



# LTC7510

## Digital DC/DC Controller with PMBus Interface

### FEATURES

- Digital PID Control Loop with 4x Voltage Oversampling
- PMBus™ Serial Interface
  - Query Voltage, Current, Temperature, and Faults
  - Voltage Set and Adjustment
  - Open Loop Tracking, Sequencing, Margining
  - Over-ride Hardwired Settings
- Resistor Based PMBus Address, Output Voltage, Frequency, and Current Limit Set
- 150kHz to 2MHz Switching Frequency
- Output Voltage Range: 0.7V to 3.6V
- DCR Current Sense with Temperature Compensation
- Internal Non-Volatile Memory (NVM) to Store Custom Configurations
- Extensive Fault Detection Capability
- Soft-Start into Pre-Biased Load
- Current Sharing Between Multiple LTC7510 Devices
- Programmable Droop Control (Loadline)
- 32-Lead 5mm × 5mm QFN Package

### DESCRIPTION

The LTC®7510 is a digital DC/DC controller with onboard non-volatile memory and PMBus interface for real time reporting and controlling of point-of-load (POL) power management attributes such as current, voltage, and operating frequency and temperature. Power supply sequencing, margining, turn-on/off are easily programmed via the PMBus interface. The LTC7510 also provides extensive POL fault detection reporting capability.

The LTC7510 uses a digital control loop to eliminate external compensation components. The controller supports current sharing of multiple ICs in high power designs. Up to four controllers can be synchronized for multiphase operation.

The LTC7510 provides superior accuracy through internal calibration that measures and corrects current sense error sources upon startup. Programmable current sense temperature compensation allows the designer to tailor the response for best accuracy over temperature. The LTC7510 is available in the 32-lead QFN package.

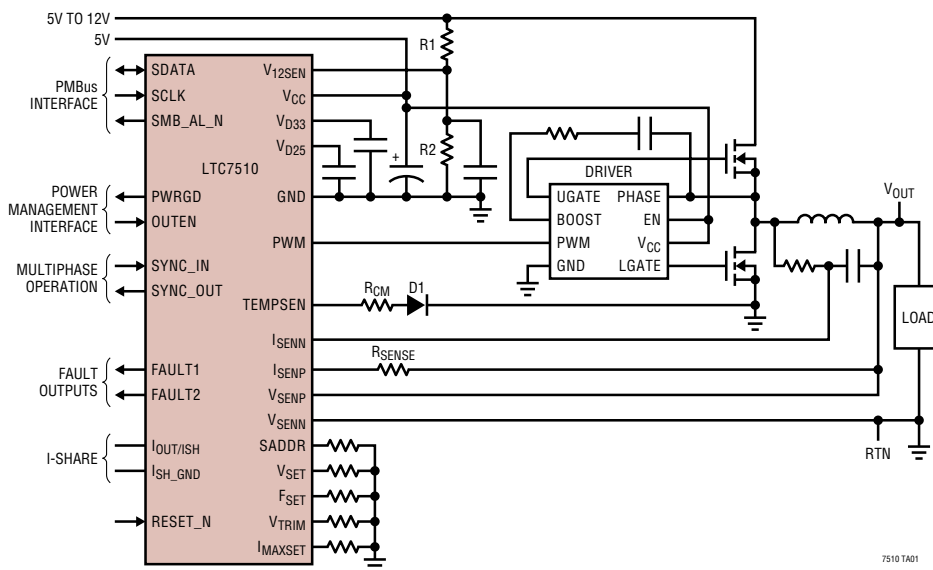
LT, LT, LTC and LTM are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners.

### APPLICATIONS

- Intelligent Point-of-Load (POL) Power Regulation

### TYPICAL APPLICATION

Typical Application for Single-Channel Operation



7510 TA01



## ABSOLUTE MAXIMUM RATINGS

(Note 1)

Supply Voltage ( $V_{CC}$ ) .....	-0.3V to 6V
$V_{SENP}$ , $V_{SENN}$ .....	-0.3V to 3V
OUTEN, SYNC_IN, SYNC_OUT, SMB_AL_N, PWRGD, RESET_N, PWM, SDATA, SCLK .....	-0.3 to 6V
All Other Pins .....	-0.3 to 4.25V
Differential Voltage	
$V_{SEN\_DIFF}$ ( $V_{SENP} - V_{SENN}$ ) .....	-0.3 to 2.5V
Junction Temperature .....	125°C
Storage Temperature Range .....	-65°C to 125°C
Operating Temperature Range .....	0°C to 85°C

## PACKAGE/ORDER INFORMATION

TOP VIEW

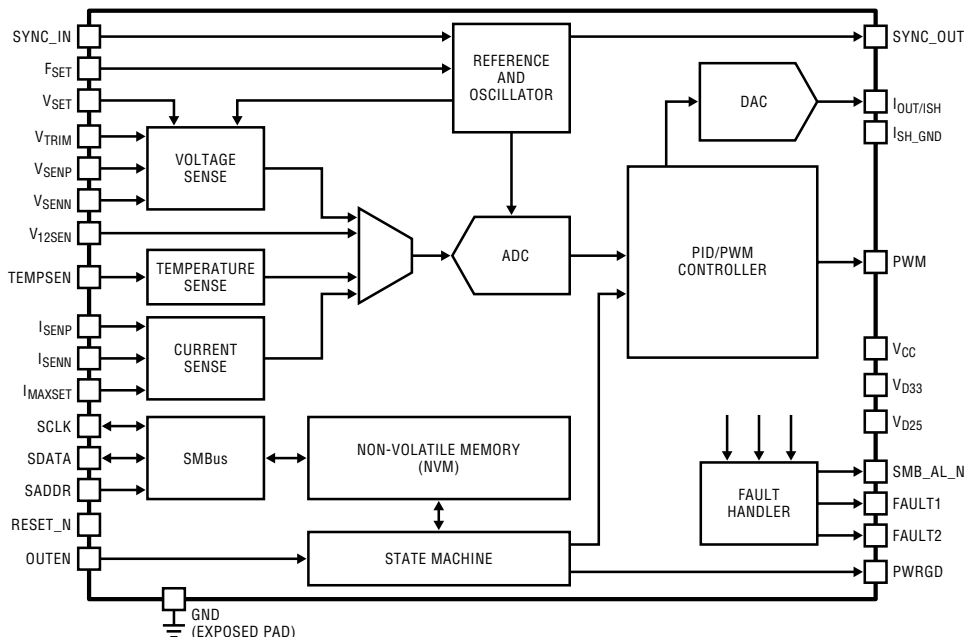
UH PACKAGE  
32-LEAD (5mm × 5mm) PLASTIC QFN  
 $T_{JMAX} = 125^{\circ}\text{C}$ ,  $\theta_{JA} = 34^{\circ}\text{C/W}$   
EXPOSED PAD (PIN 33) IS GND, MUST BE SOLDERED TO PCB

ORDER PART NUMBER	QFN PART MARKING
LTC7510CUH	7510

**Order Options** Tape and Reel: Add #TR  
Lead Free: Add #PBF Lead Free Tape and Reel: Add #TRPBF  
Lead Free Part Marking: <http://www.linear.com/leadfree/>

Consult LTC Marketing for parts specified with wider operating temperature ranges.

## BLOCK DIAGRAM



7510p