RADIO REPORT

FCC 47 CFR Part 15C
ISED Canada RSS-247

Digital transmission systems operating within the 2400 – 2483.5 MHz band

Report Reference No	G0M-2002-8796-TFC247BL-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A-2 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Robert Bosch Tool Corporation
Address	60056 Mount Prospect, IL USA
Test Specification	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, Amendment 1, 2019-03
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Laser Rangefinder
Model(s)	GLM165-27C
Additional Model(s)	None
Brand Name(s)	BOSCH
Hardware Version(s)	Main PCBA v0.1 (BOM 08.06.20); CF340 PCBA v11 (BOM 03.01.20)
Software Version(s)	MCU 0.3.1, Bluetooth 1.6.0
FCCID	TXTGLM1652XX
IC	909H-GLM1652XX
Test Result	**PASSED**

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
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	2020-06-02	Test Sample ID 29603 Test Sample ID 29604
Report:		
Compiled by	Christian Weber	
Tested by (+ signature) (Responsible for Test)	Christian Weber	C. Weber .....
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	T. J .....
Date of Issue	2020-10-02	
Total number of pages	97	
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:		
None.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2020-10-02	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
N/A	Not applicable
RBW	Resolution bandwidth
RMS	Root mean square
T_{NOM}	Nominal temperature
VBW	Video bandwidth
V_{NOM}	Nominal supply voltage

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1 Equipment (Test Item) Under Test

Description	Laser Rangefinder	
Model	GLM165-27C	
Additional Model(s)	None	
Brand Name(s)	BOSCH	
Serial Number(s)	100191258 100191311	Test Sample ID 29603 (radiated measurements) Test Sample ID 29604 (conducted measurements)
Hardware Version(s)	Main PCBA v0.1 (BOM 08.06.20); CF340 PCBA v11 (BOM 03.01.20)	
Software Version(s)	MCU 0.3.1, Bluetooth 1.6.0	
PMN	GLM165-27C	
HVIN	GLM165-27C	
FVIN	1.6.0	
HMN	N/A	
FCCID	TXTGLM1652XX	
IC	909H-GLM1652XX	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400 MHz - 2483.5 MHz	
Radio technology	Bluetooth LE 4.2	
Modulation	GFSK	
Number of antenna ports	1	
Antenna	Type	Integrated antenna (2.4 GHz Inverted F PCB antenna according to Texas Instruments design SWRU120D)
	Model	SWRU120D
	Manufacturer	-
	Gain	3.3 dBi (declared by client)
Supply Voltage	V_{NOM}	3.0 VDC (alkaline 2x1.5V(AA))
Operating Temperature	T_{NOM}	25 °C
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A
Manufacturer	Robert Bosch Power Tools GmbH 70538 Stuttgart Germany	

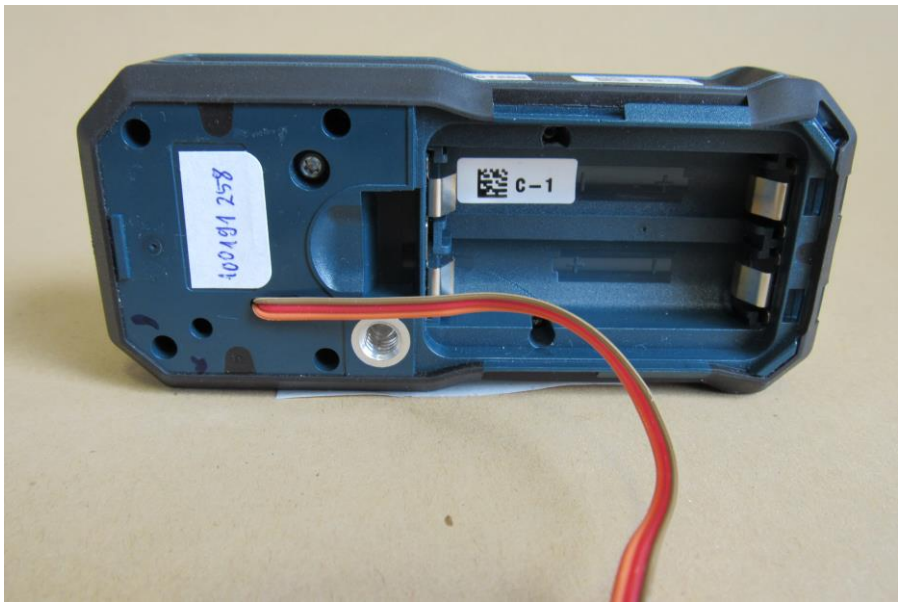
1.1 Photos – Equipment External

VIEW A1[1]

VIEW A2[2]

[1]EUT measurement position VERTICAL
[2]EUT measurement position HORIZONTAL

VIEW A3

VIEW A4


1.2 Photos – Equipment Internal

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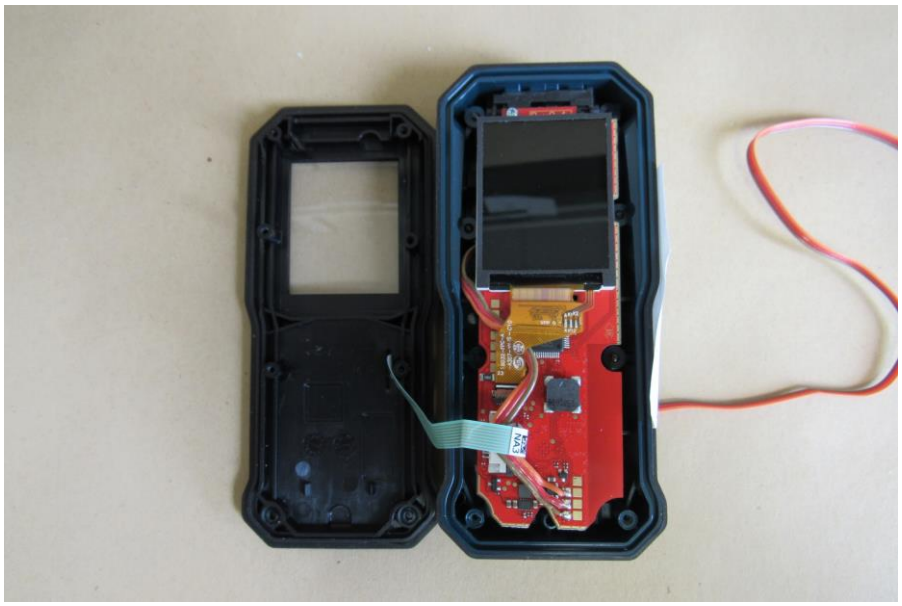

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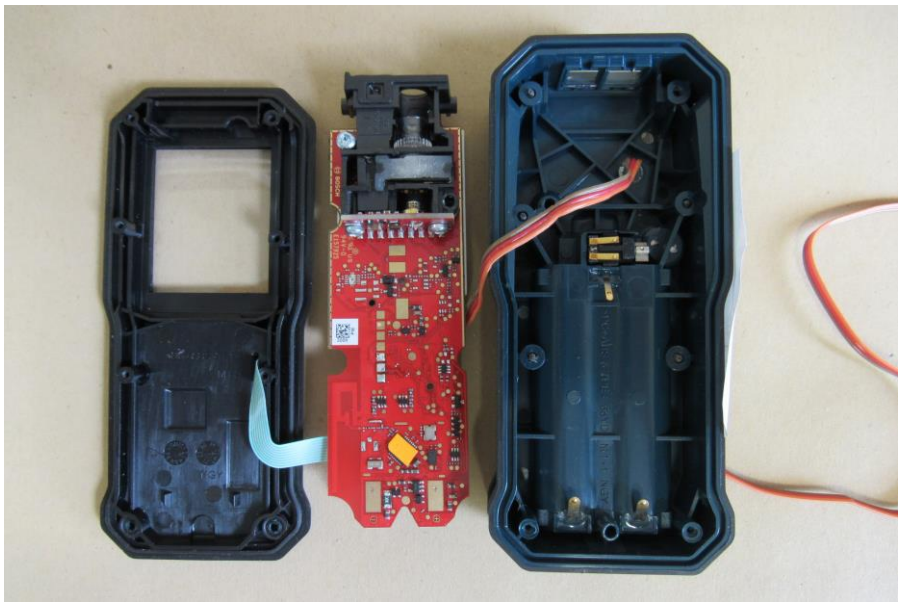

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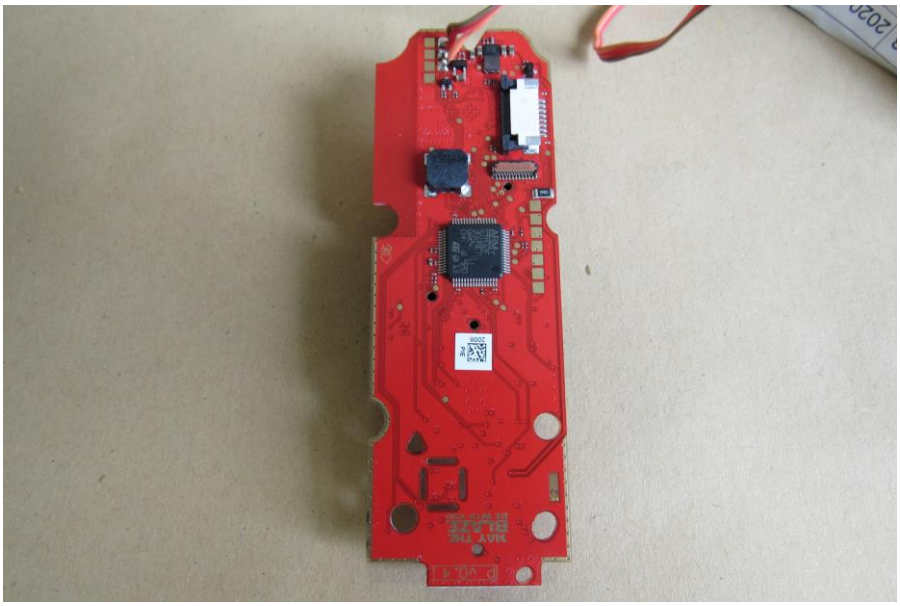

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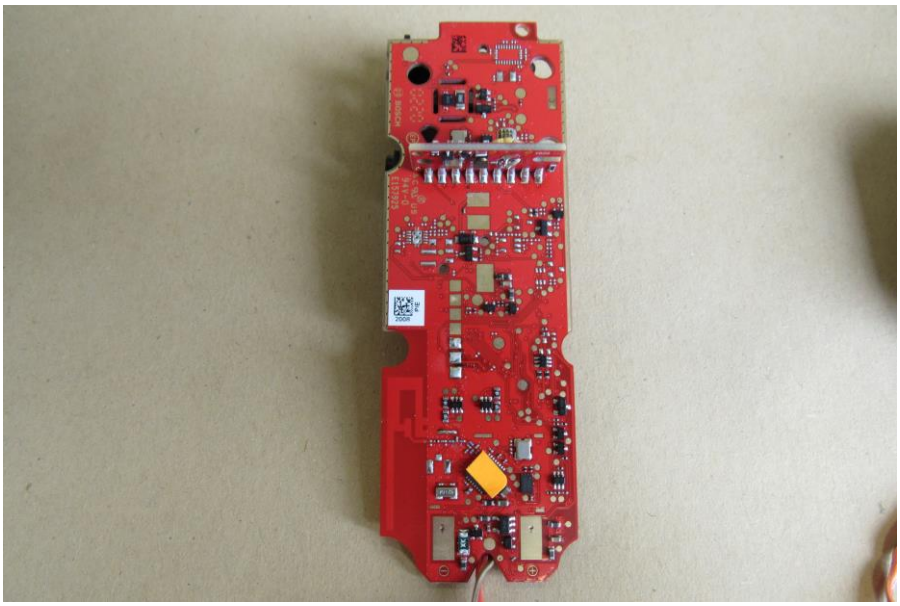

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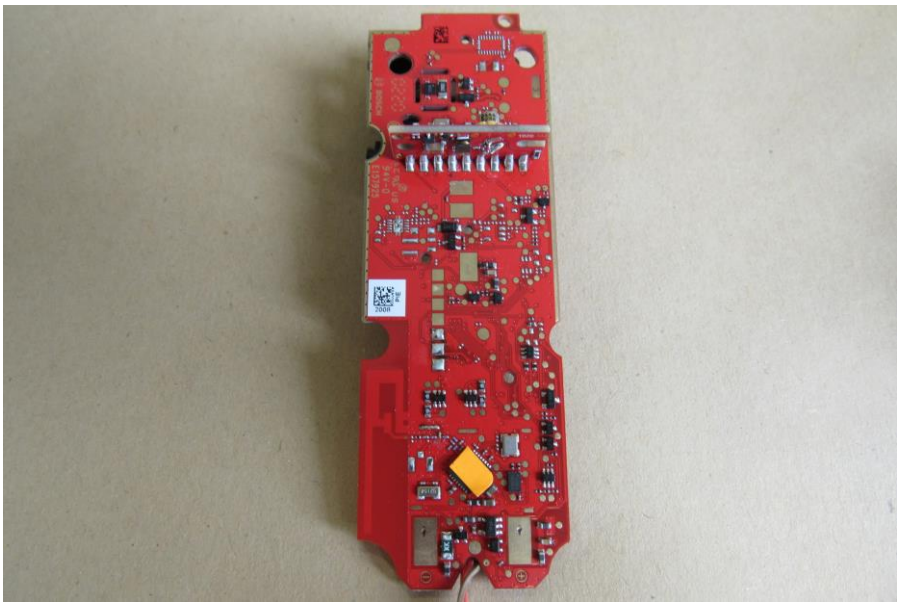

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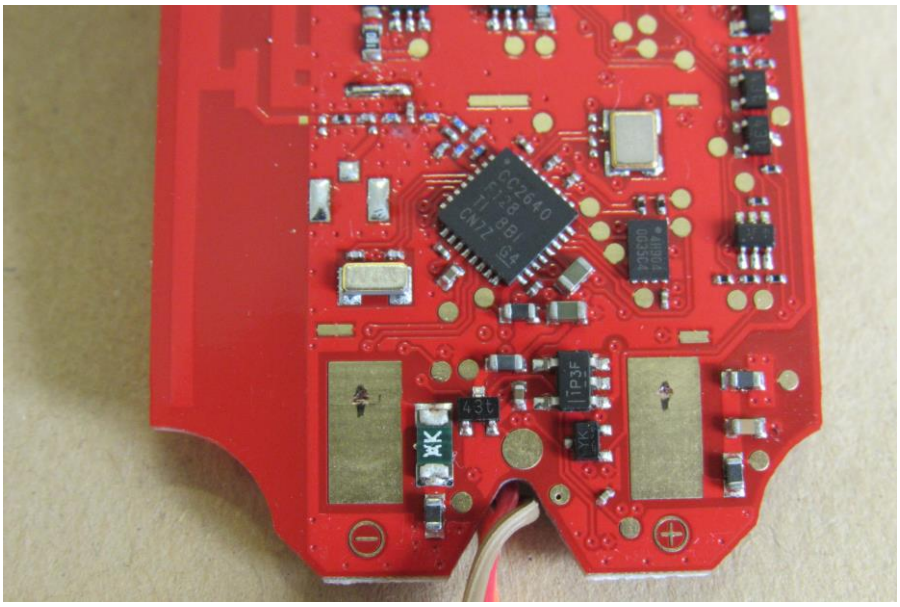

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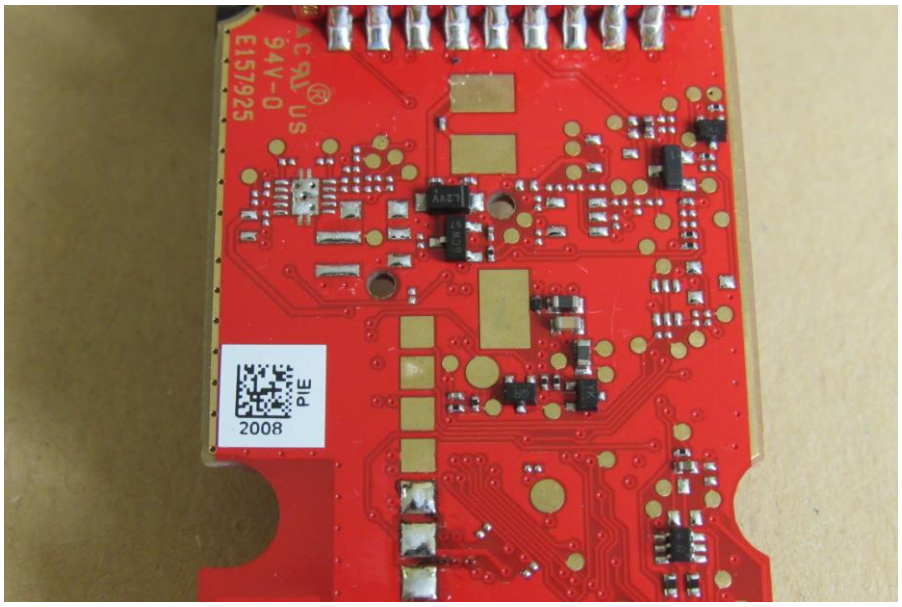

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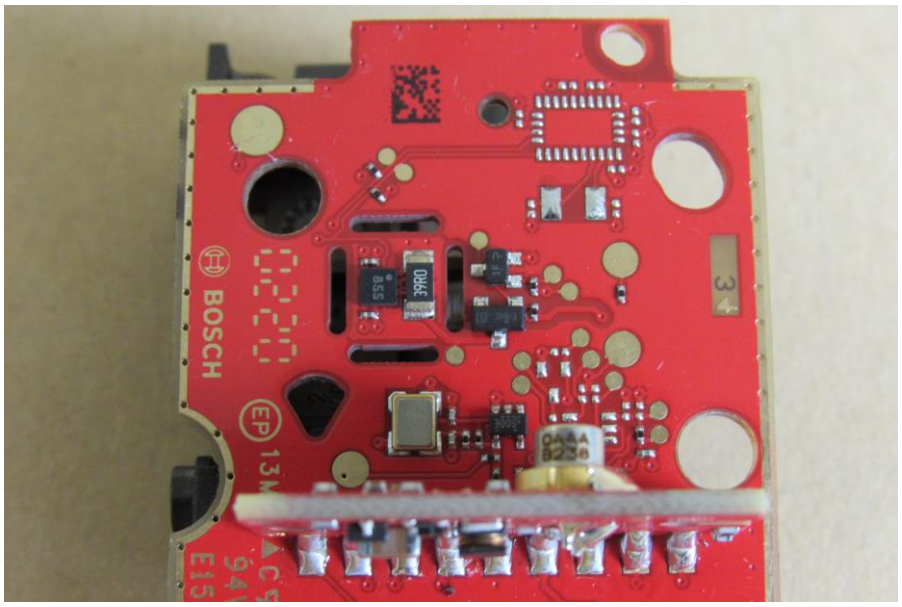

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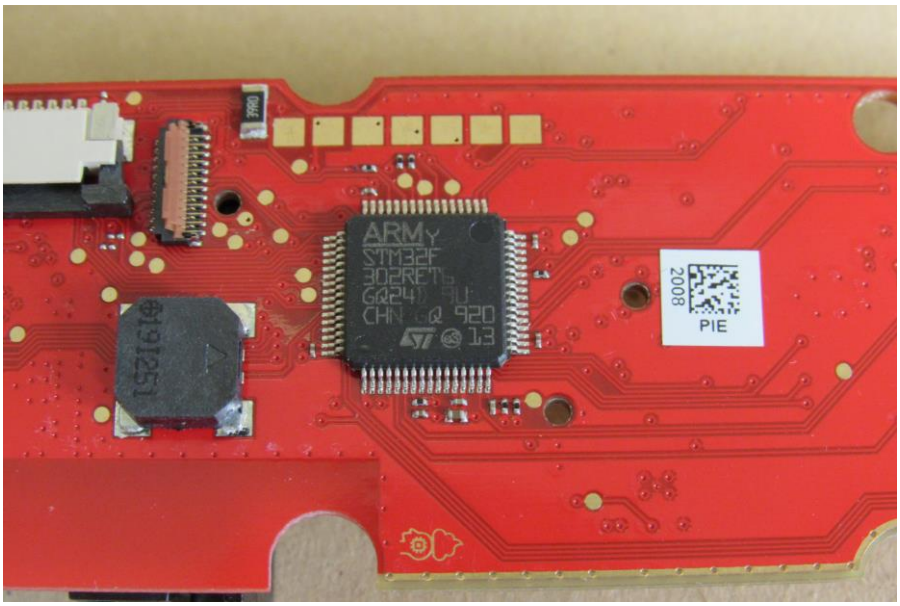

1.3 Photos – Equipment Label

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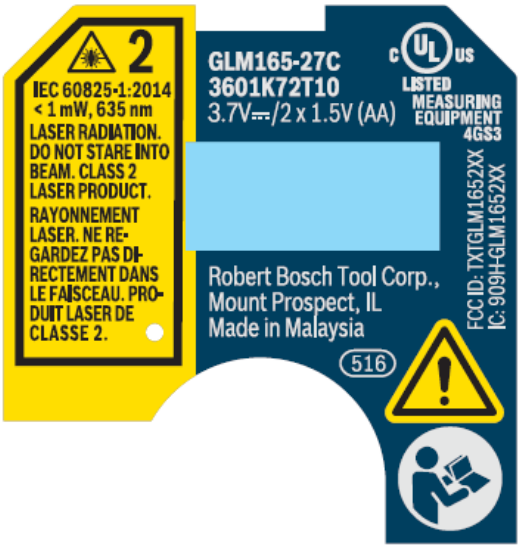
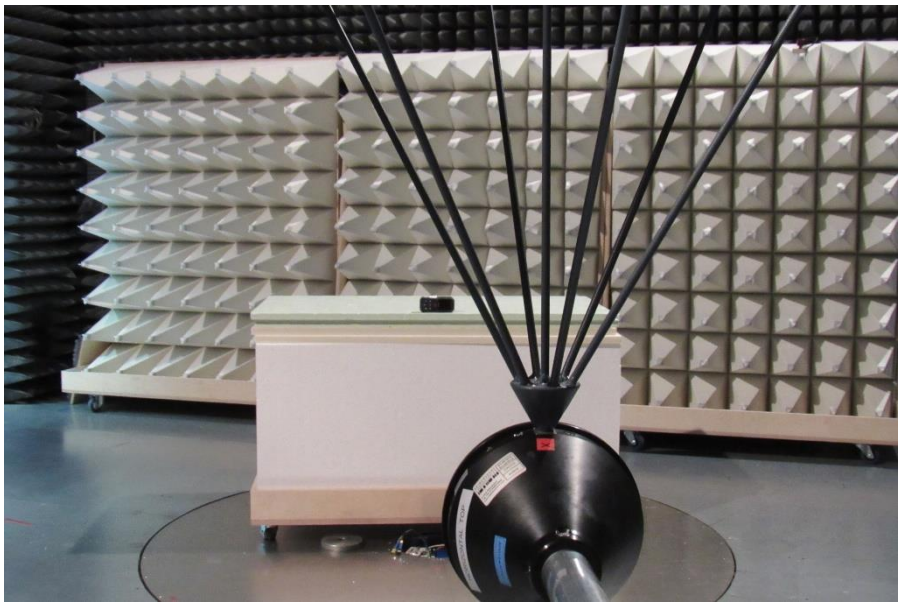


[1]Provided by applicant.

1.4 Photos – Test Setup

VIEW C1


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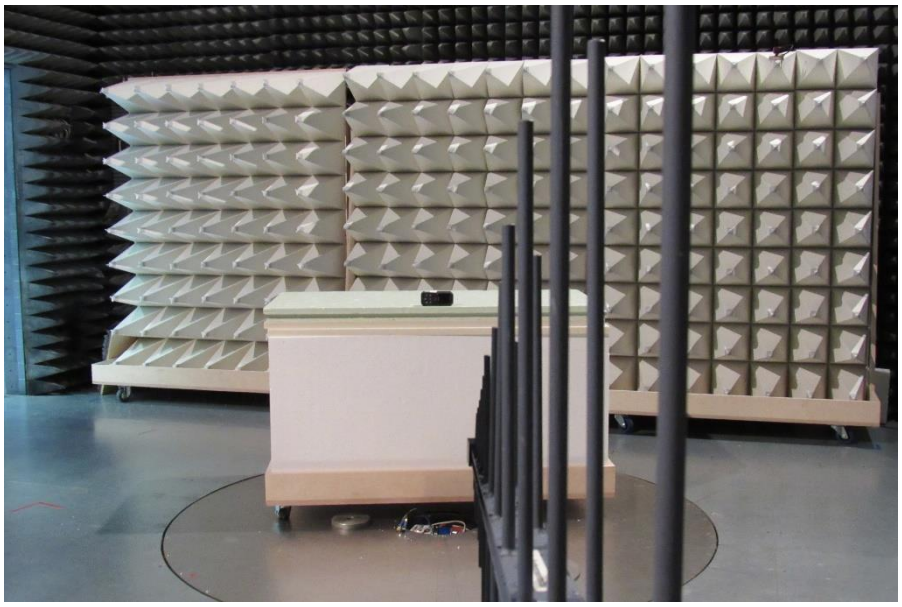

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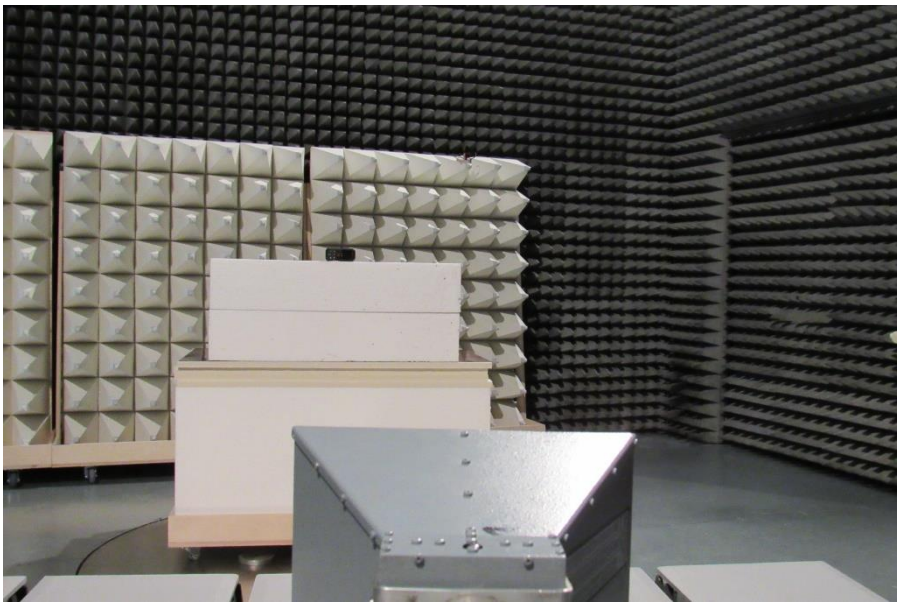


1.5 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE1	Notebook	Lenovo	L470	Serial number PF0VH6SK
AE2	Power Supply AC Adapter	Lenovo	ADLX65NCC3A	2015/07
SFT	BlueC	CETECOM ICT Services	Version 0.1.0.3	Bluetooth Low Energy control software – control of individual test modes via *Bluetooth Direct Test Mode*
Description:				
AE1 – AE2	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment: None.				

1.6 Test Modes

Mode	Description
GFSK	Mode = Transmit Modulation = GFSK Spreading = None Duty cycle = 64%
Receive	Mode = Receive
Comment: None.	

1.7 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	0	2402
F2	Tx / Rx	19	2440
F3	Tx / Rx	39	2480

1.8 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/m) = 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/m	= 47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-247				
Product Standard Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
ISED RSS-Gen, Issue 5 (section 6.6)	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	PASS	
FCC § 15.247(b)(1) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	PASS	
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	N/R	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 (section 6.13)	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.10-2013	PASS	
Comment: None.				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

3.1.1 Information

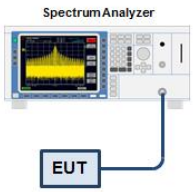
Test Information	
Reference	ISED RSS-Gen, Issue 5 (section 6.6)
Measurement Method	ANSI C63.10 6.9.3
Measurement Uncertainty	± 1.26 %
Operator	Abdullah Al Jamal
Date	2020-06-02

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup

Test Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 43	EF01631	2019-12	2020-12
Cable	Gigalane	SMS111B	EF00779 CAABB	2018-10	2020-10

3.1.5 Procedure

Test Procedure

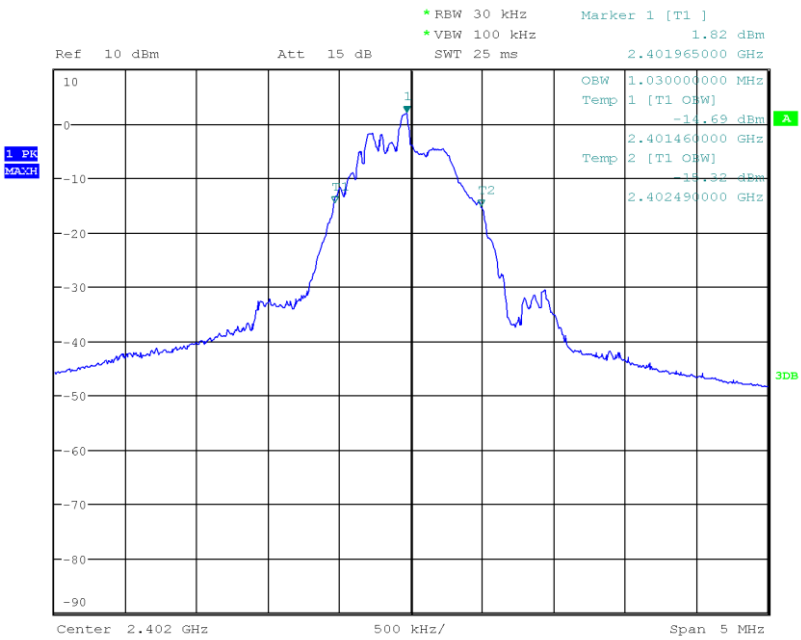
1. EUT transmitter is activated in test mode under normal conditions
2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum
3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth
4. The occupied bandwidth is measured with the build-in analyzer function

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
GFSK	2402	1.030
GFSK	2440	1.035
GFSK	2480	1.035

Occupied Bandwidth

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Occupied Bandwidth [MHz]:	1.030



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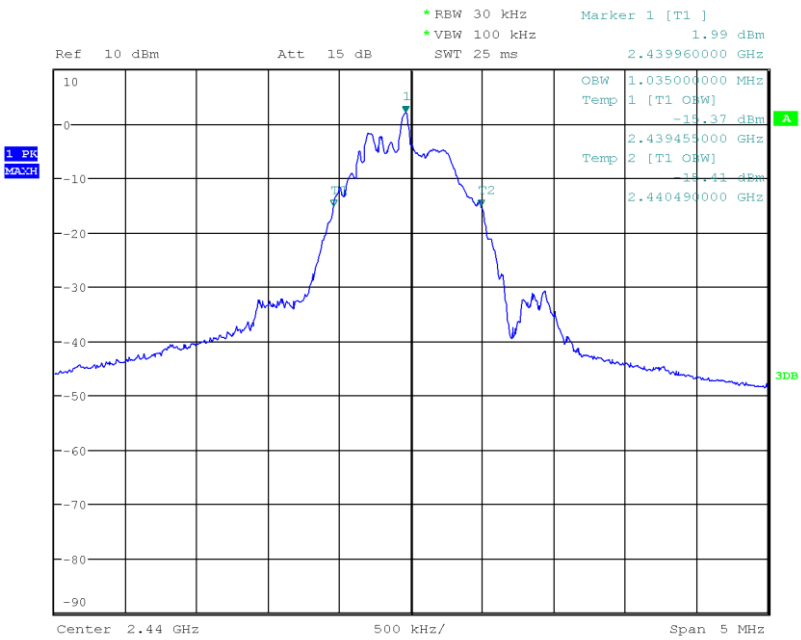
Occupied Bandwidth

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Occupied Bandwidth [MHz]:	1.035



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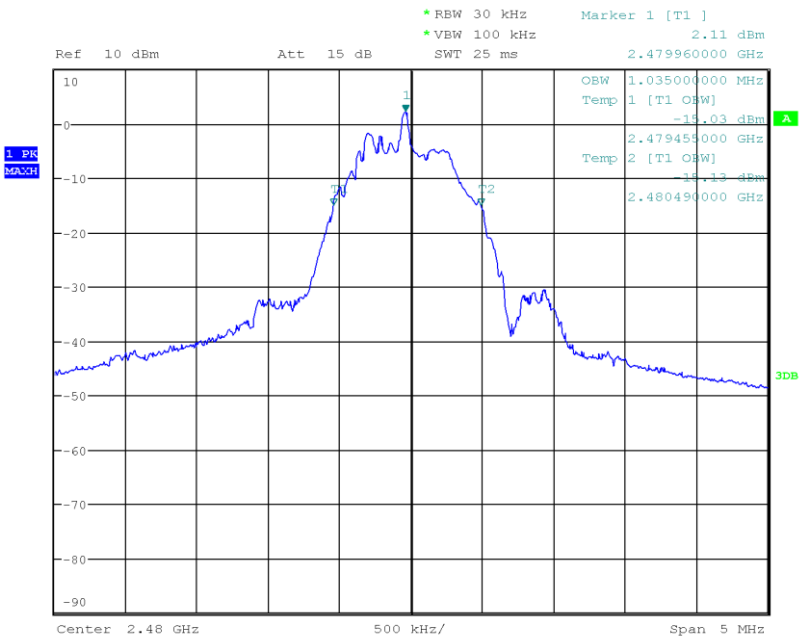
Occupied Bandwidth

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Occupied Bandwidth [MHz]:	1.035



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3.2 Test Conditions and Results - 6 dB bandwidth

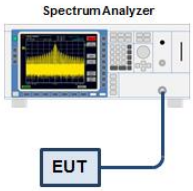
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Measurement Uncertainty	± 1.26 %
Operator	Abdullah Al Jamal
Date	2020-06-02

3.2.2 Limits

Limits
≥ 500kHz

3.2.3 Setup

Test Setup


3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 43	EF01631	2019-12	2020-12
Cable	Gigalane	SMS111B	EF00779 CAABB	2018-10	2020-10

3.2.5 Procedure

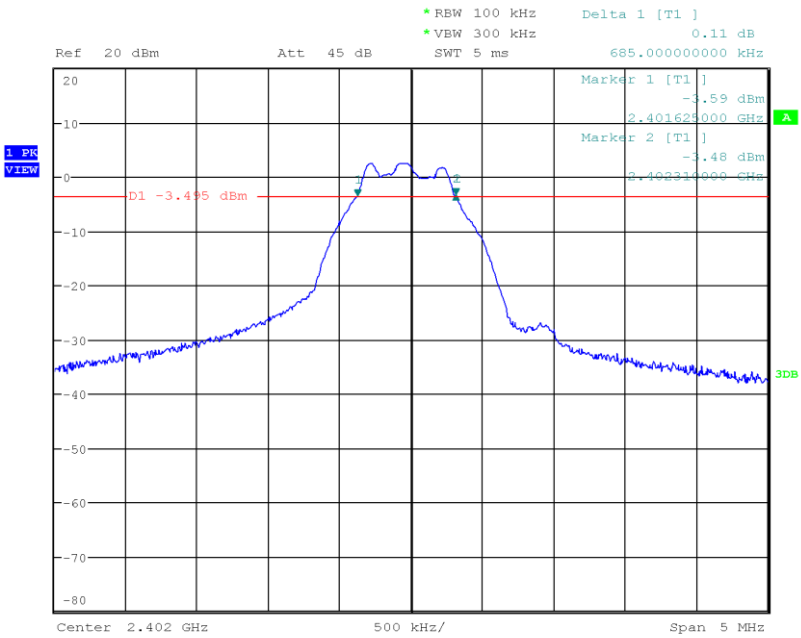
Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker 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

3.2.6 Results

Test Results				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
GFSK	2402	685	500	PASS
GFSK	2440	700	500	PASS
GFSK	2480	700	500	PASS

DTS (6 dB) Bandwidth

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Lower Frequency [MHz]:	2401.625
Upper Frequency [MHz]:	2402.310
6 dB Bandwidth [kHz]:	685



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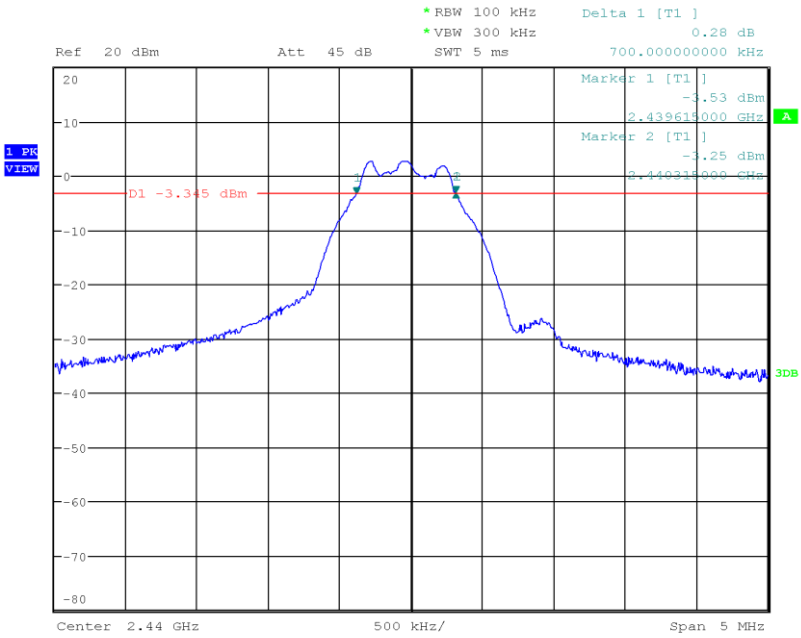
DTS (6 dB) Bandwidth

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Lower Frequency [MHz]:	2439.615
Upper Frequency [MHz]:	2440.315
6 dB Bandwidth [kHz]:	700



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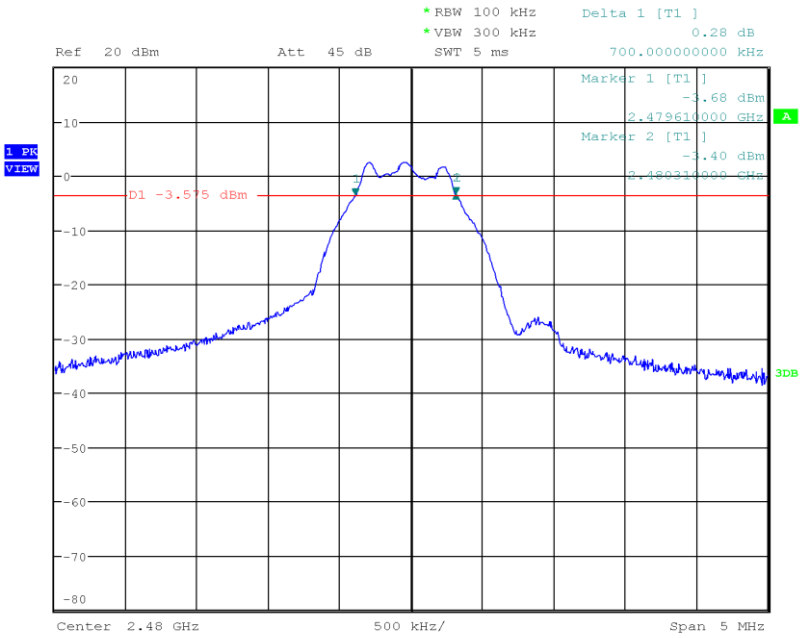
DTS (6 dB) Bandwidth

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Lower Frequency [MHz]:	2479.610
Upper Frequency [MHz]:	2480.310
6 dB Bandwidth [kHz]:	700



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3.3 Test Conditions and Results - Maximum peak conducted output power

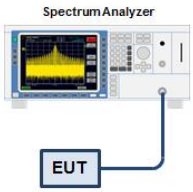
3.3.1 Information

Test Information	
Reference	FCC § 15.247(b)(1); ISED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Measurement Uncertainty	± 1.77 dB
Operator	Abdullah Al Jamal
Date	2020-06-02

3.3.2 Limits

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.

3.3.3 Setup

Test Setup


3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 43	EF01631	2019-12	2020-12
Cable	Gigalane	SMS111B	EF00779 CAABB	2018-10	2020-10

3.3.5 Procedure

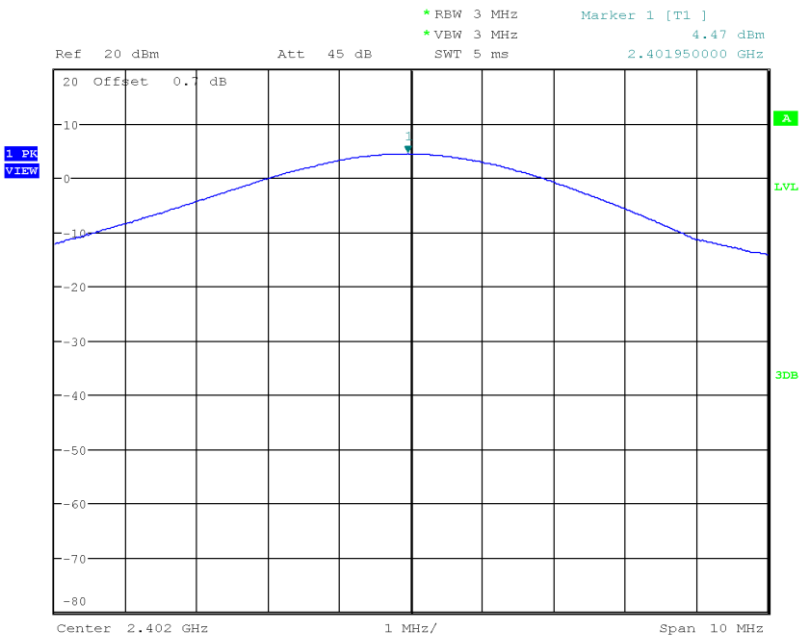
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set ≥ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.3.6 Results

Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	4.469	0.0028	1.0	PASS
2440	4.708	0.0030	1.0	PASS
2480	4.591	0.0029	1.0	PASS

Peak Conducted Output Power

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM 165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Peak Power [dBm]:	4.469
Peak Power [W]:	0.0028



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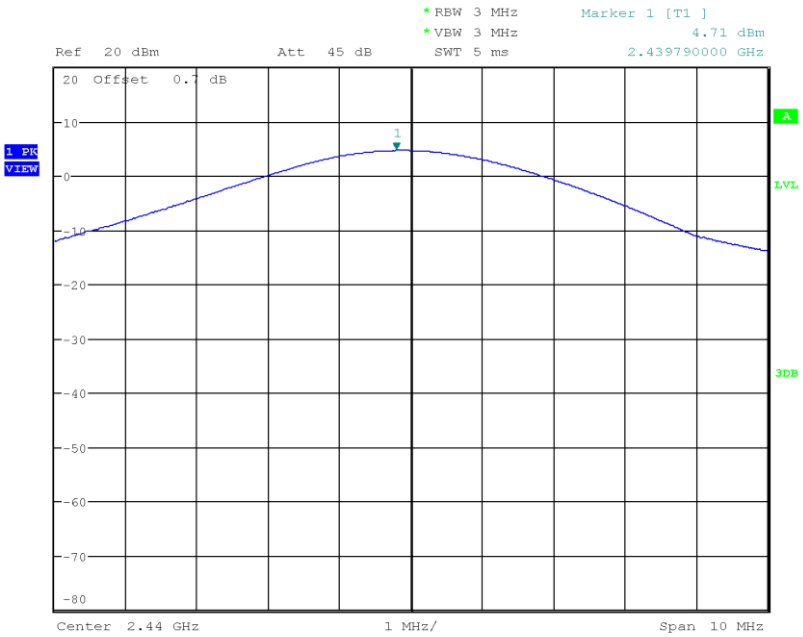
Peak Conducted Output Power

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM 165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Peak Power [dBm]:	4.708
Peak Power [W]:	0.0030



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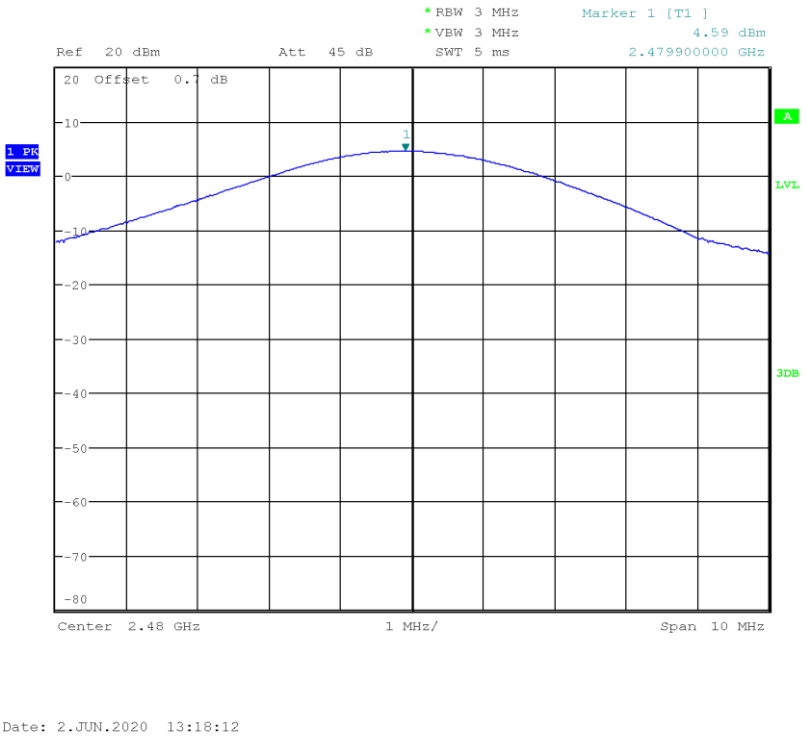
Peak Conducted Output Power

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM 165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Peak Power [dBm]:	4.591
Peak Power [W]:	0.0029



3.4 Test Conditions and Results - Power spectral density

3.4.1 Information

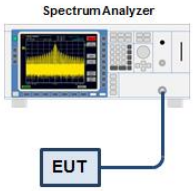
Test Information	
Reference	FCC § 15.247(e); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.10.2, 14.3.2
Measurement Uncertainty	± 1.73 dB
Operator	Abdullah Al Jamal
Date	2020-06-02

3.4.2 Limits

Limits
8 dBm / 3 kHz

3.4.3 Setup

Test Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 43	EF01631	2019-12	2020-12
Cable	Gigalane	SMS111B	EF00779 CAABB	2018-10	2020-10

3.4.5 Procedure

Test Procedure

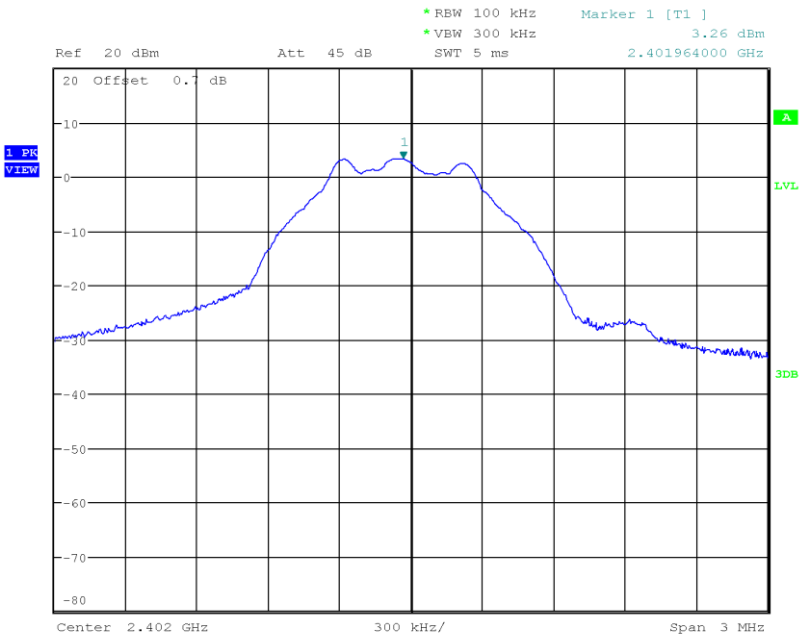
1. EUT set to test mode
2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth
3. The RBW is set to 100 kHz with VBW ≥ RBW and the detector is set to peak with max hold
4. After the trace has stabilized a marker is set to the envelope maximum
5. If the power spectral density is above the limit the RBW is reduced (not lower than 3 kHz) and the measurement is repeated
6. If the EUT has more than one transmit chain the procedure is repeated for each transmit chain

3.4.6 Results

Test Results			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2402	3.256	8.0	PASS
2440	3.397	8.0	PASS
2480	3.163	8.0	PASS
RBW = 100 kHz			

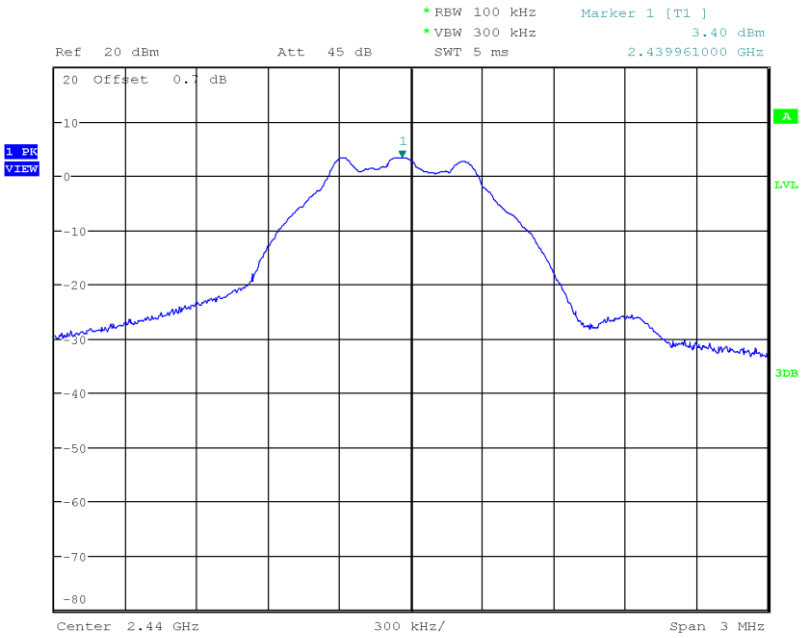
Peak Power Spectral Density

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Peak Frequency [MHz]:	2401.964
Spectral Density [dBm/RBW]:	3.256
Resolution Bandwidth [kHz]:	100 kHz



Peak Power Spectral Density

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Peak Frequency [MHz]:	2439.961
Spectral Density [dBm/RBW]:	3.397
Resolution Bandwidth [kHz]:	100 kHz



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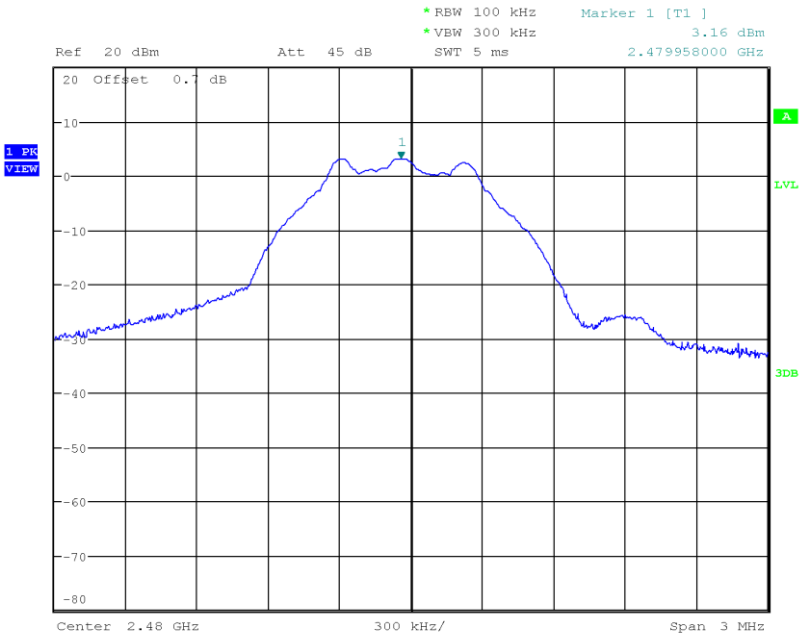
Peak Power Spectral Density

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Peak Frequency [MHz]:	2479.958
Spectral Density [dBm/RBW]:	3.163
Resolution Bandwidth [kHz]:	100 kHz



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3.5 Test Conditions and Results - Band-edge compliance

3.5.1 Information

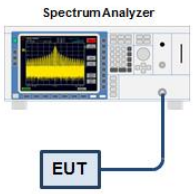
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.13
Measurement Uncertainty	± 1.80 dB
Operator	Abdullah Al Jamal
Date	2020-06-02

3.5.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.5.3 Setup

Test Setup



3.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 43	EF01631	2019-12	2020-12
Cable	Gigalane	SMS111B	EF00779 CAABB	2018-10	2020-10

3.5.5 Procedure

Test Procedure

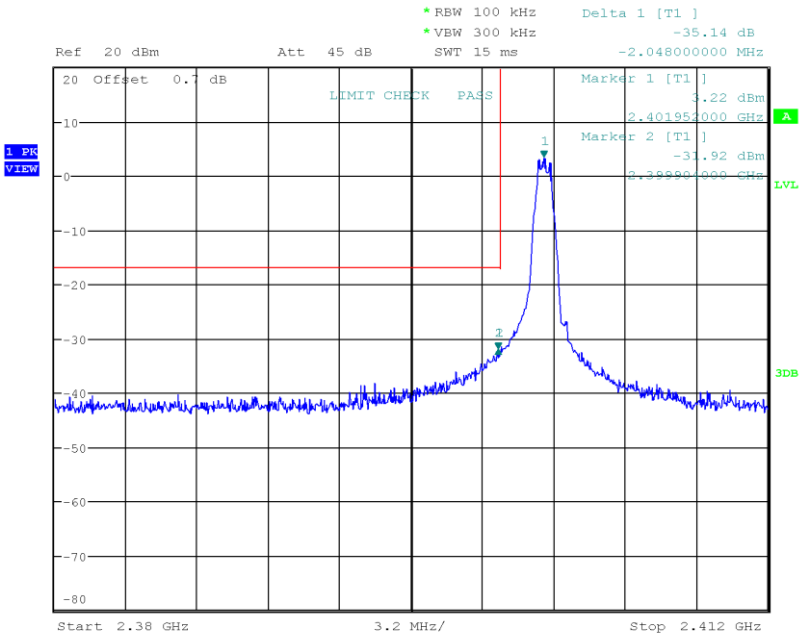
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is determined from level difference

3.5.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
GFSK	2402	-35.13	-20	PASS
GFSK	2480	-40.24	-20	PASS

Emissions in nonrestricted frequency bands at the Band-edge

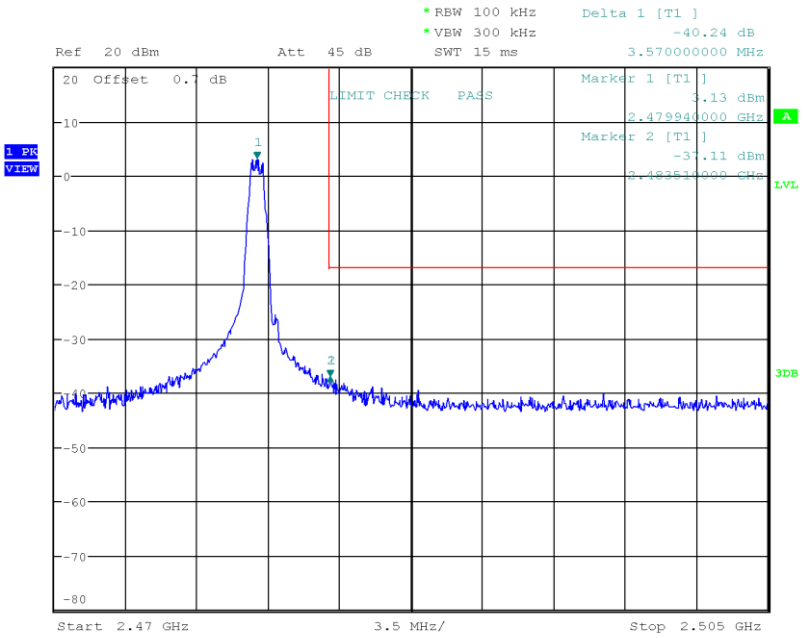
Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Band-edge	Lower
In-band Frequency [MHz]:	2401.952
Max. in-band Level [dBm/100 kHz]:	3.217
Out-of-band Frequency [MHz]:	2399.904
Max. out-of-band Level [dBm/100 kHz]:	-31.918
Attenuation [dB]:	-35.13



Date: 2.JUN.2020 13:29:18

Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Band-edge	Upper
In-band Frequency [MHz]:	2479.94
Max. in-band Level [dBm/100 kHz]:	3.128
Out-of-band Frequency [MHz]:	2483.51
Max. out-of-band Level [dBm/100 kHz]:	-37.108
Attenuation [dB]:	-40.24



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3.6 Test Conditions and Results - Conducted spurious emissions

3.6.1 Information

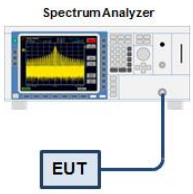
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.11
Measurement Uncertainty	± 4.25 dB
Operator	Abdullah Al Jamal
Date	2020-06-02

3.6.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.6.3 Setup

Test Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 43	EF01631	2019-12	2020-12
Cable	Gigalane	SMS111B	EF00779 CAABB	2018-10	2020-10

3.6.5 Procedure

Test Procedure

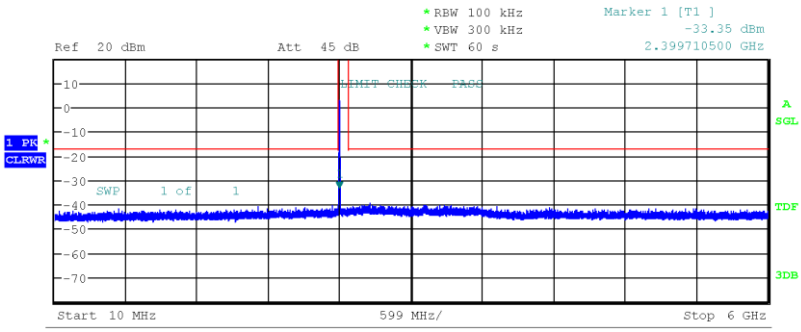
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is determined from level difference

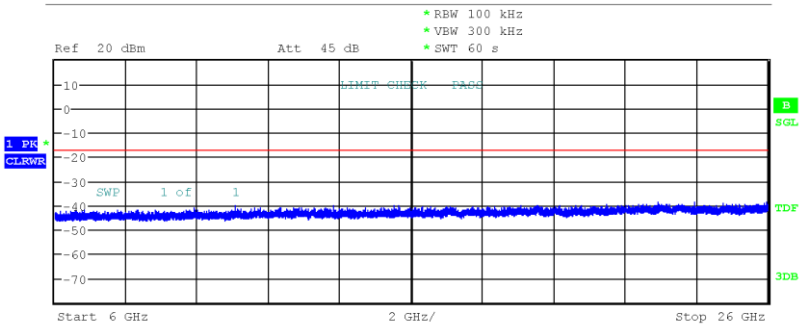
3.6.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
GFSK	2402	PASS
GFSK	2440	PASS
GFSK	2480	PASS

Conducted Spurious Emissions

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Max. in-band Frequency [MHz]:	2402.0
Max. in-band Level [dBm/100 kHz]:	3.0
Out-of-band Limit [dBm/100 kHz]:	-17.0

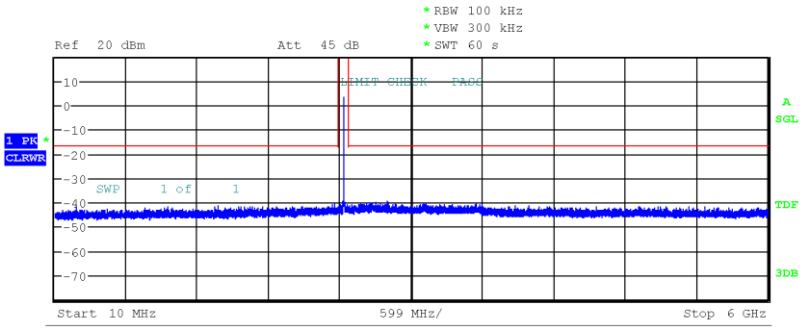


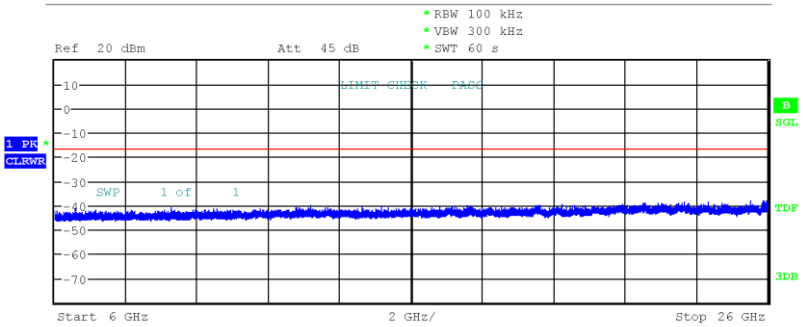


Date: 2.JUN.2020 13:39:54

Conducted Spurious Emissions

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Max. in-band Frequency [MHz]:	2440.0
Max. in-band Level [dBm/100 kHz]:	3.2
Out-of-band Limit [dBm/100 kHz]:	-16.8





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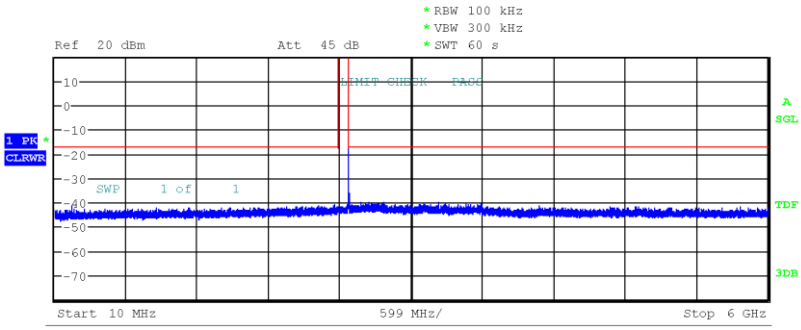
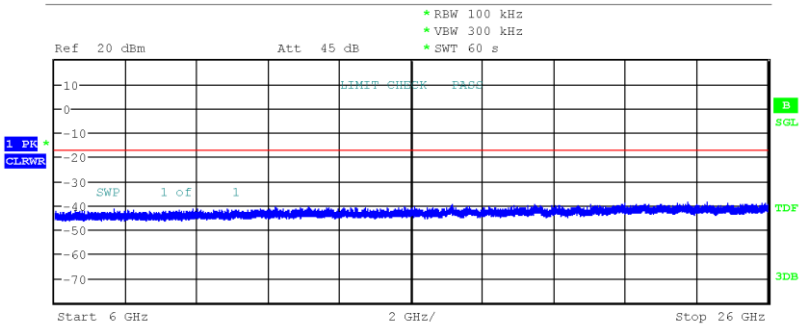
Conducted Spurious Emissions

Project Number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27C
Test Sample ID:	29604
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-02
Max. in-band Frequency [MHz]:	2479.9
Max. in-band Level [dBm/100 kHz]:	3.0
Out-of-band Limit [dBm/100 kHz]:	-17.0





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3.7 Test Conditions and Results - Transmitter radiated emissions

3.7.1 Information

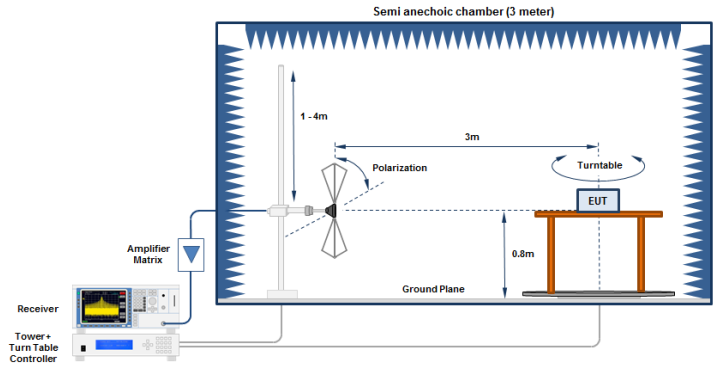
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 (section 6.13)
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Measurement Uncertainty	± 5.95 dB
Operator	Abdullah Al Jamal
Date	2020-06-03
Measurement note	Measurement plots not listed in this test report (related to the frequency range to be measured) contain noise floor only. No significant emissions detected in these measurement ranges. An evaluation was performed manually with the spectrum analyser.

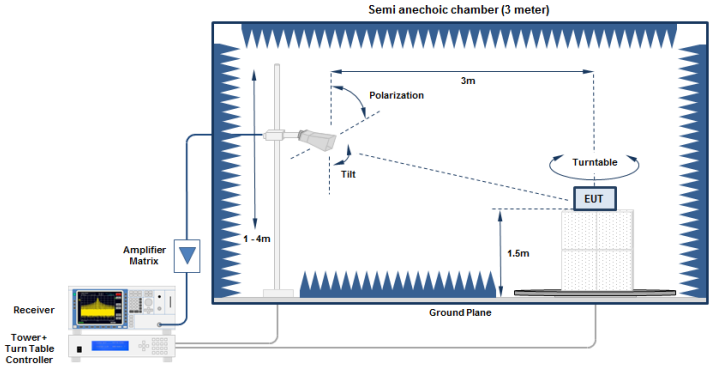
3.7.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.7.3 Setup

Test Setup 30 - 1000 MHz



Test Setup > 1 GHz


3.7.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	R&S	HK 116	EF00030	2019-04	2022-04
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	Schwarzbeck	BBHA 9120D	EF01153	2019-10	2020-10
Antenna	Amplifier Research	AT4560	EF01152	2018-10	2020-10

3.7.5 Procedure

Test Procedure 30 - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

3.7.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	4803	46.39	RMS	ver	54.00	-07.61
2402	4804	48.52	RMS	hor	54.00	-05.48
2402	4804	46.52	RMS	ver	54.00	-07.48
2440	4880	48.39	RMS	hor	54.00	-05.61
2440	7319	50.94	RMS	hor	54.00	-03.06
2440	4880	46.48	RMS	ver	54.00	-07.52
2440	7319	54.63	pk	hor	74.00	-19.37
2440	7319	52.19	RMS	hor	54.00	-01.81
2440	7321	56.07	pk	ver	74.00	-17.93
2440	7321	52.13	RMS	ver	54.00	-01.87
2480	4960	48.61	RMS	hor	54.00	-05.39
2480	4960	46.43	RMS	ver	54.00	-07.57

3.8 Test Conditions and Results - Receiver radiated emissions

3.8.1 Information

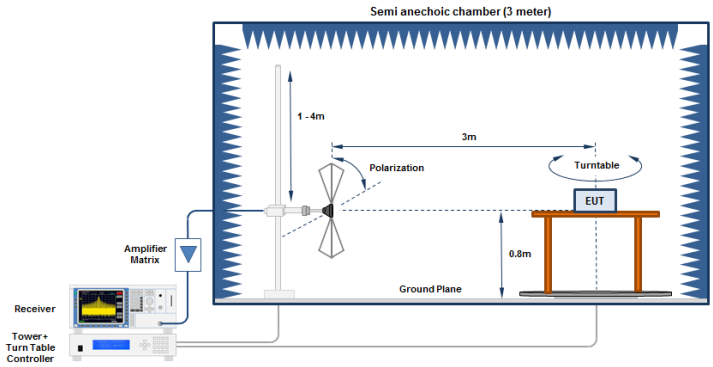
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Measurement Uncertainty	± 5.95 dB
Operator	Abdullah Al Jamal
Date	2020-06-03
Measurement note	Measurement plots not listed in this test report (related to the frequency range to be measured) contain noise floor only. No significant emissions detected in these measurement ranges. An evaluation was performed manually with the spectrum analyser.

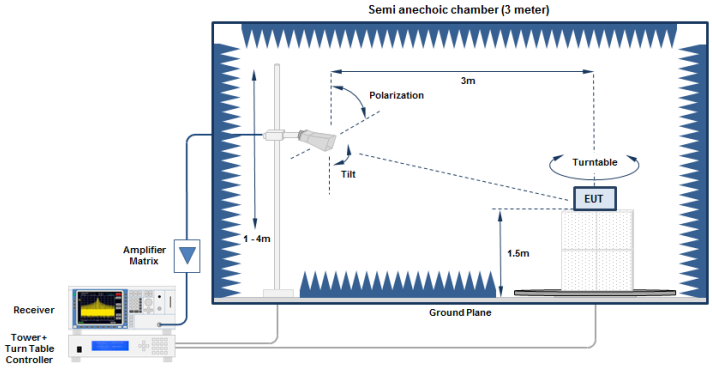
3.8.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.8.3 Setup

Test Setup 30 - 1000 MHz



Test Setup > 1 GHz


3.8.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	R&S	HK 116	EF00030	2019-04	2022-04
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	Schwarzbeck	BBHA 9120D	EF01153	2019-10	2020-10
Antenna	Amplifier Research	AT4560	EF01152	2018-10	2020-10

3.8.5 Procedure

Test Procedure 30 - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

3.8.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2440	No significant emission detected.					

ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	HK116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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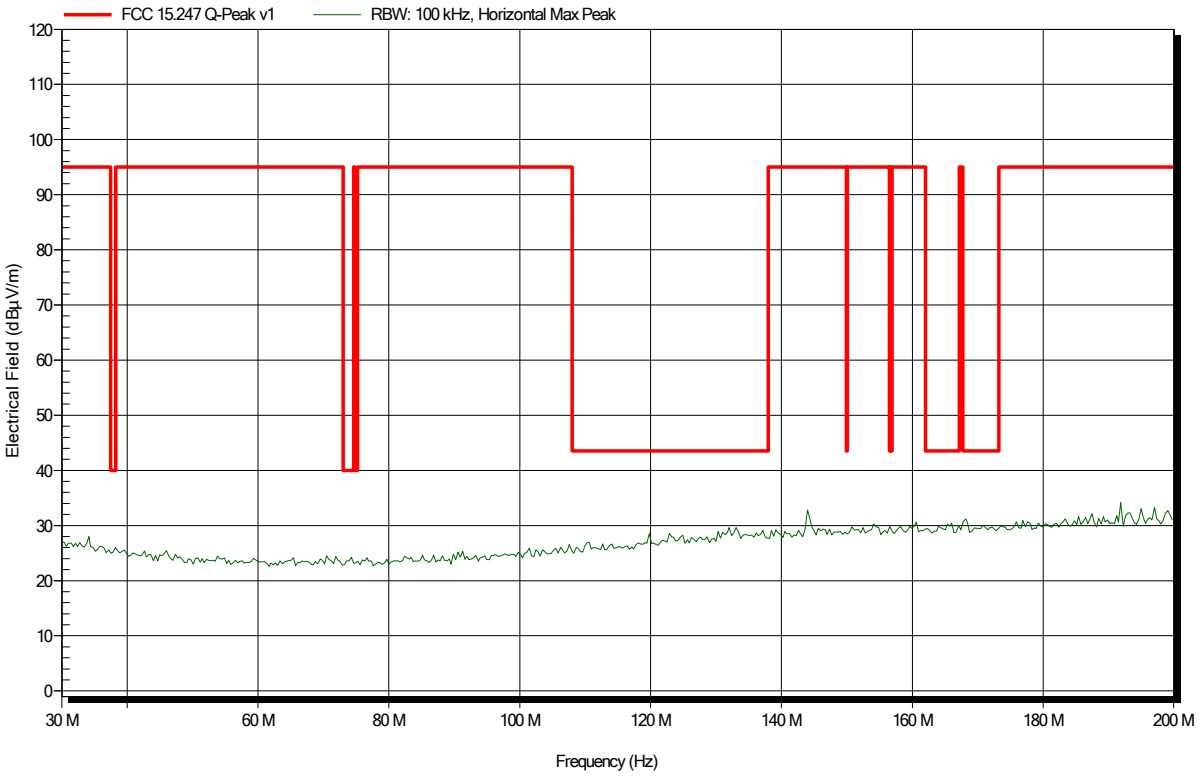

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	HK116, Vertical
Measurement distance:	3 m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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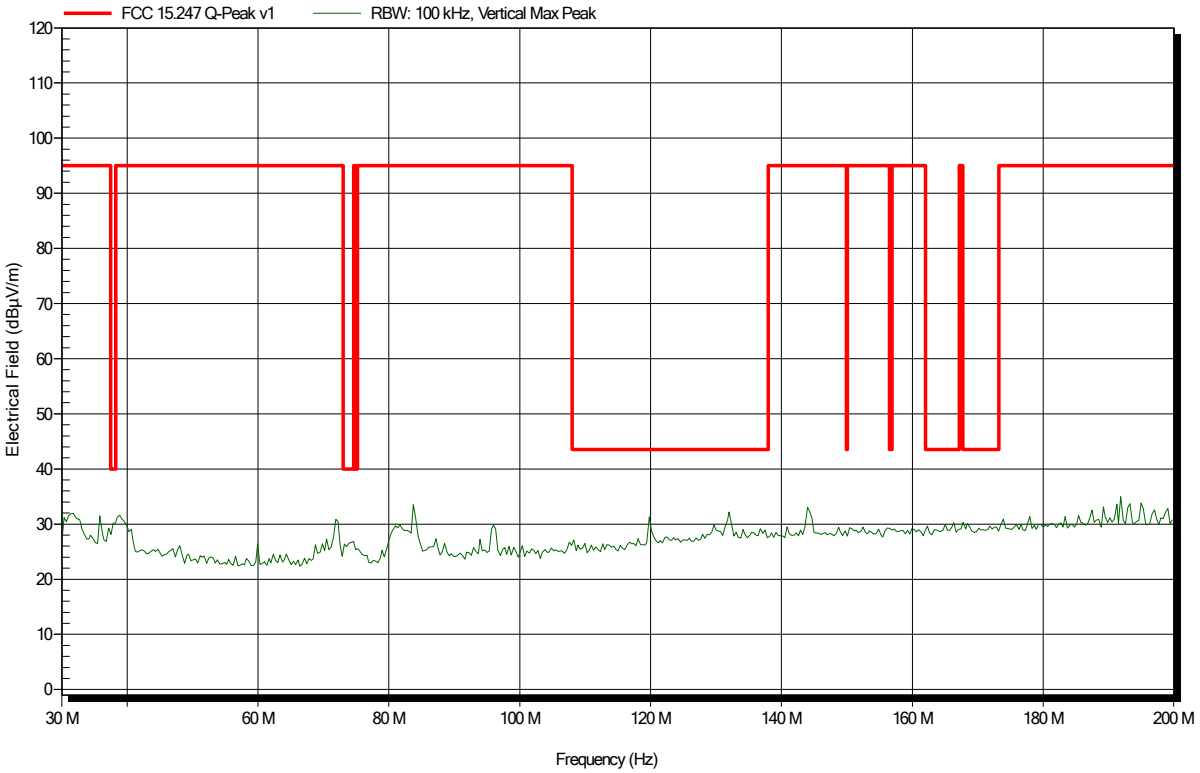

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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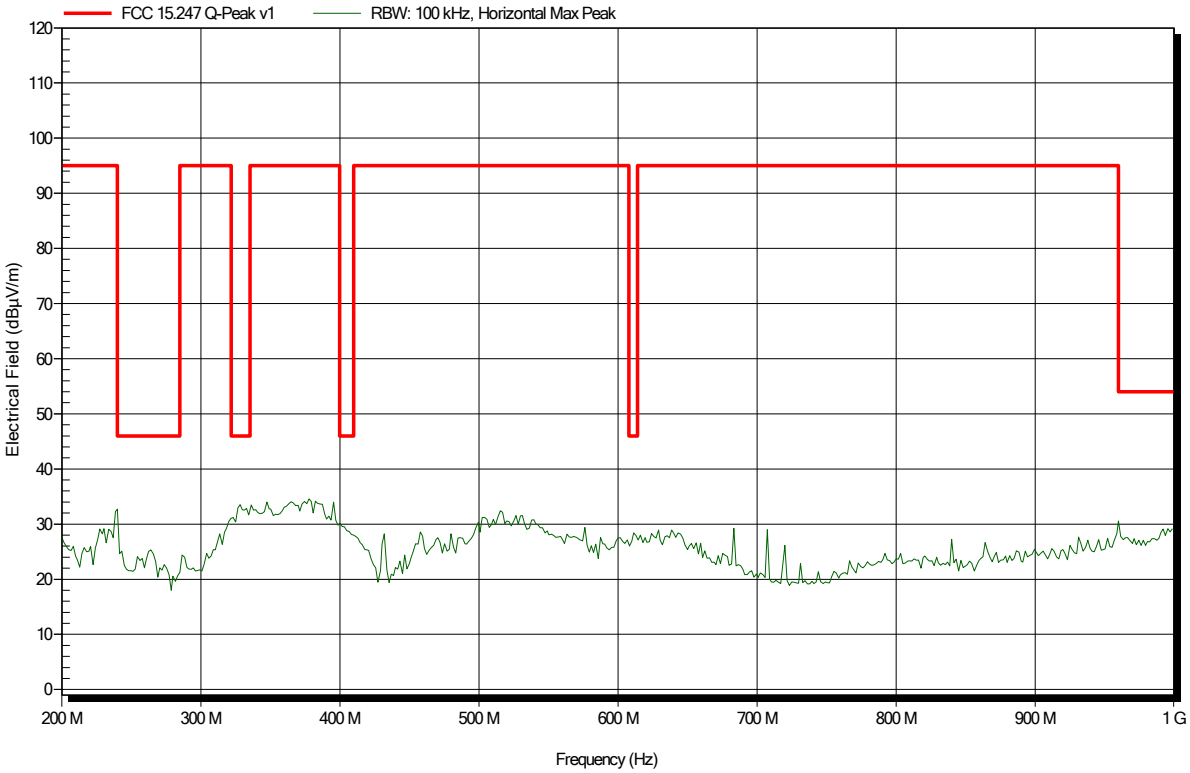

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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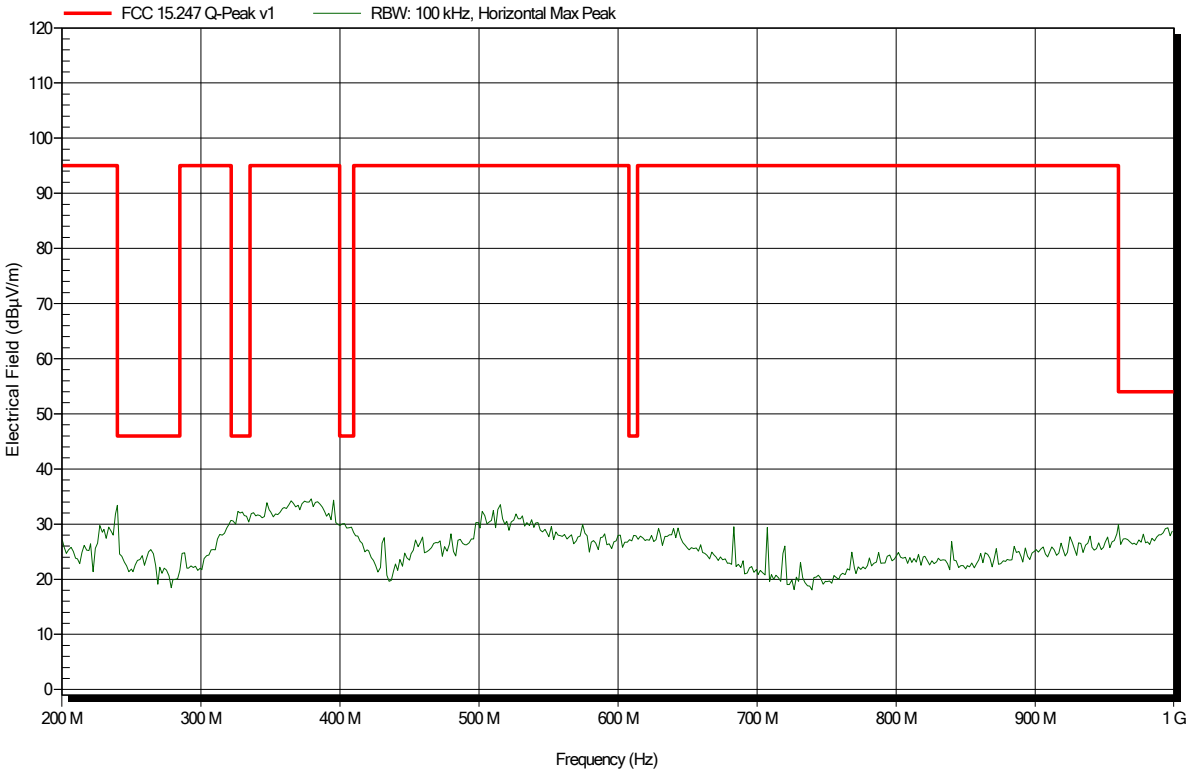

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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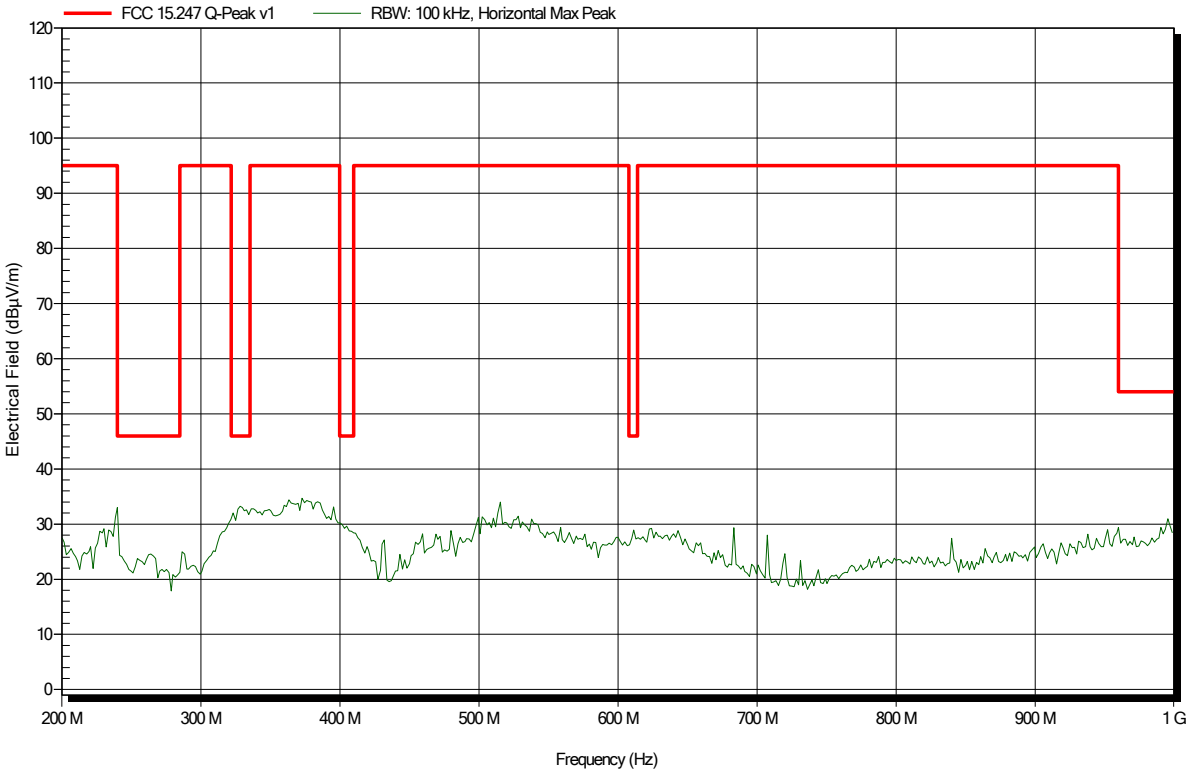

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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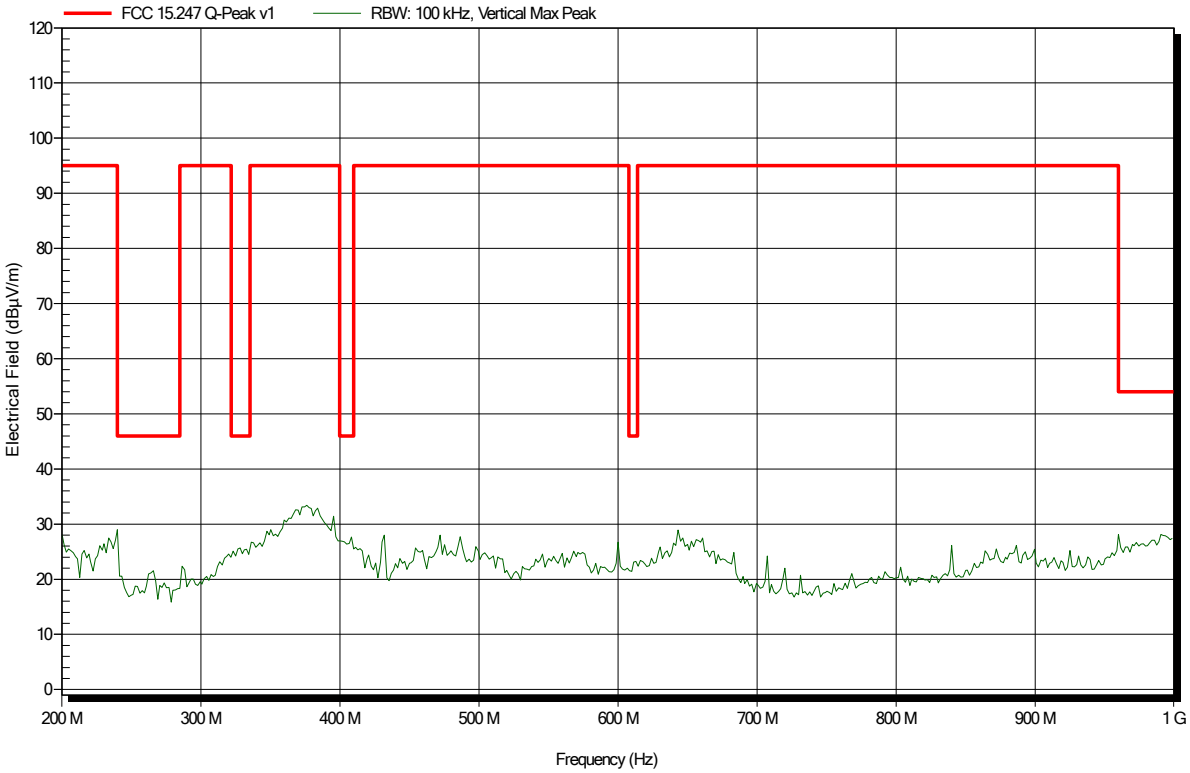

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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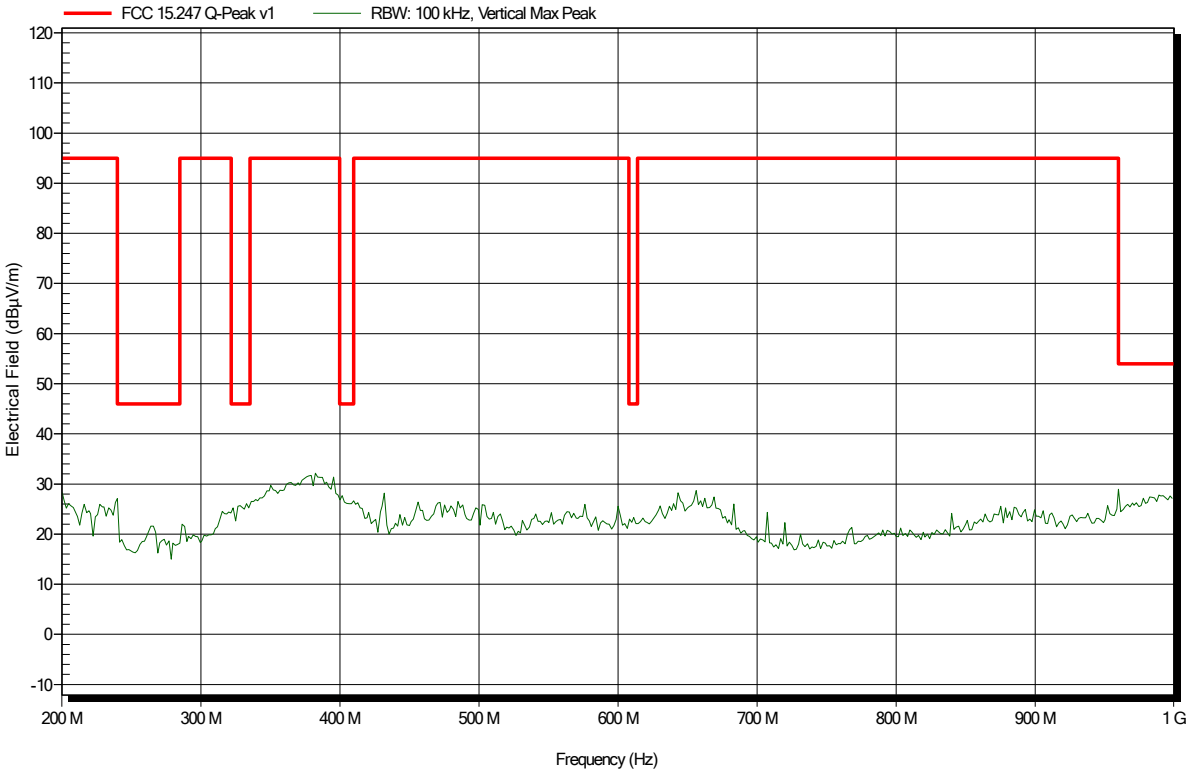

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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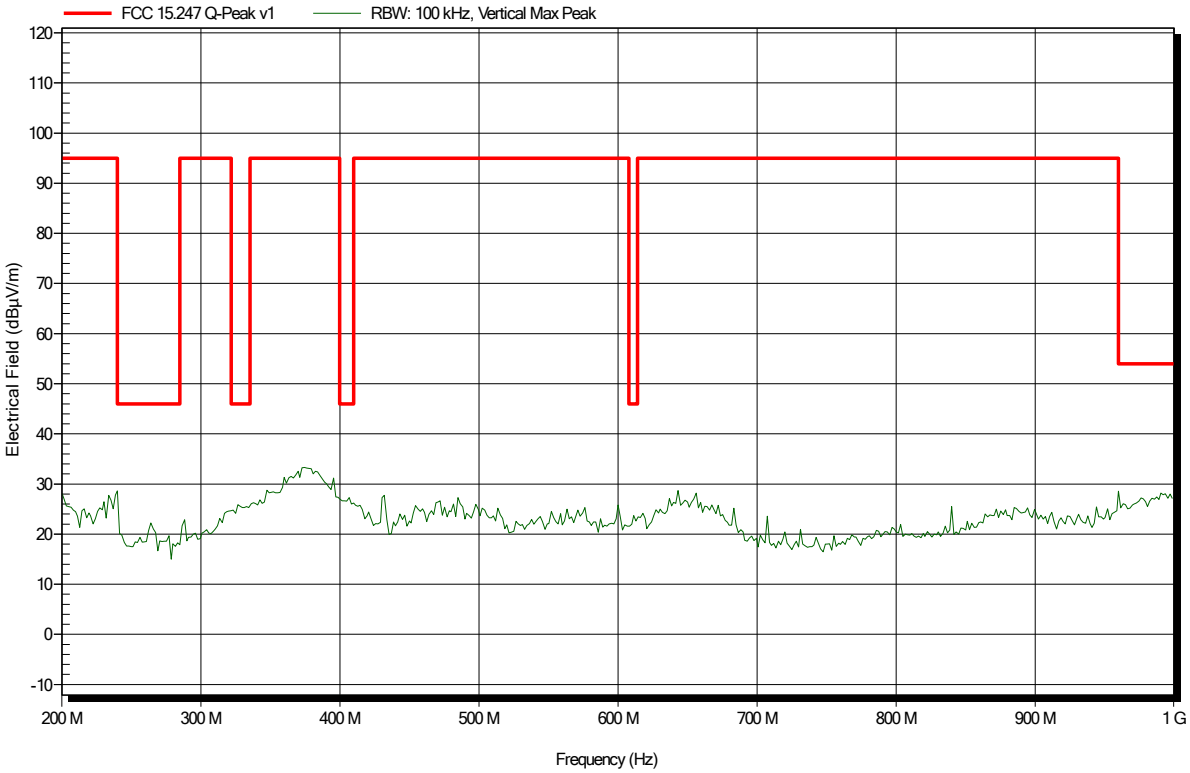

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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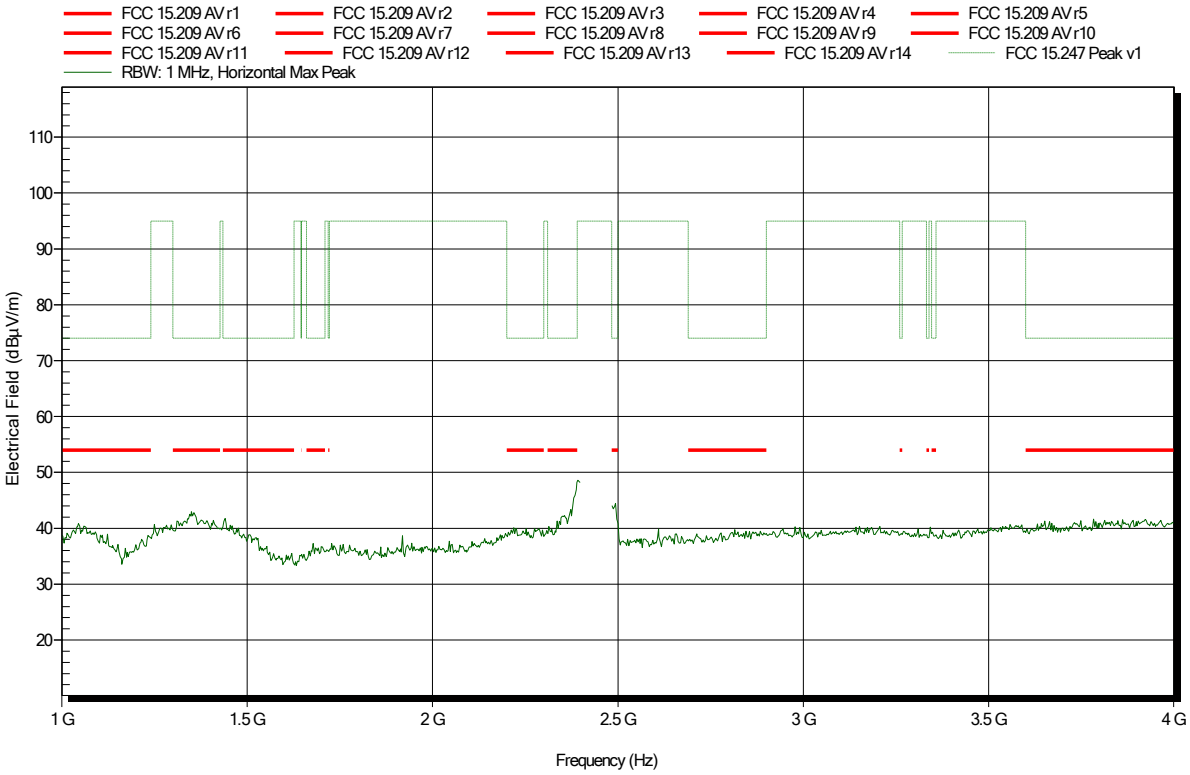

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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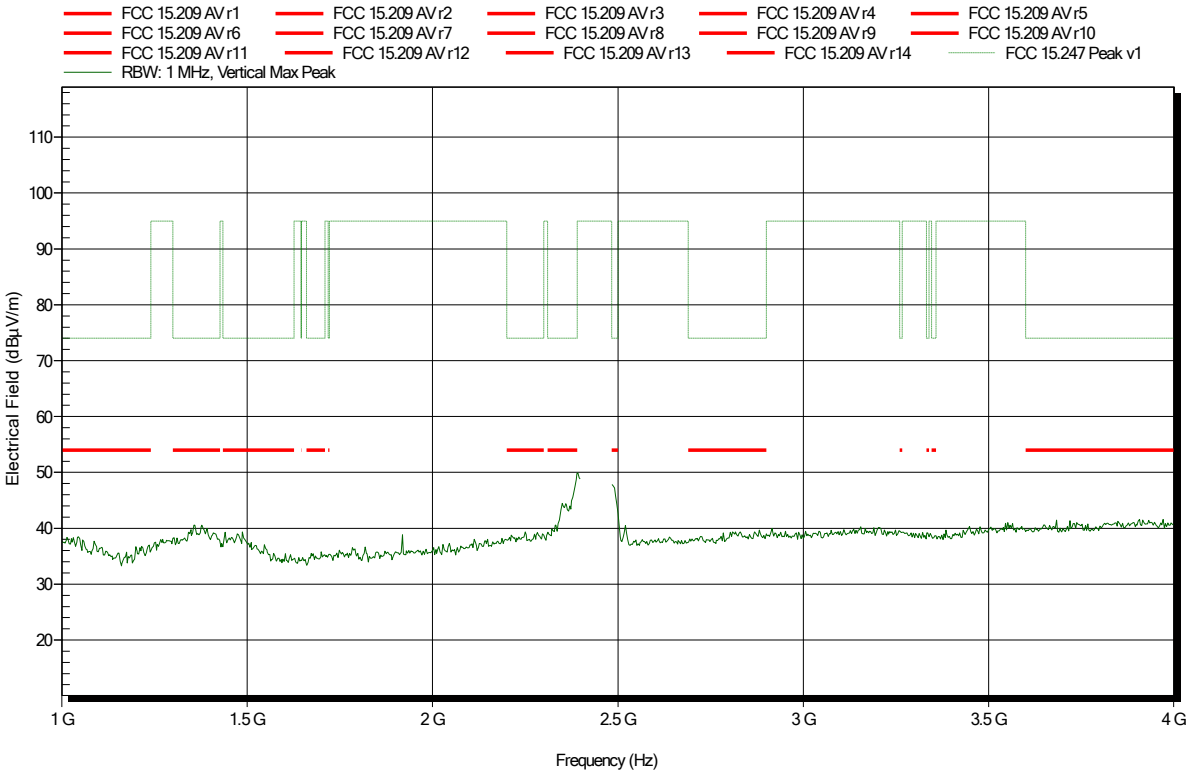

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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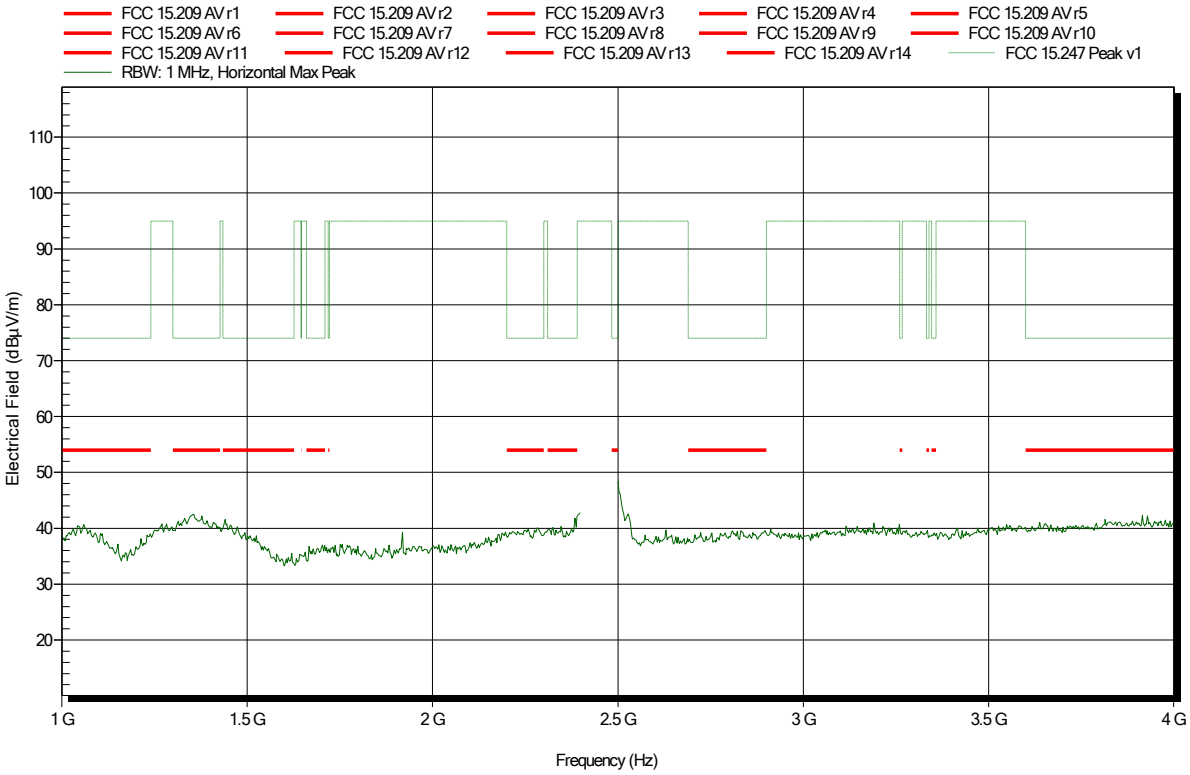

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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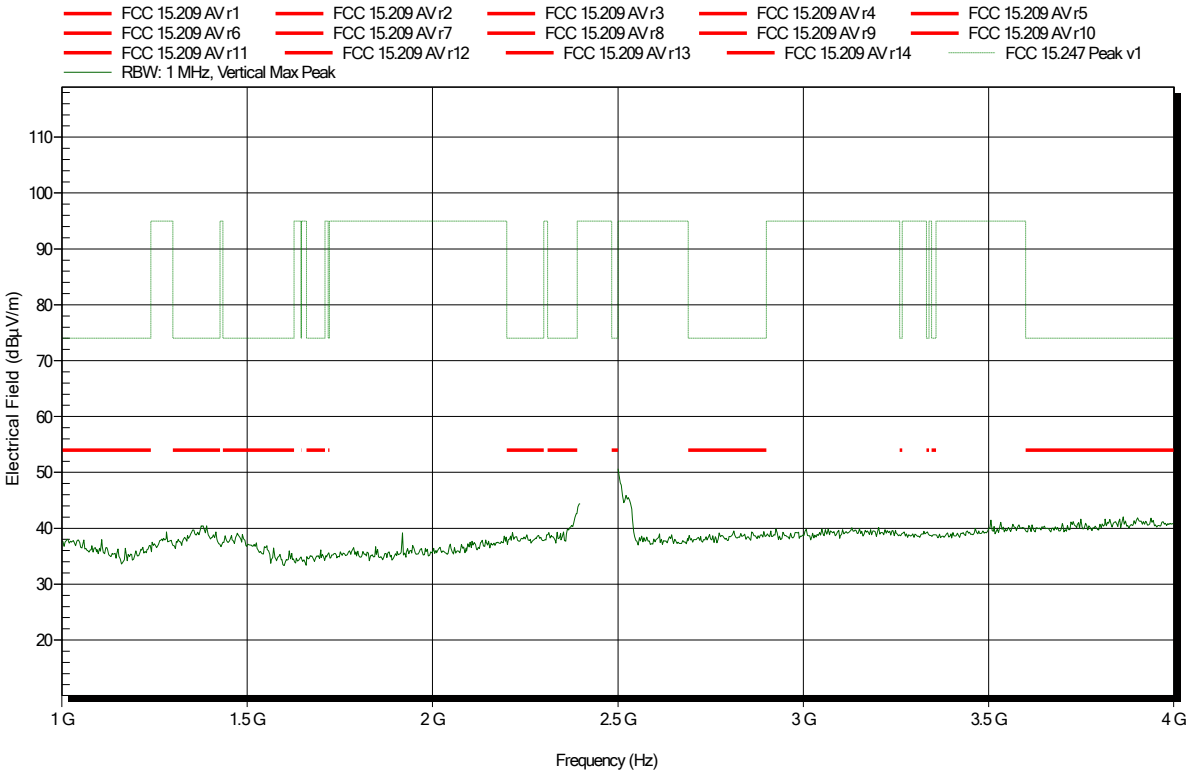

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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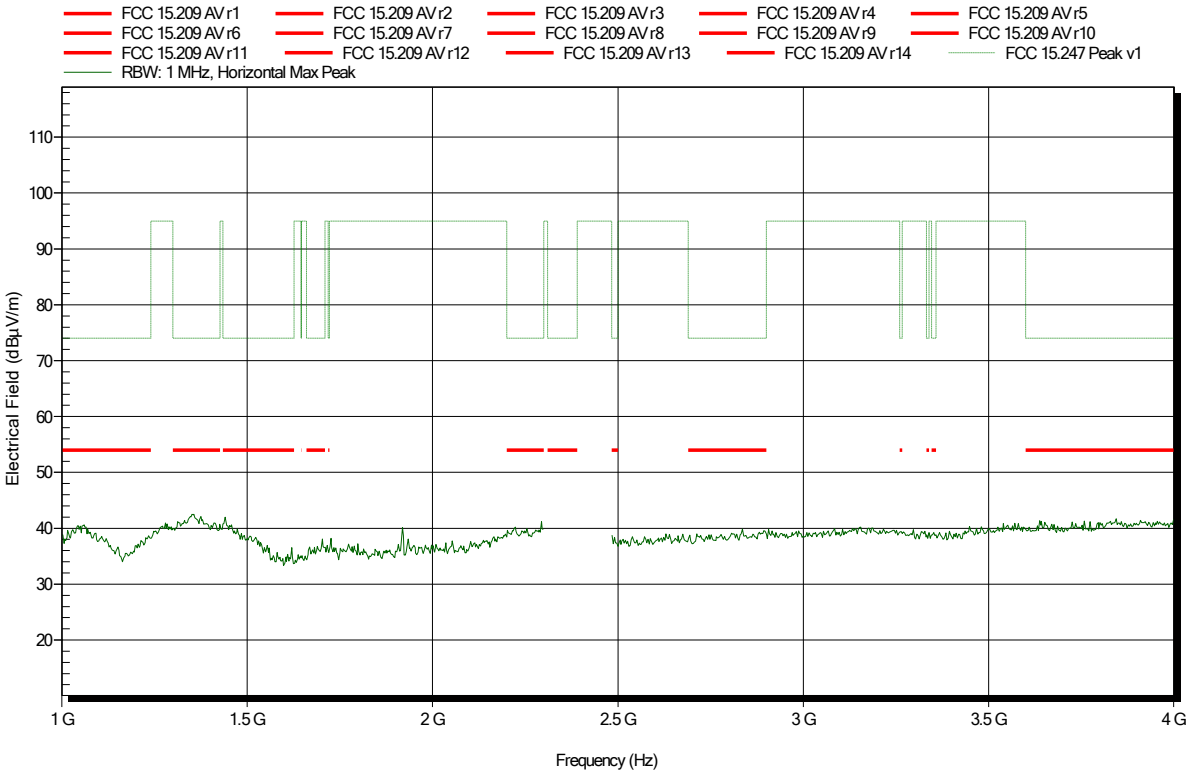

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
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Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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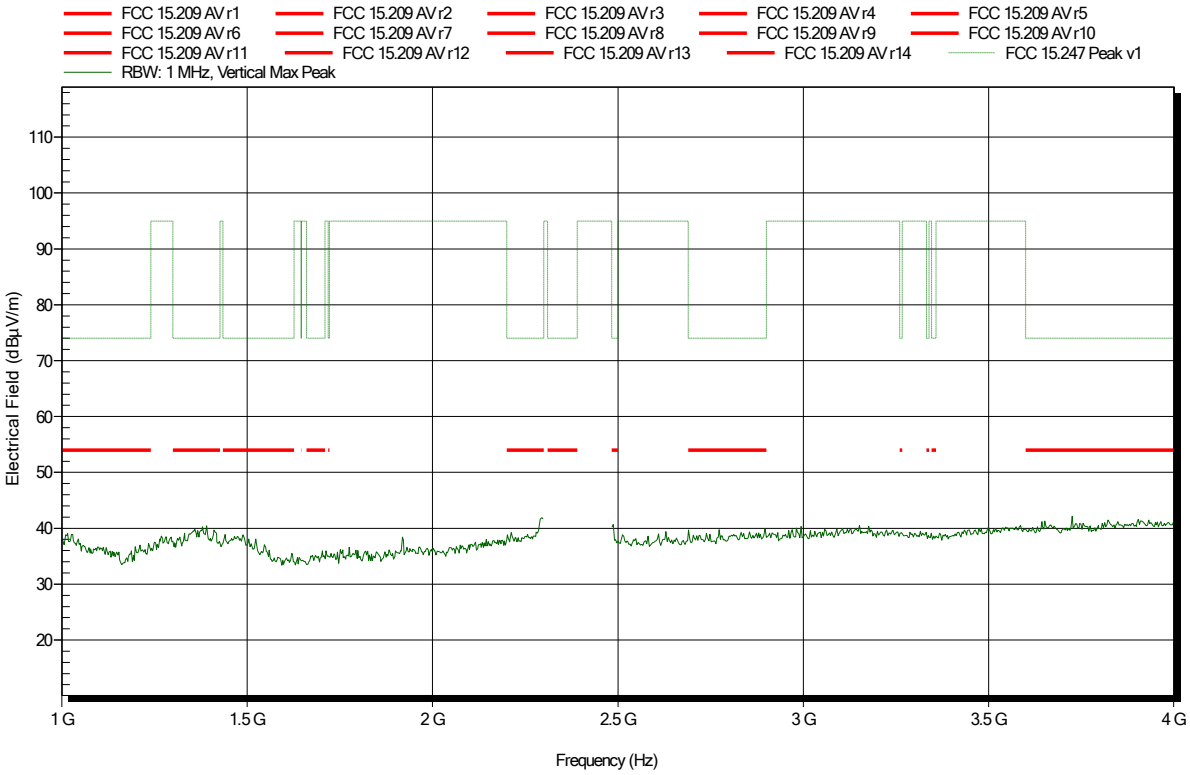

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	Band Edge. Low Channel.

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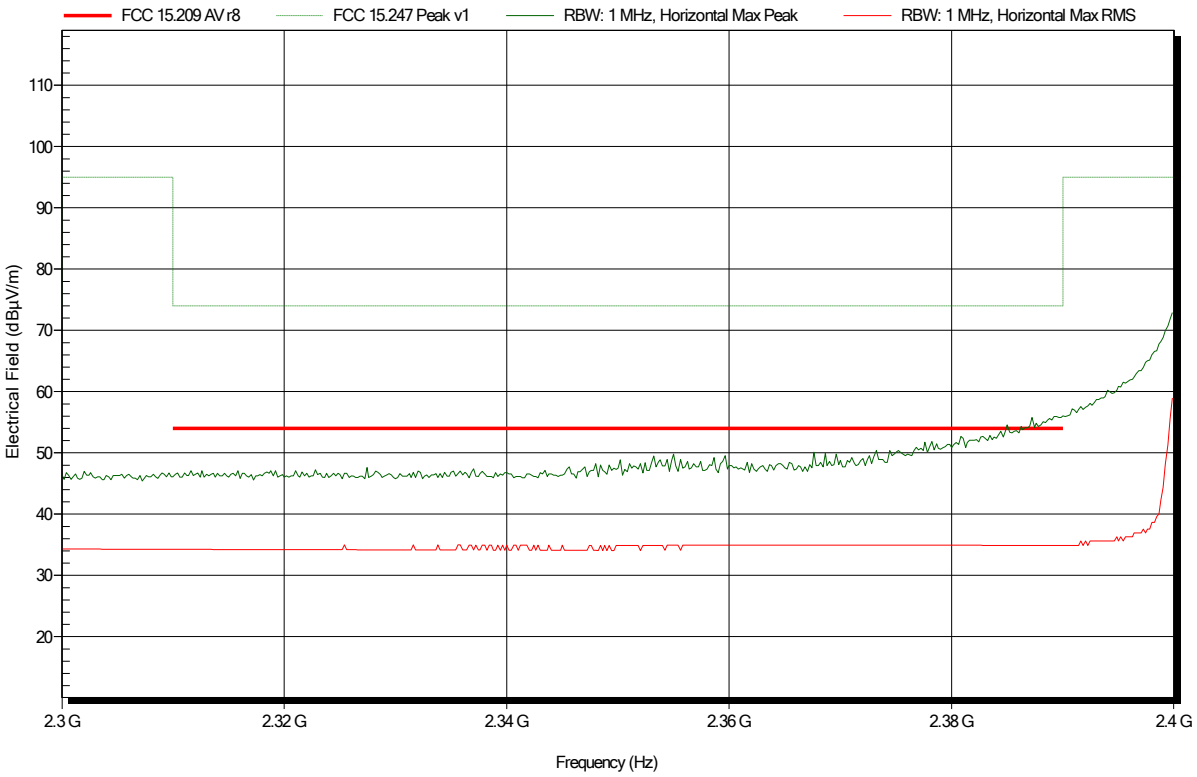

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	Band Edge. Low Channel.

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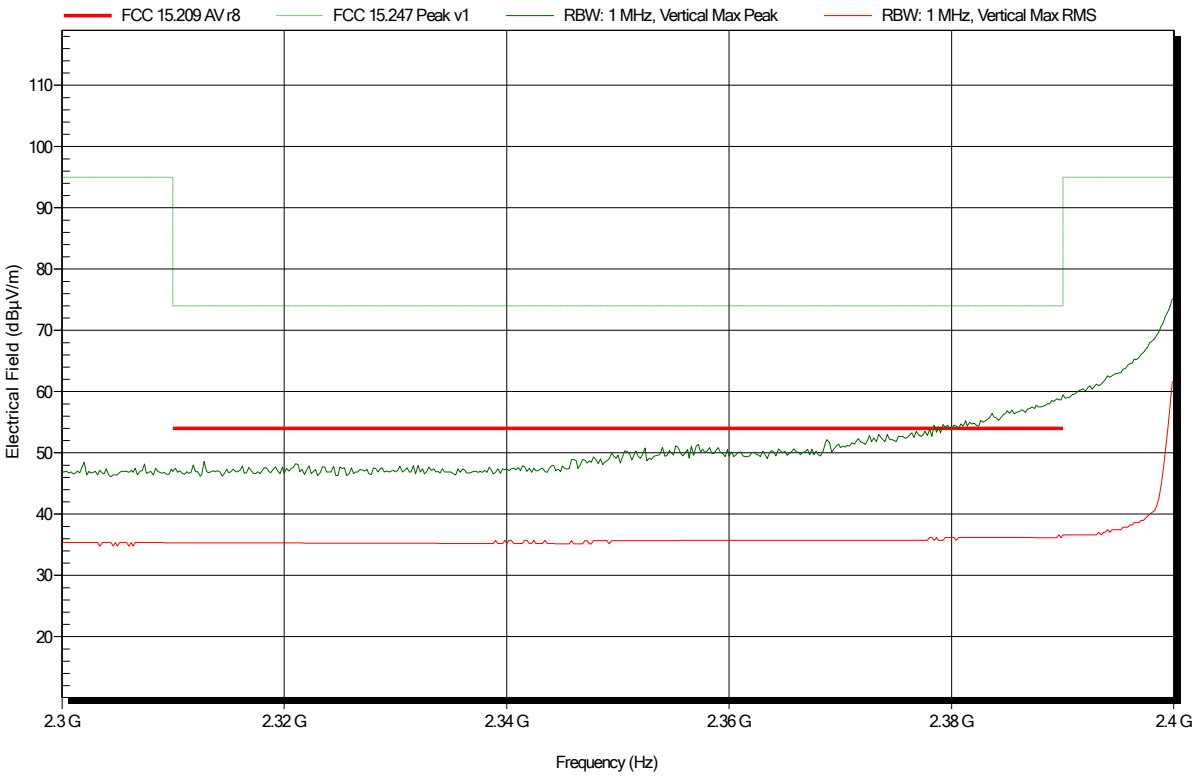

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	Band Edge. High Channel.

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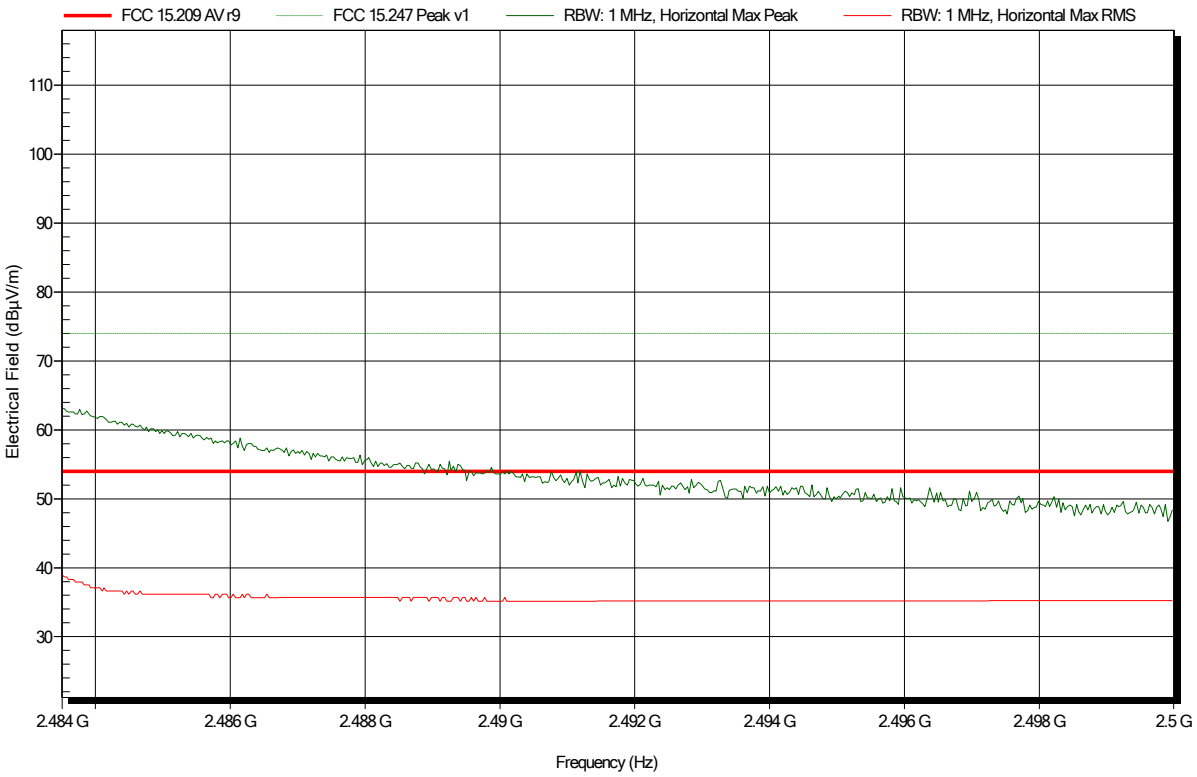

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	Band Edge. High Channel.

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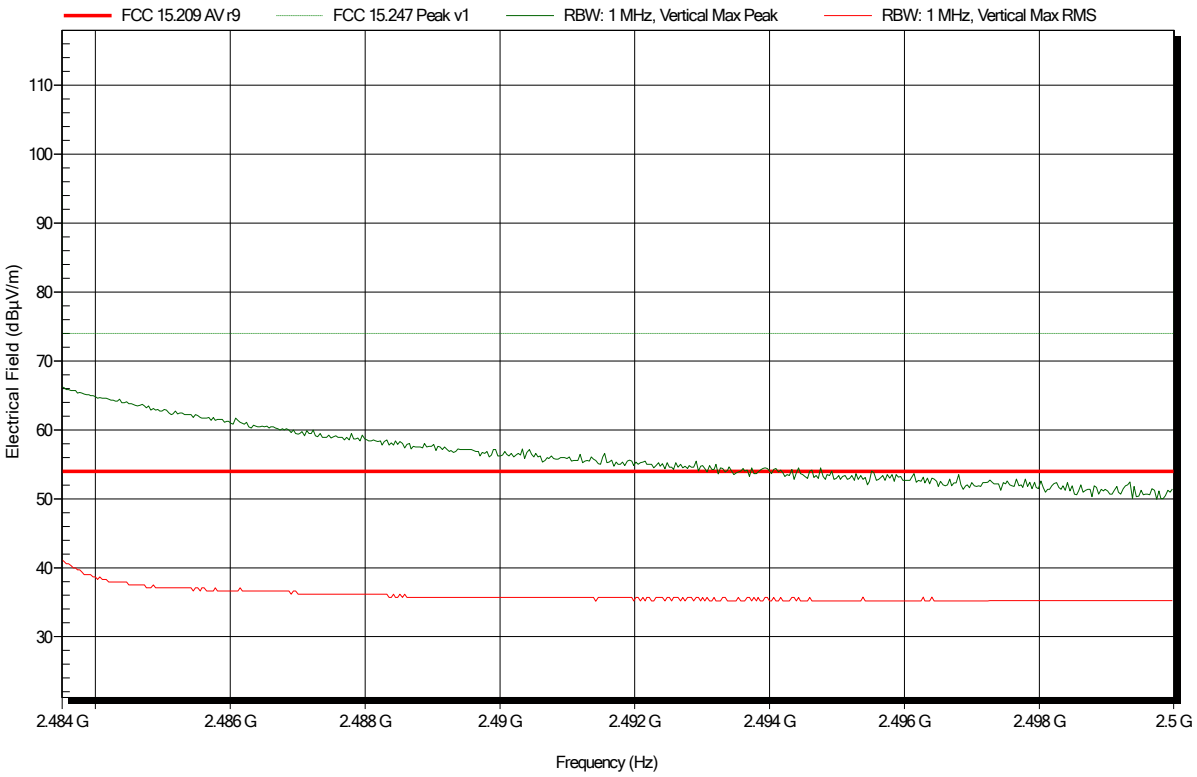

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT horizontal – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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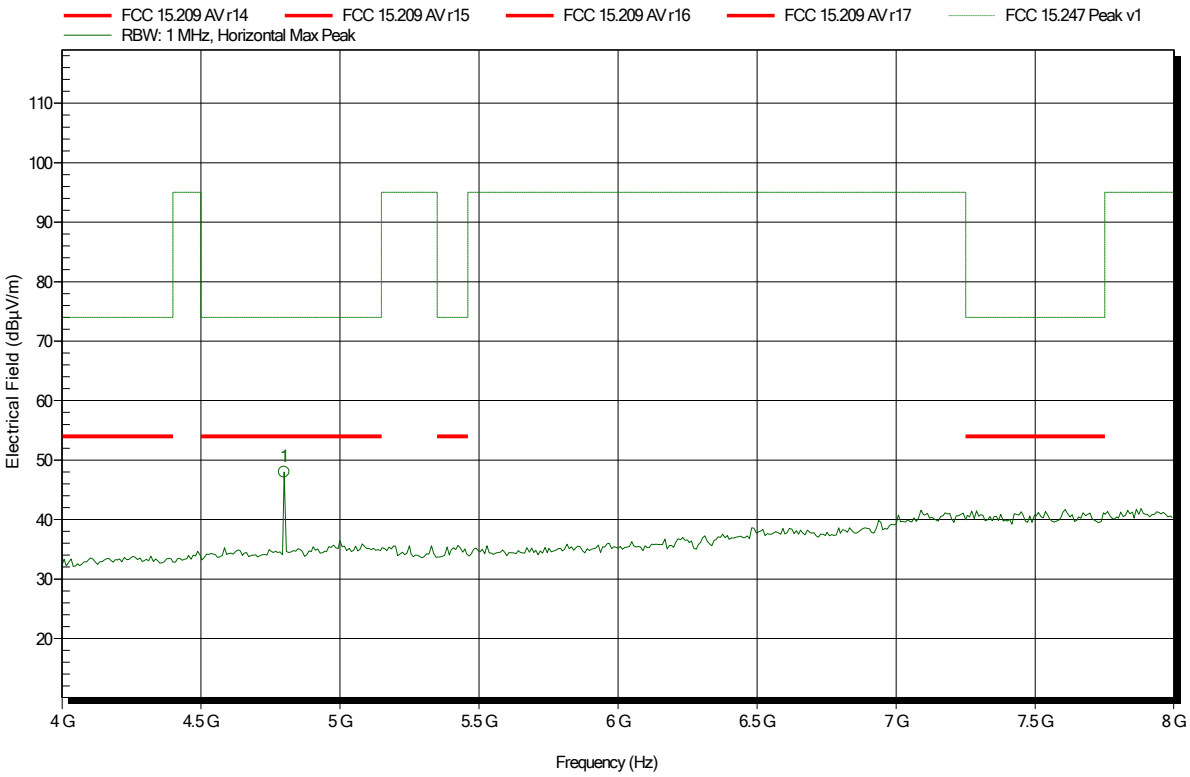

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.8 GHz	47.99 dBµV/m	74 dBµV/m	-26.01 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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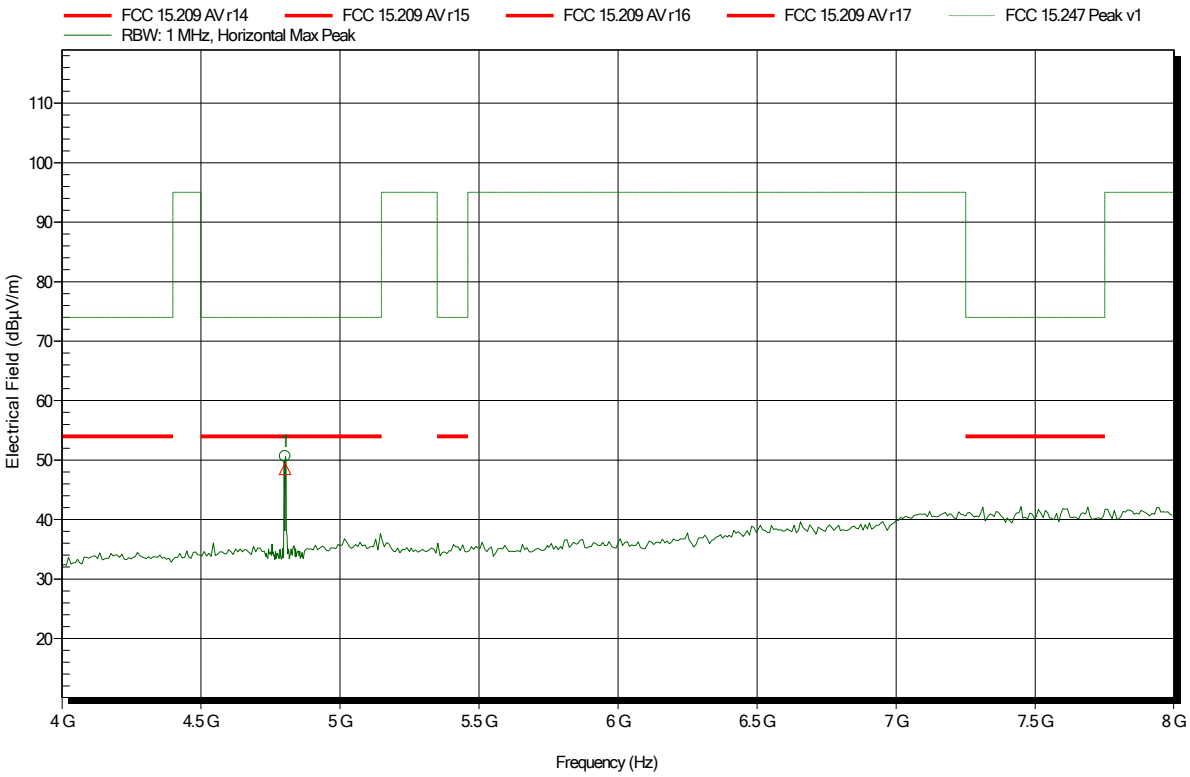

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.804 GHz	50.64 dBµV/m	74 dBµV/m	-23.36 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.804 GHz	48.52 dBµV/m	54 dBµV/m	-5.48 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440 MHz – EUT horizontal – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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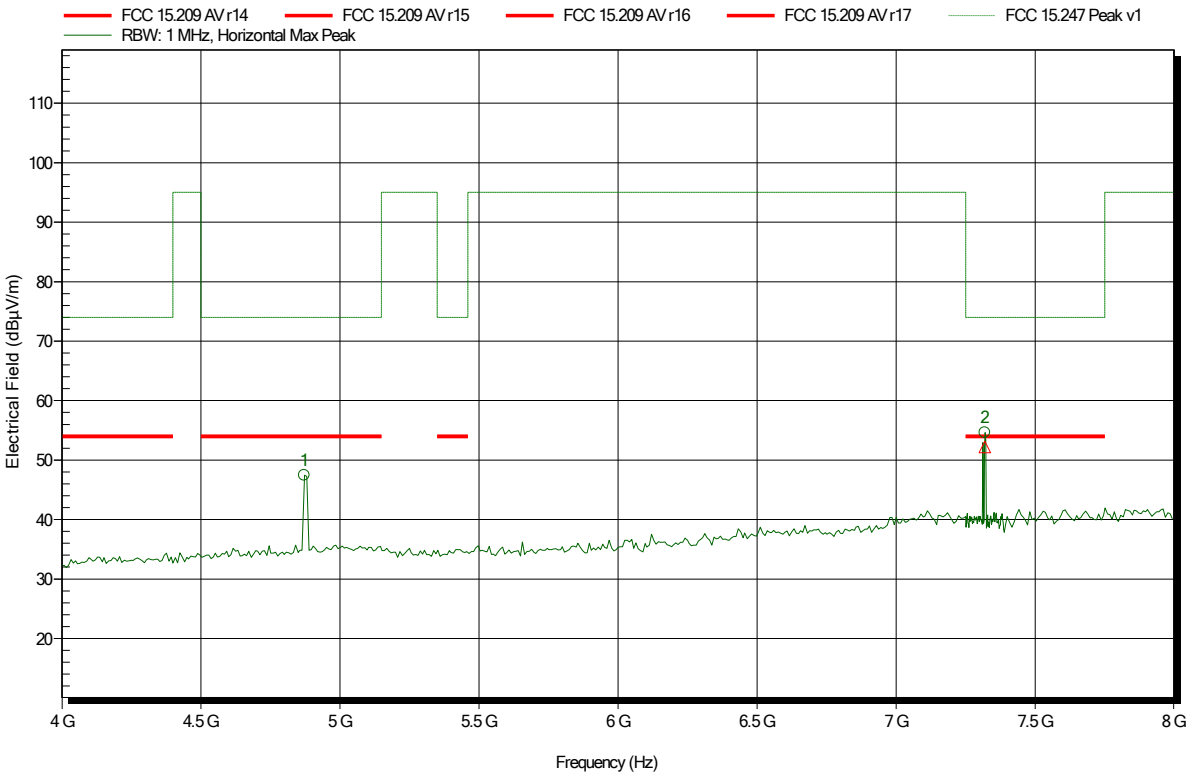


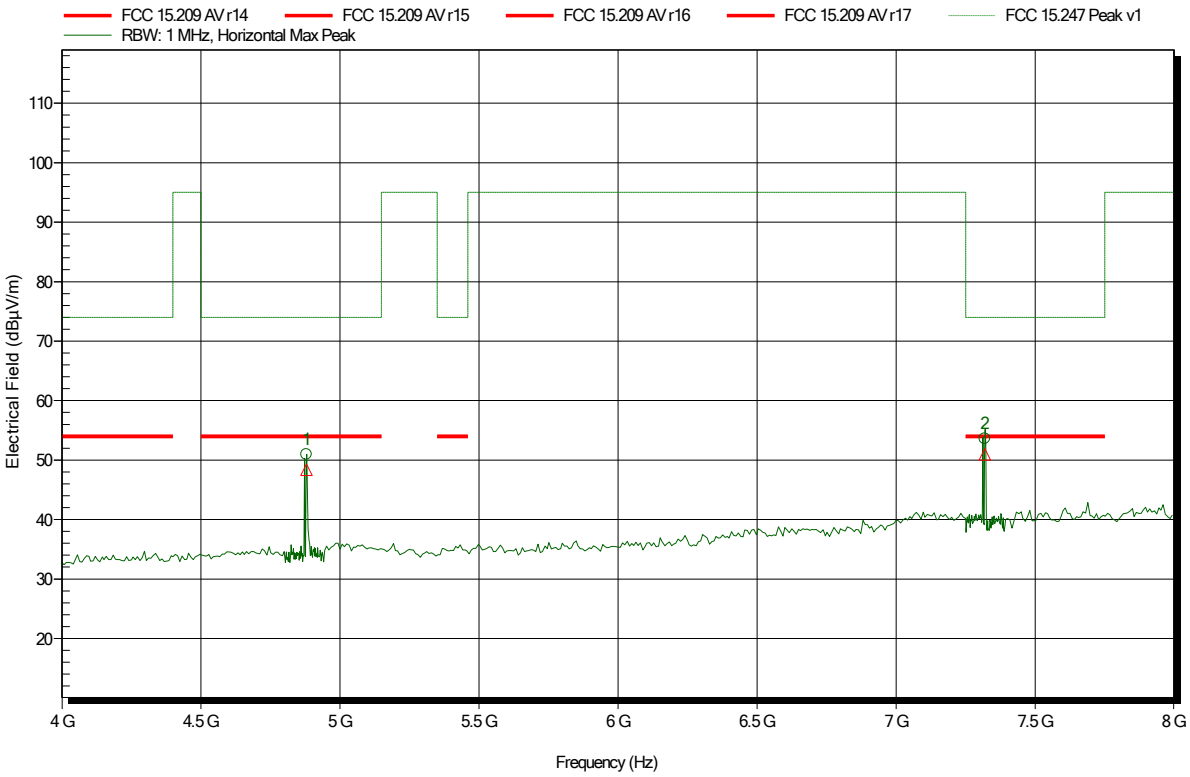
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.872 GHz	47.44 dBµV/m	74 dBµV/m	-26.56 dB	Pass
7.319 GHz	54.63 dBµV/m	74 dBµV/m	-19.37 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.319 GHz	52.19 dBµV/m	54 dBµV/m	-1.81 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

Index 2



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.88 GHz	50.96 dBµV/m	74 dBµV/m	-23.04 dB	Pass
7.319 GHz	53.61 dBµV/m	74 dBµV/m	-20.39 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.88 GHz	48.39 dBµV/m	54 dBµV/m	-5.61 dB	Pass
7.319 GHz	50.94 dBµV/m	54 dBµV/m	-3.06 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT horizontal – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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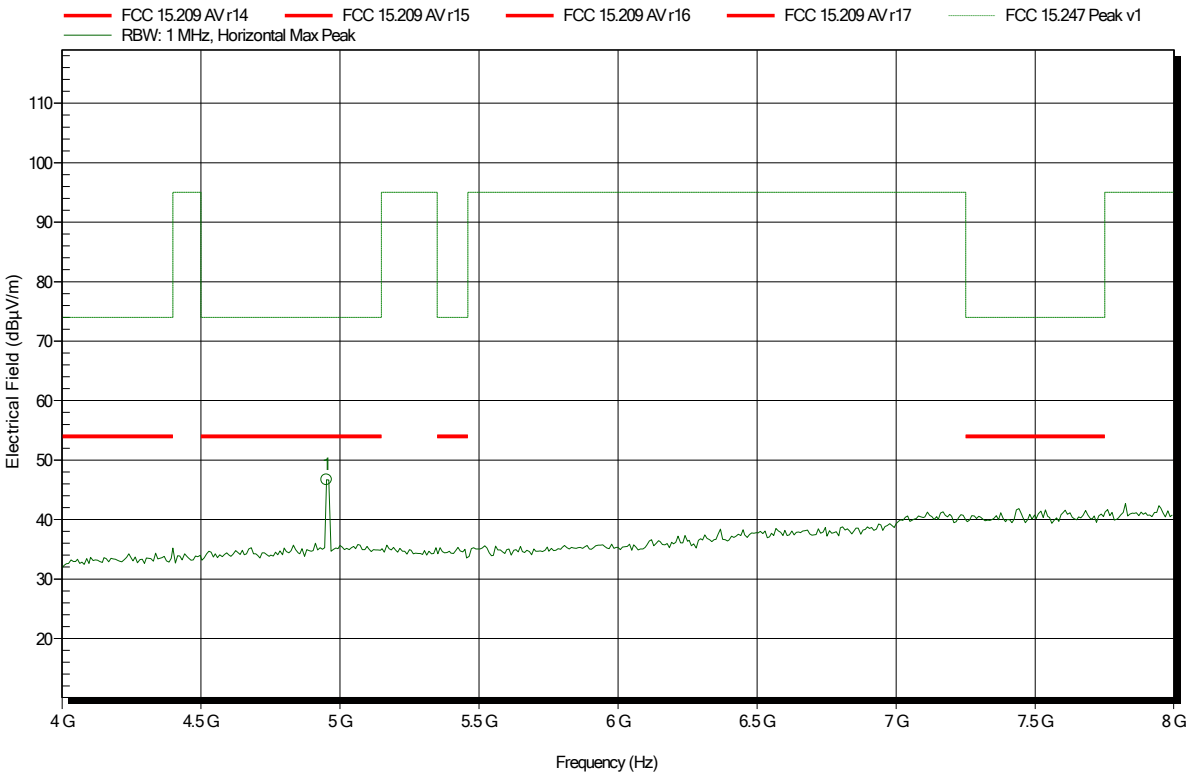
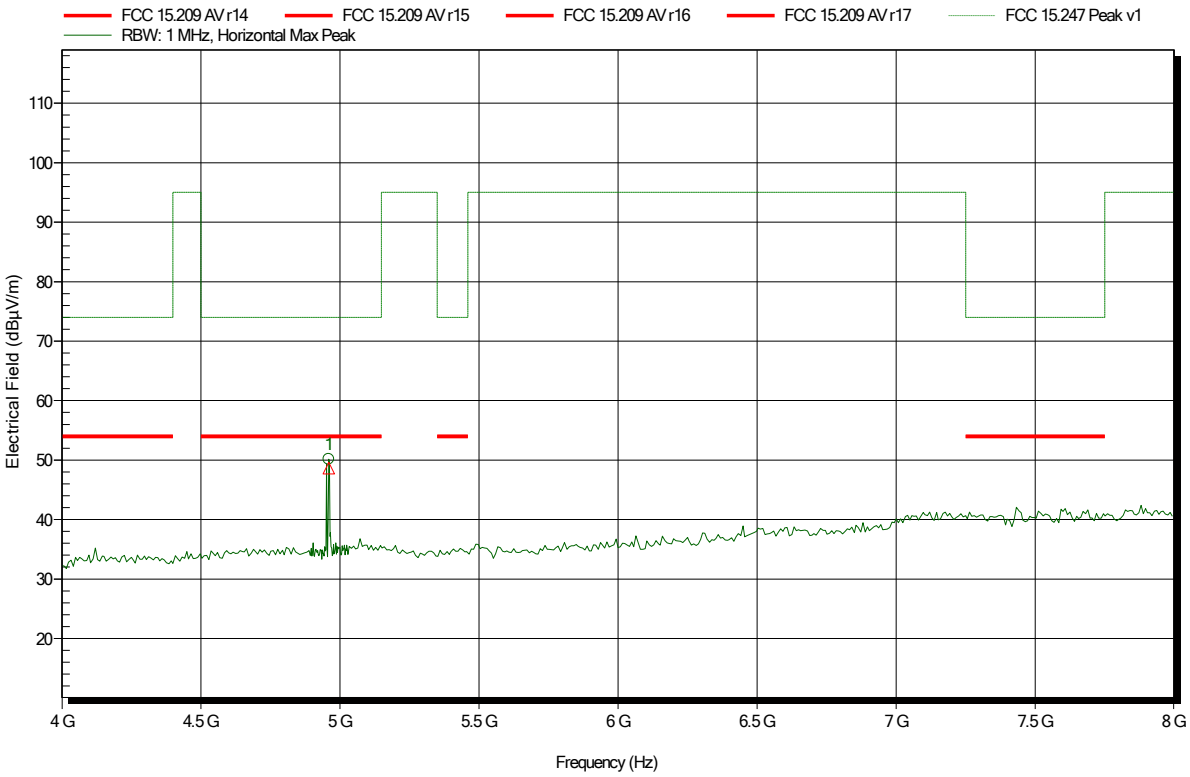


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.952 GHz	46.68 dBµV/m	74 dBµV/m	-27.32 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

Index 3



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.96 GHz	50.17 dBµV/m	74 dBµV/m	-23.83 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.96 GHz	48.61 dBµV/m	54 dBµV/m	-5.39 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT horizontal – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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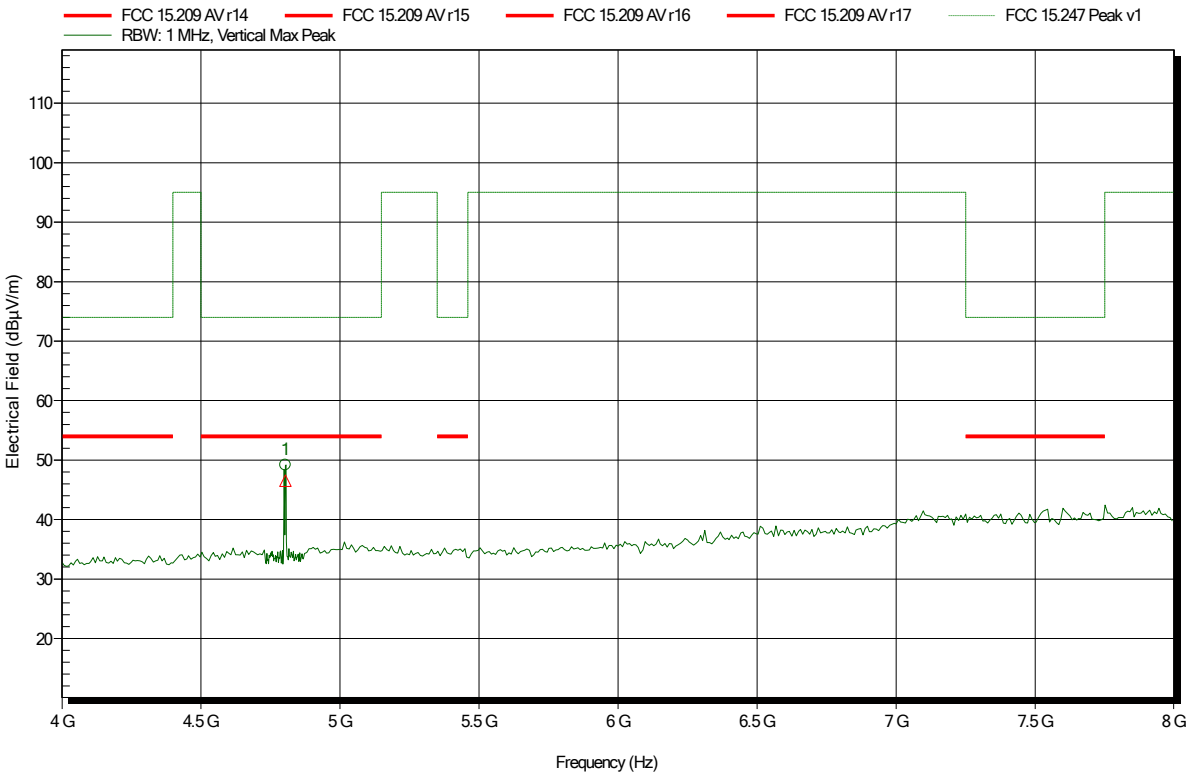

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.804 GHz	49.18 dBµV/m	74 dBµV/m	-24.82 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.804 GHz	46.52 dBµV/m	54 dBµV/m	-7.48 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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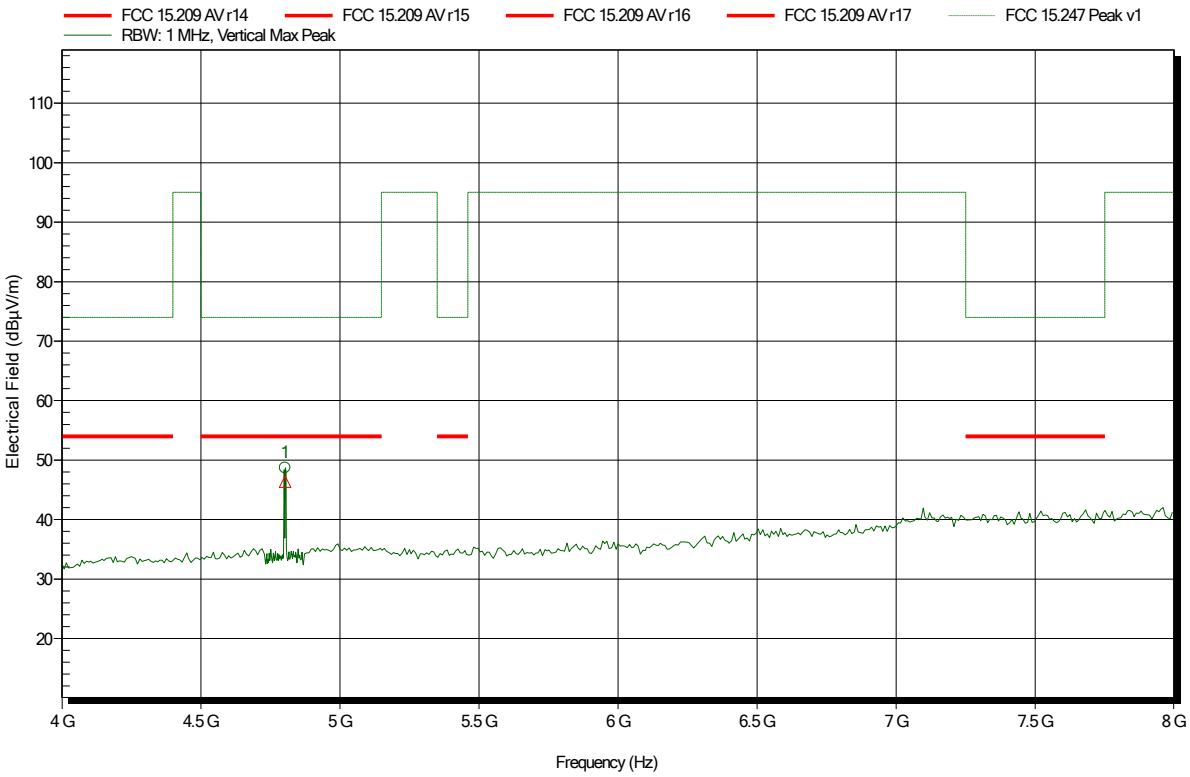

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.803 GHz	48.7 dBµV/m	74 dBµV/m	-25.3 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.803 GHz	46.39 dBµV/m	54 dBµV/m	-7.61 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440 MHz – EUT horizontal – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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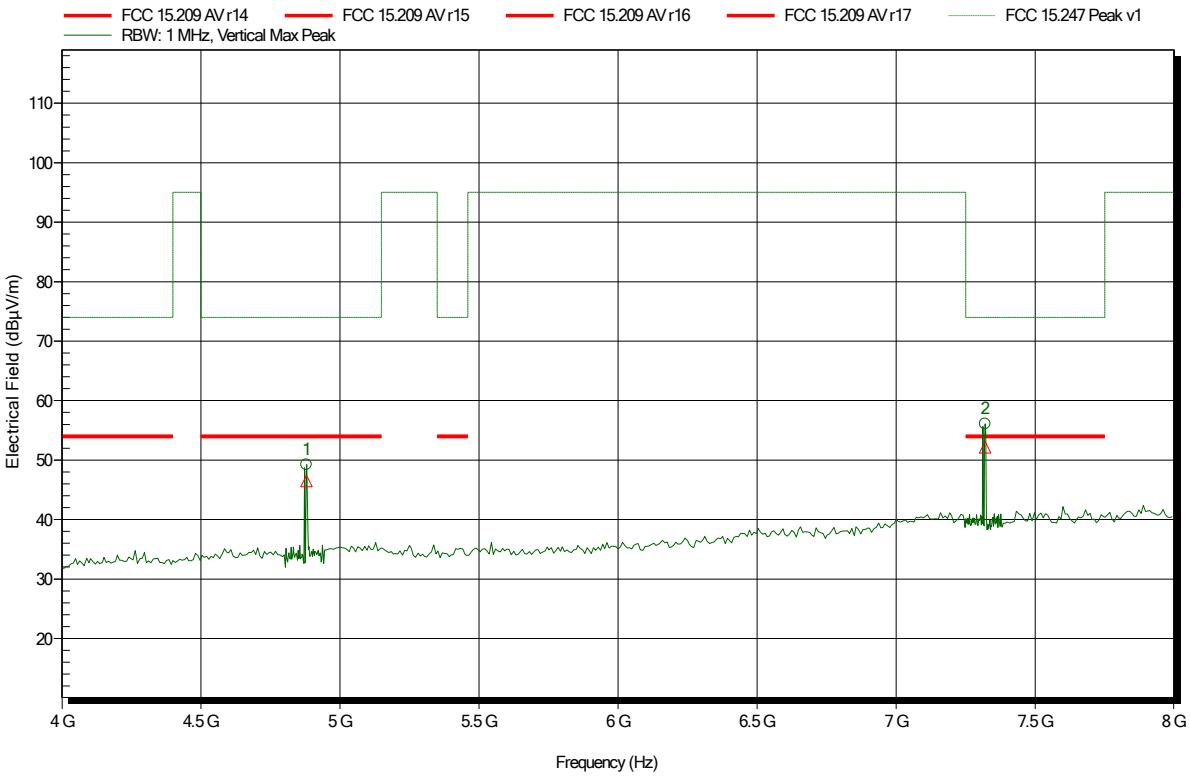

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.88 GHz	49.22 dBµV/m	74 dBµV/m	-24.78 dB	Pass
7.321 GHz	56.07 dBµV/m	74 dBµV/m	-17.93 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.88 GHz	46.48 dBµV/m	54 dBµV/m	-7.52 dB	Pass
7.321 GHz	52.13 dBµV/m	54 dBµV/m	-1.87 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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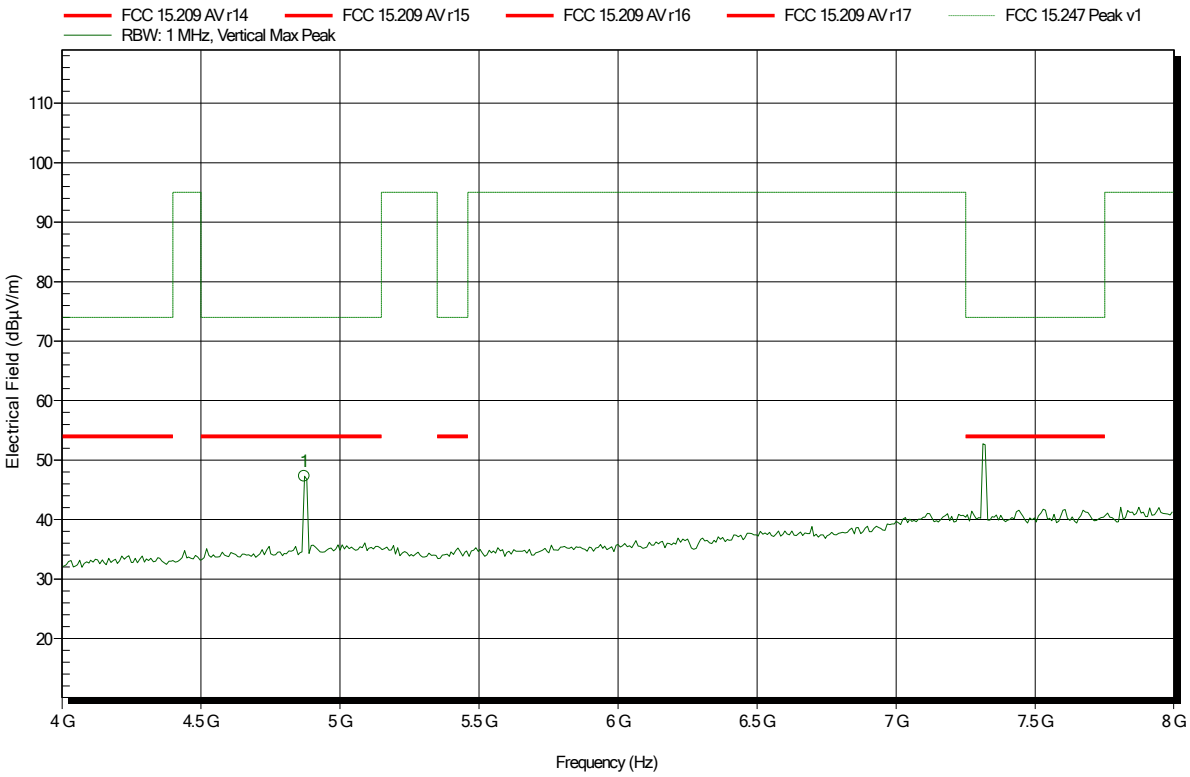

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.872 GHz	47.3 dBµV/m	74 dBµV/m	-26.7 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT horizontal – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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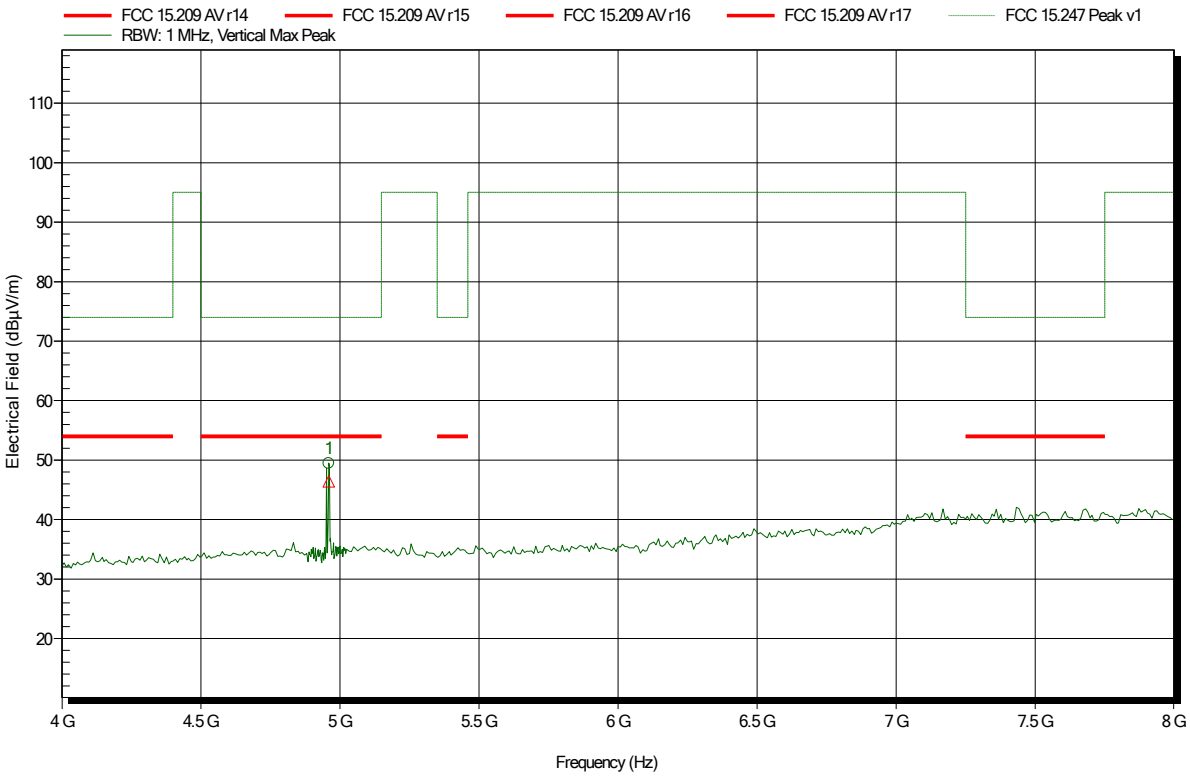

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.96 GHz	49.47 dBµV/m	74 dBµV/m	-24.53 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.96 GHz	46.43 dBµV/m	54 dBµV/m	-7.57 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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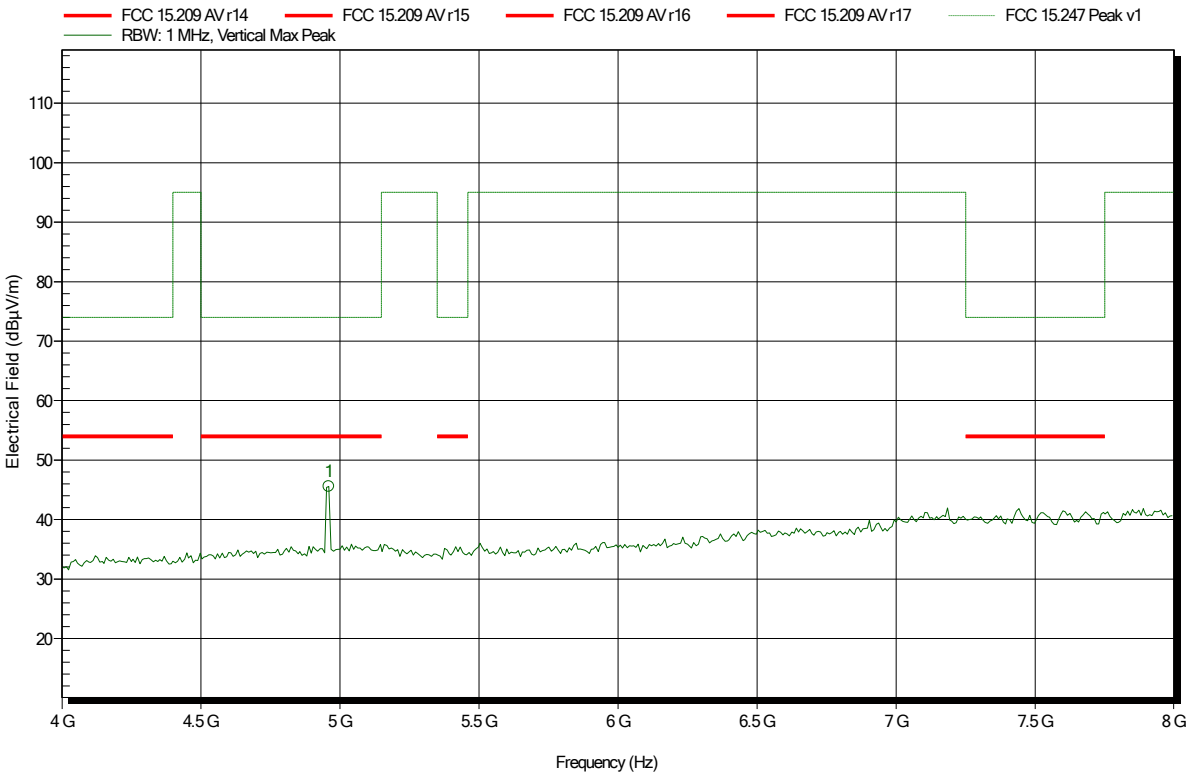

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.96 GHz	45.57 dBµV/m	74 dBµV/m	-28.43 dB	Pass

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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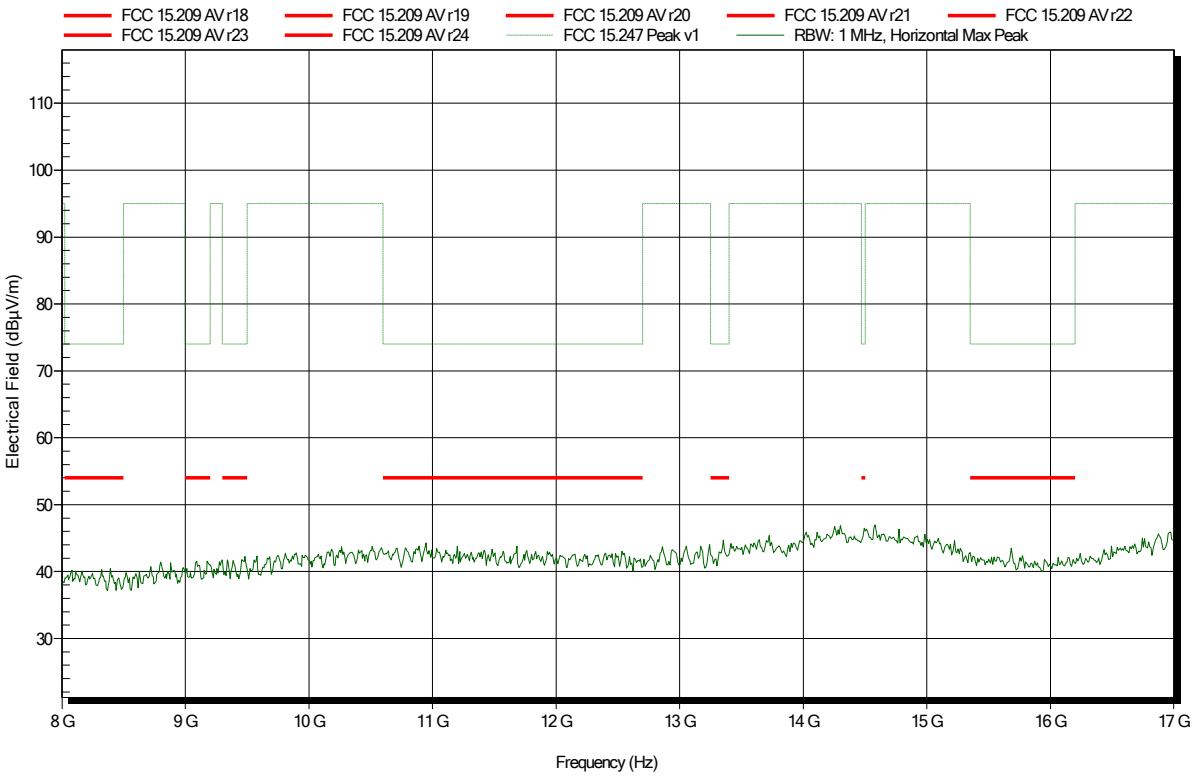

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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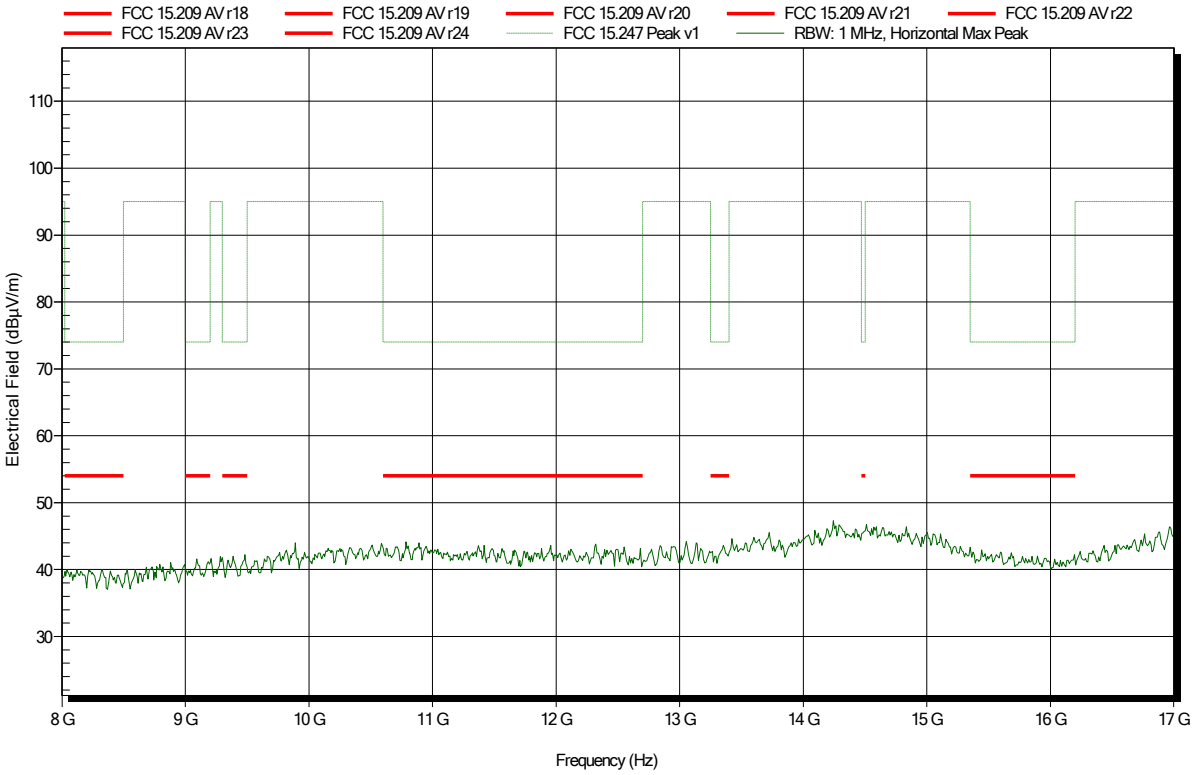

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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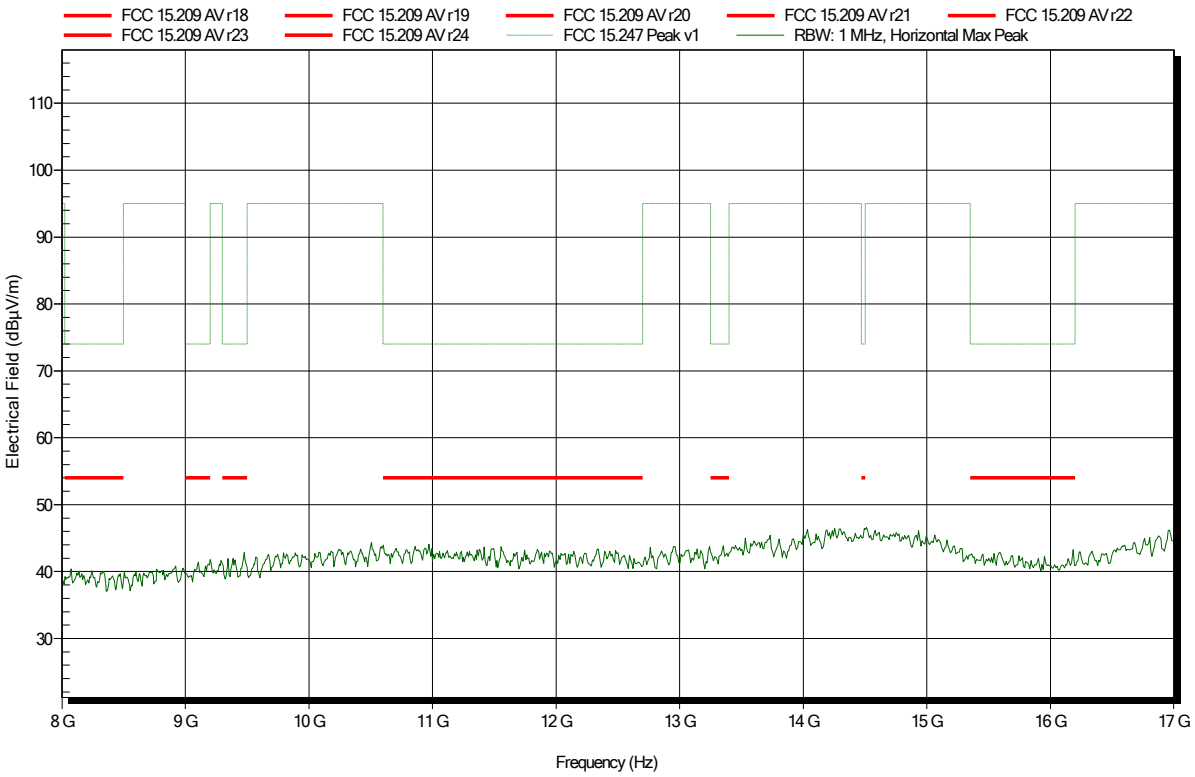

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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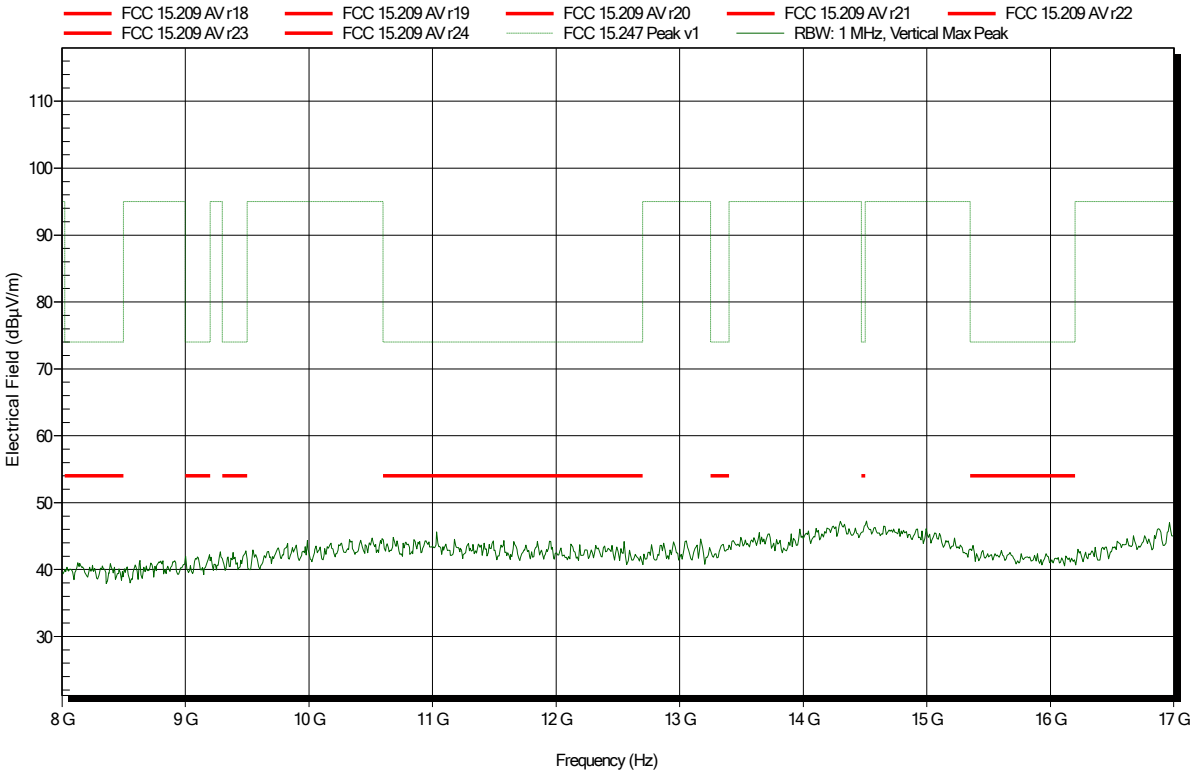

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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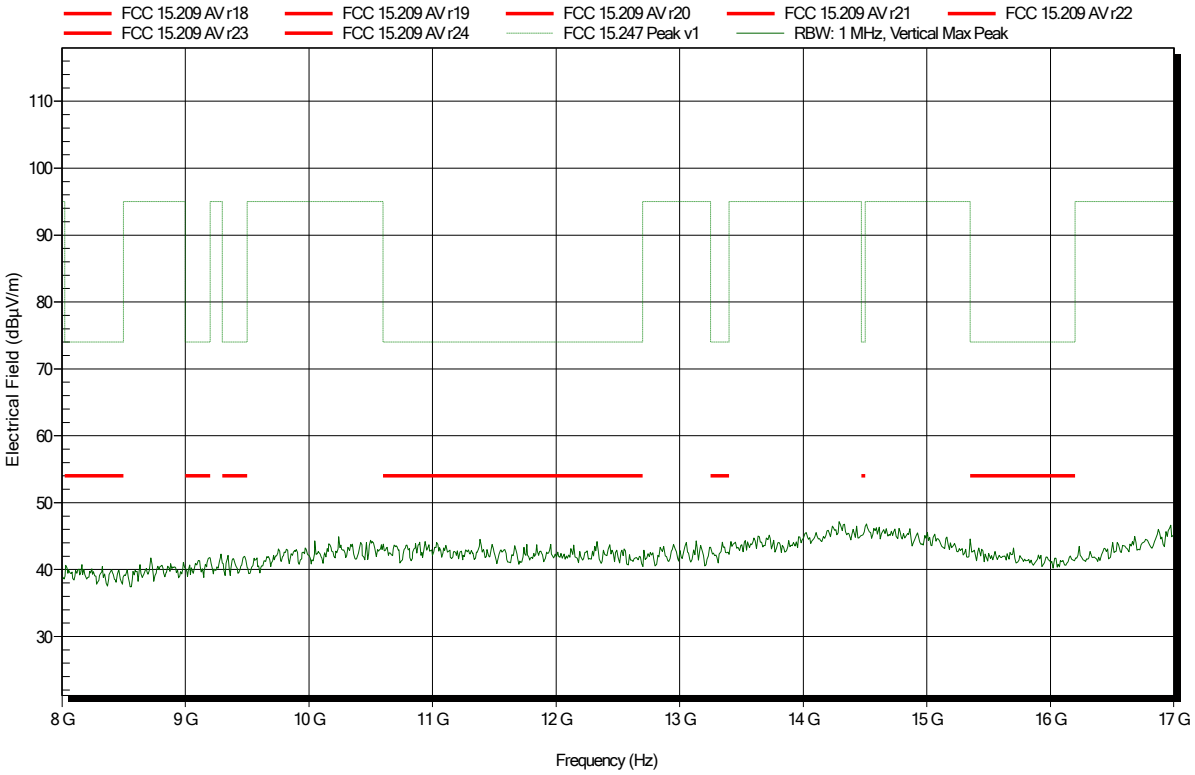

Spurious emissions according to FCC 47 CFR § 15.247

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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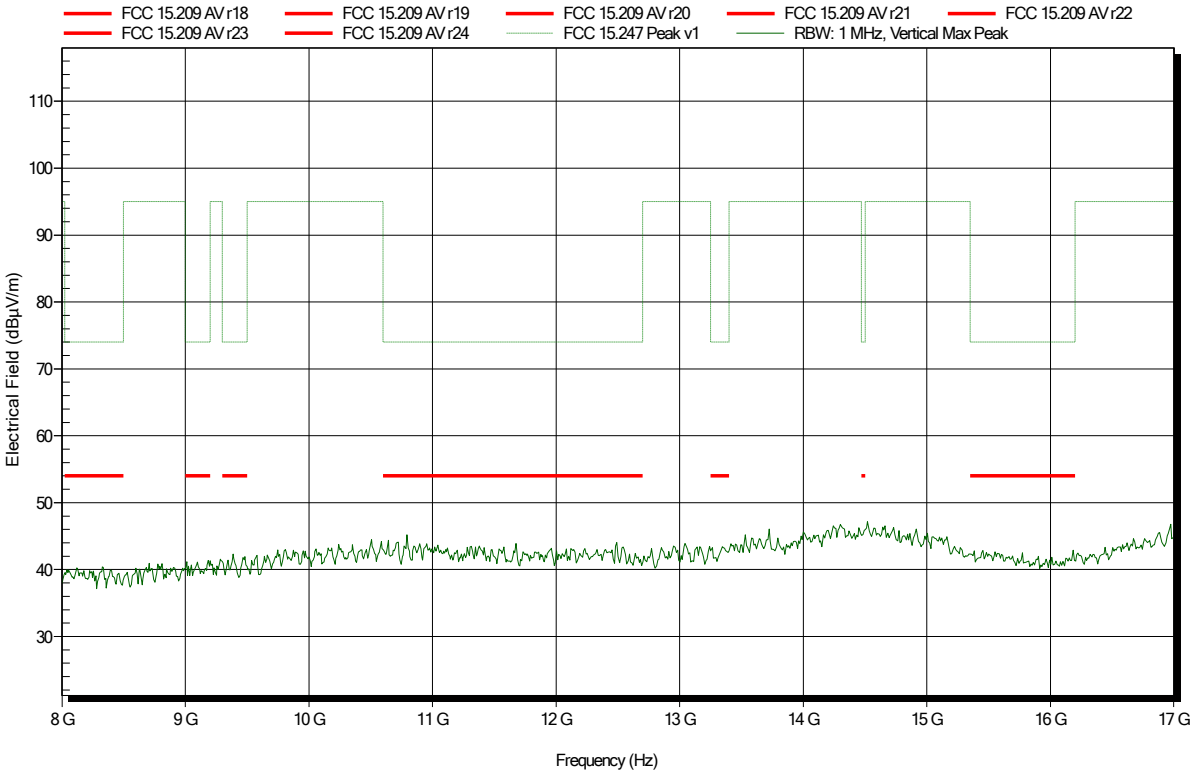

ANNEX B Receiver spurious emissions

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	HK116, Horizontal
Measurement distance:	3 m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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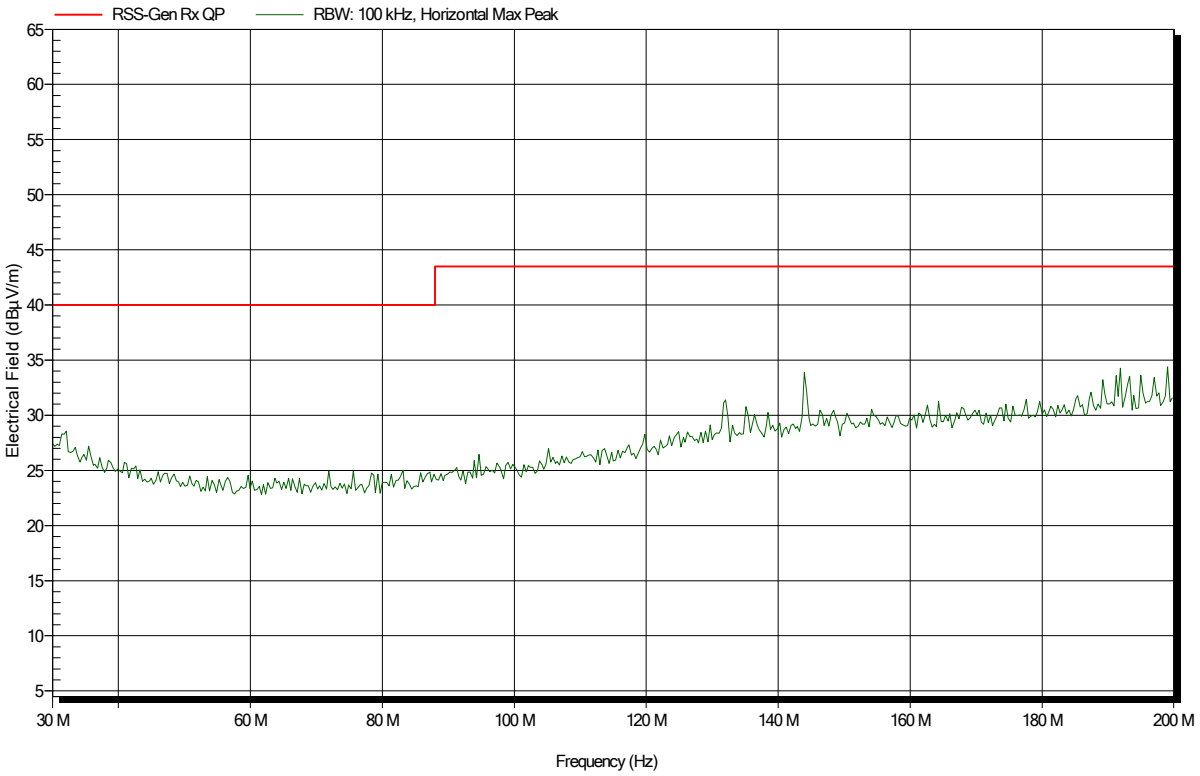

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	HK116, Vertical
Measurement distance:	3 m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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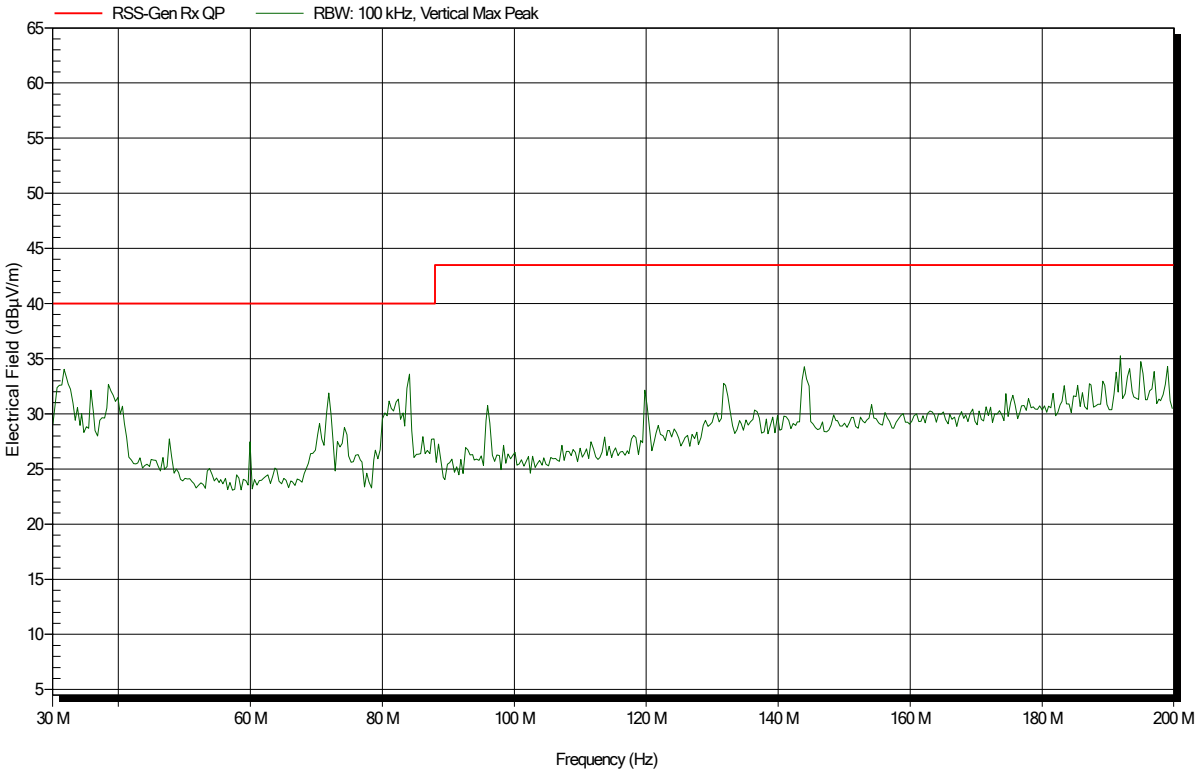

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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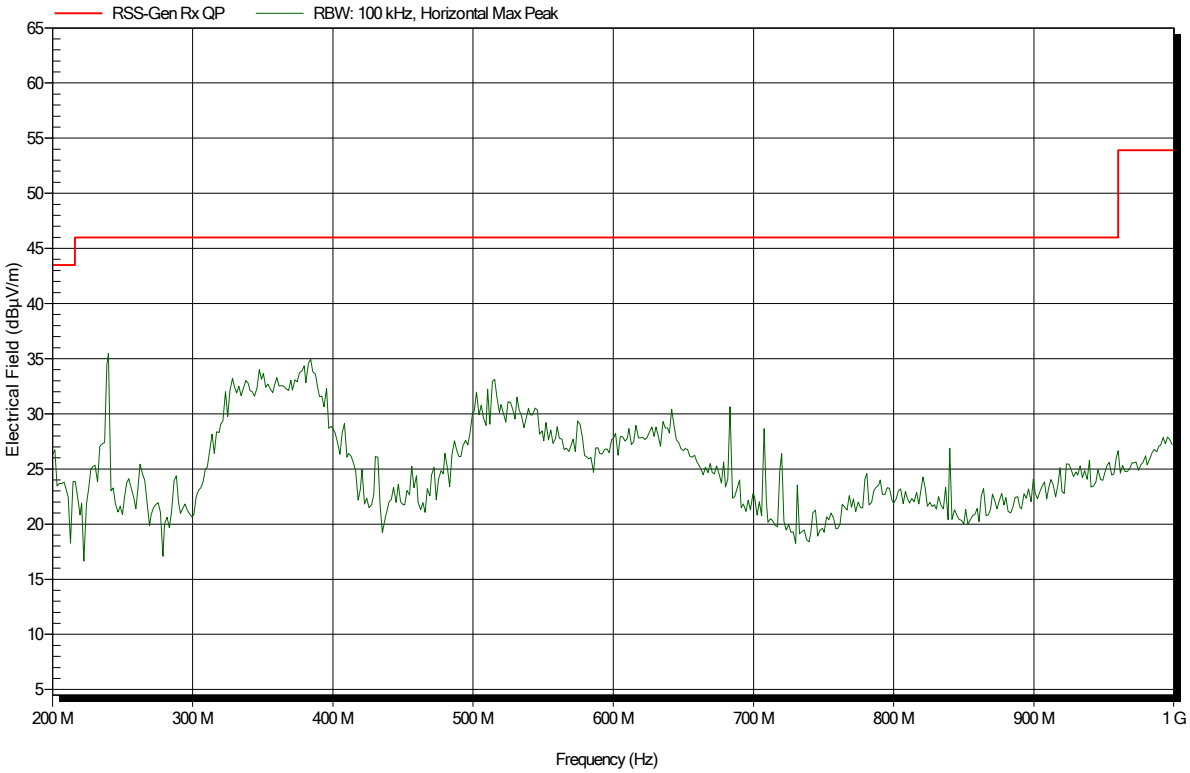

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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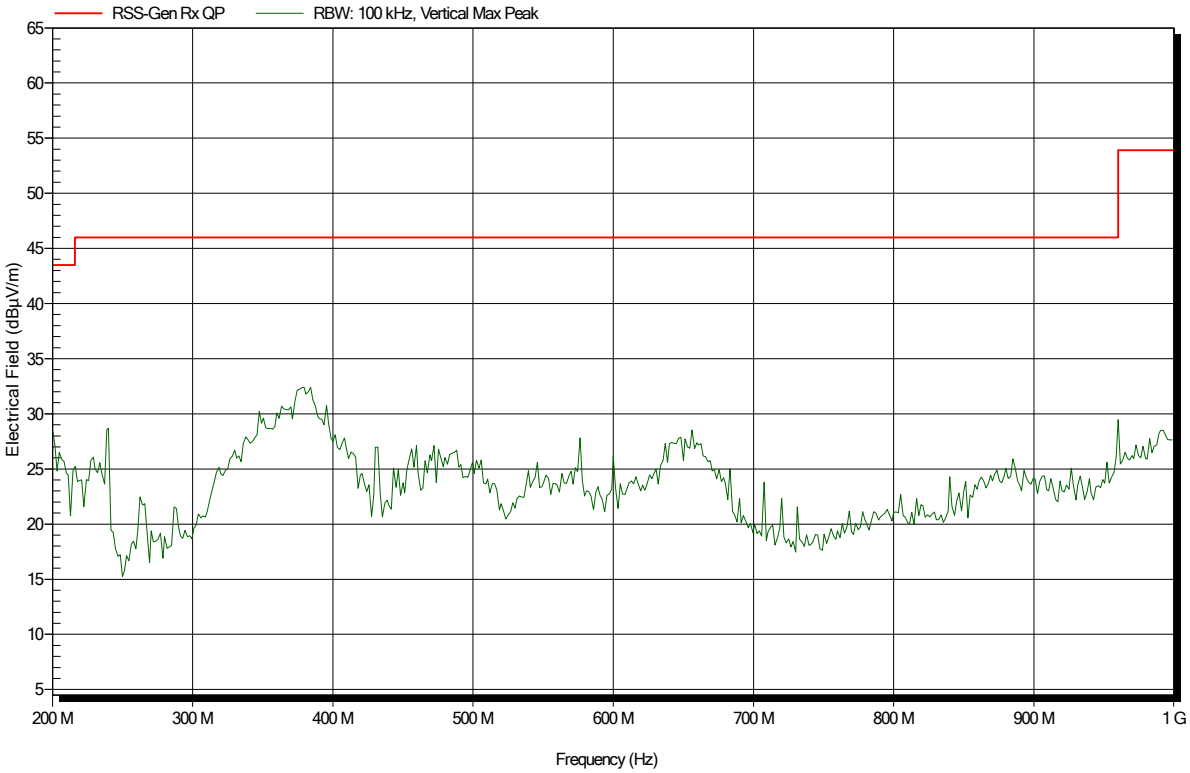

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Measurement software:	RadiMation, version 2015.2.4
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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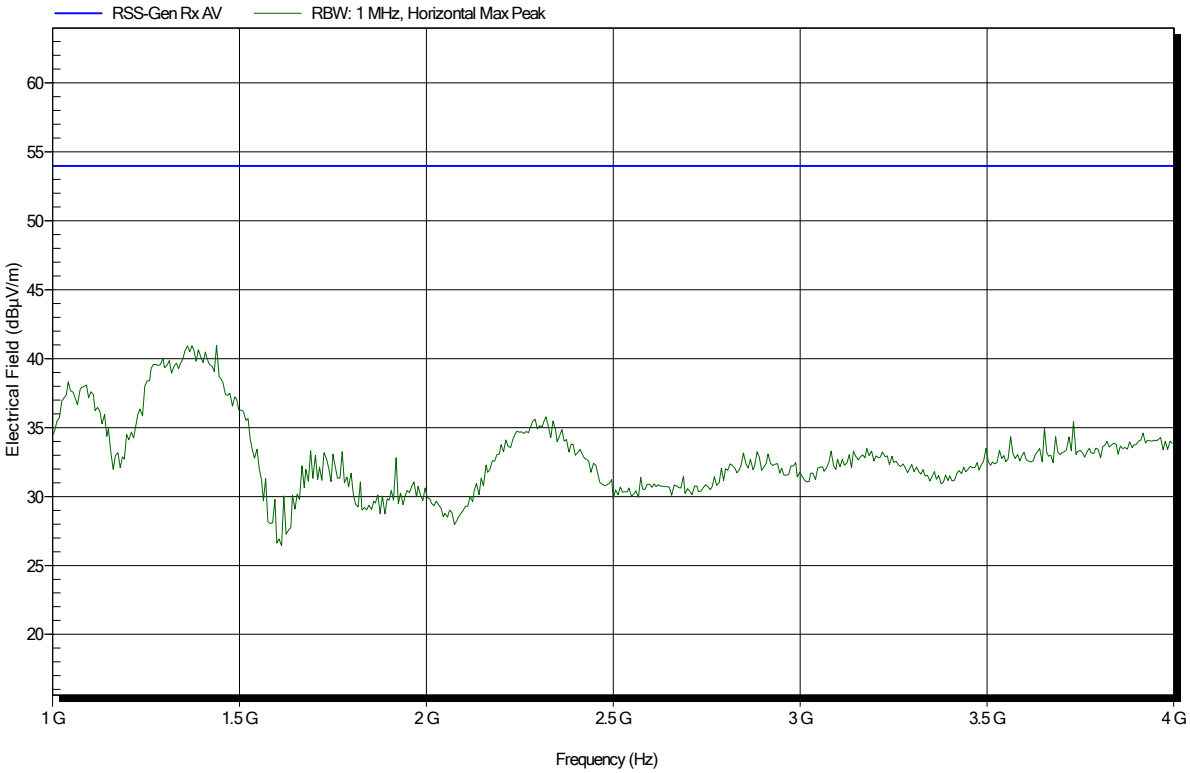

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Measurement software:	RadiMation, version 2015.2.4
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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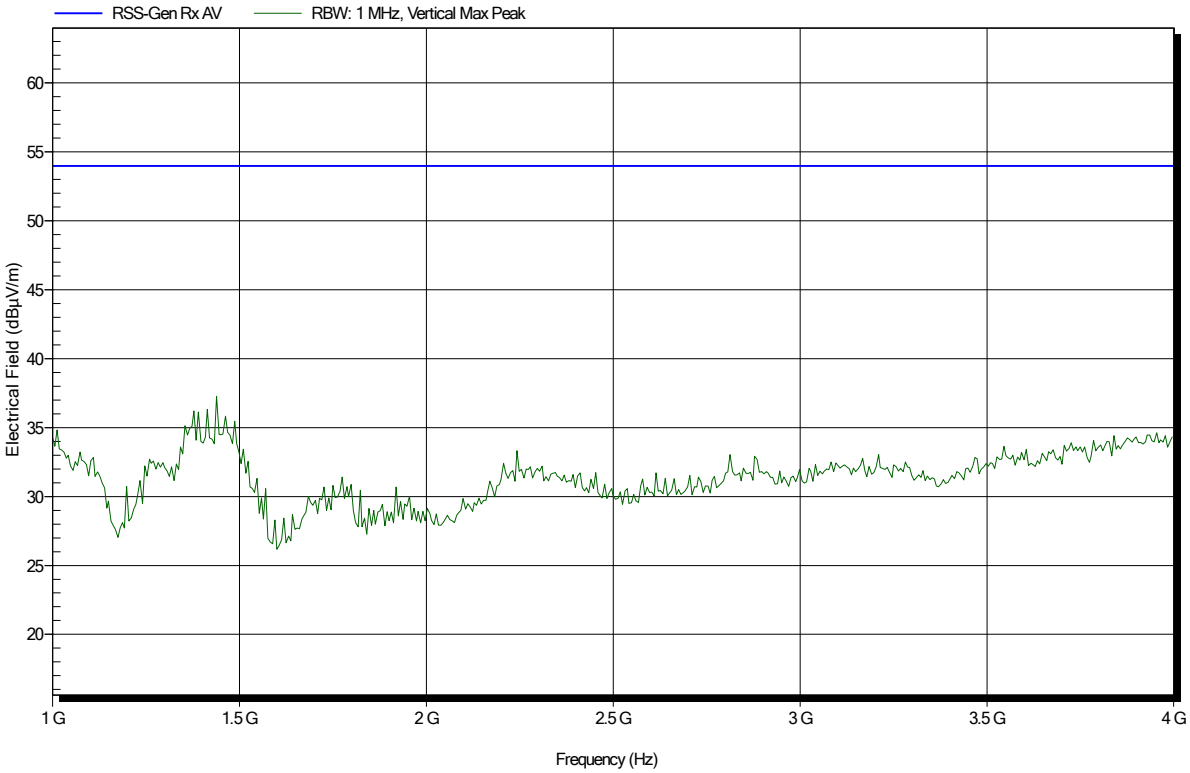

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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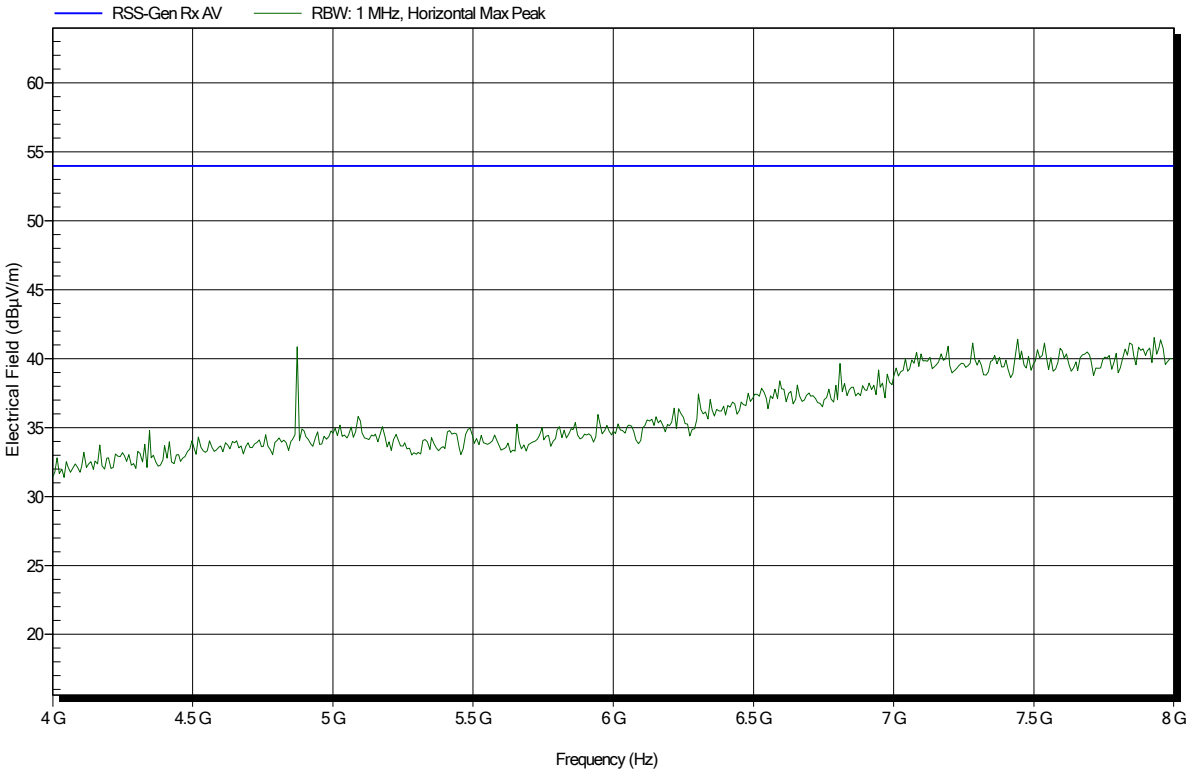

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Measurement software:	RadiMation, version 2015.2.4
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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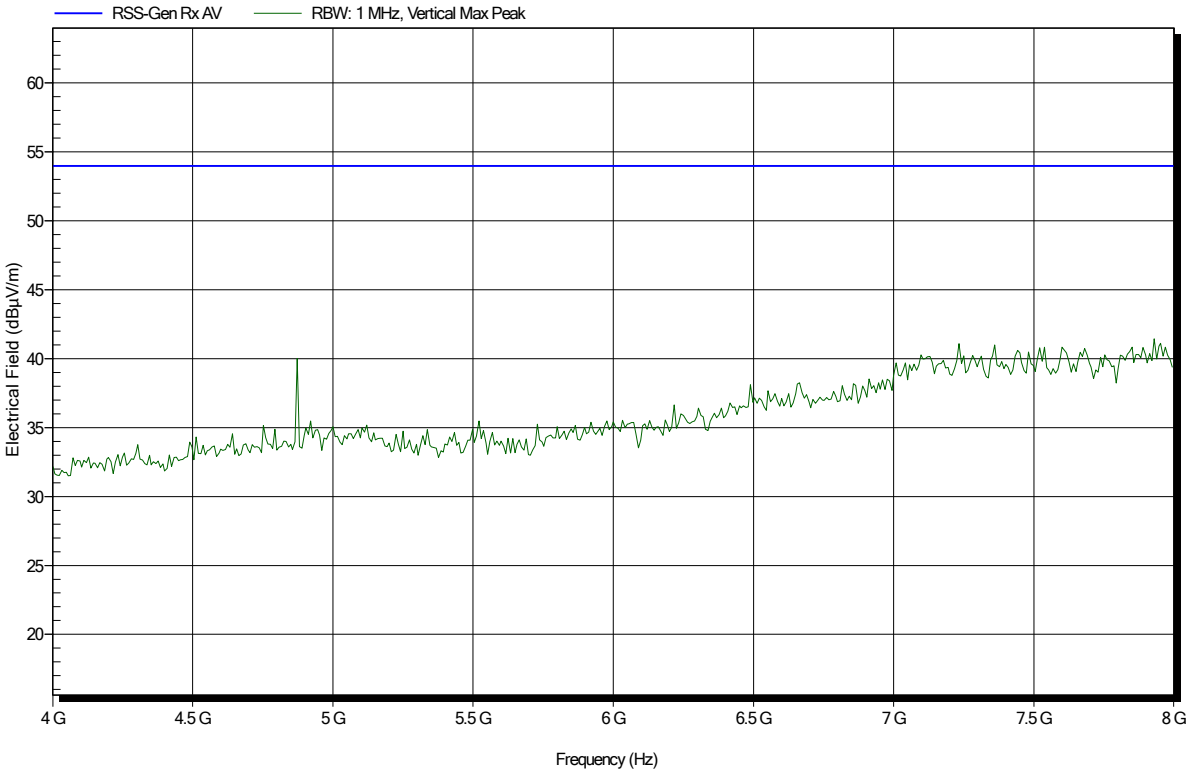

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Measurement software:	RadiMation, version 2015.2.4
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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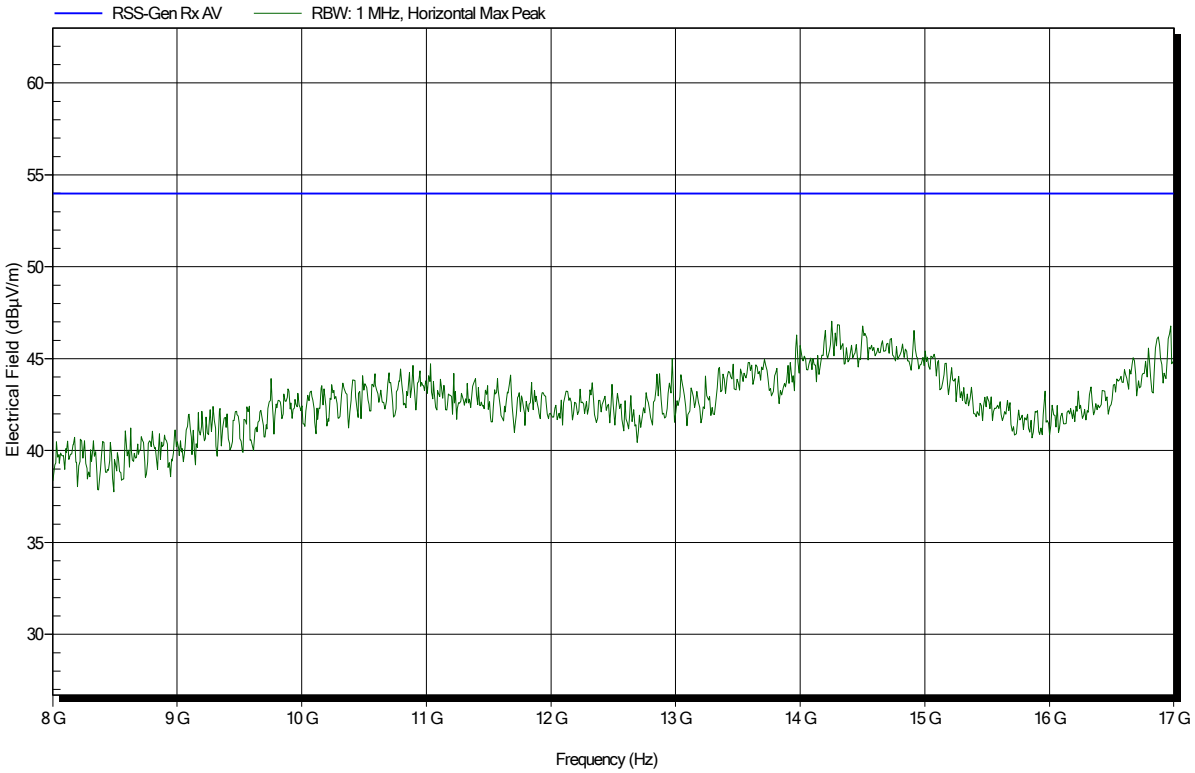
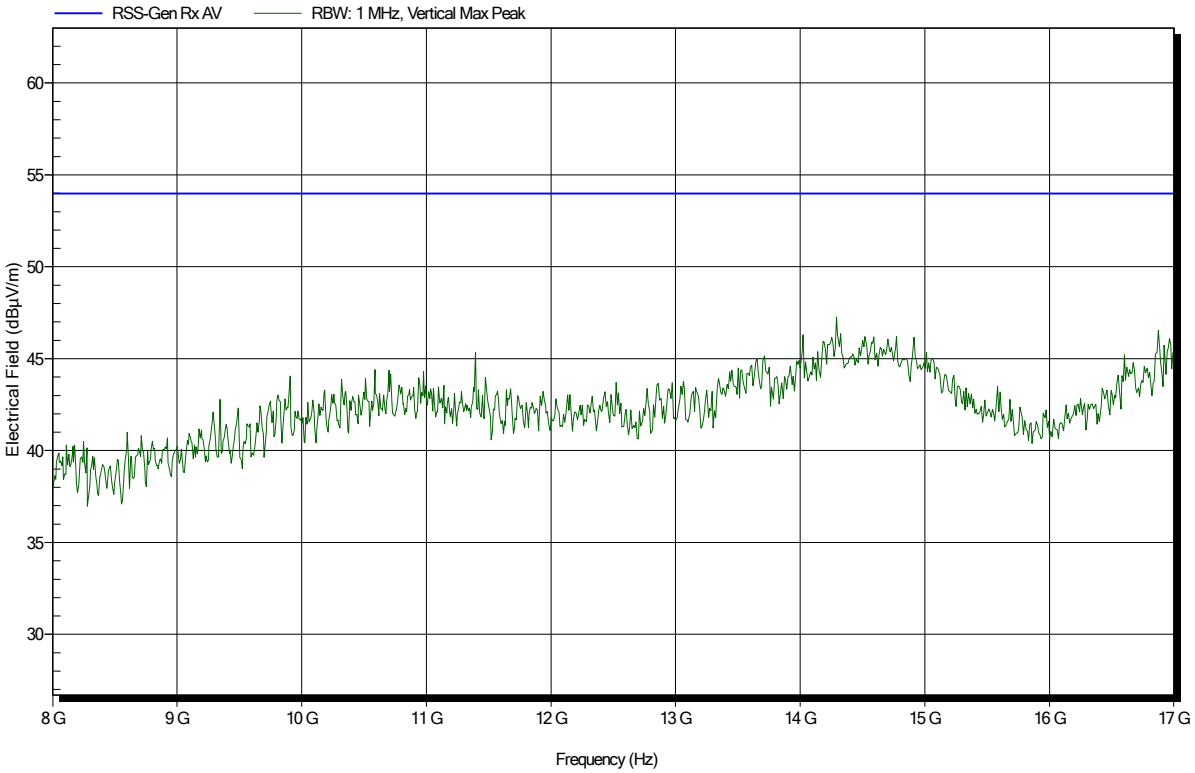


Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-2002-8796
Applicant:	Robert Bosch Tool Corporation
EUT Name:	Laser Rangefinder
Model:	GLM165-27C
Test Site:	Eurofins Product Service GmbH
Measurement software:	RadiMation, version 2015.2.4
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 23.5°C, Vnom: 3.0 VDC (external battery)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; 2440 MHz – EUT vertical – Test Sample ID 29603
Test Date:	2020-06-03
Note:	

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