



Data Center Solutions

DC/DC Power Conversion for Data Center, Open Compute & AI Applications



Quality Assurance & Reliability Commitment

The MPS Quality Assurance organization develops, coordinates, and champions strategic quality initiatives throughout MPS Inc., its foundries, and subcontractors. Its mission is to enable MPS to design, develop, manufacture, and deliver products to our customers with world-class quality and reliability that meet and exceed our customers' expectations.

MPS and Its Supplier Quality Systems and Certificates:

- ISO 9001:2008 (MPS)
- EU RoHS/HF/REACH Compliant (MPS)
- Sony Green Partner (MPS & Suppliers)
- TS16949 (Suppliers)
- ISO 14001 (Suppliers)

Product Quality:

- Automotive Products Qualified per AEC-Q100 Standards
- Standard Products Qualified per JEDEC and Military Standards
- Reliability Failure Rate <10FIT
- Product Quality Level <1.0ppm

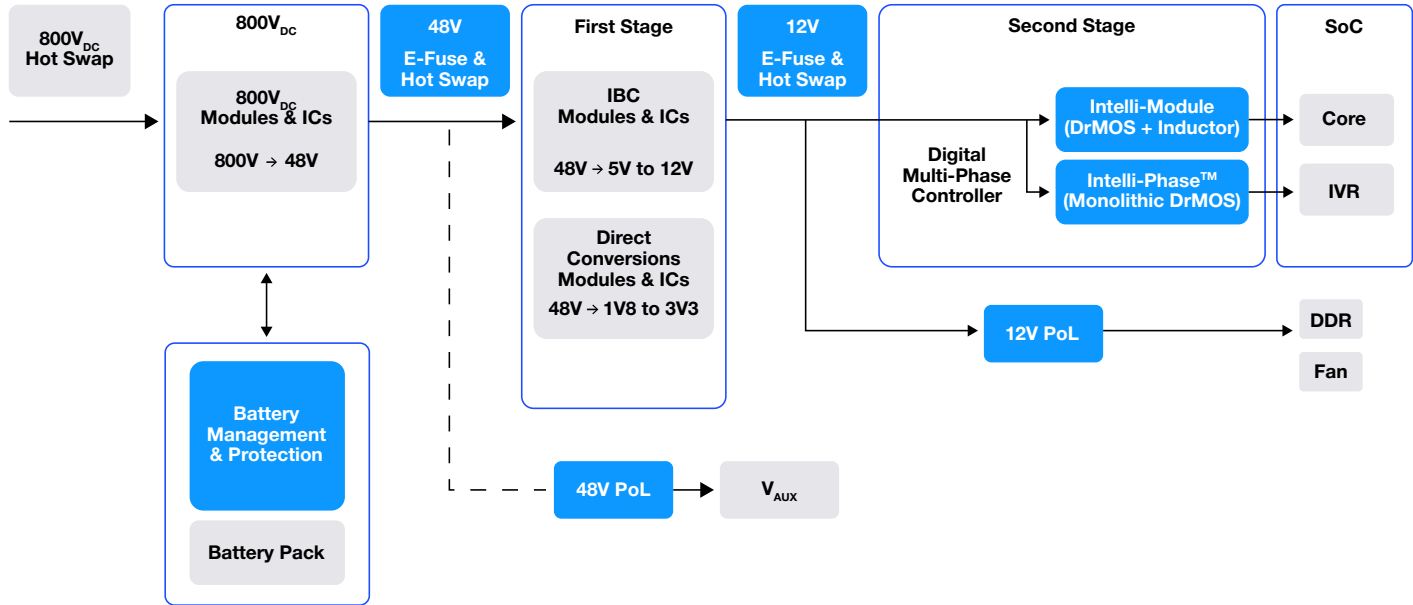
Quality Control and Monitoring:

- On-Site Foundry and Assembly Teams for Real-Time Actions
- Quarterly Supplier Quality Review and Annual Supplier Audit
- Short-Term Reliability Monitoring Test – Daily
- Long-Term Reliability Monitoring Test – Monthly
- Real-Time Engineering Actions on Monitored Failures
- Quarterly Reliability Monitoring Reports

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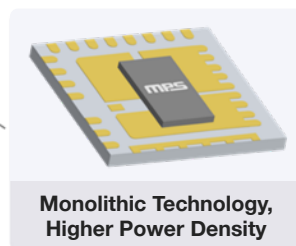
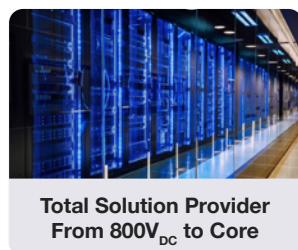
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MPS Powers Every AI Socket



Your Engineering Partner

Powering the Next Generation of AI Hardware



100+ AI Power Products

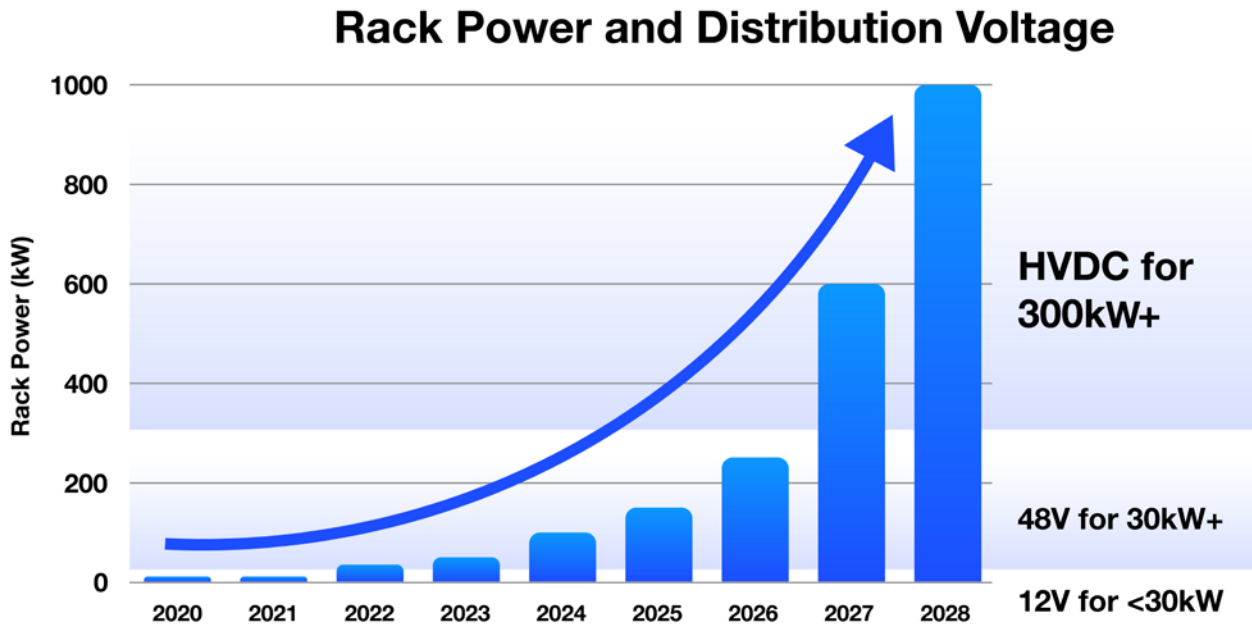
Solutions for All Form Factors and Space-Constrained Configurations

2x Speed

Sample Handoffs

Transition from 12V to 48V to HVDC

Rack Power and Distribution Voltage

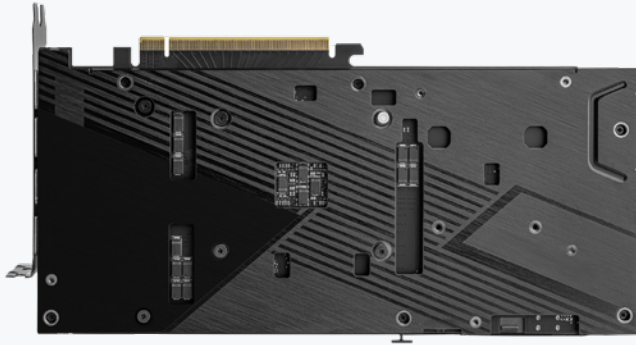


In the early 2000s, the 12V_{DC} bus power distribution architecture was a simple and cost-effective solution for data centers. With the continued exponential trajectory of data center rack power, power distribution architecture has transitioned from 12V_{DC} to 48V_{DC}, and is now transitioning to high-voltage DC (HVDC, typically 800V).

As rack power began to exceed 30kW, power distribution architecture transitioned from a 12V_{DC} to 48V_{DC} bus to improve overall system efficiency by reducing I²R loss. This streamlined power conversion by removing redundant conversion stages, and enabled higher rack density by reducing component size.

As rack power is on track to exceed 300kW, the industry is transitioning to 800V_{DC} power distribution architecture to further improve end-to-end system efficiency by eliminating intermediate conversion steps, reduce cost by decreasing copper required for busbars and cabling, and improve data center floor space utilization.

AI Form Factors

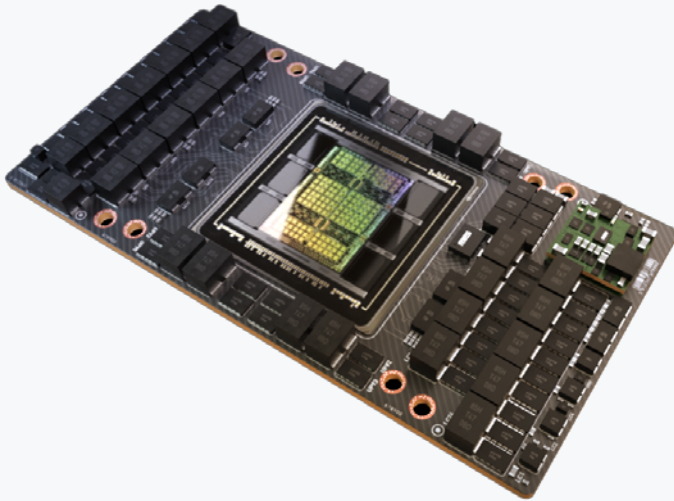


PCIe Accelerator

Power:
<600W

V_{IN} :
12V

Featured Solutions:
E-Fuse and Hot Swap
Multi-Phase Controllers
Intelli-Phase™
Intelli-Module™
Point-of-Load (POL)

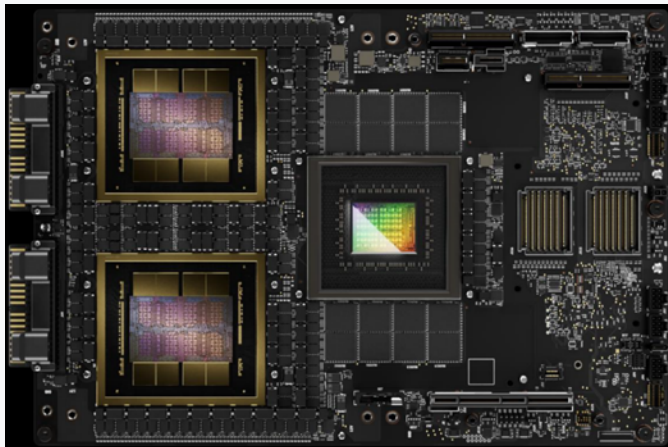


OAM

Power:
750W to 1.5kW

V_{IN} :
54V

Featured Solutions:
E-Fuse and Hot Swap
IBC Modules
Multi-Phase Controllers
Intelli-Phase™
Intelli-Module™
Point-of-Load (POL)



Motherboard + PDB:

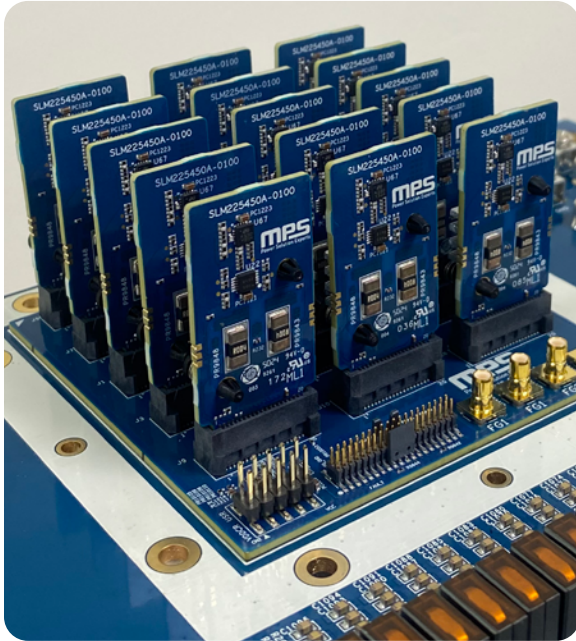
Power:
>1.5kW

V_{IN} :
Power Delivery Board (PDB): 54V or >400V
Motherboard: 12V

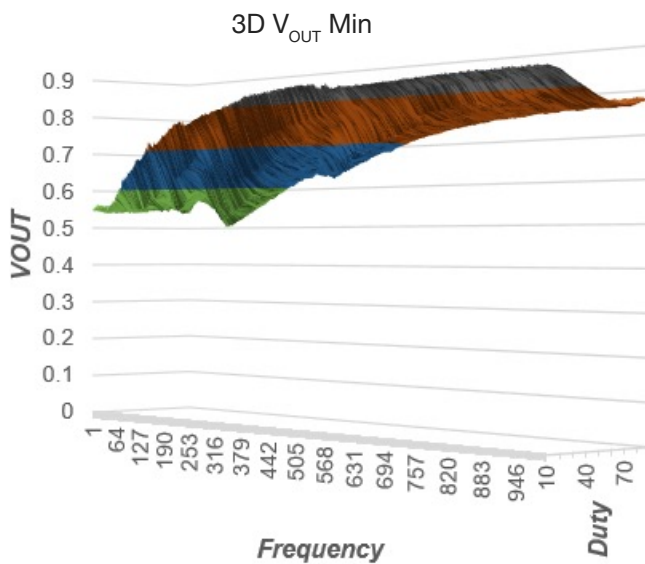
Featured Solutions:
Hot Swap and 800V_{DC} Hot Swap
IBC Modules and 800V_{DC} Modules
Multi-Phase Controllers
Intelli-Phase™
Intelli-Module™
Point-of-Load (POL)

MPSlammer: Load Transient Tool

The MPSlammer is designed to be an easy-to-use and cost-effective method to evaluate MPS power solutions in customer designs.



MPSlammer 3D Transient Plot Example:



Features

- 100A Peak Current (AC Only)
- Minimum Rise/Fall Time: 130ns
- Max di/dt: 769A/ μ s
- Stackable
- Reuseable
- Reverse Insertion Protection
- Bad Insertion Protection
- Over-Temperature Protection (OTP)
- Over-Current Protection (OCP)
- MPS GUI
 - Auto-Test Mode: Sweep Load Frequency and Load Duty Cycle
 - Automatic 3D Transient Test Plots

800V_{DC}

MPS's 800V_{DC} hot-swap solutions are designed to support two-wire or three-wire connections into the $\pm 400\text{V}$ ecosystem. Figure 1 shows an example application with a two-wire connection and 800V conversion modules.

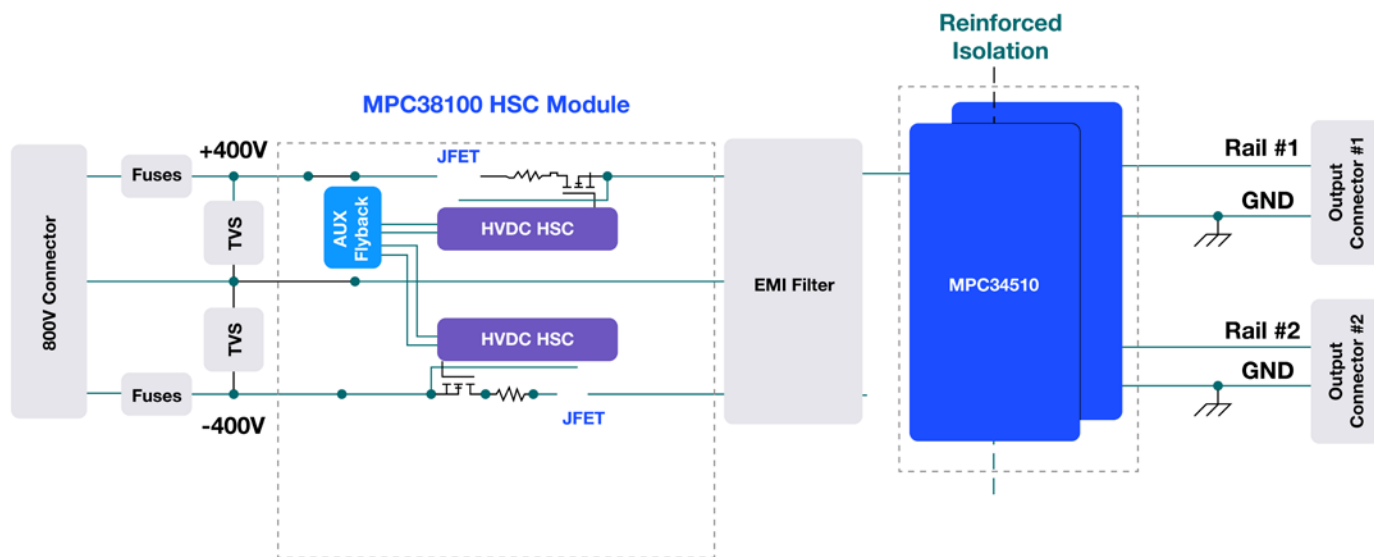
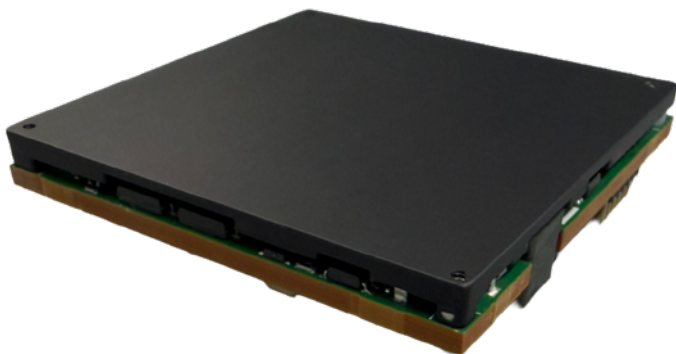
 $\pm 400\text{V}$, 3-Wire with Hot Swap, 16:1 Module

Figure 1

MPC38100-3K20-08A0



Features

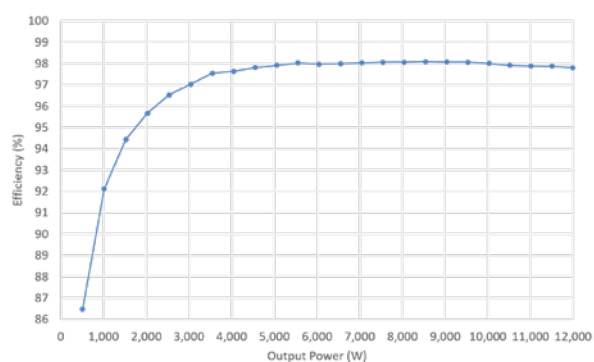
- 3-Wire, $\pm 400\text{V}$
- 32kW TDP
- 99.85% Efficiency
- Blackbox
- Analog Telemetry
- Active Discharge
- Coordinated Turn-On (CTO)
- Coordinated Shutoff (CSO)
- 12V 6W Aux
- PMBus
- Opto-Free
- Size: 65mmx65mmx11mm

MPC34510-12K0-0760

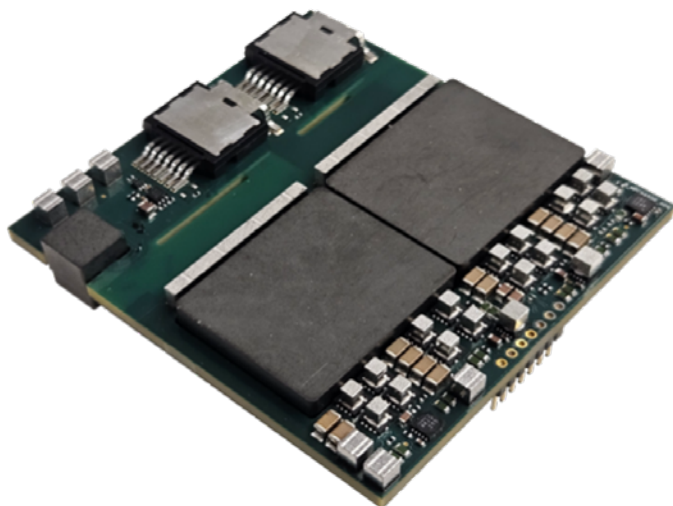


Features

- $V_{IN} = \pm 400V$, $V_{OUT} = 50V$
- Unregulated and Reinforced Isolation, 16:1
- 12kW TDP
- 98.2% Efficiency (Room Temperature)
- 1970W/in³
- UL/IEC-62368-1 Compliant
- Size: 116.8mmx61mmx14.0mm (6.09in³)



MPC34520-6000-0880



Features

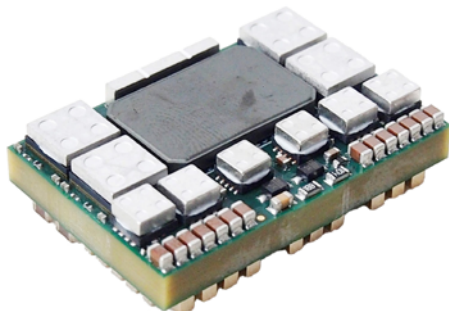
- $V_{IN} = \pm 400V$, $V_{OUT} = 50V$
- Unregulated and Reinforced Isolation, 16:1
- 6kW TDP
- 98.5% Efficiency (Room Temperature)
- 1905W/in³
- UL/IEC-62368-1 Compliant
- Size: 65mmx61mmx13.0mm (3.15in³)

First-Stage Solution: Power Modules

MPS Offers Multiple Options for First-Stage Modules

8:1 and 10:1 IBC Modules

54V to 6.75V, or 5.4V



Enables a higher-frequency second stage due to lower switching losses, which allows the use of a low-height inductor.

4:1 IBC Modules

54V to 13.5V



Higher power density, established common footprint in the market.

Regulated Modules

54V to 12V



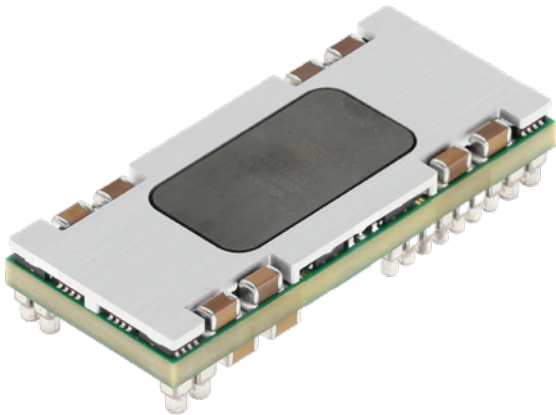
Targeted for systems such as CPU servers that require a regulated 12V supply

All of MPS's IBC modules can be paralleled to reach >1kW power levels.

MPC10206-54-1000-0540

1000W, Digital DC/DC Power Module with Intermediate Bus Converter

The MPC10206-54-1000-0540 is a high-efficiency, non-isolated power module with a fixed 8:1 ratio, operating from a 40V to 60V DC primary bus with a 5V to 7.5V output voltage (V_{OUT}). It can deliver up to 1000W of continuous power at a typical 54V input voltage (V_{IN}). The built-in multiple-time programmable (MTP) memory can store device configurations. The fault status, V_{IN} , V_{OUT} , current, and temperature can be easily monitored via the communication interface.



Features

- Supports Up to 1000W of Continuous Power
- Built-In Non-Volatile Memory (NVM)
- Input Voltage (V_{IN}), Output Voltage (V_{OUT}), Output Current (I_{OUT}), Output Power (P_{OUT}), and Temperature Monitoring
- V_{IN} Over-Voltage Protection (OVP), V_{IN} Under-Voltage Lockout (UVLO), V_{OUT} OVP, V_{OUT} Under-Voltage Protection (UVP), OCP_TDC/OCP_SPIKE, and Over-Temperature Protection (OTP)

Dimensions

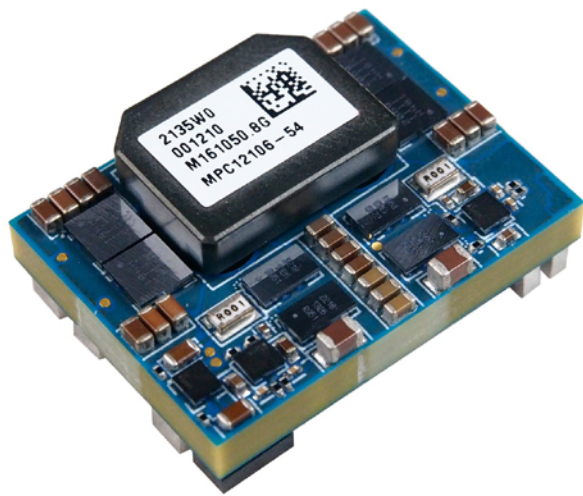
41.8mmx18mmx7.7mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	Power Density (W/in ³)	P_{OUT} (W)	Peak Efficiency (%)	Efficiency at 600W (%)
MPC10206-54-1000-0540	40 to 60	5 to 5.7	2828	1000	98	96.8

MPC12106-54-0750

4:1 Fixed-Ratio, Digital, DC/DC 800W Power Module

The MPC12106-54-0750 is an open-frame, digital DC/DC power module with continuous power up to 750W. This module accepts up to a 60V input, and is configured in a 4:1 input-to-output ratio. It offers a digital controller with a multiple-time programmable (MTP) memory, which can be easily configured to quickly bring up the system and nimbly adapt to system requirements.



Features

- Input Voltage (V_{IN}) Range: 40V to 60V
- 4:1 Input-to-Output Ratio
- Power Density: 3310W/in³
- Non-Isolated LLC Topology
- Compatible with Serial Interface
- Built-In Multiple-Time Programmable (MTP) Memory to Store Custom Configurations
 - V_{IN} Under-Voltage Lockout (UVLO)
 - V_{OUT} Over-Voltage Protection (OVP) and Under-Voltage Protection (UVP)
 - OCP_TDC/SPIKE
 - Over-Temperature Protection (OTP)
- GUI Configuration Software Provided

Dimensions

24mmx18mmx8.6mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	Power Density (W/in ³)	P_{OUT} (W)	Peak Efficiency (%)	Efficiency at 750W (%)
MPC12106-54-0750-xxxx	40 to 60	10 to 15	3310	750	98.1	96.5

MPC42013

High-Efficiency, Non-Isolated, Regulated, Digital DC/DC 1300W and 1600W Power Module

The MPC42013 is a quarter-brick open-frame digital DC/DC power module with up to 1300W or 1600W of continuous power. This module operates from a 40V to 60V DC primary bus to a regulated 12V output voltage (V_{OUT}). It offers a digital controller with multiple-time programmable (MTP) memory, which can be easily configured to quickly bring up the system and nimbly adapt to system requirements.



Features

- 40V to 60V Input Voltage (V_{IN}) Range
- 12V Regulated Output Voltage (V_{OUT})
- Power Level: Up to 1300W or 1600W
- Power Density: 906W/in³ or 736W/in³
- HSC Topology
- Compatible with Serial Interface
- Option for Load-Line Current-Sharing in Parallel or Differential Remote Sense
- Built-In Multiple-Time Programmable (MTP) Memory to Store Custom Configurations
 - V_{IN} Under-Voltage Lockout (UVLO)
 - V_{OUT} Over-Voltage Protection (OVP) and Under-Voltage Protection (UVP)
 - Over-Current Protection (OCP)
 - Over-Temperature Protection (OTP)
- GUI Configuration Software Provided

Dimensions

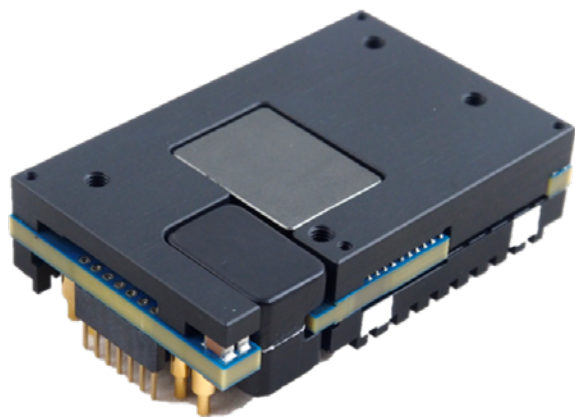
27mmx18mmx6.7mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	Power Density (W/in ³)	P_{OUT} (W)	Peak Efficiency (%)	Full Load Efficiency (%)
MPC42013-54-1300	40 to 60	12	736	1300	97.7	97.1
MPC42013-54-1600	40 to 60	12	906	1600	97.8	97

MPC16253-X-54-2500

2.5kW, Regulated 12V Output, Quarter-Brick Digital DC/DC Power Module

The MPC16253-X-54-2500 is a high-efficiency, non-isolated power module with a quarter-brick form factor, operating from a 40V to 60V DC primary bus to a regulated 12.2V output voltage (V_{OUT}). It can deliver up to 2500W of continuous power at a typical 54V input voltage (V_{IN}). The built-in multiple-time programmable (MTP) memory can store and restore device configurations.



Features

- Supports Up to 2500W of Continuous Power
- Quarter-Brick
- Built-In Multiple-Time Programmable (MTP) Memory to Store Custom Configurations
- Input Voltage (V_{IN}), Output Voltage (V_{OUT}), Output Current (I_{OUT}), and Temperature Monitoring via the PMBus/I²C Interface
- V_{IN} Over-Voltage Protection (OVP), V_{IN} Under-Voltage Protection (UVP), V_{OUT} OVP and UVP, Over-Current Protection (OCP), and Over-Temperature Protection (OTP)
- Parallel Load-Line Current-Sharing or Differential Remote Sense
- PMBus Communication
- Supports Wave and Reflow Soldering

Dimensions

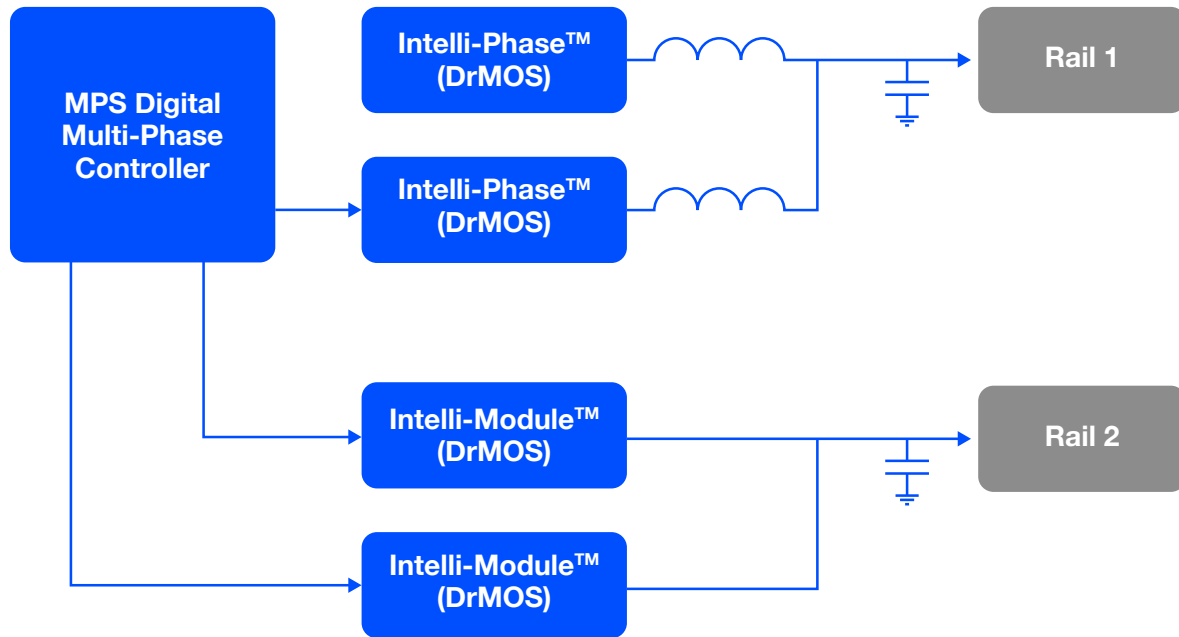
58.4mmx36.8mmx14.8mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	Power Density (W/in ³)	P_{OUT} (W)	Peak Efficiency (%)	Full Load Efficiency (%)
MPC16253-X-54-2500	40 to 60	12	1289	2500	98.1	97.3

Second-Stage Solution: Digital Multi-Phase Controller + Intelli-Phase™ or Intelli-Module™

MPS has a robust product portfolio of digital, multi-phase controllers that are paired with Intelli-Phase™ and Intelli-Module™ devices for a complete second-stage solution.

For more information, visit <https://www.monolithicpower.com/en/powering-ai-hardware>



Digital Multi-Phase Controller Features:

- Patented Constant-On-Time (COT) Control
- Multiple Loops, Flexible Phase Assignment
- Interface Options: SVID, SVI2/3, OVR, or AVSBus
- Fault Handling and Telemetry Capabilities

Part Number	Description
MP2975	2-Loop, 8-Phase Digital Controller
MP29816-C	2-Loop, 16-Phase Digital Controller
MP2928	3-Loop, 12-Phase Digital Controller

Intelli-Phase™ Features:

- 12A to 100A Range across Family of Devices
- Wide Switching Frequency (f_{sw}) Range Provides Balance between Transient and Efficiency
- Built-In Zero-Current Detection (ZCD), Over-Current Protection (OCP), Negative OCP (NOCP), Over-Temperature Protection (OTP), and Short-Circuit Protection (SCP)
- Minimal External Components

Part Number	Description
MP87297	16V, 100A, 4mmx6mm
MP87563	16V, Dual 60A, 5mmx5mm
MP87595	16V, Dual 60A, 6mmx6mm

Intelli-Module™ Features:

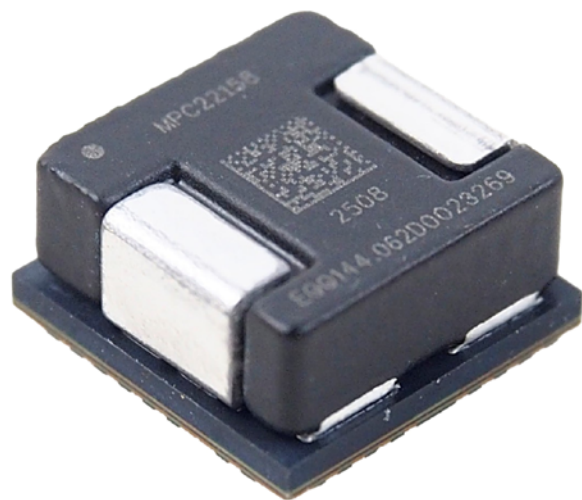
- High Power Density in Space-Constrained Applications
- Flexible Output Assignment
- Footprint Compatible TLVR Options
- Optimized for Top-Side Cooling

Part Number	Description
MPC22166-D-130 MPC22175-130 (TLVR)	130A Module, 2-Phase 9mmx10mmx8mm
MPC22154-170 MPC22174-170 (TLVR)	130A Module, 2-Phase 8mmx8mmx5mm
MPC24160-280 MPC24170-280 (TLVR)	260A Module, 4-Phase 9mmx10mmx5mm

MPC22158-130

130A, Two-Phase Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC22158-130 is a non-isolated, step-down power module with up to 130A of continuous peak output current (I_{OUT}). This module integrates driver MOSFETs (DrMOS) and an inductor in a compact package to save layout space and achieve higher power density. It has two independent outputs, which can be used separately or in parallel. The 4mm maximum height makes it suitable for many applications, such as PCIe form factor boards.



Features

- 3V to 16V Input Voltage (V_{IN}) Range
- 0.5V to 2V Output Voltage (V_{OUT})
- 130A Output Current (I_{OUT})
- Accu-Sense™ Current Sense
- Temperature Sense
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Supports Parallel Operation
- Fault Reporting
- Available in a Common-Footprint LGA-45 (8mmx8mm) Package

Dimensions

8mmx8mmx3.8mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	I_{OUT} (A)	f_{SW} (kHz)	Current Density (A/mm ²)	Peak Efficiency (%)
MPC22158-130	3 to 16	0.5 to 2	130	600 to 1500	1.6	90

MPC22166-D-130

130A, Dual-Phase Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC22166-D-130 is a non-isolated, step-down power module with up to 130A of continuous peak output current (I_{OUT}). This module integrates driver MOSFETs (DrMOS) and an inductor in a compact package to save layout space and achieve higher power density. It has two independent outputs, which can be used separately or in parallel. The 5mm maximum height makes it suitable for many applications, such as PCIe form factor boards.



Features

- 3V to 16V Input Voltage (V_{IN}) Range
- 0.2V to 2V Output Voltage (V_{OUT})
- 130A Output Current (I_{OUT})
- Accu-Sense™ Current Sense
- Temperature Sense
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Supports Parallel Operation
- Fault Reporting
- Available in a Common-Footprint LGA-72 (9mmx10mm) Package

Dimensions

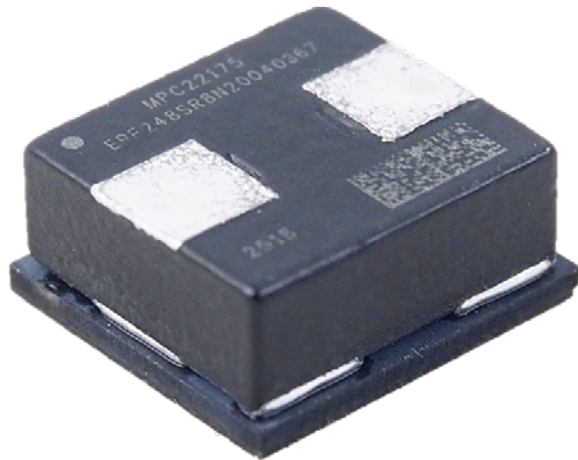
9mmx9.9mmx4.75mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	I_{OUT} (A)	f_{SW} (kHz)	Current Density (A/mm ²)	Peak Efficiency (%)
MPC22166-D-130	3 to 16	0.2 to 2	130	400 to 2000	1	91

MPC22175-130

130A, Dual-Phase, TLVR Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC22175-130 is a non-isolated, step-down trans-inductor voltage regulator (TLVR) power module with up to 130A of continuous peak output current (I_{OUT}). This module integrates driver MOSFETs (DrMOS) and an inductor in a compact package to save layout space and achieve higher power density. It has two independent outputs, which can achieve parallel layout and operation with the TLVR footprint. The 5mm maximum height makes it suitable for many applications, such as PCIe form factor boards.



Features

- 4V to 16V Input Voltage (V_{IN}) Range
- 0.2V to 2V Output Voltage (V_{OUT})
- 130A Output Current (I_{OUT})
- Accu-Sense™ Current Sense
- Temperature Sense
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Supports Parallel Operation
- Fault Reporting
- Available in a Common-Footprint LGA-72 (9mmx10mm) Package

Dimensions

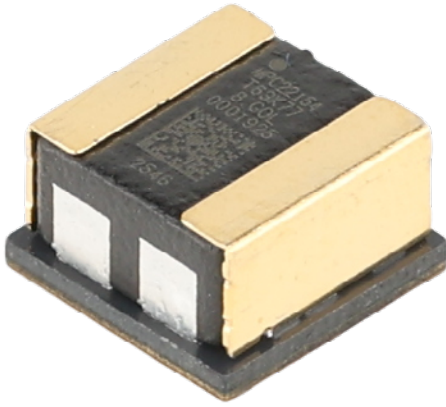
9mmx9.9mmx4.75mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	I_{OUT} (A)	f_{SW} (kHz)	Current Density (A/mm ²)	Peak Efficiency (%)
MPC22175-130	4 to 16	0.2 to 2	130	400 to 2000	1	89

MPC22154-170

170A, Dual-Phase Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC22154-170 is a non-isolated, step-down power module with up to 170A of continuous peak output current (I_{OUT}). This module integrates driver MOSFETs (DrMOS) and an inductor in a compact package to save layout space and achieve higher power density. It has two outputs, which can support both dual-rail and single-rail operation. It can achieve up to 170A (85A/phase) of I_{OUT} across a wide input voltage (V_{IN}) range.



Features

- Quiet Switcher™ Technology (QST™) Limits Peak Switching Voltages
- 3V to 16V Input Voltage (V_{IN}) Range
- Up to 170A of Output Current (I_{OUT})
- Accu-Sense™ Current Sense
- Temperature Sense
- Compatible with Tri-State Pulse-Width Modulation (PWM) Signals
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Fault Reporting

Dimensions

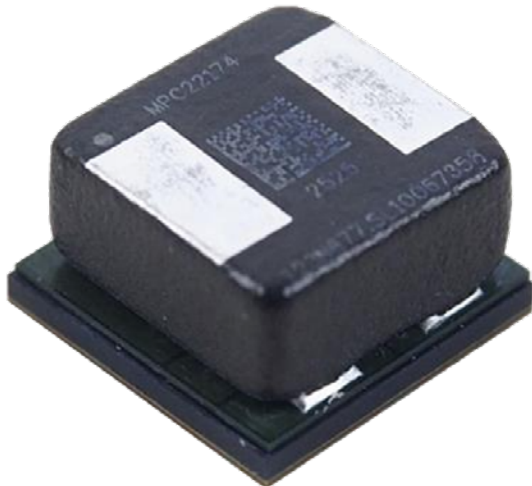
8mmx8mmx4.8mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	I_{OUT} (A)	f_{SW} (kHz)	Current Density (A/mm ²)	Peak Efficiency (%)
MPC22154-170	4 to 16	0.4 to 2	170	400 to 2000	1.6	92

MPC22174-170

170A, Dual-Phase, TLVR Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC22174-170 is a non-isolated, step-down power module with up to 170A of continuous peak output current (I_{OUT}). This module integrates driver MOSFETs (DrMOS) and an inductor in a compact package to save layout space and achieve higher power density. It can support both dual-rail and single-rail operation. For single-rail operation, it supports TLVR and non-TLVR operation.



Features

- Quiet Switcher™ Technology (QST™) Limits Peak Switching Voltages
- 3V to 16V Input Voltage (V_{IN}) Range
- Up to 170A Output Current (I_{OUT})
- Common-Footprint TLVR Land Pattern
- Accu-Sense™ Current Sense
- Temperature Sense
- Compatible with Tri-State Pulse-Width Modulation (PWM) Signals
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Fault Reporting

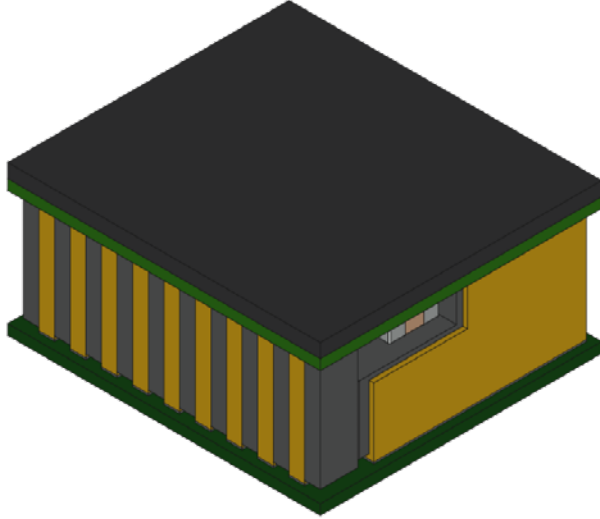
Dimensions

8mmx8mmx4.8mm

MPC24160-280

280A, Four-Phase, Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC24160-280 is a four-phase, non isolated, high-efficiency step-down power module. It integrates driver MOSFETs (DrMOS), inductors, and output capacitors to provide high efficiency and a small footprint, which makes it ideal for server applications. The MPC24160-280 can achieve up to 280A (70A/phase) of output current (I_{OUTx}) across a wide input voltage (V_{IN}) range.



Features

- Quad-Phase Intelli-Module™
- 2A/mm² TDC Current Density
- 4V to 16V Input Voltage (V_{IN}) Range
- 280A EDC (70A/Phase), 200A TDC (50A/Phase)
- 0.8°C/W Θ_{JT} and 4.6°C/W Θ_{JB}
- 5μA/A Accu-Sense™ Current Sense
- 8mV/°C Temperature Sense
- Current-Limit Protection and Over-Temperature Protection (OTP)
- Fault Reporting via the TMON Pins

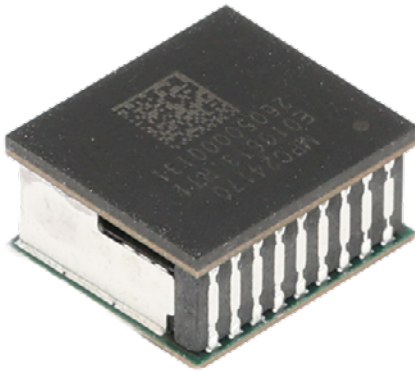
Dimensions

9mmx10mmx4.8mm

MPC24170-280

280A, Four-Phase, TLVR Intelli-Module™ with Quiet Switcher™ Technology (QST™)

The MPC24170-280 is a four-phase, trans-inductor voltage regulator (TLVR), non isolated, high-efficiency step-down power module. It integrates driver MOSFETs (DrMOS), inductors, and output capacitors to provide high efficiency and a small footprint. The MPC24170-280 can achieve up to 280A (70A/phase) of output current (I_{OUT}) across a wide input voltage (V_{IN}) range.



Features

- Quiet Switcher™ Technology (QST™)
- Wide 4V to 16V Input Voltage (V_{IN}) Range
- Up to 280A of Continuous Output Current (I_{OUT})
- TLVR
- Integrated Output Capacitors
- Accu-Sense™ Current Sense (CS)
- Temperature Sense
- Compatible with Tri-State Pulse-Width Modulation (PWM) Signals
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Fault Reporting

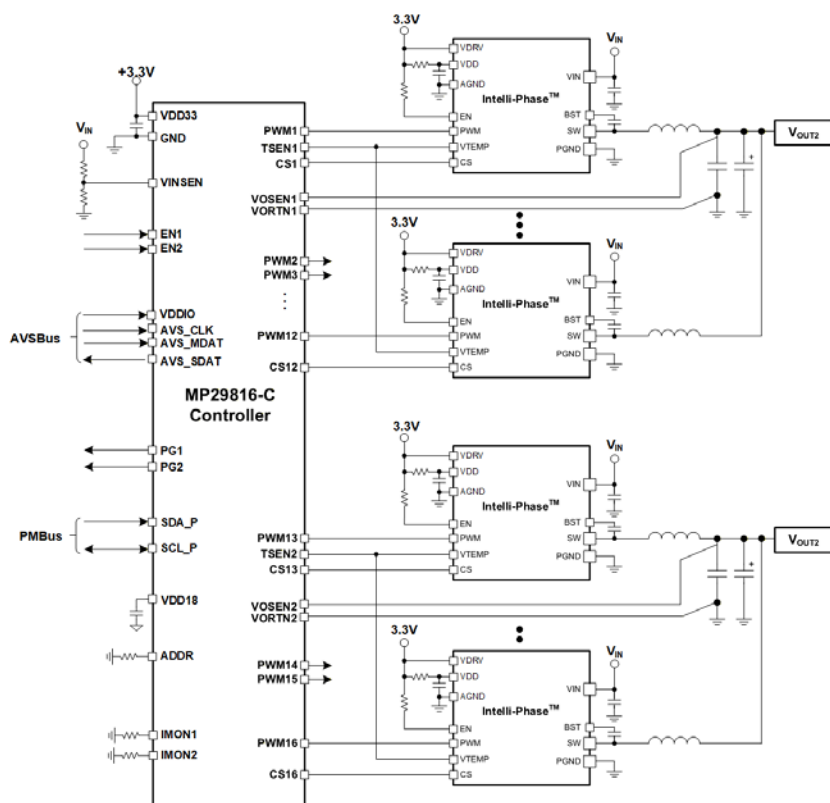
Dimensions

9mmx10mmx4.8mm

Part Number	V_{IN} (V)	V_{OUT} Range (V)	I_{OUT} (A)	f_{sw} (kHz)	Current Density (A/mm ²)	Peak Efficiency (%)
MPC24170-280	4 to 16	0.4 to 2	280	400 to 2000	2	91.3

MP29816-C

16-Phase, Dual-Loop Digital Controller

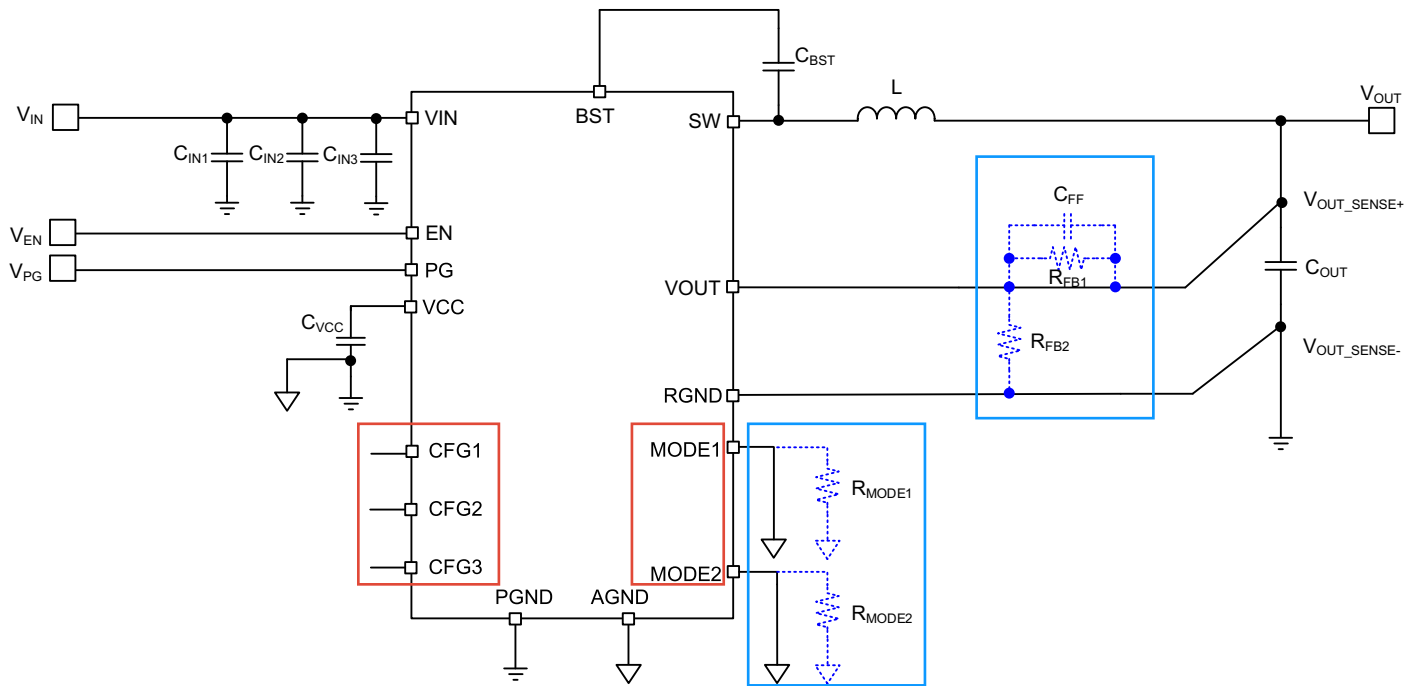


Features

- Automatic Loop Compensation
- Supports 200kHz to 3MHz Switching Frequency (f_{SW})
- Multi-Configuration Function Supports Up to 6 Different Applications
- Flexible PWM Assignment for 2 Rails
- Flexible Output Current (I_{OUT}) Sense via DrMOS I_{OUT}
- Automatic Phase-Shedding (APS) Function Improves Overall Efficiency
- Phase-to-Phase Active Current-Balancing with Configurable Offsets for Thermal Balance
- Input Voltage (V_{IN}), Output Voltage (V_{OUT}), Current, and Power Monitoring
- V_{IN} Under-Voltage Lockout (UVLO), Output Over-Voltage Protection (OVP) and Under-Voltage Protection (UVP), Over-Current Protection (OCP), Over-Temperature Protection (OTP) with No Action, Latch-Off, and Hiccup Options
- Overclocking Mode by Adding Offset to V_{OUT}
- Available in a TQFN-56 (7mmx7mm) Package

MPQ82D00

16V, 20A, High-Efficiency, Synchronous Step-Down Converter with Integrated Telemetry via PMBus



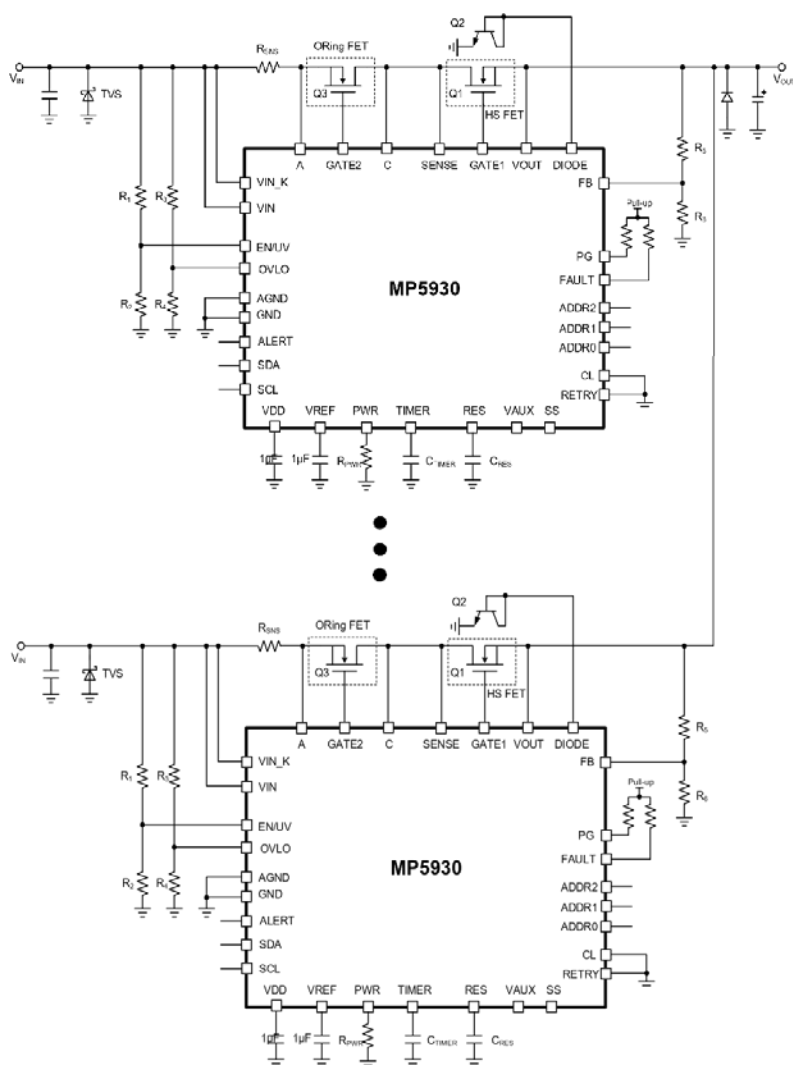
BOM-Free Mode = No External Components
External FB Mode = More Settings Options

Features

- 2.7V to 16V Input Voltage (V_{IN}) with External 3.3V VCC Voltage (V_{CC})
- 20A Continuous Output Current (I_{OUT})
- 0.3V to 5.5V Output Voltage (V_{OUT})
- Adaptive Constant-On-Time (COT) Control for Ultra-Fast Transient Response
- BOM-Free Configuration Option
- $\pm 0.5\%$ Reference Voltage (V_{REF}) from -40°C to $+150^{\circ}\text{C}$
- Selectable 600kHz, 800kHz, 1MHz, or 1.2MHz Switching Frequency (f_{SW})
- PMBus V1.4 Compliant
- Register Read/Write (R/W) Protection for Security
- Hiccup or Latch-Off Over-Current Protection (OCP), Under-Voltage Protection (UVP), Temperature Protection (OTP), Over-Voltage Protection (OVP)
- 5% V_{OUT} and I_{OUT} Accuracy
- Black Box to Record Fault Information
- Remote Sense

MP5930

80V Hot-Swap and O-Ring Controller with PMBus Interface



Features

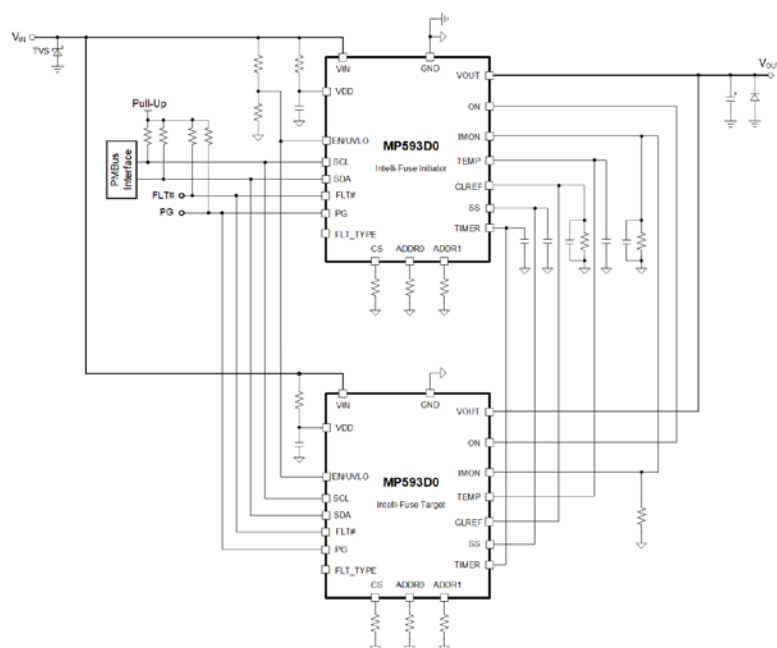
- Supports Ideal Diode and E-Fuse Back-to-Back Structure
 - Reverse Current Blocking and Protection
 - Configurable Over-Current Protection (OCP)
 - Configurable Power Limit
 - Configurable Short-Circuit Protection (SCP)
 - Configurable Soft Start (SS) Current Limit
 - Configurable Over-Temperature Protection (OTP)
 - Configurable Soft Start Time (t_{SS})
- PMBus Interface
 - Configurable Device Configuration via the PMBus
 - 12-Bit Analog-to-Digital (ADC) to Monitor Input Voltage (V_{IN}), Output Voltage (V_{OUT}), Output Current (I_{OUT}), Aux Voltage (V_{AUX}), and Temp Voltage (V_{TEMP}) via the PMBus

Multiple Power Supplies Can Be Paralleled Together with Each MP5930 in Back-to-Back Mode

- The O-ring FET allows paralleling multiple supplies
- The HS-FET allows for all e-fuse protections
- Combining both allows the ability to completely isolate V_{IN} from V_{OUT} in both directions

MP593D0

80V, 20A, 4mΩ $R_{DS(ON)}$, Fully Integrated Hot-Swap Solution with PMBus Interface



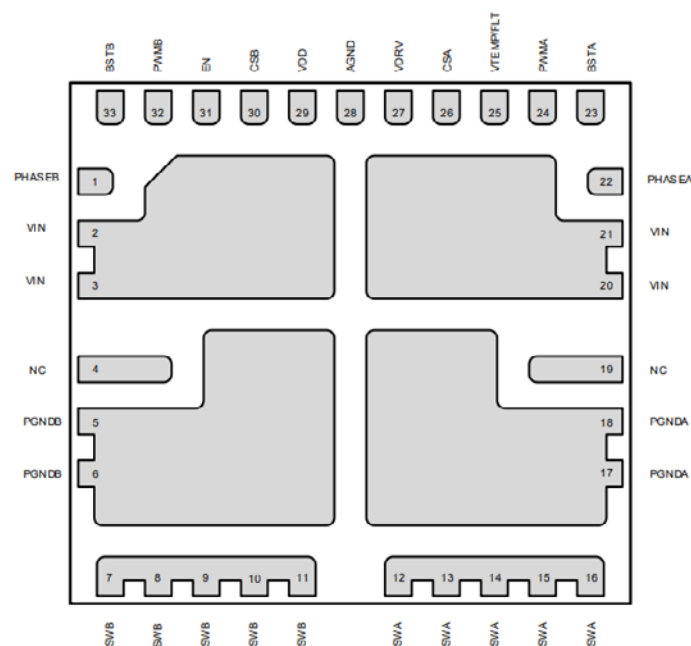
Supports >4000W Application Using
4 MP593D0 Devices in Parallel

Features

- 10V to 80V Operating Input Voltage (V_{IN}) Range
- Maximum 20A Output Current (I_{OUT})
- 4mΩ Integrated Power MOSFET
- $\pm 3\%$ IMON Reporting Accuracy
- PMBus/I²C 1.3 Compatible
- Full Protection Functions:
 - Over-Current Protection (OCP), Output Short-Circuit Protection (SCP), Over-Temperature Protection (OTP), Over-Voltage Protection (OVP), and Under-Voltage Protection (UVP)
- Separate Current-Sense Output Used to Configure the Over-Current (OC) Threshold
- Built-In Soft Start (SS) and Insertion Delay
- Output Voltage (V_{OUT}) Shutdown Control
- Parallel Operation for Higher-Current Applications
- Integrated Current, Voltage, and Temperature Sensing
- Supports Complete Protection Function for the System
- Built-In Fuse Health Diagnostics

MP87563

Dual 60A DrMOS with Quiet Switcher™ Technology (QST™)



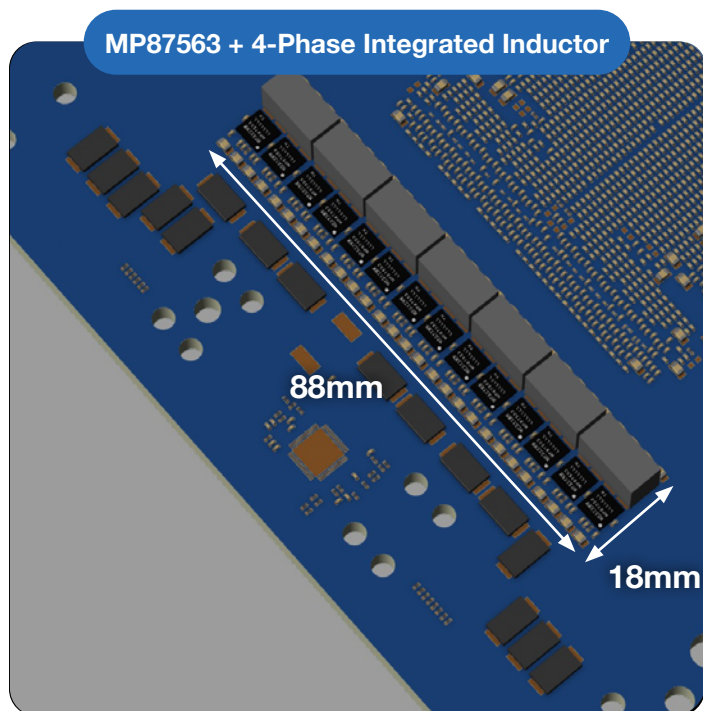
LGA-33 (5.25mmx5mm) Package

Features

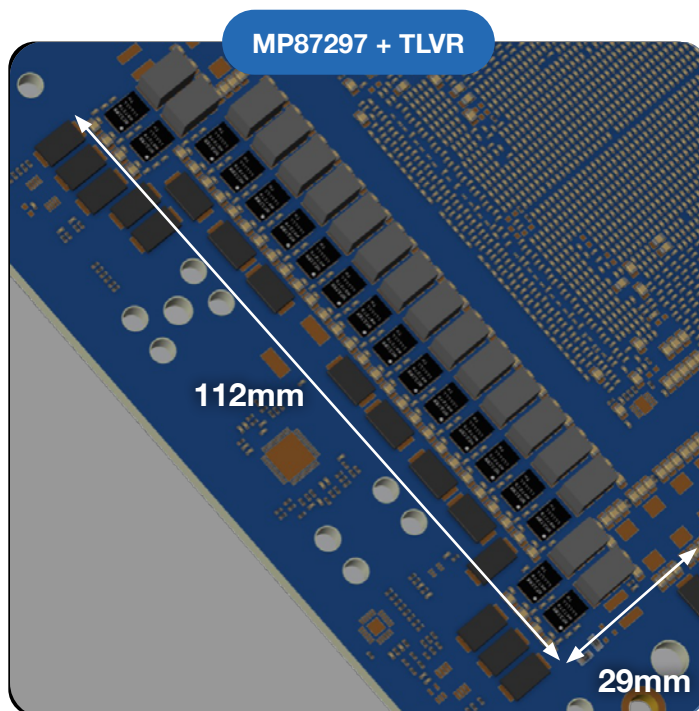
- Wide 3V to 16V Operating Input Voltage (V_{IN}) Range
- Up to per-Phase 60A Output Current (I_{OUT})
- Highest Power Density with Smallest Placement Area
- 3.3V V_{DD}/V_{DRV} Operation for Best Efficiency
- Junction Temperature (T_J) Sense
- Per-Phase Accurate Current Reporting
- Available in a Common Footprint TLGA-33 (5.25mmx5mm) Package

Placement Benefit

Conditions: 50% Area Reduction Using the MP87563 in a 700A Application



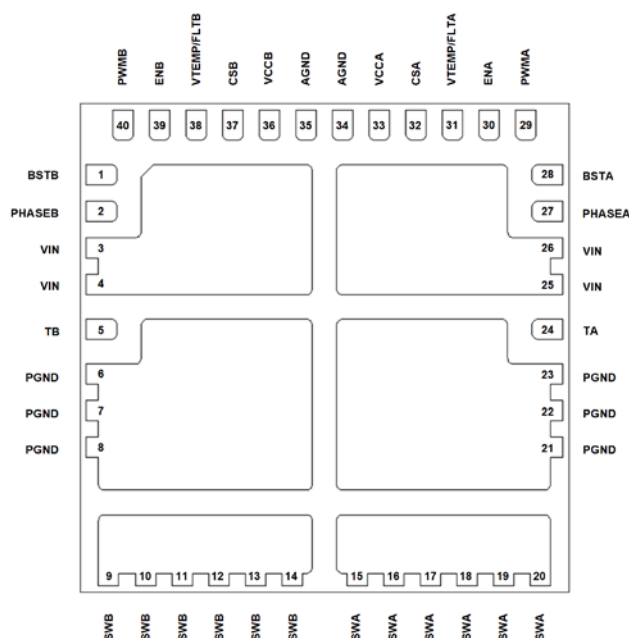
MP87563:
60A+60A Part, TDC 30+30A
28 Phases Needed Total/14pcs



MP87297:
100A Part, TDC 40A
18 Phases Needed Total

MP87595

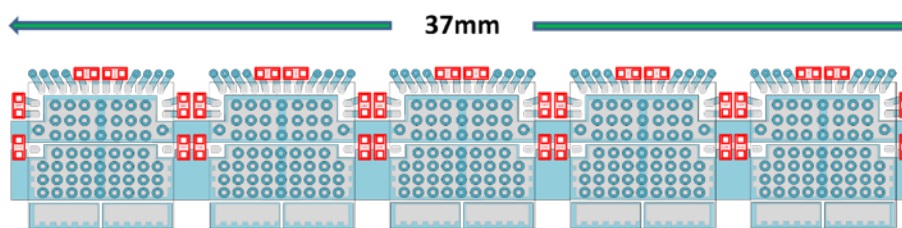
Dual 90A DrMOS with Quiet Switcher™ Technology (QST™)



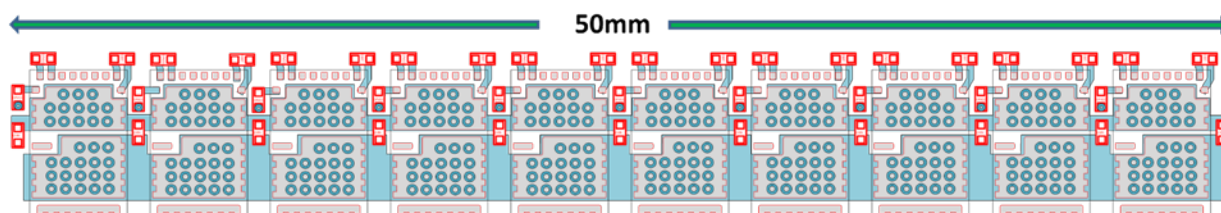
LGA-40 (6mmx6mm) Package

Features

- 3V to 16V Operating Input Voltage (V_{IN})
- Dual-Phase Operation, 90A Output Current (I_{OUT}) per Phase
- Accu-Sense™ Current Sense
- Individual Junction Temperature (T_J) Sense and Reporting
- Accepts Tri-State Pulse-Width Modulation (PWM) Signal
- Positive Current Limit with Hysteresis
- Negative Current Limit
- Fast Catastrophic Fault Response
- Quiet Switcher™ Technology (QST™) Limits Peak Switching Voltage with Minimal Dependency on PCB Layout
- Available in Exposed-Top Package for Low Junction-to-Case-Top Thermal Resistance



MP87595

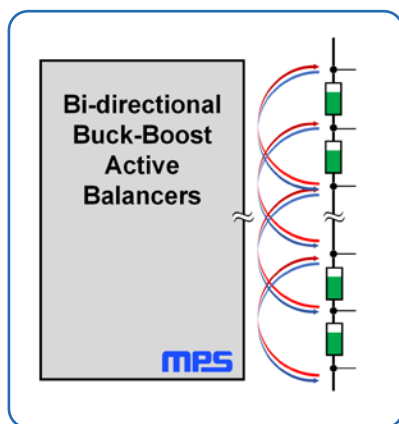


CFP 4x6 DrMOS

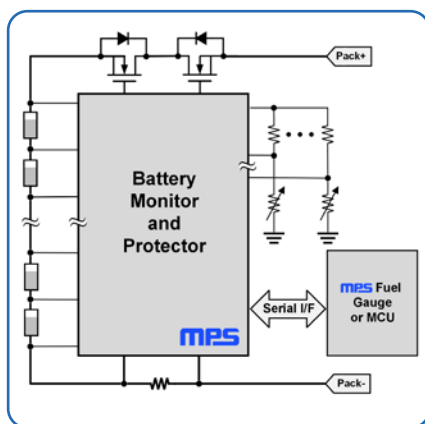
26% Width Reduction

MPS Battery Management Solutions

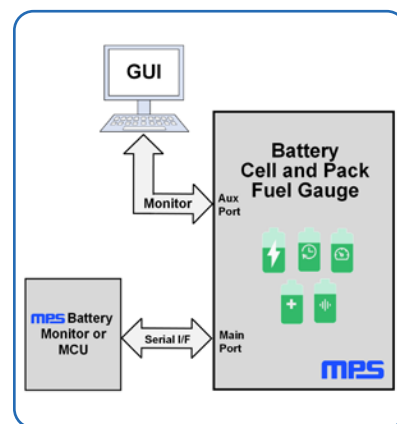
Active Balancers



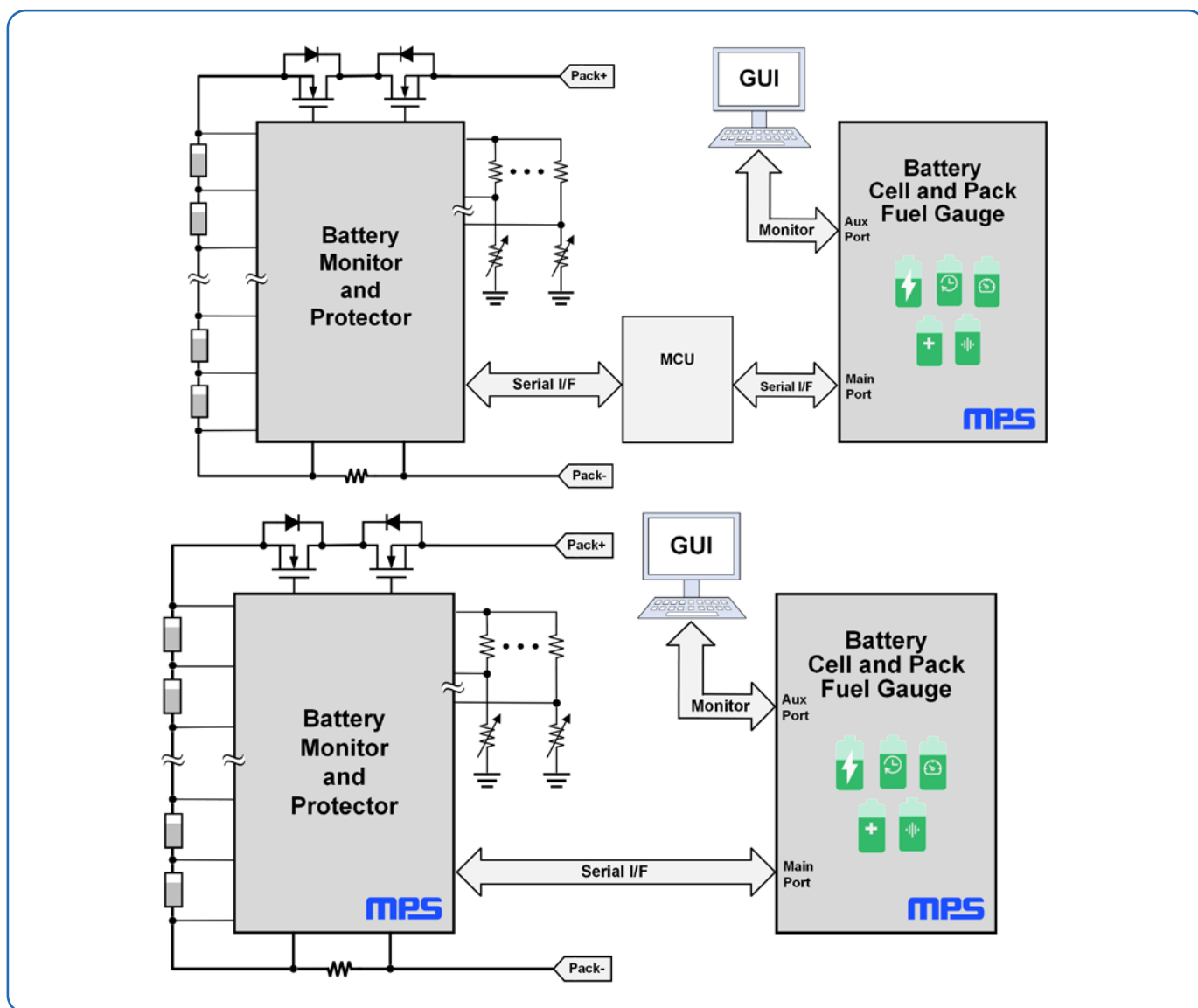
Battery Monitors



Fuel Gauges



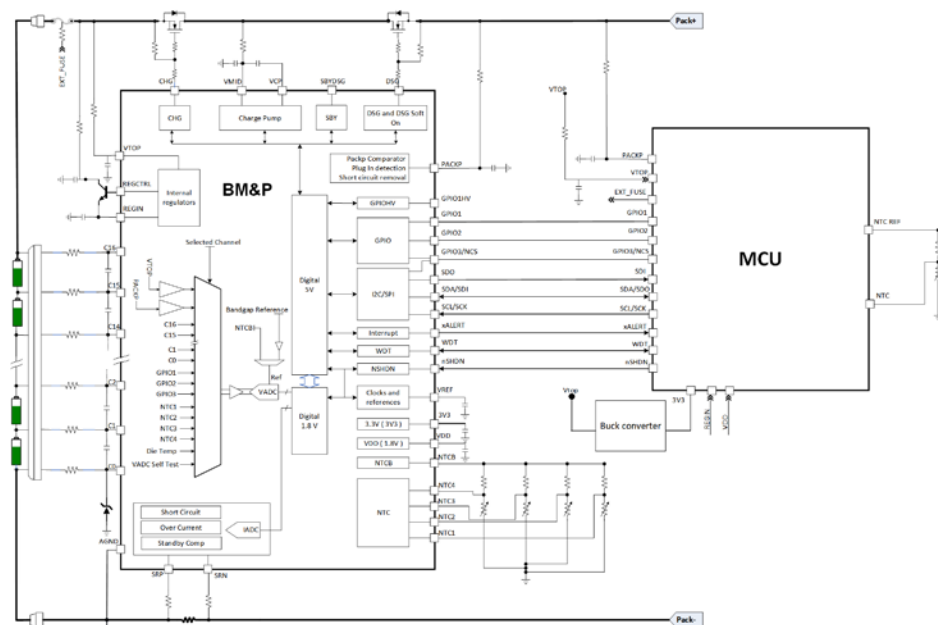
BMS Complete Solutions



MPS Functional Safety Concept

ISO 13849 PL-C Architecture Certified

MPS's functional safety concept uses a redundancy architecture in which the MCU senses key parameters for the battery and for the battery monitor and protector to ensure correct functioning. A PL-C functional safety level can be achieved with MPS's safety concept.



Your Need

A Complete BMS Solution

Meet Functional Safety Requirements

Straightforward Implementation

Customizable Hardware

Minimal Design and Schedule Risk

MPS Advantage

Fully Validated Comprehensive Design

Pre-Certified FuSa-Ready Architecture

MPS's Dedicated FuSa Software

Hardware Schematics Provided

Reference Designs and Complete Solutions Available

BMS for Data Center Battery Backup Units (BBUs)

Applications Characteristics

- Current systems typically use 48V to 54V; new high-power systems are targeting 400V to 800V
- Battery reliability is critical to product success
 - Systems subject to “rarely used pack” condition
 - State-of-health (SOH) must be periodically assessed to guarantee uptime
 - System must always know the available energy and power with high accuracy
- Evolving architectures for growing power requirements
 - Two common voltage ranges: 48V and 400V to 800V
 - Rack-mount and floor-mount systems
 - Integration of supercapacitors for peak-shaving
- Commonly requires high discharge rates (15C+)
 - Accurate fuel gauging becomes increasingly important and difficult
 - MOSFET-based current control requires parallel devices with very strong charge/discharge drive capability



MPS Advantages

- Battery Monitors
 - Enable outstanding product reliability and lifetime via high-accuracy, I/V synchronized measurements
 - Very strong drive capacity, up to 10X the leading competitor, which is particularly important for short-circuit protection (SCP)
 - Support LFP, Li-Ion, and LiPo
- Fuel Gauges
 - Provide accurate pack and cell state-of-charge (SOC) for challenging LFP cells, particularly for the high C-rate requirements of BBUs
 - Provide accurate pack and cell SOH estimates for guaranteed performance at all times
- Active Balancers
 - Speed up cell balancing with less heat generation
 - Extend battery runtime by compensating for cell mismatch
 - Increase reliability and lifetime by maintaining continuously balanced cells

Market Trends for Data Center Battery Backup Units

Gov.
Regulation

Industry
Standards

Evolving
Batteries

Cost
Differentiation

End-Product
Differentiation

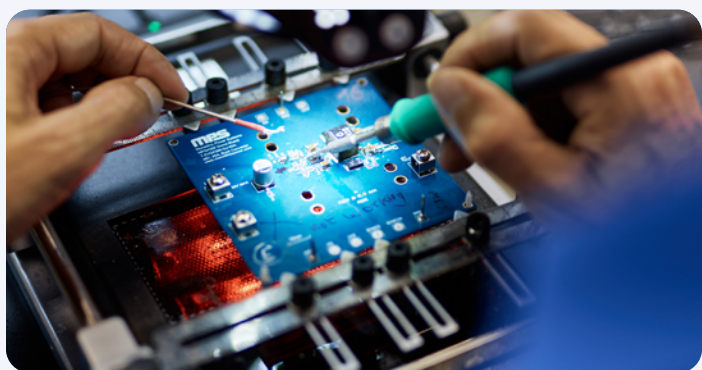
Manufacturing
Localization



Why Choose MPS

For almost 30 years, Monolithic Power Systems (MPS) — headquartered in Kirkland, Washington, and listed on Nasdaq — has been powering the most important technological innovations, from electric vehicles to artificial intelligence, renewable energy systems to advanced medical devices. Our fully customized service, dedicated support, and steadfast partnerships have attracted industry leaders and startups on the cusp of groundbreaking discoveries.

MPS is agile, nimble, and forward-thinking, always looking for better, faster, and more efficient ways to drive technological progress. We forge ahead to create what's next and make a sustainable impact.



We are a global leader in powering the most important technological innovations of our lives — working with our customers to create what's next. We design high-performance, super efficient power solutions for a wide range of product categories — from AI Data Centers to automation, advanced medical devices to robotics.



Expert Engineering Resources



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Embedded engineering teams join our largest customers on location

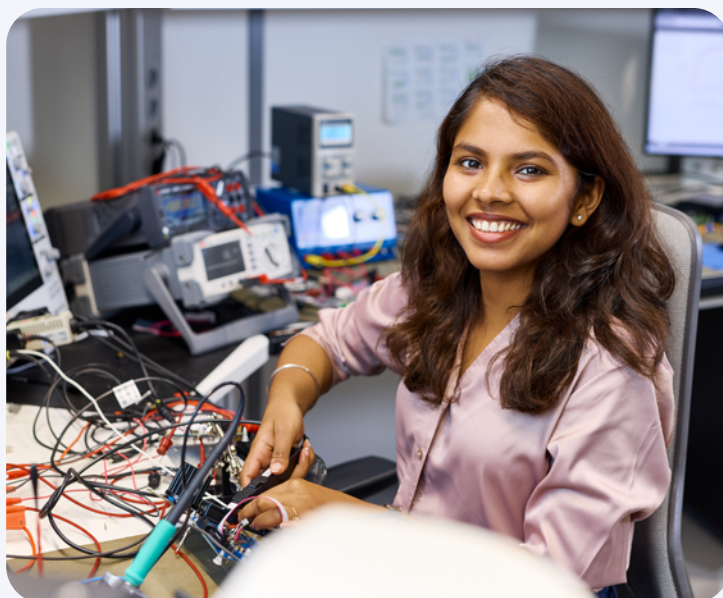
On-Demand

Knowledgeable field application engineers (FAEs) and application engineers (AEs) respond as needed to assist customers in optimizing designs

Virtual

Remote engineers provide virtual design sessions

- Product Recommendations
- Project Troubleshooting
- Technical Consulting



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