TCC
Copenhagen

DANAK
Reg. Nr. 416

Bluetooth Spurious Emissions Compliance Test Report

Test Report no.:	DTX09949-EN	**Date of Report:**	19-02-2004
Number of pages:	14	**Customer's Contact person:**	Ernst Edelmann
		Responsible Test engineer:	Christian N. Andersen
Testing laboratory:	TCC Copenhagen Nokia Danmark A/S Frederikskaj DK-1790 Copenhagen V Denmark Tel. +45 33 29 29 29 Fax. +45 33 29 20 01 FCC FRN: 99059 IC FRN: IC 4820	**Client:**	Nokia GmbH Product Creation Side Bochum, Rensingstr.15, D-44807 Bochum Germany Tel.: +49 234 984 2881 Fax. +49 234 984 3801
Tested devices/ accessories:	**Phone; RH-47 (HW: 0406), BL-6C, MMC**		
Supplement reports:			
Testing has been carried out in accordance with:	**Bluetooth RF Test Specification: TRC/CA/01/C (Out-of-Band Spurious Emissions): FCC Part 15.247 and IC RSS-210, section 6.2.2**		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Copenhagen.		
Test Results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		

Date and signatures for the contents:

19-02-2004

Allan Franch Henriksen **Test engineer**	**Ruben Hansen** **Team Leader**

1. Summary for Bluetooth Spurious Emissions Compliance Test Report

Date of receipt	08-12-2003
Testing completed	21-01-2004
The customer's contact person	Ernst Edelmann
Test Plan referred to	\\Cord04m\TCC\EMC\Reports\Aquarius_RH-47\Testplan.doc
Notes	None
Document name	\\Cord04mTCC\EMC\Reports\Aquarius_RH-47\Ta_Test\B4.0\DTX09949-EN.doc

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RH-47	001004/00/127387/0	0406	-	2.10	233290
Battery	BL-6C	-	-	-	-	233354
Multi Media Card	MMC	-	-	-	-	233326

Test methods and levels, test equipments and standards applied are described in document *Bluetooth FCC 15.247 Spurious Emissions description.doc* version 1.0. That document is delivered on the customer's request.

The following tests have been carried out in accordance with the test-plan, which can specify some test cases to be performed partly.

EUT with Battery								
Frequency Range			Channel			Position		RESULT
30 – 12.7500 MHz	-	12.75 – 25 GHz	Low	Mid	High	Hor	Ver	
X	-	X	X	X	X	X	X	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.
X	The test was selected to be done.

CONTENTS

2. EUT with Battery

EUT with DUT number	RH-47 Dut # 233290
Accessories with DUT numbers	BL-6C Dut # 233354 + MMC Dut # 233326
Result	Passed
Remarks	*See the specific Tests
Temp °C / Humidity RH %	20.2°C / 41%
Date of measurements	21-01-2004
Measured by	Jesper Nielsen

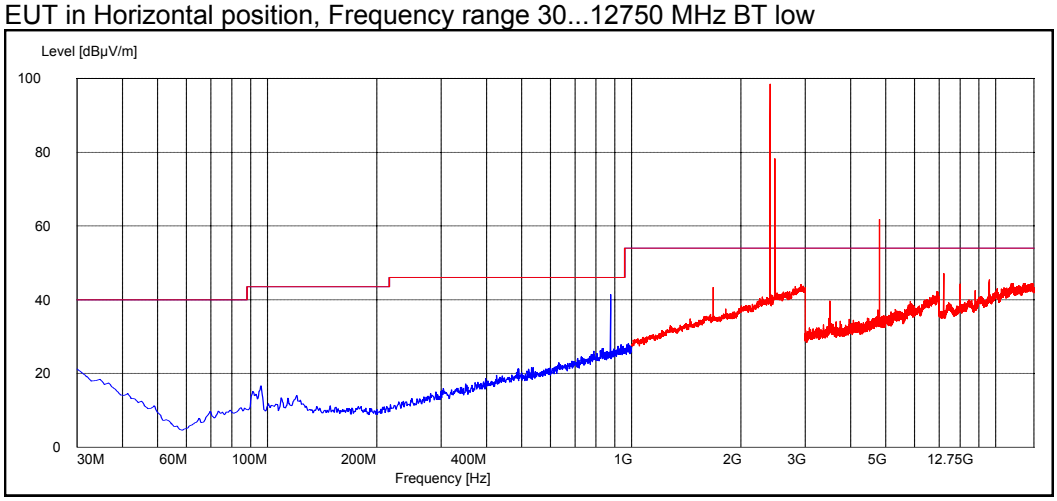
2.1. Test setup

For a photo of the test-setup that was used for Bluetooth Radiated Spurious Emissions, refer to Section 1 of Appendix A.

2.2. Frequency range 30 – 12.750 MHz

2.2.1 Low operating frequency (TX 2402 MHz, RX 2480 MHz)

EUT in Horizontal position, Frequency range 30...12750 MHz BT low

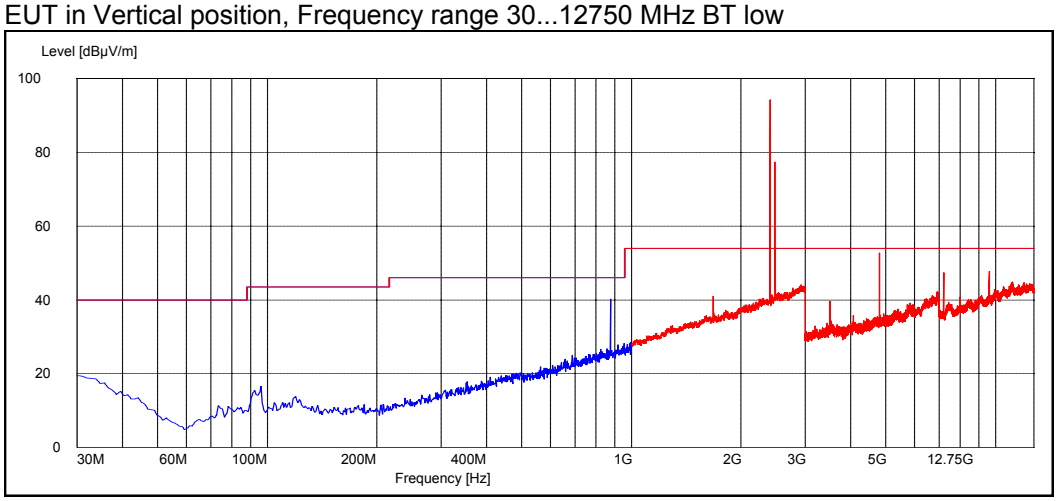


*876.0 MHz frequency is coming from communication tester and thus ignored.
*2480.0 MHz frequency is coming from communication tester and thus ignored.
*2402.0 MHz frequency is BT carrier signal and thus ignored.
*The peaks at 4.804 GHz and 7.206 GHz was caused by saturation in the preamplifier. No emission was found Re-measuring the frequency range manually.

The highest values

Frequency / MHz	Level / dBµV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2402.805611	98.43	---------	---------	---------	*BT carrier
4804.609218	61.76	-7.76	---------	---------	*Passed
7206.412826	47.04	-6.96	---------	---------	*Passed

EUT in Vertical position, Frequency range 30...12750 MHz BT low



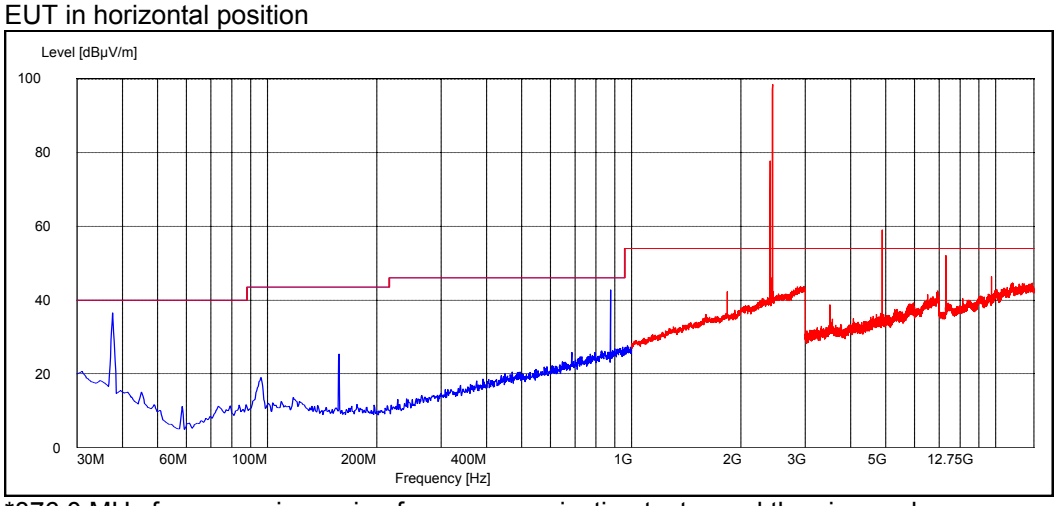
*876.0 MHz frequency is coming from communication tester and thus ignored.
*2480.0 MHz frequency is coming from communication tester and thus ignored.
*2402.0 MHz frequency is BT carrier signal and thus ignored.
*The peaks at 4.804 GHz, 7.205 GHz and 9608 GHz were caused by saturation in the preamplifier. No emission was found Re-measuring the frequency range manually.

The highest values

Frequency / MHz	Level / dBµV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2402.805611	94.21	---------	---------	---------	*BT carrier
4804.609218	52.74	-1.26	---------	---------	*Passed
7205.410822	47.23	-6.77	---------	---------	*Passed
9608.216433	47.77	-6.23	---------	---------	*Passed

2.2.2 Mid operating frequency (TX 2441 MHz, RX 2402 MHz)

EUT in horizontal position

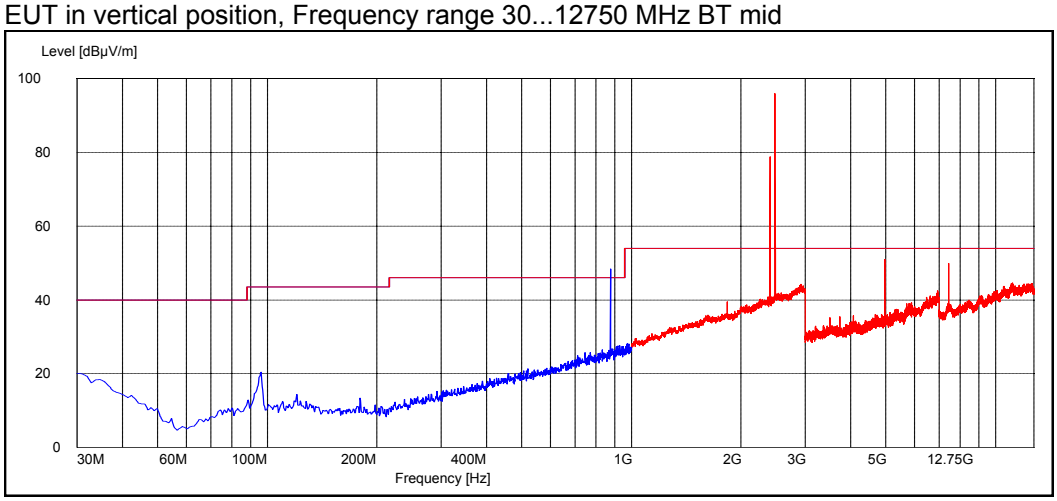


*876.0 MHz frequency is coming from communication tester and thus ignored.
*2402.0 MHz frequency is coming from communication tester and thus ignored.
*2441.0 MHz frequency is BT carrier signal and thus ignored.
*The peaks at 4.882 GHz and 7.323 GHz was caused by saturation in the preamplifier. No emission was found Re-measuring the frequency range manually.

The highest values

Frequency / MHz	Level / DBuV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2441.883768	98.37	--------	--------	--------	*BT carrier
4882.765531	59.05	-5.05	--------	--------	*Passed
7323.647295	52.02	1.98	--------	--------	*Passed

EUT in vertical position, Frequency range 30...12750 MHz BT mid



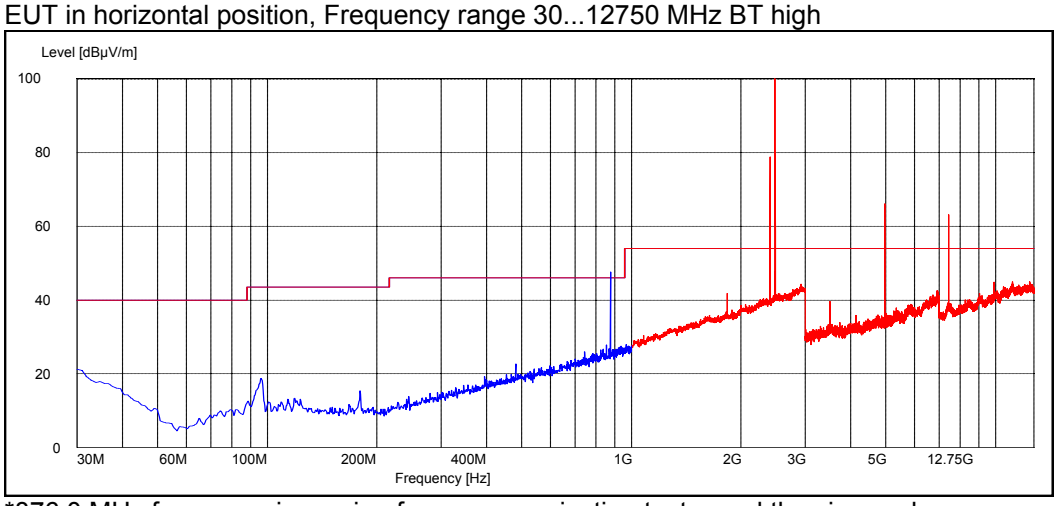
*876.0 MHz frequency is coming from communication tester and thus ignored.
*2402.0 MHz frequency is coming from communication tester and thus ignored.
*2441.0 MHz frequency is BT carrier signal and thus ignored.
*The peaks at 4.882 GHz and 7.323 GHz was caused by saturation in the preamplifier. No emission was found Re-measuring the frequency range manually.

The highest values

Frequency / MHz	Level / DBuV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2441.883768	97.81	--------	--------	--------	*BT carrier
4882.765531	55.28	-1.28	--------	--------	*Passed
7323.647295	49.92	4.08	--------	--------	*Passed

2.2.3 High operating frequency (TX 2480 MHz, RX 2402 MHz)

EUT in horizontal position, Frequency range 30...12750 MHz BT high

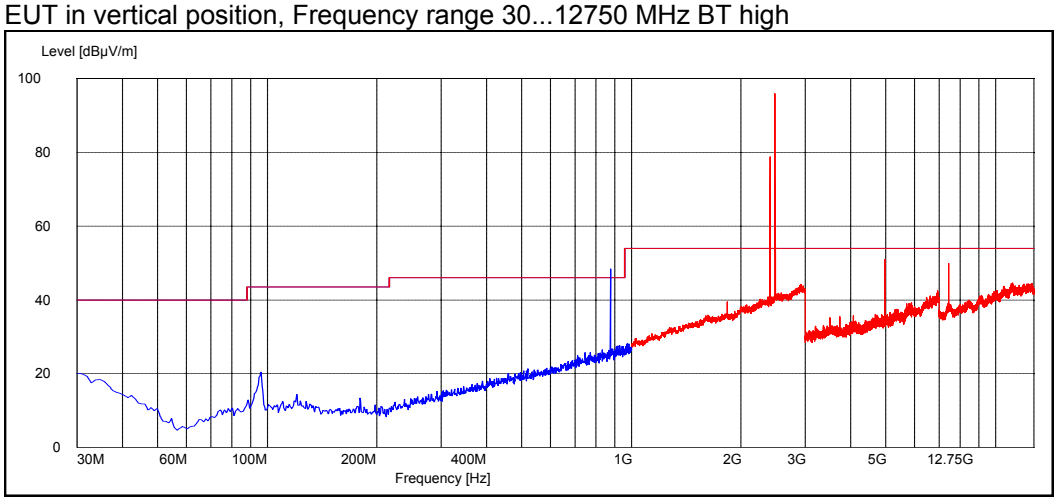


*876.0 MHz frequency is coming from communication tester and thus ignored.
*2402.0 MHz frequency is coming from communication tester and thus ignored.
*2480.0 MHz frequency is BT carrier signal and thus ignored.
*The peak at 4.960 GHz and 7.440 GHz was caused by saturation in the preamplifier. No emission was found Re-measuring the frequency range manually.

The highest values

Frequency / MHz	Level / DBuV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2480.961924	100.32	--------	--------	--------	*BT carrier
4960.921844	66.08	-12.08	--------	--------	*Passed
7439.87976	63.10	-9.1	--------	--------	*Passed

EUT in vertical position, Frequency range 30...12750 MHz BT high



*876.0 MHz frequency is coming from communication tester and thus ignored.
*2402.0 MHz frequency is coming from communication tester and thus ignored.
*2480.0 MHz frequency is BT carrier signal and thus ignored.
*The peak at 4.960 GHz and 7.440 GHz was caused by saturation in the preamplifier. No emission was found Re-measuring the frequency range manually.

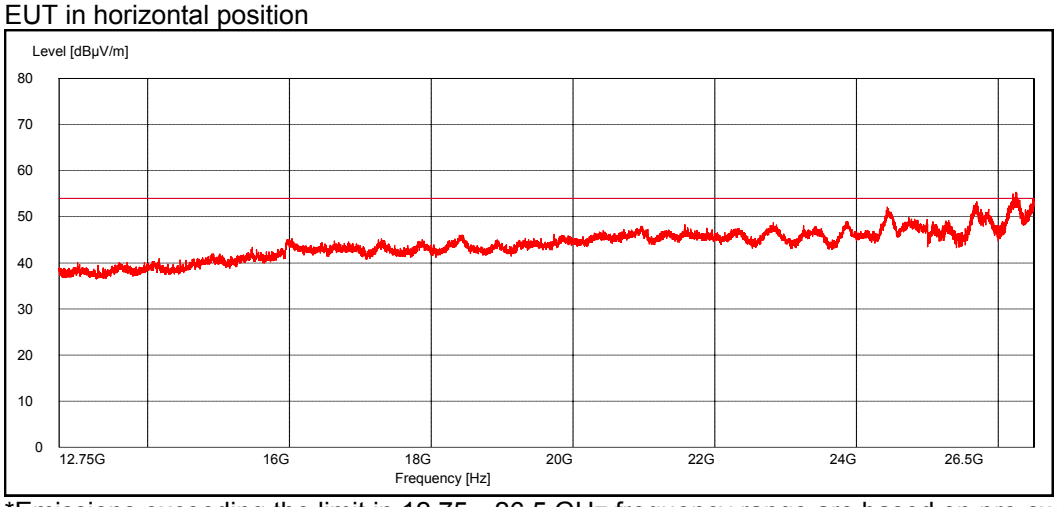
The highest values

Frequency / MHz	Level / DBuV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2480.961924	95.87	--------	--------	--------	*BT carrier
4960.921844	50.98	3.02	--------	--------	*Passed
7440.881764	49.85	4.15	--------	--------	*Passed

2.3. Frequency range 12.75 – 25 GHz

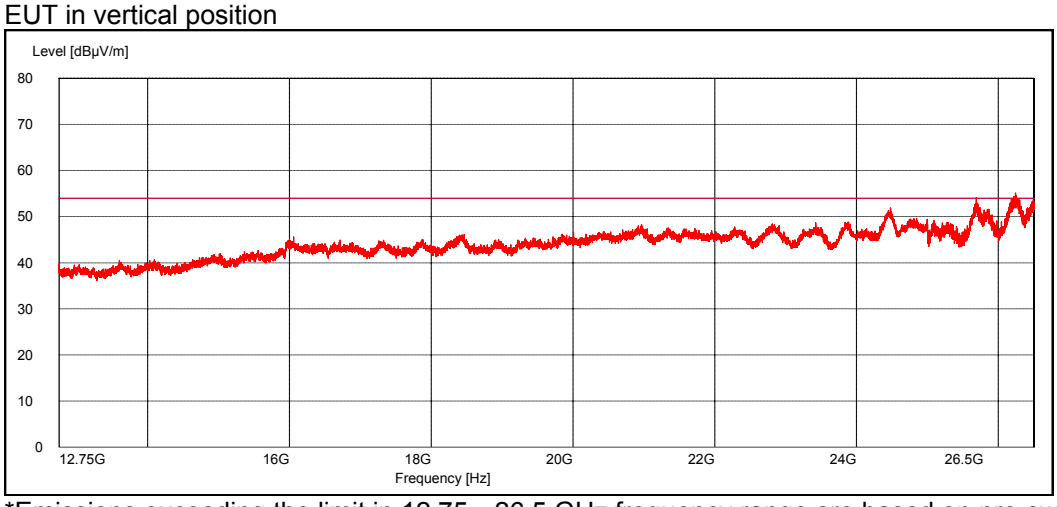
2.3.1 Low operating frequency (TX 2402 MHz, RX 2480 MHz)

EUT in horizontal position



*Emissions exceeding the limit in 12.75…26.5 GHz frequency range are based on pre-sweep measurements. Pre-sweep uses wider IF-BW than specified in the standard. Final measurement was performed with correct IF-BW and the result was PASSED.

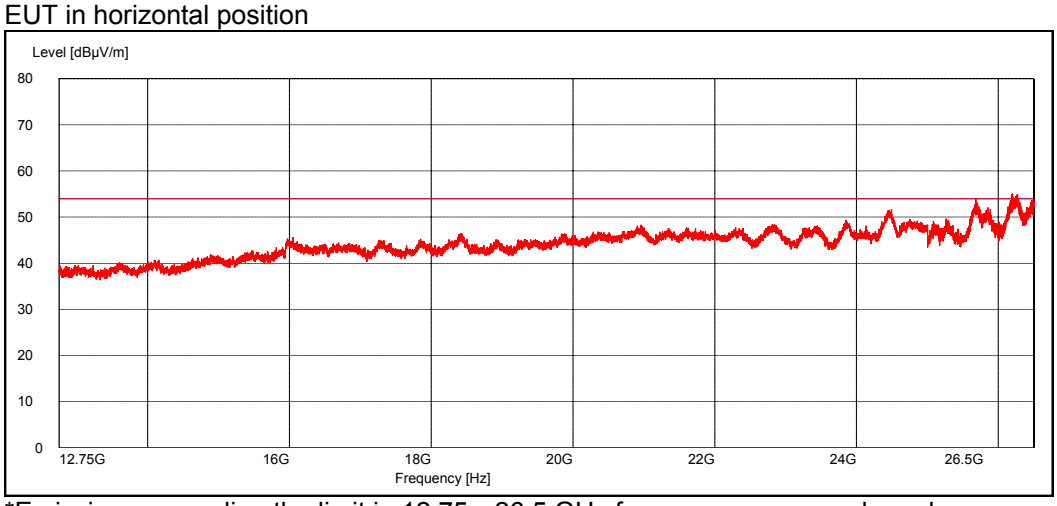
EUT in vertical position



*Emissions exceeding the limit in 12.75…26.5 GHz frequency range are based on pre-sweep measurements. Pre-sweep uses wider IF-BW than specified in the standard. Final measurement was performed with correct IF-BW and the result was PASSED.

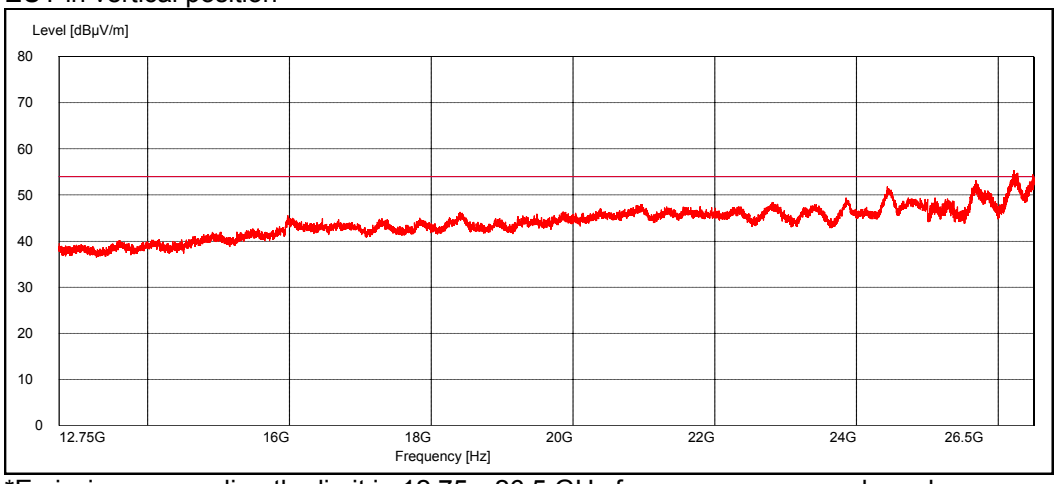
2.3.2 Mid operating frequency (TX 2441 MHz, RX 2402 MHz)

EUT in horizontal position



*Emissions exceeding the limit in 12.75…26.5 GHz frequency range are based on pre-sweep measurements. Pre-sweep uses wider IF-BW than specified in the standard. Final measurement was performed with correct IF-BW and the result was PASSED.

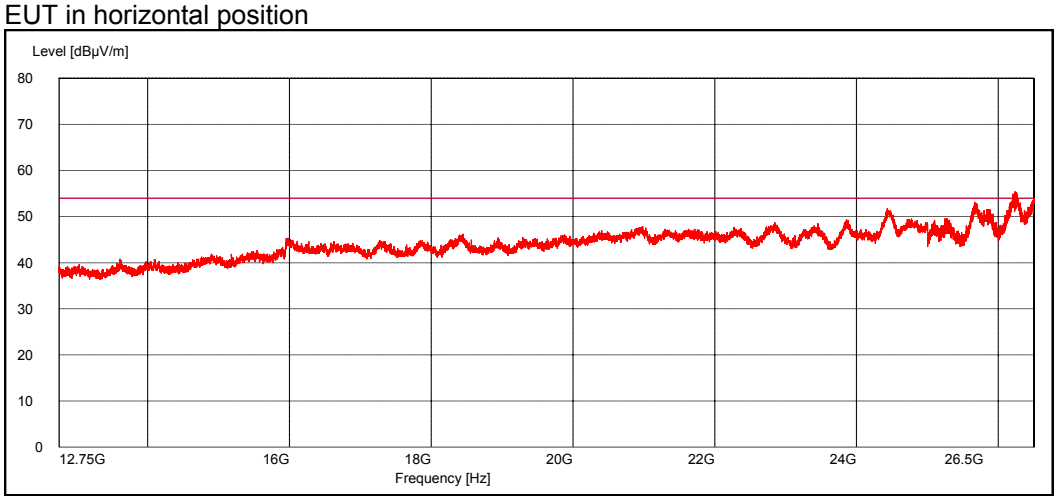
EUT in vertical position



*Emissions exceeding the limit in 12.75…26.5 GHz frequency range are based on pre-sweep measurements. Pre-sweep uses wider IF-BW than specified in the standard. Final measurement was performed with correct IF-BW and the result was PASSED.

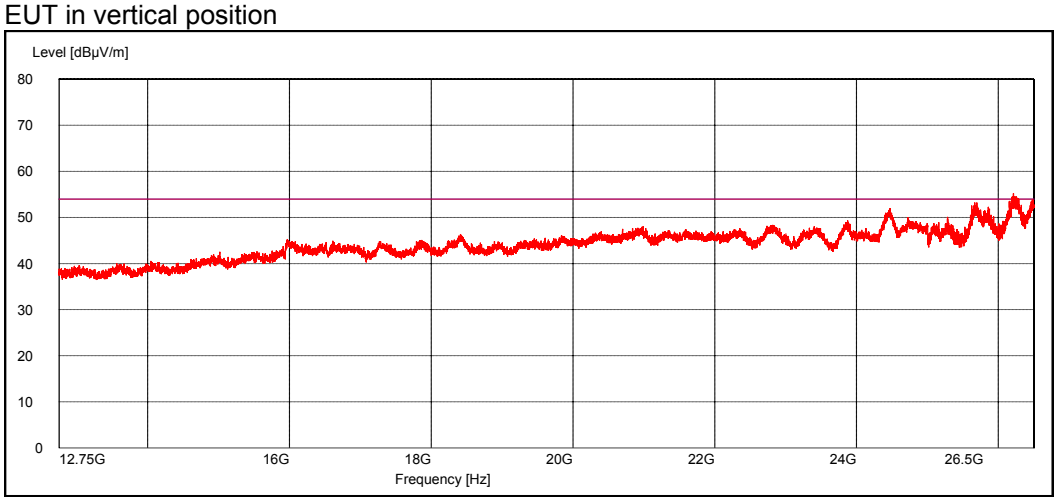
2.3.3 High operating frequency (TX 2480 MHz, RX 2402 MHz)

EUT in horizontal position



*Emissions exceeding the limit in 12.75…26.5 GHz frequency range are based on pre-sweep measurements. Pre-sweep uses wider IF-BW than specified in the standard. Final measurement was performed with correct IF-BW and the result was PASSED.

EUT in vertical position



*Emissions exceeding the limit in 12.75…26.5 GHz frequency range are based on pre-sweep measurements. Pre-sweep uses wider IF-BW than specified in the standard. Final measurement was performed with correct IF-BW and the result was PASSED.

2.4. Measurement uncertainty for a level of confidence of approximately 95%, (k = 2)

30...200 MHz, +4.12 / -4.15 dB
200...3000 MHz, ± 3.17 dB
3...25 GHz, ± 4.26 dB