



# Dual, 5A, 1.5MHz Step-Down Regulator with Integrated High-Side Switches

MAX8653

## General Description

The MAX8653 dual-output, synchronous, step-down regulator contains low  $R_{DS(ON)}$  integrated high-side MOSFET switches for ease of layout and achieving small footprints. Each output delivers up to 5A. The output voltage is adjustable down to 0.6V and operates from a 9V to 14V input voltage. The MAX8653 uses a proprietary high-bandwidth, constant-frequency, peak-voltage-mode control architecture and operates at an adjustable switching frequency between 300kHz to 1.5MHz. The architecture is suitable for use with a wide range of output capacitor technologies such as aluminum electrolytic, POSCAPs, and ceramic capacitors for flexible design. The simple compensation scheme achieves fast response under both line and load transients.

The switching frequency is adjustable using a single external resistor. The output channels operate 180° out-of-phase to reduce the input ripple current, thus reducing the required input capacitance. The high operating frequency minimizes the size of external components. The external reference input (REFIN) enables implementation of tracking applications such as DDR power supplies. The MAX8653 utilizes internal digital soft-start and features a lossless (cycle-by-cycle) current sensing. It includes adjustable, hiccup-mode current-limit and short-circuit protection for minimum power dissipation under fault conditions. Each output contains an enable (EN\_) input along with a power-good (POK\_) signal for easy sequencing. The MAX8653 is available in a 28-pin, 5mm x 5mm Thin QFN package.

## Applications

Telecom	DDR Memories
Network Equipment	DSL
Storage	Set-Top Box
Servers	Cable Modem

## Features

- ◆ Integrated 80mΩ  $R_{DS(ON)}$ , High-Side MOSFETs
- ◆ Adjustable Hiccup-Mode Short-Circuit Current-Limit Protection
- ◆ ±1% Output Accuracy over Load, Line, and Temperature
- ◆ 9V to 14V Input Supply Range
- ◆ Adjustable Output Down to 0.6V
- ◆ Digital Soft-Start Reduces Inrush Supply Current
- ◆ 300kHz to 1.5MHz Adjustable Switching Frequency
- ◆ External Frequency Synchronization
- ◆ Compatible with Ceramic, Polymer, and Electrolytic Capacitors
- ◆ 180° Out-of-Phase Operation
- ◆ Enable and POK for Each Output
- ◆ REFIN Feature for Tracking Applications
- ◆ 28-Lead 5mm x 5mm Thin QFN Package

## Ordering Information

PART	TEMP RANGE*	PIN-PACKAGE	PKG CODE
MAX8653ETI+	-40°C to +85°C	28 Thin QFN-EP** (5mm x 5mm)	T2855-5

+Denotes lead-free package.

\*The MAX8653 is specified in the extended temperature range.

\*\*EP = Exposed pad.

Pin Configuration appears at end of data sheet.

## Typical Operating Circuit

