



GE Energy

## Functional Testing Specification

Parts & Repair Services  
Louisville, KY

LOU-GE-IS200EGDM

### Test Procedure for an EX2100 Exciter Ground Plane Module


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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	John Madden	06-11-08
B	Clarified procedure and added two steps to section 6	Darren Johnson	7/30/2009
C	Corrected errors in procedure	Steve Pharris	3/8/11

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<b>PREPARED BY</b> John Madden	<b>REVIEWED BY</b> D. Johnson	<b>REVIEWED BY</b> Steve Pharris	<b>QUALITY APPROVAL</b> 
<b>DATE</b> June 11, 2008	<b>DATE</b> 7/30/2009	<b>DATE</b> 3/8/11	<b>DATE</b> 6/12/2008

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## 1. SCOPE

1.1 This is a functional testing procedure for an IS200EGDM Exciter Ground Plane 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 N:\Design Folders\IS2\IS200E\EGDM

## 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	H188702	EGDM test fixture (made from ½ of an EPBP backplane board)
1		Tenma Dual Power Supply
1		Small flashlight (to activate the fiber optic receiver)
1		Oscilloscope
1		DS3800 Power Supply box

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## 6. TESTING PROCESS

**6.1 Setup** (Note: This procedure is copied almost verbatim from the handwritten one drawn up by Roger Johnson. Any technical questions on this procedure should be directed toward him.)

- 6.1.1** *Setup for now is based on the use of the incomplete fixture H188702, which is basically an EPBP backplane card, cut in half. It has been mounted in a box of some sort without an integral power supply. Upon completion of the fixture this test will need amending. Until then, you must connect each of the various leads to a Tenma dual power supply and the DS3800 power supply per the instructions. If you happen to be the first one to use this test after such modifications are made to the fixture, please be sure to amend this procedure to reflect those changes.*
- 6.1.2** From the Tenma power supply, connect the +24V and Common for +24 to the Purple and White jacks respectively.
- 6.1.3** Connect the Red +5V from the DS3800 power supply to the Red jack on fixture.
- 6.1.4** Connect the Yellow +15V from the DS3800 power supply to the Yellow jack on fixture,
- 6.1.5** Connect the Blue -15V from the DS3800 power supply to the Orange jack on fixture,
- 6.1.6** Connect the Black GND from the DS3800 power supply to any Green jack on fixture
- 6.1.7** From the Tenma power supply, connect the 0-9V and Common for 0-9V Blue and Black jacks respectively.
- 6.1.8** Set 0-9 volt supply to 0V. **\*NOTE: Do not exceed 10V\***
- 6.1.9** Install the EGDM card to EPBP backplane.



**Note: During testing, some circuits *may* surpass the 50V threshold for NFPA PPE usage requirements, so be cautious while working with exposed circuitry.**

## 6.2 Testing Procedure

- 6.2.1** With the card installed power the +5V, +/-15V, and set the adjustable 9V supply to 0vdc. **Do not power the 24V supply at this time.**
- 6.2.2** TP301 should measure along with the 9V adj. supply; TP301 is measured with a multimeter. Pin1 of U304- will adjust from 500KHz to 1MHz (squarewave), measure with an O-scope. Reverse the polarity of the 9vdc supply; pin1 of U304 will adjust from 500KHZ down to 100KHz or less.

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- 6.2.3** With the card installed and powered from the +5V and +/-15V, return the adjustable 9V supply to +9vdc. **Do not power the 24V supply at this time.**
- 6.2.4** Set SW1 to OFF
- 6.2.5** Check for overcurrent draw on the +/-15V supplies. The DC voltmeter should read either + or -15V output and “Selected” led ON with no fiber optic input. Xmit led should also be ON. Note the switch SW1. This switch controls the board’s function from the command mode to the master mode. Switch to the ON position. The DC voltmeter should read 0V and “Selected” led should be off. This switch turns off the +/-50V output and changes the board into the command mode (no LEDs on). Put the switch to the OFF position. The +/-15V output and selected LED should come on.
- 6.2.6** Shine a flashlight into the “REC IN” fiber optic port. The DC meter (on fixture) should switch polarity and the “Selected” LED should go off then come on and “Active” LED should come on.
- 6.2.7** **If any of the above tests fail, repair BEFORE 24V is applied.**
- 6.2.8** Apply power to the 24V supply. **Current should not be greater than .4mA.** Normal current is .3mA. If greater than .3mA, unit has a short and will burn up. If current is normal then the output with switch “OFF” should be –50V on fixture mounted meter. Switch to the ON position. Output should be 0V. Switch to the OFF position, output should again be –50V. Shine the flashlight into the “REC IN” fiber optic port and output should switch to +50V and the “Selected” LED should go off then come on and “Active” LED should come on, and the relay should switch on. Switch to the “ON” position, shine a light into the “REC IN” fiber optic port, and listen for the relay to close.

**6.3 \*\*\*TEST COMPLETE \*\*\***

**7. NOTES: Technical issues found:**

- 7.1 No +/-50V output: U206
- 7.2 No +/-50V output: Q8, Q9, and EC resistor between them
- 7.3 No relay output: U206
- 7.4 No relay output: QN203
- 7.5 No receipt of fiber optic: U201
- 7.6 No transmit on fiber optic: U305
- 7.7 No transmit on fiber optic: U303
- 7.8 No "Selected Master" and/or "Active" LED's: check U306 for 4MHZ output, 2.4Vdc
- 7.9 24V current draw too high: use chill spray on U204, if current goes normal, replace U204
- 7.10 Unit burns Q201-202: U204 bad, output too high DC
- 7.11 Unit burns Q201 or Q202: Q201 or Q202 bad
- 7.12 Unit burns Q10: Q10 bad, .4mA or less
- 7.13 Unit burns Q3: Q3 bad
- 7.14 Unit burns U206: U206 bad
- 7.15 Unit burns C22, C25, and/or C26: Check to be sure that ECN for three legged cap replacement has been performed

**8. ATTACHMENTS**

- 8.1 EGDM Fixture H188702 with IS200EGDM Test Card installed.

