

## A True 150-nA $I_Q$ , 0.9-3.6V<sub>IN</sub>, Selectable 1.8-5V<sub>OUT</sub>, Instant-ON™ Boost Converter

### FEATURES

- ◆ Ultra-Efficient Boost Converter:
  - Active-mode, No-load Supply Current: 150nA
  - Efficiency: Up to 92%
  - Input Voltage Range: 0.9V-3.6V
  - Delivers up to 35 mA at 3V<sub>STORE</sub> from 1.2V<sub>IN</sub>
  - Single-inductor, Discontinuous-Conduction Mode Operation
  - No External Schottky Diode Required
- ◆ Pin-Selectable Output Voltages: 1.8V, 2.1V, 2.5V, 2.85V, 3.0V, 3.3V, 4.1V, and 5.0V
- ◆ Output Power Good Indicator
- ◆ User-enabled Secondary Output Load Switch
- ◆ 10-Pin, Low-profile, 2mm x 2mm TDFN Package

### APPLICATIONS

Coin Cell-Powered Portable Equipment  
 Single Cell Li-ion or Alkaline Powered Equipment  
 Solar or Mechanical Energy Harvesting  
 Wireless Microphones  
 Wireless Remote Sensors  
 RFID Tags  
 Blood Glucose Meters  
 Personal Health-Monitoring Devices  
 ZigBee Radio Devices

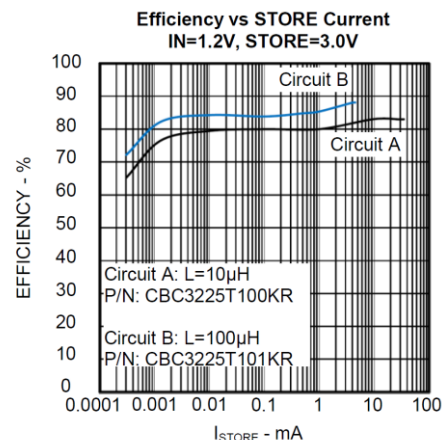
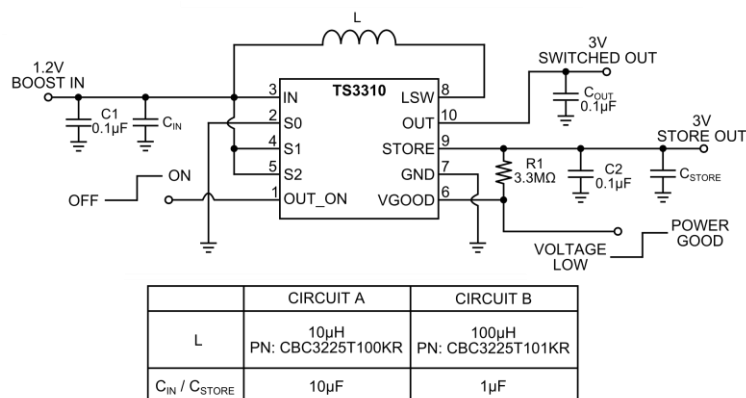
### DESCRIPTION

The TS3310 is a low power boost converter with an industry-leading low quiescent current of 150nA. The 150nA is the actual, no-load supply current drawn from the battery while the output is in regulation. The TS3310's extremely low power internal circuitry consumes approximately 90nA. With periodic switching cycles which service the load occurring at intervals of up to 25 seconds, the total average no-load supply current is 150nA. The TS3310 boosts input voltages from 0.9V-3.6V to one of eight user-selectable output voltages ranging from 1.8V to 5.0V. The TS3310 includes two outputs: (a) an always-on primary output and (b) a user-enabled, load-switched secondary output designed to power burst-on loads intended to operate at low duty cycles. The TS3310 operates in discontinuous conduction mode with an on-time proportional to  $1/V_{IN}$ , thereby limiting the maximum input current by the selection of the inductor value, ensuring the boost start-up current does not cause the input source to sag.

The extremely low quiescent current combined with a secondary output load switch makes the TS3310 an ideal choice for applications where a burst-on load can be periodically powered from the switched output. In this way, the burst-on load is disconnected from the output storage capacitor when it is turned off, preventing the burst-on load's leakage current from discharging the output storage capacitor.

The TS3310 is fully specified over the -40°C to +85°C temperature range and is available in a low-profile, thermally-enhanced 10-pin 2x2mm TDFN package with an exposed back-side paddle.

### TYPICAL APPLICATION CIRCUIT



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# TS3310 Product Brief



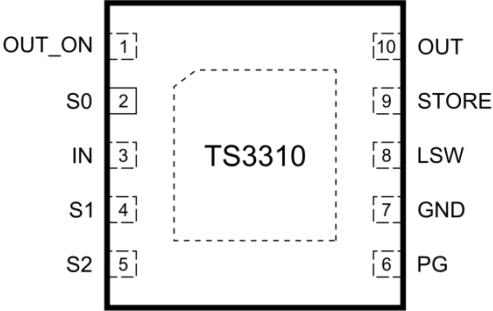
## ABSOLUTE MAXIMUM RATINGS

IN to GND.....	-0.3V to +6.0V
STORE to GND.....	-0.3V to +6.0V
OUT to GND.....	-0.3V to +6.0V
LSW to GND.....	-0.3V to +6.0V
OUT_ON, S0, S1, S2 to GND.....	-0.3V to +6.0V
VGOOD to GND.....	-0.3V to +6.0V
LSW to GND.....	-0.3V to +6.0V

Continuous Power Dissipation ( $T_A = +70^{\circ}\text{C}$ )	
10-Pin TDFN22EP	
(Derate at 13.48mW/ $^{\circ}\text{C}$ above $+70^{\circ}\text{C}$ ) .....	1078mW
Operating Temperature Range.....	$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$
Junction Temperature .....	$+150^{\circ}\text{C}$
Storage Temperature Range.....	$-65^{\circ}\text{C}$ to $+150^{\circ}\text{C}$
Lead Temperature (Soldering, 10s).....	$+300^{\circ}\text{C}$

Electrical and thermal stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to any absolute maximum rating conditions for extended periods may affect device reliability and lifetime.

## PACKAGE/ORDERING INFORMATION

<div>TOP VIEW</div> <div></div> <div>2mm x 2mm x 0.75mm TDFN-10 EP BD 10TSLP Package</div>			
ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TS3310ITD1022T	AAW	Tape & Reel	-----
TS3310ITD1022TP		Tape & Reel	3000

**Lead-free Program:** Touchstone Semiconductor supplies only lead-free packaging.

Consult Touchstone Semiconductor for products specified with wider operating temperature ranges.