



Introducing MPS's Open Accelerator Module (OAM) Power System for AI and HPC Applications

Introduction

As the world transitions to a more sustainable future, there is a growing demand for energy-efficient solutions that reduce carbon emissions, and emerging fields such as artificial intelligence (AI) prove to be no exception. In response to the trend for energy-efficient solutions, MPS is committed to providing power solutions with higher efficiency toward the effort of reducing carbon emissions. This helps customers achieve increasingly urgent energy conservation and emission reduction goals in AI and high-performance computing (HPC).

MPS's Open Accelerator Module (OAM) Power System

MPS's power products follow the direction of modularization and AI with the goal of building green and energy-saving datacenters that demonstrate efficiency and stable performance. Figure 1 shows MPS's 48V open accelerator module (OAM) power system.

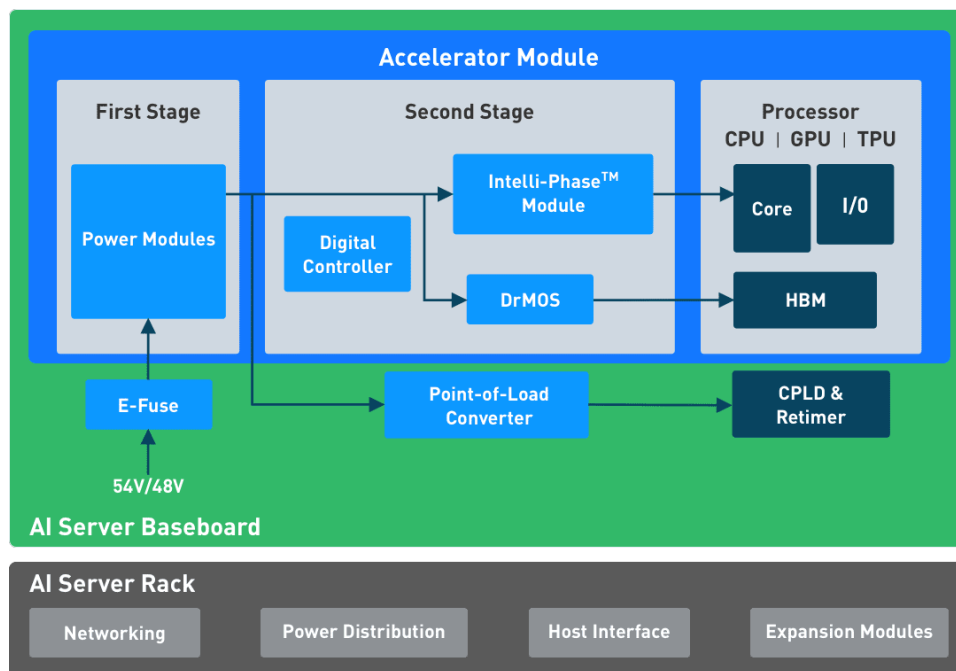


Figure 1: 48V OAM Power System

The AI OAM power system adopts a variety of power management technologies — including intelligent adjustment, energy-saving management, and real-time monitoring — to meet the requirements of AI technology and HPC applications.

Features include:

- Ultra-small package that effectively reduces the board area compared to traditional solutions
- High conversion efficiency to reduce power consumption and save energy
- Automatic phase-shedding to improve efficiency and thermal management
- Constant-on-time (COT) control and digital load-line regulation to reduce power consumption and improve dynamic response
- MPS's Quiet Switcher™ technology (QST) effectively reduces switching voltage spikes and improves system reliability

Introducing the MPC22167-130

The [MPC22167-130](#) is a two-phase Intelli-Module™ that powers processor core rails. It is optimized for HPC applications such as AI processors in OAM form factors, field-programmable gate array (FPGA) and application-specific integrated circuit (ASIC) core power supplies, and PCIe accelerator cards.

Key Features

The MPC22167-130 provides superior performance with features including:

- Quiet Switcher™ technology (QST) that limits peak switching voltages
- Integrates two DrMOS, an inductor, and input capacitors
- 4V to 16V input voltage (V_{IN}) range
- Supports up to 130A of continuous output current (I_{OUT})
- Accu-Sense™ current sense
- Temperature sense
- Receives tri-state pulse-width modulation (PWM) signals
- Current-limit protection
- Over-temperature protection (OTP)
- Fault reporting
- Independent phase outputs for more flexibility

Figure 2 shows the typical application circuit of the MPC22167-130.

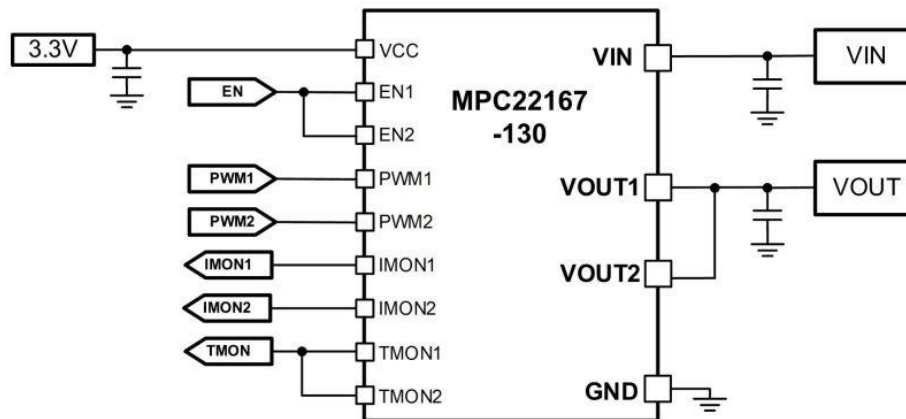


Figure 2: MPC22167-130 Typical Application Circuit

Compact Solution

The MPC22167-130 is available in an LGA-72 (9mmx9.9mmx7.65mm) package. The compact size improves layout and the power delivery network by shortening the distance from the output to the load, which reduces heat loss.

Scalability

The MPC22167-130 Intelli-Module™ is highly scalable. When paired with a multi-phase controller, it can support power systems ranging between hundreds to thousands of watts.

Outstanding Efficiency

The MPC22167-130 also offers high power density, excellent efficiency, and low thermal resistance. Peak efficiencies exceeding 91% can be achieved at 5V V_{IN} and an output voltage (V_{OUT}) of 0.8V.

Introducing the MPC12106-54-0750-0220

The [MPC12106-54-0750-0220](#) is a high-efficiency, non-isolated LLC-DCX power module card with a fixed 4:1 transformer turns ratio. It operates across a 40V to 60V DC primary bus voltage, with a 10V to 15V V_{OUT} . The module can deliver up to 800W of continuous output power (P_{OUT}) with a typical 54V V_{IN} .

Features include:

- Built-in multiple-time programmable (MTP) memory to store custom configurations
- V_{IN} , V_{OUT} , I_{OUT} , and temperature monitoring
- Input over-voltage protection (OVP) and under-voltage protection (UVP)
- Output OVP and UVP
- Over-current protection (OCP) thermal design current, OCP spike, and OTP
- Available in a surface-mount (24mmx18mmx9.1mm) package

Figure 3 shows the typical application circuit of the MPC12106-54-0750-0220.

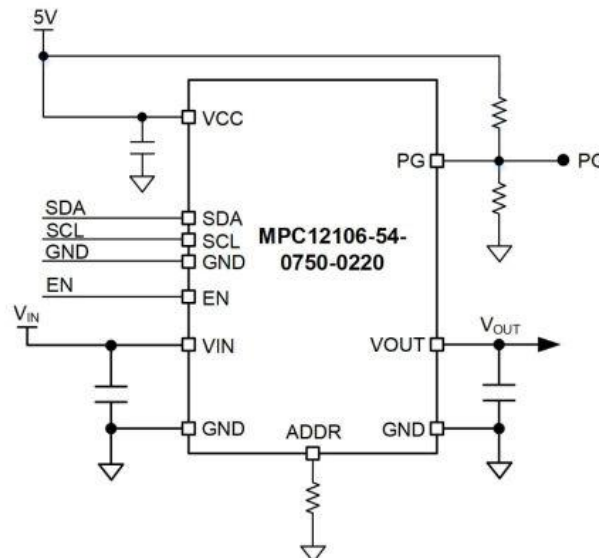


Figure 3: MPC12106-54-0750-0220 Typical Application Circuit

The computing power and massive data processing of AI chips require extremely high currents, ranging from hundreds of amperes to thousands of amperes. Given the extreme current fluctuations, a stable and reliable power supply voltage is a prerequisite for ensuring the stable performance of AI chips. MPS’s digital multi-phase controllers provide COT control to achieve fast transient response and optimal processor performance.

Conclusion

MPS offers innovative power solutions such the [MPC22167-130](#) and the [MPC12106-54-0750-0220](#) that demonstrate high efficiency and high power density for AI and HPC applications. These products support customers in meeting energy conservation and emission reduction goals. For more information, learn about MPS’s [AI hardware](#) solutions.