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GE Energy

**Functional Testing Specification***Parts & Repair Services  
Louisville, KY***LOU-GED-DS3800NSCA****Test Procedure for a DS3800NSCA, Speed Current Regulator 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	4/30/2010
B	Corrected typo on step 6.2.148.	Cristyn Edlin	12/13/2013
C	Corrected typos and added missing steps. Verified with Roger Johnson. Edited steps 6.2.125 through 6.2.128, & 6.2.130, and 6.2.179 through 6.2.183.	Cristyn Edlin	6/24/2014

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4/30/2010**DATE**  
05/4/10**DATE**  
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## 1. SCOPE

1.1 This is a functional testing procedure for a DS3800NSCA.

## 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		DS3800 Power Supply
1		DS3800DSCA Daughter board
1		DS3800 Connector Box
1		Variable DC Power Supply
1		Rainbow Box

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## 6. TESTING PROCESS

### 6.1 Setup

- 6.1.1 Make the following connections.
- 6.1.2 Connect PA40 to PA29.
- 6.1.3 Connect PA29 to PA9.
- 6.1.4 Connect PA12 to PA2.
- 6.1.5 Connect PA5 to PA46.
- 6.1.6 Connect PA7 to PA52.
- 6.1.7 Connect PA20 to PA17.
- 6.1.8 Connect PA37 to PA54.
- 6.1.9 Connect PA32 to PA31.
- 6.1.10 Connect PA23 to PA19.
- 6.1.11 Connect SW81 to PA80 set to L.
- 6.1.12 Connect SW82 to PA74 set to L.
- 6.1.13 Connect SW83 to PA67 set to H.
- 6.1.14 Connect SW84 to PA66 set to H.
- 6.1.15 Connect SW85 to PA64 set to H.
- 6.1.16 Connect SW86 to PA59 set to H.
- 6.1.17 Connect SW87 to PA76 set to H.
- 6.1.18 Connect SW88 to PA71 set to L.
- 6.1.19 Connect SW89 to PA6 set to H.
- 6.1.20 Connect SW90 to PA78 set to H.

### 6.2 Testing Procedure

- 6.2.1 Apply Power.
- 6.2.2 Verify PA33=-9.75VDC.
- 6.2.3 Verify PA35=9.75VDC.
- 6.2.4 Connect Variable DC supply to PA34.
- 6.2.5 Apply 6.5VDC from Variable DC supply.
- 6.2.6 Verify PA23=-6.25VDC.
- 6.2.7 Set SW89-L.
- 6.2.8 Verify PA23=-3.2VDC.
- 6.2.9 Set SW89-H.
- 6.2.10 Move connection at PA34 to PA08.

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- 6.2.11** Verify PA23=-6.22VDC.
- 6.2.12** Set SW89-L.
- 6.2.13** Verify PA23=-3.18VDC.
- 6.2.14** Set SW89-H.
- 6.2.15** Move connection at PA08 to PA10.
- 6.2.16** Verify PA23=-8.14VDC.
- 6.2.17** Set SW89-L.
- 6.2.18** Verify PA23=-4.17VDC.
- 6.2.19** Set SW89-H.
- 6.2.20** Move connection at PA10 to PA13.
- 6.2.21** Verify PA23=-.625VDC.
- 6.2.22** Set SW89-L.
- 6.2.23** Verify PA23=-.321VDC.
- 6.2.24** Set SW89-H.
- 6.2.25** Move connection at PA13 to PA14.
- 6.2.26** Verify PA23=-6.22VDC.
- 6.2.27** Set SW89-L.
- 6.2.28** Verify PA23=-3.18VDC.
- 6.2.29** Set SW89-H.
- 6.2.30** Move connection at PA14 to PA18.
- 6.2.31** Verify PA23=-6.14VDC.
- 6.2.32** Set SW89-L.
- 6.2.33** Verify PA23=-3.14VDC.
- 6.2.34** Record voltage at PA23.
- 6.2.35** Verify voltage recorded in previous step is found at the following points.  
PA11:  
PA16:  
PA24:
- 6.2.36** Repeat steps 6.2.5-6.2.35 using a negative voltage and verify output is opposite Polarity.
- 6.2.37** Verify PA38=H.
- 6.2.38** Apply +10VDC to PA18.
- 6.2.39** Verify PA38=L.

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**6.2.40** Verify PA38=L if +10VDC is applied to any of the following points.

PA08:

PA10:

PA14:

**6.2.41** Set Variable DC Supply to 0VDC.

**6.2.42** Connect Variable DC Supply to PA56.

**6.2.43** Verify PA62=0VDC.

**6.2.44** Verify IMOK=on.

**6.2.45** Increase voltage at PA56 to 10VDC.

**6.2.46** Verify PA62=-10VDC.

**6.2.47** Verify IMOK-on.

**6.2.48** Increase voltage at PA56 to 12VDC.

**6.2.49** Verify PA62=-12VDC.

**6.2.50** Verify IMOK-off.

**6.2.51** Reverse polarity at PA56.

**6.2.52** Verify PA62=12VDC.

**6.2.53** Verify IMOK=off.

**6.2.54** Decrease voltage at PA56 to -10VDC.

**6.2.55** Verify PA62=10VDC.

**6.2.56** Verify IMOK=on.

**6.2.57** Set Variable DC Supply to 0VDC.

**6.2.58** Using Variable DC Supply apply 9VDC to PA08.

**6.2.59** Verify PA62=8.6VDC.

**6.2.60** Set SW90-L.

**6.2.61** Verify PA62=-8.6VDC.

**6.2.62** Set Variable DC Supply to 0VDC.

**6.2.63** Connect Variable DC Supply to PA53.

**6.2.64** Verify PA50=0VDC.

**6.2.65** Verify IMOK=on.

**6.2.66** Increase voltage at PA53 to 10VDC.


**6.2.67** Verify PA50=-10VDC.

**6.2.68** Verify IMOK=on.


**6.2.69** Increase voltage at PA53 to 12VDC.

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- 6.2.70** Verify PA50=-12VDC.
- 6.2.71** Verify IMOK=off.
- 6.2.72** Reverse polarity of voltage at PA53.
- 6.2.73** Verify PA50=12VDC.
- 6.2.74** Verify IMOK=off.
- 6.2.75** Decrease voltage at PA53 to -10VDC.
- 6.2.76** Verify PA50=10VDC.
- 6.2.77** Verify IMOK=on.
- 6.2.78** Set Variable DC Supply to 0VDC.
- 6.2.79** Connect Variable DC Supply to PA41.
- 6.2.80** Verify PA36=0VDC.
- 6.2.81** Verify PA47=0VDC.
- 6.2.82** Verify IMOK=on.
- 6.2.83** Verify PA57=-4.34VDC.
- 6.2.84** Increase voltage at PA41 to 10VDC.
- 6.2.85** Verify PA36=10VDC.
- 6.2.86** Verify PA47=-10VDC.
- 6.2.87** Verify IMOK=on.
- 6.2.88** Verify PA57=-7.4VDC.
- 6.2.89** Increase voltage at PA41 to 12VDC.
- 6.2.90** Verify PA36=12VDC.
- 6.2.91** Verify PA47=-12VDC.
- 6.2.92** Verify IMOK=off.
- 6.2.93** Verify PA57=-8.03VDC.
- 6.2.94** Reverse polarity of voltage at PA41.
- 6.2.95** Verify PA36=-12VDC.
- 6.2.96** Verify PA47=12VDC.
- 6.2.97** Verify IMOK=off.
- 6.2.98** Verify PA57=-.675VDC.
- 6.2.99** Decrease voltage at PA41 to -10VDC.
- 6.2.100** Verify PA36=-10VDC.
- 6.2.101** Verify PA47=10VDC.
- 6.2.102** Verify IMOK=on.
- 6.2.103** Verify PA57=-1.34VDC.

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- 6.2.104** Move connection at PA41 to PA60.
- 6.2.105** Set Variable DC Supply to 12VDC.
- 6.2.106** Verify PA58=1.8VDC.
- 6.2.107** Verify PA55=0VDC.
- 6.2.108** Verify PA54=-10.3VDC.
- 6.2.109** Verify PA39=10.3VDC.
- 6.2.110** Reverse polarity of voltage at PA60.
- 6.2.111** Verify PA58=-1.8VDC.
- 6.2.112** Verify PA55=0VDC.
- 6.2.113** Verify PA54=10.3VDC.
- 6.2.114** Verify PA39=-10.3VDC.
- 6.2.115** Set Variable DC Supply to 0VDC.
- 6.2.116** Verify PA58=0VDC.
- 6.2.117** Verify PA55=0VDC.
- 6.2.118** Verify PA54=-9.79VDC.
- 6.2.119** Verify PA39=9.82VDC.
- 6.2.120** Remove Variable DC Supply from PA60.
- 6.2.121** Connect DMM to PA39.
- 6.2.122** Toggle SW86 until PA39 is outputting a +9.9VDC.
- 6.2.123** Connect Variable DC Supply to PA30 set up for a negative output.
- 6.2.124** Adjust Variable DC Supply until PA39=12VDC and IMOK=off.
- 6.2.125** Reverse polarity of voltage at PA30.
- 6.2.126** Verify PA39=7.5VDC.
- 6.2.127** Toggle SW86 until voltage at PA39=-12VDC.
- 6.2.128** Adjust Variable DC Supply until PA39=-5.5VDC.
- 6.2.129** Reverse polarity of voltage at PA30.
- 6.2.130** Toggle SW26.
- 6.2.131** Verify IMOK=off.
- 6.2.132** Connect Variable DC Supply to PA27.
- 6.2.133** Toggle SW86 until PA39=12VDC.
- 6.2.134** Set Variable DC Supply to 0VDC.
- 6.2.135** Verify PA39=9.9VDC.
- 6.2.136** Verify IMOK=on.
- 6.2.137** Verify PA48=0VDC.

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**6.2.138** Adjust the voltage at PA27 until IMOK=off (approx 22VDC).

**6.2.139** Set Variable DC Supply to 0VDC.

**6.2.140** Move Variable DC Supply to PA21.

**6.2.141** Verify PA22=H.

**6.2.142** Increase voltage at PA21 to 1VDC.

**6.2.143** Verify PA22=L.

**6.2.144** Reverse polarity of voltage at PA21.

**6.2.145** Verify PA22=L.

**6.2.146** Set SW81-86-H.

**6.2.147** Verify PA72=H.

**6.2.148** Set SW81-L.

**6.2.149** Set SW82-L.

**6.2.150** Verify PA72-L.

**6.2.151** Now take SW83-L.

**6.2.152** Verify PA72-H.

**6.2.153** Now take SW84-L.

**6.2.154** Verify PA72-L.

**6.2.155** Now take SW84 high and SW85 Low.

**6.2.156** Verify PA72-L.

**6.2.157** Now take SW85 high and SW86 Low.

**6.2.158** Verify PA72-L.

**6.2.159** Set SW81, SW82, SW88-Low. All other switches high.

**6.2.160** Connect a 5 Volt source to PA08.

**6.2.161** Connect a DC meter to PA23 it should measure –5V.

**6.2.162** Switch SW86 L.

**6.2.163** Verify PA23-L.

**6.2.164** Switch SW86-H.

**6.2.165** Switch SW87-L.

**6.2.166** Verify PA23-L.

**6.2.167** Set Power supply to 0VDC.

**6.2.168** Connect Variable DC Supply to PA04.

**6.2.169** Verify PA25=0VDC.

**6.2.170** Verify IMOK=on.

**6.2.171** Increase voltage at PA04 to 12VDC.



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**6.2.172** Verify PA25=12VDC.

**6.2.173** Verify IMOK=off.

**6.2.174** Reverse polarity of voltage at PA04.

**6.2.175** Verify PA25=-12VDC.

**6.2.176** Verify IMOK=off.

**6.2.177** Set Power supply to 0VDC.

**6.2.178** Connect Variable DC Supply to PA41.

**6.2.179** Adjust Variable DC Supply to -5VDC.

**6.2.180** Connect a DC meter to PA48.

**6.2.181** Toggle SW81.

**6.2.182** Verify PA48=0VDC.

**6.2.183** Adjust Variable DC Supply to 0VDC.

**6.3 \*\*\*TEST COMPLETE \*\*\***

## **7. NOTES**

**7.1** None at this time.

## **8. ATTACHMENTS**

**8.1** None at this time.