



GE Energy Services

Functional Testing Specification

*Inspection & Repair Services
Louisville, KY*

LOU-GED-115D2279G0001

Test Procedure for a 115D2279G0001 Card

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A	Initial release	Dan Laemmle	5/23/2006
B	Corrected several voltage polarities	Dan Laemmle	4/11/2007
C			

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DATE 5/23/2006	DATE 5/23/2006	DATE	DATE 4/27/2007

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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 **P3K-AL-0379-A01 Salem revised**

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)
4		Regulated supplies

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6. TESTING PROCESS

6.1 Setup

6.1.1 +22 volts to Pin 37, -22 volts to Pin 41, common to Pin 39



**Note: This test written from the Salem revised test P3K-AL-0397-A01.
Where a card Pin # and a TP (test point) are electrically the same, the two
may be used interchangeably in the test.**

6.2 Testing Procedure

- 6.2.1 Apply + and - 22 volts: Volts TP1 =15.7 +/- 1v Volts TP2 + -15.7 +/- 1v. ma Pin 37 = 55+/- 15ma. ma Pin 39 = -50+/- 15ma
- 6.2.2 Meter TP50. VR8 CW 1.45 to 1.9 VDC VR8 CCW -6.2 to -7.5 VDC. Adjust VR8 so TP50 =0v.
- 6.2.3 Ground Pin 33. Adjust volts on Pin 35 with a very small voltage so that TP7 is less than 5 mv. Apply +1.00 v to TP50. TP7 should be -2.00 +/- .05v. (Gain of 2) Remove input to TP50.
- 6.2.4 Ground Pins 33 and 35. Adjust VR8 so TP7 = 0 +/- 5mv. Remove ground from Pin 35 and apply +1.00v into Pin 36. TP7 should be -1.00 +/- .03v. (1:1 gain)
- 6.2.5 Remove volts from Pin 36. Remove ground from Pin 33 and ground Pin 35. Apply 1.00v to Pin 32. TP7 should be 1.00v +/- .03. (1:1 gain) Remove 1.00v input.
- 6.2.6 Ground Pins 33 and 35. Readjust VR8 for TP7 =0mv. Remove ground from Pin 35 and apply +1.0v. After 1 msec TP7 will be Approx. -6.5v. After 5 msec TP7 will be -10.0v. Repeat procedure at Pin 33, grounding Pin 35 and applying +1.0v to Pin 33 for a similar response at TP7.
- 6.2.7 Meter TP53. VR10 CW = -22v. VR10 CCW = -5.8 to - 6.85v.
- 6.2.8 Attach multimeter Pin 24 to ground. Ground TP5 and zero IC3 with VR50 measuring at TP4. Insure that VR50 runs TP4 thru zero. Remove ground at TP5 and apply 1.00VDC. Read 1.00VDC at TP4. Raise the input voltage at TP5 to 10.00v. With VR5 CW multimeter reads approx 1.5 ma. VR5 CCW meter reads .82 to .92 ma. Remove multimeter and input voltage at TP5.
- 6.2.9 Meter TP60. With VR4 CCW = 0v With VR4 CW = -5.0 to -6.0v.
- 6.2.10 Meter TP55. With VR7 CCW = 0v With VR7 CW = -12.8 to -13.8v.
- 6.2.11 Meter TP61. With VR1CCW = 12 to 14v. With VR1 CW = 8.1 to 10.5v.

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- 6.2.12** With VR1 CW and VR7 CCW, ground TP7, TP5, TP54, TP56. Short TP57 to TP52. Short TP58 to TP59. Apply neg volts to TP61 until it reads -1.00v. TP3 should be 1.55 to 1.65v. (Gain is approx 1.6)
- 6.2.13** Remove ground to TP5 and ground TP61. Remove short TP52 to TP57. Adjust VR6 fully CCW. Input +1.00v to TP5. TP3 should be -5.0v. (Gain is 5) Adjust VR6 fully CW. TP3 should be approx -10v. (Gain is 10) Remove input volts.
- 6.2.14** Short TP57 to TP52. Ground TP5, TP7, TP54, TP61. Input 1.00v at TP56. TP3 should be -1.00v +/- .02v.
- 6.2.15** Remove all shorts and jumpers except TP5 to ground. Ground TP 51. VR6 fully CCW.
- 6.2.16** Set TP55 to -10.0v with VR7. Set TP7 to -2.00v with VR8. Set TP3 to -5.0v by applying +volts to TP56. (Approx. +16.4v) (TP3 will begin to go negative at approx +15v at TP56)
- 6.2.17** Set TP7 to -1.0v with VR8. TP3 = -6.0 +/- .05v.
- 6.2.18** Set TP7 to -3.0v with VR8. TP3 = -4.0 +/- .05v.
- 6.2.19** Set TP55 to -1.0v with VR7. Set TP7 to -2.0v with VR8. Set TP3 to -5.0v by applying + volts to TP56. (Approx +3.5v)
- 6.2.20** Set TP7 to -2.20v with VR8. TP3 = -3.25v +/- .05v.
- 6.2.21** Set TP7 to -1.8v with VR8. TP3 = -6.82v +/- .05v. Remove input to TP56.
- 6.2.22** Short TP58 to TP59. TP3 = less than 5v (nom 3.15v)
- 6.2.23** Remove TP52 to TP57 short. TP3 = 0.3v +/- .1v
- 6.2.24** Remove ground from TP51 and TP5. Pin 8 should read 1 diode drop less than TP3. (TP3 = -12.8 and Pin 8 = -13.5 nom) The voltage on IC2 pin 2 and IC2 pin 3 should be different by 1 diode drop. (Pin 2 = 1.461v and pin 3 = .822v nom)
- 6.2.25** Adjust VR6 fully CCW. Ground TP7, TP51, TP54. Apply 1.0v to TP5. After approx 1 msec TP3 will be -3.3v. After 5 msec TP3 will be -5.0v.

6.3 Post Testing Burn-in Required ☒ 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