



GE Energy

## Functional Testing Specification

*Parts & Repair Operations  
Louisville, KY*

**LOU-GED-531XPSGD**

**This test procedure is for the 531X303 Power Supply and 531X304 Gate Driver cards.**

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Cristyn Edlin	11/19/08
B	Added modification changes to section 6.	K. Greenwell	9/17/2010
C	Clarify step 7.16, 7.17, and 7.27	C. Wade	5/23/2011
D.	Added step to verify DB circuit at 7.18	R. Johnson	8/22/2017

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<b>DATE</b> 11/19/08	<b>DATE</b> 9/17/2010	<b>DATE</b> 8/22/2017	<b>DATE</b> 8/22/2017

LOU-GED-531XPSGD REV. D	g  <b>GE Energy</b> <i>Parts &amp; Repair Operations</i> <i>Louisville, KY</i>	Page 2 of 5
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## 1. SCOPE

- 1.1 This is a functional testing procedure for the 531X303 Power Supply and 531X304 Gate Driver cards.

## 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 Any 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 the 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 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 or cracked
- 4.2.1.2 Terminal strips / connectors broken or cracked
- 4.2.1.3 Loose wires
- 4.2.1.4 Components visually damaged
- 4.2.1.5 Capacitors leaking
- 4.2.1.6 Solder joints damaged or cold
- 4.2.1.7 Circuit board burned or de-laminated
- 4.2.1.8 Printed wire runs 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	H188526	Test fixture
1	H033763	CI004 AC2000 test drive
1		Fluke 85 DMM (or Equivalent)
1		O-scope

## 6. Modification/Upgrades

### 6.1 Upgrading 531X303MCPAPG1 to 531X303MCPBAG1

531X303MCPxx	FROM	TO	ECN change
	AP	AR	Change R183 to 68A7024P3480D
	AR	AS	Change heat-sink on D4 to 68A9925P1 and add RTV to base
	AS	AT	Change U9 and 10 to PDU01001HP4503
	AT	AW	REFER to rev AY
	AW	AX	Change C106 to 104X122AA383
	AX	AY	Change R121 to 68A7035P100F
	AY	BA	Change U12 TO PDU01003H11N1
	BA	BB	Change R28 and 29 to 104X123BH001
	BB	BC	Change C41 to 336A5156H47N35B
	BC	BD	Change Q30 to 104X170DA005

## 7. TESTING

### 7.1 SETUP

7.1.1 Connect O-scope to the O-scope output on the back of the fixture.

7.1.2 Connect card to test box H188526.

### 7.2 TESTING PROCEDURE

7.3 Turn power switch to on.

7.4 Verify all GREEN NEON lights of the test fixture come on.

7.5 Verify power supply voltages using the test jacks on the fixture.

7.6 Identify the fault indicator LEDs of the Gate Driver card.

7.7 Verify that there is some combination of fault indicator LEDs lit.

7.8 Verify LEDs CR31, CR32 of the Power Supply card are off.

7.9 Press the red FLTRST-27 pushbutton.

7.10 Verify that the fault indicator LEDs of the Gate Driver card go off.

7.11 Verify that LED CR31 of the Power Supply card comes on.

7.12 Verify that LED CR32 of the Power Supply card remains off.

7.13 Press the red pushbuttons, labeled ENA-20, ENB-21, and ENC-22 at the same time and release.

7.14 Verify that LED CR32 of the Power Supply card comes on.

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- 7.15** Press and release the black pushbutton, labeled ENERGIZES K1 and K2 and verify that the green neon light, labeled CNTB-1 goes off and comes back on.
- 7.16** Repeat step 7.15 and verify contacts 4PL-1 and 2 switches from closed to opened and back to closed.
- 7.17** Repeat step 7.15 and verify contacts 4PL-1 and 3 switches from opened to closed and back to opened.
- 7.18** Press DBTST-19 and verify DBPL-3 LED does not illuminate.
- Press ENDB-23 and verify DBPL-3 LED does not illuminate.
- Press both DBTST-19 and ENDB-23 and verify that DBPL-3 LED does illuminate.
- 7.19** Press SS1-24 and verify that CCPL-1 LED comes on.
- 7.20** Press SS1-25 and verify that CCPL-2 LED comes on.
- 7.21** Press SS1-26 and verify that CCPL-3 and 4 LED's comes on.
- 7.22** Connect your meter to the meter output on the back of the fixture.
- 7.23** Turn rotary switch to 1PL-3 and verify 5VDC.
- 7.24** Turn rotary switch to 1PL-5 and verify 0VDC.
- 7.25** Turn rotary switch to 1PL-6 and verify 2.5VDC.
- 7.26** Turn rotary switch to 1PL-8 and verify 5V p-p with a frequency increase from 250 kHz to 305 kHz when the knob, labeled APL, BPL, CPL-8 is varied from min to max.
- 7.27** Repeat step 7.26 for rotary switch positions 1PL-9 and 10.
- 7.28** Turn rotary switch to 1PL-11 and verify 5V p-p with a frequency of 250 kHz.
- 7.29** Turn rotary switch to 1PL-12 and verify 5V p-p with a frequency of 250 kHz.
- 7.30** Turn rotary switch to 1PL-13 and verify 5V p-p with a frequency of 160 kHz.

**7.31** Verify the voltages of the following table with a 1kHz Square wave.

Switch Position	Output
APL-1	10 V p-p
APL-5	3 V p-p
APL-7	10 V p-p
APL-12	3 V p-p
BPL-1	10 V p-p
BPL-5	3 V p-p
BPL-7	10 V p-p
BPL-12	3 V p-p
CPL-1	10 V p-p
CPL-5	3 V p-p
CPL-7	10 V p-p
CPL-12	3 V p-p

**7.32** Remove card from test fixture H188526.

**7.33** Install card into the AC2000 test drive H033763 and perform SCR test.

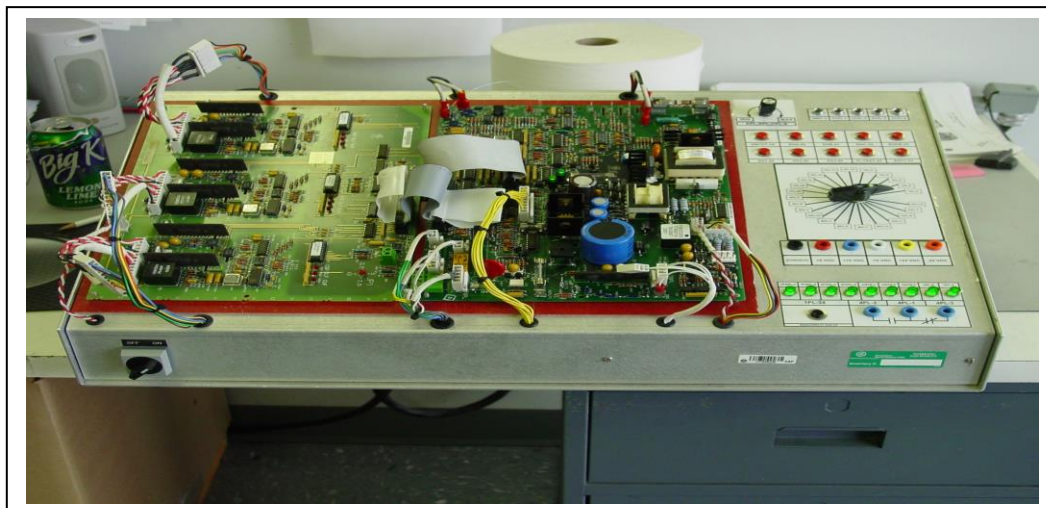
**7.33.1** Enter the following keystrokes on the programmer keypad: [set], [drv], [7], [7], [Enter], [Reset], [Reset], [test], [1], [2], [Enter]

**7.33.2** Push run switch up and verify motor runs in both directions.

**7.33.3** Let card run in the drive for at least 30 minutes in each direction.

**7.34 \*\*\*TEST COMPLETE \*\*\***

## 8. Notes



Picture of test fixture H188526