

*FCC PART 15, SUBPART B and C
TEST REPORT**for*

PowerLinc™ SERIAL

MODEL: 2413S

Prepared for

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IRVINE, CALIFORNIA 92606Prepared by: *Kyle Fujimoto*

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BREA, CALIFORNIA 92823
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DATE: JANUARY 2, 2009

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
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E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Plot Map And Layout of Radiated Test Site – 3 Meters

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: PowerLinc™ Serial
Model: 2413S
S/N: N/A

Product Description: See Expository Statement

Modifications: The EUT was modified in order to meet the specifications. Please see the list located in Appendix B.

Manufacturer: SmartLabs, Inc.
16542 Millikan Avenue
Irvine, California 92606

Test Dates: December 16 and 19, 2008

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15.209 and 15.249

Test Procedure: ANSI C63.4

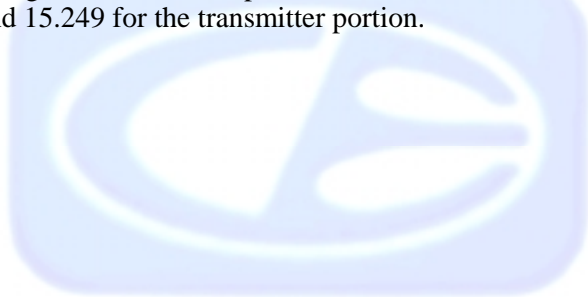
Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and Subpart C section 15.207.
2	Radiated RF Emissions, 10 kHz – 9300 MHz (Transmitter Portion)	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and 15.249.
3	Radiated RF Emissions, 10 kHz – 9300 MHz (Digital and Receiver Portion)	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the PowerLinc™ Serial, Model: 2413S. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B for the digital and receiver portion; and the limits defined in Subpart C, sections 15.205, 15.207, 15.209, and 15.249 for the transmitter portion.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

SmartLabs, Inc.

John Lockyer
Marcus Escobosa

Compatible Electronics, Inc.

Kyle Fujimoto Test Engineer
Michael Christensen Lab Manager

2.4 Date Test Sample was Received

The test sample was received on December 15, 2008.

2.5 Disposition of the Test Sample

The sample has not been returned to SmartLabs, Inc. as of January 2, 2009.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description Of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The PowerLinc™ Serial, Model: 2413S (EUT) was directly connected to the AC public mains. The EUT was also connected to a laptop via its serial port (through a USB to serial adapter). The laptop was also connected to an AC Adapter and scanner via its power and USB ports, respectively. The scanner was also connected to its AC Adapter via its power port. The EUT was controlled by a ControlLinc Model: 2430 that was also connected to the AC public mains. The EUT's antenna is hardwired onto the PCB itself. The EUT was tested in three orthogonal axis. The EUT was continuously transmitting and/or receiving while sending data for the laptop via its serial port.

The final radiated data as well as the conducted data was taken in the both the transmitting and receiving modes. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

- Cable 1** This is a 2-meter unshielded cable connecting the EUT to the AC public mains. The cable has a 3-prong female connector at the EUT end and a 3-prong male connector at the AC public mains end.
- Cable 2** This is a 2-meter unshielded cable connecting the ControLinc to the AC public mains. The cable is hard wired at the ControLinc end and has a 2-prong power connector at the AC public mains end.
- Cable 3** This is a 3-meter braid shielded cable connecting the laptop to the scanner. The cable has an RS-232 type 'A' connector at the laptop end and a RS-232 type 'B' connector at the scanner end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.
- Cable 4** This is a 2-meter unshielded cable connecting the AC Adapter to the scanner. The cable has a 1/8 inch power connector at the scanner end and is hard wired into the AC Adapter.
- Cable 5** This is a 1.5-meter braid unshielded cable connecting the EUT to the USB to serial adapter. The cable has a D-9 pin metallic connector at the laptop end and an RJ-45 connector at the EUT end. The cable was bundled to a length of 1 meter.
- Cable 6** This is a 20-centimeter braid shielded cable connecting the USB to serial adapter to the laptop. The cable is hard wired at the USB to serial adapter end and has a type 'A' USB connector at the laptop end. The shield of the cable was grounded to the chassis via the connector.
- Cable 7** This is a 2-meter unshielded cable connecting the AC Adapter to the laptop. The cable has a 1-pin power connector at the laptop end and is hard wired into the AC Adapter. The cable was bundled to a length of 1 meter.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIALNUMBER	FCC ID
POWERLINCTM SERIAL (EUT)	SMARTLABS, INC.	2413S	N/A	SBP2413S
LAPTOP	IBM	2623-DAU	L3-AV583 06/12	N/A
SCANNER	MICROTEK	5800	W3756A12478	N/A
AC ADAPTER FOR SCANNER	DVE	DSA-0151A-12 S	N/A	N/A
CONTROLINC	SMARTHOME	2430	N/A	N/A
AC ADAPTER FOR LAPTOP	LENOVO	P/N: 92P1109	11S92P1109Z1ZBTZ675626	N/A
USB TO SERIAL ADAPTER	N/A	N/A	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	September 17, 2008	Sept. 17, 2010
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Radiated Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Biconical Antenna	Com Power	AB-900	15226	February 28, 2008	Feb. 28, 2009
Log Periodic Antenna	Com Power	AL-100	16060	June 27, 2008	June 27, 2009
Preamplifier	Com-Power	PA-102	1017	January 11, 2008	Jan. 11, 2009
Loop Antenna	Com Power	AL-130	17089	September 29, 2008	Sept. 29, 2009
Horn Antenna	Com Power	AH-118	071175	June 27, 2008	June 27, 2010
Microwave Preamplifier	Com Power	PA-122	181921	March 3, 2008	March 3, 2009
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
LISN	Com Power	LI-215	12078	September 29, 2008	Sept. 29, 2009
LISN	Com Power	LI-215	12082	September 29, 2008	Sept. 29, 2009
Transient Limiter	Seaward	252A910	1	September 26, 2008	Sept. 26, 2009

6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was grounded to the chassis of the laptop via the shell of the RS-232 connector.



7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.207.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

7.1.3 Radiated Emissions (Spurious and Harmonics) Test (Continued)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249.



8. CONCLUSIONS

The PowerLinc™ Serial, Model: 2413S meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital and receiver portion; and the limits defined in Subpart C, sections 15.205, 15.207, 15.209, and 15.249 for the transmitter portion.





APPENDIX A

LABORATORY RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada





APPENDIX B

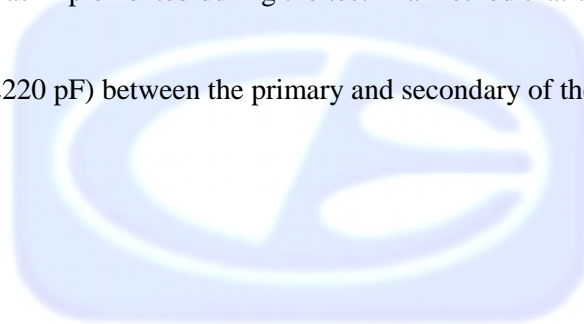
MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 or FCC Class B specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Added a high voltage capacitor (2220 pF) between the primary and secondary of the transformer. Also the inductor was shorted.




APPENDIX C***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

PowerLinc™ Serial
Model: 2413S
S/N: N/A

There were no additional models covered under this report.



APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

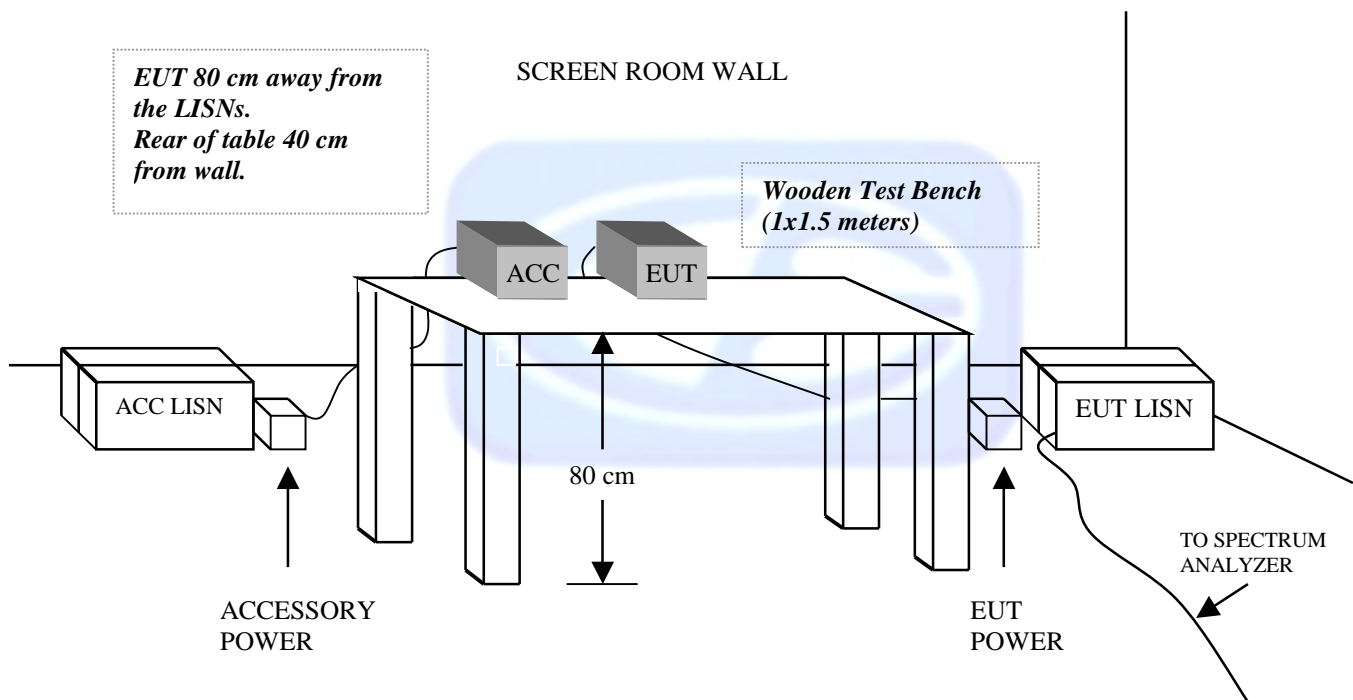
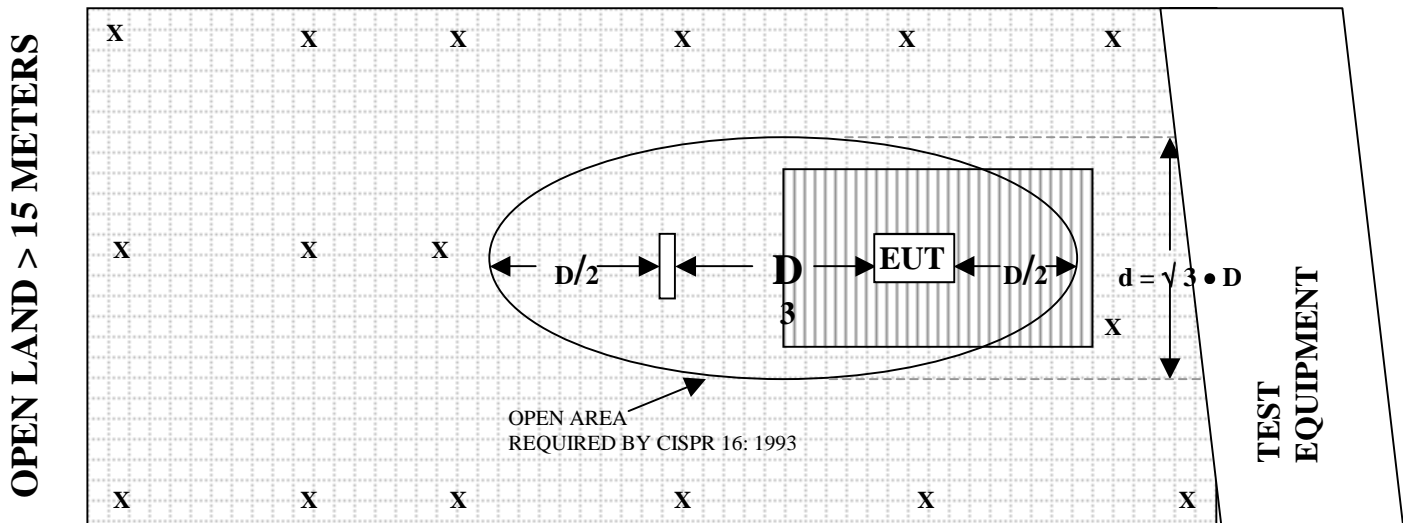


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED TEST SITE – 3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

- | | | | |
|---|--------------------------|--|-----------------|
| X | = GROUND RODS | | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) | | = WOOD COVER |

COM-POWER AB-900**BICONICAL ANTENNA**

S/N: 15226

CALIBRATION DATE: FEBRUARY 28, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	12.1	100	10.7
35	12.2	120	13.6
40	11.7	140	12.1
45	9.9	160	12.2
50	11.3	180	15.2
60	9.4	200	16.5
70	7.6	250	16.5
80	6.0	275	18.1
90	6.8	300	21.5

COM-POWER AL-100**LOG PERIODIC ANTENNA**

S/N: 16060

CALIBRATION DATE: JUNE 27, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	12.7	700	21.2
400	15.3	800	21.7
500	17.4	900	21.8
600	19.0	1000	22.8

COM POWER AH-118**HORN ANTENNA**

S/N: 071175

CALIBRATION DATE: JUNE 27, 2008

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.5	10.0	39.4
1.5	25.4	10.5	39.7
2.0	28.3	11.0	39.0
2.5	28.9	11.5	40.0
3.0	29.7	12.0	39.7
3.5	30.8	12.5	41.7
4.0	31.4	13.0	42.7
4.5	32.6	13.5	41.2
5.0	33.7	14.0	41.6
5.5	34.4	14.5	43.2
6.0	34.7	15.0	42.3
6.5	35.4	15.5	39.3
7.0	37.0	16.0	41.7
7.5	37.4	16.5	39.6
8.0	37.6	17.0	43.0
8.5	37.6	17.5	47.1
9.0	38.5	18.0	46.2
9.5	38.6		

COM-POWER PA-102**PREAMPLIFIER**

S/N: 1017

CALIBRATION DATE: JANUARY 11, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.2	300	38.0
40	38.0	350	38.3
50	38.3	400	38.0
60	38.6	450	37.5
70	38.4	500	37.9
80	38.4	550	37.9
90	38.3	600	37.8
100	38.1	650	37.5
125	38.5	700	38.0
150	38.2	750	37.7
175	38.1	800	37.1
200	38.4	850	37.1
225	38.2	900	37.1
250	38.2	950	37.0
275	38.2	1000	36.5

COM-POWER PA-122**PREAMPLIFIER**

S/N: 181921

CALIBRATION DATE: MARCH 3, 2008

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	36.32	10.0	35.47
1.5	35.40	10.5	35.05
2.0	34.77	11.0	34.16
2.5	35.07	11.5	33.75
3.0	34.86	12.0	34.65
3.5	34.48	12.5	34.41
4.0	34.30	13.0	35.36
4.5	33.96	13.5	35.30
5.0	34.06	14.0	35.87
5.5	34.54	14.5	36.44
6.0	35.90	15.0	36.24
6.5	36.85	15.5	35.92
7.0	36.55	16.0	35.53
7.5	35.31	16.5	35.29
8.0	33.57	17.0	34.96
8.5	33.36	17.5	34.02
9.0	35.01	18.0	33.39
9.5	35.97		

COM-POWER AL-130**LOOP ANTENNA**

S/N: 17089

CALIBRATION DATE: SEPTEMBER 29, 2008

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.57	9.93
0.01	-42.06	9.44
0.02	-42.43	9.07
0.05	-42.50	9.00
0.07	-42.10	9.40
0.1	-42.03	9.47
0.2	-44.50	7.00
0.3	-41.93	9.57
0.5	-41.90	9.60
0.7	-41.73	9.77
1	-41.23	10.27
2	-40.90	10.60
3	-41.20	10.30
4	-41.30	10.20
5	-40.70	10.80
10	-41.10	10.40
15	-42.17	9.33
20	-42.00	9.50
25	-42.20	9.30
30	-43.10	8.40



FRONT VIEW

SMARTLABS, INC.
PowerLinc™ Serial
MODEL: 2413S

FCC SUBPART B AND C – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



REAR VIEW

SMARTLABS, INC.
PowerLinc™ Serial
MODEL: 2413S

FCC SUBPART B AND C – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



FRONT VIEW

SMARTLABS, INC.
PowerLinc™ Serial
MODEL: 2413S

FCC SUBPART B AND C – CONDUCTED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

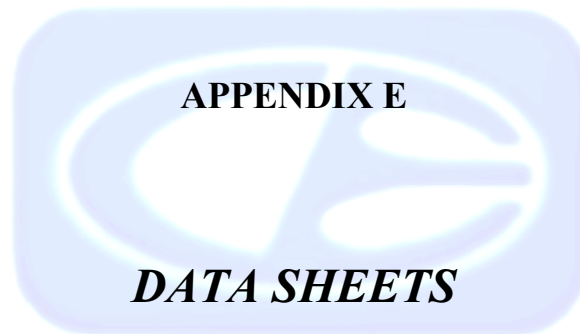


REAR VIEW

SMARTLABS, INC.
PowerLinc™ Serial
MODEL: 2413S

FCC SUBPART B AND C – CONDUCTED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



RADIATED EMISSIONS

DATA SHEETS

FCC 15.249

SmartLabs, Inc.
 PowerLinc™ Serial
 Model: 2413S

Date: 12/20/08
 Labs: B and D
 Tested By: Kyle Fujimoto

X-Axis
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.94	84.78	V	94	-9.22	Peak	3.01	125	
1829.36	46.17	V	74	-27.83	Peak	1.16	150	
1829.36	42.77	V	54	-11.23	Avg	1.16	150	
2744.3	39.48	V	74	-34.52	Peak	1.16	180	
2744.3	25.91	V	54	-28.09	Avg	1.16	180	
3659.23	40.43	V	74	-33.57	Peak	1.18	150	
3659.23	28.09	V	54	-25.91	Avg	1.18	150	
4574.16	43.28	V	74	-30.72	Peak	1.19	150	
4574.16	30.56	V	54	-23.44	Avg	1.19	150	
5489.09		V	74		Peak			No Emission Detected
5489.09		V	54		Avg			
6404.02		V	74		Peak			No Emission Detected
6404.02		V	54		Avg			
7318.96		V	74		Peak			No Emission Detected
7318.96		V	54		Avg			
8233.89		V	74		Peak			No Emission Detected
8233.89		V	54		Avg			
9148.82		V	74		Peak			No Emission Detected
9148.82		V	54		Avg			

FCC 15.249

SmartLabs, Inc.
 PowerLinc™ Serial
 Model: 2413S

Date: 12/20/08
 Labs: B and D
 Tested By: Kyle Fujimoto

**X-Axis
 Transmit Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.94	90.02	H	94	-3.98	Peak	1.15	150	
1829.36	50.61	H	74	-23.39	Peak	1.15	150	
1829.36	47.78	H	54	-6.22	Avg	1.15	150	
2744.3	37.22	H	74	-36.78	Peak	1.16	150	
2744.3	25.41	H	54	-28.59	Avg	1.16	150	
3659.23	40.95	H	74	-33.05	Peak	1.19	150	
3659.23	28.12	H	54	-25.88	Avg	1.19	150	
4574.16	42.91	H	74	-31.09	Peak	1.26	225	
4574.16	30.62	H	54	-23.38	Avg	1.26	225	
5489.09		H	74		Peak			No Emission
5489.09		H	54		Avg			Detected
6404.02		H	74		Peak			No Emission
6404.02		H	54		Avg			Detected
7318.96		H	74		Peak			No Emission
7318.96		H	54		Avg			Detected
8233.89		H	74		Peak			No Emission
8233.89		H	54		Avg			Detected
9148.82		H	74		Peak			No Emission
9148.82		H	54		Avg			Detected

FCC 15.249

SmartLabs, Inc.
 PowerLinc™ Serial
 Model: 2413S

Date: 12/20/08
 Labs: B and D
 Tested By: Kyle Fujimoto

Y-Axis
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.94	82.18	V	94	-11.82	Peak	1.84	135	
1829.36	46.98	V	74	-27.02	Peak	1.15	150	
1829.36	44.01	V	54	-9.99	Avg	1.15	150	
2744.3	38.41	V	74	-35.59	Peak	1.19	225	
2744.3	25.36	V	54	-28.64	Avg	1.19	225	
3659.23	40.02	V	74	-33.98	Peak	1.18	125	
3659.23	28.03	V	54	-25.97	Avg	1.18	125	
4574.16	45.02	V	74	-28.98	Peak	1.19	150	
4574.16	30.59	V	54	-23.41	Avg	1.19	150	
5489.09		V	74		Peak			No Emission Detected
5489.09		V	54		Avg			
6404.02		V	74		Peak			No Emission Detected
6404.02		V	54		Avg			
7318.96		V	74		Peak			No Emission Detected
7318.96		V	54		Avg			
8233.89		V	74		Peak			No Emission Detected
8233.89		V	54		Avg			
9148.82		V	74		Peak			No Emission Detected
9148.82		V	54		Avg			

FCC 15.249

SmartLabs, Inc.
 PowerLinc™ Serial
 Model: 2413S

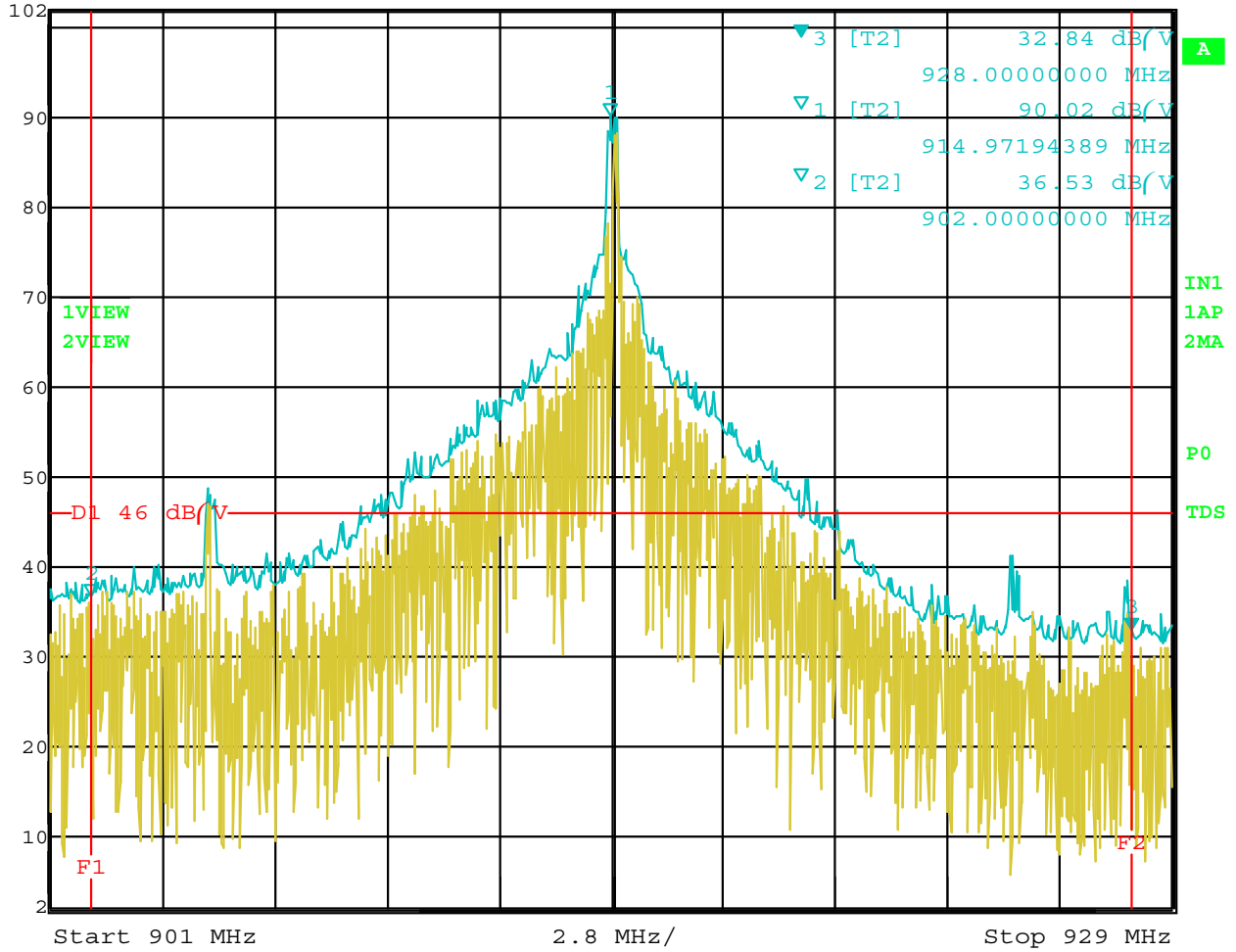
Date: 12/20/08
 Labs: B and D
 Tested By: Kyle Fujimoto

Z-Axis
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.94	86.68	V	94	-7.32	Peak	1.12	270	
1829.36	47.13	V	74	-26.87	Peak	1.15	225	
1829.36	44.34	V	54	-9.66	Avg	1.15	225	
2744.3	37.09	V	74	-36.91	Peak	1.25	225	
2744.3	25.41	V	54	-28.59	Avg	1.25	225	
3659.23	40.73	V	74	-33.27	Peak	1.16	150	
3659.23	28.01	V	54	-25.99	Avg	1.16	150	
4574.16	42.98	V	74	-31.02	Peak	1.15	150	
4574.16	30.55	V	54	-23.45	Avg	1.15	150	
5489.09		V	74		Peak			No Emission Detected
5489.09		V	54		Avg			
6404.02		V	74		Peak			No Emission Detected
6404.02		V	54		Avg			
7318.96		V	74		Peak			No Emission Detected
7318.96		V	54		Avg			
8233.89		V	74		Peak			No Emission Detected
8233.89		V	54		Avg			
9148.82		V	74		Peak			No Emission Detected
9148.82		V	54		Avg			



Ref Lvl 102 dB/V
Marker 3 [T2] 32.84 dB/V
928.00000000 MHz
RBW 100 kHz RF Att 10 dB
VBW 300 kHz
SWT 7 ms Unit dB/V



Date: 19.DEC.2008 09:40:46

Band Edge of the Fundamental – X-Axis – Horizontal Polarization (Worst Case)



Test Location : Compatible Electronics **Page** : 1/1
Customer : SmartLabs, Inc. **Date** : 12/16/2008
Manufacturer : SmartLabs, Inc. **Time** : 13:43:44
Eut name : PowerLinc™ Serial **Lab** : D
Model : 2413-S **Test Distance** : 3.0 Meters
Serial # : N/A
Specification : FCC Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Test Type: Radiated Emissions Qualification
 Test Range: 10 kHz to 1 GHz (Vertical and Horizontal)
 Clocks: 10 MHz and 22.1184 MHz (Transmit Mode - Worst Case)
 Test Engineer: Kyle Fujimoto

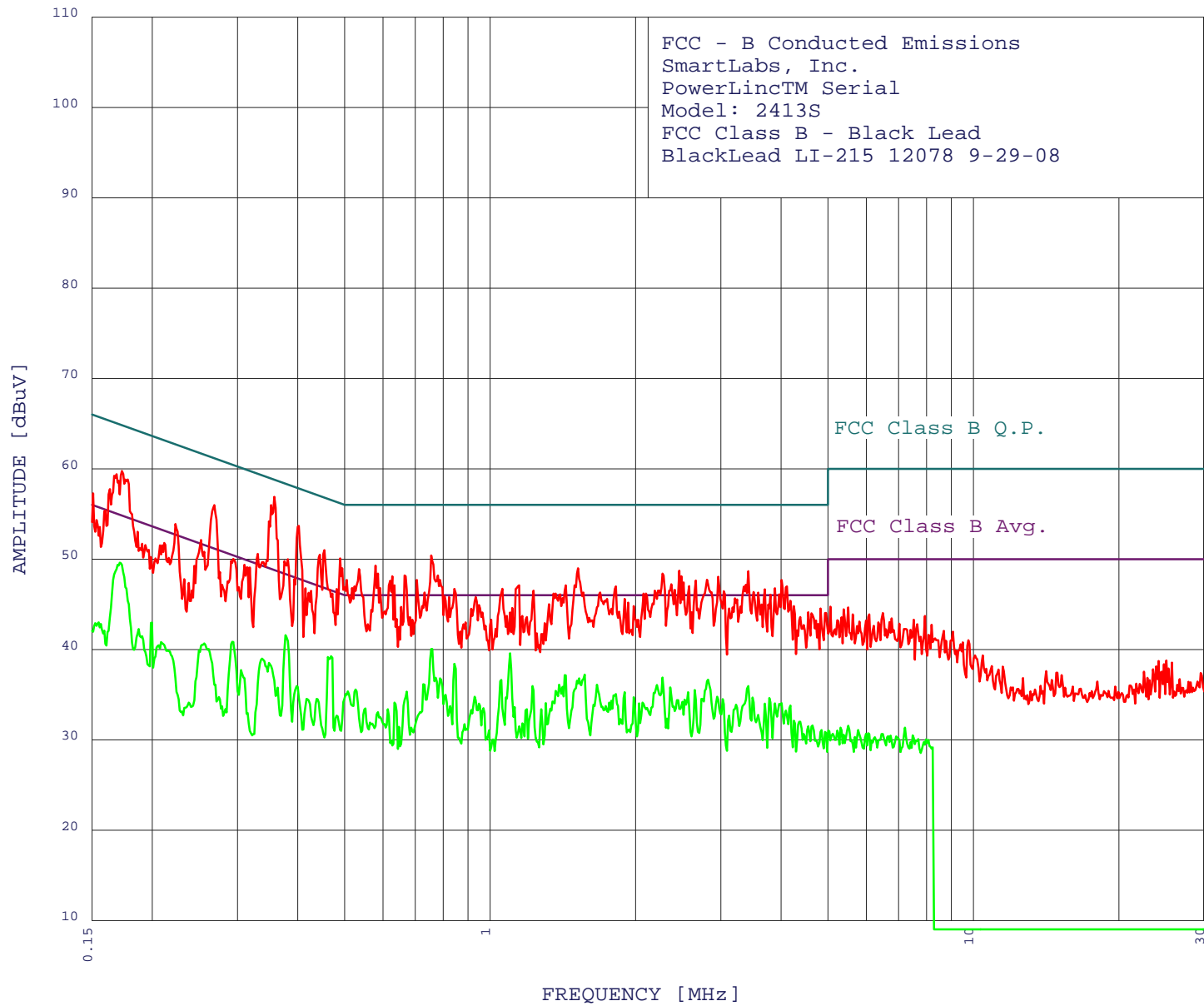
Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	Limit = L dBuV/m	Delta R-L dB
1H	59.984	43.00	0.70	9.40	38.60	14.50	40.00	-25.50
2H	66.378	45.00	0.77	8.22	38.47	15.52	40.00	-24.48
3V	66.414	59.10	0.77	8.21	38.47	29.61	40.00	-10.39
4V	75.000	57.50	0.80	6.77	38.40	26.67	40.00	-13.33
5V	81.434	54.50	0.83	6.12	38.38	23.07	40.00	-16.93
6V	87.652	59.40	0.96	6.62	38.32	28.65	40.00	-11.35
7V	90.191	57.00	1.00	6.88	38.30	26.58	43.50	-16.92
8V	91.219	59.80	1.00	7.30	38.27	29.82	43.50	-13.68
9V	110.636	60.10	1.05	12.31	38.28	35.17	43.50	-8.33
10V	144.020	41.50	1.26	12.12	38.27	16.61	43.50	-26.89
11H	144.067	45.10	1.26	12.12	38.27	20.21	43.50	-23.29
12H	162.081	42.50	1.35	12.53	38.15	18.23	43.50	-25.27
13V	192.006	38.20	1.47	16.00	38.31	17.36	43.50	-26.14
14H	216.043	38.20	1.63	16.50	38.27	18.06	46.00	-27.94
15V	216.070	39.90	1.63	16.50	38.27	19.76	46.00	-26.24
16H	228.051	38.70	1.70	16.50	38.20	18.70	46.00	-27.30
17H	228.051	36.90	1.70	16.50	38.20	16.90	46.00	-29.10
18H	228.079	37.00	1.70	16.50	38.20	17.00	46.00	-29.00
19V	228.097	39.40	1.70	16.50	38.20	19.40	46.00	-26.60
20H	240.101	54.20	1.70	16.50	38.20	34.20	46.00	-11.80
21V	240.120	48.60	1.70	16.50	38.20	28.60	46.00	-17.40
22H	246.056	35.90	1.70	16.50	38.20	15.90	46.00	-30.10
23H	252.057	37.20	1.71	16.64	38.20	17.35	46.00	-28.65
24V	270.076	45.80	1.78	17.80	38.20	27.18	46.00	-18.82
25H	303.724	37.20	1.92	12.81	38.02	13.91	46.00	-32.09
26V	355.176	35.80	2.22	14.23	38.27	13.98	46.00	-32.02
27V	379.214	35.80	2.32	14.82	38.12	14.82	46.00	-31.18
28H	401.710	40.30	2.40	15.34	37.98	20.06	46.00	-25.94
29V	408.120	38.40	2.42	15.49	37.91	18.39	46.00	-27.61
30H	541.890	39.30	2.87	18.11	37.90	22.37	46.00	-23.63
31V	861.749	39.50	3.88	21.76	37.10	28.04	46.00	-17.96

CONDUCTED EMISSIONS

DATA SHEETS

EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average

12/16/2008 11:34:23



FCC - B Conducted Emissions
SmartLabs, Inc.
PowerLinc™ Serial
Model: 2413S
FCC Class B - Black Lead
BlackLead LI-215 12078 9-29-08

FCC Class B Q.P.

FCC Class B Avg.



COMPATIBLE
ELECTRONICS



12/16/2008

11:34:23

FCC - B Conducted Emissions

SmartLabs, Inc.

PowerLinc™ Serial

Model: 2413S

FCC Class B - Black Lead

BlackLead LI-215 12078 9-29-08

TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line

Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.358	56.87	48.78	8.10**
2	0.402	53.68	47.81	5.87**
3	0.173	59.75	54.81	4.94**
4	0.269	55.98	51.15	4.82**
5	0.755	50.39	46.00	4.39**
6	0.169	59.39	55.03	4.36**
7	0.454	50.98	46.80	4.18**
8	0.489	50.09	46.18	3.90**
9	0.445	50.48	46.98	3.51**
10	0.580	49.29	46.00	3.29**
11	1.520	48.99	46.00	2.99**
12	0.535	48.89	46.00	2.89**
13	2.462	48.70	46.00	2.70**
14	3.419	48.65	46.00	2.65**
15	0.163	57.74	55.29	2.44**
16	2.274	48.39	46.00	2.39**
17	0.586	48.39	46.00	2.39**
18	0.665	48.19	46.00	2.19**
19	2.488	48.10	46.00	2.10**
20	0.627	48.09	46.00	2.09**
21	2.963	48.03	46.00	2.03**
22	0.381	49.98	48.25	1.73**
23	2.811	47.72	46.00	1.72**
24	0.705	47.69	46.00	1.69**
25	0.505	47.69	46.00	1.69**
26	4.008	47.68	46.00	1.68**
27	2.665	47.61	46.00	1.61**
28	0.621	47.59	46.00	1.59**
29	2.514	47.41	46.00	1.41**
30	0.151	57.27	55.95	1.32**
31	2.371	47.20	46.00	1.20**
32	0.223	53.87	52.70	1.18**
33	0.331	50.57	49.44	1.13**
34	1.148	47.10	46.00	1.10**
35	1.434	47.09	46.00	1.09**
36	0.634	47.09	46.00	1.09**
37	2.582	47.01	46.00	1.01**
38	4.114	46.98	46.00	0.98**
39	1.820	46.98	46.00	0.98**
40	0.592	46.79	46.00	0.79**
41	0.518	46.79	46.00	0.79**
42	3.882	46.77	46.00	0.77**
43	1.060	46.70	46.00	0.70**
44	0.844	46.69	46.00	0.69**
45	3.702	46.66	46.00	0.66**
46	2.410	46.60	46.00	0.60**
47	1.230	46.49	46.00	0.49**
48	0.252	52.12	51.68	0.44**



12/16/2008

11:34:23

FCC - B Conducted Emissions

SmartLabs, Inc.

PowerLinc™ Serial

Model: 2413S

FCC Class B - Black Lead

BlackLead LI-215 12078 9-29-08

TEST ENGINEER : Kyle Fujimoto

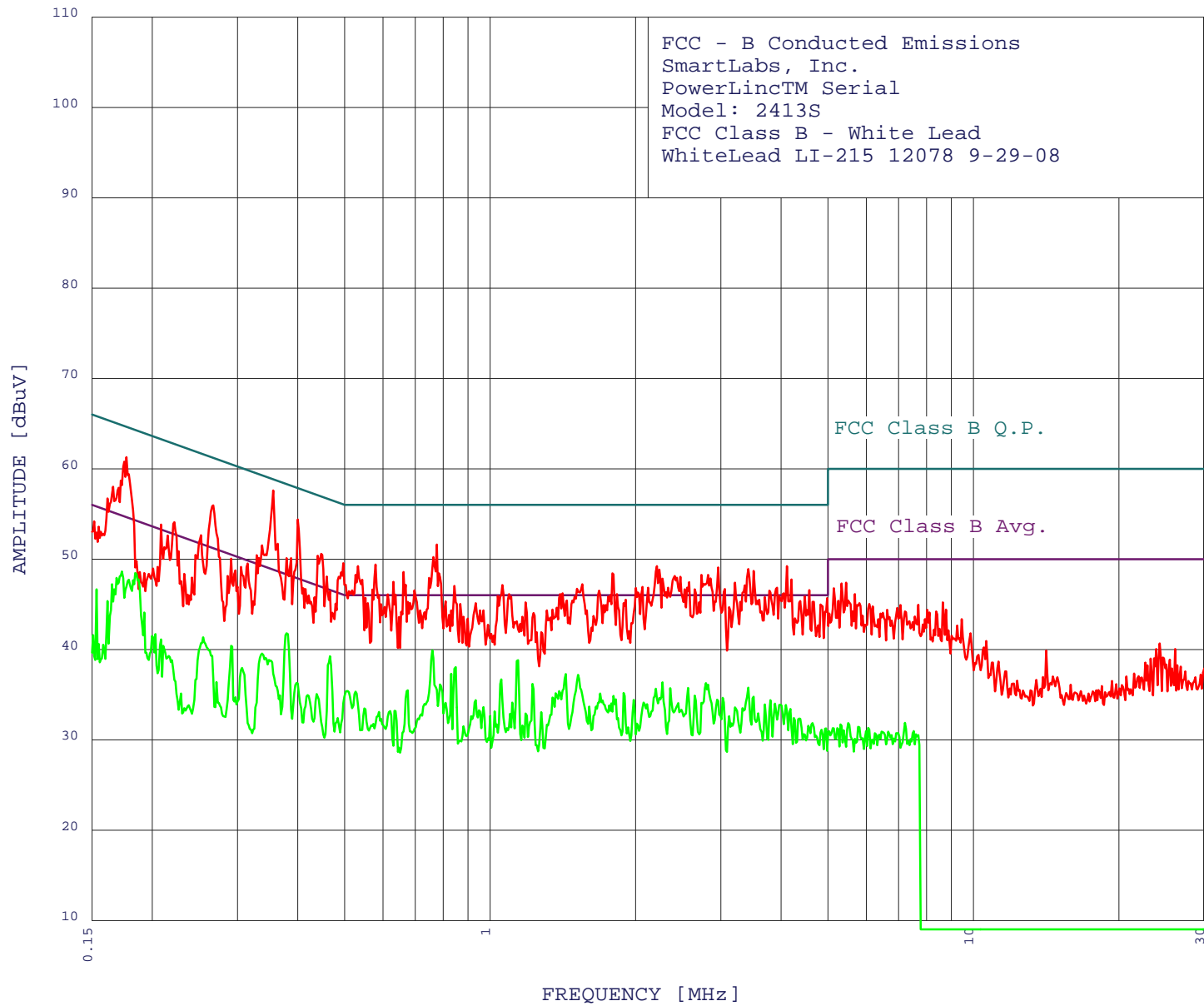
48 highest peaks above -50.00 dB of FCC Class B Avg. limit line

Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.171	49.59	54.90	-5.31
2	0.170	49.36	54.98	-5.63
3	0.759	40.03	46.00	-5.97
4	1.100	39.59	46.00	-6.41
5	0.377	41.58	48.34	-6.76
6	0.469	39.25	46.53	-7.28
7	0.461	39.17	46.67	-7.49
8	0.844	38.40	46.00	-7.60
9	1.569	37.21	46.00	-8.79
10	1.426	37.15	46.00	-8.85
11	2.274	36.87	46.00	-9.13
12	0.771	36.86	46.00	-9.14
13	0.788	36.79	46.00	-9.21
14	1.528	36.79	46.00	-9.21
15	2.826	36.65	46.00	-9.35
16	1.055	36.63	46.00	-9.37
17	1.512	36.54	46.00	-9.46
18	0.293	40.85	50.45	-9.60
19	0.728	36.14	46.00	-9.86
20	1.389	36.10	46.00	-9.90
21	1.663	36.10	46.00	-9.90
22	2.214	36.05	46.00	-9.95
23	3.419	35.94	46.00	-10.06
24	1.223	35.93	46.00	-10.07
25	1.412	35.84	46.00	-10.16
26	2.358	35.81	46.00	-10.19
27	0.338	38.97	49.26	-10.29
28	0.527	35.55	46.00	-10.45
29	0.348	38.50	49.00	-10.50
30	2.651	35.50	46.00	-10.50
31	1.367	35.42	46.00	-10.58
32	0.508	35.36	46.00	-10.64
33	0.200	42.98	53.62	-10.64
34	0.672	35.33	46.00	-10.67
35	2.568	35.27	46.00	-10.73
36	1.899	35.26	46.00	-10.74
37	0.256	40.68	51.55	-10.87
38	0.502	35.06	46.00	-10.94
39	1.820	35.05	46.00	-10.95
40	0.809	34.96	46.00	-11.04
41	1.800	34.91	46.00	-11.09
42	0.929	34.77	46.00	-11.23
43	2.948	34.76	46.00	-11.24
44	1.981	34.69	46.00	-11.31
45	1.077	34.67	46.00	-11.33
46	0.262	40.04	51.38	-11.33
47	3.492	34.66	46.00	-11.34
48	3.781	34.63	46.00	-11.37

EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average

12/16/2008 11:23:10



FCC - B Conducted Emissions
SmartLabs, Inc.
PowerLinc™ Serial
Model: 2413S
FCC Class B - White Lead
WhiteLead LI-215 12078 9-29-08

FCC Class B Q.P.

FCC Class B Avg.



COMPATIBLE
ELECTRONICS



12/16/2008

11:23:10

FCC - B Conducted Emissions

SmartLabs, Inc.

PowerLinc™ Serial

Model: 2413S

FCC Class B - White Lead

WhiteLead LI-215 12078 9-29-08

TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line

Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.356	57.61	48.82	8.79**
2	0.177	61.29	54.63	6.66**
3	0.400	54.39	47.86	6.53**
4	0.175	60.80	54.72	6.08**
5	0.775	51.61	46.00	5.61**
6	0.267	55.95	51.20	4.75**
7	0.763	50.21	46.00	4.21**
8	0.447	50.57	46.93	3.64**
9	0.497	49.55	46.05	3.50**
10	0.580	49.40	46.00	3.40**
11	0.532	49.23	46.00	3.23**
12	4.114	49.22	46.00	3.22**
13	2.214	49.22	46.00	3.22**
14	2.963	49.06	46.00	3.06**
15	0.170	57.90	54.94	2.96**
16	3.419	48.89	46.00	2.89**
17	0.166	58.01	55.16	2.86**
18	2.238	48.82	46.00	2.82**
19	3.511	48.69	46.00	2.69**
20	0.662	48.56	46.00	2.56**
21	0.783	48.41	46.00	2.41**
22	1.790	48.41	46.00	2.41**
23	2.826	48.25	46.00	2.25**
24	0.338	51.52	49.26	2.25**
25	2.736	48.25	46.00	2.25**
26	2.410	48.13	46.00	2.13**
27	2.475	48.03	46.00	2.03**
28	0.387	50.09	48.12	1.98**
29	0.747	47.92	46.00	1.92**
30	2.274	47.82	46.00	1.82**
31	0.379	50.10	48.29	1.80**
32	4.204	47.73	46.00	1.73**
33	0.631	47.48	46.00	1.48**
34	2.582	47.44	46.00	1.44**
35	3.209	47.38	46.00	1.38**
36	0.222	54.09	52.74	1.35**
37	0.459	48.06	46.71	1.35**
38	0.162	56.72	55.38	1.34**
39	1.552	47.21	46.00	1.21**
40	0.669	47.16	46.00	1.16**
41	1.060	47.12	46.00	1.12**
42	3.365	47.08	46.00	1.08**
43	0.844	47.02	46.00	1.02**
44	0.252	52.65	51.68	0.97**
45	0.329	50.42	49.48	0.94**
46	2.066	46.91	46.00	0.91**
47	2.123	46.82	46.00	0.82**
48	3.924	46.81	46.00	0.81**



12/16/2008

11:23:10

FCC - B Conducted Emissions

SmartLabs, Inc.

PowerLinc™ Serial

Model: 2413S

FCC Class B - White Lead

WhiteLead LI-215 12078 9-29-08

TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line

Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.184	48.47	54.28	-5.82
2	0.759	39.88	46.00	-6.12
3	0.173	48.64	54.81	-6.17
4	0.187	47.74	54.15	-6.41
5	0.379	41.80	48.29	-6.50
6	0.183	47.67	54.37	-6.70
7	0.179	47.71	54.54	-6.84
8	0.169	47.92	55.03	-7.11
9	1.142	38.81	46.00	-7.19
10	0.466	39.26	46.58	-7.32
11	0.849	38.03	46.00	-7.97
12	0.165	47.22	55.20	-7.99
13	0.167	46.66	55.11	-8.45
14	0.831	37.30	46.00	-8.70
15	1.434	37.28	46.00	-8.72
16	1.520	37.18	46.00	-8.82
17	0.153	46.66	55.82	-9.16
18	1.055	36.67	46.00	-9.33
19	2.274	36.36	46.00	-9.64
20	0.338	39.55	49.26	-9.72
21	2.796	36.28	46.00	-9.72
22	0.193	44.10	53.93	-9.83
23	1.223	36.17	46.00	-9.83
24	0.788	36.12	46.00	-9.88
25	2.826	36.08	46.00	-9.92
26	0.162	45.34	55.38	-10.04
27	0.343	39.08	49.13	-10.05
28	0.291	40.39	50.49	-10.11
29	0.352	38.76	48.91	-10.15
30	0.348	38.83	49.00	-10.17
31	3.419	35.76	46.00	-10.24
32	0.255	41.33	51.60	-10.26
33	2.568	35.73	46.00	-10.27
34	2.358	35.72	46.00	-10.28
35	2.201	35.64	46.00	-10.36
36	0.676	35.49	46.00	-10.51
37	0.505	35.38	46.00	-10.62
38	1.389	35.38	46.00	-10.62
39	0.527	35.31	46.00	-10.69
40	1.889	35.17	46.00	-10.83
41	1.367	35.16	46.00	-10.84
42	1.690	35.12	46.00	-10.88
43	2.651	34.87	46.00	-11.13
44	1.800	34.84	46.00	-11.16
45	3.511	34.76	46.00	-11.24
46	1.345	34.69	46.00	-11.31
47	3.027	34.66	46.00	-11.34
48	2.238	34.61	46.00	-11.39