Working Together for a Greener Society

Future of Power Electronics and the Earth



LLC Current-resonant Off-line Switching Controller

SSC3S932A



Compact and High-efficiency

The SSC3S932A uses an external auxiliary power supply and is ideal for applications requiring low standby power consumption. With a wide operating voltage range of 11.9 V ≤ VCC < 32 V, the IC offers design friendliness in auxiliary power supply design. In addition, the IC has a wide range of functions and contributes to the design of compact, high-efficiency resonant power supplies.

Expanded Peak Load Range in Normal Operation

By optimizing overcurrent protection in normal operation, the peak load range has been expanded. This helps large-screen TVs deliver a sudden boost in audio output when required.

Various Protection Functions

In addition to two-level overcurrent protection (OCP), the IC incorporates a wide range of protections such as optocoupler open protection (OOP). The RT pin selects* which protection recovery mode (auto-restart or latch) to enable.

*The protection recovery mode can be selected only for VCC_OVP, HVP, OLP, OOP, and TSD. The protection recovery mode cannot be set individually for each protection function.

■ Description

The SSC3S932A is a controller with the SMZ* method for LLC current resonant switching power supplies, incorporating a floating drive circuit for a high-side power MOSFET. The IC uses an external auxiliary power supply and is ideal for applications requiring low standby power consumption (P_{IN} ≤ 30 mW). The product includes useful functions such as the automatic dead time adjustment and the capacitive mode detection. The product achieves high efficiency, low noise, and high cost-effective power supply systems with few external components.

■ SMZ is the Soft-switched Multi-resonant Zero Current Switch (soft switching operation during all switching periods).

■ Package

SOP18



■ Applications

Switching power supplies for electronic devices such as:

- Audio Visual (AV) Equipment
- Office Automation (OA) Equipment
- Industrial Apparatus
- Communication Facilities

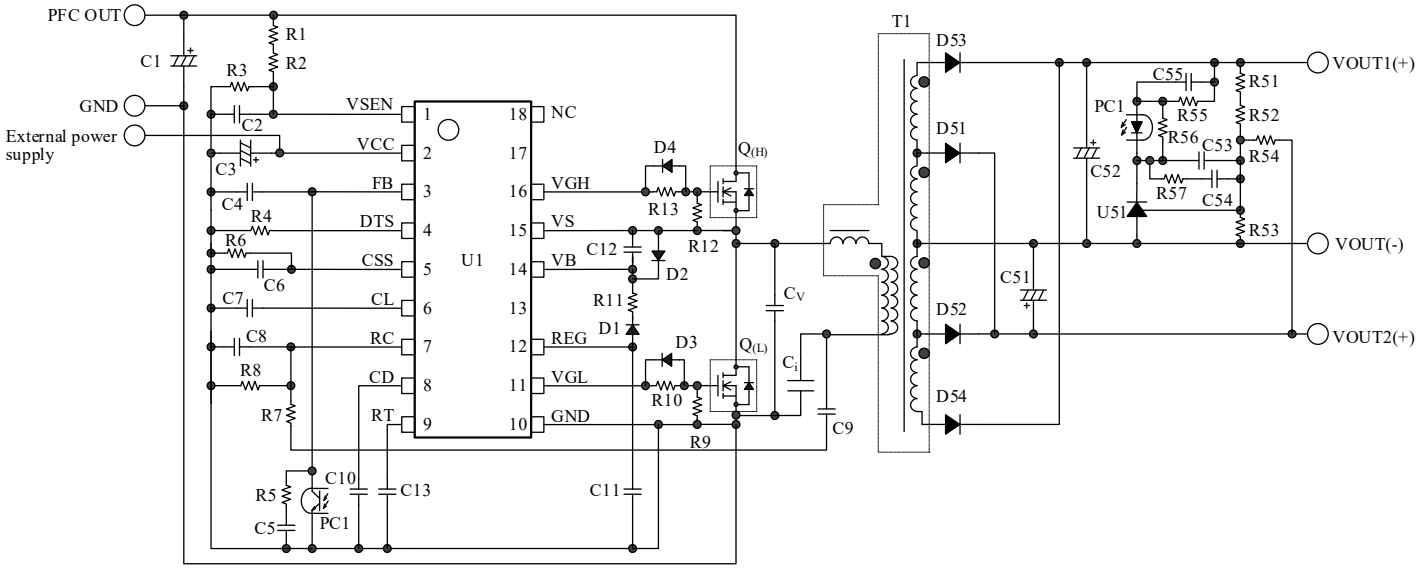
■ Features

- Pb-free (RoHS Compliant)
- Soft Start Function
- Capacitive Mode Detection Function
- Reset Detection Function
- Automatic Dead Time Adjustment Function
- Protections

  Auto-restart:
  – High-side Driver UVLO
  – Overcurrent Protection (OCP):
  Peak drain current detection, two-level protection
  – Input Undervoltage Protection (UVP)

  Auto-restart / Latched Shutdown selected by RT pin setting:
  – VCC Pin Output Overvoltage Protection (VCC_OVP)
  – Input Overvoltage Protection (HVP)
  – Overload Protection (OLP)
  – Optocoupler Open Protection (OOP)
  – Thermal Shutdown (TSD)

■ Typical Application



Explore More Products

See our selection guide for a complete list of
LLC current-resonant switching power supply control ICs.

Compact and High-efficiency

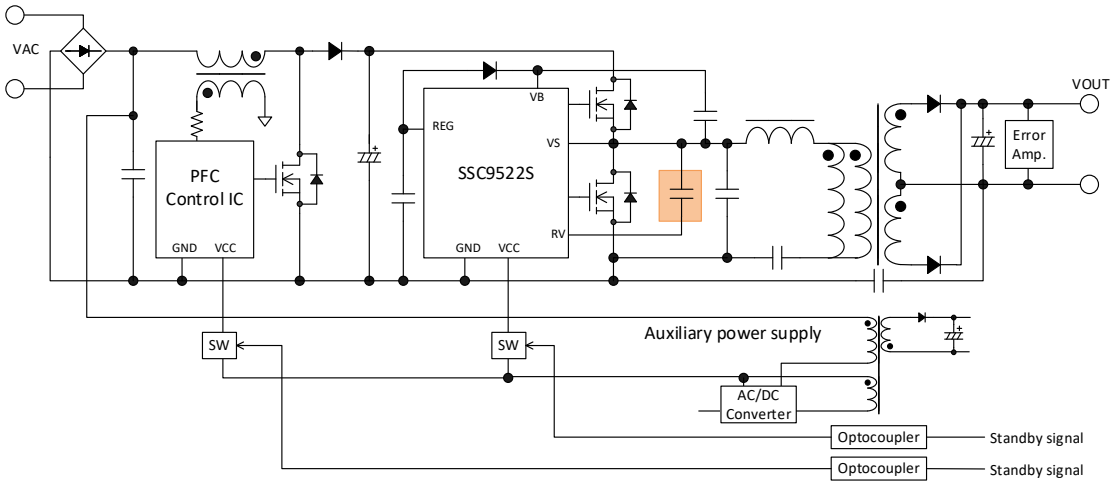
The SSC3S932A uses an external auxiliary power supply and is ideal for applications requiring low standby power consumption ($P_{IN} \leq 30$ mW).

With a wide operating voltage range of 11.9 V ≤ VCC < 32 V, the IC offers design friendliness in auxiliary power supply design.

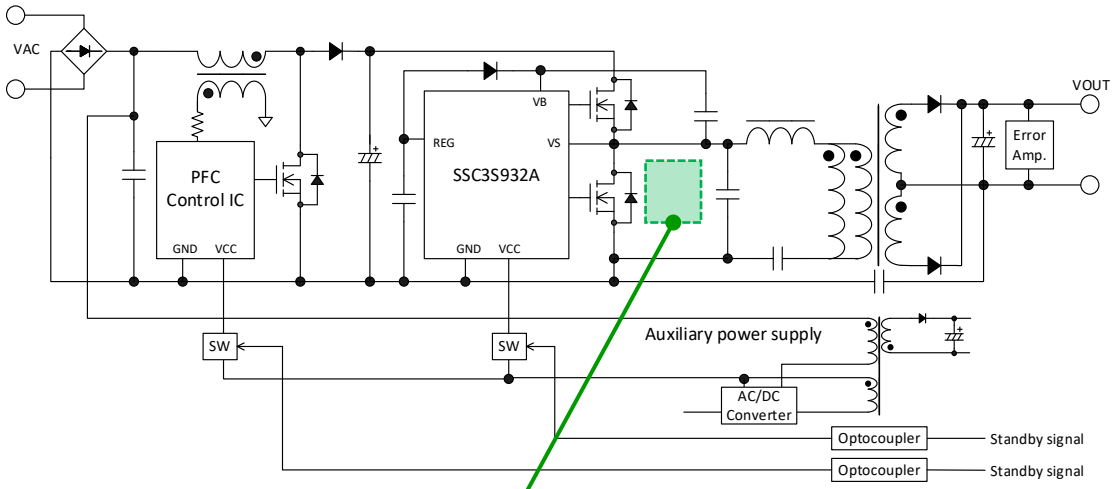
In addition, the IC has functions such as automatic dead time adjustment and capacitive mode detection, and contributes to the design of compact, high-efficiency resonant power supplies.

- ✓ **Built-in Dead Time Detection Capacitor: No High-voltage Capacitor Required**
- ✓ **Capacitive Mode Detection Function: Improved Transformer Utilization!**

Conventional



SSC3S932A



No high-voltage capacitor required

Expanded Peak Load Range in Normal Operation

The SSC3S932A incorporates two-level overcurrent protection (OCP).

By optimizing overcurrent protection in normal operation, the peak load range has been expanded.

This helps large-screen TVs deliver a sudden boost in audio output when required.

	SSC3S932	SSC3S932A
Startup/Restart	Threshold Voltage, $V_{RC(L)}$ = ±1.9 V (typ.)（OCP1）	Threshold Voltage, $V_{RC(L)}$ = ±1.9 V (typ.)（OCP1）
Normal Operation	Threshold Voltage, $V_{RC(L)}$ = ±1.9 V (typ.)（OCP1）	**Threshold Voltage, $V_{RC(H)}$ = ±2.8 V (typ.)（OCP2）** **OCP1 is not activated, allowing momentary peak loads.**
Sudden Overcurrent (e.g., Load Short)	Threshold Voltage, $V_{RC(H)}$ = ±2.8 V (typ.)（OCP2）	Threshold Voltage, $V_{RC(H)}$ = ±2.8 V (typ.)（OCP2）

Various Protection Functions

In addition to two-level overcurrent protection (OCP), the IC incorporates a wide range of protections such as optocoupler open protection (OOP).

The RT pin selects* which protection recovery mode (auto-restart or latch) to enable.

*The protection recovery mode can be selected only for VCC_OVP, HVP, OLP, OOP, and TSD. The protection recovery mode cannot be set individually for each protection function.

Protection Functions

Auto-restart:

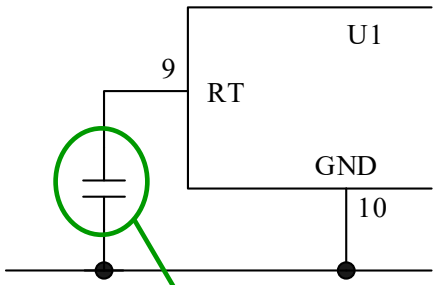
– High-side Driver UVLO
– Overcurrent Protection (OCP):
  Peak drain current detection, two-level protection
– Input Undervoltage Protection (UVP)

Auto-restart / Latched Shutdown selected by RT pin setting:

– VCC Pin Output Overvoltage Protection (VCC_OVP)
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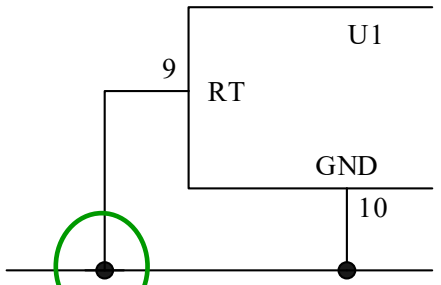
Protection Recovery Mode

Auto-restart



Connect a capacitor to the RT pin

Latched



Short the RT pin to ground

Important Notes

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