





EMC TEST REPORT FCC 47 CFR Part 15B Industry Canada RSS-Gen Electromagnetic compatibility - Unintentional radiators		
Report Reference No.	G0M-1409-4119-EF0115B-V02	
Testing Laboratory	Eurofins Product Service GmbH	
Address	Storkower Str. 38c 15526 Reichenwalde Germany	
Accreditation	  A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A	
Applicant's name	Leica Geosystems AG	
Address	Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND	
Test specification:		
Standard.....	47 CFR Part 15 Subpart B RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009	
Equipment under test (EUT):		
Product description	GNSS Receiver for Machine Control	
Model No.	iCG80	
Additional Models	None	
Hardware version	Pantani PROTO1	
Firmware / Software version	None	
FCC / IC ID	FCC-ID: RFD-ICG8XNG	IC: 3177A-ICG8XNG
Test result	Passed	

Possible test case verdicts:	
- not applicable to test object	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
Testing:	
Date of receipt of test item	2014-09-22
Date (s) of performance of tests	2015-02-12 – 2015-02-26
Compiled by	Marcus Klein
Tested by (+ signature).....	Marcus Klein 
Approved by (+ signature)	Jens Marquardt 
Date of issue.....	2015-07-01
Total number of pages.....	62
General remarks:	
<p>The test results presented in this report relate only to the object tested.</p> <p>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.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p>	
Additional comments:	

Version History

Version	Issue Date	Remarks	Revised by
V01	2015-04-13	Initial Release	
V02	2015-07-01	Replaced Document: G0M-1409-4119-EF0115B-V01 Replaced By: G0M-1409-4119-EF0115B-V02 Reason: FCC / IC IDs corrected	M. Klein

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1 Equipment (Test item) Description

Description	GNSS Receiver for Machine Control	
Model	iCG80	
Additional Models	None	
Serial number	None	
Hardware version	Pantani PROTO1	
Software / Firmware version	None	
FCC-ID	RFD-ICG8XNG	
IC-ID	3177A-ICG8XNG	
Power supply	24 VDC	
Radio module	Type	Internal Radio
	FCC ID	KNY-42182112519
	IC ID	2329B-FGR209
	Model	SLR900
	Manufacturer	Intuicom
Manufacturer	Leica Geosystems AG Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND	
Highest emission frequency	Fmax [MHz] = 2600	
Device classification	Class B	
Equipment type	Tabletop	
Number of tested samples	1	

1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
SIM	Radio Communication Tester	R&S	CMW	-
AE	Notebook	lenovo	R61	-
AE	Power Supply	TTi	EX752M	-

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

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.5 Input / Output Ports

Port #	Name	Type*	Max. Cable Length	Cable Shielded	Comments
1	DC Power	DC	>3m	No	
2	Ethernet	TP	2m	Yes	Service only
3	USB	I/O	<3m	Yes	Service only
4	GNSS Antenna	I/O	10m	Yes	2x
5	GSM Antenna	I/O	10m	Yes	1x
6	Radio Antenna	I/O	10m	Yes	1x
7	CAN	I/O	10m	No	1x
8	Lemo P1	I/O	2m	Yes	Service only
9	Lemo P2	I/O	1m	Yes	-

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

AC : AC power port

DC : DC power port

N/E : Non electrical

I/O : Signal input or output port

TP : Telecommunication port

1.6 Operating Modes and Configurations

Mode #	Description
1	24 VDC, GSM850, SRD900MHz, BT2.1, CAN, GPS receive
2	24 VDC, GSM1900, SRD900MHz, BT2.1, CAN, GPS receive
3	24 VDC, UMTS FDDII, SRD900MHz, BT2.1, CAN, GPS receive
4	24 VDC, UMTS FDDV, SRD900MHz, BT2.1, CAN, GPS receive

Configuration #	EUT Configuration
1	Fully equipped with 2 GPS Antennas, 1 GSM Antenna, 1 SRD Antenna

1.7 Test Equipment Used During Testing

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

Radiated emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD-Antenne	R&S	HL 223	EF00187	2014-03	2017-03
Horn antenna	Schwarzbeck	BBHA 9120D	EF00018	2013-09	2016-09
EMI Test Receiver	R&S	ESU26	EF00887	2015-01	2016-01

Conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2014-11	2016-11
AMN	R&S	ESH3-Z5	EF00036	2014-12	2016-12
EMI Test Receiver	R&S	ESCS 30	EF00295	2014-10	2015-10

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

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

2 Result Summary

FCC 47 CFR Part 15B, Industry Canada RSS-Gen				
Product Specific Standard	Requirement – Test	Reference Method	Result	Remarks
47 CFR 15.109 RSS-Gen 4.9 & 4.10	Radiated emissions	ANSI C 63.4	PASS	
47 CFR 15.107 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS	
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

Radiated emissions acc. FCC 47 CFR 15.109 / IC RSS-Gen		Verdict: PASS				
Laboratory Parameters:	Required prior to the test	During the test				
Ambient Temperature	15 to 35 °C	24°C				
Relative Humidity	30 to 60 %	33%				
Test according referenced standards	Reference Method					
	ANSI C63.4					
Sample is tested with respect to the requirements of the equipment class	Equipment class					
	Class B					
Test frequency range determined from highest emission frequency	Highest emission frequency					
	Fmax [MHz] = 2600					
Fully configured sample scanned over the following frequency range	Frequency range					
	30 MHz to 13 GHz					
Operating mode and configuration	1 - 1 / 2 / 3 / 4					
Limits and results Class B						
Frequency [MHz]	Quasi-Peak [dB μ V/m]	Result	Average [dB μ V/m]	Result	Peak [dB μ V/m]	Result
30 – 88	40	PASS	-		-	-
88 – 216	43.5	PASS	-		-	-
216 – 960	46	PASS	-		-	-
960 – 1000	54	PASS	-		-	-
> 1000	-	-	54	PASS	74	PASS
Comments:						

Test Procedure:

The test site is in accordance with ANSI C63-4:2009 requirements and is listed by FCC.

The measurement procedure is as follows:

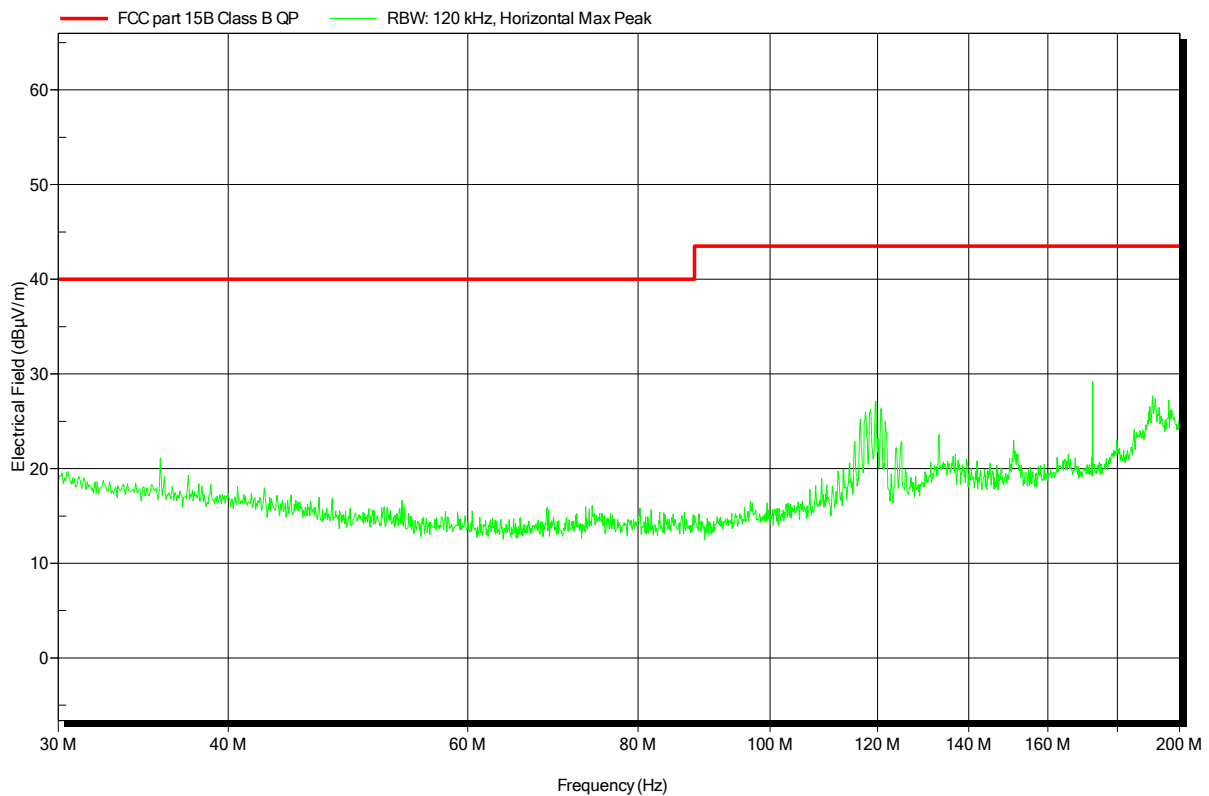
- 1) The EUT was placed on a 0.8 m non conductive table at a 3 m distance from the receive antenna (ANSI C63.4: 2009 item 6.2)
- 2) The antenna output was connected to the measurement receiver
- 3) A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast
- 4) Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded.

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-12
Note:	

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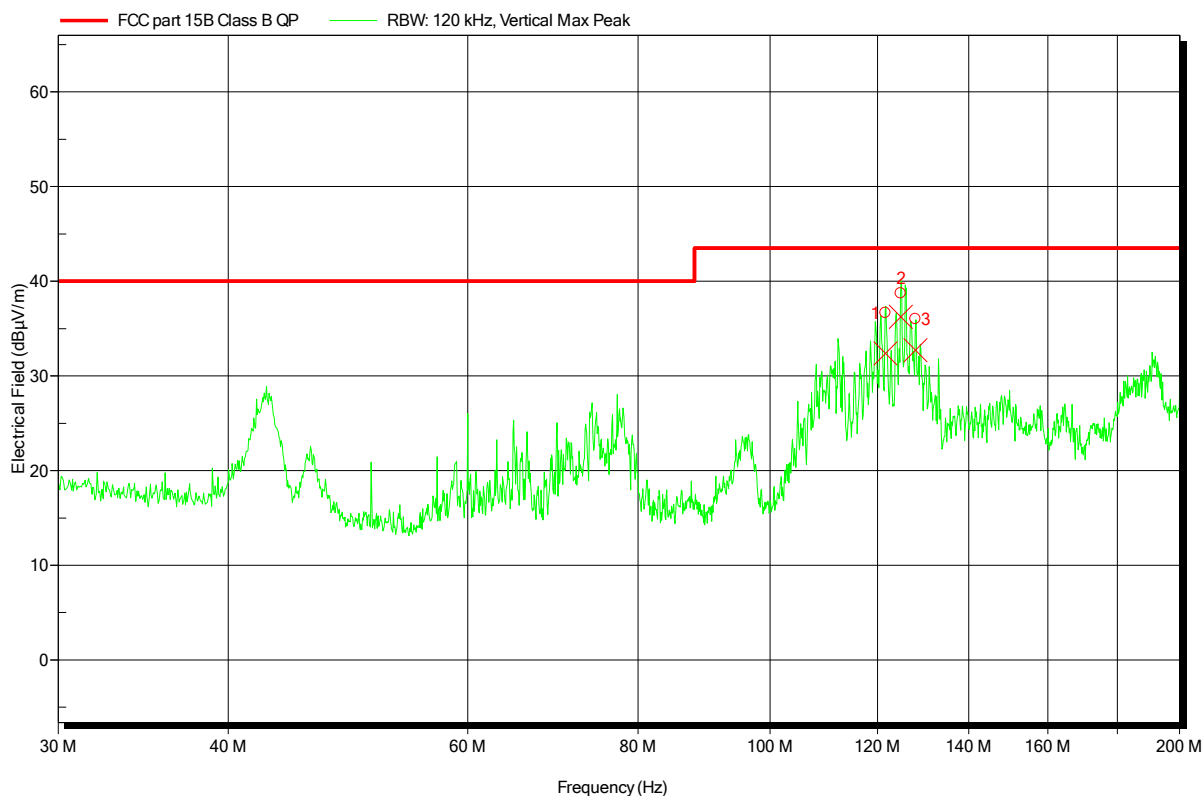


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-12
 Note:

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Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
121,572 MHz	32,37 dBµV/m	43,5 dBµV/m	-11,13 dB	Pass
124,8 MHz	36,25 dBµV/m	43,5 dBµV/m	-7,25 dB	Pass
127,92 MHz	32,7 dBµV/m	43,5 dBµV/m	-10,8 dB	Pass

Test Report No.: G0M-1409-4119-EF0115B-V02

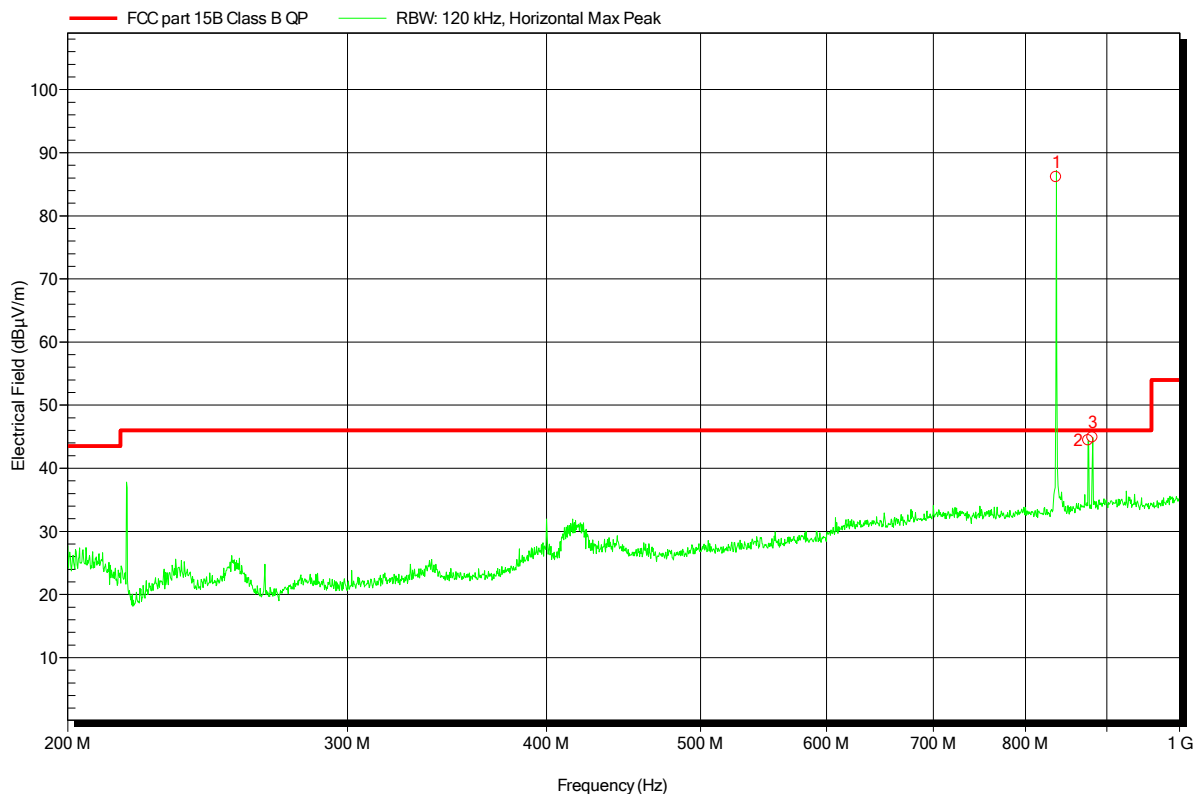
 Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-12
 Note: Peak 1: GSM downlink
 Peak 2/3: GSM uplink

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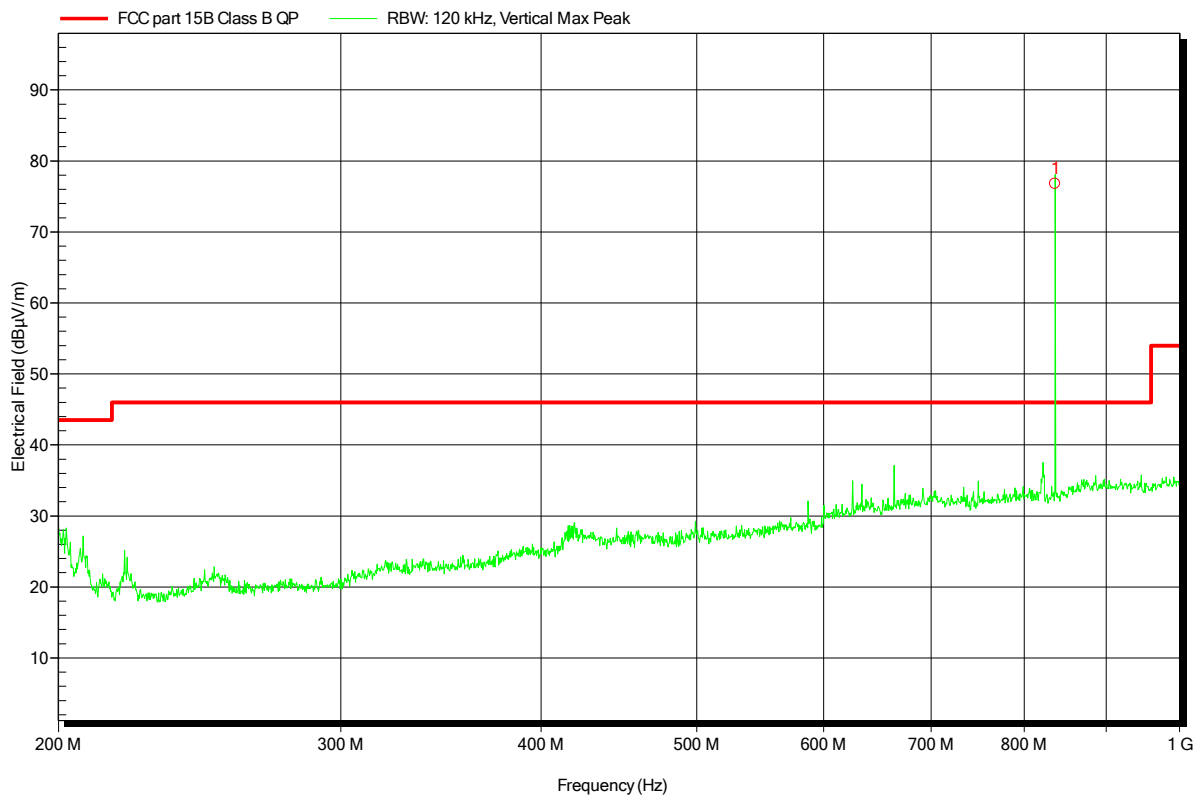
Frequency
 836,165 MHz
 876,021 MHz
 881,271 MHz

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-12
Note:	Peak 1: GSM Carrier

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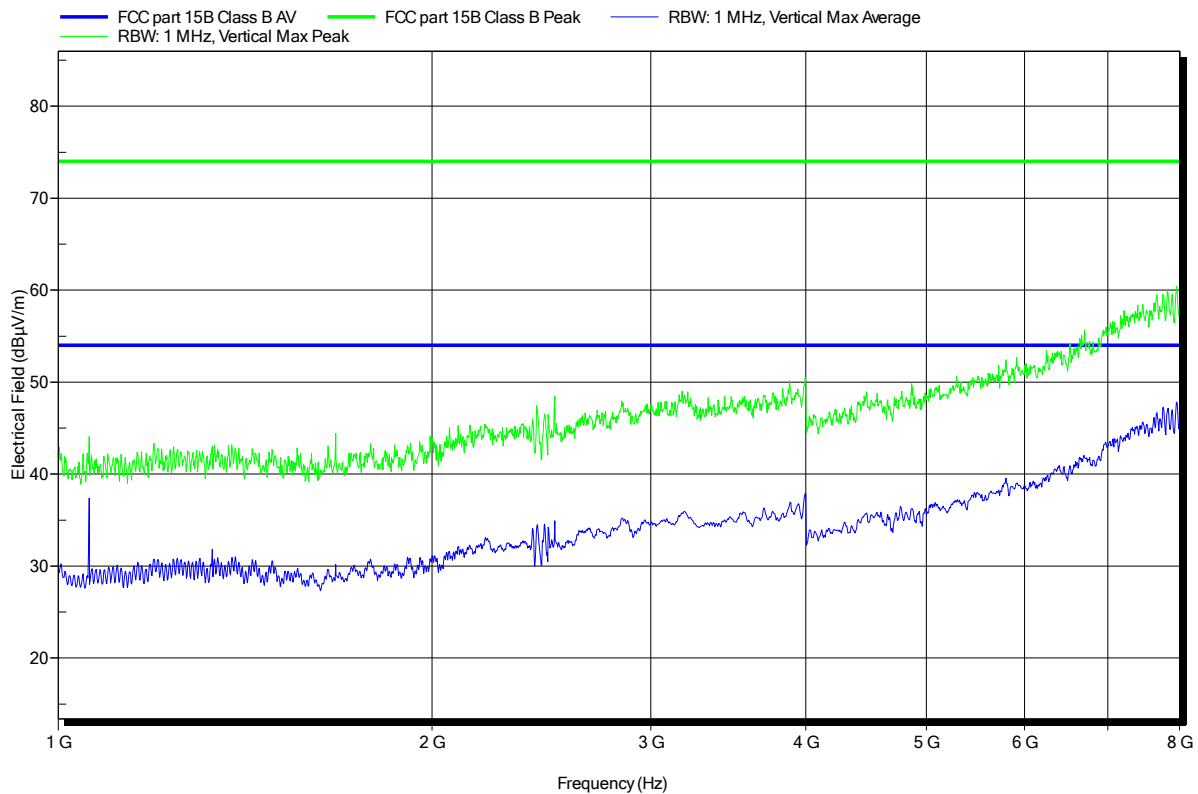

 Frequency
 836,18 MHz

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-12
 Note:

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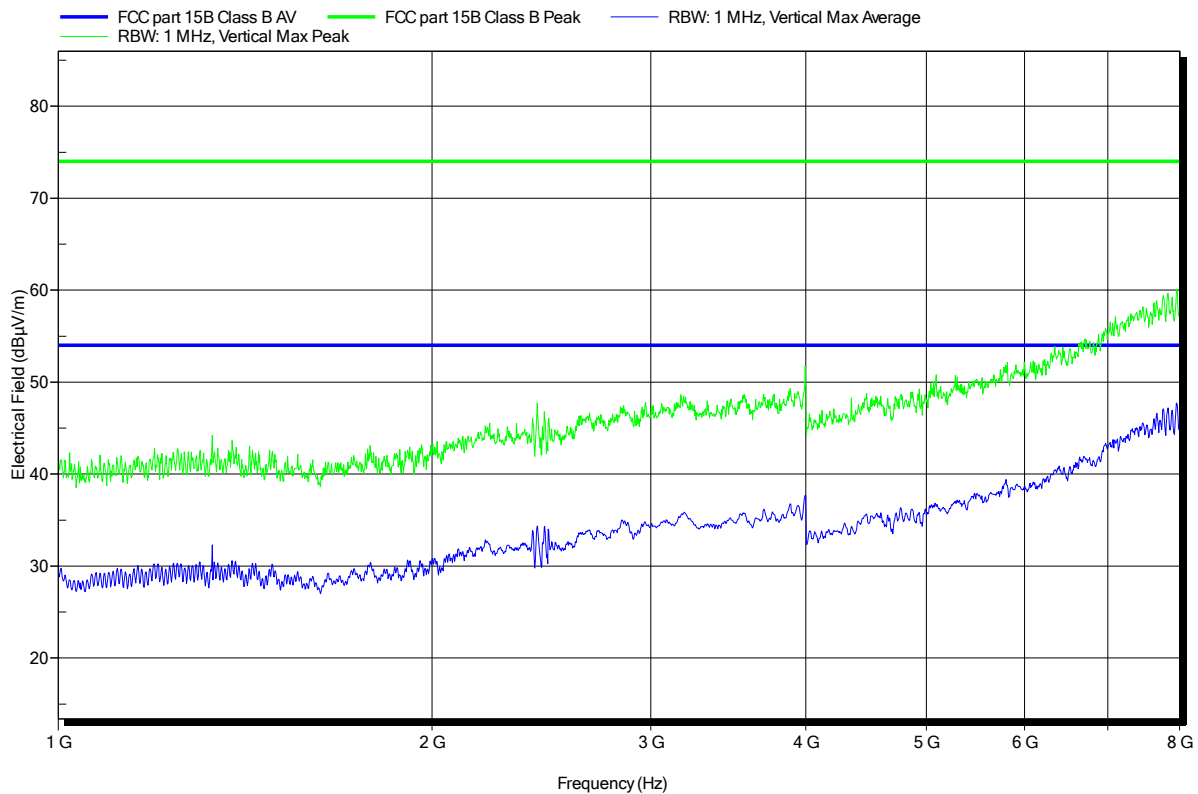


Spurious emissions under normal conditions according to FCC 15B

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 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-12
 Note:

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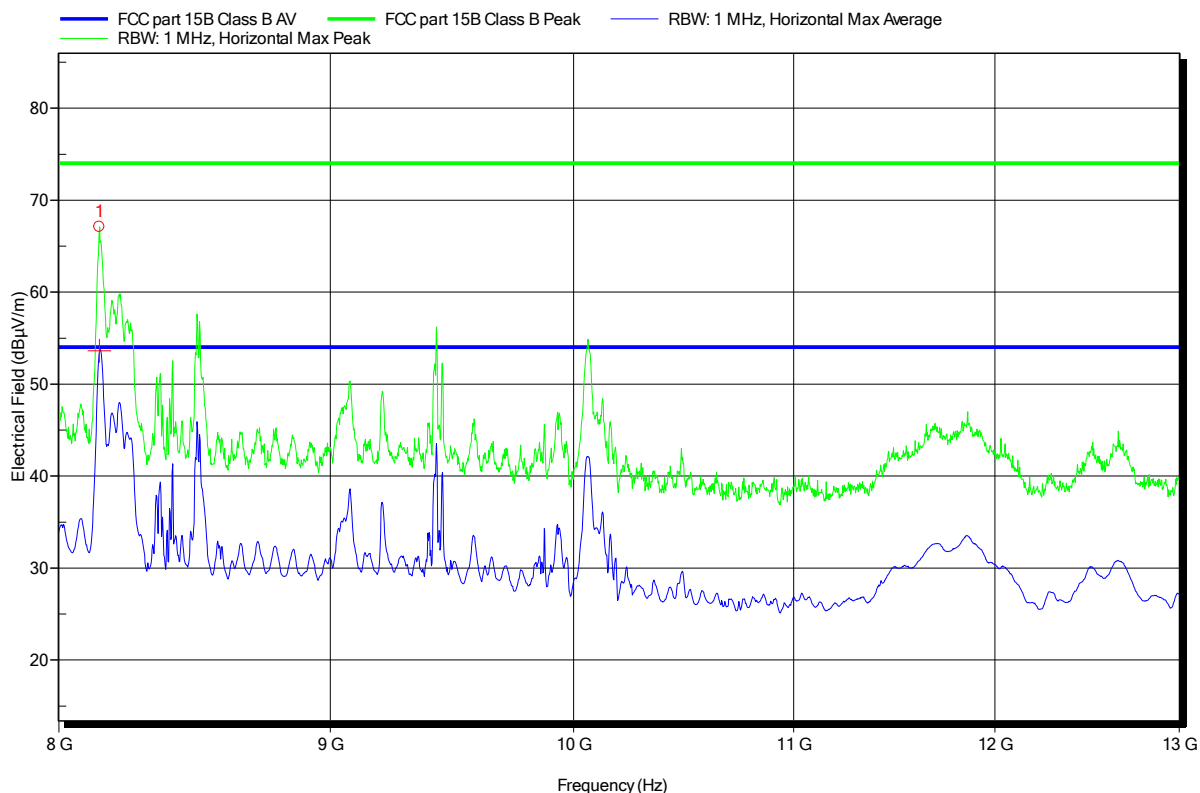


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Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-12
 Note:

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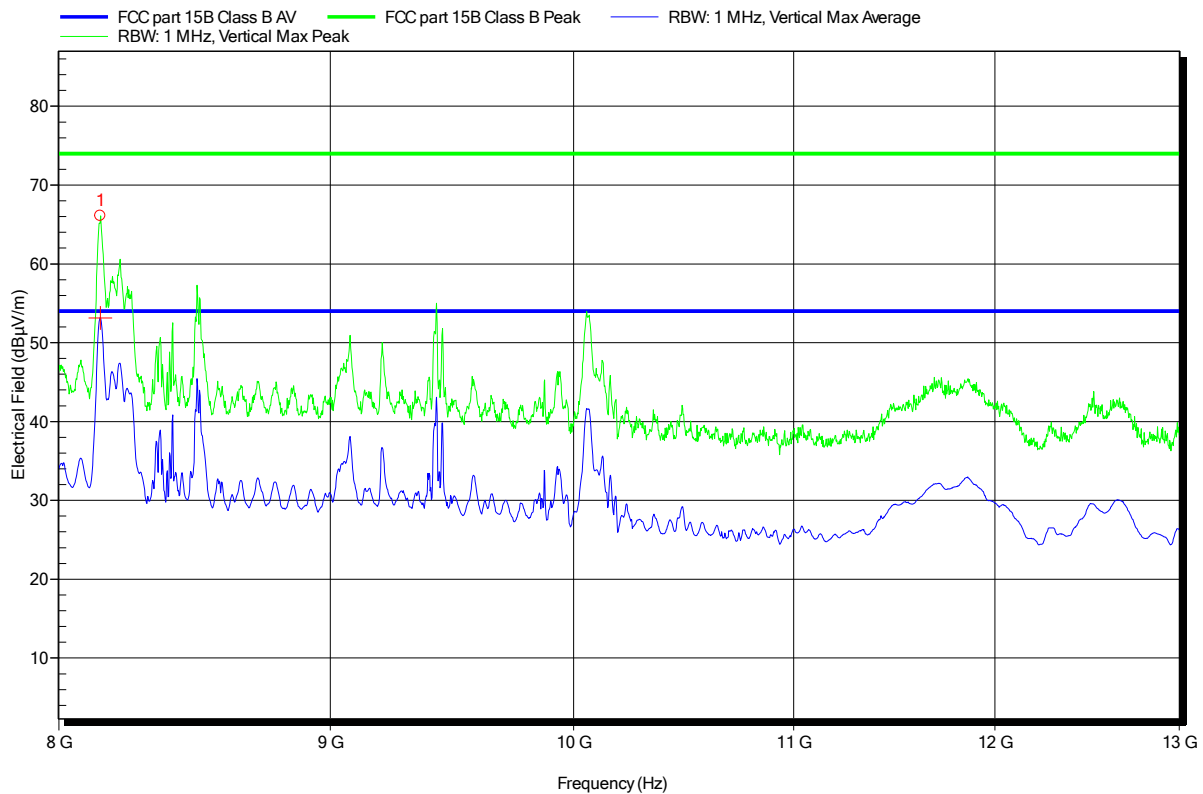
Frequency	Average	Average Limit	Average Difference	Average Status
8,144 GHz	53,62 dBµV/m	54 dBµV/m	-0,38 dB	Pass

Spurious emissions under normal conditions according to FCC 15B

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Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-12
 Note:

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Frequency	Average	Average Limit	Average Difference	Average Status
8,148 GHz	53,12 dBµV/m	54 dBµV/m	-0,88 dB	Pass

Test Report No.: G0M-1409-4119-EF0115B-V02

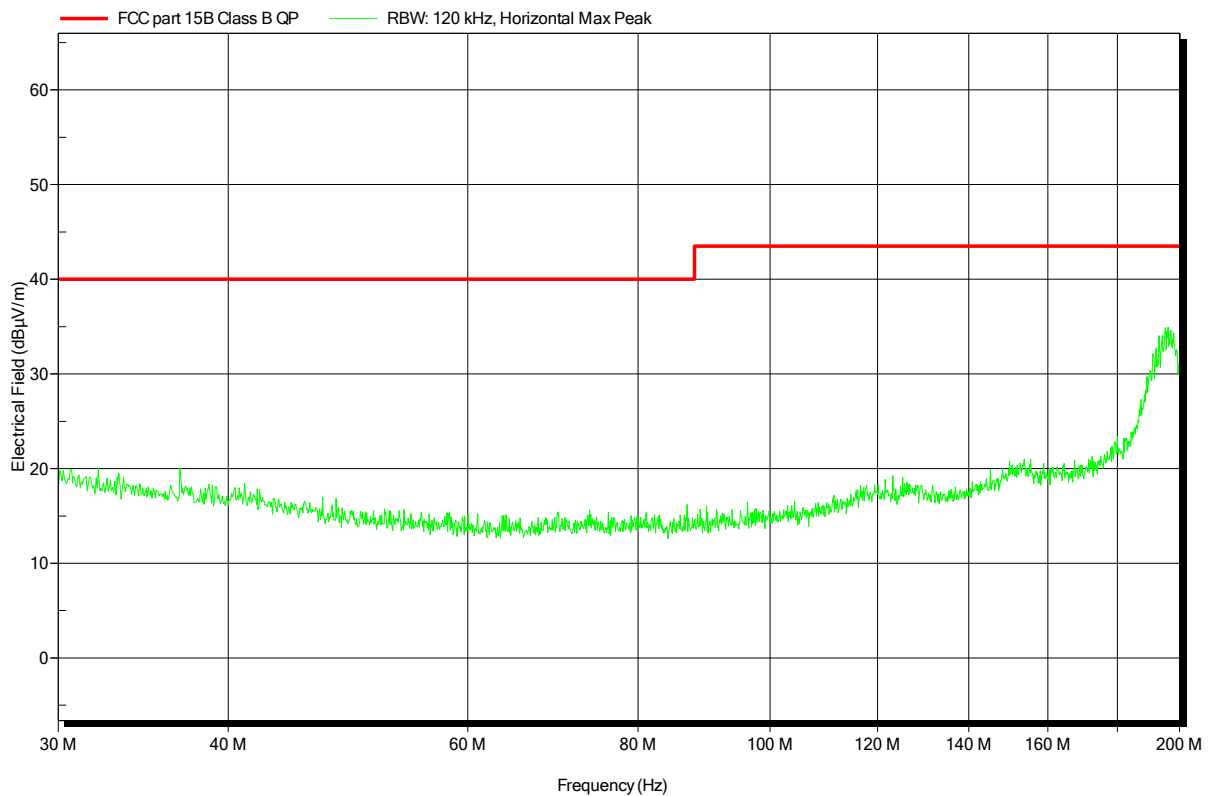
 Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

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Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	SRD 900MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-25
Note:	

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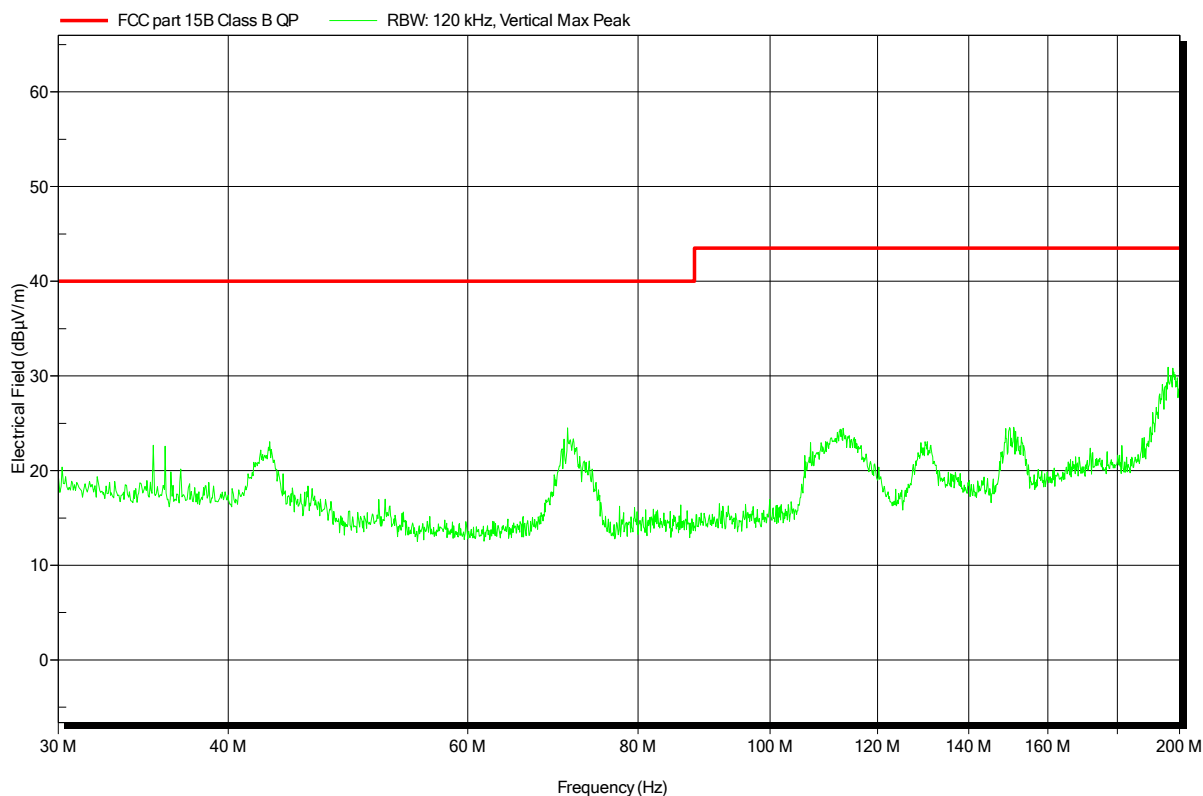


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Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-25
Note:	

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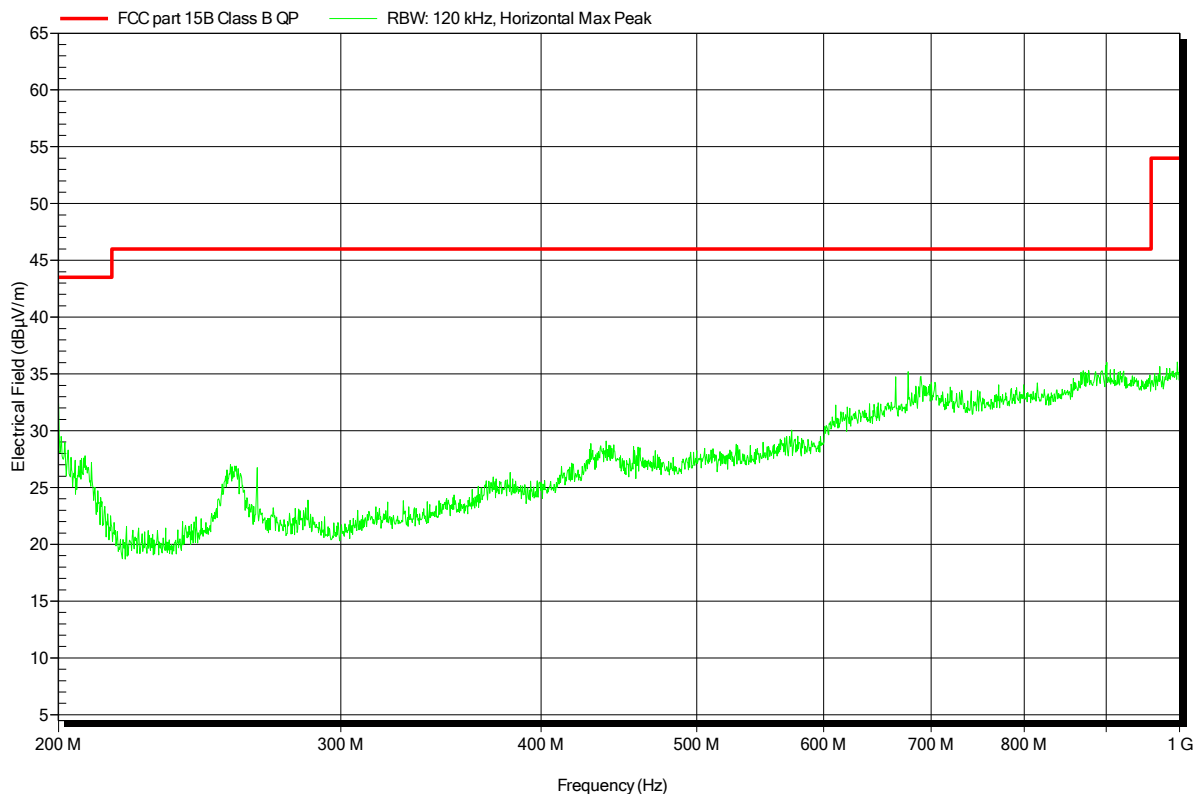


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Measurement distance:	3m
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Test Date:	2015-02-25
Note:	

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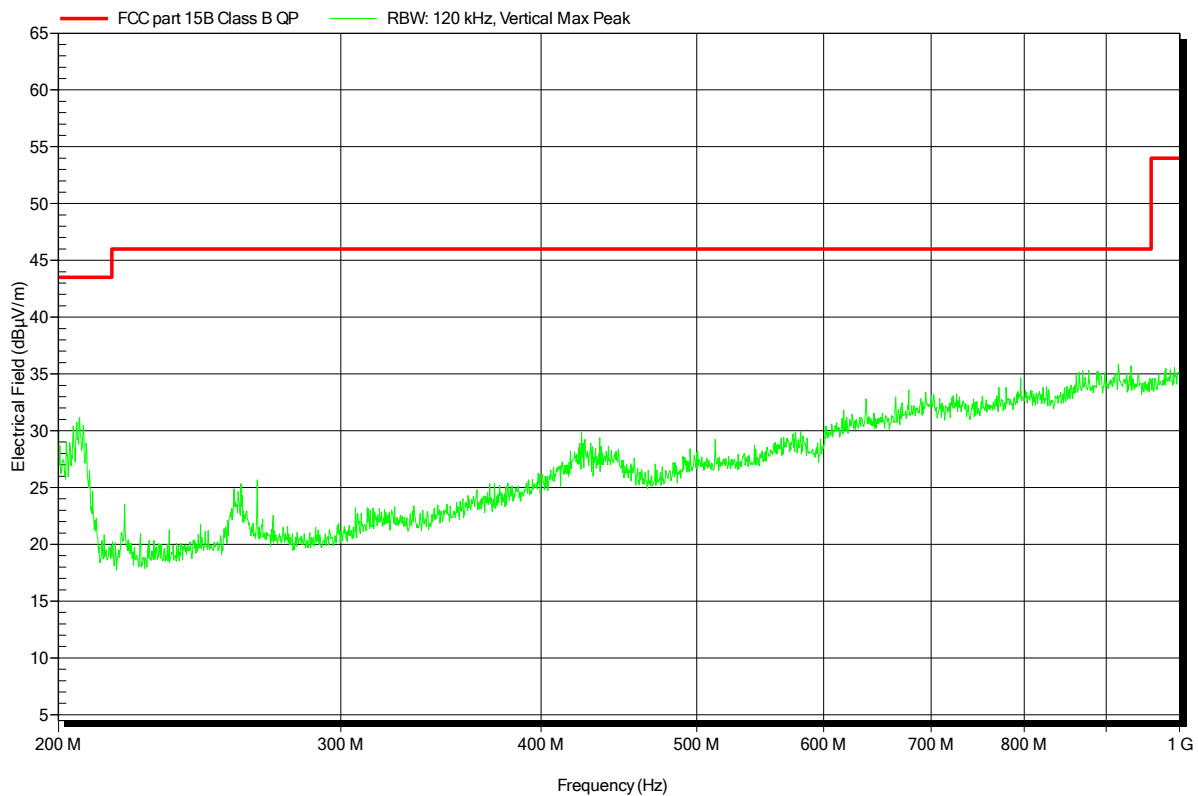


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Measurement distance:	3m
Mode:	SRD 900MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-25
Note:	

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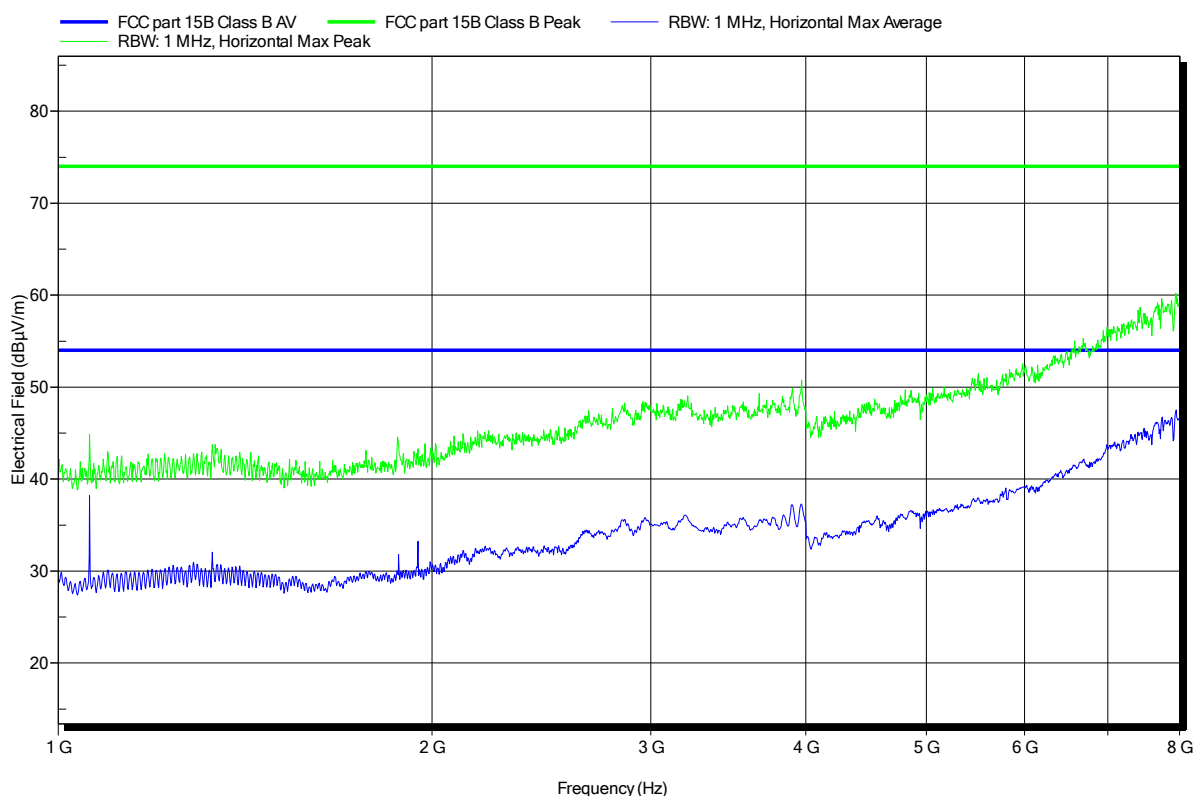


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Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: SRD 900MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-25
 Note:

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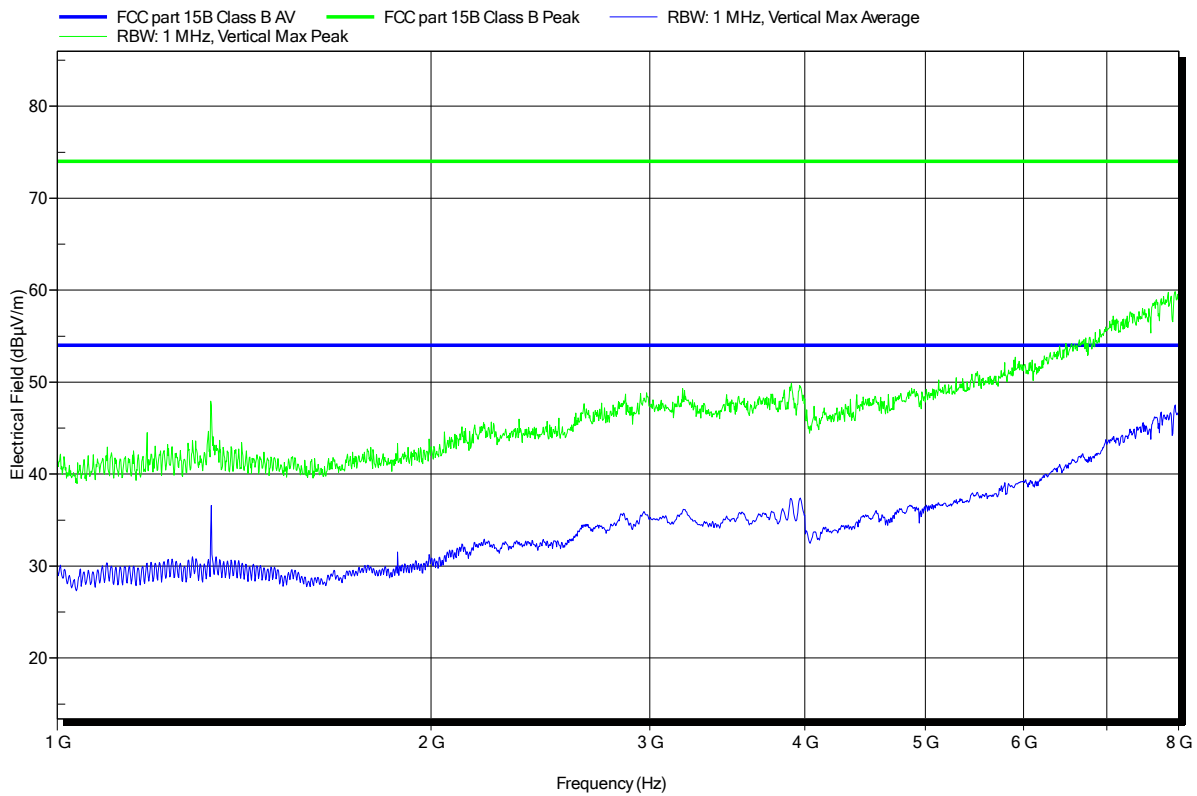


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Mode:	SRD 900MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-25
Note:	

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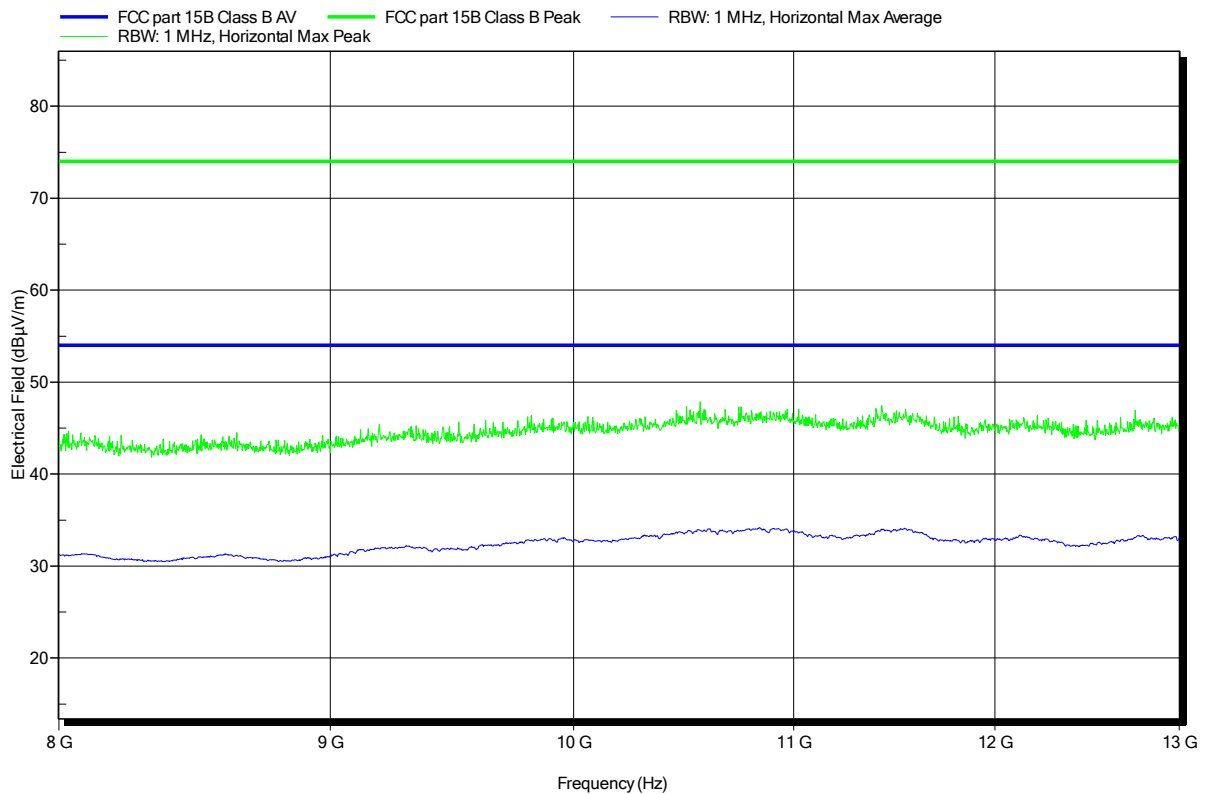


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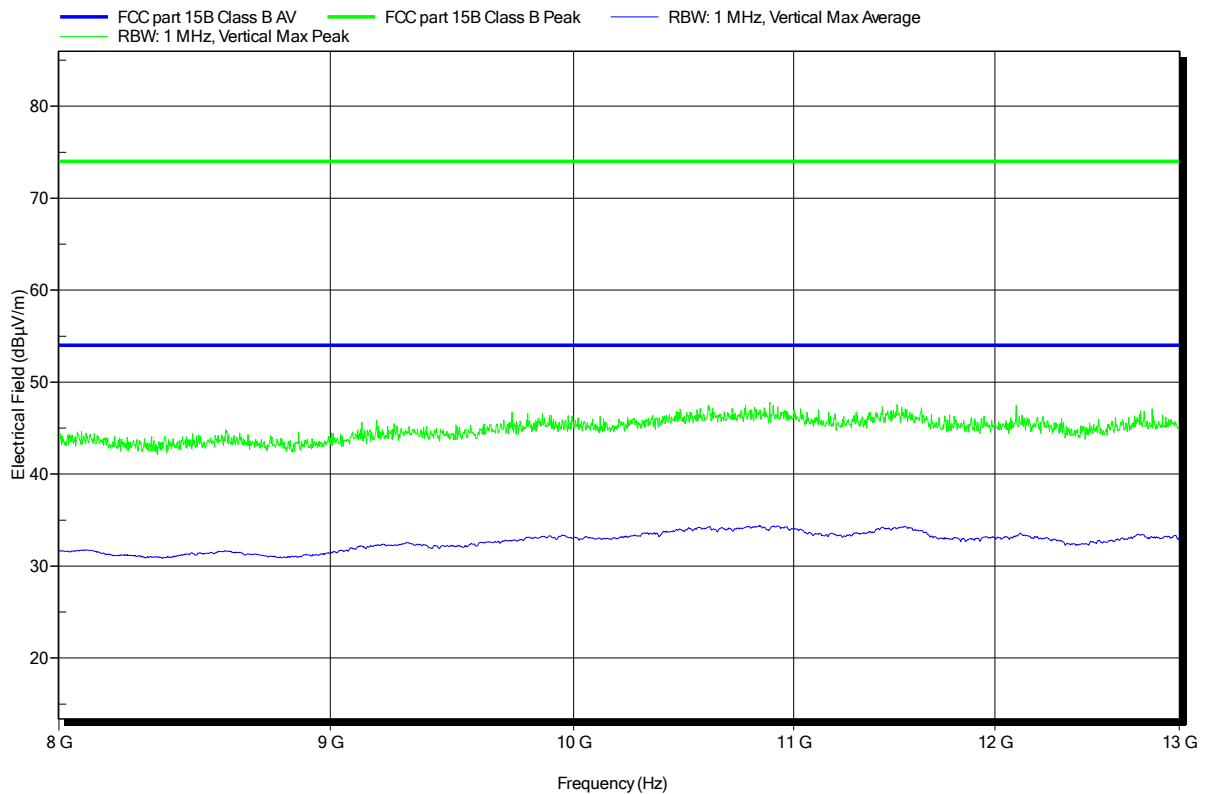


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 Test Date: 2015-02-25
 Note:

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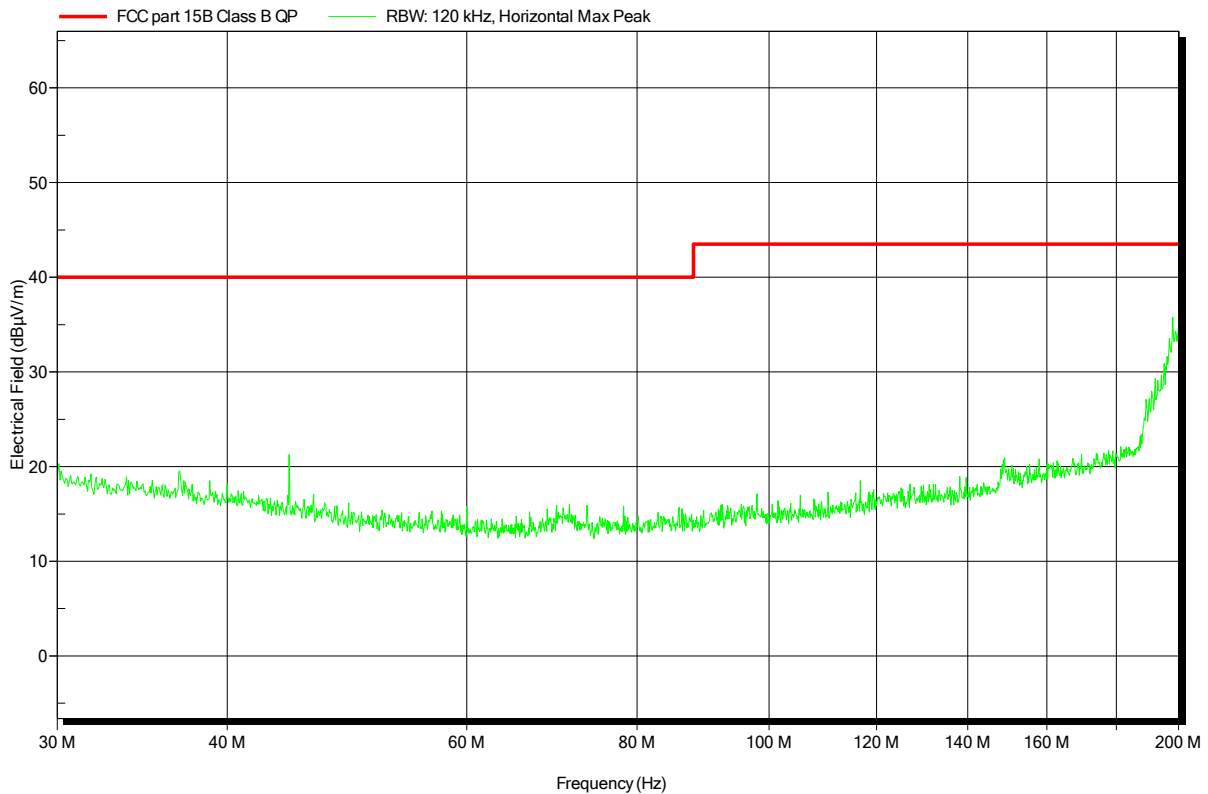


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Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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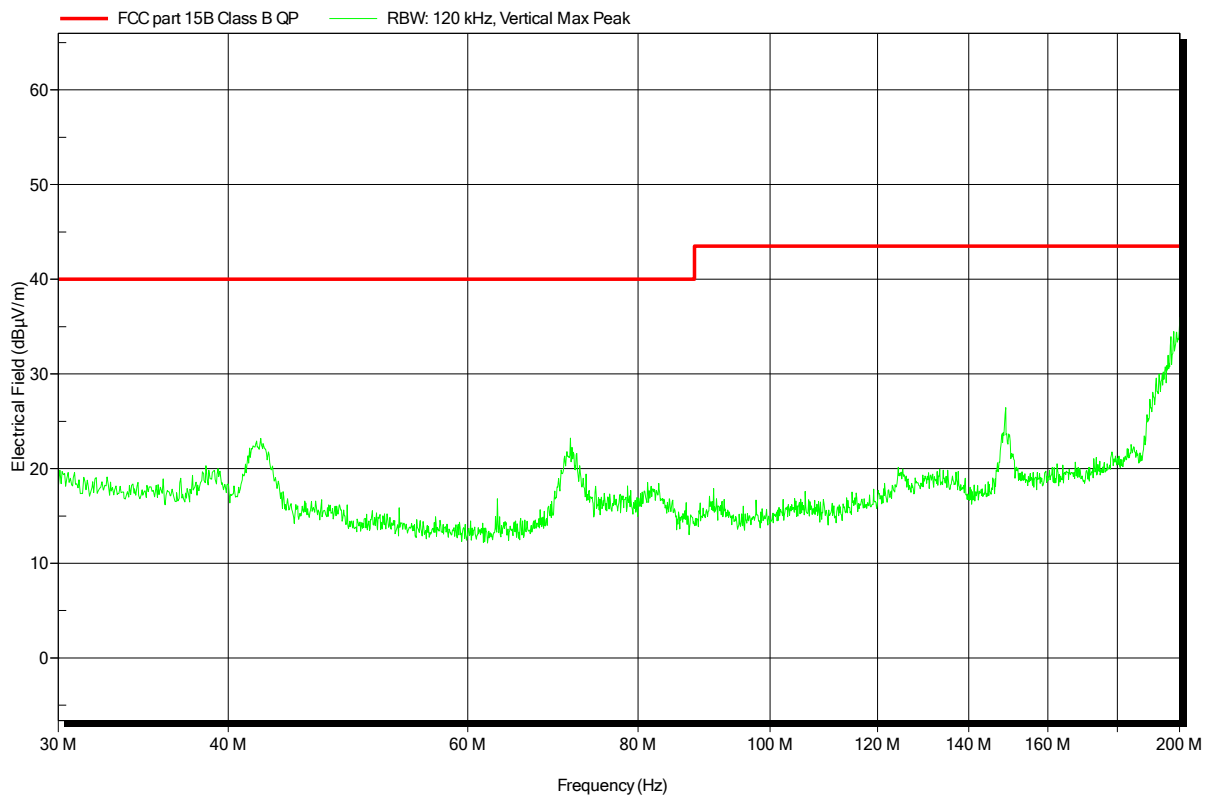


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Measurement distance:	3m
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Note:	

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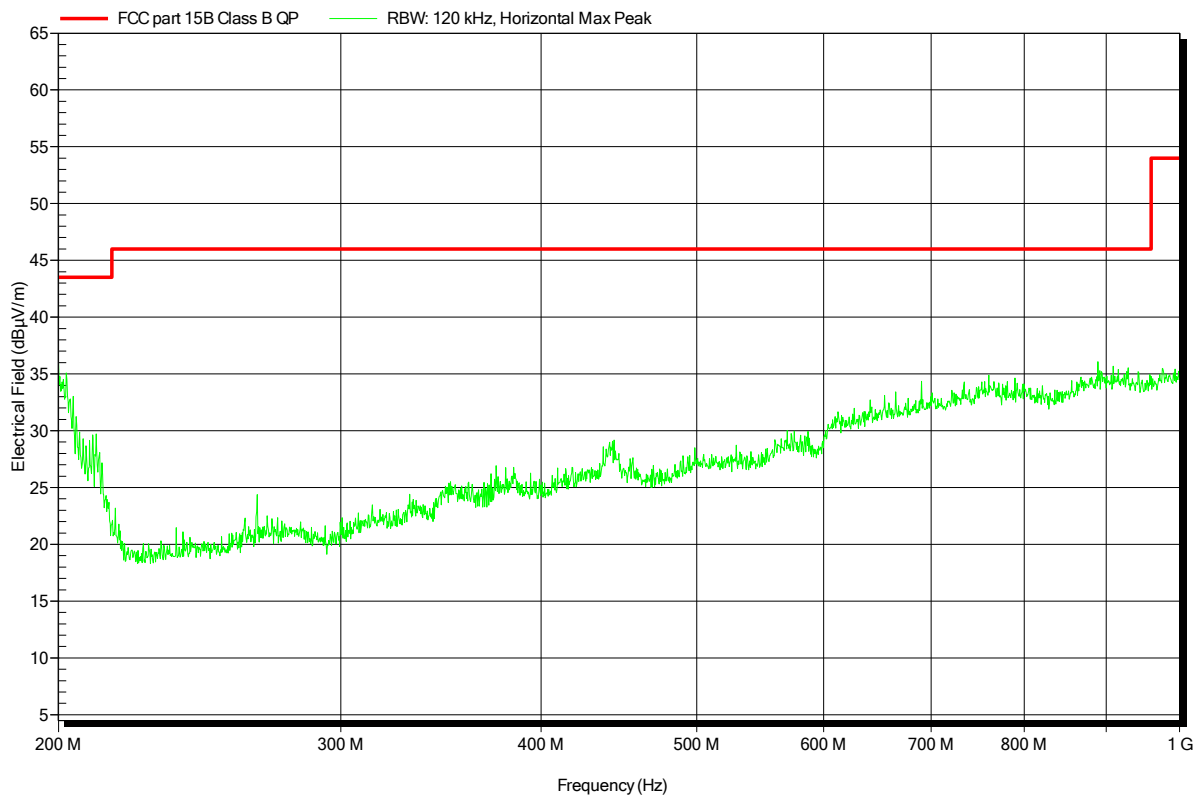


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Mode:	SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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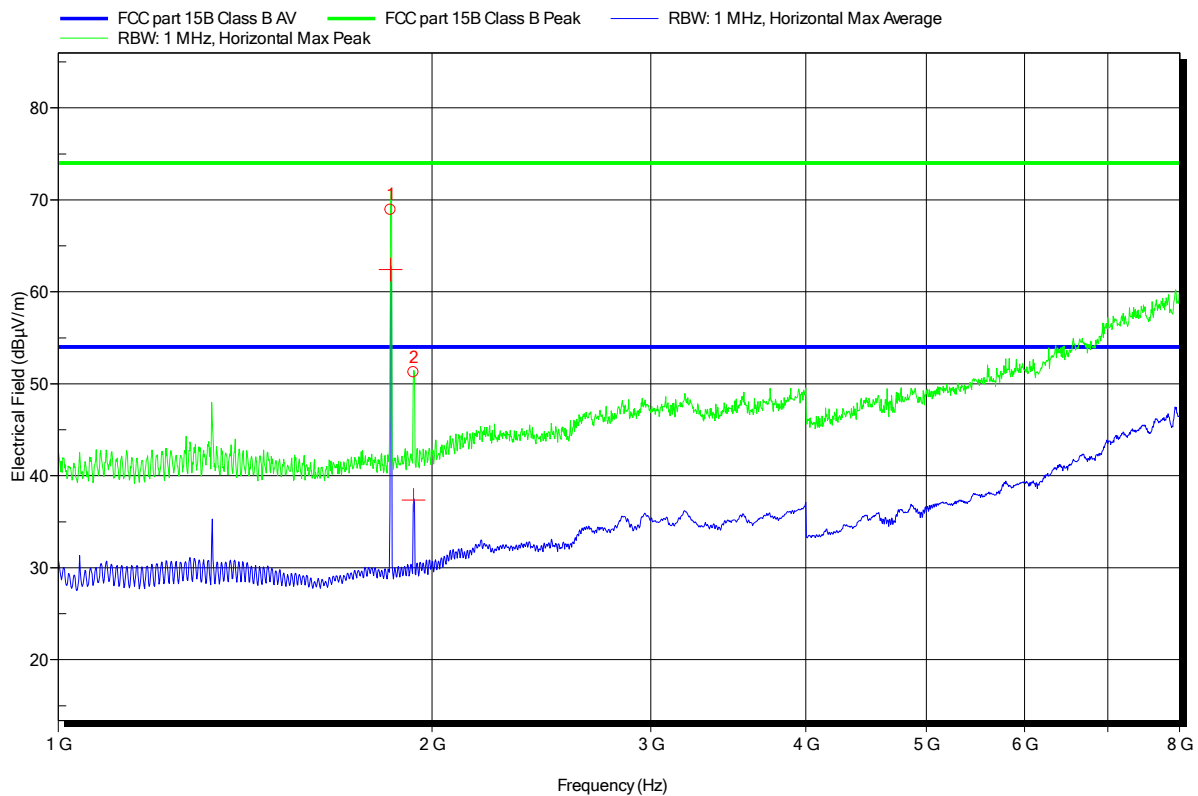


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	Peak1: Uplink UMTS Band II Peak2: Downlink UMTS Band II

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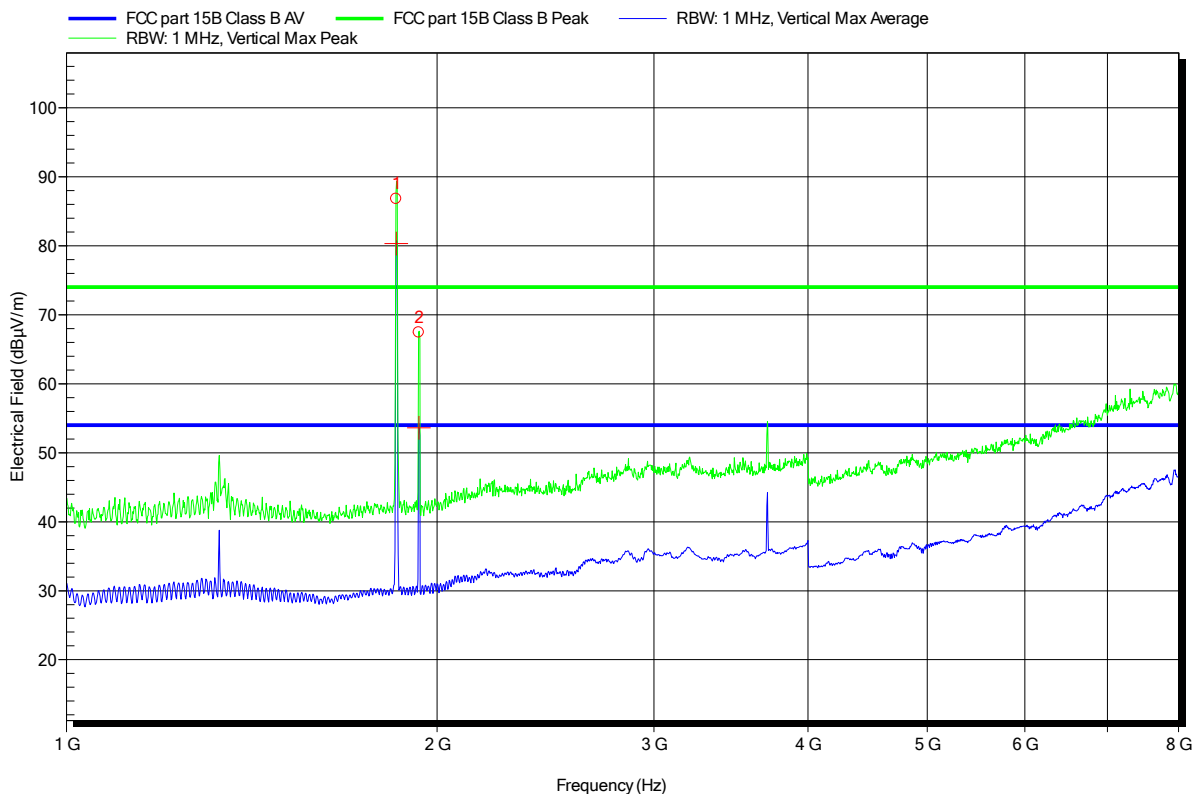
Frequency
1,853 GHz
1,933 GHz

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	Peak1: Uplink UMTS Band II Peak2: Downlink UMTS Band II

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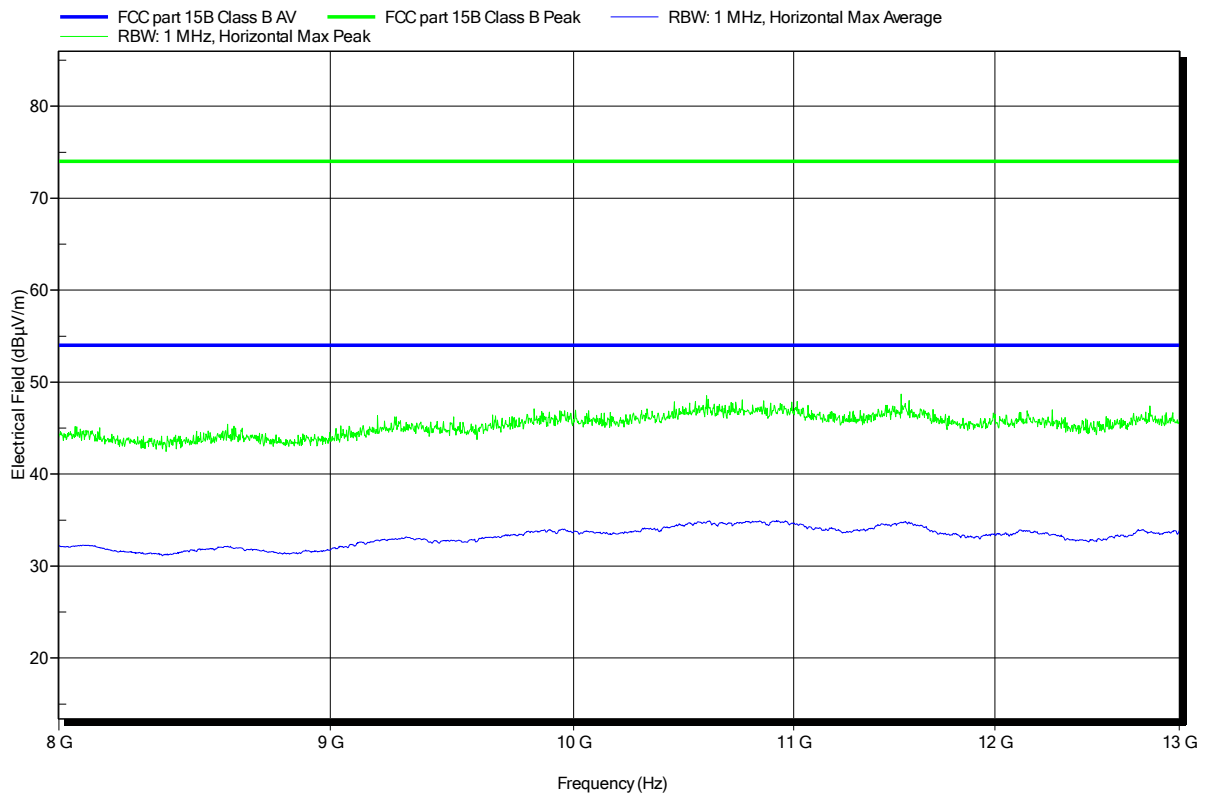
Frequency
 1,853 GHz
 1,933 GHz

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-26
 Note:

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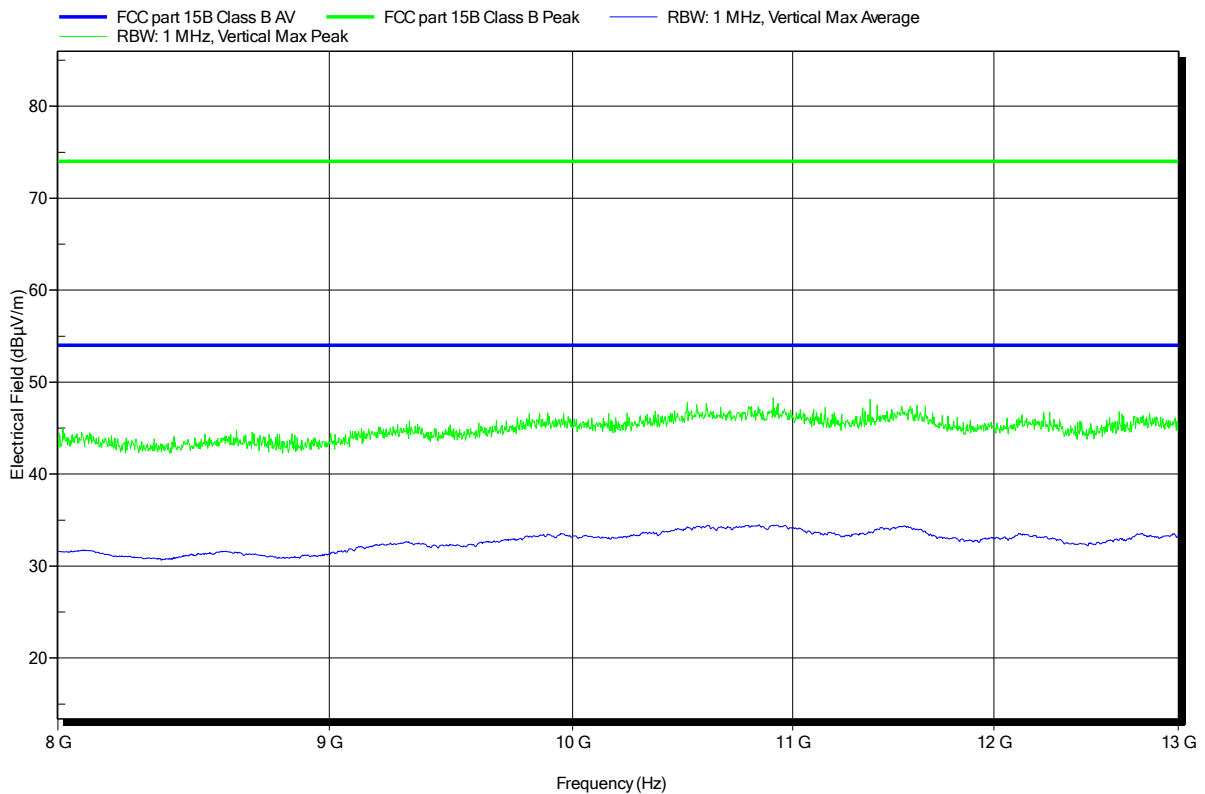


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band II, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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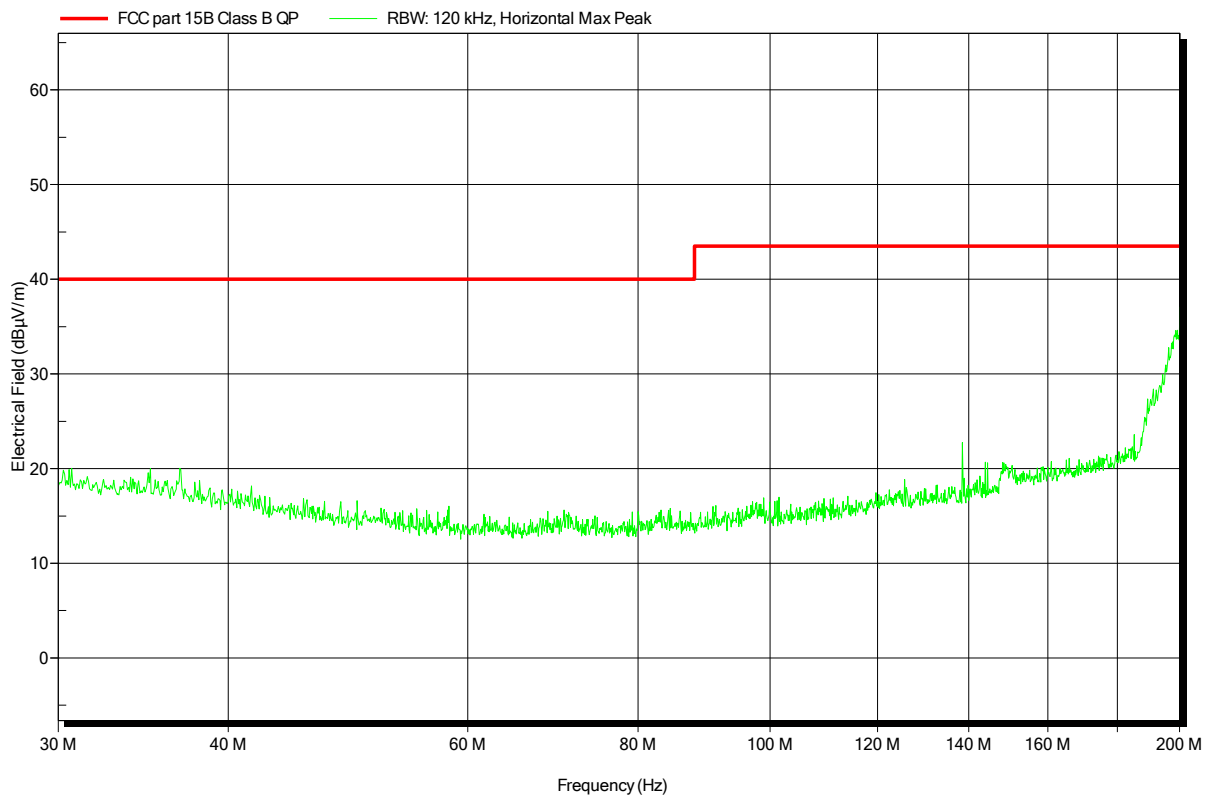


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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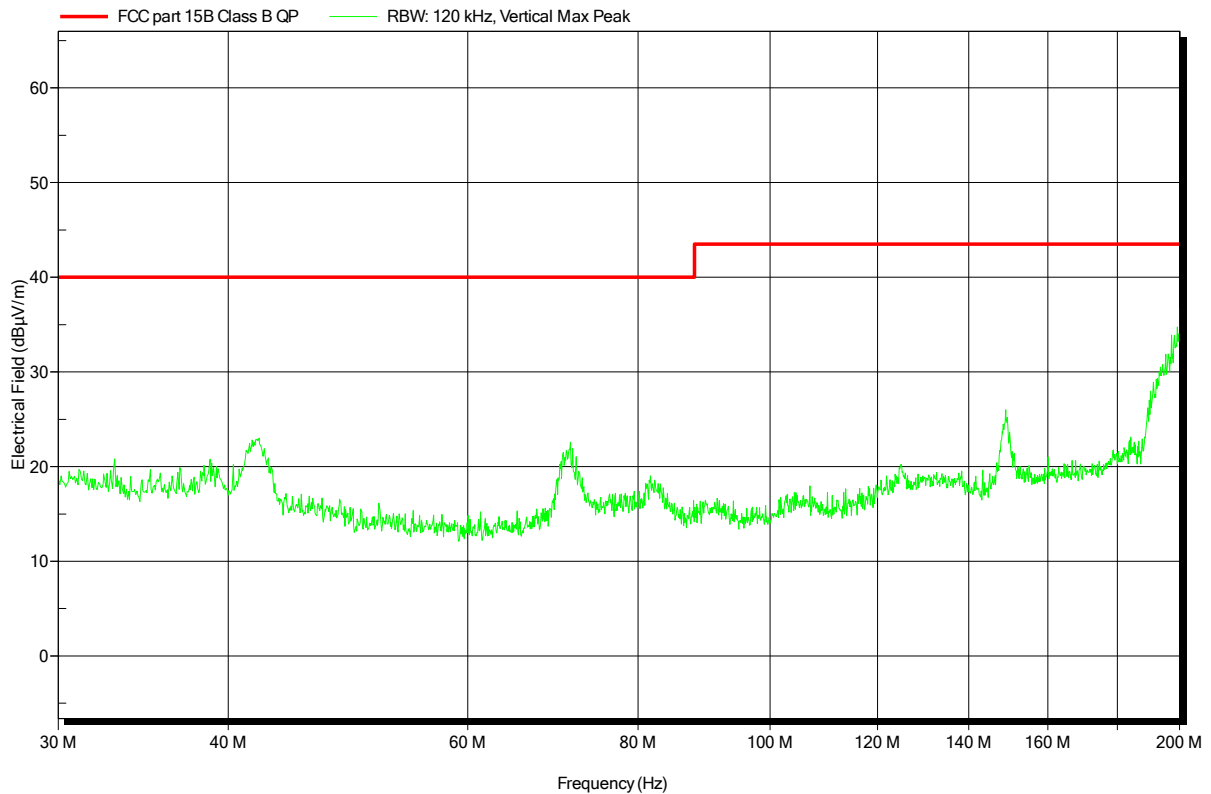


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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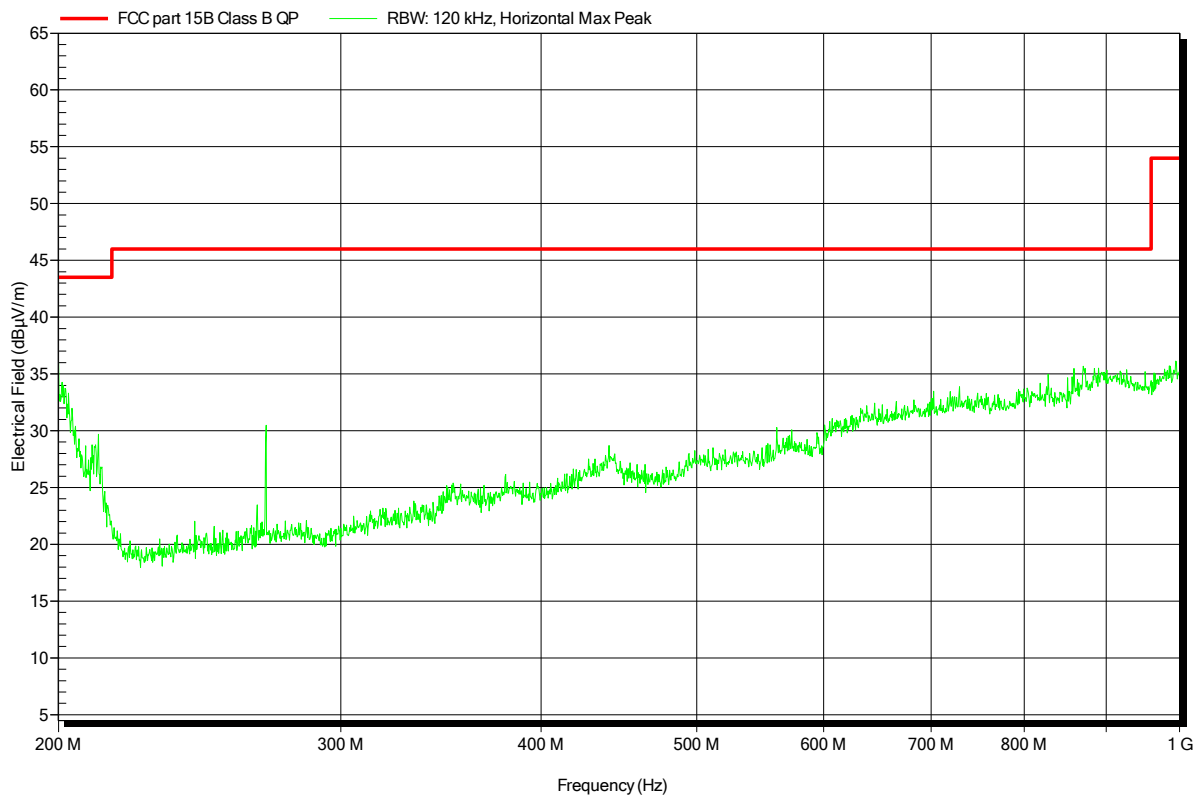


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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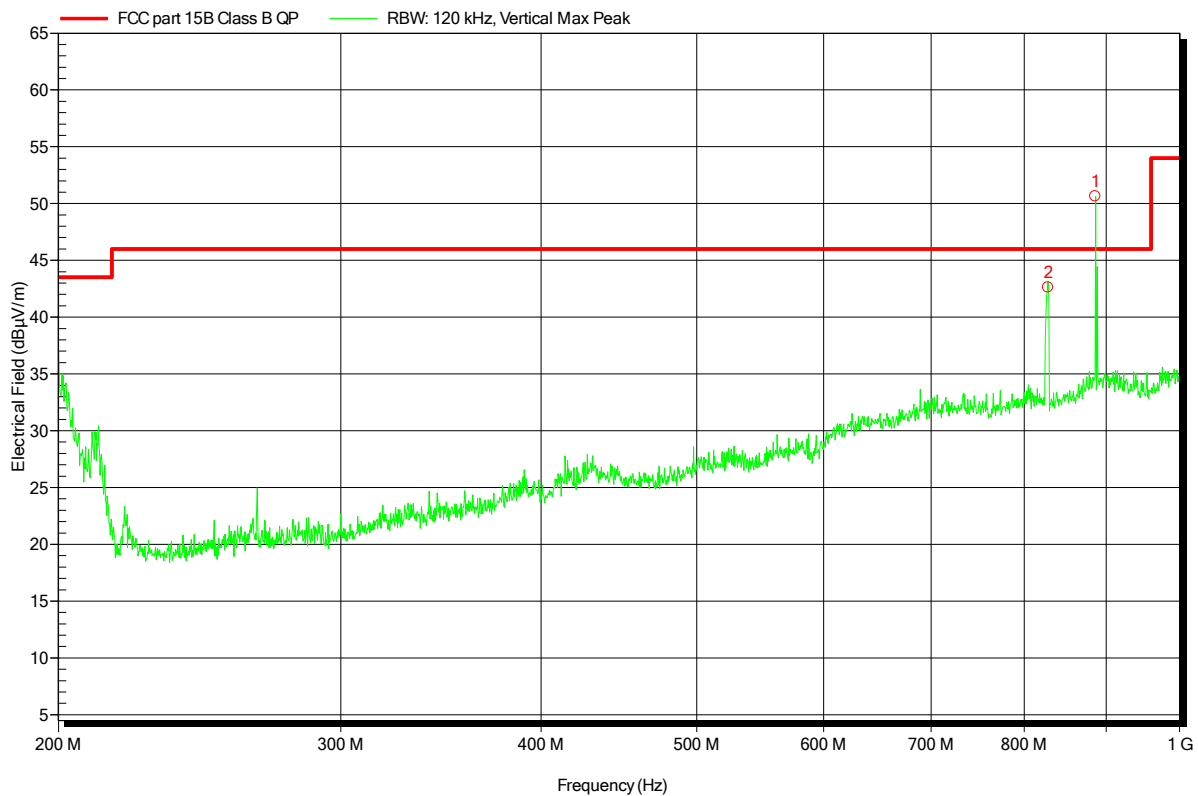


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	Peak 1 + 2: UMTS Carrier

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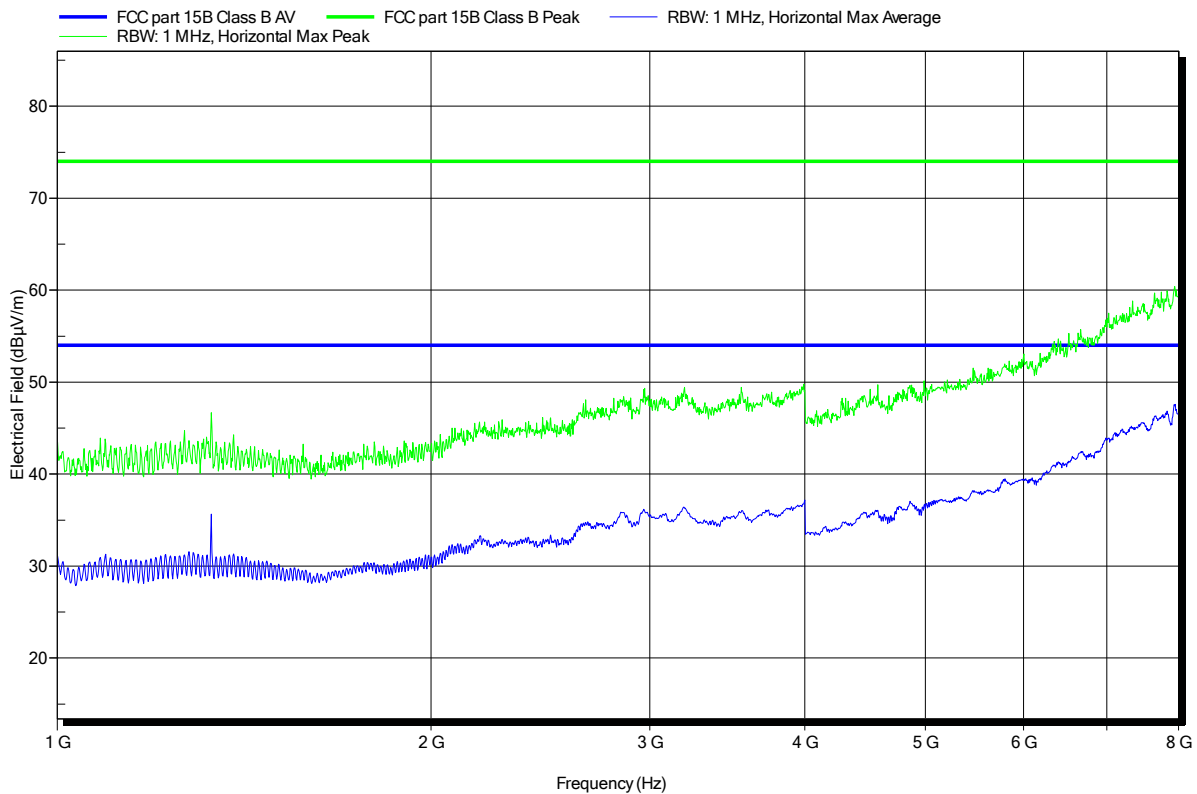
Frequency
 827,96 MHz
 886,04 MHz

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-26
 Note:

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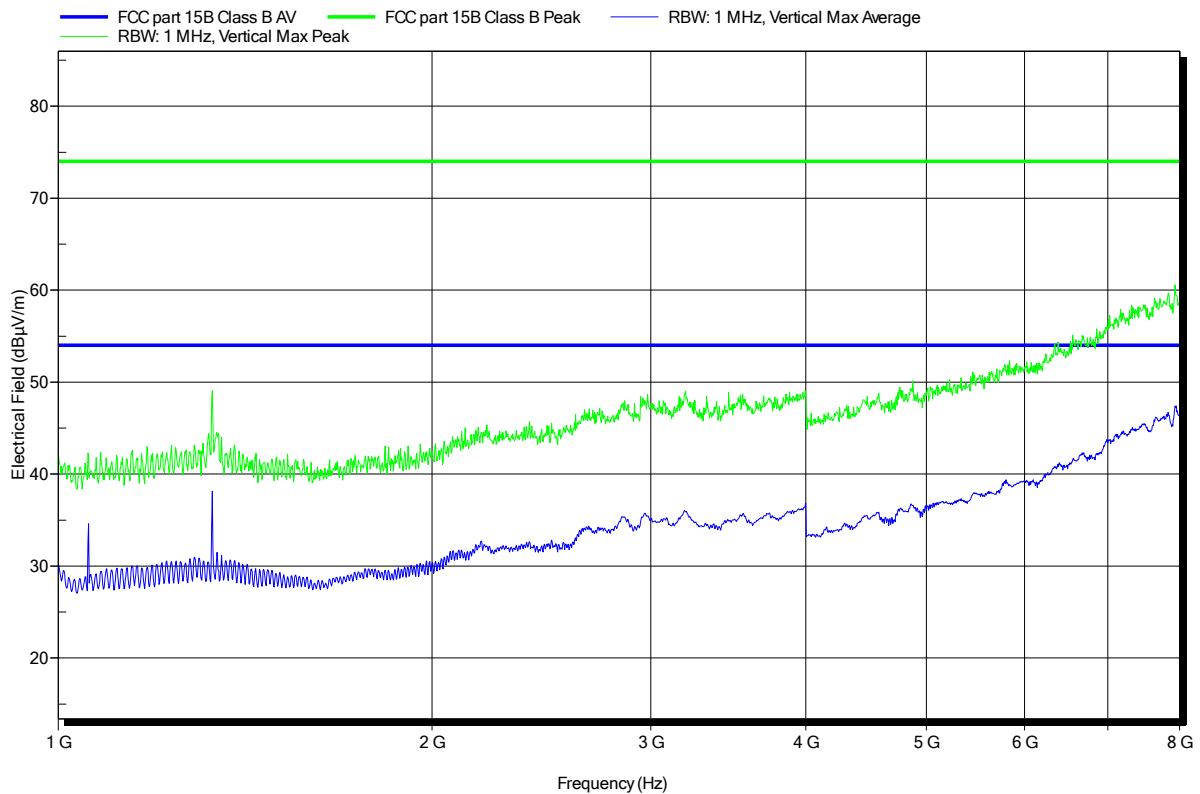


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer:	Leica Geosystems AG
EUT Name:	GNSS Receiver for Machine Control
Model:	iCG80
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 24 VDC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m
Mode:	SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
Test Date:	2015-02-26
Note:	

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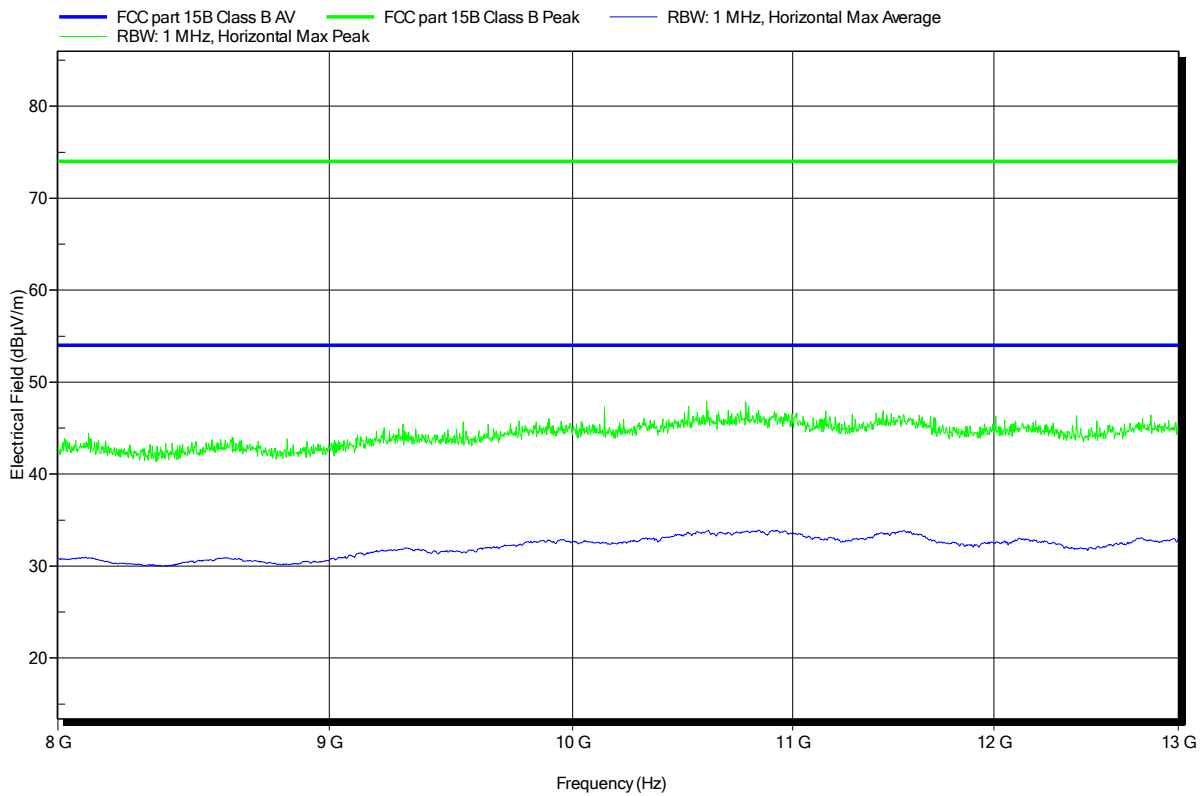


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-26
 Note:

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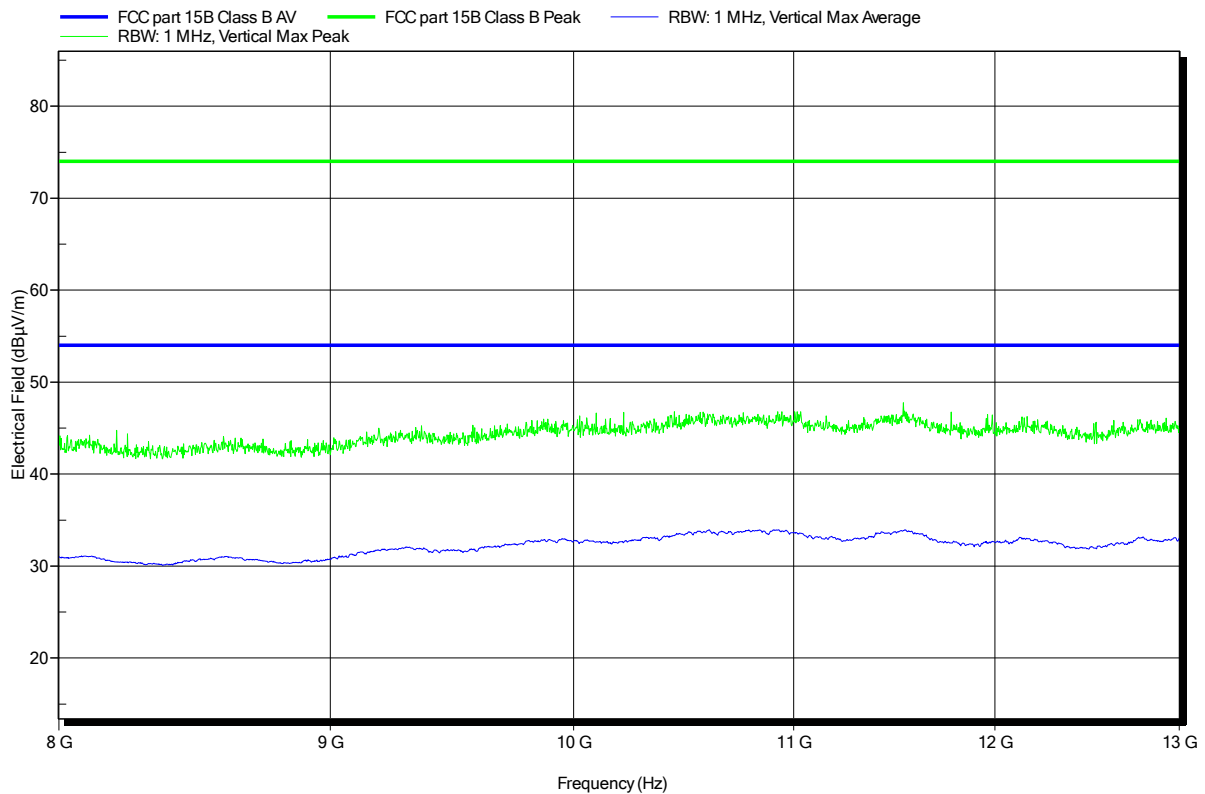


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3m
 Mode: SRD 900MHz, UMTS Band V, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-26
 Note:

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3.2 Test Conditions and Results – AC power line conducted emissions

Conducted emissions acc. FCC 47 CFR 15.107 / IC RSS-Gen			Verdict: PASS	
Laboratory Parameters:	Required prior to the test		During the test	
Ambient Temperature	15 to 35 °C		23°C	
Relative Humidity	30 to 60 %		41%	
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			
Sample is tested with respect to the requirements of the equipment class	Equipment class			
	Class B			
Points of Application	Application Interface			
AC Mains	LISN			
Operating mode and configuration	1 - 1 / 2			
Limits and results Class B				
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Average [dBµV]	Result
0.15 to 5	66 to 56*	PASS	56 to 46*	PASS
0.5 to 5	56	PASS	46	PASS
5 to 30	60	PASS	50	PASS
Comments:				
* Limit decreases linearly with the logarithm of the frequency.				

Test Procedure:

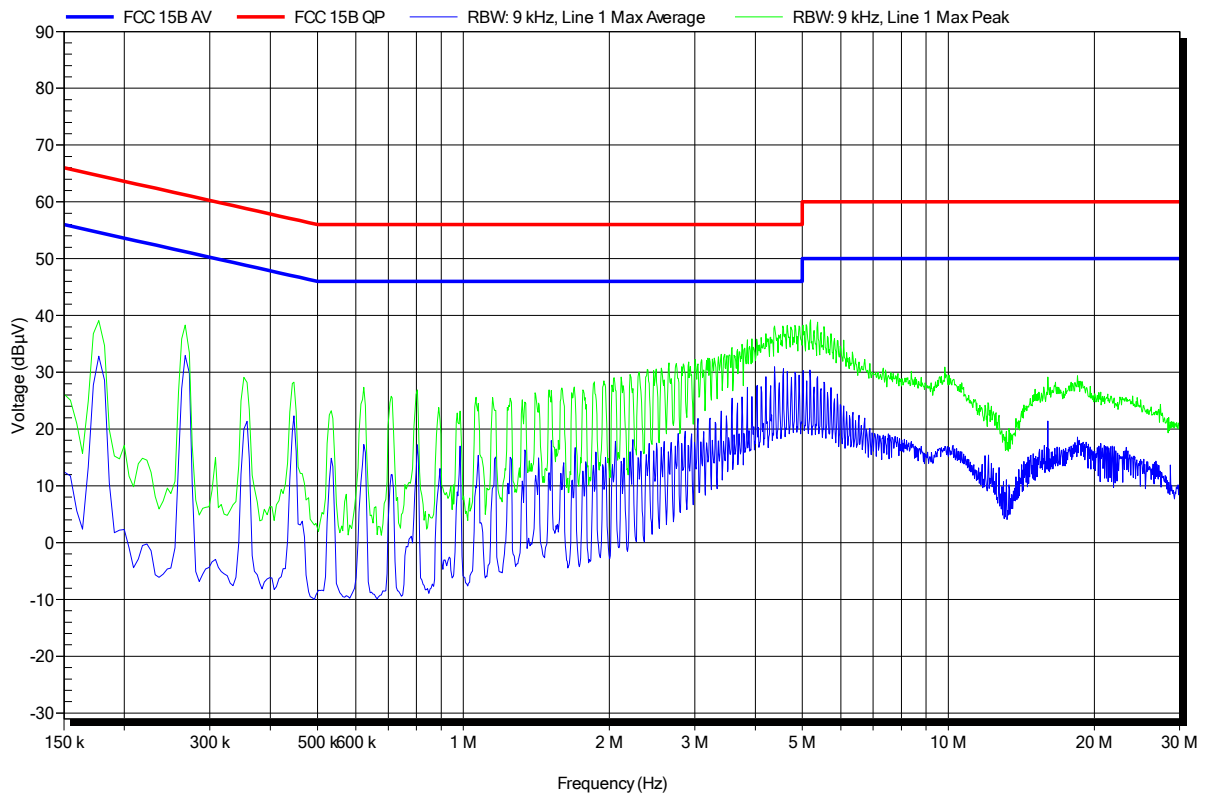
- 1) The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2009 item 7.3.1)
- 2) The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
- 3) The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
- 4) The LISN measurement port was connected to a measurement receiver
- 5) I/O cables were bundled not longer than 0.4 m
- 6) Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor

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

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 LISN: ESH2-Z5 L
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-25
 Note:

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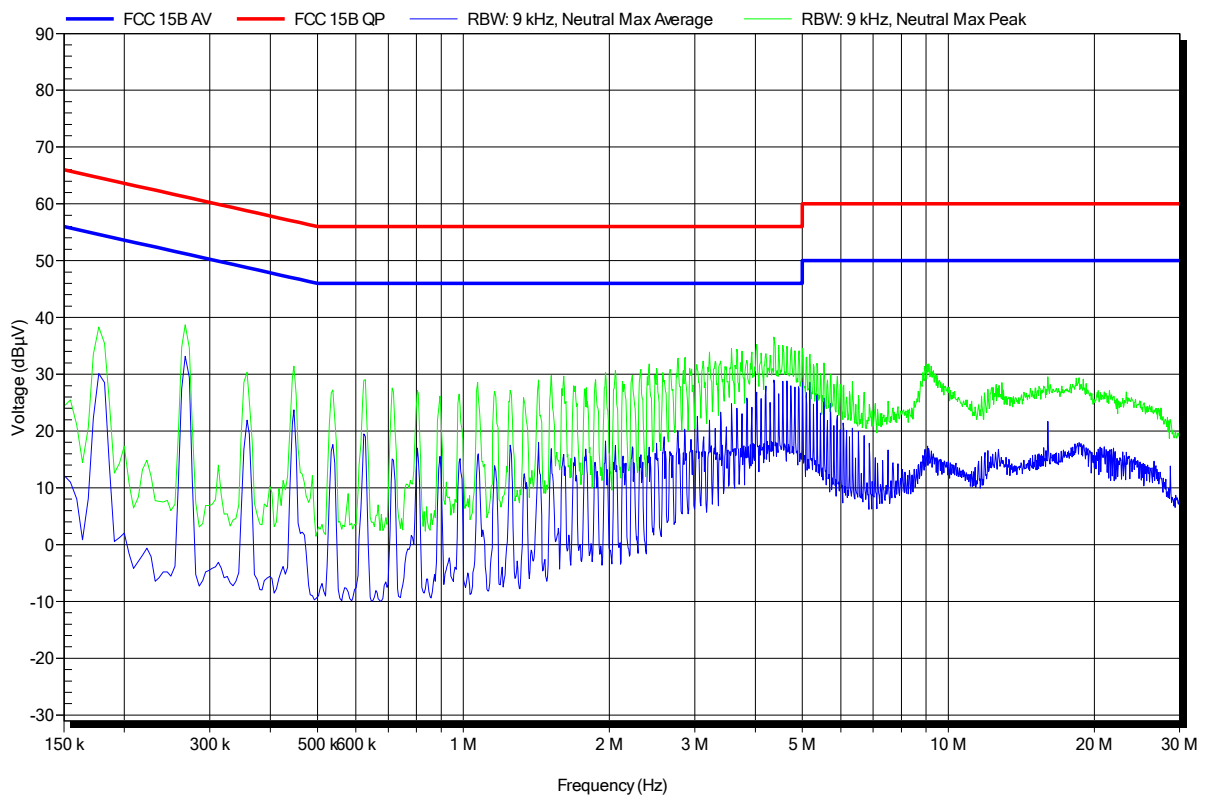


EMI voltage test in the ac-mains according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 LISN: ESH2-Z5 N
 Mode: SRD 900MHz, GSM850, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-25
 Note:

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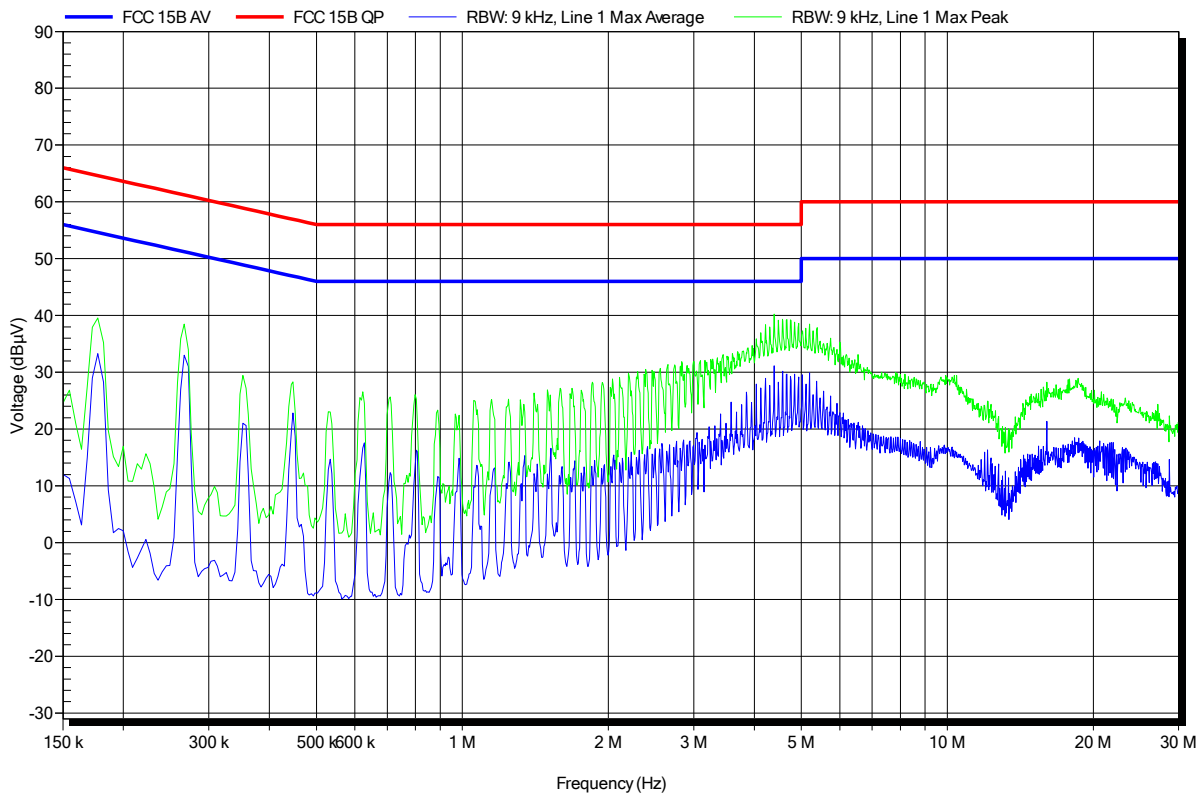


EMI voltage test in the ac-mains according to FCC 15B

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 LISN: ESH2-Z5 L
 Mode: SRD 433MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-25
 Note:

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

Project number: G0M-1409-4119

Manufacturer: Leica Geosystems AG
 EUT Name: GNSS Receiver for Machine Control
 Model: iCG80
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 24 VDC
 LISN: ESH2-Z5 N
 Mode: SRD 433MHz, GSM1900, GPS receive, Ethernet link, CAN active, Bluetooth Classic active
 Test Date: 2015-02-25
 Note:

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