



TEST REPORT

Report Number: 3177527MIN-002

Project Number: 3177527

Testing performed on the
Mercury 5e

FCC ID: XGF0406091126

Industry Canada ID: 8404A-0406091126

to

47 CFR Part 15. 247:2008

RSS- 210, Issue 7, 2007

For

Harvest Tec Inc.

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

Test Authorized by:
Harvest Tec Inc.
2821 Harvey Street
Hudson, WI 54016

Prepared by: 
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Date: May 26, 2009

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Uri Spector

Date: May 26, 2009

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TABLE OF CONTENTS

1.0 GENERAL DESCRIPTION..... 3

1.1 Product Description; Test Facility 4

1.3 Environmental conditions..... 5

1.4 Measurement uncertainty 6

1.5 Field Strength Calculation..... 6

2.0 TEST SUMMARY..... 7

3.0 TEST CONDITIONS AND RESULTS..... 8

3.1 Maximum peak output power..... 8

3.2 Hopping channel carrier frequencies separation..... 12

3.3 20dB bandwidth of the hopping channel 14

3.4 Number of hopping frequencies 16

3.5 Average time of occupancy of hopping frequency 18

3.6 Antenna conducted spurious emissions..... 21

3.6.1 Antenna conducted band edge compliance 28

3.7 Radiated spurious emissions..... 31

3.8 RF Exposure Compliance 43

3.9 Transmitter power line conducted emissions 44

3.10 Receiver/digital device radiated emissions..... 47

3.11 Digital device conducted emissions..... 52

4.0 TEST EQUIPMENT..... 55

1.0 GENERAL DESCRIPTION

Model:	Mercury 5e
Type of EUT:	Remote Reader Unit, and Tagger Control Unit
Serial Number:	N/A
FCC ID:	XGF0406091126
Industry Canada ID:	8404A-0406091126
Related Submittal(s) Grants:	None
Company:	Harvest Tec Inc.
Customer:	Mr. Jeff Roberts
Address:	2821 Harvey Street Hudson, WI 54016
Phone:	715-386-9100
Fax:	715-381-1792
Test Standards:	<input checked="" type="checkbox"/> 47 CFR, Part 15:2008, §15.247 <input checked="" type="checkbox"/> RSS-210, Issue 7, 2007 <input checked="" type="checkbox"/> RSS-Gen, Issue 2, 2007 <input checked="" type="checkbox"/> 47 CFR, Part 15:2008, §15.107 and §15.109, Class A <input checked="" type="checkbox"/> Other ICES 003, Issue 4, 2004
Type of radio:	<input checked="" type="checkbox"/> Stand -alone <input type="checkbox"/> Module <input type="checkbox"/> Hybrid
Date Sample Submitted:	April 16, 2009
Test Work Started:	April 30, 2009
Test Work Completed:	May 15, 2009
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:	RFID Frequency Hopping Spread Spectrum transceivers
Transmitter Type:	<input checked="" type="checkbox"/> FHSS <input type="checkbox"/> Digital Modulation <input type="checkbox"/> WiFi <input type="checkbox"/> Blue Tooth
Operating Frequency Range(s):	From 902 to 928 MHz
Number of Channels:	50
Modulation:	
Emission Designator:	DTS
Antenna(s) Info:	Type: Linear Patch Gain: 5.5 dBi Connector Type: RP-TNC Plug
Antenna Installation:	<input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory
Transmitter power configuration:	<input checked="" type="checkbox"/> Internal rechargeable battery <input checked="" type="checkbox"/> External power adapter model HK-H1-A12 (CUI Inc) 100-240VAC; 50/60Hz / 12VDC
Special Test Arrangement:	As a hand-held device the EUT was rotated through three orthogonal axes to determine and tested with the maximum emissions
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.4-2003 and FCC Public Notice DA 00-705

1.2 EUT Configuration

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

- ☒ - Standby
- ☒ - Continuous transmissions with hopping function enabled
- ☒ - Continuous transmissions with hopping function disabled
- ☐ - 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
2	In standby mode testing was performed with and without external power source

Cables:

No.	Type	Length	Designation	Note
1	N/A			
2				

Support equipment/Services:

No.	Item	Description
1	USB memory stick with firmware file(s)	Firmware files to run the EUT in the desire mode
2	CUI Inc. HK-H1-A12 Power Adapter	100-240VAC, 50/60Hz / 12VDC power adapter for Remote Unit

General notes: The both Remote Reader and Tagger Control transceivers use identical RF portions and similar interface portions, therefore the Remote Reader only was tested to demonstrate compliance with FCC and IC requirements

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).

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

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

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

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

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

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

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

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment **does not comply** 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(e) / RSS-210 A8.1	Hopping channel carrier frequencies separation	Pass
15.247(a) / RSS-210 A8.1	20dB bandwidth of the hopping channel	Pass
15.247(e) / RSS-210 A8.1	Number of hopping frequencies	Pass
15.247(e) / RSS-210 A8.1	Average time of occupancy of hopping frequency	Pass
15.247(d) / RSS-210 A8.5	Antenna conducted spurious and band edge 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. Margin: 2.7dB below the limits

Power Output:	Conducted					
Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz					
Low Frequency MHz	Measured power dBm	Antenna Cable Attenuation dB	Power at Antenna dBm	Limit dBm	Limit Reduction dB	Margin dB
903	27.54	0.2	27.34	30	0	-2.66
Middle Frequency MHz						
915	27.44	0.2	27.24	30	0	-2.76
Upper Frequency MHz						
927	27.18	0.2	26.98	30	0	-3.02
RBW:	<input checked="" type="checkbox"/> 1MHz <input type="checkbox"/> 3MHz <input type="checkbox"/> 10MHz					
VBW:	<input checked="" type="checkbox"/> 1MHz <input type="checkbox"/> 3MHz <input type="checkbox"/> 10MHz					
Antenna Gain:	<input type="checkbox"/> < 6dBi <input checked="" type="checkbox"/> = 6dBi <input type="checkbox"/> >6dBi and = <input type="text"/> dBi, Output power reduction = 0 dB					

Notes: None



Graph 3.1.1



Graph 3.1.2



Graph 3.1.3

3.2 Hopping channel carrier frequencies separation

Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz	
Measured Separation (kHz)	Limit (kHz)	Result
500	25	Pass
Limit:	<input checked="" type="checkbox"/> 25kHz <input type="checkbox"/> 20dB channel bandwidth <input type="checkbox"/> 2/3 of 20dB channel bandwidth	
Span:	1000kHz	
RBW:	<input type="checkbox"/> 3kHz <input checked="" type="checkbox"/> 10kHz <input type="checkbox"/> 100kHz <input type="checkbox"/> other <input type="text"/> kHz	
VBW:	<input type="checkbox"/> 3kHz <input checked="" type="checkbox"/> 10kHz <input type="checkbox"/> 100kHz <input type="checkbox"/> other <input type="text"/> kHz	

Notes: None



Graph 3.2.1

3.3 20dB bandwidth of the hopping channel

Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
20dB bandwidth (kHz)		Limit (kHz)	Result
73.2		500	Pass
Span:	200kHz		
RBW:	<input type="checkbox"/> 3kHz <input checked="" type="checkbox"/> 10kHz <input type="checkbox"/> 100kHz <input type="checkbox"/> other	kHz	
VBW:	<input type="checkbox"/> 3kHz <input checked="" type="checkbox"/> 10kHz <input type="checkbox"/> 100kHz <input type="checkbox"/> other	kHz	

Notes: None



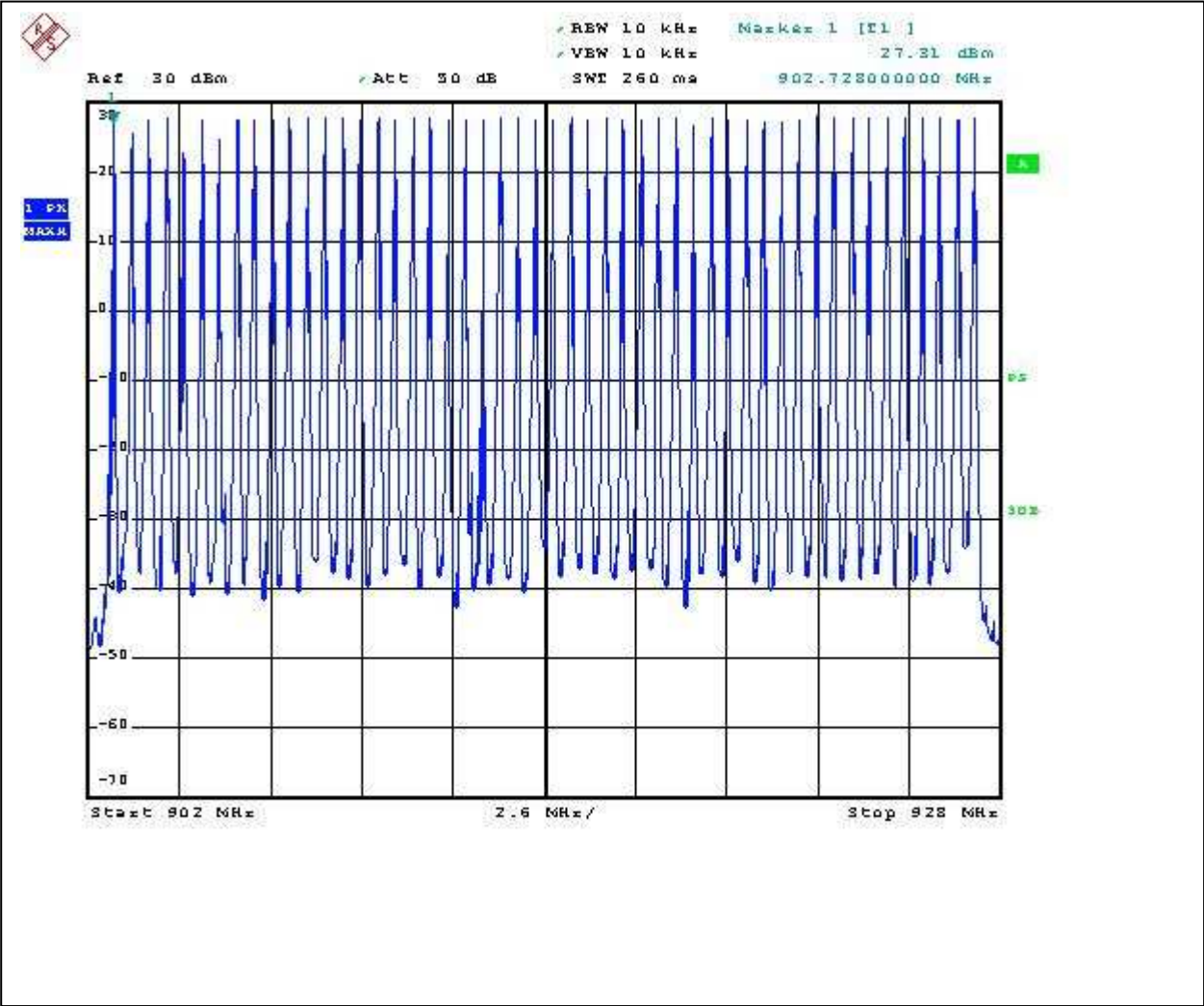
Graph 3.3.1



3.4 Number of hopping frequencies

Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz	
Measured Number	Requirements	Result
50	50	Pass
Channel 20dB Bandwidth:	<input checked="" type="checkbox"/> <250kHz <input type="checkbox"/> ≥250kHz	

Notes: Npne



Graph 3.4.1

3.5 Average time of occupancy of hopping frequency

Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
Measured / Calculated Time sec	Period sec	Limit sec	Result
0.39	20	0.40	Pass
Period:	<input type="checkbox"/> 10s <input checked="" type="checkbox"/> 20s <input type="checkbox"/> 30s <input type="checkbox"/> 0.4s multiplied by the channel number		
Channel 20dB Bandwidth:	<input checked="" type="checkbox"/> <250kHz <input type="checkbox"/> ≥250kHz		

Time of occupancy calculation:

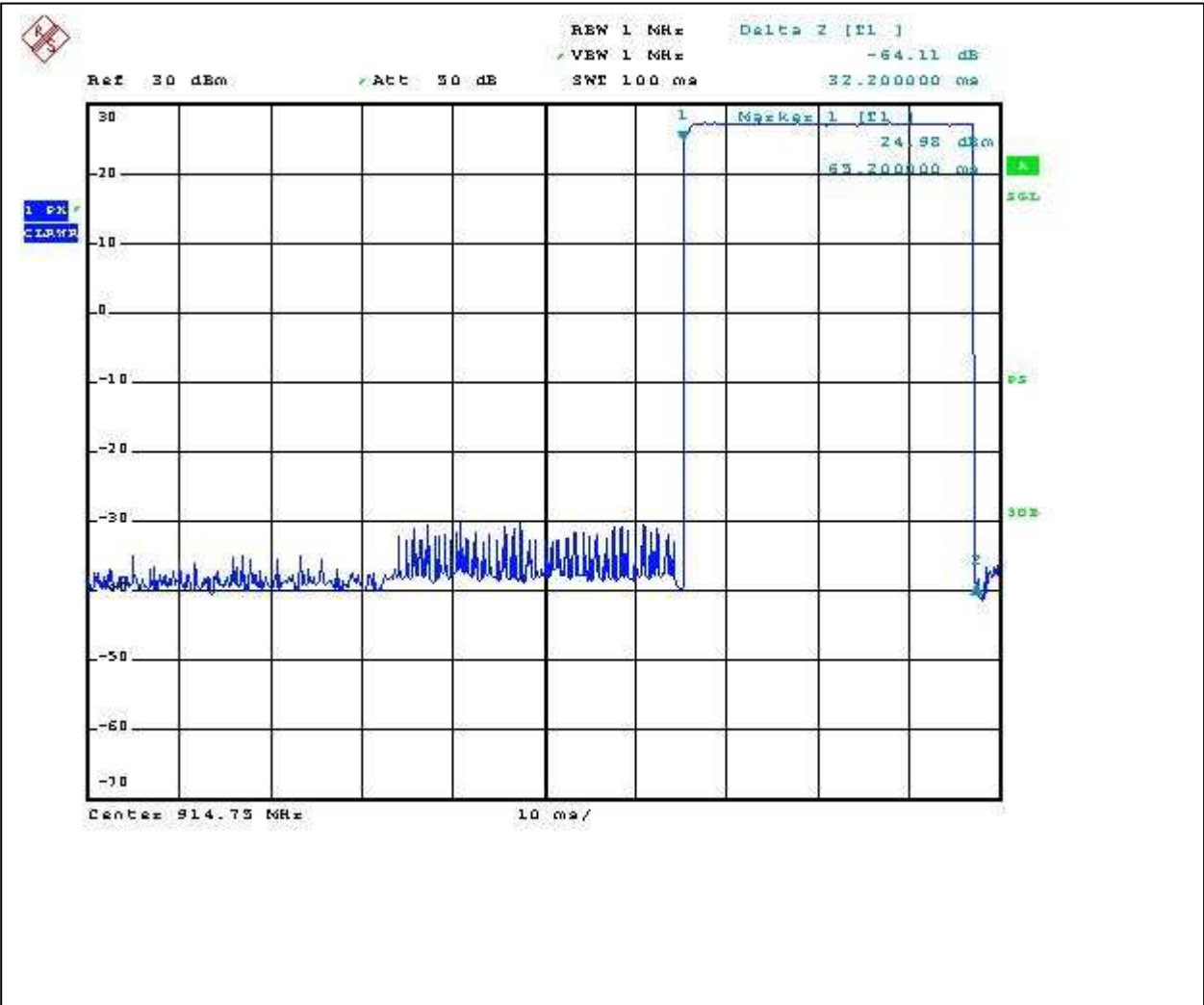
The minimum measured repetition of the channel occupancy (repetition) = 12 times in 20 sec

Single occupancy duration (single duration) = 32.2 ms

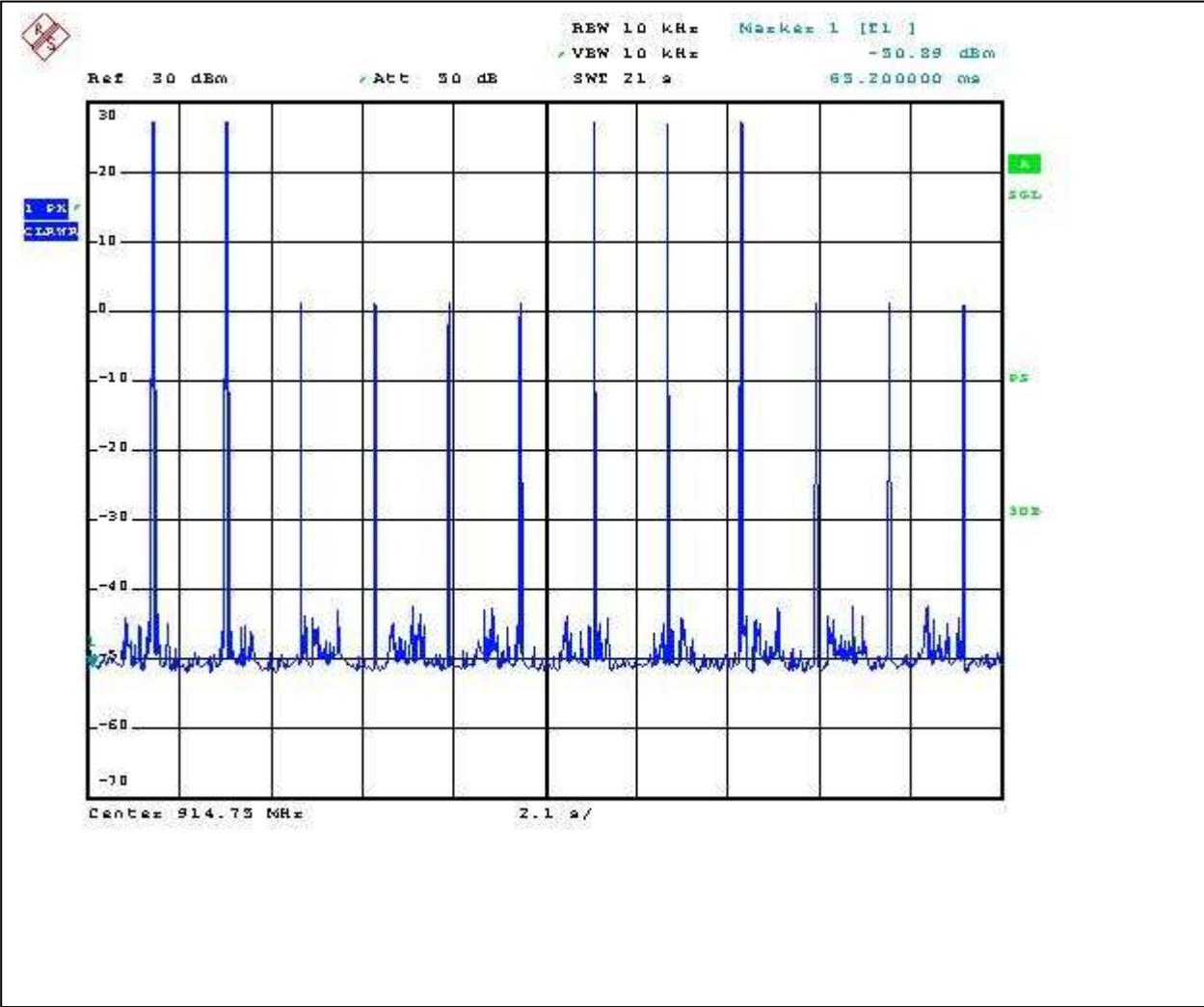
Period = 20 sec

Time of occupancy = (single duration) x (repetition) = 32.2ms x 12times = 0.3864 sec

Notes: None



Graph 3.5.1



Graph 3.5.2

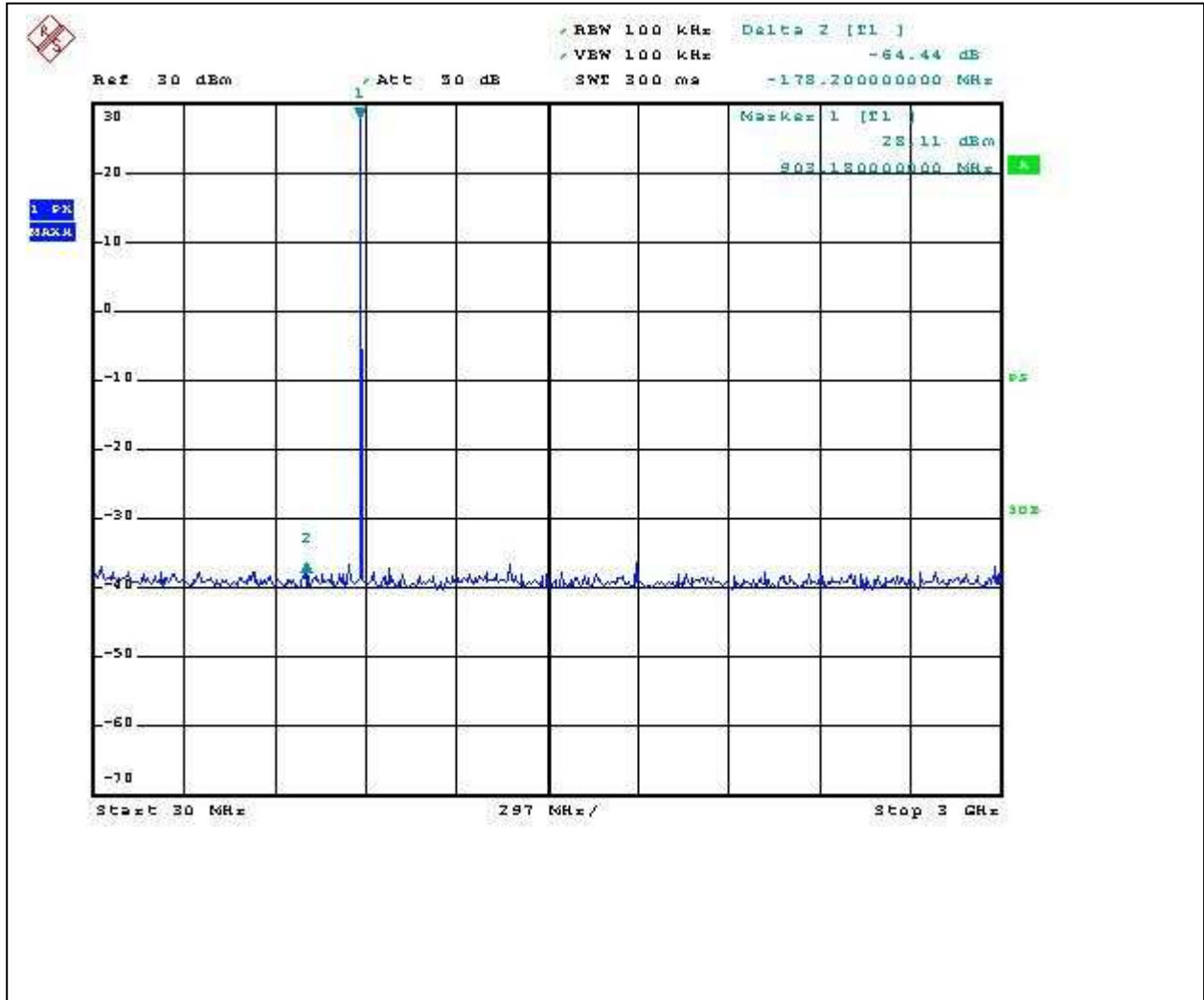


3.6 Antenna conducted spurious emissions

Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
	Minimum Measured Attenuation dB	Minimum Allowed Attenuation dB	Margin dB
Low Frequency Channel	64.4	20	-44.4
Middle Frequency Channel	62.7	20	-42.7
Upper Frequency Channel	64.7	20	-44.7
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)		

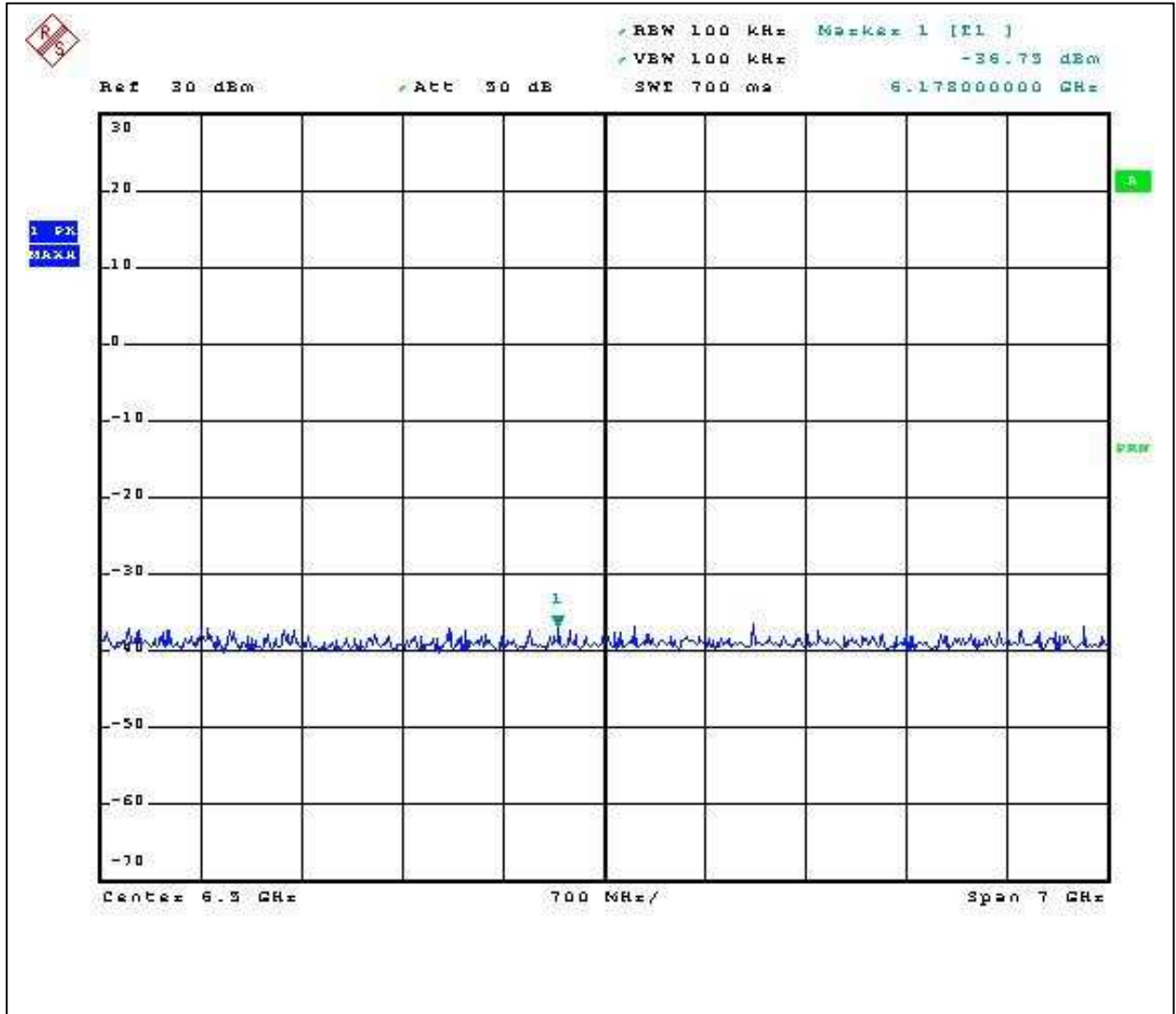
Notes: None

Channel 903MHz



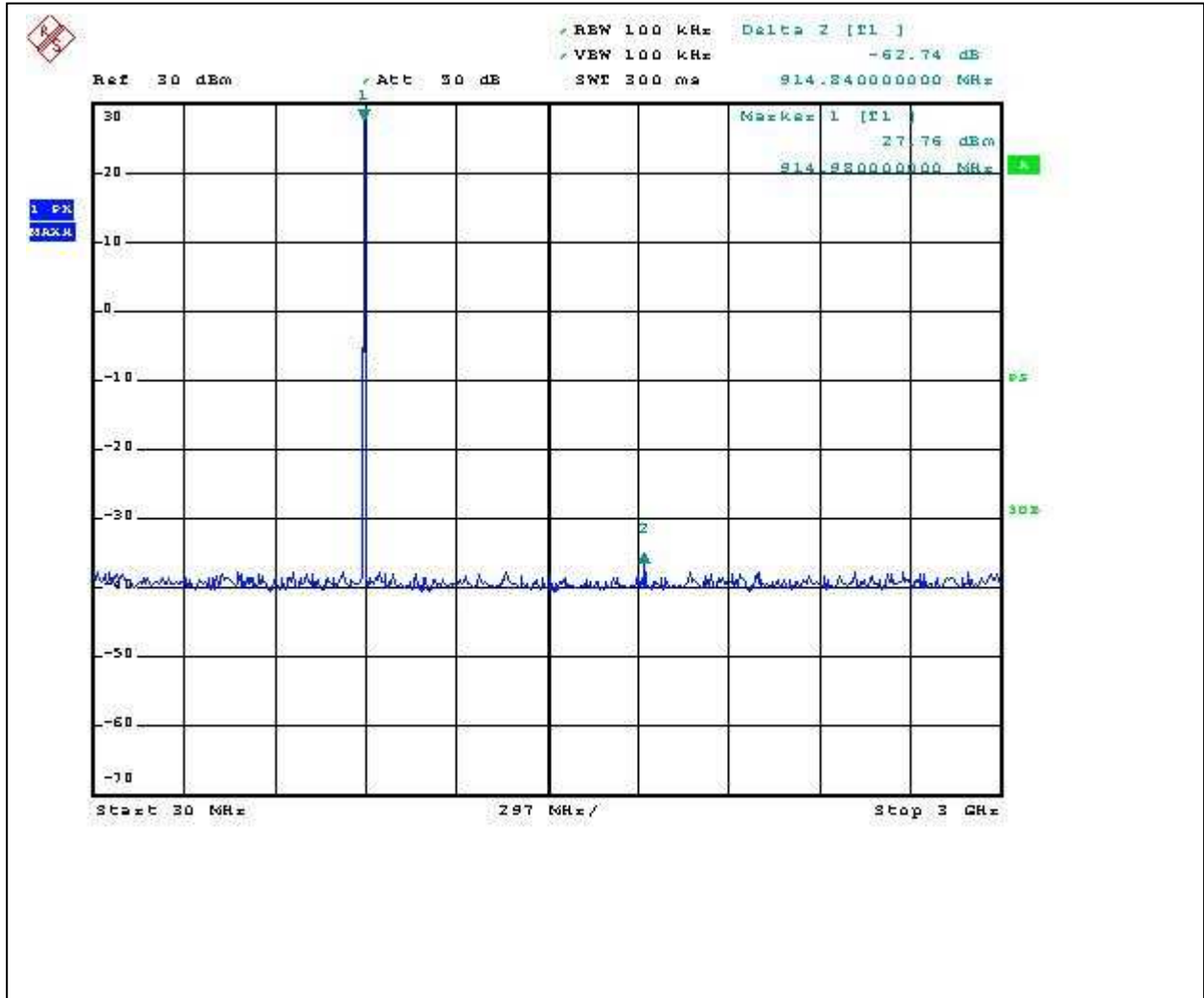
Graph 3.6.1

Channel 903MHz



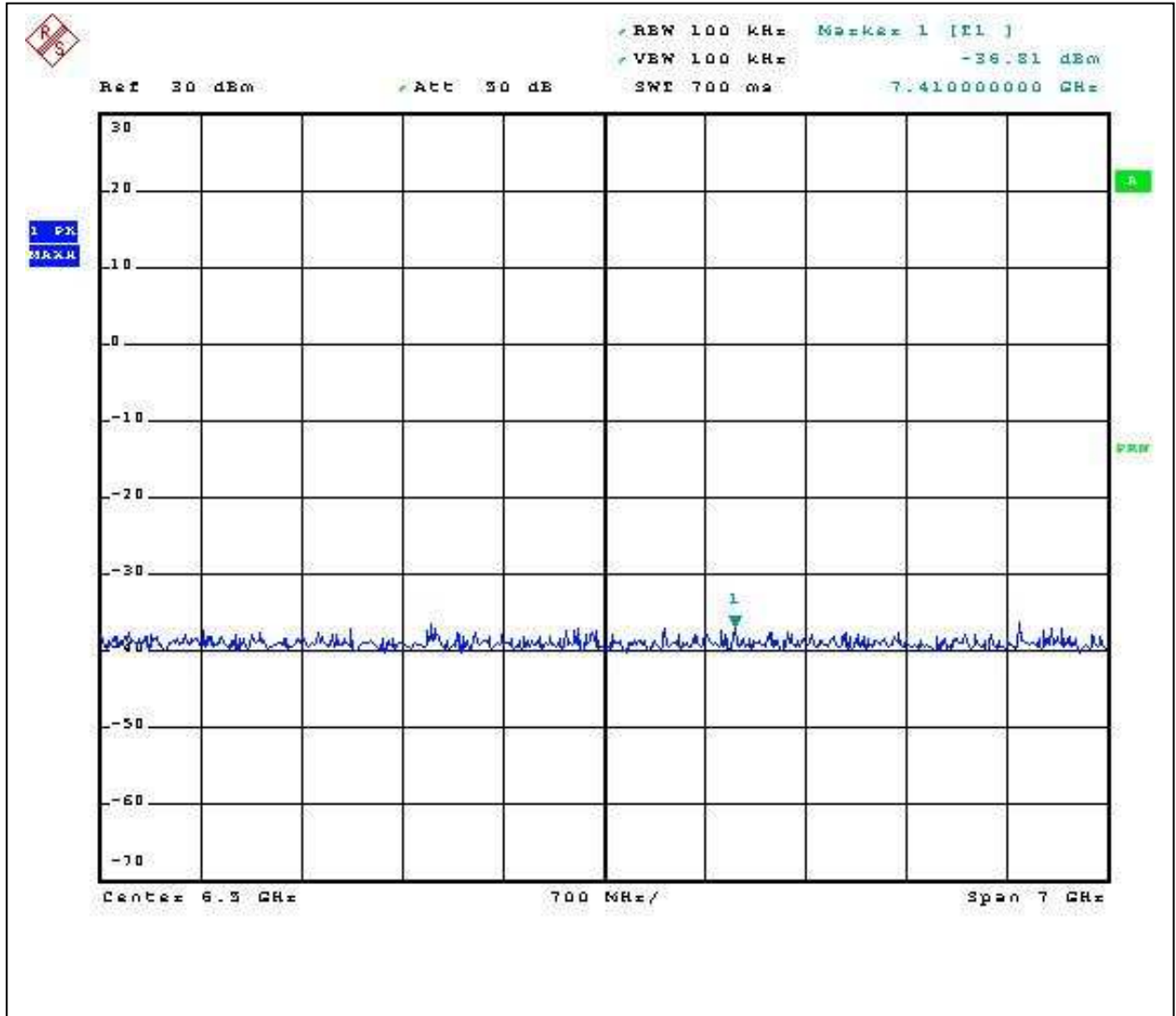
Graph 3.6.2

Channel 915MHz



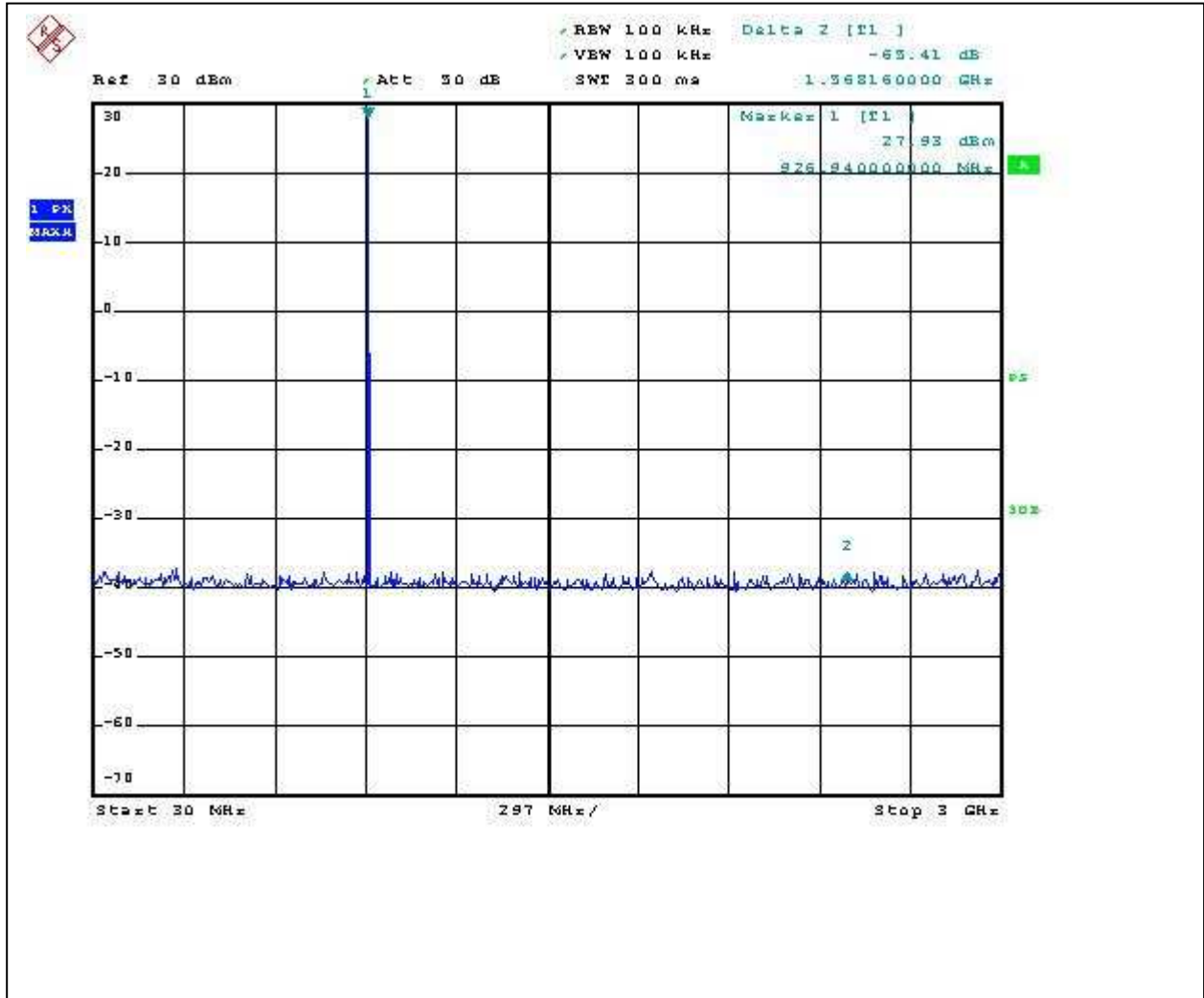
Graph 3.6.3

Channel 915MHz



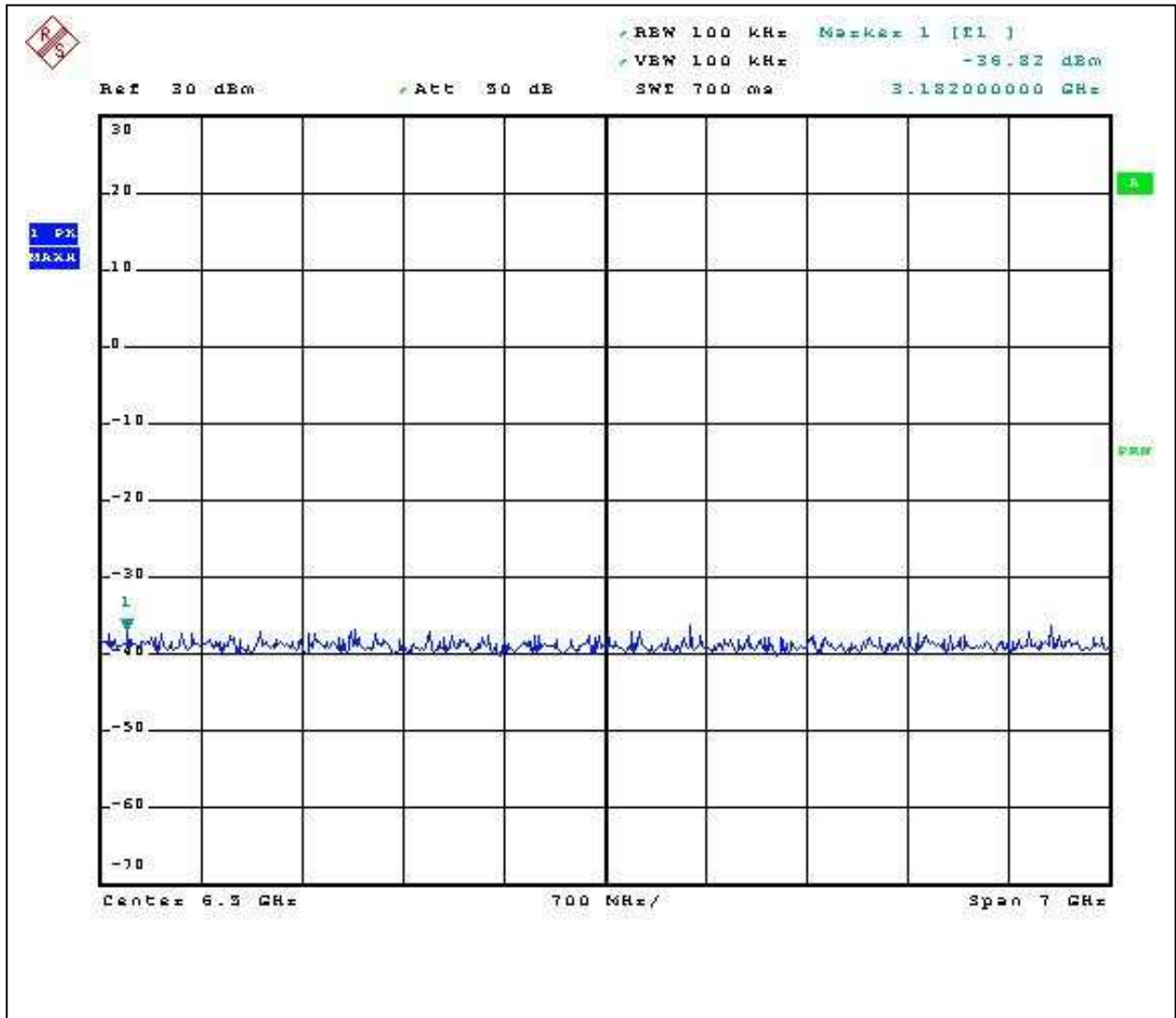
Graph 3.6.4

Channel 927MHz



Graph 3.6.5

Channel 927MHz



Graph 3.6.6



3.6.1 Antenna conducted band edge compliance

Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
	Minimum Measured Attenuation dB	Minimum Allowed Attenuation dB	Margin dB
Low Frequency Channel	58.83	20	-38.83
Upper Frequency Channel	62.46	20	-42.46
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: None



Graph 3.6.7



Graph 3.6.8

3.7 Radiated spurious emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Max. Margin: 4.8dB below the peak limits

Date:	May 11-15, 2009	Result: Pass
Standard:	FCC Part 15.247(d) / 15.209	
Tested by:	Simon Khazon	
Test Point:	Low frequency channel	
Operation mode:	See Page 5	
Note:	903MHz operating frequency	

Table 3.7.1

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	QP Limit dBμV/m	Margin dB
1.013 GHz	V	22.4	26.5	0.0	48.9	54.0	-5.1
1.084 GHz	V	22.0	27.3	0.0	49.2	54.0	-4.8
1.102 GHz	V	21.2	27.4	0.0	48.6	54.0	-5.4
1.12 GHz	V	20.2	27.6	0.0	47.8	54.0	-6.2
1.297 GHz	V	14.8	29.3	0.0	44.1	54.0	-9.9
1.806 GHz	V	13.8	33.1	0.0	46.9	54.0	-7.1
9.7333 GHz	V	36.1	46.8	38.6	44.3	54.0	-9.7
1.0045 GHz	H	19.0	26.4	0.0	45.4	54.0	-8.6
1.016 GHz	H	19.3	26.6	0.0	45.9	54.0	-8.1
1.175 GHz	H	17.9	28.2	0.0	46.0	54.0	-7.9
1.806 GHz	H	15.1	33.1	0.0	48.2	54.0	-5.8
2.7093 GHz	H	43.7	33.3	39.9	37.1	54.0	-16.8
9.6053 GHz	H	36.1	46.7	38.6	44.2	54.0	-9.8

Date:	May 11-15, 2009	Result: Pass
Standard:	FCC Part 15.247(d) / 15.209	
Tested by:	Simon Khazon	
Test Point:	Low frequency channel	
Operation mode:	See Page 5	
Note:	915MHz operating frequency	

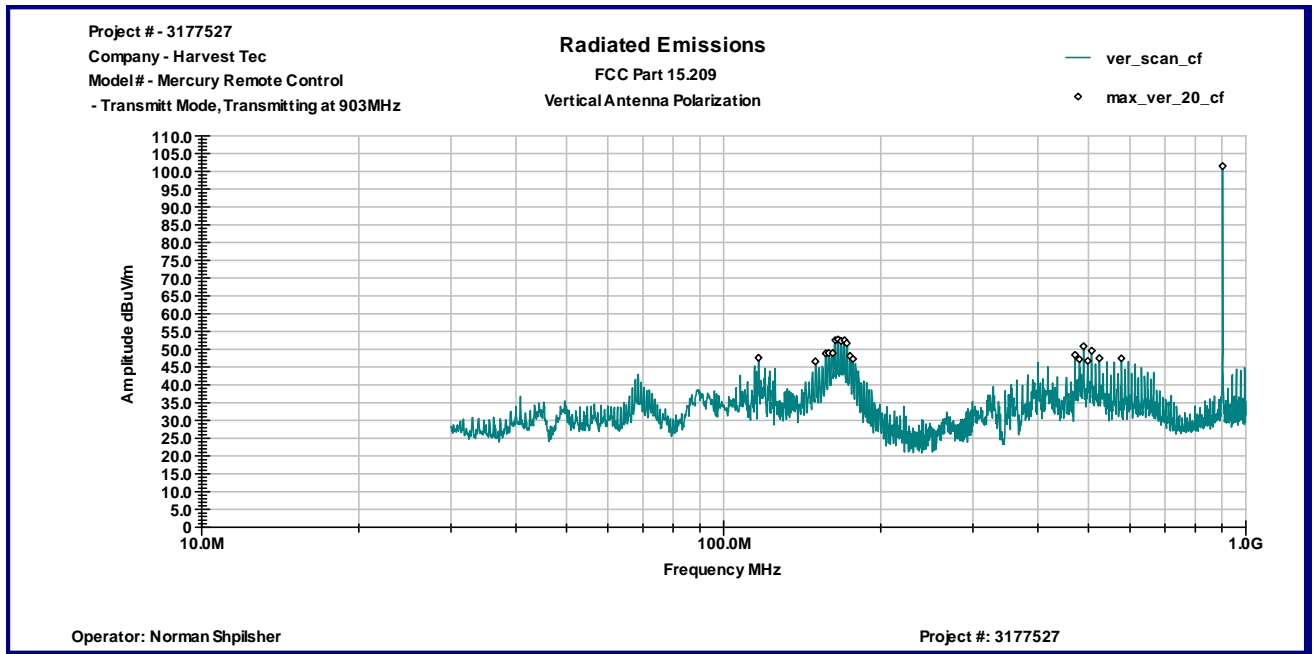
Table 3.7.2

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	QP Limit dBμV/m	Margin dB
1.013 GHz	V	23.3	26.5	0.0	49.8	60.0	-10.2
1.067 GHz	V	22.7	27.1	0.0	49.8	60.0	-10.2
1.0845 GHz	V	22.3	27.3	0.0	49.6	60.0	-10.4
1.92 GHz	V	12.7	34.3	0.0	46.9	60.0	-13.1
2.3787 GHz	V	44.7	32.3	39.8	37.2	54.0	-16.8
2.7467 GHz	V	43.4	33.4	39.9	36.9	54.0	-17.1
9.92 GHz	V	35.8	47.0	38.6	44.2	54.0	-9.8
1.0845 GHz	H	17.6	27.3	0.0	44.8	60.0	-15.2
1.1025 GHz	H	17.7	27.4	0.0	45.1	60.0	-14.9
1.8305 GHz	H	13.7	33.3	0.0	46.9	60.0	-13.1
2.7467 GHz	H	44.9	33.4	39.9	38.3	54.0	-15.6
9.2853 GHz	H	36.4	46.4	38.7	44.0	54.0	-10.0

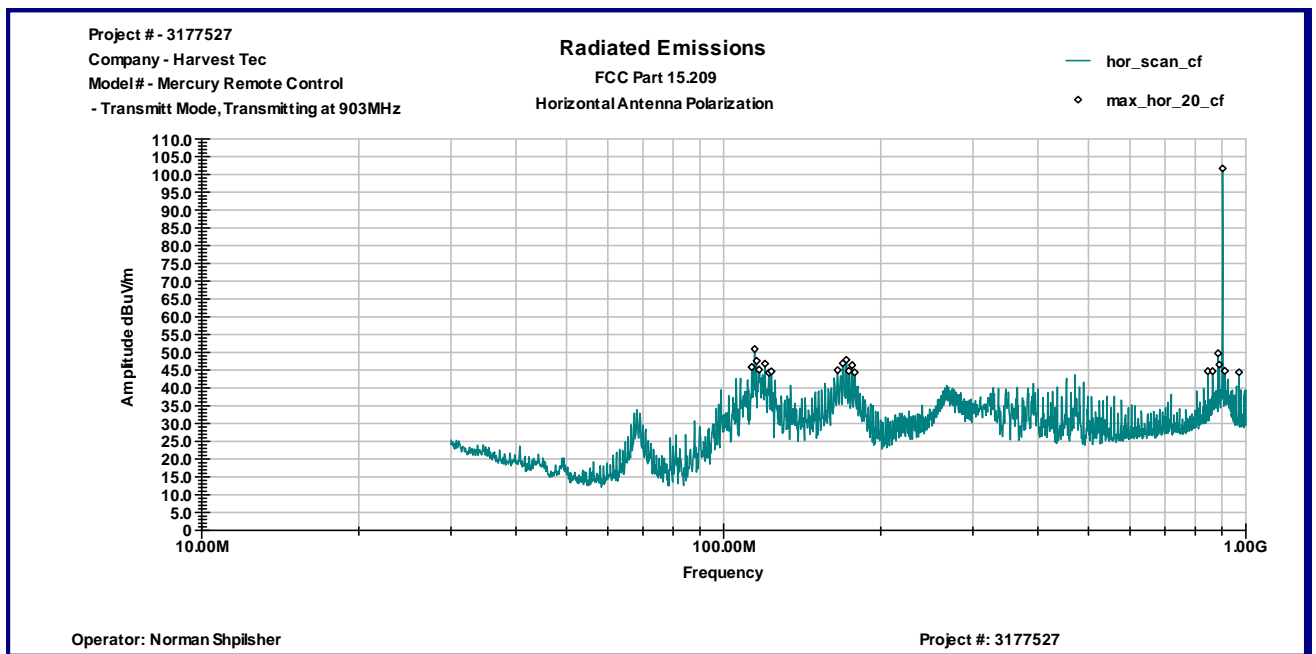
Date:	May 11-15, 2009	Result: Pass
Standard:	FCC Part 15.247(d) / 15.209	
Tested by:	Simon Khazon	
Test Point:	Low frequency channel	
Operation mode:	See Page 5	
Note:	927MHz operating frequency	

Table 3.7.3

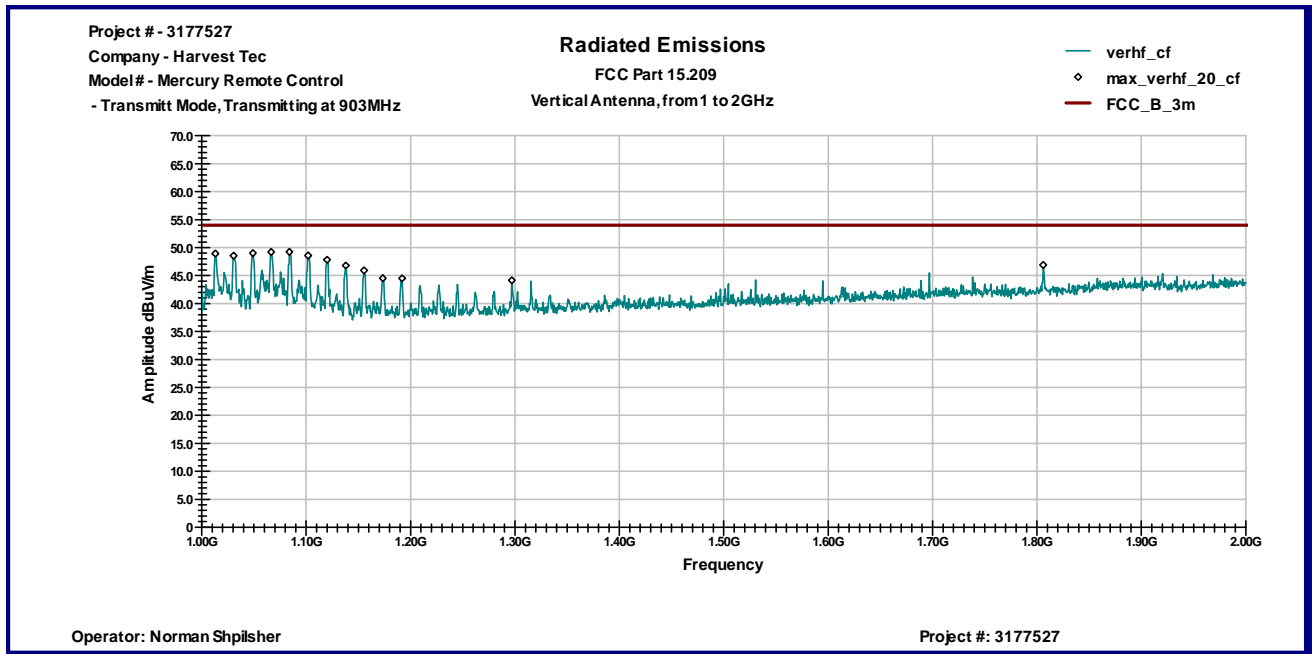
Frequency MHz	Antenna Polarity	Peak Reading dB μ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB μ V/m	QP Limit dB μ V/m	Margin dB
1.0135 GHz	V	22.1	26.5	0.0	48.6	54.0	-5.4
1.102 GHz	V	20.5	27.4	0.0	47.9	54.0	-6.1
1.854 GHz	V	14.8	33.8	0.0	48.5	54.0	-5.4
2.7787 GHz	V	45.9	33.5	39.9	39.5	54.0	-14.5
9.264 GHz	V	36.2	46.3	38.7	43.8	54.0	-10.2
1.043 GHz	H	18.6	26.9	0.0	45.5	54.0	-8.5
1.12 GHz	H	17.0	27.6	0.0	44.5	54.0	-9.5
1.854 GHz	H	15.1	33.8	0.0	48.8	54.0	-5.1
2.7787 GHz	H	44.1	33.5	39.9	37.7	54.0	-16.3
9.9947 GHz	H	34.6	47.1	38.6	43.1	54.0	-10.9



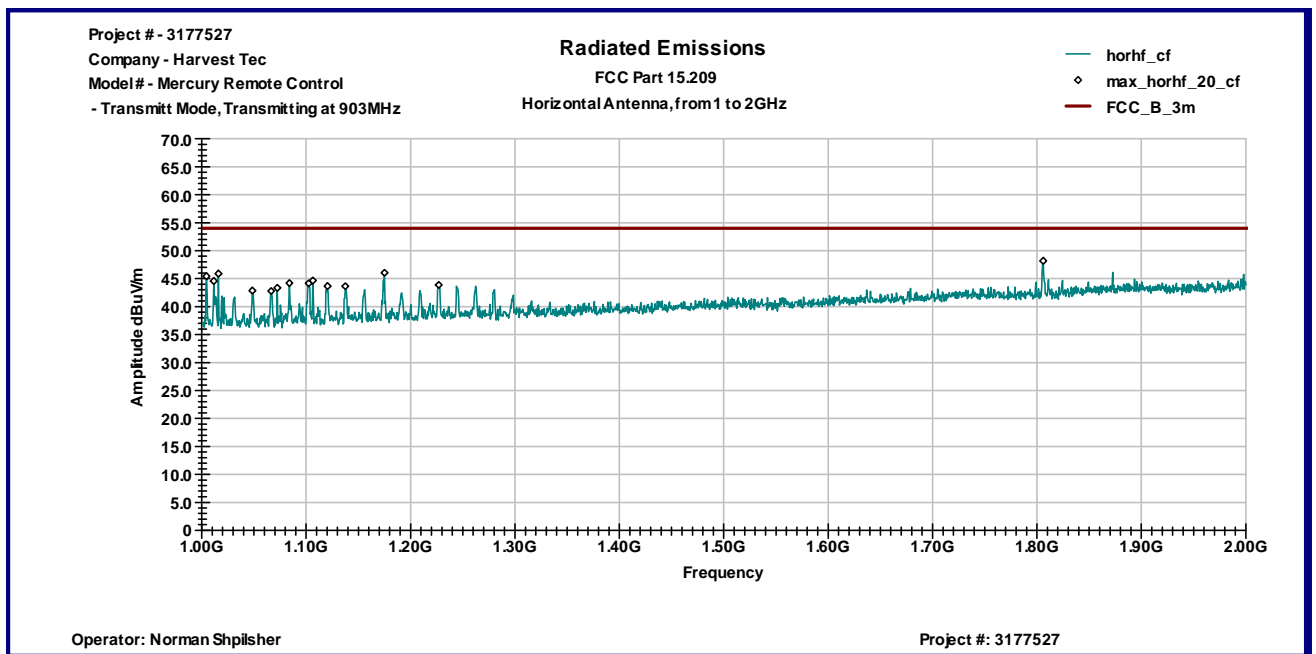
Graph 3.7.1



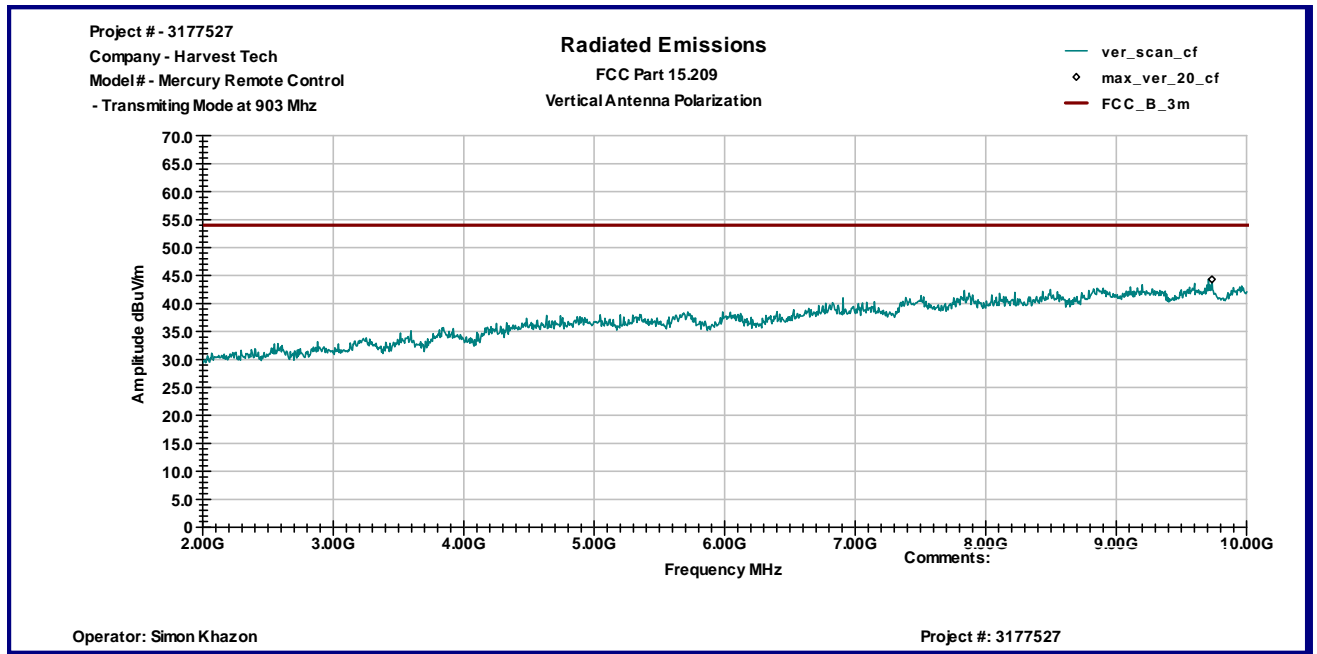
Graph 3.7.2



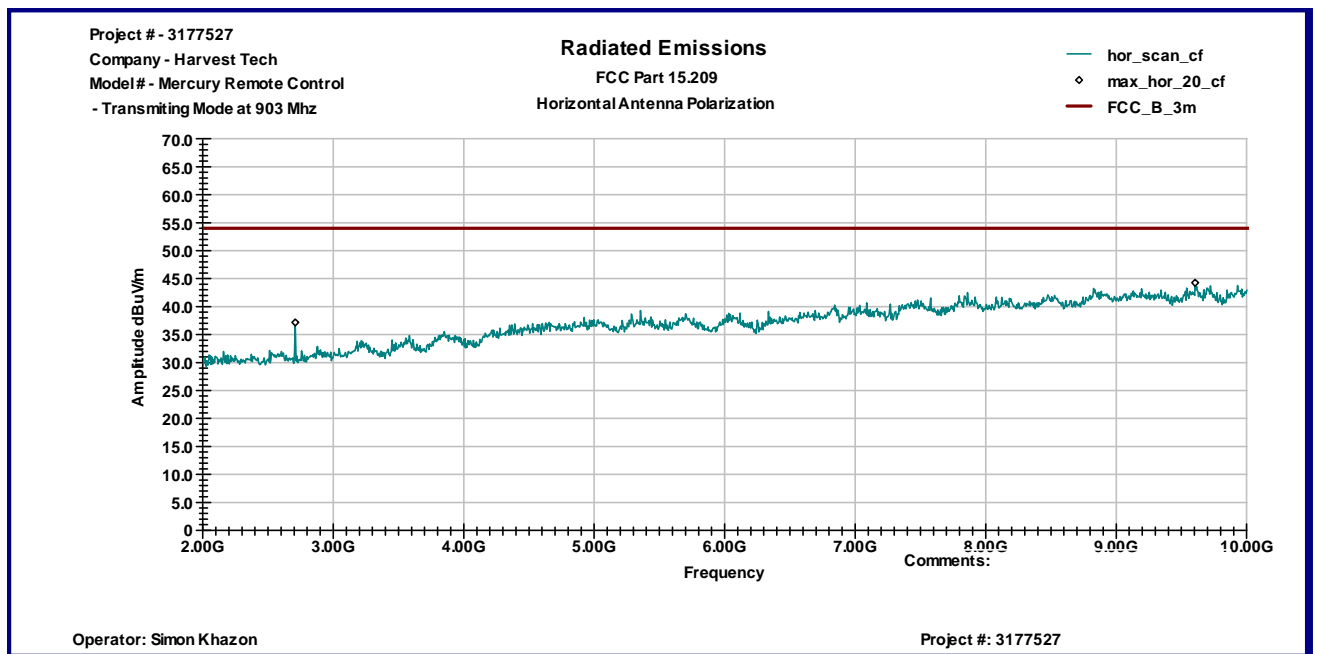
Graph 3.7.3



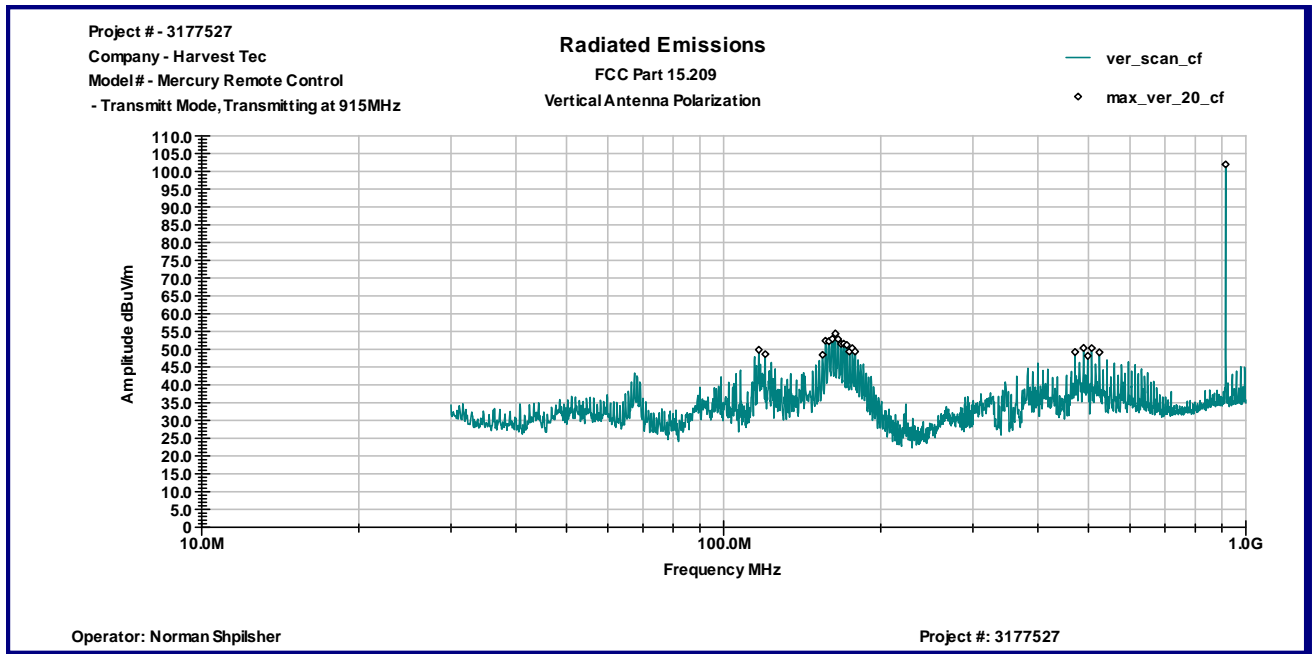
Graph 3.7.4



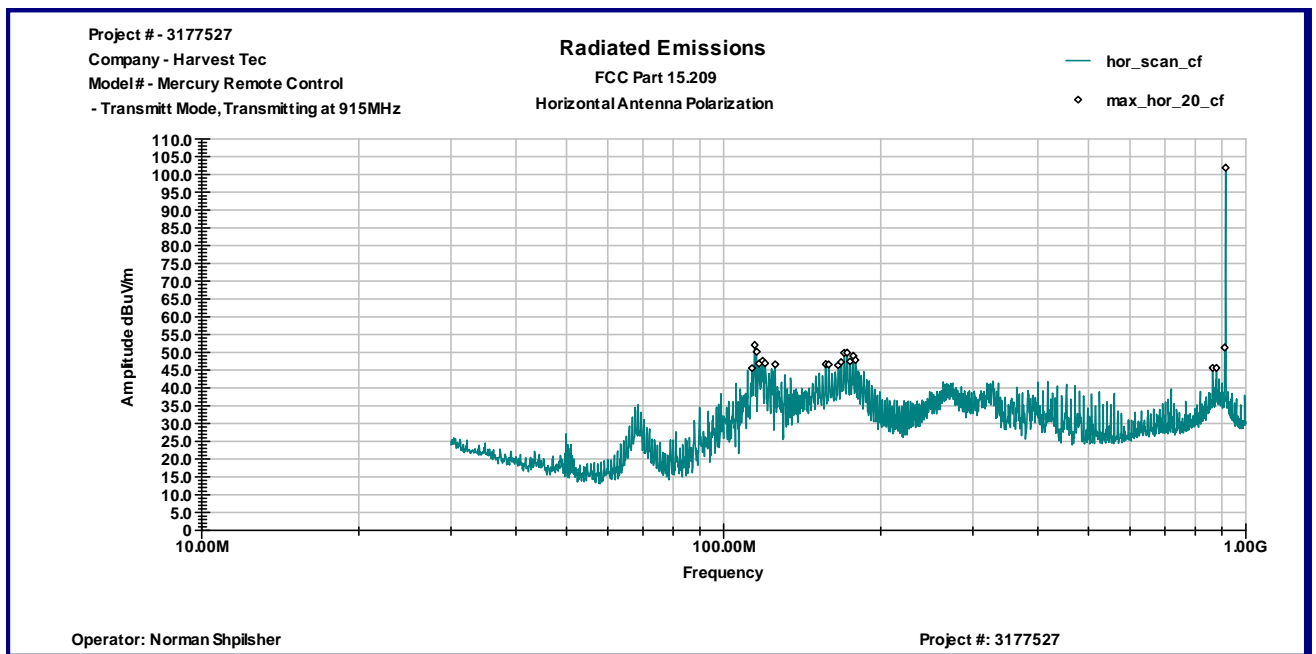
Graph 3.7.5



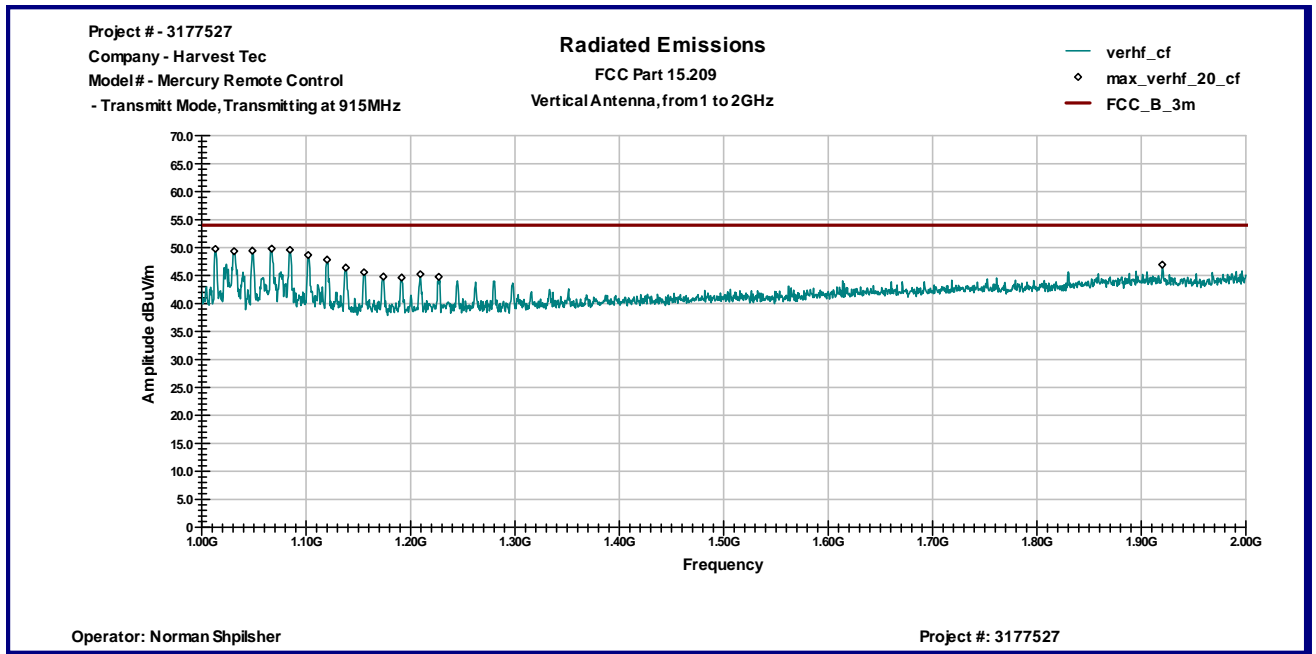
Graph 3.7.6



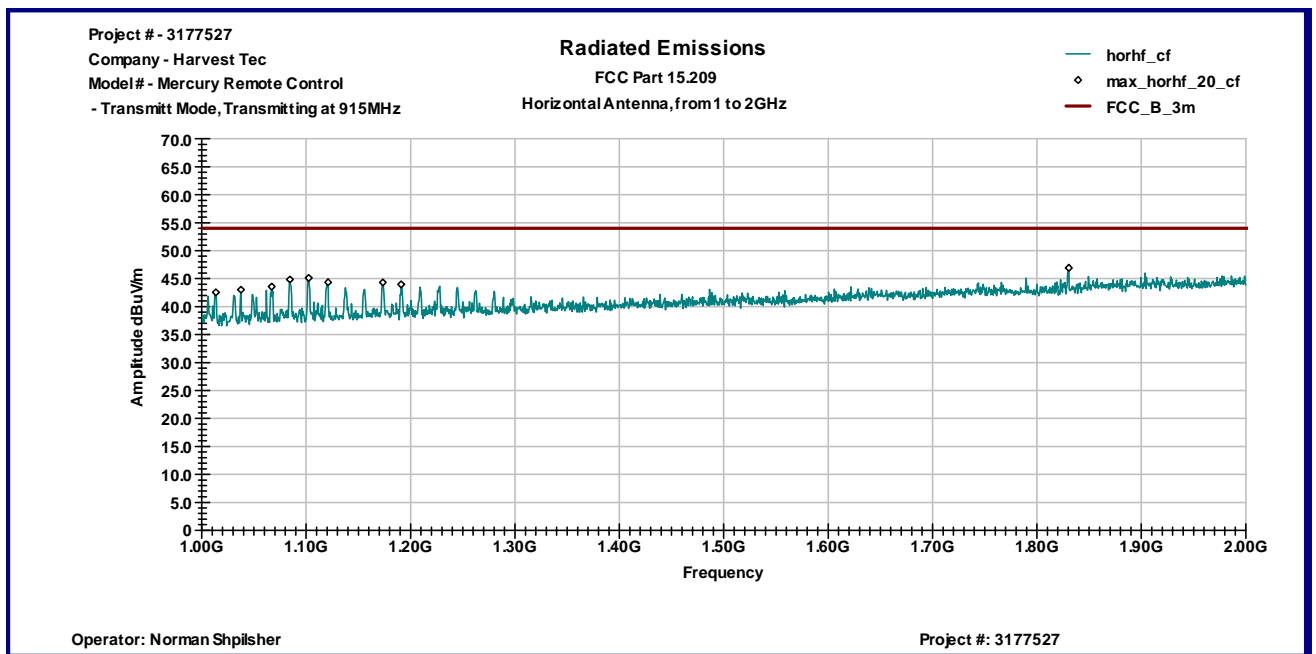
Graph 3.7.7



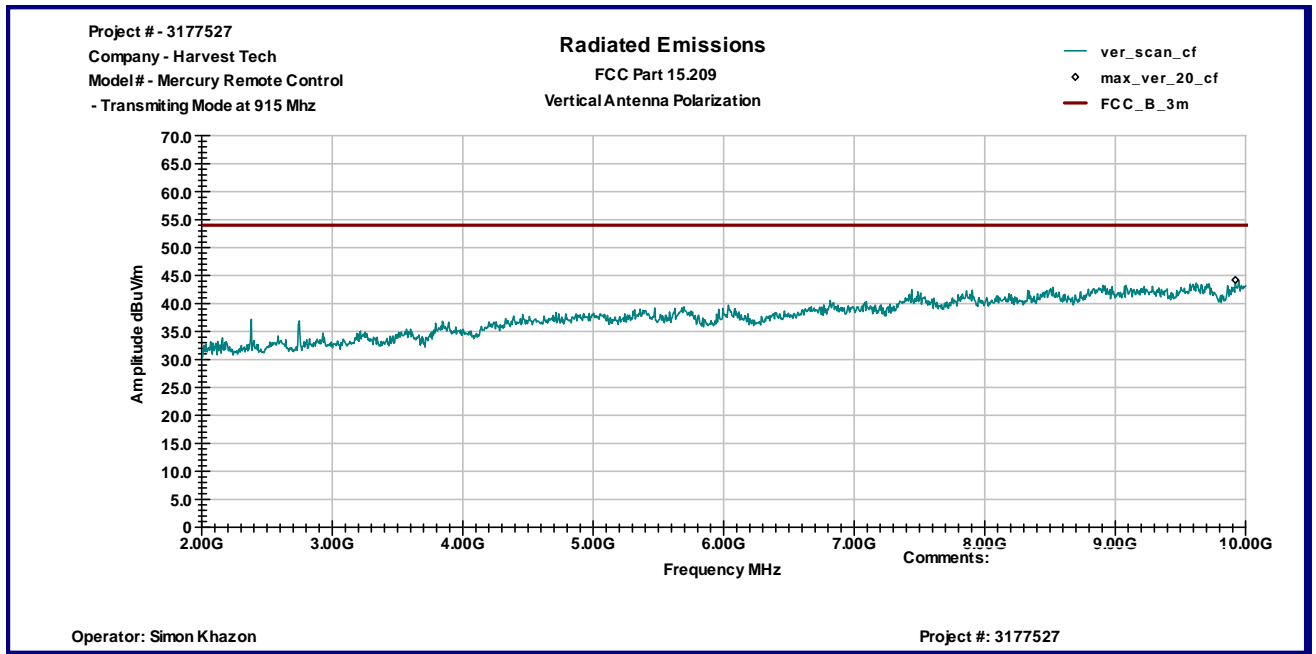
Graph 3.7.8



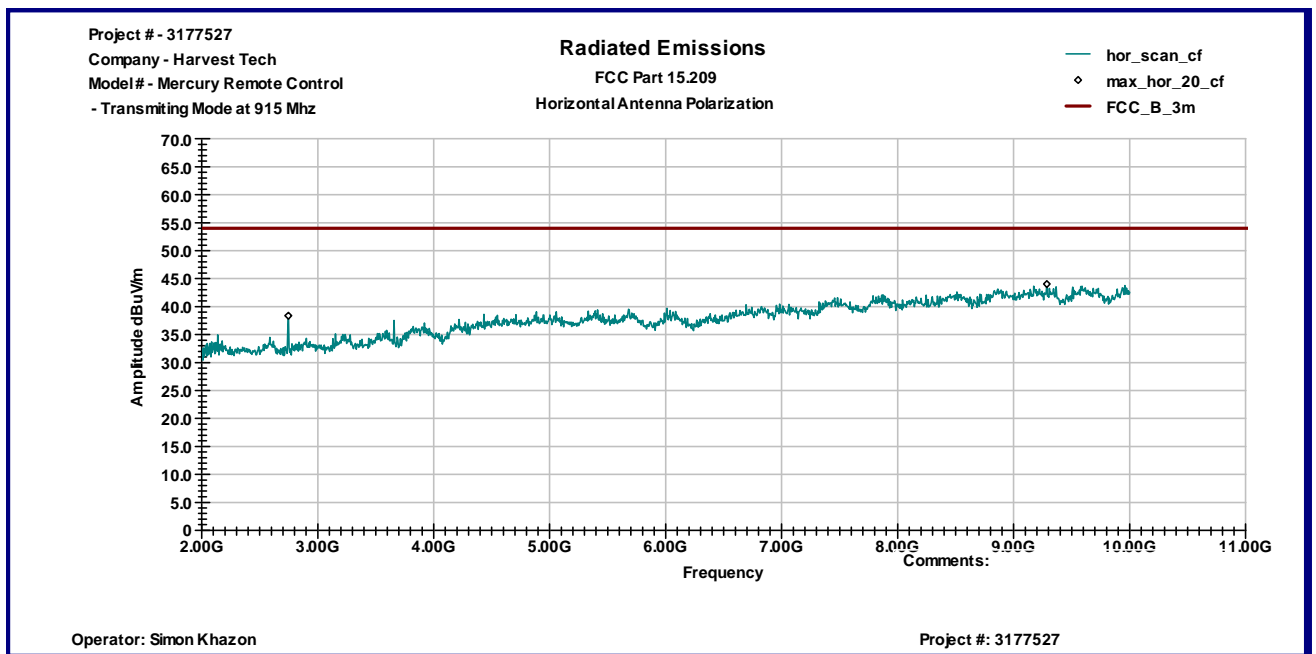
Graph 3.7.9



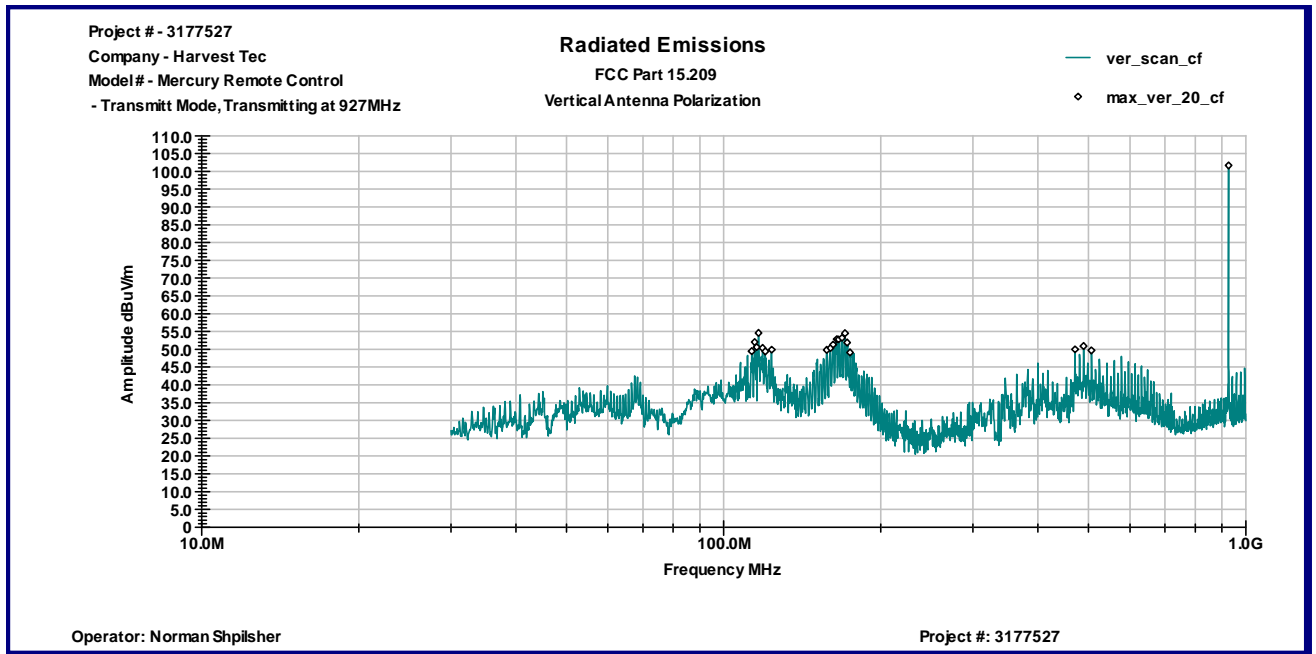
Graph 3.7.10



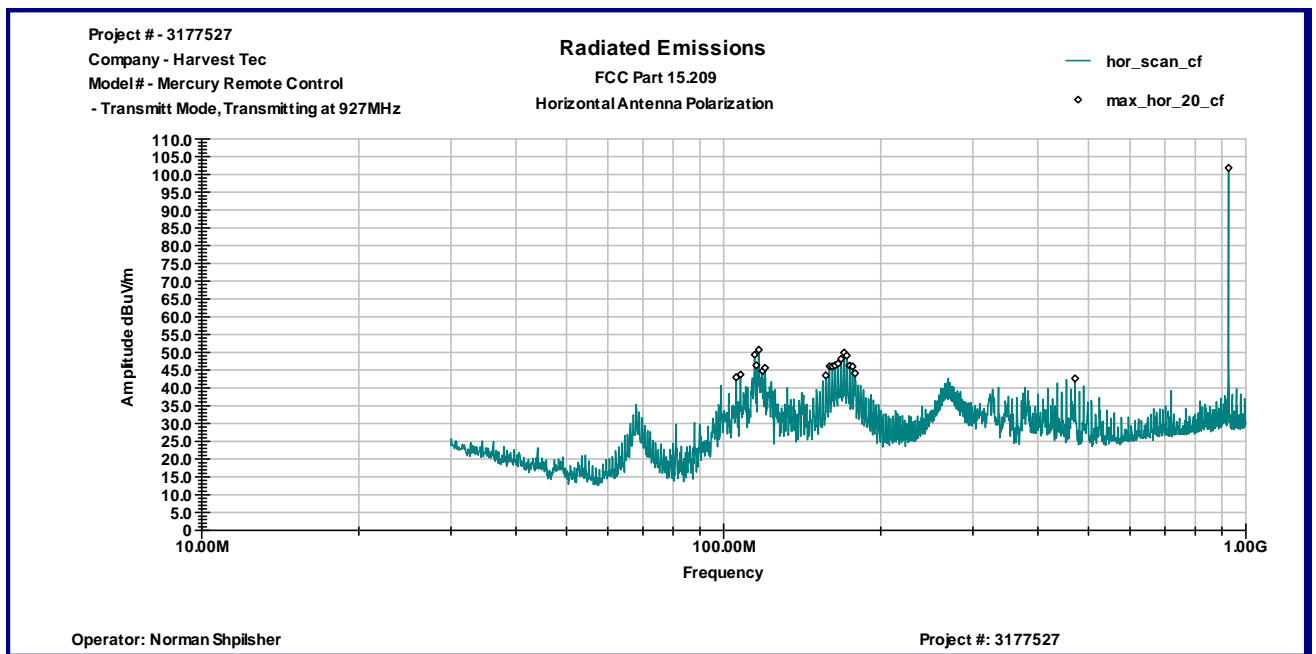
Graph 3.7.11



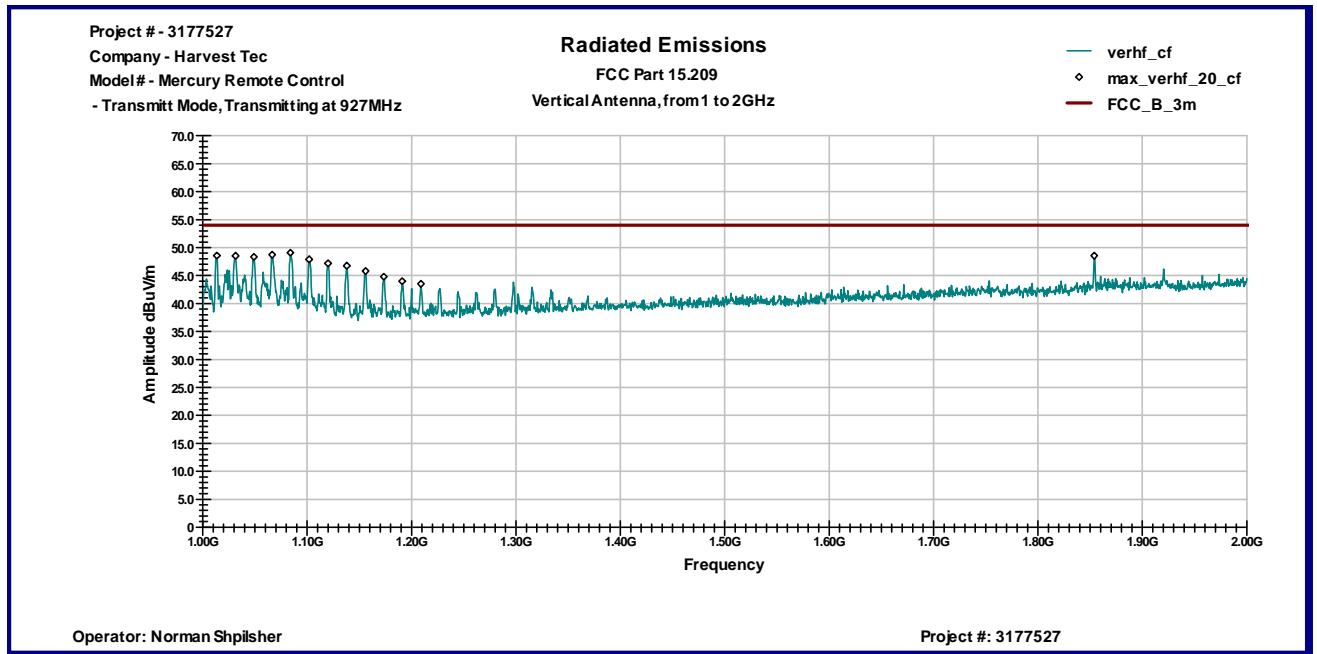
Graph 3.7.12



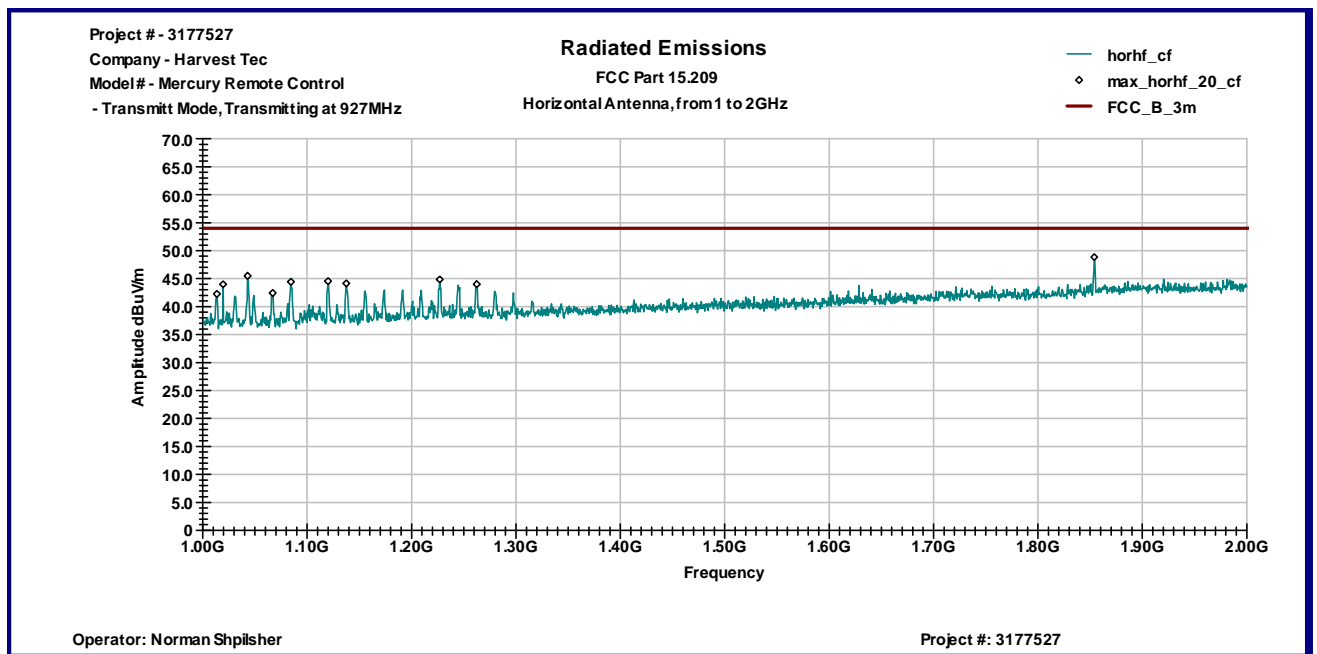
Graph 3.7.13



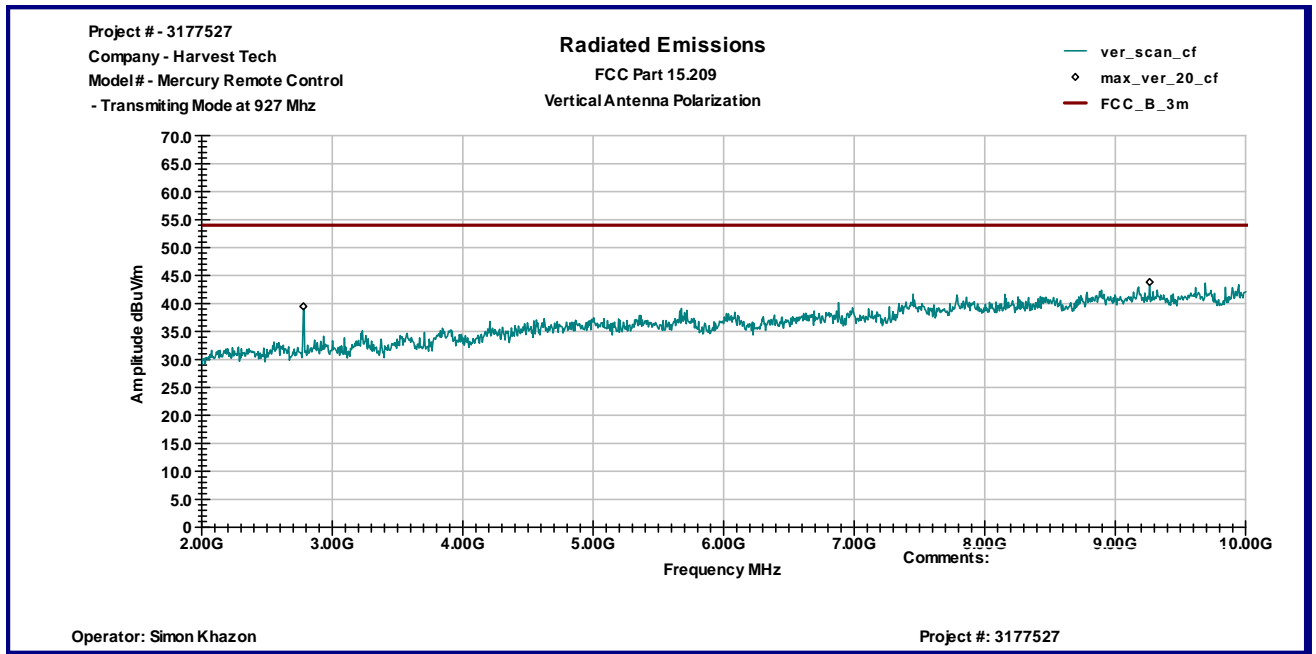
Graph 3.7.14



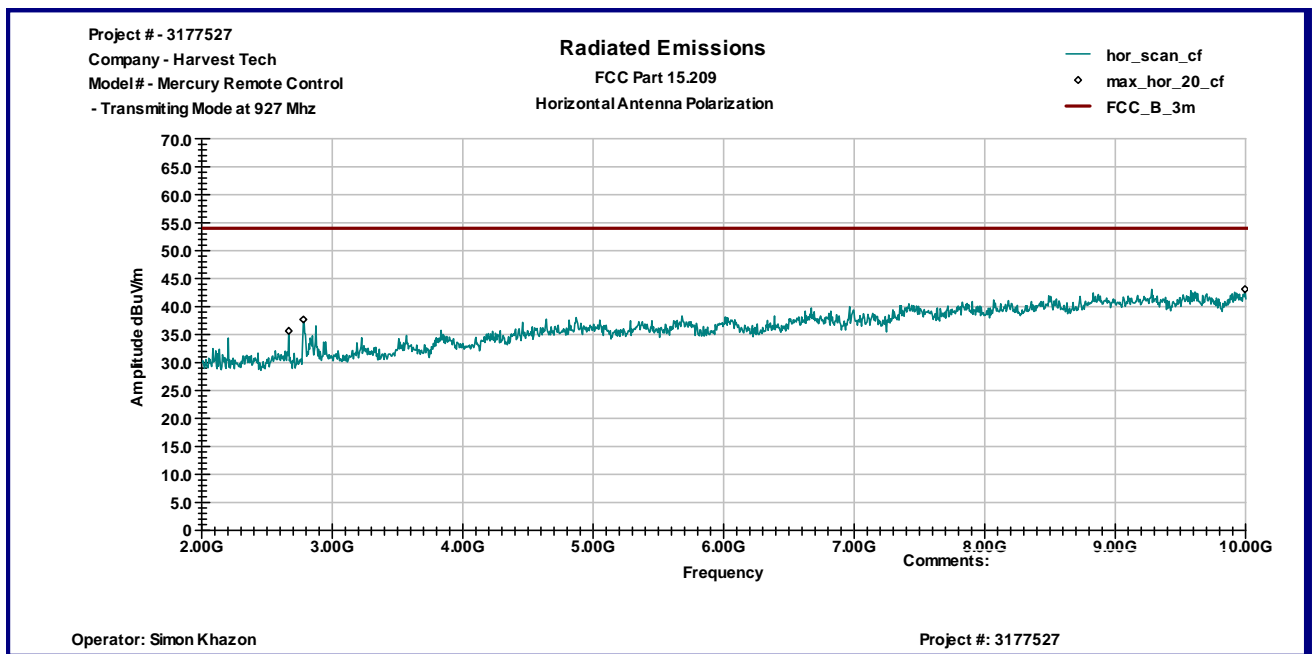
Graph 3.7.15



Graph 3.7.16



Graph 3.7.17



Graph 3.7.18

3.8 RF Exposure Compliance

The maximum measured antenna conducted power, P is 27.34dBm

The antenna gain, G is 6dBi

The maximum EIRP power = P + G

ERP = 27.34+ 6= 33.34dBm, or 2.158W

The limits for Maximum Permissible Exposure (MPE) for transmitter operating at 902-928MHz, MPE is 928/1500 = 0.619mW/cm², or 6.2W/m²

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

$S = 2.158 / 4\pi 0.2^2$,

$S = 4.29\text{mW/cm}^2$, or below the Maximum Permissible Exposure (MPE) of 6.2W/m²



3.9 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 13.3dB below the Quasi-peak limits

Notes: None

Date:	May 11, 2009	Result: Pass
Standard:	FCC 15.207	
Tested by:	Norman Shpilsher	
Test Point:	Power Line	
Operation mode:	Transmitting mode	
Note:		

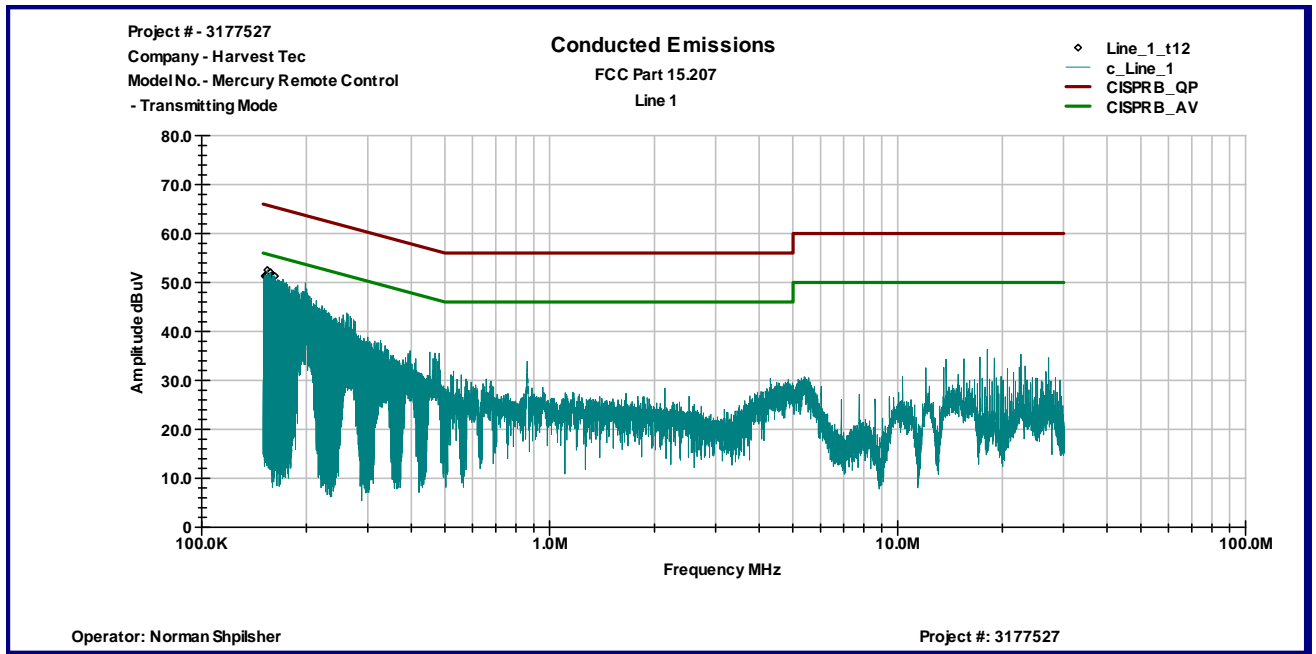
Table 3.9.1

Line 1

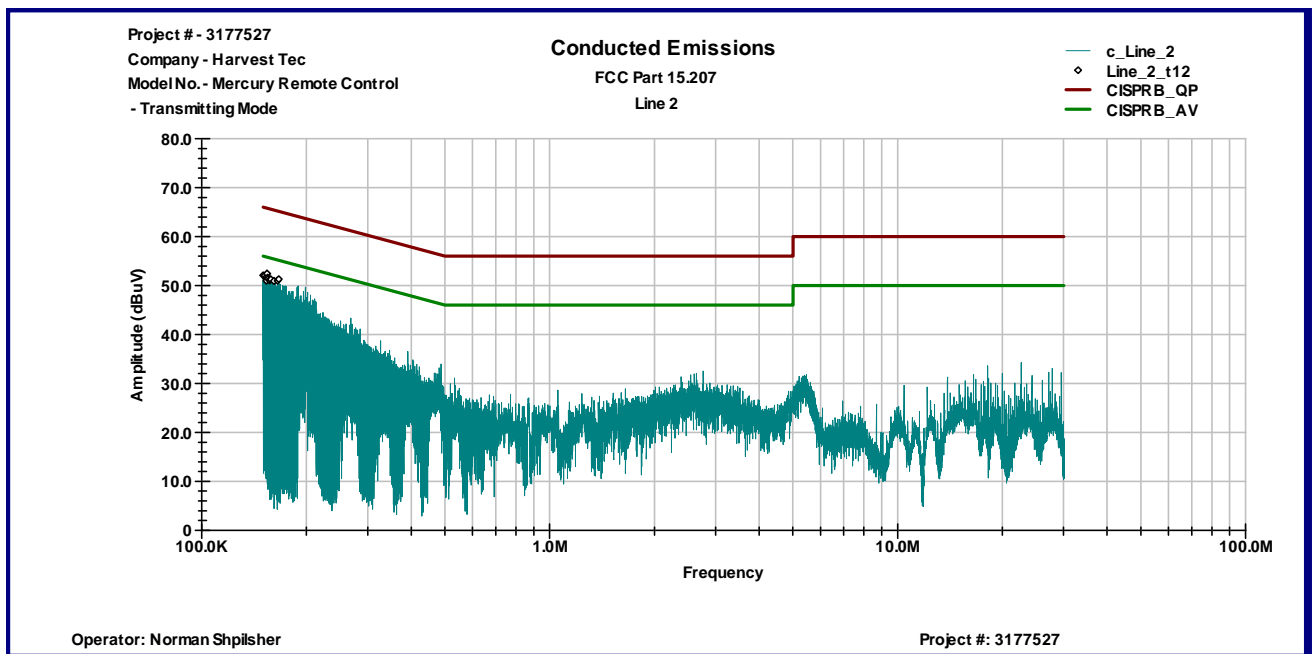
Frequency	Peak dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
151.71 KHz	51.3	65.9	55.9	-14.6	-4.6
152.41 KHz	51.4	65.9	55.9	-14.4	-4.4
153.03 KHz	51.1	65.8	55.8	-14.8	-4.8
153.65 KHz	51.3	65.8	55.8	-14.5	-4.5
154.35 KHz	52.5	65.8	55.8	-13.2	-3.2
154.97 KHz	51.6	65.7	55.7	-14.1	-4.1
156.91 KHz	52.0	65.6	55.6	-13.7	-3.7
157.61 KHz	52.1	65.6	55.6	-13.5	-3.5
159.55 KHz	51.5	65.5	55.5	-14.0	-4.0
160.18 KHz	51.1	65.5	55.5	-14.3	-4.3
161.5 KHz	51.3	65.4	55.4	-14.1	-4.1
162.12 KHz	51.3	65.4	55.4	-14.1	-4.1

Line 2

Frequency	Peak dBμV	QP Limit dBmV	AVG Limit dBmV	QP Margin dB	AVG Margin dB
150.23 KHz	52.1	66.0	56.0	-13.9	-3.9
151.48 KHz	52.0	65.9	55.9	-13.9	-3.9
152.8 KHz	51.6	65.9	55.9	-14.3	-4.3
153.42 KHz	51.0	65.8	55.8	-14.8	-4.8
154.12 KHz	52.4	65.8	55.8	-13.3	-3.3
154.74 KHz	51.6	65.7	55.7	-14.2	-4.2
155.36 KHz	51.4	65.7	55.7	-14.3	-4.3
156.68 KHz	51.1	65.6	55.6	-14.5	-4.5
158.0 KHz	51.3	65.6	55.6	-14.3	-4.3
161.26 KHz	50.9	65.4	55.4	-14.5	-4.5
165.15 KHz	51.0	65.2	55.2	-14.2	-4.2
166.47 KHz	51.3	65.1	55.1	-13.8	-3.8



Graph 3.9.1



Graph 3.9.2



3.10 Receiver/digital device radiated emissions

Test location: ☐ OATS ☒ Anechoic Chamber

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Frequency range: 30MHz-1000MHz

Max. Emissions margin: dB below the limits

Notes: The Radiated Emissions test was performed in the Anechoic chamber at 3m measurement distance.
2. Testing was performed on the EUT powered from AC/DC power adapter and also on the EUT powered from the internal re-chargeable battery.

Date:	May 7, 2009	Result: Pass
Standard:	FCC Part 15.109, Class A	
Tested by:	Norman Shpilsher	
Test Point:	Enclosure	
Operation mode:	Standby	
Note:	Powered from AC/DC Adapter	

Table 3.10.1

Frequency MHz	Antenna		Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	QP Reading dBµV	Total @ 3m dBµV/m	Limit dBµV/m	Margin dB	Comments
	Polarity	Hts(cm)								
45.31	V	100	11.9	0.8	0.0	26.9	39.6	49.5	-10.0	
62.69	V	122	6.6	0.9	0.0	32.4	39.9	49.5	-9.7	
123.43	V	100	12.7	1.2	0.0	33.7	47.6	54.0	-6.4	
453.07	V	100	17.3	2.4	0.0	24.1	43.8	56.9	-13.1	
453.07	V	100	17.3	2.4	0.0	26.7	46.4	56.9	-10.5	
560.00	V	100	19.0	2.9	0.0	21.8	43.6	56.9	-13.3	
63.38	H	127	6.5	0.9	0.0	28.3	35.7	49.5	-13.8	
125.49	H	329	12.7	1.2	0.0	39.0	52.9	54.0	-1.1	
150.18	H	190	11.5	1.3	0.0	27.2	40.0	54.0	-13.9	
176.87	H	122	10.0	1.5	0.0	24.3	35.8	54.0	-18.2	

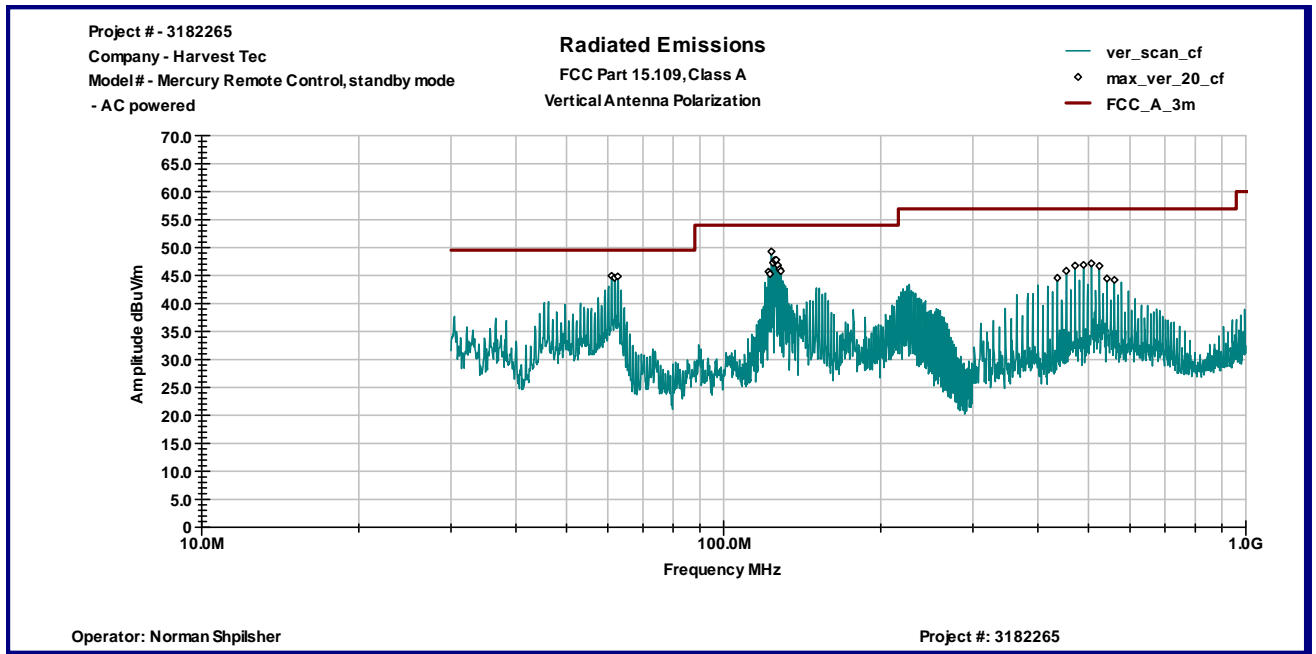
Comments:

Date:	June 10, 2009	Result: Pass
Standard:	FCC Part 15.109, Class A	
Tested by:	Norman Shpilsher	
Test Point:	Enclosure	
Operation mode:	Standby	
Note:	Powered from internal batteries	

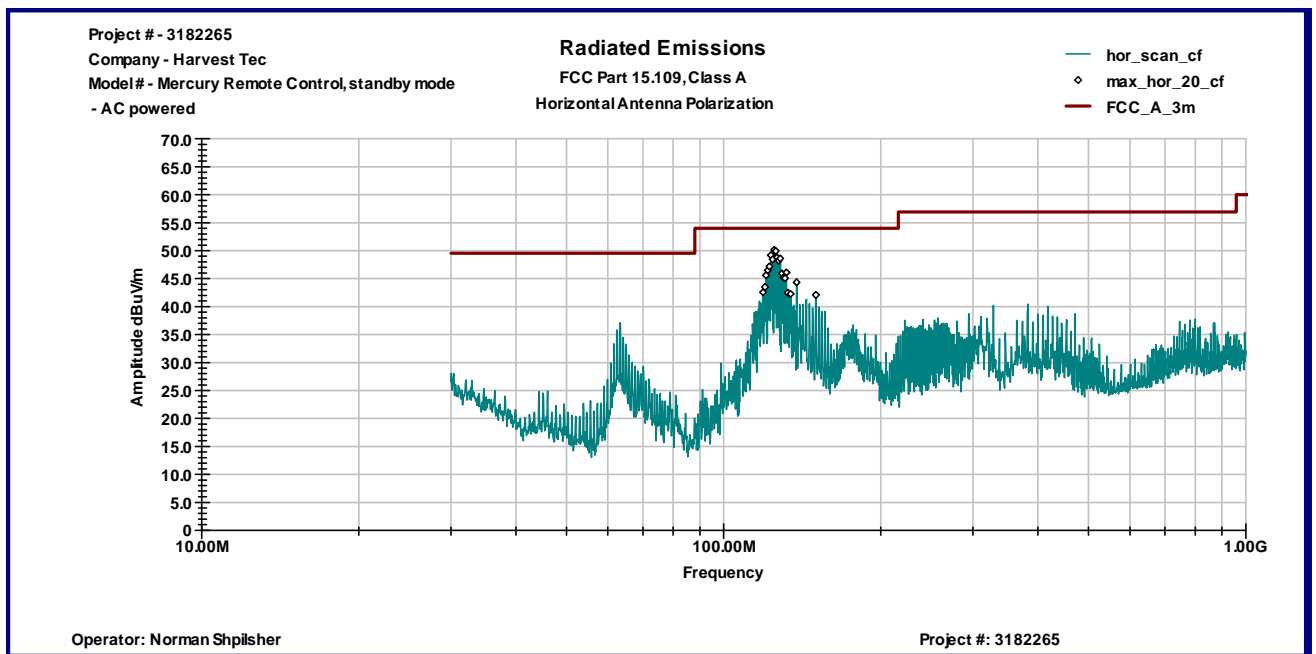
Table 3.10.2

Frequency MHz	Antenna		Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	QP Reading dBμV	Total @ 3m dBμV/m	Limit dBμV/m	Margin dB	Comments
	Polarity	Hts(cm)								
120.01	V	100	12.8	1.2	0.0	33.5	47.4	54.0	-6.6	
121.94	V	100	12.8	1.2	0.0	29.5	43.4	54.0	-10.6	
542.22	V	100	18.7	2.8	0.0	26.6	48.1	56.9	-8.8	
560.00	V	100	19.0	2.9	0.0	26.4	48.2	56.9	-8.7	
120.00	H	262	12.8	1.2	0.0	38.7	52.6	54.0	-1.4	
121.91	H	265	12.8	1.2	0.0	34.5	48.4	54.0	-5.6	
156.78	H	190	11.0	1.4	0.0	30.9	43.3	54.0	-10.7	

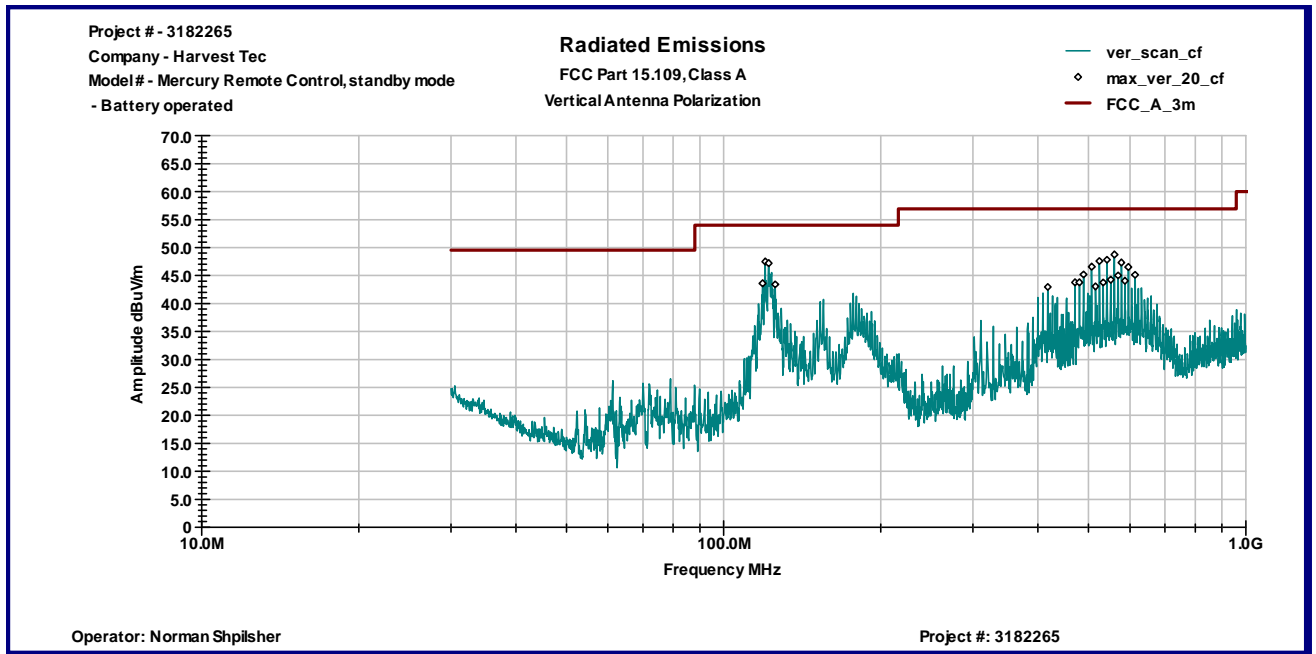
Comments:



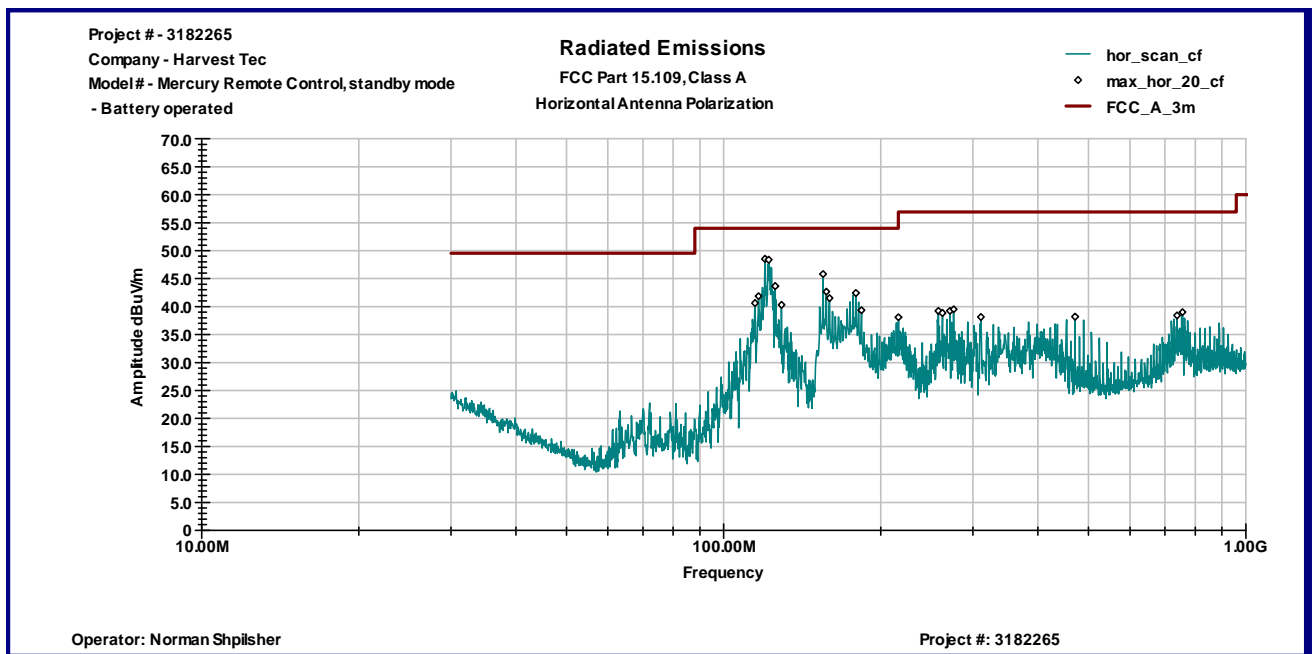
Graph 3.10.1



Graph 3.10.2



Graph 3.10.3



Graph 3.10.4



3.11 Digital device conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 18.7dB below the Quasi-peak limits

Notes: None

Date:	May 11, 2009	Result: Pass
Standard:	FCC 15.107, Class B	
Tested by:	Norman Shpilsher	
Test Point:	Power Line	
Operation mode:	Standby	
Note:		

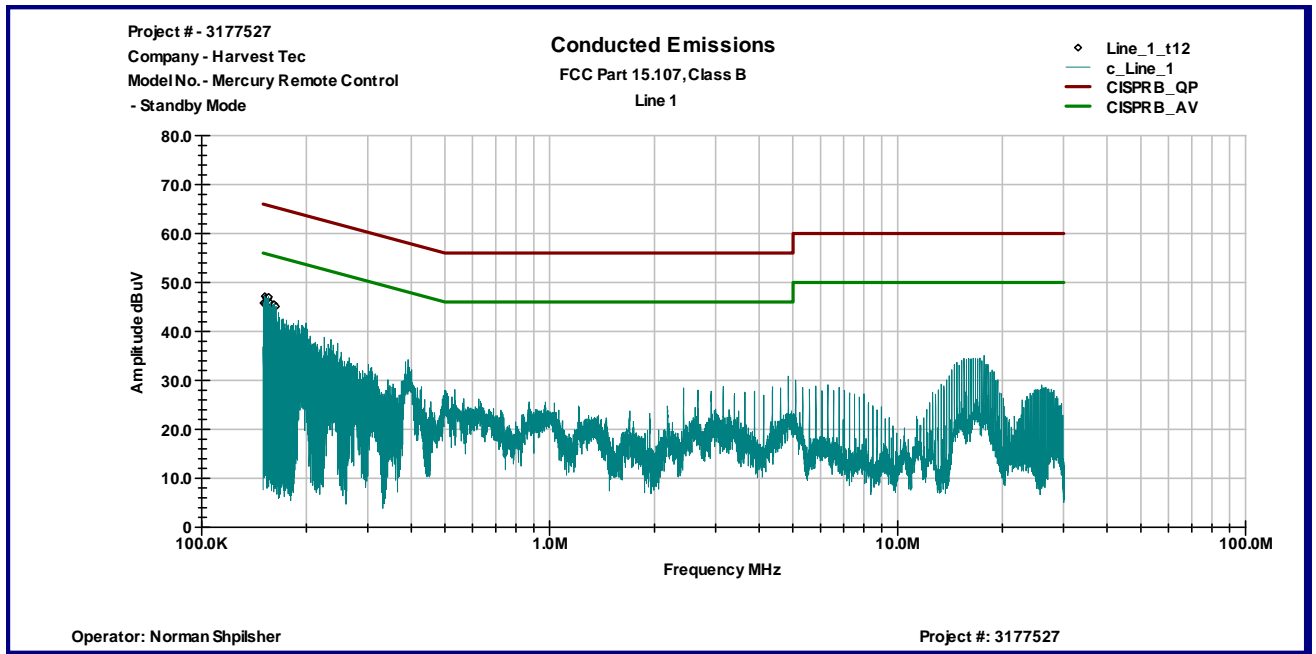
Table 3.11.1

Line 1

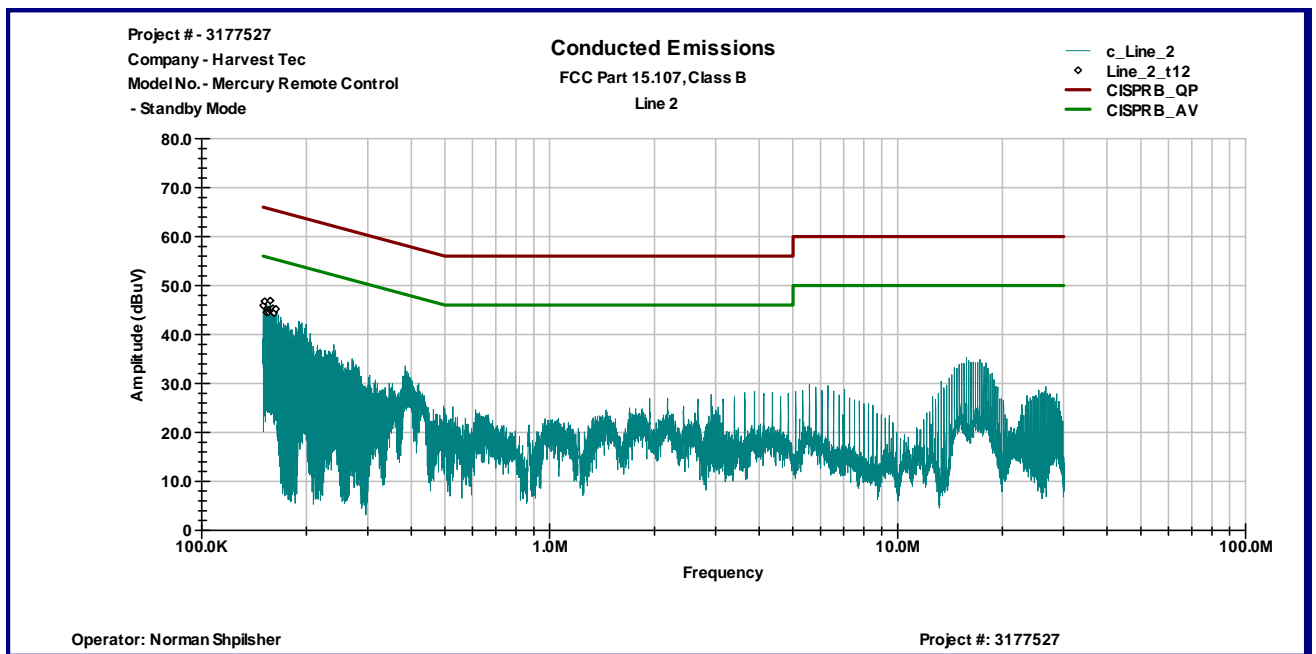
Frequency	Peak dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
150.47 KHz	45.8	66.0	56.0	-20.2	-10.2
151.79 KHz	47.2	65.9	55.9	-18.7	-8.7
152.41 KHz	45.7	65.9	55.9	-20.2	-10.2
153.11 KHz	46.9	65.8	55.8	-19.0	-9.0
155.05 KHz	46.7	65.7	55.7	-19.0	-9.0
155.67 KHz	47.0	65.7	55.7	-18.7	-8.7
156.29 KHz	45.3	65.7	55.7	-20.3	-10.3
157.61 KHz	45.8	65.6	55.6	-19.8	-9.8
158.93 KHz	44.9	65.5	55.5	-20.6	-10.6
160.25 KHz	45.5	65.5	55.5	-20.0	-10.0
161.5 KHz	45.6	65.4	55.4	-19.8	-9.8
163.44 KHz	45.1	65.3	55.3	-20.2	-10.2

Line 2

Frequency	Peak dBμV	QP Limit dBmV	AVG Limit dBmV	QP Margin dB	AVG Margin dB
150.31 KHz	45.9	66.0	56.0	-20.1	-10.1
151.63 KHz	46.8	65.9	55.9	-19.1	-9.1
153.5 KHz	44.5	65.8	55.8	-21.3	-11.3
154.89 KHz	45.0	65.7	55.7	-20.8	-10.8
155.52 KHz	44.6	65.7	55.7	-21.1	-11.1
156.84 KHz	45.0	65.6	55.6	-20.6	-10.6
157.46 KHz	46.9	65.6	55.6	-18.7	-8.7
158.78 KHz	44.9	65.5	55.5	-20.6	-10.6
160.1 KHz	45.4	65.5	55.5	-20.1	-10.1
160.72 KHz	44.7	65.4	55.4	-20.7	-10.7
161.42 KHz	44.4	65.4	55.4	-21.0	-11.0
163.36 KHz	45.2	65.3	55.3	-20.1	-10.1



Graph 3.11.1



Graph 3.11.2



4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Receiver RF Section	HP	85462A	3549A00306	9995	02/27/2010	<input type="checkbox"/>
RF Filter Section	HP	85460A	3448A00276	9937	02/27/2010	<input type="checkbox"/>
Spectrum Analyzer	R & S	FSP 40	100024	12559	08/22/2009	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	05/18/2010	<input checked="" type="checkbox"/>
Spectrum Analyzer	Agilent	E7402A	MY44212200	12660	11/13/2009	<input type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2468	14459	08/27/2009	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2630	14459	09/26/2009	<input type="checkbox"/>
Horn Antenna	EMCO	3115	9507-4513	9936	03/04/2010	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	6579	15580	04/03/2010	<input type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	08/12/2009	<input type="checkbox"/>
Loop Antenna	ETS	6512	00060486	19942	08/05/2009	<input type="checkbox"/>
Monopole Antenna	ETS-Lindgren	3310B	0071915	MIN-0054	11/14/2009	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-2 MOD.SD	316	9945	10/28/2009	<input checked="" type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-50-25-2	2014	9665	11/06/2009	<input type="checkbox"/>
Field Monitor	NARDA	ELT-400	J-0039	12740	02/18/2010	<input type="checkbox"/>
B-Field Sensor	NARDA	BN 2300	J-0049	12769	02/18/2010	<input type="checkbox"/>
Absorbing Clamp	Fischer Custom Communications	F-201	167	9964	03/03/2010	<input type="checkbox"/>
Absorbing Clamp	Fischer Custom Communications	F-201	213	9997	11/14/2009	<input type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	06/05/2009	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	08/12/2009	<input type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-26004000-40-8P	13224444	MIN-0064	11/13/2009	<input type="checkbox"/>
High Pass Filter	Reactel Inc.	7HS-1G-S1	0223	15275	VBU	<input checked="" type="checkbox"/>
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>
5001ix	California Instruments System	5001	55864, 55863, 55862, 72277	17672	11/14/2009	<input type="checkbox"/>
CTS 3.0.19	California Instruments Harmonic/Flicker Software	632		12723	11/14/2009	<input type="checkbox"/>

