

ABB

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-DS200IPCSGxxx

Test Procedure for a DS200IPCSG1xxx

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	J. Francis	01/31/2019

PREPARED BY
J. Francis

REVIEWED BY

REVIEWED BY

QUALITY APPROVAL
L. Groves

DATE

01/31/2019

DATE

DATE

DATE

1/31/2019

LOU-GED-DS200IPCSGxxxx Rev A	<div style="text-align: center;">  <i>Parts & Repair Services</i> <i>Louisville, KY</i> </div>	Page 2 of 8
---	--	--------------------

1. SCOPE

1.1 This is a functional testing procedure for a DS200TCTEG1Axx Mark V Trip Module 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 Check board's electronic folder for more information.

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
*	*	Called out in Factory Test below

6. TESTING PROCESS

6.1 Testing Procedure

6.1.1 Setup

6.1.1.1 Factory Test:

IGBT P3 SNUBBER CARD

Page 1 of 5
Filename: 200IPCS.DOC

1.0 APPLICABLE DOCUMENTS

Elementary Diagram
Material List

NOTE: G1 OR G2 USE THE SAME TEST.
G1 USES A TYPE CM300DY-24H MODULE
AND G2 USES A TYPE CM300DY-28H MODULE.

2.0 EQUIPMENT

Power Supply #1 0-100VDC 0-1A (connected to 115VAC receptacle), or equivalent.
Power Supply #2 0-100VDC 0-1A (connected to 115VAC receptacle), or equivalent.
Digital Voltmeter A
Digital Voltmeter B
Digital Voltmeter C

3.0 PROCEDURE

- 3.1 Verify that no solder shorts exist between adjacent pins.
- 3.2 Using the material list, verify that all parts shown on the silk-screen are present, and are assembled per the silk-screen.
- 3.3 Verify that all leads are properly soldered and connections are filleted and clipped.
- 3.4 Make sure PL connector is mounted with the high guard side facing the resistors and the zeners on the card.
- 3.5 Check to see that only pins 3, 4, 10, and 11 are missing from PL connector.
- 3.6 With an Ohmmeter check the following:
 - 3.6.1 Check R9 and R10 expect 950 to 1050 ohms.
 - 3.6.3 Check that PL-12, E1, and E2 are all tied together.
 - 3.6.4 Check that E3 & E4 are shorted together.

4.0 POWER TEST - ZENER TESTS

- 4.1 Set DC Power Supply #1 to current limit at 125 ma as follows:
 - 4.1.1 With Supply off connect a jumper across + and - terminals.
 - 4.1.2 Turn the I limit and voltage knob fully counterclockwise.
 - 4.1.3 Turn the Supply on and adjust I limit to 125 ma.
 - 4.1.4 Turn Supply off and remove jumper from the + and - terminals.

DISTRIBUTION LIST: **PWB TEST**

6.2

LOU-GED-DS200IPCSGxxxx Rev A	<div style="text-align: center; color: red; font-size: 2em; font-weight: bold;">ABB</div> <div style="text-align: center; font-weight: bold;">Parts & Repair Services Louisville, KY</div>	Page 4 of 8
---	--	--------------------

Page 2 of 5
Filename: 200IPCS.DOC

- 4.2 Connect DC Power Supply #1 with a 1K 2W resistor (104X123BH 031) in series with the plus lead to PL-7 and the minus lead to PL-6.
- 4.3 Connect Digital Voltmeter A across DC Power Supply #1 before the 1K 2W resistor, connect the plus lead to Supply plus and the minus lead to Supply minus.
- 4.4 Connect Digital Voltmeter B plus to E5 and minus to E6.
- 4.5a **Warning Do Not Exceed 20 VDC on Digital Voltmeter B as damage will result to the transistor.**
- 4.5b Adjust the DC Power Supply #1 to 40 VDC, while watching the Voltage on Digital Voltmeter B it should read 17.8 to 19.7 VDC.
- 4.6 Turn the DC Power Supply #1 voltage to zero and connect the plus lead (after the 1K resistor) to PL-5 and minus to PL-7.
- 4.7 Adjust the DC Power Supply #1 to 40 VDC, while watching the voltage on the Digital Voltmeter B it should read - 17.8 to -19.7 VDC.

ZENERS D1 and D2 TESTED

- 4.8 Connect DC Power Supply #1 with 1K 2W resistor in series with the plus lead to PL-1 and the minus lead to PL-2.
- 4.9 Connect Digital Voltmeter A across DC Power Supply #1 before the 1K 2W resistor, connect the plus lead to Supply plus and the minus to Supply minus.
- 4.10 Connect Digital Voltmeter B plus to E7 and minus to E8.
- 4.11a **Warning Do Not Exceed 20 VDC on Digital Voltmeter B as damage will result to the transistor.**
- 4.11b Adjust the DC Power Supply #1 to 40 VDC, while watching the Voltage on Digital Voltmeter B it should read 17.8 to 19.7 VDC.
- 4.12 Turn the DC Power Supply #1 voltage to zero and connect the plus lead (after the 1K resistor) to PL-2 and minus to PL-1.
- 4.13 Adjust the DC Power Supply #1 to 40 VDC, while watching the voltage on the Digital Voltmeter B it should read - 17.8 to -19.7 VDC.

ZENER D3 and D4 TESTED

LOU-GED-DS200IPCSGxxxx Rev A	<div style="text-align: center;">  </div> <div style="text-align: center;"> <i>Parts & Repair Services</i> <i>Louisville, KY</i> </div>	Page 5 of 8
---	---	--------------------

Page 3 of 5
Filename: 200IPCS.DOC

TRANSISTOR TEST

- 4.14 Connect DC Power Supply #1 with a 1K 2W resistor in series with the plus lead to PL-7 and the minus lead to PL-6.
- 4.15 Connect DC Power Supply #2 with a 1K 10W resistor (104X123AG 008) in series with the plus lead to PL-12 and the minus lead to PL-5.
- 4.16 Connect Digital Voltmeter A plus lead to DC Power Supply #2 and minus lead to PL-12.
- 4.17 Connect Digital Voltmeter B plus to E5 and minus to E6.
- 4.18 Adjust DC Power Supply #2 for 10 VDC (using a third Digital Voltmeter).
- 4.19 Verify that Digital Voltmeter A reads zero volts (no current flow).
- 4.20 Next slowly adjust DC Power Supply #1 until a voltage drop appears on Digital Voltmeter B continue to slowly adjust DC Power Supply #1 in the range 4.5 to 7.5 VDC on Digital Voltmeter B .
- 4.21 The voltage drop displayed on Digital Voltmeter A shows that the transistor is turn on..

C1-G1-E1 TRANSISTOR TESTED

- 4.22 Connect DC Power Supply #1 with a 1K 2W resistor in series with the plus lead to PL-1 and the minus lead to PL-2.
- 4.23 Connect DC Power Supply #2 with a 1K 10W resistor (104X123AG 008) in series with the plus lead to E4 and the minus lead to PL-2.
- 4.24 Connect Digital Voltmeter A plus lead to DC Power Supply #2 and minus lead to E4
- 4.25 Connect Digital Voltmeter B plus to E7 and minus to E8.
- 4.26 Adjust DC Power Supply # 2 for 10 VDC (using a third Digital Voltmeter).
- 4.27 Verify that Digital Voltmeter A reads zero volts (no current flow).
- 4.28 Next slowly adjust DC Power Supply #1 until a voltage drop appears on Digital Voltmeter B continue to slowly adjust DC Power Supply #1 in the range 4.5 to 7.5 VDC on Digital Voltmeter B
- 4.29 The voltage drop displayed on Digital Voltmeter A shows that the transistor is turn on.

C2E1-G2-E2 TRANSISTOR TESTED

Page 4 of 5
Filename: 200IPCS.DOC

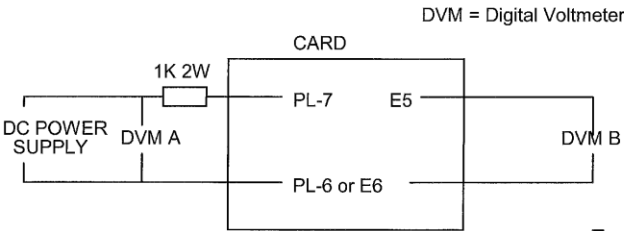
4.30 Apply test stamp to top of card.

5.0 SCOPE OF TEST

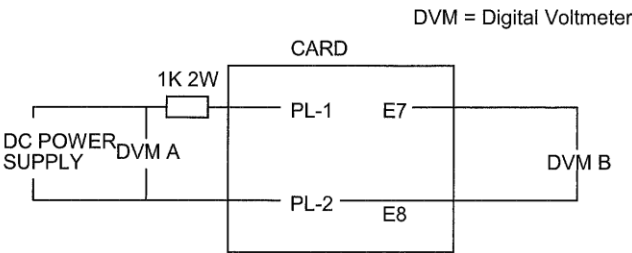
- 5.1 Check that resistor values for R1, R2, and R9, R10 are correct this is done in 3.6.1 and 3.6.2.
- 5.2 Step 3.6.3 determines that continuity exists from PL-12 to E1 and E2.
- 5.3 Step 3.6.4 determines that continuity exists between E3 and E4.
- 5.4 Steps 4.1 through 4.13 test that the Zeners are operating correctly and that the connections are good.
- 5.5 Steps 4.14 through 4.29 test that transistors in the module are operating correctly.

CONNECTION DIAGRAMS:

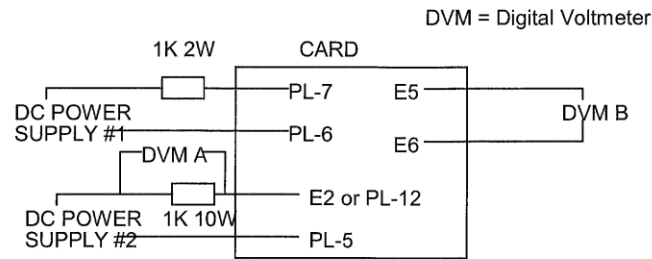
D1 & D2 CIRCUIT



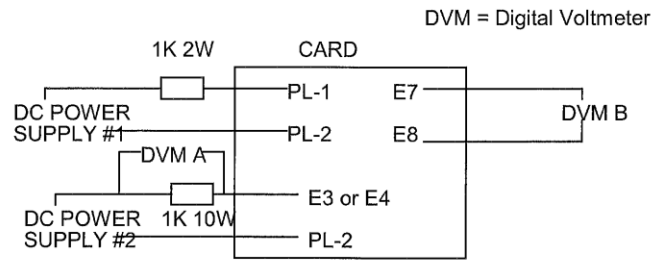
D3 & D4 CIRCUIT



TRANSISTOR CIRCUIT #1



TRANSISTOR CIRCUIT #2



REV	INIT	DESCRIPTION OF FAILURE	DATE
0	RJL	INITIAL RELEASE	5/20/94
1	RJL	CHANGE REF. DSIGNATOR ON CONNECTOR "APL" TO "PL"	7/07/94
2	RJL	NOTE ADDED, G1 OR G2 USE THE SAME TEST AND WHICH MODULE EACH USES.	12/07/94

6.6

6.7 ***TEST COMPLETE ***

LOU-GED-DS200IPCSGxxxx Rev A	ABB <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 8 of 8
---	---	--------------------

7. **NOTES**

7.1 None.

8. **ATTACHMENTS**

8.1 None.