TEST REPORT

Report Number: 100682721MIN-001
Project Number: G100682721

Testing performed on the
Oneprox GS3-LF Mullion

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

to
47 CFR Part 15.209; Part 15.215:2010
47 CFR, Part 15:2010, §15.107 and §15.109, Class B
RSS- Gen, Issue 3, 2010
ICES-003, Issue 4:2004

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: _____ Date: April 10, 2012
Uri Spector

Reviewed by: _____ Date: April 10, 2012
Norman Shpilsher

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1.0 GENERAL DESCRIPTION

Model:	Oneprox GS3-LF Mullion
Type of EUT:	Mullion LF Card Reader
Intertek Sample ID:	MIN1203260921-001
FCC ID:	OQLGS3LFM
Industry Canada ID:	7309A-OQLGS3LFM
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
e-mail:	Christopher.Harris@sbdinc.com
Test Standards:	☒ 47 CFR, Part 15:2010, §15.209, §15.215 ☐ RSS–210, Issue 8, 20010 ☒ RSS-Gen, Issue 3, 2010 ☒ 47 CFR, Part 15:2010, §15.107 and §15.109, Class B ☒ ICES-003, Issue 4:2004 ☐ Other
Type of radio:	☐ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	March 27, 2012
Test Work Started:	March 27, 2012
Test Work Completed:	March 30, 2012
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	SGR Mullion LF Reader
Operating Frequency	123kHz
Modulation:	ASK
Emission Designator:	123KA1D
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:	None
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	>6ft.	Reader cable, not shielded	

Support equipment/Services:

No.	Item	Description
1	512 Controller	

General notes: None

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	Pass
15.107/ ICES-003	Digital device 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: 32.3dB below the limits

Max. margin of harmonics and spurious emissions: 25.4dB below the limits

Notes:

1. The Emissions pre-scan was performed in the Anechoic chamber at 3m measurement distance (Graphs 3.1.1); final measurements were performed in the Open Area Test Site at 10m measurement distance (see Tables 3.1.1).
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=100kHz (below 150kHz) and RBW=9kHz (above 150kHz).

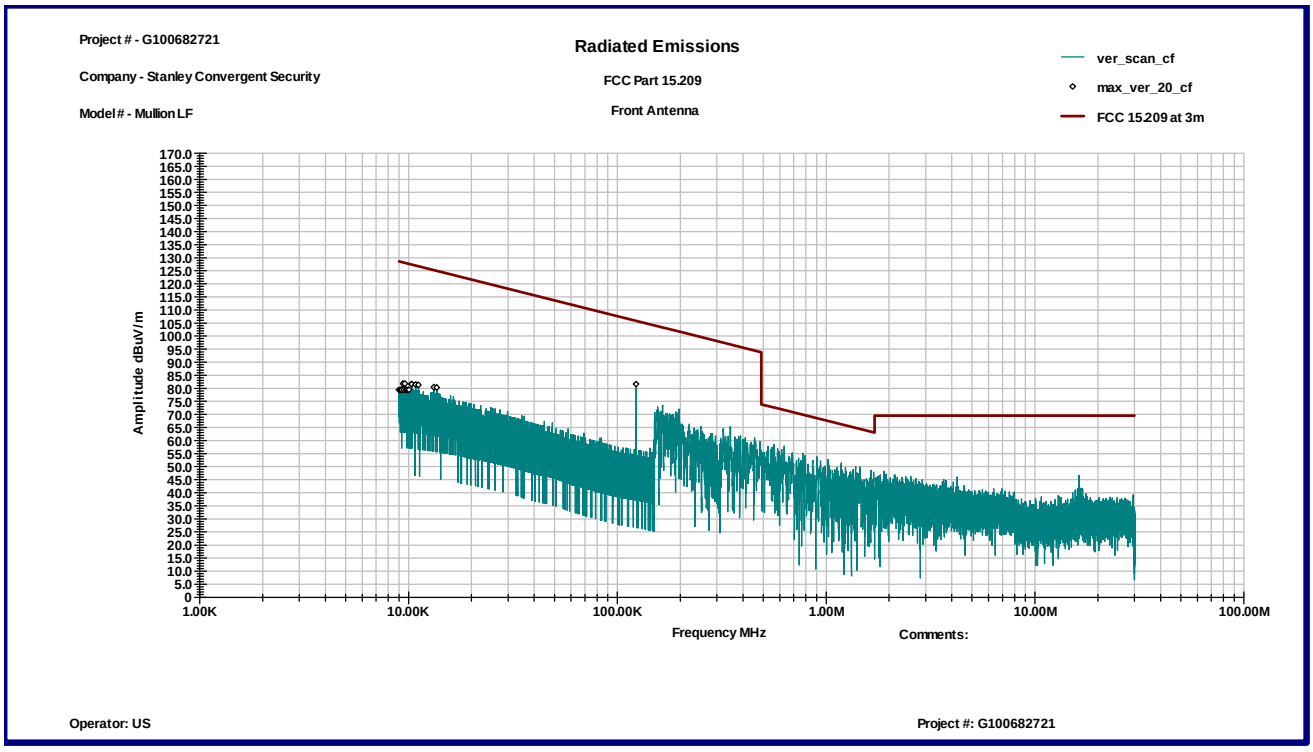
Date:	March 27, March 29, 2012	**Result:** **Pass**
Standard:	FCC 15.209 / RSS-210 A1.1.2	
Tested by:	Uri Spector	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	None	

Table 3.1.1

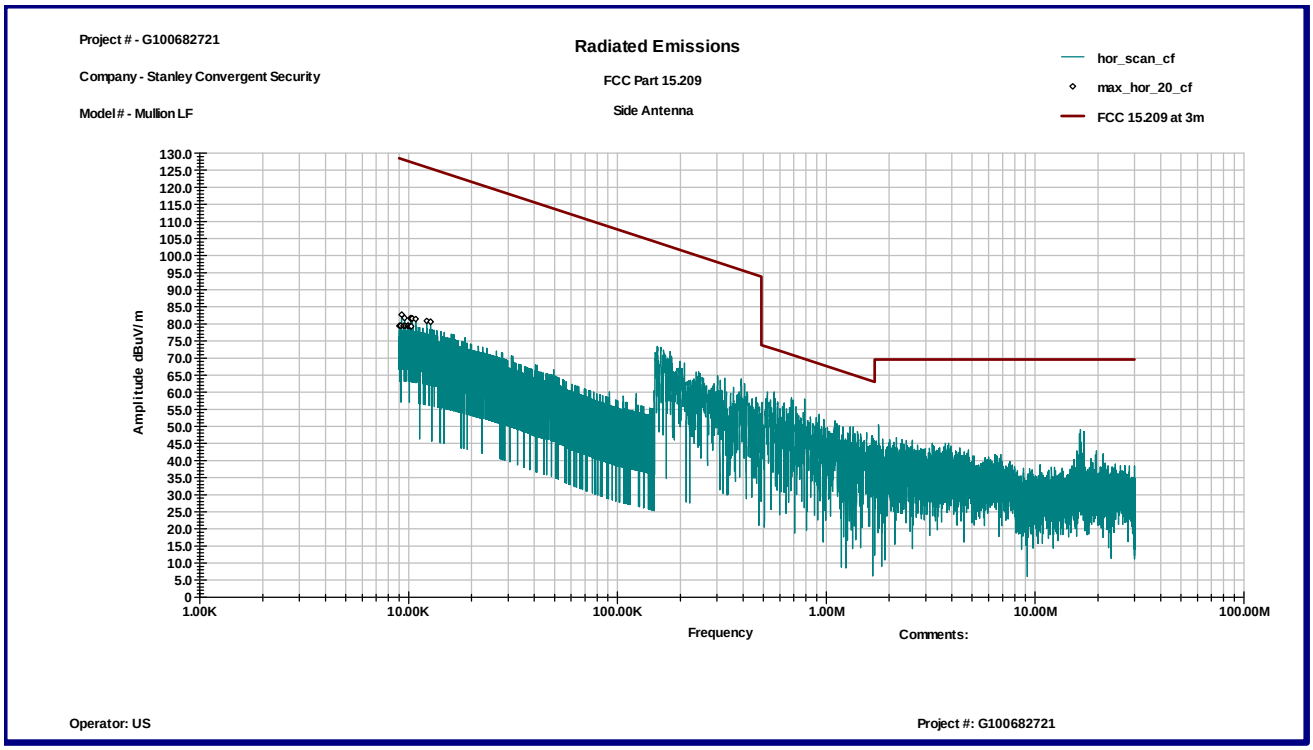
Frequency MHz	Antenna Orient.	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Peak Reading dBµV	Total @ 10m dBµV/m	15.209 Limit dBµV/m	Distance Factor (dB)	Margin dB	Comments
0.123	Front	63.6	0.1	28.8	17.7	52.6	25.8	59.1	-32.3	Fund
0.123	Side	63.6	0.1	28.8	13.9	48.8	25.8	59.1	-36.1	Fund
Spurious Emissions										
0.246	Front	57.9	0.1	28.7	10.7	39.9	19.8	59.1	-38.9	
0.246	Side	57.9	0.1	28.7	3.8	33.0	19.8	59.1	-45.8	
0.369	Front	54.3	0.1	28.7	5.3	30.9	16.3	59.1	-44.4	
0.369	Side	54.3	0.1	28.7	1.2	26.8	16.3	59.1	-48.5	
0.492	Front	51.9	0.1	28.7	4.1	27.4	33.8	19.1	-25.4	
0.492	Side	51.9	0.1	28.7	2.3	25.6	33.8	19.1	-27.2	
0.615	Front	49.9	0.1	28.7	2.7	24.0	31.8	19.1	-26.9	
0.615	Side	49.9	0.1	28.7	0.9	22.2	31.8	19.1	-28.7	
1.107	Front	45.7	0.1	28.7	2.5	19.6	26.7	19.1	-26.2	
1.107	Side	45.7	0.1	28.7	1.1	18.2	26.7	19.1	-27.6	

Graph 3.1.1

Front of antenna



Side of antenna



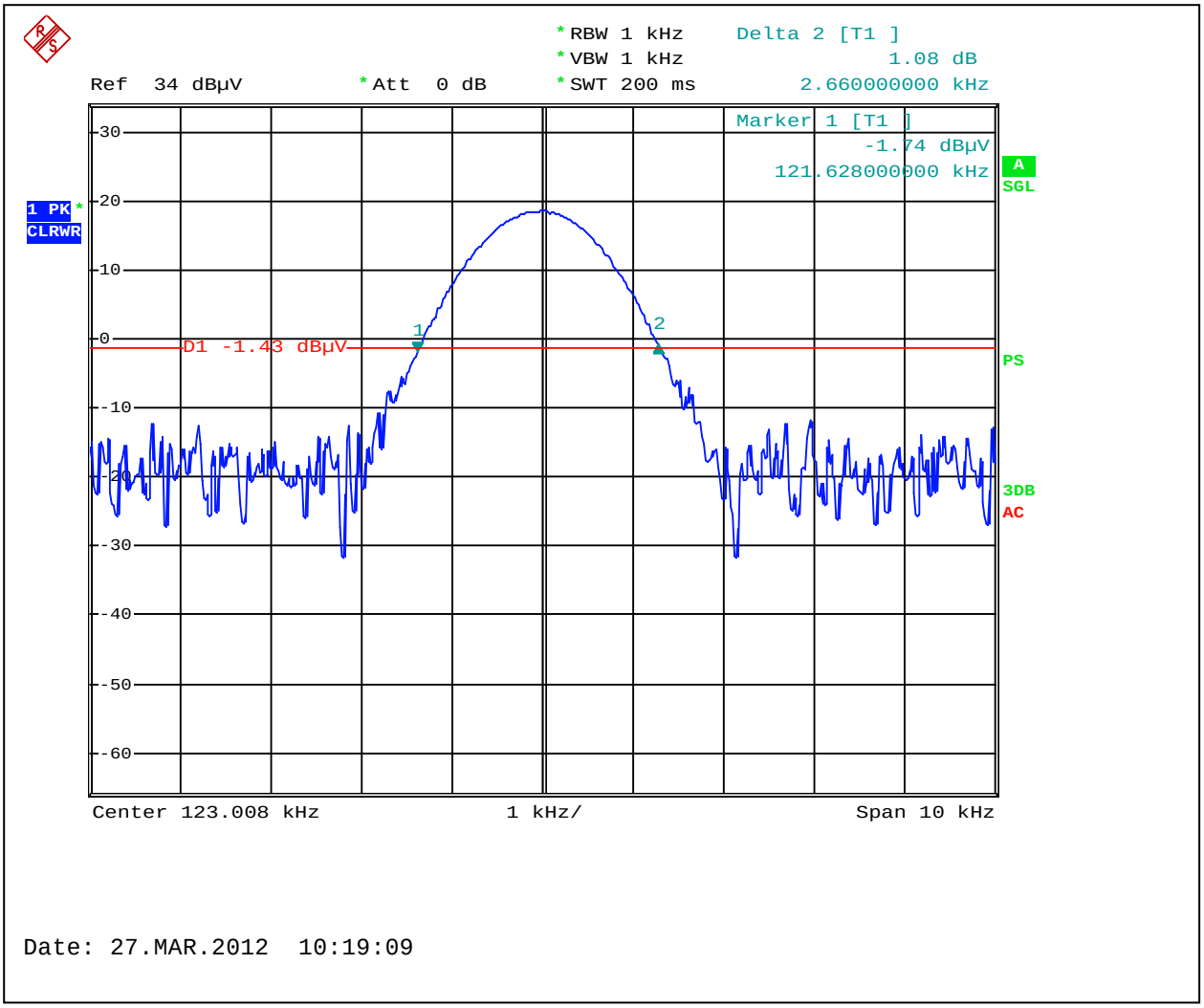
3.2 Bandwidth of Emissions

Center Frequency of operation MHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz	Result
0.123	2.66	2.34	**Pass**
RBW: **VBW:**	☐ 10kHz ☐ 100kHz ☒ other 1kHz ☐ 30kHz ☐ 300kHz ☒ other 1kHz		

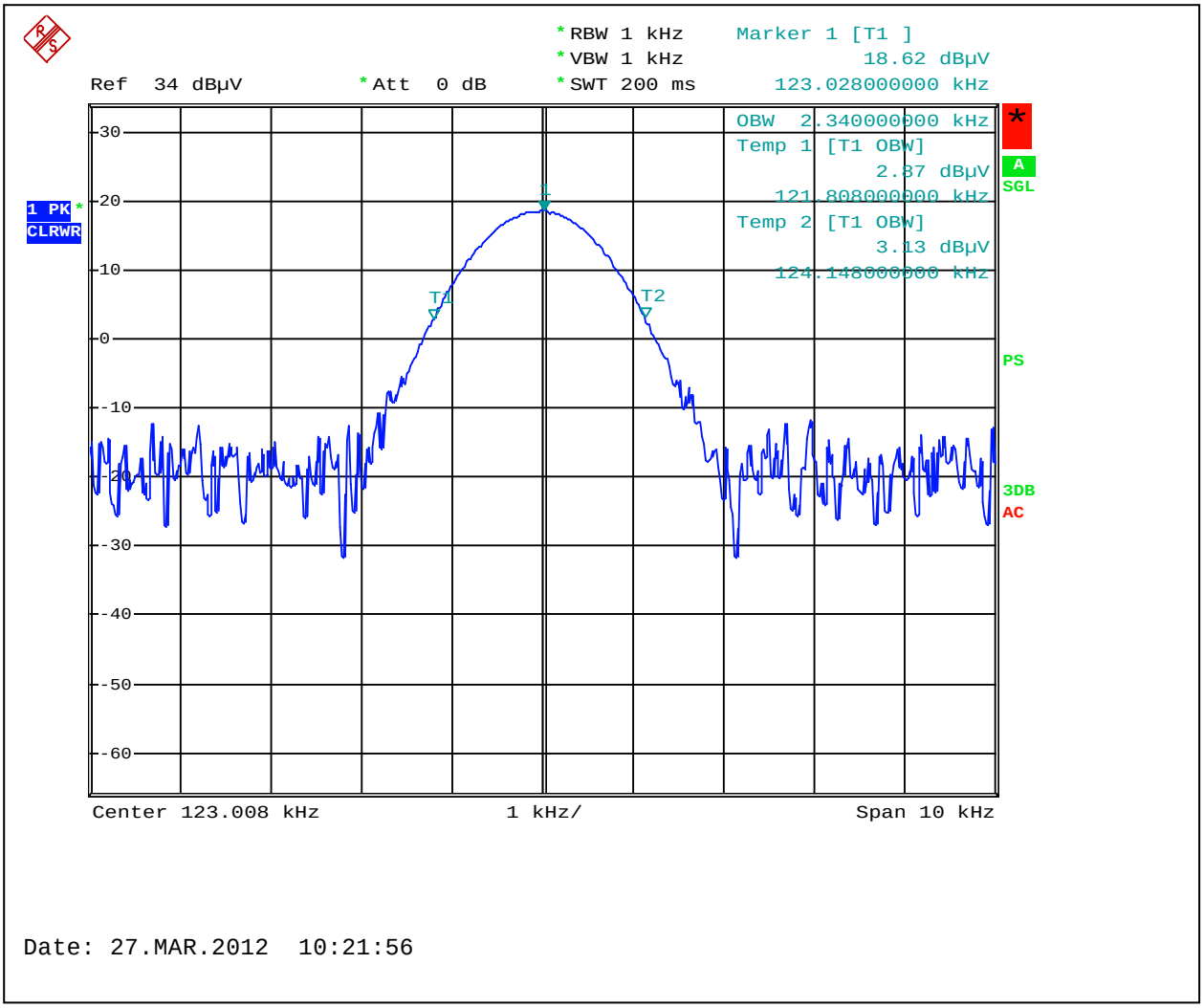
Graphs 3-2-1 and 3-2-2 are show bandwidth of emissions

Notes: None

Graph 3.1.1


*RBW 1 kHz
*VBW 1 kHz
*SWT 200 ms
Delta 2 [T1]
1.08 dB
2.660000000 kHz
Ref 34 dBµV
*Att 0 dB
Marker 1 [T1]
-1.74 dBµV
121.628000000 kHz
A
SGL
1 PK *
CLRWR
30
20
10
0
-10
-20
-30
-40
-50
-60
D1 -1.43 dBµV
1
2
PS
3DB
AC
Center 123.008 kHz
1 kHz/
Span 10 kHz
Date: 27.MAR.2012 10:19:09

Graph 3.1.2


*RBW 1 kHz
*VBW 1 kHz
*SWT 200 ms
Marker 1 [T1]
18.62 dBµV
123.028000000 kHz
Ref 34 dBµV
*Att 0 dB
OBW 2.340000000 kHz
Temp 1 [T1 OBW]
2.87 dBµV
121.808000000 kHz
Temp 2 [T1 OBW]
3.13 dBµV
124.148000000 kHz
1 PK
CLRWR
A
SGL
PS
3DB
AC
30
20
10
0
-10
-20
-30
-40
-50
-60
T1
T2
Center 123.008 kHz
1 kHz/
Span 10 kHz
Date: 27.MAR.2012 10:21:56

3.3 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 4.8dB below the limits

Notes: None

Date:	March 27, 2012	**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

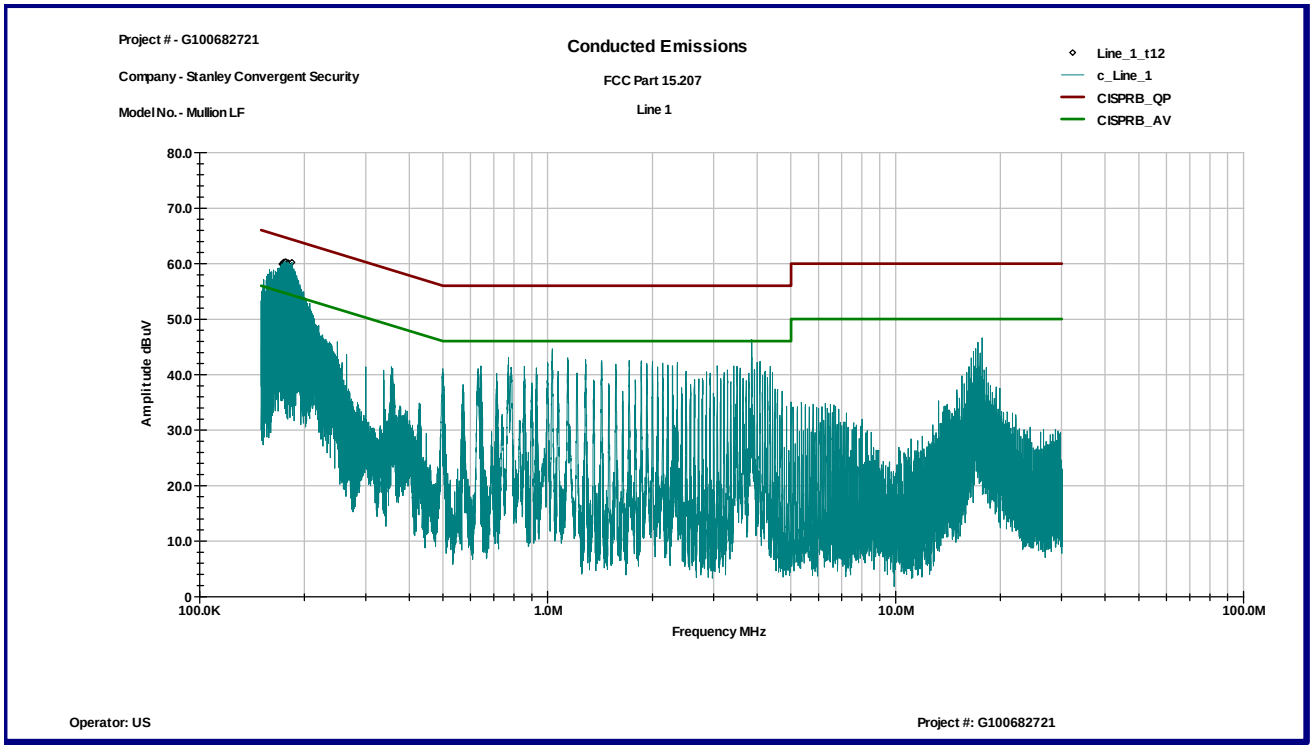
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.179	53.5	32.4	0.1	64.5	54.5	-10.9	-22.0
0.199	47.6	28.8	0.1	63.7	53.7	-16.0	-24.8
0.500	40.0	35.7	0.2	56.0	46.0	-15.8	-10.1
1.029	43.1	41.0	0.2	56.0	46.0	-12.7	-4.8
3.860	41.7	30.0	0.5	56.0	46.0	-13.8	-15.5
17.710	41.5	40.4	1.0	60.0	50.0	-17.5	-8.6

Line 2

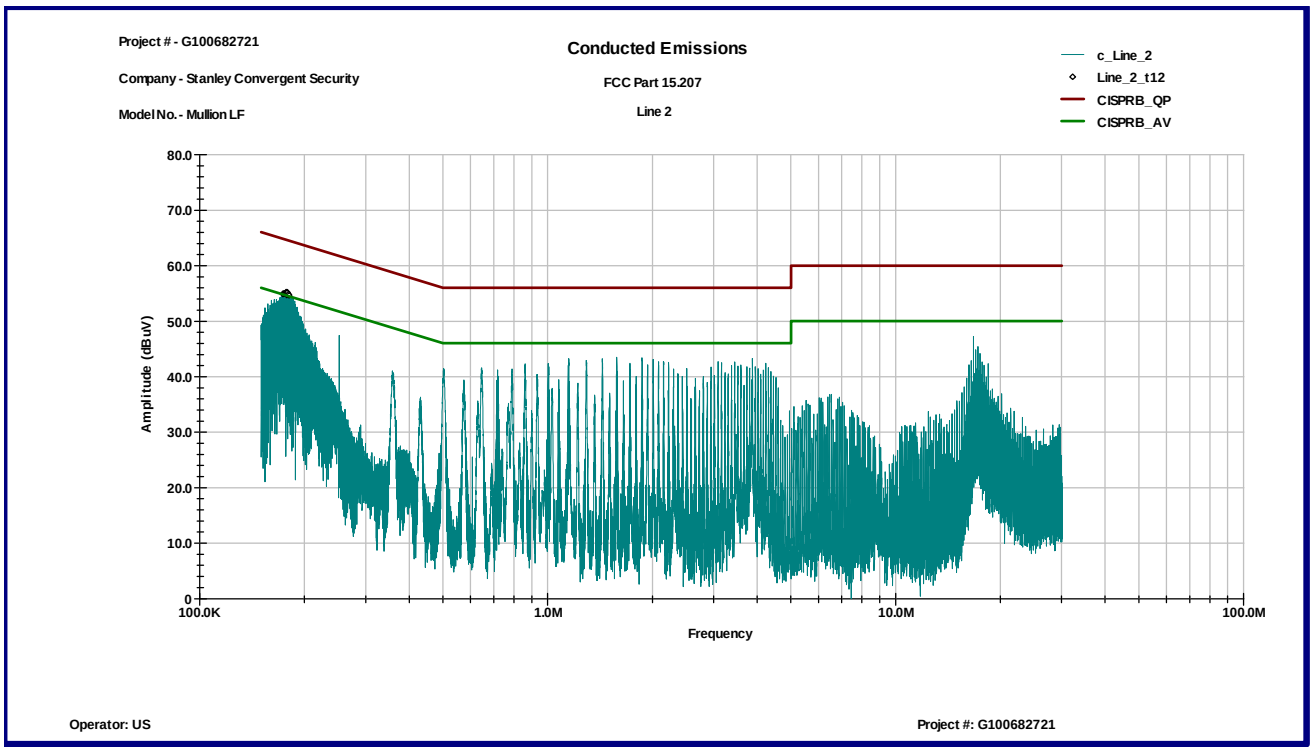
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.177	48.6	28.5	0.1	64.6	54.6	-15.9	-26.0
0.360	39.6	35.7	0.1	58.7	48.7	-19.0	-12.9
1.149	42.4	37.4	0.2	56.0	46.0	-13.4	-8.4
3.087	37.9	31.9	0.4	56.0	46.0	-17.7	-13.7
6.463	27.2	18.1	0.6	60.0	50.0	-32.2	-31.3
16.971	46.1	43.9	1.0	60.0	50.0	-12.9	-5.1

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: **Pass**

Frequency range: 30MHz-1000MHz

Max. Emissions margin: 6.7dB below the limits

Notes: None

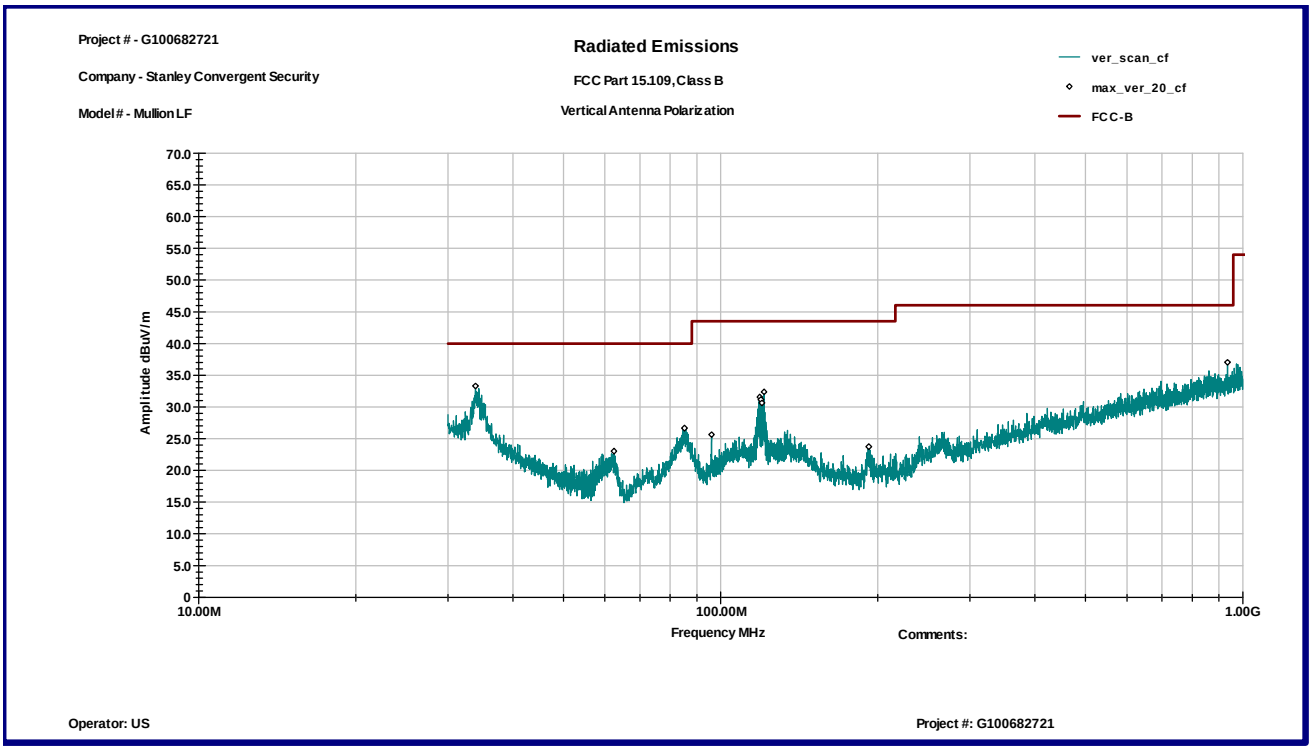
Date:	March 27, March 28, 2012	**Result:** **Pass**
Standard:	FCC Part 15.109, Class B	
Tested by:	Uri Spector	
Test Point:	Enclosure	
Operation mode:	Standby mode	
Note:	None	

Table 3.4.1

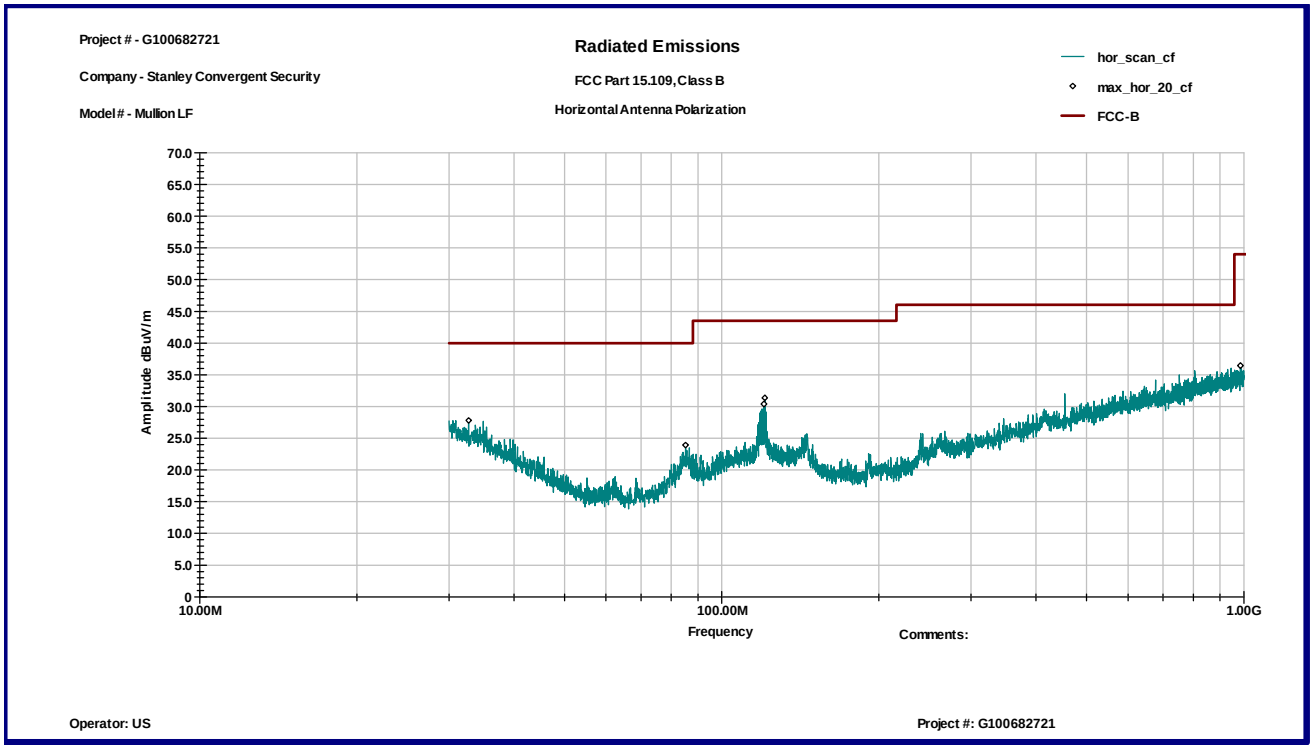
Frequency	Ant. Polarity	Peak Reading dBµV	Ant.Factor dB1/m	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
33.914 MHz	V	15.1	18.2	33.3	40.0	-6.7
62.451 MHz	V	16.0	7.0	23.0	40.0	-17.0
85.227 MHz	V	17.2	9.5	26.7	40.0	-13.4
96.046 MHz	V	13.9	11.7	25.6	40.0	-14.4
118.8 MHz	V	17.7	13.9	31.6	40.0	-8.4
121.04 MHz	V	18.4	14.0	32.4	40.0	-7.6
192.14 MHz	V	12.3	11.4	23.7	40.0	-16.3
32.736 MHz	H	9.0	18.8	27.8	40.0	-12.2
85.227 MHz	H	14.5	9.5	23.9	40.0	-16.1
120.89 MHz	H	17.4	14.0	31.4	40.0	-8.6

Graph 3.4.1

Vertical antenna polarization



Horizontal antenna polarization



3.5 Digital device conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 4.8dB below the limits

Notes: None

Date:	March 27, 2012	**Result:** **Pass**
Standard:	FCC 15.107, Class B	
Tested by:	Uri Spector	
Test Point:	Power Line	
Operation mode:	See page 5	
Note:	None	

Table 3.5.1

Line 1

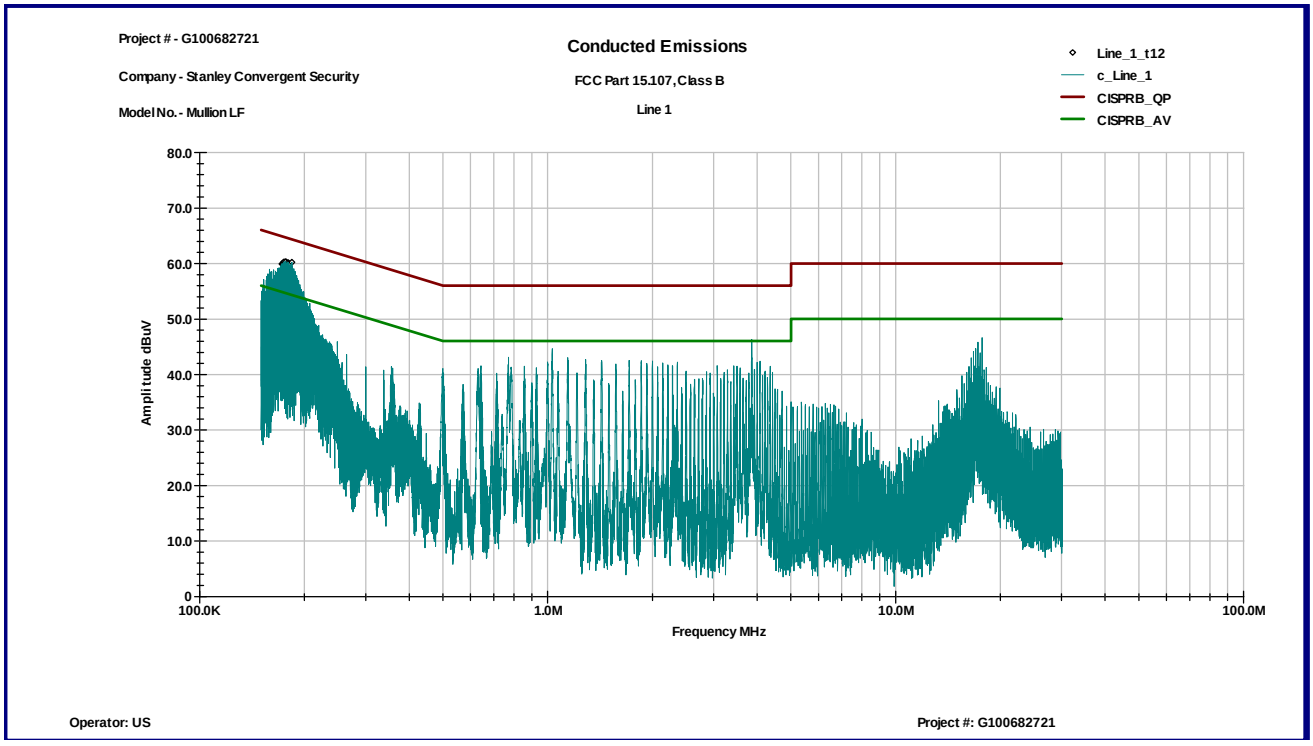
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.179	53.5	32.4	0.1	64.5	54.5	-10.9	-22.0
0.199	47.6	28.8	0.1	63.7	53.7	-16.0	-24.8
0.500	40.0	35.7	0.2	56.0	46.0	-15.8	-10.1
1.029	43.1	41.0	0.2	56.0	46.0	-12.7	-4.8
3.860	41.7	30.0	0.5	56.0	46.0	-13.8	-15.5
17.710	41.5	40.4	1.0	60.0	50.0	-17.5	-8.6

Line 2

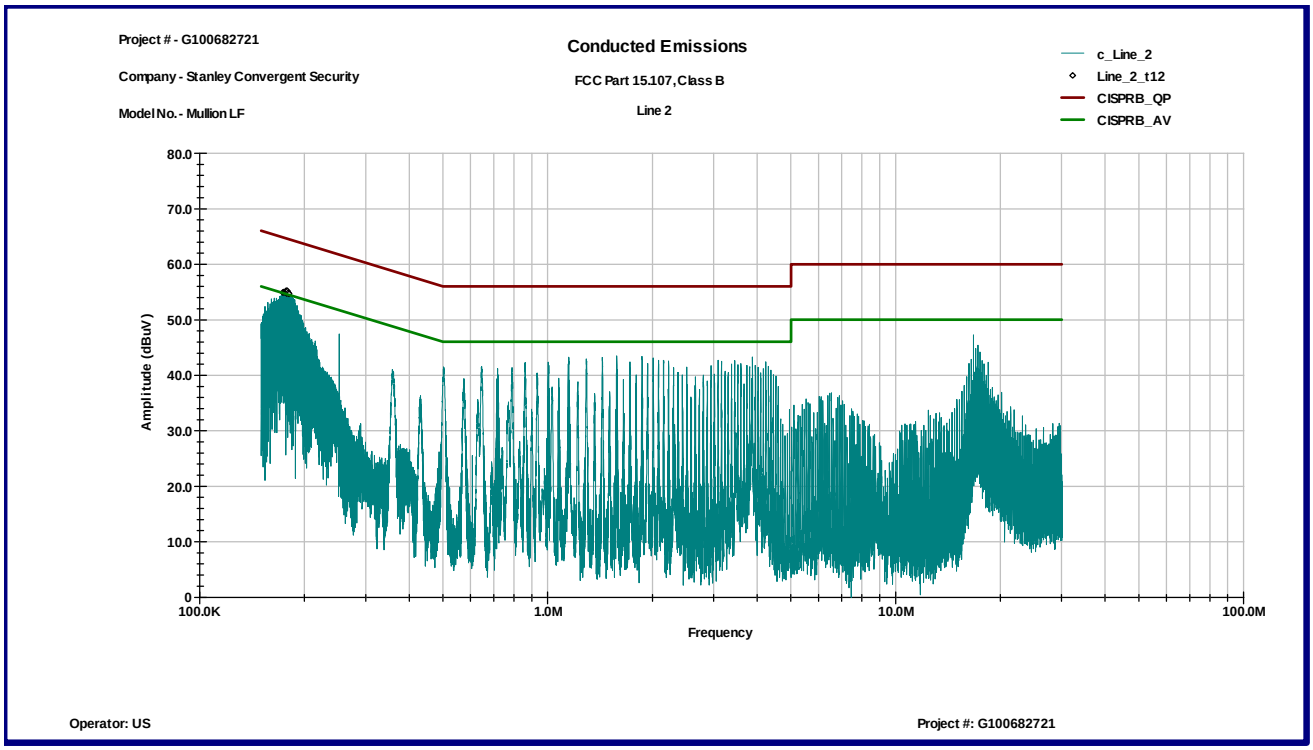
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.177	48.6	28.5	0.1	64.6	54.6	-15.9	-26.0
0.360	39.6	35.7	0.1	58.7	48.7	-19.0	-12.9
1.149	42.4	37.4	0.2	56.0	46.0	-13.4	-8.4
3.087	37.9	31.9	0.4	56.0	46.0	-17.7	-13.7
6.463	27.2	18.1	0.6	60.0	50.0	-32.2	-31.3
16.971	46.1	43.9	1.0	60.0	50.0	-12.9	-5.1

Graph 3.5.1

Line 1



Line 2



4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Receiver RF Section	HP	85462A	3549A00306	9995	04/27/2012	☒
RF Filter Section	HP	85460A	3448A00276	9937	04/27/2012	☒
Spectrum Analyzer	R & S	FSP 40	100024	12559	11/17/2012	☐
Spectrum Analyzer	R & S	ESU	100398	25283	12/09/2012	☒
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2468	9734	11/08/2012	☒
Loop Antenna	ETS	6512	00060486	19942	10/26/2012	☒
LISN	Fischer Custom Communications	FCC-LISN-2 MOD.SD	316	9945	05/26/2012	☒
Pre-Amplifier	HP	8447F OPT H64	3113A04974	9934	07/12/2012	☒
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	☒