

# TOP252-262 TOPSwitch™-HX Family



Enhanced EcoSmart™, Integrated Off-Line Switcher with  
Advanced Feature Set and Extended Power Range

## Product Highlights

### Lower System Cost, Higher Design Flexibility

- Multi-mode operation maximizes efficiency at all loads
- New eSIP-7F and eSIP-7C packages
  - Low thermal impedance junction-to-case (2 °C per watt)
  - Low height is ideal for adapters where space is limited
  - Simple mounting using a clip to aid low cost manufacturing
  - Horizontal eSIP-7F package ideal for ultra low height adapter and monitor applications
- Extended package creepage distance from DRAIN pin to adjacent pin and to heat sink
- No heat sink required up to 35 W using P, G and M packages with universal input voltage and up to 48 W at 230 VAC
- Output overvoltage protection (OVP) is user programmable for latching/non-latching shutdown with fast AC reset
  - Allows both primary and secondary sensing
- Line undervoltage (UV) detection prevents turn-off glitches
- Line overvoltage (OV) shutdown extends line surge limit
- Accurate programmable current limit
- Optimized line feed-forward for line ripple rejection
- 132 kHz frequency (254Y-258Y and all E/L packages) reduces transformer and power supply size
  - Half frequency option for video applications
- Frequency jittering reduces EMI filter cost



Figure 1. Typical Flyback Application.

- Heat sink is connected to SOURCE for low EMI
- Improved auto-restart delivers <3% of maximum power in short circuit and open loop fault conditions
- Accurate hysteretic thermal shutdown function automatically recovers without requiring a reset
- Fully integrated soft-start for minimum start-up stress
- Extended creepage between DRAIN and all other pins improves field reliability

## Output Power Table

| Product <sup>5</sup> | 230 VAC ±15% <sup>4</sup> |                         |                   | 85-265 VAC           |                         |                   | Product <sup>5</sup>  | 230 VAC ±15%         |                         | 85-265 VAC           |                         |
|----------------------|---------------------------|-------------------------|-------------------|----------------------|-------------------------|-------------------|-----------------------|----------------------|-------------------------|----------------------|-------------------------|
|                      | Adapter <sup>1</sup>      | Open Frame <sup>2</sup> | Peak <sup>3</sup> | Adapter <sup>1</sup> | Open Frame <sup>2</sup> | Peak <sup>3</sup> |                       | Adapter <sup>1</sup> | Open Frame <sup>2</sup> | Adapter <sup>1</sup> | Open Frame <sup>2</sup> |
| TOP252PN/GN          | 9 W                       | 15 W                    | 21 W              | 6 W                  | 10 W                    | 13 W              | TOP252EN/EG           | 10 W                 | 21 W                    | 6 W                  | 13 W                    |
| TOP252MN             |                           |                         | 21 W              |                      |                         | 13 W              | TOP253EN/EG           | 21 W                 | 43 W                    | 13 W                 | 29 W                    |
| TOP253PN/GN          | 15 W                      | 25 W                    | 38 W              | 9 W                  | 15 W                    | 25 W              | TOP254EN/YN/EG        | 30 W                 | 62 W                    | 20 W                 | 43 W                    |
| TOP253MN             |                           |                         | 43 W              |                      |                         | 29 W              | TOP255EN/YN/EG        | 40 W                 | 81 W                    | 26 W                 | 57 W                    |
| TOP254PN/GN          | 16 W                      | 28 W                    | 47 W              | 11 W                 | 20 W                    | 30 W              | TOP255LN              | 40 W                 | 81 W                    | 26 W                 | 57 W                    |
| TOP254MN             |                           |                         | 62 W              |                      |                         | 40 W              | TOP256EN/YN/EG        | 60 W                 | 119 W                   | 40 W                 | 86 W                    |
| TOP255PN/GN          | 19 W                      | 30 W                    | 54 W              | 13 W                 | 22 W                    | 35 W              | TOP256LN              | 60 W                 | 88 W                    | 40 W                 | 64 W                    |
| TOP255MN             |                           |                         | 81 W              |                      |                         | 52 W              | TOP257EN/YN/EG        | 85 W                 | 157 W                   | 55 W                 | 119 W                   |
| TOP256PN/GN          | 21 W                      | 34 W                    | 63 W              | 15 W                 | 26 W                    | 40 W              | TOP257LN              | 85 W                 | 105 W                   | 55 W                 | 78 W                    |
| TOP256MN             |                           |                         | 98 W              |                      |                         | 64 W              | TOP258EN/YN/EG        | 105 W                | 195 W                   | 70 W                 | 148 W                   |
| TOP257PN/GN          | 25 W                      | 41 W                    | 70 W              | 19 W                 | 30 W                    | 45 W              | TOP258LN              | 105 W                | 122 W                   | 70 W                 | 92 W                    |
| TOP257MN             |                           |                         | 119 W             |                      |                         | 78 W              | TOP259EN/YN/EG        | 128 W                | 238 W                   | 80 W                 | 171 W                   |
| TOP258PN/GN          | 29 W                      | 48 W                    | 77 W              | 22 W                 | 35 W                    | 50 W              | TOP259LN              | 128 W                | 162 W                   | 80 W                 | 120 W                   |
| TOP258MN             |                           |                         | 140 W             |                      |                         | 92 W              | TOP260EN/YN/EG        | 147 W                | 275 W                   | 93 W                 | 200 W                   |
|                      |                           |                         |                   |                      |                         |                   | TOP260LN              | 147 W                | 190 W                   | 93 W                 | 140 W                   |
|                      |                           |                         |                   |                      |                         |                   | TOP261EN/YN/EG        | 177 W                | 333 W                   | 118 W                | 254 W                   |
|                      |                           |                         |                   |                      |                         |                   | TOP261LN              | 177 W                | 244 W                   | 118 W                | 177 W                   |
|                      |                           |                         |                   |                      |                         |                   | TOP262EN <sup>6</sup> | 177 W                | 333 W                   | 118 W                | 254 W                   |
|                      |                           |                         |                   |                      |                         |                   | TOP262LN <sup>6</sup> | 177 W                | 244 W                   | 118 W                | 177 W                   |

Table 1. Output Power Table. (for notes see page 2).

## EcoSmart™ – Energy Efficient

- Energy efficient over entire load range
- No-load consumption
  - Less than 200 mW at 230 VAC
- Standby power for 1 W input
  - >600 mW output at 110 VAC input
  - >500 mW output at 265 VAC input

## Description

TOPSwitch-HX cost effectively incorporates a 700 V power MOSFET, high voltage switched current source, PWM control, oscillator, thermal shutdown circuit, fault protection and other control circuitry onto a monolithic device.

Notes for Table 1:

1. Minimum continuous power in a typical non-ventilated enclosed adapter measured at +50 °C ambient. Use of an external heat sink will increase power capability.
2. Minimum continuous power in an open frame design at +50 °C ambient.
3. Peak power capability in any design at +50 °C ambient.
4. 230 VAC or 110/115 VAC with doubler.
5. Packages: P: DIP-8C, G: SMD-8C, M: SDIP-10C, Y: TO-220-7C, E: eSIP-7C, L: eSIP-7F.  
See part ordering information.
6. TOP261 and TOP262 have the same current limit set point. In some applications TOP262 may run cooler than TOP261 due to a lower  $R_{DS(ON)}$  for the larger device.

## Y Package Option for TOP259-261

In order to improve noise-immunity on large TOPSwitch-HX Y package parts, the F pin has been removed (TOP259-261YN are fixed at 66 kHz switching frequency) and replaced with a SIGNAL GROUND (G) pin. This pin acts as a low noise path for the C pin capacitor and the X pin resistor. It is only required for the TOP259-261YN package parts.



Figure 2. Typical Flyback Application TOP259YN, TOP260YN and TOP261YN.