g GE Energy *Parts & Repair Services* *Louisville, KY*	**Functional Testing Specification** **LOU-GED-531X152IOCA**

Test Procedure for an IOC card, 531X152IOCA

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1. SCOPE

1.1 This is a functional testing procedure for an IOC card, 531X152IOCA

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
2		Fluke Multi meter any version
1		Millivolt source or power supply w\fine adjustment.
1		Dan's multi break out box, see Glen
2		Tenma dual power supplies or equivalent.

6. Modifications/Upgrades

6.1 Check Orange Book for any modifications or upgrades.

7. Testing Process

7.1 Setup

7.1.1 Install UUT in break out box.

7.1.2 Connect 15 VDC thru 10K 2W resistors to pins 12, 14, 16 and 19.

7.1.3 Connect 24 VDC positive to pin 20 and common to pin 38.

7.1.4 Connect 15 VDC positive to pin 5 and common to pin 38.

7.1.5 Connect -15 VDC to pin 48 and common to pin 38.

7.1.6 Connect pin 28 to pin 38.

7.1.7 Set JP1-JP4 to 2-3 position. Set P2, 4, 6, 8 to a full CCW position. Set P1, 3, 5, 7 to a full CCW position.

7.2 Testing Procedure

7.2.1 Power up supplies and may sure LEDs 1-4 are off. If the LED's stay on or if the 24 VDC supply is drawing more than .25 amps U9 is probably bad.

7.2.2 Make sure P1 and P2 are set to a full CCW position and connect a millivolt source to APL with positive connect to R and negative connected to W. Slowly increase the millivolt source until LED 1 lights. It should light up at 480 MVDC +\- 25 MVDC.

7.2.3 The output at pin 19 should transition from approximately .7 VDC to 14-15 VDC when LED 1 lights.

7.2.4 The voltage at pin 15 should increase from 0 VDC to approximately 5 VDC when LED 1 lights. Continue to increase the APL voltage another 100-200 millivolts after the LED lights and Pin 15 should increase to approximately 6 VDC and become static.

7.2.5 Reduce APL back to zero and set P1 and P2 to a full CW position.

7.2.6 Slowly increase APL again until LED 1 lights; this should happen between 100 and 150 millivolts.

7.2.7 Pin 19 should again transition from approximately .7 VDC to 14-15 VDC.

7.2.8 Pin 15 will increase from approximately 1.8 VDC to approximately 13.5 VDC when the LED lights.

7.2.9 Make sure P3 and P4 are set to a full CCW position and connect a millivolt source to APL with positive connect to R and negative connected to W. Slowly increase the millivolt source until LED 1 lights. It should light up at 480 MVDC +\- 25 MVDC.

7.2.10 The output at pin 12 should transition from approximately .7 VDC to 14-15 VDC when LED 1 lights up.

7.2.11 The voltage at pin 13 should increase from 0 VDC to approximately 5 VDC when LED 1 lights. Continue to increase the APL voltage another 100-200 millivolts after the LED lights and Pin 13 should increase to approximately 6 VDC and become static.

7.2.12 Reduce APL back to zero and set P3 and P4 to a full CW position.

7.2.13 Slowly increase APL again until LED 1 lights up, this should happen between 100 and 150 millivolts.

7.2.14 Pin 12 should again transition from approximately .7 VDC to 14-15 VDC.

7.2.15 Pin 13 will increase from approximately 1.8 VDC to approximately 13.5 VDC when the LED lights.

7.2.16 Make sure P5 and P6 are set to a full CCW position and connect a millivolt source to APL with positive connect to R and negative connected to W. Slowly increase the millivolt source until LED 1 lights. It should light up at 480 MVDC +\- 25 MVDC.

7.2.17 The output at pin 16 should transition from approximately .7 VDC to 14-15 VDC when LED 1 lights.

7.2.18 The voltage at pin 11 should increase from 0 VDC to approximately 5 VDC when LED 1 lights. Continue to increase the APL voltage another 100-200 millivolts after the LED lights and Pin 11 should increase to approximately 6 VDC and become static.

7.2.19 Reduce APL back to zero and set P5 and P6 to a full CW position.

7.2.20 Slowly increase APL again until LED 1 lights, this should happen between 100 and 150 millivolts.

7.2.21 Pin 16 should again transition from approximately .7 VDC to 14-15 VDC.

7.2.22 Pin 11 will increase from approximately 1.8 VDC to approximately 13.5 VDC when the LED lights.

7.2.23 Make sure P7 and P8 are set to a full CCW position and connect a millivolt source to APL with positive connect to R and negative connected to W. Slowly increase the millivolt source until LED 1 lights. It should light up at 480 MVDC +\- 25 MVDC.

7.2.24 The output at pin 14 should transition from approximately .7 VDC to 14-15 VDC when LED 1 lights up.

7.2.25 The voltage at pin 18 should increase from 0 VDC to approximately 5 VDC when LED 1 lights up. Continue to increase the APL voltage another 100-200 millivolts after the LED lights and Pin 18 should increase to approximately 6 VDC and become static.

7.2.26 Reduce APL back to zero and set P7 and P8 to a full CW position.

7.2.27 Slowly increase APL again until LED 1 lights up, this should happen between 100 and 150 millivolts.

7.2.28 Pin 14 should again transition from approximately .7 VDC to 14-15 VDC.

7.2.29 Pin 18 will increase from approximately 1.8 VDC to approximately 13.5 VDC when the LED lights.

7.2.30 Turn off power to UUT.

7.2.31 Remove connection to APL thru DPL.

7.2.32 Set all pots to a full CCW position and move JP1-4 to the 1-2 position.

7.2.33 Return power to the UUT, all LED's should be off.

7.2.34 Connect the millivolt source to APL and increase the supply to 500 millivolts to cause a trip of LED 1. Reduce the supply back to 0 VDC and verify that LED 1 latches on.

7.2.35 Repeat previous step for BPL thru DPL and verify the corresponding LED's also latch in the on position. At this point all four LED's should be lit.

7.2.36 Remove power, test is complete.

7.3 ***TEST COMPLETE ***

8. Notes

8.1 None at this time.

9. Attachments

9.1 None at this time.