

Design Kit and Evaluation System: 5W to 10W Ultra-Green Power Supply

OPTIMIZED FOR VERY LOW STANDBY POWER HICCUP MODE LINE-SIDE OUTPUT POWER LIMITING

August 2006

Featured Component Description

IPS18 – Ultra-Green Flyback Controller – ASIC Advantage

The new IPS18 Ultra-Green flyback controller is a power saving technology used in Switch Mode Power Supplies to keep the power consumption to a minimum. It has been optimized for SMPSs in the 2 - 25 Watts power range that remain connected to the mains wall outlet with an active load, as well as for applications where an SMPS has to deliver a small amount of power in "light load" conditions. It monitors the output power from the primary and no secondary sensing circuitry is required, which also results in power and cost savings. It incorporates a special circuitry called "HICCUP" that involves a counter and other digital blocks which prevent delivering a high current to the load when overloaded. It enters cycle skipping in "no load" or light load" conditions to reduce standby power to a trickle. The IPS18 can be used in applications where the input voltage ranges from 12 to 400Volts. It also features adjustable frequency from 15 to 500KHz (operating at high frequency reduces size and cost of magnetic and decoupling components), separate P & N drive to simplify EMI control, line overvoltage protection and a thermal shutdown. In most of the applications below 10 Watts it saves costly filtering components such as X-Cap, Y-Cap, MOV etc...

HICCUP Mode and Protection Against Feedback Loop Failure

The IPS18 flyback controller offers a built-in overload protection called "HICCUP" and a protection against feedback loop failure with a simple low-cost Zener diode. (see ASIC Advantage HICCUP MODE FLYBACK CONTROLLERS flyer for details).

IXTY1R4N60P – PolarHV™ Power MOSFET – IXYS

PolarHV™ Power MOSFETs are designed with IXYS unique cell design and process improvements that dramatically enhance the power handling capability and system efficiency. These design and process changes provide "best-in-class" on-resistance, gate charge, thermal resistance and power handling capability. The PolarHV™ line is offered in 500V and 600V versions, with current ratings to as high as 100A. Note that 800V and higher versions are also in development.

DSS2-60AT2 – Schottky Diode – IXYS

IXYS Schottky diodes feature very low forward voltage drop and switching loss, providing cost effective output rectification for switch-mode power supply applications. In addition, the 175°C rated junction temperature and low I_{RM} extend the useful range for many of IXYS Schottky diodes. The DSS2-60AT2 is offered in the TO-92 to minimize board area and cost.

System Features

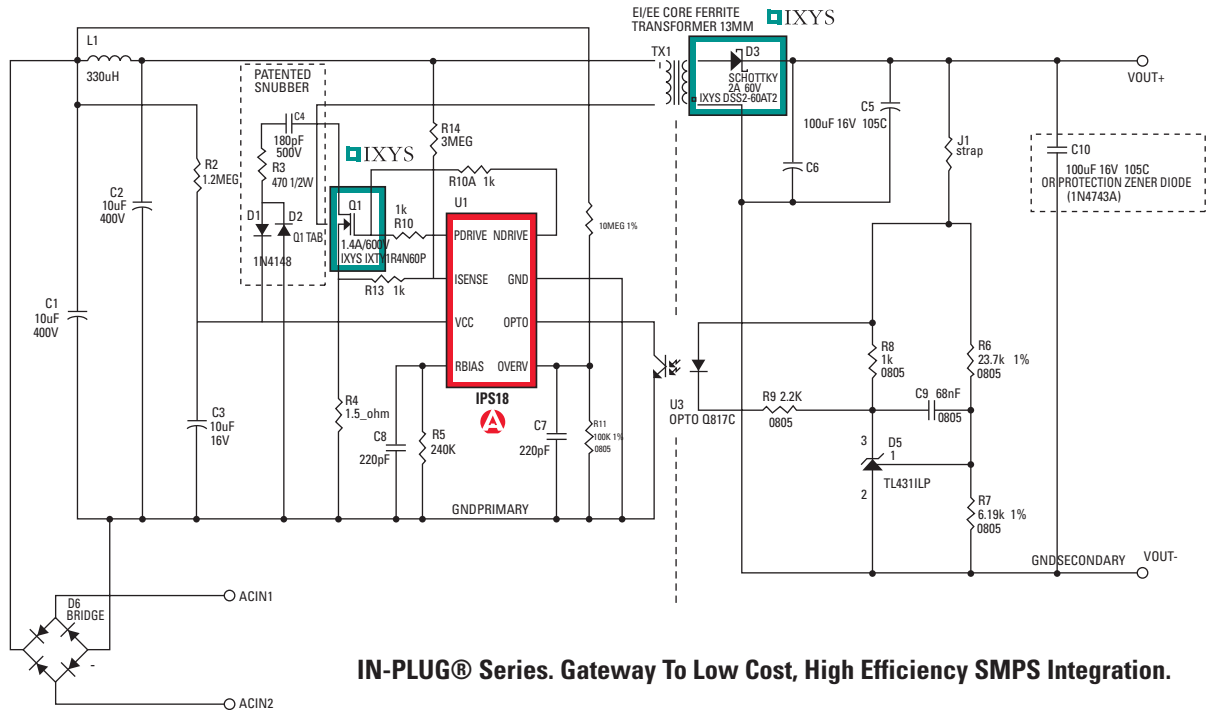
- Less than 100mW of board standby power
- Low startup current < 70µA
- Operational current consumption as low as 350µA
- Only 150mW when output shorted
- Line and load overvoltage protections
- Built-in overload/short-circuit protection
- Adjustable frequency
- Cycle skipping for very low board standby power



ASIC Advantage Part Number – IPS-DK18
IXYS Part Number – EVPS001

† Design Kit and Evaluation System
Available for Qualified Designers

IPS-DK18 / EVPS001 Schematic



Featured Component Summary Table

| Part Number | Company | Summary Information | Package | Qty per Pack / Packing Style |
|-----------------|------------------|--|------------|------------------------------|
| IPS18C-D(1) | ASIC Advantage | Adj. Frequency, Overload Protected, Low Standby PWM Controller | 8-Pin PDIP | 50 / Tube |
| IPS18C-SO(1) | ASIC Advantage | Adj. Frequency, Overload Protected, Low Standby PWM Controller | 8-Pin SOIC | 98 / Tube |
| IPS18C-SO(1)-TR | ASIC Advantage | Adj. Frequency, Overload Protected, Low Standby PWM Controller | 8-Pin SOIC | 2500 / Tape and Reel |
| IXTY1R4N60P | IXYS Corporation | V_{DSS} 600V, $I_{d(25^{\circ}C)}$ 1.4A, $R_{DS(on,25^{\circ}C,Max)}$ 9.0 Ω , $Q_{g(on,Typ)}$ 5.2 nC, $R_{th,jc}$ 2.5 K/W | D-Pak | 75 / Tube |
| IXTY1R4N60PTRL | IXYS Corporation | V_{DSS} 600V, $I_{d(25^{\circ}C)}$ 1.4A, $R_{DS(on,25^{\circ}C,Max)}$ 9.0 Ω , $Q_{g(on,Typ)}$ 5.2 nC, $R_{th,jc}$ 2.5 K/W | D-Pak | 800 / Tape and Reel |
| DSS2-60AT2 | IXYS Corporation | $V_{RSM/RRM}$ 60V, $I_{FAV(Tc = 85^{\circ}C)}$ 2A, $V_{F(Typ, Tj = 125^{\circ}C)}$ 43V, $R_{th,jb}$ 80 K/W | TO-92 | 1000 / Bulk |
| DSS2-60AT2AP | IXYS Corporation | $V_{RSM/RRM}$ 60V, $I_{FAV(Tc = 85^{\circ}C)}$ 2A, $V_{F(Typ, Tj = 125^{\circ}C)}$ 43V, $R_{th,jb}$ 80 K/W | TO-92 | 2000 / Ammo Pack |

Add "-G-LF" in place of (1) to denote RoHS + Lead Free.

Excellent Standby Operation And Overload Protection

