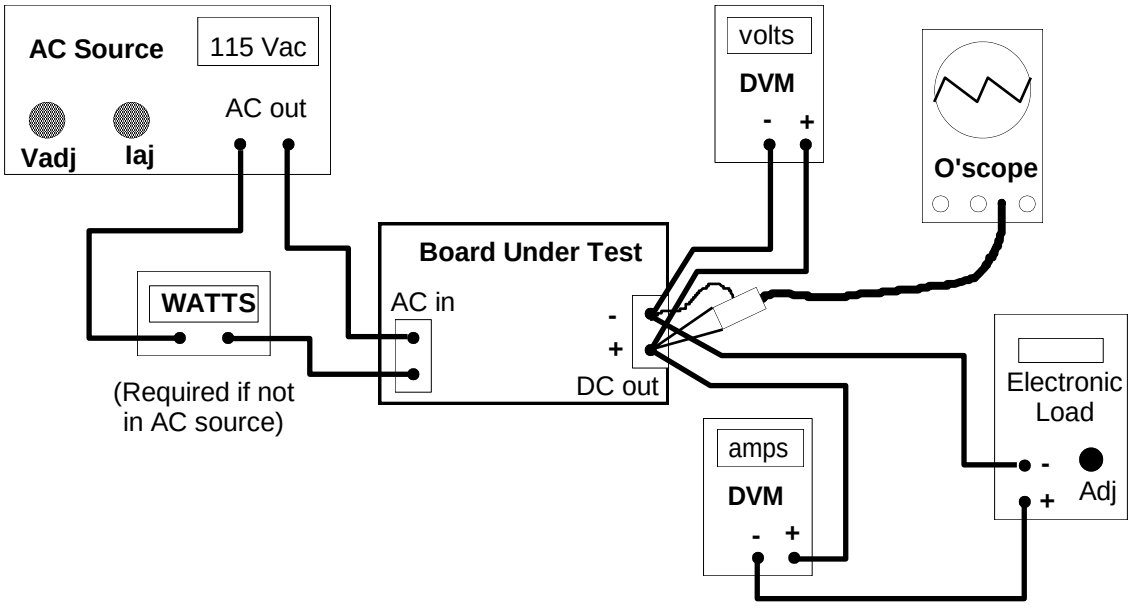
Test Procedure for the NCP1077STGEVB Evaluation Board

Introduction: The NCP1077 EVAL demo board is a universal input, off-line, 20 watt output, constant voltage power supply for powering E-meters or white goods applications. The output can be configured easily with a few component changes for most typically used output voltages. The switching topology is a continuous conduction mode flyback converter essentially identical to the circuit of the NCP1075 EVAL board with the exception of a larger transformer. This specific demo board has an output rating of 12 volts at 1.75 amps.

Equipment Required:

1. Adjustable, isolated AC power source capable of zero to 265 Vac output up to 500 mA. AC source should have the capability of measuring output power in watts. If not, an AC line analyzer or AC wattmeter should be used. Wattmeter should be capable if reading down to 50 mW (for standby power measurements.)
2. Digital volt/amp meters to measure output current and voltage to the electronic load.
3. A variable electronic load or rheostat capable of up to a 7 amp load. If an electronic load is used it is preferable to have a constant resistance load mode. The current meter on the electronic load can be used in lieu of a series, in-line ammeter.
4. Oscilloscope with probe to monitor output ripple on the demo converter.

Setup Procedure: Set the equipment as shown in the diagram below so that the output voltage and current to the demo board can be measured and the output ripple can be monitored.



Test Procedure:

1. Switch the electronic load on and set to 10 mA load; switch all of the digital meters on (assuming they are wired properly for voltage and current sensing); turn the oscilloscope on with sensing in AC mode and 100 mV per division vertical and a sweep rate of 5 uS per division. Connect the scope probe to the demo board's output terminals.
2. With the AC source OFF, set the current limit on the AC source to 400 mA and the output voltage to 120 Vac.
3. Turn on the AC source and the power supply output voltage should be should be 12V +/- 0.50V, - 0.15V on the DVM.
4. Adjust the electronic load from no load slowly up to the full load rating of 1.75 amps. The output voltage should remain within 120 mV (1%) of nominal if properly regulating. The output ripple (switching frequency) on the oscilloscope should be less than 150 mV peak-to-peak at full load. (Note – scope probe tip should be decoupled with a 0.1uF ceramic capacitor and ground wire should not be used to get best accuracy and max attenuation of switching noise pickup.)
5. Adjust the electronic load to 1.6 amps and the AC source down to 90 Vac and the power supply output should still be in spec. Return the AC source to 120 Vac.
6. Set the output load to 75% of full load (1.31 amps), check the efficiency. Effic = (Vout x Iout)/Pin. It should be greater than 76%.
7. Continue to increase the load slowly and the over-current protection should kick in about an amp or less above the maximum current output rating. This should result in a "hick-up" start-stop type of operation.
8. Set the load back to the rated max output current and the power supply should recover with proper output voltage.
9. Adjust the electronic load to back to zero, switch the load off, and check the input power (standby power). It should be below 75 mW.
10. Adjust the AC input to 230 Vac and repeat tests (3) through (8) with the exception of (5).
11. Switch the AC source off and disconnect the demo board.

End of Test.