

# NCP1336A/B

## Quasi-Resonant Current Mode Controller for High Power Universal Off-Line Supplies

The NCP1336 hosts a high-performance circuitry aimed to powering quasi-resonant converters. Capitalizing on a novel valley-lockout system, the controller shifts gears and reduces the switching frequency as the power loading becomes lighter. This results in a stable operation despite switching events always occurring in the drain-source valley. This system works down to the 4<sup>th</sup> valley and toggles to a variable frequency mode beyond, ensuring an excellent standby power performance.

The controller takes benefit of a high-voltage start-up current source to provide a quick and lossless power-on sequence. To improve the safety in overload situations, the controller includes an Over Power Protection circuit which clamps the delivered power at high-line. Safety-wise, an adjustable timer relies on the feedback voltage to detect a fault. On version B, this fault triggers a triple-hiccup on the VCC pin which naturally reduces the average input power drawn by the converter. On version A, when a fault is detected, the controller is latched-off.

Particularly well suited for adapter applications, the controller features two latch inputs: one dedicated to Over Temperature protection (OTP) which offers an easy means to connect a pull-down temperature sensor like an NTC, and a second one more classical that can be used to perform an accurate Over Voltage Protection.

Finally, a brownout pin which stops the circuit operation in presence of a low mains condition is included.

### Features

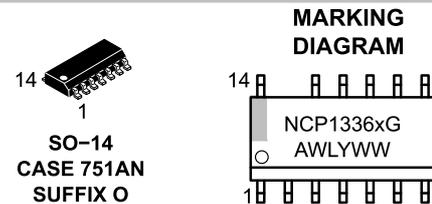
- Quasi-Resonant Peak Current-Mode Control Operation
- Valley Switching Operation with Valley-Lockout for Noise-Immune Operation
- Internal 5 ms Soft-Start
- Loss-Free Adjustable Over Power Protection
- Auto-Recovery or Latched Internal Output Short-Circuit Protection
- Adjustable Timer for Improved Short-Circuit Protection
- Overvoltage and Overtemperature Protection Inputs
- Brownout Input
- -500 mA/+800 mA Peak Current Source/Sink Capability
- Internal Temperature Shutdown
- Direct Optocoupler Connection
- 3  $\mu$ s Blanking Delay to Ignore Leakage Ringing at Turn-Off
- Extremely Low No-Load and Standby Power



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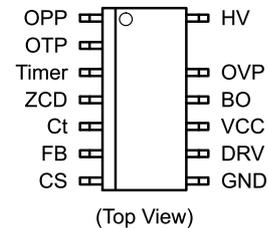
[www.onsemi.com](http://www.onsemi.com)

### QUASI-RESONANT PWM CONTROLLER FOR HIGH POWER AC-DC WALL ADAPTERS



- A = Assembly Location
- x = A or B
- WL = Wafer Lot
- Y = Year
- WW = Work Week
- G = Pb-Free Package

### PIN CONNECTIONS



### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 25 of this data sheet.

- SO14 Package
- These are Pb-Free Devices
- This Device uses Halogen-Free Molding Compound

### Typical Applications

- High Power ac-dc Converters for TVs, Set-Top Boxes etc
- Offline Adapters for Notebooks

## NCP1336A/B

### PIN FUNCTION DESCRIPTION

Pin No.	Pin Name	Function	Pin Description
1	OPP	Adjust the Over Power Protection	A negative voltage applied to this pin reduces the internal maximum peak current setpoint. Connecting it to an auxiliary winding through a resistor divider thus performs Over Power compensation. If grounded, OPP is null.
2	OTP	Over-Temperature Protection	Connect an NTC between this pin and GND pin. Pin 2 features an internal current source that biases the NTC. When the NTC pulls the pin down, the circuit permanently latches-off.
3	Timer	Timer	Wiring a capacitor to ground helps selecting the timer duration.
4	ZCD	Zero Crossing Detection	Connected to the auxiliary winding, this pin detects the core reset event.
5	Ct	Timing Capacitor	A capacitor connected to this pin acts as the timing capacitor in foldback mode.
6	FB	Feedback Pin	Hooking an optocoupler collector to this pin will allow regulation.
7	CS	Current Sense	This pin monitors the primary peak current.
8	GND	-	This pin is the controller ground.
9	DRV	Driver Output	This pin is the driver's output to an external MOSFET.
10	VCC	Supplies the Controller	This pin is connected to an external auxiliary voltage.
11	BO	Brownout	This pin is the brownout input.
12	OVP	Over-Voltage Protection	By pulling this pin high, the controller can be permanently latched-off.
13	NC	-	This pin is omitted for improved creepage.
14	HV	High-Voltage Input	Connected to the bulk capacitor, this pin powers the internal current source to deliver a startup current.

### OVERCURRENT PROTECTION ON NCP1336 VERSIONS

	Auto-Recovery Overcurrent protection	Latched Overcurrent protection
NCP1336 / A		X
NCP1336 / B	X	

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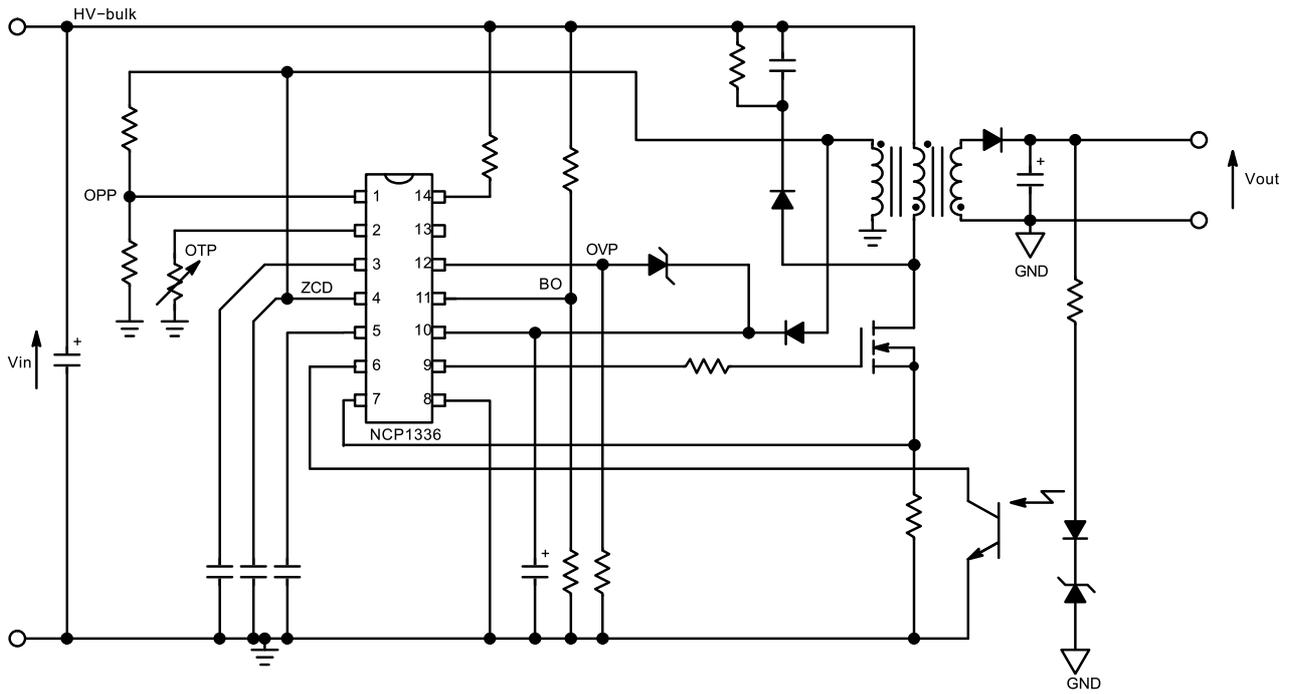


Figure 1. Typical Application Example