



<b>FCC TEST REPORT</b> <b>FCC 47 CFR Part 15C</b> <b>ISED RSS-247</b> <b>Digital transmission systems operating within the 2400 – 2483.5 MHz band</b>	
<b>Report Reference No.</b> .....	G0M-1602-5371-TFC247BL-V02
<b>Testing Laboratory</b> .....	Eurofins Product Service GmbH
<b>Address</b> .....	Storkower Str. 38c 15526 Reichenwalde Germany
<b>Accreditation</b> .....	  A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 ISED OATS Filing assigned code: 3470A
<b>Applicant's name</b> .....	Emperra GmbH E-Health Technologies
<b>Address</b> .....	Friedrich-Ebert-Str. 33 14469 Potsdam Germany
<b>Test specification:</b>	
<b>Standard</b> .....	47 CFR Part 15C RSS-247, Issue 1, 2015-05
<b>Test scope</b> .....	complete Radio compliance test
<b>Equipment under test (EUT):</b>	
Product description	Insulin Pen with BLE interface
Model No.	ESYSTA BT Pen B
Additional Model(s)	ESYSTA BT Pen w
Brand Name(s)	None
Hardware version	A
Firmware / Software version	AA
	FCC-ID: 2AHMS-BTPEN1      IC: N/R
<b>Test result</b>	<b>Passed</b>

**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:**

Test Lab Temperature ..... : 20 – 23 °C

Test Lab Humidity ..... : 32 – 38 %

Date of receipt of test item ..... : 2016-04-11

Date (s) of performance of tests ..... : 2016-04-11 – 2016-04-13

Compiled by ..... : Wilfried Treffke

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

(Responsible for Test)

Approved by (+ signature) ..... : Christian Weber

(Head of Lab)

Date of issue ..... : 2016-11-15

Total number of pages ..... : 87

*W. Treffke*

*C. Weber*

**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.**

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

**Additional comments:**

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## Version History

Version	Issue Date	Remarks	Revised by
01	2016-05-13	Initial Release	
02	2016-11-15	Number of channels corrected	C. Weber

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## 1 Equipment (Test item) Description

Description	Insulin Pen with BLE interface	
Model	ESYSTA BT Pen B	
Additional Model(s)	ESYSTA BT Pen w	
Brand Name(s)	None	
Serial number	None	
Hardware version	A	
Software / Firmware version	AA	
PMN	N/R	
HVIN	ESYSTA BT Pen B	
FVIN	N/R	
HMN	N/R	
FCC ID	2AHMS-BTPEN1	
ISED Certification Number	N/R	
Equipment type	End product	
Radio type	Transceiver	
Radio technology	Bluetooth 4.0 Low Energy	
Operating frequency range	2402 - 2480 MHz	
Assigned frequency band	2400 - 2483.5 MHz	
Main test frequencies	F <sub>LOW</sub>	2402 MHz
	F <sub>MID</sub>	2440 MHz
	F <sub>HIGH</sub>	2480 MHz
Spreading	Frequency Hopping	
Modulations	GFSK	
Number of channels	40	
Channel spacing	2MHz	
Number of antennas	1	
Antenna	Type	integrated
	Model	PCB-Antenna
	Manufacturer	n.a.
	Gain	0.8 dB (by measurement)
Manufacturer	Emperra GmbH E-Health Technologies Friedrich-Ebert-Str. 33 14469 Potsdam Germany	
Power supply	V <sub>NOM</sub>	3.0VDC
	V <sub>MIN</sub>	2.0VDC
	V <sub>MAX</sub>	3.3VDC
AC/DC-Adaptor	none	

#### 1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Laptop	Dell	Latitude E6420	nRFgo-Studio
<p><b>*Note:</b> Use the following abbreviations:</p> <p>AE : Auxiliary/Associated Equipment, or</p> <p>SIM : Simulator (Not Subjected to Test)</p> <p>CABL : Connecting cables</p>				

## 1.5 Test Modes

Mode #	Description	
Transmit	General conditions:	EUT powered by battery or laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = Hopping stopped (single hopping channel) Modulation = GFSK Data rate = 1 Mbps Bandwidth = 2 MHz Duty cycle = 100 % Power level = Maximum
Receive	General conditions:	EUT powered by battery or laboratory power supply.
	Radio conditions:	Mode = standalone receive Spreading = On Modulation = GFSK

## 1.6 Test Equipment Used During Testing

Measurement Software			
Description	Manufacturer	Name	Version
EMC Test Software	Dare Instruments	Radimation	2014.1.15

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2016-02	2017-02

6dB Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2016-02	2017-02

Maximum peak conducted power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2016-02	2017-02

Power spectral density					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2016-02	2017-02

Band edge compliance					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2016-02	2017-02

Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2016-02	2017-02

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSEK30	EF00168	2016-01	2017-01
Biconical Antenna	R&S	HK 116	EF00203	2014-04	
LPD Antenna	R&S	HL 223	EF00013	2014-04	2016-04
Horn Antenna	Schwarzbeck	BBHA9120D	EF00018	2013-09	2016-09
LPD Antenna	R&S	HL 025	EF00327	2015-10	2018-10



## 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:

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

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, ISED RSS-247				
Product Specific Standard Section	Requirement – Test	Reference Method	Result	Remarks
RSS-Gen 6.6	Occupied Bandwidth	ANSI C63.10	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247 § 5.2	6dB Bandwidth	ANSI C63.10	PASS	
FCC § 15.247(b)(3) ISED RSS-247 § 5.4	Maximum peak conducted power	ANSI C63.10	PASS	
FCC § 15.247(e) ISED RSS-247 § 5.2	Power spectral density	ANSI C63.10	PASS	
47 CFR 15.207 ISED RSS-247 § 3.1	AC power line conducted emissions	ANSI C63.4	N/R	Not powered (directly or indirectly) via AC-Mains, EUT power via battery
FCC § 15.247(d) ISED RSS-247 § 5.5	Band edge compliance	ANSI C63.10	PASS	
FCC § 15.247(d) ISED RSS-247 § 5.5	Conducted spurious emissions	ANSI C63.10	PASS	
FCC § 15.247(d) FCC § 15.209 ISED RSS-247 § 5.5	Transmitter radiated spurious emissions	ANSI C63.10	PASS	
ISED RSS-247 § 3.1	Receiver radiated spurious emissions	ANSI C63.10	PASS	
Remarks:				

### 3 Test Conditions and Results

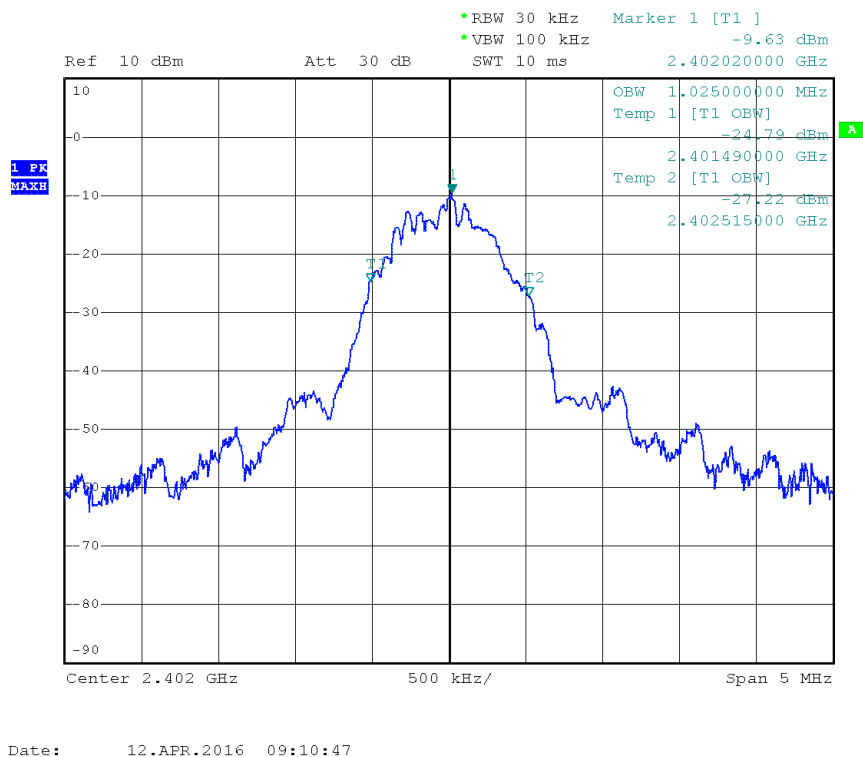
#### 3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. to ISSED RSS-Gen			Verdict: PASS
Test according to measurement reference	Reference Method		
	ANSI C63.10		
Test frequency range	Tested frequencies		
	F <sub>LOW</sub> / F <sub>MID</sub> / F <sub>HIGH</sub>		
Limits			
None (Informational only)			
Test setup			
<div><div>Spectrum Analyzer</div><div>EUT</div></div>			
Test procedure			
<div>1. EUT set to test mode (Communication tester is used if needed)</div> <div>2. Span set to at least twice the emission spectrum</div> <div>3. Resolution bandwidth set to 1 % of span</div> <div>4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function</div>			
Test results			
Channel	Frequency [MHz]	Mode	Occupied Bandwidth [MHz]
F <sub>LOW</sub>	2402	Transmit	1.025
F <sub>MID</sub>	2440	Transmit	1.030
F <sub>HIGH</sub>	2480	Transmit	1.030
Comments:			

# Occupied Bandwidth – F<sub>Low</sub>

## Occupied Bandwidth

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: GFSK, Channel: 0, 2402 MHz  
 Operating Conditions: Tnom/Vnom  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Occupied Bandwidth [MHz]: 1.025



# Occupied Bandwidth – F<sub>MID</sub>

## Occupied Bandwidth

Project Number: G0M-1602-5371  
Applicant: EMPERRA GmbH  
Model Description: Insulin Pen with BLE interface  
Model: ESYSTA BT Pen  
Test Sample ID: 1  
Reference Standards: FCC 15.247, RSS-247  
Reference Method: ANSI C63.10:2013, Section 6.9.3  
Operational Mode: GFSK, Channel: 19, 2440 MHz  
Operating Conditions: Tnom/Vnom  
Operator: W. Treffke  
Test Site: Eurofins Product Service GmbH  
Test Date: 2016-04-12  
Occupied Bandwidth [MHz]: 1.030



Date: 12.APR.2016 09:20:29

# Occupied Bandwidth – F<sub>HIGH</sub>

## Occupied Bandwidth

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: GFSK, Channel: 39, 2480 MHz  
 Operating Conditions: Tnom/Vnom  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Occupied Bandwidth [MHz]: 1.030



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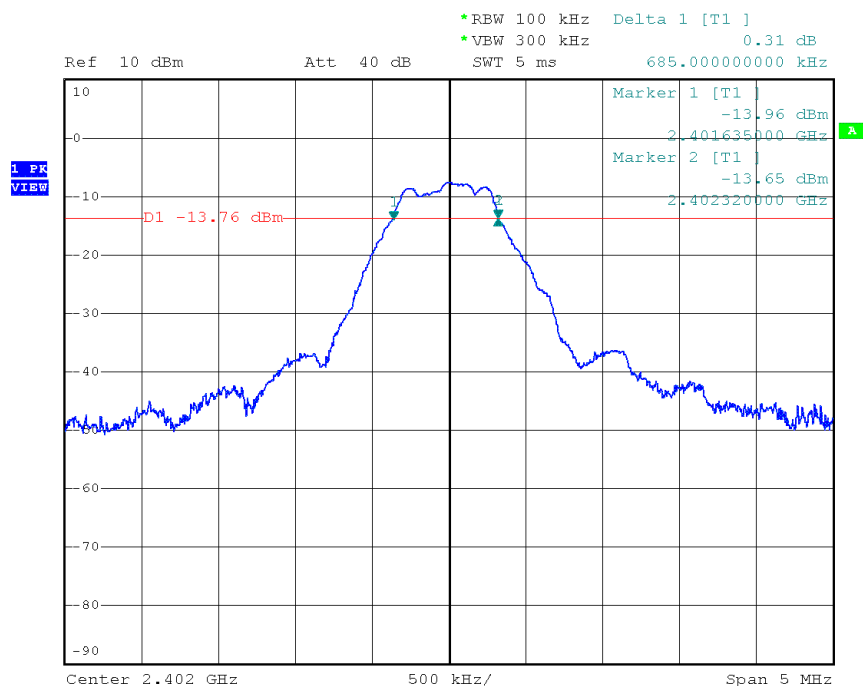
### 3.2 Test Conditions and Results – 6 dB Bandwidth

6dB Bandwidth acc. to FCC 15.247 / ISED RSS-247				Verdict: PASS	
EUT requirement rule parts and clause	Reference				
	FCC 15.247(a)(2) / ISED RSS-247 5.2				
Test according to measurement reference	Reference Method				
	ANSI C63.10				
Test frequency range	Tested frequencies				
	F <sub>LOW</sub> / F <sub>MID</sub> / F <sub>HIGH</sub>				
Limits					
Limit					
≥ 500kHz					
Test setup					
<div><div>Spectrum Analyzer</div><div>EUT</div></div>					
Test procedure					
<div>1. EUT set to test mode</div> <div>2. Span set to at least twice the emission spectrum</div> <div>3. Detector set to peak and max hold and RBW is set to 100 kHz</div> <div>4. Envelope peak value of emission spectrum is selected</div> <div>5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak</div> <div>6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak</div> <div>7. 6 dB Bandwidth is determined by marker frequency separation</div>					
Test results					
Channel	Frequency [MHz]	Mode	6 dB Bandwidth [kHz]	Limit [kHz]	Result
F <sub>LOW</sub>	2402	Transmit	685	500	PASS
F <sub>MID</sub>	2442	Transmit	680	500	PASS
F <sub>HIGH</sub>	2480	Transmit	685	500	PASS
Comments:					

### 6 dB Bandwidth – F<sub>Low</sub>

#### DTS (6 dB) Bandwidth

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1  
 Operational Mode: GFSK, Channel: 0, 2402 MHz  
 Operating Conditions: Tnom/Vnom  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Lower Frequency [MHz]: 2401.635  
 Upper Frequency [MHz]: 2402.320  
 6 dB Bandwidth [kHz]: 685



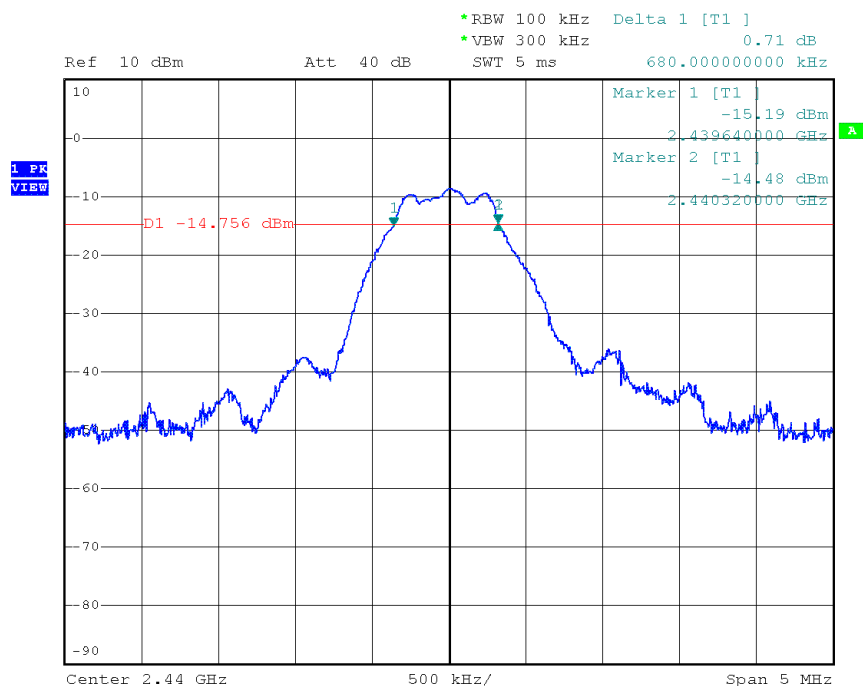
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6 dB Bandwidth – F<sub>MID</sub>

## DTS (6 dB) Bandwidth

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1  
 Operational Mode: GFSK, Channel: 19, 2440 MHz  
 Operating Conditions: Tnom/Vnom  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Lower Frequency [MHz]: 2439.640  
 Upper Frequency [MHz]: 2440.320  
 6 dB Bandwidth [kHz]: 680

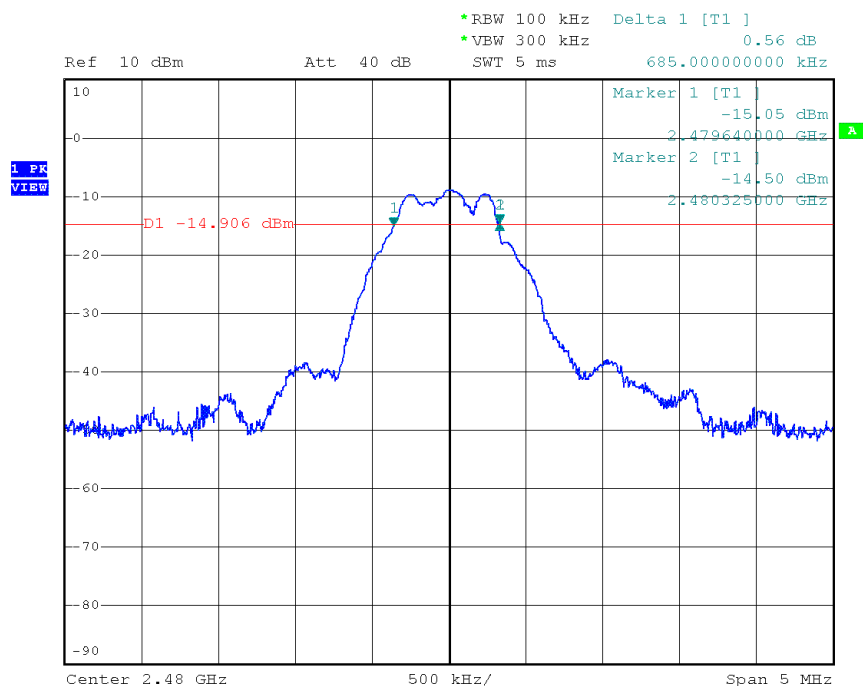


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### 6 dB Bandwidth – F<sub>HIGH</sub>

#### DTS (6 dB) Bandwidth

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1  
 Operational Mode: GFSK, Channel: 39, 2480 MHz  
 Operating Conditions: Tnom/Vnom  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Lower Frequency [MHz]: 2479.640  
 Upper Frequency [MHz]: 2480.325  
 6 dB Bandwidth [kHz]: 685



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### 3.3 Test Conditions and Results – Maximum peak conducted power

Maximum peak conducted power acc. to FCC 15.247 / ISED RSS-247		Verdict: PASS
EUT requirement rule parts and clause	Reference	
	FCC 15.247(b)(3) / ISED RSS-247 5.4	
Test according to measurement reference	Reference Method	
	ANSI C63.10	
Test frequency range	Tested frequencies	
	F <sub>LOW</sub> / F <sub>MID</sub> / F <sub>HIGH</sub>	
Measurement mode	Peak	
Maximum antenna gain	0.8 dBi ⇒ Limit correction = 0 dB	
Limits		
1 W (30 dBm)		
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		
<div><div>Spectrum Analyzer</div><div>EUT</div></div>		
Test procedure		
<div><div>1. EUT set to test mode (Communication tester is used if needed)</div><div>2. Center frequency set to test channel center frequency</div><div>3. Span set to twice the 20 dB bandwidth and detector to peak and max hold</div><div>4. Resolution bandwidth is set to 3 MHz</div><div>5. Peak conducted power is determined from peak of spectrum envelope</div></div>		

Test results							
Channel	Frequency [MHz]	Voltage	Mode	Peak power [dbm]	Peak power [W]	Limit [dBm]	Margin [dB]
F <sub>LOW</sub>	2402	V <sub>nom</sub> = 3.3V	Transmit	-8.614	0.00014	30	-38.61
F <sub>MID</sub>	2442	V <sub>nom</sub> = 3.3V	Transmit	-8.486	0.00014	30	-38.49
F <sub>HIGH</sub>	2480	V <sub>nom</sub> = 3.3V	Transmit	-7.548	0.00018	30	-37.55
Comment:							

### 3.4 Test Conditions and Results – Power spectral density

Power spectral density acc. to FCC 15.247 / ISED RSS-247					Verdict: PASS	
EUT requirement rule parts and clause	Reference					
	FCC 15.247(e) / ISED RSS-247 5.2					
Test according to measurement reference	Reference Method					
	ANSI C63.10					
Test frequency range	Tested frequencies					
	F <sub>LOW</sub> / F <sub>MID</sub> / F <sub>HIGH</sub>					
Measurement mode	Peak					
Limits						
8 dBm / 3 kHz						
Test setup						
<div><div>Spectrum Analyzer</div><div>EUT</div></div>						
Test procedure						
<div>1. EUT set to test mode (Communication tester is used if needed)</div> <div>2. Center frequency set to test channel center frequency</div> <div>3. Span is set large enough to capture maximum emissions in passband, RBW is set to 3kHz</div> <div>4. Peak power density is determined from peak emission of envelope</div>						
Test results						
Channel	Frequency [MHz]	Test mode	Peak frequency [MHz]	Peak power density [dBm]	Limit [dBm/3kHz]	Margin [dB]
F <sub>LOW</sub>	2402	Transmit	2402.003	-7.753	8.0	-15.75
F <sub>MID</sub>	2442	Transmit	2440.012	-8.807	8.0	-16.81
F <sub>HIGH</sub>	2480	Transmit	2480.006	-8.913	8.0	-16.91
Comments:						

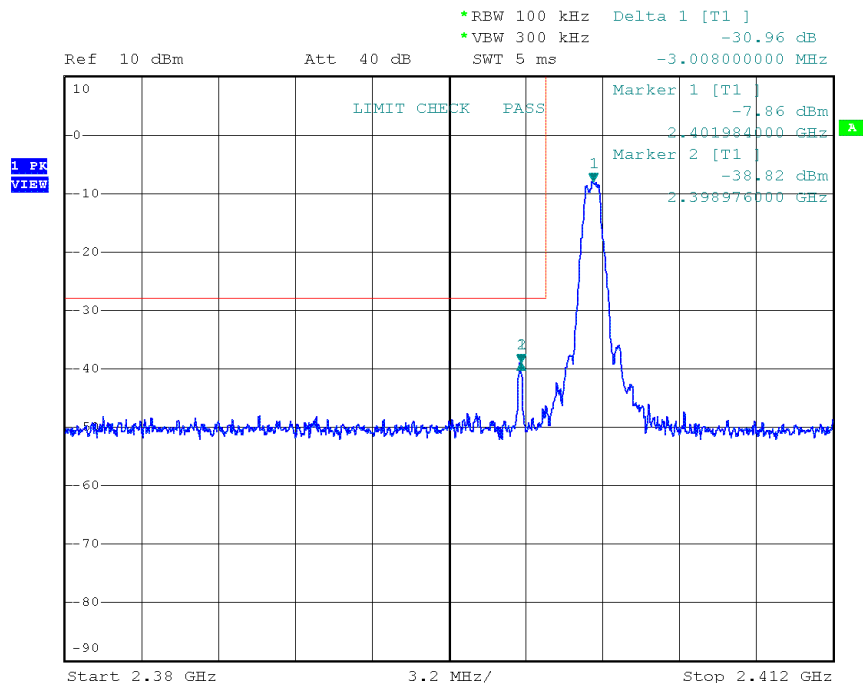
### 3.5 Test Conditions and Results – Band edge compliance

Band-edge compliance acc. to FCC 15.247 / ISED RSS-247				Verdict: PASS	
EUT requirement rule parts and clause		Reference			
		FCC 15.247(d) / ISED RSS-247 5.5			
Test according to measurement reference		Reference Method			
		ANSI C63.10			
Test frequency range		Tested frequencies			
		F <sub>LOW</sub> / F <sub>HIGH</sub>			
Measurement mode		Peak			
Limits					
Limit			Condition		
≤ -20 dB / 100 kHz			Power measurement detector = Peak		
≤ -30 dB / 100 kHz			Power measurement detector = RMS		
Test setup					
<div><div>Spectrum Analyzer</div><div>EUT</div></div>					
Test procedure					
<div>1. EUT set to test mode (Communication tester is used if needed)</div> <div>2. Span set around lower band edge and detector is set to peak and max hold</div> <div>3. Resolution bandwidth is set to 100 kHz</div> <div>4. Markers are set to peak emission levels within frequency band and outside frequency band</div> <div>5. Band edge attenuation is determined from level difference</div>					
Test results					
Channel	Frequency [MHz]	Mode	Level [dBc]	Limit [dBc]	Margin [dB]
F <sub>LOW</sub>	2402	Transmit	-30.96	-20	-10.96
F <sub>HIGH</sub>	2480	Transmit	-30.46	-20	-10.46
Comments:					

# Band-edge compliance

## Band-edge Compliance

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.11  
 Operational Mode: GFSK, Channel: 0, 2402 MHz  
 Operating Conditions: Tnom/Vnom  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Band-edge: Lower  
 In-band Frequency [MHz]: 2401.984  
 Max. in-band Level [dBm/100 kHz]: -7.862  
 Out-of-band Frequency [MHz]: 2398.976  
 Max. out-of-band Level [dBm/100 kHz]: -38.819  
 Attenuation [dB]: -30.96



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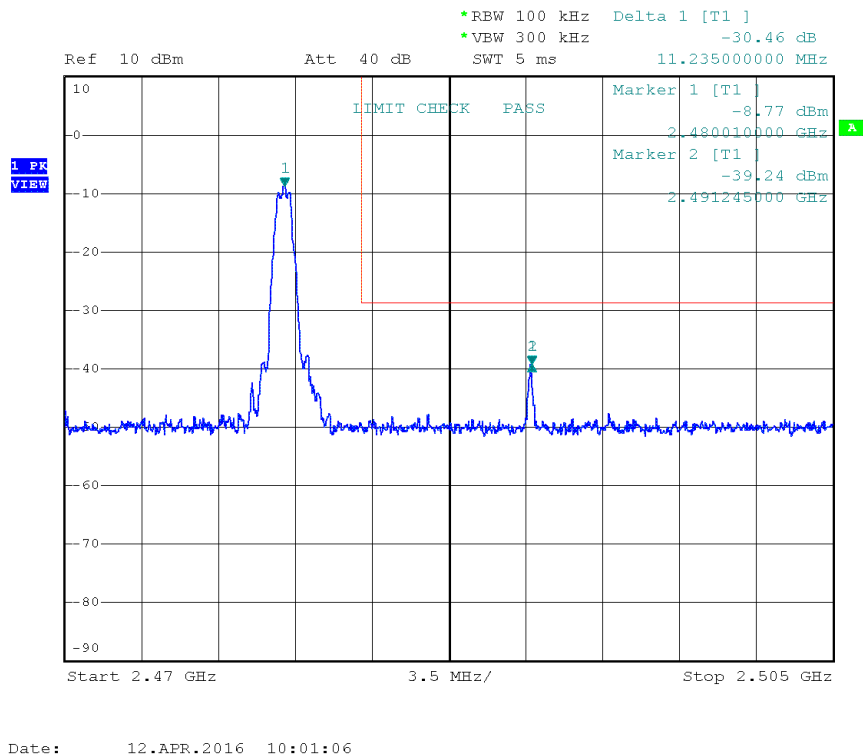
Test Report No.: G0M-1602-5371-TFC247BL-V02

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

# Band-edge compliance

## Band-edge Compliance

Project Number: G0M-1602-5371  
Applicant: EMPERRA GmbH  
Model Description: Insulin Pen with BLE interface  
Model: ESYSTA BT Pen  
Test Sample ID: 1  
Reference Standards: FCC 15.247, RSS-247  
Reference Method: ANSI C63.10:2013, Section 11.11  
Operational Mode: GFSK, Channel: 39, 2480 MHz  
Operating Conditions: Tnom/Vnom  
Operator: W. Treffke  
Test Site: Eurofins Product Service GmbH  
Test Date: 2016-04-12  
Band-edge: Upper  
In-band Frequency [MHz]: 2480.01  
Max. in-band Level [dBm/100 kHz]: -8.772  
Out-of-band Frequency [MHz]: 2491.245  
Max. out-of-band Level [dBm/100 kHz]: -39.235  
Attenuation [dB]: -30.46





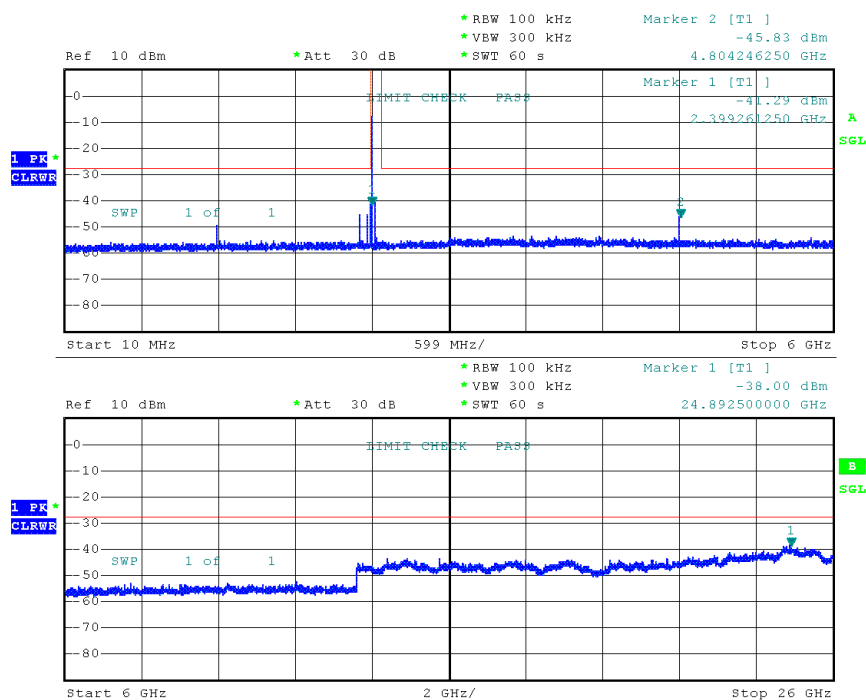
### 3.6 Test Conditions and Results – Conducted spurious emissions

Conducted spurious emissions acc. to FCC 15.247 / ISED RSS-247						Verdict: PASS	
EUT requirement rule parts and clause			Reference				
			FCC 15.247(d) / ISED RSS-247 5.5				
Test according to measurement reference			Reference Method				
			ANSI C63.10				
Test frequency range			Tested frequencies				
			10 MHz – 10 <sup>th</sup> 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							
<div><div>Spectrum Analyzer</div><div>EUT</div></div>							
Test procedure							
<div>1. EUT set to test mode (Communication tester is used if needed)</div> <div>2. Span it set according to measurement range</div> <div>3. Resolution bandwidth is set to 100 kHz and detector to peak and max hold</div> <div>4. Markers are set to peak emission levels within frequency band</div> <div>5. Emission level is determined by second marker on emission peak</div> <div>6. Attenuation is determined from level difference</div>							
Test results							
Channel	Frequency [MHz]	Mode	Emission [MHz]	Emission Level [dbm]	Peak power [dBm]	Limit [dBm]	Margin [dB]
F <sub>LOW</sub>	2402	Transmit	2399.26	-41.3	-7.9	-27.9	-13.40
F <sub>MID</sub>	2440	Transmit	2560.24	-43.6	-9.0	-29.0	-14.60
F <sub>HIGH</sub>	2480	Transmit	2491.35	-42.2	-9.1	-29.1	-13.10
Comments:							

Conducted spurious emissions – F<sub>Low</sub>

## Conducted Spurious Emissions

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.11  
 Operational Mode: GFSK, Channel: 0, 2402 MHz  
 Operating Conditions: T<sub>nom</sub>/V<sub>nom</sub>  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Max. in-band Frequency [MHz]: 2402.0  
 Max. in-band Level [dBm/100 kHz]: -7.9  
 Out-of-band Limit [dBm/100 kHz]: -27.9

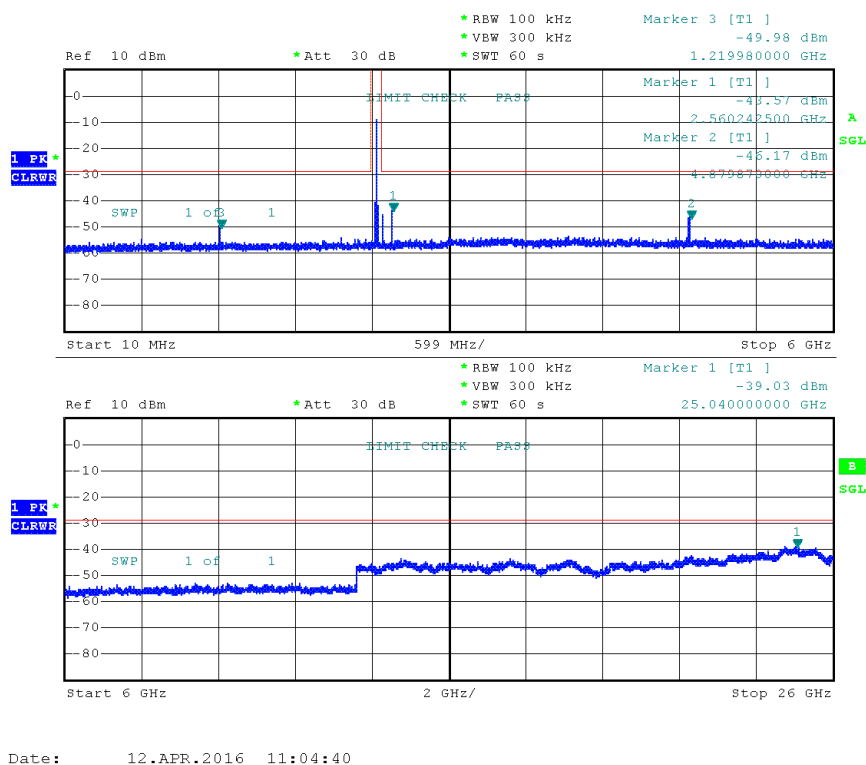


Date: 12.APR.2016 11:00:46

Conducted spurious emissions – F<sub>MID</sub>

## Conducted Spurious Emissions

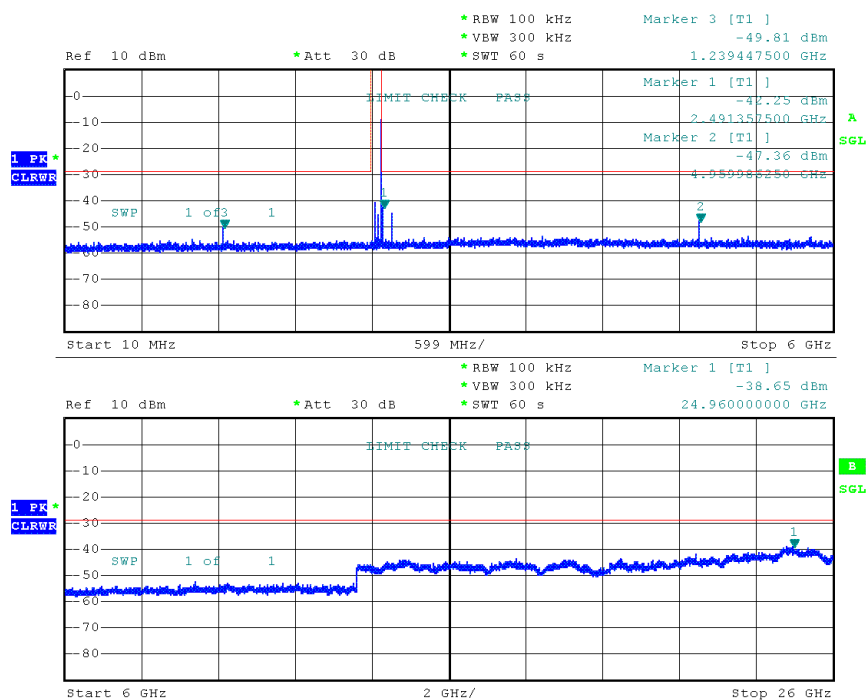
Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.11  
 Operational Mode: GFSK, Channel: 19, 2440 MHz  
 Operating Conditions: T<sub>nom</sub>/V<sub>nom</sub>  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Max. in-band Frequency [MHz]: 2440.0  
 Max. in-band Level [dBm/100 kHz]: -9.0  
 Out-of-band Limit [dBm/100 kHz]: -29.0



Conducted spurious emissions – F<sub>HIGH</sub>

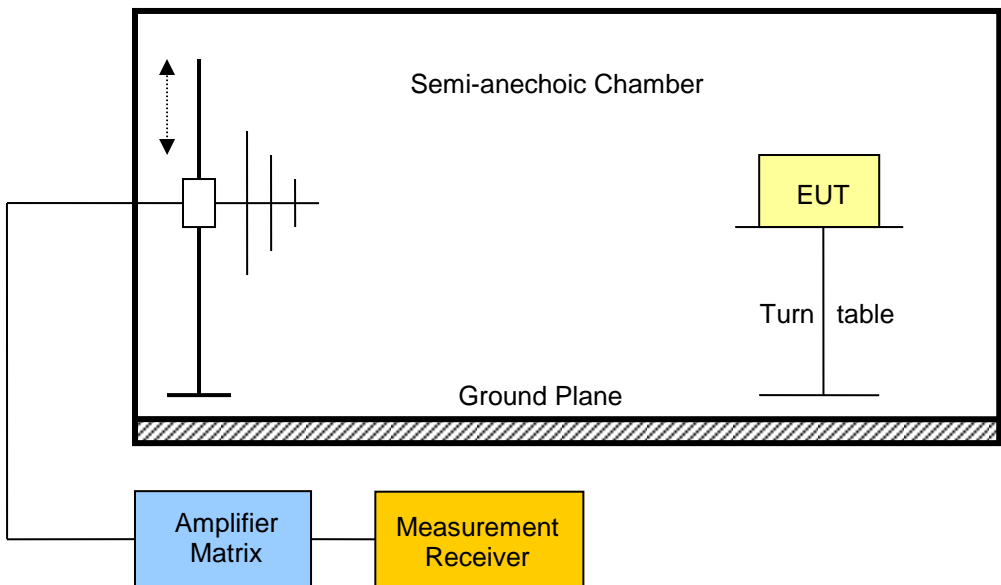
## Conducted Spurious Emissions

Project Number: G0M-1602-5371  
 Applicant: EMPERRA GmbH  
 Model Description: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Sample ID: 1  
 Reference Standards: FCC 15.247, RSS-247  
 Reference Method: ANSI C63.10:2013, Section 11.11  
 Operational Mode: GFSK, Channel: 39, 2480 MHz  
 Operating Conditions: T<sub>nom</sub>/V<sub>nom</sub>  
 Operator: W. Treffke  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2016-04-12  
 Max. in-band Frequency [MHz]: 2480.0  
 Max. in-band Level [dBm/100 kHz]: -9.1  
 Out-of-band Limit [dBm/100 kHz]: -29.1



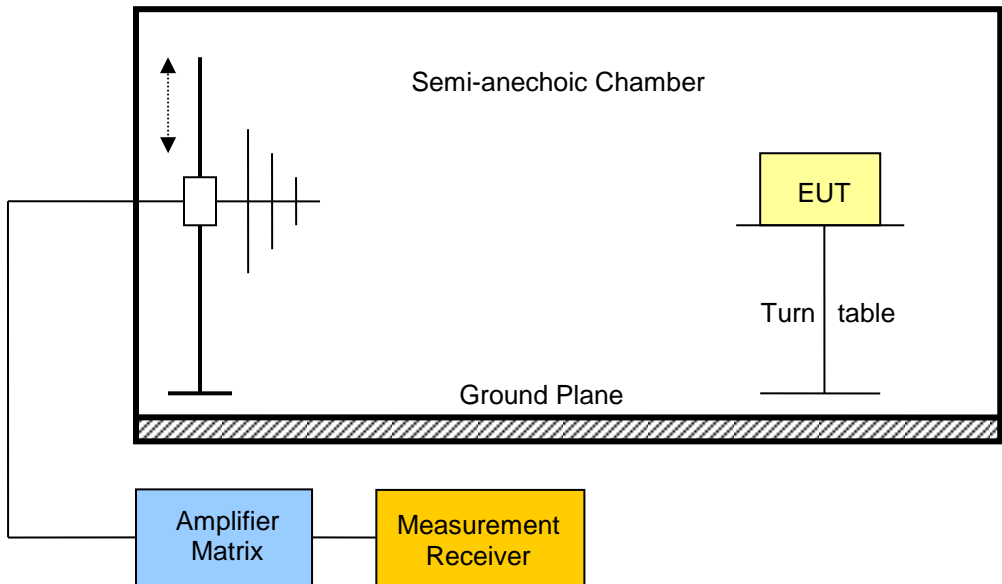
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### 3.7 Test Conditions and Results – Transmitter radiated emissions

Transmitter radiated emissions acc. to FCC 47 CFR 15.247 / ISED RSS-247				Verdict: PASS
Test according referenced standards	Reference Method			
	FCC 15.247(d) / ISED RSS-247 5.5			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 10 <sup>th</sup> 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
<p>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.</p>				
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]
0	2402	TX; BT LE	2311	54.98	pk	hor	74.00	3	-19.02
0	2402	TX; BT LE	2311	36.33	RMS	hor	54.00	3	-17.67
0	2402	TX; BT LE	2367	56.91	pk	hor	74.00	3	-17.09
0	2402	TX; BT LE	2367	37.73	RMS	hor	54.00	3	-16.27
0	2402	TX; BT LE	4800	47.09	pk	hor	74.00	1	-26.91
0	2402	TX; BT LE	4800	46.51	pk	ver	74.00	1	-27.49
19	2440	TX; BT LE	2488.3	57.84	pk	hor	74.00	3	-16.16
19	2440	TX; BT LE	2488.3	28.36	avg	hor	54.00	3	-25.64
19	2440	TX; BT LE	4880	47.82	pk	hor	74.00	1	-26.18
19	2440	TX; BT LE	4880	47.80	pk	ver	74.00	1	-26.20
39	2480	TX; BT LE	2488.2	56.98	pk	hor	74.00	3	-17.02
39	2480	TX; BT LE	2488.2	39.23	RMS	hor	54.00	3	-14.77
39	2480	TX; BT LE	4960	47.97	pk	hor	74.00	1	-26.03
39	2480	TX; BT LE	4960	47.94	pk	ver	74.00	1	-26.06
Comments: * Physical distance between EUT and measurement antenna.									

### 3.8 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. to ISED RSS-247				Verdict: PASS
Test according referenced standards	Reference Method			
	ISED RSS-247 3.1			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 5 <sup>th</sup> 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							
<div>1. EUT set to receive mode (Communication tester is used if needed)</div> <div>2. Span it set according to measurement range</div> <div>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</div> <div>4. Markers are set to peak emission levels</div>							
Test results							
Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dBμV/m]	Pol.	Det.	Limit [dBμV/m]	Margin [dBμV/m]
19	2440	No significant spurious emissions					
Comments:							
* Emission level corresponds to ambient noise floor							



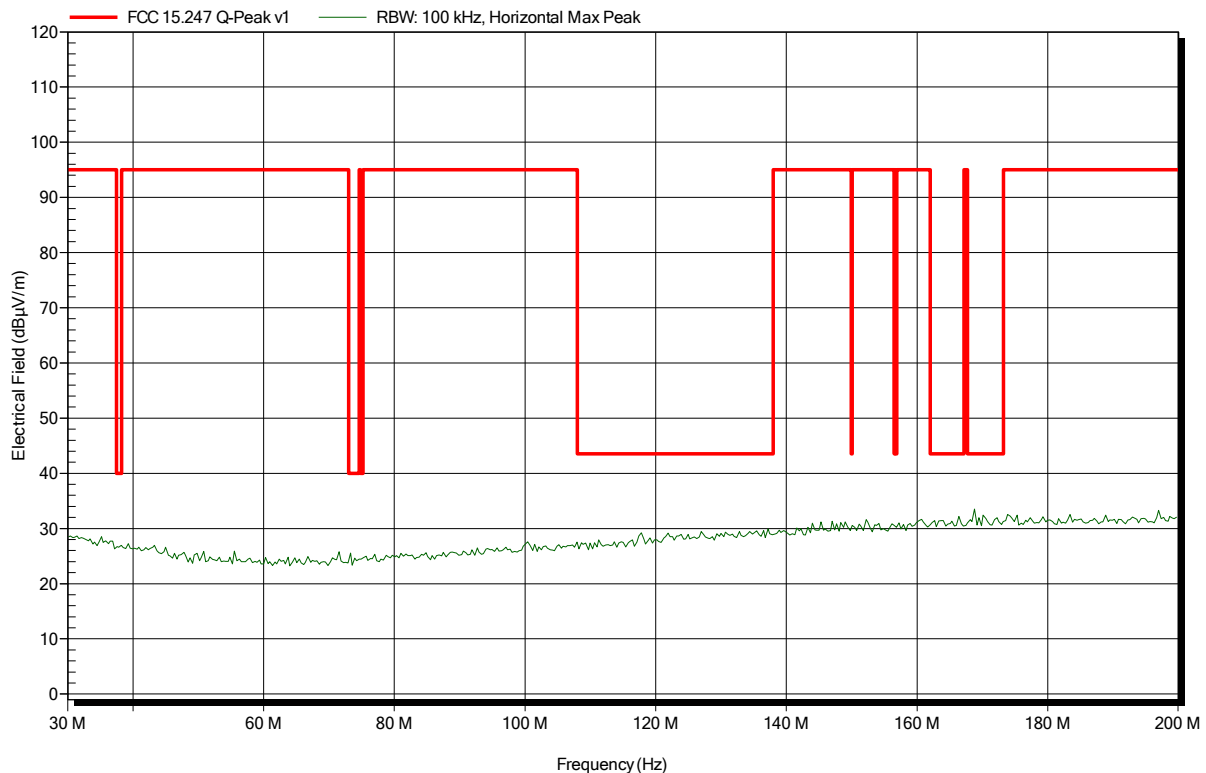
## ANNEX A Transmitter radiated spurious emissions

### Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; BT LE; 2402 MHz
Test Date:	2016-04-13
Note:	

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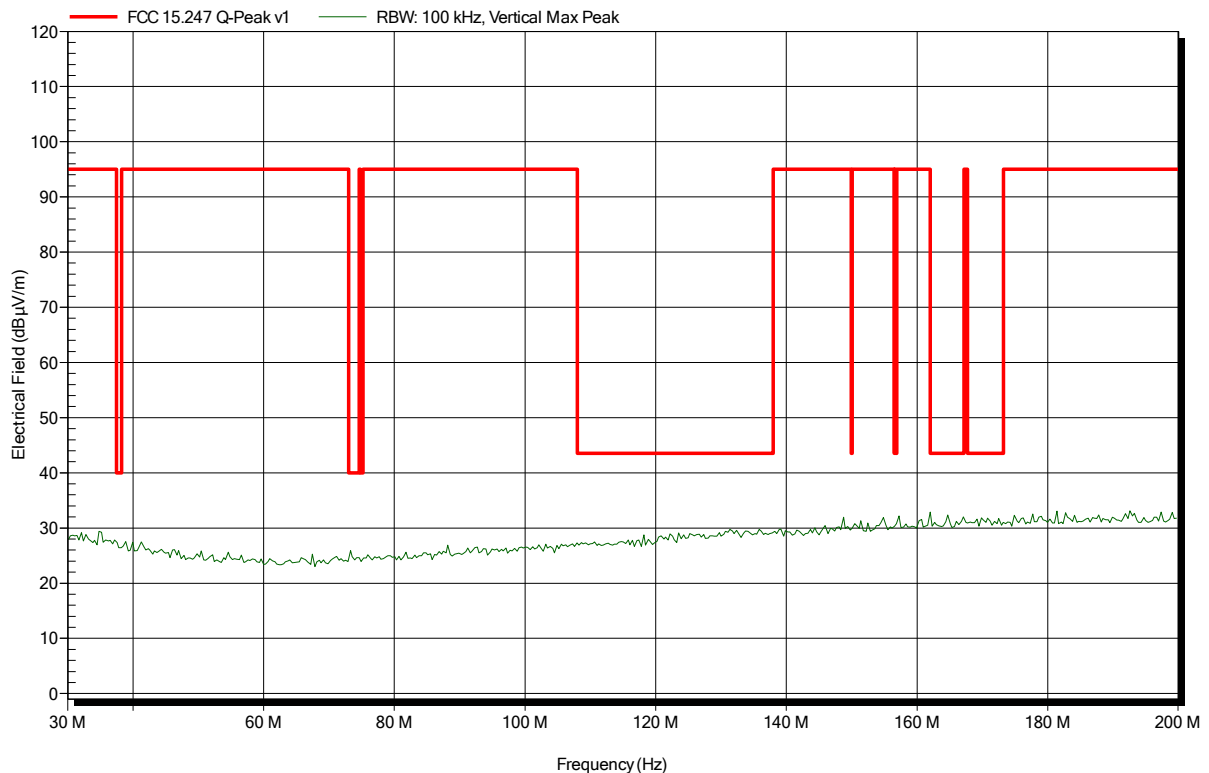


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; BT LE; 2402 MHz
Test Date:	2016-04-13
Note:	

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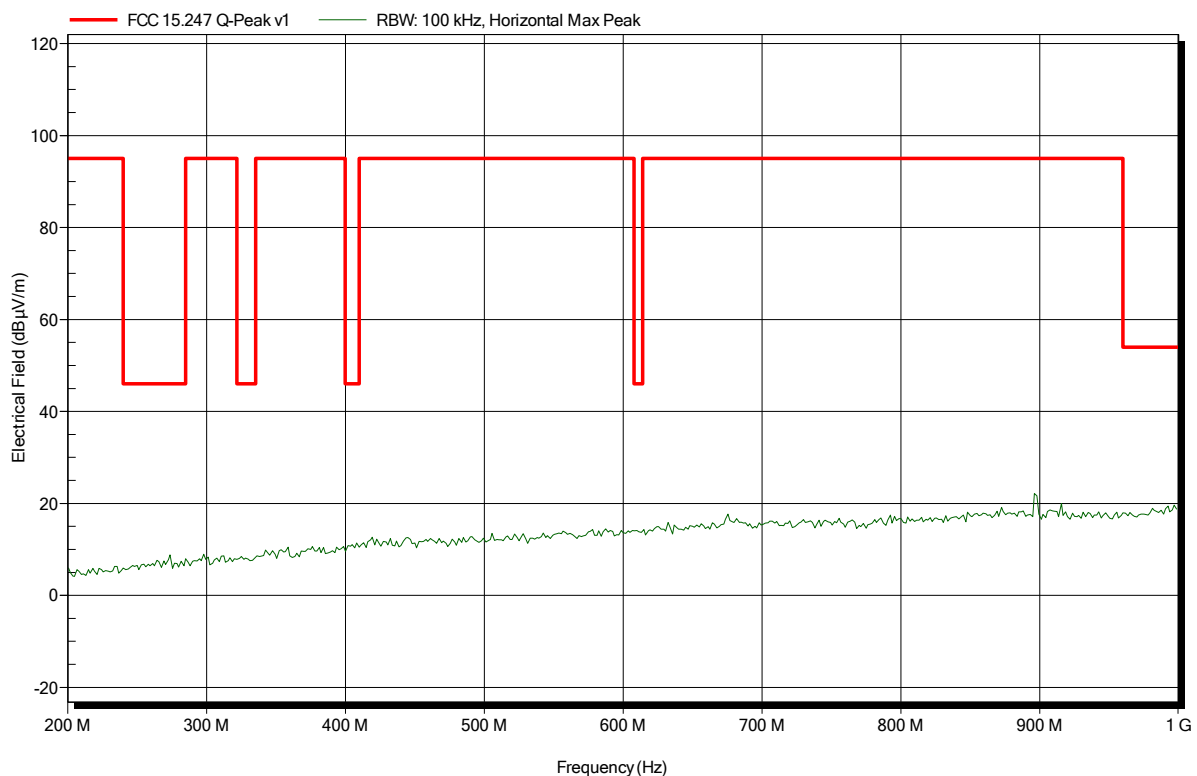


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; BT LE; 2402 MHz
Test Date:	2016-04-13
Note:	

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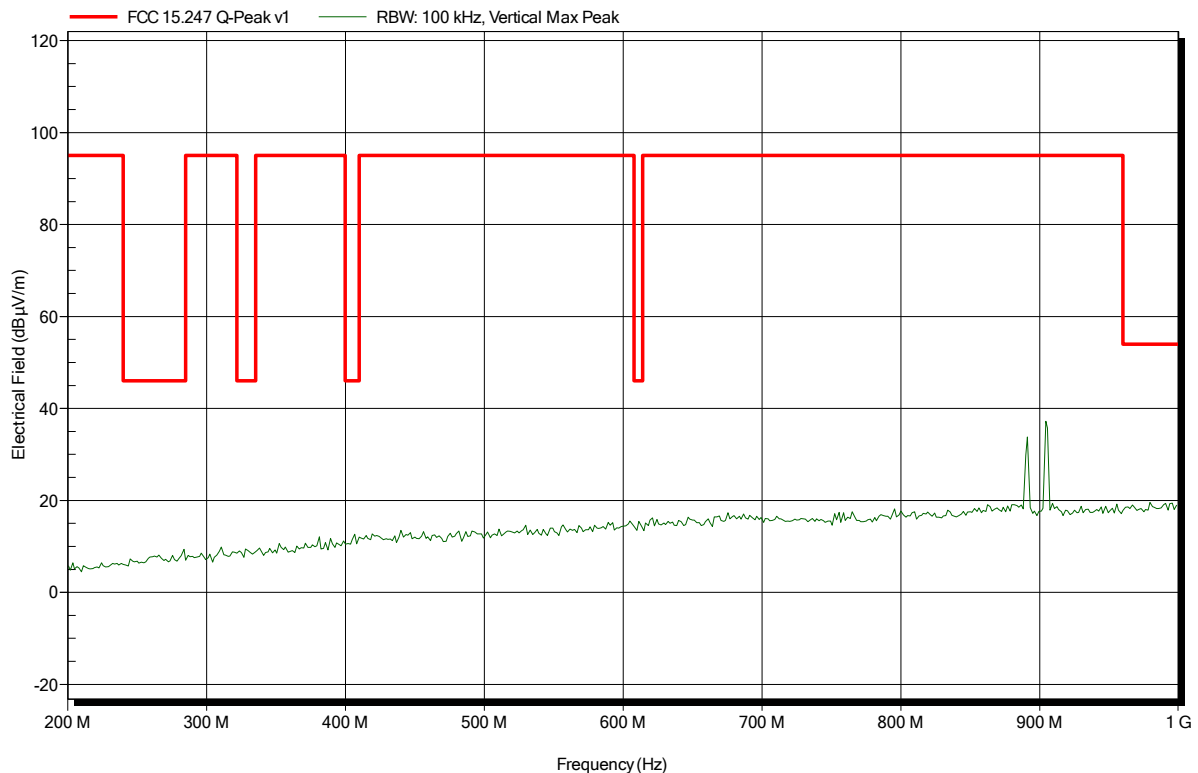


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; BT LE; 2402 MHz
Test Date:	2016-04-13
Note:	

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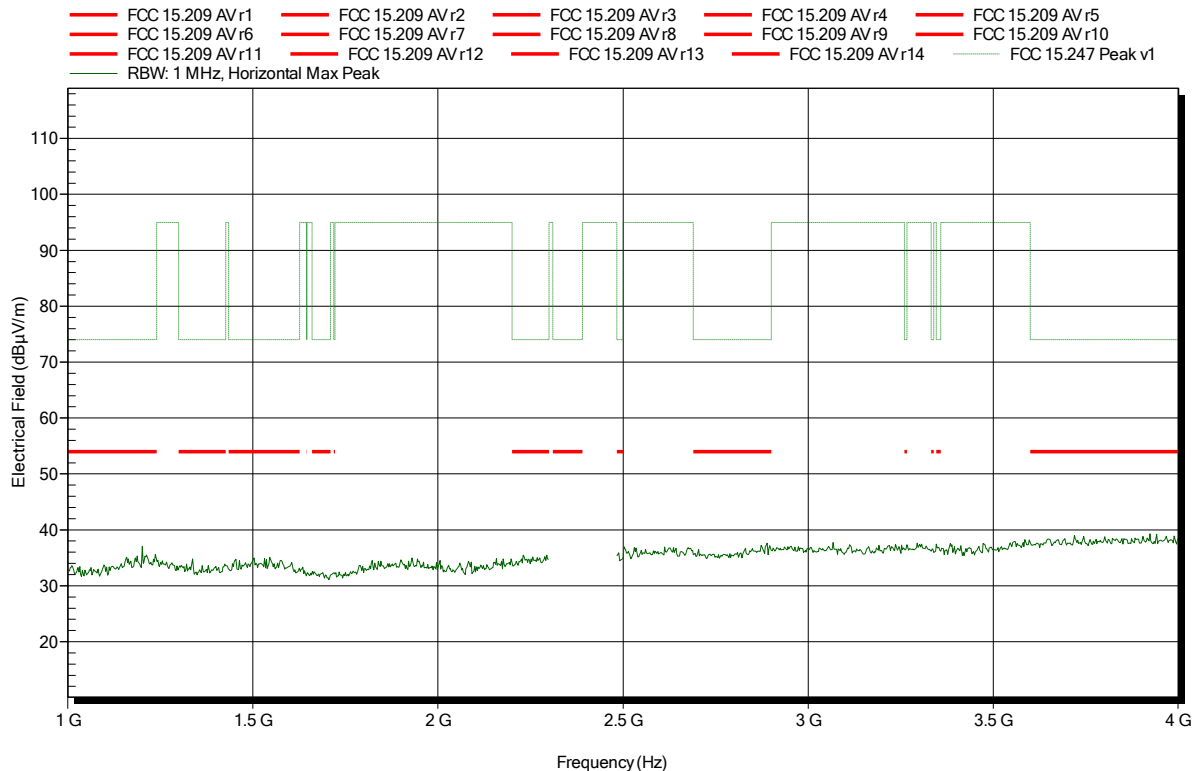


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

Index 2

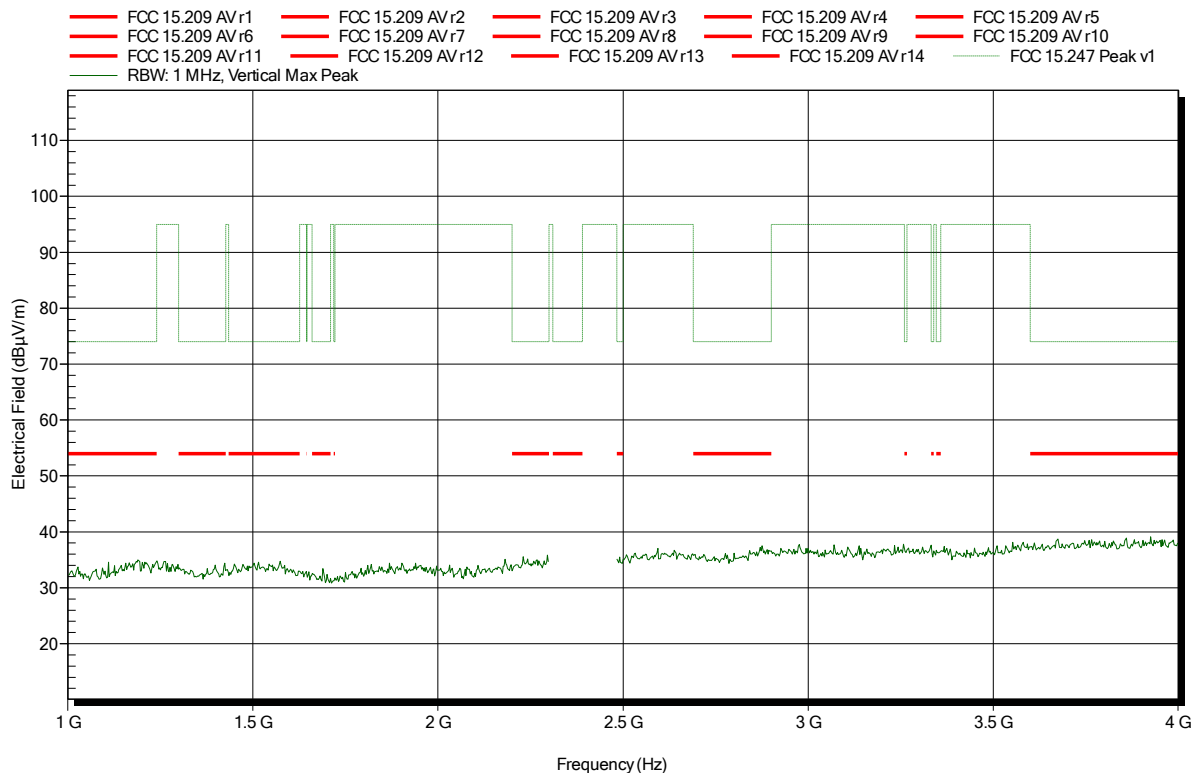


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

Index 3

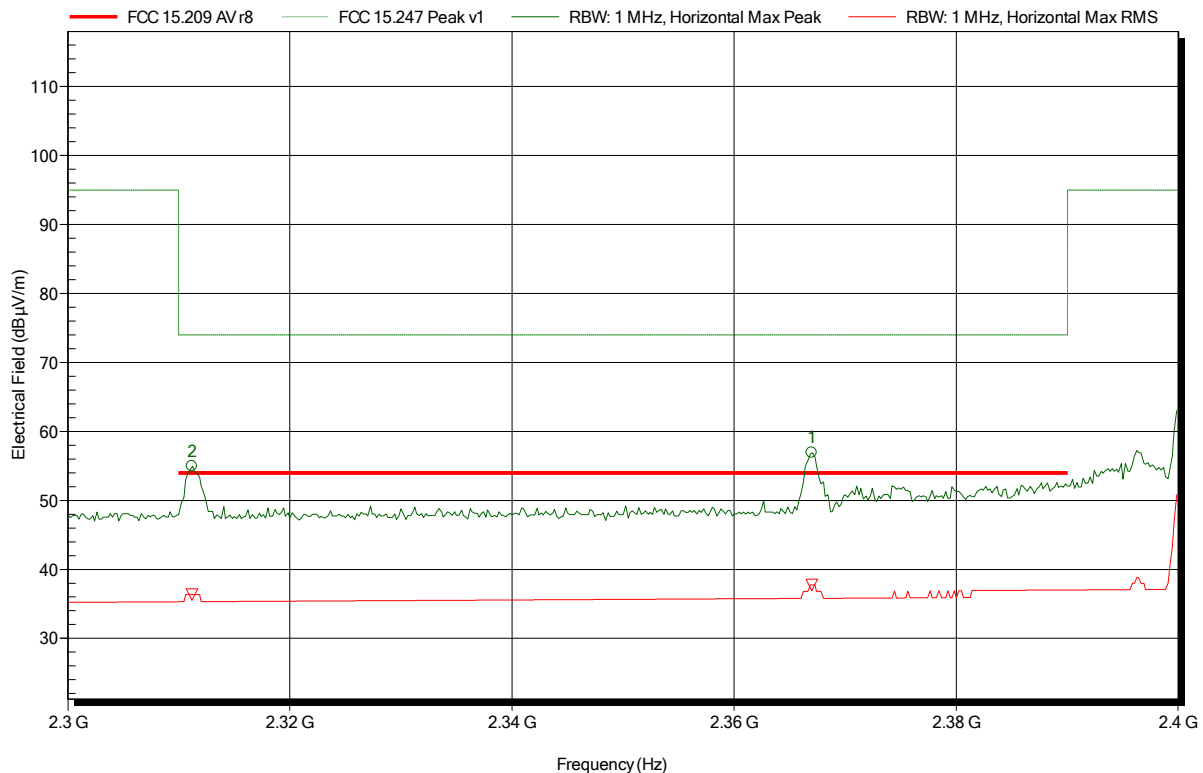


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note: lower bandedge

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.311 GHz	54.98 dBµV/m	74 dBµV/m	-19.02 dB	Pass
2.367 GHz	56.91 dBµV/m	74 dBµV/m	-17.09 dB	Pass

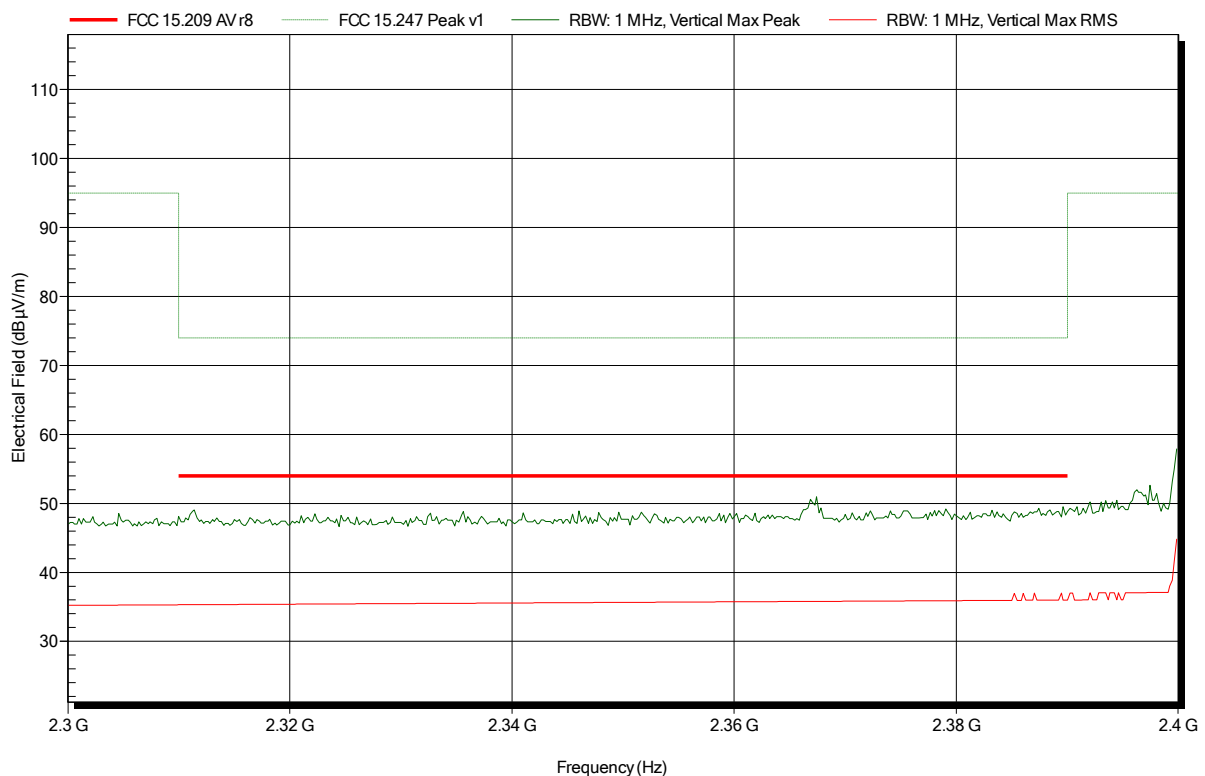
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.311 GHz	36.33 dBµV/m	54 dBµV/m	-17.67 dB	Pass
2.367 GHz	37.73 dBµV/m	54 dBµV/m	-16.27 dB	Pass

## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT LE; 2402 MHz
Test Date:	2016-04-13
Note:	lower bandedge

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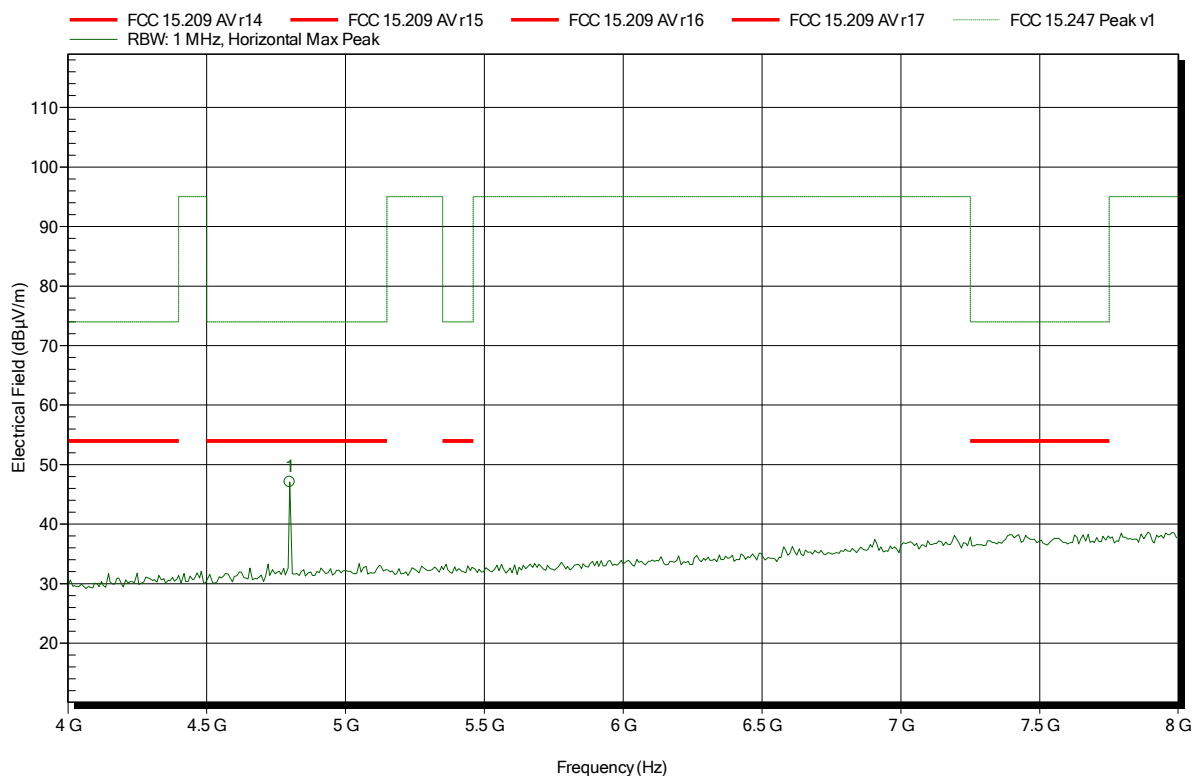


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

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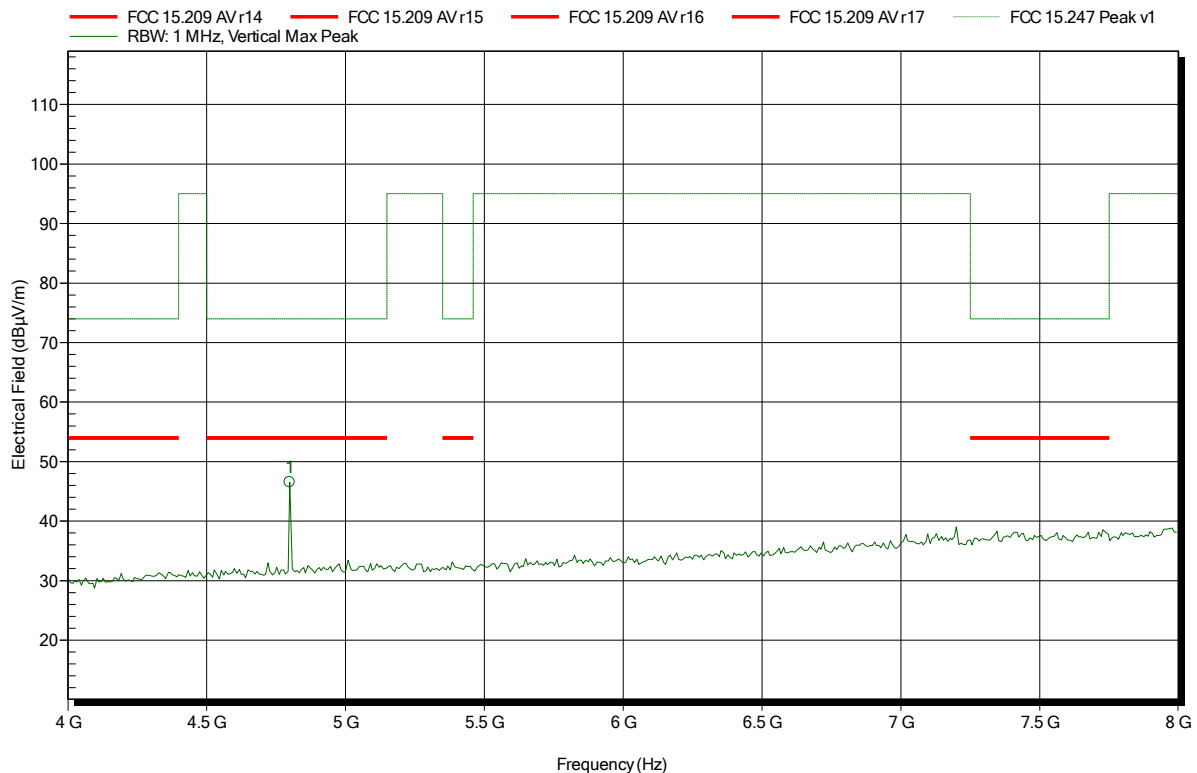
Frequency	Peak	Peak Limit	Peak Difference	Status
4.8 GHz	47.09 dBµV/m	74 dBµV/m	-26.91 dB	Pass

## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

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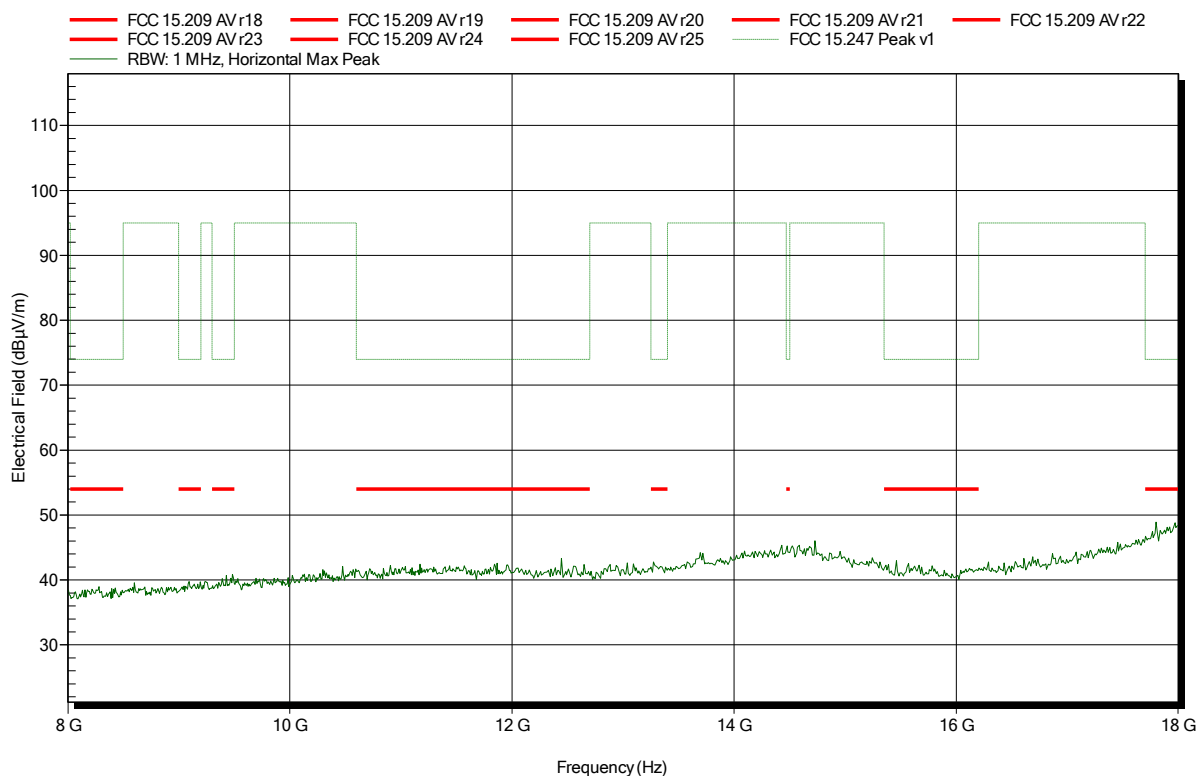
Frequency	Peak	Peak Limit	Peak Difference	Status
4.8 GHz	46.51 dBµV/m	74 dBµV/m	-27.49 dB	Pass

## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

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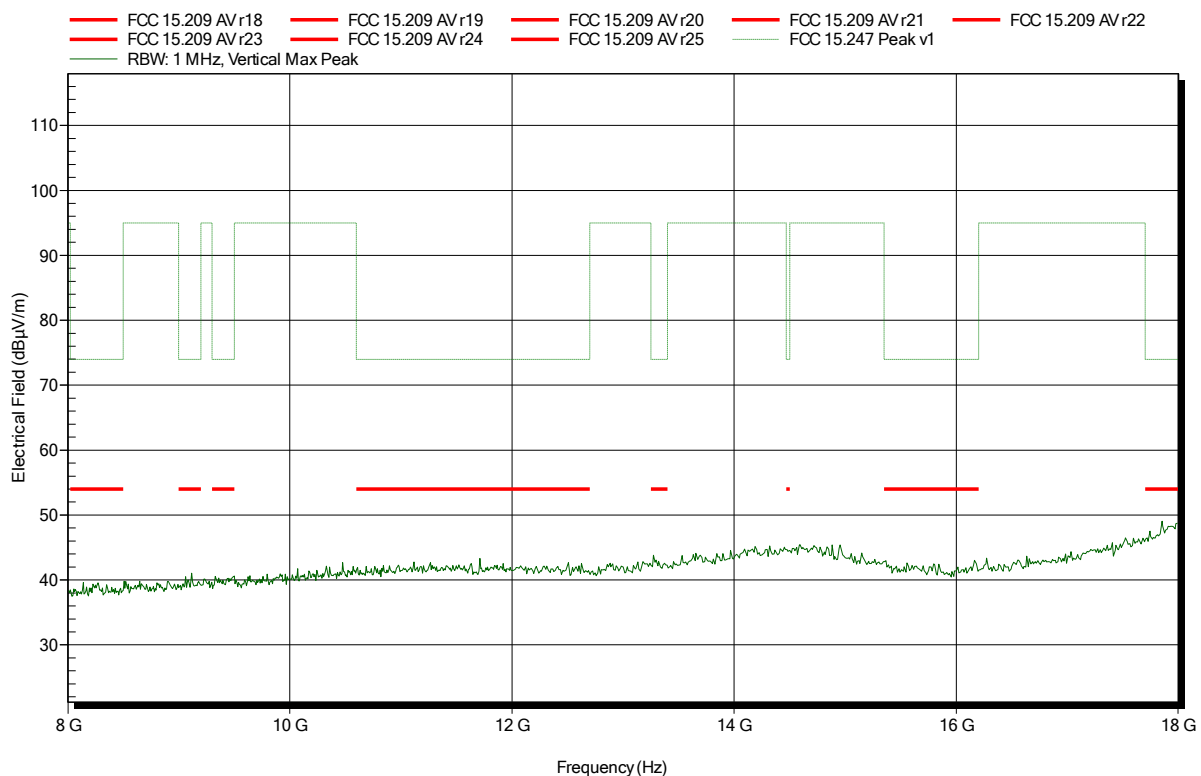


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

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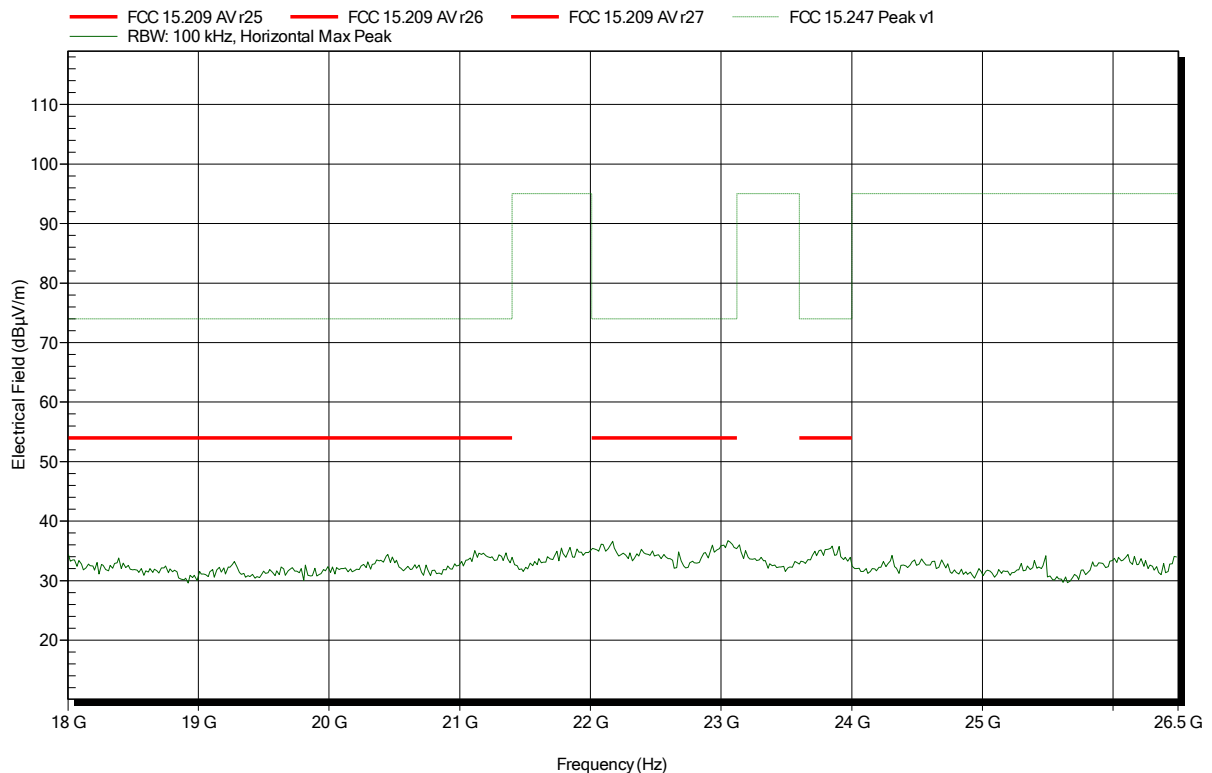


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Configurable Antenna, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

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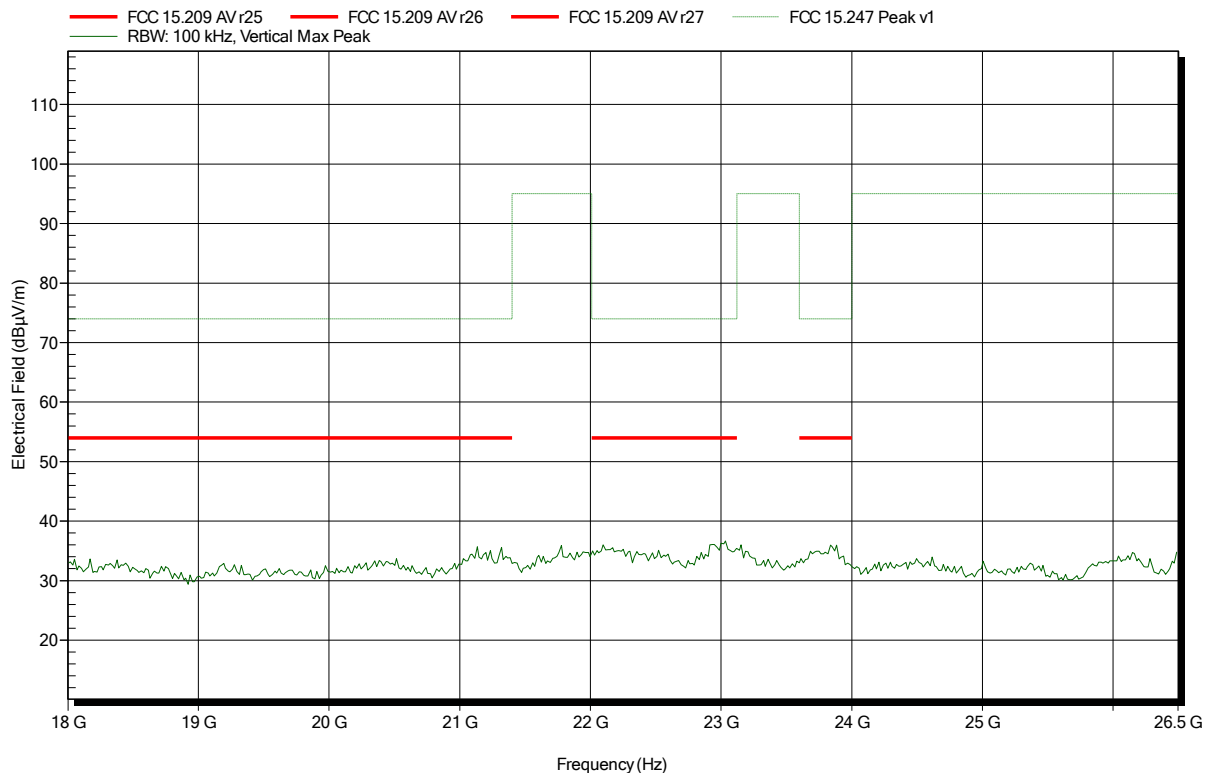


**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Configurable Antenna, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2402 MHz  
 Test Date: 2016-04-13  
 Note:

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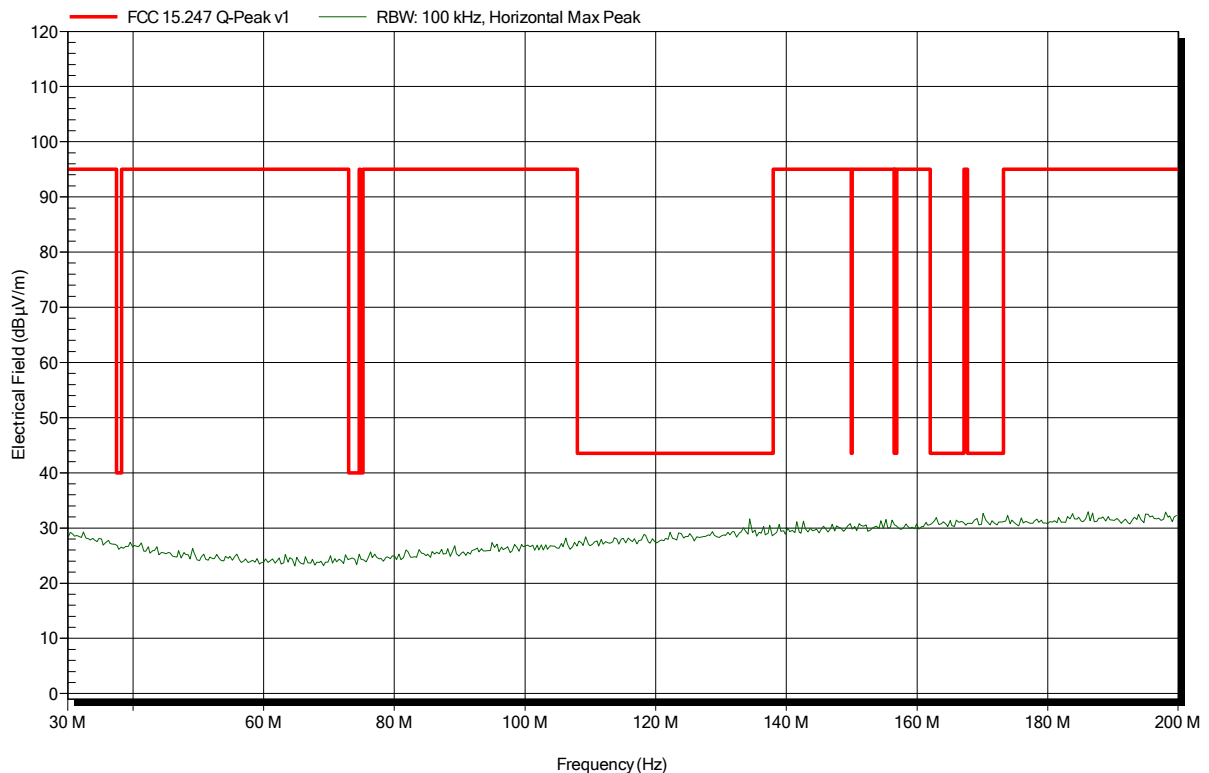


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; BT LE; 2440 MHz
Test Date:	2016-04-13
Note:	

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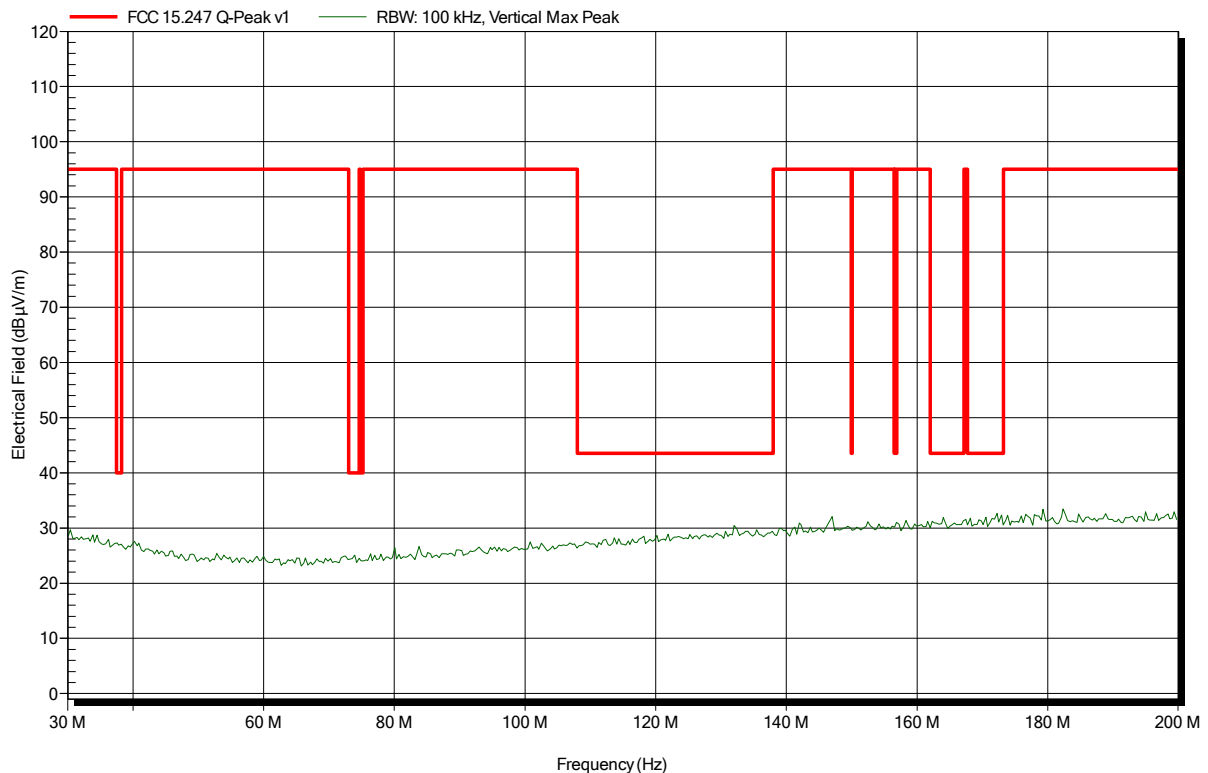


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; BT LE; 2440 MHz
Test Date:	2016-04-13
Note:	

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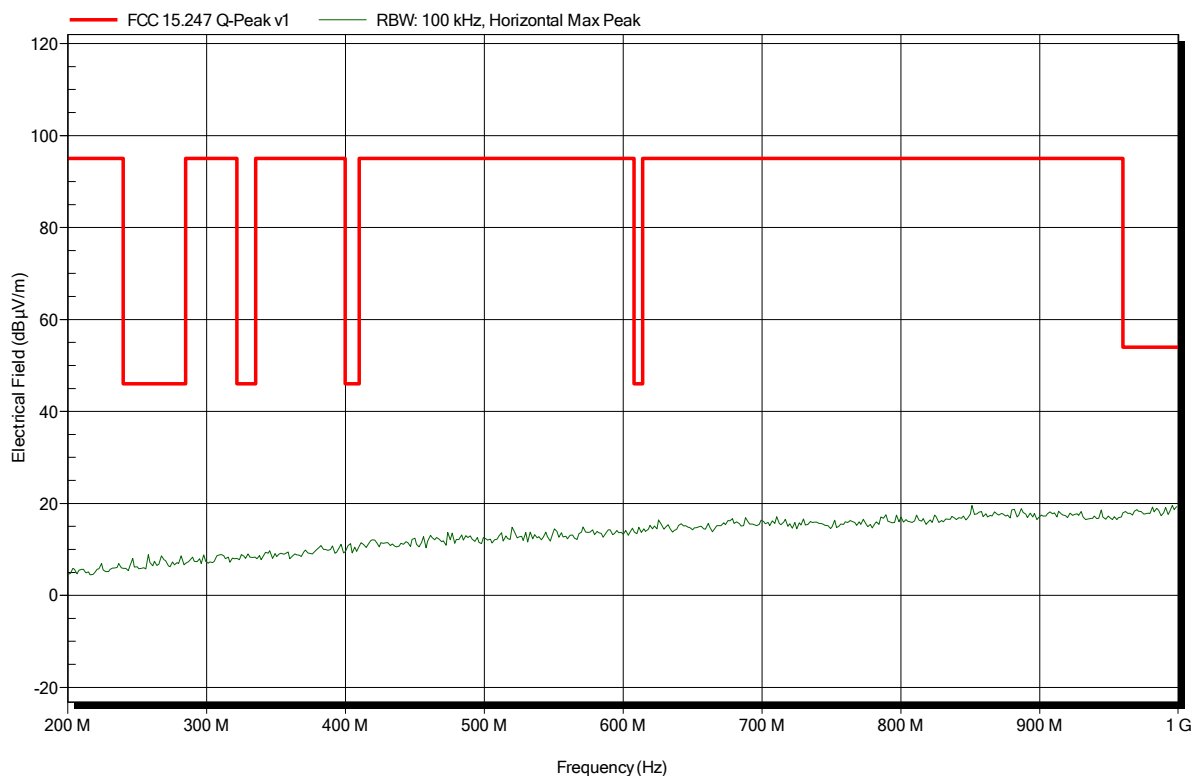


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; BT LE; 2440 MHz
Test Date:	2016-04-13
Note:	

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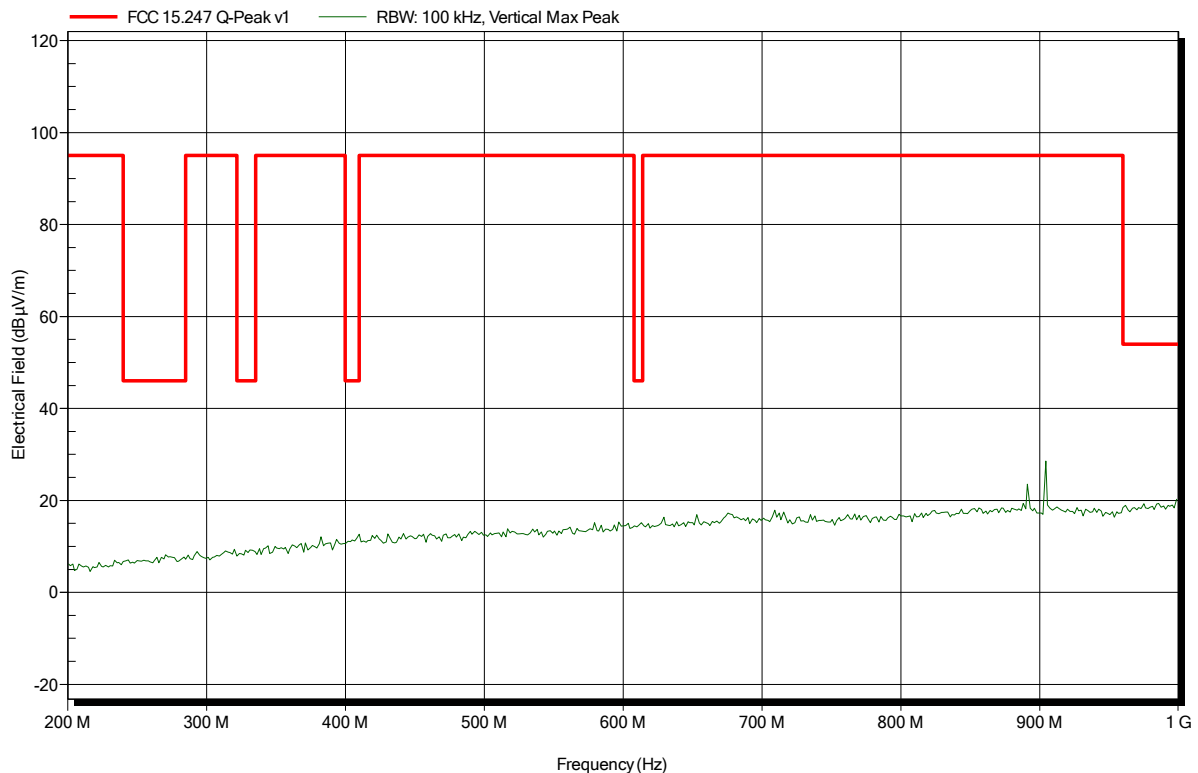


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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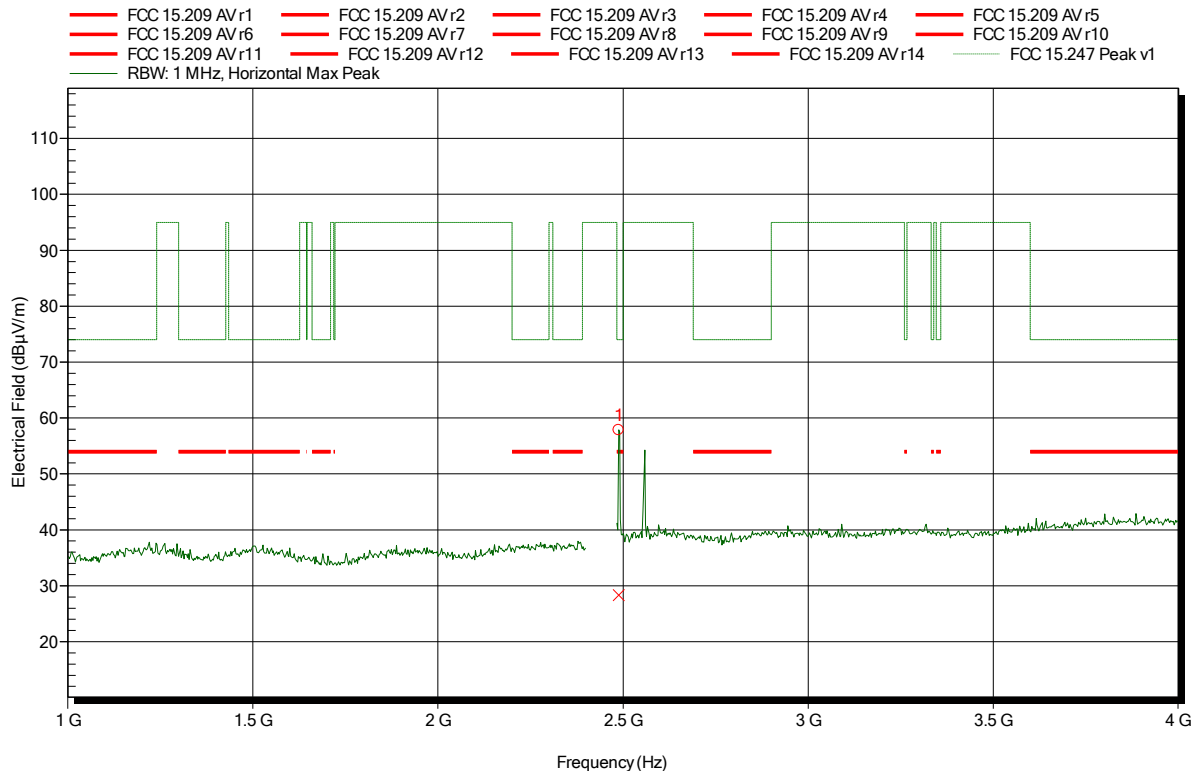


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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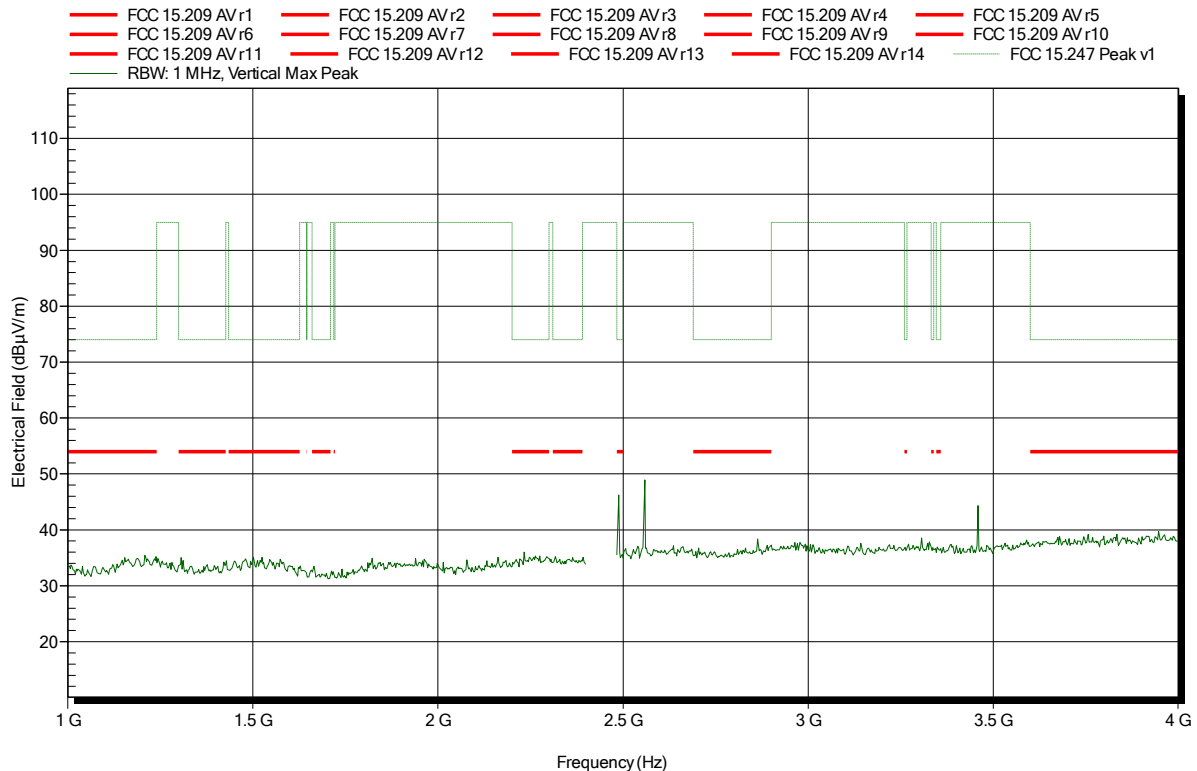
Frequency 2.4883 GHz	Peak 57.84 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -16.16 dB	Peak Status Pass
Frequency 2.4883 GHz	Average 28.36 dBµV/m	Average Limit 54 dBµV/m	Average Difference -25.64 dB	Average Status Pass

**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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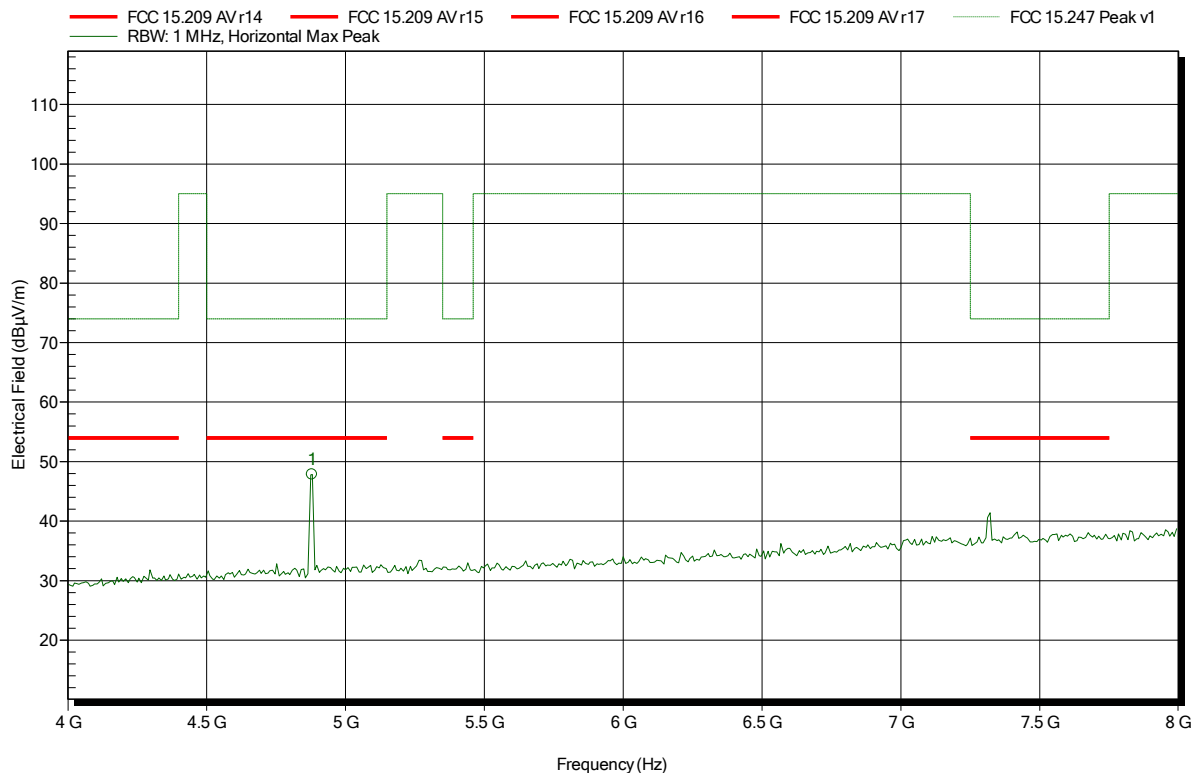


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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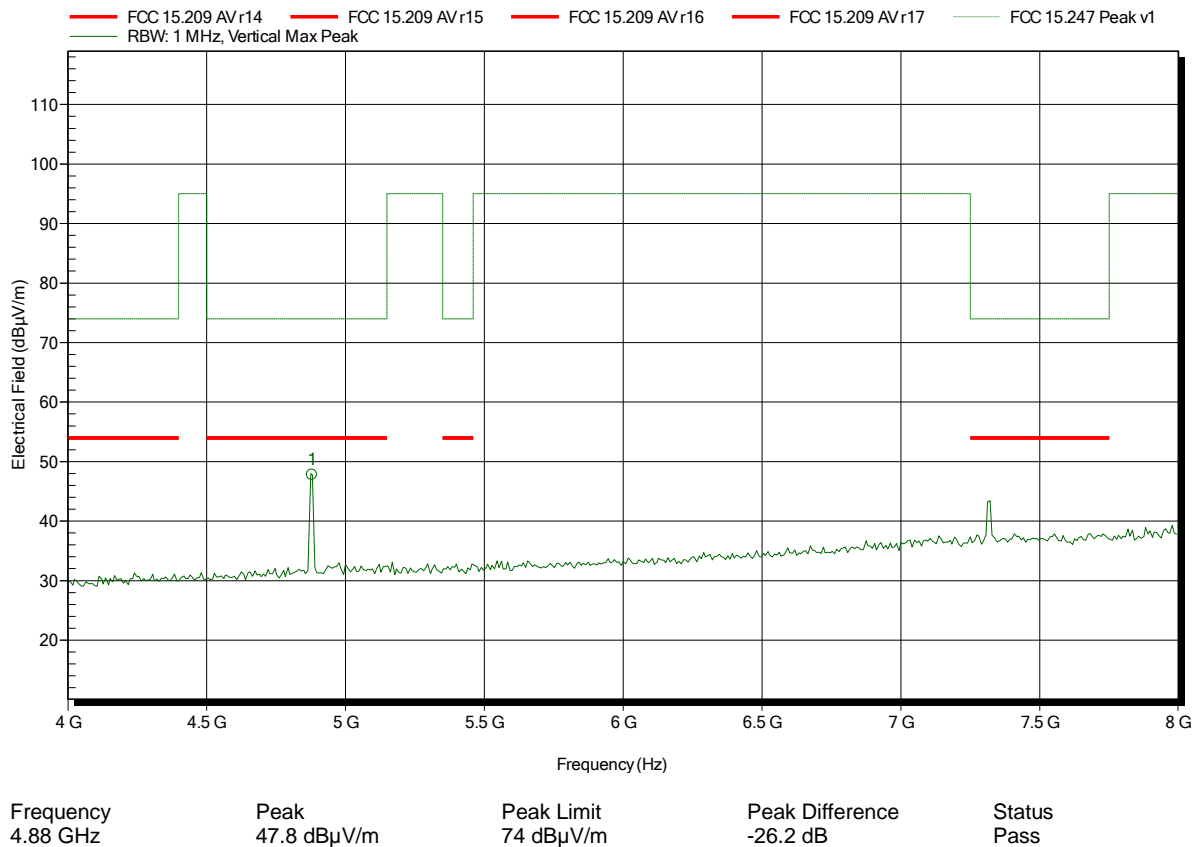
Frequency	Peak	Peak Limit	Peak Difference	Status
4.88 GHz	47.82 dBµV/m	74 dBµV/m	-26.18 dB	Pass

## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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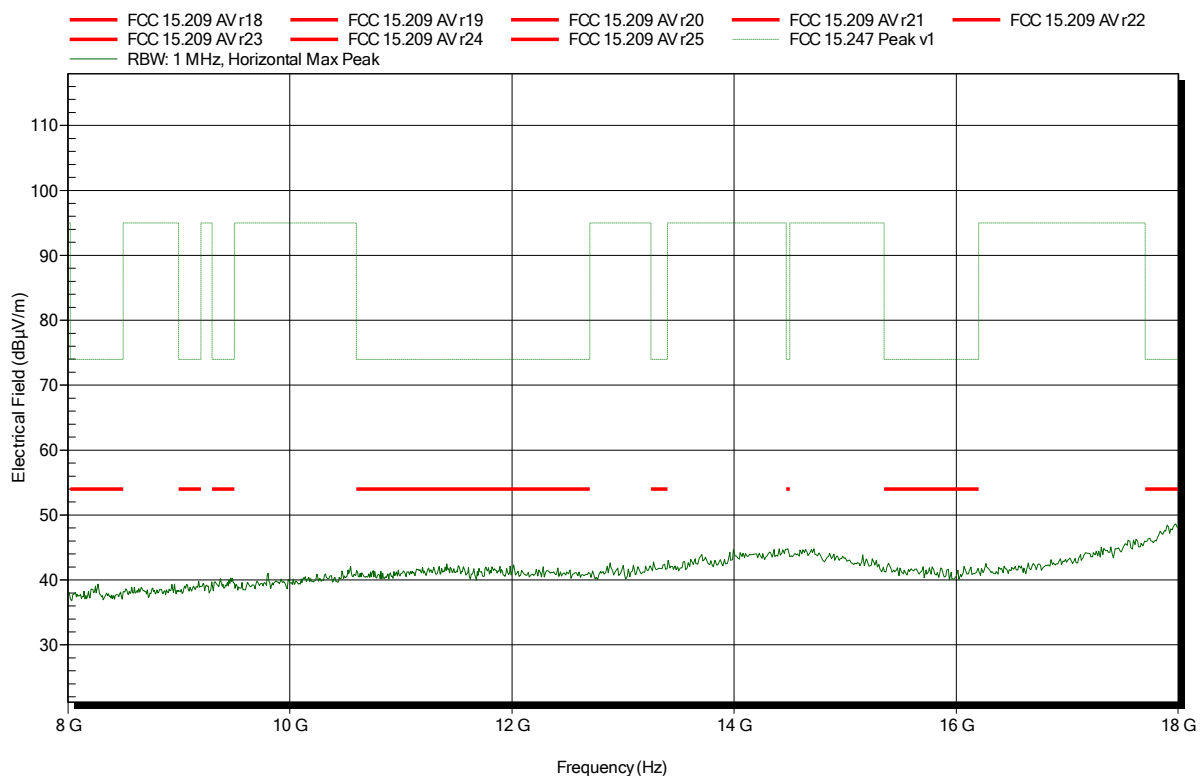


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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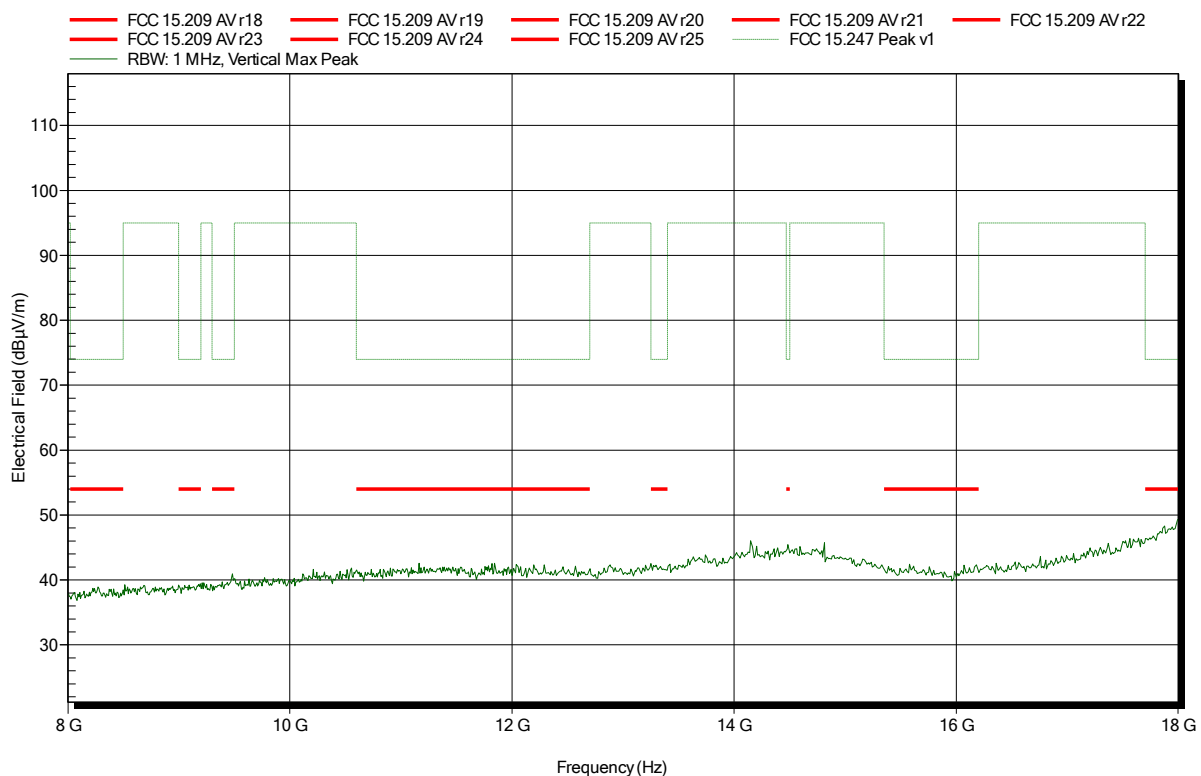


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2440 MHz  
 Test Date: 2016-04-13  
 Note:

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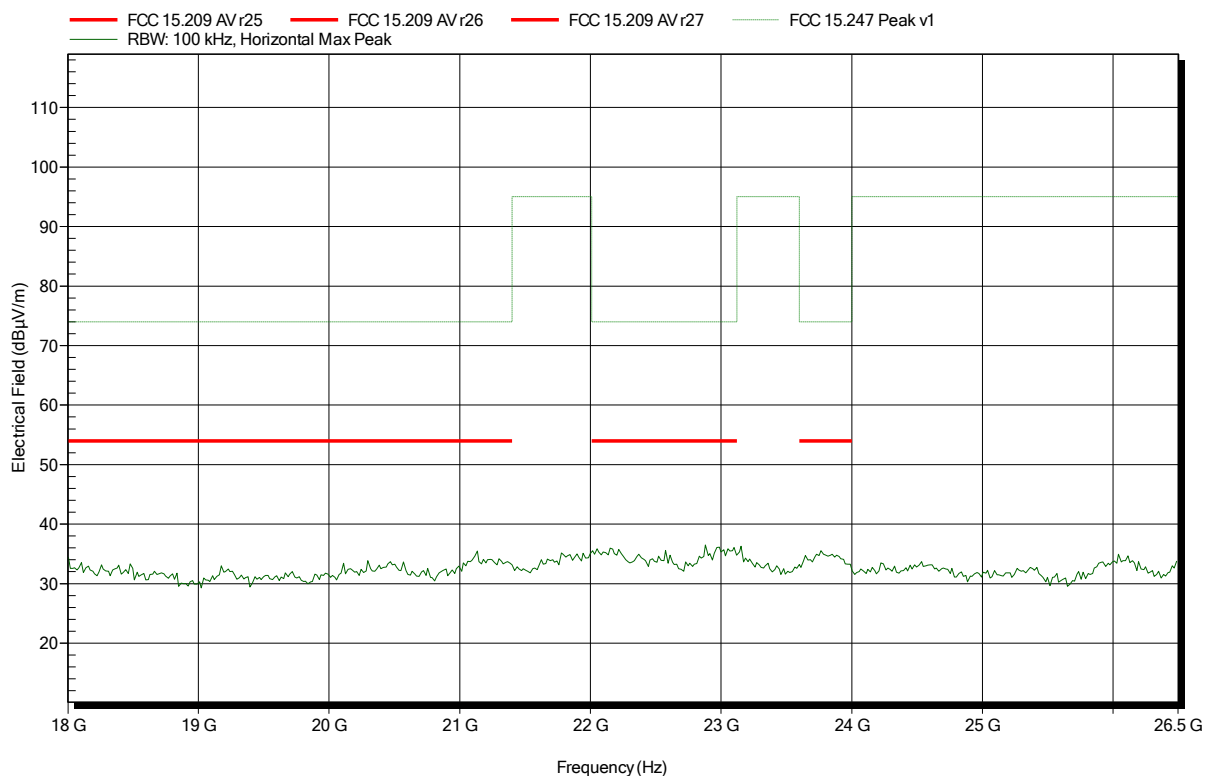


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Configurable Antenna, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT LE; 2440 MHz
Test Date:	2016-04-13
Note:	

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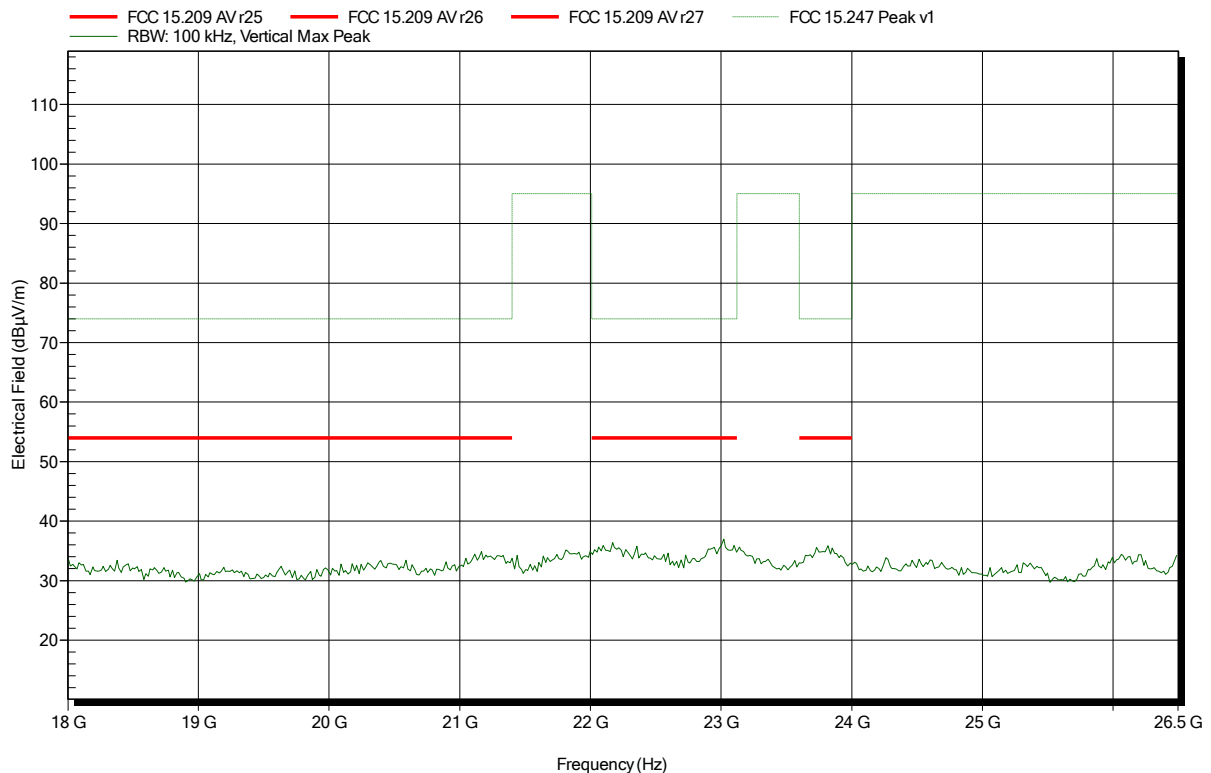


**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Configurable Antenna, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT LE; 2440 MHz
Test Date:	2016-04-13
Note:	

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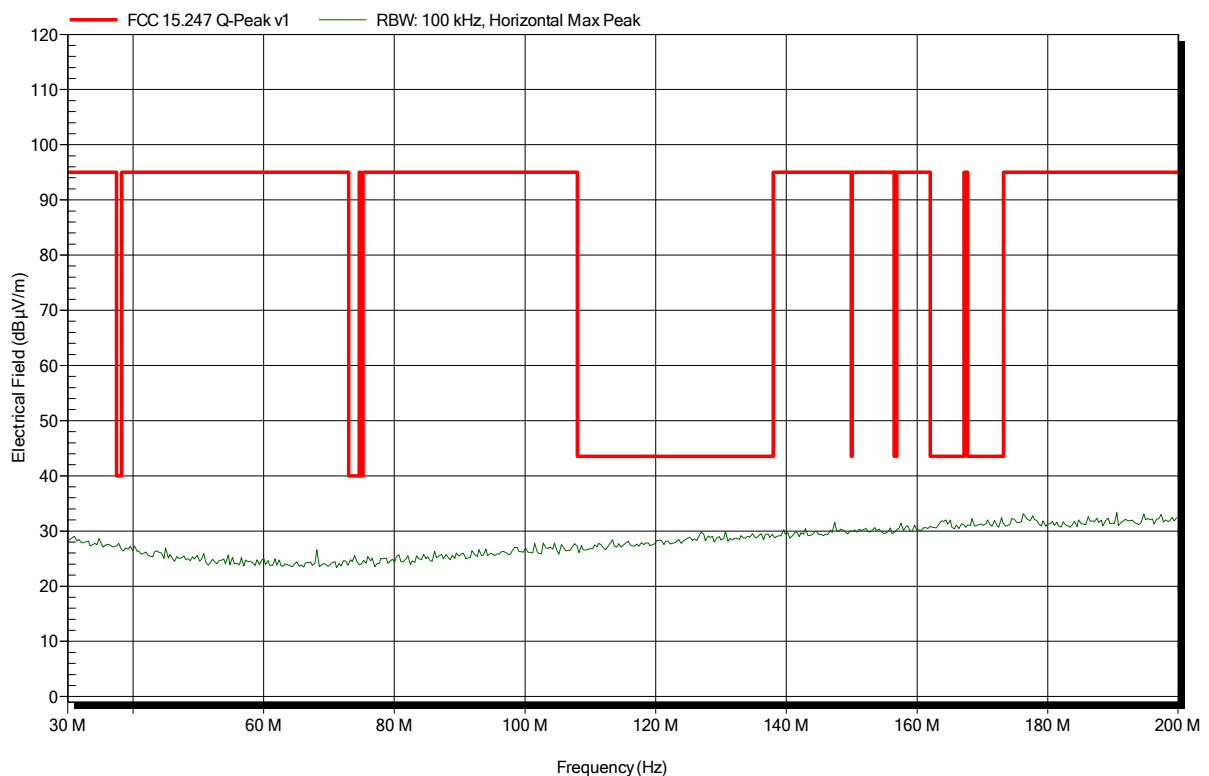


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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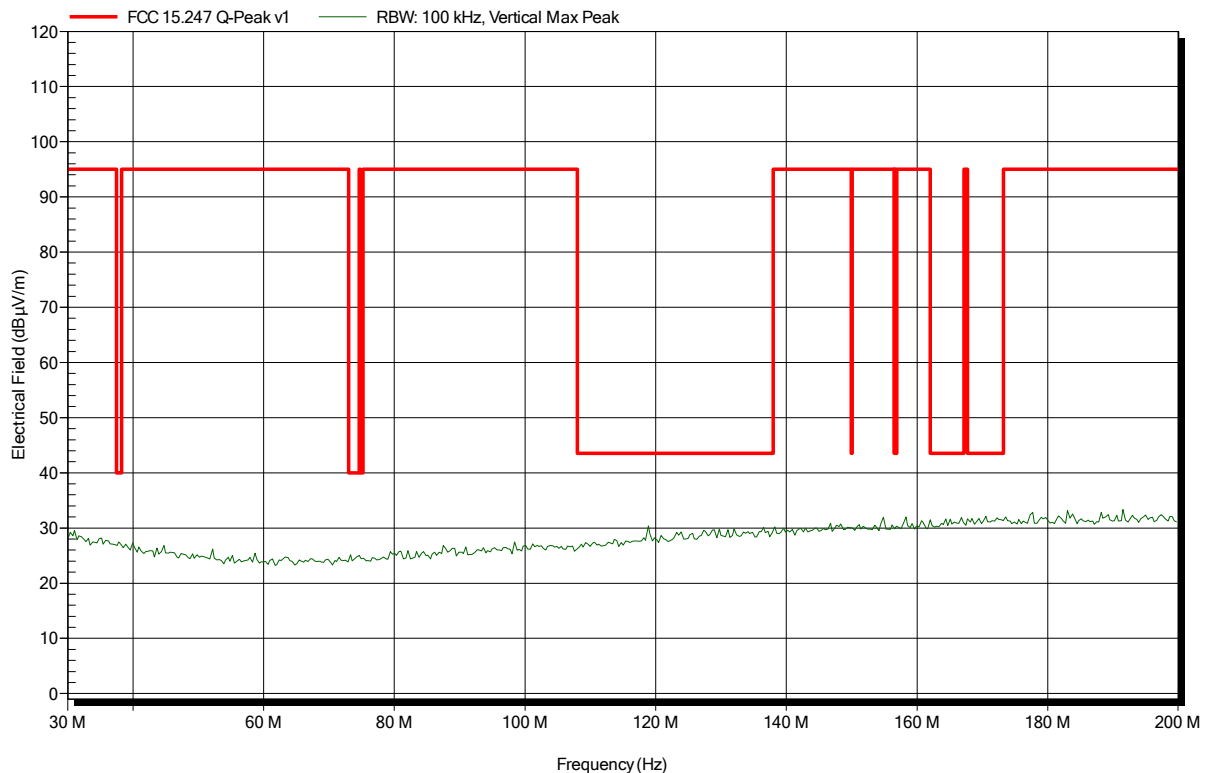


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; BT LE; 2480 MHz
Test Date:	2016-04-13
Note:	

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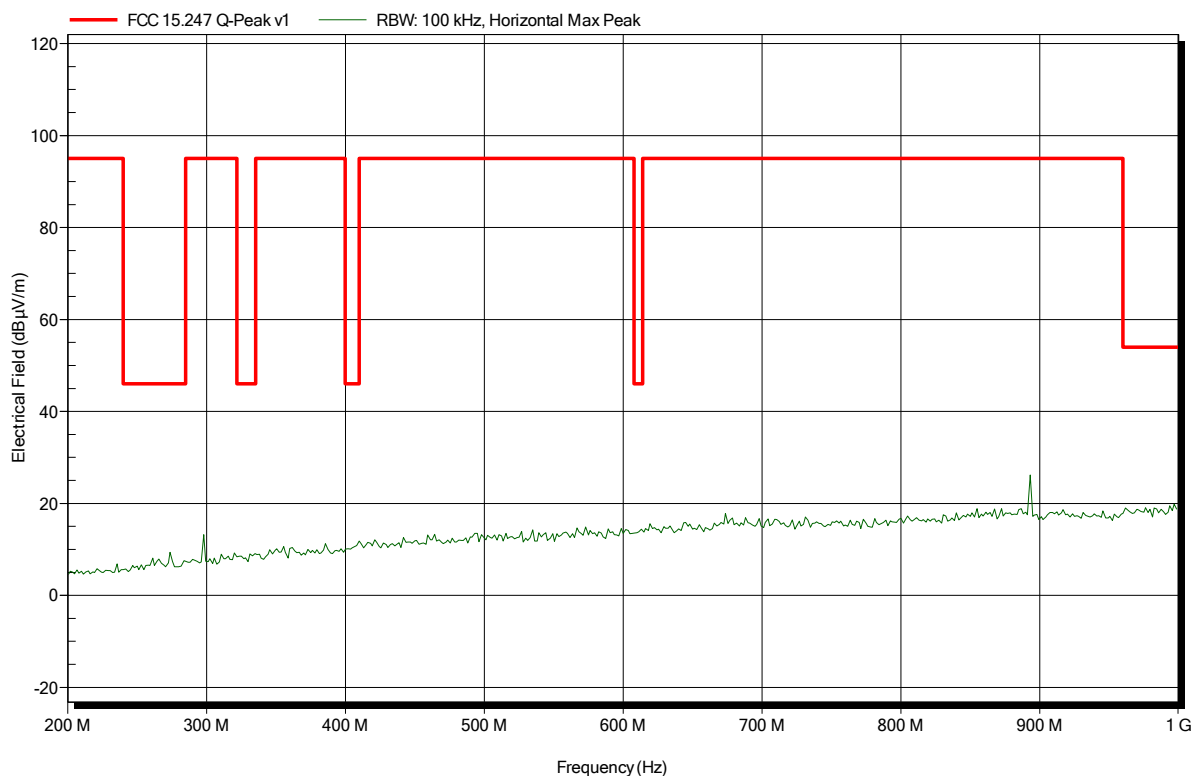


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; BT LE; 2480 MHz
Test Date:	2016-04-13
Note:	

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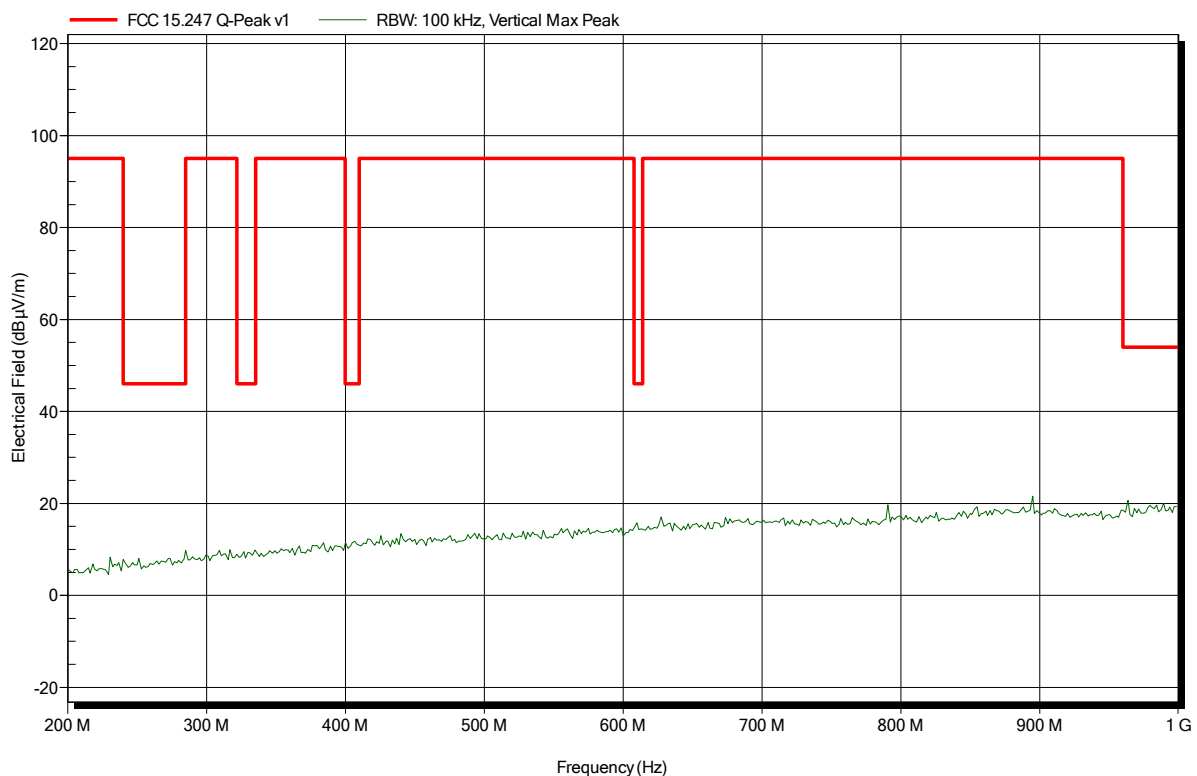


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; BT LE; 2480 MHz
Test Date:	2016-04-13
Note:	

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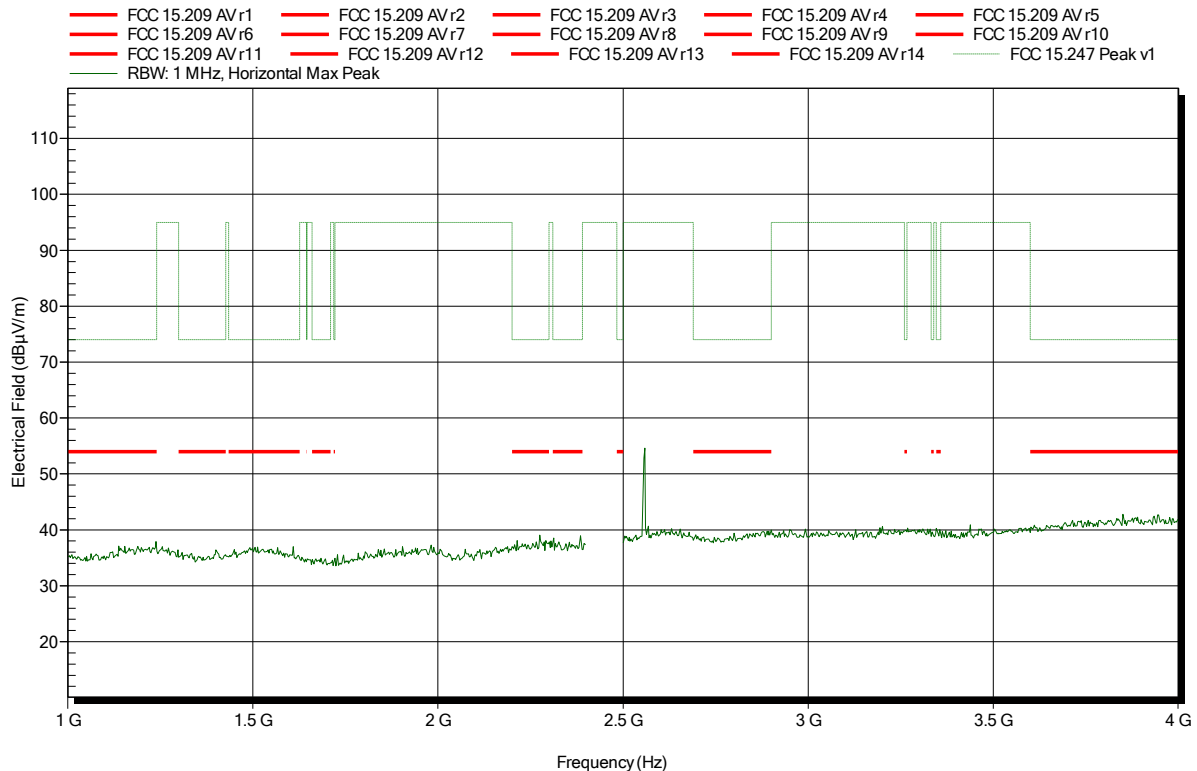


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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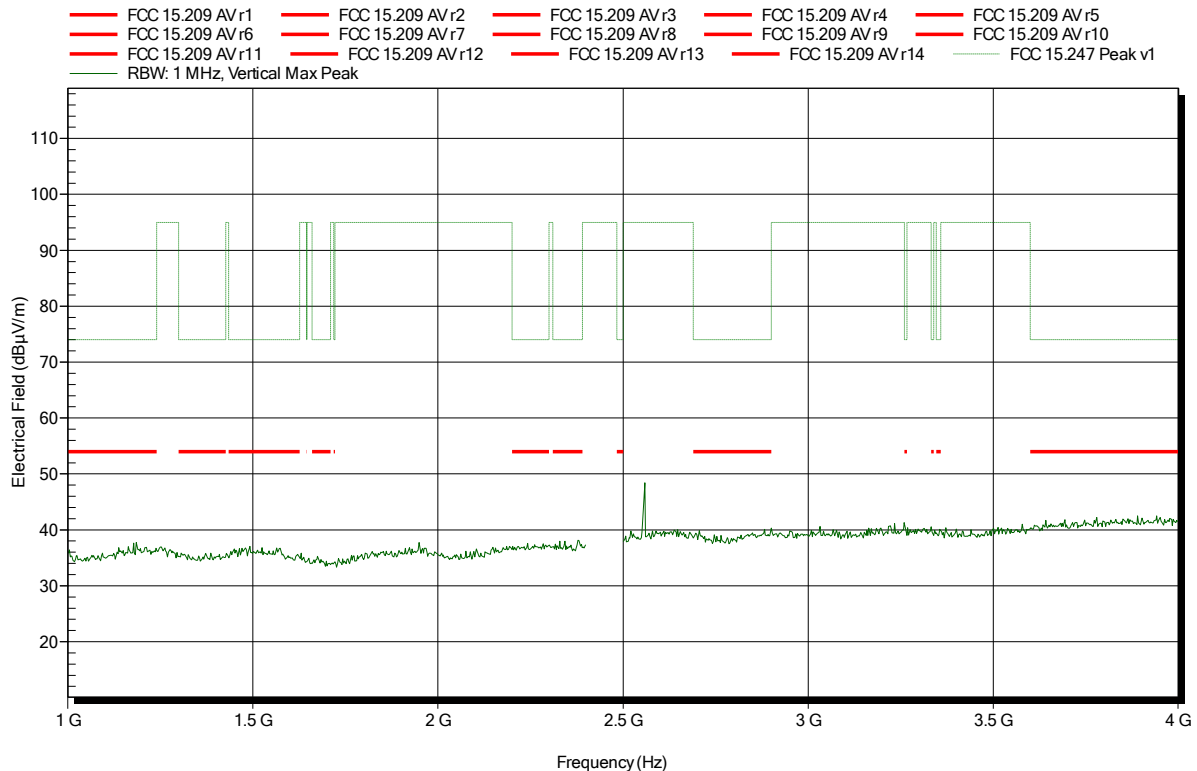


**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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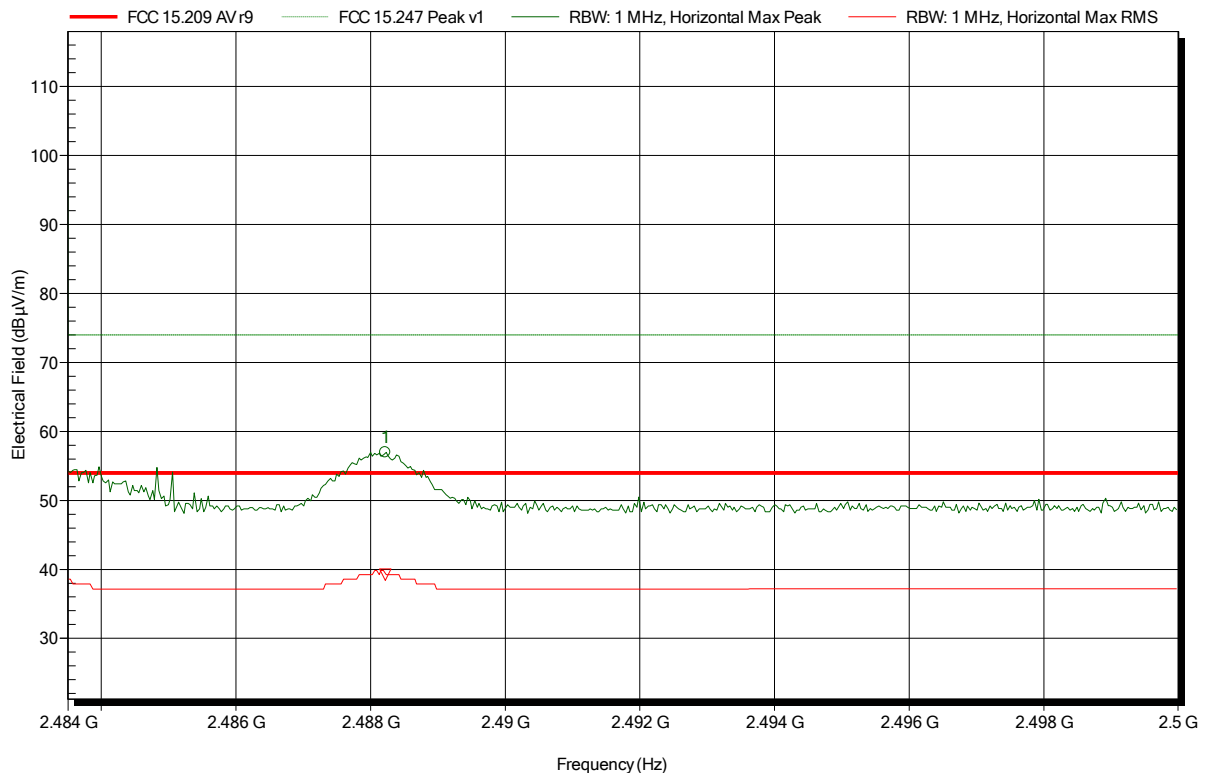


**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note: upper bandedge

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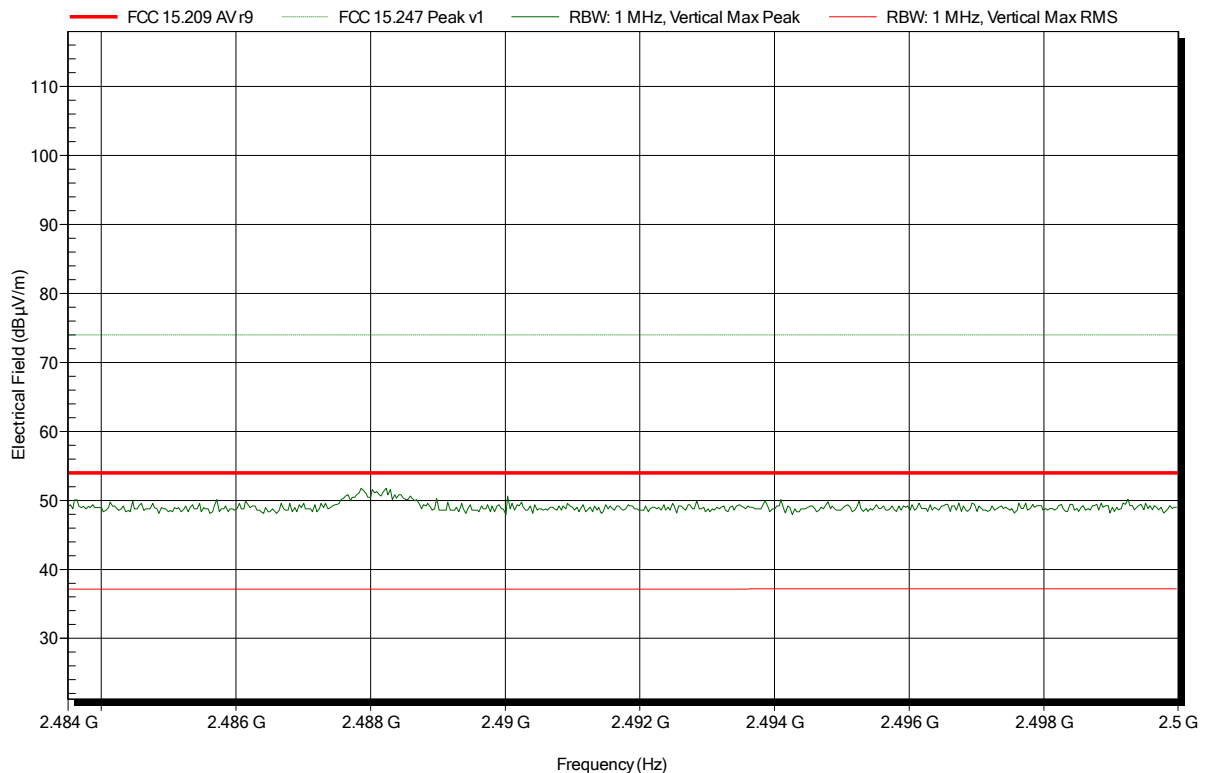
Frequency 2.4882 GHz	Peak 56.98 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -17.02 dB	Peak Status Pass
Frequency 2.4882 GHz	RMS 39.23 dBµV/m	RMS Limit 54 dBµV/m	RMS Difference -14.77 dB	RMS Status Pass

**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT LE; 2480 MHz
Test Date:	2016-04-13
Note:	upper bandedge

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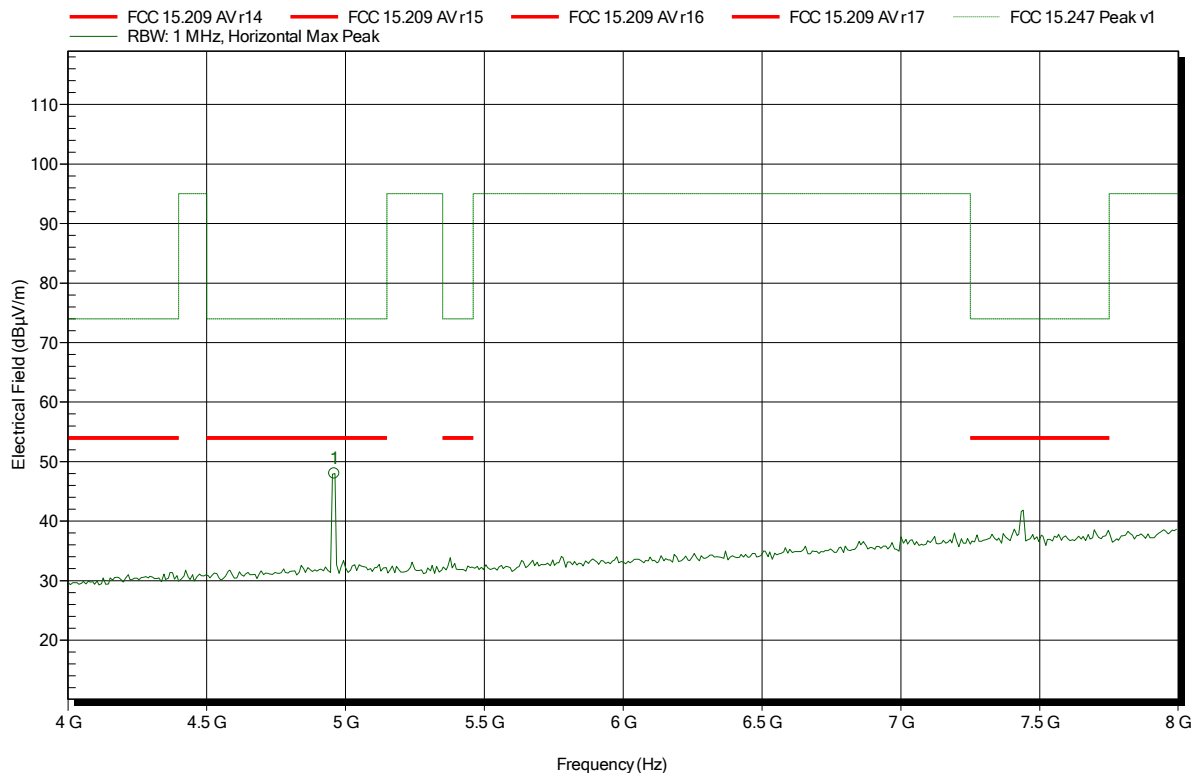


**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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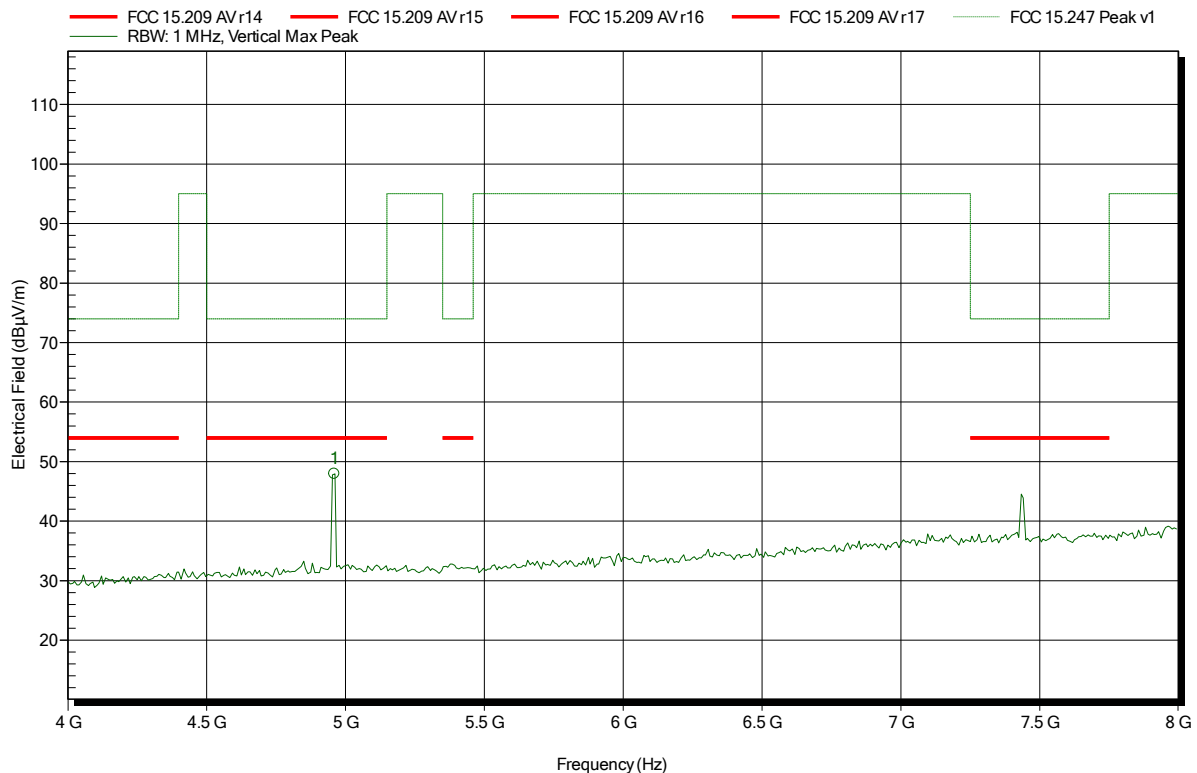
Frequency	Peak	Peak Limit	Peak Difference	Status
4.96 GHz	47.97 dBµV/m	74 dBµV/m	-26.03 dB	Pass

## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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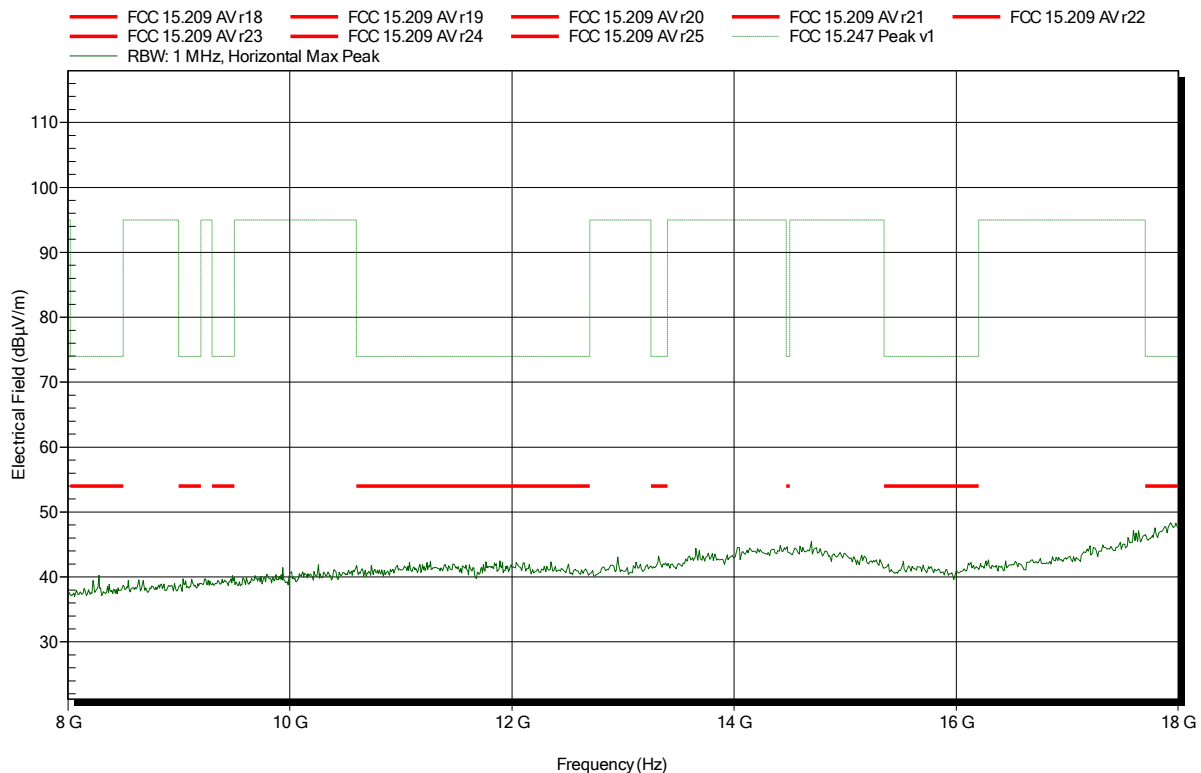
Frequency	Peak	Peak Limit	Peak Difference	Status
4.96 GHz	47.94 dBµV/m	74 dBµV/m	-26.06 dB	Pass

## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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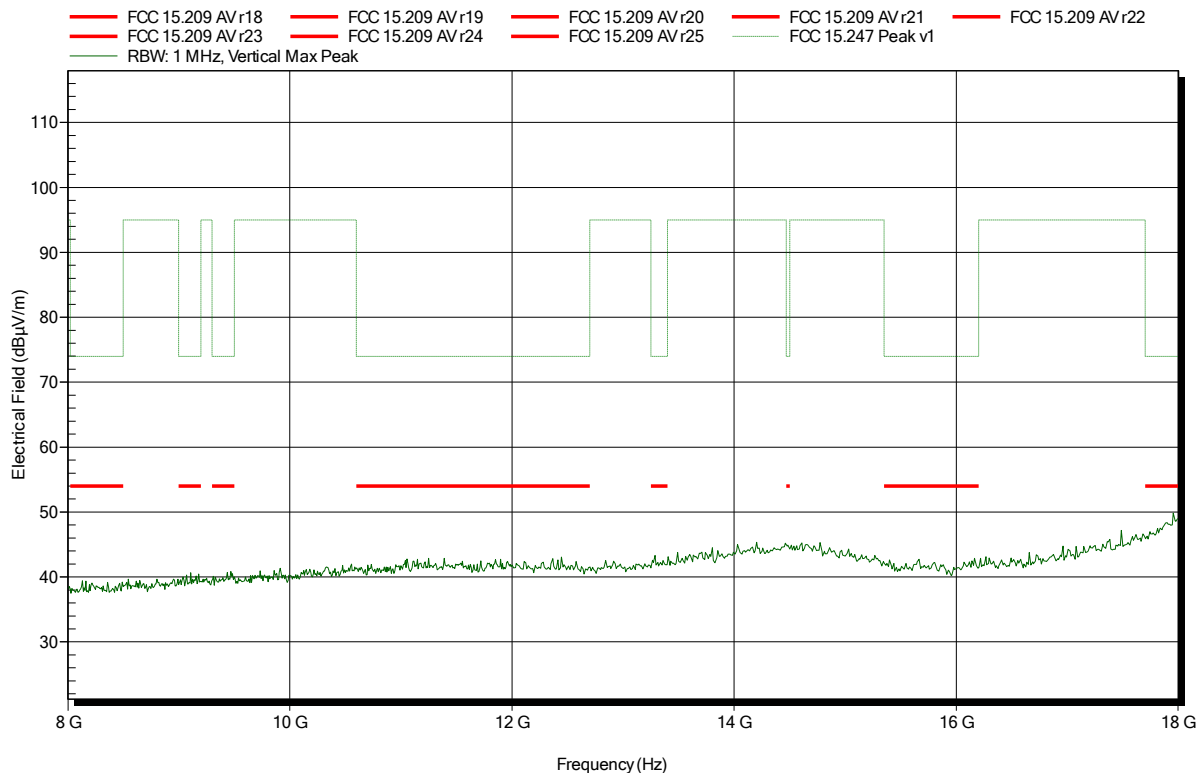


**Spurious emissions according to FCC 15.247, RSS-247 Issue 1**

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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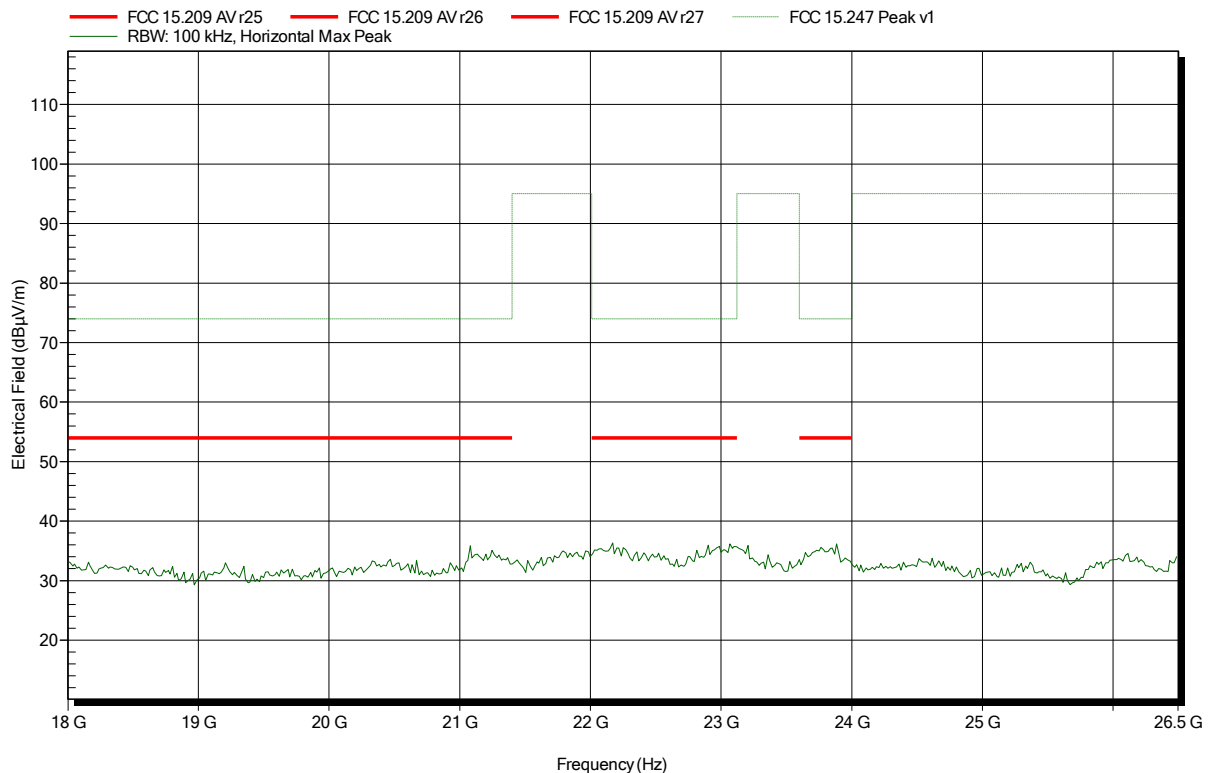


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Configurable Antenna, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT LE; 2480 MHz
Test Date:	2016-04-13
Note:	

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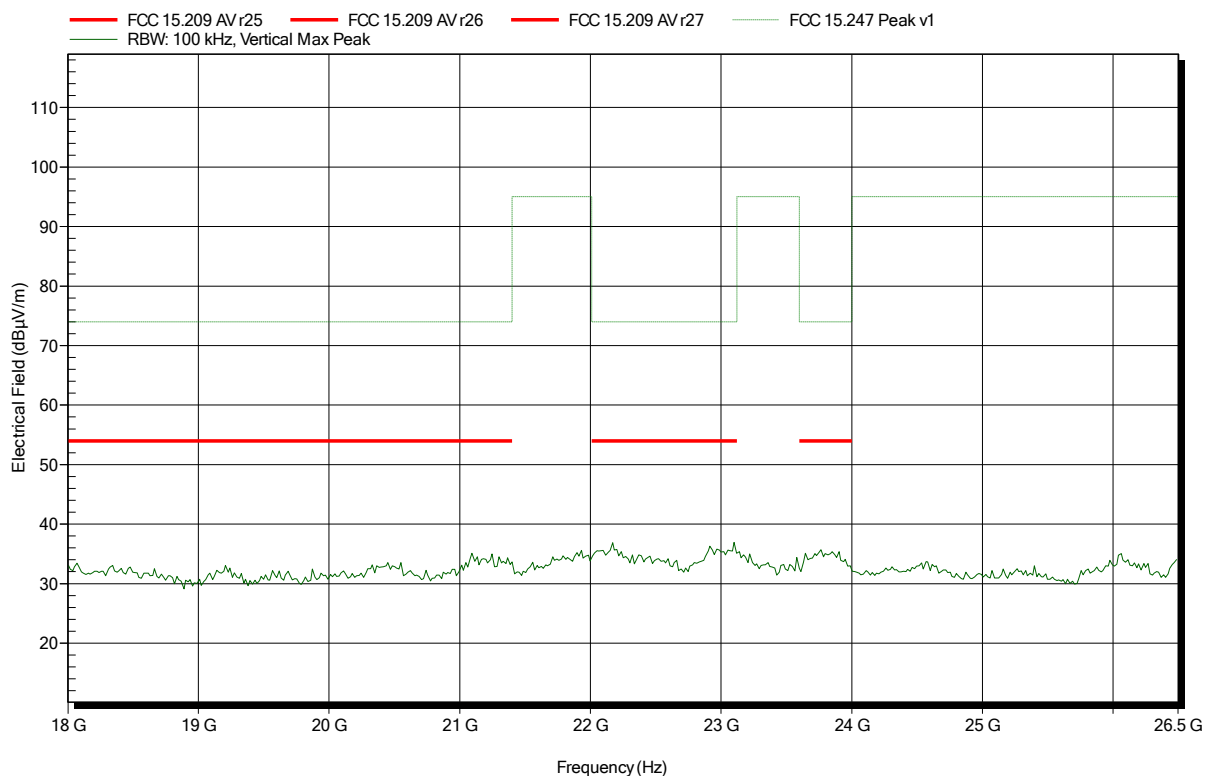


## Spurious emissions according to FCC 15.247, RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Configurable Antenna, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT LE; 2480 MHz  
 Test Date: 2016-04-13  
 Note:

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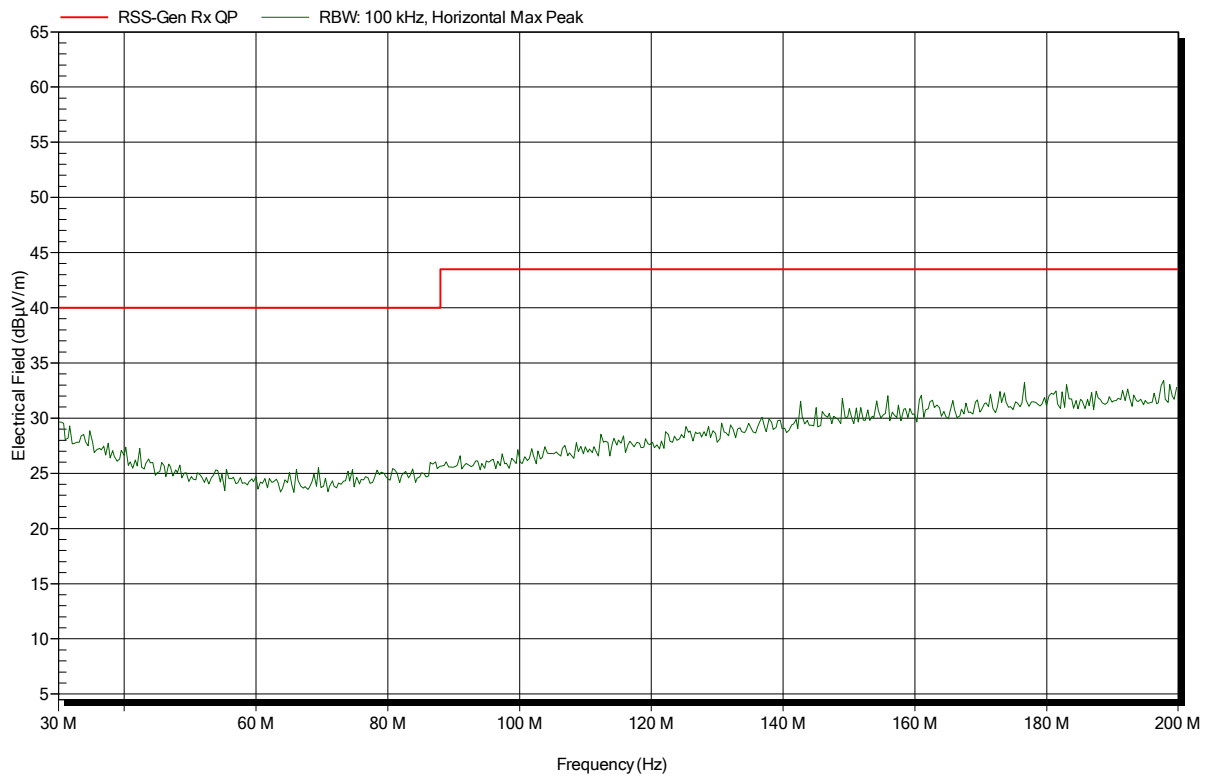
## ANNEX B Receiver radiated spurious emissions

### Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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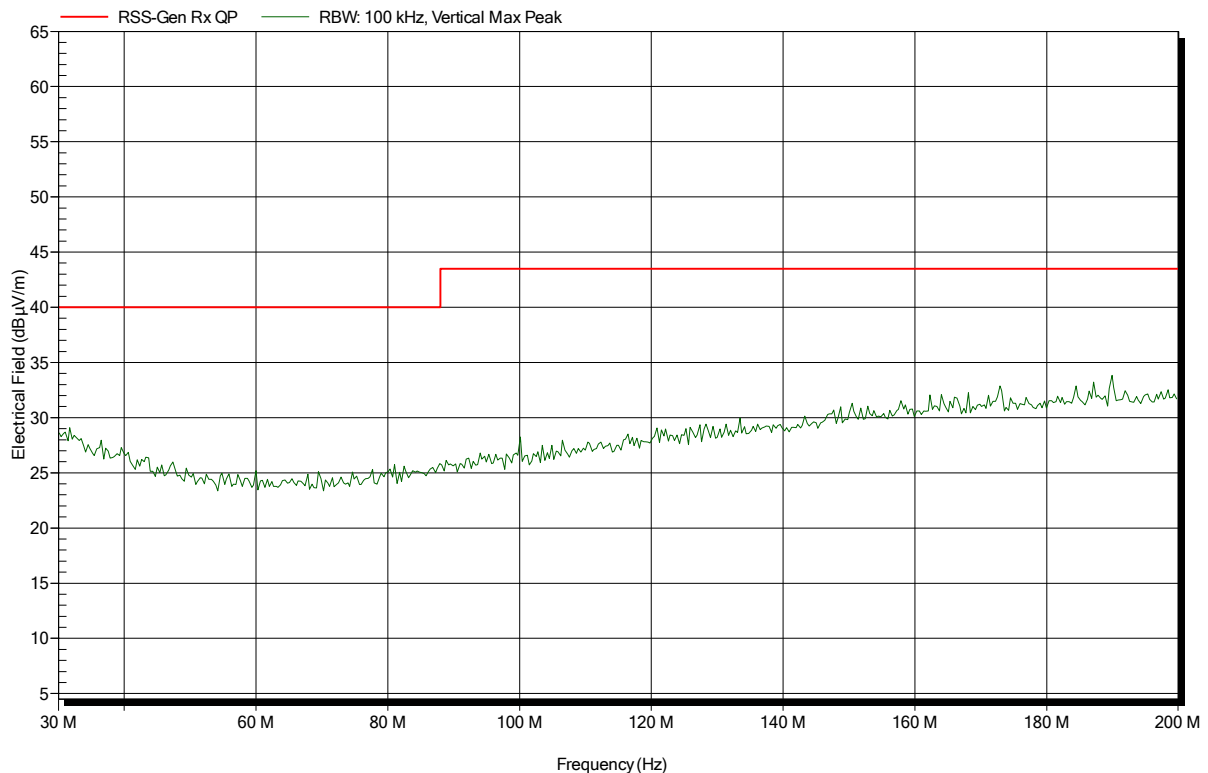


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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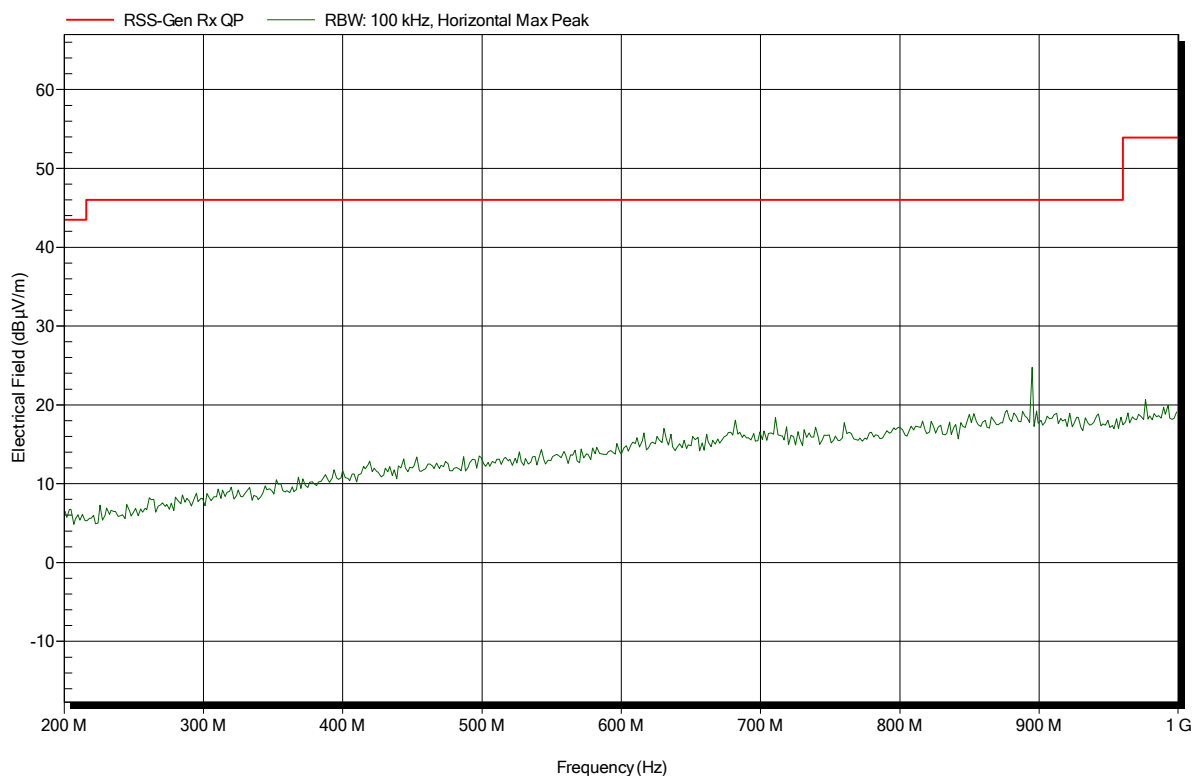


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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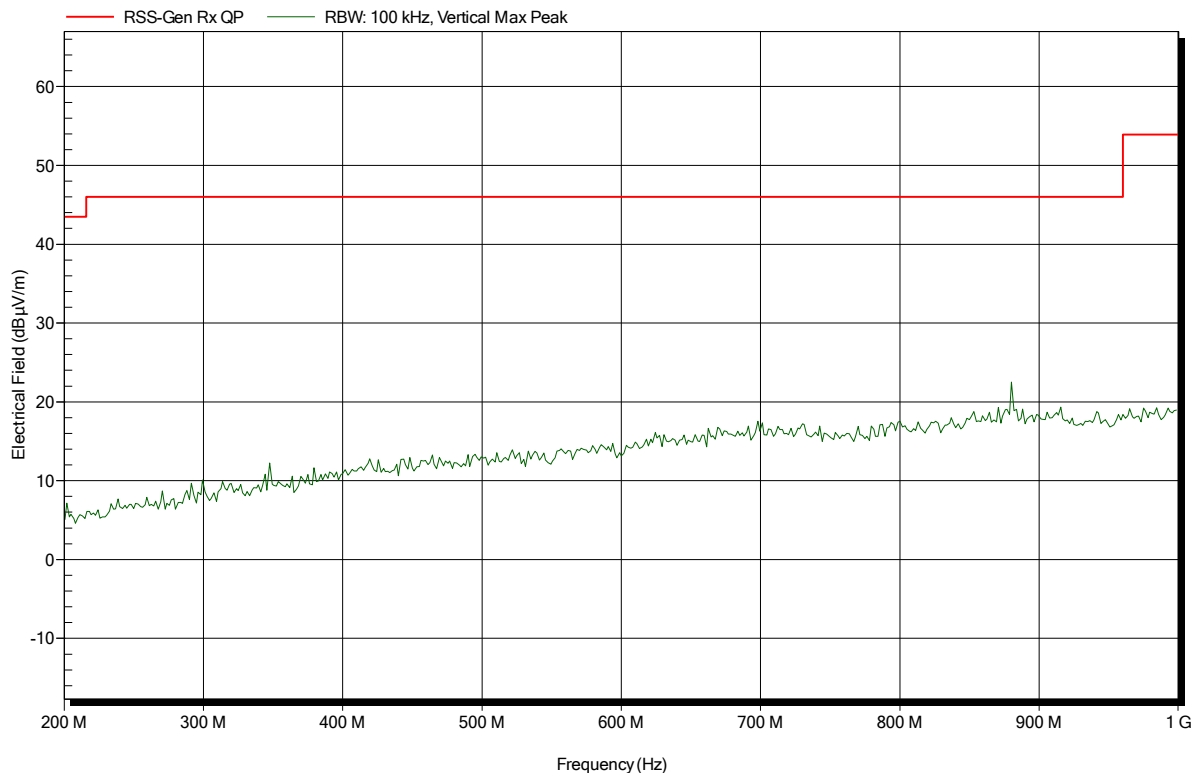


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: RX; BT LE; CH.19  
 Test Date: 2016-04-13  
 Note:

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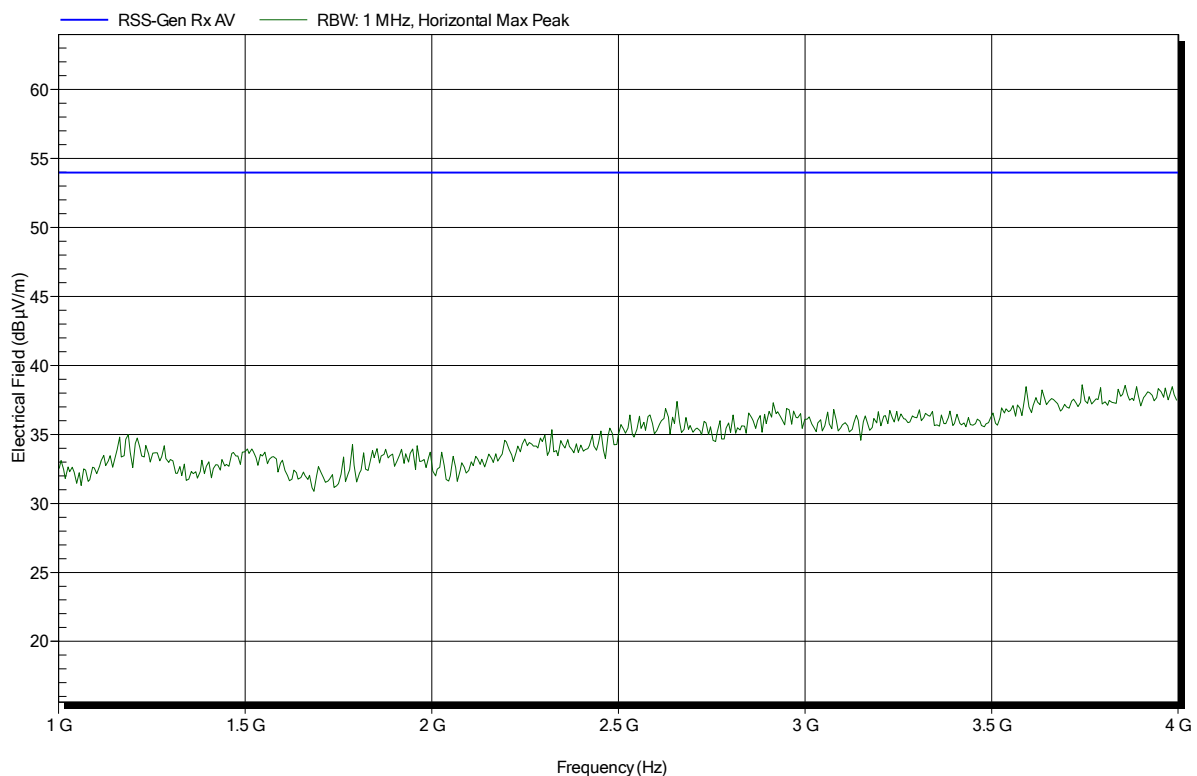


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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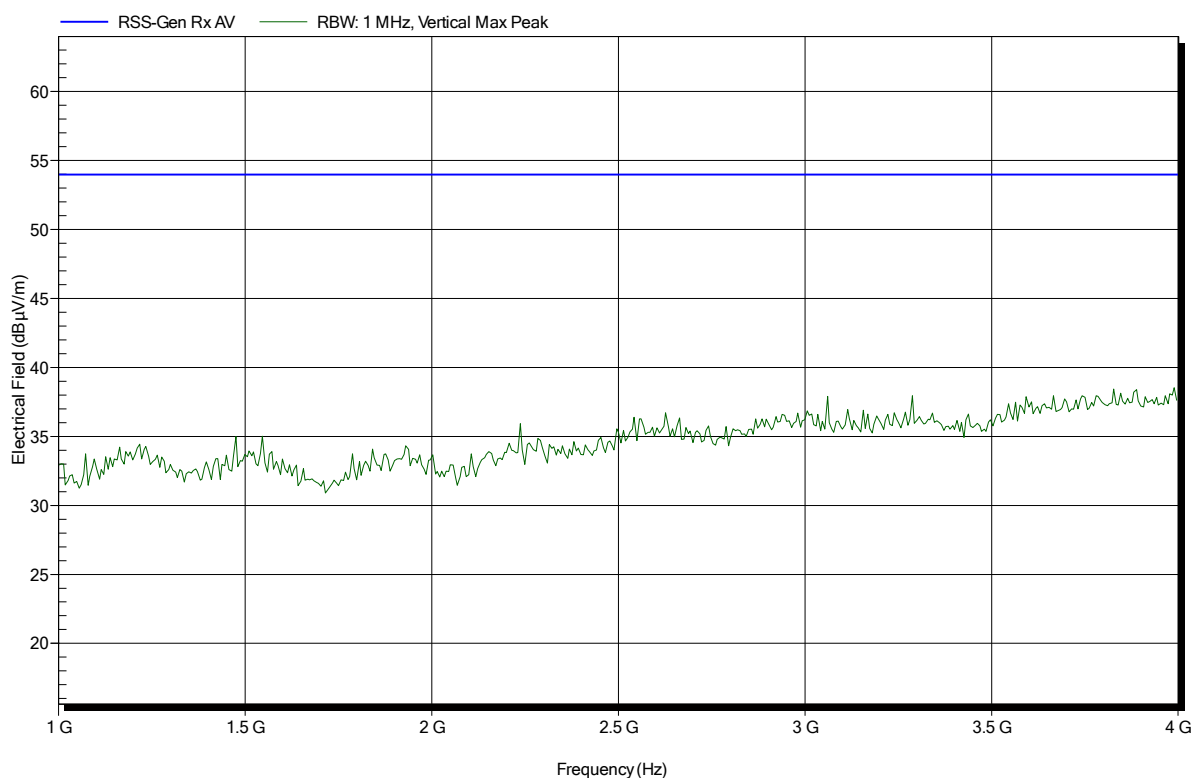


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: RX; BT LE; CH.19  
 Test Date: 2016-04-13  
 Note:

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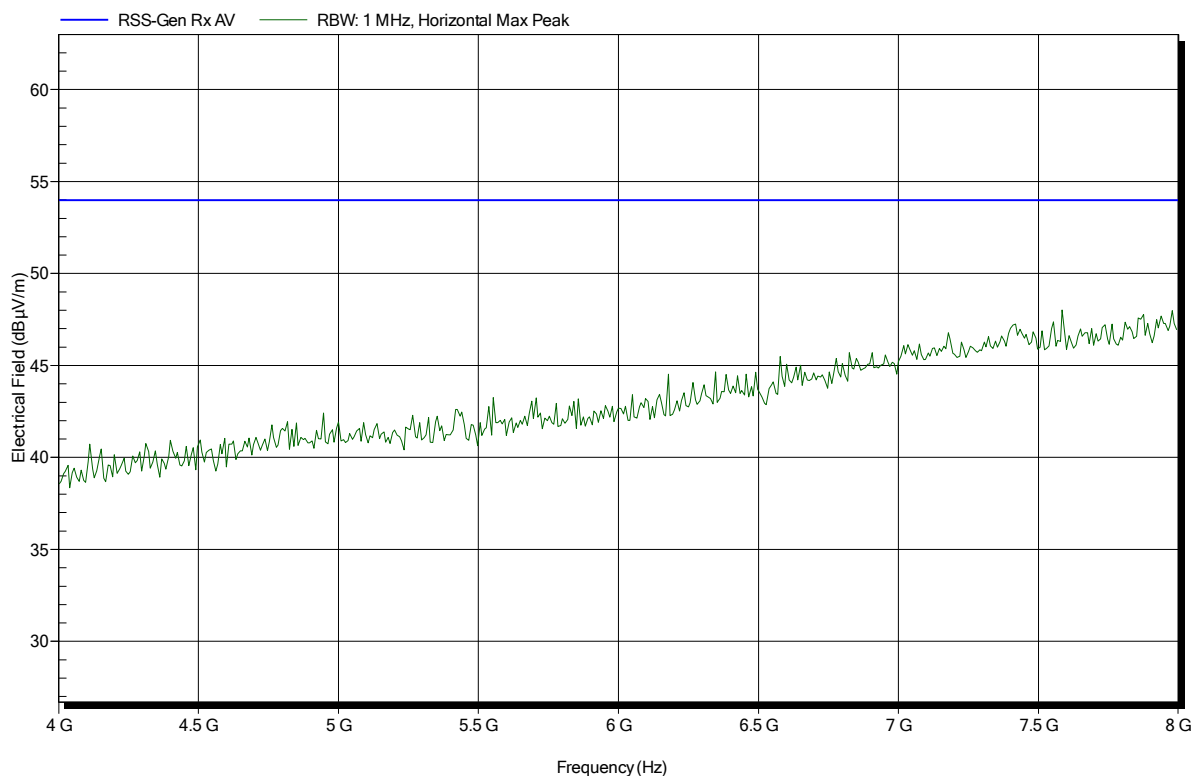


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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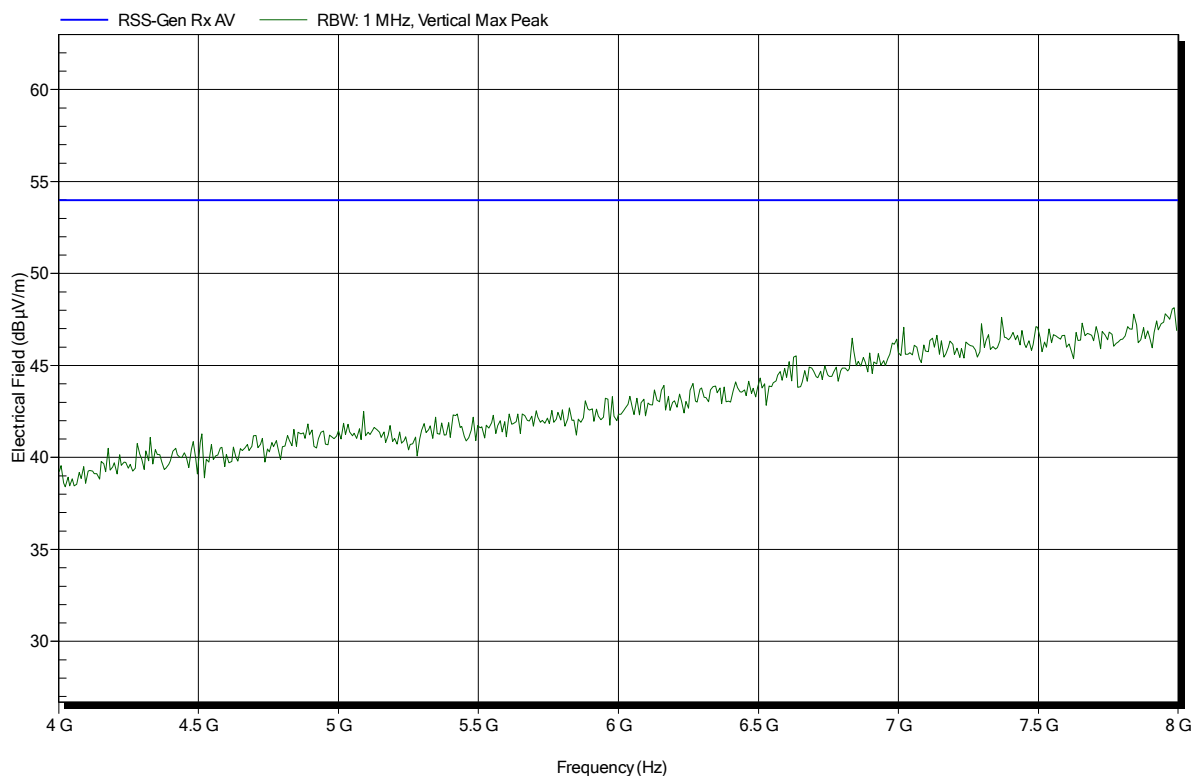


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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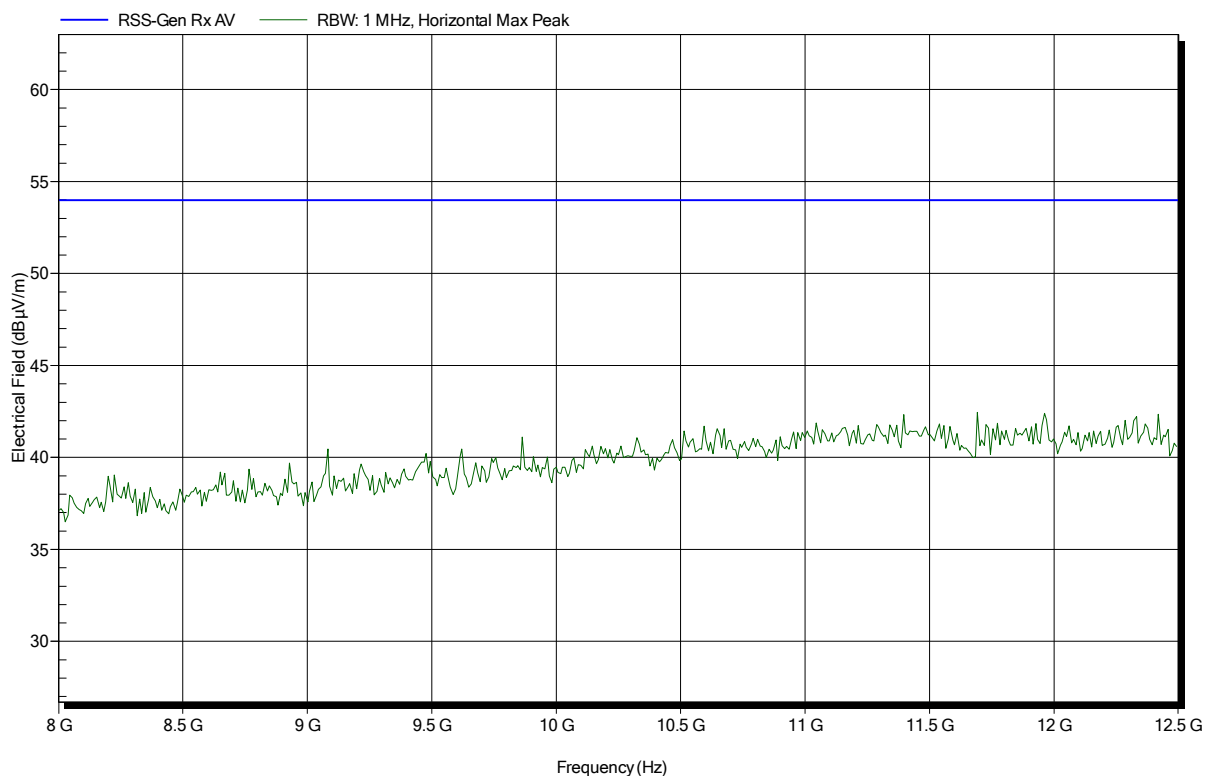


## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant: EMPERRA GmbH  
 EUT Name: Insulin Pen with BLE interface  
 Model: ESYSTA BT Pen  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 24°C, Vnom: 3 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: RX; BT LE; CH.19  
 Test Date: 2016-04-13  
 Note:

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## Spurious emissions according to RSS-247 Issue 1

Project number: G0M-1602-5371

Applicant:	EMPERRA GmbH
EUT Name:	Insulin Pen with BLE interface
Model:	ESYSTA BT Pen
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; BT LE; CH.19
Test Date:	2016-04-13
Note:	

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