



GE Energy

Functional Testing Specification

Parts & Repair Services
Louisville, KY

LOU-GED-IS200SHRAH2A

Test Procedure for IS200SHRAH2A

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Functional test procedure for a IS200SHRAH2A card.

1. **SCOPE**

1.1 This is a functional testing procedure for the IS200SHRAH2A.

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 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
1	H188701	UTS Tester
1		28V Adjustable Power Supply
1		Fluke 85 DMM (or Equivalent)

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6. TESTING PROCESS

6.1 Setup

6.1.1 Get the required PS and jumper cables needed to make connections

6.2 Testing Procedure

6.2.1 Put all 20MA/VDC jumpers to 20MA.

6.2.2 Put all RET/OPEN jumpers to RET.

6.2.3 Apply positive of the 28V PS to JA1-2 and negative to JA1-1.

6.2.4 For the following measurement use negative of 28V PS as common.

6.2.5 Verify 27.8 to 28.2V on JA1-20,JA1-23,JA1-41.

6.2.6 With 500 ohm load across DVM leads verify 23.8V to 24.2V on TB1-1, TB1-5, TB1-9, TB1-13, TB1-17, TB1-21, TB1-25, TB1-29, TB1-33, TB1-37.

6.2.7 Remove the 28V PS from the board.

6.2.8 With a 2VDC PS (+ - 3mv) apply the neg side to TB1-4 (RET?) and the pos side to TB1-2 (20MA?) through a 249 ohm (+ - 2 ohms) resistor.

6.2.9 Verify .98 to 1.02 VDC between JA1-24 (AIN?HFX) and JA1-3 (AIN?LFX).

6.2.10 Remove PS and DVM in above 2 steps and repeat the 2 steps using 20MA? = TB1-6, RET? = TB1-8, AIN?HFX = JA1-44, AIN?LFX = JA1-45.

6.2.11 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-10, RET? = TB1-12, AIN?HFX = JA1-25, AIN?LFX = JA1-4.

6.2.12 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-14, RET? = TB1-16, AIN?HFX = JA1-26, AIN?LFX = JA1-5


6.2.13 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-18, RET? = TB1-20, AIN?HFX = JA1-46, AIN?LFX = JA1-47..

6.2.14 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-22, RET? = TB1-24, AIN?HFX = JA1-27, AIN?LFX = JA1-6.

6.2.15 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-26, RET? = TB1-28, AIN?HFX = JA1-28, AIN?LFX = JA1-7

6.2.16 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-30, RET? = TB1-32, AIN?HFX = JA1-29, AIN?LFX = JA1-8

6.2.17 Remove PS and DVM in above step and repeat the step using 20MA? = TB1-34, RET? = TB1-36, AIN?HFX = JA1-48, AIN?LFX = JA1-49

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- 6.2.18** Remove PS and DVM in above step and repeat the step using 20MA? = TB1-38, RET? = TB1-40, AIN?HFX = JA1-31, AIN?LFX = JA1-50
- 6.2.19** Remove the PS and the DVM in the above 2 steps.
- 6.2.20** Put all 20MA/VDC jumpers to VDC.
- 6.2.21** With JA-21 as common apply a 12KHZ , 4.0V RMS sine wave with a DC offset of +1V to TB1-3 (VDC?).
- 6.2.22** Verify .98 to 1.02 VDC between JA1-24 (AIN?HFX) and JA1-3 (AIN?LFX).
- 6.2.23** Verify 3.9 to 4.1 VRMS between JA1-52 (HART?A) and JA1-53 (HART?B).
- 6.2.24** Remove the waveform in above 3 steps and repeat the 3 steps using VDC? = TB1-7, AIN?HFX = JA1-44, AIN?LFX = JA1-45, HART?A = JA1-32, HART?B = JA1-10.
- 6.2.25** Repeat the previous step using VDC? = TB1-11, AIN?HFX = JA1-25, AIN?LFX = JA1-4, HART?A = JA1-33, HART?B = JA1-11.
- 6.2.26** Repeat the previous step using VDC? = TB1-15, AIN?HFX = JA1-26, AIN?LFX = JA1-5, HART?A = JA1-54, HART?B = JA1-55.
- 6.2.27** Repeat the previous step using VDC? = TB1-19, AIN?HFX = JA1-46, AIN?LFX = JA1-47, HART?A = JA1-34, HART?B = JA1-12.
- 6.2.28** Repeat the previous step using VDC? = TB1-23, AIN?HFX = JA1-27, AIN?LFX = JA1-6, HART?A = JA1-35, HART?B = JA1-13
- 6.2.29** Repeat the previous step using VDC? = TB1-27, AIN?HFX = JA1-28, AIN?LFX = JA1-7, HART?A = JA1-56, HART?B = JA1-57
- 6.2.30** Repeat the previous step using VDC? = TB1-31, AIN?HFX = JA1-29, AIN?LFX = JA1-8, HART?A = JA1-36, HART?B = JA1-14
- 6.2.31** Repeat the previous step using VDC? = TB1-35, AIN?HFX = JA1-48, AIN?LFX = JA1-49, HART?A = JA1-37, HART?B = JA1-15
- 6.2.32** Repeat the previous step using VDC? = TB1-39, AIN?HFX = JA1-31, AIN?LFX = JA1-50, HART?A = JA1-58, HART?B = JA1-59.
- 6.2.33** Between TB1-45 (OUT?) and JA1-16 (OUTP?A) verify < 2 ohms.
- 6.2.34** Between OUT? and JA1-38 (OUTP?B) verify 99.5 to 101.5 ohms.
- 6.2.35** Between OUT? and JA1-17 (OUTP?C) verify 50 to 52 ohms.
- 6.2.36** Between TB1-46 (OUTRET?) and JA1-19 verify < 2 ohms.

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- 6.2.37** Apply a 10KHZ 4V RMS sinewave, no offset through a 2K resistor to OUT? using SCOM (corner metal ring labeled E2) as a common point. Verify a 2.2 to 2.4V RMS signal on OUTP?C.
- 6.2.38** Move the signal input on OUT? To OUTRET? And reduce frequency to 1KHZ.
- 6.2.39** Verify between .5 to .8V RMS on JA1-19
- 6.2.40** Repeat the above 7 steps using OUT? = TB1-47, OUTRET? = TB1-46, OUTP?A = JA1-39, OUTP?B = JA1-60, OUTP?C = JA1-18.
- 6.2.41** Remove all connections.
- 6.2.42** Connect one lead from the DVM to SCOM (E2). Connect the other lead to the following pins and verify they all have more than 1M ohms to SCOM: TB1-1, TB1-4, TB1-5, TB1-8, TB1-9, TB1-12, TB1-13, TB1-16, TB1-17, TB1-20, TB1-21, TB1-24, TB1-25, TB1-28, TB1-29, TB1-32, TB1-33, TB1-36, TB1-37, TB1-40, TB1-45, TB1-46, TB1-47, TB1-48.
- 6.2.43** Connect one lead from the DVM to SCOM (E2). Connect the other lead to each of the center pins of the 20MA?VDC jumpers and verify they all have more than 1M ohms to SCOM. Leave the jumpers on VDC while doing this.
- 6.2.44** Verify continuity between each of the following pairs of pins: JA1-2 & JA1-20, JA1-2 & JA1-23, JA1-2 & JA1-41, JA1-1 & JA1-21, JA1-1 & JA1-22, JA1-1 & JA1-42, JA1-9 & JA1-30, JA1-9 & JA1-40, JA1-9 & JA1-43, JA1-9 & JA1-51, JA1-9 & JA1-61.
- 6.2.45** The board ID pins are JA1-62 (DATA) and JA1-61 (GND). Verify the board ID EPROM matches the board model number by reading it on the UTS 3000 system. Use the left connector on the UTS. g3 (GND) to JA1-61 and g4 (DATA) to JA1-62.

6.3 *TEST COMPLETE*****

7. NOTES

7.1 None at this time.

8. Attachments

8.1 None at this time.