g GE Industrial Systems *Renewal Services* *Louisville,KY*	**Functional Testing Specification** **LOU–GED-DS3800NSWB**

Test Procedure for a Switching card

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	J. Madden	07/22/02
B			
C			

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
J. Madden			Robert Dunell
DATE	**DATE**	**DATE**	**DATE**
07/22/02			08/09/02

Functional test procedure for a Switching Card

1. SCOPE

1.1 This is a functional testing procedure for a DS3800NSWB SwitchingCard.

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 DS3800NSWB Documentation folder

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
1		Fluke 85 DMM (or Equivalent)
1	H033772	DS3800 Power Supply
1	H033787	Standard DS3800 connector box
1		Rainbow box
1		Oscilloscope
1		Function Generator
1		Dual 0-30 Vdc Power Supply
1		DS3800DSWB Daughter Card

6. TESTING PROCESS

6.1 Setup

6.1.1 Connect H033772 (Power Supply Box) and H033787 (DS3800 Connector box) to Rainbow box.

6.1.2 Connect DS3800DSWB daughter card to UUT and install in connector box.

Note:

6.2 Testing Procedure

6.2.1 .

9.1.0 SCOPE

This document establishes the performance requirement and recommended tests for the
identified as:

DS3800

This specification will check digital logic, analog transfer functions and component tolerances.

9.2.0 TEST EQUIPMENT & DOCUMENTATION

9.2.1 Standard Equipment Required:

Test equipment shall be provided which meets the requirements and accuracies prescribed in this specification. All test equipment is defined by Quality Control Standard_____ except as noted in Section 9.2.2.

9.2.2 Special Equipment Required:

NONE

9.3.0 POWER SUPPLY REQUIREMENTS AND PIN CONNECTIONS

The following regulated input voltage sources are required to test this product element.

REV. 1	REV. 4	REV. 7	DL109	9-7-90	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	8-7-90				DS3800NSWB
REV. 3	REV. 6	W.D. Brackman				9BA 9AA

NOMINAL VOLTAGE [1]	MAXIMUM CURRENT [2] (AMPS)	MIN.ADJ. RANGE	% REG.	MAXIMUM VOLTAGE (VDC)	PIN(S) [4]
P28		10%	±5%	+32.0	PA75
P15		10%	±5%	+18.0	PA5
N15		10%	±5%	-18.0	PA7
P5		10%	±5%	+7.0	PA3,PA45,PA77
ACOM	-	-	-	-	PA9
DCOM	-	-	-	-	PA43,PA79
P10	20 ma	10%	±5%	+11	Signal
P15	10 ma	100%		+15.0	Signal
N15	10 ma	100%		+15.0	Signal

NOTES:

1. Nominal voltage used unless otherwise specified.
2. Elements requiring more than the maximum value may suffer damage.
3. Voltages above maximum voltage may impair element life.
4. Connect all DCOM pins together first, then wire to ACOM. Analog signal power supplies, oscilloscopes, and voltmeters should connect to ACOM for the most accurate readings.

The maximum power dissipation of this product element during test is:

_____ Watts

REV. 1	REV. 4	REV. 7	DL109		GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	9-9-80				DS3800NSWB 9CA 9BA
REV. 3	REV. 6	W. D. Brackman				

9.4.0 SETUP AND INITIAL LOADING

9.4.1 Connections

None

9.4.2 Element Loads

Connect as required in section 9.6.5.

9.4.3 Daughter Board

9.4.3.1 Component material list required for modification:

None required

9.4.3.2 Circuit diagram as modified:

No modifications required

9.4.3.3 Set Pots as follows:

R1,

R2,

9.5.0 SIGNAL LEVELS

9.5.1 TTL Input Levels

Unless otherwise specified, the following input data levels shall be applied to the element at TTL inputs:

Logic "0" level = 0.4 $\pm$ 0.4VDC

Logic "1" level = 2.2 $\pm$ 0.2VDC

The signal source for these logic levels shall be capable of sinking 10 ma in the logic "0" state and sourcing 0.5 ma in the logic "1" state.

The rise and fall time of the signals shall be less than 100 and more than 3 nanoseconds. The TTL input signals shall be applied at a rate within a range of DC to 1 KHZ, except as noted for time delays.

9.5.2 Process Inputs Levels

None

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80				DS3800NSWB
REV. 3	REV. 6	MADE BY W.D. Brackman				CONT. ON SH. 9DA SH. NO. 9CA

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9.5.0 SIGNAL LEVELS (Cont'd)

9.5.3 TTL Output Signals

Unless otherwise specified, the following output data levels shall be verified:

Logic "0" level = 0.0 to 2.0 VDC

Logic "1" level = 2.0 to 5.0 VDC

An "X" = Do not care or not to be tested

NOTE:

1. Characters within quotation (") marks are used in the test vector table of Section 9.6.2.2.

9.6.0 TEST PROCEDURE

9.6.1 Preliminary Inspection

The element shall be inspected prior to application of power to verify that it is assembled according to the assembly drawing.

9.6.2 Digital Tests

9.6.2.1 Current Limit Test

With nominal power supply voltages applied to element under test, it should not exceed maximum current specified in paragraph 9.3.0. Repeat with normal voltages plus 10%. The element shall be considered to have failed test if it draws more than maximum specified.

9.6.2.2 Test Vector Sequence

None

9.6.3 Hybrid Interface Tests

None

9.6.4 Analog Tests

None

9.6.5 Special Tests

9.6.5.0 Switch Tests (see sheet 4AA-4CA)

9.6.5.1.1 Connect G1SA01 (PA30) through 10K ohm to a +10.0±0.1VDC sourc

9.6.5.1.2 Connect G1SB01 (PA35) " " " " "

9.6.5.1.3 Connect G1SC01 (PA40) " " " " "

9.6.5.1.4 Connect G1SD01 (PA25) " " " " "

9.6.5.1.5 Connect G2SB01 (PA74) " " " " "

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 8-7-80	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80				DS3800NSWB
REV. 3	REV. 6	MADE BY W.D. Brackman				CONT. ON SH. 9EA SH. NO. 9DA

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9.6.5 Special Tests (Cont'd)

9.6.5.1.6 Connect G2SB01 (PA63) through 10K ohm to a +10.0±0.1VDC source.
9.6.5.1.7 Connect G2SC01 (PA71) " " " "
9.6.5.1.8 Connect G2SD01 (PA80) " " " "
9.6.5.1.9 Connect FC1NC (PA31) " " " "
9.6.5.1.10 Connect FC1NO (PA33) " " " "
9.6.5.1.11 Connect FC2NC (PA36) " " " "
9.6.5.1.12 Connect FC2NO (PA32) " " " "

9.6.5.2.1 Connect G1SA02 (PA27) to A com.
9.6.5.2.2 Connect G1SB02 (PA38) to A com.
9.6.5.2.3 Connect G1SC02 (PA37) to A com.
9.6.5.2.4 Connect G1SD02 (PA28) to A com.
9.6.5.2.5 Connect G2SA02 (PA76) to A com.
9.6.5.2.6 Connect G2SB02 (PA66) to A com.
9.6.5.2.7 Connect G2SC02 (PA72) to A com.
9.6.5.2.8 Connect G2SD02 (PA78) to A com.
9.6.5.2.9 Connect FC1CT (PA34) to A com.
9.6.5.2.10 Connect FC2CT (PA29) to A com.
9.6.5.2.11 Connect the negative terminal of the 10.0 VDC source to A com.

9.6.5.3.1 Connect all power busses to the board.

9.6.5.4.1 Visually observe the state of the LED's on the printed wiring board under test. IMOK should be on, and all other LED's should be off.

9.6.5.5.1 Install a jumper from TA20 to D com. Install a jumper from TA6 to Dcom. All LED's except IMOK should be in the off state.

9.6.5.6.0 Group 1 Switch Tests (see sh.4AA)

9.6.5.6.1 Connect G1SAIN (PA62) to Dcom. Note that "S1A" LED turns on and the voltage at G1SA0a (PA30) switches from 10.0 ± 0.1 VDC to 0.1 ± 0.1VDC.

9.6.5.6.2 Connect G1SBIN (PA59) to Dcom. Note that"S1B" LED turns on and the voltage at G1SB01 (PA35) switches from 10.0 ± 0.1 VDC to 0.1 ± 0.1VDC.

REV. 1 810228 DJ Update	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 8-7-80	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	TestSpecifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80				
REV. 3	REV. 6	MADE BY W.D.Brackman				DS3800NSWB CONT. ON SH. 9FA SH. NO. 9EA

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9.6.5 Special Tests (cont'd)

9.6.5.6.3 Connect G1SCIN (PA60) to Dcom. Note that "S1C" LED turns on and the voltage at G1SB01 (PA40) switches from 10.0 ±0.1VDC to 0.1 ± 0.1VDC.

9.6.5.6.4 Connect G1SDIN (PA61) to Dcom. Note that "S1D" LED turns on and the voltage at G1SD01 (PA25) switches from 10.0 ± 0.1VDC to 0.1 ± 0.1VDC.

9.6.5.6.5 Remove the connections connecting G1SAIN (PA62), G1SBIN (PA59), G1SCIN (PA60), and G1SDIN (PA61) to Dcom. LEDs "S1A","S1B","S1C", and "S1D" should turn off. G1SA01 (PA30), G1SB01 (PA35), G1SC01 (PA40), and G1SD01 (PA25) should return to 10.0 ± 0.1 VDC.

9.6.5.6.6 Remove the jumper from TA20 to DCOM and install a jumper from TA21 to DCOM. LED's "S1A", "S1B", "S1C" and "S1D" should turn on when the jumper is installed. G1SA01 (PA30), G1SB01 (PA35), G1SC01 (PA40), and G1SD01 (PA25) should return to 0.1 ± 0.1VDC.

9.6.5.6.7 Connect G1SAIN (PA62) to D COM. "S1A" LED should turn off and G1SA01 (PA30) should switch to 10.0 ± 0.1VDC.

9.6.5.6.8 Connect G1SBIN (PA59) to D COM "S1B" LED should turn off and G1SB01 (PA35) should switch to 10.0 ± 0.1VDC.

9.6.5.6.9 Connect G1SCIN (PA60) to DCOM. "S1C" LED should turn off and G1SC01 (PA40) should switch to 10.0 ± 0.1VDC.

9.6.5.6.10 Connect G1SDIN (PA61) to DCOM. "S1D" LED should turn off and G1SD01 (PA25) should switch to 10.0 ± 0.1VDC.

9.6.5.6.11 Remove the connections from G1SAIN (PA62), G1SBIN (PA59), G1SCIN (PA60), and G1SDIN (PA61) to D COM.

9.6.5.6.12 Remove the jumper from TA21 to D COM.

9.6.5.7.0 Group 2 Switch Tests (See sh. 4BA)

9.6.5.7.1 Connect G2SAIN (PA42) to D COM. Note that "S2A" LED turns on and the voltage at G2SA01 (PA74) switches from 10.0 ± 0.1 VDC to 0.1 ± 0.1VDC.

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 8-7-80 W.D.B.	GENERAL ELECTRIC	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80			DSD SALEM, VA. U.S.A.	DS3800NSWB
REV. 3	REV. 6	MADE BY W.D.Brackman				CONT. ON SH. 9GA SH. NO. 9FA

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9.6.5 Special Tests (Cont'd)

9.6.5.7.2 Connect G2SBIN (PA41) to D COM. Note that "S2B" LED turns on and the voltage at G2SB01 (PA63) switches from 10.0 ± 0.1VDC to 0.1 ± 0.1 VDC.

9.6.5.7.3 Connect G2SCIN (PA47) to D COM. Note that "S2C" LED turns on and the voltage at G2SC01 (PA71) switches from 10.0 ± 0.1 VDC to 0.1 ± 0.1VDC.

9.6.5.7.4 Connect G2SDIN (PA48) to D COM. Note that "S2D" LED turns on and the voltage at G2SD01 (PA80) switches from 10.0 ± 0.1VDC to 0.1 ± 0.1 VDC.

9.6.5.7.5 Remove the connections connecting G2SAIN (PA42), G2SBIN (PA41), G2SCIN (PA47), and G3SDIN (PA48) to D COM. LED's "S2A", "S2B", "S2C", and "S2D" should turn off. G2SA01 (PA74), G2SB01 (PA63), G2SC01 (PA71), and G2SD01 (PA80) should return to 10.0 ± 0.1VDC.

9.6.5.7.6 Remove the jumper from TA6 to D COM and install a jumper from TA7 to D COM. LED's "S2A", "S2B", "S2C" and "S2D" should turn on when the jumper is installed. G2SA01 (PA74) G2SB01 (PA63), G2SC01 (PA71), and G2SD01 (PA80) should return to 0.1 ± 0.1VDC.

9.6.5.7.7 Connect G2SAIN (PA42) to D COM. "S2A" LED should turn off & G2SA01 (PA74) should switch to 10.0 ± 0.1VDC.

9.6.5.7.8 Connect G2SBIN (PA41) to D COM. "S2B" LED should turn off and G2SB01 (PA63) should switch to 10.0 ± 0.1VDC.

9.6.5.7.9 Connect G2SCIN (PA47) to D COM. "S2C" LED should turn off and G2SC01 (PA71) should switch to 10.0 ± 0.1VDC.

9.6.5.7.10 Connect G2SDIN (PA48) to D COM. "S2D" LED should turn off and G2SD01 (PA80) should switch to 10.0 ± 0.1VDC.

9.6.5.7.11 Remove the connections from G2SAIN (PA42), G2SBIN, (PA41) G2SCIN (PA47) and G2SDIN (PA48) to D COM.

9.6.5.8.0 Form C Switch Tests (See Sh. 4CA)

9.6.5.8.1 Connect FC1IN (PA44) to D COM. Note that "FC1" LED turns on. The voltage at FC1 NC (PA31) should switch from 0.1 ± 0.1 VDC to 10.0 ± 0.1VDC. And the voltage at FC1 NO (PA33) should switch from 10.0 ± 0.1VDC.to 0.1 ± 0.1VDC.

REV. 1820128 DJ Update	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 7-7-80 W. D. B.	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80				
REV. 3	REV. 6	MADE BY W. D. Brackman				D S 3 8 0 0 N S W B CONT. ON SH. 9HA SH. NO. 9GA

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9.6.5 Special Tests Cont'd)

9.6.5.8.2 Connect FC2IN (PA46) to D COM. Note that "FC2" LED turns on. The voltage at FC2NC (PA36) should switch from 0.1 ± 0.1VDC to 10.0 ± 0.1VDC, and the voltage at FC2NO(PA32) should switch from 10.0 ± 0.1VDC to 0.1 ± 0.1VDC.

9.6.5.8.3 Remove the connection between FC1IN (PA44) and D COM. "FC1" LED should turn off, FC1NC (PA31) should switch to 0.1 ± 0.1VDC and FC1NO (PA33) should switch to 10.0 ± 0.1VDC.

9.6.5.8.4 Remove the connection between FC2IN (PA46) and D COM. "FC2" LED should turn off, FC2NC (PA36) should switch to 0.1 ± 0.1VDC and FC2NO (PA32) should switch to 10.0 ± 0.1VDC.

9.6.5.8.5 Remove the 10.0 VDC source connected to the 10K ohm loads section 9.6.5.

9.6.5.9.0 Comparator Tests (See sh. 4DA)

9.6.5.9.1 Connect TA1 to A COM. Measure the voltage at TB23. The voltage at TB23 should be 13.4 ± 0.4VDC. Remove the connection between 1 and A COM.

9.6.5.9.2 Apply a 5.00 ± 0.01VDC signal to TB22.

9.6.5.9.3 Connect CMPP (PA13) to A COM.

9.6.5.9.4 Connect CMPN (PA12) to a variable negative going DC power supply. Increase the voltage on the variable DC power supply and verify that the voltage at "CMPO" (TP6) switches from +15.0 ± 1.0 VDC to -15 ± 1.0VDC when the voltage at "CMPN" (PA12) exceeds the voltage at "THRESH" (TP7). This voltage should be 5.00 ± 0.01VDC

9.6.5.9.5 Verify that the Ø CMPO (PA54) output becomes a "1" and the 1CMPO (PA53) output becomes a "0" when the voltage on CMPN is greater than the "THRESH" voltage (TP7)

9.6.5.9.6 Remove the 4.00 VDC signal applied to TB22. Connect TA2 to TA1 verify that the voltage on TA2 is 0.0 ± 2.0VDC.

9.6.5.9.7 Remove the connection between TA1 and TA2, the connection between PA13 and A COM.

9.6.5.9.8 Remove the variable DC power supply connected to PA12.

REV. 1 82012 DJ Update	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 9-7-80 W.D.B	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 9-8-80				
REV. 3	REV. 6	MADE BY W. D. Brackman				D S 3 8 0 0 N S W B CONT. ON SH. 9JA SH. NO. 9HA

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9.6.5 Special Tests (cont'd)

9.6.5.10.0 Relay Driver Tests (Sh.sheet 4EA)

9.6.5.10.1 Connect a 561 ohm 2W resistor (68A7002P561) from PA20 (ORD1) to D COM. Connect a second 561 ohm 2W resistor from PA39 to D COM.

9.6.5.10.2 Measure the voltage at INRD1 (PA50) and INRD2 (PA64). The voltages should be 5.00 ± 0.01VDC.

9.6.5.10.3 Measure the voltage at ORD1 (PA20) and ORD2 (PA39). The voltages should be 0.00 ± 0.01VDC.

9.6.5.10.4 Connect INRD1 (PA50) to D COM. Measure the voltage at ORD1 (PA20). The voltage at ORD1 should be 28.0 ± 1.4VDC.

9.6.5.10.5 Connect INRD2 (PA64) to D COM. Measure the voltage at ORD2 (PA39). The voltage at ORD2 should be 28.0 ± 1.4VDC.

9.6.5.10.6 Remove the connections from INRD1 (PA50) and from INRD2 (PA64) to the D COM. Remove 561 ohm load resistors from PA20 and from PA39 to D COM.

9.6.5.10.7 Connect a 2.7K ohm resistor from PA20 to a -30 volt DC signal voltage. Measure the voltage at TP9. The voltage at TP9 should be -22.6 ± 1.5VDC.

9.6.5.10.8 Remove the -30V signal voltage and 2.7K ohm resistor from PA20.

9.6.5.10.9 Connect a 2.7K ohm resistor from PA39 to a -30 volt DC signal voltage. Measure the voltage at TP10. The voltage at TP10 should be -22.6 ± 1.5VDC.

9.6.5.10.10 Remove the -30V signal voltage and 2.7K ohm resistor from PA20.

9.6.5.11.0 Inverting Buffer Tests (See sh. 4FA)

9.6.5.11.1 Measure the voltage at BI1 (PA65). The voltage should be 5.00 ± 0.25VDC. Measure the voltage at BO1 (PA56). BO1 should be a "0".

9.6.5.11.2 Connect BI1 (PA65) to D COM. BO1 (PA56) should switch to a "1".

9.6.5.11.3 Measure the voltage at BI2 (PA68). The voltage should be 5.00 ± 0.25 VDC. Measure the voltage at BO2 (PA55). BO2 should be a "0".

REV. 1 82012 DJ Update	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 8-7-80	GENERAL ELECTRIC	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80			DSD	DS3800NSWB
REV. 3	REV. 6	MADE BY W.D. Brackman			SALEM, VA. U.S.A.	CONT. ON SH. 9KA SH. NO. 9JA

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9.6.5 Special Tests (Cont'd)

9.6.5.11.4 Connect BI2 (PA68) to D COM. BO2 (PA55) should switch to a "1".

9.6.5.11.5 Measure the voltage at BI3 (PA69). The voltage should be 5.00 ± 0.25 VDC. Measure the voltage at BO3 (PA58). BO3 should be a "0".

9.5.6.11.6 Connect BI3 (PA69) to D COM. BO3 (PA58) should switch to a "1".

9.6.5.11.7 Measure the voltage at BI4 (PA70). The voltage should be 5.00 ± 0.25 VDC. Measure the voltage at BO4 (PA52). BO4 (PA52). BO4 should be a "0".

9.6.5.11.8 Connect BI4 (PA70) to D COM. BO4 (PA52) should switch to a "1".

9.6.5.11.9 Measure the voltage at BI5 (PA67). The voltage should be 5.00 ± 0.25 VDC. Measure the voltage at BO5 (PA57). BO5 should be a "0".

9.6.5.11.10 Connect BI5 (PA67) to D COM. BO5 (PA57) should switch to a "1".

9.6.5.11.11 Remove the connections between BI1 (PA65), BI2 (PA68), BI3 (PA69), BI4 (PA70) BI5 (PA67) and D COM.

9.6.5.12.0 Analog Amplifier Test (See sheets 4GA-4JA).

9.6.5.12.1 Connect the following points to A COM.

PA2 (DAI3N)
PA4 (DAI3)
PA8 (DAI1)
PA10(DAI1N)
PA14(DAI4N)
PA15(DAI4)
PA23(DAI5)
PA26(DAIN5)
PA49(DAI2)
PA51(DAI2N)

The voltages measured at the following points should be 0.0 ± 0.1VDC.

PA11 (ODA3)
PA16 (ODA1)
PA21 (ODA2)
PA22 (ODA5)
PA24 (ODA4)

Remove the above connections to A COM.

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER	GENERAL ELECTRIC	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80			DSD	D S 3 8 0 0 N S W B
REV. 3	REV. 6	MADE BY W. D. Brackman			SALEM, VA. U.S.A.	CONT. DWG. NO. 9LA ST. NO. 9KA

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9.6.5 Special Tests (Cont'd)

9.6.5.12.2 Connect a 5.00 ± 0.01 VDC signal from PA8 (-) to PA10 (+) and measure the voltage at ODA1 (PA16). The voltage at ODA1 (PA16) should be -5.00 ± 0.25VDC. Remove the 5.00V signal voltage.

9.6.5.12.3 Connect a 5.00 ± 0.01 VDC signal from PA51 (-) to PA49(+) and measure the voltage at ODA2 (PA21). The voltage at ODA2 should be-5.00 ± 0.25VDC. Remove the 5.00 V signal voltage.

9.6.5.12.4 Connect a 5.00 ± 0.01VDC signal from PA2 (-) to PA4 (+) and measure the voltage at ODA3 (PA11). The voltage at ODA3 should be-5.00 ± 0.25VDC. Remove the 5.00V signal voltage.

9.6.5.12.5 Connect a 5.00 ± 0.01 VDC signal from PA14(-) to PA15(+) and measure the voltage at ODA4 (PA24) the voltage at ODA4 should be-5.00 ± 0.25 VDC. Remove the 5.00V signal voltage.

9.6.5.12.6 Connect a 5.00 ± 0.01 VDC signal from PA26(-) to PA23 (+) and measure the voltage at ODA5 (PA22). The voltage at ODA5 should be-5.00 ± 0.25VDC. Remove the 5.00V signal voltage.

9.6.5.12.7 Connect DAI1N (PA8) to A COM. Connect DAI1 (PA10) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA1 (PA16). Verify that the voltage on ODA1 is clamped at -10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.8 Remove the positive going variable DC power supply connected to DAI1 (RA10) and connect a negative going variable DC power supply to DAI1 (PA10). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA1 (PA16). Verify that the voltage on ODA1 is clamped at +10.5 ± 0.5 VDC and the IMOK LED stays on bright.

9.6.5 Special Tests (Cont'd)

9.6.5.12.9 Disconnect the variable DC power supply from DAI1 (PA10) and the connection between DAI1N(PA8) and A COM.

9.6.5.12.10 Connect DAI2N (PA51) to A COM. Connect DAI2 (PA49) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA2(PA21). Verify that the voltage on ODA2 is clamped at -10.5 ± 0.5VDC and that IMOK LED stays on bright.

9.6.5.12.11 Remove the positive going variable DC power supply connected to DAI2 (PA49) and connect a negative going variable DC power supply to DAI2 (PA49). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA2 (PA21). Verify that the voltage on ODA2 is clamped at +10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.12 Disconnect the variable DC power supply from DAI2 (PA49) and the connection between DAI2N (PA51) and A COM.

9.6.5.12.13 Connect DAI3N (PA2) to A COM. Connect DAI3 (PA4) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA3 (PA11). Verify that the voltage on ODA3 is clamped at 10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.14 Remove the positive going variable DC power supply connected to DAI3 (PA4) and connect a negative going variable DC power supply to DAI3 (PA4). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA3 (PA11). Verify that the voltage on ODA3 is clamped at +10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.15 Disconnect the variable DC power supply from DAI3 (PA4) and the connection between DAI3N (PA2) and A COM.

9.6.5 Special Tests (Cont'd)

9.6.5.12.16 Connect DAI4N (PA14) to A COM. Connect DAI4 (PA15) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA4 (PA24). Verify that the voltage on ODA4 is clamped at -10.5 ± 0.5 VDC and the IMOK LED stays on bright.

9.6.5.12.17 Remove the positive going variable DC power supply connected to DAI4 (PA15) and connect a negative going variable DC power supply to DAI4 (PA15). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA4 (PA24). Verify that the voltage on ODA4 is clamped at +10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.18 Disconnect the variable DC power supply from DAI4 (PA15) and the connection between DAI4N (PA14) and A COM.

9.6.5.12.19 Connect DAI5N (PA26) to A COM. Connect DAI5 (PA23) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA5 (PA22). Verify that the voltage on ODA5 is clamped at -10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.20 Remove the positive going variable DC power supply connected to DAI5 (PA23) and connect a negative going variable DC power supply to DAI5 (PA23). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA5 (PA22). Verify that the voltage on ODA5 is clamped at +10.5 ± 0.5 VDC and the IMOK LED stays on bright.

9.6.5.12.21 Disconnect the variable DC power supply from DAI5 (PA23) and the connection between DAI5N (PA26) and A COM.

9.6.5.12.22 Connect PA8 (DAI1N) and PA10 (DAI1) together. Apply a 300 Hz. 5.00 ± 0.01V peak to peak signal from PA8 and PA10 to A COM. Measure the voltage at PA16 (ODA1). The voltage at PA16 should be 0.00 ± 0.25 peak to peak. Remove the 5 VAC signal and the connection between PA8 and PA10.

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 7-7-80 W.D.B.	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80				
REV. 3	REV. 6	MADE BY W.D. Brackman				D S 3 8 0 0 N S W B CONT. ON EL. 9PA SH. NO. 9NA

DSD 0151 (09-76)

CARS

9.6.5 Special Tests (Cont'd)

9.6.5.12.16 Connect DAI4N (PA14) to A COM. Connect DAI4 (PA15) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA4 (PA24). Verify that the voltage on ODA4 is clamped at -10.5 ± 0.5 VDC and the IMOK LED stays on bright.

9.6.5.12.17 Remove the positive going variable DC power supply connected to DAI4 (PA15) and connect a negative going variable DC power supply to DAI4 (PA15). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA4 (PA24). Verify that the voltage on ODA4 is clamped at +10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.18 Disconnect the variable DC power supply from DAI4 (PA15) and the connection between DAI4N (PA14) and A COM.

9.6.5.12.19 Connect DAI5N (PA26) to A COM. Connect DAI5 (PA23) to a positive going variable DC power supply. Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA5 (PA22). Verify that the voltage on ODA5 is clamped at -10.5 ± 0.5VDC and the IMOK LED stays on bright.

9.6.5.12.20 Remove the positive going variable DC power supply connected to DAI5 (PA23) and connect a negative going variable DC power supply to DAI5 (PA23). Slowly increase the voltage on the variable DC power supply while monitoring the voltage on ODA5 (PA22). Verify that the voltage on ODA5 is clamped at +10.5 ± 0.5 VDC and the IMOK LED stays on bright.

9.6.5.12.21 Disconnect the variable DC power supply from DAI5 (PA23) and the connection between DAI5N (PA26) and A COM.

9.6.5.12.22 Connect PA8 (DAI1N) and PA10 (DAI1) together. Apply a 300 Hz. 5.00 ± 0.01V peak to peak signal from PA8 and PA10 to A COM. Measure the voltage at PA16 (ODA1). The voltage at PA16 should be 0.00 ± 0.25 peak to peak. Remove the 5 VAC signal and the connection between PA8 and PA10.

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 7-7-80 W.D.B.	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 8-8-80				
REV. 3	REV. 6	MADE BY W.D. Brackman				D S 3 8 0 0 N S W B CONT. ON EL. 9PA SH. NO. 9NA

DSD 0151 (09-76)

CARS

.6.5 Special Tests (Cont'd)

9.6.5.12.23 Connect PA49 (DAI2) and PA51 (DAI2N) together. Apply a 300 hz. 5.00 ± 0.01V peak to peak signal from PA49 and PA51 to A COM. Measure the voltage at PA21 (ODA2). The voltage at PA21 should be 0.00 ± 0.25V peak to peak. Remove the 5VAC signal and the connection between PA49 and PA51.

9.6.5.12.24 Connect PA2 (DAI3N) to PA4 (DAI3) together. Apply a 300 Hz 5.00 ± 0.01V peak to peak signal from PA2 to ACOM. Measure the voltage at PA11 (ODA3). The voltage at PA11 should be 0.00 ± 0.25 V peak to peak. Remove the 5VAC signal and the connection between PA2 and PA4.

9.6.5.12.25 Connect PA14 (DAI4N) and PA15 (DAI4) together. Apply a 300 Hz. 5.00 ± 0.01 V peak to peak signal from PA14 and PA15 to A COM. Measure the voltage at PA24 (ODA4). The voltage at PA24 should be 0.00 ± 0.25V peak to peak. Remove the 5VAC signal and the connection between PA14 and PA15.

9.6.5.12.26 Connect PA23 (DAI5) and PA26 (DAI5N) together. Apply a 300 Hz. 5.00 ± 0.01 V peak to peak signal from PA23 and PA26 to A COM. Measure the voltage at PA22 (ODA5). The voltage at PA22 should be 0.00 ± 0.25 V peak to peak. Remove the 5VAC signal and the connection between PA23 and PA26.

9.6.5.12.27 Apply a 1500 Hz. 10.00 ± 0.01V peak to peak signal voltage between PA8 (DAI1N) and PA10 (DAI1). The voltage at PA16 (ODA1) should be 2.0 ± 0.2V. peak to peak. Remove the signal voltage.

9.6.5.12.28 Apply a 1500 Hz 10.00 ± 0.01V peak to peak signal voltage between PA49 (DAI2) and PA51 (DAI2N). The voltage at PA21 (ODA2) should be 2.0 ± 0.2V. peak to peak. Remove the signal voltage.

9.6.5 Special Tests (Cont'd)

9.6.5.12.29 Apply a 1500Hz, 10.00 ± 0.01V peak to peak signal voltage between PA2 (DAI3N) and PA4 (DAI3). The voltage at PA11 (ODA3) should be 2.0 ± 0.2V peak to peak. Remove the signal voltage.

9.6.5.12.30 Apply a 1500 Hz., 10.00 ± 0.01V peak to peak signal voltage between PA14 (DAI4N) and PA15 (DAI4). The voltage at PA24 (ODA4) should be 2.0 ± 0.02V peak to peak. Remove the signal voltage.

9.6.5.12.31 Apply a 1500 Hz., 10.00 ± 0.01V peak to peak signal voltage between PA23 (DAI5) and PA26 (DAI5N). The voltage at PA22 (ODA5) should be 2.0 ± 0.2V peak to peak. Remove the signal voltage.

9.6.5.13.0 IMOK Circuit Test (See sheets 4GA-4JA).

9.6.5.13.1 Apply a positive going 12.9 ± 0.1VDC signal from A COM.

to PA11 (ODA3),
to PA16 (ODA1),
to PA21 (ODA2),
to PA22 (ODA5) and
to PA24 (ODA4)

Verify that IMOK LED does not turn off when 12.9 ± 0.1VDC is applied to any of the above points.

9.6.5.13.2 Apply a positive going 13.6 ± 0.1VDC signal from A COM.

to PA11 (ODA3),
to PA16 (ODA1),
to PA21 (ODA2),
to PA22 (ODA5) and
to PA24 (ODA4)

Verify that IMOK LED turns off when 13.6 ± 0.1 VDC is ap applied to any of the above points.

9.6.5.13.3 Apply a negative going 12.9 ± 0.1VDC signal from A COM.

to PA11 (ODA3),
to PA16 (ODA1),
to PA21 (ODA2),
to PA22 (ODA5) and
to PA24 (ODA4)

Verify that IMOK LED does not turn off when -12.9 ± 0.1VDC is applied to any of the above points

9.6.5 Special Tests (Cont'd)

9.6.5.13.4 Apply a negative going 13.6 ± 0.1VDC signal from A COM.

to PA11 (ODS3),
to PA16 (ODA1),
to PA21 (ODA2),
to PA22 (ODA5) and
to PA24 (ODA4)

Verify that IMOK LED turns off when -13.6 ± 0.1VDC is applied to any of the above points.

END OF TEST

REV. 1	REV. 4	REV. 7	PRINTS TO DL109	ENGINEER 7-7-80 W.D.B.	GENERAL ELECTRIC DSD SALEM, VA. U.S.A.	Test Specifications Switching Card
REV. 2	REV. 5	ISSUED 7-8-80				DS 3800NSWB
REV. 3	REV. 6	MADE BY W. D. Brackman				CONT. ON SH. F1. SH. NO. 9RA

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6.3 ***TEST COMPLETE ***

7. NOTES

8. Oscilloscope Verification Examples:

Fig. 1

Fig. 2