| g GE Energy | **Functional Testing Specification** |
|---|---|
| ***Parts & Repair Services***<br>***Louisville, KY*** | **LOU-GED-DS200TCEBG1** |

**Test Procedure for a Protection Termination Expander**

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

| REV. | DESCRIPTION | SIGNATURE | REV. DATE |
|---|---|---|---|
| A | Initial release | Scott Cash | 3-12-2009 |
| B | Added Data Sheet to procedure, Page 5 | C. Wade | 4/2/2009 |
| C | Added comments to section 6-2 and reviewed procedure | J Hardin | 5/12/2009 |
| D | Changed voltage from 24 to 12 volts in line 6.2.12. | J. Hardin | 7/28/2009 |
| E | Change function generator to Variac | J. Hardin | 10/14/2009 |
| F | Added section 6.2.14 | J. Hardin | 8/25/2011 |
| G | Changed wording in procedure | J. Hardin | 12/7/2011 |
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| PREPARED BY | REVIEWED BY | REVIEWED BY | QUALITY APPROVAL |
|---|---|---|---|
| Scott Cash | J Hardin | J Hardin | Charlie Wade |
| **DATE** | **DATE** | **DATE** | **DATE** |
| 3/12/2009 | 5/12/2009 | 12/7/2011 | 3/12/2009 |

## 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 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 | | Variac |
| | | |
| | | |
| | | |

## 6. TESTING PROCESS

### 6.1 Setup

**6.1.1** You will need two Fluke meters, a Variac outputting 10VAC sine wave and some clip on meter leads

**6.1.2** Perform the following additional inspections from factory test procedure.

**6.1.2.1** Verify that no shorts exist between adjacent traces

**6.1.2.2** Using the material list, verify that all parts shown on the silk-screen are present, and are assembled per the silk-screen.

**6.1.2.3** Verify proper part number and mounting of T5, T6 and T7.

**6.1.2.4** Verify that all leads are properly soldered and connections are properly filleted and clipped.

### 6.2 Testing Procedure

**6.2.1** Verify the following resistance between the cathode terminal of CR1, 2, or 3 (cathodes are tied together) and the points below: The DS200TCEBG1A only has the JVA connector, whereas the DS200TCEBG1B has both the JVA & JVB connectors.

DS200TCEBG1A

| | |
|---|---|
| **JVA-1** | 809K to 842K |
| **JVA-2** | 809K to 842K |
| **JVA-3** | 809K to 842K |
| **JVA-4** | 809K to 842K |
| **JVA-5** | 809K to 842K |
| **JVA-6** | 809K to 842K |
| **JVA-7** | 809K to 842K |
| **JVA-8** | 809K to 842K |

DS200TCEBG1B

| | |
|---|---|
| **JVA-1** | 809K to 842K |
| **JVA-3** | 809K to 842K |
| **JVA-5** | 809K to 842K |
| **JVA-7** | 809K to 842K |
| **JVB-1** | 809K to 842K |
| **JVB-3** | 809K to 842K |
| **JVB-5** | 809K to 842K |
| **JVB-7** | 809K to 842K |

**6.2.2** With (-) minus lead on cathode of CR1 and Fluke meter set to diode test, verify reading of 0.50 to 0.85 to each of the following points:

| |
|---|
| **JWX-1** |
| **JWY-1** |
| **JWZ-1** |

**6.2.3** Verify the resistance between each pair of points listed below:

| | | |
|---|---|---|
| JV-1 | JV-2 | 1.220 to 1.820K ohms |
| JV-3 | JV-2 | 1.220 to 1.820K ohms |
| JV-4 | JV-5 | 1.220 to 1.820K ohms |
| JV-6 | JV-5 | 1.220 to 1.820K ohms |
| JKX-11 | JKX-12 | 16.5 to 24.9 Ohms |
| JKX-10 | JKX-12 | 16.5 to 24.9 Ohms |
| JPU\V\W-4 | JPU\V\W-5 | 20 to 32 Ohms |
| JPU\V\W-6 | JPU\V\W-7 | 20 to 32 Ohms |
| JPU\V\W-8 | JPU\V\W-9 | 20 to 32 Ohms |
| JMP-6 | JMP-9 | 21 to 32 Ohms |
| JMP-7 | JMP-9 | 22 to 32 Ohms |
| JMP-8 | JMP-9 | 23 to 32 Ohms |

**6.2.4** Using the variac, apply 10 +/- .01 volts rms at 60 Hz between JV-1 and JV-2 (continue to monitor on Fluke 8050A or equiv. for rest of test).

**6.2.5** Adjust R20 until the voltage across JMP-1 and JU-16 is (**.**4350 +/- .0002 volts rms).

**6.2.6** Attach the variac at the same setting to JV-2 and JV-3.

**6.2.7** Adjust R22 until the voltage across JMP-3 and JU-16 is (**.**4350 +/- .0002 volts rms).

**6.2.8** Attach the variac at the same setting to JV-4 and JV-5

**6.2.9** Adjust R21 until the voltage across JMP-2 and JU-16 is (**.**4350 +/- .0002 volts rms).

**6.2.10** Attach the variac at the same setting to JV-5 and JV-6.

**6.2.11** Adjust R23 until the voltage across JMP-4 and JU-16 is (**.**4350 +/- .0002 volts rms).

**6.2.12** Test the beeper by applying <12 volts DC between JU-18 (+) and JU-17 (-). You may wish to hold one finger over top of the beeper so it won't sound so loud.

**6.2.13** If card passes all the above tests, seal all pots and apply proper stamps.

**6.2.14** **Seal pots R20 thru R23**

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

## 7. NOTES

**7.1** None at this time

## 8. ATTACHMENTS

**8.1** See Data Sheet on next page

Data Sheet for Test for __LOU-GED-DS200TCEB__

| Test Procedure Step | Nominal | Lower Limit | Results | Upper Limit | Pass/Fail |
|---|---|---|---|---|---|
| 6.2.1-1 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-2 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-3 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-4 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-5 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-6 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-7 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.1-8 | 820K ohms | 809K ohms | | 842K ohms | |
| 6.2.2-1 | .540 | .500 | | .850 | |
| 6.2.2-2 | .540 | .500 | | .850 | |
| 6.2.2-3 | .540 | .500 | | .850 | |
| 6.2.3-1 | 1.6K ohms | 1.22K ohms | | 1.82K ohms | |
| 6.2.3-2 | 1.6K ohms | 1.22K ohms | | 1.82K ohms | |
| 6.2.3-3 | 1.6K ohms | 1.22K ohms | | 1.82K ohms | |
| 6.2.3-4 | 1.6K ohms | 1.22K ohms | | 1.82K ohms | |
| 6.2.3-5 | 20.7 ohms | 16.5 ohms | | 24.9 ohms | |
| 6.2.3-6 | 20.7 ohms | 16.5 ohms | | 24.9 ohms | |
| 6.2.3-7 | 26 ohms | 20 ohms | | 32 ohms | |
| 6.2.3-8 | 26 ohms | 20 ohms | | 32 ohms | |
| 6.2.3-9 | 26 ohms | 20 ohms | | 32 ohms | |
| 6.2.3-10 | 26 ohms | 20 ohms | | 32 ohms | |
| 6.2.3-11 | 26 ohms | 20 ohms | | 32 ohms | |
| 6.2.3-12 | 26 ohms | 20 ohms | | 32 ohms | |
| 6.2.5 * | .4350V RMS | .4348V RMS | | .4352V RMS | |
| 6.2.7 * | .4350V RMS | .4348V RMS | | .4352V RMS | |
| 6.2.9 * | .4350V RMS | .4348V RMS | | .4352V RMS | |
| 6.2.11 * | .4350V RMS | .4348V RMS | | .4352V RMS | |

* Note must use true RMS meter or digital scope