TNY274-280

TinySwitch®-III Family

Energy Efficient, Off-Line Switcher with Enhanced Flexibility and Extended Power Range



Product Highlights

Lowest System Cost with Enhanced Flexibility

- Simple ON/OFF control, no loop compensation needed
- Selectable current limit through BP/M capacitor value
 - Higher current limit extends peak power or, in open frame applications, maximum continuous power
 - Lower current limit improves efficiency in enclosed adapters/chargers
 - Allows optimum *TinySwitch-III* choice by swapping devices with no other circuit redesign
- Tight I²f parameter tolerance reduces system cost
 - Maximizes MOSFET and magnetics power delivery
 - Minimizes max overload power, reducing cost of transformer, primary clamp & secondary components
- ON-time extension extends low line regulation range/ hold-up time to reduce input bulk capacitance
- · Self-biased: no bias winding or bias components
- · Frequency jittering reduces EMI filter costs
- Pin-out simplifies heatsinking to the PCB
- SOURCE pins are electrically quiet for low EMI

Enhanced Safety and Reliability Features

- Accurate hysteretic thermal shutdown protection with automatic recovery eliminates need for manual reset
- Improved auto-restart delivers <3% of maximum power in short circuit and open loop fault conditions
- Output overvoltage shutdown with optional Zener
- Line under-voltage detect threshold set using a single optional resistor
- Very low component count enhances reliability and enables single-sided printed circuit board layout
- High bandwidth provides fast turn on with no overshoot and excellent transient load response
- Extended creepage between DRAIN and <u>all</u> other pins improves field reliability

EcoSmart® – Extremely Energy Efficient

- Easily meets all global energy efficiency regulations
- No-load <150 mW at 265 VAC without bias winding,
 <50 mW with bias winding
- ON/OFF control provides constant efficiency down to very light loads – ideal for mandatory CEC regulations and 1 W PC standby requirements

Applications

 Chargers/adapters for cell/cordless phones, PDAs, digital cameras, MP3/portable audio, shavers, etc.

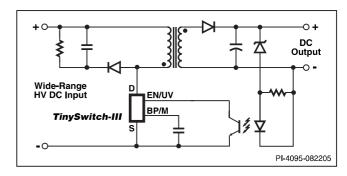


Figure 1. Typical Standby Application.

OUTPUT POWER TABLE				
PRODUCT ³	230 VAC ±15%		85-265 VAC	
	Adapter ¹	Peak or Open Frame ²	Adapter ¹	Peak or Open Frame ²
TNY274 P or G	6 W	11 W	5 W	8.5 W
TNY275 P or G	8.5 W	15 W	6 W	11.5 W
TNY276 P or G	10 W	19 W	7 W	15 W
TNY277 P or G	13 W	23.5 W	8 W	18 W
TNY278 P or G	16 W	28 W	10 W	21.5 W
TNY279 P or G	18 W	32 W	12 W	25 W
TNY280 P or G	20 W	36.5 W	14 W	28.5 W

Table 1. Notes: **1.** Minimum continuous power in a typical nonventilated enclosed adapter measured at 50 °C ambient. Use of an external heatsink will increase power capability **2.** Minimum peak power capability in any design or minimum continuous power in an open frame design (see Key Application Considerations). **3.** Packages: P: DIP-8C, G: SMD-8C. See Part Ordering Information.

- PC Standby and other auxiliary supplies
- DVD/PVR and other low power set top decoders
- Supplies for appliances, industrial systems, metering, etc.

Description

TinySwitch-III incorporates a 700 V power MOSFET, oscillator, high voltage switched current source, current limit (user selectable) and thermal shutdown circuitry. The IC family uses an ON/OFF control scheme and offers a design flexible solution with a low system cost and extended power capability.

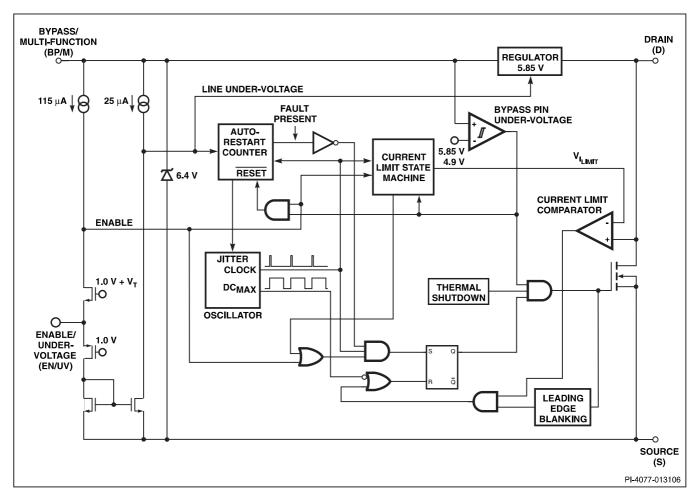


Figure 2. Functional Block Diagram.

Pin Functional Description

DRAIN (D) Pin:

This pin is the power MOSFET drain connection. It provides internal operating current for both start-up and steady-state operation.

BYPASS/MULTI-FUNCTION (BP/M) Pin:

This pin has multiple functions:

- 1. It is the connection point for an external bypass capacitor for the internally generated 5.85 V supply.
- 2. It is a mode selector for the current limit value, depending on the value of the capacitance added. Use of a 0.1 μF capacitor results in the standard current limit value. Use of a 1 μF capacitor results in the current limit being reduced to that of the next smaller device size. Use of a 10 μF capacitor results in the current limit being increased to that of the next larger device size for TNY275-280.
- 3. It provides a shutdown function. When the current into the bypass pin exceeds 5.5 mA, the device latches off until the BP/M voltage drops below 4.9 V, during a power down. This can be used to provide an output overvoltage function

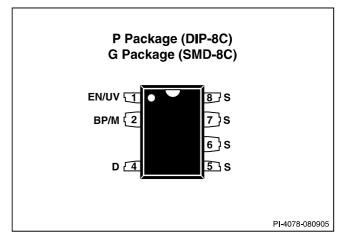


Figure 3. Pin Configuration.

with a Zener connected from the BP/M pin to a bias winding supply.

ENABLE/UNDER-VOLTAGE (EN/UV) Pin:

This pin has dual functions: enable input and line under-voltage sense. During normal operation, switching of the power

