g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-IS200VATFG1**

Test Procedure for an IS200VATFG1

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

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1. SCOPE

1.1 This is a functional testing procedure for a 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
1		Fluke 87 DMM (or Equivalent)
1		GDPA 27 kHz, Square-wave Output Power Supply
1		High Accuracy Voltmeter (5 digits min.); Fluke 45 or equivalent
1		DS200MBHAG1PR1A Multi-Bridge Com-Link Hub Board
1		12 VDC, 1.2 Amp Power Supply for MBHA; HP6214B or equivalent
1		Line transformer for GDPA (0.5 - 5 KVA)
1		200 VDC regulated and adjustable power supply, 10W min.
1		Simplex Fiber Optic Cable, Qty = 2, Length = 36" Each
1		Frequency Counter, High Resolution (6 digits min.); HP5326B or equivalent
1		Terminator for Frequency Counter Input - Series R-C Across Input (R=82 Ohm, C=220 pF)
1		Digital Storage Scope, 2-Chnl, 100 MS/sec Minimum.

6. TESTING PROCESS

6.1 Setup

6.1.1 Solder REF TP to SHLD TP with #20 bus wire (min.)

6.1.2 Verify GDPA output is adjusted for 48 VAC square-wave (flat top is ±48 V pk)

6.1.3 Connect the GDPA output 1, 2, 3, or 4GDPL to VATF input J1 or J2.

6.1.4 On the MBHA, remove U1 (socketed PLD) install the following jumpers in the socket: pin 17 to 18 and pin 19 to 20.

6.1.5 On the MBHA the following components are connected to DCOM: GSTAB, TP21, and TP22.

6.1.6 Install the fiber optic cables between VATF-VBA to MBHA-U6 and connect VATF-VCA to MBHA-U7.

6.1.7 Connect the 12 VDC supply to MBHA TBSA-1 (Pos) and TBSA-2 (Neg). Verify +5 VDC on the MBHA and measure from TP20 and DCOM.

6.1.8 The electrical signal corresponding to VBA and VCA are measured on the left lead of resistors R14 and R15 respectively. Note that the left lead is **not** connected to the adjacent capacitor. VBA and VCA are low active, where low is approximately 2V and high is 5 V.

6.1.9 The HP frequency counter will measure the frequency of VBA and VCA.

6.2 Testing Procedure

6.2.1 Note: On the VATF, REF TP connects to both ACOM and DCOM.

6.2.2 Measure resistance from STAB B1 to TPB, and from STAB C1 to TBC. Both resistances should be 4.96 - 5.00 Mega Ohms.

6.2.3 Use the DMM to verify the following voltages with respect to REF (TP3):

Signal	*Measure At*	*Specification*
P15	D1 cathode	13.0 to +17.0 VDC
N15	D4 anode	-13.0 to -17.0 VDC
P5	C14 + (in front of U8)	4.75 to +5.25 VDC

Table 1: Power Supply Verification

6.2.4 Use the frequency counter to verify that the VATF clock frequency = 3.9960 to 4.0040 MHz @ oscillator U9-5 (numbered like an 8-pin dip).

6.2.5 Use the oscilloscope to verify the pulse width of VBA and VCA, measured on the MBHA are 230 to 375 ns.

6.2.6 In this step, the frequency scaling of the TPB input will be tested. The variable power supply, connected between TPB and REF TP, will be used to input 3 dc voltages into TPB, the frequency of VBA (FBA) will be measured, the Hz/Volt scaling will be determined, and the results will be compared to the specified values.

TPB (Vdc) measure w/ high accuracy voltmeter	*FBA (kHz)*	*Gain, Calc (kHz/V)*	*F0 Spec (kHz)*	*Gain Spec (kHz/V)*	*Pass (y/n)*
(shorted to REF TP)	F0	N/A	1010 - 1030	N/A	y/n
V1 = +200.00	F1	(F1-F0) / V1	N/A	0.608 - 0.615	y/n
V2 = - 200.00	F2	(F0-F2) / V2	N/A	0.608 - 0.615	y/n

Table 2: Output Frequency Verification

6.2.7 Repeat the previous step for input TPC and measure the frequency of VCA (FCA).

6.3 ***TEST COMPLETE ***

7. NOTES

7.1 None at this time?

8. ATTACHMENTS

8.1 None at this time?