



## TEST REPORT

Report Number: 100240125MIN-001R

Project Number: G100240125

Testing performed on the  
Aquamantys3 Generator

FCC ID: Y73COGNITA001SAL

to  
47 CFR Part 15. 247:2010  
RSS- 210, Issue 8, 2010

For  
Minnetronix Inc.

Test Performed by:  
Intertek Testing Services NA, Inc.  
7250 Hudson Blvd., Suite 100  
Oakdale, MN 55128 USA

Test Authorized by:  
Minnetronix Inc.  
1635 Energy Park Drive  
Saint Paul, MN 55108, USA

Prepared by: SKhazon  
Simon Khazon

Date: June 28, 2011

Reviewed by: Norman Shpilsher  
Norman Shpilsher

Date: June 28, 2011

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## 1.0 GENERAL DESCRIPTION

<b>Model:</b>	Aquamantys3 Generator, catalogue number 40-404-1
<b>Type of EUT:</b>	Surgical Equipment
<b>Serial Number:</b>	001112
<b>FCC ID:</b>	Y73COGNITA001SAL
<b>Related Submittal(s) Grants:</b>	None
<b>Company:</b>	Minnetronix
<b>Customer:</b>	Mr. Vlad Bluvshstein
<b>Address:</b>	1635 Energy Park Drive Saint Paul, MN 55108, USA
<b>Phone:</b>	651-251-9401
<b>Fax:</b>	651-917-4066
<b>e-mail:</b>	vbluvshstein@minnetronix.com
<b>Test Standards:</b>	<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 15:2010, §15.107 and §15.109, Class A <input type="checkbox"/> ICES-003, Issue 4:2004 <input type="checkbox"/> Other <span style="background-color: #cccccc; display: inline-block; width: 80px; height: 1em; vertical-align: middle;"></span>
<b>Type of radio:</b>	<input checked="" type="checkbox"/> Stand -alone <input type="checkbox"/> Module <input type="checkbox"/> Hybrid
<b>Date Sample Submitted:</b>	January 14, 2011
<b>Test Work Started:</b>	January 14, 2011
<b>Test Work Completed:</b>	January 20, 2011
<b>Test Sample Conditions:</b>	<input type="checkbox"/> Damaged <input type="checkbox"/> Poor (Usable) <input checked="" type="checkbox"/> Good



## 1.1 Product Description; Test Facility

<b>Product Description:</b>	Wi-Fi Radio
<b>Transmitter Type:</b>	<input type="checkbox"/> FHSS <input checked="" type="checkbox"/> Digital Modulation <input checked="" type="checkbox"/> WiFi <input type="checkbox"/> Blue Tooth
<b>Operating Frequency Range(s):</b>	From 2400 to 2483.5 MHz
<b>Number of Channels:</b>	11
<b>Modulation:</b>	OFDM, DSSS, DBPSK, DQPSK, CCK , 16QAM, 64QAM
<b>Antenna(s) Info:</b>	Type: Embedded    Gain: 2.0dBi
<b>Antenna Installation:</b>	<input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory
<b>Transmitter power configuration:</b>	<input type="checkbox"/> Internal battery <input type="checkbox"/> External power source <input checked="" type="checkbox"/> 120-230VAC <input type="checkbox"/> 400VAC <input type="checkbox"/> <input type="text"/> VDC <input type="checkbox"/> Other: <input type="text"/> 6.0 Amp. <input checked="" type="checkbox"/> 50/60Hz
<b>Test Facility Accreditation:</b>	A2LA (Certificate No. 1427.01)
<b>Test Methodology:</b>	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	Transmitter was programmed to transmit continuously at low channel, middle channel, and upper channel Testing was performed at the maximum 54MBPS data transfer rate as a worse scenario for emissions; 6dB bandwidth measurements were performed at the maximum data transfer rate of 54MBPS and at the minimum data transfer rate of 1MBPS.

### Cables:

No.	Type	Length	Designation	Note
1	3 wires, unshielded	1.6 m	AC Power	

### Support equipment/Services:

No.	Item	Description
1	HP Laptop	Remote Laptop

## 1.3 Environmental conditions

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

### ☐ Normal

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

### ☐ Extreme

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

## 1.4 Measurement uncertainty

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

$\pm 4$  dB at 10m and  $\pm 5.4$  dB at 3m

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

$\pm 1.0$  dB

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

$\pm 2.6$  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( $\mu$ V/m)

RA = Receiver Amplitude in dB( $\mu$ 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( $\mu$ 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( $\mu$ 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**

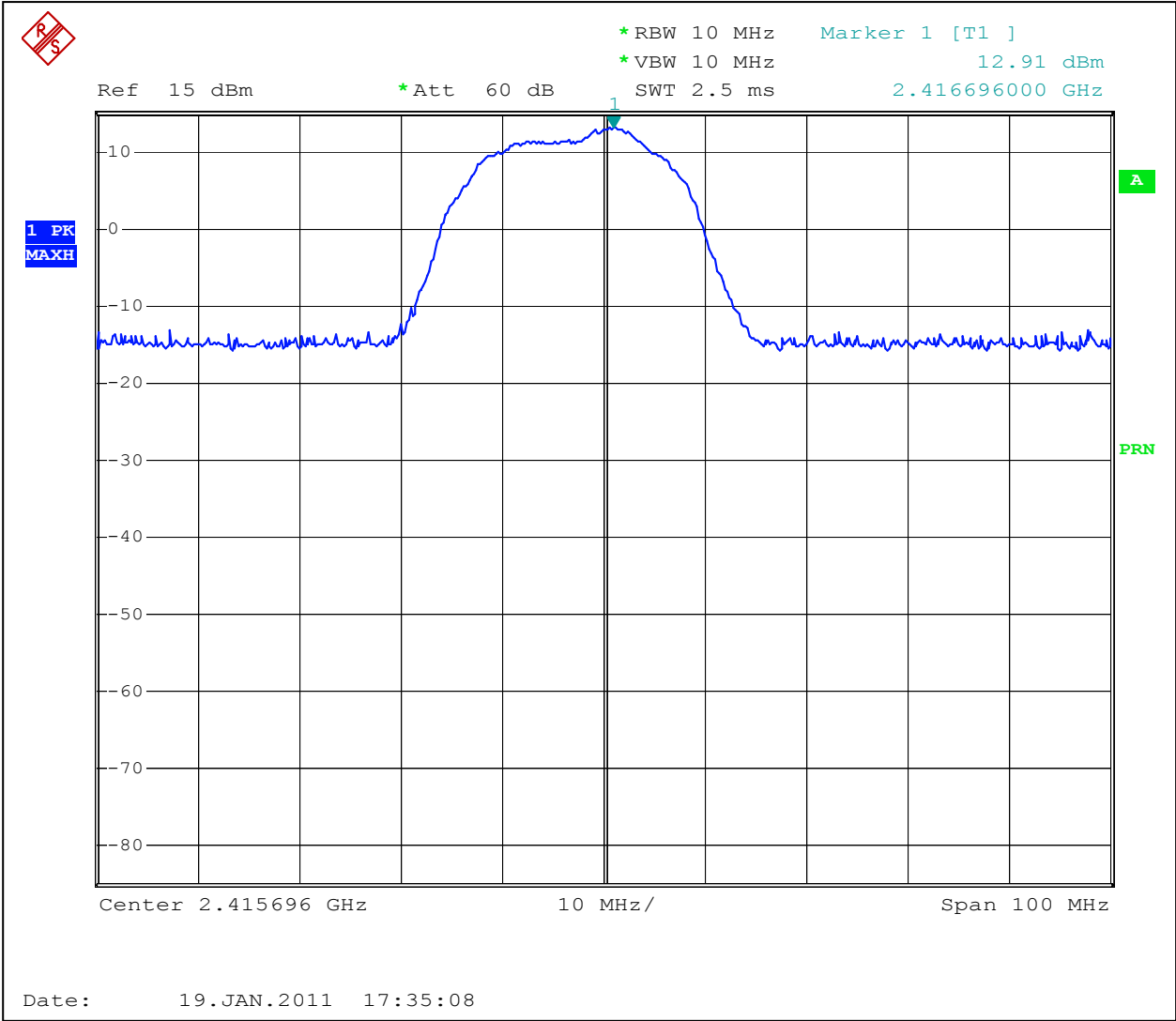
Max Emissions Margin: 16.6dB below the limits

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 power dBm	Attenuation dB	Power at Antenna dBm	Limit dBm	Limit Reduction dB	Margin dB
2416.69	12.9	0.1	13.0	30.0	0	-17.0
Middle Frequency MHz						
2440.49	12.3	0.1	12.4	30.0	0	-17.6
Upper Frequency MHz						
2467.29	13.3	0.1	13.4	30.0	0	-16.6
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 = 0 dB					

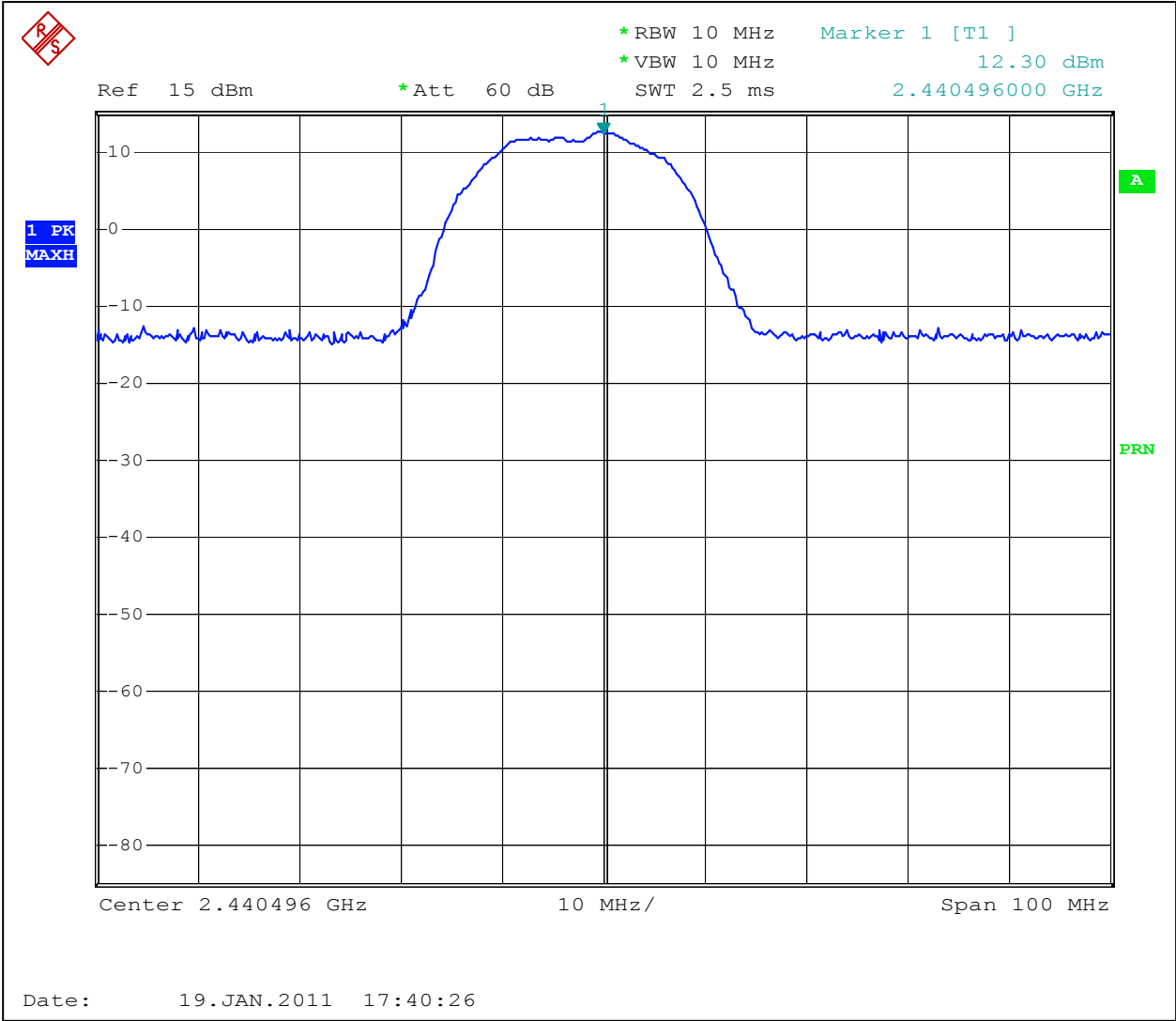
Notes:

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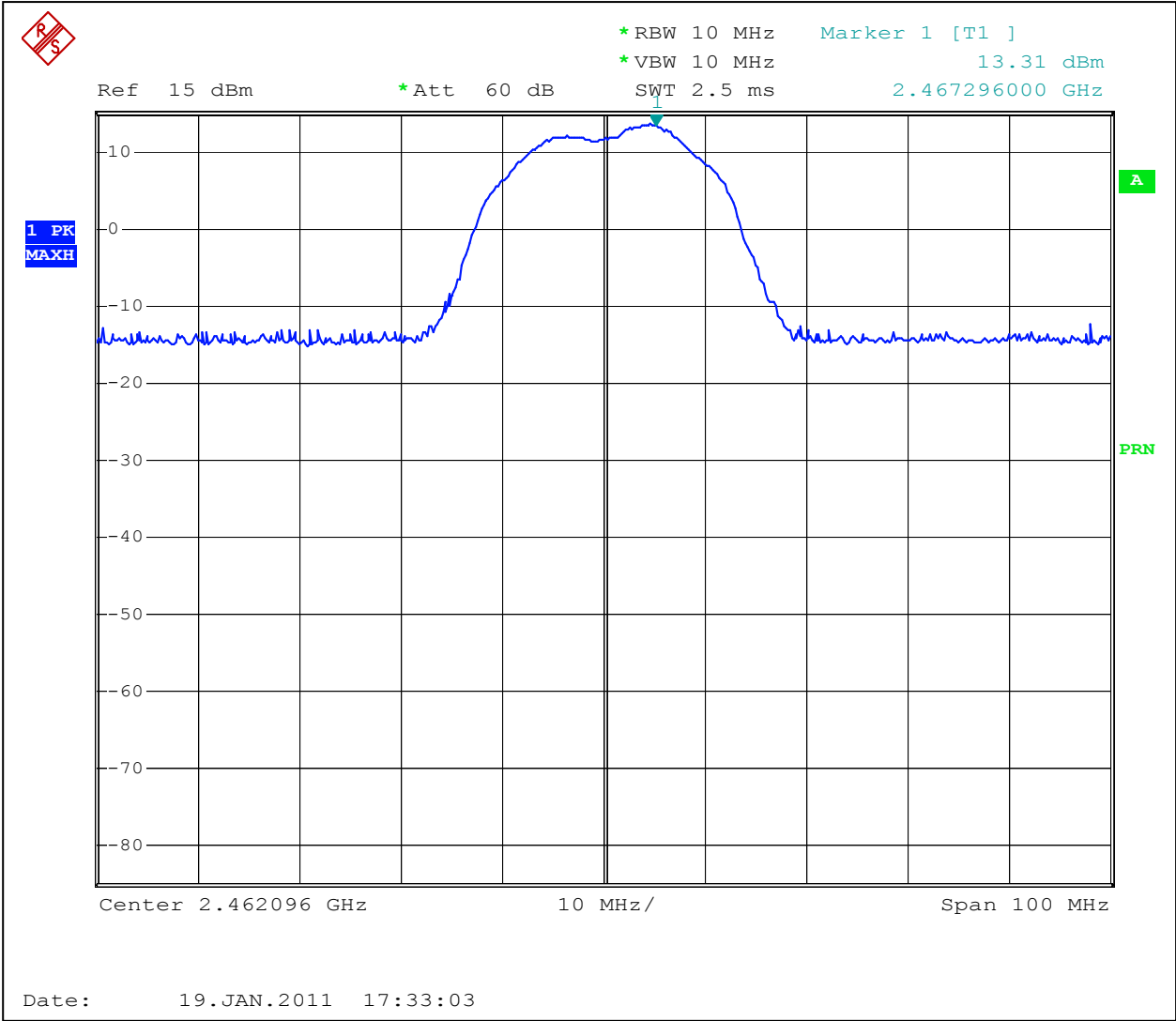




Graph 3.1.1



Graph 3.1.2



Graph 3.1.3

### 3.2 6dB bandwidth of the digital modulation

#### Data Transfer Rate – 1 MBPS

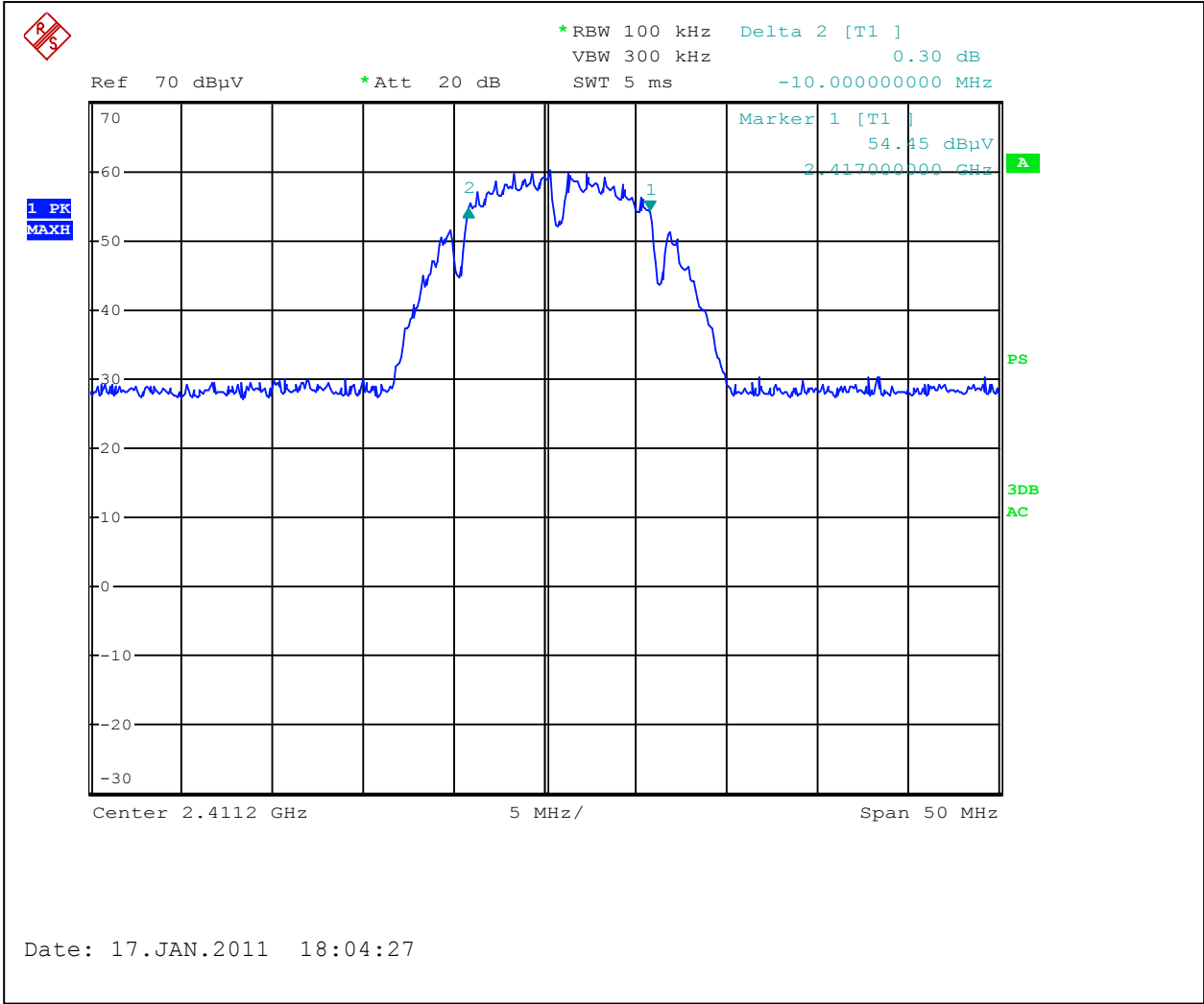
Low Frequency Channel kHz	Middle Frequency Channel kHz	Upper Frequency Channel kHz	Minimum Bandwidth kHz	Result
10,000	10,100	10,000	500	Pass
<b>RBW:</b> <input checked="" type="checkbox"/> 100kHz <input type="checkbox"/> other <input type="text"/> kHz <b>VBW:</b> <input type="checkbox"/> 100kHz <input checked="" type="checkbox"/> 300kHz <input type="checkbox"/> other <input type="text"/> kHz				

#### Data Transfer Rate – 54 MBPS

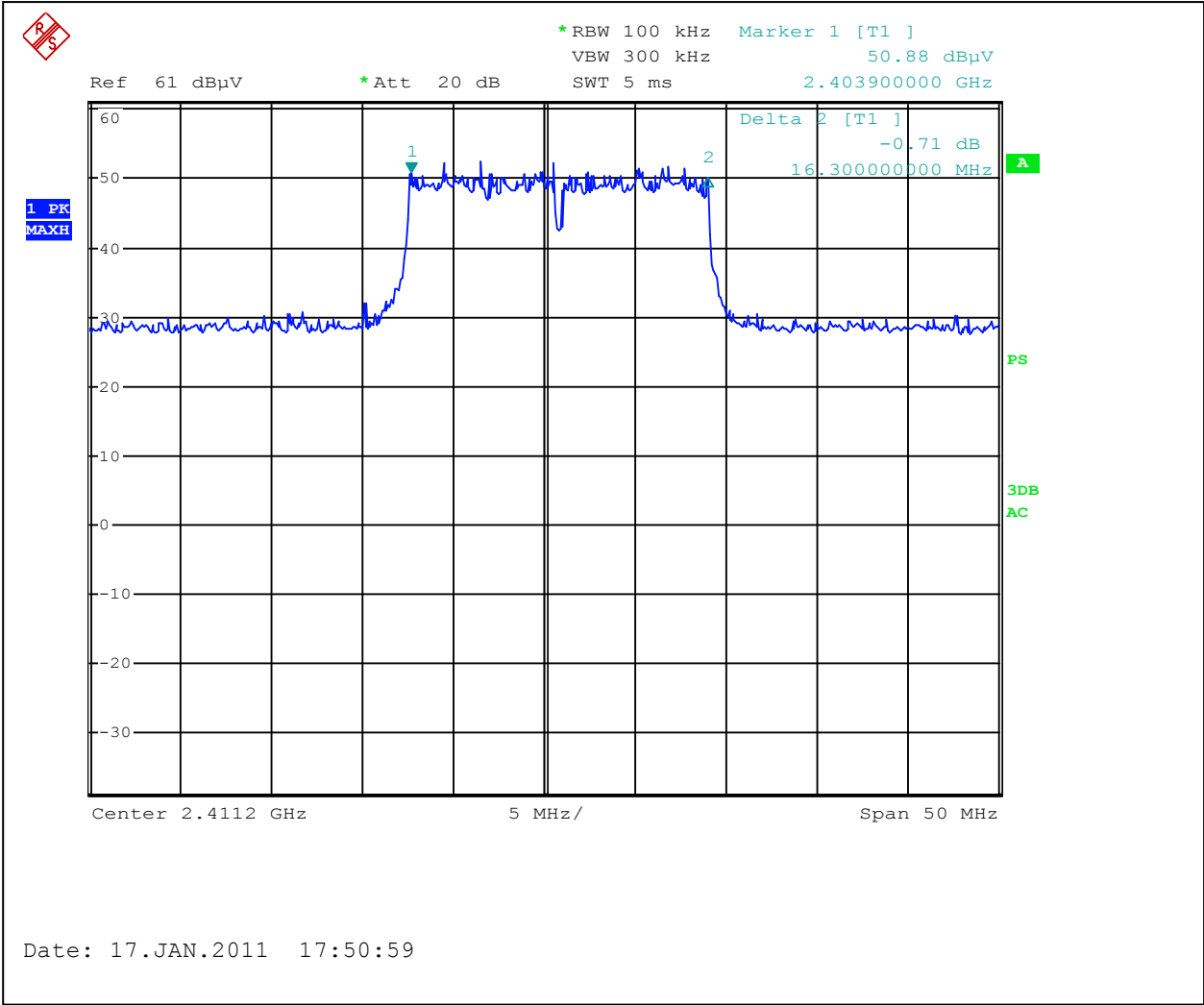
Low Frequency Channel kHz	Middle Frequency Channel kHz	Upper Frequency Channel kHz	Minimum Bandwidth kHz	Result
16,300	16,600	16,400	500	Pass
<b>RBW:</b> <input checked="" type="checkbox"/> 100kHz <input type="checkbox"/> other <input type="text"/> kHz <b>VBW:</b> <input type="checkbox"/> 100kHz <input checked="" type="checkbox"/> 300kHz <input type="checkbox"/> other <input type="text"/> kHz				

Notes:

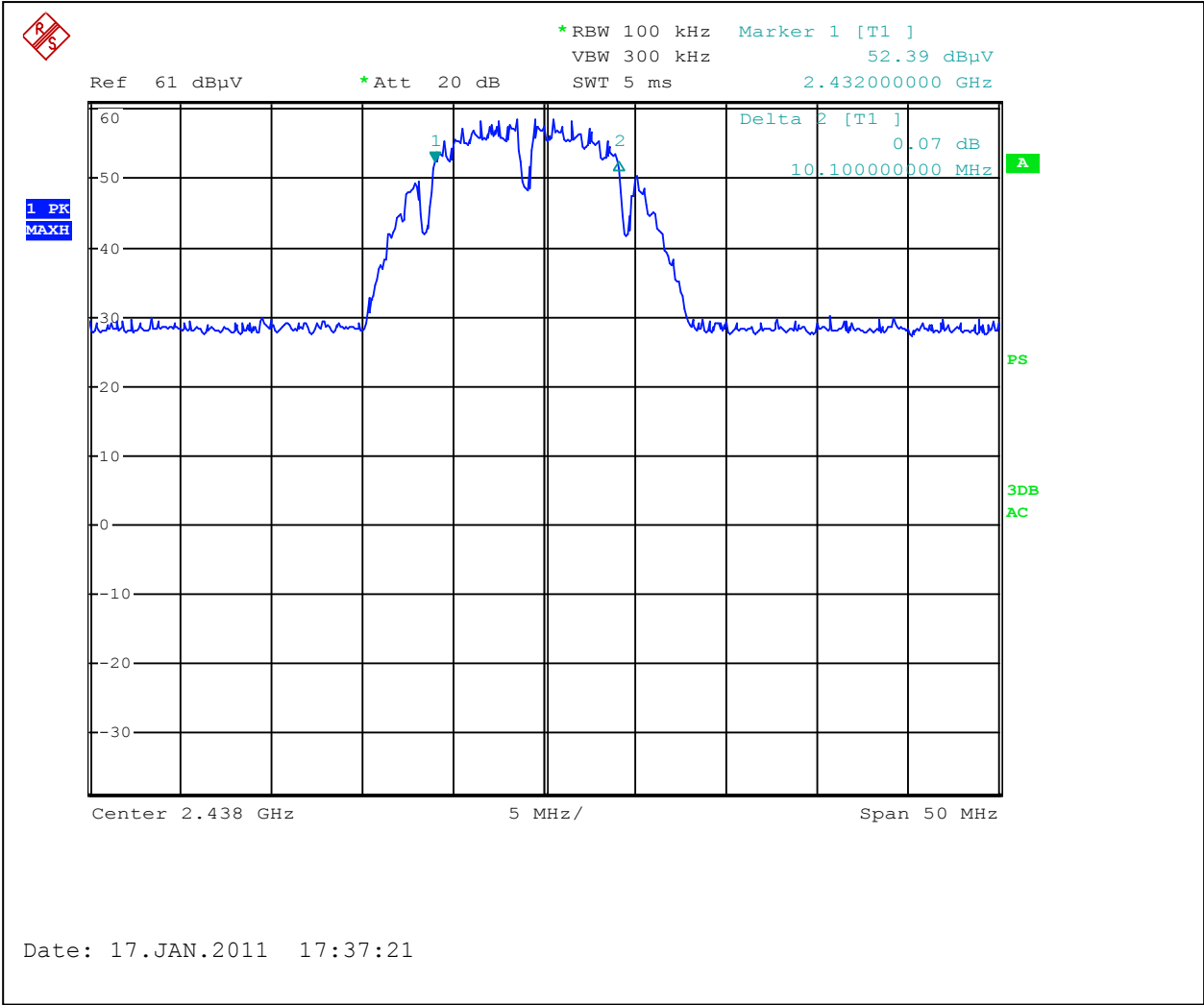
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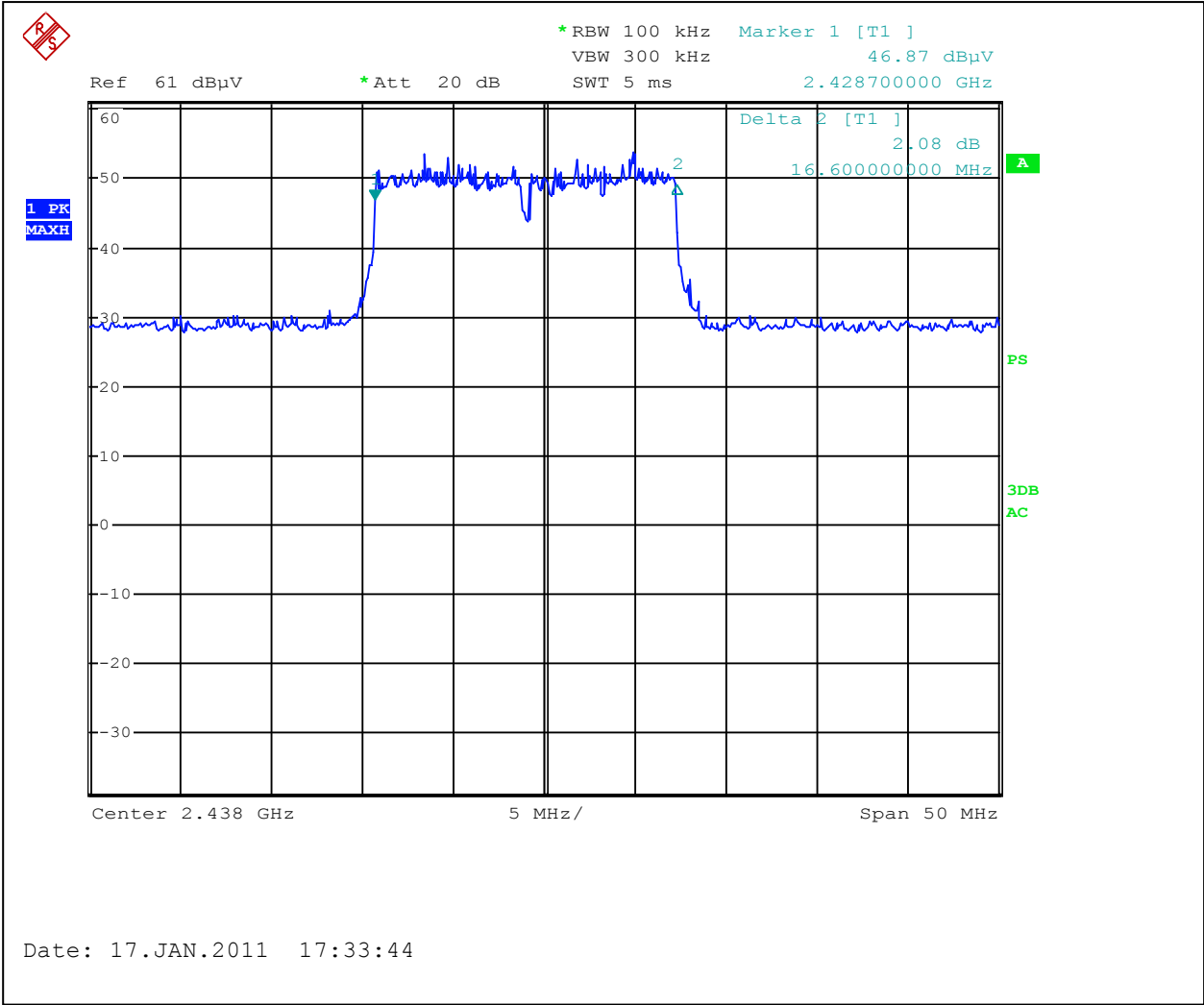
Graph 3.2.1



Graph 3.2.2

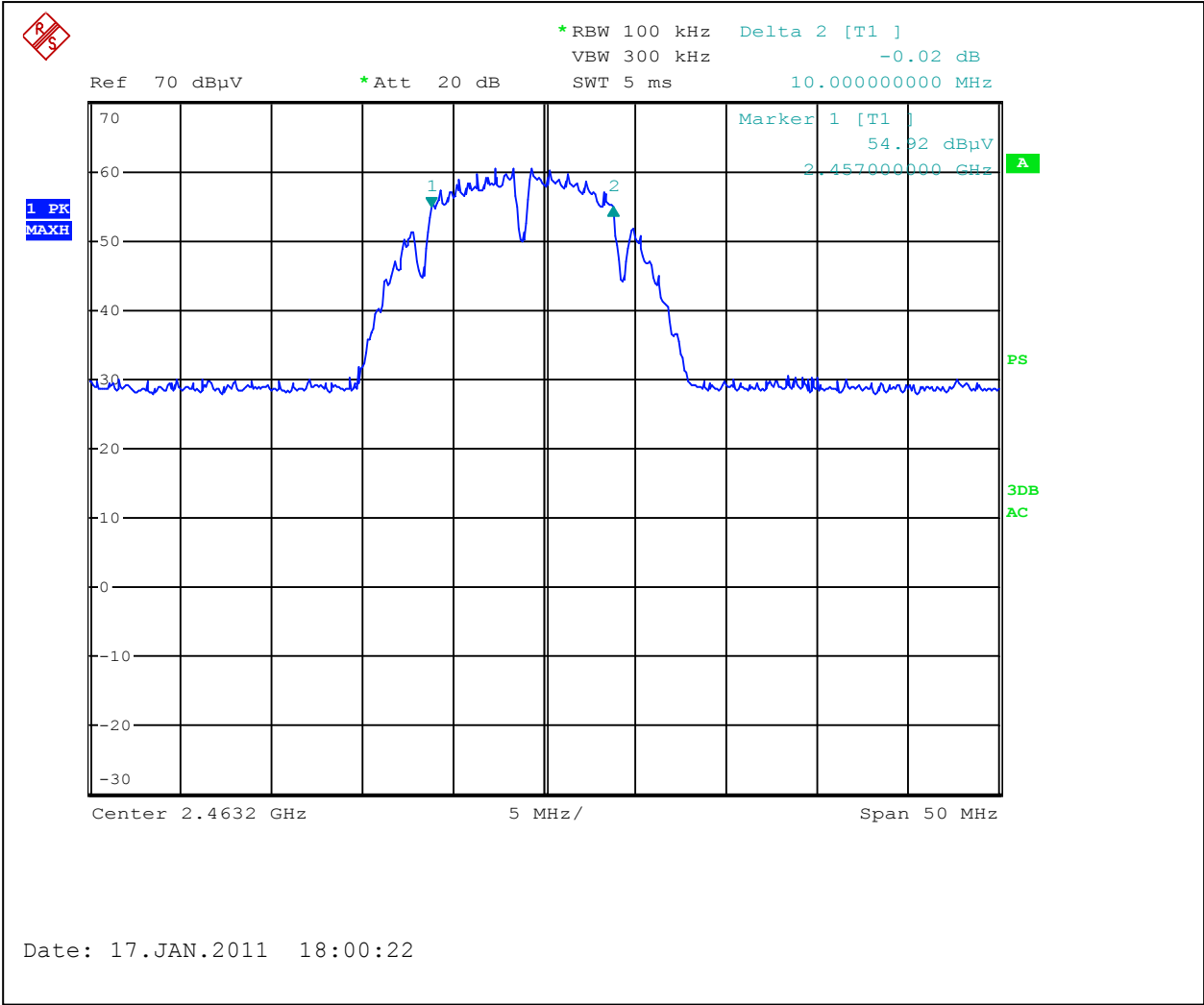


Graph 3.2.3

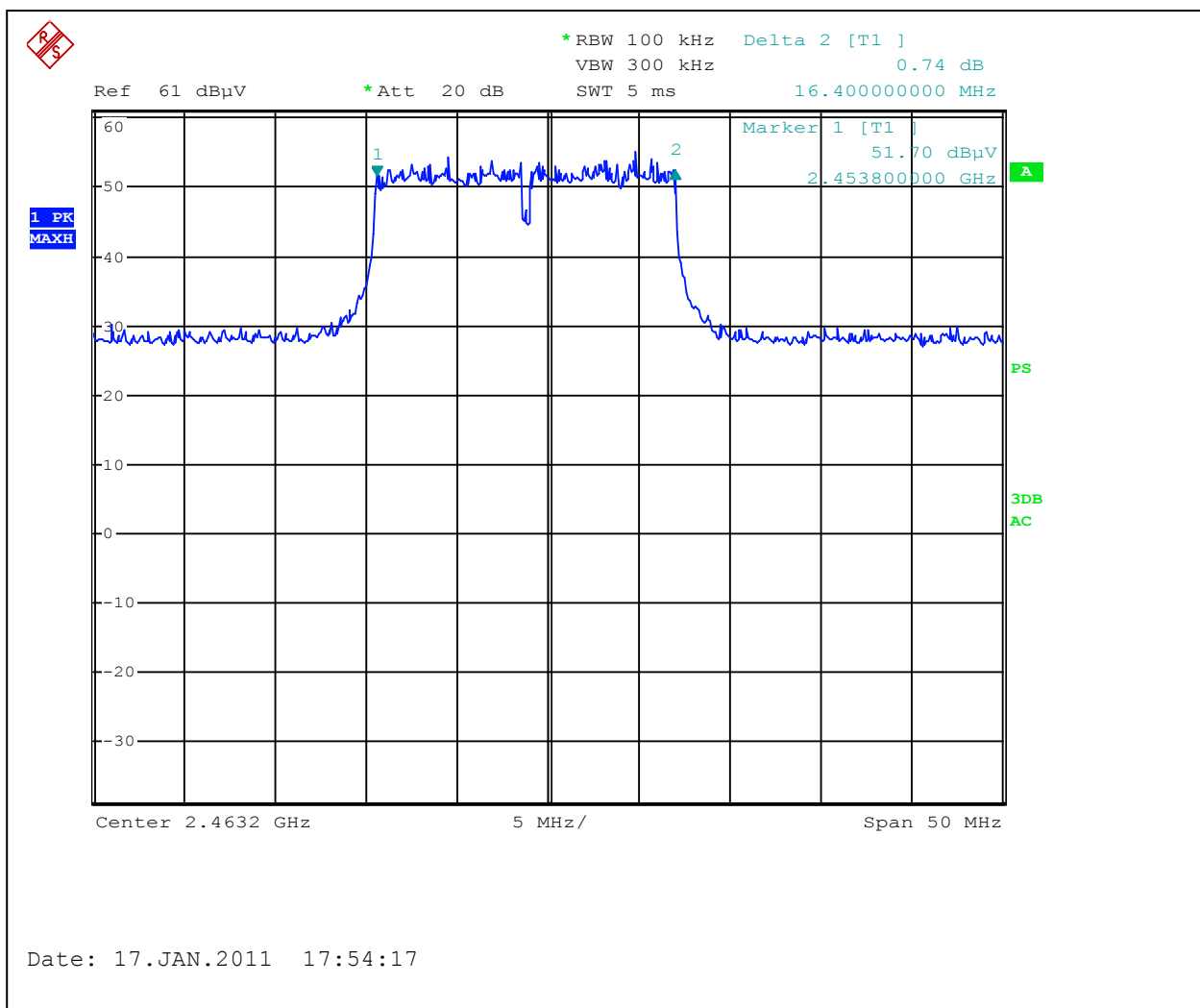


Graph 3.2.4





Graph 3.2.5



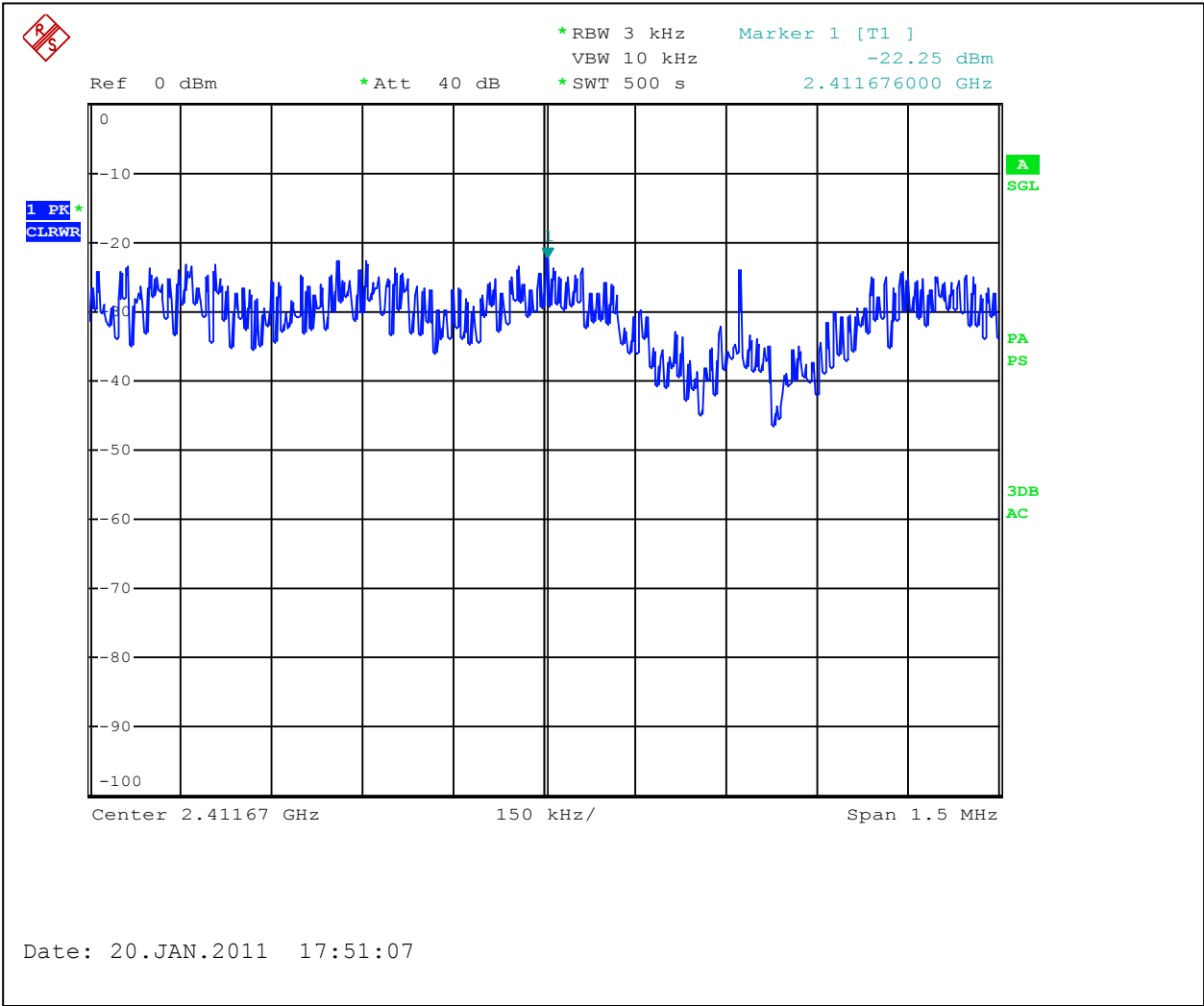
Graph 3.2.6

### 3.3 Power spectral density

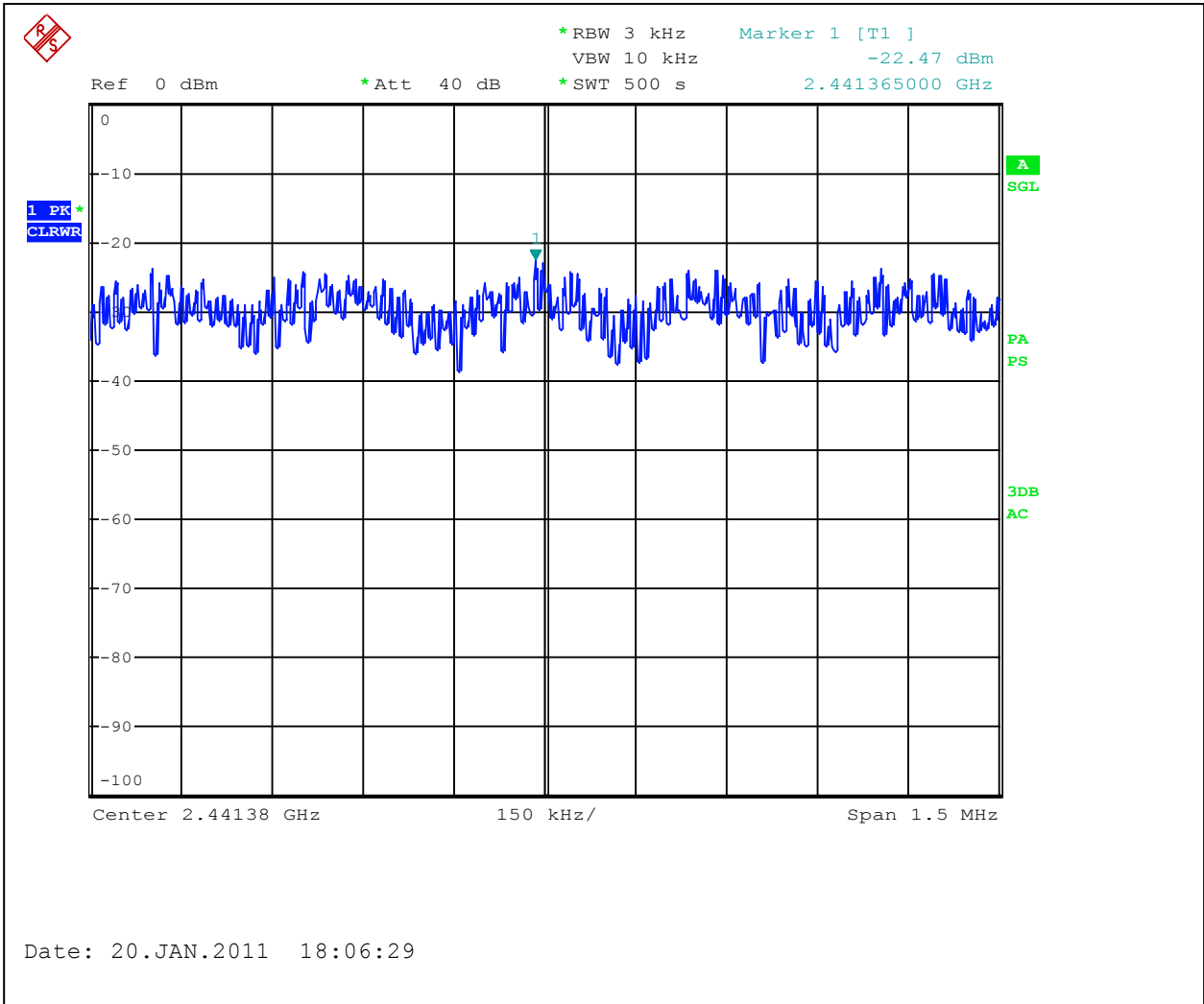
Power Output:	<input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated			
	Measured Density dBm or dBμV/m	Power Spectral Density dBm	Limit dBm	Margin dB
Low Frequency Channel	-22.25	-22.15	8	-30.15
Middle Frequency Channel	-22.47	-22.37	8	-30.37
Upper Frequency Channel	-22.20	-22.10	8	-30.1
Analyzer Settings:	<input checked="" type="checkbox"/> RBW=3KHz <input checked="" type="checkbox"/> VBW=10KHz <input checked="" type="checkbox"/> Span=1.5 MHz <input checked="" type="checkbox"/> Sweep=500 sec			
Antenna Gain:	<input checked="" type="checkbox"/> < 6dBi and = <input type="text"/> 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/attenuator loss of 0.1dB from the measured density value.

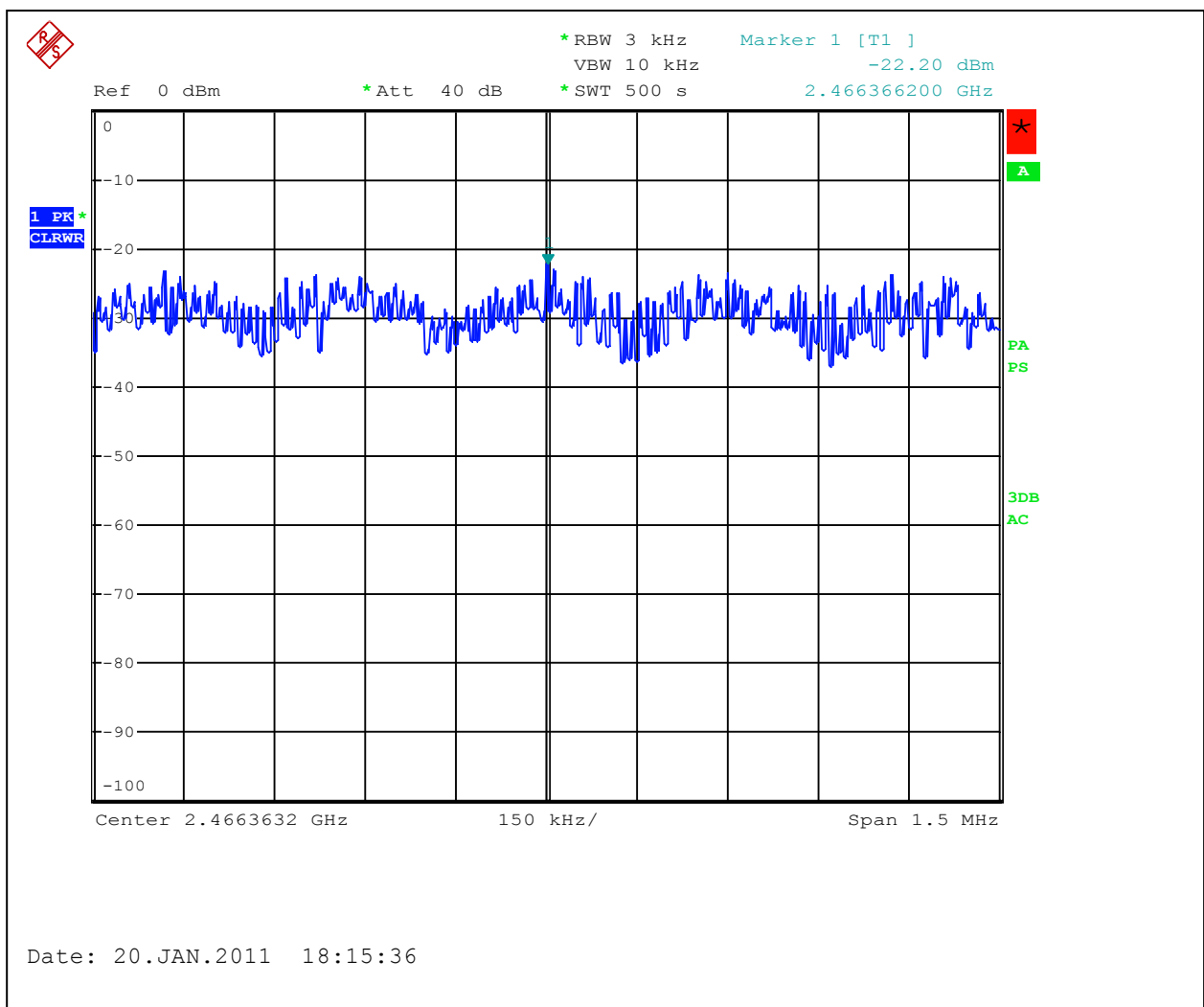
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Graph 3.3.1



Graph 3.3.2

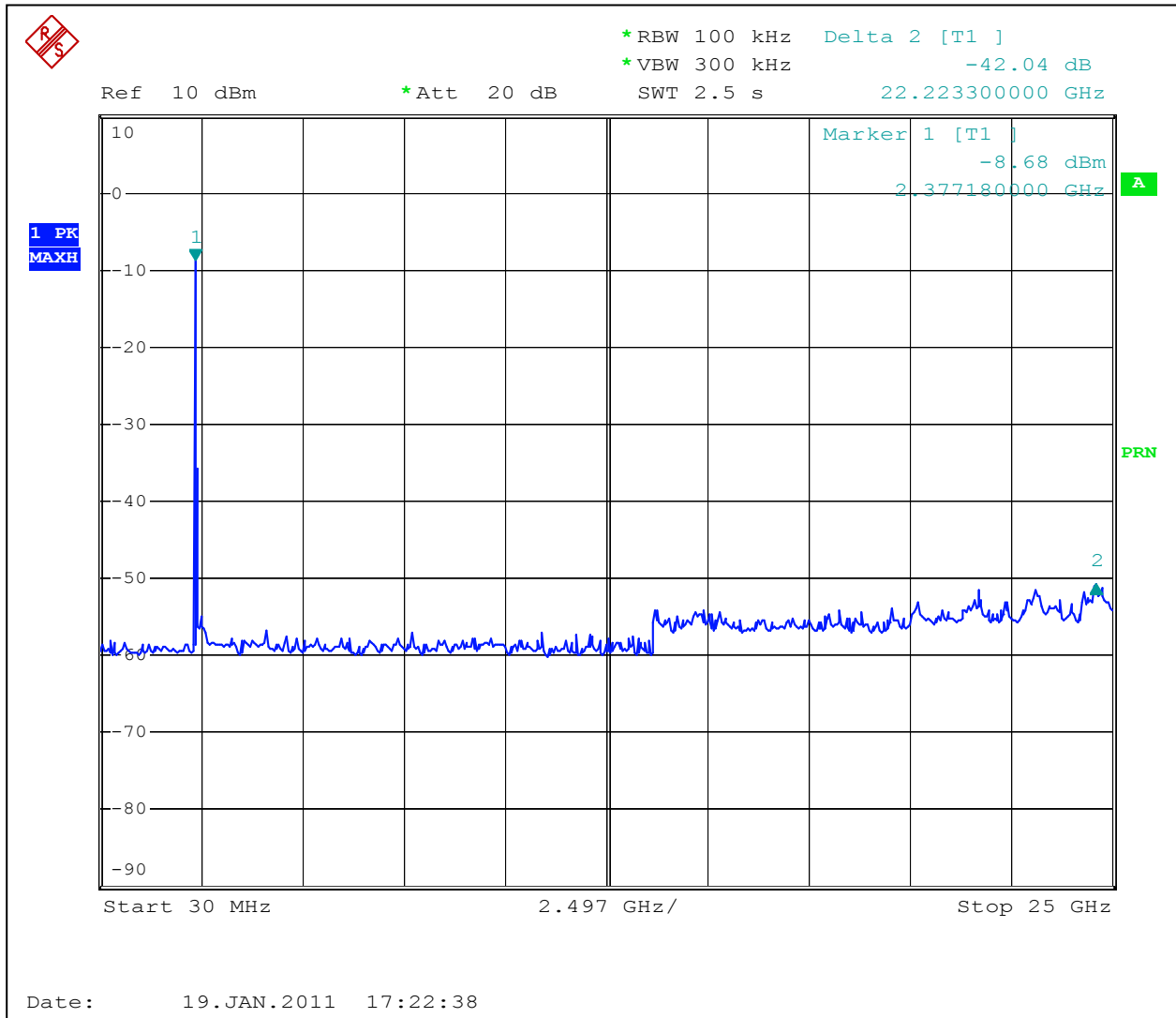


Graph 3.3.3

### 3.4 Antenna conducted spurious emissions

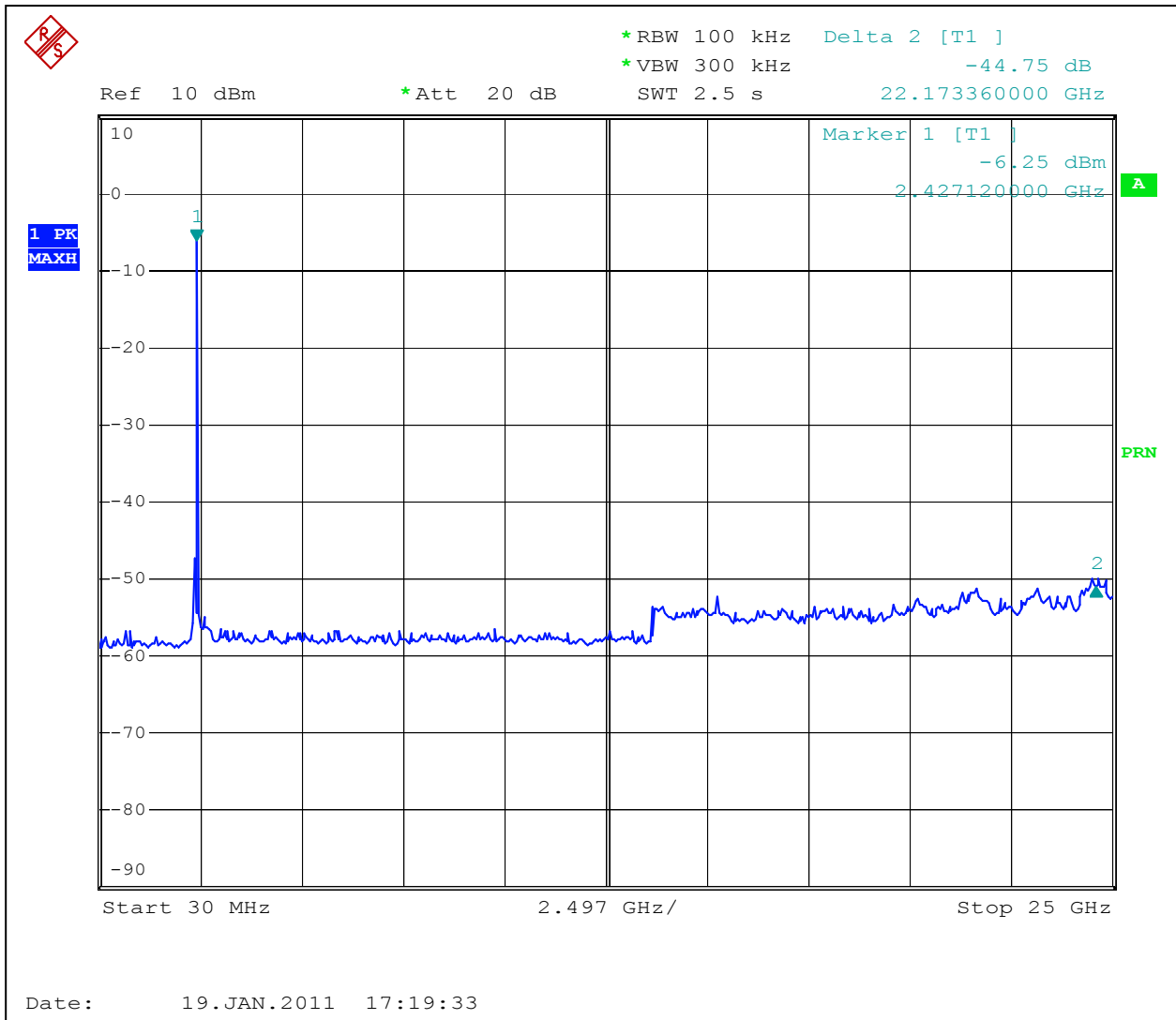
	Minimum Measured Attenuation dB	Minimum Allowed Attenuation dB	Margin dB
Low Frequency Channel	42.04	20	- 22.04
Middle Frequency Channel	44.75	20	-24.75
Upper Frequency Channel	43.77	20	-23.77
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz		
<b>Minimum Allowed Attenuation:</b>	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

**Notes:** Band edge emissions compliance is demonstrated on graphs 3.2.1, 3.2.2, 3.2.5, and 3.2.6: no emissions above ambient were detected outside of 2400 – 2483.5MHz band

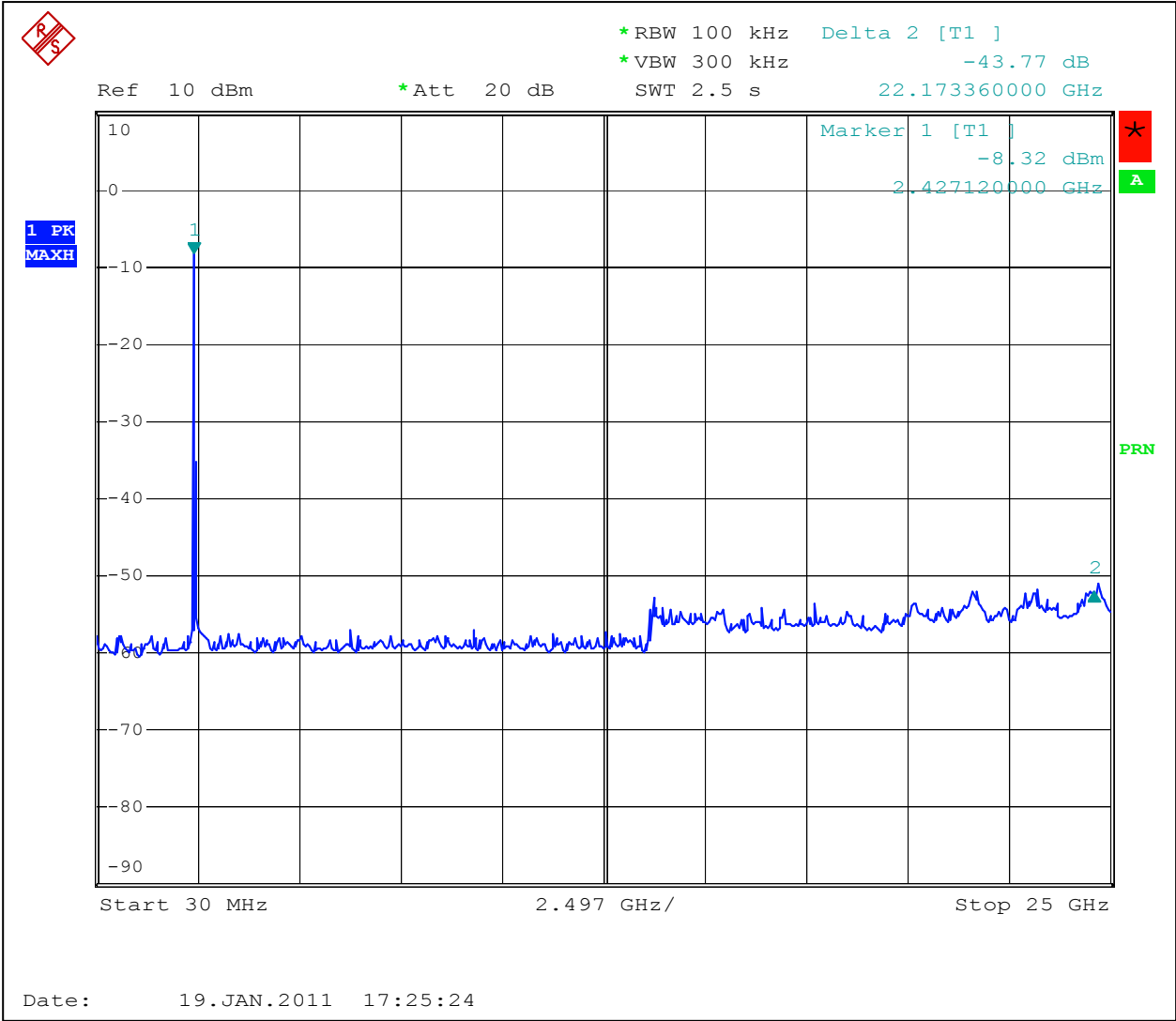


Graph 3.4.1





Graph 3.4.2



Graph 3.4.3

### 3.5 Radiated spurious emissions

**Test location:** ☐ OATS ☒ Anechoic Chamber ☐ Other

**Test result:** **Pass**

**Max. Margin:** 0.1 dB below the limits

- Notes:**
1. Tables 3.5.1-3.5.2 and Graphs 3.5.1-3.5.15 show radiated spurious emissions compliance.
  2. No spurious or harmonics emissions above ambient were detected above 2GHz (fundamental frequencies are excluded)
  3. Band edge emissions compliance: no emissions above ambient were detected at 2400 and 2483.5MHz.

<b>Date:</b>	January 17, 2011	<b>Result: Pass</b>
<b>Standard:</b>	FCC part 15.247(d)	
<b>Tested by:</b>	Simon Khazon	
<b>Test Point:</b>	Low frequency channel (1)	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	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
31.369 MHz	V	11.9	19.6	31.5	40.0	-8.5
60.006 MHz	V	19.7	7.1	26.7	40.0	-13.3
79.94 MHz	V	25.9	8.9	34.8	40.0	-5.2
119.99 MHz	V	28.7	14.0	42.8	43.5	-0.8
139.97 MHz	V	19.0	13.3	32.3	43.5	-11.2
280.07 MHz	V	23.7	15.6	39.2	46.0	-6.8
519.96 MHz	V	16.4	20.8	37.2	46.0	-8.8
580.03 MHz	V	18.3	22.4	40.7	46.0	-5.3
1.9152 GHz	V	12.1	34.3	46.4	54.0	-7.6
30.632 MHz	H	11.7	20.0	31.7	40.0	-8.3
113.09 MHz	H	20.4	13.8	34.2	43.5	-9.3
119.99 MHz	H	28.9	14.0	42.9	43.5	-0.6
284.06 MHz	H	19.5	15.6	35.1	46.0	-10.9
288.04 MHz	H	16.8	15.7	32.5	46.0	-13.5

<b>Date:</b>	January 17-18, 2011	<b>Result: Pass</b>
<b>Standard:</b>	FCC part 15.247(d)	
<b>Tested by:</b>	Simon Khazon	
<b>Test Point:</b>	Middle frequency channel (6)	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	None	

**Table 3.5.2**

Frequency	Ant. Polarity	Peak Reading dB $\mu$ V	Ant.Factor dB1/m	Total at 3m dB $\mu$ V/m	QP Limit dB $\mu$ V/m	Margin dB
79.94 MHz	V	25.4	8.9	34.3	40.0	-5.7
119.99 MHz	V	28.7	14.0	42.8	43.5	-0.8
280.07 MHz	V	23.1	15.6	38.7	46.0	-7.3
479.92 MHz	V	16.6	20.3	36.9	46.0	-9.2
499.94 MHz	V	16.2	20.8	37.0	46.0	-9.0
539.99 MHz	V	16.0	21.3	37.3	46.0	-8.7
580.03 MHz	V	17.7	22.4	40.1	46.0	-5.9
864.46 MHz	V	13.8	25.1	38.9	46.0	-7.1
31.369 MHz	H	12.9	19.6	32.5	40.0	-7.5
113.35 MHz	H	20.1	13.8	33.9	43.5	-9.6
119.99 MHz	H	29.4	14.0	43.4	43.5	-0.1
280.07 MHz	H	22.0	15.6	37.6	46.0	-8.4
580.03 MHz	H	15.4	22.4	37.8	46.0	-8.2
959.09 MHz	H	12.6	26.0	38.6	46.0	-7.4

<b>Date:</b>	January 18, 2011	<b>Result: Pass</b>
<b>Standard:</b>	FCC part 15.247(d)	
<b>Tested by:</b>	Simon Khazon	
<b>Test Point:</b>	Upper frequency channel (11)	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	None	

**Table 3.5.3**

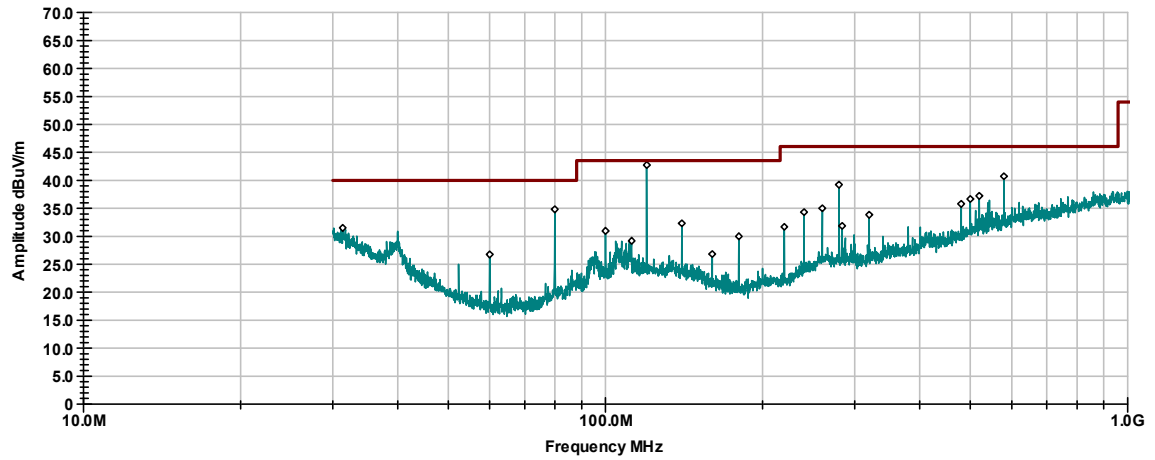
Frequency	Ant. Polarity	Peak Reading dB $\mu$ V	Ant.Factor dB1/m	Total at 3m dB $\mu$ V/m	QP Limit dB $\mu$ V/m	Margin dB
30.772 MHz	V	11.5	19.9	31.4	40.0	-8.6
79.94 MHz	V	26.1	8.9	35.0	40.0	-5.1
119.99 MHz	V	27.5	14.0	41.6	43.5	-2.0
280.07 MHz	V	23.2	15.6	38.7	46.0	-7.3
519.96 MHz	V	15.8	20.8	36.6	46.0	-9.4
539.99 MHz	V	16.2	21.3	37.4	46.0	-8.6
580.03 MHz	V	18.0	22.4	40.4	46.0	-5.7
30.175 MHz	H	11.7	20.2	31.9	40.0	-8.1
119.99 MHz	H	29.3	14.0	43.4	43.5	-0.2
280.07 MHz	H	21.2	15.6	36.7	46.0	-9.3

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Channel1, Tx, 14 dBm power

## Radiated Emissions

FCC Part 15.209  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf  
— FCC\_B\_3m



Operator: Simon Khazon

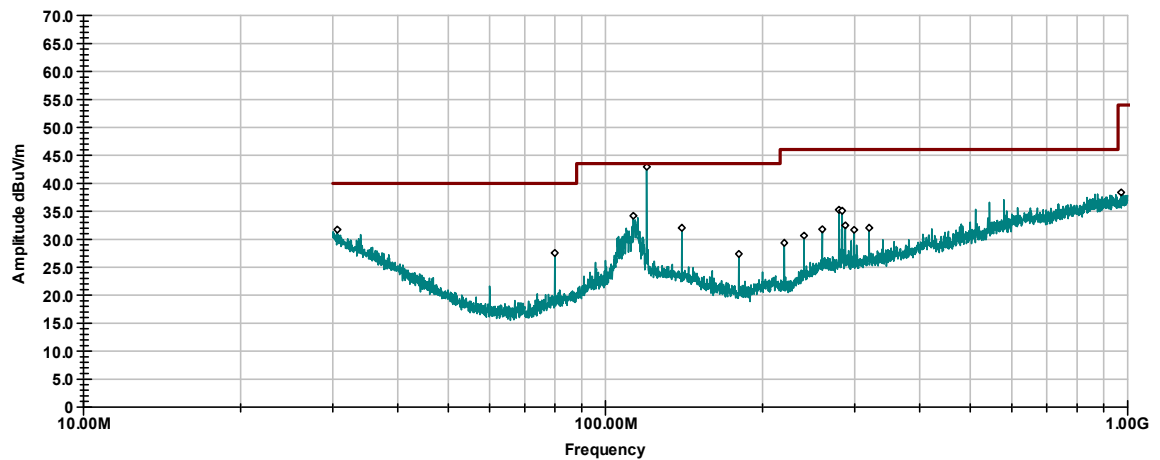
Project #: G100240125

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Company - Minnetronix  
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## Radiated Emissions

FCC Part 15.209  
Horizontal Antenna Polarization

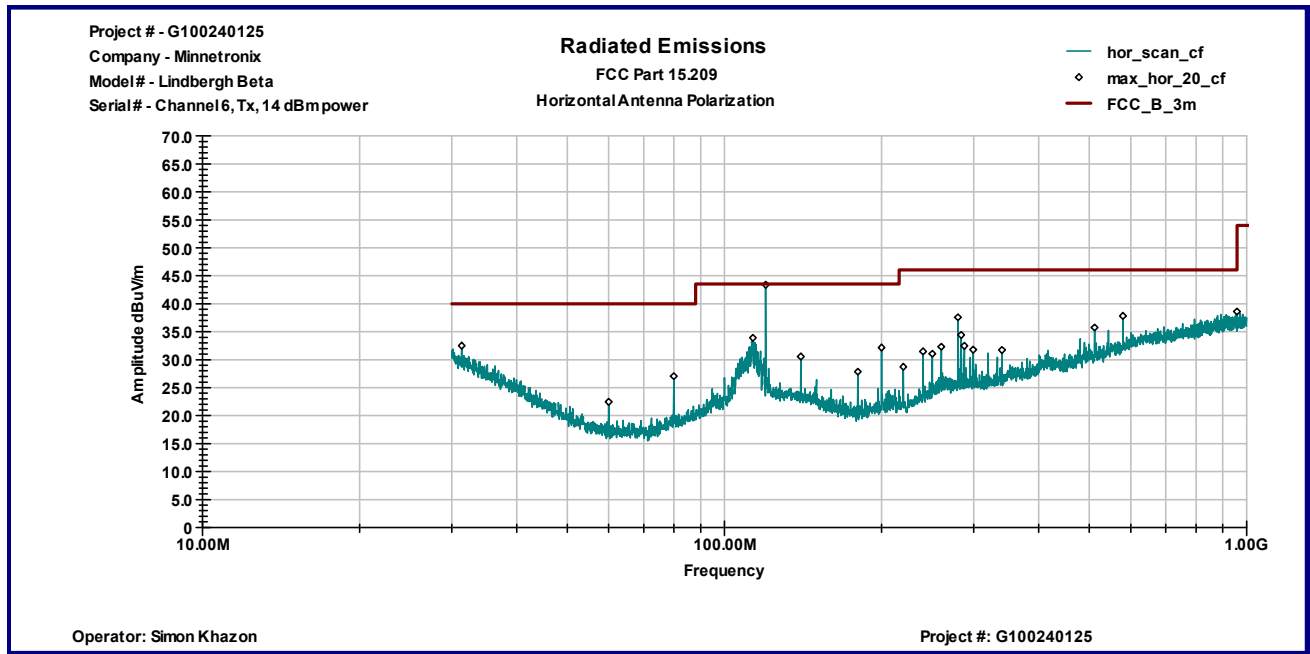
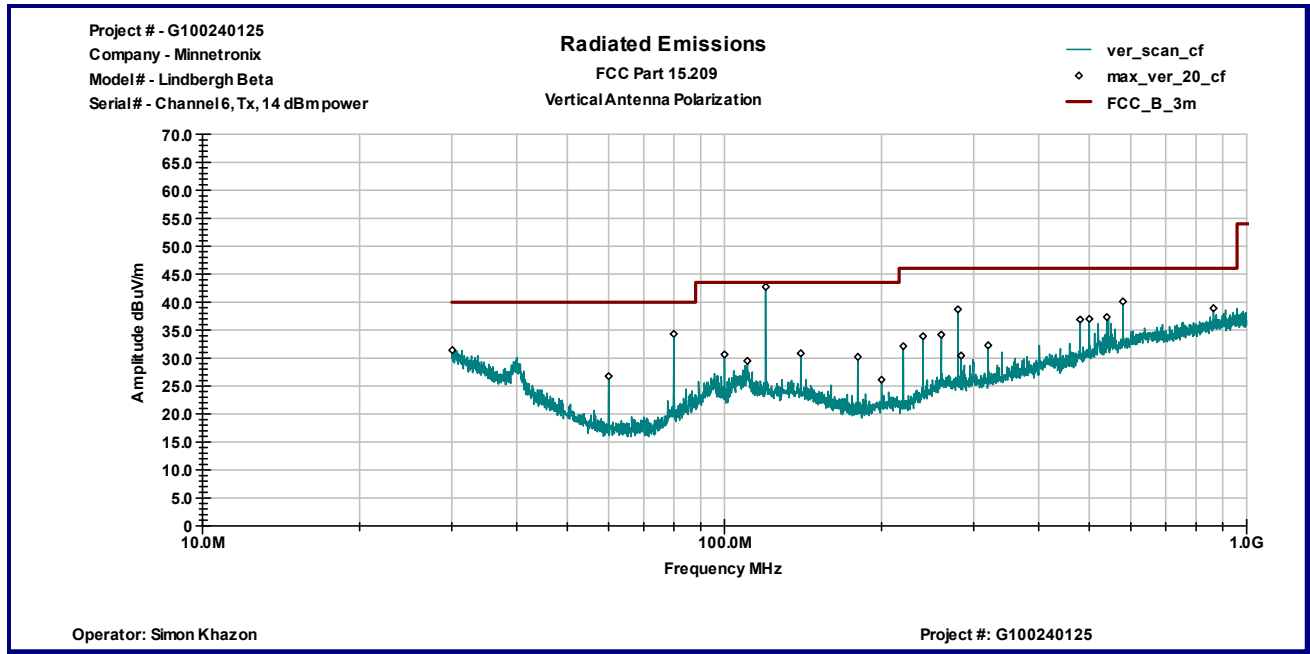
— hor\_scan\_cf  
◇ max\_hor\_20\_cf  
— FCC\_B\_3m



Operator: Simon Khazon

Project #: G100240125

Graph 3.5.1



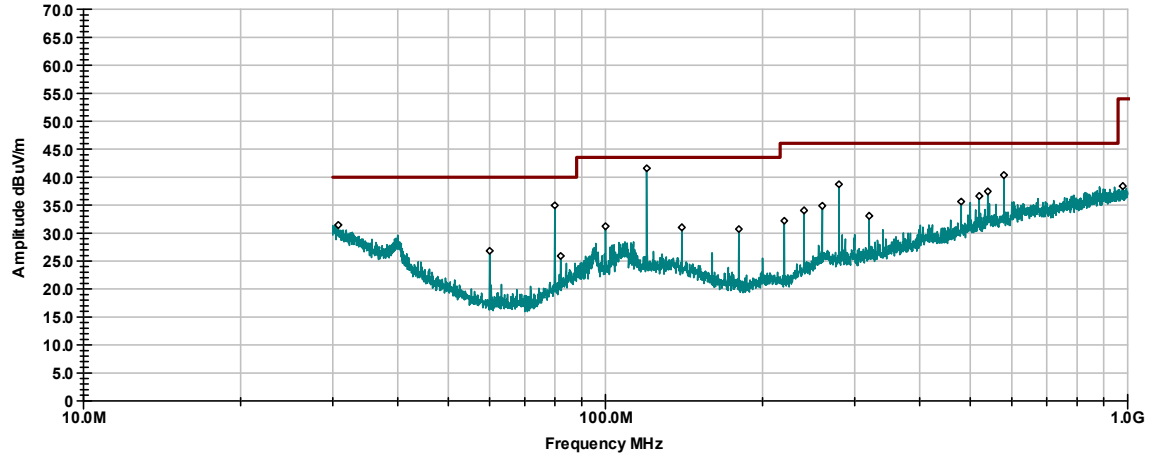
Graph 3.5.2

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Channel11, Tx, 14 dBm power

## Radiated Emissions

FCC Part 15.209  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf  
— FCC\_B\_3m



Operator: Simon Khazon

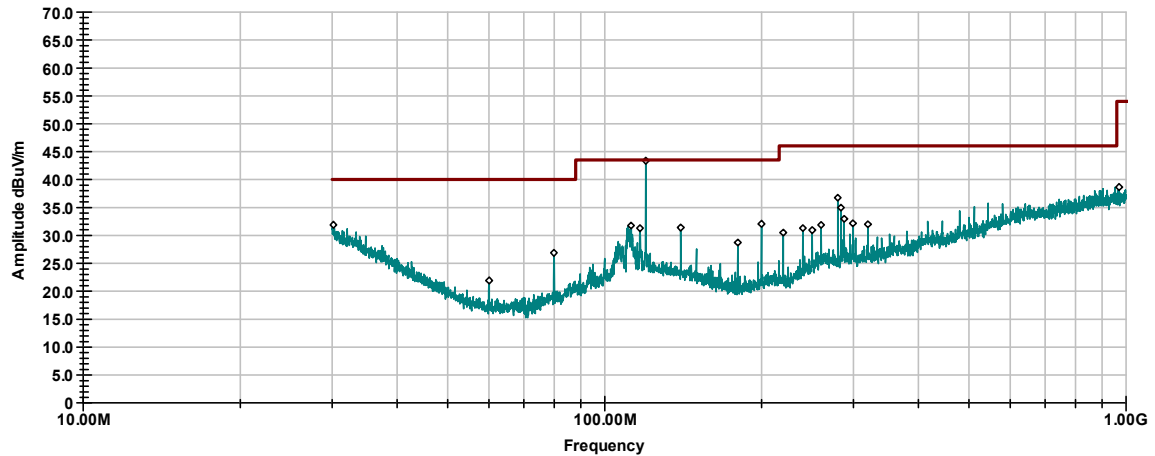
Project #: G100240125

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Channel11, Tx, 14 dBm power

## Radiated Emissions

FCC Part 15.209  
Horizontal Antenna Polarization

— hor\_scan\_cf  
◇ max\_hor\_20\_cf  
— FCC\_B\_3m

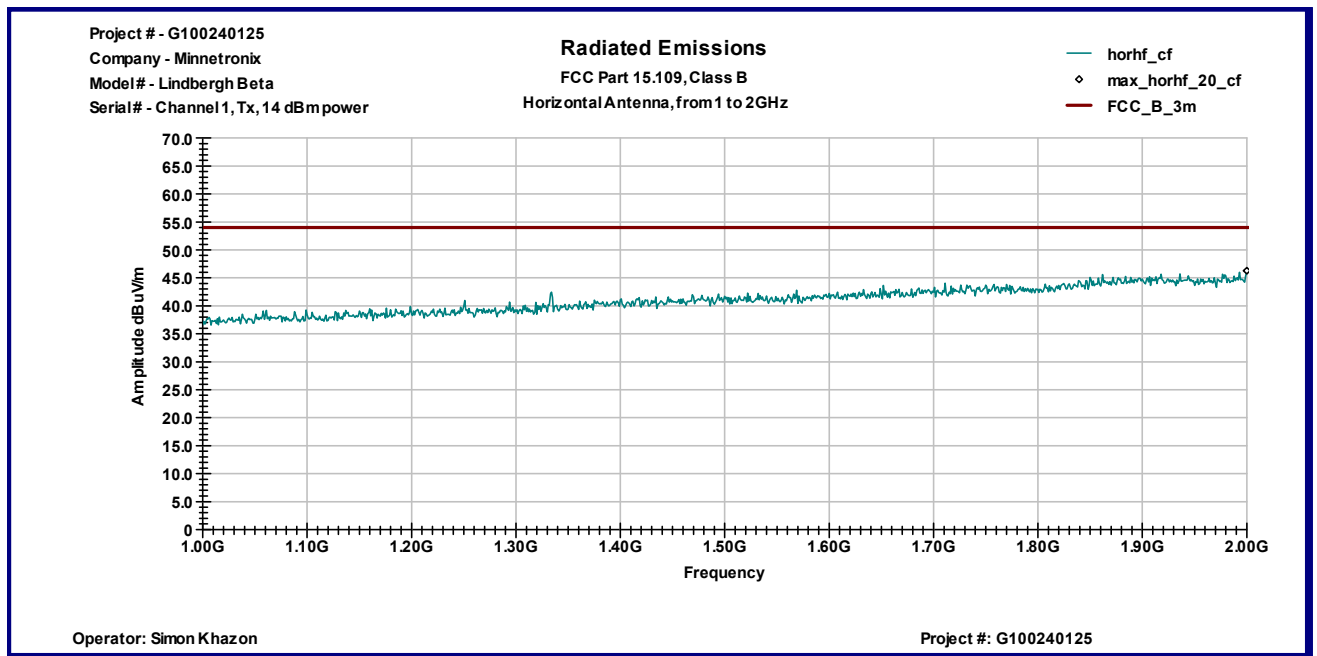
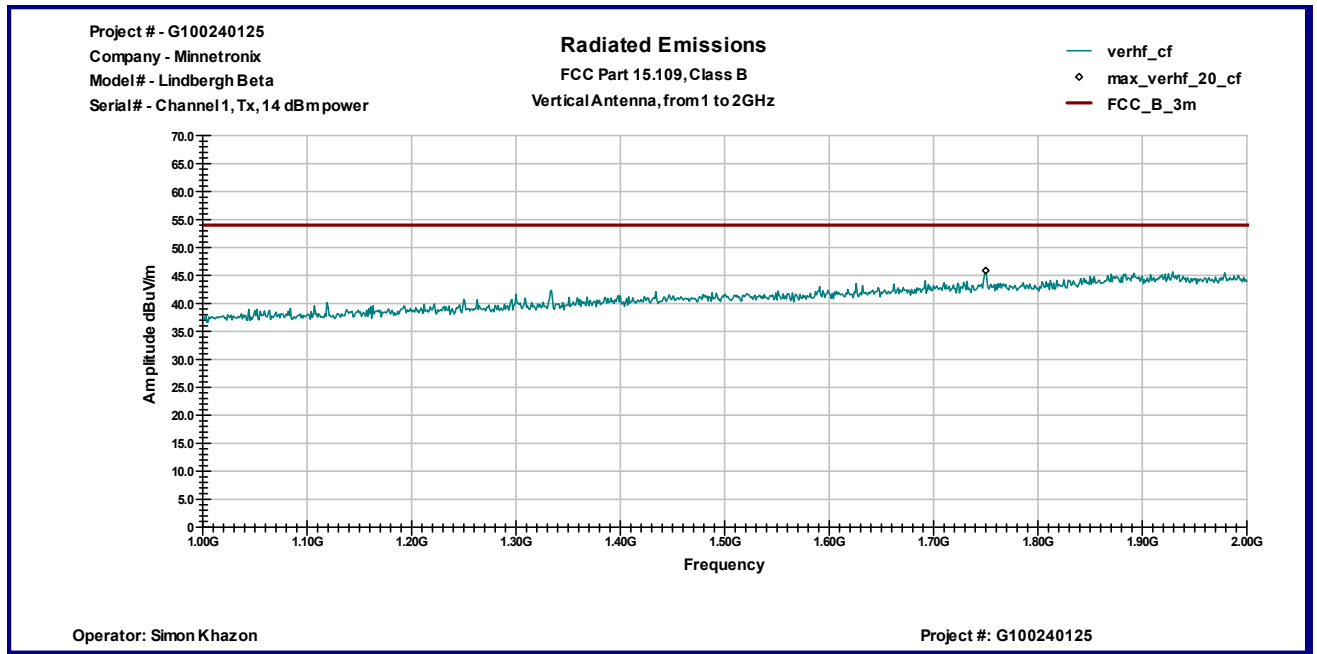


Operator: Simon Khazon

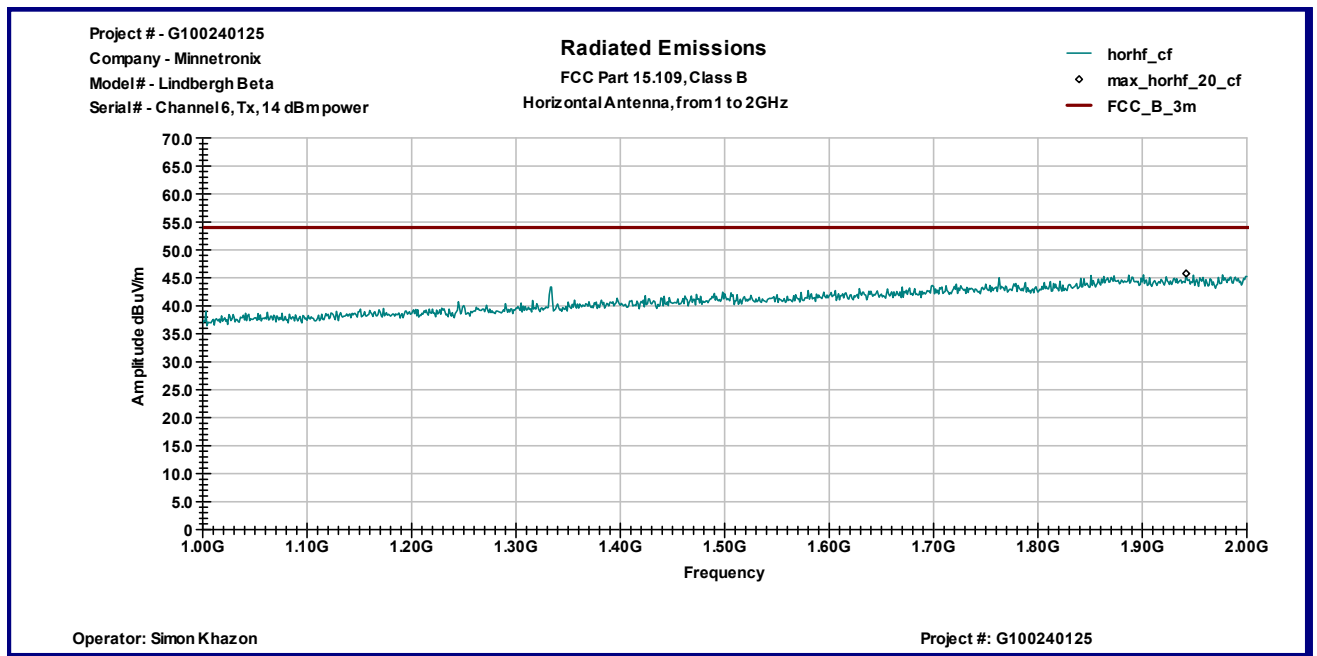
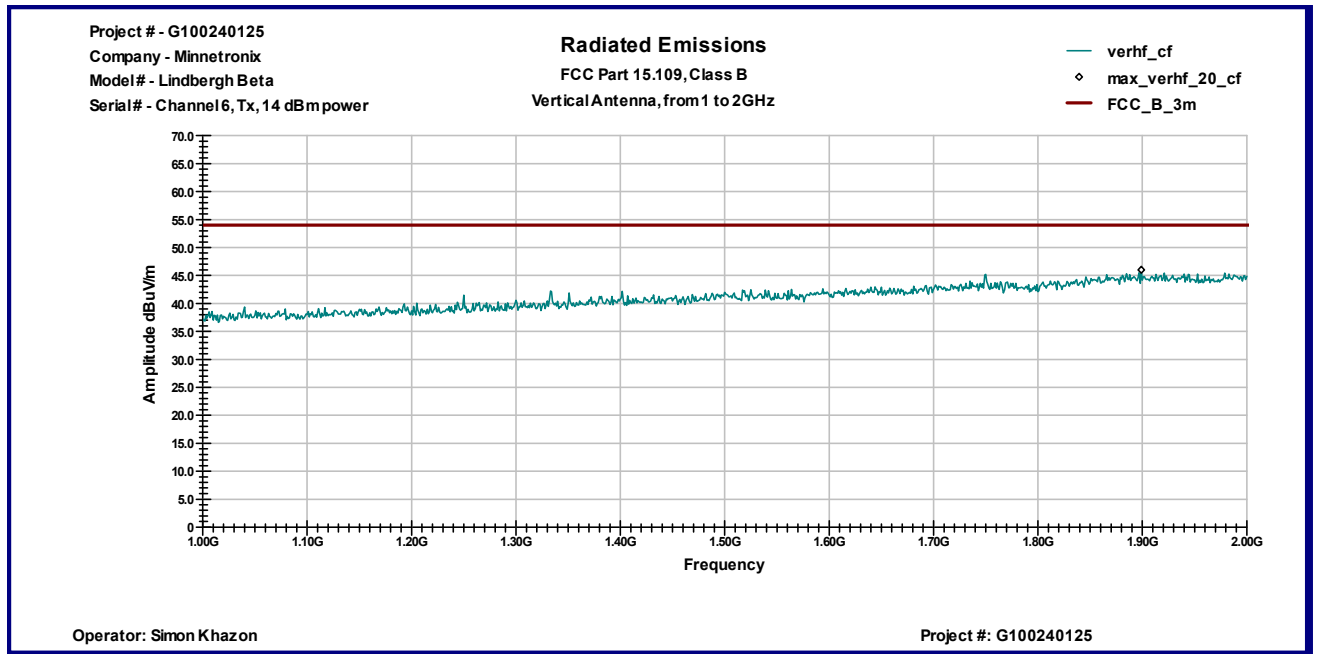
Project #: G100240125

Graph 3.5.3

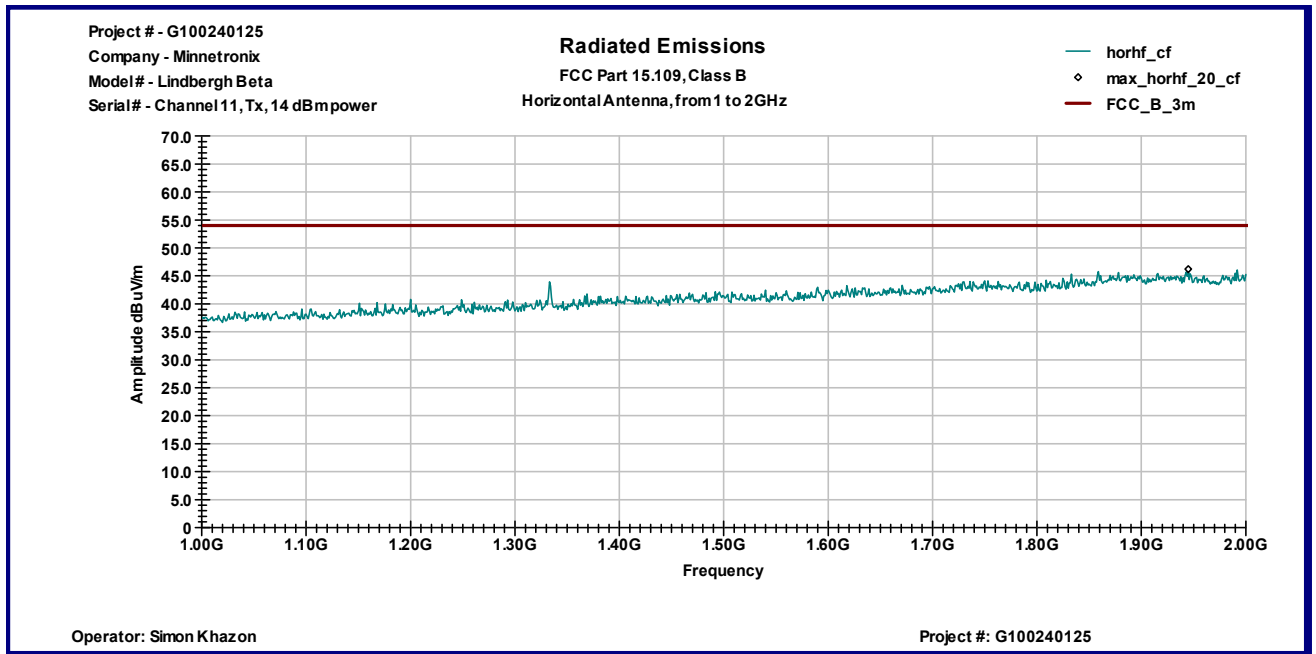
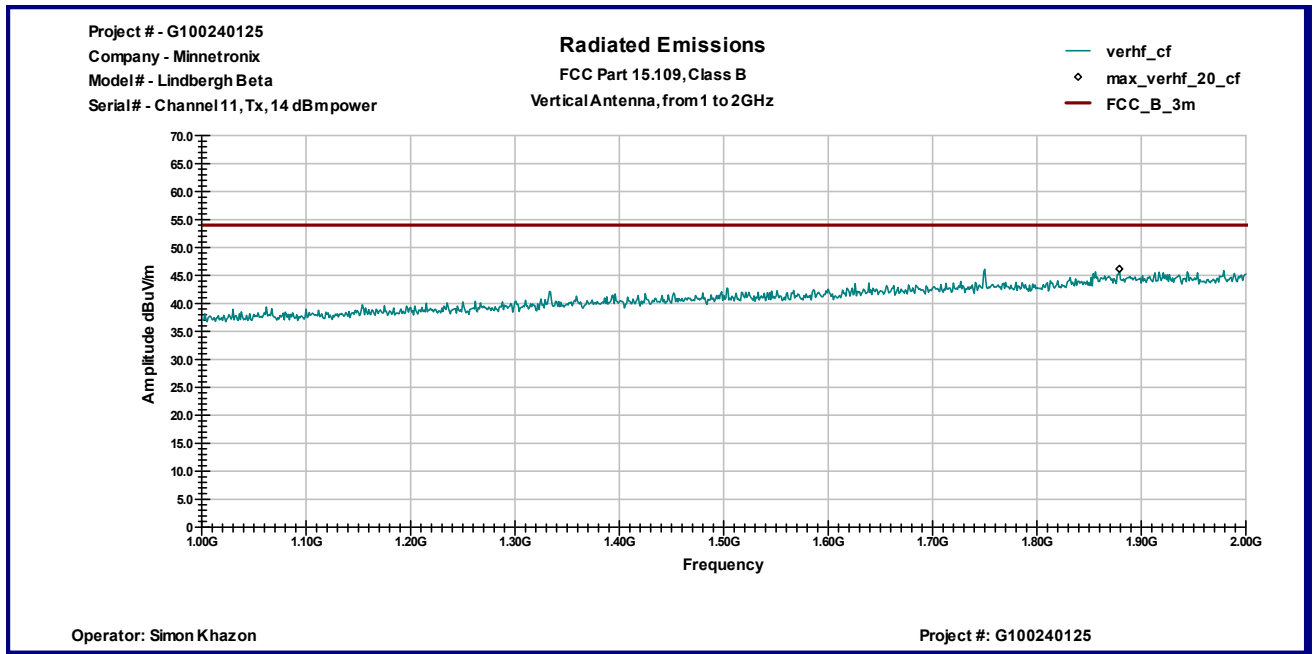




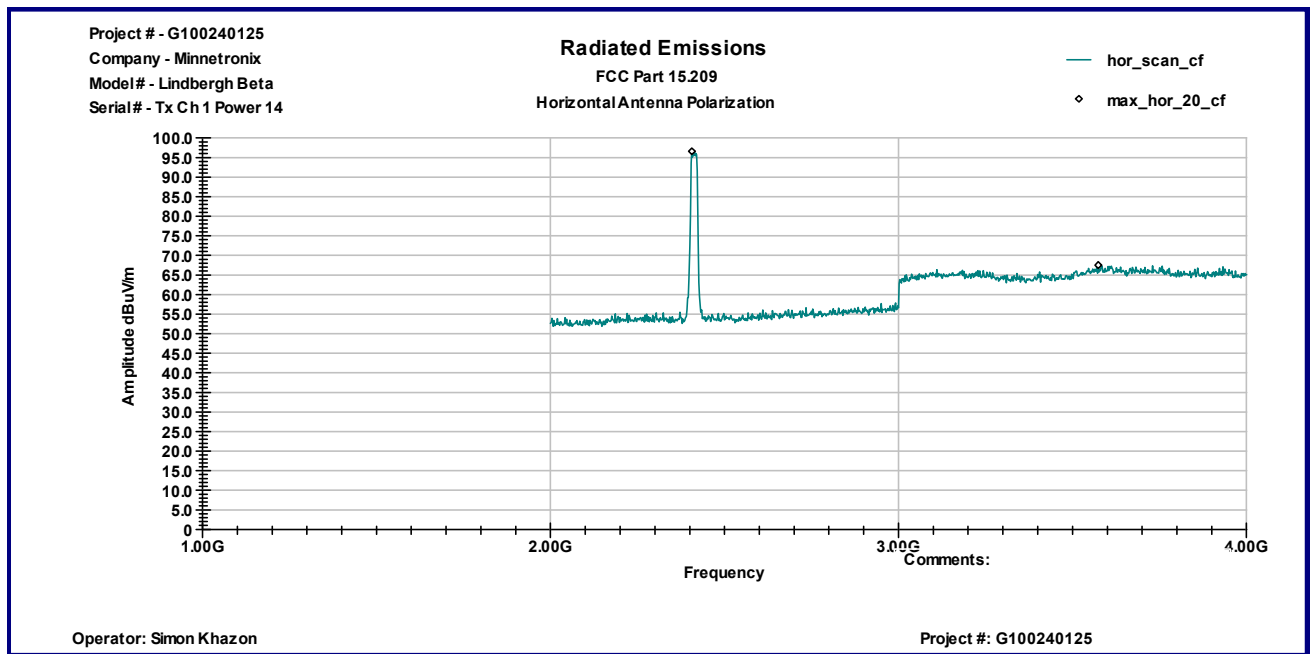
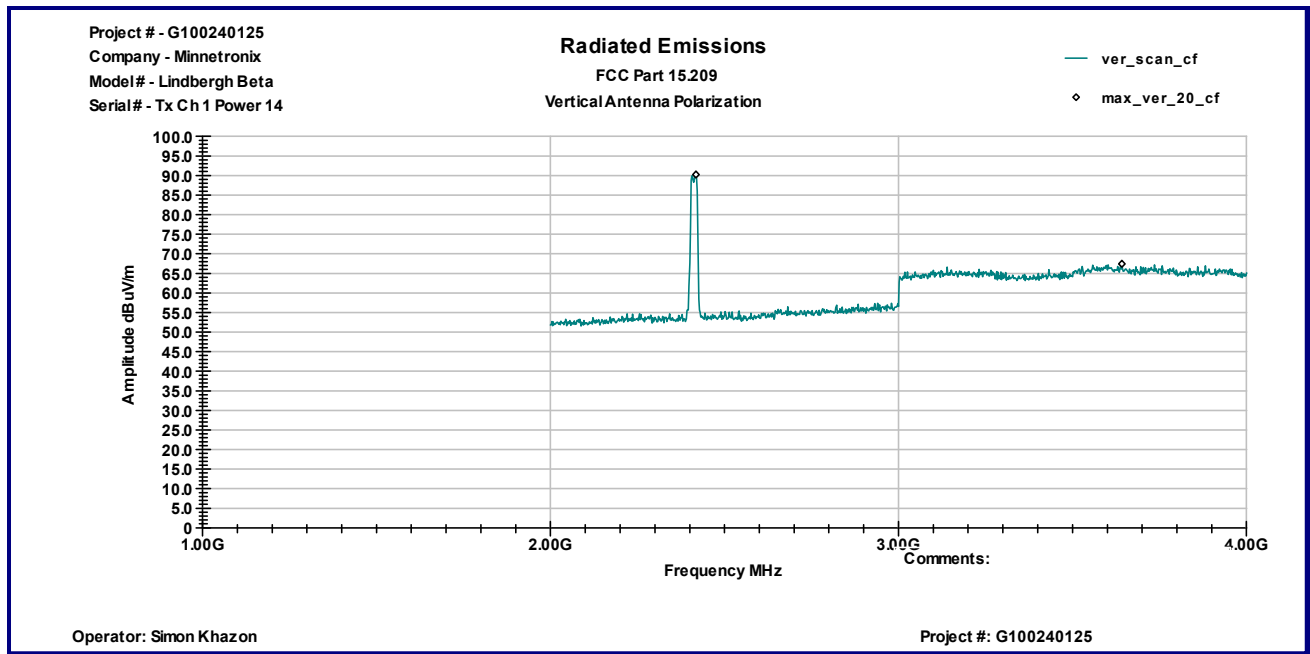
Graph 3.5.4



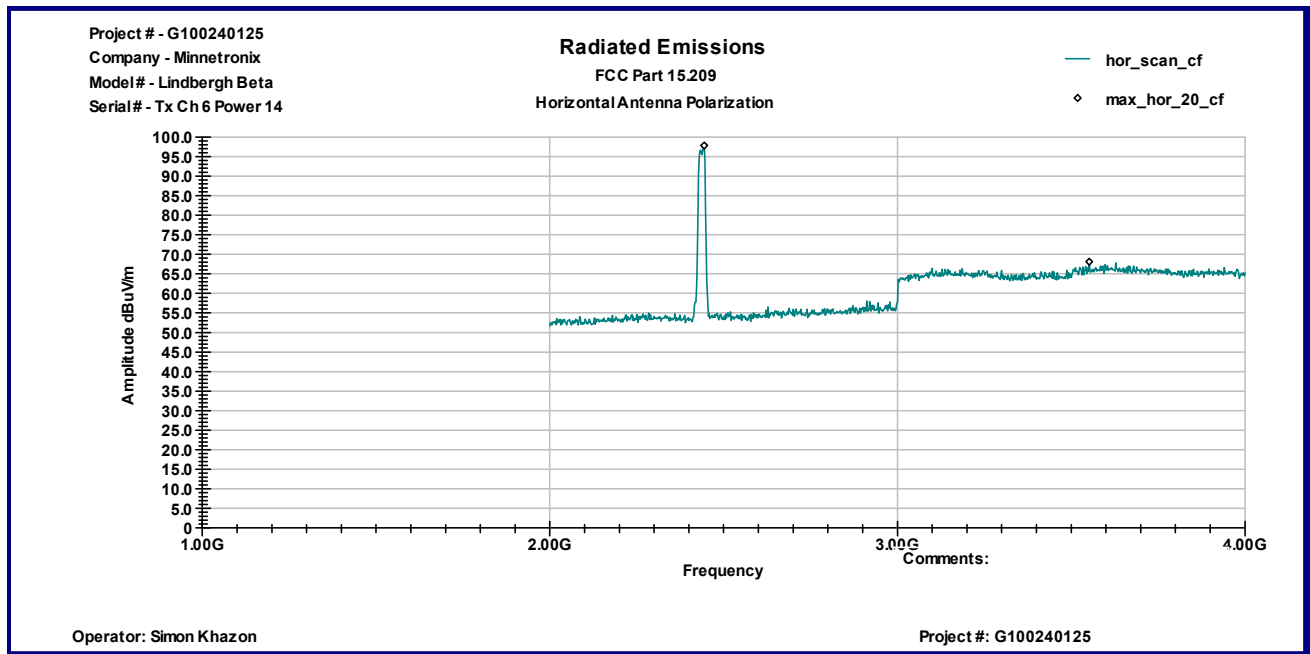
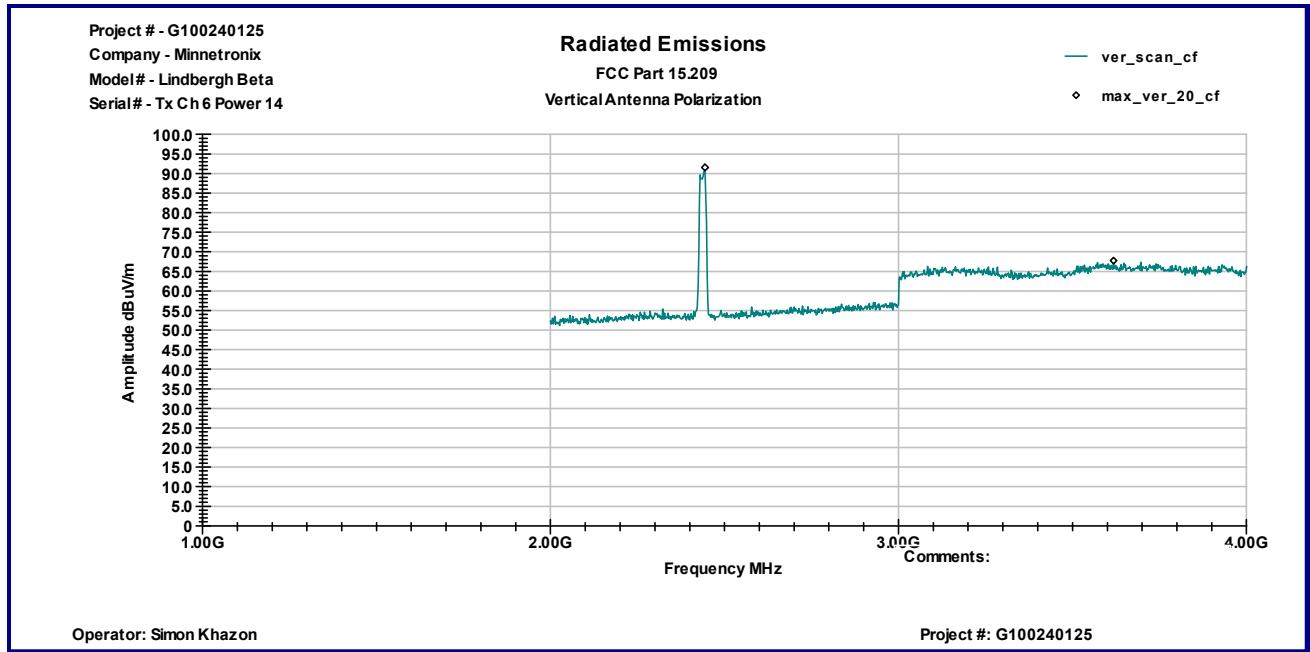
Graph 3.5.5



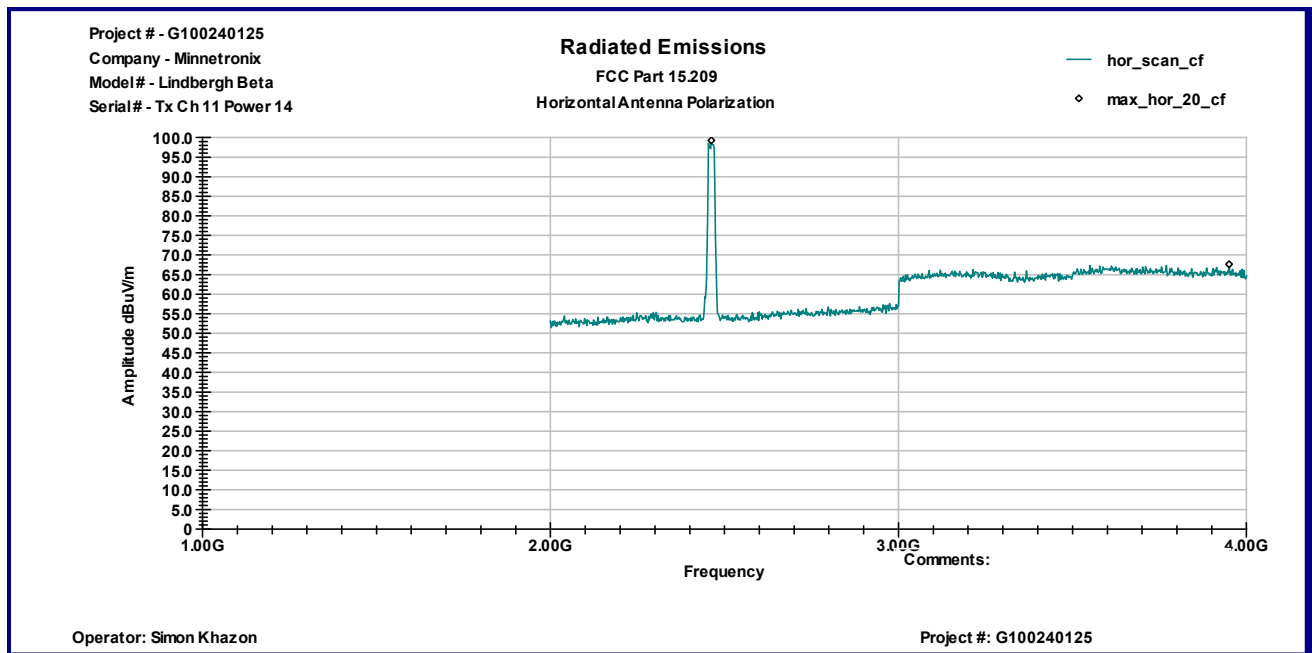
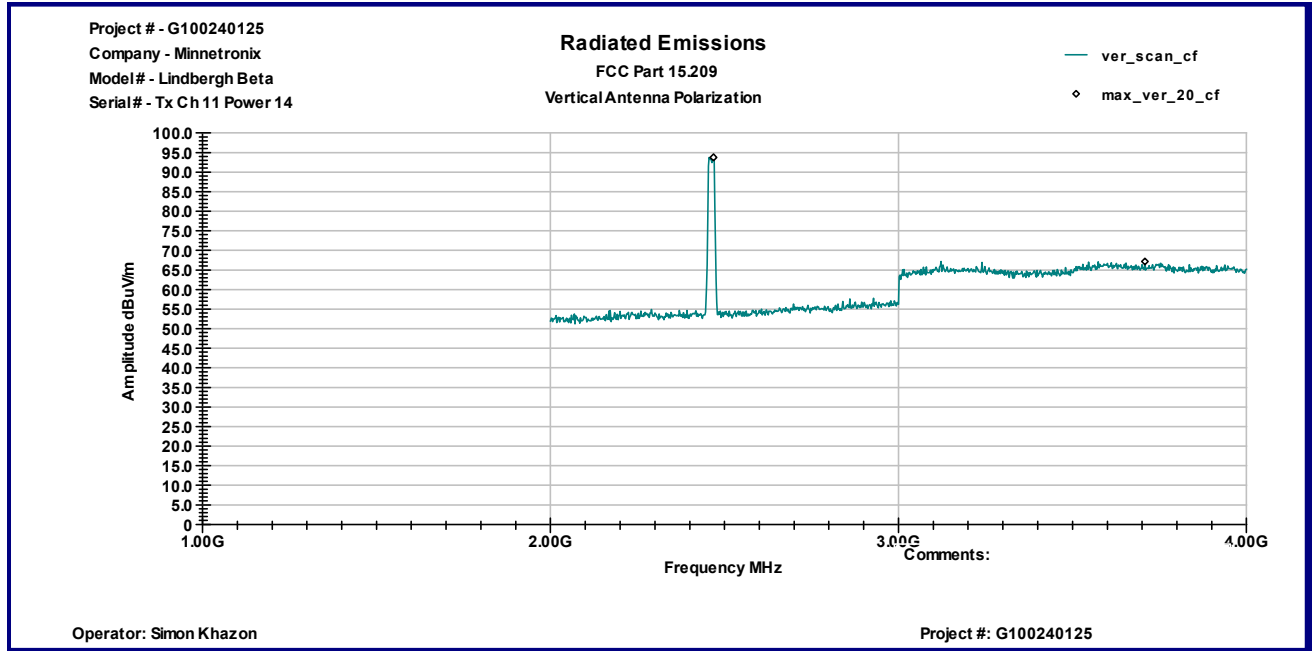
Graph 3.5.6



Graph 3.5.7



Graph 3.5.8

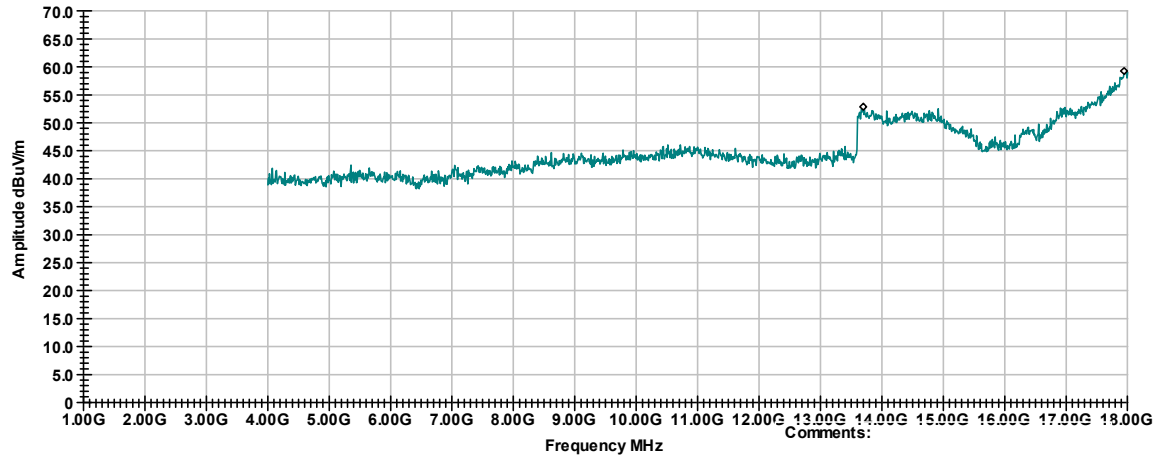


Graph 3.5.9

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Tx Ch 01 Power 14

**Radiated Emissions**  
FCC Part 15.209  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf



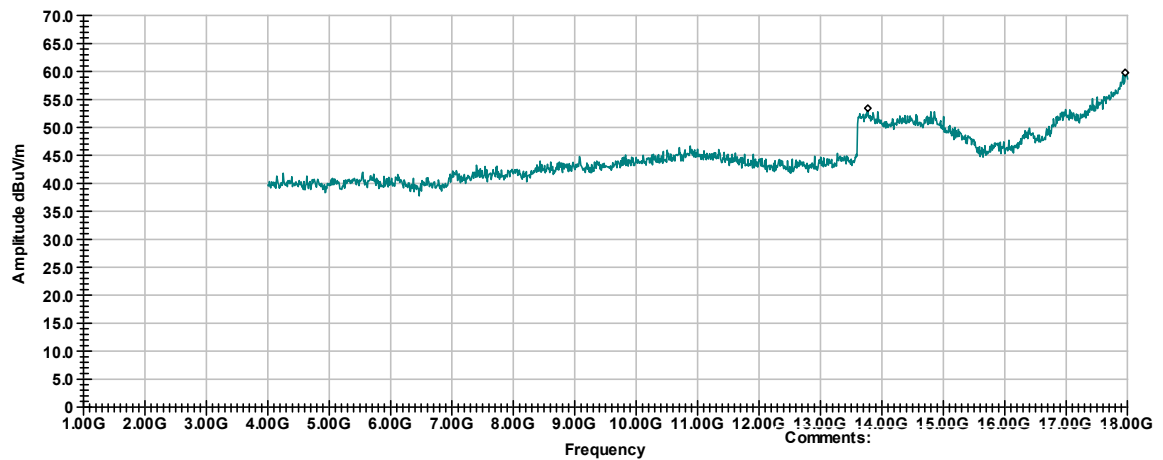
Operator: Simon Khazon

Project #: G100240125

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Tx Ch 01 Power 14

**Radiated Emissions**  
FCC Part 15.209  
Horizontal Antenna Polarization

— hor\_scan\_cf  
◇ max\_hor\_20\_cf



Operator: Simon Khazon

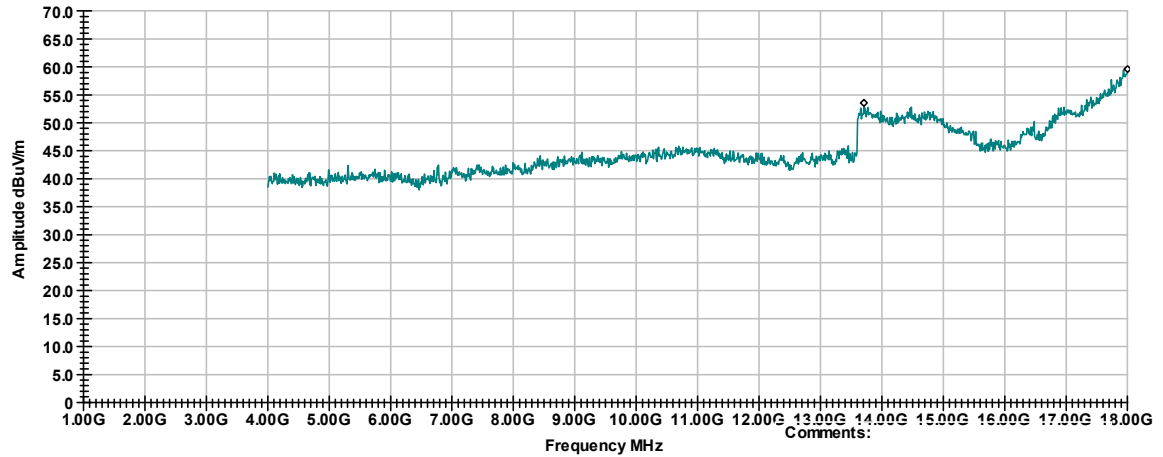
Project #: G100240125

Graph 3.5.10

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Tx Ch 06 Power 14

**Radiated Emissions**  
FCC Part 15.209  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf



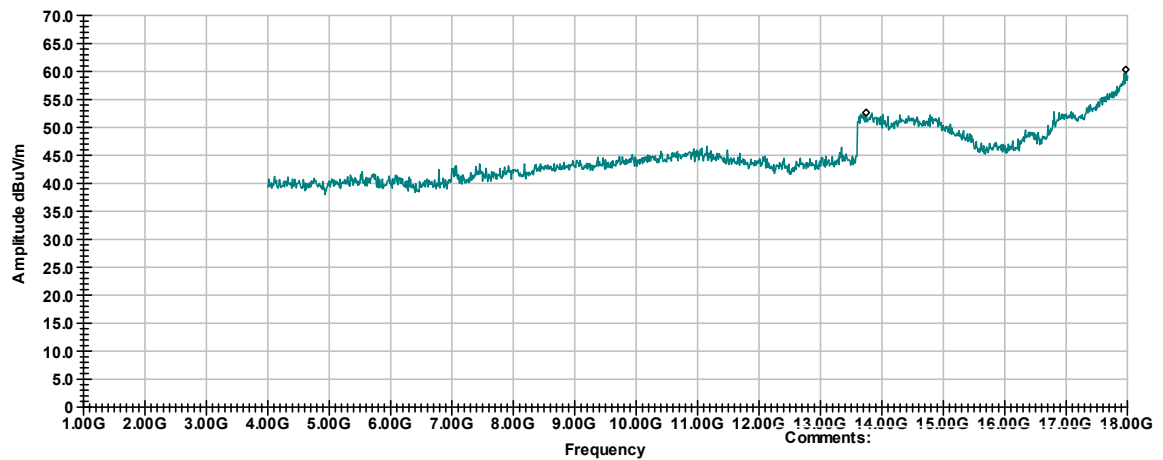
Operator: Simon Khazon

Project #: G100240125

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Tx Ch 06 Power 14

**Radiated Emissions**  
FCC Part 15.209  
Horizontal Antenna Polarization

— hor\_scan\_cf  
◇ max\_hor\_20\_cf

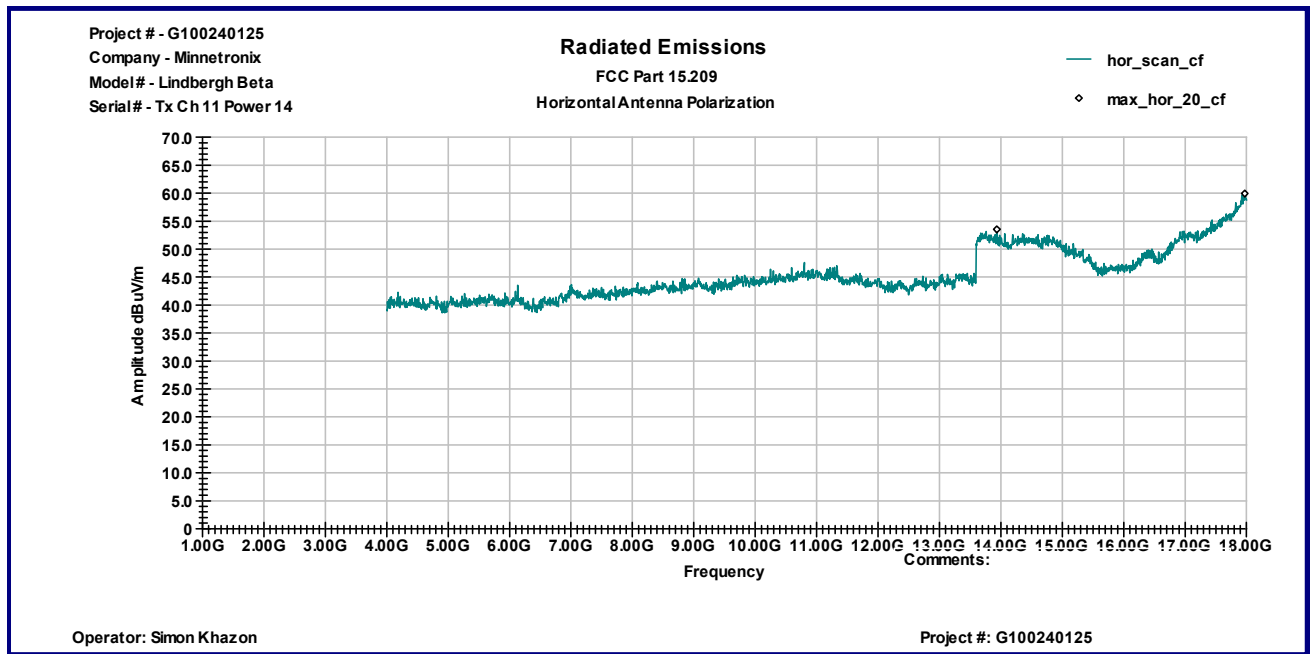
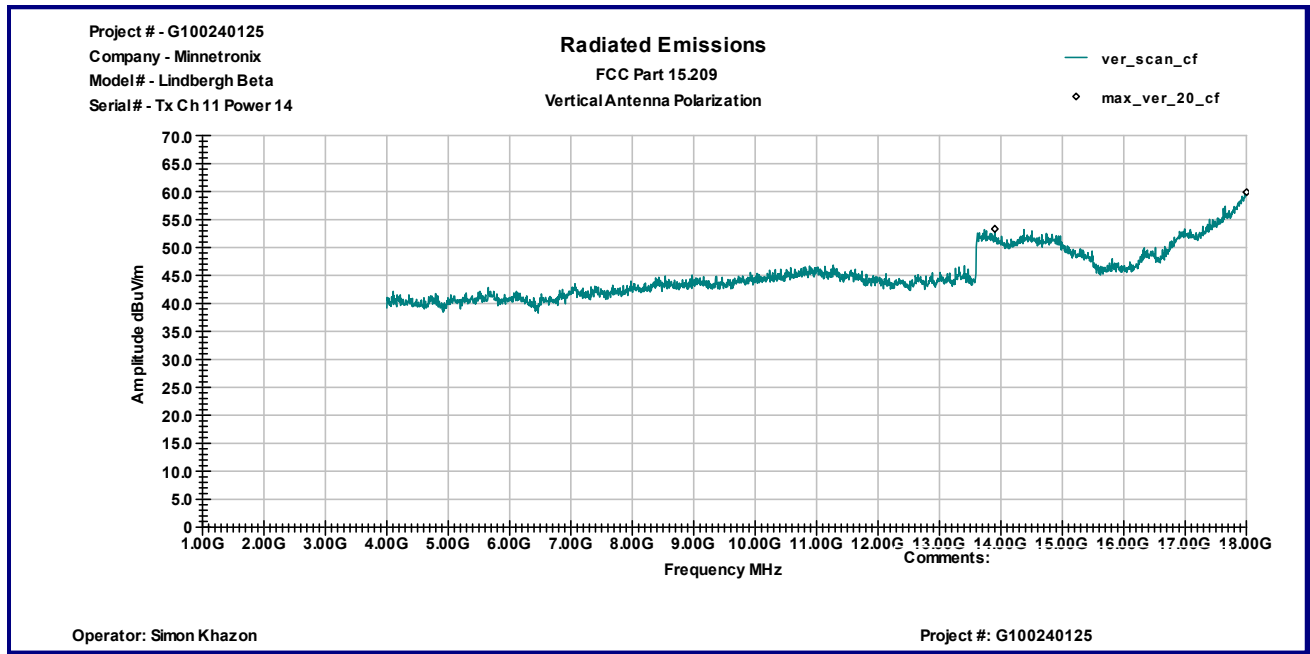


Operator: Simon Khazon

Project #: G100240125

Graph 3.5.11





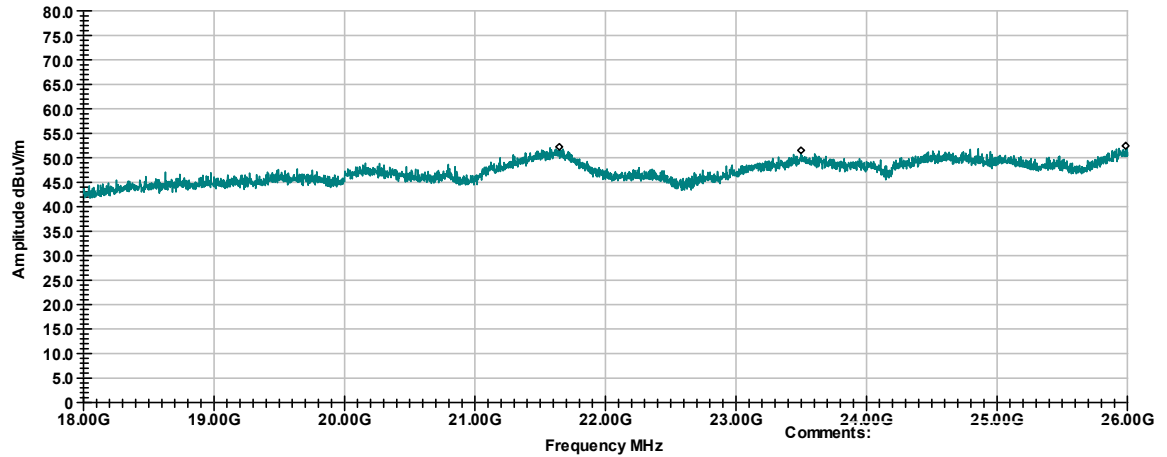
Graph 3.5.12

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Tx Ch 1 Power 14, Trans Rate 54

## Radiated Emissions

FCC Part 15.209  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf



Operator: Simon Khazon

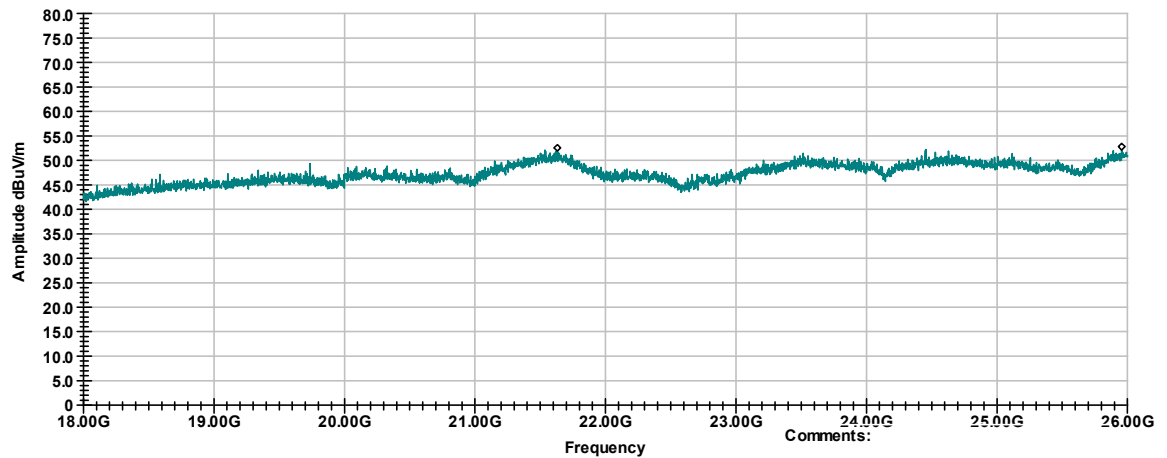
Project #: G100240125

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Tx Ch 1 Power 14, Trans Rate 54

## Radiated Emissions

FCC Part 15.209  
Horizontal Antenna Polarization

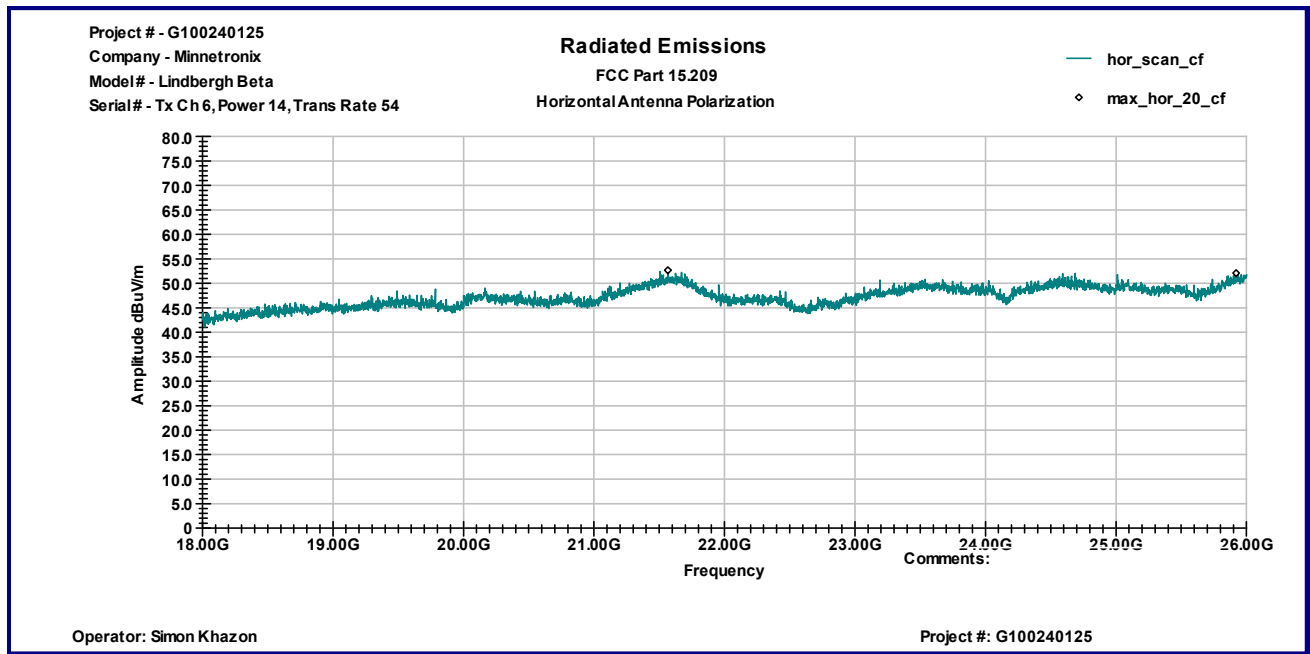
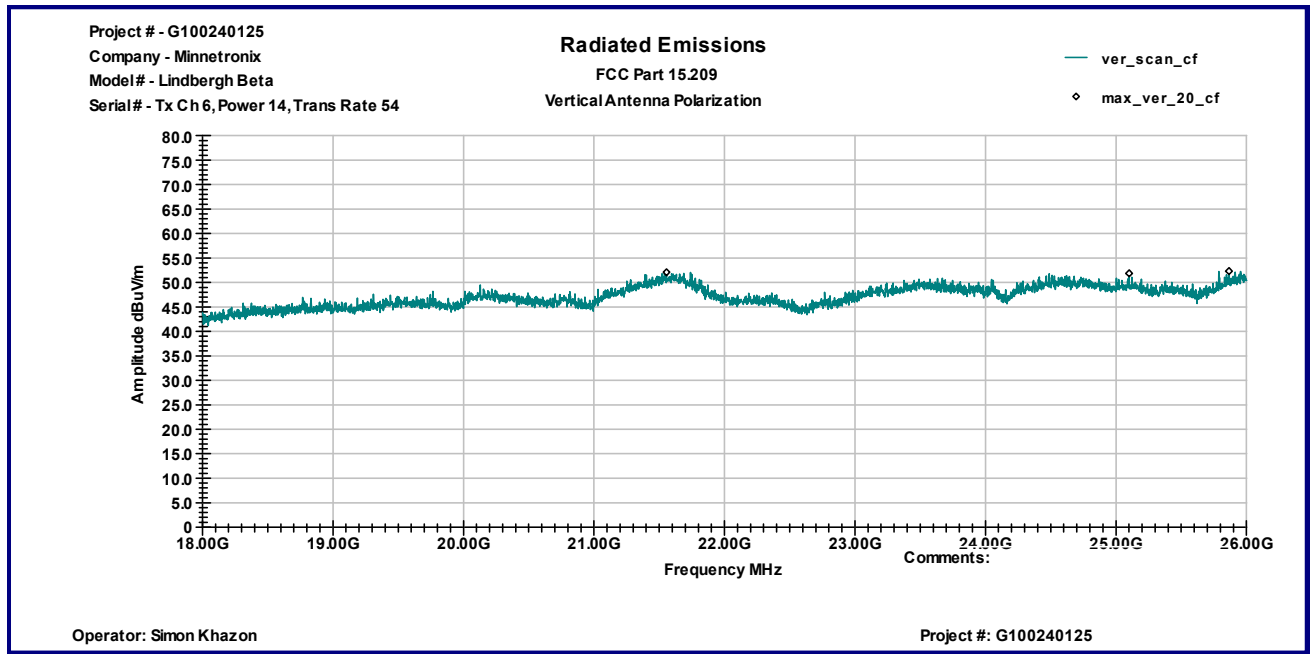
— hor\_scan\_cf  
◇ max\_hor\_20\_cf



Operator: Simon Khazon

Project #: G100240125

Graph 3.5.13



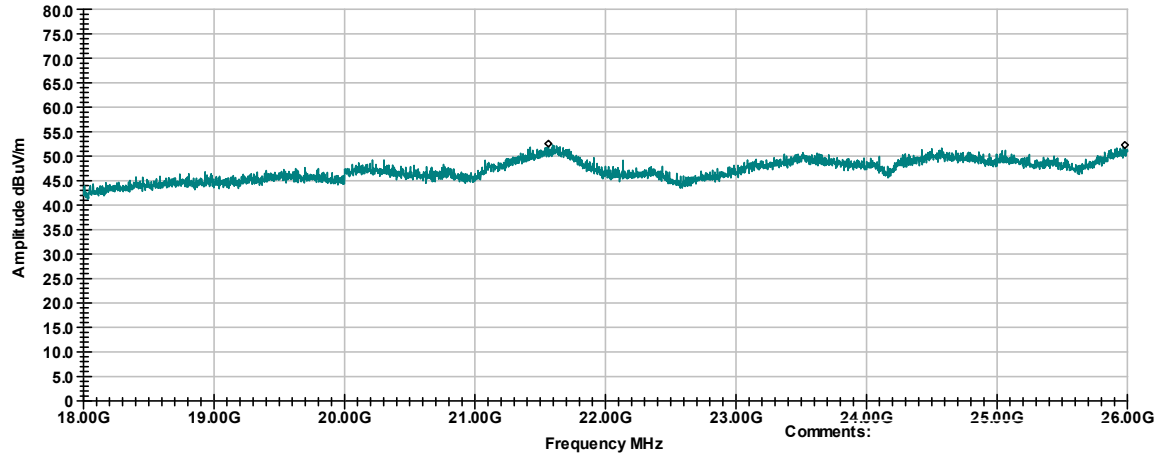
Graph 3.5.14

Project # - G100240125  
Company - Minnetronix  
Model # - Lindbergh Beta  
Serial # - Tx Ch 11, Power 14, Trans Rate 54

## Radiated Emissions

FCC Part 15.209  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf



Operator: Simon Khazon

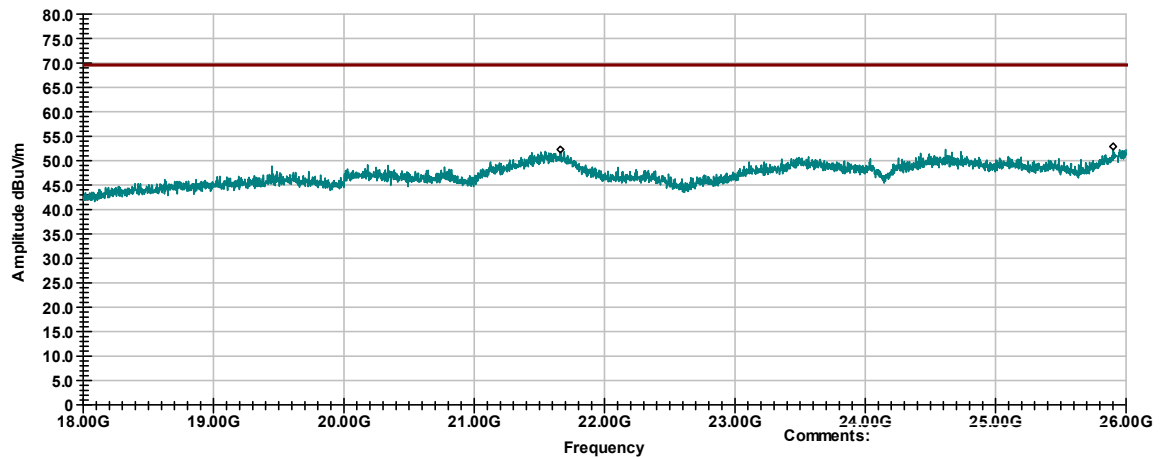
Project #: G100240125

Project # - G100240125  
Company - Minnetronix  
Model # - Lindbergh Beta  
Serial # - Tx Ch 11, Power 14, Trans Rate 54

## Radiated Emissions

FCC Part 15.209, Class A  
Horizontal Antenna Polarization

— hor\_scan\_cf  
◇ max\_hor\_20\_cf  
— FCC\_A\_1m



Operator: Simon Khazon

Project #: G100240125

Graph 3.5.15

### 3.6 RF Exposure Compliance

The maximum measured antenna conducted power, P is 13.4 dBm

The antenna gain, G is 2.0 dBi

The maximum EIRP power = P + G

ERP = 13.4 + 2.0 = 15.4 dBm, or 0.0347W

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

The Power Density, S is related to EIRP with the equation:

$S = \text{EIRP} / 4\pi D^2$ , where D is the safe separation distance and = 0.2m, or 20cm

$S = 0.0347 / 4\pi 0.2^2 = \textbf{0.07W/ m}^2$



### 3.7 Transmitter power line conducted emissions

**Test location:** ☐ OATS ☒ Anechoic Chamber ☐ Other

**Test result:** **Pass**

**Frequency range:** 0.15MHz-30MHz

**Max. Emissions margin:** 0.3 dB below the limits

Notes:

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<b>Date:</b>	January 21, 2011	<b>Result: Pass</b>
<b>Standard:</b>	FCC 15.207	
<b>Tested by:</b>	Simon Khazon	
<b>Test Point:</b>	Power Line	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	None	

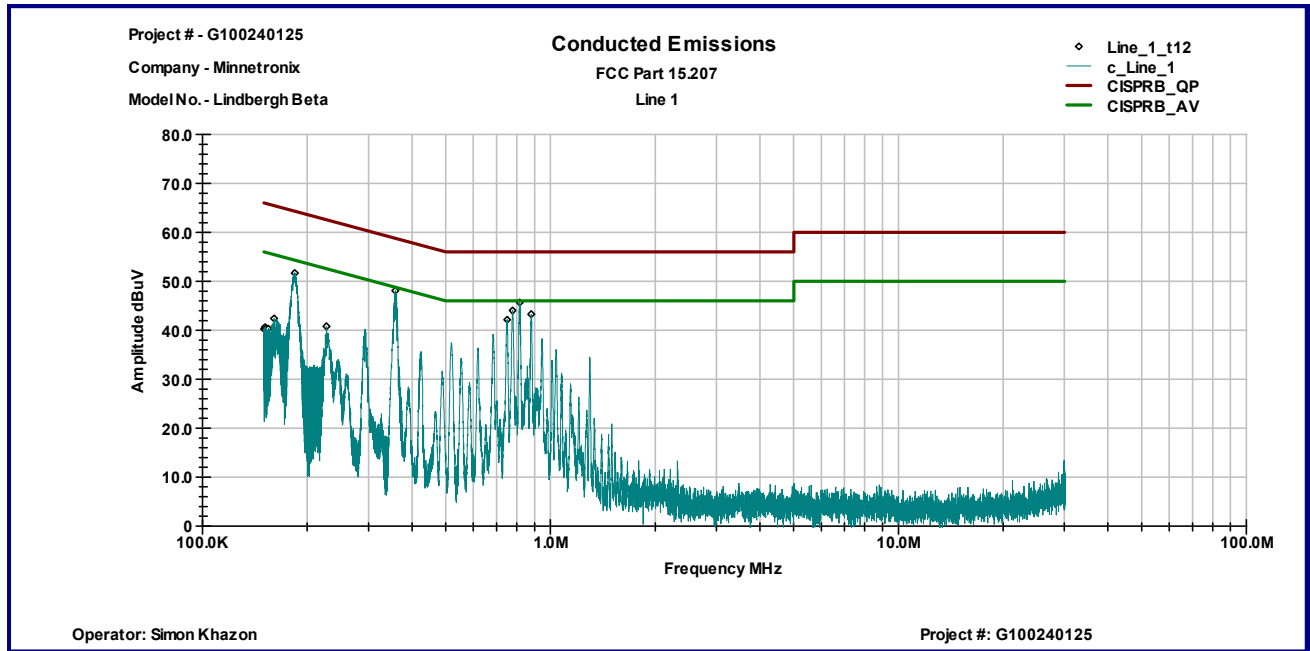
**Table 3.7.1**

**Line 1**

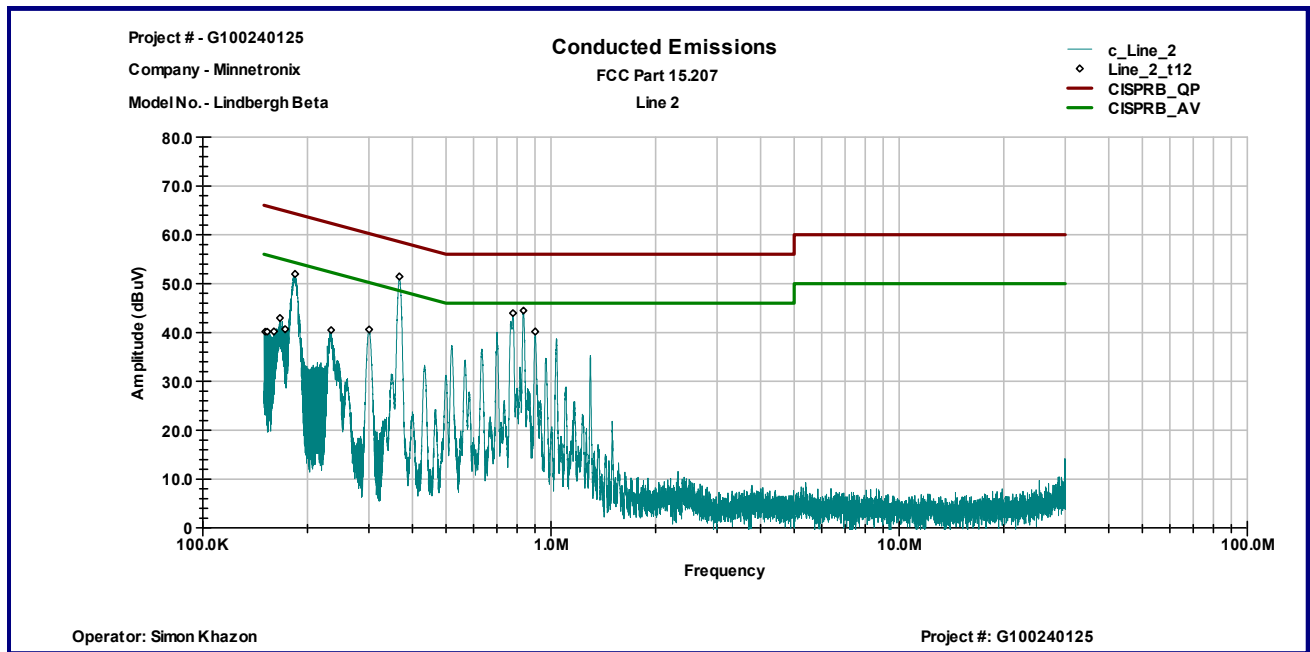
Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
151.74 KHz	33.8	19.0	65.9	55.9	-32.1	-37.0
164.8 KHz	37.6	34.9	65.2	55.2	-27.7	-20.3
183.14 KHz	50.6	47.6	64.3	54.3	-13.8	-6.8
233.27 KHz	38.2	34.3	62.3	52.3	-24.1	-18.1
366.5KHz	50.6	46.8	58.5	48.5	-7.9	-1.7
778.89 KHz	43.0	43.2	56.0	46.0	-13.0	-2.8
839.33 KHz	21.5	18.9	56.0	46.0	-34.5	-27.1

**Line 2**

Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
183.1 KHz	50.7	47.7	64.3	54.3	-13.6	-6.7
233.35 KHz	39.0	35.7	62.3	52.3	-23.3	-16.6
302.77 KHz	39.7	36.6	60.2	50.2	-20.5	-13.6
369.8KHz	51.0	48.2	58.5	48.5	-7.5	-0.3
776.96 KHz	43.9	42.6	56.0	46.0	-12.1	-3.4
840.43 KHz	39.2	38.3	56.0	46.0	-16.8	-7.7
909.25 KHz	34.1	33.4	56.0	46.0	-21.9	-12.6



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:** 9.7 dB below the limits

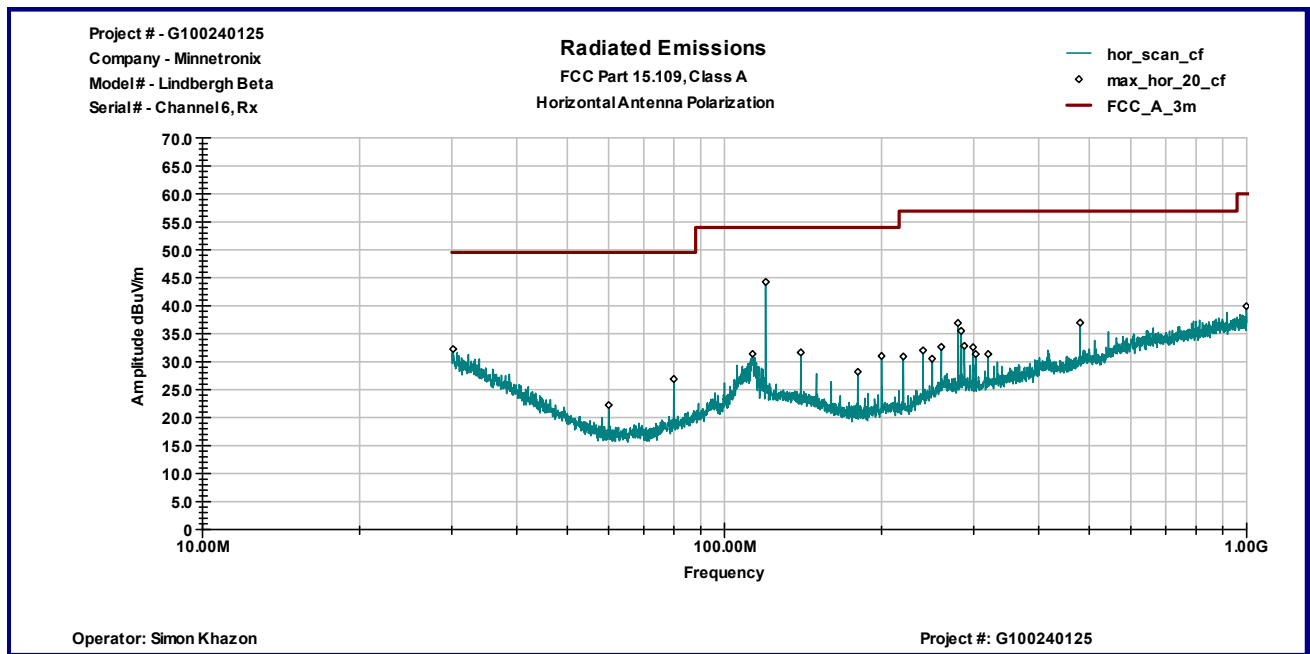
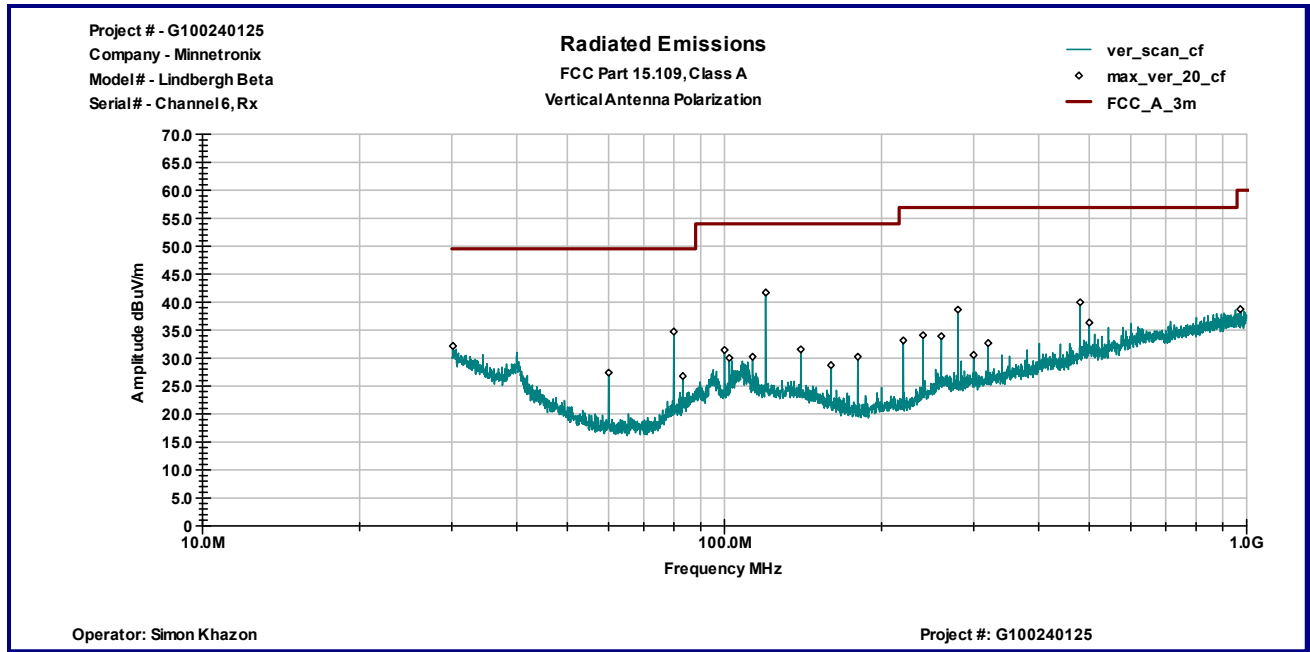
**Notes:** The Radiated Emissions test was performed in the Anechoic chamber at 3m measurement distance (see Table 3.8.1 and Graphs 3.8.1 and 3.8.2)

<b>Date:</b>	January 17-18, 2011	<b>Result: Pass</b>
<b>Standard:</b>	FCC Part 15.109, Class A	
<b>Tested by:</b>	Simon Khazon	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	Receiving Mode	
<b>Note:</b>		

**Table 3.8.1**

Frequency	Ant. Polarity	Peak Reading dB $\mu$ V	Ant.Factor dB1/m	Total at 3m dB $\mu$ V/m	QP Limit dB $\mu$ V/m	Margin dB
30.175 MHz	V	11.9	20.2	32.2	49.5	-17.4
79.94 MHz	V	25.8	8.9	34.7	49.5	-14.8
119.99 MHz	V	27.7	14.0	41.7	54.0	-12.3
280.07 MHz	V	23.1	15.6	38.7	56.9	-18.2
320.0 MHz	V	16.1	16.6	32.7	56.9	-24.2
479.92 MHz	V	19.7	20.3	40.0	56.9	-16.9
499.94 MHz	V	15.6	20.8	36.3	56.9	-20.6
973.39 MHz	V	12.6	26.1	38.7	60.0	-21.3
30.211 MHz	H	12.1	20.2	32.3	49.5	-17.3
119.99 MHz	H	30.2	14.0	44.2	54.0	-9.7
280.07 MHz	H	21.3	15.6	36.9	56.9	-20.0
479.92 MHz	H	16.6	20.3	36.9	56.9	-20.0
999.51 MHz	H	13.5	26.4	39.9	60.0	-20.1

Frequency MHz	Antenna Polarity	Reading dB $\mu$ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB $\mu$ V/m	QP Limit dB $\mu$ V/m	Margin dB
1.3344 GHz	V	52.1	27.5	38.9	40.7	60.0	-19.3
1.5016 GHz	V	50.9	28.0	38.9	40.0	60.0	-20.0
1.7524 GHz	V	52.5	29.3	38.6	43.2	60.0	-16.9
11.041 GHz	V	34.3	47.1	34.7	46.6	60.0	-13.4
1.2508 GHz	H	49.6	27.1	38.9	37.8	60.0	-22.2
1.3344 GHz	H	50.6	27.4	38.9	39.1	60.0	-20.9
1.9988 GHz	H	47.4	30.9	38.3	40.0	60.0	-20.0
10.865 GHz	H	34.6	46.8	34.7	46.6	60.0	-13.4

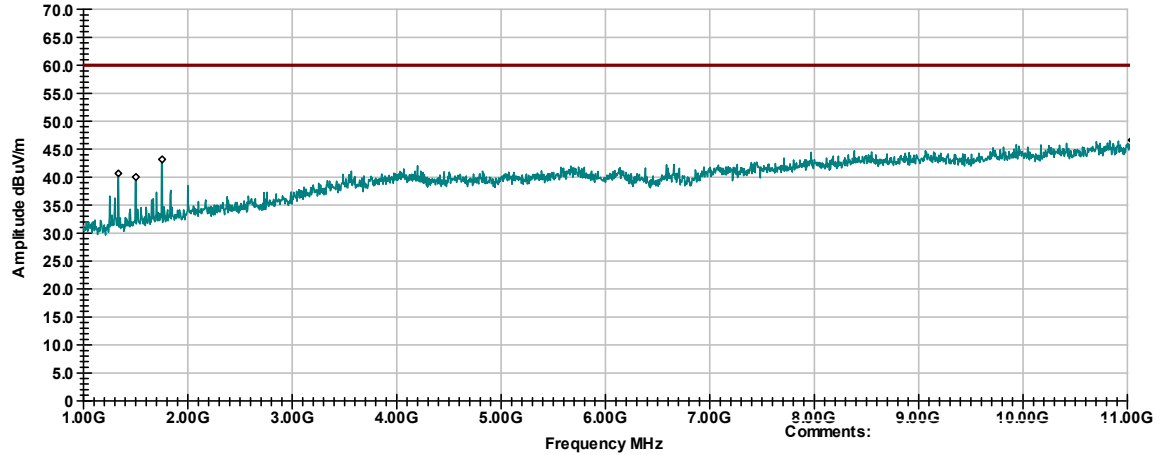


Graph 3.8.1

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Rx Ch 6

**Radiated Emissions**  
FCC Part 15.109, Class A  
Vertical Antenna Polarization

— ver\_scan\_cf  
◇ max\_ver\_20\_cf  
— FCC\_A\_3m



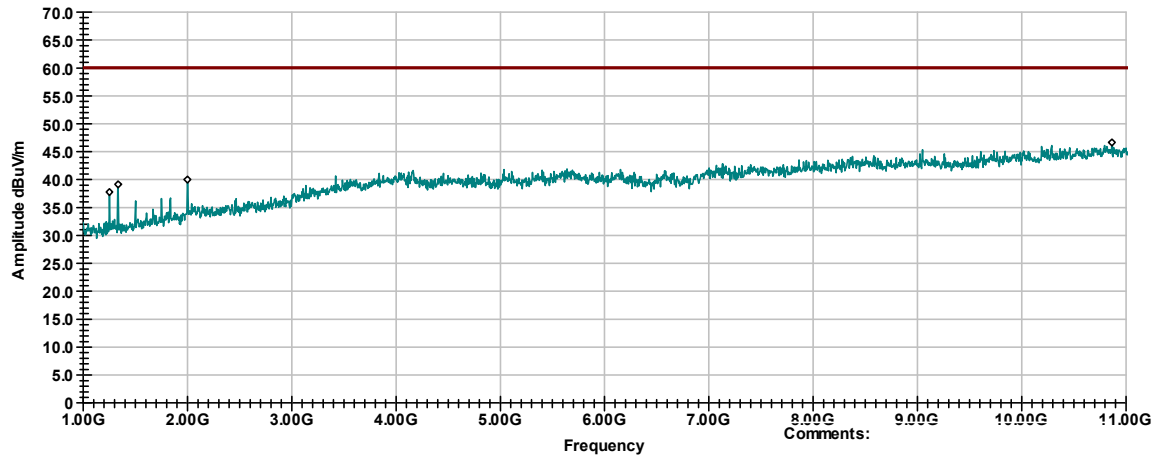
Operator: SK

Project #: G100240125

Project # - G100240125  
Company - Minnetronix  
Model# - Lindbergh Beta  
Serial# - Rx Ch 6

**Radiated Emissions**  
FCC Part 15.109, Class A  
Horizontal Antenna Polarization

— hor\_scan\_cf  
◇ max\_hor\_20\_cf  
— FCC\_A\_3m



Operator: SK

Project #: G100240125

Graph 3.8.2



### 3.9 Digital device conducted emissions

**Test location:** ☐ OATS ☒ Anechoic Chamber ☐ Other

**Test result:** **Pass**

**Frequency range:** 0.15MHz-30MHz

**Max. Emissions margin:** 0.1 dB below the limits

Notes:

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<b>Date:</b>	January 11, 2011	<b>Result: Pass</b>
<b>Standard:</b>	FCC 15.107 Class B	
<b>Tested by:</b>	Simon Khazon	
<b>Test Point:</b>	Power Line	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	None	

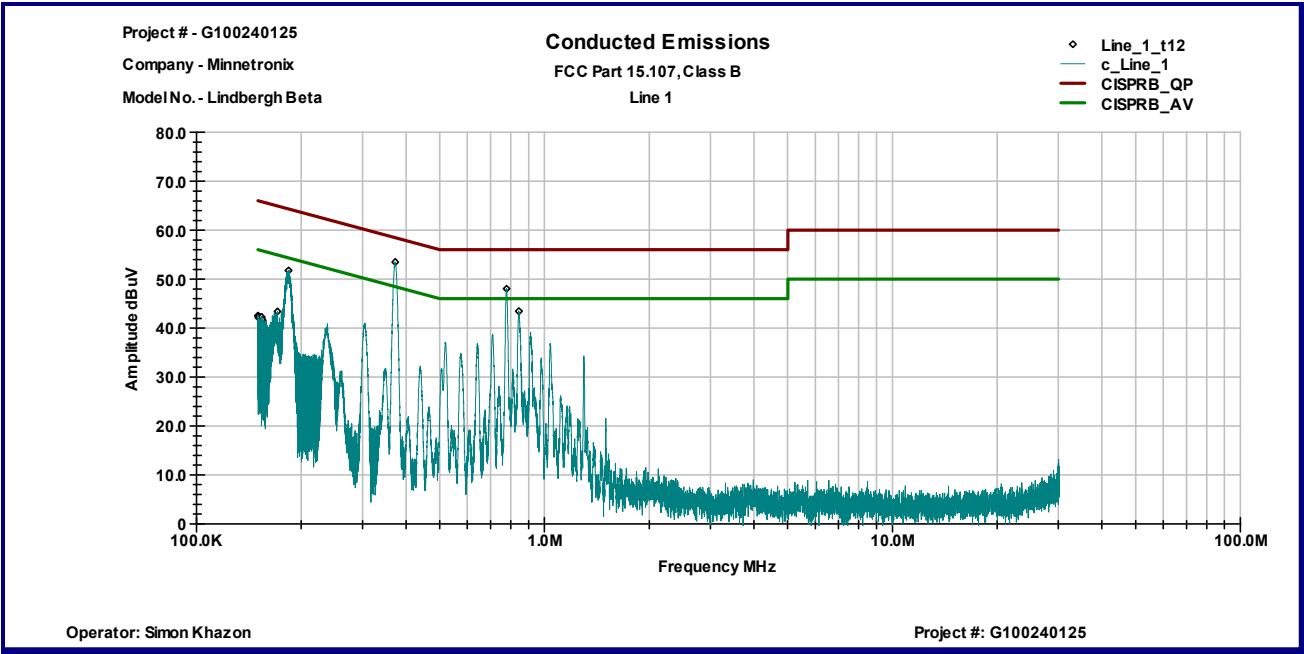
**Table 3.9.1**

**Line 1**

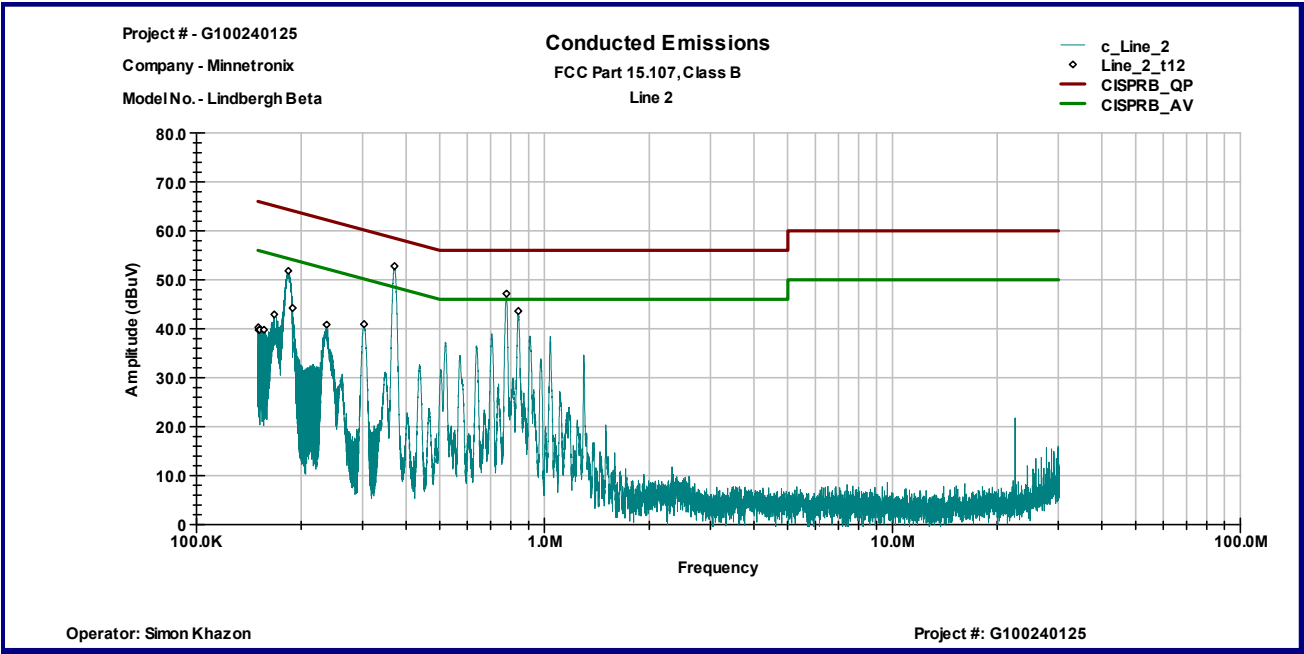
Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
183.84 KHz	50.8	47.7	64.3	54.3	-13.5	-6.6
306.54 KHz	39.4	36.0	60.1	50.1	-20.7	-14.0
373.67 KHz	52.9	48.3	58.4	48.4	-5.5	-0.1
779.64 KHz	46.8	43.8	56.0	46.0	-9.2	-2.2
846.6 KHz	40.6	40.4	56.0	46.0	-15.4	-5.6
914.79 KHz	35.6	35.1	56.0	46.0	-20.4	-10.9

**Line 2**

Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
183.25 KHz	50.8	47.7	64.3	54.3	-13.5	-6.6
304.61 KHz	40.1	37.0	60.1	50.1	-20.1	-13.1
372.03 KHz	52.5	48.1	58.5	48.5	-5.9	-0.4
779.34 KHz	45.9	43.6	56.0	46.0	-10.1	-2.4
845.09 KHz	39.2	38.9	56.0	46.0	-16.8	-7.1
1.0405 MHz	34.5	34.1	56.0	46.0	-21.5	-11.9



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	FSP 40	100024	12559	07/12/2011	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	07/12/2011	<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	6579	15580	04/29/2011	<input checked="" type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-2 MOD.SD	316	9945	03/11/2011	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	10/06/2011	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	10/06/2011	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-26004000-40-8P	13224444	MIN-0064	10/06/2011	<input checked="" type="checkbox"/>
Pre-Amplifier	HP	8447F OPT H64	3113A04974	9934	06/02/2011	<input type="checkbox"/>
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>





## Test Setup Photos

