

## 8-Pin High-Performance Resonant Mode Controller

Check for Samples: [UCC25600](#)

### FEATURES

- Variable Switching Frequency Control
- Programmable Minimum Switching Frequency With 4% Accuracy (3% accuracy at temperature range:  $-20^{\circ}\text{C}$  to  $105^{\circ}\text{C}$ )
- Programmable Maximum Switching Frequency
- Programmable Dead Time for Best Efficiency
- Programmable Soft-Start Time
- Easy ON/OFF Control
- Over-Current Protection
- Over-Temperature Protection
- Bias Voltage UVLO and OVP
- Integrated Gate Driver With 0.4-A Source and 0.8-A Sink Capability
- Operating Temperature Range:  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$
- SOIC 8-Pin Package

### APPLICATIONS

- 100-W to 1-kW Power Supplies
- LCD, Plasma and DLP® TVs
- Adaptors, Computing and ATX Power Supplies
- Home Audio Systems
- Electronic Lighting Ballasts

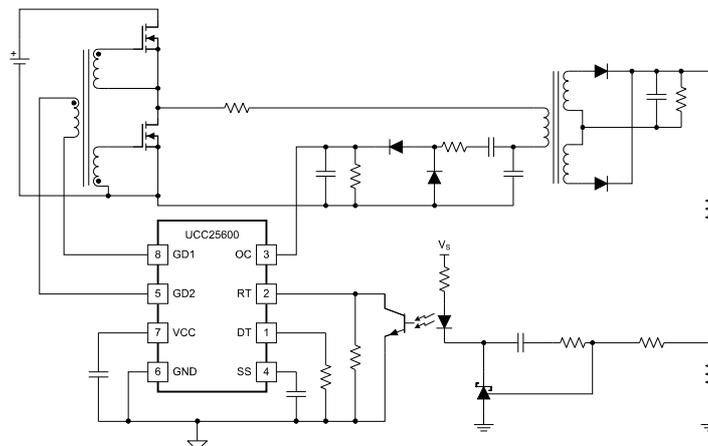
### DESCRIPTION

The UCC25600 high performance resonant mode controller is designed for dc-to-dc applications utilizing resonant topologies, especially the LLC half bridge resonant converter. This highly integrated controller implements frequency modulation control and complete system functions in only an 8-pin package. Switching to the UCC25600 will greatly simplify the system design, layout and improve time to market, all at a price point lower than competitive 16-pin device offerings.

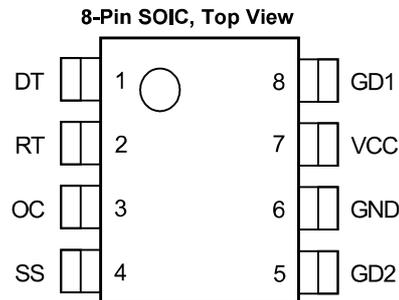
The internal oscillator supports the switching frequencies from 40 kHz to 350 kHz. This high accuracy oscillator realizes the minimum switching frequency limiting with 4% tolerance, allowing the designer to avoid "over design" of the power stage and, thus, further reducing overall system cost. The programmable dead time enables zero-voltage switching with minimum magnetizing current. This will maximize system efficiency across a variety of applications. The programmable soft-start timer maximizes design flexibility demanded by the varied requirements of end equipments utilizing a half bridge topology. By incorporating 0.4-A source and 0.8-A sink driving capability, a low cost, reliable gate driver transformer is a real option.

The UCC25600 delivers complete system protection functions including over current, UVLO, bias supply OVP and over temperature protection.

### TYPICAL APPLICATION DIAGRAM



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

**DEVICE INFORMATION**

**TERMINAL FUNCTIONS**

TERMINAL			DESCRIPTION
NAME	NO.	I/O	
DT	1	I	This pin sets the dead time of high-side and low-side switch driving signals. Connect a resistor to ground. With internal 2.25-V voltage reference, the current flowing through the resistor sets the dead time. To prevent shoot through when this pin is accidentally short to ground, the minimum dead time is set to 120 ns. Any dead time setting less than 120 ns will automatically have 120-ns dead time.
RT	2	I	The current flowing out of this pin sets the frequency of the gate driver signals. Connect the opto-coupler collector to this pin to control the switching frequency for regulation purpose. Parallel a resistor to ground to set the minimum current flowing out of the pin and set the minimum switching frequency. To set the maximum switching frequency limiting, simply series a resistor with the opto-coupler transistor. This resistor sets the maximum current flowing out of the pin and limits the maximum switching frequency.
OC	3	I	Over-current protection pin. When the voltage on this pin is above 1 V, gate driver signals are actively pulled low. After the voltage falls below 0.6 V, the gate driver signal recovers with soft start. When OC pin voltage is above 2 V, the device is latched off. Bringing VCC below UVLO level resets the overcurrent latch off.
SS	4	I	Soft-start pin. This pin sets the soft-start time of the system. Connect a capacitor to ground. Pulling this pin below 1 V will disable the device to allow easy ON/OFF control. The soft-start function is enabled after all fault conditions, including bias supply OV, UVLO, over-current protection and over-temperature protection.
GD1	8	O	High-side and low-side switch gate driver. Connect gate driver transformer primary side to these two pins to drive the half bridge.
GD2	5	O	
GND	6	-	Ground.
VCC	7	-	Bias Supply. Connect this pin to a power supply less than 20 V. Parallel a 1- $\mu$ F capacitor to ground to filter out noise.

Block Diagram

