g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-531X179PLMA**

Test Procedure for a 531X179PLMA Card.

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	F. Howard	5/5/2005
B	Recopied test for quality into our shops format.	J. Hardin	12/8/2010
C	Added steps to test HV input components instead of static checking these parts.	P. Kelley	2/25/2011

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
Frank Howard	Jill Hardin	Paul Kelley	Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
05/05/2005	12/8/2010	2/25/2011	12/8/2010

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		Function Generator
1		0-30VDC Dual Power Supply

6. Testing Process

6.1 Setup

6.1.1 Place jumpers JP-1 to JP-6 in position 1-2.

6.1.2 Place jumpers JP-8 and JP-9 in position 2-3

6.1.3 All switches on dip switch SW1 and SW2 closed.

6.1.4 Position all potentiometers to approximate mid-range.

Note: If testing a "K" or earlier revision, jumper HTB6 and HTB7. There are 8 LEDs on older cards, CR8 is green. CR7 is under voltage, CR6 over voltage. The test will work on older cards but you must have jumper in place or CR4 stays on and CR5 will come on during test.

6.2 Testing Procedure

6.2.1 Connect 24VDC to HTB-14 for relay power.

6.2.2 Connect 5.5 VDC through a 39K 1W resistor to junction of R3 and R8.

6.2.3 Connect 115 VAC between HTB-1 and HTB-2

6.2.3.1 Applying AC voltage to card first will result in CR6 (under voltage trip) coming on and staying on even after application of DC voltage. The only way to reset is cycling AC power after DC is applied.

6.2.4 With power on, LED CR7 (green LED) should be on and all others off. HTB-8 and HTB-9 should be shorted; HTB-10 and HTB-11 should be shorted and HTB-12 and HTB-13 should be shorted.

6.2.4.1 Increase voltage on R3 and R8 to 8VDC and LED CR5 (over voltage trip) should come on and HTB-8 and HTB-9 should open.

6.2.4.2 Decrease voltage to 4VDC and CR5 should go out, CR6 should come on and HTB-10 and HTB-11 should open. Return voltage to 5.5VDC, cycle AC power and CR6 should be out (it may come on momentarily but should turn off).

6.2.4.3 Remove input voltage from R3 and R8. Once this is done, CR6 will come on and stay on for the remainder of the test. You can leave 5.5V on r3 and R8 (which will keep CR6 off and use another power supply for the rest of the test or CR6 can stay on. Either way it will not affect the remainder of the test.

6.2.5 Input 4VDC to junction R54 and R60 through a 39K 1 W resistor and verify the following:

6.2.5.1 CR1 is on.

6.2.5.2 CR4 is on (may take up to 15 seconds).

6.2.5.3 HTB-12 and HTB-13 is open.

6.2.5.4 Remove input to R54 and R60 and both LEDs should go out.

6.2.6 Input 4VDC to junction R74 and R80 through a 39K 1 W resistor and verify the following:

6.2.6.1 CR2 is on.

6.2.6.2 CR4 is on.

6.2.6.3 Remove input to R74 and R80 and both LEDs should go out.

6.2.7 Input 4VDC to junction R94 and R100 through a 39K 1 W resistor and verify the following:

6.2.7.1 CR3 is on.

6.2.7.2 CR4 is on.

6.2.7.3 Reduce input on R94 and R100 to 0V and both LEDs should go out. Leave all inputs on for next portion of test.

6.2.8 Set function generator for 60HZ sine wave, full amplitude, no offset and connect between common and the junction of R24 and R26. Using P1, set pin 8 of U4 for –6VDC.

6.2.9 Apply 30 VDC to GTB3(+) and GTB1(-).Verify the voltage between VMPL-1 and VMPL-2 is .45V to .5V. Remove the 30 VDC.

6.2.10 Apply 30 VDC to GTB5(+) and GTB1(-).Verify the voltage between VMPL-1 and VMPL-2 is .45V to .5V. Remove the 30 VDC.

6.2.11 Apply 30 VDC to GTB7(+) and GTB1(-).Verify the voltage between VMPL-1 and VMPL-2 is .45V to .5V. Remove the 30 VDC.

6.2.12 Apply the 30 VDC to GTB15(+) and GTB9(-). Verify the voltage on U2 pin 14 is 1.2V to 1.3V (HTB3 is DCOM). Remove the 30 VDC.

6.2.13 Apply the 30 VDC to GTB13(+) and GTB9(-). Verify the voltage on U4 pin 14 is 1.2V to 1.3V (HTB3 is DCOM). Remove the 30 VDC.

6.2.14 Apply the 30 VDC to GTB11(+) and GTB9(-). Verify the voltage on U5 pin 14 is 1.2V to 1.3V (HTB3 is DCOM). Remove the 30 VDC.

6.3 ***TEST COMPLETE ***

7. Notes

7.1 None at this time.

8. Attachments

8.1 None at this time.