

ICE2QS03

Quasi-Resonant PWM Controller

Power Management & Supply

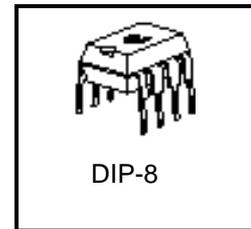


Never stop thinking.

Quasi-Resonant PWM Controller

Product Highlight

- Active burst mode for low standby power
- Digital frequency reduction for better overall system efficiency
- Integrated power cell for IC self-power supply



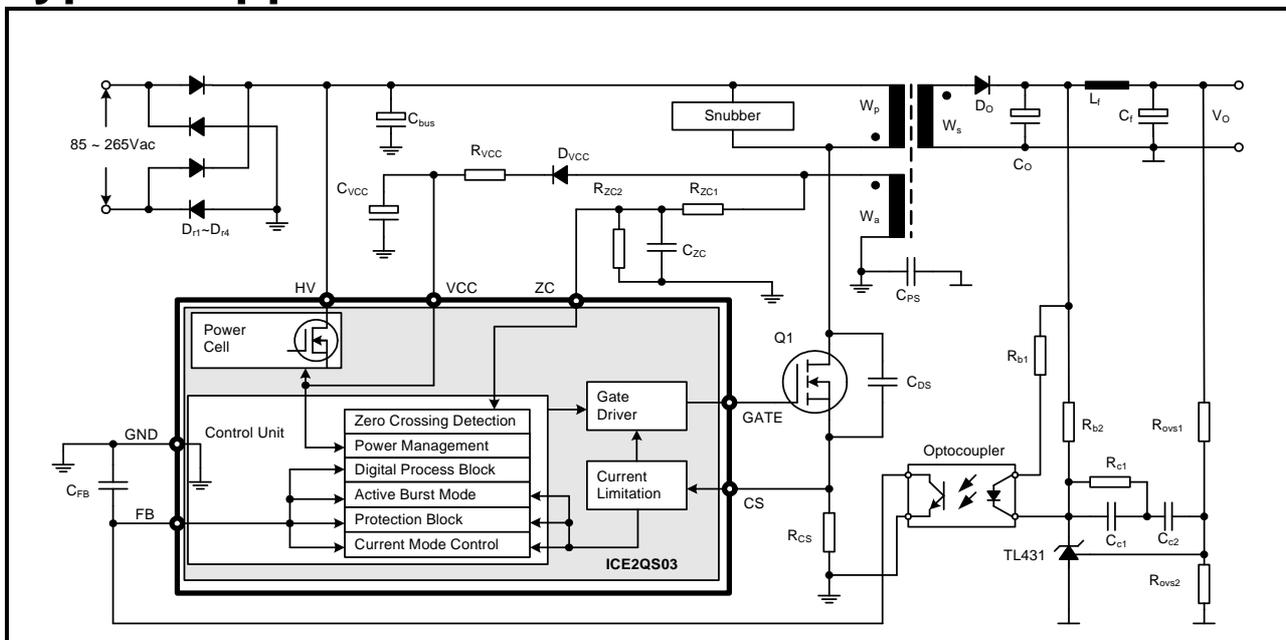
Features

- Quasiresonant operation till very low load
- Active burst mode operation at light/no load for low standby input power (< 100mW)
- Digital frequency reduction with decreasing load
- Power cell for VCC pre-charging with constant current
- Built-in digital soft-start
- Foldback correction and cycle-by-cycle peak current limitation
- Auto restart mode for VCC Overvoltage protection
- Auto restart mode for VCC Undervoltage protection
- Auto restart mode for openloop/overload protection
- Latch-off mode for adjustable output overvoltage protection
- Latch-off mode for Short-winding protection

Description

ICE2QS03 is a quasi-resonant PWM controller optimized for off-line switch power supply applications such as LCD TV, CRT TV and notebook adapter. The digital frequency reduction with decreasing load enables a quasi-resonant operation till very low load. As a result, the overall system efficiency is significantly improved compared to other conventional solutions. The active burst mode operation enables an ultra-low power consumption at standby mode with small and controllable output voltage ripple. Based on the BiCMOS technology, the product has a wide operation range (up to 26V) of IC power supply and lower power consumption. The numerous protection functions give a full protection of the power supply system in failure situations. All of these make the ICE2QS03 an outstanding controller for quasi-resonant flyback converter in the market.

Typical Application Circuit



Type	Marking	Package
ICE2QS03	ICE2QS03	PG-DIP-8

Pin Configuration and Functionality

1 Pin Configuration and Functionality

1.1 Pin Configuration with PG-DIP-8

Pin	Symbol	Function
1	ZC	Zero Crossing
2	FB	Feedback
3	CS	Current Sense
4	HV	High Voltage Input
5	HV	High Voltage Input
6	GATE	Gate Drive Output
7	VCC	Controller Supply Voltage
8	GND	Controller Ground

1.2 Package PG-DIP-8

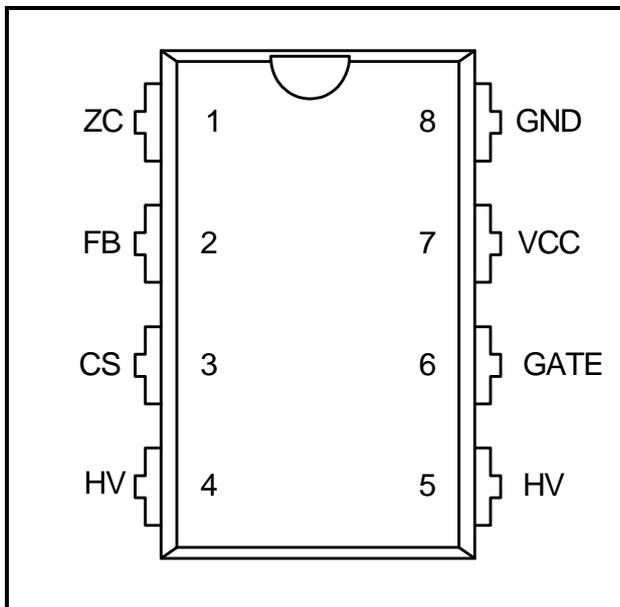


Figure 1 Pin Configuration PG-DIP-8(top view)

1.3 Pin Functionality

ZC (Zero Crossing)

At this pin, the voltage from the auxiliary winding after a time delay circuit is applied. Internally, this pin is connected to the zero-crossing detector for switch-on determination. Additionally, the output overvoltage detection is realized by comparing the voltage V_{zc} with an internal preset threshold.

FB (Feedback)

Normally, an external capacitor is connected to this pin for a smooth voltage V_{FB} . Internally, this pin is connected to the PWM signal generator for switch-off determination (together with the current sensing signal), the digital signal processing for the frequency reduction with decreasing load during normal operation, and the Active Burst Mode controller for entering Active Burst Mode operation determination and burst ratio control during Active Burst Mode operation. Additionally, the open-loop / over-load protection is implemented by monitoring the voltage at this pin.

CS (Current Sense)

This pin is connected to the shunt resistor for the primary current sensing, externally, and the PWM signal generator for switch-off determination (together with the feedback voltage), internally. Moreover, short-winding protection is realised by monitoring the voltage V_{cs} during on-time of the main power switch.

GATE (Gate Drive Output)

This output signal drives the external main power switch, which is a power MOSFET in most case.

HV (High Voltage)

The pin HV is connected to the bus voltage, externally, and to the power cell, internally. The current through this pin pre-charges the VCC capacitor with constant current once the supply bus voltage is applied.

VCC (Power supply)

VCC pin is the positive supply of the IC. The operating range is between V_{VCCoff} and V_{VCCOV} .

GND (Ground)

This is the common ground of the controller.