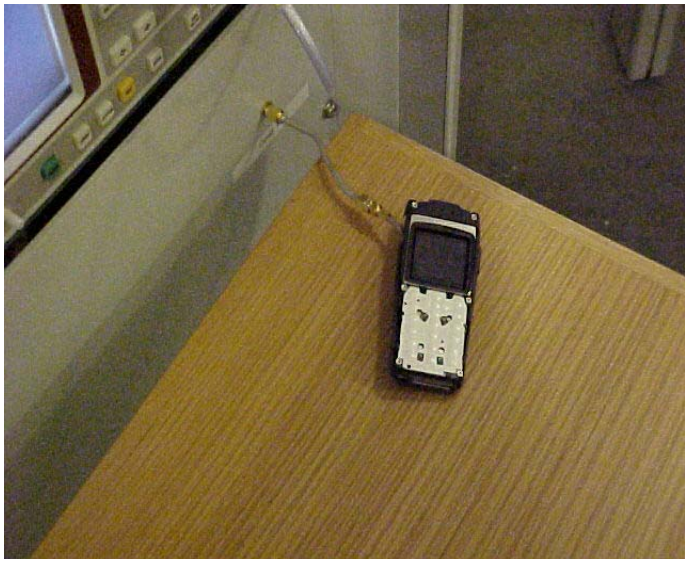
Test setup photographs

11.3. Conducted RF measurements





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