



GE Energy

Functional Testing Specification

Parts & Repair Services
Louisville, KY

LOU-GED-DS200MBHA

Test Procedure for a DS200MBHA card.

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REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	John Madden	8-14-2006
B	Update to include input voltage tolerances	J. Francis	6/29/2010
C	Added testing of JP1 jumper	J. Francis	12/9/2010

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DATE August 14, 2006	DATE 6/29/2010	DATE 12/9/2010	DATE August 15, 2006

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1. SCOPE

1.1 This is a functional testing procedure for a DS200MBHA Multi-Bridge COM-Link Hub Card.

2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.

3.1.1 **DS200MBHAG#AG Sh4AA – 4CA**

3.1.2 **K:\DS\DS200\DS200M\DS200MBHA\Schematic**

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning

4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.

4.2 Equipment Inspection

4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.2.1.1 Wires - broken, cracked, or loosely connected

4.2.1.2 Terminal strips / connectors - broken or cracked

4.2.1.3 Components - visually damaged

4.2.1.4 Capacitors - bloated or leaking

4.2.1.5 Solder joints - damaged or cold

4.2.1.6 Circuit board - burned or de-laminated

4.2.1.7 Printed wire runs / Traces - burned or damaged

5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
1		Fluke 87 DMM (or Equivalent)
1		Tenma DC power supply
1		Firmware reader (Data I/O Chip Writer or equivalent)
1		Fiber optic Cable

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6. TESTING PROCESS

6.1 Setup

- 6.1.1** Check electrolytic caps for date and change if necessary. Remove the PAL chip U1 from its socket and set it aside for testing later.

6.2 Testing Procedure

- 6.2.1** Connect 1st power supply positive lead to TBPSA – 1. Connect 1st power supply negative lead to TBPSA – 2. Leave power supply off at this time. Make sure output is adjusted to 0.
- 6.2.2** Connect 2nd power supply positive lead to TBPSB – 1. Connect 2nd power supply negative lead to TBPSB – 2. Leave power supply off at this time. Make sure output is adjusted to 0.
- 6.2.3** Connect positive lead of DC voltmeter to TP20. Connect negative lead of DC voltmeter to TP21.
- 6.2.4** Turn on both power supplies. Adjust 1st power supply output to 15 VDC. Voltmeter should read +5 VDC +/- 0.1 VDC. Look to see that all 7 transmitters are lit. They should all be lit solid.
- 6.2.5** Adjust 2nd power supply output to 30 VDC. Adjust the 1st power supply output to 0 VDC. Voltmeter should read +5 VDC +/- 0.1 VDC. Look to see that all 7 transmitters are lit. They should all be lit solid.
- 6.2.6** Adjust 1st power supply output to 24 VDC. Adjust 2nd power supply to 0 VDC. Voltmeter should read +5 VDC +/- 0.1 VDC. Turn off 2nd power supply at this time. Look to see that all 7 transmitters are lit. They should all be lit solid.
- 6.2.7** Move positive lead of voltmeter to socket U1 – 7. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.8** Connect fiber optic cable from fiber optic transmitter U9 to fiber optic receiver U2. Voltmeter should read < +0.7 VDC, logic low.
- 6.2.9** Disconnect fiber optic cable from fiber optic transmitter U9 to fiber optic receiver U2. Voltmeter should read > +4.5 VDC, logic high.
- 6.2.10** Move positive lead of voltmeter to socket U1 – 4. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.11** Connect fiber optic cable from fiber optic transmitter U10 to fiber optic receiver U3. Voltmeter should read < +0.7 VDC, logic low.

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- 6.2.12** Disconnect fiber optic cable from fiber optic transmitter U10 to fiber optic receiver U3.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.13** Move positive lead of voltmeter to socket U1 – 23. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.14** Connect fiber optic cable from fiber optic transmitter U11 to fiber optic receiver U4.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.15** Disconnect fiber optic cable from fiber optic transmitter U11 to fiber optic receiver U4.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.16** Move positive lead of voltmeter to socket U1 – 21. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.17** Connect fiber optic cable from fiber optic transmitter U12 to fiber optic receiver U5.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.18** Disconnect fiber optic cable from fiber optic transmitter U12 to fiber optic receiver U5.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.19** Move positive lead of voltmeter to socket U1 – 19. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.20** Connect fiber optic cable from fiber optic transmitter U13 to fiber optic receiver U6.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.21** Disconnect fiber optic cable from fiber optic transmitter U13 to fiber optic receiver U6.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.22** Move positive lead of voltmeter to socket U1 – 17. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.23** Connect fiber optic cable from fiber optic transmitter U14 to fiber optic receiver U7.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.24** Disconnect fiber optic cable from fiber optic transmitter U14 to fiber optic receiver U7.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.25** Move positive lead of voltmeter to socket U1 – 15. Voltmeter should read > + 4.5 VDC, logic high.
- 6.2.26** Connect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U8.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.27** Disconnect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U8.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.28** Move positive lead of voltmeter to socket U1 – 2. Voltmeter should read > + 4.5 VDC, logic high.

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- 6.2.29** Connect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U20.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.30** Disconnect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U20.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.31** Move positive lead of voltmeter to socket U1 – 11. Voltmeter should read > + 4.5 VDC,
logic high.
- 6.2.32** Connect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U21.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.33** Disconnect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U21.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.34** Move positive lead of voltmeter to socket U1 – 14. Voltmeter should read < + 0.7 VDC,
logic low.
- 6.2.35** Connect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U22.
Voltmeter should read > +4.5 VDC, logic high.
- 6.2.36** Disconnect fiber optic cable from fiber optic transmitter U15 to fiber optic receiver U22.
Voltmeter should read < +0.7 VDC, logic low.
- 6.2.37** Move positive lead of voltmeter to socket U1 – 1 (also, check U1 – 13 for same reading).
Set voltmeter for AC volts and set to read frequency. Frequency should read between 99
KHz and 125 KHz.
- 6.2.38** Disconnect all connections made at this time.
- 6.2.39** Move jumper on JP1 to 3 and 2 (DCOM).
- 6.2.40** Connect positive lead of Ohmmeter to U1-10 and negative lead of Ohmmeter to TP22.
Ohmmeter should read 4.75 Kohms +/- 0.25 Kohms.
- 6.2.41** Move jumper JP1 to 1 and 2.
- 6.2.42** Connect positive lead of Ohmmeter to U1-10 and negative lead of Ohmmeter to TP20.
Ohmmeter should read 4.75 Kohms +/- 0.25 Kohms.
- 6.2.43** Take the PLD chip over to the Chip Writer PC.
- 6.2.44** Select device as ALTERA EP-610.
- 6.2.45** You can either compare your customer's chip with the one we have stored in the drawer
under **PLD68A9450AAFM01AC**, or you can call up the data stored in the program under
n:\firmware\ds2\ds200mbha\pld68a9450aafm01ac1 (altera ep610) and compare it to
what's on your chip. The checksum of the known good file is **0000DAA5**.

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6.2.46 If the comparison is good, then re-install the chip into the customer's card and green dot it. If the checksum is incorrect, replace U1 with new, since these IC's are single program IC's. Program, verify, relabel, and green dot new IC if replaced.

6.3 *TEST COMPLETE *****

7. NOTES

7.1 None at this time.

8. ATTACHMENTS

8.1 None at this time.