| g GE Energy | **Functional Testing Specification** |
|---|---|
| ***Parts & Repair Services***<br>***Louisville, KY*** | **LOU-GED-IC3600CCCC1** |

## Test Procedure for a Relay Driver Card

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

| REV. | DESCRIPTION | SIGNATURE | REV. DATE |
|---|---|---|---|
| A | Initial release | G. Chandler | 4/28/2010 |
| B | | | |
| C | | | |



| PREPARED BY | REVIEWED BY | REVIEWED BY | QUALITY APPROVAL |
|---|---|---|---|
| G. Chandler | | | Charlie Wade |
| **DATE** | **DATE** | **DATE** | **DATE** |
| 4/28/2010 | | | 4/28/210 |

## 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 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 | | Current Meter |
| 2 | | 20-30 VDC Power Supplies |
| 1 | | Fluke 5500 |
| 1 | | 50V Power Supply |

## 6. TESTING PROCESS

### 6.1 Setup

**6.1.1** Connect Pin-28 to 5.3VDC

**6.1.2** Connect Pin-51 to Common (DCOM)

**6.1.3** Connect a current meter, negative side to Pin-12 and the positive side of meter to an adjustable 19VDC power supply.

**6.1.4** Connect PCOM (Pin-22) to the adjustable 19VDC source ground. Connect PCOM (Pin-22) to DCOM (Pin-51) or ground to ground on the power supplies.

**6.1.5** Set the current meter to measure m-amps.

Special Note: This circuit is 50m Amps MAX, do not go over 50m Amps.

**6.1.6** Set the adjustable 19VDC source to zero volts.

### 6.2 Testing Procedure

**6.2.1** Power on the 5.3VDC supply.

**6.2.2** Power on the adjustable power supply.

**6.2.3** Adjust the voltage from zero to +15VDC. The current meter should remain at zero current.

**6.2.4** Adjust supply back to 10VDC.

**6.2.5** Momentarily touch Pin-44 to ground, this should latch on the current relay driver and you should read 25mA. As the adjustable source is increased the current will increase.

| Adjustable Voltage Level | Current reading |
|---|---|
| 0VDC | 0 mA |
| 5VDC | 13mA |
| 10VDC | 25mA |
| 15VDC | 39mA |
| 19VDC | 49mA |

**DO NOT GO OVER 50m Amps**

**6.2.6** Time Delay A (Pin-28): Touch Pin-47 to 5.3VDC, this will unlatch the above circuit and current will drop to 0mA.

**6.2.7** Touch Pin-45 to ground, this will latch the relay driver circuit once again.

**6.2.8** Power Down.

**6.2.9** Connect a 5K pull-up resistor from Pin-37 to 5.3VDC.

**6.2.10** Connect a –50V supply to Pin-30. Positive side of supply to ACOM (Pin-50 or P2).

**6.2.11** Connect a voltmeter to DCOM (Pin-37).

**6.2.12** Power up the supplies (+5.3VDC, -50VDC, and 10VDC Adjustable).

**6.2.13** Pin-37 should read zero volts & current should be at 0 Amps.

Special note: Pin-47 can be used to reset this circuit.

**6.2.14** Momentarily touch Pin-44 to ground, latch on (SET)

**6.2.14.1** Voltmeter on Pin-37 shall be 5.3VDC

**6.2.14.2** Current Meter shall read 25m Amps

**6.2.15** Momentarily touch Pin-47 to 5.3VDC, latch off (RESET)

**6.2.15.1** Voltmeter on Pin-37 shall be 0VDC

**6.2.15.2** Current Meter shall read 0m Amps

**6.2.16** Momentarily touch Pin-45 to ground, latch on (SET)

**6.2.16.1** Voltmeter on Pin-37 shall be 5.3VDC

**6.2.16.2** Current Meter shall read 25m Amps

**6.2.17** Momentarily touch Pin-47 to 5.3VDC, latch off (RESET)

**6.2.17.1** Voltmeter on Pin-37 shall be 0VDC

**6.2.17.2** Current Meter shall read 0m Amps

**6.2.18** Turn pots R25 & R30 fully CCW

**6.2.19** Connect the 5500 to Pin-15 & Pin-16.

**6.2.20** Set to 60Hz sine wave, amplitude set to .1V RMS.

**6.2.21** Connect Pin-44 to ground and adjust the variable DC supply until output current is 40m Amps at Pin-12.

**6.2.22** Monitor Pin-48 & Pin-49 will a DMM.

**6.2.23** With .1V signal applied to Pin-15 & Pin-16, Pin-48 should be logic HIGH and Pin-49 should be logic LOW.

**6.2.24** Begin increasing the amplitude of the signal applied to Pin-15 & Pin 16 until the voltage at Pin-48 begins to drop.

**6.2.25** The voltage on the Fluke 5500 should be approx 8V RMS.

**6.2.26** Reset the Fluke 5500 to .1V

**6.2.27**

**6.2.28** Turn Pot R25 fully CW.

**6.2.29** Again increase the amplitude of the Fluke 5500 until the DC volts at Pin-48 begins to drop. The voltage on the Fluke 5500 should be approx 21VDC.

**6.2.30** Continue to increase the amplitude of the Fluke 5500 until the voltage at pin-48 is 0VDC.

**6.2.31** The voltage at Pin-49 should be 5.3VDC.

**6.2.32** Reset the Fluke 5500 to .1V

**6.2.33** Turn Pot R30 fully CW.

**6.2.34** Again increase the amplitude of the Fluke5500A until the DC volts at Pin-46 begins to drop. The voltage on the Fluke 5500A should be approx 21VDC.

**6.2.35** Continue to increase the amplitude of the Fluke 5500A until the voltage at pin-46 is 0VDC.

**6.2.36** The voltage at Pin-47 should be 5.3VDC.

**6.2.37** Voltage should begin to drop on Pin-46 at 8V RMS on the Fluke 5500 and 18V RMS with R30 in CW position.

**6.2.38** Set the Fluke 5500 for 10V RMS.

**6.2.39** Measure the DC volts at Pin-13. It should measure approx 9.8VDC. Pin-14 should measure approx 10.2VDC

**6.2.40** Adjust the amplitude of Fluke 5500 until the current meter connect to Pin-12 = 20m Amps

**6.2.41** Move the input from the Fluke 5500 from Pin15 & Pin-16 to Pin 17 & Pin-18.

**6.2.42** Current should measure 20m Amps again.

**6.2.43** Move the input from the Fluke 5500 from Pin17 & Pin-18 to Pin 19 & Pin-20.

**6.2.44** Current should measure 20m Amps again.

**6.2.45** Power down and remove all connections from the unit under test.

**6.2.46** Apply +20VDC in series with a mA meter & 1.5K ohm resistor to Pin-13. Common of the supply to Pin-14.

**6.2.47** Current meter should measure less then 2m Amps.

**6.2.48** Reverse polarity on current meter, should measure 0m Amps

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

## 7. NOTES

**7.1** None at this time.

## 8. ATTACHMENTS

**8.1** None at this time.