| g GE Energy | **Functional Testing Specification** |
|---|---|
| ***Parts & Repair Services***<br>***Louisville, KY*** | **LOU-GED-133D6339G0001** |

# Test Procedure for a Load Rate Set Limit Card

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

| REV. | DESCRIPTION | SIGNATURE | REV. DATE |
|---|---|---|---|
| A | This work instruction was transition from the test instructions P3KAL0513A01 for better a better understanding. | G. Chandler | 6/17/2014 |
| B | | | |
| C | | | |



| PREPARED BY | REVIEWED BY | REVIEWED BY | QUALITY APPROVAL |
|---|---|---|---|
| G. Chandler | | | Charlie Wade |
| **DATE** | **DATE** | **DATE** | **DATE** |
| 6/17/2014 | | | 6/17/2014 |

## 1. SCOPE

**1.1** This is a functional testing procedure for a TC 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
- **3.1.2** Reference P3K-AL-0513-A01 Test Instruction

## 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) |
| 2 | | 30VDC adjustable Power Supplies |
| 1 | | 2.74K ohm ½ watt resistor |
| 2 | | 1M ohm ½ watt resistor |
| 1 | | 20VDC adjustable power supply |

## 6. Testing Process

### 6.1 Setup

**6.1.1** Apply +22VDC +/- 2mv to pin 37

**6.1.2** Apply -22VDC +/- 2mv to pin 41.

**6.1.3** Apply common to pin 39.

**6.1.4** Install a 2.74Kohm resistor from +22v supply to pin 16 and another 2.74Kohm resistor from pin 16 to common.

**6.1.5** Install a 1 Meg ohm resistor from pin 25 to common.

**6.1.6** Install a 1 Meg ohm resistor from pin 38 to common.

### 6.2 Testing Procedure

**6.2.1** Apply power to card and verify the following:

**6.2.2** TP1 = +18.7VDC +/- 1.1VDC.

**6.2.3** TP2 = -18.7VDC +/- 1.1VDC.

**6.2.4** Connect pin 30 to +22V supply.

**6.2.5** Connect pin 35 to common.

**6.2.6** Adjust VR51 for 0VDC +/- 1mv at TP6.

**6.2.7** Remove common from pin 35.

**6.2.8** Adjust VR2 full CCW.

**6.2.9** Apply -100mVDC to pin 35.

**6.2.10** Verify +0.4031VDC +/- 8.1mv at TP6.

**6.2.11** Adjust VR2 full CW.

**6.2.12** Verify 1.4042VDC +/- .1181VDC at TP6.

**6.2.13** Verify TP5 is approx. 0.7VDC higher than TP7.

**6.2.14** Remove input to pin 35.

**6.2.15** Place a jumper wire across capacitor C6.

**6.2.16** Apply +22VDC to pin 35.

**6.2.17** Connect pin 30 and TP10 to common

**6.2.18** Adjust VR52 for 0VDC +/-1mv at TP6.

**6.2.19** Remove pin 30 and TP10 from common.

**6.2.20** Apply +22VDC to pin 30.

**6.2.21** Verify -60.28mVDC +/- 3mv at TP6.

**6.2.22** Remove +22VDCv from pin 30.

**6.2.23** Apply +22VDC to TP10.

**6.2.24** Verify -20.02mVDC +/-1mv at TP6.

**6.2.25** Remove supply from TP10.

**6.2.26** Remove jumper wire from capacitor C6.

**6.2.27** Apply -10VDC to pin 30.

**6.2.28** Verify TP8 is approx. 0.7VDC higher than TP7.

**6.2.29** Apply +22VDC to pin 31 and verify the following.

**6.2.30** With VR3 full CW TP10 = 3.666VDC +/-.061VDC

**6.2.31** With VR3 full CCW TP10 = 0.709VDC +/- .104VDC.

**6.2.32** Set VR3 for 1.961VDC.

**6.2.33** Move +22vdvc from pin 31 and apply it to pin 32 and verify the following.

**6.2.34** With VR4 full CW TP10 = 0.889VDC +/-.017VDC

**6.2.35** With VR4 full CCW TP10 = 0.444VDC +/- .029VDC.

**6.2.36** Set VR4 for 0.588VDC

**6.2.37** Move +22vdvc from pin 32 and apply it to pin 33 and verify the following.

**6.2.38** With VR5 full CW TP10 = 0.326VDC +/-.006VDC

**6.2.39** With VR5 full CCW TP10 = 0.132VDC +/- .010VDC.

**6.2.40** Set VR5 for .195VDC

**6.2.41** Move +22vdvc from pin 33 and apply it to pin 34 and verify the following.

**6.2.42** With VR6 full CW TP10 = 0.188VDC +/-.004VDC

**6.2.43** With VR6 full CCW TP10 = 0.061VDC +/- .005VDC.

**6.2.44** Set VR6 for 0.098VDC.

**6.2.45** Remove +22VDC from pin 34.

**6.2.46** Apply +VDC to pin 35 so that TP5 = -10.00VDC

**6.2.47** Verify -4.951VDC +/-50mv at pin 38.

**6.2.48** Remove +VDC from pin 34.

**6.2.49** Apply +VDC to pin 30 so that TP8 = -10.00VDC

**6.2.50** Verify -4.951VDC +/-50mv at pin 29.

**6.2.51** Remove +VDC from pin 30.

**6.2.52** Apply +22VDC to pin 30.

**6.2.53** Apply +1VDC to pin 35 and adjust VR2 for -10VDC +/- 1mv at TP6.

**6.2.54** Remove +1VDC from pin 35,

**6.2.55** Move +22VDC from pin 30 to in 31.

**6.2.56** Adjust VR3 for 1.961VDC at TP10.

**6.2.57** Apply +1VDC to pin 35 and verify the following.

**6.2.58** TP6 increases at a rate of 1VDC per minute +/- .588%/minute.

**6.3 Post Testing Burn-in** **Required** **_X_ Yes** **___ No**

**Note:** All MARK I, II, & III Turbine related cards require a post testing burn-in of 100 hours.

**6.3.1** Apply BUS or Operational power to the card for a period of 100 hours.

**6.3.2** Re-test card while warm using the above procedure.

***6.4 ***TEST COMPLETE ******

## 7. Notes

**7.1** None at this time.

## 8. Attachments

**8.1** None at this time.