

ABB

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-IC3600SVDC1

Test Procedure for a IC3600SVDC1

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Jimmy Morgan	5/20/2019
B			
C			

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DATE
5/20/2019

DATE
5/20/2019

DATE

DATE
5/22/2019

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1. **SCOPE**

1.1 This is a functional testing procedure for a IC3600SVDC1 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
2		Fluke 87 DMM (or Equivalent)
1		Function Generator
1		Decade Resistor Box
1		Break out box
1		Oscilloscope

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6. Modifications/Upgrades

6.1 Fill out if applicable.

7. Testing Process

7.1 Setup

7.2 Do not apply power yet, but set up card as follows

7.2.1 Connect Negative 12Vdc on pin (29)

7.2.2 +12Vdc on pin (27)

7.2.3 Negative 50Vdc on pins (10), (30)

7.2.4 Connect COM to pins (2),(50),(1),(51)

7.3 Testing Procedure

7.3.1 Connect fault pin (4) to VIB pin (7)

7.3.2 Connect decade resistor box set for 7.5K ohm +-30ohm between pin (4) and COM

7.3.3 Apply power to card. Verify that the light stays off when power is applied. Fault and vibration flip flop circuits should be in the cleared state. Verify that pins (49) and (14) are logic 1 (5.7 to 7.4V), verify pins (48) and (13) are logic 0 (less than .3v).

7.3.4 Open and short circuit detection.

7.3.4.1 Increase decade resistance until fault flip flow switches and light comes on for open circuit test. Pin (13) should be 5.7 to 7.4V and pin (14) should be less than .3v. Verify that decade resistance is between 30K and 60K ohm. Verify that pin (4) to COM is 6.2 to 7.5V

7.3.4.2 Return decade resistance to 7.5K ohms and push RESET on the card. Verify that the light goes out.

7.3.4.3 Decrease decade resistance until flip flop again latches and light comes on for short circuit test. Verify that this occurs when resistance is between 1.5 and 4.5K ohm. Verify that FLT to COM measures .4 to 1V.

7.3.4.4 Return decade resistance to 7.5K ohm. Reset card by momentarily connecting pin (20) to (27). Verify the light goes out.

7.3.5 Open and Short Circuit Detection

7.3.5.1 Set decade box to 250 ohm.

7.3.5.2 Connect pin (9) to Pin (27). Verify that open circuit now occurs when decade resistance is between .5K and 1K ohms. Short circuit should occur when decade

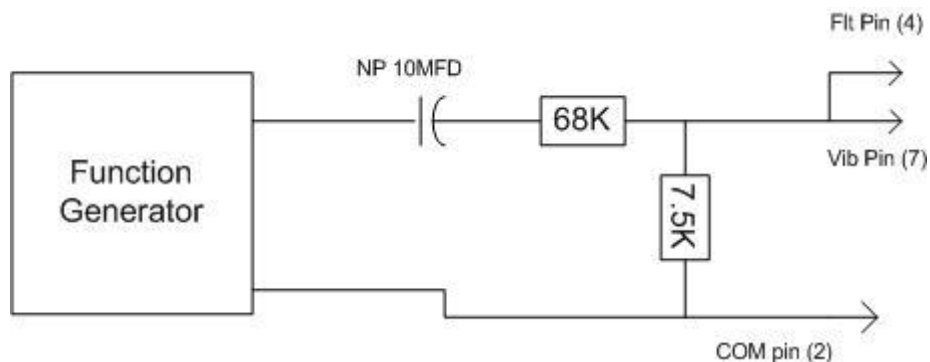
resistance is between 40 and 120 ohms. Return resistance to 250 ohms. Reset by momentarily connecting Pin (18) to COM, and verify that the light goes out.

7.3.5.3 Set decade resistance to 500 ohms.

7.3.5.4 Remove Pin (9) to Pin (27) connection. Connect Pin (6) to Pin (27). Verify that open circuit now occurs when resistance is 2.1K to 2.9K Ohms. Short circuit occurs between 135 and 350 ohms. Remove Pin (6) to Pin (27) connection.

7.3.6 Amplifier Gain Check

7.3.6.1 Remove decade resistor box. Connect the function generator circuit as listed below. Set function generator to output a sine wave 100hz at 0V output.



7.3.6.2 Connect O-scope from Pin (7) to COM.

7.3.6.3 Connect meter 1 to Vibration level jacks on front of card + and -. (V1)

7.3.6.4 Connect meter 2 to Pin (38) and COM. (V2).

7.3.6.5 Adjust R1 to center position. (count turns)

7.3.6.6 Note: The following set of measurements need time to stabilize between readings, please allow at least 2 Minutes for each.

7.3.6.6.1 Verify that dynamics meter reads less than 100mV

7.3.6.6.2 Set function generator so that the scope input measures:

7.3.6.6.3 100mV P-P, Verify V1 and V2 read .58V +/- .15V

7.3.6.6.4 400mV P-P, Verify V1 and V2 read 2.5V +/- .3V

7.3.6.6.5 Set R1 fully CW.

7.3.6.6.6 1.2V P-P Verify V1 and V2 read 7.2 – 8.5V

7.3.6.6.7 400mV P-P Verify V1 and V2 read 5.65V +/- .6V with a jumper between Pin (15) and Pin (2).

7.3.6.7 Amplifier frequency check

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- 7.3.6.7.1** Remove (15) to (2) jumper.
- 7.3.6.7.2** Adjust Function generator for 400mV P-P and maintain for all frequencies during the following tests.
- 7.3.6.7.3** Verify V1 and V2 read 2.7V as before.
- 7.3.6.7.4** Now set frequency to 400Hz and verify output (v2) drops less than 10%.
- 7.3.6.7.5** Set frequency to 40Hz and verify output increases less than 10% from the 100Hz initial reading.
- 7.3.6.7.6** Set frequency to 10Hz, Verify output changes less than +- 10%.
- 7.3.6.7.7** Set frequency to 3KHz, verify output drops by 30 to 50% from the 100Hz reading.
- 7.3.6.7.8** Reduce function generator output to zero. Set frequency to 100Hz. Adjust R1 so that pin (12) measures 5V +- .05V.

7.3.6.8 Comparator gain

- 7.3.6.9** Connect (V2) as follows, negative lead to pin (38) and positive lead on pin (12).
Slowly increase function generator voltage until excess vibration latch circuit trips and light comes on. Verify that this occurs when the meter reads less than +- 50mV.
Meter (V1) should read 5V +- .1v.

- 7.3.6.10** Verify that pin (48) is logic 1 (5.7 to 7.4V) and pin (49) is a logic 0.

7.3.7 Adjustment range

- 7.3.8** Remove power. Reduce function generator output to 0v.
- 7.3.9** Re-apply power. Latch should be reset and light out.
- 7.3.10** Adjust R1 so that set point reads 1.25V
- 7.3.11** Adjust R1 so that set point reads 8v.
- 7.3.12** Adjust R1 so set point reads 5V as before. Remove power.

7.4 Load regulation

- 7.4.1** Connect (V2) between pin (38) and COM. Connect a 4K Ohm resistor between vibration level + and – jacks on front of card
- 7.4.2** Apply power and increase function generator until meter reads 5V. Verify that voltage across the resistor is 4.8 to 5.2V
- 7.4.3** Decrease function generator output to 0 and reset card.

7.5 Open bus detection

- 7.5.1** Verify light is off.

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7.5.2 Open the -12V connection. Light should come on. Reconnect -12V, Momentarily short (4) to COM and reset. Light should go off

7.5.3 Open the COM connection to the card. Light should come on. Reconnect COM and momentarily short (4) to COM and reset, light goes off.

7.5.4 Remove all power.

7.6 Holding capacitor and discharge circuit

7.6.1 Verify the light is out and (13) is low. Trip circuit by applying function generator signal at 100Hz and slowly increasing amplitude. Pin (48) is logic 1 (5.7 to 7.4V).

7.7 End of test.

7.8 Post Testing Burn-in **Required** ☐ **Yes** ☐ **No**



Note: All MARK I, II, & III Turbine related cards require a post testing burn-in of 100 hours.

7.8.1 Apply BUS or Operational power to the card for a period of 100 hours.

7.8.2 Re-test card while warm using the above procedure.

7.9 *TEST COMPLETE *****

8. Notes

8.1 None at this time?

9. Attachments

9.1 None at this time?