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FCC TEST REPORT

FCC 47 CFR Part 15C
Industry Canada RSS-247
Digital transmission systems operating within the 2400 – 2483.5 MHz band

Report Reference No. ..... :	G0M-1602-5388-TFC247ZB-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 ..... :	ZIGPOS GmbH
Address ..... :	Strehlener Str. 12/14 01069 Dresden GERMANY
Test specification:	
Standard..... :	47 CFR Part 15C RSS-247, Issue 1, 2015-05
Test scope…….. ..... :	complete Radio compliance test
Equipment under test (EUT):	
Product description	Temperature Humidity Sensor
Model No.	LTHP_v3
Additional Model(s)	None
Brand Name(s)	None
Hardware version	v3
Firmware / Software version	v1.9
	FCC-ID: 2AHHJ-LTHPV3 IC: N/A
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:		
Test Lab Temperature ..... :	20 – 23 °C	
Test Lab Humidity ..... :	32 – 38 %	
Date of receipt of test item ..... :	2016-03-14	
Date (s) of performance of tests ..... :	2016-03-14 - 2016-03-24	
Compiled by ..... :	Christian Weber	
Tested by (+ signature) ..... : (Responsible for Test)	Christian Weber	C. Weber .....
Approved by (+ signature) ..... : (Deputy Head of Lab)	Toralf Jahn	.....
Date of issue ..... :	2017-03-21	
Total number of pages ..... :	85	

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:

Version History

Version	Issue Date	Remarks	Revised by
01	2017-03-21	Initial Release	

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1 Equipment (Test item) Description

Description	Temperature Humidity Sensor	
Model	LTHP_v3	
Additional Model(s)	None	
Brand Name(s)	None	
Serial number	None	
Hardware version	v3	
Software / Firmware version	v1.9	
FCC-ID	2AHHJ-LTHPV3	
IC	N/A	
Equipment type	End product	
Radio type	Transceiver	
Radio technology	IEEE 802.15.4	
Operating frequency range	2405 - 2480 MHz	
Assigned frequency band	2400 - 2483.5 MHz	
Main test frequencies	F_{LOW}	2405 MHz
	F_{MID}	2440 MHz
	F_{HIGH}	2480 MHz
Spreading	DSSS	
Modulations	O-QPSK	
Number of channels	16 (11-26)	
Channel spacing	5MHz	
Number of antennas	1	
Antenna	Type	integrated
	Model	Inverted-F
	Manufacturer	TI
	Gain	3.3 dBi (manufacturer declaration)
Manufacturer	ZIGPOS GmbH Strehlener Str. 12/14 01069 Dresden GERMANY	
Power supply	V_{NOM}	3.0 VDC (Lithium Battery)
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

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	
IEEE 802.15.4-PS	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone transmit Spreading = DSSS Modulation = O-QPSK Data rate = 250 kbps Duty cycle = 100 % Power level = Maximum
IEEE 802.15.4-BAT	General conditions:	EUT powered by fully charged battery
	Radio conditions:	Mode = standalone transmit Spreading = DSSS Modulation = O-QPSK Data rate = 250 kbps Duty cycle = 100 % Power level = Maximum
Receive	General conditions:	EUT powered by fully charged battery
	Radio conditions:	Mode = standalone receive Spreading = DSSS

1.6 Test Equipment Used During Testing

Measurement Software			
Description	Manufacturer	Name	Version
EMC Test Software	Dare Instruments	Radimation	2015.2.4

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW43	EF00896	2015-03	2016-03

6dB Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW43	EF00896	2015-03	2016-03

Maximum peak conducted power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW43	EF00896	2015-03	2016-03

Power spectral density					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW43	EF00896	2015-03	2016-03

Band edge compliance					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW43	EF00896	2015-03	2016-03

Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW43	EF00896	2015-03	2016-03

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSIQ26	EF00151	2015-03	2016-03
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD Antenna	R&S	HL 223	EF00187	2014-03	2017-03
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:

Reading on Analyzer (dBµV) + A.F. (dB) = Net field strength (dBµV/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:

Limit (dBµV/m) = 20*log (µV/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:

Reading	+	AF	=	Net Reading	:	Net reading - FCC limit	= Margin
21.5 dBµV	+	26 dB	=	47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, IC 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) IC RSS-247 § 5.2	6dB Bandwidth	ANSI C63.10	PASS	
FCC § 15.247(b)(3) IC RSS-247 § 5.4	Maximum peak conducted power	ANSI C63.10	PASS	
FCC § 15.247(e) IC RSS-247 § 5.2	Power spectral density	ANSI C63.10	PASS	
47 CFR 15.207 IC RSS-247 § 3.1	AC power line conducted emissions	ANSI C63.4	N/R	EUT exclusively battery powered
FCC § 15.247(d) IC RSS-247 § 5.5	Band edge compliance	ANSI C63.10	PASS	
FCC § 15.247(d) IC RSS-247 § 5.5	Conducted spurious emissions	ANSI C63.10	PASS	
FCC § 15.247(d) FCC § 15.209 IC RSS-247 § 5.5	Transmitter radiated spurious emissions	ANSI C63.10	PASS	
IC RSS-247 § 3.1	Receiver radiated spurious emissions	ANSI C63.10	PASS	
Remarks:				

3 Test Conditions and Results

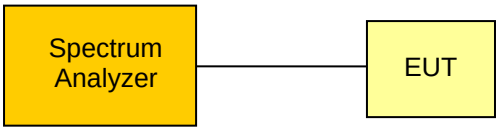
3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. to IC RSS-Gen	**Verdict: PASS**
Test according to measurement reference	Reference Method
	ANSI C63.10
Test frequency range	Tested frequencies
	F_{LOW} / F_{MID} / F_{HIGH}

Limits

None (Informational only)

Test setup



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

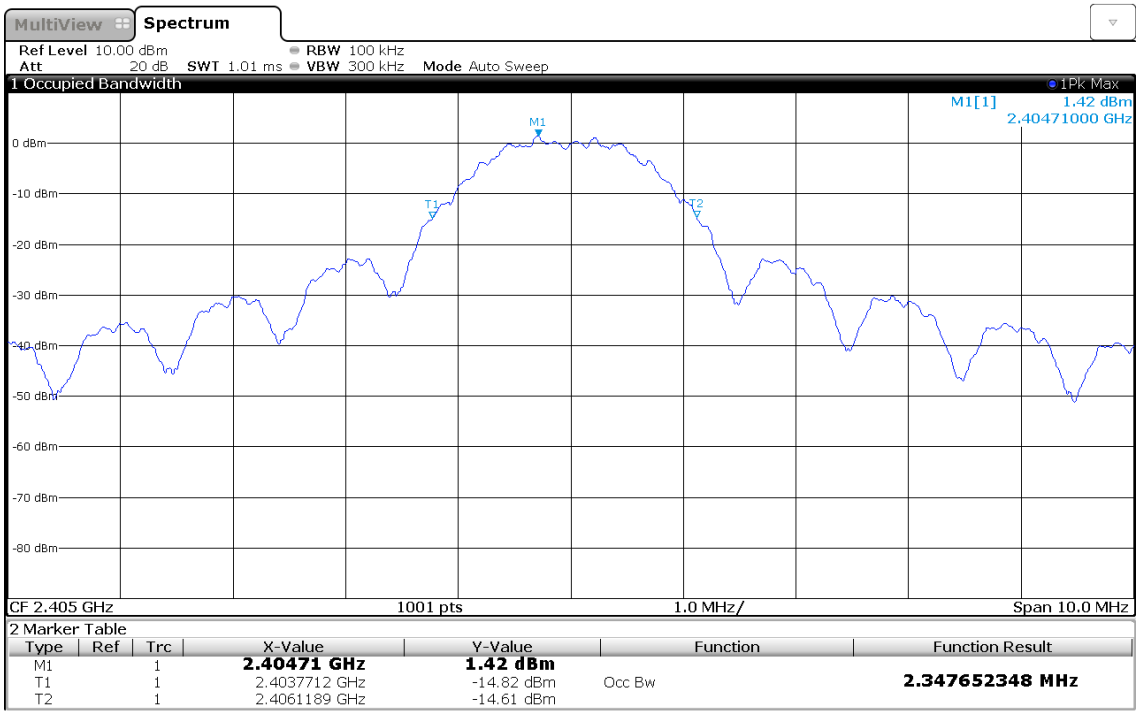
Channel	Frequency [MHz]	Mode	Occupied Bandwidth [MHz]
F_{LOW}	2405	IEEE 802.15.4-PS	2.348
F_{MID}	2440	IEEE 802.15.4-PS	2.418
F_{HIGH}	2480	IEEE 802.15.4-PS	2.478

Comments:

Occupied Bandwidth – IEEE 802.15.4 F_{LOW}

Occupied Bandwidth

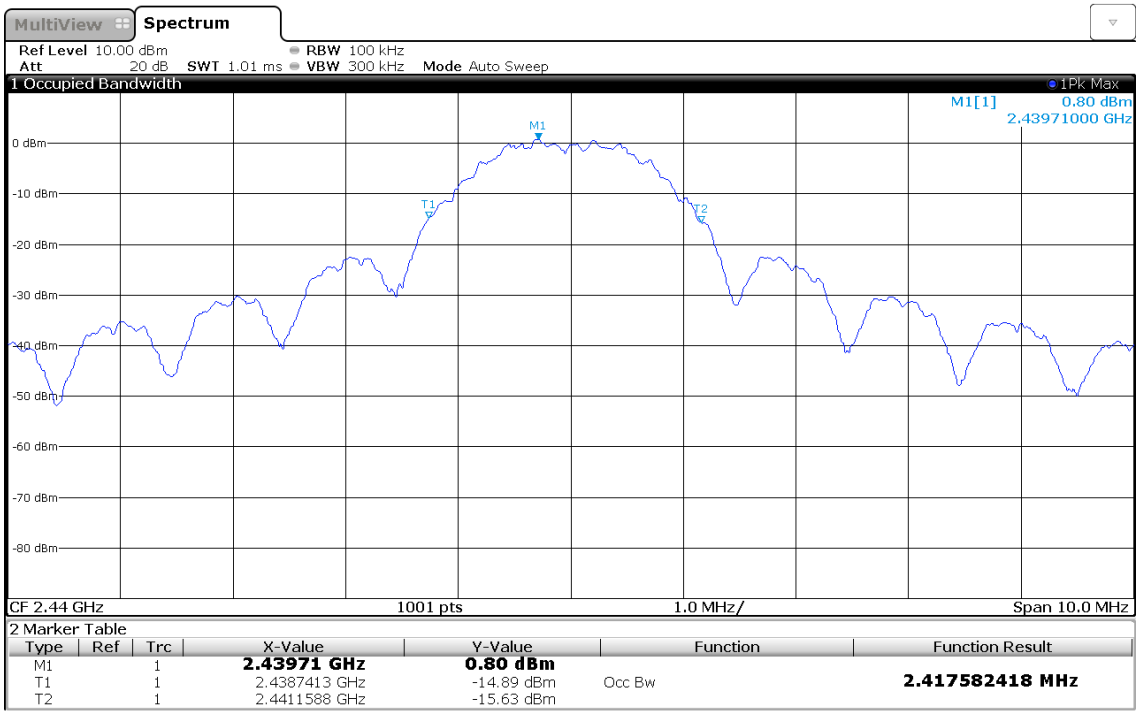
Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 11, 2405 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Occupied Bandwidth [MHz]:	2.348



Occupied Bandwidth – IEEE 802.15.4 F_{MID}

Occupied Bandwidth

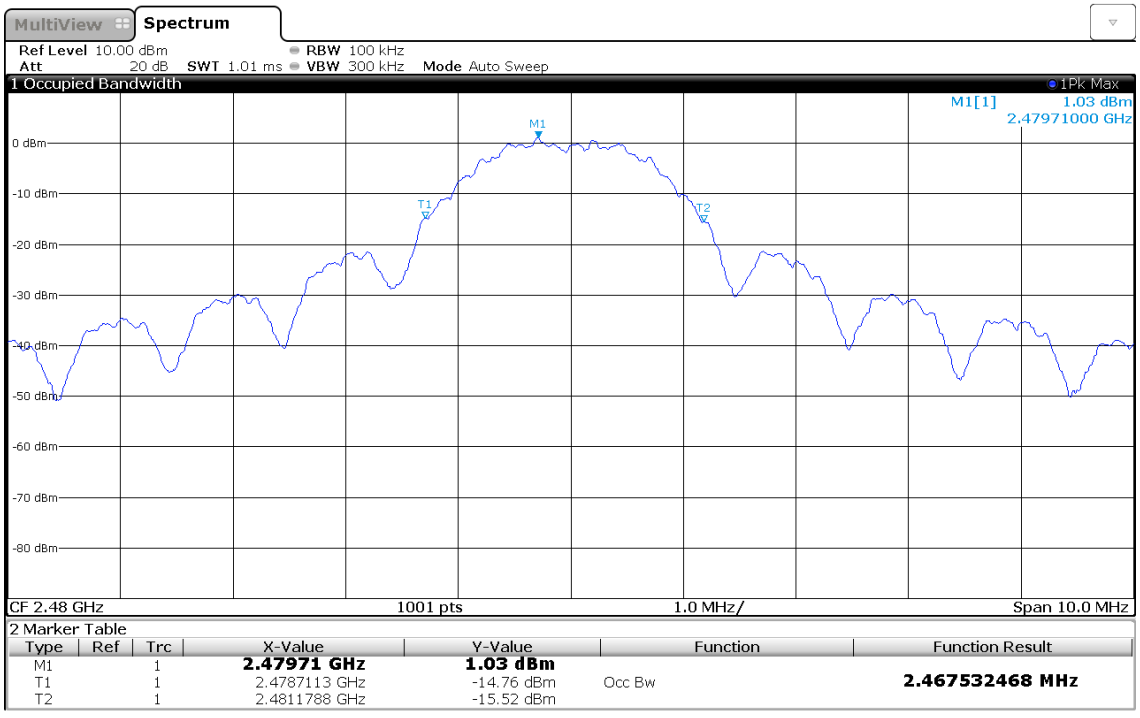
Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 18, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Occupied Bandwidth [MHz]:	2.418



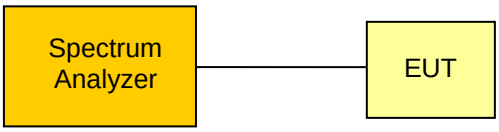
Occupied Bandwidth – IEEE 802.15.4 F_{HIGH}

Occupied Bandwidth

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 26, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Occupied Bandwidth [MHz]:	2.478



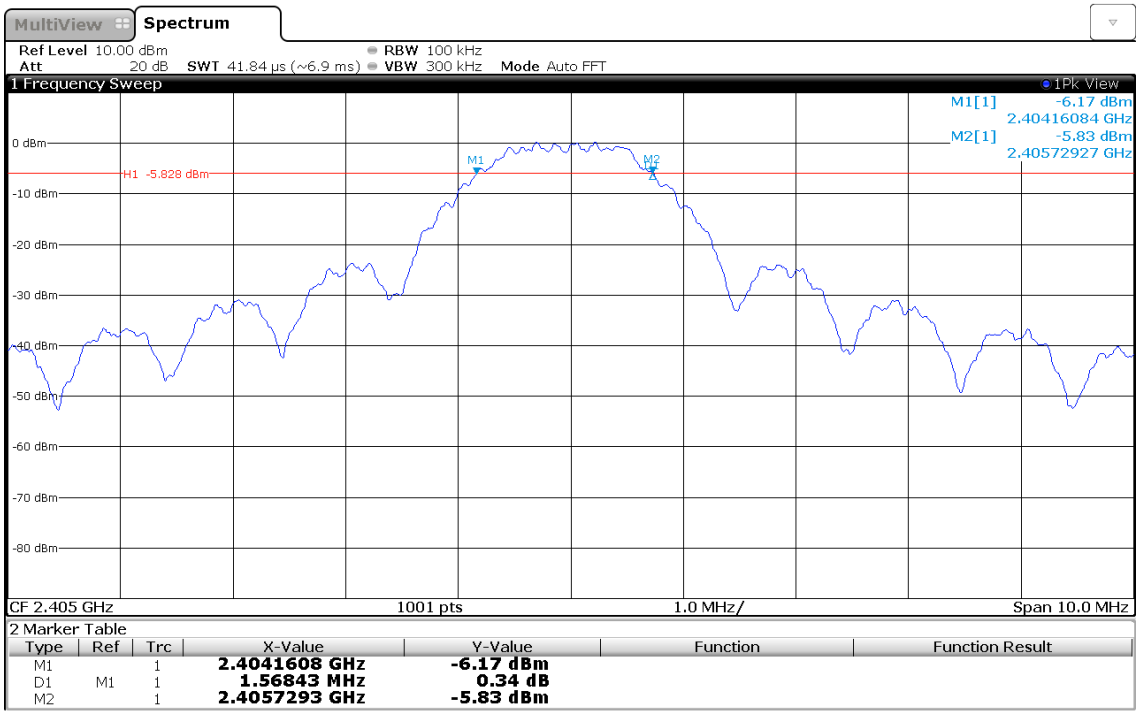
3.2 Test Conditions and Results – 6 dB Bandwidth

6dB Bandwidth acc. to FCC 15.247 / IC RSS-247					**Verdict: PASS**
EUT requirement rule parts and clause	Reference				
	FCC 15.247(a)(2) / IC RSS-247 5.2				
Test according to measurement reference	Reference Method				
	ANSI C63.10				
Test frequency range	Tested frequencies				
	F_{LOW} / F_{MID} / F_{HIGH}				
Limits					
≥ 500kHz					
Test setup					
					
Test procedure					
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak 7. 6 dB Bandwidth is determined by marker frequency separation					
Test results					
Channel	Frequency [MHz]	Mode	6 dB Bandwidth [kHz]	Limit [kHz]	Result
F_{LOW}	2405	IEEE 802.15.4-PS	1568	500	PASS
F_{MID}	2440	IEEE 802.15.4-PS	1608	500	PASS
F_{HIGH}	2480	IEEE 802.15.4-PS	1648	500	PASS
Comments:					

6 dB Bandwidth – IEEE 802.15.4 F_{LOW}

DTS (6 dB) Bandwidth

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 11, 2405 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Lower Frequency [MHz]:	2404.161
Upper Frequency [MHz]:	2405.729
6 dB Bandwidth [kHz]:	1568



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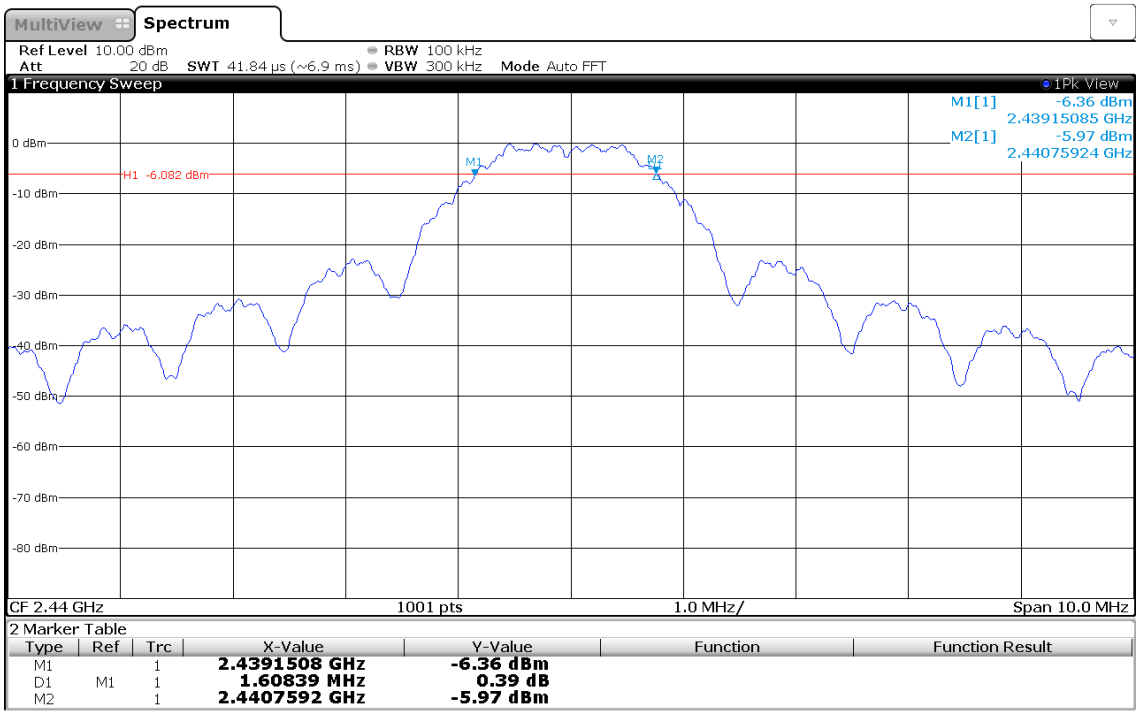
6 dB Bandwidth – IEEE 802.15.4 F_{MID}

DTS (6 dB) Bandwidth

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 18, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Lower Frequency [MHz]:	2439.151
Upper Frequency [MHz]:	2440.759
6 dB Bandwidth [kHz]:	1608



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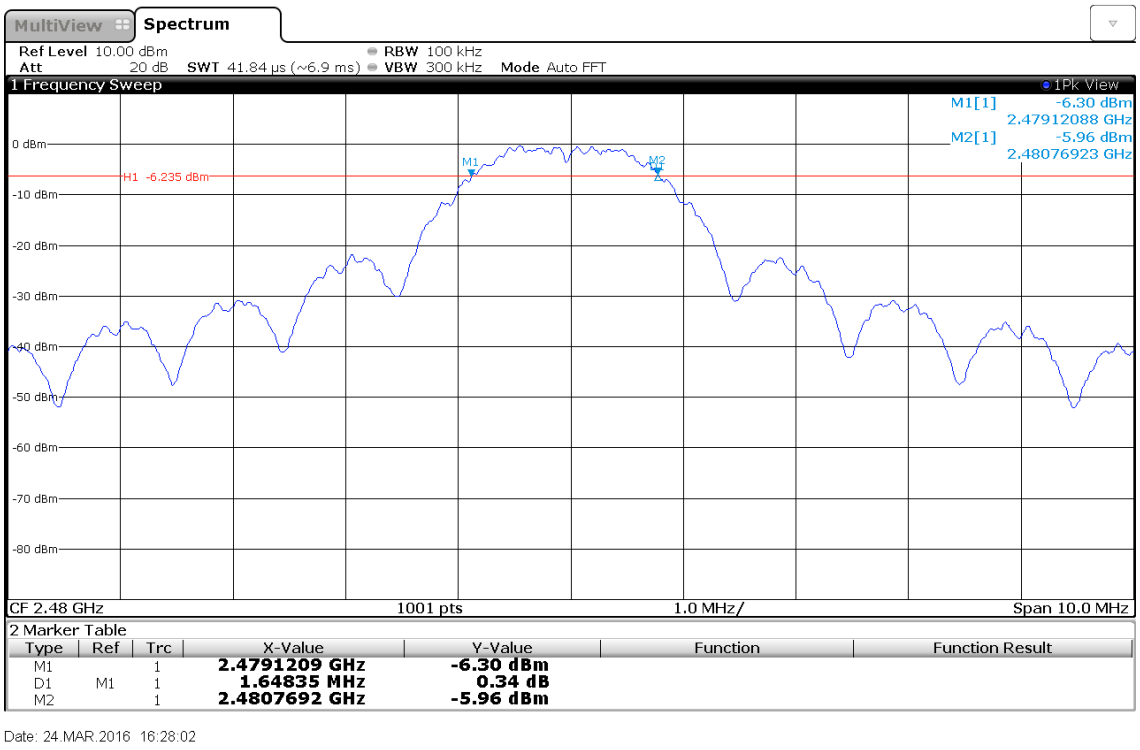
6 dB Bandwidth – IEEE 802.15.4 F_{HIGH}

DTS (6 dB) Bandwidth

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 26, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Lower Frequency [MHz]:	2479.121
Upper Frequency [MHz]:	2480.769
6 dB Bandwidth [kHz]:	1648



3.3 Test Conditions and Results – Maximum peak conducted power

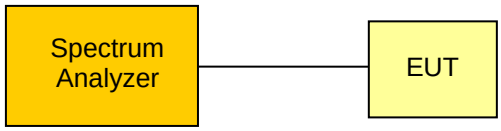
Maximum peak conducted power acc. to FCC 15.247 / IC RSS-247	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(b)(3) / IC RSS-247 5.4
Test according to measurement reference	Reference Method
	ANSI C63.10
Test frequency range	Tested frequencies
	F_{LOW} / F_{MID} / F_{HIGH}
Measurement mode	Peak
Maximum antenna gain	3.3 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



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 [VDC]	Mode	Peak power [dbm]	Peak power [W]	Limit [dBm]	Margin [dB]
F_{LOW}	2405	V_{NOM} = 3.0	IEEE 802.15.4-PS	4.211	0.003	30	-25.79
F_{MID}	2440	V_{NOM} = 3.0	IEEE 802.15.4-PS	4.097	0.003	30	-25.90
F_{HIGH}	2480	V_{NOM} = 3.0	IEEE 802.15.4-PS	4.100	0.003	30	-25.90

Comments:

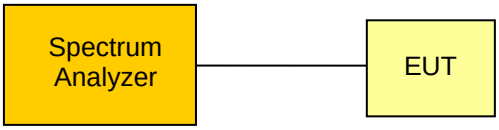
3.4 Test Conditions and Results – Power spectral density

Power spectral density acc. to FCC 15.247 / IC RSS-247	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(e) / IC RSS-247 5.2
Test according to measurement reference	Reference Method
	ANSI C63.10
Test frequency range	Tested frequencies
	F_{LOW} / F_{MID} / F_{HIGH}
Measurement mode	Peak

Limits

8 dBm / 3 kHz

Test setup



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 is set large enough to capture maximum emissions in passband, RBW is set to 3kHz
4. Peak power density is determined from peak emission of envelope

Test results

Channel	Frequency [MHz]	Test mode	Peak frequency [MHz]	Peak power density [dBm]	Limit [dBm/3kHz]	Margin [dB]
F_{LOW}	2405	IEEE 802.15.4-PS	2405.208	0.767	8.0	-07.23
F_{MID}	2440	IEEE 802.15.4-PS	2440.204	0.719	8.0	-07.28
F_{HIGH}	2480	IEEE 802.15.4-PS	2480.204	0.454	8.0	-07.55

Comments: RBW=100 kHz

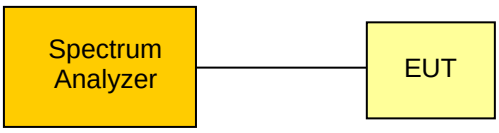
3.5 Test Conditions and Results – Band edge compliance

Band-edge compliance acc. to FCC 15.247 / IC RSS-247	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(d) / IC RSS-247 5.5
Test according to measurement reference	Reference Method
	ANSI C63.10
Test frequency range	Tested frequencies
	F_{LOW} / F_{HIGH}
Measurement mode	Peak

Limits

Limit	Condition
≤ -20 dB / 100 kHz	Power measurement detector = Peak
≤ -30 dB / 100 kHz	Power measurement detector = RMS

Test setup



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

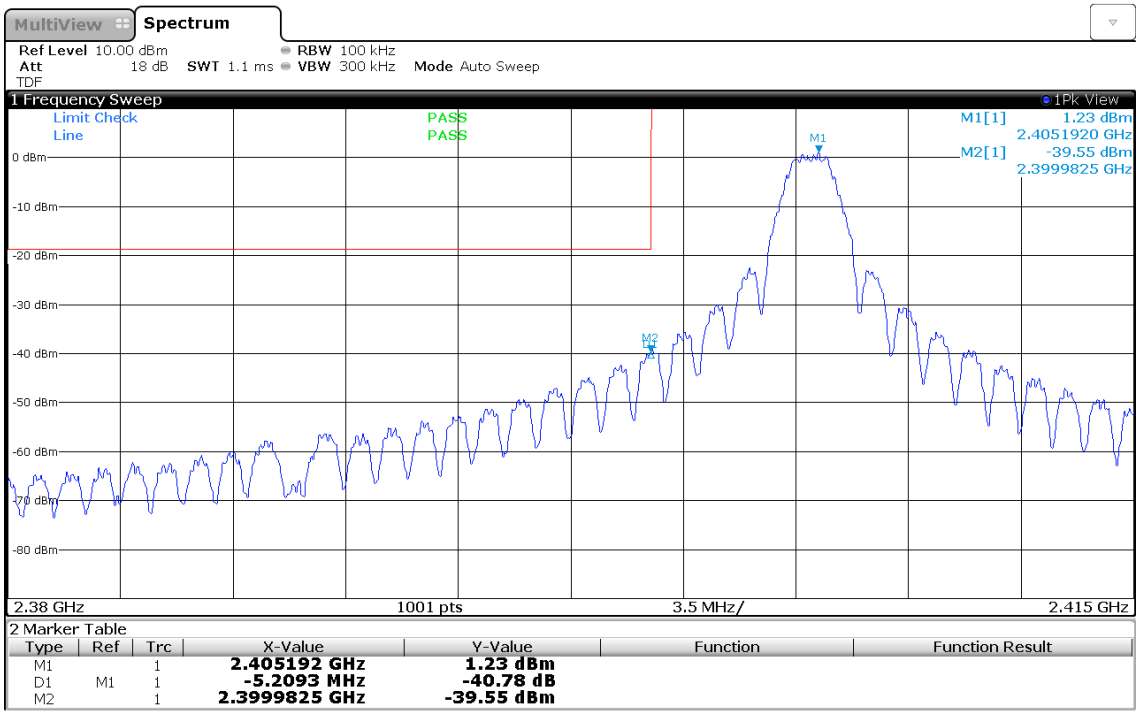
Channel	Frequency [MHz]	Mode	Level [dBc]	Limit [dBc]	Margin [dB]
F_{LOW}	2405	IEEE 802.15.4-PS	-40.78	-20	-20.78
F_{HIGH}	2480	IEEE 802.15.4-PS	-35.14	-20	-15.14

Comments:

Band-edge compliance – IEEE 802.15.4 F_{LOW}

Band-edge Compliance

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 11, 2405 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Band-edge	Lower
In-band Frequency [MHz]:	2405.192
Max. in-band Level [dBm/100 kHz]:	1.235
Out-of-band Frequency [MHz]:	2399.983
Max. out-of-band Level [dBm/100 kHz]:	-39.55
Attenuation [dB]:	-40.78

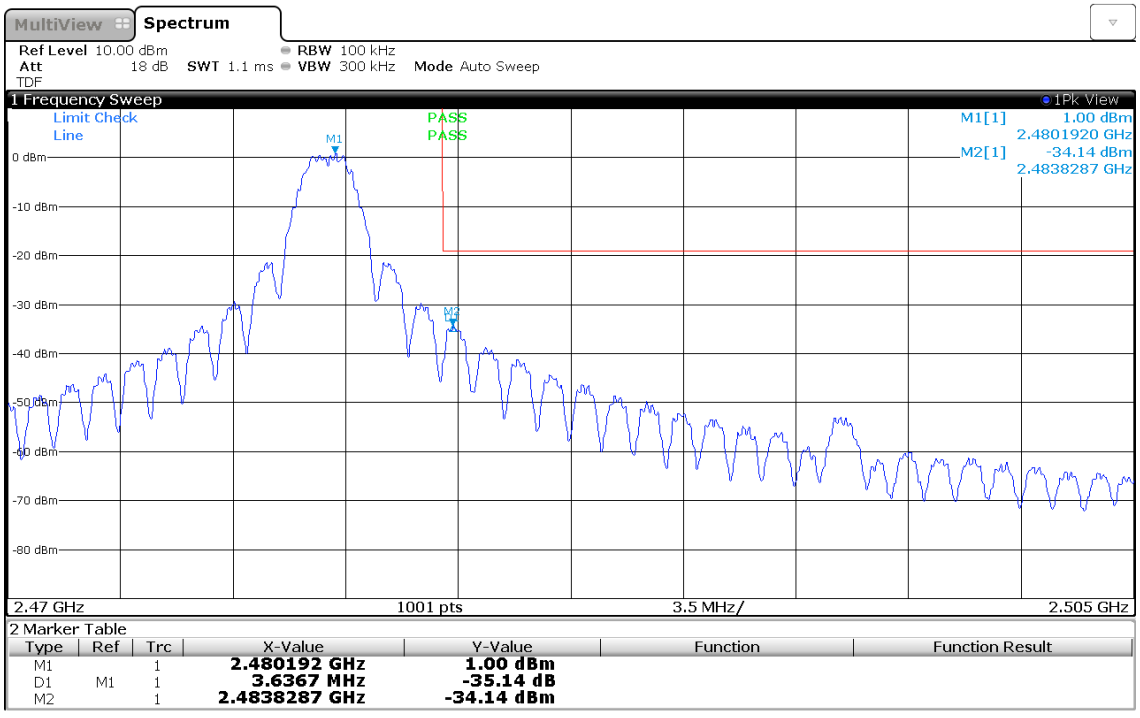


Date: 24.MAR.2016 12:10:30

Band-edge compliance – IEEE 802.15.4 F_{HIGH}

Band-edge Compliance

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 26, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Band-edge	Upper
In-band Frequency [MHz]:	2480.192
Max. in-band Level [dBm/100 kHz]:	1.003
Out-of-band Frequency [MHz]:	2483.829
Max. out-of-band Level [dBm/100 kHz]:	-34.141
Attenuation [dB]:	-35.14



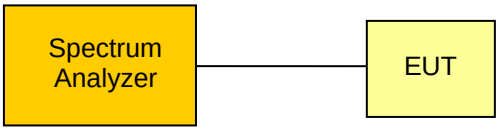
3.6 Test Conditions and Results – Conducted spurious emissions

Conducted spurious emissions acc. to FCC 15.247 / IC RSS-247	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(d) / IC RSS-247 5.5
Test according to measurement reference	Reference Method
	ANSI C63.10
Test frequency range	Tested frequencies
	10 MHz – 10th 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



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

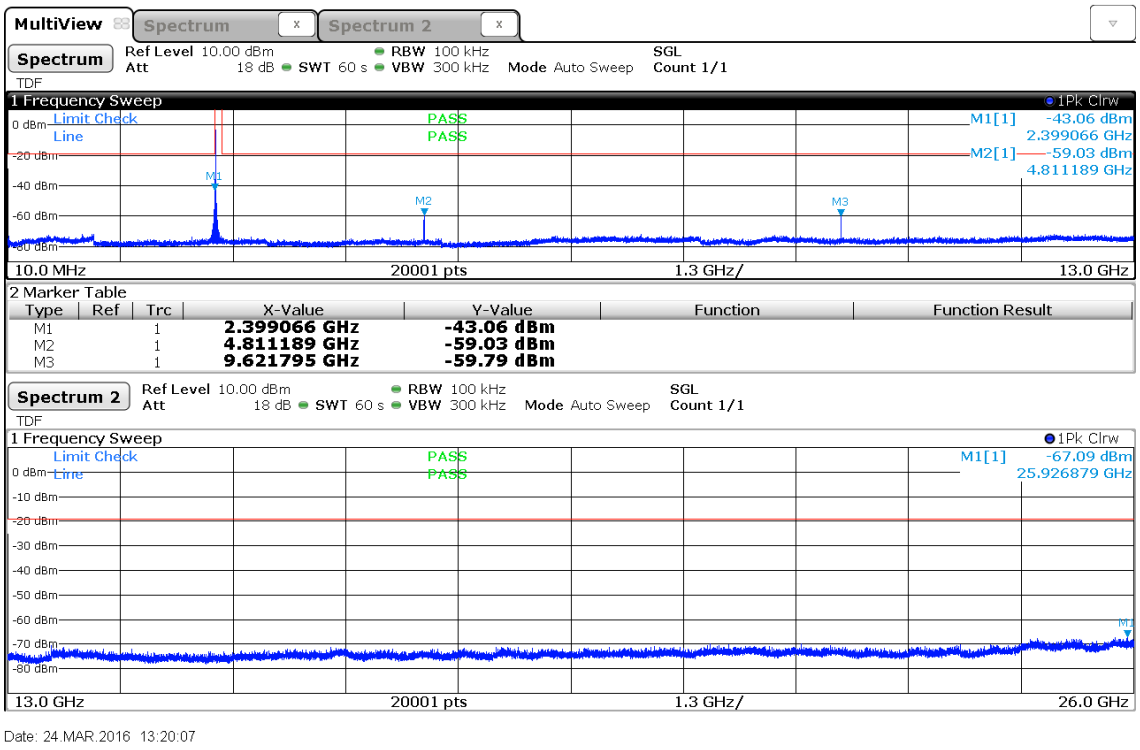
Channel	Frequency [MHz]	Mode	Emission [MHz]	Emission Level [dbm]	Peak power [dBm]	Limit [dBm]	Margin [dB]
F_{LOW}	2405	IEEE 802.15.4-PS	2399	-43.06	0.8	-19.2	-23.86
F_{MID}	2440	IEEE 802.15.4-PS	9758	-57.10	0.7	-19.3	-37.80
F_{HIGH}	2480	IEEE 802.15.4-PS	2485	-39.87	0.4	-19.6	-20.27

Comments:

Conducted spurious emissions – IEEE 802.15.4 F_{LOW}

Conducted Spurious Emissions

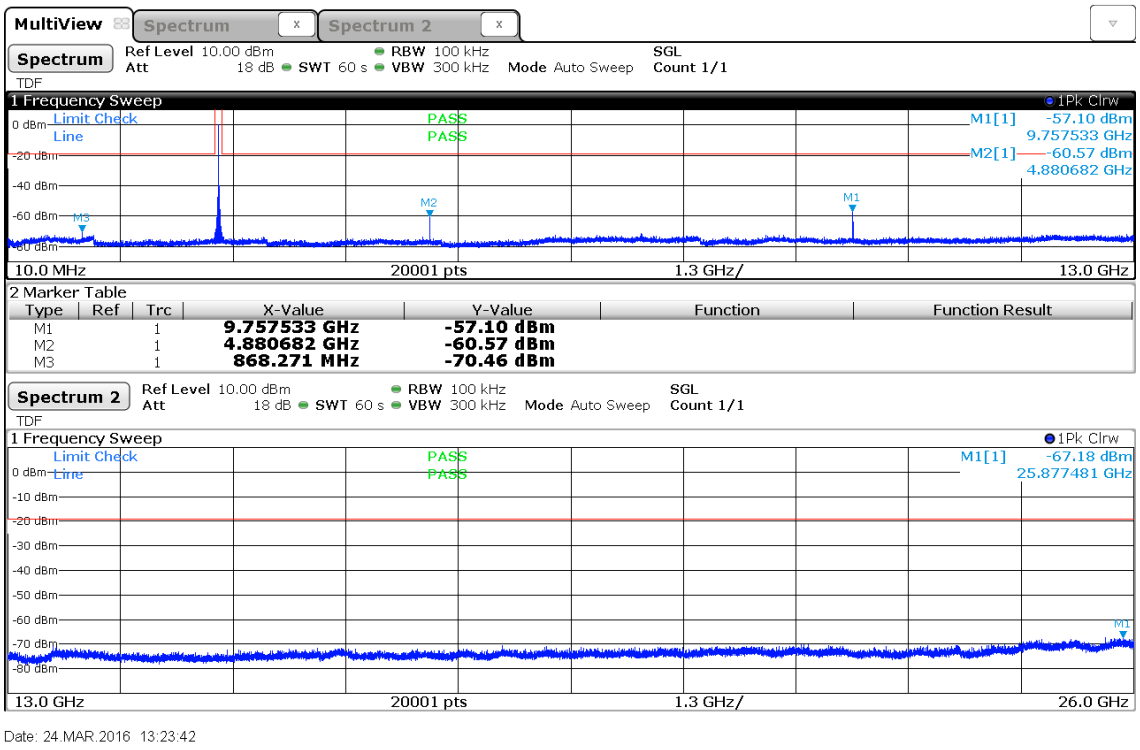
Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 11, 2405 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Max. in-band Frequency [MHz]:	2404.7
Max. in-band Level [dBm/100 kHz]:	0.8
Out-of-band Limit [dBm/100 kHz]:	-19.2



Conducted spurious emissions – IEEE 802.15.4 F_{MID}

Conducted Spurious Emissions

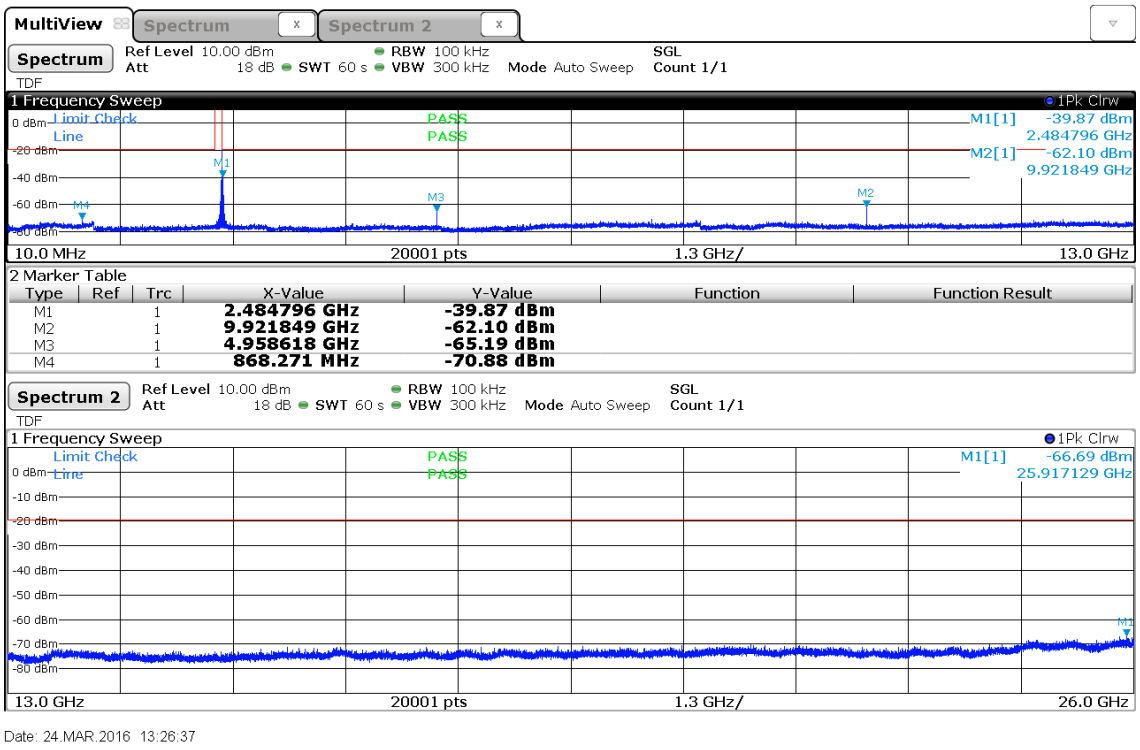
Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 18, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Max. in-band Frequency [MHz]:	2439.7
Max. in-band Level [dBm/100 kHz]:	0.7
Out-of-band Limit [dBm/100 kHz]:	-19.3



Conducted spurious emissions – IEEE 802.15.4 F_{HIGH}

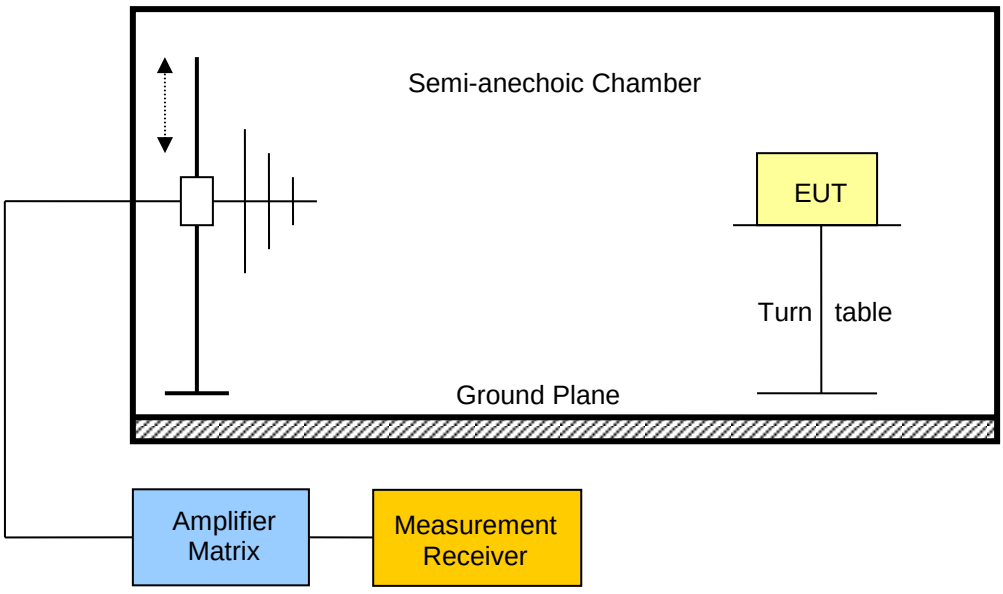
Conducted Spurious Emissions

Project Number:	G0M-1602-5388
Applicant	ZIGPOS GmbH
Model Description	Temperature Humidity Sensor
Model:	LTHP_v3
Test Sample ID:	4
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.15.4 (DSSS/250 kbps), Channel: 26, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	C. Weber
Test Site:	Eurofins Product Service GmbH
Test Date:	2016-03-24
Max. in-band Frequency [MHz]:	2479.7
Max. in-band Level [dBm/100 kHz]:	0.4
Out-of-band Limit [dBm/100 kHz]:	-19.6



3.7 Test Conditions and Results – Transmitter radiated emissions

Transmitter radiated emissions acc. to FCC 47 CFR 15.247 / IC RSS-247				**Verdict: PASS**
Test according referenced standards	Reference Method			
	FCC 15.247(d) / IC RSS-247 5.5			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 10th 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

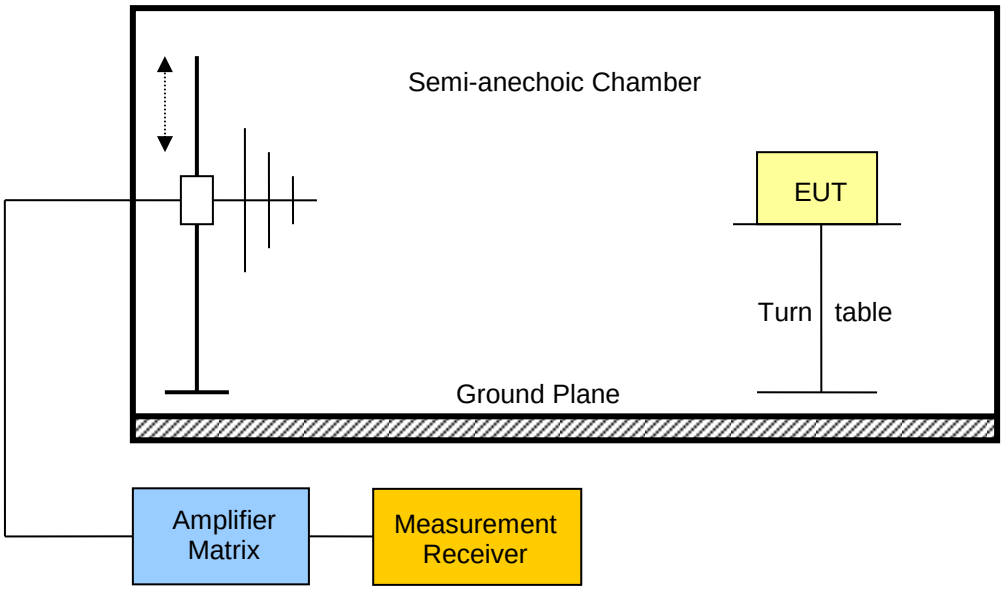
Test results

Channel	Freq. [MHz]	Mode	Emission [MHz]	Level [dbµV/m]	Det.	Pol.	Limit [dbµV/m]	Limit dist. [m]*	Margin [dB]
F_{LOW}	2405	IEEE 802.15.4	4808	47.79	pk	ver	74.00	3	-26.21
F_{LOW}	2405	IEEE 802.15.4	4808	47.47	pk	hor	74.00	3	-26.53
F_{MID}	2440	IEEE 802.15.4	4880	49.29	pk	ver	74.00	3	-24.71
F_{MID}	2440	IEEE 802.15.4	4880	48.94	pk	hor	74.00	3	-25.06
F_{HIGH}	2480	IEEE 802.15.4	2484	59.89	pk	ver	74.00	3	-14.11
F_{HIGH}	2480	IEEE 802.15.4	2484	52.45	RMS	ver	54.00	3	-01.55
F_{HIGH}	2480	IEEE 802.15.4	2484	57.47	pk	hor	74.00	3	-16.53
F_{HIGH}	2480	IEEE 802.15.4	2484	49.83	RMS	hor	54.00	3	-04.17
F_{HIGH}	2480	IEEE 802.15.4	2485	54.63	pk	ver	74.00	3	-19.37
F_{HIGH}	2480	IEEE 802.15.4	2485	47.02	RMS	ver	54.00	3	-06.98
F_{HIGH}	2480	IEEE 802.15.4	4960	48.74	pk	ver	74.00	3	-25.26
F_{HIGH}	2480	IEEE 802.15.4	4960	48.73	pk	hor	74.00	3	-25.27

Comments: * Physical distance between EUT and measurement antenna.

3.8 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. to IC RSS-247				**Verdict: PASS**
Test according referenced standards	Reference Method			
	IC RSS-247 3.1			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 5th 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]
All	Scan		**				

Comments:
* Physical distance between EUT and measurement antenna.
** Emission level corresponds to ambient noise floor

ANNEX A Transmitter radiated spurious emissions

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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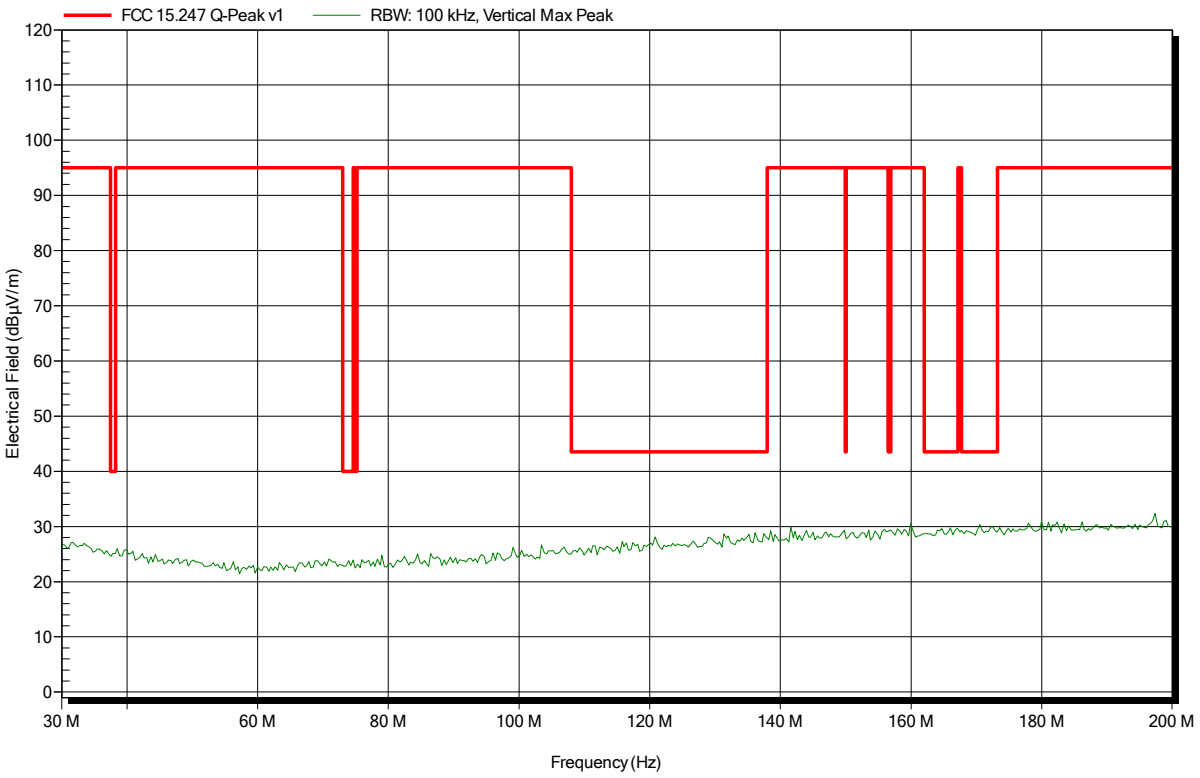

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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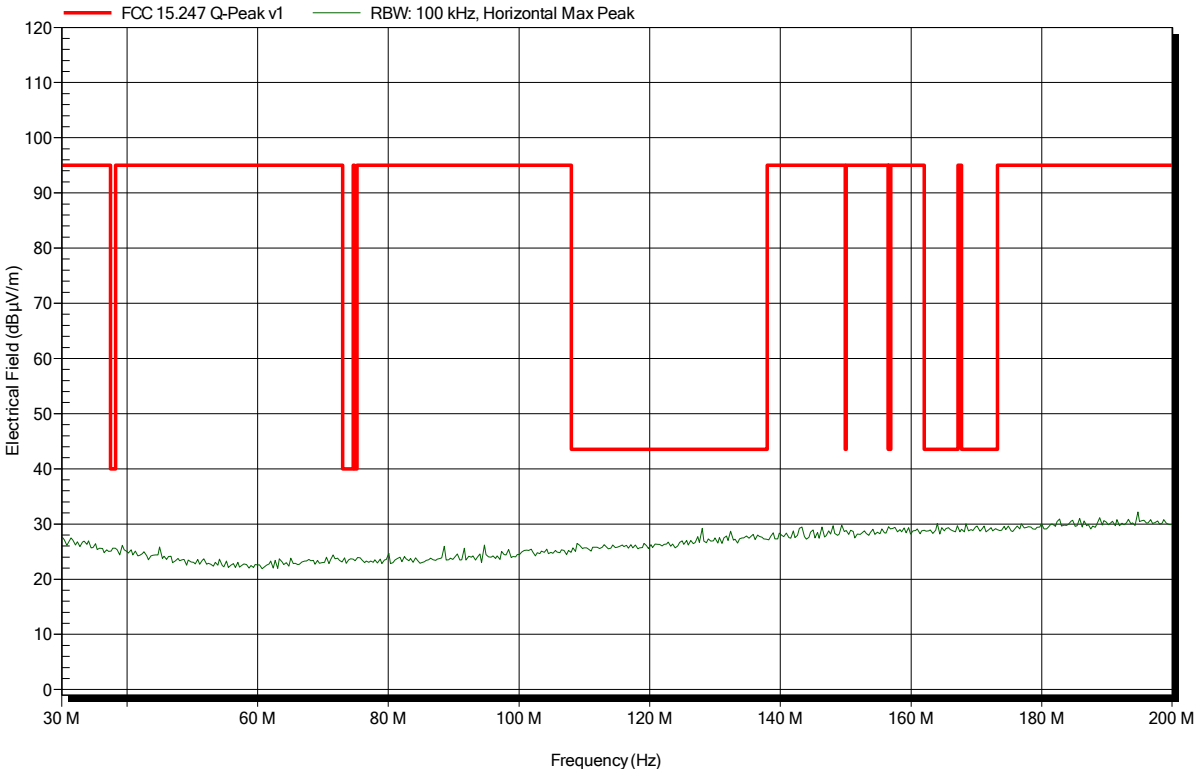

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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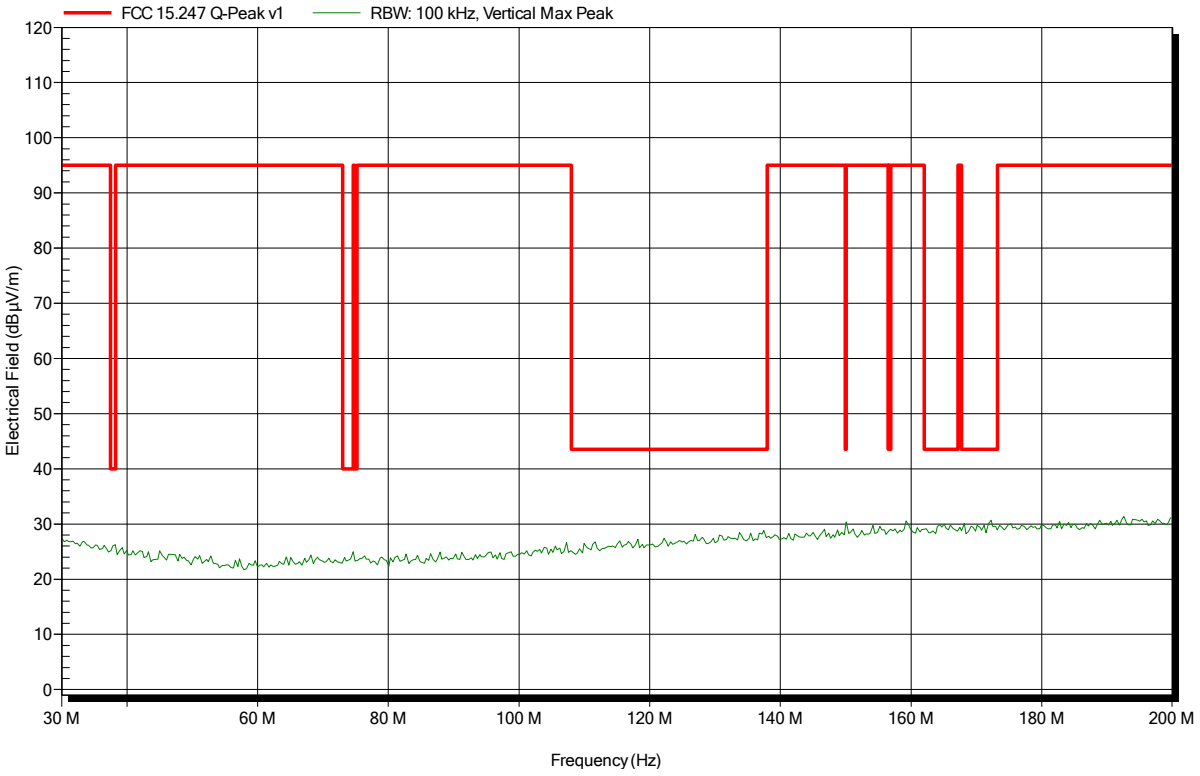

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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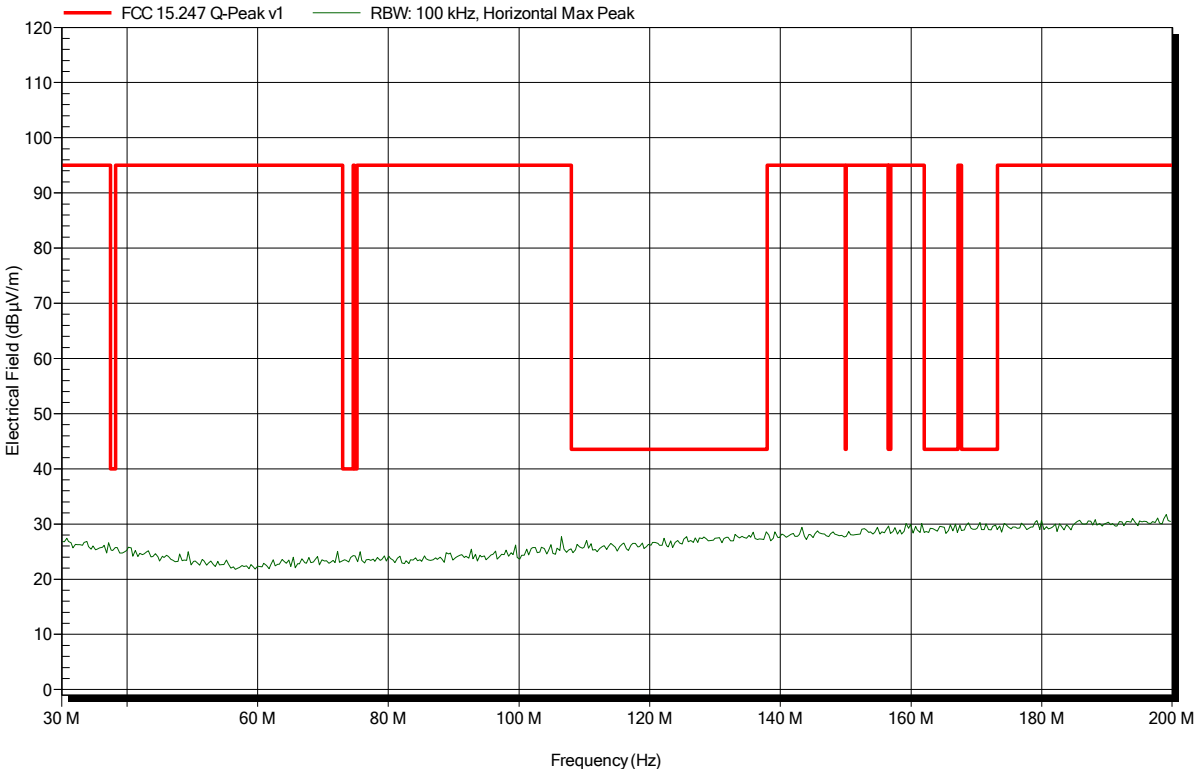

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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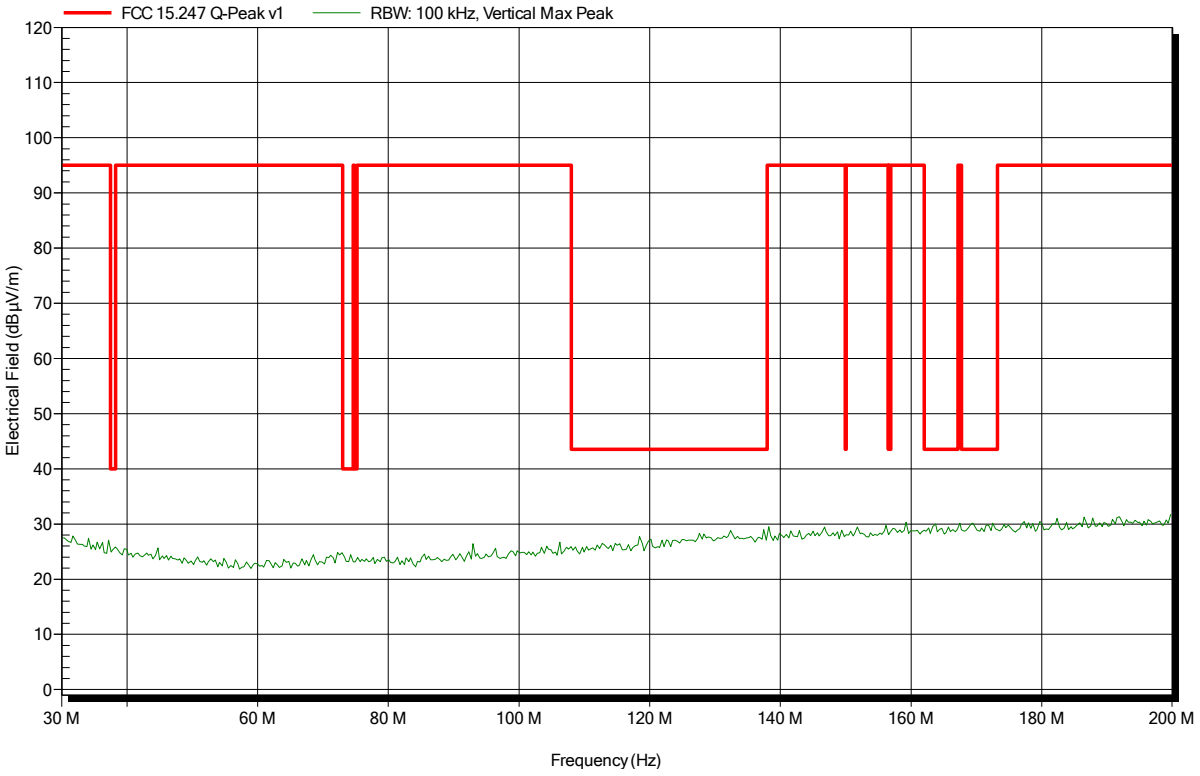

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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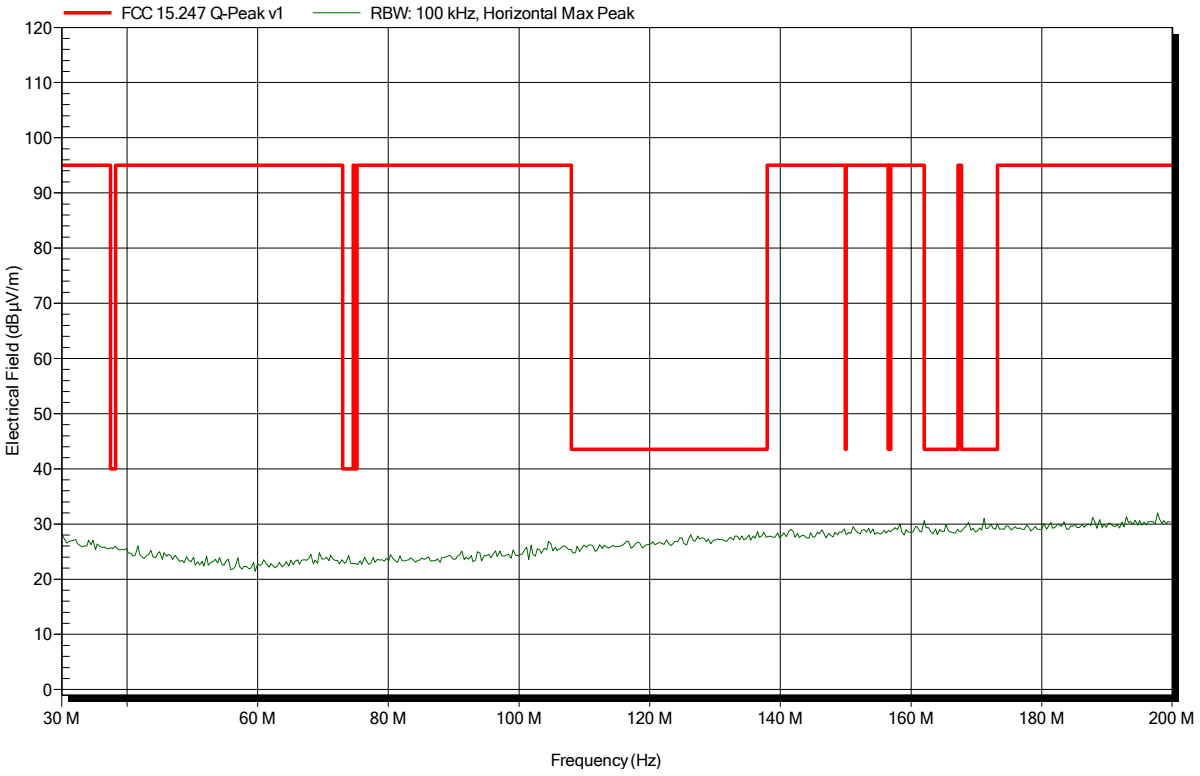

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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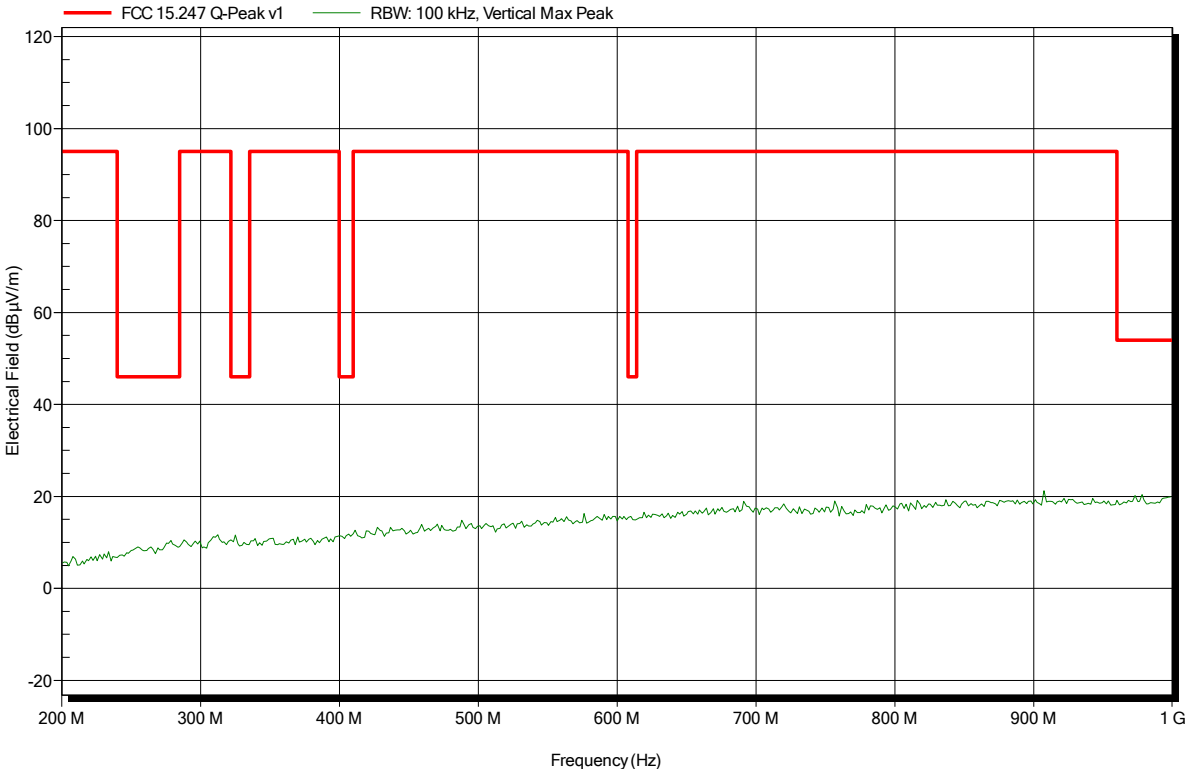

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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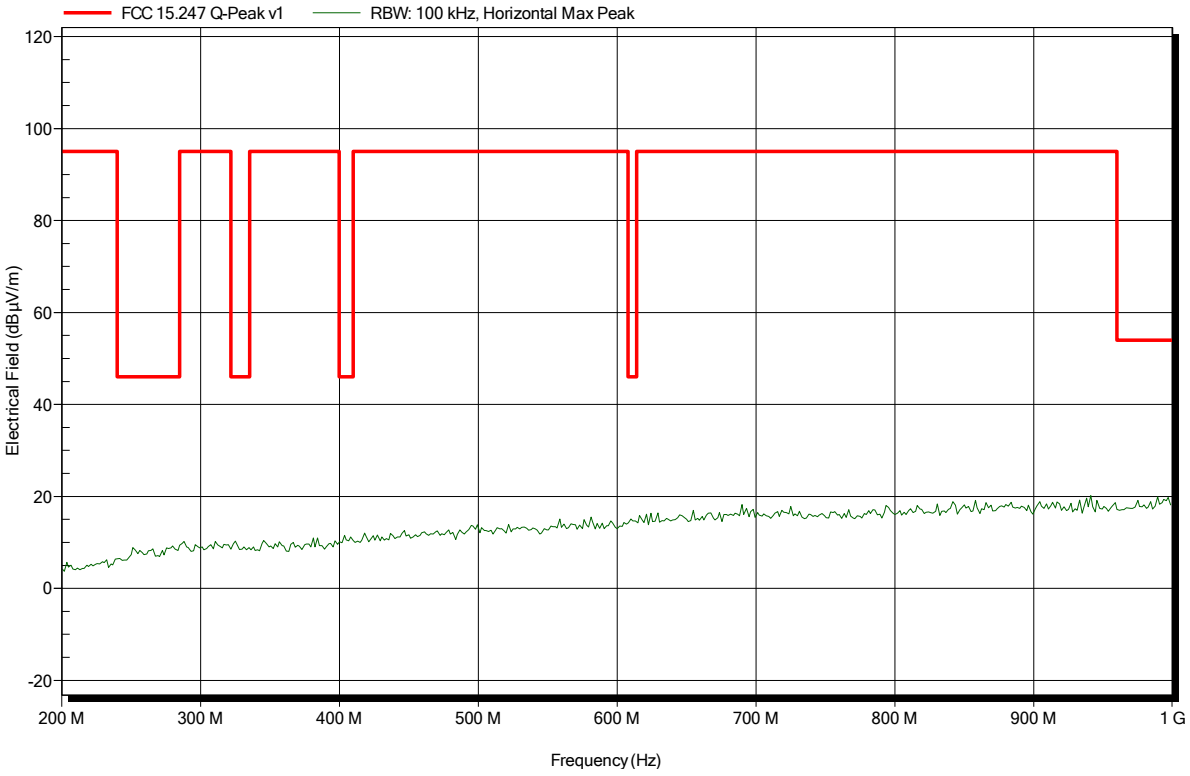

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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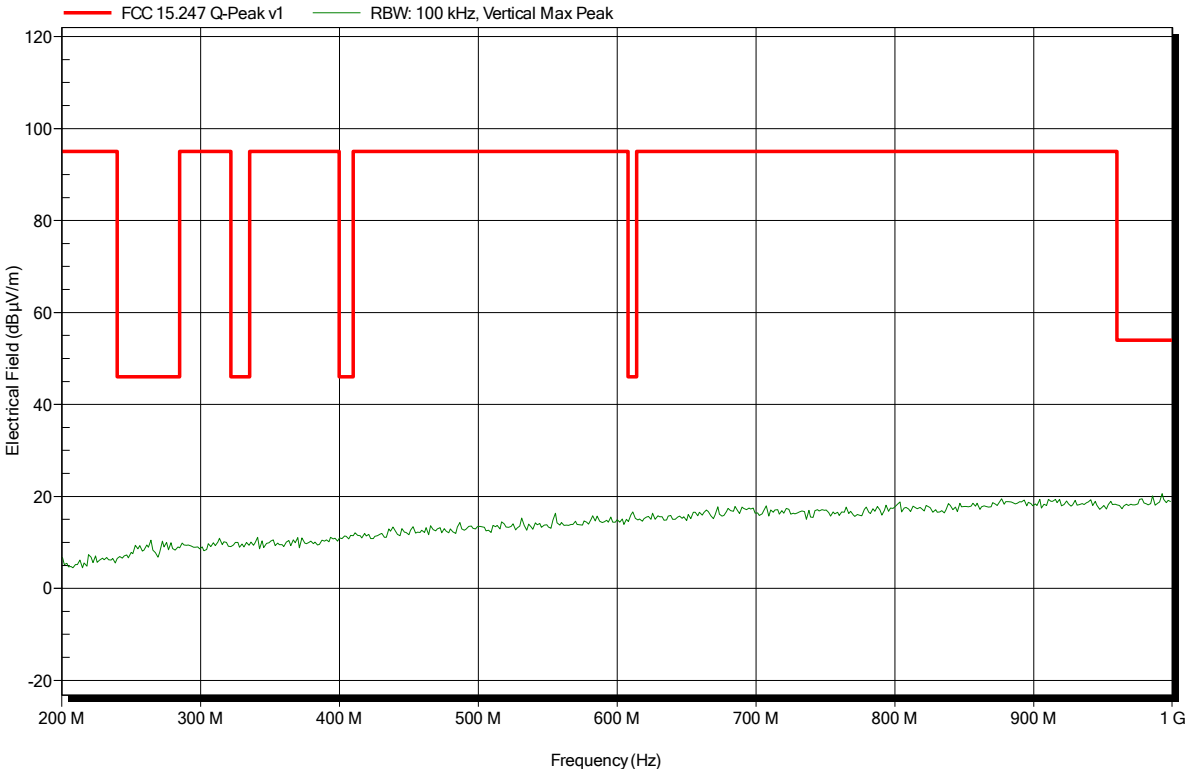

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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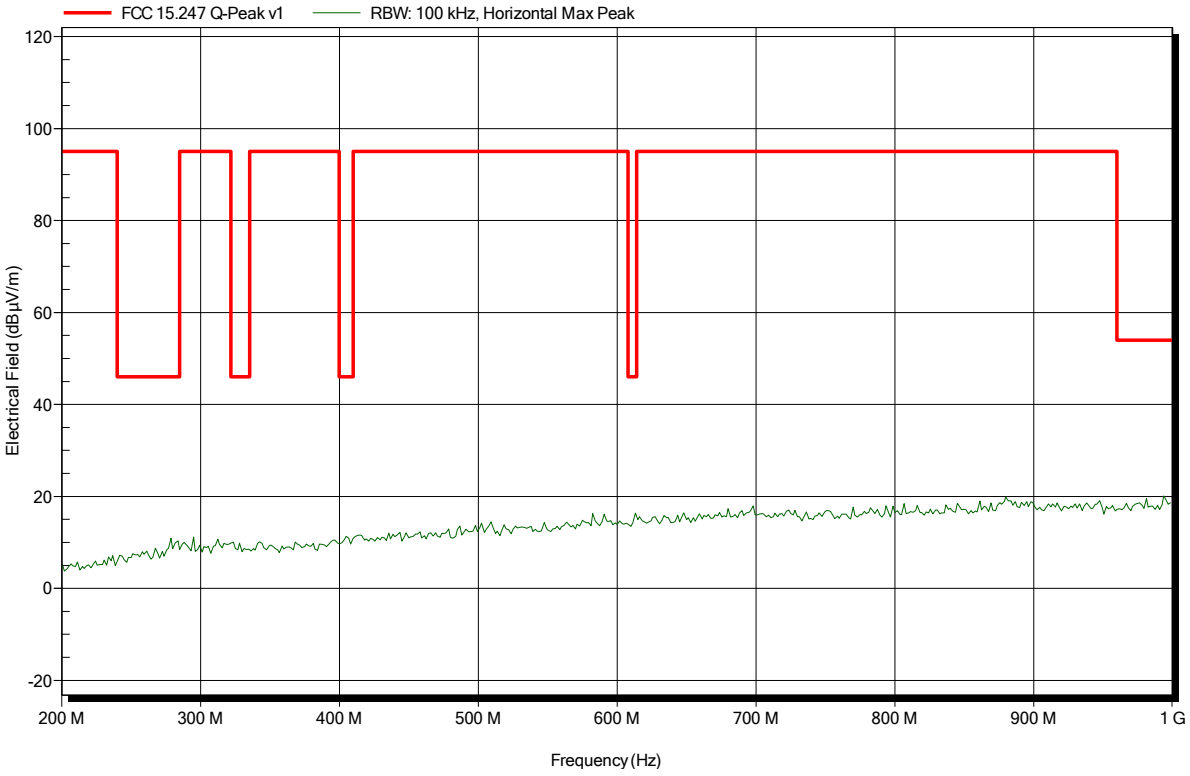

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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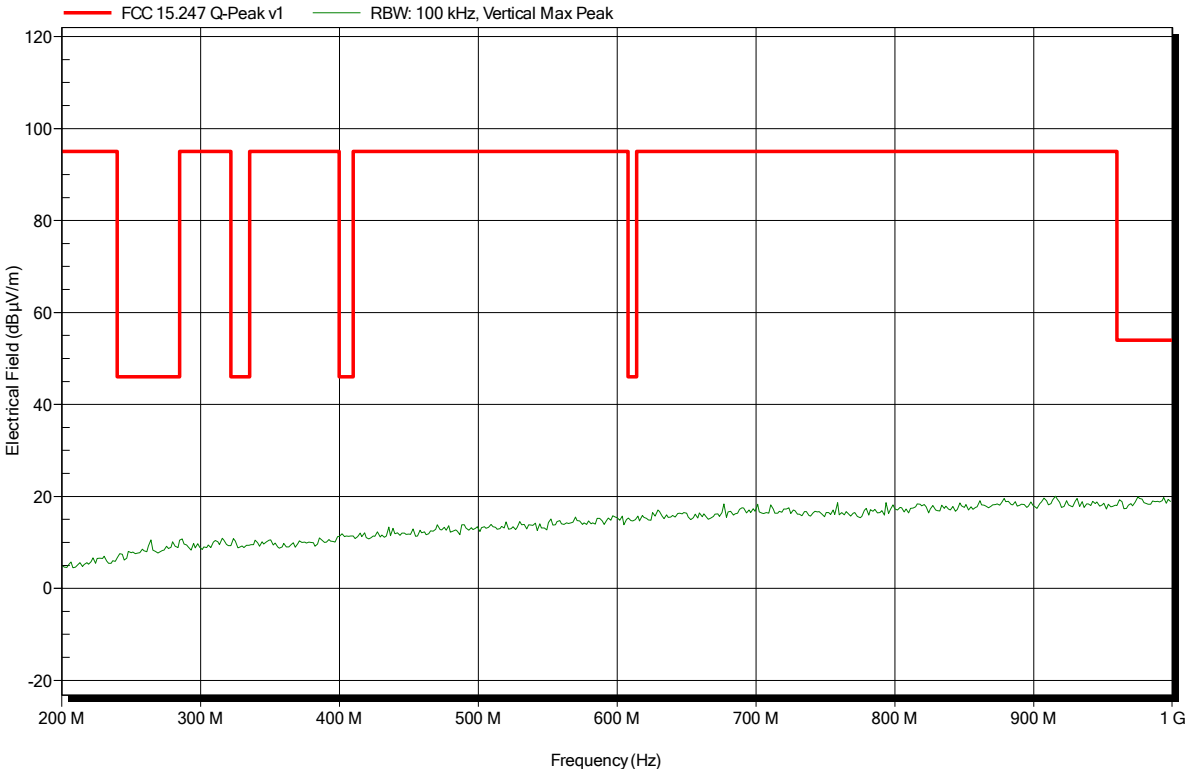

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-15
Note:	EUT vertical

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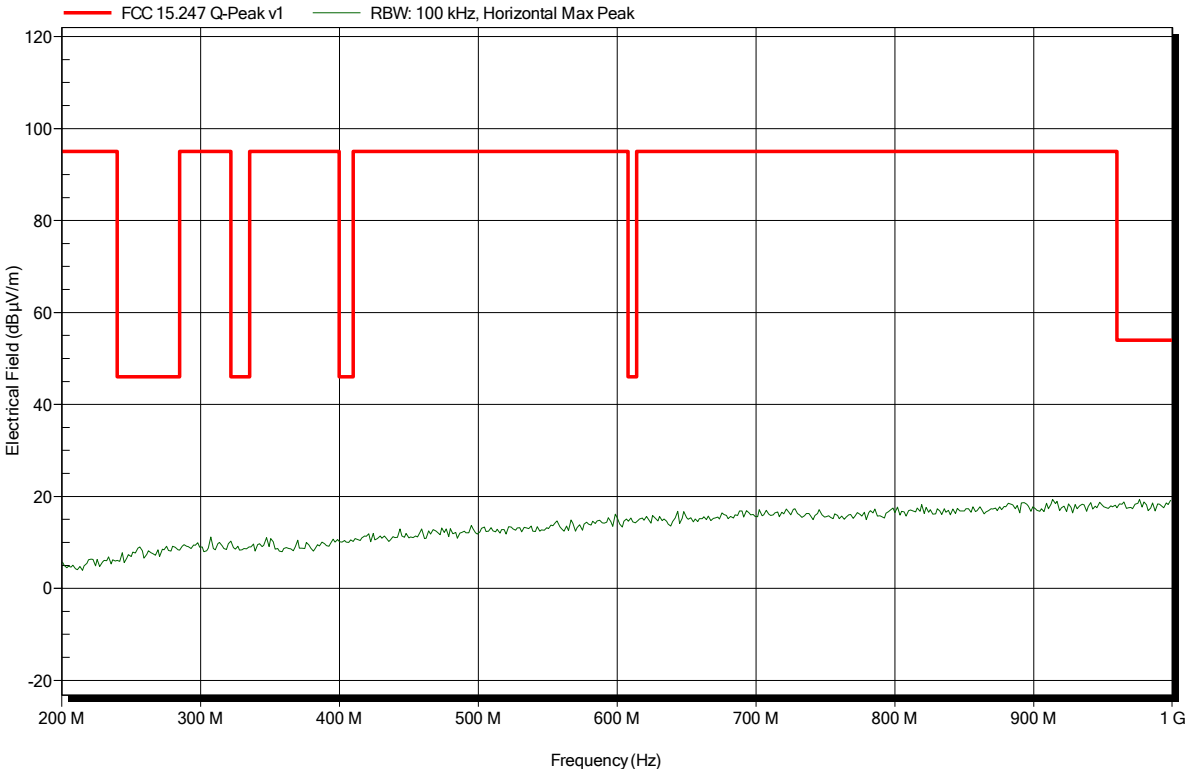

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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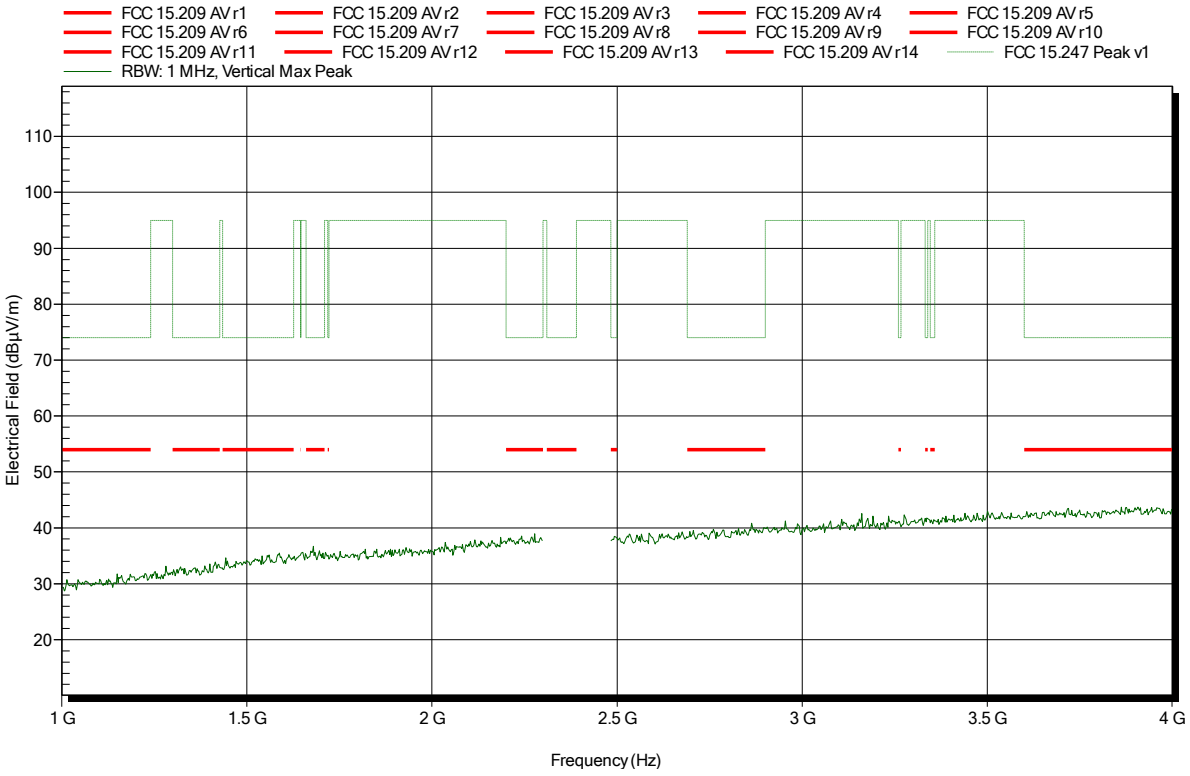

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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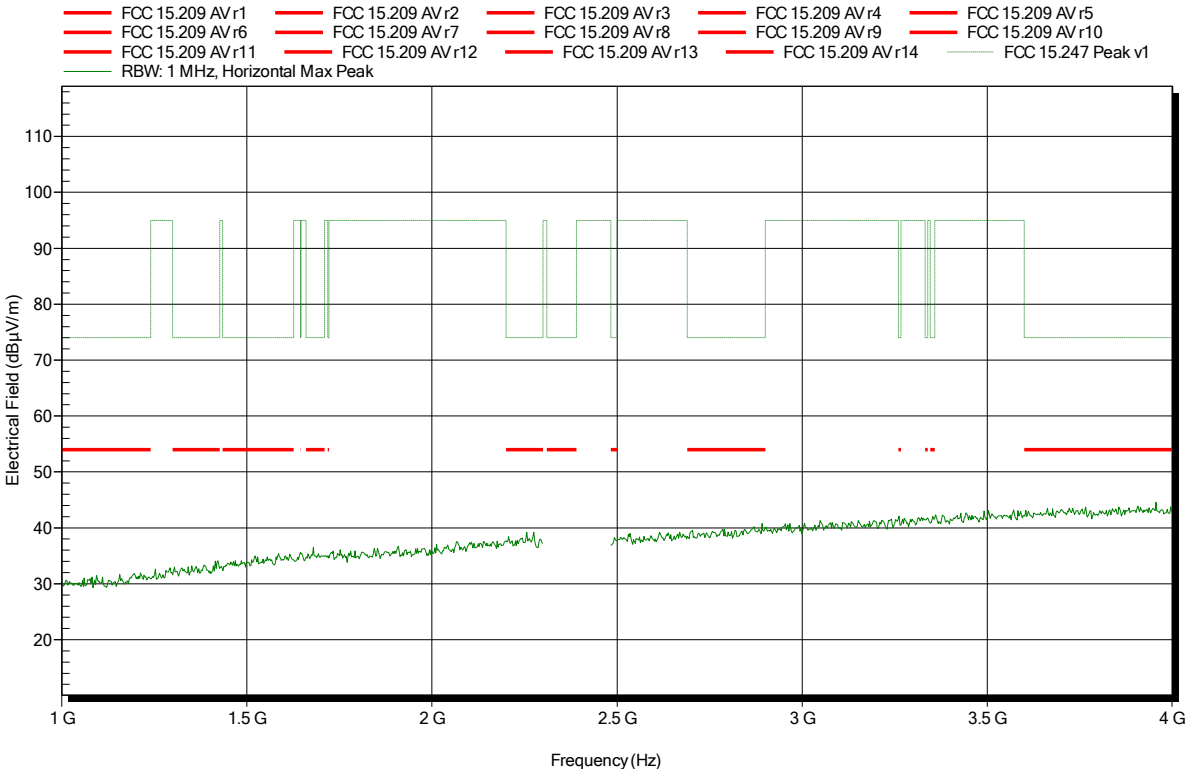

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical; lower bandedge

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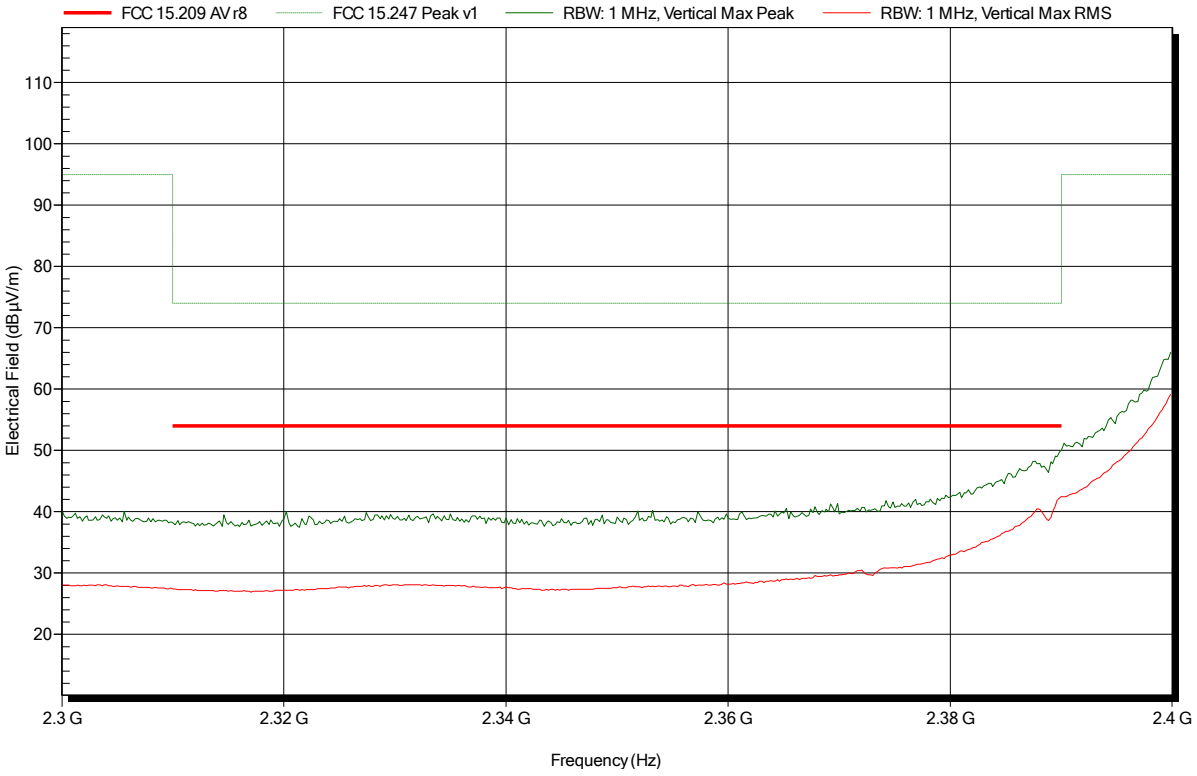

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical; lower bandedge

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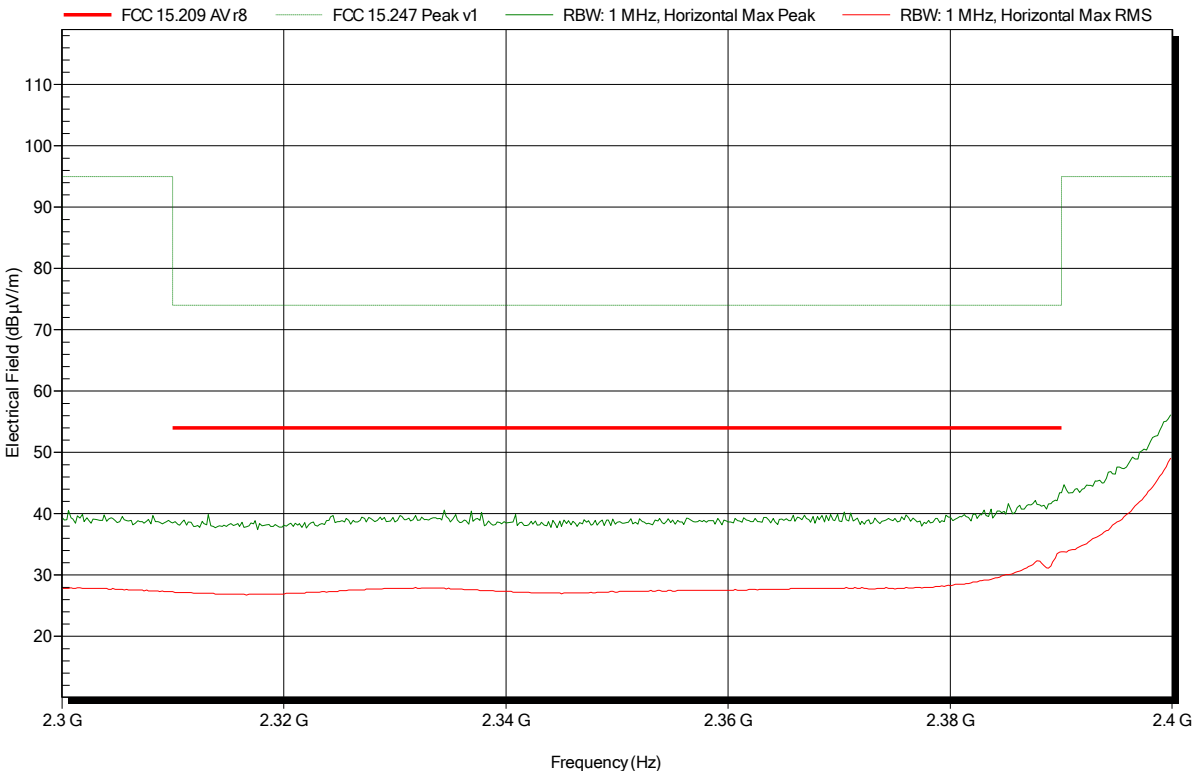

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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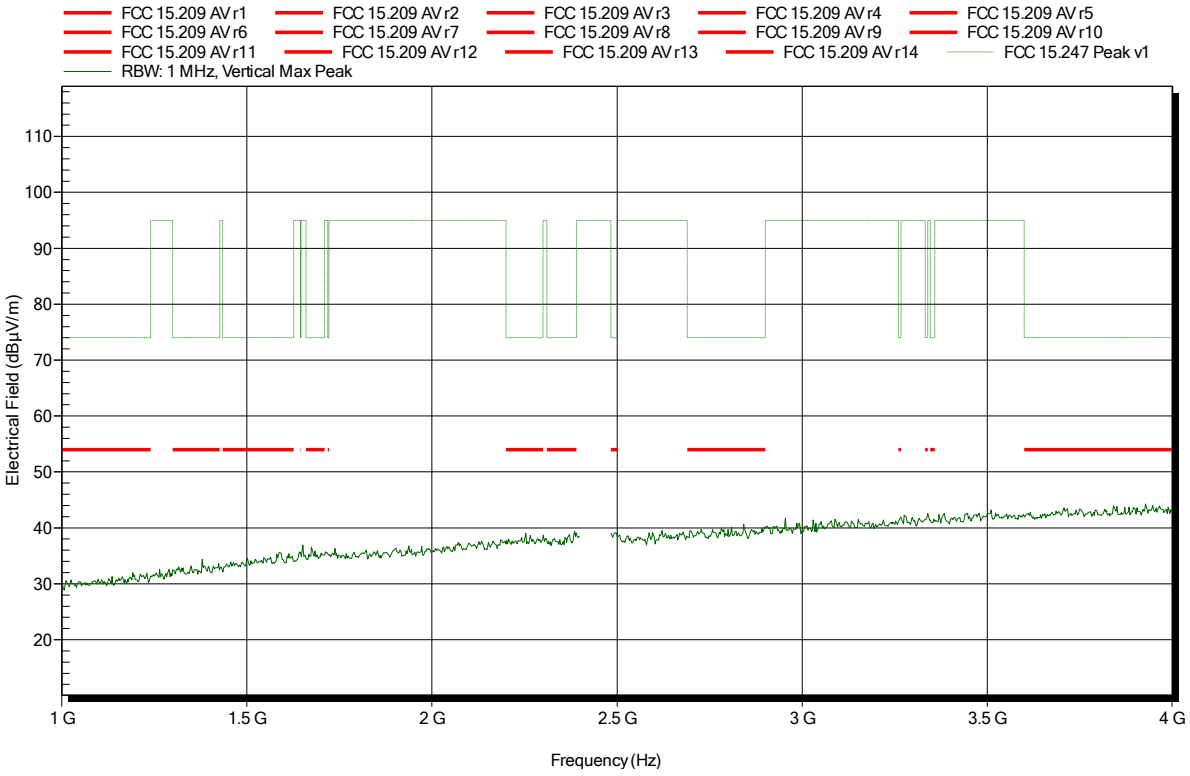

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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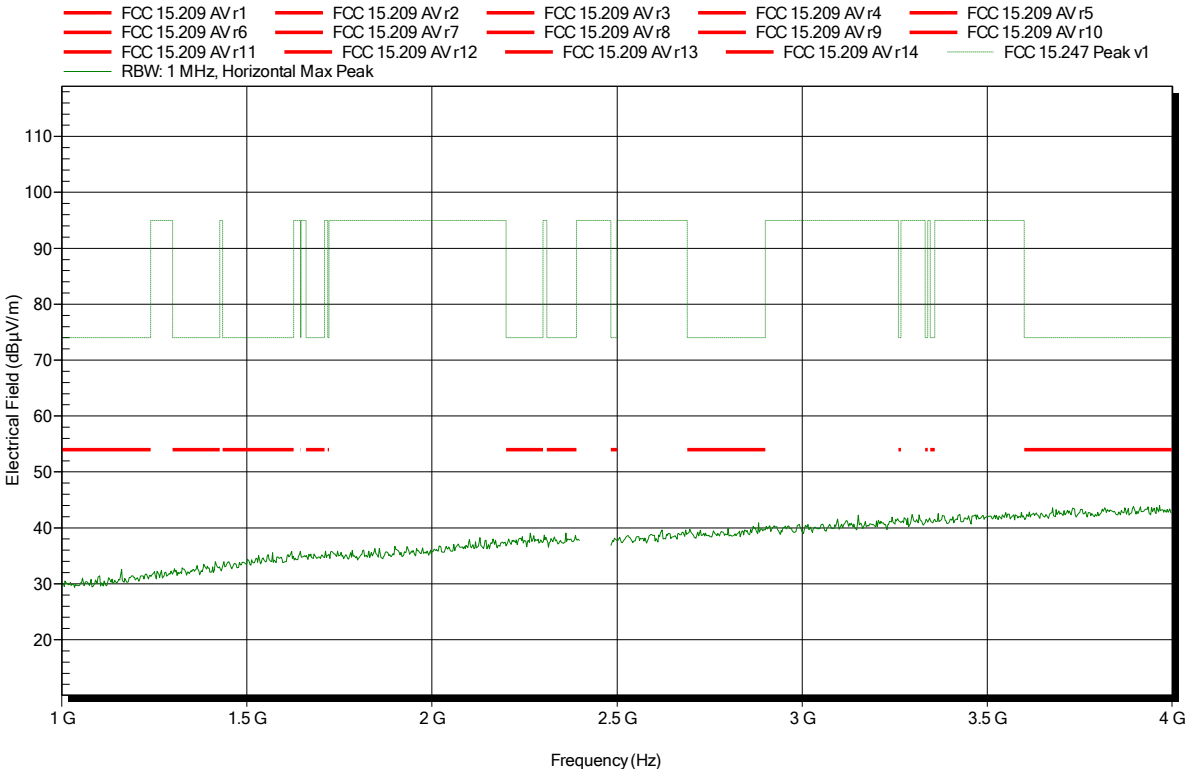

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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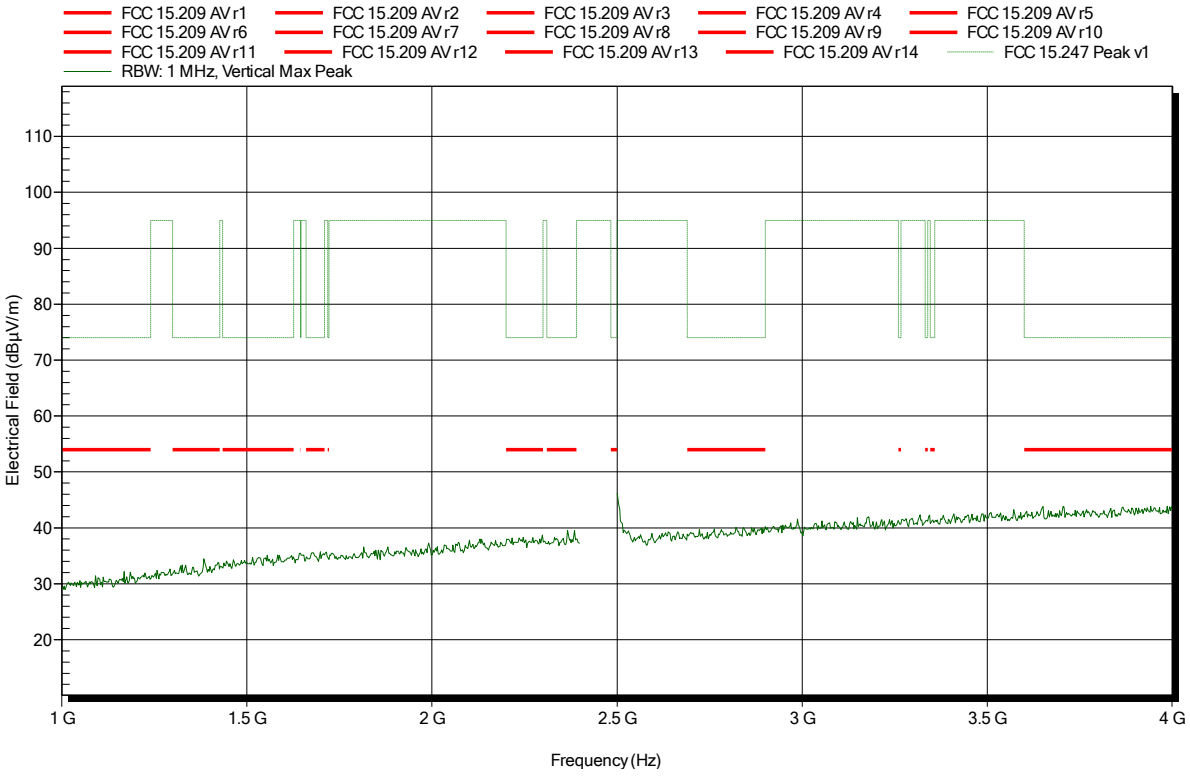

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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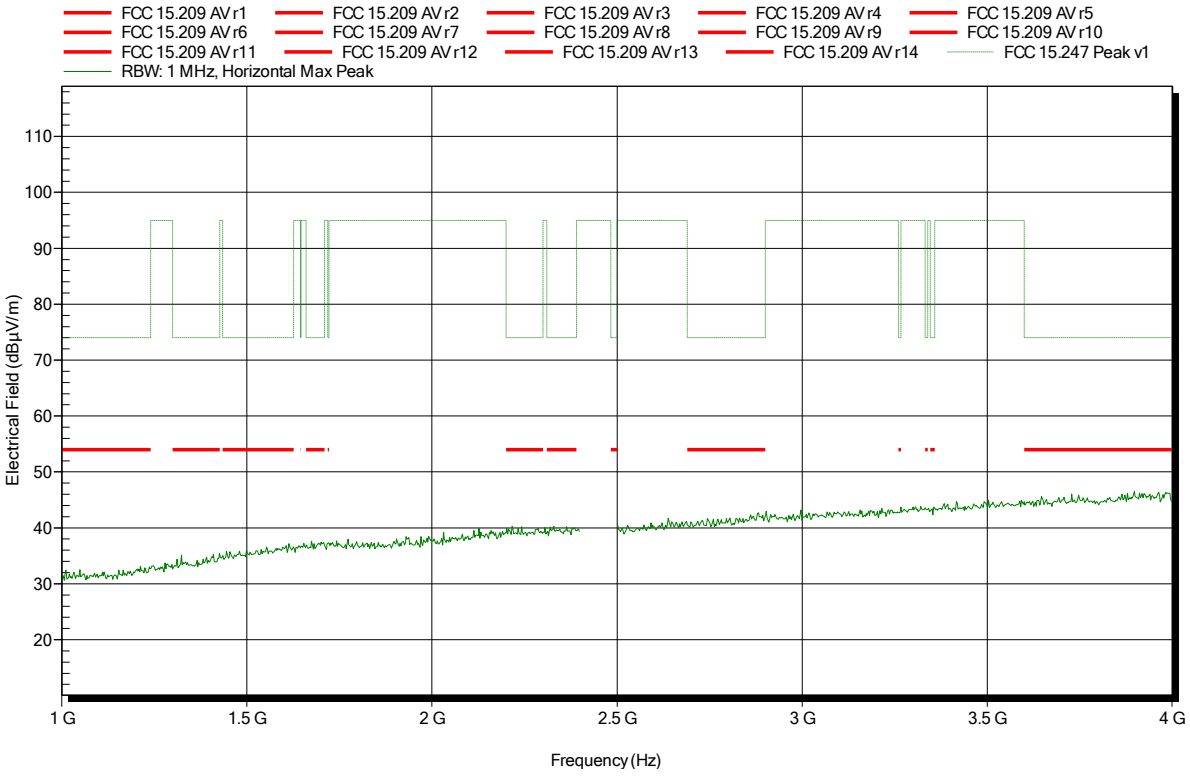

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-31
Note:	EUT vertical; higher bandedge

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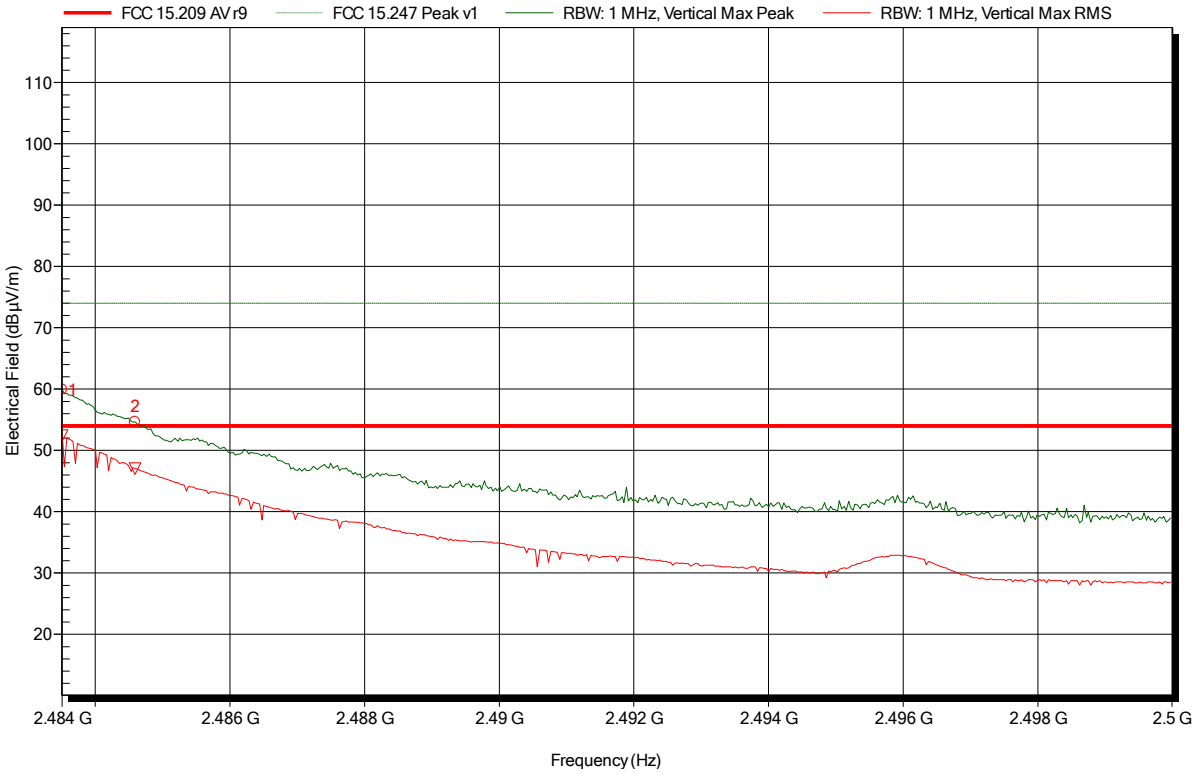

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.484 GHz	59.89 dBµV/m	74 dBµV/m	-14.11 dB	Pass
2.485 GHz	54.63 dBµV/m	74 dBµV/m	-19.37 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.484 GHz	52.45 dBµV/m	54 dBµV/m	-1.55 dB	Pass
2.485 GHz	47.02 dBµV/m	54 dBµV/m	-6.98 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-31
Note:	EUT vertical; higher bandedge

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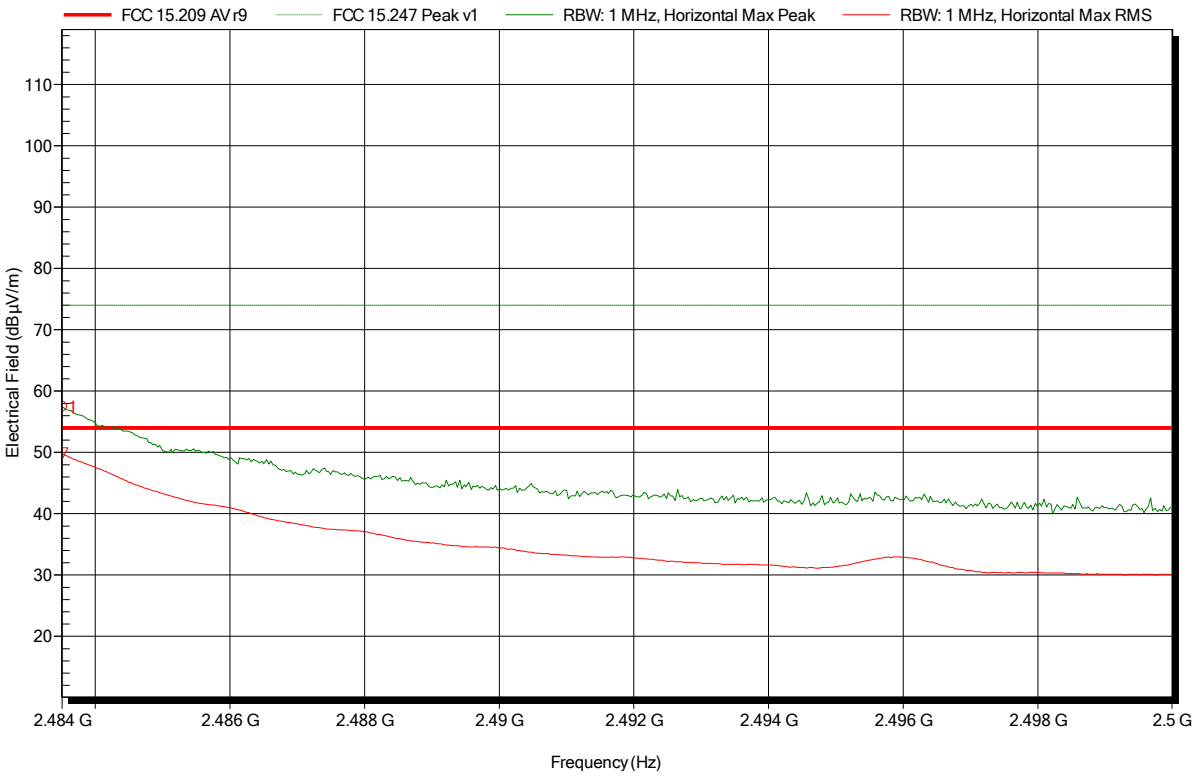

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.484 GHz	57.47 dBµV/m	74 dBµV/m	-16.53 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.484 GHz	49.83 dBµV/m	54 dBµV/m	-4.17 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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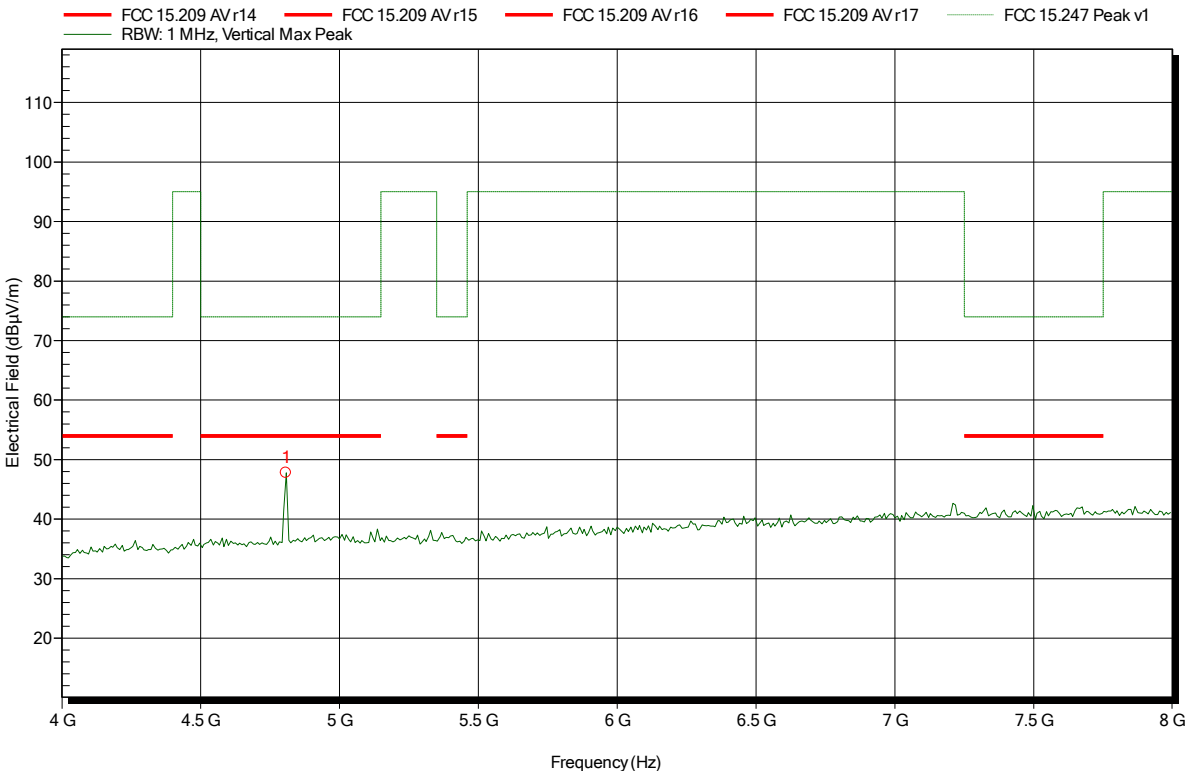

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.808 GHz	47.79 dBµV/m	74 dBµV/m	-26.21 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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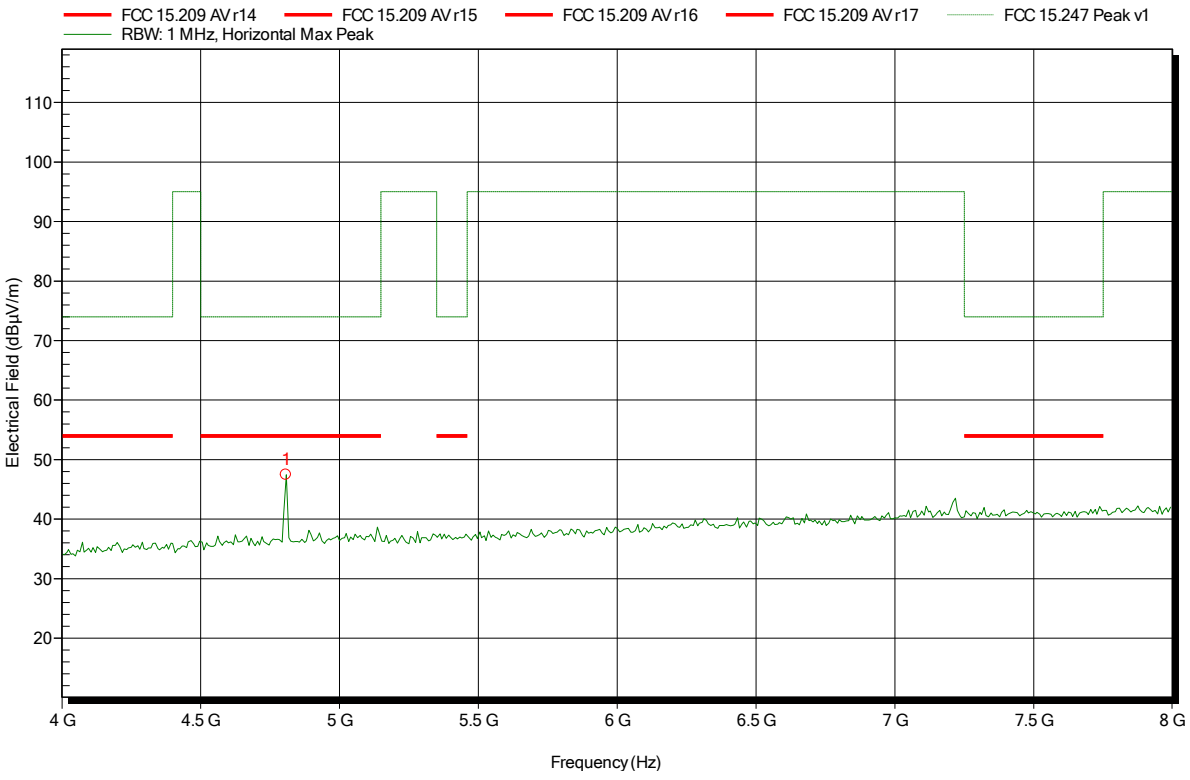

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.808 GHz	47.47 dBµV/m	74 dBµV/m	-26.53 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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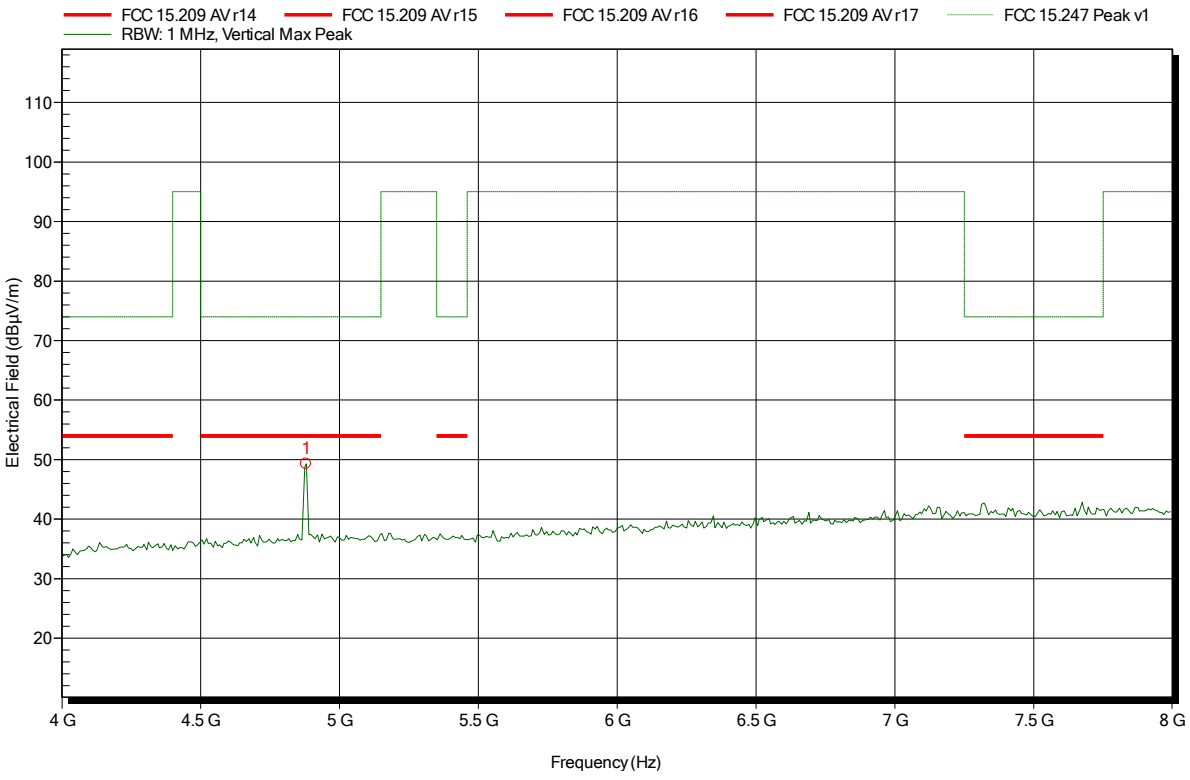

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.88 GHz	49.29 dBµV/m	74 dBµV/m	-24.71 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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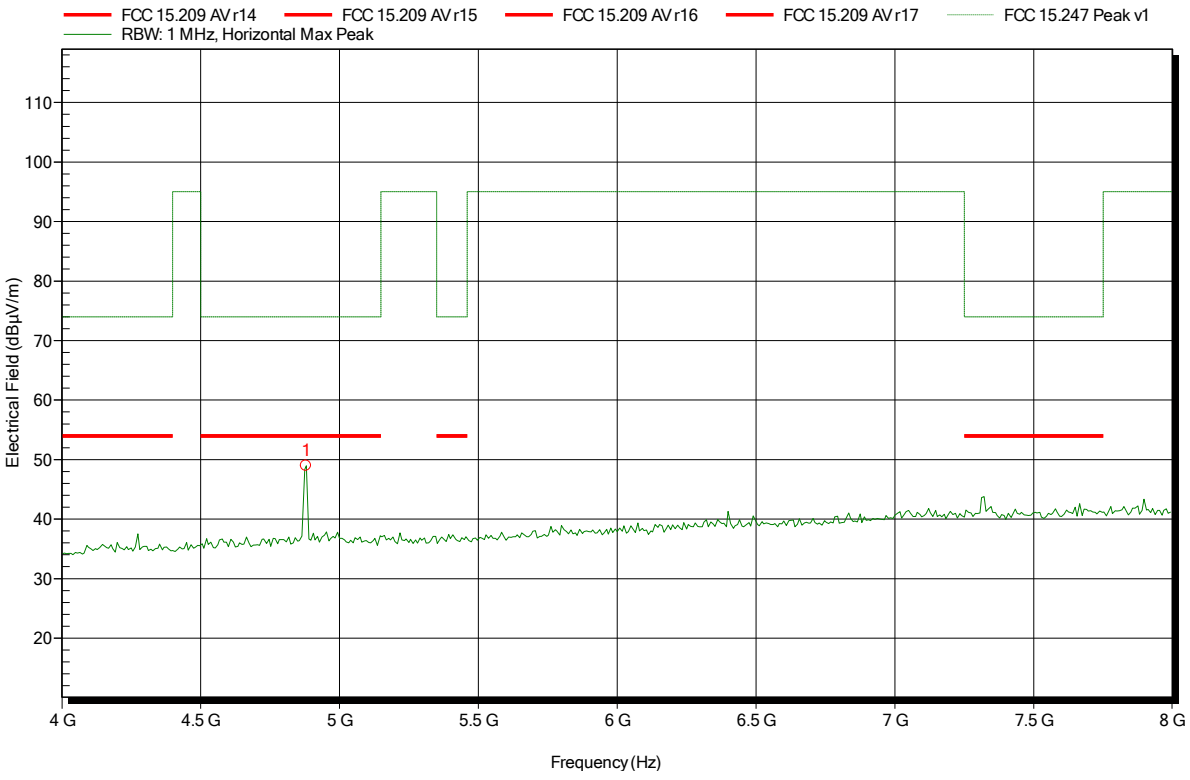

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.88 GHz	48.94 dBµV/m	74 dBµV/m	-25.06 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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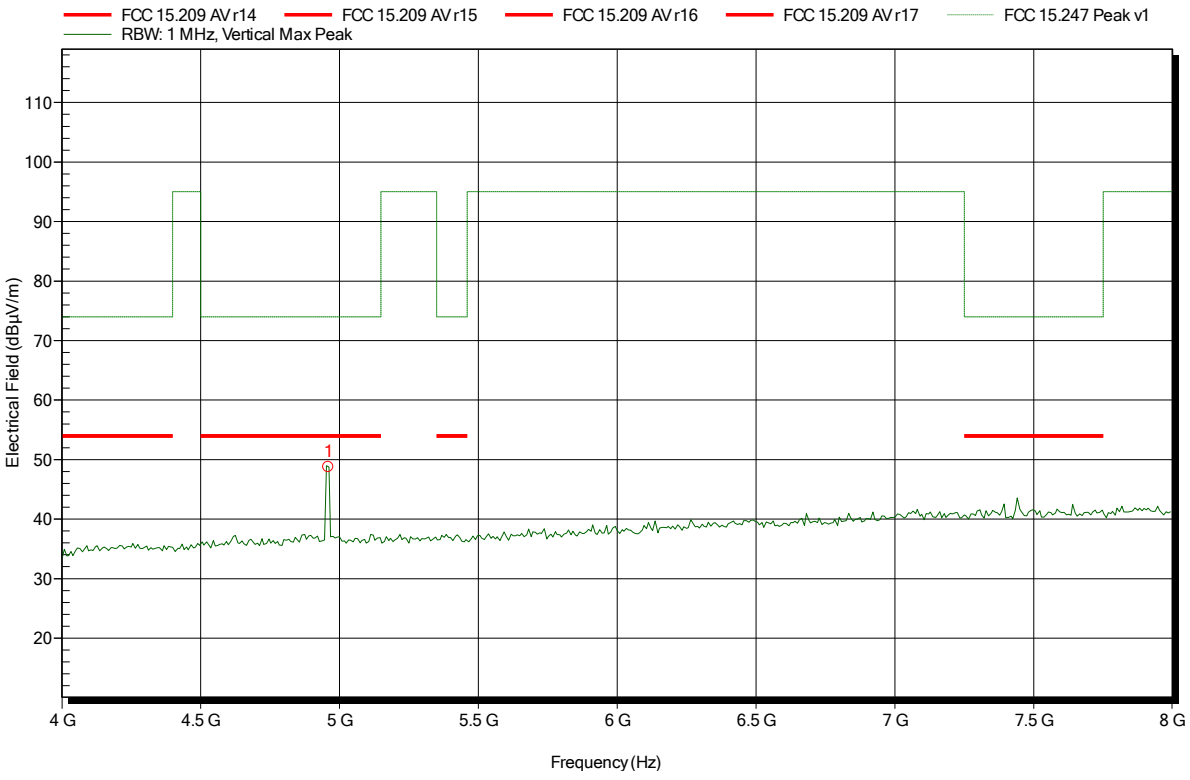

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.96 GHz	48.74 dBµV/m	74 dBµV/m	-25.26 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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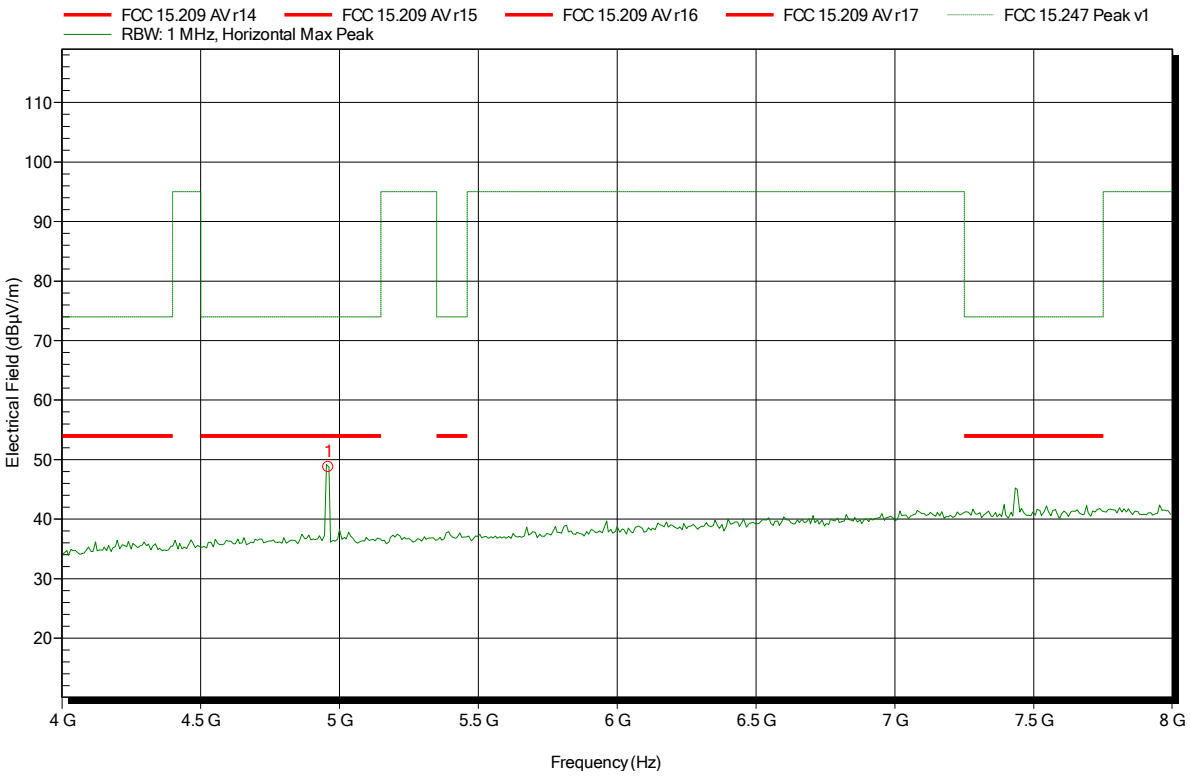

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.96 GHz	48.73 dBµV/m	74 dBµV/m	-25.27 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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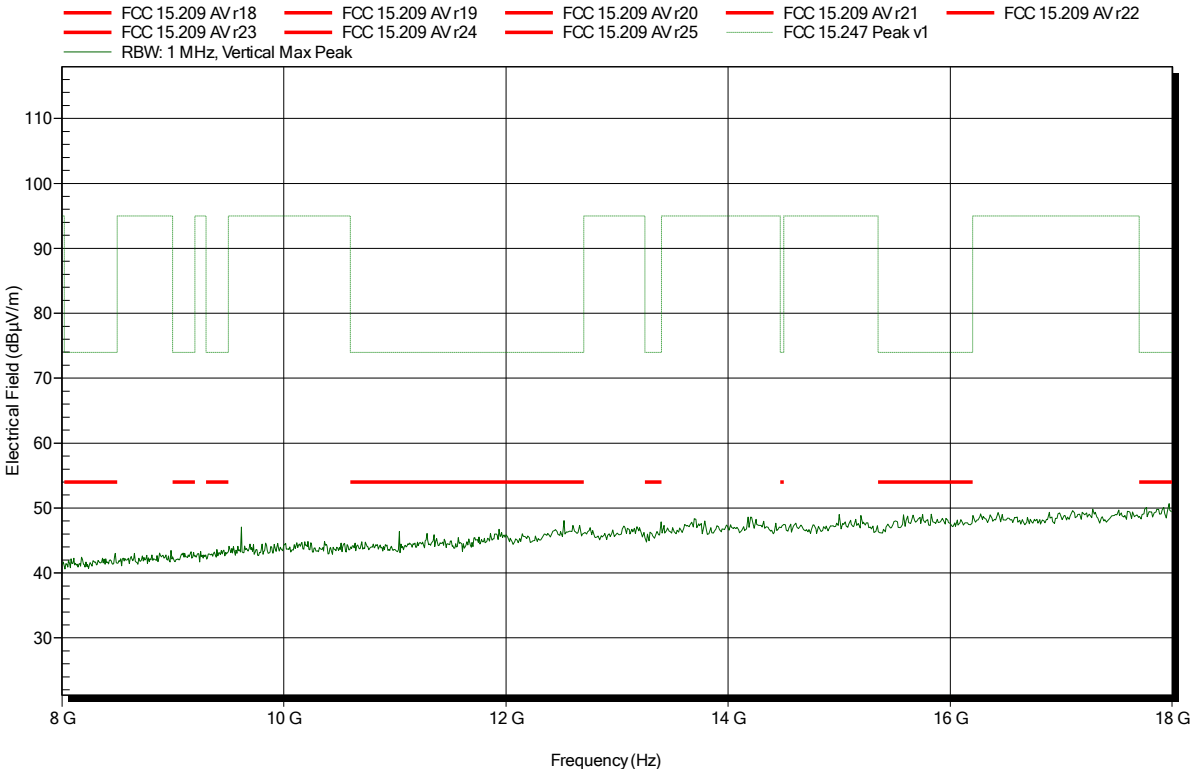

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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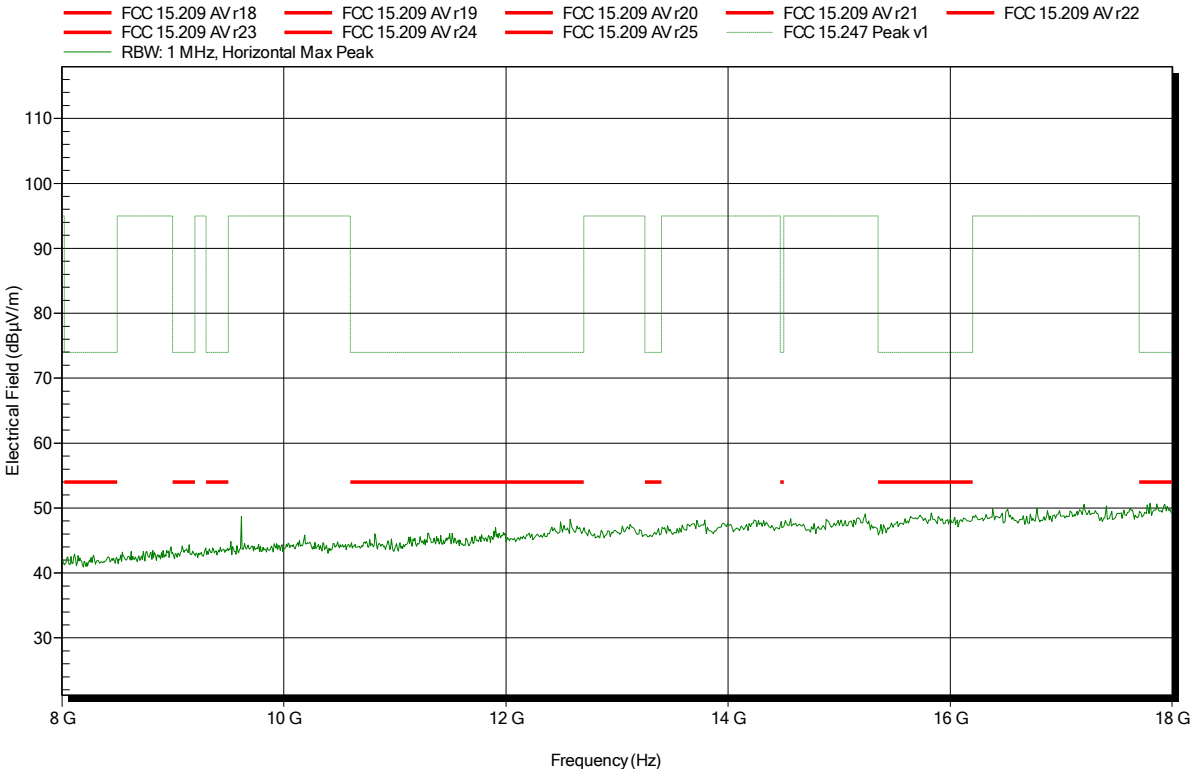

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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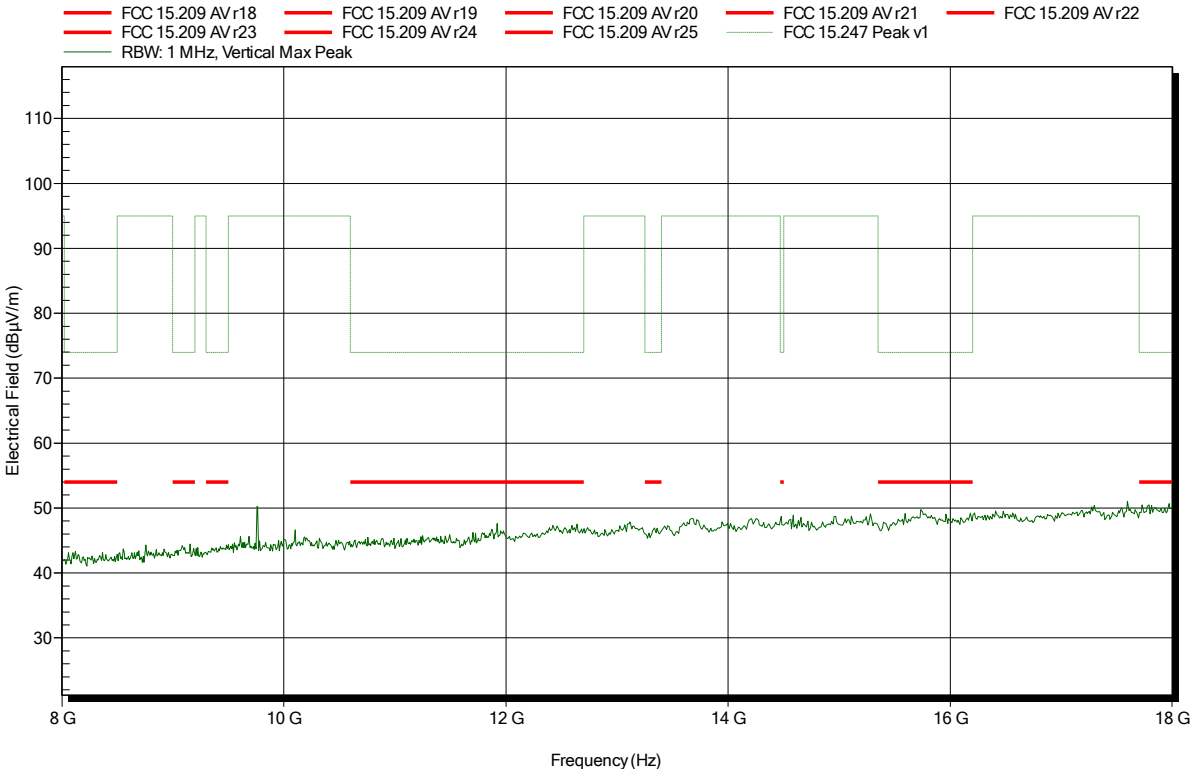

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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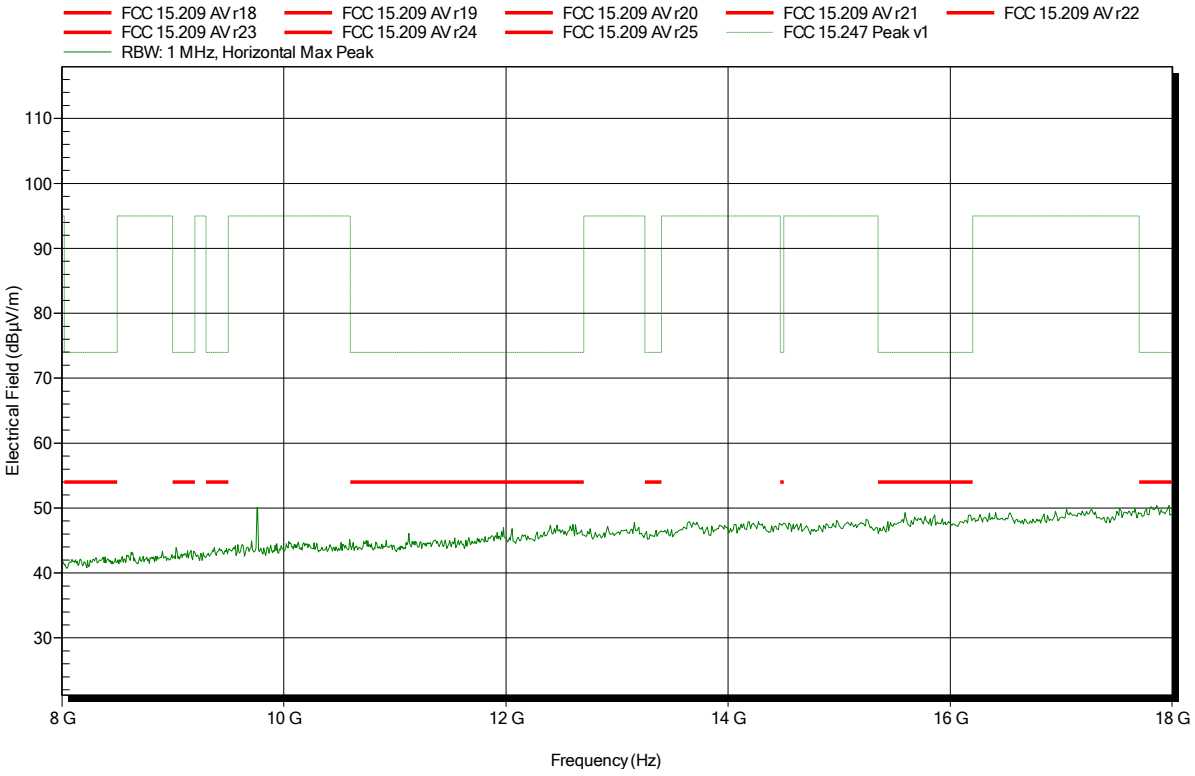

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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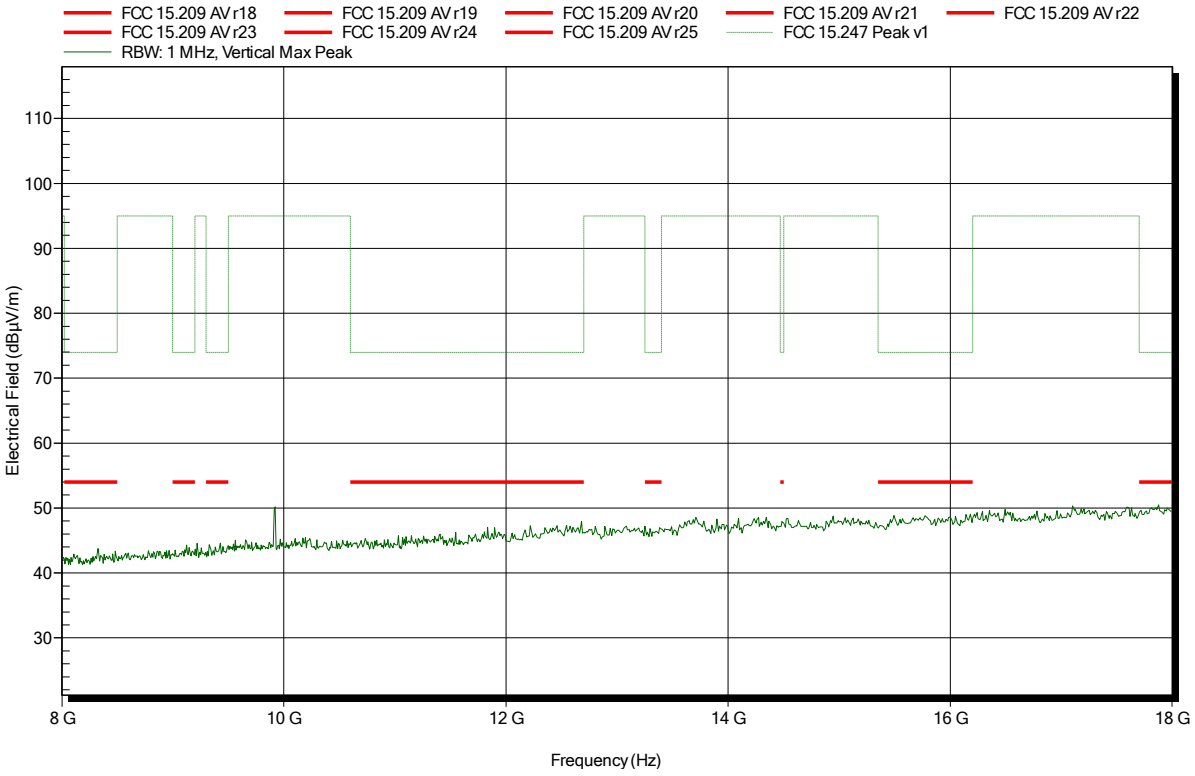

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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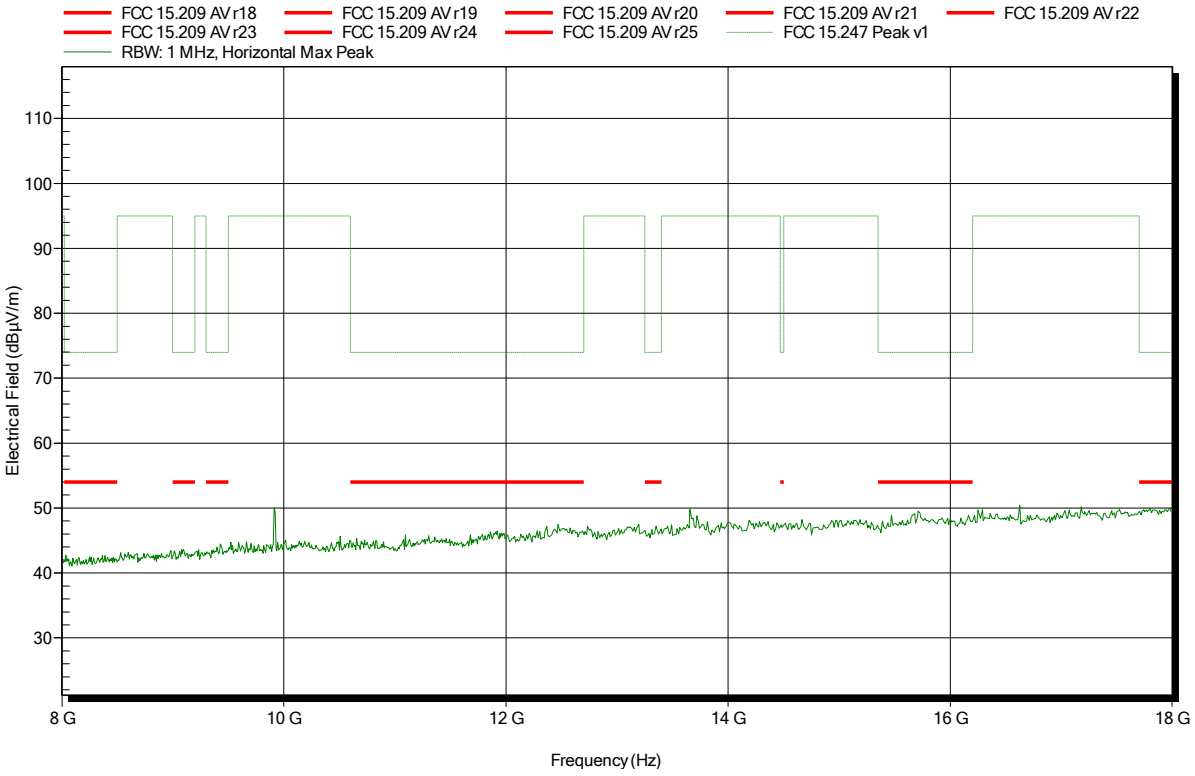

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
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Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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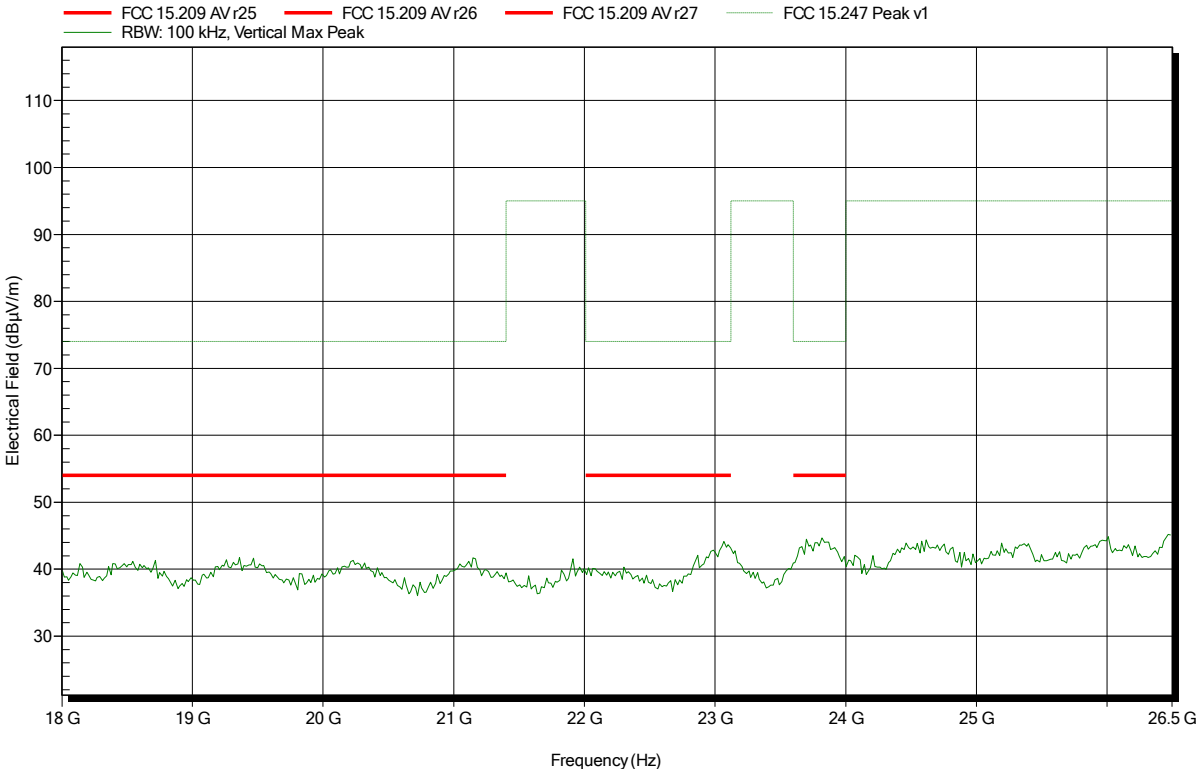

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 11; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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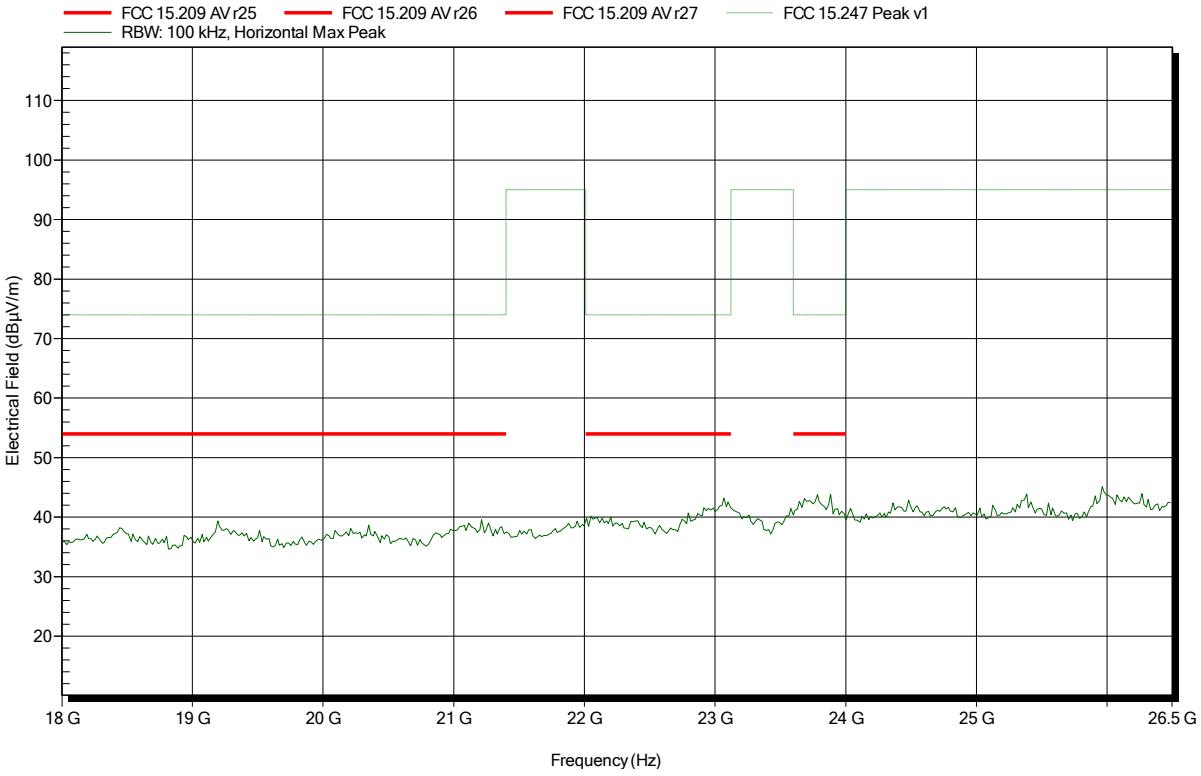

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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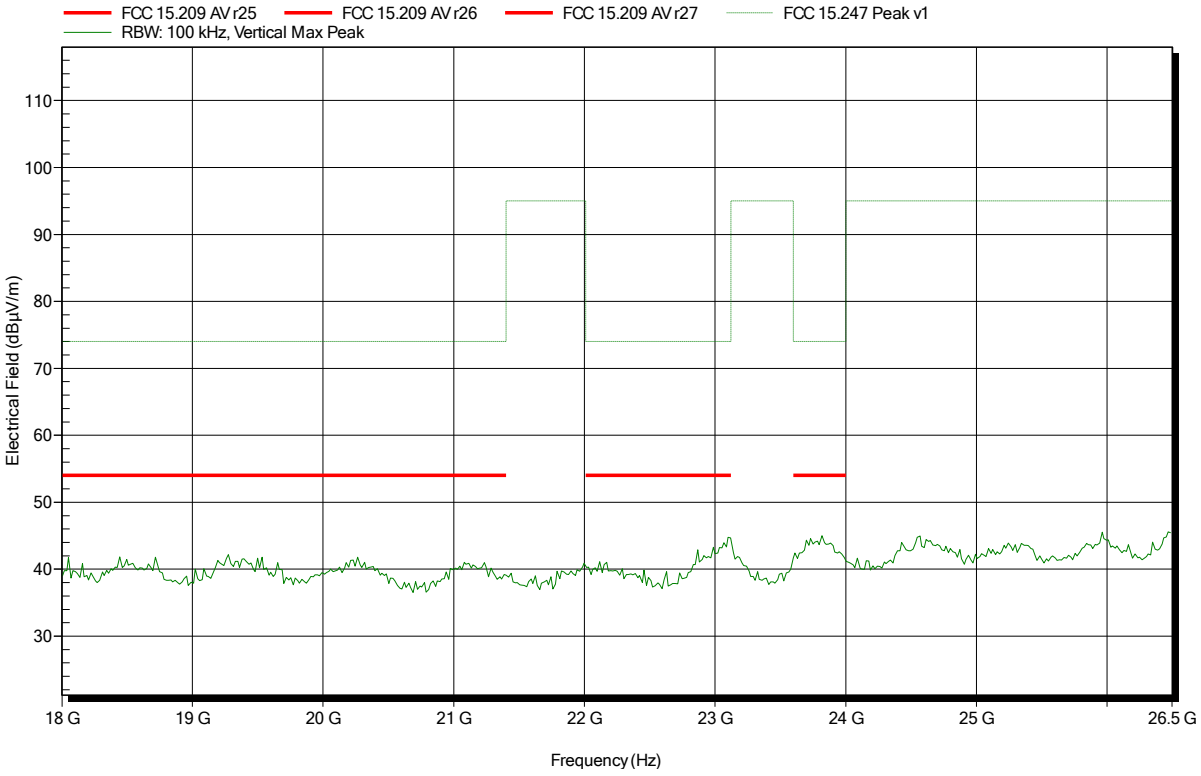

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 18; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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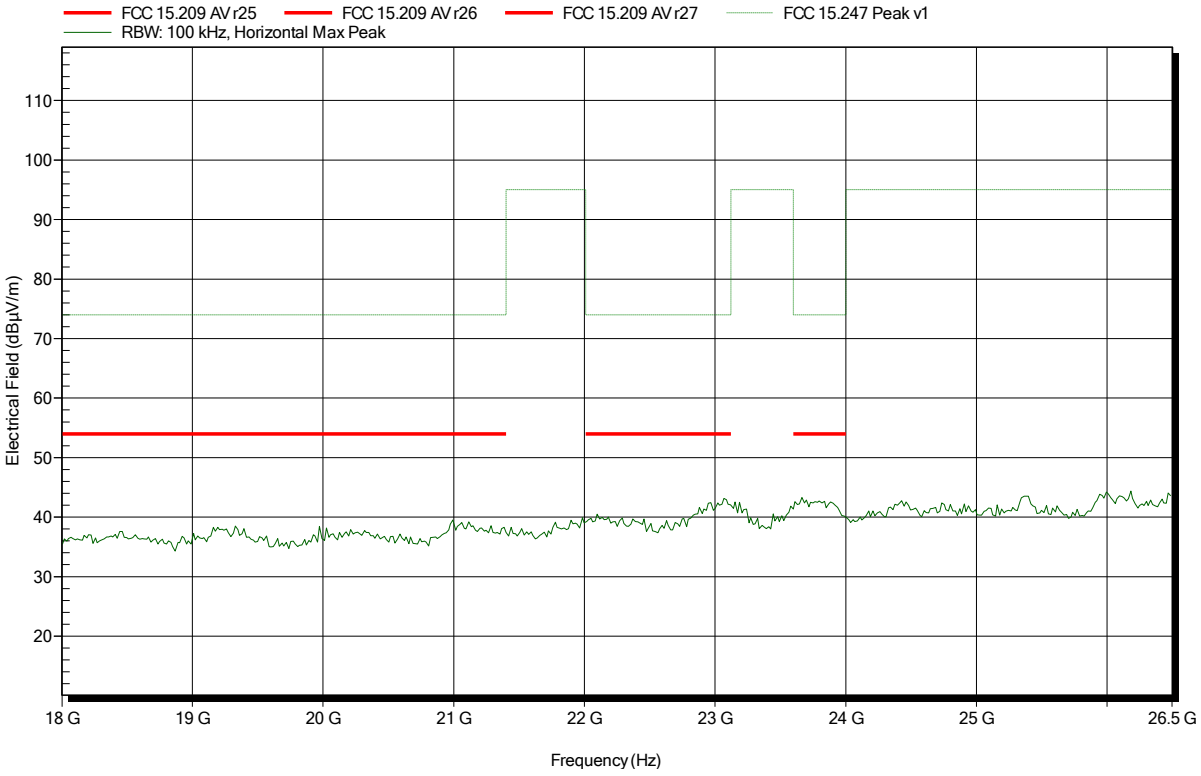

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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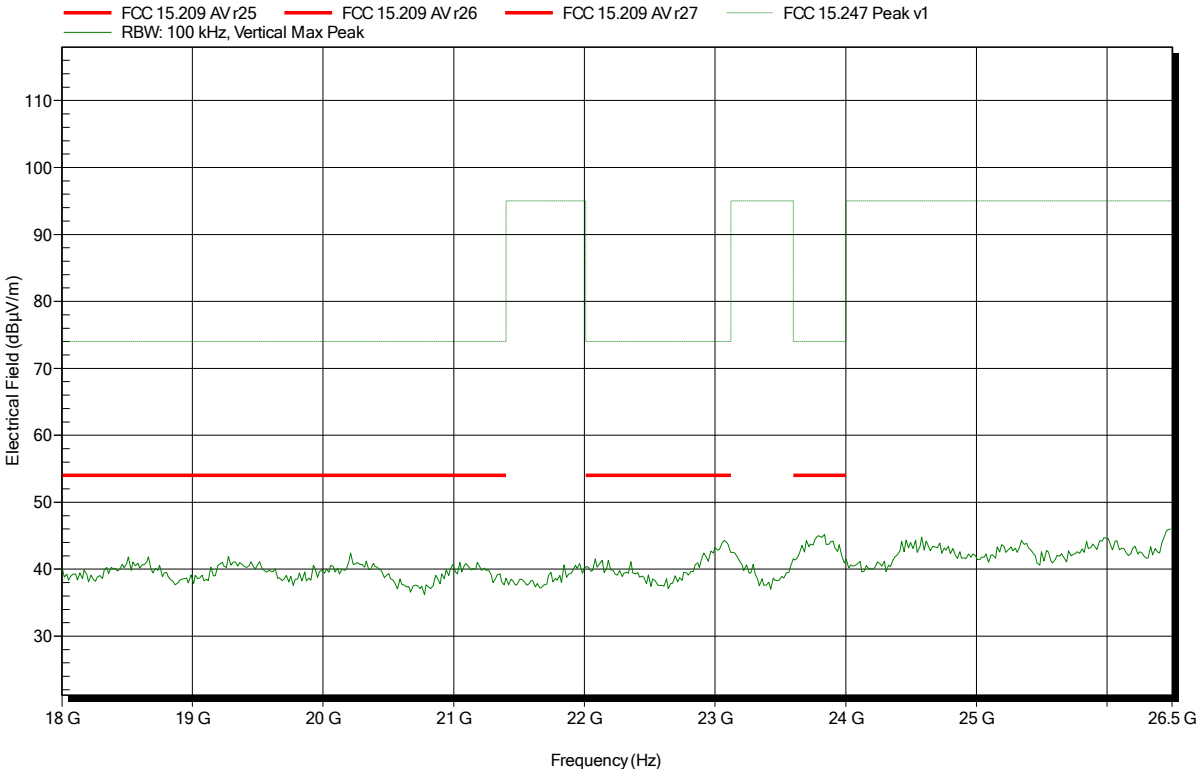

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Zigbee; CH: 26; OQPSK; Pmax
Test Date:	2016-03-14
Note:	EUT vertical

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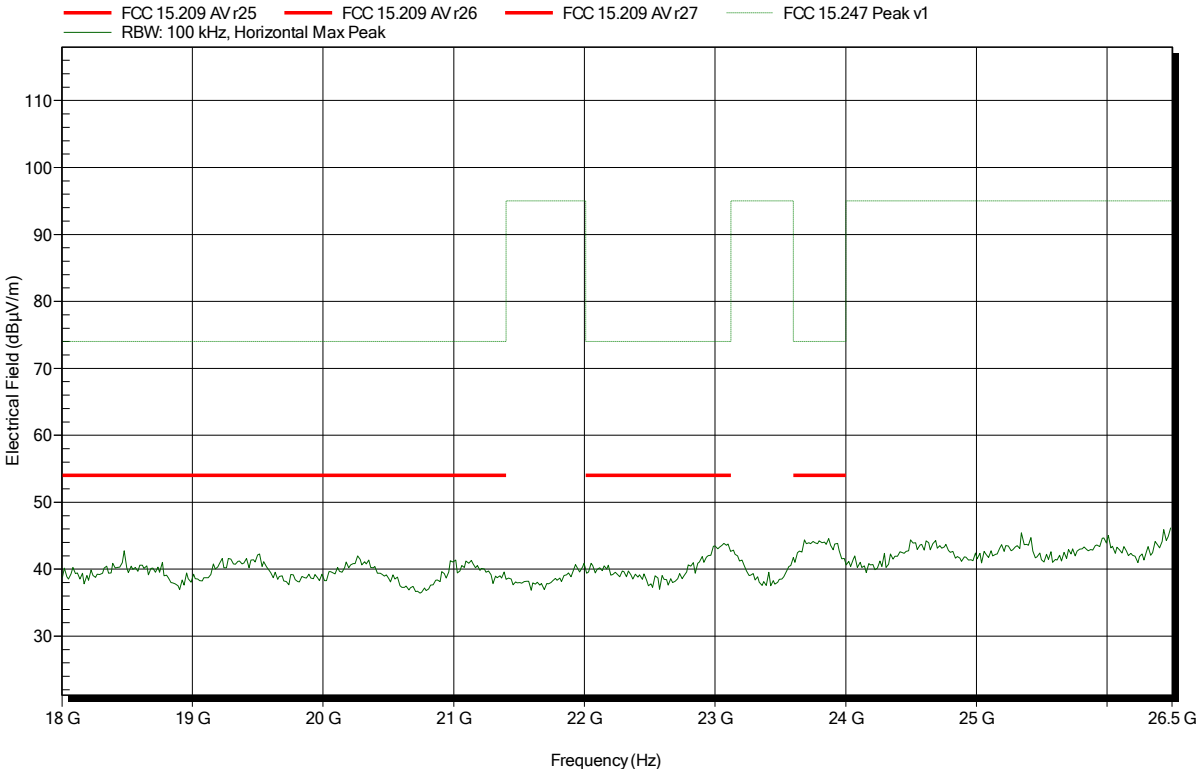

ANNEX B Receiver radiated spurious emissions

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-15
Note:	EUT vertical

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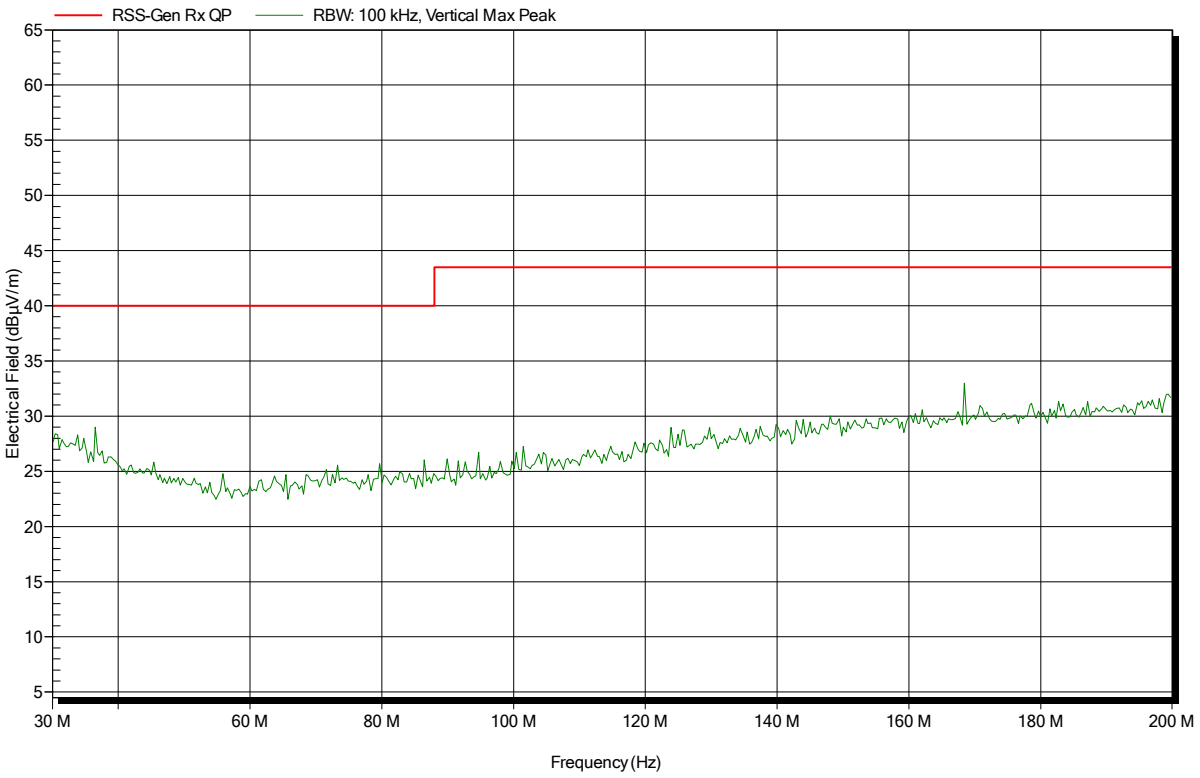

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-15
Note:	EUT vertical

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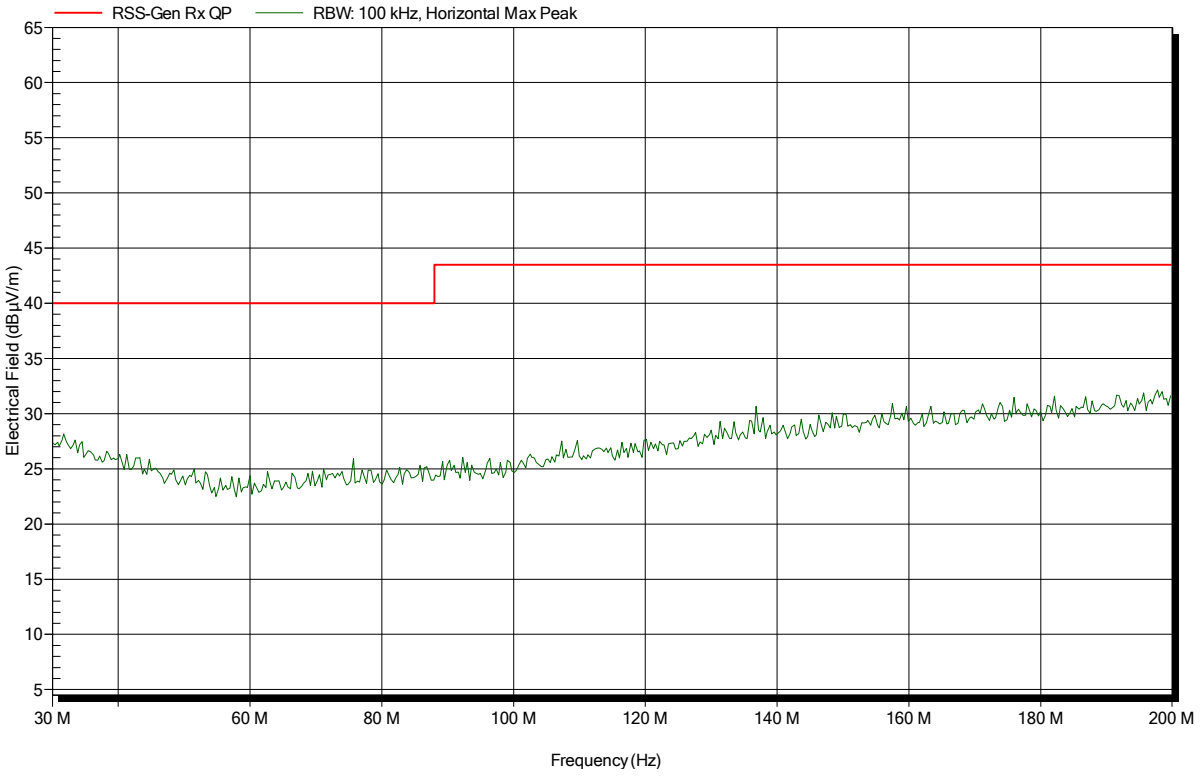

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-15
Note:	EUT vertical

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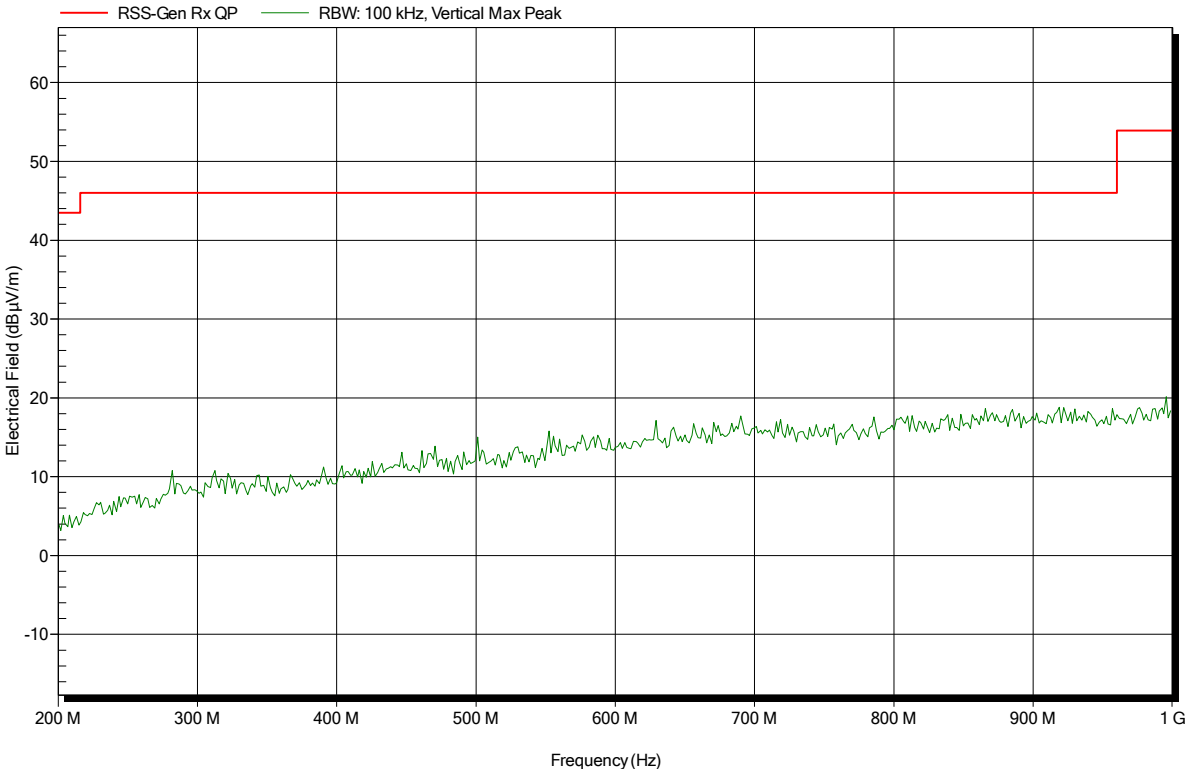

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-15
Note:	EUT vertical

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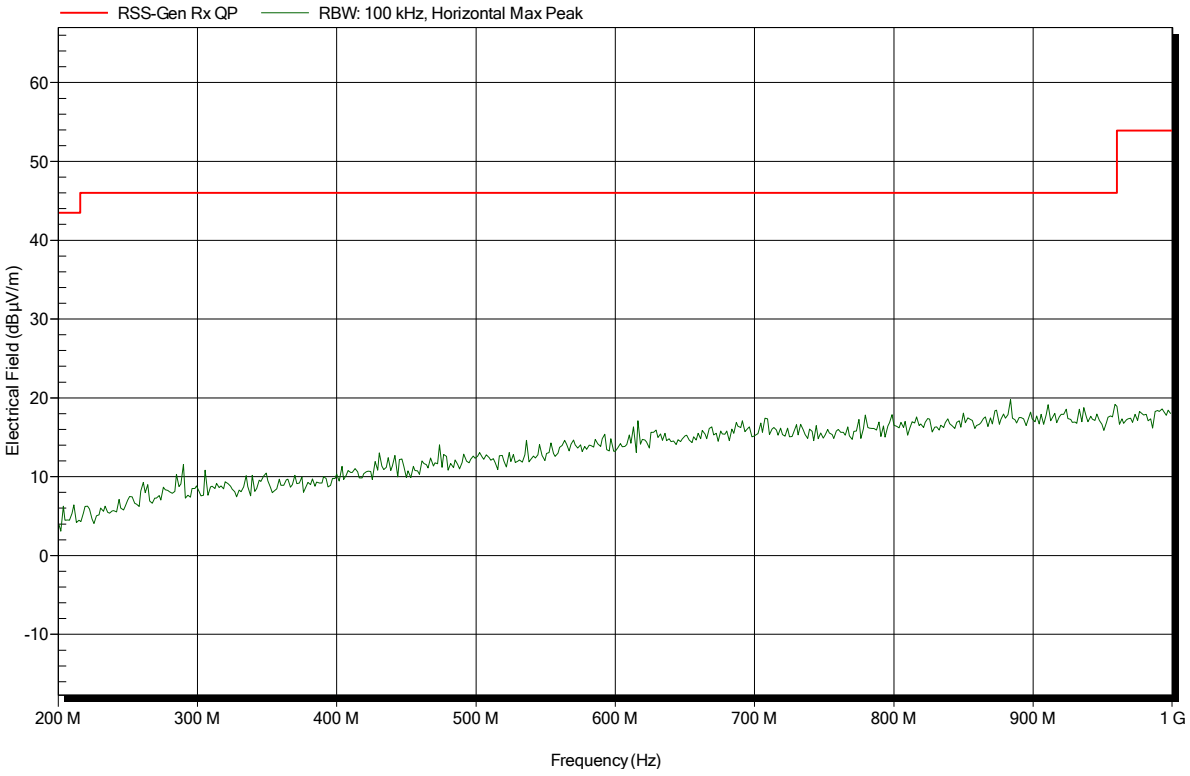

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-14
Note:	EUT vertical

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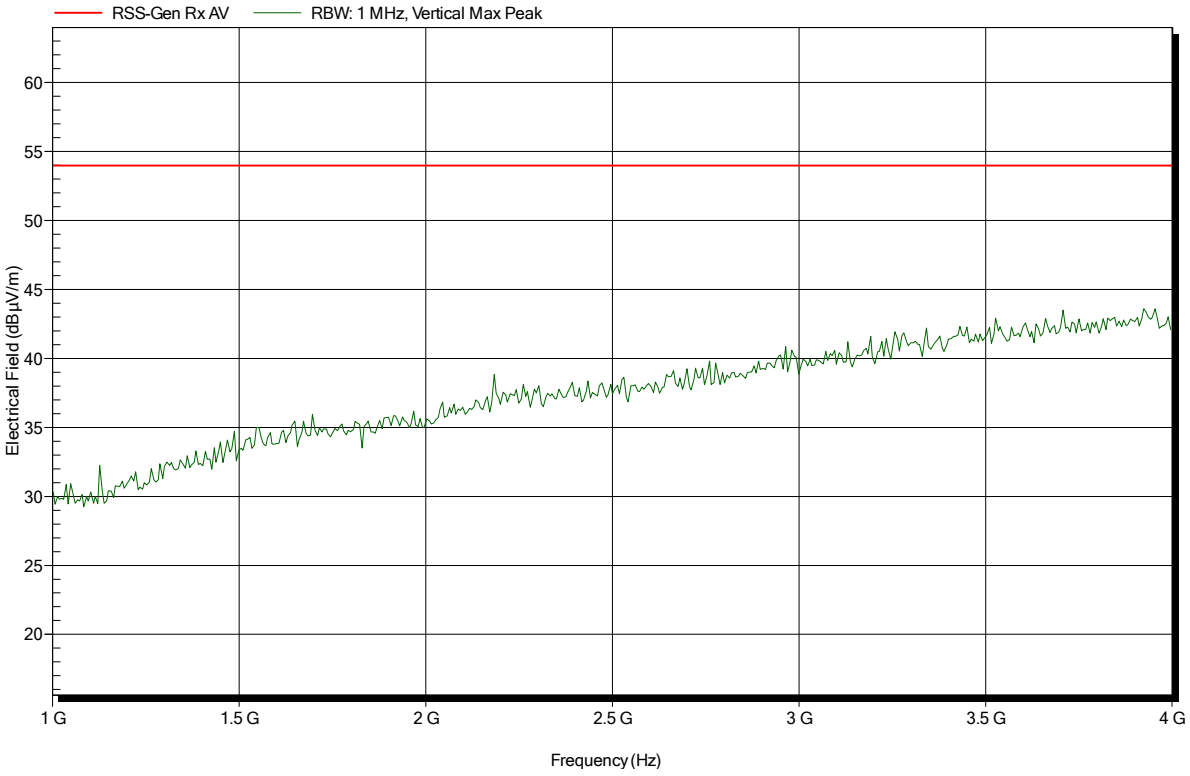

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-14
Note:	EUT vertical

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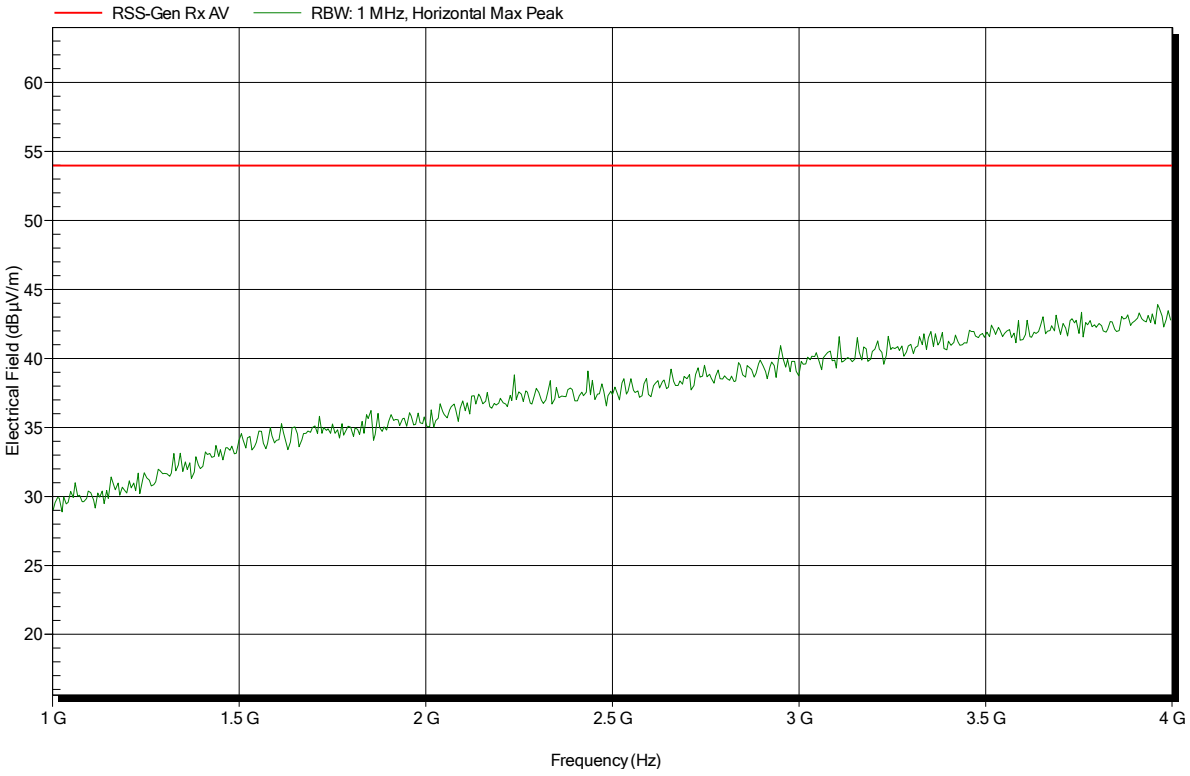

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-14
Note:	EUT vertical

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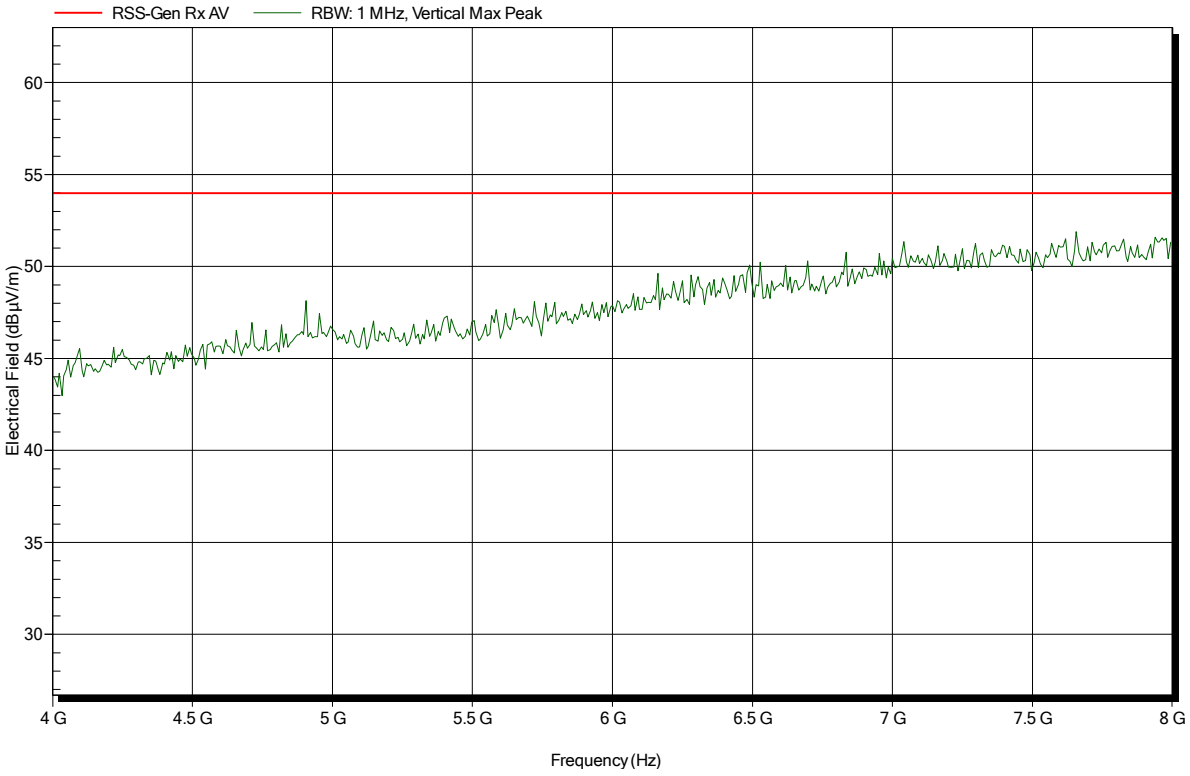

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-14
Note:	EUT vertical

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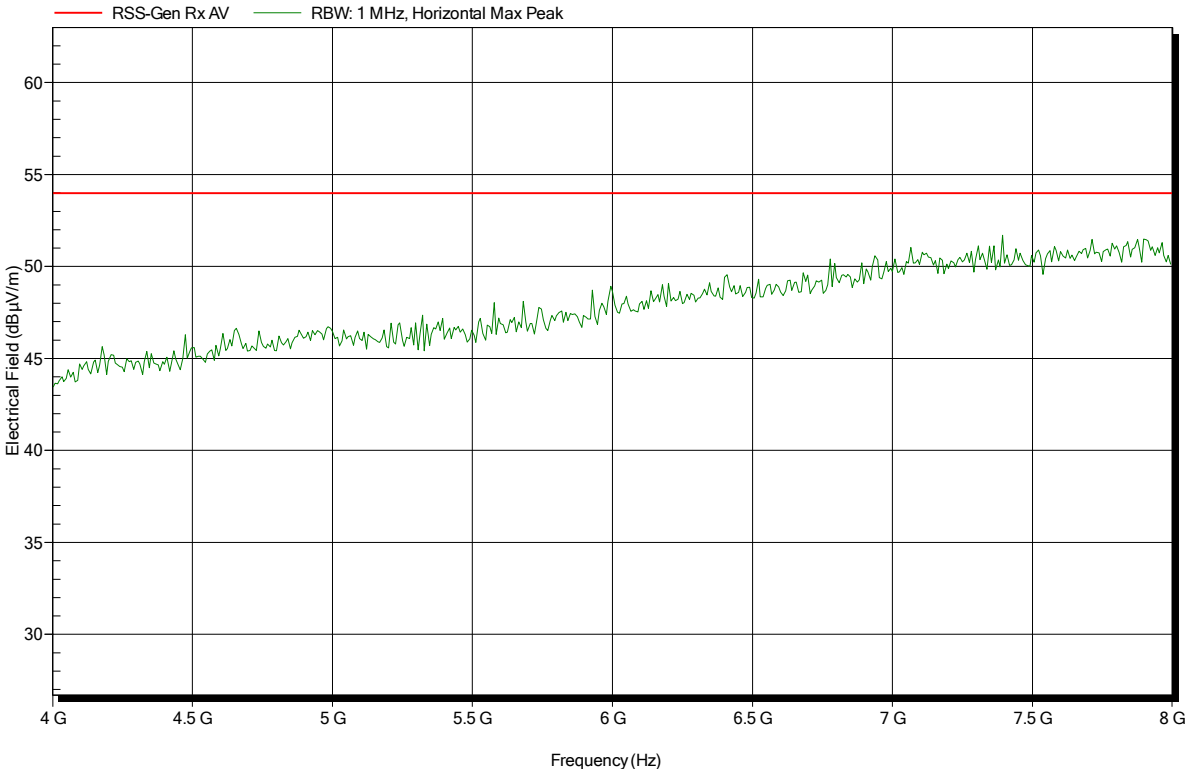

Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-14
Note:	EUT vertical

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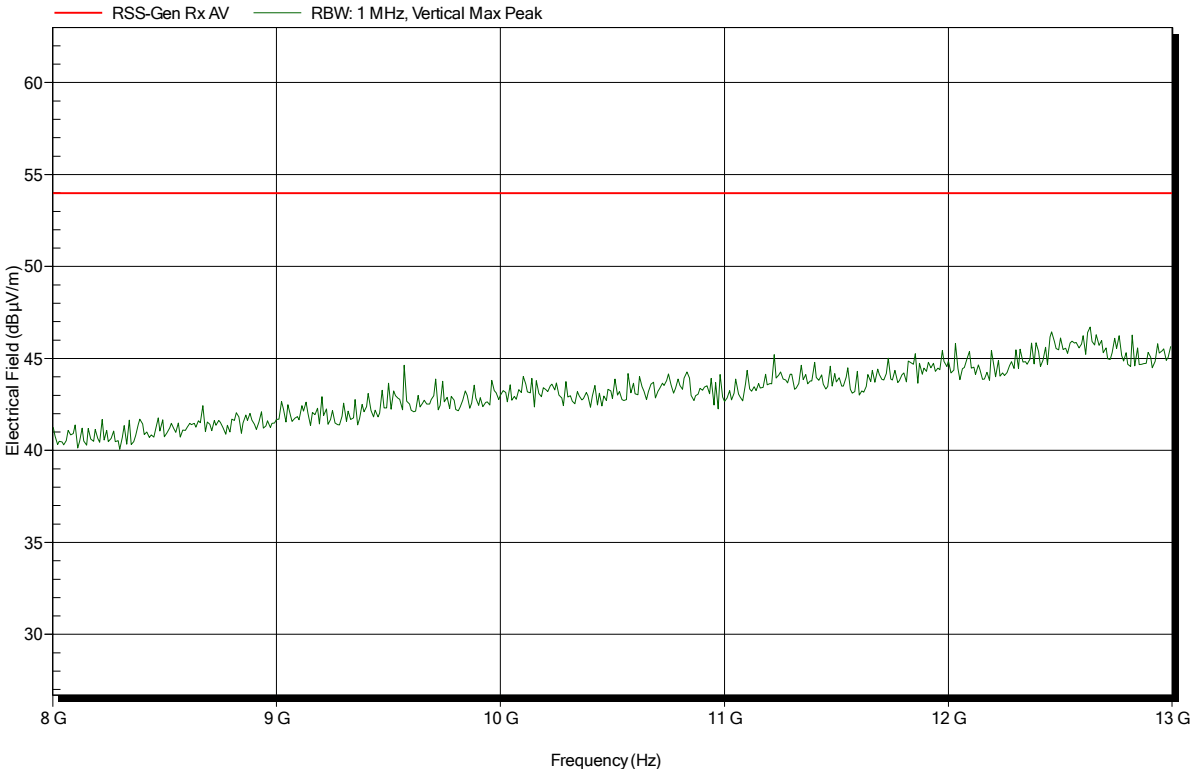
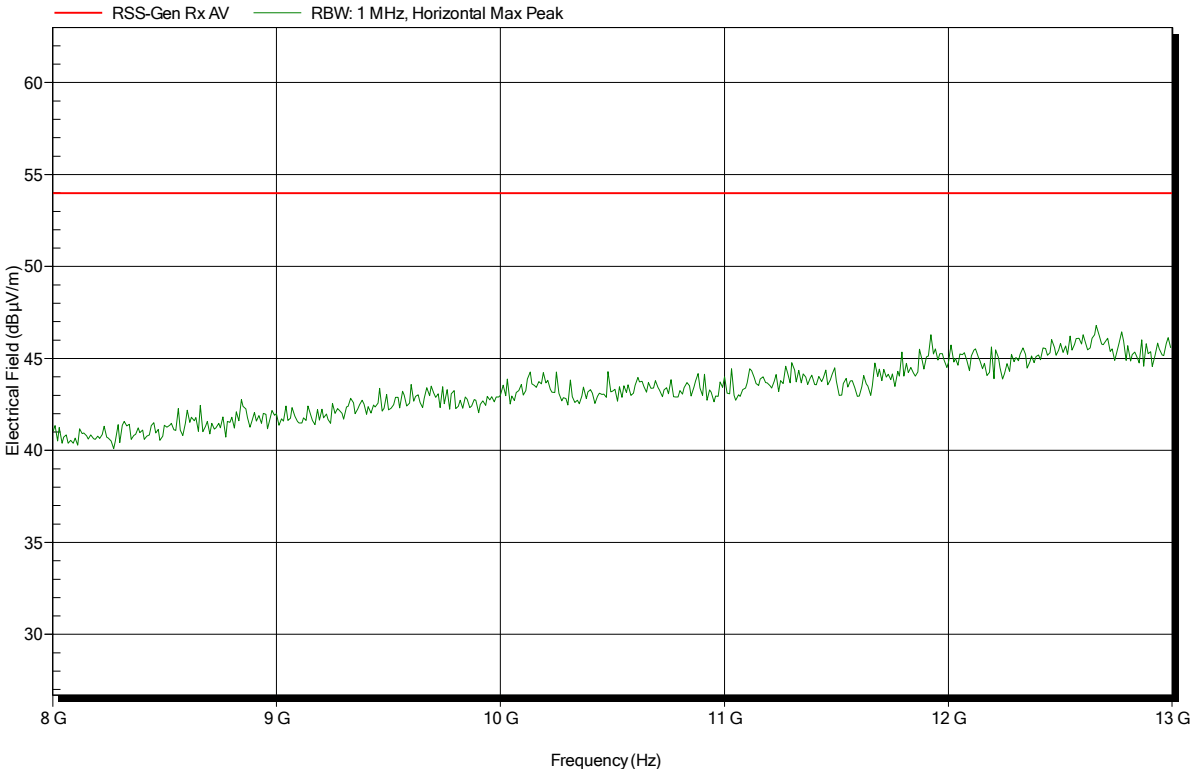


Spurious emissions according to IC RSS-247, I1

Project number: G0M-1602-5388

Applicant:	ZIGPOS GmbH
EUT Name:	Temperatursensor
Model:	LTHP v3
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.0 V DC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; Zigbee; CH: 18; OQPSK; RX-mode
Test Date:	2016-03-14
Note:	EUT vertical

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