EUROFINS PRODUCT SERVICE GMBH

Testing Cert #1983.01

TEST- REPORT

Compliance Test Report

FCC PART 15 SUBPART C
IC RSS 210 ISSUE 7

FCC ID: T7V4561HM

802.15.04 Modem - PAN4561 Mid, High

ENWC9A21yzEF; ENWC9A22yzEF

TEST REPORT NUMBER: G0M21002-2884-C-1

Eurofins Product Service GmbH
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Germany

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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.

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Operator:

Date	Eurofins-Lab.	Name	Signature
2014-01-27		W. Treffke	W. Treffke

Technical responsibility for area of testing:

Date	Eurofins	Name	Signature
2014-01-27		C. Weber	C. Weber

1.2 Testing laboratory

EUROFINS PRODUCT SERVICE GMBH
Storkower Strasse 38c
D-15526 Reichenwalde b. Berlin
Germany
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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

Test location, where different:

Name	: ./.
Street	: ./.
Town	: ./.
Country	: ./.
Telephone	: ./.
Fax	: ./.

1.3 Details of approval holder

Name	: Panasonic Electronic Devices Europe GmbH
Street	: Zeppelinstr. 28
Town	: 21337 Lueneburg
Country	: Germany
Telephone	: +49 4131 899 304
Fax	: +49 4131 899 210
Contact	: Herr Heino Kaehler
Telephone	: +49 4131 899 304

1.4 Application details

Date of receipt of application	: 18.02.2010
Date of receipt of test item	: 18.02.2010
Date of test	: 18.02.2010 - 25.02.2010

1.5 Test item

Description of test item	: 802.15.04 Modem - PAN4561 Mid, High
Type identification	: ENWC9A21yzEF; ENWC9A22yzEF
Brand Name	: PAN4561
Hardware version	: 03 / BM4561C4FM
Software version	: 02 / Synapse SNAP V2.2

Technical data

Frequency range	: 2400 - 2483.5MHz
Tested frequencies	: F_1 2405MHz
Tested frequencies	: F_2 2440MHz
Tested frequencies	: F_3 2475MHz
Number of Channels	: 14
Antenna type	: internal / external
Antenna Gain	: 1.3 dBi
Power supply	: 3.0VDC 120VAC Adaptor
Operating mode	: semi duplex
Modulation	: DSSS
Fixed Point-to-Point	: No
Device classification	: Mobile Device (Human Body distance > 20 cm)

Manufacturer:
(if applicable)

Name	: Panasonic Electronic Devices Slovakia s.r.o.
Street	: Tovarenska 13
Town	: 06401 Stara Lubovna
Country	: Slovakia

1.6 Test standards

Technical standard	: **FCC PART 15 SUBPART C** **IC RSS 210 ISSUE 7**

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 2.4 were ascertained in the course of the tests performed. ☐

2.2 Test environment

Temperature	: 22	...	26°C
Relative humidity content	: 20	...	75%
Air pressure	: 86	...	103kPa

Extreme conditions parameters:

V_{nom}	:	3.0VDC
V_{min} (V_{nom}-15%)	:	--
V_{max} (V_{nom}+15%)	:	--
T_{nom}	:	25°C

2.3 Test equipment utilized

Measurement Equipment List					
No.	**Measurement device:**	**Type:**	**Manufacturer:**	**Cal. :**	**Cal Due. :**
ETS 0086	Semi-anechoic chamber	AC1	Frankonia	-	-
ETS 0271	Spectrum Analyzer	FSEK30	Rhode & Schwarz	2009-03	2011-03
ETS 0030	Biconical Antenna	HK 116	Rhode & Schwarz	2010-02	2011-02
ETS 0013	LPD Antenna	HL 223	Rhode & Schwarz	2008-04	2011-04
ETS 0019	Horn Antenna	BBHA 9120D	Schwarzbeck	2006-08	2011-08
ETS 0432	Amplifier-Matrix	RSU-ETS-BT	ETS	-	-
ETS 0259	Power Meter	NRVD	Rhode & Schwarz	2008-09	2010-09
ETS 0278	Power Sensor	NRV-Z31	Rhode & Schwarz	2008-08	2010-08
ETS 0496	Spectrum Analyzer	FSP30	Rhode & Schwarz	2009-04	2010-04

2.4 Test results

☒ 1st test ☐ test after modification ☐ production test

Test case	Subclause	Required	Test passed	Test failed
INFORMATIONAL TRANSMITTER PARAMETERS				
Occupied Bandwidth	FCC § 2.1049 IC RSS-Gen. 4.6.1	☒		
TRANSMITTER PARAMETERS				
6dB Bandwidth	FCC § 15.247(a)(2) IC RSS-210 § A8.2	☒	☒	☐
Spectral Density	FCC § 15.247(e) IC RSS-210 § A8.2	☒	☒	☐
Maximum peak conducted output power	FCC § 15.247(b) IC RSS-210 § A8.4	☒	☒	☐
Conducted spurious emissions	FCC § 15.247(d) IC RSS-210 § A8.5	☒	☒	☐
Radiated spurious emissions	FCC § 15.247(d) FCC § 15.209 IC RSS-210 § A8.5 IC RSS-Gen § 4.9	☒	☒	☐
RECEIVER PARAMETERS				
Radiated spurious emissions	FCC § 15.109 IC RSS-Gen § 4.10 IC RSS-Gen § 7.2.3	☒	☒	☐
POWER LINE PARAMETERS				
AC power line conducted emissions	FCC § 15.207 IC RSS-Gen. 7.2.2	☒	☒	☐

3 Informational Transmitter parameters

3.1 Transmitter Modes for conformance testing

The following transmission modes are elected for compliance testing.

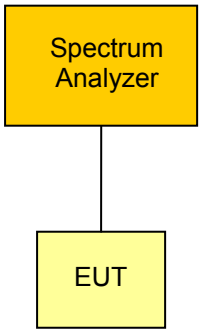
TEST MODE A	
Conditions	
Spread Spectrum :	☒ Yes ☐ No
Spreading Technique :	DSSS
Modulation :	O-QPSK
Data rate :	250 kbps
Duty Cycle :	95% test mode
Power level :	13

TEST MODE	
Conditions	
Spread Spectrum :	☒ Yes ☐ No
Spreading Technique :	DSSS
Modulation :	O-QPSK
Data rate :	250 kbps
Duty Cycle :	10% normal mode
Power level :	13

3.2 Occupied Bandwidth

According FCC rules 47 CFR 2.1049 and RSS-Gen Section 4.6.1 the 99% emission bandwidth occupied by the digital modulated transmitted signal has to be reported.

3.2.1 Measurement procedure



The eut is connected to a spectrum analyzer and set to transmission mode with maximum power under normal test conditions. The span of the analyzer is set wide enough to capture all significant emissions of the modulation spectrum. The resolutions bandwidth is set as close as possible to 1% of the selected span without being below 1%. The occupied bandwidth is than measured evaluated by an internal measurement procedure of the analyzer.

3.2.2 Results

Transmitter occupied bandwidth			
Measurement Conditions			
Test mode :		A	
Power occupation :		99%	
Channel [MHz]	**Lower edge frequency [MHz]**	**Upper edge frequency [MHz]**	**Occupied Bandwidth [MHz]**
2405	2404.100	2406.260	2.16
2440	2438.830	2441.230	2.40
2475	2473.800	2476.230	2.43
See attached diagram in Annex			
Verdict			**PASS**

4 Transmitter parameters

4.1 6dB Bandwidth

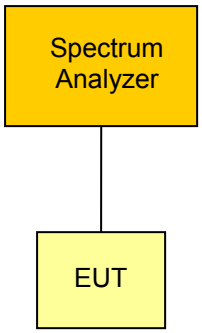
According FCC rules 47 CFR 15.247(a)(2) and RSS-210 Section A8.2 the minimum 6dB Bandwidth has to be validated.

4.1.1 Limits

According FCC and IC rules the minimum 6 dB bandwidth shall be at least 500 kHz.

6dB Bandwidth limit
≥ 500kHz

4.1.2 Measurement procedure



The eut is connected to a spectrum analyzer and set to transmission mode with maximum power under normal test conditions. The resolution bandwidth is set to 100kHz (VBW≥RBW). The center frequency is set to the channel center frequency. The span of the analyzer is set to 2 -3 times the 6dB bandwidth. The bandwidth is determined using markers with peak detector and max hold.

4.1.3 Results

Transmitter 6dB bandwidth	
Measurement Conditions	
Test mode :	A
Channel [MHz]	**6dB Bandwidth [MHz]**
2405	1.553
2440	1.703
2475	1.577
See attached diagram in Annex	
Verdict	**PASS**

4.2 Power spectral density

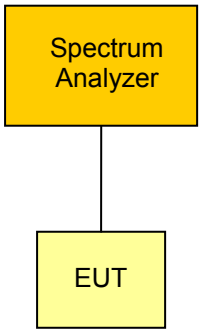
According FCC rules 47 CFR 15.247(e) and RSS-210 Section A8.2 the maximum pwer density in any 3kHz bandwidth is limited and has to be validated.

4.2.1 Limits

According FCC and IC rules the transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0-second duration.

6dB Bandwidth limit
≤ 8dBm/3kHz

4.2.2 Measurement procedure



The eut is connected to a spectrum analyzer and set to transmission mode with maximum power under normal test conditions. The resolution bandwidth is set to 3kHz (VBW≥RBW). The center frequency is set to the channel center frequency. The span of the analyzer is set to 1.5MHz. The sweep time is set to SPAN/RBW. The spectral density is determined using peak detector and max hold.

4.2.3 Results

Power spectral Density		
Measurement Conditions		
Test mode :	A	
Measurement Method :	☒ Regular ☐ Alternative	
Channel [MHz]	**Max. emission frequency [MHz]**	**Spectral density [dBm/3kHz]**
2405	2405.604	6.47
2440	2440.108	5.34
2475	2475.108	4.87
See attached diagram in Annex		
Verdict		**PASS**

4.3 Maximum peak conducted output power

According FCC rules 47 CFR 15.247(b)(3) and RSS-210 Section A8.4 the maximum peak conducted output power is limited and has be verified.

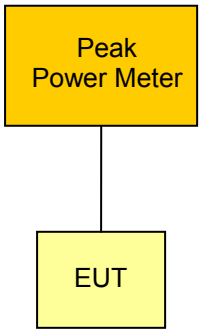
4.3.1 Limits

For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W.

Maximum peak conducted power limit
1W / 30dBm

*) The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3.2 Measurement procedure



The eut is connected to a peak power sensor of a power meter and activated with the maximum power level. The peak power is measured and recorded.

4.3.3 Results

Maximum peak conducted output power		
Measurement Conditions		
Antenna gain :	1.3dBi	
Power correction :	0dB	
Channel [MHz]	**Conducted ouput power [dBm]**	**Power Limit [dBm]**
Test mode A		
2405	20.5	30
2440	20.1	30
2475	19.4	30
See attached diagrams in Annex		
Measurement uncertainty		4.22dB
Verdict		**PASS**

4.4 Transmitter conducted spurious emissions

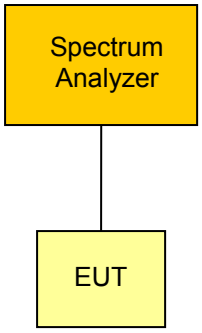
According FCC rules 47 CFR 15.247(d) and RSS-210 Section A8.5 unwanted emissions in the spurious domain are power limited and has to be validated.

4.4.1 Limits

The emission limit of out of band emission in any 100kHz bandwidth outside the frequency band in which the spread spectrum device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits (see “Transmitter radiated spurious emissions”-measurement) is not required.

Transmitter band-edge emission limits	
TX-Power Detector	**Out of band attenuation**
Peak	-20dBc/100kHz
RMS	-30dBc/100kHz

4.4.2 Measurement procedure



The eut is connected to a spectrum analyzer and set to transmission mode with maximum power under normal test conditions. The span of the analyzer is set large enough to capture the maximum emission within the emission band as well as any spurious emission outside the authorized band of operation. The resolution bandwidth is set to 100kHz (VBW≥RBW). The emissions are measured using peak detector and max hold.

The measurement is performed over the frequency range of 30MHz up to the tenth harmonic.

4.4.3 Results

Transmitter conducted spurious Emissions					
Measurement Conditions					
Test mode :	A				
Modulated :	☒ Yes ☐ No				
Peak field strength :	15.37dBm				
Peak emission limit :	-4.63dBm				
Channel Frequency [MHz]	**Emission Frequency [MHz]**	**Measured Power Level [dBm]**	**Limit [dBm]**	**Detector**	**Margin [dB]**
--	--	--	--	--	
--	--	--	--	--	
--	--	--	--	--	
See attached diagrams in Annex					
Verdict				**PASS**	

Comment: No significant spurious emissions have been observed!

4.5 Transmitter radiated spurious emissions

According FCC rules 47 CFR 15.209, 15.247(d) and RSS-210 Section A8.5 unwanted emissions in the spurious domain are power limited and has to be validated.

4.5.1 Limits

The emission limit of out of band emission in any 100kHz bandwidth outside the frequency band in which the spread spectrum device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits (see "Transmitter spurious emissions"-measurement) is not required.

Transmitter out-of-band emission limits	
TX-Power Detector	**Out of band attenuation**
Peak	-20dBc/100kHz
RMS	-30dBc/100kHz

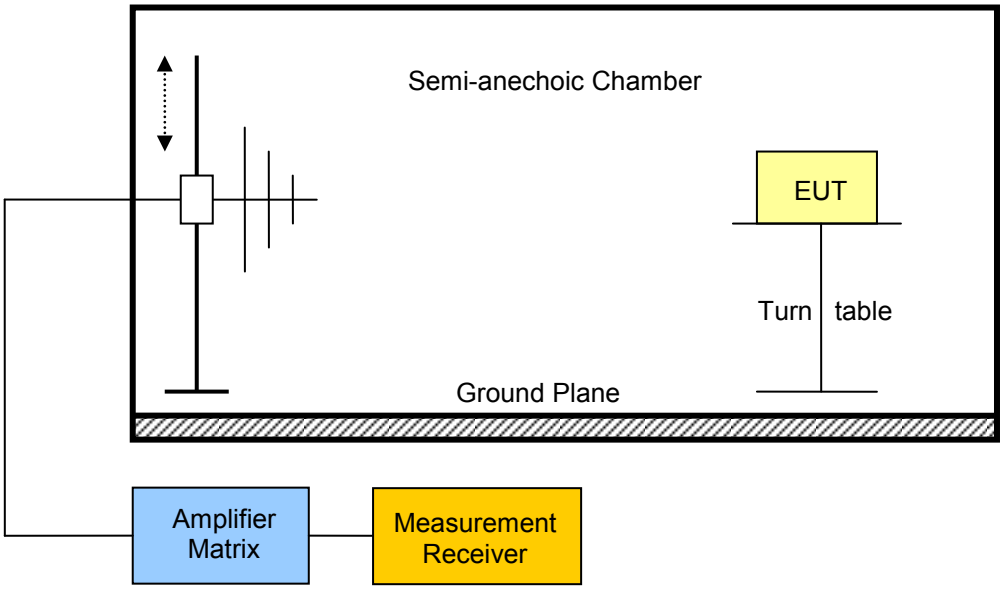
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Tranmitter restricted band spurious emission limits				
Frequency range [MHz]	**Detector**	**Limit [µV/m]**	**Calculated Limit@3m [dBµV/m]**	**Measurement Distance [m]**
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3

When average radiated emission measurements are specified, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

4.5.2 Measurement procedure

The spurious emission measurement is performed on 3m a semi-anechoic test site.



The eut is placed on a non-metallic table. Any emission is received by the measurement antenna and measured via a measurement receiver connected to the antenna. To obtain the maximum emission the eut is rortated through 360°.

Due to pratical reasons the spurious emission level check is first performed with a peak detector and the quasi-peak and average limits.

If any emission is detected that gets close to the emission limit the detector is changed and the quasi-peak or average detector is used. Which detector is used is determined by the emission frequency. If pulsed transmission is used, averaging over the pulse train is used.

The measurement values are also corrected to obtain the field strength values at the defined measurement distances of the emission limits.

The measurement is performed over the frequency range of 30MHz up to the tenth harmonic.

4.5.3 Results

Transmitter radiated spurious Emissions						
Measurement Conditions						
Test mode :	A					
Measurement distance :	3m					
Modulated :	☒ Yes ☐ No					
Peak field strength :	108.52dBµV/m					
Peak emission limit :	88.52dBµV/m					
Channel Frequency [MHz]	**Emission Frequency [MHz]**	**Polarization**	**Measured Field Strength * [dBµV/m]**	**Limit@3m [dBµV/m]**	**Detector**	**Margin [dB]**
2405	2388	h	68.5	74	peak	-5.5
2405	2389	h	48.5	54	average	-5.5
2405	2388	v	70.4	74	peak	-3.6
2405	2388	v	43.7	54	average	-10.3
2405	4810	h	65.0	74	peak	-9.0
2405	4811	h	48.9	54	average	-5.1
2405	4810	v	67.4	74	peak	-6.6
2405	4811	v	48.7	54	average	-5.3
2440	2377	h	58.4	74	peak	-15.6
2440	2389	h	34.9	54	average	-19.1
2440	4874	h	60.6	74	peak	-13.4
2440	4881	h	50.1	54	average	-3.9
2440	4873	v	60.2	74	peak	-13.8
2440	4881	v	48.2	54	average	-5.8
2440	7327	h	62.9	74	peak	-11.1
2440	7321	h	45.2	54	average	-11.8
2440	7327	v	65.7	74	peak	-8.3
2440	7322	v	47.0	54	average	-7.0
2475	2484	h	71.9	74	peak	-2.1
2475	2484	h	47.4	54	average	-6.6
2475	2484	v	66.9	74	peak	-7.1
2475	2484	v	44.4	54	average	-9.6

2475	4945	h	60.9	74	peak	-13.1
2475	4951	h	44.6	54	average	-9.4
2475	4945	v	56.6	74	peak	-17.4
2475	4951	v	39.0	54	average	-15.0
2475	7431	h	61.8	74	peak	-12.2
2475	7424	h	43.9	54	average	-10.1
2475	7423	v	63.7	74	peak	-10.3
2475	7424	v	45.1	54	average	-8.9
See attached diagrams in Annex						
Verdict					**PASS**	

5 Receiver parameters

5.1 Receiver spurious emissions

According FCC rules 47 CFR 15.109 and RSS-Gen Section 4.9 the emission of unintentional radiators have to comply with limits stated in the rules.

5.1.1 Limits

According § 15.109 of the FCC rules, the field strength of radiated emissions from a Class A digital device *(a digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.)*, as determined at a distance of 10 meters, shall not exceed the following:

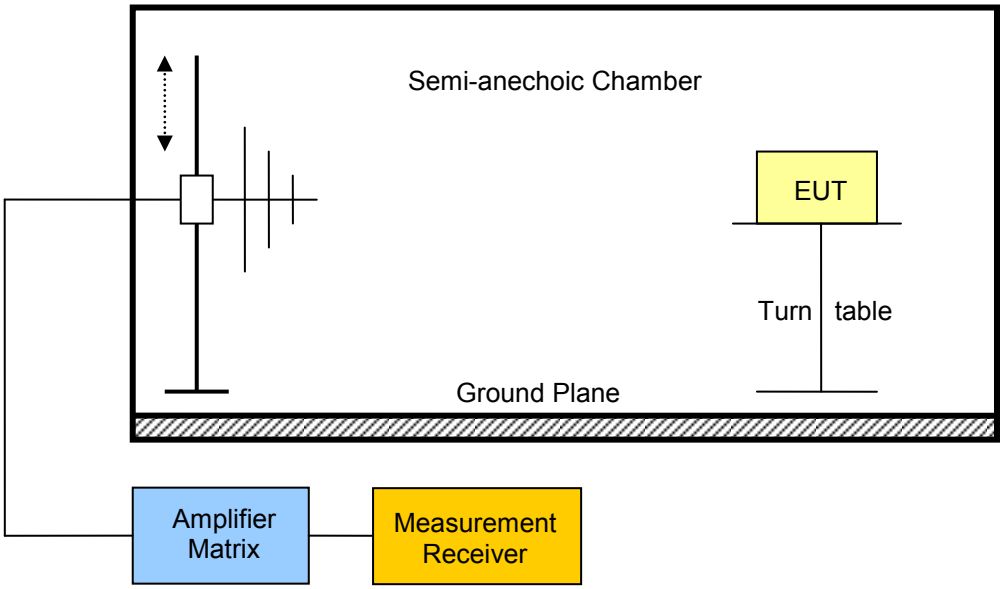
Class A receiver spurious emission limits @ 10m				
Frequency range [MHz]	**Detector**	**Limit [µV/m]**	**Calculated Limit [dBµV/m]**	**Measurement Distance [m]**
30 – 88	Quasi-Peak	90	39.1	10
88 – 216	Quasi-Peak	150	43.5	10
216 – 960	Quasi-Peak	210	46.4	10
960 – 1000	Quasi-Peak	300	49.5	10
> 1000	Average	300	49.5	10

Except for Class A digital devices *(Class B, a digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computers, calculators, and similar electronic devices that are marketed for use by the general public.)*, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Class B receiver spurious emission limits @ 3m				
Frequency range [MHz]	**Detector**	**Limit [µV/m]**	**Calculated Limit @ 3m [dBµV/m]**	**Measurement Distance [m]**
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3

5.1.2 Measurement procedure

The spurious emission measurement is performed on a 10m open area test site.



The eut is placed on a non-metallic table. Any emission is received by a loop antenna and measured via a measurement receiver connected to the loop antenna. To obtain the maximum emission the eut is rortated through 360°.

Due to pratical reasons the spurious emission level check is first performed with a peak detector and the quasi-peak and average limits.

If any emission is detected that gets close to the emission limit the detector is changed and the quasi-peak or average detector is used. Which detector is used is determined by the emission frequency. If pulsed transmission is used, averaging over the pulse train is used.

The measurement values are also corrected to obtain the field strength values at the defined measurement distances of the emission limits.

The measurement is performed over the frequency range of 30MHz up to the fifth harmonic.

5.1.3 Results

Receiver spurious Emissions						
Measurement Conditions						
Measurement dístance :		3m				
Device class :		B				
Channel Frequency [MHz]	**Emission Frequency [kHz]**	**Polarization**	**Measured Field Strength * [dBµV/m]**	**Limit@3m [dBµV/m]**	**Detector**	**Margin [dB]**
2440	496.593	V	35.27	46	Peak	-10.73
2440	833.267	H	34.09	46	peak	-11.91
See attached diagrams in Annex						
Verdict					**PASS**	

*** Note :** The measured field strength values are corrected to reflect the field strength values at the measurement distance stated in the table. Correction acc. $20 \cdot \log_{10}$(measurement distance/limit distance).

6 Power Line parameters

6.1 AC power line conducted emissions

According FCC rules 47 CFR 15.207 and RSS-Gen Section 7.2.2 for any intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits given below.

6.1.1 Limits

AC power line emission limits		
Frequency [MHz]	**Conducted Limit [dBµV]**	
	Quasi-Peak	**Average**
0.15 – 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

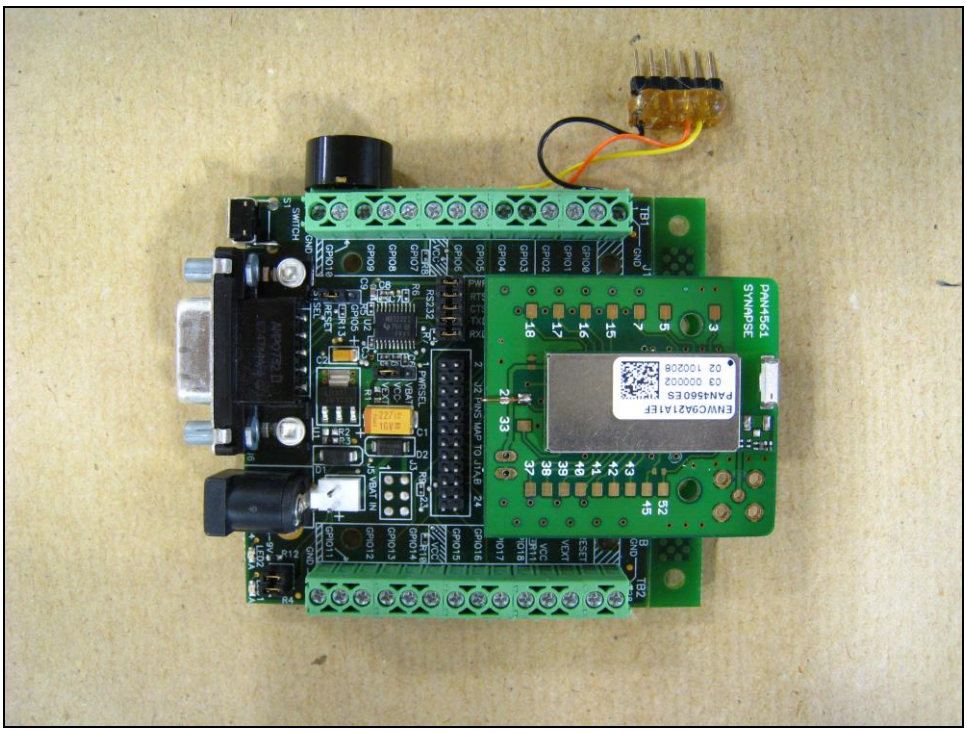
6.1.2 Measurement procedure

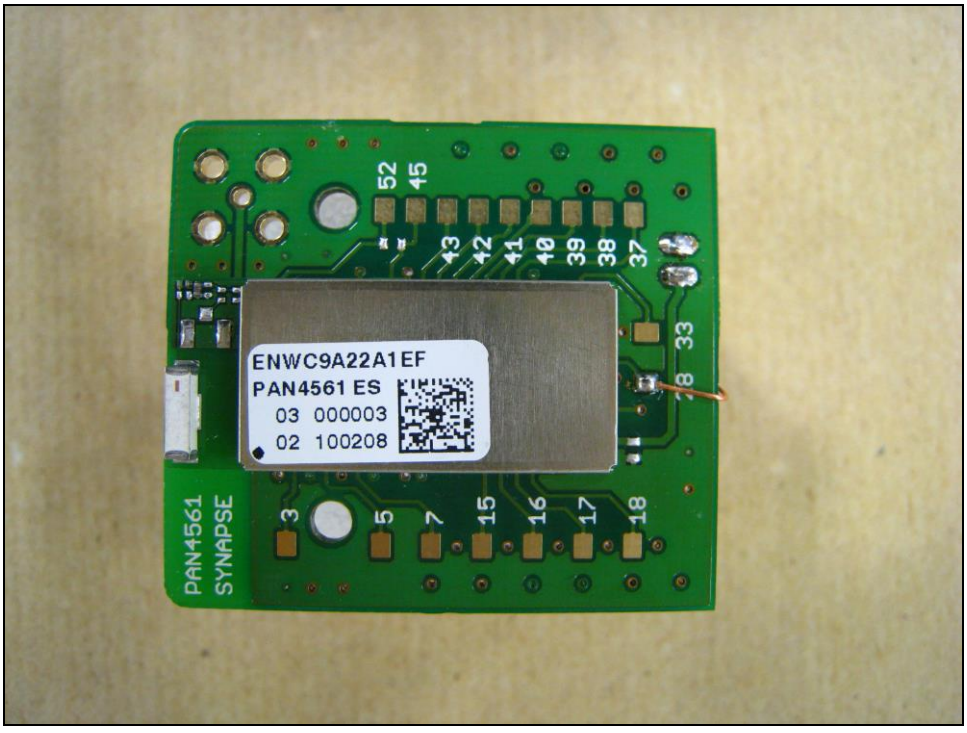
The ac power line emissions are measured using a 50µH / 50Ω line impedance stabilization network (LINS). The radio frequency voltage between each power line and ground at the power terminal is measured.

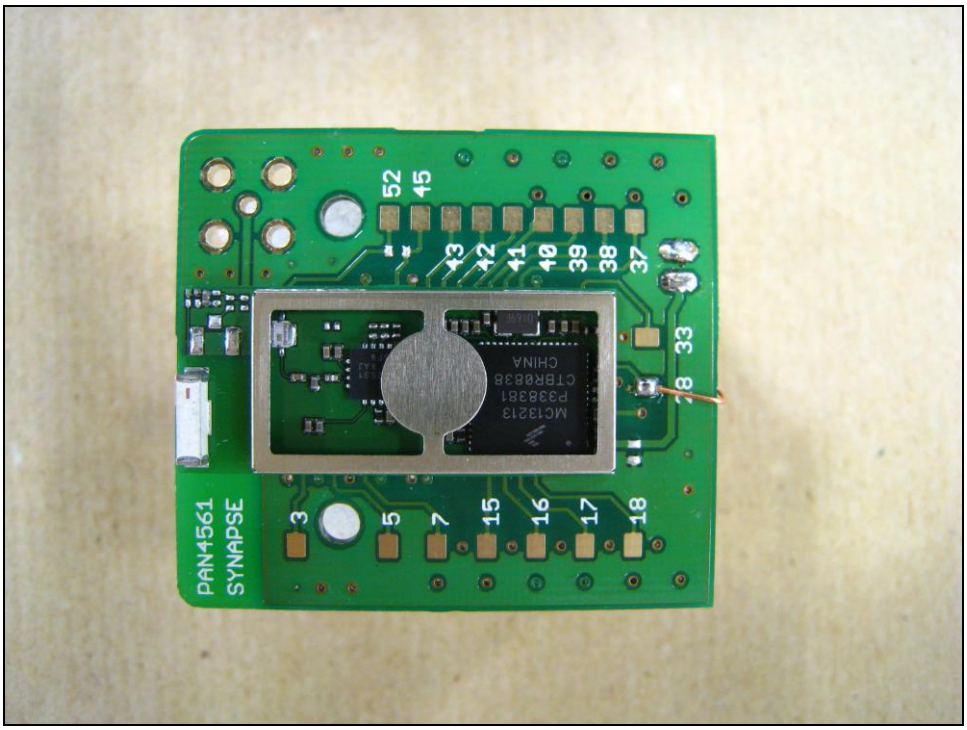
6.1.3 Results

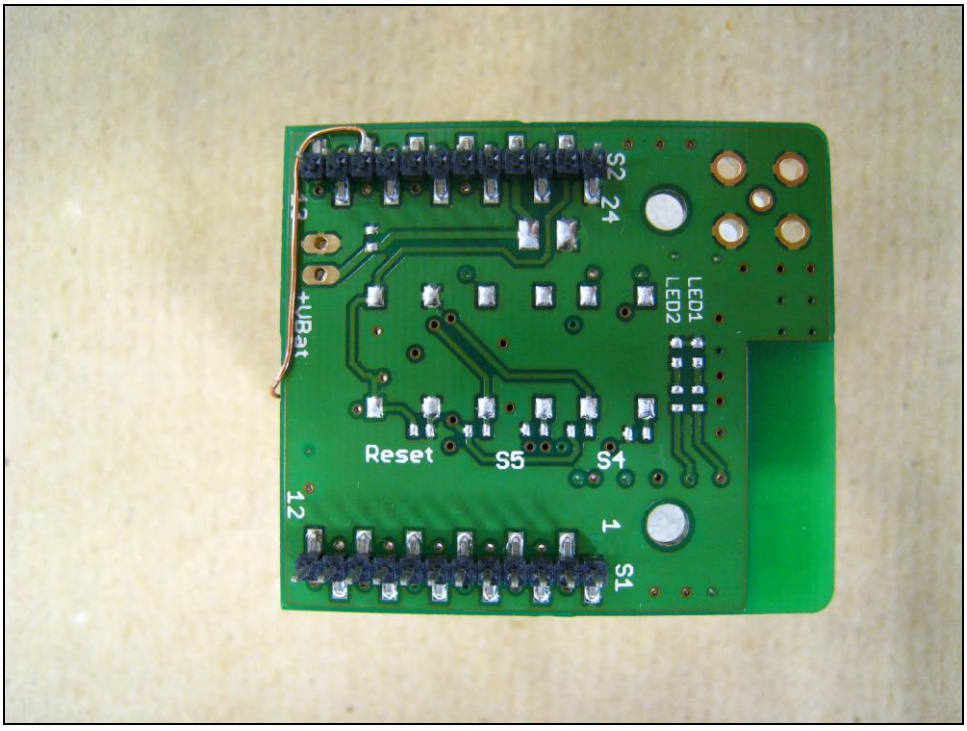
AC power line emissions	
Conducted emission level	
See attached Diagram	
Verdict	**PASS**

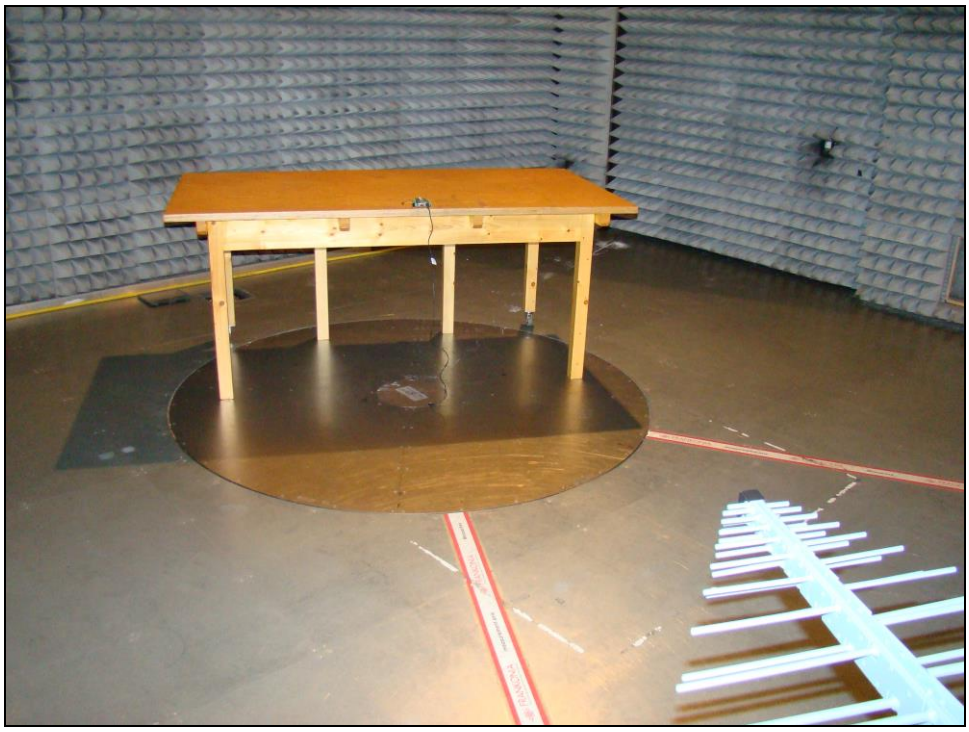
Annex A Photos






PAN4561
SYNAPSE
MC13213
CHINA

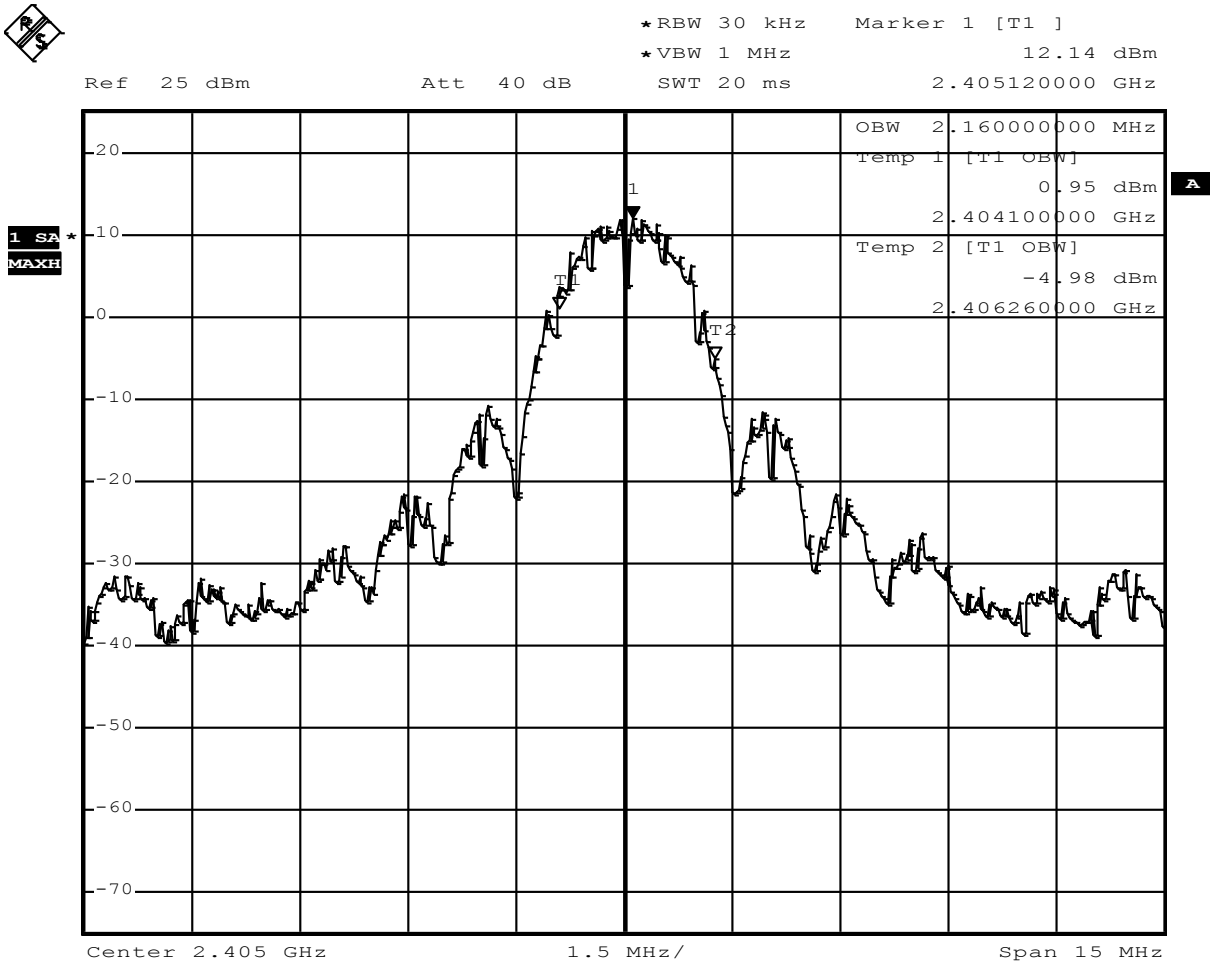

S2
24
LED1
LED2
+UBat
Reset
S5
S4
12
1
S1



Annex B Transmitter Occupied Bandwidth; 6dB Bandwidth

RSS Gen
Occupied Bandwidth

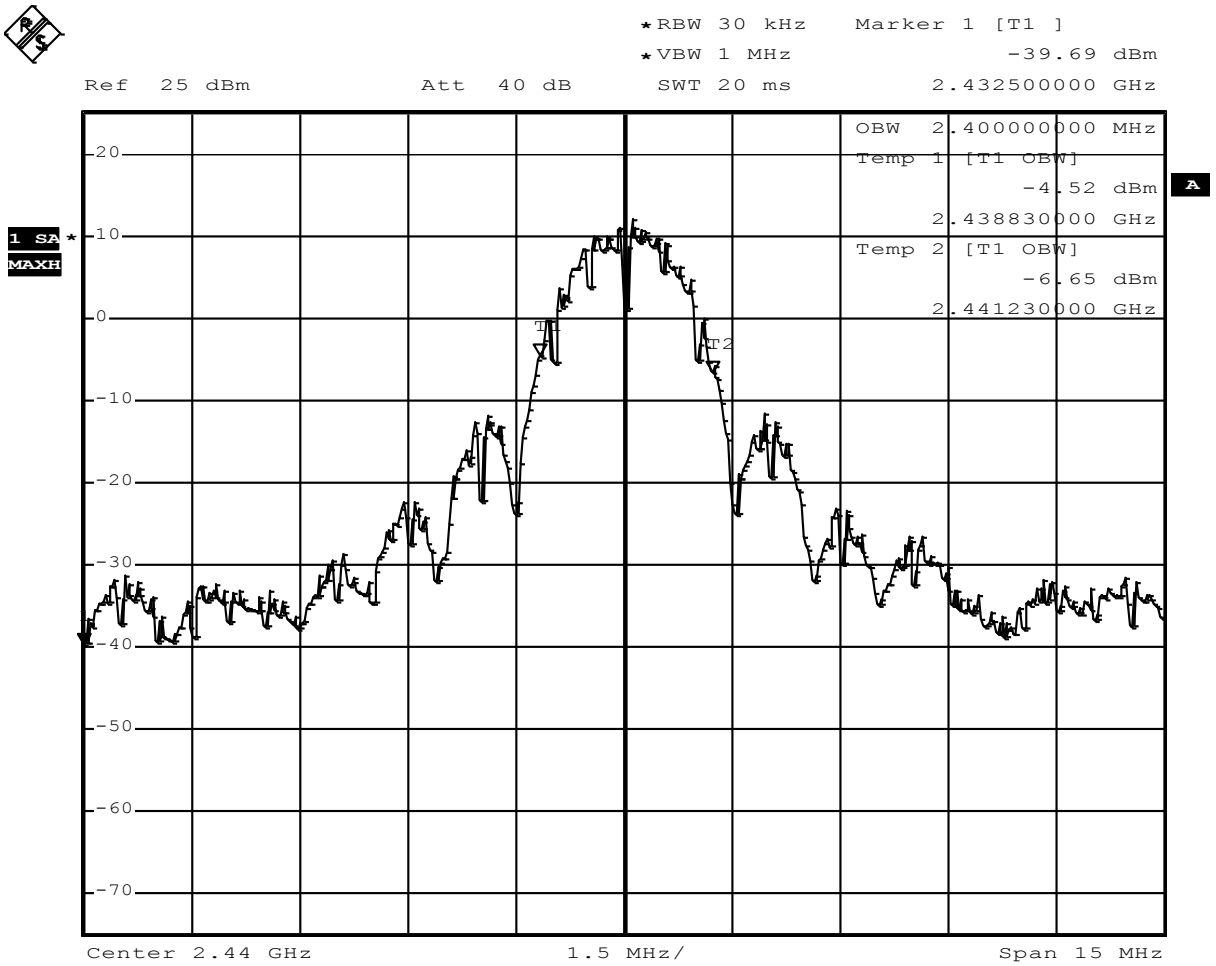
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	4.4.1 Occupied Bandwidth
Comment 1	Channel.: 2405 MHz
Comment 2	A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3	DSSS



Date: 24.FEB.2010 15:35:20

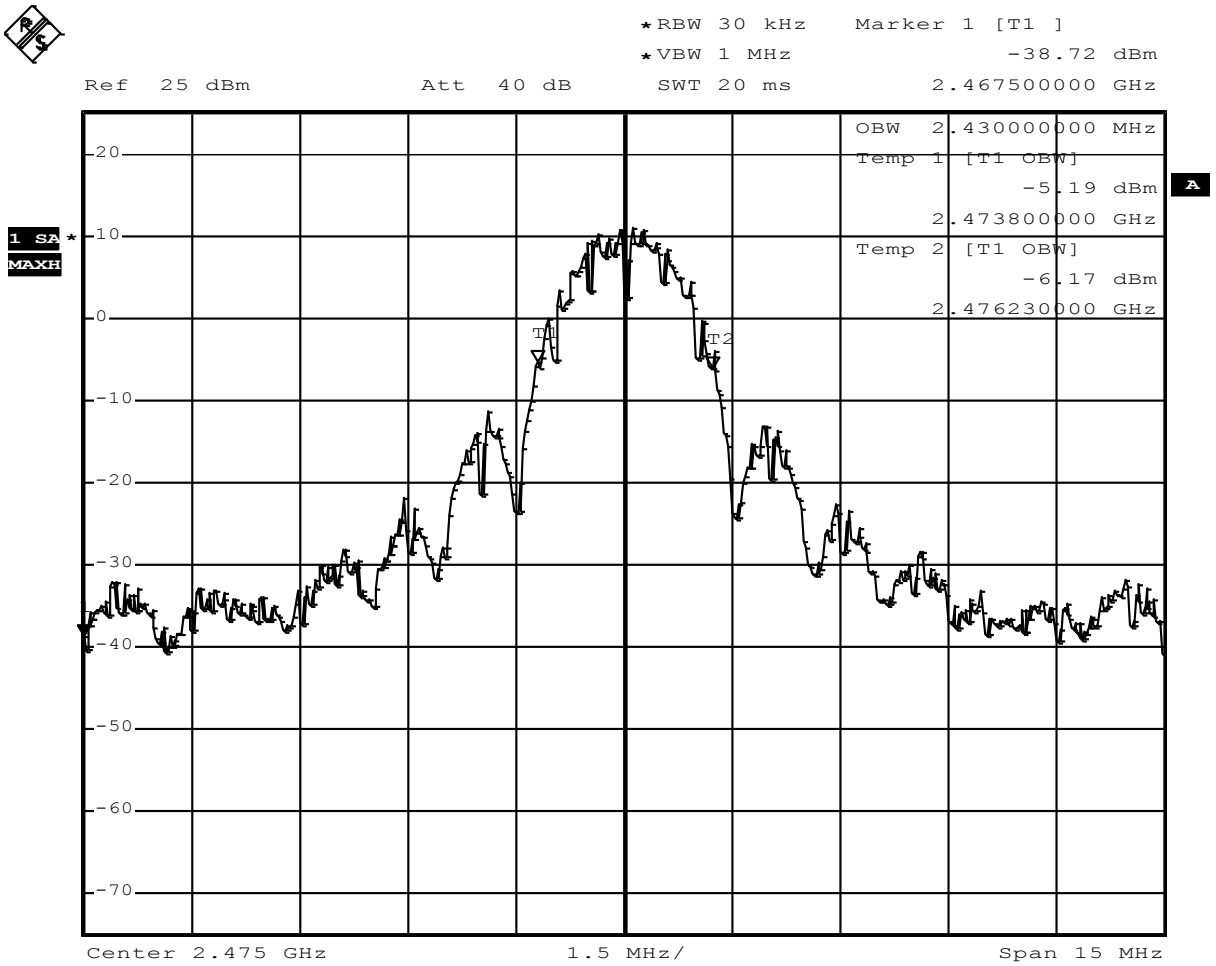
RSS Gen
Occupied Bandwidth

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	4.4.1 Occupied Bandwidth
Comment 1	Channel.: 2440 MHz
Comment 2	A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3	DSSS



RSS Gen
Occupied Bandwidth

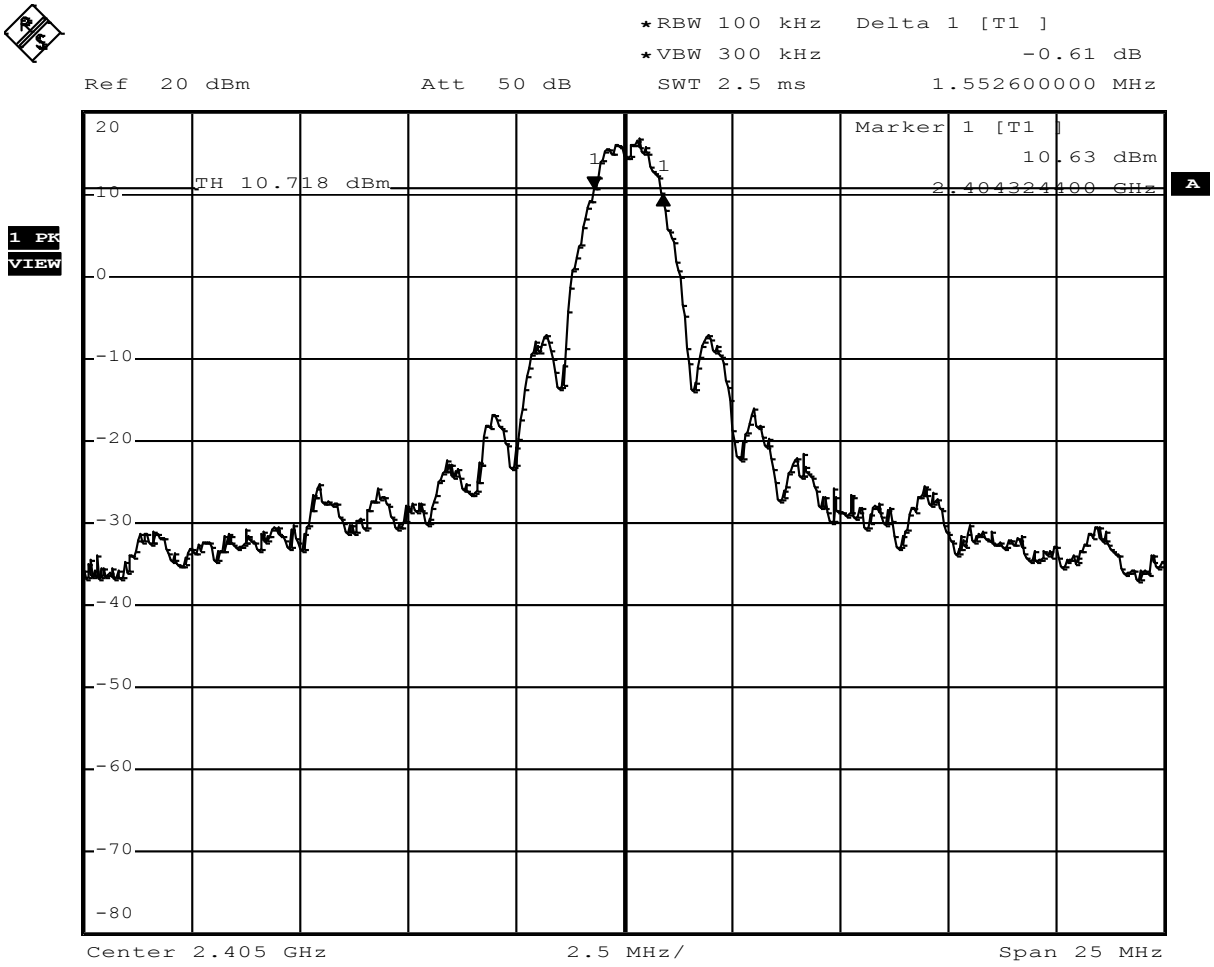
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	4.4.1 Occupied Bandwidth
Comment 1	Channel.: 2475 MHz
Comment 2	A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3	DSSS



Date: 24.FEB.2010 15:41:45

FCC part 15.247 (a)2
Minimum 6 dB Bandwidth

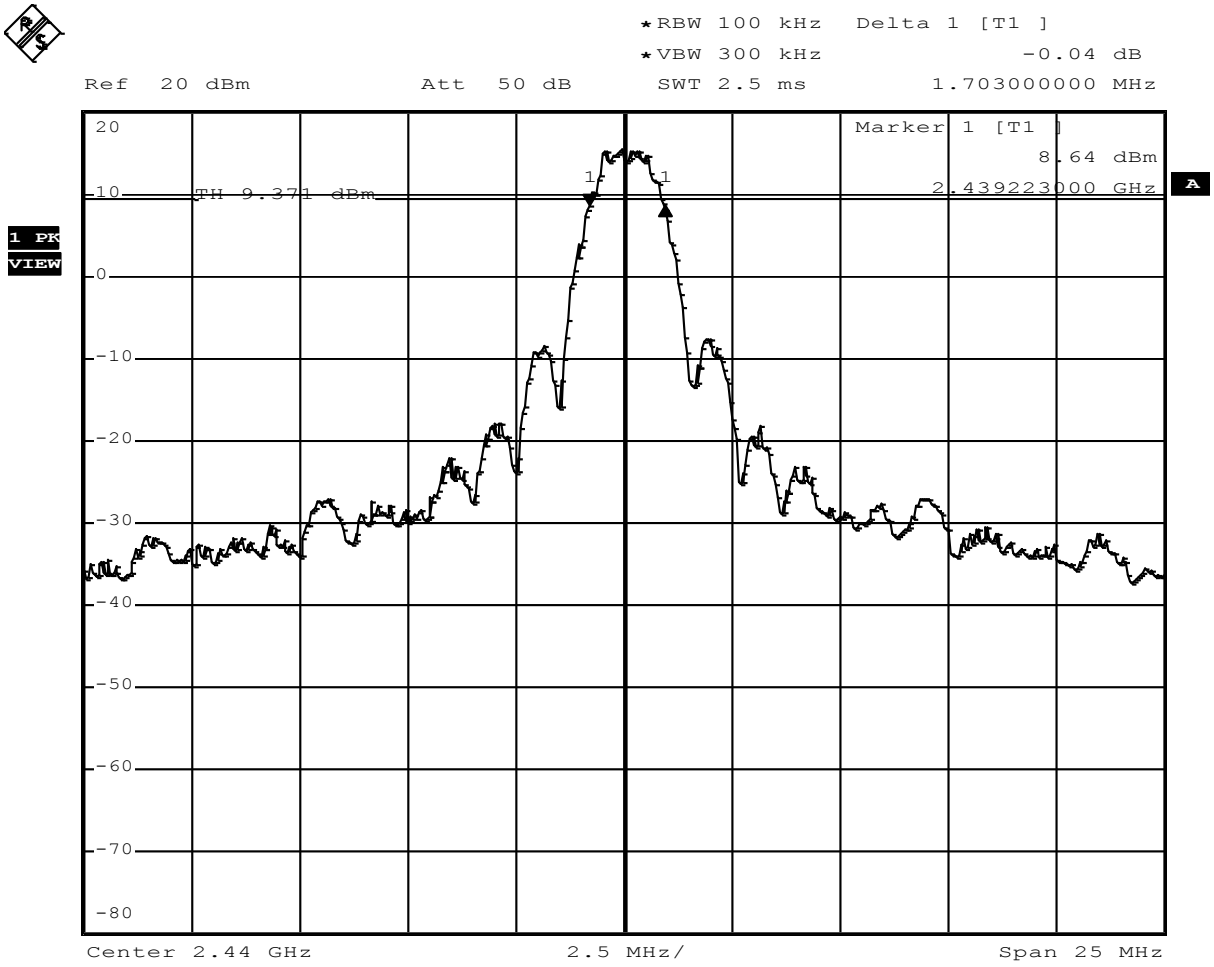
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (a)2
Comment 1	Minimum 6 dB Bandwidth
Comment 2	Channel : 2405 MHz
Comment 3	DSSS



Comment: 6 dB bandwidth: 1552.6 KHz > 500 KHz; verdict: PASS
Date: 24.FEB.2010 15:19:40

FCC part 15.247 (a)2
Minimum 6 dB Bandwidth

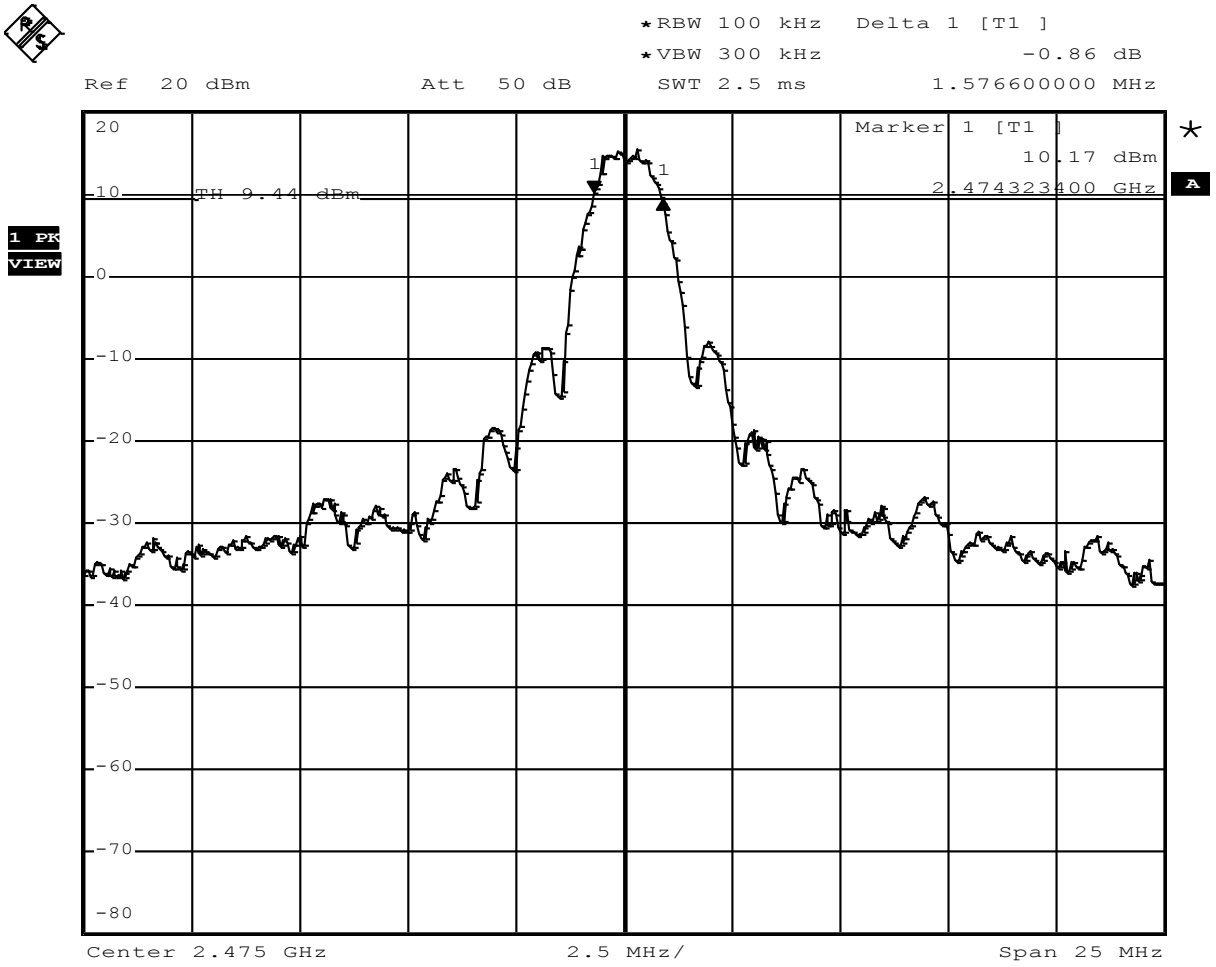
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (a)2
Comment 1	Minimum 6 dB Bandwidth
Comment 2	Channel : 2440 MHz
Comment 3	DSSS



Comment: 6 dB bandwidth: 1703 KHz > 500 KHz; verdict: PASS
Date: 24.FEB.2010 15:24:50

FCC part 15.247 (a)2
Minimum 6 dB Bandwidth

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (a)2
Comment 1	Minimum 6 dB Bandwidth
Comment 2	Channel : 2475 MHz
Comment 3	DSSS

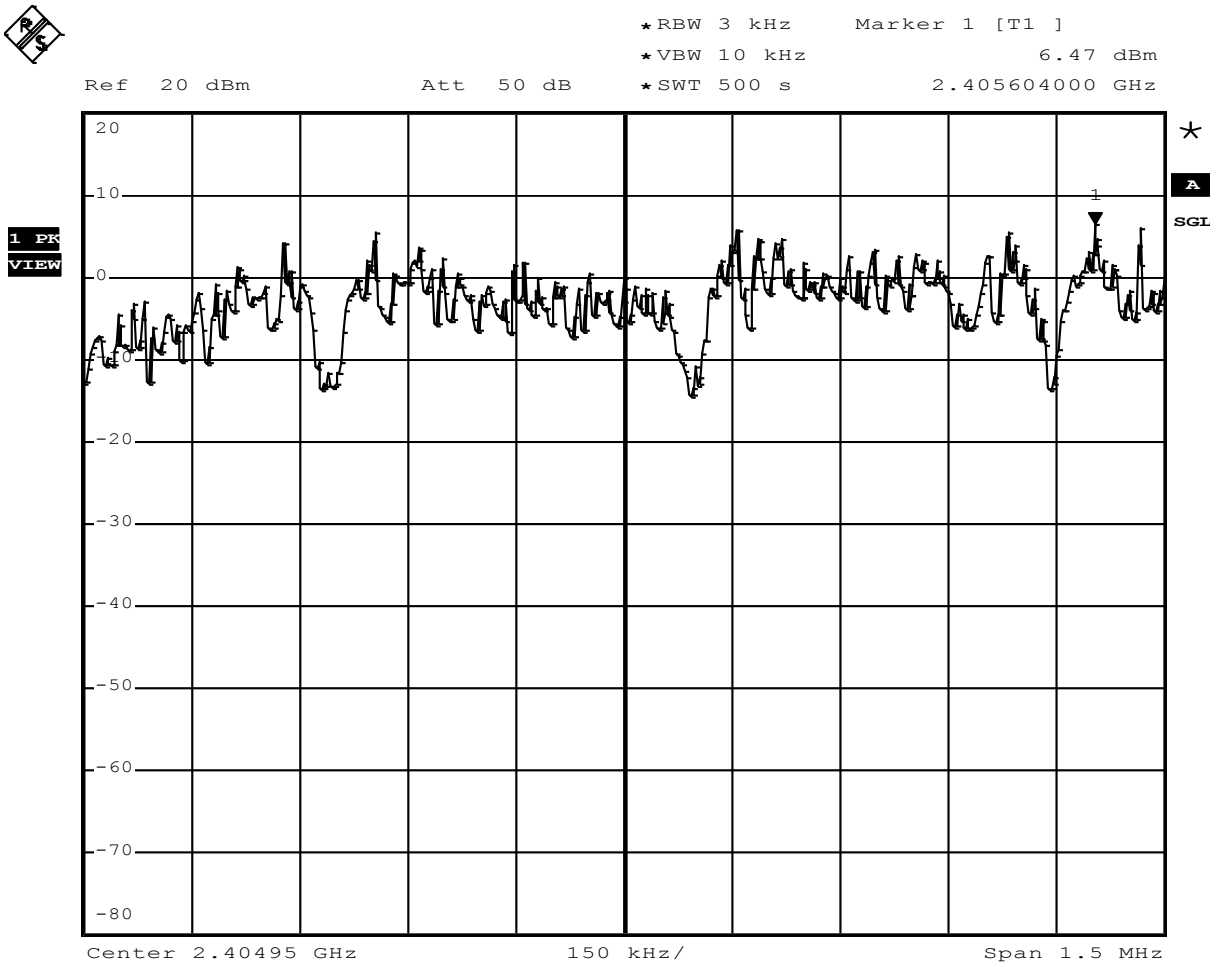


Comment: 6 dB bandwidth: 1576.6 KHz > 500 KHz; verdict: PASS
Date: 24.FEB.2010 15:28:52

Annex C Power Spectral Density

FCC part 15.247 (d)
Power spectral density (PSD)

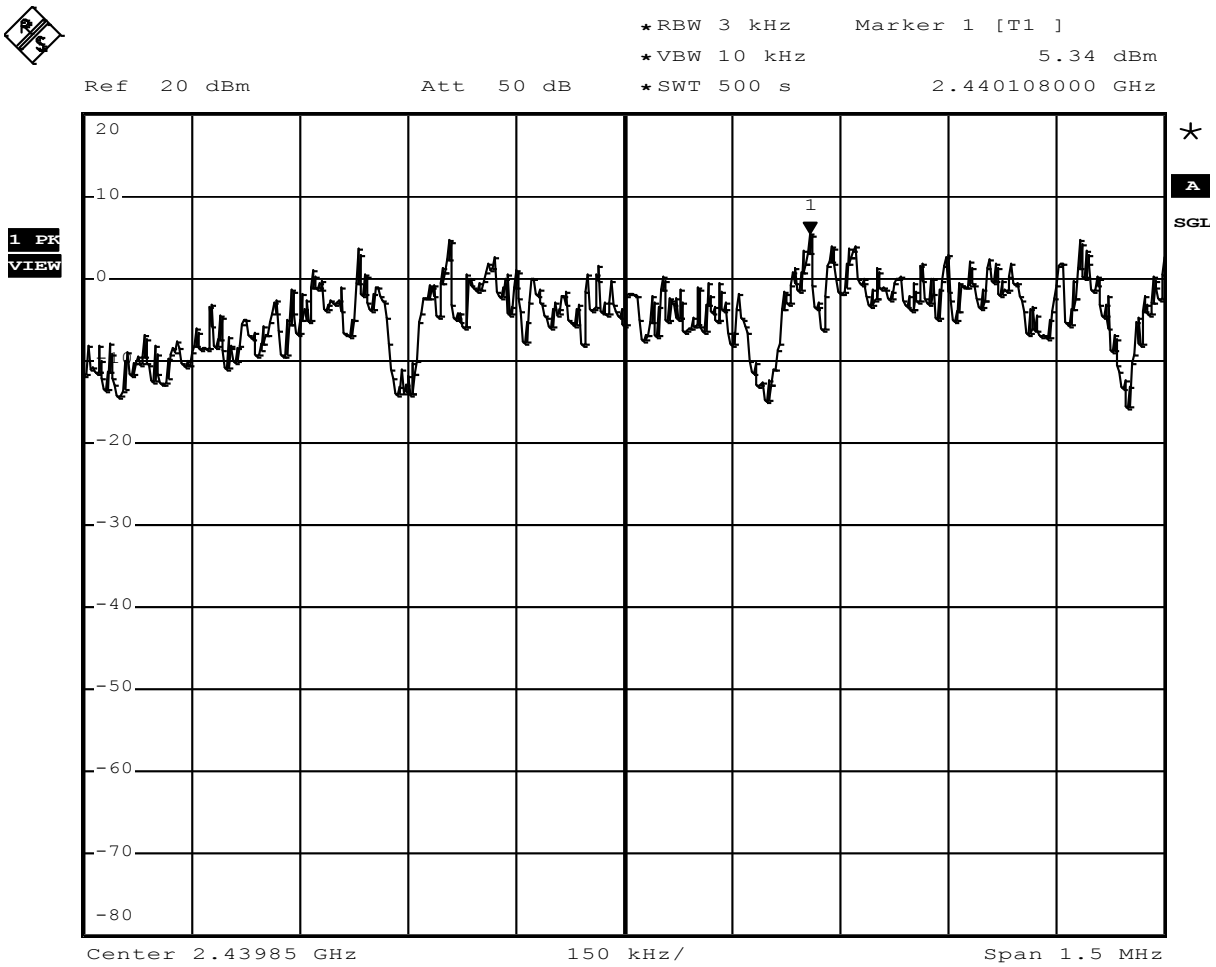
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d) (PSD Option1)
Comment 1	Power spectral density conducted
Comment 2	Channel : 2405 MHz
Comment 3	DSSS



Date: 24.FEB.2010 15:00:15

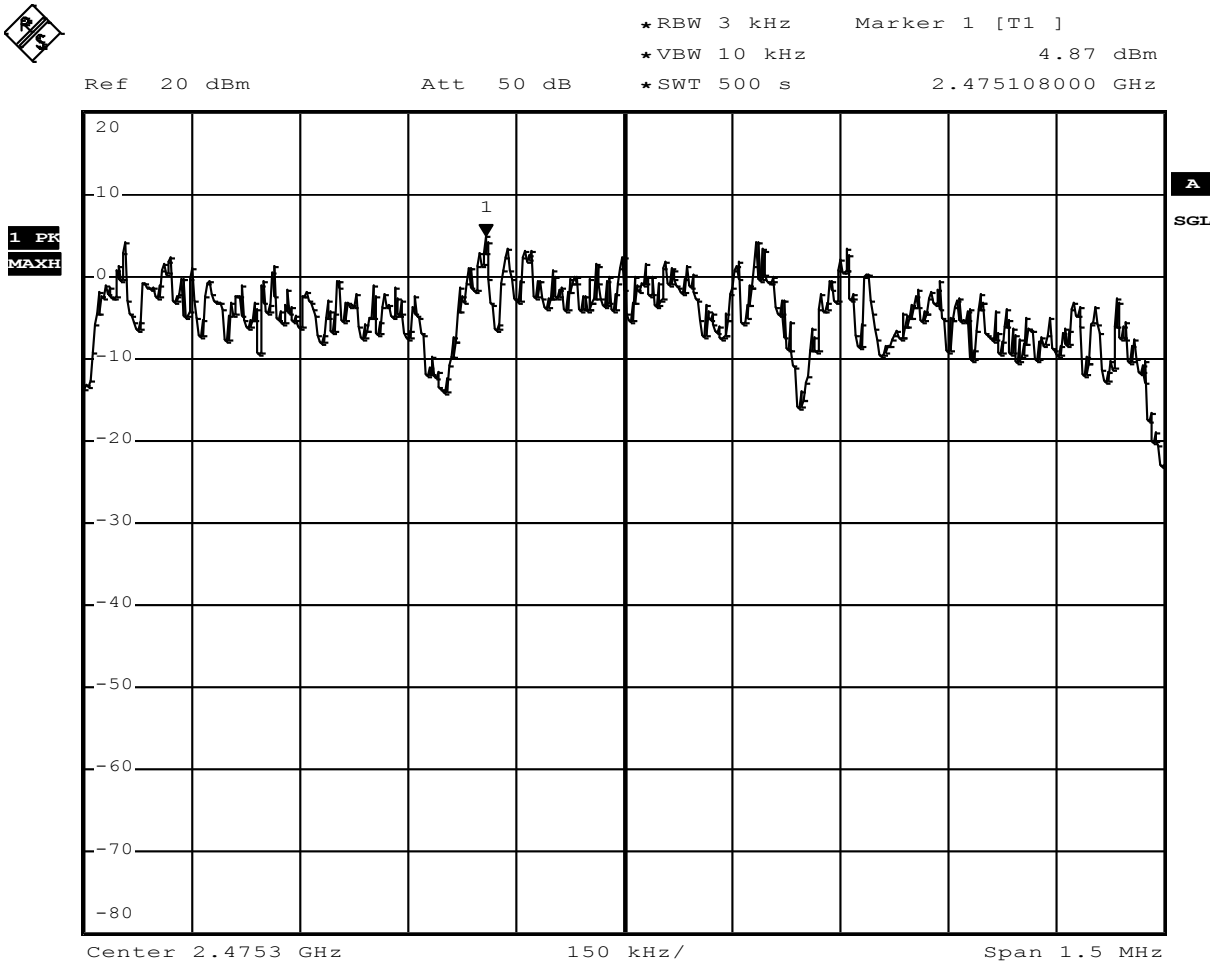
FCC part 15.247 (d)
Power spectral density (PSD)

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d) (PSD Option1)
Comment 1	Power spectral density conducted
Comment 2	Channel : 2440 MHz
Comment 3	DSSS



FCC part 15.247 (d)
Power spectral density (PSD)

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d) (PSD Option1)
Comment 1	Power spectral density conducted
Comment 2	Channel : 2475 MHz
Comment 3	DSSS

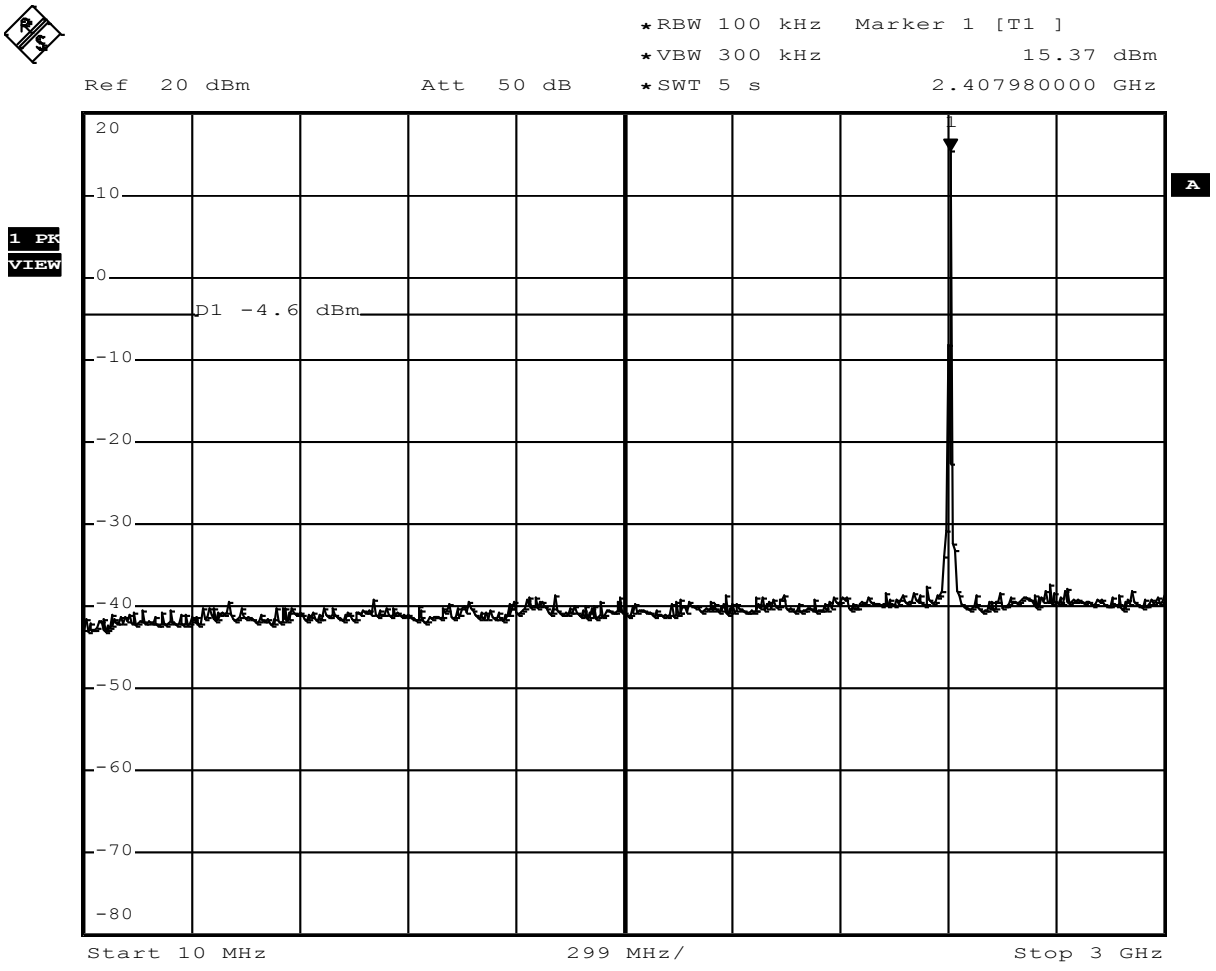


Date: 24.FEB.2010 15:12:37

Annex D Conducted Spurious Emissions

FCC part 15.247 (d)
Spurious Emissions

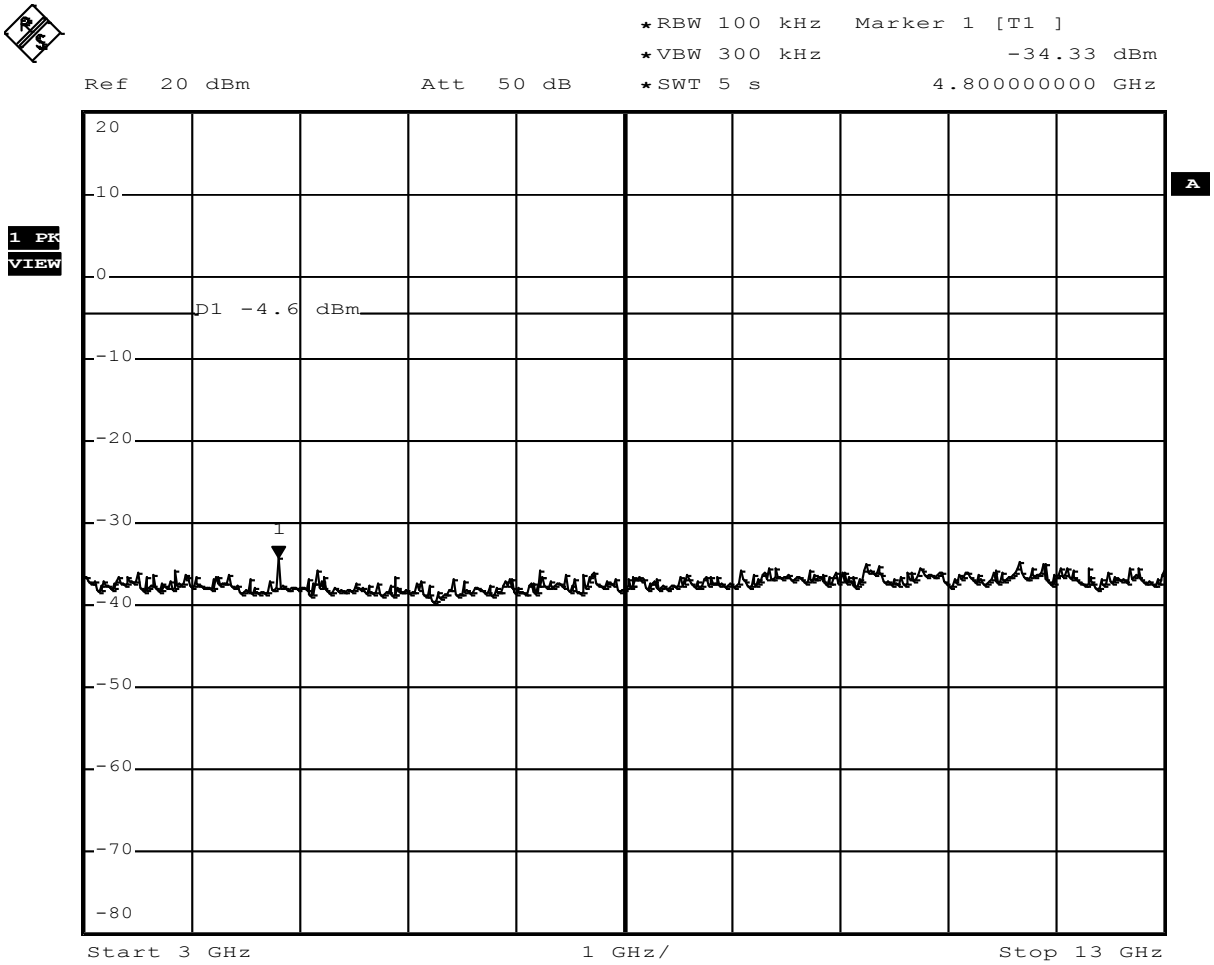
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2405 MHz
Comment 3	DSSS



Date: 25.FEB.2010 08:30:35

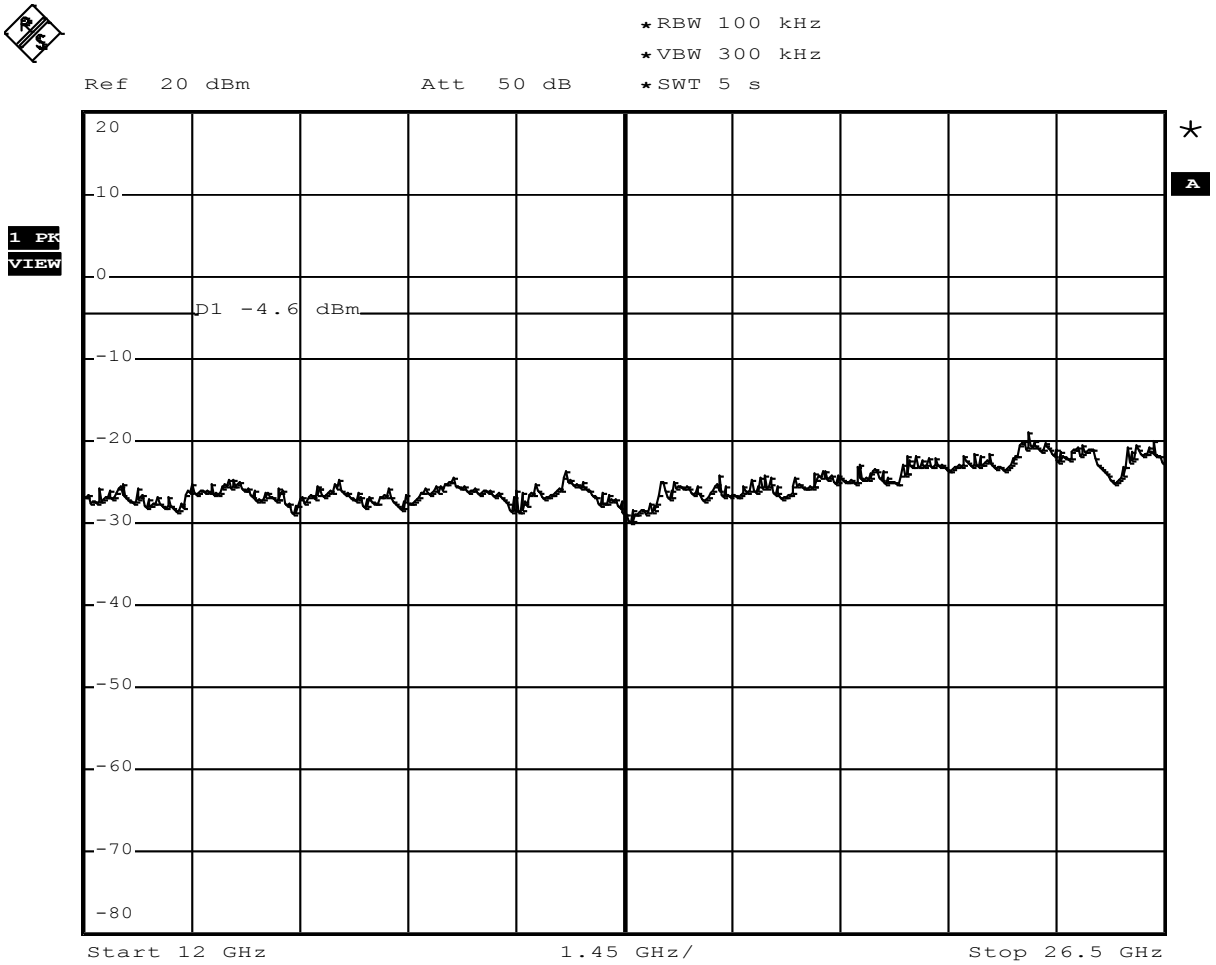
FCC part 15.247 (d)
Spurious Emissions

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2405 MHz
Comment 3	DSSS



FCC part 15.247 (d)
Spurious Emissions

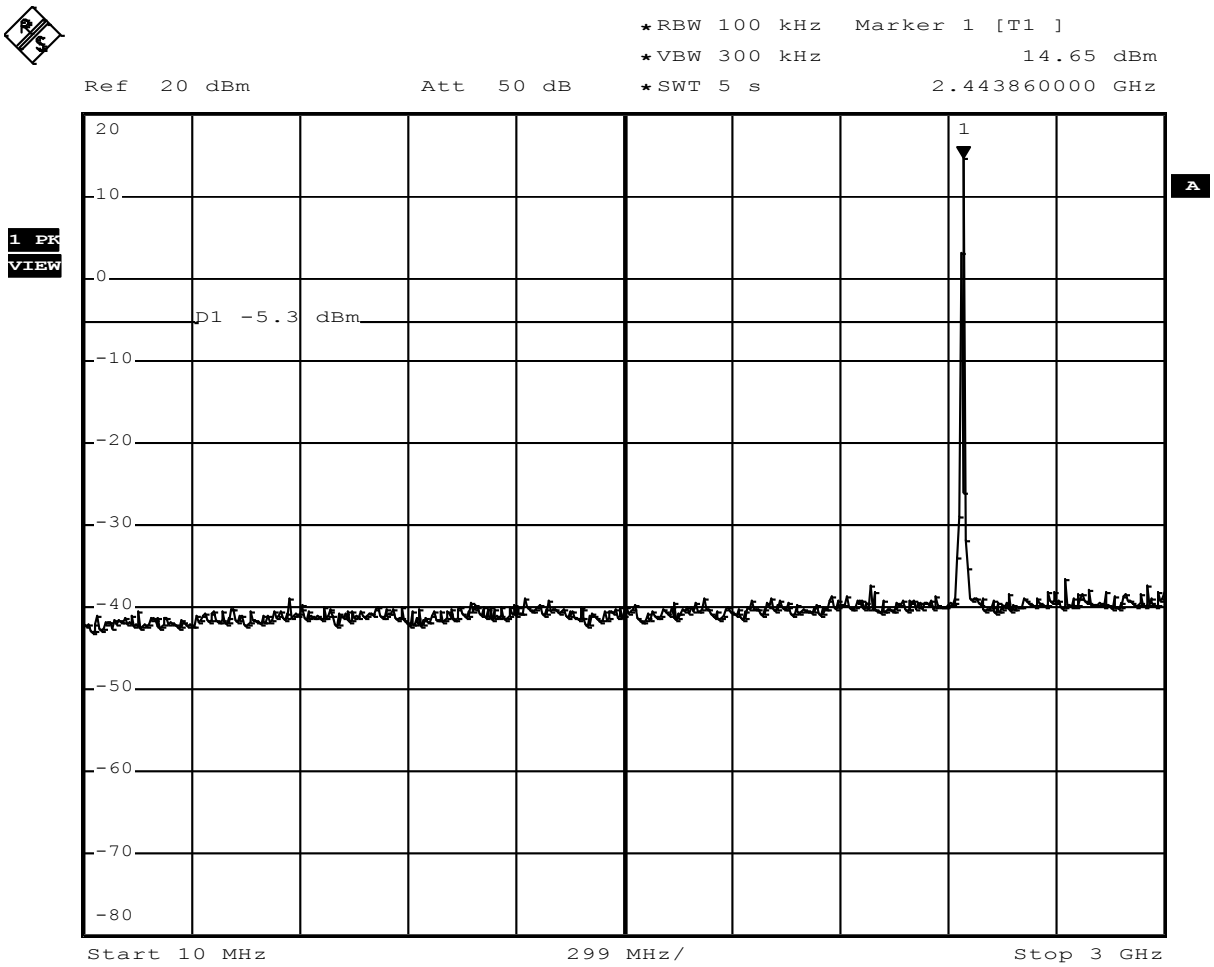
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2405 MHz
Comment 3	DSSS



Date: 25.FEB.2010 08:33:13

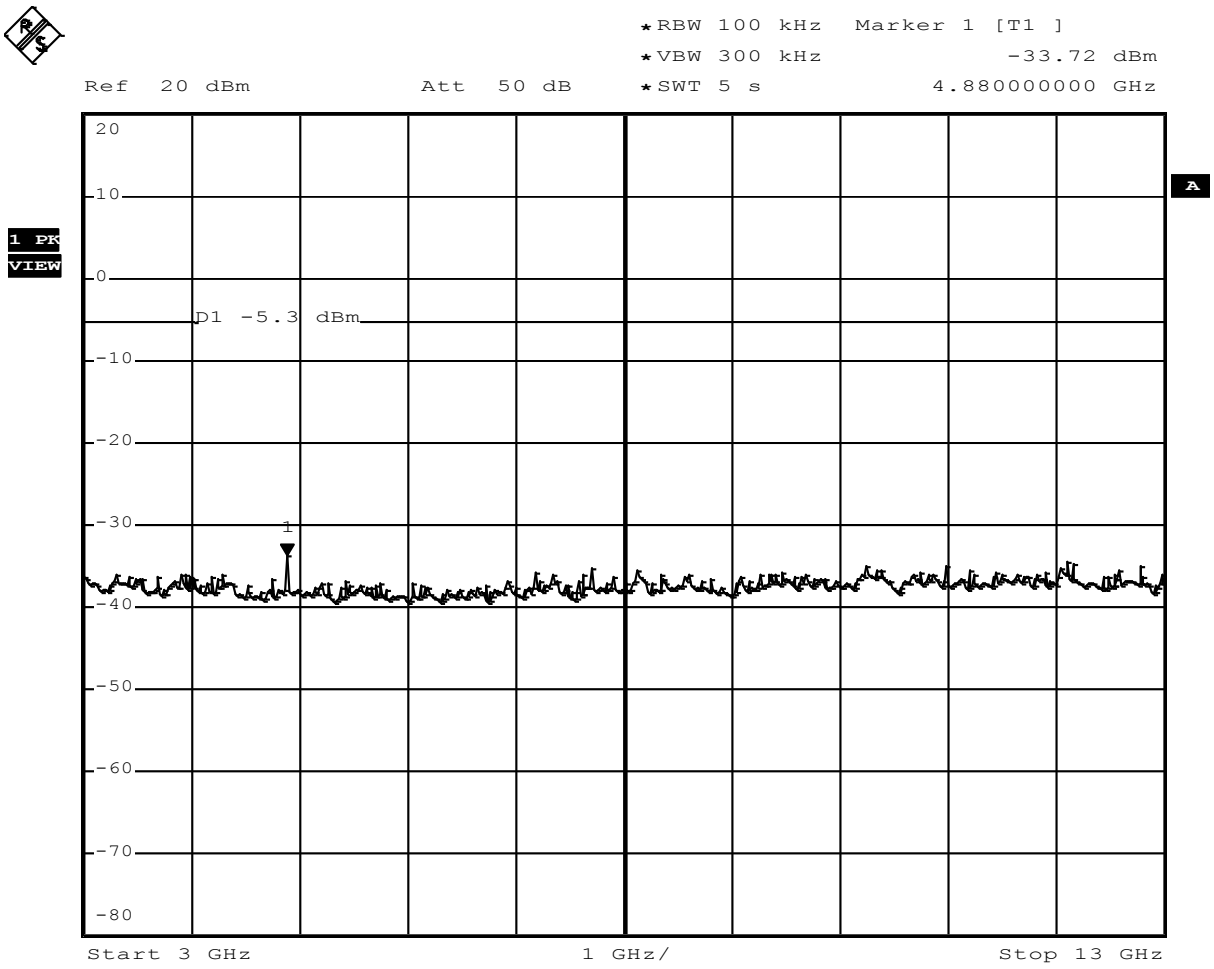
FCC part 15.247 (d)
Spurious Emissions

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2440 MHz
Comment 3	DSSS



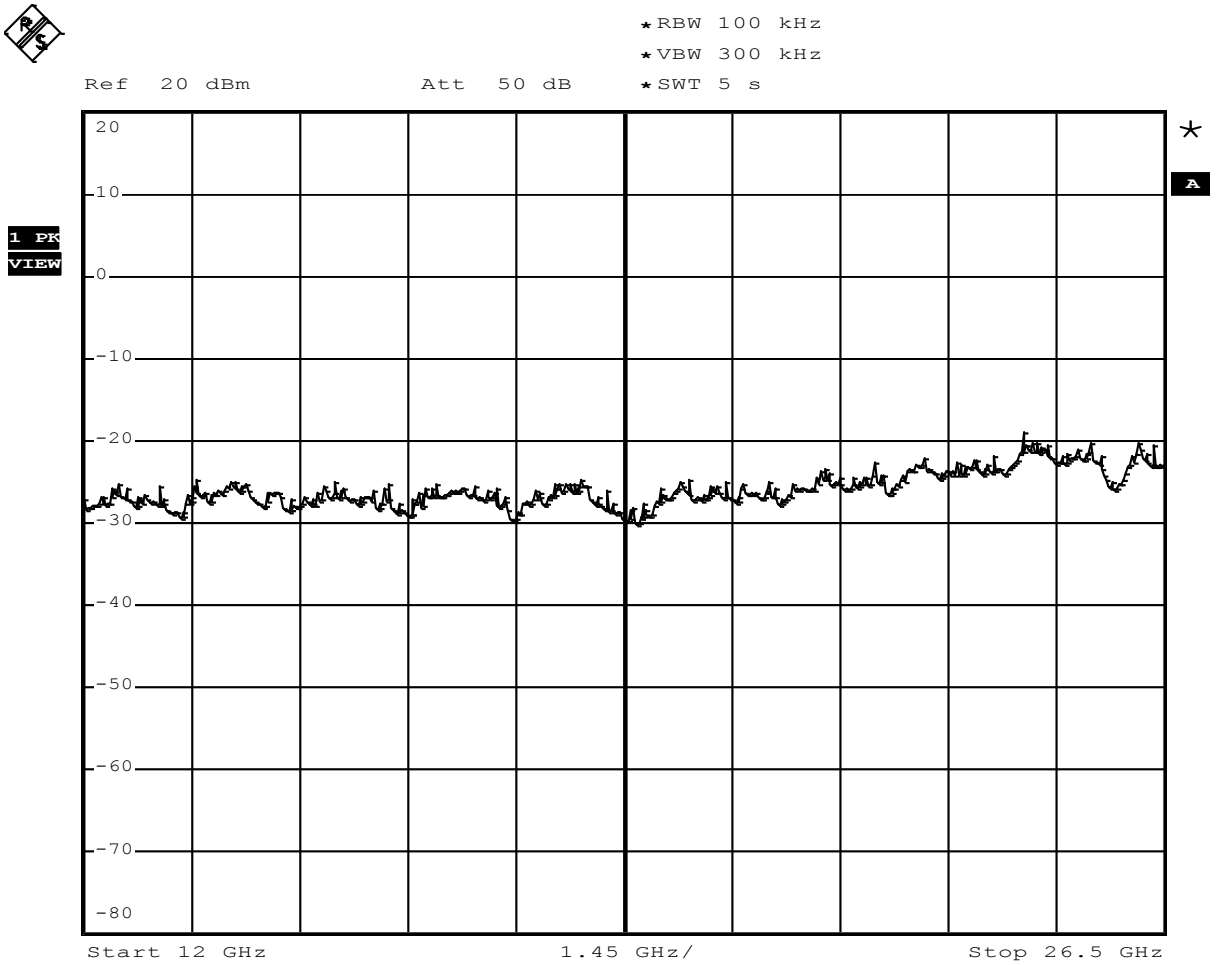
FCC part 15.247 (d)
Spurious Emissions

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2440 MHz
Comment 3	DSSS



FCC part 15.247 (d)
Spurious Emissions

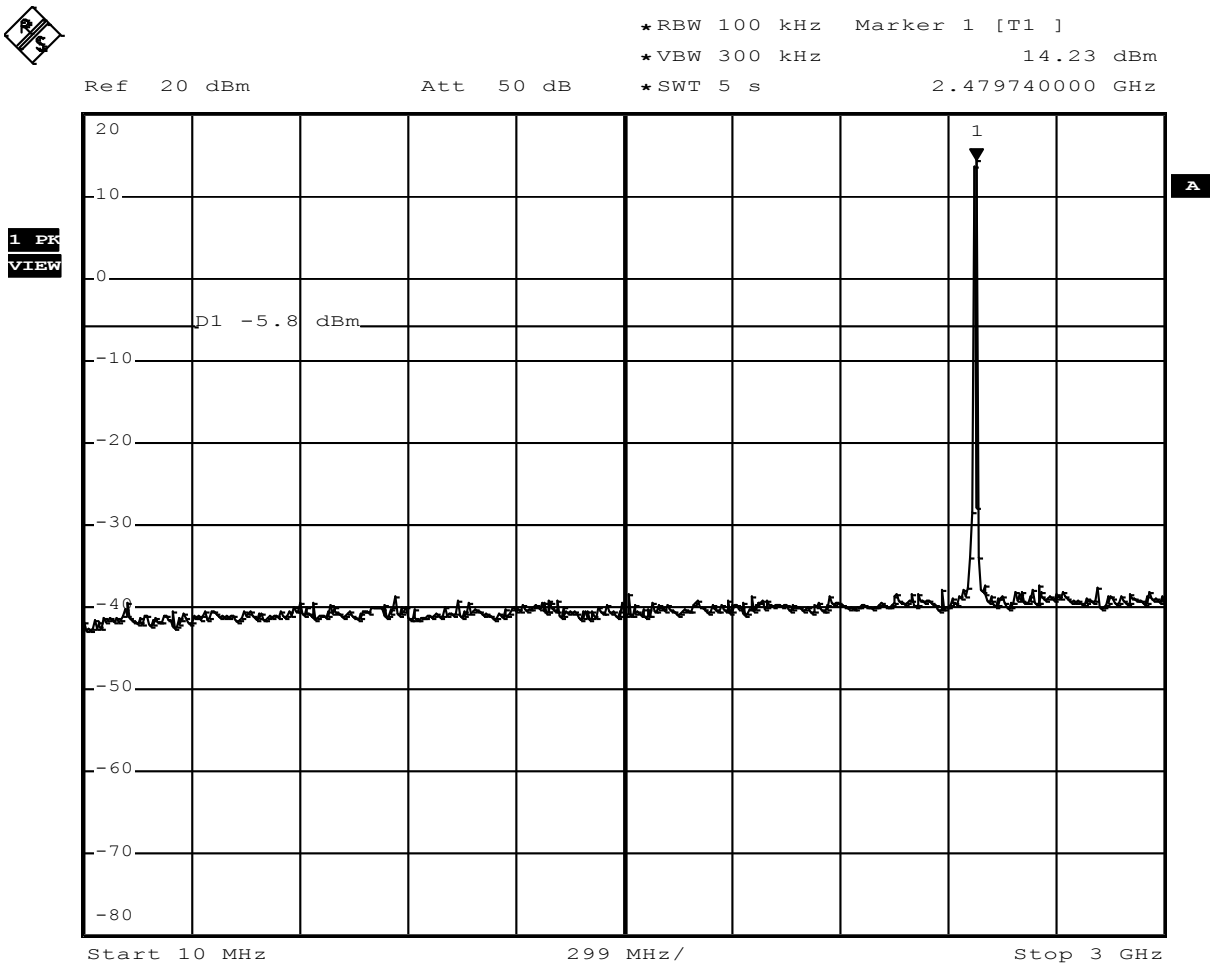
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2440 MHz
Comment 3	DSSS



Date: 25.FEB.2010 09:12:33

FCC part 15.247 (d)
Spurious Emissions

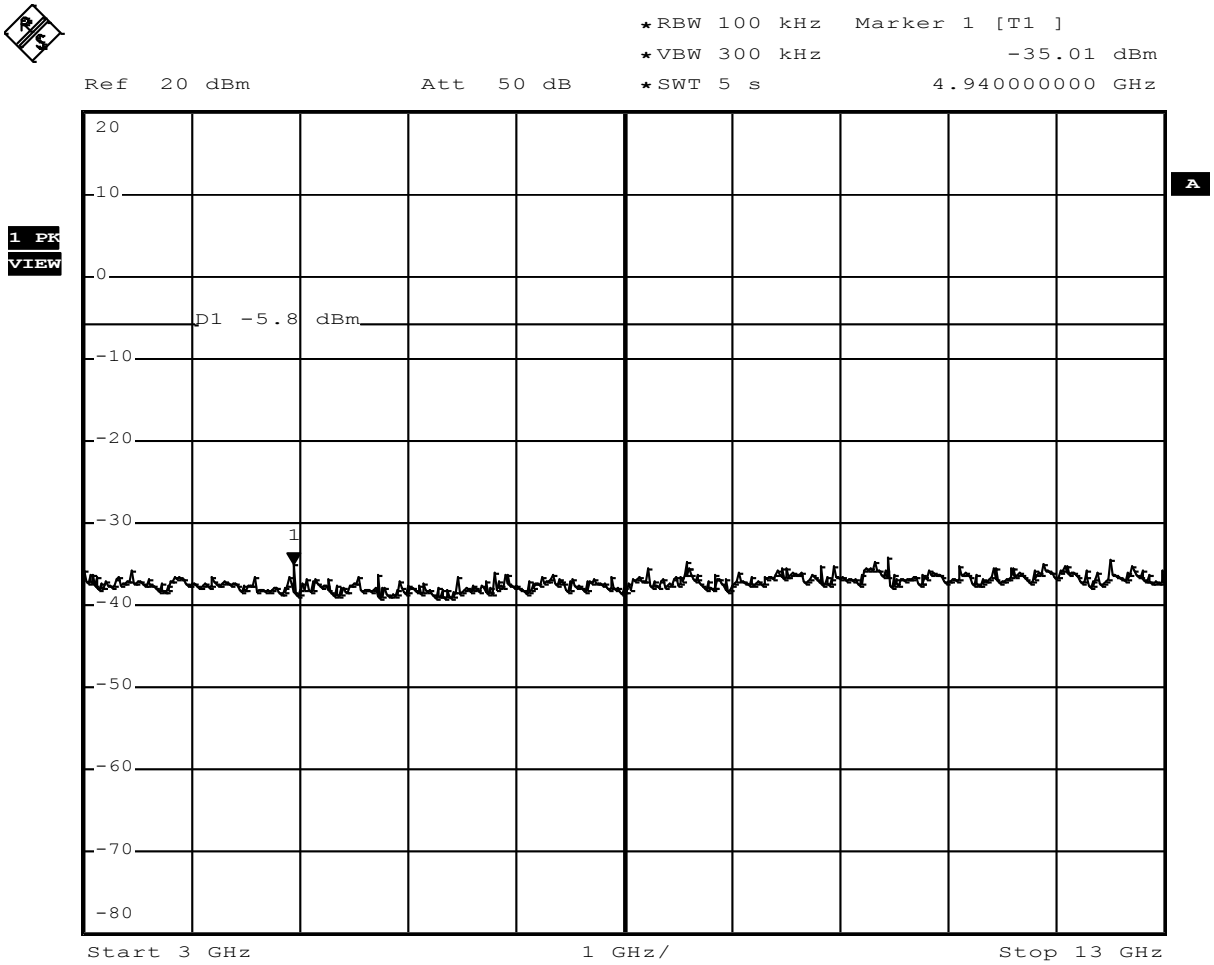
EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2475 MHz
Comment 3	DSSS



Date: 25.FEB.2010 09:15:40

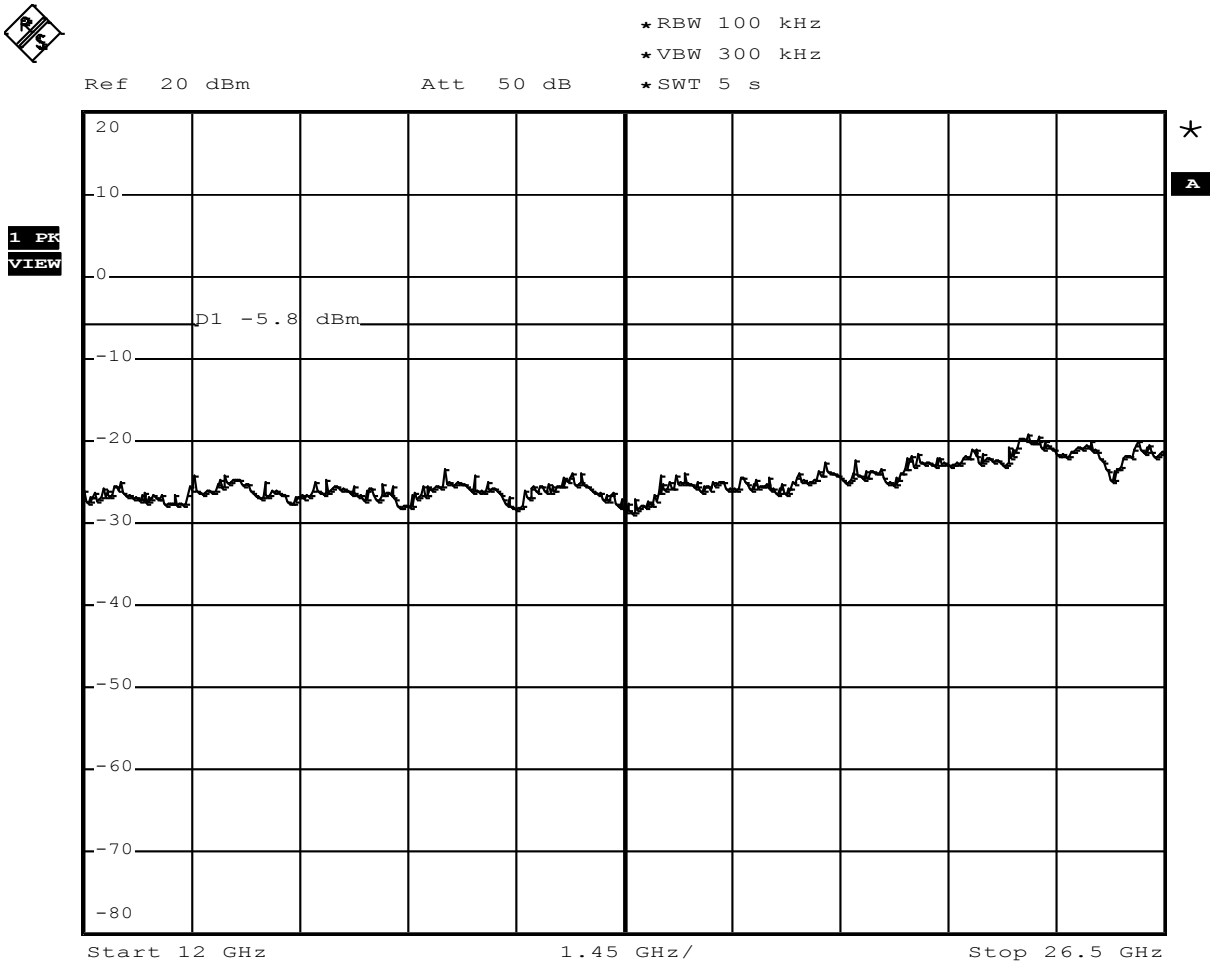
FCC part 15.247 (d)
Spurious Emissions

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel: 2475 MHz
Comment 3	DSSS



FCC part 15.247 (d)
Spurious Emissions

EUT	802.15.4 module
Model	PAN4561 High
Approval Holder	Panasonic Electronic Devices Europ GmbH
Temperature / Voltage	23°C / Vnom: 3.0 V
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2475 MHz
Comment 3	DSSS



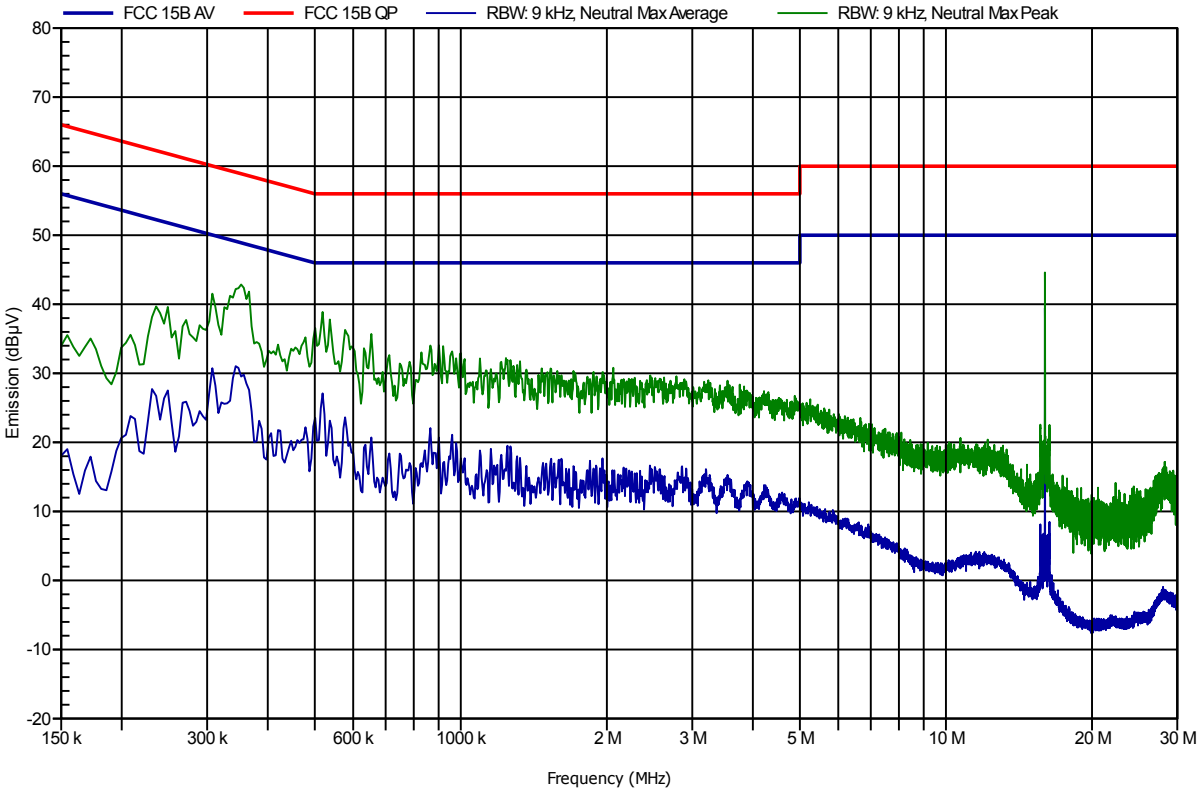
Date: 25.FEB.2010 09:21:41

Annex E AC Power Line Conducted Emissions

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

Ordernumber: G0M21002-2884

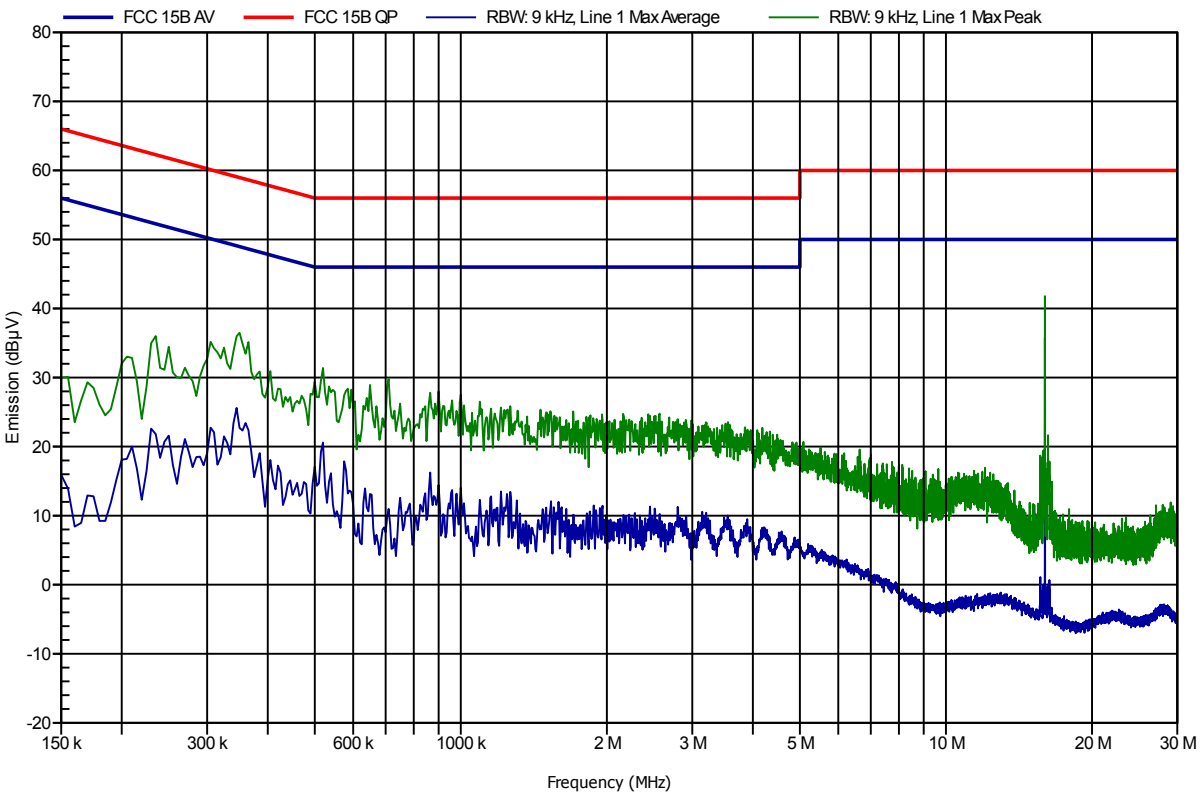
Manufacturer:	Panasonic Electronic Devices Europe GmbH
EUT Name:	802.15.4 module
Model:	PAN4561 High/Mid
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Marquardt
Test Conditions:	Tnom: 23°C, Unom: 120 VAC (AC/DC adaptor)
LISN:	ESH2-Z5 N
Mode:	Power Supply 3A-061WP5
Test Date:	02.03.2010



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

Ordernumber: G0M21002-2884

Manufacturer:	Panasonic Electronic Devices Europe GmbH
EUT Name:	802.15.4 module
Model:	PAN4561 High/Mid
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Marquardt
Test Conditions:	Tnom: 23°C, Unom: 120 VAC (AC/DC adaptor)
LISN:	ESH2-Z5 L
Mode:	Power Supply 3A-061WP5
Test Date:	02.03.2010

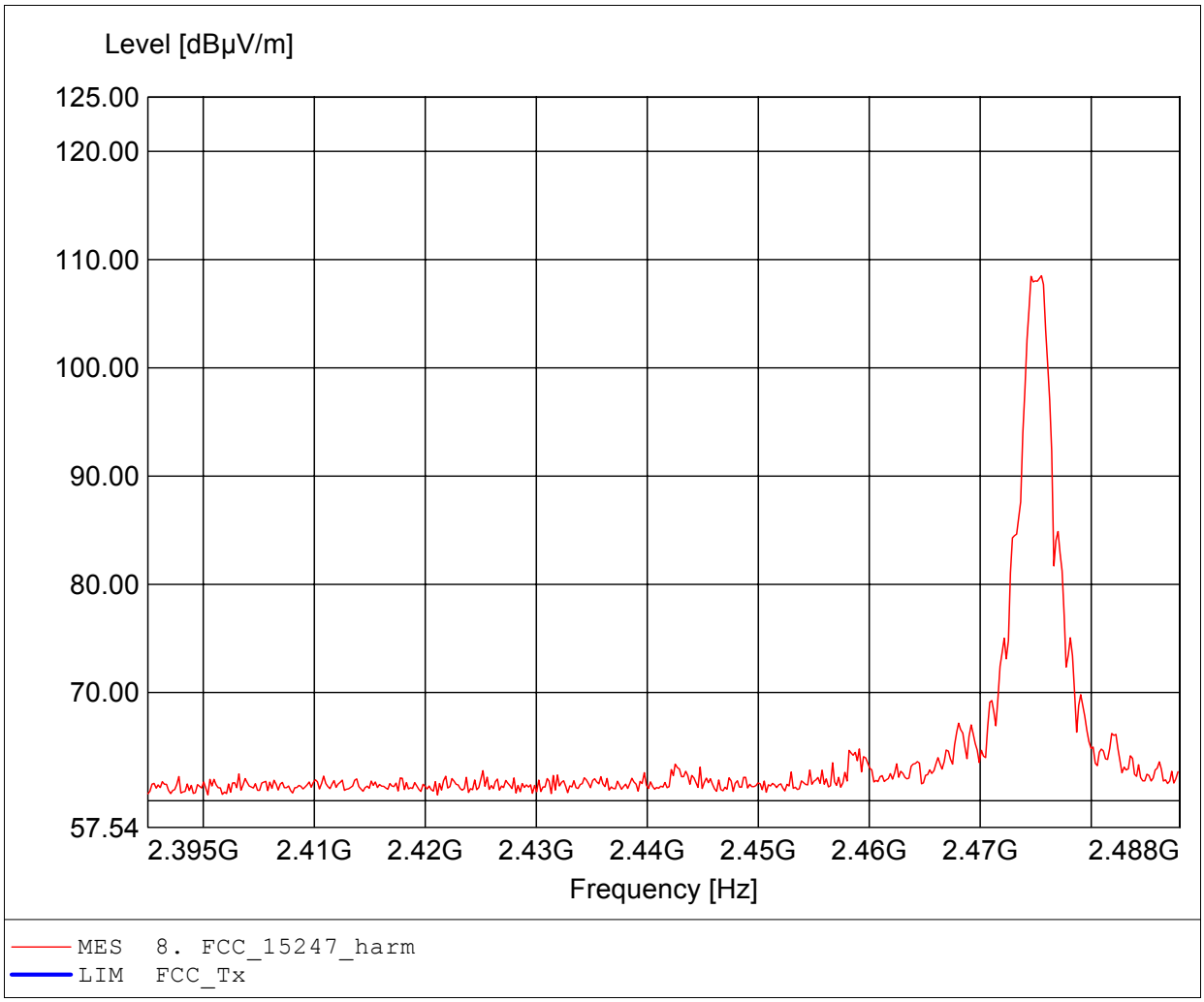


Annex F Transmitter Spurious Emissions

Carrier power (Field Strength)

FCC RULES PART 15, SUBPART C

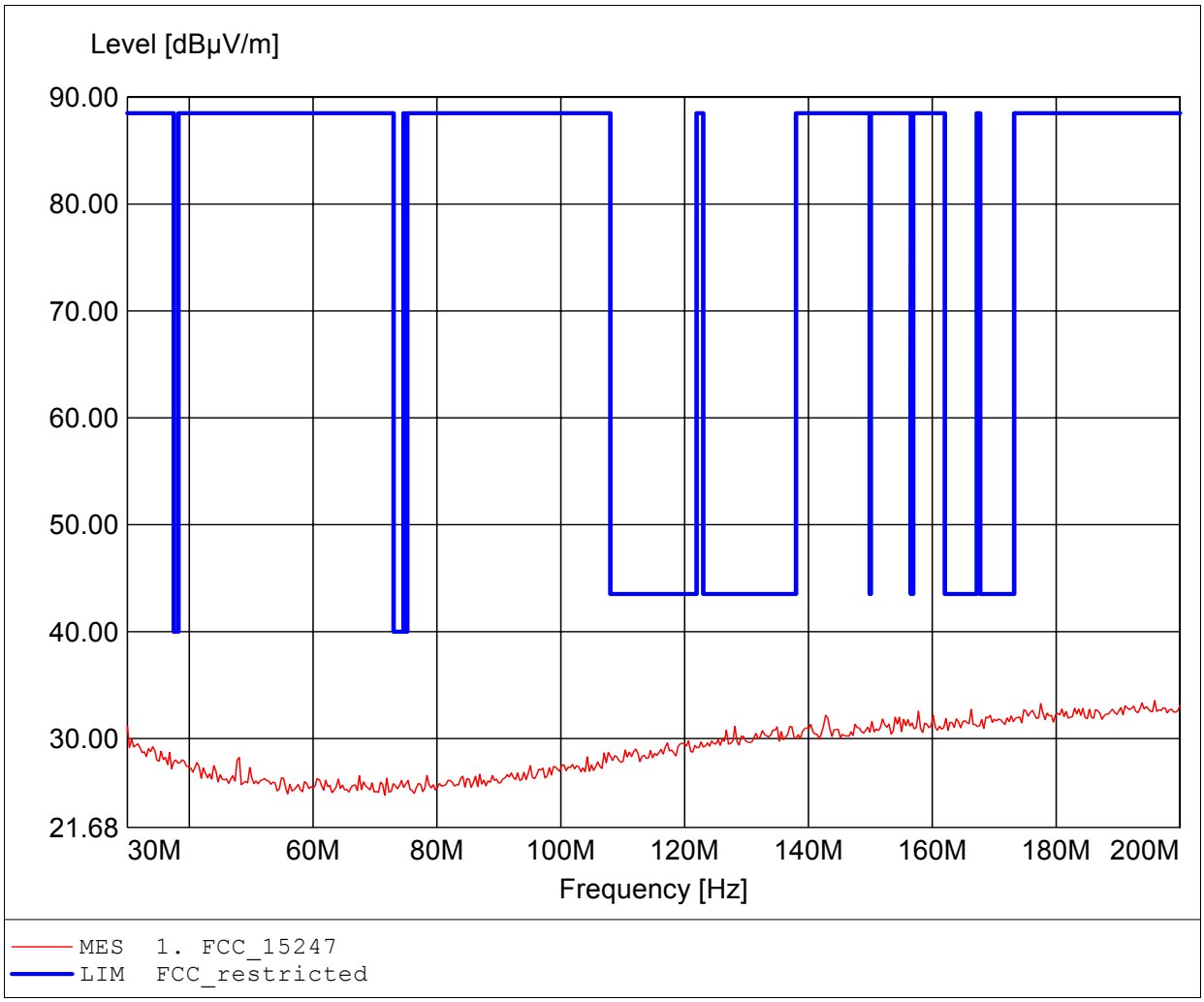
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 Standard / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: BBHA9120D
Comment 2:	Freq: 2.476GHz, Emax: 108.52dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

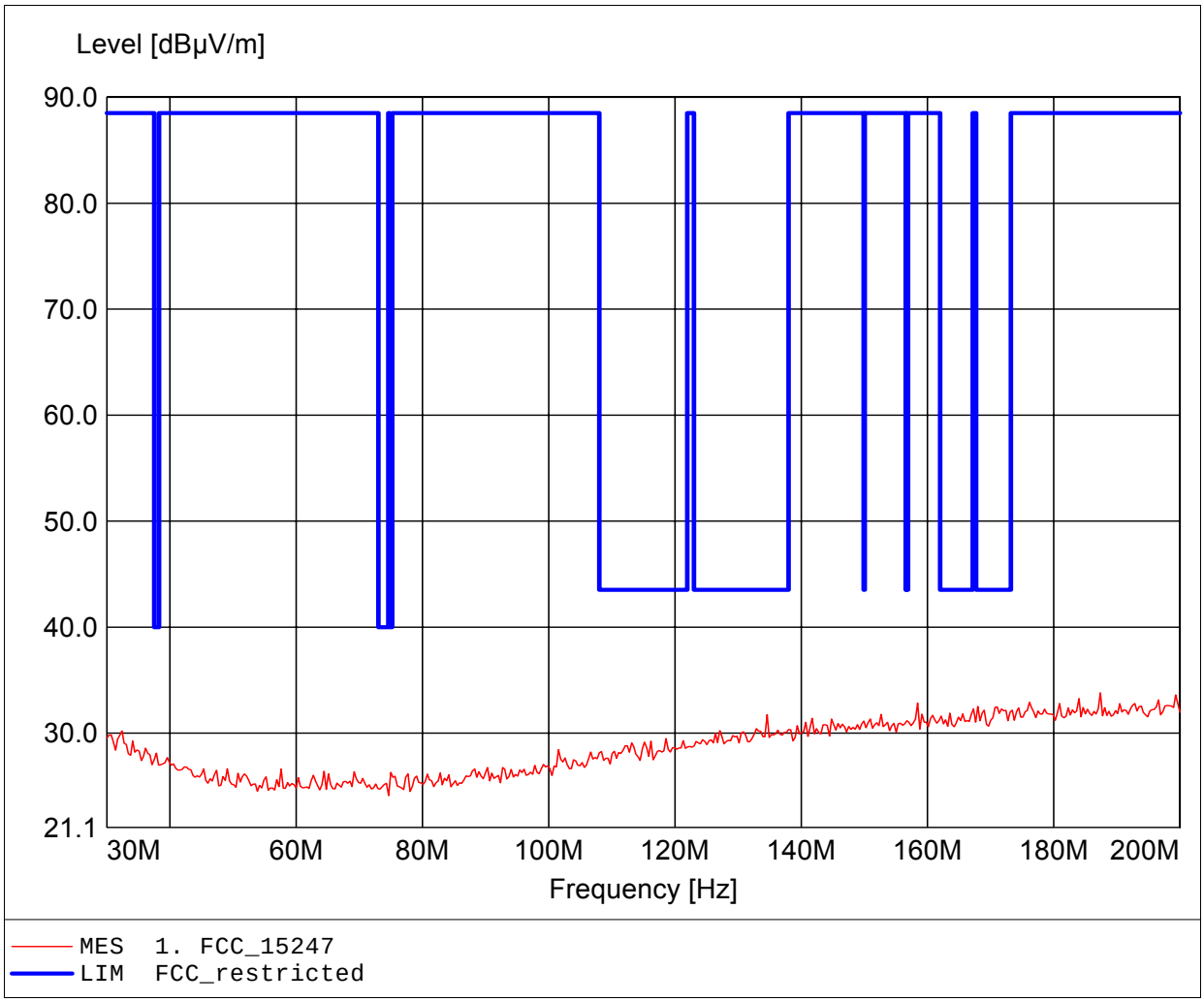
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq: 195.912MHz, Emax: 33.56dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

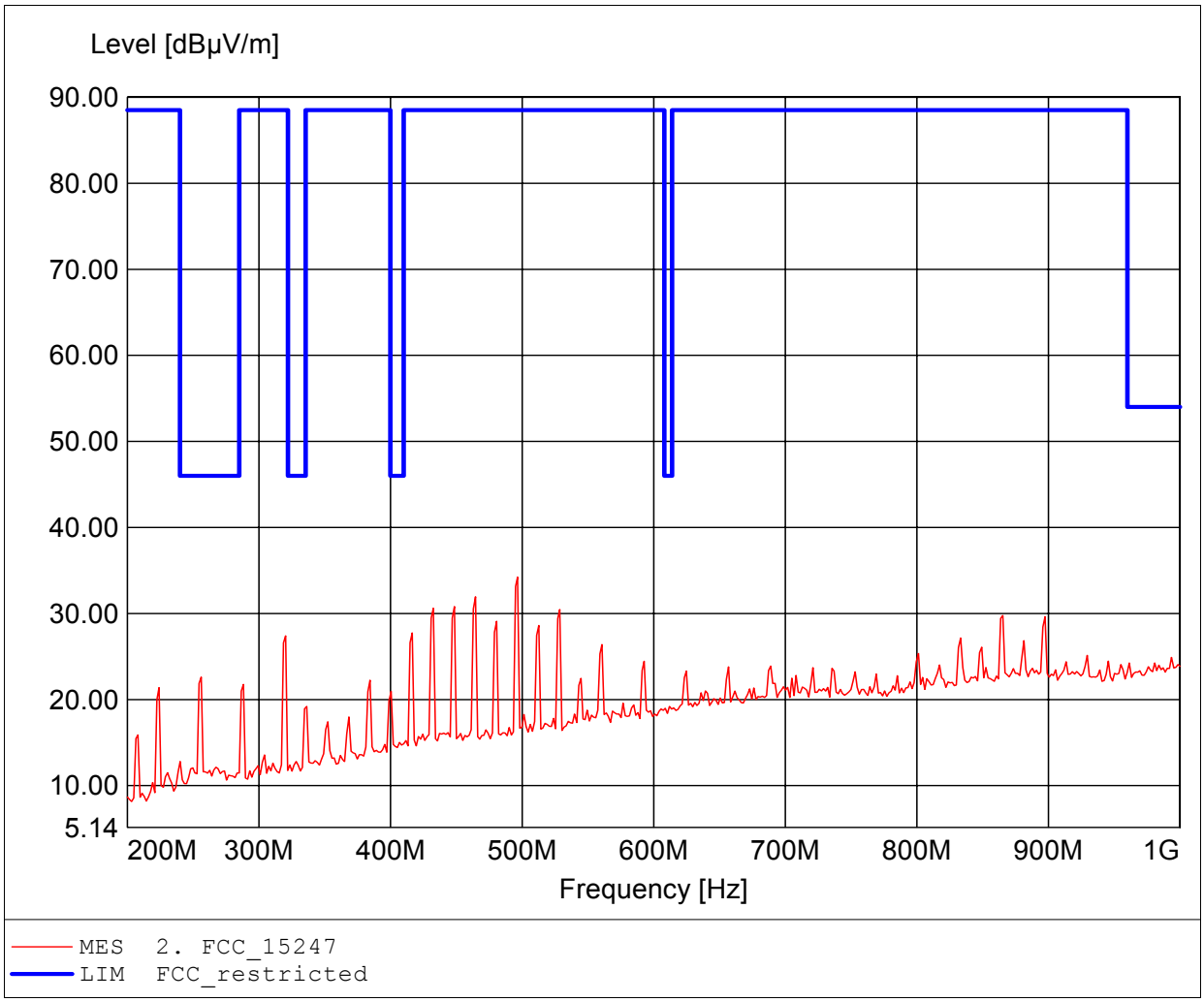
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq: 187.395MHz, Emax: 33.81dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

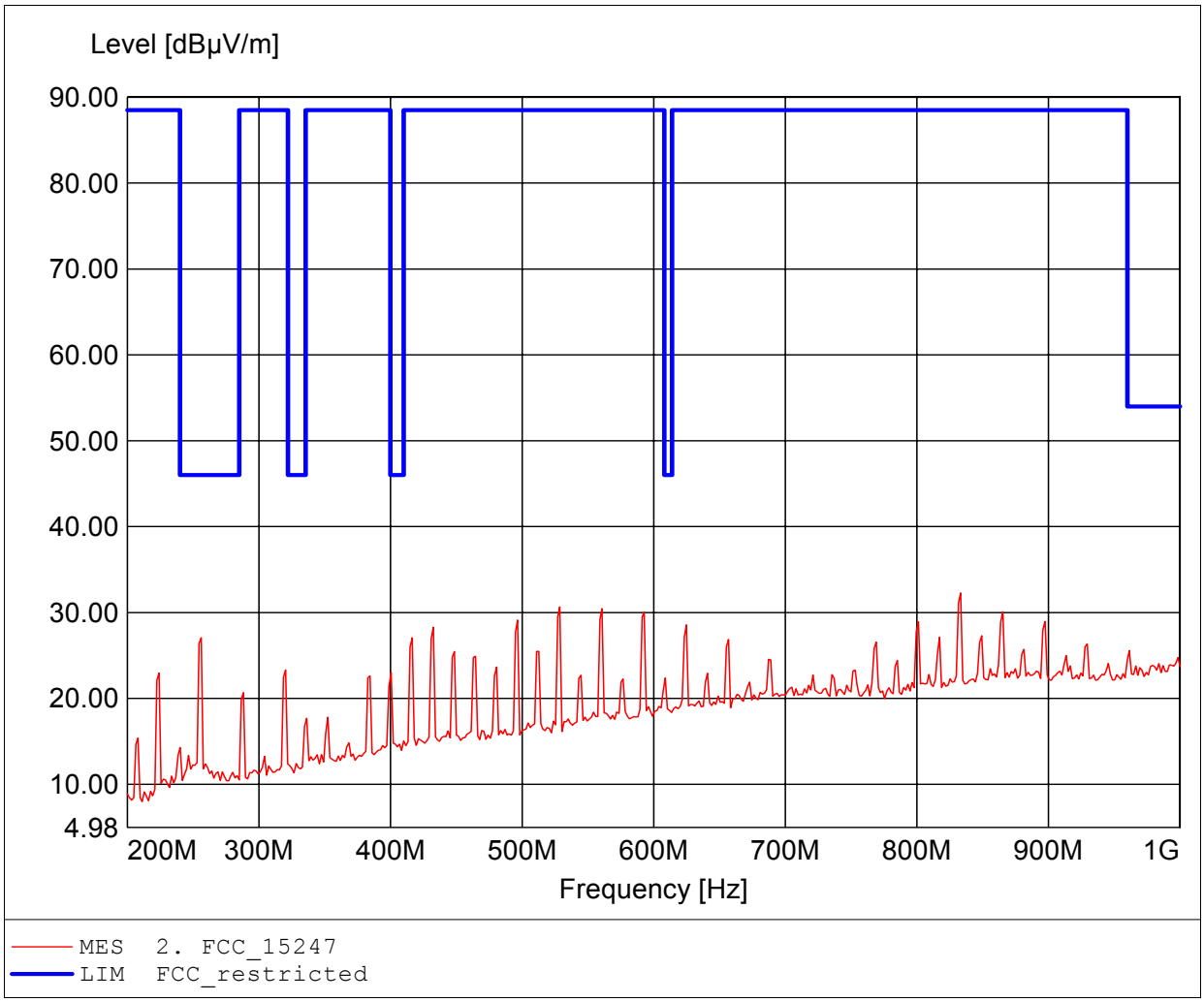
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
Comment 2:	Freq: 496.593MHz, Emax: 34.22dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

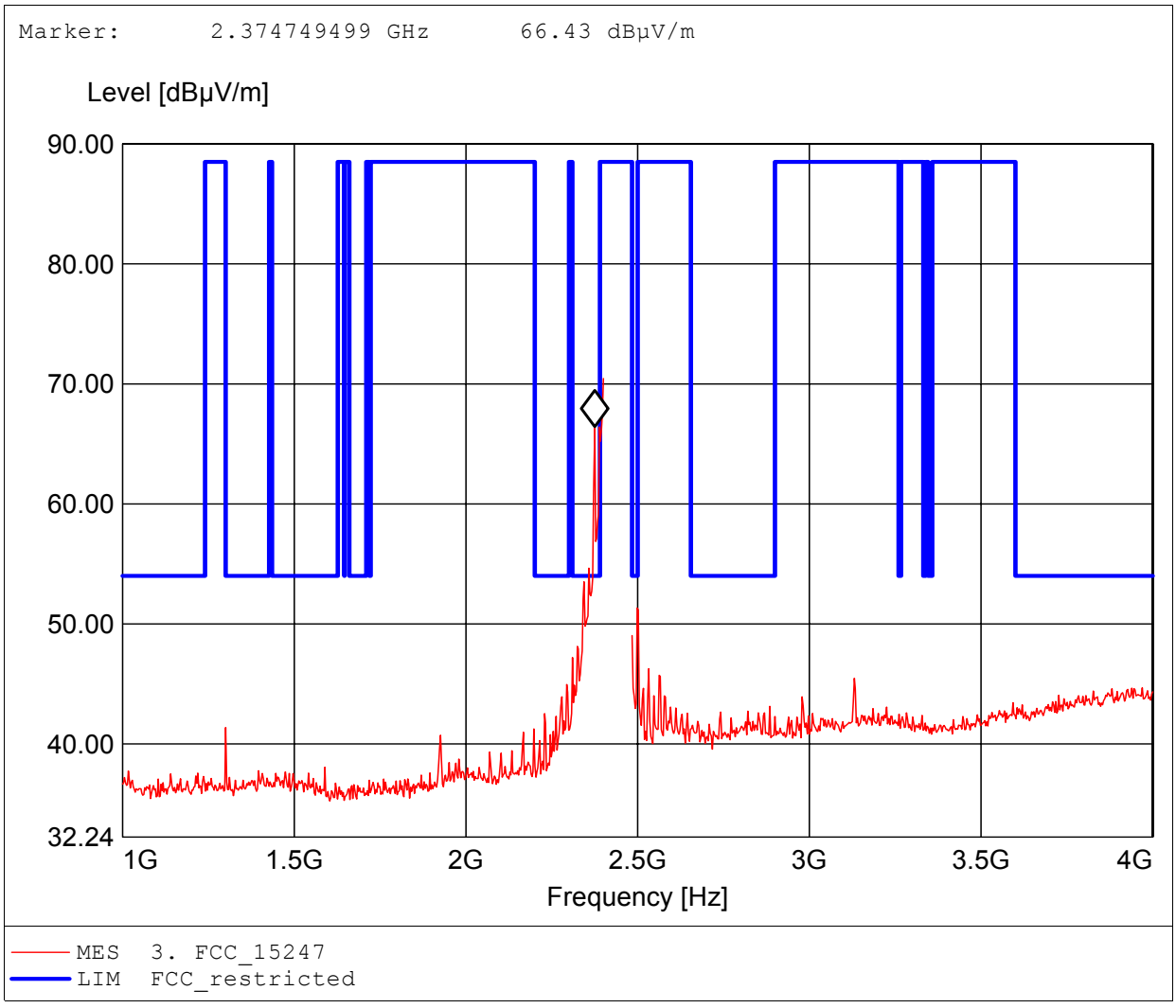
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz worst case
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
Comment 2:	Freq: 833.267MHz, Emax: 32.28dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

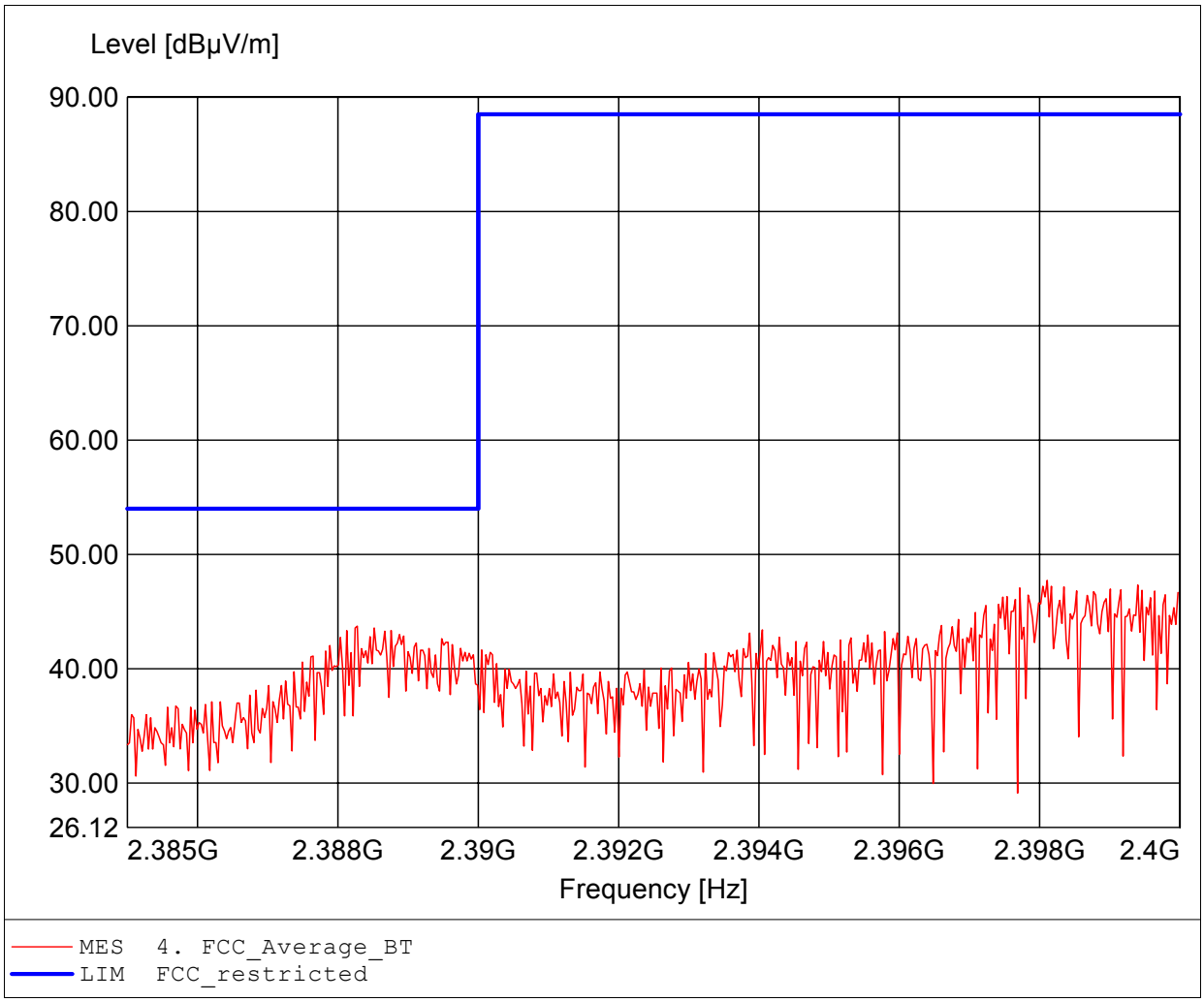
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.400GHz, Emax: 70.44dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

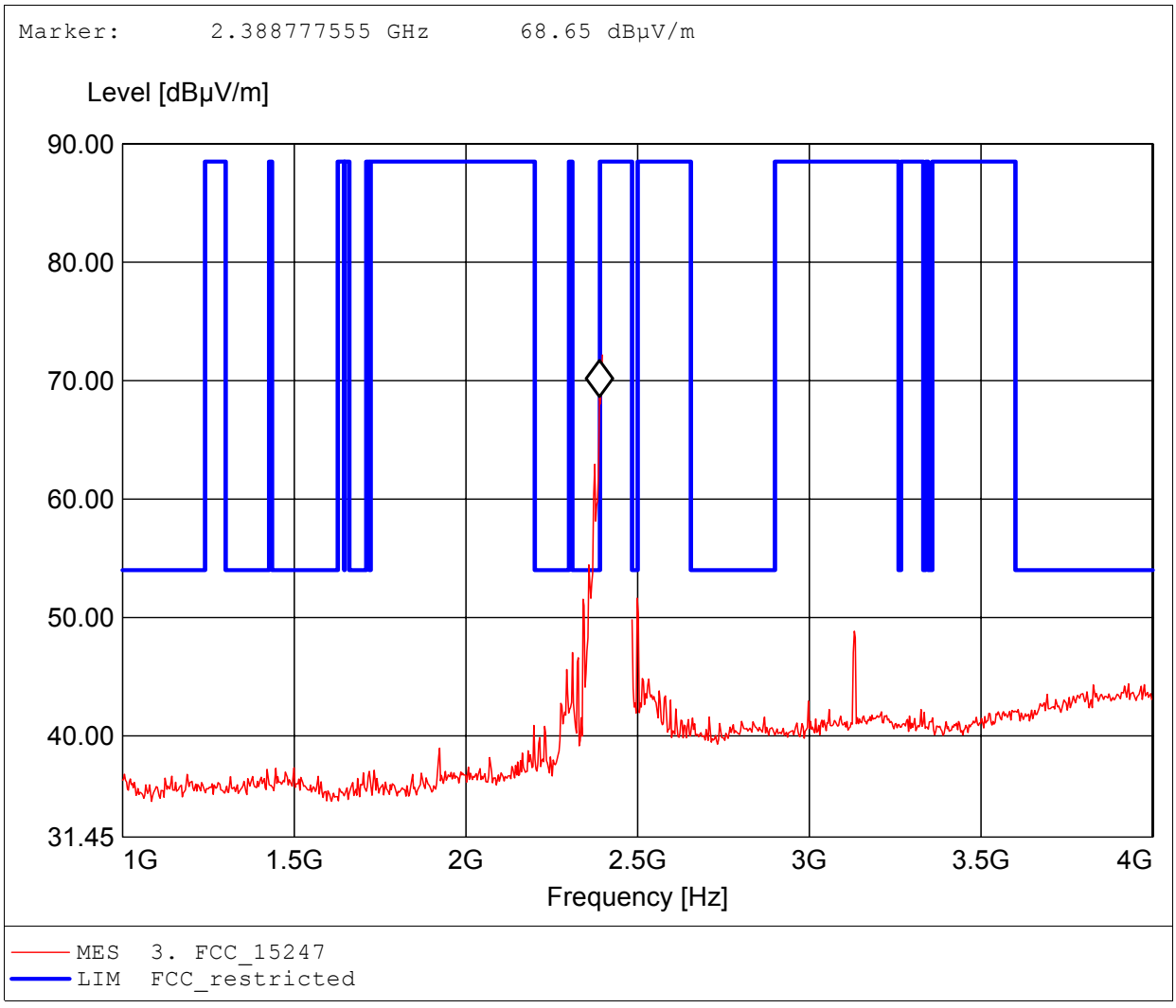
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 2.398GHz, Emax: 47.74dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

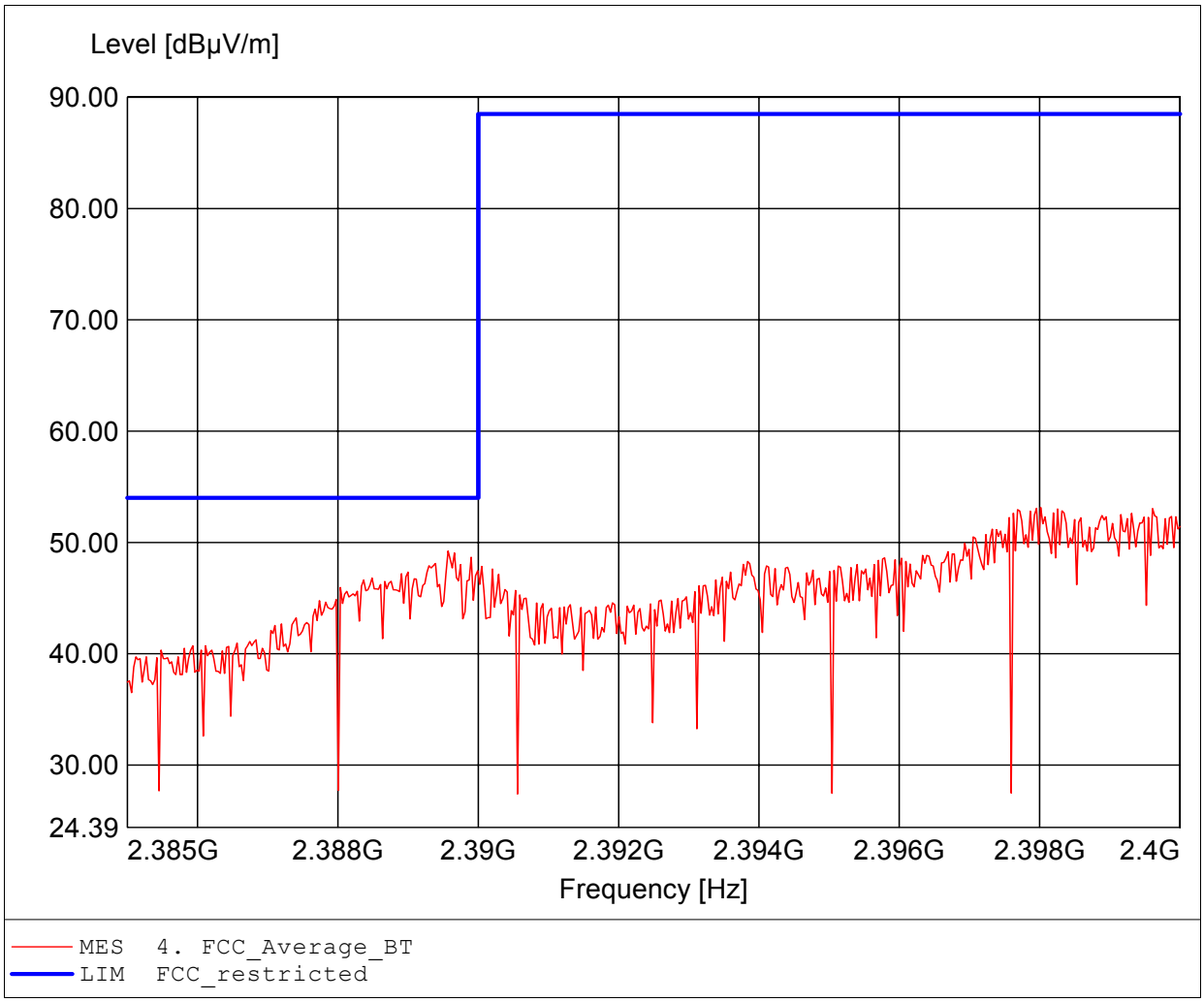
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.397GHz, Emax: 72.16dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

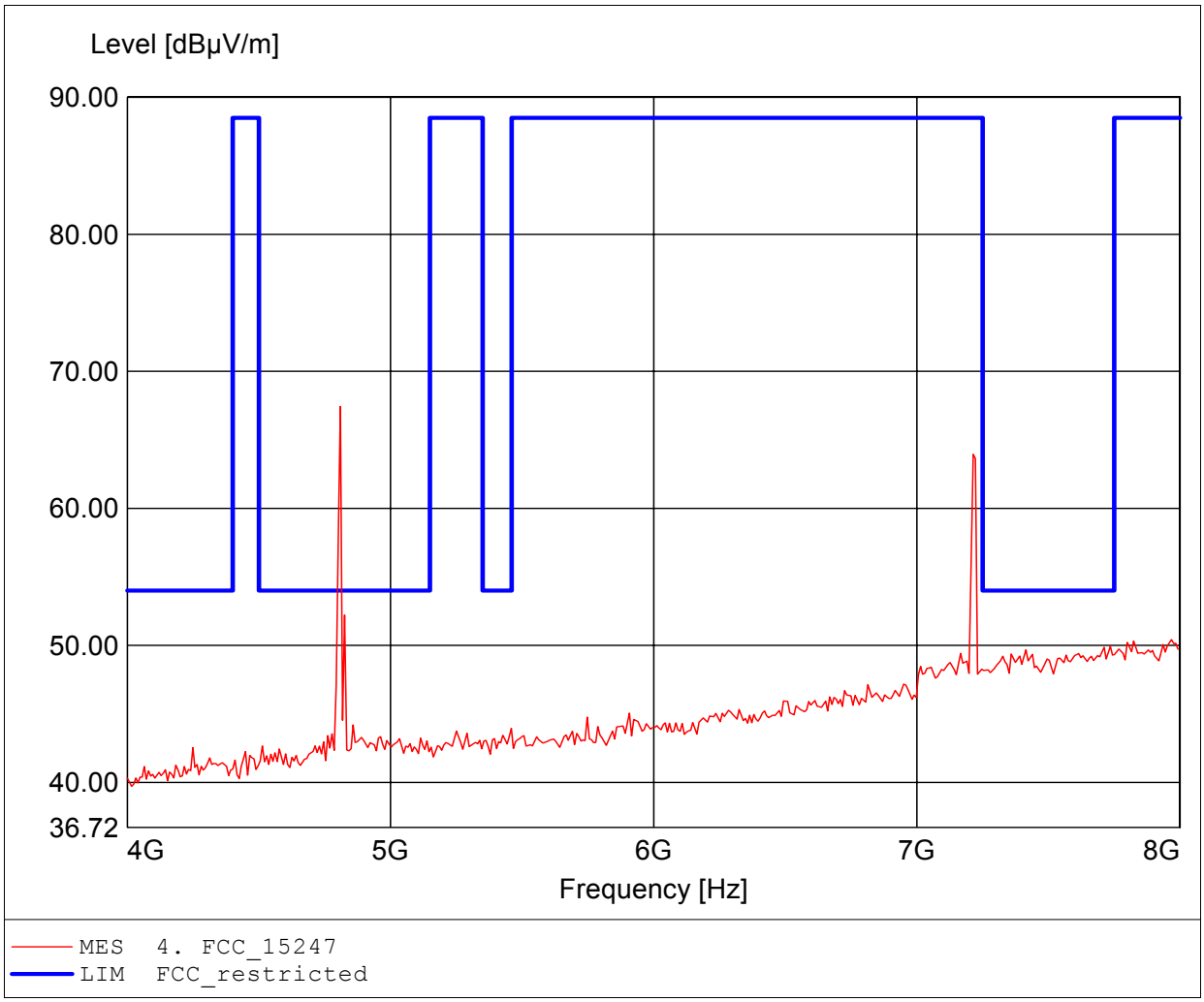
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 2.398GHz, Emax: 53.14dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

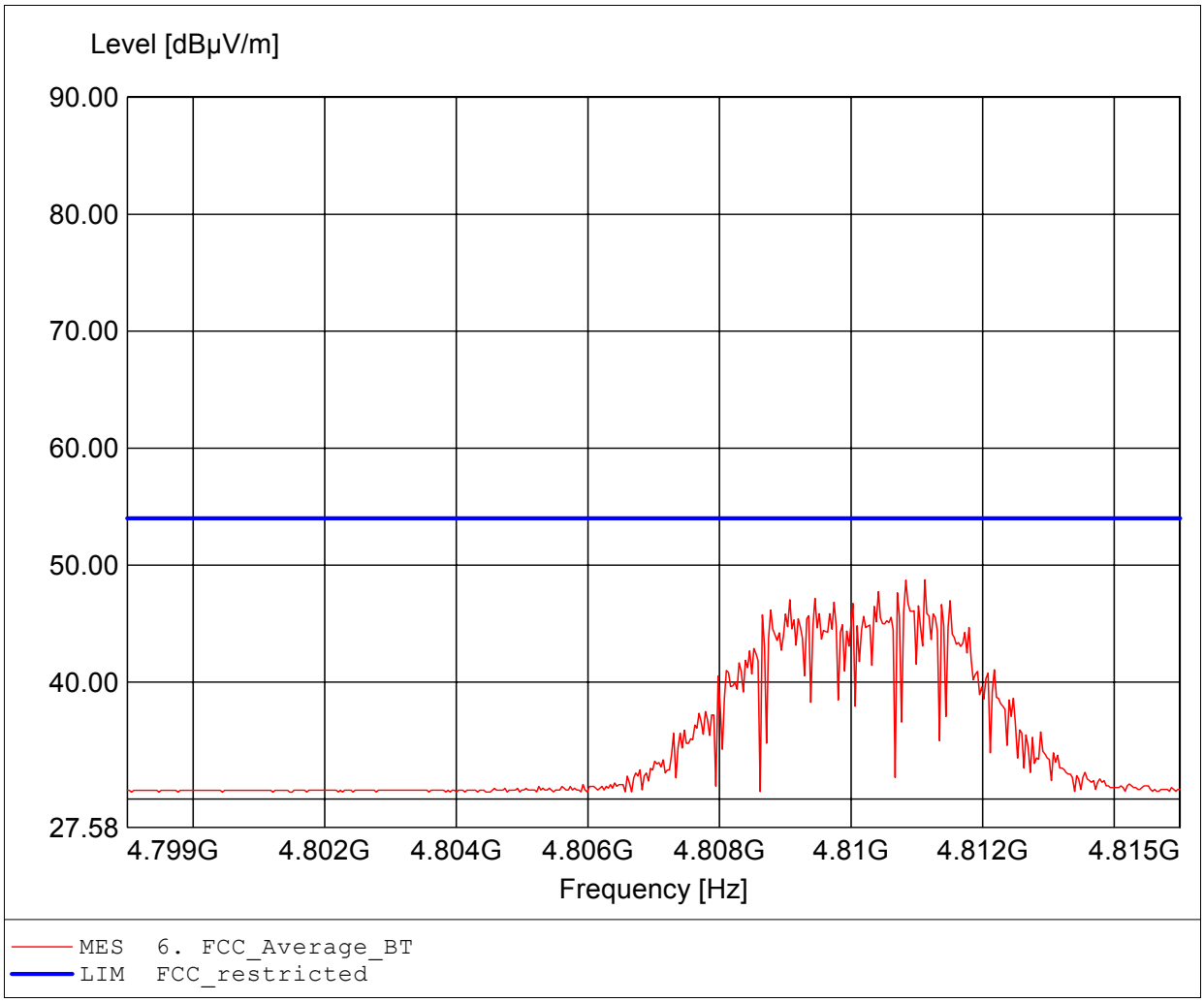
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 4.810GHz, Emax: 67.43dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

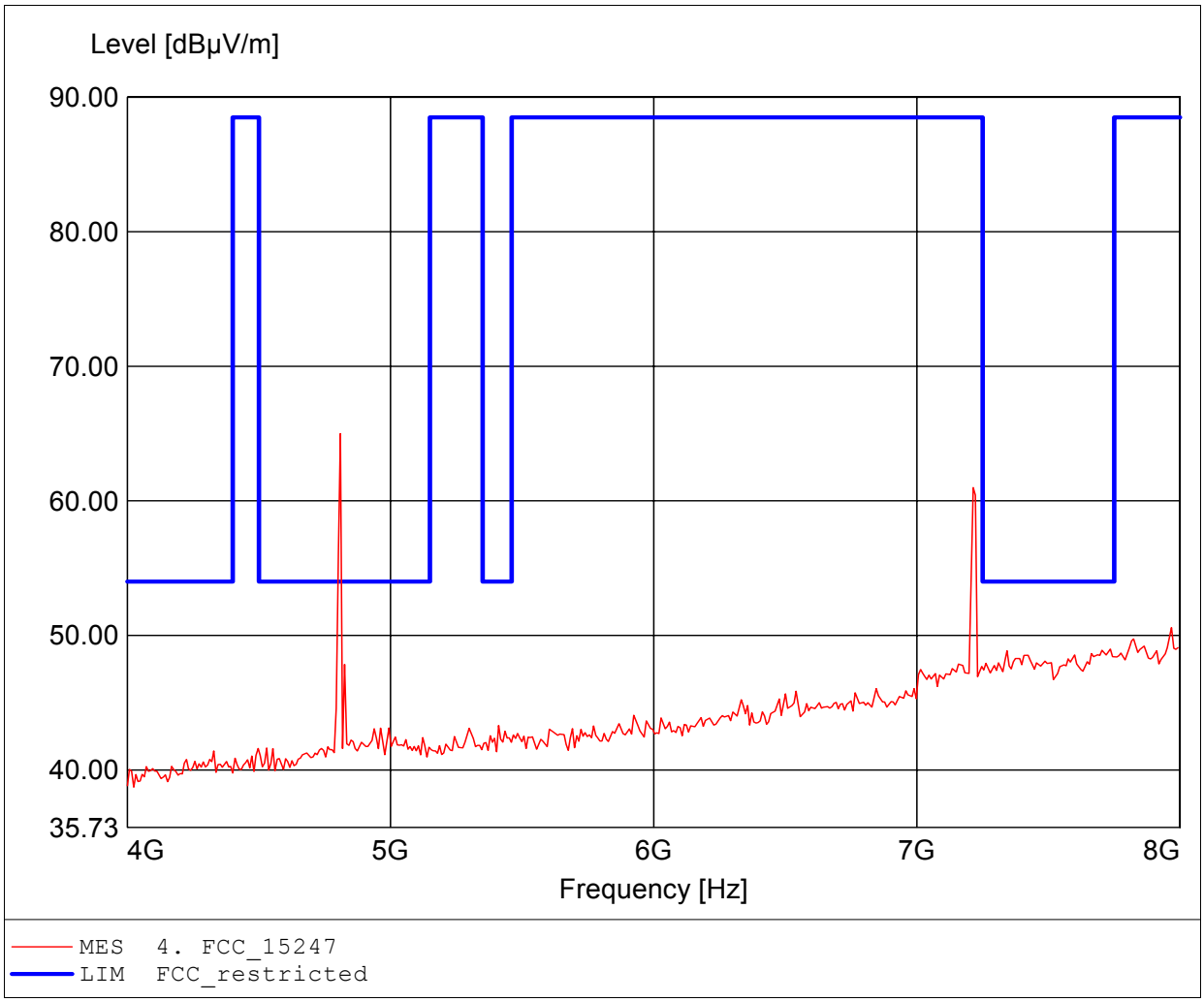
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 4.811GHz, Emax: 48.75dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

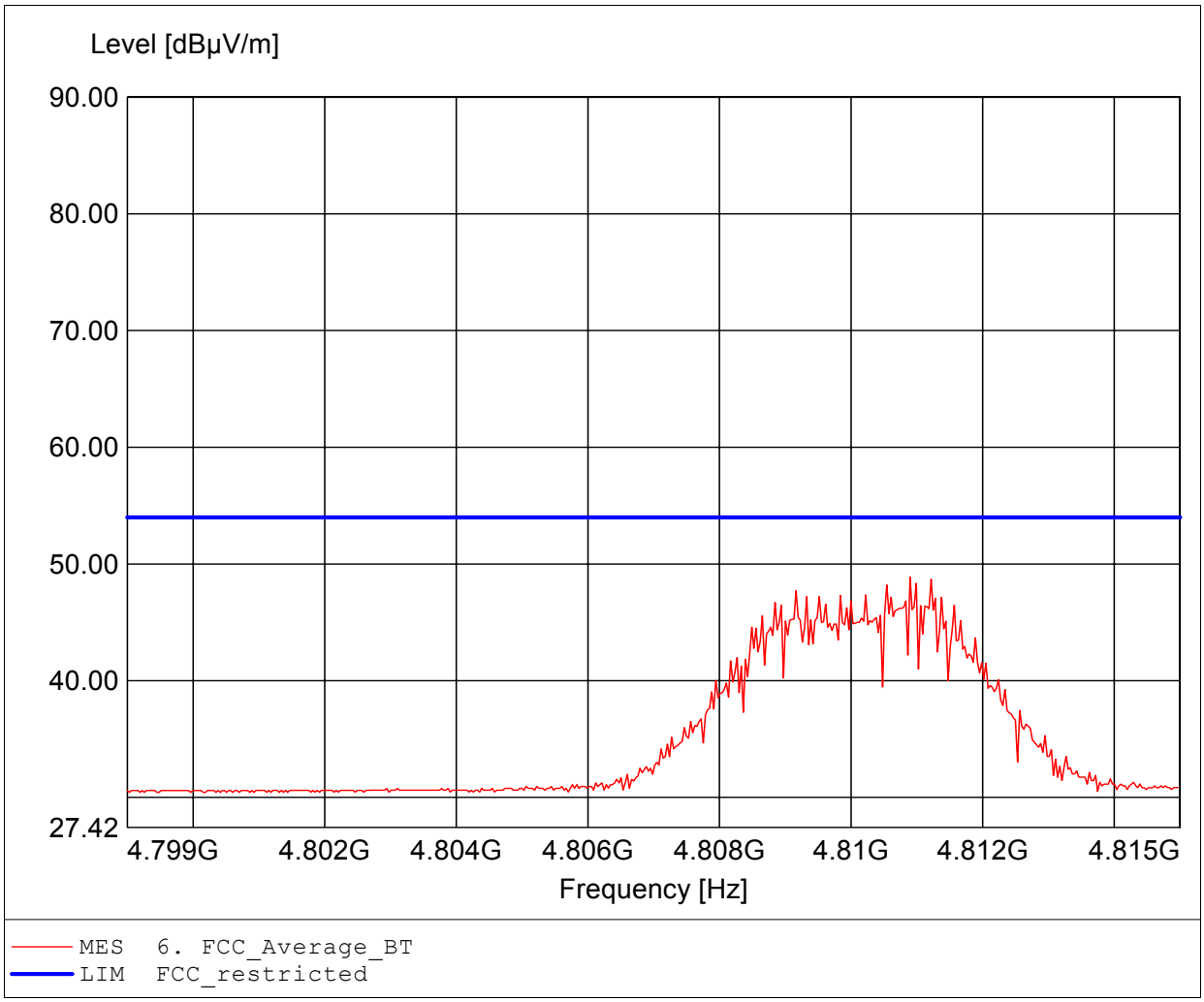
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 4.810GHz, Emax: 65.00dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

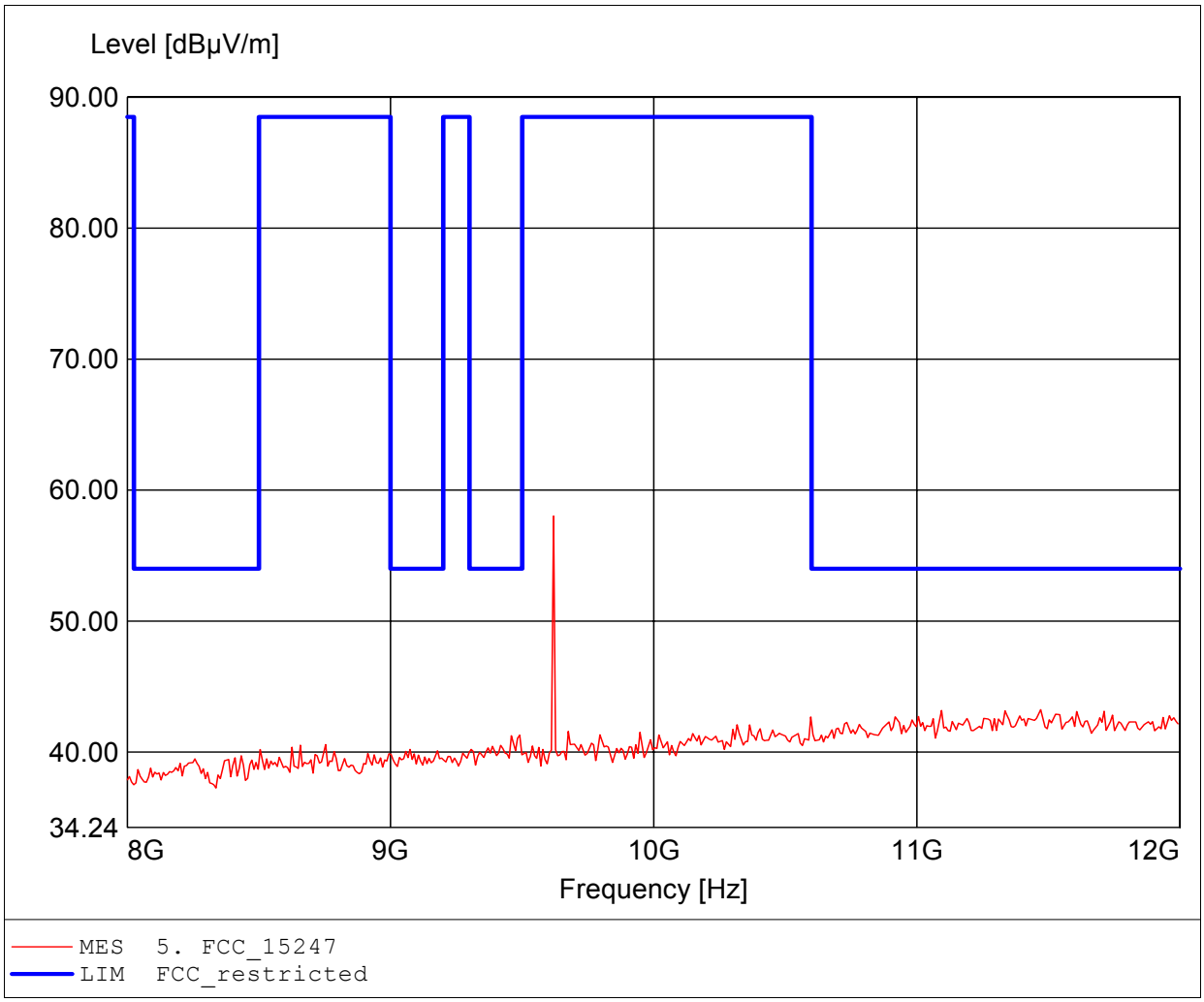
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 4.811GHz, Emax: 48.87dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

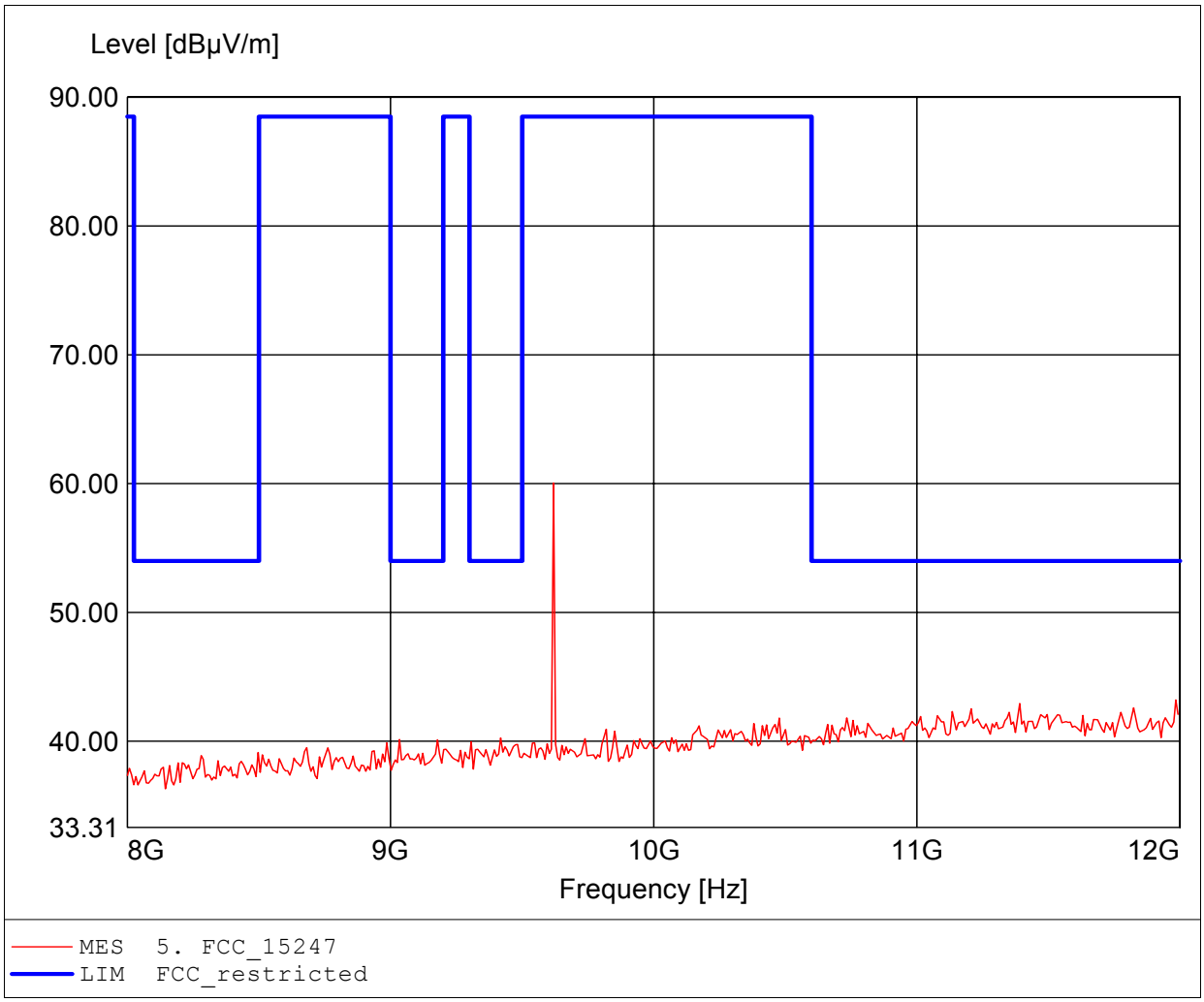
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 9.619GHz, Emax: 58.01dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

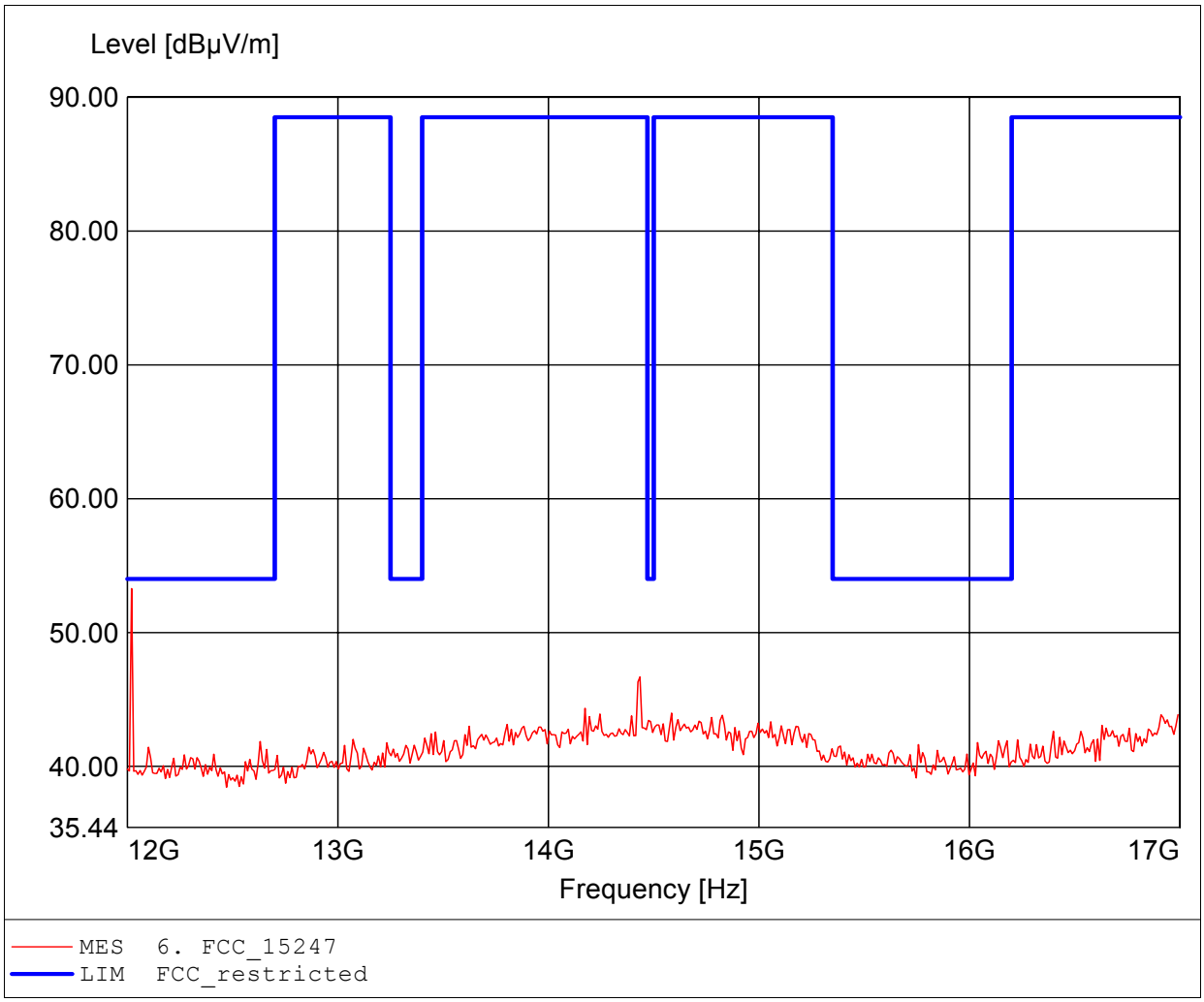
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 9.619GHz, Emax: 60.05dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

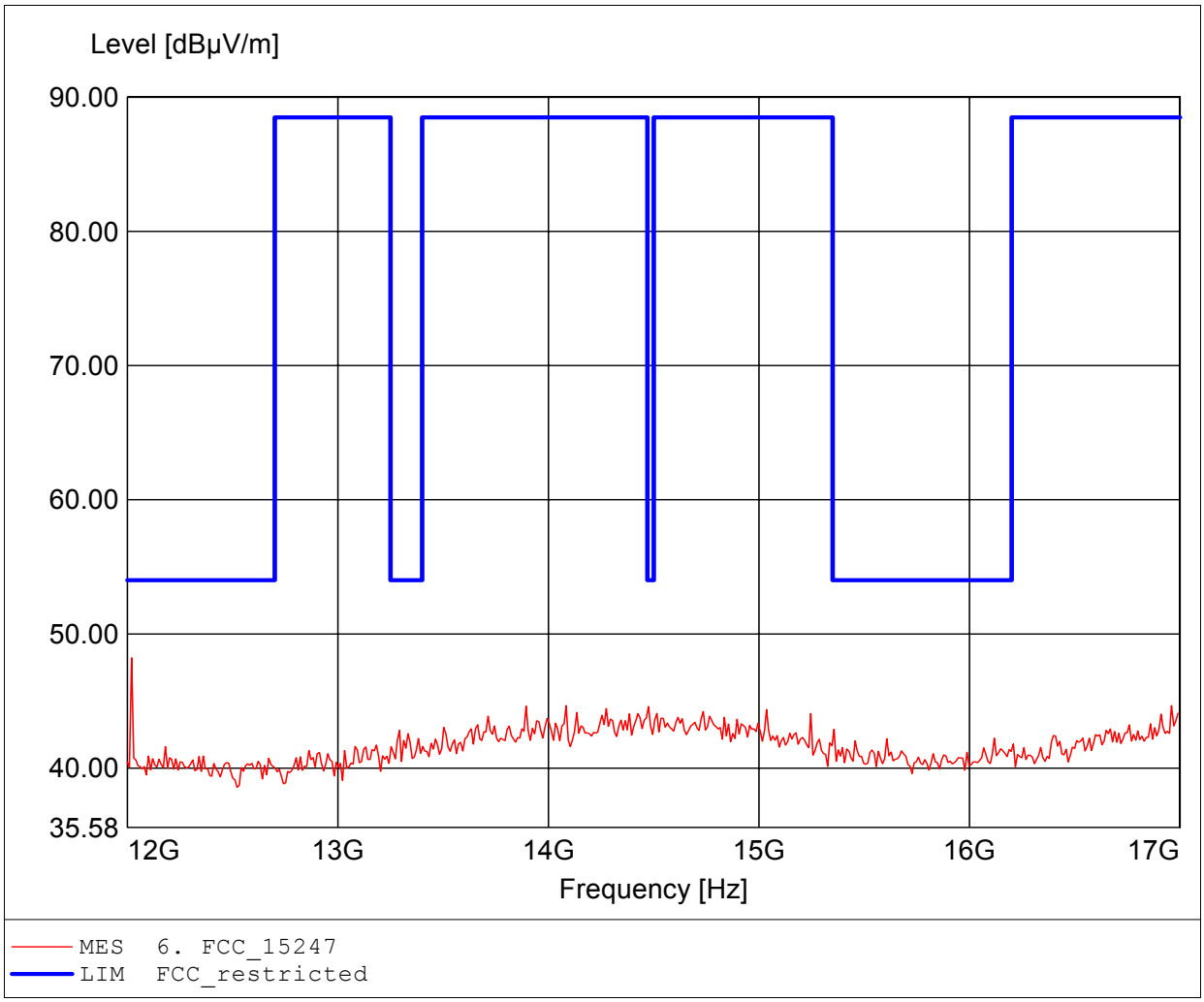
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 12.020GHz, Emax: 53.29dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

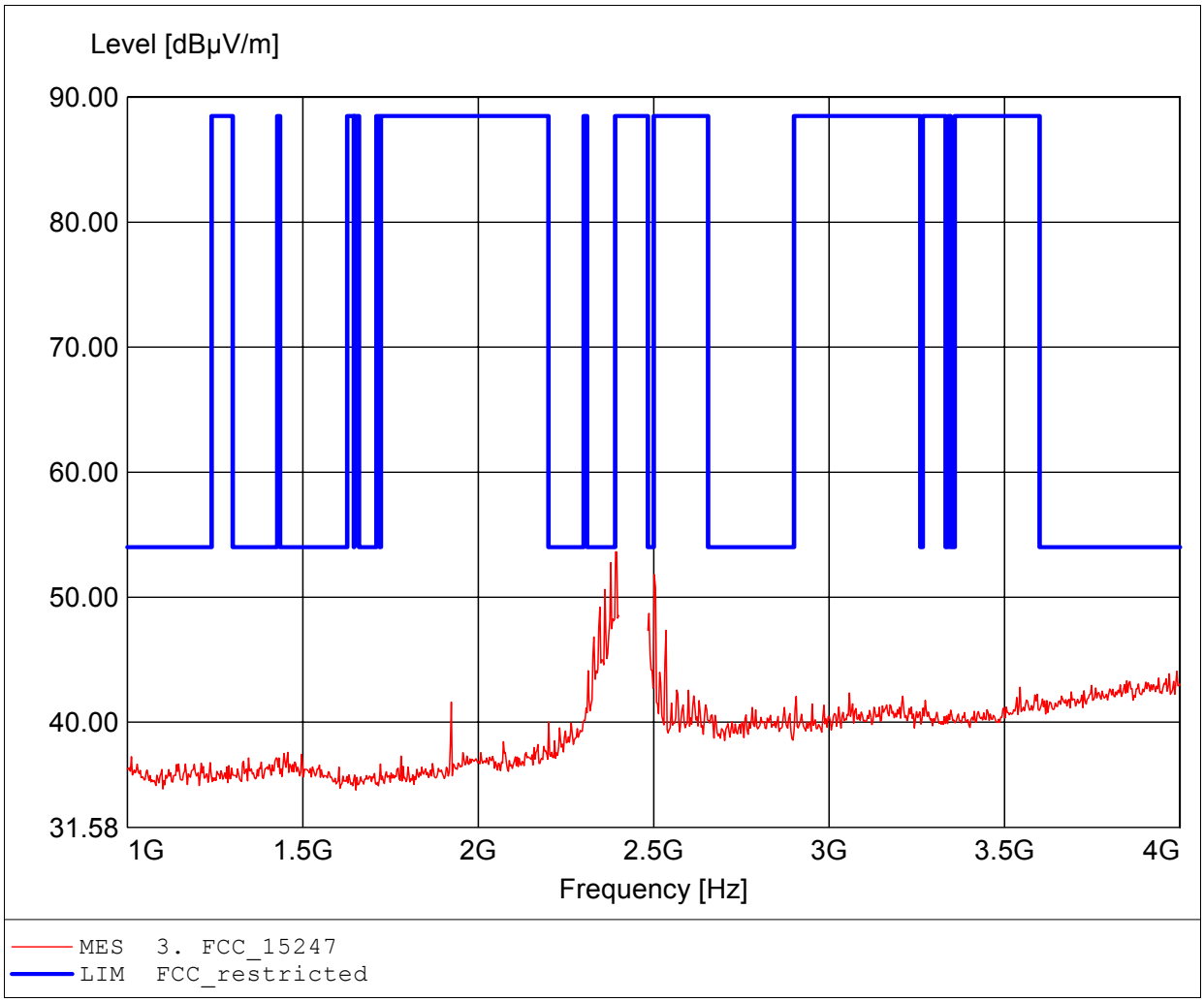
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2405 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 12.020GHz, Emax: 48.21dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

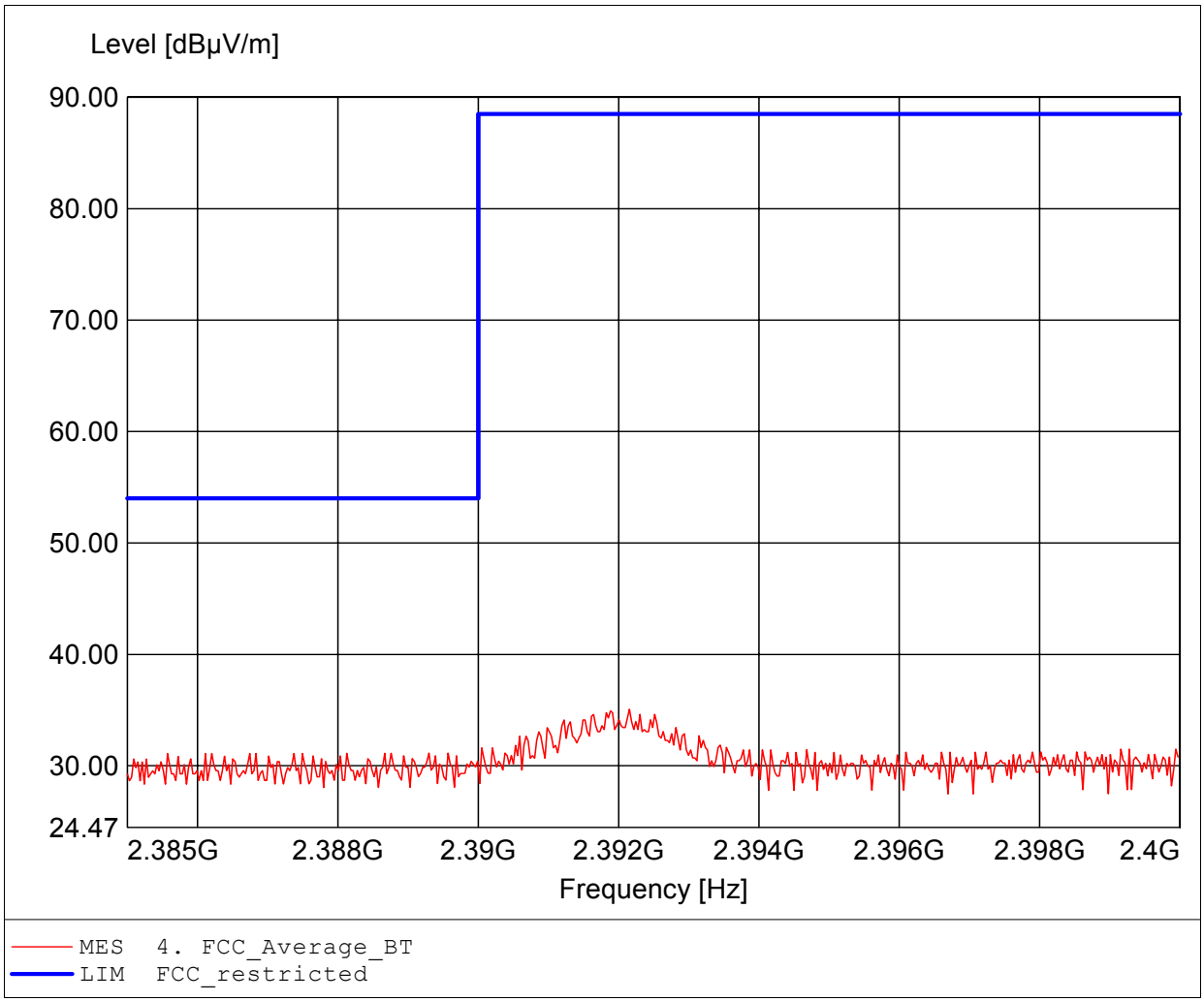
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.392GHz, Emax: 53.63dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

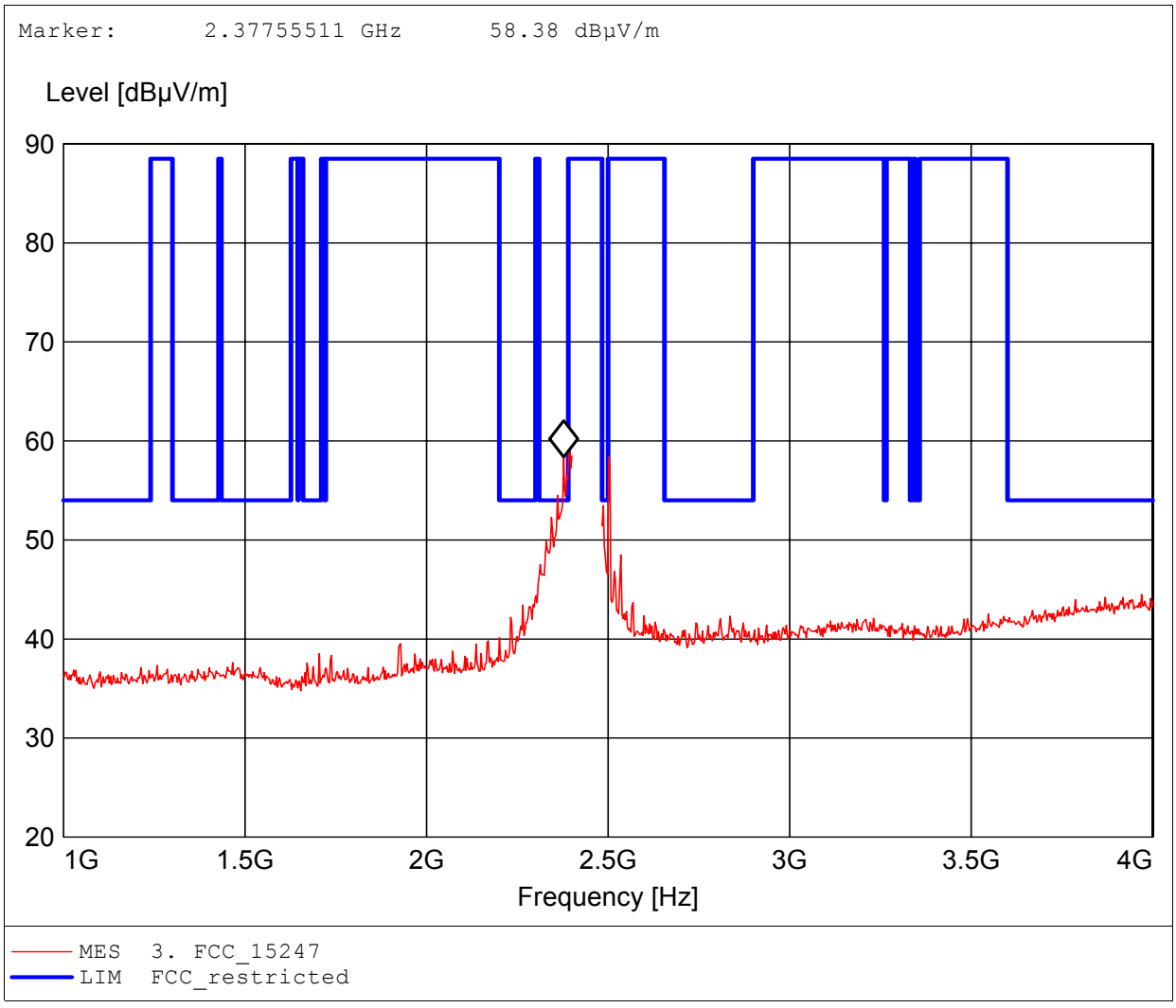
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 2.392GHz, Emax: 35.08dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

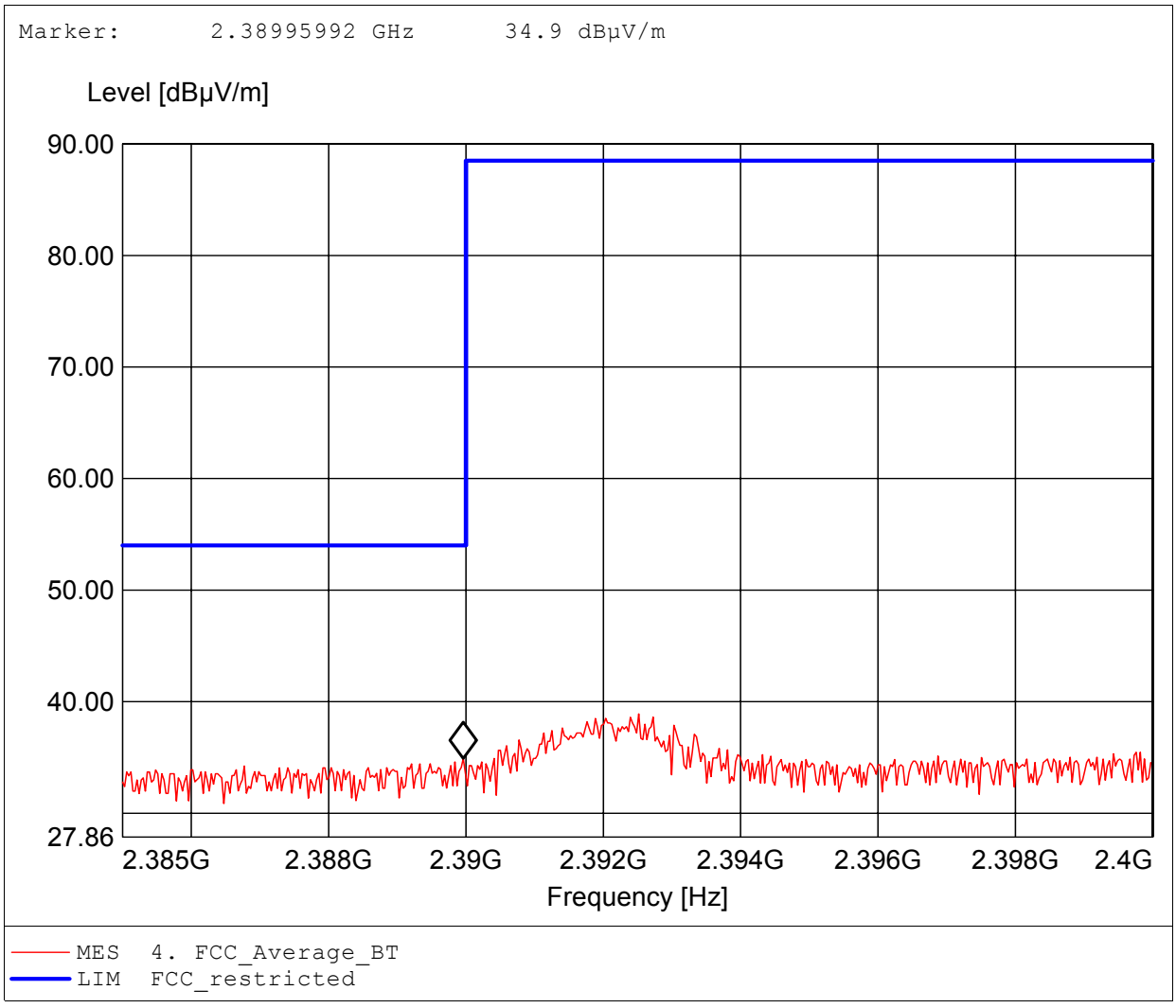
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.394GHz, Emax: 59.60dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

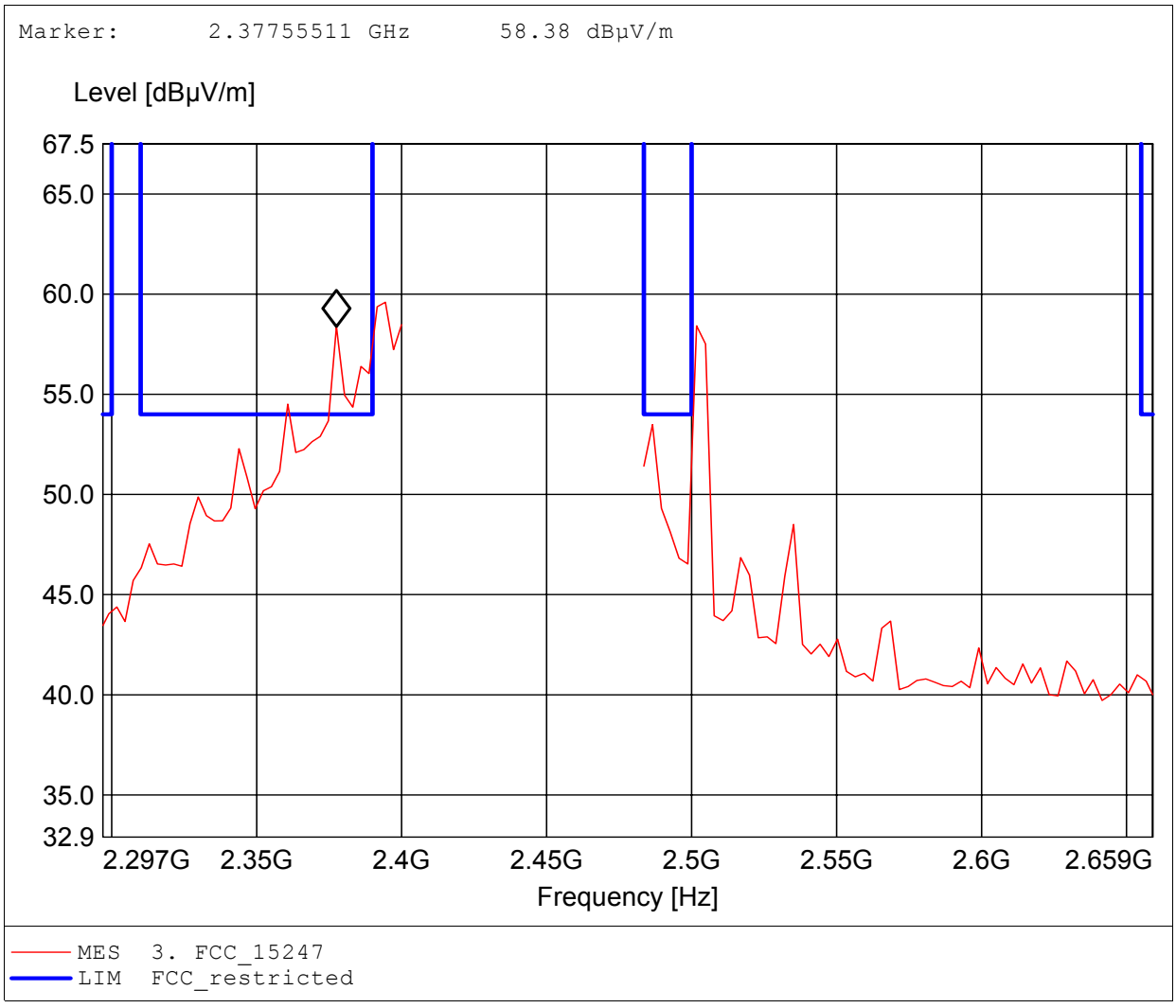
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 2.393GHz, Emax: 38.90dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

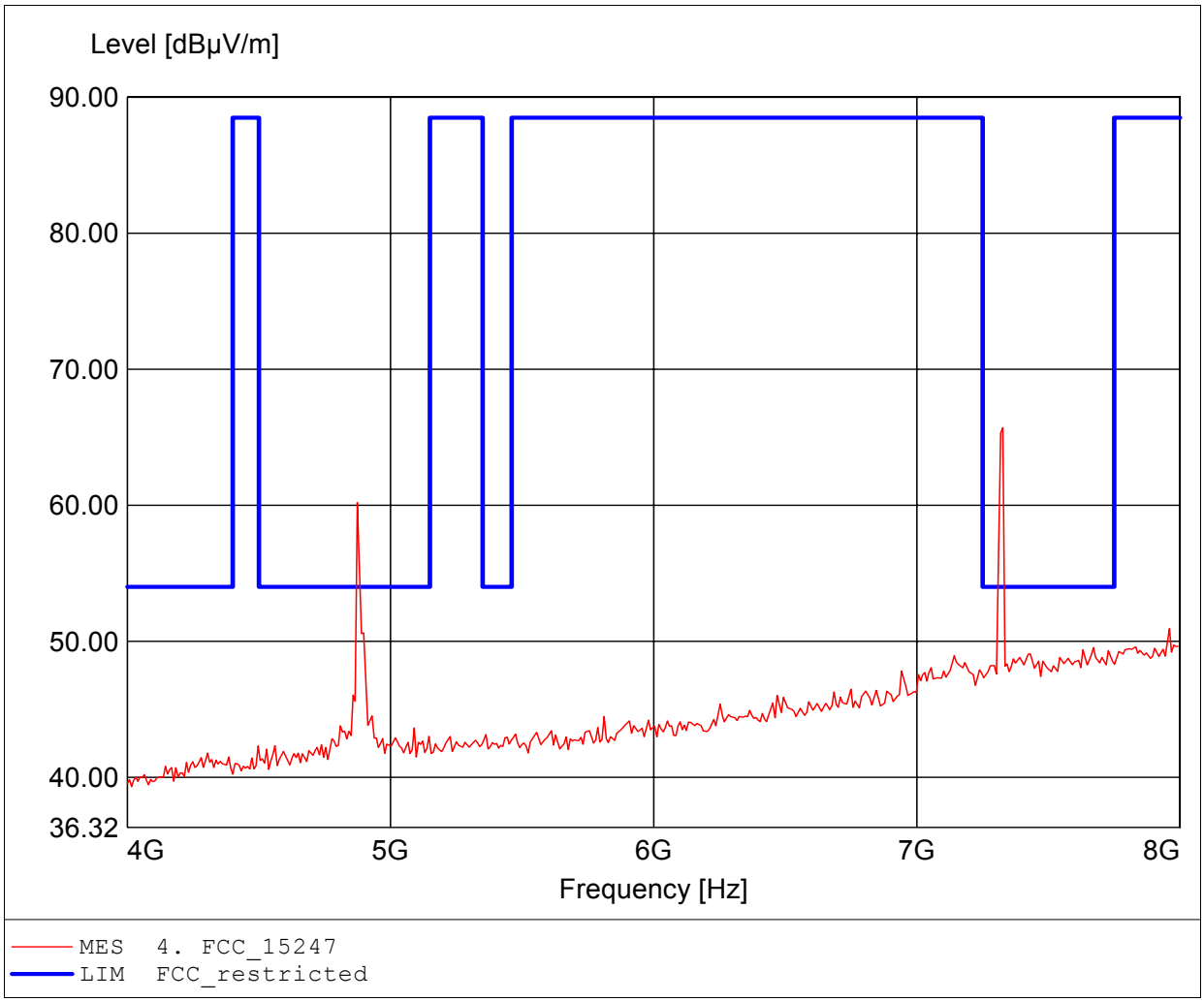
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.394GHz, Emax: 59.60dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

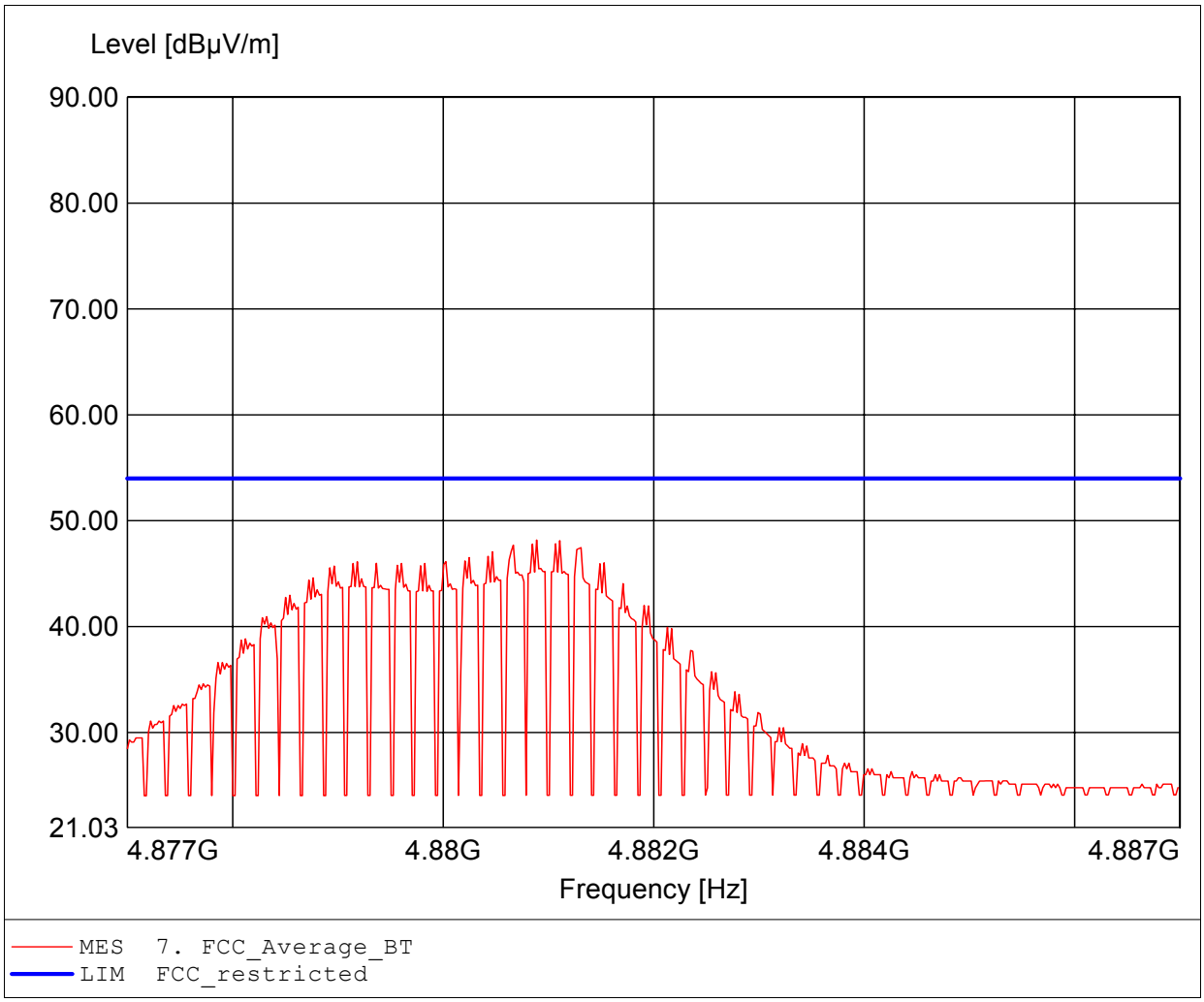
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 7.327GHz, Emax: 65.70dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

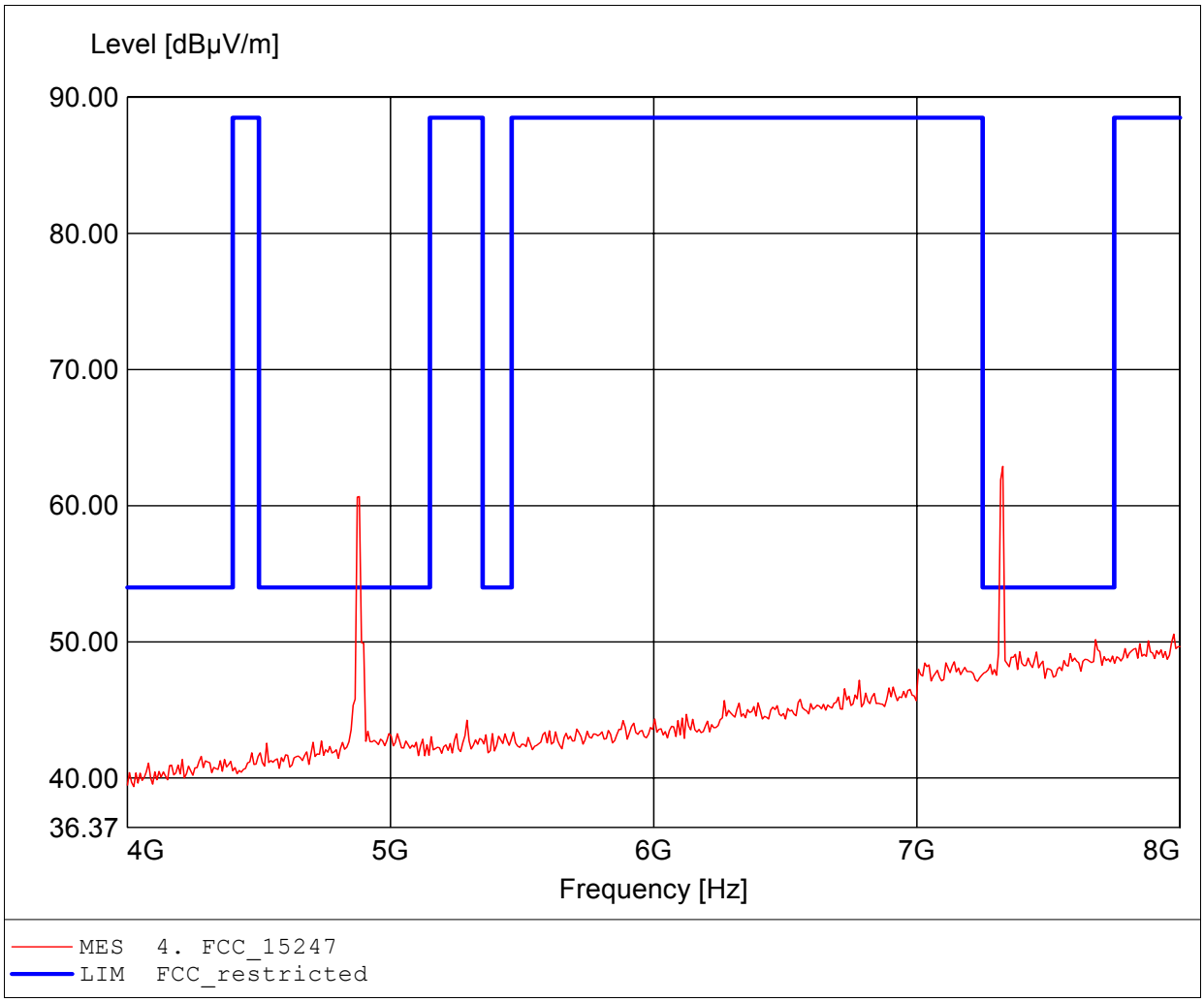
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 4.881GHz, Emax: 48.18dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

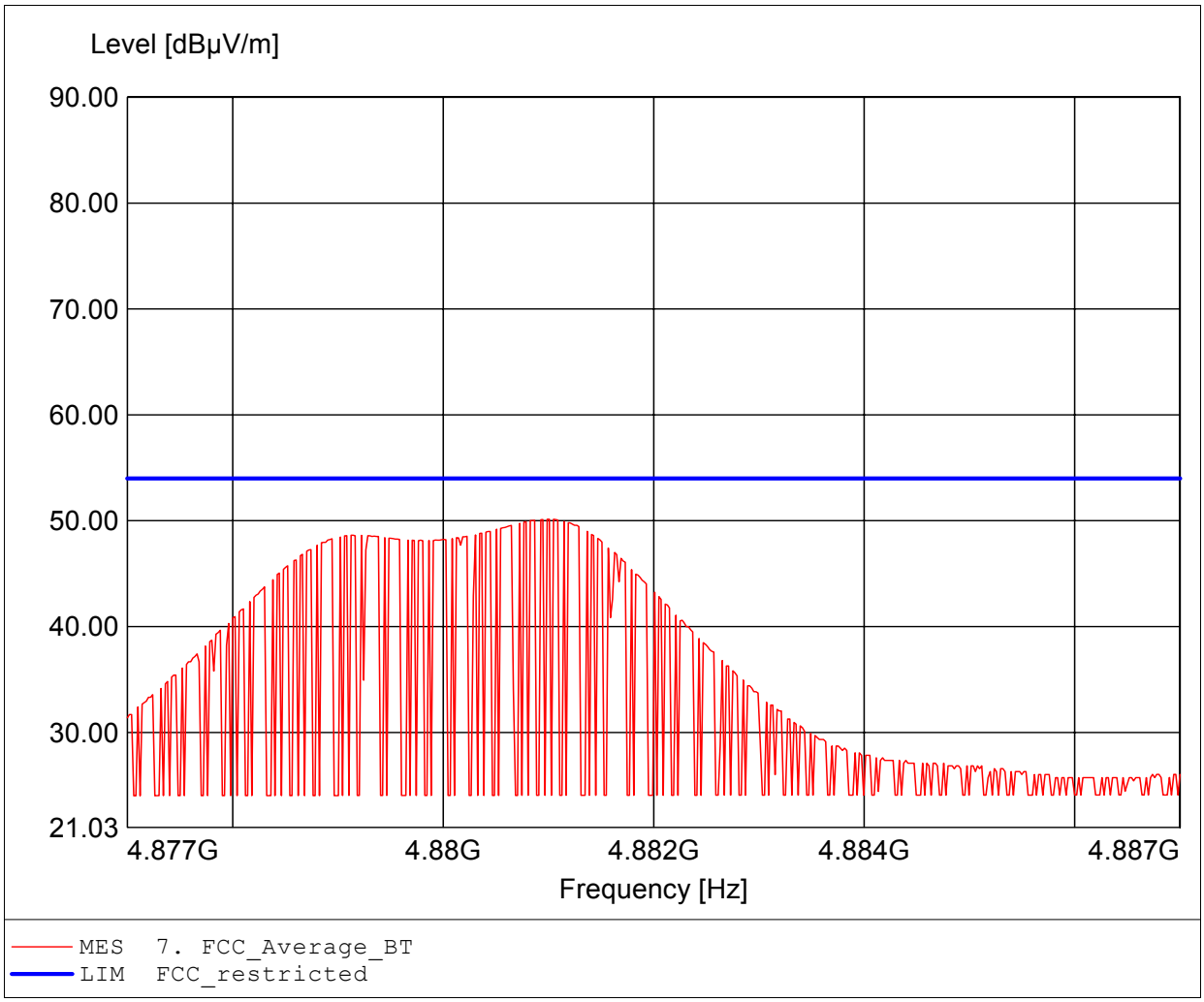
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 7.327GHz, Emax: 62.89dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

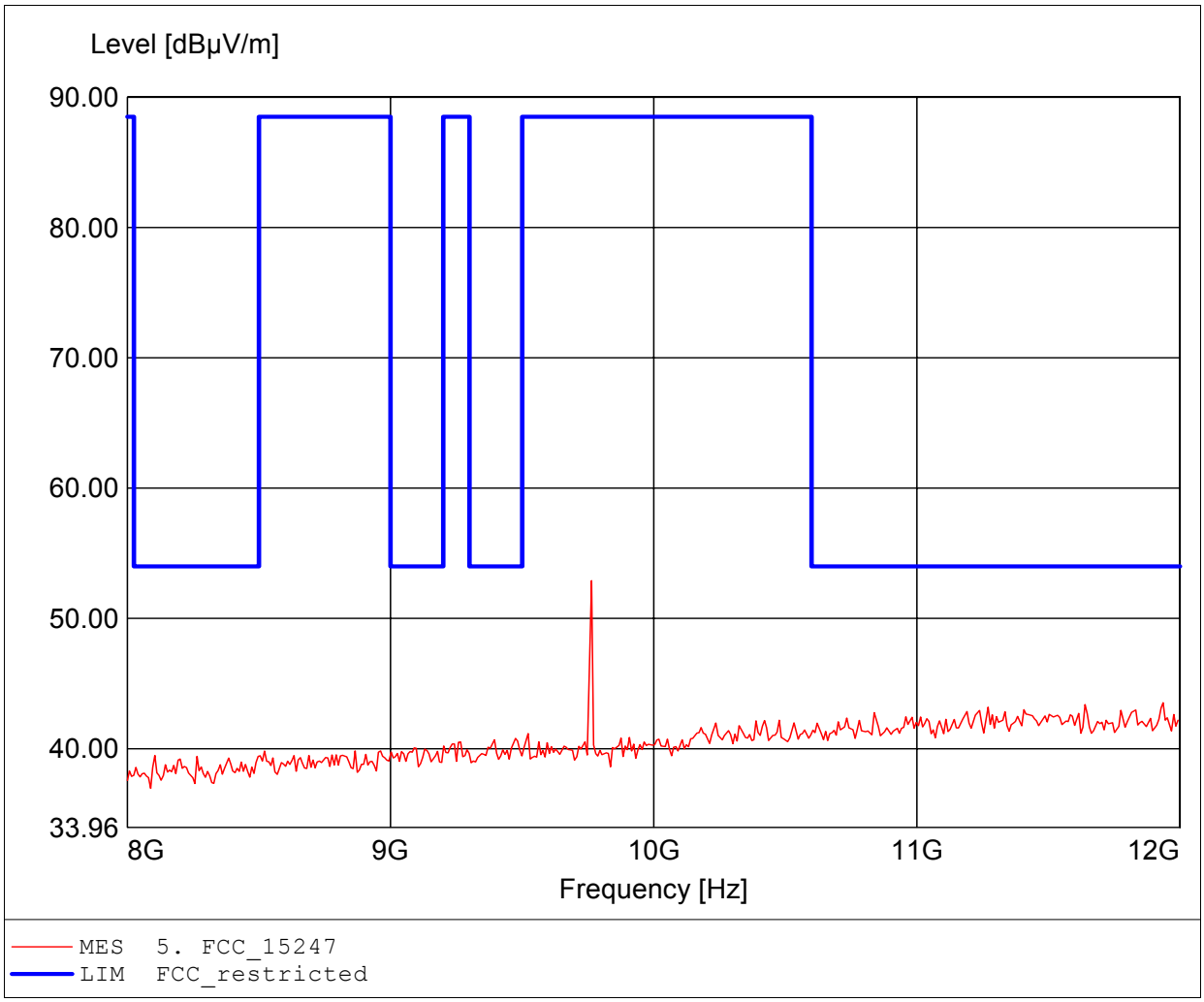
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 4.881GHz, Emax: 50.15dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

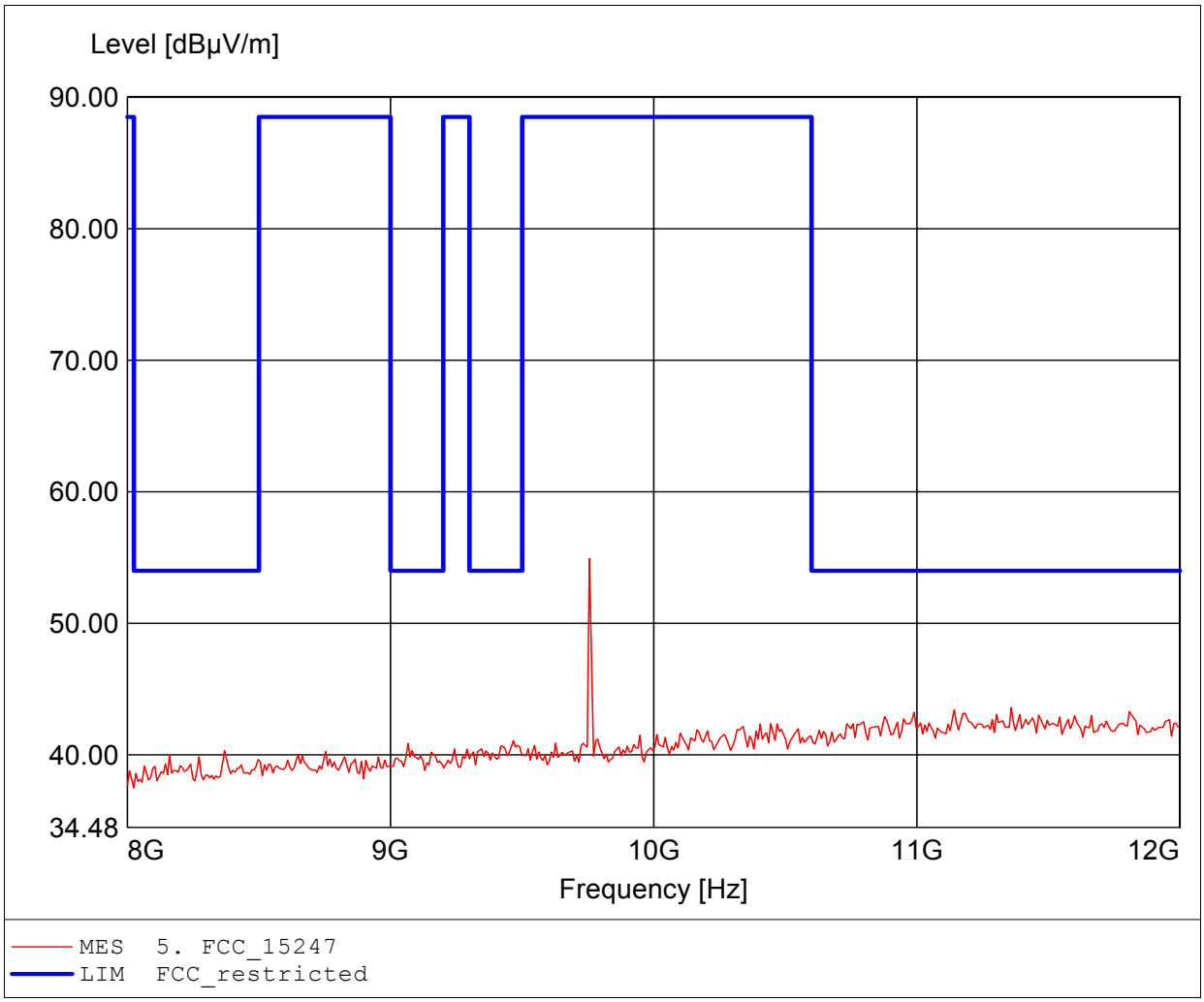
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 9.764GHz, Emax: 52.89dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

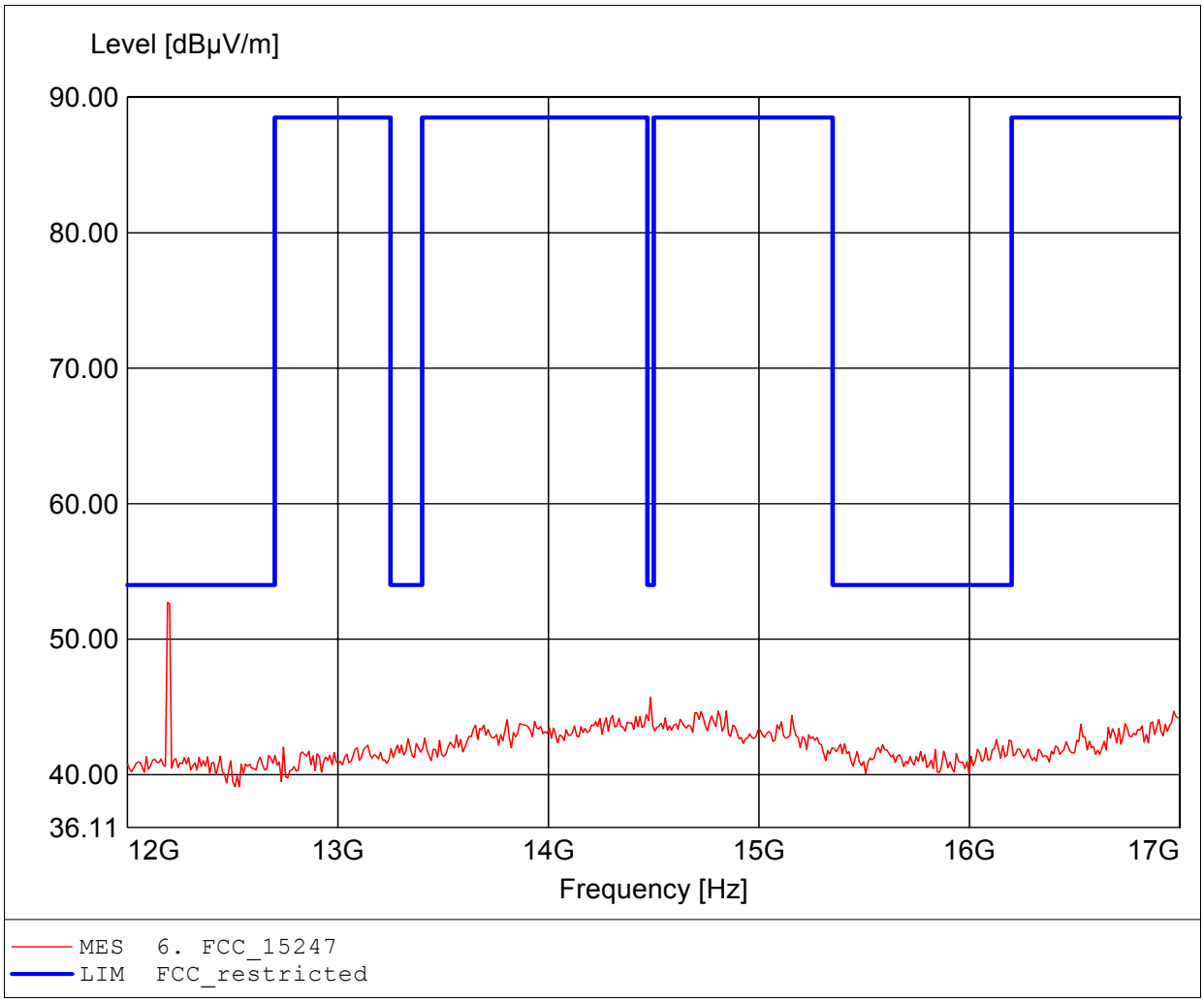
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 9.756GHz, Emax: 54.93dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

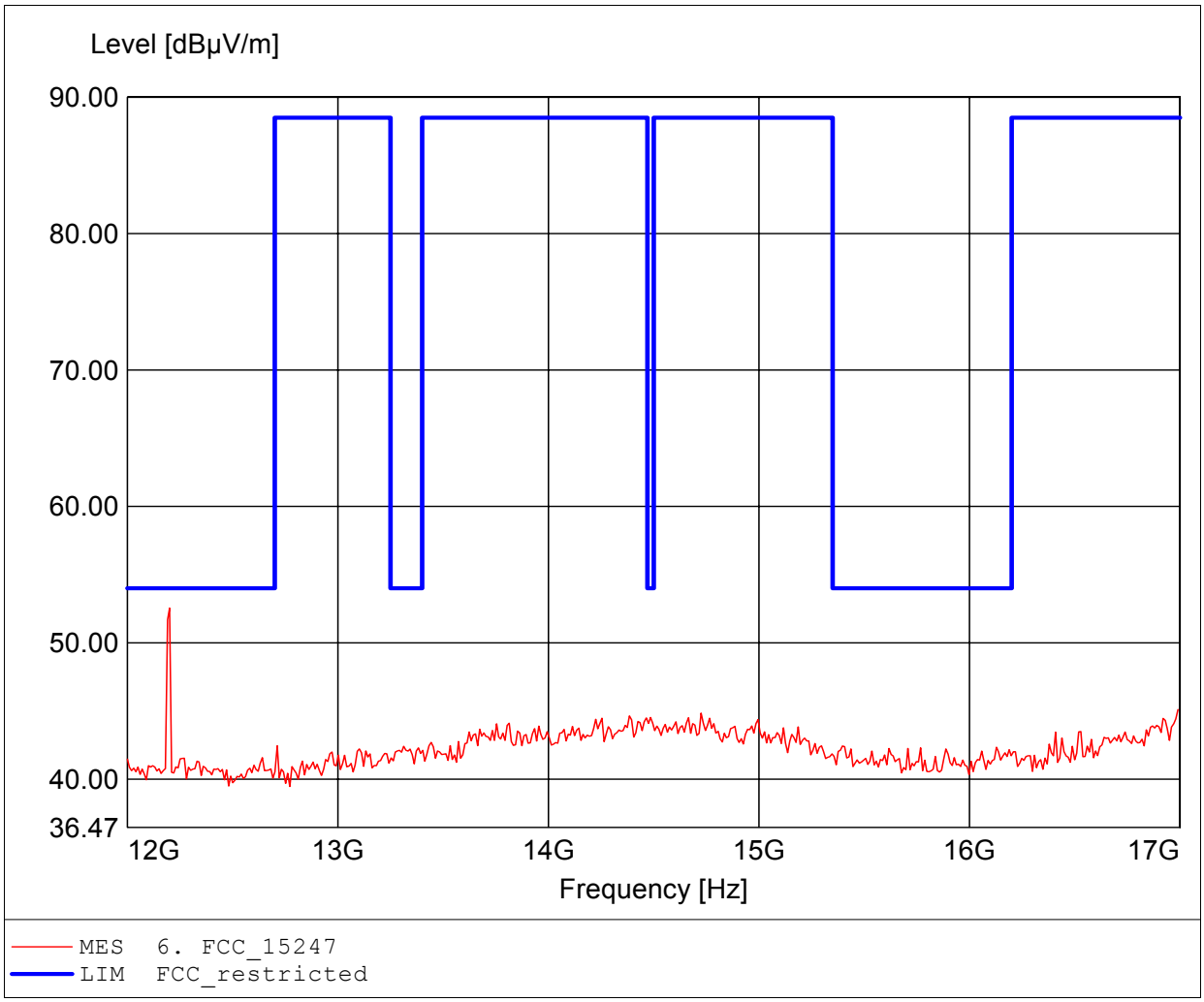
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 12.190GHz, Emax: 52.72dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

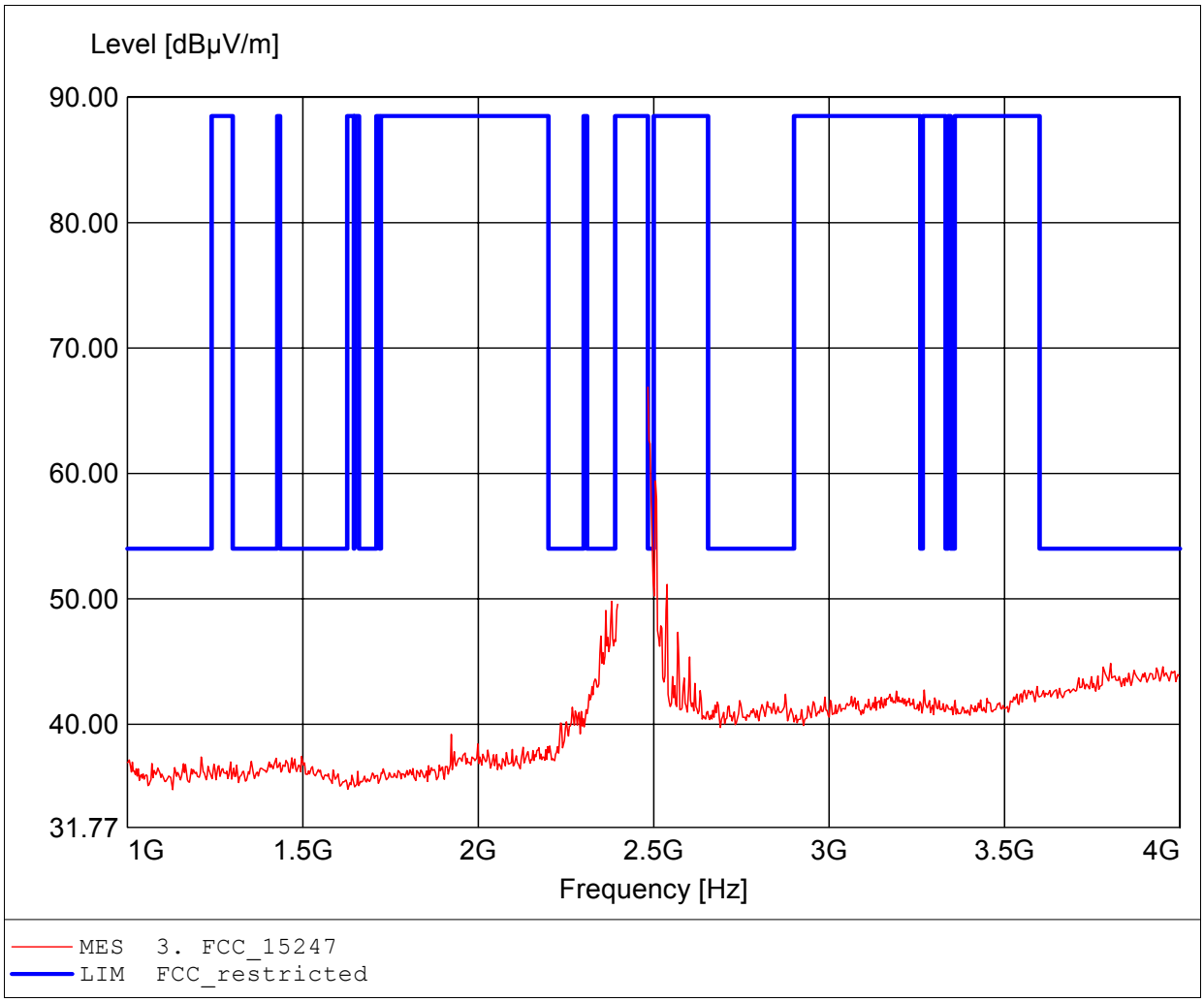
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 12.200GHz, Emax: 51.55dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

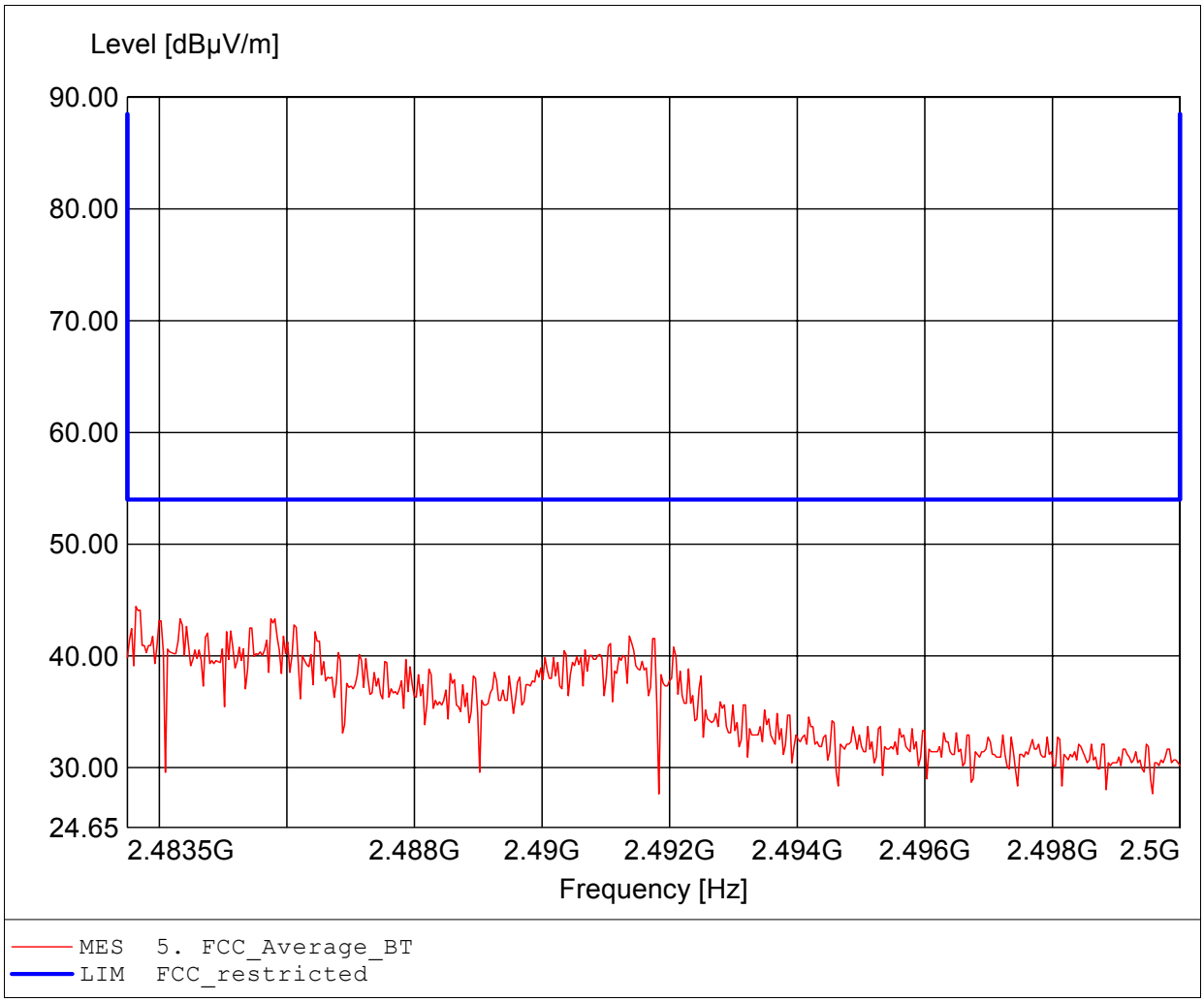
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.484GHz, Emax: 66.89dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

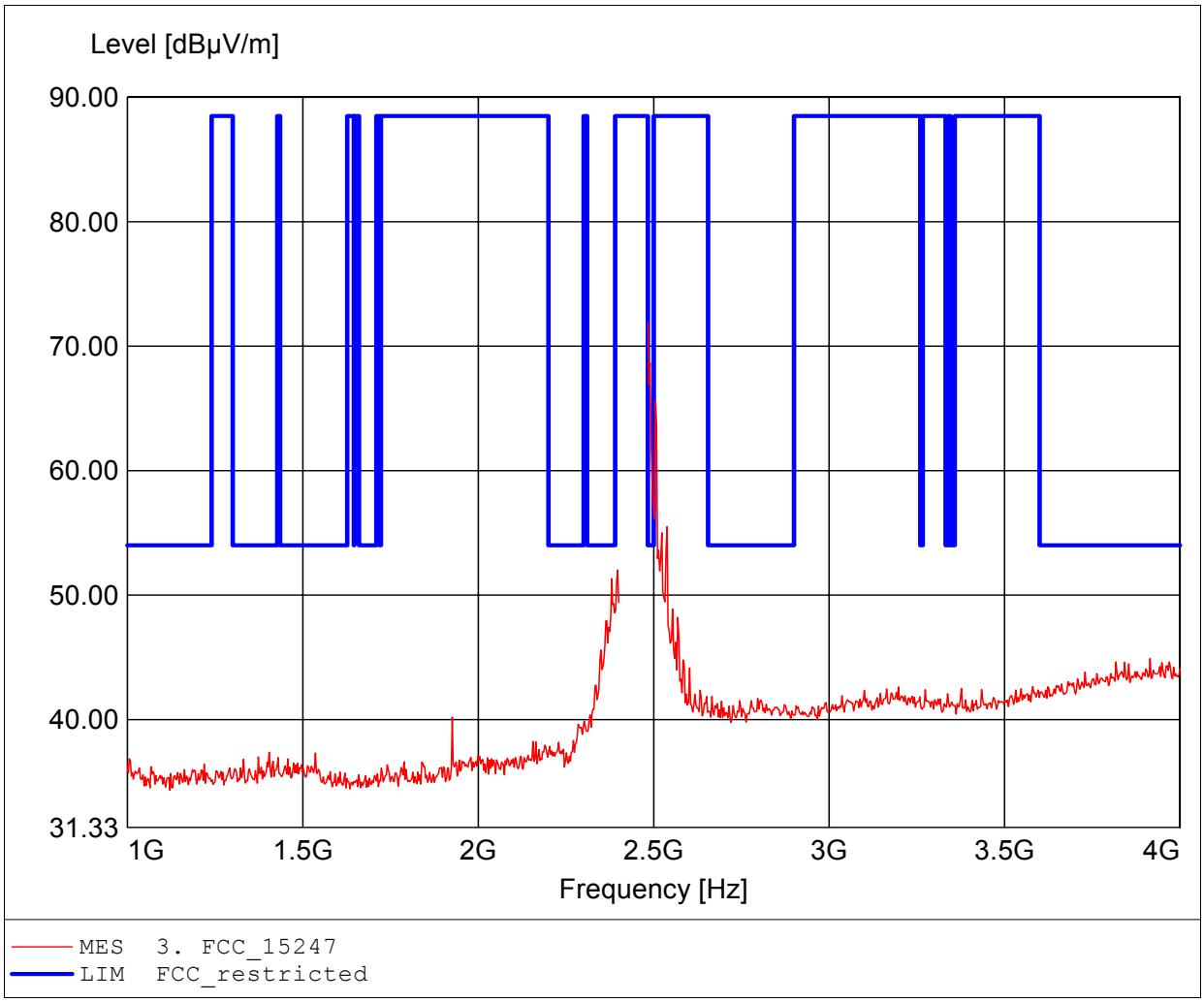
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 2.484GHz, Emax: 44.43dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

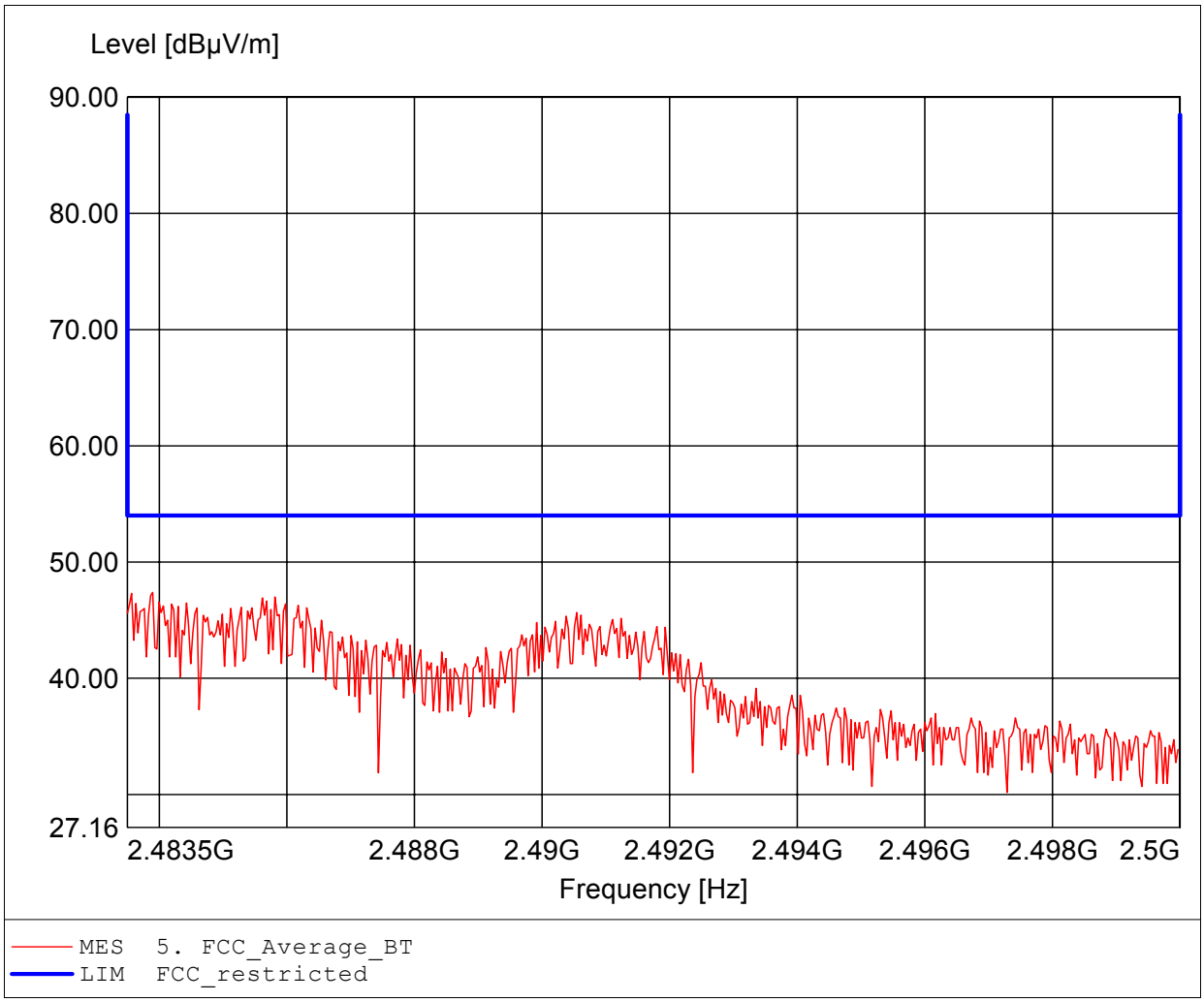
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 2.484GHz, Emax: 71.88dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

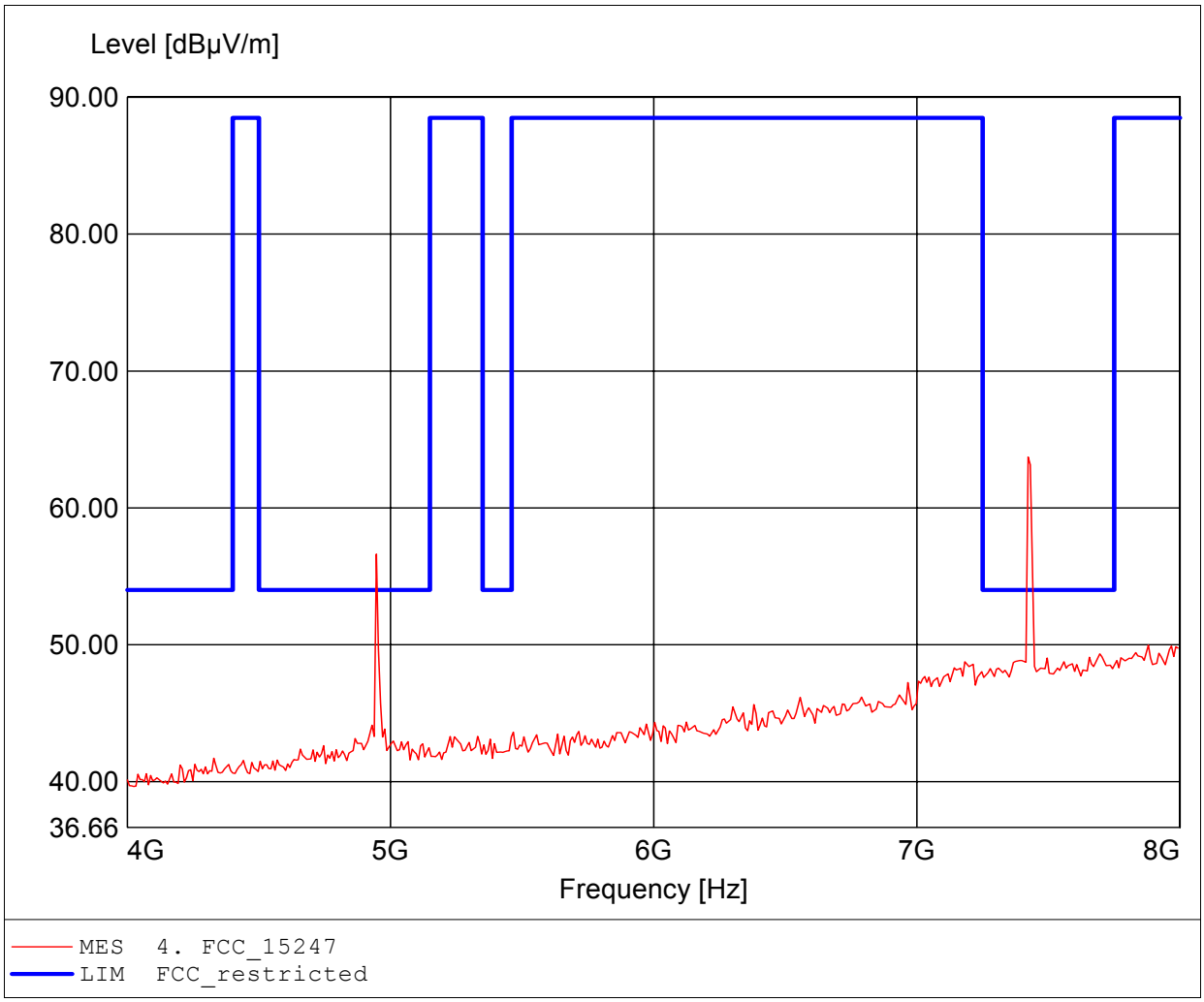
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 2.484GHz, Emax: 47.37dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

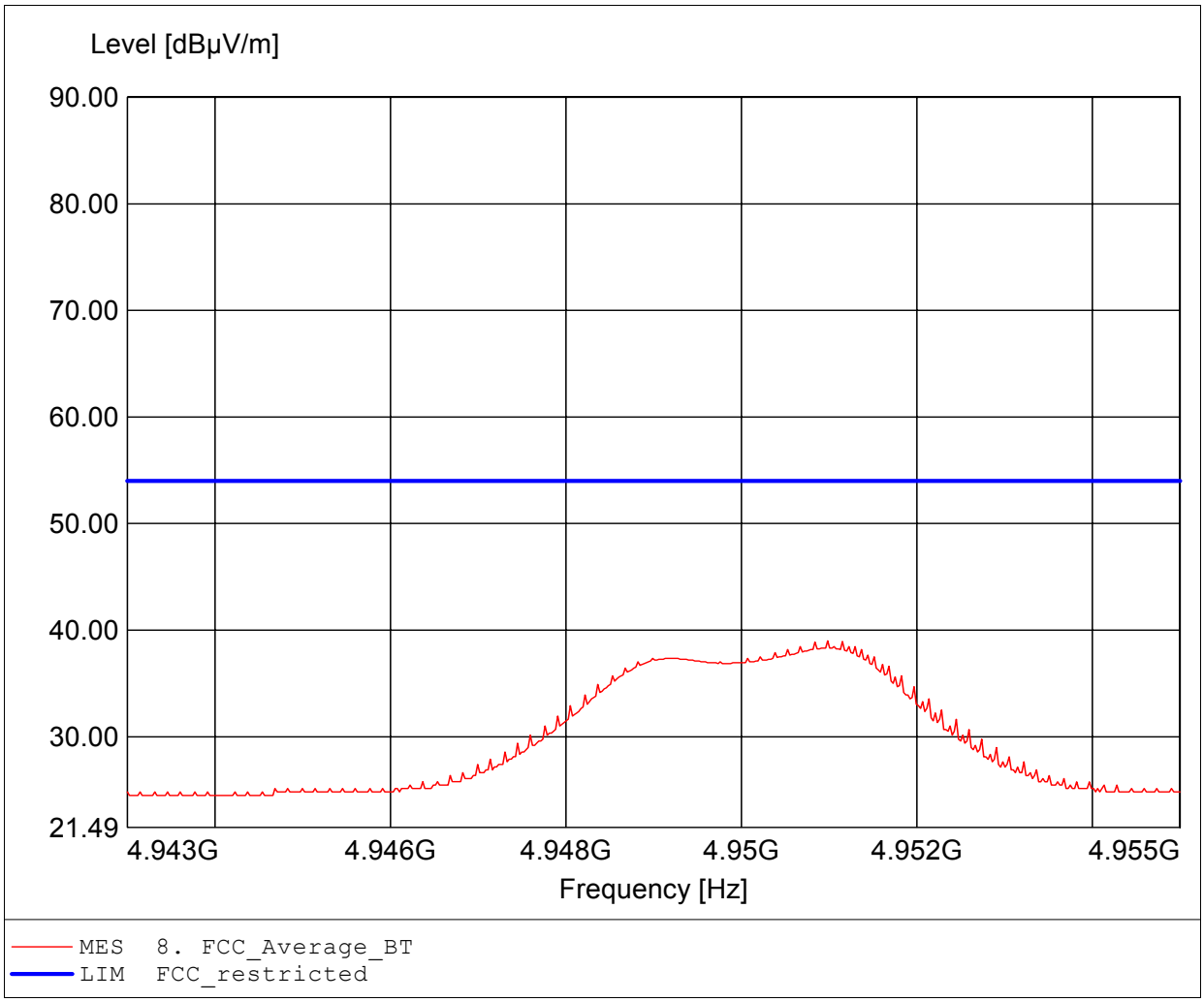
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 7.423GHz, Emax: 63.71dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

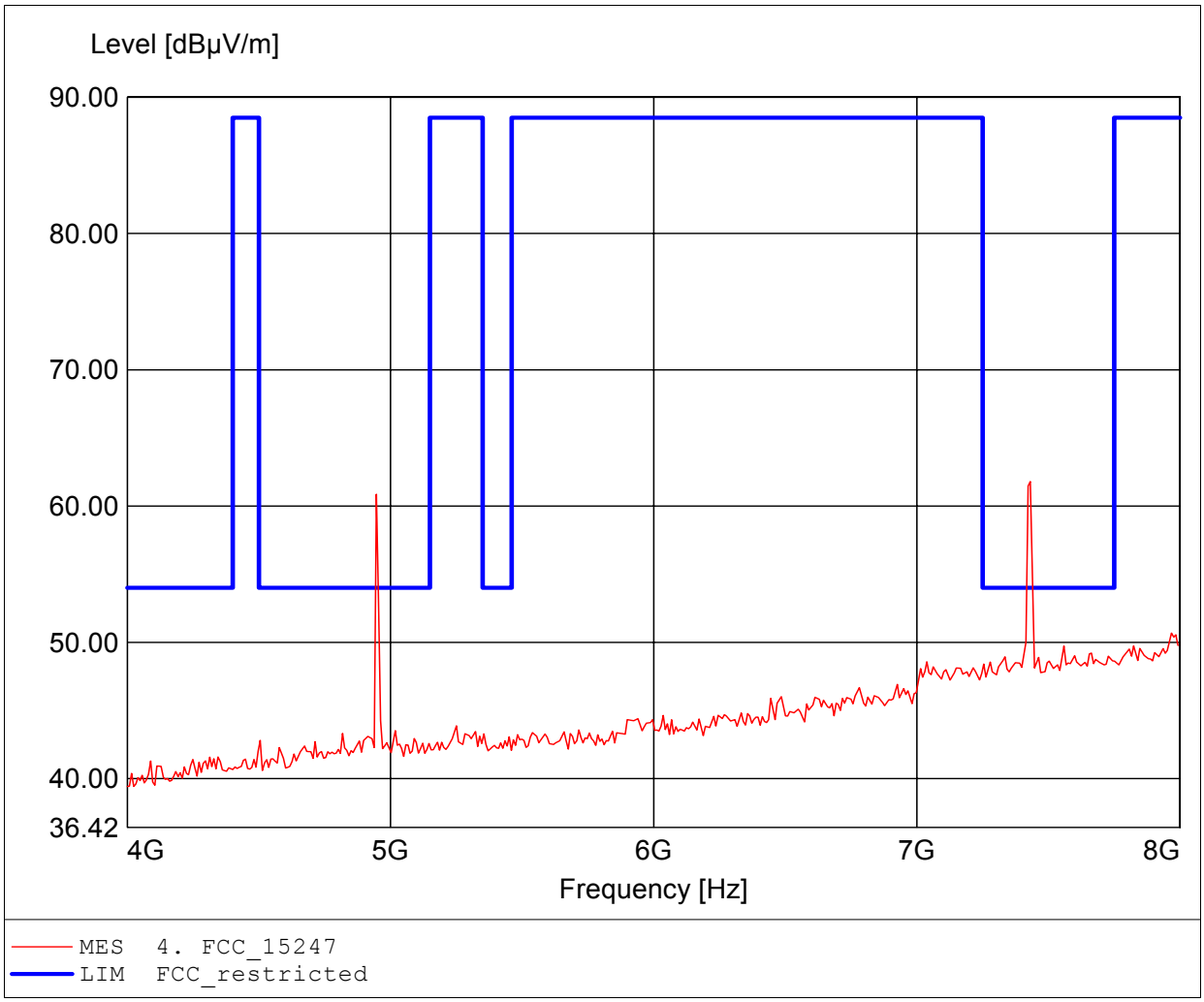
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 4.951GHz, Emax: 39.00dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

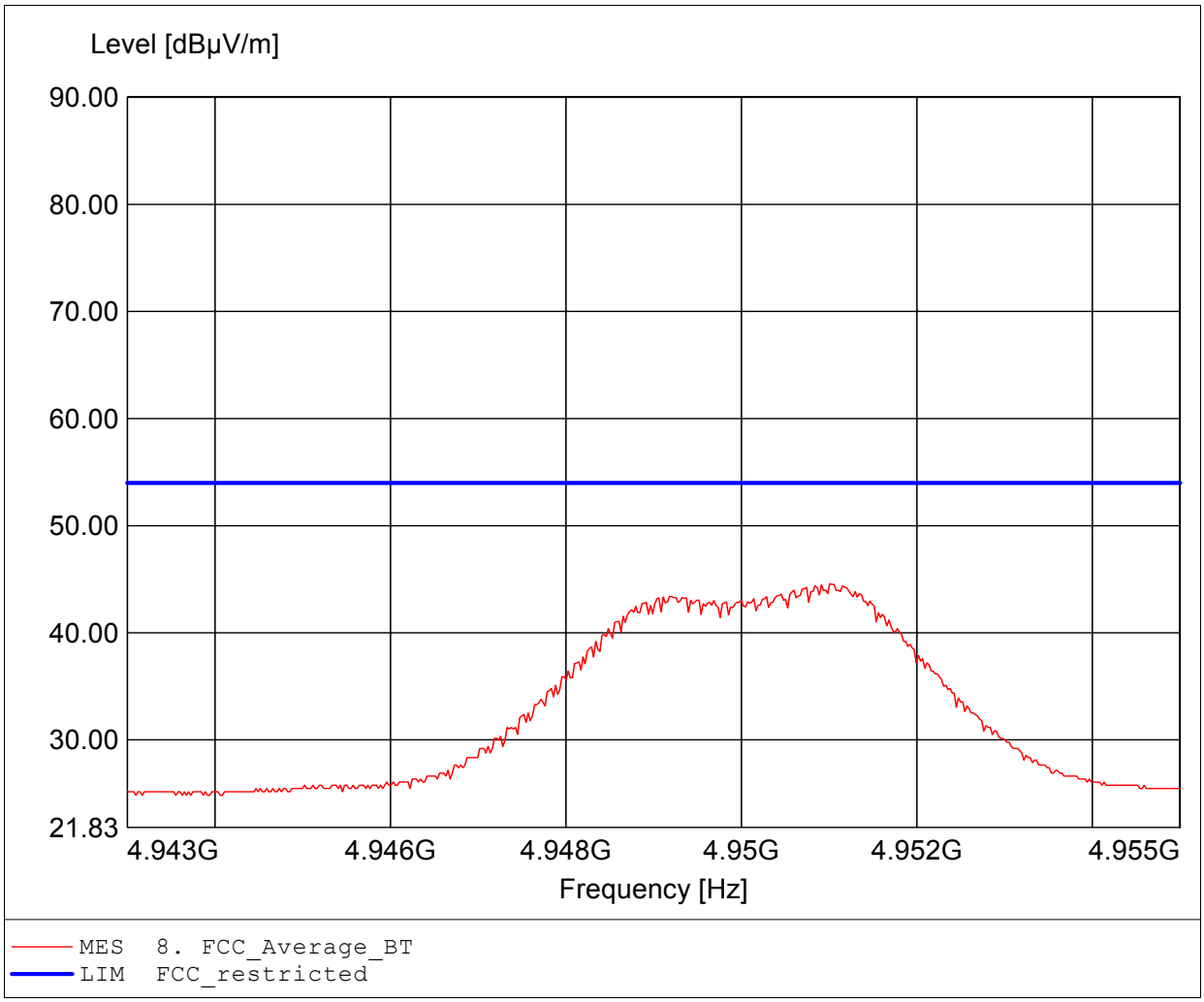
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 7.431GHz, Emax: 61.80dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

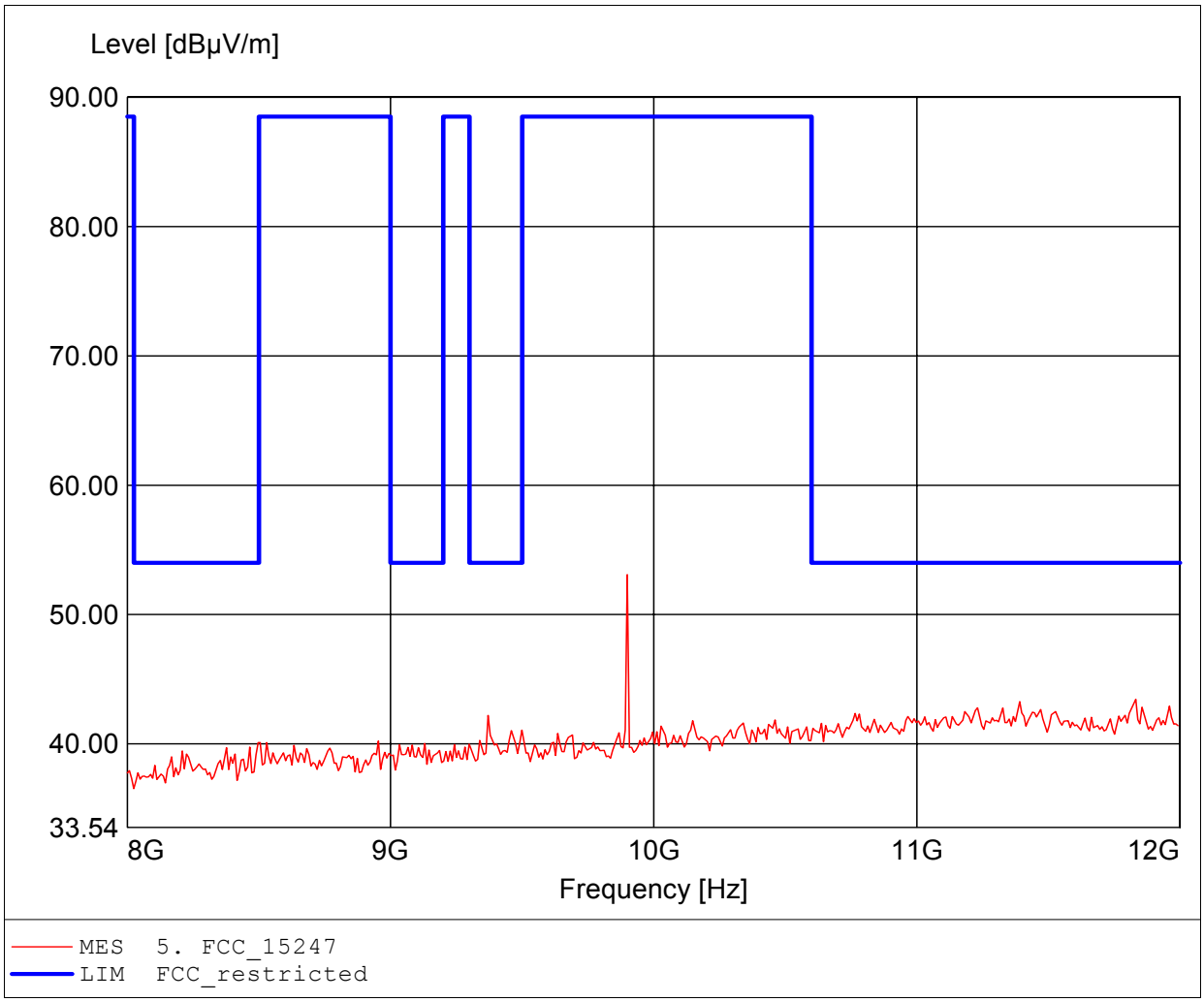
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 4.951GHz, Emax: 44.58dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

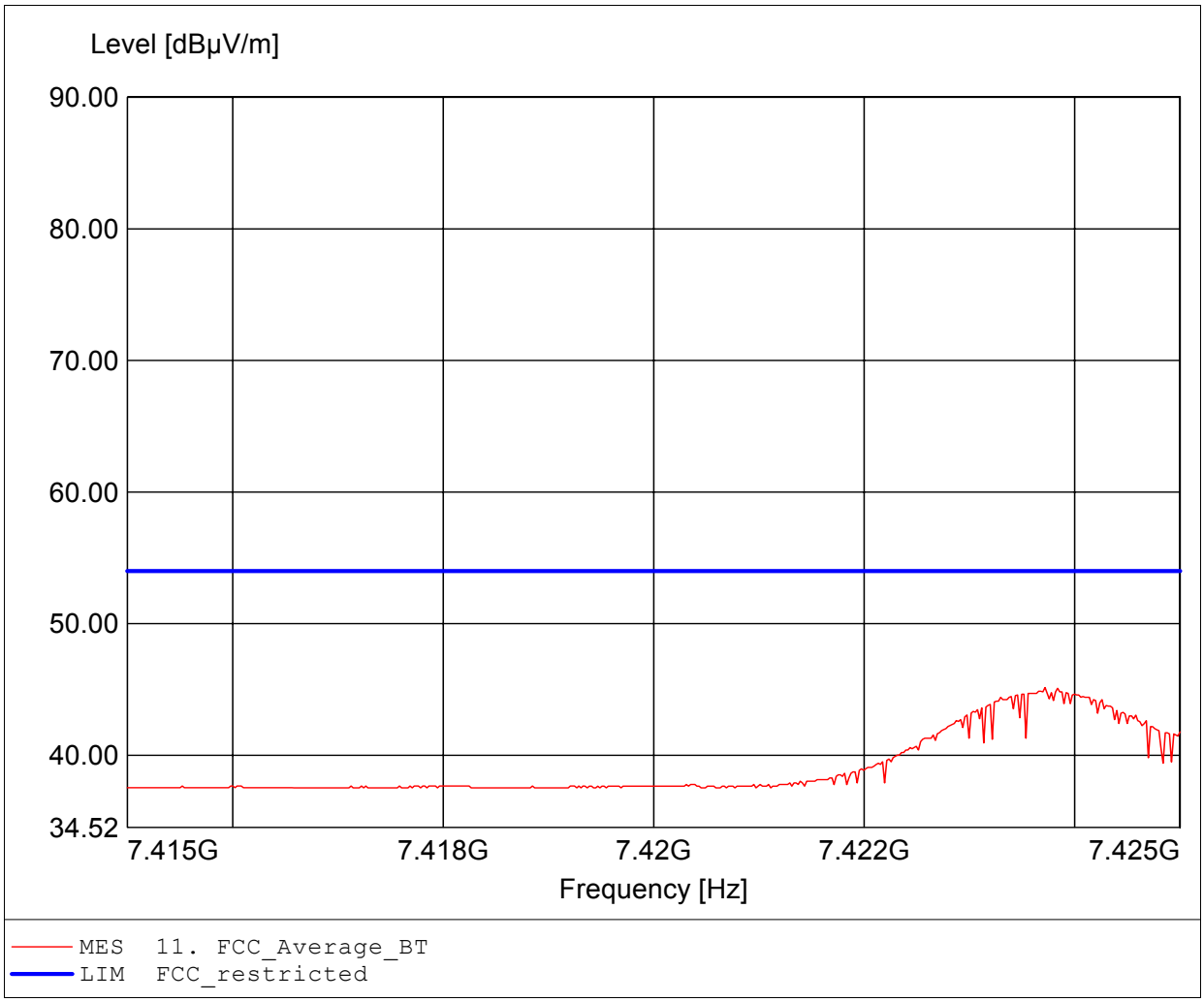
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 9.900GHz, Emax: 53.08dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

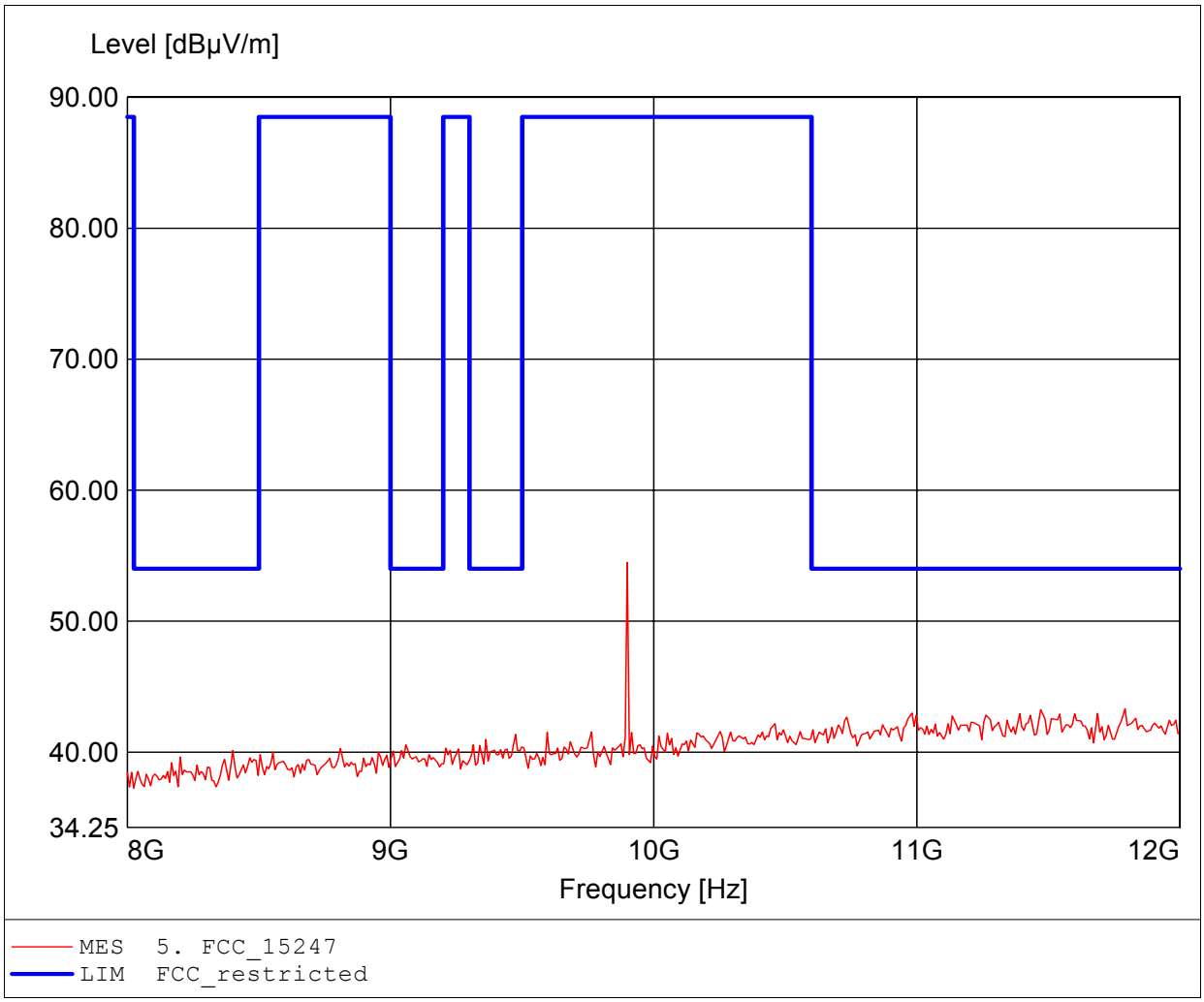
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 7.424GHz, Pmax: 45.15dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

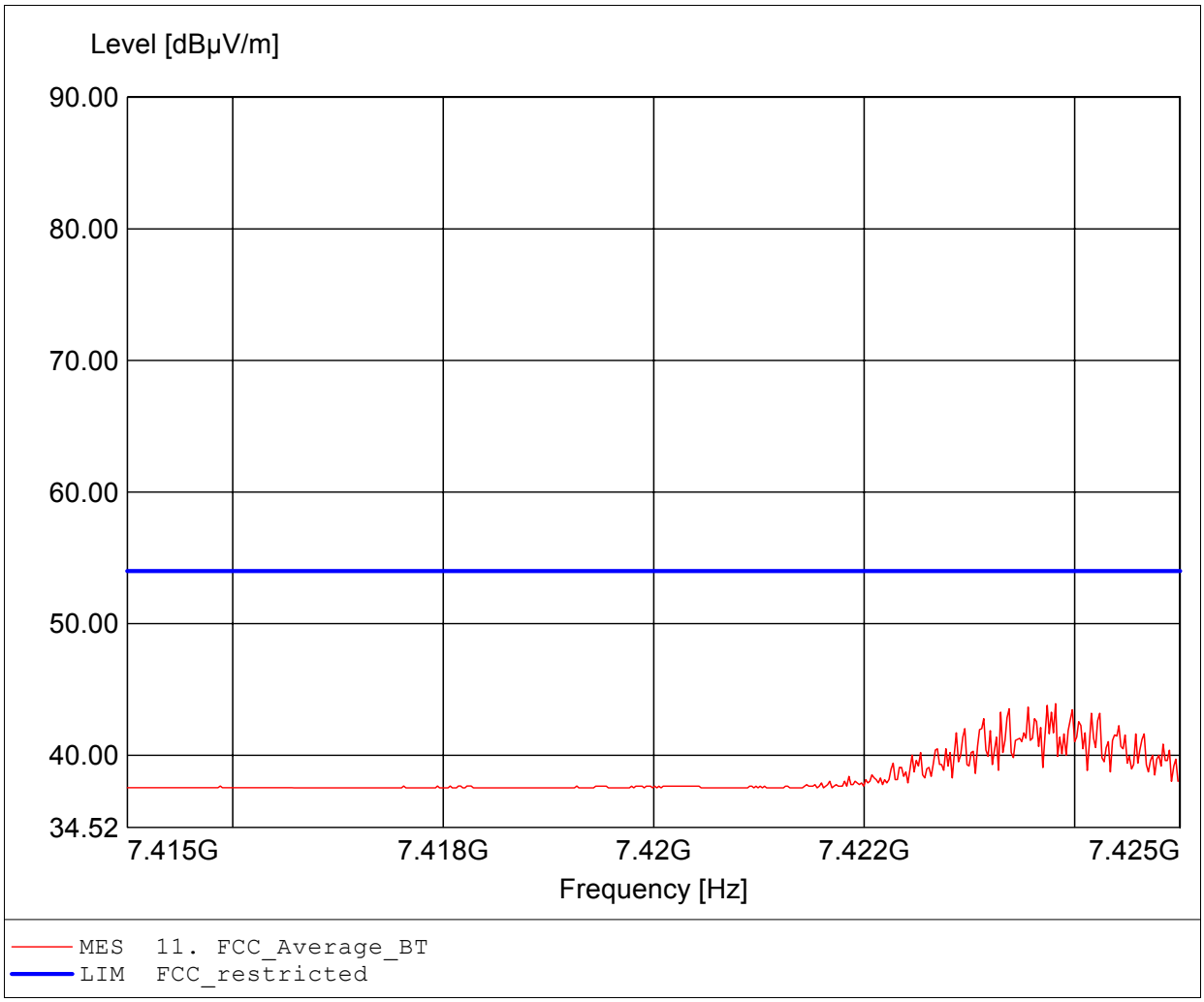
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 9.900GHz, Emax: 54.48dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

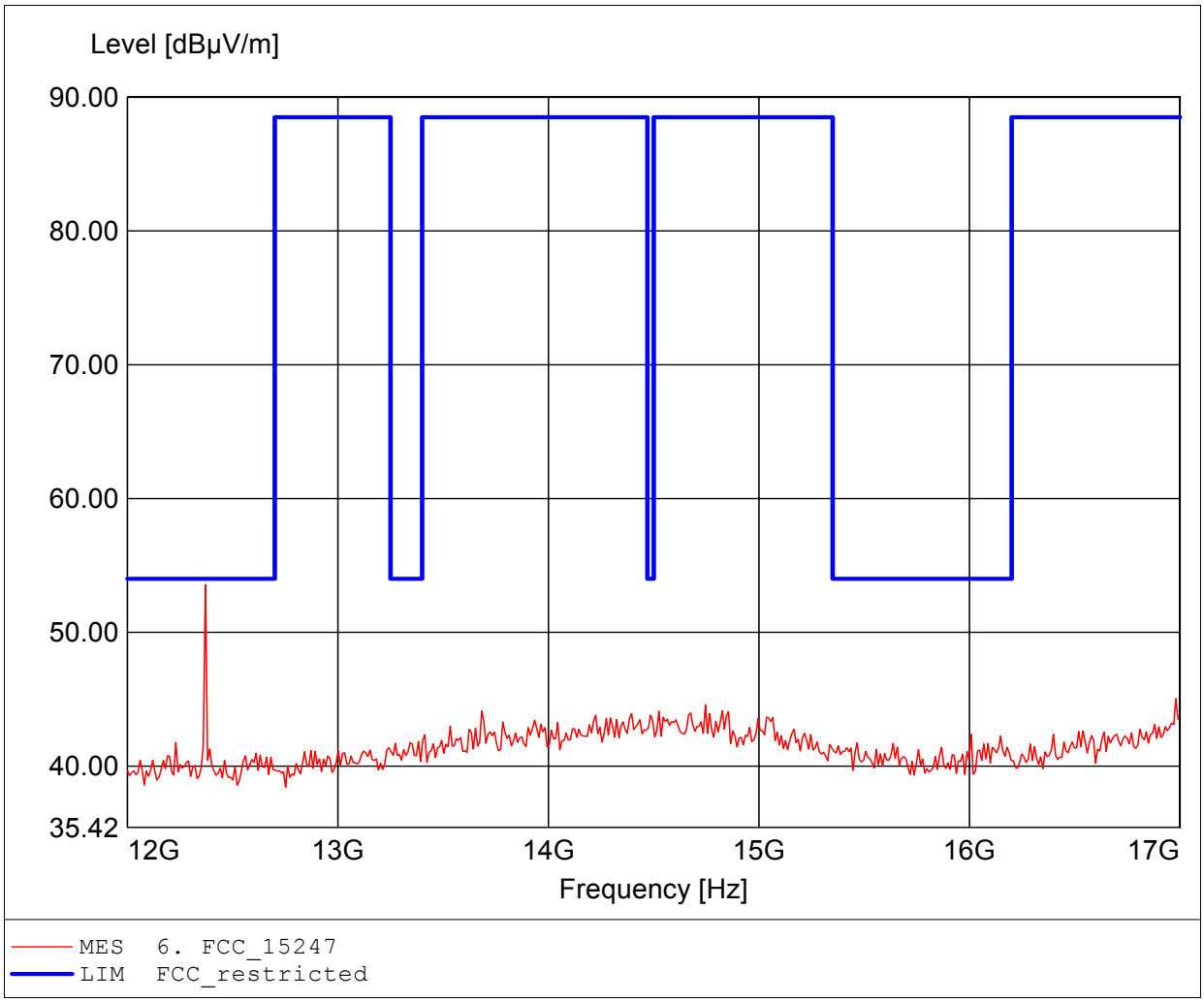
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, average detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2:	Freq: 7.424GHz, Pmax: 43.92dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

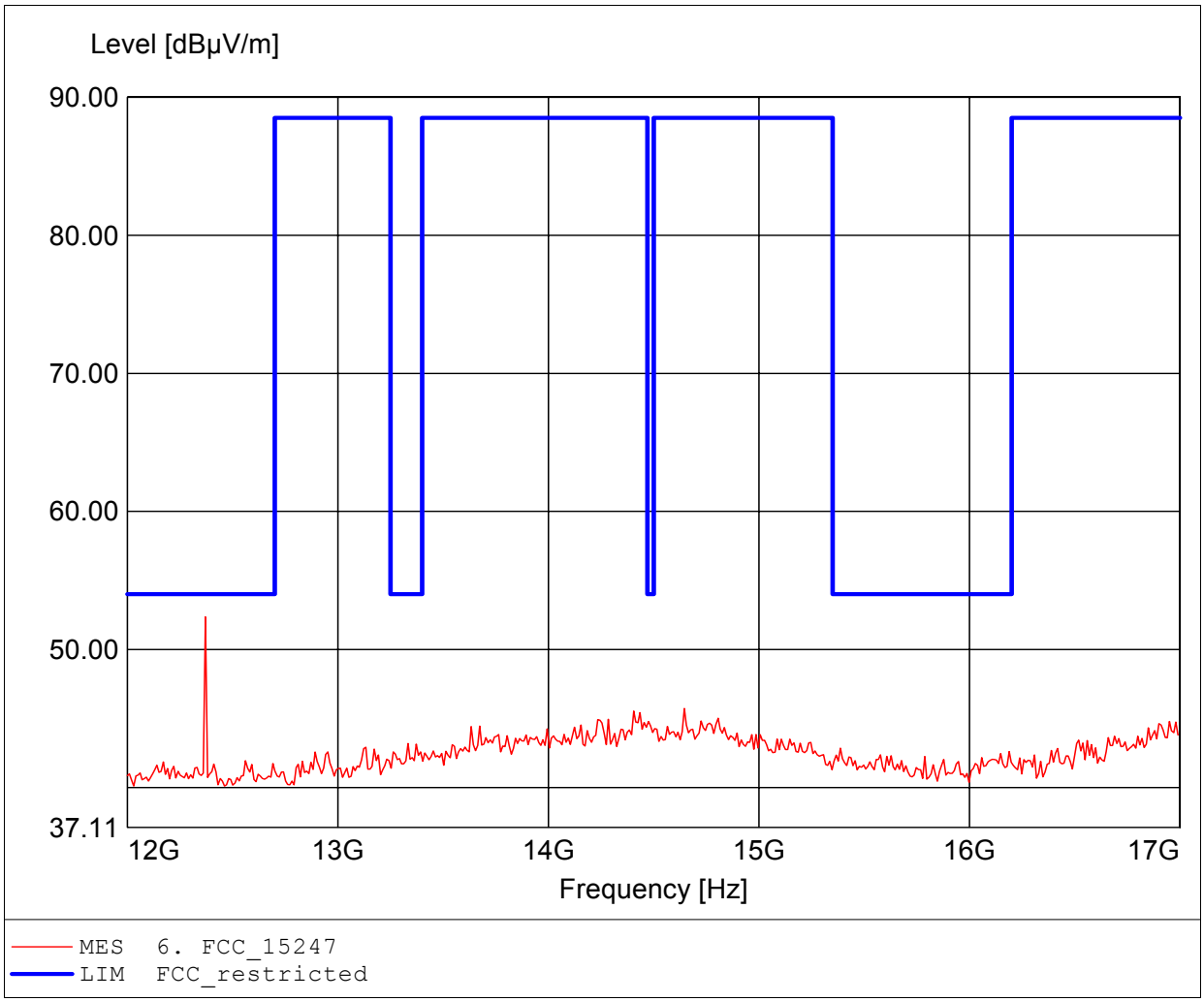
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 12.371GHz, Emax: 53.57dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

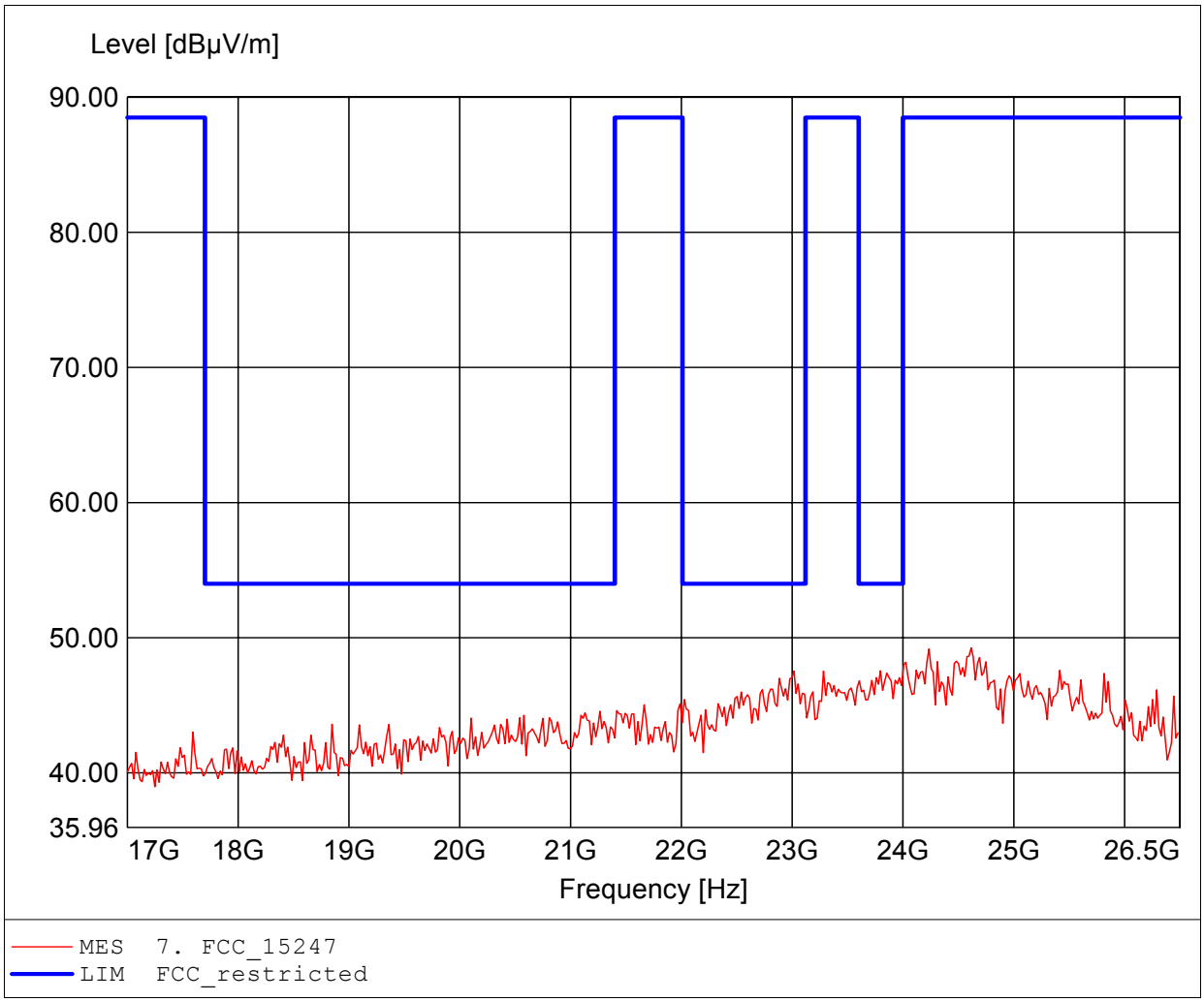
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2:	Freq: 12.371GHz, Emax: 52.36dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

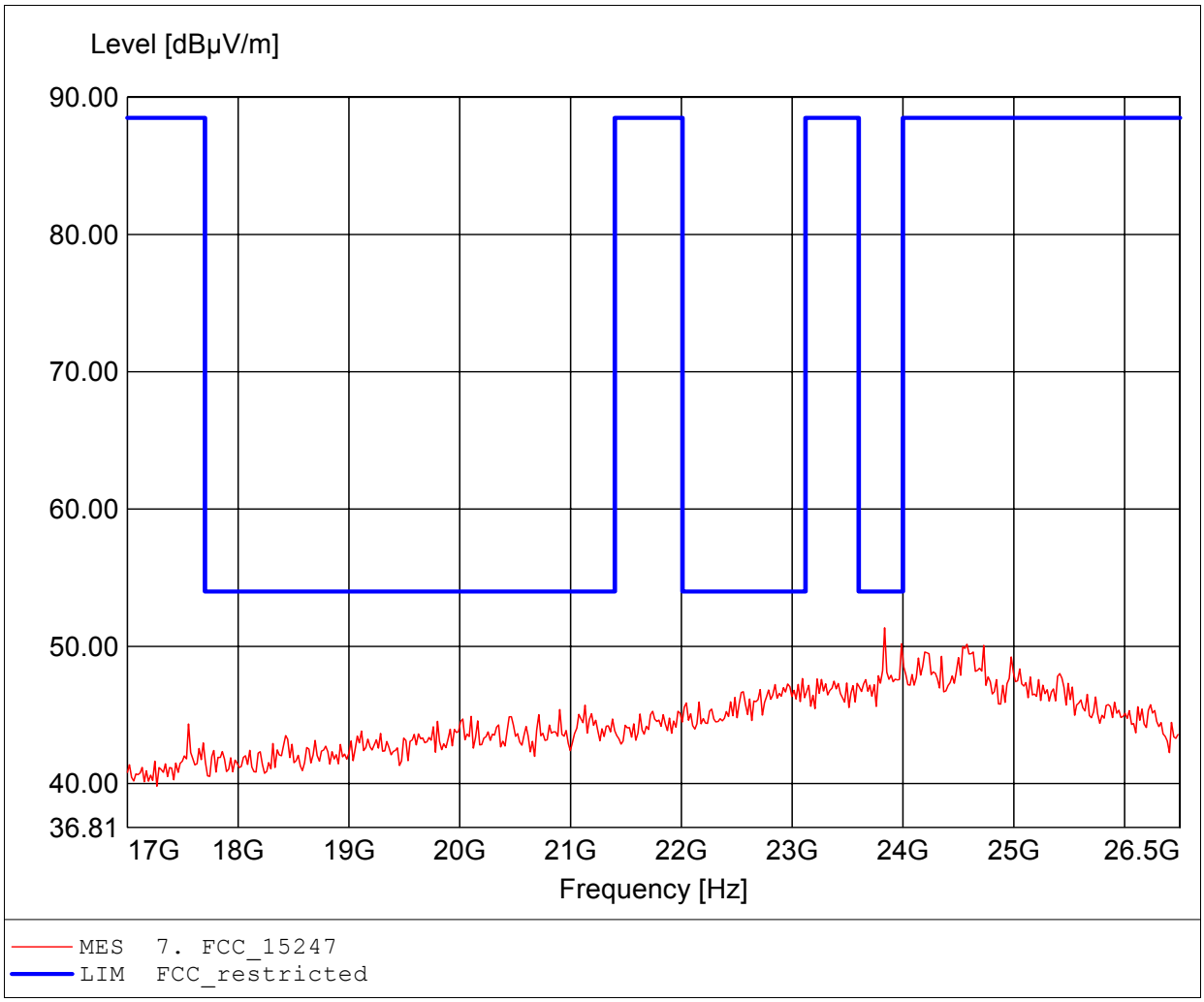
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: HL025, amplif.
Comment 2:	Freq: 24.615GHz, Emax: 49.25dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / power level 13, 2475 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	according to §15.247, peak detector
Comment 1:	Dist.: 3m, Ant.: HL025, amplif.
Comment 2:	Freq: 23.835GHz, Emax: 51.35dBµV/m, RBW: 1MHz

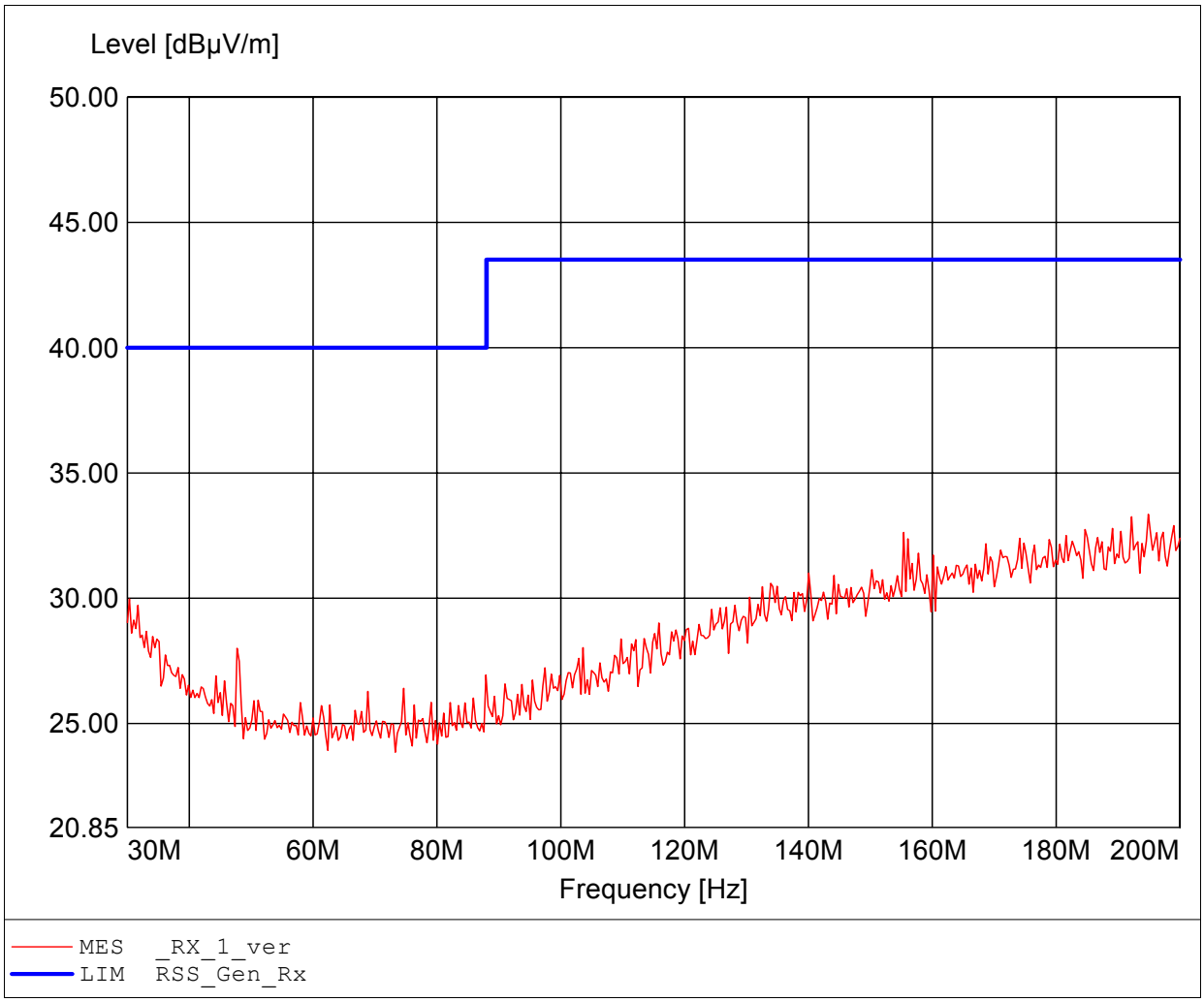


Annex G Receiver Spurious Emissions

Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq:194.890MHz Emax:33.35dBµV/m RBW: 100 kHz



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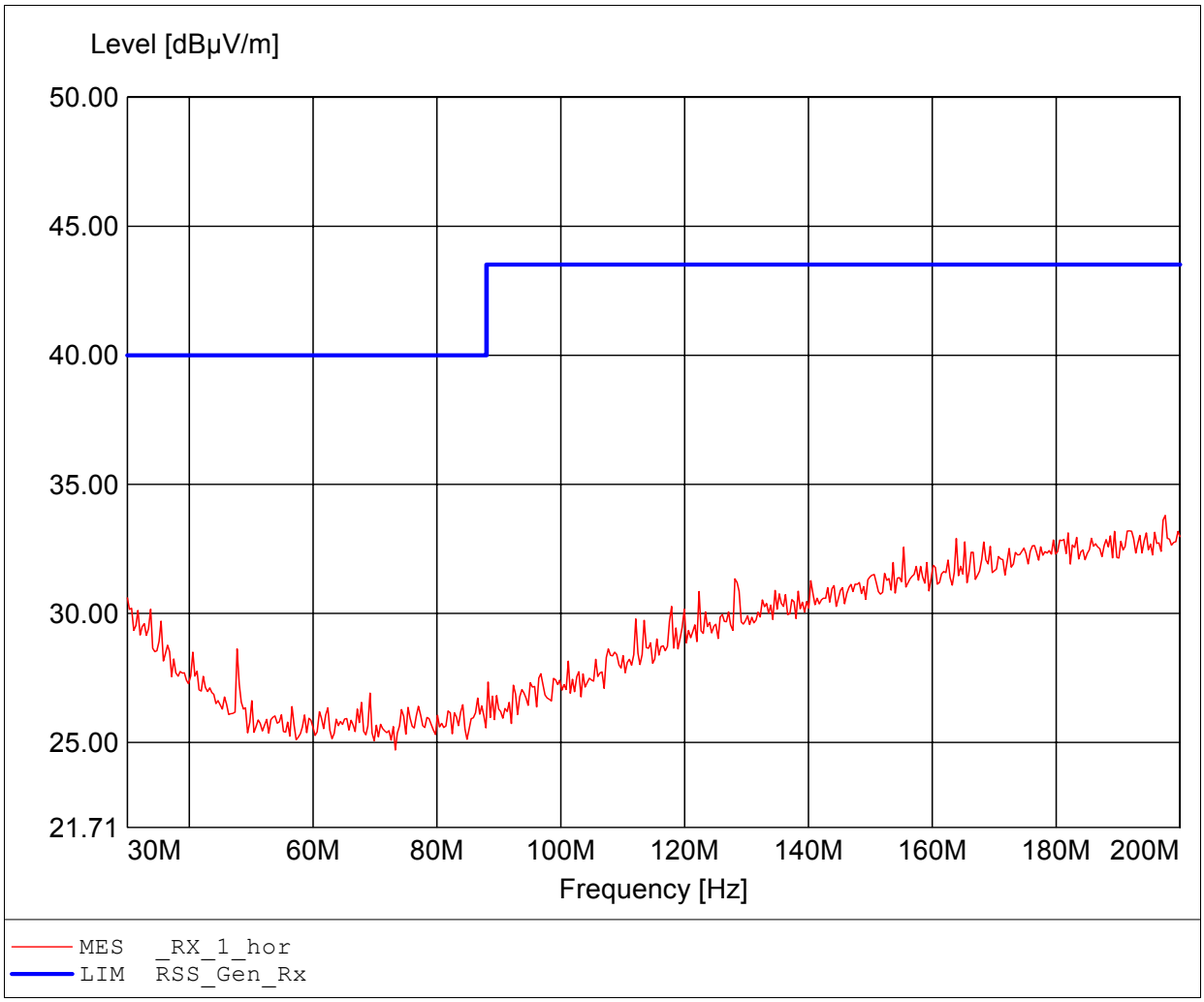
Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HK 116
Comment 2:	Freq:197.615MHz Emax:33.80dBµV/m RBW: 100 kHz



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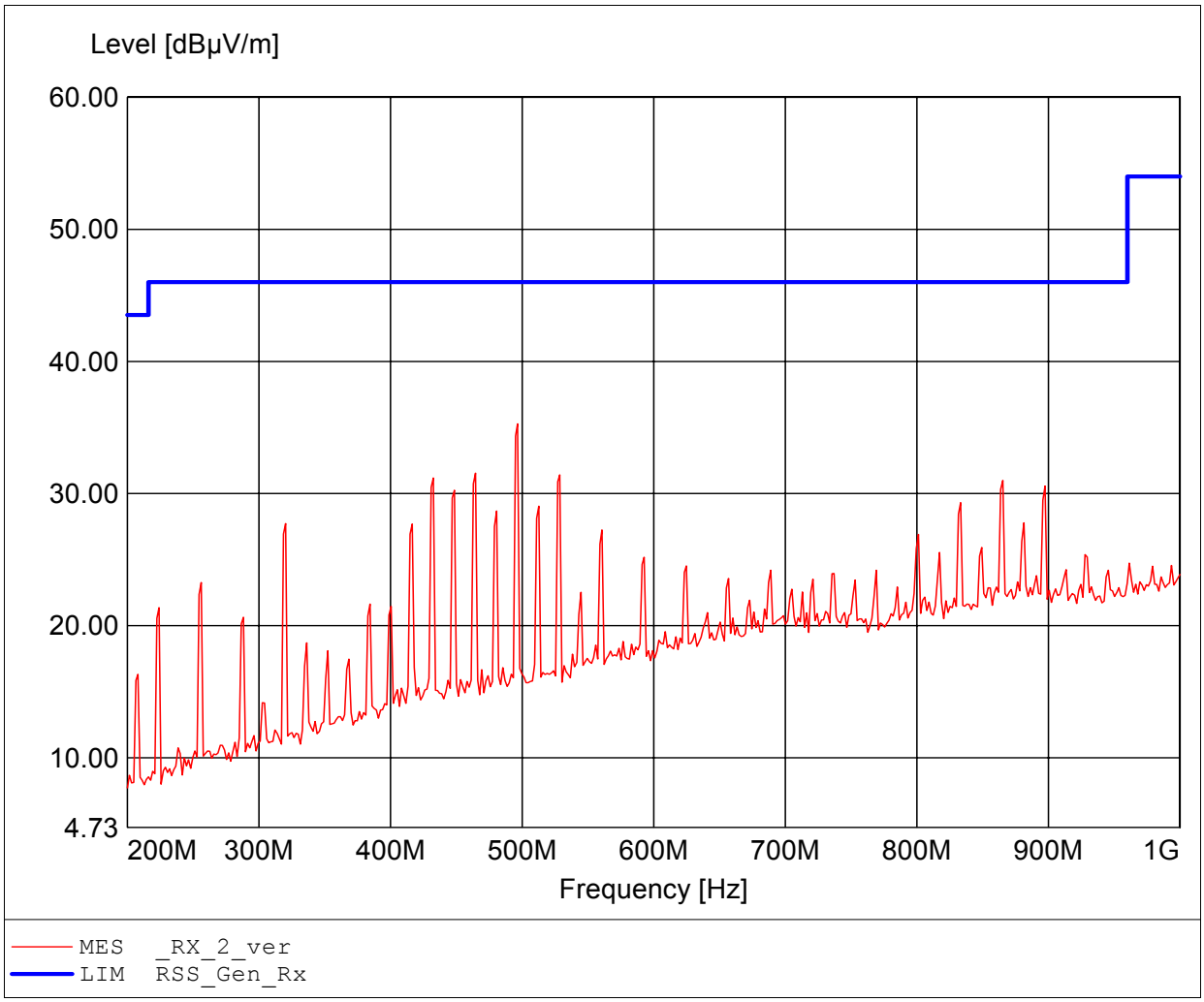
Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HL 223, ampl.
Comment 2:	Freq:496.593MHz Emax:35.27dBµV/m RBW: 100 kHz



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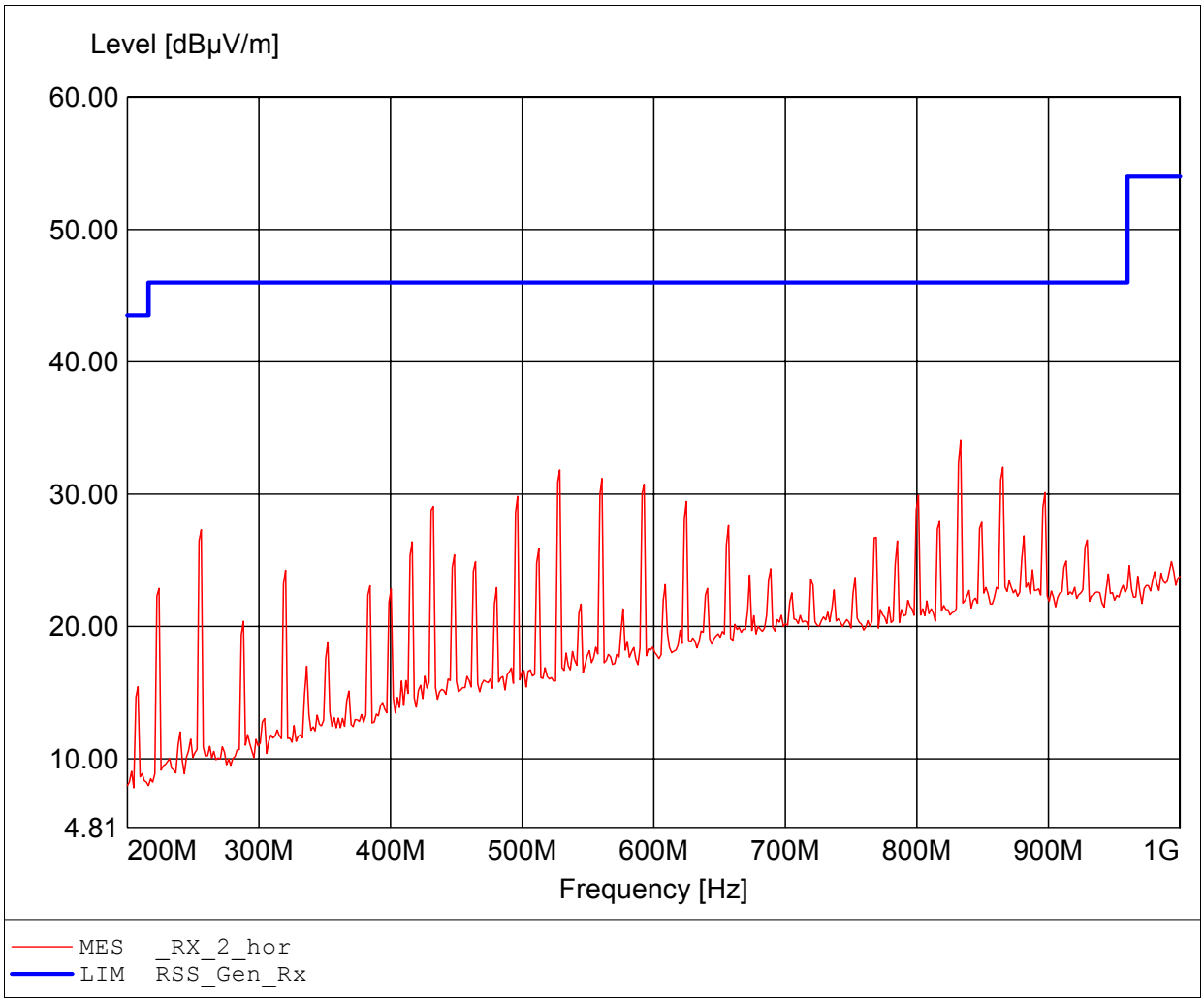
Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

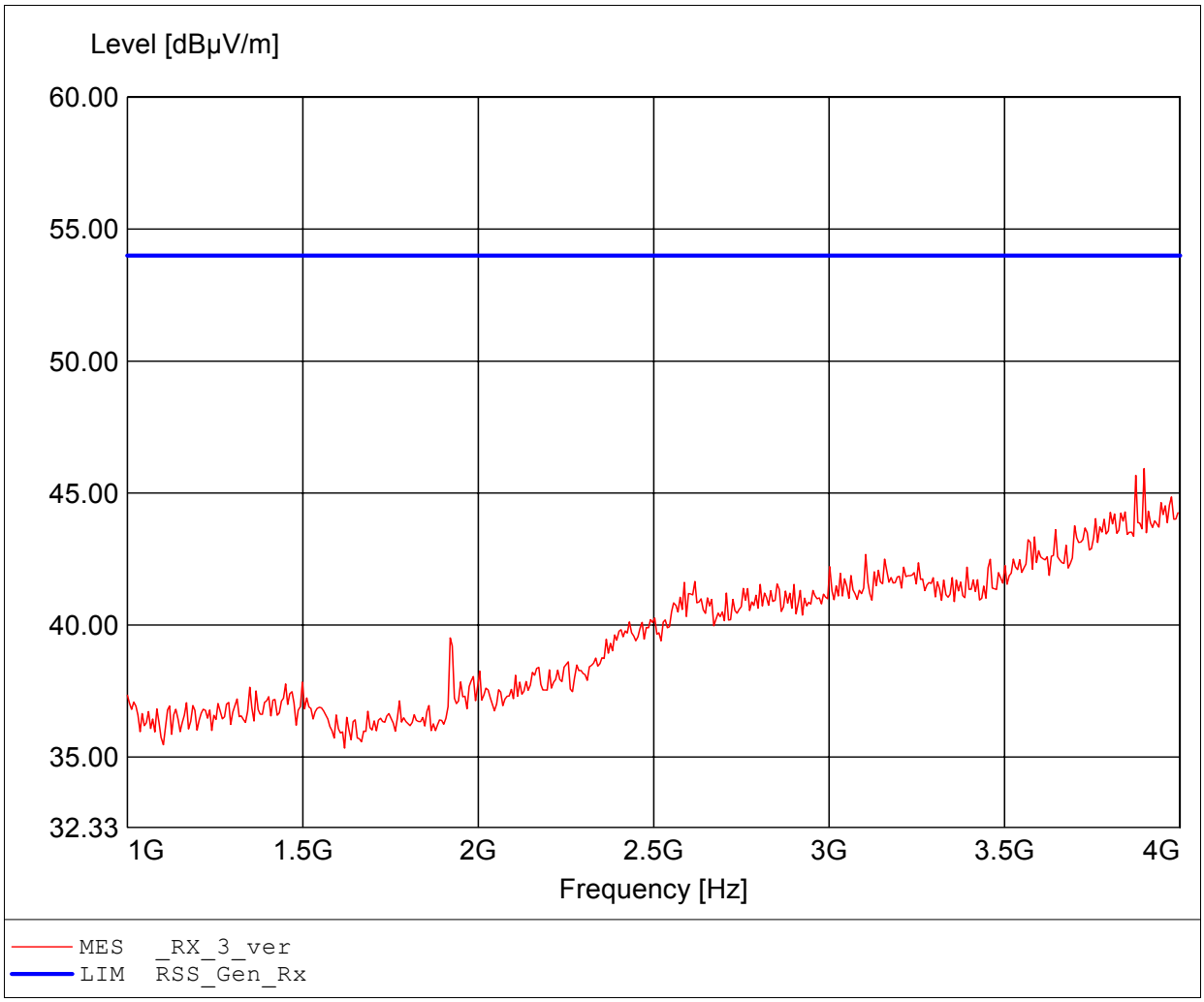
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HL 223, ampl.
Comment 2:	Freq:833.267MHz Emax:34.09dBµV/m RBW: 100 kHz



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

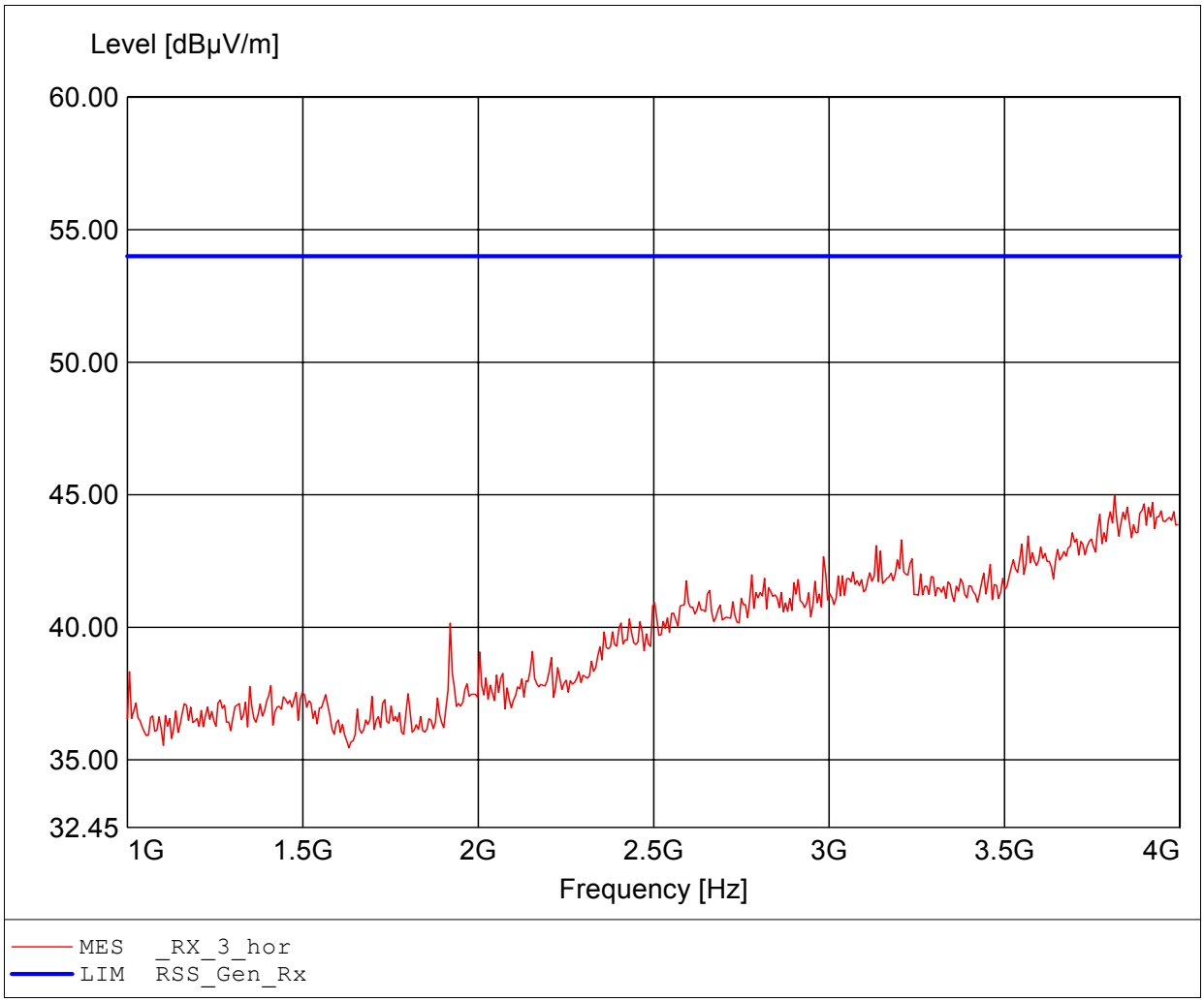
Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HL025, ampl.
Comment 2:	Freq:3.898GHz Emax:45.93dBµV/m RBW: 1 MHz



Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HL025, ampl.
Comment 2:	Freq:3.814GHz Emax:44.98dBµV/m RBW: 1 MHz



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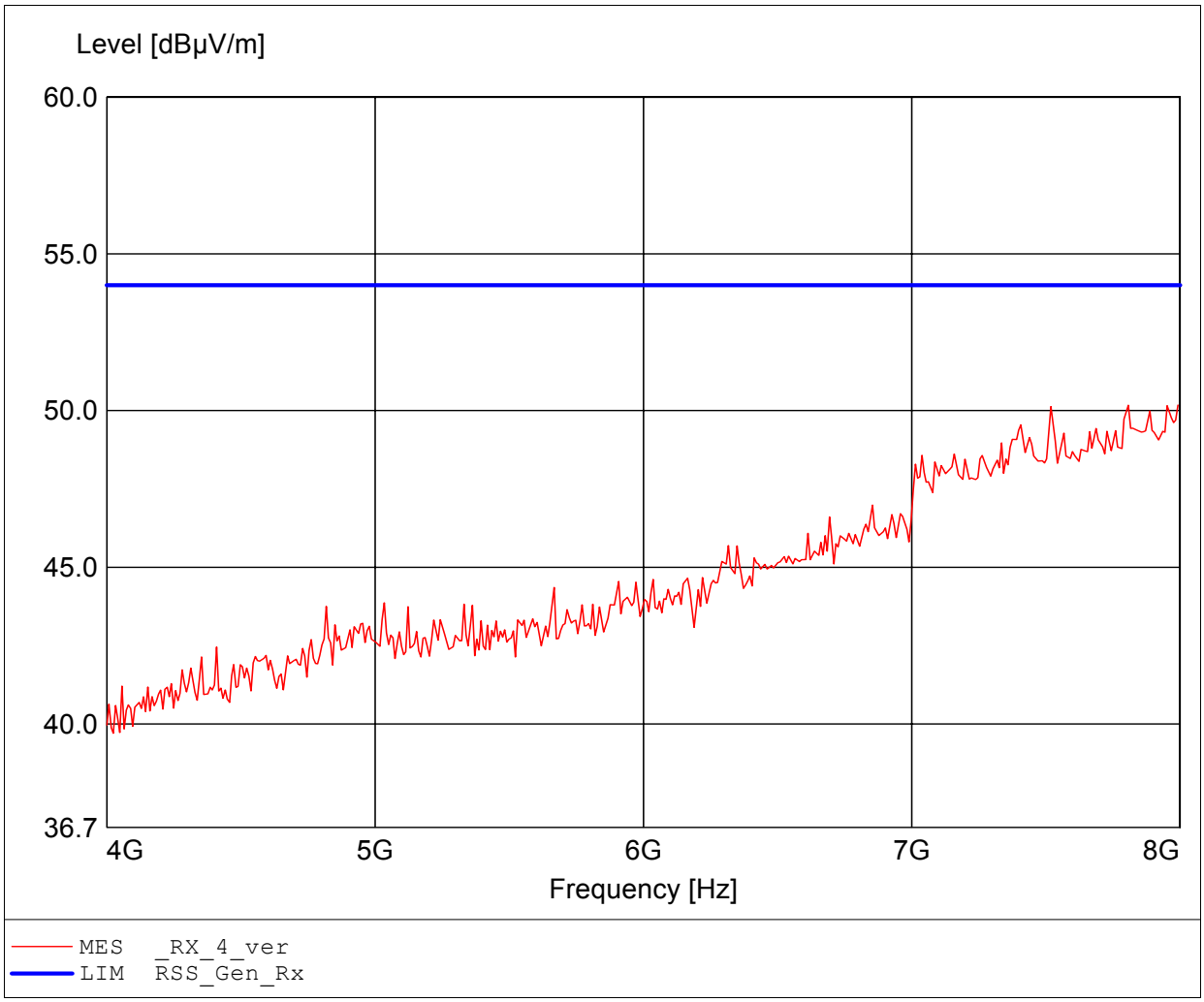
Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HL025, ampl.
Comment 2:	Freq:7.992GHz Emax:50.18dBµV/m RBW: 1 MHz



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Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder:	Panasonic Electronic Devices Europe GmbH
EUT:	802.15.04 module / Ord.: G0M21002-2884
Model:	PAN4561 High, Mid / Rx 2440 MHz
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Treffke
Test Condition:	Tnom: 24°C / Vnom.: 120 V AC adaptor, 3 VDC (module)
Test Specification:	Freq. / CH:
Comment 1:	Dist.: 3m, Ant.: HL025, ampl.
Comment 2:	Freq:7.824GHz Emax:49.37dBµV/m RBW: 1 MHz