

TEST REPORT

Report Number: 100525686MIN-001

Project Number: G100525686

Testing performed on the
LCR 6200

FCC ID: Y86-62020X31

Industry Canada ID: 6766C-62020X31

to

47 CFR Part 15. 247:2010

RSS- 210, Issue 8, 2010

RSS-Gen, Issue 3, 2010

47 CFR, Part 15:2010, §15.107 and §15.109, Class B

ICES-003, Issue 4:2004

For

Cooper Power Systems
Cannon Technologies

Test Performed by:
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Test Authorized by:
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Date: October 26, 2011

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Date: October 26, 2011

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1.0 GENERAL DESCRIPTION

Model:	62020X31
Type of EUT:	Load Control Switch
FCC ID:	Y86-62020X31
Industry Canada ID:	6766C-62020X31
Related Submittal(s) Grants:	None
Company:	Cooper Power Systems Cannon Technologies
Customer:	Mr. Nathan Brandt
Address:	505 Hwy 169 North Minneapolis, MN 55427, USA
Phone:	(763) 543-7770
Fax:	(763) 595-7776
e-mail:	Nathan.Brandt@CooperIndustries.com
Test Standards:	<input checked="" type="checkbox"/> 47 CFR, Part 15:2010, §15.247 <input checked="" type="checkbox"/> RSS-210, Issue 8, 2010 <input checked="" type="checkbox"/> RSS-Gen, Issue 3, 2010 <input checked="" type="checkbox"/> 47 CFR, Part 15:2009, §15.107 and §15.109, Class B <input checked="" type="checkbox"/> ICES-003, Issue 4:2004 <input type="checkbox"/> Other
Type of radio:	<input type="checkbox"/> Stand -alone <input type="checkbox"/> Module <input type="checkbox"/> Hybrid
Date Sample Submitted:	October 17, 2011
Test Work Started:	October 17, 2011
Test Work Completed:	October 26, 2011
Test Sample Conditions:	<input type="checkbox"/> Damaged <input type="checkbox"/> Poor (Usable) <input checked="" type="checkbox"/> Good



1.1 Product Description; Test Facility

Product Description:	2.4 – 2.4835GHz Transceiver
Transmitter Type:	<input type="checkbox"/> FHSS <input checked="" type="checkbox"/> Digital Modulation <input type="checkbox"/> WiFi <input type="checkbox"/> Blue Tooth
Operating Frequency Range(s):	2400-2483.5MHz
Number of Channels:	16
Modulation:	O-QPSK
Emission Designator:	952KG1D
Antenna(s) Info:	Integral Antenna, Antenna gain: -2.0dBi
Antenna Installation:	<input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory
Transmitter power configuration:	<input type="checkbox"/> Internal battery <input type="checkbox"/> External power source <input type="checkbox"/> 120VAC <input checked="" type="checkbox"/> 240VAC <input type="checkbox"/> 400VAC <input type="checkbox"/> 20mA. <input type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz
Special Test Arrangement:	None
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2009 and FCC DTS Measurement Guide

1.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

- ☐ - Standby
- ☒ - Continuous transmissions (modulated signal)
- ☒ - Continuous transmissions (un-modulated signal)
- ☒ - Continuous receiving
- ☐ - Test program (customer specific)
- ☐ -

Operating modes of the EUT:

No.	Description
1	Test was performed at low channel, middle channel, and upper channel

Cables:

No.	Type	Length	Designation	Note
1	2-wire unshielded	>3m	AC Power	
2	2-wire unshielded	>3m	Relay Cable	

Support equipment/Services:

No.	Item	Description
1	Dell M4400	Laptop computer

General notes: Temporary SMA connector was connected to antenna when taking conducted measurements

1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

☒ **Normal**

Temperature:	+15 to +35 °C
Humidity:	20-75 %
Atmospheric pressure:	86-106 kPa

☐ **Extreme**

<input type="checkbox"/> Temperature:	-20 to +50 °C
<input type="checkbox"/> Supply voltage:	85% to +115%

1.4 Measurement uncertainty

The expanded uncertainty ($k = 2$) for radiated measurements has been determined to be:

± 4 dB at 10m and ± 5.4 dB at 3m

The expanded uncertainty ($k = 2$) for conducted measurements at antenna terminal has been determined to be:

± 1.0 dB

The expanded uncertainty ($k = 2$) for line conducted measurements has been determined to be:

± 2.6 dB

1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where: FS = Field Strength in dB(μ V/m)

RA = Receiver Amplitude in dB(μ V)

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB(m^{-1})

AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(μ V) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(μ V/m).

$$RA = 48.1 \text{ dB}(\mu\text{V})$$

$$AF = 7.4 \text{ dB}(m^{-1})$$

$$CF = 1.6 \text{ dB}$$

$$AG = 16.0 \text{ dB}$$

$$FS = RA + AF + CF - AG$$

$$FS = 48.1 + 7.4 + 1.6 - 16.0$$

$$FS = 41.1 \text{ dB}(\mu\text{V}/\text{m})$$

General notes:

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST SPECIFICATION	TEST PARAMETERS	RESULT
15.247(b), (c) / RSS-210 A8.4	Maximum peak output power	Pass
15.247(a) / RSS-210 A8.2	6dB bandwidth of the digital modulation system	Pass
15.247(e) / RSS-210 A8.2	Power spectral density	Pass
15.247(d) / RSS-210 A8.5	Antenna conducted spurious emissions	Pass
15.247(d) / RSS-210 A8.5	Radiated spurious emissions	Pass
15.247(i) / RSS- Gen 5.5	RF Exposure Compliance	Pass
15.207 / RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	Pass
15.109 / ICES-003	Receiver/digital device radiated emissions	Pass
15.107 / ICES-003	Digital device conducted emissions	Pass

3.0 TEST CONDITIONS AND RESULTS

3.1 Maximum peak output power

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

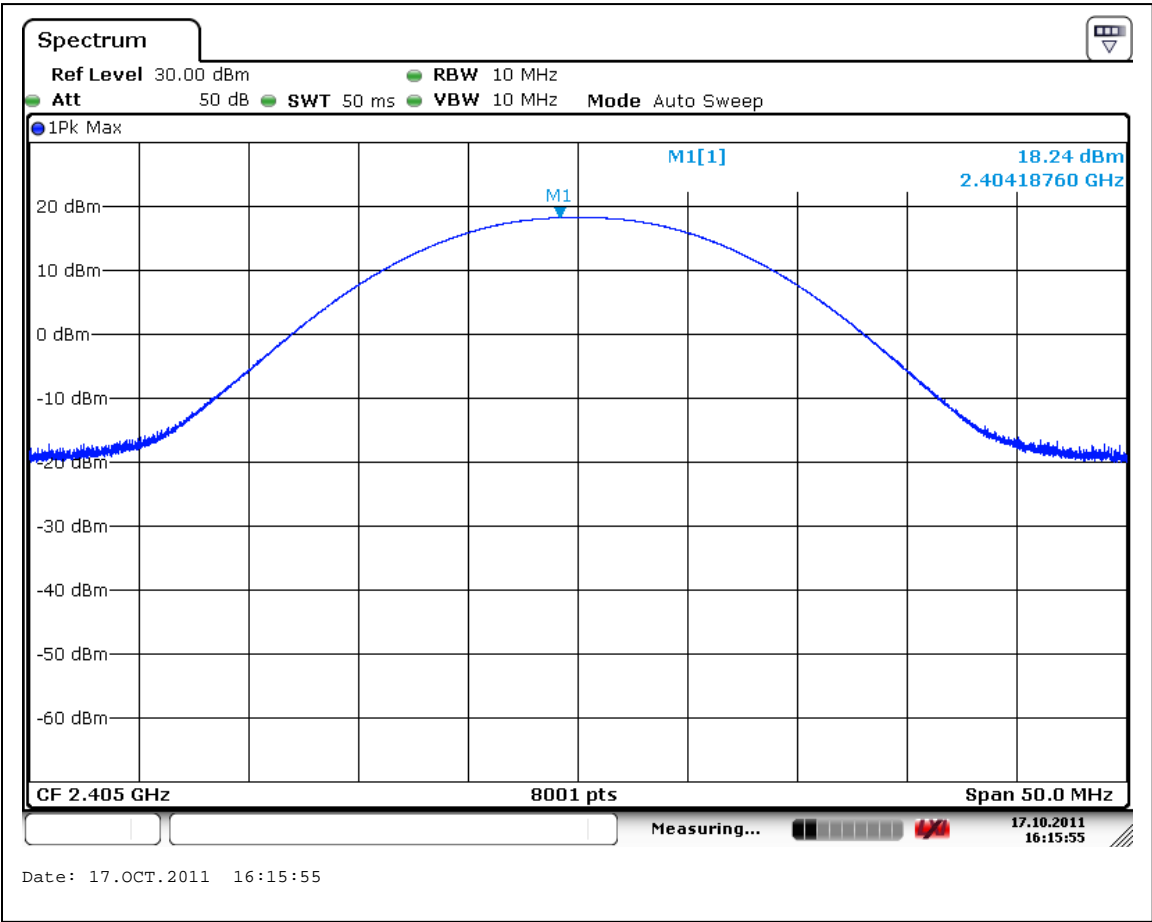
Test result: **Pass**

Maximum peak output power: 19.96dBm

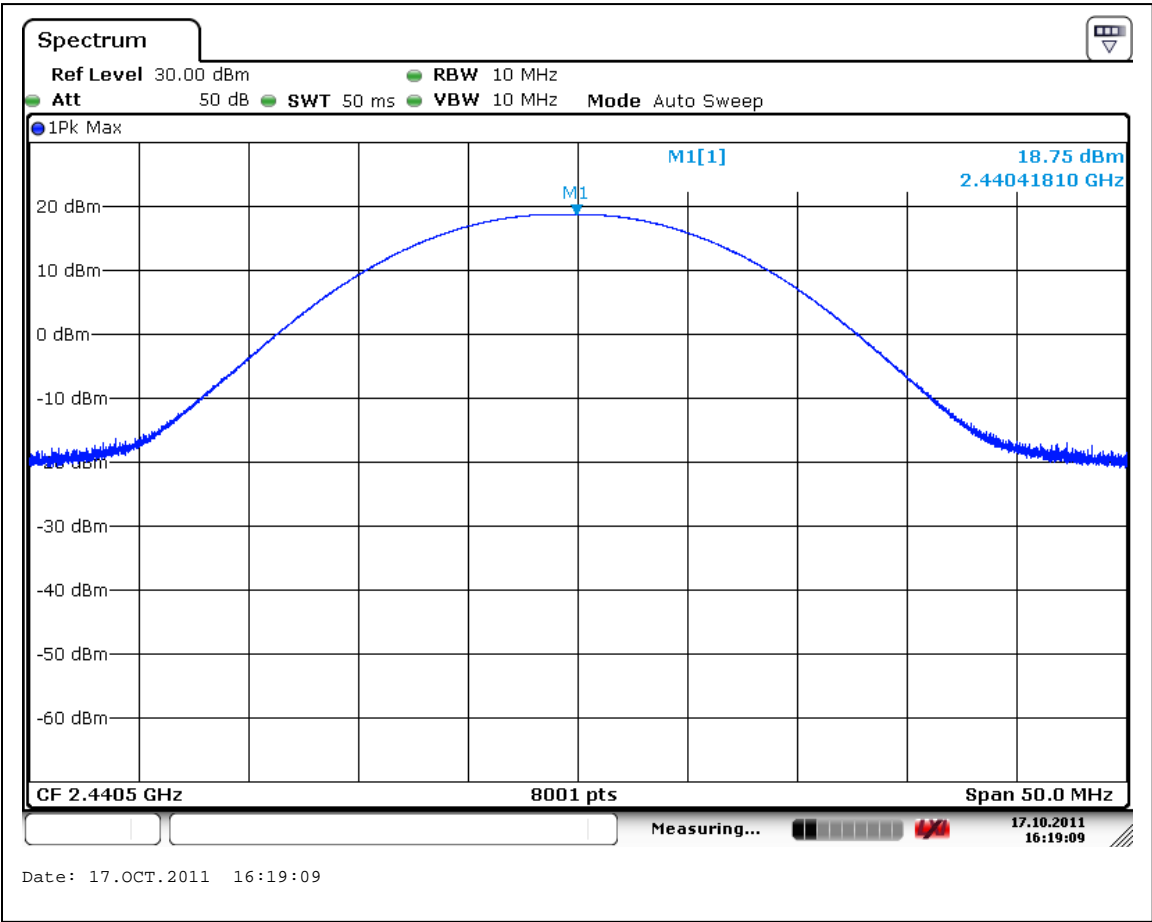
Margin: 10.0dB below the limits

Power Output:	Conducted						
Frequency Range:	<input type="checkbox"/> 902-928MHz <input checked="" type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz						
Low Frequency MHz	Measured peak power dBm	Attenuation dB	Peak Power at Antenna		Limit dBm	Limit Reduction dB	Margin dB
			dBm	mW			
	18.24	0.25	18.49	70.6	30	0	-11.5
Middle Frequency MHz							
	18.75	0.25	19.00	79.4	30	0	-11.0
Upper Frequency MHz							
	19.71	0.25	19.96	99.1	30	0	-10.0
RBW:	<input type="checkbox"/> 1MHz <input type="checkbox"/> 3MHz <input checked="" type="checkbox"/> 10MHz						
VBW:	<input type="checkbox"/> 1MHz <input type="checkbox"/> 3MHz <input checked="" type="checkbox"/> 10MHz						
Antenna Gain:	<input checked="" type="checkbox"/> < 6dBi <input type="checkbox"/> >6dBi and = <input type="text"/> dBi, Output power reduction = <input type="text"/> dB						

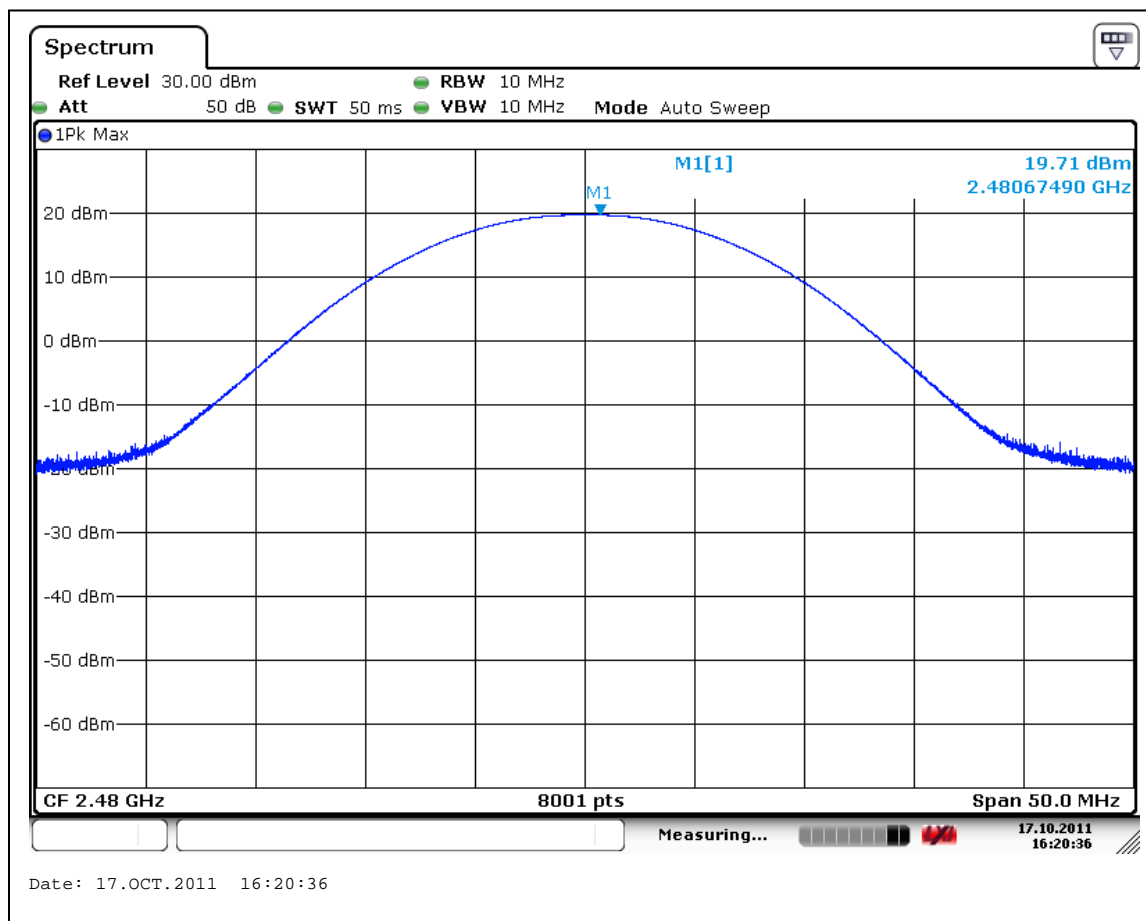
Notes: The maximum peak conducted output power limit is 1 W, or 30dBm
 Graphs 3.1.1 to 3.1.3 show the conducted output power.



Graph 3.1.1



Graph 3.1.2

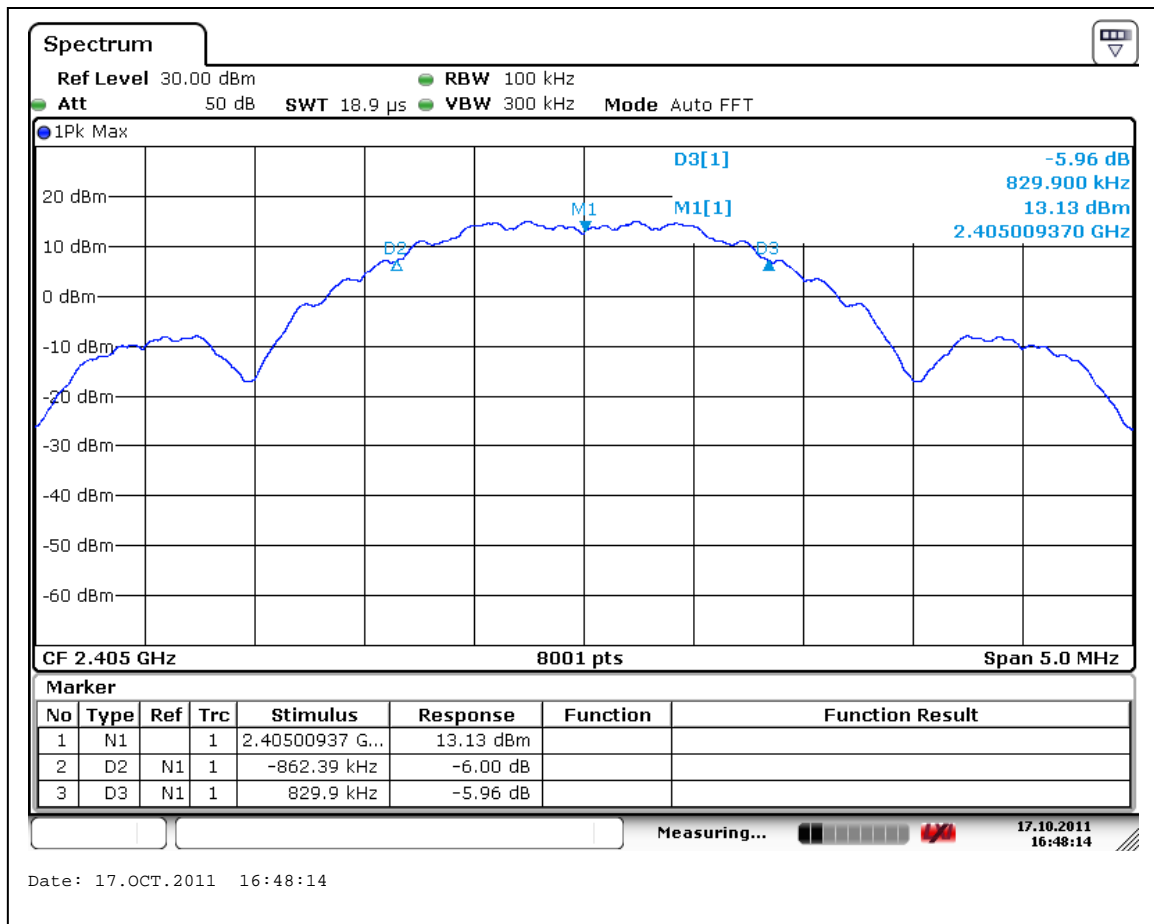


Graph 3.1.3

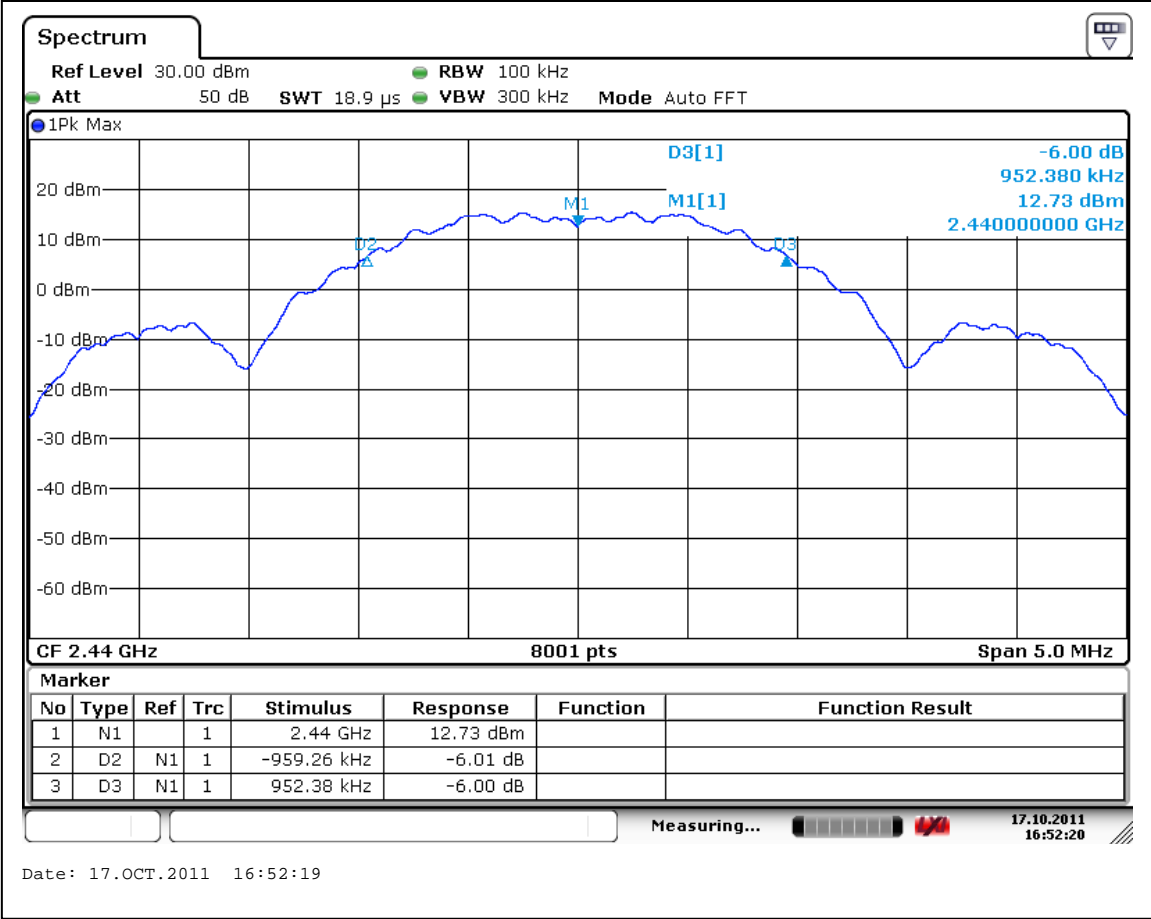
3.2 6dB bandwidth of the digital modulation

Low Frequency Channel kHz	Middle Frequency Channel kHz	Upper Frequency Channel kHz	Minimum Bandwidth kHz	Result
829.90	952.38	919.89	500	Pass
RBW: <input checked="" type="checkbox"/> 100kHz <input type="checkbox"/> other <input type="text"/> kHz VBW: <input type="checkbox"/> 100kHz <input checked="" type="checkbox"/> 300kHz <input type="checkbox"/> other <input type="text"/> kHz				

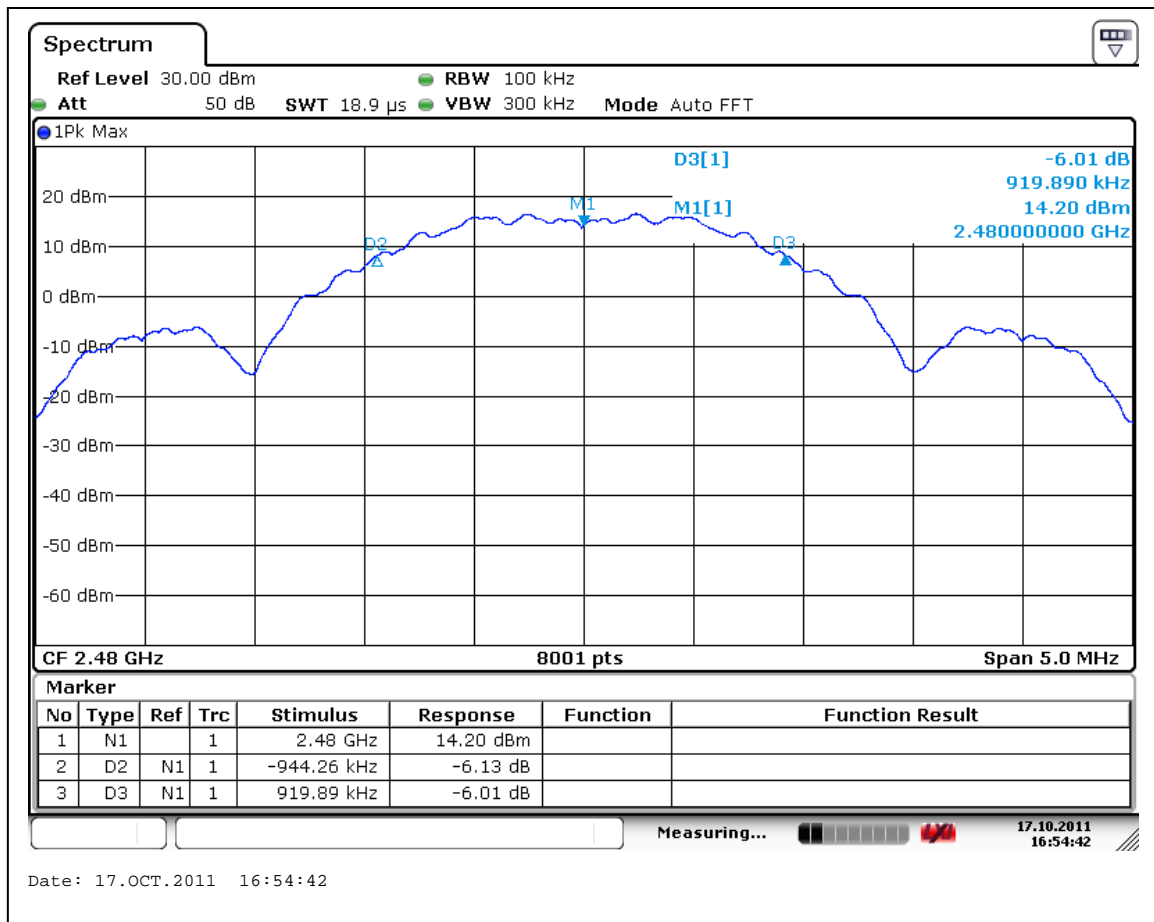
Notes: Graphs 3.2.1 to 3.2.3 show the 6dB bandwidth



Graph 3.2.1



Graph 3.2.2

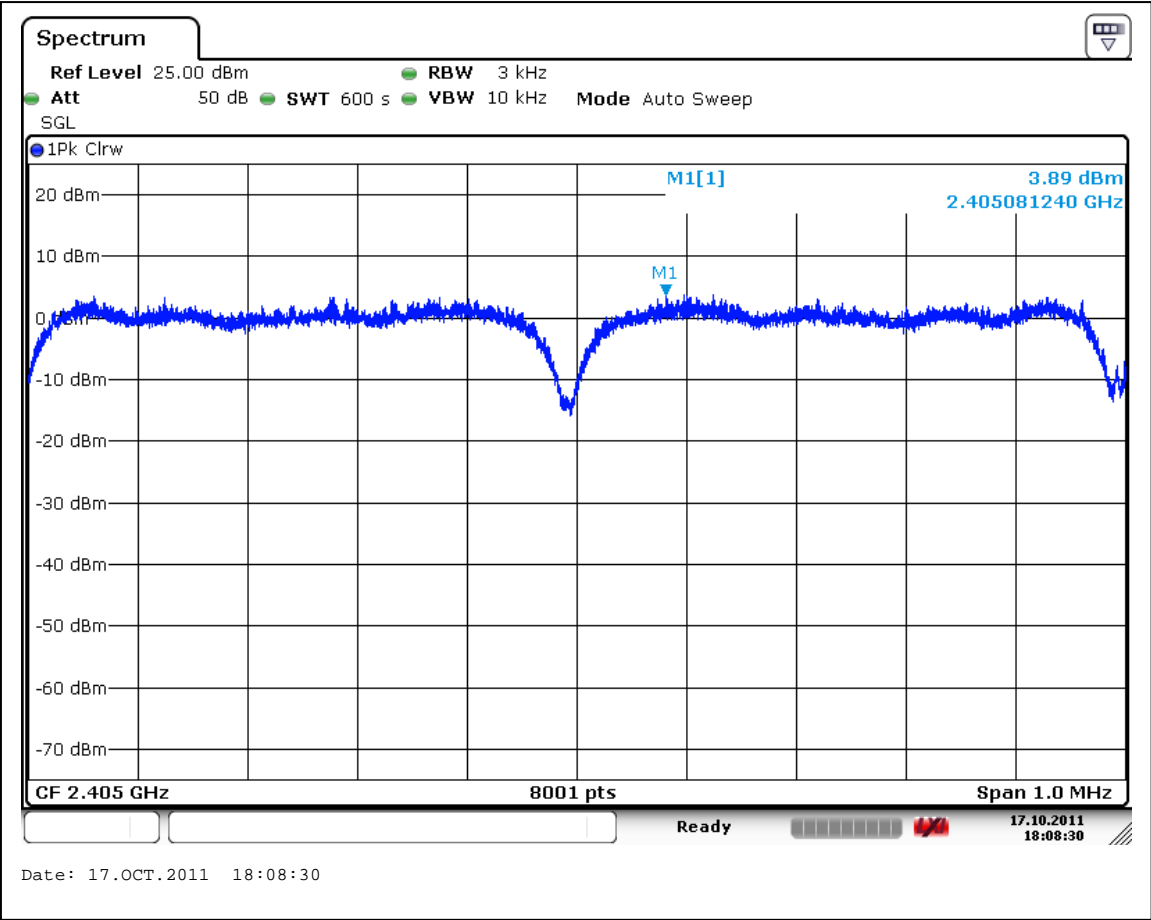


Graph 3.2.3

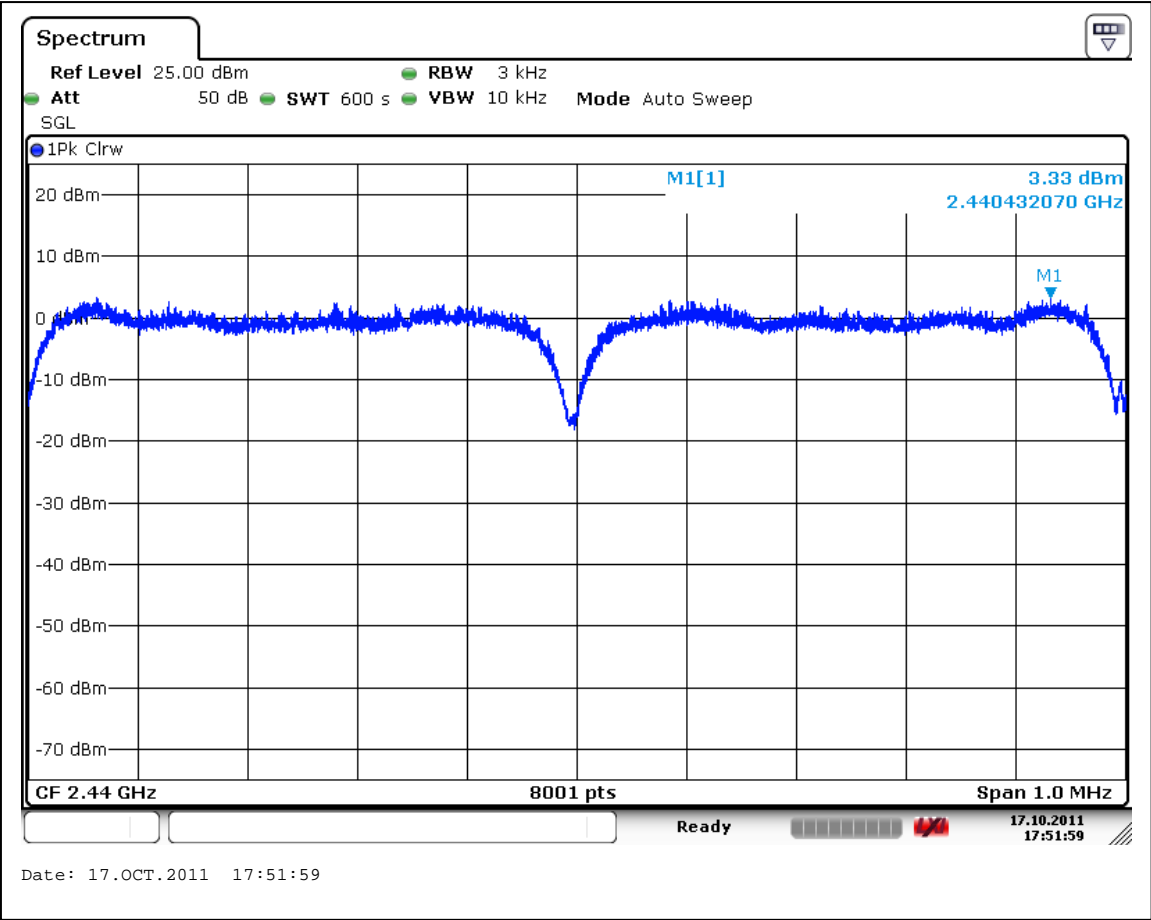
3.3 Power spectral density

Power Output:	<input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated			
	Measured Density dBm	Power Spectral Density dBm	Limit dBm	Margin dB
Low Frequency Channel	3.89	4.14	8	-3.86
Middle Frequency Channel	3.33	3.58	8	-4.42
Upper Frequency Channel	5.12	5.37	8	-2.63
Analyzer Settings:	<input checked="" type="checkbox"/> RBW=3KHz <input checked="" type="checkbox"/> VBW=10KHz <input checked="" type="checkbox"/> Span=1MHz <input checked="" type="checkbox"/> Sweep=600sec			
Antenna Gain:	<input checked="" type="checkbox"/> < 6dBi and = -2.0 dBi <input type="checkbox"/> >6dBi and = <input type="text"/> dBi, limit reduction = <input type="text"/> dB			

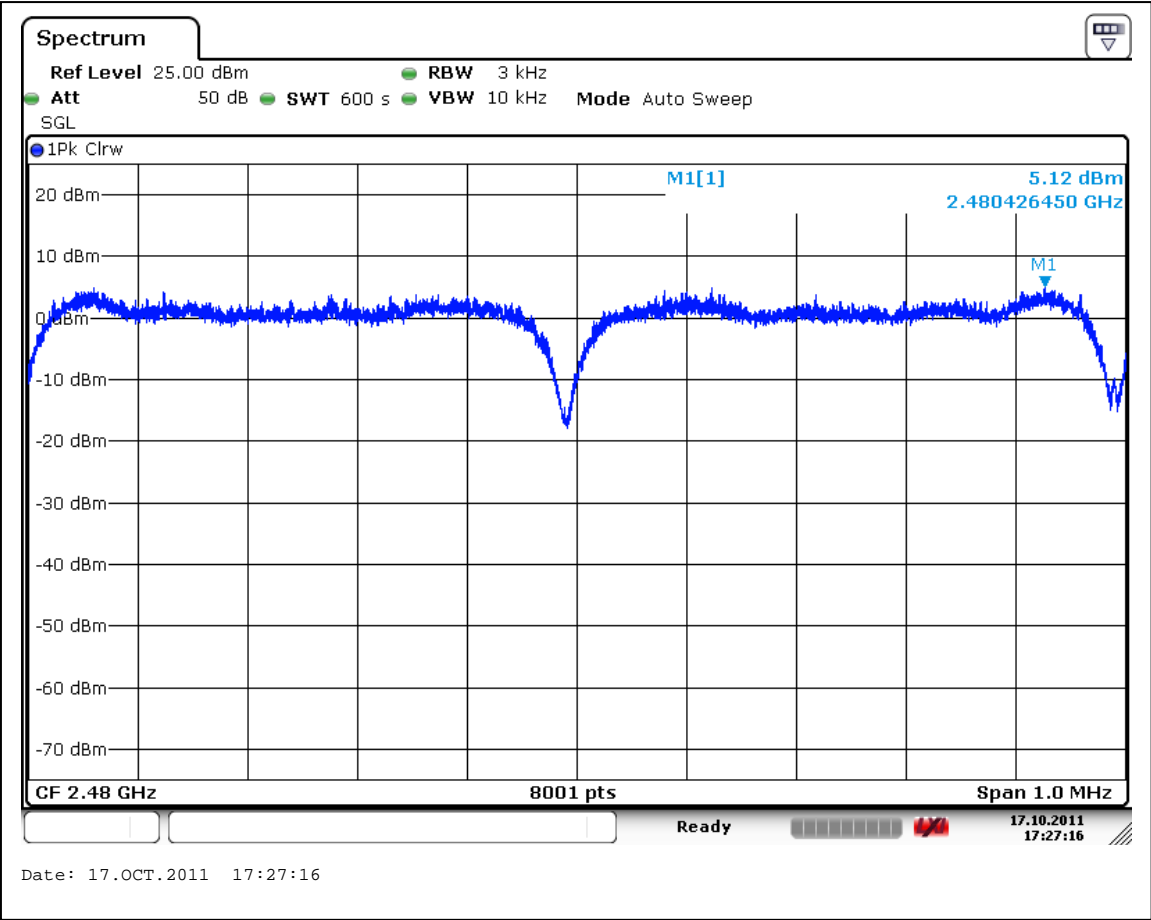
Notes: The Power Spectral Density was calculated adding the cable loss of 0.25 dB from the measured density value.



Graph 3.3.1



Graph 3.3.2

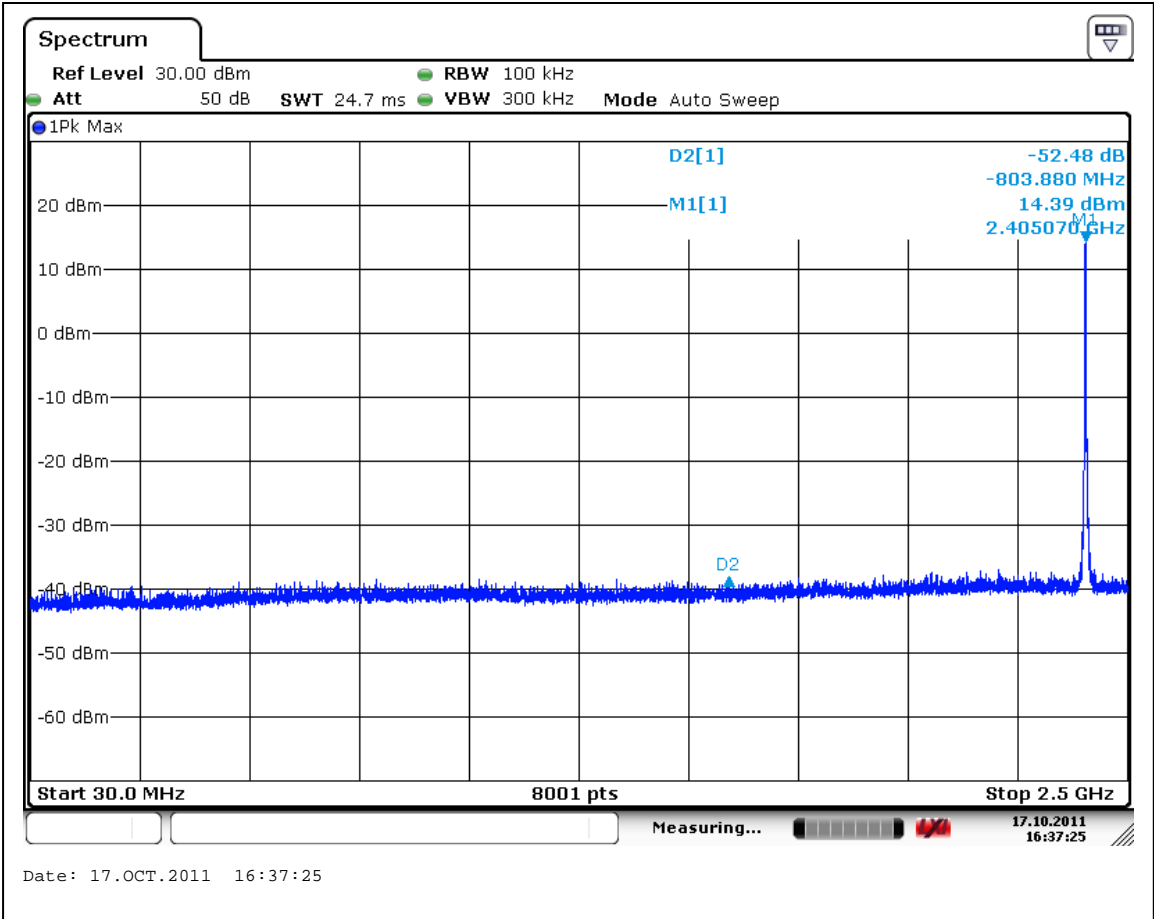


Graph 3.3.3

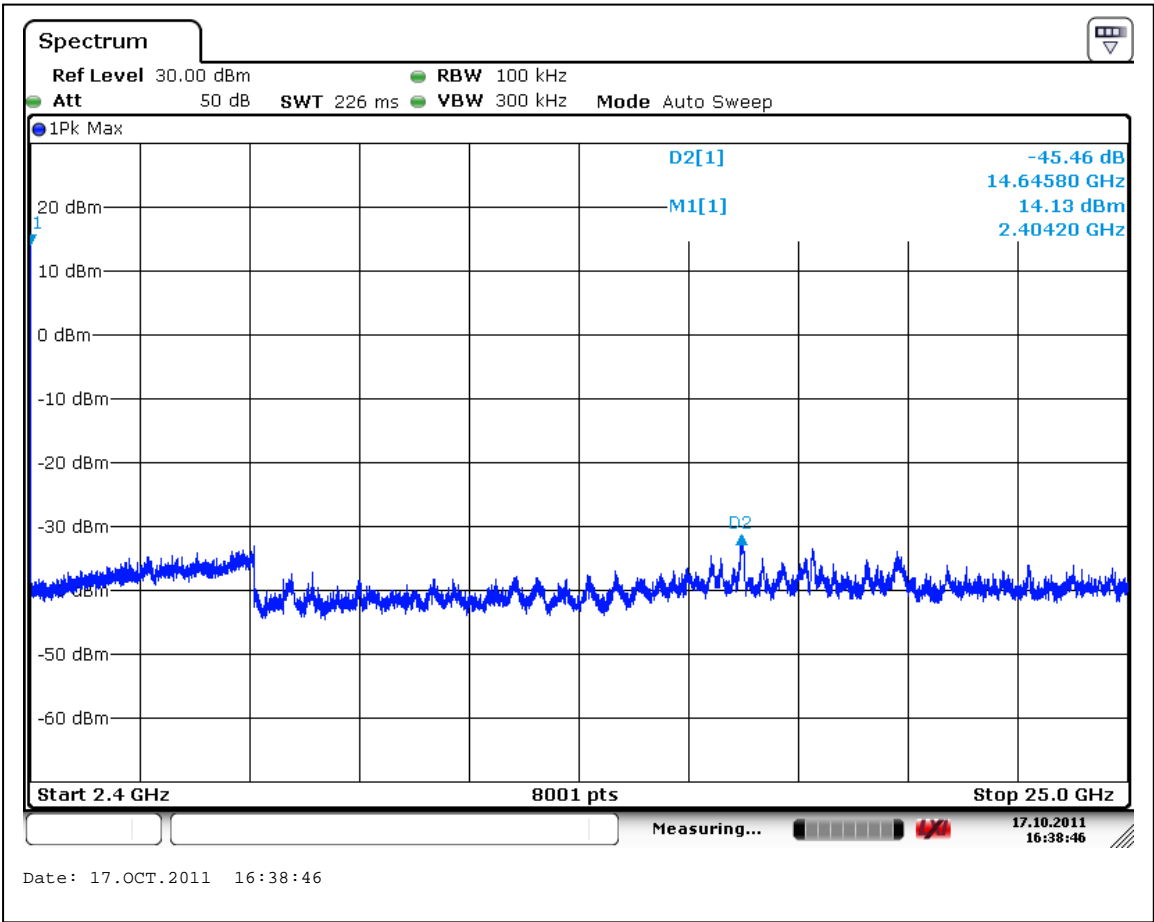
3.4 Antenna conducted spurious emissions

	Minimum Measured Attenuation dB	Minimum Allowed Attenuation dB	Margin dB
Low Frequency Channel	45.46	20	-25.46
Middle Frequency Channel	44.74	20	-24.74
Upper Frequency Channel	46.42	20	-26.42
Analyzer Settings:	<input checked="" type="checkbox"/> RBW=100KHz		
Minimum Allowed Attenuation:	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

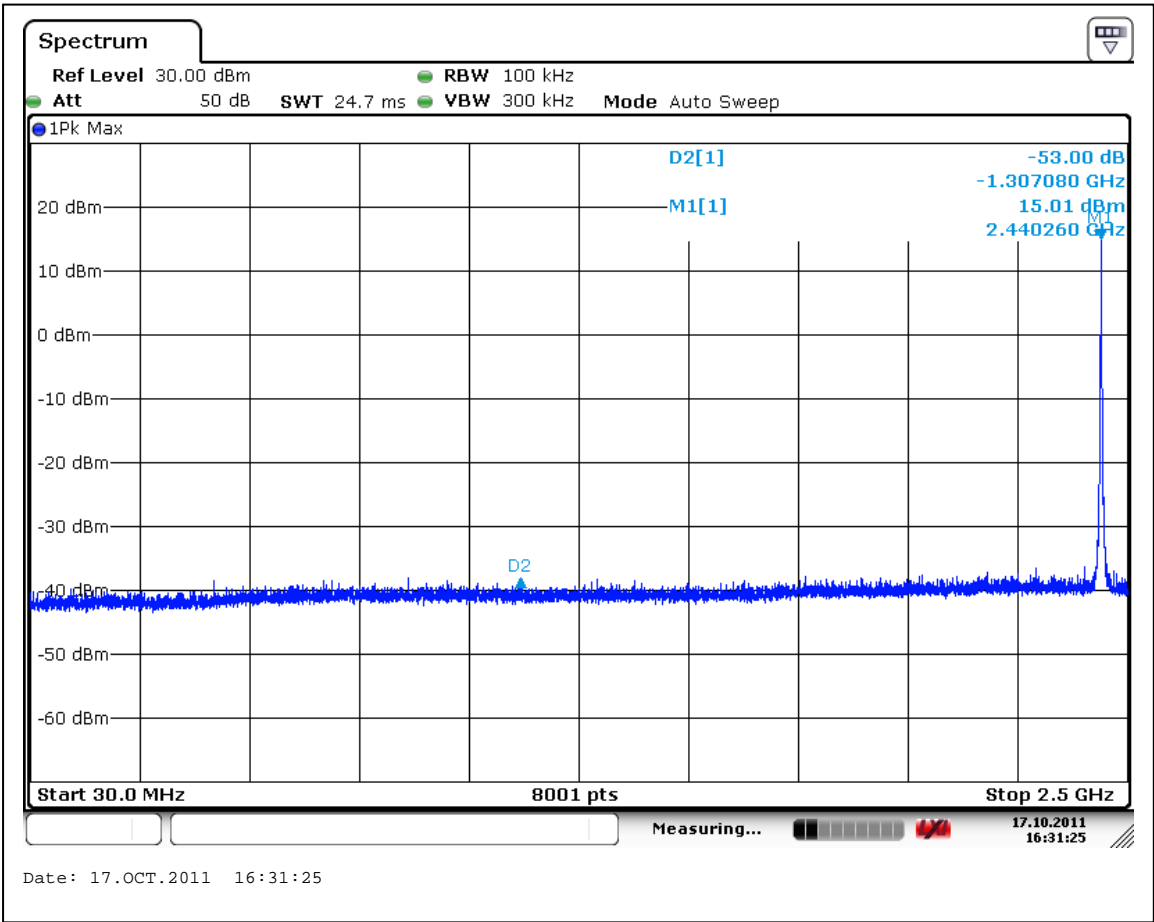
Notes: Test was performed in frequency range from 30MHz to 25GHz
 Graphs 3.4.1 to 3.4.2 show the Antenna Conducted Spurious Emissions for low channel
 Graphs 3.4.3 to 3.4.4 show the Antenna Conducted Spurious Emissions for mid channel
 Graphs 3.4.5 to 3.4.6 show the Antenna Conducted Spurious Emissions for high channel
 Graph 3.4.7 shows band edge compliance at 2400MHz
 Graph 3.4.8 shows band edge compliance at 2483.5MHz



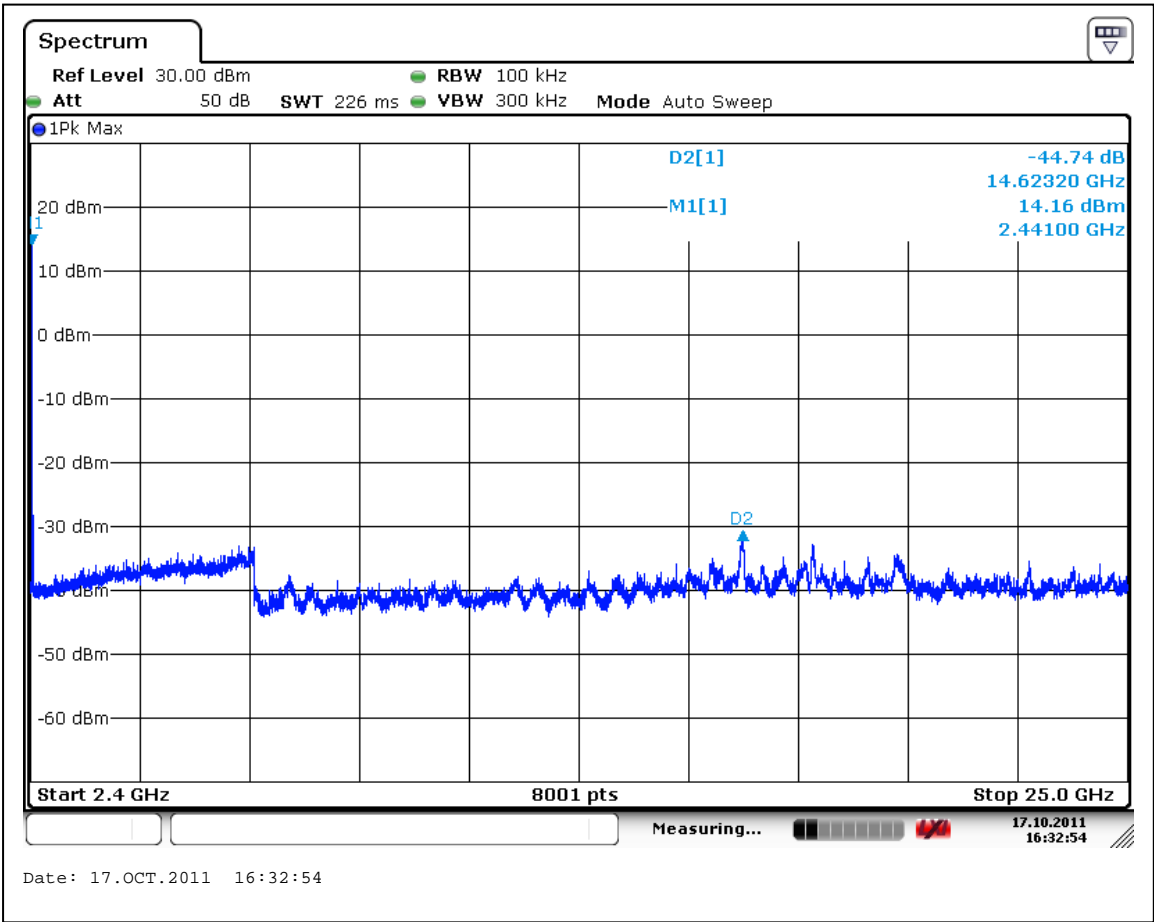
Graph 3.4.1



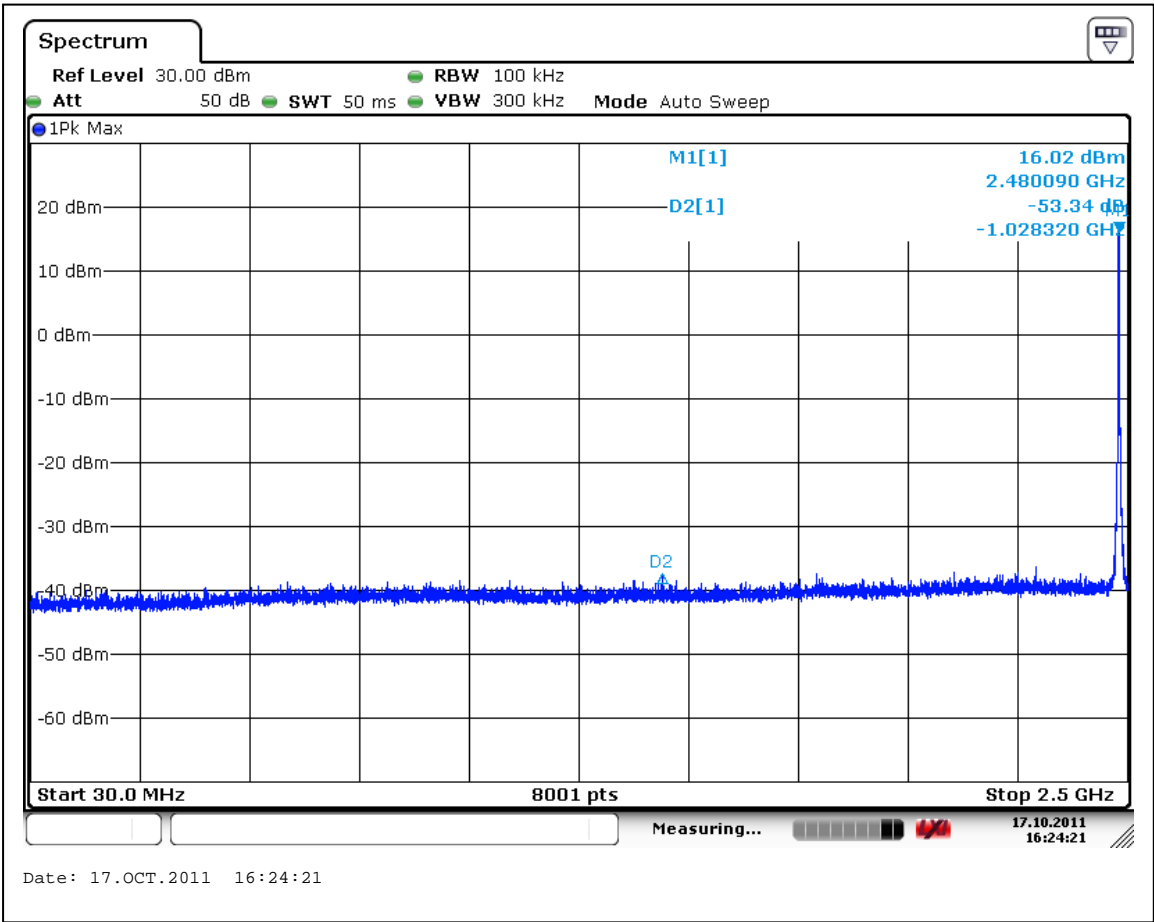
Graph 3.4.2



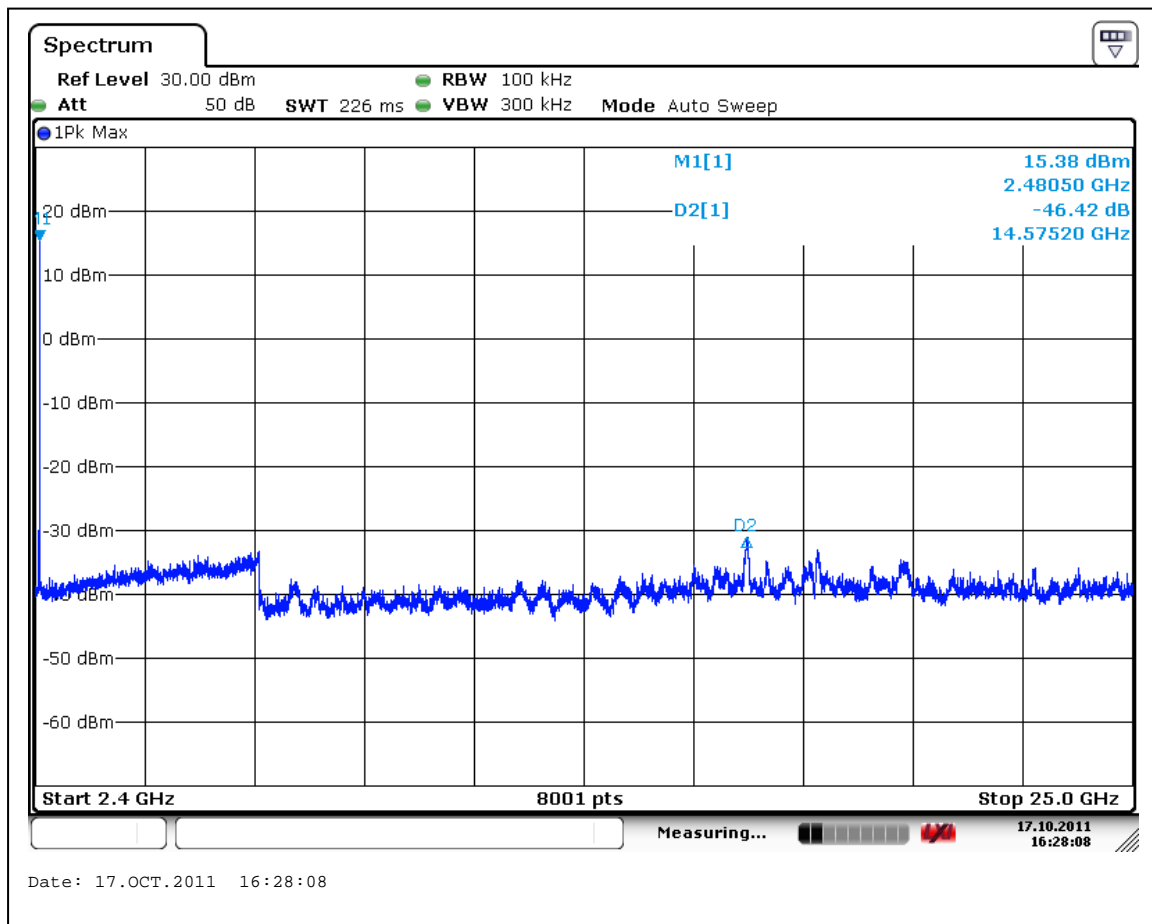
Graph 3.4.3



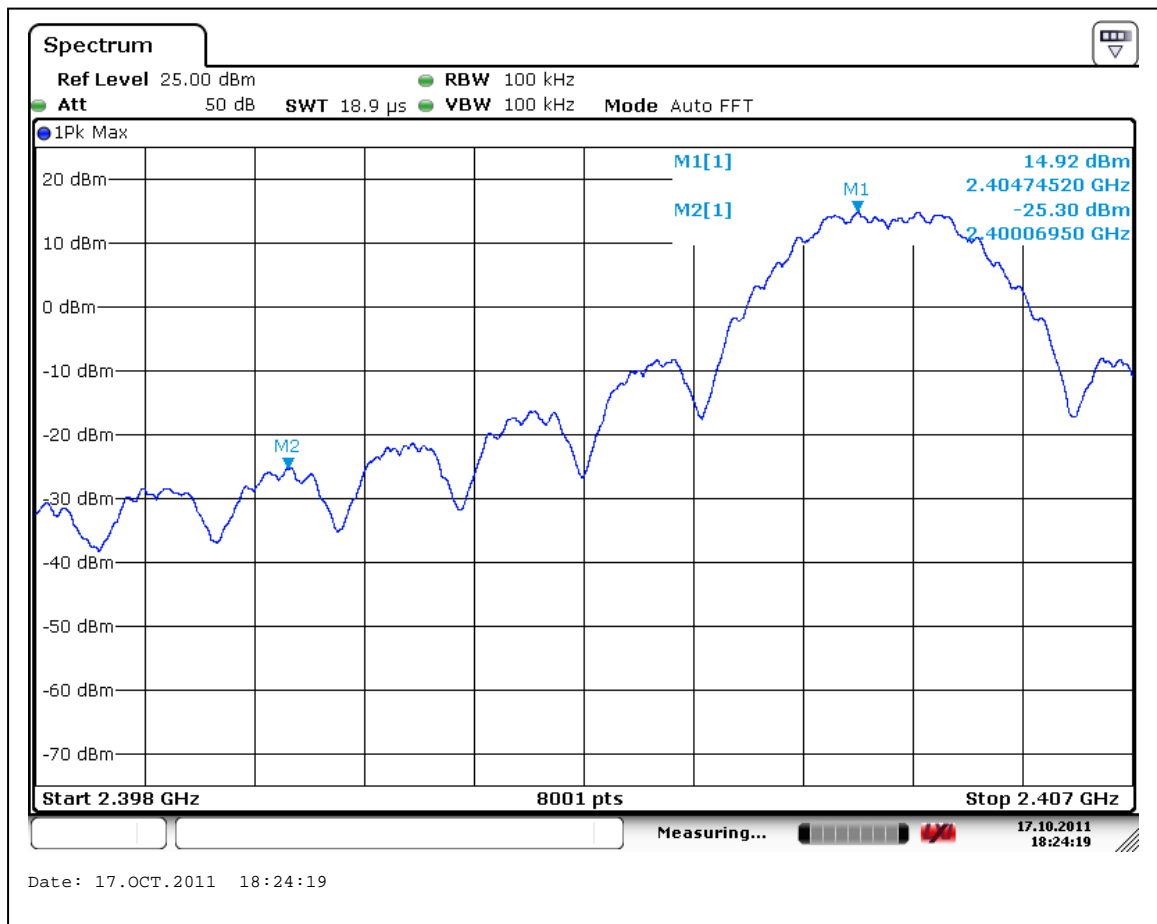
Graph 3.4.4



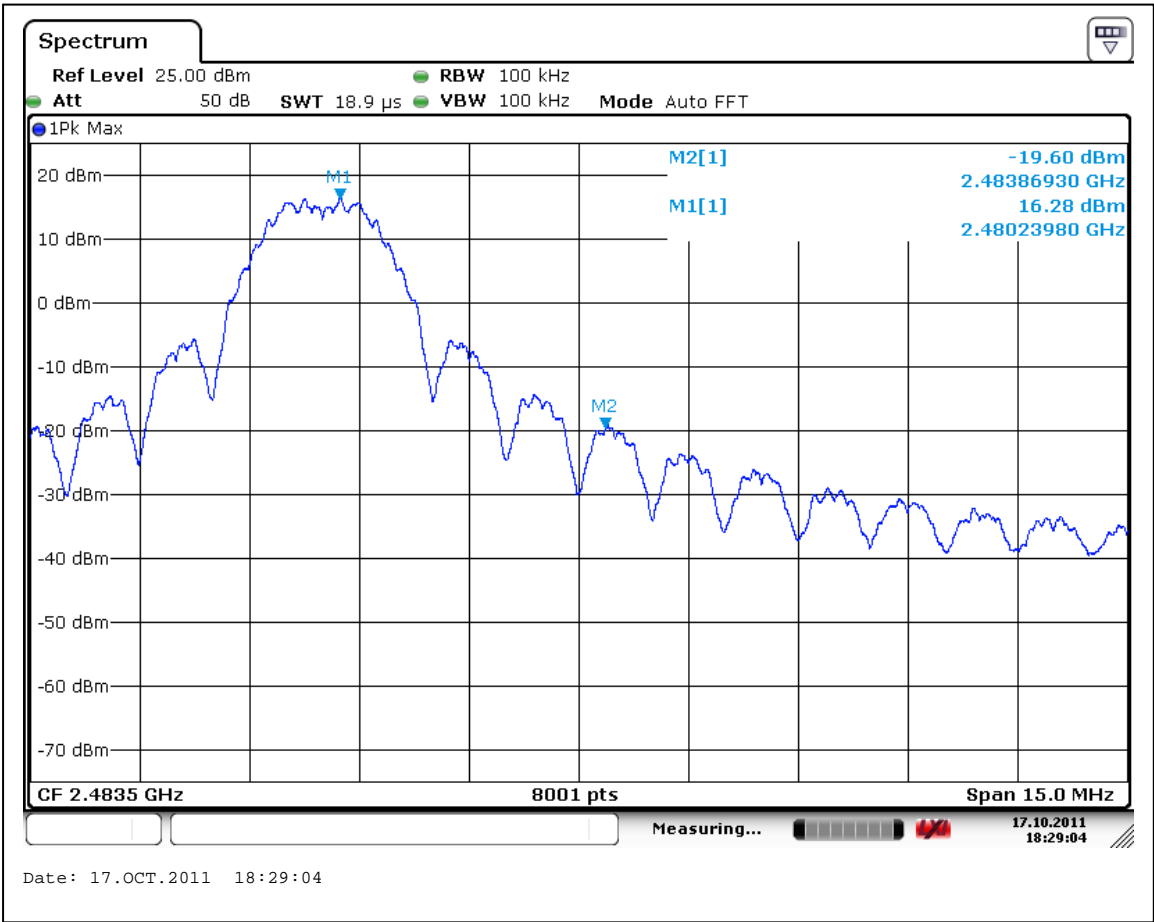
Graph 3.4.5



Graph 3.4.6



Graph 3.4.7



Graph 3.4.8



3.5 Radiated spurious emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Frequency Range: 30MHz to 25GHz (10th Harmonic)

Test result: **Pass**

Max. Margin: 0.2dB below the limits

Notes: Tables 3.5.1, 3.5.2 and 3.5.3 show spurious and harmonics emissions in restricted band of operation per FCC 15.205. Transmitting fundamental frequencies were excluded.

Date:	October 24-25, 2011	Result: Pass
Standard:	FCC part 15.247(d)	
Tested by:	Uri Spector	
Test Point:	Enclosure	
Operation mode:	See Page 5	
Note:	None	

Table 3.5.1

Frequency	Ant. Polarity	Peak Reading dBμV	Ant.Factor dB1/m	Total at 3m dBμV/m	QP Limit dBμV/m	Margin dB
Ch. 11						
32.529 MHz	V	14.9	18.9	33.8	40.0	-6.2
57.34 MHz	V	31.9	7.6	39.4	40.0	-0.6
66.189 MHz	V	27.8	7.0	34.8	40.0	-5.2
80.051 MHz	V	19.0	8.9	27.9	40.0	-12.1
94.036 MHz	V	19.5	11.2	30.6	43.5	-12.9
147.46 MHz	V	15.6	12.9	28.5	43.5	-15.0
30.014 MHz	H	11.4	20.3	31.7	40.0	-8.3
62.262 MHz	H	22.8	7.0	29.8	40.0	-10.3
79.018 MHz	H	16.1	8.8	24.9	40.0	-15.2
93.24 MHz	H	17.9	11.0	28.9	43.5	-14.6
148.49 MHz	H	19.7	12.8	32.5	43.5	-11.1
Ch. 18						
31.86 MHz	V	13.3	19.3	32.6	40.0	-7.4
39.686 MHz	V	22.9	14.9	37.8	40.0	-2.2
51.329 MHz	V	24.1	9.4	33.5	40.0	-6.5
73.466 MHz	V	30.8	7.9	38.7	40.0	-1.3
152.26 MHz	V	18.3	12.5	30.9	43.5	-12.7
30.035 MHz	H	12.2	20.3	32.5	40.0	-7.5
73.521 MHz	H	20.9	7.9	28.9	40.0	-11.2
95.014 MHz	H	16.6	11.4	27.9	43.5	-15.6
150.73 MHz	H	18.4	12.6	31.0	43.5	-12.5
Ch. 26						
30.42 MHz	V	15.9	20.1	36.0	40.0	-4.1
43.627 MHz	V	24.7	13.0	37.7	40.0	-2.3
64.4 MHz	V	26.2	6.9	33.1	40.0	-6.9
79.256 MHz	V	21.6	8.8	30.4	40.0	-9.6
91.703 MHz	V	21.8	10.7	32.5	43.5	-11.0
274.27 MHz	V	17.5	15.6	33.2	46.0	-12.8
511.81 MHz	V	15.2	20.7	35.8	46.0	-10.2
30.717 MHz	H	13.0	19.9	32.9	40.0	-7.1
53.457 MHz	H	16.8	8.6	25.4	40.0	-14.6
77.861 MHz	H	18.0	8.6	26.6	40.0	-13.4
133.59 MHz	H	16.4	13.7	30.2	43.5	-13.4

Table 3.5.2

Frequency MHz	Antenna		Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBμV	Total @ 3m dBμV/m	CF dB	Limit dBμV/m	Margin dB	Comments
	Polarity	Hts(cm)									
Ch 11											
4808.94	V	100	33.2	4.1	36.7	47.2	47.9	13.5	54.0	-19.6	
4808.94	H	192	33.2	4.1	36.7	45.8	46.5	13.5	54.0	-21.0	
12027.43	V	185	39.5	6.7	35.5	44.7	55.3	13.5	54.0	-12.1	
12027.43	H	205	39.5	6.7	35.5	41.4	52.0	13.5	54.0	-15.4	
Ch 18											
4881.02	V	100	33.4	4.2	36.6	52.3	53.2	13.5	54.0	-14.3	
4881.02	H	186	33.4	4.2	36.6	51.3	52.2	13.5	54.0	-15.3	
7321.43	V	194	36.1	5.0	36.6	56.7	61.2	13.5	54.0	-6.3	
7321.43	H	137	36.1	5.0	36.6	57.3	61.8	13.5	54.0	-5.7	
12202.45	V	229	39.3	6.7	35.7	53.0	63.3	13.5	54.0	-4.2	
12202.45	H	174	39.3	6.7	35.7	49.1	59.4	13.5	54.0	-8.1	
Ch 26											
4961.02	V	100	33.5	4.2	36.6	59.5	60.6	13.5	54.0	-6.9	
4961.02	H	188	33.5	4.2	36.6	57.4	58.5	13.5	54.0	-9.0	
7438.49	V	207	36.4	5.0	36.5	60.0	64.9	13.5	54.0	-2.6	
7438.49	H	146	36.4	5.0	36.5	59.3	64.2	13.5	54.0	-3.3	
12397.41	V	169	39.0	6.7	35.9	55.3	65.1	13.5	54.0	-2.3	
12397.41	H	170	39.0	6.7	35.9	49.7	59.5	13.5	54.0	-7.9	

Comments: The table shows spurious and harmonics emissions in restricted band of operation per FCC 15.205
All measurements were taken using an Average Value (RBW 1MHz, VBW 10Hz)

Table 3.5.3

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
Ch. 11							
4808.94	V	55.0	37.4	36.7	55.7	74.0	-18.3
12027.43	V	57.9	46.2	35.5	68.5	74.0	-5.5
4808.94	H	52.5	37.3	36.7	53.2	74.0	-20.8
12027.43	H	51.0	46.2	35.5	61.6	74.0	-12.4
Ch. 18							
4881.02	V	62.3	37.5	36.6	63.1	74.0	-10.9
7321.43	V	67.6	41.1	36.6	72.1	74.0	-1.9
12202.45	V	63.3	46.0	35.7	73.6	74.0	-0.4
4881.02	H	58.7	37.4	36.6	59.5	74.0	-14.5
7321.43	H	68.0	41.1	36.6	72.5	74.0	-1.5
12202.45	H	58.2	46.0	35.7	68.5	74.0	-5.5
Ch. 26							
4961.02	V	70.6	37.7	36.6	71.7	74.0	-2.3
7438.49	V	68.8	41.4	36.5	73.8	74.0	-0.2
12397.41	V	63.6	45.7	35.9	73.4	74.0	-0.6
4961.02	H	66.3	37.6	36.6	67.3	74.0	-6.7
7438.49	H	67.4	41.5	36.5	72.4	74.0	-1.6
12397.41	H	59.4	45.7	35.9	69.2	74.0	-4.8

Comments: All measurements were taken using RBW 1MHz, VBW 1MHz

3.5.1 Average correction factor calculation

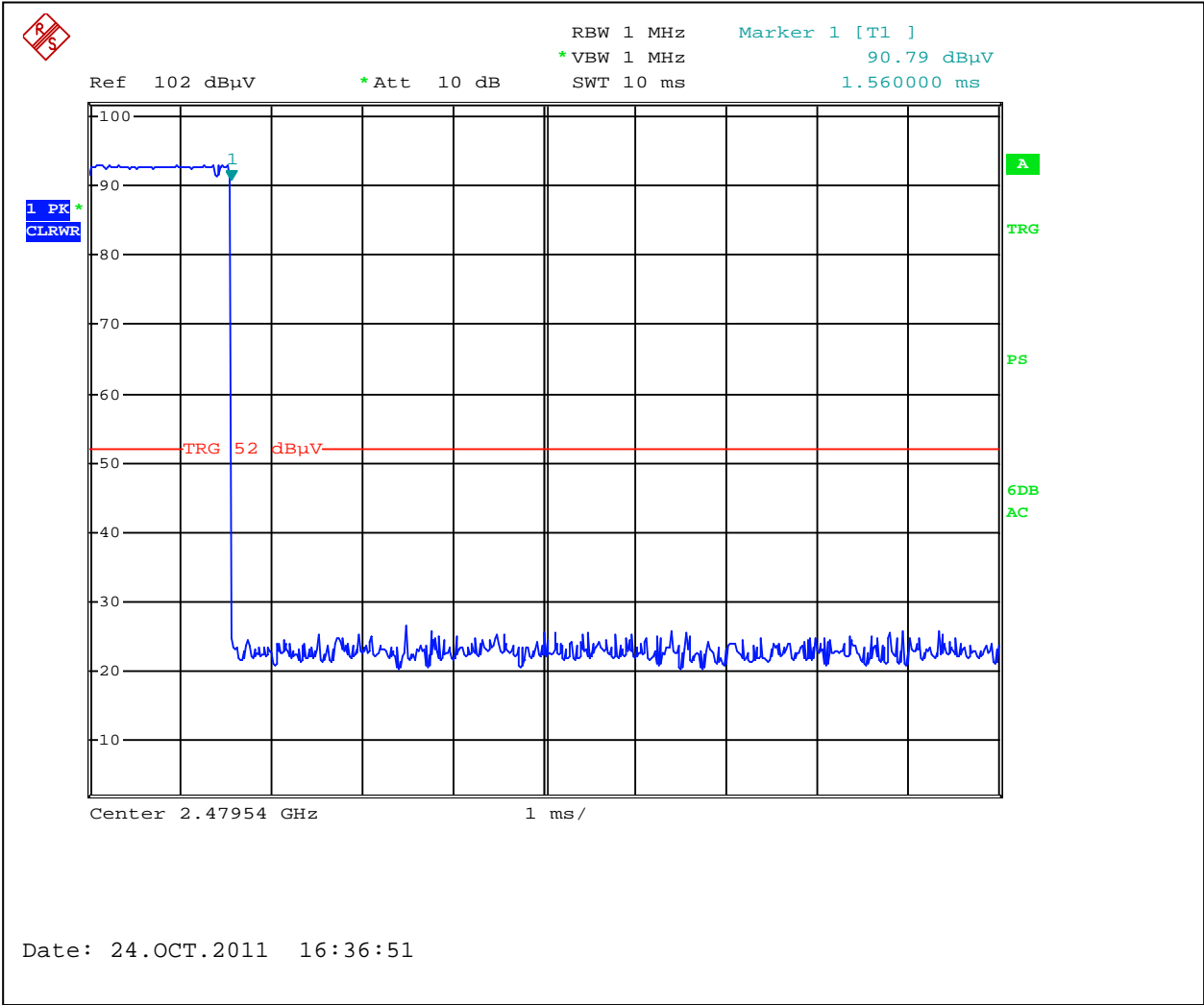
An Average correction factor is calculated by averaging one complete pulse train.

Time with field strength is in its maximum value (length of pulses) = 1.56ms

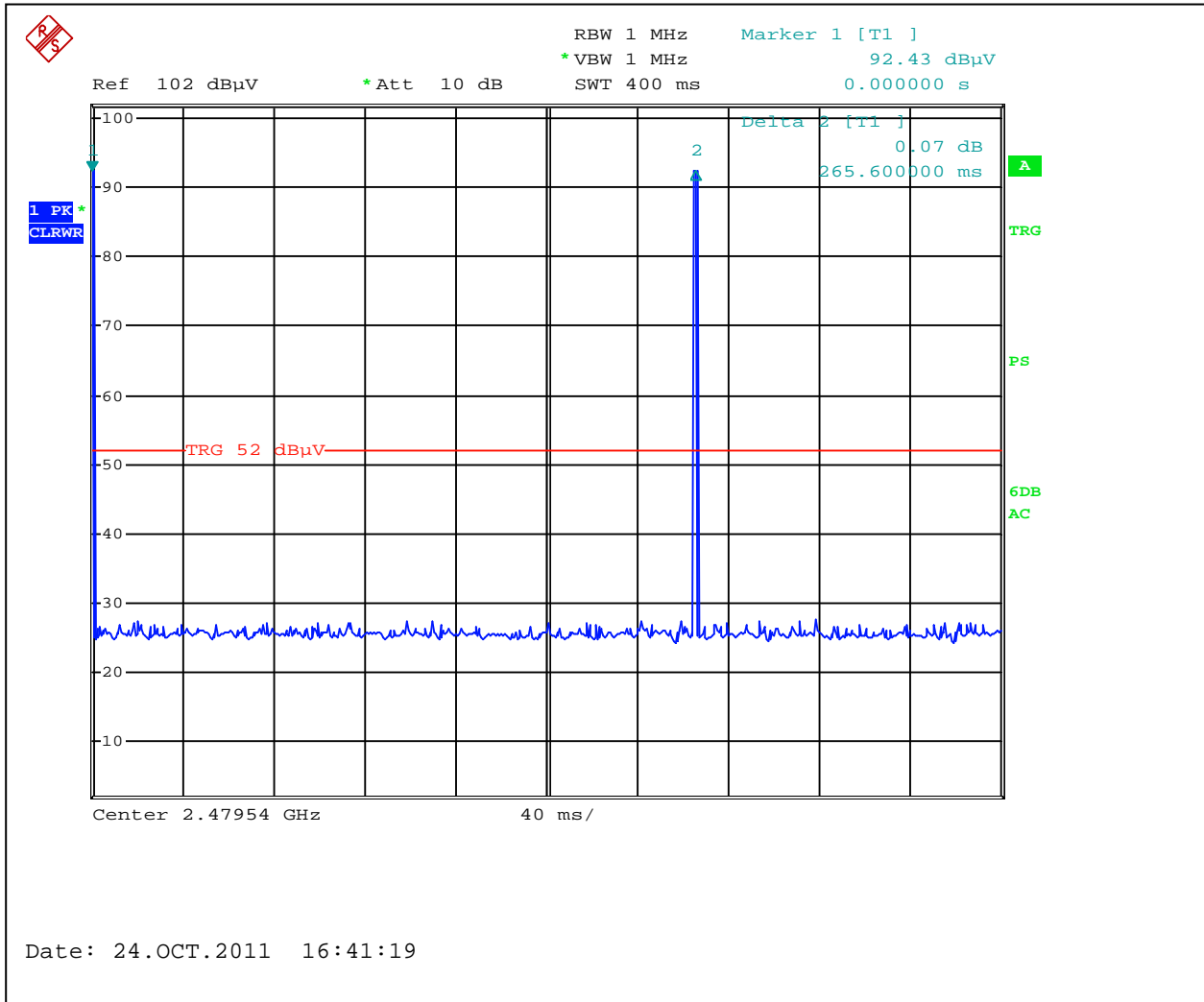
Graphs 3-5-1 to 3-5-2 show the measured pulse train timing. Average Correction Factor was calculated using the minimum complete cycle of 7.36ms as stated by the manufacturer.

Average Correction Factor = $20\text{Log}(1.56\text{ms}/7.36\text{ms}) = -13.5\text{dB}$

Graph 3.5.1



Graph 3.5.2

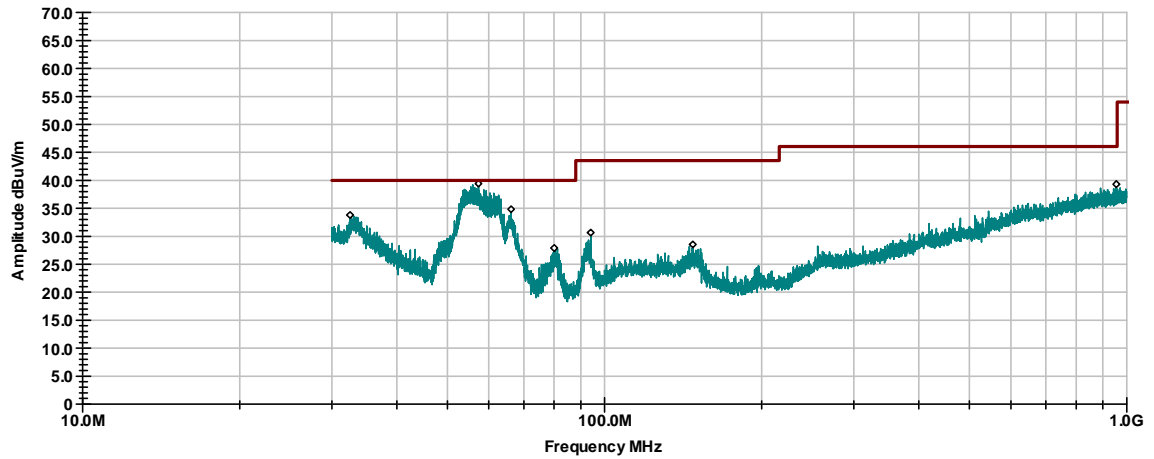


Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr., Channel 11

Radiated Emissions

FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: Simon Khazon

Project #: G100525686

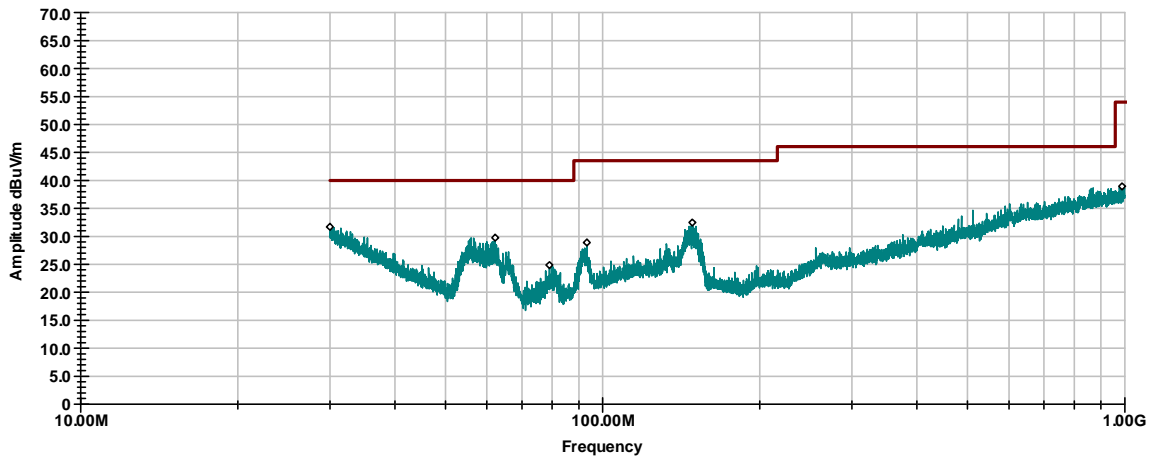
Graph 3.5.3

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr., Channel 11

Radiated Emissions

FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: Simon Khazon

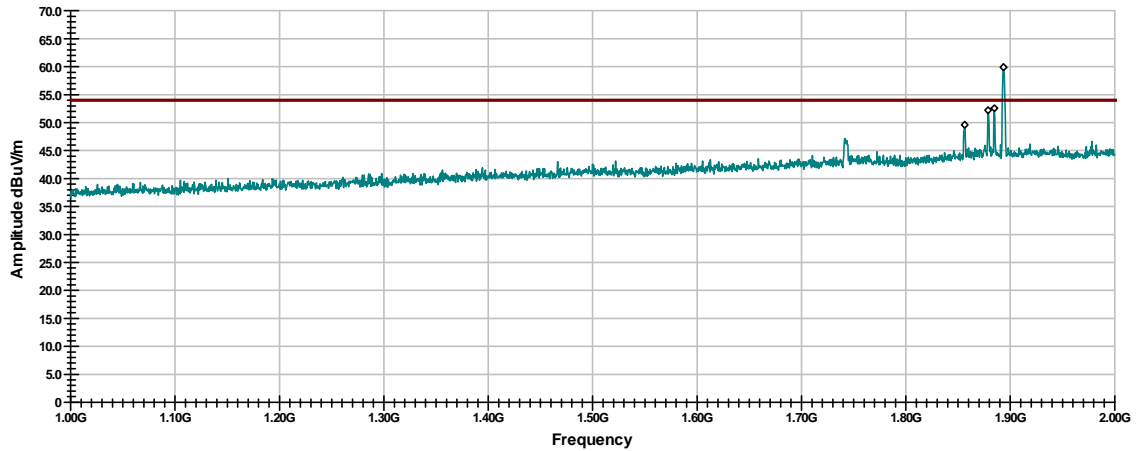
Project #: G100525686

Graph 3.5.4

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr, Channel11

Radiated Emissions FCC Part 15.247 Vertical Antenna, from 1 to 2GHz

— verhf_cf
◊ max_verhf_20_cf
— FCC_B_3m



Operator: Simon Khazon

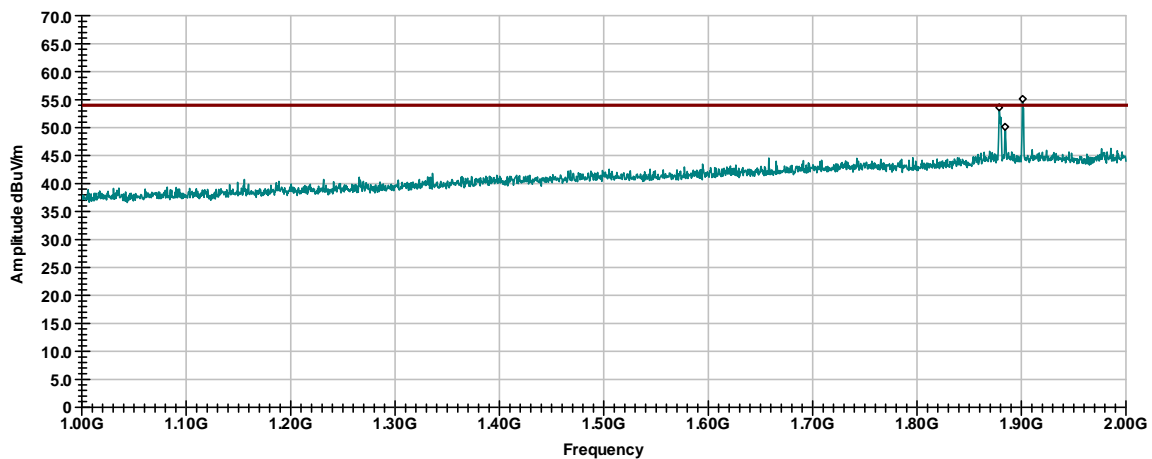
Project #: G100525686

Graph 3.5.5

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr, Channel11

Radiated Emissions FCC Part 15.247 Horizontal Antenna, from 1 to 2GHz

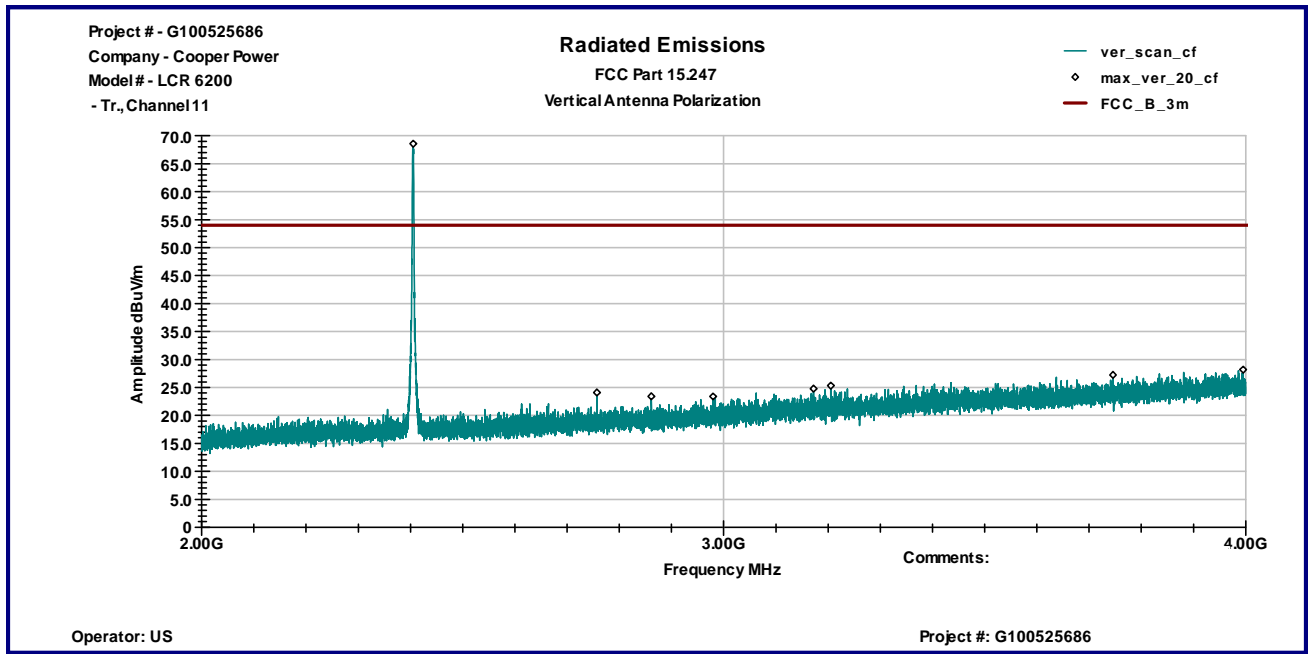
— horhf_cf
◊ max_horhf_20_cf
— FCC_B_3m



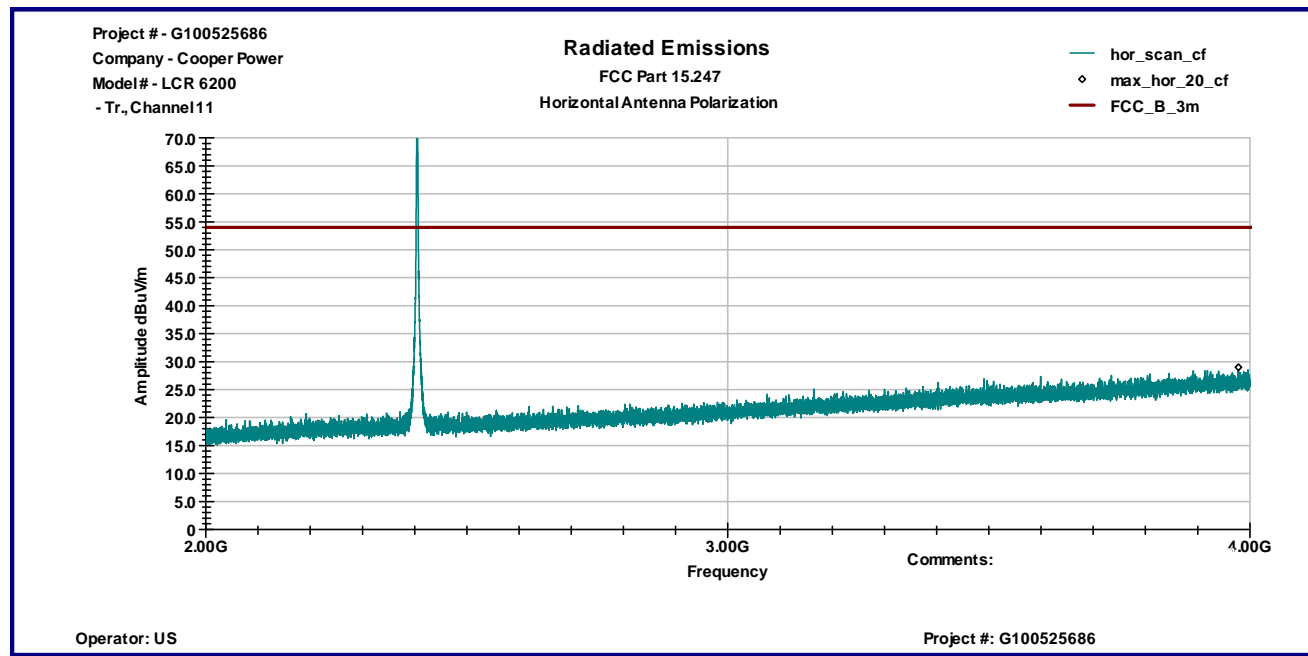
Operator: Simon Khazon

Project #: G100525686

Graph 3.5.6



Graph 3.5.7



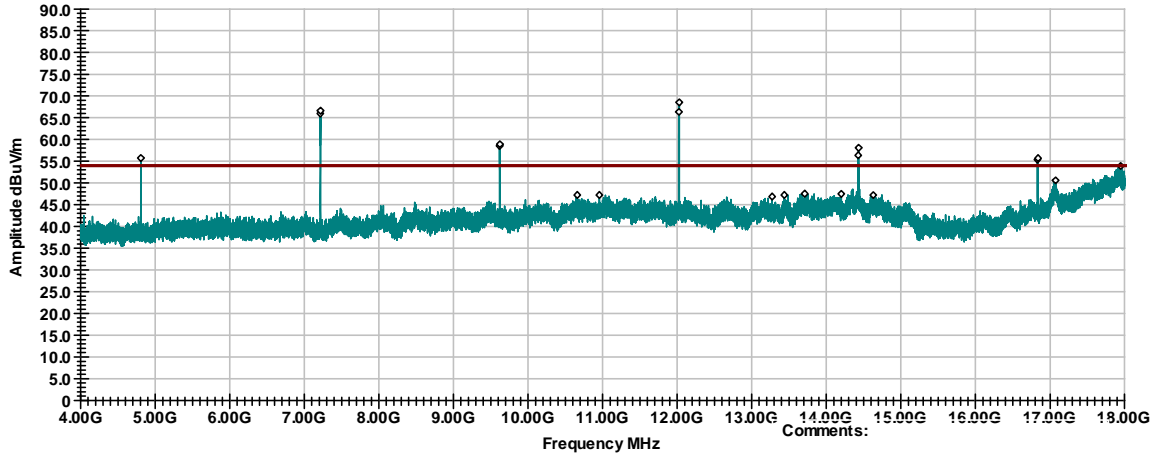
Graph 3.5.8

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 11

Radiated Emissions

FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

Project #: G100525686

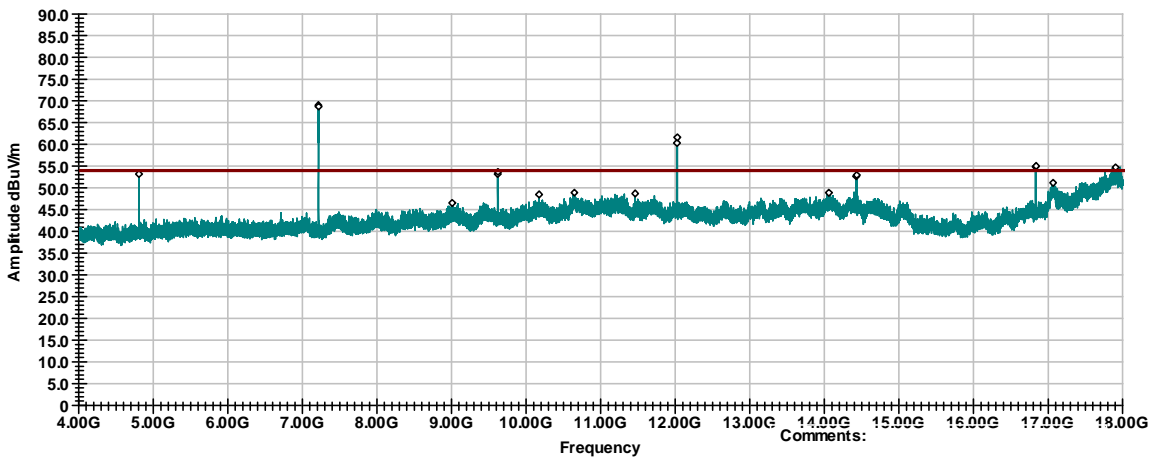
Graph 3.5.9

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 11

Radiated Emissions

FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

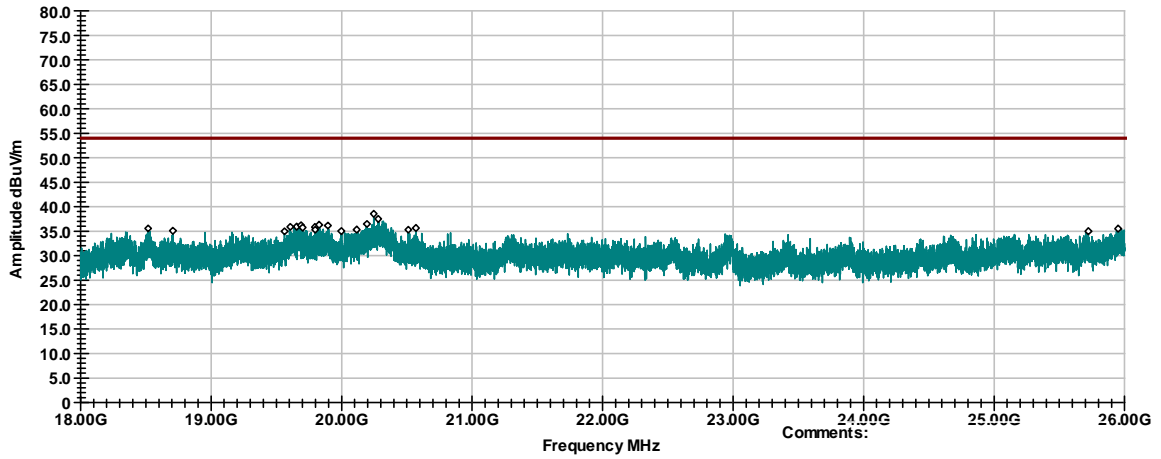
Project #: G100525686

Graph 3.5.10

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 11

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

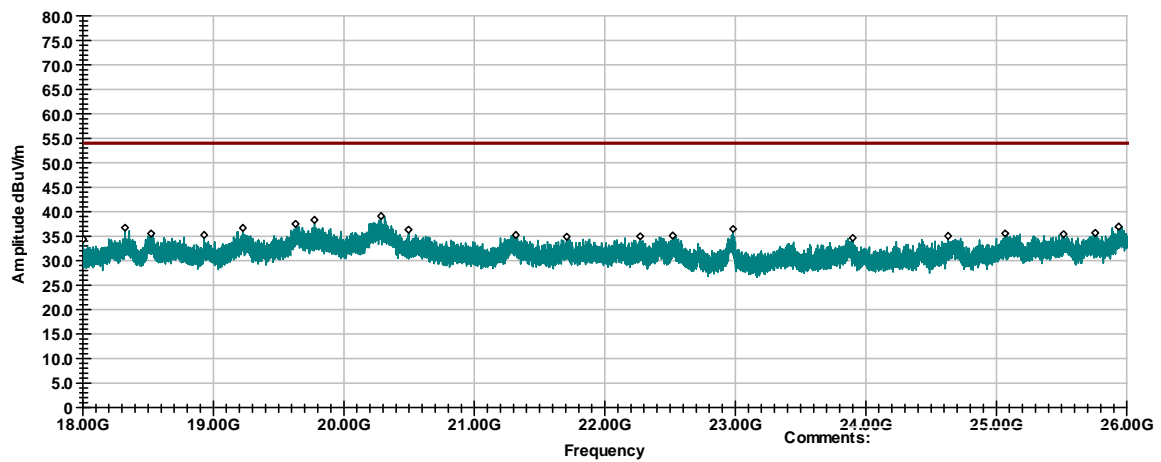
Project #: G100525686

Graph 3.5.11

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 11

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

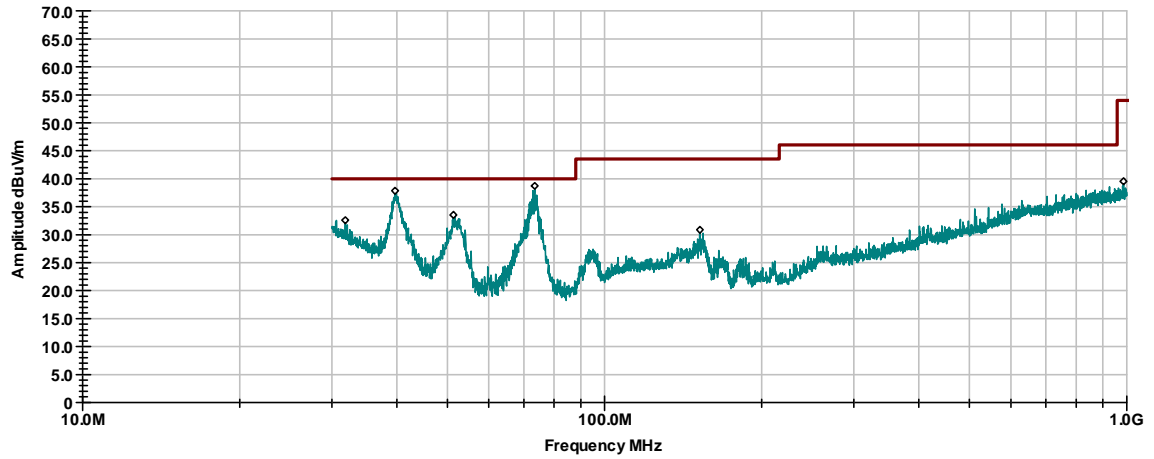
Project #: G100525686

Graph 3.5.12

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr, Channel 18

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◊ max_ver_20_cf
— FCC_B_3m



Operator: Simon Khazon

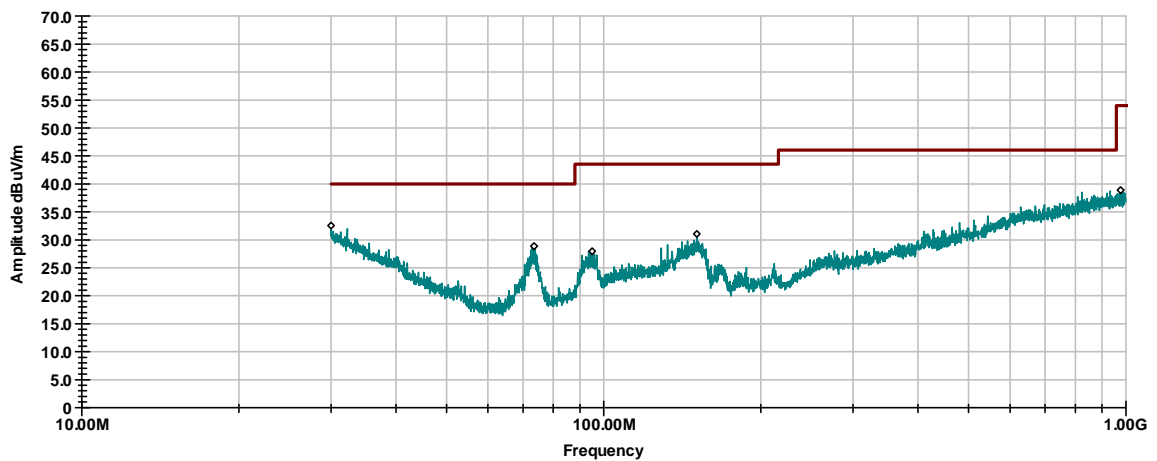
Project #: G100525686

Graph 3.5.13

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr, Channel 18

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◊ max_hor_20_cf
— FCC_B_3m



Operator: Simon Khazon

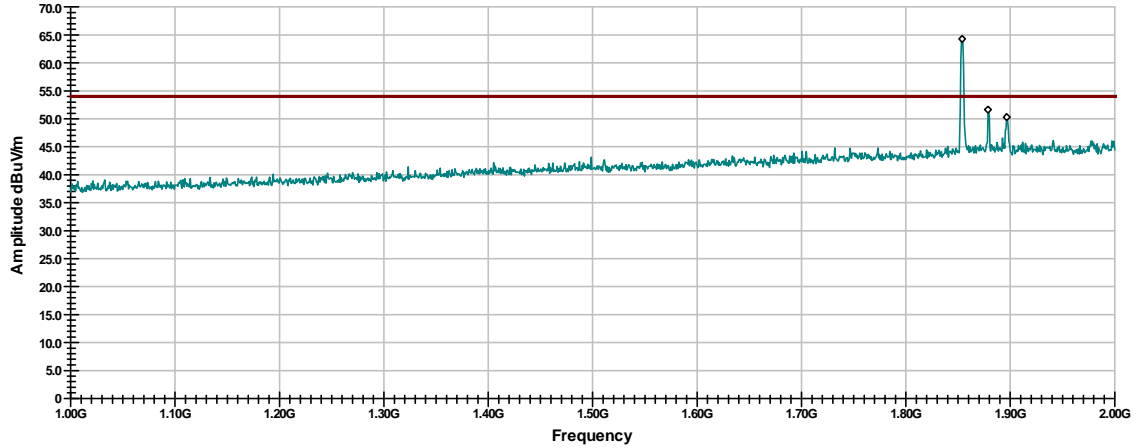
Project #: G100525686

Graph 3.5.14

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr., Channel18

Radiated Emissions
FCC Part 15.247
Vertical Antenna, from 1 to 2GHz

— verhf_cf
◇ max_verhf_20_cf
— FCC_B_3m



Operator: Simon Khazon

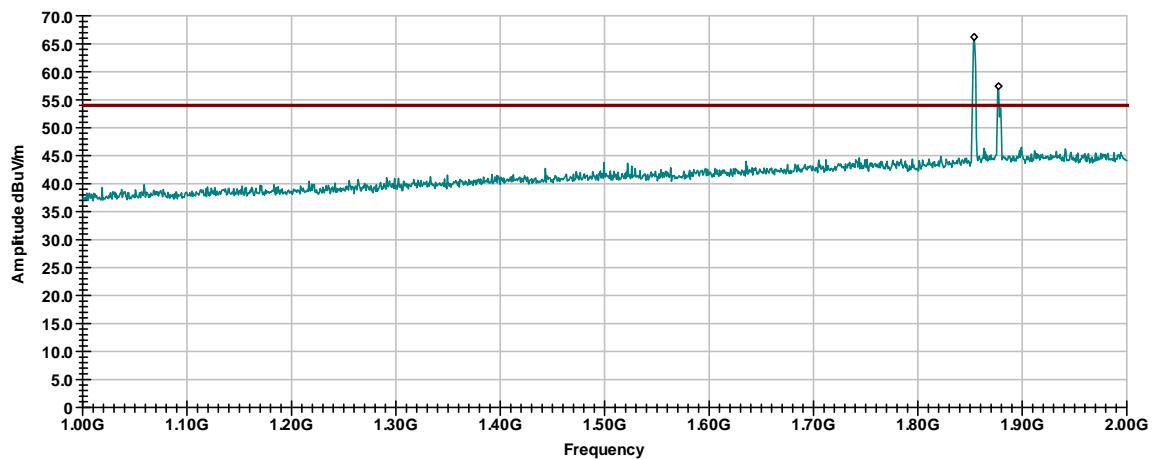
Project #: G100525686

Graph 3.5.15

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr., Channel18

Radiated Emissions
FCC Part 15.247
Horizontal Antenna, from 1 to 2GHz

— horhf_cf
◇ max_horhf_20_cf
— FCC_B_3m



Operator: Simon Khazon

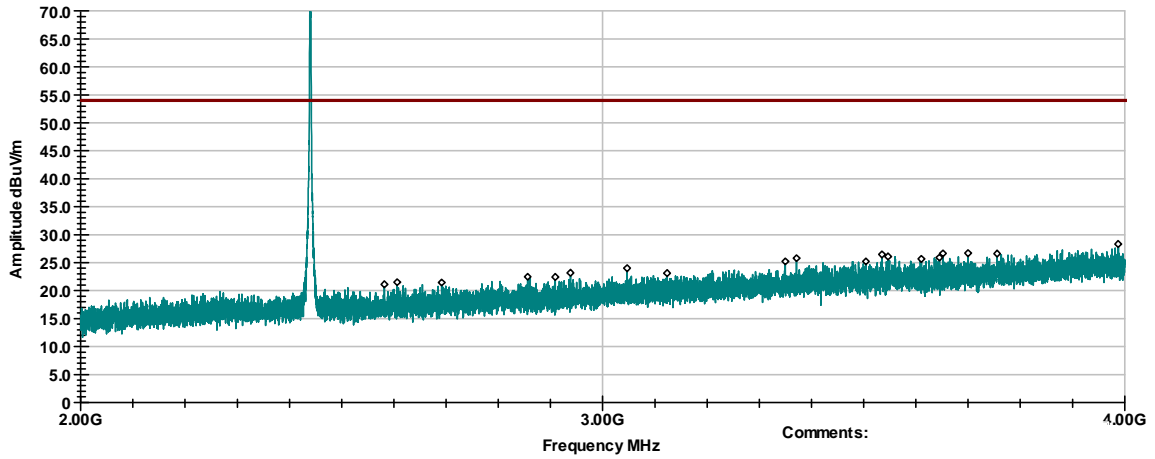
Project #: G100525686

Graph 3.5.16

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 18

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

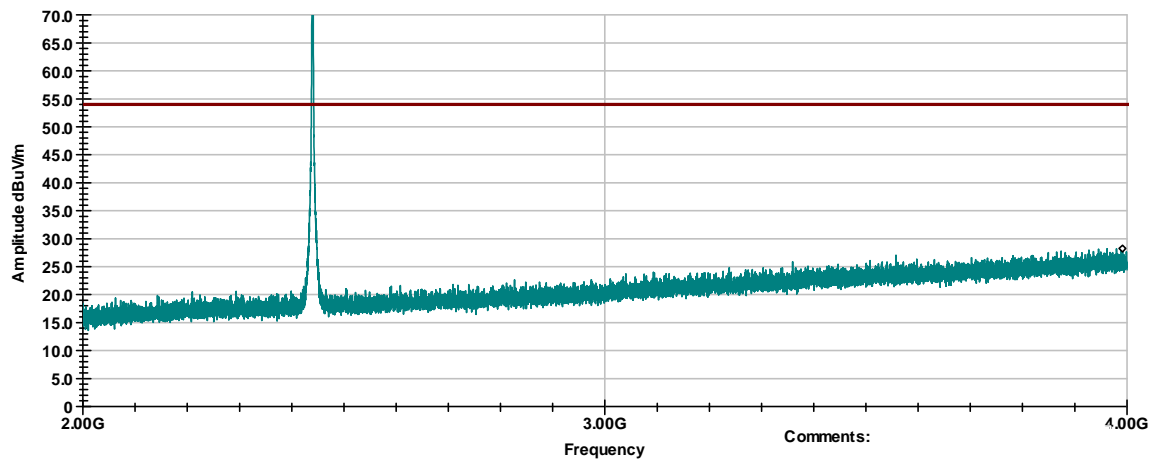
Project #: G100525686

Graph 3.5.17

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 18

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

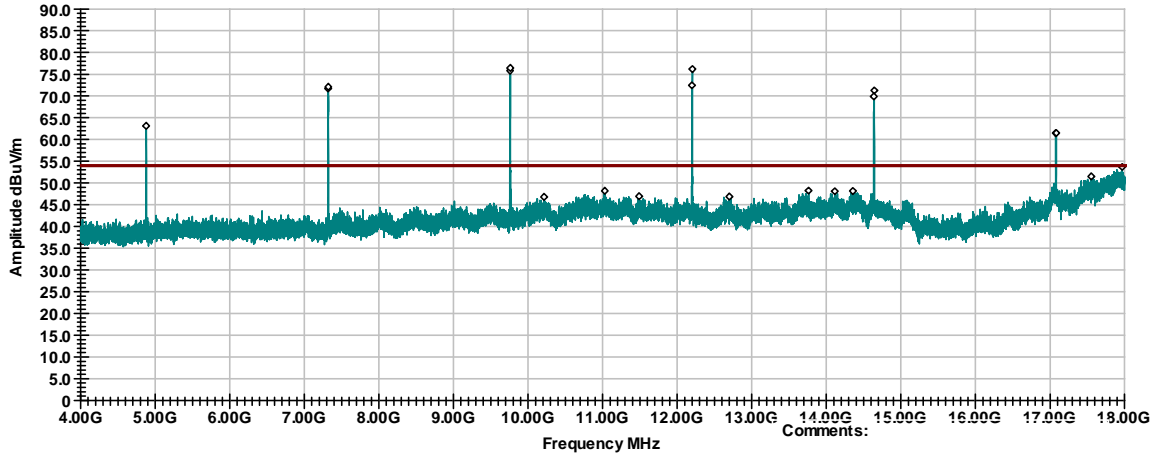
Project #: G100525686

Graph 3.5.18

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 18

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

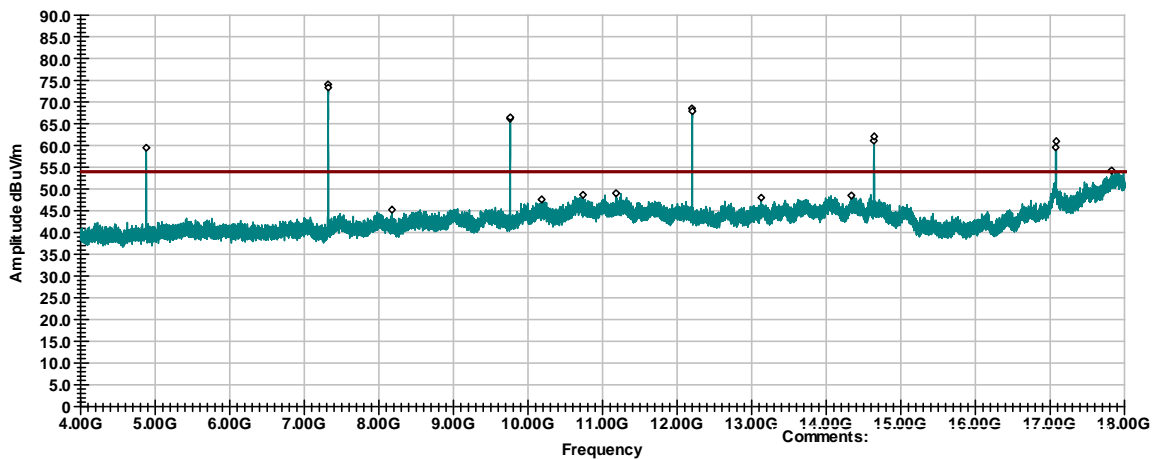
Project #: G100525686

Graph 3.5.19

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 18

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

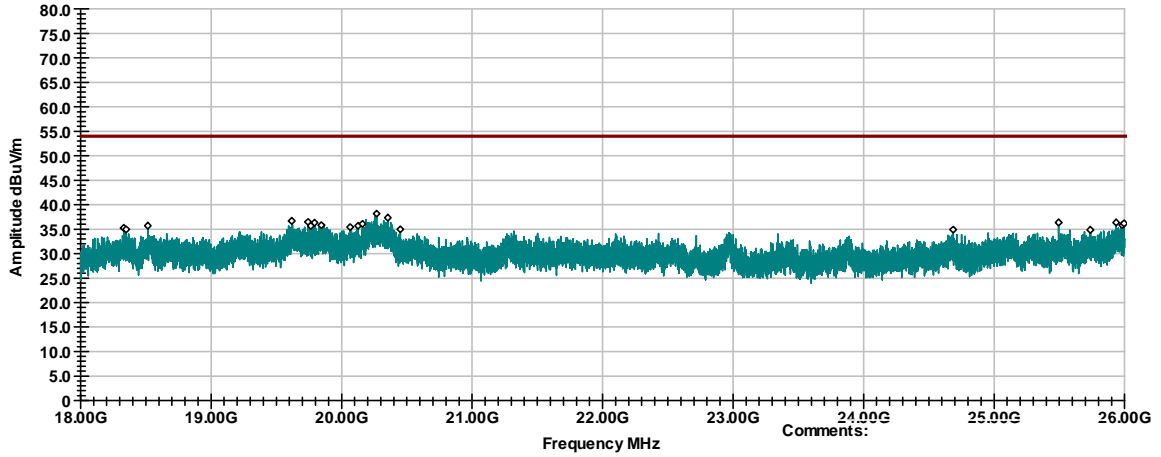
Project #: G100525686

Graph 3.5.20

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 18

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

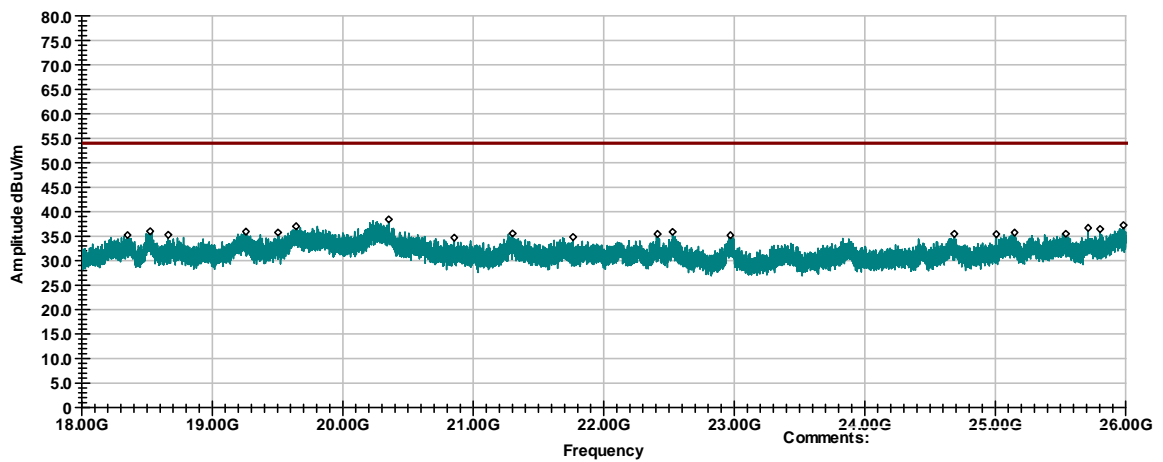
Project #: G100525686

Graph 3.5.21

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 18

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

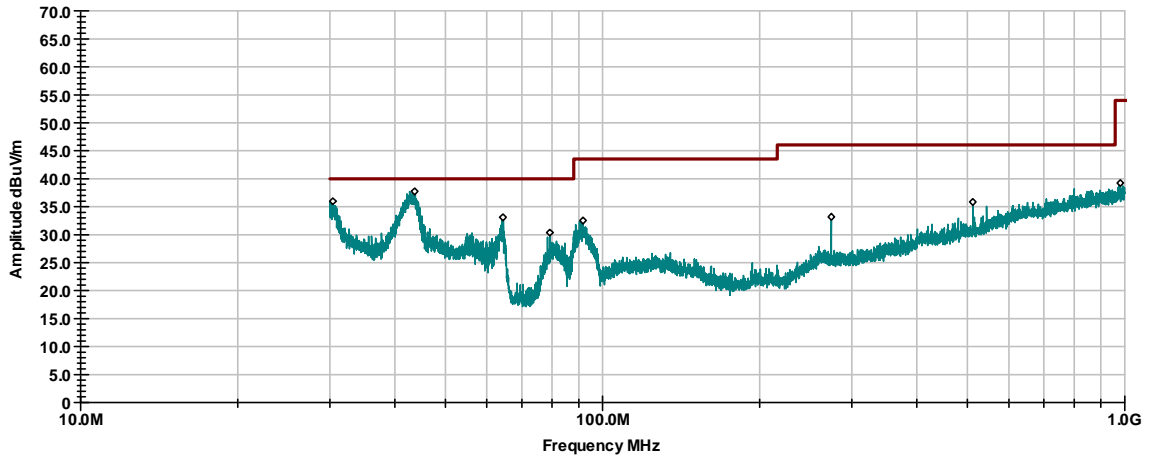
Project #: G100525686

Graph 3.5.22

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr, Channel26

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◊ max_ver_20_cf
— FCC_B_3m



Operator: US

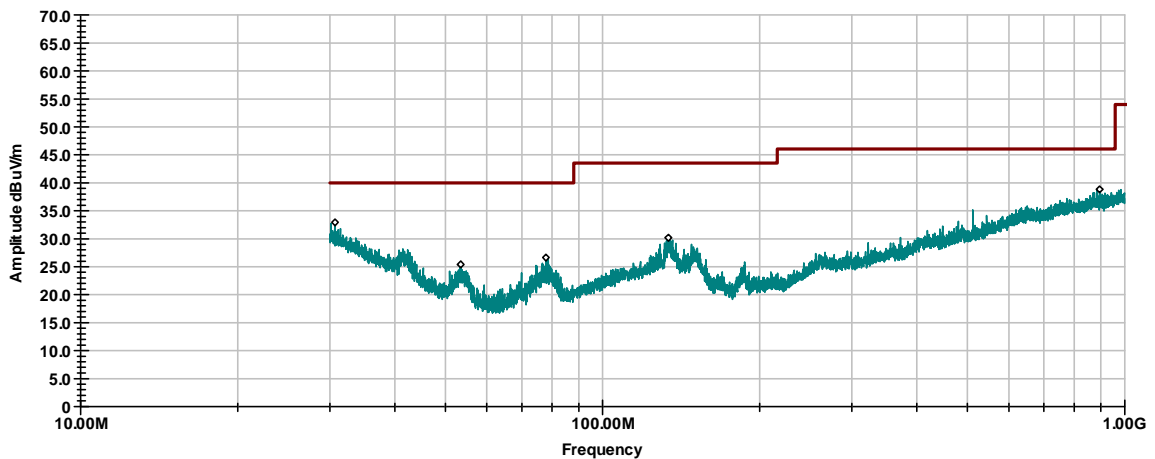
Project #: G100525686

Graph 3.5.23

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
Note - Tr, Channel26

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◊ max_hor_20_cf
— FCC_B_3m



Operator: US

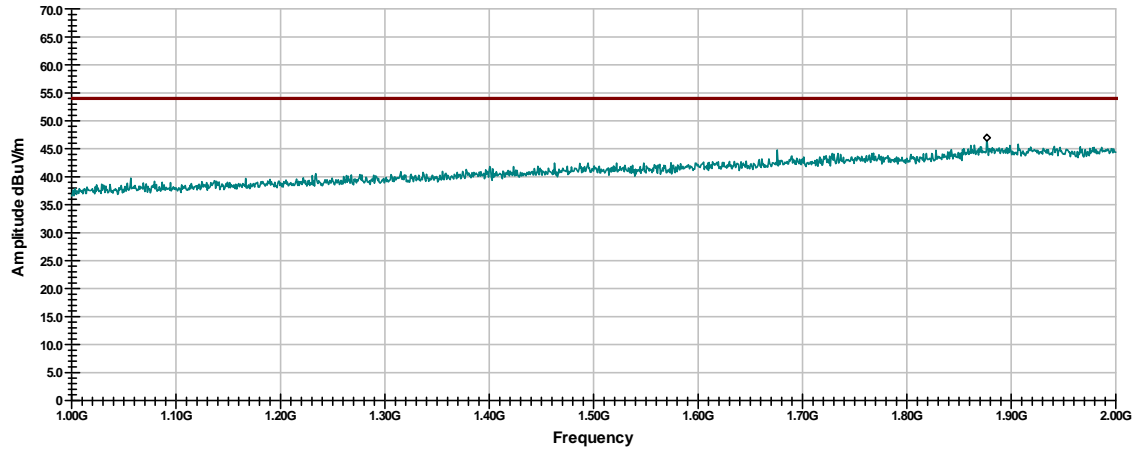
Project #: G100525686

Graph 3.5.24

Project # - G100525686
Company - Cooper Power
Model# - LCR 6200
Note - Tr., Channel 26

Radiated Emissions
FCC Part 15.247
Vertical Antenna, from 1 to 2GHz

— verhf_cf
◇ max_verhf_20_cf
— FCC_B_3m



Operator: US

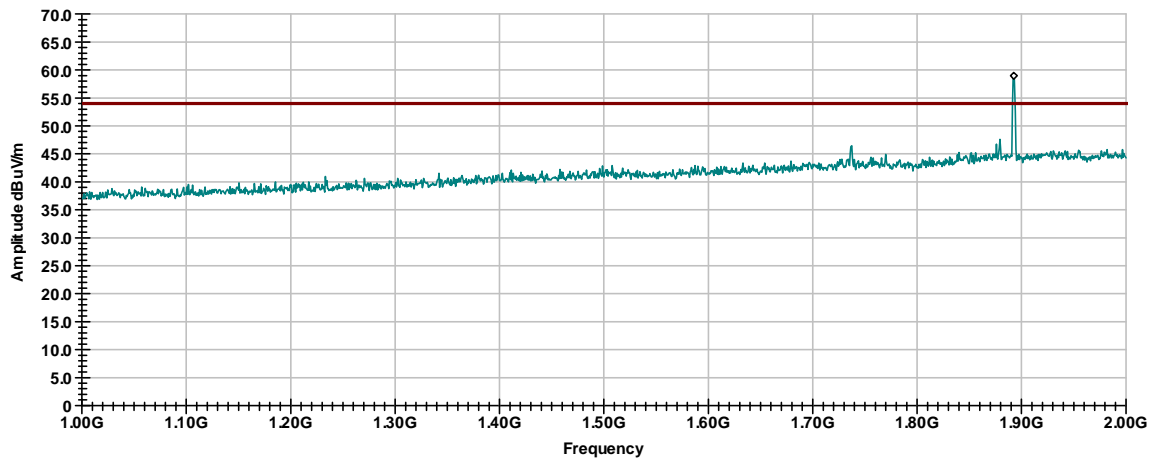
Project #: G100525686

Graph 3.5.25

Project # - G100525686
Company - Cooper Power
Model# - LCR 6200
Note - Tr., Channel 26

Radiated Emissions
FCC Part 15.247
Horizontal Antenna, from 1 to 2GHz

— horhf_cf
◇ max_horhf_20_cf
— FCC_B_3m



Operator: US

Project #: G100525686

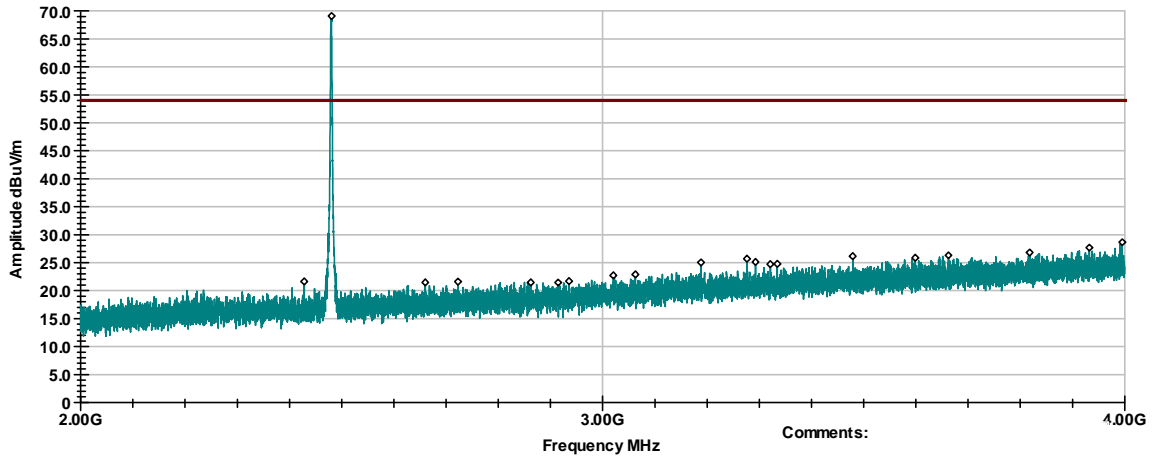
Graph 3.5.26

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 26

Radiated Emissions

FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

Project #: G100525686

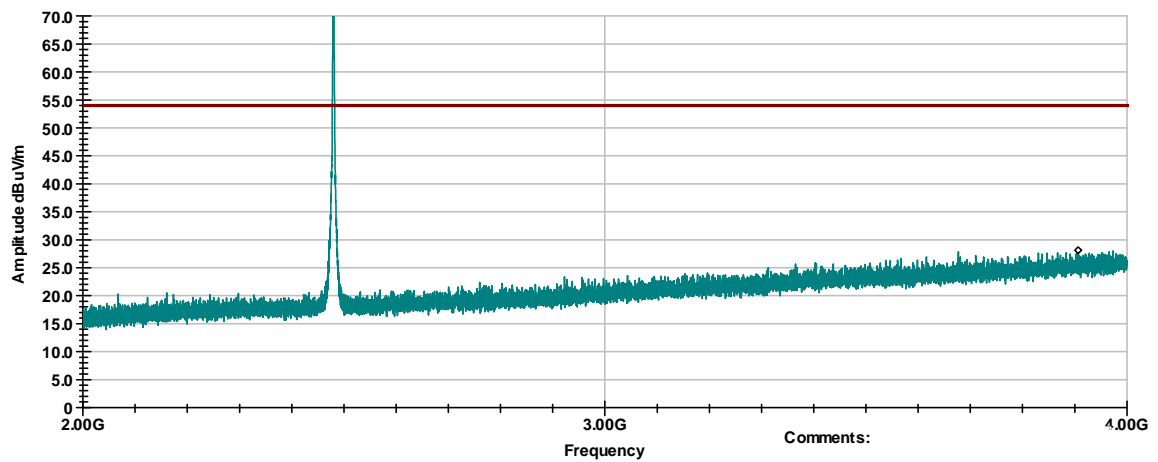
Graph 3.5.27

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 26

Radiated Emissions

FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

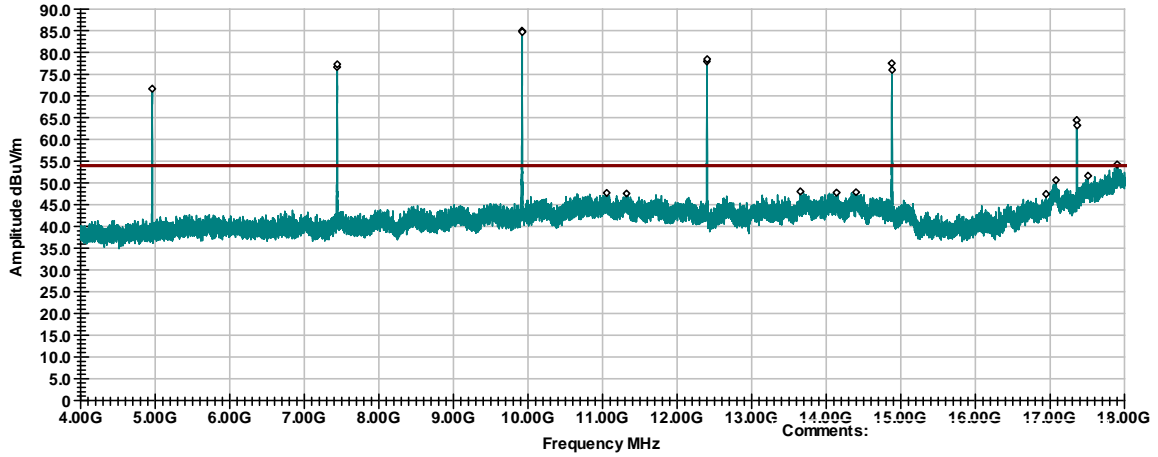
Project #: G100525686

Graph 3.5.28

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 26

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◊ max_ver_20_cf
— FCC_B_3m



Operator: US

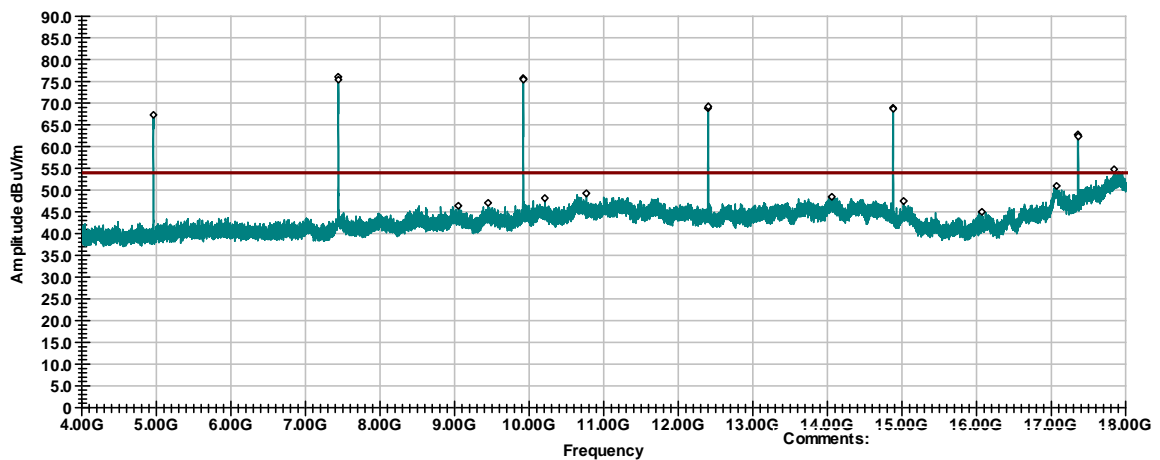
Project #: G100525686

Graph 3.5.29

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 26

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◊ max_hor_20_cf
— FCC_B_3m



Operator: US

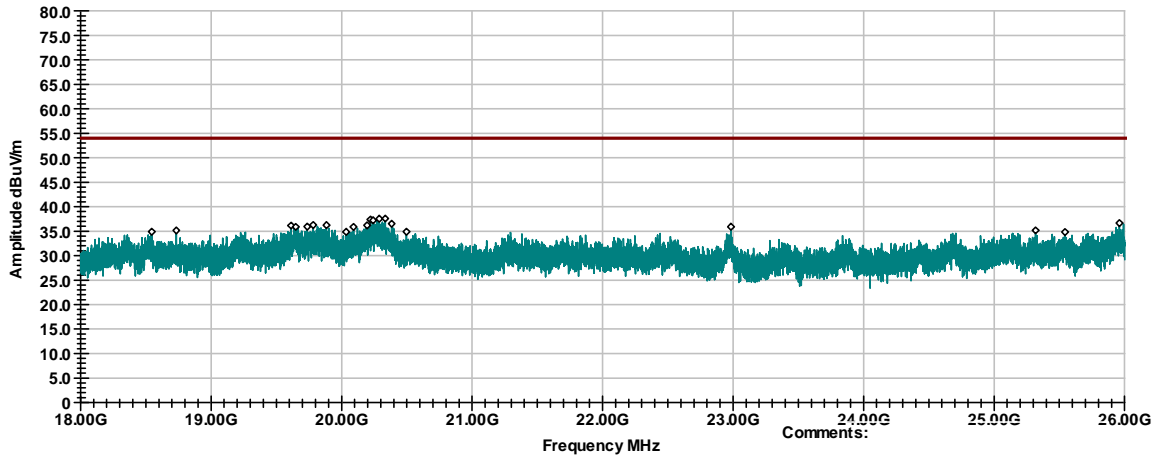
Project #: G100525686

Graph 3.5.30

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 26

Radiated Emissions
FCC Part 15.247
Vertical Antenna Polarization

— ver_scan_cf
◇ max_ver_20_cf
— FCC_B_3m



Operator: US

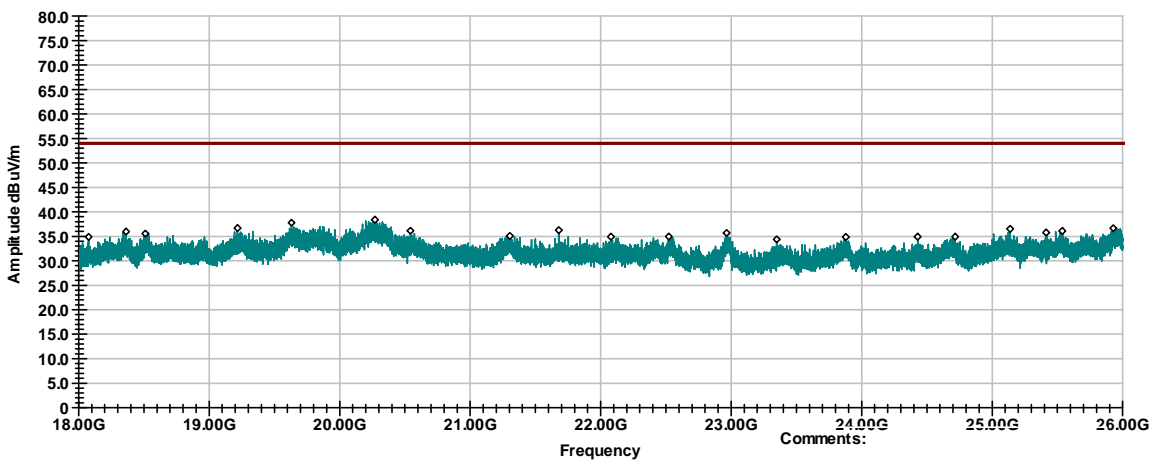
Project #: G100525686

Graph 3.5.31

Project # - G100525686
Company - Cooper Power
Model # - LCR 6200
- Tr., Channel 26

Radiated Emissions
FCC Part 15.247
Horizontal Antenna Polarization

— hor_scan_cf
◇ max_hor_20_cf
— FCC_B_3m



Operator: US

Project #: G100525686

Graph 3.5.32

3.6 RF Exposure Compliance

The maximum measured antenna conducted power, P is 19.96dBm

The antenna gain, G is -2.0 dBi

The maximum EIRP power = P + G

ERP = 19.96 + (-2.0) = 17.96dBm, or 0.063W

The limits for Maximum Permissible Exposure (MPE) for transmitter operating at 2.4GHz, MPE is $1\text{mW}/\text{cm}^2$, or $10\text{W}/\text{m}^2$

The Power Density is related to EIRP with the equation:

$S = \text{EIRP} / 4\pi D^2$, or $10 = 0.063 / 4\pi D^2$,

The minimum safe separation distance, D = 2.2cm, which is below 20cm



3.7 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 14.2dB below the limits

Notes: None

Date:	October 25, 2011	Result: Pass
Standard:	FCC 15.207	
Tested by:	Uri Spector	
Test Point:	Power Line	
Operation mode:	See Page 5	
Note:	None	

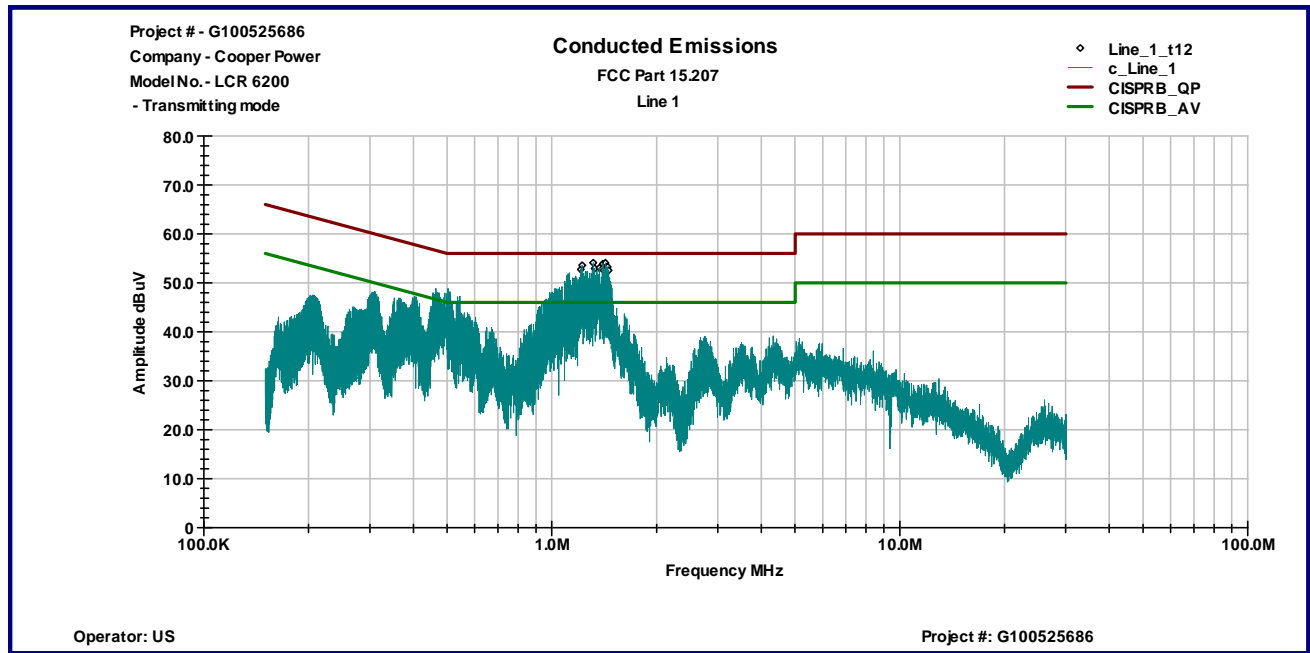
Table 3.7.1

Line 1

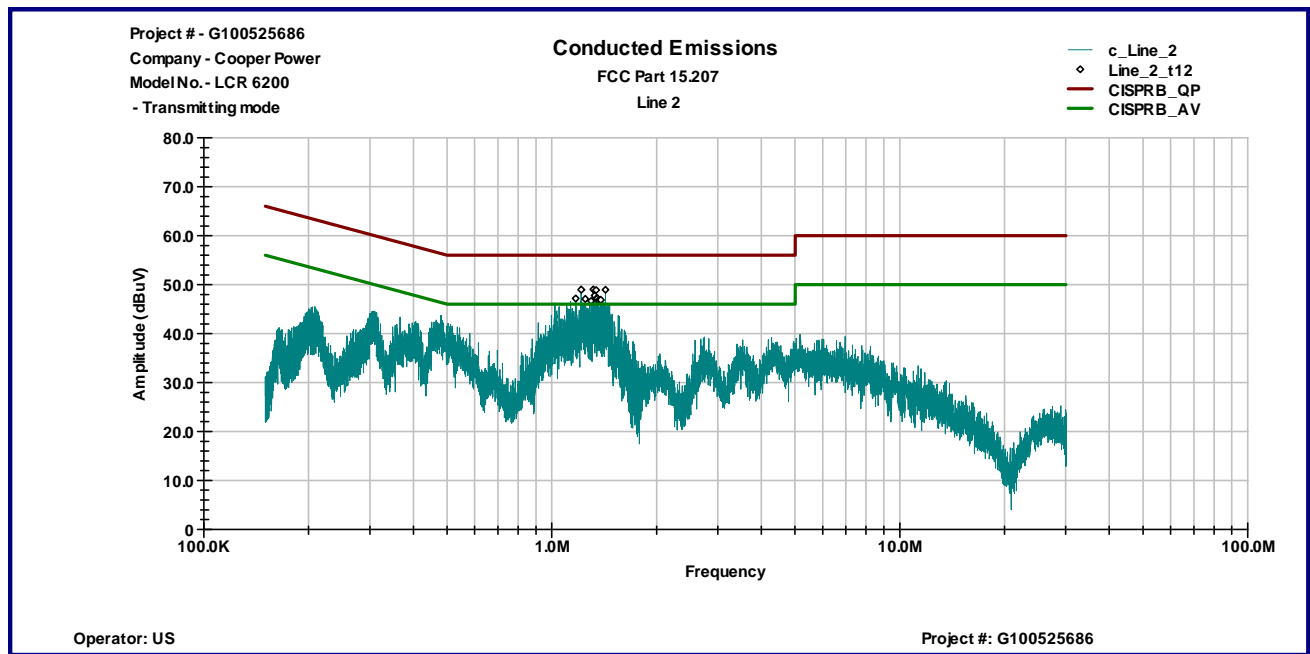
Frequency MHz	QP dBμV	AVG dBμV	Cable Loss dB	QP Lim dBμV	AVG Lim dBμV	QP Margin dB	AVG Margin dB
0.209	47.2	30.7	0.1	63.2	53.2	-16.0	-22.5
0.310	41.6	29.9	0.1	60.0	50.0	-18.2	-19.9
0.492	41.3	31.7	0.2	56.1	46.1	-14.7	-14.3
1.402	41.5	31.5	0.3	56.0	46.0	-14.2	-14.2
2.774	30.4	22.6	0.4	56.0	46.0	-25.2	-23.0
3.586	30.3	23.1	0.4	56.0	46.0	-25.3	-22.5

Line 2

Frequency MHz	QP dBμV	AVG dBμV	Cable Loss dB	QP Lim dBμV	AVG Lim dBμV	QP Margin dB	AVG Margin dB
0.208	45.4	30.2	0.1	63.3	53.3	-17.8	-23.0
0.309	38.2	28.8	0.1	60.0	50.0	-21.7	-21.1
0.480	36.0	30.0	0.2	56.3	46.3	-20.2	-16.2
1.317	40.1	28.6	0.3	56.0	46.0	-15.6	-17.1
2.742	30.2	23.0	0.4	56.0	46.0	-25.4	-22.6
3.538	30.6	24.1	0.4	56.0	46.0	-25.0	-21.5



Graph 3.7.1



Graph 3.7.2



3.8 Receiver/digital device radiated emissions

Test location: ☐ OATS ☒ Anechoic Chamber

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Frequency range: 30MHz-12.5GHz

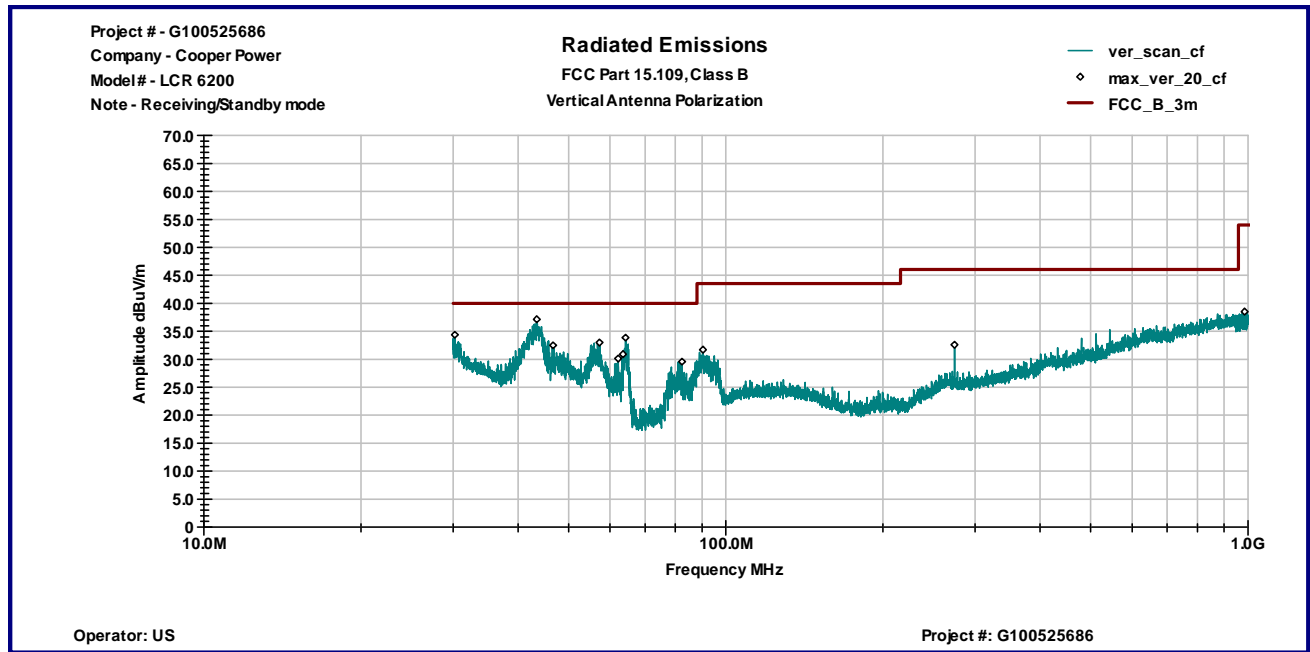
Max. Emissions margin: 2.9dB below the limits

Notes: The Radiated Emissions test was performed in the Anechoic chamber at 3m measurement distance (see Table 3.8.1 and Graphs 3.8.1 - 3.8.4)

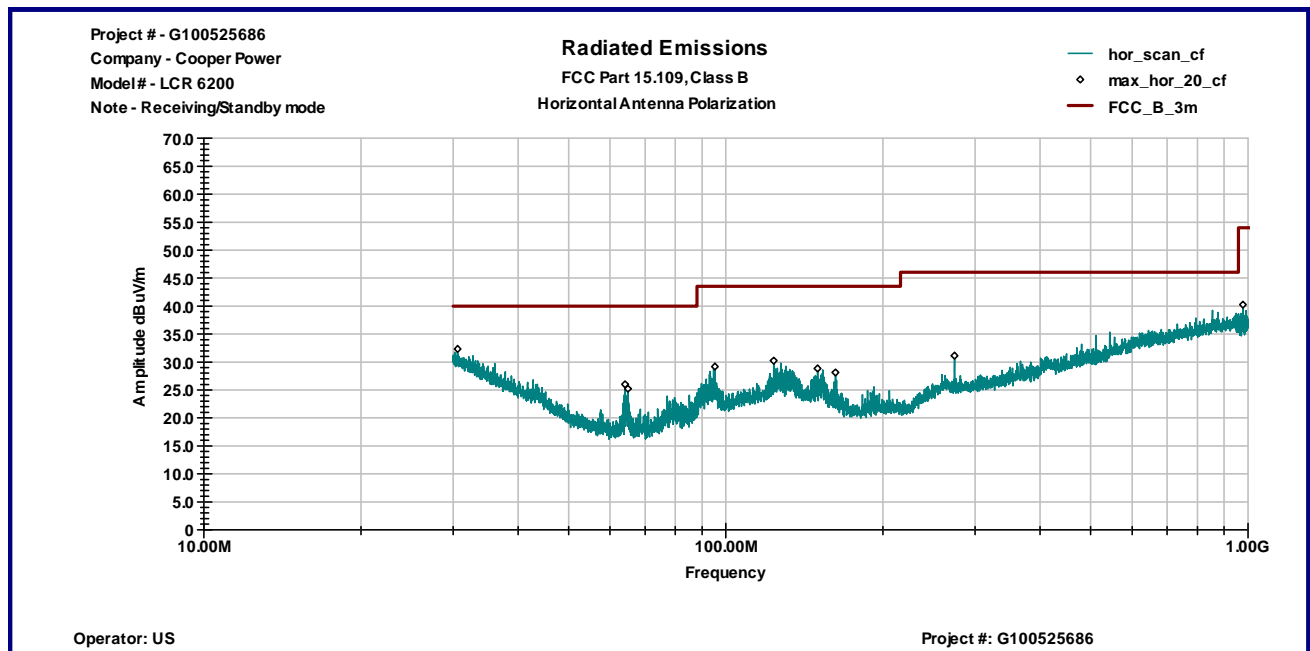
Date:	October 25, 2011	Result: Pass
Standard:	FCC Part 15.109, Class B	
Tested by:	Uri Spector	
Test Point:	Enclosure	
Operation mode:	Receiving/Standby mode	
Note:	None	

Table 3.8.1

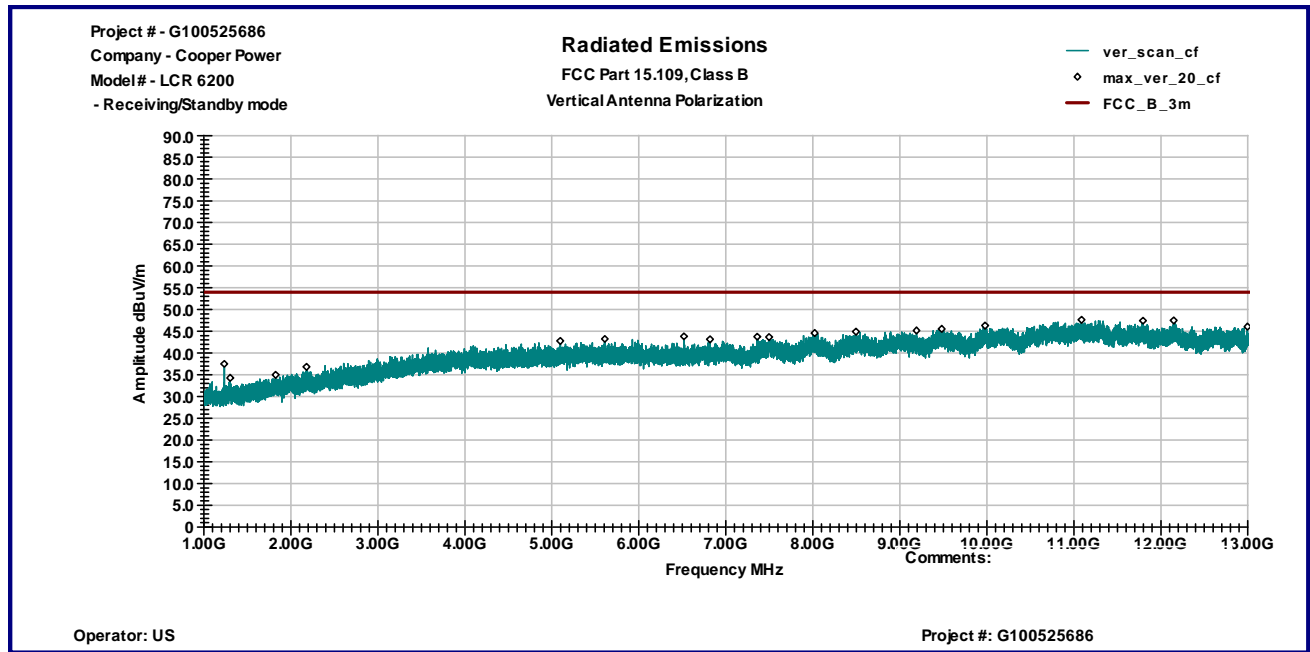
Frequency	Ant. Polarity	Peak Reading dB μ V	Ant.Factor dB1/m	Total at 3m dB μ V/m	QP Limit dB μ V/m	Margin dB
30.24 MHz	V	14.2	20.2	34.4	40.0	-5.6
43.421 MHz	V	24.0	13.1	37.1	40.0	-2.9
46.65 MHz	V	20.9	11.5	32.5	40.0	-7.5
57.263 MHz	V	25.4	7.6	33.0	40.0	-7.0
64.238 MHz	V	26.9	6.9	33.8	40.0	-6.2
82.435 MHz	V	20.4	9.2	29.6	40.0	-10.4
90.36 MHz	V	21.3	10.4	31.7	43.5	-11.8
274.19 MHz	V	16.9	15.6	32.6	46.0	-13.5
30.62 MHz	H	12.3	20.0	32.3	40.0	-7.7
64.131 MHz	H	19.1	6.9	26.0	40.0	-14.0
95.248 MHz	H	17.7	11.4	29.2	43.5	-14.3
123.47 MHz	H	16.2	14.0	30.2	43.5	-13.3
149.88 MHz	H	16.1	12.7	28.8	43.5	-14.7
162.12 MHz	H	16.3	11.8	28.1	43.5	-15.4
274.19 MHz	H	15.5	15.6	31.1	46.0	-14.9



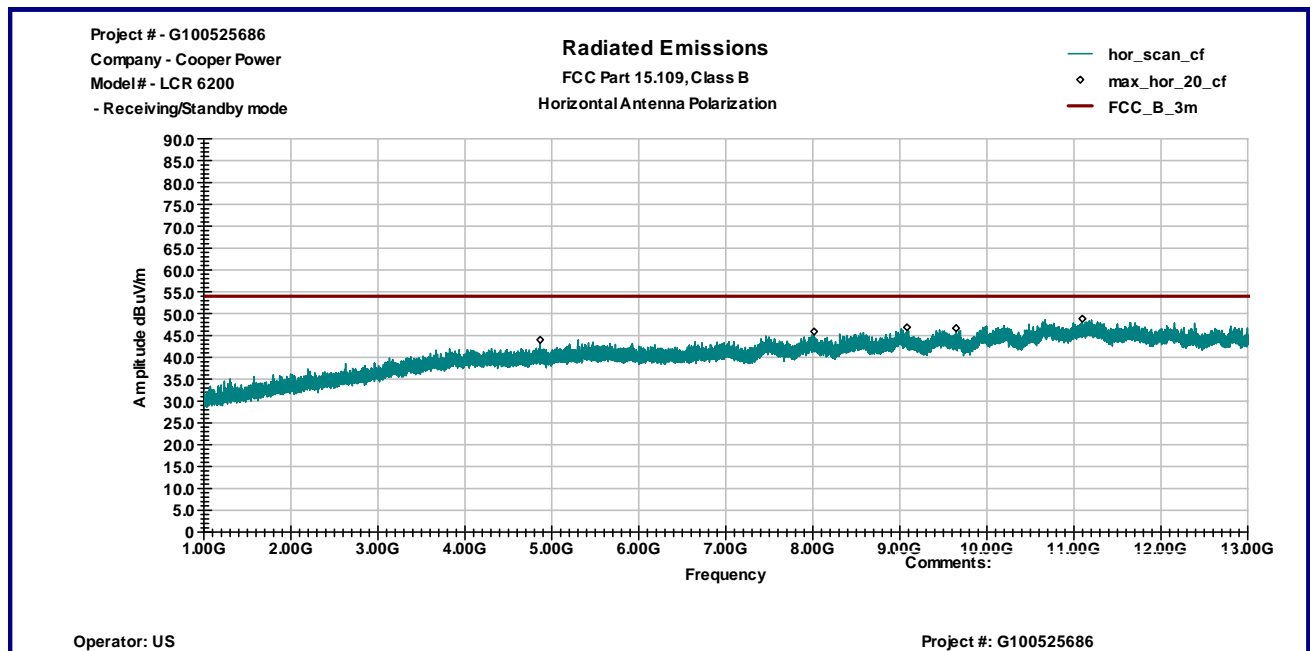
Graph 3.8.1



Graph 3.8.2



Graph 3.8.3



Graph 3.8.4



3.9 Digital device conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 14.2dB below the limits

Notes: None

Date:	October 25, 2011	Result: Pass
Standard:	FCC 15.107, Class B	
Tested by:	Uri Spector	
Test Point:	Power Line	
Operation mode:	Standby	
Note:	None	

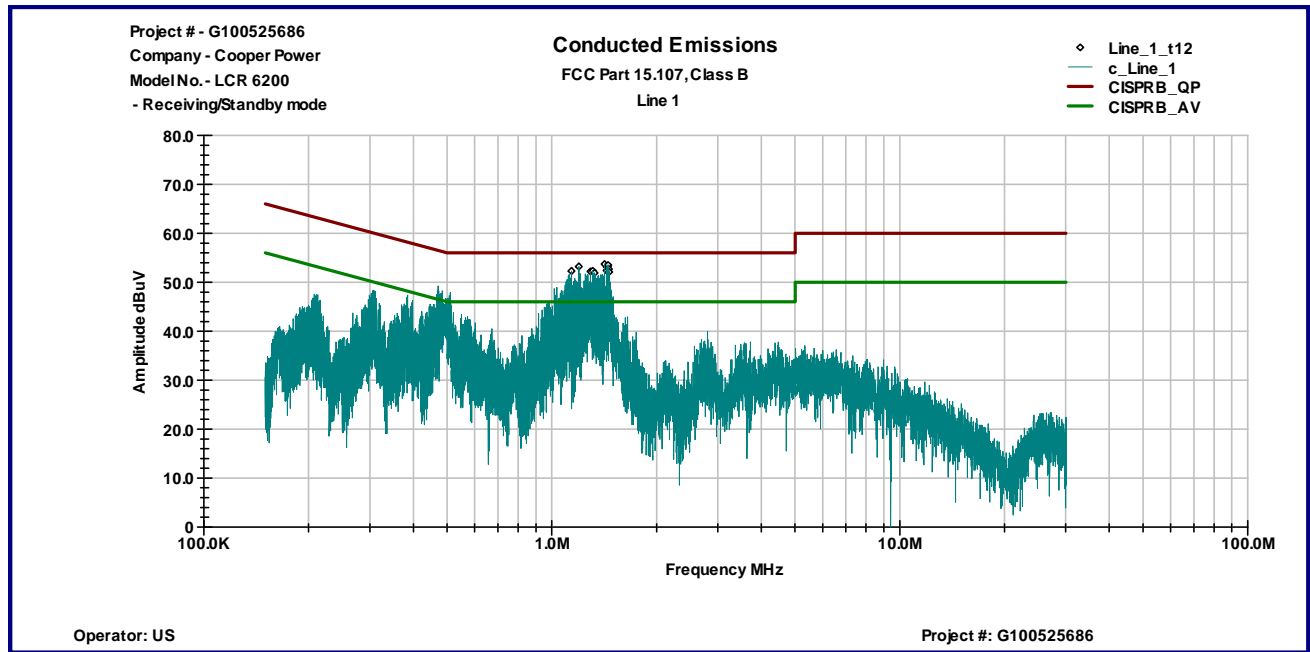
Table 3.9.1

Line 1

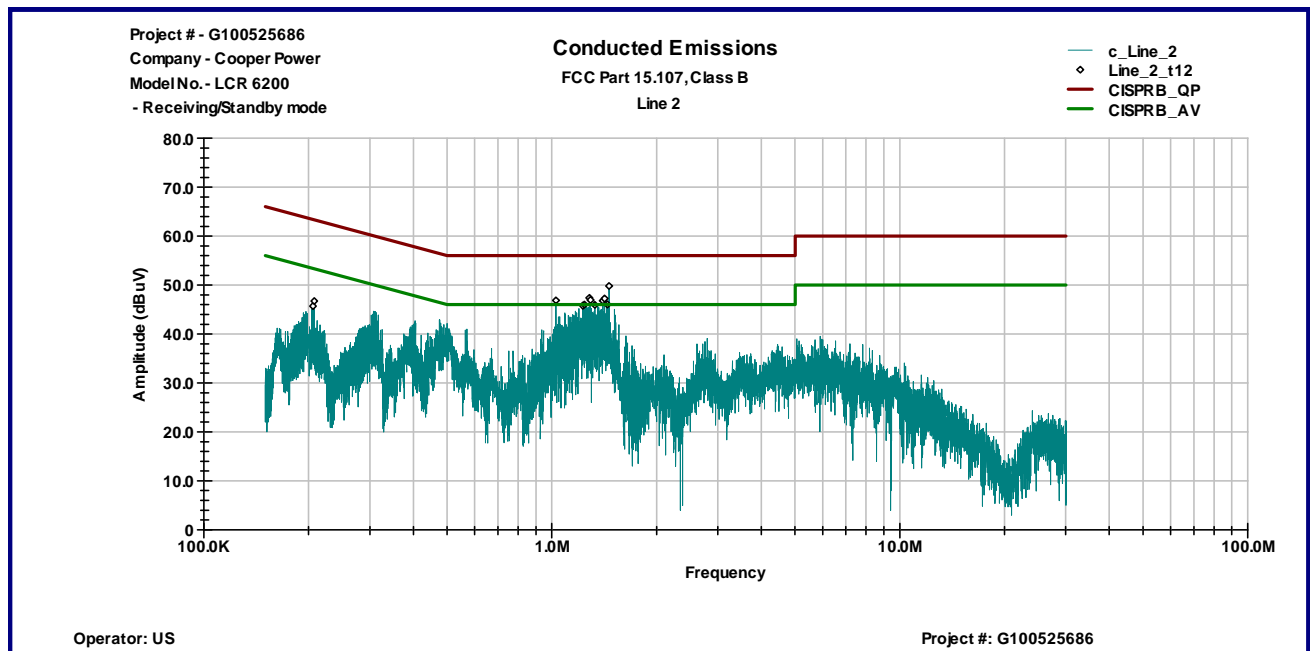
Frequency MHz	QP dBμV	AVG dBμV	Cable Loss dB	QP Lim dBμV	AVG Lim dBμV	QP Margin dB	AVG Margin dB
0.207	47.5	23.7	0.1	63.3	53.3	-15.7	-29.5
0.310	39.5	21.0	0.1	60.0	50.0	-20.3	-28.8
0.471	40.1	28.0	0.1	56.5	46.5	-16.2	-18.3
1.195	41.6	24.0	0.2	56.0	46.0	-14.2	-21.8
1.416	43.7	26.0	0.3	56.0	46.0	-12.0	-19.7
2.799	30.0	12.9	0.4	56.0	46.0	-25.6	-32.7

Line 2

Frequency MHz	QP dBμV	AVG dBμV	Cable Loss dB	QP Lim dBμV	AVG Lim dBμV	QP Margin dB	AVG Margin dB
0.207	46.7	24.0	0.1	63.3	53.3	-16.5	-29.2
1.028	34.1	24.4	0.2	56.0	46.0	-21.7	-21.4
1.282	38.0	21.0	0.2	56.0	46.0	-17.8	-24.8
1.460	37.9	21.9	0.3	56.0	46.0	-17.8	-23.8
2.797	30.0	16.0	0.4	56.0	46.0	-25.6	-29.6
5.050	30.0	19.0	0.5	60.0	50.0	-29.5	-30.5



Graph 3.9.1



Graph 3.9.2



4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSV 30	101101		11/09/2011	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	05/12/2012	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2630	14459	11/22/2011	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	9507-4513	9936	04/29/2012	<input checked="" type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	11/04/2011	<input checked="" type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-2 MOD.SD	316	9945	05/25/2012	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	11/06/2011	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	11/06/2011	<input checked="" type="checkbox"/>
High Pass Filter	Reactel	7HS-4G-S12	0223	015274	VBU	<input checked="" type="checkbox"/>
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>

