g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-DS3800NDIx**

Test Procedure for a DS3800NDIB & NDIC cards

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	J. Wychulis	8/11/2009
B	Added voltage tolerances from NDIA-9AA Test sheets missing from initial release	C. Wade	8/3/2011
C			

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
J. Wychulis	C. Edlin		Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
8/11/2009	8/3/2011		8/18/2009

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 Check 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 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		Rainbow Box
1	H033772	3800 P/S BOX
1	H033767	DS3800 CONNECTOR BOX

6. TESTING PROCESS

6.1 Setup

6.1.1 CONNECT THE P/S BOX AND THE CONNECTOR BOX TO RAINBOW BOX

6.1.2 CONNECT ACOM AND DCOM TOGETHER PA1 AND PA9

6.2 Testing Procedure

6.2.1 Bridge Interface

6.2.1.1 APPLY 8V TO PA39, -2V TO PA23, CHECK FOR VOLTAGES PA30=8.2V, PA60=8.2V, PA57= 9.6V(ADJUST WITH VCAL POT ON DAUGHTERBOARD), Voltage Tolerances (+-5%).

6.2.1.2 REVERSE POLARITY ON PA 39 AND 23 VOLTAGES ON PA30, PA60, PA57 SHOULD BE REVERSED, Voltage Tolerances (+-5%).

6.2.1.3 DISCONNECT PA 39 AND 23

6.2.2 METER DRIVERS

6.2.2.1 CONNECT PA2 AND PA4 TO 15V CHECK PA14 AND PA13 FOR 10V, voltage tolerances (+-0.071VDC)

6.2.2.2 REVERSE THE POLARITY ON THE 15V AND PA14, 13 SHOULD REVERSE POLARITY, voltage tolerances (+-0.071VDC)

6.2.2.3 DISCONNECT PA2,4

6.2.3 MOTOR TERMINAL VOLTS TEST

6.2.3.1 CONNECT A 10K RESISTOR TO PA17 AND PA6 THE OTHER END OF THE RESISTORS WILL BE 17X AND 6X

6.2.3.2 CONNECT 6X TO –2V AND PA17X TO 8V CHECK PA16 AND PA38 FOR 9.3V, voltage tolerances (+-5%)

6.2.3.3 REVERSE THE POLARITY ON THE INPUTS AND PA16 IS –9.3 AND PA38 IS 9.3V, voltage tolerances (+-5%)

6.2.3.4 DISCONNECT 6X AND 17X

6.2.4 IA TESTS

6.2.4.1 INPUT 5 V AT PA34 AND VERIFY 9.7V AT PA33, voltage tolerances (+-0.2V)

6.2.4.2 ADJUST INPUT AT PA34 SO THE OUTPUT AT PA33 IS 10V (+-0.005) VERYIFY THAT THE FOLLOWING POINTS ARE PA31= 5V (+-0.05VDC) PA44= 10V(+-0.21VDC) PA35=10V(+-0.01VDC), PA29=9.4V(+-0.2VDC), PA28=.75V(+-0.03VDC), LOGIC LOW AT PA76, PA25=10V(+-0.21VDC).

6.2.4.3 CONNECT PA31 TO COM AND PA29 IS 4.6V(+-0.3VDC) REMOVE PA31 FROM COM

6.2.4.4 CHANGE INPUT PA34 TO –5V AND VERIFY –9.7(+-0.2VDC) AT PA33

6.2.4.5 ADJUST THE INPUT AT PA34 TO GET –10V(+-0.005VDC) AT PA33 CHECK THE FOLLOWING OUTPUTS PA31=-5V(+-0.05VDC), PA44=–10V(+-0.21VDC), PA35=10V(+-0.22VDC), PA29=-.75(+-0.03VDC), PA28=-9.4(+-0.2VDC), PA76 IS LOGIC HIGH, PA25 IS –10(+-0.21VDC).

6.2.4.6 CONNECT 31 TO COM and PA28 IS –4.66(+-0.3VDC)

6.2.4.7 REMOVE INPUTS AT PA31 AND PA34

6.2.5 IF TEST

6.2.5.1 CONNECT PA46 TO 8V AND Verify PA37=8V(+-0.02VDC), PA11=10(+-0.21VDC) (IFM POT), PA12=8V(+-0.35VDC)

6.2.5.2 REVERSE POLARITY ON PA46 and Verify PA37=8V(+-0.18VDC), PA11=-10V(+-0.21VDC), PA12V=-8V(+-0.35VDC)

6.2.5.3 REMOVE PA46 INPUT.

6.2.6 FIELD FIRING TEST

6.2.6.1 PA64 TO COM, PA51, 61, 63=LOW and 1F AND 2R LEDS ARE ON

6.2.6.2 TAKE PA59 LOW, 2F AND 1R LEDS ARE ON 1F, 2R ARE OFF

6.2.6.3 TAKE 62 LOW, there should be no changes in LEDs.

6.2.6.4 REMOVE LOW FROM PA59 AND 1F, 2R ARE ON 2F, 1R ARE OFF

6.2.7 SINE WAVE RECONSTRUCTION

6.2.7.1 APPLY 60HZ 6V(+-0.1VP-P) SINE WAVE TO PA8

6.2.7.2 CHECK TP6 FOR 60HZ SQUARE WAVE 90 DEGREES OUT OF PHASE WITH THE INPUT

6.2.7.3 VERIFY PLL LIGHT IS OFF AND PA72 IS LOGIC 1

6.2.8 PLL TEST

6.2.8.1 APPLY 60 HZ(+-1 HZ) LOGIC SQUARE WAVE TO PA69

6.2.8.2 PA67 TO COM VERFY A 60HZ LOGIC SQUARE WAVE AT TP6 (NO PASE SHIFT FROM INPUT)

6.2.8.3 MOVE SIGNAL FROM PA69 TO PA68. PA67 TO COM VERFY THE WAVE FORM AT TP7 WITH NO SHIFT.

6.2.8.4 REMOVE SIGNAL AT PA68

6.2.8.5 J1 IN TEST POSITION, verify 2.5V(+-0.15VDC) AT PIN 9 U20.

6.2.8.6 ADJUST R1 FOR 150KHZ AT PA47 (SHORT PINS 2 AND 6 ON U2 FOR THIS)

6.2.8.7 APPLY 150KHZ LOGIC SQUARE WAVE TO PA69, JUMPER PA47 TO PA68 AND TIE PA67 TO COM, PLL IS ON.

6.2.8.8 CONNECT SCOPE TO PA69 AND PA47, THEY ARE SAME FREQUENCY AND IN SYNC.

6.2.8.9 LOWER FREQUENCY TO 50KHZ AND PLL STAYS ON AND WAVEFORMS STILL IN SYNC.

6.2.8.10 DISCONNECT PA47 AND 68, PLL IS OFF AND SYNC IS LOST.

6.2.8.11 RECONNECT 47 AND 68 AND THE LIGHT IS ON AND SIGNAL IN SYNC.

6.2.8.12 PA64 TO COM AND ALL OTHER INPUTS FLOATING VERIFY PA55 IS LOGIC LOW AND IMOK IS ON, OPEN PA64 AND PA55 IS LOGIC HIGH AND LIGHT IS OFF.

6.2.8.13 RECONNECT PA64 TO COM AND VERFY THAT CONNECTING PA46 TO EITHER P15 OR N15 CAUSES IMOK TO GO OFF.

6.3 ***TEST COMPLETE ***

7. NOTES

7.1 None at this time

8. ATTACHMENTS

8.1 None at this time