



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-DS3800HLCA

Test Procedure for a DS3800HLCA card.

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A	Initial release	Steve Pharris	10/29/09
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DATE 10/29/09	DATE	DATE	DATE 6/25/2010

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1. SCOPE

1.1 This is a functional testing procedure for a DS3800HLCA.

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 Check board's electronic folder for more information

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		Rainbow Box
1		DS3800 Power Supply
1		DS3800 Connector Box
1		O-Scope
1	H188850	HLCA Test Box

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6. TESTING PROCESS

6.1 Setup

- 6.1.1 Remove U13 and U14 from their sockets.
- 6.1.2 Set jumpers as follows: BJ1-A, BJ2 and BJ3- Gone.
- 6.1.3 Connect PA9 to PA1 to PA14 to PA2 to PA10 to PA8 to PA27
- 6.1.4 Connect HLCA Test Box to U13 and set to A
- 6.1.5 Make the following connections and set switches as follows:
 - SW81-PA68-H
 - SW82-PA66-H
 - SW83-PA74-H
 - SW84-PA64-H
 - SW85-PA76-H
 - SW86-PA61-H
 - SW87-PA72-H
 - SW88-PA70-L

6.2 Testing Procedure

- 6.2.1 Apply power to card.
- 6.2.2 Measure at PA4 and adjust R1 for –10.00VDC
- 6.2.3 Set switches as follows:
 - SW81-L
 - SW82-L
 - SW83-L
 - SW84-L
 - SW85-L
 - SW86-L
 - SW87-L
 - SW88-H
- 6.2.4 Measure at PA4 and adjust R2 for 9.92VDC

6.2.5 Continue to monitor PA4 while following the table below

Switches

Output VDC	81	82	83	84	85	86	87	88
0	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	0	1
2.5	1	1	1	1	1	0	1	1
1.25	1	1	1	1	0	1	1	1
.63	1	1	1	0	1	1	1	1
.31	1	1	0	1	1	1	1	1
.15	1	0	1	1	1	1	1	1
.08	0	1	1	1	1	1	1	1
-.08	0	0	0	0	0	0	0	0
-.15	1	0	0	0	0	0	0	0
-.31	1	1	0	0	0	0	0	0
-.63	1	1	1	0	0	0	0	0
-.1.25	1	1	1	1	0	0	0	0
-2.5	1	1	1	1	1	0	0	0
-5	1	1	1	1	1	1	0	0

6.2.6 Power down UUT

6.2.7 Move output from test box to U14

6.2.8 Move the following connections as follows:

PA68-PA41

PA66-PA48

PA74-PA47

PA64-PA50

PA76-PA51

PA61-PA49

PA72-PA46

PA70-PA39

6.2.9 Set switches as follows:

SW81-H
SW82-H
SW83-H
SW84-H
SW85-H
SW86-H
SW87-H
SW88-L

6.2.10 Reapply power to UUT

6.2.11 Measure PA15 and adjust R3 for –10.00VDC

6.2.12 Set switches as follows:


SW81-L
SW82-L
SW83-L
SW84-L
SW85-L
SW86-L
SW87-L
SW88-H

6.2.13 Adjust R4 for 9.921VDC at PA15

6.2.14 Repeat table from **6.2.5** while monitoring PA15 instead of PA4.

6.2.15 Check Pin 9 of U7 for 4.915MHz signal.

6.2.16 Remove connection at PA27

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6.2.17 Make the following connections and set switches as follows:

SW81-PA22-L

SW82-PA17-H

SW83-PA23-L

SW84-PA18-H

SW85-PA25-L

SW86-PA21-H

SW87-PA24-L

SW88-PA19-H

SW89-PA56-H

SW90-PA60-H

SW91-PA13-L

SW92-PA26-L

SW93-PA27-L

SW94-PA11-L

PA14-H

6.2.18 Verify the following logic states at the following points

PA41-H

PA48-L

PA47-H

PA50-L


PA51-H

PA49-L

PA46-H

PA39-L

6.2.19 Reverse SW81-SW88

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6.2.20 Verify the following logic states at the following points

PA41-L

PA48-H

PA47-L

PA50-H

PA51-L

PA49-H

PA46-L

PA39-H

6.2.21 Move the following connections

PA22-PA36

PA17-PA42

PA23-PA34

PA18-PA52

PA25-PA31

PA21-PA54

PA24-PA32

PA19-PA53

6.2.22 Set SW89-L

6.2.23 Connect PA20-L

6.2.24 Verify the following logic states at the following points

PA41-L

PA48-H

PA47-L

PA50-H

PA51-L

PA49-H

PA46-L

PA39-H

6.2.25 Set switches as follows

SW81-L
SW82-H
SW83-L
SW84-H
SW85-L
SW86-H
SW87-L
SW88-H

6.2.26 Verify the following logic states at the following points


PA41-H
PA48-L
PA47-H
PA50-L
PA51-H
PA49-L
PA46-H
PA39-L

6.2.27 Move the following connections

PA36-PA41
PA42-PA48
PA34-PA47
PA52-PA50
PA31-PA51
PA54-PA49
PA32-PA46
PA53-PA39

6.2.28 Make the following switch settings and connections

SW89-H
SW90-L
PA14-L
PA20-SW96-H

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6.2.29 Toggle SW89-L-H

6.2.30 Set SW96-L

6.2.31 Verify the following logic states at the following points

PA40-H

PA58-L

PA59-H

PA62-L

PA63-H

PA57-L

PA65-H

PA44-L

6.2.32 Set switches as follows

SW81-H

SW82-L

SW83-H

SW84-L

SW85-H

SW86-L

SW87-H

SW88-L

6.2.33 Set SW96-H then toggle SW89-L-H

6.2.34 Set SW96-L

6.2.35 Verify the following logic states at the following points

PA40-L

PA58-H

PA59-L

PA62-H

PA63-L

PA57-H

PA65-L

PA44-H

6.2.36 Verify pin 8 of U13 and U14 are opposite logic state as SW90

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- 6.2.37** Verify pin 9 of U13 and U14 are opposite logic state as SW89
- 6.2.38** Set SW89-H
- 6.2.39** Set SW90-L
- 6.2.40** Remove the following connections
 - PA41
 - PA48
 - PA47
 - PA50
 - PA51
 - PA49
 - PA46
 - PA39
- 6.2.41** Connect PA14-H and tie TP3, TP4, TP5, and TP6-L
- 6.2.42** Verify the following logic states at the following points
 - PA41-L
 - PA48-L
 - PA47-L
 - PA50-L
- 6.2.43** Remove connections at TP3-TP6
- 6.2.44** Momentarily connect pin17 of U14-L and verify Test LED illuminates
- 6.2.45** Connect PA30-L
- 6.2.46** Set SW89 and SW90-L
- 6.2.47** Verify pin10 of U14 toggles when SW1 (on card) is toggled
- 6.2.48** Set SW89 and SW90-H
- 6.2.49** Verify pin13 of U14 toggles when SW2 (on card) is toggled
- 6.2.50** Remove connection at PA30
- 6.2.51** Set SW89-H and SW90-L
- 6.2.52** Connect SW81-PA80
- 6.2.53** Verify pin11 of U14 toggles when SW81 is toggled
- 6.2.54** Move connection at PA80-PA6
- 6.2.55** Set SW89-L and SW90-H
- 6.2.56** Verify pin12 of U14 toggles when SW81 is toggled
- 6.2.57** Verify pin36 of U14 and U13-H

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6.2.58 Set SW96-H

6.2.59 Toggle SW94-H-L

6.2.60 Verify pin36 of U14 and U13 latches-L by toggling SW81

6.2.61 Toggle SW96-L-H

6.2.62 Verify pin36 of U14 and U13 returns-H

6.2.63 Using PP2 test the following IC's

U15-U22, U24, U34-U39, U40 , and U41

6.2.64 Test 8255's (removed during test setup) in digital siltron on NDID card by installing in
Sockets at U23 and U24, Installing card in drive and verifying proper operation of drive

6.2.65 Reinstall 8255's in UUT

6.3 *TEST COMPLETE *****

7. NOTES

7.1 None at this time.

8. ATTACHMENTS

8.1 None at this time.