TCC
Copenhagen

DANAK
Reg. Nr. 416

Bluetooth FCC 15.247 Spurious Emissions Compliance Test Report

Test Report no.:	DTX10453-EN	**Date of Report:**	20-04-2004
Number of pages:	12	**Customer's Contact person:**	Robert W. Müller
		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	**Client:**	Nokia Corporation Rensingstrasse 15, D-44807 Bochum, Germany Tel. +49 234 984 4128 Fax. +49 234 984 3801
Tested devices/ accessories:	**Advanced Car Kit; Model: HF-5**		
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:

20-04-2004

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

1. Summary for Bluetooth FCC 15.247 Spurious Emissions Compliance Test Report

Date of receipt	31-03-2004
Testing completed	05-04-2004
The customer's contact person	Robert W. Müller
Test Plan referred to	\EMC\TESTPLAN\
Notes	None.
Document name	\\Cord04m\TCC\EMC\Reports\CK-7\Compliance Reports\DTX10453-EN.doc

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
BT Car-kit CK-7W	HF-5	0630786/93/000306	0201	-	2.010	233795
Cradle	MBC-15S	065004101761338311	-	-	-	233420
Pop-Port cable	CA-27		-	-	-	233423
Power cable	PCU-4		-	-	-	233421
Input device	CU-7	070008617039K48311	-	-	-	233422
Microphone	HFM-8		-	-	-	233418
Loudspeaker	HFS-12		-	-	-	233419

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 External DC Supply						
Frequency Range			Channel			RESULT
30 – 3000 MHz	3 – 12.75 GHz	12.75 – 25 GHz	Low	Mid	High	
Passed	Passed	Passed	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 External DC Supply

EUT with DUT number	HF-5 dut#233795
Accessories with DUT numbers	MBC-15S dut#233420, CA-27 dut#233423, PCU-4 dut#233421, CU-7 dut#233422, HFM-8 dut#233418, HFS-12 dut#233419
Result	EUT is compliant
Remarks	None.
Temp °C / Humidity RH %	20.9°C / 40.0%
Date of measurements	05-04-2004
Measured by	Jesper Nielsen

2.1. Test setup

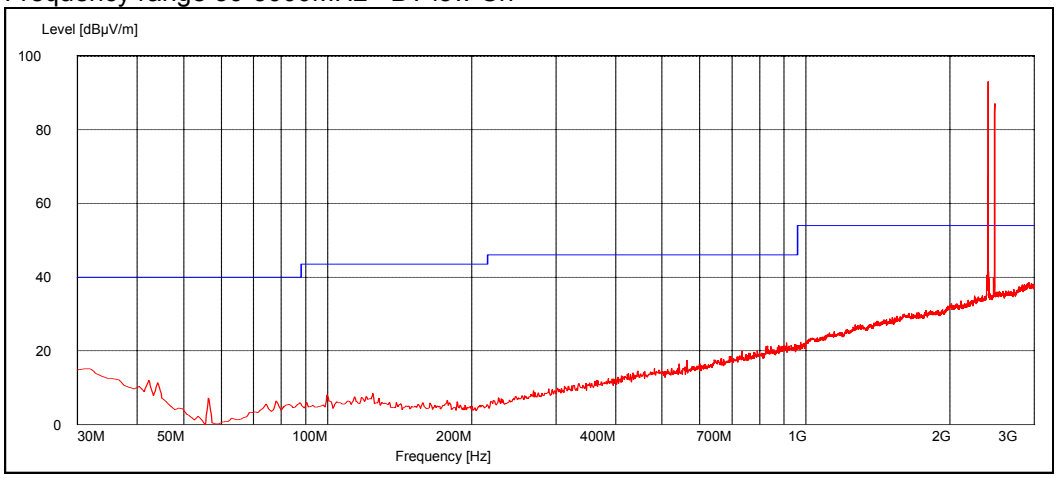
2.2. Measurements Bandwidths

Below 1GHz RBW/VBW is 120kHz/300kHz Peak detector.
Above 1GHz RBW/VBW is 1MHz/3MHz Avg. detector.

2.3. Frequency range 30 – 3000 MHz

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

Frequency range 30-3000MHz - BT low Ch



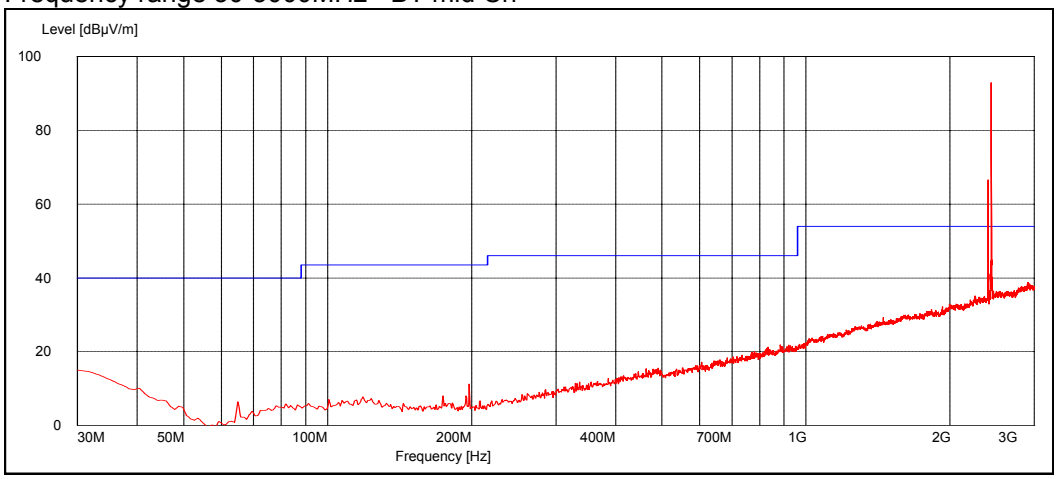
*2402.0 MHz frequency is BT carrier signal and thus ignored.
*2480.0 MHz frequency is coming from communication tester and thus ignored.

The highest values

Frequency / MHz	Level / dBµV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2402.205611	92.92	----	35.00	HORIZONTAL	Carrier
2480.361924	86.97	----	55.00	VERTICAL	CMU

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

Frequency range 30-3000MHz - BT mid Ch



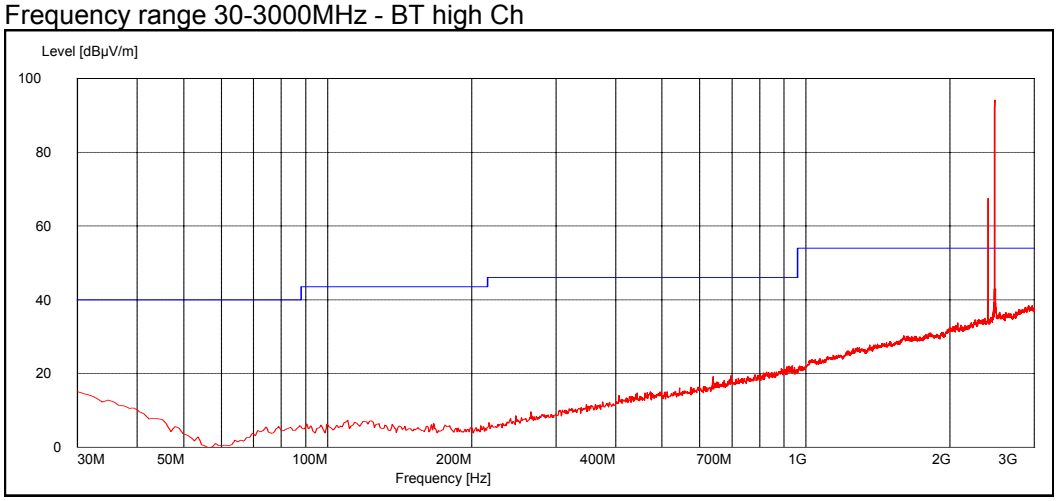
*2402.0 MHz frequency is coming from communication tester and thus ignored.
*2441.0 MHz frequency is BT carrier signal and thus ignored.

The highest values

Frequency / MHz	Level / dBµV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2402.205611	66.58	----	115.00	VERTICAL	CMU
2441.283768	92.85	-----	88.00	VERTICAL	Carrier

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

Frequency range 30-3000MHz - BT high Ch



*2402.0 MHz frequency is coming from communication tester and thus ignored.
*2480.0 MHz frequency is BT carrier signal and thus ignored.

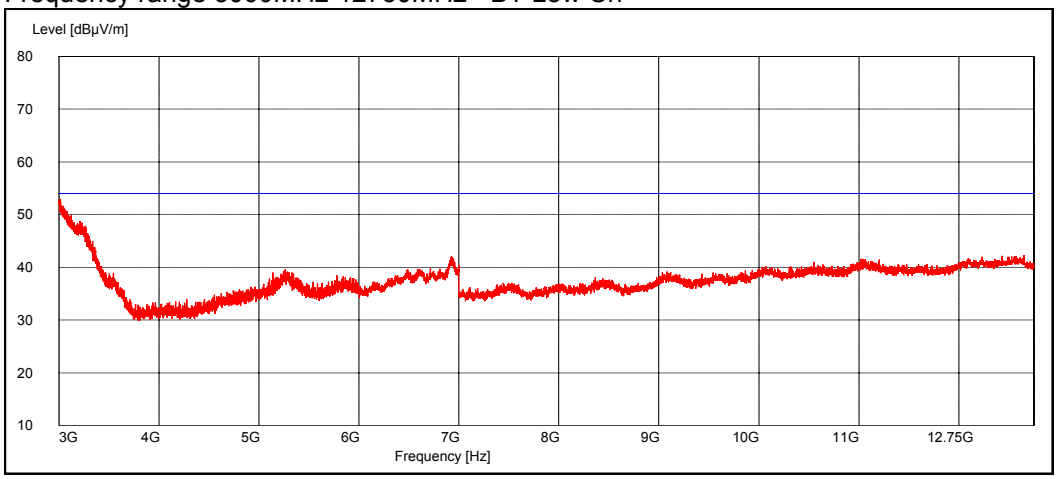
The highest values

Frequency / MHz	Level / dBµV/m	Margin / dB	Azimuth / deg	Polarisation	Result
2402.205611	67.45	----	176.00	VERTICAL	CMU
2480.361924	94.12	----	134.00	HORIZONTAL	Carrier

2.4. Frequency range 3 – 12.75 GHz

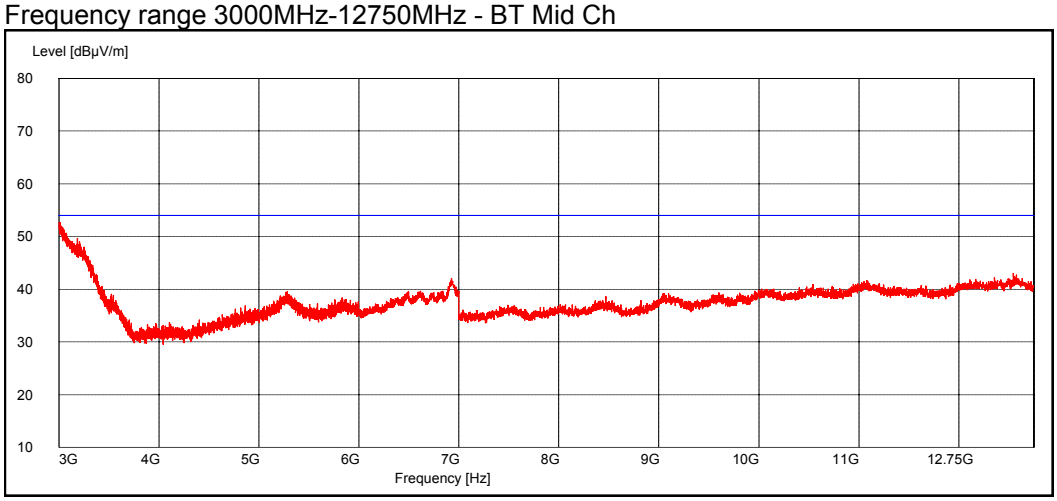
2.4.1 Low operating frequency (TX 2402 MHz, RX 2480 MHz)

Frequency range 3000MHz-12750MHz - BT Low Ch



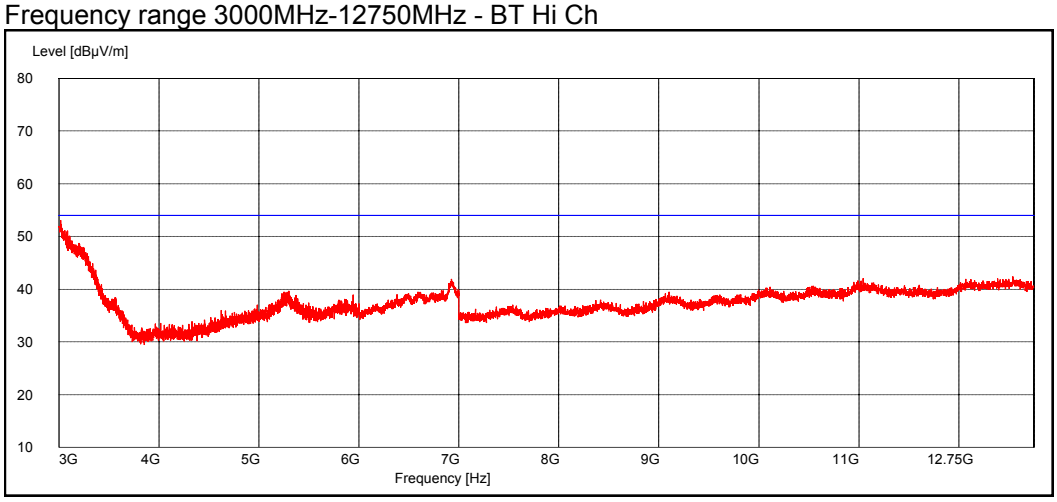
2.4.2 Mid operating frequency (TX 2441 MHz, RX 2402 MHz)

Frequency range 3000MHz-12750MHz - BT Mid Ch



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

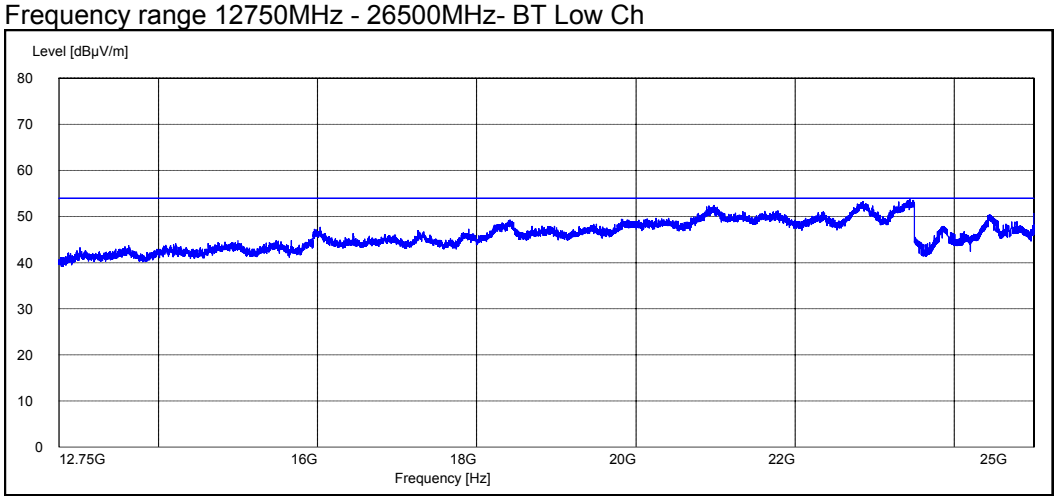
Frequency range 3000MHz-12750MHz - BT Hi Ch



2.5. Frequency range 12.75 – 25 GHz

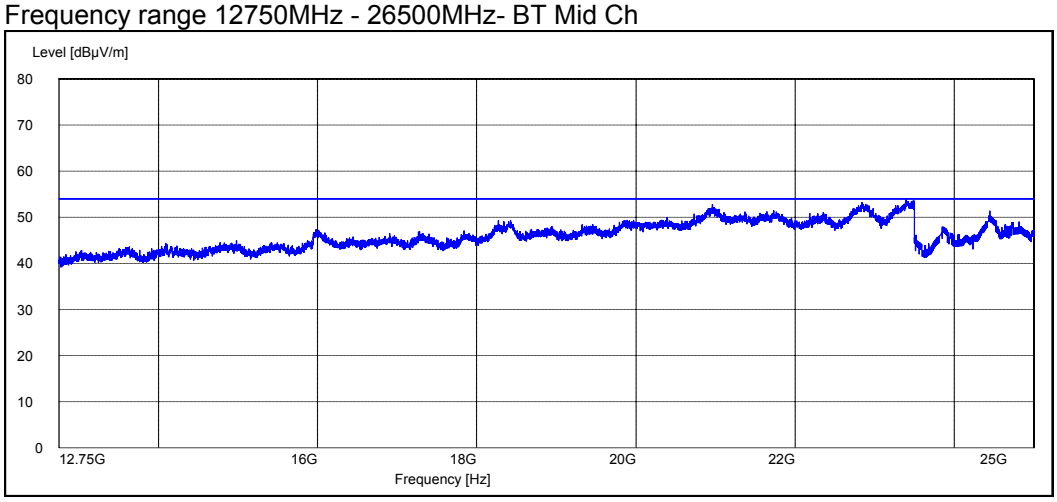
2.5.1 Low operating frequency (TX 2402 MHz, RX 2480 MHz)

Frequency range 12750MHz - 26500MHz- BT Low Ch



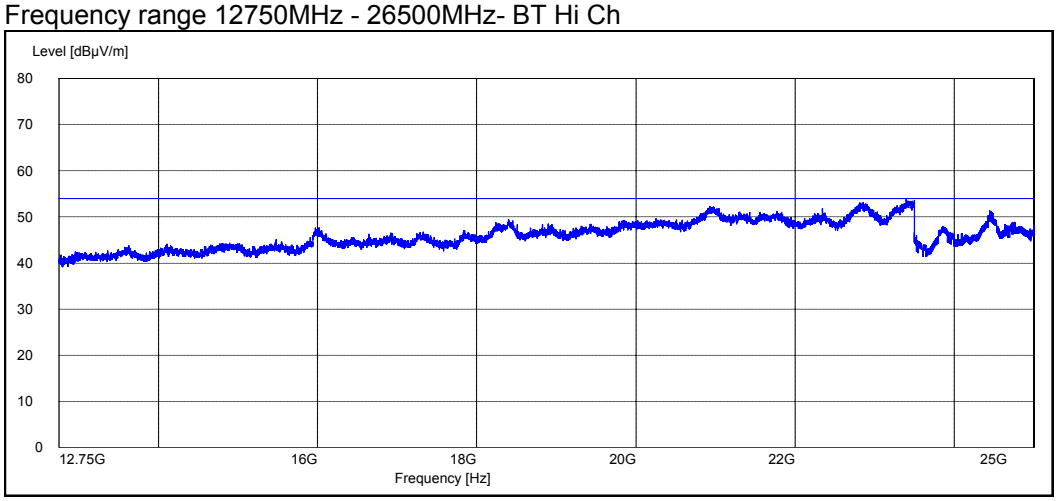
2.5.2 Mid operating frequency (TX 2441 MHz, RX 2402 MHz)

Frequency range 12750MHz - 26500MHz- BT Mid Ch



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

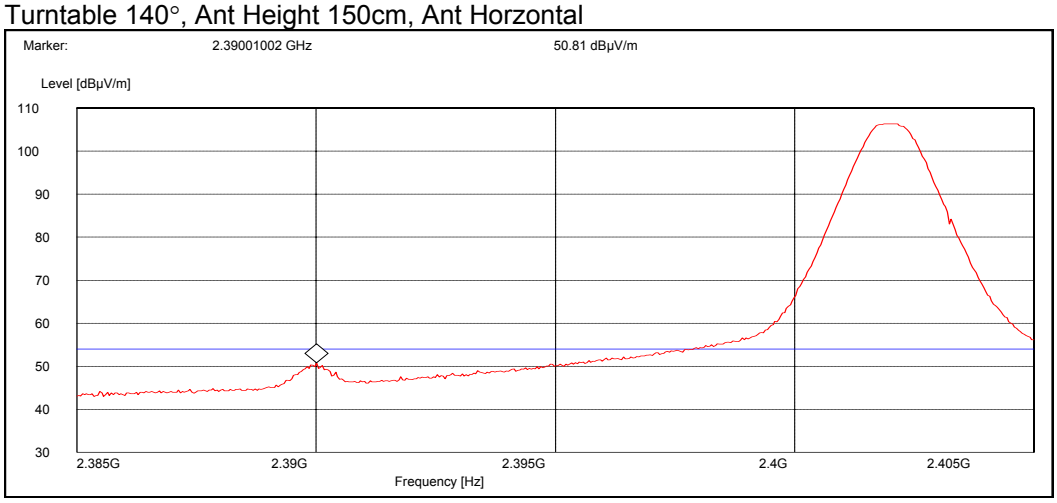
Frequency range 12750MHz - 26500MHz- BT Hi Ch



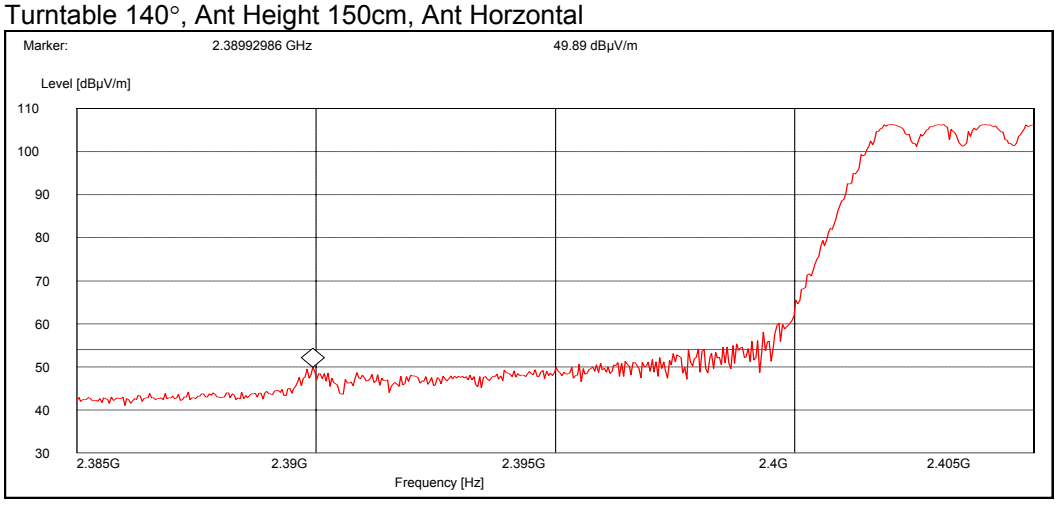
2.6. Band Edge Compliance Verification

2.6.1 Low Edge (2390 MHz)

Frequency range 2385 MHz – 2405 MHz – single freq mode
Turntable 140°, Ant Height 150cm, Ant Horzontal

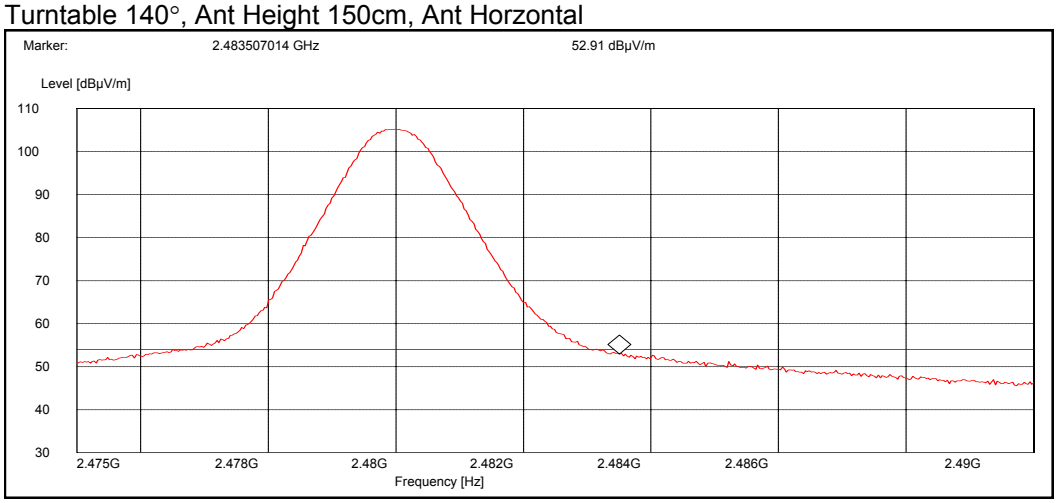


Frequency range 2385 MHz – 2405 MHz – hopping freq mode
Turntable 140°, Ant Height 150cm, Ant Horzontal

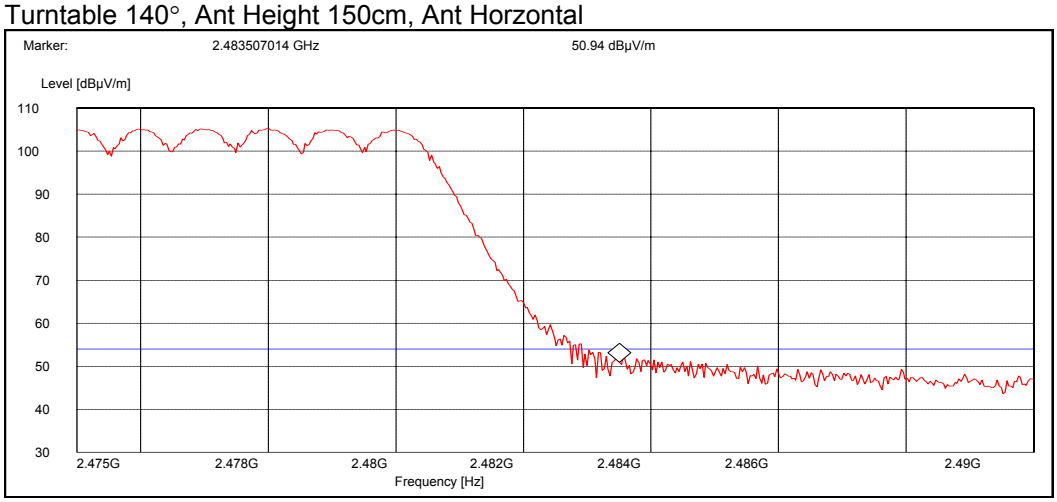


2.6.2 High Edge (2483.5 MHz)

Frequency range 2475 MHz – 2490 MHz – single freq mode
Turntable 140°, Ant Height 150cm, Ant Horzontal



Frequency range 2475 MHz – 2490 MHz – hopping freq mode
Turntable 140°, Ant Height 150cm, Ant Horzontal



2.7. 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

2.8. Measurement equipment

Equipment no	Equipment	Type	Cal Date
18860	Antenna (used for 30M-3GHz)	HL562	Week26 Y05
14508	Communication Antenna	BBHA 9120 LF-A	Not to be Calibrated
14507	Communication Antenna	BBHA 9120 LF-A	Not to be Calibrated
15805	Antenna (grey-Used for 3-26GHz)	HL025	Week48 Y05
4894 (Salo)	EMI Test Reciever	ESI	Week23 Y04
18416	Communication Tester	CMU-200	Week2 Y05