



# MPQ3910A

Peak-Current Mode, Boost PWM Controller  
with Programmable Frequency,  
External Soft Start, and Light-Load Operation  
AEC-Q100 Qualified

**PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE**

## DESCRIPTION

The MPQ3910A is a peak-current mode, PWM, boost controller that can drive an external MOSFET capable of handling more than 10A of current. The MPQ3910A has a typical operational current of 288 $\mu$ A and can accommodate flyback, boost and sepic application.

Current-mode control provides an inherently simple loop compensation and cycle-by-cycle current limit. Under-voltage lockout (UVLO), soft start (SS), an internal regulated supply, and slope compensation are all provided to minimize the external component count.

The 1A gate driver minimizes the power loss of the external MOSFET while allowing the use of a wide variety of standard threshold devices. Additionally, the MPQ3910A uses pulse-skipping mode to improve the efficiency at light load or no load. Protection features include hiccup protection for overload protection (OLP), over-voltage protection (OVP), and short-circuit protection (SCP).

The MPQ3910A is available in an MSOP-10 package.

## FEATURES

- Guaranteed Industrial/Automotive Temp
- 5V to 35V Supply Voltage Range <sup>(1)</sup>
- 12V, 1A MOSFET Gate Driver
- External Soft Start (SS)
- Pulse-Skipping Operation at Light Load
- Programmable Switching Frequency (30kHz to 400kHz)
- Frequency Synchronizable from 80kHz to 400kHz
- Cycle-by-Cycle Current Limit
- Over-Voltage Protection (OVP)
- Short-Circuit Protection (SCP)
- Over-Temperature Protection (OTP)
- Available in an MSOP-10 Package
- Available in AEC-Q100 Grade 1

## APPLICATIONS

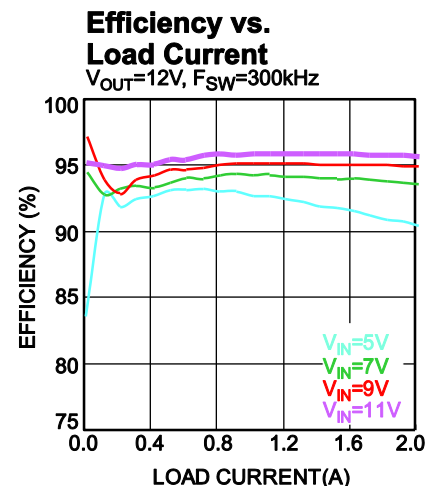
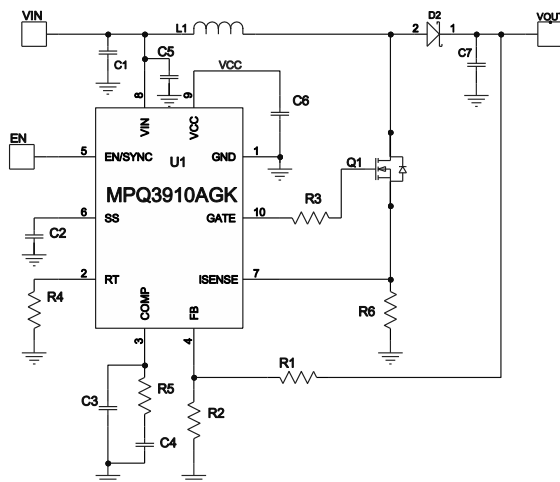
- Telecom Isolated Power Supplies
- Back-Up Boost
- Start-Stop Boost

All MPS parts are lead-free, halogen-free, and adhere to the RoHS directive. For MPS green status, please visit the MPS website under Quality Assurance. "MPS", the MPS logo, and "Simple, Easy Solutions" are trademarks of Monolithic Power Systems, Inc. or its subsidiaries.

### NOTE:

- 1) Refer to the Internal VCC Regulation section on page 12 for a <7V input voltage application.

## TYPICAL APPLICATION



**PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE**

**ORDERING INFORMATION**

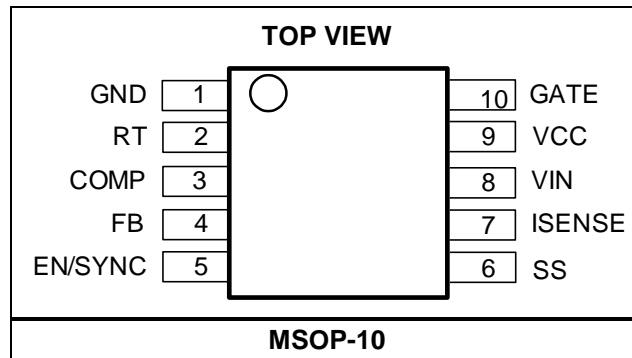
Part Number*	Package	Top Marking	MSL Rating
MPQ3910AGK-AEC1	MSOP-10	See Below	Level 1

\* For Tape & Reel, add suffix -Z (e.g. MPQ3910AGK-AEC1-Z).

**TOP MARKING**

TBD

**PACKAGE REFERENCE**



**PIN FUNCTIONS**

Pin #	Name	Description
1	GND	<b>Power ground pin gate driver return.</b>
2	RT	<b>Switching frequency set pin.</b> Connect a resistor from RT to GND to set the switching frequency (30 ~ 400kHz).
3	COMP	<b>Error amplifier output.</b>
4	FB	<b>Feedback and OVP monitor.</b> FB has a respective internal reference voltage for un-isolated solution. OVP monitor pin for isolated solution. Connected to GND, if not used in isolated solution.
5	EN/SYNC	<b>On/off control Input.</b> EN/SYNC is connected to GND internally with a 1MΩ resistor. Apply an external clock higher than the RT-set frequency to EN/SYNC to synchronize the switching frequency.
6	SS	<b>Soft start.</b> Connect a capacitor between SS and GND to control the duration of the COMP voltage rising. SS determines both the soft-start current and hiccup protection delay.
7	ISENSE	<b>Current sense and application mode set.</b> During start-up, ISENSE outputs a current signal and senses the voltage for mode setting detection. During normal operation, ISENSE senses the voltage across the sense resistor for current-mode control, cycle-by-cycle current limit, overload protection, and short-circuit protection.
8	VIN	<b>Input supply.</b> Connect a bypass capacitor from VIN to GND.
9	VCC	<b>Internal 12V regulator output.</b> Connect a capacitor between VCC and GND to bypass the internal regulator.
10	GATE	<b>External N-channel power MOSFET device driver.</b>

**Notice:** The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.