eurofins | Product Service

FCC TEST REPORT

FCC 47 CFR Part 22H
Industry Canada RSS-132, Issue 3
Cellular Telephones Operating in the Bands 824-849MHz and 869-894MHz
FCC 47 CFR Part 24E
Industry Canada RSS-133, Issue 6
2GHz Personal Communication Services
FCC 47 CFR Part 90S
Regulations governing licensing and use of frequencies in the 806-824 band

Report Reference No.....:	G0M-1406-3915-TFC224CD-V01
Testing Laboratory.....:	Eurofins Product Service GmbH
Address.....:	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation.....:	A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name.....:	Leica Geosystems AG
Address.....:	Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND
Test specification:	
Standard.....:	47 CFR Part 22H, 47 CFR Part 24E, 47 CFR Part 90S RSS-132, Issue 3 : 2013-01, RSS-133, Issue 6 : 2013-01 SRSP-503 Issue 7 : 2008-09, SRSP-510 Issue 5 : 2009-02 RSS-Gen, Issue 4, 2014-11, ANSI/TIA-603-C-2004
Equipment under test (EUT):	
Product description	Field Controller Win EC7
Model No.	CS20 CDMA Disto
Additional Model(s)	None
Brand Name(s)	Leica Geosystems
Hardware version	V5.0
Firmware / Software version	None
	FCC-ID: RFD-CSNGC IC: 3177A-CSNGC
Test result	**Passed**

Possible test case verdicts:

- neither assessed nor tested ..... :	N/N
- required by standard but not appl. to test object..... :	N/A
- required by standard but not tested..... :	N/T
- not required by standard for the test object ..... :	N/R
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)

Testing:

Test Lab Temperature..... :	20 – 23 °C	
Test Lab Humidity ..... :	32 – 38 %	
Date of receipt of test item ..... :	2014-09-22	
Date (s) of performance of tests ..... :	2014-12-11 - 2015-01-28	
Compiled by ..... :	Christian Weber	
Tested by (+ signature)..... : (Responsible for Test)	Burkhard Pudell	B. Pudell
Approved by (+ signature) ..... :	Christian Weber	C. Weber
Date of issue ..... :	2015-04-20	
Total number of pages ..... :	135	

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:

Test case selection is based on full modular approval of licensed transmitter module used by the EUT. The EUT uses a CDMA module with full modular approval according to FCC and IC rules. For details about the radio module see EUT description in section 1.

Version History

Version	Issue Date	Remarks	Revised by
01	2015-04-20	Initial Release	

REPORT INDEX

1	**EQUIPMENT (TEST ITEM) DESCRIPTION**	**5**
1.1	Photos – Equipment External	7
1.2	Photos – Equipment internal	8
1.3	Photos – Test setup	10
1.4	Supporting Equipment Used During Testing	11
1.5	Test Modes	12
1.6	Test Equipment Used During Testing	13
1.7	Sample emission level calculation	14
2	**RESULT SUMMARY**	**15**
3	**TEST CONDITIONS AND RESULTS**	**16**
3.1	Test Conditions and Results – Occupied Bandwidth	16
3.2	Test Conditions and Results – Effective radiated power / Equivalent isotropic radiated power	36
3.3	Test Conditions and Results – Transmitter radiated emissions	38
3.4	Test Conditions and Results – Receiver radiated emissions	40
ANNEX A	Transmitter radiated spurious emissions	42
ANNEX B	Receiver radiated spurious emissions	116

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

1 Equipment (Test item) Description

Description	Field Controller Win EC7		
Model	CS20 CDMA Disto		
Additional Model(s)	None		
Brand Name(s)	Leica Geosystems		
Serial number	None		
Hardware version	V5.0		
Software / Firmware version	None		
FCC-ID	RFD-CSNGC		
IC	3177A-CSNGC		
Equipment type	End product		
Equipment classification	Portable Device (Human Body distance < 20 cm)		
Radio type	Transceiver		
Radio technology	CDMA		
Operating frequency range	CDMA BC0 : TX = 824.7 - 848.3 MHz, RX = 869.7 - 893.3 MHz CDMA BC1 : TX = 1851.25 - 1908.75 MHz, RX = 1931.25 - 1988.75 MHz CDMA BC10 : TX = 817.9 - 823.1 MHz, RX = 862.9 - 868.1 MHz		
Assigned frequency band	Cell. Service Block A & B : 824 - 849 MHz & 869 - 894 MHz Broadband PCS : 1850 - 1910 MHz & 1930 - 1990 MHz Special Radio Service : 806 - 824 MHz & 851 - 869 MHz		
Main test frequencies BC0	F_{LOW}	CH : 1013 UL: 824.7 MHz	CH : 1013 DL: 869.7 MHz
	F_{MID}	CH : 384 UL: 836.5 MHz	CH : 384 DL: 881.5 MHz
	F_{HIGH}	CH : 777 UL: 848.3 MHz	CH : 777 DL: 893.3 MHz
Main test frequencies BC1	F_{LOW}	CH : 25 UL: 1851.25 MHz	CH : 25 DL: 1931.25 MHz
	F_{MID}	CH : 600 UL: 1880.0 MHz	CH : 600 DL: 1960.0 MHz
	F_{HIGH}	CH : 1175 UL: 1908.75 MHz	CH : 1175 DL: 1988.75 MHz
Main test frequencies BC10	F_{LOW}	CH : 476 UL: 817.9 MHz	CH : 476 DL: 862.9 MHz
	F_{MID}	CH : 580 UL: 820.5 MHz	CH : 580 DL: 865.5 MHz
	F_{HIGH}	CH : 684 UL: 823.1 MHz	CH : 684 DL: 868.1 MHz
Supported transmission modes	CDMA2000, EV-DO		
Number of antennas	1		
Radio module	Type	CDMA module	
	Model	PXS8	
	Manufacturer	Gemalto	
	HW Version	B2	
	SW Version	3.001	
	FCC-ID	QIPPXS8	
	IC	7830A-PXS8	

Antenna	Type	integrated
	Model	P522303
	Manufacturer	Ethertronics
	Gain	2.8 dBi
Manufacturer	Leica Geosystems AG Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND	
Power supply	V_{NOM}	11.1 VDC (Lithium Battery)
	V_{MIN}	N/A
	V_{MIN}	N/A
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
SIM	Communication Tester	R&S	CMW500	

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

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.5 Test Modes

Mode #	Description	
CDMA BC0	General conditions:	EUT powered by battery
	Radio conditions:	Mode = RC3 Connection = circuit switched Configuration = SO55 Power level = Maximum (TPC all 1)
CDMA BC1	General conditions:	EUT powered by battery
	Radio conditions:	Mode = RC3 Connection = circuit switched Configuration = SO55 Power level = Maximum (TPC all 1)
CDMA BC10	General conditions:	EUT powered by battery
	Radio conditions:	Mode = RC3 Connection = circuit switched Configuration = SO55 Power level = Maximum (TPC all 1)
EV-DO BC0	General conditions:	EUT powered by battery
	Radio conditions:	Mode = EV-DO Connection = packet switched Configuration = RTAP 153.6 kbps Power level = Maximum (TPC all 1)
EV-DO BC1	General conditions:	EUT powered by battery
	Radio conditions:	Mode = EV-DO Connection = packet switched Configuration = RTAP 153.6 kbps Power level = Maximum (TPC all 1)
EV-DO BC10	General conditions:	EUT powered by battery
	Radio conditions:	Mode = EV-DO Connection = packet switched Configuration = RTAP 153.6 kbps Power level = Maximum (TPC all 1)
IDLE BC0	General conditions:	EUT powered by battery
	Radio conditions:	Mode = idle
IDLE BC1	General conditions:	EUT powered by battery
	Radio conditions:	Mode = idle
IDLE BC10	General conditions:	EUT powered by battery
	Radio conditions:	Mode = idle

1.6 Test Equipment Used During Testing

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

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSEK 30	EF00168	2014-01	2015-01

Radiated power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Fully-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSEK 30	EF00168	2014-01	2015-01
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD Antenna	R&S	HL 223	EF00212	2013-02	2016-02
LPD Antenna	R&S	HL 025	EF00327	2013-02	2016-02

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSEK 30	EF00168	2014-01	2015-01
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD Antenna	R&S	HL 223	EF00212	2013-02	2016-02
LPD Antenna	R&S	HL 025	EF00327	2013-02	2016-02

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

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

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

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

2 Result Summary

FCC 47 CFR Part 22H, 24E, 90S, IC RSS-132, 133				
Product Specific Standard Section	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
FCC § 2.1049 RSS-Gen 6.6	Occupied Bandwidth	RSS-Gen 6.6		Informational only
FCC § 24.235 FCC § 22.355 IC RSS-132 § 4.3 IC RSS-133 § 6.3 90.213	Frequency stability	FCC § 24.235 FCC § 22.355 IC RSS-132 § 4.3 IC RSS-133 § 6.3 90.213	N/R	Conducted results of licensed radio unaffected. See module radio report.
FCC § 22.913(a) 90.635(b)	Effective radiated power	ANSI/TIA-603-C	PASS	
FCC § 24.232(c) IC RSS-132 § 4.4 IC RSS-133 § 6.4	Equivalent isotropic radiated power	ANSI/TIA-603-C	PASS	
FCC § 24.232(d) IC RSS-133 § 6.4	Peak to average ratio	FCC § 24.232(d) IC RSS-133 § 6.4	N/R	Conducted results of licensed radio unaffected. See module radio report
FCC § 22.917(b) FCC § 24.238(b) IC RSS-132 § 4.5 IC RSS-133 § 6.5 90.691	Band-edge compliance	FCC § 22.917(b) FCC § 24.238(b) IC RSS-132 § 4.5 IC RSS-133 § 6.5 90.691	N/R	Conducted results of licensed radio unaffected. See module radio report
FCC § 22.917(a) FCC § 24.238(a) IC RSS-132 § 4.5 IC RSS-133 § 6.5 90.691	Conducted out-of-band emissions	FCC § 22.917(a) FCC § 24.238(a) IC RSS-132 § 4.5 IC RSS-133 § 6.5 90.691	N/R	Conducted results of licensed radio unaffected. See module radio report
FCC § 22.917(a) FCC § 24.238(a) IC RSS-132 § 4.5 IC RSS-133 § 6.5 90.669	Radiated out-of-band emissions	ANSI/TIA-603-C	PASS	
IC RSS-132 § 4.6 IC RSS-133 § 6.6 IC RSS-Gen 7.1	Receiver radiated spurious emissions	IC RSS-132 § 4.6 IC RSS-133 § 6.6 IC RSS-Gen 7.1	PASS	
Remarks:				

3 Test Conditions and Results

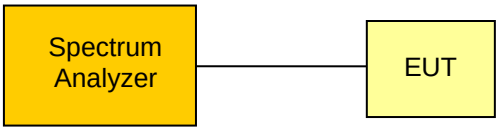
3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. to FCC Part 2 / IC RSS-Gen	
Test according to measurement reference	Reference Method
	RSS-Gen 6.6
Test frequency range	Tested frequencies
	F_{LOW} / F_{MID} / F_{HIGH}

Limits

None (Informational only)

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Resolution bandwidth set to 1 % of span
4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function

Test results - CDMA

Channel	Frequency [MHz]	Mode	Occupied Bandwidth [MHz]
1013	824.7	CDMA BC0	1.383
384	836.5	CDMA BC0	1.343
777	848.3	CDMA BC0	1.333
25	1851.25	CDMA BC1	1.353
600	1880.0	CDMA BC1	1.333
1175	1908.75	CDMA BC1	1.353
476	817.9	CDMA BC10	1.393
580	820.5	CDMA BC10	1.383
684	823.1	CDMA BC10	1.373

Comments:

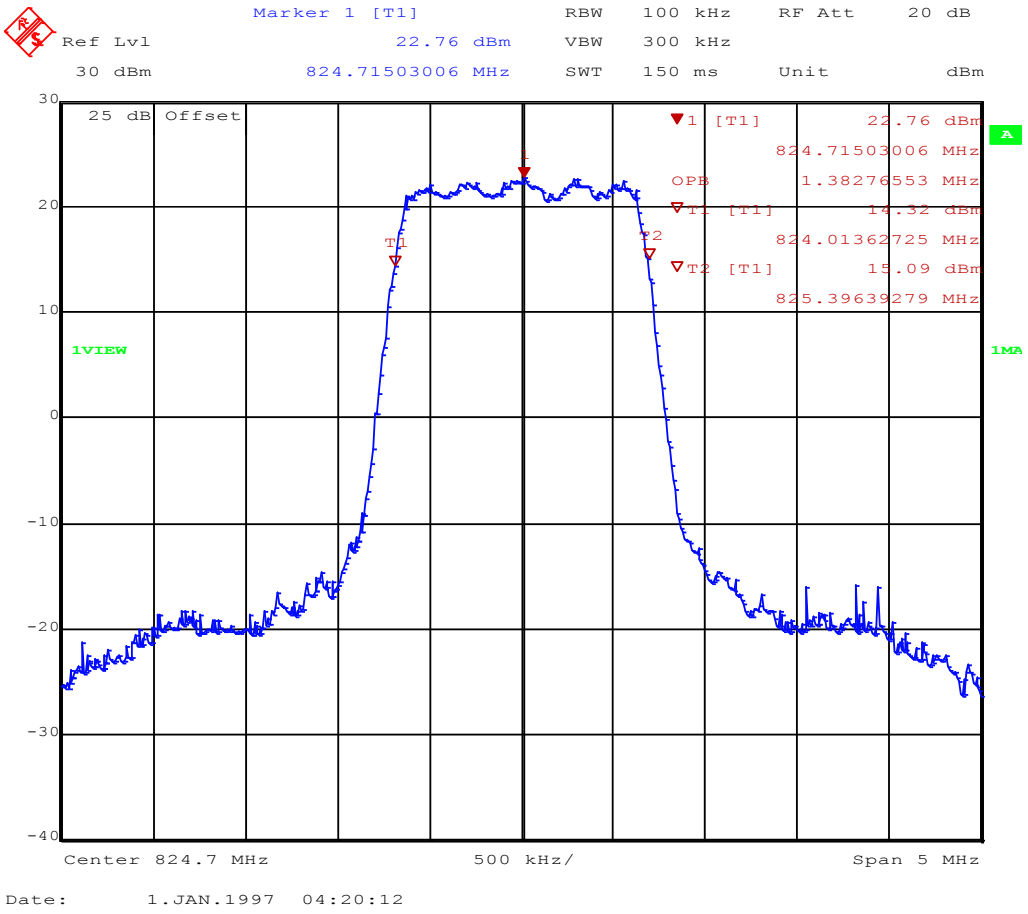
Test results – EV-DO			
Channel	Frequency [MHz]	Mode	Occupied Bandwidth [MHz]
F_{LOW}	824.7	CDMA BC0	1.373
F_{MID}	836.5	CDMA BC0	1.323
F_{HIGH}	848.3	CDMA BC0	1.333
F_{LOW}	1851.25	CDMA BC1	1.363
F_{MID}	1880.0	CDMA BC1	1.363
F_{HIGH}	1908.75	CDMA BC1	1.353
F_{LOW}	817.9	CDMA BC10	1.383
F_{MID}	820.5	CDMA BC10	1.373
F_{HIGH}	823.1	CDMA BC10	1.373
Comments:			

Occupied Bandwidth – CDMA BC0 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC0 / CH: 1013 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.383 MHz

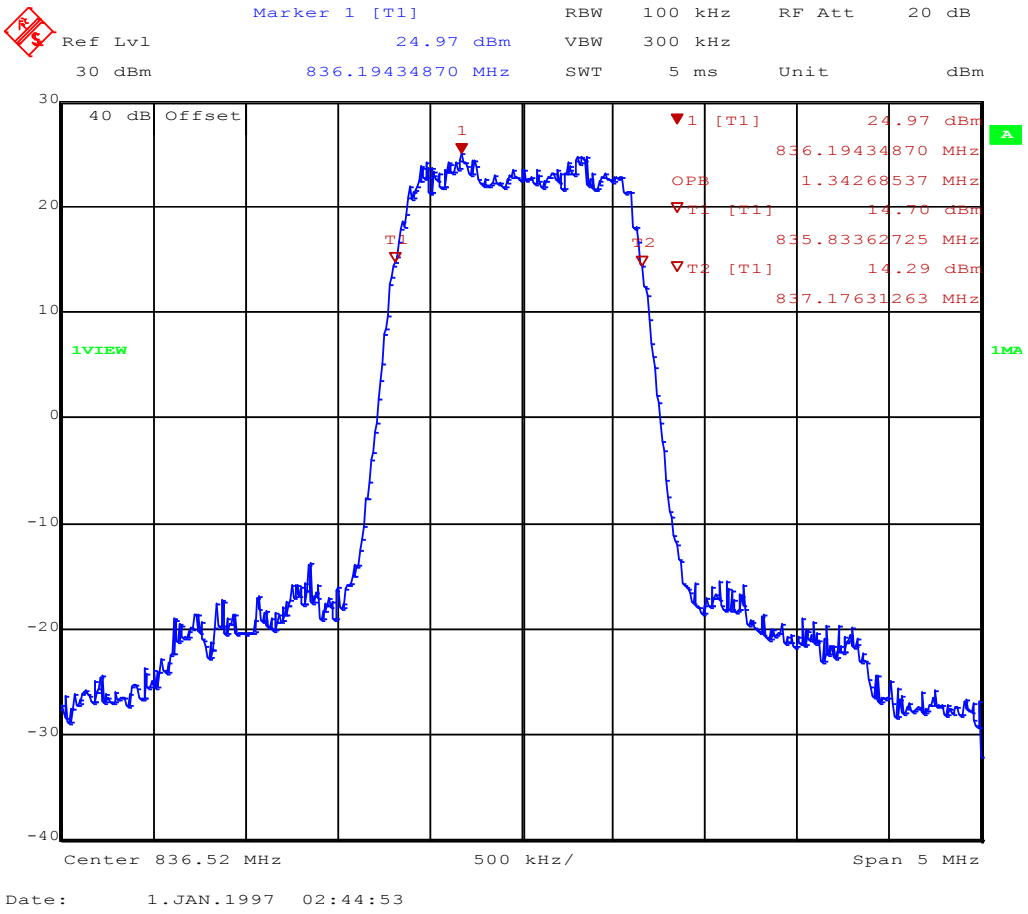


Occupied Bandwidth – CDMA BC0 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC0 / CH: 384 / 1xRTT / RC3/3
Test Date:	2015-01-28
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.343 MHz

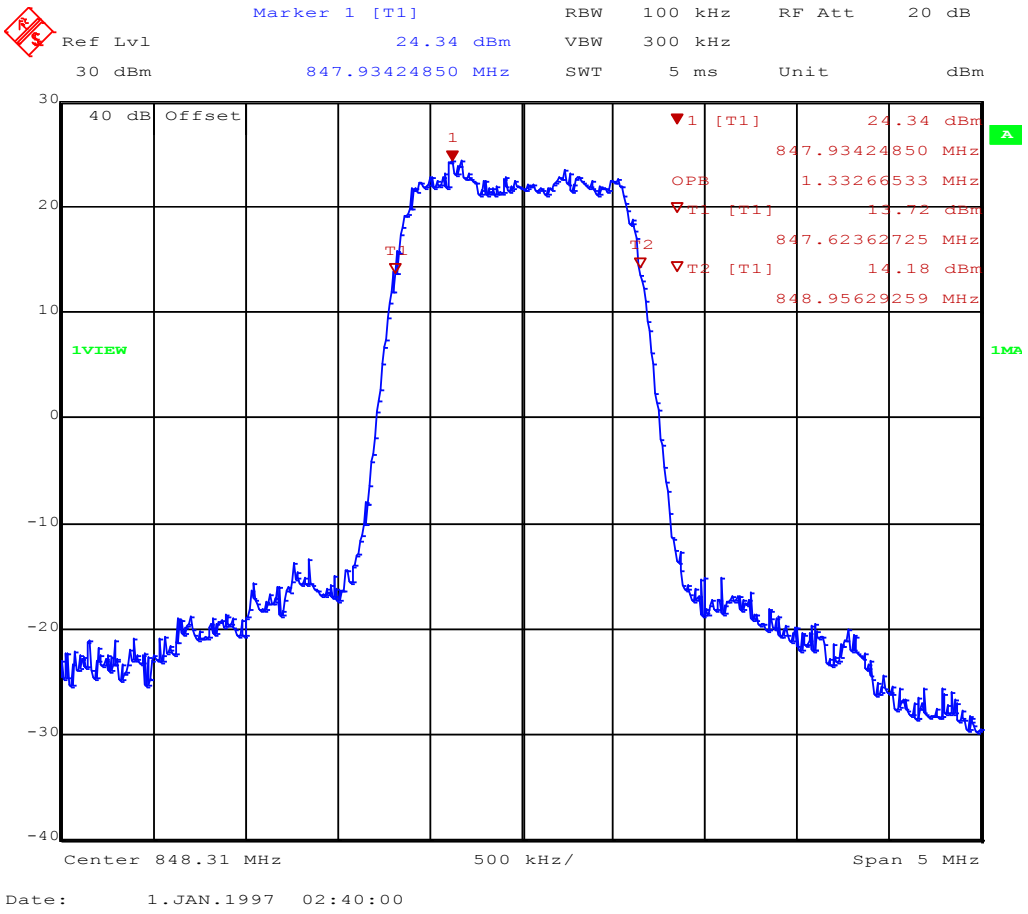


Occupied Bandwidth – CDMA BC0 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC0 / CH: 777 / 1xRTT / RC3/3
Test Date:	2015-01-28
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.333 MHz

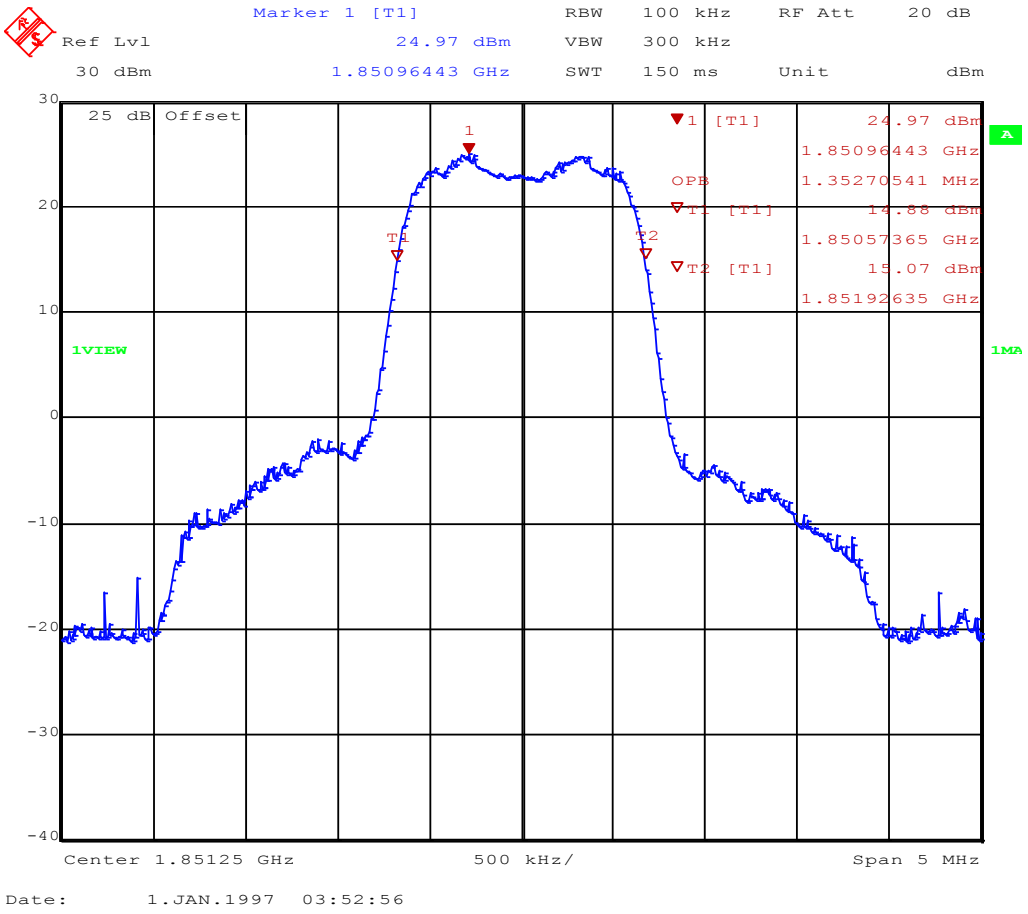


Occupied Bandwidth – CDMA BC1 F_{Low}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC1 / CH: 25 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.353 MHz

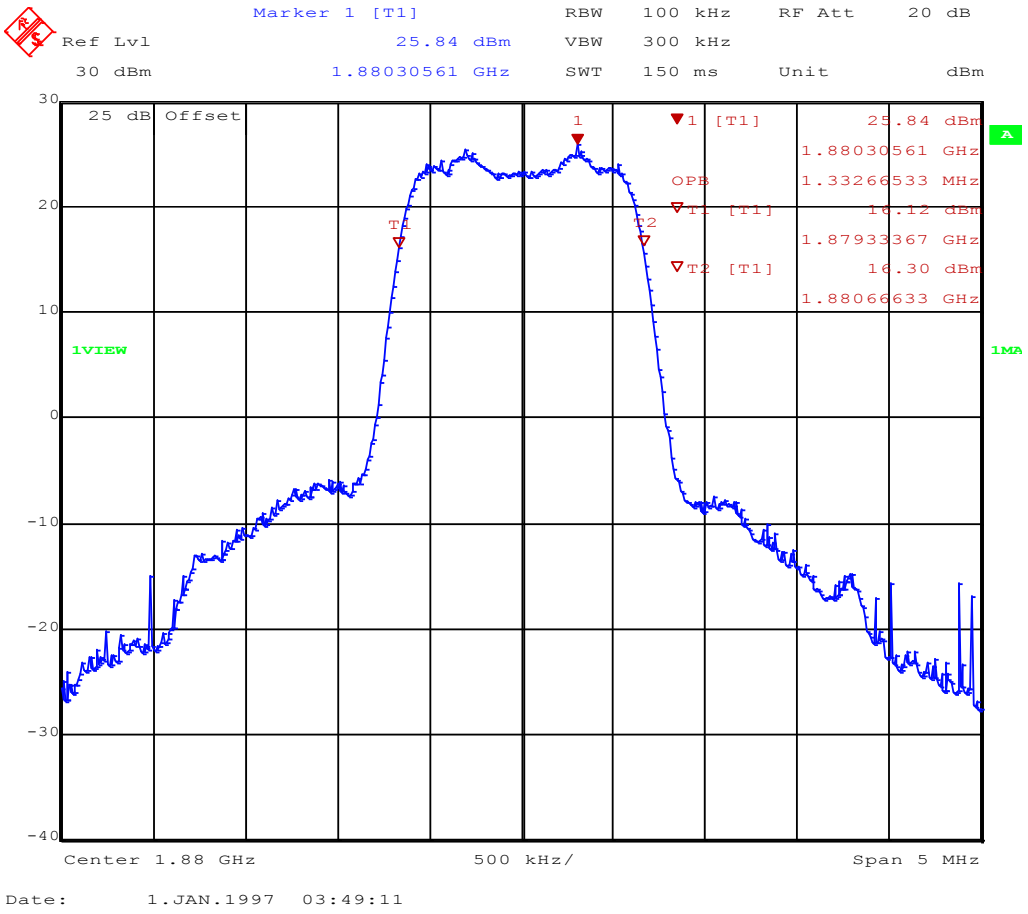


Occupied Bandwidth – CDMA BC1 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC1 / CH: 600 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.333 MHz

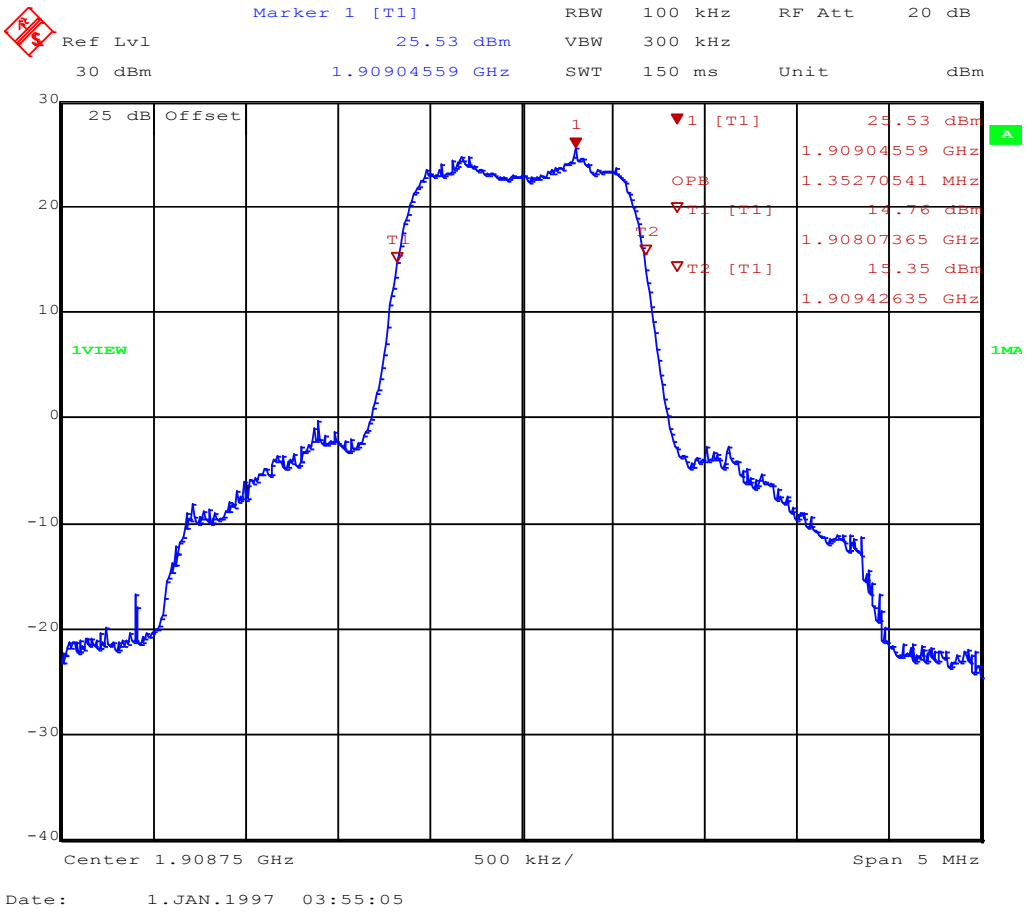


Occupied Bandwidth – CDMA BC1 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC1 / CH: 1175 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.353 MHz

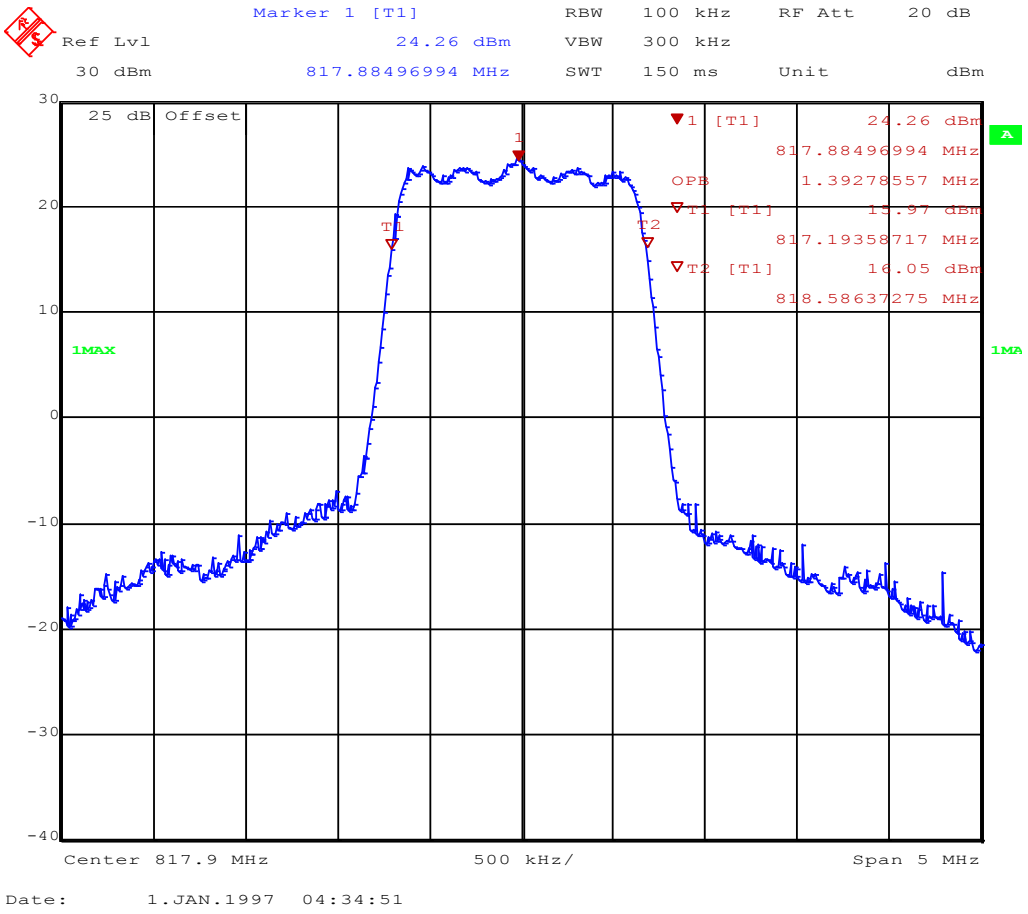


Occupied Bandwidth – CDMA BC10 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC10 / CH: 476 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.393 MHz

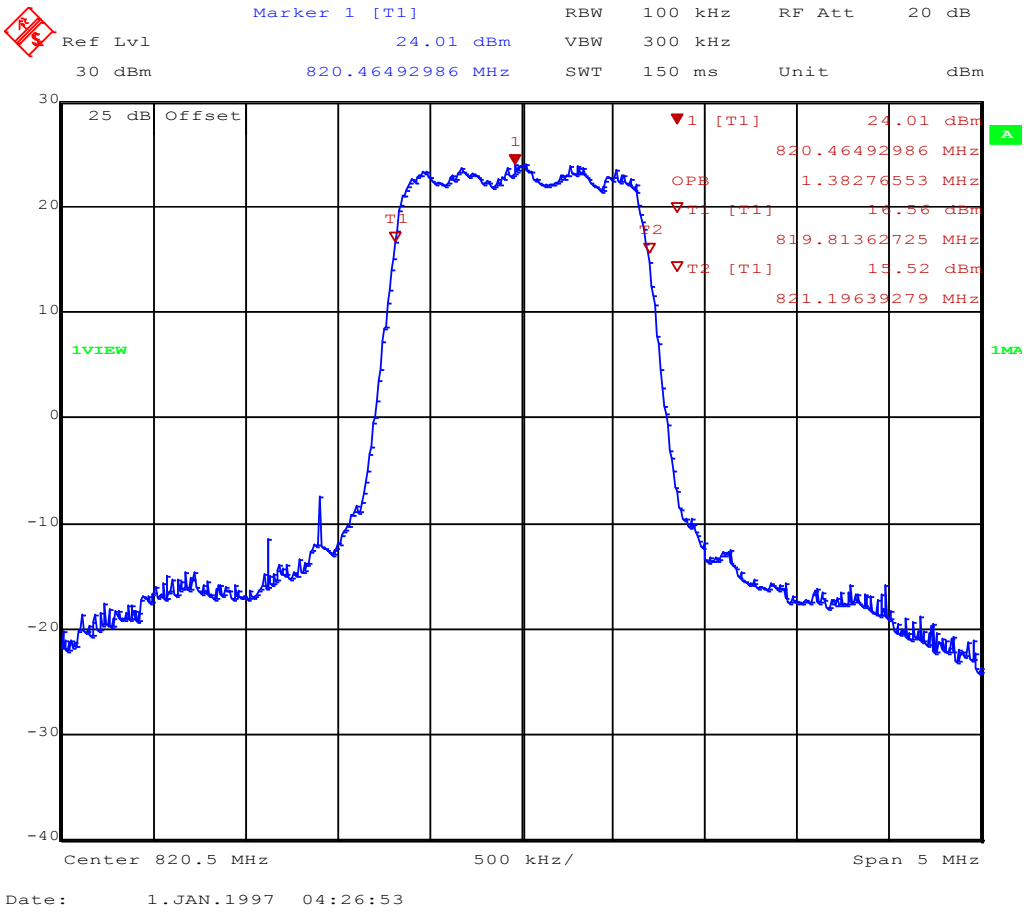


Occupied Bandwidth – CDMA BC10 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC10 / CH: 580 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.383 MHz

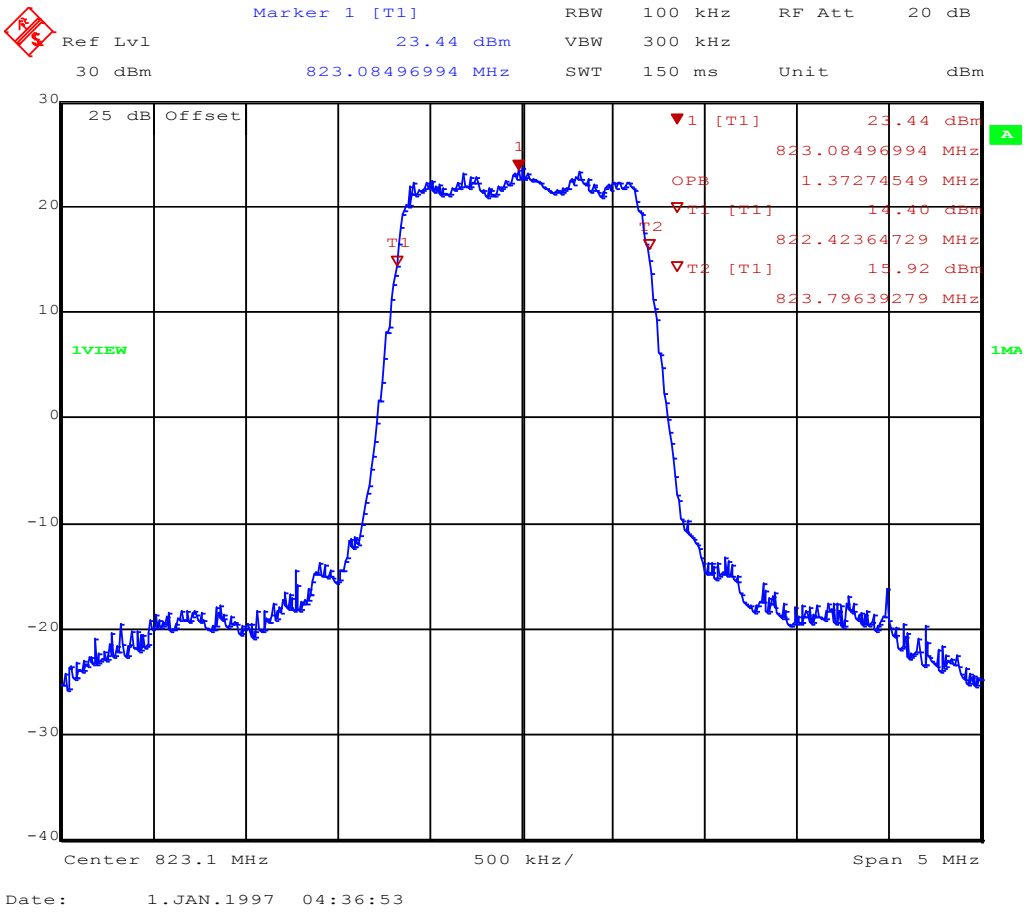


Occupied Bandwidth – CDMA BC10 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC10 / CH: 684 / 1xRTT / RC3/3
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.373 MHz

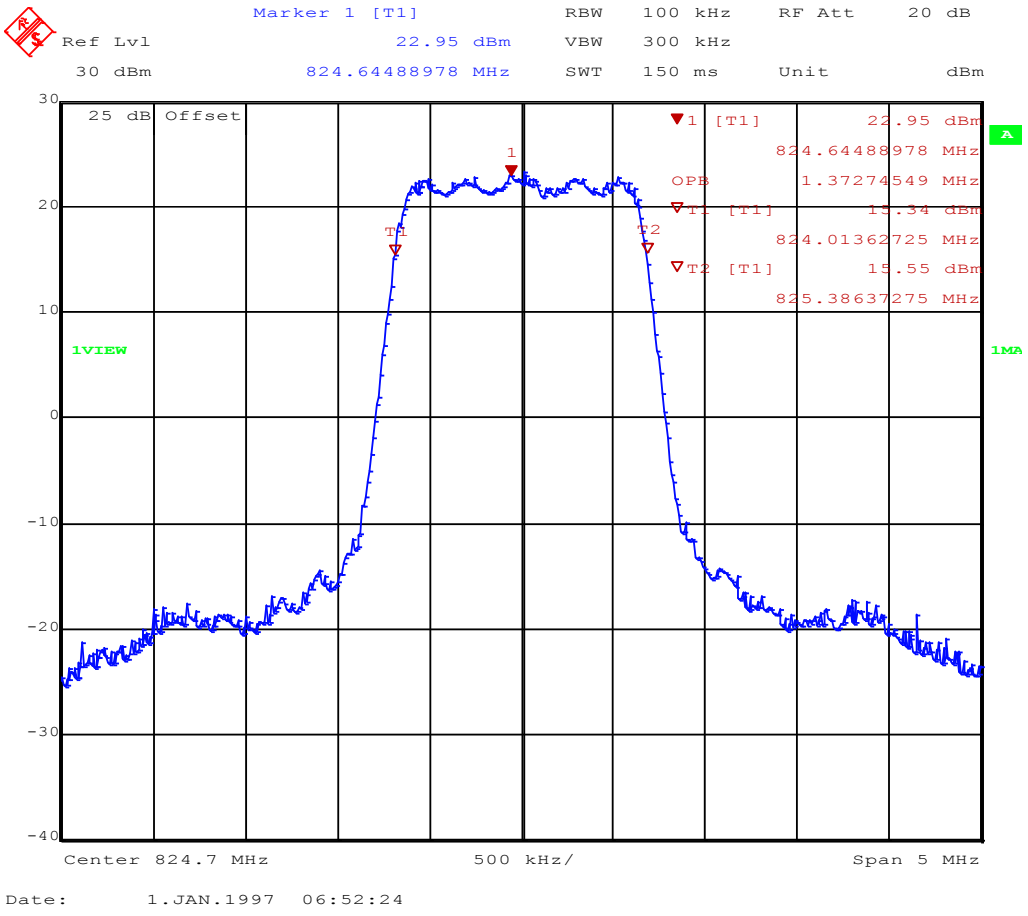


Occupied Bandwidth – EV-DO BC0 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC0 / CH: 1013 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.373 MHz

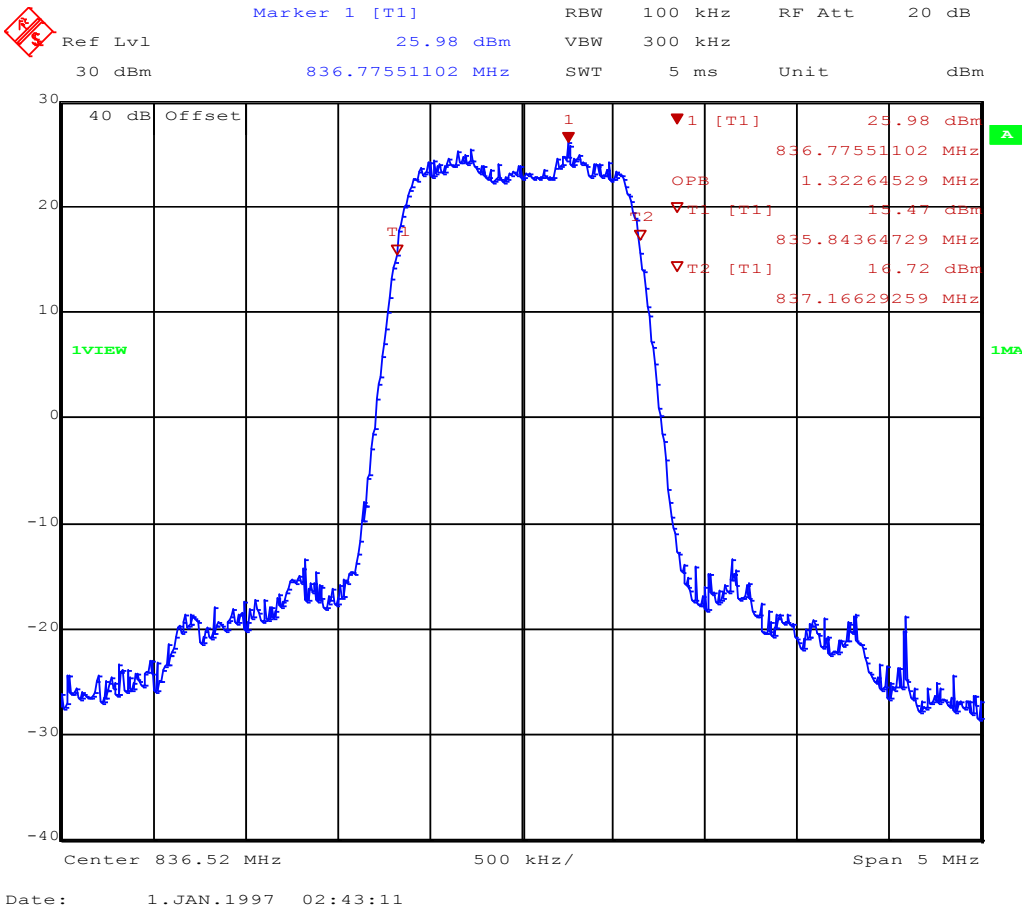


Occupied Bandwidth – EV-DO BC0 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC0 / CH: 384 / 1xEV-DO / Rev.0
Test Date:	2015-01-28
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.323 MHz

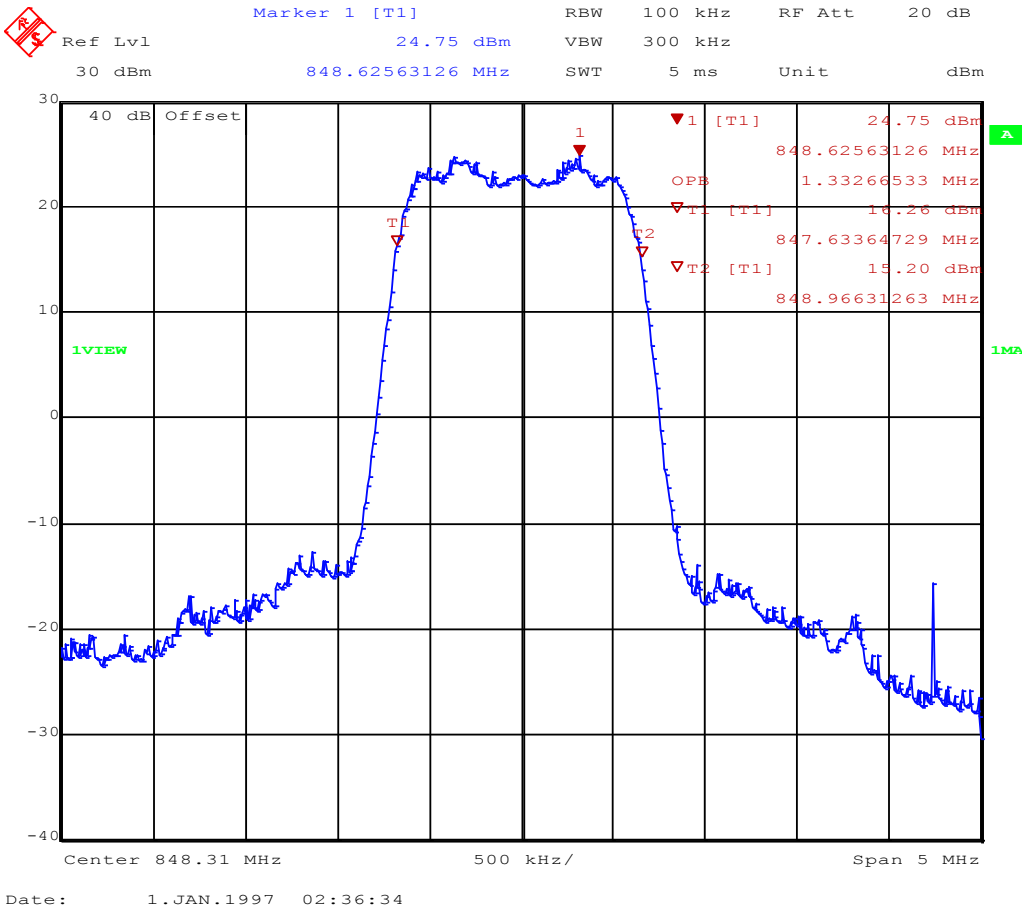


Occupied Bandwidth – EV-DO BC0 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC0 / CH: 777 / 1xEV-DO / Rev.0
Test Date:	2015-01-28
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.333 MHz

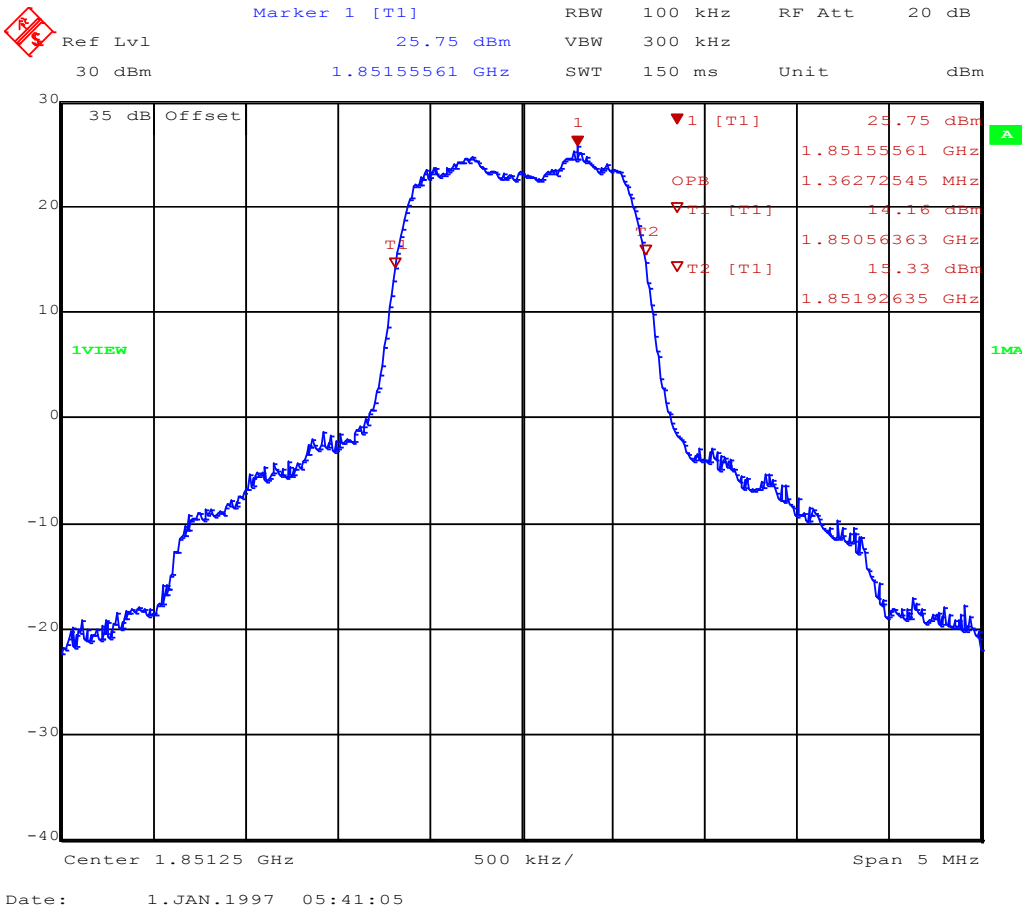


Occupied Bandwidth – EV-DO BC1 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC1 / CH: 25 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.363 MHz

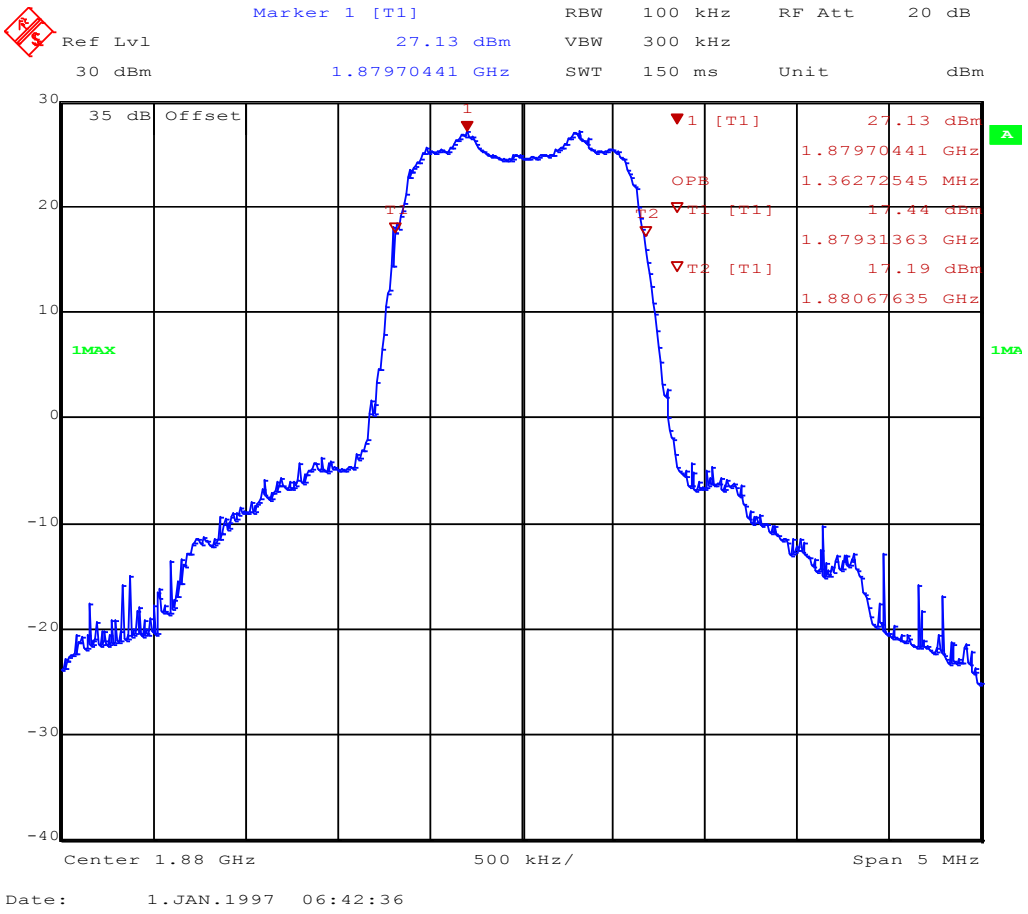


Occupied Bandwidth – EV-DO BC1 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC1 / CH: 600 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.363 MHz

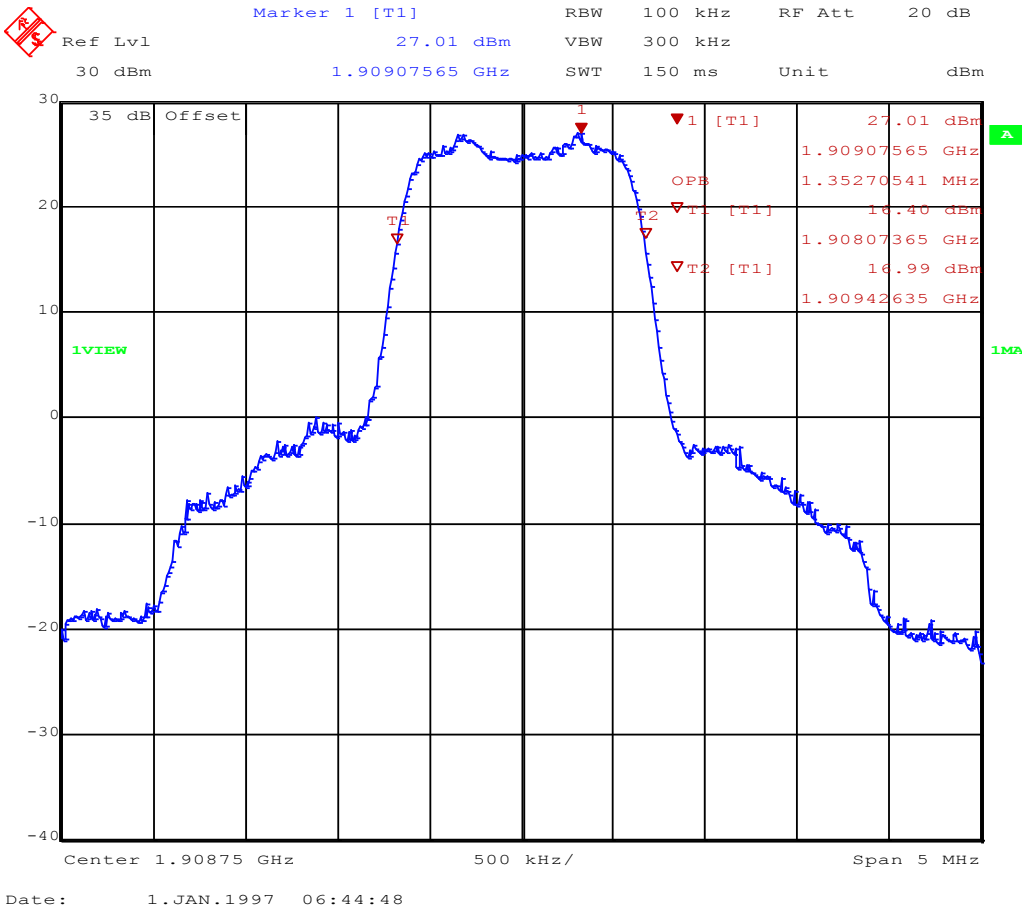


Occupied Bandwidth – EV-DO BC1 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC1 / CH: 1175 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.353 MHz

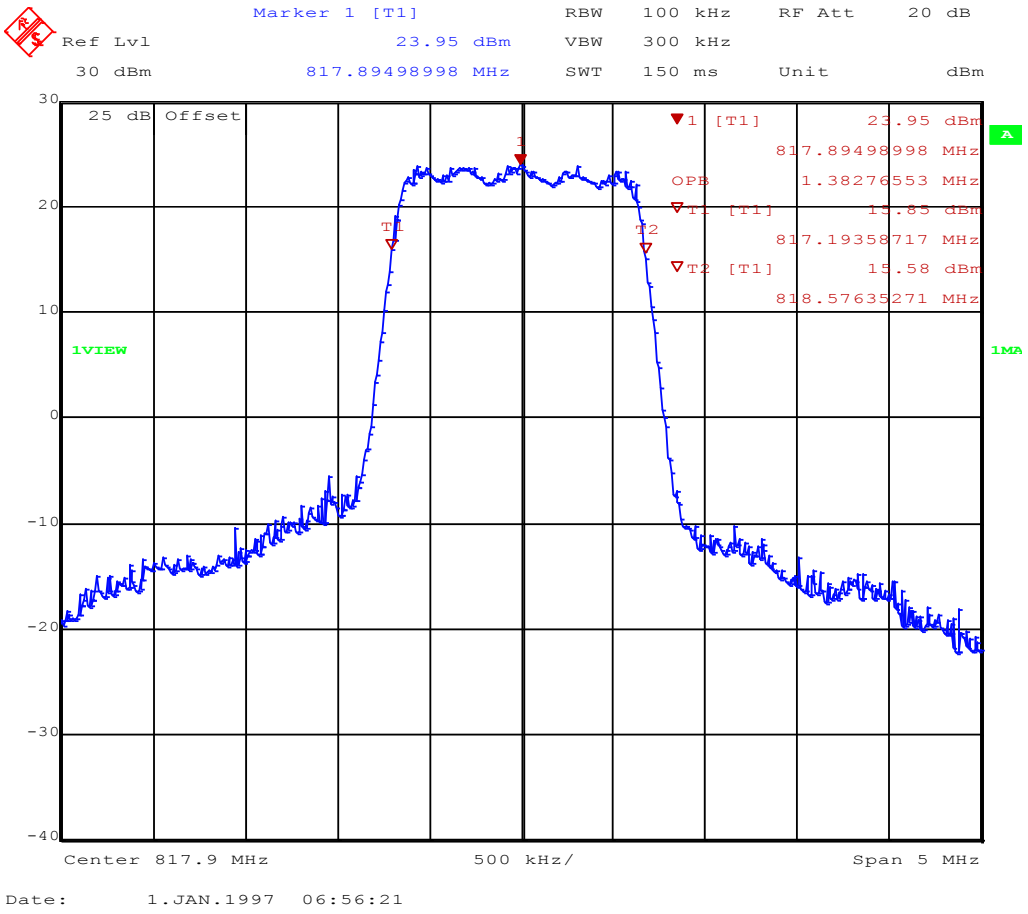


Occupied Bandwidth – EV-DO BC10 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC10 / CH: 476 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.383 MHz

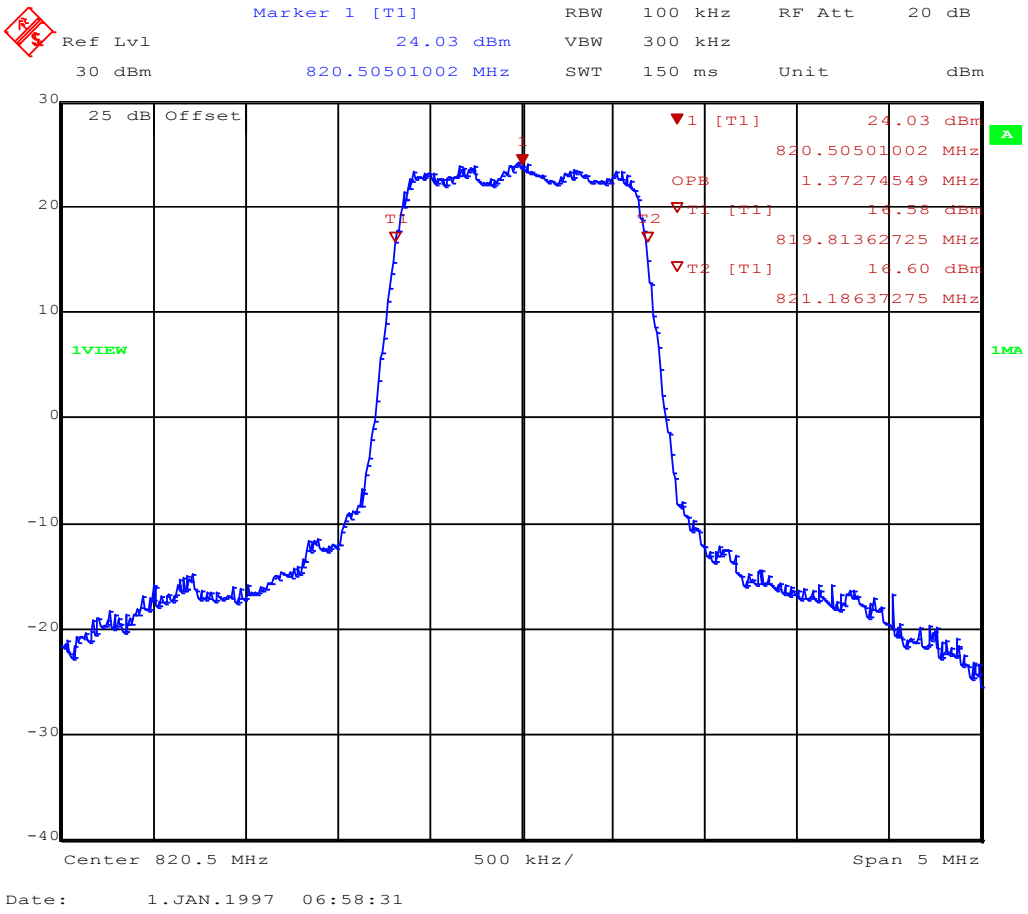


Occupied Bandwidth – EV-DO BC10 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC10 / CH: 580 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.373 MHz

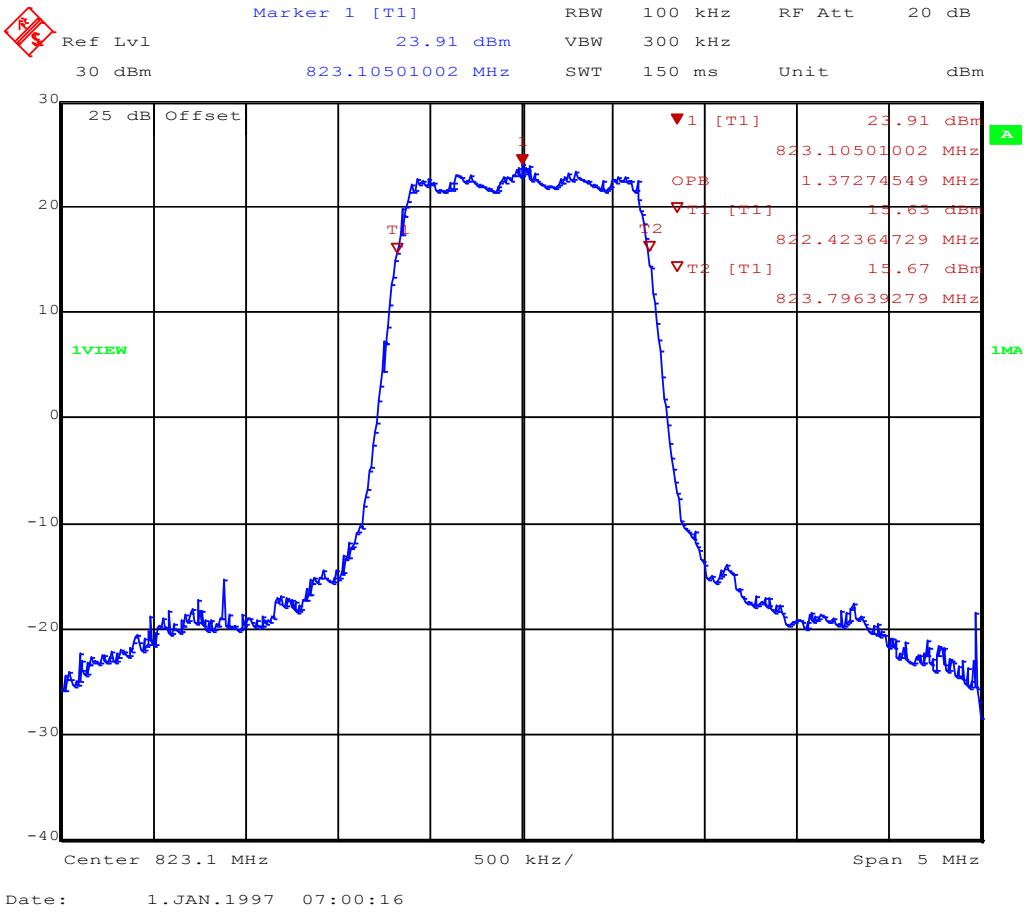


Occupied Bandwidth – EV-DO BC10 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

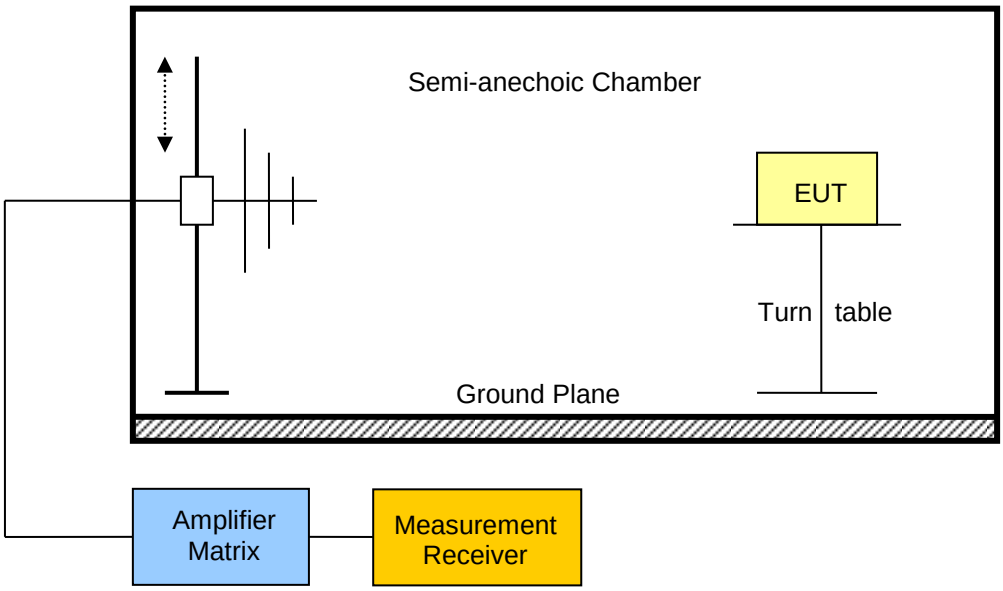
Project Number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom / Vnom
Mode:	CDMA BC10 / CH: 684 / 1xEV-DO / Rev.0
Test Date:	2014-12-11
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	OBW = 1.373 MHz



3.2 Test Conditions and Results – Effective radiated power / Equivalent isotropic radiated power

Radiated power acc. FCC 22H / FCC 24E / FCC 90S / IC RSS-132 / IC RSS-133		**Verdict: PASS**
EUT requirement rule parts and clause	Reference	
	FCC § 22.913(a) / FCC § 24.232(c) / FCC § 90.635(b) IC RSS-132 § 4.4 /IC RSS-133 § 6.4	
Test according to measurement reference	Reference Method	
	FCC § 22.913(a) / FCC § 24.232(c) / ANSI/TIA-603-C IC RSS-132 § 4.4 /IC RSS-133 § 6.4	
Test frequency range	Tested frequencies	
	F_{LOW} / F_{MID} / F_{HIGH}	
Limits		
Frequency range	Equipment type	Power limit
806-824 MHz	Mobile transmitter	FCC : 100 Watts (50 dBm) e.r.p.
824-849 MHz	Mobile transmitter	FCC : 7 Watts (38.45 dBm) e.r.p. IC : 11.5 Watts (40.6 dBm) e.i.r.p.
1850-1910 MHz	Mobile transmitter	FCC : 2 Watts (33 dBm) e.i.r.p. IC : 2 Watts (33 dBm) e.i.r.p.
Test setup		



Test procedure
1. EUT set to test mode 2. The radiated power is measured with a measurement antenna in vertical polarization 3. To obtain maximum level the EUT is rotated 4. The EUT is replaced with a half-wave dipole and the power to the dipole is adjusted to obtain same radiated power measurement value

Test results – CDMA BC0

Channel	Frequency [MHz]	Mode	Pol.	Power [dBm e.r.p]	Limit [dBm e.r.p]	Margin [dB]	Result
1013	824.7	EV-DO BC0	hor	23.6	38.45	-14.85	PASS
384	836.5	EV-DO BC0	hor	23.2	38.45	-15.25	PASS
777	848.3	EV-DO BC0	hor	25.3	38.45	-13.15	PASS

Test results – CDMA BC0

Channel	Frequency [MHz]	Mode	Pol.	Power [dBm e.i.r.p]	Limit [dBm e.i.r.p]	Margin [dB]	Result
1013	824.7	EV-DO BC0	hor	25.75	40.6	-14.85	PASS
384	836.5	EV-DO BC0	hor	25.35	40.6	-15.25	PASS
777	848.3	EV-DO BC0	hor	27.45	40.6	-13.15	PASS

Test results – CDMA BC10

Channel	Frequency [MHz]	Mode	Pol.	Power [dBm e.r.p]	Limit [dBm e.r.p]	Margin [dB]	Result
476	817.9	EV-DO BC10	hor	23.8	50	-26.20	PASS
580	820.5	EV-DO BC10	hor	24.9	50	-25.10	PASS
684	823.1	EV-DO BC10	hor	24.6	50	-25.40	PASS

Test results – CDMA BC1

Channel	Frequency [MHz]	Mode	Pol.	Power [dBm e.i.r.p]	Limit [dBm e.i.r.p]	Margin [dB]	Result
25	1851.25	EV-DO BC1	hor	29.8	33	-03.20	PASS
600	1880.0	EV-DO BC1	hor	31.5	33	-01.50	PASS
1175	1908.75	EV-DO BC1	hor	29.3	33	-03.70	PASS

Comments:

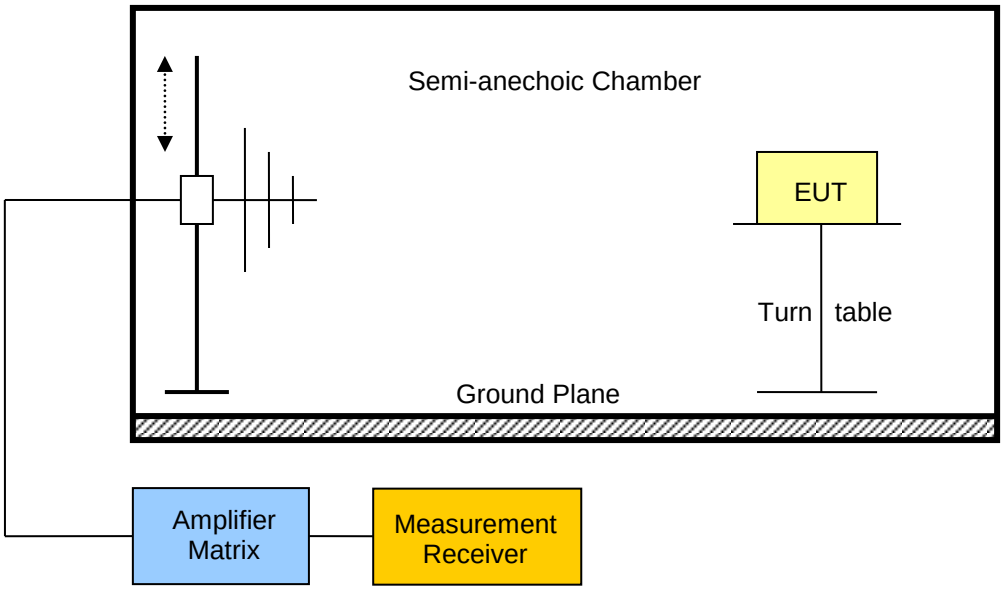
3.3 Test Conditions and Results – Transmitter radiated emissions

Transmitter radiated power acc. to FCC 22H / FCC 24E / FCC 90S IC RSS-132 / IC RSS-133	**Verdict: PASS**
Test according referenced standards	Reference Method
	FCC § 22.917(a) / FCC § 24.238(a) / FCC § 90.669(a) IC RSS-132 § 4.5 / IC RSS-133 § 6.5
Test according to measurement reference	Reference Method
	ANSI/TIA-603-C
Test frequency range	Tested frequencies
	30 MHz – 10th Harmonic

Limits

Frequency range	Limit
806-824 MHz	Attenuation below transmitter power ≥ 43 + 10 · $\log_{10}$(P) [dB] = -13 dBm
824-849 MHz	Attenuation below transmitter power ≥ 43 + 10 · $\log_{10}$(P) [dB] = -13 dBm
1850-1910 MHz	Attenuation below transmitter power ≥ 43 + 10 · $\log_{10}$(P) [dB] = -13 dBm

Test setup



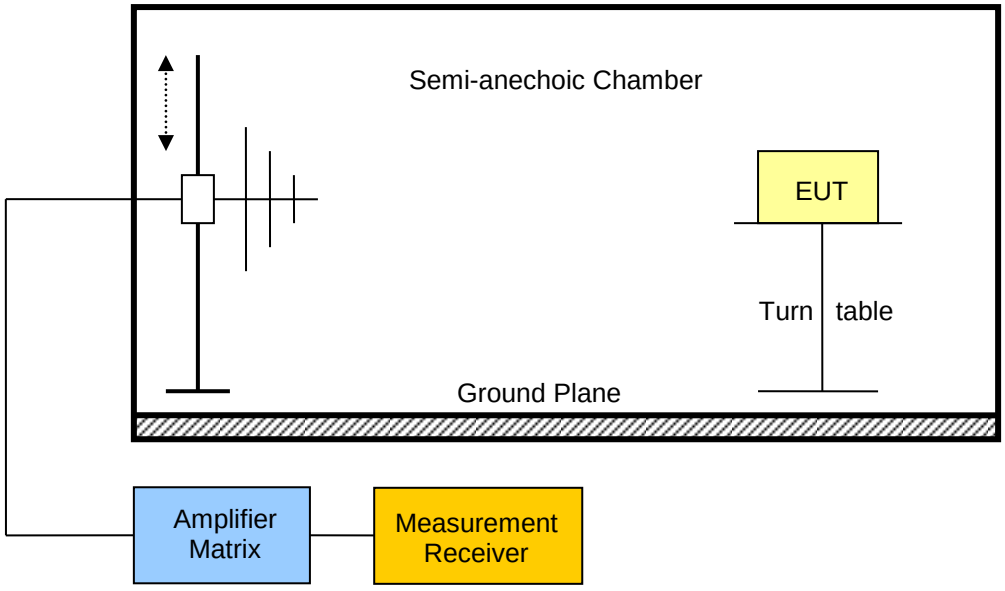
Test procedure

1. EUT set to test mode
2. Maximum emission level is measured by rotating the EUT and adjusting the antenna height for vertical polarization
3. The EUT is replaced by a substitution antenna and generator
4. The power level is set to obtain the same power reading
5. Measurement is repeated for horizontal polarization

Test results – CDMA BC0							
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbm]	Pol.	Limit [dBm]	Margin [dB]
1013	824.7	EV-DO BC0	824	-17.40	ver	-13.00	-04.40
1013	824.7	EV-DO BC0	824	-15.50	hor	-13.00	-02.48
777	848.3	EV-DO BC0	849	-15.20	ver	-13.00	-02.20
777	848.3	EV-DO BC0	849	-15.90	hor	-13.00	-02.94
Test results – CDMA BC1							
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbm]	Pol.	Limit [dBm]	Margin [dB]
25	1851.25	EV-DO BC1	1850	-20.90	hor	-13.00	-07.93
25	1851.25	EV-DO BC1	1850	-29.80	ver	-13.00	-16.84
1175	1908.75	EV-DO BC1	1910	-28.40	ver	-13.00	-15.36
1175	1908.75	EV-DO BC1	1910	-24.50	hor	-13.00	-11.48
Test results – CDMA BC10							
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbm]	Pol.	Limit [dBm]	Margin [dB]
476	817.9	EV-DO BC10	815.914	-26.60	hor	-13.00	-13.60
684	823.1	EV-DO BC10	824.13	-19.90	hor	-13.00	-06.92
684	823.1	EV-DO BC10	824.162	-22.20	ver	-13.00	-09.16
Comments:							

3.4 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. to IC RSS-132 / IC RSS-133				**Verdict: PASS**
Test according to measurement reference	Reference Method			
	ANSI C63.4			
Test frequency range	Tested frequencies			
	30 MHz – 3th Harmonic			
EUT test mode	Receive			
Limits				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3
Test setup				



Test procedure
1. EUT set to receive mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1MHz with peak/average detector is used above 1GHz 4. Markers are set to peak emission levels

Test results – CDMA BC0

Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbµV/m]	Pol.	Det.	Limit [dBµV/m]	Margin [dB]
384	881.5	374.4	34.88	ver	pk	46.00	-11.12
384	881.5	750.822	35.94	hor	pk	46.00	-10.06
384	881.5	886.4	35.33	ver	pk	46.00	-10.67

Test results – CDMA BC1

Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbµV/m]	Pol.	Det.	Limit [dBµV/m]	Margin [dB]
600	1960.0	374.4	35.09	ver	pk	46.00	-10.91
600	1960.0	752.249	36.42	hor	pk	46.00	-09.58
600	1960.0	887.677	34.59	ver	pk	46.00	-11.41
600	1960.0	7816	52.68	hor	pk	53.98	-01.30

Test results – CDMA BC10

Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbµV/m]	Pol.	Det.	Limit [dBµV/m]	Margin [dB]
580	865.5	374.4	34.88	ver	pk	46.00	-11.12
580	865.5	750.4	36.37	hor	pk	46.00	-09.63
580	865.5	886.4	34.91	ver	pk	46.00	-11.09

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

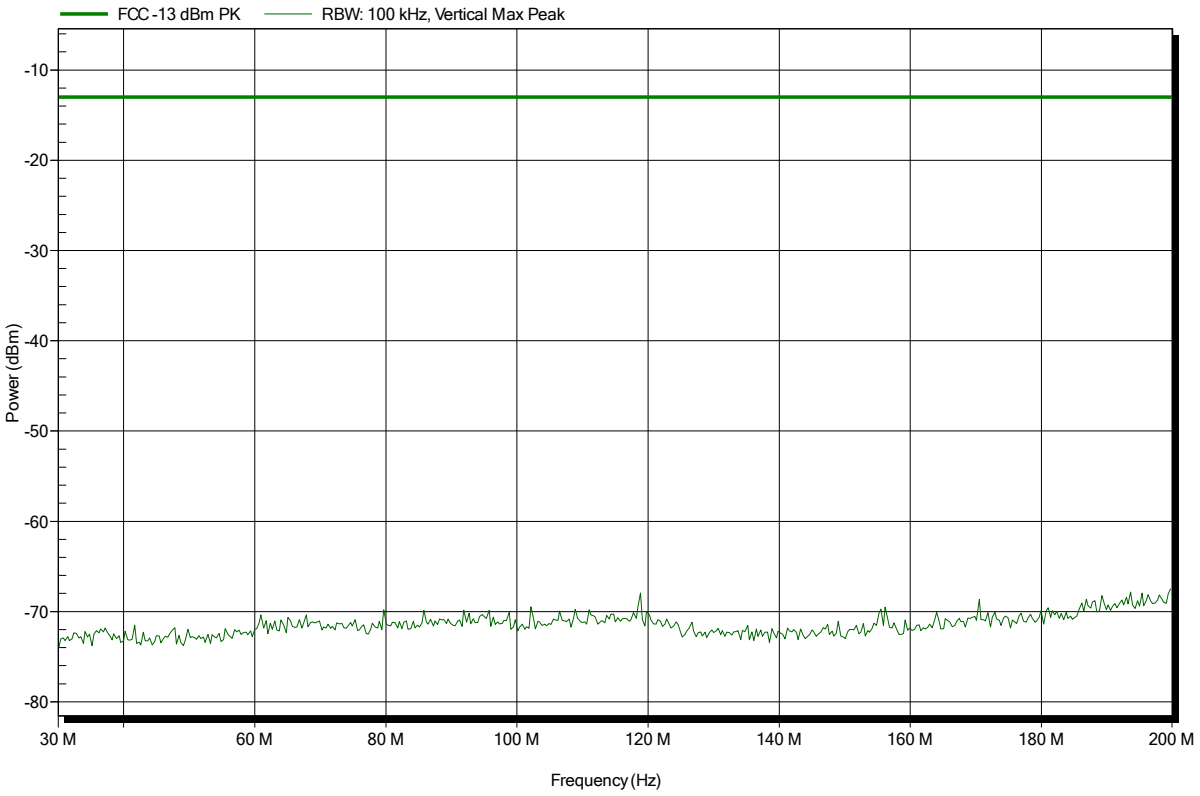
ANNEX A Transmitter radiated spurious emissions

Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical

Index 70

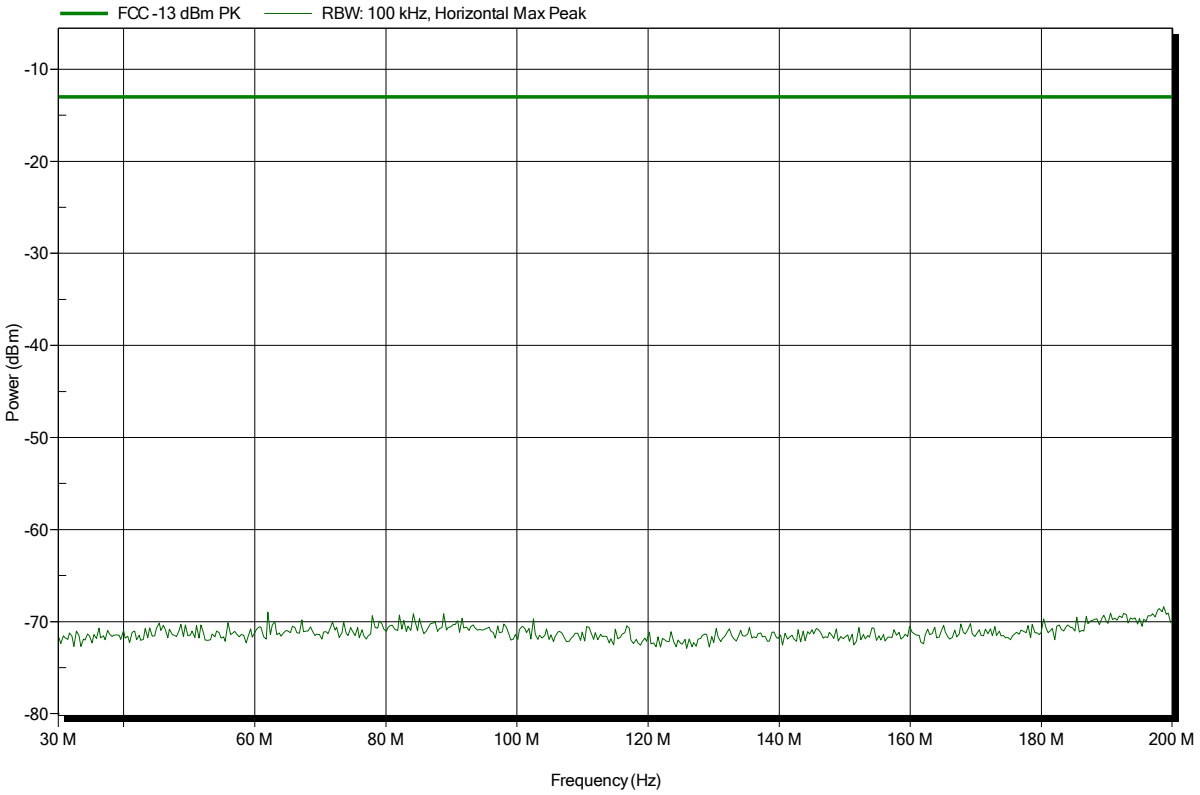


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical

Index 69

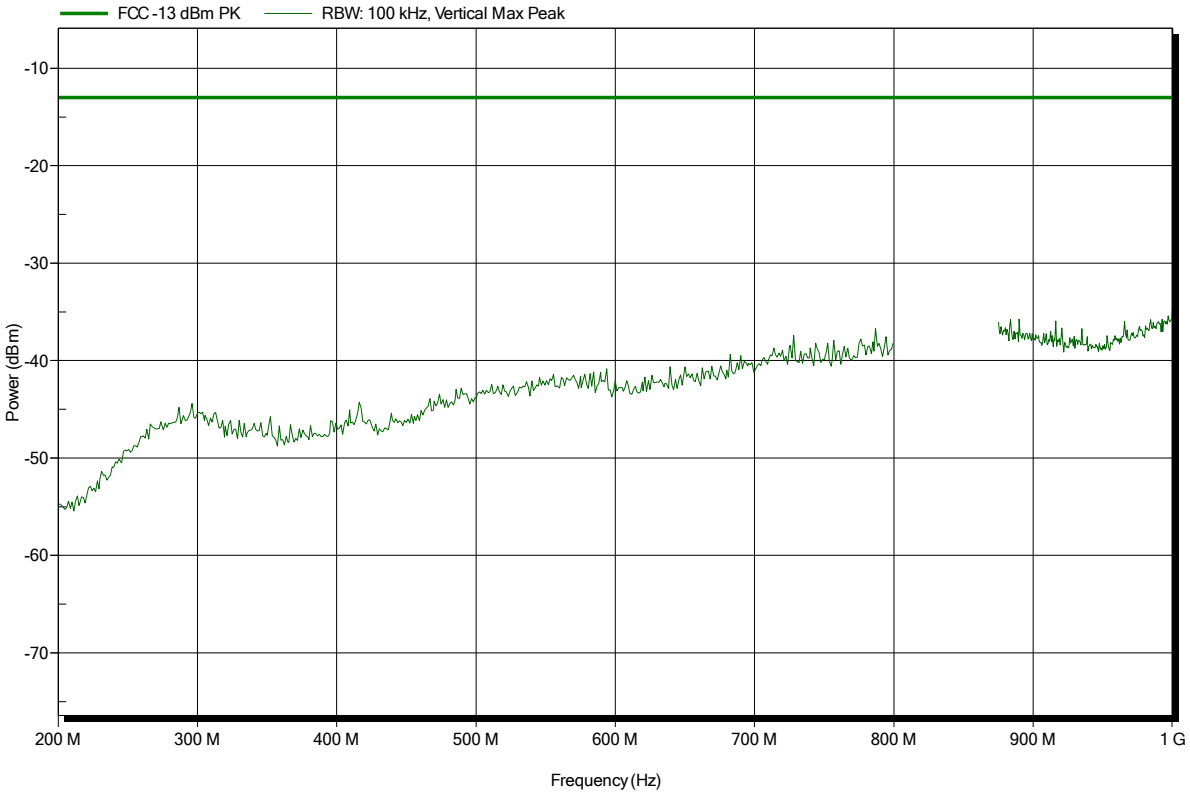


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 82

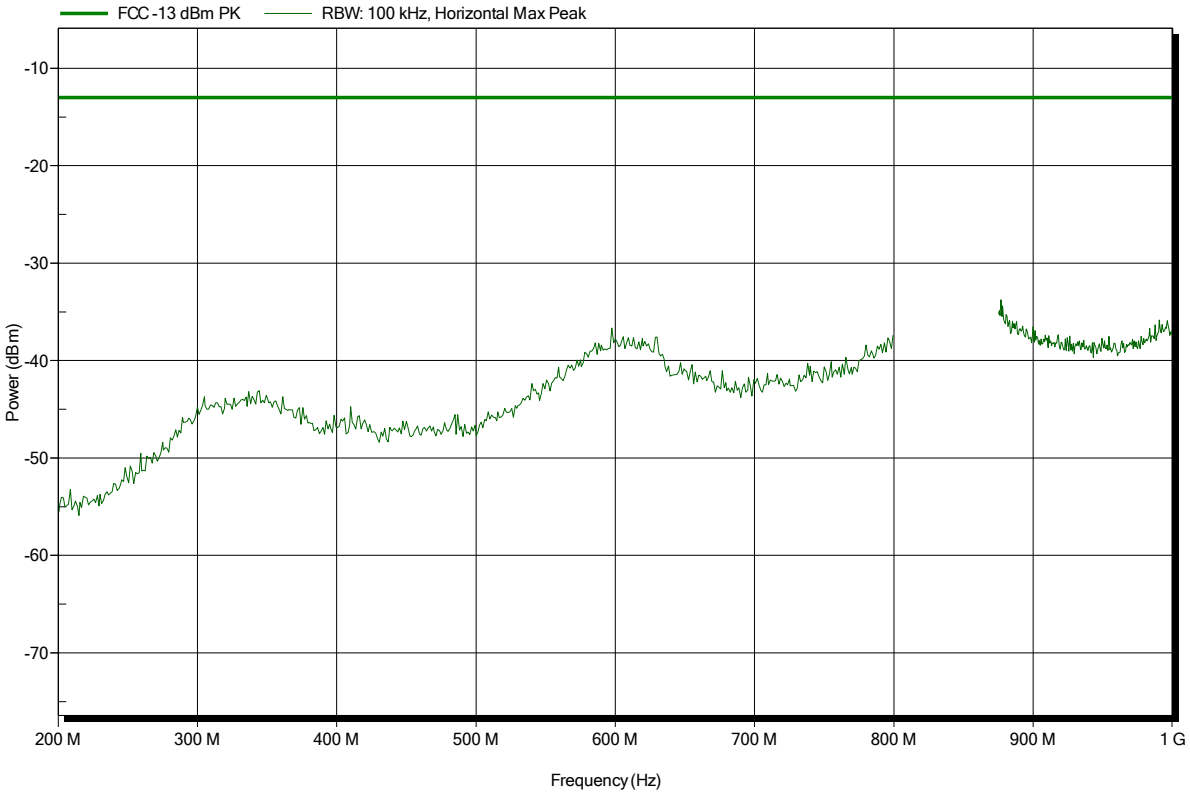


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 83

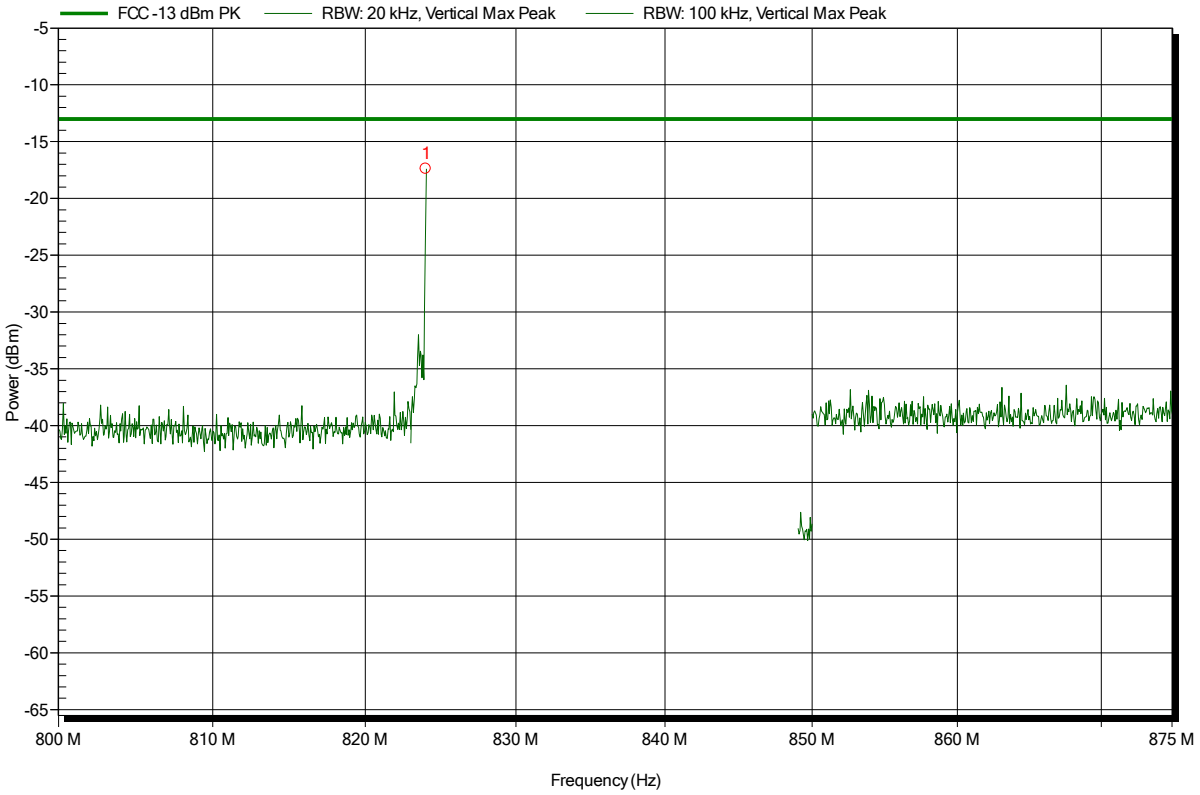


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 93



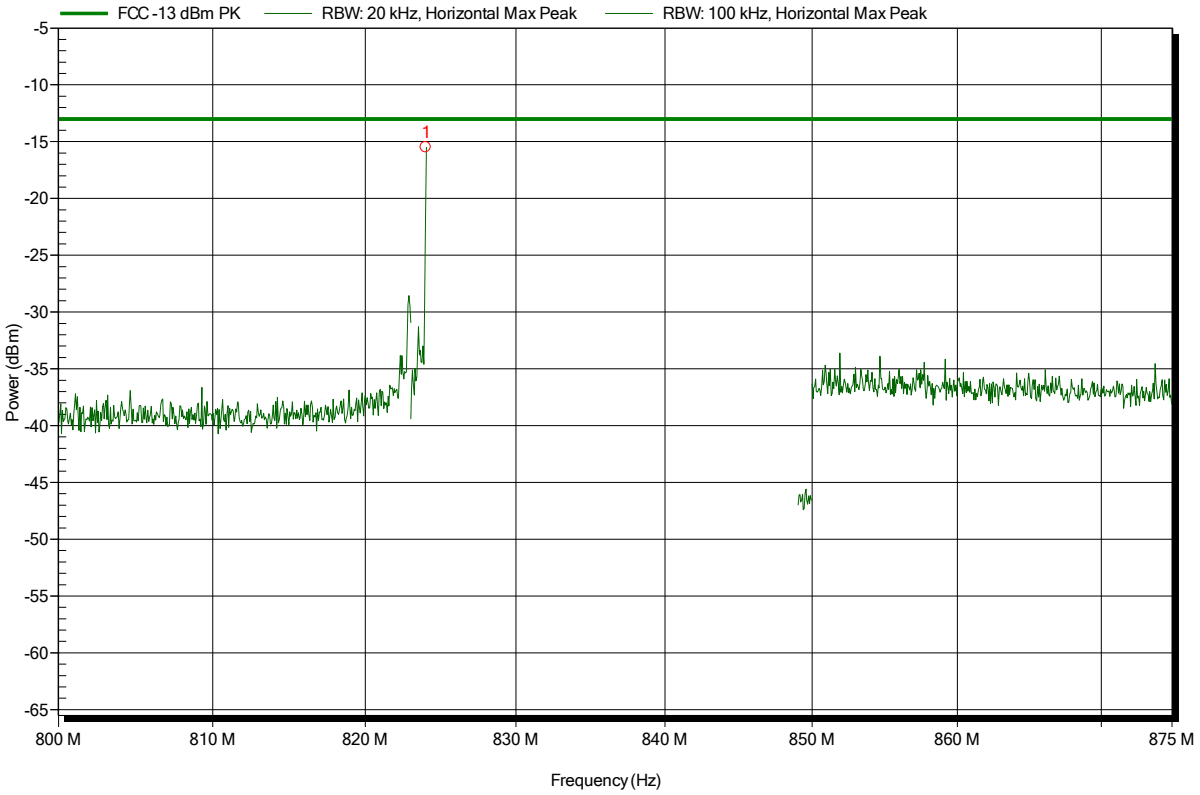
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
824 MHz	-17.4 dBm	-13 dBm	-4.4 dB	Pass

Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 98



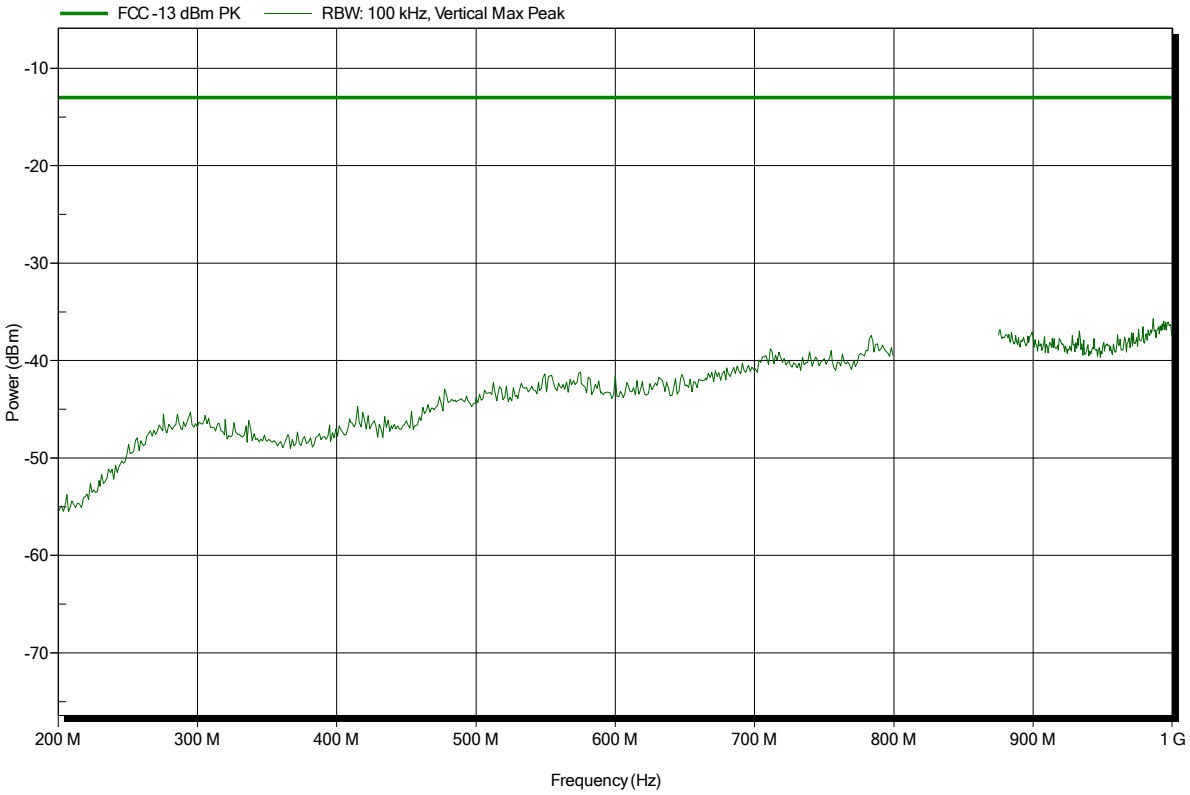
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
824 MHz	-15.5 dBm	-13 dBm	-2.48 dB	Pass

Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-27
Note:	EUT vertical

Index 84

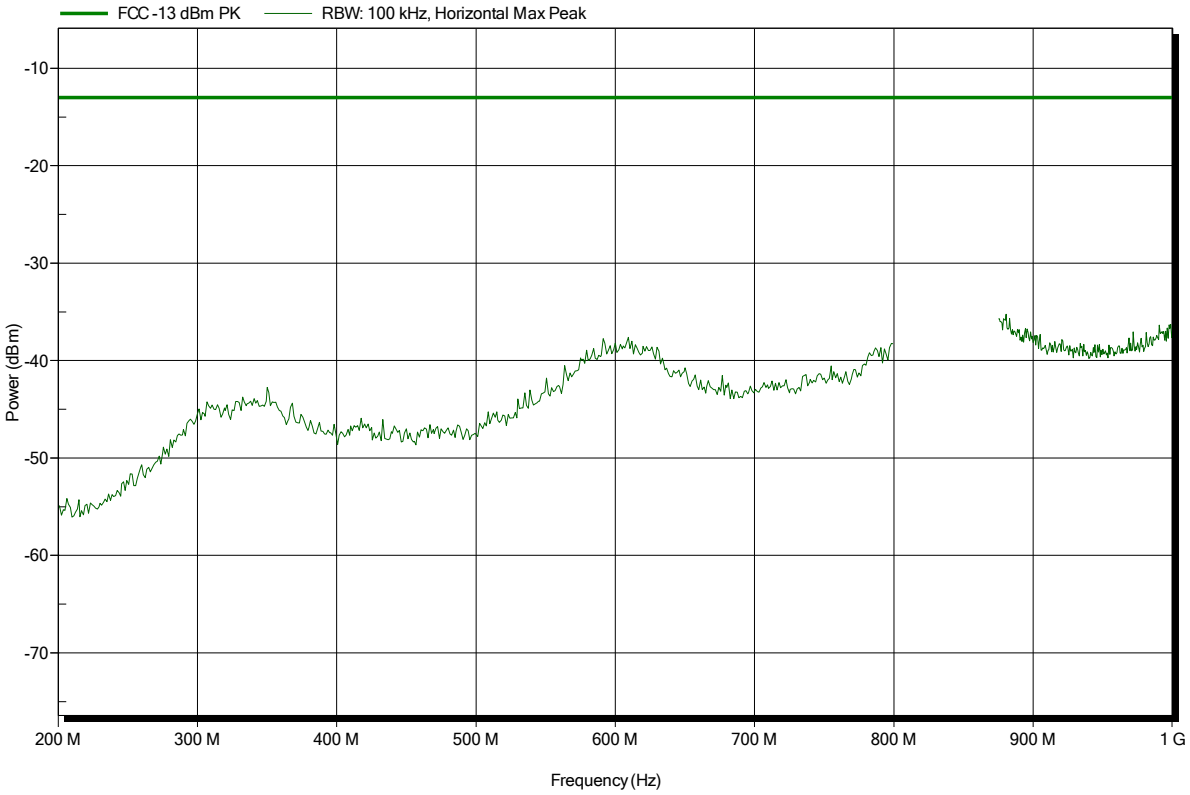


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-27
Note:	EUT vertical

Index 85

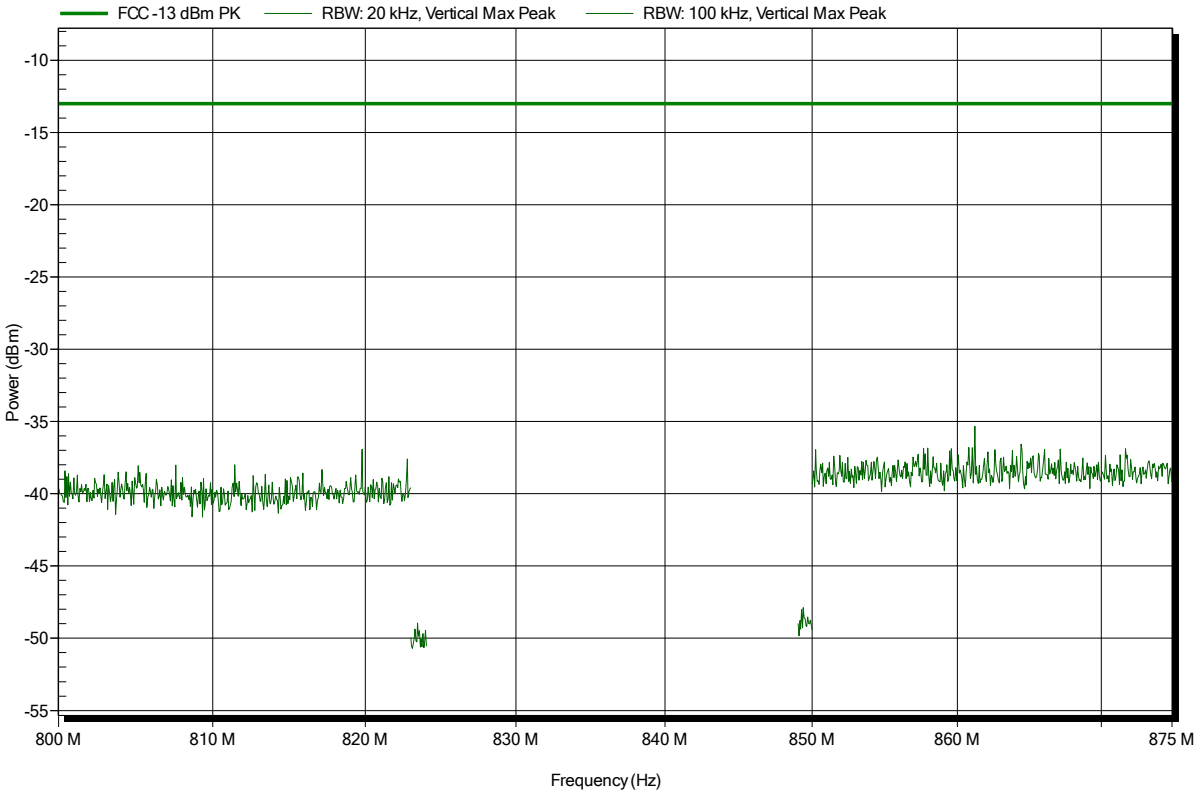


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 94

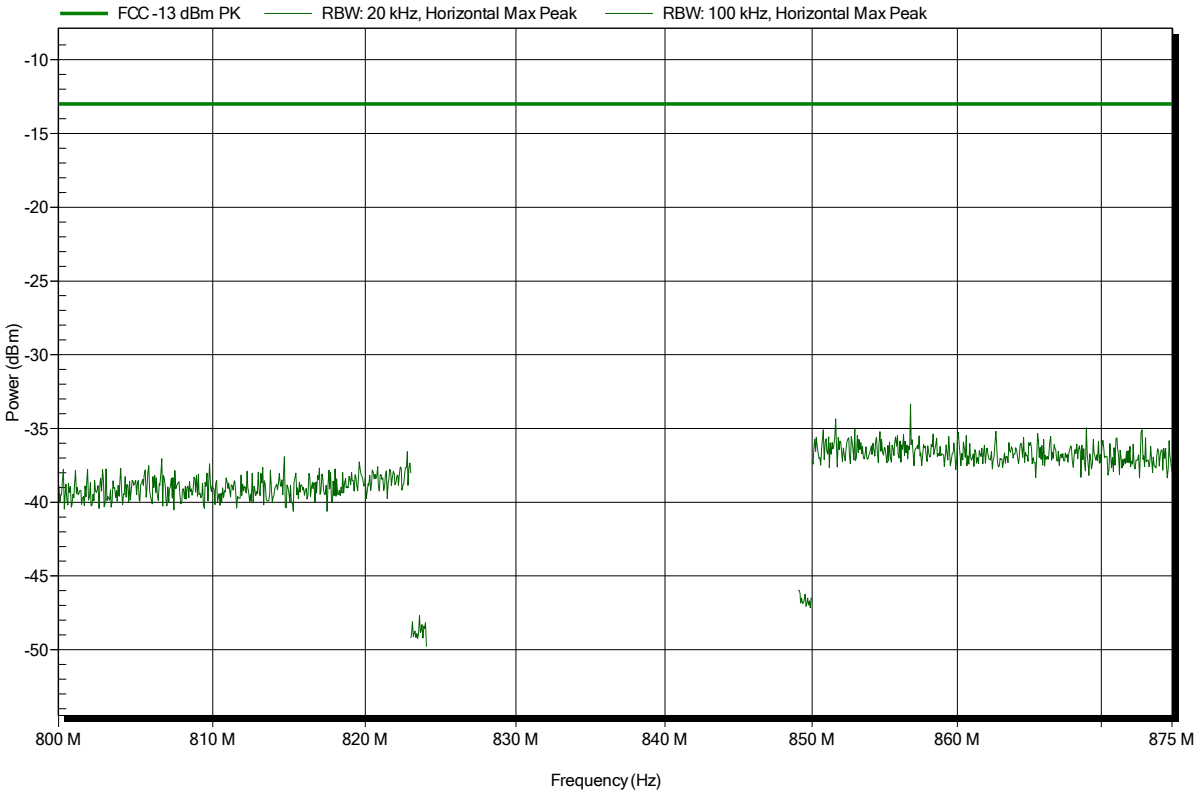


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 97

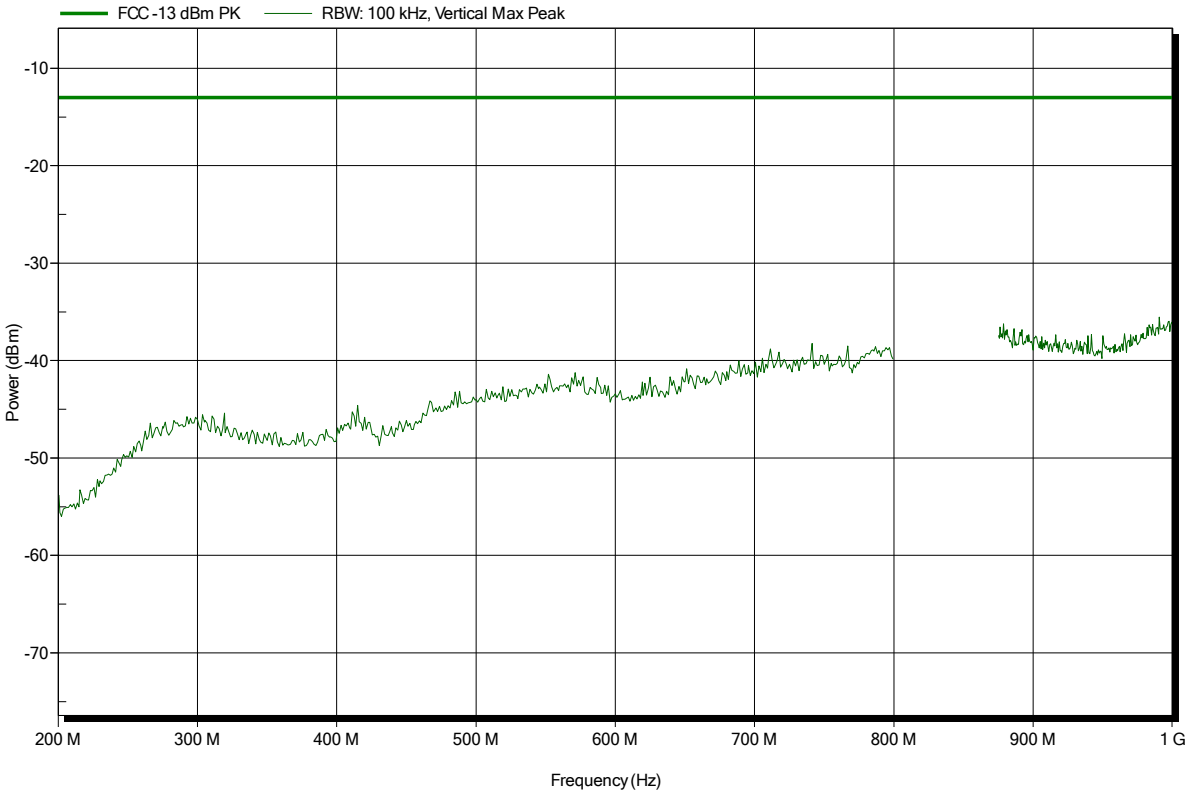


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-27
Note:	EUT vertical

Index 86

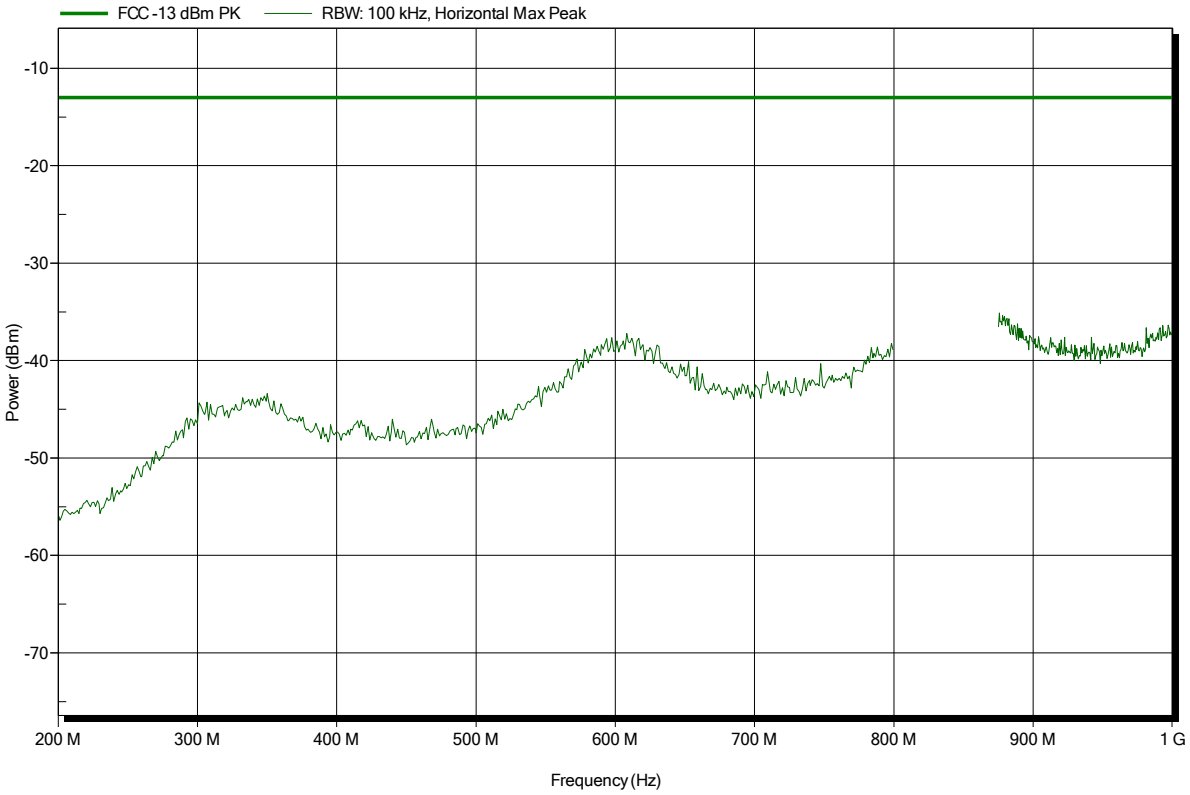


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-27
Note:	EUT vertical

Index 87

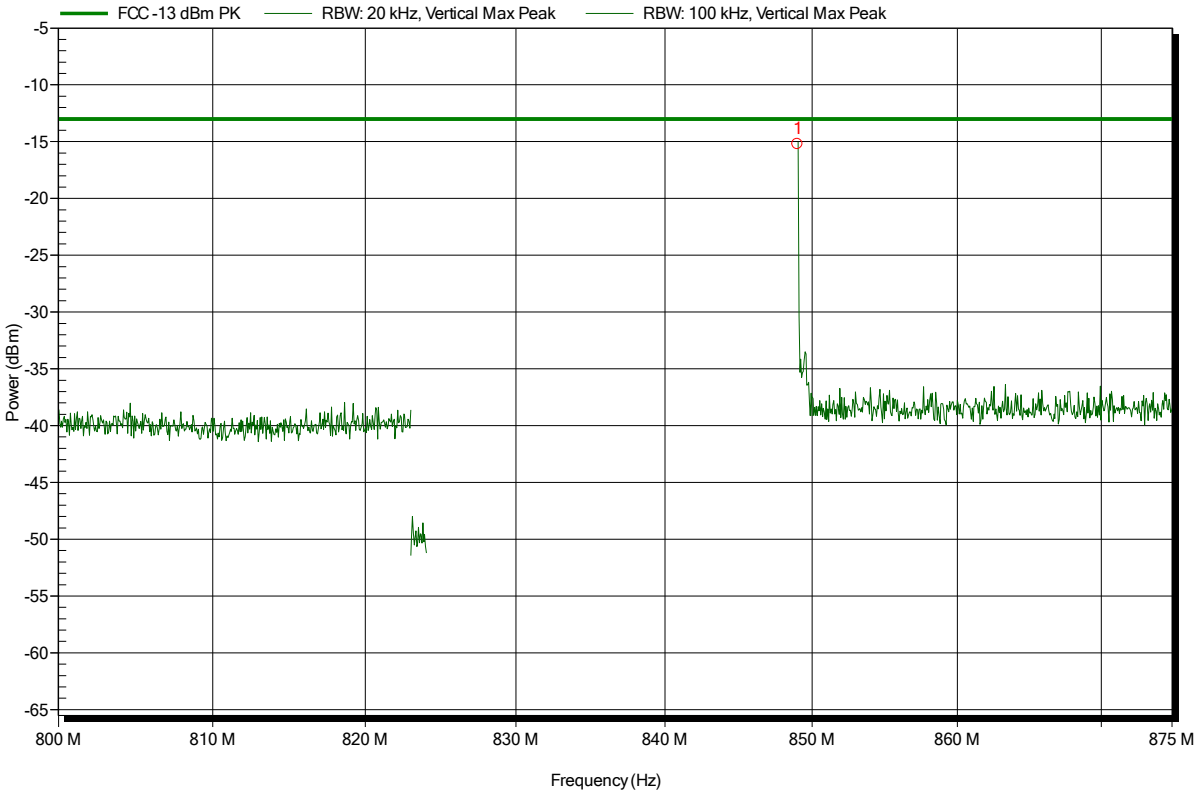


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 95



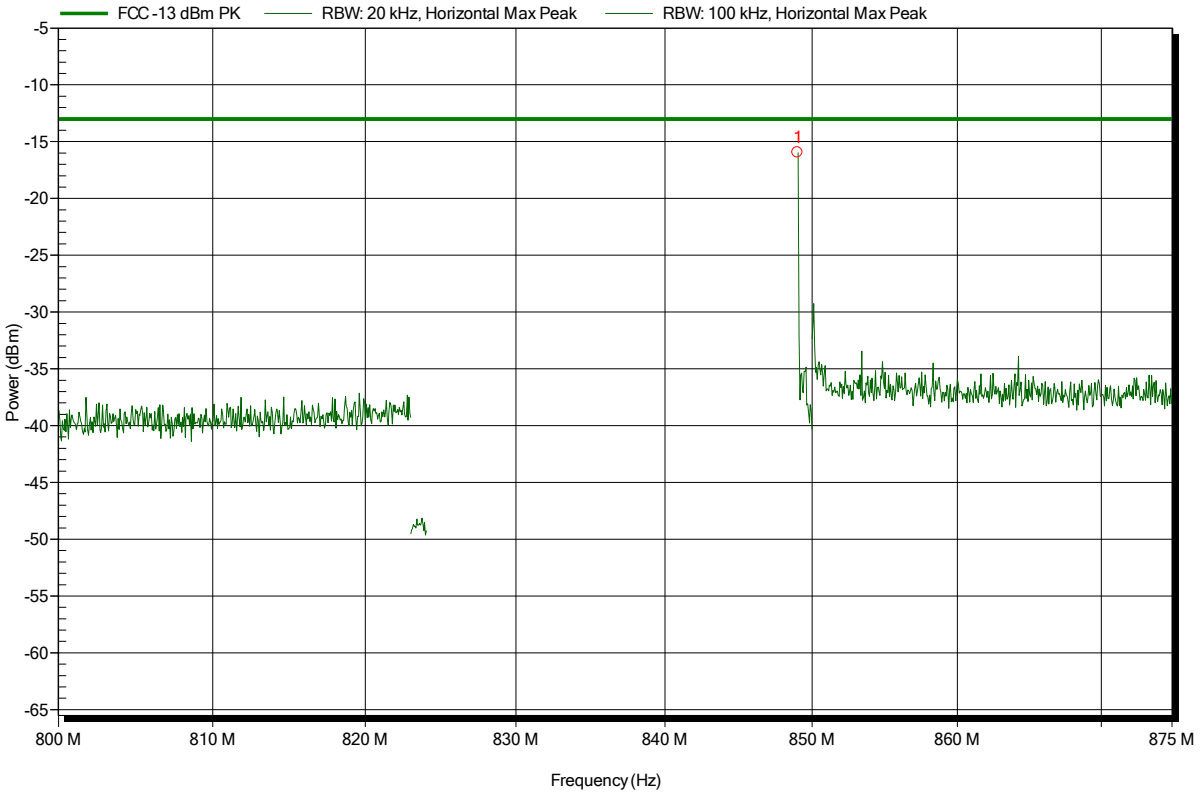
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
849 MHz	-15.2 dBm	-13 dBm	-2.2 dB	Pass

Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 96



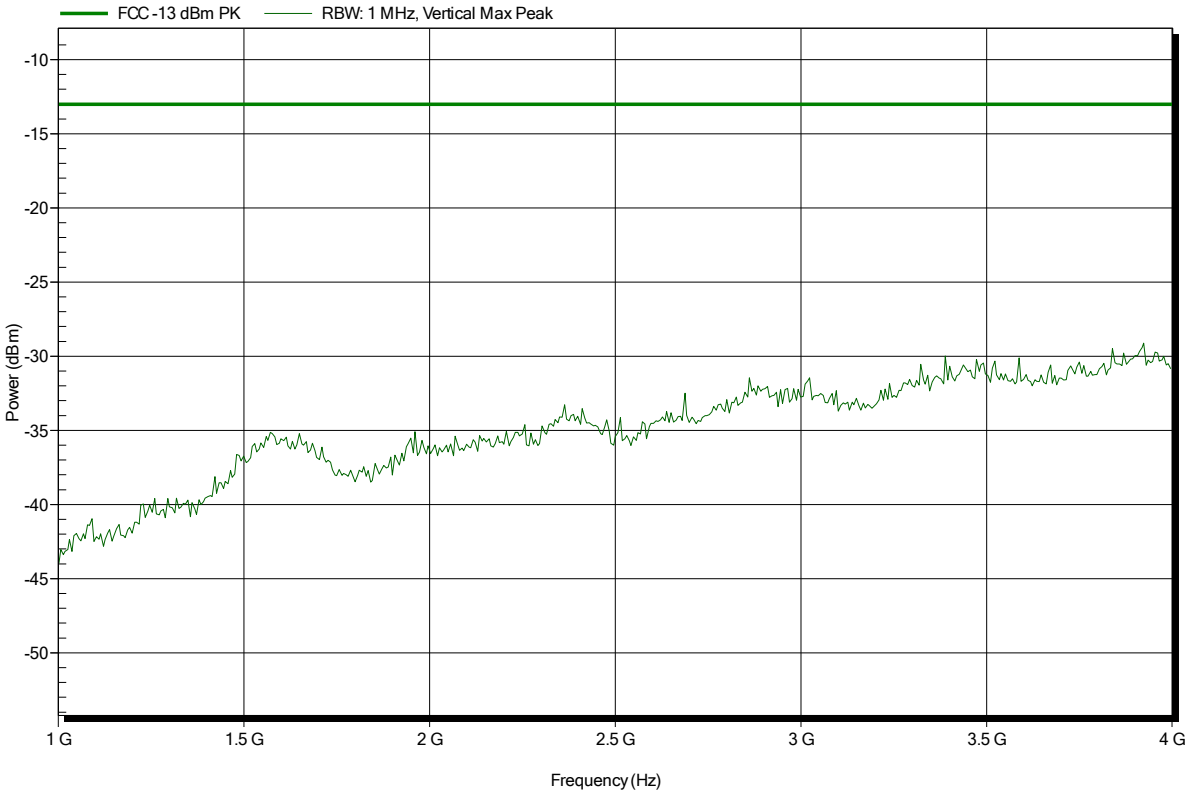
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
849 MHz	-15.9 dBm	-13 dBm	-2.94 dB	Pass

Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 79

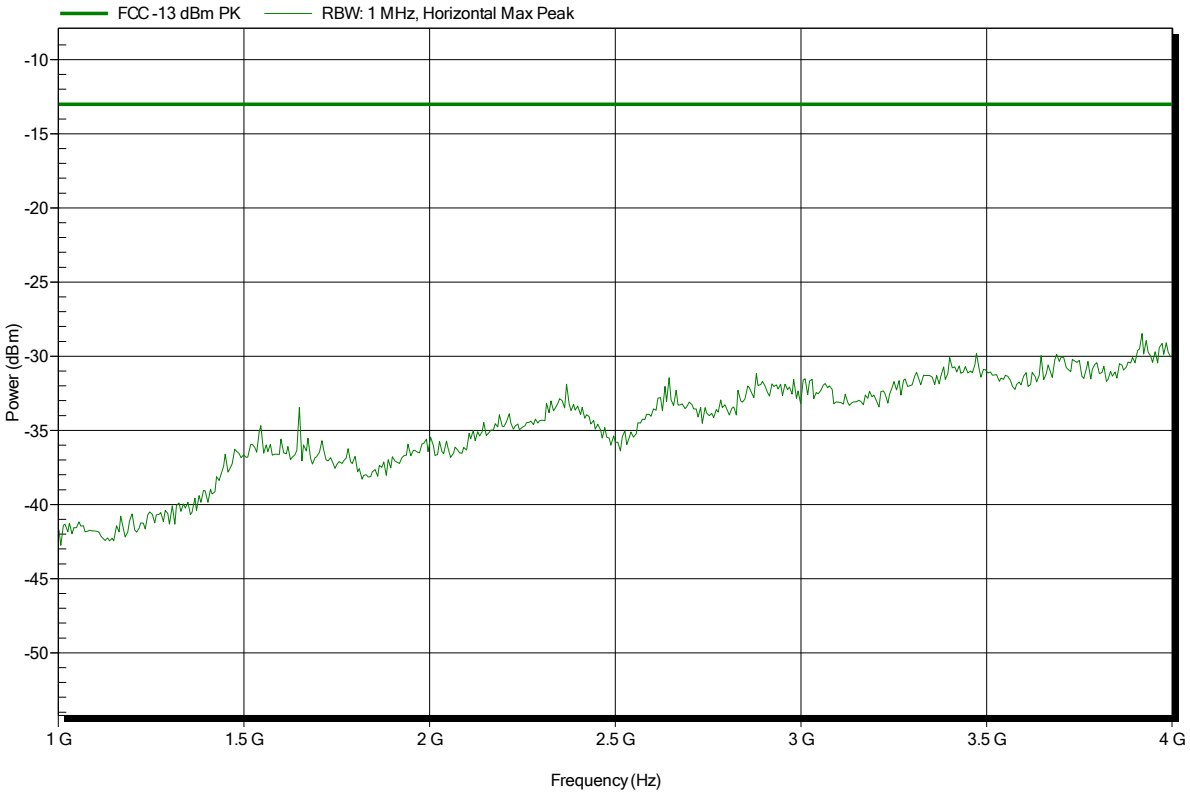


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 72

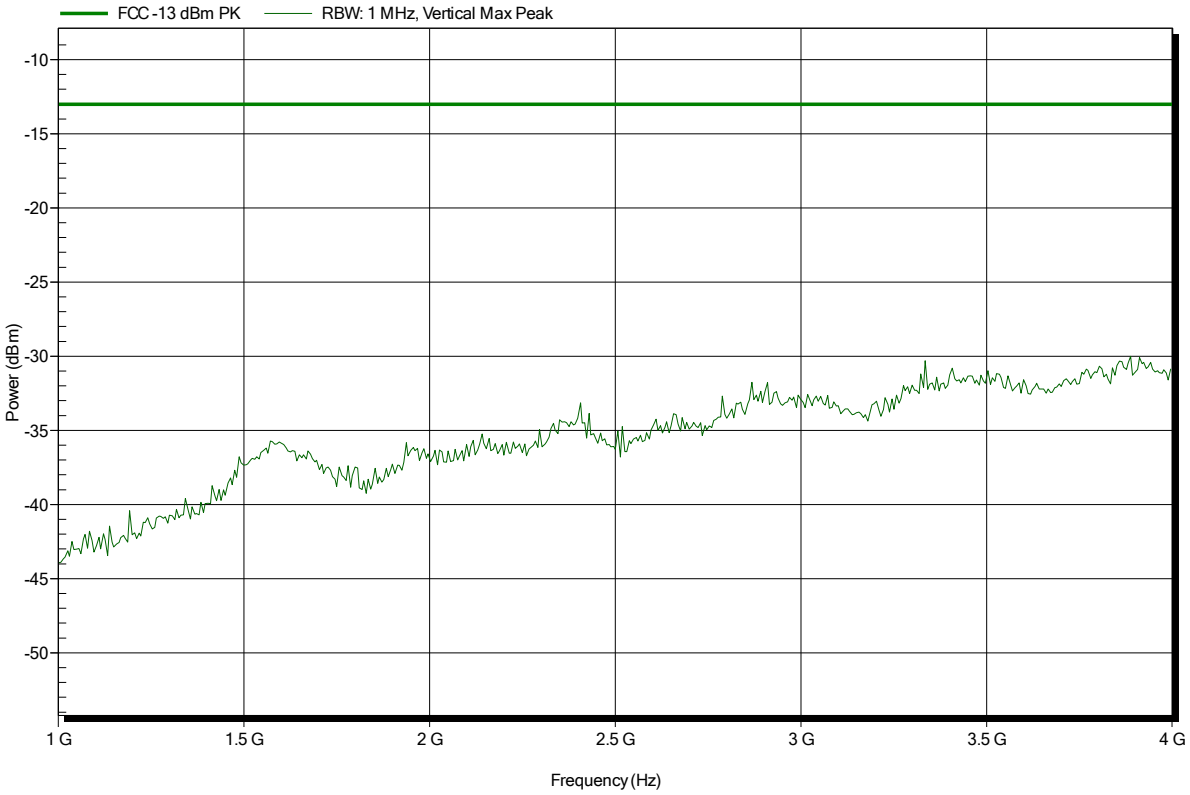


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 99

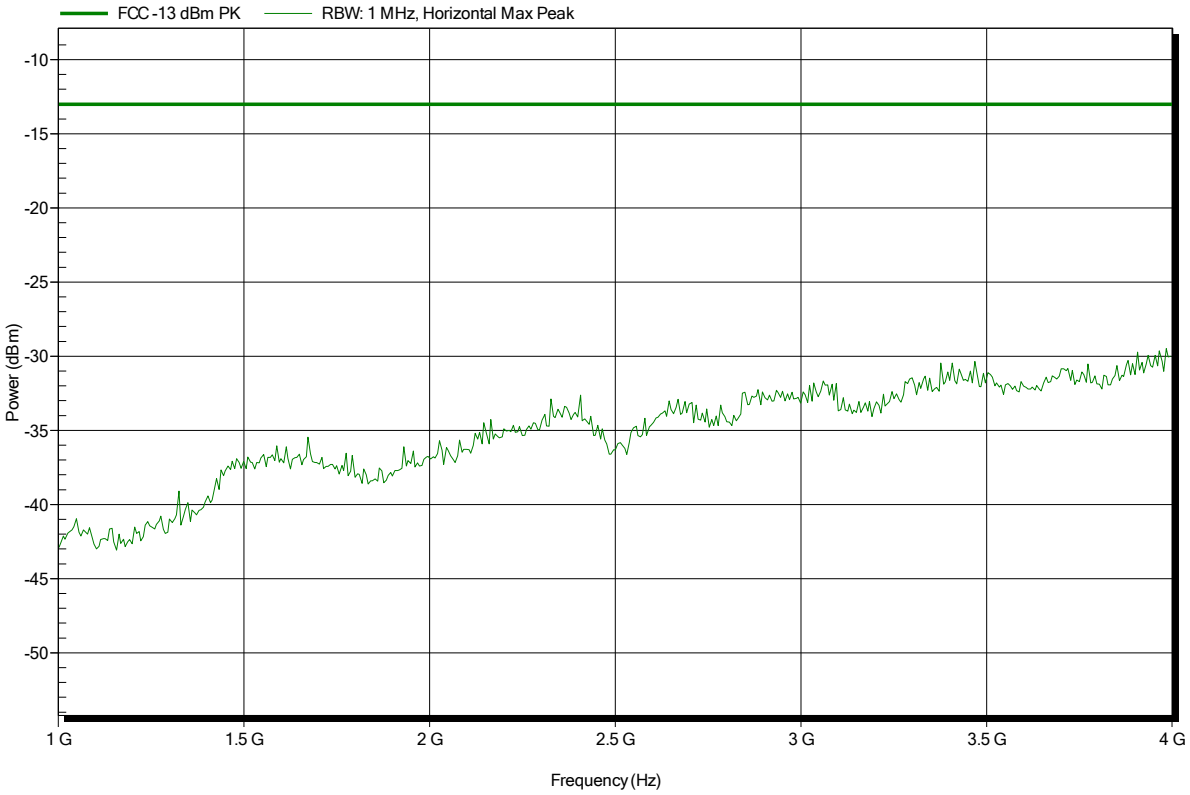


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 102

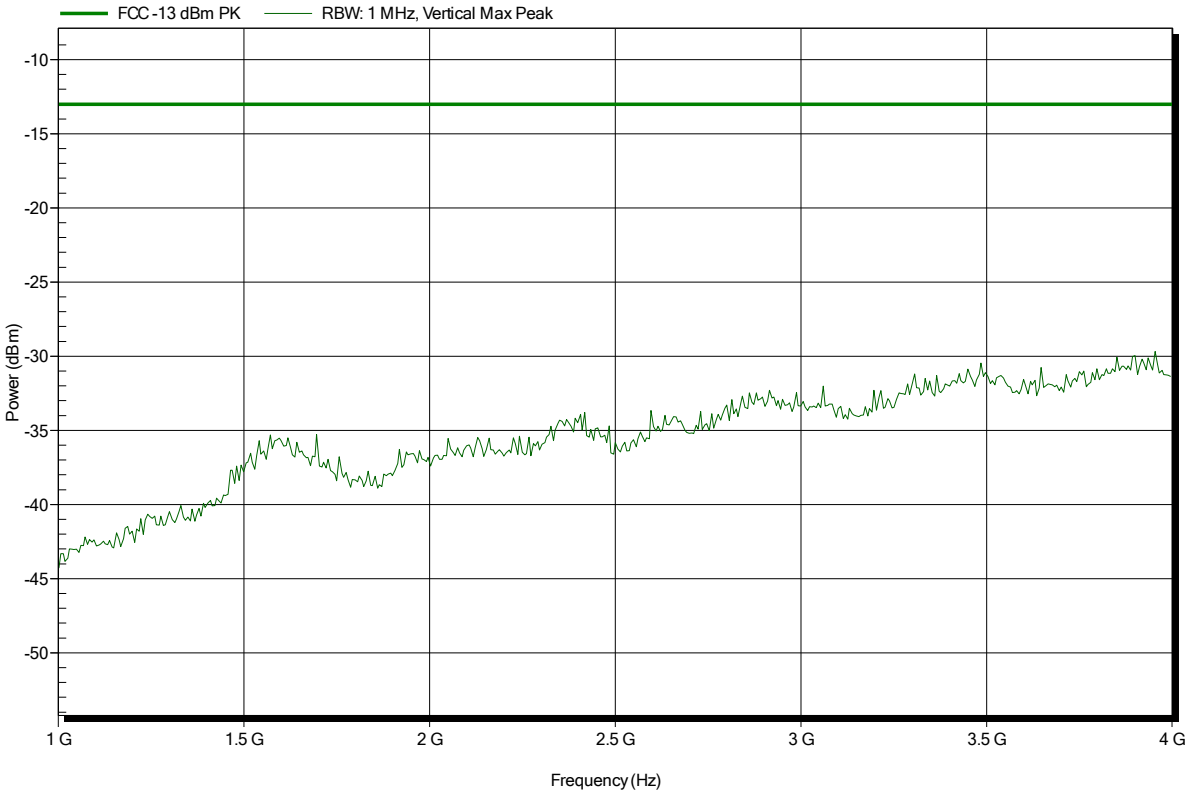


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 108

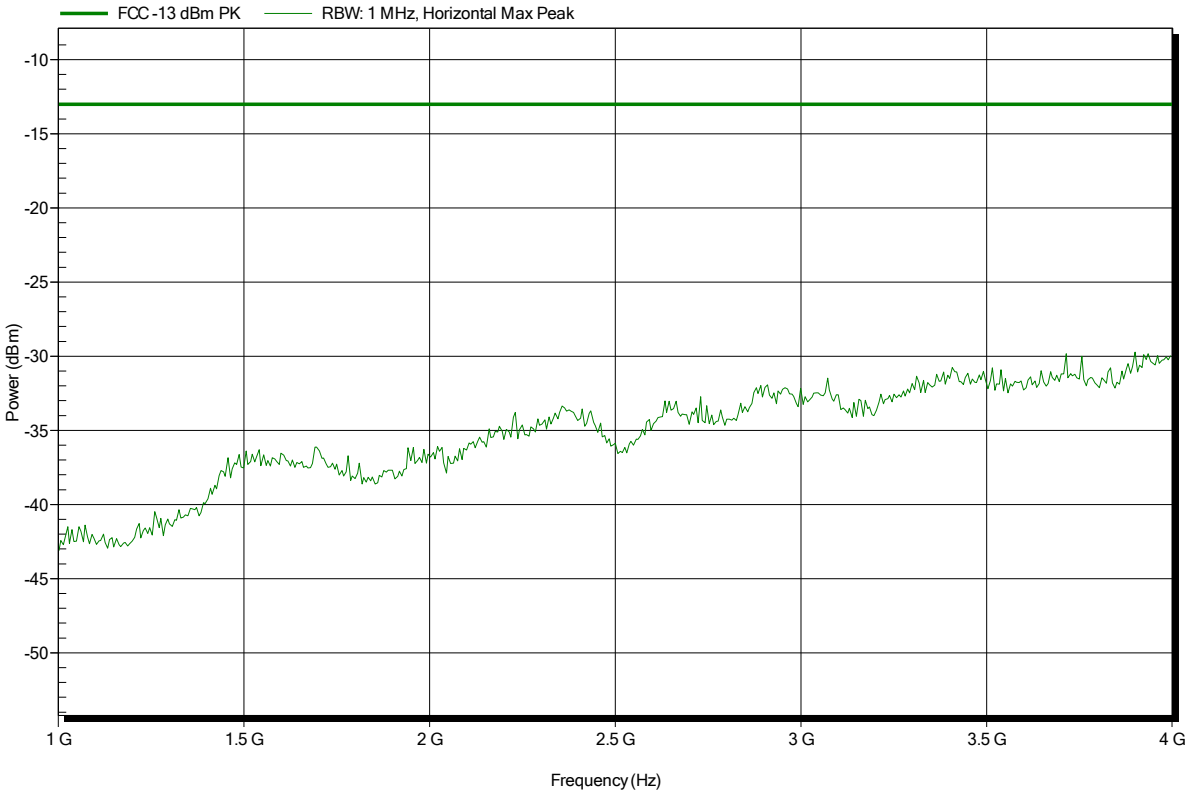


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 105

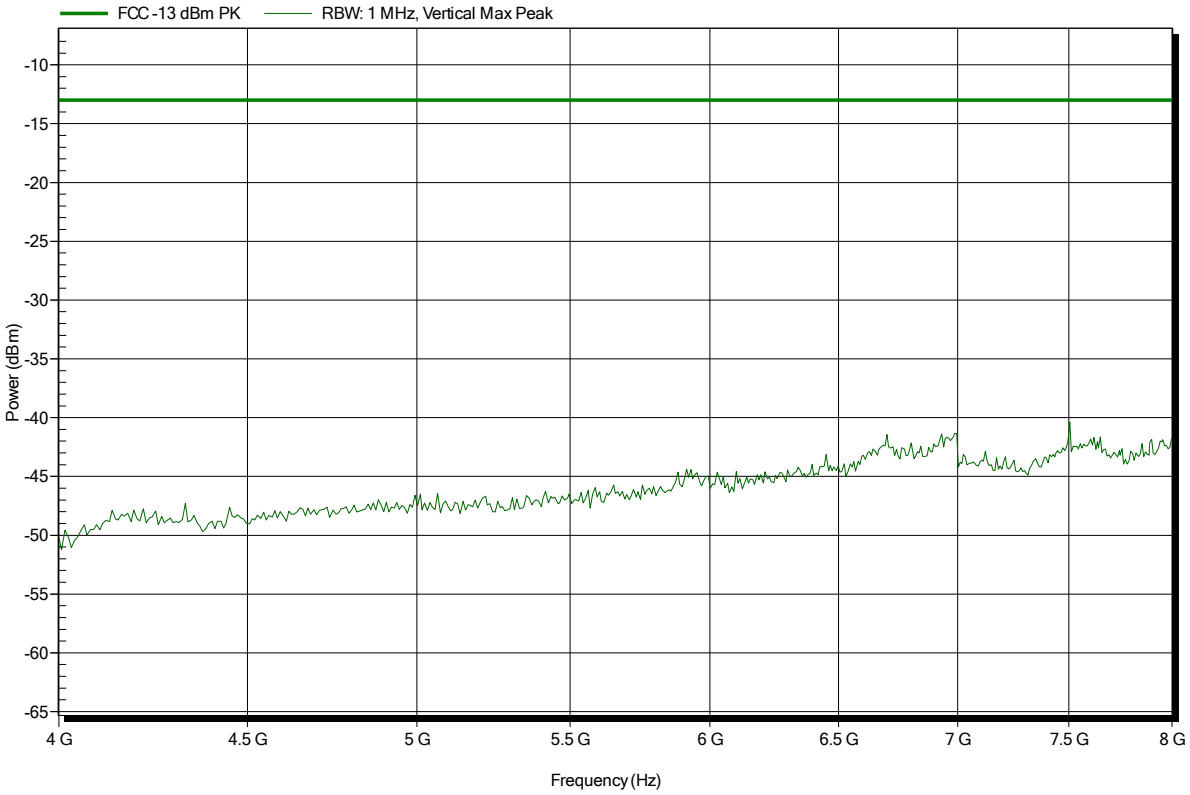


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 80

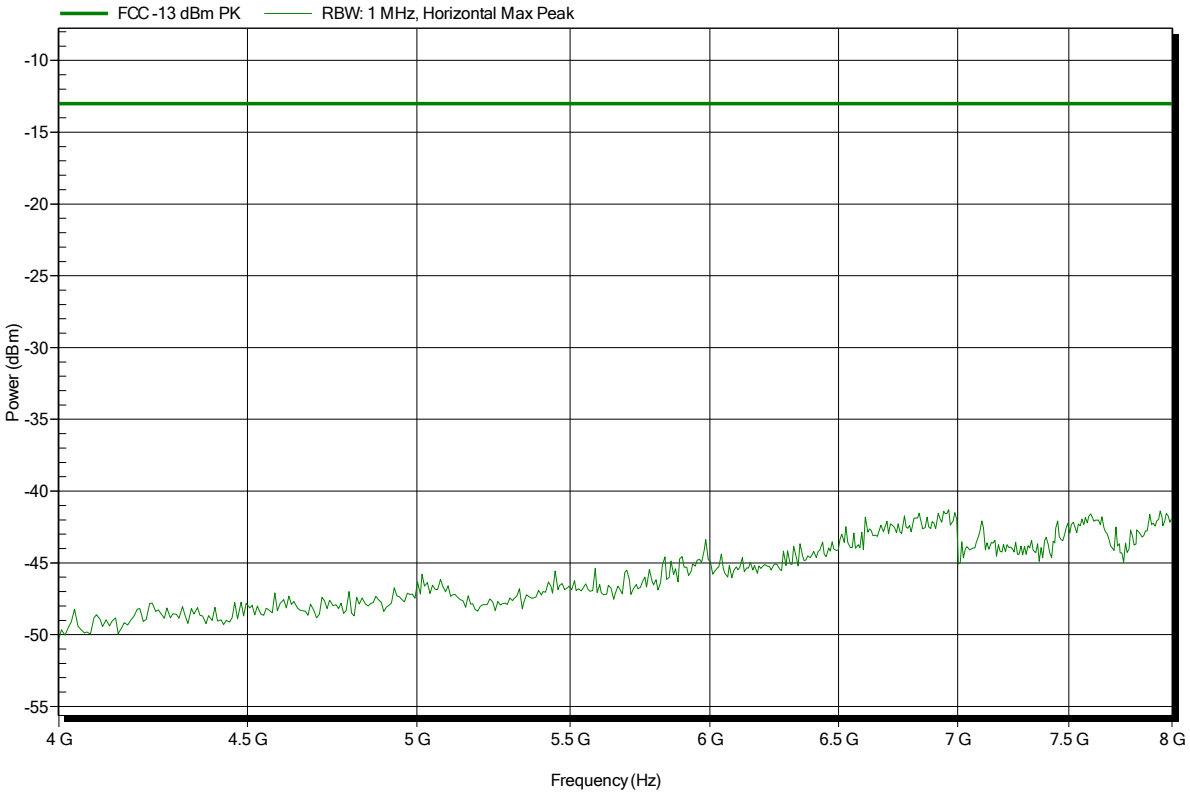


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 73

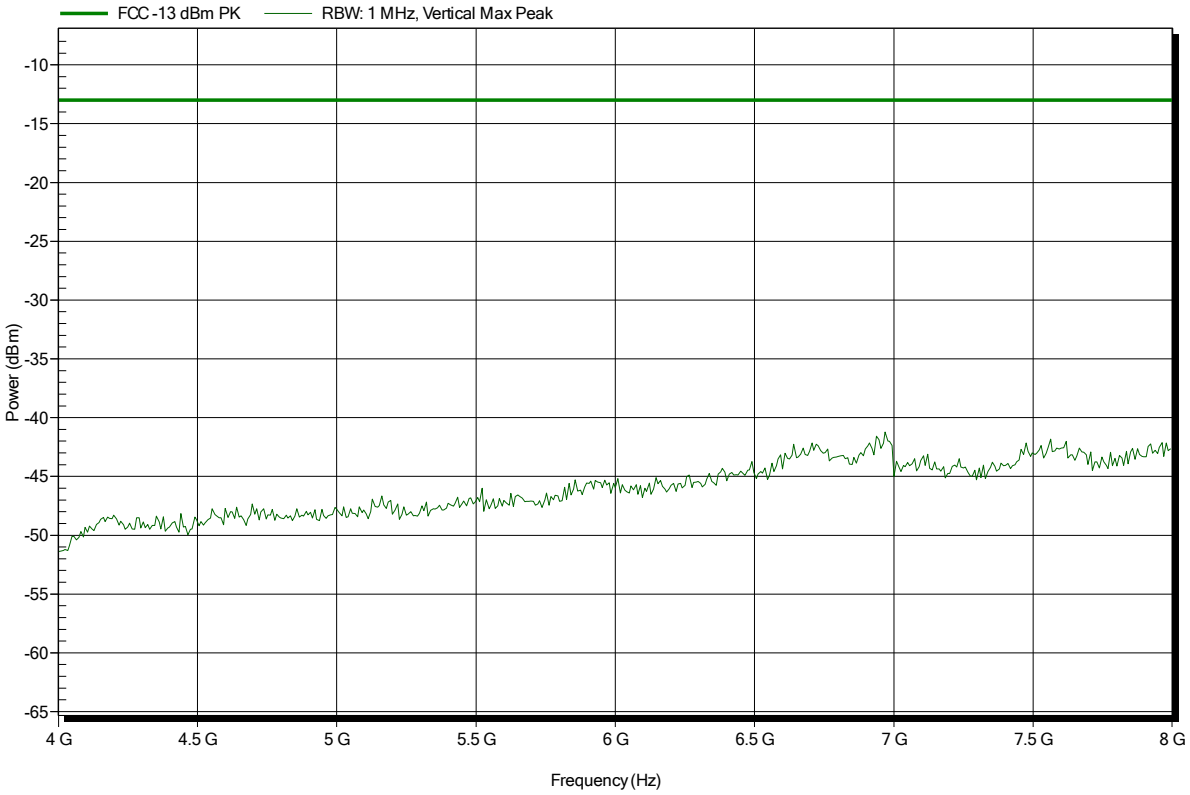


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 100

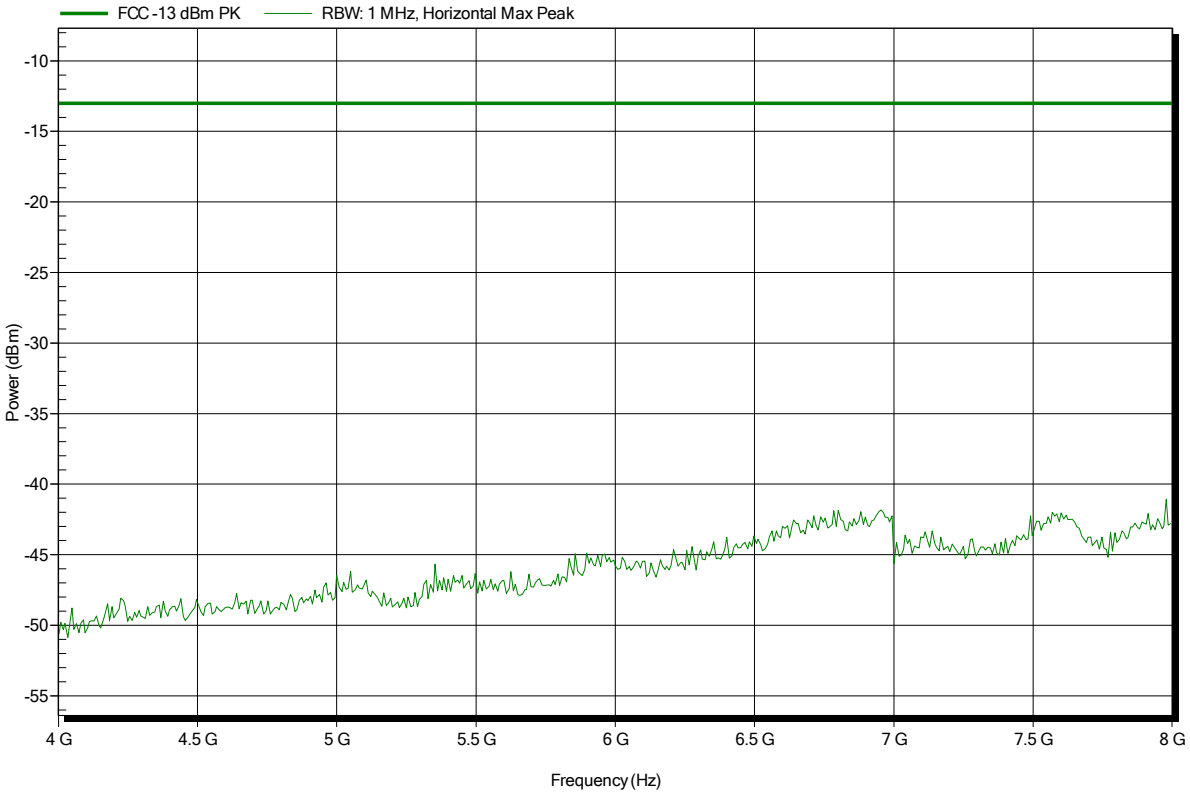


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 103

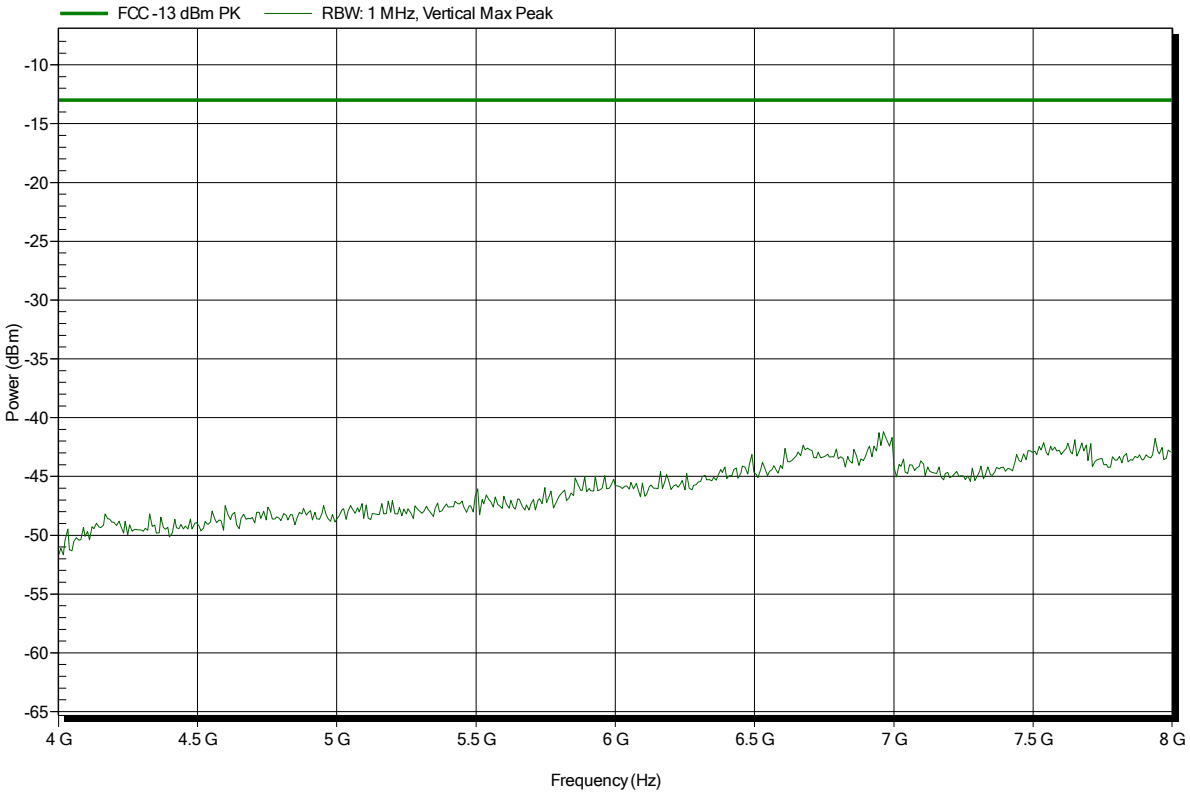


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 109

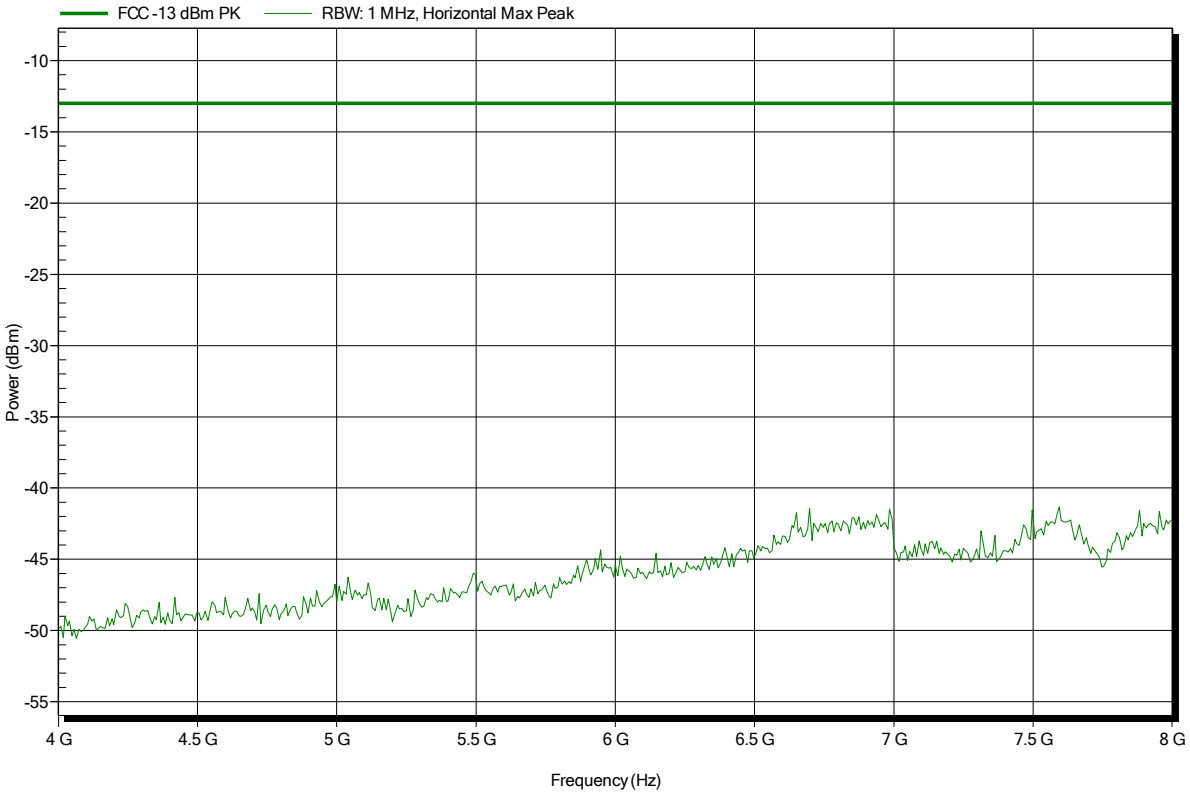


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 106

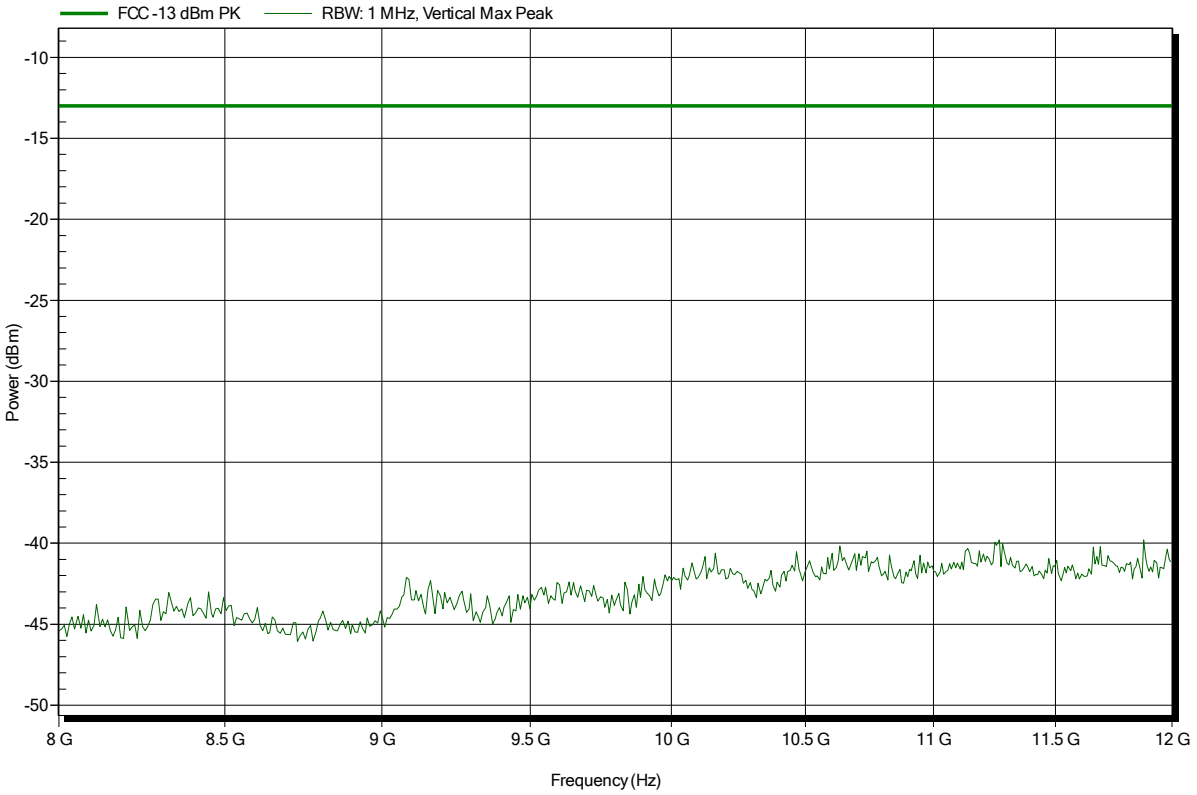


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 81

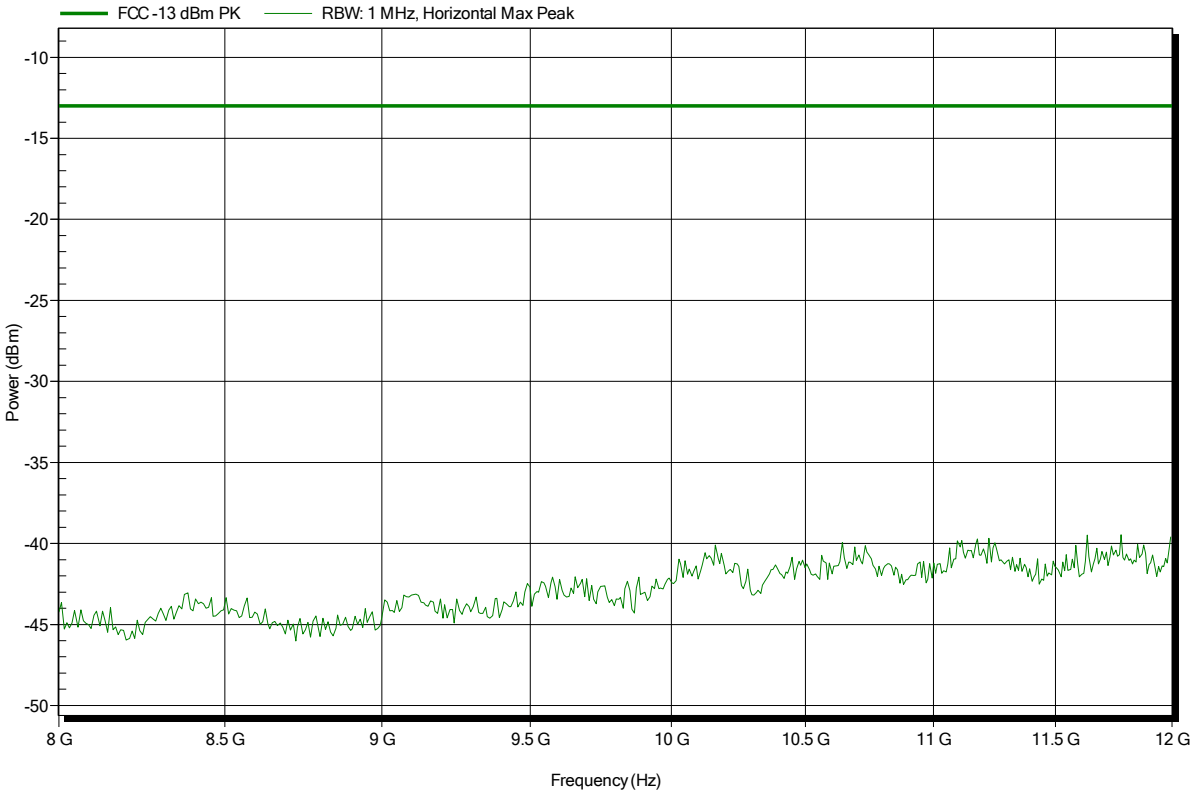


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 1013; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 74

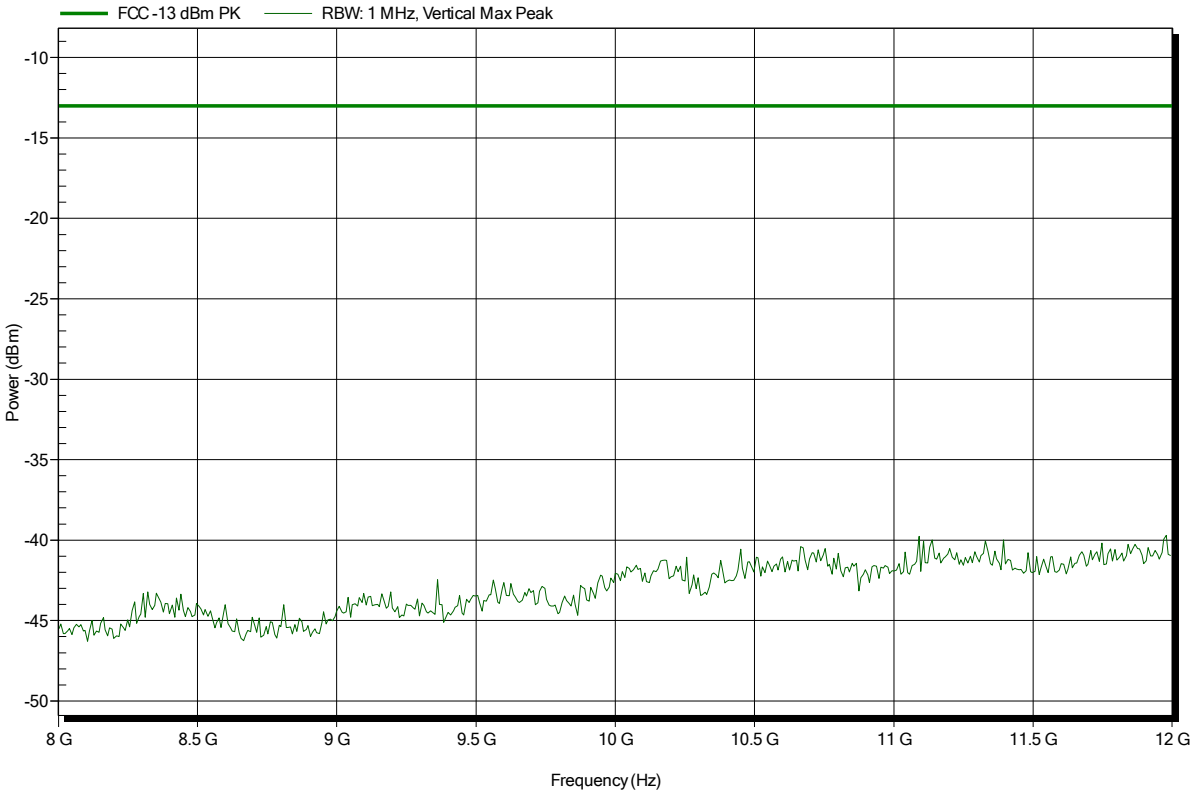


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 101

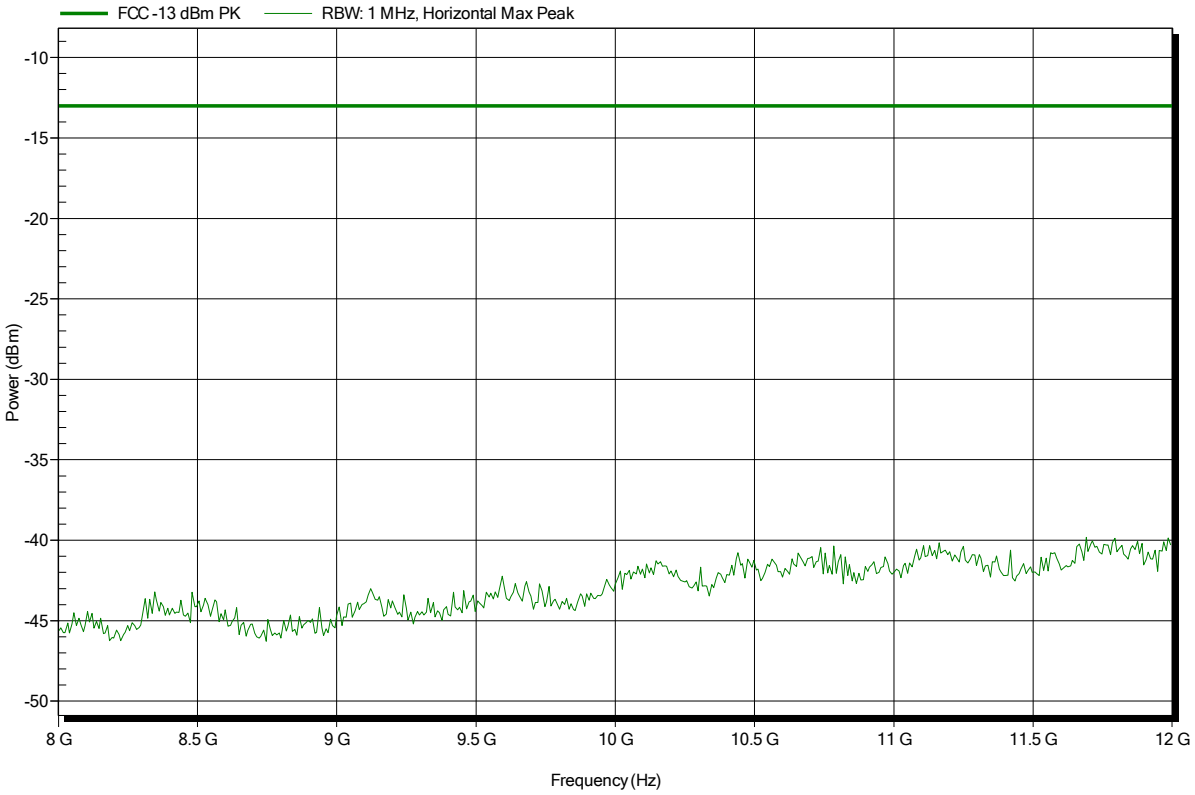


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 384; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 104

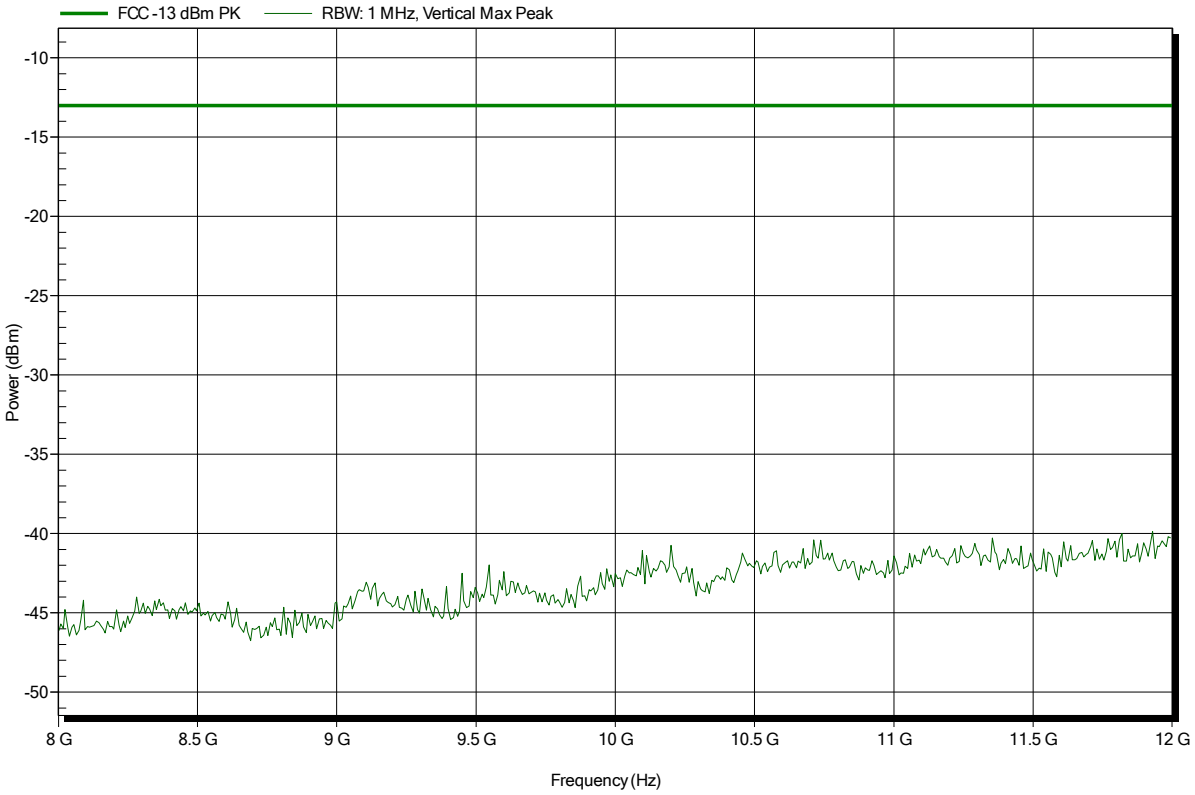


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 110

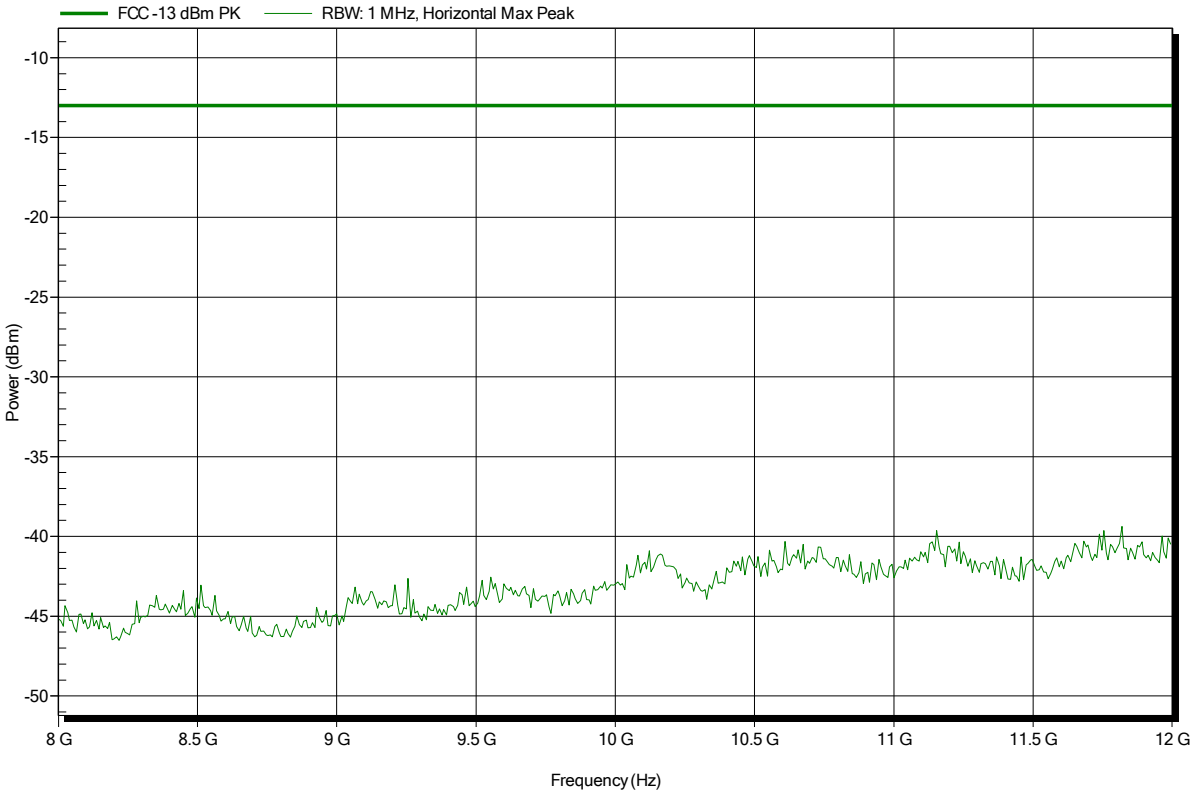


Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC0; CH: 777; 1xED-VO; Rev.0
Test Date:	2015-01-28
Note:	EUT vertical

Index 107

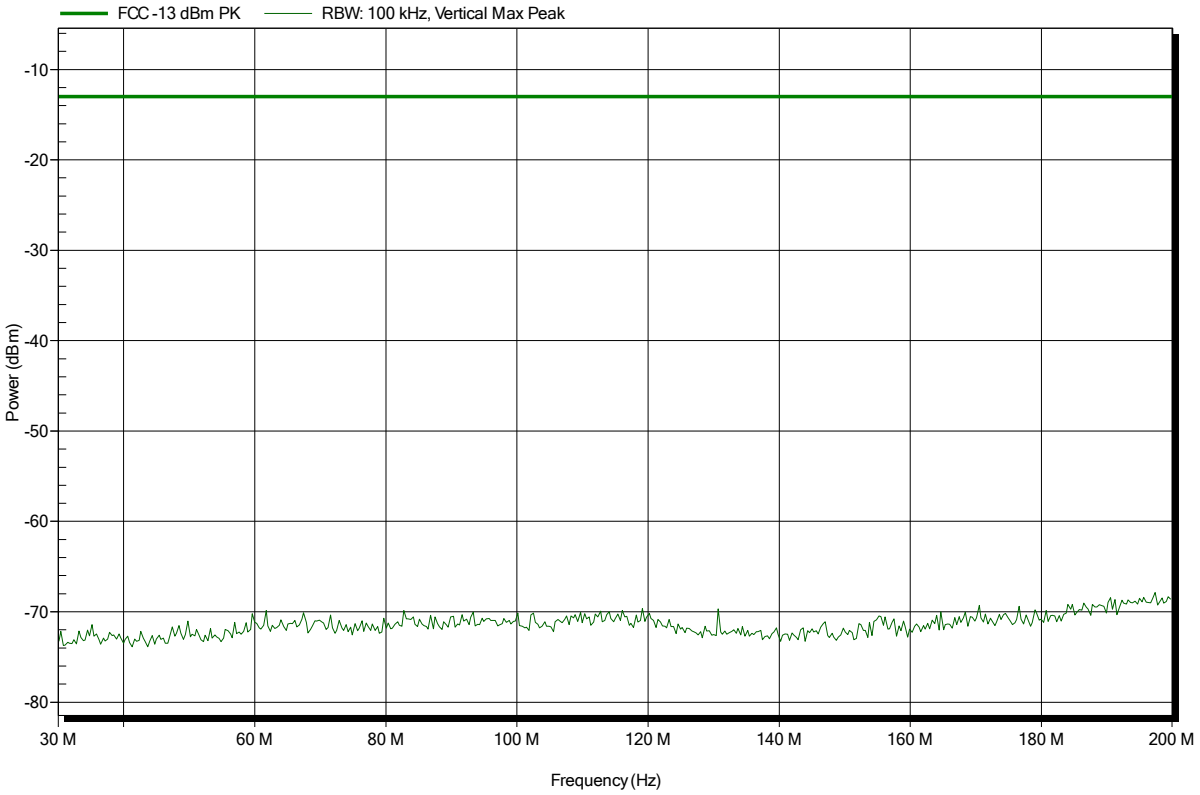


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 67

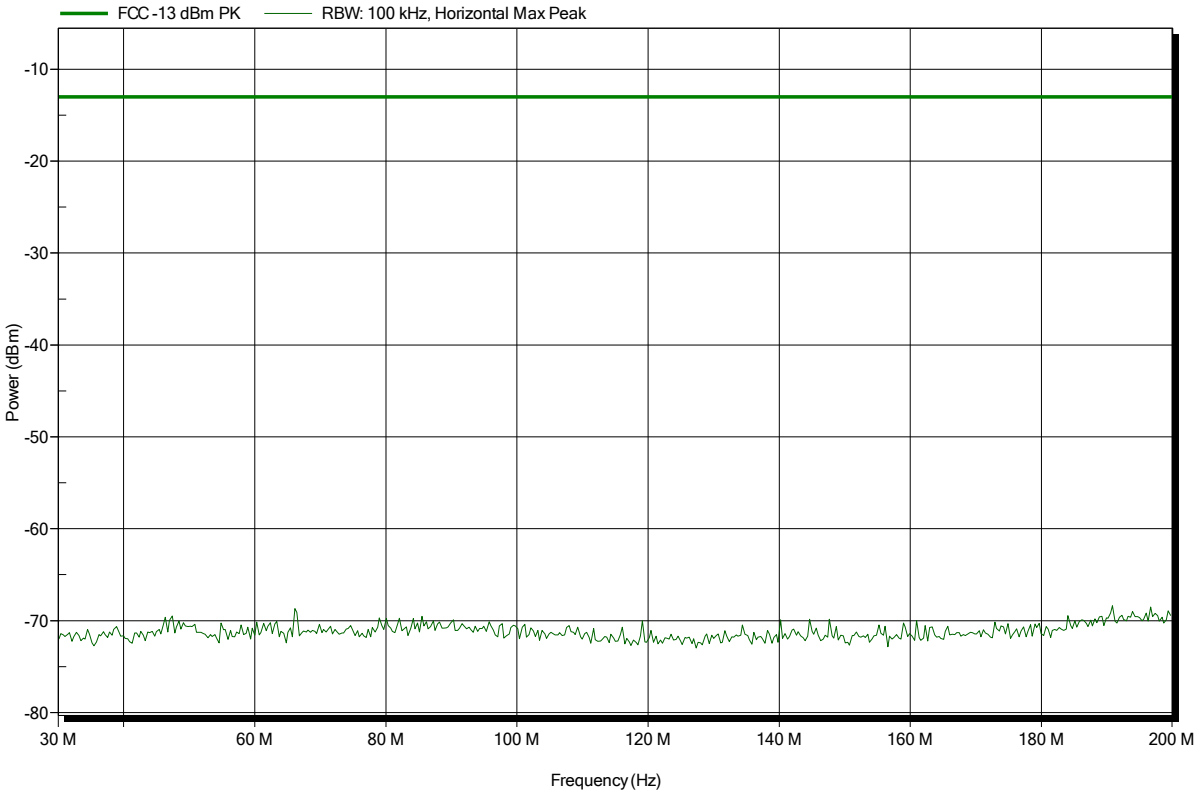


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 68

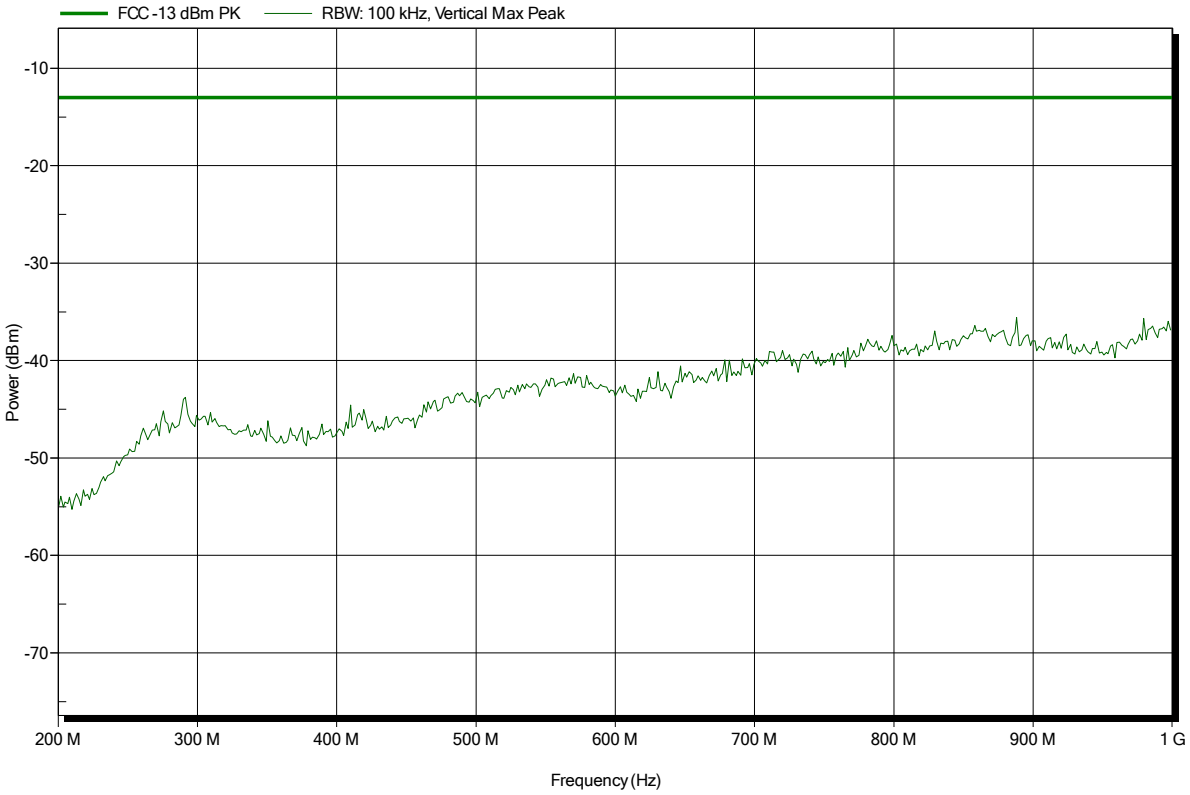


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 69

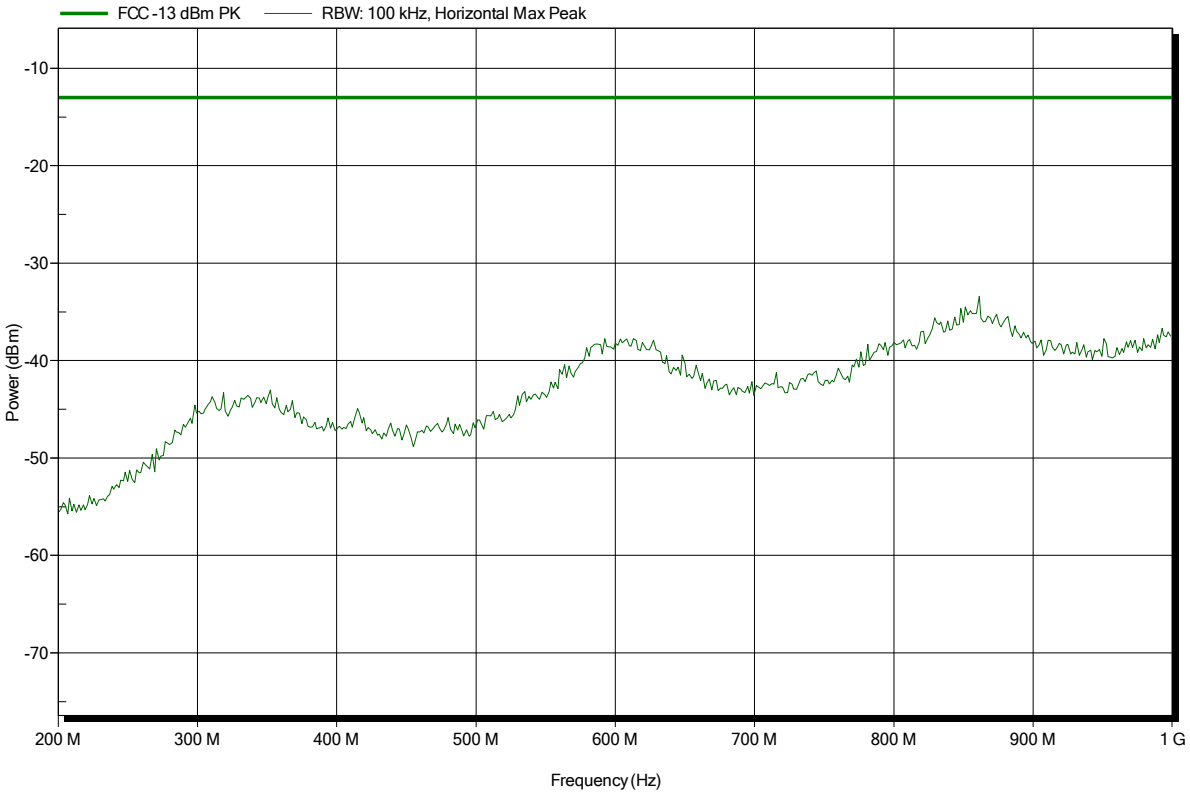


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 70

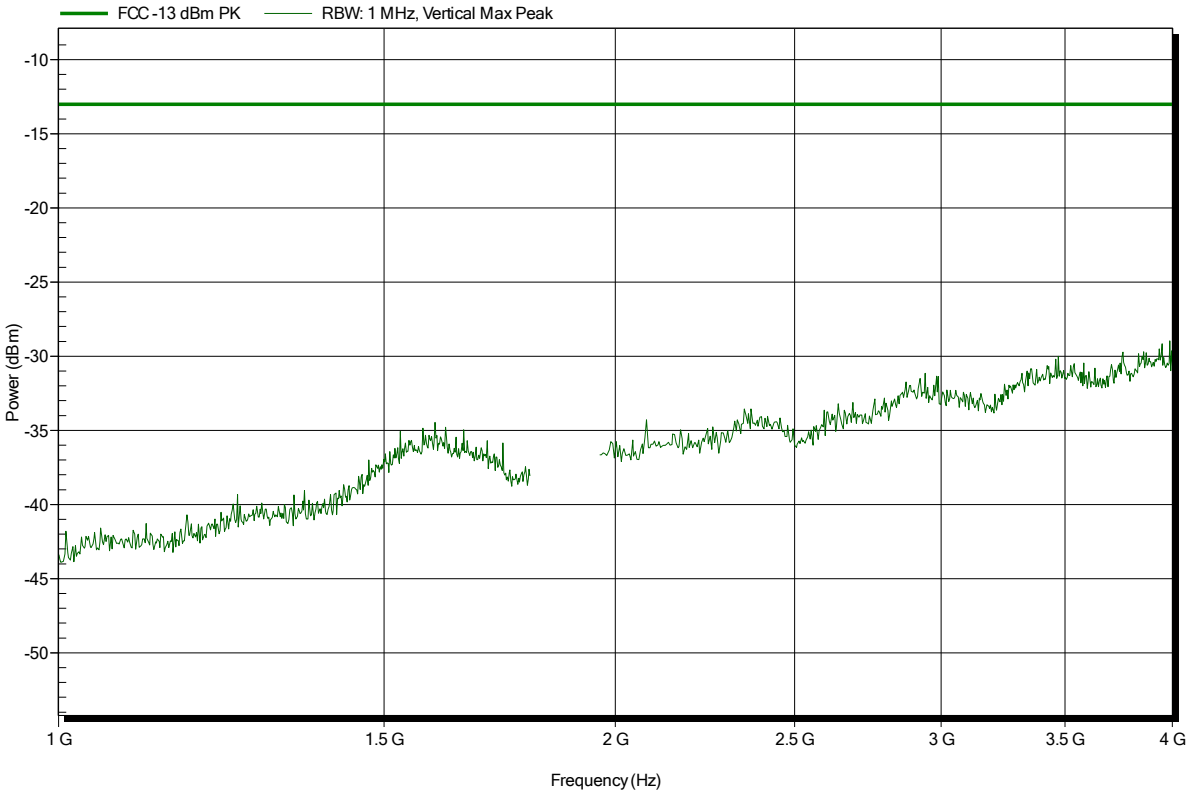


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 71

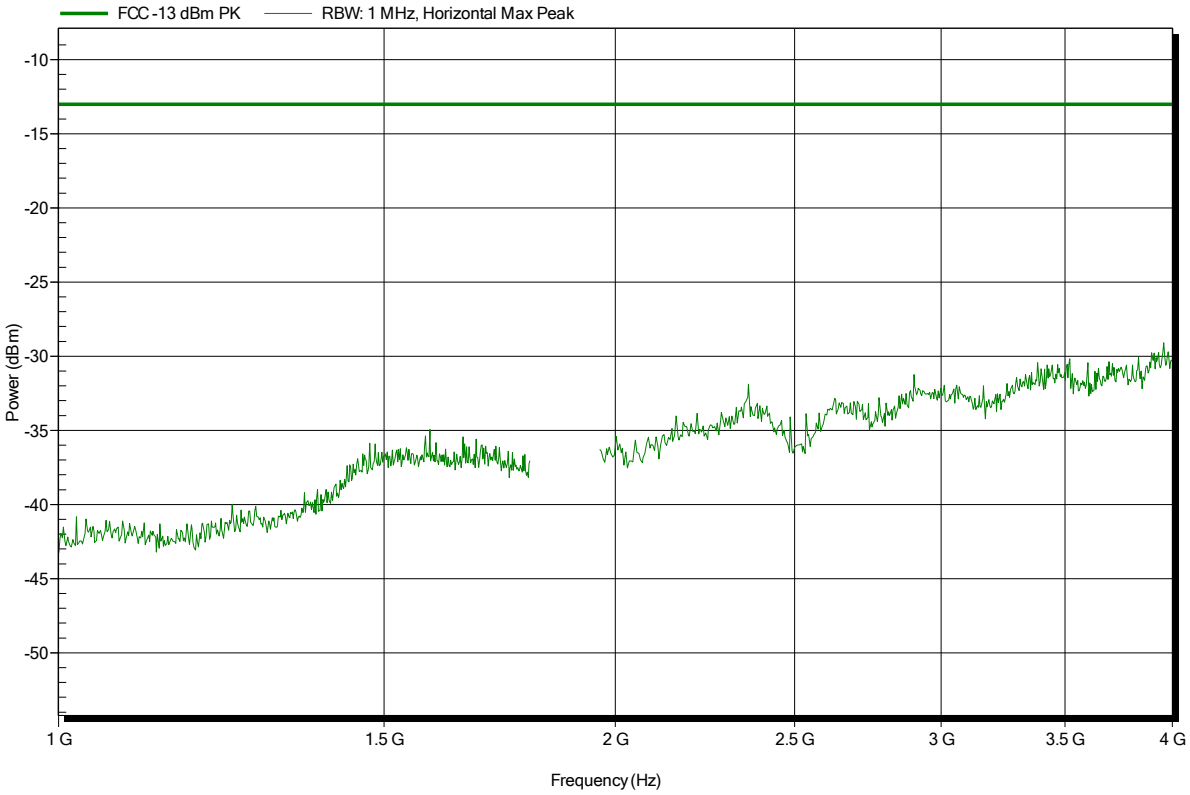


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 73

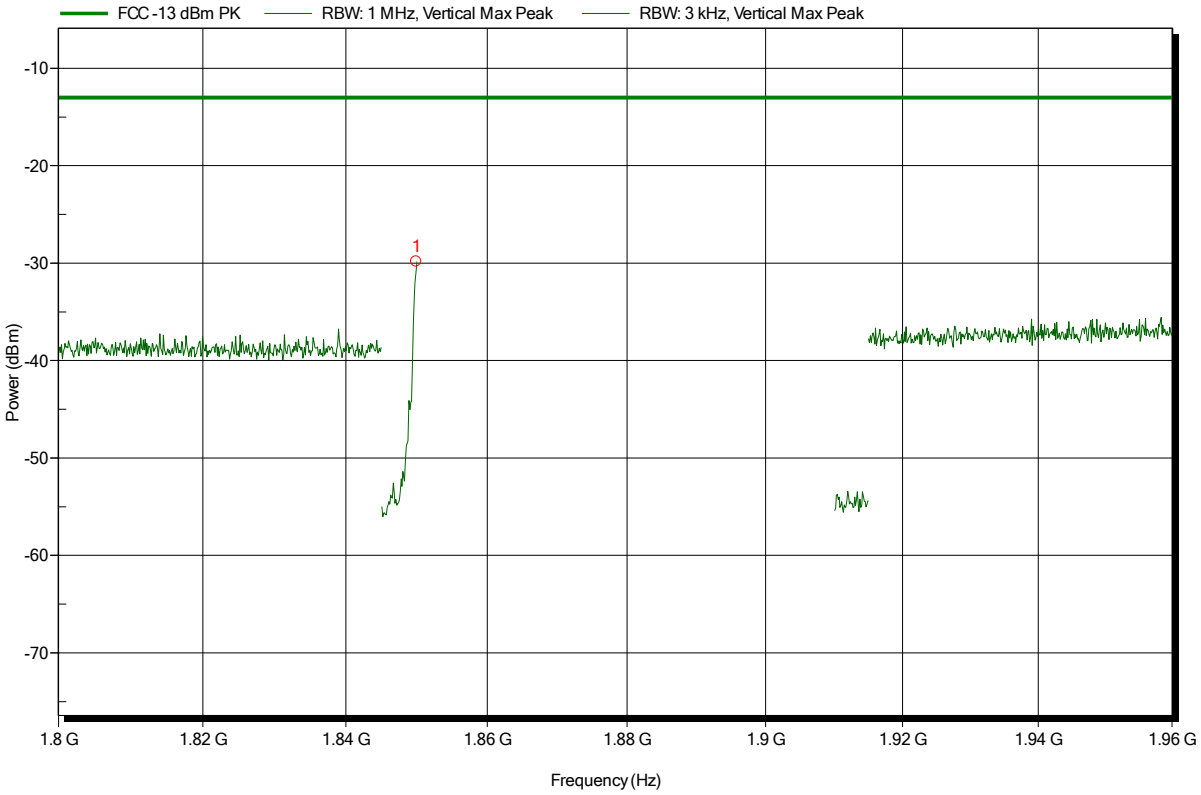


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 25; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 74



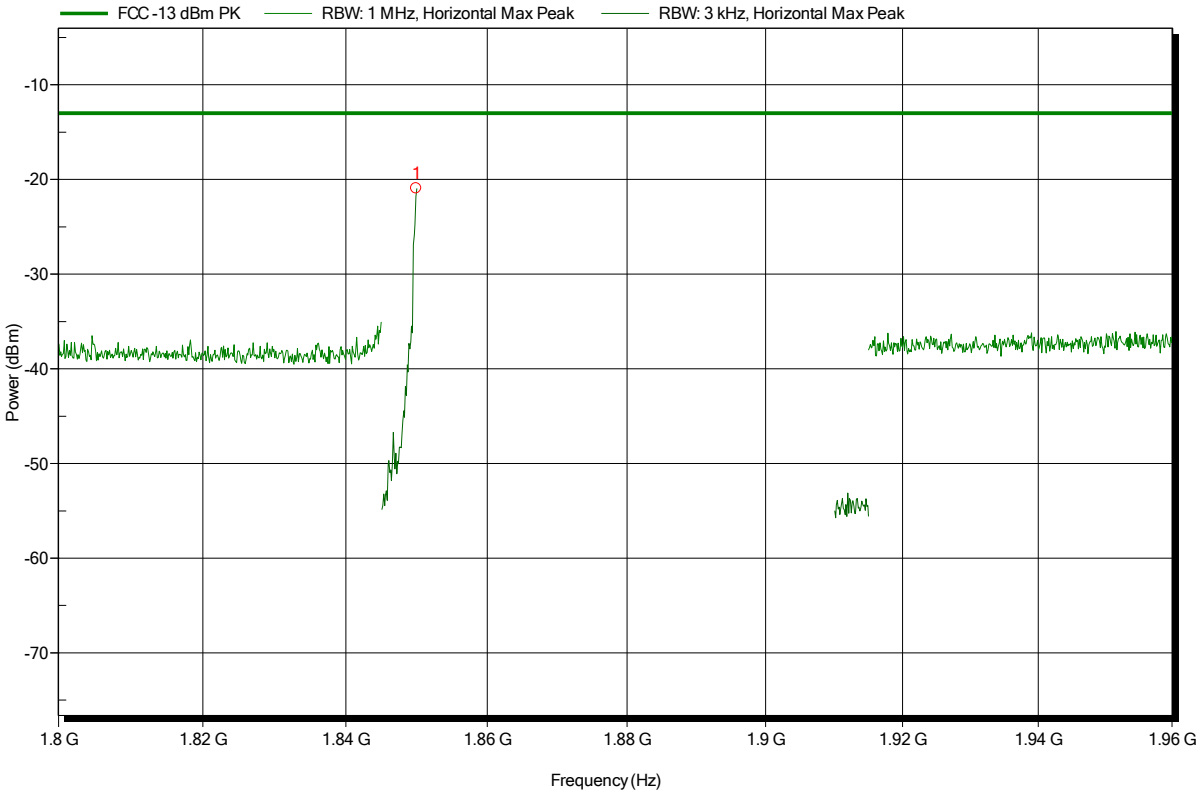
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.85 GHz	-29.8 dBm	-13 dBm	-16.84 dB	Pass

Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 25; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 79



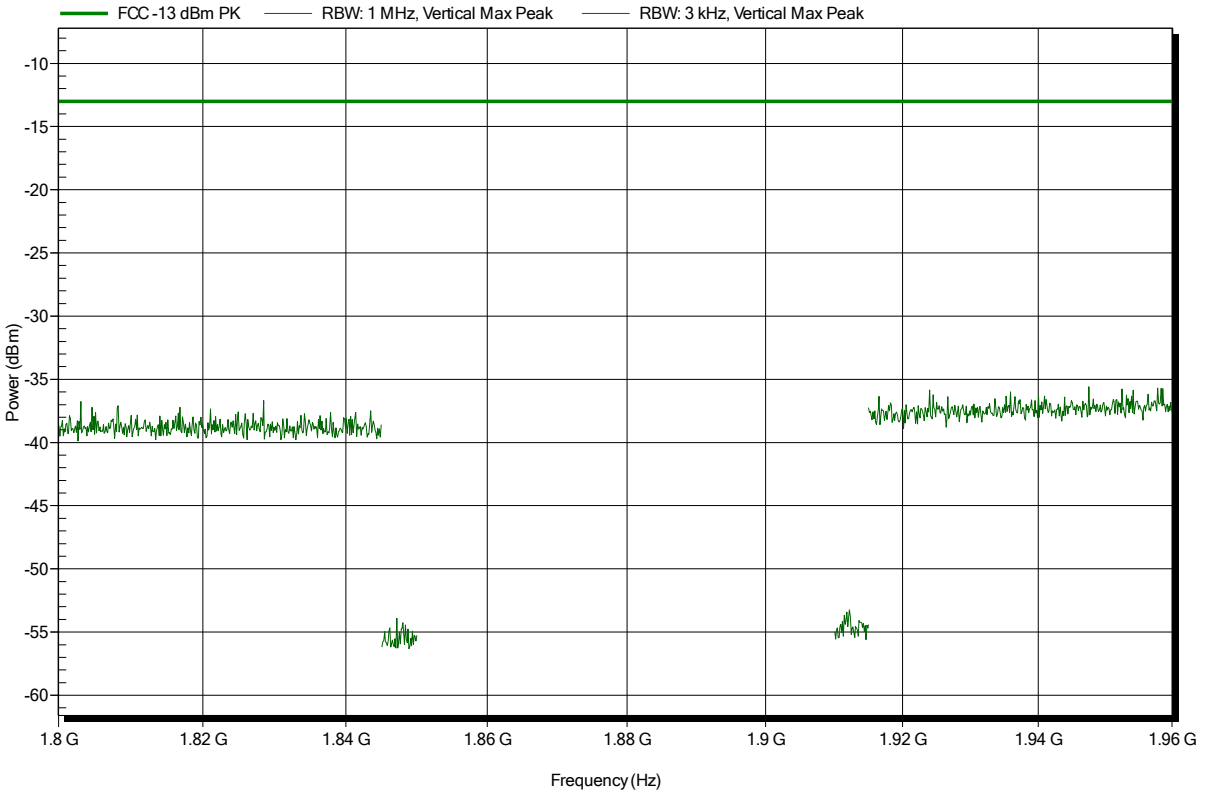
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.85 GHz	-20.9 dBm	-13 dBm	-7.93 dB	Pass

Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 75

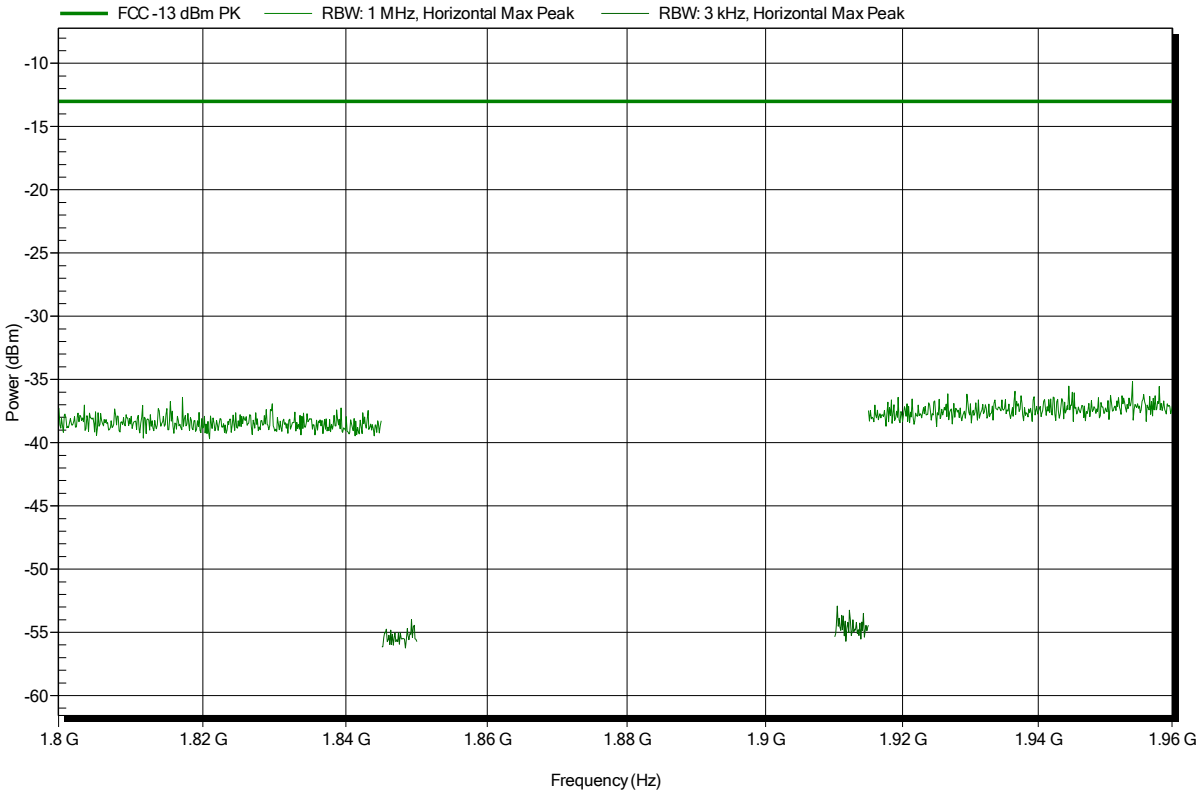


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 78

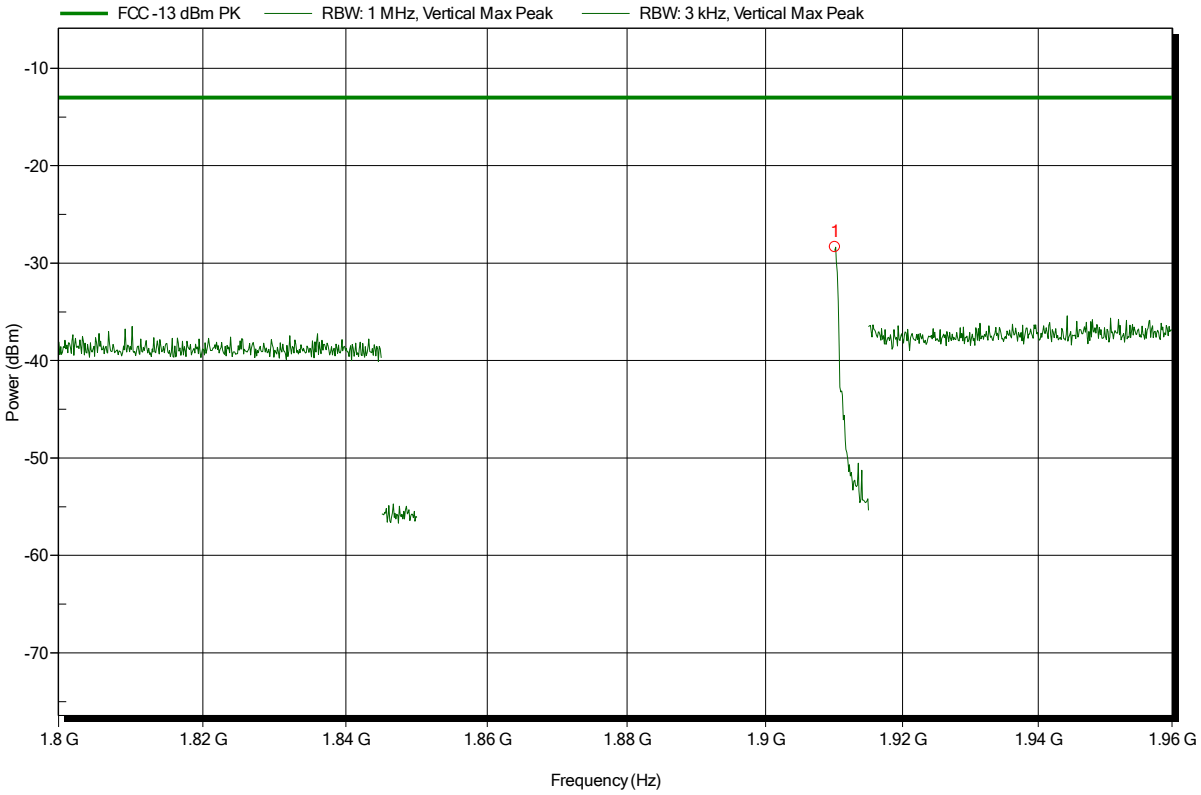


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 1175; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 76



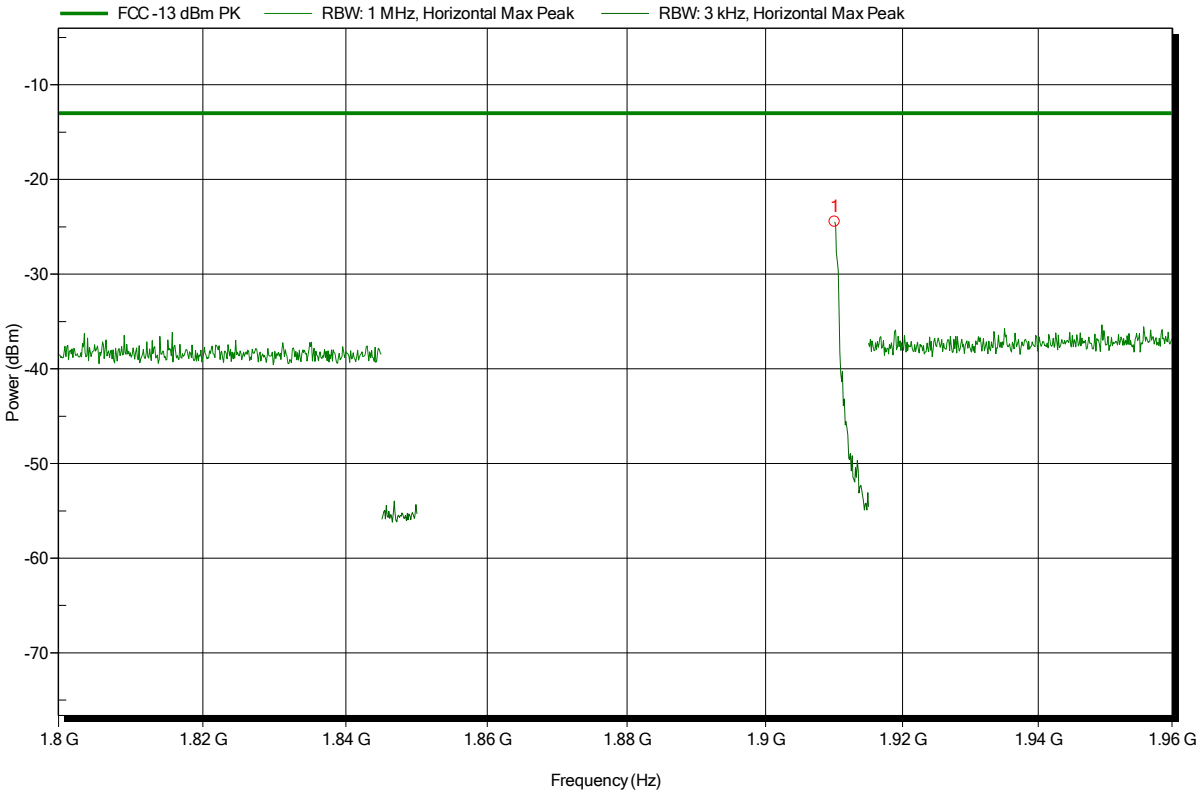
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.91 GHz	-28.4 dBm	-13 dBm	-15.36 dB	Pass

Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 1175; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 77



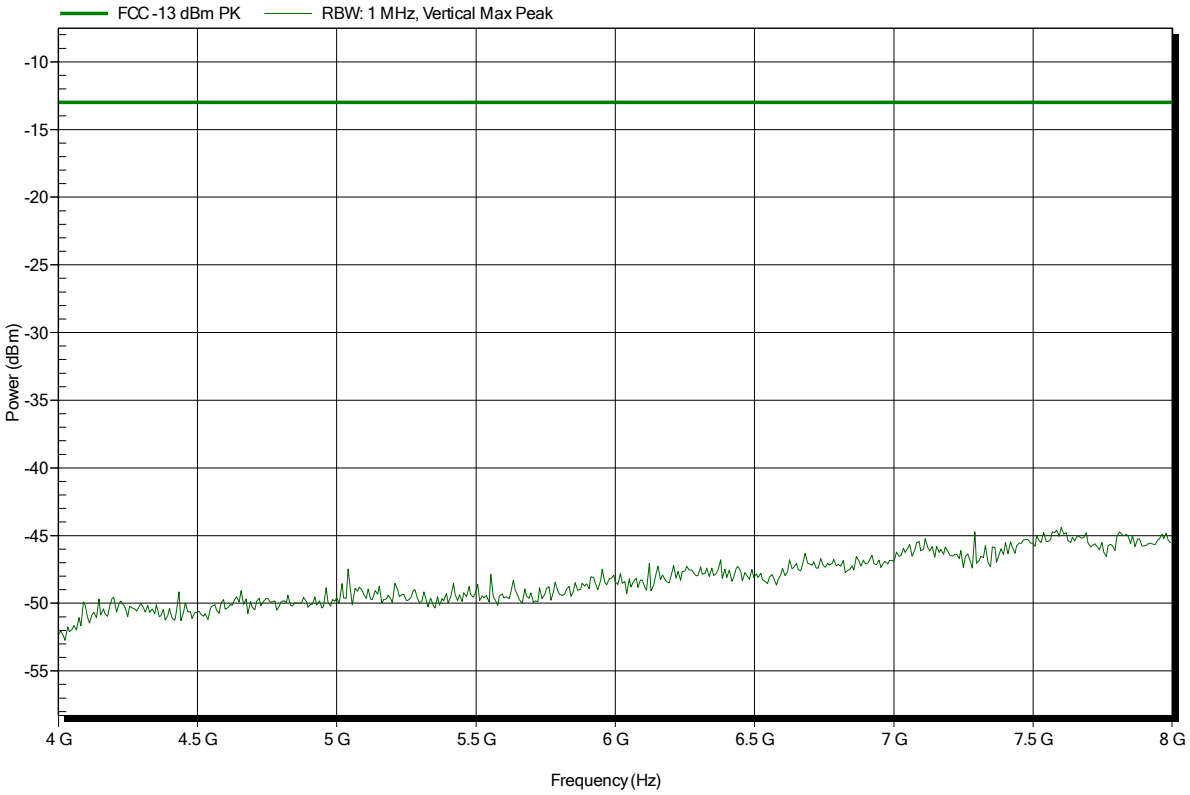
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.91 GHz	-24.5 dBm	-13 dBm	-11.48 dB	Pass

Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 25; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 80

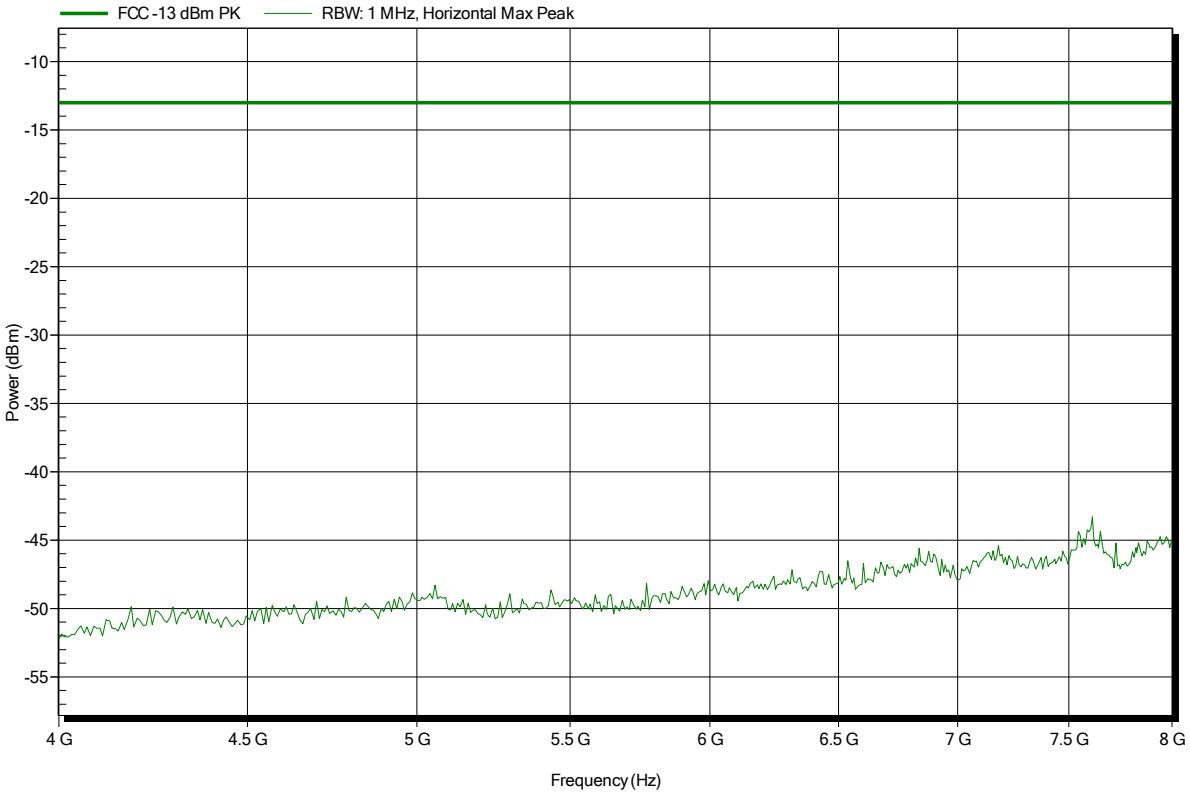


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 25; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 89

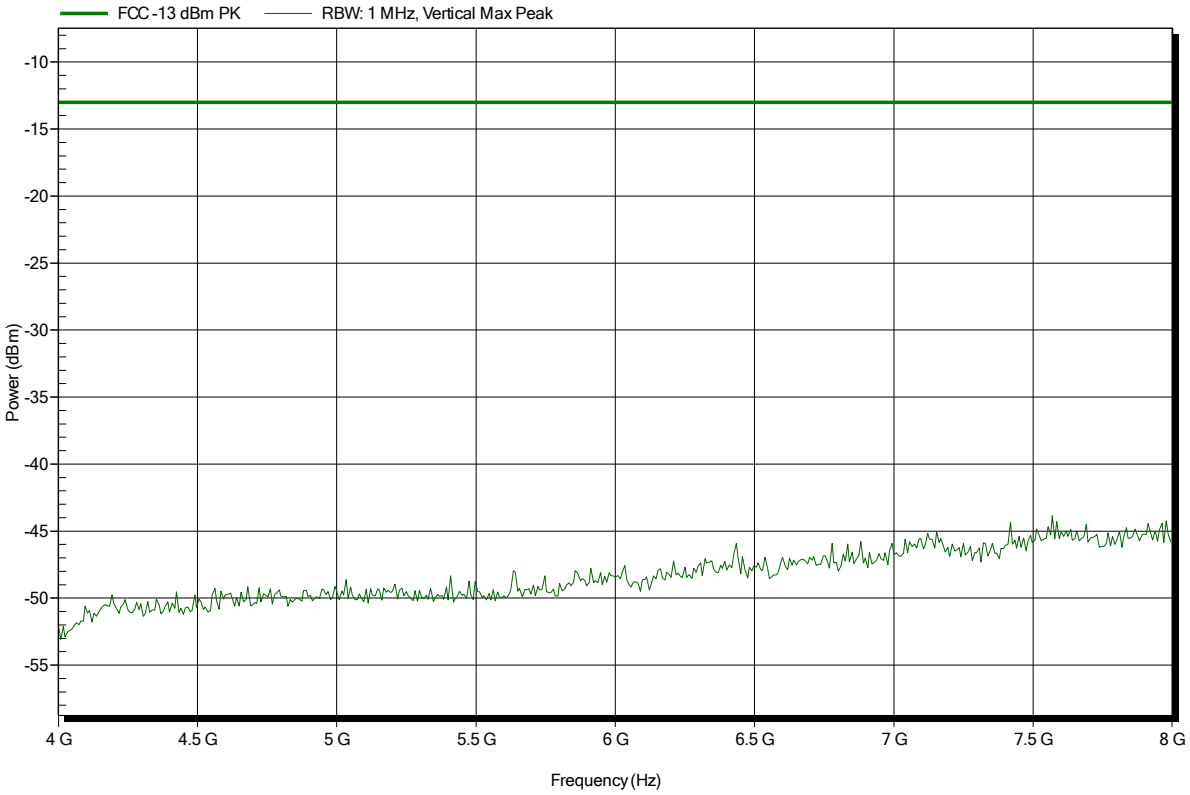


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 81

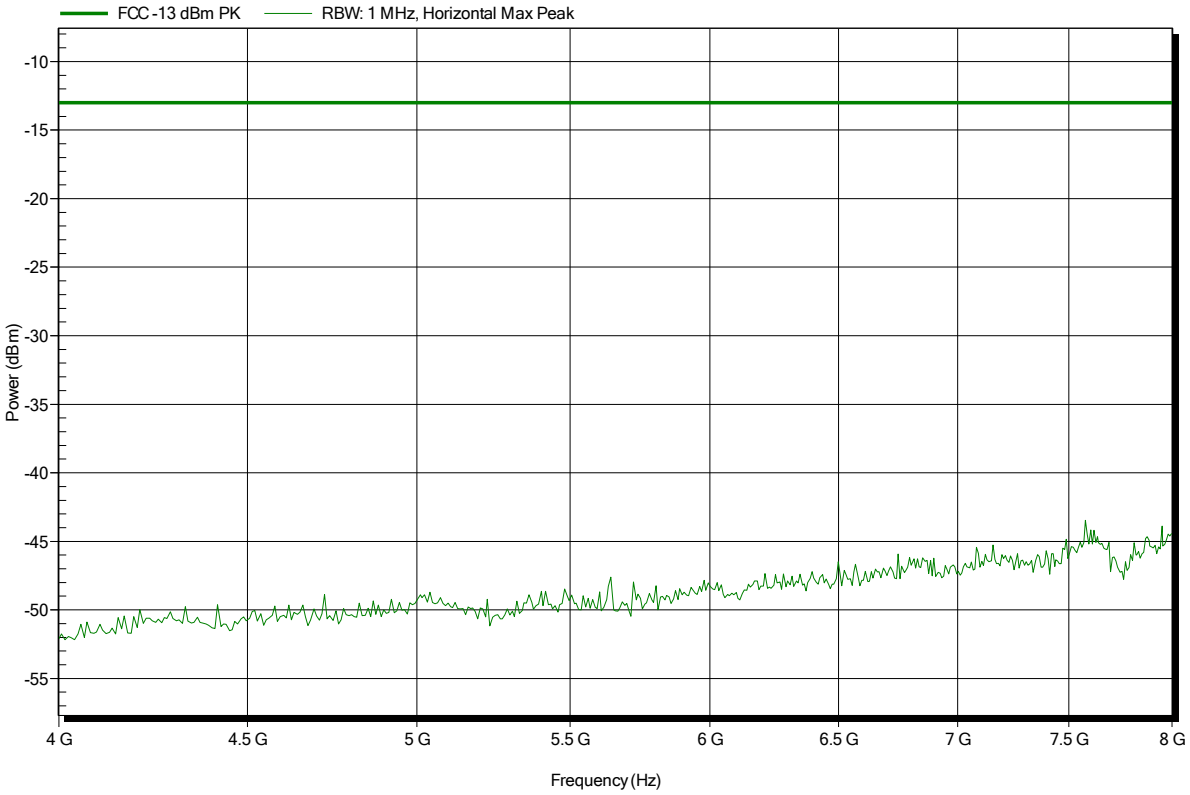


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 88

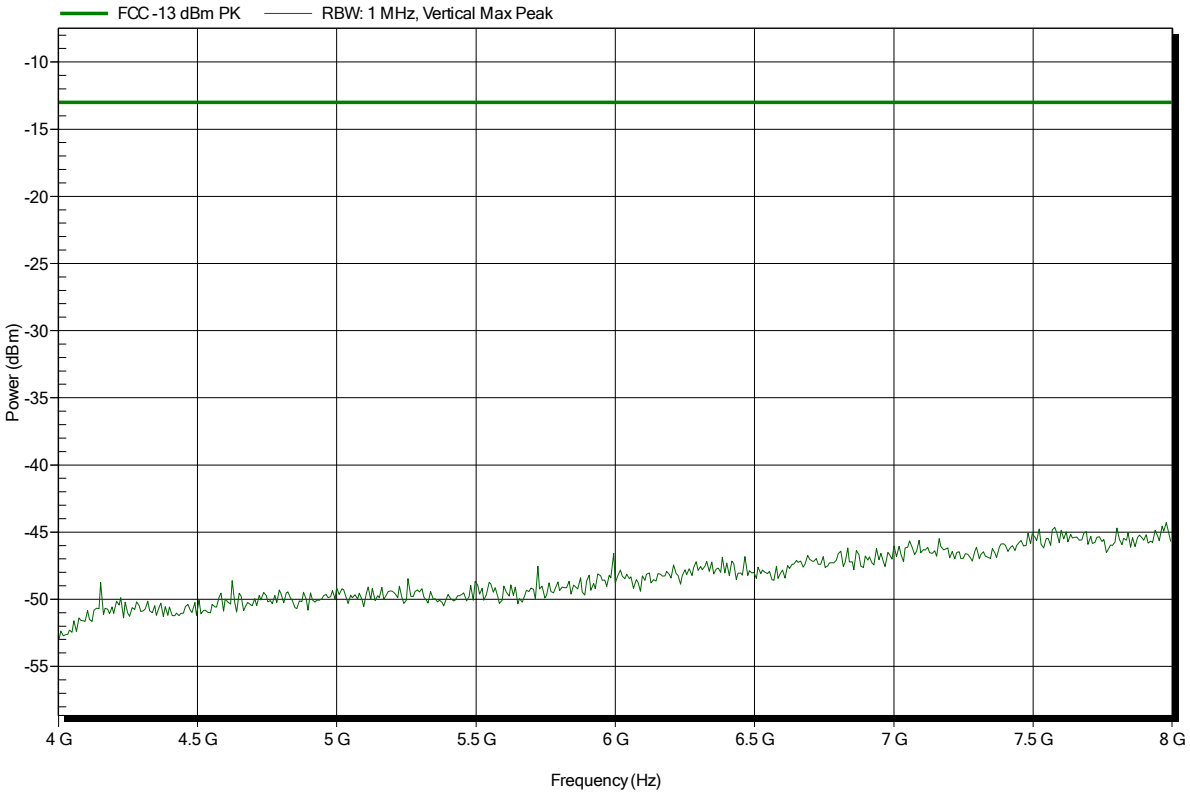


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 1175; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 82

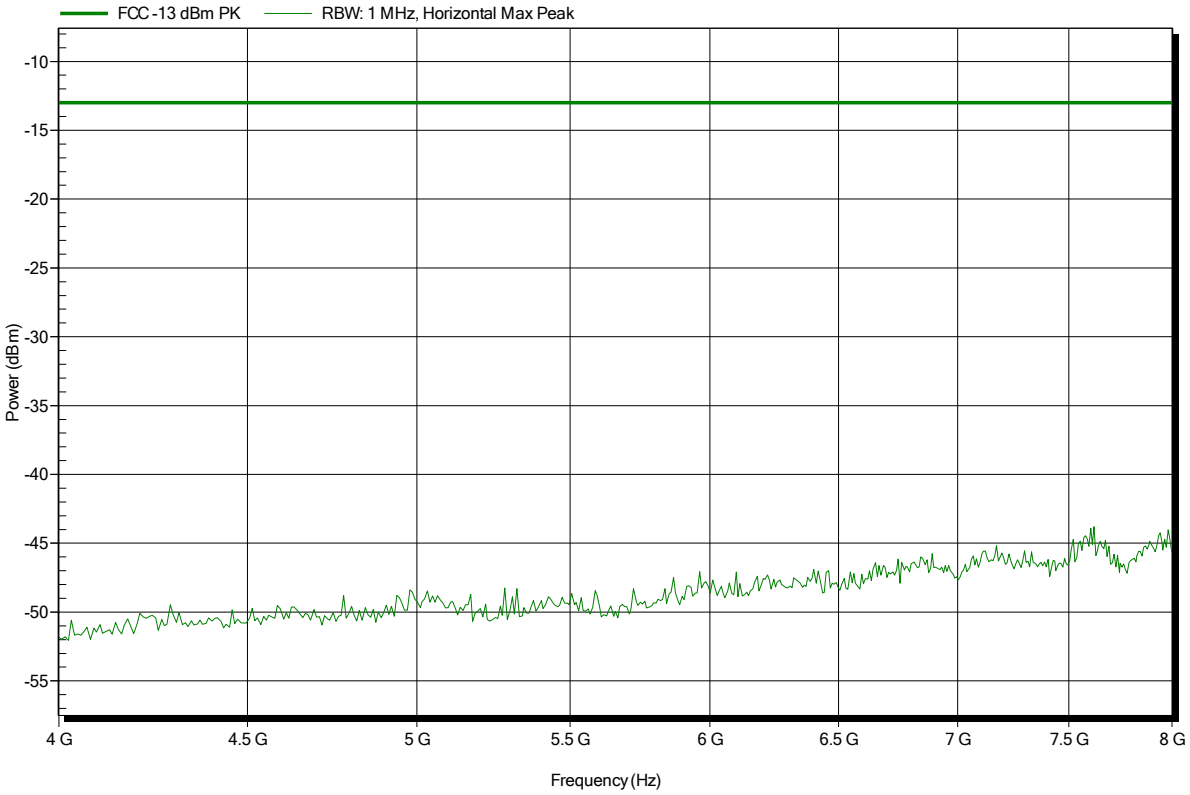


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 1175; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 87

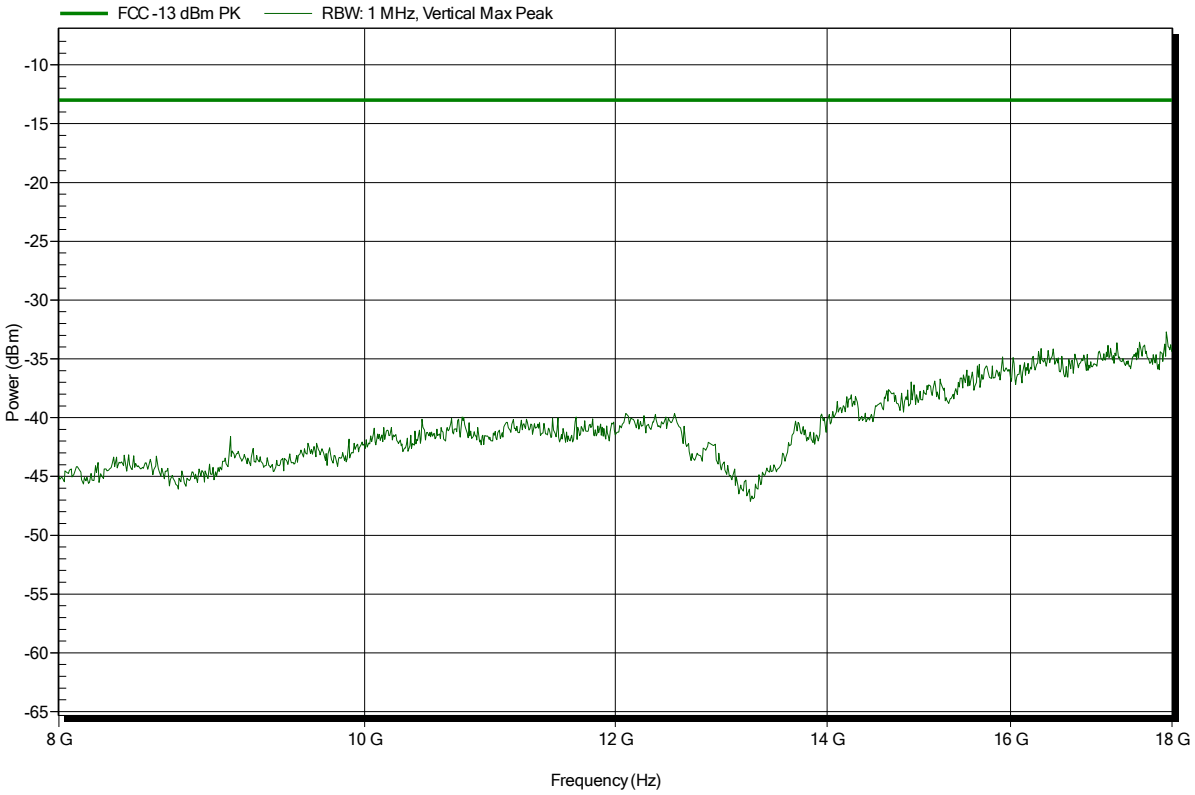


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 83

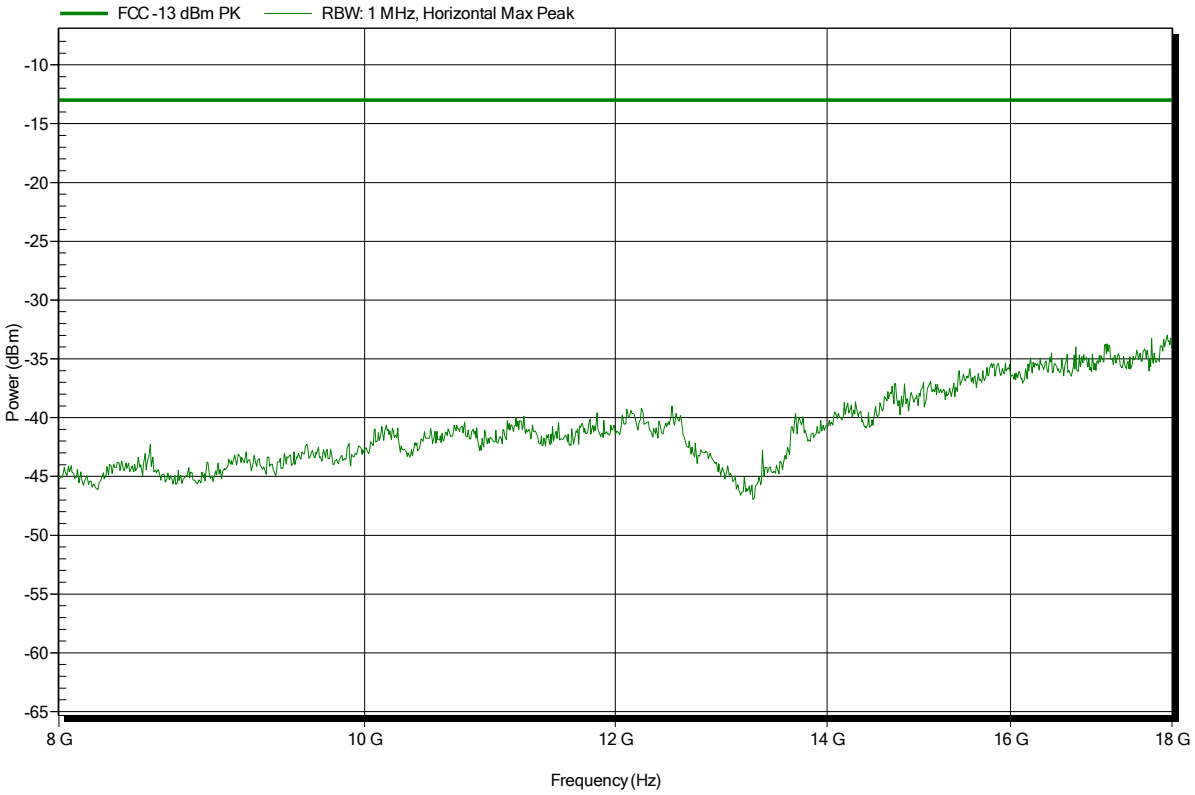


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 86

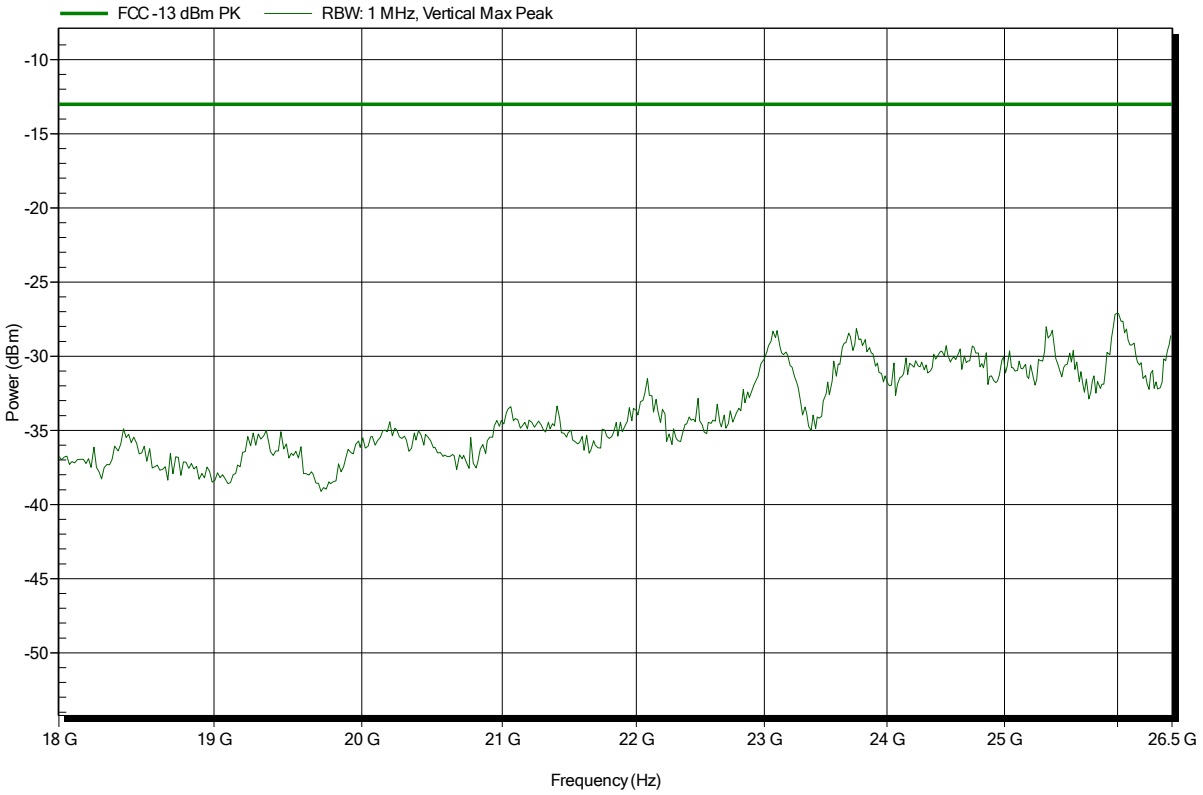


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 84

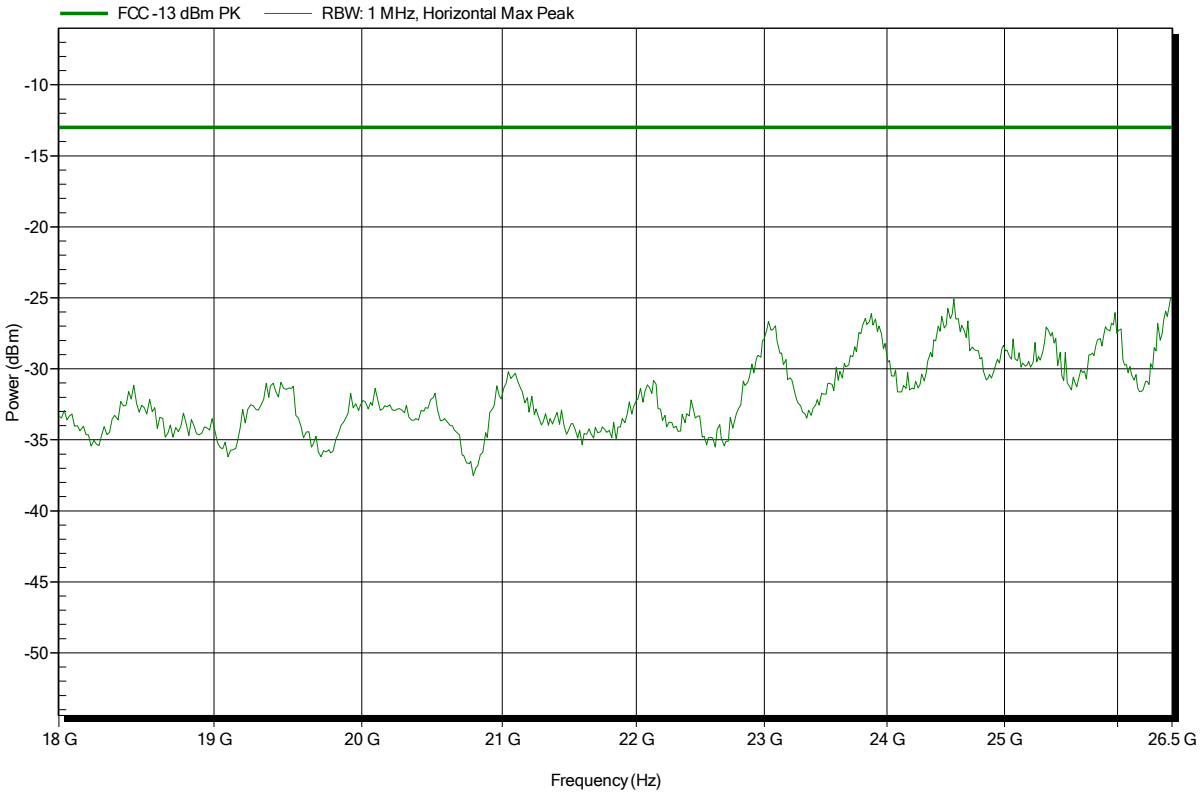


Spurious emissions according to FCC part 24 Subpart E, IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC1; CH: 600; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 85

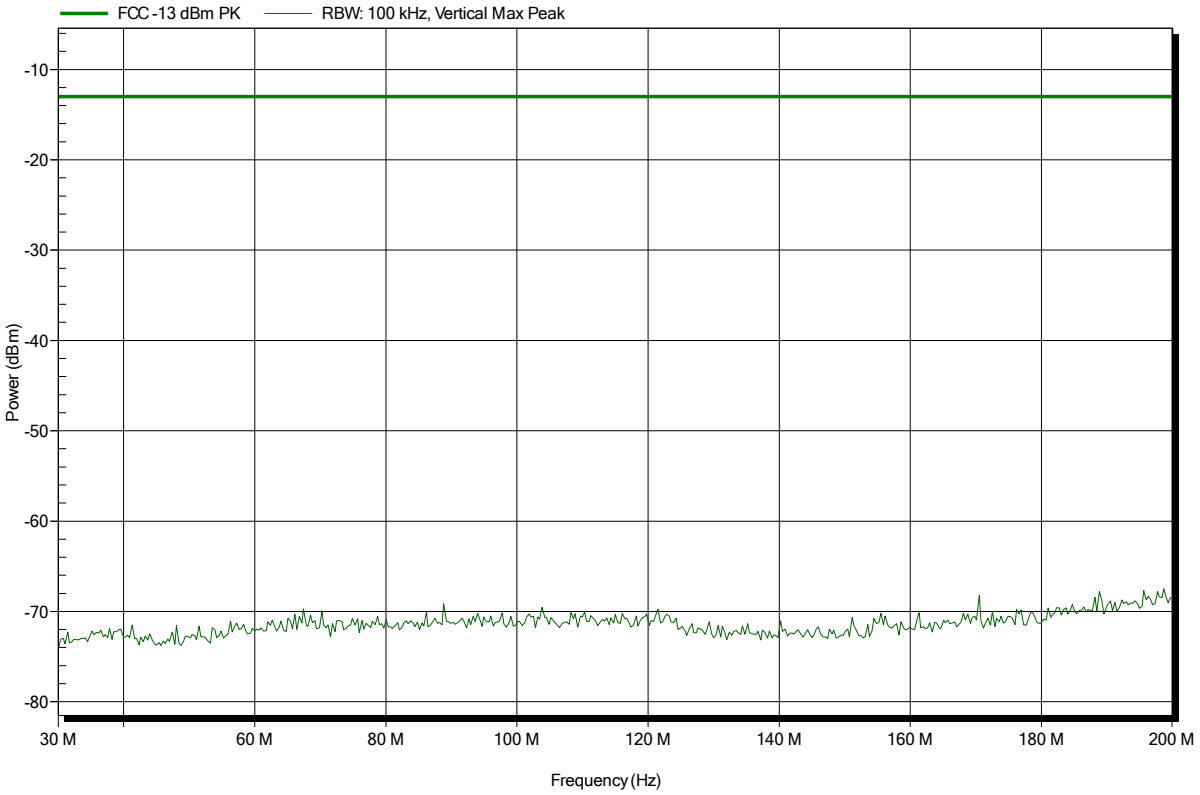


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 70

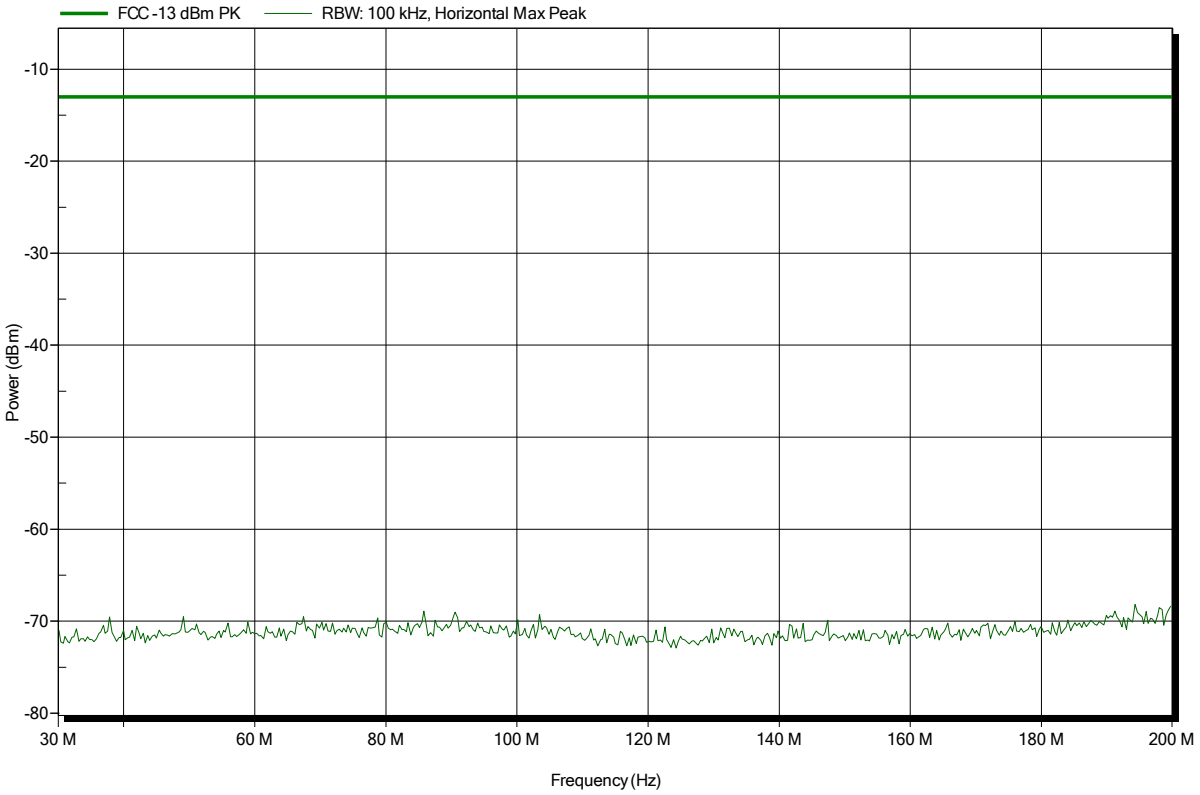


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-11
Note:	EUT vertical; worst case

Index 69

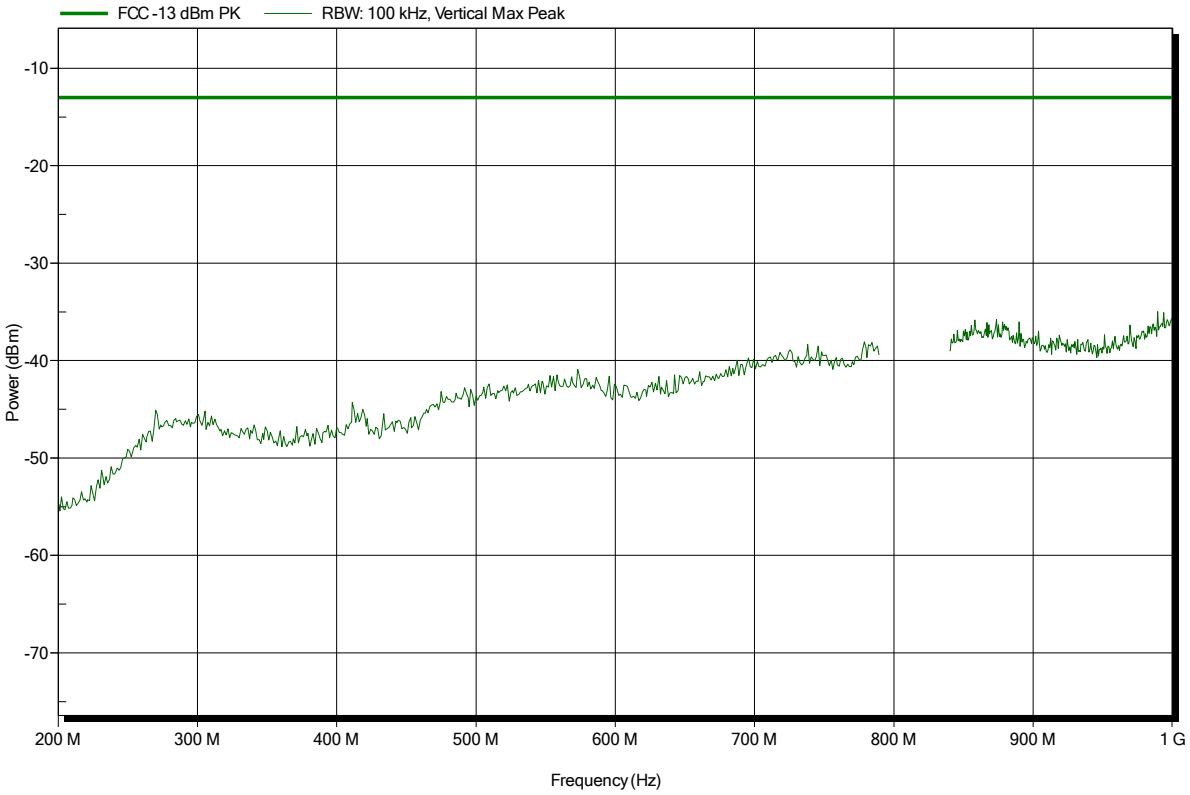


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical; worst case

Index 83

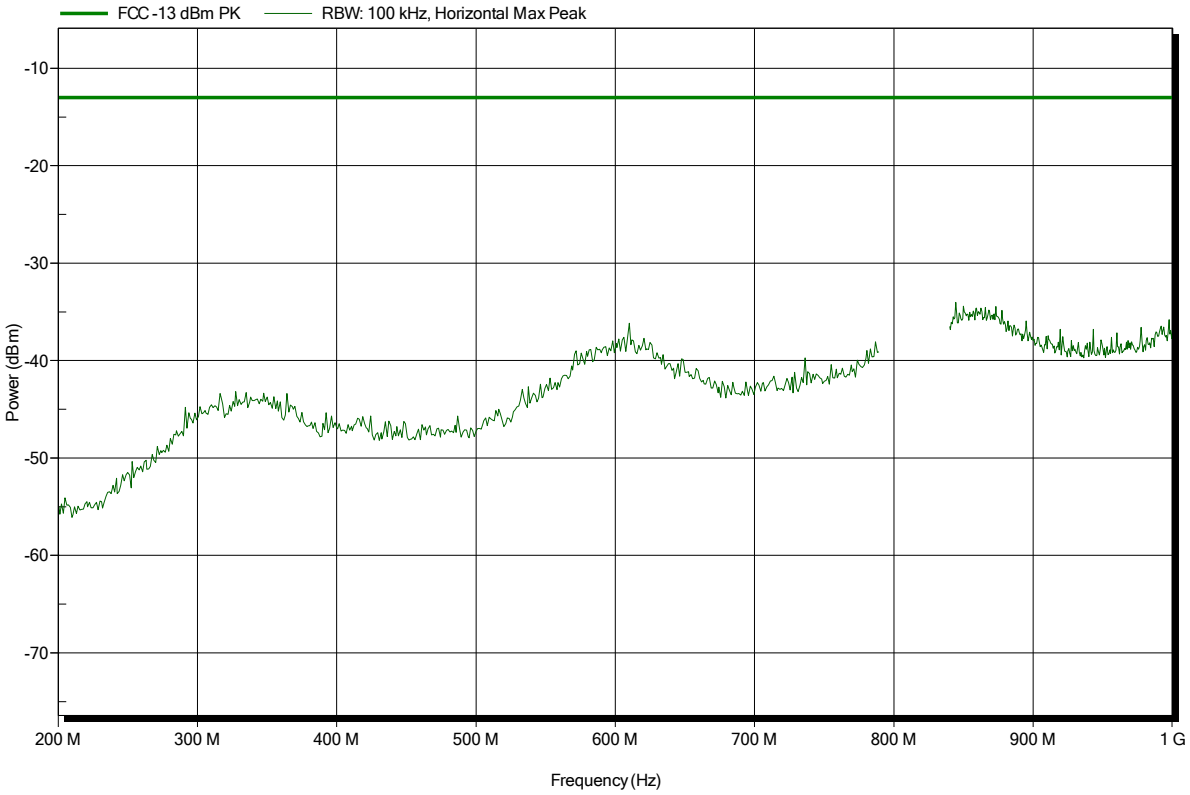


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical; worst case

Index 87

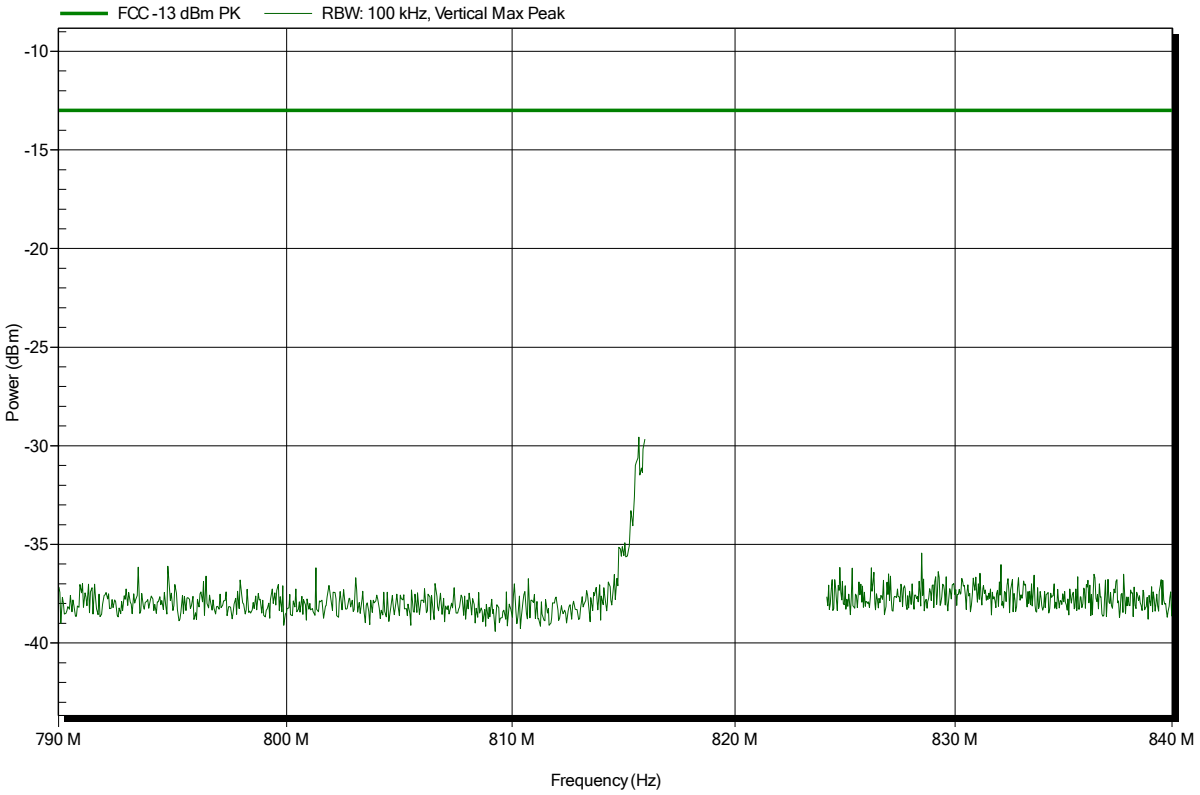


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 476; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical

Index 85

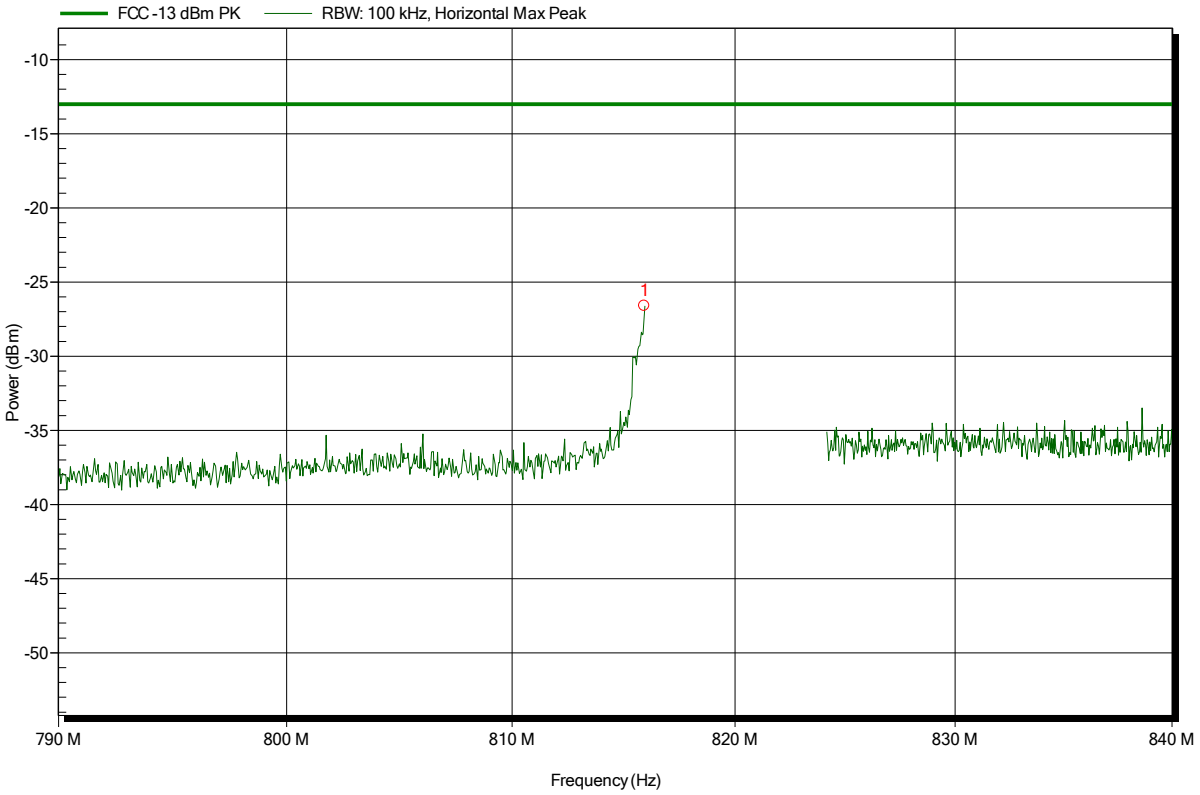


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 476; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical

Index 89



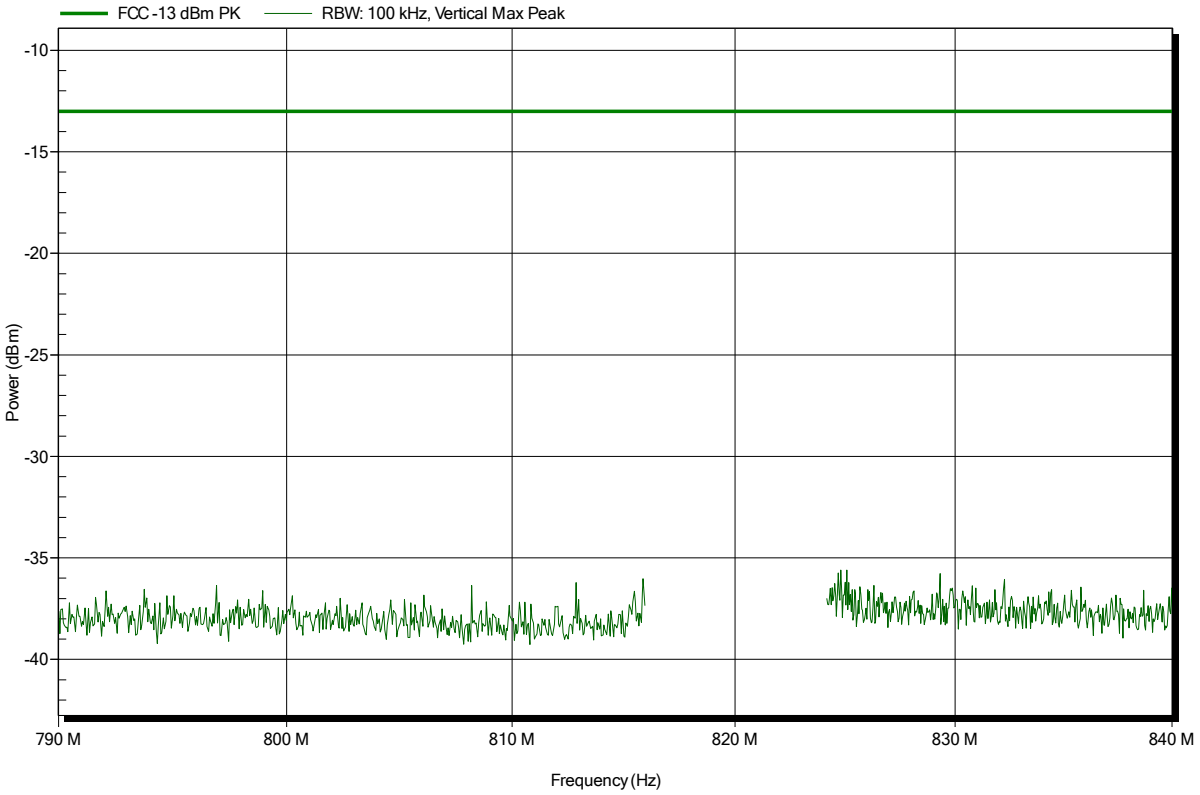
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
815.914 MHz	-26.6 dBm	-13 dBm	-13.6 dB	Pass

Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical

Index 84

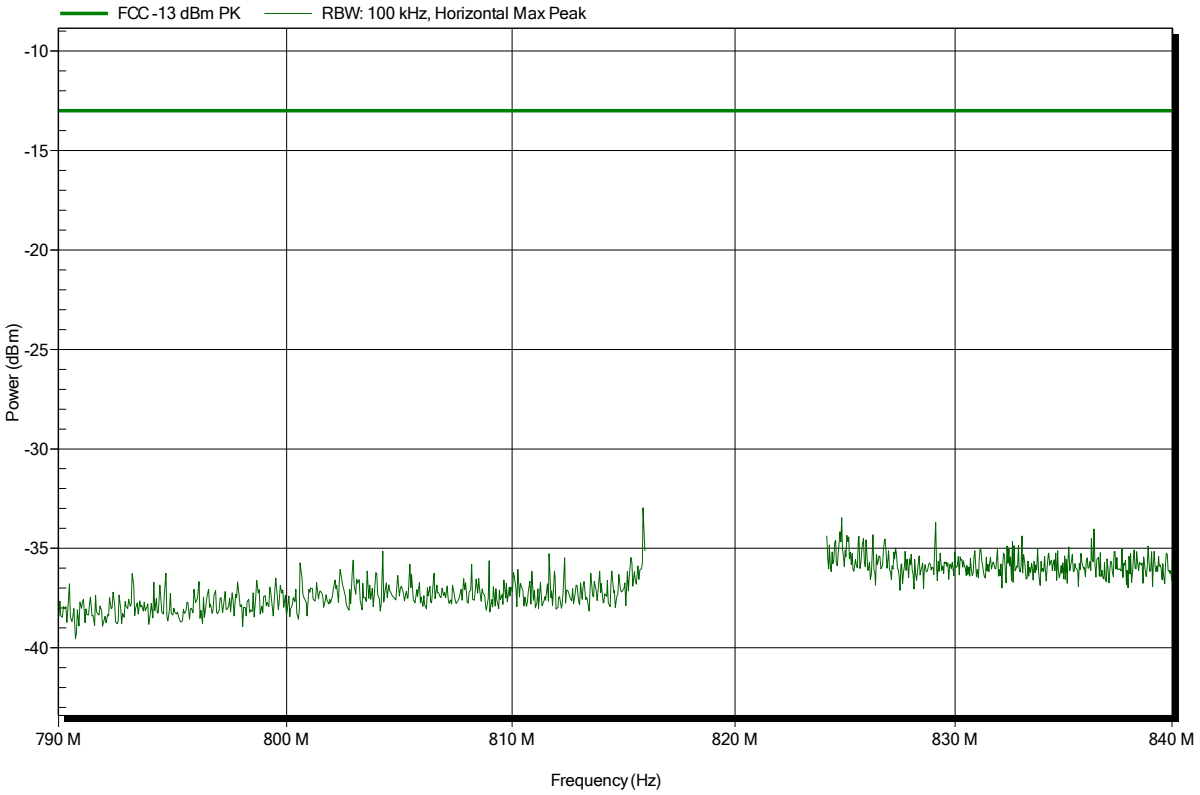


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical

Index 88

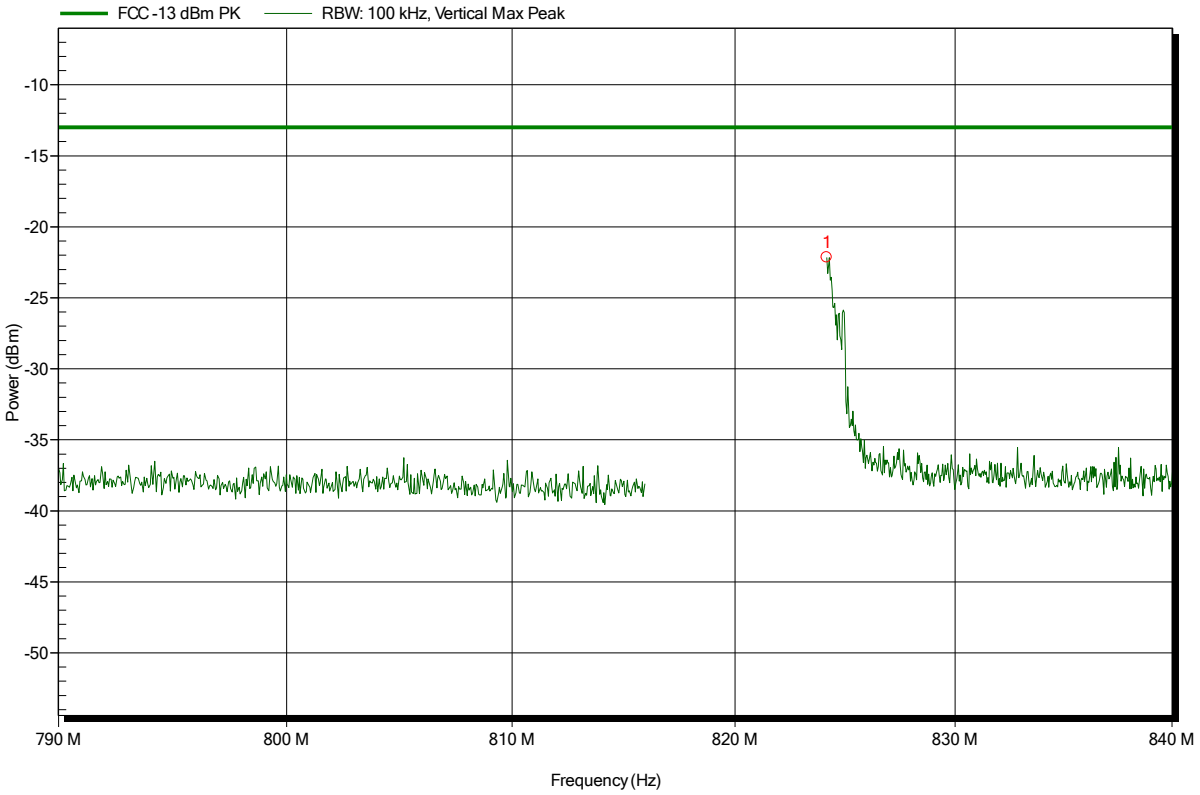


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 684; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical

Index 86



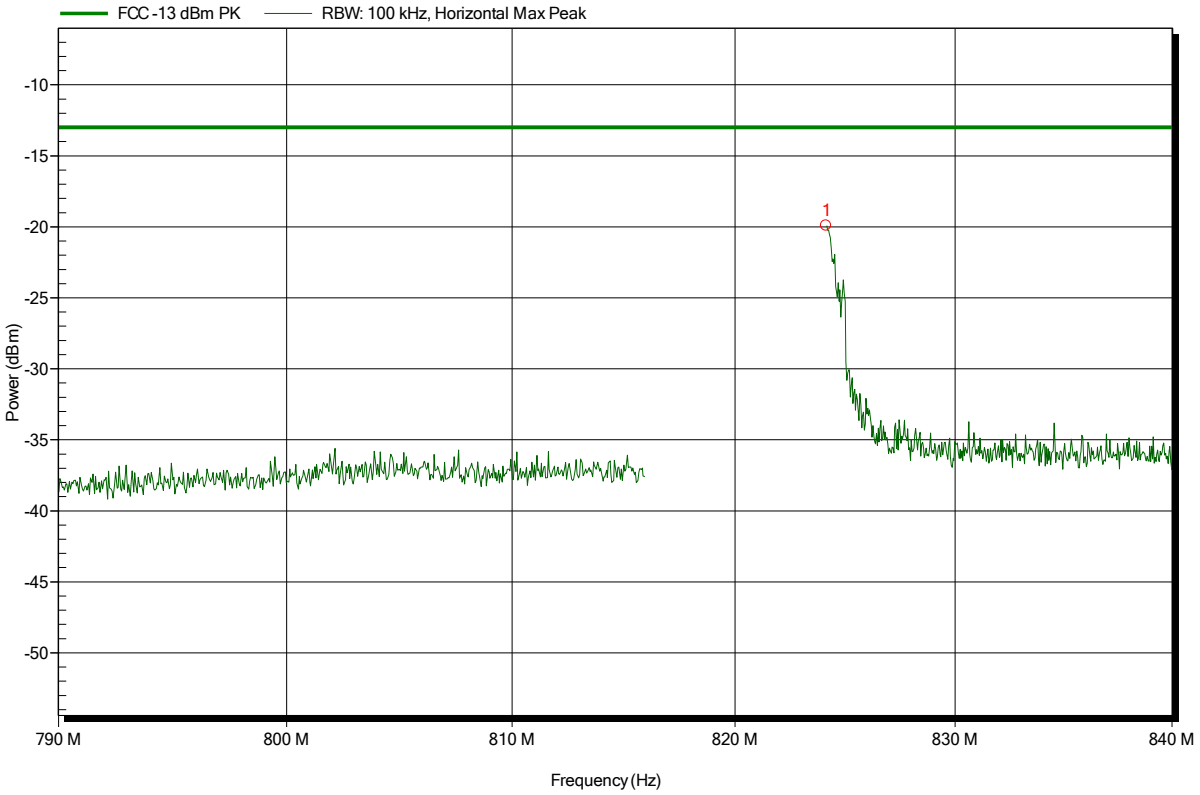
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
824.162 MHz	-22.2 dBm	-13 dBm	-9.16 dB	Pass

Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 684; 1xED-VO; Rev.0
Test Date:	2014-12-19
Note:	EUT vertical

Index 90



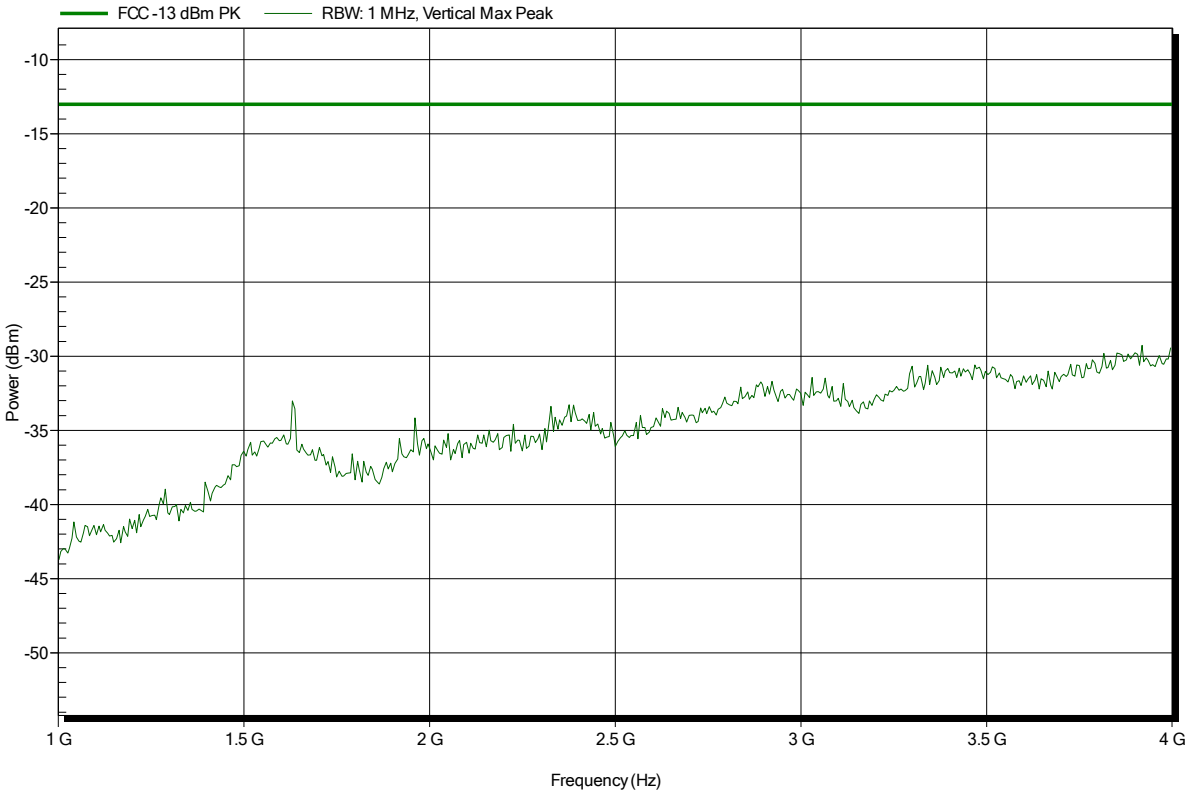
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
824.13 MHz	-19.9 dBm	-13 dBm	-6.92 dB	Pass

Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 476; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 74

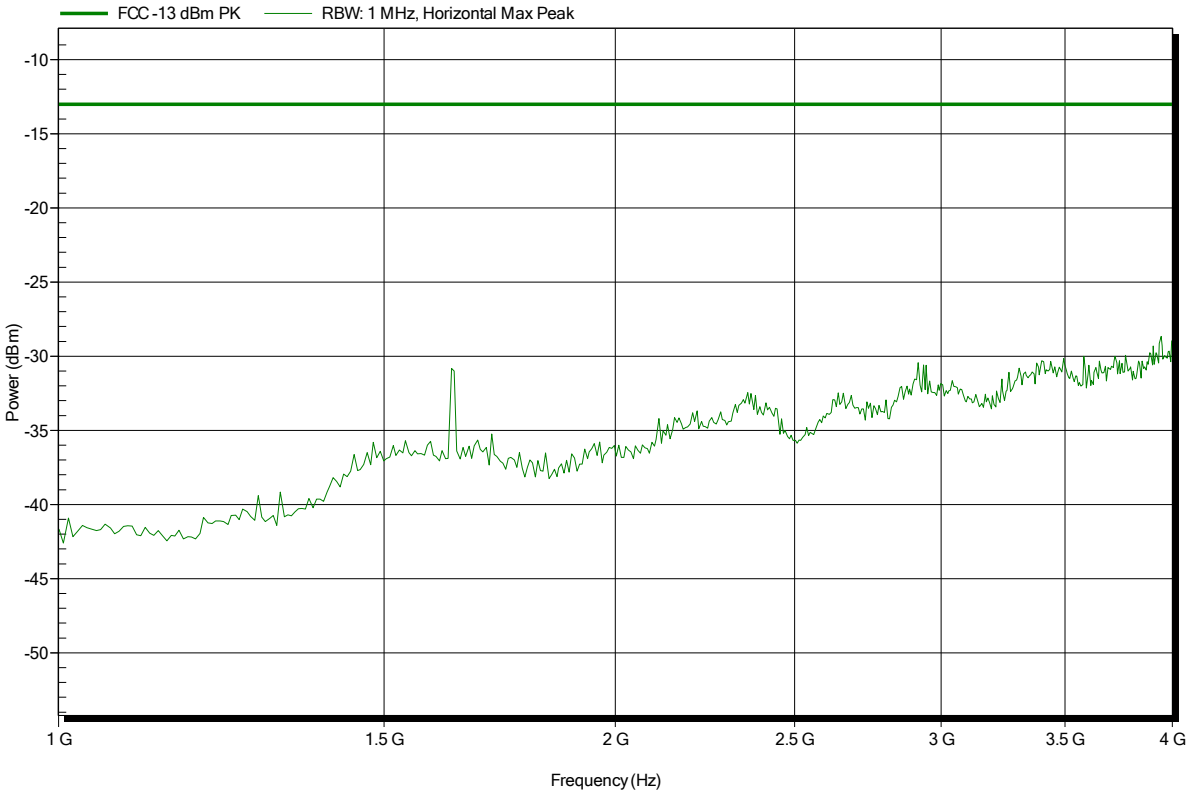


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 476; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 77

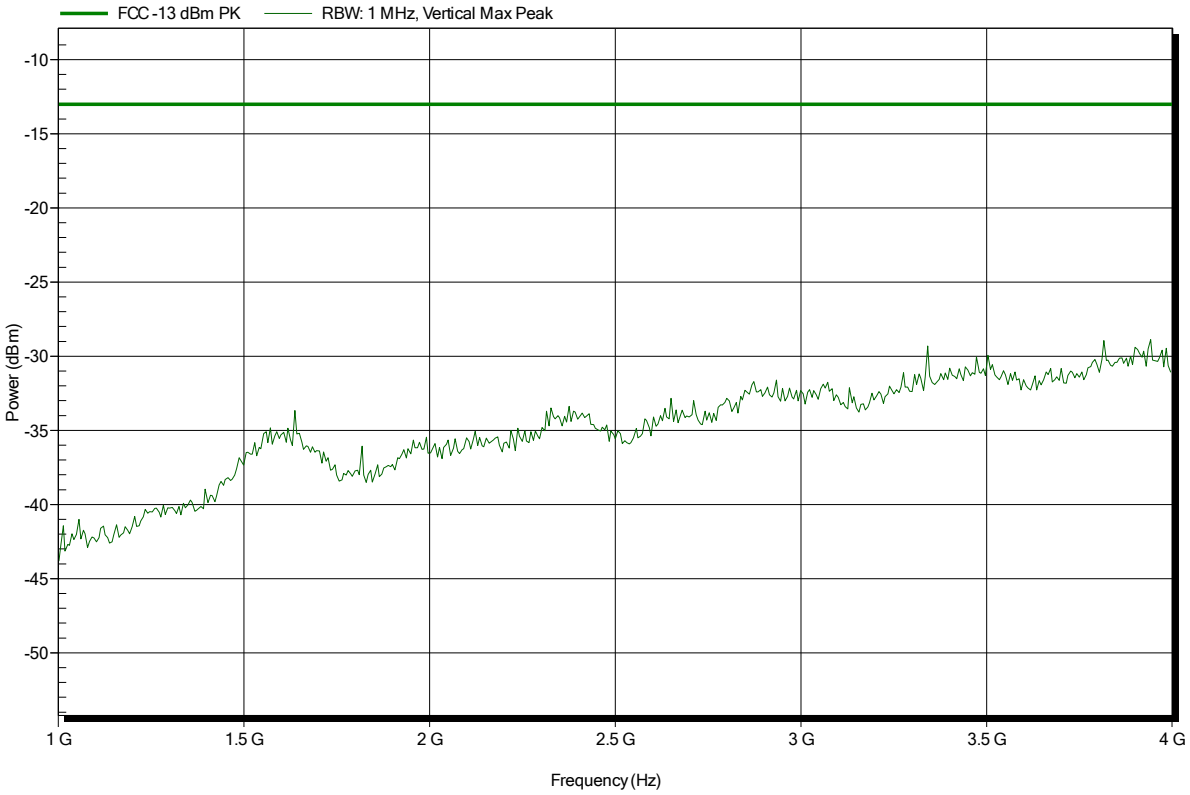


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 71

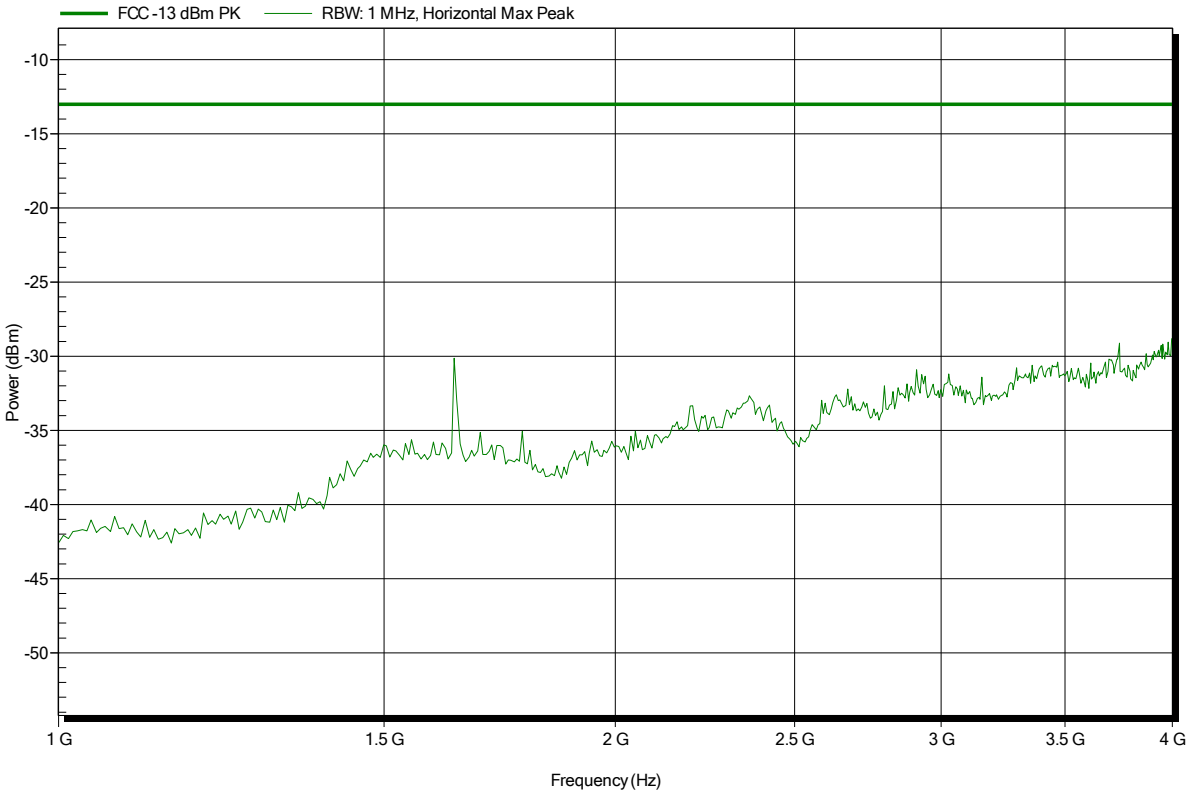


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 78

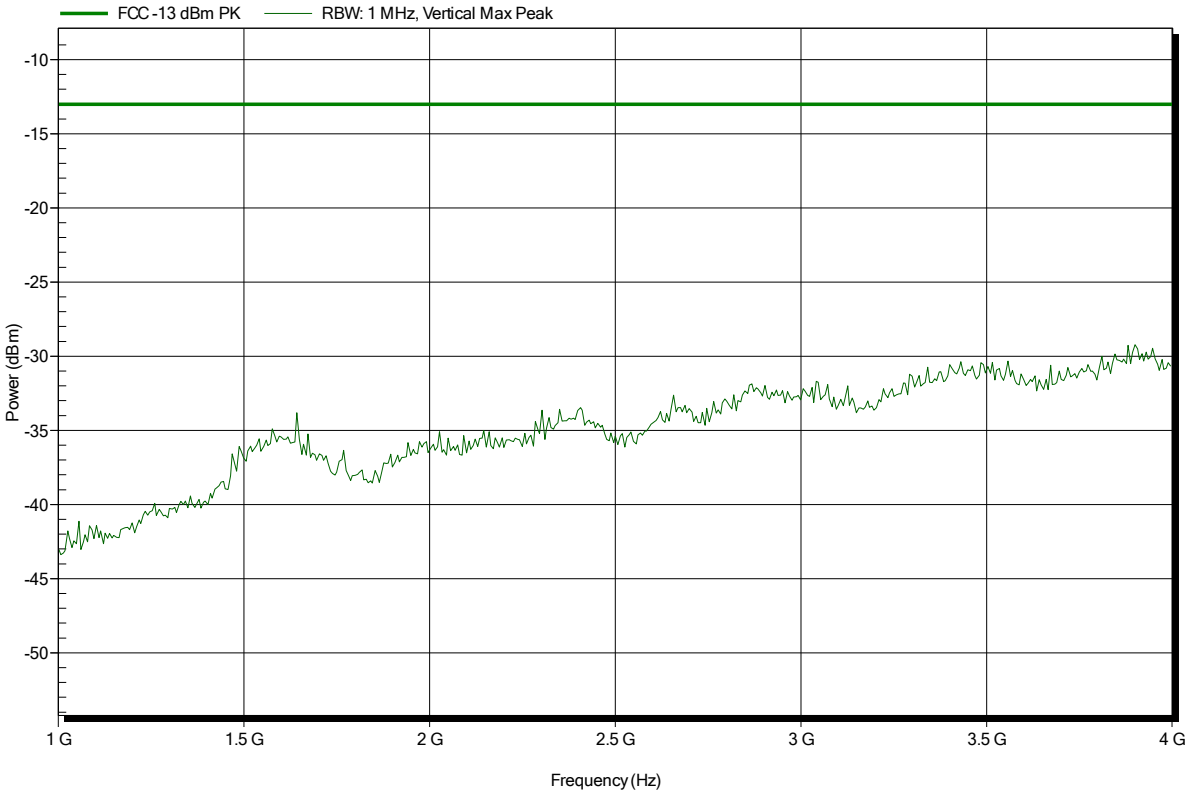


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 684; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 75

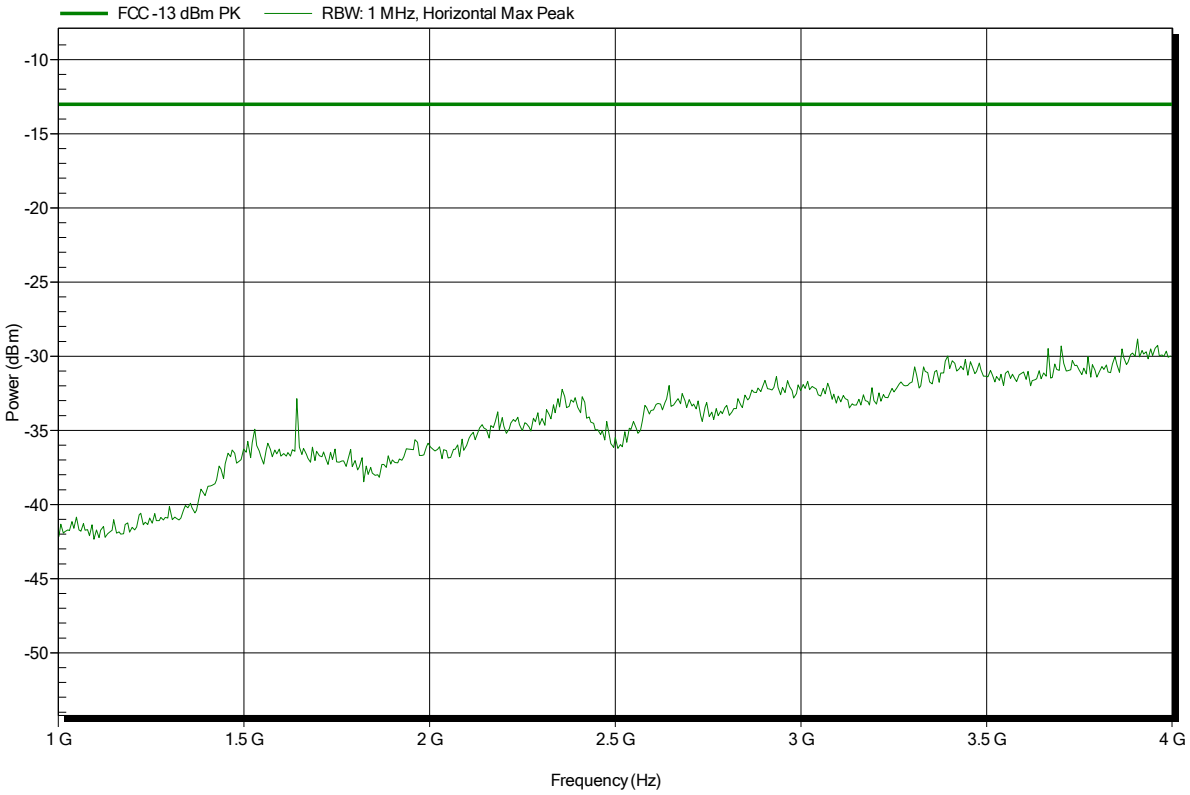


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 684; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical

Index 76

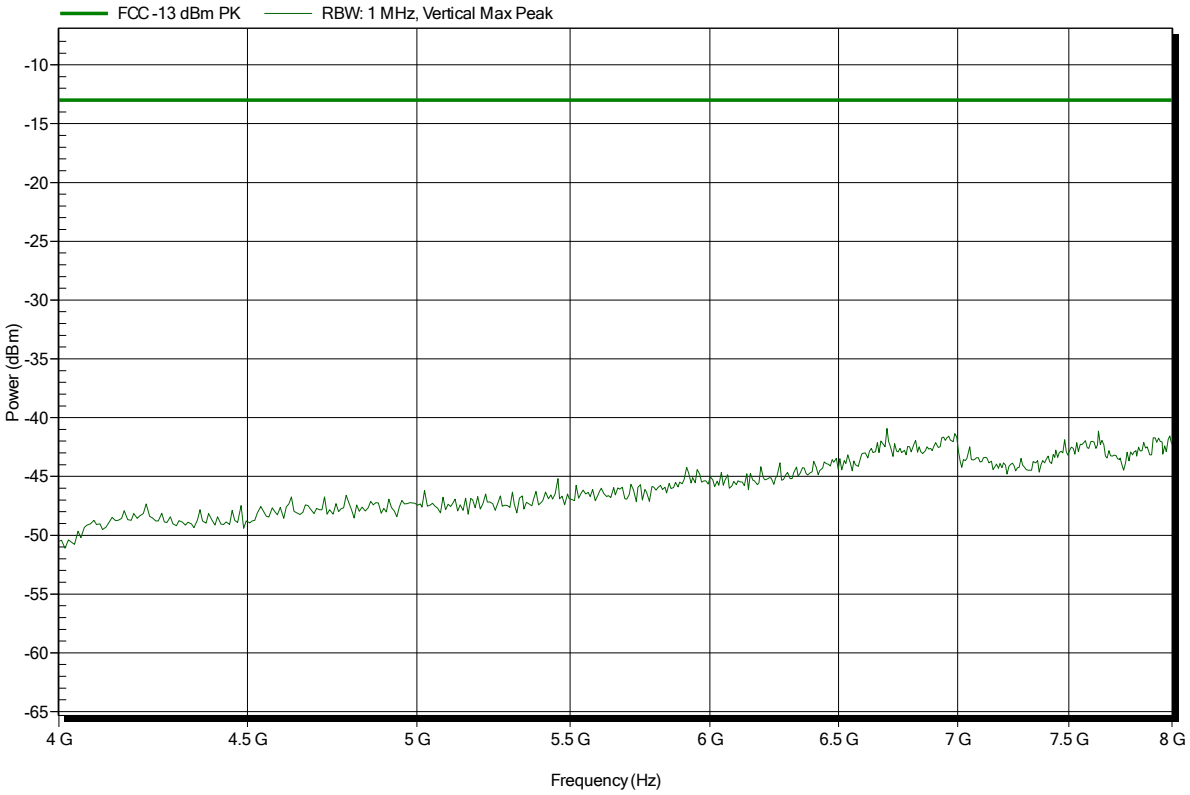


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 72

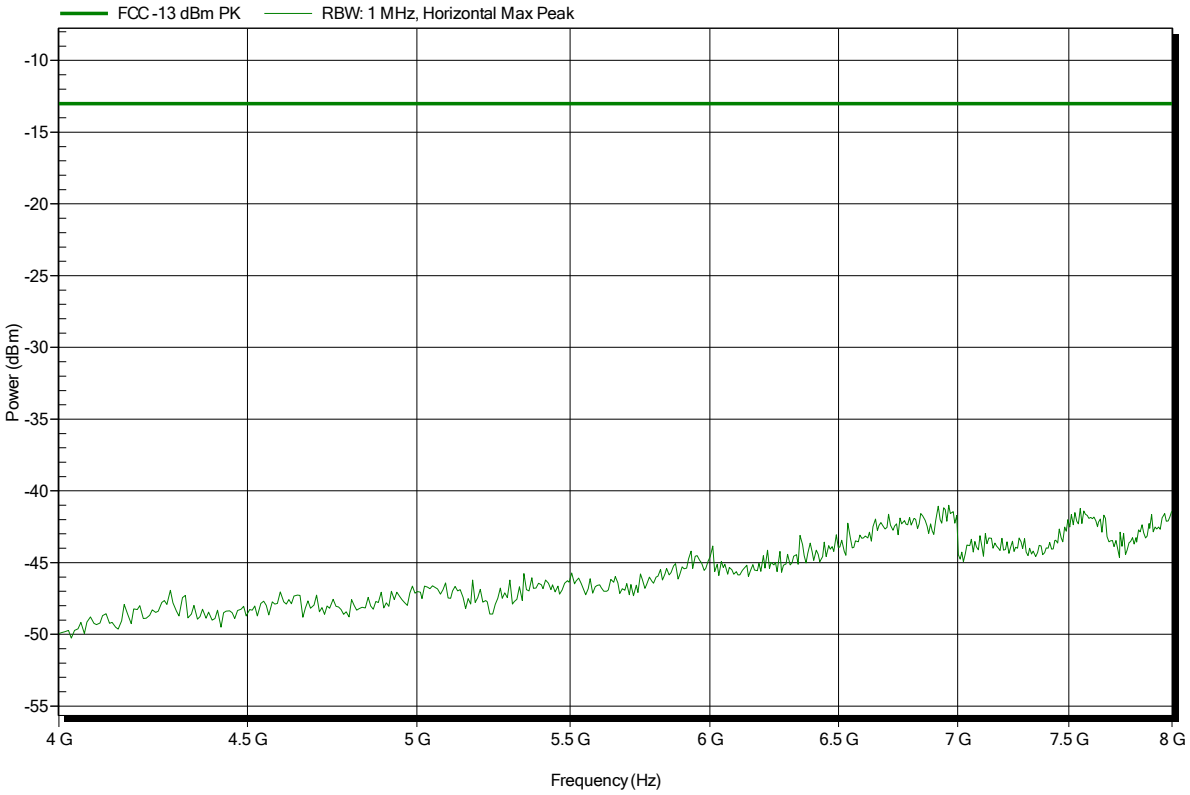


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 79

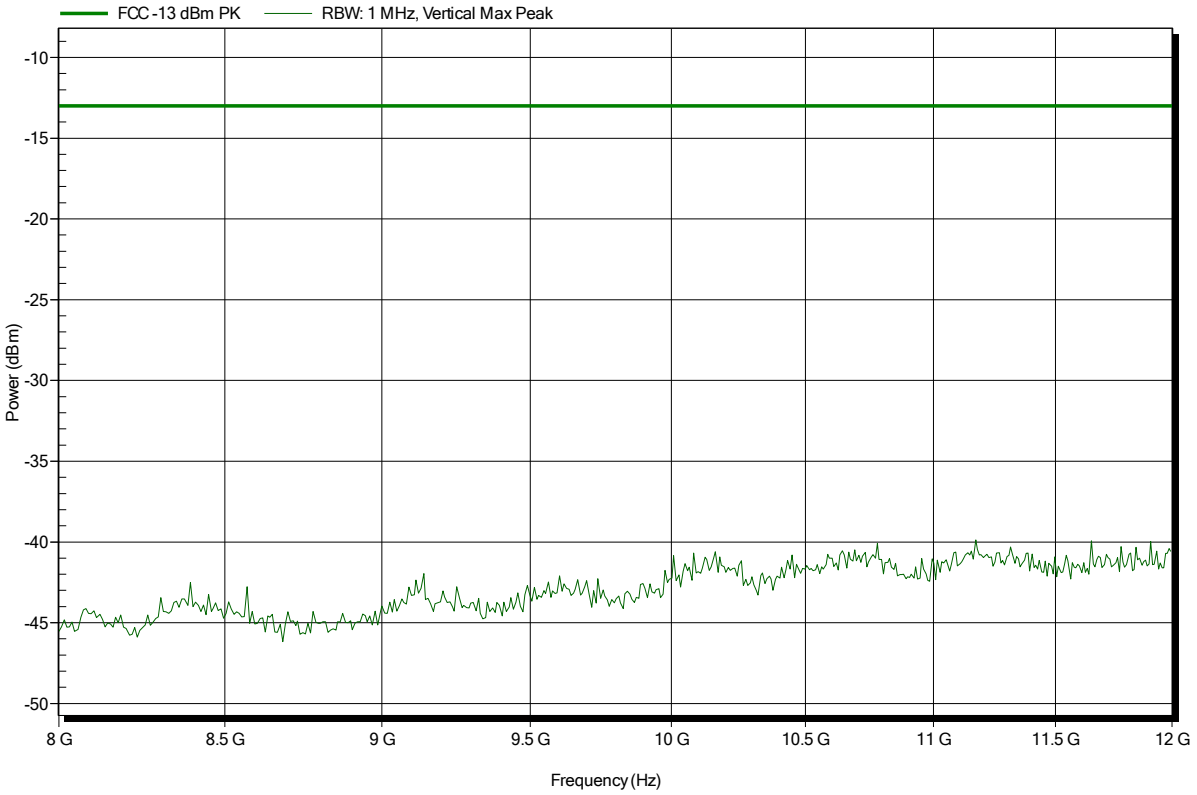


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 73

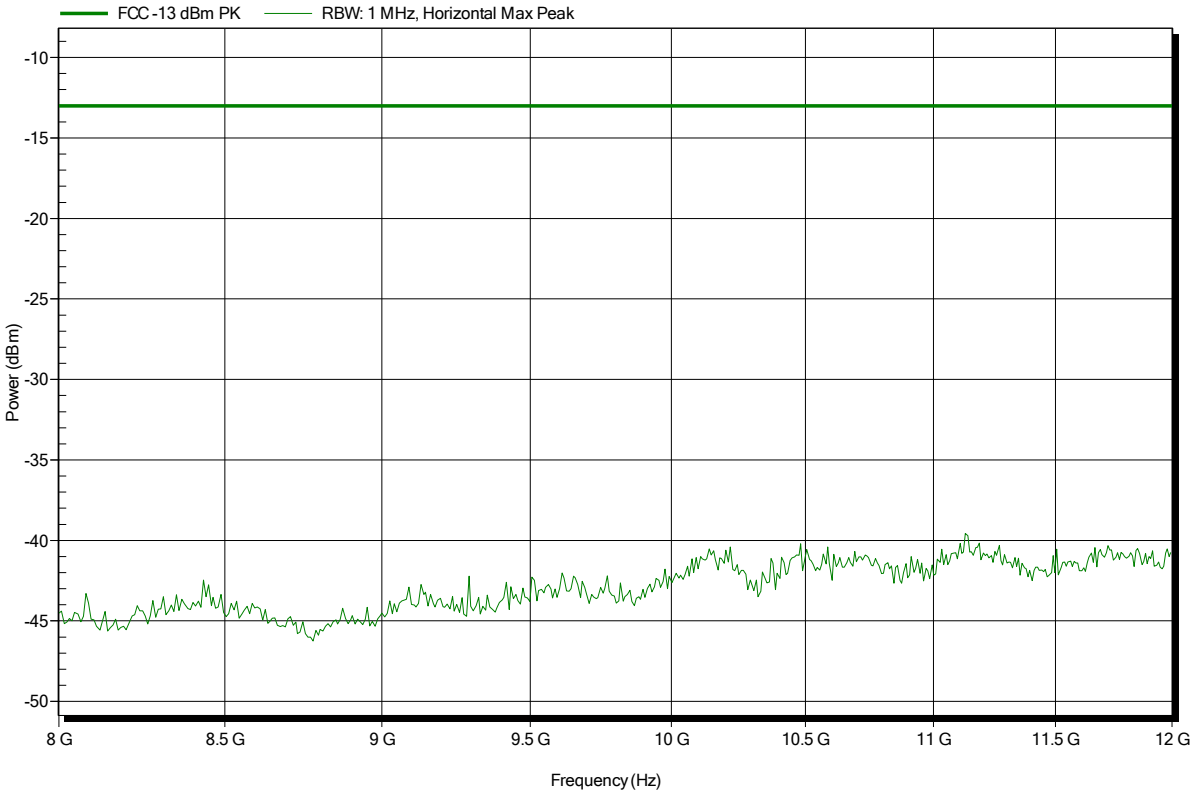


Spurious emissions according to FCC part 90 Subpart S, IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	TX; CDMA BC10; CH: 580; 1xED-VO; Rev.0
Test Date:	2014-12-12
Note:	EUT vertical; worst case

Index 80



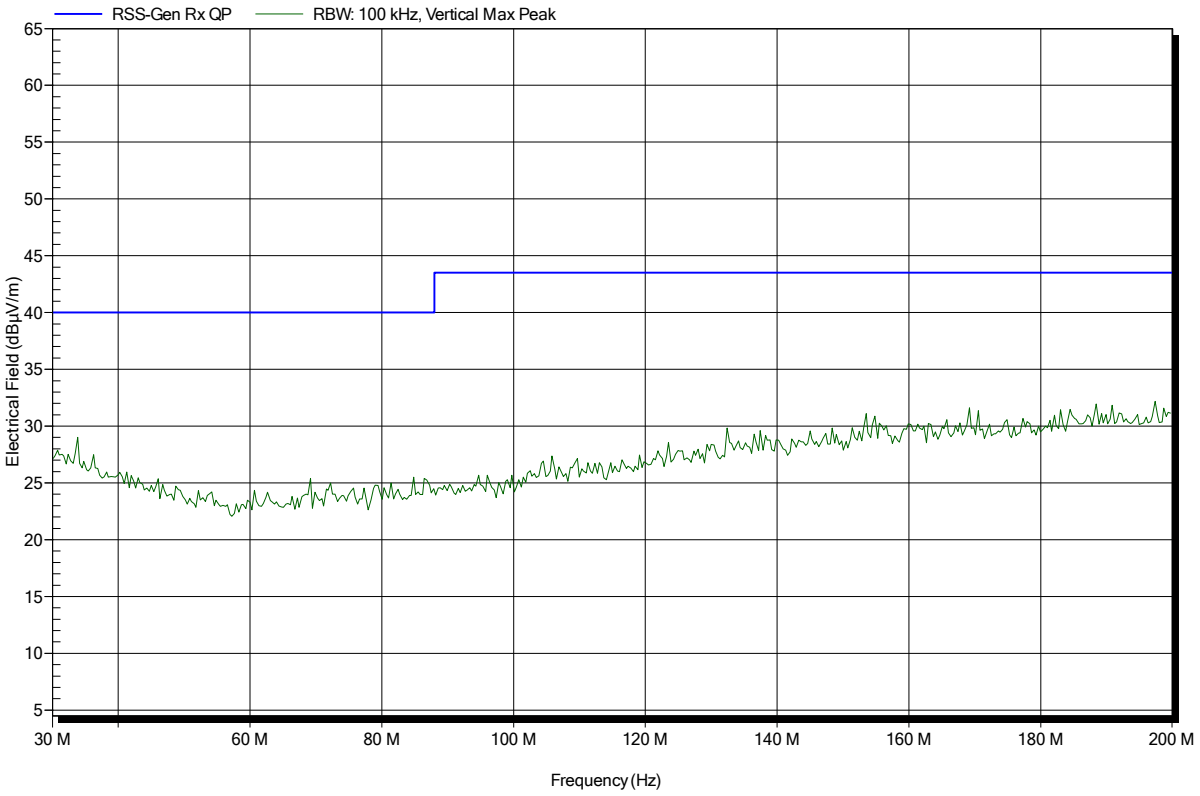
ANNEX B Receiver radiated spurious emissions

Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC0; CH: 384, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 102

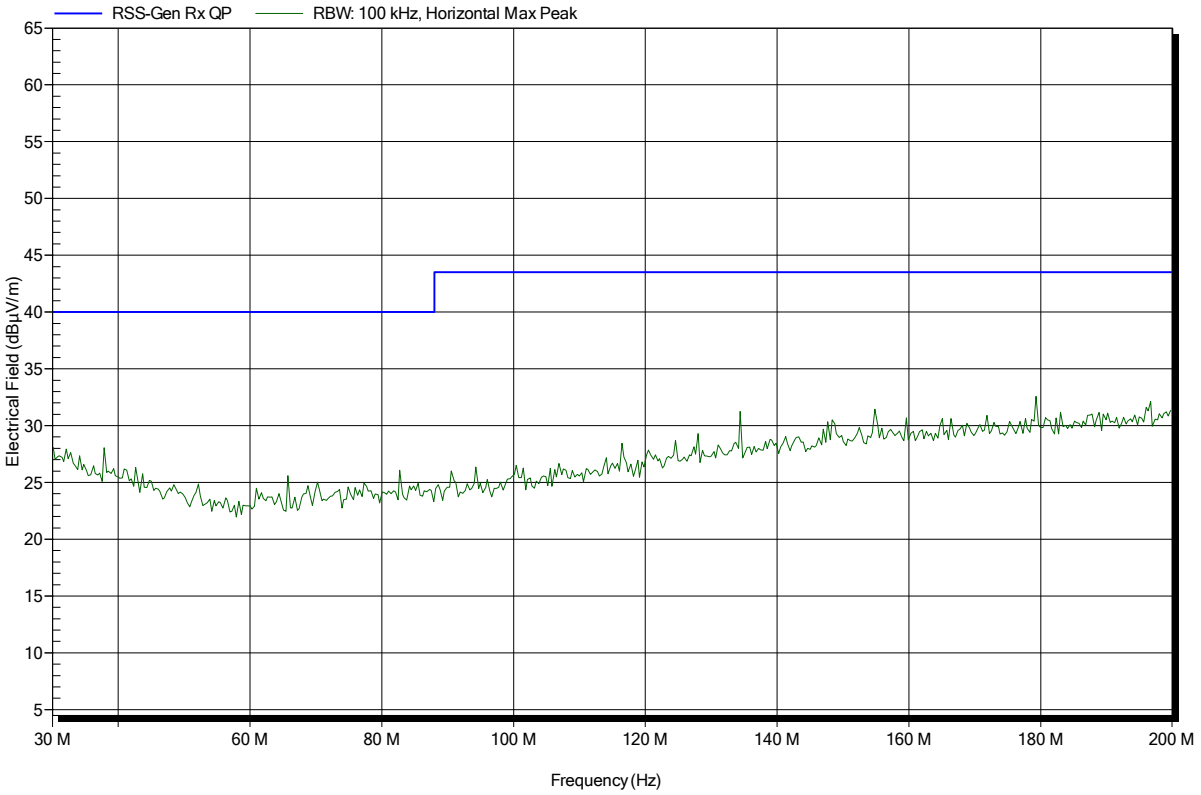


Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC0; CH: 384, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 104

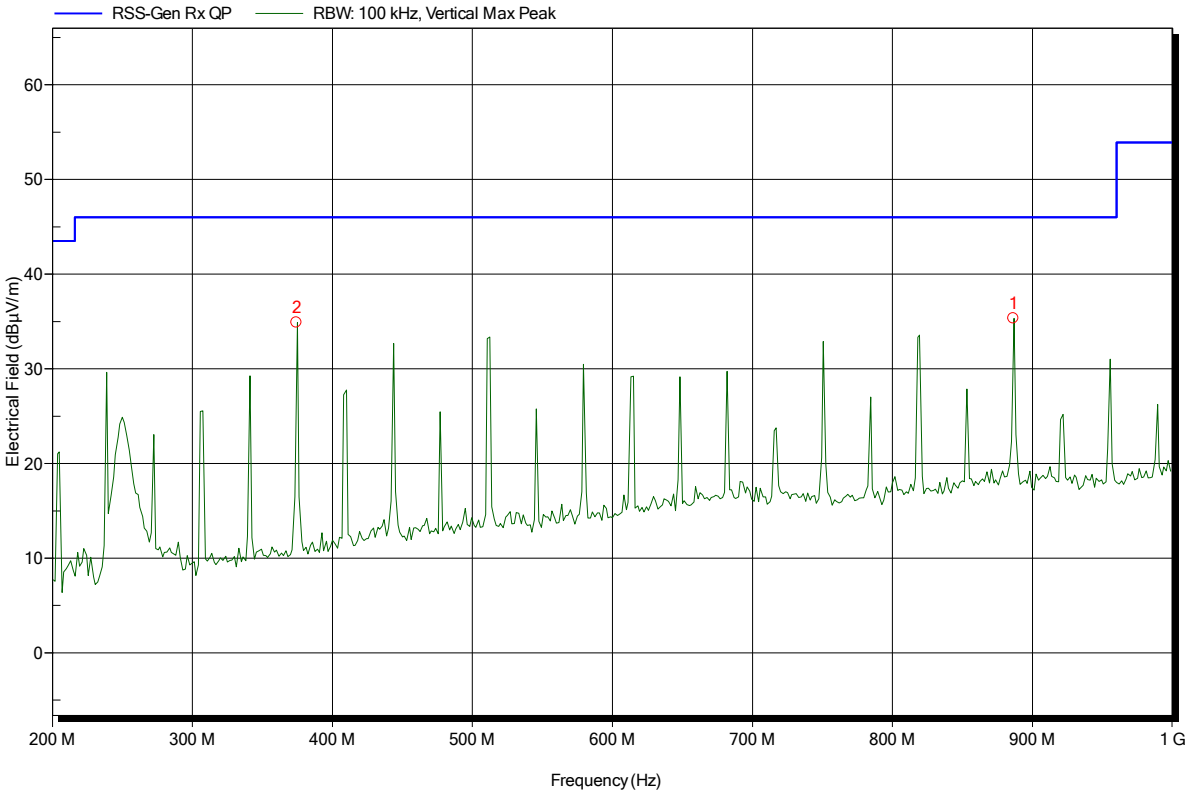


Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC0; CH: 384, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 95



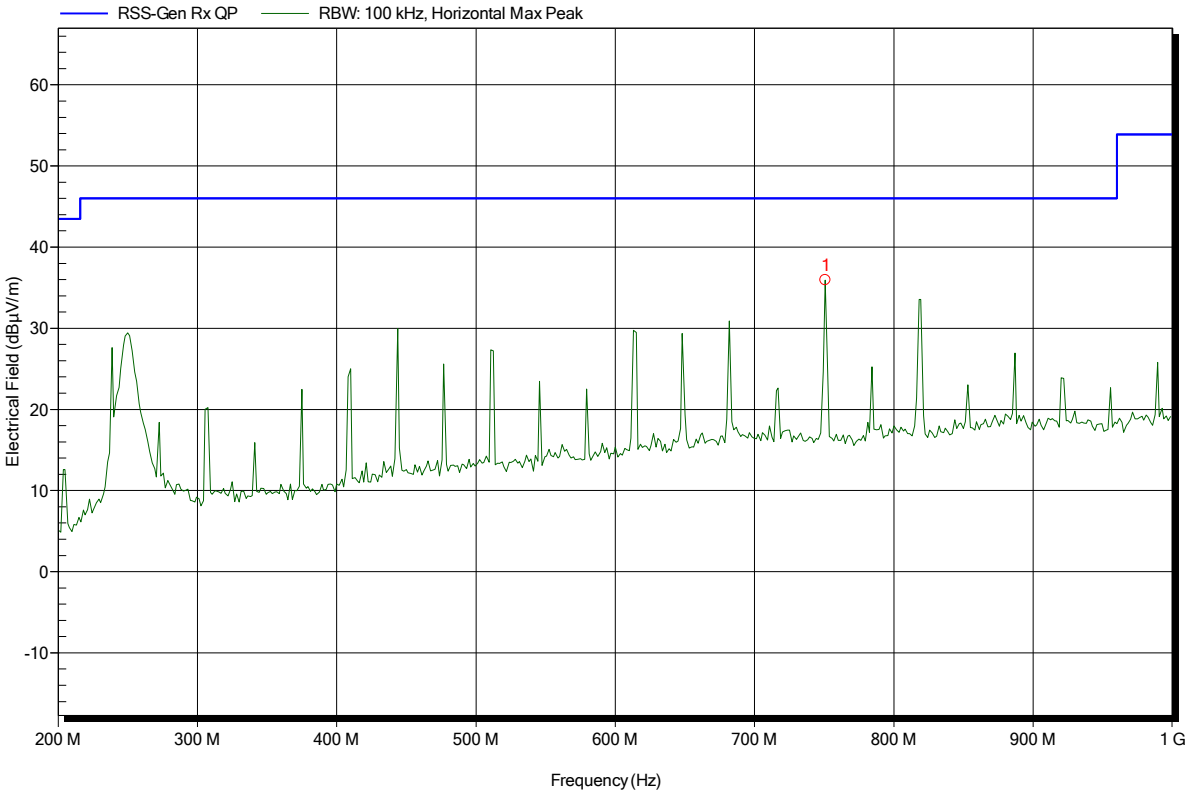
Frequency	Peak	Peak Limit	Peak Difference	Status
374.4 MHz	34.88 dBµV/m	46 dBµV/m	-11.12 dB	Pass
886.4 MHz	35.33 dBµV/m	46 dBµV/m	-10.67 dB	Pass

Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC0; CH: 384, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 98



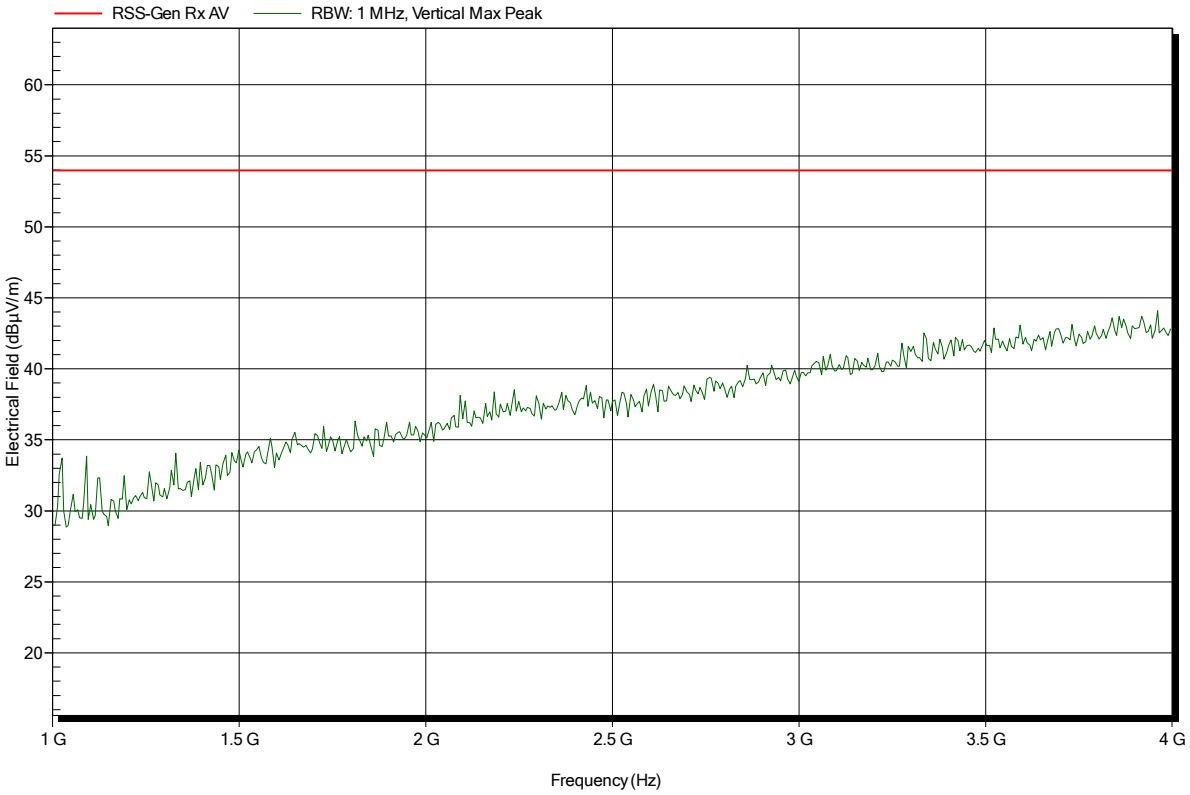
Frequency	Peak	Peak Limit	Peak Difference	Status
750.822 MHz	35.94 dBµV/m	46 dBµV/m	-10.06 dB	Pass

Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC0; CH: 384, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 87

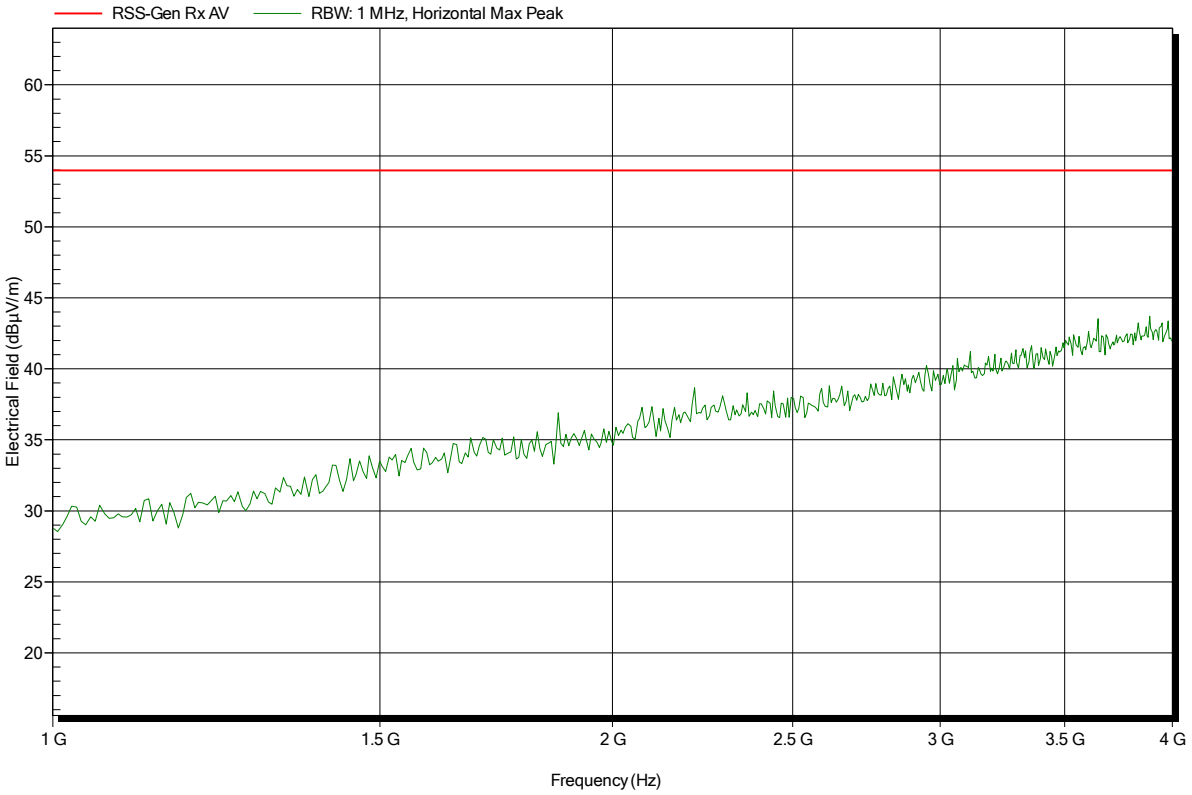


Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC0; CH: 384, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 91

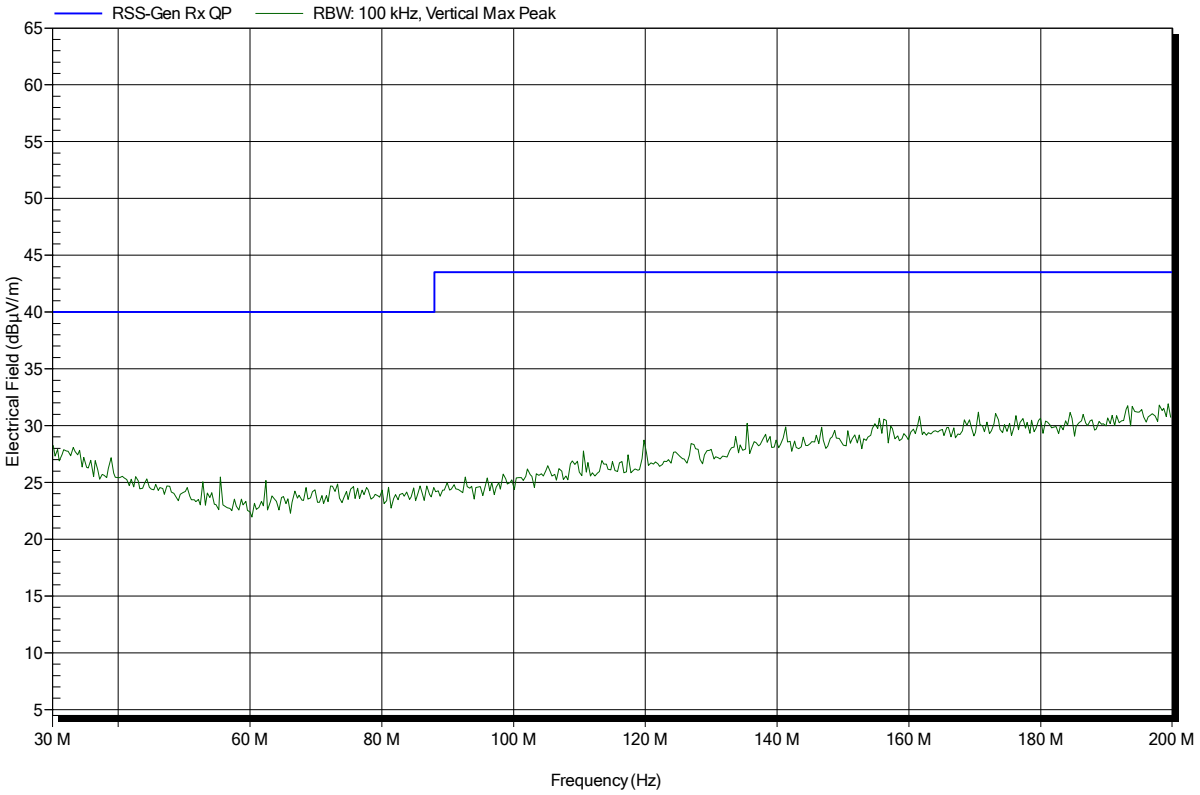


Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 101

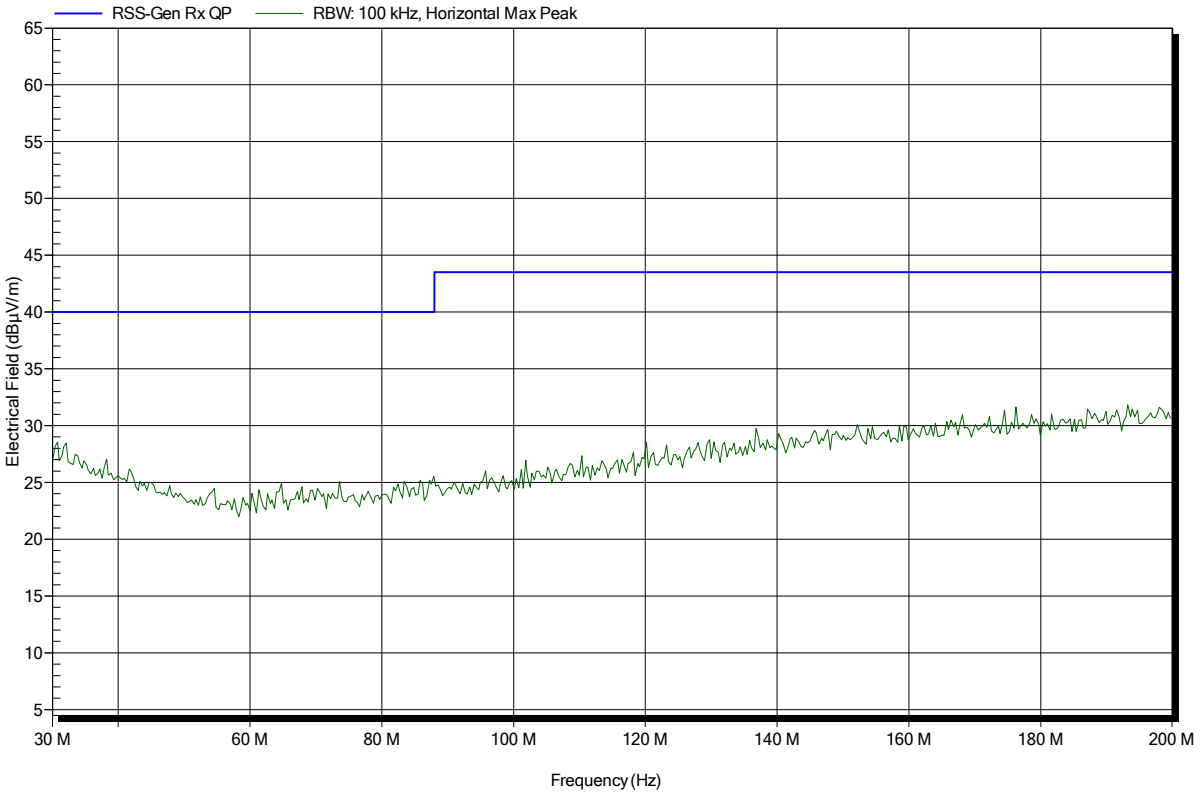


Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 106

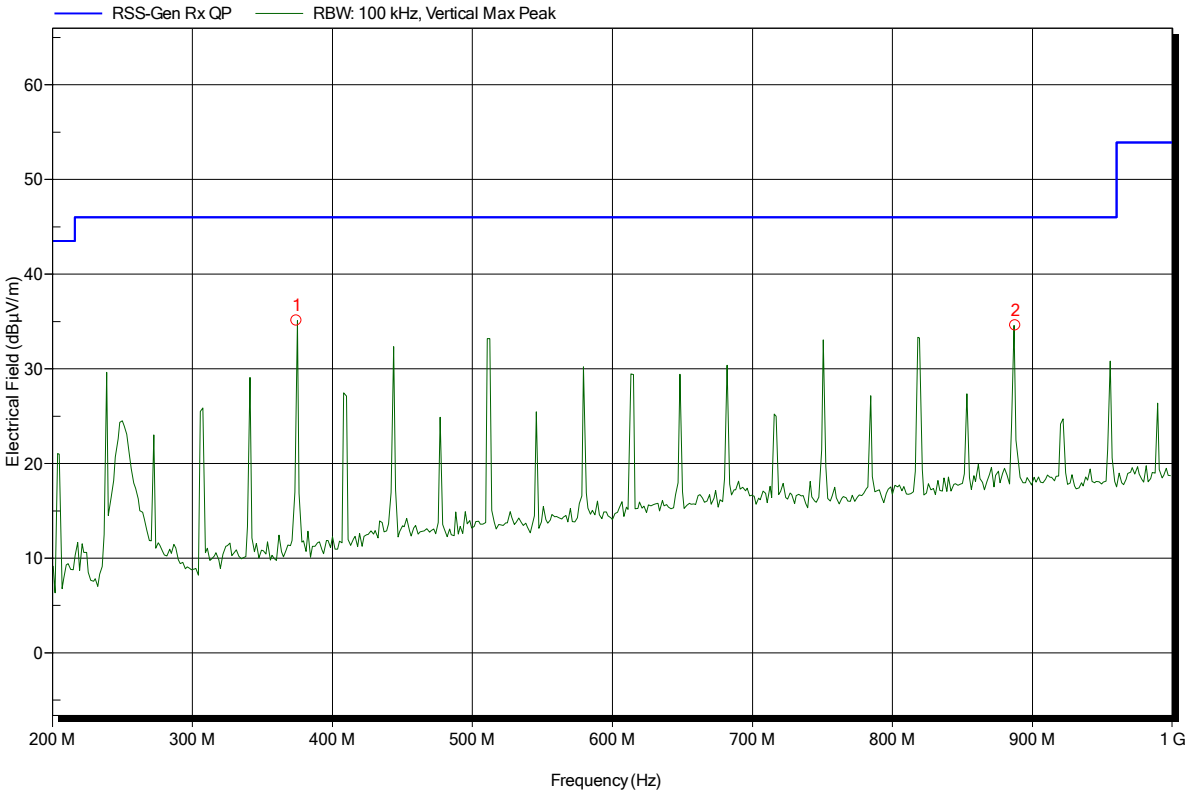


Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 97



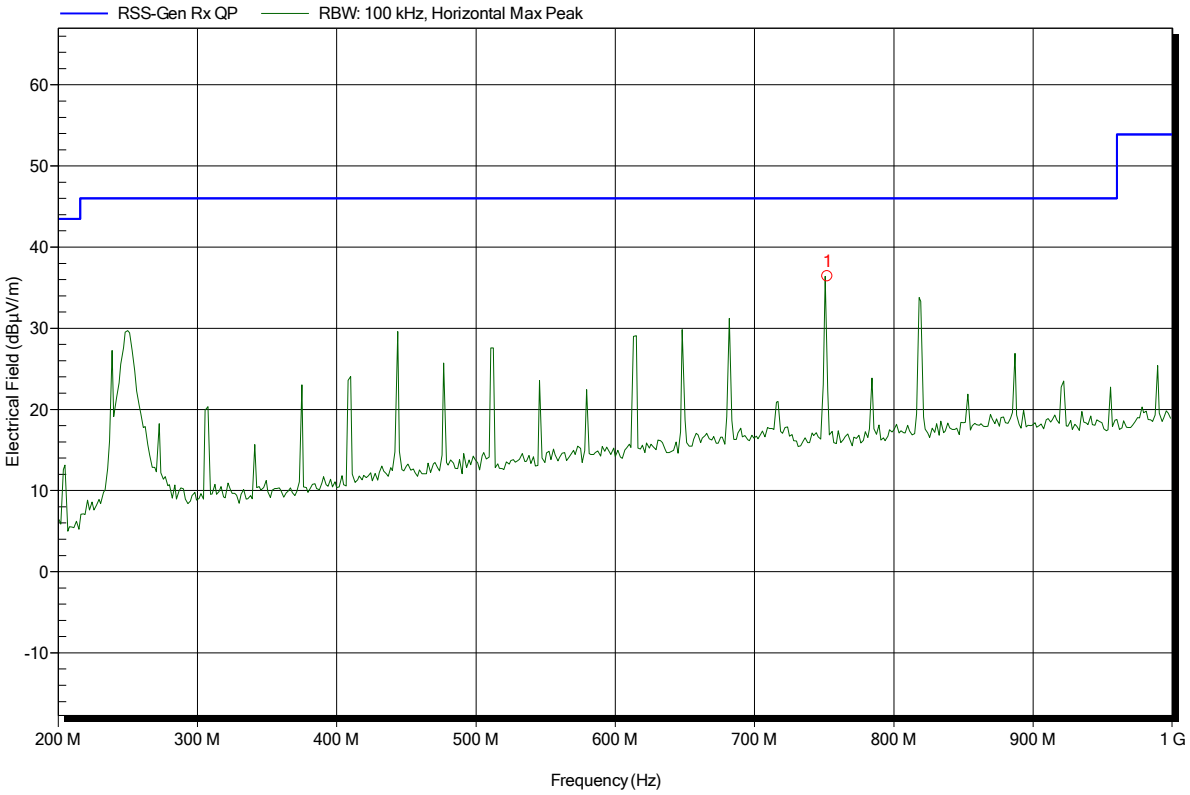
Frequency	Peak	Peak Limit	Peak Difference	Status
374.4 MHz	35.09 dBµV/m	46 dBµV/m	-10.91 dB	Pass
887.677 MHz	34.59 dBµV/m	46 dBµV/m	-11.41 dB	Pass

Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 100



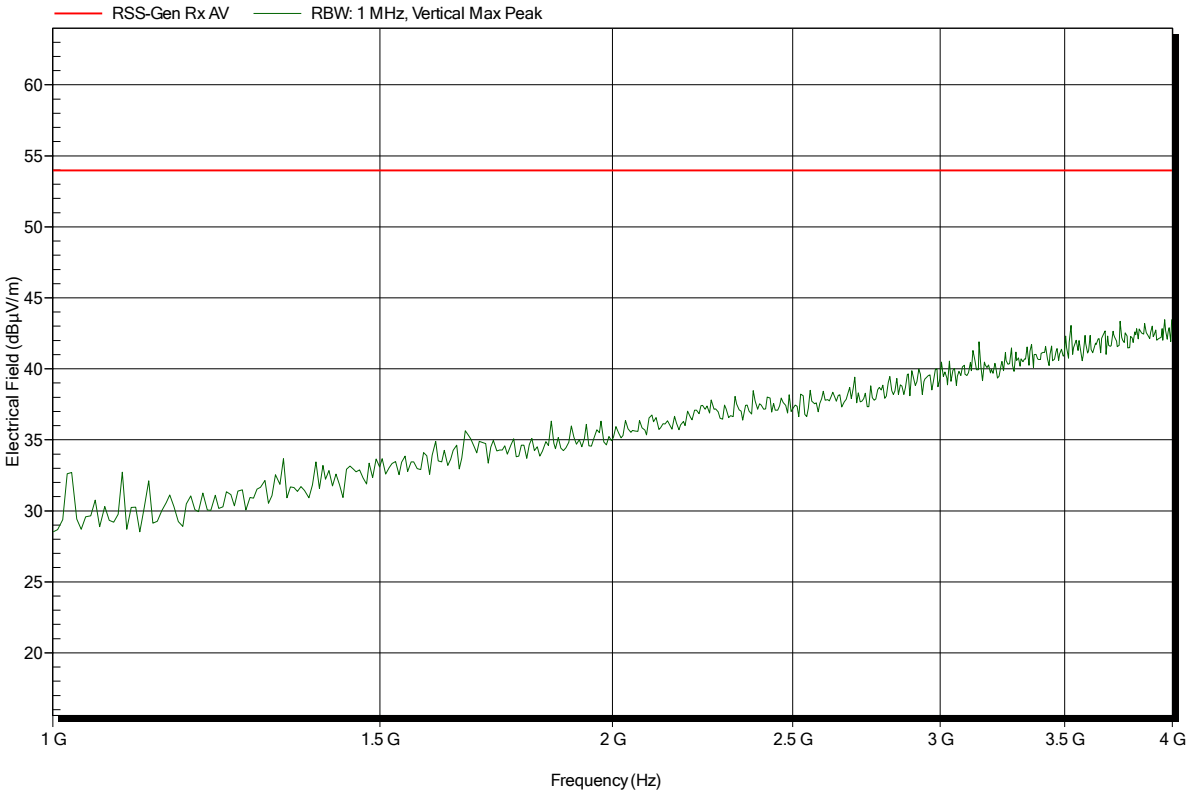
Frequency	Peak	Peak Limit	Peak Difference	Status
752.249 MHz	36.42 dBµV/m	46 dBµV/m	-9.58 dB	Pass

Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 89

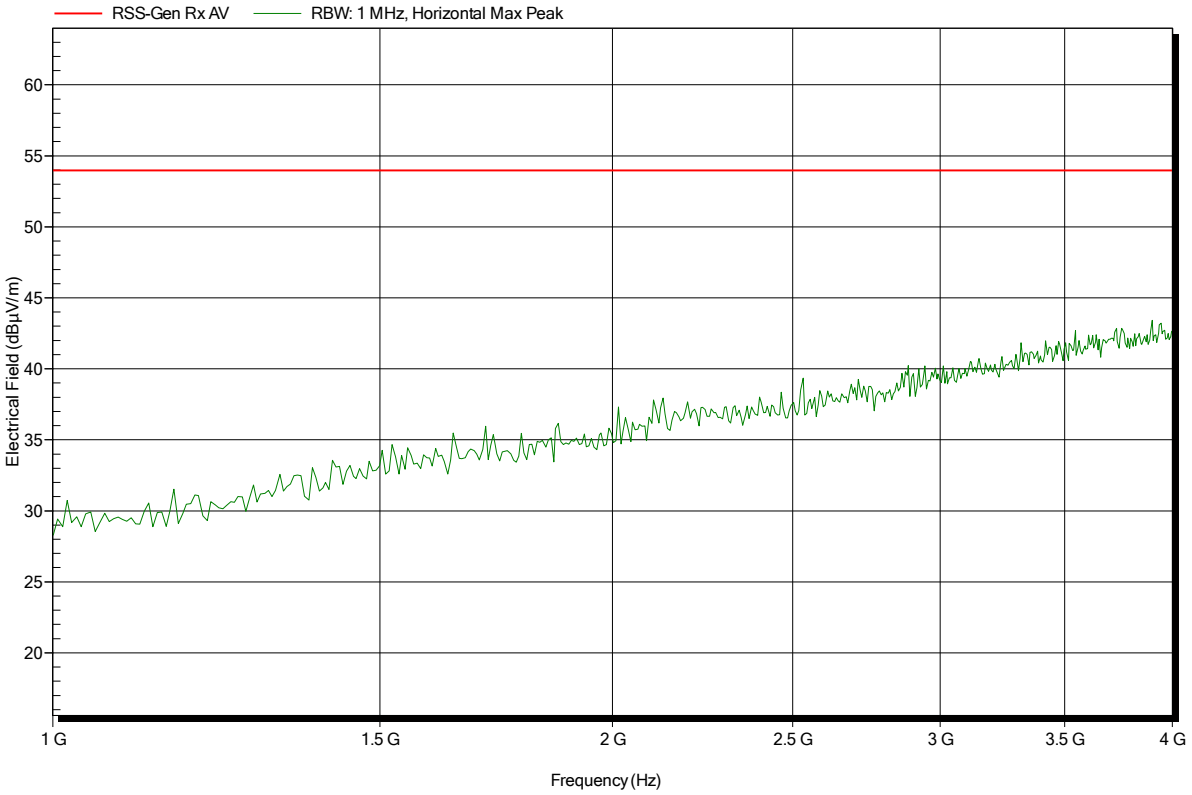


Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 93

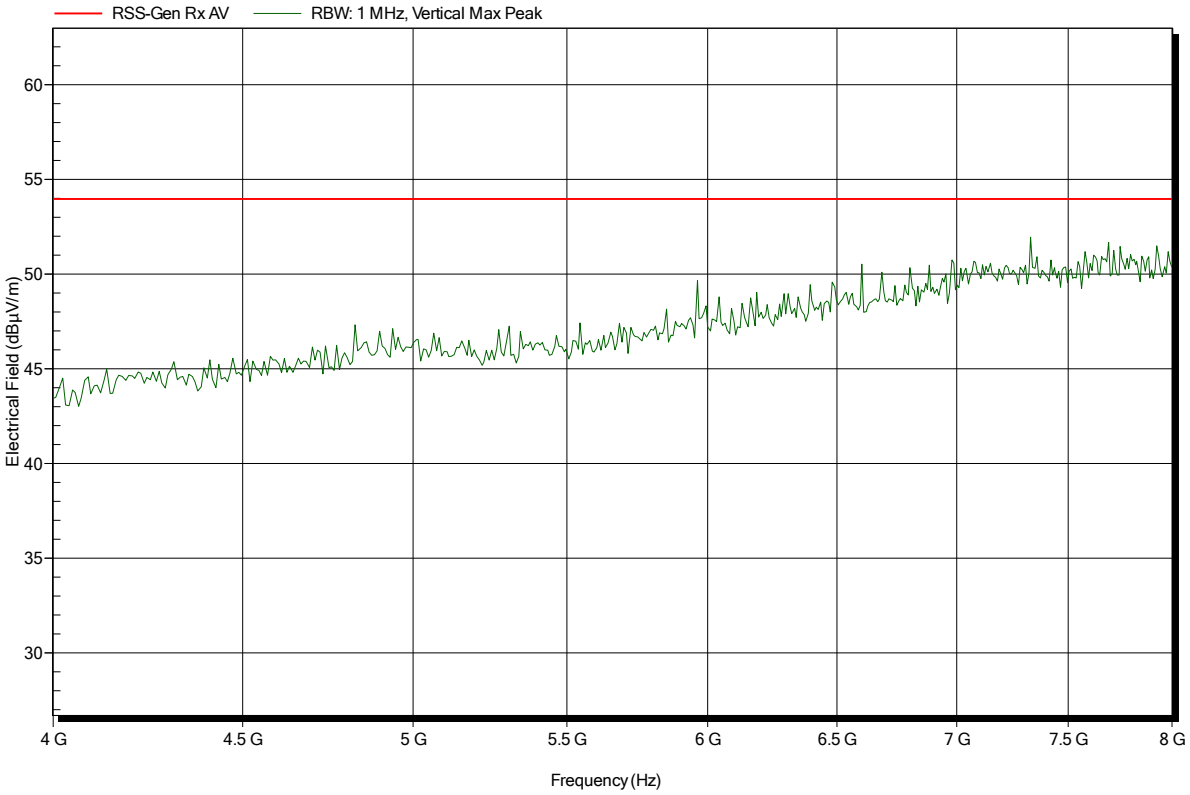


Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 90

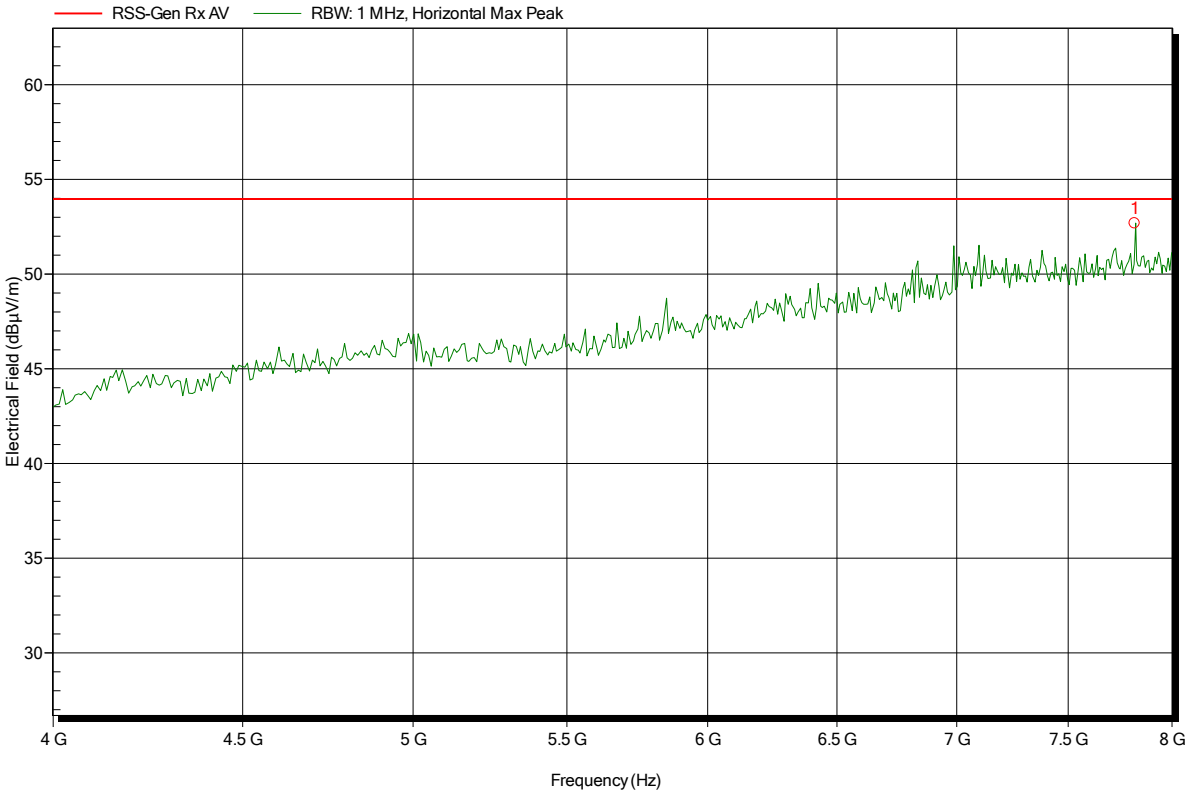


Spurious emissions according to IC RSS-133

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC1; CH: 600, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 94



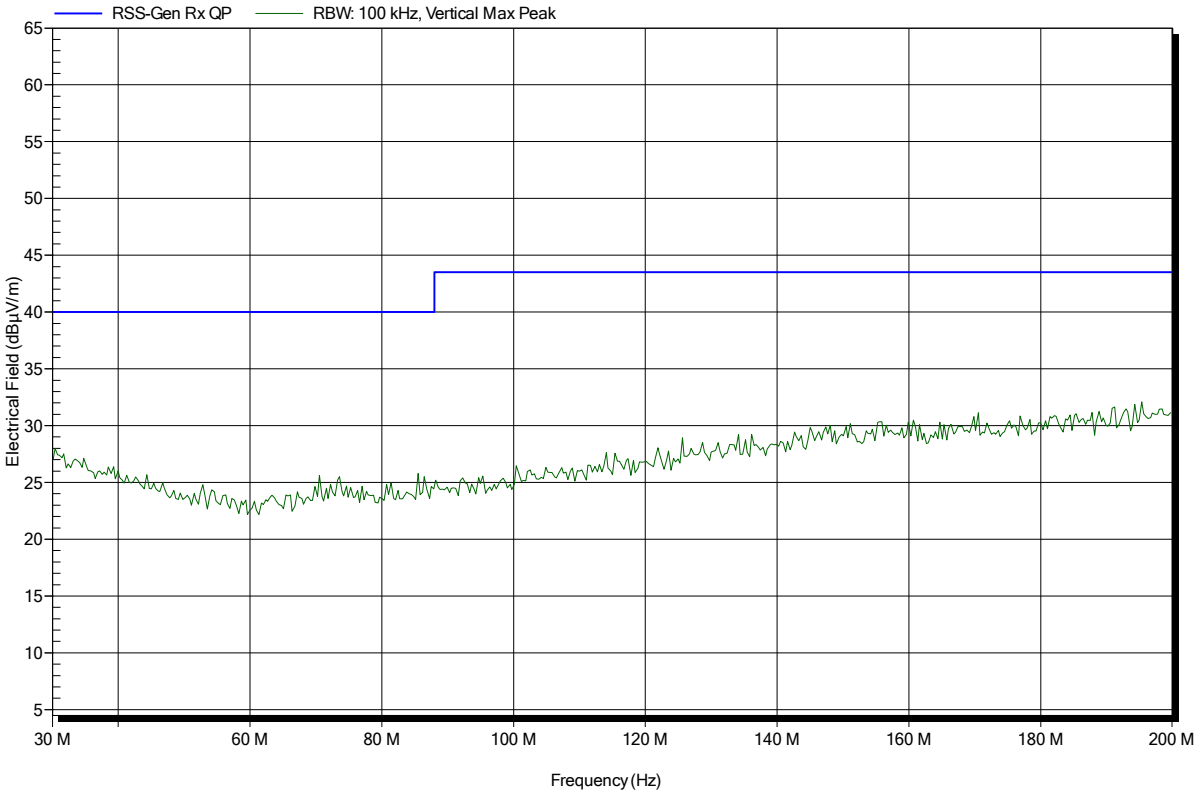
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.816 GHz	52.68 dBµV/m	53.98 dBµV/m	-1.3 dB	Pass

Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC10; CH: 580, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 103

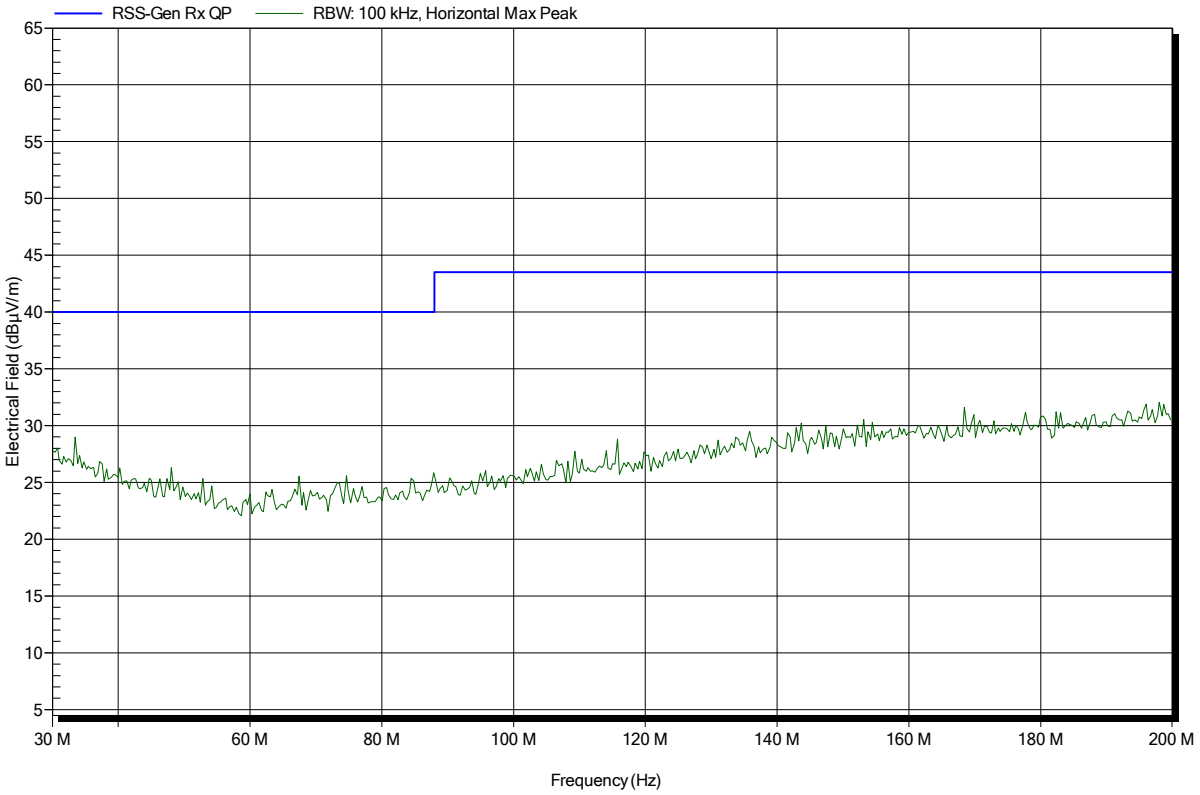


Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC10; CH: 580, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 105

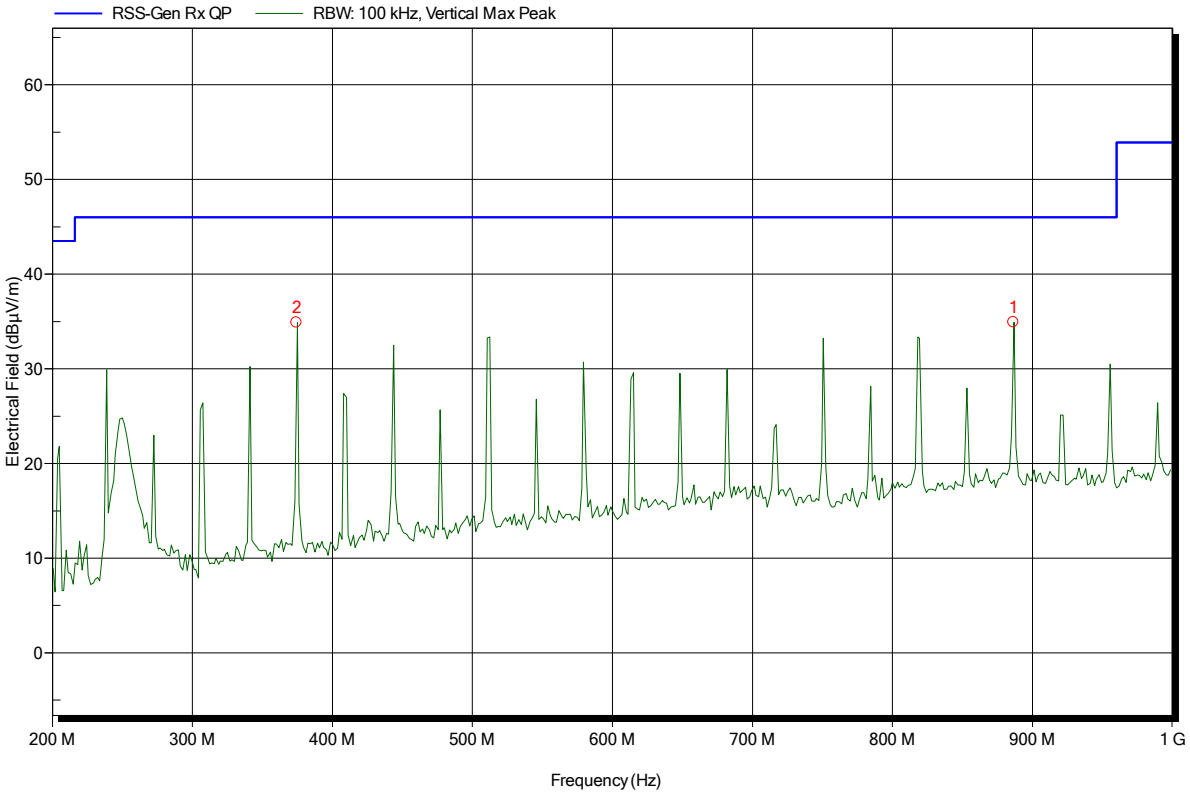


Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC10; CH: 580, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 96



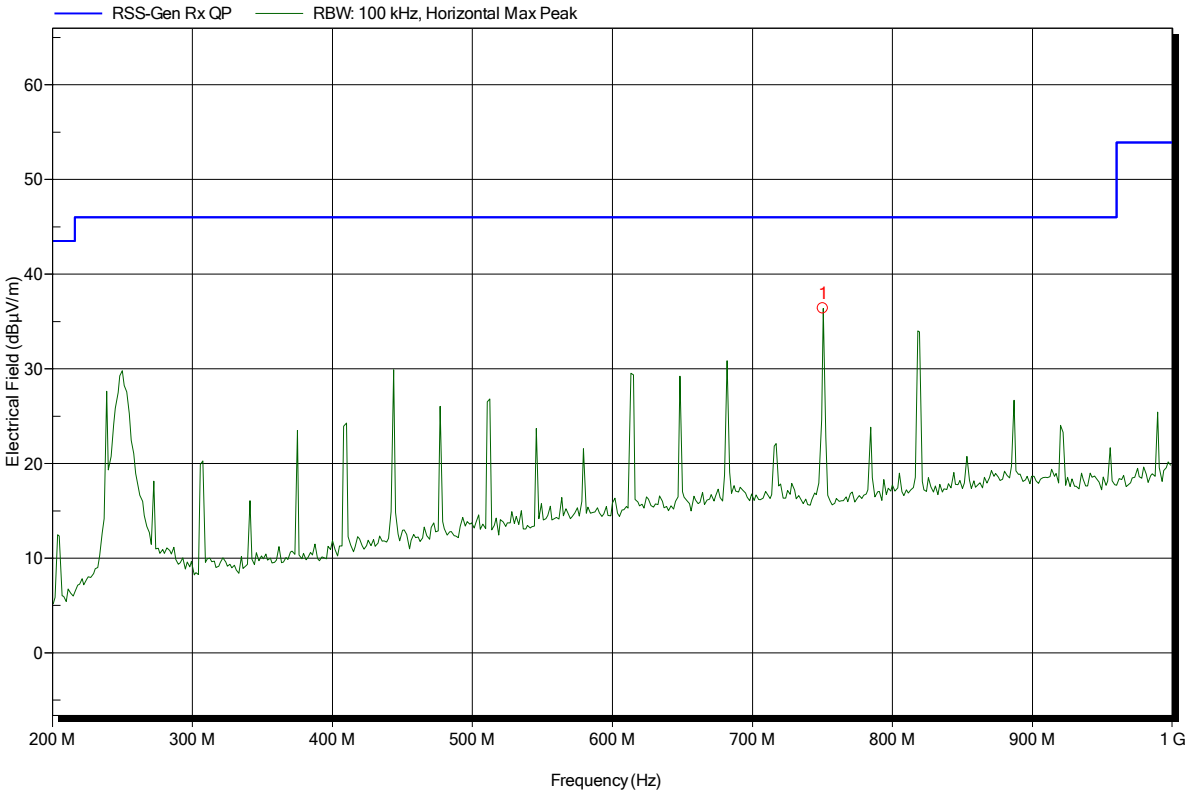
Frequency	Peak	Peak Limit	Peak Difference	Status
374.4 MHz	34.88 dBµV/m	46 dBµV/m	-11.12 dB	Pass
886.4 MHz	34.91 dBµV/m	46 dBµV/m	-11.09 dB	Pass

Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC10; CH: 580, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 99



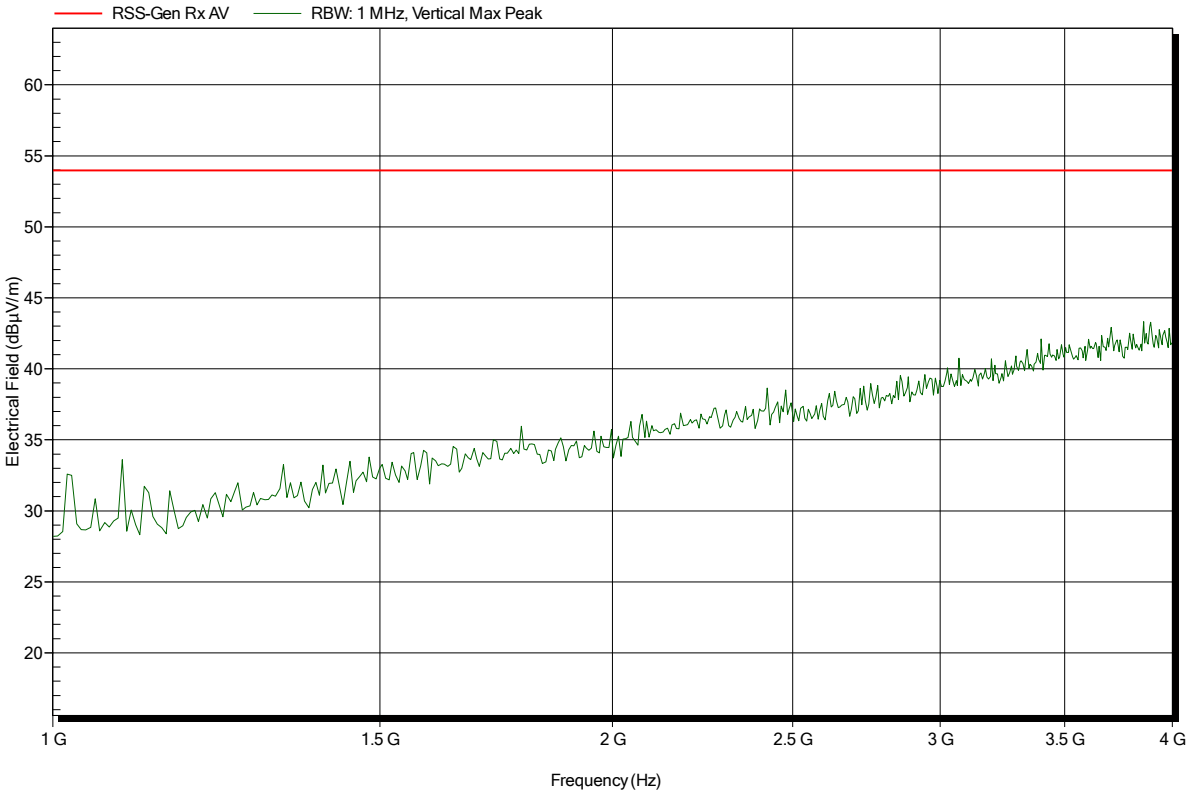
Frequency	Peak	Peak Limit	Peak Difference	Status
750.4 MHz	36.37 dBµV/m	46 dBµV/m	-9.63 dB	Pass

Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

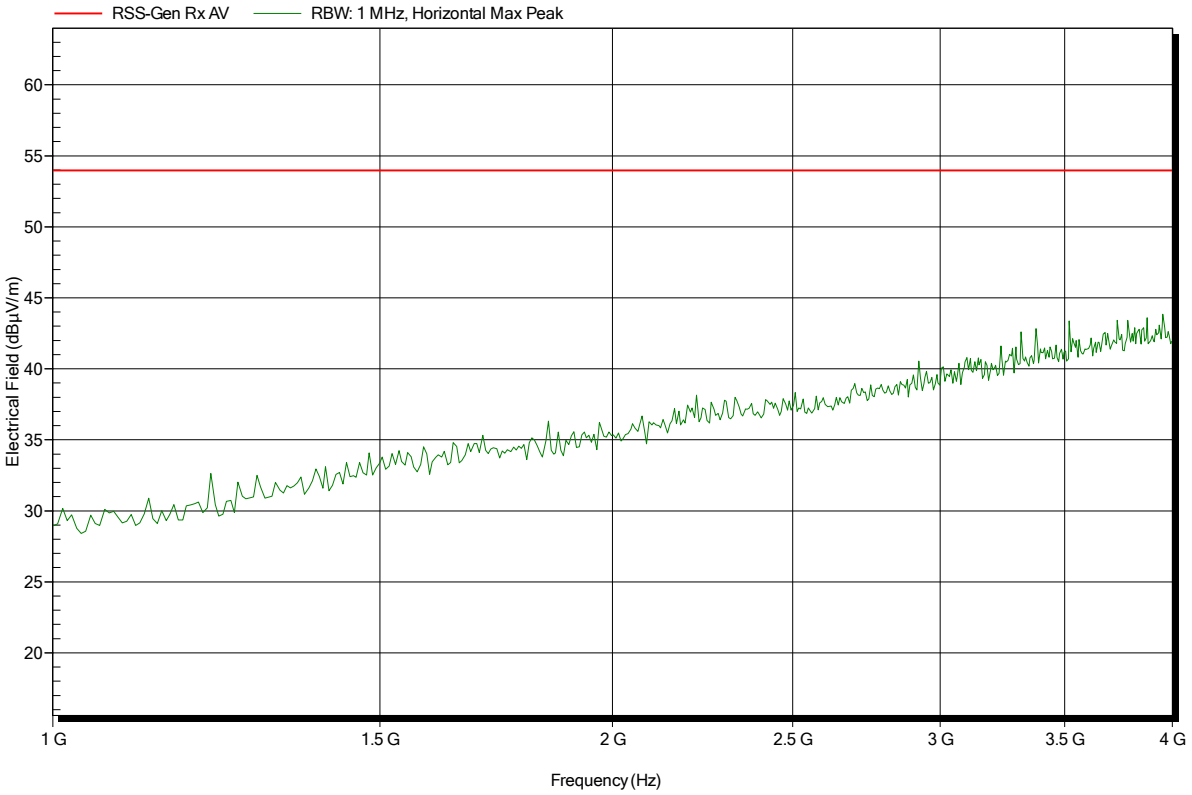
Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3 m
Mode:	RX; CDMA BC10; CH: 580, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 88



Spurious emissions according to IC RSS-132

Project number: G0M-1406-3915

Applicant:	Leica Geosystems AG
EUT Name:	Field Controller Win EC7
Model:	CS20
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 11.1 VDC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3 m
Mode:	RX; CDMA BC10; CH: 580, RX-Idle Mode
Test Date:	2014-12-11
Note:	EUT vertical

Index 92