

FCC TEST REPORT FCC 47 CFR Part 15C Industry Canada RSS-210 Frequency hopping systems operating within the 2400 – 2483.5 MHz band	
Report Reference No.	G0M-1303-2693-TFC247B-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	  A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name	Panasonic Industrial Devices Europe GmbH
Address	Zeppelinstr. 19 21337 Lüneburg GERMANY
Test specification:	
Standard	47 CFR Part 15C RSS-210, Issue 8, 2010-12 RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009
Equipment under test (EUT):	
Product description	Bluetooth Module
Model No.	ENW89823C2KF/ENW89823A2KF
Hardware version	4x
Firmware / Software version	0x
	FCC-ID: T7V1316 IC: 216Q-1316
Test result	Passed

Possible test case verdicts:

- neither assessed nor tested: N/N
- required by standard but not appl. to test object.....: N/A
- required by standard but not tested.....: N/T
- not required by standard for the test object: N/R
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

Testing:

Date of receipt of test item: 2013-04-02

Date (s) of performance of tests: 2010-08-31 - 2010-09-02 & 2013-04-05

Compiled by: Christian Weber

Tested by (+ signature).....: Wilfried Treffke
(Testing Manager) 

Approved by (+ signature): Jens Zimmermann
(Test Lab Manager) 

Date of issue: 2013-04-18

Total number of pages: 121

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

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Additional comments:

According to manufacturer declaration the two modules ENW89823C2KF/ENW89823A2KF (PAN1316/PAN1326) are technical identical to the two modules PAN1315/PAN1325 with the 0.9dBi antenna. The only difference is that the PAN1316/PAN1326 modules not only support Bluetooth 4.0 BR+EDR but also the Bluetooth 4.0 Low Energy mode.

It has been verified by measurements that the radio performance of the PAN1315/PAN1325 and PAN1316/PAN1326 modules is identical. Therefore the Bluetooth BR+EDR measurement results obtained for the PAN1315/1325 modules are supposed to be applicable to the PAN1316/PAN1326 modules and given in this test report.

Test Report No.: G0M-1303-2693-TFC247B-V01

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Storkower Str. 38c, D-15526 Reichenwalde, Germany

Version History

Version	Issue Date	Remarks	Revised by
01	2013-04-15	Initial Release	

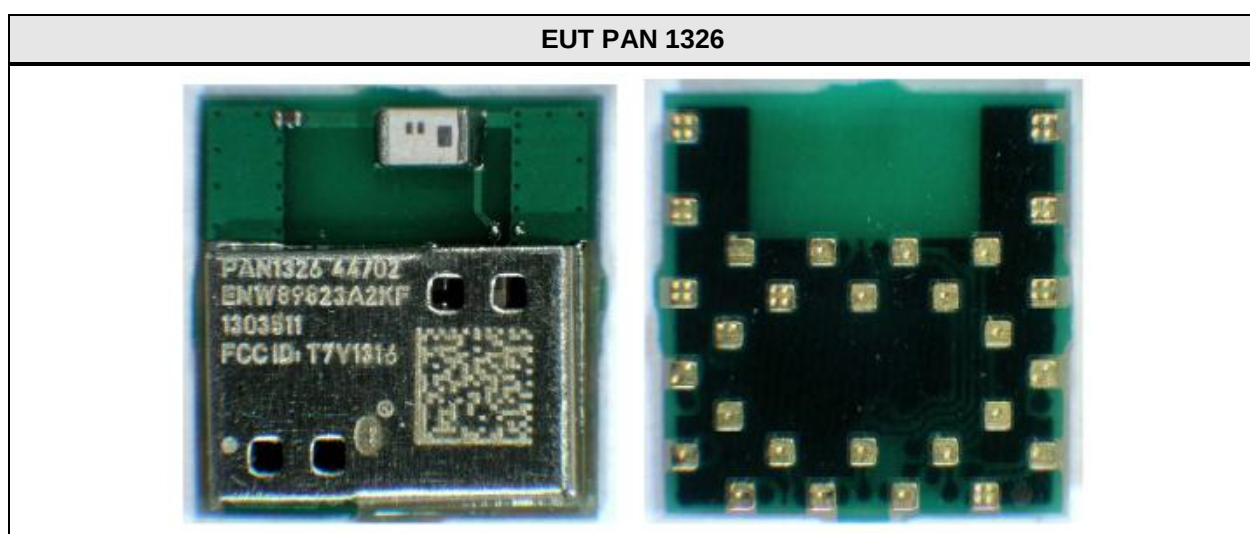
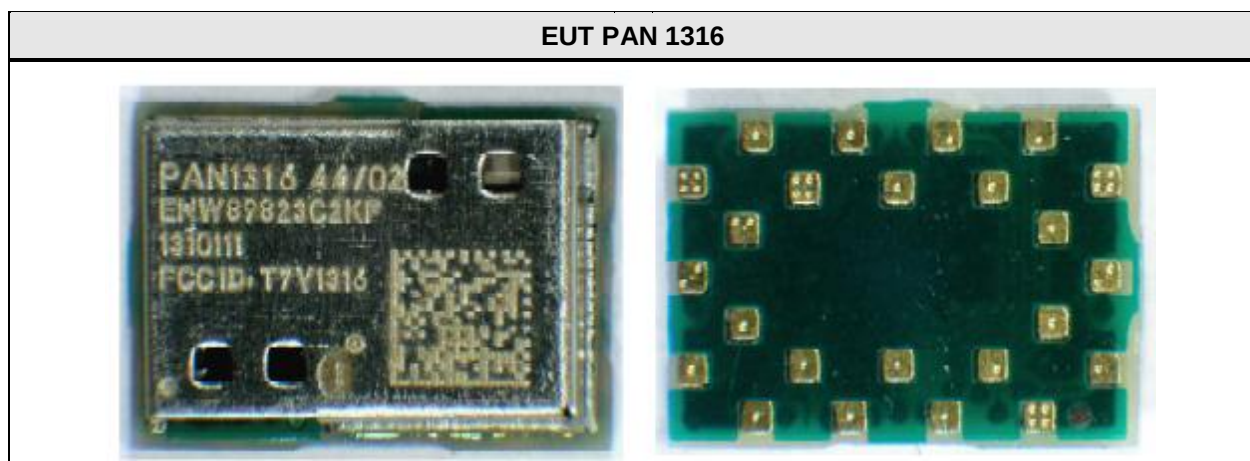
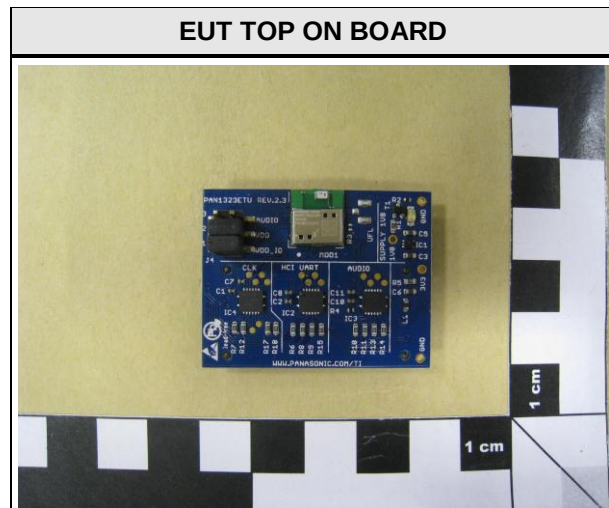
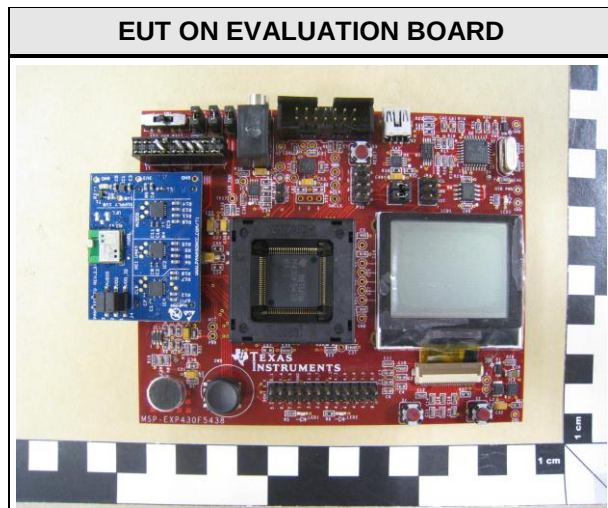
REPORT INDEX

1	EQUIPMENT (TEST ITEM) DESCRIPTION	5
1.1	Photos – Equipment External	6
1.2	Photos – Equipment internal	7
1.3	Photos – Test setup	8
1.4	Supporting Equipment Used During Testing	9
1.5	Test Modes	10
1.6	Test Equipment Used During Testing	12
1.7	Sample emission level calculation	13
2	RESULT SUMMARY	14
3	TEST CONDITIONS AND RESULTS	15
3.1	Test Conditions and Results – Occupied Bandwidth	15
3.2	Test Conditions and Results – 20 dB Bandwidth	22
3.3	Test Conditions and Results – Number of hopping frequencies	32
3.4	Test Conditions and Results – Frequency hopping channel separation	37
3.5	Test Conditions and Results – Time of occupancy (Dwell Time)	39
3.6	Test Conditions and Results – Maximum peak conducted power	41
3.7	Test Conditions and Results – AC power line conducted emissions	43
3.8	Test Conditions and Results – Band edge compliance	46
3.9	Test Conditions and Results – Conducted spurious emissions	59
3.10	Test Conditions and Results – Transmitter radiated emissions	78
3.11	Test Conditions and Results – Receiver radiated emissions	80
ANNEX A	Transmitter radiated spurious emissions	82
ANNEX B	Receiver radiated spurious emissions	120

1 Equipment (Test item) Description

Description	Bluetooth Module	
Model	ENW89823C2KF/ENW89823A2KF	
Serial number	None	
Hardware version	4x	
Software / Firmware version	0x	
FCC-ID	T7V1316	
IC	216Q-1316	
Equipment type	Radio module	
Radio type	Transceiver	
Radio technology	Bluetooth	
Operating frequency range	2402 - 2480 MHz	
Assigned frequency band	2400 - 2483.5 MHz	
Main test frequencies	F _{LOW}	2402 MHz
	F _{MID}	2441 MHz
	F _{HIGH}	2480 MHz
Spreading	FHSS	
Modulations	GFSK, PI/4-DQPSK, 8-PSK	
Number of channels	79 hopping channels at all	
Channel spacing	1 MHz	
Number of antennas	1	
Antenna	Type	integrated
	Model	LDA21K 7488930245
	Manufacturer	Murata
	Gain	+0.9 dBi (manufacturer declaration)
Manufacturer	Panasonic Industrial Devices Europe GmbH Zeppelinstr. 19 21337 Lüneburg GERMANY	
Power supply	V _{NOM}	3.0 VDC
	V _{MIN}	2.55 VDC
	V _{MIN}	3.45 VDC
AC/DC-Adaptor	None	

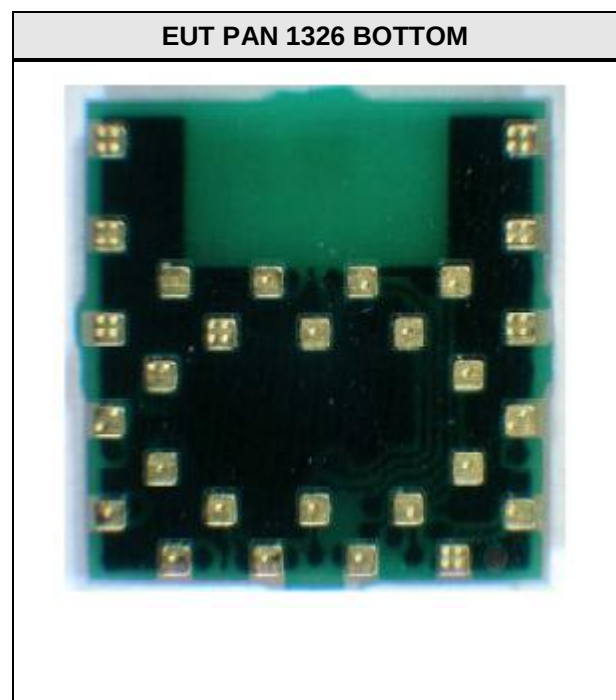
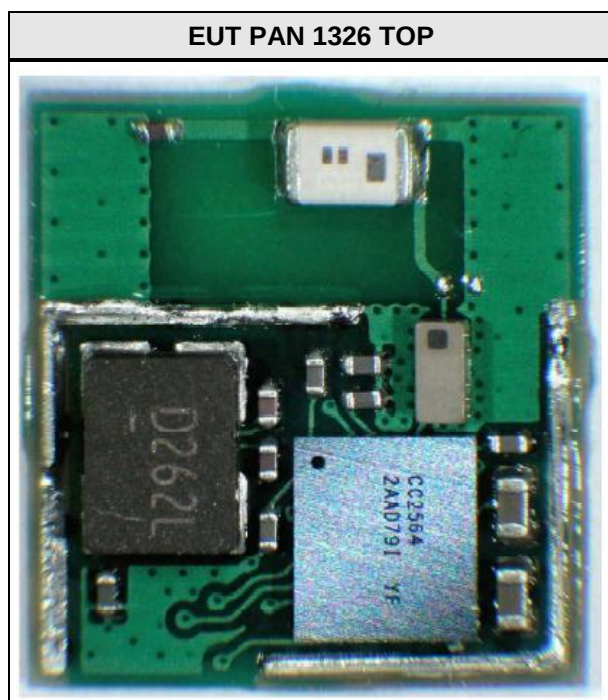
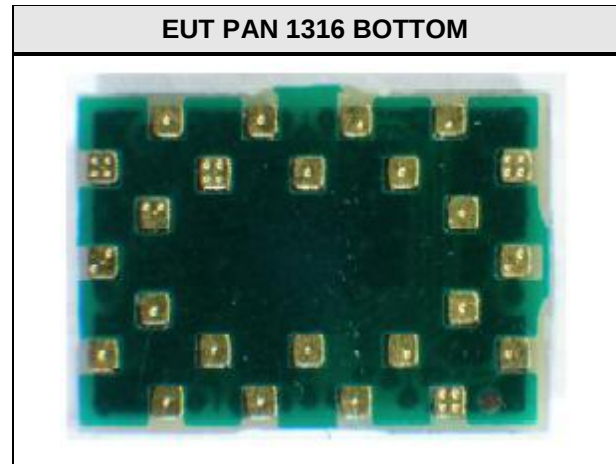
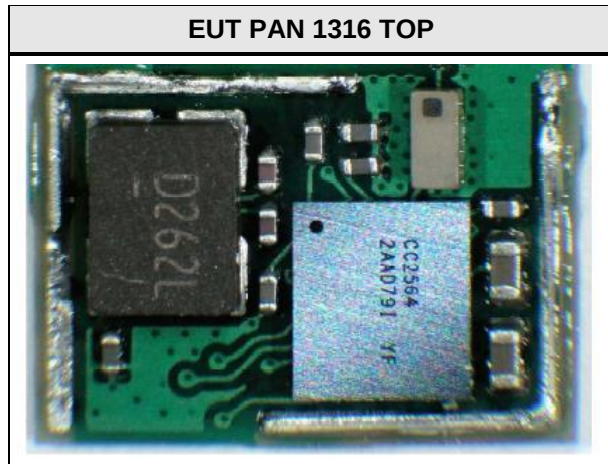
1.1 Photos – Equipment External



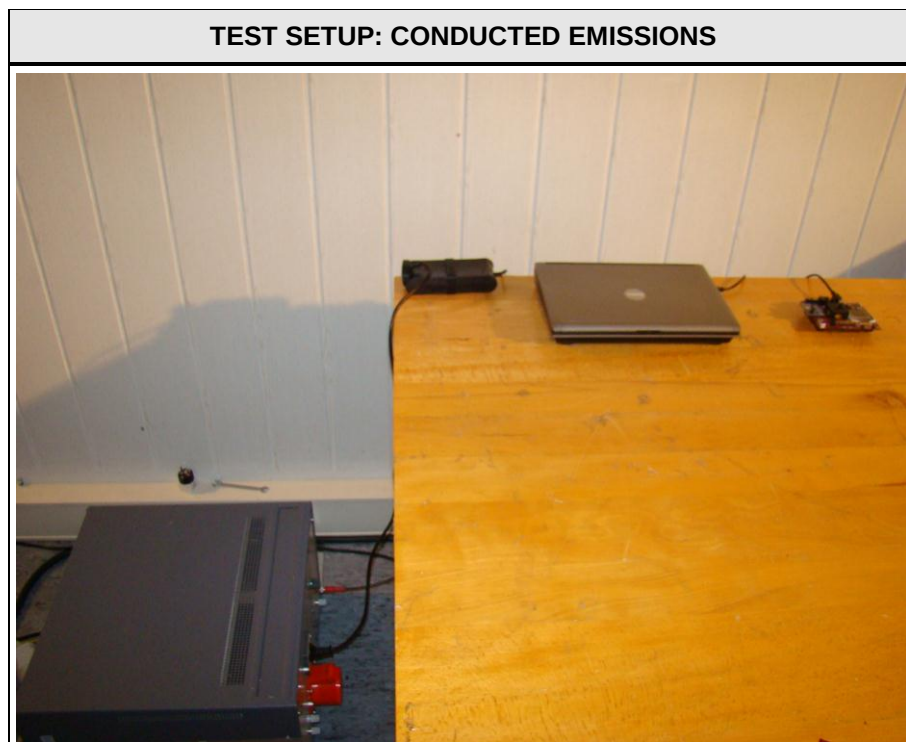
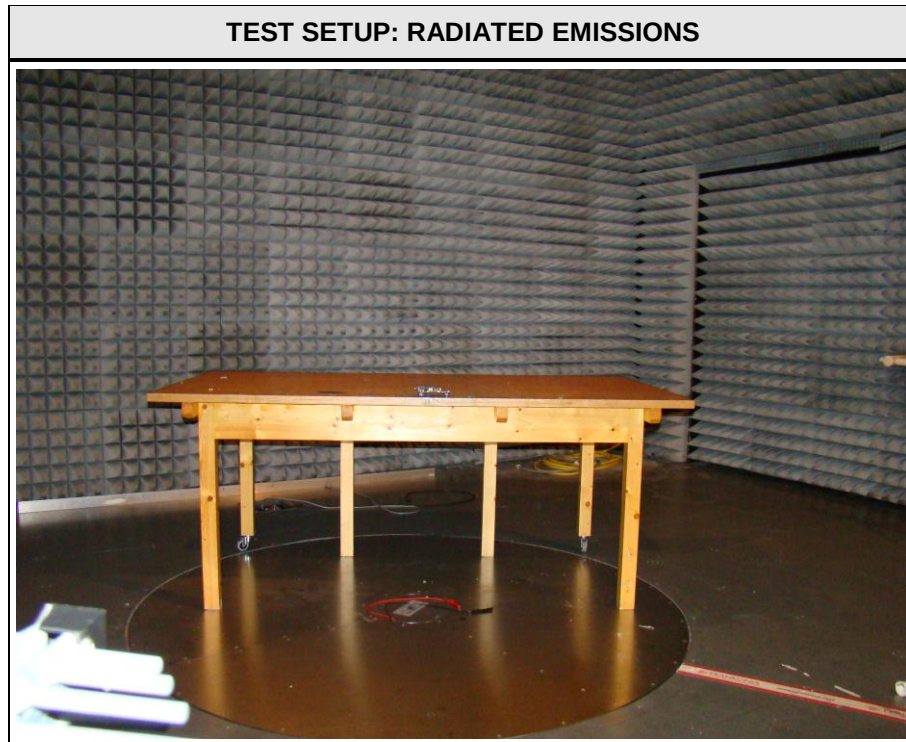
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1.2 Photos – Equipment internal



1.3 Photos – Test setup



1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
None				
*Note: Use the following abbreviations: AE : Auxiliary/Associated Equipment, or SIM : Simulator (Not Subjected to Test) CABL : Connecting cables				

1.5 Test Modes

Mode #	Description	
DH5-Sngl	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping stopped (single hopping channel) Modulation = GFSK Packet type = DH5 Data rate = 1 Mbps Duty cycle = 47 % Power level = Maximum
2DH5-Sngl	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping stopped (single hopping channel) Modulation = $\pi/4$ -DQPSK Packet type = 2DH5 Data rate = 2 Mbps Duty cycle = 47 % Power level = Maximum
3DH5-Sngl	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping stopped (single hopping channel) Modulation = 8-DPSK Packet type = 3DH5 Data rate = 3 Mbps Duty cycle = 47 % Power level = Maximum
DH5-Hop	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping Modulation = GFSK Packet type = DH5 Data rate = 1 Mbps Duty cycle = 47 % Power level = Maximum

2DH5-Hop	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping Modulation = $\pi/4$ -DQPSK Packet type = 2DH5 Data rate = 2 Mbps Duty cycle = 47 % Power level = Maximum
3DH5-Hop	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping Modulation = 8-DPSK Packet type = 3DH5 Data rate = 3 Mbps Duty cycle = 47 % Power level = Maximum
Receive	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone receive Spreading = Hopping
AC-Powerline	General conditions:	EUT powered by commercial AC/DC-Adapter
	Radio conditions:	Mode = standalone transmit Spreading = Hopping Power level = Maximum

1.6 Test Equipment Used During Testing

20dB Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2010-08	2011-08

Number of hopping frequencies					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2010-08	2011-08

Time of occupancy					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2010-08	2011-08

Maximum peak conducted power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2010-08	2011-08

Band edge compliance					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2010-08	2011-08

Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2010-08	2011-08

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSEK30	EF00168	2009-03	2011-03
Biconical Antenna	R&S	HK 116	EF00012	2010-01	2011-01
LPD Antenna	R&S	HL 223	EF00187	2010-01	2011-01
LPD Antenna	R&S	BBHA 9120D	EF00019	2010-08	2011-08

AC powerline conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2010-09	2012-09
EMI Test Receiver	R&S	ESCS 30	EF00295	2010-06	2011-06

Test Report No.: G0M-1303-2693-TFC247B-V01

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1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBμV/m). The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log (\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

$$\begin{array}{rclclcl} \text{Reading} & + & \text{AF} & = & \text{Net Reading} & : & \text{Net reading - FCC limit} & = & \text{Margin} \\ 21.5 \text{ dB}\mu\text{V} & + & 26 \text{ dB} & = & 47.5 \text{ dB}\mu\text{V/m} & : & 47.5 \text{ dB}\mu\text{V/m} - 57.0 \text{ dB}\mu\text{V/m} & = & -9.5 \text{ dB} \end{array}$$

2 Result Summary

FCC 47 CFR Part 15C, IC RSS-210				
Product Specific Standard Section	Requirement – Test	Reference Method	Result	Remarks
RSS-Gen 4.6.1	Occupied Bandwidth	RSS-Gen 4.6.1	N/R	Informational only
FCC § 15.247(a)(1) IC RSS-210 § A8.1	20 dB Bandwidth	Public notice DA 00-705	PASS	
FCC § 15.247(a)(1)(iii) IC RSS-210 § A8.1	Number of hopping frequencies	Public notice DA 00-705	PASS	
FCC § 15.247(a)(1) IC RSS-210 § A8.1	Frequency hopping channel separation	Public notice DA 00-705	PASS	
FCC § 15.247(a)(1)(iii) IC RSS-210 § A8.1	Time of occupancy (Dwell time)	Public notice DA 00-705	PASS	
FCC § 15.247(b)(1) IC RSS-210 § A8.4	Maximum peak conducted power	Public notice DA 00-705	PASS	
47 CFR 15.207 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS	
FCC § 15.247(d) IC RSS-210 § A8.5	Band edge compliance	Public notice DA 00-705	PASS	
FCC § 15.247(d) IC RSS-210 § A8.5	Conducted spurious emissions	Public notice DA 00-705	PASS	
FCC § 15.247(d) FCC § 15.209 IC RSS-210 A8.5 IC RSS-Gen 4.9 IC RSS-Gen 7.2.5	Transmitter radiated spurious emissions	Public notice DA 00-705 / ANSI C 63.4	PASS	
IC RSS-Gen 4.10 IC RSS-Gen 6.1	Receiver radiated spurious emissions	ANSI C 63.4	PASS	
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. IC RSS-Gen			Verdict: PASS
Test according to measurement reference	Reference Method		
	RSS-Gen 4.6.1		
Test frequency range	Tested frequencies		
	F _{LOW} / F _{MID} / F _{HIGH}		
Limits			
None (Informational only)			
Test setup			
Spectrum Analyzer EUT			
Test procedure			
1. EUT set to test mode (Communication tester is used if needed) 2. Span set to at least twice the emission spectrum 3. Resolution bandwidth set to 1 % of span 4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function			
Test results			
Channel	Frequency [MHz]	Mode	Occupied Bandwidth [kHz]
F _{LOW}	2402	DH5-Sngl	0.842
F _{MID}	2441	DH5-Sngl	0.832
F _{HIGH}	2480	DH5-Sngl	0.852
F _{LOW}	2402	3DH5-Sngl	1.192
F _{MID}	2441	3DH5-Sngl	1.212
F _{HIGH}	2480	3DH5-Sngl	1.192
Comments:			

Occupied Bandwidth – DH5-Sngl F_{Low}

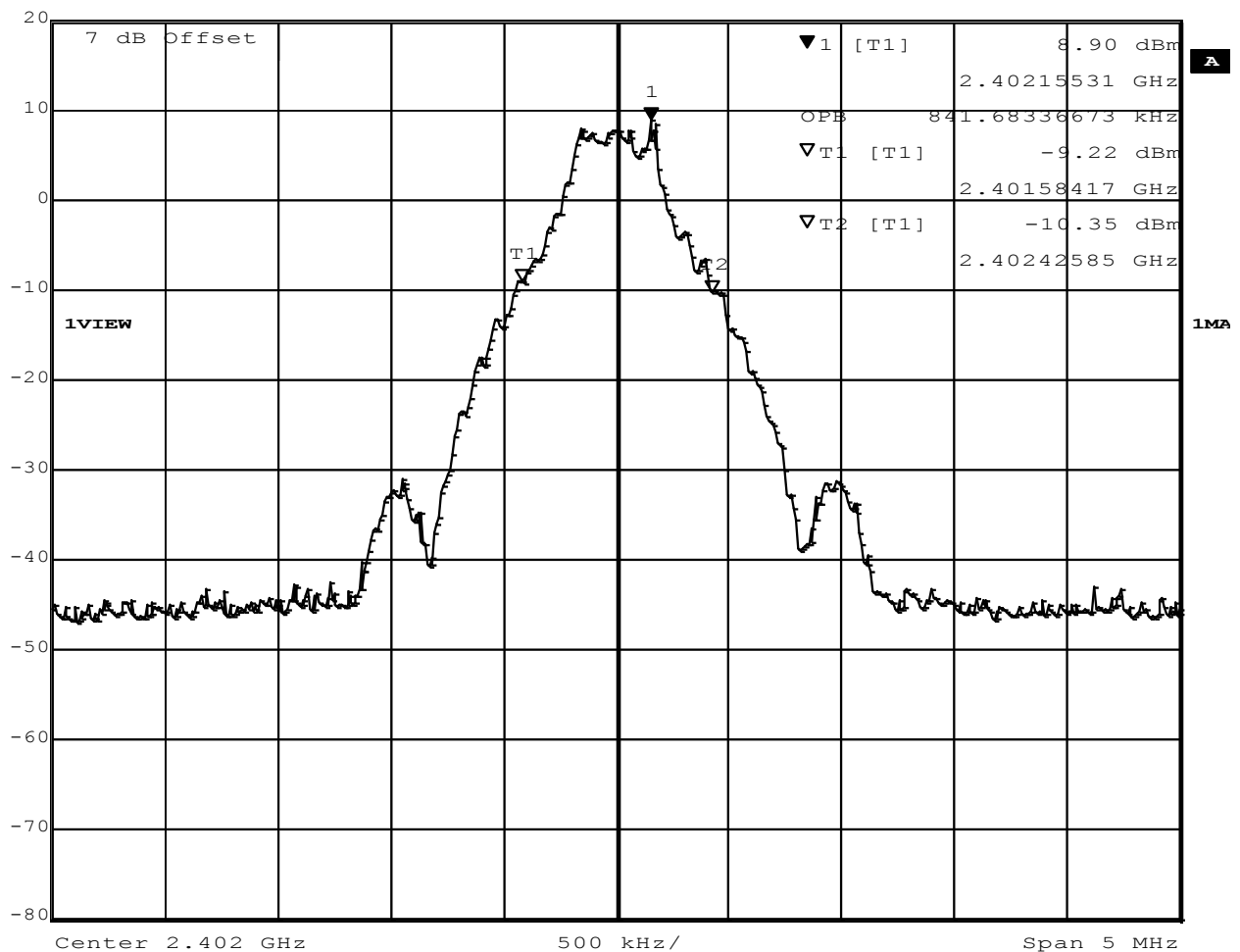
RSS Gen

Occupied Bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification 4.4.1 Occupied Bandwidth
Comment 1 Channel.: 0 / 2402 MHz
Comment 2 A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3 GFSK



Marker 1 [T1] RBW 30 kHz RF Att 40 dB
Ref Lvl 8.90 dBm VBW 100 kHz
20 dBm 2.40215531 GHz SWT 14 ms Unit dBm



Comment A: Occupied bandwidth: 841.7 KHz

Date: 31.AUG.2010 14:10:39

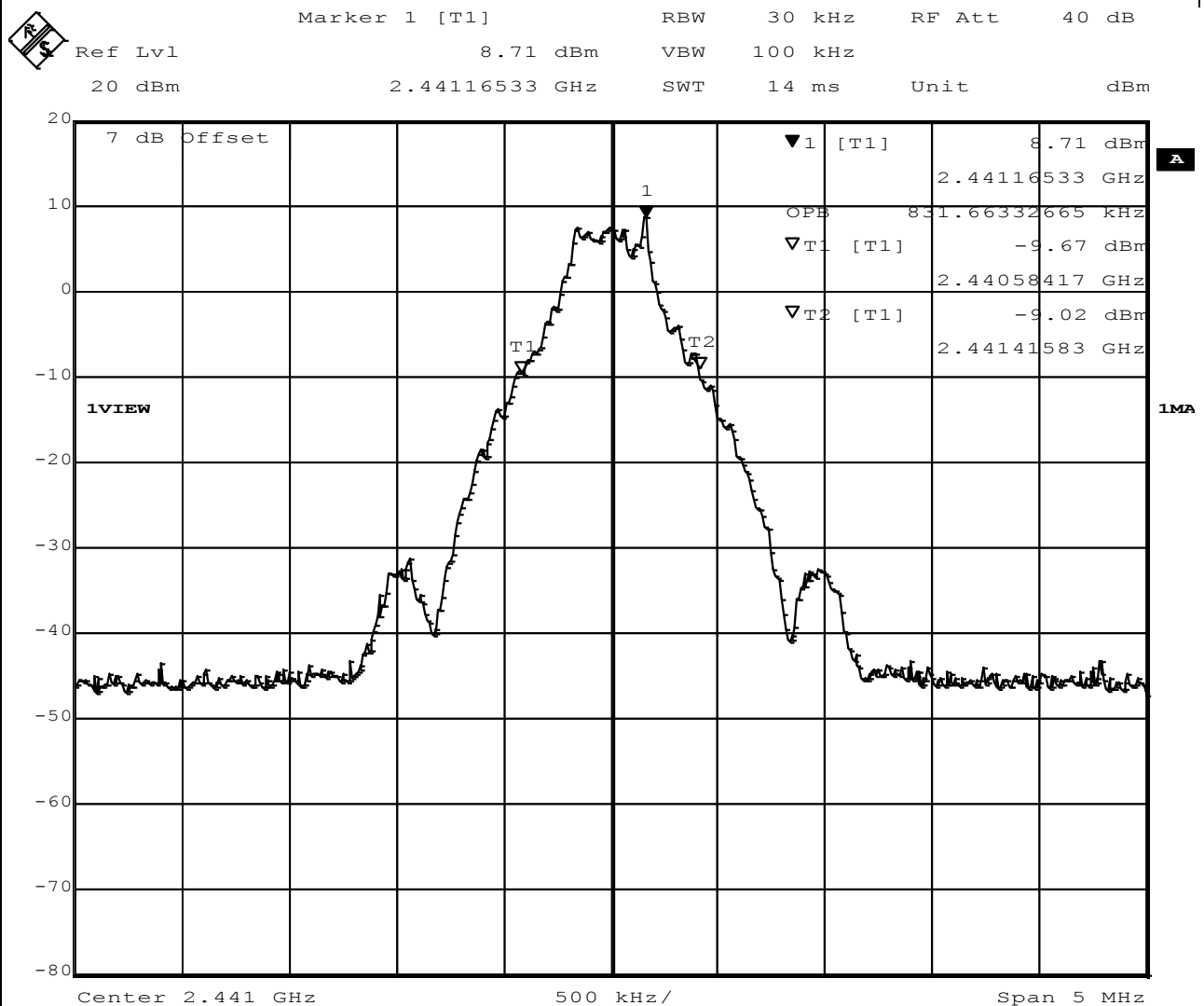
Test Report No.: G0M-1303-2693-TFC247B-V01

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Occupied Bandwidth – DH5-Sngl F_{MID}

RSS Gen Occupied Bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification 4.4.1 Occupied Bandwidth
Comment 1 Channel.: 39 / 2441 MHz
Comment 2 A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3 GFSK



Comment A: Occupied bandwidth: 831.7 KHz
Date: 31.AUG.2010 14:33:44

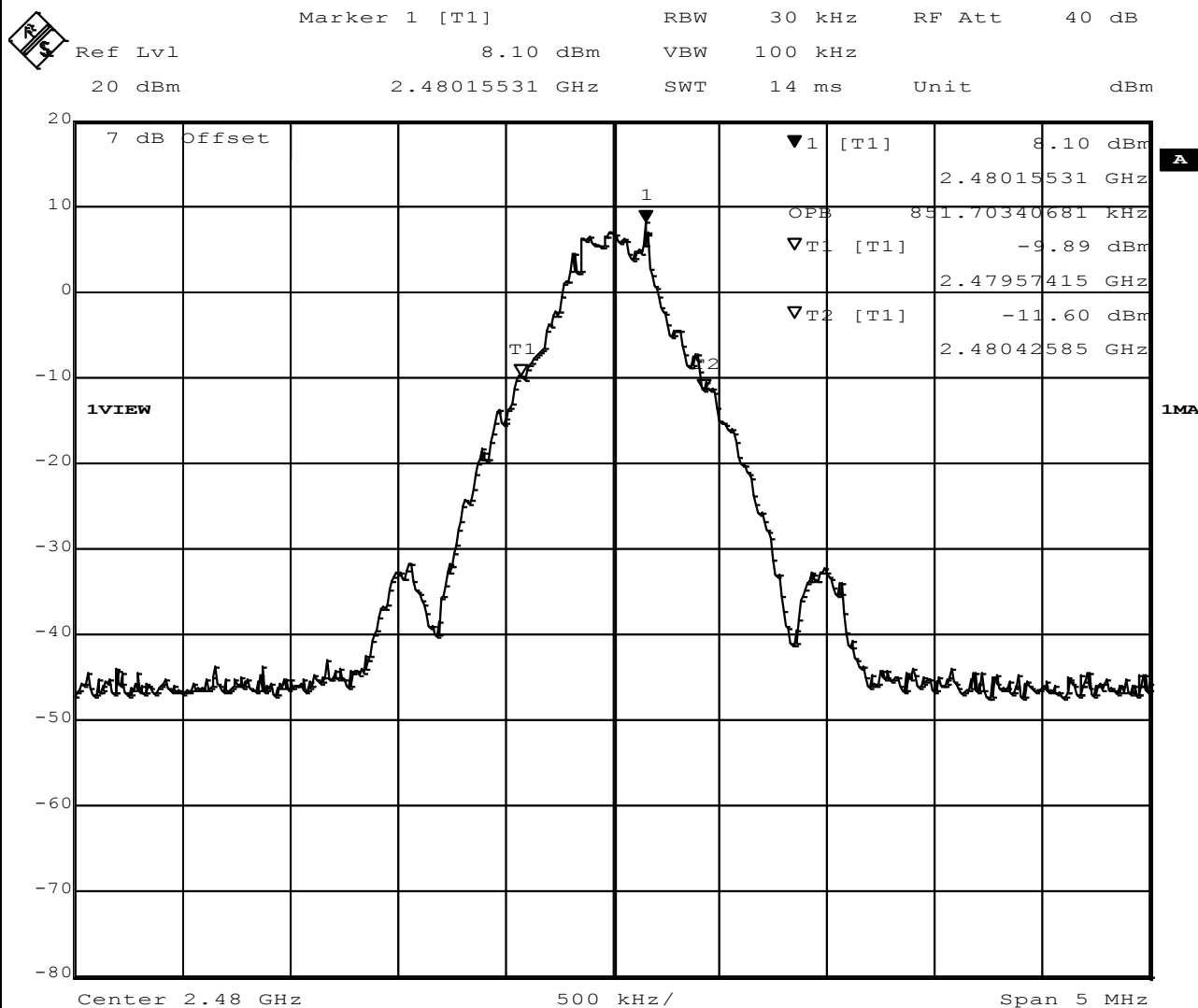
Test Report No.: G0M-1303-2693-TFC247B-V01

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Occupied Bandwidth – DH5-Sngl F_{HIGH}

RSS Gen Occupied Bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification 4.4.1 Occupied Bandwidth
Comment 1 Channel.: 78 / 2480 MHz
Comment 2 A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3 GFSK



Comment A: Occupied bandwidth: 851.7 KHz

Date: 31.AUG.2010 14:36:56

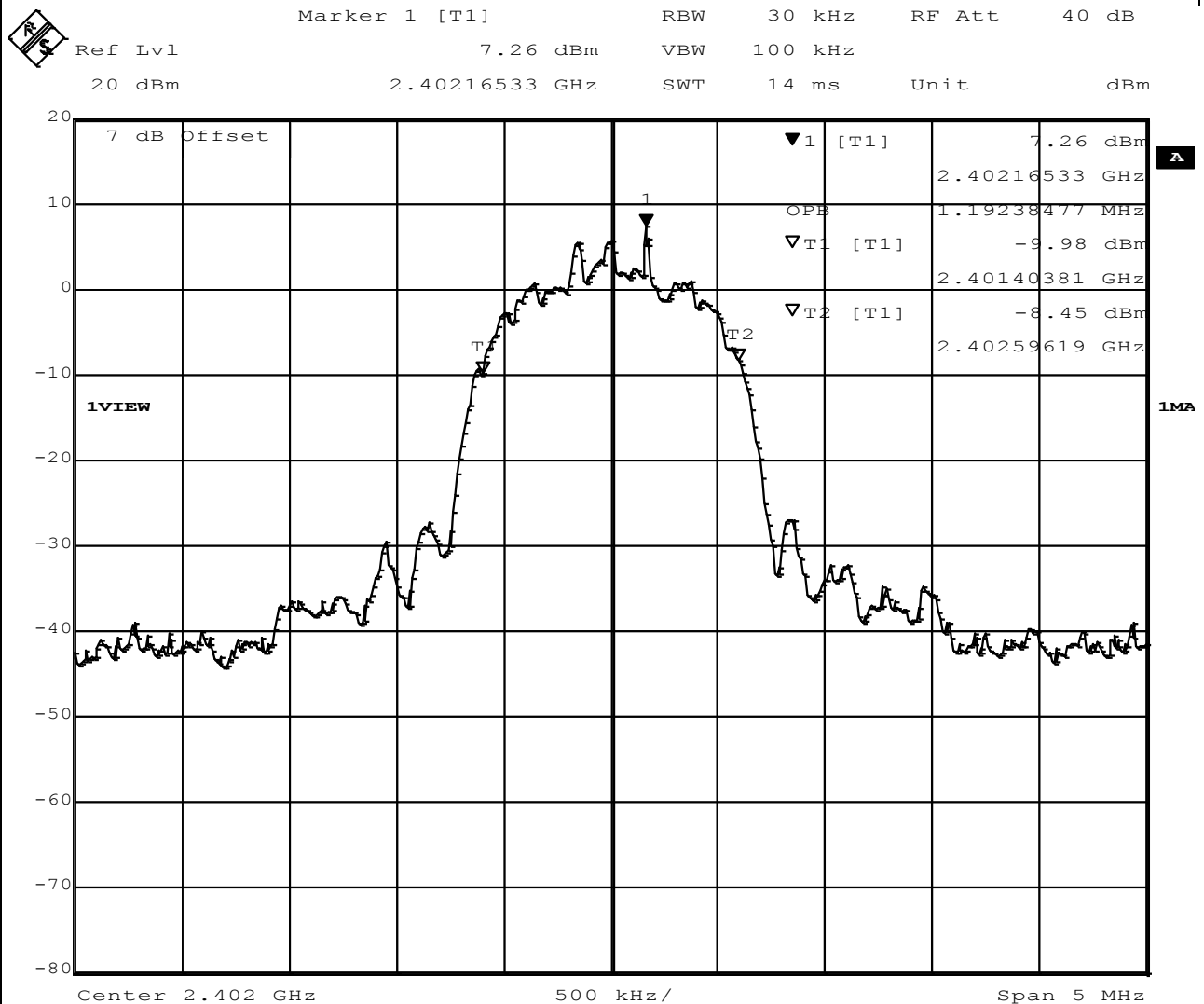
Test Report No.: G0M-1303-2693-TFC247B-V01

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Occupied Bandwidth – 3-DH5-Sngl F_{LOW}

RSS Gen Occupied Bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification 4.4.1 Occupied Bandwidth
Comment 1 Channel.: 0 / 2402 MHz
Comment 2 A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3 8DPSK



Comment A: Occupied bandwidth: 1192.4 KHz

Date: 31.AUG.2010 14:28:22

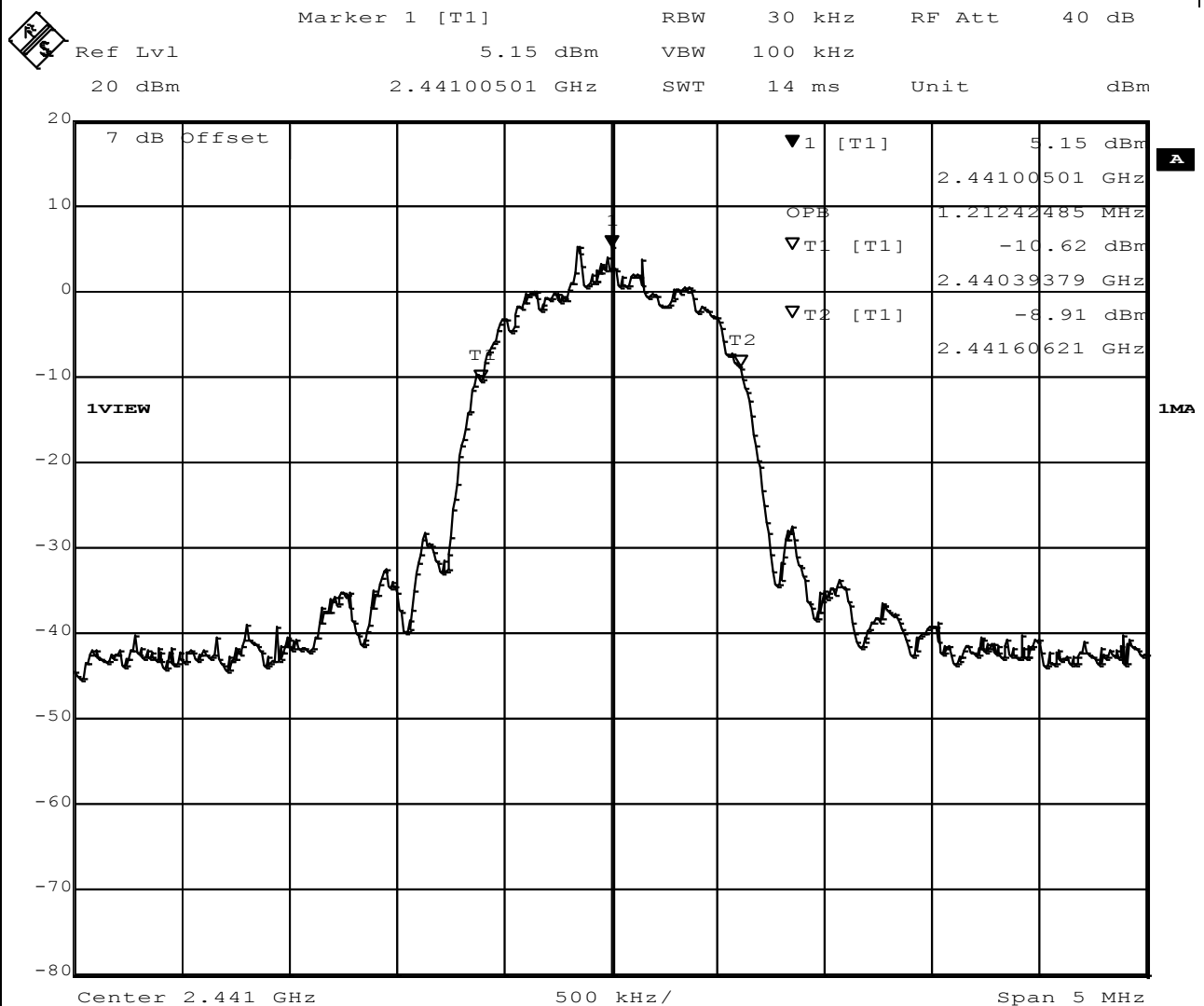
Test Report No.: G0M-1303-2693-TFC247B-V01

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Occupied Bandwidth – 3-DH5-Sngl F_{MID}

RSS Gen Occupied Bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification 4.4.1 Occupied Bandwidth
Comment 1 Channel.: 39 / 2441 MHz
Comment 2 A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3 8DPSK



Comment A: Occupied bandwidth: 1212.4 KHz

Date: 31.AUG.2010 14:31:23

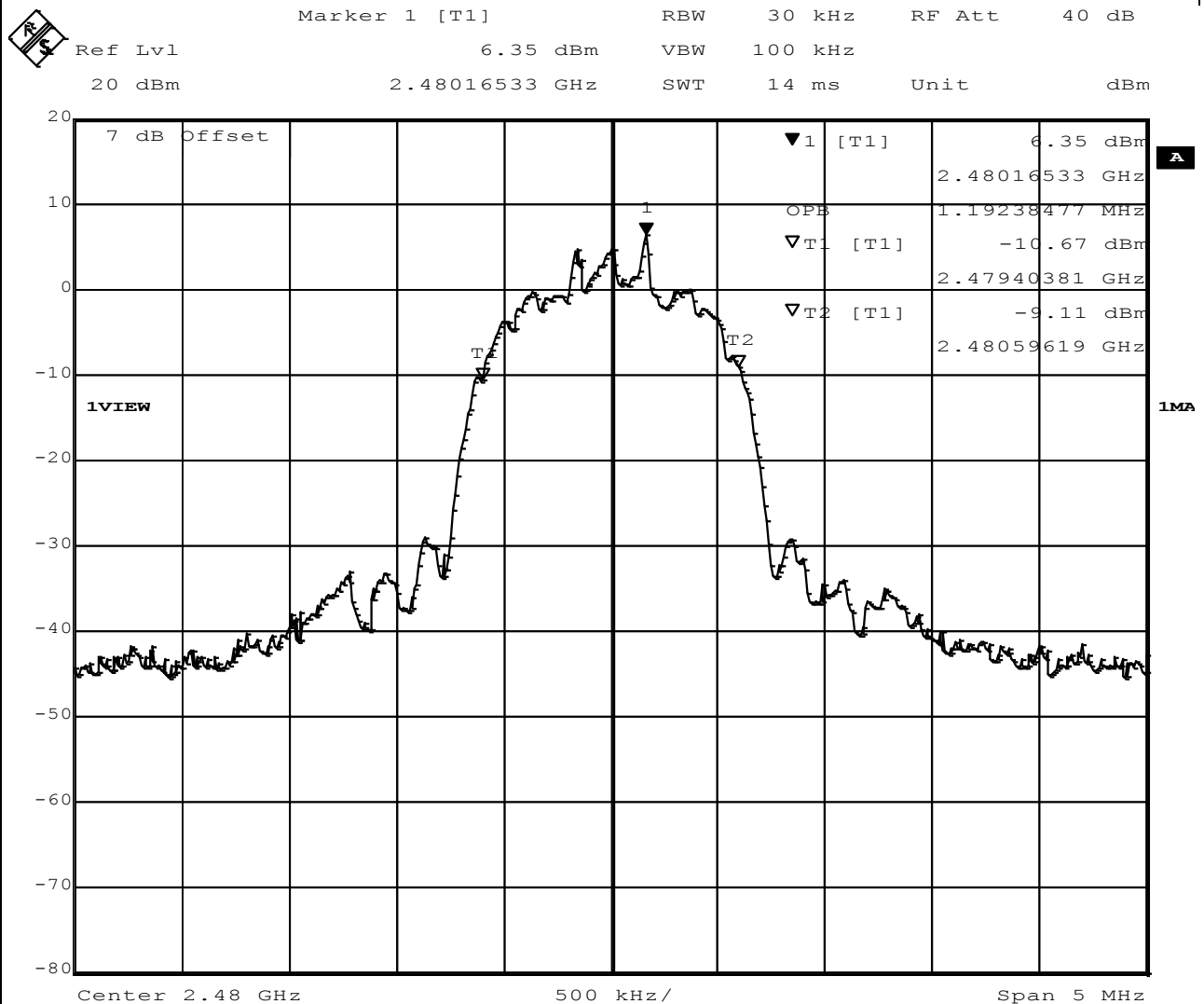
Test Report No.: G0M-1303-2693-TFC247B-V01

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Occupied Bandwidth – 3-DH5-Sngl F_{HIGH}

RSS Gen Occupied Bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification 4.4.1 Occupied Bandwidth
Comment 1 Channel.: 78 / 2480 MHz
Comment 2 A spectrum analyzer with an integrated 99% power bandwidth function is used
Comment 3 8DPSK



Comment A: Occupied bandwidth: 1192.4 KHz
Date: 31.AUG.2010 14:40:20

Test Report No.: G0M-1303-2693-TFC247B-V01

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3.2 Test Conditions and Results – 20 dB Bandwidth

20 dB Bandwidth acc. FCC 15.247 / IC RSS-210				Verdict: PASS	
EUT requirement rule parts and clause	Reference				
	FCC 15.247(a)(1) / IC RSS-210 A8.1				
Test according to measurement reference	Reference Method				
	FCC Public Notice DA 00-705				
Test frequency range	Tested frequencies				
	F _{LOW} / F _{MID} / F _{HIGH}				
Limits					
Limit		Condition			
1.5 · Carrier spacing		Output power ≤ 125 mW / 21 dBm			
1.0 · Carrier spacing		125 mW / 21 dBm < Output power ≤ 1 W / 30 dBm			
Test setup					
Spectrum Analyzer EUT					
Test procedure					
1. EUT set to test mode (Communication tester is used if needed) 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -20 dB to the left of the peak 6. Marker on envelope of spectrum is set to level of -20 dB to the right of the peak 7. 20dB Bandwidth is determined by marker frequency separation					
Test results					
Channel	Frequency [MHz]	Mode	20 dB Bandwidth [MHz]	Limit [MHz]	Result
F _{LOW}	2402	DH5-Sngl	0.930	1.5	PASS
F _{MID}	2441	DH5-Sngl	0.930	1.5	PASS
F _{HIGH}	2480	DH5-Sngl	0.930	1.5	PASS
F _{LOW}	2402	2DH5-Sngl	1.327	1.5	PASS
F _{MID}	2441	2DH5-Sngl	1.327	1.5	PASS
F _{HIGH}	2480	2DH5-Sngl	1.327	1.5	PASS
F _{LOW}	2402	3DH5-Sngl	1.327	1.5	PASS
F _{MID}	2441	3DH5-Sngl	1.327	1.5	PASS
F _{HIGH}	2480	3DH5-Sngl	1.327	1.5	PASS
Comments:					

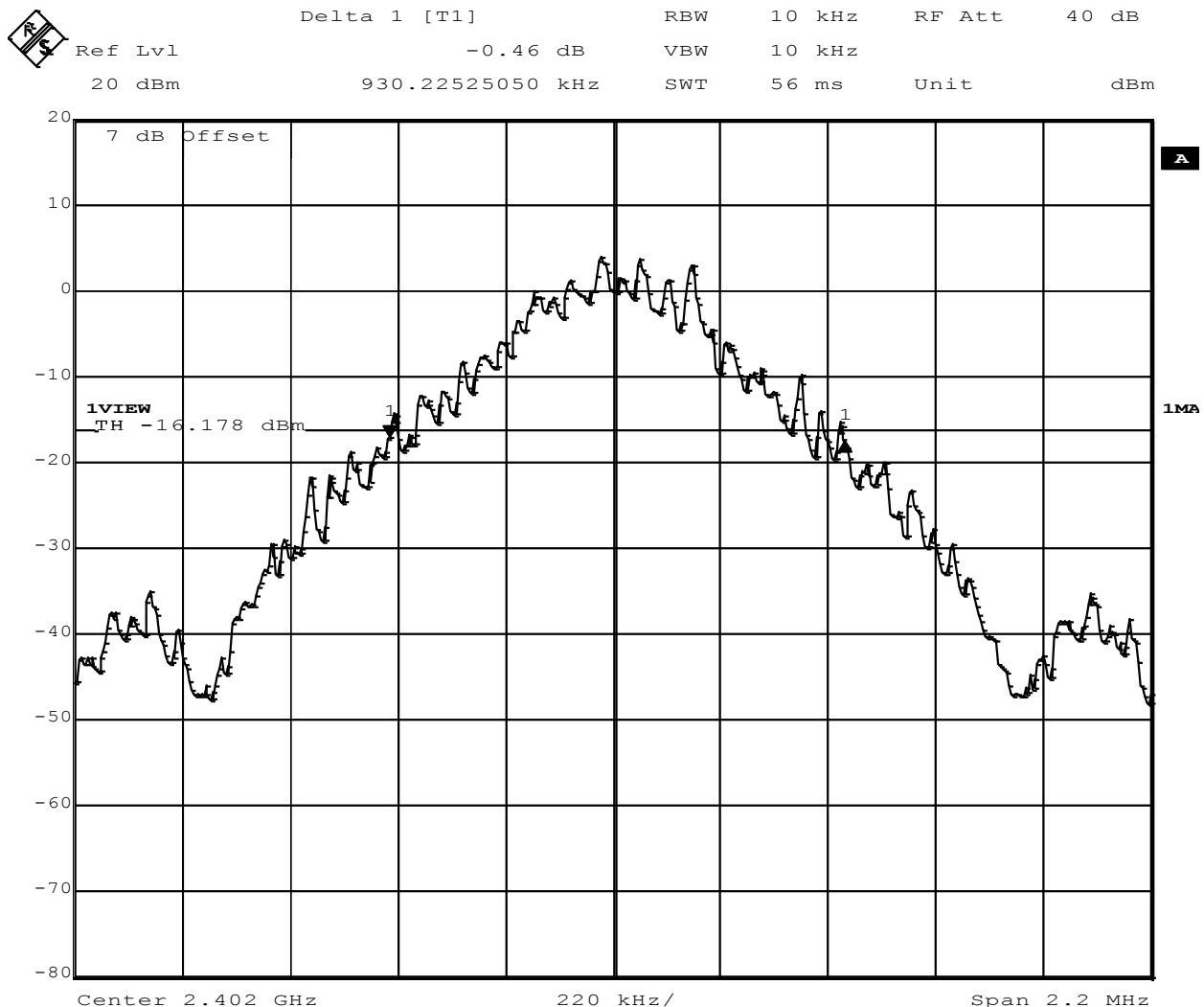
Test Report No.: G0M-1303-2693-TFC247B-V01

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Storkower Str. 38c, D-15526 Reichenwalde, Germany

20 dB Bandwidth – DH5-Sngl F_{LOW}

FCC part 15.247
20 dB bandwidth

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(a)
Comment 1	20 dB bandwidth
Comment 2	Channel.: 0 / 2402 MHz / GFSK
Comment 3	



Comment A: 20 dB bandwidth: 930.2 KHz

Date: 31.AUG.2010 11:00:59

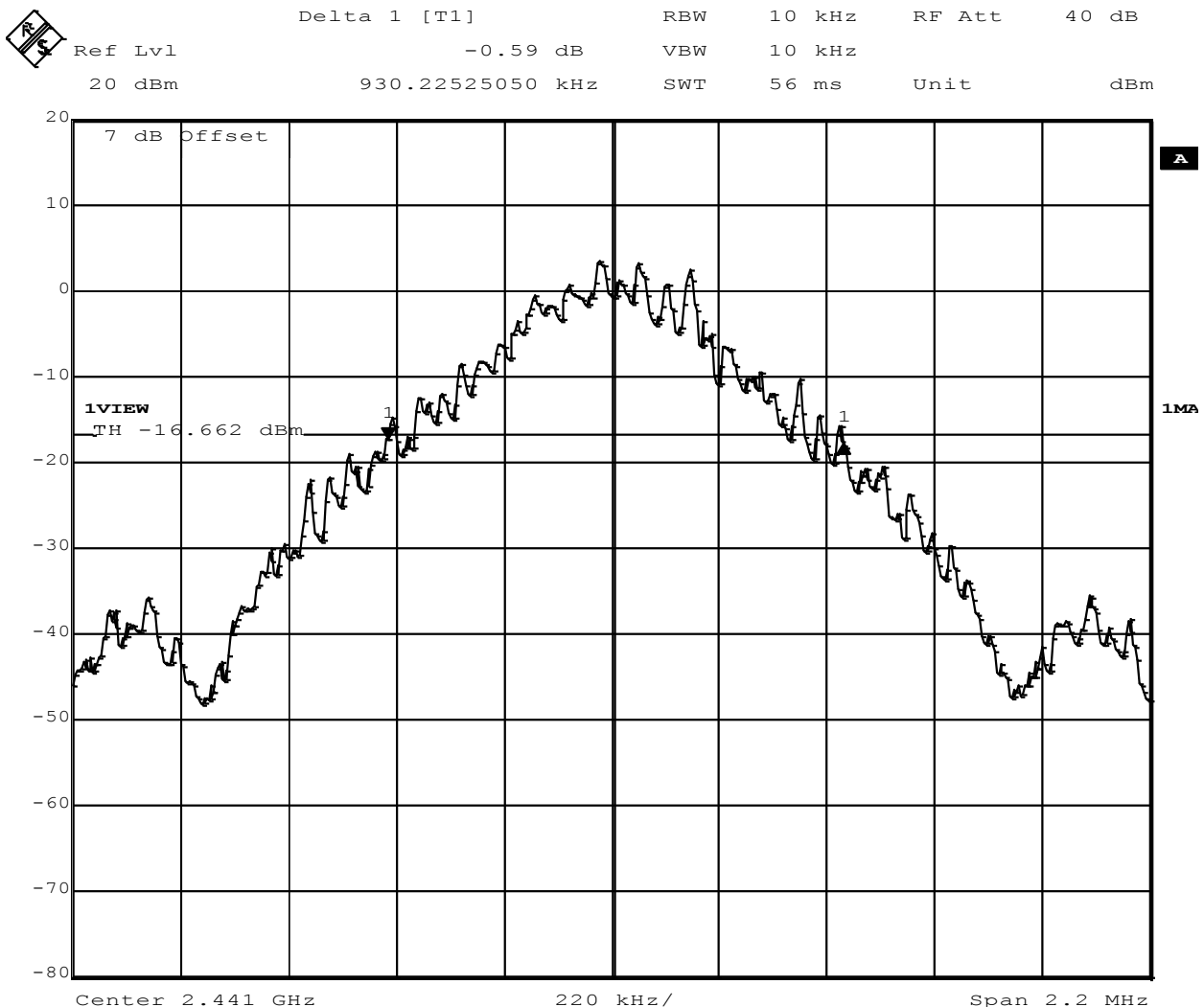
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Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

20 dB Bandwidth – DH5-Sngl F_{MID}

FCC part 15.247
20 dB bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 20 dB bandwidth
Comment 2 Channel.: 39 / 2441 MHz / GFSK
Comment 3



Comment A: 20 dB bandwidth: 930.2 KHz

Date: 31.AUG.2010 11:11:58

Test Report No.: G0M-1303-2693-TFC247B-V01

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

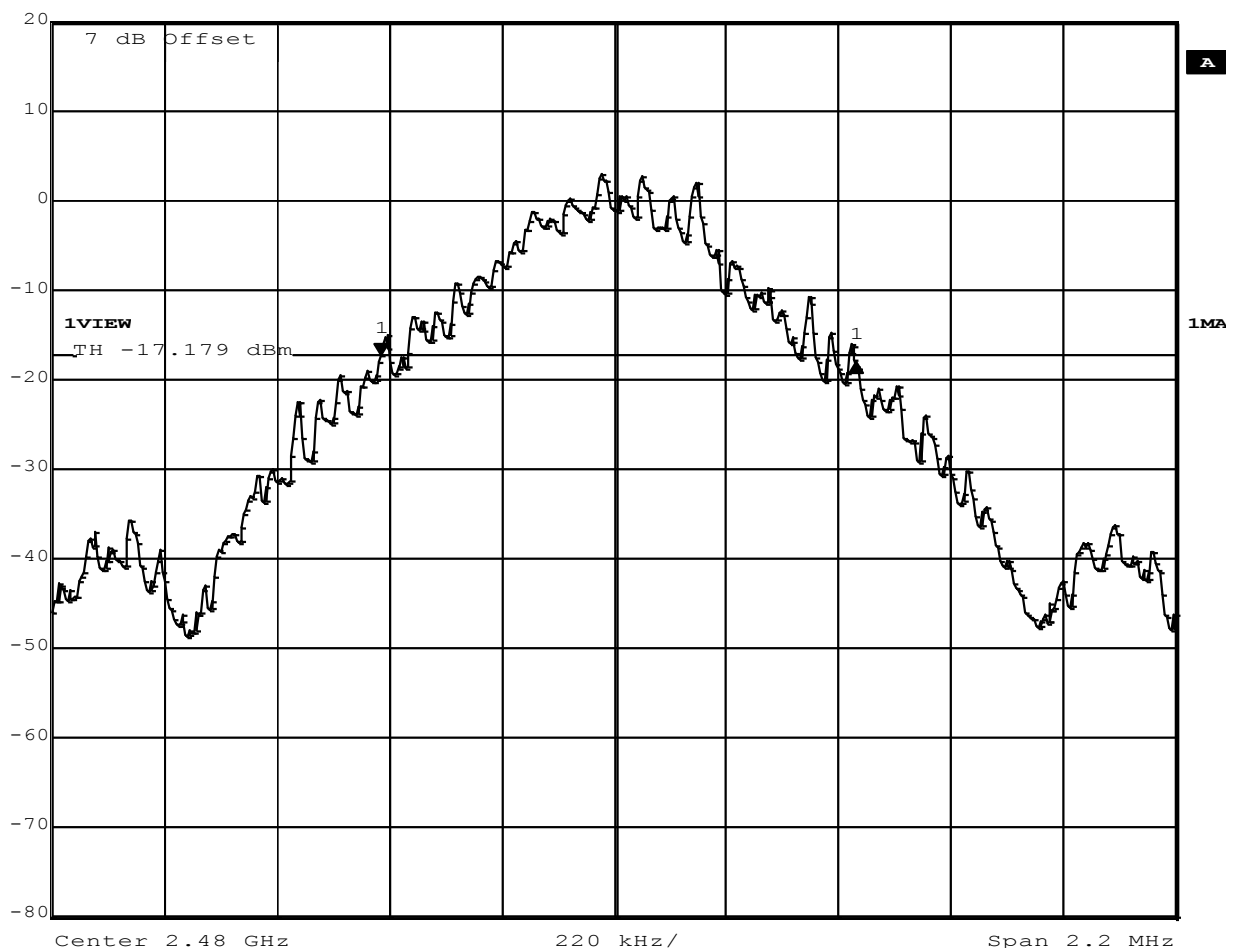
20 dB Bandwidth – DH5-Sngl F_{HIGH}

FCC part 15.247
20 dB bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 20 dB bandwidth
Comment 2 Channel.: 78 / 2480 MHz / GFSK
Comment 3



Delta 1 [T1] RBW 10 kHz RF Att 40 dB
Ref Lvl -0.64 dB VBW 10 kHz
20 dBm 930.21643286 kHz SWT 56 ms Unit dBm



Comment A: 20 dB bandwidth: 930.2 KHz

Date: 31.AUG.2010 11:27:31

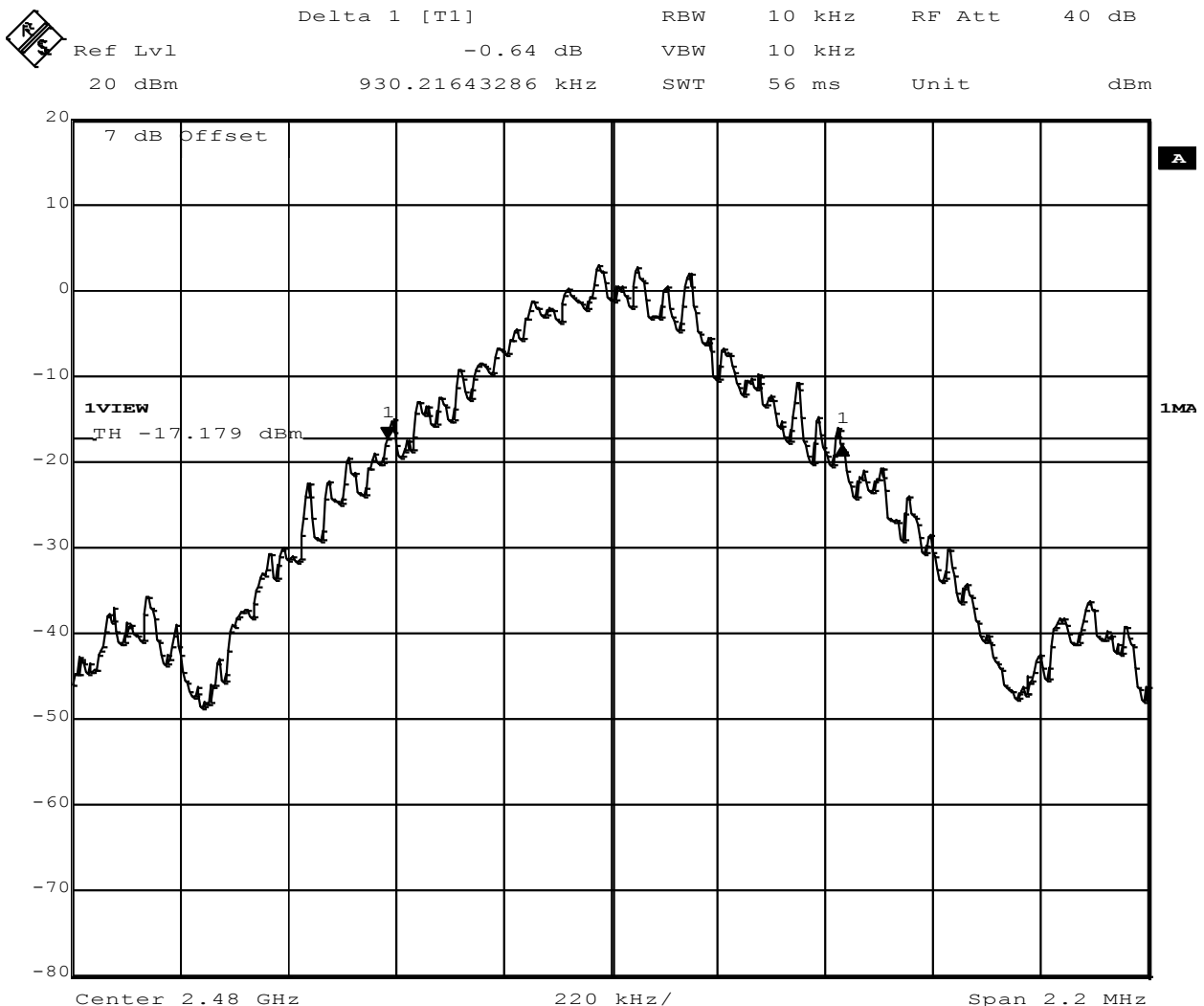
Test Report No.: G0M-1303-2693-TFC247B-V01

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

20 dB Bandwidth – 2-DH5-Sngl F_{Low}

FCC part 15.247
20 dB bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 20 dB bandwidth
Comment 2 Channel.: 78 / 2480 MHz / GFSK
Comment 3



Comment A: 20 dB bandwidth: 930.2 KHz

Date: 31.AUG.2010 11:27:31

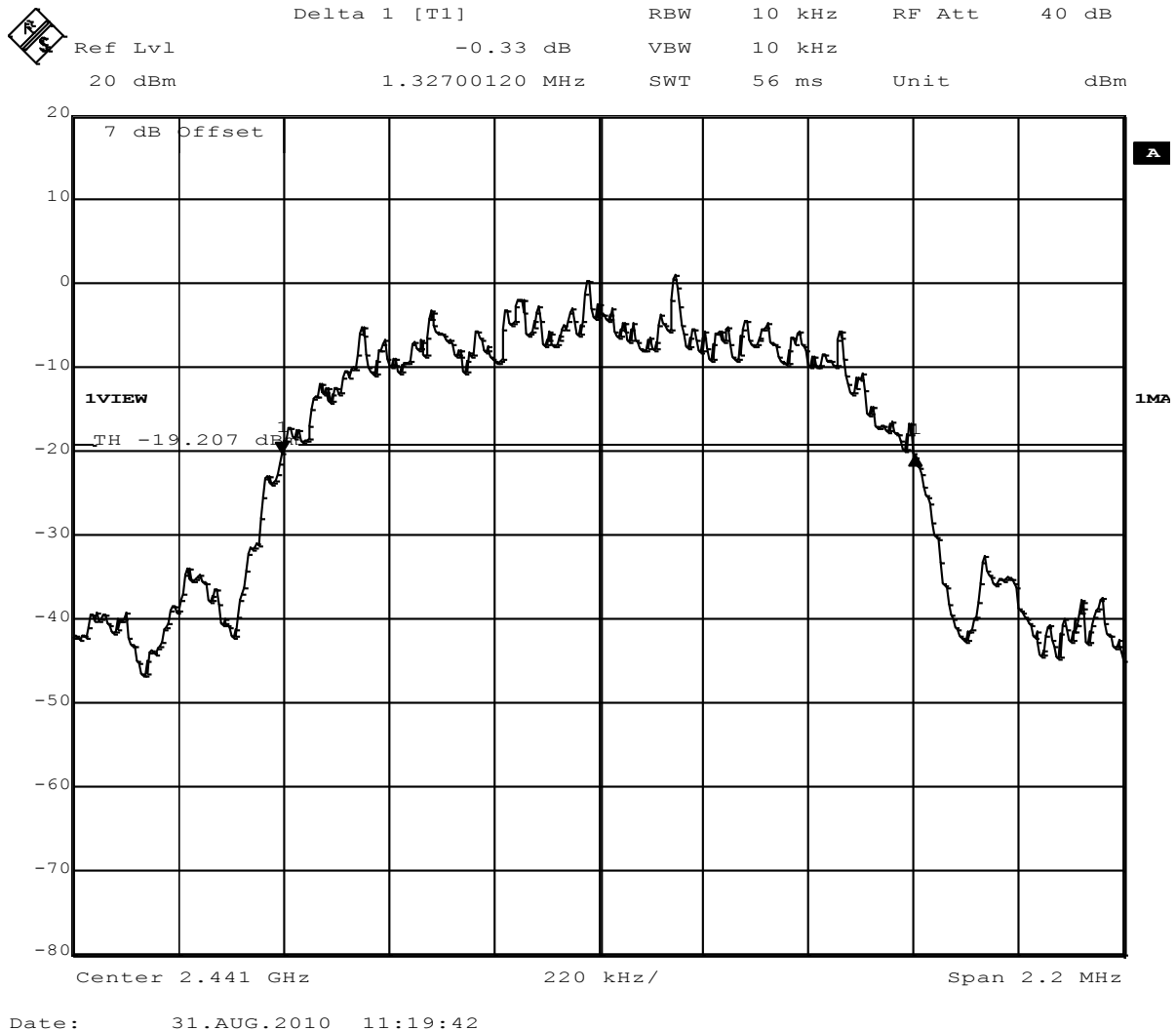
Test Report No.: G0M-1303-2693-TFC247B-V01

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

20 dB Bandwidth – 2-DH5-Sngl F_{MID}

FCC part 15.247
20 dB bandwidth

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(a)
Comment 1	20 dB bandwidth
Comment 2	Channel.: 39 / 2441 MHz / DQPSK
Comment 3	



Test Report No.: G0M-1303-2693-TFC247B-V01

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

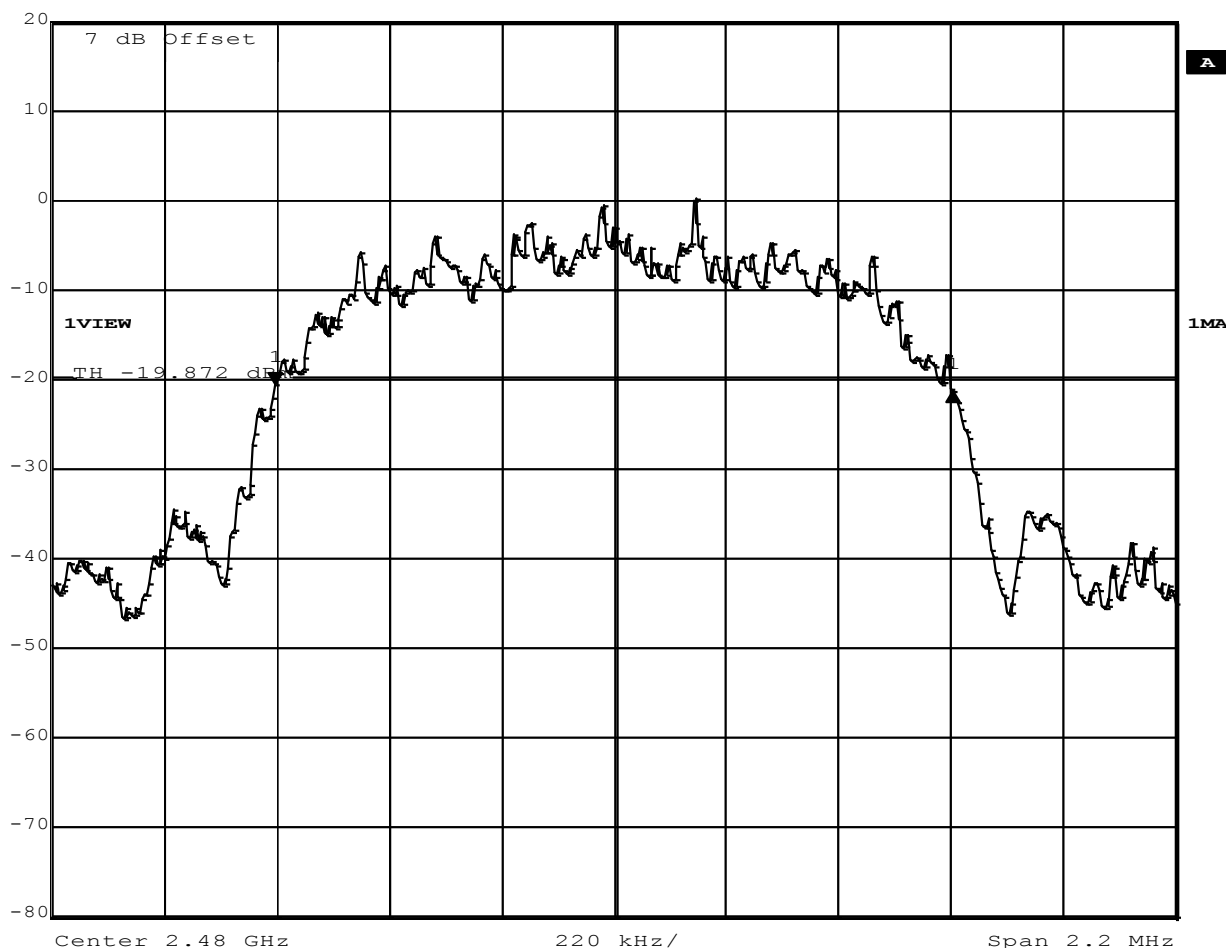
20 dB Bandwidth – 2-DH5-Sngl F_{HIGH}

FCC part 15.247
20 dB bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 20 dB bandwidth
Comment 2 Channel.: 78 / 2480 MHz / DQPSK
Comment 3



Delta 1 [T1] RBW 10 kHz RF Att 40 dB
Ref Lvl -0.95 dB VBW 10 kHz
20 dBm 1.32700120 MHz SWT 56 ms Unit dBm



Comment A: 20 dB bandwidth: 1327 KHz

Date: 31.AUG.2010 11:30:29

Test Report No.: G0M-1303-2693-TFC247B-V01

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

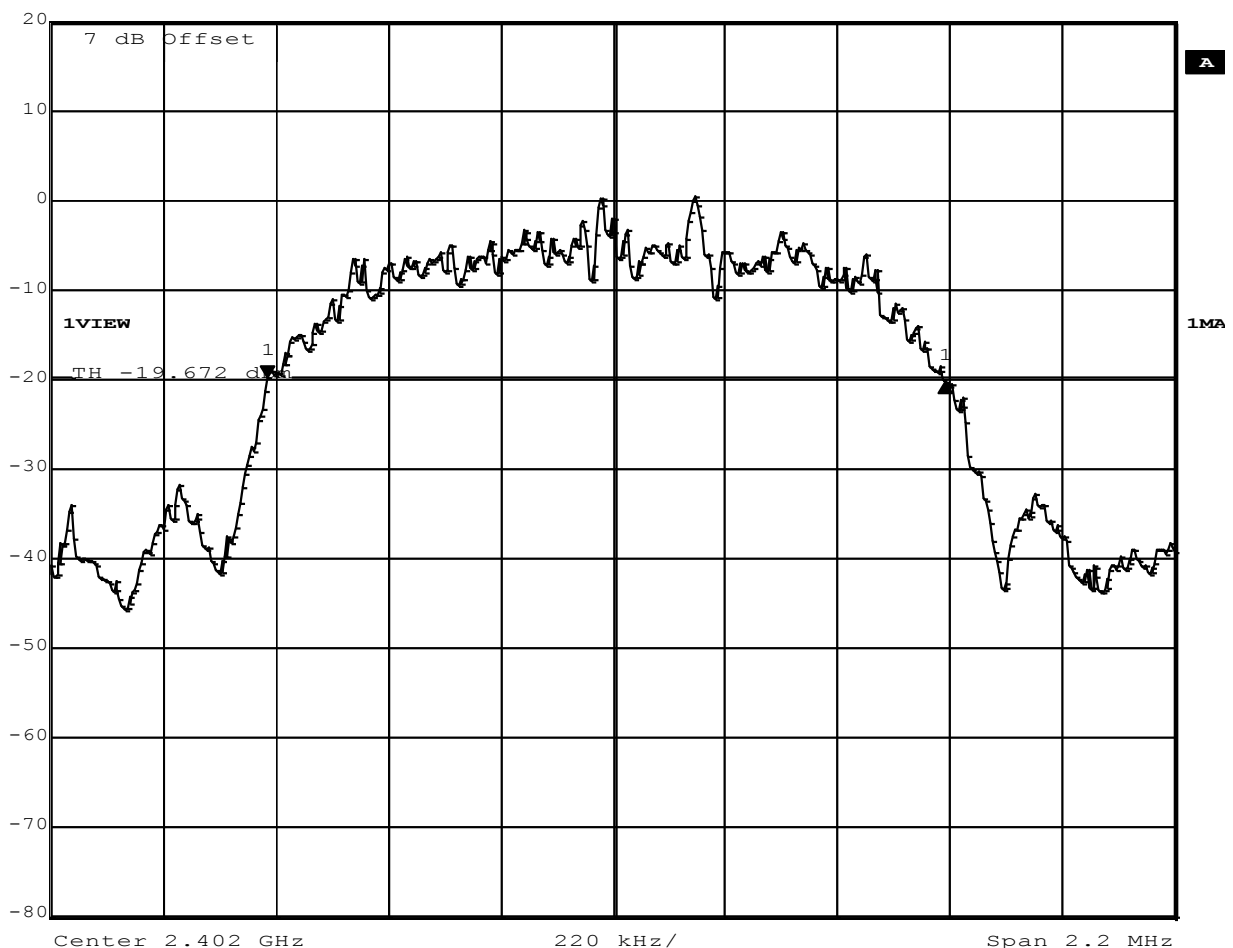
20 dB Bandwidth – 3-DH5-Sngl F_{Low}

FCC part 15.247
20 dB bandwidth

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 20 dB bandwidth
Comment 2 Channel.: 0 / 2402 MHz / 8DPSK
Comment 3



Delta 1 [T1] RBW 10 kHz RF Att 40 dB
Ref Lvl -0.68 dB VBW 10 kHz
20 dBm 1.32702766 MHz SWT 56 ms Unit dBm



Comment A: 20 dB bandwidth: 1327 KHz

Date: 31.AUG.2010 11:10:08

Test Report No.: G0M-1303-2693-TFC247B-V01

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

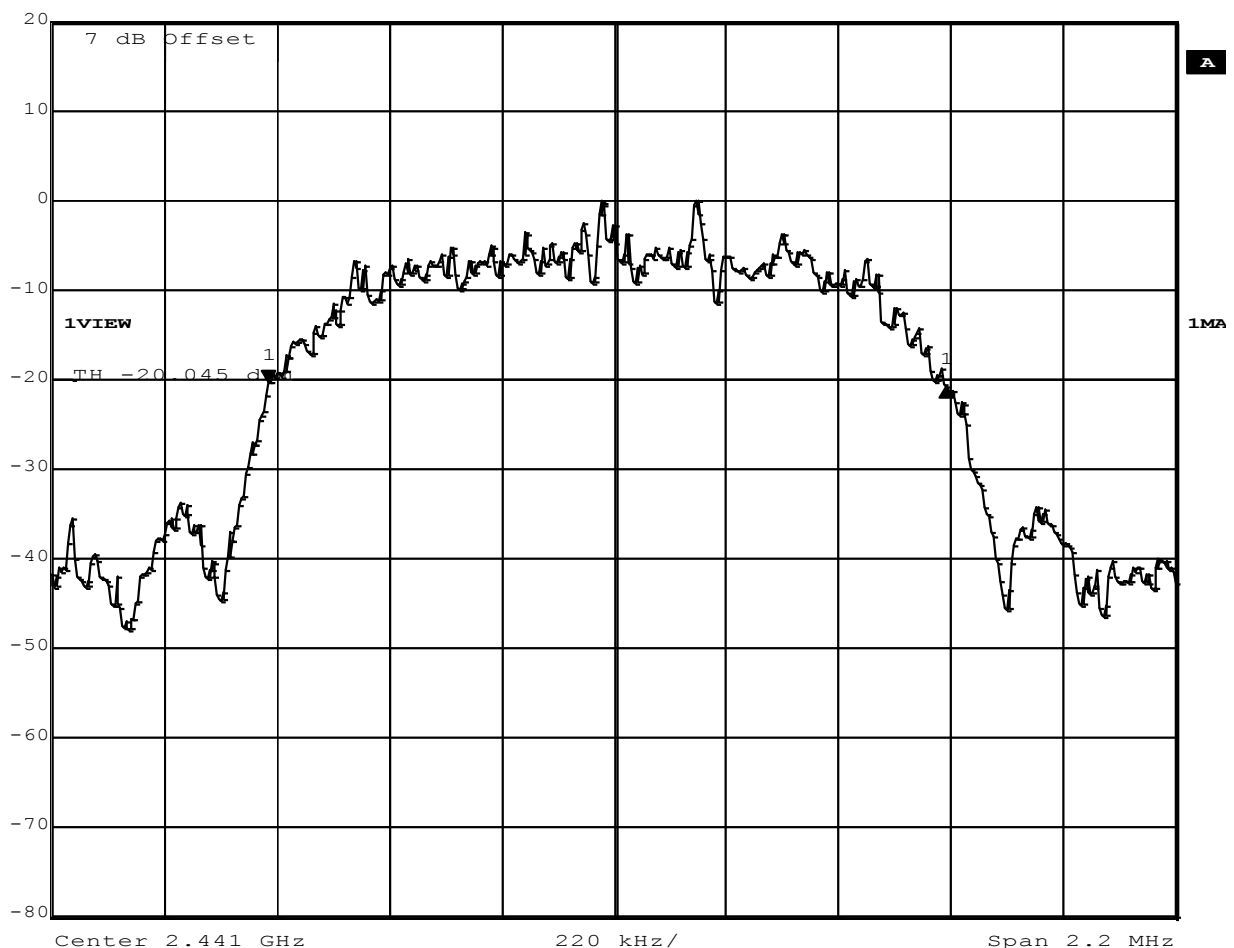
20 dB Bandwidth – 3-DH5-Sngl F_{MID}

FCC part 15.247
20 dB bandwidth

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(a)
Comment 1	20 dB bandwidth
Comment 2	Channel.: 39 / 2441 MHz / 8DPSK
Comment 3	



Delta 1 [T1]	RBW	10 kHz	RF Att	40 dB
Ref Lvl	-0.53 dB	VBW	10 kHz	
20 dBm	1.32702766 MHz	SWT	56 ms	Unit dBm



Comment A: 20 dB bandwidth: 1327 KHz

Date: 31.AUG.2010 11:22:51

Test Report No.: G0M-1303-2693-TFC247B-V01

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

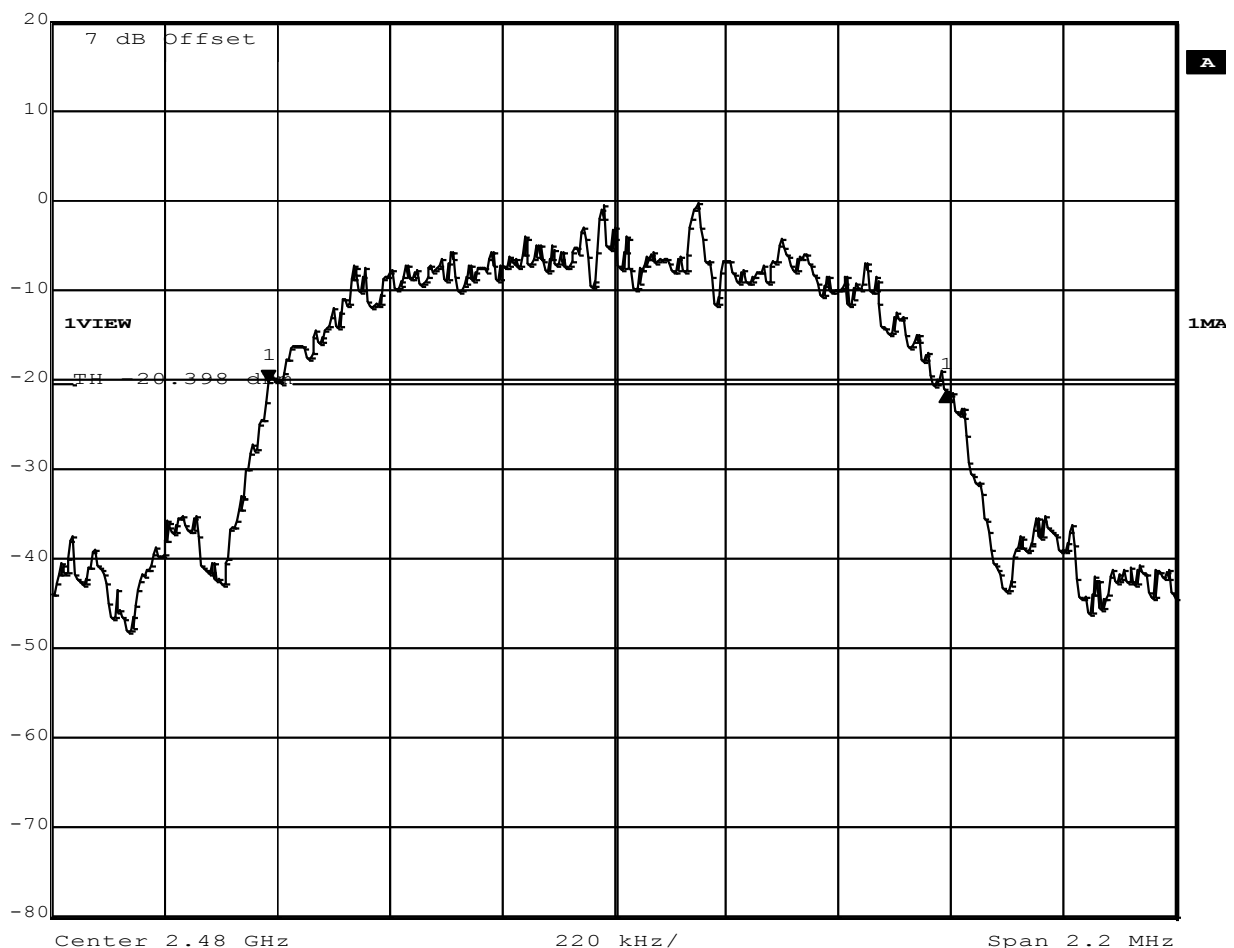
20 dB Bandwidth – 3-DH5-Sngl F_{HIGH}

FCC part 15.247
20 dB bandwidth

EUT Bluetooth Module
 Model ENW89818C2JF / ENW89818A2JF
 Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
 Temperature / Voltage 23°C / V_{nom}
 Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
 Test Specification FCC part 15 section 247(a)
 Comment 1 20 dB bandwidth
 Comment 2 Channel.: 78 / 2480 MHz / 8DPSK
 Comment 3



Delta 1 [T1] RBW 10 kHz RF Att 40 dB
 Ref Lvl -1.06 dB VBW 10 kHz
 20 dBm 1.32697475 MHz SWT 56 ms Unit dBm



Comment A: 20 dB bandwidth: 1353.4 KHz

Date: 31.AUG.2010 11:34:18

Test Report No.: G0M-1303-2693-TFC247B-V01

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

3.3 Test Conditions and Results – Number of hopping frequencies

Number of hopping frequencies acc. FCC 15.247 / IC RSS-210		Verdict: PASS
EUT requirement rule parts and clause	Reference	
	FCC 15.247(a)(1)(iii) / IC RSS-210 A8.1	
Test according to measurement reference	Reference Method	
	FCC Public Notice DA 00-705	
Test frequency range	Tested frequencies	
	F _{LOW} - F _{HIGH}	
EUT test mode	DH5-Hop	
Limits		
Limit	Condition	
Number of hopping channels ≥ 15	Output power ≤ 125 mW / 21 dBm	
Number of hopping channels ≥ 75	125 mW / 21 dBm < Output power ≤ 1 W / 30 dBm	
Test setup		
Spectrum Analyzer EUT		
Test procedure		
1. EUT set to test mode (Communication tester is used if needed) 2. Span set to measurement frequency range 3. Detector set to peak and max hold 4. Resolution bandwidth is set small enough to resolve hopping channel emission spectra 5. The number of peaks is counted to determine number of hopping frequencies		
Test results		
Number of hopping frequencies	Limit	Result
79	≥ 15	PASS
Comments:		

Number of hopping frequencies - Range A

FCC part 15.247

Number of hopping frequencies

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / Vnom
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 Number of hopping frequencies
Comment 2 Channel.: 0-13
Comment 3



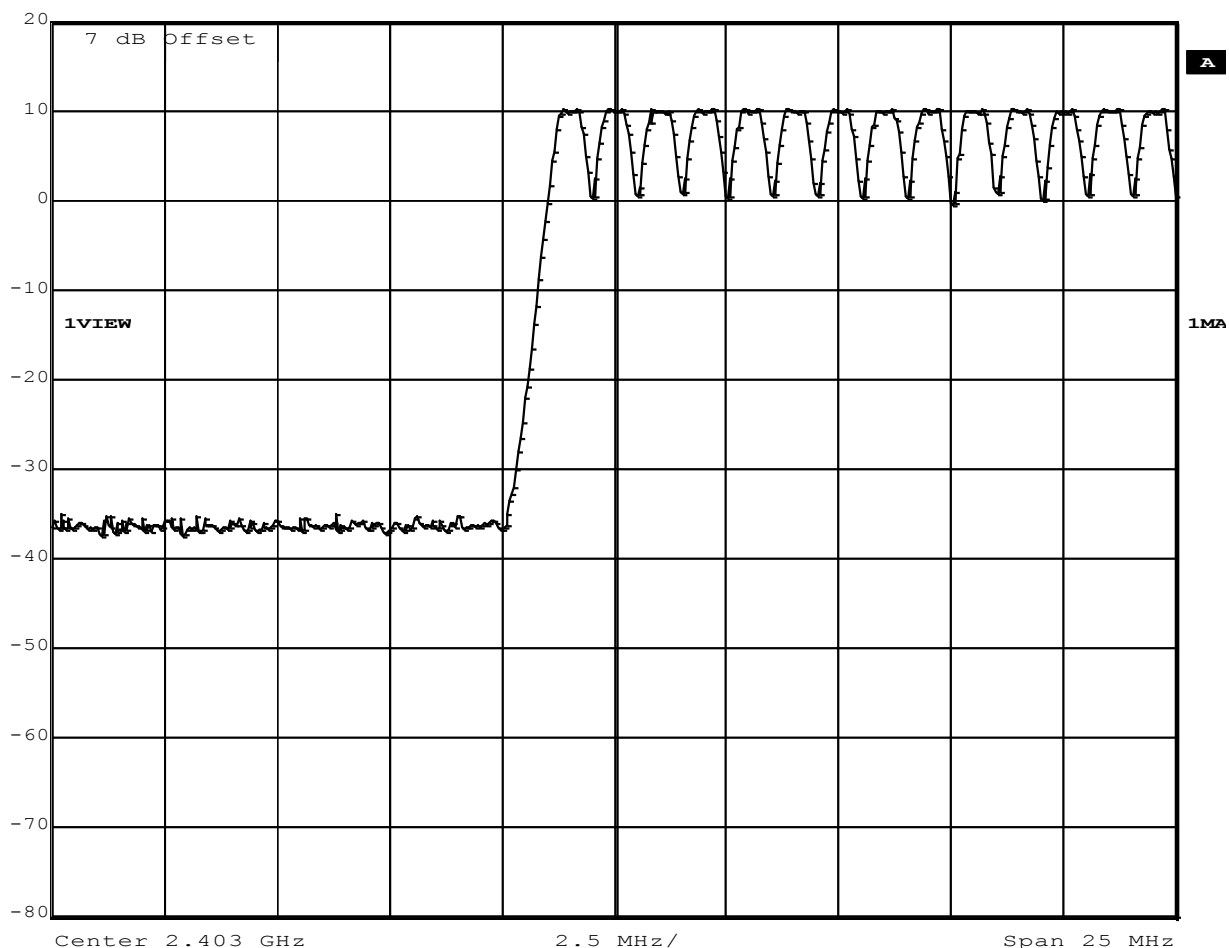
Ref Lvl

20 dBm

RBW 300 kHz RF Att 40 dB

VBW 300 kHz

SWT 5 ms Unit dBm



Comment A: Number of hopping frequencies

Date: 31.AUG.2010 13:59:59

Test Report No.: G0M-1303-2693-TFC247B-V01

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

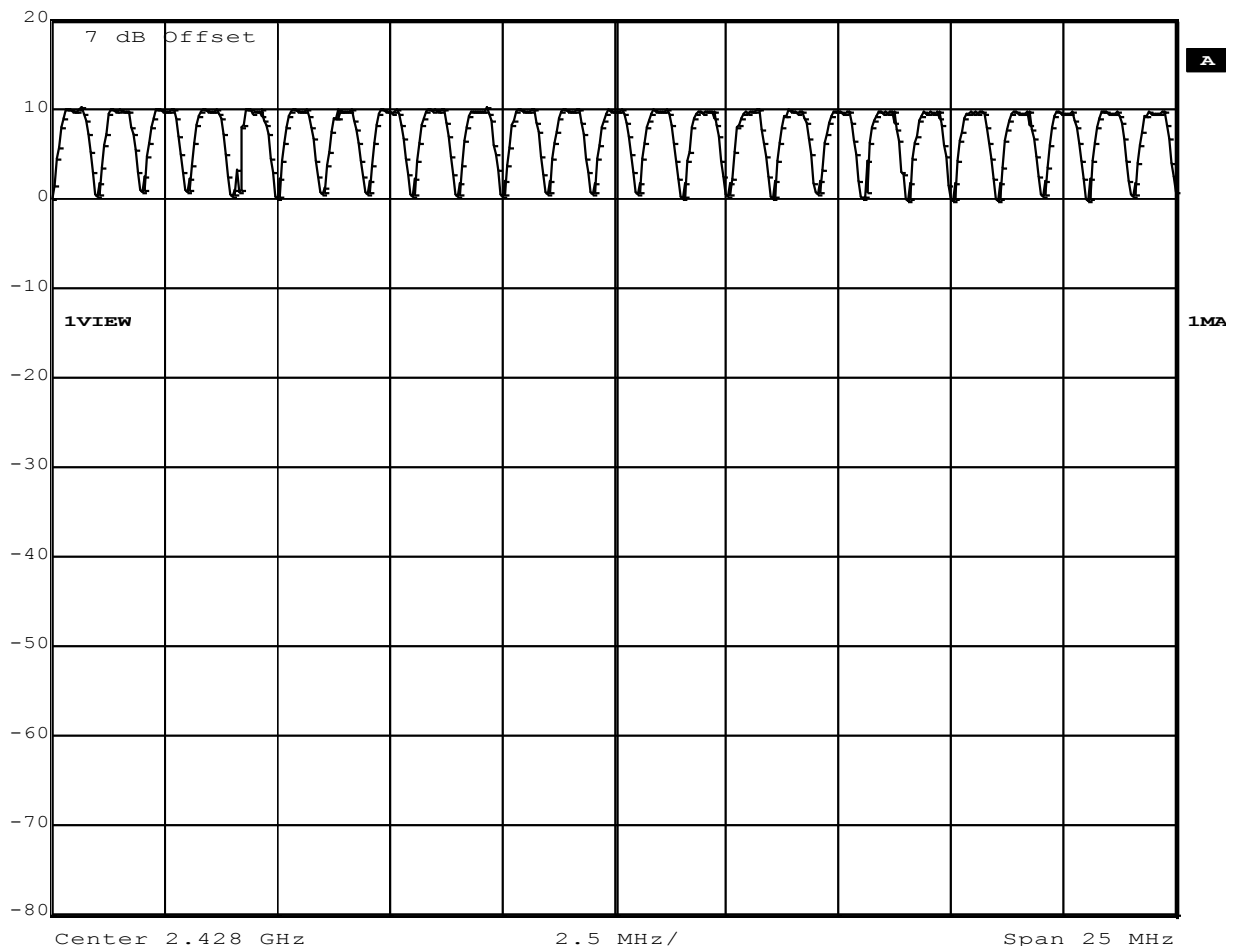
Number of hopping frequencies - Range B

FCC part 15.247

Number of hopping frequencies

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / Vnom
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 Number of hopping frequencies
Comment 2 Channel.: 14-38
Comment 3


Ref Lvl
20 dBm

RBW 300 kHz RF Att 40 dB
VBW 300 kHz
SWT 5 ms Unit dBm


Comment A: Number of hopping frequencies

Date: 31.AUG.2010 14:02:30

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Number of hopping frequencies - Range C

FCC part 15.247

Number of hopping frequencies

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / Vnom
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)
Comment 1 Number of hopping frequencies
Comment 2 Channel.:39-63
Comment 3



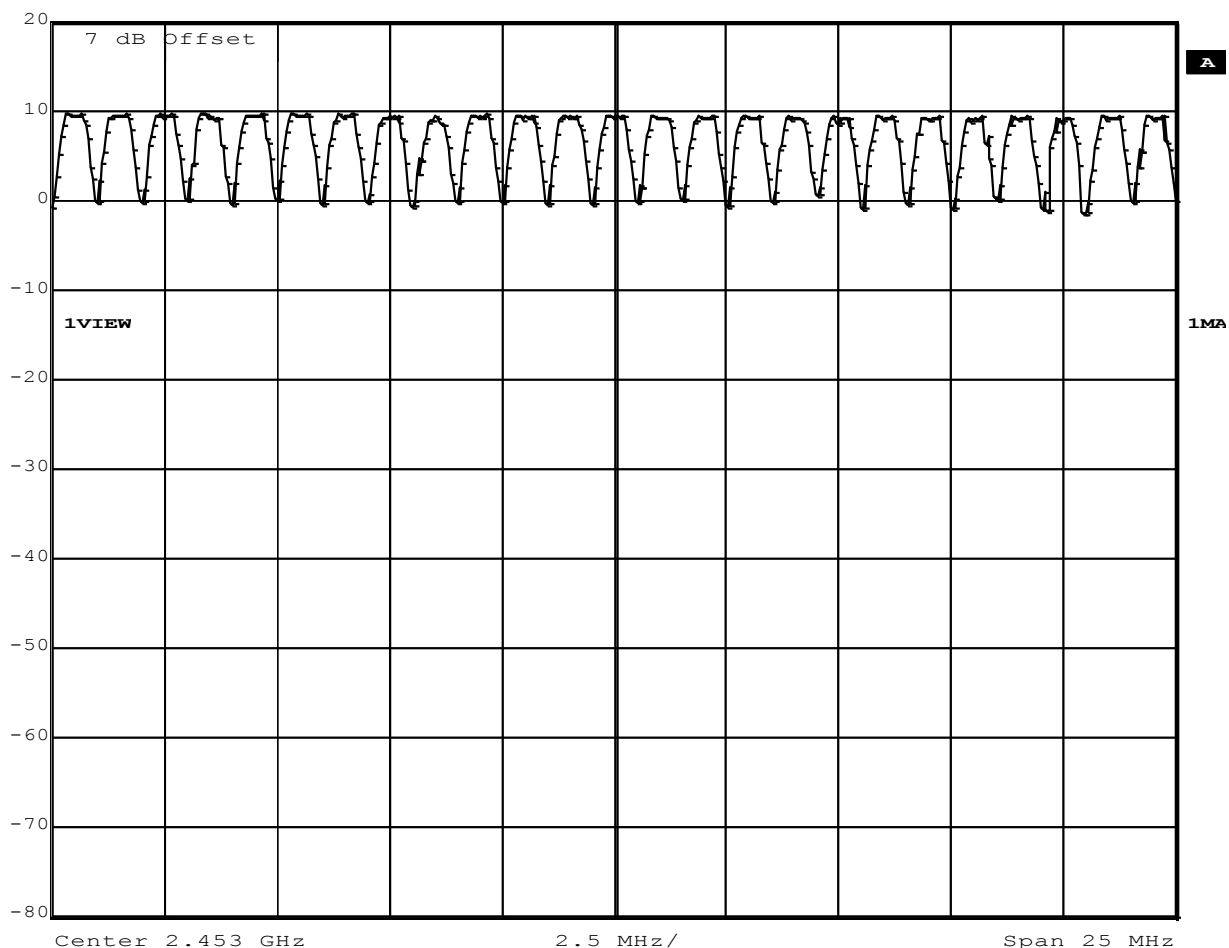
Ref Lvl

20 dBm

RBW 300 kHz RF Att 40 dB

VBW 300 kHz

SWT 5 ms Unit dBm



Comment A: Number of hopping frequencies

Date: 31.AUG.2010 14:03:41

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Number of hopping frequencies - Range D

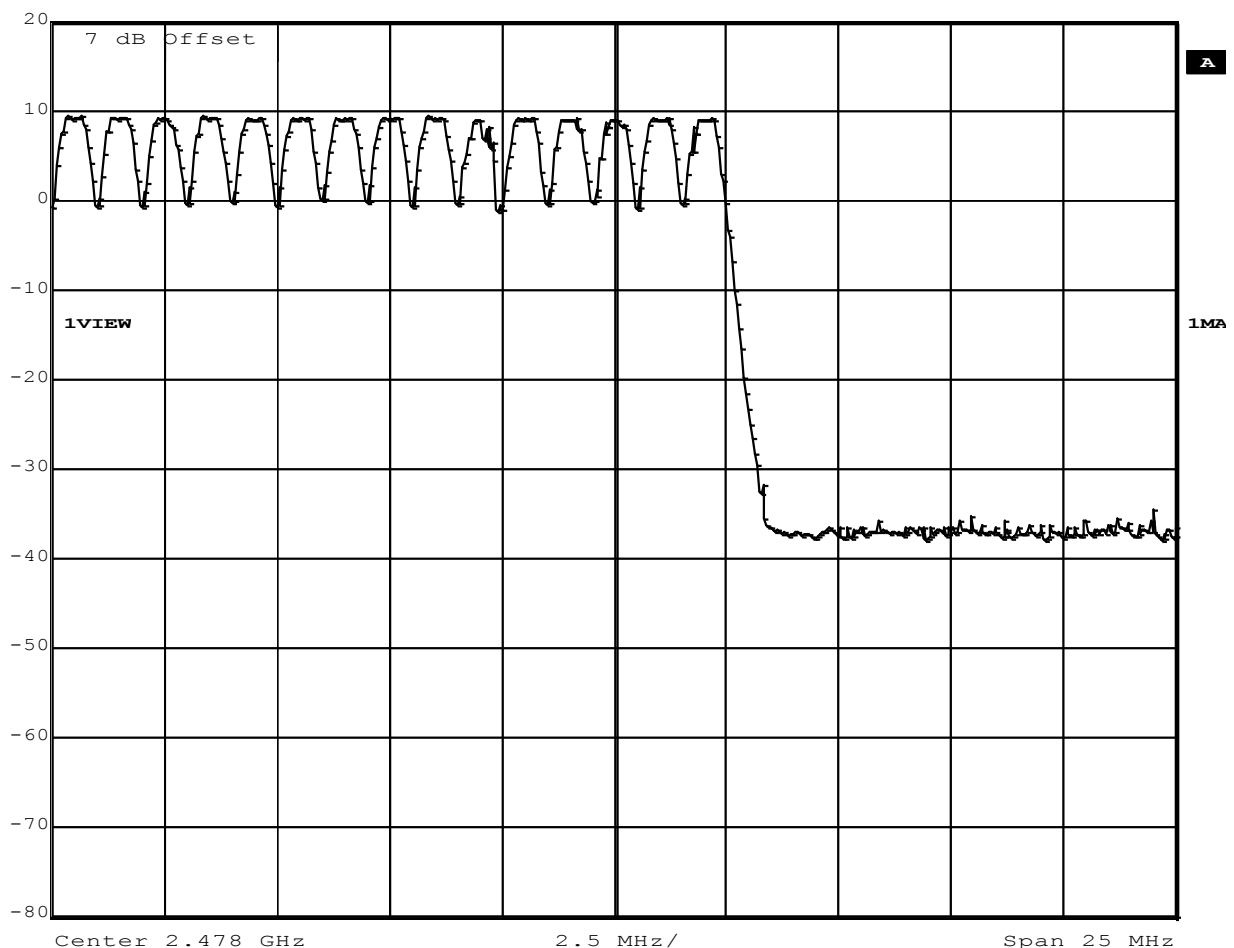
FCC part 15.247

Number of hopping frequencies

EUT Bluetooth Module
 Model ENW89818C2JF / ENW89818A2JF
 Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
 Temperature / Voltage 23°C / Vnom
 Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
 Test Specification FCC part 15 section 247(a)
 Comment 1 Number of hopping frequencies
 Comment 2 Channel.: 64-78
 Comment 3



Ref Lvl 20 dBm
 RBW 300 kHz RF Att 40 dB
 VBW 300 kHz
 SWT 5 ms Unit dBm



Comment A: Number of hopping frequencies

Date: 31.AUG.2010 14:05:04

Test Report No.: G0M-1303-2693-TFC247B-V01

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

3.4 Test Conditions and Results – Frequency hopping channel separation

Frequency hopping channel separation acc. FCC 15.247 / IC RSS-210		Verdict: PASS
EUT requirement rule parts and clause	Reference	
	FCC 15.247(a)(1) / IC RSS-210 A8.1	
Test according to measurement reference	Reference Method	
	FCC Public Notice DA 00-705	
Test frequency range	Tested frequencies	
	2441 & 2442 MHz	
EUT test mode	DH5-Hop	
Limits		
Limit	Condition	
≥ 25 kHz or ⅔ of 20 dB bandwidth	Output power ≤ 125 mW / 21 dBm	
≥ 25 kHz or 20 dB bandwidth	125 mW / 21 dBm < Output power ≤ 1 W / 30 dBm	
Test setup		
Spectrum Analyzer EUT		
Test procedure		
1. EUT set to test mode (Communication tester is used if needed) 2. Span set to measurement frequency range 3. Detector set to peak and max hold 4. Resolution bandwidth is set small enough to resolve hopping channel emission spectra 5. The two adjacent channel peaks are marked 6. Channel separation is determined from frequency separation of markers		
Test results		
Channel separation [kHz]	Limit [kHz]	Result
1008.8	≥ ⅔ · 930 = 620	PASS
Comments:		

Frequency hopping channel separation

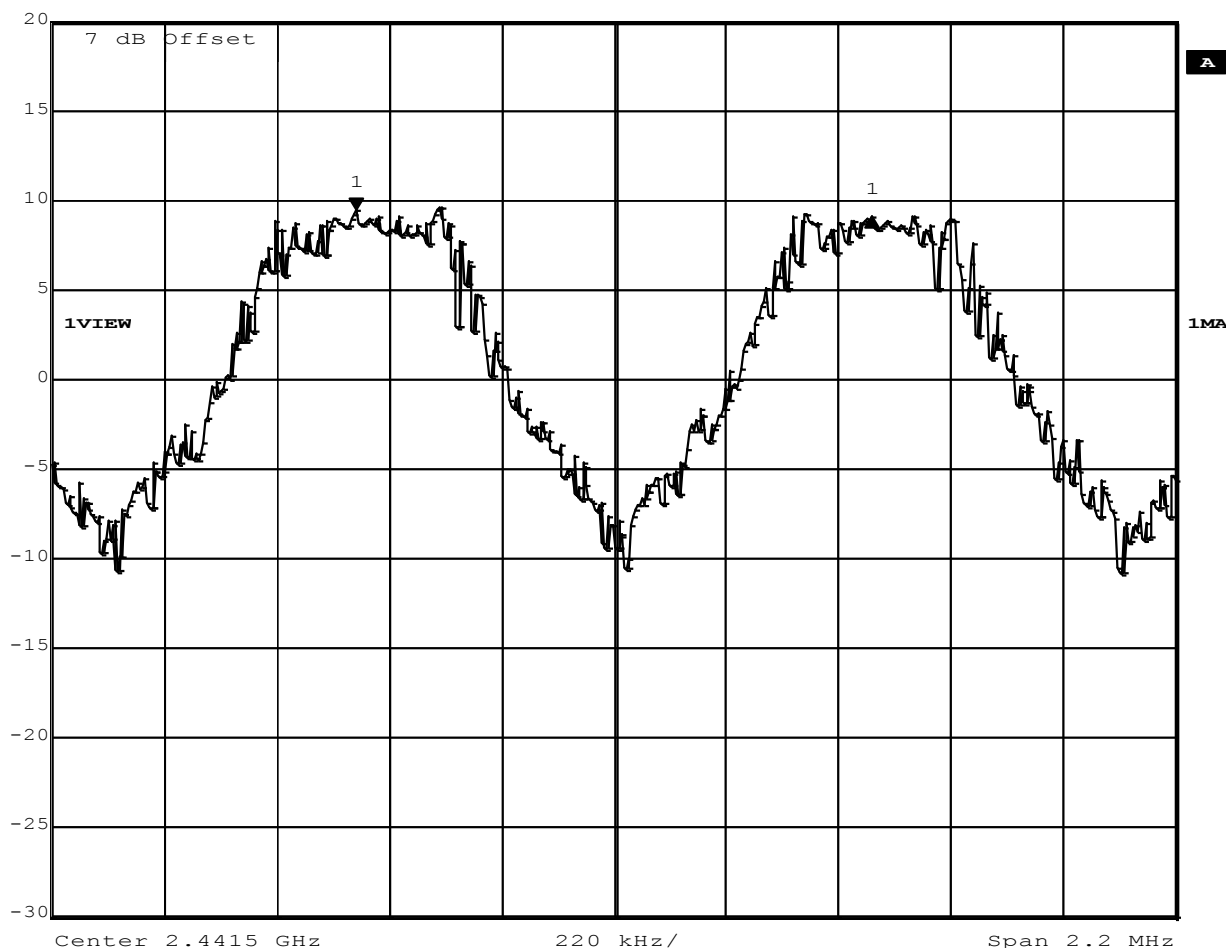
FCC part 15.247

Carrier frequency separation

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / Vnom
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)(1)
Comment 1 Carrier frequency separation
Comment 2 Channel.: 39/40 / 2441/2442 MHz
Comment 3 Hopping mode



Delta 1 [T1] RBW 100 kHz RF Att 40 dB
Ref Lvl -0.41 dB VBW 100 kHz
20 dBm 1.00881764 MHz SWT 5 ms Unit dBm



Comment A: Limit: > two-thirds of the 20 dB bandwidth ; Result: Pass

Date: 31.AUG.2010 13:47:26

Test Report No.: G0M-1303-2693-TFC247B-V01

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

3.5 Test Conditions and Results – Time of occupancy (Dwell Time)

Time of occupancy (Dwell time) acc. FCC 15.247 / IC RSS-210				Verdict: PASS	
EUT requirement rule parts and clause	Reference				
	FCC 15.247(a)(1)(iii) / IC RSS-210 A8.1				
Test according to measurement reference	Reference Method				
	FCC Public Notice DA 00-705				
Test frequency range	Tested frequencies				
	2441 MHz				
EUT test mode	DH5-Hop				
Limits					
Limit					
Time of occupancy ≤ 0.4 s within 0.4 s · Number of hopping channels					
Test setup					
Spectrum Analyzer EUT					
Test procedure					
1. EUT set to test mode (Communication tester is used if needed) 2. Center frequency set to test channel center frequency 3. Span set to zero span and detector to peak and max hold 4. Resolution bandwidth is set to 100kHz and sweep time to observation period 5. Time of occupancy determined from number of peaks multiplied by single hop dwell time					
Test results					
Observation period [s]	No. of hops	Dwell time/hop [s]	Time of occupancy [s]	Limit [s]	Result
31.6	63	0.2903	0.183	≤ 0.4	PASS
Comments:					

Time of occupancy

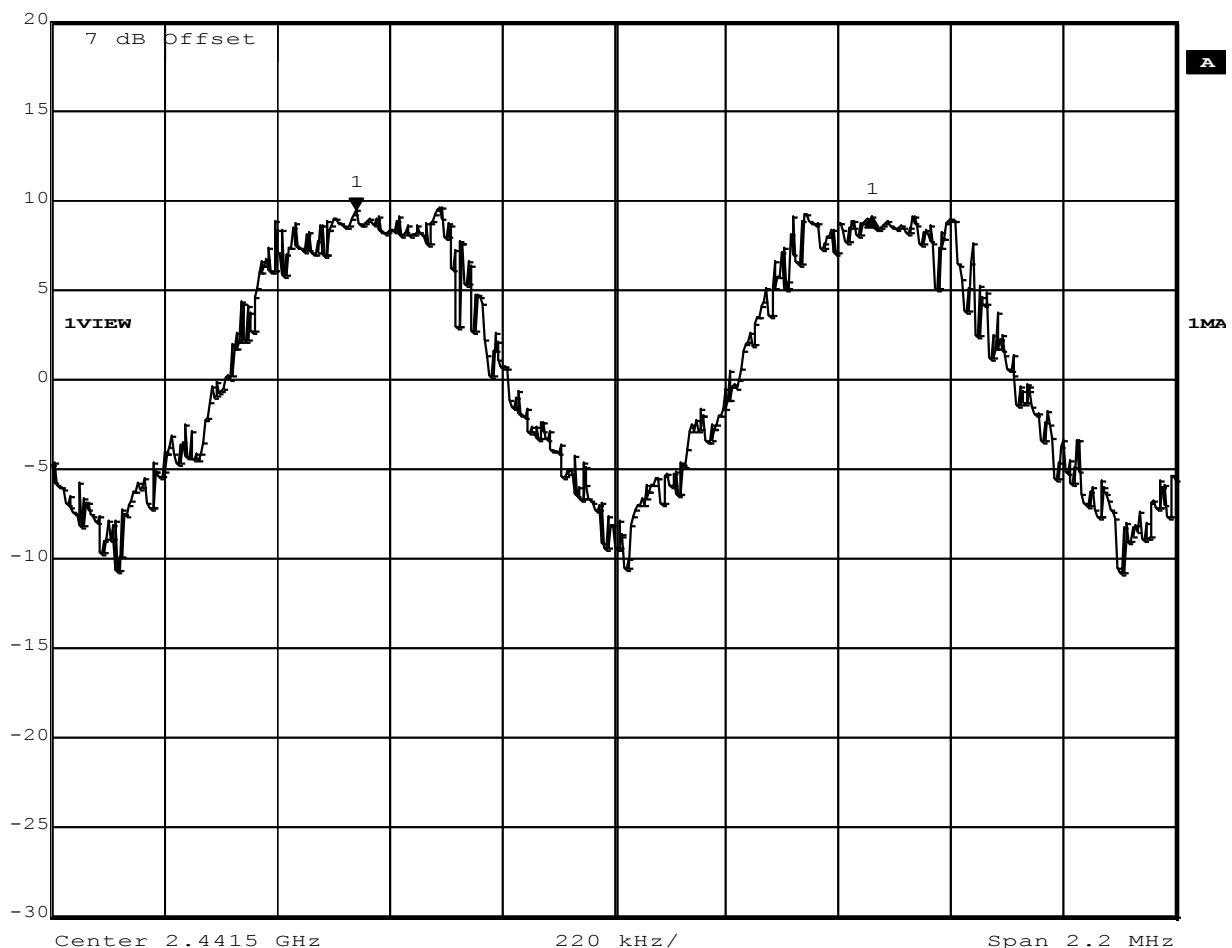
FCC part 15.247

Carrier frequency separation

EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / Vnom
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15 section 247(a)(1)
Comment 1 Carrier frequency separation
Comment 2 Channel.: 39/40 / 2441/2442 MHz
Comment 3 Hopping mode



Delta 1 [T1] RBW 100 kHz RF Att 40 dB
Ref Lvl -0.41 dB VBW 100 kHz
20 dBm 1.00881764 MHz SWT 5 ms Unit dBm



Comment A: Limit: > two-thirds of the 20 dB bandwidth ; Result: Pass

Date: 31.AUG.2010 13:47:26

Test Report No.: G0M-1303-2693-TFC247B-V01

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

3.6 Test Conditions and Results – Maximum peak conducted power

Maximum peak conducted power acc. FCC 15.247 / IC RSS-210		Verdict: PASS
EUT requirement rule parts and clause	Reference	
	FCC 15.247(b)(1) / IC RSS-210 A8.4	
Test according to measurement reference	Reference Method	
	FCC Public Notice DA 00-705	
Test frequency range	Tested frequencies	
	F _{LOW} / F _{MID} / F _{HIGH}	
Measurement mode	Peak	
Maximum antenna gain	0.9 dBi ⇒ Limit correction = 0 dB	
Limits		
Limit	Condition	
1 W (30 dBm)	Number of hopping channels ≥ 75	
0.125 W (21 dBm)	75 > Number of hopping channels ≥ 15	
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.		
Test setup		
Spectrum Analyzer EUT		
Test procedure		
1. EUT set to test mode (Communication tester is used if needed) 2. Center frequency set to test channel center frequency 3. Span set to twice the 20 dB bandwidth and detector to peak and max hold 4. Resolution bandwidth is set to 3 MHz 5. Peak conducted power is determined from peak of spectrum envelope		

Test results								
Channel	Frequency [MHz]	Voltage	Mode	Peak power [dbm]	Peak power [W]	Limit [dBm]	Margin [dB]	Result
F _{LOW}	2402	3.0 VDC	DH5-Sngl	10.2	0.011	30	-19.80	PASS
F _{MID}	2441	3.0 VDC	DH5-Sngl	9.7	0.009	30	-20.30	PASS
F _{HIGH}	2480	3.0 VDC	DH5-Sngl	9.2	0.008	30	-20.80	PASS
F _{LOW}	2402	3.0 VDC	2DH5-Sngl	9.7	0.009	30	-20.30	PASS
F _{MID}	2441	3.0 VDC	2DH5-Sngl	9.2	0.008	30	-20.80	PASS
F _{HIGH}	2480	3.0 VDC	2DH5-Sngl	8.8	0.007	30	-21.20	PASS
F _{LOW}	2402	3.0 VDC	3DH5-Sngl	10.1	0.010	30	-19.90	PASS
F _{MID}	2441	3.0 VDC	3DH5-Sngl	9.6	0.009	30	-20.40	PASS
F _{HIGH}	2480	3.0 VDC	3DH5-Sngl	9.1	0.008	30	-20.90	PASS
Comments:								

3.7 Test Conditions and Results – AC power line conducted emissions

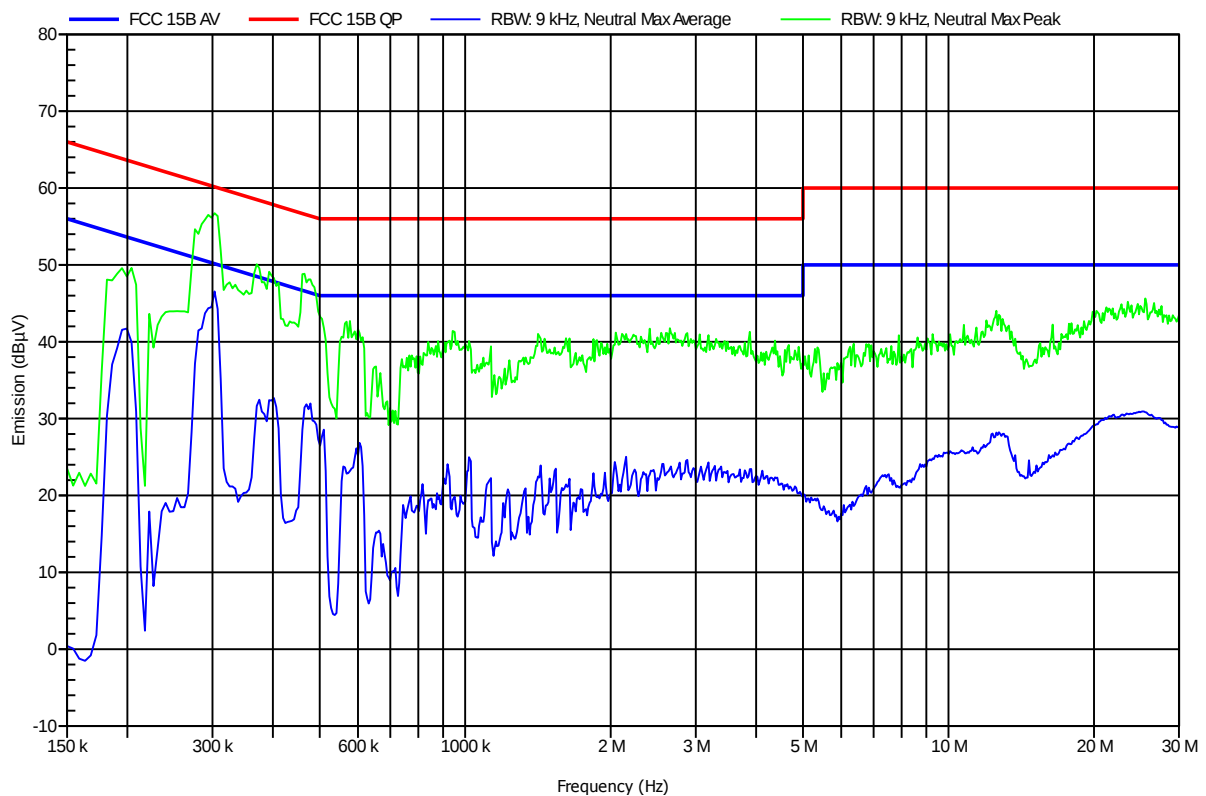
Power line conducted emissions acc. FCC 47 CFR 15.207 / IC RSS-Gen				Verdict: PASS	
Test according referenced standards		Reference Method			
		ANSI C63.4			
Fully configured sample scanned over the following frequency range		Frequency range			
		0.15 MHz to 30 MHz			
Points of Application		Application Interface			
AC Mains		LISN			
EUT test mode		AC-Powerline			
Limits and results					
Frequency [MHz]	Quasi-Peak [dBμV]	Result	Average [dBμV]	Result	
0.15 to 5	66 to 56*	PASS	56 to 46*	PASS	
0.5 to 5	56	PASS	46	PASS	
5 to 30	60	PASS	50	PASS	
Comments:					
* Limit decreases linearly with the logarithm of the frequency.					

Conducted Emissions

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

Order number: G0M21008-3623

Manufacturer: Panasonic Electronic Devices Europe GmbH
 EUT Name: Bluetooth module
 Model: ENW89818C2JF
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Marquardt
 Test Conditions: Tnom: 23°C, Unom: 5VDC (USB via Notebook Lenovo R61)
 LISN: ESH2-Z5 N
 Mode: active
 Test Date: 22.09.2010
 Note:

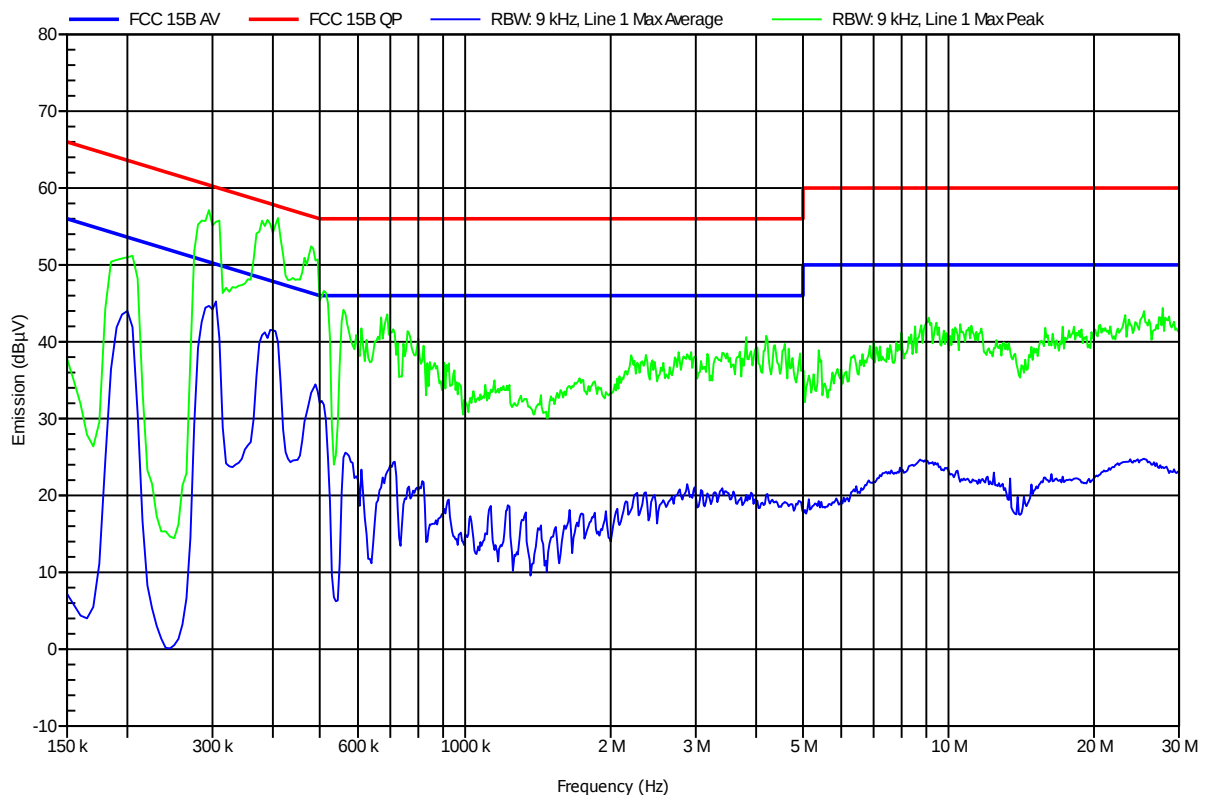


Conducted Emissions

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

Order number: G0M21008-3623

Manufacturer: Panasonic Electronic Devices Europe GmbH
 EUT Name: Bluetooth module
 Model: ENW89818C2JF
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Marquardt
 Test Conditions: Tnom: 23°C, Unom: 5VDC (USB via Notebook Lenovo R61)
 LISN: ESH2-Z5 L
 Mode: active
 Test Date: 22.09.2010
 Note:



3.8 Test Conditions and Results – Band edge compliance

Band-edge compliance acc. FCC 15.247 / IC RSS-210					Verdict: PASS	
EUT requirement rule parts and clause		Reference				
		FCC 15.247(d) / IC RSS-210 A8.5				
Test according to measurement reference		Reference Method				
		FCC Public Notice DA 00-705				
Test frequency range		Tested frequencies				
		F _{LOW} / F _{HIGH}				
Measurement mode		Peak				
Limits						
Limit			Condition			
≤ -20 dB/100 kHz			Peak power measurement detector = Peak			
≤ -30 dB/100 kHz			Peak power measurement detector = RMS			
Test setup						
Spectrum Analyzer EUT						
Test procedure						
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge attenuation is determined from level difference						
Test results						
Channel	Frequency [MHz]	Mode	Level [dBc]	Limit [dBc]	Margin [dB]	Result
F _{LOW}	2402	DH5-Sngl	-47.41	-20	-27.41	PASS
F _{HIGH}	2480	DH5-Sngl	-42.96	-20	-22.96	PASS
F _{LOW}	2402	DH5-Hop	-46.92	-20	-26.92	PASS
F _{HIGH}	2480	DH5-Hop	-46.10	-20	-26.10	PASS
F _{LOW}	2402	2DH5-Sngl	-42.96	-20	-22.96	PASS
F _{HIGH}	2480	2DH5-Sngl	-45.33	-20	-25.33	PASS
F _{LOW}	2402	2DH5-Hop	-42.89	-20	-22.89	PASS
F _{HIGH}	2480	2DH5-Hop	-43.11	-20	-23.11	PASS

F _{LOW}	2402	3DH5-Sngl	-42.96	-20	-22.96	PASS
F _{HIGH}	2480	3DH5-Sngl	-44.52	-20	-24.52	PASS
F _{LOW}	2402	3DH5-Hop	-42.73	-20	-22.73	PASS
F _{HIGH}	2480	3DH5-Hop	-42.68	-20	-22.68	PASS
Comments:						

Band-edge compliance – DH5-Sngl F_{LOW}

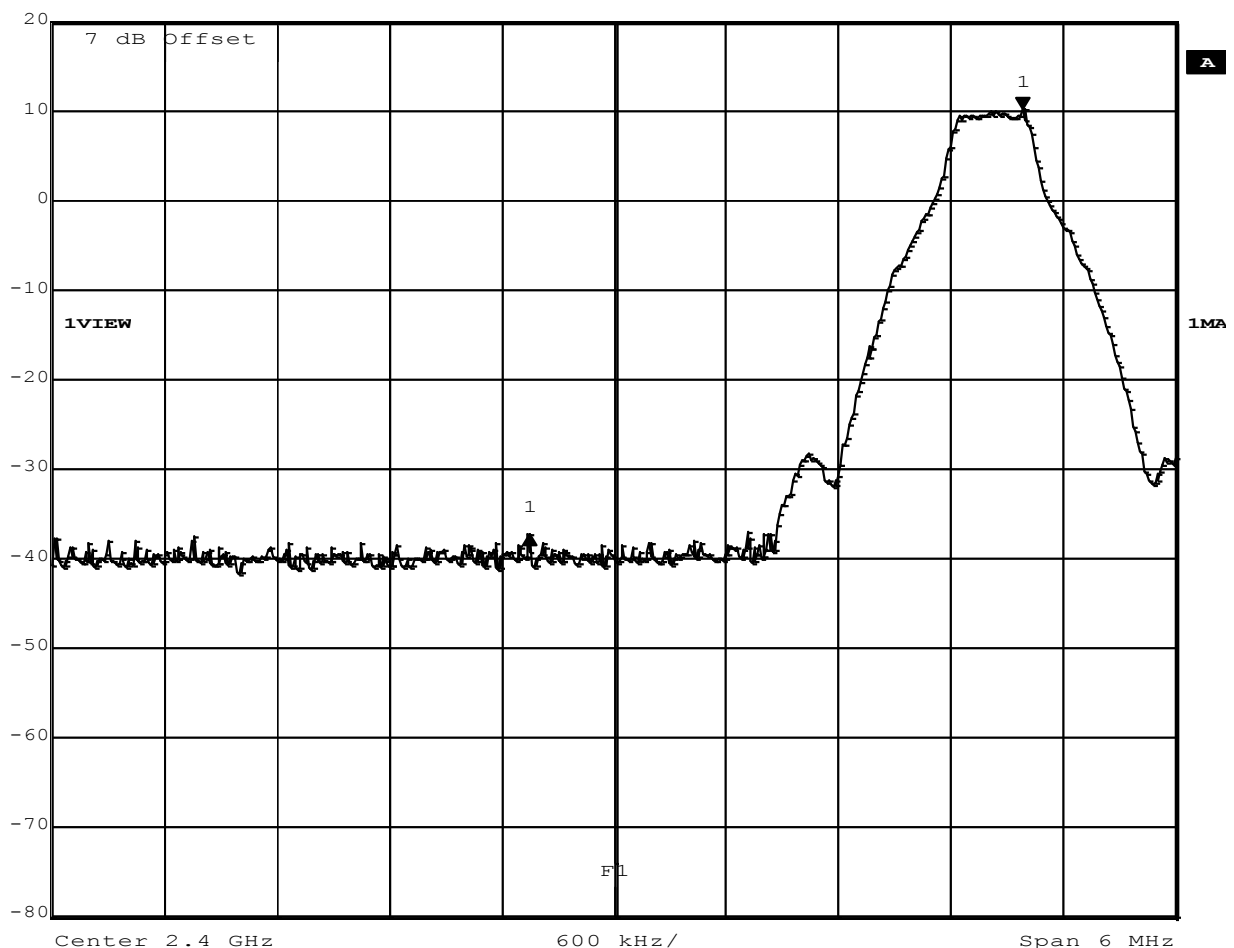
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 0 / 2402 MHz / GFSK
Comment 3	Single frequency mode



Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
20 dBm	-47.41 dB	VBW	100 kHz		
	-2.63326653 MHz	SWT	5 ms	Unit	dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 12:09:49

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – DH5-Hop F_{LOW}

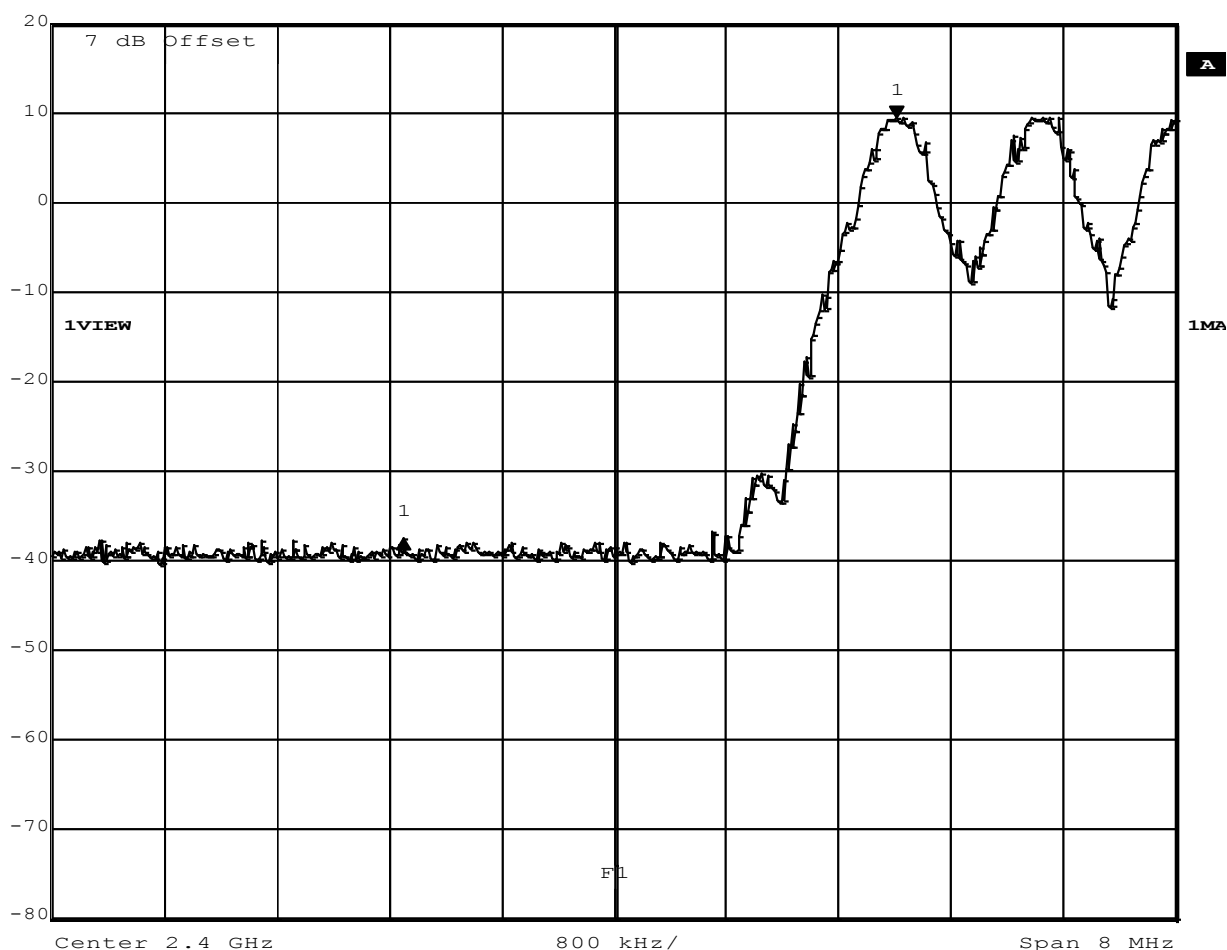
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 0 / 2402 MHz /GFSK
Comment 3	Hopping mode



Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
20 dBm	-46.92 dB	VBW	100 kHz		
	-3.51102204 MHz	SWT	5 ms	Unit	dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 13:20:42

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – DH5-Hop F_{HIGH}

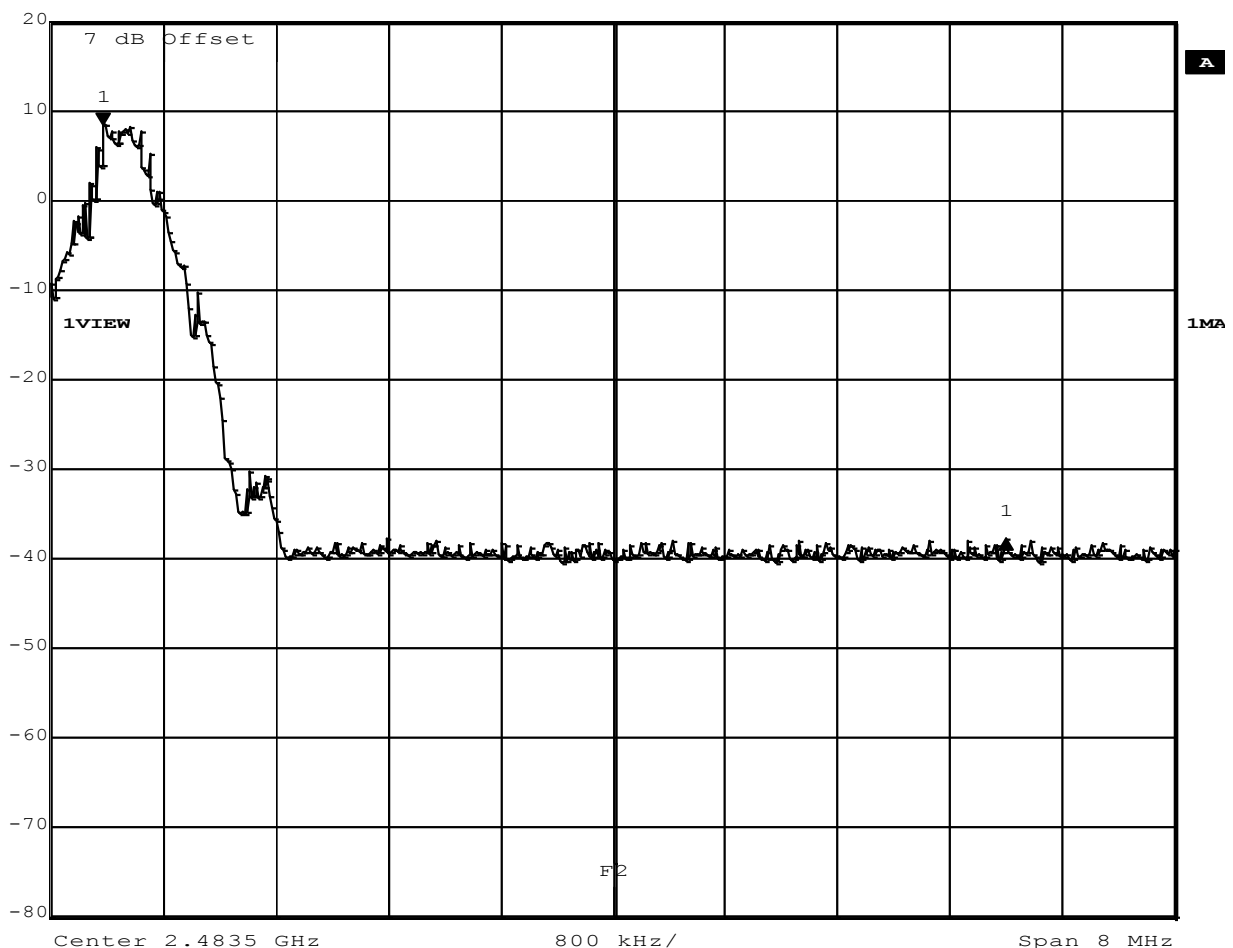
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT Bluetooth Module
 Model ENW89818C2JF / ENW89818A2JF
 Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
 Temperature / Voltage 23°C / V_{nom}
 Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
 Test Specification FCC part 15 section 247(c)
 Comment 1 Band-edge compliance
 Comment 2 Channel.: 78 / 2480 MHz / GFSK
 Comment 3 Hopping mode



Delta 1 [T1] RBW 100 kHz RF Att 40 dB
 Ref Lvl -46.10 dB VBW 100 kHz
 20 dBm 6.42885772 MHz SWT 5 ms Unit dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 13:39:32

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – 2-DH5-Sngl F_{LOW}

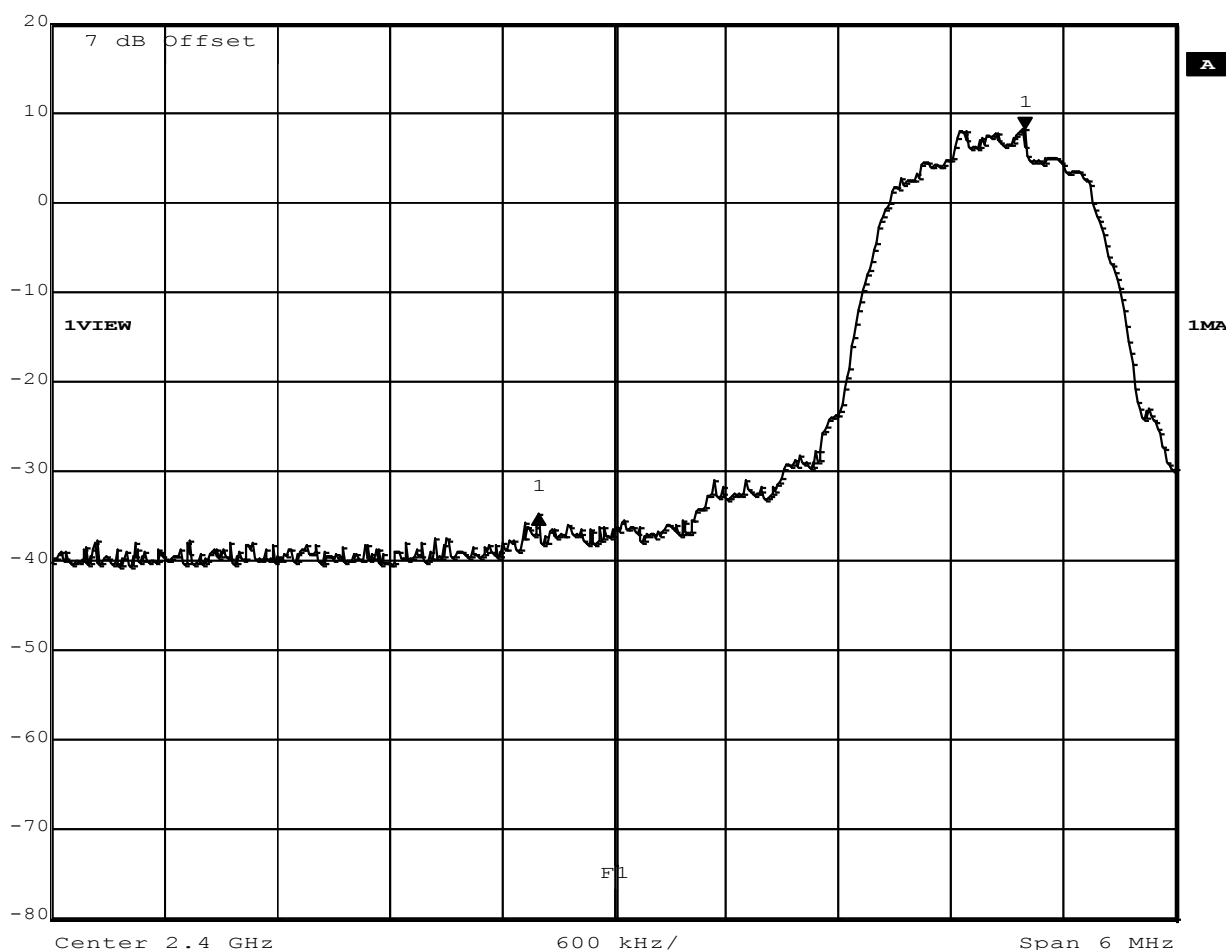
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 0 / 2402 MHz / DQPSK
Comment 3	Single frequency mode



Ref Lvl	-42.96 dB	RBW	100 kHz	RF Att	40 dB
20 dBm	-2.59719439 MHz	VBW	100 kHz	SWT	5 ms
		Unit			dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 12:13:14

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – 2-DH5-Sngl F_{HIGH}

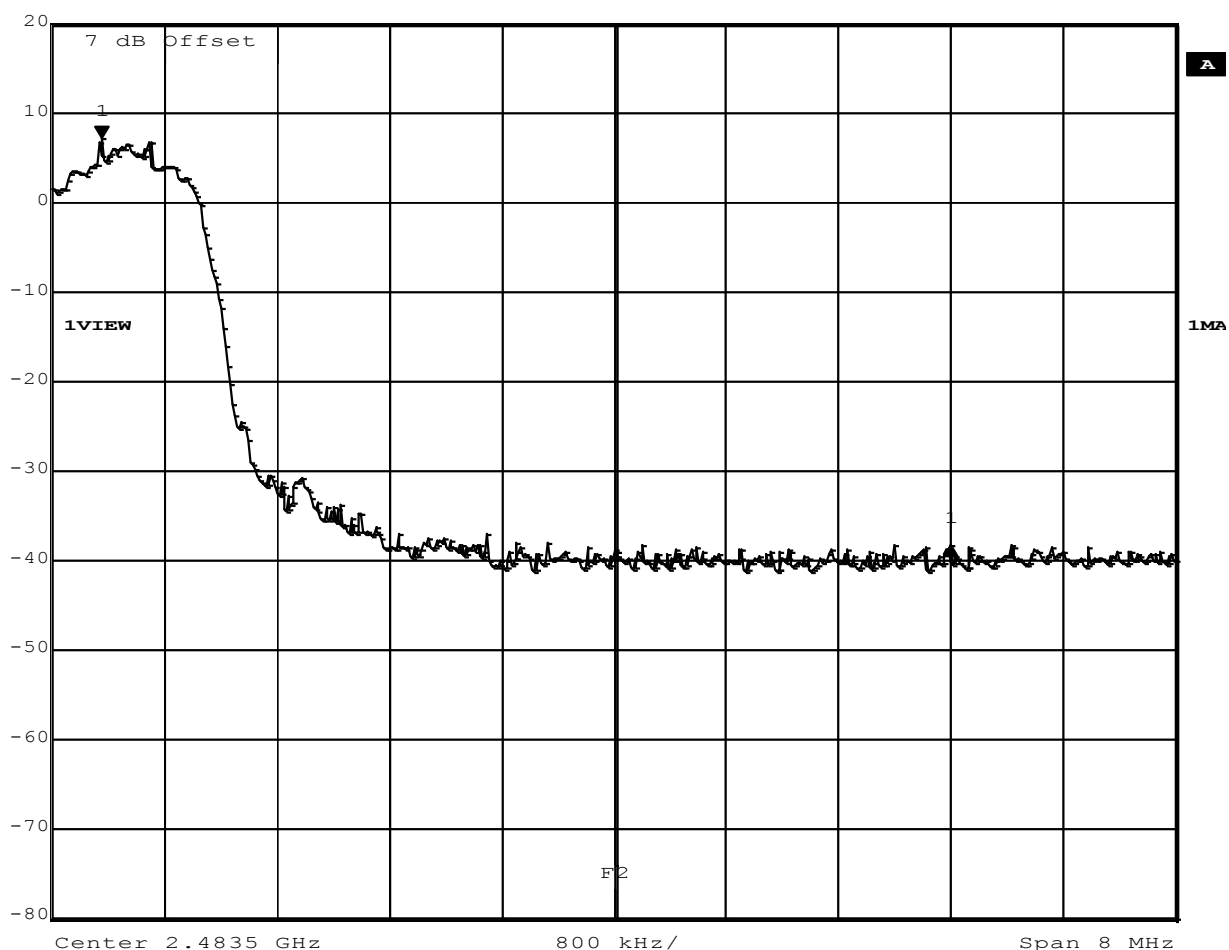
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 78 / 2480 MHz / DQPSK
Comment 3	Single frequency mode



Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
Ref Lvl	-45.33 dB	VBW	100 kHz	
20 dBm	6.04408818 MHz	SWT	5 ms	Unit dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 13:07:00

Test Report No.: G0M-1303-2693-TFC247B-V01

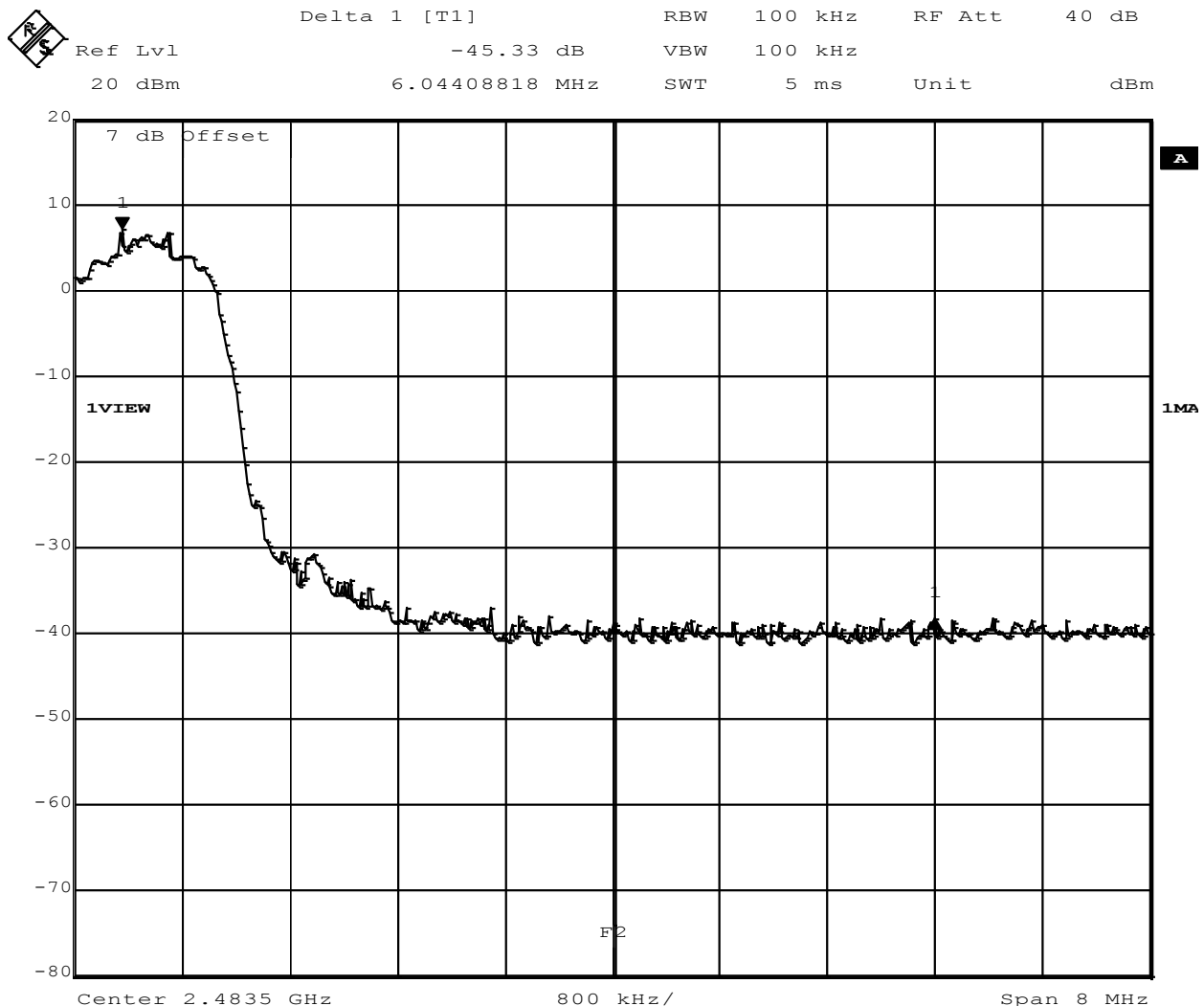
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Band-edge compliance – 2-DH5-Hop F_{LOW}

FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 78 / 2480 MHz / DQPSK
Comment 3	Single frequency mode



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 13:07:00

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – 2-DH5-Hop F_{HIGH}

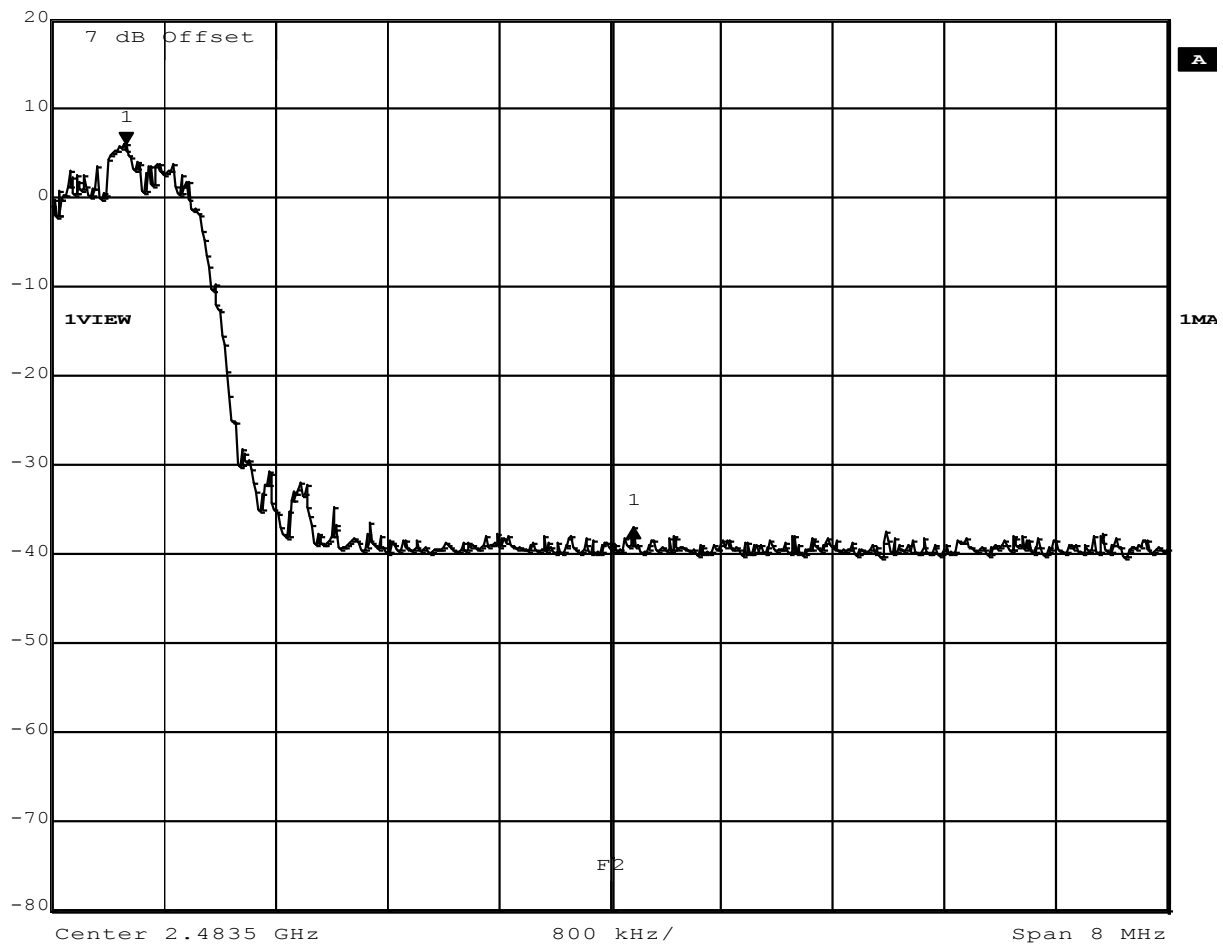
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 78 / 2480 MHz / DQPSK
Comment 3	Hopping mode



Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
20 dBm	-43.11 dB	VBW	100 kHz		
	3.63927856 MHz	SWT	5 ms	Unit	dBm



Date: 31.AUG.2010 13:33:14

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – 3-DH5-Sngl F_{LOW}

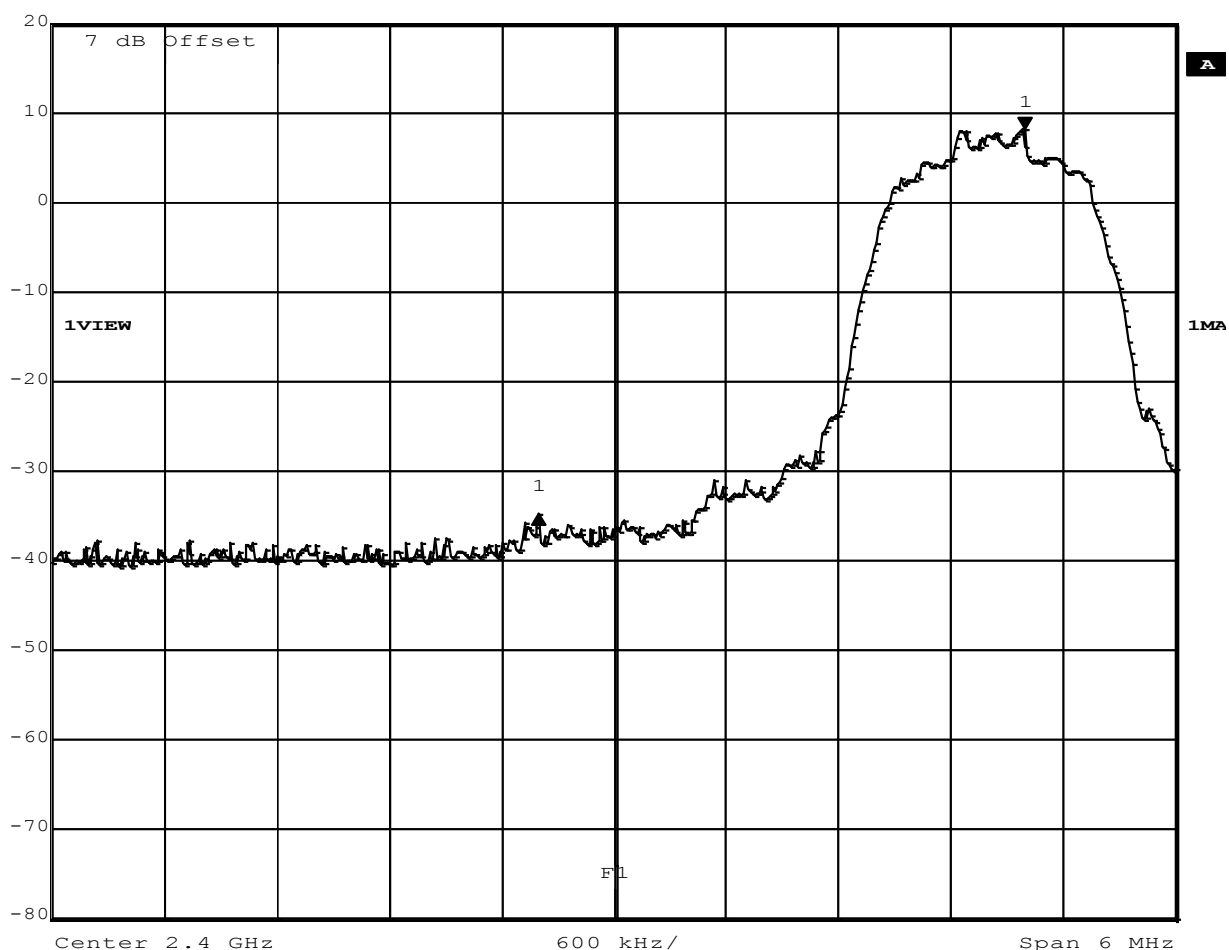
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT Bluetooth Module
 Model ENW89818C2JF / ENW89818A2JF
 Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
 Temperature / Voltage 23°C / V_{nom}
 Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
 Test Specification FCC part 15 section 247(c)
 Comment 1 Band-edge compliance
 Comment 2 Channel.: 0 / 2402 MHz / 8DPSK
 Comment 3 Single frequency mode



Delta 1 [T1] RBW 100 kHz RF Att 40 dB
 Ref Lvl -42.96 dB VBW 100 kHz
 20 dBm -2.59719439 MHz SWT 5 ms Unit dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 12:57:05

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – 3-DH5-Sngl F_{HIGH}

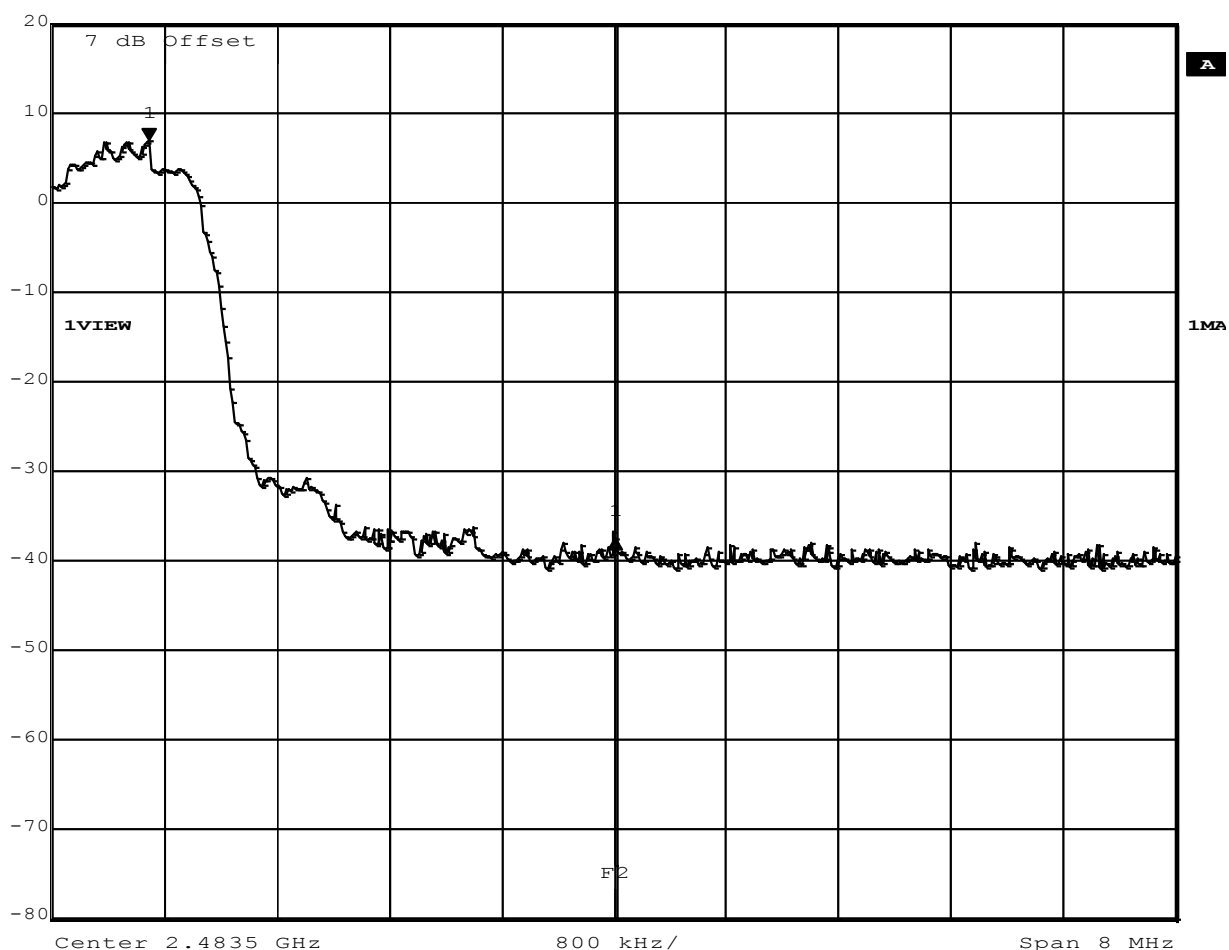
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 78 / 2480 MHz / 8DPSK
Comment 3	Single frequency mode



Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
20 dBm	-44.52 dB	VBW	100 kHz		
	3.31062124 MHz	SWT	5 ms	Unit	dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 13:09:27

Test Report No.: G0M-1303-2693-TFC247B-V01

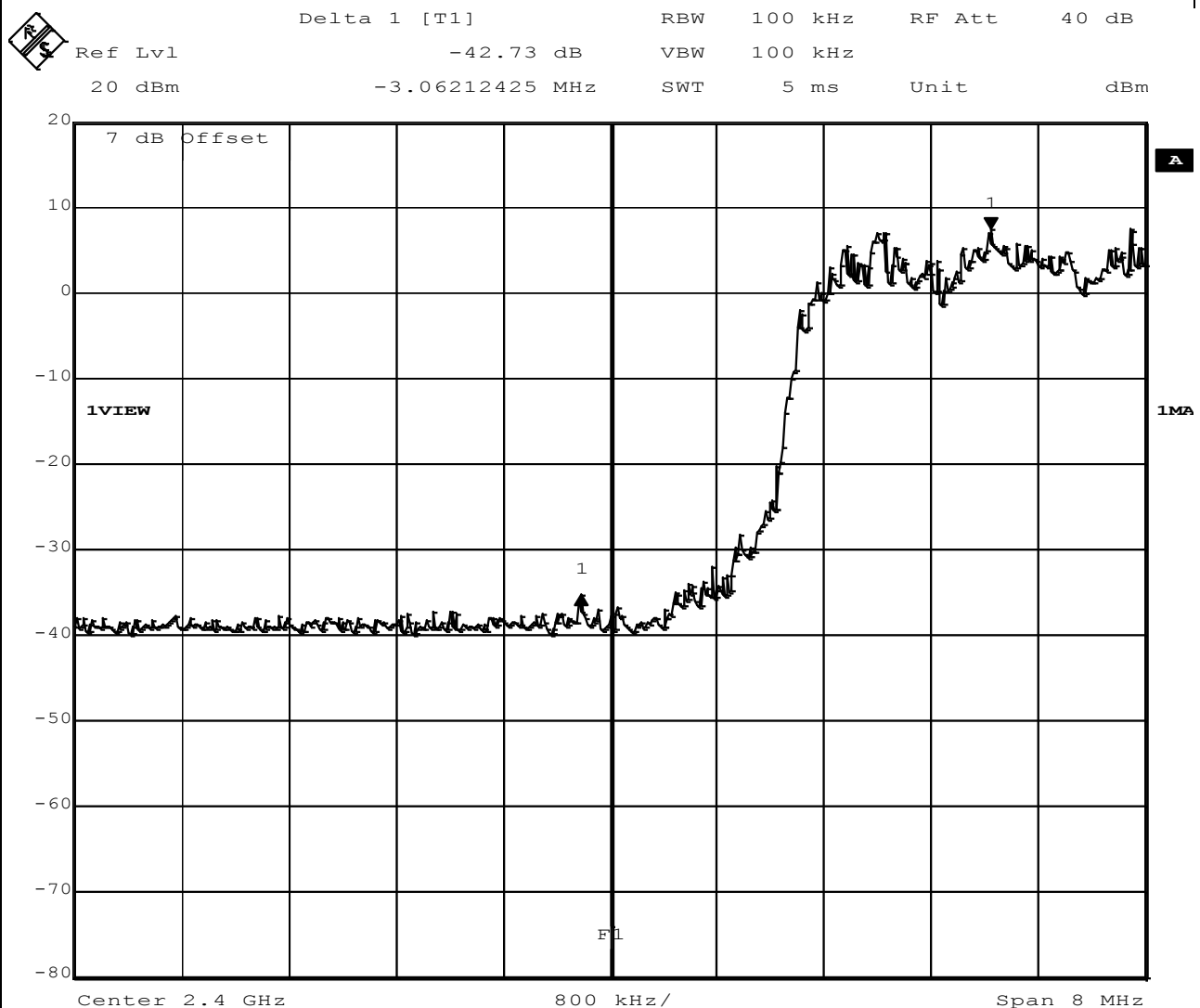
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Band-edge compliance – 3-DH5-Hop F_{LOW}

FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 0 / 2402 MHz / 8DPSK
Comment 3	Hopping mode



Date: 31.AUG.2010 13:26:50

Test Report No.: G0M-1303-2693-TFC247B-V01

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

Band-edge compliance – 3-DH5-Hop F_{HIGH}

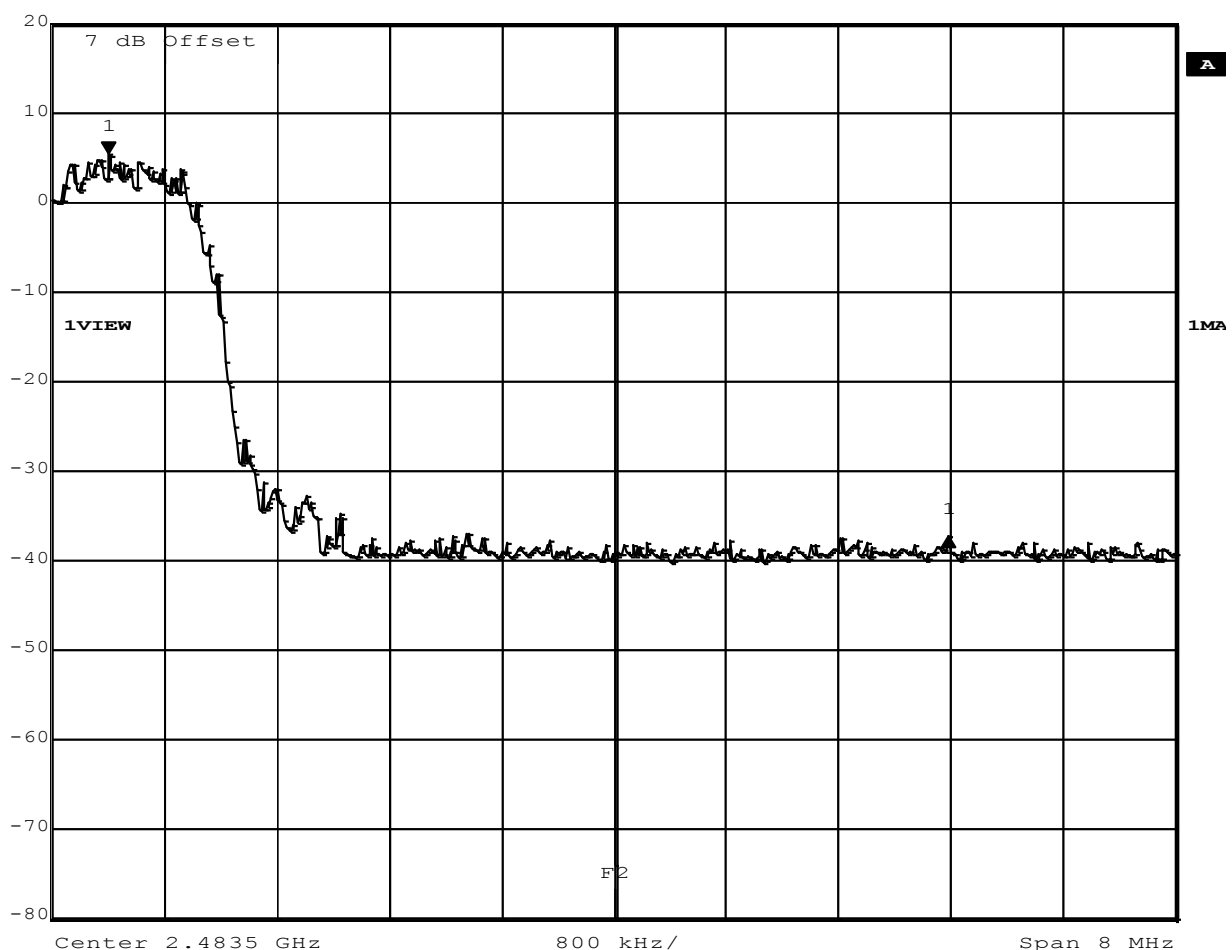
FCC part 15.247

Band-edge compliance of RF conducted emissions

EUT Bluetooth Module
 Model ENW89818C2JF / ENW89818A2JF
 Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
 Temperature / Voltage 23°C / V_{nom}
 Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
 Test Specification FCC part 15 section 247(c)
 Comment 1 Band-edge compliance
 Comment 2 Channel.: 78 / 2480 MHz / 8DPSK
 Comment 3 Hopping mode



Delta 1 [T1] RBW 100 kHz RF Att 40 dB
 Ref Lvl -42.68 dB VBW 100 kHz
 20 dBm 5.97995992 MHz SWT 5 ms Unit dBm



Comment A: Limit: Marker Delta value >20 dB; Result: PASS

Date: 31.AUG.2010 13:29:47

Test Report No.: G0M-1303-2693-TFC247B-V01

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

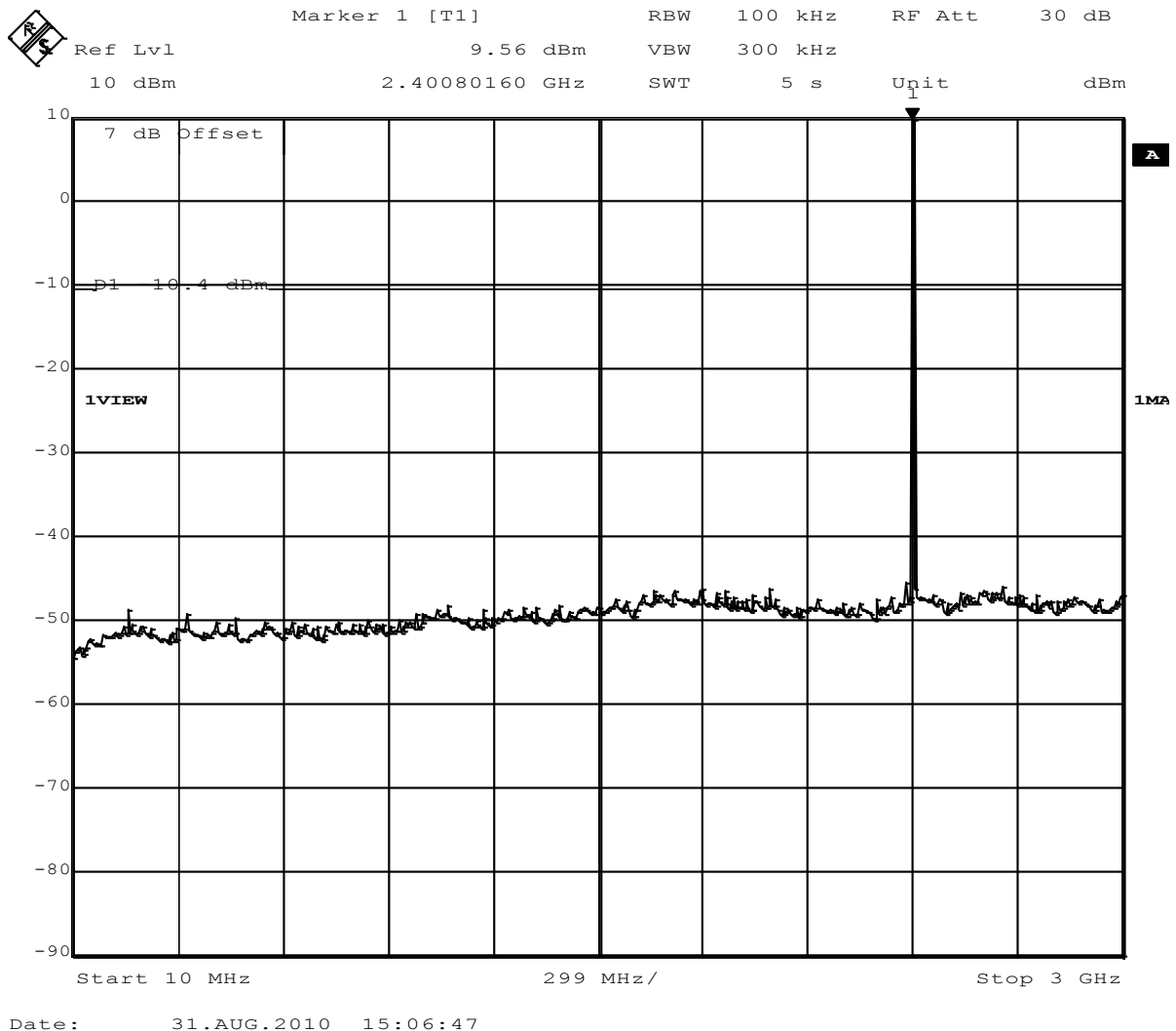
3.9 Test Conditions and Results – Conducted spurious emissions

Conducted spurious emissions acc. FCC 15.247 / IC RSS-210							Verdict: PASS	
EUT requirement rule parts and clause			Reference					
			FCC 15.247(d) / IC RSS-210 A8.5					
Test according to measurement reference			Reference Method					
			FCC Public Notice DA 00-705					
Test frequency range			Tested frequencies					
			10 MHz – 10 th Harmonic					
Measurement mode			Peak					
Limits								
Limit				Condition				
≤ -20 dB/100 kHz				Peak power measurement detector = Peak				
≤ -30 dB/100 kHz				Peak power measurement detector = RMS				
Test setup								
Spectrum Analyzer EUT								
Test procedure								
1. EUT set to test mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth is set to 100 kHz and detector to peak and max hold 4. Markers are set to peak emission levels within frequency band 5. Emission level is determined by second marker on emission peak 6. Attenuation is determined from level difference								
Test results								
Channel	Frequency [MHz]	Mode	Emission [MHz]	Emission Level [dbm]	Peak power [dBm]	Limit [dBm]	Margin [dB]	Result
F _{LOW}	2402	DH5-Sngl	13511	-27.01	9.56	-10.44	-16.57	PASS
F _{MID}	2441	DH5-Sngl	13773	-26.45	9.24	-10.76	-15.69	PASS
F _{HIGH}	2480	DH5-Sngl	14005	-29.82	8.70	-11.30	-18.52	PASS
F _{LOW}	2402	3DH5-Sngl	13511	-32.23	5.84	-14.16	-18.07	PASS
F _{MID}	2441	3DH5-Sngl	13744	-33.49	6.43	-13.57	-19.92	PASS
F _{HIGH}	2480	3DH5-Sngl	14005	-33.41	5.57	-14.43	-18.98	PASS
Comments:								

Conducted spurious emissions – DH5-Sngl F_{Low}

FCC part 15.247 (d)
Spurious Emissions

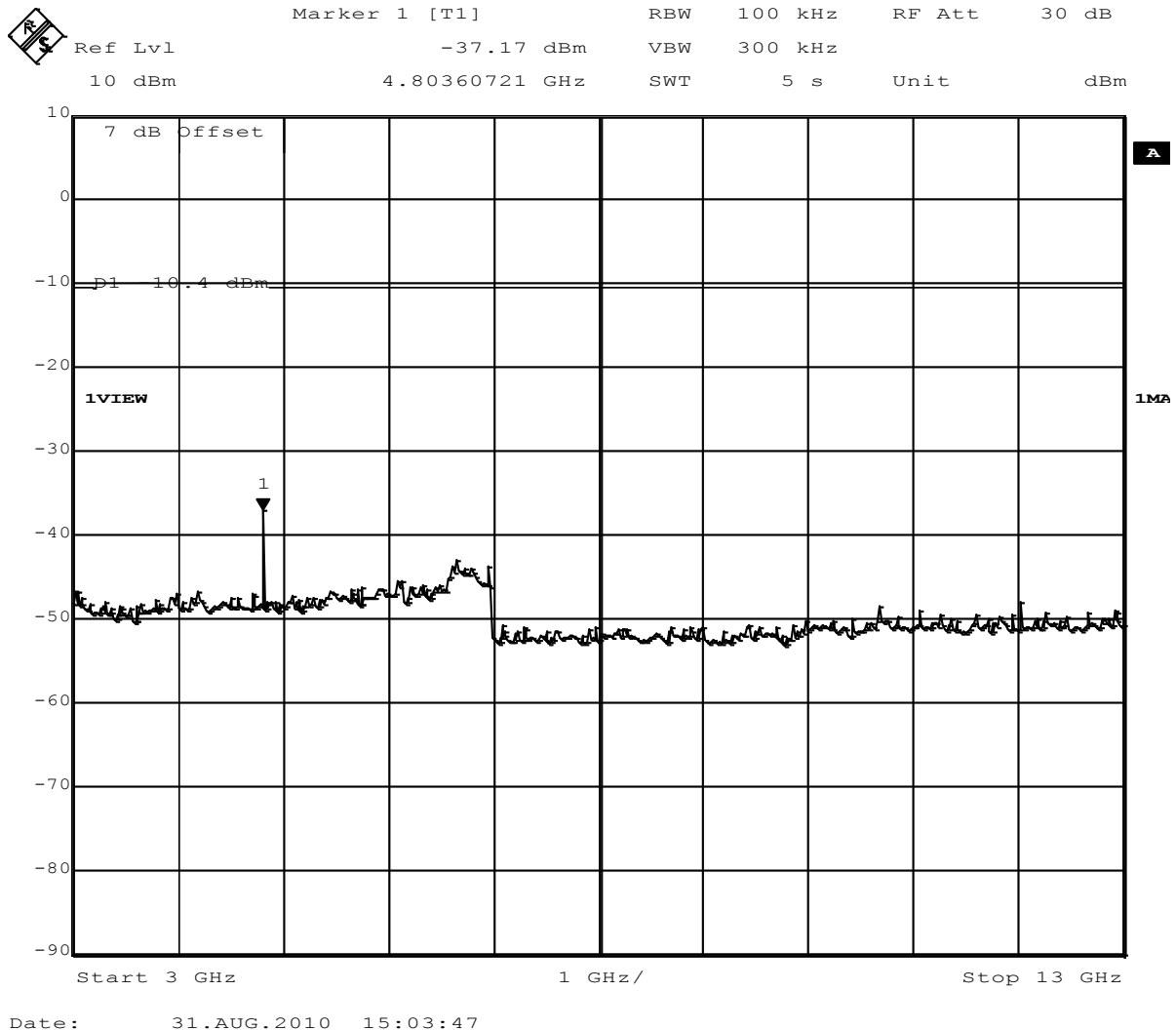
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2402 MHz
Comment 3 GFSK



Conducted spurious emissions – DH5-Sngl F_{Low}

FCC part 15.247 (d)
Spurious Emissions

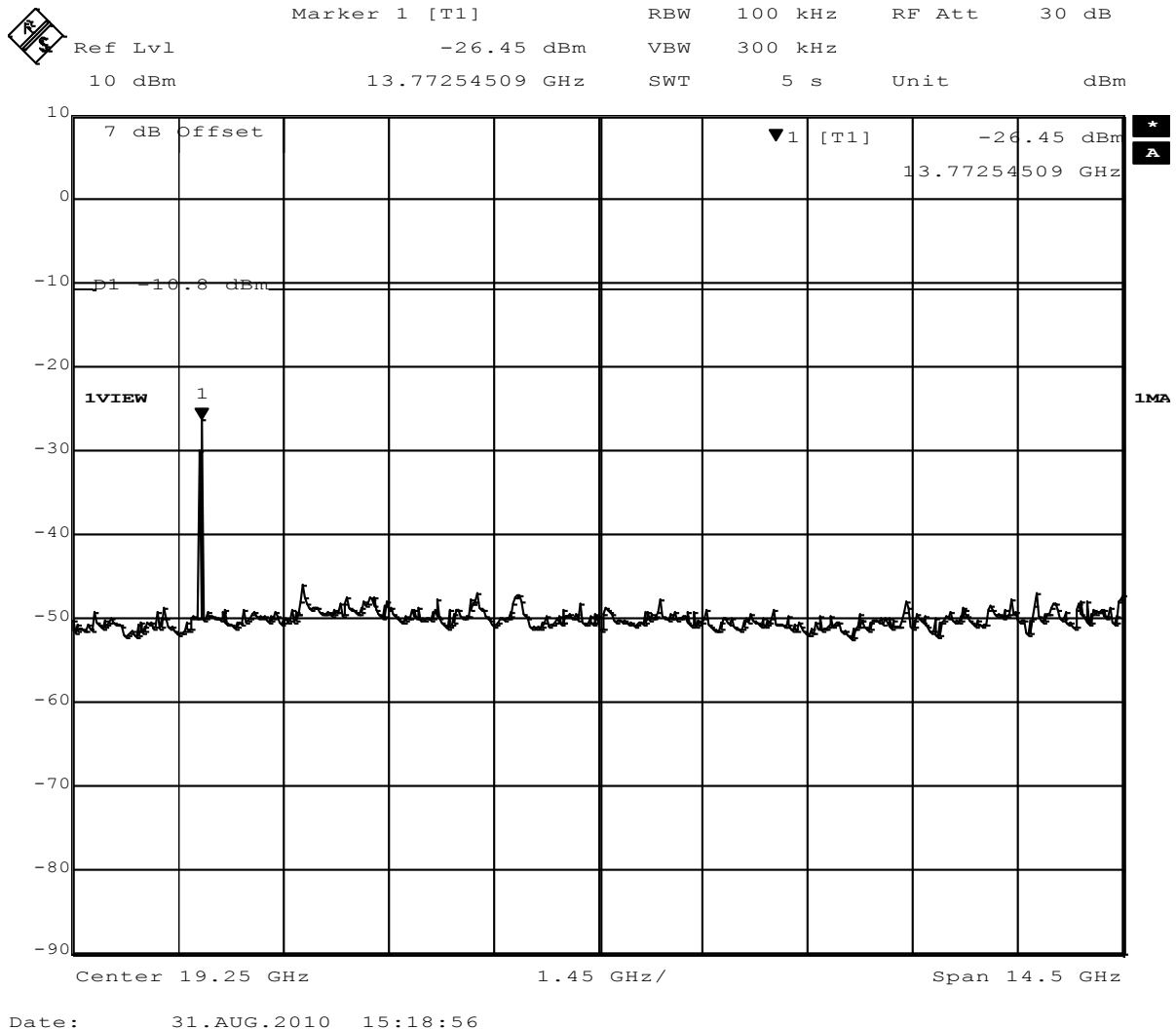
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2402 MHz
Comment 3 GFSK



Conducted spurious emissions – DH5-Sngl F_{Low}

FCC part 15.247 (d)
Spurious Emissions

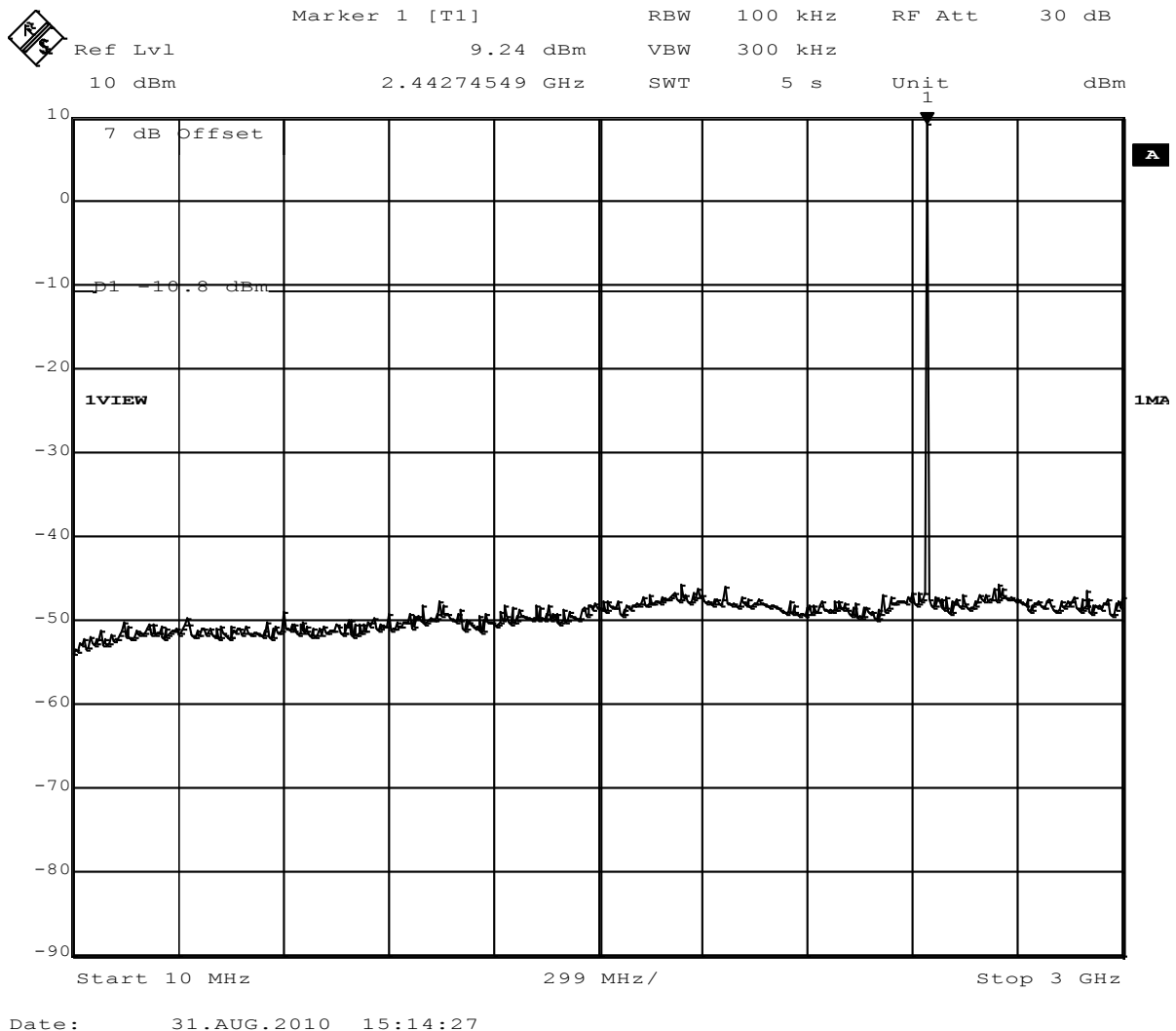
EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2441 MHz
Comment 3	GFSK



Conducted spurious emissions – DH5-Sngl F_{MID}

FCC part 15.247 (d)
Spurious Emissions

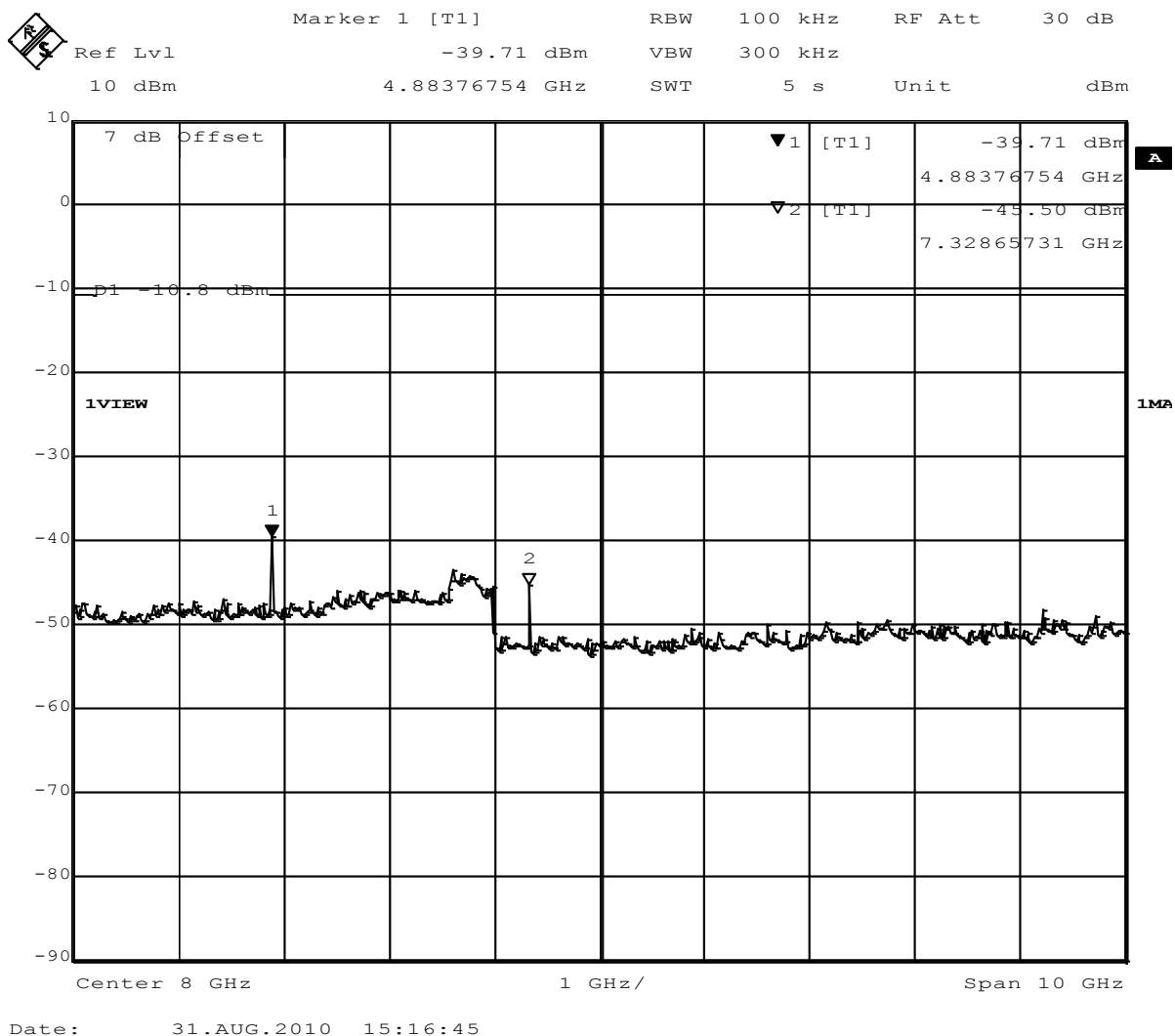
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2441 MHz
Comment 3 GFSK



Conducted spurious emissions – DH5-Sngl F_{MID}

FCC part 15.247 (d)
Spurious Emissions

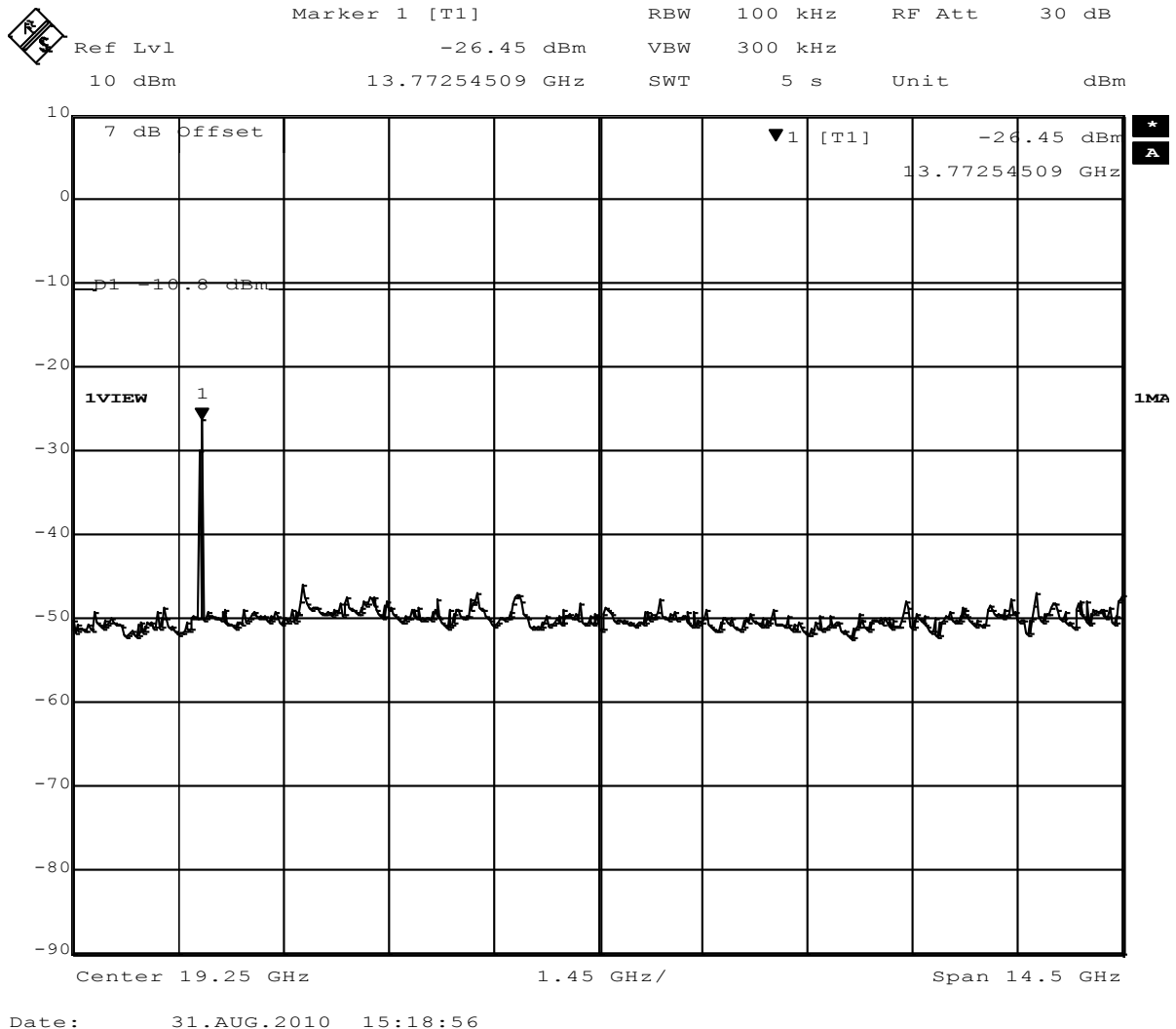
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2441 MHz
Comment 3 GFSK



Conducted spurious emissions – DH5-Sngl F_{MID}

FCC part 15.247 (d)
Spurious Emissions

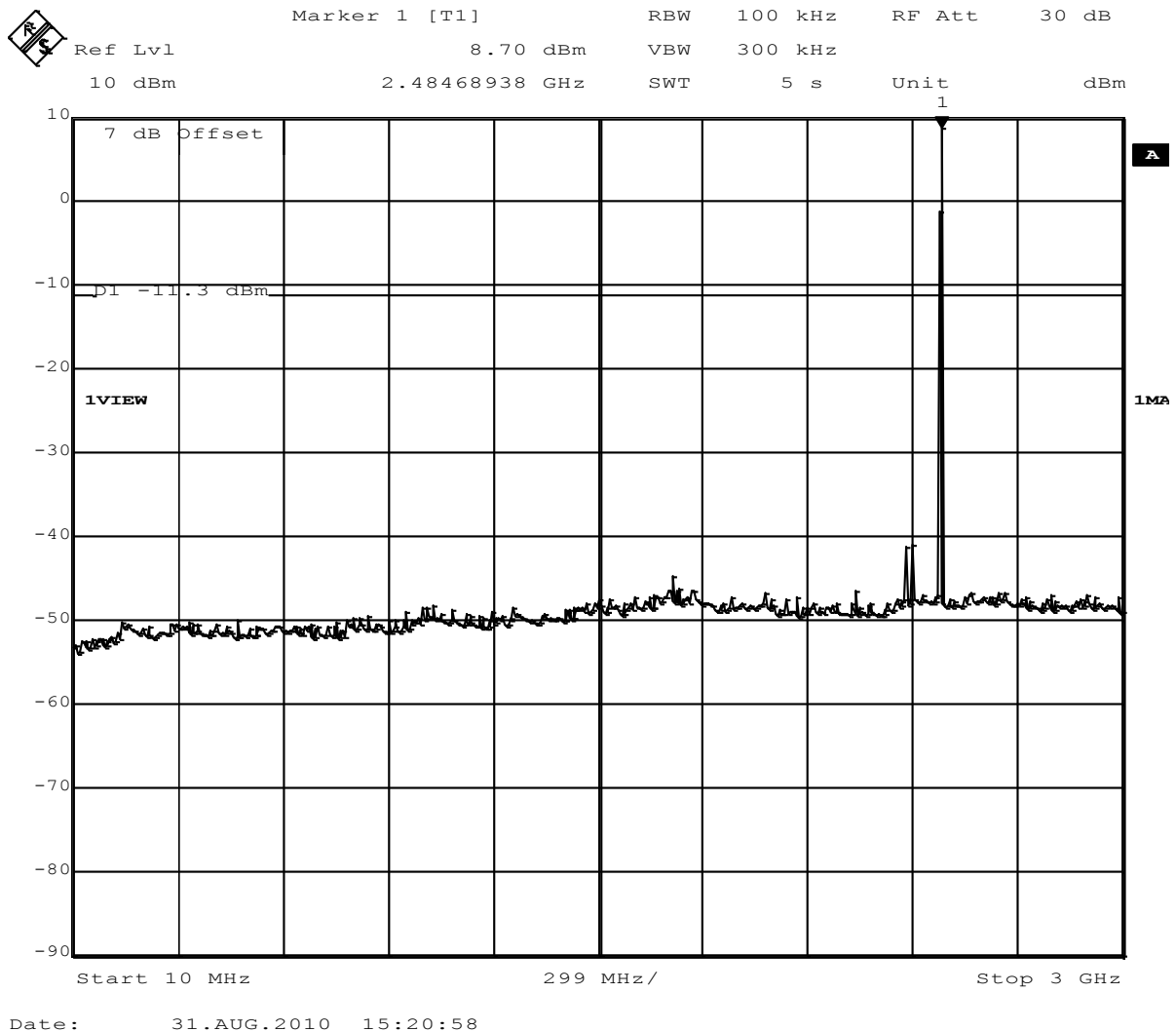
EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2441 MHz
Comment 3	GFSK



Conducted spurious emissions – DH5-Sngl F_{HIGH}

FCC part 15.247 (d)
Spurious Emissions

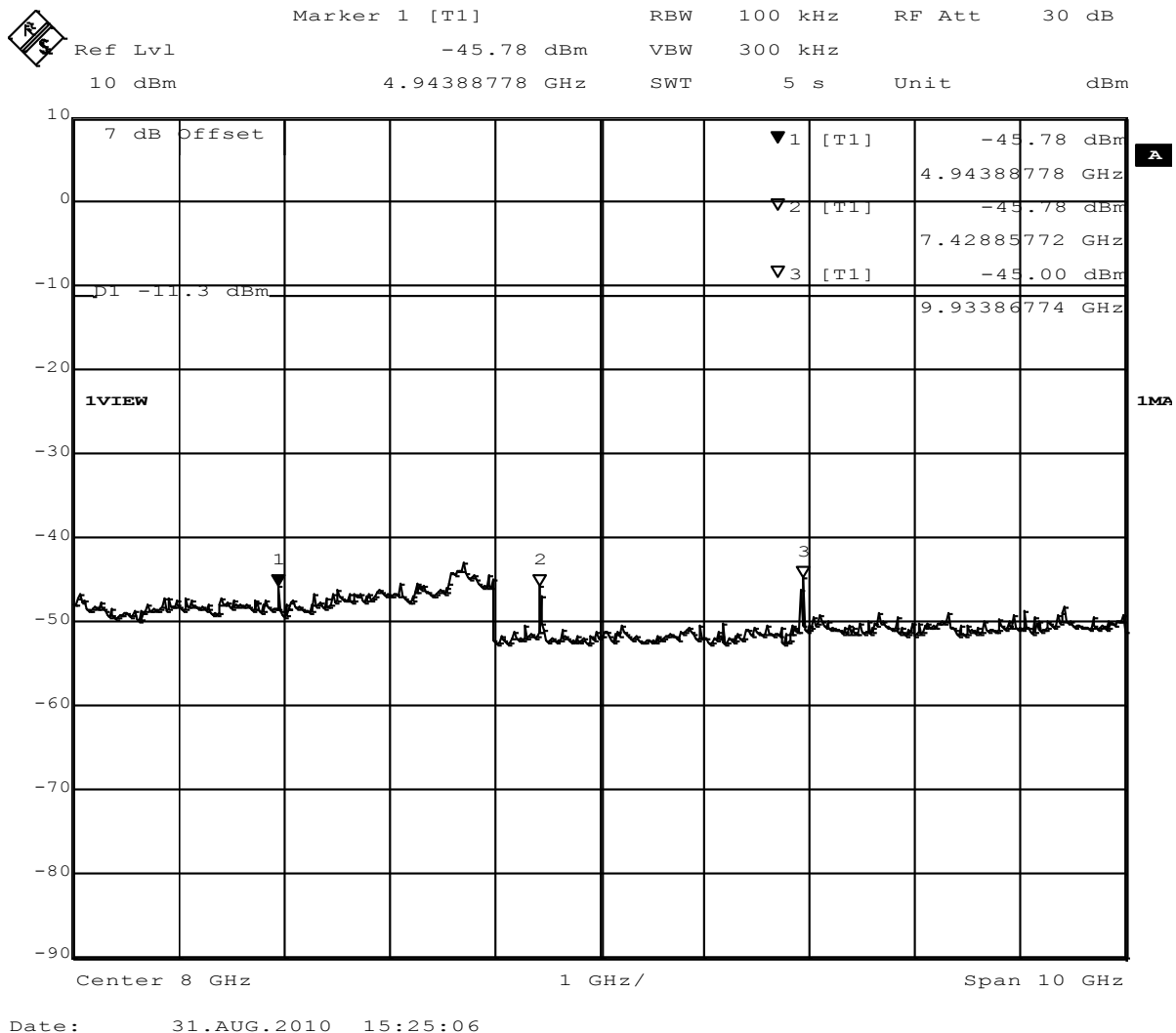
EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2480 MHz
Comment 3	GFSK



Conducted spurious emissions – DH5-Sngl F_{HIGH}

FCC part 15.247 (d)
Spurious Emissions

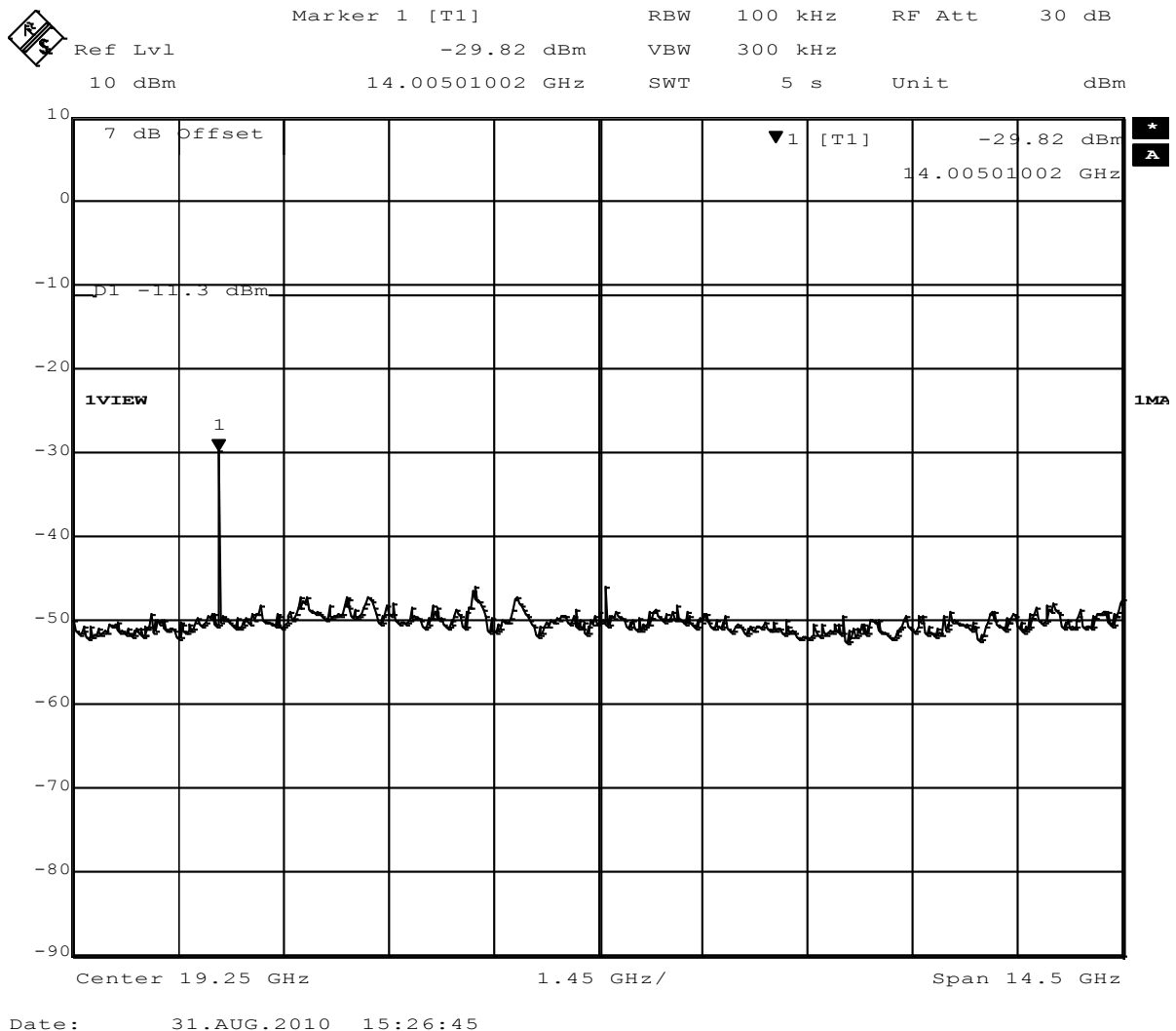
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2480 MHz
Comment 3 GFSK



Conducted spurious emissions – DH5-Sngl F_{HIGH}

FCC part 15.247 (d)
Spurious Emissions

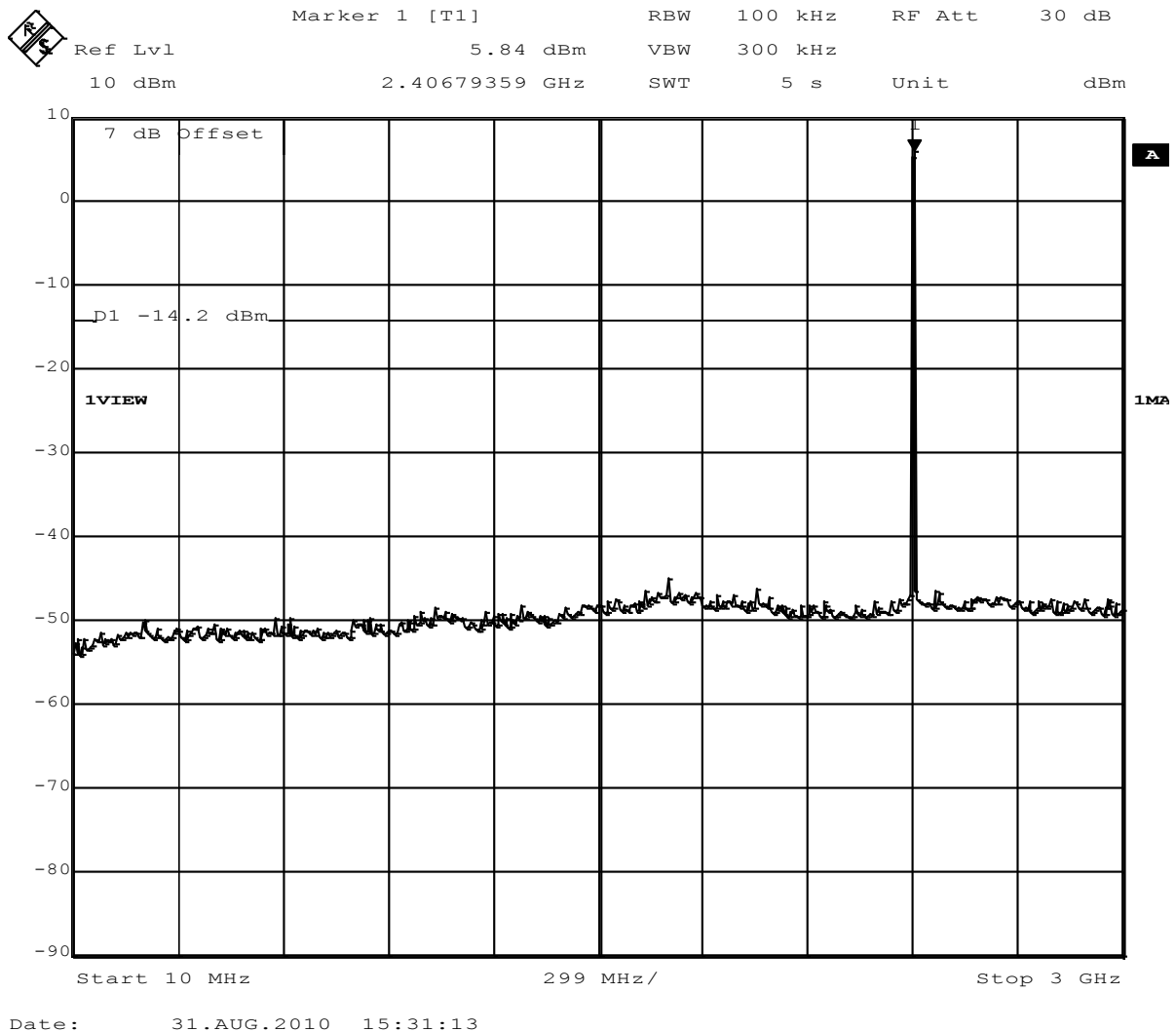
EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2480 MHz
Comment 3	GFSK



Conducted spurious emissions – 3-DH5-Sngl F_{Low}

FCC part 15.247 (d)
Spurious Emissions

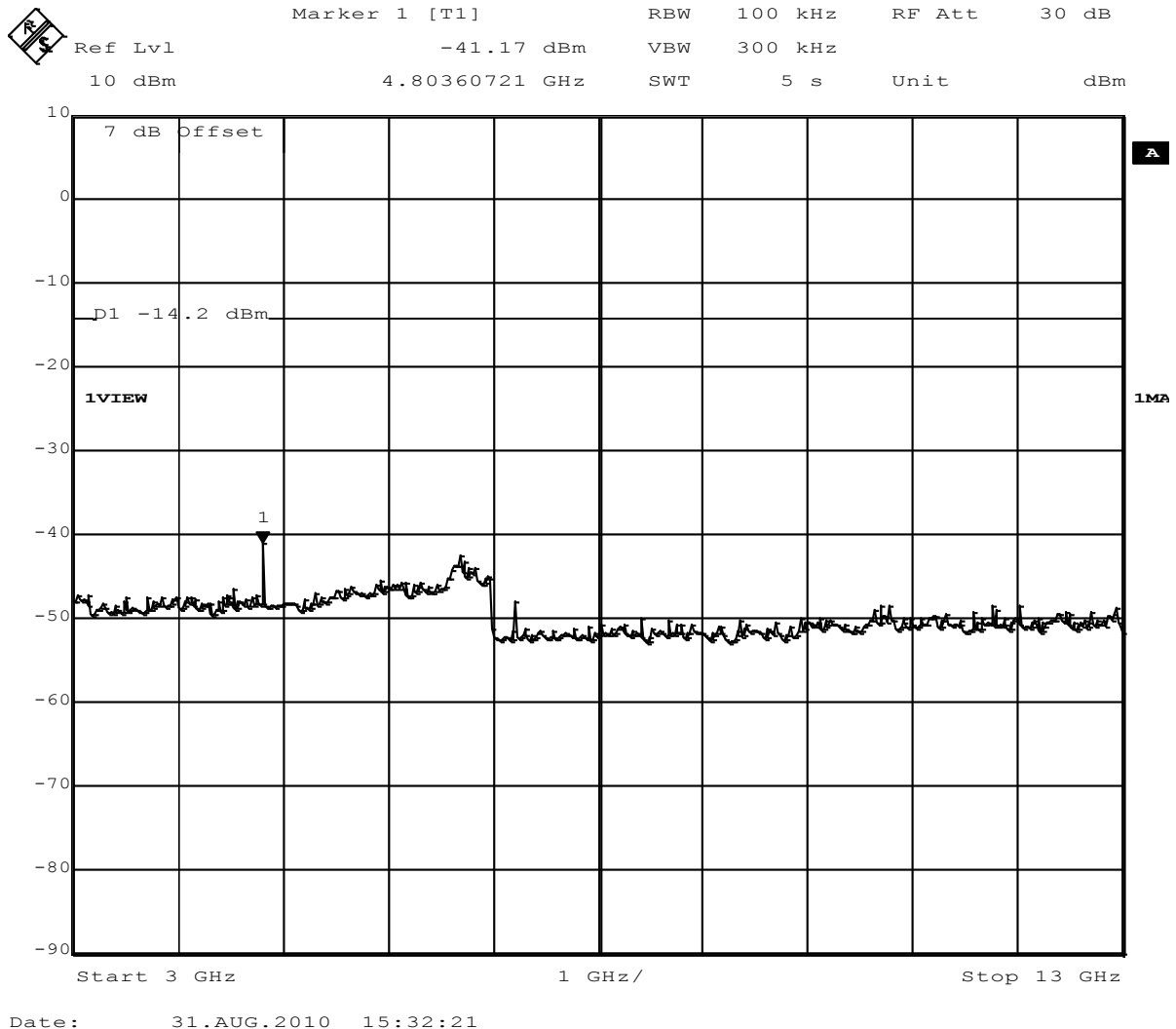
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2402 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{Low}

FCC part 15.247 (d)
Spurious Emissions

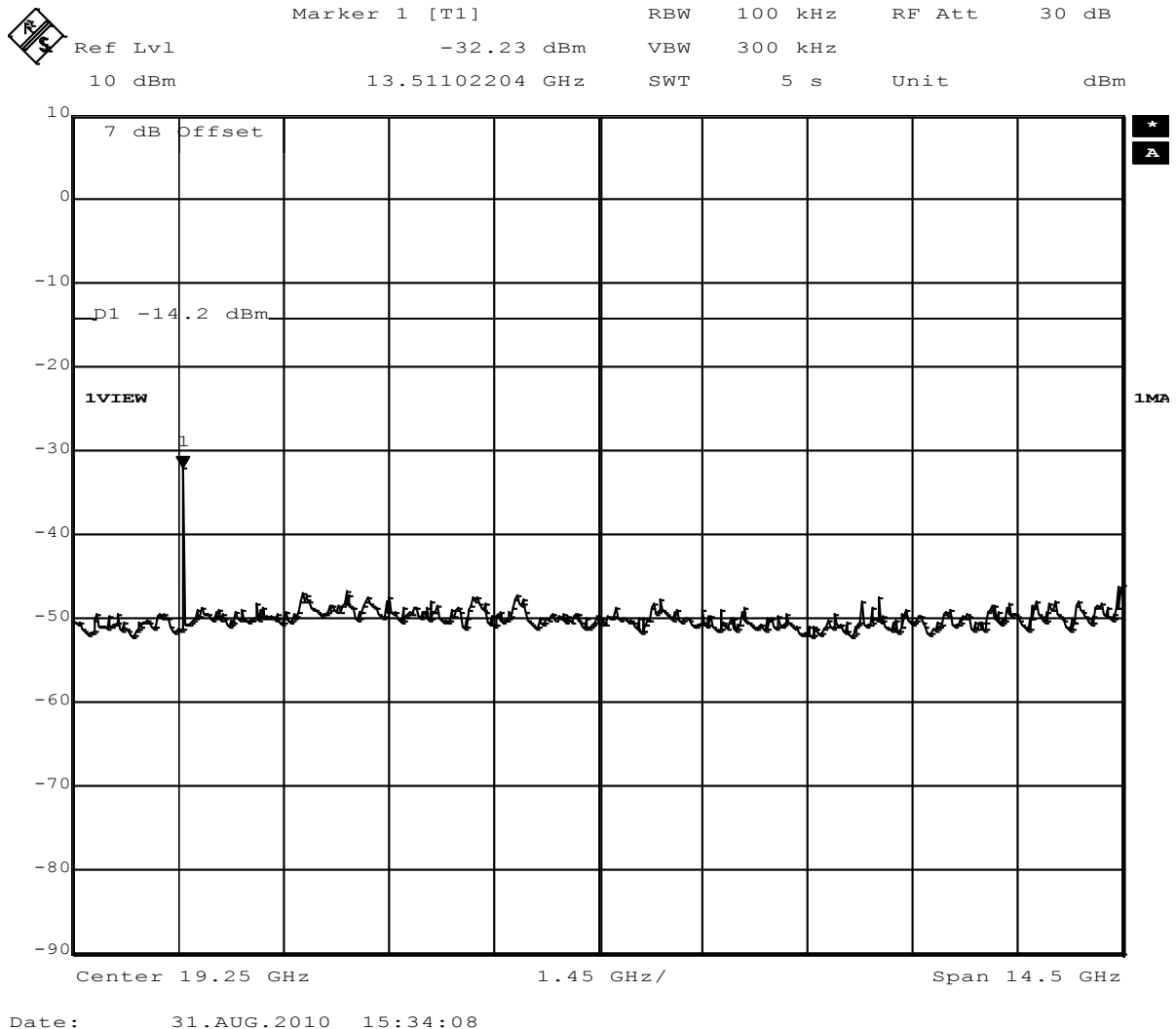
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2402 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{Low}

FCC part 15.247 (d)
Spurious Emissions

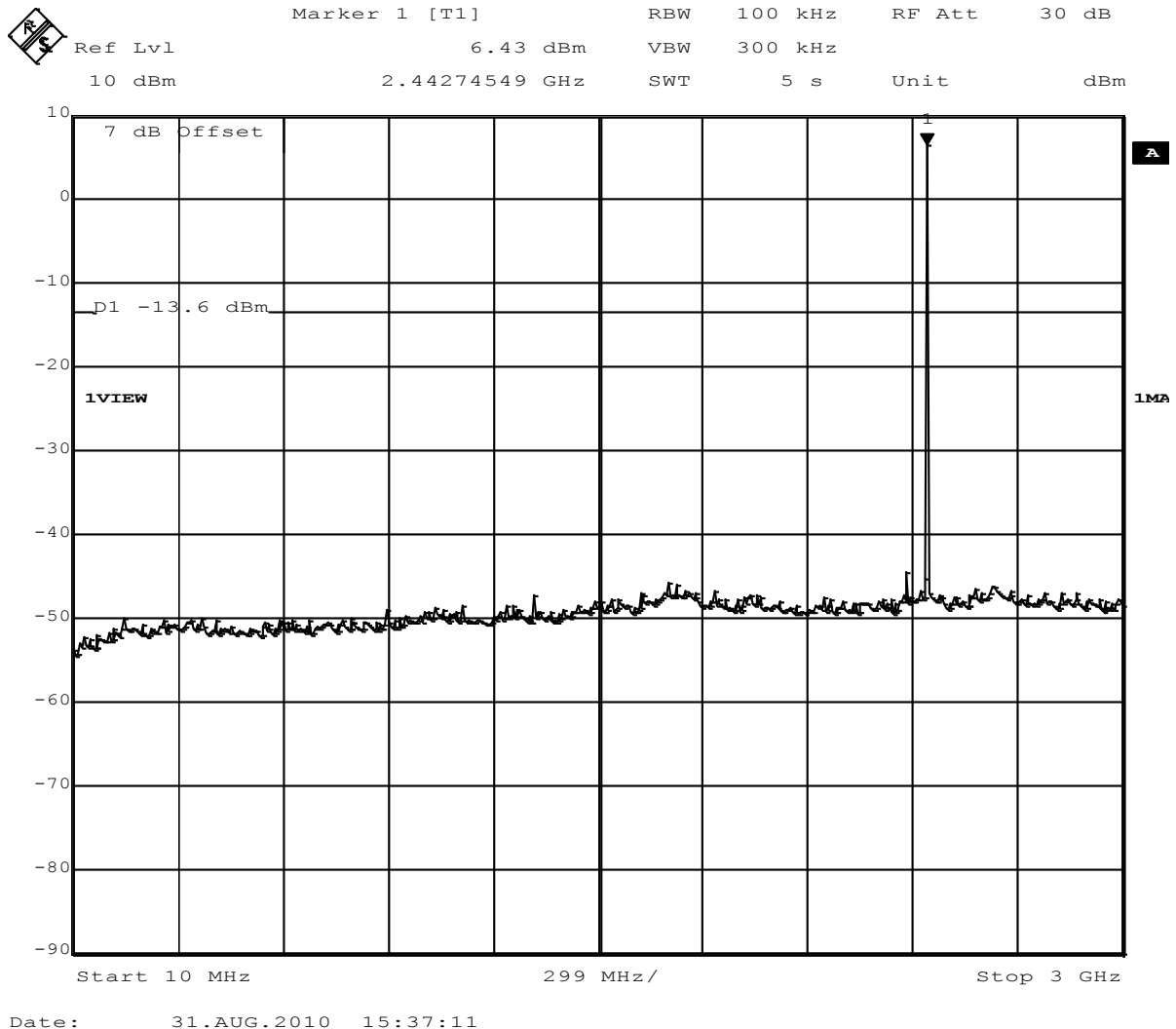
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2402 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{MD}

FCC part 15.247 (d)
Spurious Emissions

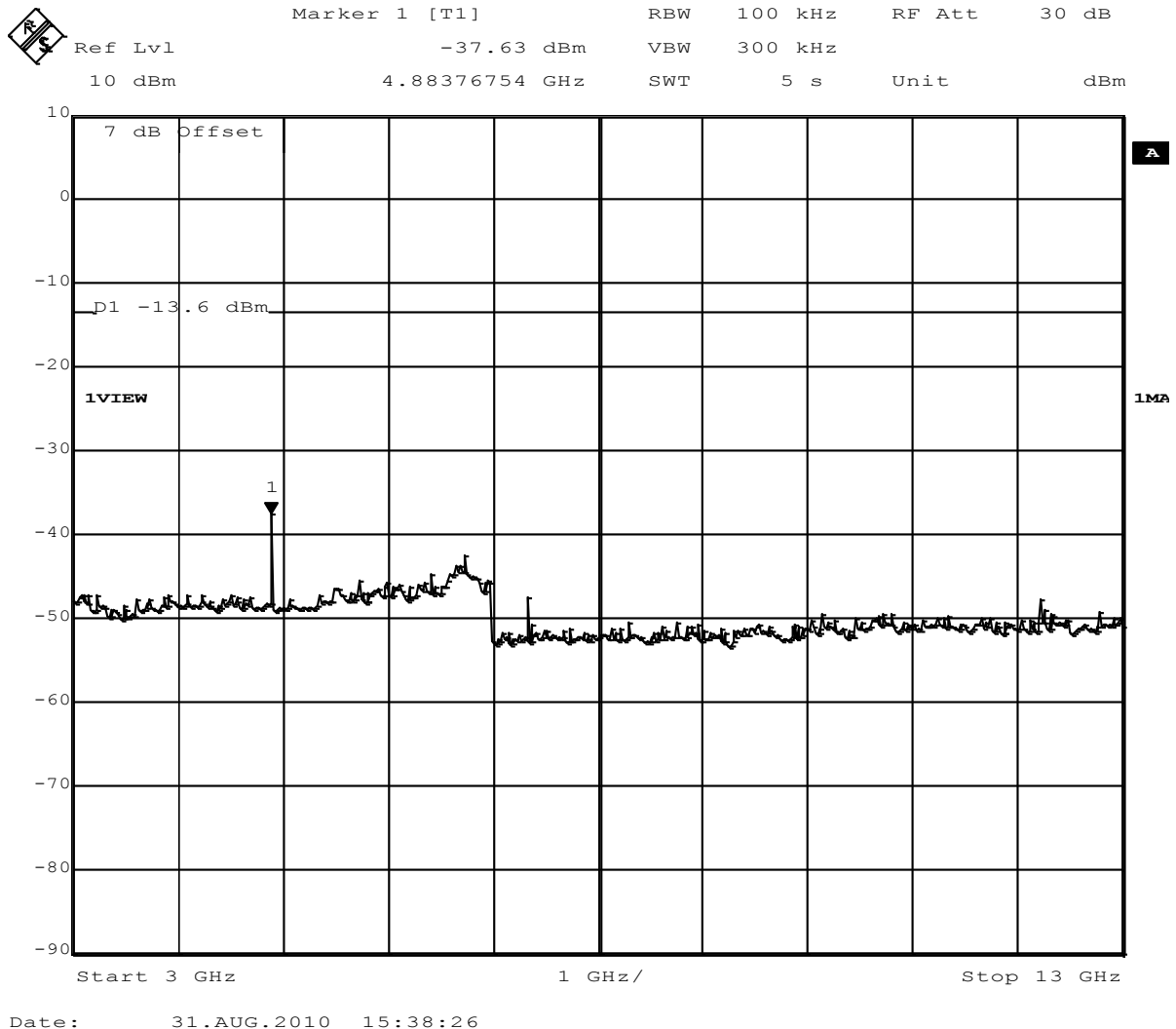
EUT	Bluetooth Module
Model	ENW89818C2JF / ENW89818A2JF
Approval Holder	Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage	23°C / V _{nom}
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel : 2441 MHz
Comment 3	8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{MID}

FCC part 15.247 (d)
Spurious Emissions

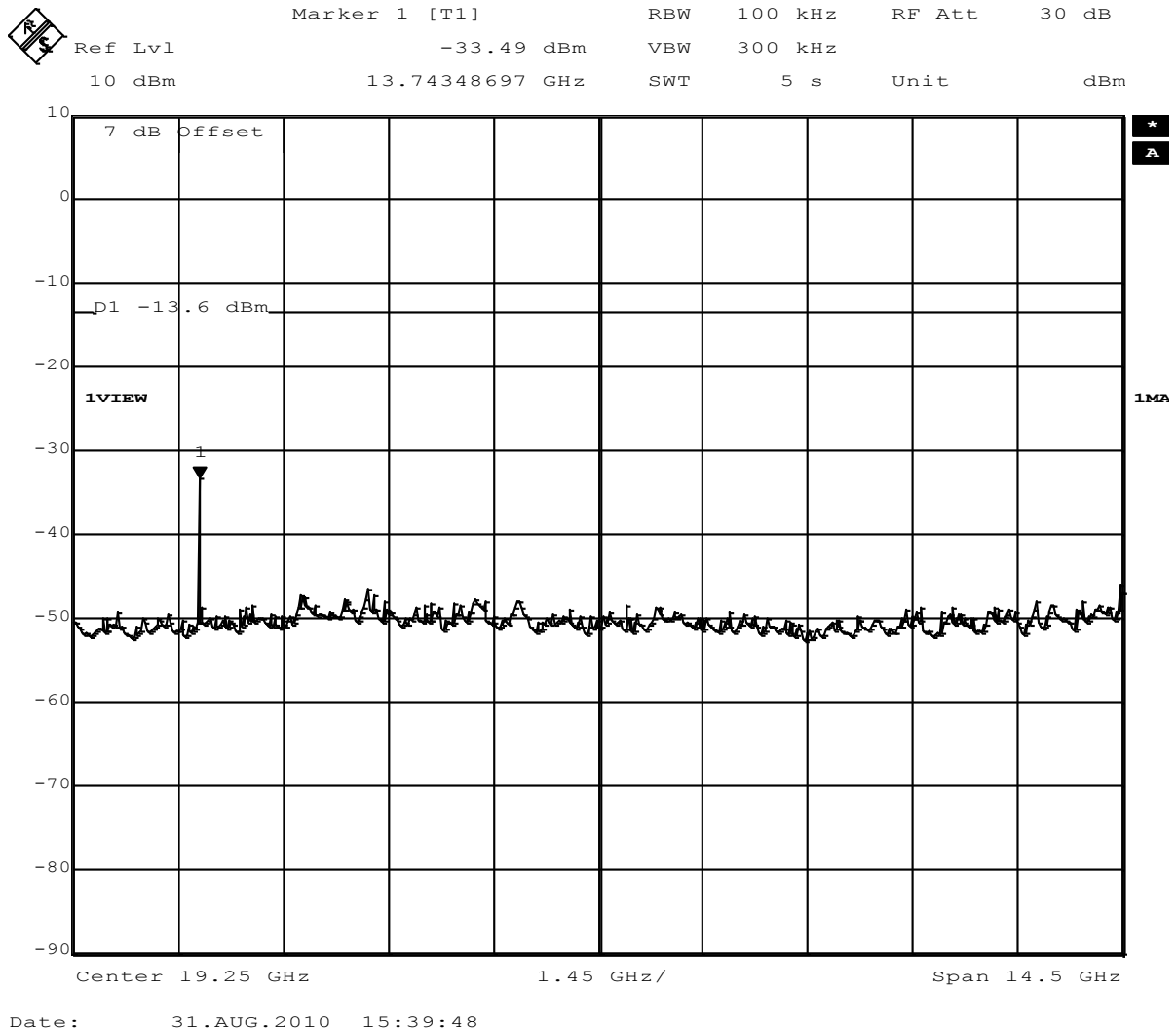
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2441 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{MID}

FCC part 15.247 (d)
Spurious Emissions

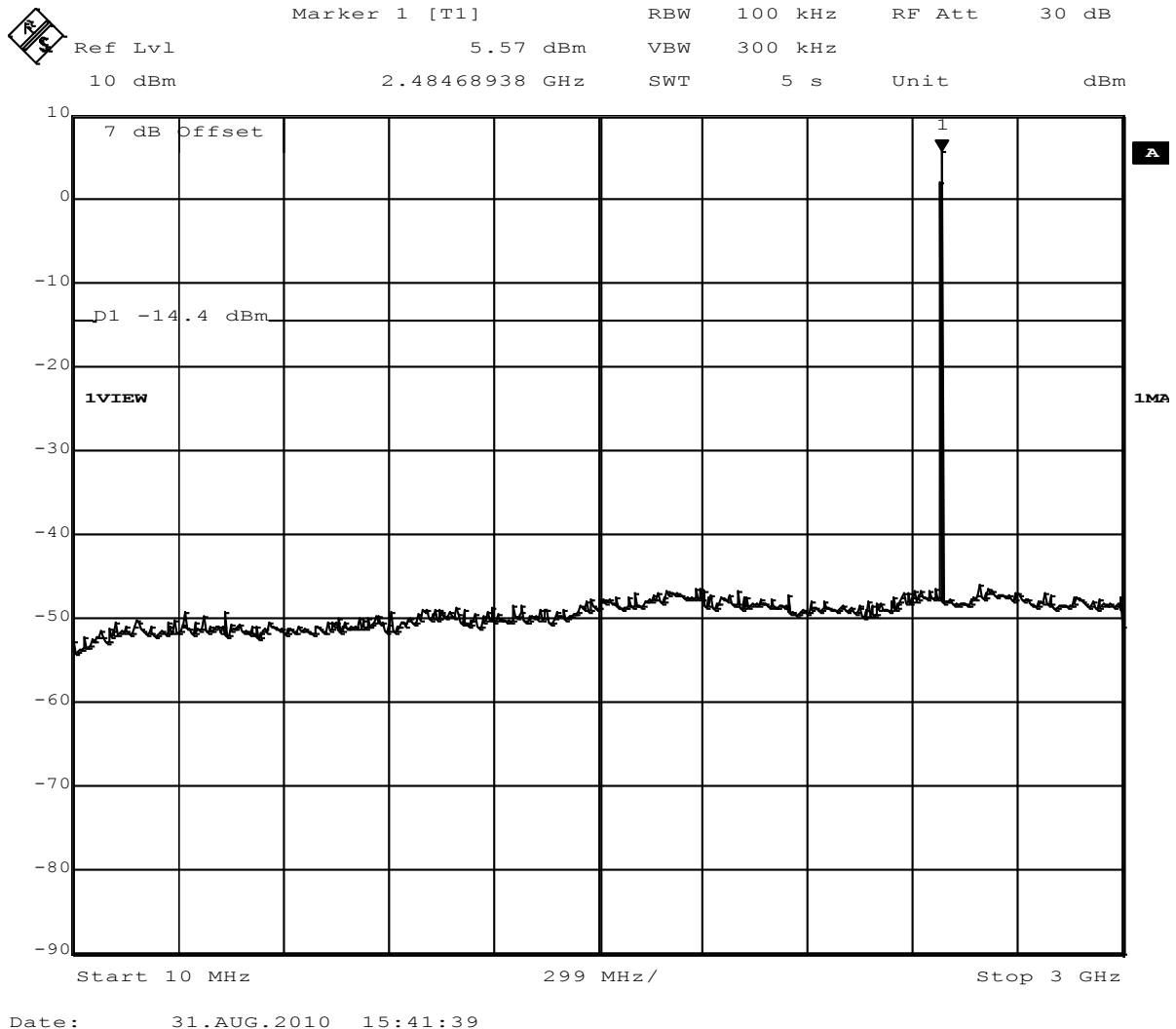
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2441 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{HIGH}

FCC part 15.247 (d)
Spurious Emissions

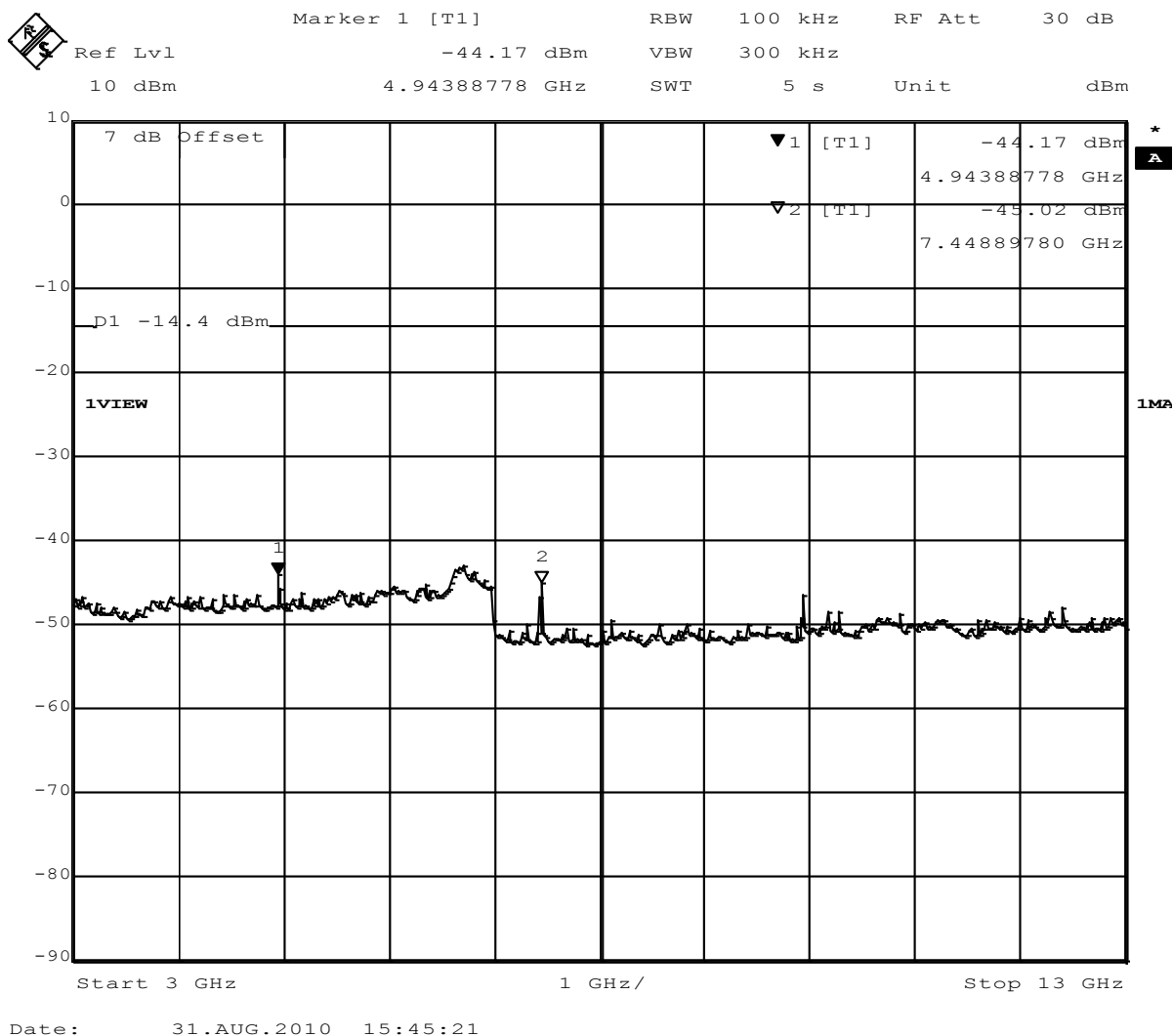
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2480 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{HIGH}

FCC part 15.247 (d)
Spurious Emissions

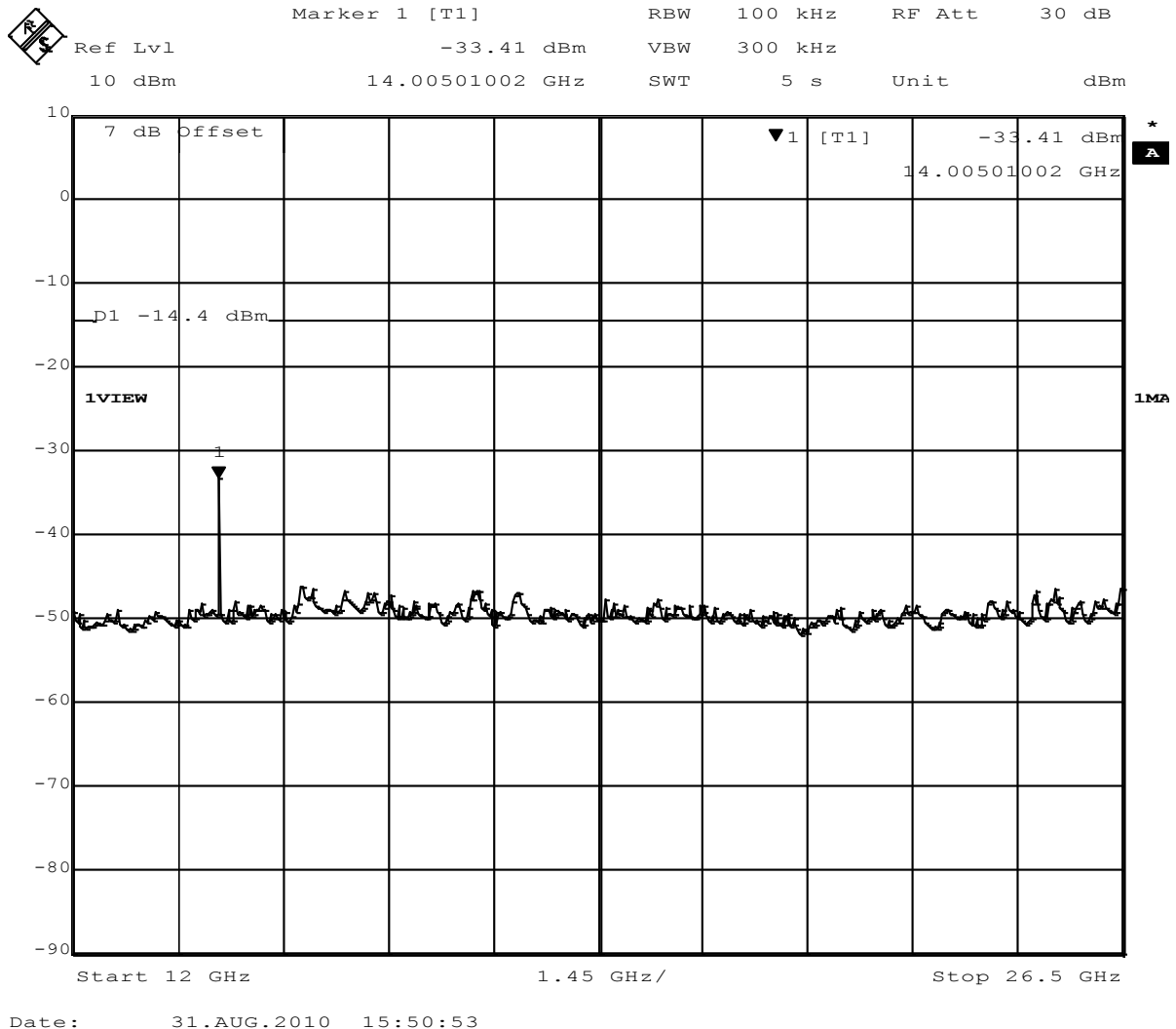
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2480 MHz
Comment 3 8DPSK



Conducted spurious emissions – 3-DH5-Sngl F_{HIGH}

FCC part 15.247 (d)
Spurious Emissions

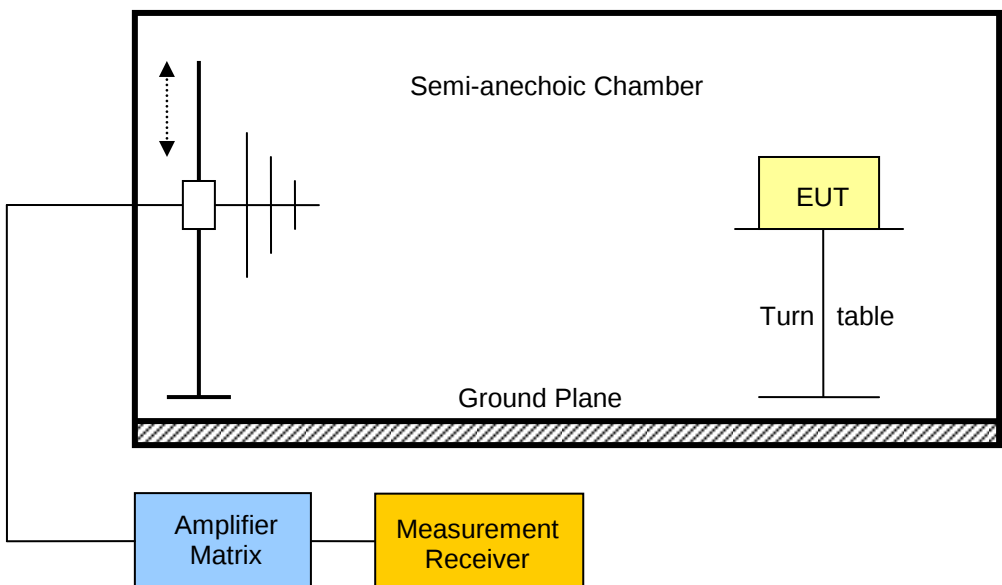
EUT Bluetooth Module
Model ENW89818C2JF / ENW89818A2JF
Approval Holder Panasonic Electronic Devices Europe GmbH / Ord.: G0M21008-3623
Temperature / Voltage 23°C / V_{nom}
Test Site / Operator Eurofins Product Service GmbH / Mr. Treffke
Test Specification FCC part 15.247 (d)
Comment 1 Spurious Emissions conducted
Comment 2 Channel : 2480 MHz
Comment 3 8DPSK



3.10 Test Conditions and Results – Transmitter radiated emissions

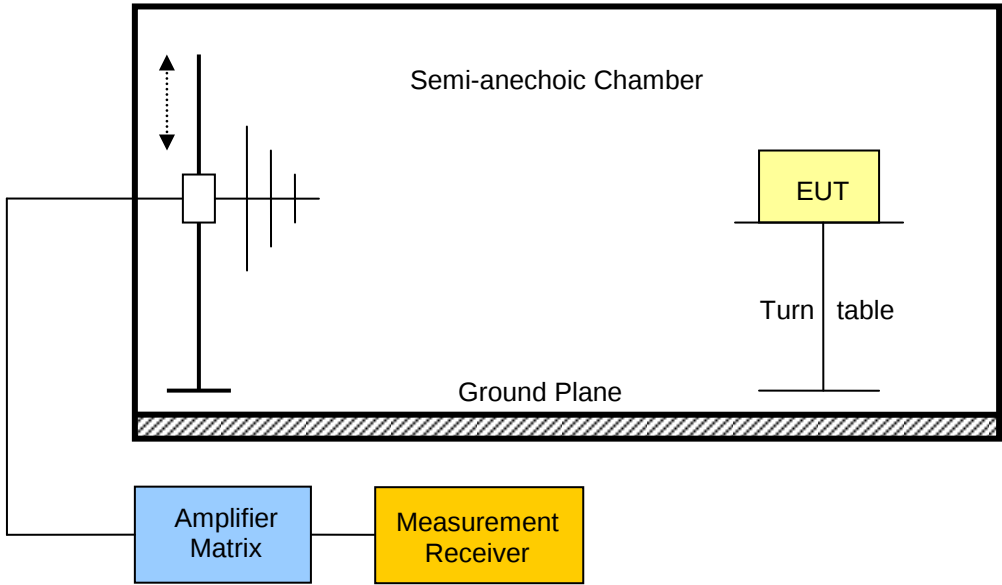
Transmitter radiated emissions acc. FCC 47 CFR 15.247 / IC RSS-210				Verdict: PASS	
Test according referenced standards		Reference Method			
		FCC 15.247(d) / IC RSS-210 A8.5			
Test according to measurement reference		Reference Method			
		FCC Public Notice DA 00-705 / ANSI C63.4			
Test frequency range		Tested frequencies			
		30 MHz – 10 th Harmonic			
Limits					
Frequency range [MHz]	Detector	Limit [μV/m]	Limit [dBμV/m]	Limit 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	

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)).
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.

Test setup	
	

Test procedure									
1. EUT set to test mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Markers are set to peak emission levels within restricted bands									
Test results									
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Limit dist. [m]*	Margin [dB]
F _{LOW}	2402	DH5-Sngl	2377	56.9	pk	hor	74	3	-17.1
F _{LOW}	2402	DH5-Sngl	2390	39.8	avg	hor	54	3	-14.2
F _{LOW}	2402	DH5-Sngl	4802	55.9	pk	hor	74	3	-18.2
F _{LOW}	2402	DH5-Sngl	4804	29.7	avg	hor	54	3	-24.3
F _{MID}	2441	DH5-Sngl	7327	55.3	pk	hor	74	3	-18.7
F _{MID}	2441	DH5-Sngl	7323	46.7	avg	hor	54	3	-7.3
F _{HIGH}	2480	DH5-Sngl	7439	55.3	pk	hor	74	3	-18.7
F _{HIGH}	2480	DH5-Sngl	7440	43.1	avg	hor	54	3	-10.9
F _{LOW}	2402	3-DH5-Sngl	No significant spurious emissions						
F _{MID}	2441	3-DH5-Sngl	4882	54.8	pk	ver	74	3	-19.2
F _{MID}	2441	3-DH5-Sngl	4881	45.7	avg	ver	54	3	-8.3
F _{MID}	2441	3-DH5-Sngl	4882	55.6	pk	hor	74	3	-18.4
F _{MID}	2441	3-DH5-Sngl	4881	47.9	avg	hor	54	3	-6.1
F _{HIGH}	2480	3-DH5-Sngl	No significant spurious emissions						
Comments: * Physical distance between EUT and measurement antenna.									

3.11 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. IC RSS-210				Verdict: PASS
Test according referenced standards	Reference Method			
	IC RSS-210 A8.5			
Test according to measurement reference	Reference Method			
	ANSI C63.4			
Test frequency range	Tested frequencies			
	30 MHz – 3 th Harmonic			
EUT test mode	Receive			
Limits				
Frequency range [MHz]	Detector	Limit [μV/m]	Limit [dBμV/m]	Limit 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
Test setup				
				

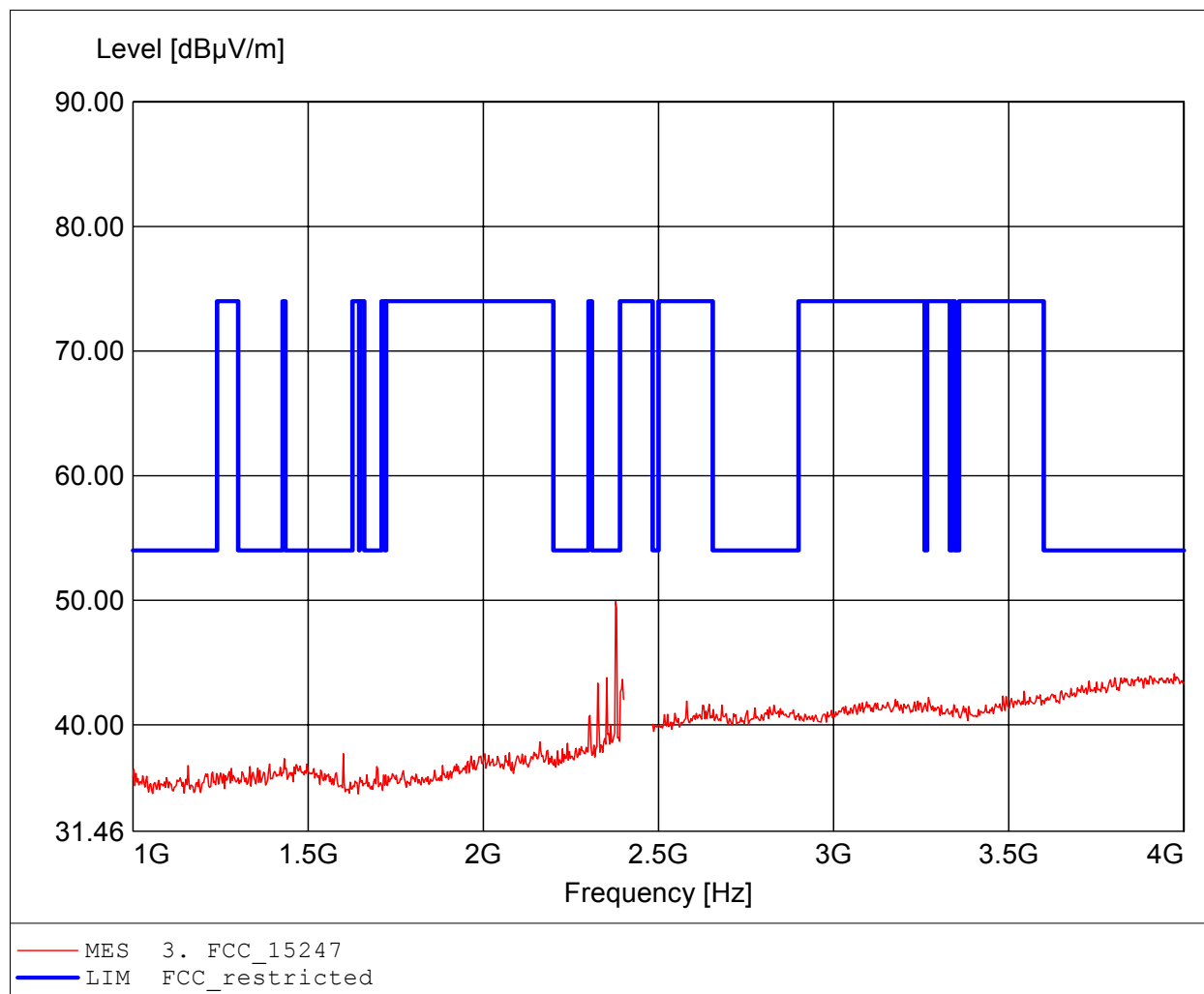
Test procedure							
1. EUT set to receive mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Markers are set to peak emission levels							
Test results							
Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbμV/m]	Emission Level [μV/m]	Det.	Limit [μV/m]	Margin [μV/m]
F _{MID}	2441	7816	50.8	346.7	pk	500	-153.30
Comments: * Physical distance between EUT and measurement antenna.							

ANNEX A Transmitter radiated spurious emissions

Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

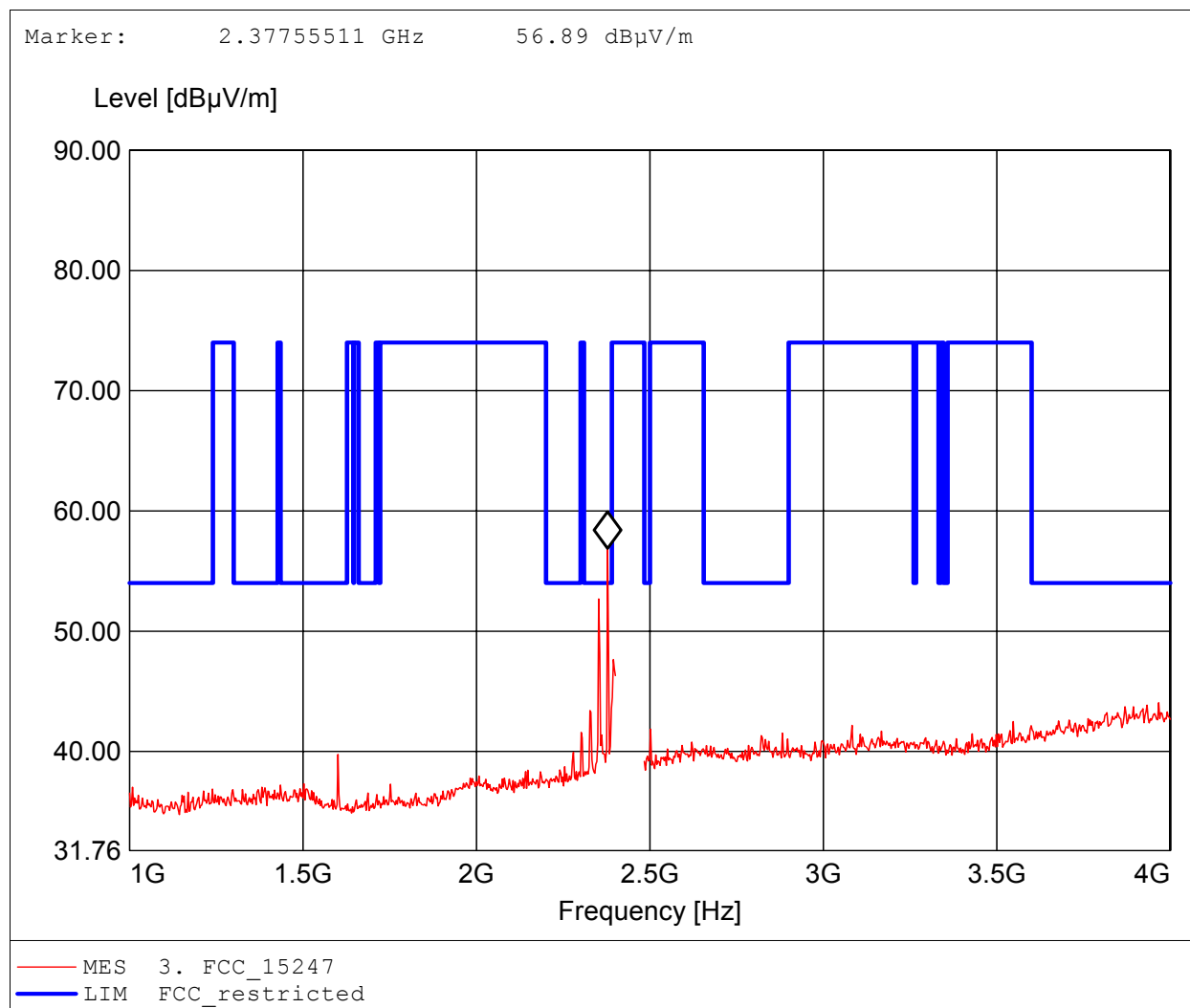
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 2.378GHz, Emax: 49.89dBuV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

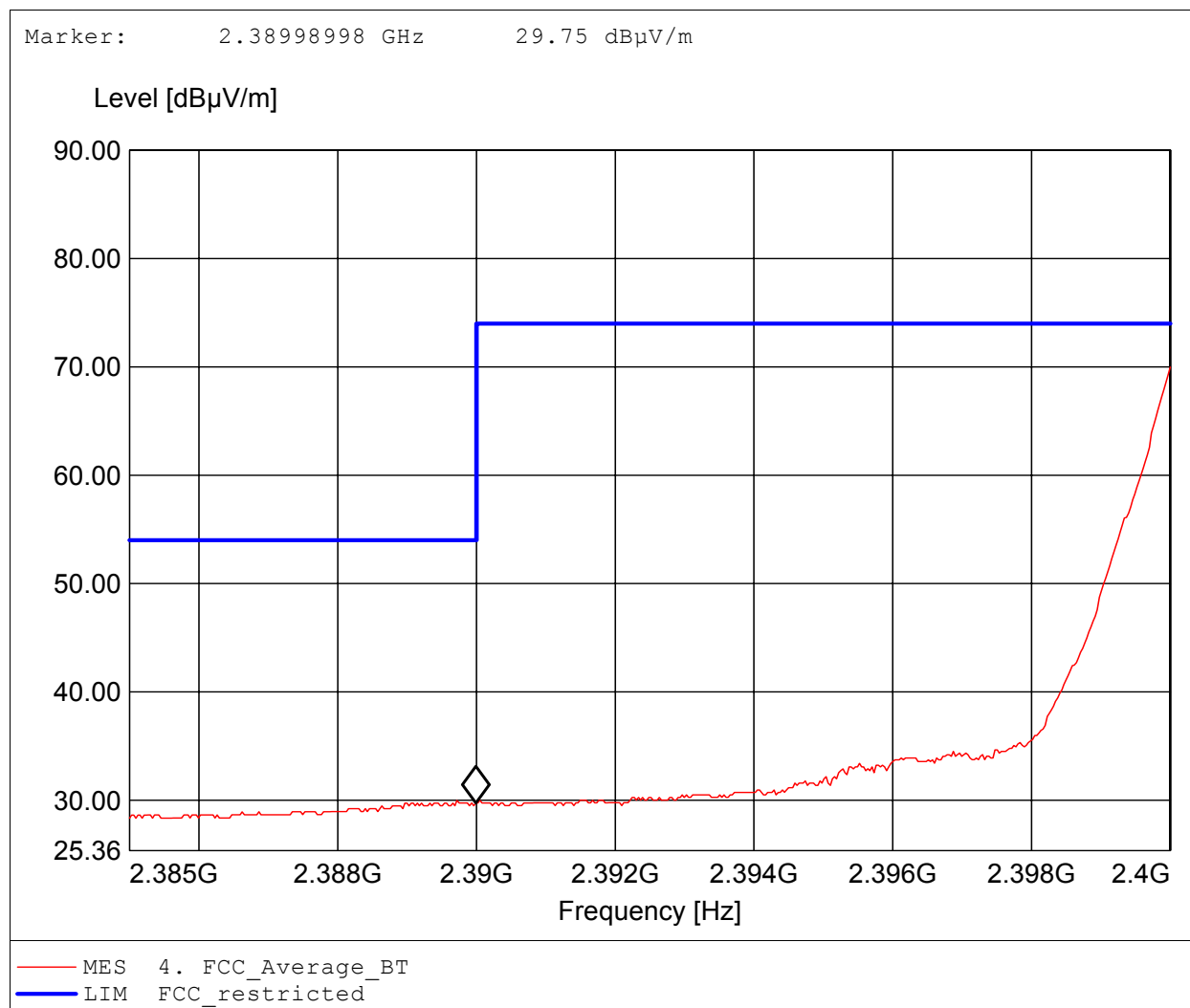
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 2.378GHz, Emax: 56.89dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

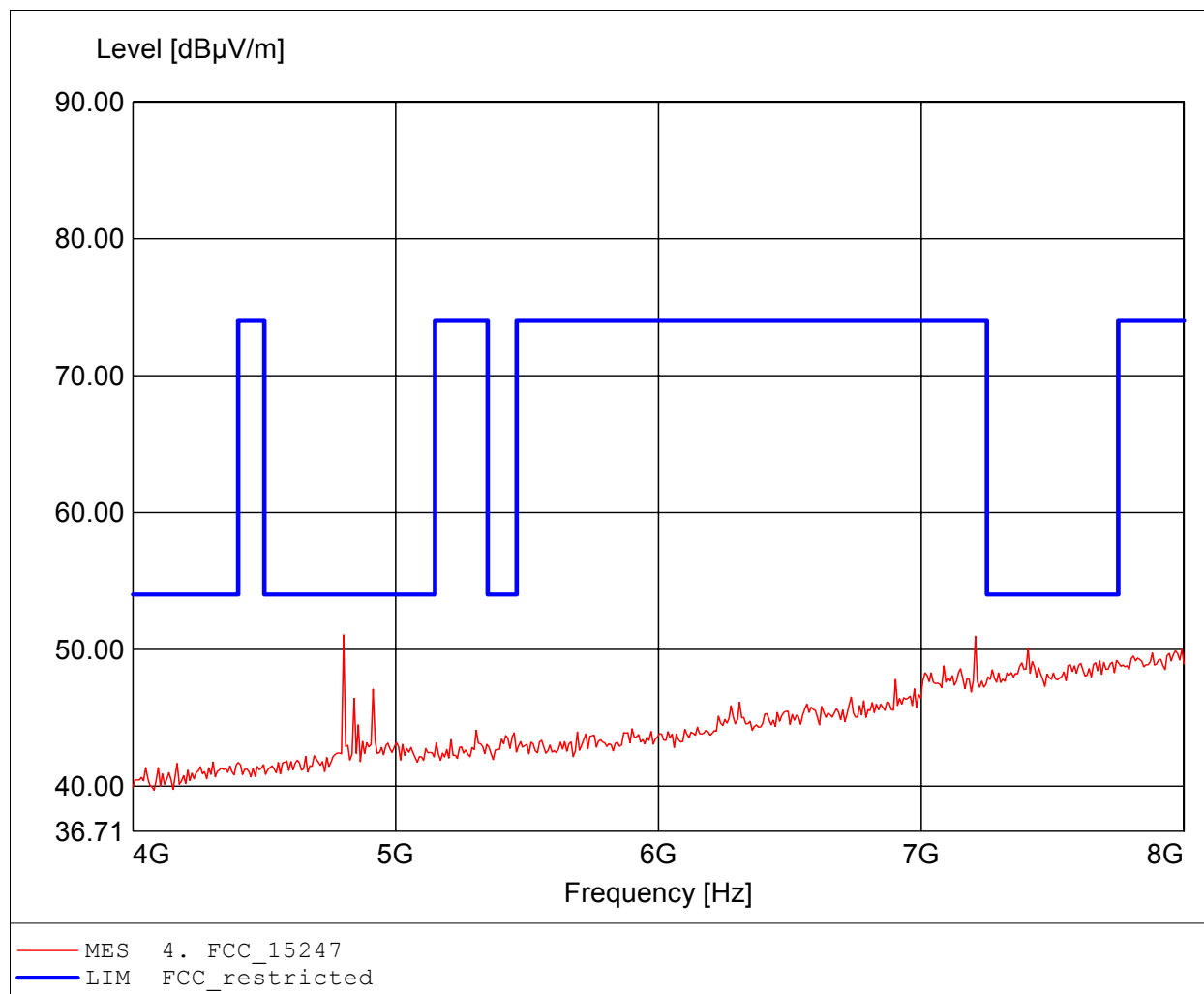
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, average detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 2.400GHz, Emax: 69.98dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

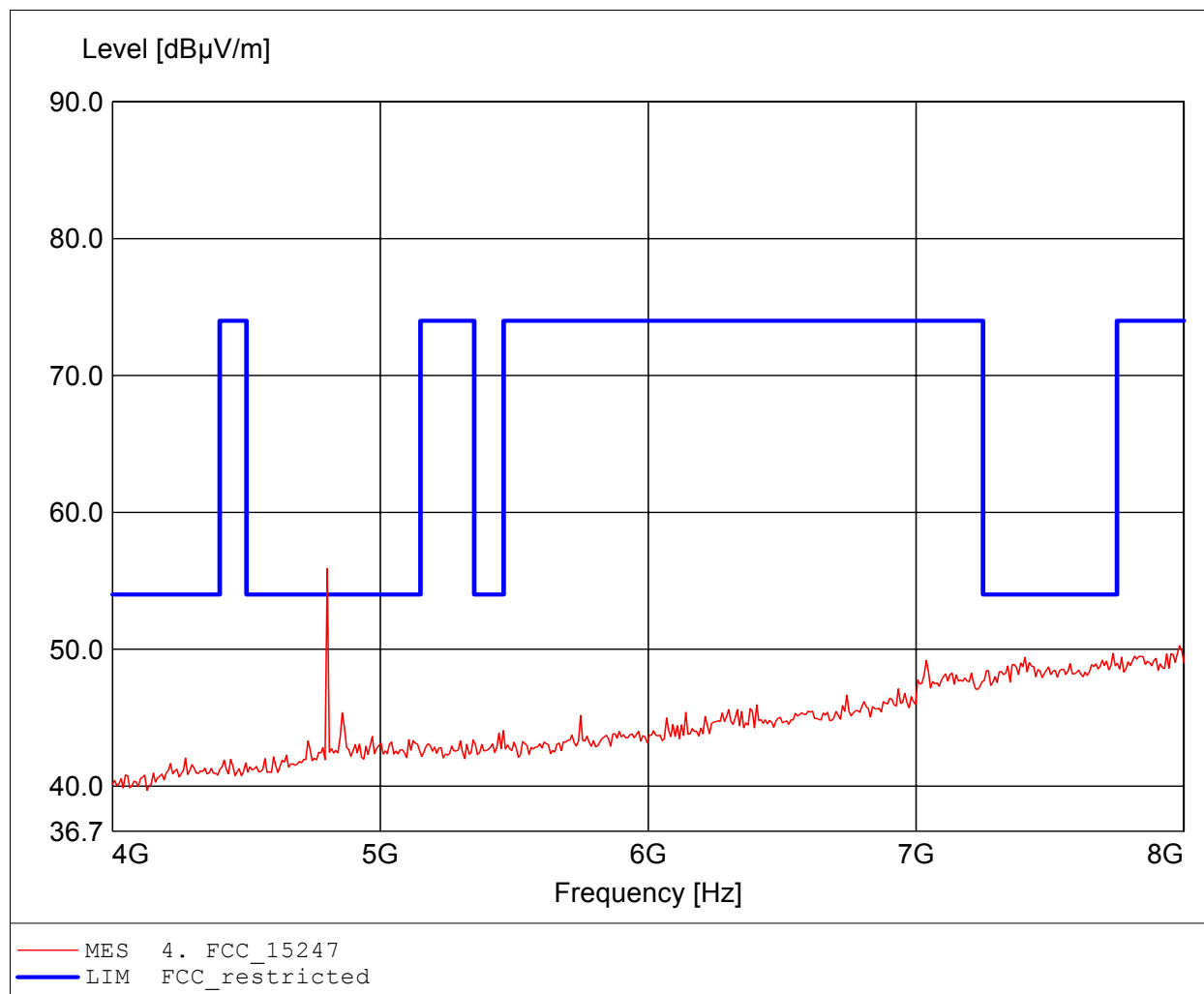
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 4.802GHz, Emax: 51.06dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

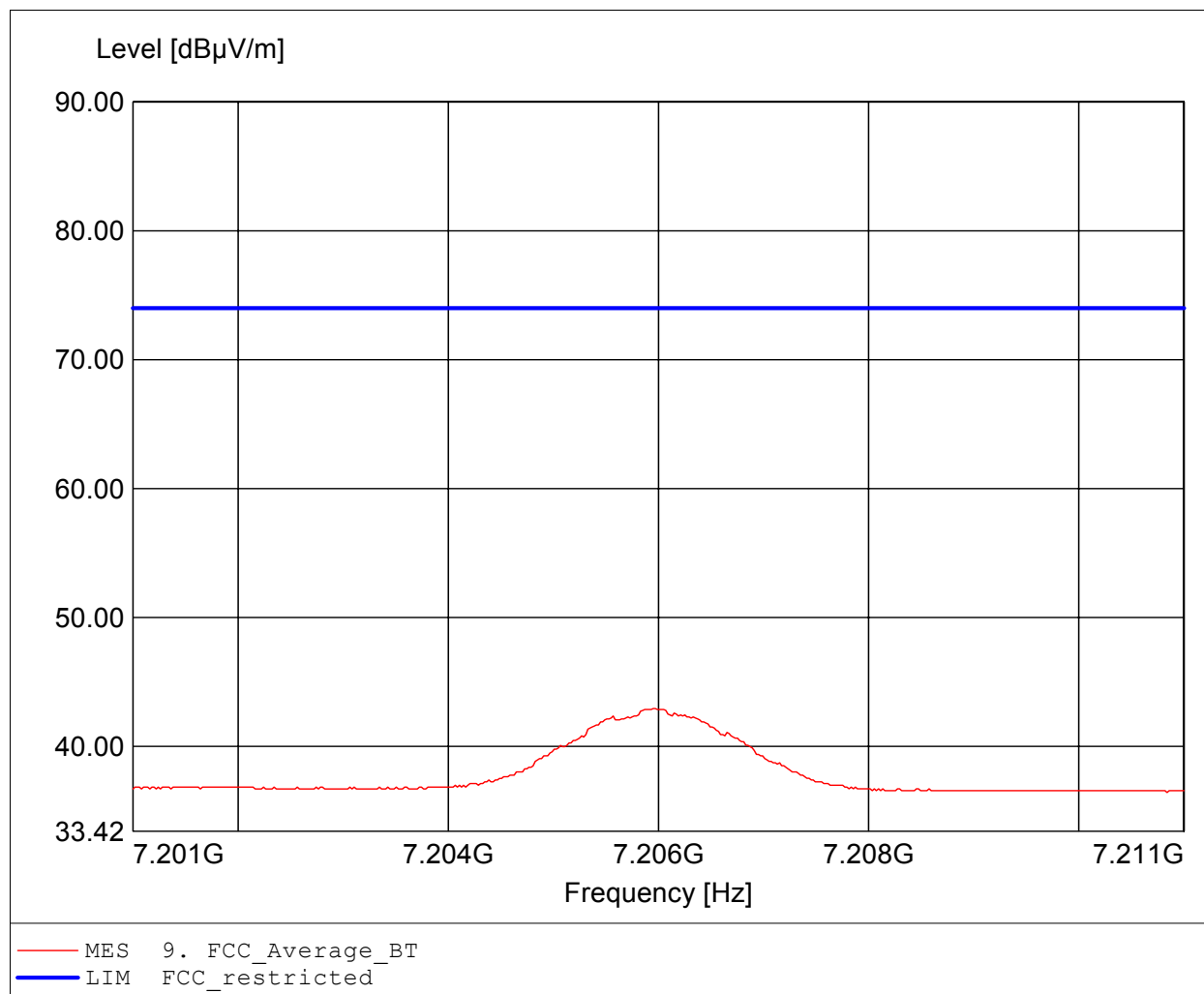
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 4.802GHz, Emax: 55.90dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

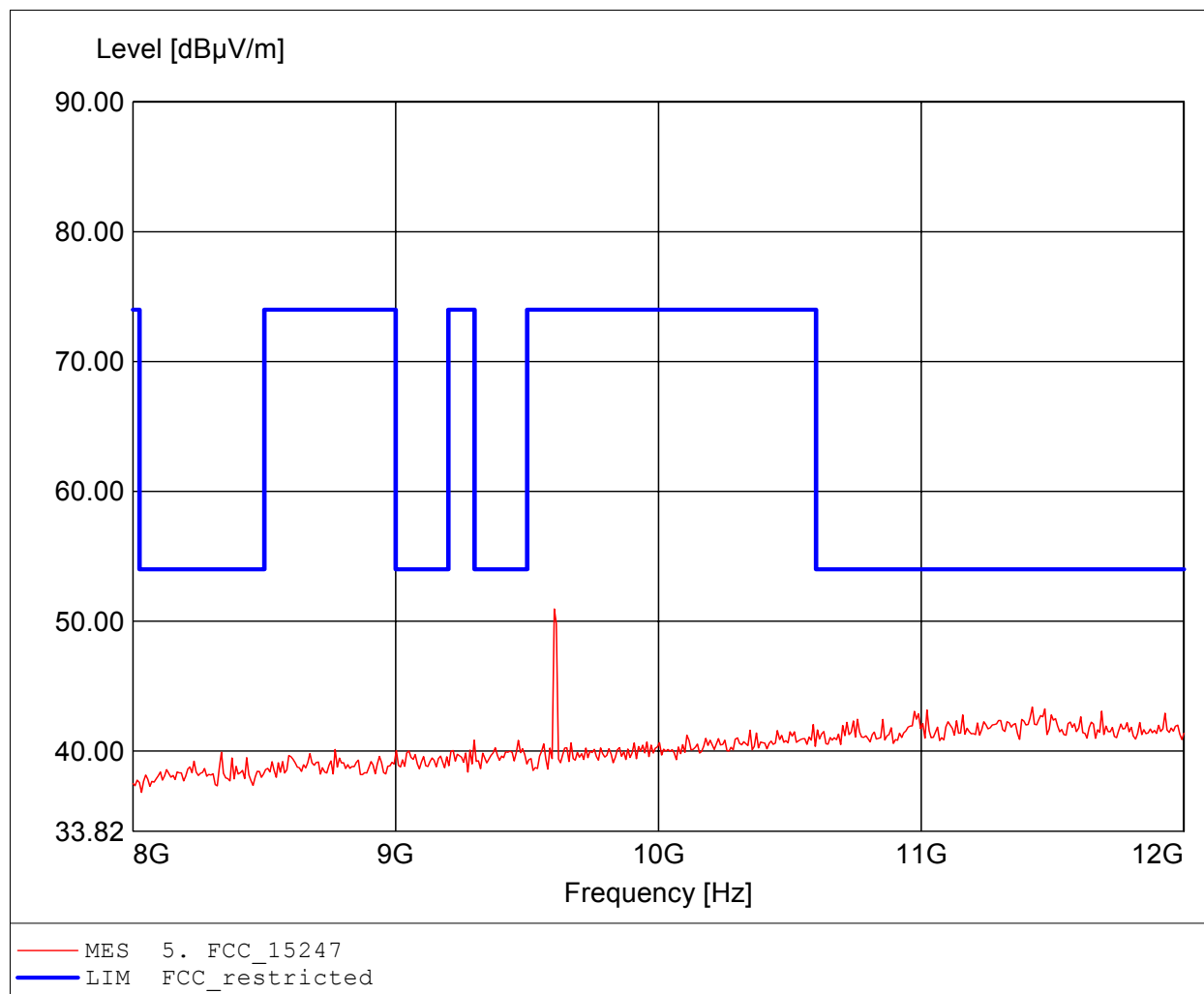
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, average detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 7.206GHz, Pmax: 42.94dBμV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

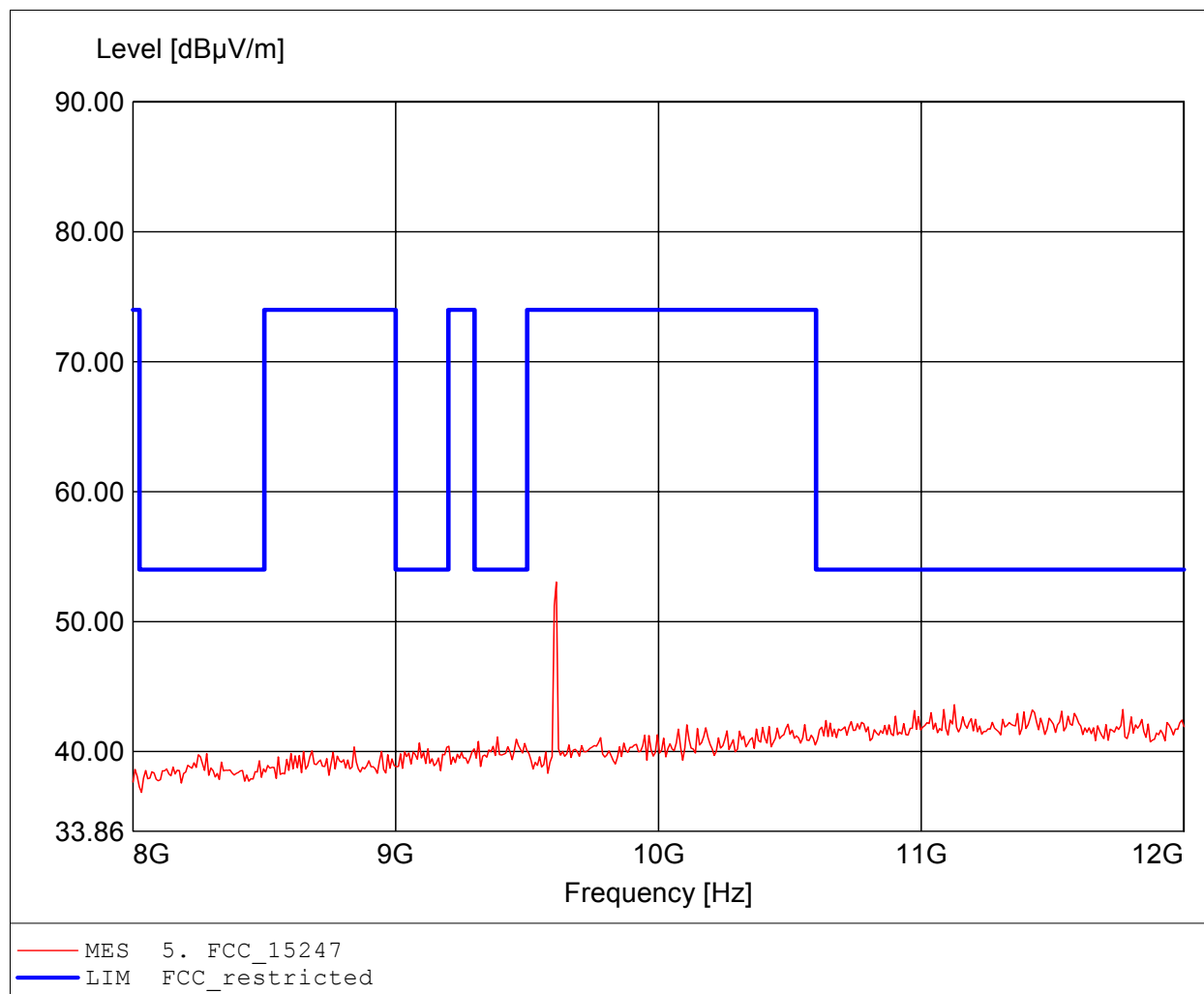
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 9.603GHz, Emax: 50.95dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

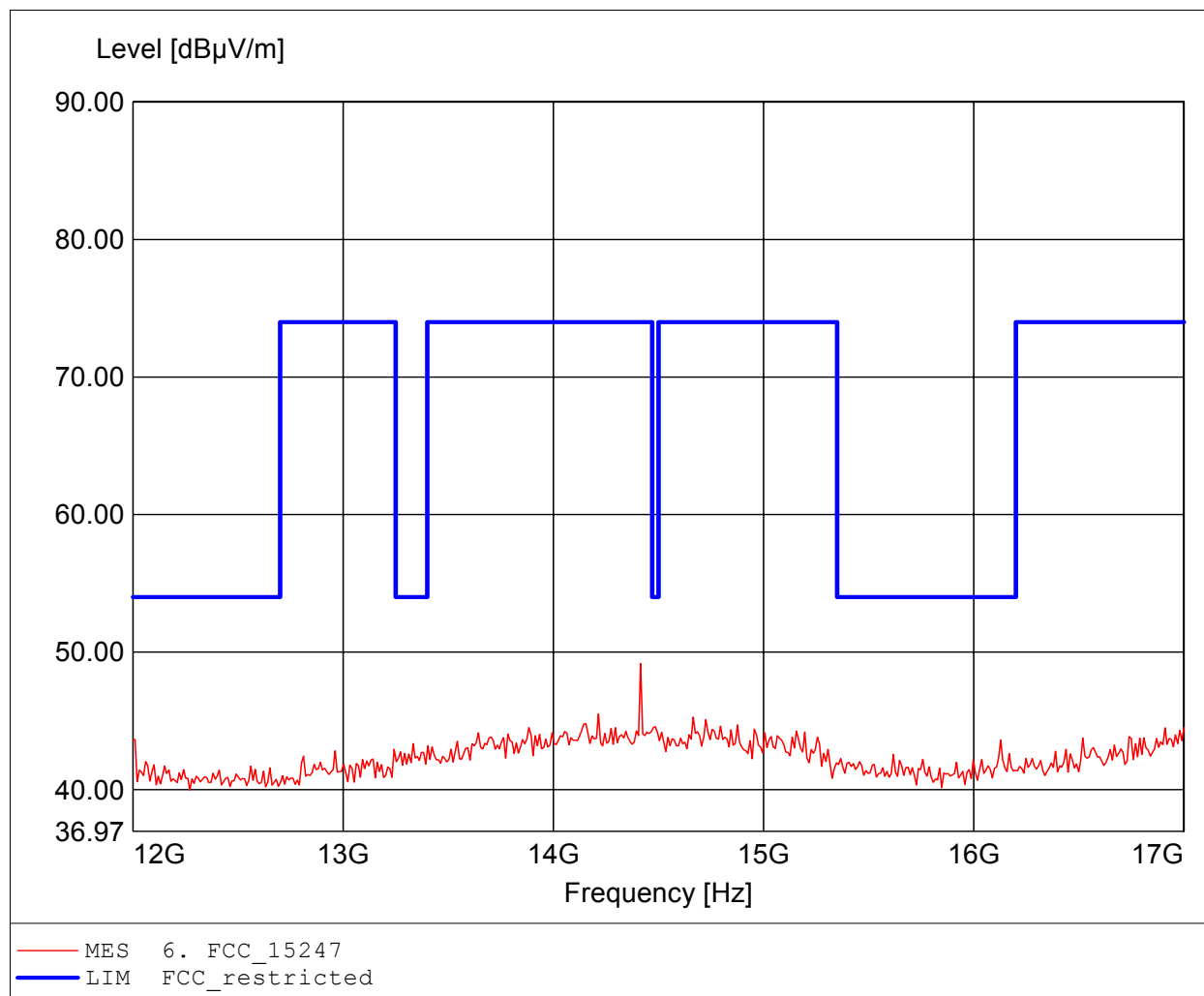
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 9.611GHz, Emax: 53.05dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

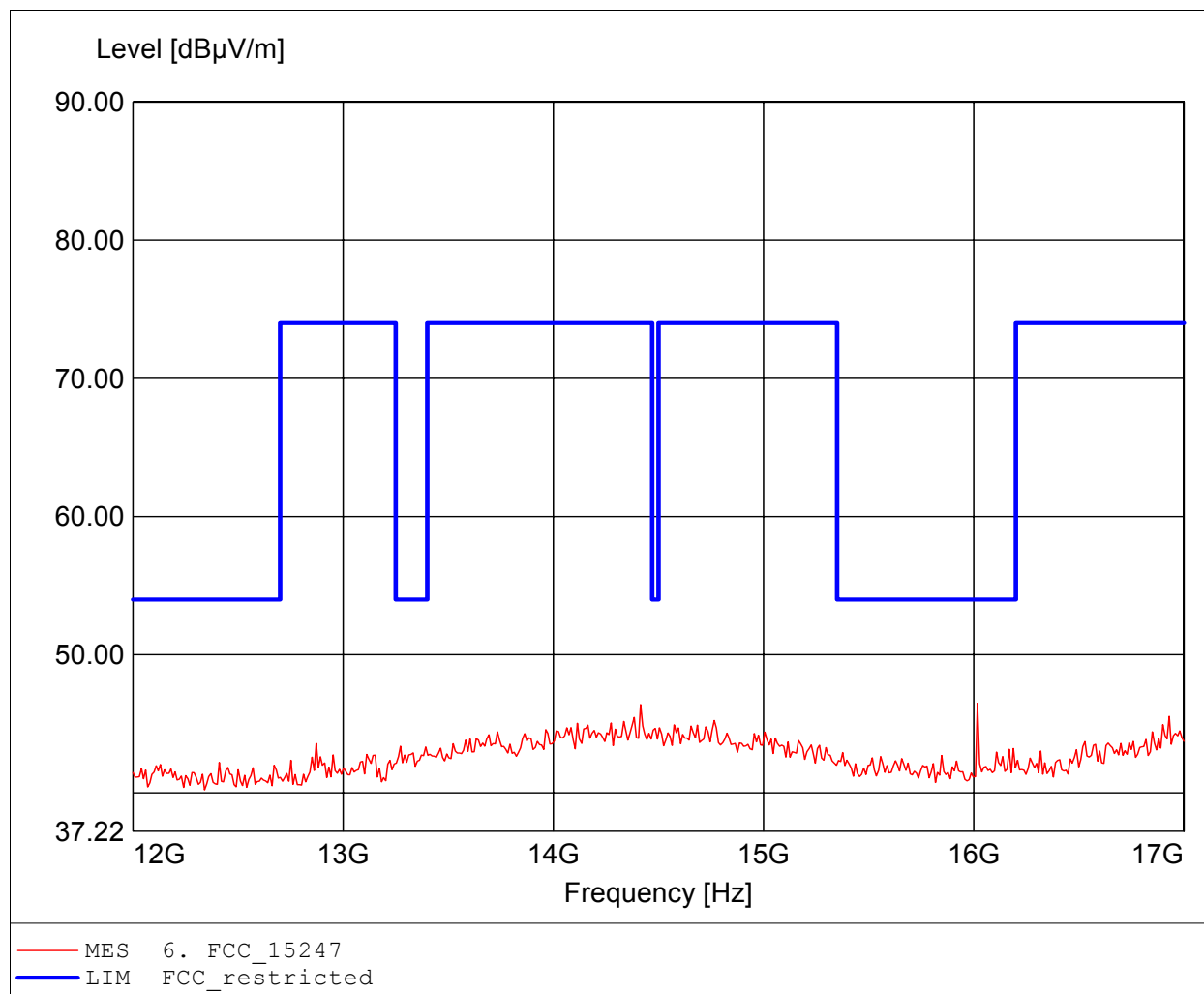
Approval Holder: Panasonic Electronic Devices Europe GmbH / GOM21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.415GHz, Emax: 49.17dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

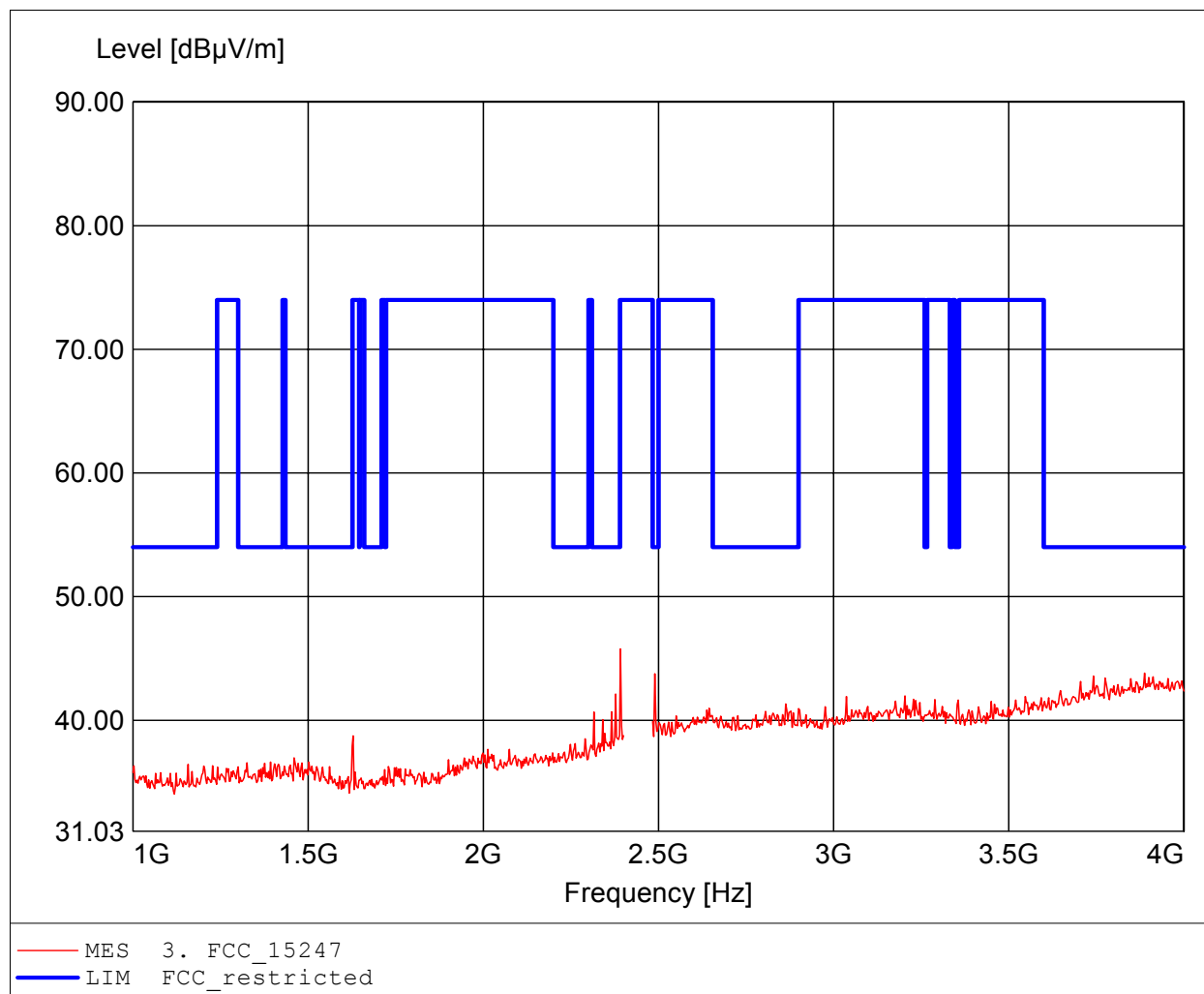
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 16.018GHz, Emax: 46.48dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

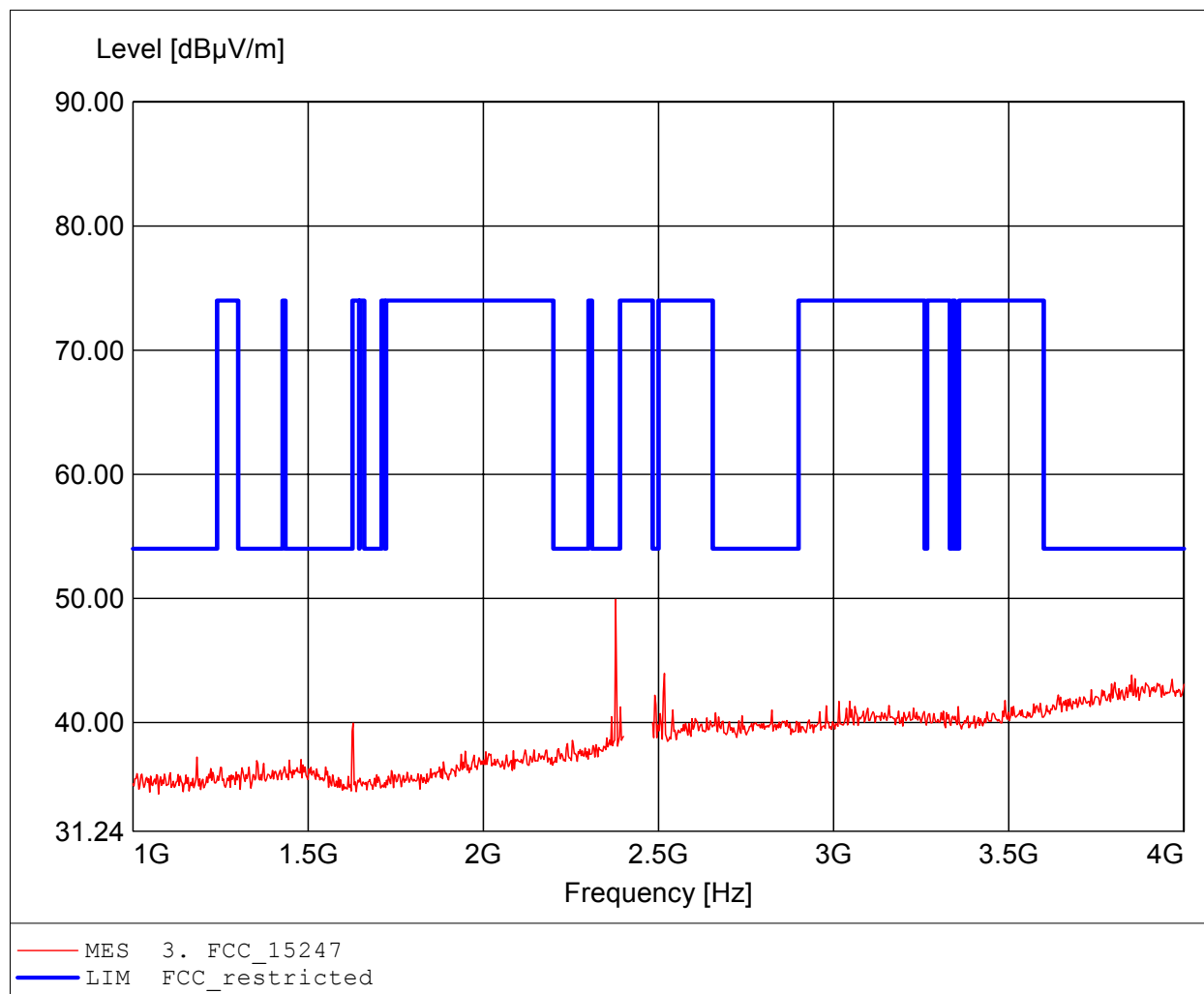
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 2.392GHz, Emax: 45.77dBuV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

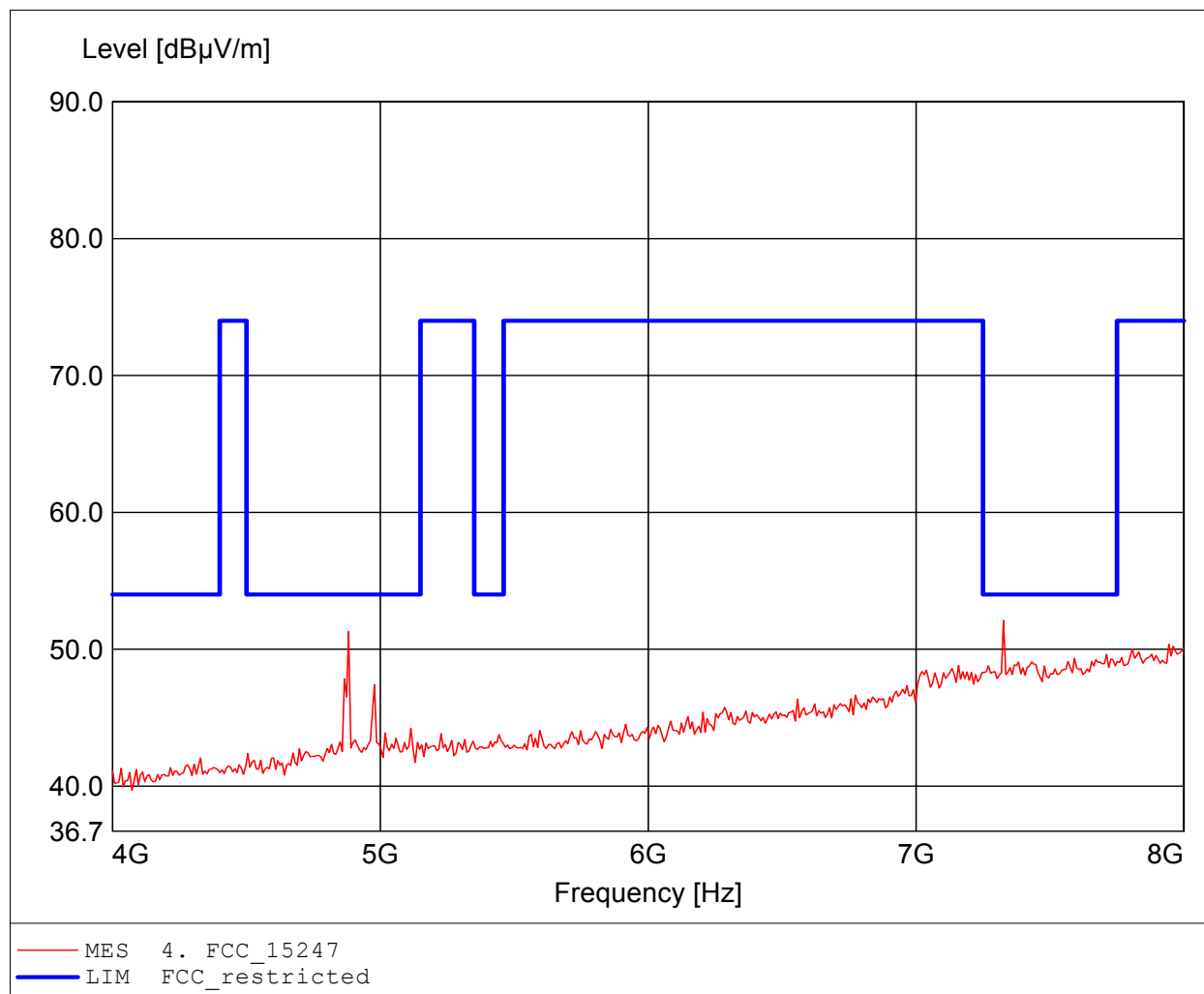
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 2.378GHz, Emax: 49.91dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

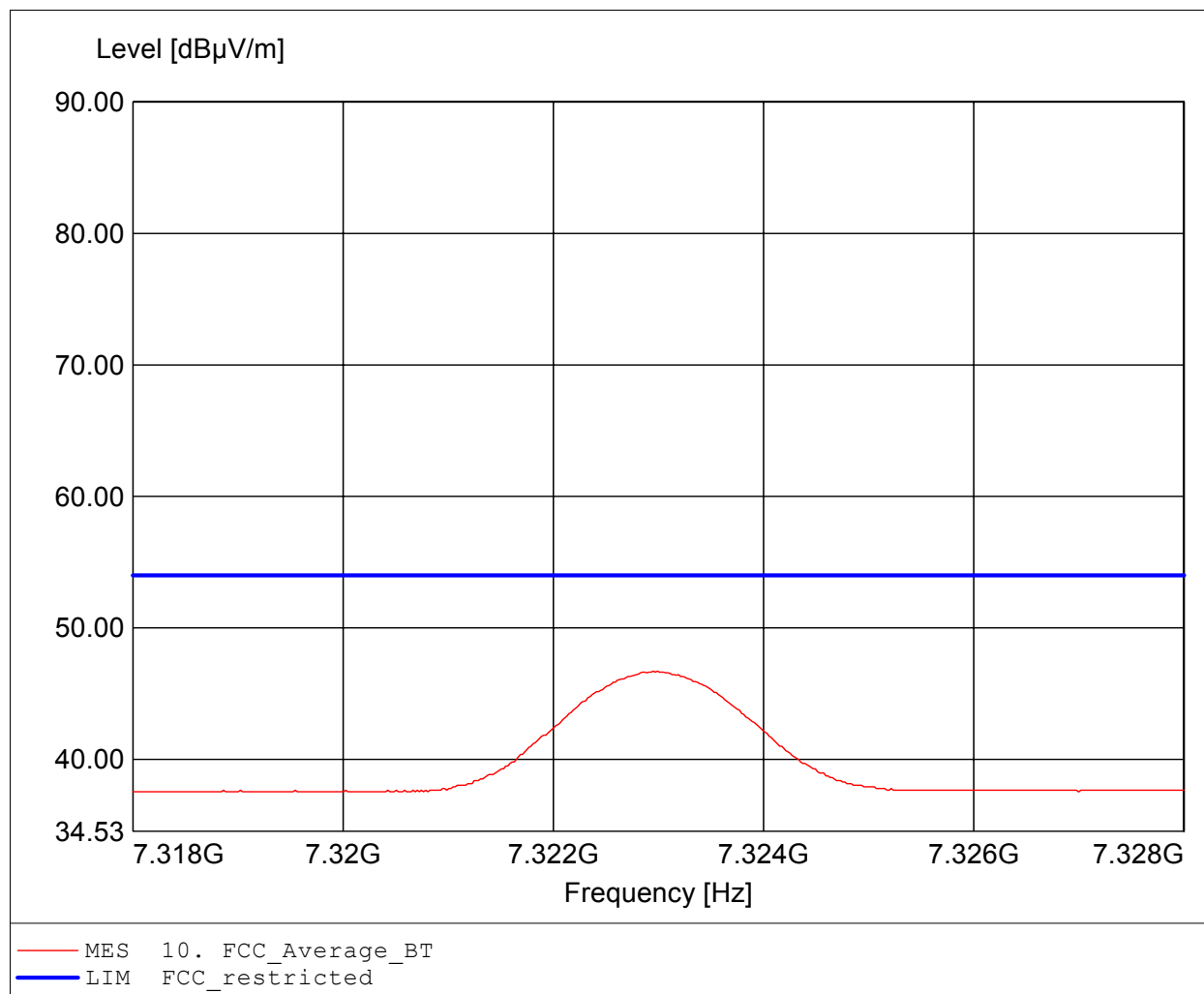
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 7.327GHz, Emax: 52.10dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

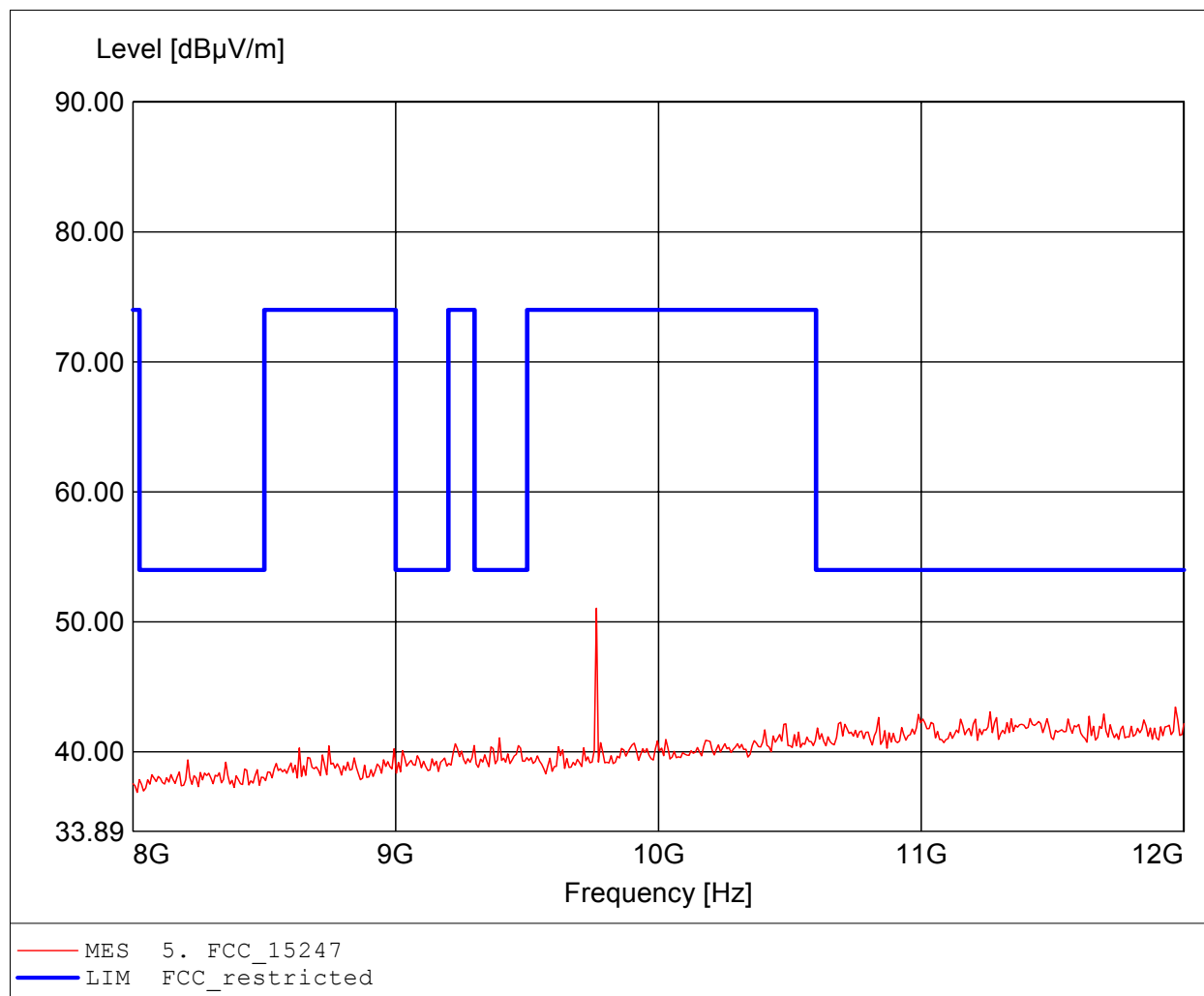
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, average detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 7.323GHz, Pmax: 46.72dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

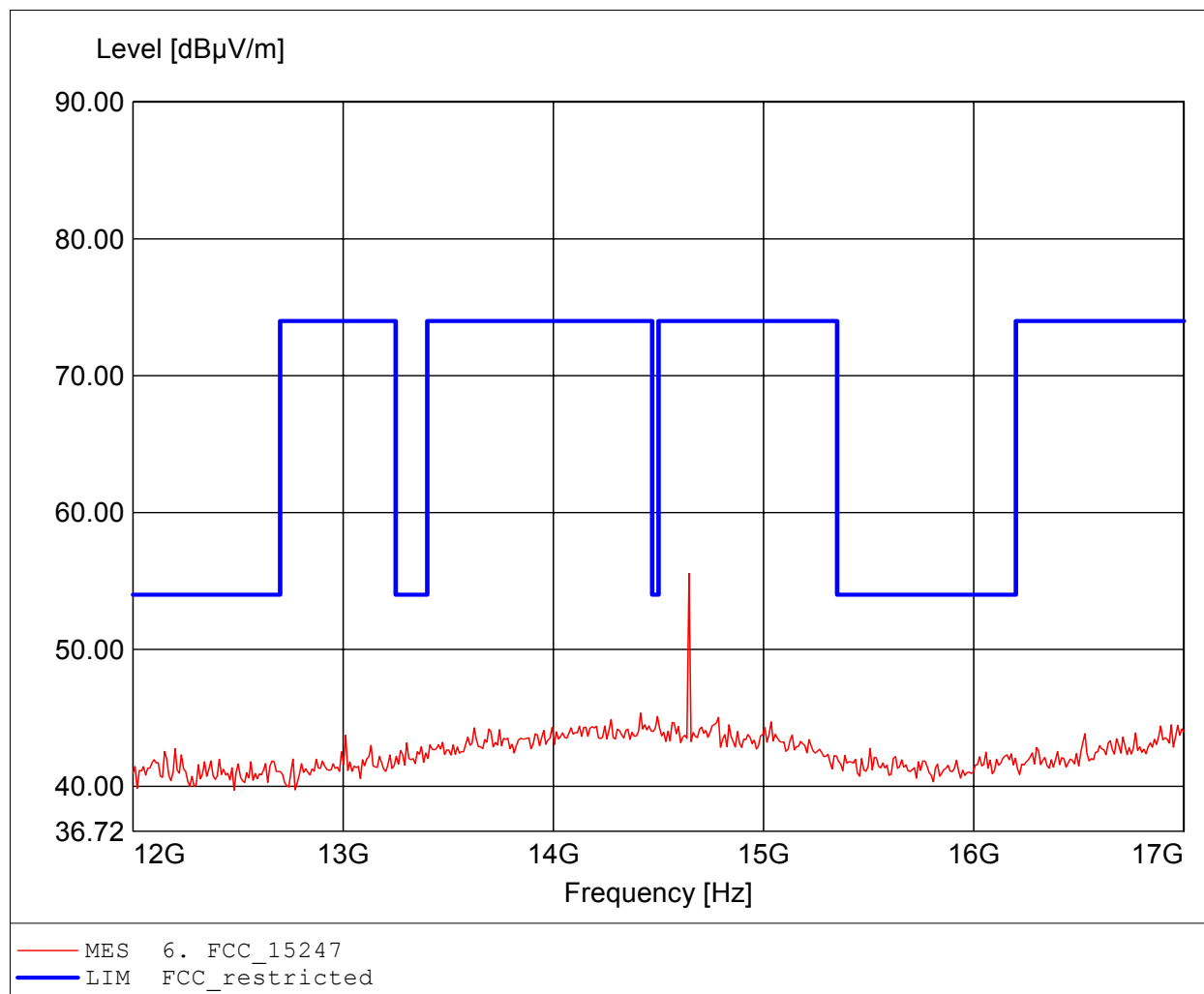
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 9.764GHz, Emax: 51.05dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

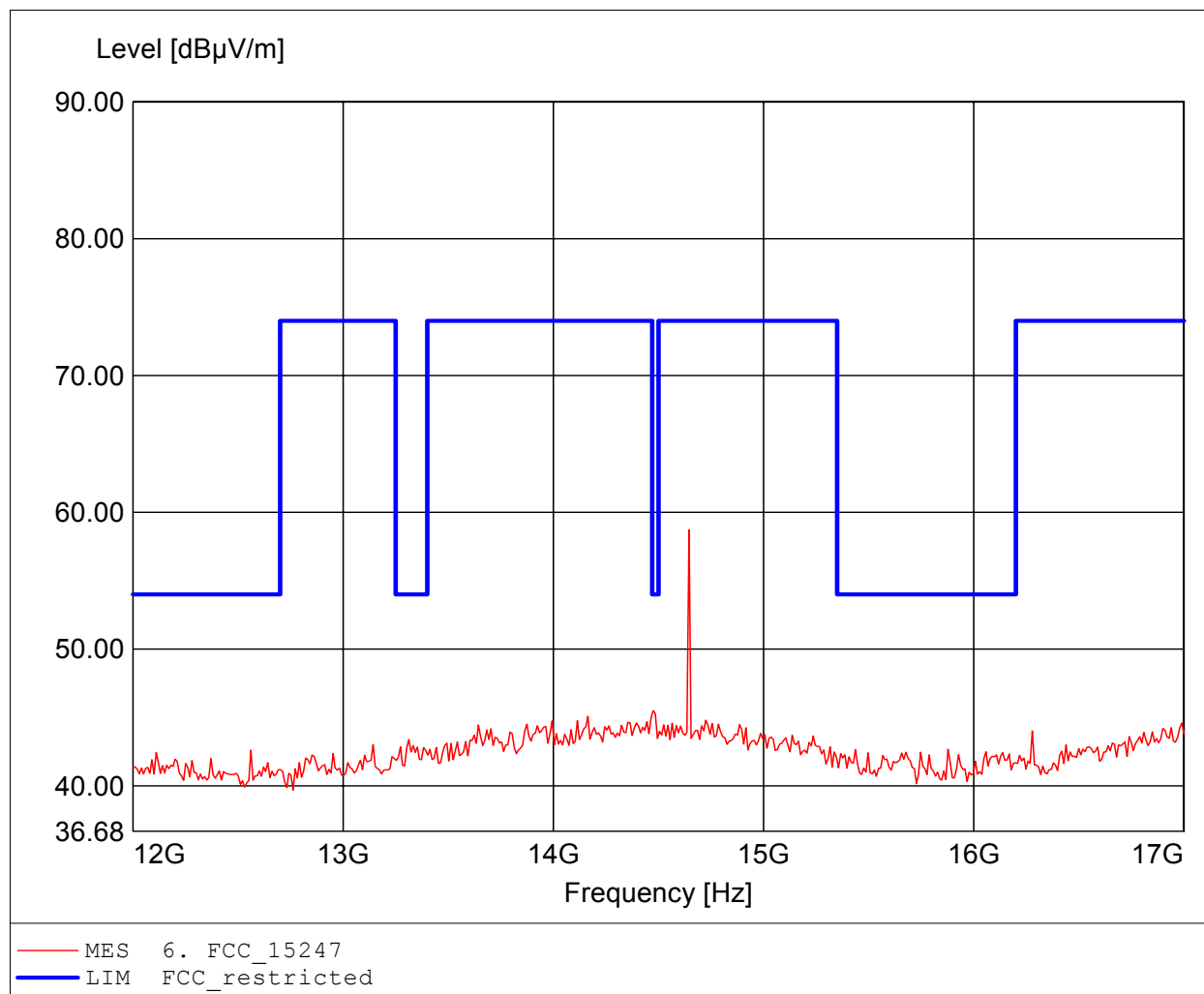
Approval Holder: Panasonic Electronic Devices Europe GmbH / GOM21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.645GHz, Emax: 55.55dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

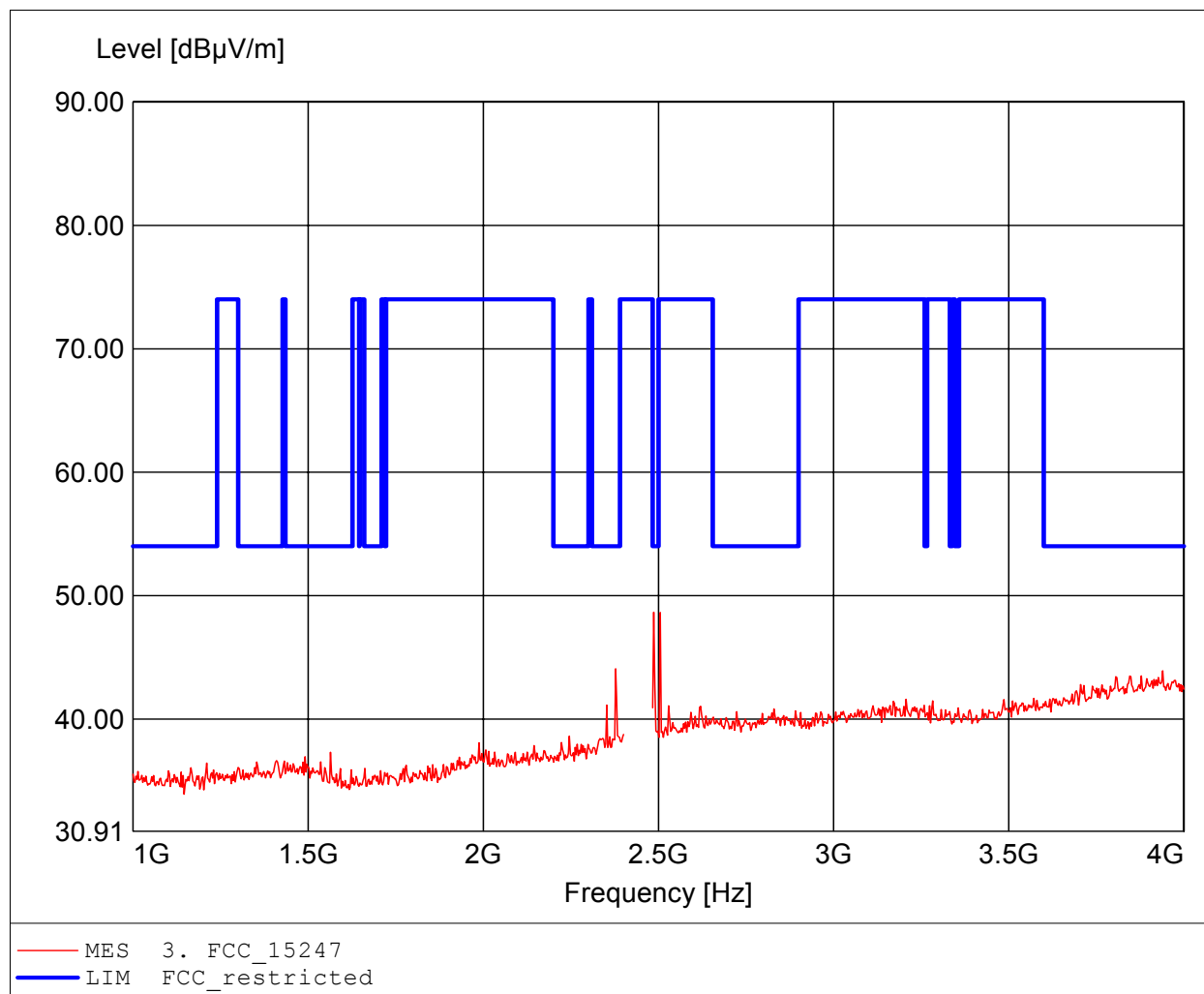
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.645GHz, Emax: 58.72dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

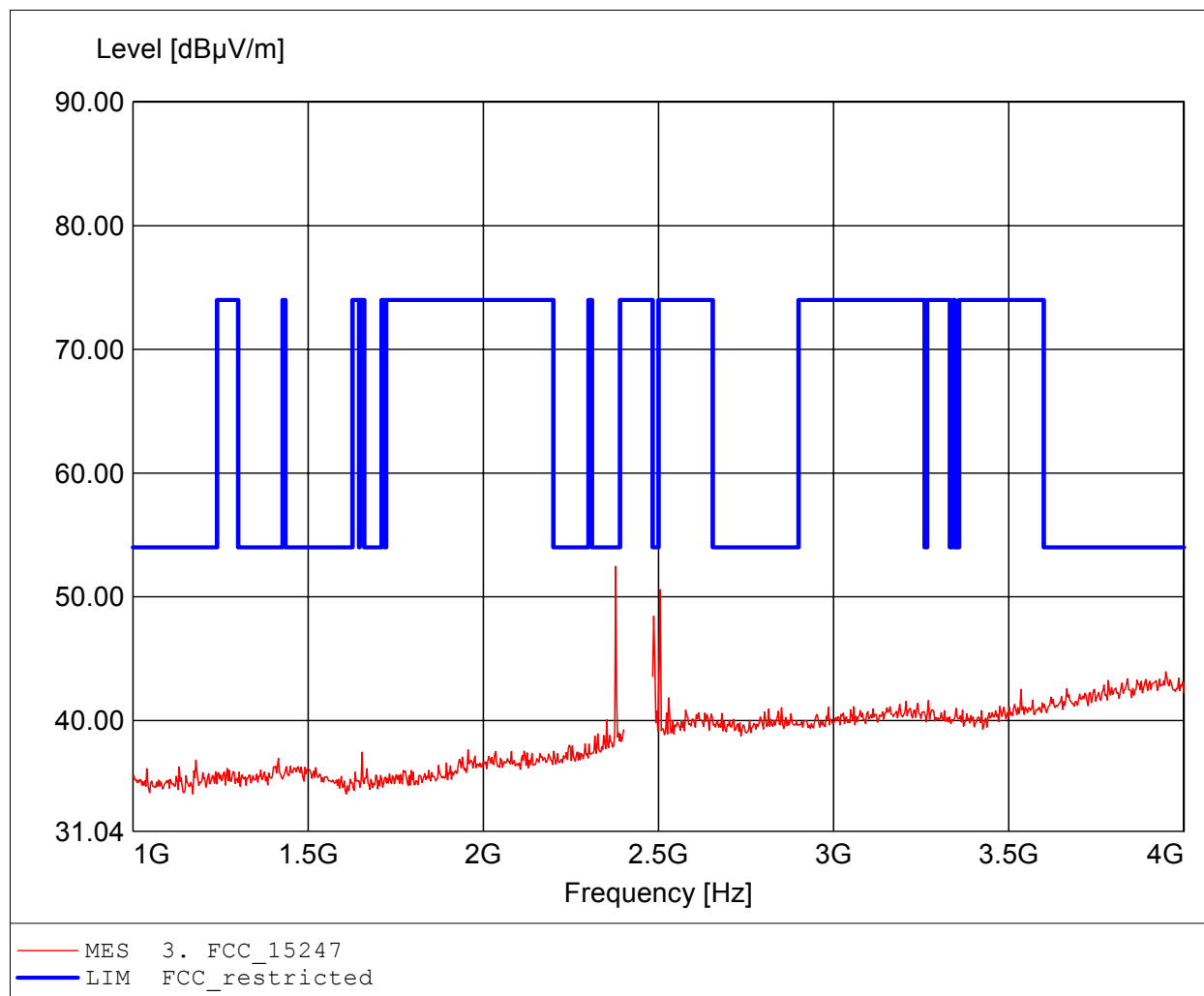
Approval Holder: Panasonic Electronic Devices Europe GmbH / GOM21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 2.487GHz, Emax: 48.66dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

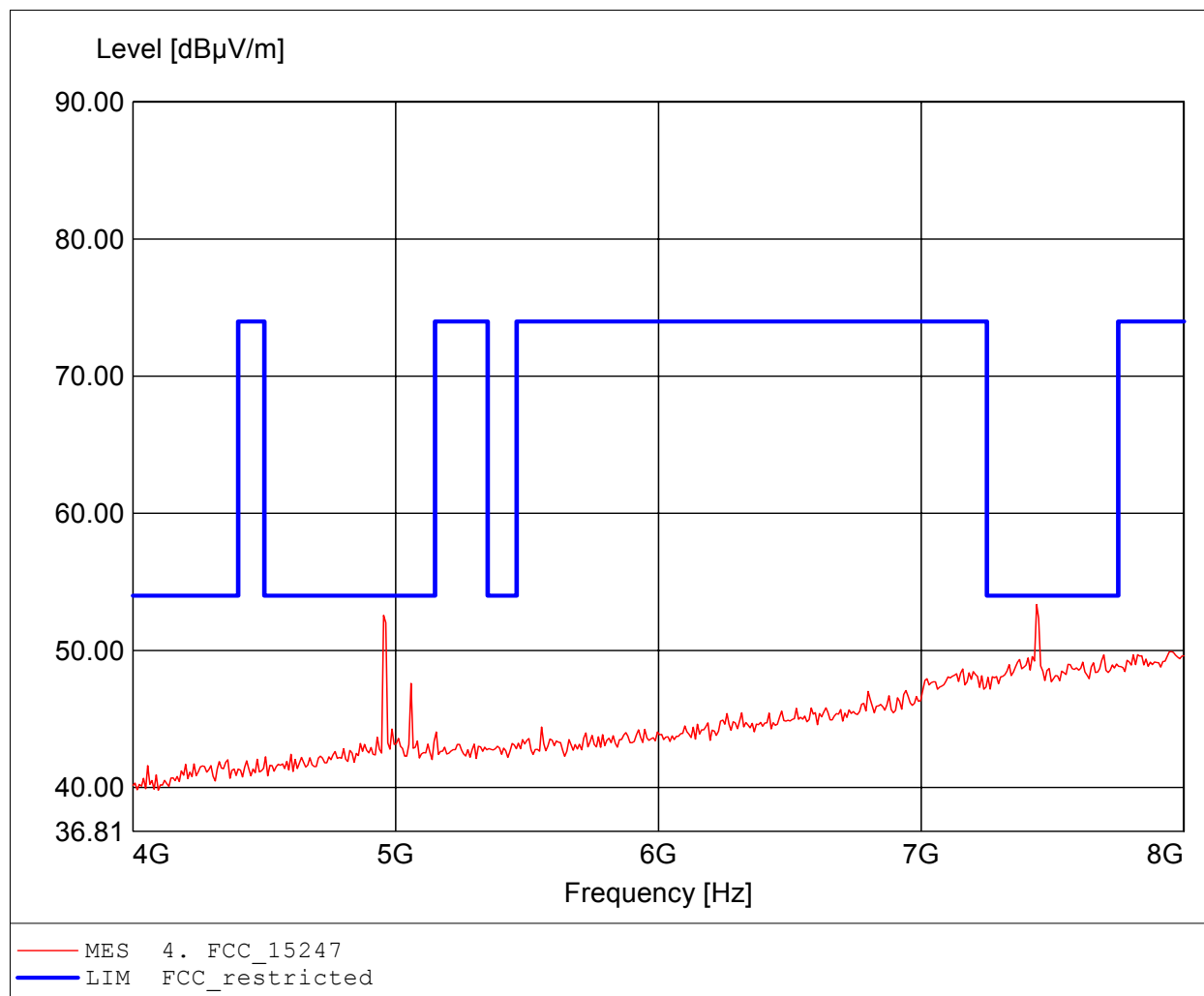
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 2.378GHz, Emax: 52.46dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

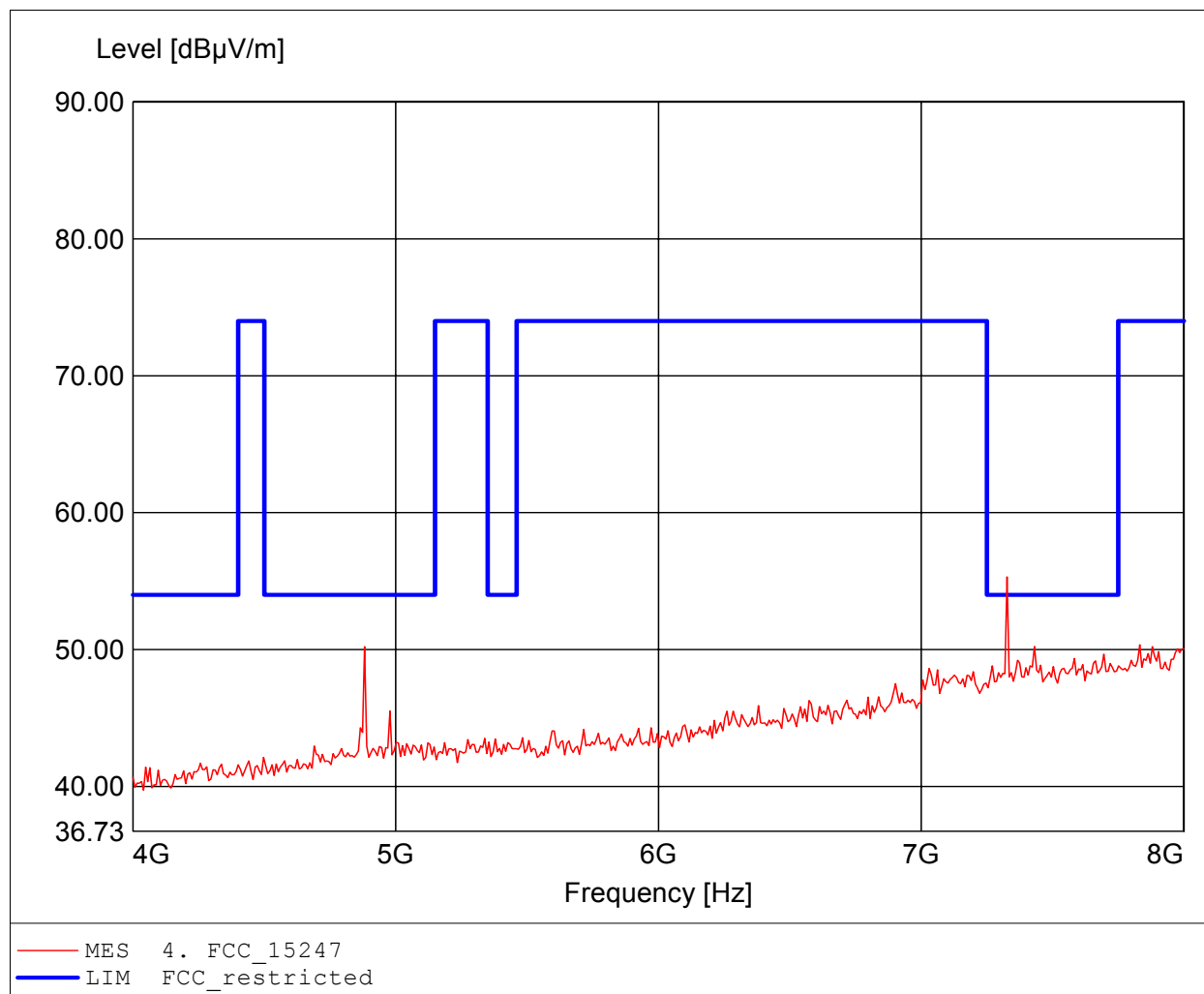
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 7.439GHz, Emax: 53.35dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

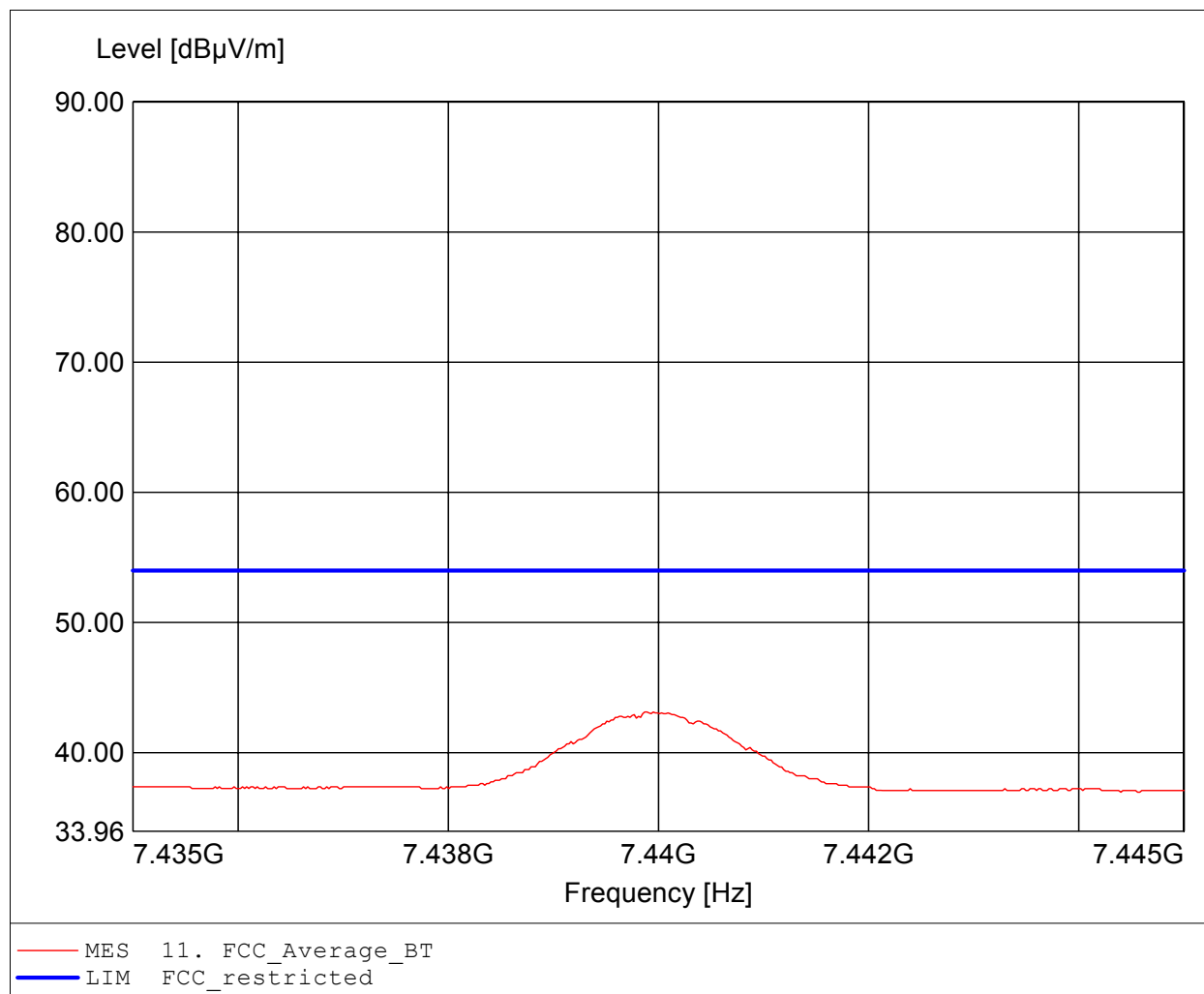
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 7.327GHz, Emax: 55.31dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

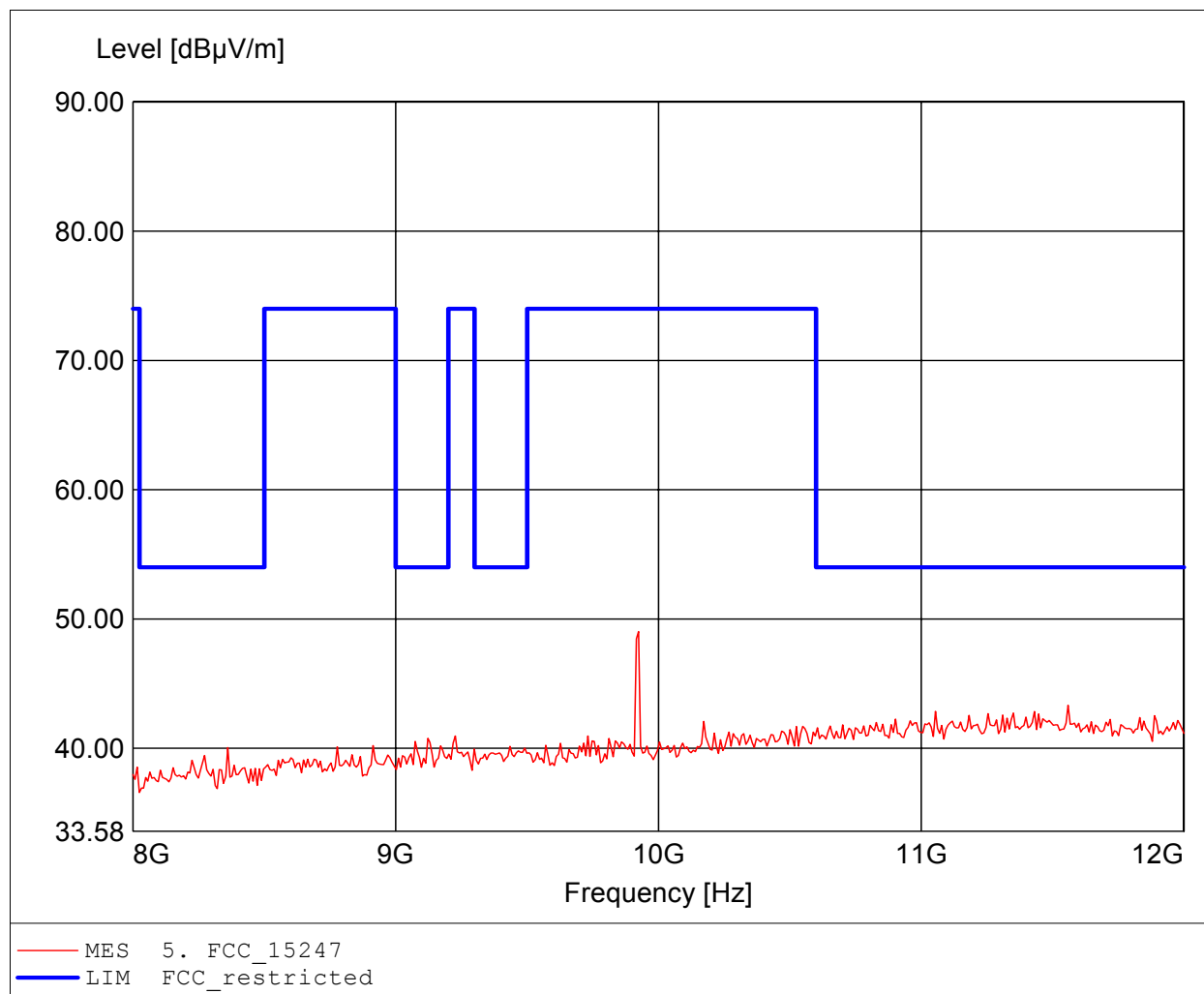
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, average detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 7.440GHz, Pmax: 43.13dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

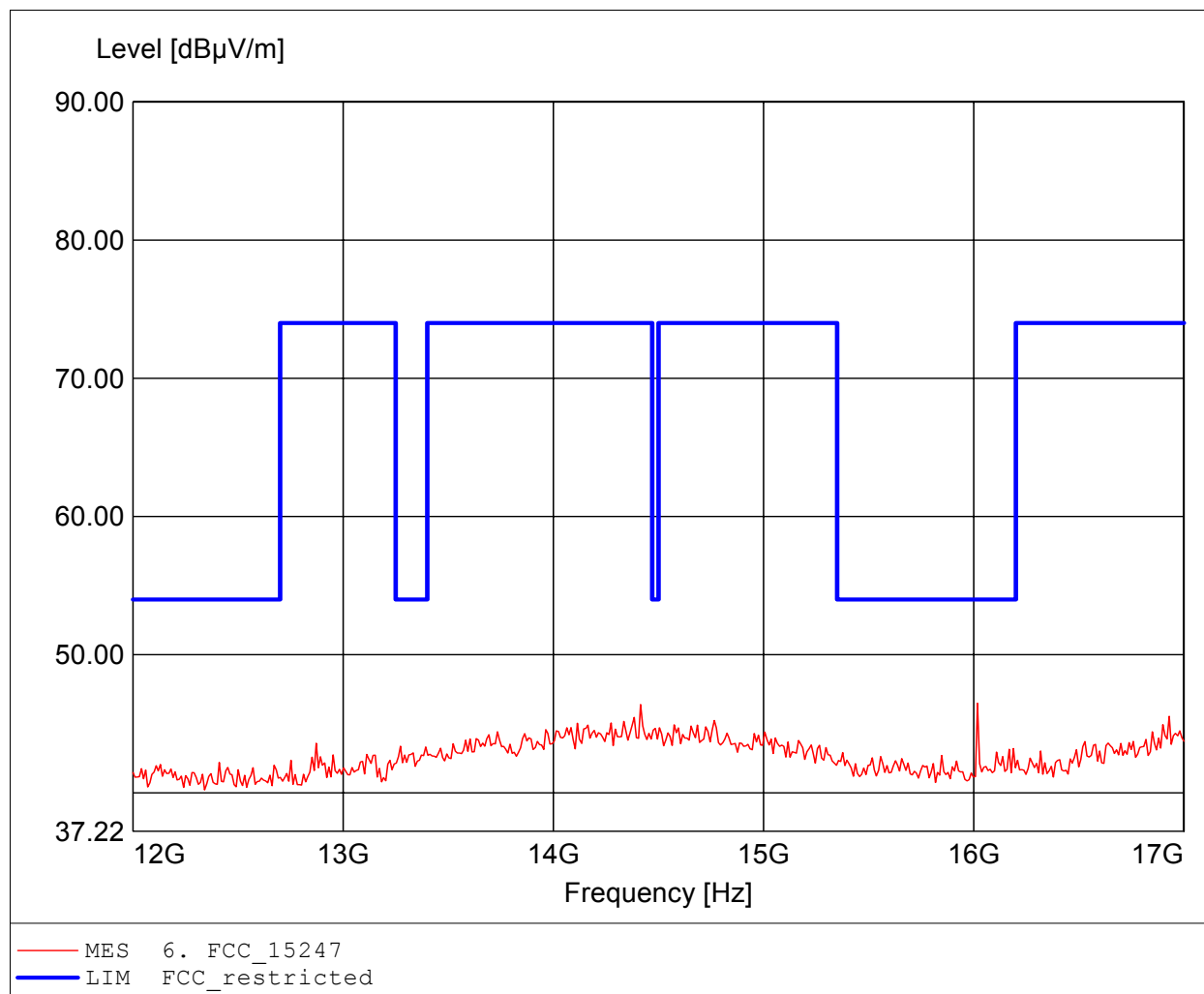
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 9.924GHz, Emax: 49.03dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

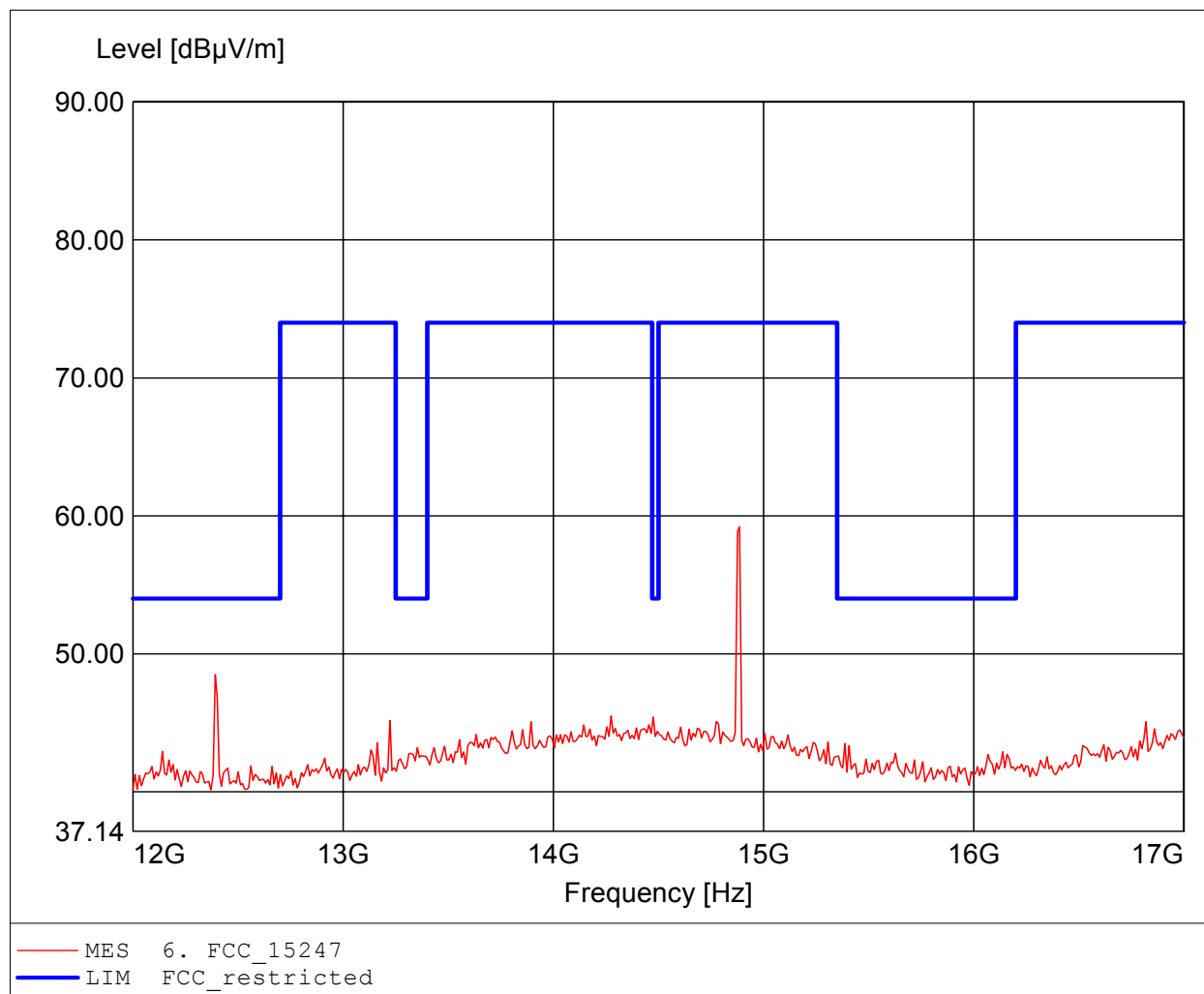
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 16.018GHz, Emax: 46.48dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

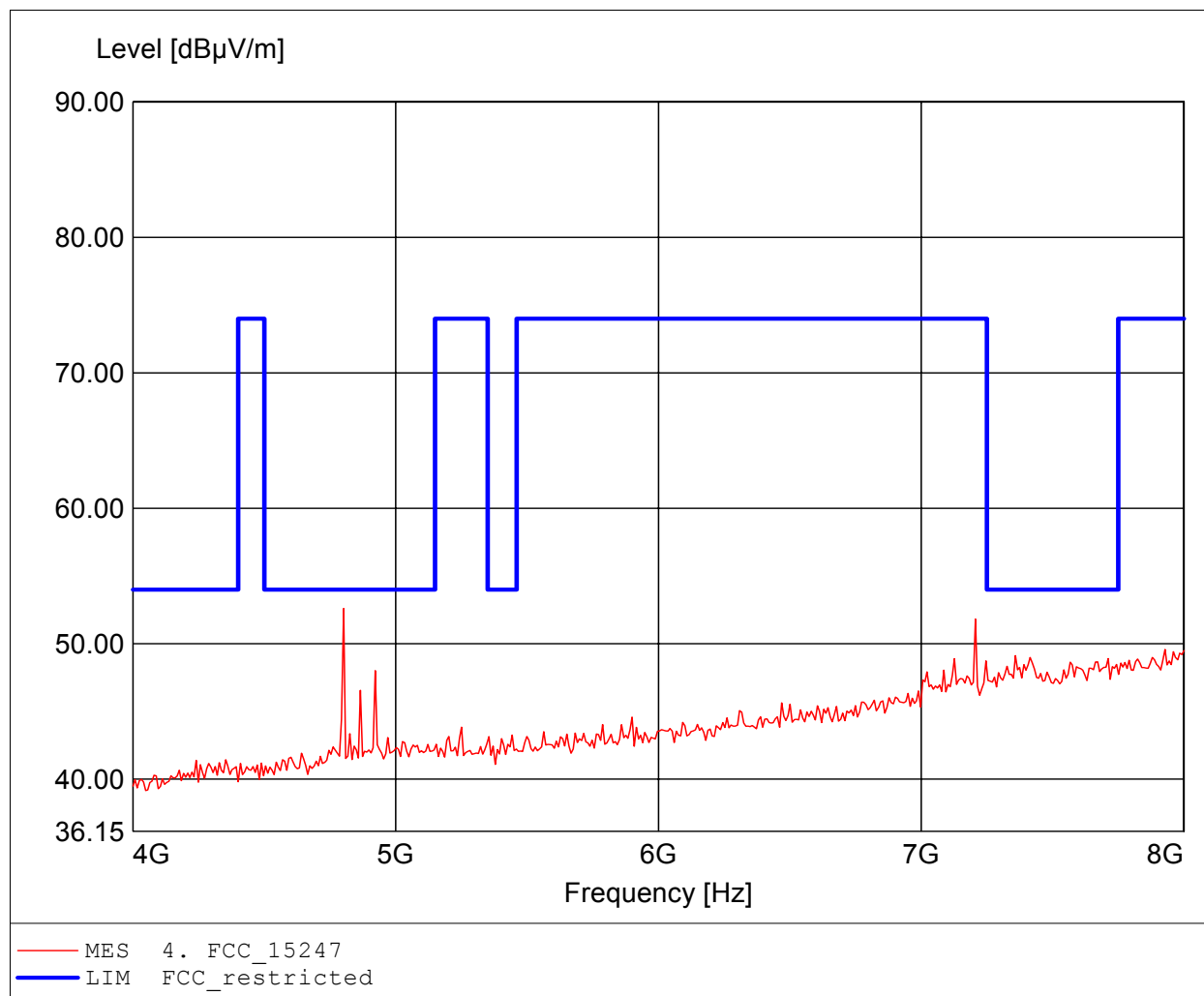
Approval Holder: Panasonic Electronic Devices Europe GmbH / GOM21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.886GHz, Emax: 59.21dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

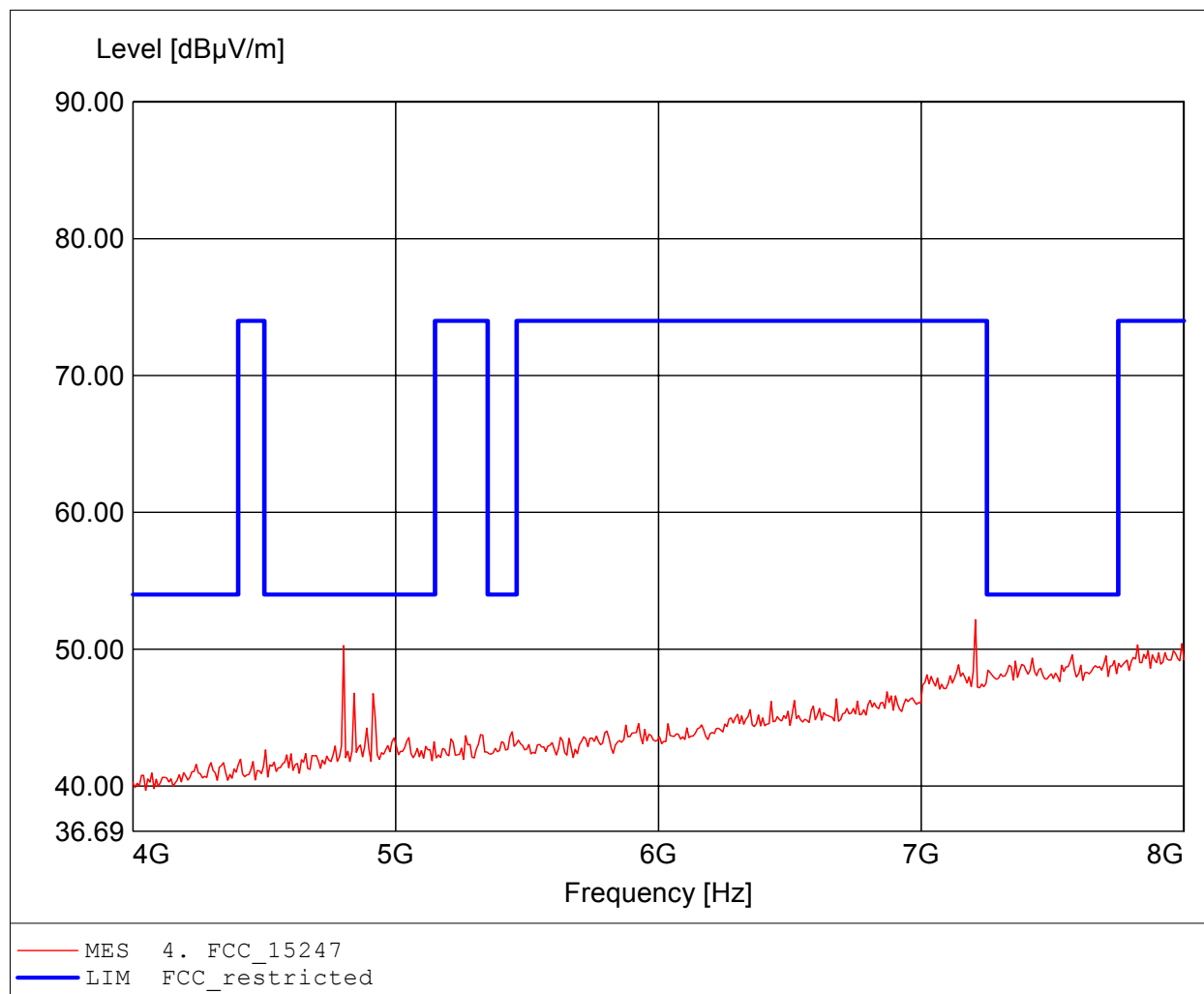
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 4.802GHz, Emax: 52.60dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

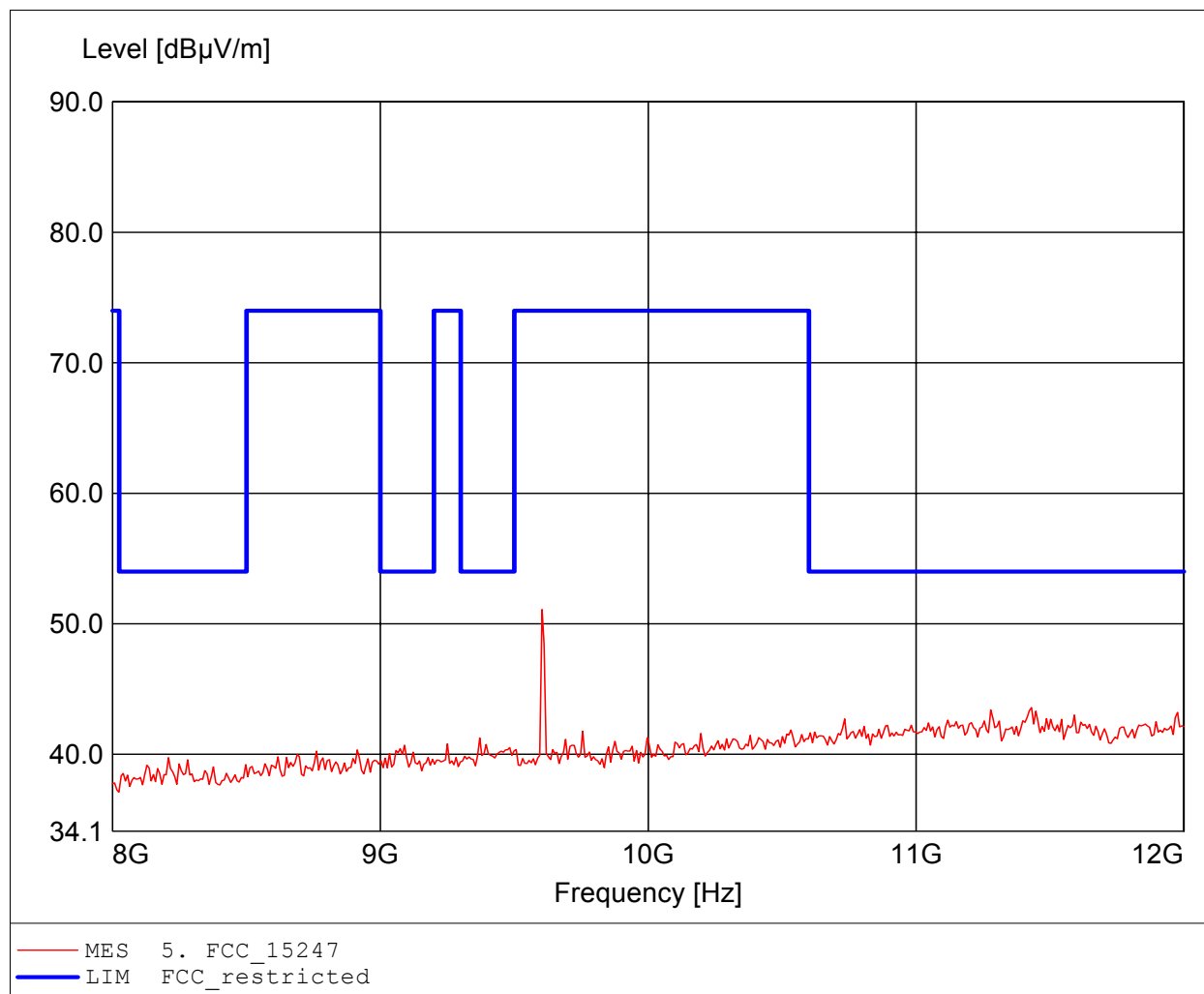
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 7.206GHz, Emax: 52.16dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

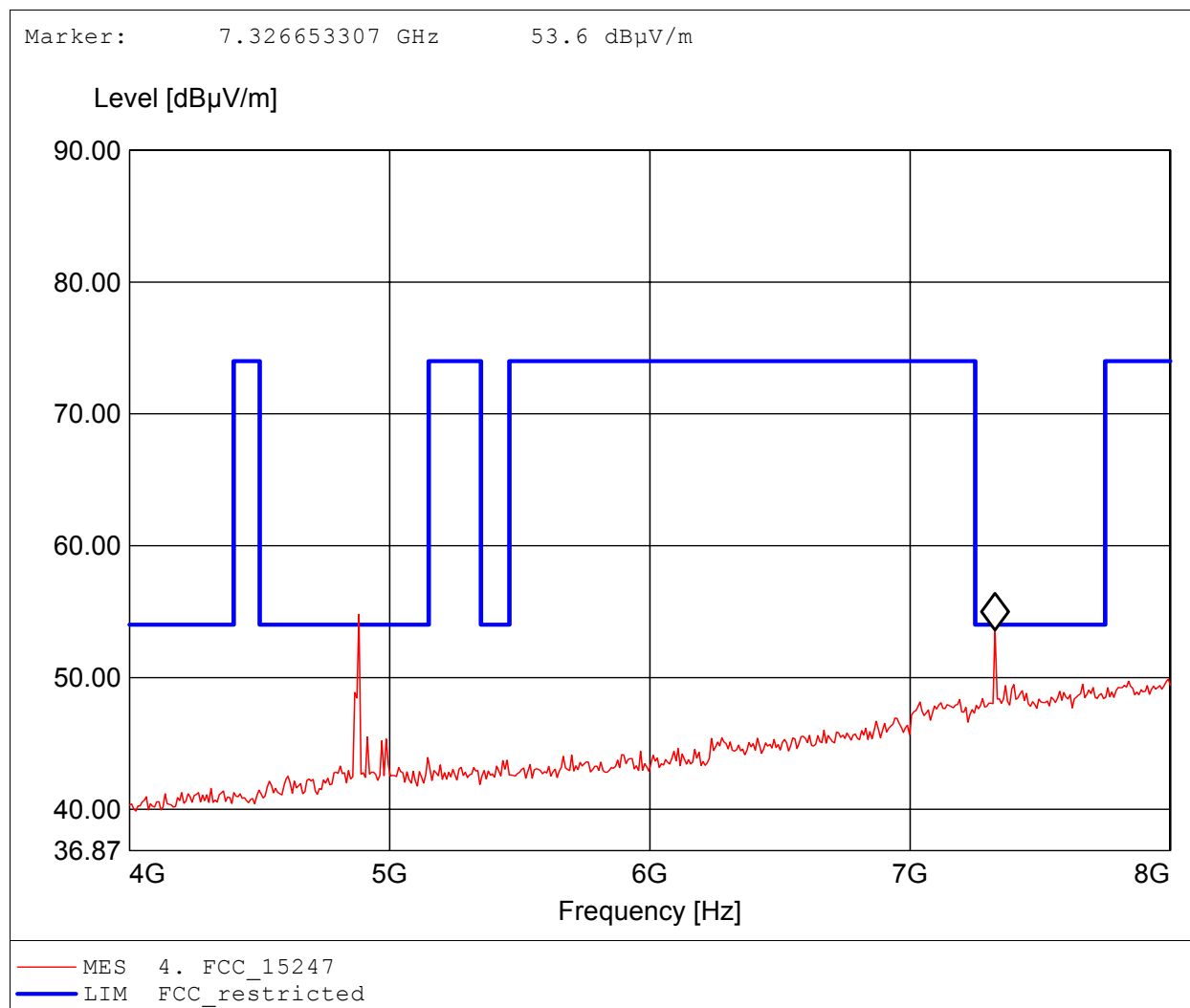
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2402 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 9.603GHz, Emax: 51.09dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

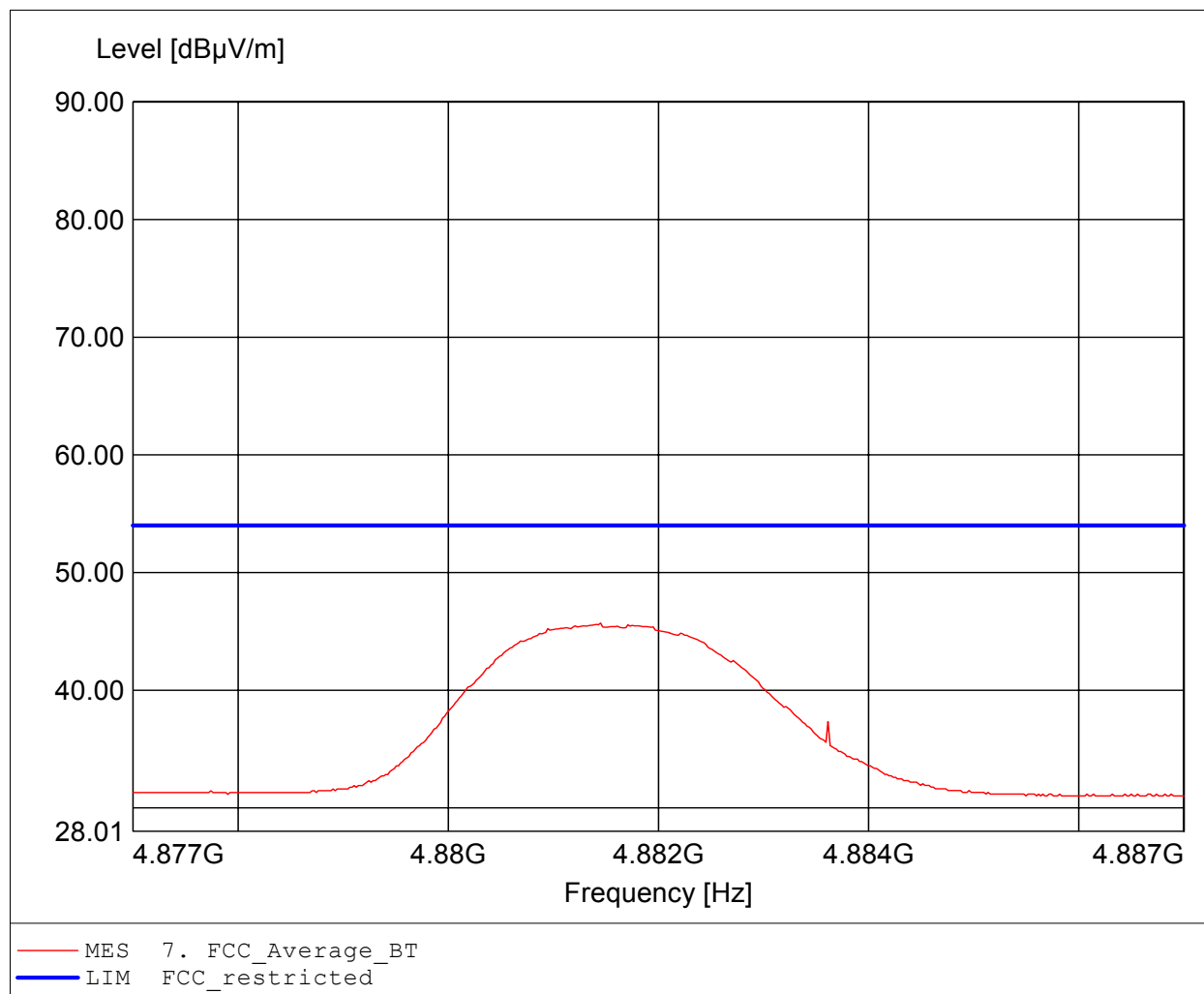
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 4.882GHz, Emax: 54.80dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

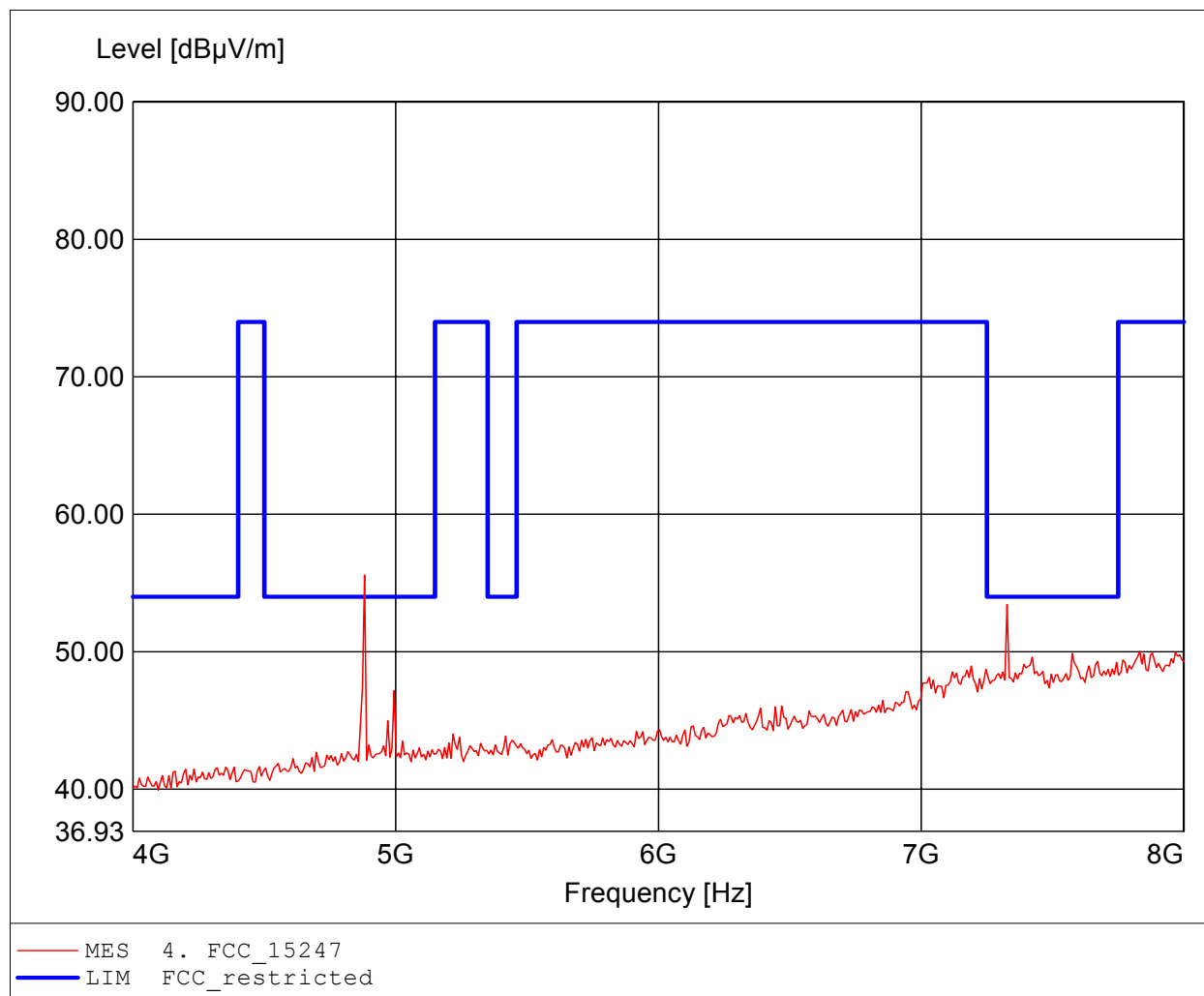
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, average detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 4.881GHz, Emax: 45.71dBuV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

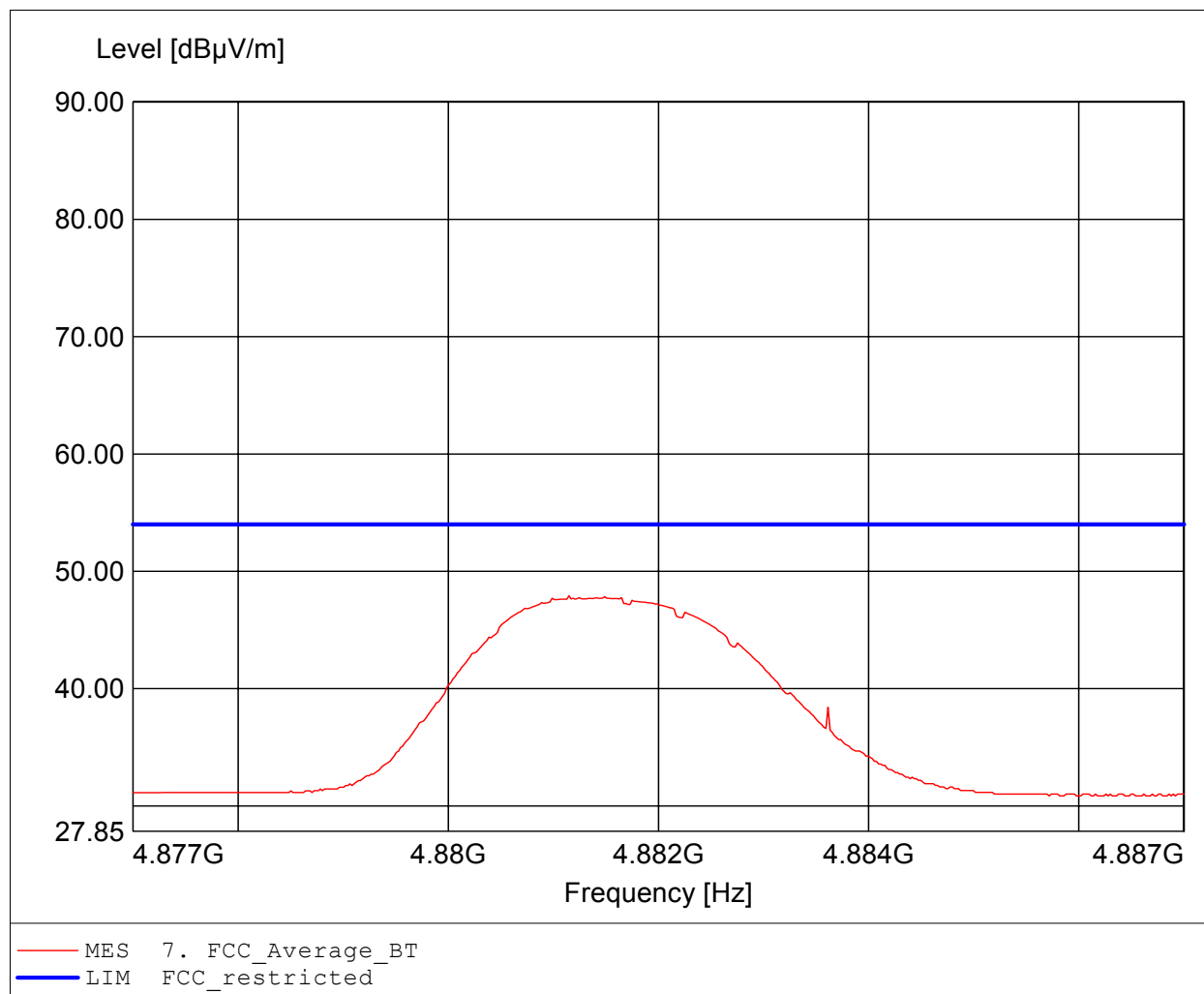
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 4.882GHz, Emax: 55.57dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

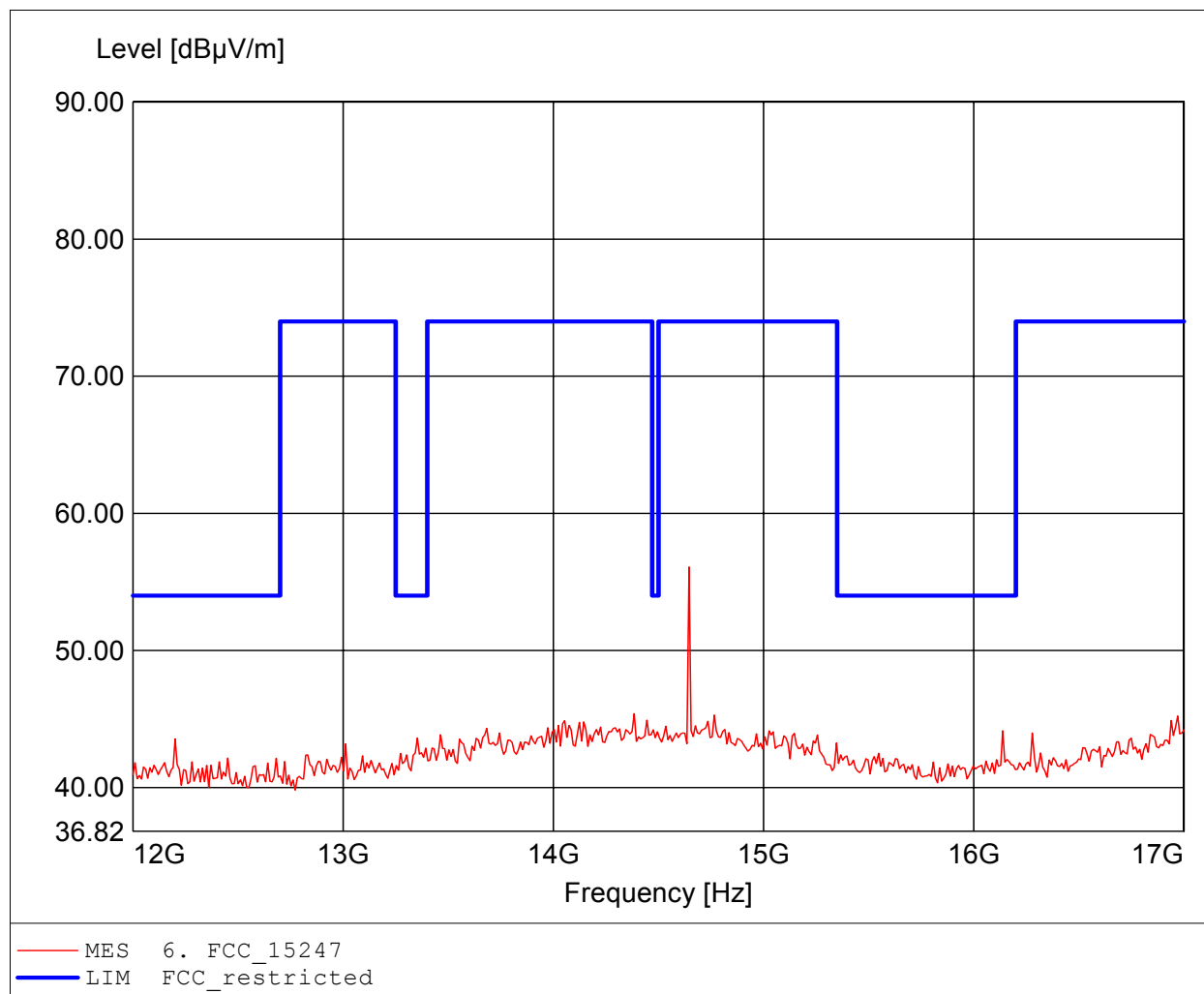
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, average detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, amplif.
Comment 2: Freq: 4.881GHz, Emax: 47.92dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

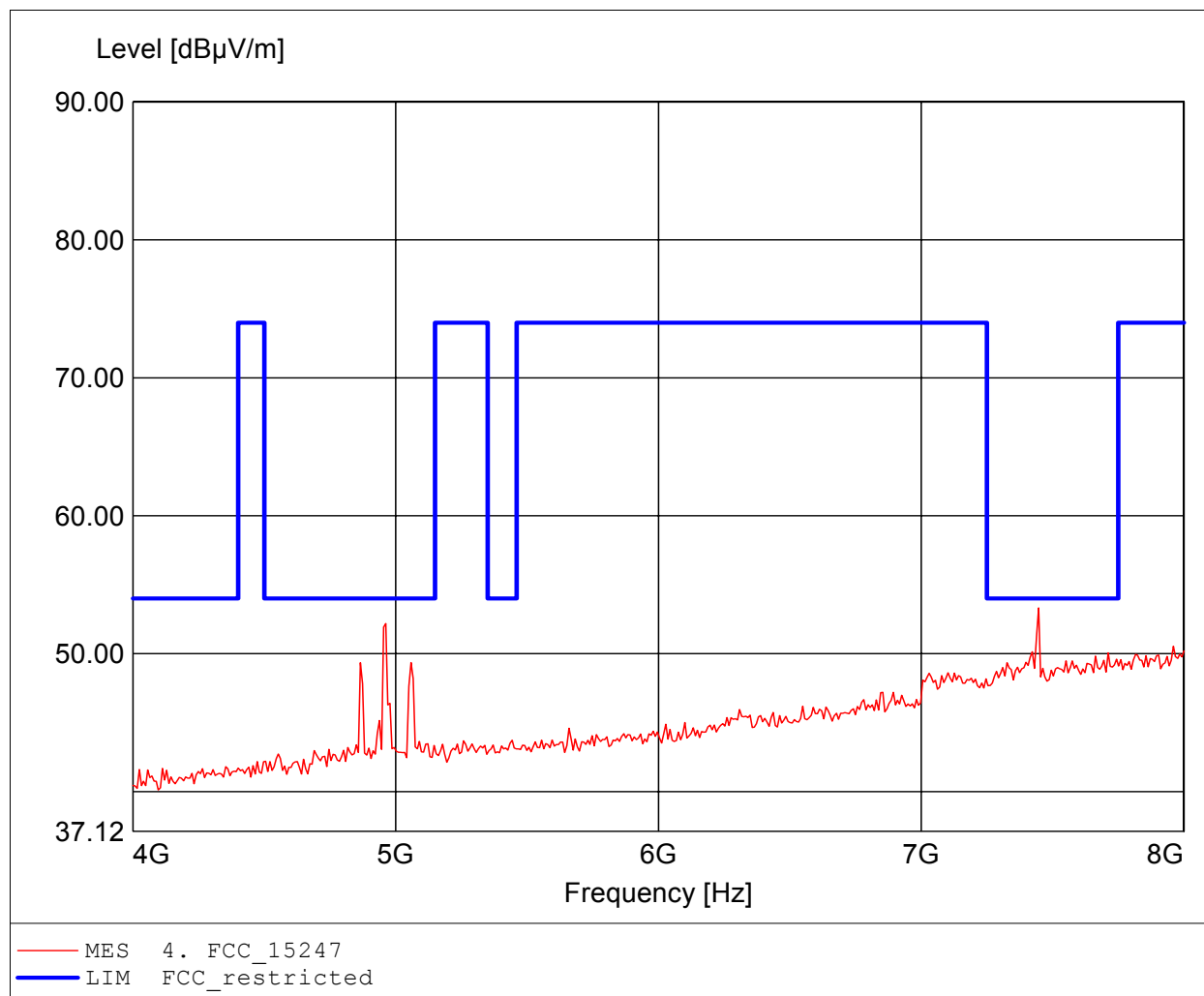
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.645GHz, Emax: 56.09dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

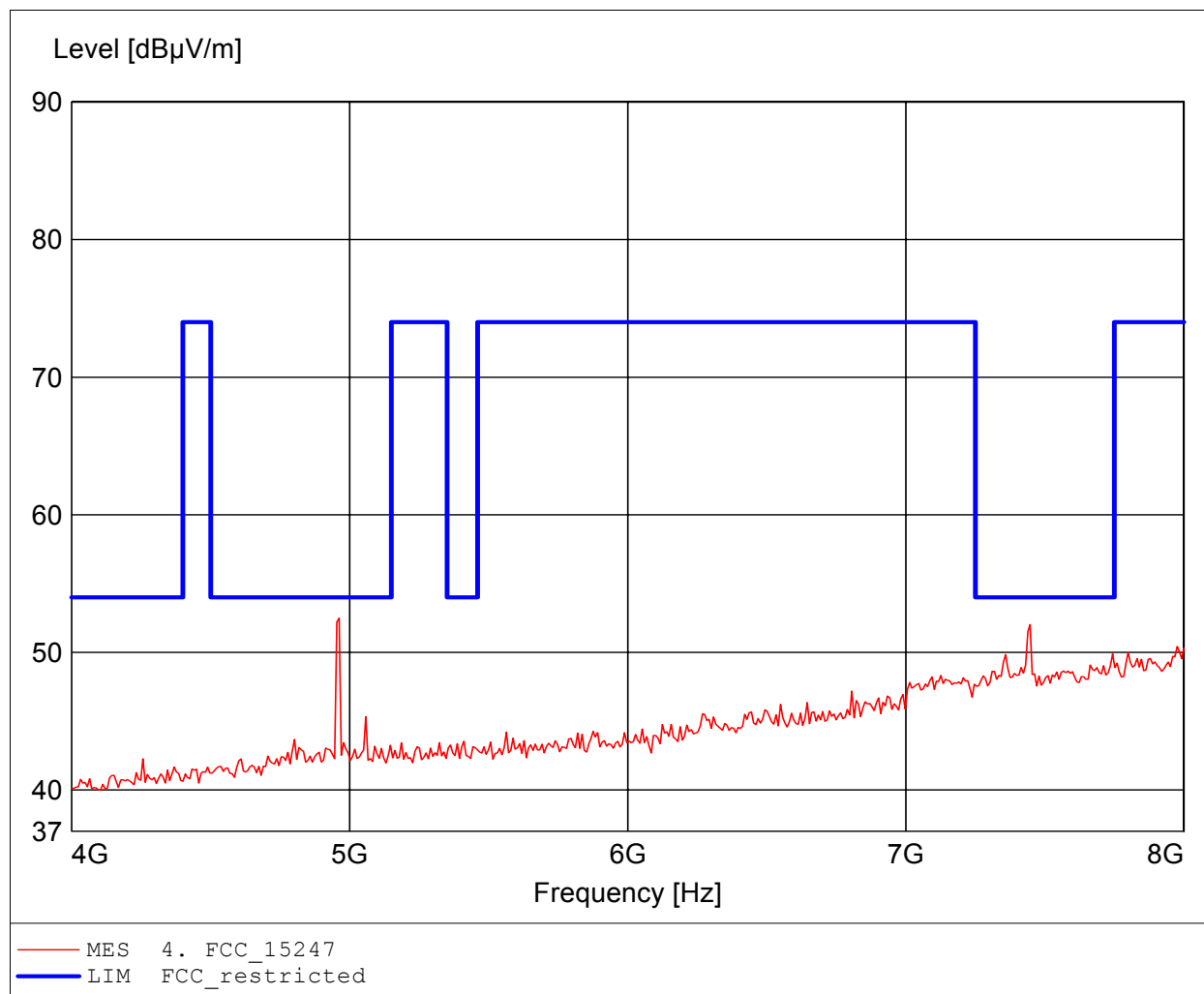
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 7.447GHz, Emax: 53.32dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

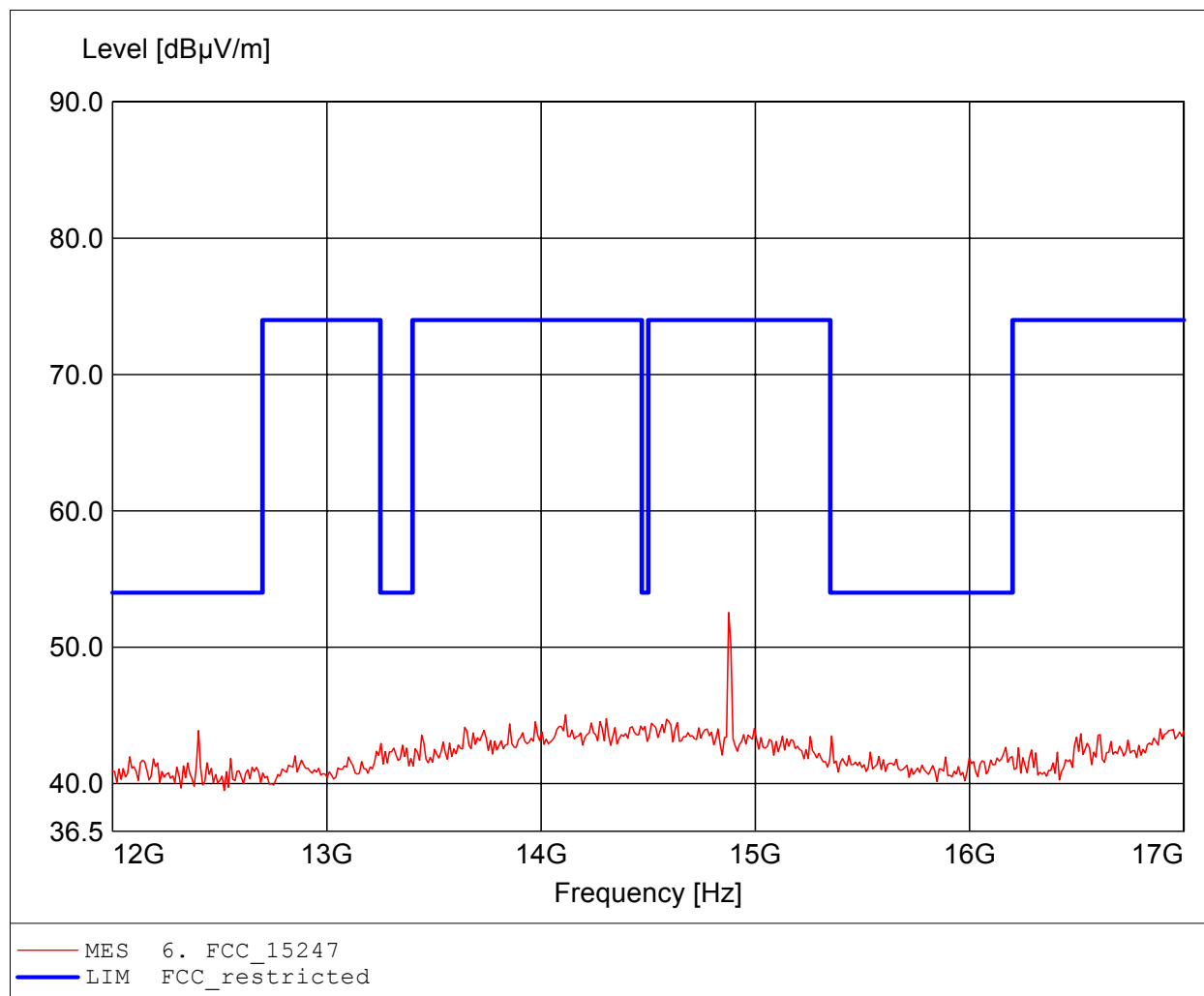
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 4.962GHz, Emax: 52.49dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

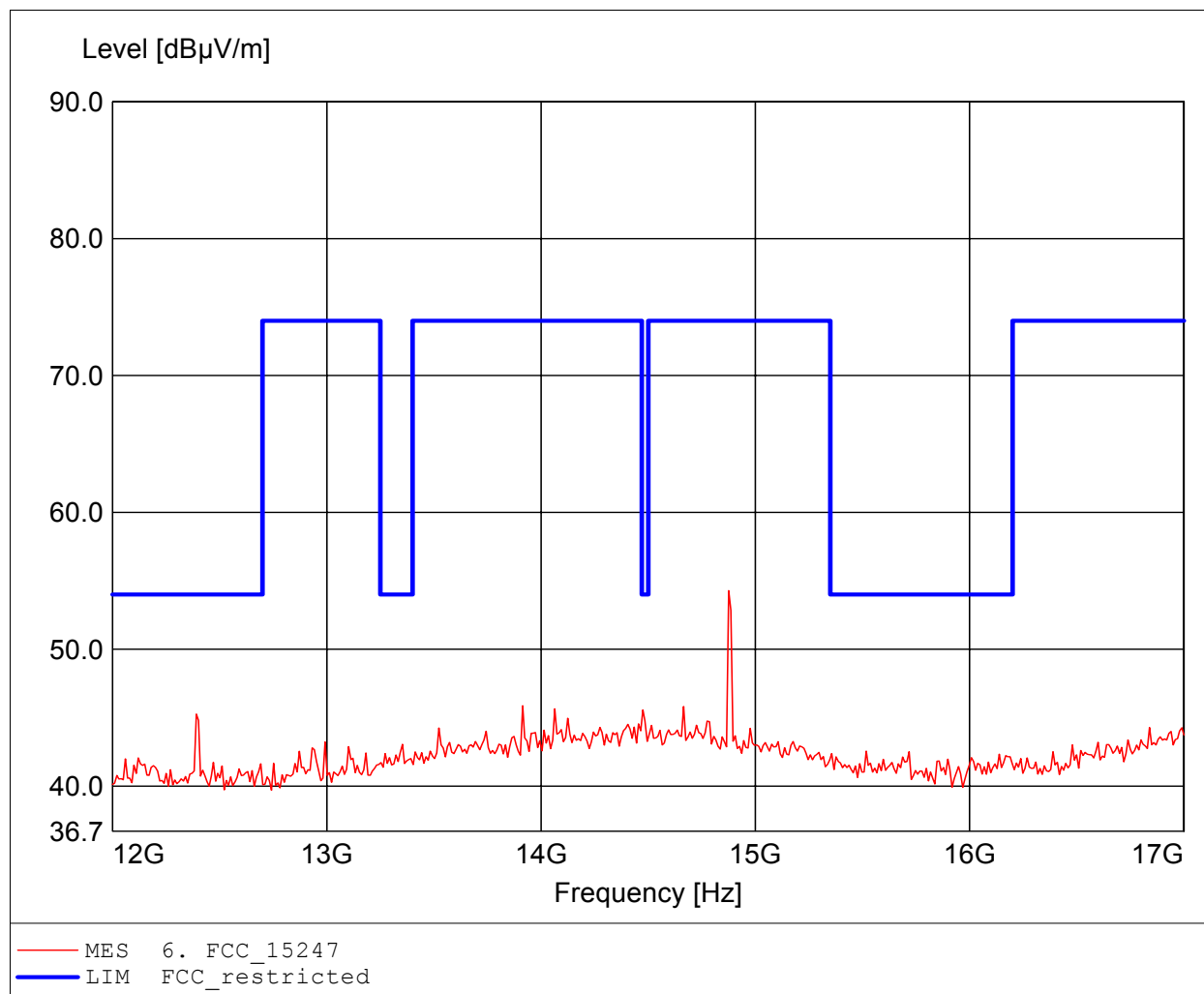
Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.876GHz, Emax: 52.54dBµV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C

Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup: EDR, 2480 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: according to §15.247, peak detector
Comment 1: Dist.: 3m, Ant.: BBHA9120D, ampl.+HP.
Comment 2: Freq: 14.876GHz, Emax: 54.29dBµV/m, RBW: 1MHz



ANNEX B Receiver radiated spurious emissions

Field Strength under normal conditions

Standards Industry Canada, RSS-GEN

Approval Holder: Panasonic Electronic Devices Europe GmbH / G0M21008-3623
EUT: Bluetooth Module
Model: ENW89818C2JF / ENW89818A2JF / setup basic, 2441 MHz
Test Site / Operator: Eurofins Product Service GmbH / Mr. Treffke
Test Condition: Temp.: 22°C / Unom.: 3.3 V DC
Test Specification: Freq. / CH:
Comment 1: Dist.: 3m, Ant.: HL025, ampl.
Comment 2: Freq:7.816GHz Emax:50.83dBµV/m RBW: 1 MHz

