EUROFINS PRODUCT SERVICE GMBH

TEST - REPORT

FCC RULES PARTS 15.E
IC RADIO STANDARDS RSS-210 Annex 9

FCC-ID: PV7-WIBEAR-I

Model Name: WiBear-I, AN00K59744

Test report no.:G0M21008-3606-C-2

ACCREDITED
Certificate #1983.01

eurofins
Eurofins Product Service GmbH
Storkower Str. 38c, 15526 Reichenwalde,
Germany

Phone +49-33631-888 0
Fax +49-33631-888 660

TABLE OF CONTENTS

1	**General information**	**3**
1.1	Notes	3
1.2	Testing laboratory	4
1.3	Details of approval holder	5
1.4	Application details	5
1.5	Test item	5
1.6	Test standards	6
2	**Technical test**	**6**
2.1	Summary of test results	6
2.2	Test environment	6
2.3	Test equipment utilized	7
2.4	General test procedure	8
2.5	Test results	9
3	**Transmitter parameters**	**10**
3.1	RF power output conducted	10
3.2	RF power output radiated (EIRP)	12
3.3	26 dB bandwidth, occupied bandwidth	14
3.4	Peak power spectral density	16
3.5	Peak excursion of the Modulation	17
3.6	Channel move Time and Channel Closing Tansmission Time	18
3.7	Spurious emission radiated	19
3.8	AC power line conducted emission	21
3.9	Frequency stability	22
4	**Receiver parameters**	**24**
4.1	Radiated emission	24
ANNEX		**25**

1 General information

1.1 Notes

The results of this test report relate exclusively to the item tested as specified in chapter "Description of test item" and are not transferable to any other test items.

Eurofins Product Service GmbH is not responsible for any generalisations and conclusions drawn from this report. Any modification of the test item can lead to invalidity of test results and this test report may therefore be not applicable to the modified test item.

The test report may only be reproduced or published in full. Reproducing or publishing extracts of the report requires the prior written approval of the Eurofins Product Service GmbH.

This document is subject to the General Terms and Conditions and the Testing and Certification System of Eurofins Product Service GmbH, available on request or accessible at www.pt.eurofins.com

Operator:

22.11.2010		B. Pudell	B. Pudell
Date	Eurofins -Lab.	Name	Signature

Technical responsibility for area of testing:

22.11.2010		J. Zimmermann	J. Z
Date	Eurofins	Name	Signature

1.2 Testing laboratory

1.2.1 Location

EUROFINS PRODUCT SERVICE GMBH
Storkower Straße 38c
D-15526 Reichenwalde b. Berlin
Germany
Telephone : +49 33631 888 00
Telefax : +49 33631 888 660

1.2.2 Details of accreditation status

DAR ACCREDITED TESTING LABORATORY
DAR-REGISTRATION NUMBER: DAT-P-268/08

RECOGNIZED NOTIFIED BODY EMC
REGISTRATION NUMBER: BNetzA-bS EMV-07/61

RECOGNIZED NOTIFIED BODY R&TTE
REGISTRATION NUMBER: BNetzA-bS-02/51-53

FCC FILED TEST LABORATORY
REG.-NO. 96970

A2LA ACCREDITED TESTING LABORATORY
CERTIFICATE NO. 1983.01

BLUETOOTH QUALIFICATION TEST FACILITY (BQTF)
ACCREDITED BY BLUETOOTH QUALIFICATION REVIEW BOARD

INDUSTRY CANADA FILED TEST LABORATORY
REG. NO. IC 3470

1.3 Details of approval holder

Name	: lesswire AG
Street	: Im Technologiepark 1
Town	: 15236 Frankfurt/Oder
Country	: Germany
Telephone	: 030 / 6392 8282
Fax	: 030 / 6392 8282
Contact	: Herr Ralph Meyfarth
E-Mail	: meyfarth@lesswire.com

1.4 Application details

Date of receipt of application	: 31.08.2010
Date of receipt of test item	: 31.08.2010
Date of test	: 04.10.2010 – 22.11.2010

1.5 Test item

Description of test item	: Component
Type identification	: WiBear-I, AN00K59744
Hardware version	: 1.0
Software version	: 10.38.x
Serial number	: Unknown
Photos	: See Annex A.

Technical data

Frequency band	:	5150 - 5250 MHz	5250 -5350 MHz	5470 -5725 MHz
Frequency (ch A)	:	5180 MHz	5260 MHz	5500 MHz
Frequency (ch B)	:	5220 MHz	5280 MHz	5600 MHz
Frequency (ch C)	:	5240 MHz	5320 MHz	5700 MHz
Number of channels	:	4	4	7

Antenna Type	: Compact Dual-band Reach Xtend Chip Antenna, Model: FR05-S1-NO-1-004, FRACTUS, S.A.
Antenna Gains	: 3 dBi
Power supply	: 3.3 VDC
Operating mode	: duplex
DFS operational mode	: Client whitout radar detection
Equipment type	: End Product
Type of modulation	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)

Manufacturer:
(if applicable)

Name	: lesswire AG
Street	: Im Technologiepark 1
Town	: 15236 Frankfurt/Oder
Country	: Germany

1.6 Test standards

Technical standard :	FCC Parts:	15E
	IC Standards:	RSS 210 Issue 7 Annex 9

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations as specified in 2.5 were ascertained in the course of the tests performed. ☐

2.2 Test environment

Temperature	: 25 °C
Relative humidity content	: 20 ... 75 %
Air pressure	: 86 ... 103 kPa

Canada: Applicants info for the User Manual

The user manual of local area network devices shall contain clear instructions on the restrictions mentioned above, namely that:

(i) the device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems;

(ii) the maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the e.i.r.p. limit; and

(iii) the maximum antenna gain permitted (for devices in the band 5725-5825 MHz) to comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate, as stated in section A9.2(3).

In addition, users should also be cautioned to take note that high-power radars are allocated as primary users (meaning they have priority) of the bands 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices.

2.3 Test equipment utilized

No.	Test equipment	Type	Manufacturer
ETS 0014	Log Periodical Antenna	HL 025	R & S
ETS 0253	Spectrum Analyzer	FSIQ 26	R & S
ETS 0271	Spectrum Analyzer	FSEK 30	R & S
ETS 0288	Artificial mains	ESH2-Z5	R & S
ETS 0294	Biconical antenna	HK 116	R & S
ETS 0295	LPD antenna	HL 223	R & S
ETS 0310	Anechoic chamber	AC 3	Frankonia
ETS 0311	Anechoic chamber	AC 4	Frankonia
ETS 0416	Power Supply	EX752M	TTi
ETS 0474	EMI Test Receiver	ESCS 30	R&S

2.4 General test procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 using a 50µH LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 6.4 using a spectrum analyzer. The resolution bandwidth of the spectrum analyzer was 100 kHz for measurements below 1 GHz and RBW 1 MHz was used above 1 GHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS for Field strength: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBµV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:
Freq. (MHz) METER READING + ACF + CABLE LOSS (to the receiver) = FS
20 dBµV + 10.36 dB + 6 dB = 36.36 dBµV/m @3m

ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to at least 10th harmonic of the fundamental.
Peak readings were taken in three (3) orthogonal planes and the highest readings.
Measurements were made by Eurofins at the registered open field test site located at Storkower Str. 38c, 15526 Reichenwalde, Germany.
When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.
RF Exposure Compliance Requirements
According to FCC OET Bulletin 65 Edition 97-01 Supplement C and RSS-102 §2.5, this spread spectrum transmitter is categorically excluded from routine environmental evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.
The antenna used for this transceiver must not be co-located or operating in conjunction with any other antenna or transmitter.

ANTENNA & GROUND:
This unit use 2 x printed dualband inverted F antenna.

2.5 Test results

☒ 1st test ☐ test after modification ☐ production test

SECT.	TEST CASE	FCC 47CFR PART	IC RSS-	Required	Test passed	Test failed
3	*TRANSMITTER PARAMETERS*					
3.1	RF power output conducted	15.407 (a)	210 A9.2	☒	☒	☐
3.2	RF power output radiated (EIRP)	15.407 (a)	210 A9.2	☐	☐	☐
3.3	Emission bandwidth/ occupied bandwidth	15.407 (a)	210 A9.2	☒	☒	☐
3.4	Peak power spectral density	15.407 (a)	210 A9.2	☒	☒	☐
3.5	Peak excursion of the modulation	15.407 (a)(6)	210 A9.2	☒	☒	☐
3.6	Channel Move Time / Channel Closing Transmission Time	15.407 (a)	210 A9.4	☒	☒	☐
3.7	Undesirable emission radiated	15.407(b)(1-3)	210 A9.3	☒	☒	☐
3.8	AC power line conducted emissions	15.207	Gen 7.2.2	☒	☒	☐
3.9	Frequency stability	15.407 (g)	210 A2.1 A9.5(5)	☒	☒	☐
4	*RECEIVER PARAMETERS*					
4.1	Radiated emissions	-	Gen 7.2.3	☐	☐	☐

3. Transmitter parameters

3.1 RF power output, conducted,

Reference

FCC	CFR part 15.407 (a)(1-4)
IC	RSS-210 A9.2

Method of measurement

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

Limits

FCC	5150-5250 MHz ≤ 50 mW or 4 dBm + 10log B 5250-5350 MHz ≤ 250 mW or 11 dBm + 10log B 5470-5725 MHz ≤ 250 mW or 11 dBm + 10log B 5725-5825 MHz ≤ 1 W or 17 dBm + 10log B B is the 26-dB emission bandwidth in MHz The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement conforming to the above definitions for the emission in question.
IC	5150-5250 MHz ≤ Limit from item 3.2 - 6 dbi 5250-5350 MHz ≤ 250 mW or 11 dBm + 10log B, whichever power is less. 5470-5725 MHz ≤ 250 mW or 11 dBm + 10log B, whichever power is less. 5725-5825 MHz ≤ 1 W or 17 dBm + 10log B, whichever power is less. B is the 99% emission bandwidth in MHz.

Test results

Test conditions	Frequency MHz	[mW]
T_{nom}= 25°C; V_{nom} = 5V DC	5180	32
T_{nom}= 25°C; V_{nom} = 5V DC	5220	34
T_{nom}= 25°C; V_{nom} = 5V DC	5240	33
T_{nom}= 25°C; V_{nom} = 5V DC	5260	33
T_{nom}= 25°C; V_{nom} = 5V DC	5280	32
T_{nom}= 25°C; V_{nom} = 5V DC	5320	31
T_{nom}= 25°C; V_{nom} = 5V DC	5500	21
T_{nom}= 25°C; V_{nom} = 5V DC	5600	26
T_{nom}= 25°C; V_{nom} = 5V DC	5700	24
Measurement uncertainty	< 3 dB	

Test equipment: ETS 0253, ETS 0271

3.2 RF power output, radiated,

Reference

FCC	CFR part 15.407 (a)(3)
IC	RSS-210 A8.4

Method of measurement

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

Limits

FCC	5150-5250 MHz ≤ Limit from item 3.1 + 6 dbi 5250-5350 MHz ≤ Limit from item 3.1 + 6 dbi 5470-5725 MHz ≤ Limit from item 3.1 + 6 dbi 5725-5825 MHz ≤ Limit from item 3.1 + 6 dbi If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. If the measured transmit power is already below the limit a reduction may not be necessary
IC	5150-5250 MHz ≤ 200 mW or 10 + 10 log10 B , whichever power is less. 5250-5350 MHz ≤ 1.0 W or 17 + 10 log10 B , whichever power is less. In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where θ is the angle above the local horizontal plane (of the earth) as shown below: (i) -13 dB(W/MHz) for $0^o \le \theta < 8^o$ (ii) -13 – 0.716 (θ-8) dB(W/MHz) for $8^o \le \theta < 40^o$ (iii) -35.9 – 1.22 (θ-40) dB(W/MHz) for $40^o \le \theta \le 45^o$ (iv) -42 dB(W/MHz) for $\theta > 45^o$ 5470-5725 MHz ≤ 1.0 W or 17 + 10 log10 B , whichever power is less. 5250-5350 MHz ≤ 4.0 W or 23 + 10 log10 B , whichever power is less. Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to-point systems.

Test Results

Test conditions	**Frequency**	EIRP [dBm]
T_{nom}= °C; V_{nom} =	--	--
Measurement uncertainty	< 3 dB	

Comment: not required.

Test equipment: --

3.3 Emission Bandwidth / Occupied Bandwidth (99%)

Reference

FCC	CFR part 15.407 (a)
IC	RSS-210 A9.2

Method of measurement

Spectrum analyser:
RBW: 100 kHz
Span: > RBW

Limits

FCC	Emission bandwidth: For purpose of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency., That are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emission bandwidth is based on the use of measurement instrumentation employing a peak detector function with aninstrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.
IC	99% Occupied Bandwidth Measurement No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99 % occupied bandwidth.

Test results 26 dB Bandwidth

Test conditions	**Frequency** (MHz)	**[MHz]**
T_{nom}= 25°C; V_{nom} = 5V DC	5180	22.6
T_{nom}= 25°C; V_{nom} = 5V DC	5220	22.8
T_{nom}= 25°C; V_{nom} = 5V DC	5240	23.9
T_{nom}= 25°C; V_{nom} = 5V DC	5260	23.8
T_{nom}= 25°C; V_{nom} = 5V DC	5280	23.7
T_{nom}= 25°C; V_{nom} = 5V DC	5320	23.0
T_{nom}= 25°C; V_{nom} = 5V DC	5500	22.6
T_{nom}= 25°C; V_{nom} = 5V DC	5600	22.9
T_{nom}= 25°C; V_{nom} = 5V DC	5700	22.9
Measurement uncertainty	< 3 dB	

Test results occupied Bandwidth 99%

Test conditions	**Frequency** (MHz)	**(MHz]**
T_{nom}= 25°C; V_{nom} = 5V DC	5180	-
T_{nom}= 25°C; V_{nom} = 5V DC	5220	-
T_{nom}= 25°C; V_{nom} = 5V DC	5240	-
T_{nom}= 25°C; V_{nom} = 5V DC	5260	-
T_{nom}= 25°C; V_{nom} = 5V DC	5280	-
T_{nom}= 25°C; V_{nom} = 5V DC	5320	-
T_{nom}= 25°C; V_{nom} = 5V DC	5500	-
T_{nom}= 25°C; V_{nom} = 5V DC	5600	-
T_{nom}= 25°C; V_{nom} = 5V DC	5700	-
Measurement uncertainty	< 3 dB	

See attached diagrams in Annex.

System receiver input bandwidth: The manufacturer declares that the receiver input bandwidth matches to the bandwidth of the transmitter signal.

Test equipment: ETS 0271

3.4 Peak power spectral density

Reference

FCC	CFR part 15.407 (a)
IC	RSS-210 A9.2

Method of measurement

The same method of determine the conducted output power shall be used to determine the power spectral density. The ratio of peak modulation envelope excursion to peak transmit power meet the 13 dB/MHz limit. The comparison between the two measured levels is made within the same 1 MHz segment.

Limits

FCC	5150-5250 MHz	≤ 4 dBm in any 1 MHz band
	5250-5350 MHz	≤ 11 dBm in any 1 MHz band
	5470-5725 MHz	≤ 11 dBm in any 1 MHz band
	5725-5825 MHz	≤ 17 dBm in any 1 MHz band
IC	5150-5250 MHz	≤ 10 dBm EIRP in any 1 MHz band
	5250-5350 MHz	≤ 11 dBm in any 1 MHz band
	5470-5725 MHz	≤ 11 dBm in any 1 MHz band
	5725-5825 MHz	≤ 17 dBm in any 1 MHz band

Test results

Test conditions	**Frequency** MHz	[dBm]
T_{nom}= 25°C; V_{nom} = 5V DC	5180	2.4
T_{nom}= 25°C; V_{nom} = 5V DC	5220	2.1
T_{nom}= 25°C; V_{nom} = 5V DC	5240	1.6
T_{nom}= 25°C; V_{nom} = 5V DC	5260	1.9
T_{nom}= 25°C; V_{nom} = 5V DC	5280	1.1
T_{nom}= 25°C; V_{nom} = 5V DC	5320	1.4
T_{nom}= 25°C; V_{nom} = 5V DC	5500	0.0
T_{nom}= 25°C; V_{nom} = 5V DC	5600	0.6
T_{nom}= 25°C; V_{nom} = 5V DC	5700	0.3
Measurement uncertainty	< 3 dB	

See attached diagrams in Annex.

Test equipment: ETS 0271

3.5 Peak Excursion of the Modulation

Reference

FCC	CFR part 15.407 (a)(6)
IC	RSS-210 A9.2

Method of measurement

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specific above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test results

Test conditions	**Frequency** MHz	[dB]
T_{nom}= °C; V_{nom} =	5180	9.9
T_{nom}= °C; V_{nom} =	5220	9.6
T_{nom}= °C; V_{nom} =	5240	9.5
T_{nom}= °C; V_{nom} =	5260	9.9
T_{nom}= °C; V_{nom} =	5280	10.1
T_{nom}= °C; V_{nom} =	5320	10.3
T_{nom}= °C; V_{nom} =	5500	10.1
T_{nom}= °C; V_{nom} =	5600	9.7
T_{nom}= °C; V_{nom} =	5700	10.3
Measurement uncertainty	< 3 dB	

See attached diagrams in Annex.

Test equipment: ETS 0271

3.6 Channel closing Transmission Time and Channel Move Time

The UUT is a U-NII Device operating in Client mode without radar detection. Radar detection is provided by the master device.

Agency	Channel Move Time (sec)	Limit (sec)
FCC/IC	0.538	10

	Channel Closing Transmission Time (msec)	Limit (msec)
before 200 ms	≤ 144	≤ 200
after 200 ms	≤ 8	≤ 60

See attached diagrams in Annex.

Test equipment: ETS 0271

3.7 Undesirable emission radiated

Reference

FCC	CFR part 15.407(b), 15.205. 15.209, 15.35
IC	RSS-210 A9.3, 2.2

Method of measurement

The EUT is connected to the spectrum analyzer via a low loss cable.

The analyzer setting was as following:

Frequency range	RES bandwidth		Video bandwidth	
	Pk	Avg	Pk	Avg
		-		-
40 > f > 1GHz	1 MHz	1 MHz	> 1 MHz	> 1 MHz

Undesirable emission limits: Except as shown in paragraph 15.407(b)(6), the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits. These limits are on the Effective Isotropic Radiated Transmit Power.

Additionally the provisions of 15.205 apply.

The ratio of peak modulation envelope excursion to peak transmit power meet the 13 dB/MHz limit. The comparison between the two measured levels is made within the same 1 MHz segment..

Limits

FCC	5150-5250 MHz	an EIRP ≤ -27 dBm/MHz band
	5250-5350 MHz	an EIRP ≤ -27 dBm/MHz band
	5470-5725 MHz	an EIRP ≤ -27 dBm/MHz band
	5725-5825 MHz	an EIRP ≤ -17 dBm/MHz band from band edge to 10 MHz above or below the band edge
		an EIRP ≤ -27 dBm/MHz band for all other out of band emissions
IC	5150-5250 MHz	an EIRP ≤ -27 dBm/MHz band
	5250-5350 MHz	an EIRP ≤ -27 dBm/MHz band
	5470-5725 MHz	an EIRP ≤ -27 dBm/MHz band
	5725-5825 MHz	an EIRP ≤ -17 dBm/MHz band from band edge to 10 MHz above or below the band edge
		an EIRP ≤ -27 dBm/MHz band for all other out of band emissions

Test results

Summary table with radiated data of the test plots

Freq.	Used Ch.	Frequency Marker [GHz]	Polari-zation	Δ corrections dB	Max. Field Strength [dBµV/m]	Compliance Limit [dBµV/m]	Detec-tor	BW [MHz]	Margin [dB]
	36	5.150	v		71.1	74	p	1	-2.9
	36	5.149	v		52.8	54	av	1	-1.2
	36	5.150	h		64.6	74	p	1	-9.4
	36	5.150	h		45.7	54	av	1	-8.3
	36	15.537	v		59.1	74	p	1	-14.9
	36	15.544	v		41.7	54	av	1	-12.3
	64	5.350	v		61.8	74	p	1	-12.2
	64	5.351	v		45.5	54	av	1	-8.5
	64	5.350	h		62.8	74	p	1	-11.2
	64	5.350	h		46.2	54	av	1	-7.8
	100	5.461	v		60.2	74	p	1	-13.8
	100	5.470	v		46.4	54	av	1	-7.6

See attached diagrams in Annex.

All other not noted test plots do not contain significant test results in relation to the limits.

Test equipment: ETS 0012, ETS 0013, ETS 0015, ETS 0018, ETS 0271, ETS 0253, ETS 0311

3.9 AC power line conducted emissions

Reference

FCC	CFR part 15.407(b)(6), 15.207
IC	RSS-Gen 7.2.2

Method of measurement

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

Limits

	Frequency of emission	Conducted limit field strength [dBµV]	
	[MHz]	Quasi Peak	Avg
FCC & IC	0.15 - 0.5	66 to 56	56 - 46
	0.5 - 5	56	46
	5 - 30	60	50

Test results

Frequency	Level	
	Quasi-peak	Average
150 kHz	Lower limit line	Lower limit line

See attached diagrams in Annex.

Test equipment: ETS 0288, ETS 0474

3.10 Frequency Stability

Reference

FCC	CFR part 15.407(g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.
IC	RSS-210 I7 A9.5 The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.

Limits:

UNII lower band	5150 MHz ≤ f ≤ 5250 MHz
UNII middle band	5250 MHz ≤ f ≤ 5350 MHz
	5470 MHz ≤ f ≤ 5725 MHZ
UNII Upper band	5725 MHz ≤ f ≤ 5825 MHz

Test results:

Technical characteristics		5180 MHz	5240 MHz
25 °C	V_{min}	5180.0065	5240.0145
	V_{max}	5180.0070	5240.0090
-40 °C	V_{nom}	5179.9885	5239.9935
85 °C	V_{nom}	5179.9825	5239.9855

Technical characteristics		5260 MHz	5320 MHz
25°C	V_{min}	5260.0065	5320.0115
	V_{max}	5260.0015	5319.9980
-40°C	V_{nom}	5259.9955	5319.9925
85°C	V_{nom}	5259.9825	5319.9855

Technical characteristics		5500 MHz	5700 MHz
25°C	V_{min}	5500.0100	5700.0080
	V_{max}	5500.0015	5700.0080
-40°C	V_{nom}	5499.9930	5699.9855
85°C	V_{nom}	5499.9840	5699.9800

Test equipment: ETS 0288, ETS 0474

4 Receiver parameters

4.1 Radiated emissions

Reference

FCC	-
IC	RSS-Gen 7.2.3

Method of measurement

The compliance of the EUT Receiver with the Limits of spurious emissions was performed according to the radiated measurement method.

The spectrum analyser RBW was set to 100 kHz for measurements below 100 kHz and 1.0 MHz above 1.0 GHz. The measurement results are evaluated according to the procedure described in section 2.5 of this test report.

Limits

	Spurious frequency MHz	Field strength microvolt/m at 3 metre
IC	30 – 88 88 – 216 216 – 960 above 960	100 150 200 500

Test Results

Frequency MHz	Frequency marker indication [MHz]	Antenna polarization	Worst case emission level [µV/m]	Compliance limit [µV/M]	Results
-	-	-	-	-	-

Test equipment: ETS 0014, ETS 0294, ETS 0295, ETS 0310, ETS 0416, ETS 0484

Annex

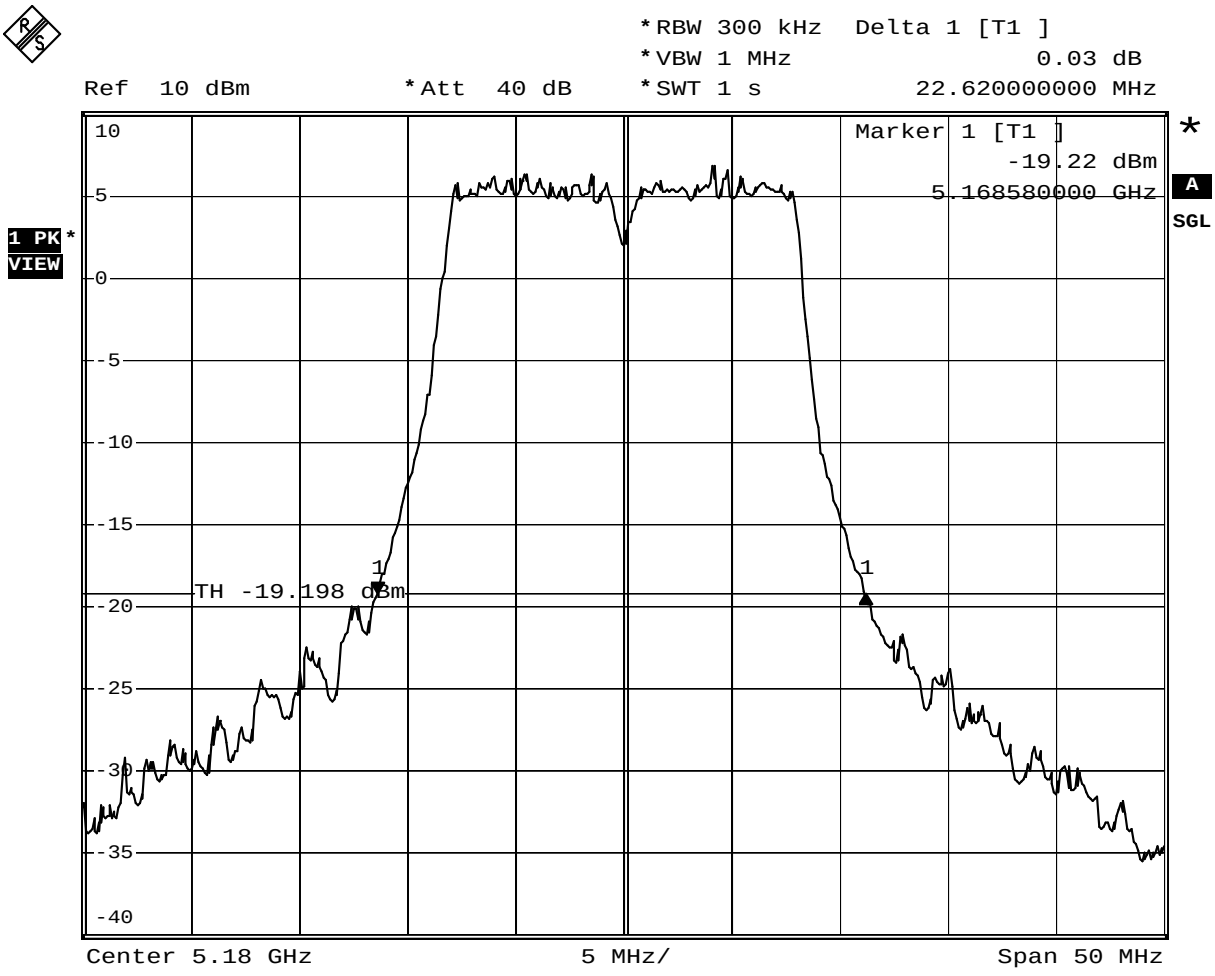
A	Pictures	3 pages
B	Emission bandwidth / Occupied bandwidth	9 pages
C	Peak power spectral density	9 pages
D	Peak Excursion of the modulation	9 pages
E	Channel Move Time and Channel Closing Transmission Time	4 pages
F	AC powerline conducted emissions	2 pages
G	Spurious emission radiated	38 pages

Annex B

Emission bandwidth / Occupied bandwidth

FCC part 15.407(a)
Emission Bandwidth

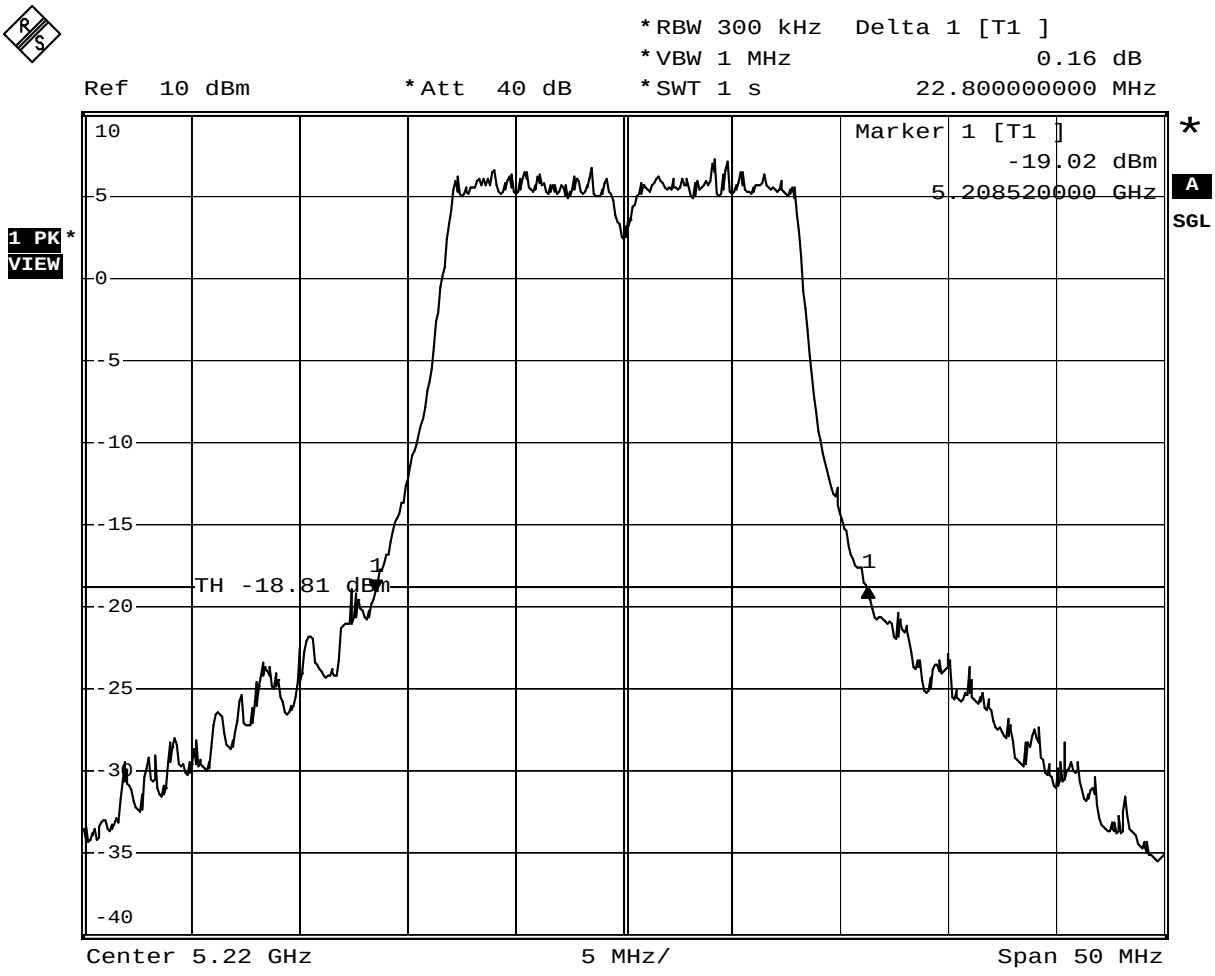
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5180 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Emission bandwidth: 22.62 MHz
Date: 19.NOV.2010 14:09:34

FCC part 15.407(a)
Emission Bandwidth

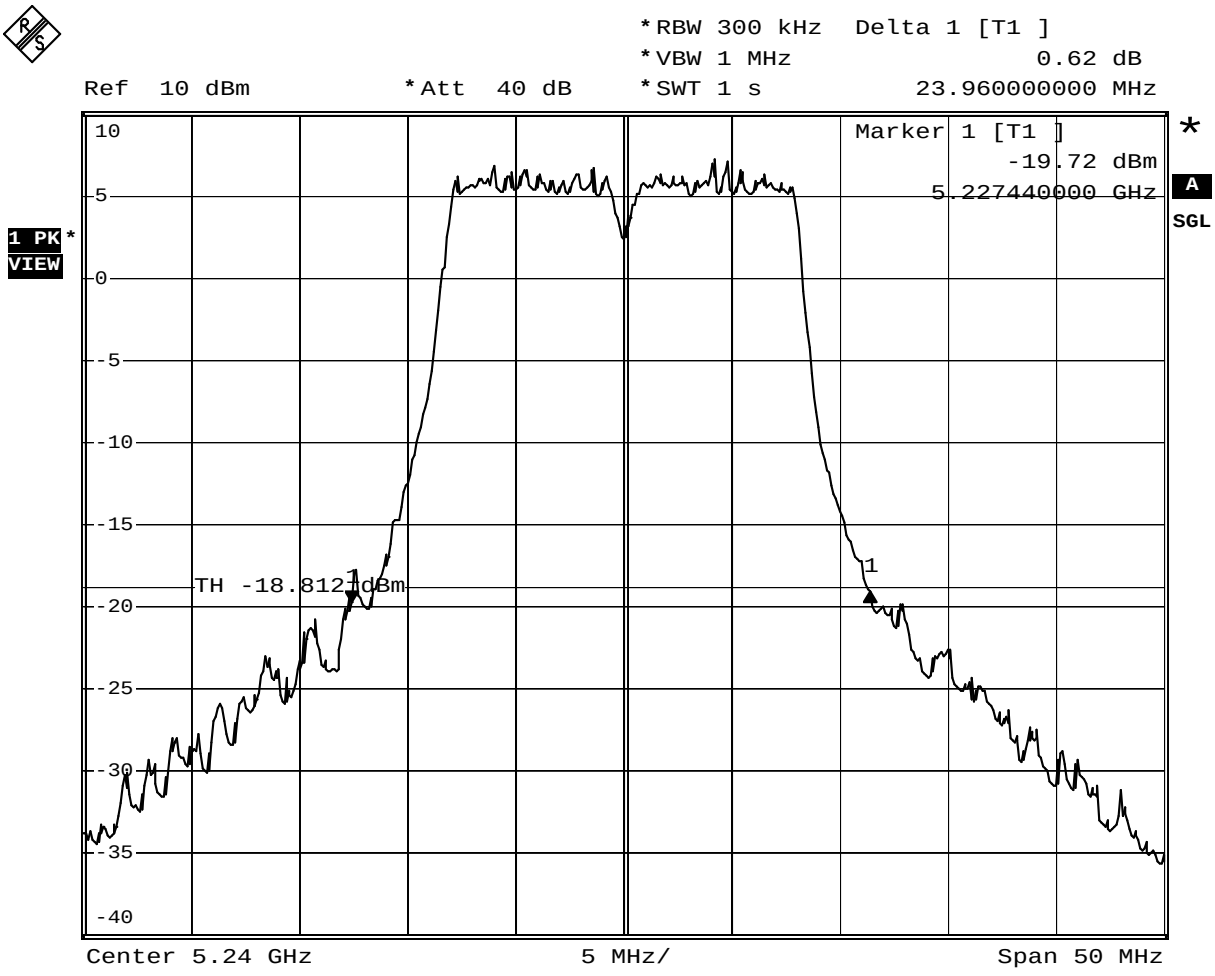
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5220 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Emission bandwidth: 22.8 MHz
Date: 19.NOV.2010 14:04:55

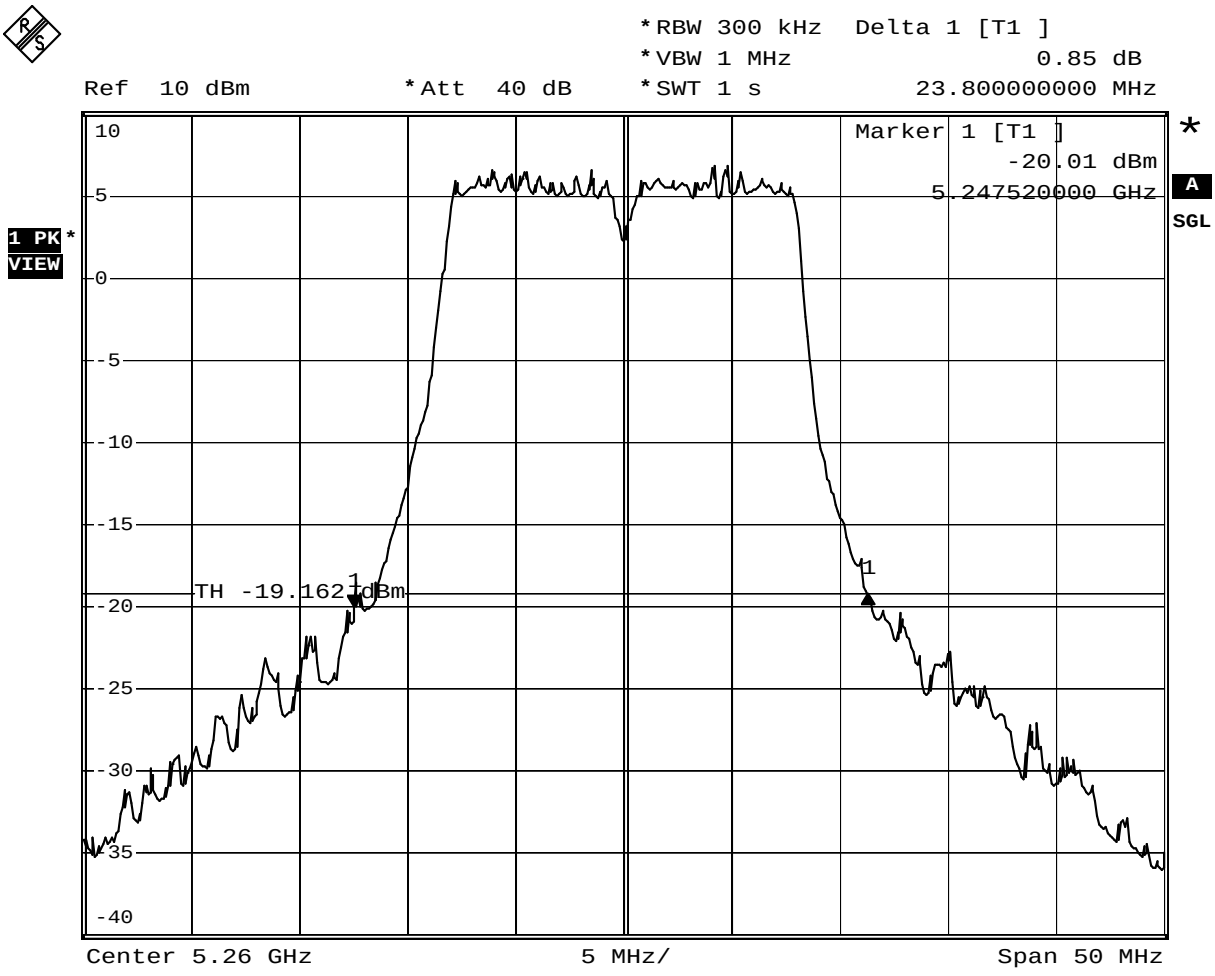
FCC part 15.407(a)
Emission Bandwidth

EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5240 MHz
Comment 3	OFDM / 6 Mbit/s



FCC part 15.407(a)
Emission Bandwidth

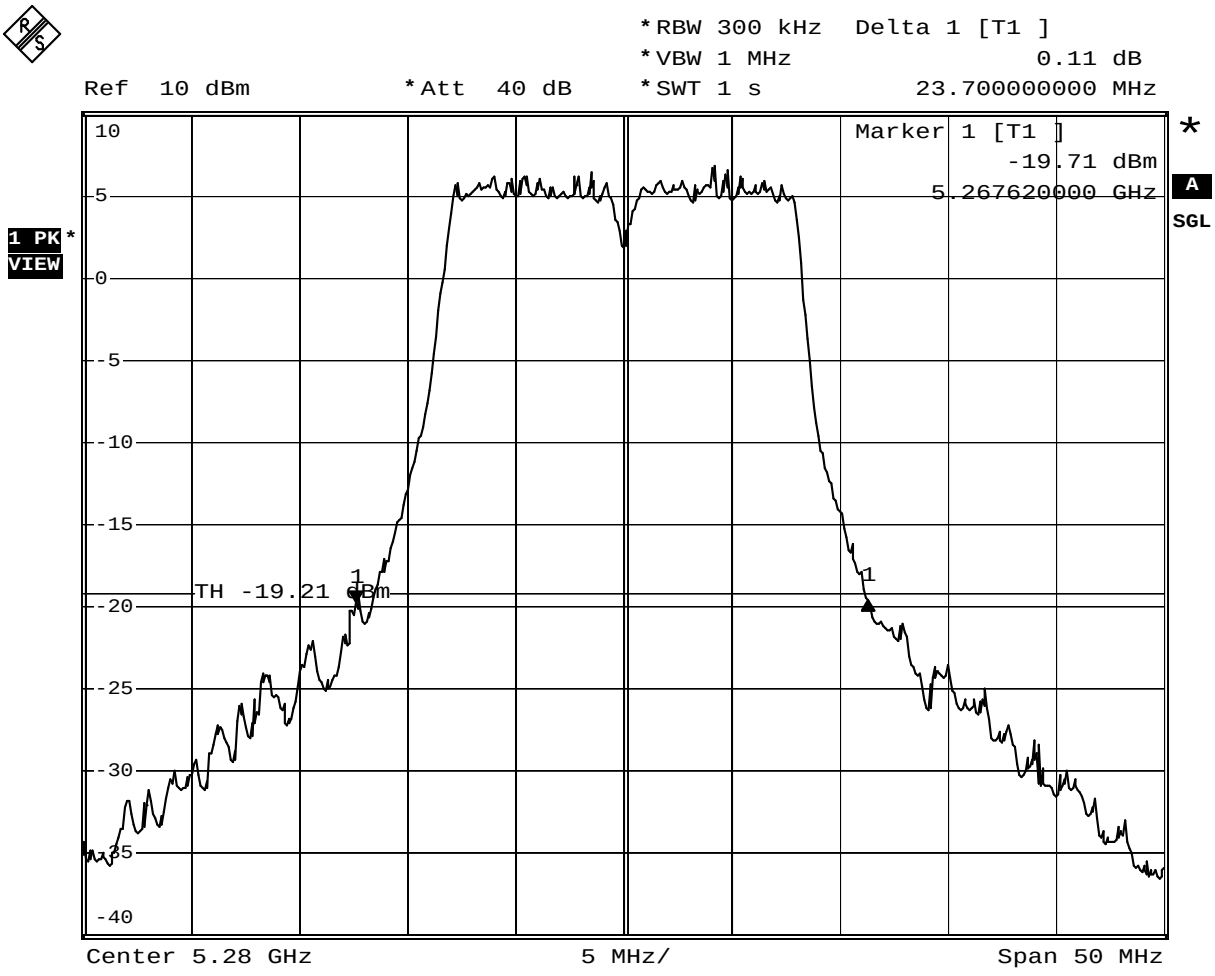
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5260 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Emission bandwidth: 23.8 MHz
Date: 19.NOV.2010 14:16:48

FCC part 15.407(a)
Emission Bandwidth

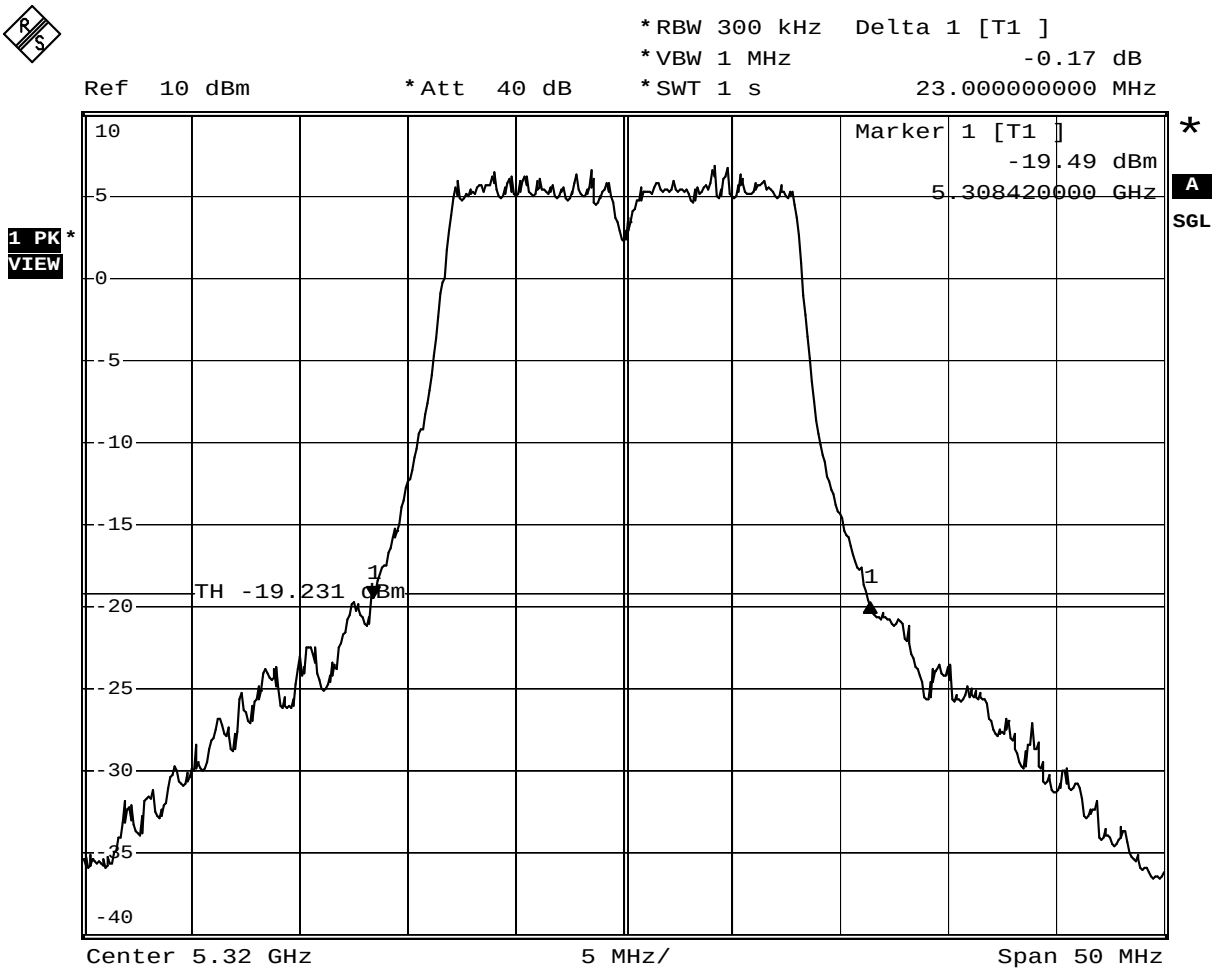
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5280 MHz
Comment 3	OFDM / 6 Mbit/s



Date: 19.NOV.2010 14:20:26

FCC part 15.407(a)
Emission Bandwidth

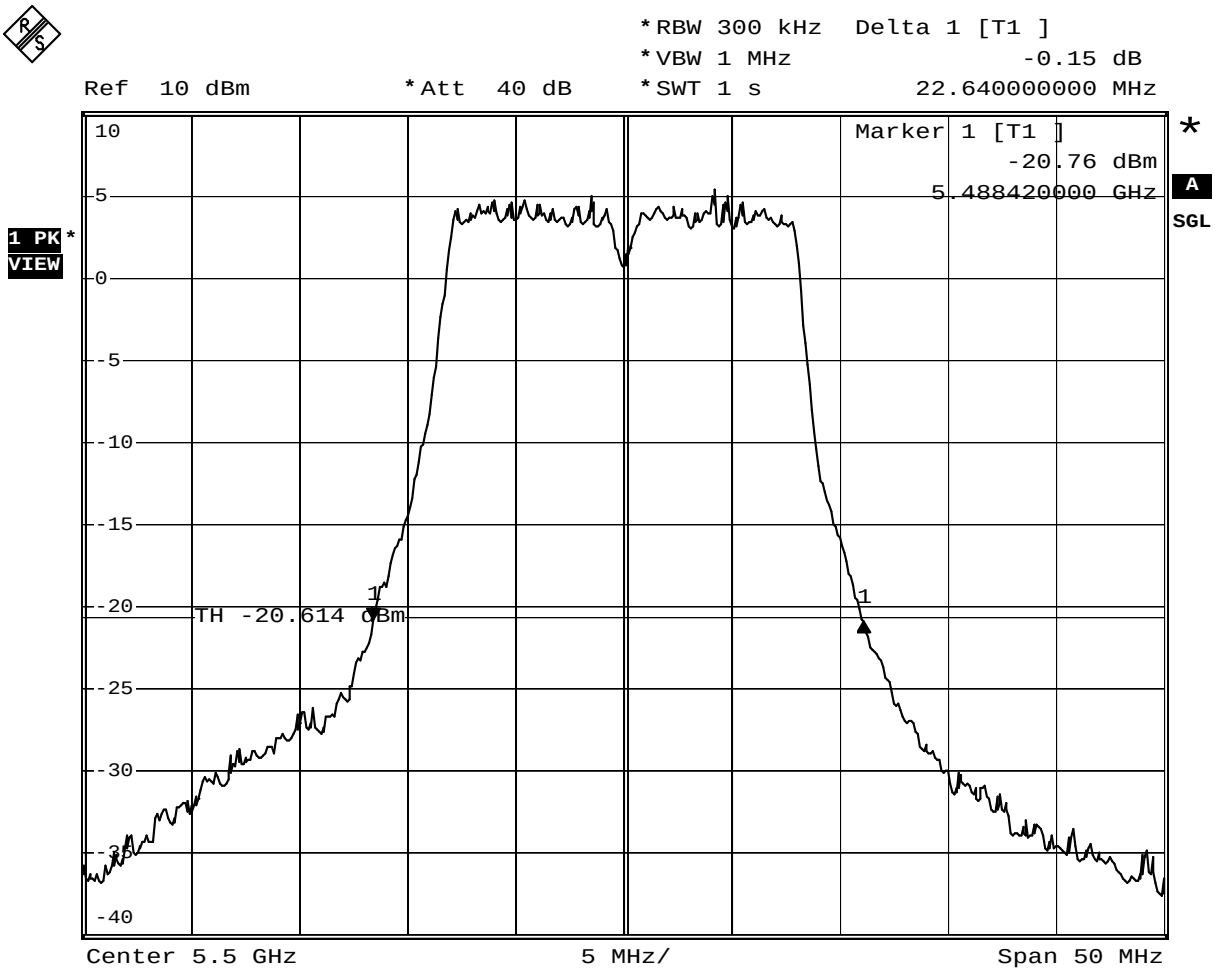
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5320 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Emission bandwidth: 23 MHz
Date: 19.NOV.2010 14:23:19

FCC part 15.407(a)
Emission Bandwidth

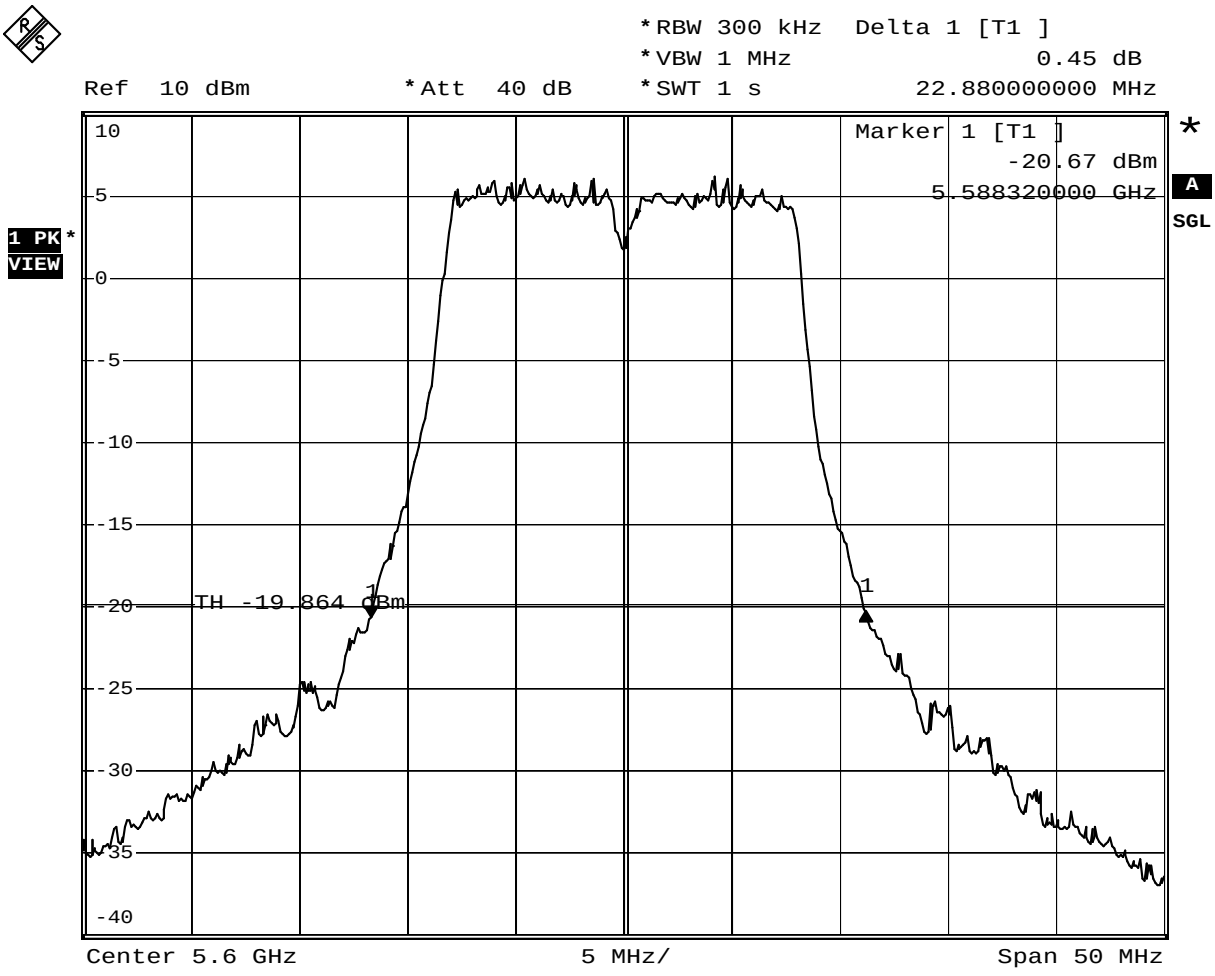
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5500 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Emission bandwidth: 22.64 MHz
Date: 19.NOV.2010 14:27:48

FCC part 15.407(a)
Emission Bandwidth

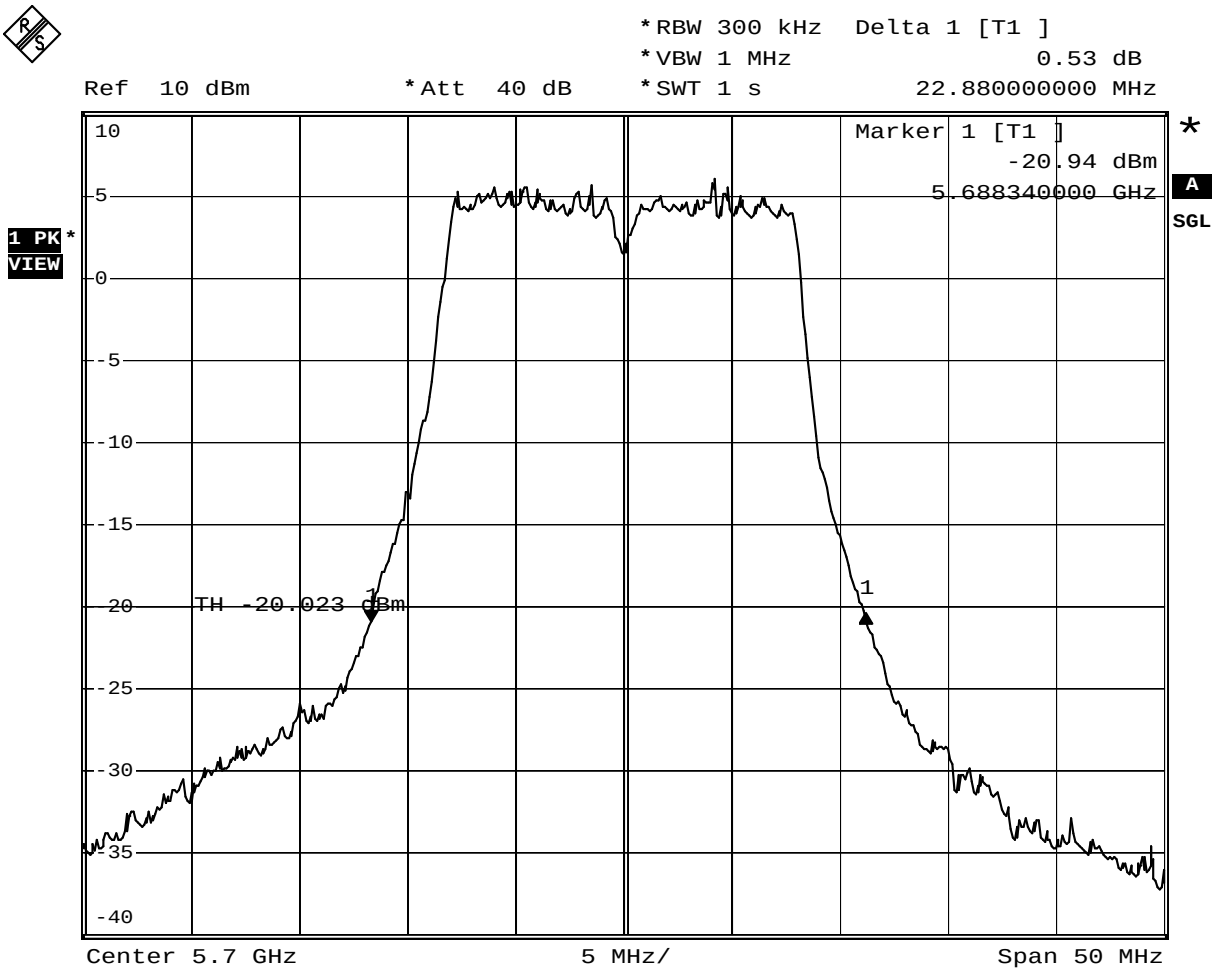
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5600 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Emission bandwidth: 22.88 MHz
Date: 19.NOV.2010 14:31:22

FCC part 15.407(a)
Emission Bandwidth

EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a) / DA 02-2138
Comment 1	26 dB Bandwidth
Comment 2	Channel frequency: 5700 MHz
Comment 3	OFDM / 6 Mbit/s



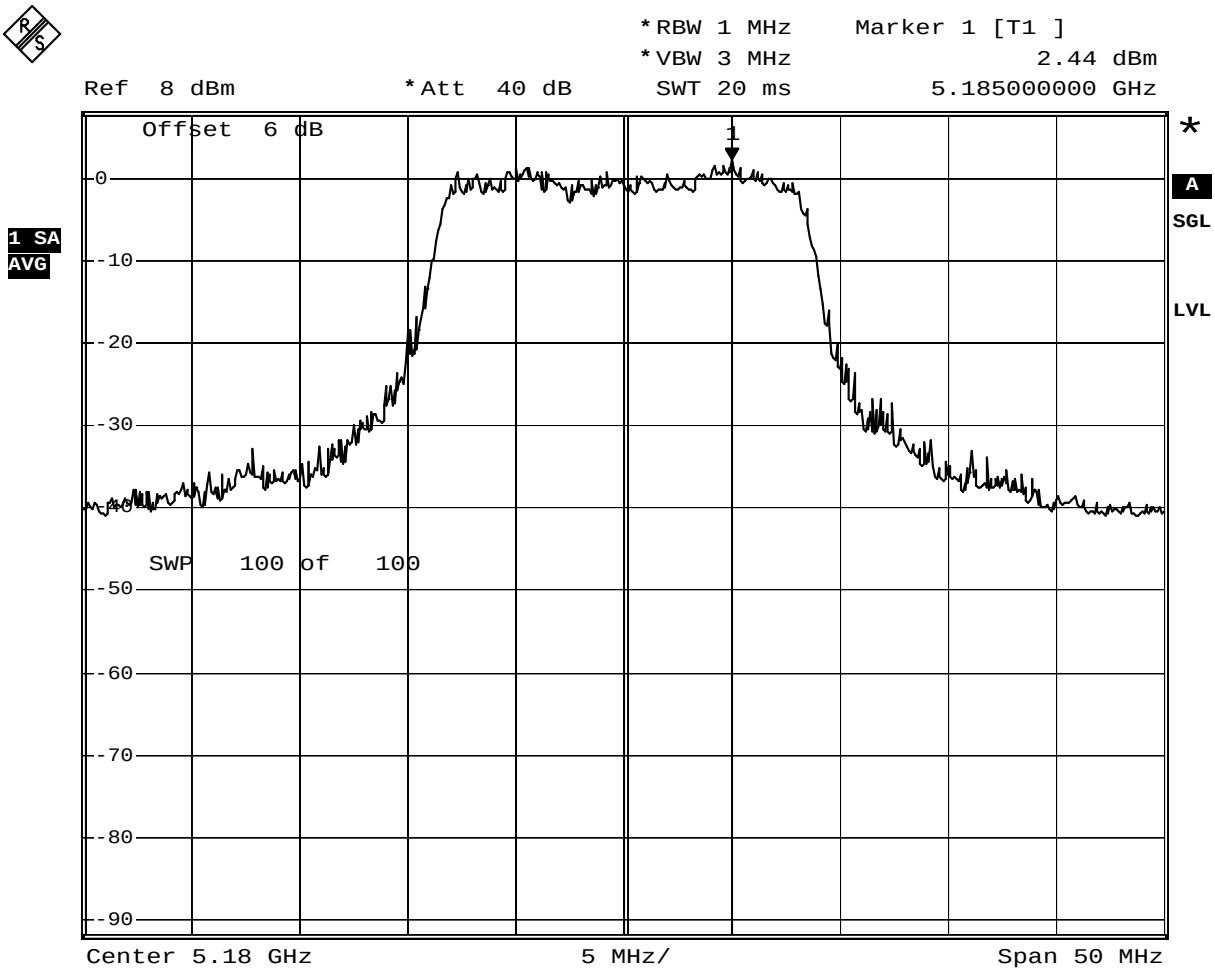
Comment: Emission bandwidth: 22.88 MHz
Date: 19.NOV.2010 14:34:30

Annex C

Peak power spectral density

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

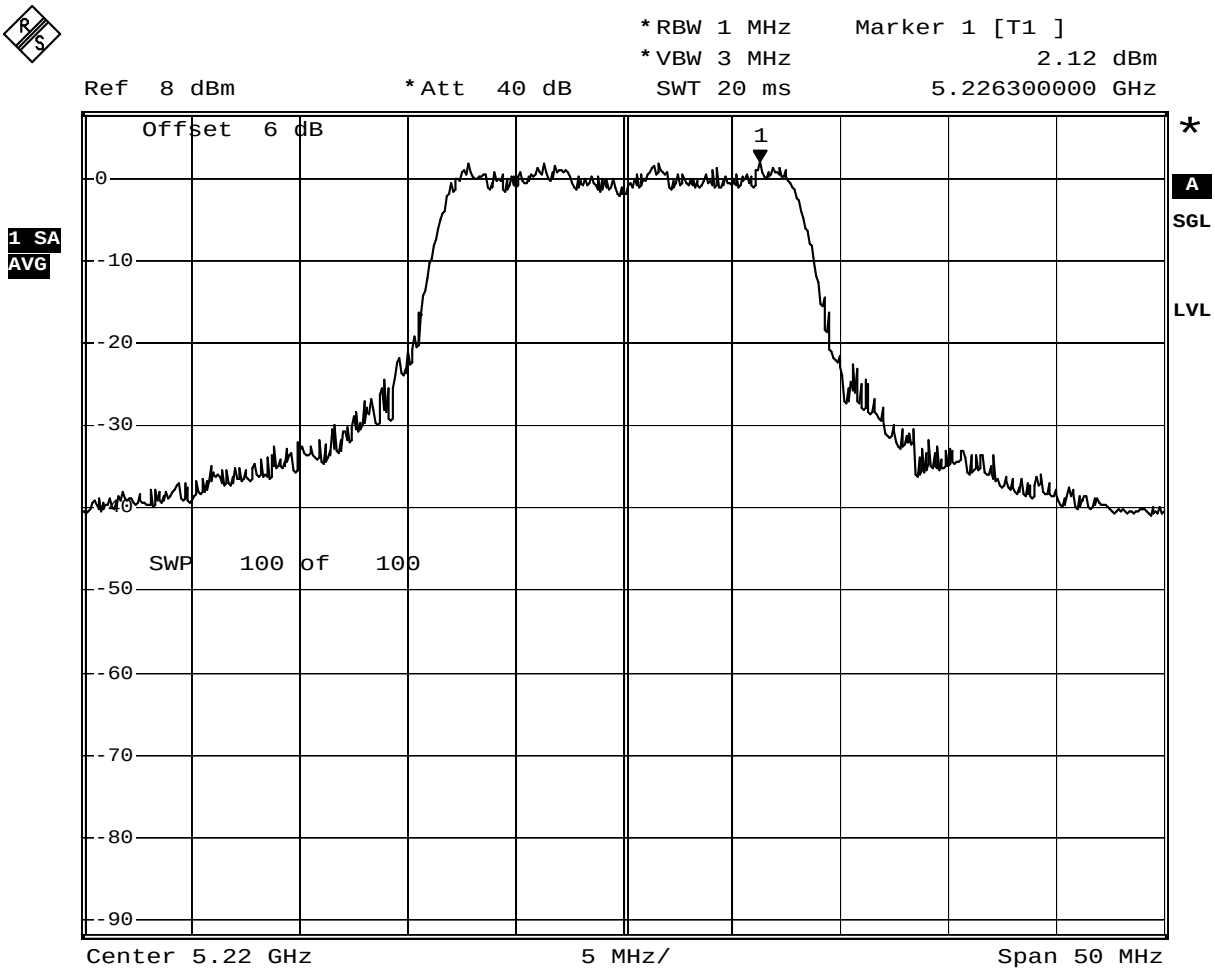
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5180 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 2.44 dBm at 5.185 GH
Comment: z
Date:      22.NOV.2010  09:13:54
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

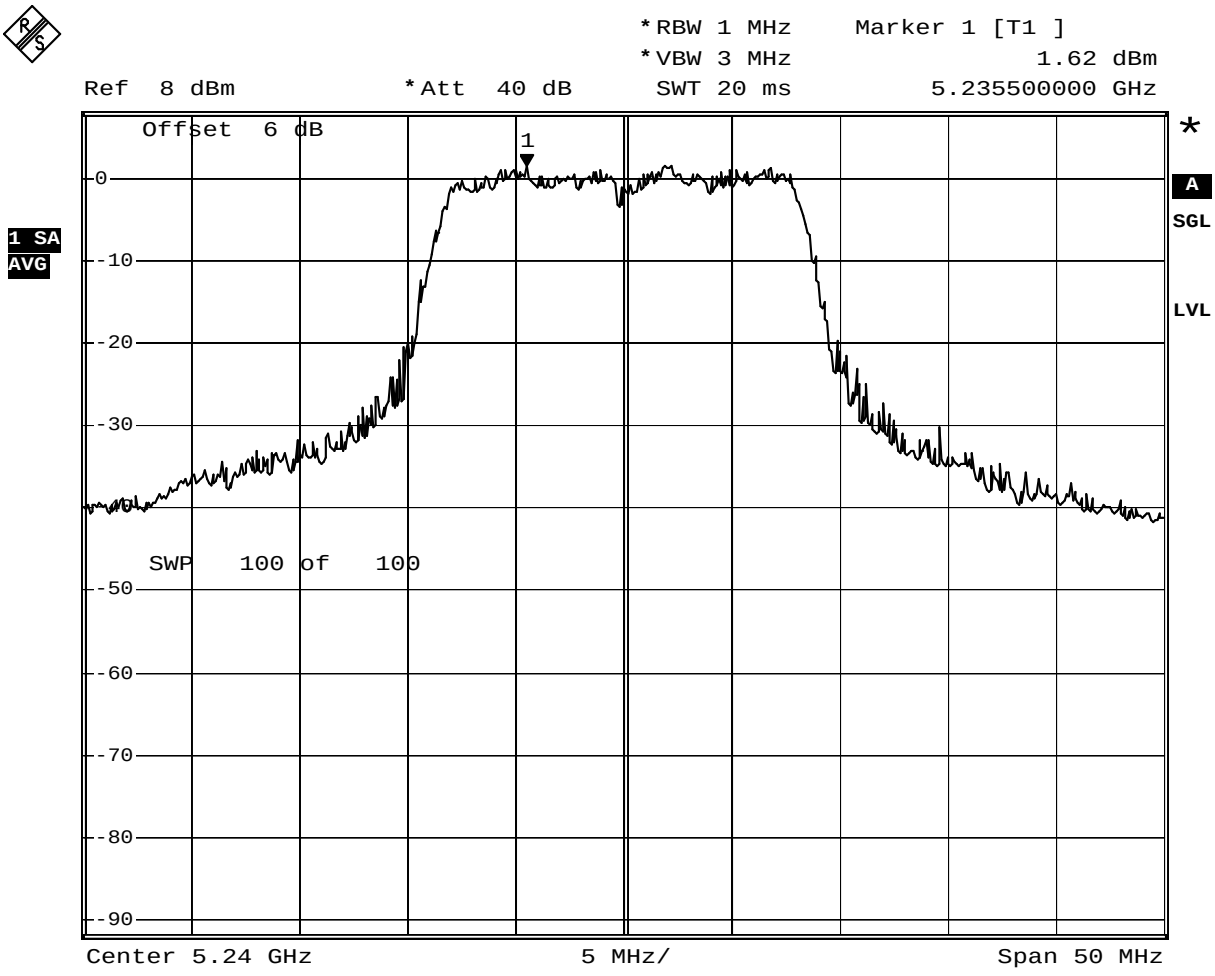
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5220 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 2.12 dBm at 5.226 GH
Comment: z
Date:      22.NOV.2010  09:17:24
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

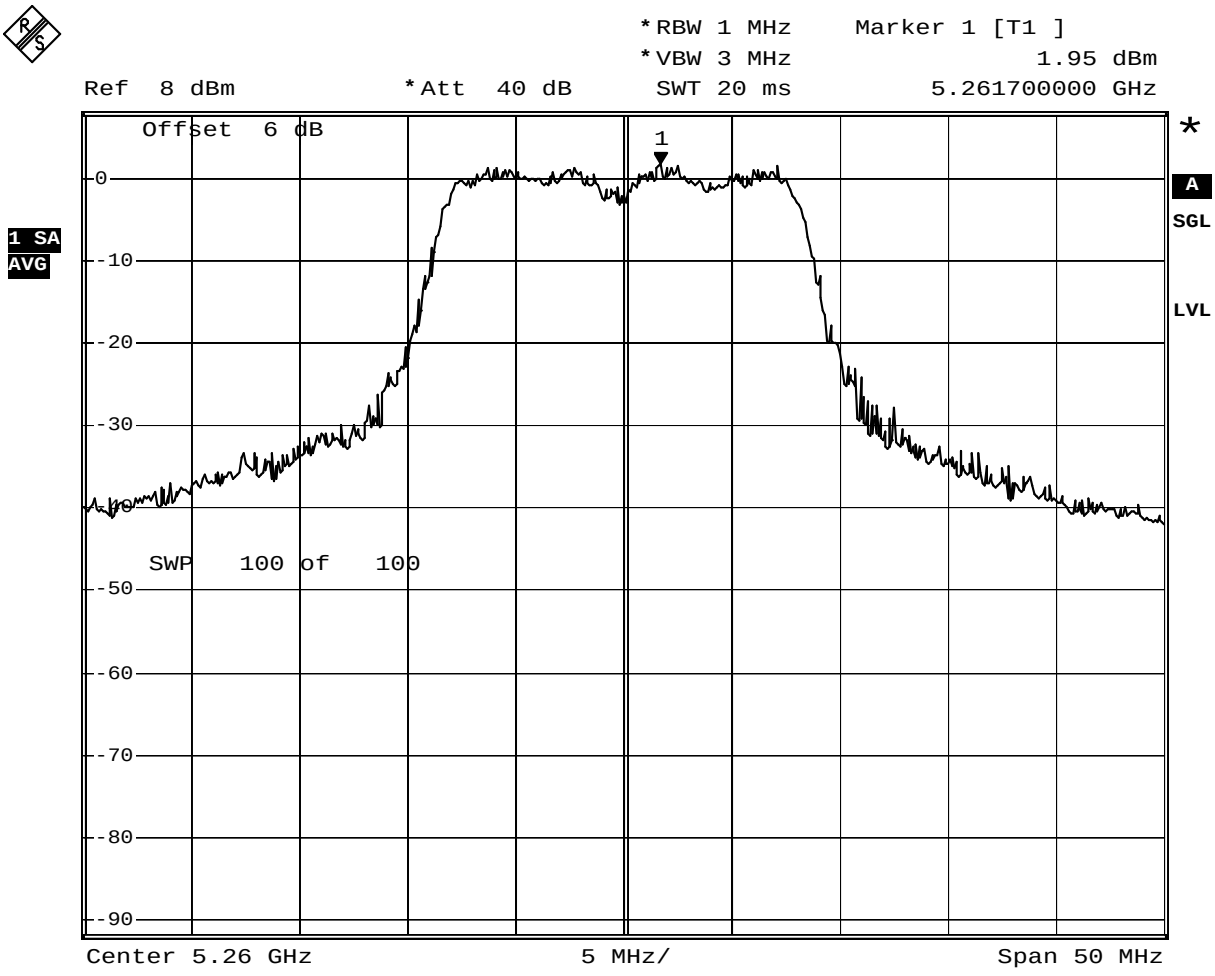
EUT	Component
Model	WiBear-E
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5240 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 1.62 dBm at 5.236 GH
Comment: z
Date:      22.NOV.2010  09:21:08
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

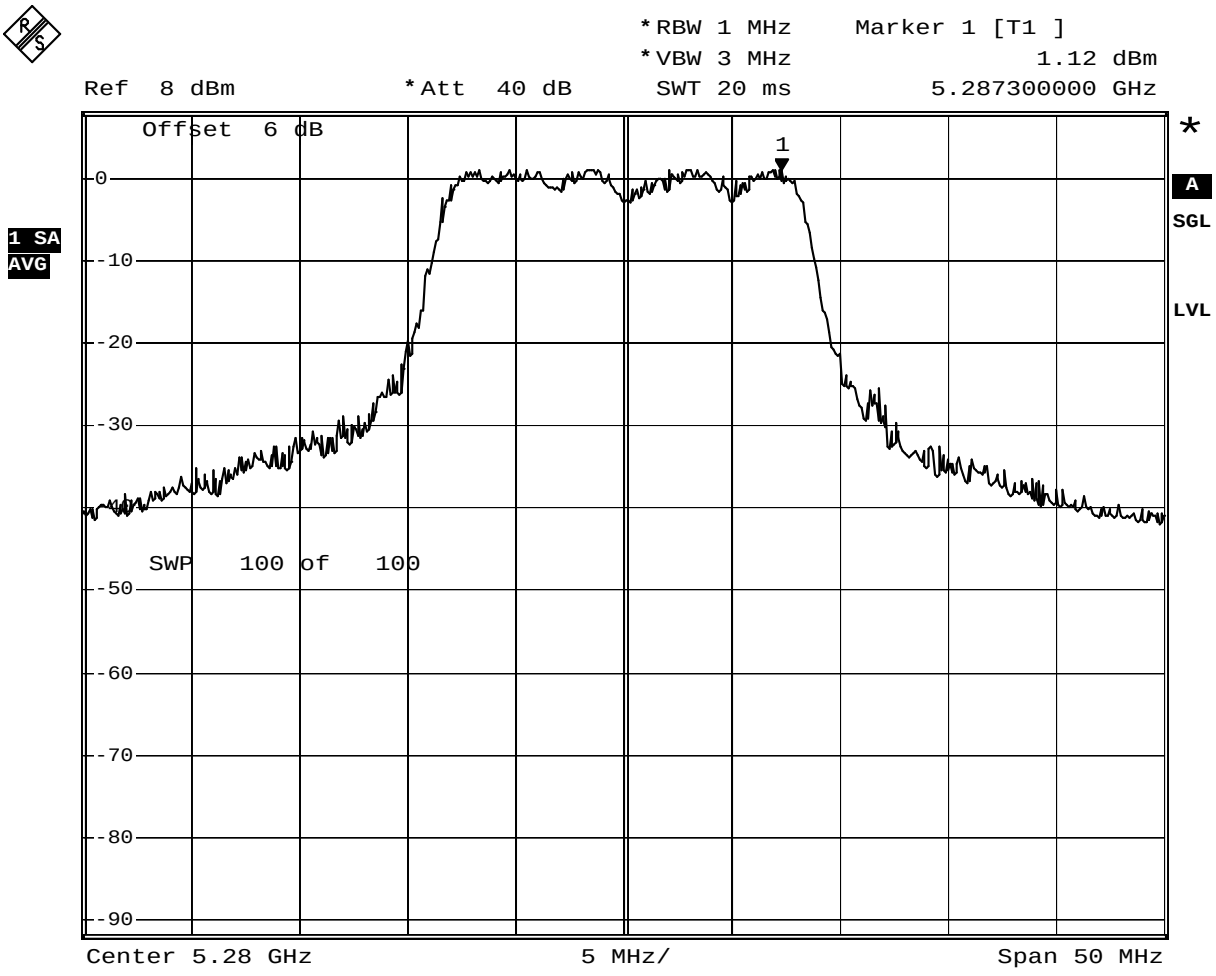
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5260 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 1.95 dBm at 5.262 GH
Comment: z
Date:      22.NOV.2010  09:25:24
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

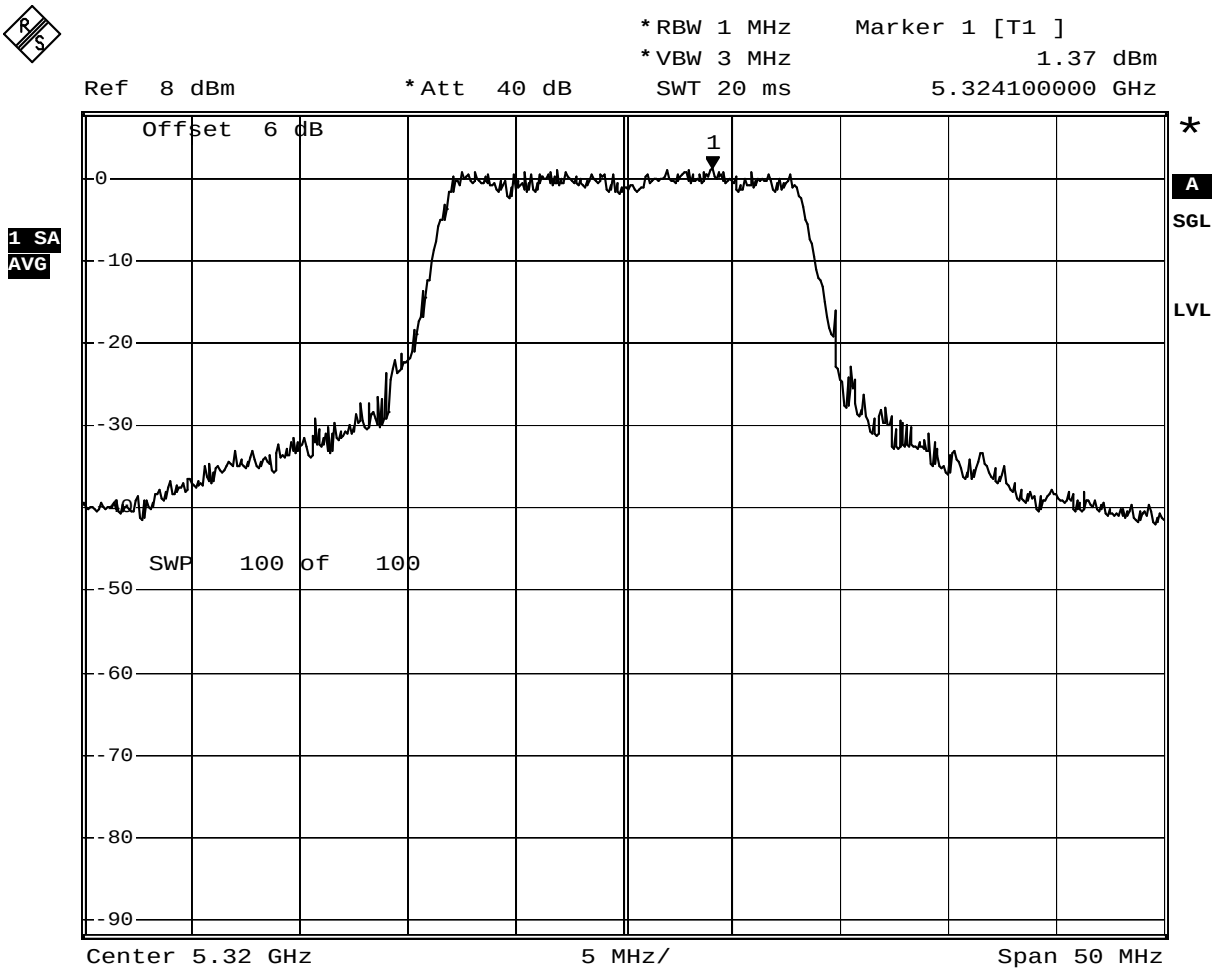
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5280 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 1.12 dBm at 5.287 GH
Comment: z
Date:      22.NOV.2010  09:28:36
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

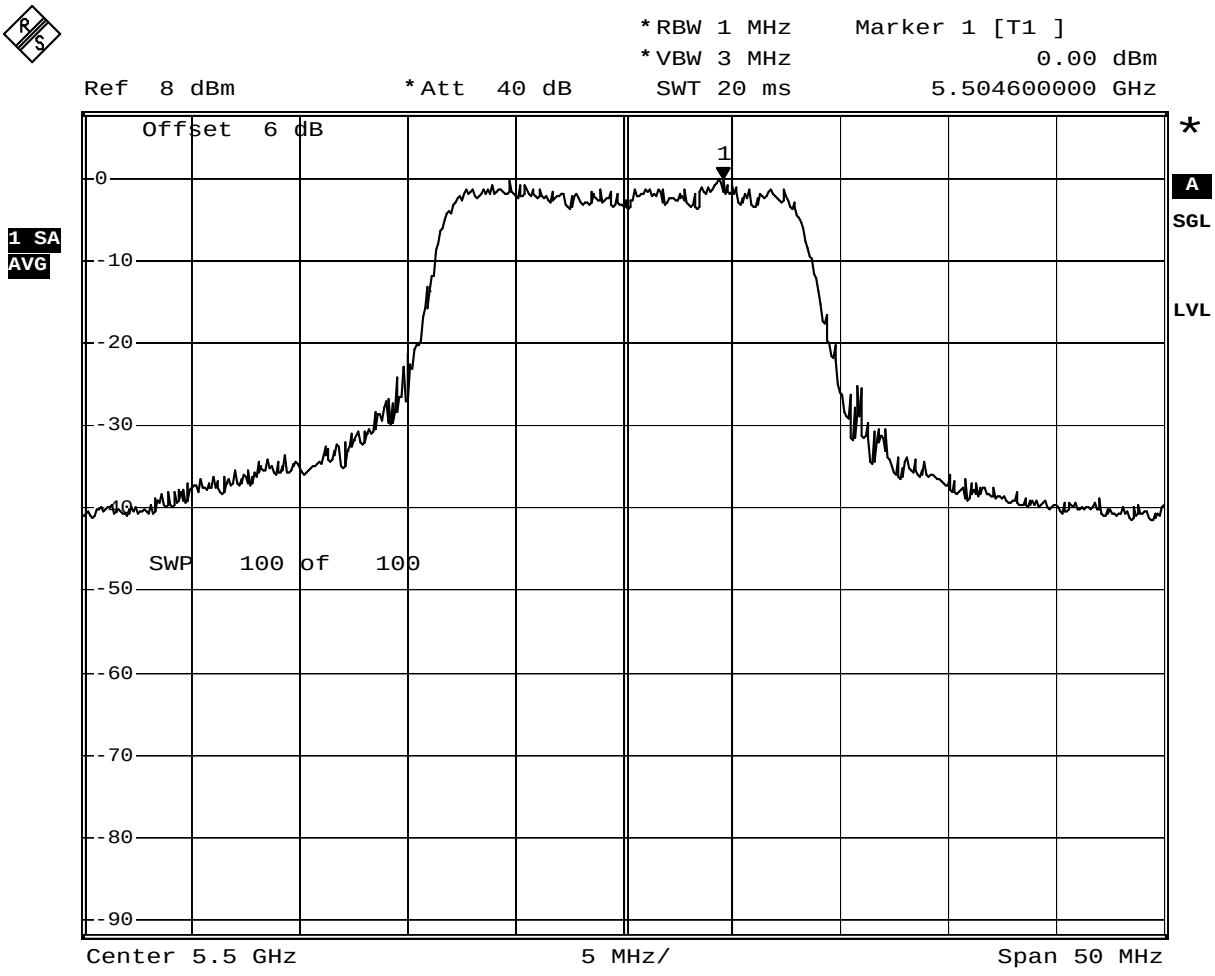
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5320 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 1.37 dBm at 5.324 GH
Comment: z
Date:      22.NOV.2010  09:33:15
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

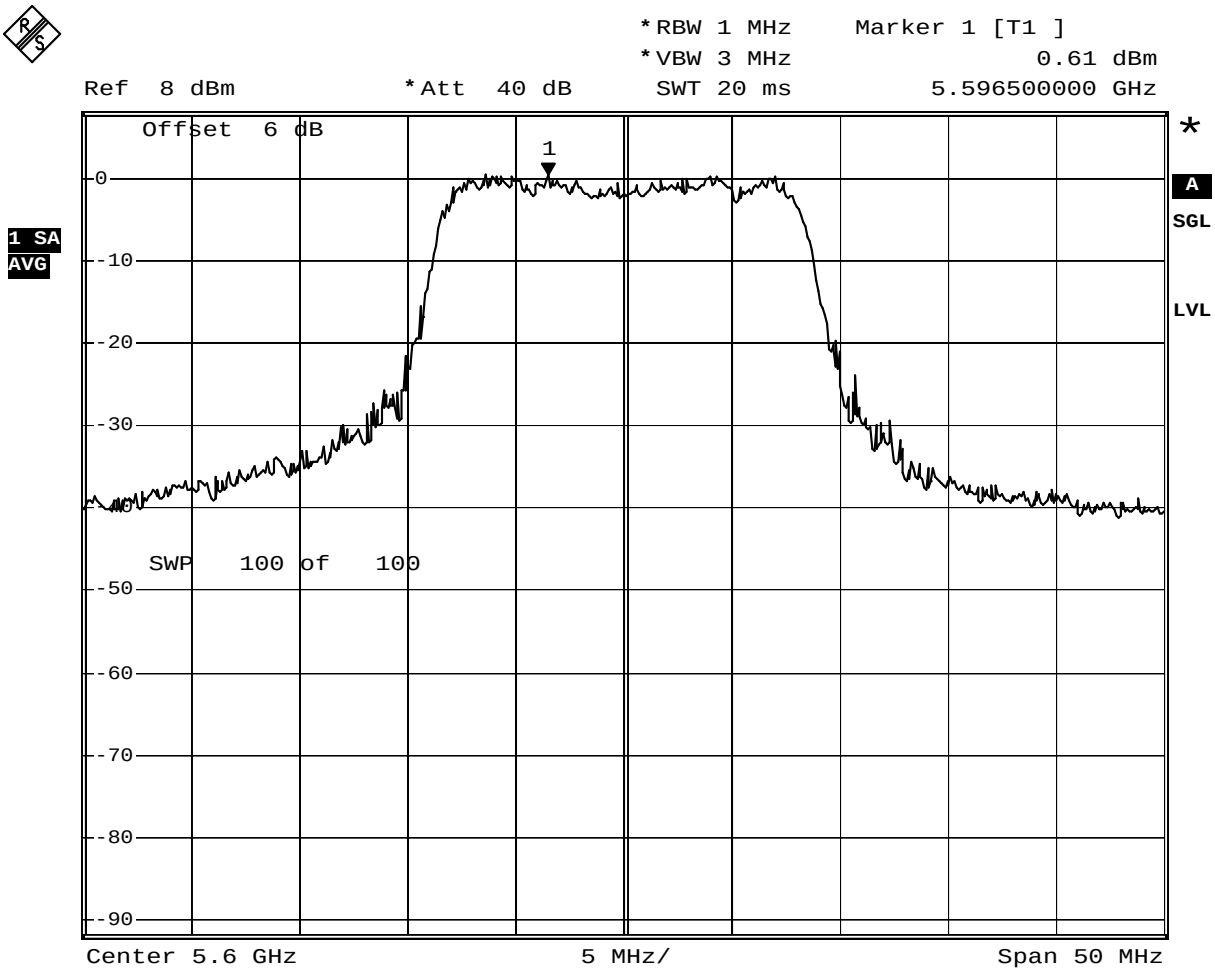
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5500 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 0 dBm at 5.505 GHz
Date:      22.NOV.2010  09:06:50
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

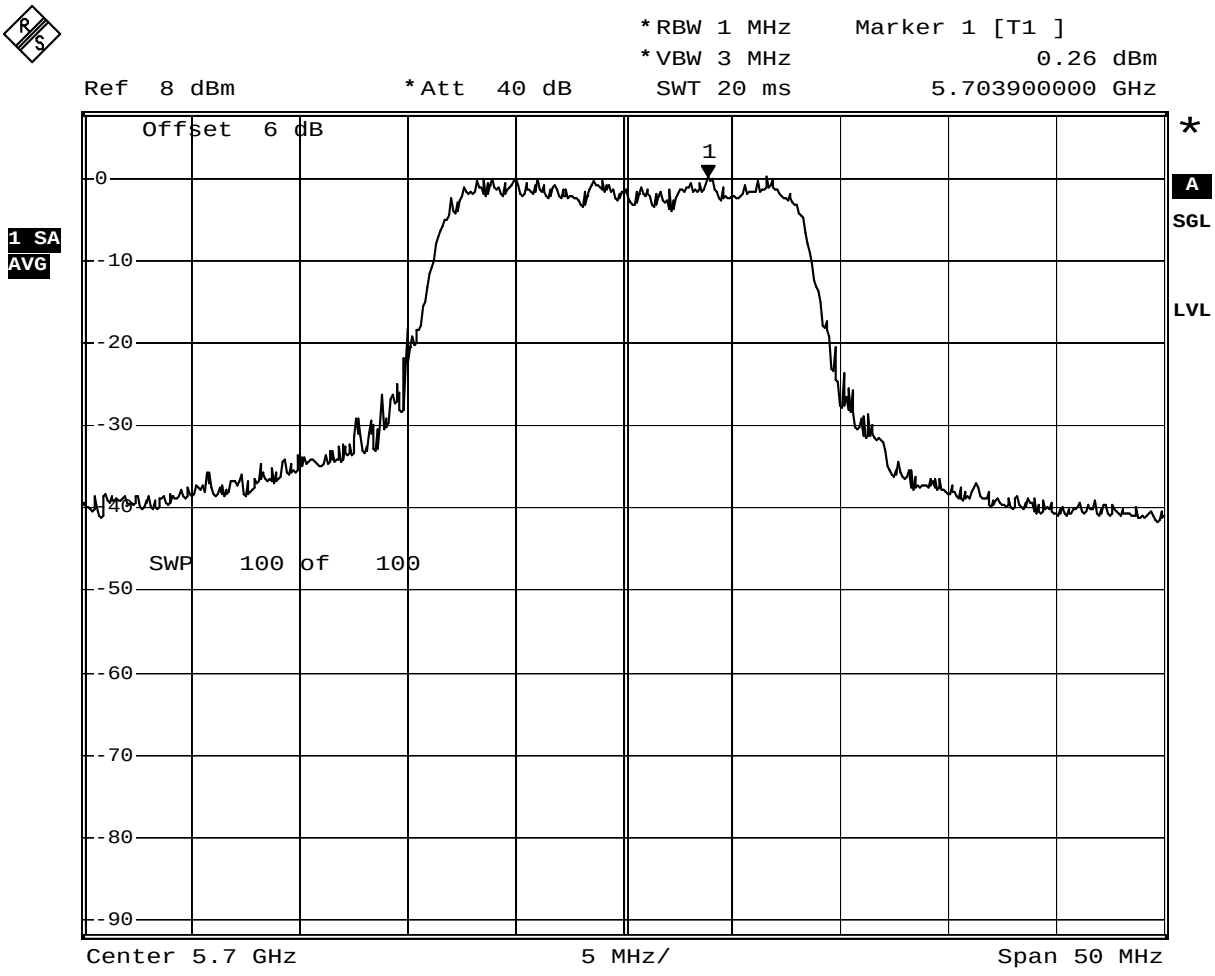
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5600 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Peak Power Spectral Density (Method#2): 0.61 dBm at 5.596 GH
Comment: z
Date:      22.NOV.2010  09:40:17
```

FCC part 15.407(a)(1-5)
Peak Power Spectral Density

EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(1-5) / DA 02-2138
Comment 1	Peak Power Spectral Density (Method #2)
Comment 2	Channel frequency: 5700 MHz
Comment 3	OFDM / 6 Mbit/s



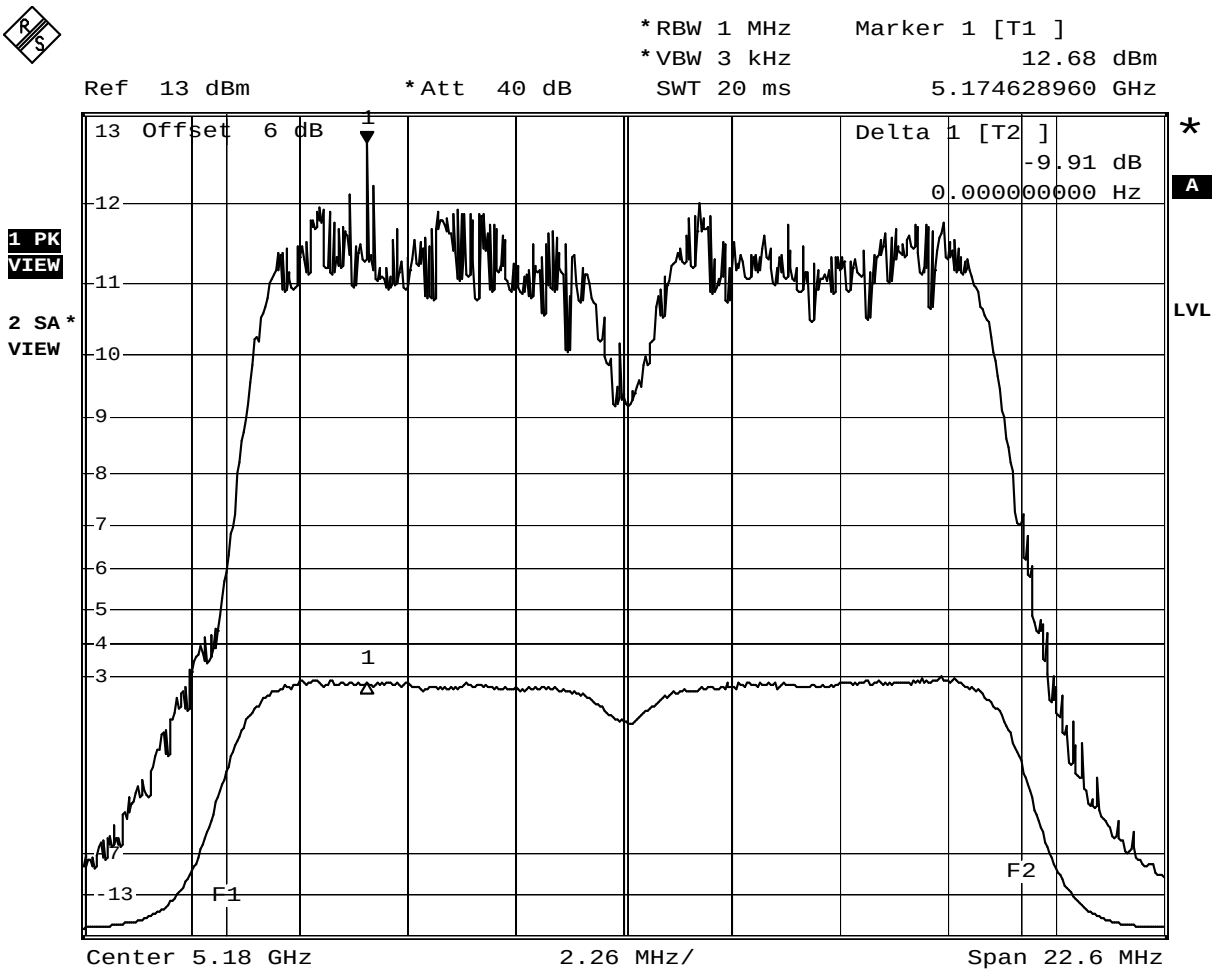

```
Comment: Peak Power Spectral Density (Method#2): 0.26 dBm at 5.704 GH
Comment: z
Date:      22.NOV.2010  09:45:14
```

Annex D

Peak Excursion of the modulation

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

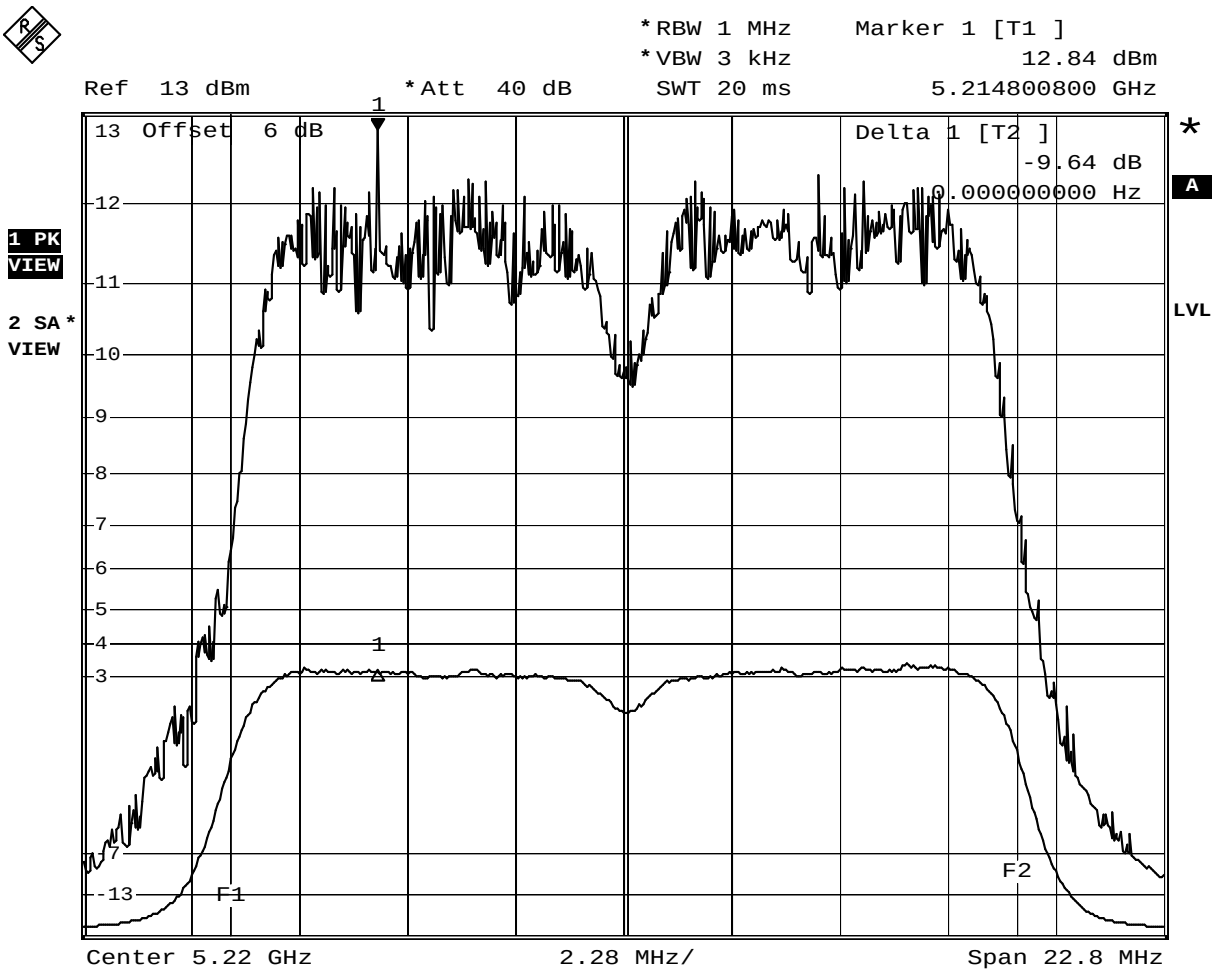
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5180 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Maximum peak excursion (method #2)=9.91 dB
Date: 22.NOV.2010 10:04:08

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

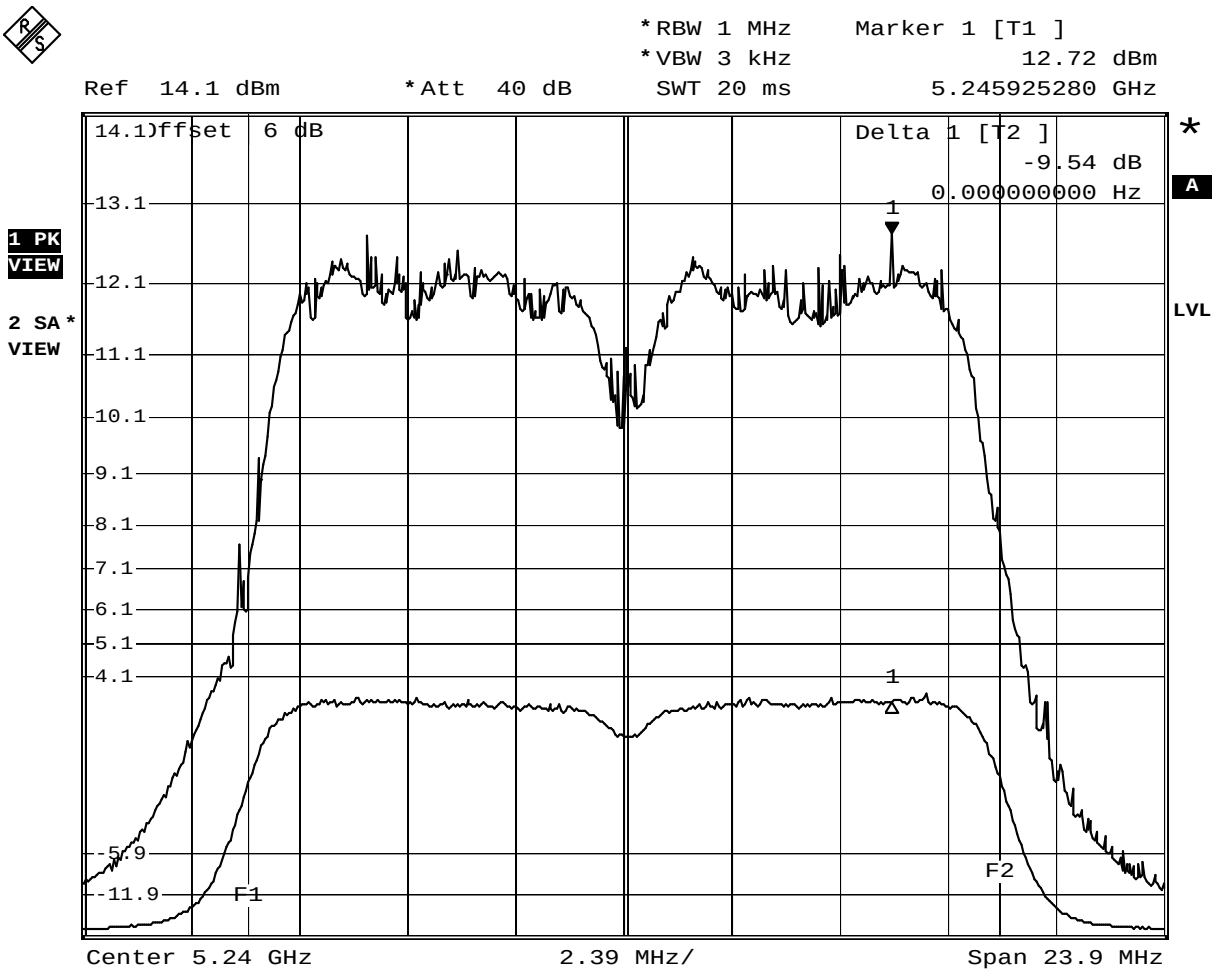
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5220 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Maximum peak excursion (method #2)=9.64 dB
Date: 22.NOV.2010 10:13:14

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

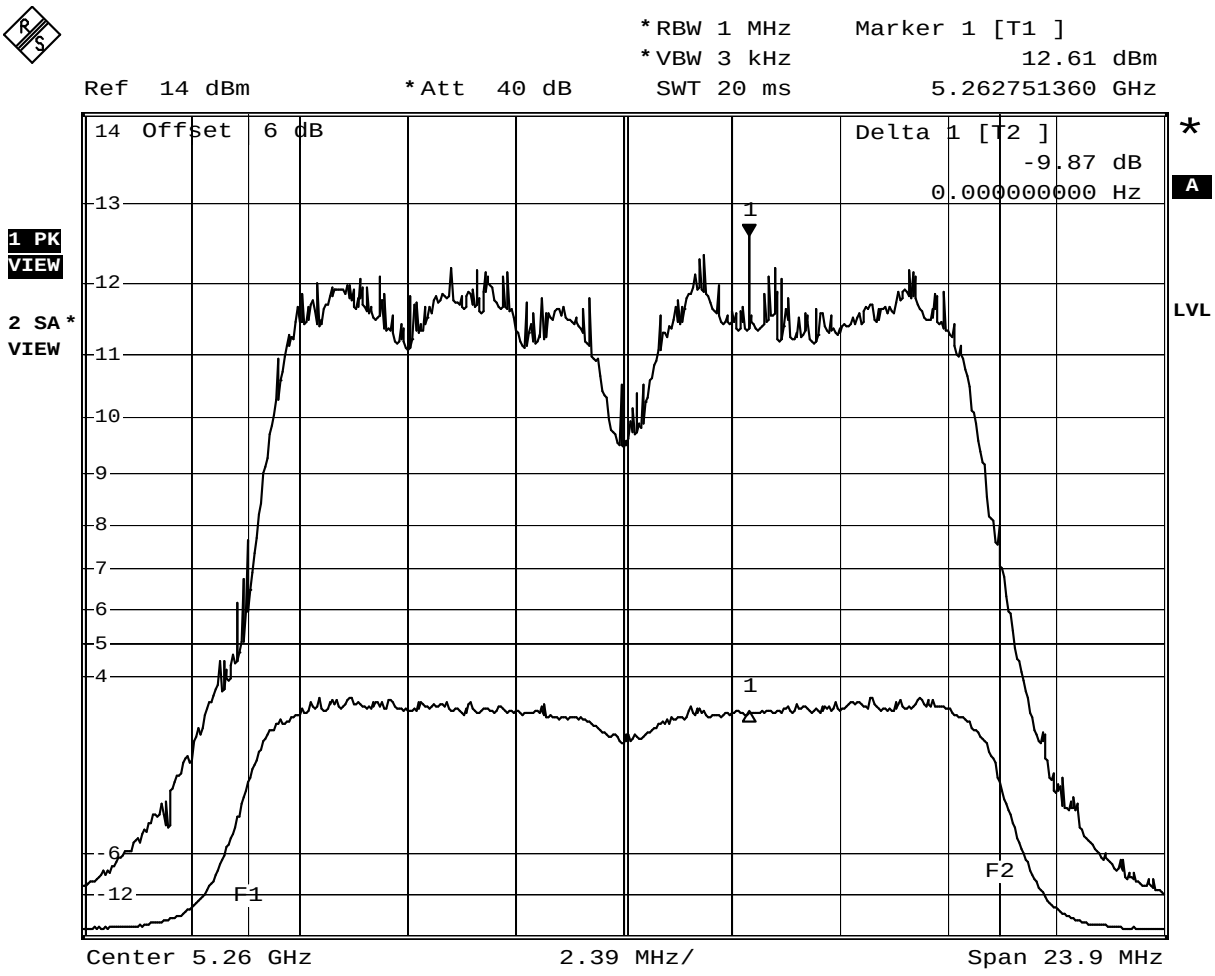
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5240 MHz
Comment 3	OFDM / 6 Mbit/s




```
Comment: Maximum peak excursion (method #2)=9.54 dB
Date:      22.NOV.2010  10:18:10
```

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

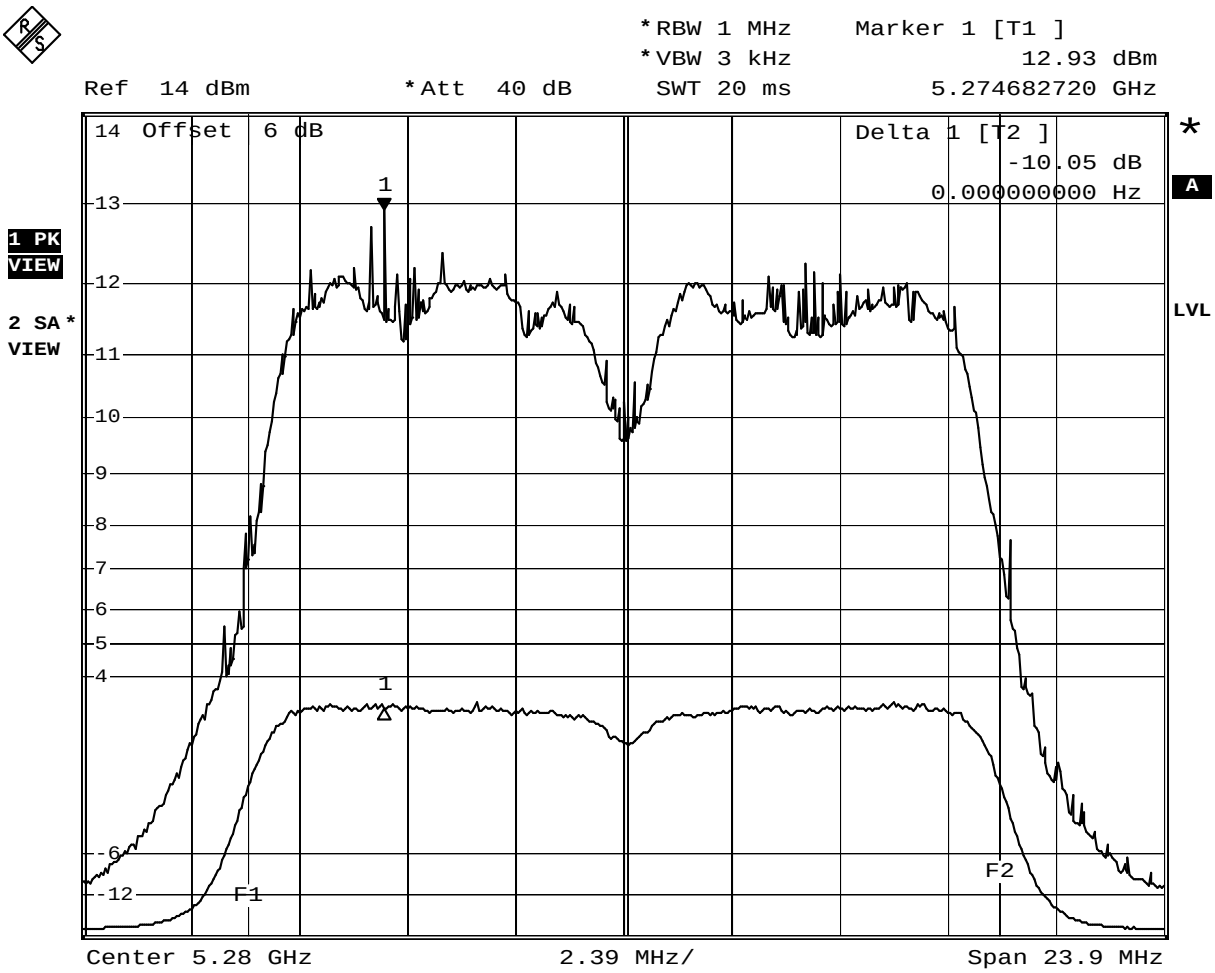
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5260 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Maximum peak excursion (method #2)=9.87 dB
Date: 22.NOV.2010 10:52:10

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

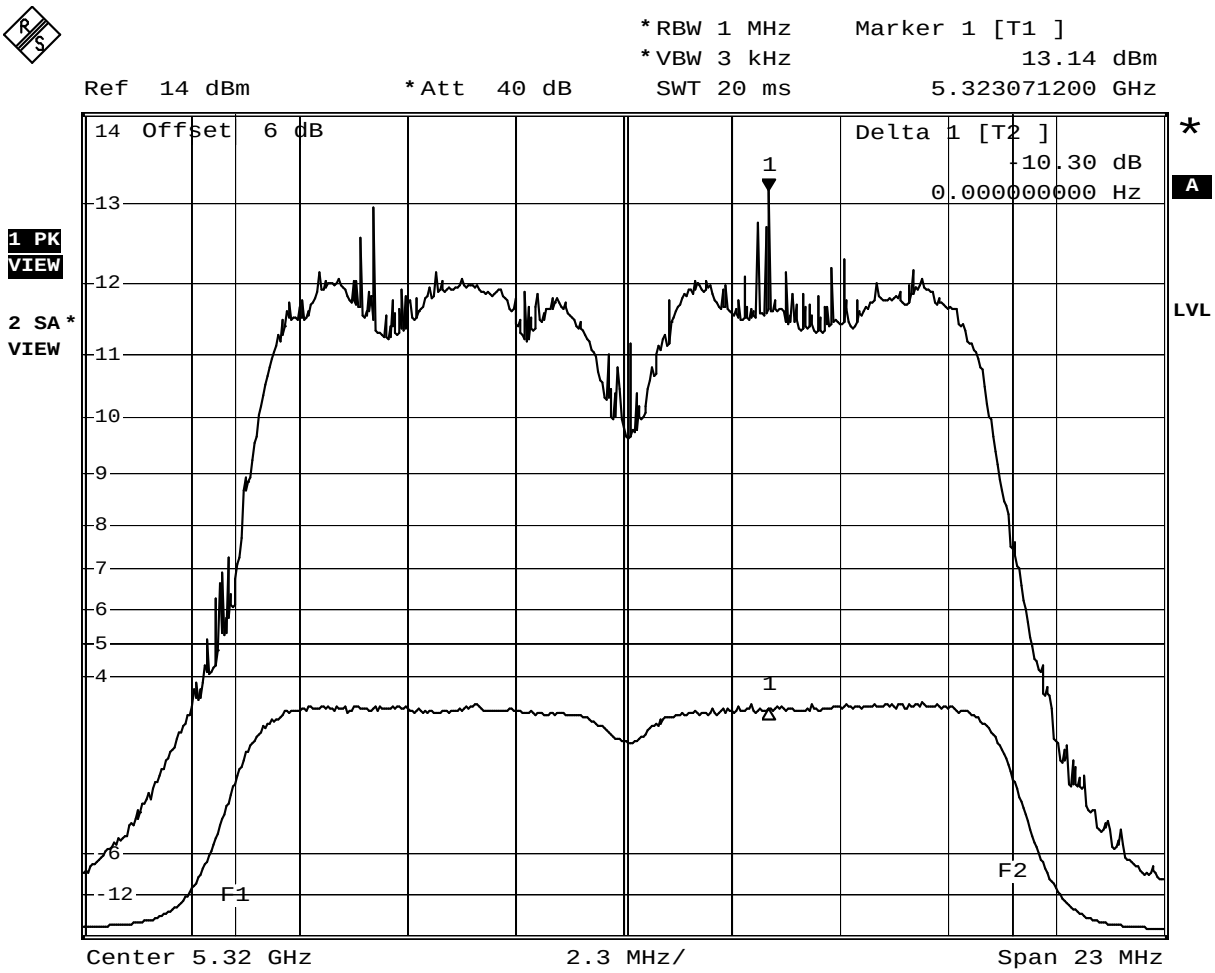
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5280 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Maximum peak excursion (method #2)=10.05 dB
Date: 22.NOV.2010 10:48:42

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

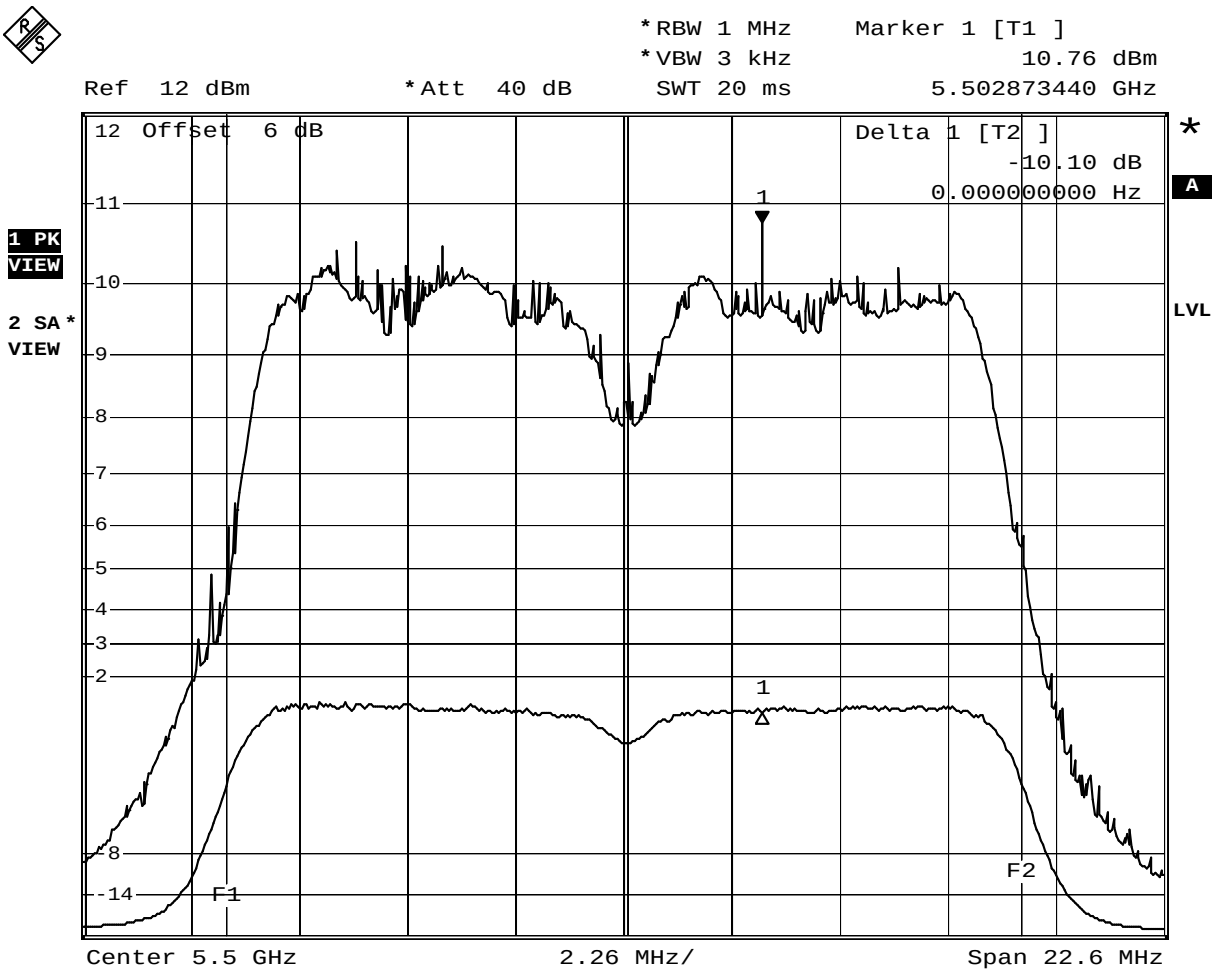
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5320 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Maximum peak excursion (method #2)=10.3 dB
Date: 22.NOV.2010 10:56:43

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

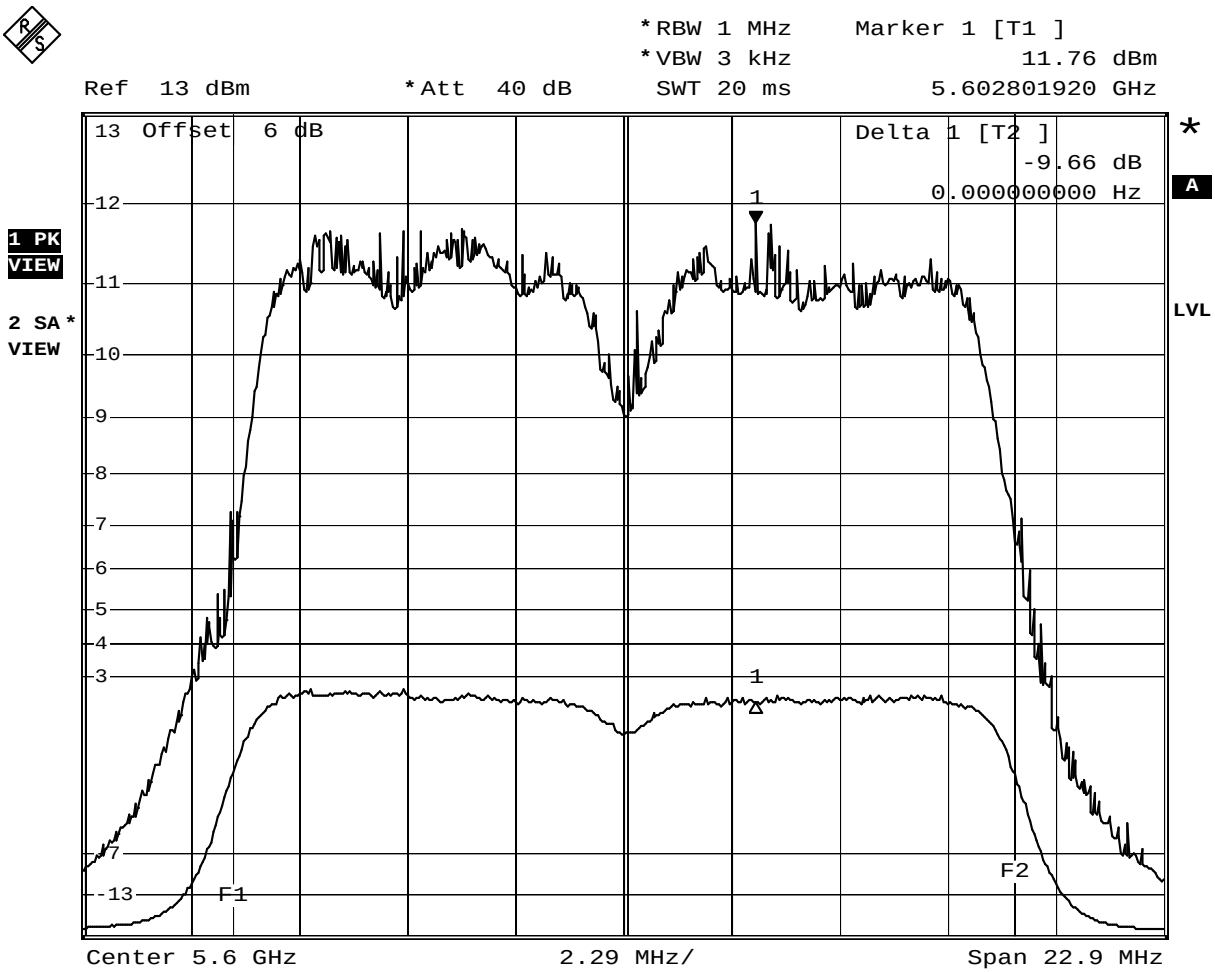
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5500 MHz
Comment 3	OFDM / 6 Mbit/s



Comment: Maximum peak excursion (method #2)=10.1 dB
Date: 22.NOV.2010 11:01:43

FCC part 15.407(a)(6)
Peak Excursion of the Modulation

EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	lesswire AG
Temperature / Voltage	tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.407(a)(6) / DA 02-2138
Comment 1	Peak Excursion of the Modulation (Method #2)
Comment 2	Channel frequency: 5600 MHz
Comment 3	OFDM / 6 Mbit/s



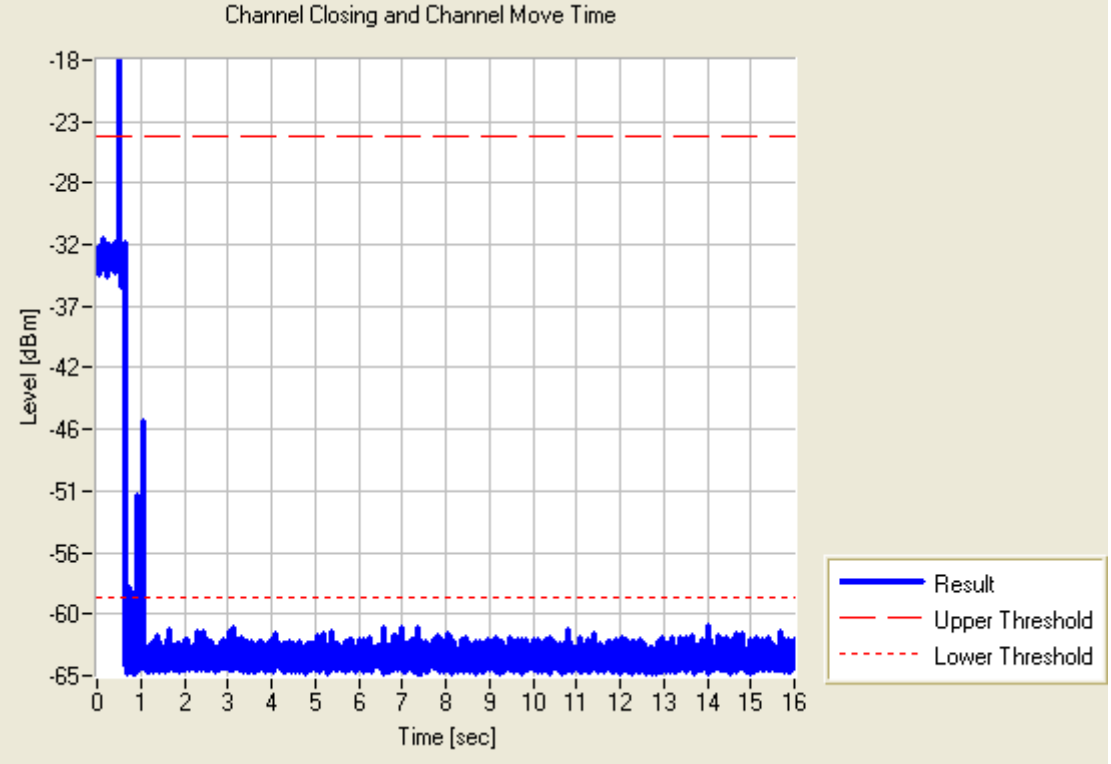

```
Comment: Maximum peak excursion (method #2)=9.66 dB
Date:      22.NOV.2010  11:06:57
```

Annex E

Channel Move Time and Channel Closing Transmission Time

FCC 15.407 and FCC 06-96
Channel Closing Time and Channel Move Time

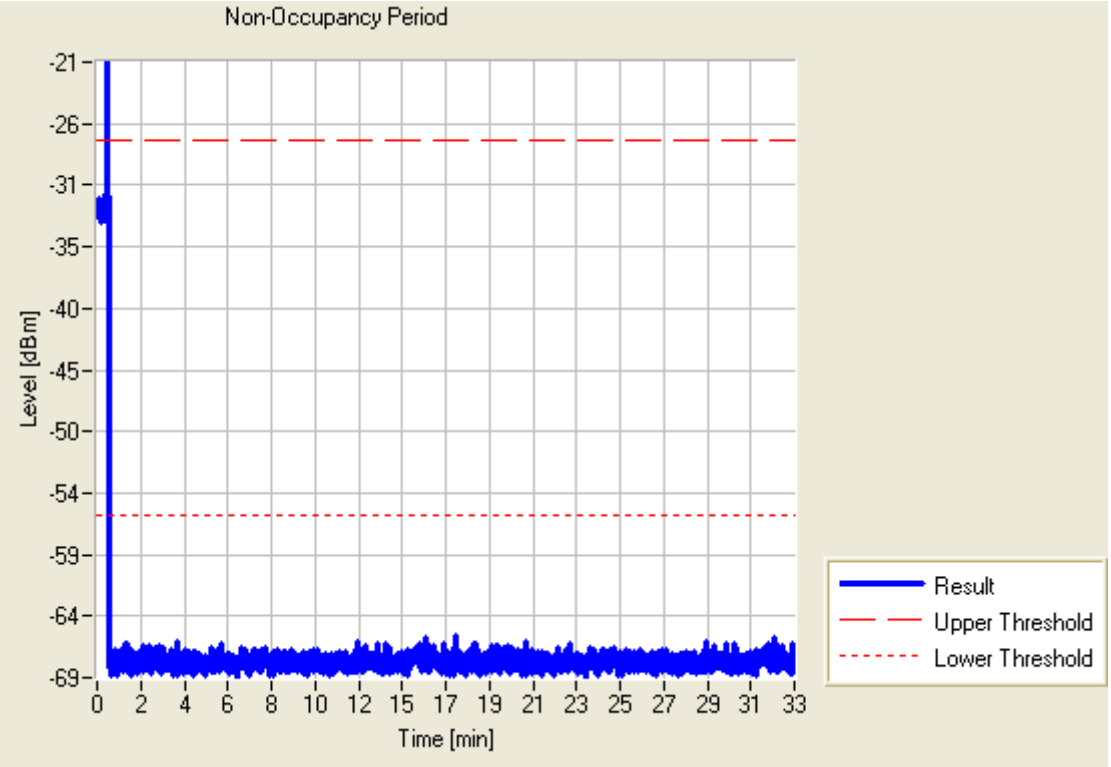
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	Lesswire AG
Temperature / Voltage	23°C / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Date / Time	3.Sep.2010 / 14:22:07
Test Specification	FCC 06-96 sub-clause 5.3
Comment 1	Channel.: 5320 MHz
Radar Type:	4
Radar Pulse Width:	20 µsec
Radar Pulse Interval:	2000 µsec



	Limit	Result	Verdict
Channel Closing Time until 200 msec after last Radar Signal	≤ 200 msec	144 msec	PASS
Channel Closing Time in the remainder of the 10 seconds period	≤ 60 msec	8 msec	PASS
Channel Move Time	≤ 10.0 sec	0.538 sec	PASS

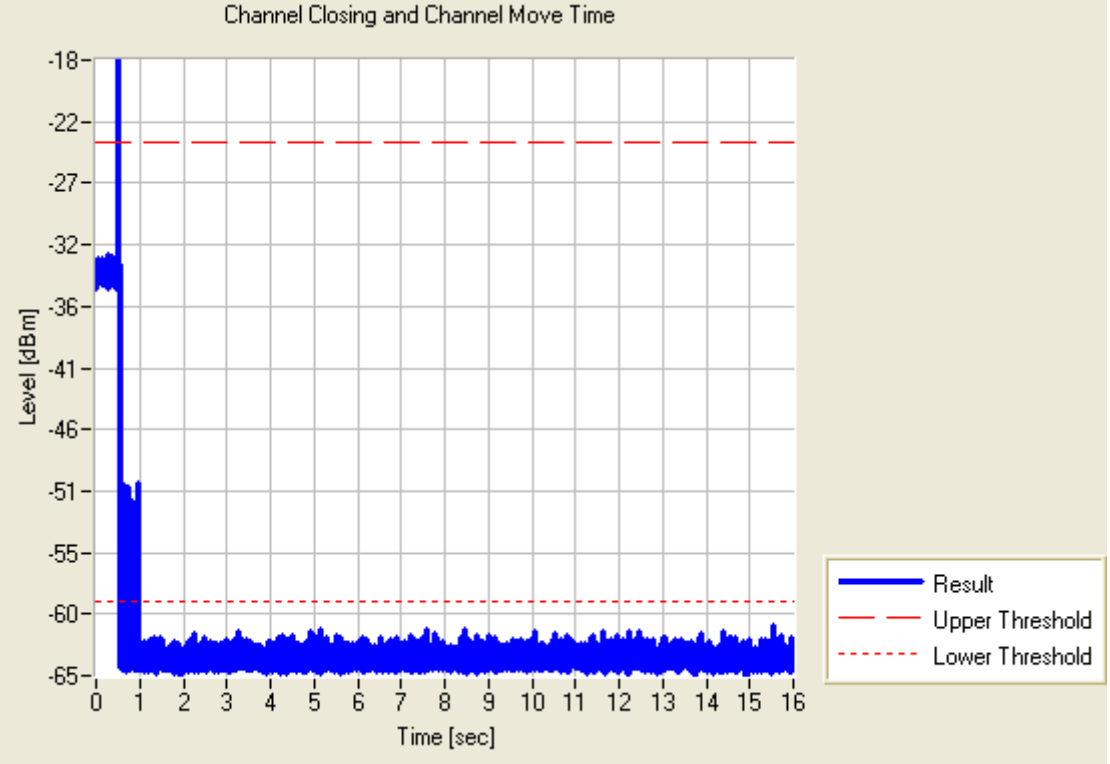
FCC 15.407 and FCC 06-96
Non-Occupancy Period

EUT	Component
Model	WiBear-I
Approval Holder	lesswire AG
Temperature / Voltage	23°C / Vnom
Test Site / Operator	Eurofins ETS Product Service GmbH / Mr. Jahn
Test Date / Time	03.Sep.2010 / 14:22:16
Test Specification	FCC 06-96
Comment 1	Channel.: 5320 MHz
Radar Type:	1
Radar Pulse Width:	1 µsec
Radar Pulse Interval:	1428 µsec



FCC 15.407 and FCC 06-96
Channel Closing Time and Channel Move Time

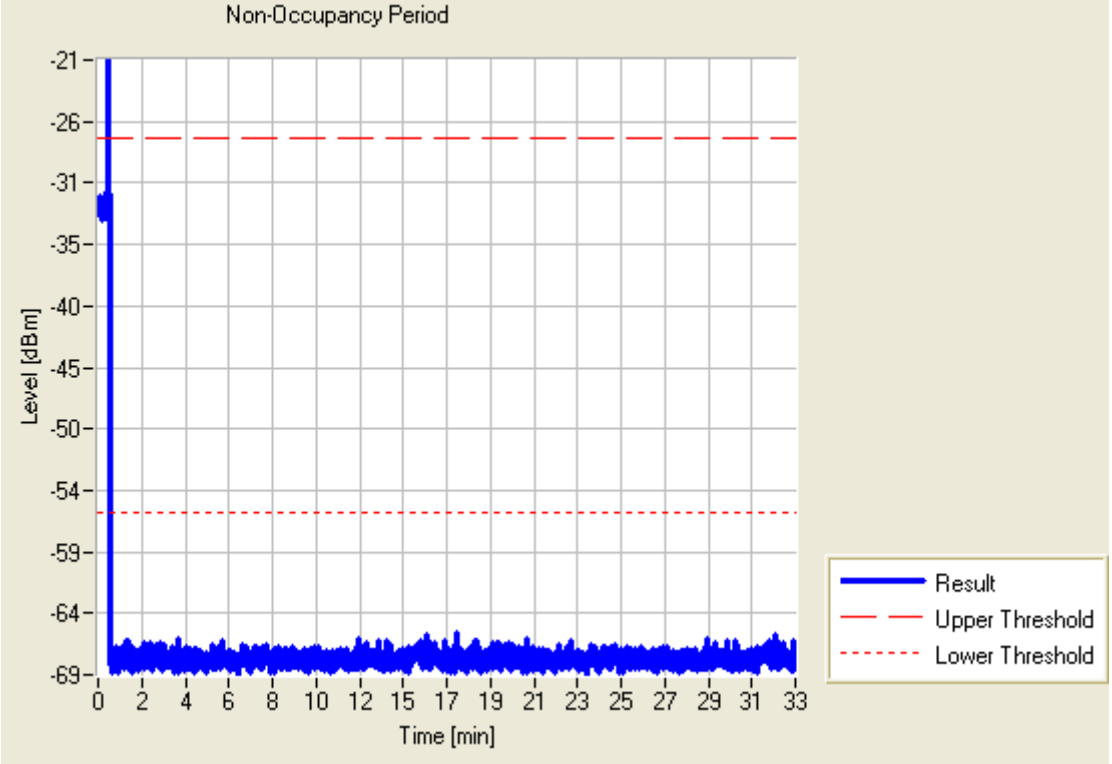
EUT	Component
Model	WiBear-I, AN00K59744
Approval Holder	Lesswire AG
Temperature / Voltage	23°C / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Date / Time	3.Sep.2010 / 14:22:07
Test Specification	FCC 06-96 sub-clause 5.3
Comment 1	Channel.: 5600 MHz
Radar Type:	4
Radar Pulse Width:	20 µsec
Radar Pulse Interval:	2000 µsec



	Limit	Result	Verdict
Channel Closing Time until 200 msec after last Radar Signal	≤ 200 msec	36 msec	PASS
Channel Closing Time in the remainder of the 10 seconds period	≤ 60 msec	6 msec	PASS
Channel Move Time	≤ 10.0 sec	0.440 sec	PASS

FCC 15.407 and FCC 06-96
Non-Occupancy Period

EUT	Component
Model	WiBear-I
Approval Holder	lesswire AG
Temperature / Voltage	23°C / Vnom
Test Site / Operator	Eurofins ETS Product Service GmbH / Mr. Jahn
Test Date / Time	03.Sep.2010 / 15:28:16
Test Specification	FCC 06-96
Comment 1	Channel.: 5600 MHz
Radar Type:	1
Radar Pulse Width:	1 µsec
Radar Pulse Interval:	1428 µsec



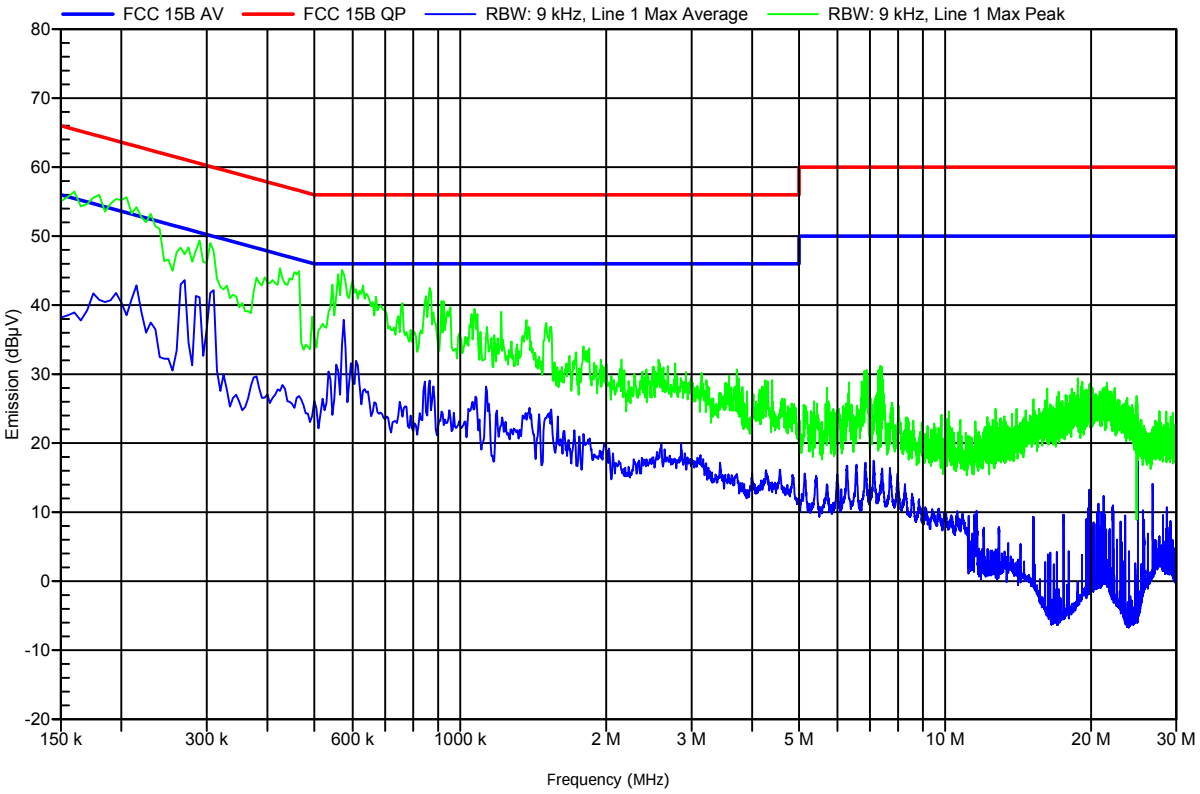
Annex F

AC powerline conducted emissions

EMI voltage test in the ac-mains according to FCC 15C

Order number: G0M21008-3606

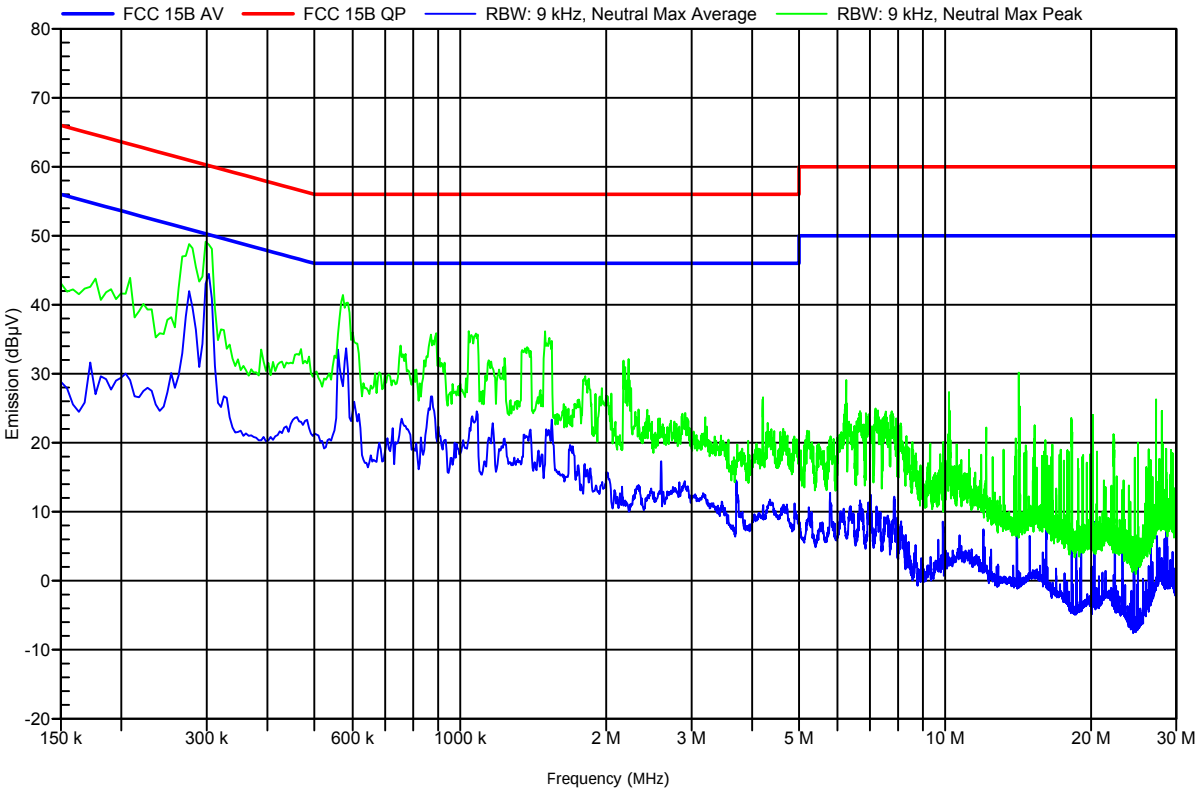
Manufacturer:	lesswire AG
EUT Name:	WiBear-I, AN00K59744
Model:	AN00960055
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120VAC
LISN:	ESH2-Z5 L
Mode:	powered from notebook
Test Date:	03.09.2010
Note:	



EMI voltage test in the ac-mains according to FCC 15C

Order number: G0M21008-3606

Manufacturer:	lesswire AG
EUT Name:	WiBear-I, AN00K59744
Model:	AN00960055
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120VAC
LISN:	ESH2-Z5 N
Mode:	powered from notebook
Test Date:	03.09.2010
Note:	



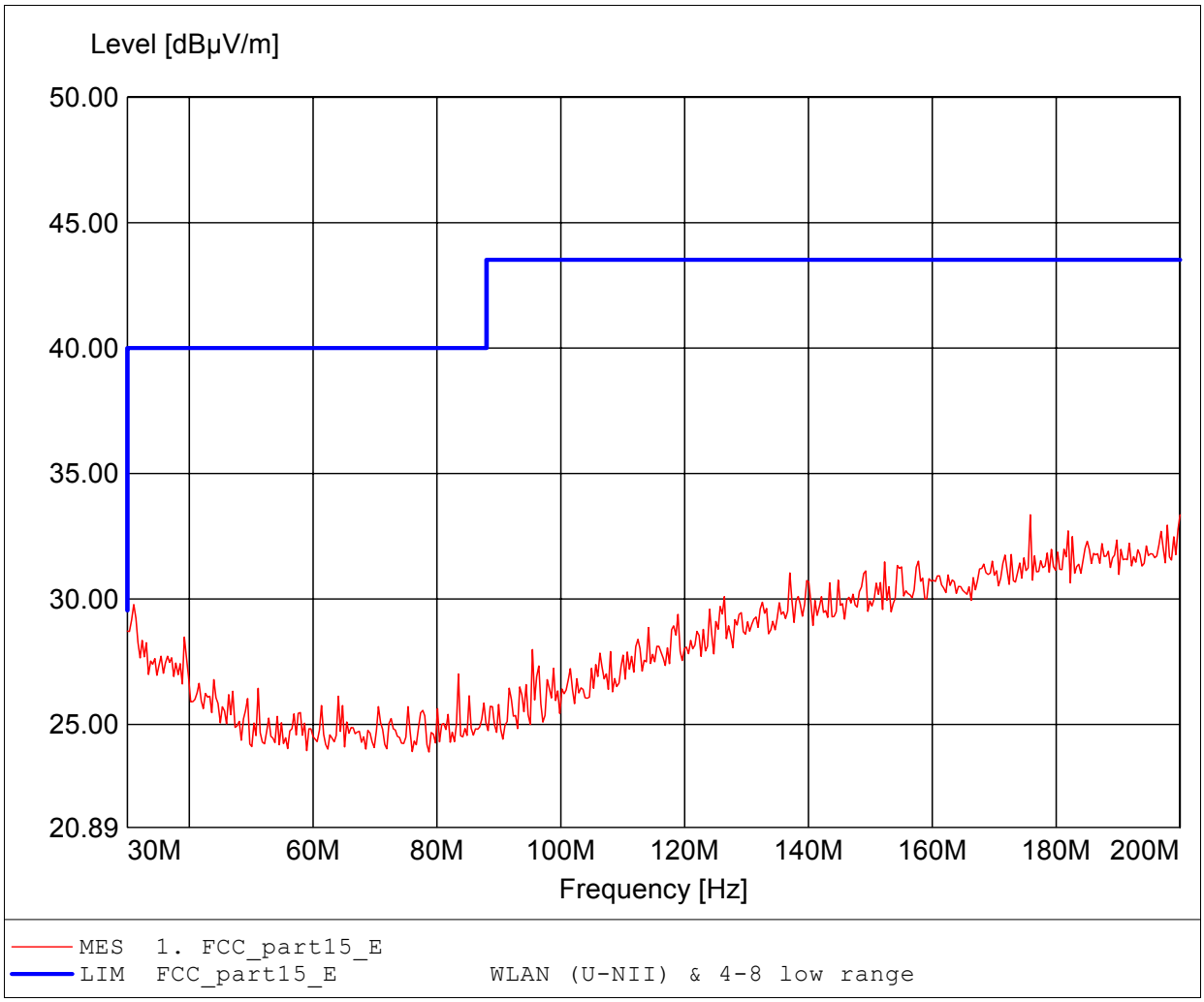
Annex G

Spurious emission radiated

Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

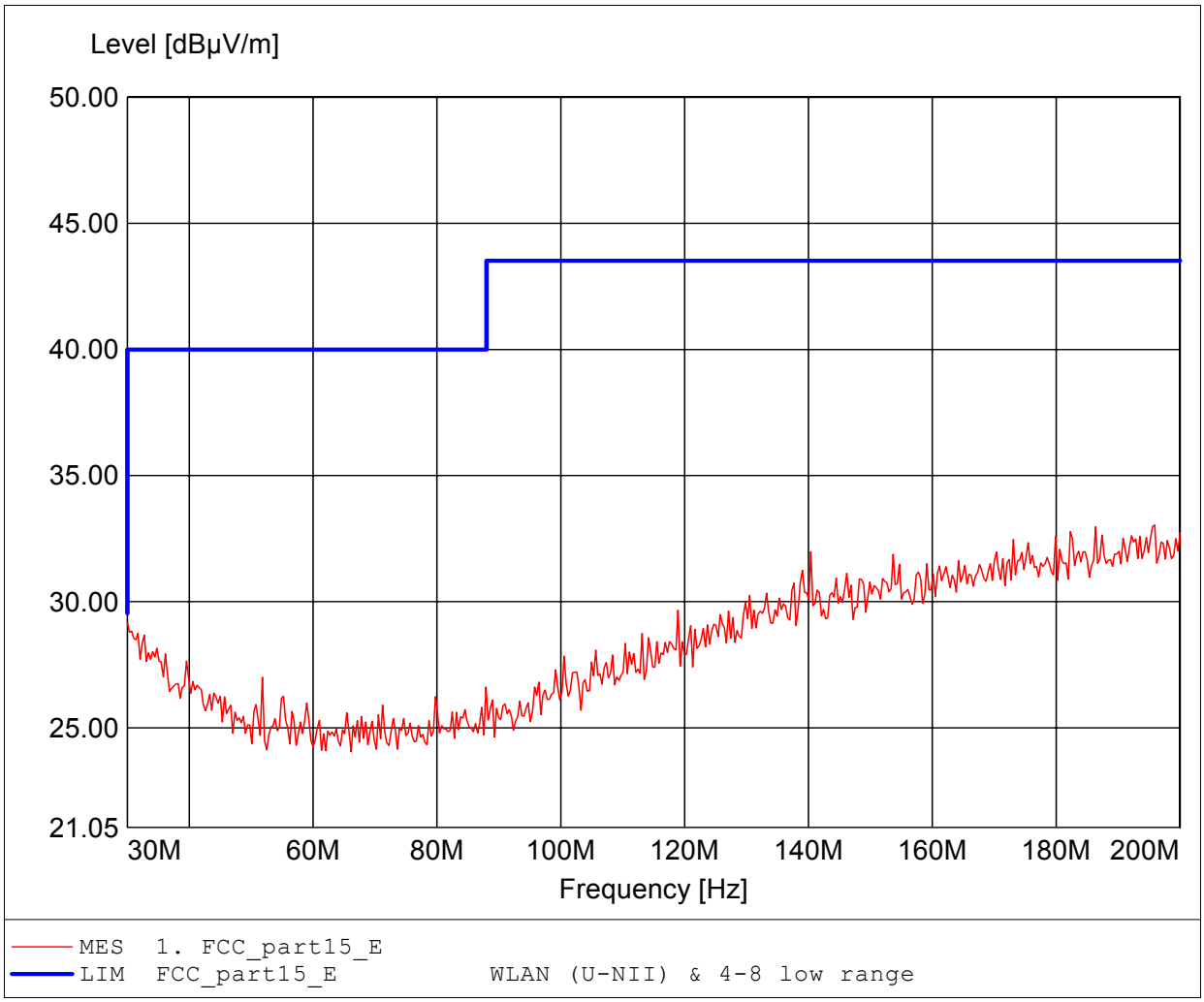
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq: 200.000MHz, Emax: 33.36dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

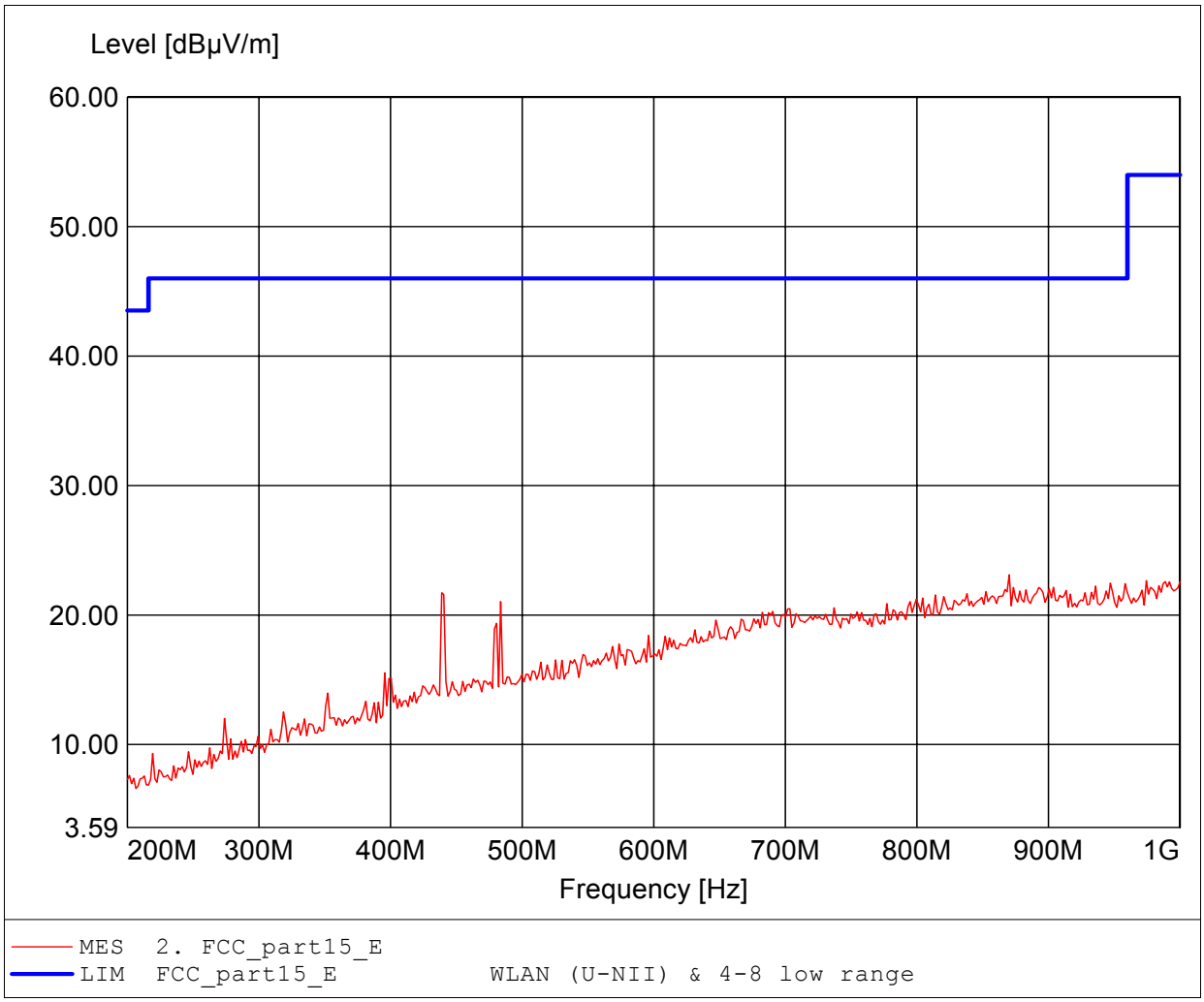
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq: 195.912MHz, Emax: 33.04dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

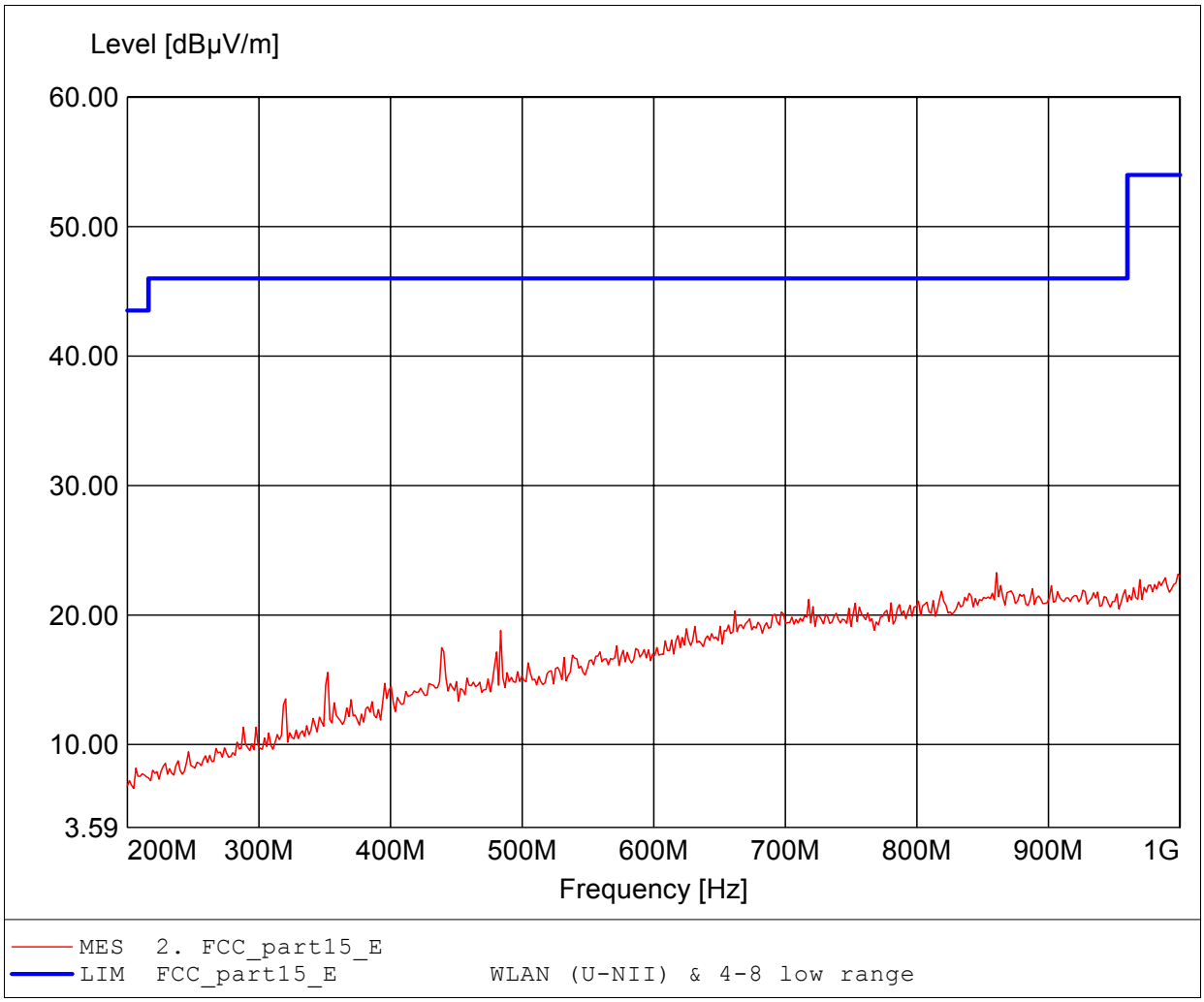
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII,5180 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
Comment 2:	Freq: 870.140MHz, Emax: 23.11dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

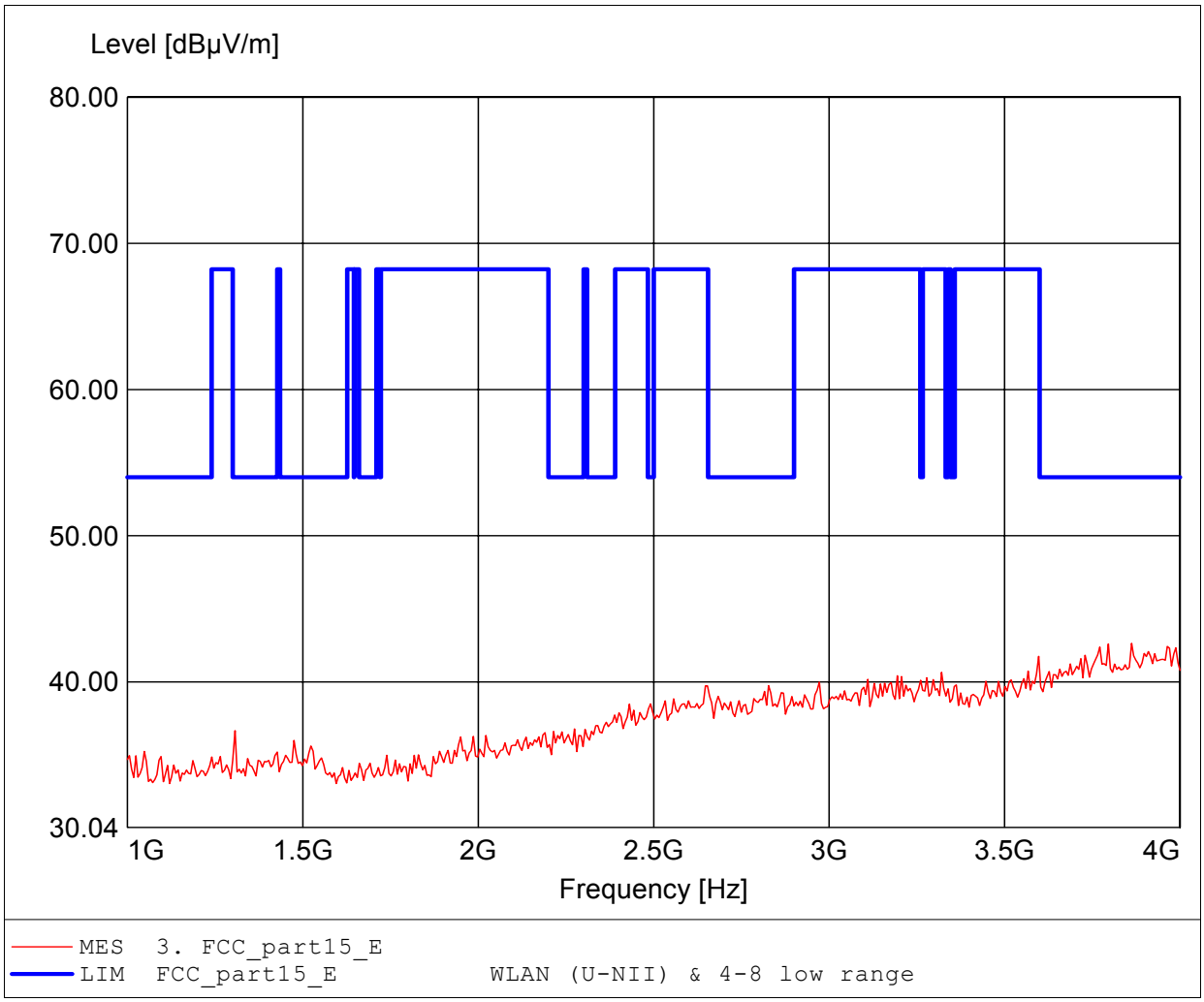
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII,5180 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
Comment 2:	Freq: 860.521MHz, Emax: 23.28dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

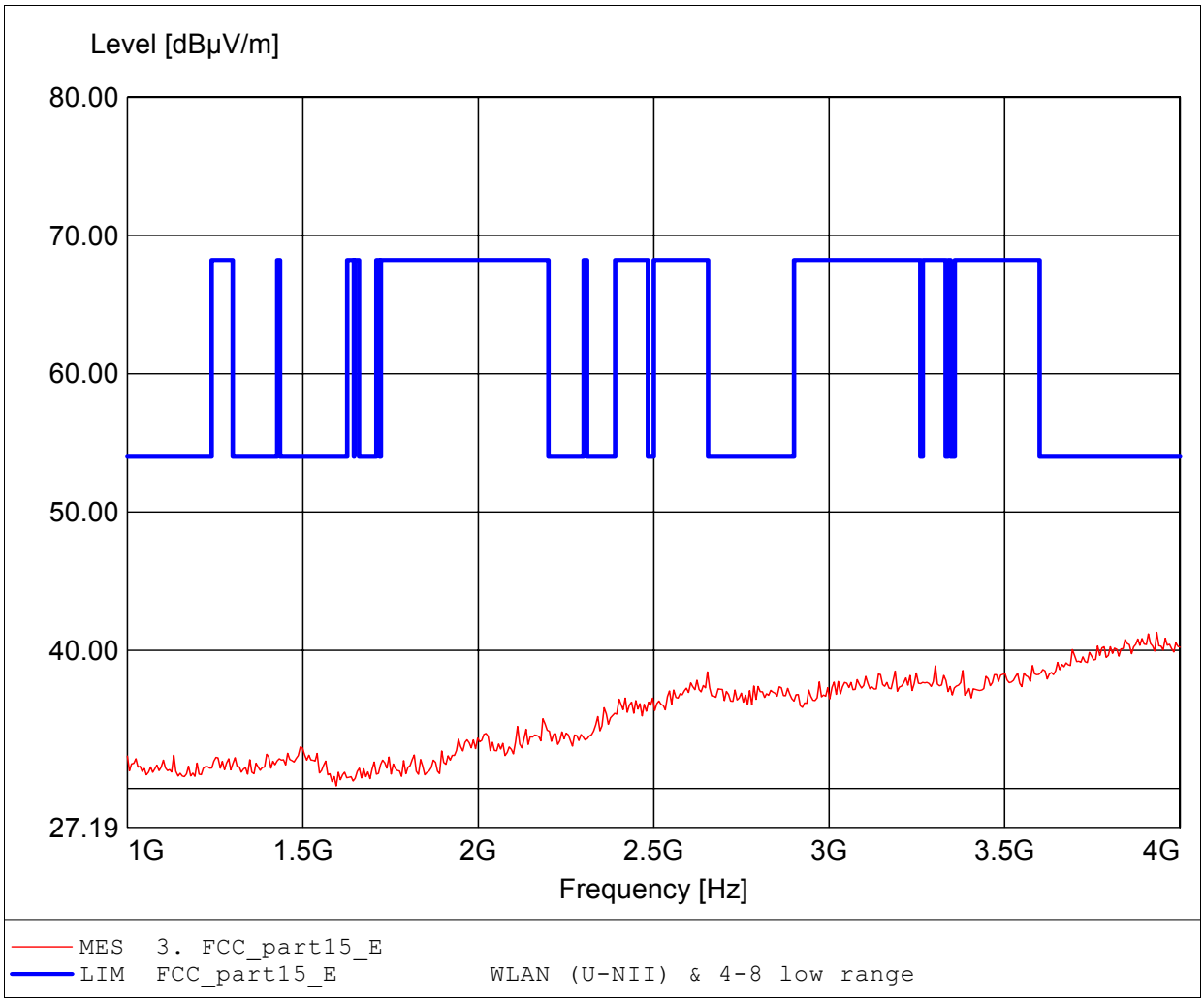
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 3.862GHz, Emax: 42.63dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

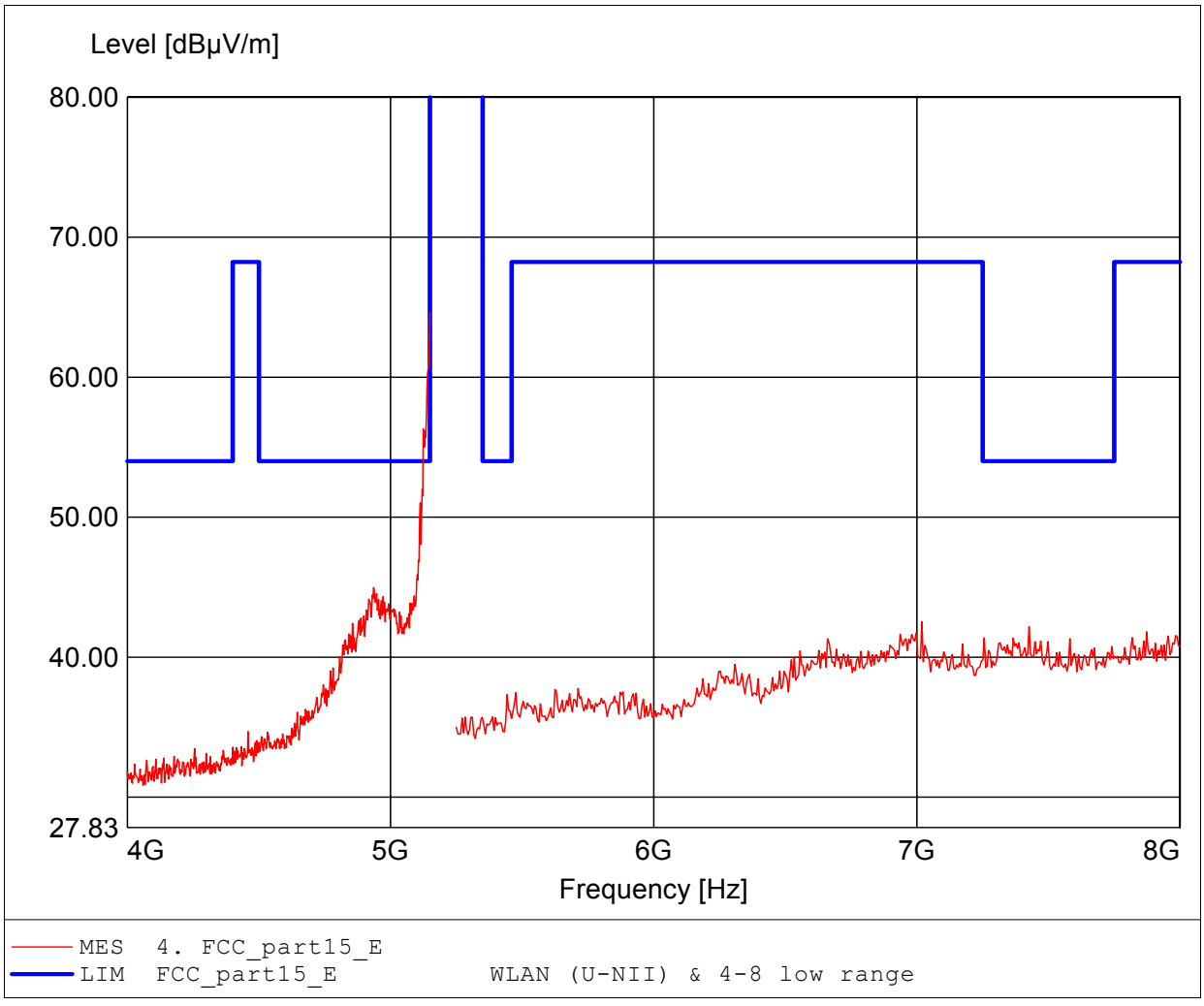
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 3.934GHz, Emax: 41.31dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

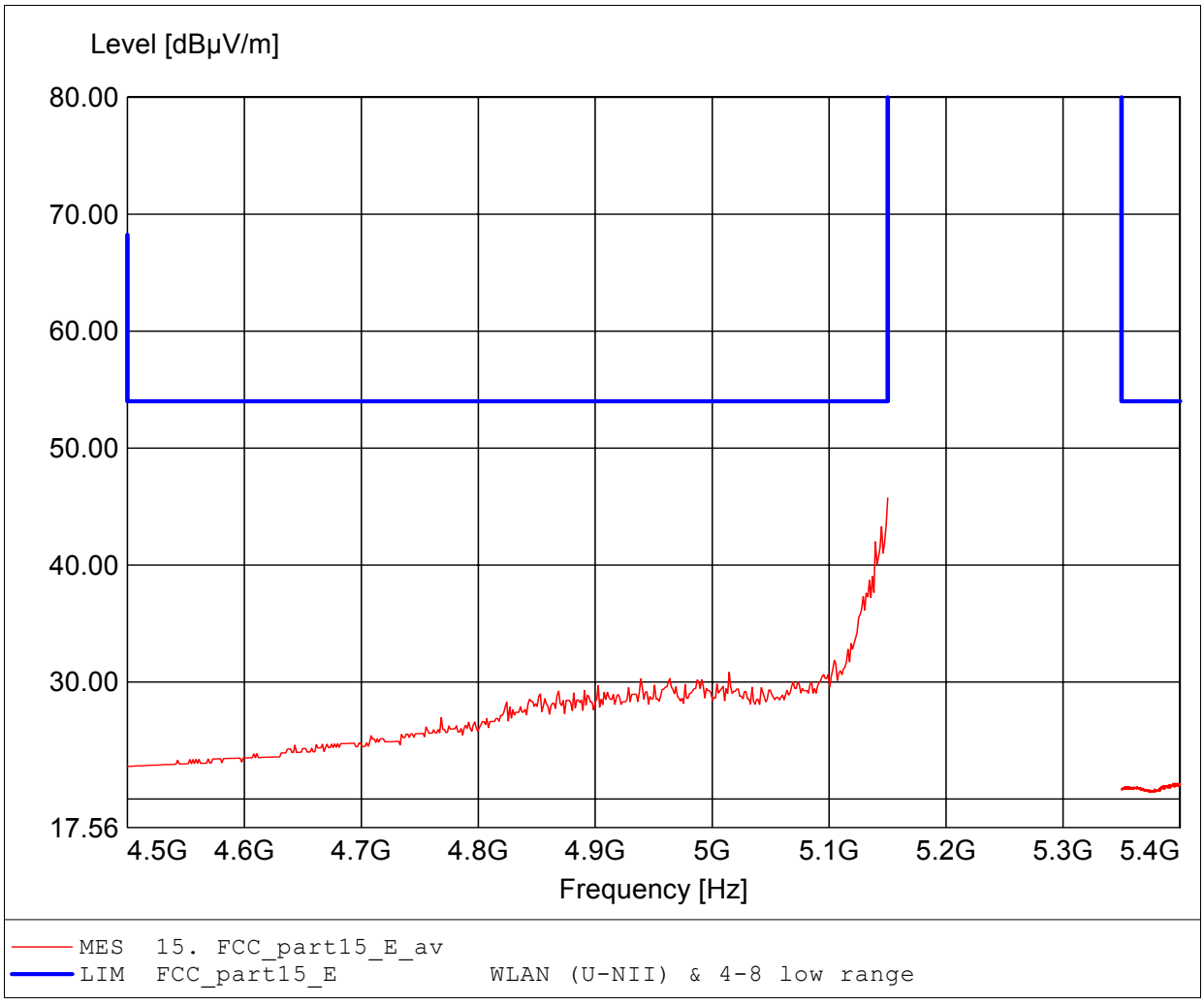
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.150GHz, Emax: 64.63dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

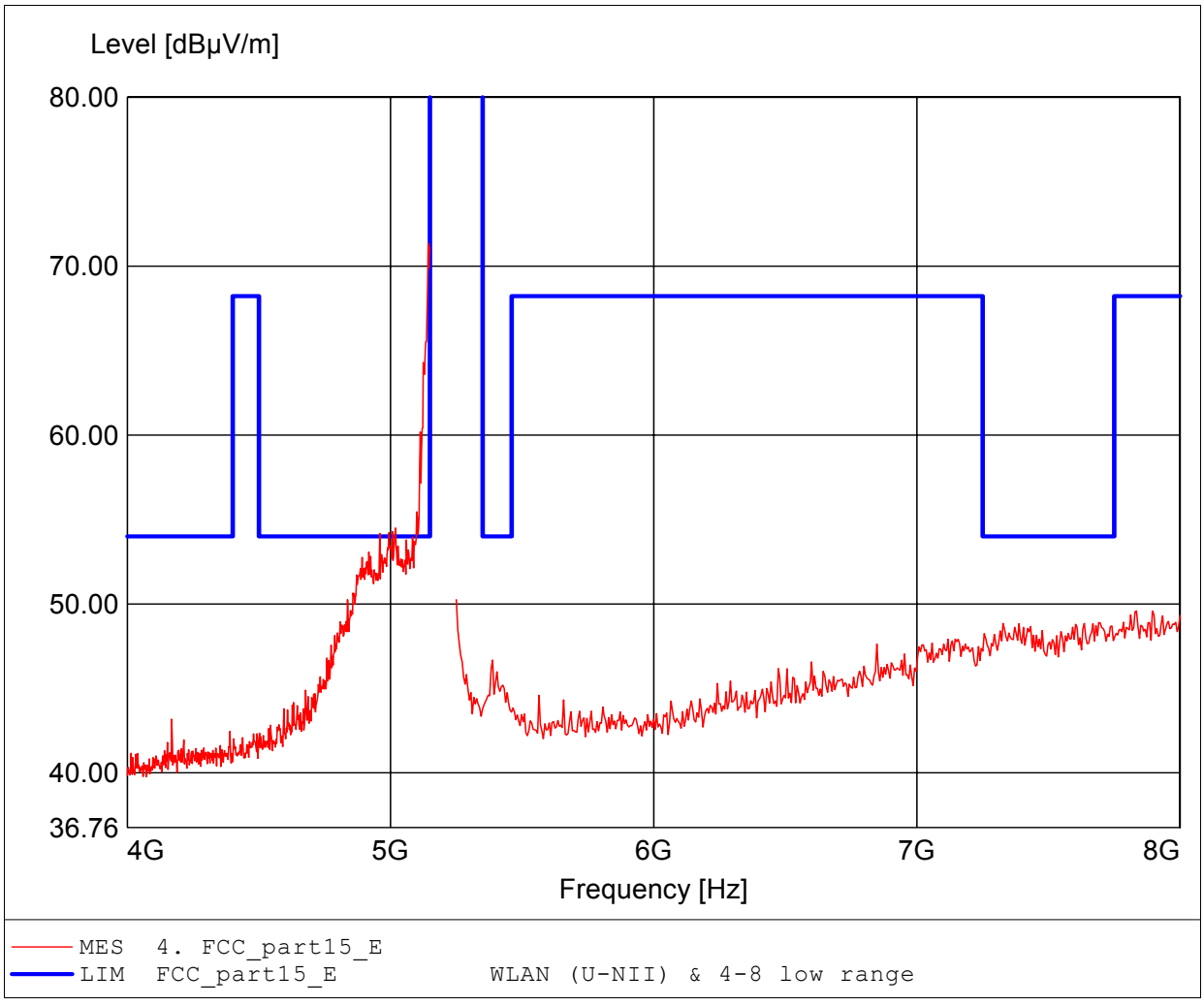
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.150GHz, Pmax: 45.74dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

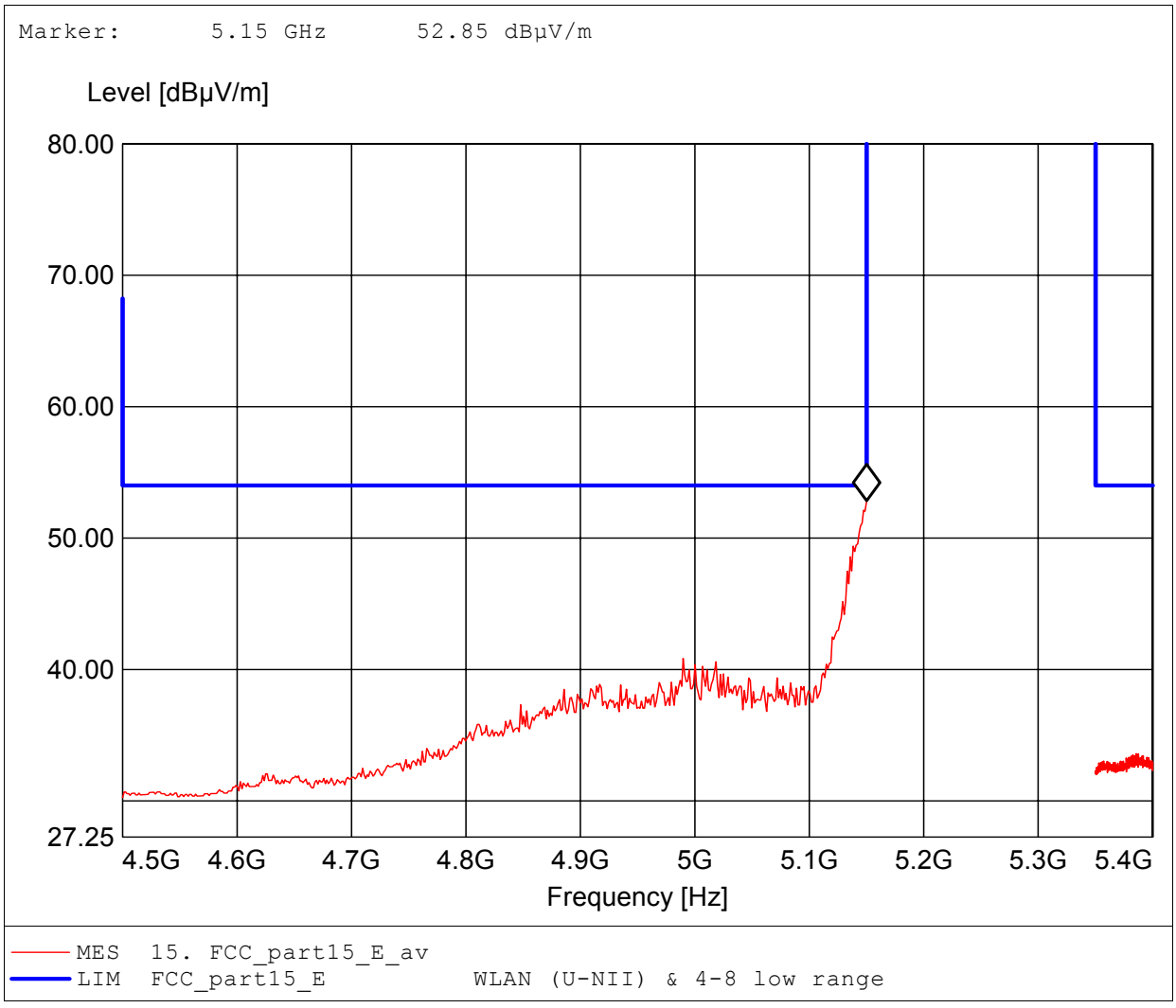
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.143GHz, Emax: 71.36dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

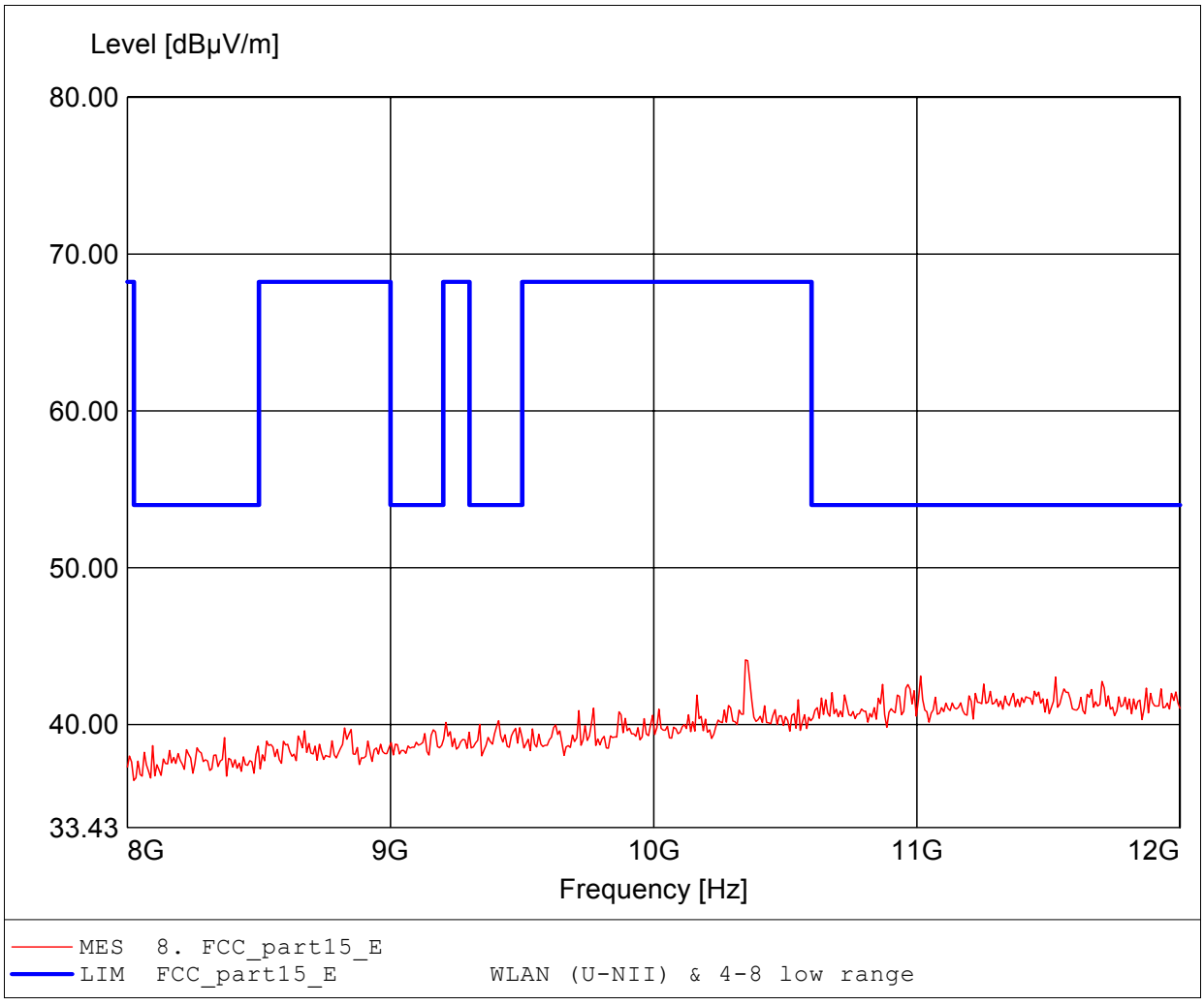
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.150GHz, Pmax: 52.85dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

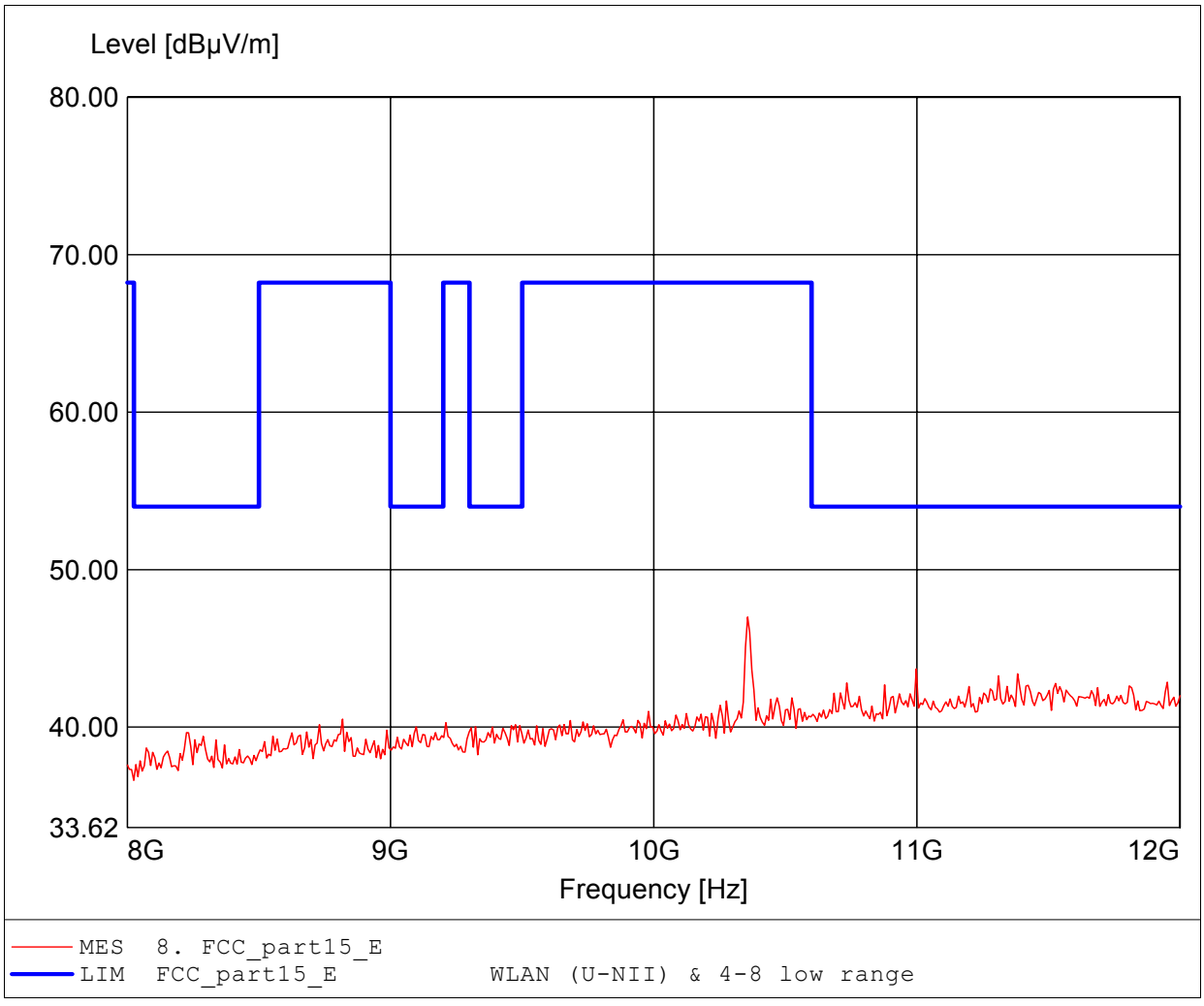
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 10.349GHz, Emax: 44.13dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

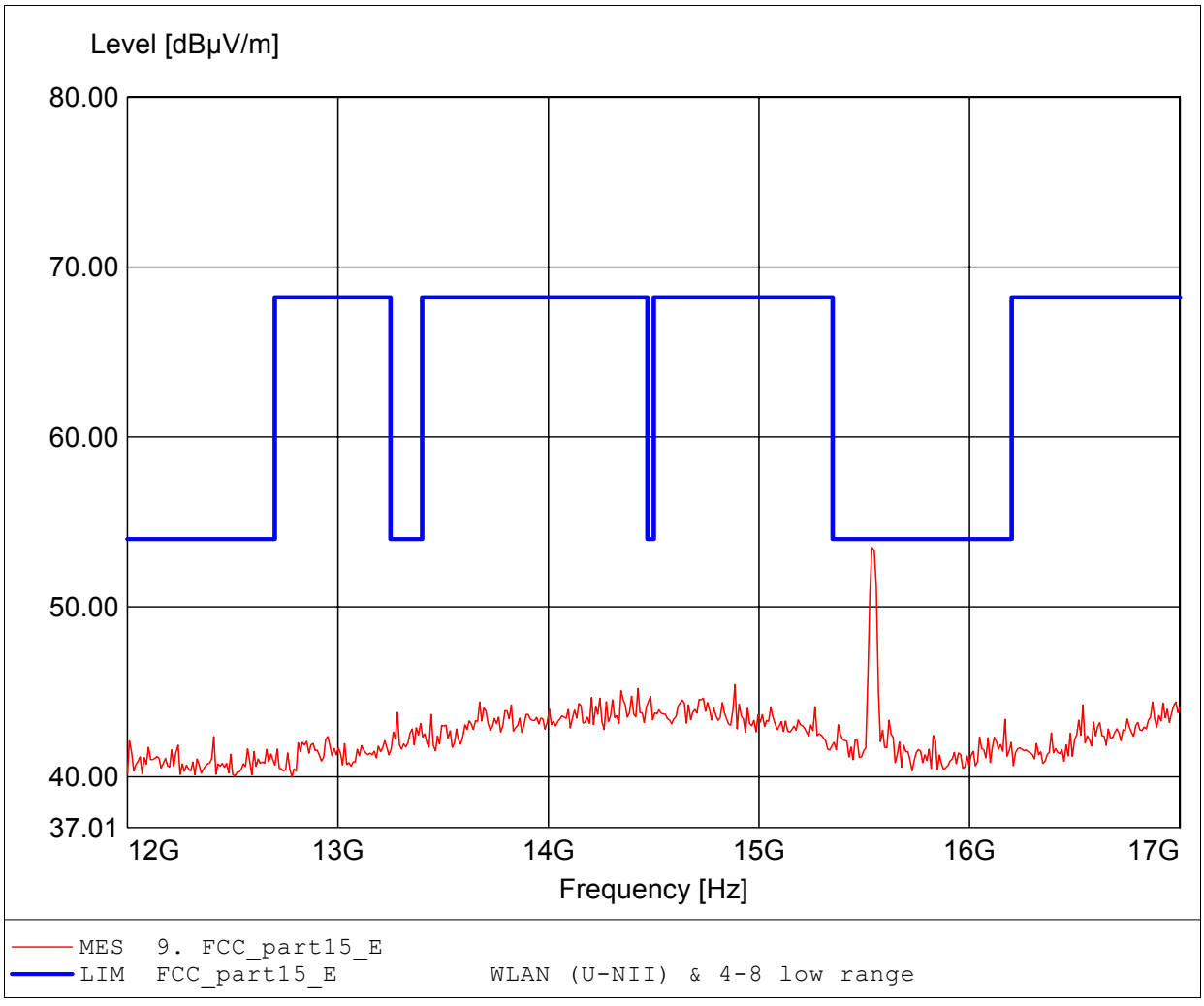
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 10.357GHz, Emax: 46.99dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

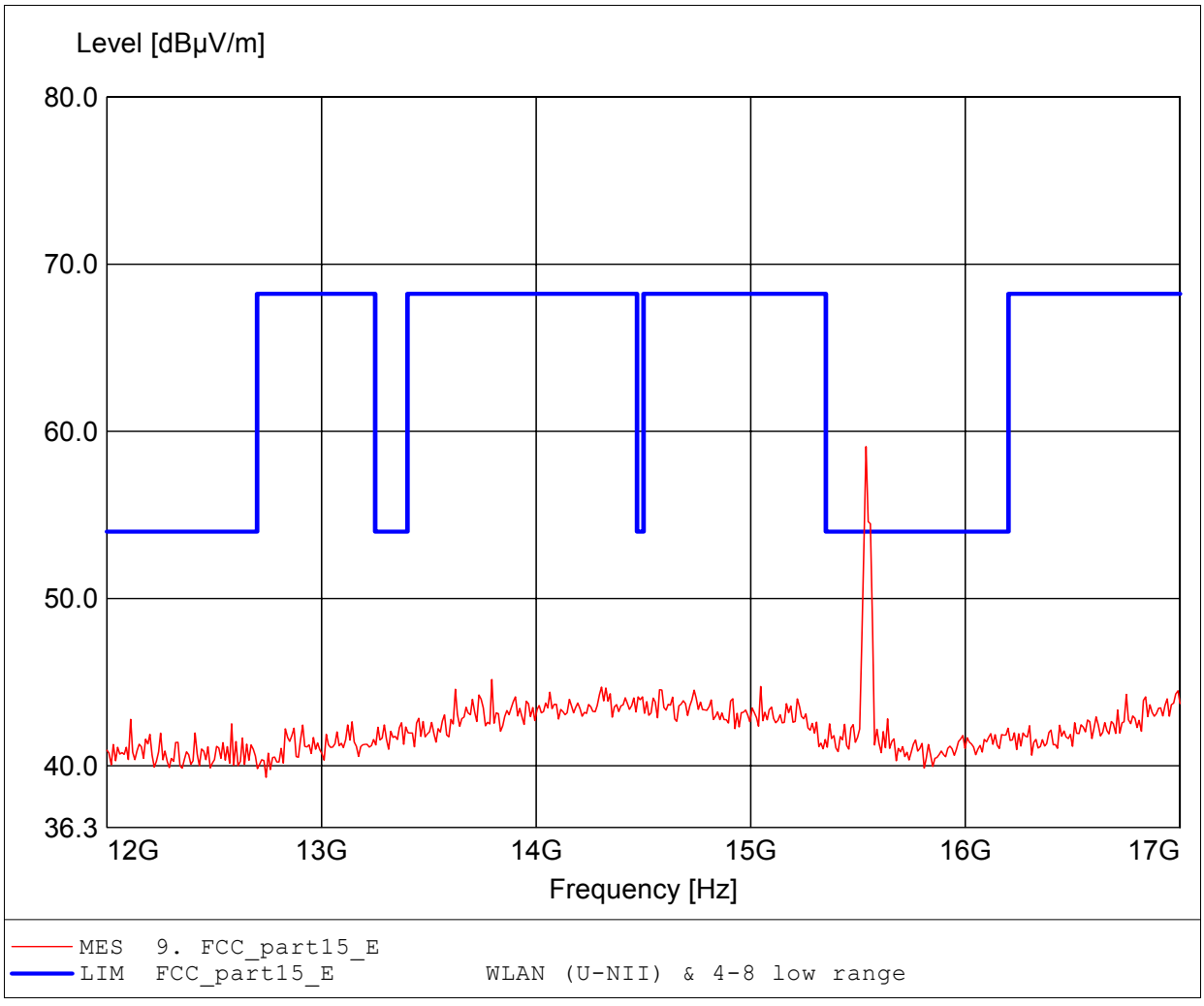
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 15.537GHz, Emax: 53.50dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

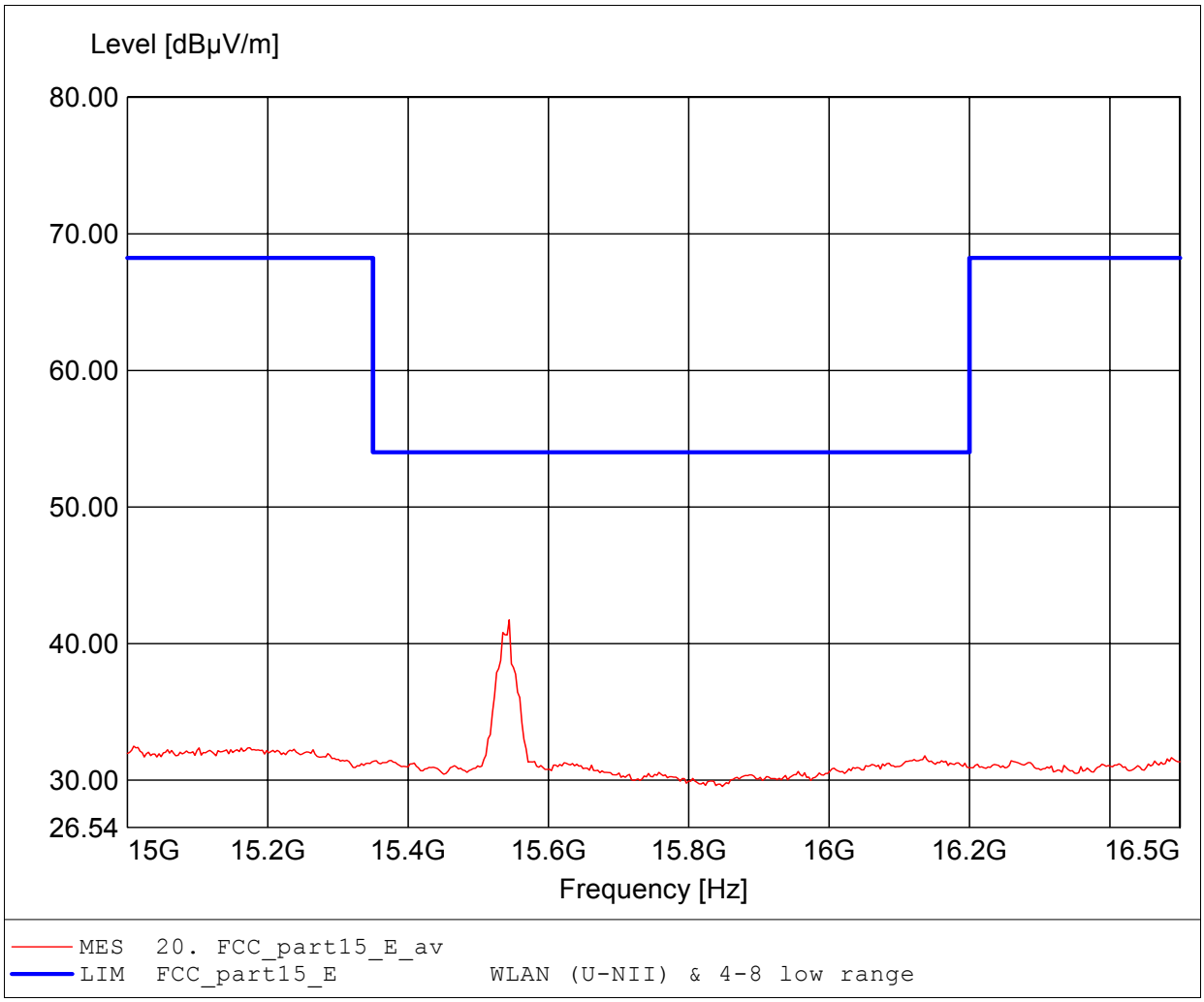
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 15.537GHz, Emax: 59.09dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

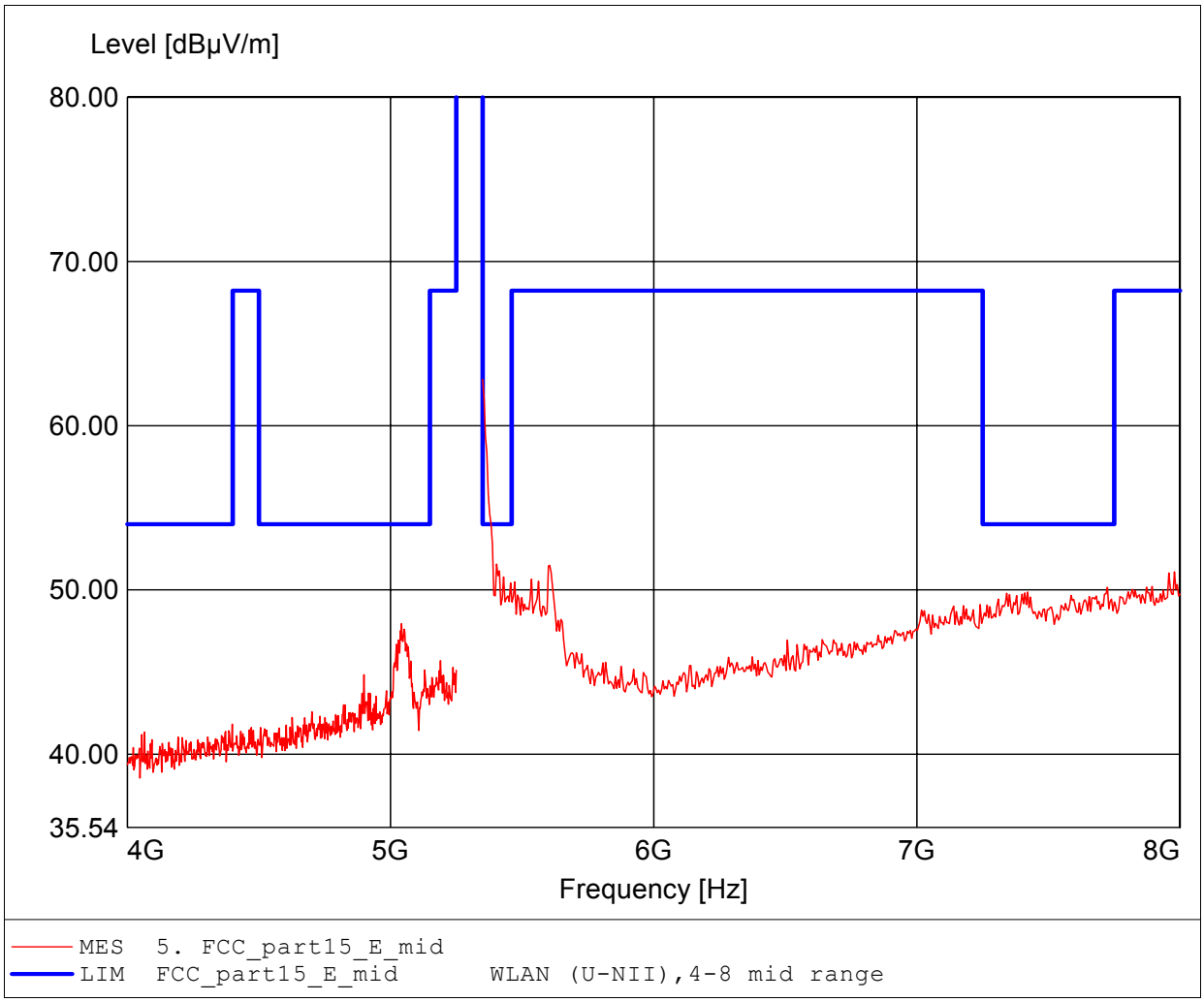
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5180 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 15.544GHz, Emax: 41.74dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

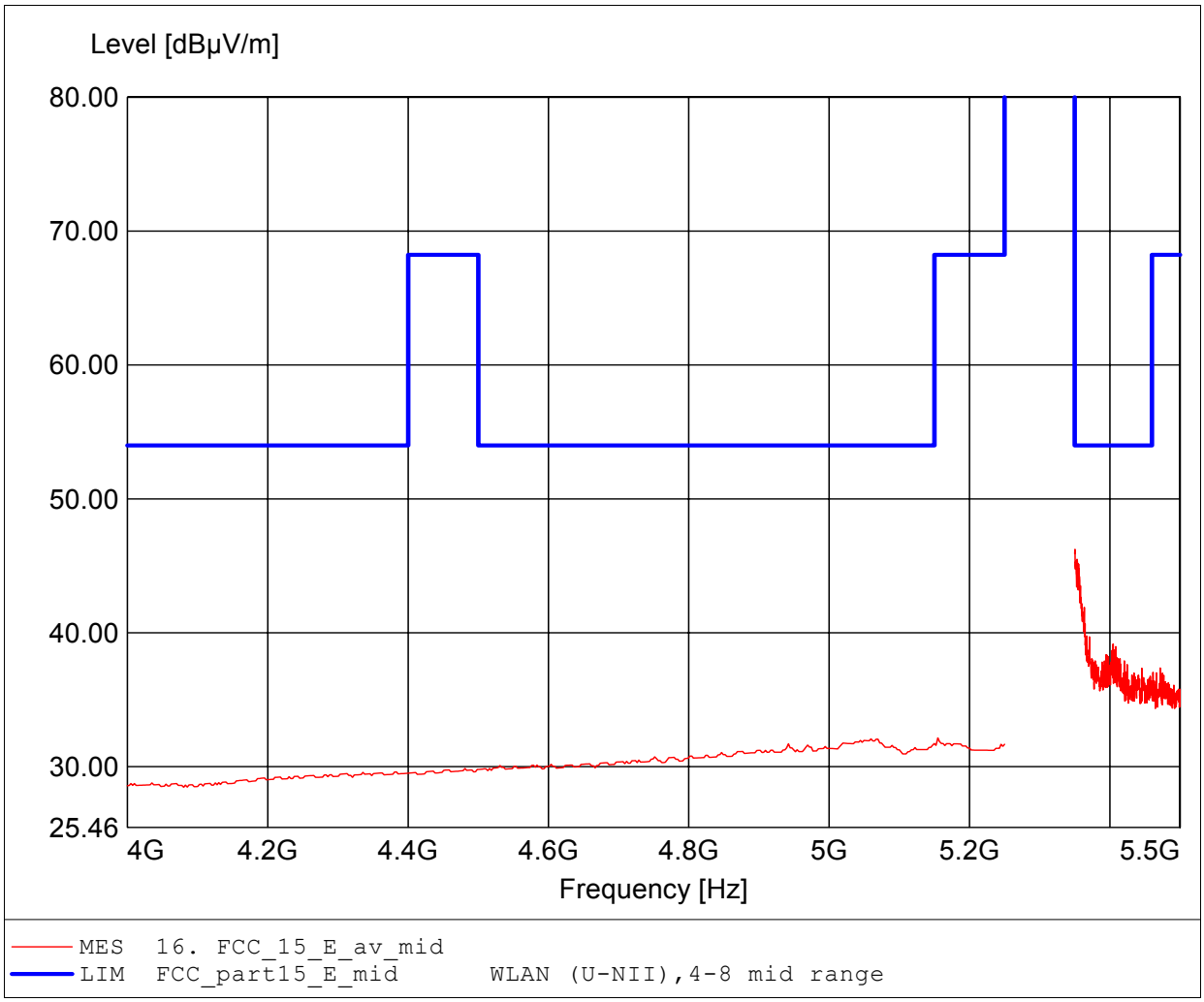
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.350GHz, Emax: 62.82dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

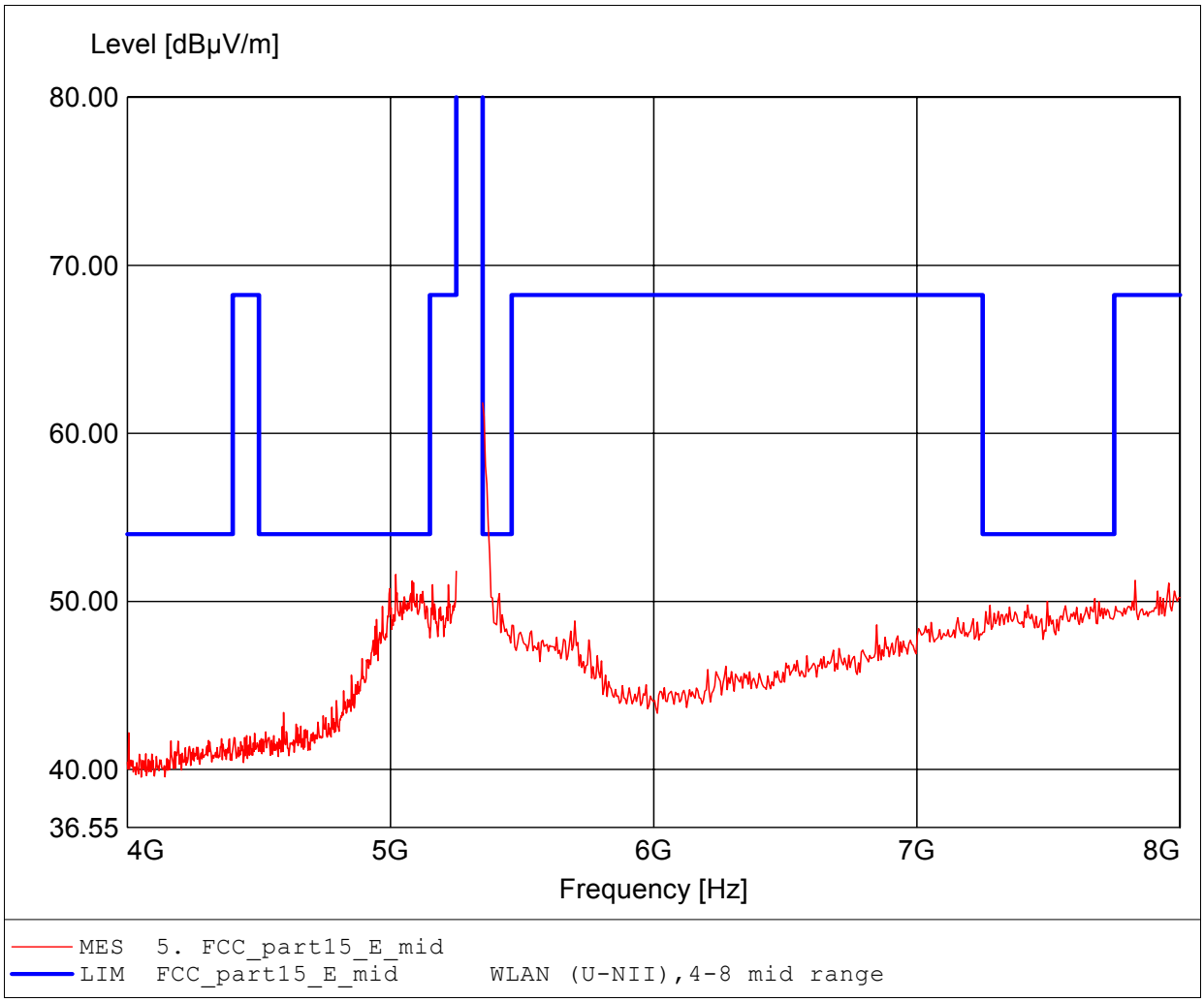
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.350GHz, Pmax: 46.22dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

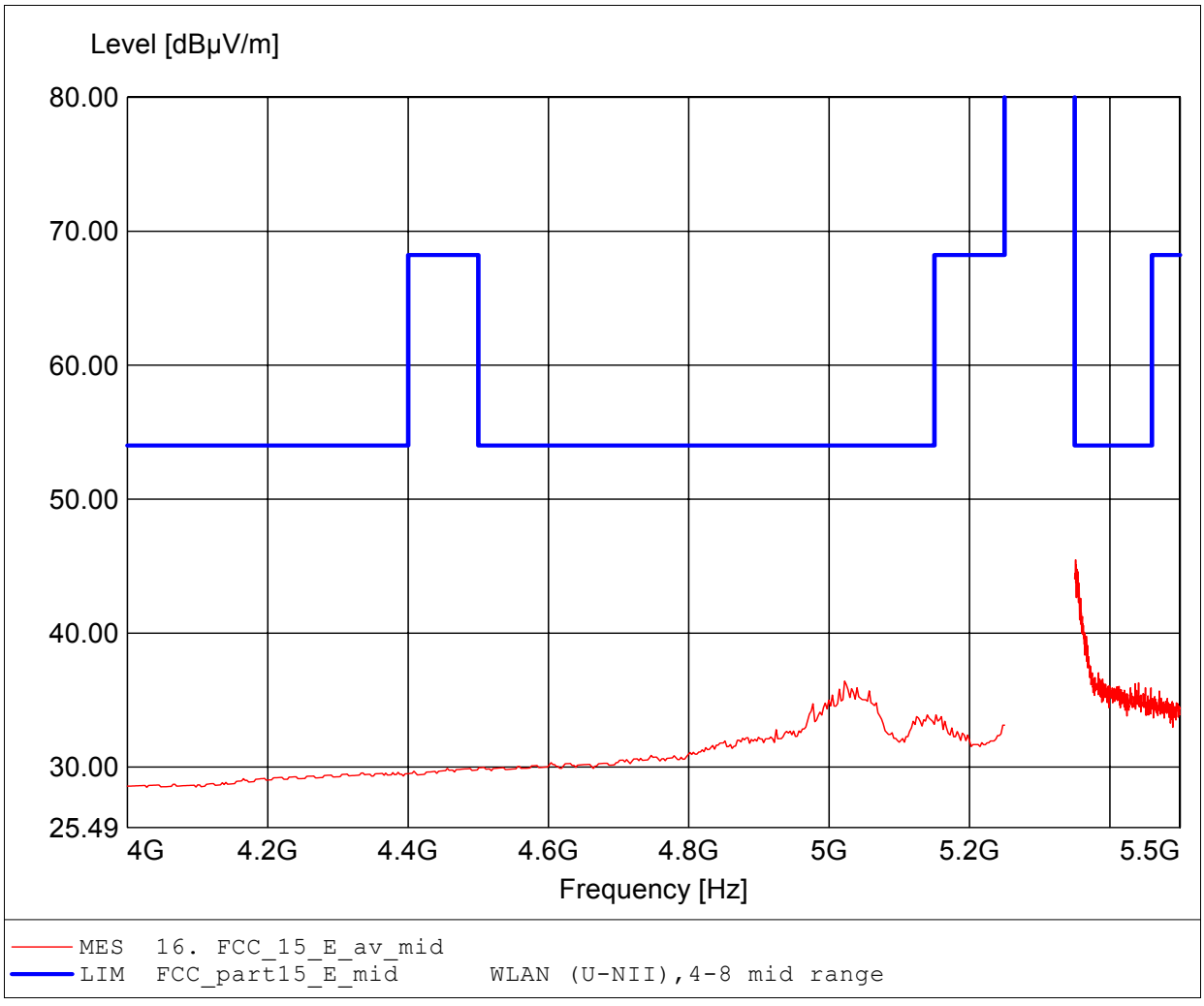
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.350GHz, Emax: 61.81dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

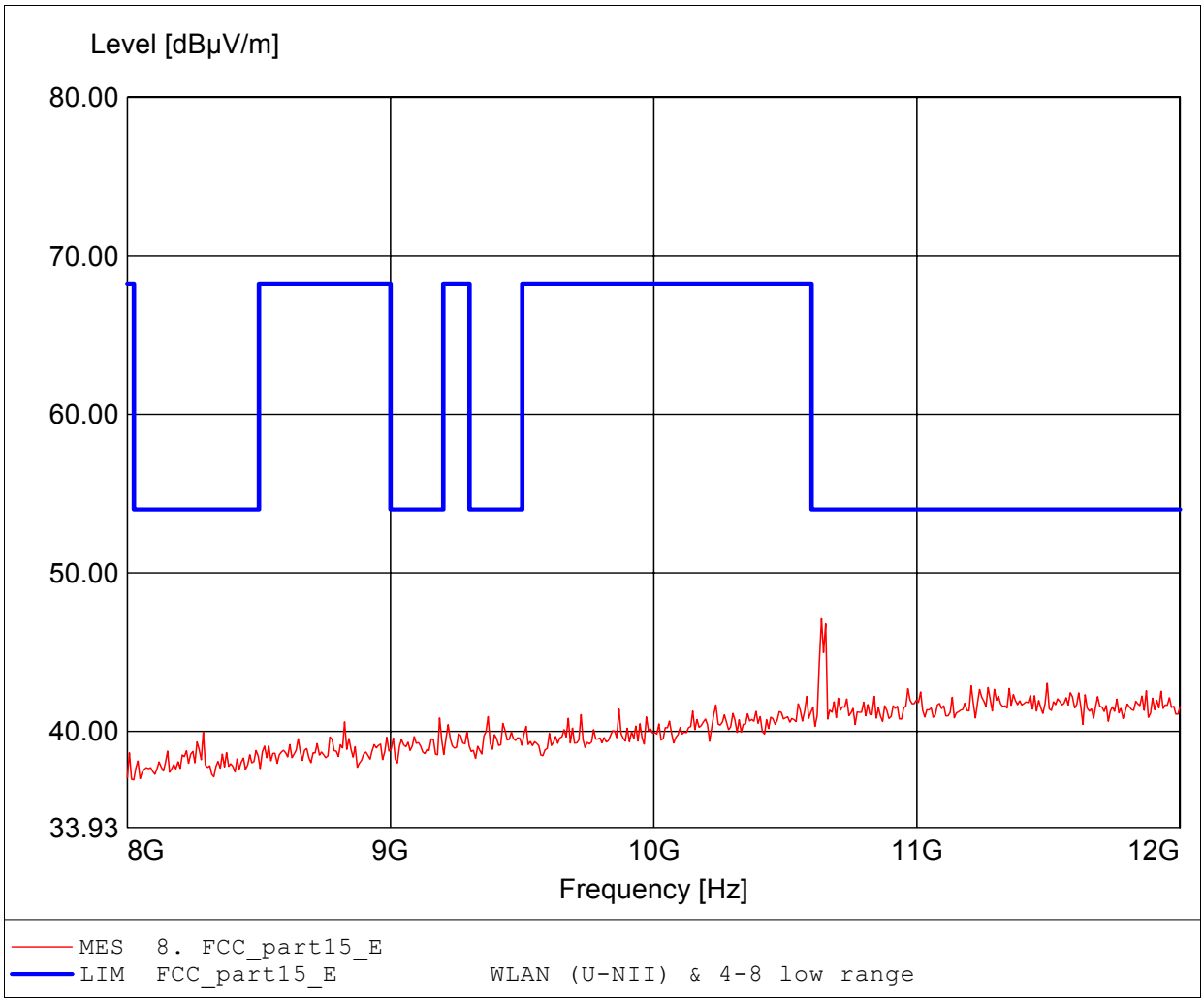
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.351GHz, Pmax: 45.48dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

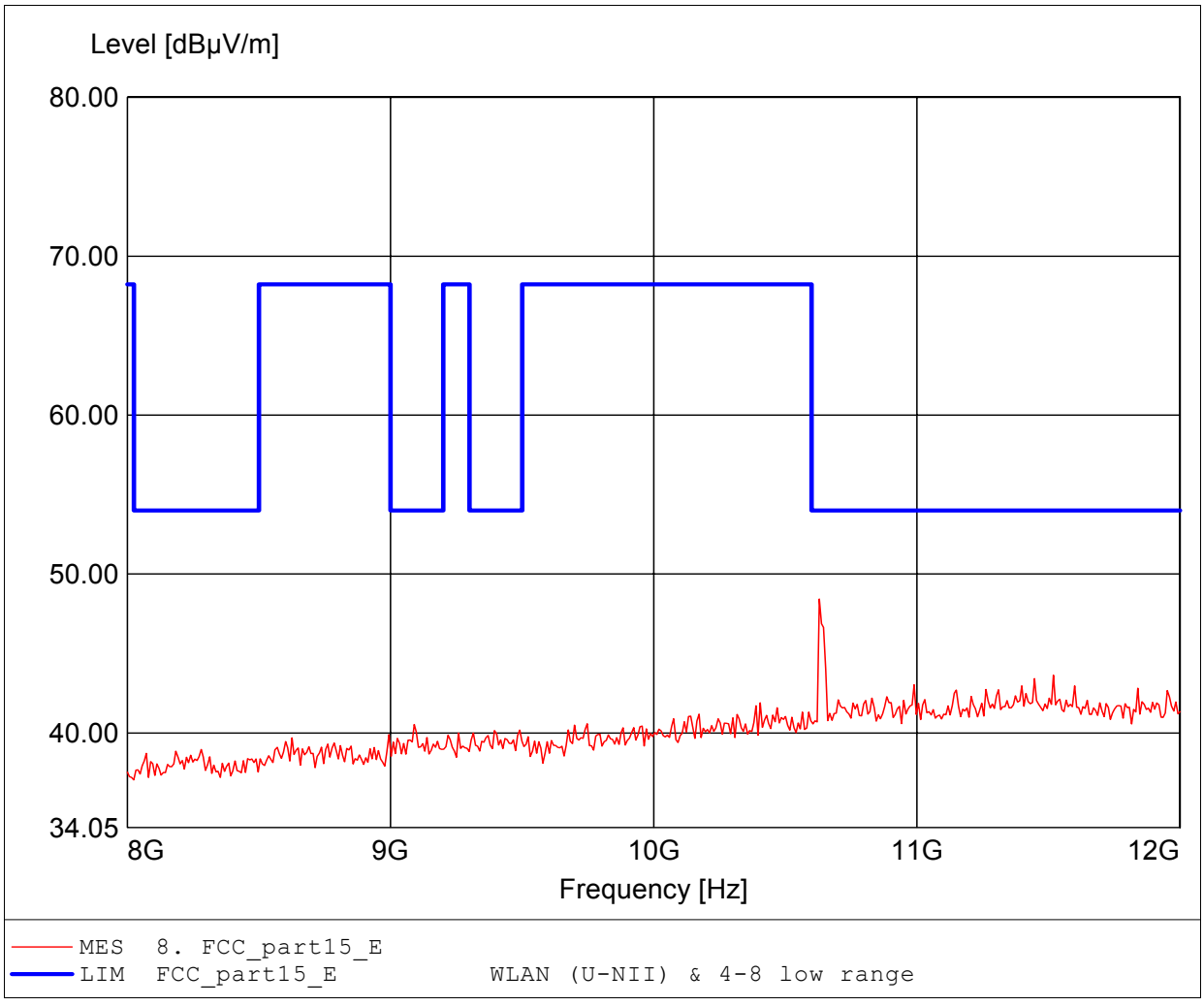
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 10.637GHz, Emax: 47.12dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

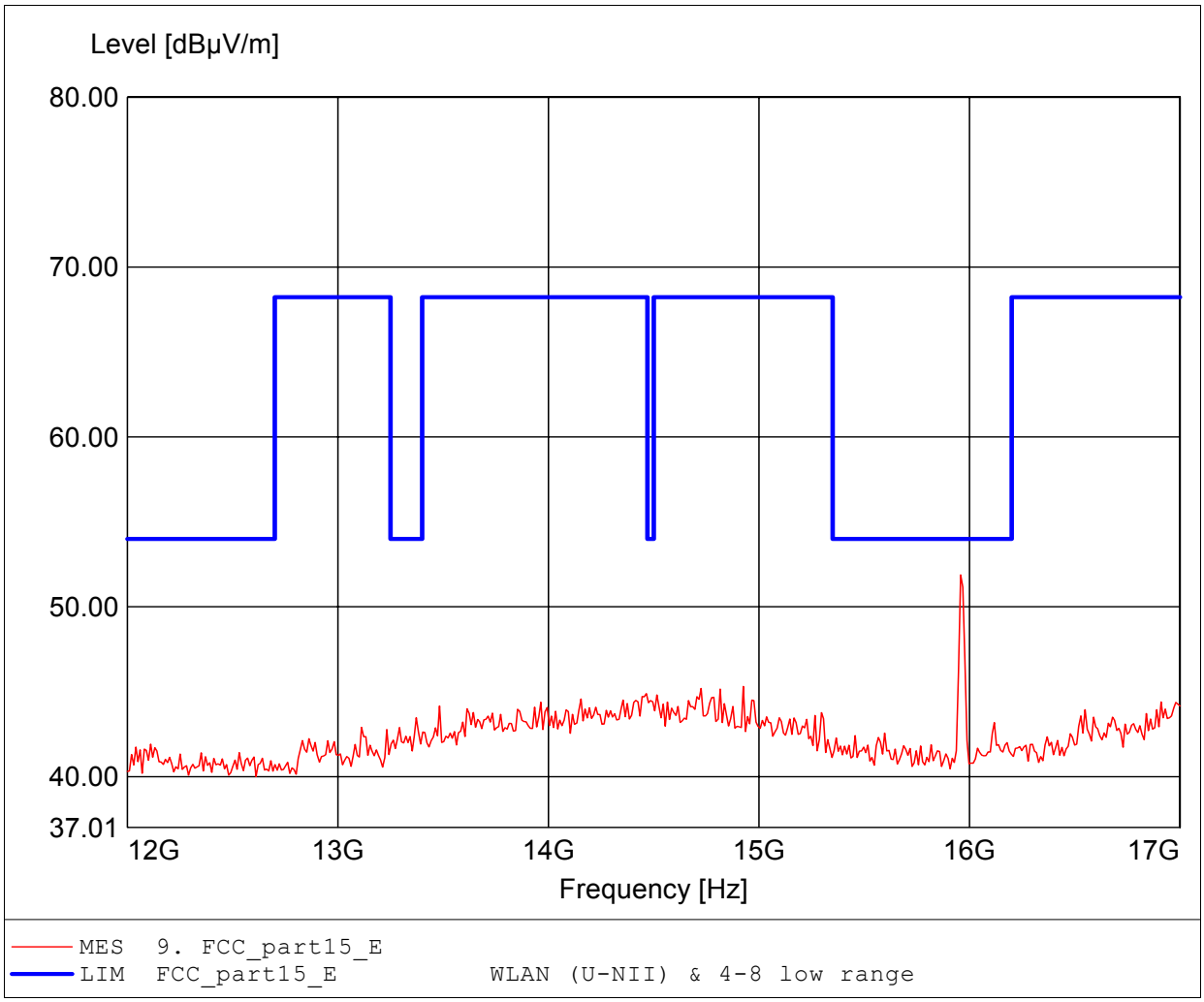
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 10.629GHz, Emax: 48.43dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

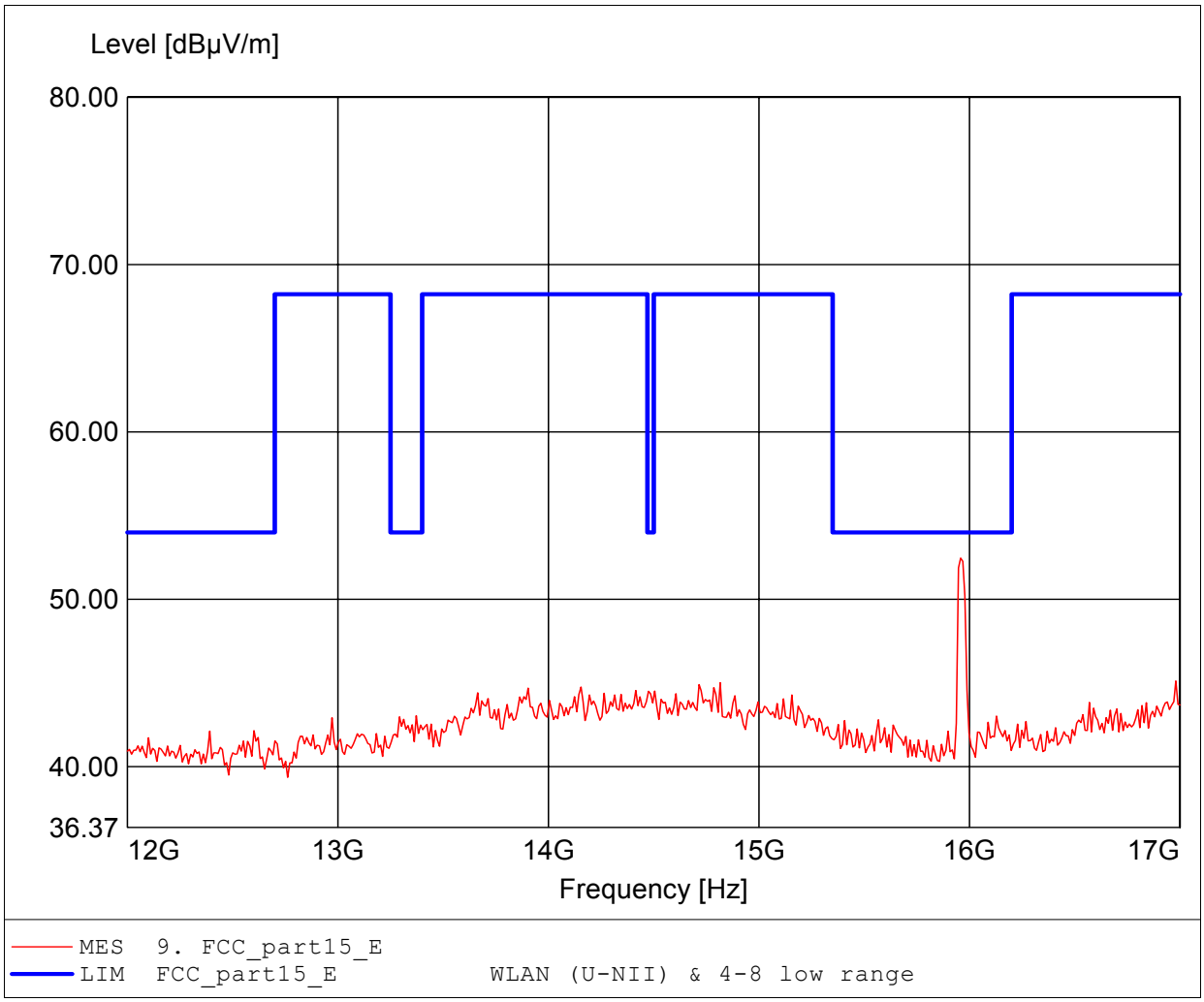
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 15.958GHz, Emax: 51.87dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

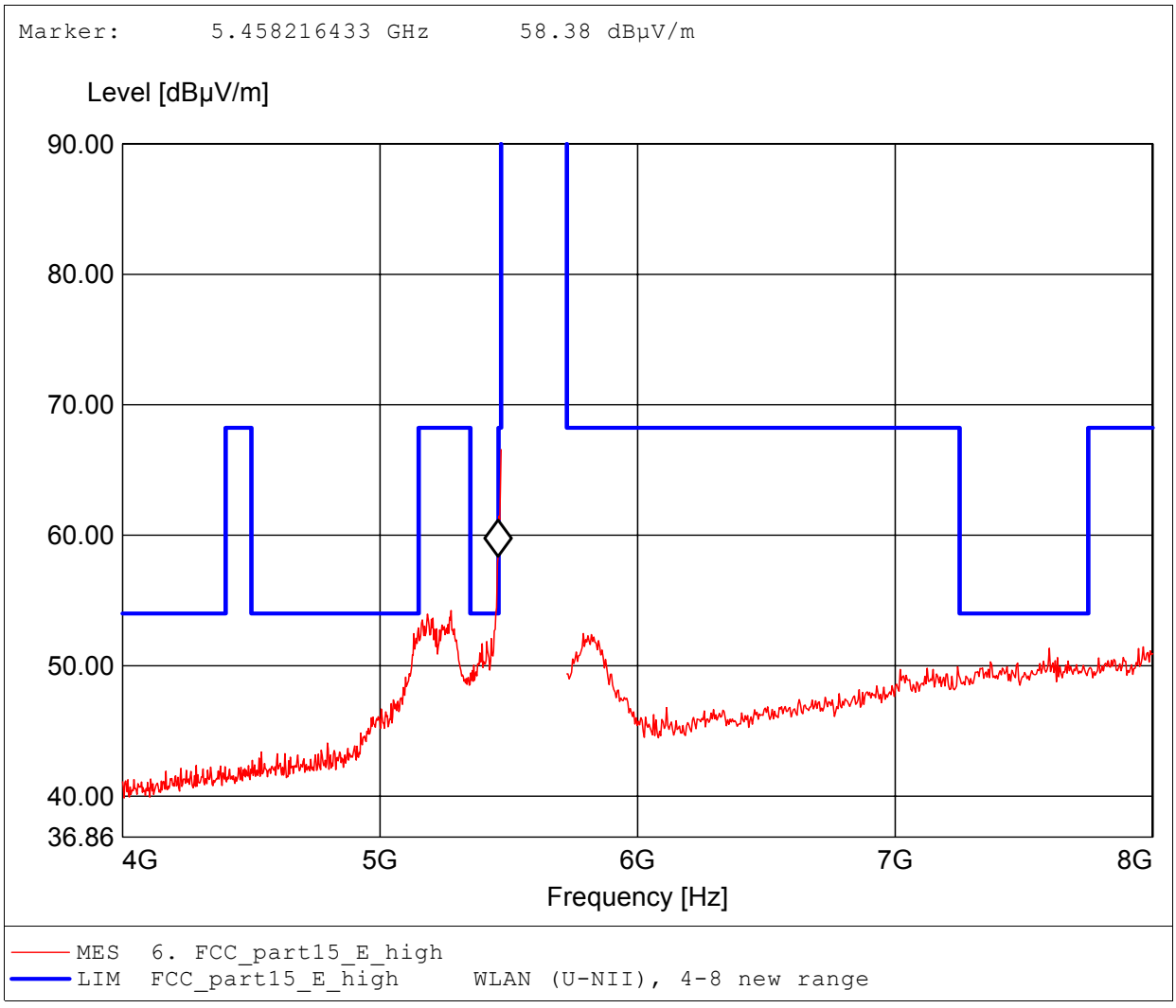
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5320 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 15.958GHz, Emax: 52.46dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

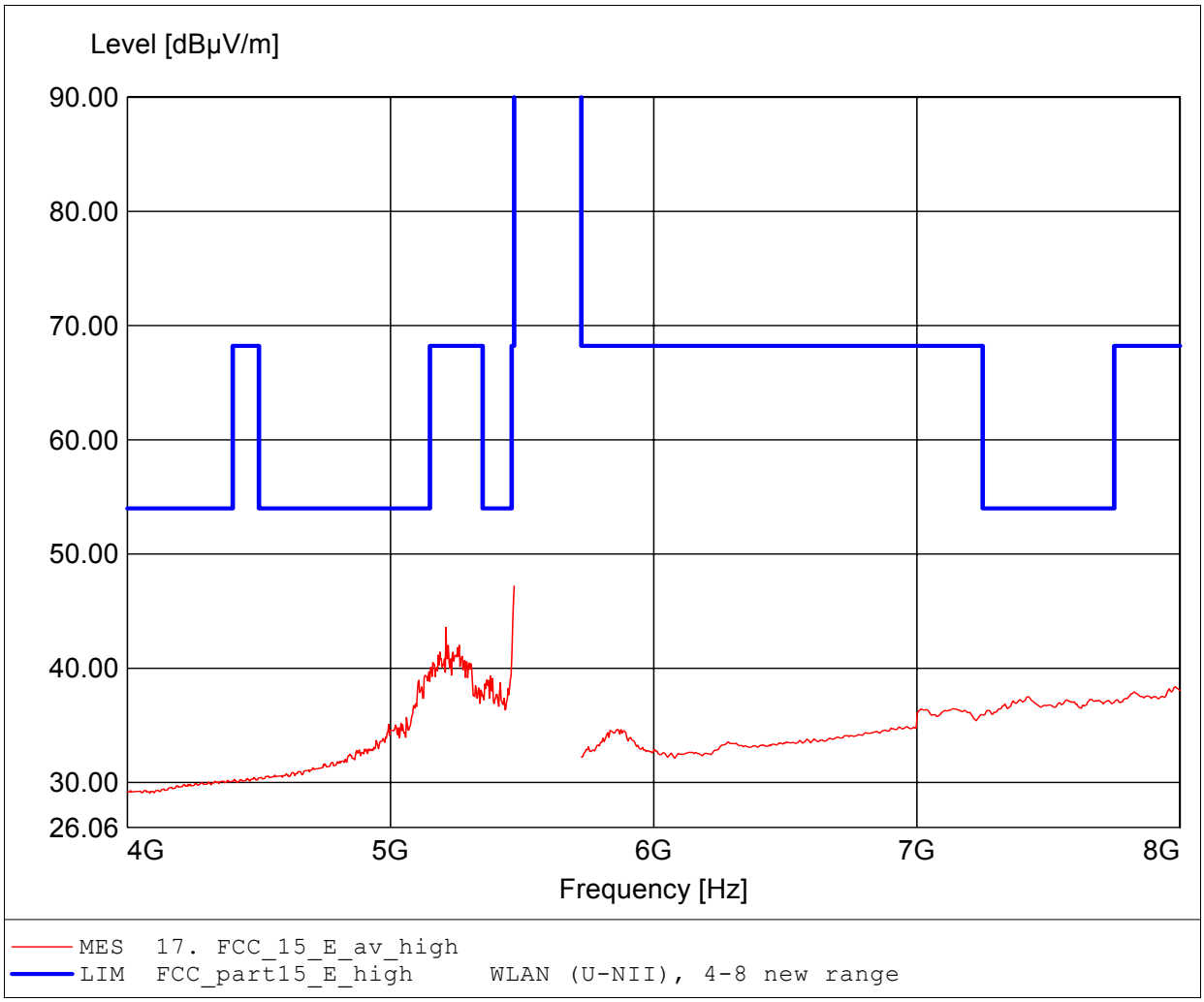
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.470GHz, Emax: 66.56dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

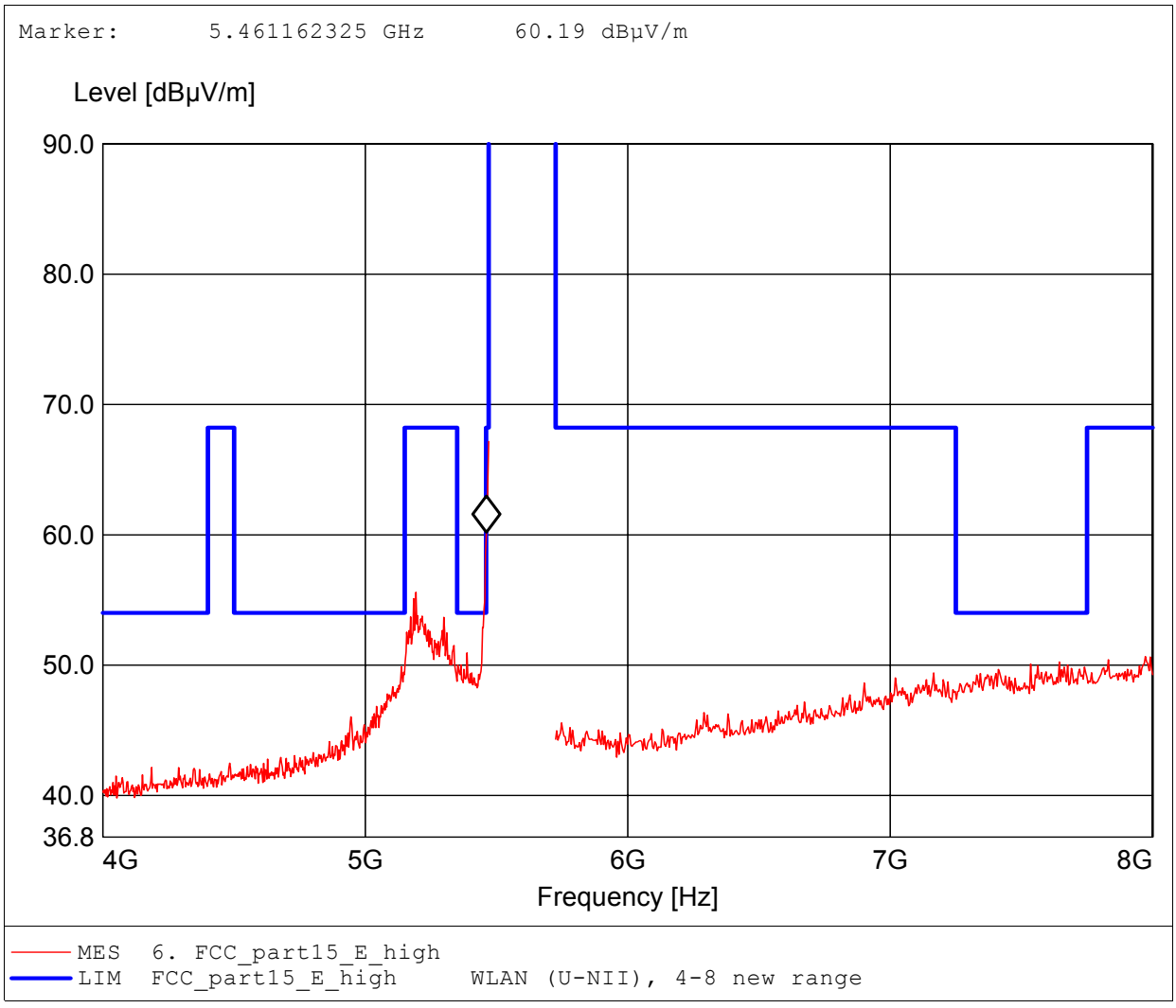
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.470GHz, Pmax: 47.19dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

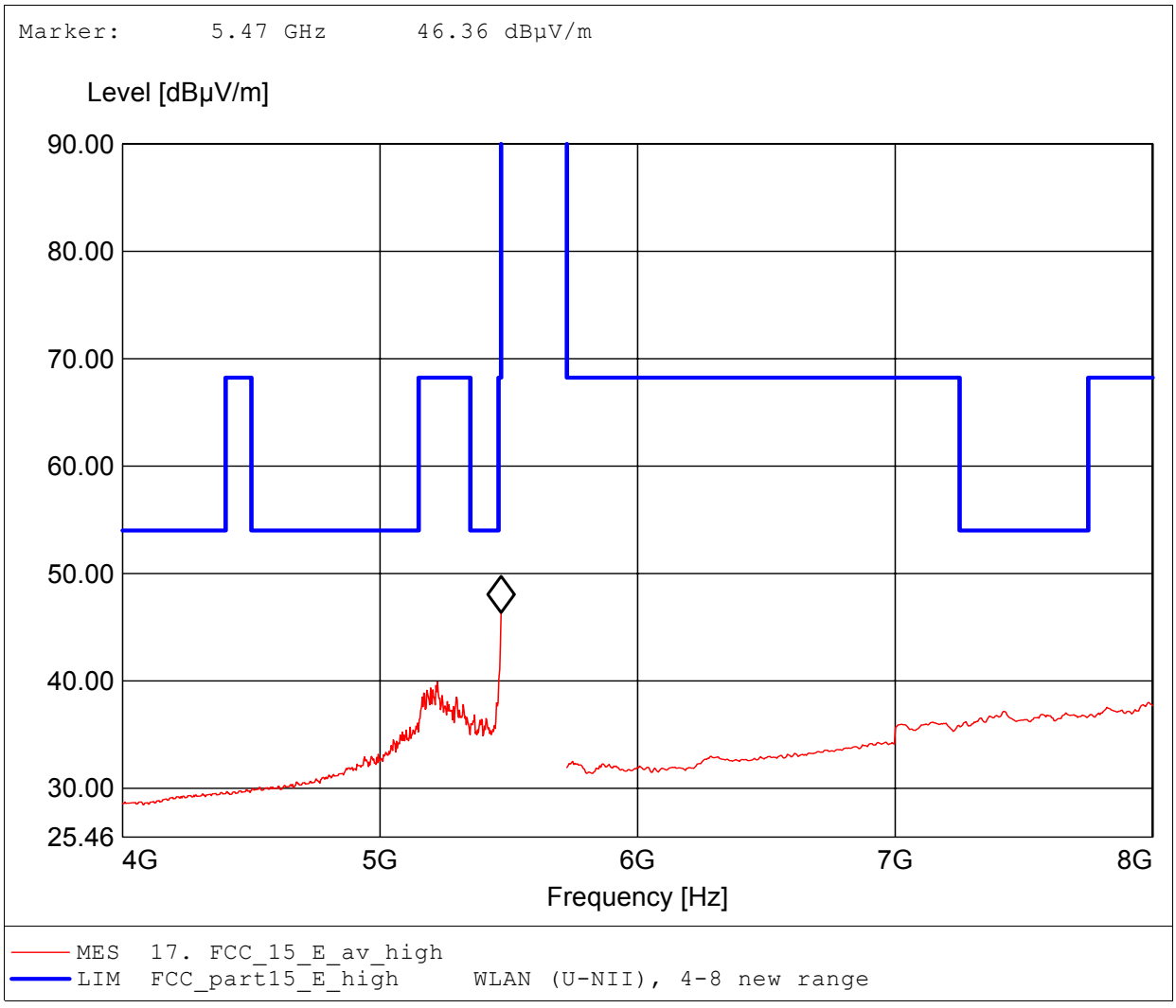
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.470GHz, Emax: 67.17dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

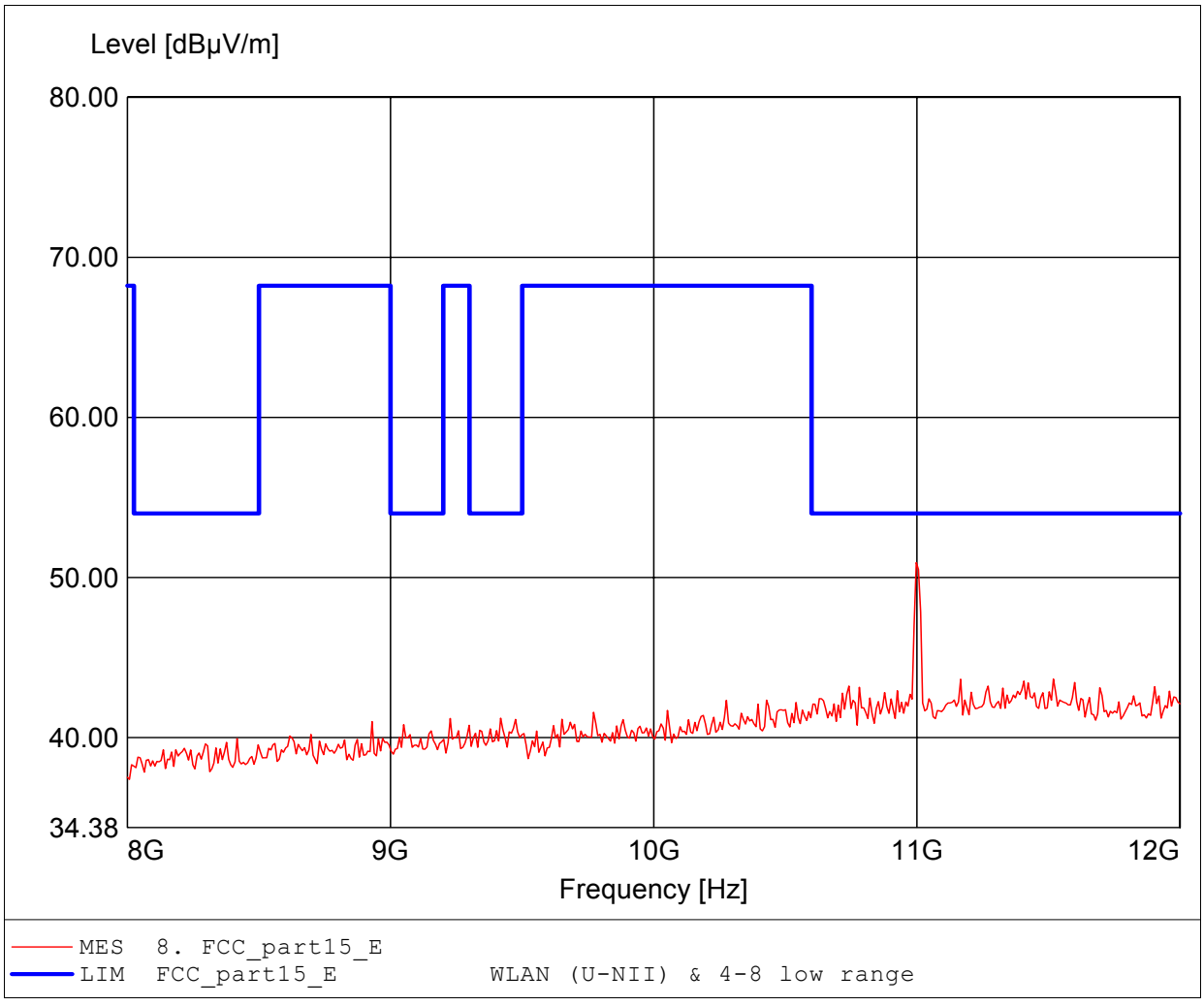
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.470GHz, Pmax: 46.36dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

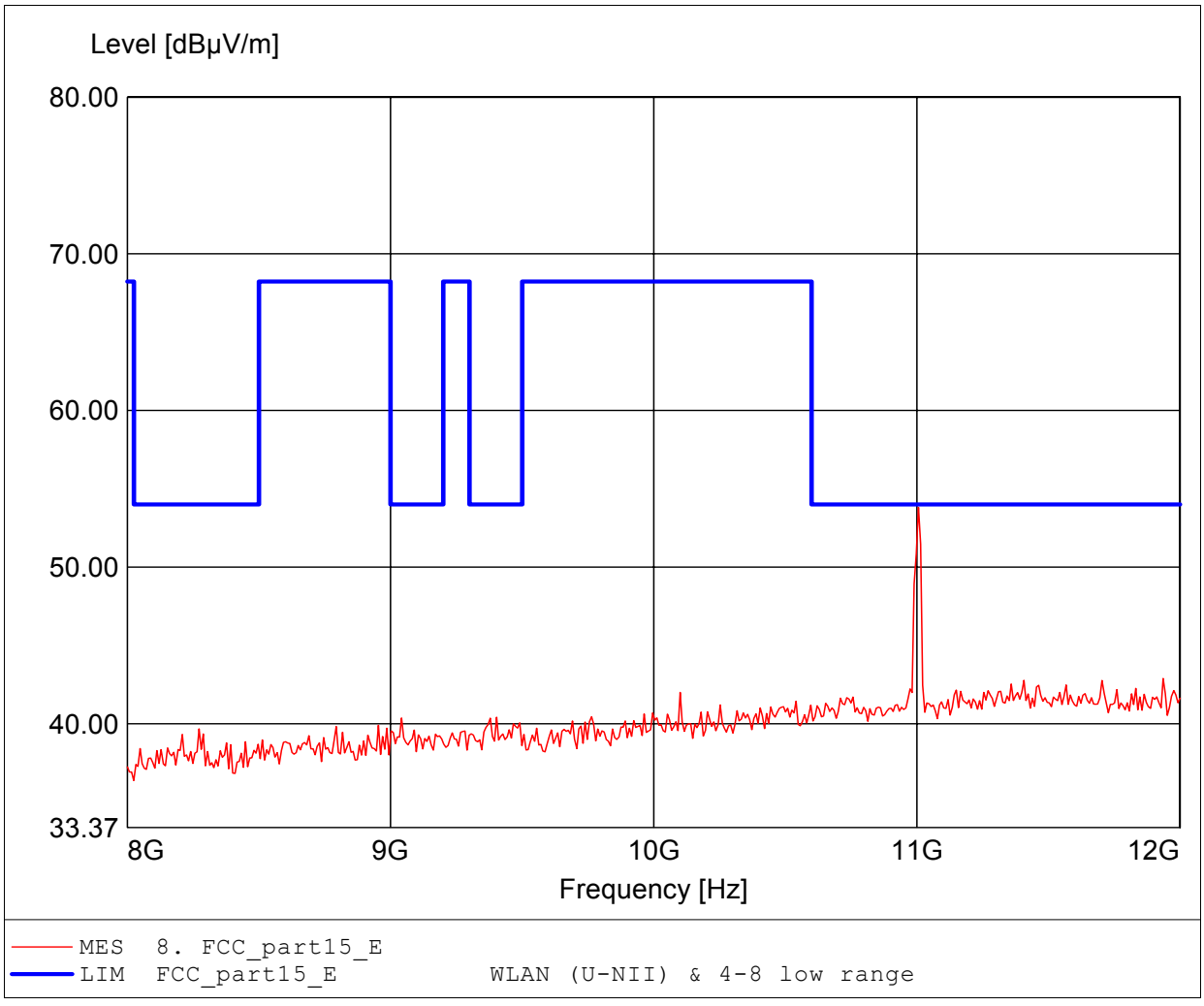
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 10.998GHz, Emax: 50.93dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

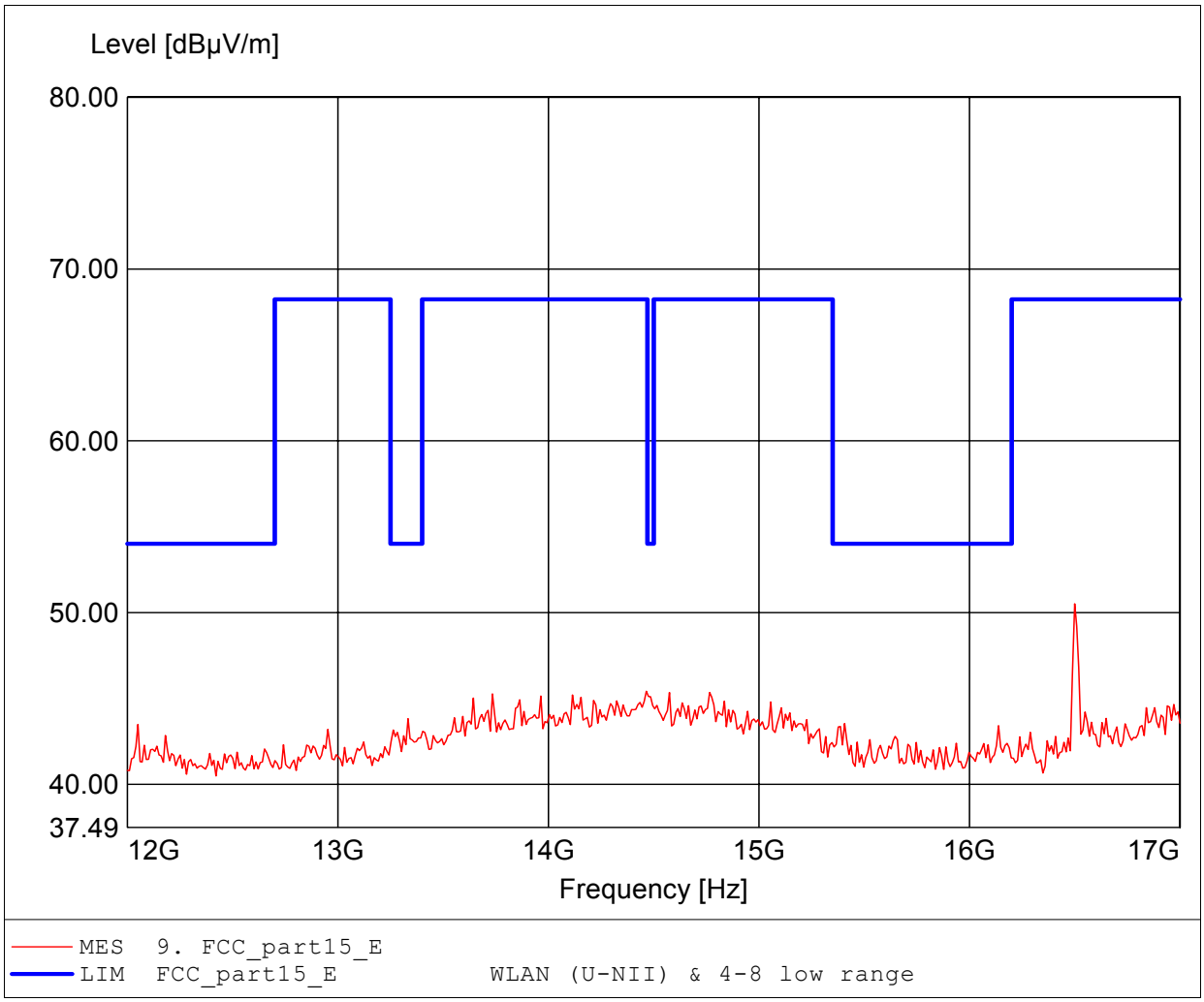
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 11.006GHz, Emax: 53.81dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

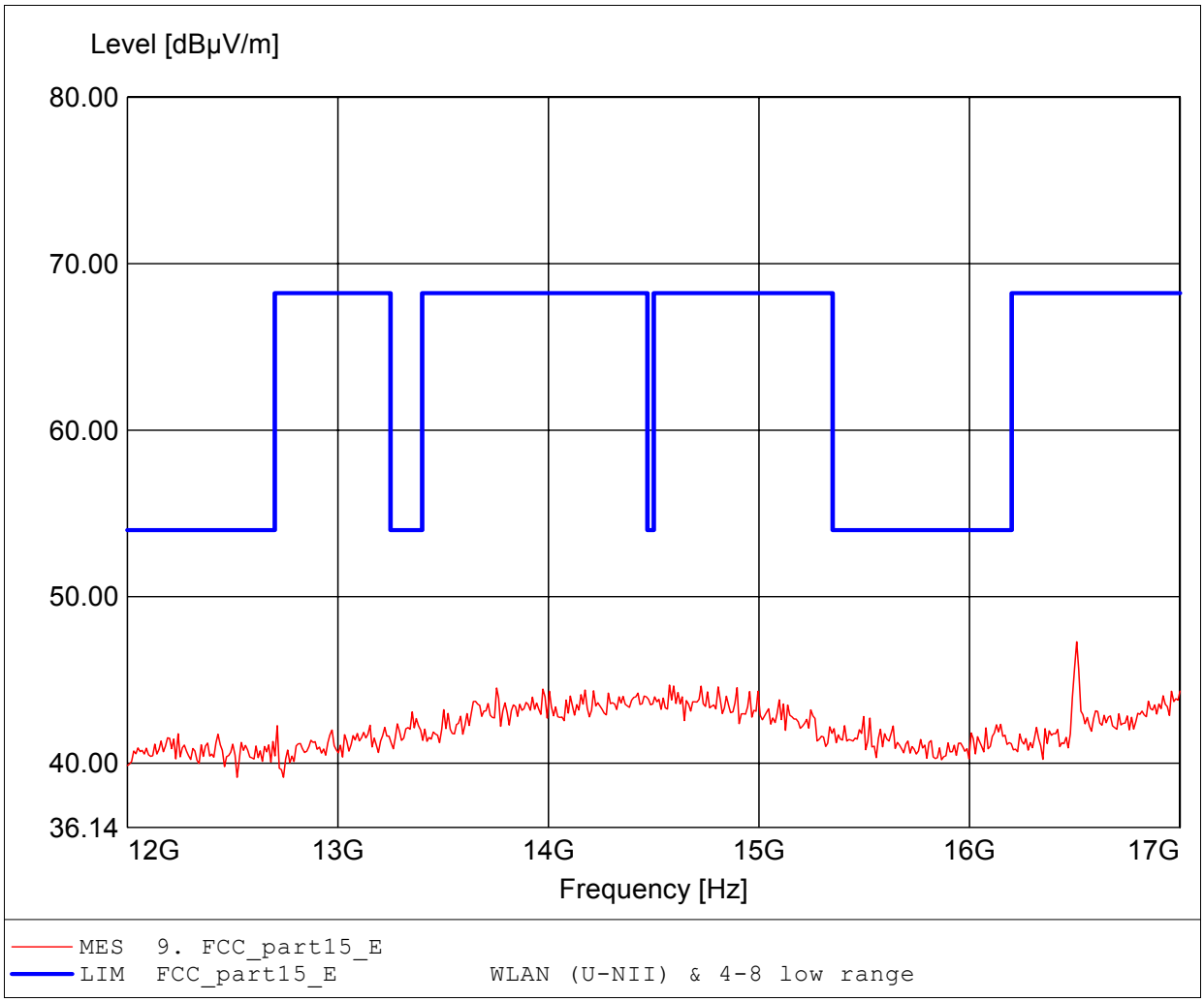
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 16.499GHz, Emax: 50.51dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

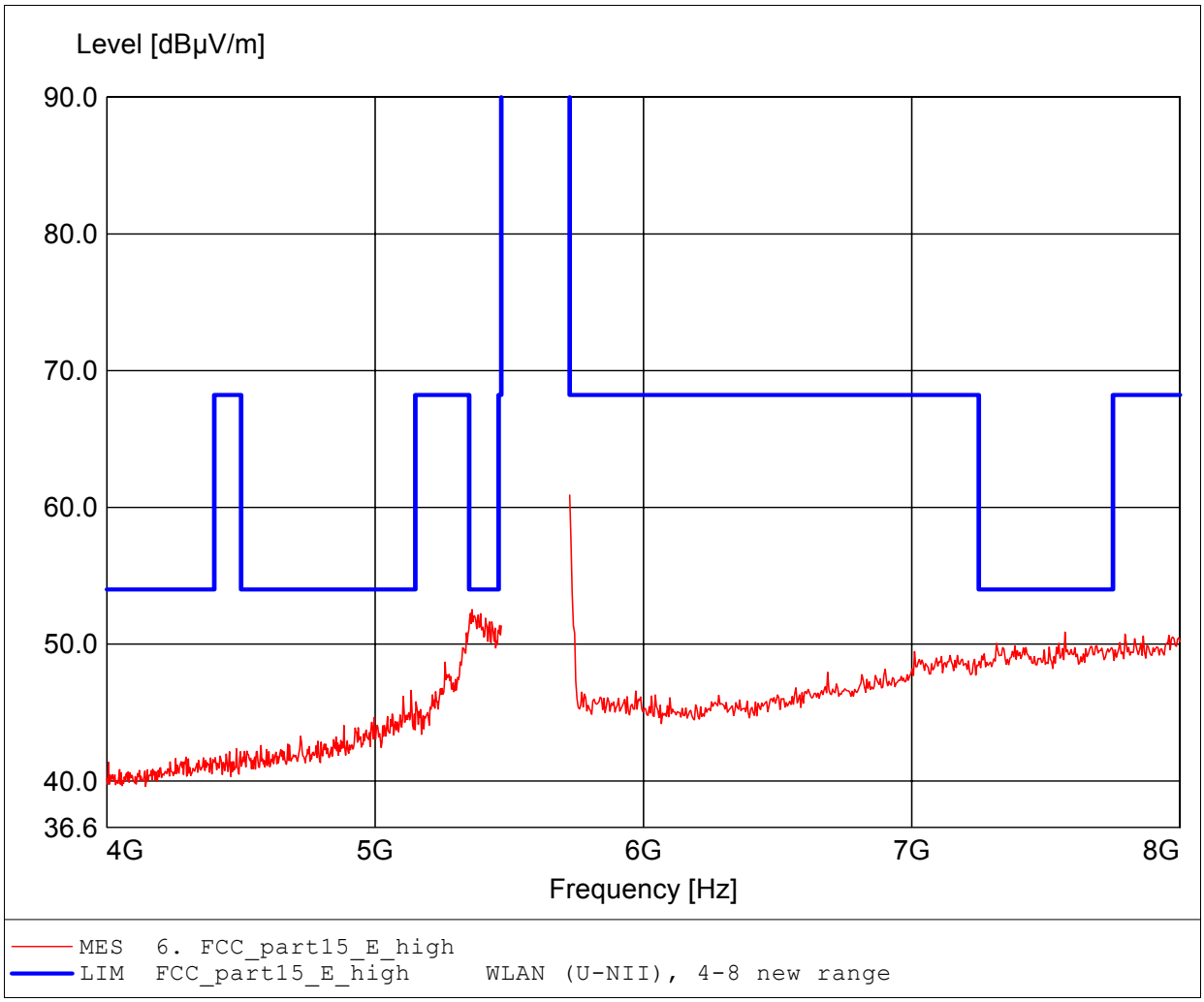
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5500 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 16.509GHz, Emax: 47.29dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

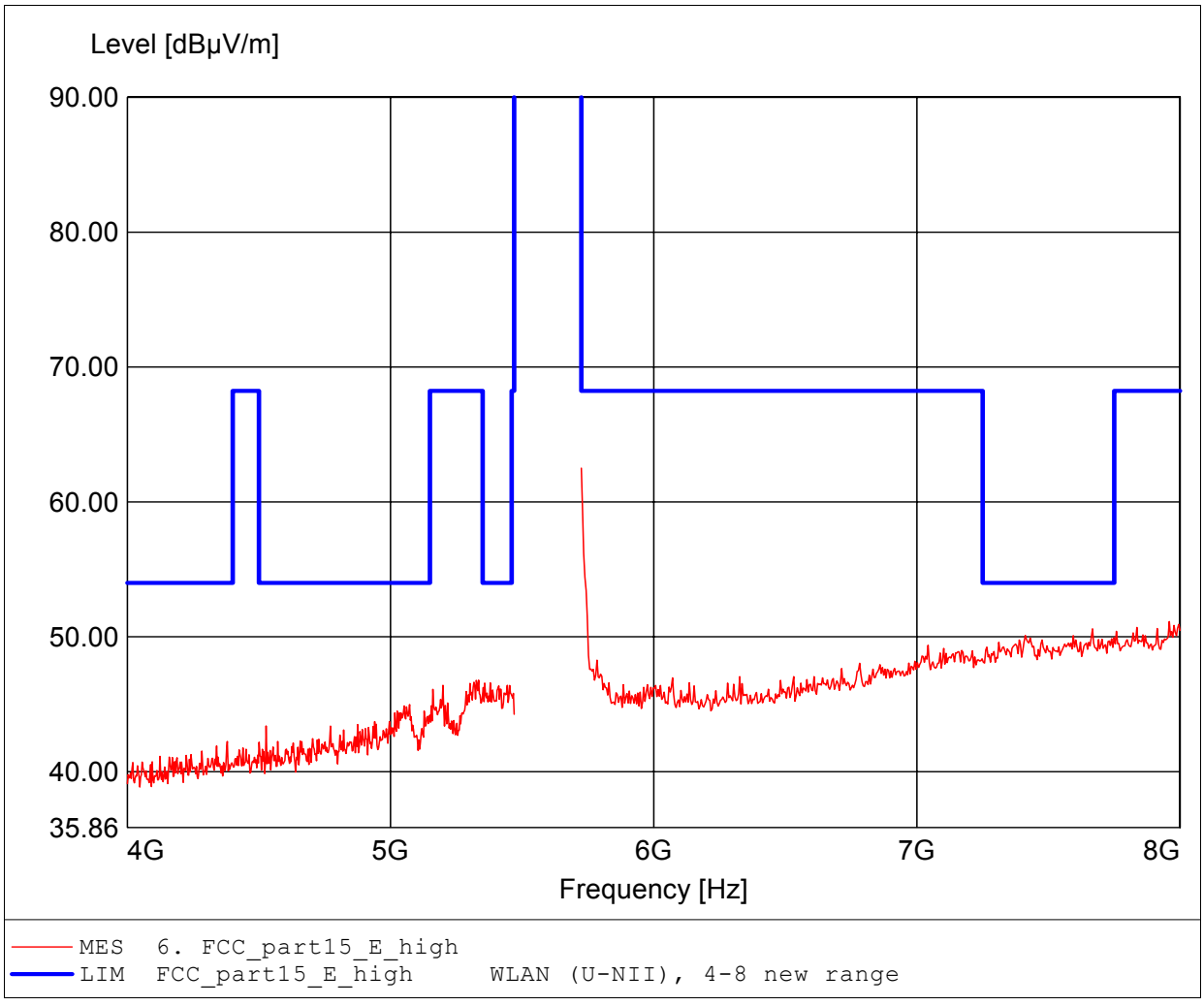
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.725GHz, Emax: 60.91dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

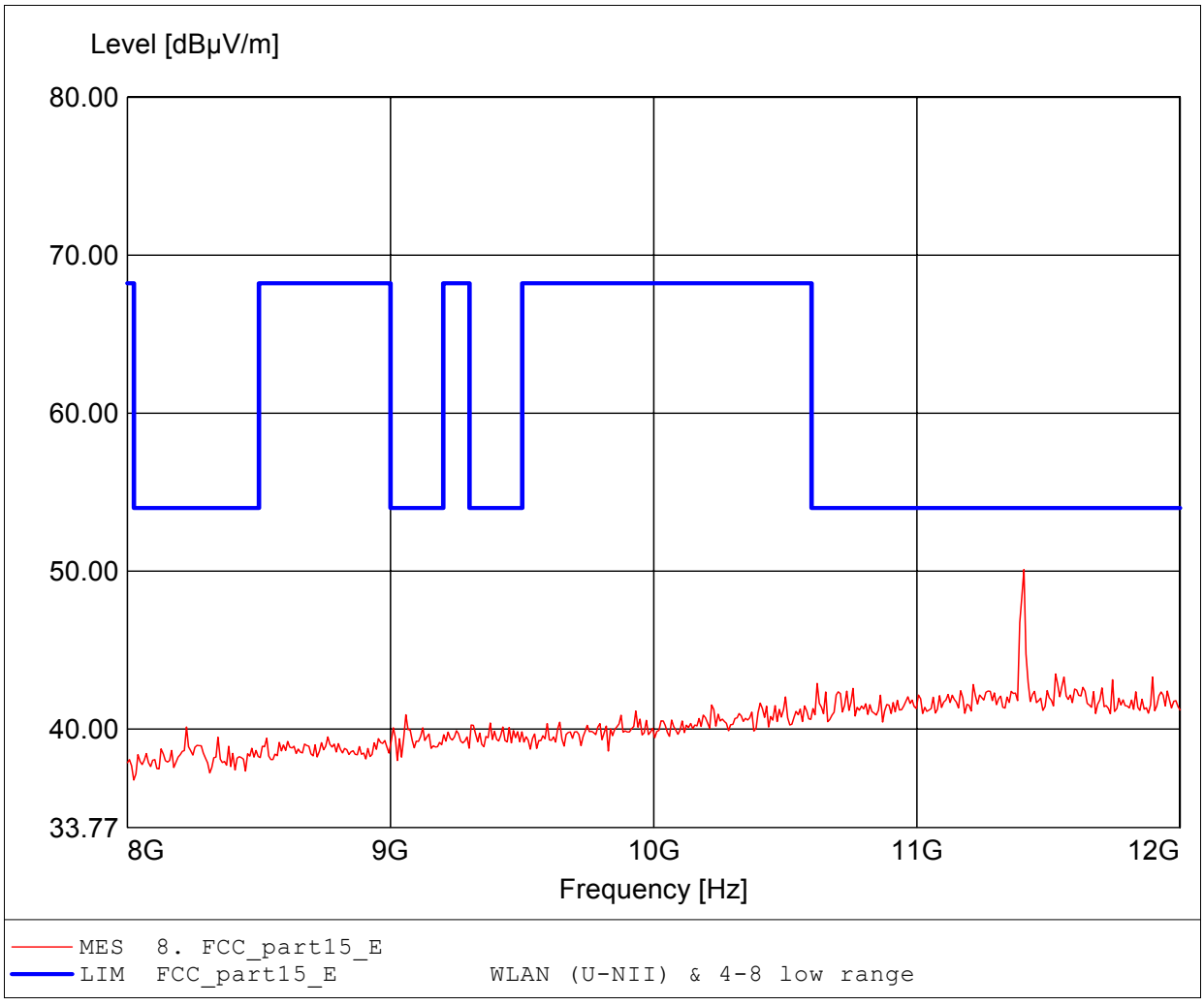
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 5.725GHz, Emax: 62.50dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

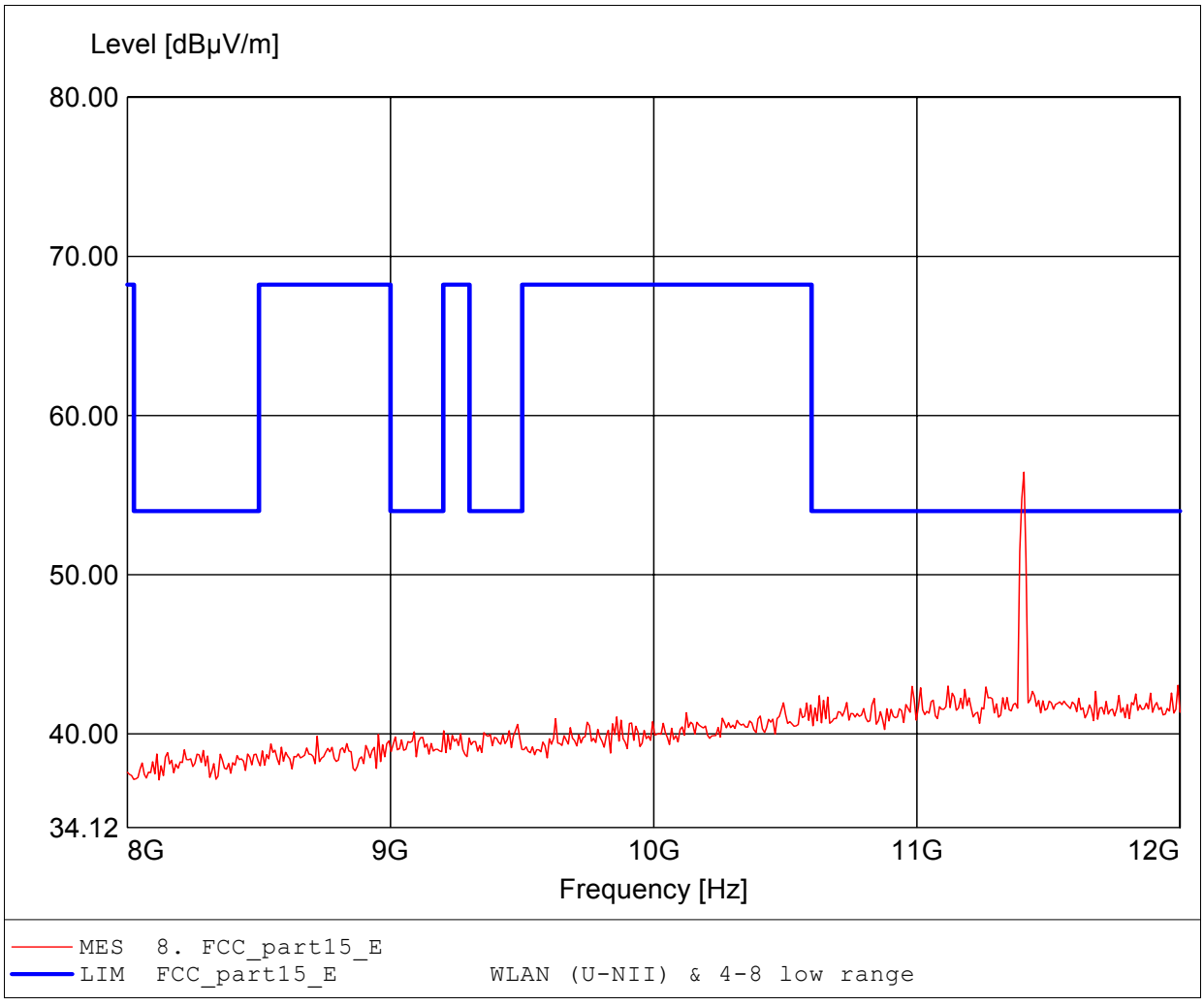
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 11.407GHz, Emax: 50.10dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

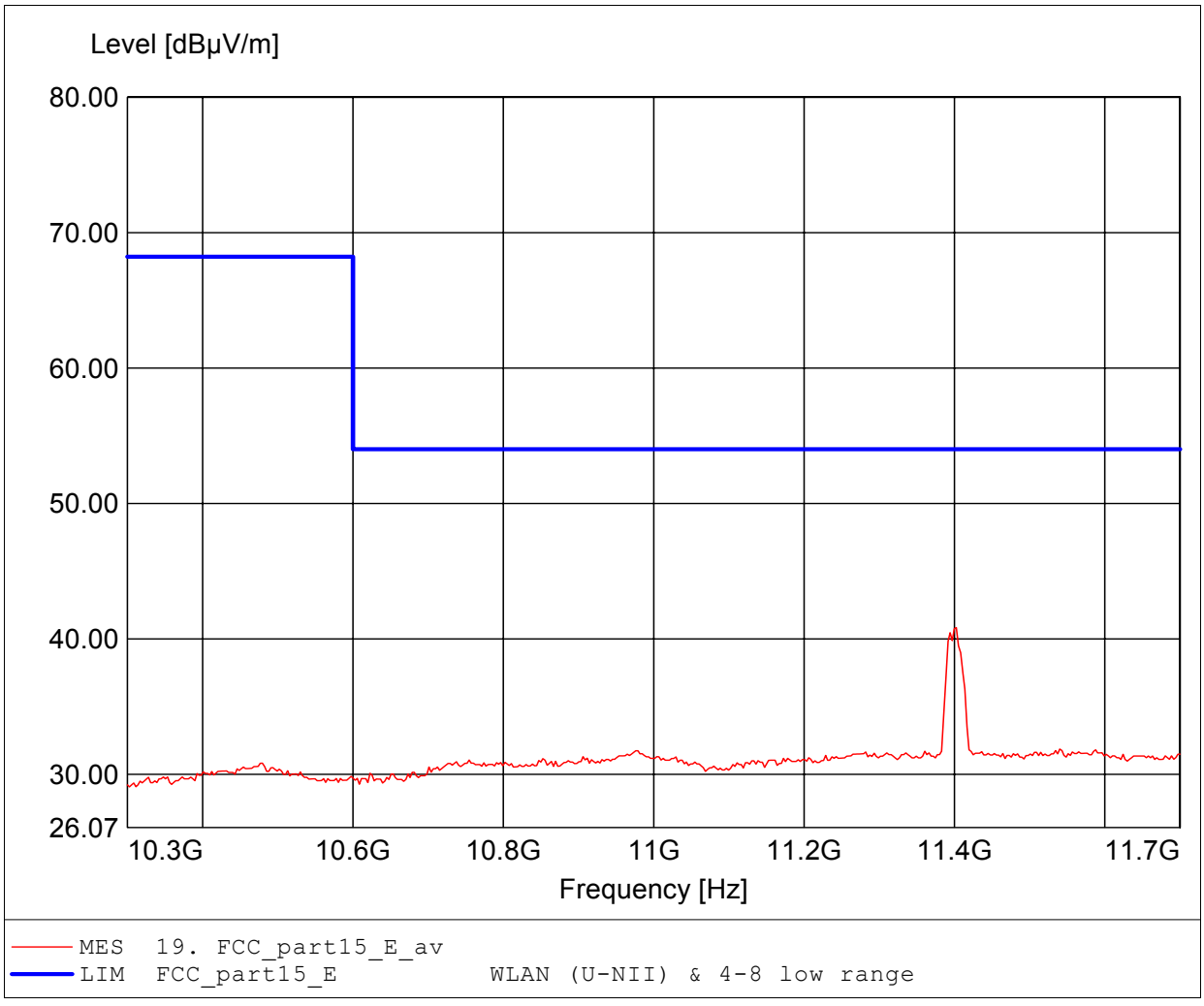
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 11.407GHz, Emax: 56.44dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

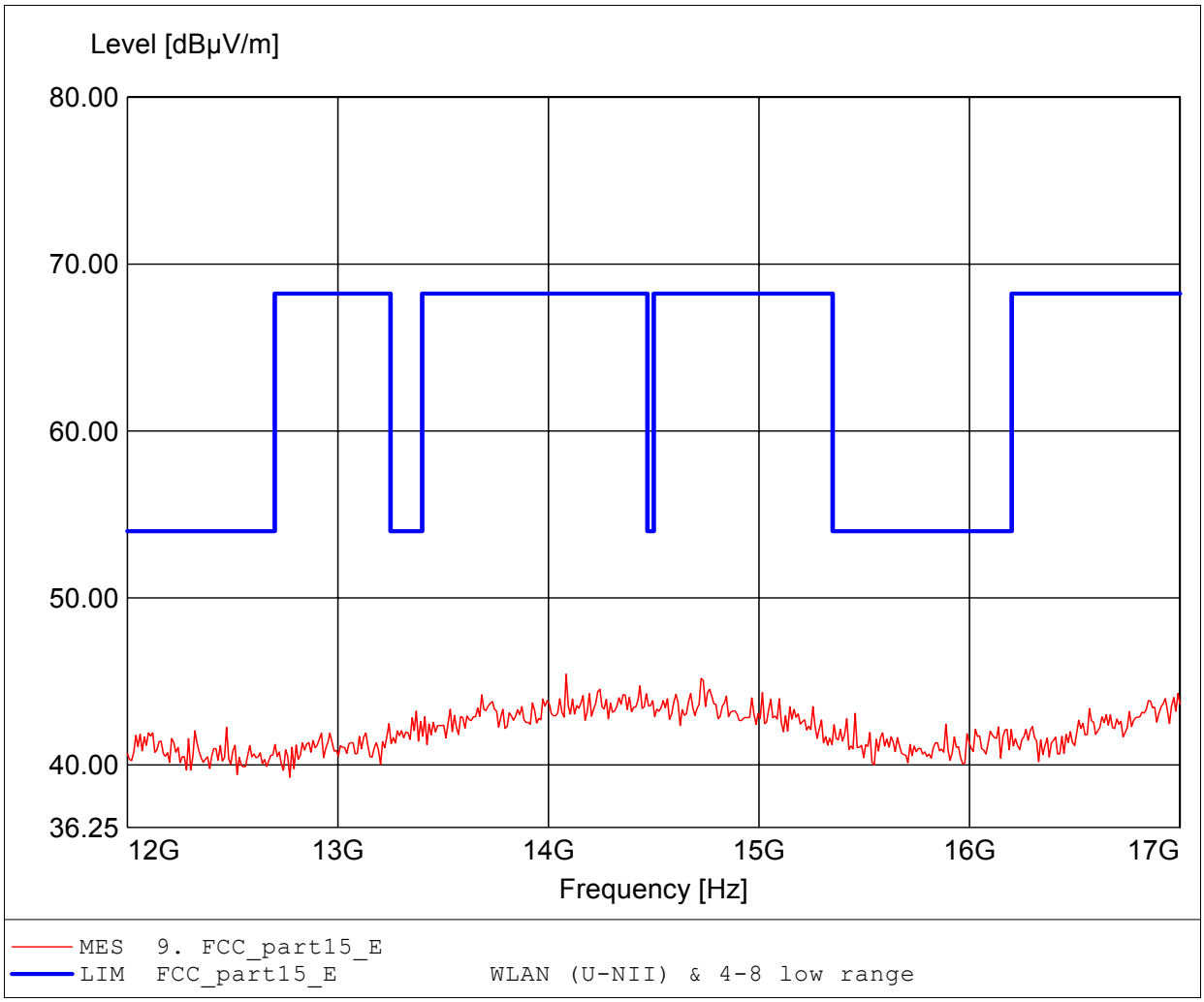
Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 11.403GHz, Emax: 40.84dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 14.084GHz, Emax: 45.43dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART E

Approval Holder:	lesswire AG / Ord.: G0M21008-3606
EUT:	Component
Model:	WiBear-I / setup: UNII, 5700 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Temp.: 24°C / Unom.: 3.3 V DC
Test Specification:	according to §15.407, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 16.990GHz, Emax: 46.08dBµV/m, RBW: 1MHz