

MP(Q)457x Family of Devices - Fully Integrated Synchronous Buck Converters

The current market situation requires customers to optimize their supply chain and the parts they use in their designs. In addition, saving engineering time and efforts is a constant requirement, which is why re-using devices like **buck converters** across several product platforms is commonplace.

However, different platforms may require different power levels. This may lead to new device selection if a previously used converter can not be scaled for a higher current rating. To address this challenge, MPS offers a family of devices that accommodate the same packaging and layout but allow scaling of the current and power rating.

An example is the **MP(Q)457x family of devices**, offering a wide **4.5V to 60V input voltage and current ratings from 0.6A to 2.5A in the same QFN-12 (2.5mmx3mm) pinout**. It can therefore be used across multiple designs with minimal layout change, making the DC/DC converter one less thing to worry about when taking your next product to market.

Part number overview (consumer, industrial and automotive grade), incl. links to released parts:

Current Rating	Consumer	Industrial	Automotive
600mA	MP4576	MPQ4576	MPQ4576-AEC1
1A	MP4571	MPQ4571	MPQ4571-AEC1
2A	MP4572	MPQ4572	MPQ4572-AEC1
2.5A	MP4573	MPQ4573	MPQ4573-AEC1



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Description

The MP(Q)457x is a synchronous buck switching converter with a configurable frequency, integrating internal high-side and low-side power MOSFETs for high efficiency without the need of an external Schottky diode.

The wide 4.5V to 60V input voltage range accommodates a variety of step-down applications in modern industrial and automotive applications. The device's 2 μ A shutdown mode quiescent current makes it ideal for battery-powered applications.

It employs advanced asynchronous modulation (AAM) to achieve high efficiency during light-load conditions by scaling down the frequency to reduce switching and gate driver losses.

Standard features include built-in soft start, enable control, and power good indication. High-duty cycle and low-dropout mode are provided for automotive cold crank conditions.

The chip provides over-current protection (OCP) with valley-current detection to avoid current runaway. It also has hiccup short-circuit protection (SCP), input under-voltage lockout (UVLO), and auto-recovery thermal protection.

With internal compensation, the QFN-12 (2.5mmx3mm) packaged device offer a very compact solution with a minimal number of readily available, standard external components.

Features

- Wide 4.5V to 60V Operating Input Range
- 0.6A to 2.5A Continuous Output Current
- High-Efficiency Synchronous Mode Control
- 250m Ω /45m Ω Internal Power MOSFETs
- Configurable Frequency Up to 2.2MHz
- 180° Out-of-Phase SYNCO Clock
- 40 μ A Quiescent Current
- Low Shutdown Mode Current: 2 μ A
- FB Tolerance: 1% at Room Temp, 2% at Full Temp
- Selectable AAM or Forced CCM Operation at Light Load
- Internal 0.45ms Soft Start
- Remote EN Control
- Power Good (PG) Indicator
- Low-Dropout Mode
- Over-Current Protection (OCP)
- Short-Circuit Protection with Hiccup Mode
- VIN Under-Voltage Lockout (UVLO)
- Thermal Shutdown

Available in:

2.5x3mm QFN-12 Package

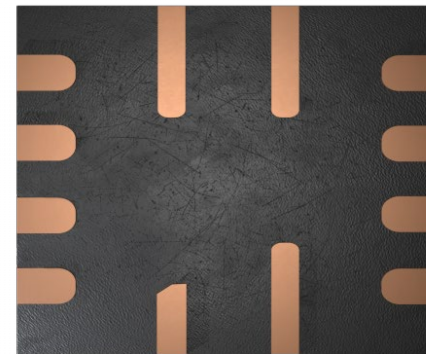
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Benefits:

- Family of devices with common footprint
- 0.6A to 2.5A current ratings allow upgrading/downgrading design
- Low 40 μ A Quiescent Current and 2 μ A Shutdown Mode Current
- Wide 4.5V to 60V Operating Input Voltage Range
- Available in Industrial and Automotive (AEC100) versions
- Space saving QFN-12 (2.5mmx3mm) Package

Applications

- Automotive
- Industrial applications
- Personal light electric vehicles (e.g. e-scooters, e-bikes...)
- Instrumentation
- Motor Control
- Infotainment
- Lamps and LEDs
- Battery pack powered devices like UAVs



Looking for a matching [inductor](#) for our MPS converters? → contact PowerMagnetics@monolithicpower.com or check our website.



MPS Now – Live Engineering Support

MPS Customer Introduction/Advantages



Product Line Overviews & Roadmaps

Power Module Roadmap

- Single Buck
- Multi-out Buck
- Boost & Buck-Boost
- POE
- USB Charger

How to get in contact

- [Visit on MPS Website](#)

Component Demonstrations & Debugging /Problem Solving

Product Crosses & Project Recommendations

MPM54304 Introduction

FEATURES

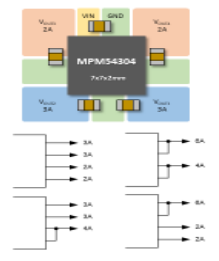
- Input range: 4V-16V;
- Output range: 0.55-5.5V, with 10mV Steps
- Output Current: 3A/3A/2A/2A
- Rails Can be Combined
- Adjustable Power On/Off Sequence
- PG & Enable
- Total Loss allowed: 2.75W
- MTP (3-time) and I2C Function
- QFN package (7x7x2mm)

KEY ADVANTAGES

- **Small Solution Size**
- **Flexible Configuration**
- **Easy Layout**
- **Sequencing & Power Management**

APPLICATIONS

- FPGA/DSP Power Supply
- Single Chip power solutions for ZYNQ-7000 series
- Multi-rail application
- Telecom and Industrial



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