High Efficiency, Low noise, Automatic Dead Time Adjustment Control IC for Half-Bridge LLC Off-line Switching Regulators

SSC9522S

June 28, 2012

General Description

The SSC9522S is a controller IC (SMZ* method) for half-bridge resonant type power supply, incorporating a floating drive circuit for High-side MOSFET drive.
*SMZ = Soft-switched Multi-resonant Zero Current switch, all switching periods work with soft switching operation.
The IC is suitable for high performance power supply system with small size, high efficiency and low noise, because for various power supply specifications, more effective and easier design works are achievable with effective functions as the Automatic Dead Time Adjustment, the Uncontrollable Operation Detection and so on.

Package

SOIC18

Not to scale

Features and Benefits

- Built-in floating drive circuit for High-side MOSFET
- Soft Start Function, reducing of power MOSFET stress and preventing Uncontrollable Operation, at startup
- Uncontrollable Operation Detection Function on pulse-by-pulse basis, improving the ability of transformer output wattage because the frequency range is available up to the resonant frequency, f_O, and reducing power MOSFET stress
- Automatic Dead Time Adjustment Function, not being necessary to make the dead time adjustment for each power supply specification
- Line Undervoltage Protection Function
  (Brown-In／Brown-Out Function)
  Prevention of excessive input current and overheat at low input voltage
- Protection Functions
  External Latch Function ---------- Latch shutdown by external signal input
  Overcurrent Protection (OCP) ----- Pulse-by-pulse
  Overvoltage Protection (OVP) ---- Latch shutdown
  Overload Protection (OLP) -------- Latch shutdown
  Thermal Shutdown (TSD)---------- Latch shutdown

Electrical Characteristics

- Maximum rating of V_{CC} : 35V(MAX)
- Minimum frequency, $F_{(MIN)}$: 28.3kHz(TYP)
- Maximum frequency, $F_{(MAX)}$: 300kHz(TYP)
- Maximum dead - time, $t_{d(MAX)}$: 2.45µs(TYP)
- Minimum dead - time , $t_{d(MIN)}$: 0.50µs(TYP)

Applications

Switching power supplies for electronic devices such as:

- LCD and PDP TV
- Sarver
- Multi Function Printer
- Industrial Equipment
- Communications Equipment

Typical Application Circuit