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GE Energy

Functional Testing Specification*Parts & Repair Services
Louisville, KY***LOU-GED-DS3800NRMA****Test Procedure for a DS3800NRMA****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Steve Pharris	12/04/2009
B	Corrected Typographical Errors	Steve Pharris	4/8/2014
C	Modified testing of CR51 and CR52, page 8	Scott Cash	7/11/2014

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PREPARED BY
Steve Pharris**REVIEWED BY**
C. Wade**REVIEWED BY**
S. Cash**QUALITY APPROVAL****DATE**
12/04/09**DATE**
6/11/2014**DATE**
7/11/2014**DATE**
12/7/09

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1. SCOPE

1.1 This is a functional testing procedure for a DS3800NRMA.

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		DS3800 Connector Box
1		DS3800 Power Supply
1		Fluke 5500A Calibrator
1		Resistors and Cap mentioned in setup

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6. TESTING PROCESS

6.1 Setup

- 6.1.1 Connect card to connector box and assemble rainbow box and power supply
- 6.1.2 Using the red and black terminals at the top of the rainbow box install the following components from left to right and connect to UUT to emulate daughter card:
 - .22uF 50V cap and 274K ohm resistor in parallel (DA1-DA2)
 - 10K ohm resistor (DA7-DA8)
 - 100K ohm resistor (DA9-DA10)
 - 100K ohm resistor (DA14-DA15)
 - 12.1K ohm resistor (DA4-DA5)
- 6.1.3 Connect common from Fluke Calibrator to JA17
- 6.1.4 Set calibrator for 55VAC @ 60hz
- 6.1.5 Connect PA1-PA9
- 6.1.6 Note: =H is a logic high and =L is a logic low!

6.2 Testing Procedure

- 6.2.1 Turn on DS3800 power supply and then apply 55VAC from Fluke Calibrator to JA2
- 6.2.2 Verify TA3=H
- 6.2.3 Change voltage to 85VAC
- 6.2.4 Verify TA3=L
- 6.2.5 Change voltage to 55VAC
- 6.2.6 Move JA2-JA4
- 6.2.7 Verify TA2=H
- 6.2.8 Change voltage to 85VAC
- 6.2.9 Verify TA2=L
- 6.2.10 Change voltage to 55VAC
- 6.2.11 Move JA4-JA6
- 6.2.12 Verify TA6=H
- 6.2.13 Change voltage to 85VAC
- 6.2.14 Verify TA6=L
- 6.2.15 Change voltage to 55VAC
- 6.2.16 Move JA6-JA8
- 6.2.17 Verify TA5=H
- 6.2.18 Change voltage to 85VAC
- 6.2.19 Verify TA5=L

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- 6.2.20** Change voltage to 55VAC
- 6.2.21** Move JA8-JA10
- 6.2.22** Verify TA4=H
- 6.2.23** Change voltage to 85VAC
- 6.2.24** Verify TA4=L
- 6.2.25** Change voltage to 55VAC
- 6.2.26** Move JA10-JA12
- 6.2.27** Verify TA7=H
- 6.2.28** Change voltage to 85VAC
- 6.2.29** Verify TA7=L
- 6.2.30** Change voltage to 55VAC
- 6.2.31** Remove connection at JA12
- 6.2.32** Move connection at JA17 to PA9
- 6.2.33** Verify TA27= -15VDC
- 6.2.34** Verify TA21= -15VDC
- 6.2.35** Verify TA28= -15VDC
- 6.2.36** Verify TA26= <1VDC
- 6.2.37** Verify PA18= 0VDC
- 6.2.38** Verify PA12= 0VDC
- 6.2.39** Verify PA2= 0VDC
- 6.2.40** Verify PA20= 0VDC
- 6.2.41** Using Fluke Calibrator apply 5VDC to PA28
- 6.2.42** Verify TA27= 1.5VDC
- 6.2.43** Verify PA18= 24VDC
- 6.2.44** Move PA28 to PA30
- 6.2.45** Verify TA21= 1.5VDC
- 6.2.46** Verify PA12= 24VDC
- 6.2.47** Move PA30 to PA27
- 6.2.48** Verify TA28= 1.5VDC
- 6.2.49** Verify PA2= 24VDC
- 6.2.50** Move PA27 to PA52 and Set to 0VDC
- 6.2.51** Verify TA26= 3.5VDC
- 6.2.52** Verify PA20= 24VDC
- 6.2.53** Remove connection at PA52

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- 6.2.54** Using Fluke Calibrator apply 10VDC to PA42
- 6.2.55** Verify TA13= 0VDC
- 6.2.56** Verify PA10= 0VDC
- 6.2.57** Connect PA49 to PA1
- 6.2.58** Verify TA13= -11.3VDC
- 6.2.59** Verify PA10= 11.3VDC
- 6.2.60** Using Fluke Calibrator apply -10VDC to PA42
- 6.2.61** Verify TA13= 11.3VDC
- 6.2.62** Verify PA10= -11.3VDC
- 6.2.63** Connect PA51 to PA49
- 6.2.64** Connect PA31 to PA51
- 6.2.65** Using Fluke Calibrator apply -5VDC to PA42
- 6.2.66** Verify TA13= 4.3VDC
- 6.2.67** Move PA42 to PA22
- 6.2.68** Verify TA13= 4.85VDC
- 6.2.69** Remove connection at PA31
- 6.2.70** Using Fluke Calibrator apply -5VDC to PA31
- 6.2.71** Verify TA13= 4.85VDC
- 6.2.72** Using Fluke Calibrator apply 5VDC to PA42
- 6.2.73** Reconnect PA31 to PA51
- 6.2.74** Verify TA13= -4.3VDC
- 6.2.75** Move PA42 to PA22
- 6.2.76** Verify TA13= -4.85VDC
- 6.2.77** Remove connection at PA31
- 6.2.78** Using Fluke Calibrator apply 5VDC to PA31
- 6.2.79** Verify TA13= -4.85VDC
- 6.2.80** Remove connection at PA51
- 6.2.81** Remove connection at PA31
- 6.2.82** Connect PA31 to TA13
- 6.2.83** Using Fluke Calibrator apply 3.536VAC @ 20hz to PA22
- 6.2.84** Verify PA10= 3.39VAC
- 6.2.85** Change frequency to 1Khz
- 6.2.86** Verify PA10= .247VAC
- 6.2.87** Remove connection at PA22

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- 6.2.88** Remove connection at PA49
- 6.2.89** Using Fluke Calibrator apply 5VDC to PA31
- 6.2.90** Verify PA47= -5VDC
- 6.2.91** Using Fluke Calibrator apply -5VDC to PA31
- 6.2.92** Verify PA47= 5VDC
- 6.2.93** Move PA31 to PA39 and repeat steps 6.2.89-6.2.92
- 6.2.94** Using Fluke Calibrator apply 5VDC to PA6
- 6.2.95** Verify PA29= -5VDC
- 6.2.96** Using Fluke Calibrator apply -5VDC to PA6
- 6.2.97** Verify PA29= 5VDC
- 6.2.98** Move PA6 to PA4 and repeat steps 6.2.94-6.2.97
- 6.2.99** Connect PA49 to PA1
- 6.2.100** Connect PA51 to PA49
- 6.2.101** Disconnect TA13
- 6.2.102** Using Tenma power supply apply -5VDC to PA31
- 6.2.103** Using Fluke Calibrator apply 7VDC to PA22
- 6.2.104** Verify TA20= 0VDC +/- 1VDC
- 6.2.105** Using Fluke Calibrator apply 9VDC to PA22
- 6.2.106** Verify TA20= H
- 6.2.107** Using Fluke Calibrator apply 7VDC to PA22
- 6.2.108** Verify TA20= 0VDC +/- 1VDC
- 6.2.109** Using Tenma power supply apply 5VDC to PA31
- 6.2.110** Using Fluke Calibrator apply -7VDC to PA22
- 6.2.111** Verify TA20= H
- 6.2.112** Using Fluke Calibrator apply -9VDC to PA22
- 6.2.113** Verify TA20= 0VDC +/- 1VDC
- 6.2.114** Using Fluke Calibrator apply -7VDC to PA22
- 6.2.115** Verify TA20= H

6.2.116 Verify short (<2 ohms) between the following points

From	To		From	To
JA1	JA3		TP5	PA2
JA1	JA5		TP6	PA20
JA1	JA7		TP7	PA14
JA1	JA9		TP9	TA13
JA1	JA11		TP1	TA20
JA1	JA13		TP2	PA9
TP3	PA18		TP2	TA14
TP4	PA12			

6.2.117 Remove power from UUT and verify the following resistance between the points listed

PA22-TP8 = 20K ohms

TP11-PA47 = 100 ohms

TP10-PA10 = 100 ohms

TP12-PA29 = 100 ohms

6.2.118 Reapply power to UUT

6.2.119 Connect the following points to common

TA2

TA3

TA4

TA5

TA6

TA7

PA71

6.2.120 Verify CR45-CR50 are all on

6.2.121 Apply 5VDC to the points listed above

6.2.122 Verify CR45-CR50 are all off

6.2.123 Remove connections made in step 6.2.119

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6.2.124 Verify that CR51 is on and should have been on until this point. Now connect the following points to common.

PA46

PA74

PA54

PA72

PA66

PA61

PA62

PA63

PA64

PA65

PA8

6.2.125 Verify CR51 has gone off.

6.2.126 Now connect PA40 to common.

6.2.127 Verify CR51 has come back on.

6.2.128 Remove all connections from step 6.2.124

6.2.129 Verify that CR52 is on and has been to this point. Now connect the following point to common.

PA60

PA59

PA56

PA55

6.2.130 Verify CR52 has gone off.

6.2.131 Now connect PA67 to common

6.2.132 Verify CR52 has come back on.

6.3 *TEST COMPLETE*****

7. NOTES

7.1 None at this time

8. ATTACHMENTS

8.1 None at this time