TEST REPORT

Report Number: 100687320MIN-001A
Project Number: G100687320

Testing performed on the
Oneprox GS3-LF Mullion, Class II Permissive Changes

FCC ID: OQLGS3LFM
Industry Canada ID: 7309A- OQLGS3LFM

to
47 CFR Part 15.209; Part 15.215:2010
RSS- Gen, Issue 3, 2010

For
Stanley Convergent Security Solutions, Inc.

Test Performed by:	Test Authorized by:
Intertek Testing Services NA, Inc.	Stanley Convergent Security Solutions, Inc.
7250 Hudson Blvd., Suite 100	1707 Orlando Central Parkway, Suite 500
Oakdale, MN 55128 USA	Orlando, FL 32809, USA

Prepared by: U. Spector — Date: June 28, 2013
Uri Spector

Reviewed by: S Khazon — Date: June 28, 2013
Simon Khazon

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1.0 GENERAL DESCRIPTION

Model:	Oneprox GS3- LF Mullion
Type of EUT:	Mullion LF Card Reader
Intertek Sample ID:	MIN1306100958-002
FCC ID:	OQLGS3LFM
Industry Canada ID:	7309A- OQLGS3LFM
Related Submittal(s) Grants:	Class II Permissive Changes
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
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Test Standards:	☒ 47 CFR, Part 15:2010, §15.209, §15.215 ☒ RSS–210, Issue 8, 2010 ☒ RSS-Gen, Issue 3, 2010 ☐ 47 CFR, Part 15:2010, §15.107 and §15.109, Class ☐ ICES-003, Issue 4:2004 ☐ Other
Type of radio:	☐ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	June 10, 2013
Test Work Started:	June 10, 2013
Test Work Completed:	June 28, 2013
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	SGR Mullion LF Reader
Operating Frequency	123 kHz
Modulation:	ASK
Emission Designator:	2K8A1D
Antenna(s) Info:	Integral antenna
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter power configuration:	☐ Internal battery ☒ External power source ☒ 120VAC ☐ 230VAC ☐ 400VAC ☐ VDC ☐ Other: Amp. ☐ 50Hz ☒ 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
☐ - Continuous un-modulated
☐ - Test program (customer specific)
☒ - Below

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	512 Controller	

General notes: Mullion LF 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: 86-106 kPa

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(μV/m)
RA = Receiver Amplitude in dB(μV)
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(μV) 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(μV/m).

RA = 48.1 dB(μV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(μV/m)

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
15.215(c) / RSS-Gen 4.6.3	Bandwidth of the emission	Pass
15.207/RSS-Gen 7.2.4	Transmitter Power Line conducted emissions	Pass
15.109/ICES-003/ RSS-Gen 4.10	Receiver/digital device radiated emissions	N/A
15.107/ ICES-003	Digital device conducted emissions	N/A

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: 24.4dB below the limits

Max. margin of harmonics and spurious emissions: 7.2dB below the limits

Notes:

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 123kHz; 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).

Date:	June 10-24, 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:	None	

Table 3.1.1

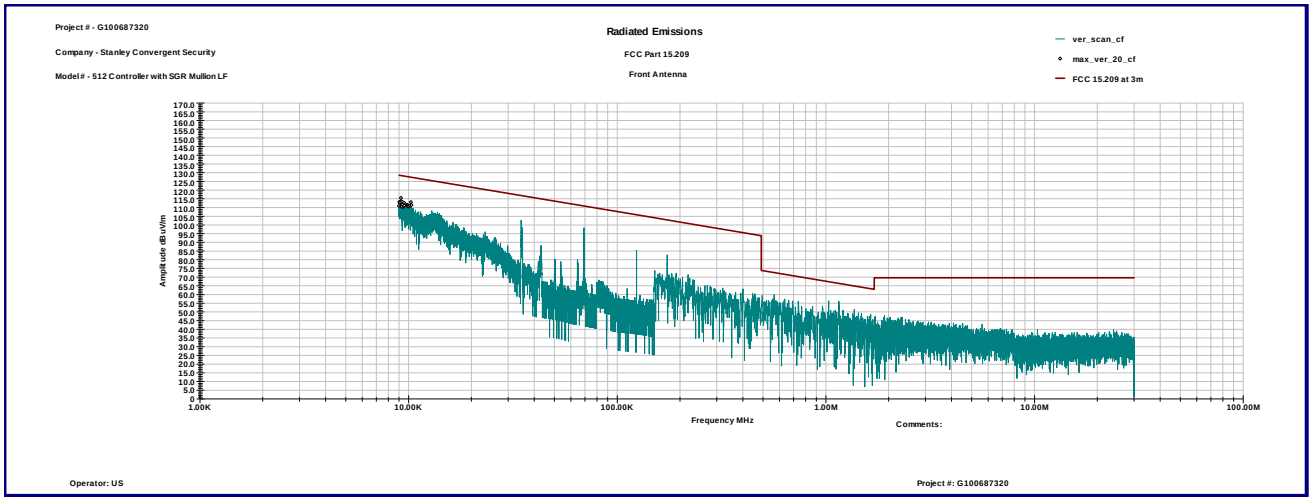
Frequency MHz	Antenna Orient.	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Peak Reading dBµV	Total @ 10m dBµV/m	15.209 Limit dBµV/m	Distance Factor (dB)	Margin dB	Comments
0.123	Front	63.6	0.1	28.8	25.6	60.5	25.8	59.1	-24.4	Fund
0.123	Side	63.6	0.1	28.8	21.4	56.3	25.8	59.1	-28.6	Fund
0.247	Front	57.9	0.1	28.7	20.3	49.5	19.8	59.1	-29.3	
0.247	Side	57.9	0.1	28.7	17.1	46.3	19.8	59.1	-32.5	
0.371	Front	54.2	0.1	28.7	17.5	43.1	16.2	59.1	-32.2	
0.371	Side	54.2	0.1	28.7	13.4	39.0	16.2	59.1	-36.3	
0.507	Front	51.7	0.1	28.7	17.5	40.6	33.5	19.1	-12.0	
0.507	Side	51.7	0.1	28.7	12.4	35.5	33.5	19.1	-17.1	
0.619	Front	49.9	0.1	28.7	13.2	34.5	31.8	19.1	-16.4	
0.619	Side	49.9	0.1	28.7	7.9	29.2	31.8	19.1	-21.7	
1.114	Front	45.7	0.1	28.7	13.6	30.7	26.7	19.1	-15.0	
1.114	Side	45.7	0.1	28.7	6.7	23.8	26.7	19.1	-21.9	

Table 3.1.2

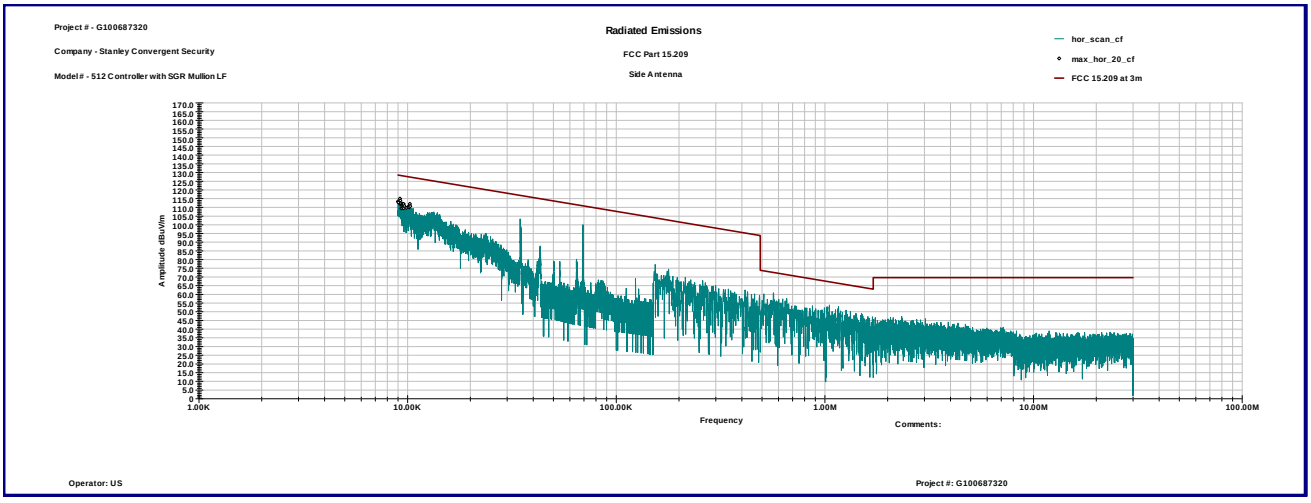
Frequency	Ant. Polarity	Peak Reading dBµV	Total C.F. dB1/m	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
30.381 MHz	V	9.5	20.0	29.5	40.0	-10.5
48.182 MHz	V	20.7	10.4	31.1	40.0	-8.9
51.126 MHz	V	23.6	9.3	32.8	40.0	-7.2
76.944 MHz	V	15.2	8.3	23.5	40.0	-16.6
128.95 MHz	V	14.9	14.0	28.8	43.5	-14.7
191.97 MHz	V	11.9	11.5	23.4	43.5	-20.2
33.152 MHz	H	8.3	18.4	26.8	40.0	-13.2
47.871 MHz	H	13.6	10.5	24.1	40.0	-15.9
51.403 MHz	H	15.3	9.2	24.5	40.0	-15.5
96.046 MHz	H	13.6	11.8	25.4	43.5	-18.1
126.94 MHz	H	10.5	14.0	24.5	43.5	-19.1

Graph 3.1.1

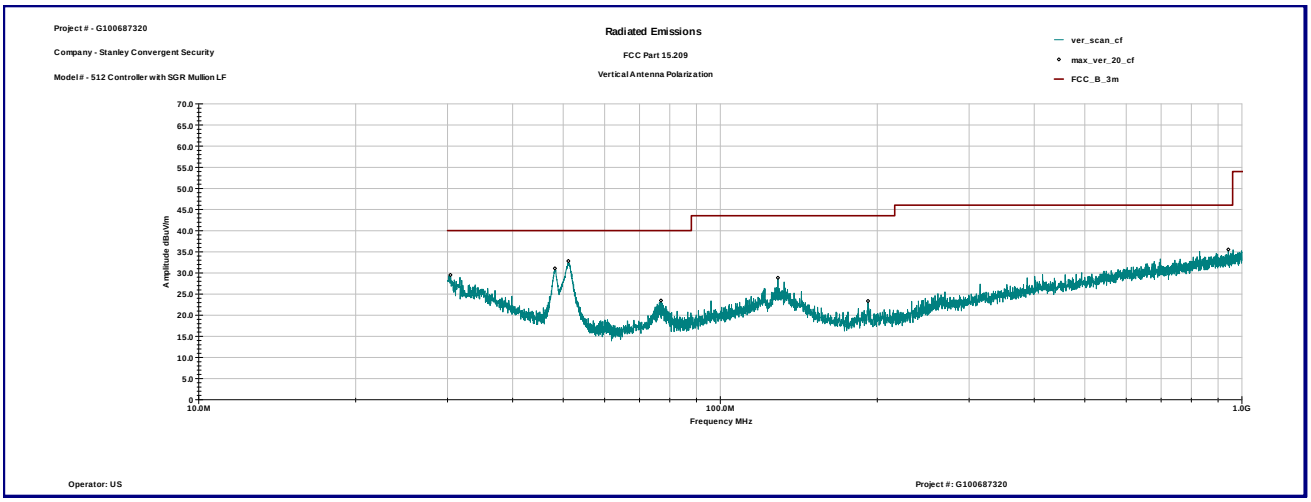
Front of antenna

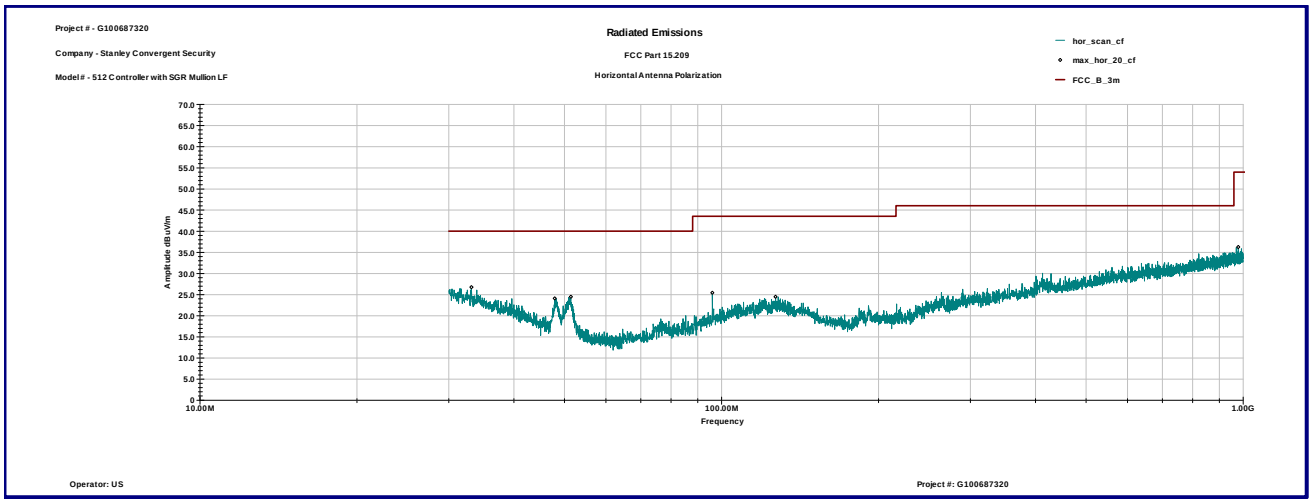


Side of antenna



Graph 3.1.2


Project # - G100687320
Company - Stanley Convergent Security
Model # - 512 Controller with SGR Mullion LF
Radiated Emissions
FCC Part 15.209
Vertical Antenna Polarization
ver_scan_cf
max_ver_20_cf
FCC_B_3m
Amplitude dBuV/m
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
10.0M
100.0M
1.0G
Frequency MHz
Operator: US
Project #: G100687320


Project # - G100687320
Company - Stanley Convergent Security
Model # - 512 Controller with SGR Mullion LF
Radiated Emissions
FCC Part 15.209
Horizontal Antenna Polarization
hor_scan_cf
max_hor_20_cf
FCC_B_3m
Amplitude dBuV/m
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
10.00M
100.00M
1.00G
Frequency
Operator: US
Project #: G100687320

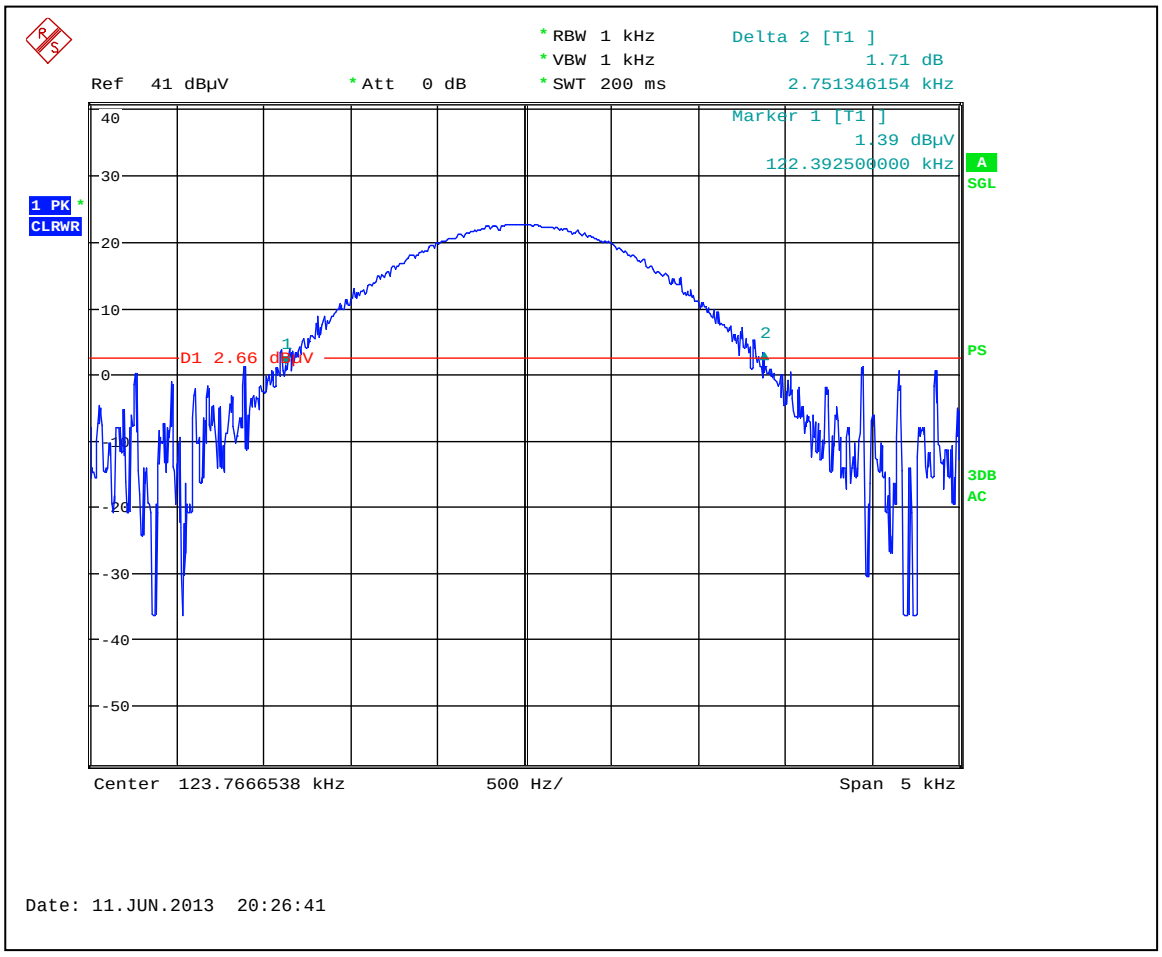
3.2 Bandwidth of Emissions

Center Frequency of operation MHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz	Result
0.123	2.75	2.32	**Pass**
RBW: **VBW:**	☐ 10kHz ☐ 100kHz ☒ other 1kHz ☐ 30kHz ☐ 300kHz ☒ other 1kHz		

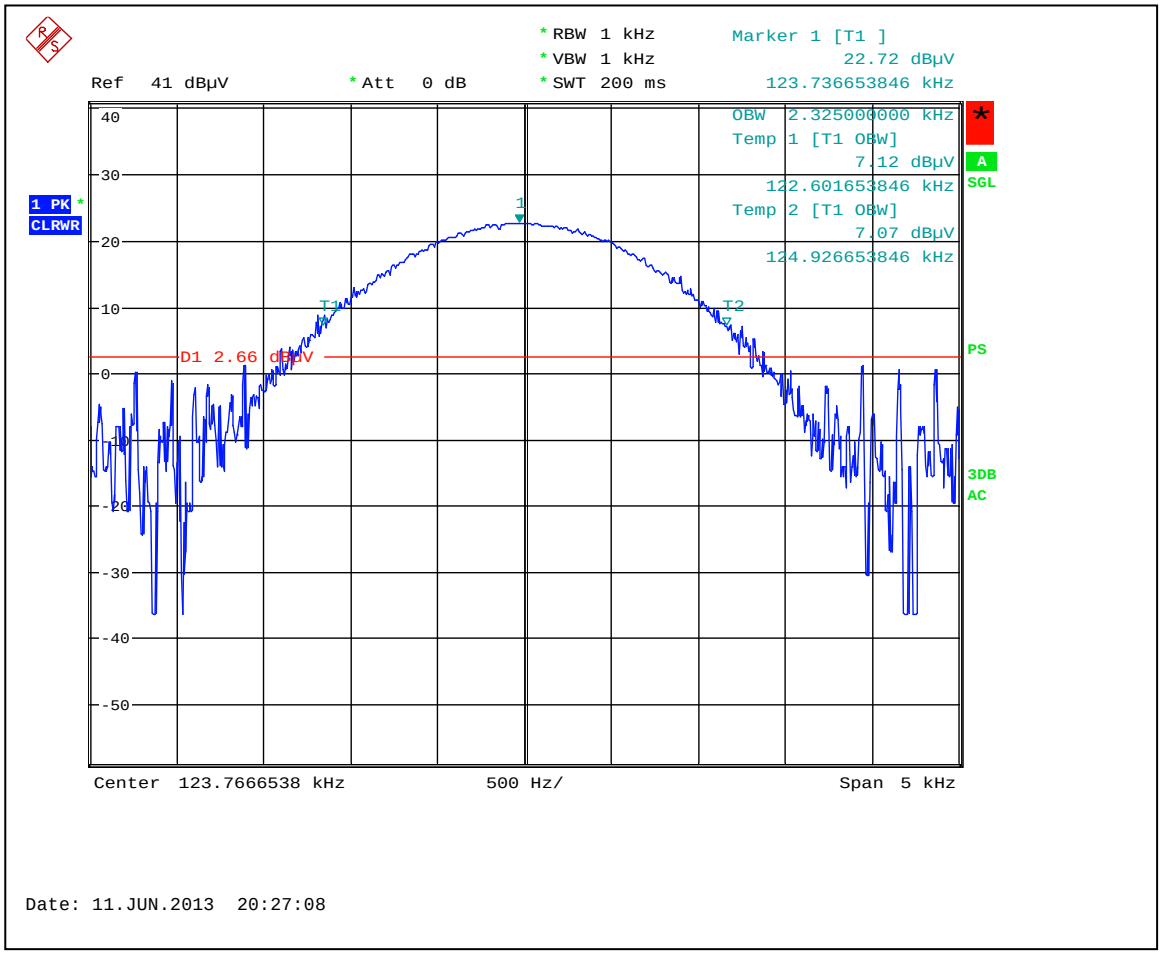
Graphs 3-2-1 and 3-2-2 are show bandwidth of emissions

Notes: None

Graph 3.1.1


*RBW 1 kHz
*VBW 1 kHz
*SWT 200 ms
Delta 2 [T1]
1.71 dB
2.751346154 kHz
Ref 41 dBµV
*Att 0 dB
Marker 1 [T1]
1.39 dBµV
122.392500000 kHz
A
SGL
1 PK *
CLRWR
40
30
20
10
0
-10
-20
-30
-40
-50
D1 2.66 dBµV
PS
3DB
AC
Center 123.7666538 kHz
500 Hz/
Span 5 kHz
Date: 11.JUN.2013 20:26:41

Graph 3.1.2


*RBW 1 kHz
*VBW 1 kHz
*SWT 200 ms
Marker 1 [T1]
22.72 dBµV
123.736653846 kHz
Ref 41 dBµV
*Att 0 dB
OBW 2.325000000 kHz
Temp 1 [T1 OBW]
7.12 dBµV
122.601653846 kHz
Temp 2 [T1 OBW]
7.07 dBµV
124.926653846 kHz
1 PK
CLRWR
A
SGL
PS
3DB
AC
D1 2.66 dBµV
40
30
20
10
0
-10
-20
-30
-40
-50
Center 123.7666538 kHz
500 Hz/
Span 5 kHz
Date: 11.JUN.2013 20:27:08

3.3 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 7.3dB below the limits

Notes: None

Date:	June 21, 2013	**Result:** **Pass**
Standard:	FCC 15.207	
Tested by:	Uri Spector	
Test Point:	Power Line	
Operation mode:	See Page 5	
Note:	None	

Table 3.3.1

Line 1

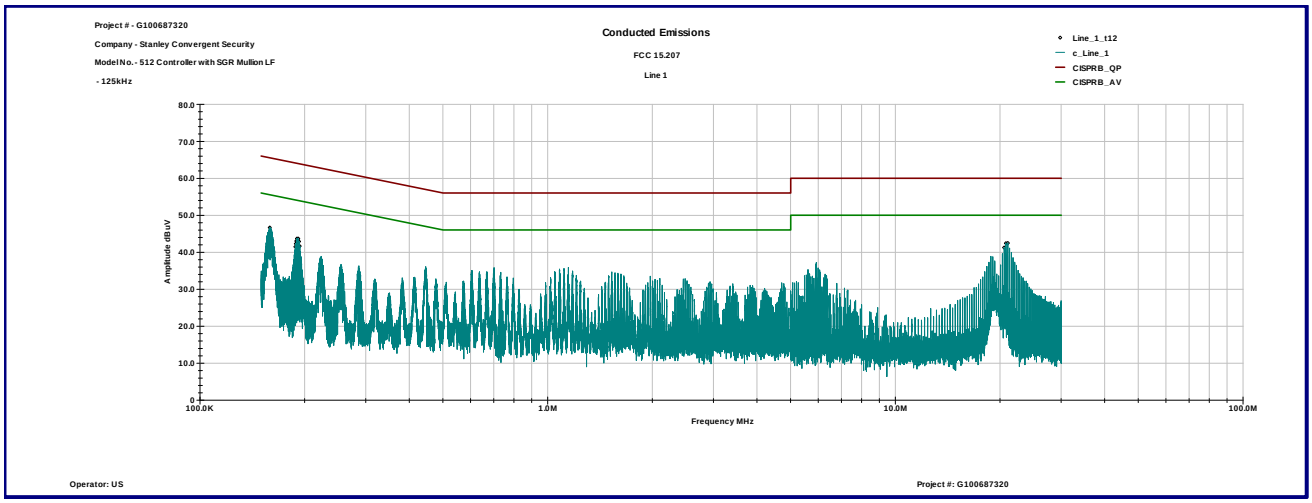
Frequency	Peak dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
158.86 KHz	46.7	65.5	55.5	-18.8	-8.8
191.82 KHz	43.7	64.0	54.0	-20.3	-10.3
192.8 KHz	42.9	63.9	53.9	-21.0	-11.0
193.43 KHz	41.7	63.9	53.9	-22.2	-12.2
20.551 MHz	41.3	60.0	50.0	-18.7	-8.7
21.045 MHz	42.5	60.0	50.0	-17.5	-7.5

Line 2

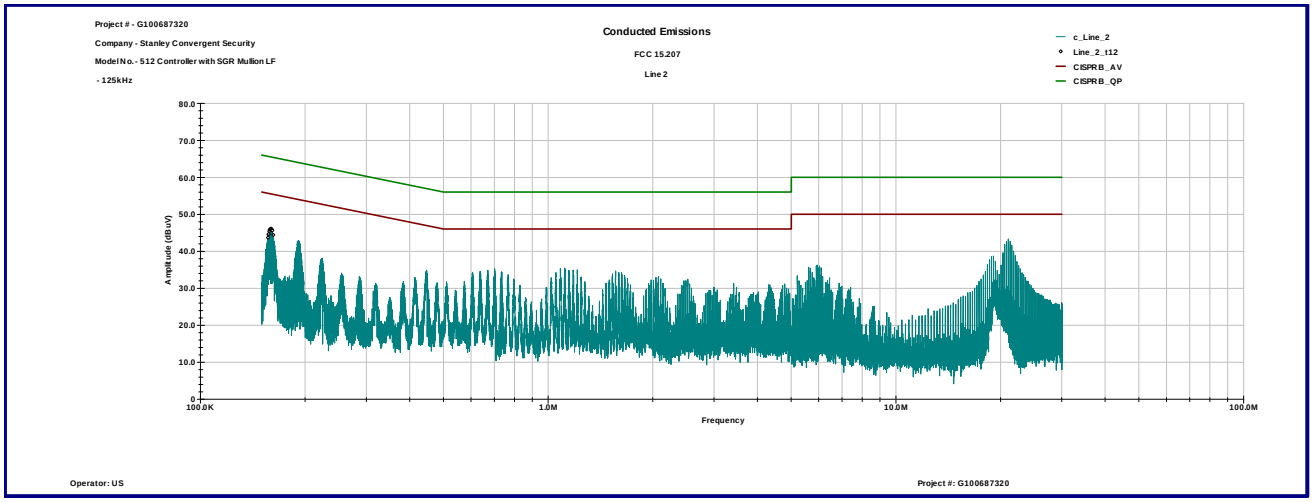
Frequency	Peak dBµV	QP Limit dBmV	AVG Limit dBmV	QP Margin dB	AVG Margin dB
156.41 KHz	43.7	65.7	55.7	-21.9	-11.9
159.05 KHz	46.1	65.5	55.5	-19.5	-9.5
160.33 KHz	45.9	65.5	55.5	-19.6	-9.6
701.22 KHz	35.3	56.0	46.0	-20.7	-10.7
5.934 MHz	36.3	60.0	50.0	-23.7	-13.7
21.3 MHz	42.7	60.0	50.0	-17.3	-7.3

Graph 3.4.1

Line 1



Line 2



3.4 Receiver/digital device radiated emissions

Test location: ☐ OATS ☐ Anechoic Chamber

Test distance: ☐ 10 meters ☐ 3 meters

Test result: **N/A**

Frequency range: 30MHz-1000MHz

Max. Emissions margin: dB below the limits

Notes: Mullion LF reader is transmitter only, and has no receiver portion.

3.5 Digital device conducted emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test result: **N/A**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: dB below the limits

Notes: Mullion LF reader is transmitter only, and has no receiver portion.

4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	ESU	100398	25283	12/19/2013	☒
Spectrum Analyzer	R & S	ESCI	100358	12909	07/02/2013	☒
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	☒