g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-DS200GGXAG1**

Test Procedure for a GTO Distribution Board

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1. SCOPE

1.1 This is a functional testing procedure for a GTO Distribution 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 GEI-100032

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		Description
1		Tenma Function Generator (or equivalent)
2		Tenma Laboratory DC Power Supply (or equivalent)
1		Tektronix 2 Channel O-scope (or equivalent)
1		Fluke 87 True RMS Multimeter (or equivalent)
1		12 Output Fiber Optic Module (in IS200GGXIG test box)
1		Fluke 5500A Calibrator

6. TESTING PROCESS

6.1 Setup

6.1.1 Set Tenma Function Generator for 10KHZ Range at maximum output (approximately 12 V). Connect output of function generator to the GXPL connector pins 1 and 4, and set the output frequency to 15 KHZ. Set O-scope for 5V/Div at 1uSec. Using and O-scope verify the output of the Transformer T1 is the same frequency and ½ the amplitude as the input as measured at the cathodes of CR4 and CR2, and ¼ the amplitude at the Anode of CR5. This verifies the Transformer T1 is operational. Disconnect the O-scope and function generator after verification.

Note: Presently we do not have the equipment in-house to produce a 50V p-p amplitude and 15 KHZ sinewave.

6.2 Testing Procedure

6.2.1 Connect +12 VDC to unit using the Tenma Power Supply. Use the multimeter to measure the voltages listed below.

6.2.1.1 Connect positive lead to cathode of CR5

6.2.1.2 Connect negative lead to anode of CR7 (this is an easily accessible point for DCOM)

6.2.2 Check the output of U30 for +5VDC

6.2.3 Check the output of U26 for +5vdc (PSOK signal)

6.2.4 Check the output of Q8 (PGATE) for approximately 10VDC.

6.2.5 Connect 12 Output Fiber Optic Module to +12VDC supply.

6.2.5.1 Connect function generator output to Signal input on the 12 Output Fiber Optic Module. Adjust for approximately 60HZ at 4.5 V.

6.2.5.2 Plug one of the fiber optic outputs from the 12 Output Fiber Optic Module into one of the blue fiber optic receivers on the UUT, and measure the output with the O-scope. Reference the following to correlate the appropriate fiber optic input with the appropriate output to be measured. The output frequency should be the same as the input frequency.

6.2.5.2.1 U1 fiber optic input measured at connector JB1 and 2.

6.2.5.2.2 U2 fiber optic input measured at connector JB3 and 4.

6.2.5.2.3 U7 fiber optic input measured at connector JB9 and 10.

6.2.5.2.4 U8 fiber optic input measured at connector JB11 and 12.

6.2.5.2.5 U12 fiber optic input measured at connector JB17 and 18.

6.2.5.2.6 U13 fiber optic input measured at connector JB19 and 20.

6.2.5.2.7 U17 fiber optic input measured at connector JB25 and 26.

6.2.5.2.8 After checking all of the fiber optic receivers, disconnect O-scope and function generator.

6.2.6 Connect the function generator output, 60HZ at 4.5V, to the following points to visually verify that the fiber optic transmitter is operational. Reference the following input points to correlate the appropriate fiber optic transmitter.

6.2.6.1 JB5 and 6 to visually verify U4

6.2.6.2 JB7 and 8 to visually verify U5

6.2.6.3 JB13 and 14 to visually verify U10

6.2.6.4 JB15 and 16 to visually verify U11

6.2.6.5 JB21 and 22 to visually verify U15

6.2.6.6 JB23 and 24 to visually verify U16

6.2.6.7 JB29 and 30 to visually verify U28

6.2.6.8 Disconnect function generator.

6.2.7 Using Fluke 5500A Calibrator input a 75 Volt at 15 KHZ signal across inputs (PT2 and 3, PT6 and 7, PT4 and 5, PT8 and 9), leaving the Fluke in STANDBY mode for now.

6.2.7.1 All of the optoisolator IC's are tied together and will be measured at the same point JC23. Connect O-scope probe to JC23 and o-scope ground to DCOM.

6.2.7.2 Press the OPERATE button on the Fluke and observe the waveform on the O-scope.

6.2.7.3 After observing the waveform (See 7.1) put the Fluke back into STANDBY mode, leaving the O-scope connected to JC23.

6.2.7.4 Move the Fluke output to each of the remaining input pairs (PT2 and 3, PT6 and 7, PT4 and 5, PT8 and 9), and test the same for all.

6.2.7.5 After all optoisolator have been verified, disconnect the Fluke and O-scope.

6.2.8 Using Multimeter, verify all remaining traces, resistors, and components not checked previously.

6.3 ***TEST COMPLETE***

7. Notes

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