



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-DS3800NBIE-A

Test Procedure for a DS3800NBIE card

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Roger Johnson	9/4/2007
B			
C			

© COPYRIGHT GENERAL ELECTRIC COMPANY

Hard copies are uncontrolled and are for reference only.

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

PREPARED BY Roger Johnson	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
DATE 9/4/2007	DATE	DATE	DATE

LOU-GED-DS3800NBIE-A REV. A	g GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 2 of 10
--------------------------------	---	--------------

1. SCOPE

1.1 This is a functional testing procedure for a 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

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 the local documented procedures 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		Rain bow box
1		Standard connector box for DS3800 boards
1		DS3800 P/S power supply for DS3800 boards
1		Two DMM's/ variable power supply +/- 10 V

LOU-GED-DS3800NBIE-A REV. A	g GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 3 of 10
--------------------------------	---	--------------

6. TESTING PROCESS

6.1 Setup

6.1.1 Install banana plugs. / IFB3-Pin29 and IfB4 Pin 30 to GND



Note:

6.2 Testing Procedure

6.2.1 Connections

6.2.1.1 OCNTRL1- Pin 55 to Pin 81 (sw81)

6.2.1.2 OCNTRL2- Pin 44 to Pin 82 (sw82)

6.2.1.3 1TSTRST- Pin 57 to Pin 83 (sw83)

6.2.1.4 OTSTOK- Pin 71 to Pin 84 (sw84) IMOK led

6.2.1.5 DMM1- Pin-Pos to 721SAT GND Pin 1 or GND plug

6.2.1.6 DMM2- Pos. Pin 10 to GND

6.2.1.7 To Start Test

6.2.1.8 OCNTRL1- SW81= LOW 0V

6.2.1.9 OCNTRL2- SW82= HIGH 5V

6.2.1.10 1STSRST- SW83= HIGH 5V

6.2.1.11 OTSTOK- SW84= HIGH 5V

6.2.2 Power up unit only the SUP1 led should be ON

6.2.2.1 Switch- 1TSTRST-SW83 TO Low 0V

6.2.2.1.1 DMM1- 0V

6.2.2.1.2 Analog DMM2- -10.61V Pin 10 IFB1

6.2.2.1.3 With DMM2 check

6.2.2.1.4 Analog Pin 16 IFB2= 0V

6.2.2.1.5 Analog Pin 36 IERR12= 10.6 V

6.2.2.1.6 Analog Pin 34 IERR34= -5V

6.2.2.1.7 Digital Pin 76 OCIB21= Logic High


6.2.2.1.8 Pin 78 OCIB12= Logic Low

6.2.2.1.9 Pin 74 OCIB43= Logic Low

6.2.2.1.10 Pin 31 OCIB34= Logic High

6.2.2.1.11 Pin 56 1SUPP1= Logic High

6.2.2.1.12 Pin 52 1SUPP2= Logic Low

LOU–GED-DS3800NBIE-A REV. A	 GE Energy <i>Parts & Repair Services</i> Louisville, KY	Page 4 of 10
--------------------------------	---	--------------

6.2.2.1.13 Pin 51 OPTI14= Logic Low

6.2.2.1.14 Pin 54 OCTI12= Logic Low

6.2.2.1.15 **Pass Test**

6.2.2.2 Switch 1TSTRST- SW83 to High

6.2.2.2.1 OCNTRL1= 5V High (sw81)

6.2.2.2.2 OCNTRL2= Low 0V (sw82)

6.2.2.2.3 Switch 1TSTRST SW83 to Low

6.2.2.2.4 DMM1- 0V

6.2.2.2.5 DMM2- Pin 10= 0V IFB1 with DMM2 check

6.2.2.2.6 Pin 16- IfB2= -10.6 V

6.2.2.2.7 Pin 36- IERR12= -10.6 V

6.2.2.2.8 Pin 34- IERR34= 5.2 V

6.2.2.2.9 Pin 76- OCIB21= Logic Low

6.2.2.2.10 Pin 78- OCIB12= Logic High

6.2.2.2.11 Pin 74- OCIB43= Logic High

6.2.2.2.12 Pin 31- OCIB34= Logic Low

6.2.2.2.13 Pin 56- 1SUPP1= Logic Low

6.2.2.2.14 Pin 52- 1SUPP2= Logic High

6.2.2.2.15 Pin 51- OPTI14= Logic Low

6.2.2.2.16 Pin 54- OCTI12= Logic High

6.2.2.2.17 **Pass Test**

6.2.2.3 Test 2

6.2.2.3.1 Install Banana plugs

6.2.2.3.2 1 Run Pin 65 to SW85 Pin 85 switch to high

6.2.2.3.3 OSTALL Pin 66 to SW86 pin 86 switch to high

6.2.2.3.4 1RST Pin 68 to SW87 PIN 87 switch to high

6.2.2.3.5 0RST Pin 69 to SW88 pin 88 switch to high

6.2.2.3.6 0PAR Pin 70 to SW89 pin 89 switch to high

6.2.2.3.7 IAP1 Pin 4 to SW90 switch to low


6.2.2.3.8 IAP2 Pin 12 to SW91 switch to low

6.2.2.3.9 IFL2 Pin 59 to SW92 switch to low

6.2.2.3.10 IFL3 Pin 60 to SW93 switch to low

6.2.2.3.11 IFL1 Pin 61 to SW94 switch to low

6.2.2.3.12 IFL0 Pin 62 to SW95 switch to low

LOU-GED-DS3800NBIE-A REV. A	 GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 5 of 10
--------------------------------	--	--------------

6.2.2.3.13 IFL4 Pin 58 to SW96 switch to low

6.2.2.3.14 PCOM Pin 41 to Ground Pin 1

6.2.2.4 Apply power All Led's should be ON

6.2.2.4.1 Turn power off toggle SW88 (ORST) to low

6.2.2.4.2 Apply power IMOK; CKT1 and CKT2- should be ON

6.2.2.4.3 Toggle SW88 to high for normal mode

6.2.2.5 SUPP1 Circuit test

6.2.2.5.1 DMM1 POS lead should still be on Pin 72 ISAT to Ground

6.2.2.5.2 DMM2- POS to lead to test point 1 (TP1) to ground

6.2.2.5.3 Toggle SW90 IAP1 to high .5V

6.2.2.5.4 DMM1= 4.31 VDC

6.2.2.5.5 DMM2= -12.43 VDC

6.2.2.5.6 SUPP1 Led should be on IMOK Led off

6.2.2.5.7 Toggle SW90 to low IMOK led on

6.2.2.5.8 SUPP1 Led ON

6.2.2.5.9 DMM1= 0V DMM2= 0V

6.2.2.5.10 Toggle SW89 to low Power-on-Reset

6.2.2.6 SUPP1 Led off

6.2.2.6.1 Remove jack from plug 4 and install into plug 19 DMM2

6.2.2.7 TP3

6.2.2.7.1 ICP1 Toggle SW90 to high

6.2.2.7.2 DMM2= -12.42 DMM1=4.31

6.2.2.7.3 Supl Led on IMOK led off

6.2.2.7.4 Toggle SW90 to low DMM1= 0V DMM2= 0V

6.2.2.7.5 Supl led ON IMOK on Reset unit with SW89 toggle to low

6.2.2.7.6 Supl Led off IMOK on

6.2.2.8 Hook a variable voltage supply to Plug 22 –15V

6.2.2.8.1 Supply neg. to Pin 22


6.2.2.8.2 Supply POS to Pin 1 Adjust the supply to zero volts

6.2.2.8.3 Connect DMM2 to TP4 Adjust to –3.9 R1

6.2.2.8.4 Switch SW83 to High- 1TSTRST

6.2.2.8.5 Increase the supply voltage until Supl led comes on


6.2.2.8.6 Now increase R1 voltage pot led should go off

LOU–GED-DS3800NBIE-A REV. A	<div style="text-align: center;">  GE Energy Parts & Repair Services Louisville, KY </div>	Page 6 of 10
--------------------------------	---	--------------


- 6.2.2.8.7 Increase R1 to max –10.12V Adjust the supply to -15V led should come on
- 6.2.2.8.8 If SW83 is low Supl led will not turn off when supply is decreased below sup limit
- 6.2.2.8.9 SW83 low increase supply to –15V than back to zero Supl led should stay on
- 6.2.2.8.10 Toggle SW to high led Supl= off
- 6.2.2.8.11 Remove jack from plug 22 and SW83 high
- 6.2.2.8.12 Install into plug 11
- 6.2.2.8.13 Adjust R1 to –3.88V increase supply to –2V
- 6.2.2.8.14 Supl led should be on
- 6.2.2.8.15 Adjust R1 to –10.12 volts Supl led off
- 6.2.2.8.16 Increase supply to –4V Supl=on
- 6.2.2.8.17 Adjust supply to zero SW83 to Low
- 6.2.2.8.18 Toggle SW81 to Low Supl led on
- 6.2.2.8.19 Toggle SW88 to Low Supl Led off. (True Reset)
- 6.2.2.8.20 Again toggle SW81 to Low Supl Led on
- 6.2.2.8.21 Toggle SW89 to Low Supl led off, this is power on reset
- 6.2.2.8.22 Remove DMM2 install into Jack (Plug 56)
- 6.2.2.8.23 Toggle SW81 DMM2= 5V Supl led on IMOK=off, DMM1=4.3V
- 6.2.2.8.24 Toggle SW83 [DMM2 =0V](#) Supl led off IMOK= on, DMM1= 0V
- 6.2.2.8.25 (PASS TEST)

6.2.2.9 SUPP2 Circuit Test

- 6.2.2.9.1 DMM1 POS lead on plug 72 ISAT to ground
- 6.2.2.9.2 DMM2 POS lead to test point TP6 to ground
- 6.2.2.9.3 Toggle SWE91 IAP2 –(SW83 Low) SV
- 6.2.2.9.4 DMM1= 4.3V DMM2= -12.42V
- 6.2.2.9.5 SUP2 Led on IMOK led off
- 6.2.2.9.6 Toggle SW89 to Low- Power on Reset
- 6.2.2.9.7 SUP2 Led off IMOK led on
- 6.2.2.9.8 Remove plug from plug 12 and install into plug 35 ICP
- 6.2.2.9.9 DMM2 to TP8
- 6.2.2.9.10 Toggle SW91 to high DMM2= -12.43 DMM1= 4.3 V
- 6.2.2.9.11 Sup2 led on IMOK= off

LOU–GED-DS3800NBIE-A REV. A	<div style="text-align: center;">  GE Energy Parts & Repair Services Louisville, KY </div>	Page 7 of 10
--------------------------------	---	--------------

- 6.2.2.9.12 Toggle SW91 to Low
- 6.2.2.9.13 Sup2= ON IMOK=ON
- 6.2.2.9.14 DMM1=0V DMM2=0V
- 6.2.2.9.15 Toggle SW89 to Low Reset
- 6.2.2.9.16 Sup2= OFF IMOK=ON
- 6.2.2.10 Hook a variable voltage supply to plug 14
 - 6.2.2.10.1 Supply neg. to Pin 14
 - 6.2.2.10.2 Supply POS to Pin 1
 - 6.2.2.10.3 Adjust the supply to zero volts
 - 6.2.2.10.4 Connect DMM2 to TP4 Adjust R1 to –3.9V
 - 6.2.2.10.5 Switch SW83 to high 1TSTRST
 - 6.2.2.10.6 Increase the supply voltage until Sup2 led comes on
 - 6.2.2.10.7 Now increase R1 voltage pot Led should go off
 - 6.2.2.10.8 Increase R1 to max –10.12 V
 - 6.2.2.10.9 Adjust the supply to –15V Led should come on
 - 6.2.2.10.10 If SW83 is Low Sup2 Led will not turn off
 - 6.2.2.10.11 When supply is decreased below the sup limit
 - 6.2.2.10.12 SW83 Low- increase supply to –15V than back to zero
 - 6.2.2.10.13 Sup2 led should stay on
 - 6.2.2.10.14 Toggle SW83 to high Sup2 led= off
- 6.2.2.11 Remove Jack from Plug 14 install into Plug 21 and SW83 High.
- 6.2.2.12 Adjust R1 to –3.88V increase supply to –2V Supp2 Led should be on
- 6.2.2.13 Adjust R1 to –10.12 volts Sup2= off
- 6.2.2.14 Increase supply to –4V Sup2=on
- 6.2.2.15 Adjust Supply to zero SW83 to Low
- 6.2.2.16 Toggle SW82 to Low Sup2 led = on
- 6.2.2.17 Toggle SW88 to Low Sup2 led=off (True Reset)
- 6.2.2.18 Again toggle SW82 to low Sup2= on
- 6.2.2.19 Toggle SW89 to Low Sup2=off (Power on Reset)
- 6.2.2.20 Remove DMM2 install into Jack 52
- 6.2.2.21 Toggle SW82 DMM2=5V Sup2= on DMM1= 4.3V IMOK= off
- 6.2.2.22 Toggle SW83 DMM2= 0V Sup2= off DMM1= 0V IMOK= On
- 6.2.2.23 (PASS TEST)

LOU-GED-DS3800NBIE-A REV. A	 GE Energy Parts & Repair Services Louisville, KY	Page 8 of 10
--------------------------------	--	--------------

- 6.2.2.24 Install Power Supply to plug 10
- 6.2.2.25 POS to plug 10 POS to ground
- 6.2.2.26 Neg. to ground Neg. to plug 10
- 6.2.2.27 Adjust R2 to .489V Plug 78 Toggle
- 6.2.2.28 DMM1 to plug 10 note they will not toggle
- 6.2.2.29 DMM2 to TP10 together
- 6.2.2.30 DMM3 to Plug 76= 4.3V
- 6.2.2.31 Adjust supply to .491 V
- 6.2.2.32 Plug 76= 0V
- 6.2.2.33 Plug 36= OPP Pol but equals supply voltage
- 6.2.2.34 Install power supply to plug 16
- 6.2.2.35 Reverse pol -/+
- 6.2.2.36 Neg. to plug
- 6.2.2.37 POS to GND
- 6.2.2.38 Adjust R2 to 0489V
- 6.2.2.39 DMM1 to plug 16 DMM2 to TP10
- 6.2.2.40 DMM3 to plug 76 Adjust supply to .491V output 76
- 6.2.2.41 Toggle to Low
- 6.2.2.42 With a pos voltage 76 toggles
- 6.2.2.43 With a neg. voltage 78 toggles
- 6.2.3 Remove ground on plug 29
 - 6.2.3.1 Tic to 5V Plug 74 toggles low
 - 6.2.3.2 Plug 29 back to ground
 - 6.2.3.3 Remove ground from plug 30
 - 6.2.3.4 Tie plug to 5V Plug 31 should toggle low
 - 6.2.3.5 Plug 34 equal to inputs opp pol

LOU-GED-DS3800NBIE-A REV. A	g GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 9 of 10
--------------------------------	---	--------------

- 6.2.4 Toggle SW81 high low
 - 6.2.4.1 Plug 46 high low
 - 6.2.4.2 Plug 48 high low
 - 6.2.4.3 Plug 47 high low
 - 6.2.4.4 Plug 51 high low
 - 6.2.4.5 Plug 53 high low
 - 6.2.4.6 Plug 54 high low
- 6.2.5 Toggle SW82 high low
 - 6.2.5.1 Plug 46 high low
 - 6.2.5.2 Plug 48 high low
 - 6.2.5.3 Plug 47 high low
 - 6.2.5.4 Plug 51 high low
 - 6.2.5.5 Plug 53 high low
 - 6.2.5.6 Plug 54 high low
- 6.2.6 Relay Circuit 1
 - 6.2.6.1 Plug 59- SW92 Low
 - 6.2.6.2 Plug 60- SW93 Low
 - 6.2.6.3 Plug 61- SW94 Low
 - 6.2.6.4 Plug 62- SW95 Low
- 6.2.7 On the DBIE Board
 - 6.2.7.1 Install BJ1, BJ2 to N.C.
 - 6.2.7.2 CKT1, CKT2 Leds should be ON
- 6.2.8 Plug 59
- 6.2.9 Plug 60 ANY one of these go high
- 6.2.10 Plug 61 Relay K1 will change state Led
- 6.2.11 Plug 62 CKT1 will go off
- 6.2.12 Plug 58 will control Relay K2 and CKT2 Led
- 6.2.13 Plug 58 Low/High
 - 6.2.13.1 CKT2 Led ON/ OFF
- 6.2.14 Move BJ1/ Bj2 to N.O. both leds should be off
 - 6.2.14.1 Toggle 58 59 60 61 62 watch for a change of state

LOU-GED-DS3800NBIE-A REV. A	g GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 10 of 10
--------------------------------	--	---------------

6.2.15 IMOK Led

6.2.15.1 SW84- Low IMOK Led= ON

6.2.15.2 SW84 High IMOK Led= off

6.2.15.3 SW90 Low IMOK ON

6.2.15.4 SW91 Low IMOK ON

6.2.15.5 SW90 High IMOK off

6.2.15.6 SW91 high IMOK off

6.3 Post Testing Burn-in Required ☐ Yes ☐ No



Note: All MARK I, II, & III Turbine related cards require a post testing burn-in of 100 hours.

6.3.1 Apply BUS or Operational power to the card for a period of 100 hours.

6.3.2 Re-test card while warm using the above procedure.

6.4 ***TEST COMPLETE***

7. NOTES

7.1

8. ATTACHMENTS