



16V, Quad 25A, Scalable DC/DC Power Module with Digital Interface

The MPM3698 is a fully integrated, single peak 120A or dual peak 80A + 40A power module with a digital interface. It integrates a VR14 compatible dual-loop digital multi-phase controller, three sets of driver MOSFETs, and inductors.

Each phase of the MPM3698 can provide up to 40A of peak output current (I_{OUT}) and 30A of continuous I_{OUT} . The outputs of the three phases can be paralleled to provide up to 120A of peak I_{OUT} or 90A of continuous I_{OUT} . The MPM3698 is compatible with the 160A-rated power block module (MPM3699) to provide a higher I_{OUT} .

The digital interface allows for flexible, digital configurations and monitoring of key parameters. The MPM3698 provides on-chip non-volatile memory (NVM) to store and restore device configurations. Device configurations and fault parameters are easy to configure and monitor.

The MPM3698 features MPS's proprietary digital, multi-phase nonlinear control scheme to provide ultra-fast transient response with minimal output capacitance. With only one power loop control method for both steady state and load transient, the power loop compensation is very easy to configure.

The MPM3698 requires a minimal number of readily available, standard external components. It is available in a thermally enhanced BGA (15mmx30mmx5.18mm) package.

Features & Benefits

- Wide 4.5V to 16V Operating Input Voltage (V_{IN}) Range
- 0.4V to 3.3V Output Voltage (V_{OUT}) Range
- 12-Phase, Dual, Digital Control Loops
- Single Peak 120A or Dual Peak 80A + 40A Output
- Up to 3MHz Switching Frequency (f_{SW})
- Parallel with 160A Power Block Module (MPM3699) for Higher Output Current (I_{OUT})
- Automatic Loop Compensation



Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33
info@alcom.be | www.alcom.be

Rivium 1e straat 52 | 2909 LE Capelle aan den IJssel | The Netherlands
 Tel. +31 (0)10 288 25 00 | info@alcom.nl | www.alcom.nl

- Overshoot Reduction with Nonlinear Control
- Flexible Phase Assignment for Dual Rails
- Automatic Phase-Shedding (APS) and IVID Function to Improve Overall Efficiency
- Phase-to-Phase Active Current Balancing with Configurable Offsets for Thermal Balancing
- Built-In Non-Volatile Memory (NVM) to Store Customized Configurations
- Selectable High Speed Bus: SVID, Voltage Scaling, or PVID
- Digital Load Line Regulation
- V_{IN} , V_{OUT} , Current, Power, and Regulator Temperature Monitoring
- Protections with No Action, Latch-Off, Retry, or Hiccup Options:
 - Under-Voltage Lockout (UVLO)
 - Over-Voltage Protection (OVP)
 - Under-Voltage Protection (UVP)
 - Over-Current Protection (OCP)
 - Under-Current Protection (UCP)
 - Over-Temperature Protection (OTP)
 - Reverse-Voltage Protection (RVP)
- Available in a BGA (15x30x5.18mm) Package

