



TEST REPORT

Report Number: 100687320MIN-001F

Project Number: G100687320

**Testing performed on the
Onepro GS3- MT Mullion**

**FCC ID: OQLGS3MTM
Industry Canada ID: 7309A-OQLGS3MTM**

to

**47 CFR Part 15.209; Part 15.215:2010
47 CFR Part 15. 225:2010
RSS- 210, Issue 8, 2010
RSS-Gen, Issue 3, 2010**

**For
Stanley Convergent Security Solutions, Inc.**

Test Performed by:
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Test Authorized by:
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Date: July 8, 2013

Reviewed by: Simon Khazon
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Date: July 8, 2013

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1.0 GENERAL DESCRIPTION

Model:	Oneprox GS3- MT Mullion
Type of EUT:	Mullion MT Card Reader
Serial Number:	MIN1306131420-008
FCC ID:	OQLGS3MTM
Industry Canada ID:	7309A-OQLGS3MTM
Related Submittal(s) Grants:	None
Company:	Stanley Convergent Security Solutions, Inc.
Customer:	Mr. Christopher Harris
Address:	1707 Orlando Central Parkway, Suite 500 Orlando, FL 32809
Phone:	(407) 206-7415
Fax:	(866) 716-9006
Test Standards:	☒ 47 CFR, Part 15:2010, §15.225 ☒ RSS-210, Issue 8, 2010 ☒ RSS-Gen, Issue 3, 2010 ☒ 47 CFR, Part 15:2010, §15.209, §15.215 ☐ 47 CFR, Part 15:2008, §15.107 and §15.109, Class ☐ Other
Type of radio:	☒ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	June 10, 2013
Test Work Started:	June 10, 2013
Test Work Completed:	July 3, 2013
Test Sample Conditions:	☐ Damaged ☐ Poor (Usable) ☒ Good



1.1 Product Description; Test Facility

Product Description:	SGR Mullion MT Reader
Operating Frequency	124.65kHz and 13.56MHz
Modulation:	ASK (124.65kHz) and FSK (13.56MHz)
Emission Designator:	2K7A1D (ASK) 2K6FXD (FSK)
Antenna(s) Info:	Integral antenna
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☐ External power source ☒ 120VAC ☐ 230VAC ☐ 400VAC ☐ VDC ☐ Other: Amp. ☒ 60Hz
Special Test Arrangement:	The transmitter was tested while connected to the SGR 512 Controller and was powered SGR 512 Controller. Conducted Emissions testing was performed at the SGR 512 Controller AC port.
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2009



1.2 EUT Configuration

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

- ☐ - Standby
- ☒ - Continuous
- ☐ - Test program (customer specific)
- ☐ -

Operating modes of the EUT:

No.	Description
1	The transmitter was set to transmit continuously.

Cables:

No.	Type	Length	Designation	Note
1	Communication cable	>1m	Reader cable, not shielded	

Support equipment/Services:

No.	Item	Description
1	Controller	SGR 512 Controller

General notes: Mullion MT card reader is transmitter only, and has no receiver portion.

1.3 Environmental conditions

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

☒ Normal

Temperature: 15-35°C

Humidity: 30-60%

Atmospheric pressure: 86-106kPa

☒ Extreme

Temperature: -20 to +50°C

Primary Supply Voltage: + 15%



1.4 Measurement uncertainty

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be: ± 4 dB at 10m and ± 5.4 dB at 3m

The expanded uncertainty ($k = 2$) for conducted emissions from 150 kHz to 30 MHz 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).

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

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

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

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

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

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

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

General notes: None



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
15.209, 15.215(b) / RSS-Gen 4.11	Field Strength of Fundamental and Spurious Emissions	Pass
15.225(a)(b)(c) / RSS-210 A2.6(a)(b)(c)	Field strength within the band of operation	Pass
15.225(d) / RSS-210 A2.6(d)	Out of band emissions	Pass
15.215(c) / RSS- Gen 4.6.1	Bandwidth of the emission	Pass
15.225(e) / RSS-210 A2.6	Frequency tolerance	Pass
15.207/RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	Pass



3.0 TEST CONDITIONS AND RESULTS

3.1 Field Strength of Fundamental and Spurious Emissions

Test location: ☒ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☒ 10 meters ☒ 3 meters

Test result: **Pass**

Max. Emissions margin at fundamental: 29.8dB below the limits

Max. margin of harmonics and spurious emissions: 9.2dB below the limits

1. The Emissions pre-scan was performed in the Anechoic chamber at 3m measurement distance (Graphs 3.1.1, 3.1.2); final measurements were performed in the Open Area Test Site at 10m measurement distance (see Tables 3.1.1, 3.1.2).
2. Field Strength of Fundamental and Spurious Emissions measurements were made at Fundamental frequency of 124kHz; Spurious Emissions were tested up to 10th harmonic.
3. Measurements were taken using Peak detector with RBW=200kHz (below 150kHz), RBW=9kHz (above 150kHz) and RBW=120kHz (above 30MHz).

Notes:

Date:	June 20-July 3, 2013	Result: Pass
Standard:	FCC 15.209 / RSS-210 A1.1.2	
Tested by:	Uri Spector	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	124kHz transmitter	

Table 3.1.1

Frequency MHz	Antenna Orient.	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Peak Reading dBμV	Total @ 10m dBμV/m	15.209 Limit dBμV/m	Distance Factor (dB)	Margin dB	Comments
0.124	Front	63.6	0.1	28.8	20.2	55.1	25.7	59.1	-29.8	Fund
0.124	Side	63.6	0.1	28.8	17.7	52.6	25.7	59.1	-32.3	Fund
0.248	Front	57.8	0.1	28.7	16.3	45.5	19.7	59.1	-33.3	
0.248	Side	57.8	0.1	28.7	14.2	43.4	19.7	59.1	-35.4	
0.373	Front	54.2	0.1	28.7	17.0	42.6	16.2	59.1	-32.7	
0.373	Side	54.2	0.1	28.7	14.1	39.7	16.2	59.1	-35.6	
0.497	Front	51.9	0.1	28.7	20.3	43.5	33.7	19.1	-9.2	
0.497	Side	51.9	0.1	28.7	14.9	38.1	33.7	19.1	-14.6	
0.621	Front	49.8	0.1	28.7	14.3	35.5	31.7	19.1	-15.3	
0.621	Side	49.8	0.1	28.7	10.0	31.2	31.7	19.1	-19.6	
1.118	Front	45.7	0.1	28.7	16.7	33.8	26.6	19.1	-11.9	
1.118	Side	45.7	0.1	28.7	10.7	27.8	26.6	19.1	-17.9	

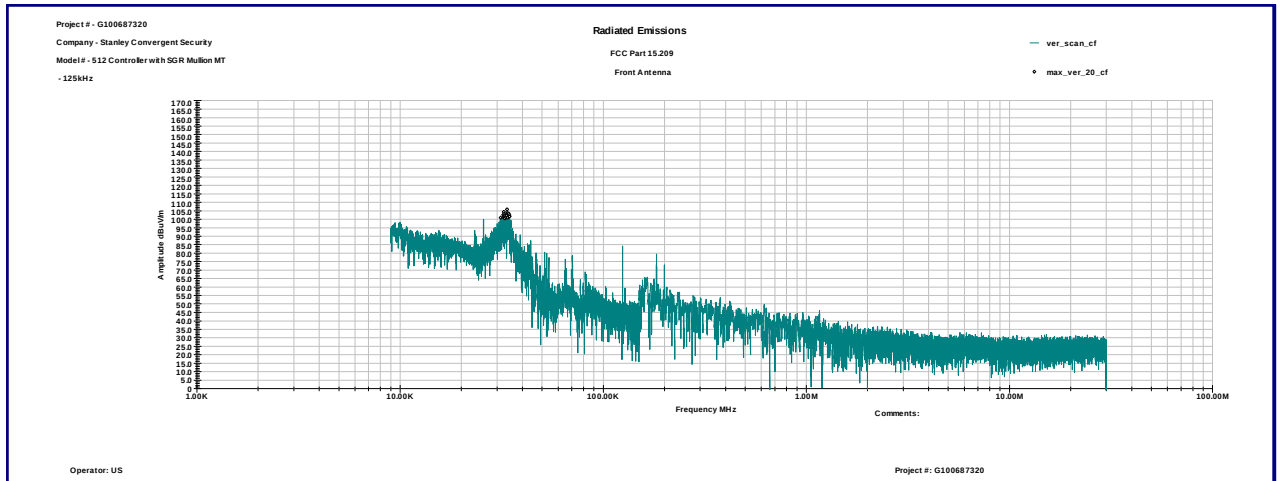
Table 3.1.2

Frequency	Ant. Polarity	Peak Reading dBμV	Total C.F. dB1/m	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
30.381 MHz	V	7.2	20.0	27.2	40.0	-12.8
57.531 MHz	V	11.9	7.5	19.3	40.0	-20.7
67.809 MHz	V	17.3	7.1	24.4	40.0	-15.6
92.781 MHz	V	11.9	11.1	23.0	43.5	-20.6
97.472 MHz	V	12.0	12.1	24.0	43.5	-19.5
121.1 MHz	V	12.8	14.0	26.7	43.5	-16.8
132.48 MHz	V	13.6	13.8	27.3	43.5	-16.2
162.74 MHz	V	11.9	12.0	23.9	43.5	-19.6
176.28 MHz	V	13.8	11.4	25.2	43.5	-18.3
458.26 MHz	V	11.7	19.7	31.4	46.0	-14.6
30.684 MHz	H	8.0	19.8	27.8	40.0	-12.2
63.113 MHz	H	11.6	7.0	18.5	40.0	-21.5
67.793 MHz	H	18.9	7.1	26.0	40.0	-14.0
95.04 MHz	H	15.2	11.6	26.8	43.5	-16.7
100.35 MHz	H	12.6	12.4	25.0	43.5	-18.6
162.74 MHz	H	12.6	12.0	24.6	43.5	-19.0
176.28 MHz	H	13.1	11.4	24.5	43.5	-19.1
272.73 MHz	H	11.6	15.5	27.1	46.0	-19.0

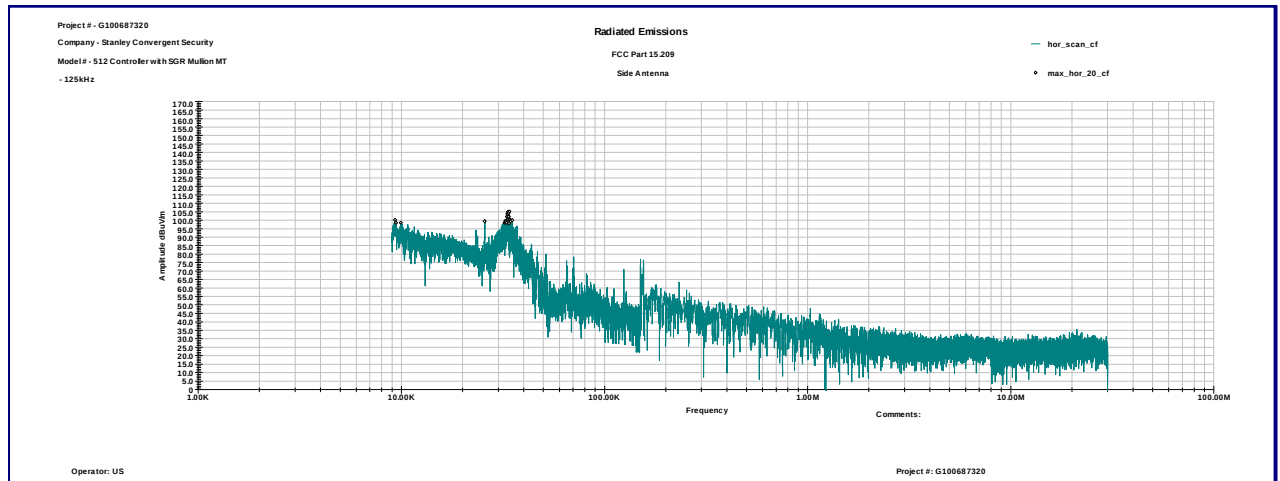


Graph 3.1.1

Front of antenna

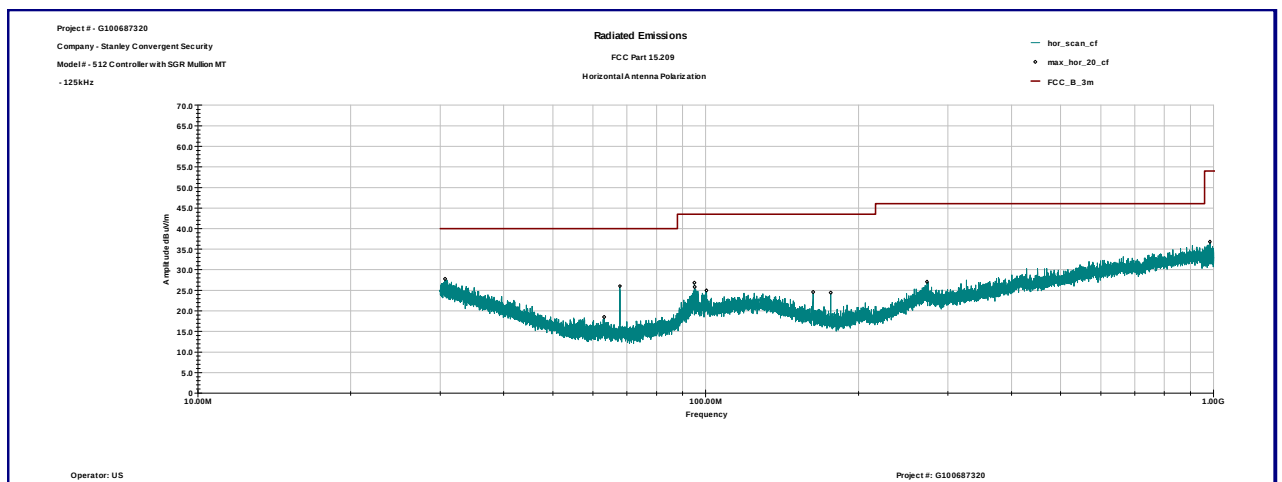
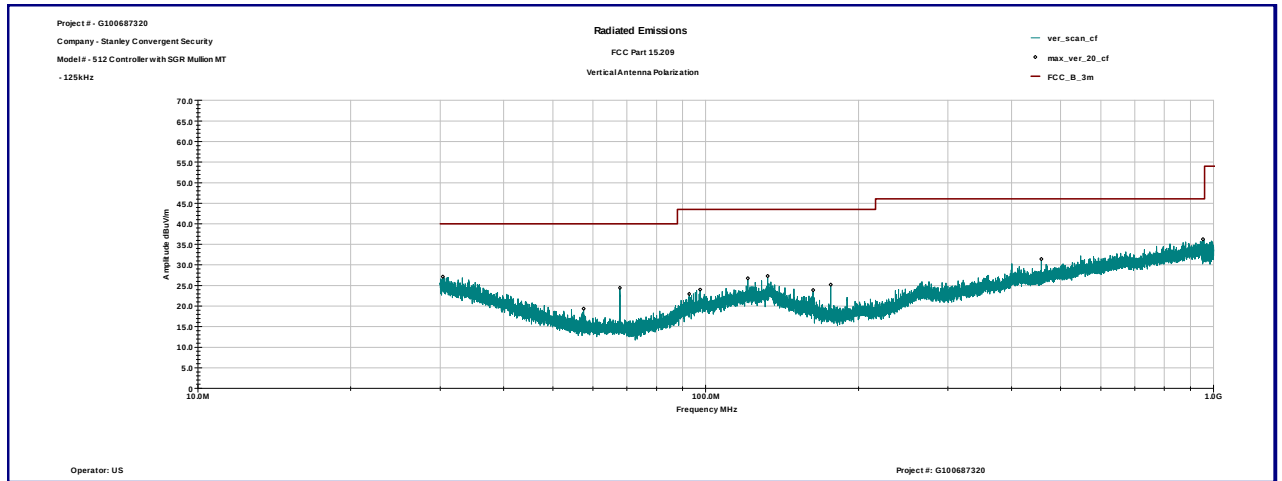


Side of antenna





Graph 3.1.2





3.2 Field strength within the band of operation

Test location: ☒ OATS ☐ Anechoic Chamber ☐ Other

Test distance: ☒ 10 meters ☐ 3 meters

Test result: **Pass**

Max. Emissions margin: 19.6dB below the limits

Notes: Measurements were taken using RBW=9kHz.



Date:	July 3, 2013	Result: Pass
Standard:	FCC 15.225(a)(b)(c) / RSS-210 A2.6(a)(b)(c)	
Tested by:	Uri Spector	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	13.56MHz transmitter	

Table 3.2.1

Frequency	Ant. Orientation	Peak Reading dBμV	Ant.Factor dB1/m	Total at 10m dBμV/m	Limit dBμV/m	Margin dB
13.110 MHz	Front	3.8	34.4	38.2	59.6	-21.4
13.410 MHz	Front	2.9	34.4	37.3	59.6	-22.3
13.553 MHz	Front	9.8	34.4	44.2	69.6	-25.4
13.560 MHz	Front	19.8	34.5	54.3	103.1	-48.8
13.567 MHz	Front	11.2	34.5	45.7	69.6	-23.9
13.710 MHz	Front	4.2	34.5	38.7	59.6	-20.9
14.010 MHz	Front	4.9	34.5	39.4	59.6	-20.2
14.500 MHz	Front	5.5	34.5	40.0	59.6	-19.6
12.600 MHz	Side	1.4	34.4	35.8	59.6	-23.8
13.110 MHz	Side	2.0	34.5	36.5	59.6	-23.1
13.410 MHz	Side	1.5	34.4	35.9	59.6	-23.7
13.553 MHz	Side	10.3	34.4	44.7	69.6	-24.9
13.560 MHz	Side	20.7	34.5	55.2	103.1	-47.9
13.567 MHz	Side	12.3	34.5	46.8	69.6	-22.8
13.710 MHz	Side	3.3	34.5	37.8	59.6	-21.8
14.010 MHz	Side	2.9	34.5	37.4	59.6	-22.2



3.3 Field strength outside of the band of operation

Test location: ☒ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☒ 10 meters ☒ 3 meters

Frequency range of measurements: 0.15MHz-1000MHz

Test result: **Pass**

Max. margin of spurious emissions: 8.7dB below the limits

Notes: The Emissions pre-test in frequency range from 150kHz to 30MHz was performed in the Anechoic chamber at 3m measurement distance (see Graphs 3.3.1); final measurements were performed in the Open Area Test Site at 10m measurement distance: no emissions above the ambient were detected.
The Emissions test in frequency range from 30MHz to 1GHz was performed in the Anechoic chamber at 3m measurement distance (see Table 3.3.1 and Graphs 3.3.2).

Date:	July 2, 2013	Result: Pass
Standard:	FCC 15.225(d) / RSS-210 A2.6(d)	
Tested by:	Uri Spector	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	Frequency range 30-1000MHz	

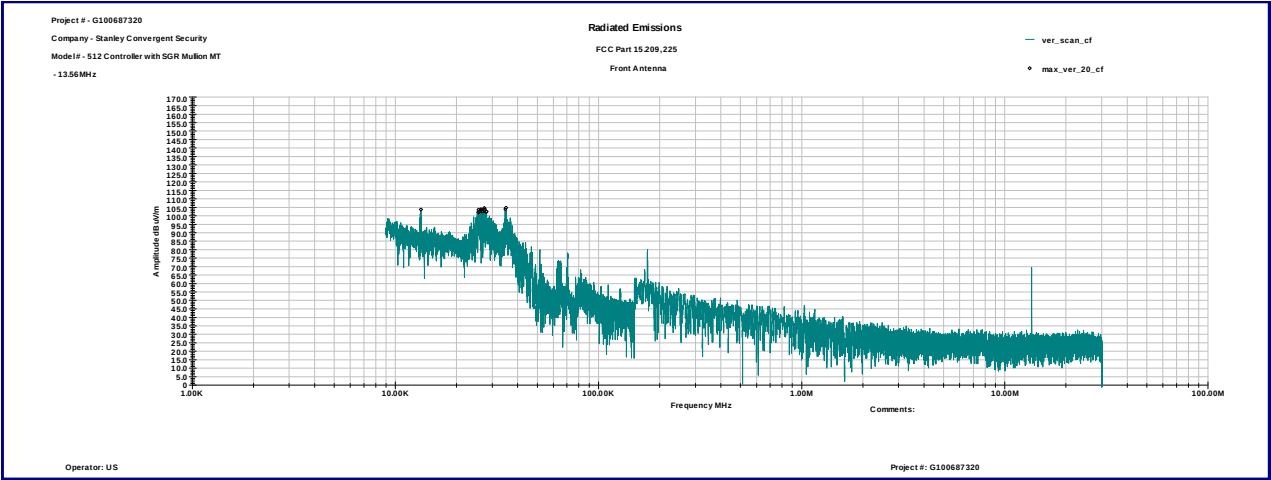
Table 3.3.1

Frequency	Ant. Polarity	Peak Reading dBμV	Total C.F. dB1/m	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
30.684 MHz	V	7.5	19.8	27.3	40.0	-12.7
40.692 MHz	V	11.8	14.2	26.0	40.0	-14.0
54.281 MHz	V	14.1	8.2	22.3	40.0	-17.7
56.472 MHz	V	15.8	7.7	23.5	40.0	-16.5
67.793 MHz	V	21.3	7.1	28.4	40.0	-11.6
98.111 MHz	V	15.0	12.1	27.1	43.5	-16.4
132.48 MHz	V	13.1	13.8	26.8	43.5	-16.7
162.7 MHz	V	18.9	12.0	30.8	43.5	-12.7
311.81 MHz	V	17.2	16.2	33.5	46.0	-12.6
338.99 MHz	V	15.2	16.9	32.0	46.0	-14.0
366.1 MHz	V	13.0	17.8	30.7	46.0	-15.3
400.85 MHz	V	11.5	18.9	30.4	46.0	-15.6
458.16 MHz	V	10.8	19.7	30.5	46.0	-15.5
31.157 MHz	H	8.1	19.5	27.6	40.0	-12.4
67.809 MHz	H	24.2	7.1	31.3	40.0	-8.7
99.707 MHz	H	14.4	12.3	26.7	43.5	-16.8
117.34 MHz	H	11.6	13.9	25.4	43.5	-18.1
189.83 MHz	H	14.2	11.4	25.5	43.5	-18.0
257.61 MHz	H	13.3	15.5	28.8	46.0	-17.2
284.76 MHz	H	14.4	15.5	29.9	46.0	-16.2
311.81 MHz	H	15.5	16.2	31.7	46.0	-14.3
325.4 MHz	H	11.6	16.6	28.2	46.0	-17.8

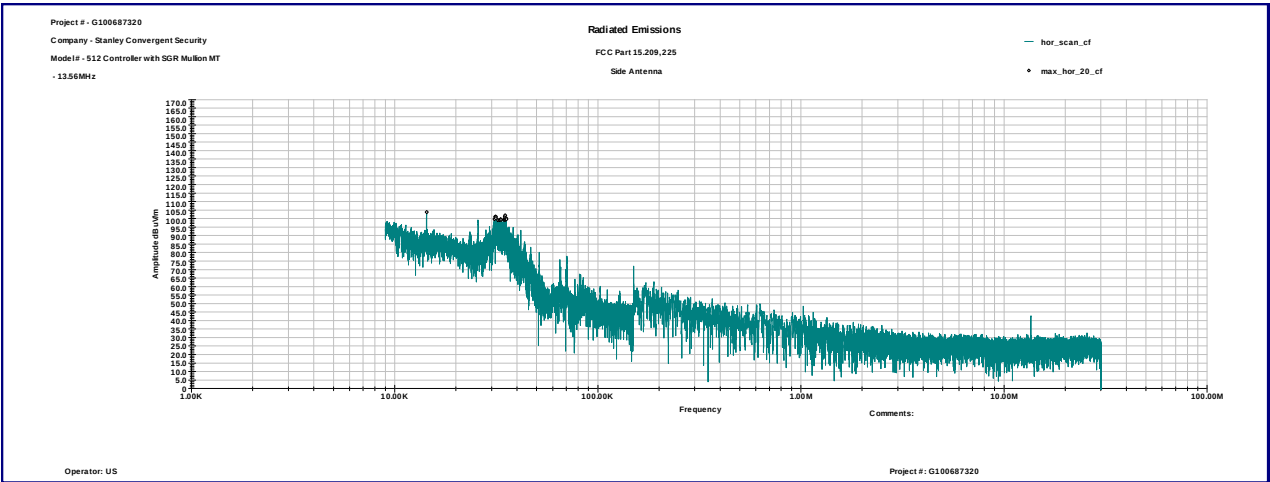


Graph 3.3.1

Front antenna orientation

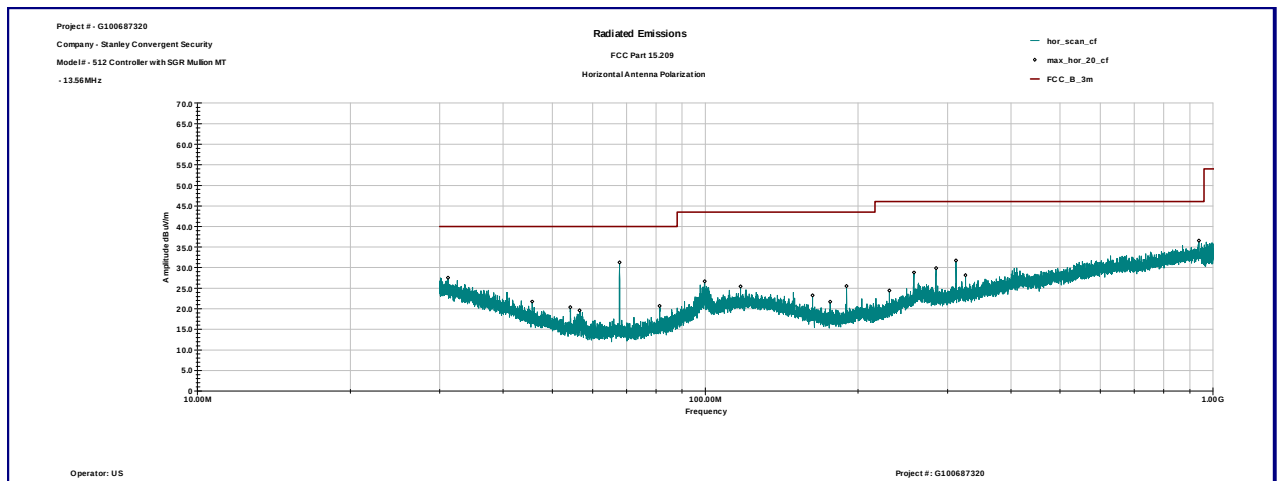
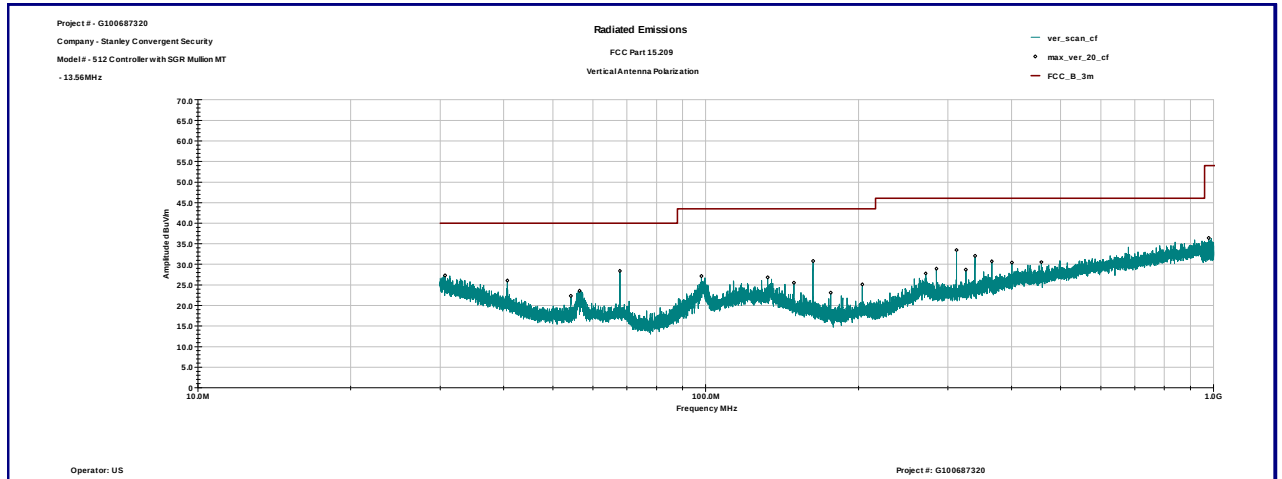


Side antenna orientation





Graph 3.3.2





3.4 Frequency Tolerance

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test date: June 26, 2013

Tested by: Uri Spector

Test result: Pass

Test Parameter		Measured Deviation (Hz)	Maximum Allowed Deviation (Hz)	Test Results
Temperature °C	Voltage V			
-20	120	50.2	1356	Pass
-10		33.1	1356	Pass
0		20.0	1356	Pass
10		11.6	1356	Pass
20		0	1356	Pass
35		40.3	1356	Pass
55		90.2	1356	Pass
20	102	0	1356	Pass
	108	0	1356	Pass
	114	0	1356	Pass
	120	0	1356	Pass
	126	0	1356	Pass
	132	0	1356	Pass
	138	0	1356	Pass

Notes: None



3.5 Bandwidth of Emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☐ 3 meters

Test result: **Pass**

Center Frequency of operation kHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz
124.65	2.7	2.3

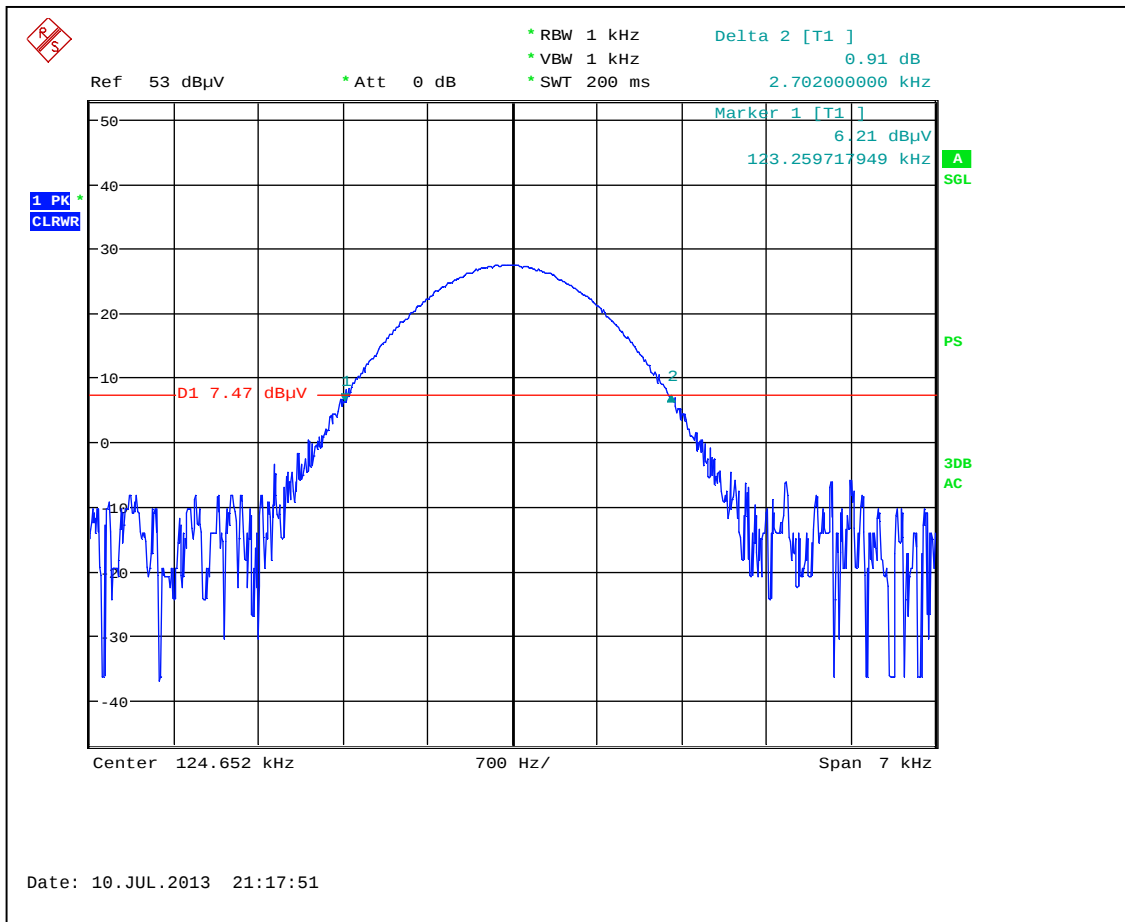
Center Frequency of operation MHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz
13.56	2.6	2.4

Graphs 3-5-1, 3-5-2, 3-5-3, 3-5-4 show bandwidth of emissions

Notes: None

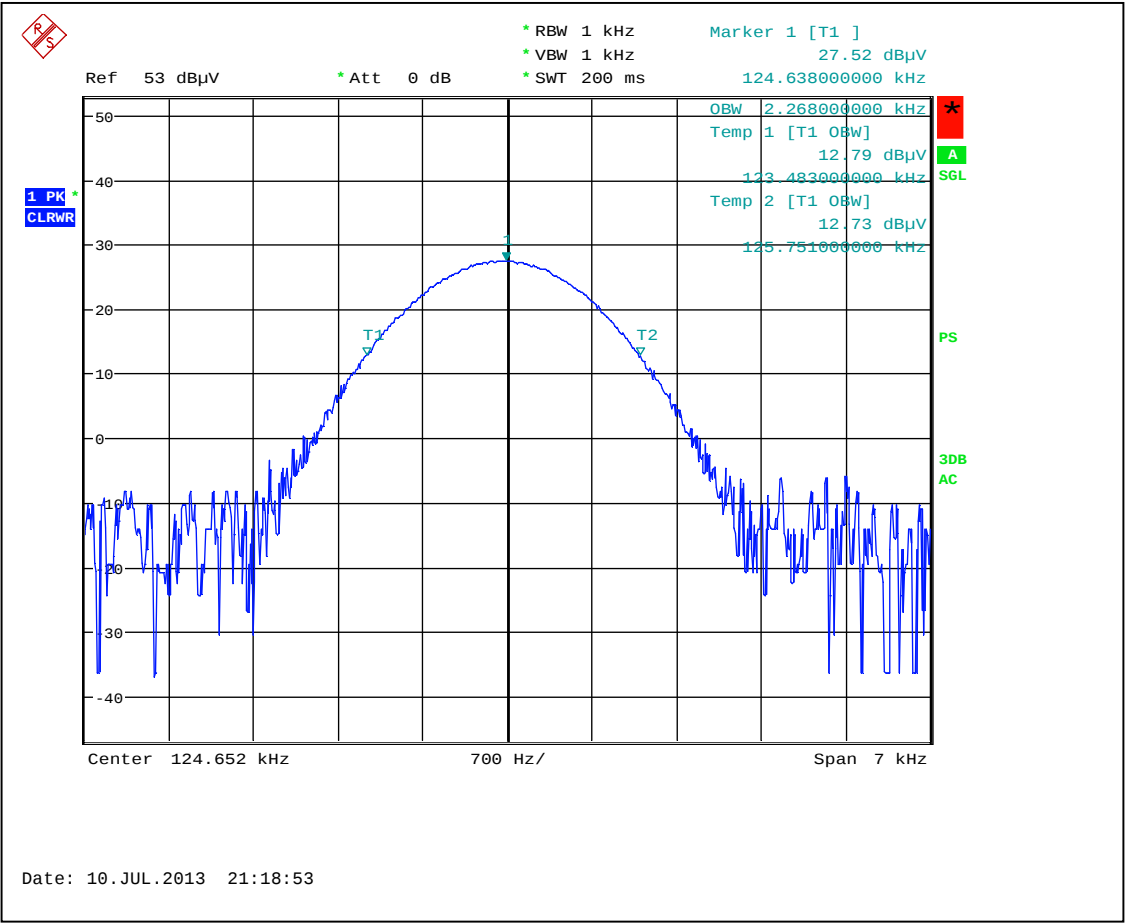


Graph 3.5.1



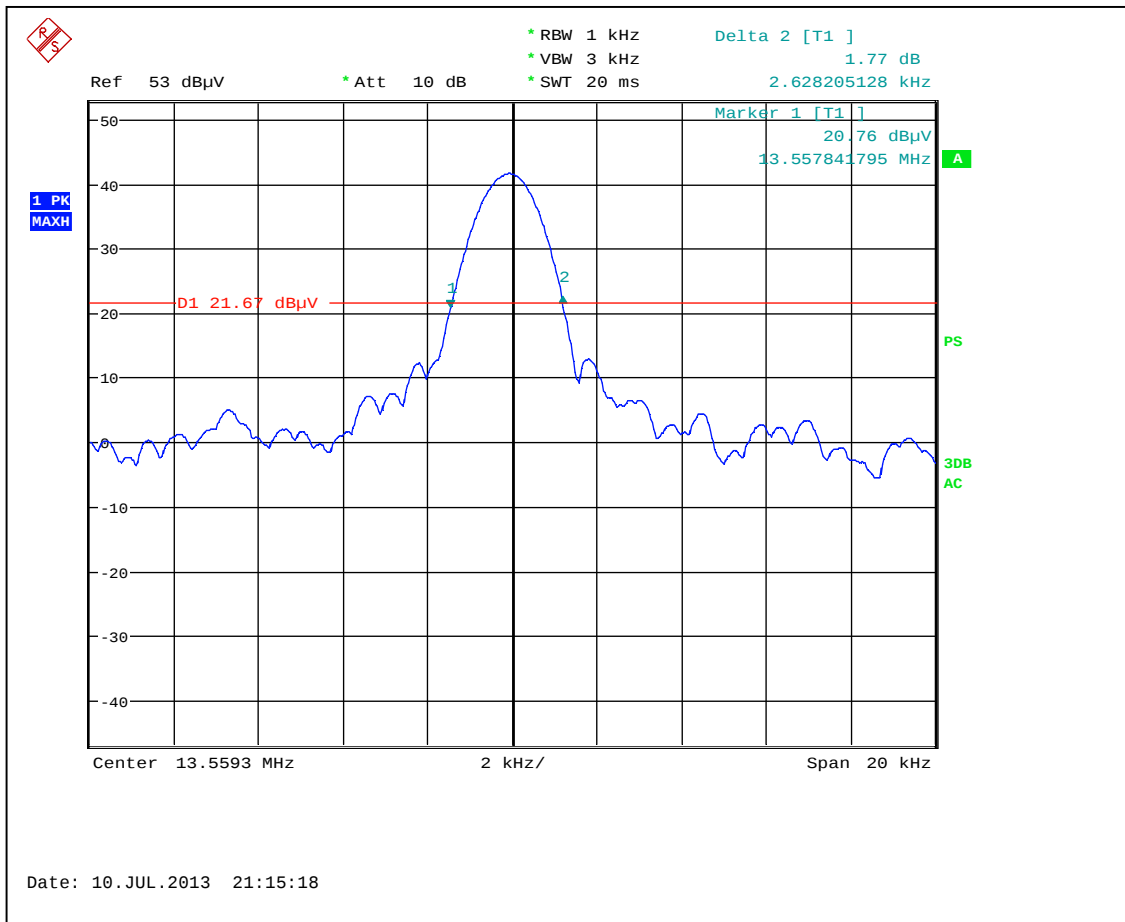


Graph 3.5.2



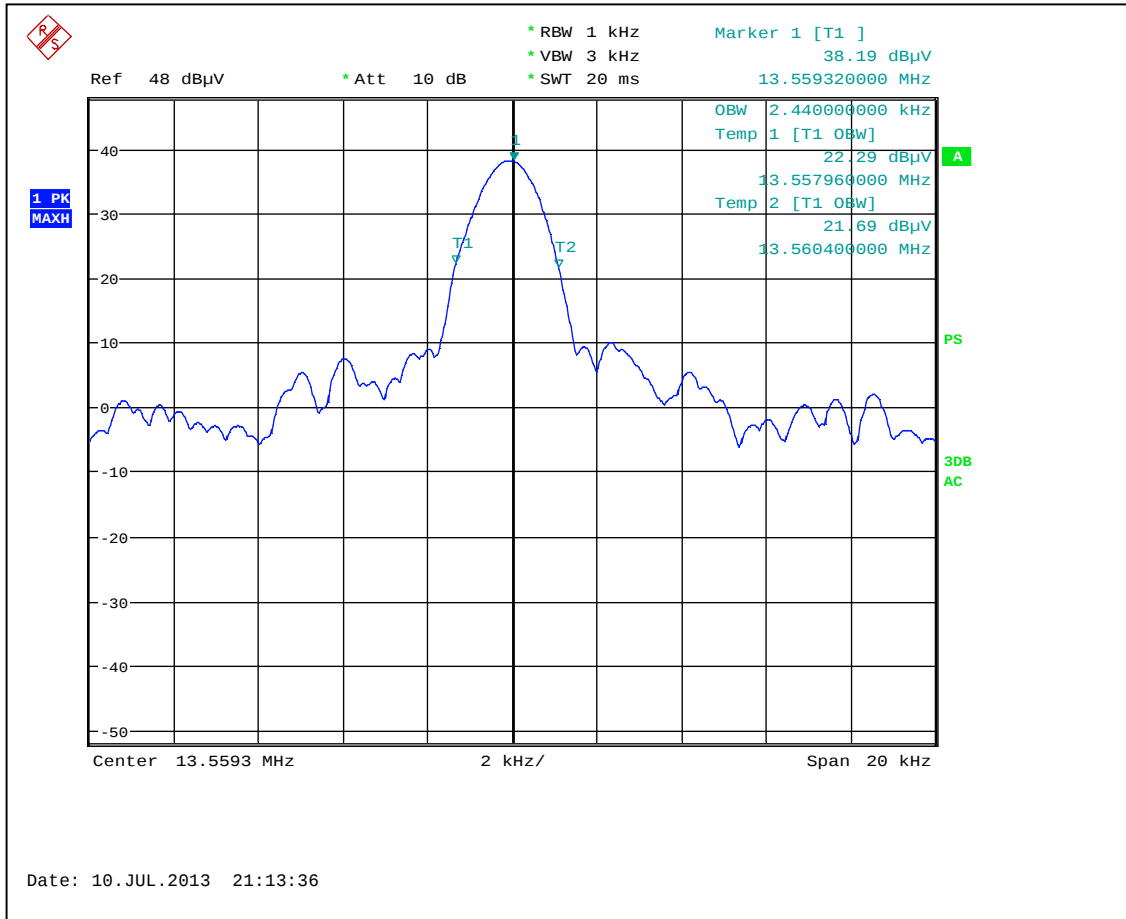


Graph 3.5.3





Graph 3.5.4





3.6 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 3.4dB below the limits

Notes: None



Date:	June 21, 2013	Result: Pass
Standard:	FCC Part 15.207	
Tested by:	Uri Spector	
Test Point:	AC Port of 512 Controller	
Operation mode:	See Page 5	
Note:	124kHz Transmitter	

Table 3.6.1

Line 1

Frequency	Peak dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
155.75 KHz	44.1	65.7	55.7	-21.6	-11.6
157.57 KHz	46.8	65.6	55.6	-18.8	-8.8
159.63 KHz	48.1	65.5	55.5	-17.4	-7.4
161.46 KHz	47.1	65.4	55.4	-18.3	-8.3
163.52 KHz	44.1	65.3	55.3	-21.2	-11.2
192.07 KHz	43.8	64.0	54.0	-20.2	-10.2

Line 2

Frequency	Peak dBμV	QP Limit dBmV	AVG Limit dBmV	QP Margin dB	AVG Margin dB
158.89 KHz	47.7	65.5	55.5	-17.9	-7.9
159.98 KHz	48.2	65.5	55.5	-17.3	-7.3
160.18 KHz	48.0	65.5	55.5	-17.5	-7.5
161.26 KHz	47.1	65.4	55.4	-18.3	-8.3
161.46 KHz	47.1	65.4	55.4	-18.3	-8.3
22.741 MHz	37.2	60.0	50.0	-22.8	-12.8



Date:	June 21, 2013	Result: Pass
Standard:	FCC Part 15.207	
Tested by:	Uri Spector	
Test Point:	AC Port of 512 Controller	
Operation mode:	See Page 5	
Note:	13.56MHz Transmitter	

Table 3.6.2

Line 1

Frequency	Peak dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
157.57 KHz	48.5	65.6	55.6	-17.1	-7.1
158.89 KHz	49.4	65.5	55.5	-16.1	-6.1
159.44 KHz	49.3	65.5	55.5	-16.2	-6.2
160.18 KHz	48.6	65.5	55.5	-16.9	-6.9
175.21 KHz	51.3	64.7	54.7	-13.4	-3.4
22.741 MHz	37.3	60.0	50.0	-21.9	-11.9

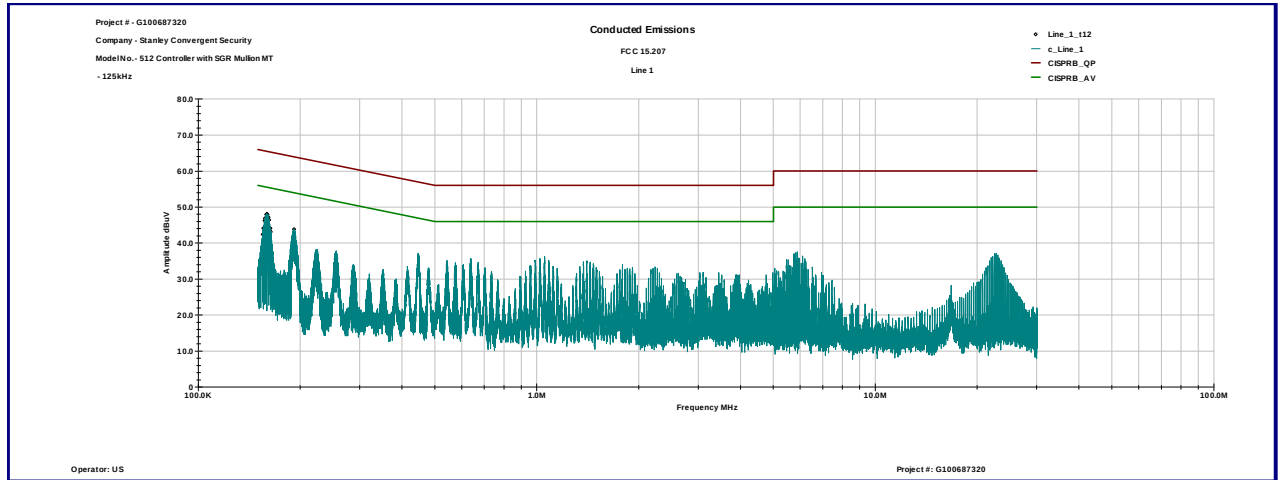
Line 2

Frequency	Peak dBμV	QP Limit dBmV	AVG Limit dBmV	QP Margin dB	AVG Margin dB
157.92 KHz	47.6	65.6	55.6	-18.0	-8.0
158.47 KHz	48.2	65.5	55.5	-17.3	-7.3
159.75 KHz	48.4	65.5	55.5	-17.1	-7.1
161.07 KHz	47.4	65.4	55.4	-18.1	-8.1
5.953 MHz	38.1	60.0	50.0	-18.4	-8.4
22.741 MHz	37.2	60.0	50.0	-22.8	-12.8

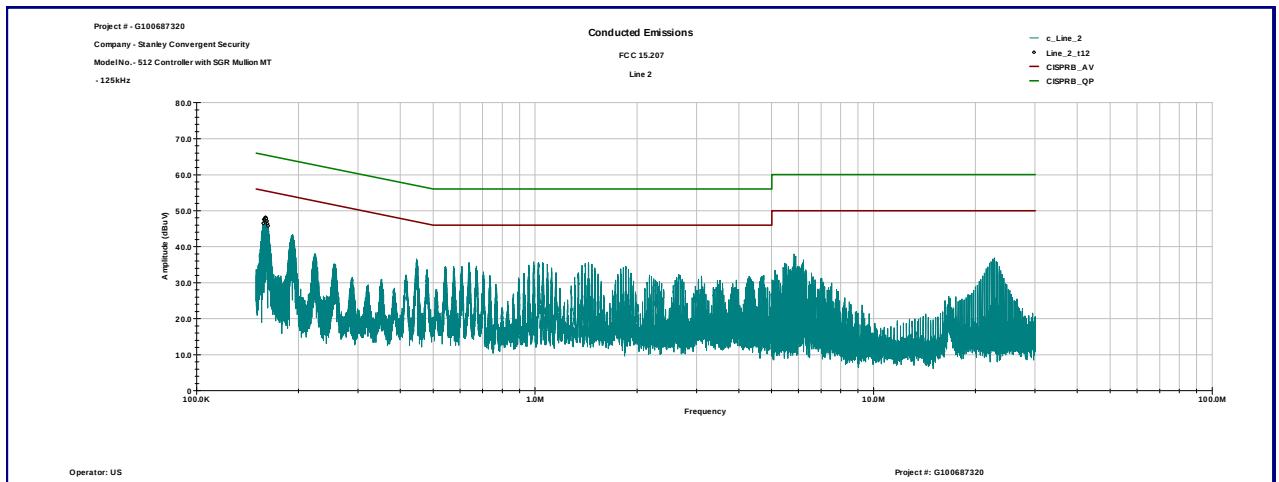


Graph 3.6.1

Line 1

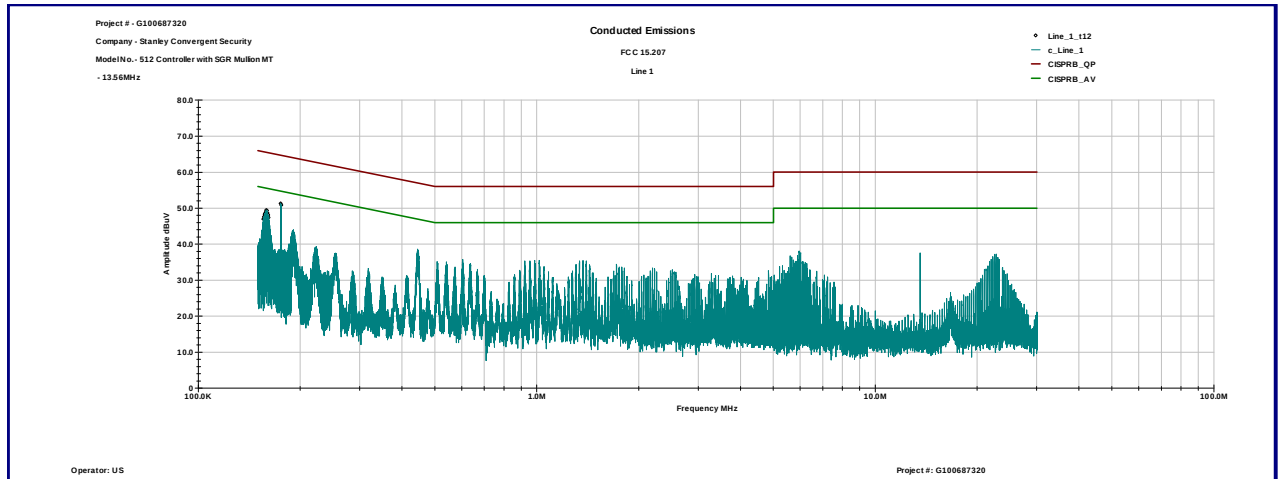


Line 2

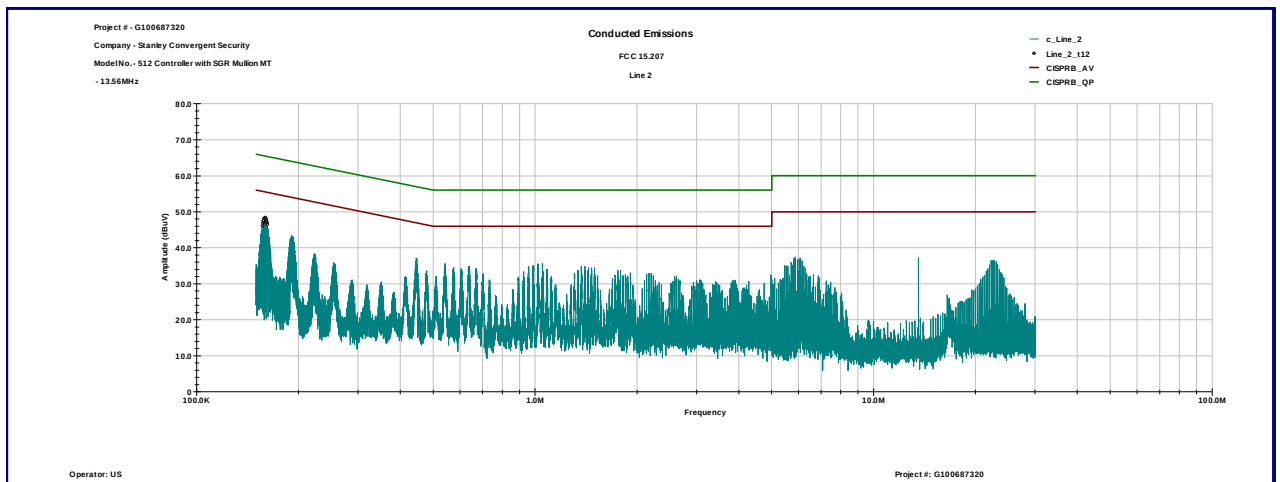


Graph 3.6.2

Line 1



Line 2





4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	ESU	100398	25283	12/19/2013	☒
Environmental Chamber	ESPEC	ESX-4CA	0111386	24300	04/11/2014	☒
Bicono-Log Antenna	Teseq	CBL6112D	32859	25289	08/09/2013	☒
Loop Antenna	ETS	6512	00060486	19942	12/10/2013	☒
LISN	Solar Electronics	9252-50-R-24-BNC	068545	MIN-0060	02/07/2014	☒
Pre-Amplifier	HP	8447F OPT H64	3113A04974	9934	08/16/2013	☒
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	☒