

 <div> <div>GE Energy</div> <div> Parts & Repair Services Louisville, KY </div> </div>		Functional Testing Specification	
		CAN-GEB-621L0453	
Test Procedure for 0621L0453-ALL Interface Cards			
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A	Initial release	Rick Diercks	03/29/2013
B	Position step 6.3.8 from previous step	R. Diercks	10/14/2013
C			
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PREPARED BY Rick Diercks	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL 
DATE 3/29/2013	DATE	DATE	DATE 4/1/2013

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Functional test procedure for all 0621L0453 Interface cards

1. **SCOPE**

1.1 This specification provides the Engineering Requirements for testing all groups of 0621L0453 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 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 **0316A093AA** Board Schematics

3.1.2 **0621L0453GALL** Test/parts information

4. **ENGINEERING REQUIREMENTS**

4.1 0621L0543 is an MPE INTERFACE CARD

4.2 Equipment Cleaning

4.2.1 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.

4.3 Equipment Inspection

4.3.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.3.1.1 Wires broken or cracked.

4.3.1.2 Terminal strips / connectors broken or cracked.

4.3.1.3 Loose wires.

4.3.1.4 Components visually damaged.

4.3.1.5 Capacitors leaking.

4.3.1.6 Solder joints damaged or cold.

4.3.1.7 Circuit board burned or de-laminated.

4.3.1.8 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		51 pin universal Test Jig or equivalent
1		Oscilloscope
3		Power supplies
1		Voltage Calibrator DVC-8500 or equivalent
6		Fluke 77 or equivalent Multimeter
1		BK115VAC transformer or equivalent
1		Variable transformer
2		120VAC relays or equivalent
3		14 pin IC Test Clips

6. Setup

6.1 Remove all customer jumpers. Take care and note where they were removed.

6.2 Connect the following. See section on wiring pictures, may help.

6.2.1 Test card in appropriate slot using Ribbon Cable 50 to 26 pin connection in the Universal test box.

6.2.2 P 5 V bus to TJ18.

6.2.3 P 15 V bus to CP37.

6.2.4 N 15 V bus to CP38.

6.2.5 P 24 V bus to CP35.

6.2.6 P 0 V bus to CP36 this is common ground (ACOM).

6.2.7 The Variac to primary side of transformer and secondary of transformer between CP04 & CP05 to provide 60-70 VAC. when requested.

6.2.8 CP06 to one side of the first 120 VAC Relay.

6.2.9 CP07 to the other side of the first 120 VAC Relay.

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6.2.10 CP08 to one side of the second 120 VAC Relay.

6.2.11 CP09 to the other side of the second 120 VAC Relay.

6.2.12 CP10 HPHTY to common (Use White Jack on 51 pin universal test jig for all commons of Power Supplies and meters).

6.2.13 (13) Connect one meter to U6 Pin 4 (VRM).

6.2.14 (14) Connect one meter to U6 pin 5 (VRB) **note these meters will be used to set and monitor voltages from VR Function Circuit Page 1.

6.3 Set the following.

6.3.1 One power supply to P15 VDC.

6.3.2 One power supply to N15 VDC.

6.3.3 One power supply to P24 VDC.

6.3.4 One power supply to +1.6V DC (voltage calibrator-DVC 8500) connect + to U1 pin 5 DC-(DN)

6.3.5 One power supply to @ +1.6VDC connect to U1 pin 3, DC+ Helper (MP) Through a Fluke meter to monitor voltage

6.3.6 One power supply to @ +1.6VDC connect to U1 pin 10, DC+ Bridge (B+) Through a Fluke meter to monitor voltage. **note use one of the Power Supplies for both voltages to U1

6.3.7 Set Function Generator to square wave @ 1 to 2 HZ at 1.7 +/- .5 pk-pk. Connect to JB18 (18 on 51 pin universal test jig and com.

6.3.8 JB17 tie 17 to Commons.

7. Instruction

7.1 Turn Power supplies +15VDC, -15VDC, +24VDC, and 60VAC.

7.2 Relay "DB" (CP8& CP9) will engage.

7.3 Observe P 15 V \pm 750 mV. Across Z1. **note if not you can adjust AC higher but do not go over 115VAC; 60AC is so we do not limit current to relay coil.

7.4 At these time LOGIC VOLTAGE at U6 pin 4 (VRM) and 5 (VRB) will be a high the voltage can be between 2.5 to 4.5 volts do to the Comparator U3.

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- 7.5** Observe that there is P 5 volts \pm 300 mV. On the pin 14 U7.
- 7.6** Observe that there is N 400 mV. \pm 20 mV. On the pin 04 or 06 of U3. Always use CP36 or White jacks as common.
- 7.7** Turn on Function Generator Relays “M” (CP6-CP7) and “DB” (CP8-CP9) will alternate on and off (at 1-2 Hz).
- 7.8** Turn on voltage calibrator-DVC 8500 power supply Relays will stop and meters at U6 VRM and VRB will go low @0.5VDC.
- 7.9** Turn power supply to @ +1.6VDC connect to U1 pin 3, DC+ Helper (MP) and U1 pin 10, DC+ Bridge (B+). Find adjust both voltages to set logic voltage at U6 pins 4 and 5. Meters should be at this test point.
- 7.10** Observe that “M” relay and “DB” relay are alternate. (if not you Logic voltage is not right)
- 7.11** Connect a meter to CP11 With relays alternating remove Common connection from CP10 Voltage at CP11 should go @4VDC and Relays will stop reconnect CP10 to Common CP11 will go low to @0.1V and Relays will start alternating.
- 7.12** Connect meter to CP 21 Voltage will be low @0.1V and relays will be alternating turn off power supply voltage calibrator-DVC 8500 voltage at CP21 will go high @ 4V and relays will stop.
- 7.13 ***TEST COMPLETE *****

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8. Upgrades

8.1 REV 0 to REV 1:

- 8.1.1 The material sheet is in error calls for 0177A1014 P076 should be 0177A1016 P070, and 0177A1014 P064 should be 0177A1016 P058.
- 8.1.2 Add inverter to MPHETY circuit as per elementary if not already present see U4 on elementary.
- 8.1.3 Change MOV1 and MOV2 from 0177A1384 P008 to 0177A1384 P003.
- 8.1.4 Add + marking to silkscreen for C8 (100 μ F 0239A2051 P005) closest to BR1 ensure C8 is mounted correctly.
- 8.1.5 Add 0.22 μ F C31 and C32 in parallel with D2 and D4 respectfully see elementary.
- 8.1.6 Move CP21 and CP22 such that they line up horizontally with CP11 and CP12.
- 8.1.7 Change R12 and R35 from 1M Ω 0177A1460 P390 to 2M 0177A1460 P392.

8.2 Rev 1 to REV 2:

- 8.2.1 Change R51 and R52 from 249 Ω 0177A1460 P067 to 300 Ω 0177A1001 P036.
- 8.2.2 Add second 300 Ω resistor in parallel with R51 and R52.
- 8.2.3 Optional skip step 1 and step 2, replace R52 with jumper and replace R51 with 300 Ω 2W resistor (0177A1005 P036)
- 8.2.4 Change R13 0177A1460 P207 6.81k Ω to 0177A1460 P193 4.99k Ω .

8.3 REV 2 to REV 3:

- 8.3.1 No Changes made. No information present.

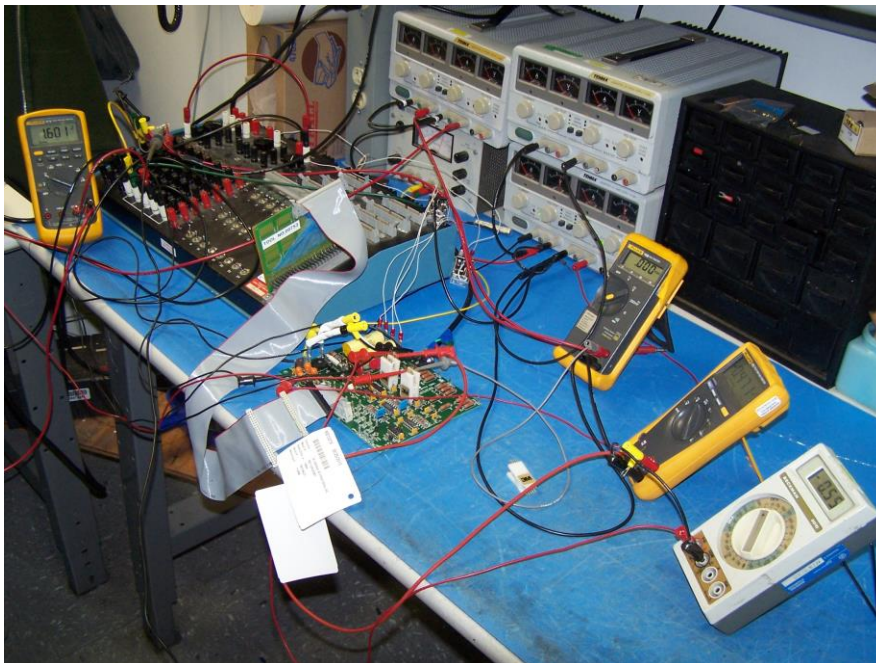
8.4 REV 3 to REV 4:

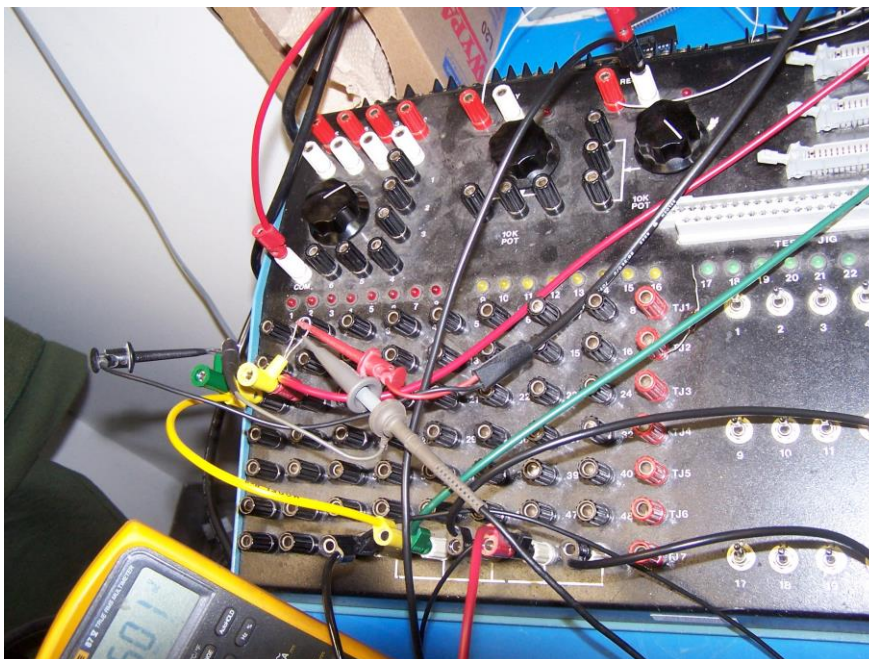
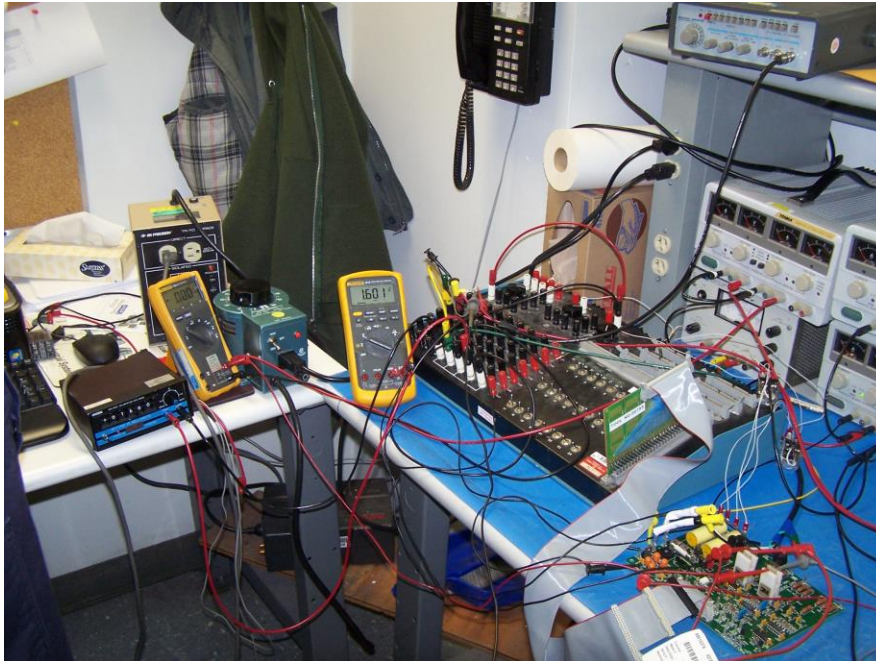
- 8.4.1 Add cap 0.1 μ F 0177A1283 P016to U4-PIN3 to U4-PIN7.
- 8.4.2 Add cap 0.001 μ F 0177A1283 P001to the following U6-PIN1 to U6-PIN7, U7-PIN1 to U7-PIN7, U7-PIN3 to U7-PIN7.
- 8.4.3 ON pwb 0166C7862AA-2 add jumper from Q2 to R55 leg closest to Q2 on solder side.

8.5 REV 4 to REV 5

- 8.5.1 On Solder Side of board, add jumper wire from Q2 to R55. See mod sheet for location.

9. Attachments





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