

**FCC TEST REPORT****FCC 47 CFR Part 15C  
Industry Canada RSS-210****Digital transmission systems operating within the 2400 – 2483.5 MHz band****Report Reference No.** .....: G0M-1502-4552-TFC247BL-V01**Testing Laboratory** .....: Eurofins Product Service GmbHAddress .....: 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** .....: BSH Hausgeräte GmbHAddress .....: Werner-von-Siemens-Str. 200  
83301 Traunreut  
GERMANY**Test specification:**Standard .....: 47 CFR Part 15C  
RSS-247, Issue 1, 2015-05  
RSS-Gen, Issue 4, 2014-11  
ANSI C63.10:2013  
ANSI C63.4:2014

Test scope .....: complete Radio compliance test

**Equipment under test (EUT):**

Product description	Bluetooth LE Receiver	
Model No.	YL245-4	
Additional Model(s)	YL245-3 / YL245-2	
Brand Name(s)	None	
Hardware version	V06	
Firmware / Software version	V1.5 (TI-Controller), V0.13 (Renesas- Controller) FCC-ID: 2AEYO-YL245      IC: 20327-YL245	

**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 .....: 2015-03-16

Date (s) of performance of tests .....: 2015-03-16 – 2015-03-27

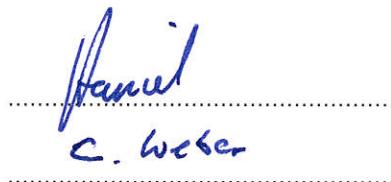
Compiled by .....: Wilfried Treffke

Tested by (+ signature).....: Matthias Handrik  
(Responsible for Test)

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

Date of issue .....: 2015-08-28

Total number of pages .....: 91

**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:**

Full Test was performed as the most complex model YL245-4 with all necessary components for the features BLE & DBUS2 & 2x FS.

Partial tests were performed on the Variant YL245-3 with all necessary components for the features BLE & DBUS2 & 1x FS and Variant YL245-2 with all necessary components for the features BLE & DBUS2. See annex C for variant overview.

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## Version History

Version	Issue Date	Remarks	Revised by
01	2015-08-28	Initial Release	

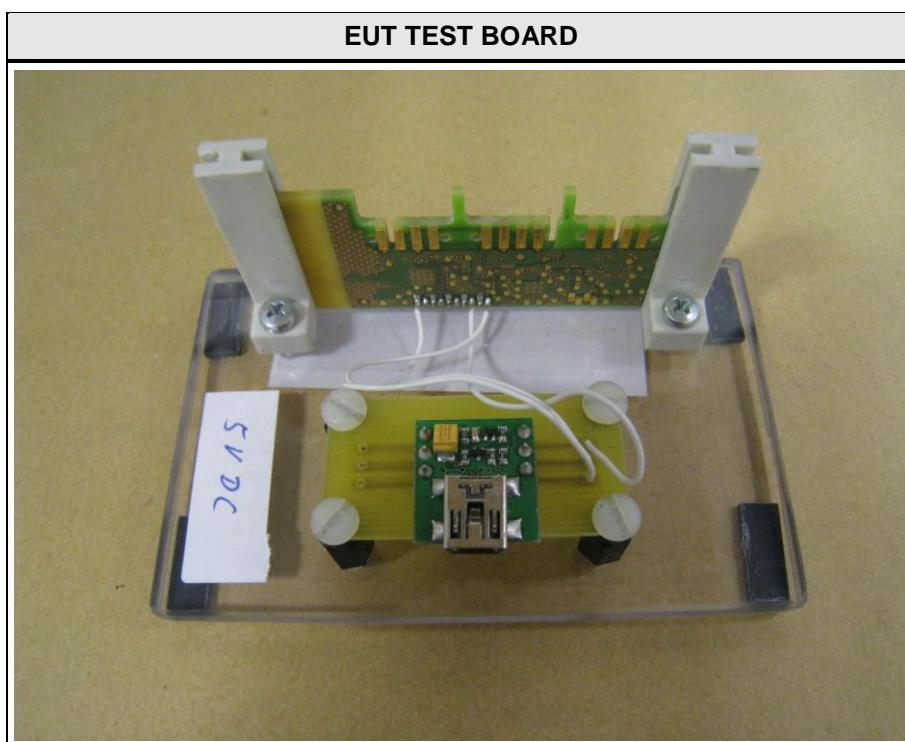
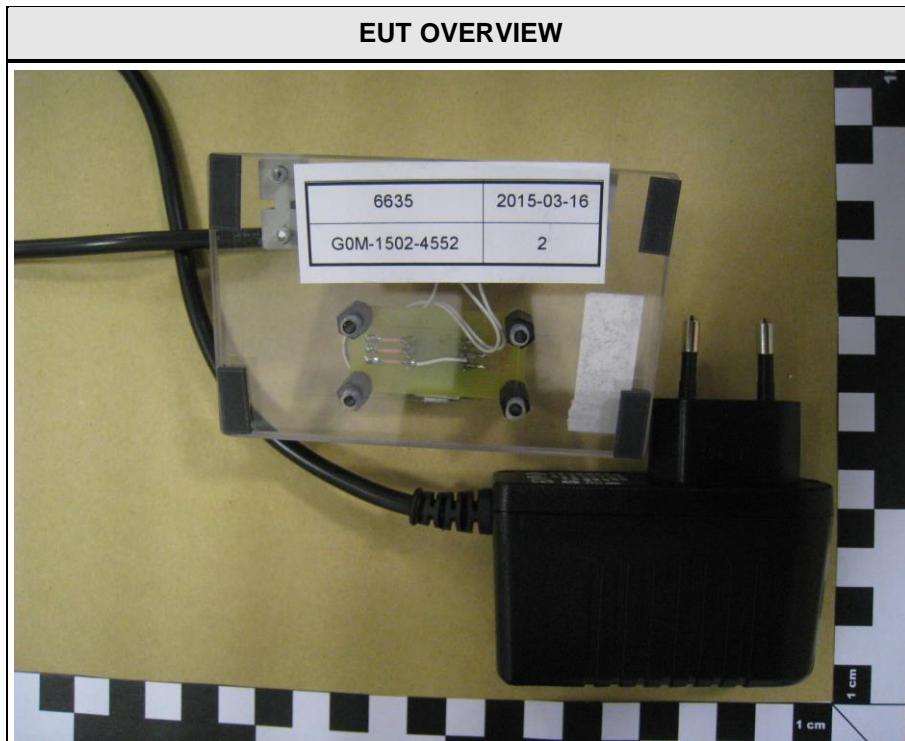
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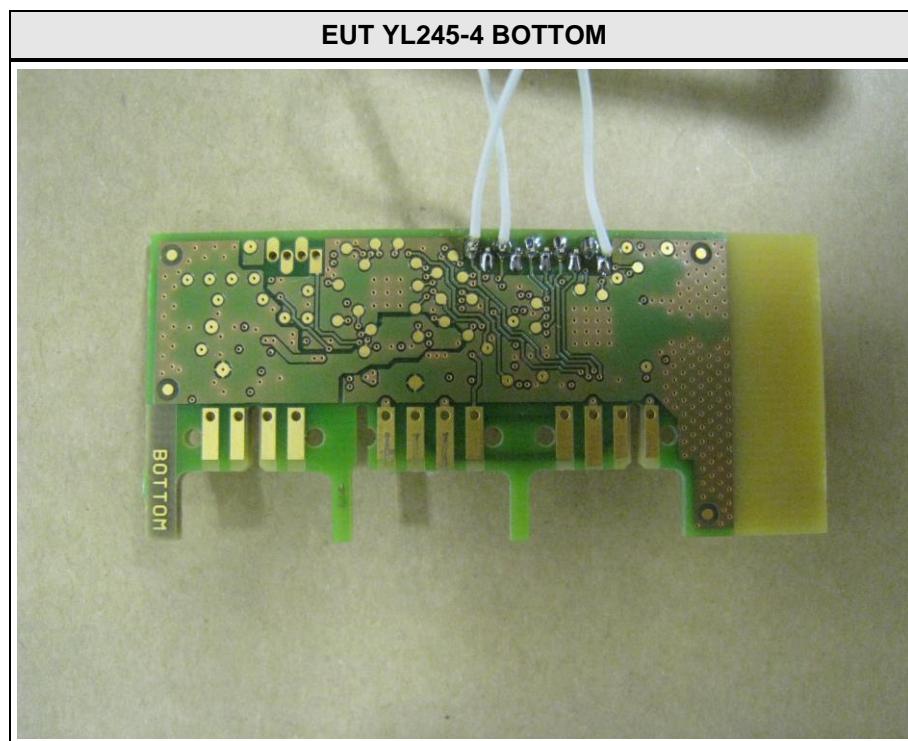
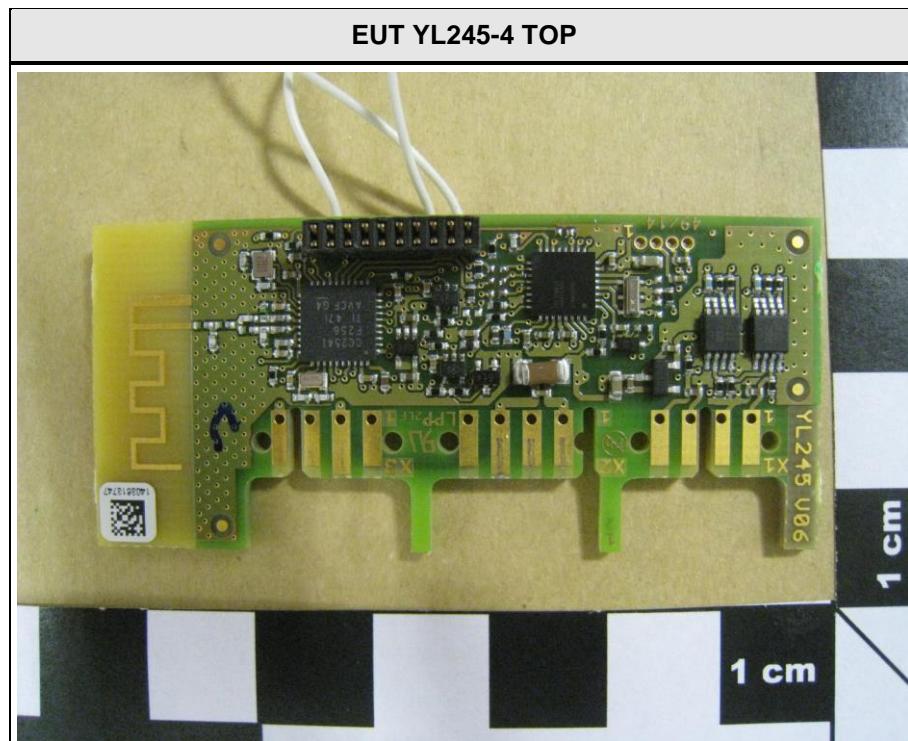
## 1 Equipment (Test item) Description

<b>Description</b>	Bluetooth LE Receiver	
<b>Model</b>	YL245-4	
<b>Additional Model(s)</b>	YL245-3 / YL245-2	
<b>Brand Name(s)</b>	None	
<b>Serial number</b>	None	
<b>Hardware version</b>	V06	
<b>Software / Firmware version</b>	V1.5 (TI-Controller), V0.13 (Renesas- Controller)	
<b>FCC-ID</b>	2AEYO-YL245	
<b>IC</b>	20327-YL245	
<b>Equipment type</b>	Radio module	
<b>Radio type</b>	Transceiver	
<b>Radio technology</b>	Bluetooth 4.0 Low Energy	
<b>Operating frequency range</b>	2402 - 2480 MHz	
<b>Assigned frequency band</b>	2400 - 2483.5 MHz	
<b>Main test frequencies</b>	$F_{\text{LOW}}$	2402 MHz
	$F_{\text{MID}}$	2440 MHz
	$F_{\text{HIGH}}$	2480 MHz
<b>Spreading</b>	Frequency Hopping	
<b>Modulations</b>	GFSK	
<b>Number of channels</b>	40	
<b>Channel spacing</b>	2MHz	
<b>Number of antennas</b>	1	
<b>Antenna</b>	Type	integrated
	Model	PCB Antenna
	Manufacturer	not specified
	Gain	-5.46 dBi (from measurement)
<b>Manufacturer</b>	Rawe Electronic GmbH Bregenzer Straße 67-69 88171 Weiler-Simmerberg Deutschland	
<b>Power supply</b>	$V_{\text{NOM}}$	5.0VDC
	$V_{\text{MIN}}$	4.7VDC
	$V_{\text{MAX}}$	5.5VDC
<b>AC/DC-Adaptor</b>	none	

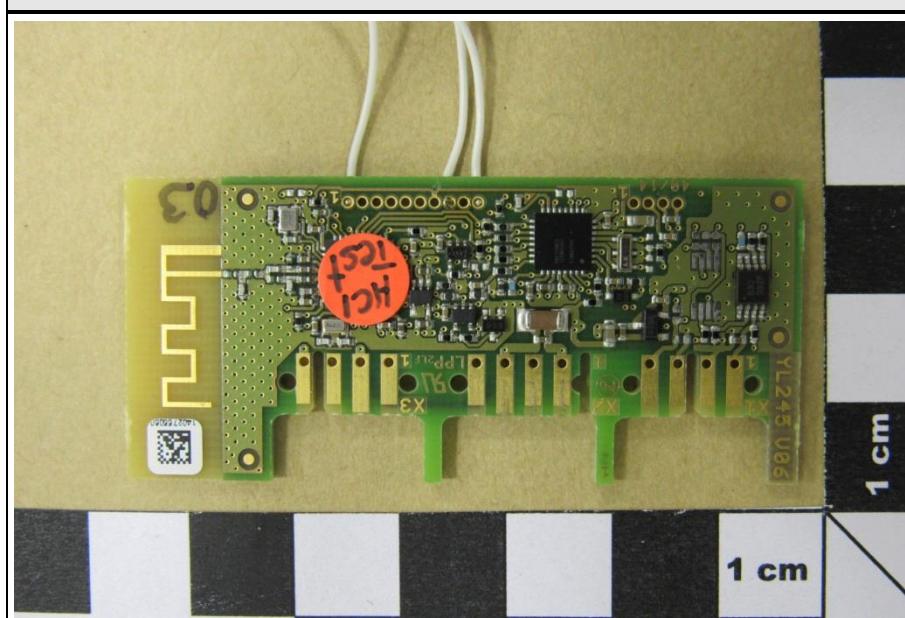
## 1.1 Photos – Equipment External



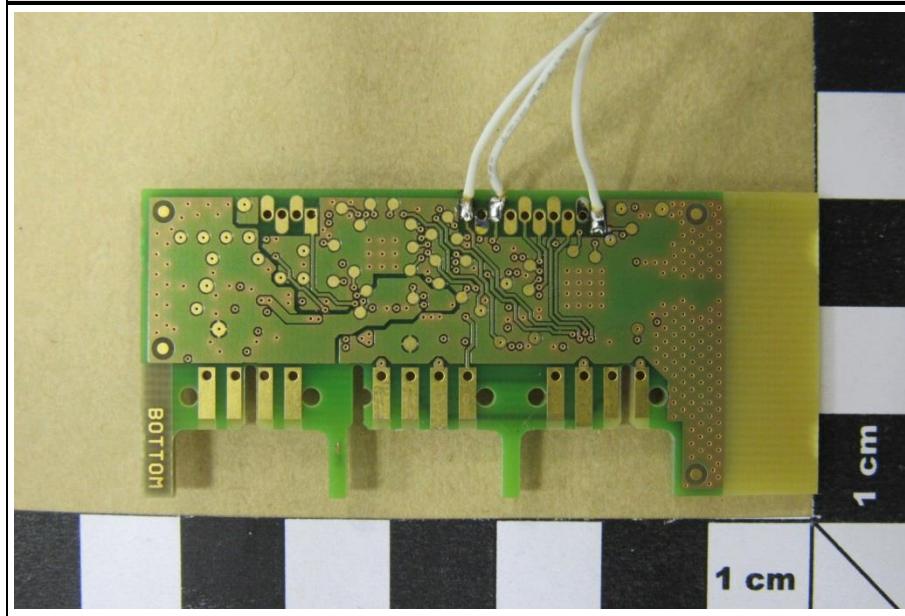
## 1.2 Photos – Equipment internal

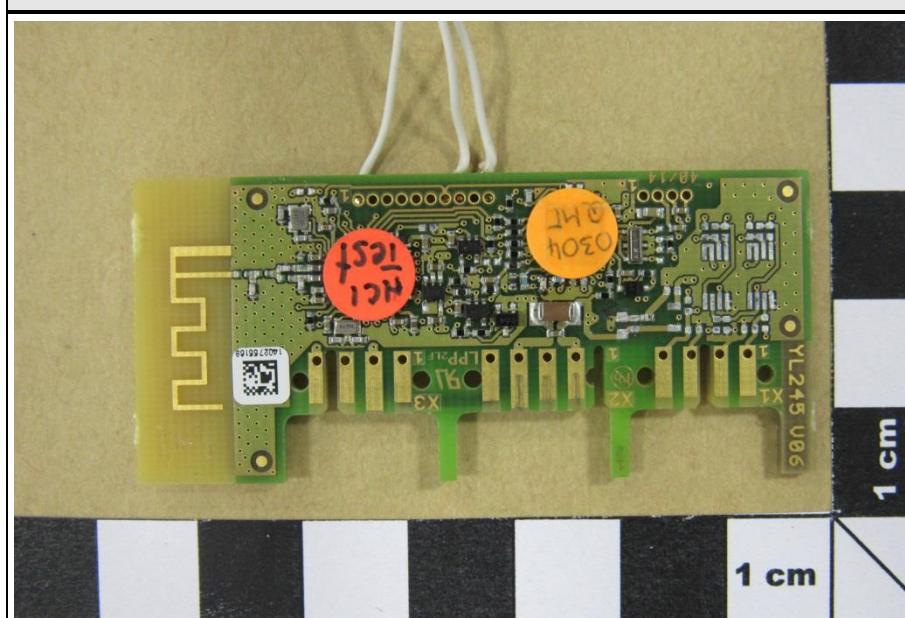
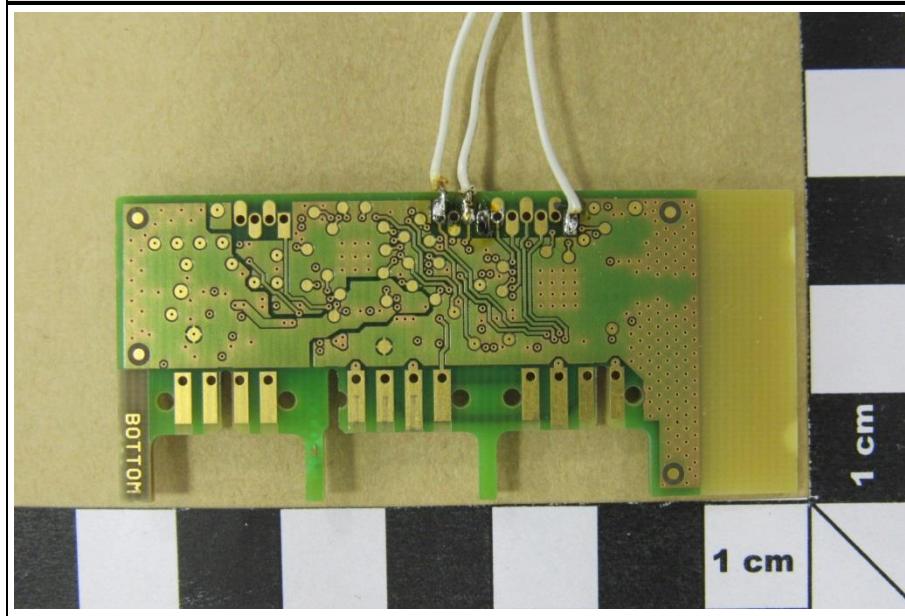


VARIANT YL245-3 TOP

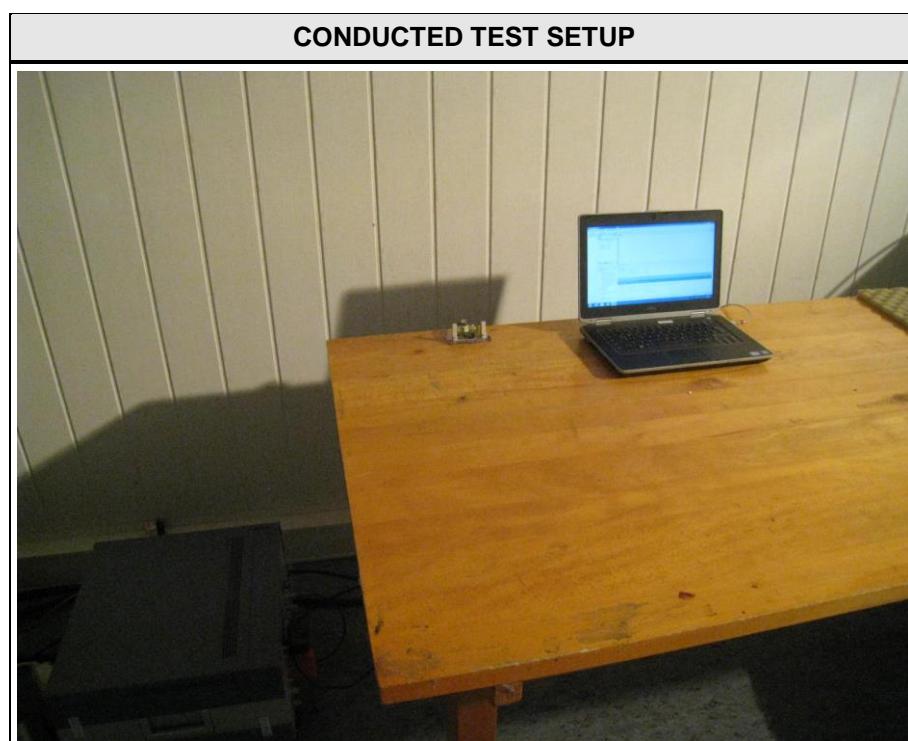
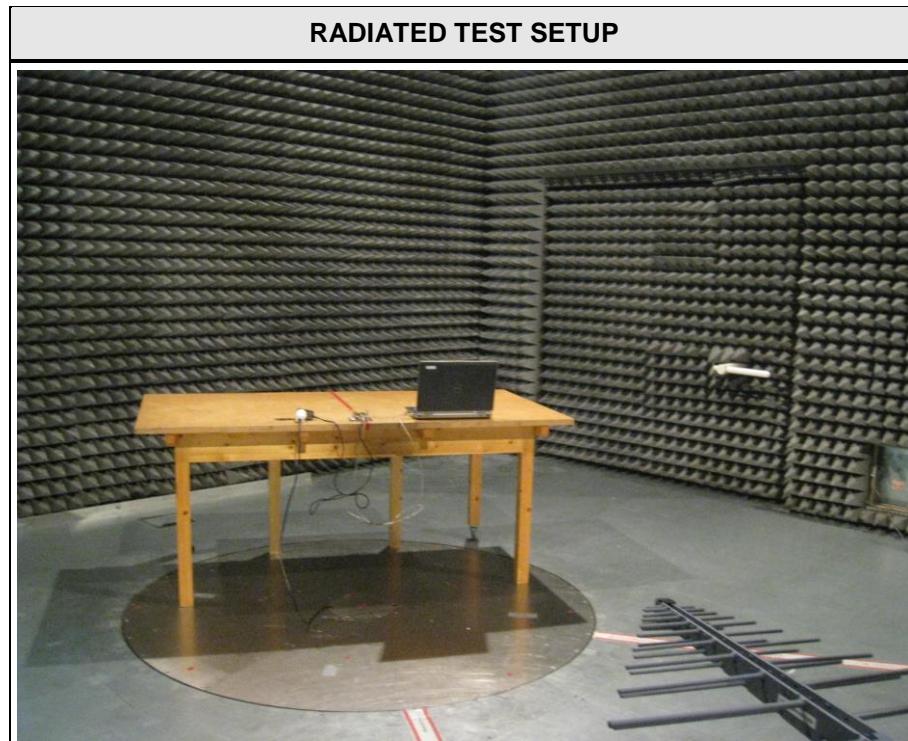


VARIANT YL245-3 BOTTOM



**VARIANT YL245-2 TOP****VARIANT YL245-2 BOTTOM**

### 1.3 Photos – Test setup



#### 1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
	None			

**\*Note:** Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

## 1.5 Test Modes

Mode #	Description	
Transmit	General conditions:	EUT powered by 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 laboratory power supply.
	Radio conditions:	Mode = standalone receive (scan mode) Spreading = On Modulation = GFSK
AC-Powerline	General conditions:	EUT powered by AC/DC adaptor
	Radio conditions:	Mode = Transmit Spreading = On

## 1.6 Test Equipment Used During Testing

Measurement Software					
Description	Manufacturer	Model	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	2015-02	2016-02
6dB Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02
Maximum peak conducted power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02
Power spectral density					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02
Band edge compliance					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02
Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02
Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSIQ26	EF00242	2014-03	2015-03
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	2013-02	2016-02

**AC powerline conducted emissions**

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2014-11	2016-11
EMI Test Receiver	R&S	ESCS 30	EF00295	2014-10	2015-10

## 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 dB $\mu$ V. 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 dB $\mu$ V/m). The FCC limits are given in units of  $\mu$ V/m. The following formula is used to convert the units of  $\mu$ V/m to dB $\mu$ V/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:

Reading + AF =	Net Reading :	Net reading - FCC limit = Margin
21.5 dB $\mu$ V + 26 dB =	47.5 dB $\mu$ V/m :	47.5 dB $\mu$ V/m - 57.0 dB $\mu$ V/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	PASS	
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	
<b>Remarks:</b>				

### 3 Test Conditions and Results

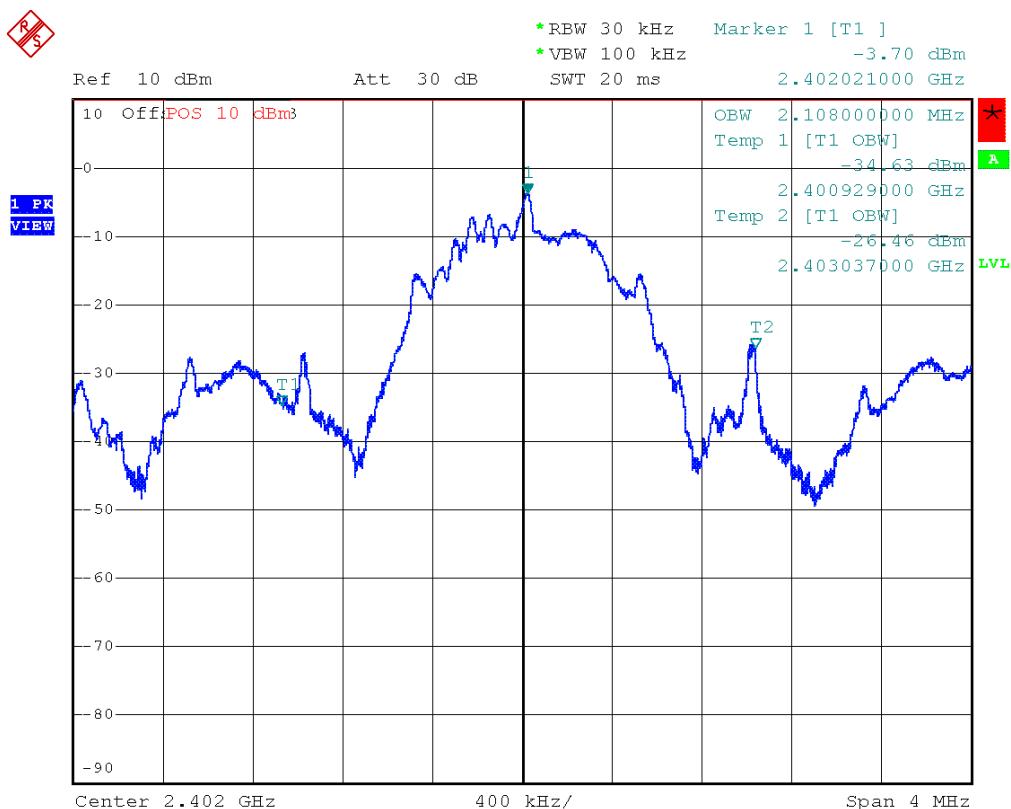
#### 3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. to IC RSS-Gen		Verdict: PASS	
Test according to measurement reference		Reference Method ANSI C63.10	
Test frequency range		Tested frequencies $F_{\text{LOW}} / F_{\text{MID}} / F_{\text{HIGH}}$	
<b>Limits</b>			
None (Informational only)			
<b>Test setup</b>			
<b>Test procedure</b>			
<ol style="list-style-type: none"> <li>1. EUT set to test mode (Communication tester is used if needed)</li> <li>2. Span set to at least twice the emission spectrum</li> <li>3. Resolution bandwidth set to 1 % of span</li> <li>4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function</li> </ol>			
<b>Test results</b>			
Channel	Frequency [MHz]	Mode	Occupied Bandwidth [kHz]
$F_{\text{LOW}}$	2402	Transmit	2108
$F_{\text{MID}}$	2440	Transmit	1253
$F_{\text{HIGH}}$	2480	Transmit	1098
Comments:			

**Occupied Bandwidth – F<sub>LOW</sub>**
**Occupied Bandwidth acc. to RSS-Gen**

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BT-LE, 2402 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: NONE (INFORMATION ONLY)  
 Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used  
 Note 2: OBW= 2.180 MHz

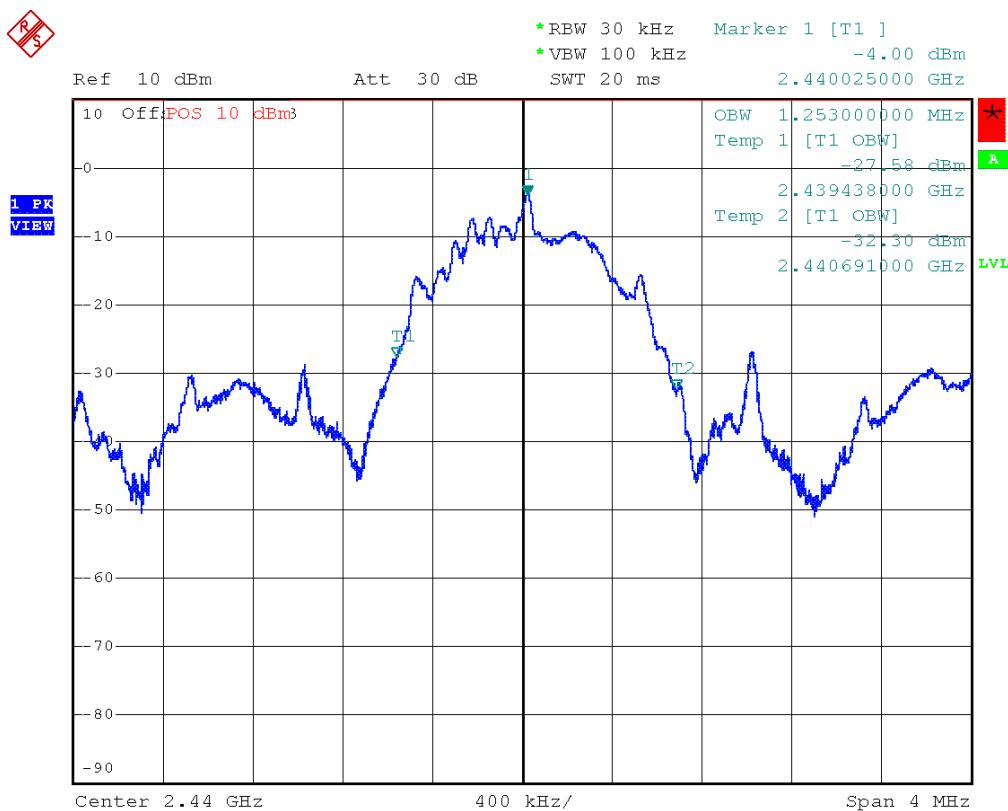


Comment: Occupied bandwidth: 2108 KHz  
 Date: 27.MAR.2015 07:24:11

**Occupied Bandwidth – F<sub>MID</sub>**
**Occupied Bandwidth acc. to RSS-Gen**

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BT-LE, 2440 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: NONE (INFORMATION ONLY)  
 Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used  
 Note 2: OBW= 1.253 MHz



Comment: Occupied bandwidth: 1253 KHz  
 Date: 27.MAR.2015 08:49:25

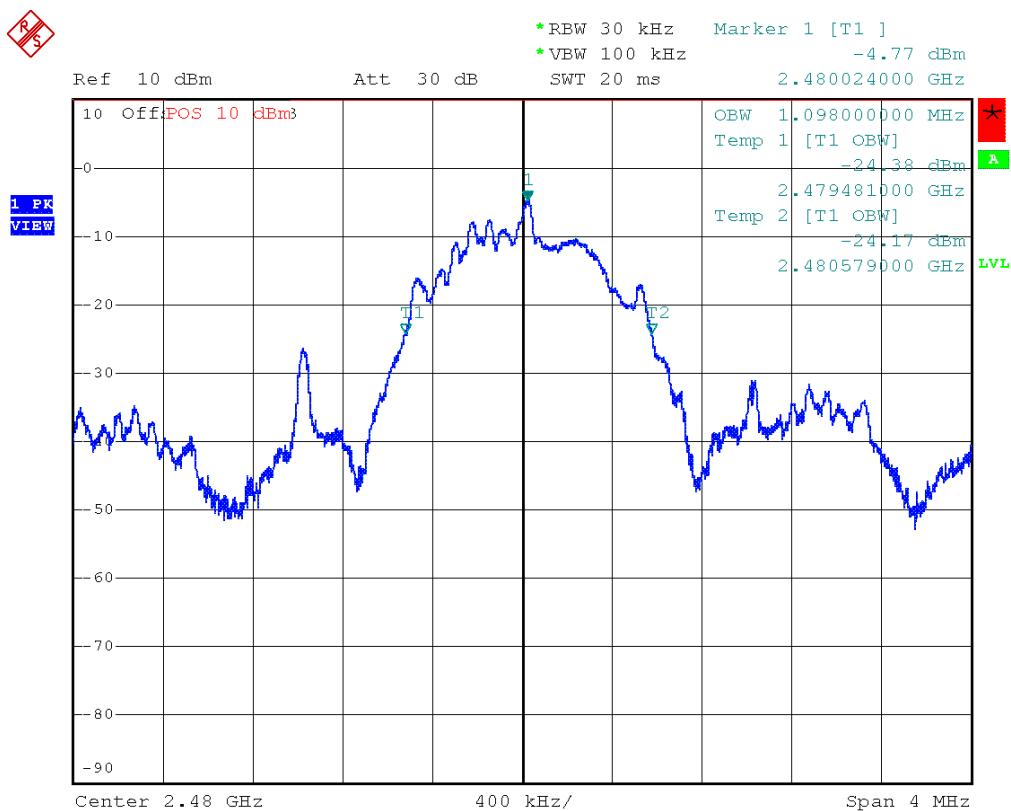
Test Report No.: G0M-1502-4552-TFC247BL-V01

Occupied Bandwidth – F<sub>HIGH</sub>

## Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BT-LE, 2480 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: NONE (INFORMATION ONLY)  
 Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used  
 Note 2: OBW= 1.098 MHz



Comment: Occupied bandwidth: 1098 KHz  
 Date: 27.MAR.2015 08:51:22

Test Report No.: G0M-1502-4552-TFC247BL-V01

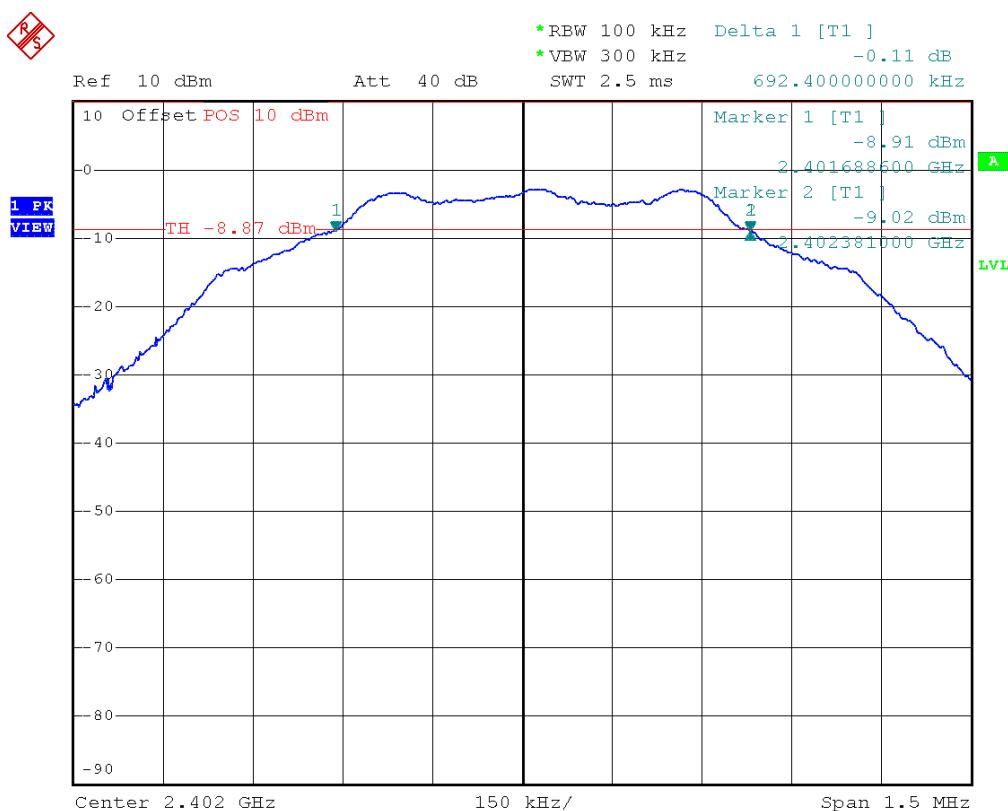
### 3.2 Test Conditions and Results – 6 dB Bandwidth

6dB Bandwidth acc. 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				
	$F_{LOW}$ / $F_{MID}$ / $F_{HIGH}$				
<b>Limits</b>					
Limit					
$\geq 500\text{kHz}$					
<b>Test setup</b>					
<b>Test procedure</b>					
<ol style="list-style-type: none"> <li>1. EUT set to test mode</li> <li>2. Span set to at least twice the emission spectrum</li> <li>3. Detector set to peak and max hold and RBW is set to 100 kHz</li> <li>4. Envelope peak value of emission spectrum is selected</li> <li>5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak</li> <li>6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak</li> <li>7. 6 dB Bandwidth is determined by marker frequency separation</li> </ol>					
<b>Test results</b>					
Channel	Frequency [MHz]	Mode	6 dB Bandwidth [kHz]	Limit [kHz]	Result
$F_{LOW}$	2402	Transmit	692.4	500	PASS
$F_{MID}$	2440	Transmit	720.0	500	PASS
$F_{HIGH}$	2480	Transmit	709.8	500	PASS
Comments:					

**6 dB Bandwidth – F<sub>LOW</sub>**
**Minimum 6 dB Bandwidth acc. to FCC 15.247**

Project Number: G0M-1502-4552

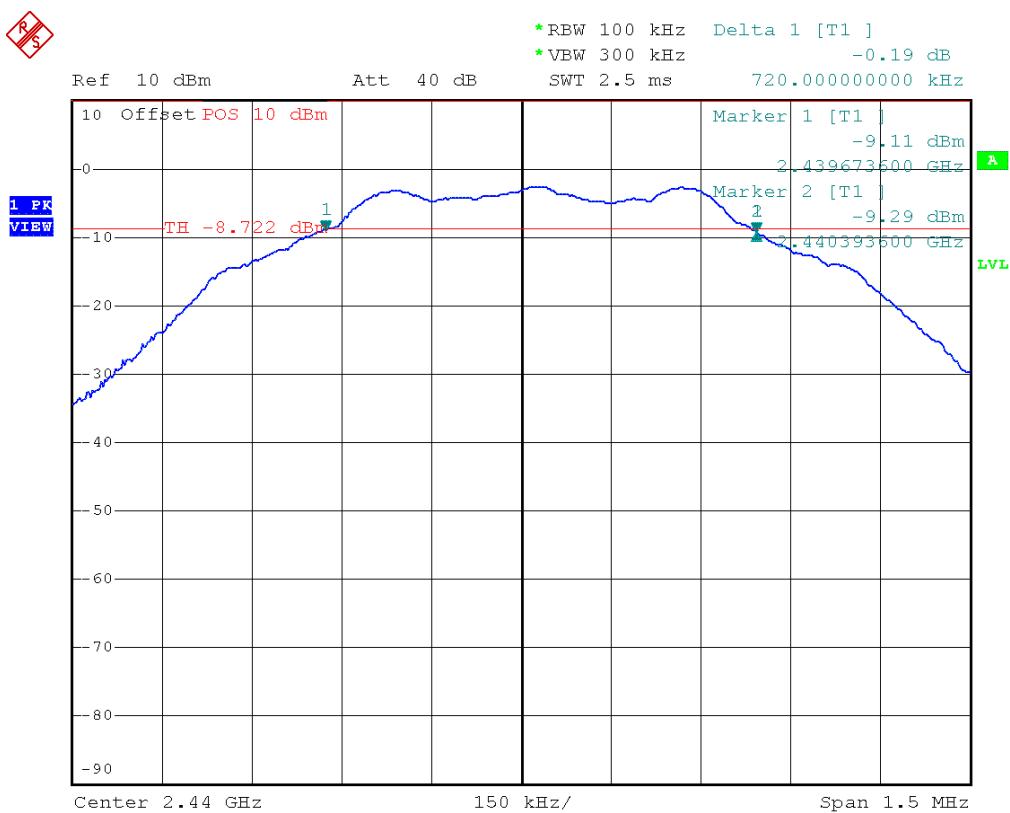
Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: T<sub>nom</sub> / V<sub>nom</sub>  
 Mode: Tx, BTLE, 2402 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: Minimum 6 dB Bandwidth conducted



**6 dB Bandwidth –  $F_{MID}$** 
**Minimum 6 dB Bandwidth acc. to FCC 15.247**

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BTLE, 2440 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: Minimum 6 dB Bandwidth conducted

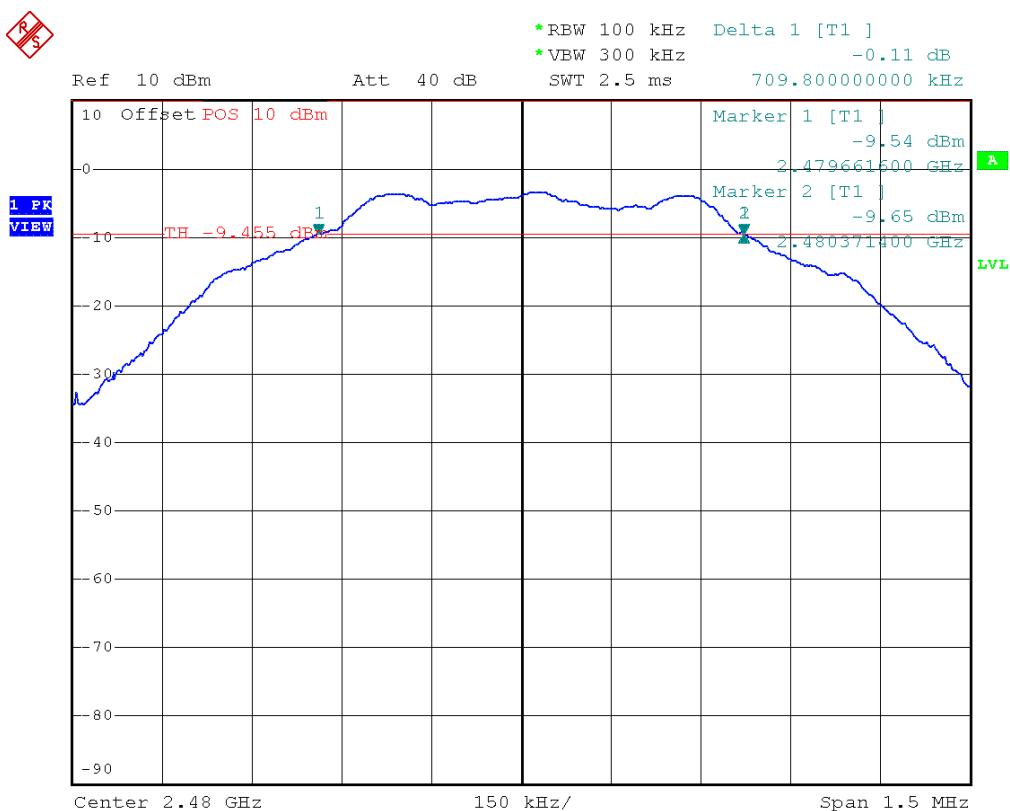


Comment: 6 dB bandwidth: 720 kHz > 500 kHz  
 Date: 27.MAR.2015 08:56:35

**6 dB Bandwidth – F<sub>HIGH</sub>**
**Minimum 6 dB Bandwidth acc. to FCC 15.247**

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BTLE, 2480 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: Minimum 6 dB Bandwidth conducted



Comment: 6 dB bandwidth: 709.8 kHz > 500 kHz  
 Date: 27.MAR.2015 08:57:46

Test Report No.: G0M-1502-4552-TFC247BL-V01

### 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	
	$F_{\text{LOW}} / F_{\text{MID}} / F_{\text{HIGH}}$	
Measurement mode	Peak	
Maximum antenna gain	0.9 dBi $\Rightarrow$ 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		
<pre> graph LR     SA[Spectrum Analyzer] --- EUT[EUT]   </pre>		
Test procedure		
<ol style="list-style-type: none"> <li>1. EUT set to test mode (Communication tester is used if needed)</li> <li>2. Center frequency set to test channel center frequency</li> <li>3. Span set to twice the 20 dB bandwidth and detector to peak and max hold</li> <li>4. Resolution bandwidth is set to 3 MHz</li> <li>5. Peak conducted power is determined from peak of spectrum envelope</li> </ol>		

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> = 5.0V	Transmit	-1.71	0.0007	30	-31.71
F <sub>MID</sub>	2440	V <sub>nom</sub> = 5.0V	Transmit	-1.52	0.0007	30	-31.52
F <sub>HIGH</sub>	2480	V <sub>nom</sub> = 5.0V	Transmit	-2.13	0.0006	30	-32.13
F <sub>LOW</sub>	2402	V <sub>min</sub> = 4.7V	Transmit	-1.67	0.0007	30	-31.67
F <sub>MID</sub>	2440	V <sub>min</sub> = 4.7V	Transmit	-1.46	0.0007	30	-31.46
F <sub>HIGH</sub>	2480	V <sub>min</sub> = 4.7V	Transmit	-2.16	0.0006	30	-32.16
F <sub>LOW</sub>	2402	V <sub>max</sub> = 5.5V	Transmit	-1.67	0.0007	30	-31.67
F <sub>MID</sub>	2440	V <sub>max</sub> = 5.5V	Transmit	-1.52	0.0007	30	-31.52
F <sub>HIGH</sub>	2480	V <sub>max</sub> = 5.5V	Transmit	-2.19	0.0006	30	-32.19
Comment:							

### 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					
	$F_{\text{LOW}} / F_{\text{MID}} / F_{\text{HIGH}}$					
Measurement mode	Peak					
<b>Limits</b>						
8 dBm / 3 kHz						
<b>Test setup</b>						
<pre> graph LR     SA[Spectrum Analyzer] --- EUT[EUT]   </pre>						
<b>Test procedure</b>						
<ol style="list-style-type: none"> <li>EUT set to test mode (Communication tester is used if needed)</li> <li>Center frequency set to test channel center frequency</li> <li>Span is set large enough to capture maximum emissions in passband, RBW is set to 3kHz</li> <li>Peak power density is determined from peak emission of envelope</li> </ol>						
<b>Test results</b>						
Channel	Frequency [MHz]	Test mode	Peak frequency [MHz]	Peak power density [dBm/100kHz]	Limit [dBm/3kHz]	Margin [dB]
$F_{\text{LOW}}$	2402	Transmit	2402.25	-2.86	8.0	-10.86
$F_{\text{MID}}$	2440	Transmit	2440.03	-2.68	8.0	-10.68
$F_{\text{HIGH}}$	2480	Transmit	2480.03	-3.44	8.0	-11.44
Comments:						

### 3.5 Test Conditions and Results – AC power line conducted emissions

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

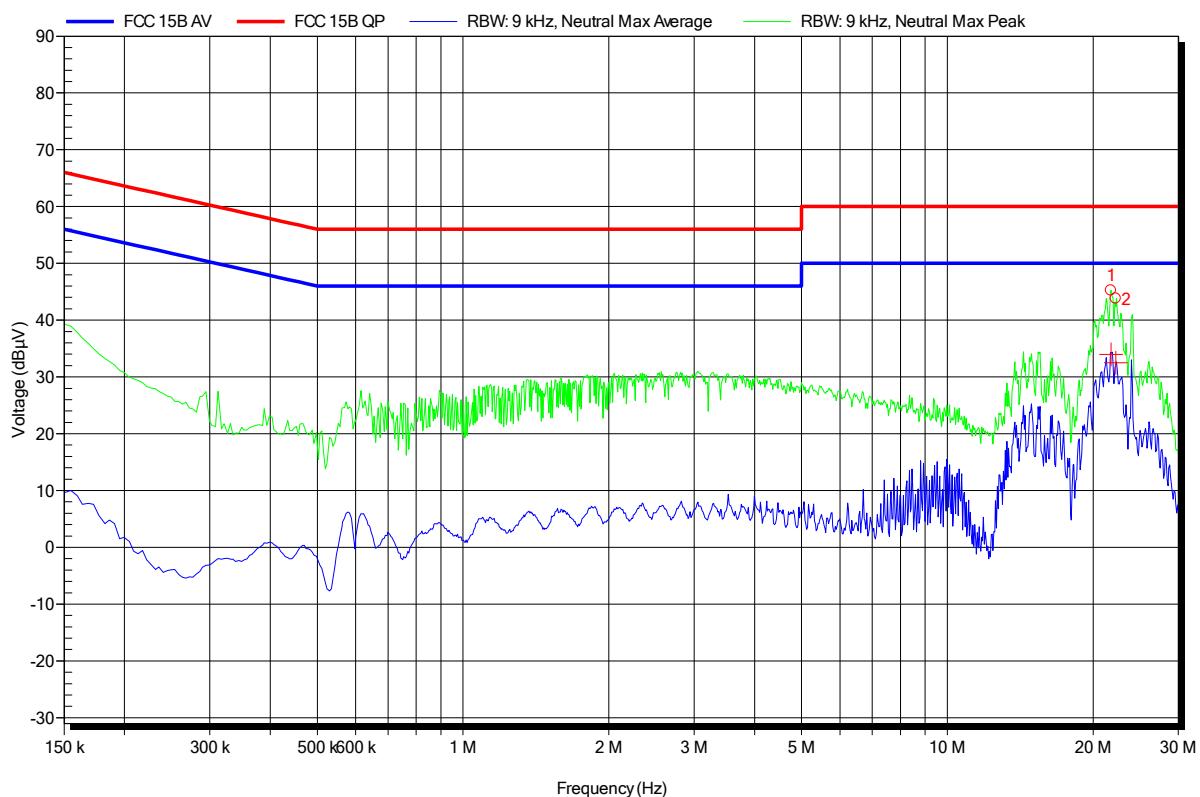
### Conducted Emissions

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

Project number: G0M-1502-4552

Manufacturer: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Conditions: Tnom: 22°C, Unom: 5V DC (AC/DC adaptor)  
 LISN: ESH2-Z5 N  
 Mode: Transmit 2.440 GHz  
 Test Date: 2015-03-30  
 Note:

Index 1



Frequency	Average	Average Limit	Average Difference	Average Status
21.795 MHz	33.98 dB $\mu$ V	50 dB $\mu$ V	-16.02 dB	Pass
22.272 MHz	32.49 dB $\mu$ V	50 dB $\mu$ V	-17.51 dB	Pass

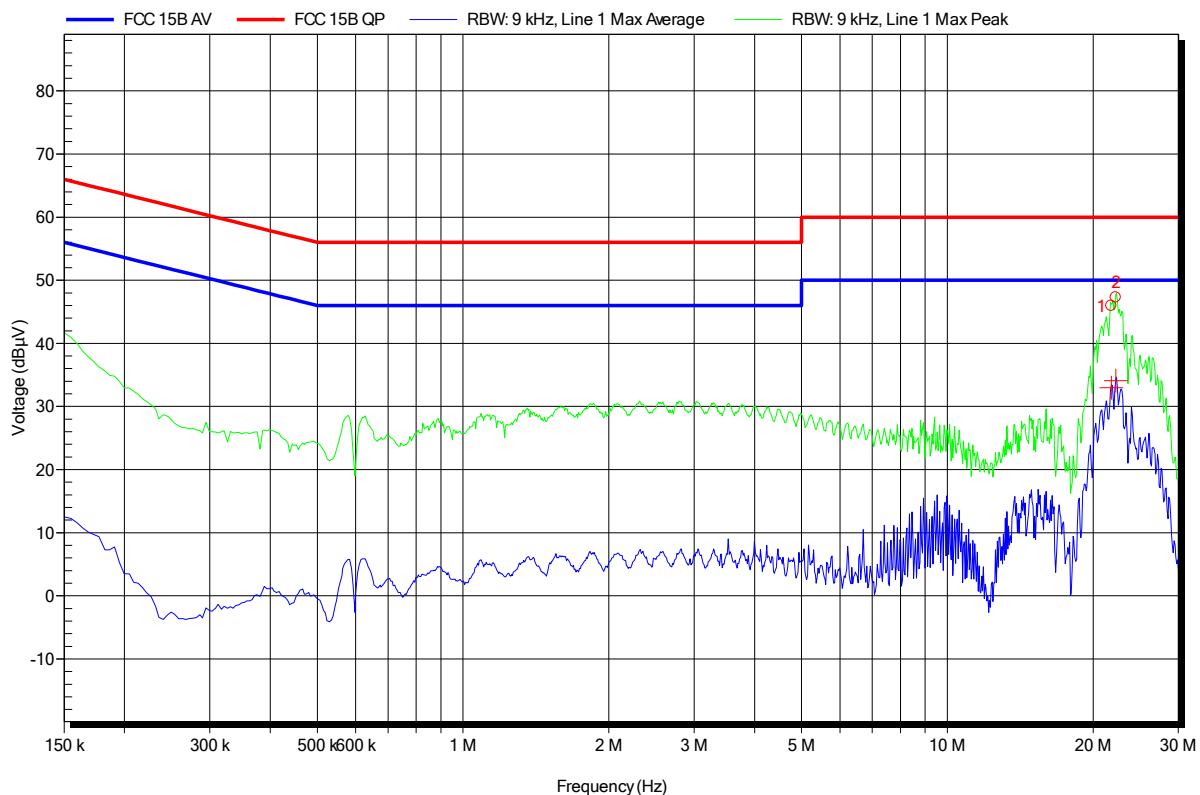
### Conducted Emissions

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

Project number: G0M-1502-4552

Manufacturer: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Conditions: Tnom: 22°C, Unom: 5V DC (AC/DC adaptor)  
 LISN: ESH2-Z5 L  
 Mode: Transmit 2.440 GHz  
 Test Date: 2015-03-30  
 Note:

Index 2



Frequency	Average	Average Limit	Average Difference	Average Status
21.804 MHz	32.98 dB $\mu$ V	50 dB $\mu$ V	-17.02 dB	Pass
22.272 MHz	34.09 dB $\mu$ V	50 dB $\mu$ V	-15.91 dB	Pass

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

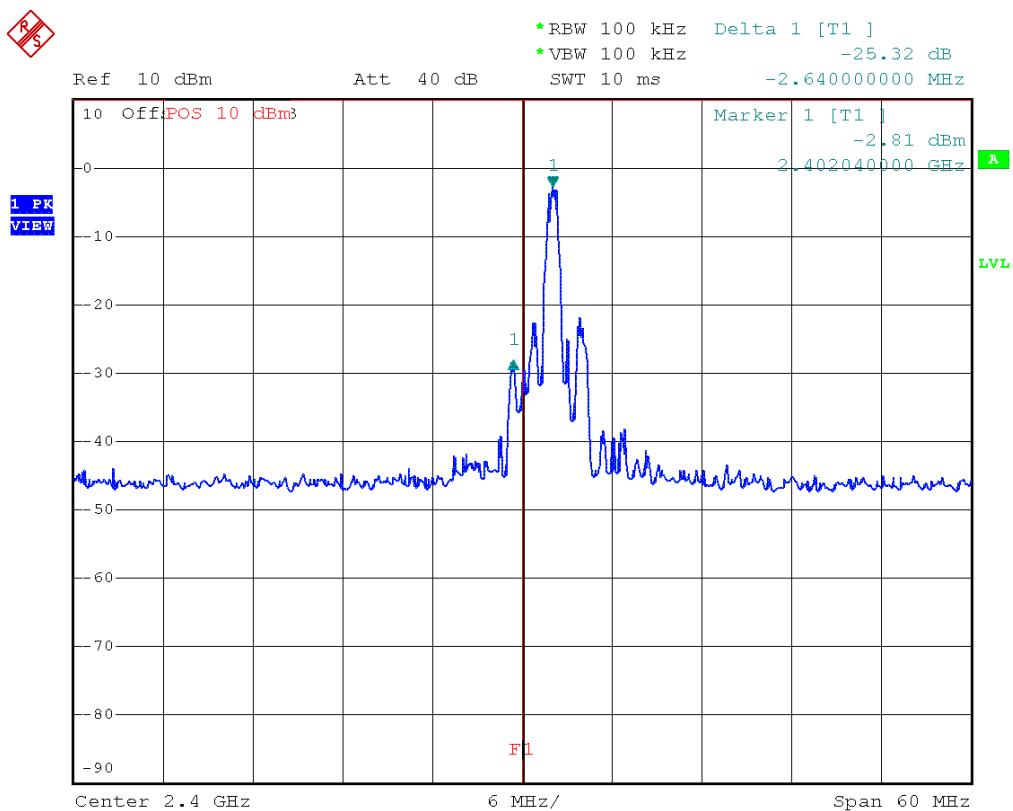
Band-edge compliance acc. to FCC 15.247 / IC RSS-247		Verdict: PASS			
EUT requirement rule parts and clause	Reference				
	FCC 15.247(d) / IC RSS-247 5.5				
Test according to measurement reference	Reference Method				
	ANSI C63.10				
Test frequency range	Tested frequencies				
	$F_{LOW} / F_{HIGH}$				
Measurement mode	Peak				
Limits					
Limit		Condition			
$\leq -20 \text{ dB} / 100 \text{ kHz}$		Peak power measurement detector = Peak			
$\leq -30 \text{ dB} / 100 \text{ kHz}$		Peak power measurement detector = RMS			
Test setup					
<pre> graph LR     SA[Spectrum Analyzer] --- EUT[EUT]   </pre>					
Test procedure					
<ol style="list-style-type: none"> <li>EUT set to test mode (Communication tester is used if needed)</li> <li>Span set around lower band edge and detector is set to peak and max hold</li> <li>Resolution bandwidth is set to 100 kHz</li> <li>Markers are set to peak emission levels within frequency band and outside frequency band</li> <li>Band edge attenuation is determined from level difference</li> </ol>					
Test results					
Channel	Frequency [MHz]	Mode	Level [dBc]	Limit [dBc]	Margin [dB]
$F_{LOW}$	2402	Transmit	-25.3	-20	-05.30
$F_{HIGH}$	2480	Transmit	-39.2	-20	-19.20
Comments:					

### Band-edge compliance F<sub>LOW</sub>

## Band-edge compliance acc. to FCC 15.247

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BTLE, 2402 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: 20 dB down method  
 Note 2: lower Band-edge, conducted measurement



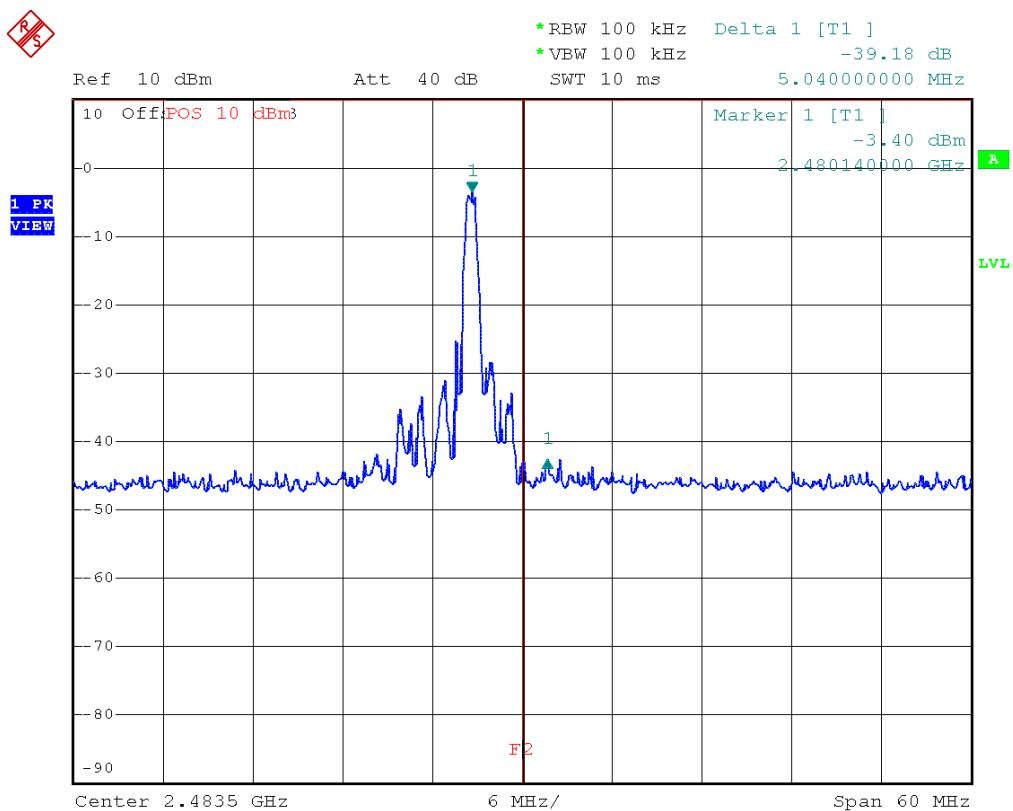
Comment: Limit: Marker Delta value >20 dB; Result: PASS  
 Date: 27.MAR.2015 09:45:11

### Band-edge compliance F<sub>HIGH</sub>

#### Band-edge compliance acc. to FCC 15.247

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BTLE, 2480 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: 20 dB down method  
 Note 2: lower Band-edge, conducted measurement



Comment: Limit: Marker Delta value >20 dB; Result: PASS  
 Date: 27.MAR.2015 09:44:02

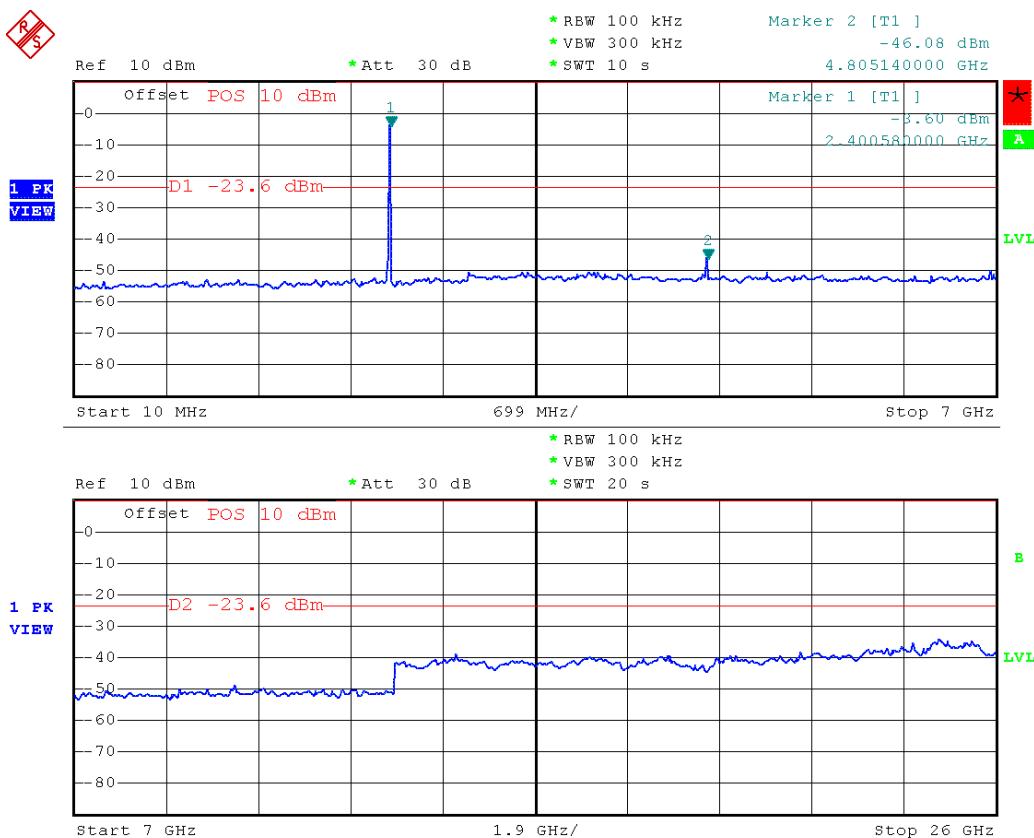
### 3.7 Test Conditions and Results – Conducted spurious emissions

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 – 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							
<pre> graph LR     SA[Spectrum Analyzer] --- EUT[EUT]   </pre>							
Test procedure							
<ol style="list-style-type: none"> <li>1. EUT set to test mode (Communication tester is used if needed)</li> <li>2. Span it set according to measurement range</li> <li>3. Resolution bandwidth is set to 100 kHz and detector to peak and max hold</li> <li>4. Markers are set to peak emission levels within frequency band</li> <li>5. Emission level is determined by second marker on emission peak</li> <li>6. Attenuation is determined from level difference</li> </ol>							
Test results							
Channel	Frequency [MHz]	Mode	Emission [MHz]	Emission Level [dBm]	Peak power [dBm]	Limit [dBm]	Margin [dB]
F <sub>LOW</sub>	2402	Transmit	4805	-46.08	-3.6	-23.6	-22.48
F <sub>MID</sub>	2440	no significant spurious emissions					
F <sub>HIGH</sub>	2480	no significant spurious emissions					
Comments:							

Conducted spurious emissions – F<sub>Low</sub>
**Spurious Emissions acc. to FCC 15.247**

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: T<sub>nom</sub> / V<sub>nom</sub>  
 Mode: Tx, BTLE, 2402 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: Spurious in non-restricted frequency bands  
 Note 2: conducted measurement



Date: 27.MAR.2015 09:48:01

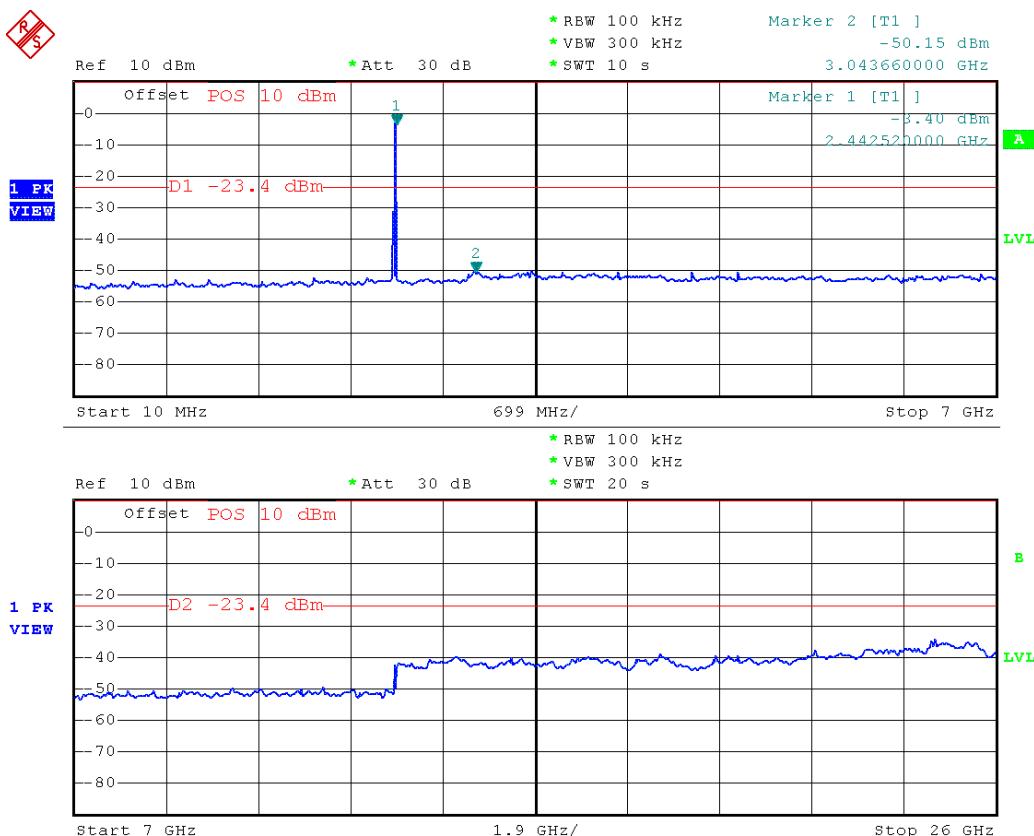
Test Report No.: G0M-1502-4552-TFC247BL-V01

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

## Spurious Emissions acc. to FCC 15.247

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: T<sub>nom</sub> / V<sub>nom</sub>  
 Mode: Tx, BTLE, 2440 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: Spurious in non-restricted frequency bands  
 Note 2: conducted measurement



Date: 27.MAR.2015 10:01:08

Test Report No.: G0M-1502-4552-TFC247BL-V01

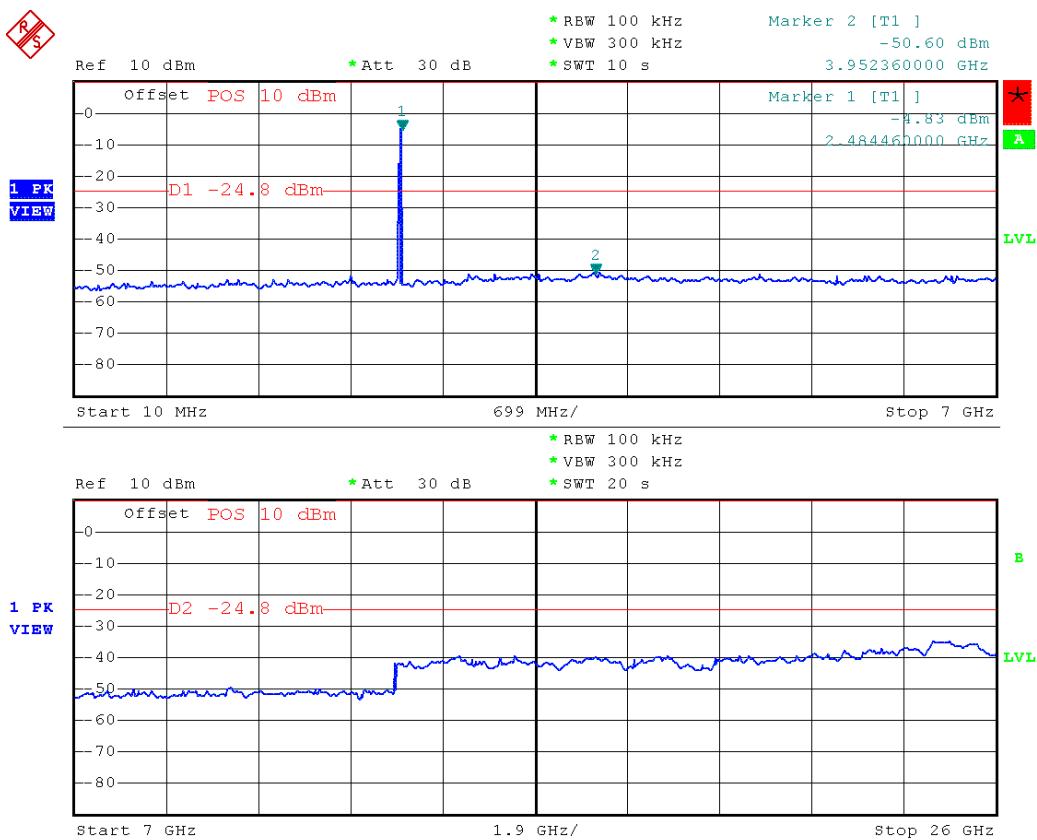
Eurofins Product Service GmbH  
Storkower Str. 38c, D-15526 Reichenwalde, Germany

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Conducted spurious emissions – F<sub>HIGH</sub>
**Spurious Emissions acc. to FCC 15.247**

Project Number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Receiver  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: M. Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: Tx, BTLE, 2480 MHz, modulated  
 Test Date: 2015-03-27  
 Verdict: PASS  
 Note 1: Spurious in non-restricted frequency bands  
 Note 2: conducted measurement



Date: 27.MAR.2015 10:03:20

Test Report No.: G0M-1502-4552-TFC247BL-V01

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

Transmitter radiated emissions acc. 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 – 10 <sup>th</sup> Harmonic			
Limits				
Frequency range [MHz]	Detector	Limit [ $\mu$ V/m]	Limit [ $\text{dB}\mu\text{V}/\text{m}$ ]	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				
<p>The diagram illustrates the test setup. A large rectangular box labeled "Semi-anechoic Chamber" contains a smaller rectangular area labeled "Turn table". On the turn table, there is a yellow box labeled "EUT". Below the turn table is a horizontal line labeled "Ground Plane". To the left of the turn table, there is a vertical antenna assembly with a dipole-like structure. At the bottom left, a blue box labeled "Amplifier Matrix" is connected by a line to a yellow box labeled "Measurement Receiver".</p>				

Test procedure									
Test results									
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [db $\mu$ V/m]	Det.	Pol.	Limit [db $\mu$ V/m]	Limit dist. [m]*	Margin [dB]
F <sub>LOW</sub>	2402	Transmit	2384	59.86	pk	ver	74.00	1	-14.14
F <sub>LOW</sub>	2402	Transmit	2384	46.71	RMS	ver	54.00	1	-07.29
F <sub>LOW</sub>	2402	Transmit	2387	49.50	pk	hor	74.00	1	-24.50
F <sub>LOW</sub>	2402	Transmit	2387	36.98	RMS	hor	54.00	1	-17.02
F <sub>LOW</sub>	2402	Transmit	4805	48.41	pk	hor	74.00	1	-25.59
F <sub>LOW</sub>	2402	Transmit	4805	42.97	avg	hor	54.00	1	-11.03
F <sub>MID</sub>	2442	Transmit	4881	47.85	pk	hor	74.00	1	-26.15
F <sub>MID</sub>	2442	Transmit	4881	42.96	avg	hor	54.00	1	-11.04
F <sub>HIGH</sub>	2480	Transmit	4960	47.45	pk	hor	74.00	1	-26.55
F <sub>HIGH</sub>	2480	Transmit	4960	43.26	avg	hor	54.00	1	-10.74

Comments: \* Physical distance between EUT and measurement antenna.

### 3.9 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 – 3 <sup>th</sup> Harmonic		
EUT test mode		Receive		
Limits				
Frequency range [MHz]	Detector	Limit [ $\mu$ V/m]	Limit [dB $\mu$ V/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 [dB $\mu$ V/m]	Pol.	Det.	Limit [dB $\mu$ V/m]	Margin [dB $\mu$ V/m]
F <sub>MID</sub>	2440	288	17.89	hor	pk	46.00	-28.11
F <sub>MID</sub>	2440	819.2	20.52	ver	pk	46.00	-25.48
F <sub>MID</sub>	2440	884.8	24.79	hor	pk	46.00	-21.21
F <sub>MID</sub>	2440	7392	49.00	ver	pk	53.98	-04.98
Comments:							

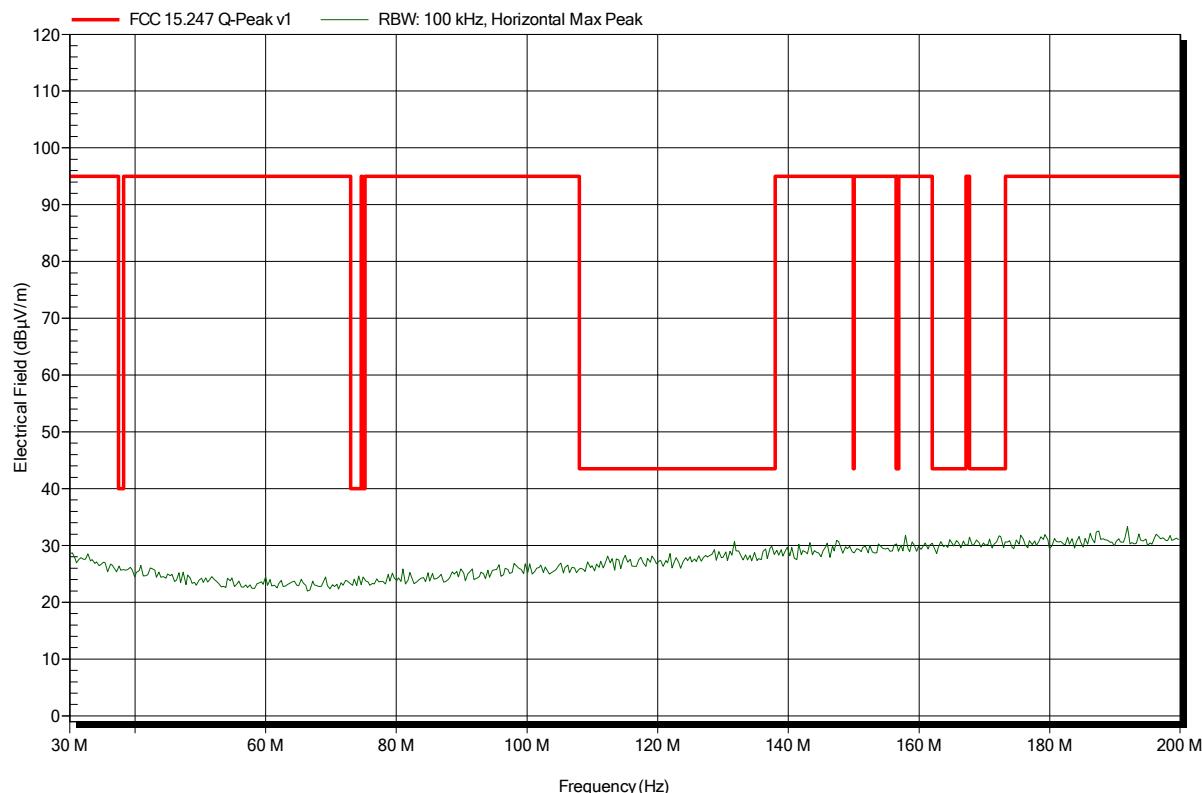
## ANNEX A Transmitter radiated spurious emissions

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions:  $T_{nom}: 25^{\circ}\text{C}$ ,  $V_{nom}: 5.0 \text{ V DC}$   
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-27  
 Note:

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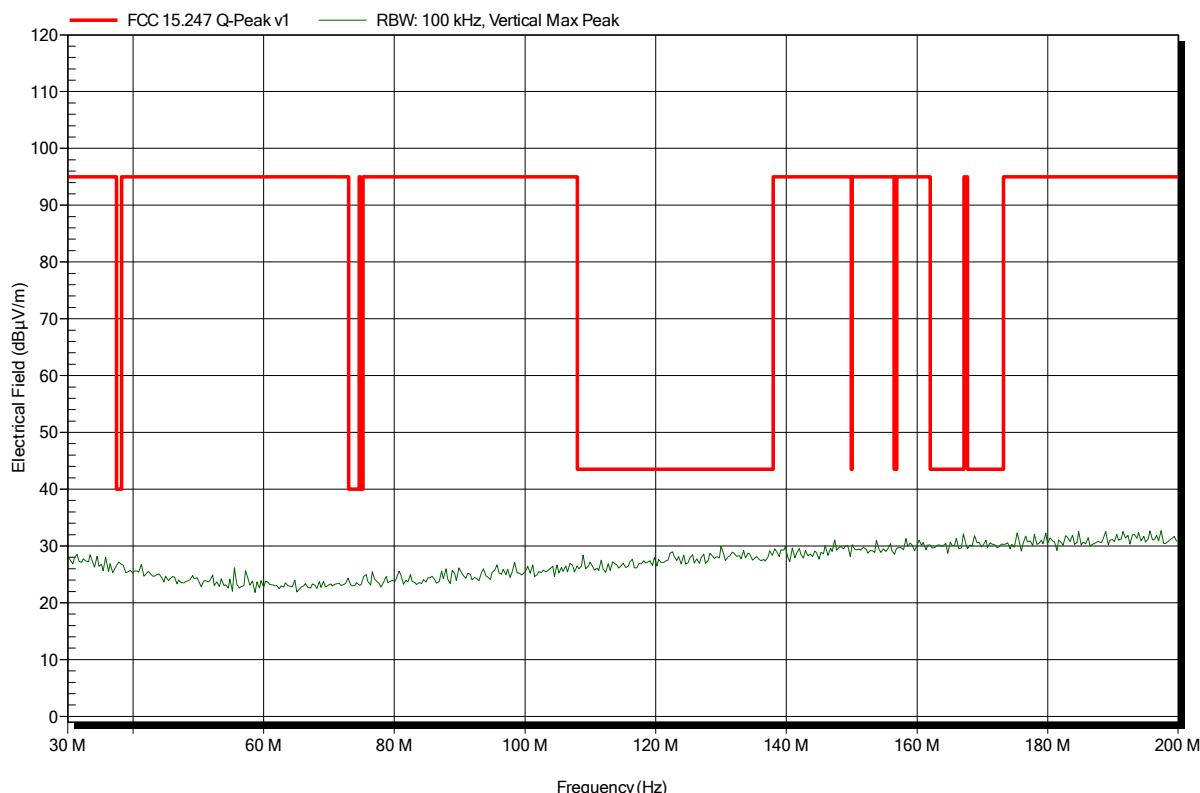


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Rohde & Schwarz HK 116, Vertical  
Measurement distance: 3 m  
Mode: TX; BT-LE; 2402 MHz  
Test Date: 2015-03-27  
Note:

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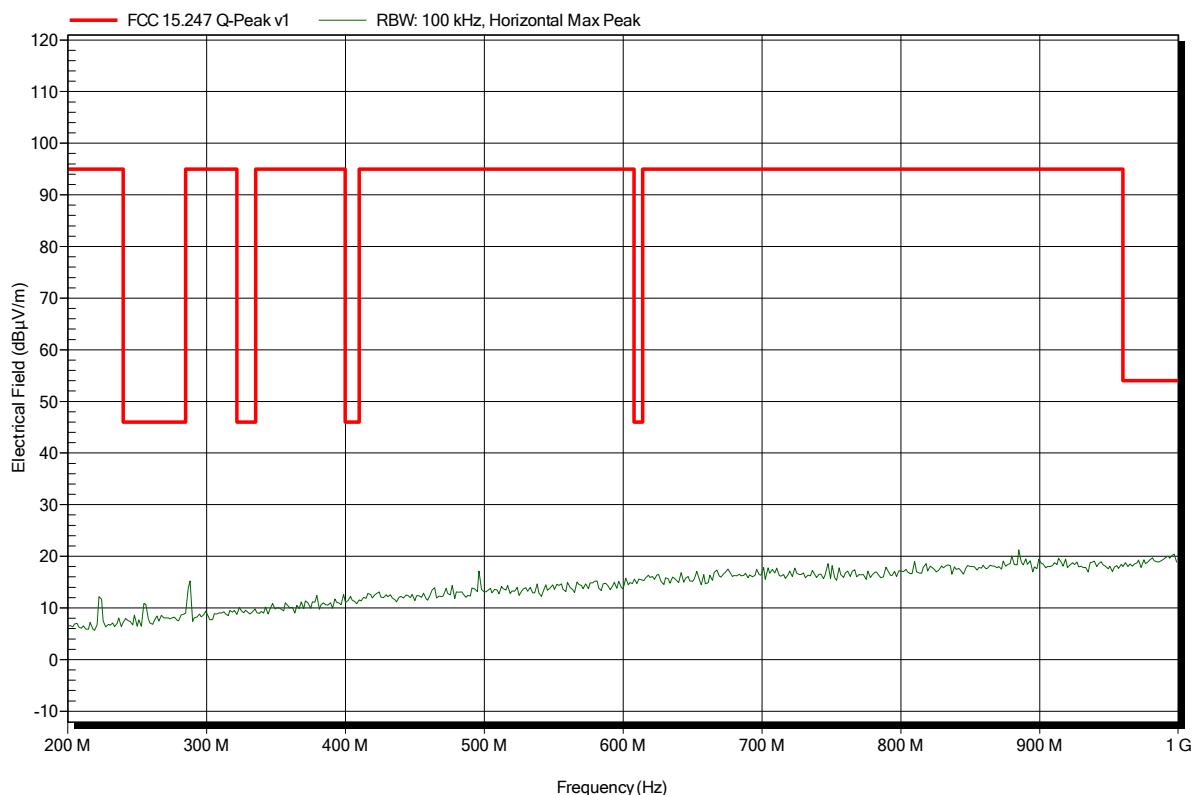


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Rohde & Schwarz HL 223, Horizontal  
Measurement distance: 3 m  
Mode: TX; BT-LE; 2402 MHz  
Test Date: 2015-03-27  
Note:

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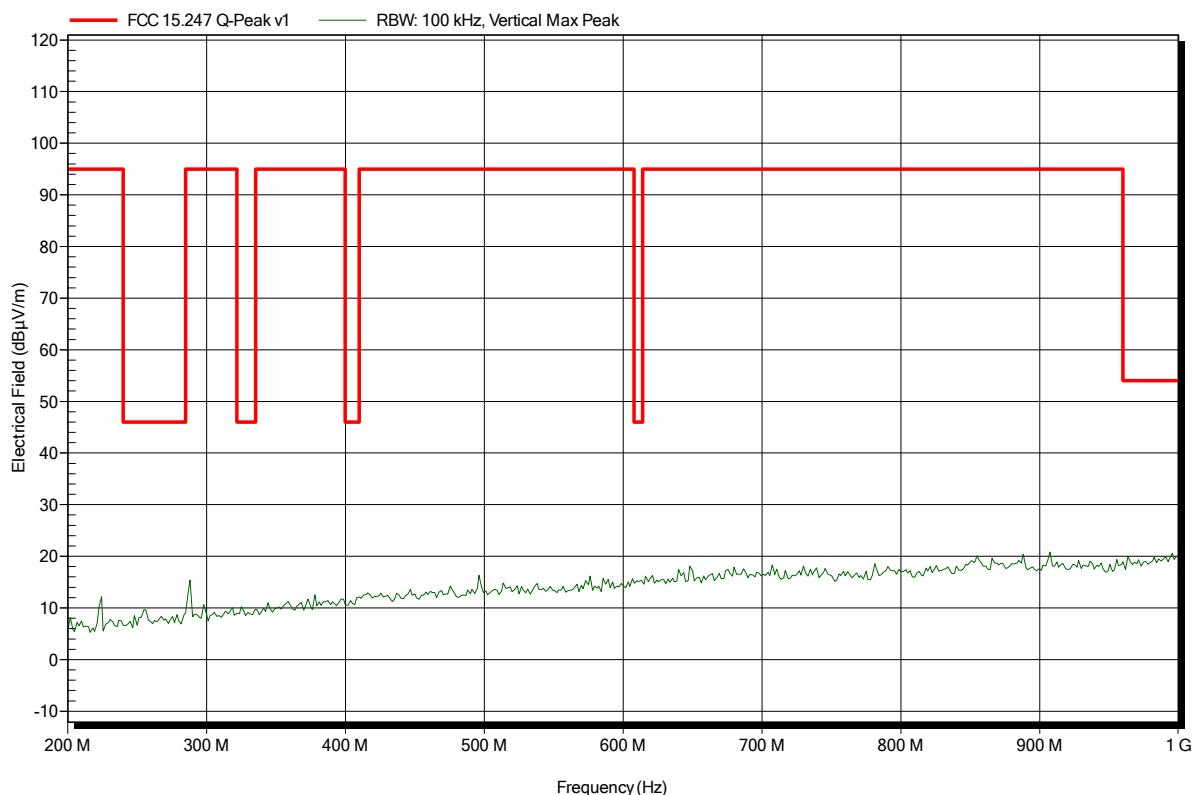


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Rohde & Schwarz HL 223, Vertical  
Measurement distance: 3 m  
Mode: TX; BT-LE; 2402 MHz  
Test Date: 2015-03-27  
Note:

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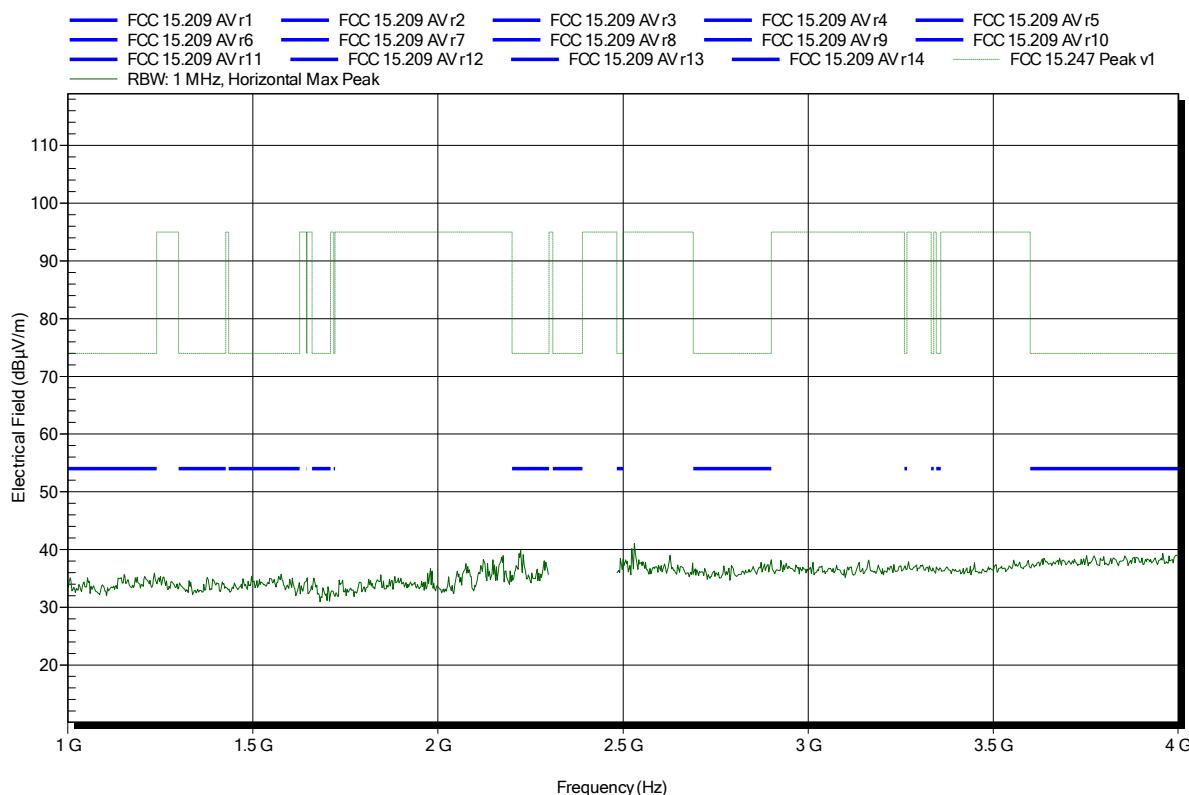


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

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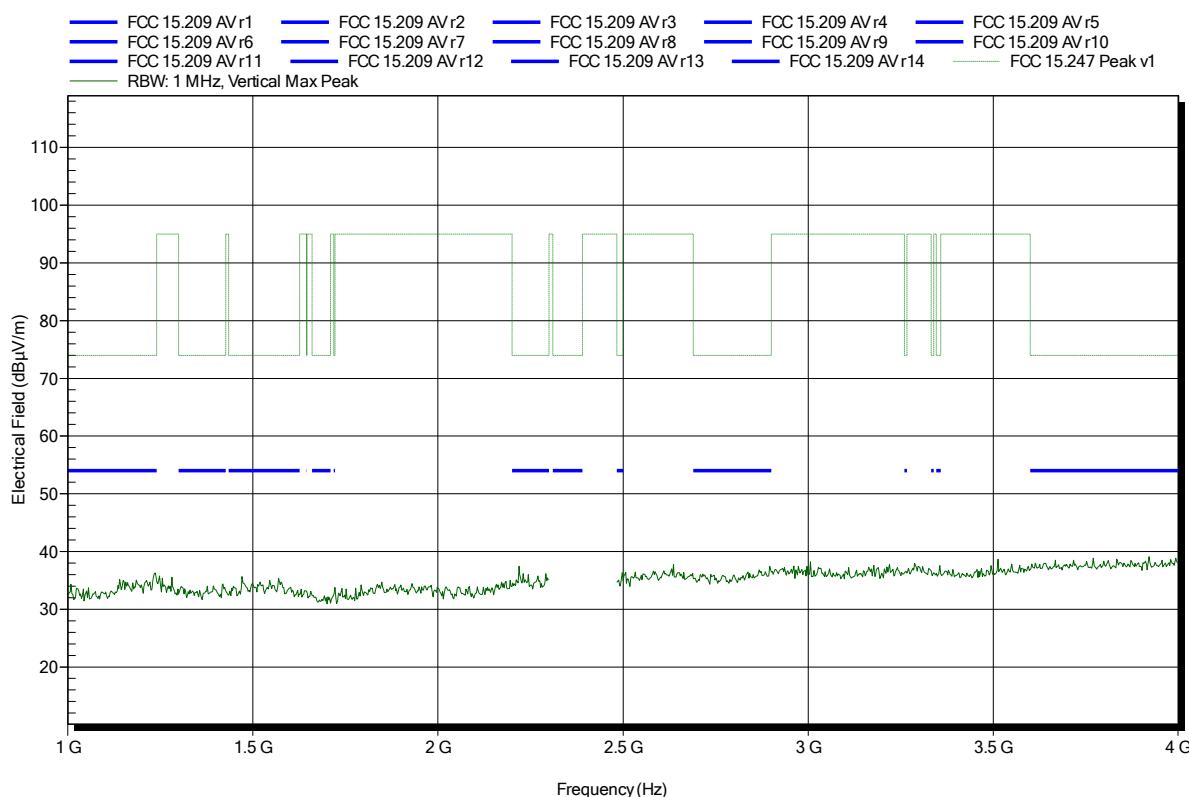
Test Report No.: G0M-1502-4552-TFC247BL-V01

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

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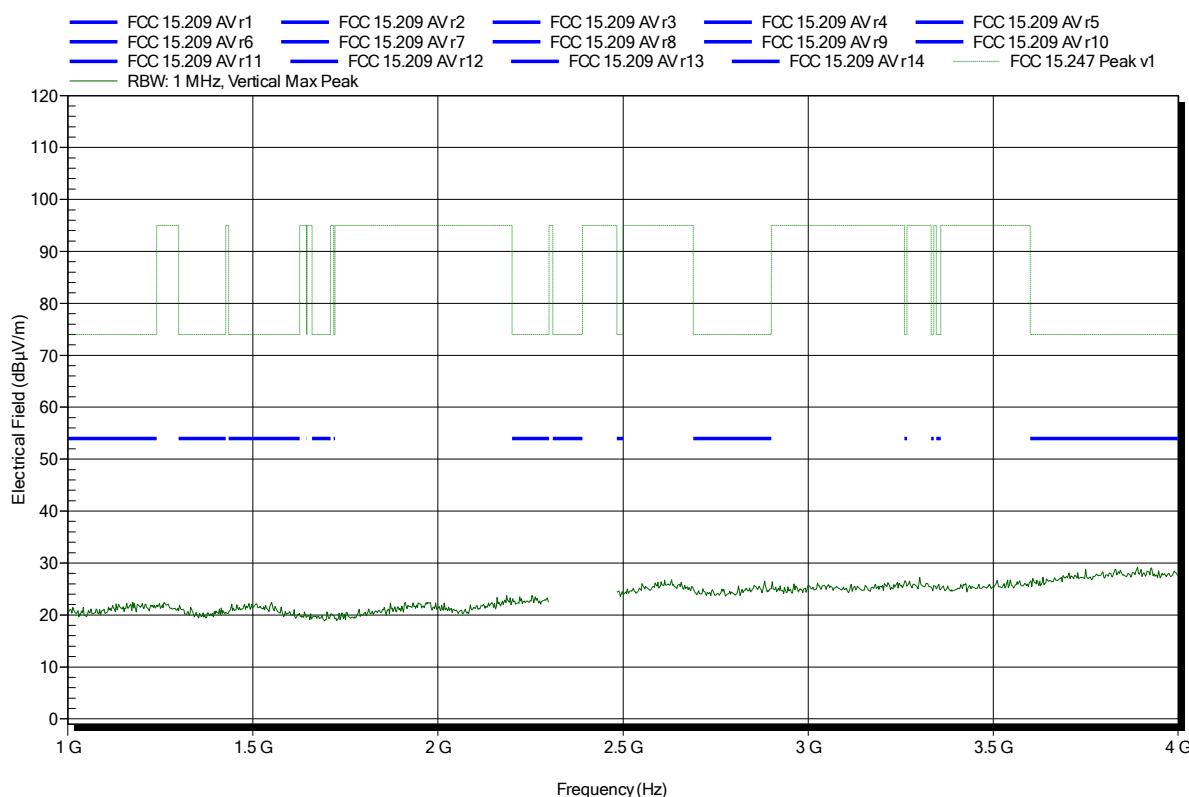


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

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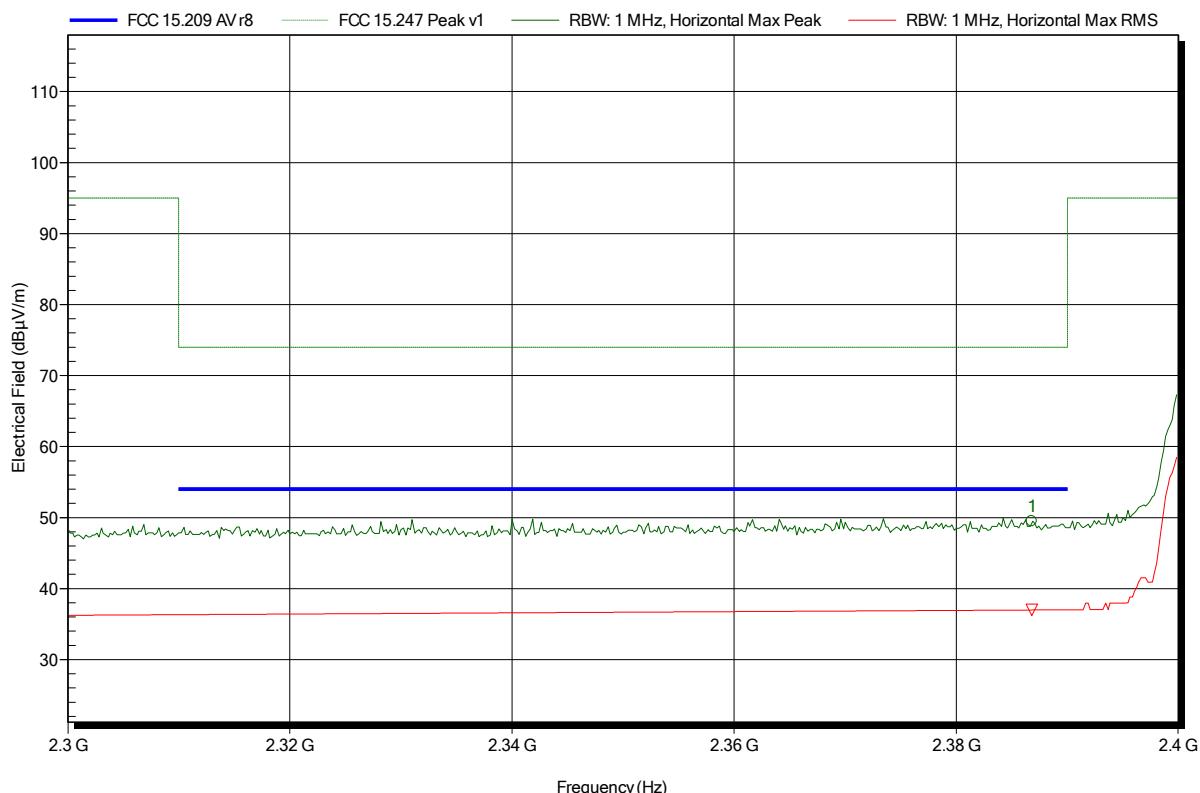


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note: lower bandedge

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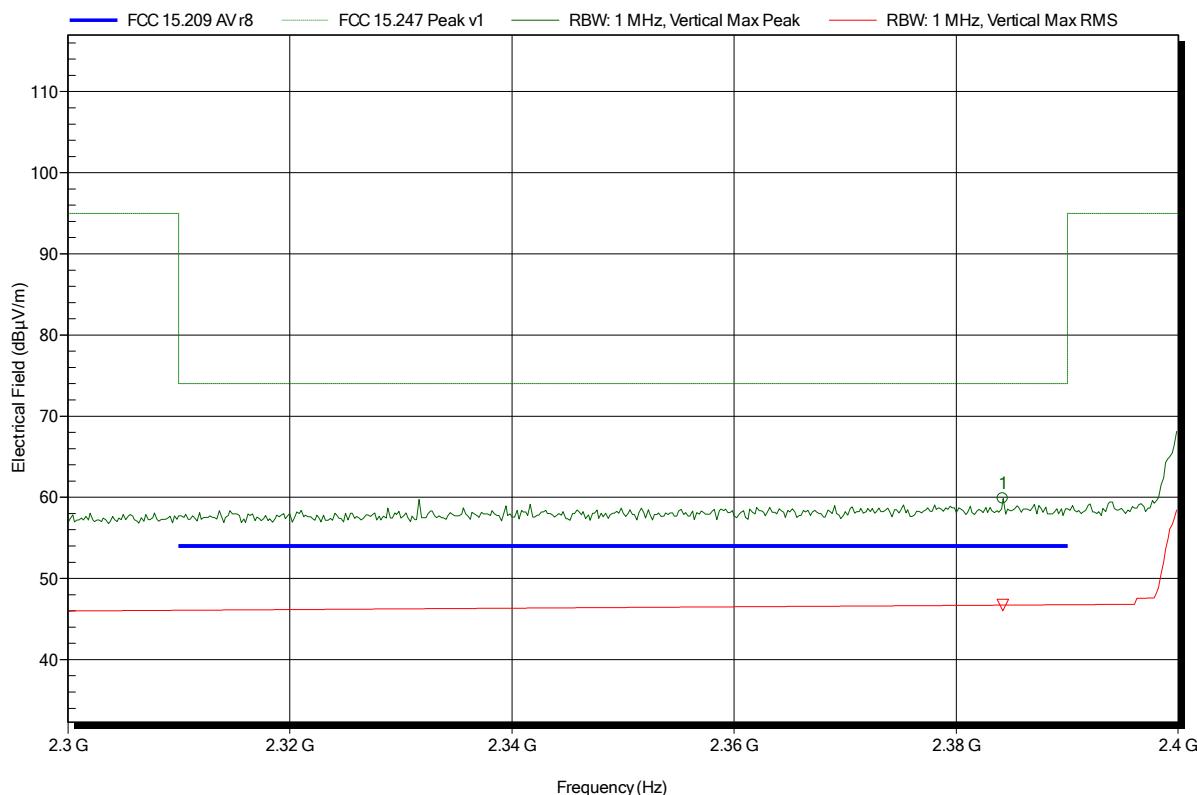
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.387 GHz	49.5 dB $\mu$ V/m	74 dB $\mu$ V/m	-24.5 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.387 GHz	36.98 dB $\mu$ V/m	54 dB $\mu$ V/m	-17.02 dB	Pass

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note: lower bandedge

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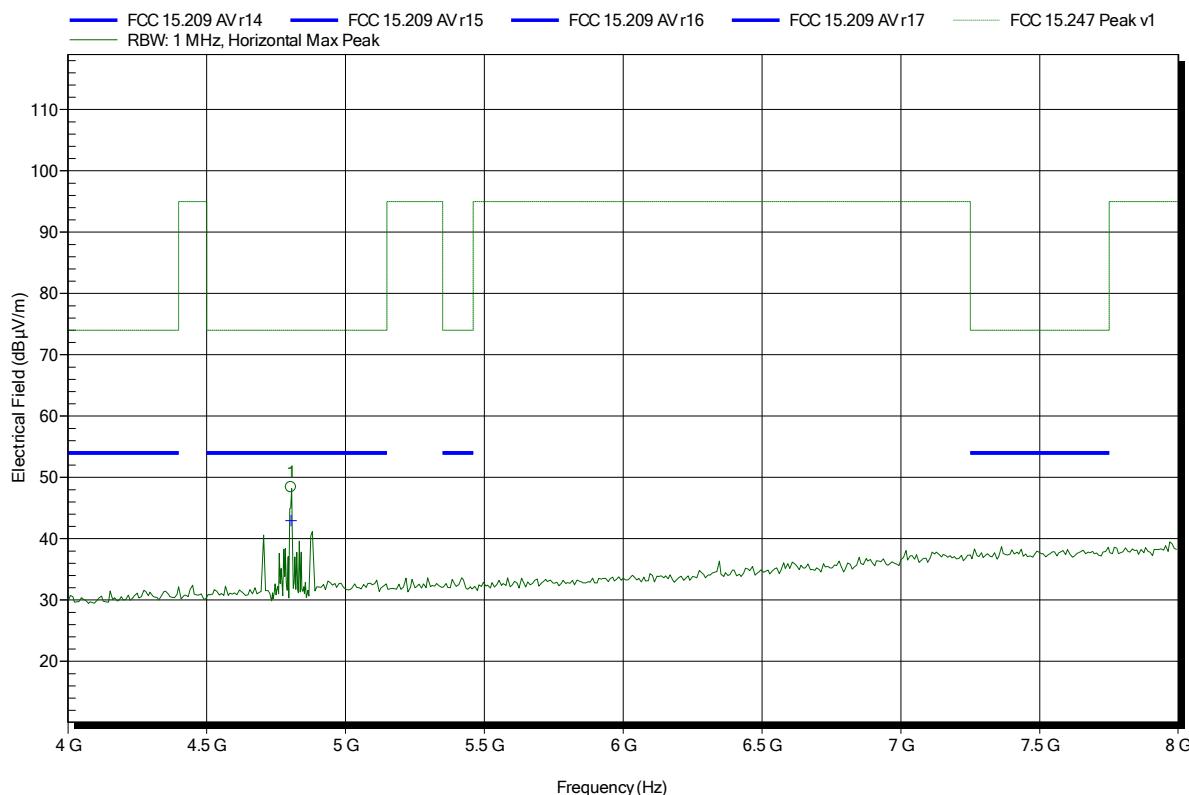
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.384 GHz	59.86 dB $\mu$ V/m	74 dB $\mu$ V/m	-14.14 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.384 GHz	46.71 dB $\mu$ V/m	54 dB $\mu$ V/m	-7.29 dB	Pass

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

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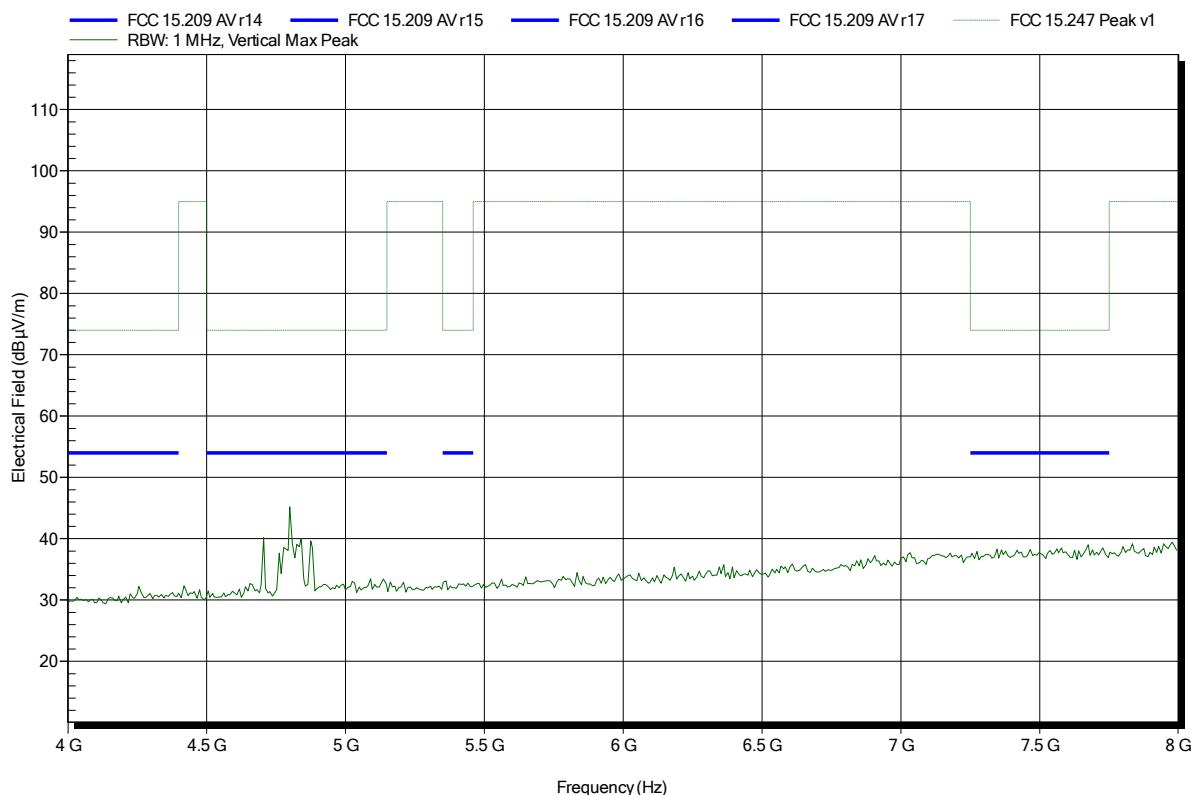
Frequency	Peak	Peak Limit	Peak Difference	Status
4.805 GHz	48.41 dB $\mu$ V/m	74 dB $\mu$ V/m	-25.59 dB	Pass
4.805 GHz	Average 42.97 dB $\mu$ V/m	Average Limit 54 dB $\mu$ V/m	Average Difference -11.03 dB	Average Status Pass

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

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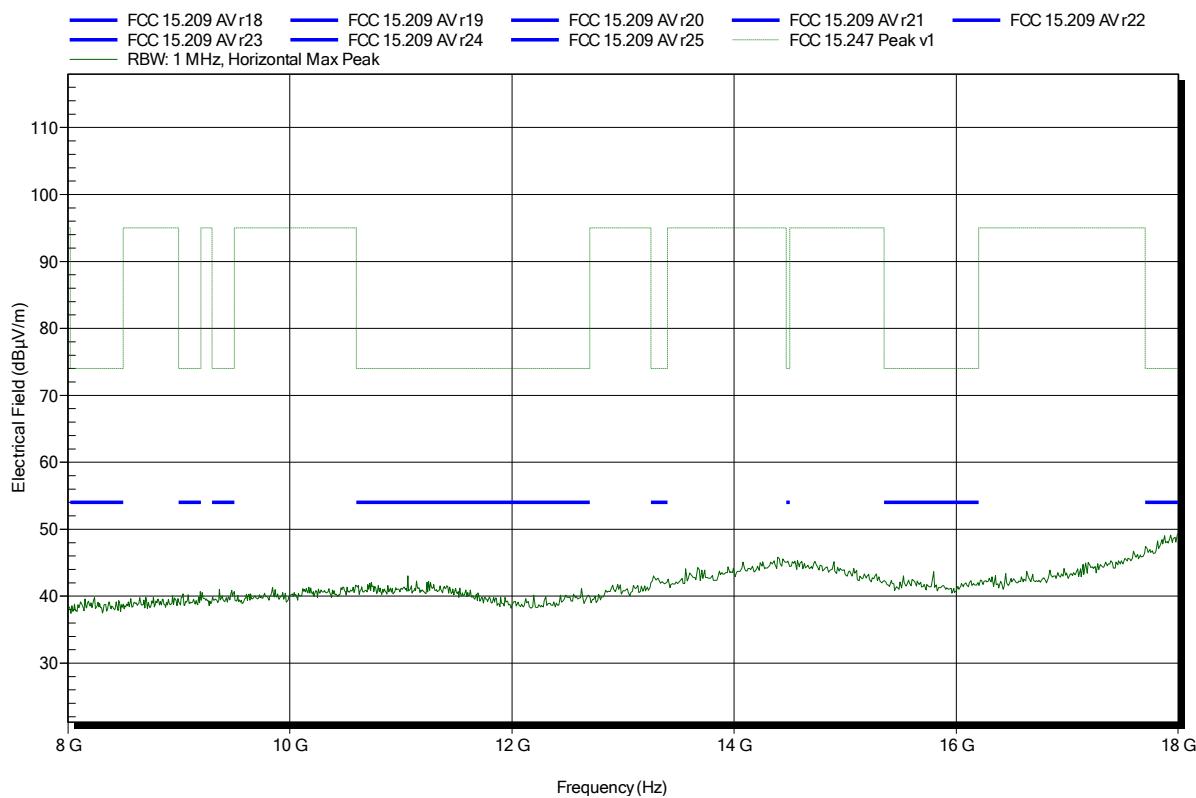


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

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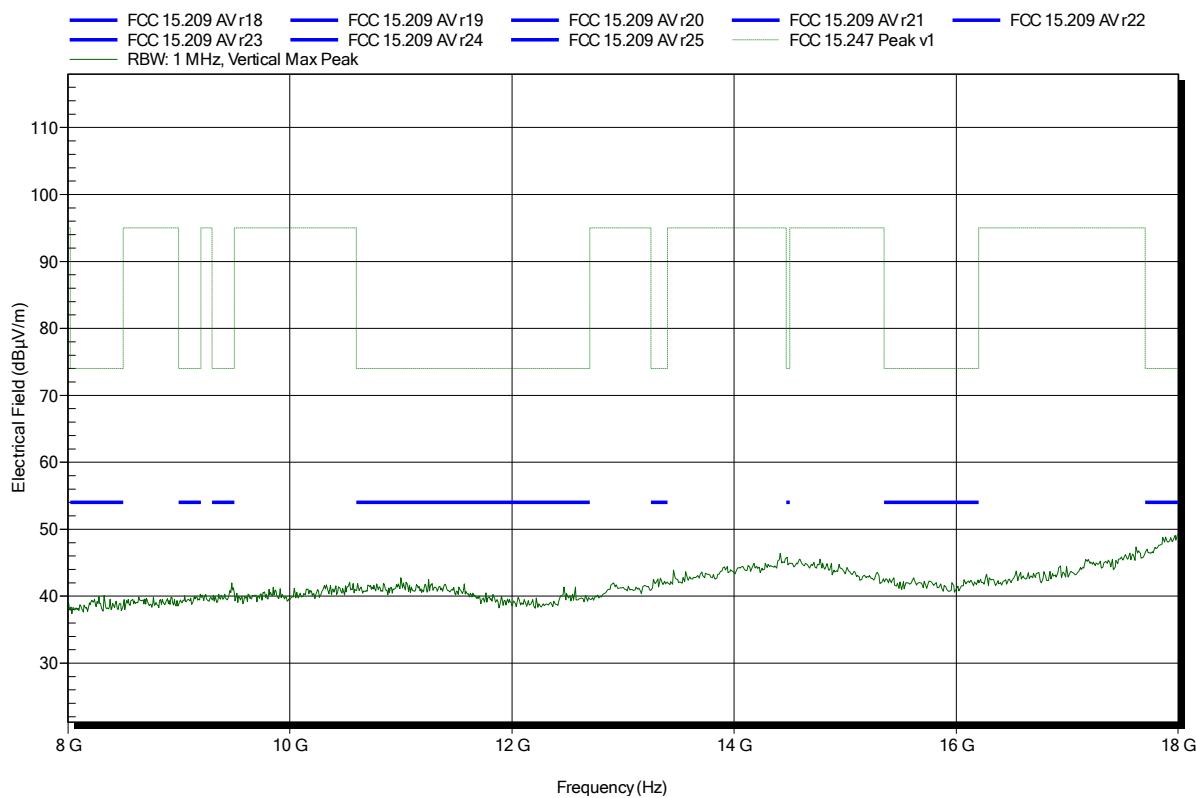


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

Index 97

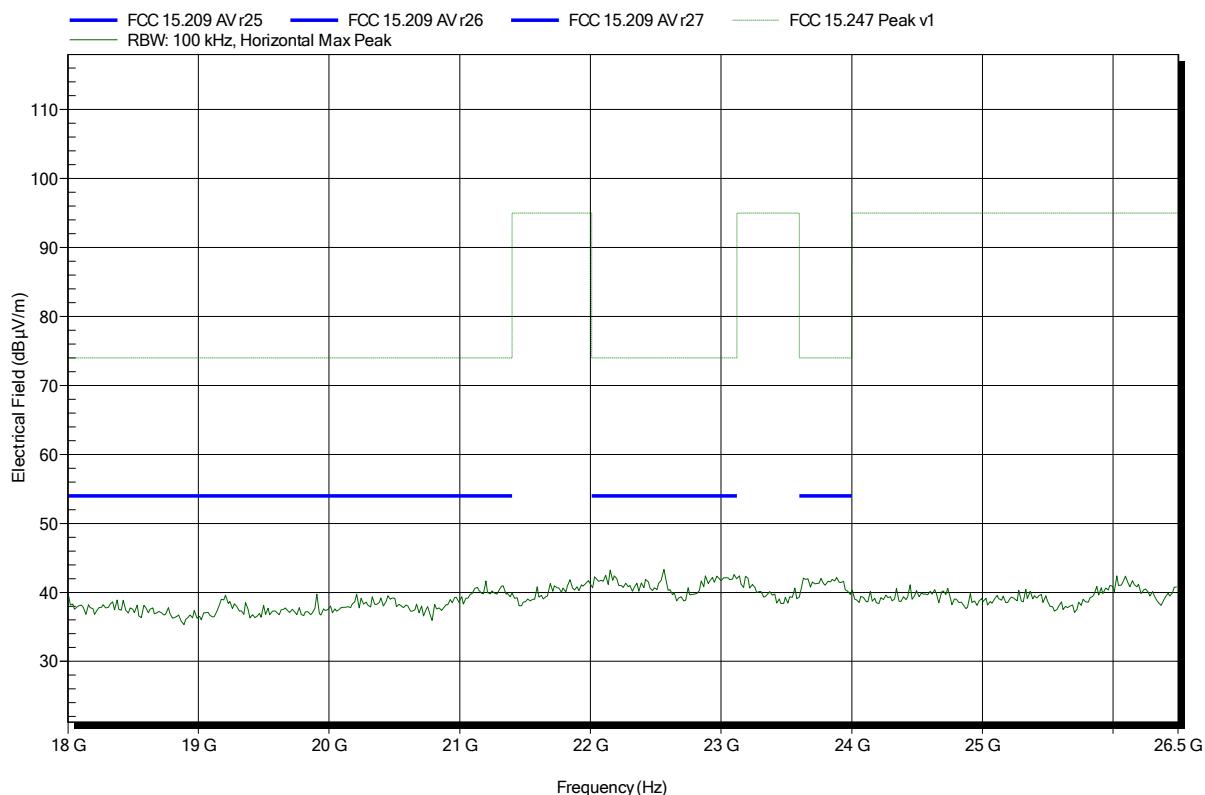


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions:  $T_{nom} = 25^{\circ}\text{C}$ ,  $V_{nom} = 5.0 \text{ V DC}$   
 Antenna: Rohde & Schwarz HL 025, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

Index 94

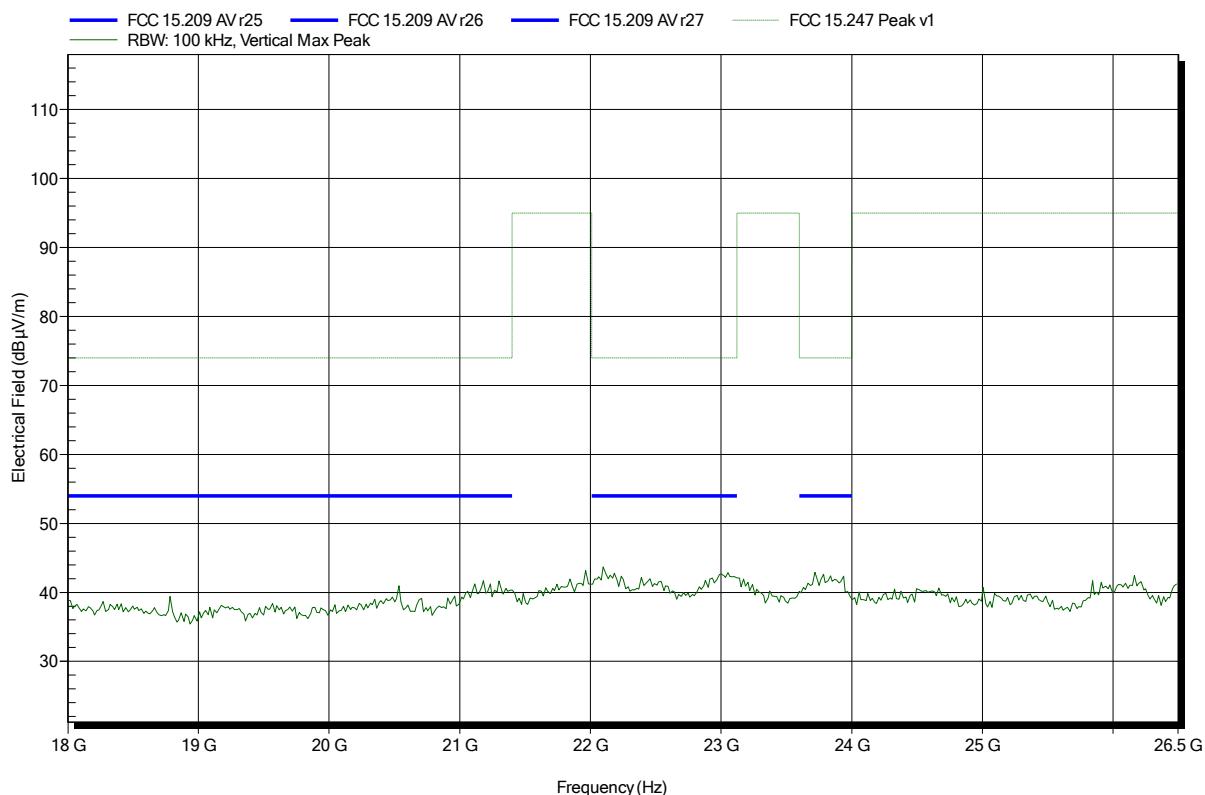


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Rohde & Schwarz HL 025, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2402 MHz  
 Test Date: 2015-03-26  
 Note:

Index 98

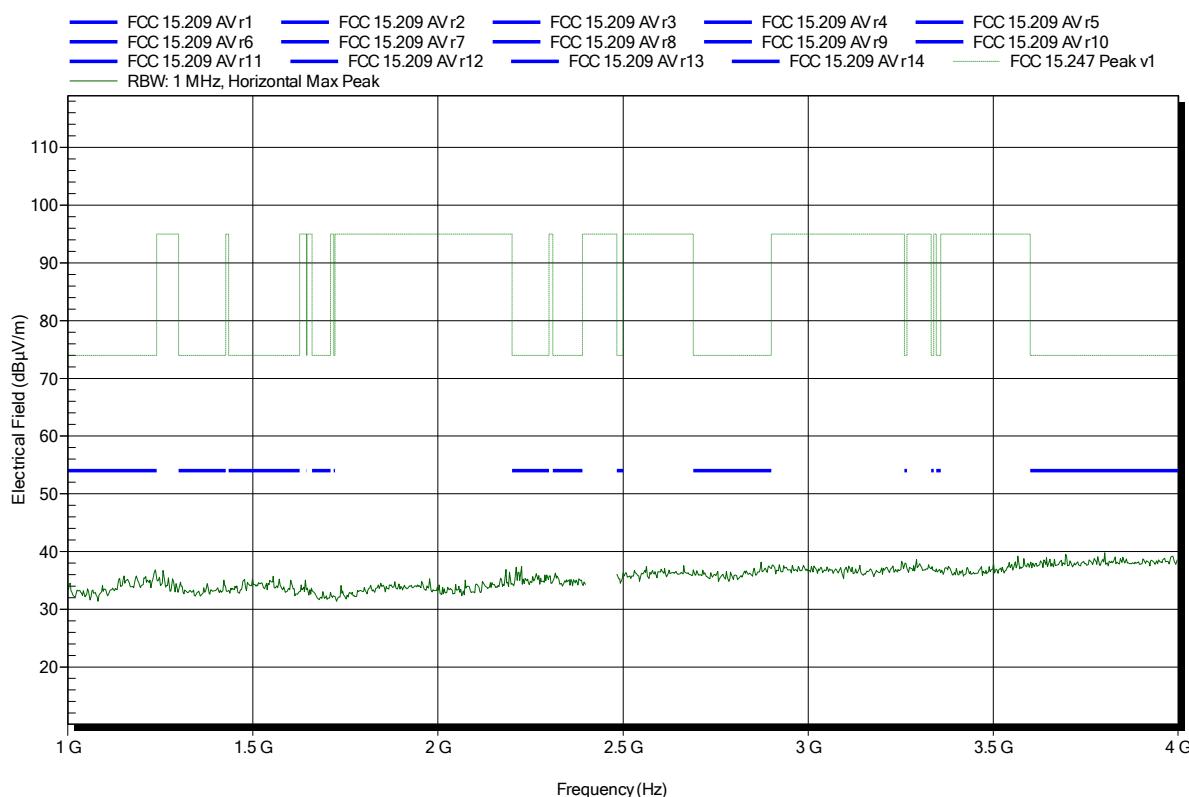


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

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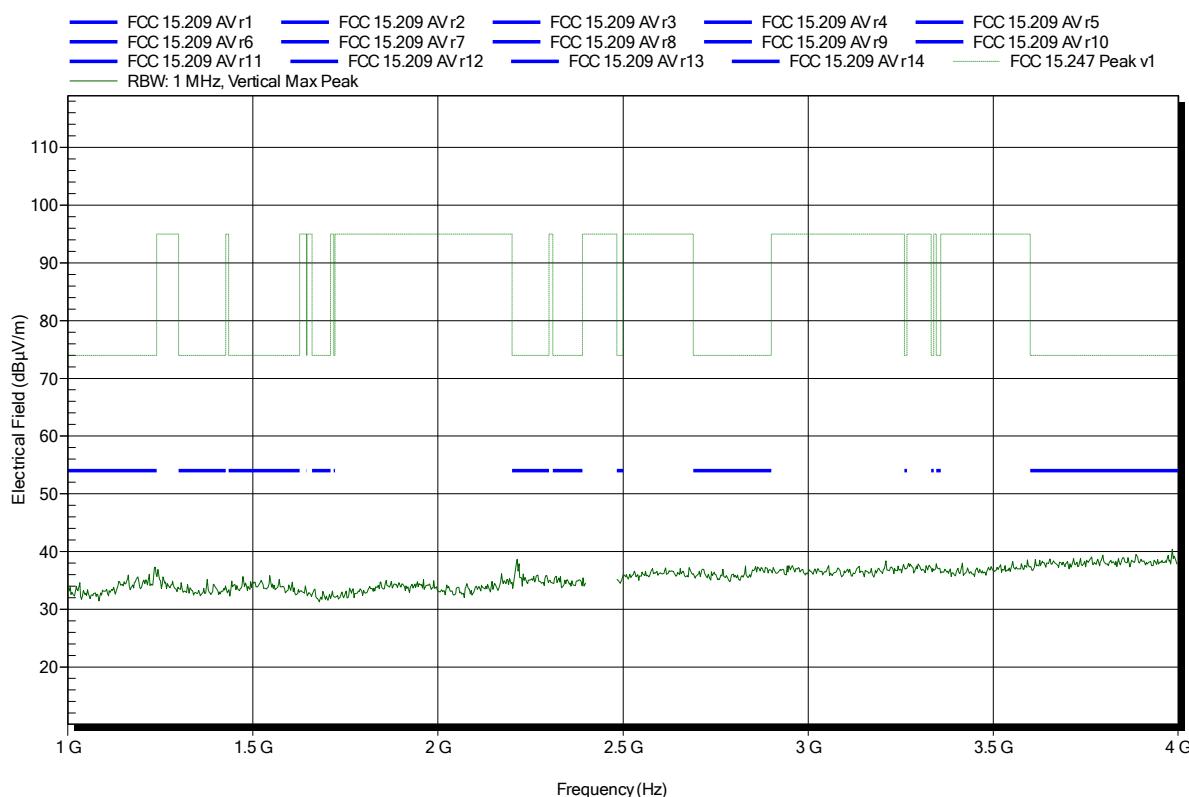


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

Index 88

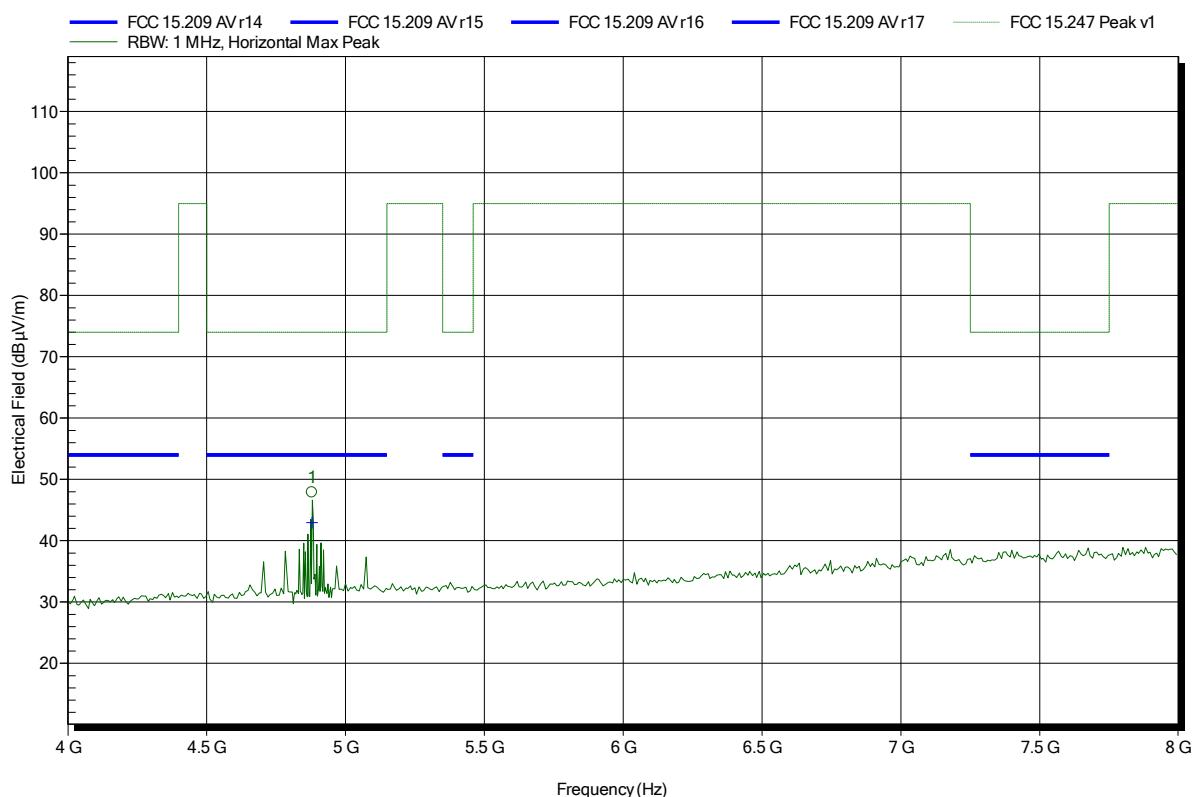


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

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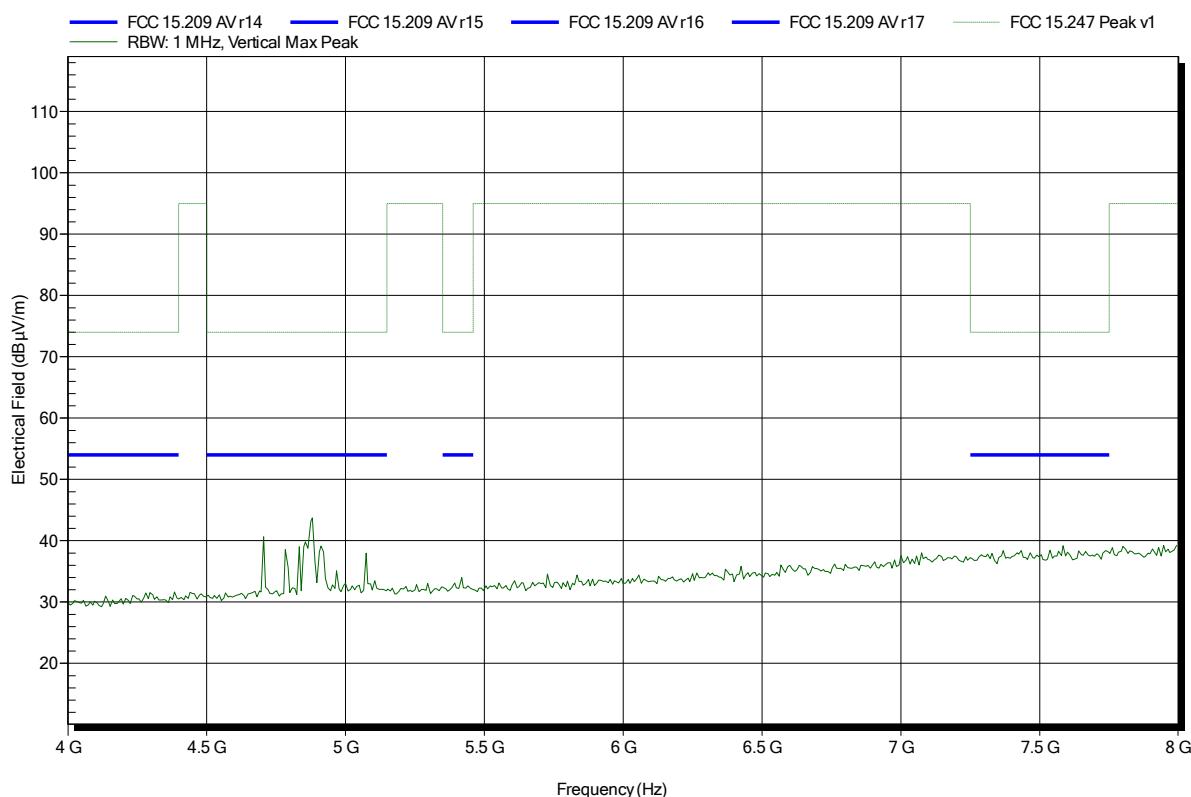
Frequency	Peak	Peak Limit	Peak Difference	Status
4.881 GHz	47.85 dB $\mu$ V/m	74 dB $\mu$ V/m	-26.15 dB	Pass
4.881 GHz	Average 42.96 dB $\mu$ V/m	Average Limit 54 dB $\mu$ V/m	Average Difference -11.04 dB	Average Status Pass

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

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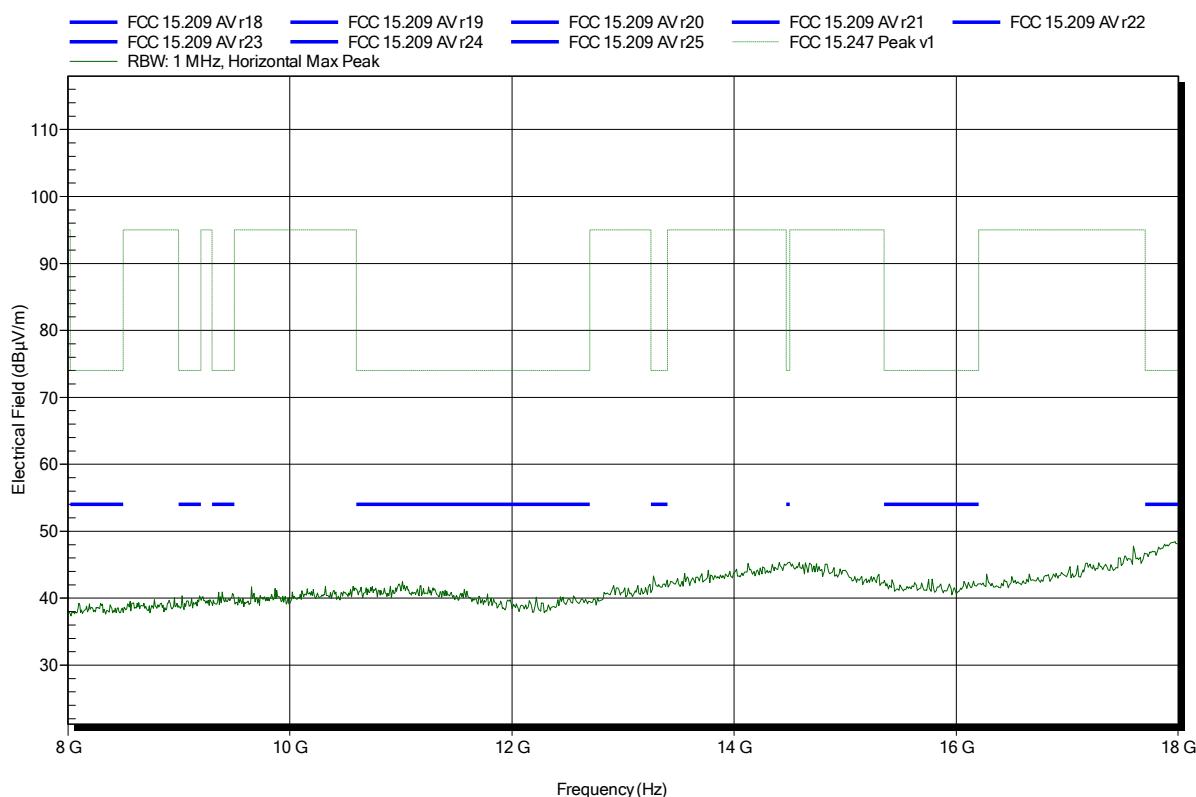


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

Index 101

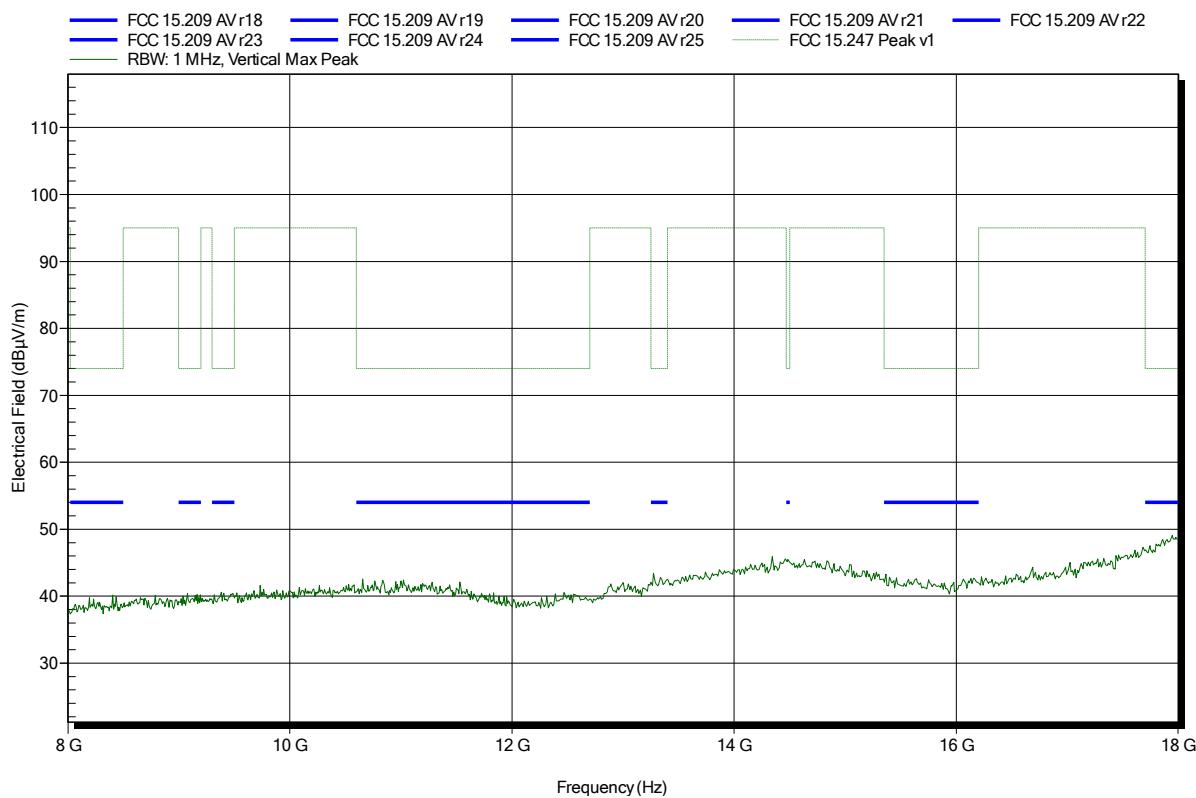


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

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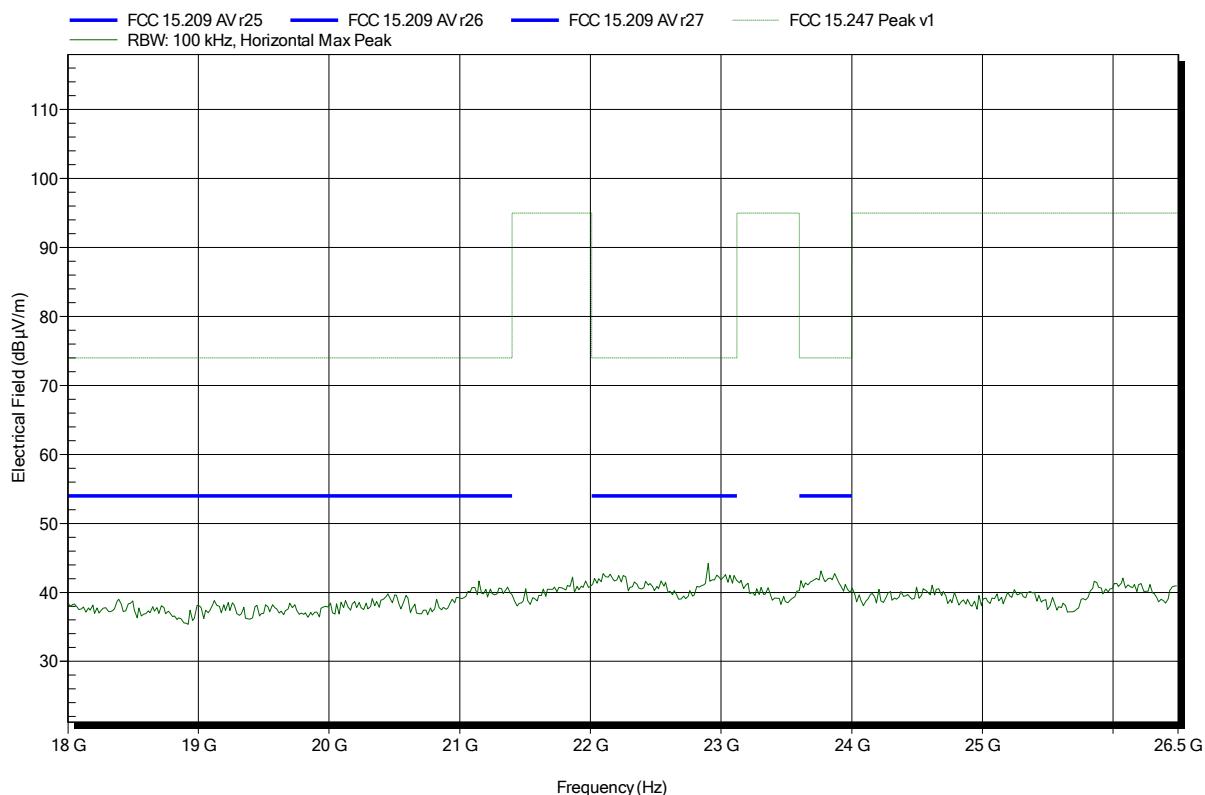


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions:  $T_{nom}: 25^{\circ}\text{C}$ ,  $V_{nom}: 5.0 \text{ V DC}$   
 Antenna: Rohde & Schwarz HL 025, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

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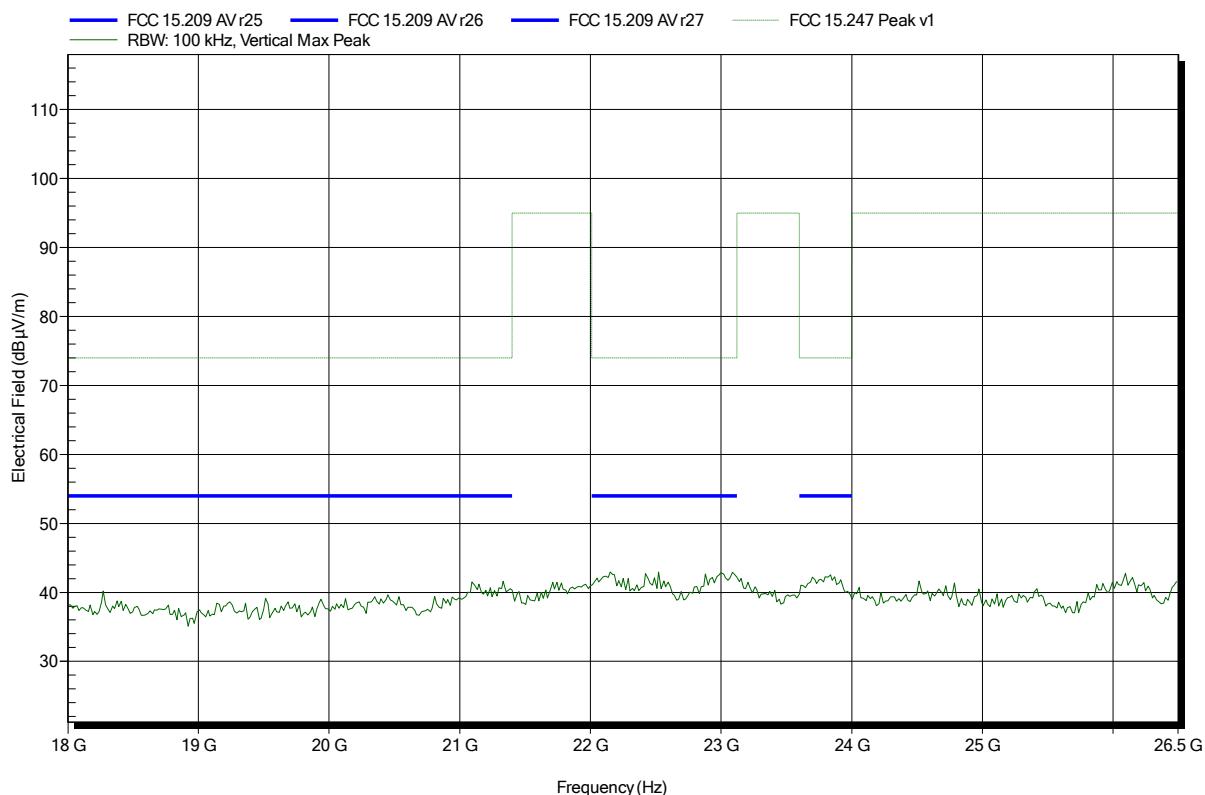


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Thom: 25°C, Vnom: 5.0 V DC  
 Antenna: Rohde & Schwarz HL 025, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2440 MHz  
 Test Date: 2015-03-26  
 Note:

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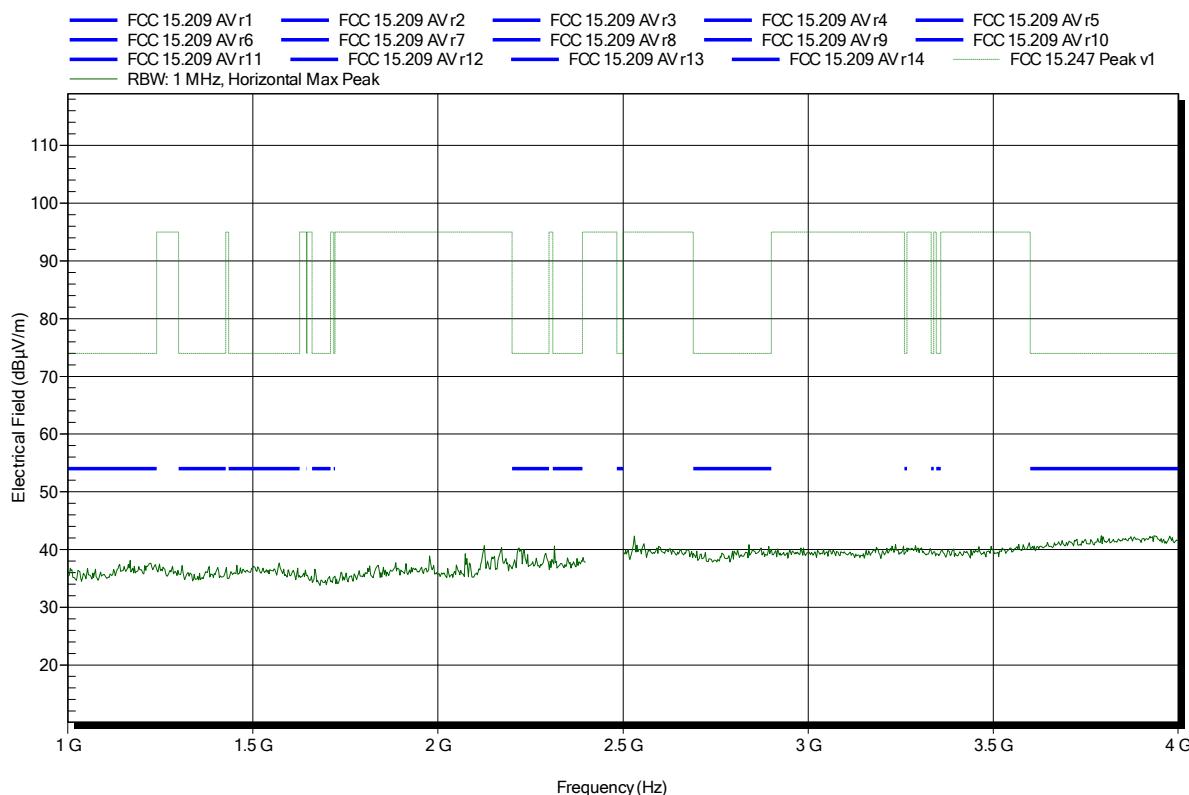


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

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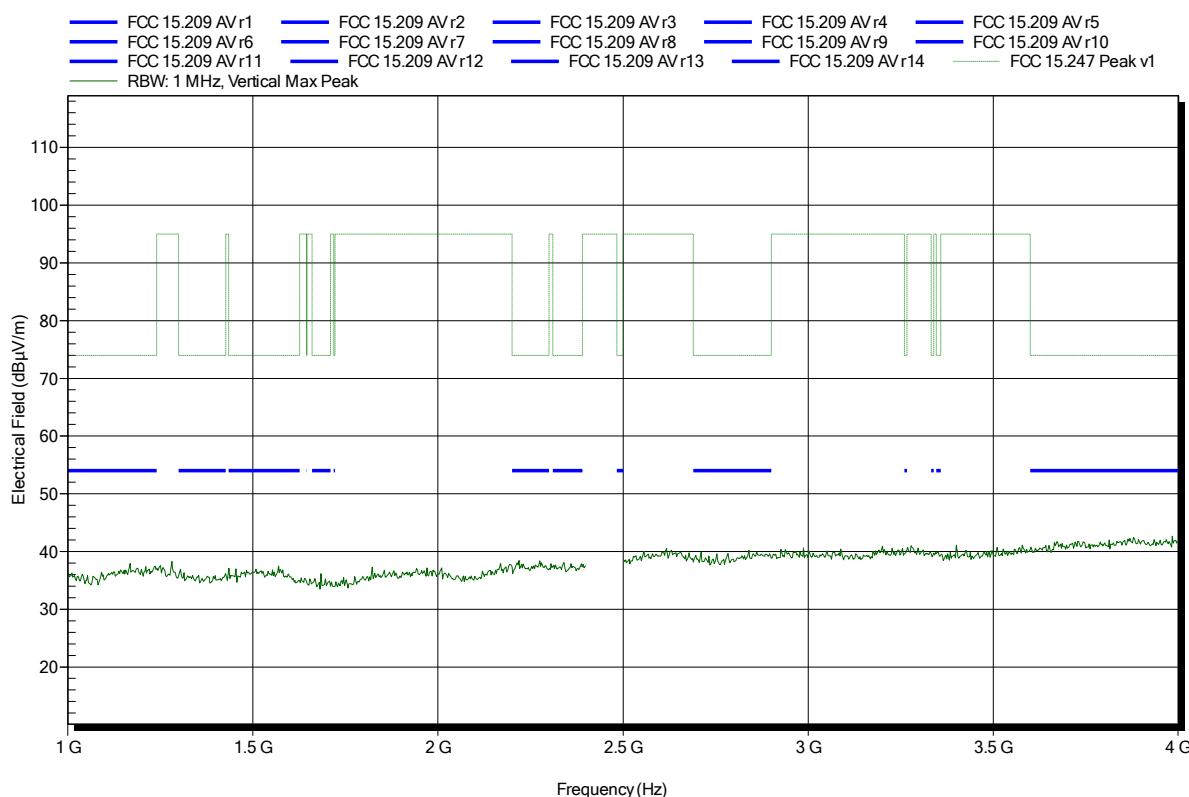


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

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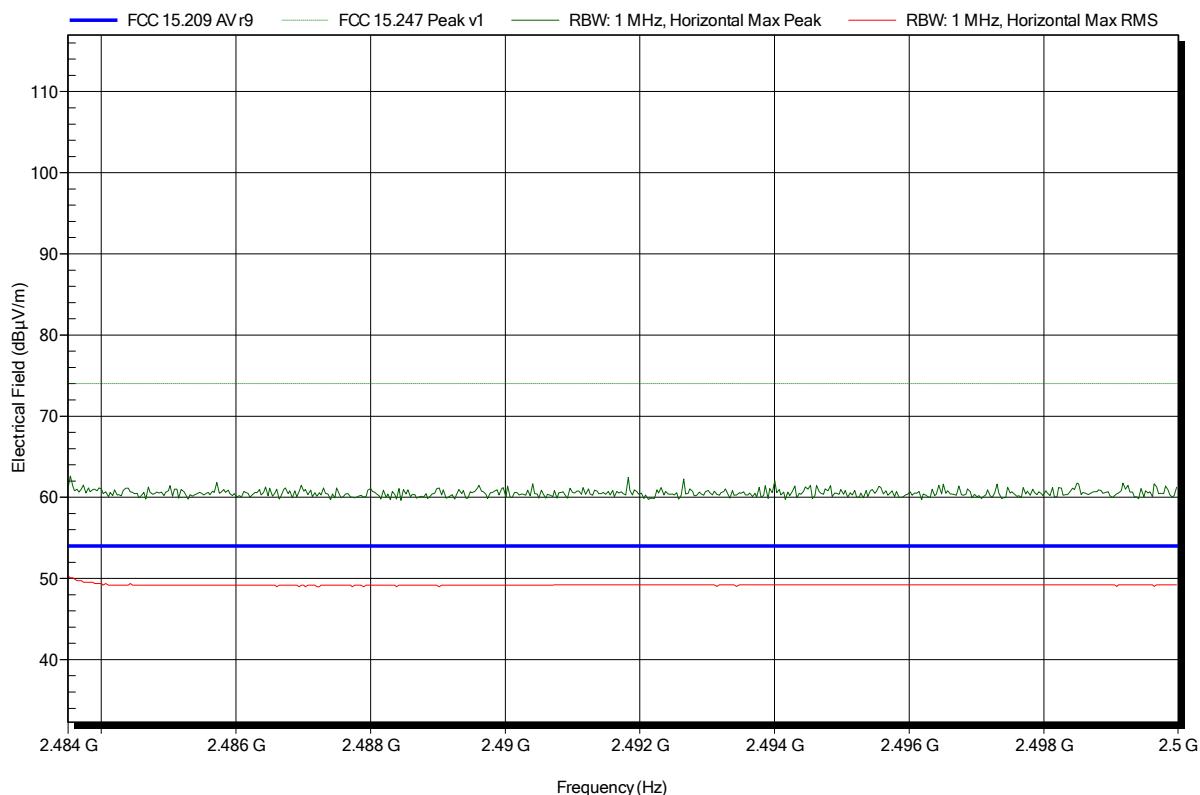
Test Report No.: G0M-1502-4552-TFC247BL-V01

**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note: upper bandedge

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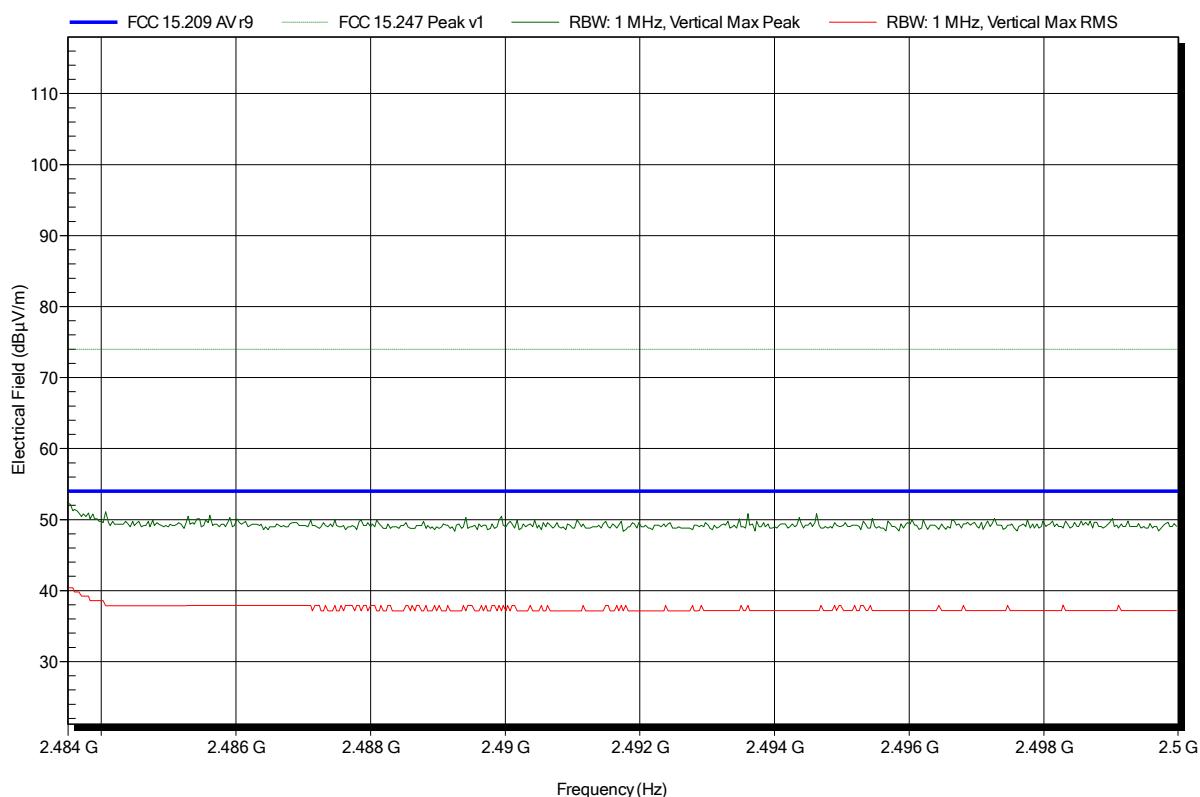


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note: upper bandedge

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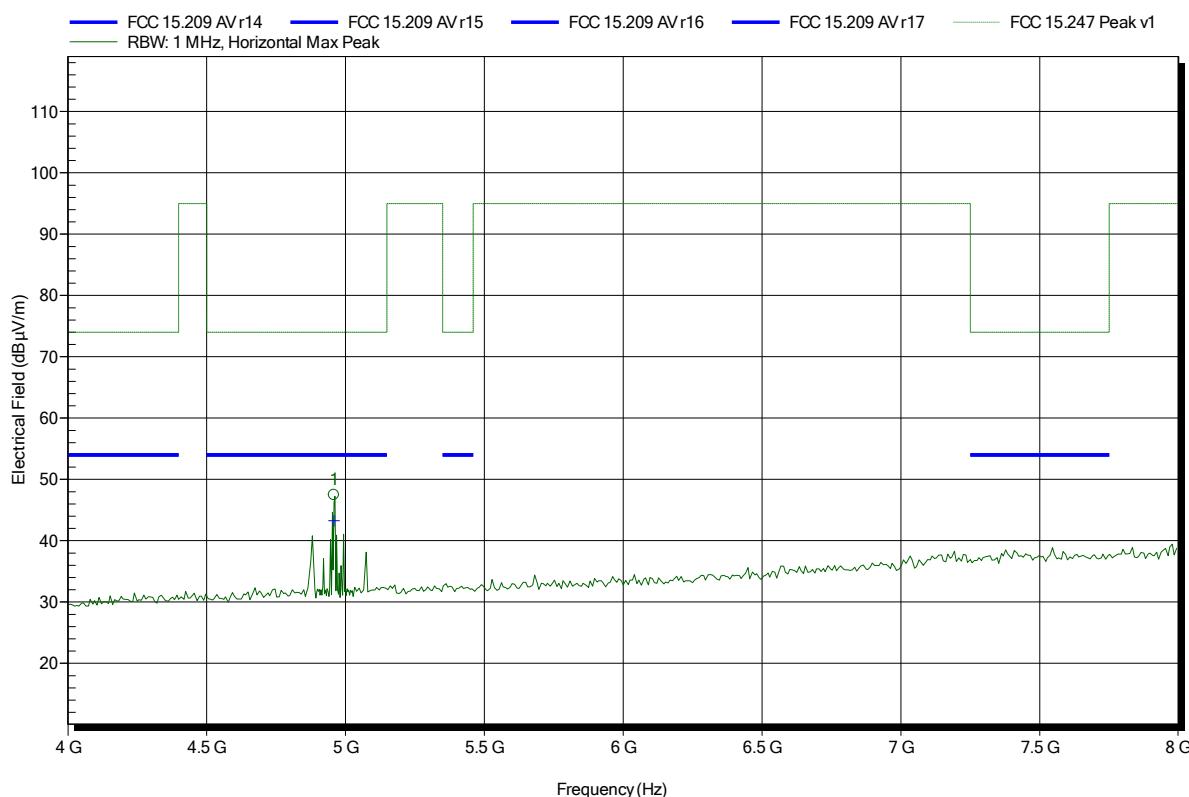


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

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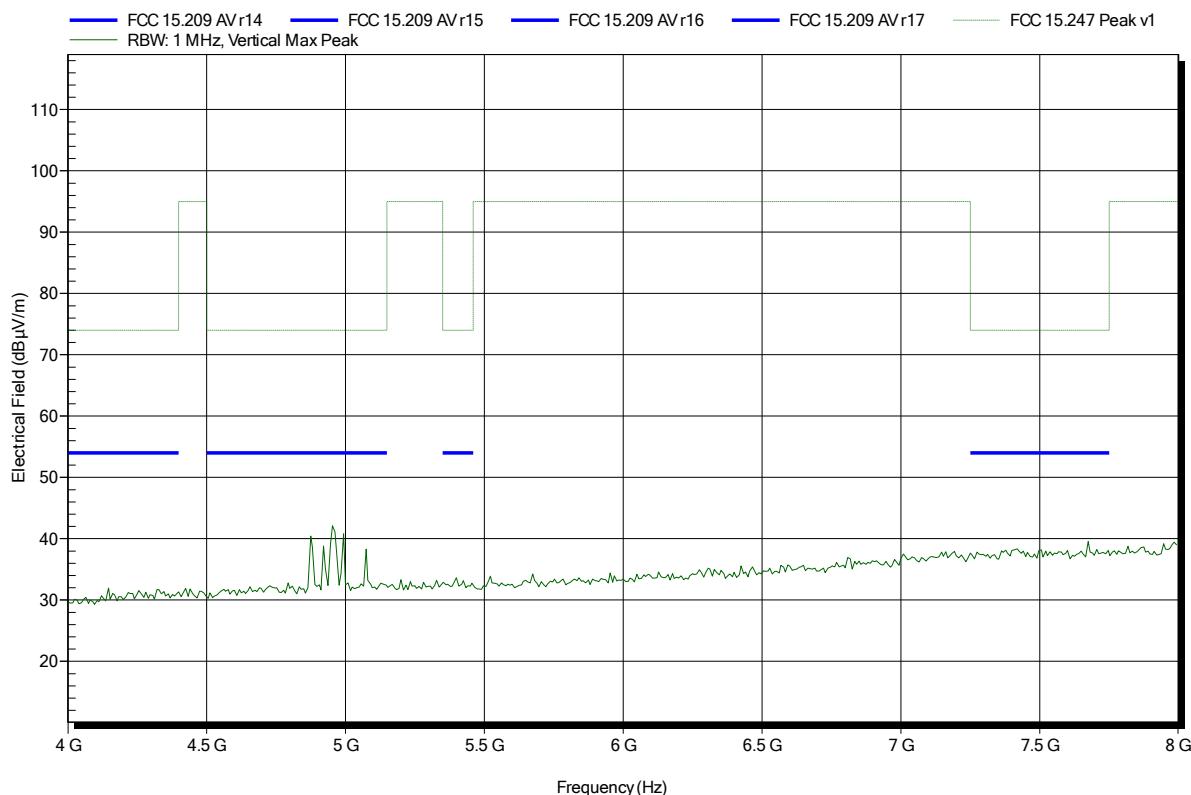
Frequency	Peak	Peak Limit	Peak Difference	Status
4.96 GHz	47.45 dB $\mu$ V/m	74 dB $\mu$ V/m	-26.55 dB	Pass
4.96 GHz	Average 43.26 dB $\mu$ V/m	Average Limit 54 dB $\mu$ V/m	Average Difference -10.74 dB	Average Status Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Thom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

Index 112

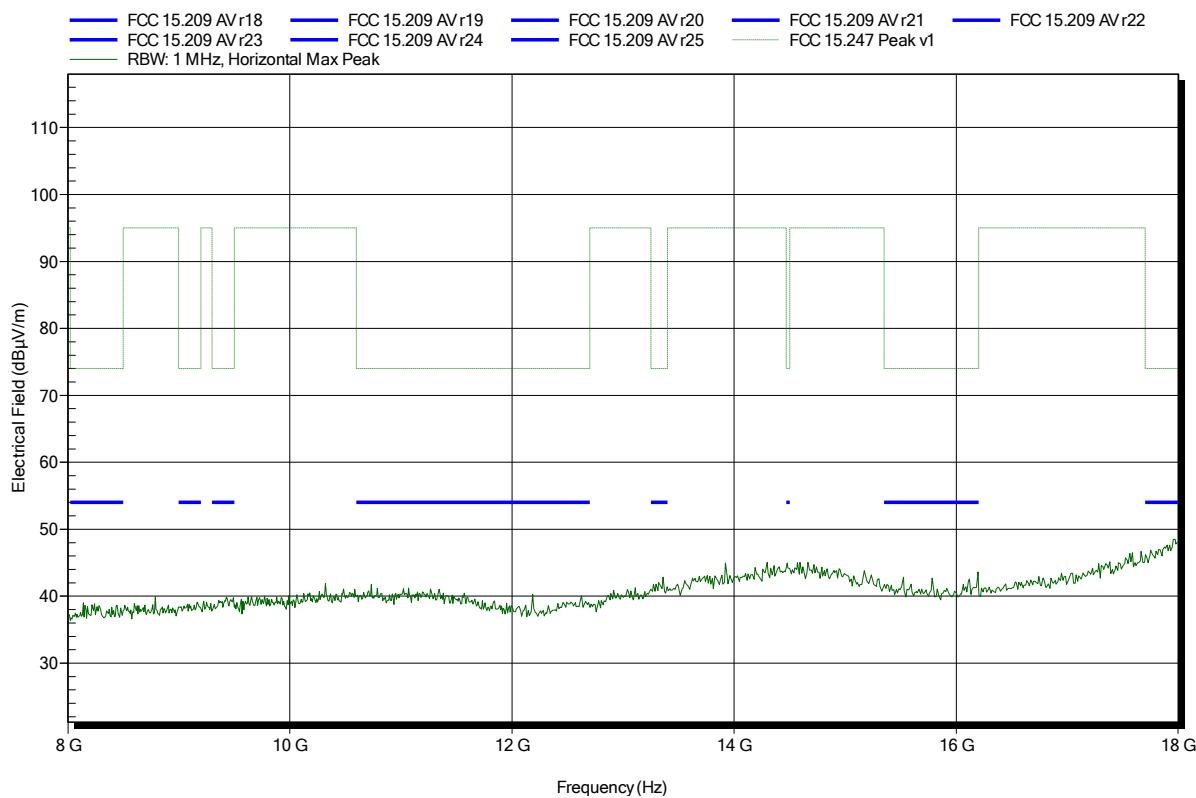


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

Index 109

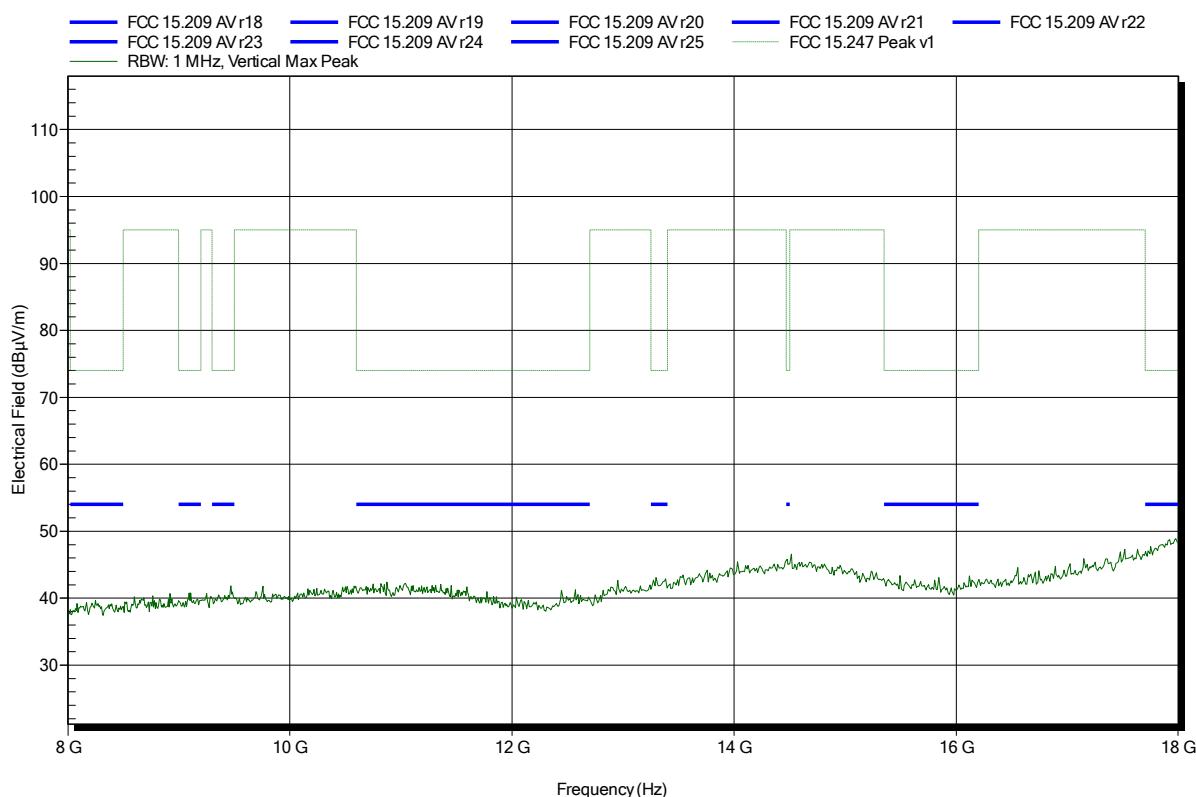


### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

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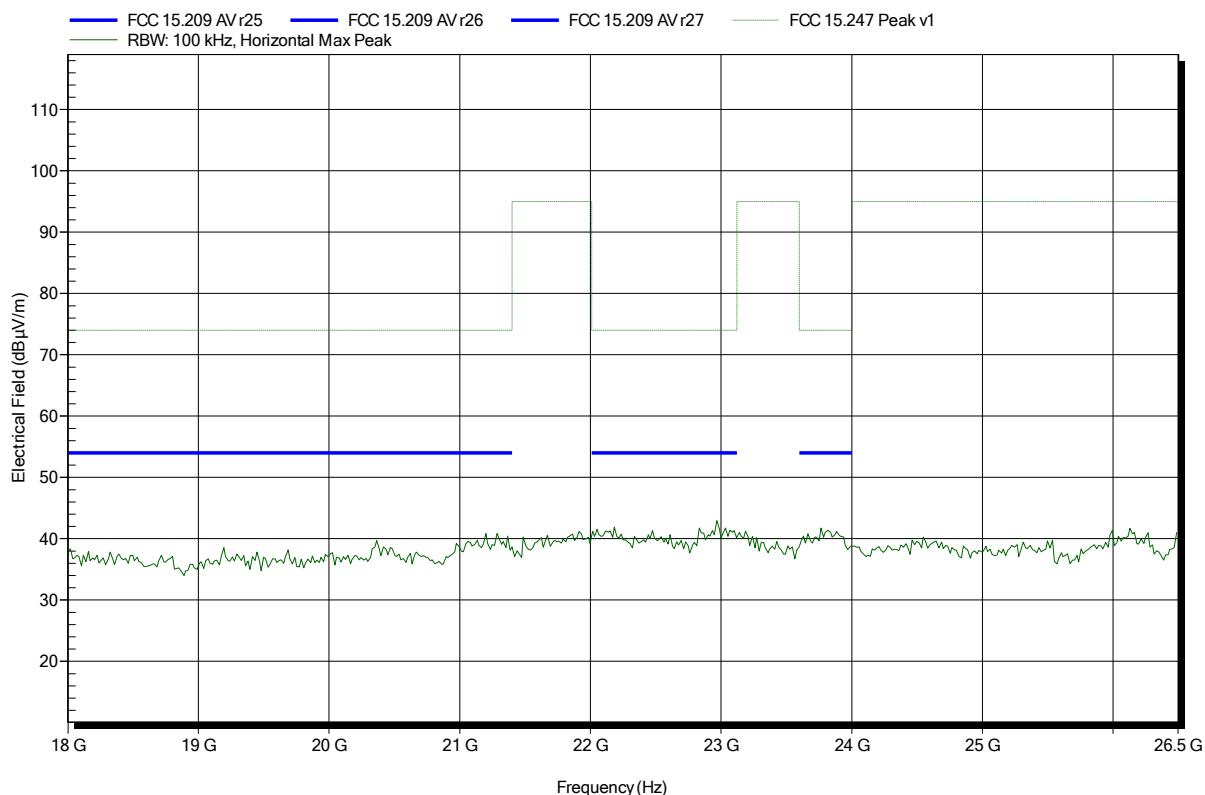


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Rohde & Schwarz HL 025, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

Index 110

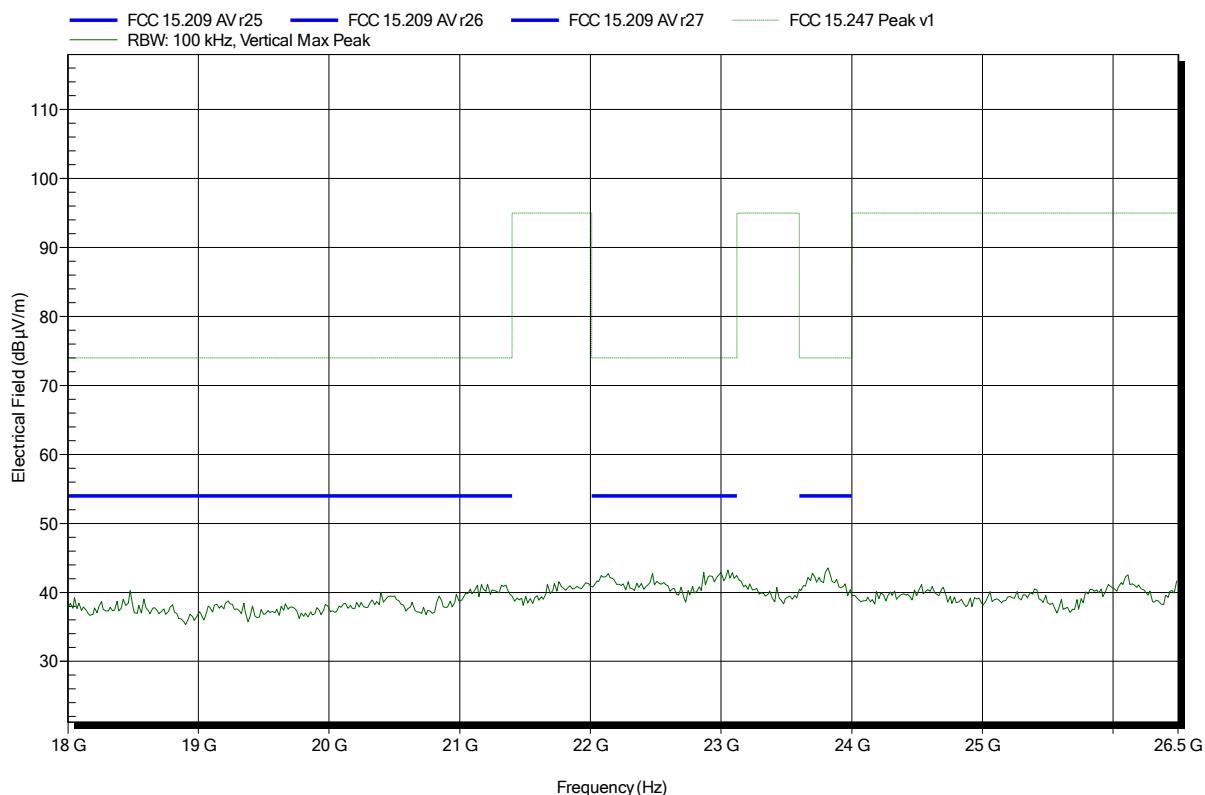


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Thom: 25°C, Vnom: 5.0 V DC  
 Antenna: Rohde & Schwarz HL 025, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; BT-LE; 2480 MHz  
 Test Date: 2015-03-26  
 Note:

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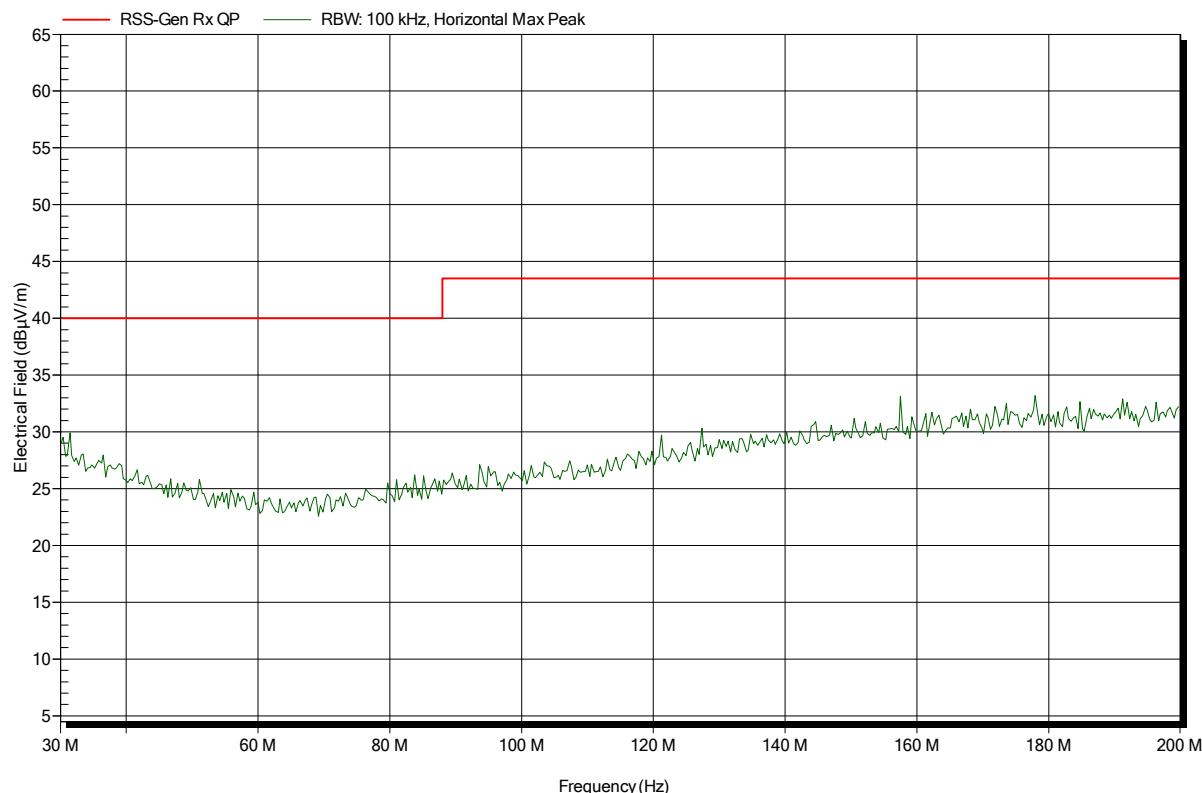
## ANNEX B Receiver radiated spurious emissions

### Spurious emissions according to FCC 15.247

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions:  $T_{nom}: 25^{\circ}\text{C}$ ,  $V_{nom}: 5.0 \text{ V DC}$   
Antenna: Rohde & Schwarz HK 116, Horizontal  
Measurement distance: 3 m  
Mode: RX; BT-LE; 2440 MHz  
Test Date: 2015-03-27  
Note:

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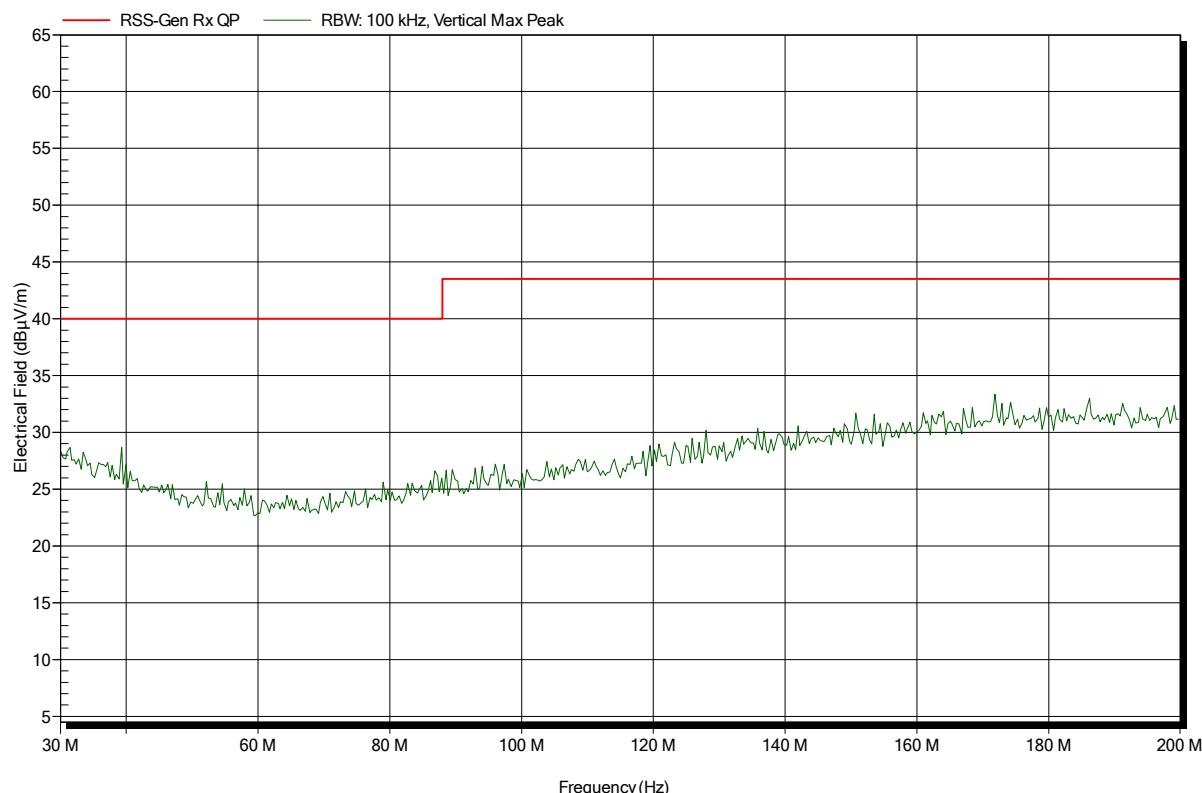


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Rohde & Schwarz HK 116, Vertical  
Measurement distance: 3 m  
Mode: RX; BT-LE; 2440 MHz  
Test Date: 2015-03-27  
Note:

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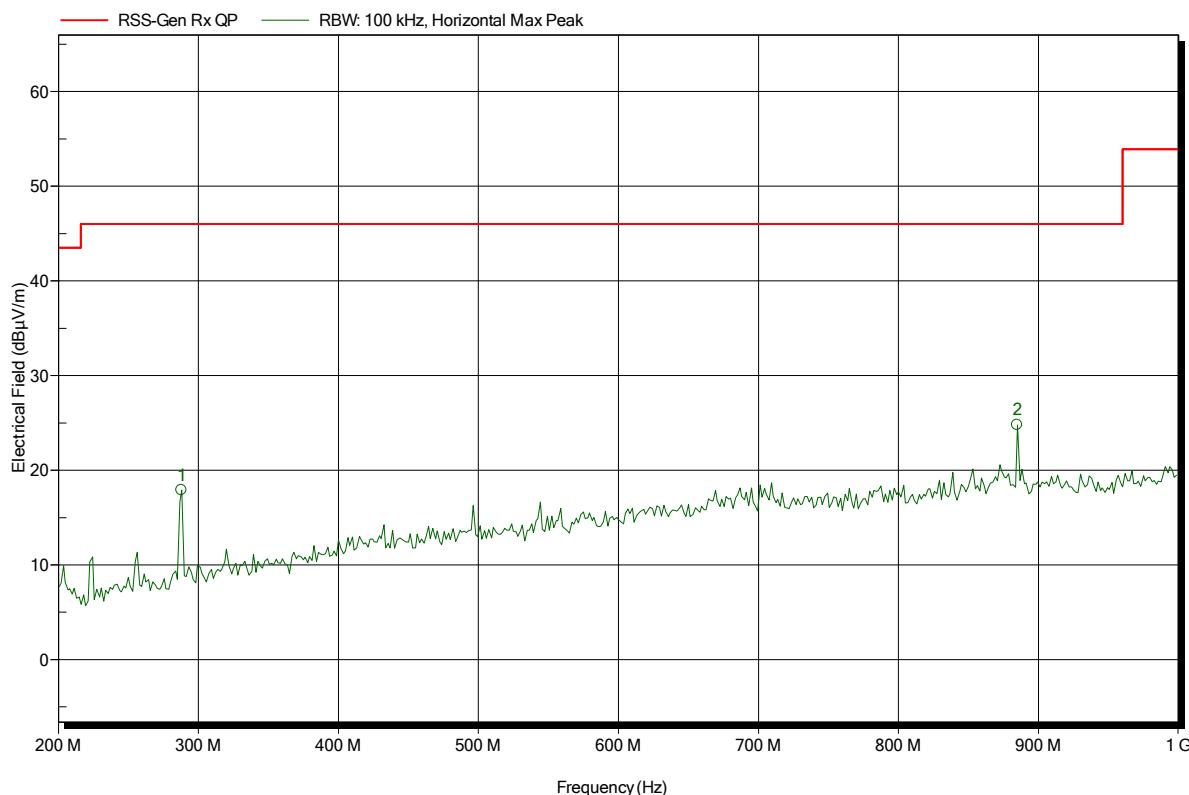


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement distance: 3 m  
 Mode: RX; BT-LE; 2440 MHz  
 Test Date: 2015-03-27  
 Note:

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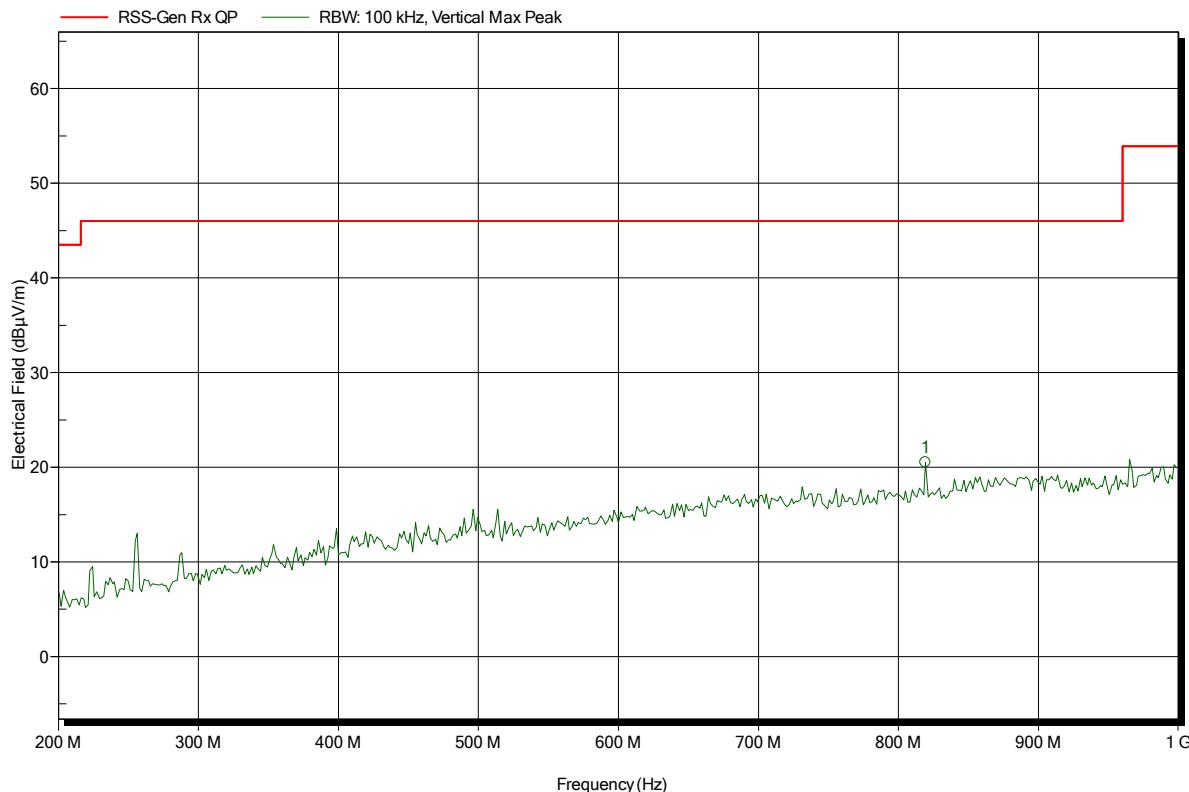
Frequency	Peak	Peak Limit	Peak Difference	Status
288 MHz	17.89 dBμV/m	46 dBμV/m	-28.11 dB	Pass
884.8 MHz	24.79 dBμV/m	46 dBμV/m	-21.21 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: RX; BT-LE; 2440 MHz  
 Test Date: 2015-03-27  
 Note:

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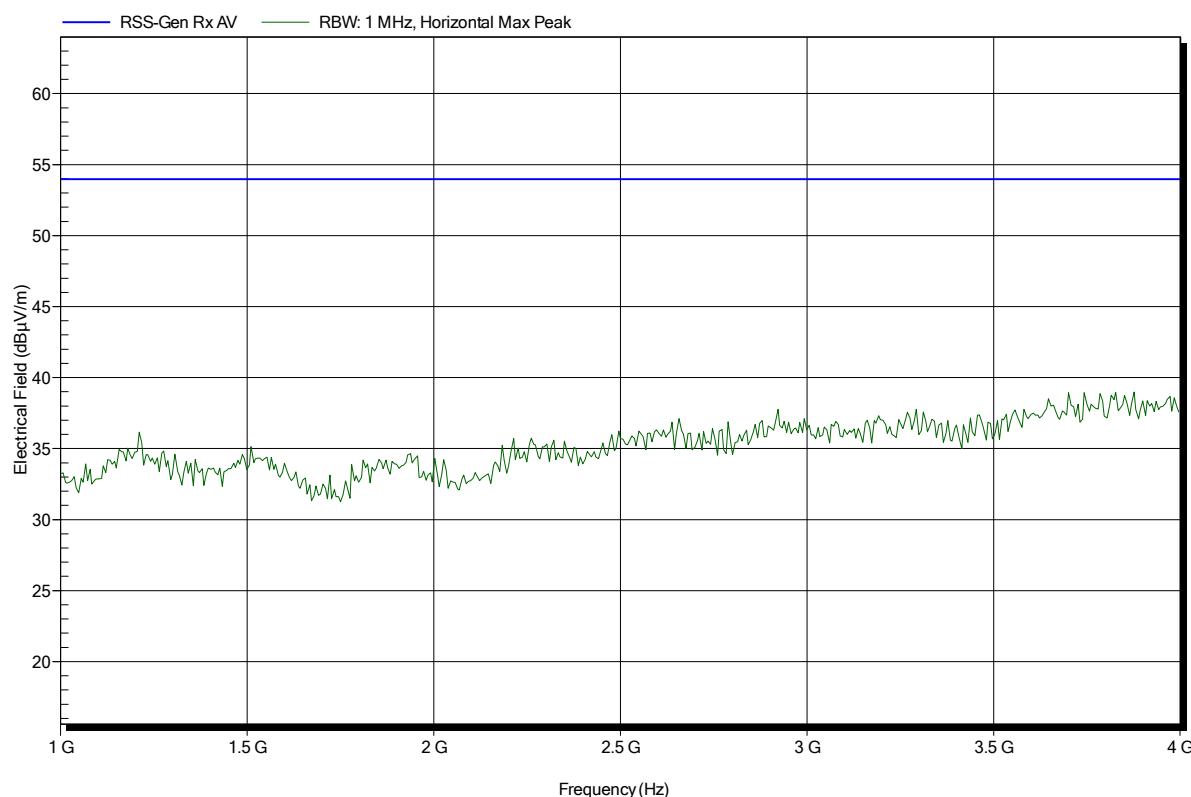
Frequency	Peak	Peak Limit	Peak Difference	Status
819.2 MHz	20.52 dBμV/m	46 dBμV/m	-25.48 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Schwarzbeck BBHA 9120D, Horizontal  
Measurement distance: 3 m  
Mode: RX; BT-LE; 2440 MHz  
Test Date: 2015-03-27  
Note:

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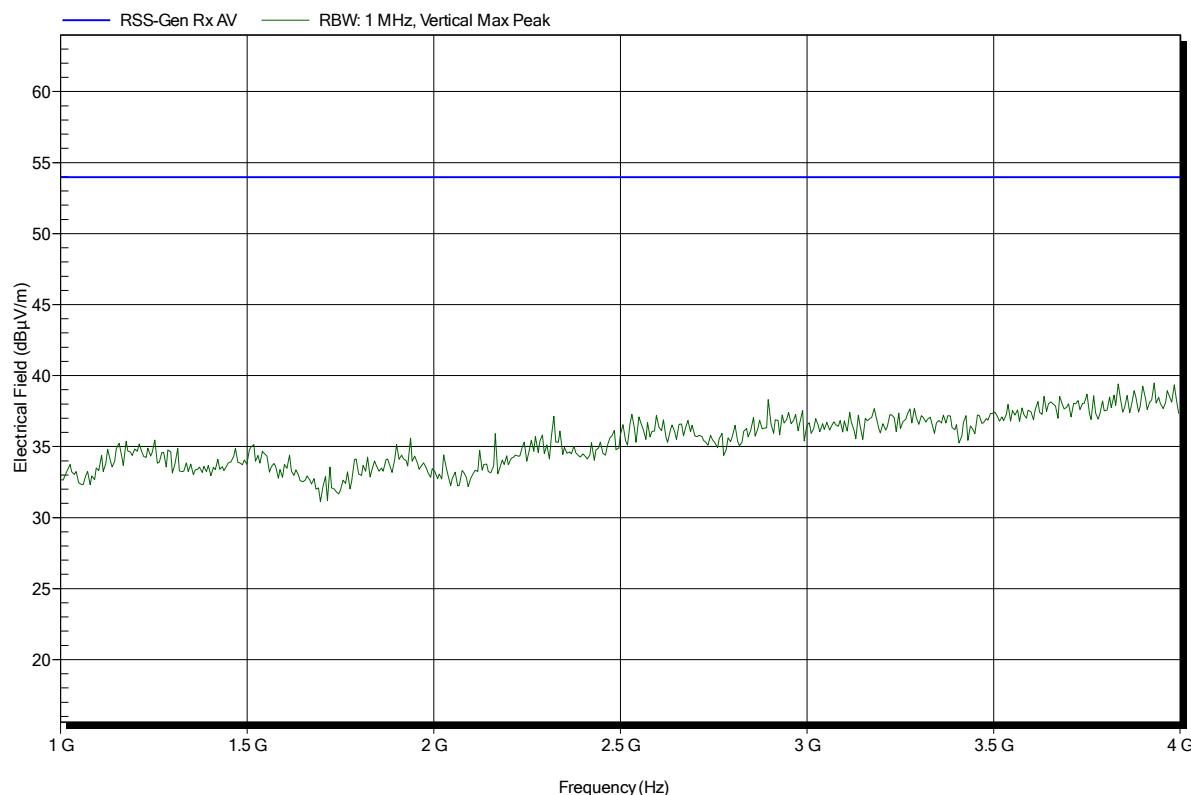


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Schwarzbeck BBHA 9120D, Vertical  
Measurement distance: 3 m  
Mode: RX; BT-LE; 2440 MHz  
Test Date: 2015-03-27  
Note:

Index 127

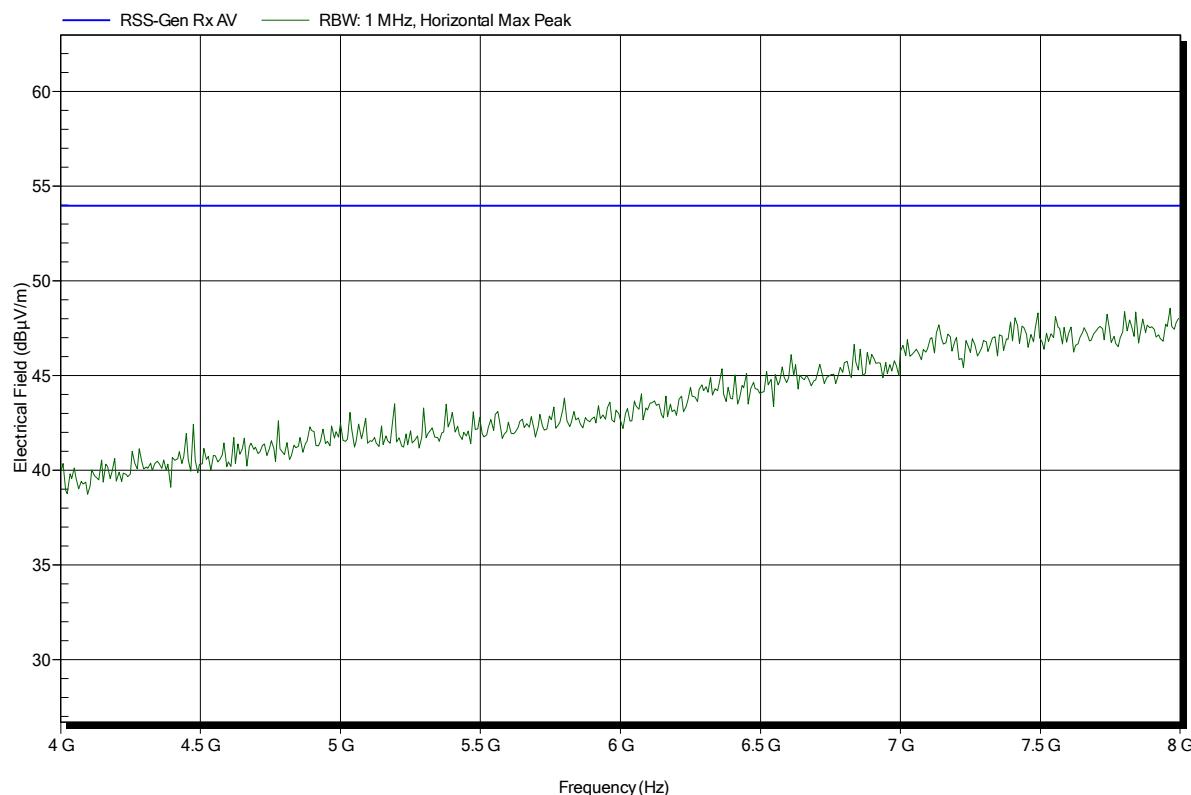


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
EUT Name: Bluetooth Empfänger  
Model: YL245-4  
Test Site: Eurofins Product Service GmbH  
Operator: Mr. Treffke  
Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
Antenna: Schwarzbeck BBHA 9120D, Horizontal  
Measurement distance: 3 m  
Mode: RX; BT-LE; 2440 MHz  
Test Date: 2015-03-27  
Note:

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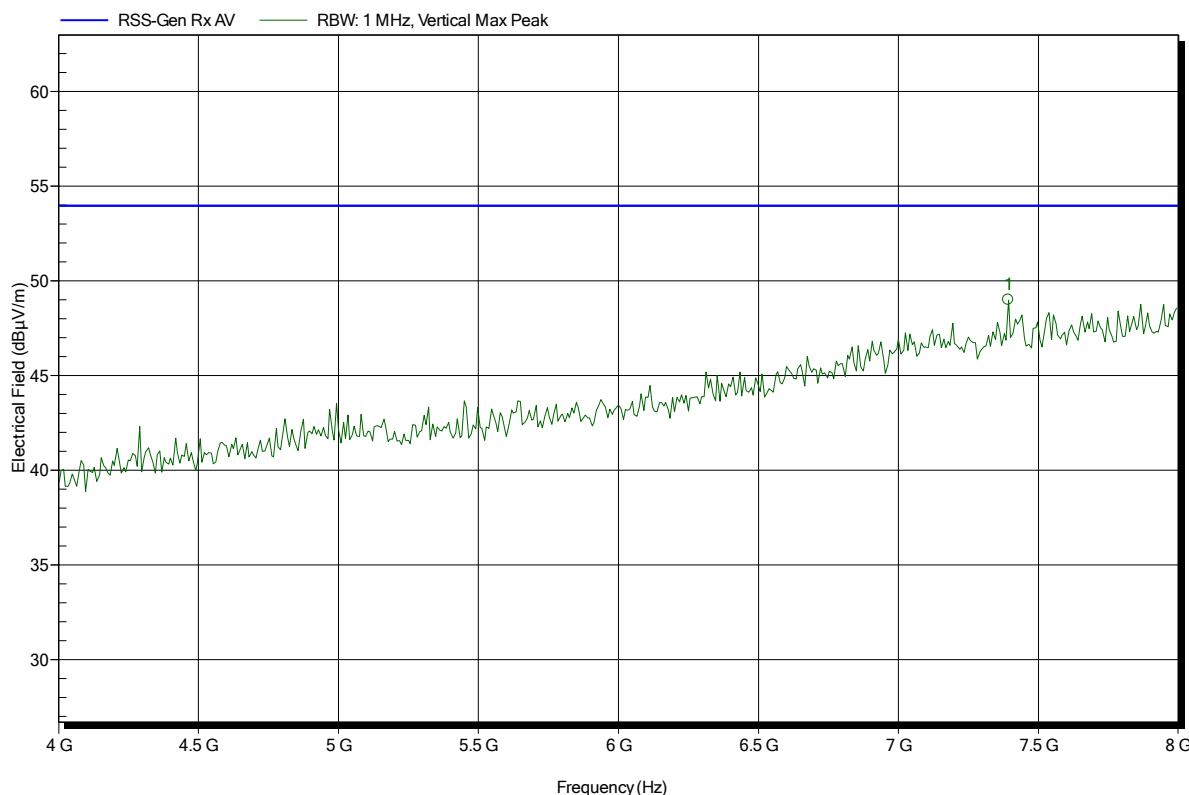


**Spurious emissions according to FCC 15.247**

Project number: G0M-1502-4552

Applicant: BSH Hausgeräte GmbH  
 EUT Name: Bluetooth Empfänger  
 Model: YL245-4  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Treffke  
 Test Conditions: Tnom: 25°C, Vnom: 5.0 V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: RX; BT-LE; 2440 MHz  
 Test Date: 2015-03-27  
 Note:

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Test Report No.: G0M-1502-4552-TFC247BL-V01

**ANNEX A    Manufacturer declaration**

## **YL245: variant-depending Schematics, Component-Mounting-Diagrams and Bill-of-Material**

### Description

The module YL245 is used as a wireless control board in induction and radiant hobs. The following features are provided:

- BLE: Bluetooth Low Energy communication to module YL244 (wireless sensor probe)
- DBUS2: diagnostics interface and universal bus system for connecting several modules (user-interface, power-board,...) within a home appliance, interface X2 & X3
- FS: Frying Sensor, temperature control for a pan at a radiant-heater, temperature measured with PT1000-sensor, interface X1

### YL245 variants

#### YL245 P02

Module is equipped with all necessary components for the features BLE & DBUS2.

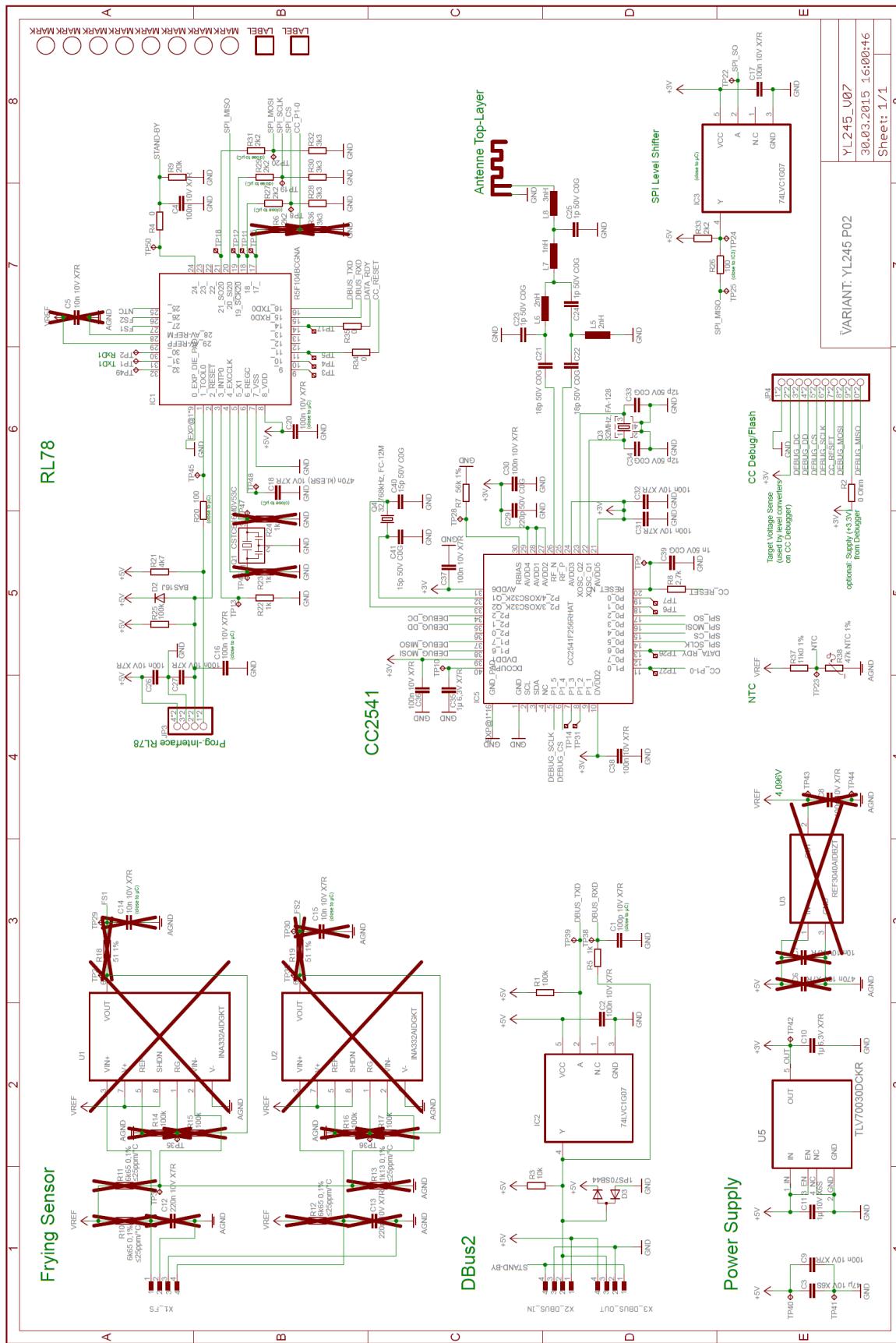
#### YL245 P03

Module is equipped with all necessary components for the features BLE & DBUS2 & 1x FS.

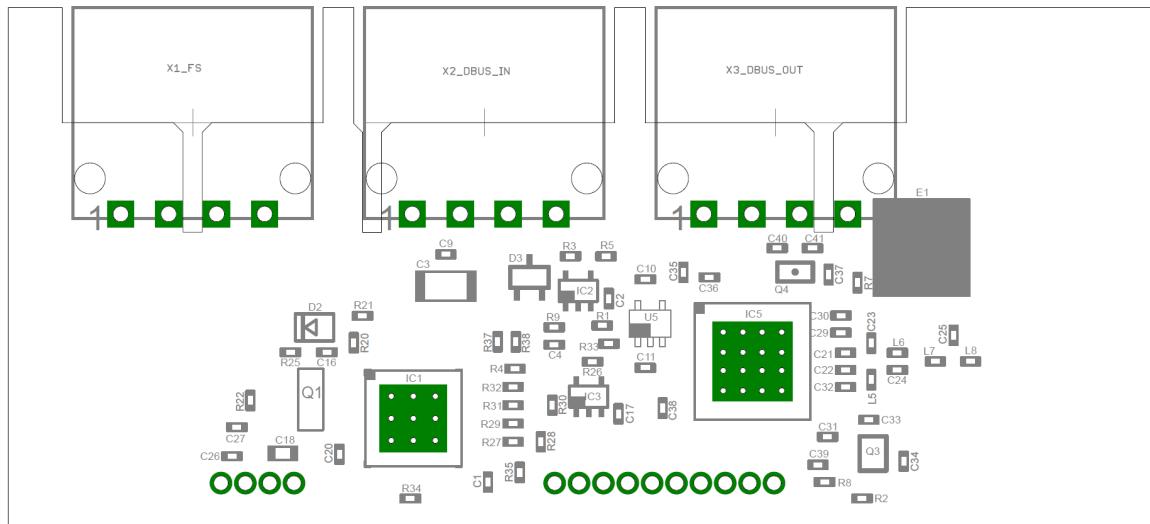
#### YL245 P04 (maximal equipment)

Module is equipped with all necessary components for the features BLE & DBUS2 & 2x FS.

## YL245 P02: Schematic



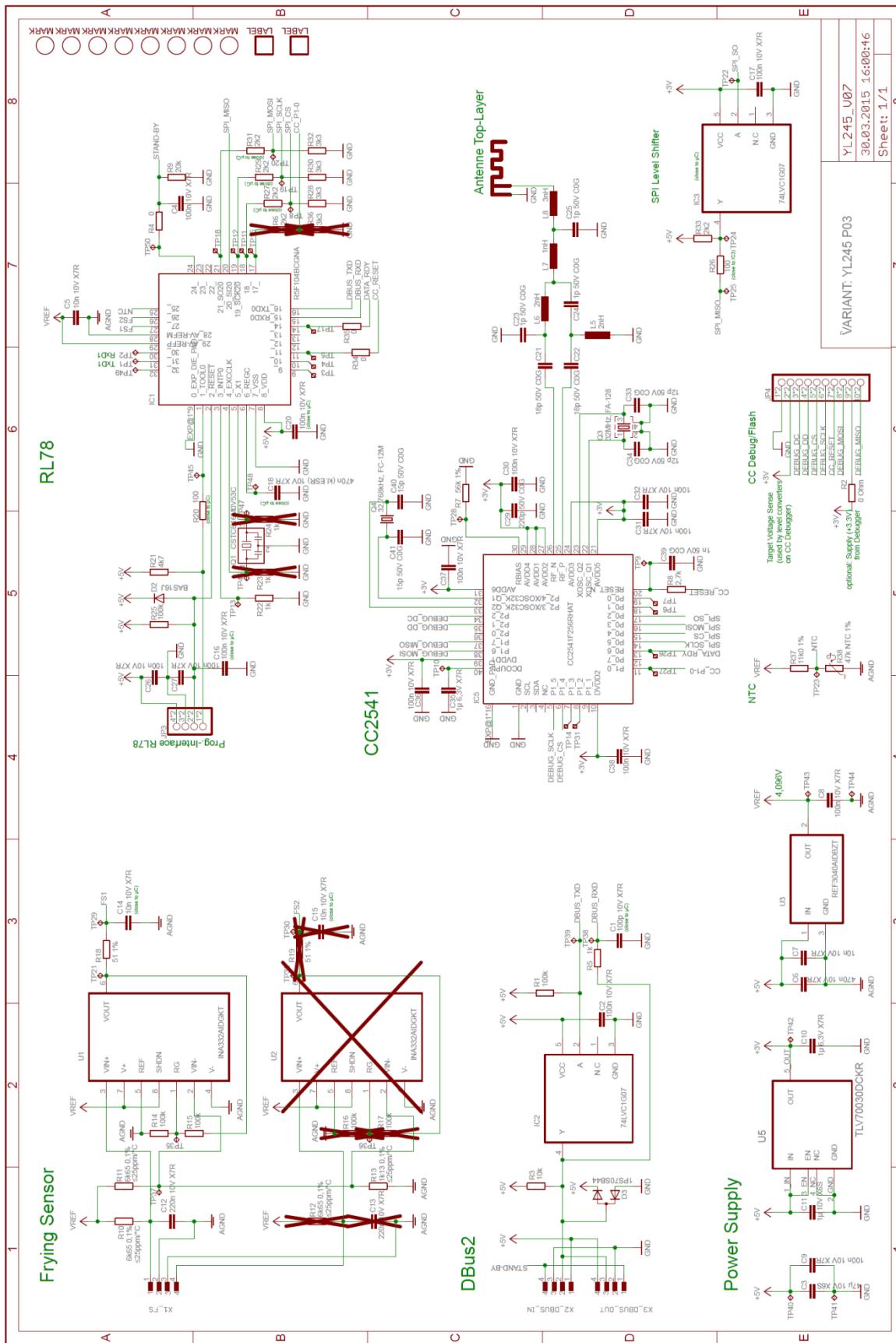
## YL245 P02: Component-Mounting-Diagram



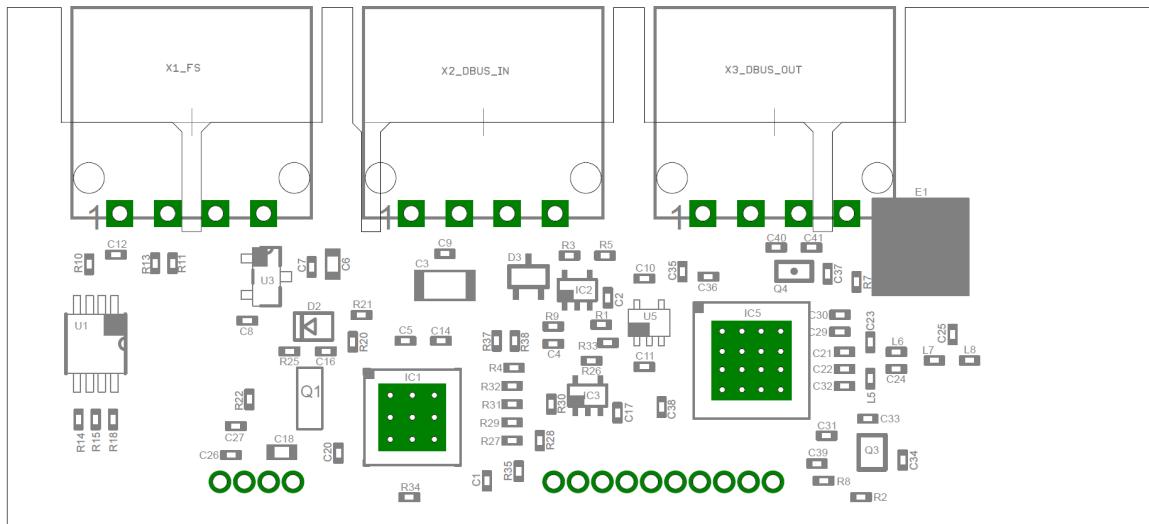
Not mounted components of YL245 P02 in comparison to maximal equipped variant YL245 P04:

Part	Value	Device	Package
C5	10n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C6	470n 10V X7R	SMD-IPC_C0603	SMD-IPC_C0603
C7	10n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C8	100n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C12	220n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C13	220n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C14	10n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C15	10n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
R10	6k65 0,1% ≤25ppm/°C	SMD-IPC_R0402	SMD-IPC_C0402
R11	6k65 0,1% ≤25ppm/°C	SMD-IPC_R0402	SMD-IPC_C0402
R12	6k65 0,1% ≤25ppm/°C	SMD-IPC_R0402	SMD-IPC_C0402
R13	1k13 0,1% ≤25ppm/°C	SMD-IPC_R0402	SMD-IPC_C0402
R14	100k	SMD-IPC_R0402	SMD-IPC_C0402
R15	100k	SMD-IPC_R0402	SMD-IPC_C0402
R16	100k	SMD-IPC_R0402	SMD-IPC_C0402
R17	100k	SMD-IPC_R0402	SMD-IPC_C0402
R18	51 1%	SMD-IPC_R0402	SMD-IPC_C0402
R19	51 1%	SMD-IPC_R0402	SMD-IPC_C0402
U1	INA332AIDGKT	INA332AIDGKT	SOP65P490X110-8N
U2	INA332AIDGKT	INA332AIDGKT	SOP65P490X110-8N
U3	REF3040AIDBZT	REF3040AIDBZT	SOT95P237X112-3N

YL245 P03: Schematic



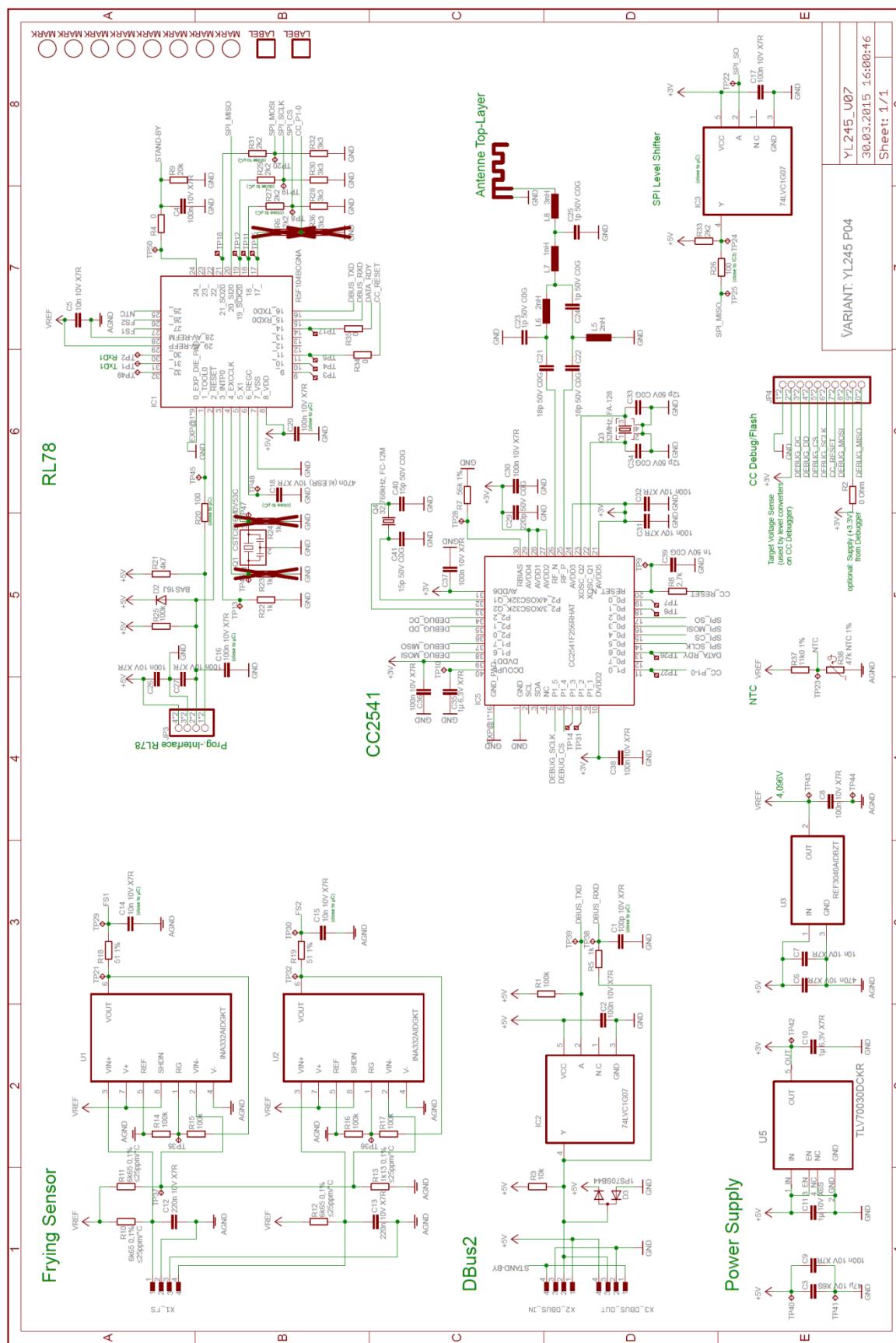
## YL245 P03: Component-Mounting-Diagram



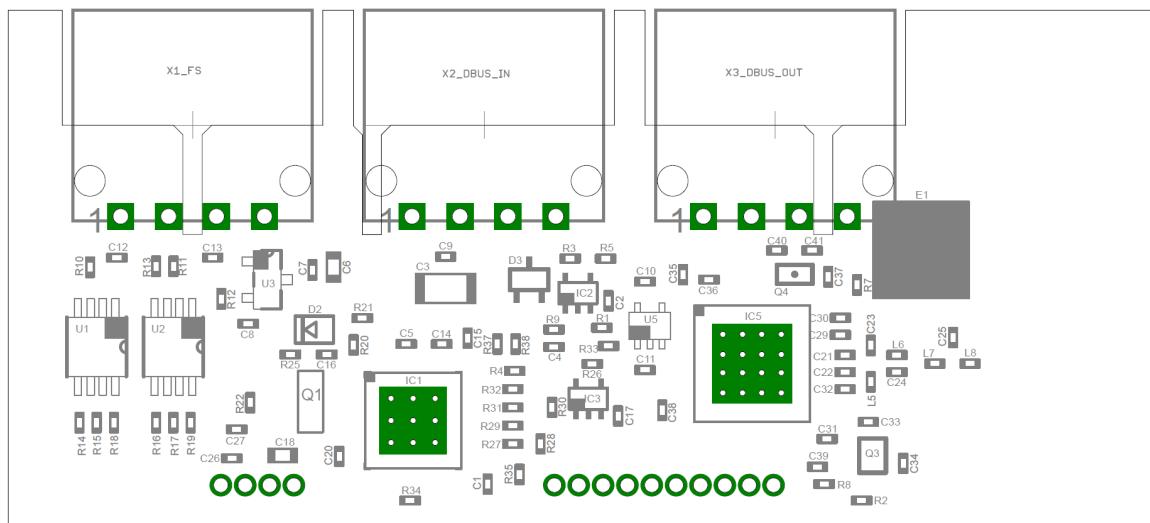
Not mounted components of YL245 P03 in comparison to maximal equipped variant YL245 P04:

Part	Value	Device	Package
C13	220n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
C15	10n 10V X7R	SMD-IPC_C0402	SMD-IPC_C0402
R12	6k65 0,1% ≤25ppm/°C	SMD-IPC_R0402	SMD-IPC_C0402
R16	100k	SMD-IPC_R0402	SMD-IPC_C0402
R17	100k	SMD-IPC_R0402	SMD-IPC_C0402
R19	51 1%	SMD-IPC_R0402	SMD-IPC_C0402
U2	INA332AIDGKT	INA332AIDGKT	SOP65P490X110-8N

YL245 P04: Schematic



YL245 P04: Component-Mounting-Diagram



## YL245: Bill of Material per Variant

				Variants:	P02	P03	P04
					BLE + DBUS2	BLE + DBUS2	BLE + DBUS2 + 1xFS + 2xFS
Part	Value	Device	Package	Description	Qty	Qty	Qty
A3	ANTENNA_2.4GHZ_MIFA	ANTENNA_2.4GHZ_MIFA	ANTENNA_2.4GHZ_MIFA	PCB-ANTENNA_2.4GHz	1	1	1
C1	100p 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C2	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C3	47u 10V X6S	C-EUC1206K	C1206K	CAPACITOR, European symbol	1	1	1
C4	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C5	10n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	1	1
C6	470n 10V X7R	SMD-IPC C0603	SMD-IPC C0603	CAPACITOR, European symbol	0	1	1
C7	10n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	1	1
C8	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	1	1
C9	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C10	1u 6,3V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C11	1u 10V X6S	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C12	220n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	1	1
C13	220n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	0	1
C14	10n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	1	1
C15	10n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	0	0	1
C16	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C17	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C18	470n (L.ESR) 10V X7R	SMD-IPC C0603	SMD-IPC C0603	CAPACITOR, European symbol	1	1	1
C20	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C21	18p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C22	18p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C23	1p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C24	1p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C25	1p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C26	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C27	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C29	220p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C30	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C31	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C32	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C33	12p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C34	12p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C35	1p 6,3V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C36	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C37	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C38	100n 10V X7R	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C39	1n 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C40	15p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
C41	15p 50V COG	SMD-IPC C0402	SMD-IPC C0402	CAPACITOR, European symbol	1	1	1
D2	BA516J	DIODE-SOD323-R	SOD323-R	DIODE	1	1	1
D3	1PS70SB44	D_ACACSO323	SOT323	Dual DIODE	1	1	1
IC1	R5F104BCGNA	RL78/G14	WQFN-32 5x5	Renesas, RL78/G14, 105°C	1	1	1
IC2	74LVC1G07	SN74LVC1G07DCK6SOT353	SC70-5	BUFFER	1	1	1
IC3	74LVC1G07	SN74LVC1G07DCK6SOT353	SC70-5	BUFFER	1	1	1
IC5	CC2541F256RHA*	CC2541	OFN40_6X6	CC2541, TI, 2.4-GHz Bluetooth® low energy a	1	1	1
L5	2nH	SMD-IPC L0402	SMD-IPC C0402	INDUCTOR, European symbol	1	1	1
L6	2nH	SMD-IPC L0402	SMD-IPC C0402	INDUCTOR, European symbol	1	1	1
L7	1nH	SMD-IPC L0402	SMD-IPC C0402	INDUCTOR, European symbol	1	1	1
L8	3nH	SMD-IPC L0402	SMD-IPC C0402	INDUCTOR, European symbol	1	1	1
Q1	CSTCE16M0V53C	RESONATOR_CSTCE...V.C	RESONATOR_CSTCE_V.C	RESONATOR, European symbol	1	1	1
Q3	32MHz, FA-128	FA-128	FA-128	MP Code: Epson Q22FA1280025800	1	1	1
Q4	32.768kHz, FC-12M	FC-12M	FC-12M	MP Code: Epson XIA000061000200	1	1	1
R1	100k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R2	0 Ohm	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R3	10k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R4	0 Ohm	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R5	1k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R7	56k 1%	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R8	2,7k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R9	20k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R10	6k65 0,1% <25ppm/°C	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	1	1
R11	6k65 0,1% <25ppm/°C	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	1	1
R12	6k65 0,1% <25ppm/°C	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	0	1
R13	1k13 0,1% <25ppm/°C	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	1	1
R14	100k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	1	1
R15	100k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	1	1
R16	100k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	0	1
R17	100k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	0	1
R18	51 1%	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	1	1
R19	51 1%	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	0	0	1
R20	100	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R21	4k7	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R22	1k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R25	100k	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R26	100	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R27	2k2	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R28	3k3	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R29	2k2	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R30	3k3	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R31	2k2	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R32	3k3	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R33	2k2	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R34	0 Ohm	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R35	0 Ohm	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R37	11k0 1%	SMD-IPC R0402	SMD-IPC C0402	RESISTOR, European symbol	1	1	1
R38	47k NTC 1%	NTC_0402IPC_0402	SMD-IPC C0402	NTC	1	1	1
U1	INA332AIDGKT	INA332AIDGKT	SOP65P490X10-8N	0.05V/°C max, SINGLE-SUPPLY CMOS OP	0	1	1
U2	INA332AIDGKT	INA332AIDGKT	SOP65P490X10-8N	0.05V/°C max, SINGLE-SUPPLY CMOS OP	0	0	1
U3	REF3040AIDBZT	REF3040AIDBZT	SOT95P237X12-3N	CMOS VOLTAGE REFERENCE	0	1	1
U5	TLV70030DCKR	TLV70030DCKR	SOT65P210X10-5N	200-mA, Low-IQ, Low-Dropout Regulator for P	1	1	1
Leiterplatte	27mm x 60mm x 1,5mm, YL245	FR4, 4-layer			1	1	1
E1	Etikett 5x5				1	1	1
E2	Etikett 11x8				1	1	1