

## Product Overview

### TL594: PWM Controller

For complete documentation, see the data sheet.

The TL594 PWM Controller incorporates all the functions required in the construction of a pulse width modulation (PWM) control circuit on a single chip. Designed primarily for power-supply control, this device offers the systems engineer the flexibility to tailor the power-supply control circuitry to a specific application. The TL594 PWM Controller contains two error amplifiers, an on-chip adjustable oscillator, a dead-time control (DTC) comparator, a pulse-steering control flip-flop, a 5-V regulator with a precision of 1.5%, an undervoltage lockout control circuit, and output control circuitry. The error amplifiers have a common-mode voltage range of -0.3 V to  $V_{CC}-2$  V. The DTC comparator has a fixed offset that provides approximately 5% dead time. The on-chip oscillator can be bypassed by terminating RT to the reference output and providing a sawtooth input to CT, or it can be used to drive the common circuitry in synchronous multiple-rail power supplies. The uncommitted output transistors provide either common-emitter or emitter-follower output capability. Each device provides for push-pull or single-ended output operation, with selection by means of the output-control function. The architecture of these devices prohibits the possibility of either output being pulsed twice during push-pull operation. The undervoltage lockout control circuit locks the outputs off until the internal circuitry is operational. The TL594CD, CN, CDTB are characterized for operation from -40C to 85C.

### Features

- PWM Buck Controller Configuration
- Variable Frequency Operation (up to 300 KHz)
- Complete Pulse Width Modulation Control Circuitry
- On-Chip Oscillator with Master or Slave Operation
- On-Chip Error Amplifiers
- On-Chip 5.0 V Reference, 1.5% Accuracy
- Adjustable Deadtime Control
- Uncommitted Output Transistors Rated to 500 mA Source or Sink
- Output Control for Push-Pull or Single-Ended Operation
- Undervoltage Lockout

For more features, see the data sheet

### Benefits

- Simple to use in buck configuration
- Optimize system size and efficiency

### Applications

- Off-line power supply
- Buck converter

### End Products

- VPA (Vehicle Power Adapter)
- LED Lighting

### Part Electrical Specifications

Product	Pricing (\$/Unit)	Compliance	Status	Topology	Phases	Control Mode	$V_{CC}$ Min (V)	$V_{CC}$ Max (V)	$f_{sw}$ Typ (kHz)	Package Type
TL594CDR2G	0.3077	Pb-free	Active	Flyback Push-Pull Forward	1	Voltage Mode	6	42	Up to 300	SOIC-16
TL594CDTBR2G		Pb-free Halide free	Active	Push-Pull Forward Flyback	1	Voltage Mode	6	42	Up to 300	TSSOP-16

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