

MP8756

26V, 6A, Low I_Q, High-Current, Synchronous, Step-Down Converter

The Future of Analog IC Technology®

DESCRIPTION

The MP8756 is a fully integrated, high-frequency, synchronous, rectified, step-down, switch-mode converter. It offers a very compact solution that achieves 6A of continuous output current with excellent load and line regulation over a wide input supply range.

The MP8756 operates with high efficiency over a wide output-current load range based on MPS' proprietary switching loss reduction technique and internal low R_{DS(ON)} power MOSFETs.

Adaptive constant-on-time (COT) control mode provides fast transient response and eases loop stabilization. The DC auto-tune loop provides good load and line regulation.

Full protection features include over-current limit, over-voltage protection (OVP), under-voltage protection (UVP), and thermal shutdown.

The converter requires a minimum number of external components and is available in a QFN-12 (2mmx3mm) package.

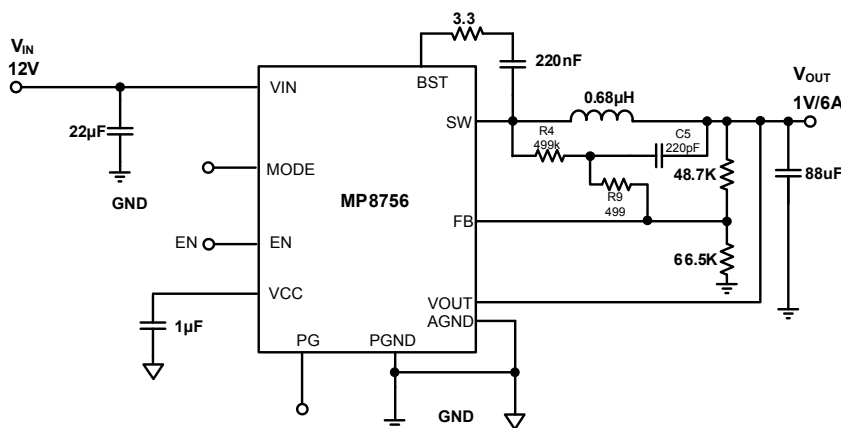
FEATURES

- Wide 4.5V to 26V Operating Input Range
- Output Adjustable from 0.6V
- Ultrasonic Mode (USM)
- 117µA Low Quiescent Current
- 6A Continuous Output Current
- Adaptive COT for Fast Transient
- DC Auto-Tune Loop
- Stable with POSCAP and Ceramic Output
- 1% Reference Voltage
- Internal Soft Start
- Output Discharge
- 700kHz Switching Frequency
- OCP, OVP, UVP (Hiccup), and Thermal Shutdown
- Available in a QFN-12 (2mmx3mm) Package

APPLICATIONS

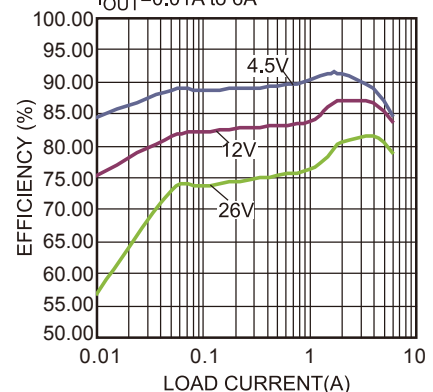
- Laptop Computer
- Tablet PC
- Networking Systems
- Personal Video Recorders
- Flat-Panel Television and Monitors
- Distributed Power Systems

TYPICAL APPLICATION



Efficiency

L=0.68µH, V_{OUT}=1V,
I_{OUT}=0.01A to 6A



ORDERING INFORMATION

Part Number*	Package	Top Marking
MP8756GD	QFN-12 (2mmx3mm)	See Below

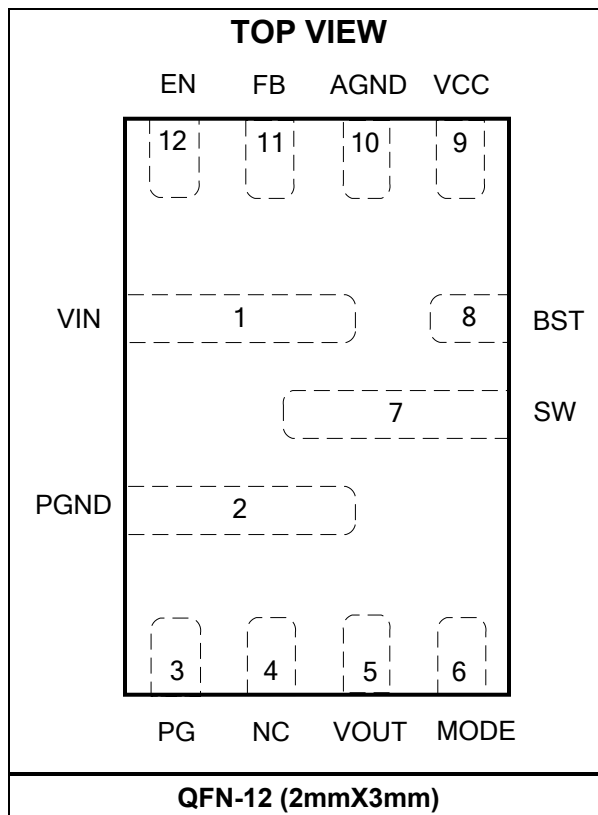
TOP MARKING

ATQ

YWW

LLL

PACKAGE REFERENCE



PIN FUNCTIONS

PIN #	Name	Description
1	VIN	Supply voltage. VIN supplies power for the internal MOSFET and regulator. The MP8756 operates from a 4.5V to 26V input rail. Decouple the input rail with an input capacitor. Use wide PCB traces and multiple vias to make the connection. Apply at least two layers for this input trace.
2	PGND	Power ground. Connect using wide PCB traces and multiple vias large enough to handle the load current.
3	PG	Power good output. The output of PG is an open-drain signal. PG is high if the output voltage is higher than 95% or lower than 105% of the nominal voltage.
4	NC	Do not connect. NC must be left floating.
5	VOUT	VOUT is used to sense the output voltage of the buck regulator. Connect VOUT to the output capacitor of the regulator directly. Keep the VOUT sensing trace far away from the SW node. Vias should also be avoided on the VOUT sensing trace. A trace larger than 25mil is required.
6	MODE	USM, PFM, PWM selection. Pull MODE higher than 2.6V to operate the MP8756 in forced PWM mode. Float MODE to operate the MP8756 in PFM mode with ultrasonic mode (USM) at light load. Connect MODE to ground to operate the MP8756 in PFM mode without USM.
7	SW	Switch output. Connect SW to the inductor and bootstrap capacitor. SW is driven up to VIN by the high-side switch during the PWM duty cycle on-time. The inductor current drives SW negative during the off time. The on resistance of the low-side switch and the internal diode fixes the negative voltage. Use wide and short PCB traces to make the connection. Keep the SW pattern area minimized.
8	BST	Bootstrap. A capacitor connected between SW and BST is required to form a floating supply across the high-side switch driver.
9	VCC	Internal VCC LDO output. The driver and control circuits are powered by VCC. Decouple with a minimum 1 μ F ceramic capacitor placed as close to VCC as possible. X7R or X5R grade dielectric ceramic capacitors are recommended for their stable temperature characteristics.
10	AGND	Signal logic ground. AGND is the Kelvin connection to PGND.
11	FB	Feedback. FB sets the output voltage when connected to the tap of an external resistor divider connected between output and GND.
12	EN	Enable. EN is a digital input that turns the regulator on or off. When the power supply of the control circuit is ready, drive EN high to turn on the regulator. Drive EN low to turn off the regulator.