

g

GE Industrial Systems

Functional Testing Specification

*Renewal Services
Louisville, KY*

LOU-GED-DS200ITXS

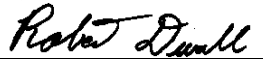
Test Procedure for an IGBT Snubber Card

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Monte Starling	7/25/02
B			
C			

© COPYRIGHT GENERAL ELECTRIC COMPANY

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

PREPARED BY Monte Starling	REVIEWED BY John Madden	REVIEWED BY	QUALITY APPROVAL 
DATE 7/25/02	DATE 7/26/02	DATE	DATE 08/09/02

Functional test procedure for

1. SCOPE

1.1 This is a functional testing procedure for a DS200ITXSG1 Snubber 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.

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
2		Fluke 85 DMM (or Equivalent)
1	#1 and #2	Tenma 72-2080 D.C. Power supply (or Equivalent)

<p>LOU-GED-DS200ITXSG1 REV. A</p>	<p>g</p> <p>GE Industrial Systems Renewal Services Louisville, KY</p>	<p>Page 3 of 7</p>
---------------------------------------	---	--------------------

6. TESTING PROCESS

6.1 Checks Prior to Applying Power

- 6.1.1 Verify that no solder shorts exist between adjacent pins.
- 6.1.2 Verify that all leads are properly soldered and connections are filleted and clipped.
- 6.1.3 Check that Capacitors C11, C12, C13, C14, C15, C16, C17, and C18 have their plus lead soldered to the plus side of the silk-screen.
- 6.1.4 Make sure PL connector is mounted with the high guard side facing the outside of the card.
- 6.1.5 Check to see that only pins 3, 4, 10, and 11 are missing from PL connector.
- 6.1.6 Establish that UPL and the LPL connectors are mounted with the high guard as shown on the silk-screen and that each has two pins.
- 6.1.7 Verify that all parts are mounted as per the silk-screen.

6.2 POWER TEST - ZENERS D1, D2, D3 and D4

- 6.2.1 Set DC Power Supply to current limit at 125 ma as follows:
 - 6.2.1.1 With Supply off connect a jumper across + and - terminals.
 - 6.2.1.2 Turn the current limit and voltage knob fully counterclockwise.
 - 6.2.1.3 Turn the Supply on and adjust I limit to 125 ma.
 - 6.2.1.4 Turn Supply off and remove jumper from the + and - terminals.
- 6.2.2 Connect DC Power Supply with a 1K-10W resistor (104X123AG 008) in series with the plus lead to E9 and the minus lead to E10. *Note: See Section 7, Connection Diagrams – D1 & D2 Circuit.*
- 6.2.3 Connect Digital Voltmeter #2 plus to E9 and minus to E10.
- 6.2.4 **Warning:** Do Not Exceed 20 VDC on Digital Voltmeter #2, as damage will result to the transistor.
- 6.2.5 Adjust the DC Power Supply slowly to 40 VDC, while watching the Voltage on Digital Voltmeter #2 it should read 17.1 to 19.7 VDC.
- 6.2.6 Turn the DC Power Supply voltage to zero and connect the plus lead (after the 1K resistor) to E10 and minus to E9.
- 6.2.7 Adjust the DC Power Supply slowly to 40 VDC, while watching the voltage on the Digital Voltmeter #2 it should read - 17.1 to -19.7 VDC.
- 6.2.8 Reduce Power Supply to zero volts, turn off Power Supply and remove leads from E10 and E9.

<p>LOU-GED-DS200ITXSG1 REV. A</p>	<p>g</p> <p>GE Industrial Systems Renewal Services Louisville, KY</p>	<p>Page 4 of 7</p>
--	---	---------------------------

6.2.9 Connect DC Power Supply with a 1K-10W resistor (104X123AG 008) in series with the plus lead to E11 and the minus lead to E12. *Note: See Section 7, Connection Diagrams – D3 & D4 Circuit.*

6.2.10 Connect Digital Voltmeter #2 plus to E11 and minus to E12.

6.2.11 **Warning:** Do Not Exceed 20 VDC on Digital Voltmeter #2, as damage will result to the transistor.

6.2.12 Adjust the DC Power Supply slowly to 40 VDC, while watching the Voltage on Digital Voltmeter #2 it should read 17.1 to 19.7 VDC.

6.2.13 Turn the DC Power Supply voltage to zero and connect the plus lead (after the 1K resistor) to E12 and minus to E11.

6.2.14 Adjust the DC Power Supply slowly to 40 VDC, while watching the voltage on the Digital Voltmeter #2 it should read - 17.1 to -19.7 VDC.

6.2.15 Reduce Power Supply to zero volts, Turn off Power Supply, remove 1K ohm resistor and connections to E11 and E12.

6.3 TRANSISTOR TESTS Q1, Q2, Q3 and Q4

6.3.1 Jumper UPL-1 to PL-7. *Note: See Section 7, Connection Diagrams – Transistor Q1 Circuit.*

6.3.2 Connect DC Power Supply with the plus lead to UPL-1 and the minus lead to PL-6.

6.3.3 Connect Digital Voltmeter #1 across the Supply, plus lead to Supply plus and the minus lead to Supply minus.

6.3.4 Connect Digital Voltmeter #2 plus to E9 and minus to E10.

6.3.5 Adjust DC Power Supply for 15 VDC on Digital Voltmeter #1.

6.3.6 Verify that Digital Voltmeter #2 reads 13.8 to 14.8 VDC.

6.3.7 Turn off Power Supply and remove jumper from UPL-1 to PL-7.

6.4 Q2 TESTS

6.4.1 Jumper UPL-2 to PL-7. *Note: See Section 7, Connection Diagrams – Transistor Q2 Circuit.*

6.4.2 Connect DC Power Supply with the plus lead to PL-6 and the minus lead to UPL-2.

6.4.3 Adjust DC Power Supply for 15 VDC on Digital Voltmeter #1.

6.4.4 Verify that Digital Voltmeter #2 reads 13.8 to 14.8 VDC.

6.4.5 Turn off Power Supply and remove jumper from UPL-2 to PL-7.

6.5 Q3 TESTS

<p>LOU-GED-DS200ITXSG1 REV. A</p>	<p>g</p> <p>GE Industrial Systems Renewal Services Louisville, KY</p>	<p>Page 5 of 7</p>
--	---	---------------------------

6.5.1 Jumper LPL-1 to PL-1. *Note: See Section 7, Connection Diagrams – Transistor Q3 Circuit.*

6.5.2 Connect DC Power Supply with the plus lead to LPL-1 and the minus lead to PL-2.

6.5.3 Connect Digital Voltmeter #2 plus to E11 and minus to E12.

6.5.4 Adjust DC Power Supply for 15 VDC on Digital Voltmeter #1.

6.5.5 Verify that Digital Voltmeter #2 reads 13.8 to 14.8 VDC.

6.5.6 Turn off Power Supply and remove jumper from LPL-1 to PL-1.

6.6 Q4 TESTS

6.6.1 Jumper LPL-2 to PL-1. *Note: See Section 7, Connection Diagrams – Transistor Q4 Circuit.*

6.6.2 Connect DC Power Supply with the plus lead to PL-2 and the minus lead to LPL-2.

6.6.3 Adjust DC Power Supply for 15 VDC on Digital Voltmeter #1.

6.6.4 Verify that Digital Voltmeter #2 reads 13.8 to 14.8 VDC.

6.6.5 Turn off Supply and disconnect all leads, testing is completed..

6.7 STATIC TESTS OF REMAINING COMPONENTS

6.7.1 Perform diode check on diodes D5 and D6. Verify diodes are not shorted or damaged.

6.7.2 Perform resistance checks on resistors R20 – R23. Verify no open conditions exist and that resistors have proper range and tolerance.

6.7.3 Verify that capacitors C1 – C10 are not shorted and are charging.

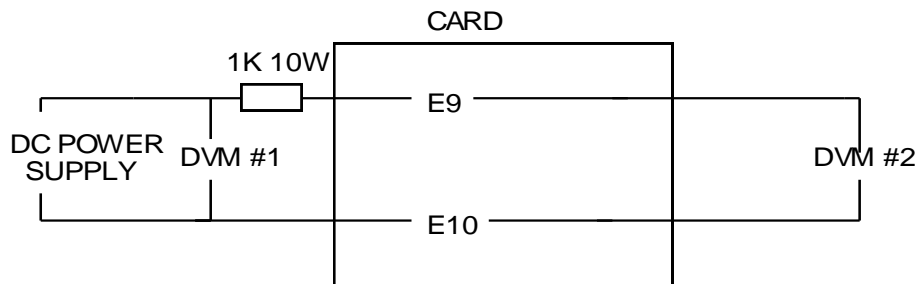
6.7.4 Apply RTV to D5 and D6 slots on the card. (If not already done).

6.8 *TEST COMPLETE *****

7. CONNECTION DIAGRAMS:

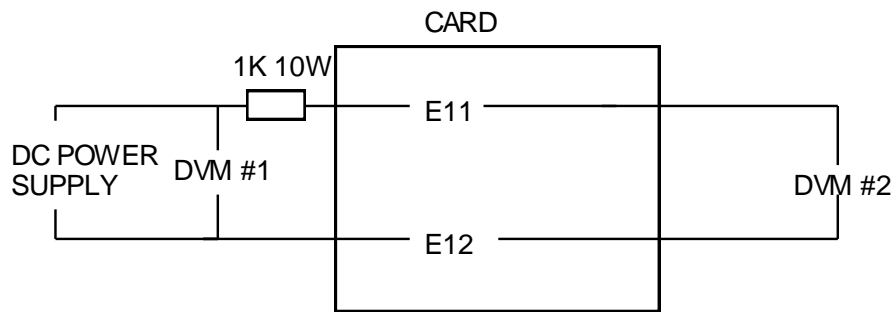
D1 & D2 CIRCUIT

DVM = Digital Voltmeter



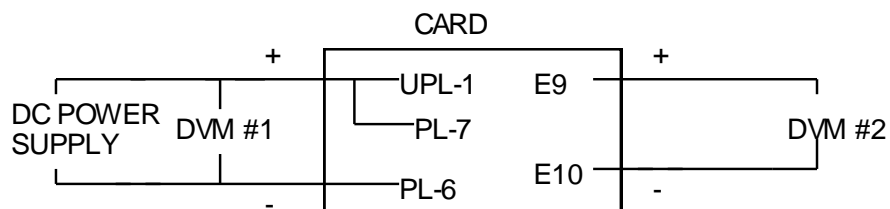
D3 & D4 CIRCUIT

DVM = Digital Voltmeter



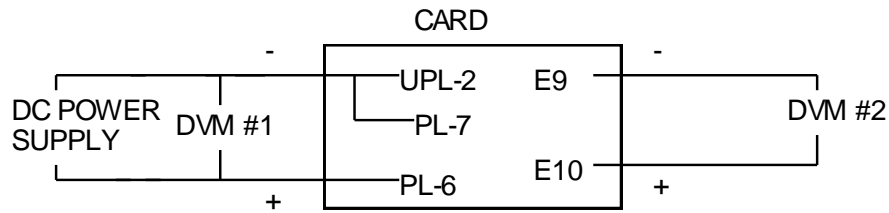
TRANSISTOR Q1 CIRCUIT

DVM = Digital Voltmeter



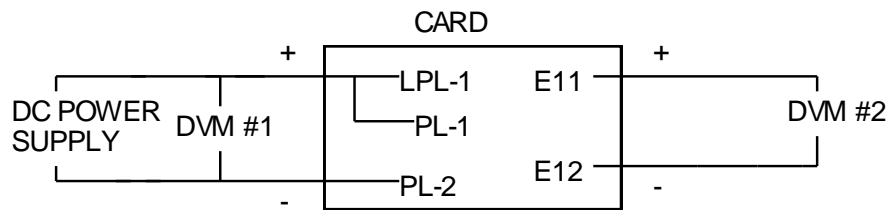
TRANSISTOR Q2 CIRCUIT

DVM = Digital Voltmeter



TRANSISTOR Q3 CIRCUIT

DVM = Digital Voltmeter



TRANSISTOR Q4 CIRCUIT

DVM = Digital Voltmeter

