g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-DS200DDTBG2A**

Test Procedure for a DS200DDTBG2A "DDTB Terminal Board"

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	John Madden	4/5/2007
B	Rewrite of procedure to clarify	Steve Pharris	2/17/11
C	Added clarity to Section 6, steps 6.2.2, 6.2.9, 6.2.13, 6.2.22, 6.2.24, and 6.2.38	G. Chandler	11/5/2012

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
John Madden	Steve Pharris	G. Chandler	Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
April 5, 2007	2/17/2011	11/5/2012	April 6, 2007

1. SCOPE

1.1 This is a functional testing procedure for an DS200DDTBG2A Terminal Board.

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 LOU-GED-DS200DDTB-A
3.1.2 N:\Design Folders\DS\DS200\DS200D\DDTB\Louisville Test prints (AB).pdf
3.1.3 N:\Design Folders\DS\DS200\DS200D\DDTB\Louisville G2 Test prints (AB).pdf
3.1.4 N:\Design Folders\DS\DS200\DS200D\DDTB\GEI-100219.pdf
3.1.5 N:\Design Folders\DS\DS200\DS200D\DDTB\Design Req's (helpful explanations).pdf
3.1.6 N:\Design Folders\DS\DS200\DS200D\DDTB\ECN's
3.1.7 N:\Design Folders\DS\DS200\DS200D\DDTB\G1AB Material List.pdf
3.1.8 N:\Design Folders\DS\DS200\DS200D\DDTB\G2AB Material List.pdf

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		Tenma Dual Power Supply (or Equivalent)
1	H188643	DS200DDTB TBPL Connector Breakout Board
1		DS3800 Power Supply
1	H188947	Transformer

6. TESTING PROCESS

6.1 Setup

6.1.1 Connect breakout box to

6.1.2 Make the following connections:

5V to TBPL-28

+15V to TBPL-52

-15V to TBPL-48

COM to TBPL-1 and TBPL-60

6.2 Testing Procedure

6.2.1 Apply Power

6.2.2 Connect TBPL-27 to +5V.

6.2.3 Verify the green DS-17 “ONLINE” LED is lit.

6.2.4 Set JP3 and JP9 to 1-2

6.2.5 Verify TBPL-45 & 47, = 0.0V

6.2.6 Move jumpers JP3 and JP9 to position 2-3

6.2.7 Verify TBPL-45 & 47 = –5V.

6.2.8 Set JP1, JP2, JP7, and JP8 to 2-3

6.2.9 Apply 10V between TB1-X1 and X2

6.2.10 Verify TBPL-45 = 14V

6.2.11 Reverse polarity at TB1-X1 and X2

6.2.12 Verify TBPL-45 = -14V

6.2.13 Apply 10V between TB1- X3 & X4

6.2.14 Verify TBPL-47 = 14V

6.2.15 Reverse polarity at TB1-X3 and X4

6.2.16 Verify TBPL-47 = -14V

6.2.17 Apply 10V across TB1-X5 (+) & X6 (-).

6.2.18 Verify TBPL-59 = 5V

6.2.19 Reverse polarity at TB1-X5 & X6

6.2.20 Verify TBPL-59 = -5V

6.2.21 Using transformer apply 480VAC single phase to TB3-1 and TB3-3.

6.2.22 Verify 2.4VAC at TBPL-55 to Com.

6.2.23 Move connection at TB3-1 and TB3-3 to TB4-1 & TB4-3

6.2.24 Verify 2.4VAC at TBPL-57 To Com.

6.2.25 Remove Transformer, you're done with it.

6.2.26 Apply 10V to the inputs listed below regardless of polarity

6.2.27 Verify output =5V regardless of polarity

6.2.28 Verify the corresponding LED illuminates

Input	Output	LED #
TB2-X7 & X8	TBPL-14	DS-1
TB2-X9 & X10	TBPL-15	DS-2
TB2-X11 & X12	TBPL-17	DS-3
TB2-X13 & X14	TBPL-18	DS-4
TB2-X15 & X16	TBPL-20	DS-5
TB2-YA & YB	TBPL-21	DS-6
TB2-Y1 & Y2	TBPL-23	DS-7
TB2-Y3 & Y4	TBPL-24	DS-8

6.2.29 Using the table below verify proper relay operation by taking the input pin to L

6.2.30 Verify the corresponding LED illuminates

Relay	LED#	Input	N/C	CMN	N/O
K1	DS-13	TBPL-8	TB2-X4	TB2-XB	TB2-X2
K2	DS-14	TBPL-9	TB2-X3	TB2-XA	TB2-X1
K3	DS-15	TBPL-11	TB5-1	TB5-3	TB5-2
K4	DS-16	TBPL-12	TB5-5	TB5-6	TB5-4

6.2.31 Connect a 10Kohm resistor in series with the 5V supply and your DMM

6.2.32 Connect from the side of the resistor connected to the DMM to the UUT according to the below table

6.2.33 Connect the (-) from each output to COM

6.2.34 Verify output changes from H to L as the input of each circuit is tied L

6.2.35 Observe the corresponding LED illuminates

Input	Led#	Meter (+) & 5V Pull-up	Meter (-) & Com
TBPL-2	DS-9	TB1-Y9	TB1-Y10
TBPL-3	DS-10	TB1-Y11	TB1-Y12
TBPL-5	DS-11	TB1-Y13	TB1-Y14
TBPL-6	DS-12	TB1-Y15	TB1-Y16

6.2.36 Set power supply for 0V

6.2.37 Using table below verify the output increases to rail as the input voltage is increased to 7V.

6.2.38 Reverse polarity on the inputs and verify output polarity reverses

Input	Output
TBPL-29 to Com	TB1-X13 to Com
TBPL-31 to Com	TB1-YA to Com
TBPL-33 to Com	TB1-Y3 to Com
TBPL-35 to Com	TB1-Y5 to Com

6.2.39 Connect a 1.2Kohm resistor across TB1-X15 and X16

6.2.40 Connect your DMM across this resistor + to TB1-X15

6.2.41 Apply 0-7Vdc to TBPL-29

6.2.42 Verify voltage across your load resistor go from 14Vdc down to almost 0.5Vdc

6.2.43 Reverse polarity on TBPL-29

6.2.44 Apply 0-7Vdc and you should read between 14 & 22Vdc across the output

6.2.45 Repeat 6.2.41-6.2.44 for input TBPL-31, with outputs TB1-Y1 (+) & TB1-Y2 (-).

6.2.46 Remove connection from TBPL-27

6.2.47 Verify TBPL-37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, & 59. = L

6.2.48 Apply a L to TBPL-2

6.2.49 Verify TBPL-37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, & 59. = 5V

6.2.50 Remove L from TBPL-2 and apply it to TBPL-3.

6.2.51 Verify TBPL-37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, & 59. = -5V

6.2.52 Apply a L to TBPL-2 and TBPL-3

6.2.53 Using table below verify the outputs = H when the correct input is tied to 5V

Inputs (with TBPL-2 & 3 LOW)	Outputs
TBPL-29	TBPL-37, 45, & 53
TBPL-31	TBPL-39, 47, & 55
TBPL-33	TBPL-41, 49, & 57
TBPL-35	TBPL-43, 51, & 59

6.2.54 6.2.54 TEST THE ID CHIP TBPL-26=DATA, TBPL-1=DCOM

6.3 ***TEST COMPLETE ***

7. NOTES

7.1 The test, as it was written, originally had a lot of theory involving the operation of this card. Amongst the theory was the discreet steps listed above. If you have any problems with this card reference the original procedure.