



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-DS3800NFCH

Test Procedure for a DS3800NFCH Card

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DATE 02/11/2010	DATE	DATE	DATE 2/11/2010

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1. SCOPE

1.1 This is a functional testing procedure for a DS3800NFCH1xxx.

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 85 DMM (or Equivalent)
2	*	Tenma Laboratory DC Power Supplies
1	H033787	DS3800 Standard Test Box
1	*	Rainbow Box
1	*	Tenma Function Generator
1	*	Tektronics TBS 2012B O-Scope

* Any equipment of same type will suffice.

6. TESTING PROCESS

6.1 Setup



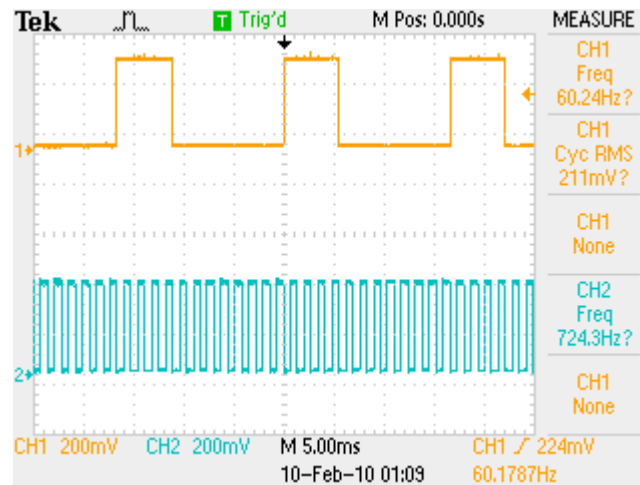
Note: If any circuit fails during testing process, repair the malfunctioning circuit, retest, and then continue with test.

- 6.1.1 If installed, removed prom from socket U36, verify good, and reinstall or replace as needed.
- 6.1.2 Connect – 15 VDC to PA-7.
- 6.1.3 Connect – 15 VDC return to PA-9 (ACOM).
- 6.1.4 Connect + 15 VDC to PA-5.
- 6.1.5 Connect + 15 VDC return to PA-9 (ACOM).
- 6.1.6 Connect +5 VDC to PA-3.
- 6.1.7 Connect + 5 VDC return to PA-1 (DCOM).
- 6.1.8 Connect PA-9 (ACOM) to PA-1 (DCOM).
- 6.1.9 Connect Multimeter negative lead to DCOM.
- 6.1.10 For this purposes of the following tests, the PA connector side of unit under test (**UUT**) will be referred to as the **right side**. The LED side of the UUT will be referred to as the **left side** of the UUT.

6.2 Functional Testing

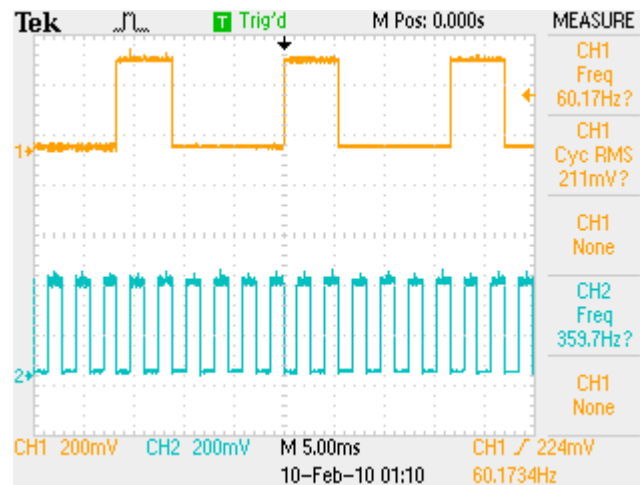
- 6.2.1 Connect Multimeter positive lead to PA-11, set to read DC Volts.
- 6.2.2 Connect PA-20 to PA-1 (DCOM), Multimeter should read greater than 3.5 Volts (logic high).
- 6.2.3 Disconnect PA-20 from PA-1 (DCOM) and connect to PA-3. Multimeter should read less than .8 VDC (logic low).
- 6.2.4 Disconnect PA-11 and PA-20.
- 6.2.5 Connect Multimeter positive lead to PA-37. Should read less than .8 VDC (logic low).
- 6.2.6 Connect PA-35 to + 5 VDC, Multimeter should read greater than 3.5 VDC (logic high).
- 6.2.7 Disconnect PA-35 from + 5 VDC, Multimeter should read less than .8 VDC (logic low).
- 6.2.8 Connect PA-38 to + 5 VDC, Multimeter should read greater than 3.5 VDC (logic high).
- 6.2.9 Disconnect PA-38 from + 5 VDC, Multimeter should read less than .8 VDC (logic low).
- 6.2.10 Disconnect Multimeter from PA-37.
- 6.2.11 Using
- 6.2.12 Connect Function Generator to PA-9 (ACOM) and PA-50, set for 1.50 Vrms at 60 Hz.

- 6.2.13** Connect 1st channel of O-Scope to PA-72 and 2nd channel of O-Scope to PA-64. Set O-Scope for 2 V/div on both channels at 5 mSec/div. O-Scope should display the following:



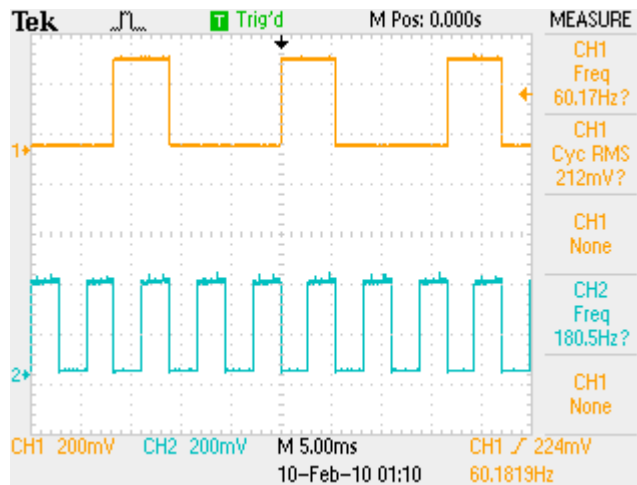
6.2.14

- 6.2.15** Disconnect 2nd channel of O-Scope from PA-64 and connect to PA-65. O-Scope should display the following:

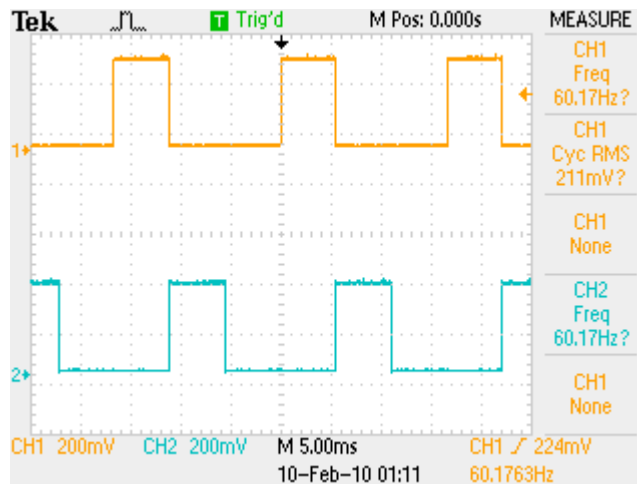


6.2.16

6.2.17 Disconnect 2nd channel of O-Scope from PA-65 and connect to PA-66. O-Scope should display the following:



6.2.19 Disconnect 2nd channel of O-Scope from PA-66 and connect to PA-69. O-Scope should display the following:

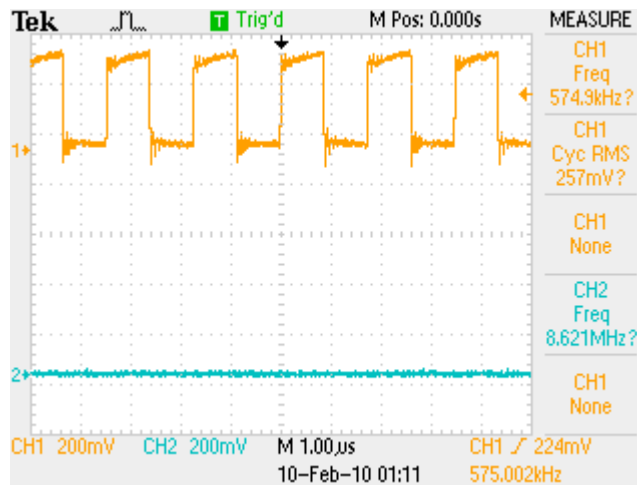


6.2.21 Note that for test steps 6.2.12 through 6.2.19, the frequency on 2nd channel of O-Scope decreases by approximately 60 % for each connection, PA64, PA-65, PA-66, and PA69.

6.2.22 Disconnect 1st channel of O-Scope from PA-72.

6.2.23 Disconnect 2nd channel of O-Scope from PA-69.

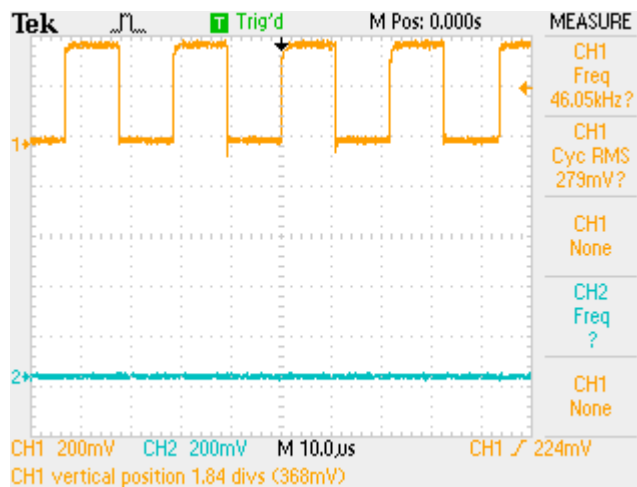
6.2.24 Connect 1st channel of O-Scope to PA-57, set for 1 uSec/div, should display the following:



6.2.25

6.2.26 Disconnect 1st channel of O-Scope from PA-57.

6.2.27 Connect 1st channel of O-Scope to TP3 and set O-Scope for 10 uSec/div. O-Scope should display the following:



6.2.28

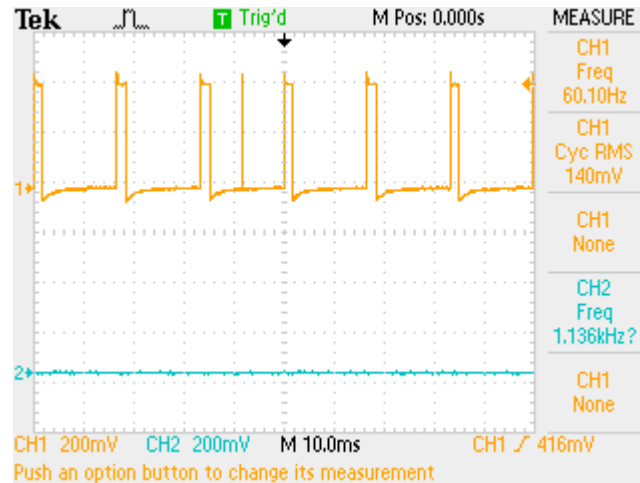
6.2.29 Put jumper J1 RUN/TEST to **TEST**. The PLL light will come on.

6.2.30 Adjust potentiometer R1 until the O-Scope displays a frequency of 46 KHz.

6.2.31 Put jumper J1 RUN/TEST to **RUN**. PLL light should go out.

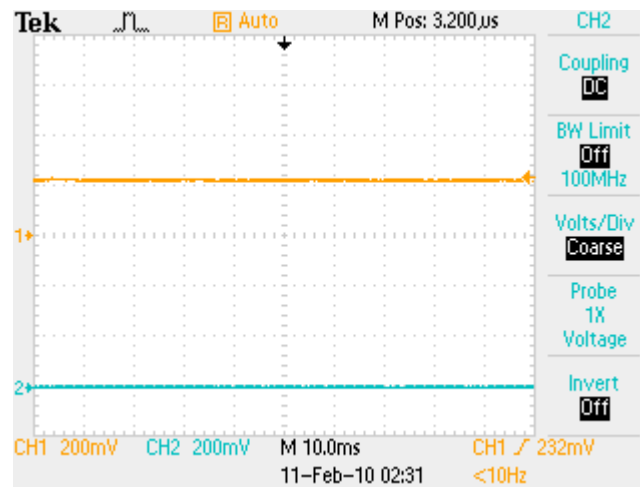
6.2.32 Disconnect 1st channel of O-Scope from TP3 and connect to TP2, and set O-Scope for 10 mSec/div.

6.2.33 The O-Scope should display the following:



6.2.34

6.2.35 Disconnect 1st channel of O-Scope from TP2 and connect to TP1, should display logic high as follows:



6.2.36

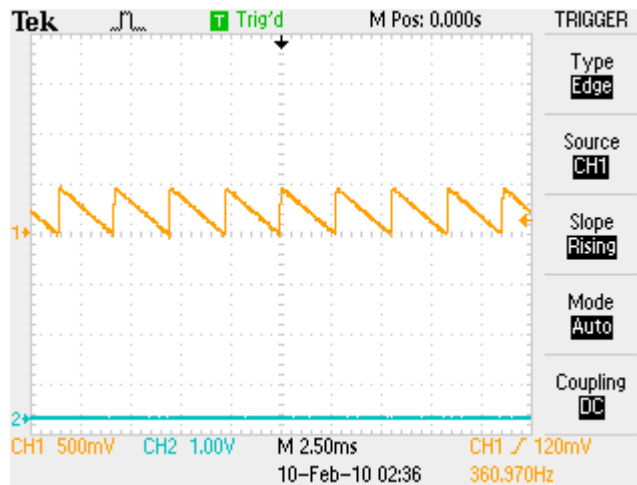
6.2.37 Disconnect 1st channel of O-Scope from TP1 and connect to PA-80.

6.2.38 O-Scope should display logic low and PLL light should be out.

6.2.39 Disconnect PA-50. O-Scope should display logic high and PLL light should be on.

6.2.40 Connect PA-50. O-Scope should display logic low and PLL light should be out.

6.2.41 Disconnect 1st channel of O-Scope from PA-80 and connect to TP4. Should display the following:

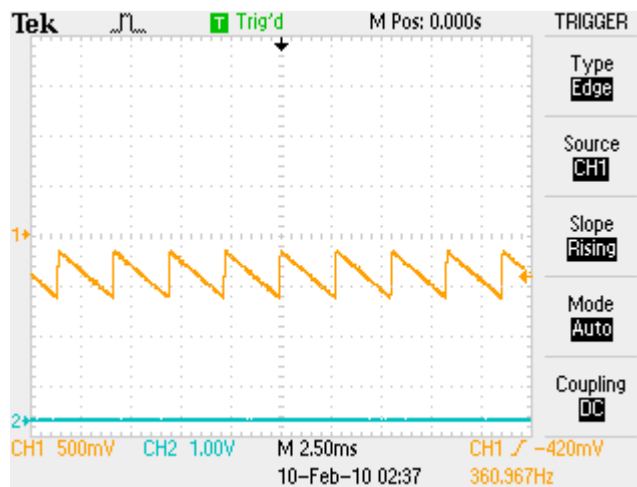


6.2.42

6.2.43 Connect adjustable power supply positive lead to PA-19, set power supply to 0 VDC.

6.2.44 Connect adjustable power supply negative lead PA-1 (DCOM).

6.2.45 Apply + 6 VDC to PA-19, O-Scope should display the following:

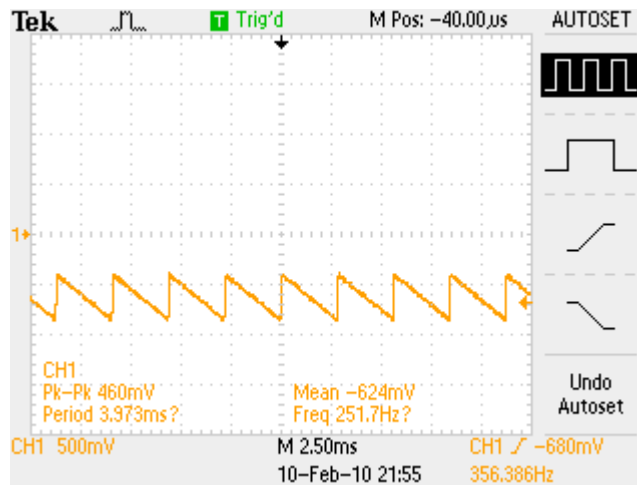


6.2.46

6.2.47 Note the + 6 VDC applied to PA-19 causes the wave to go negative.

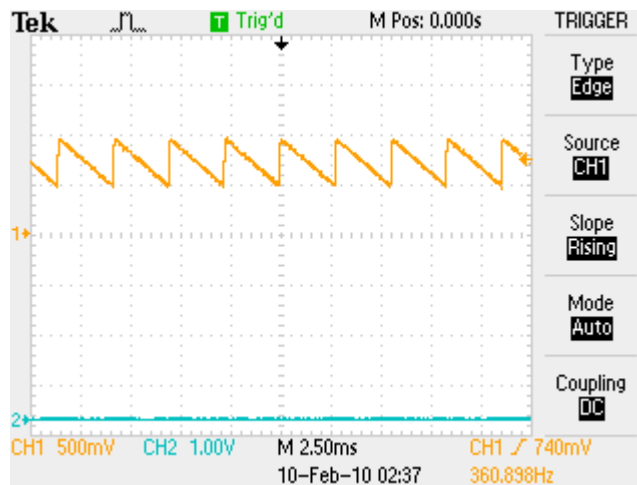
6.2.48 Apply + 12 VDC to PA-19, the **IMOK** light should go out.

6.2.49 Adjust potentiometer R2 until the upper peak of the displayed wave is at – 4 VDC as follows:



6.2.50

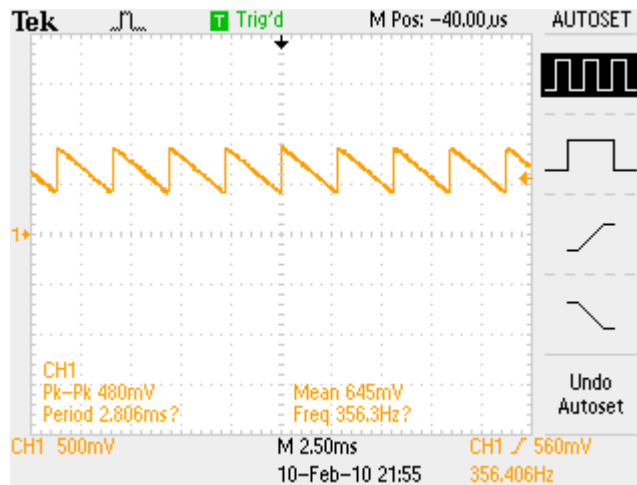
6.2.51 Apply – 6 VDC to PA-19, O-Scope should display the following:



6.2.52

6.2.53 Note the – 6 VDC applied to PA-19 causes the wave to go positive.

- 6.2.54** Apply – 12 to PA-19. The bottom peak of the wave should be approximately + 4 VDC and the O-Scope should display the following:



6.2.55

- 6.2.56** Apply 0 VDC to PA-19, O-Scope should display as in **6.2.40**.
- 6.2.57** Disconnect adjustable power supply positive lead from PA-19 and connect to PA-2.
- 6.2.58** Apply 0 VDC to PA-2, O-Scope should display as in **6.2.40**.
- 6.2.59** Apply + 6 VDC to PA-2, should display as in **6.2.48**.
- 6.2.60** Apply – 6 VDC to PA-2, should display as in **6.2.44**.
- 6.2.61** Apply 0 VDC to PA-2, O-Scope should display as in **6.2.40**.
- 6.2.62** Disconnect 1st channel of O-Scope from TP4.
- 6.2.63** Disconnect PA-2.
- 6.2.64** Using Multimeter positive lead, negative lead should still be connect to PA-1 (DCOM), check PA-34, PA-63, and PA-74 for approximately + 2 VDC (logic high).
- 6.2.65** Connect PA-39 to PA-50, using Multimeter positive lead check PA-34 for approximately + 2.6 VDC.
- 6.2.66** Disconnect PA-39 from PA-50, using Multimeter lead check for approximately + 2 VDC.
- 6.2.67** Using Multimeter positive lead, negative lead should still be connect to PA-1 (DCOM), check PA-41, PA-62, PA-55, PA-44, PA-56, and PA-49 for approximately + 1.4 VDC.
- 6.2.68** Check that P1, P2, P3, N1, N2, and N3 lights are all on.
- 6.2.69** Connect PA-70 to PA-1 (DCOM). P1, P2, P3, N1, N2, and N3 lights will go out as long as this connection is made.
- 6.2.70** Using Multimeter positive lead, negative lead should still be connect to PA-1 (DCOM), check PA-34, PA-63, and PA-74 for approximately + 0.2 VDC (logic low).

- 6.2.71 Using Multimeter positive lead, negative lead should still be connect to PA-1 (DCOM), check PA-41, PA-62, PA-55, PA-44, PA-56, and PA-49 for approximately + 0.2 VDC.
- 6.2.72 Disconnect PA-70 from PA-1. P1, P2, P3, N1, N2, and N3 lights should all come back on.
- 6.2.73 Using Multimeter positive lead, negative lead should still be connect to PA-1 (DCOM), check PA-34, PA-63, and PA-74 for approximately + 2 VDC (logic high).
- 6.2.74 Using Multimeter positive lead, negative lead should still be connect to PA-1 (DCOM), check PA-41, PA-62, PA-55, PA-44, PA-56, and PA-49 for approximately + 1.4 VDC.

6.3 **Continuity Tests**

- 6.3.1 Using Multimeter set for Ohms function, check for continuity between PA-3, PA-45, and PA-77.
- 6.3.2 Using Multimeter set for Ohms function, check for continuity between PA-1, PA-43, and PA-79.
- 6.3.3 Using Multimeter set for Ohms function, check for continuity between TP6, PA-9 and PA-71.
- 6.3.4 Using Multimeter set for Ohms function, check for continuity between TP5 and PA-19.

*******TEST COMPLETE*******

7. **NOTES**

- 7.1 None at this time?

8. **ATTACHMENTS**

- 8.1 See picture below for orientation of test box and rainbow boxes for references.

