

AUTOMOTIVE POWER MANAGEMENT

AEC-Q100 Solutions



Powering

Digital
Cockpit

Lighting

Body
Electronics

ADAS

Electrification



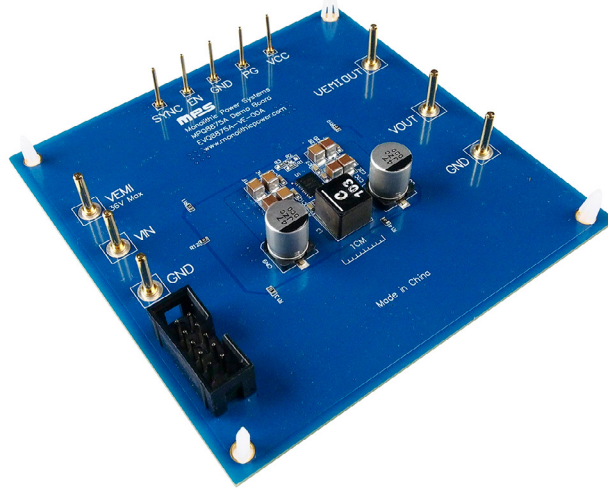
MPS
MonolithicPower.com

Automotive Qualified Products

When only the best will do, MPS offers its automotive-grade AEC-Q100 products. These solutions are rigorously stress-tested to ensure optimum reliability under demanding AEC-Q100 Grade 1 temperature conditions. Additionally, each part is put through a comprehensive, industry-leading, 300-point application “road test” to ensure robustness in the face of harsh automotive conditions such as load dump and cold crank transients.

Evaluation Boards

Evaluation boards are available for all automotive-grade products. Contact MPS for details.



Quality Assurance & Reliability Commitment

Quality is the bedrock of everything that we do at MPS, and we zealously pursue continuous improvement programs to maintain a zero-defect mentality across the company. Our mission is to design, develop, manufacture, and deliver products to our customers with world-class quality and reliability that go above and beyond customer expectations.

Quality Control and Monitor:

- On-Site Foundry and Assembly Teams
- Daily Short-Term Reliability Monitoring
- Quarterly Long-Term Reliability Monitoring
- Quarterly Reliability Monitoring Reports and Supplier Quality Review
- Annual Supplier Audits

MPS and Its Subcontractor Quality Systems and Certificates:

- ISO 9001
- EU RoHS/HF/REACH Compliant (MPS)
- Sony Green Partner
- IATF 16949 (Subcontractors)
- ISO 14001
- Member, Responsible Business Alliance (RBA)
- ISO 27001
- ISO 26262
- ISO 45001
- Member, Responsible Mineral Initiative



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Introducing MPSafe™



MPSafe™ products are safety-oriented, automotive-qualified products developed to our ISO26262 functional safety product development process.

These solutions are purpose-built for functional safety, and are engineered with a system-oriented approach. We consider not only how a device itself may handle various safety cases, but how the system can be better engineered to achieve its safety goals. The result for customers is safety coverage, more thorough documentation, pre-approved third-party safety analysis, and a cost- and schedule-optimized solution.

For systems and products needing ASIL-A to ASIL-D, choose MPSafe™.

Different ASIL Levels Available

**MPSafe
ASIL-A**

**MPSafe
ASIL-B**

**MPSafe
ASIL-C**

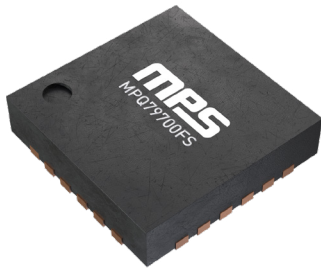
**MPSafe
ASIL-D**

Meet ISO26262 Goals Faster

- Safety Manuals, FMEDA, and More
- Consultation with Resident Safety Experts
- Pre-Vetted Safety-Assessed Subsystems



Featured Products



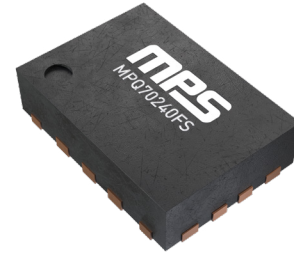
MPQ79700FS-AEC1

MPSafe™ 12-Channel
ASIL-D Power Sequencer
with Watchdog



MPQ79500FS-AEC1

MPSafe™ 6-Channel
ASIL-D Voltage Monitor
with Differential Sense



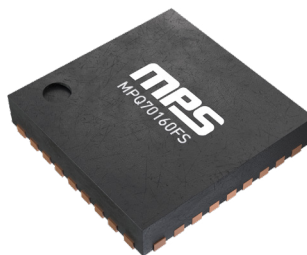
MPQ70240FS-AEC1

MPSafe™ ASIL-B PMIC
for Camera Modules



MPQ2967FS-AEC1

MPSafe™ ASIL-D Digital
Multi-Phase Controller
for Core Power



MPQ70160FS-AEC1

MPSafe™ 6-Channel ASIL-D
PMIC with 6 Bucks



MPQ70331FS-AEC1

MPSafe™ ASIL-D PMIC
for Radar Modules



EMC/EMI CISPR 25 Testing

Meeting tough OEM electromagnetic compatibility and immunity requirements is one of the biggest challenges in automotive electronics design. Minor schematic and layout choices can make a big impact on how well a design passes these tests, and early system testing can help avoid major project schedule and cost setbacks.

MPS now offers pre-compliance EMC/EMI testing for CISPR 25 and more in our new purpose-built customer labs in Livonia, Michigan, USA and Ettenheim, Germany. Our team of onsite experts help customers build experience in EMC-related topics and solve design problems during early product development stages. These state-of-the-art measurement chambers and work stations enable exact results and detailed test reports during emissions and immunity testing.

Tests Conducted

- Radiated Emissions
- Conducted Emissions
- Radiated Immunity
- Conducted Immunity
- Bulk Current Injection
- ESD

Equipment

- 3.6GHz receivers
- Rod Antenna (9kHz to 30MHz)
- Bi-Con Antenna (20MHz to 300MHz)
- Log Antenna (200MHz to 3.5GHz)
- Horn Antenna (1GHz to 18GHz)
- Horn Antenna (450MHz to 6GHz)

Services

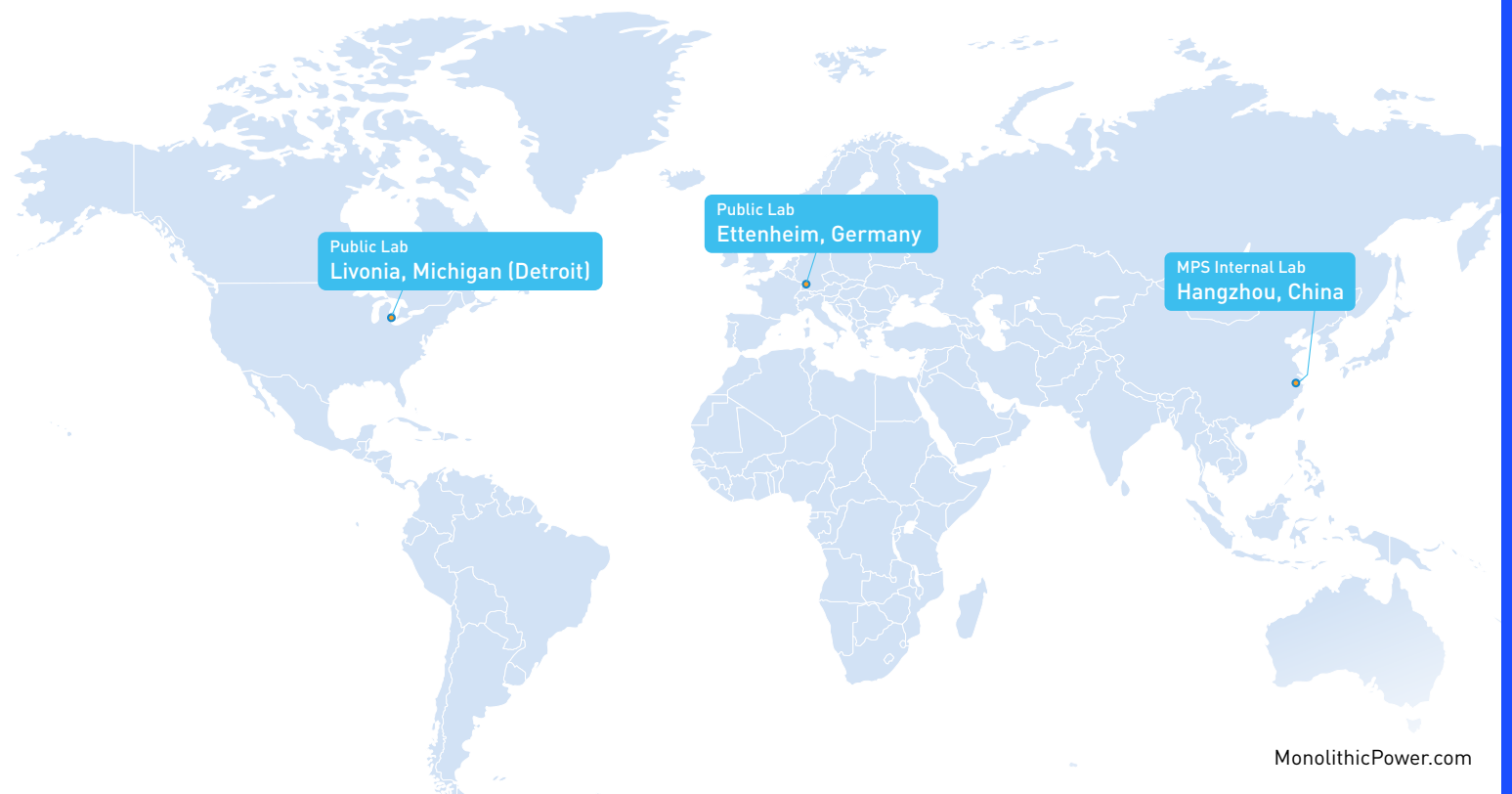
- Design Analysis and Optimization
- Testing
- Debugging

Chambers

- CISPR
- 3-Meter Chamber
- BCI



EMC Lab Locations



DC PM LR MS PS SAFE CP

ADAS



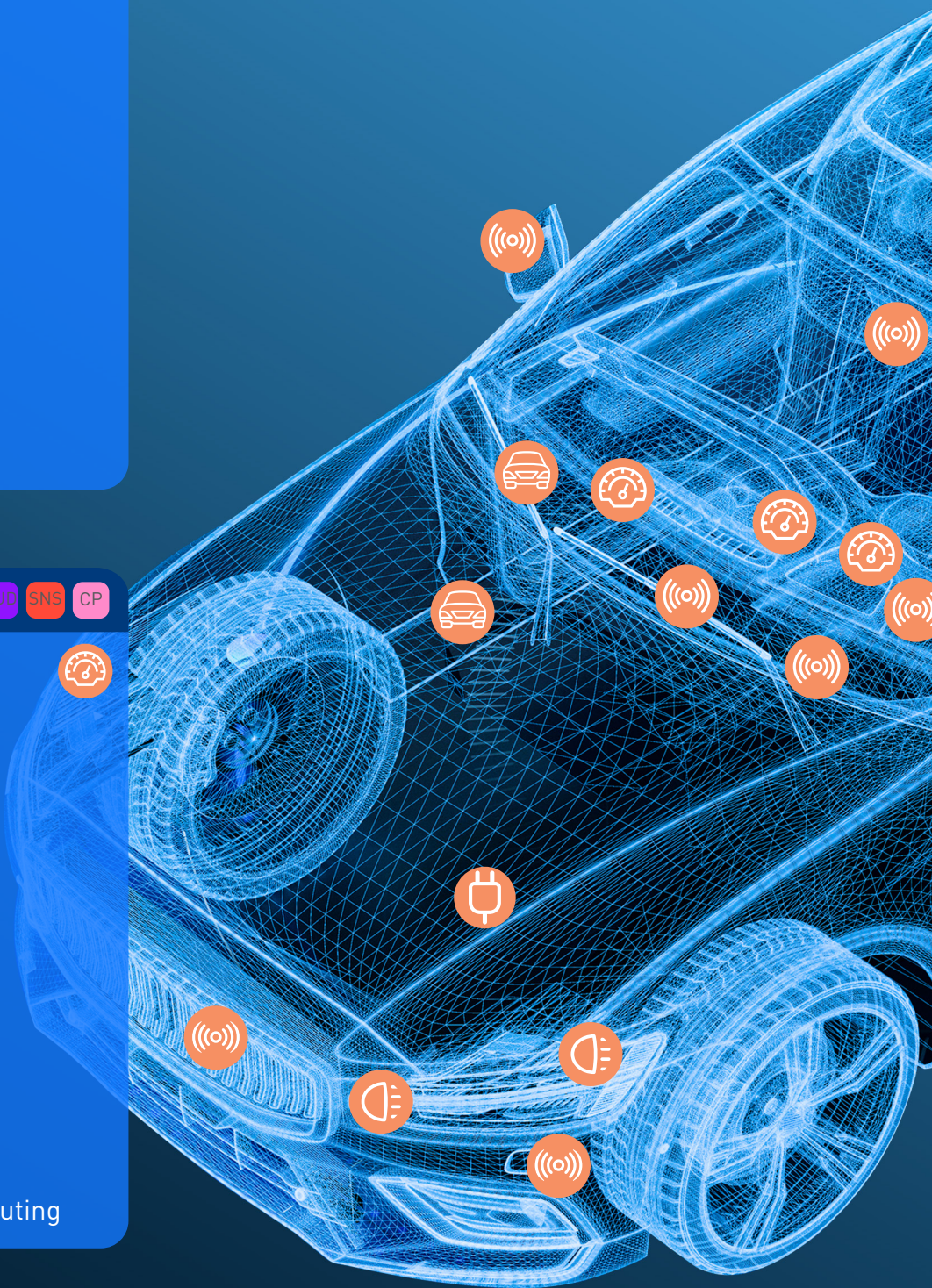
- 360° Cameras
- Front Cameras
- Backup Cameras
- Thermal Cameras
- Driver Monitoring
- Cabin Sensing
- Sensor Fusion
- Radar
- LiDAR
- Ultrasonic
- ADAS Computing

DC PM LR MS PS LED USB MD AUD SNS CP

Digital Cockpit



- Infotainment
- E-Calls
- Digital Mirror
- USB Charging
- Wireless Charging
- Telematics/V2X
- Heads-Up Displays
- Clusters
- Ambient Lighting
- High-Performance Computing



PRODUCT TYPES

Buck, Buck-Boost & Boost Converters

PMICs

Core Power

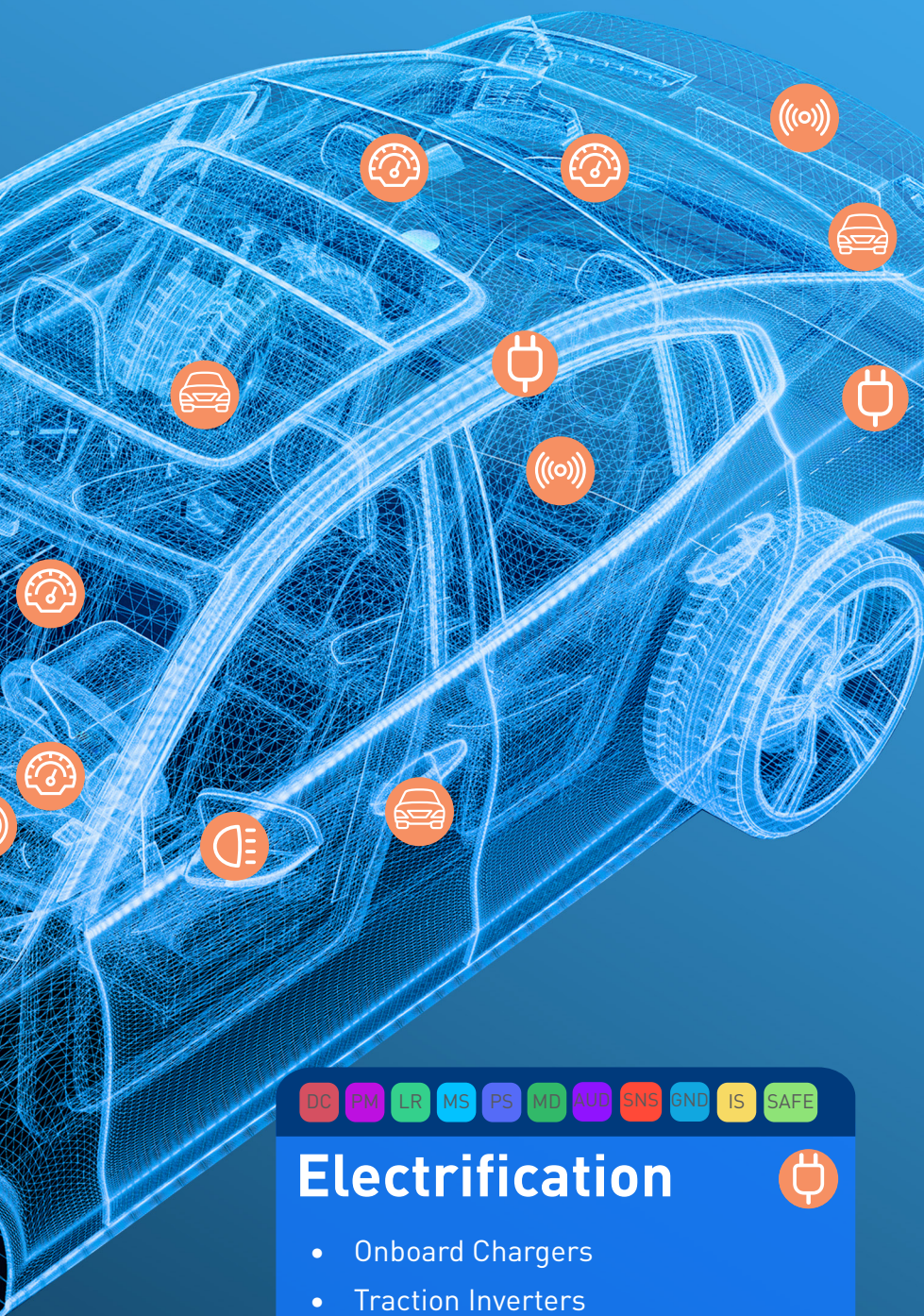
Linear Regulators

Monitoring & Supervision

Power Switches

LED Lighting

USB & Wireless Charging



DC PM LR MS PS PS SNS

Body Control & Other



- Motor Modules
- Door Latches & Locks
- Keyless Entry
- Junction Boxes
- HVAC Systems
- Gateways
- Liftgates
- Power-Assisted Steering
- Suspension Sensors
- Wiper Motors
- Electronic Braking Systems
- Fluid Pumps
- Electronic Parking Systems
- Power Seats
- eShift

DC PM LR MS PS MD AUD SNS GND IS SAFE

Electrification



- Onboard Chargers
- Traction Inverters
- Onboard DC/DC
- 48V DC/DC
- Belt Start Generators
- DC Fast Charging Stations
- Virtual Engine Noise

DC LR MS PS LED MD SAFE

Lighting



- Daytime Running Lights
- Matrix Lights
- Fog Lights
- Headlamps
- Brake Lights/CHMSL
- Turn Indicator Lights

Motor Drivers Class-D Audio Position Sensors & Current Sensors Isolation Solutions GaN Driver MPSafe™

Buck Regulators

MPS offers a full variety of DC/DC step-down solutions designed to operate directly from a 12V/24V battery or at the point of load. Choose from power-dense integrated converters with low- $R_{DS(ON)}$ MOSFETs, or flexible controllers with external MOSFETs to easily address high current requirements. Our solutions help address common automotive design challenges such as load-dump tolerance, EMI limits, and operation above or below the AM band.



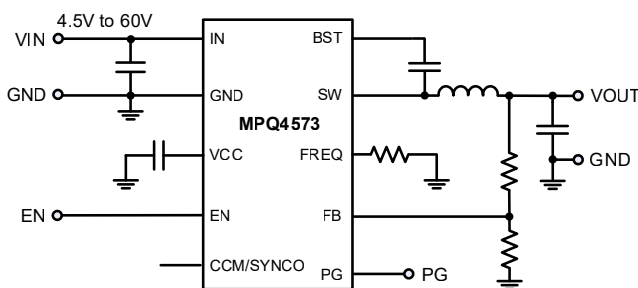
High Efficiency

EMI-Optimized

Compact Solution

MPQ4573-AEC1 NEW

65V, Up to 2.5A, High-Efficiency, Fast Transient, Synchronous Step-Down Converter



Features

Designed for 24V and 36V Automotive or Industrial Systems

- Load dump up to 65V
- Cold crank down to 4V

Cooler Thermals

- Less than 35°C T_j rise at 2.5A/400kHz
- 88% efficiency (24V to 5V, 2.5A, 400kHz)
- Low-ohmic MPS BCD FET technology

Low-Noise EMI/EMC

- MeshConnect™ flip-chip packaging
- Operates outside of AM radio band

Extends Vehicle Battery Life

- Low quiescent current in standby mode (40μA)

Reduces Board Size and BOM

- Integrated compensation network
- Small QFN (2.5mmx3mm) package

Additional Features

- Clock sync output
- Power good output
- Internal soft start
- Low-dropout mode
- Hiccup over-current protection (OCP)
- Selectable AAM or FCCM

Key Specifications:

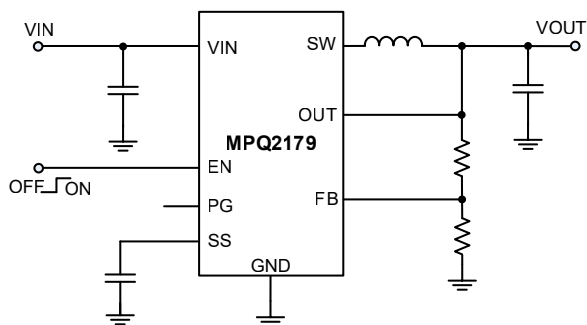
4.5V to 60V Input Voltage	40μA Standby I_o	300kHz to 2.2MHz Switching Frequency	QFN (2.5mmx3mm) Package
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Available in Pin-Compatible Family:

600mA MPQ4576	1A MPQ4571	2A MPQ4572	2.5A MPQ4573
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MPQ2179-AEC1

5.5V, 3A Synchronous Buck Converter



Key Specifications:

2.5V to 6.5V	2.4MHz	1A to 3A	Fixed: 1V, 1.1V, 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.3V Adj: From 0.6V	QFN-8 (1.5mmx2mm)
Input Voltage	Switching Frequency	Output Current	Output Voltage	Package

Available in Pin-Compatible Family:

MPQ2177	1A FCCM	MPQ2177A	1A AAM
MPQ2178	2A FCCM	MPQ2178A	2A AAM
MPQ2179	3A FCCM	MPQ2179A	3A AAM

Features

Built to Handle Tough Automotive Transients

Fast transient response and simple control loop
Constant-on-time (COT) control

Ideal for Automotive POL Power Supplies

Compact 1.5mmx2mm solution size in cost-optimized design
Fixed V_{OUT} or adjustable V_{OUT} as low as 0.6V

Cooler Thermals and Excellent System Performance

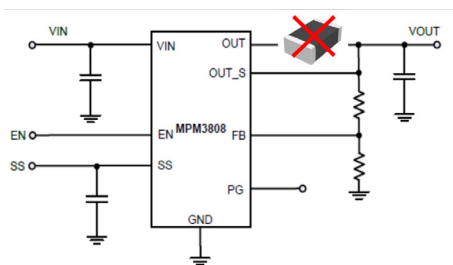
Integrated low- $R_{DS(ON)}$ 65mΩ/35mΩ MOSFETs
1% FB accuracy
2.4MHz switching frequency to avoid AM band
Low noise via external soft-start control
High efficiency

Digital + Protection

Power good (PG)
Over-voltage protection (OVP)
Short-circuit protection (SCP) with hiccup mode

MPM3808-AEC1 Module Series NEW

5.5V, 3A, Synchronous Step-Down Module Series with Integrated Inductor



Key Specifications:

2.5V to 5.5V	2.4MHz	1A to 3A	Fixed: 1V, 1.1V, 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.3V Adj: From 0.6V	QFN-15 (3mmx4mm)
Input Voltage	Switching Frequency	Output Current	Output Voltage	Package

Available in Pin-Compatible Family:

MPM3806C	1A FCCM	MPM3806	1A AAM
MPM3807C	2A FCCM	MPM3807	2A AAM
MPM3808C	3A FCCM	MPM3808	3A AAM

Features

Built to Fit in Space-Limited Automotive Systems

Compact step-down converter with 470nH integrated inductor

Fast Response and Easy Loop Stabilization

Fast transient response and simple control loop
Constant-on-time (COT) control

Excellent System Performance

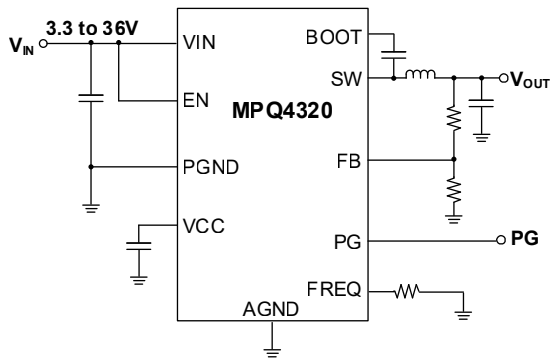
Integrated low-ohmic FETs
1% FB accuracy
External soft-start control

Digital + Protection

EN and power good (PG) for sequencing
Output discharge
Output over-voltage protection (OVP)

MPQ4320-AEC1 NEW

36V, Up to 3A, Low I_Q , Synchronous Step-Down Converter



Key Specifications:

3.3V to 42V Input Voltage	20 μ A Standby I_Q	350kHz to 2.5MHz Switching Frequency	QFN (2mmx3mm) Package
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Available in Pin-Compatible Family:

500mA MPQ4320	1A MPQ4321	2A MPQ4322	3A MPQ4323E
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Features

Compact Device Built to Handle Tough Automotive Transients

Load dump up to 42V, cold crank down to 3.1V

Cooler Thermals

Less than 42°C T_J rise at 3A/2.2MHz
92% efficiency (12V to 5V, 3A, 2.2MHz)
Low-ohmic MPS BCD FET technology

Low-Noise EMI/EMC

Symmetric V_{IN} package design
Spread spectrum frequency modulation
MeshConnect™ flip-chip packaging
Operates outside of AM radio band

Extends Vehicle Battery Life

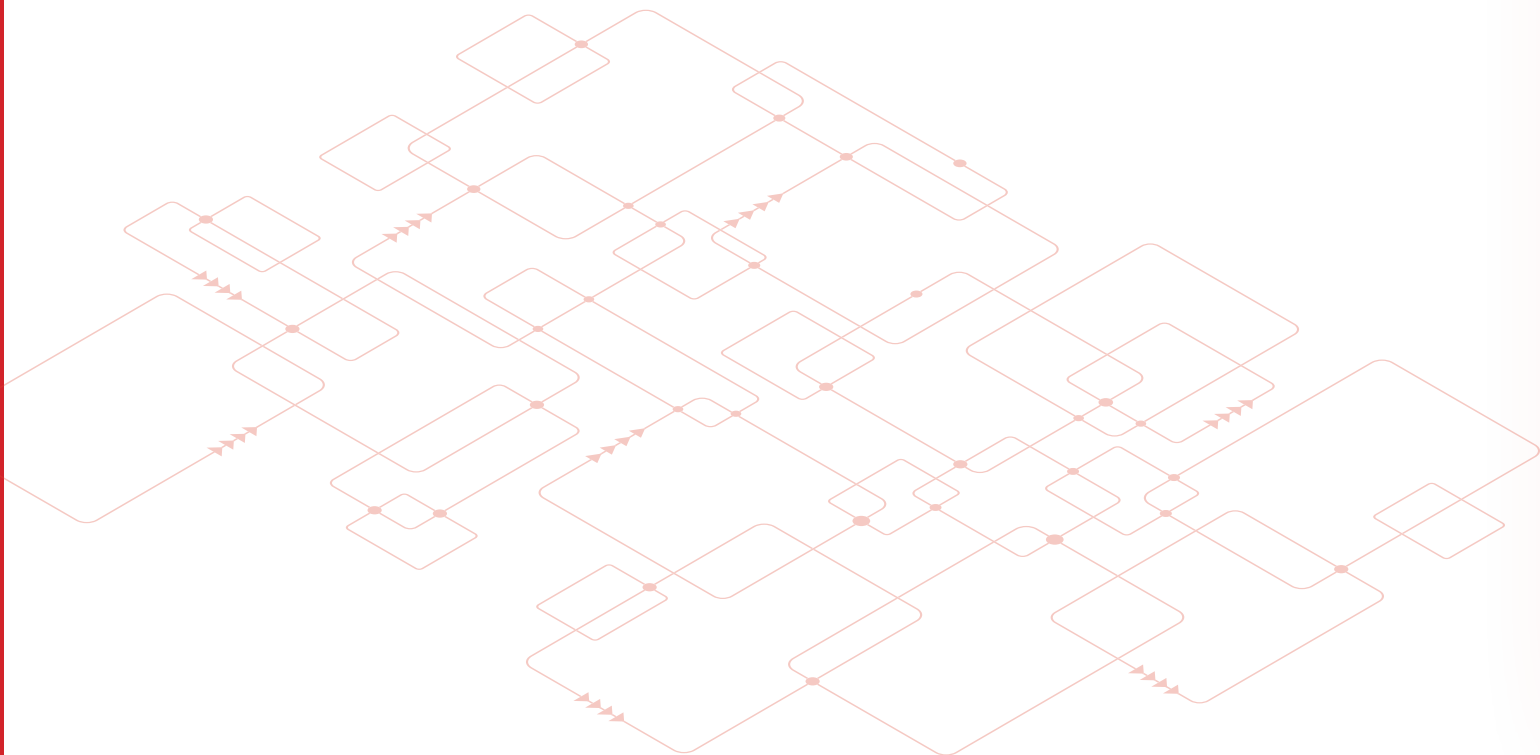
Low quiescent current in standby mode (20 μ A)

Reduces Board Size and BOM

Compact size and fewer external components

Additional Features

Power good (PG) output
Internal soft start
Fixed output versions
Low-dropout mode
Hiccup over-current protection (OCP)
Selectable AAM or FCCM



BUCK REGULATORS | AUTOMOTIVE

Buck Regulators 5V Synchronous Buck

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (A)	I _{SW} Limit (Typ) (A)	I _Q (Typ) (µA)	f _{SW} (kHz)	R _{DS(on)}	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AAM	COT Control	100% Duty Cycle	Fixed Frequency	Webtable Frank QFN Option	Package	Notes
MPM3805A-AEC1	2.6	6	0.6	1.2	485	3500	120/70	Int	-	✓	-	✓	✓	✓	✓	QFN-12 (2.5x3x0.9)	Module with integrated inductor	
MPM3805B-AEC1	2.5	6	0.6	2.1	485	3500	100/60	Int	-	✓	-	✓	✓	-	✓	QFN-12 (2.5x3x0.9)	Module with integrated inductor	
N MPM3808-AEC1	2.5	5.5	3	5	21	2400	65/35	Ext	-	-	✓	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor	
N MPM3808C-AEC1	2.5	5.5	3	5	460	2400	65/35	Ext	-	✓	-	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor	
N MPM3807-AEC1	2.5	5.5	2	3.5	21	2400	70/40	Ext	-	-	✓	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor	
N MPM3807C-AEC1	2.5	5.5	2	3.5	460	2400	70/40	Ext	-	✓	-	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor	
N MPM3806-AEC1	2.5	5.5	1	2.5	21	2400	75/45	Ext	-	-	✓	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor	
N MPM3806C-AEC1	2.5	5.5	1	2.5	460	2400	75/45	Ext	-	✓	-	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor	
MPQ2171-AEC1	2.5	5.5	1	4	520	2600	90/50	Int	-	✓	-	✓	✓	-	-	TSOT23-8	Output discharge	
MPQ2177-AEC1	2.5	5.5	1	2.5	460	2400	90/50	Ext	-	✓	-	✓	✓	✓	✓	QFN-8 (1.5x2)	MPQ2177 scalable series, ultra-compact	
MPQ2177A-AEC1	2.5	5.5	1	2.5	21	2400	90/50	Ext	-	-	✓	✓	✓	✓	✓	QFN-8 (1.5x2)	MPQ2177 scalable series, ultra-compact	
MPM3810A-AEC1	2.6	6	1.2	2.1	485	3500	110/60	Int	-	✓	-	✓	✓	-	✓	QFN-12 (2.5x3x0.9)	Module with integrated inductor	
MPQ2172-AEC1	2.5	5.5	2	4.5	520	2600	80/45	Int	-	✓	-	✓	✓	-	-	TSOT23-8	Output discharge	
MPQ2178-AEC1	2.5	5.5	2	3.5	460	2400	80/40	Ext	-	✓	-	✓	✓	✓	✓	QFN-8 (1.5x2)	MPQ2177 scalable series, ultra-compact	
MPQ2178A-AEC1	2.5	5.5	2	3.5	21	2400	80/40	Ext	-	-	✓	✓	✓	✓	✓	QFN-8 (1.5x2)	MPQ2177 scalable series, ultra-compact	
MPQ2123-AEC1	2.7	6	2	6.3	42	300 to 2200	35/25	Ext	✓	✓	✓	-	✓	✓	✓	QFN-11 (2x3)	MPQ2167 scalable series	

BUCK REGULATORS | AUTOMOTIVE

Buck Regulators

5V Synchronous Buck

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (A)	I _{SW} Limit (Typ) (A)	I _O (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AAM	COI Control	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
MPQ2143-AEC1	2.5	5.5	3	4.8	40	1200	65/40	Int	-	-	✓	✓	✓	-	-	TSOT23-8	Output discharge	
MPQ2179-AEC1	2.5	5.5	3	5	460	2400	65/35	Ext	-	✓	-	✓	✓	✓	✓	QFN-8 (1.5x2)	MPQ2177 scalable series, ultra-compact	
MPQ2179A-AEC1	2.5	5.5	3	5	21	2400	65/35	Ext	-	-	✓	✓	✓	✓	✓	QFN-8 (1.5x2)	MPQ2177 scalable series, ultra-compact	
MPQ2124-AEC1	2.7	6	3	6.3	42	300 to 2200	35/25	Ext	✓	✓	✓	-	✓	✓	✓	QFN-11 (2x3)	MPQ2167 scalable series	
MPQ2167-AEC1	2.7	6	4	6.7	42	300 to 2200	35/25	Ext	-	✓	✓	-	✓	✓	✓	QFN-11 (2x3)	MPQ2167 scalable series	
MPQ2167B-AEC1	2.7	6	4	6.7	42	300 to 2200	35/25	Ext	✓	✓	✓	-	✓	✓	✓	QFN-11 (2x3)	MPQ2167 scalable series	
N MPQ2180-AEC1	2.7	6	6	12.7	285	850 to 2200	38/21	Int	-	✓	✓	-	-	-	-	QFN-14 (2.5x3)	-	
MPQ8847A-AEC1	2.7	6	6	12.7	285	850 to 2200	22/40	Int	-	✓	✓	-	-	-	-	QFN-14 (2.5x3)	-	
MPQ2167A-AEC1	2.7	6	6	9	42	300 to 2200	35/25	Ext	✓	✓	✓	-	✓	✓	✓	QFN-14 (3x3)	MPQ2167 scalable series	
MPQ2169A-AEC1	2.7	6	2.8 (Dual)	4	65	350 to 3000	60/25	Ext	✓	✓	✓	-	✓	✓	✓	QFN-18 (2.5x3.5), QFN-18 (2x3)	Dual-output, 2.8A total with 2A single-channel max	
N MPQ2169B-AEC1	2.7	6	2.8 (Dual)	4	65	350 to 3000	60/25	Ext	✓	✓	-	-	✓	✓	✓	QFN-18 (2.5x3.5), QFN-18 (2x3)	Dual-output, 2.8A total with 2A single-channel max, CCM only	
MPQ2166A-AEC1	2.7	6	4 (Dual)	4.5	65	350 to 3000	55/20	Ext	✓	✓	✓	-	✓	✓	✓	QFN-18 (2.5x3.5), QFN-18 (2x3)	Dual-output, 4A total with 3A single-channel max	
N MPQ2166B-AEC1	2.7	6	4 (Dual)	4.5	65	350 to 3000	55/20	Ext	✓	✓	-	-	✓	✓	✓	QFN-18 (2.5x3.5), QFN-18 (2x3)	Dual-output, 4A total with 3A single-channel max, CCM only	
S MPQ2241-AEC1	2.7	6	1	3.5	42	2100	35/25	Ext	-	✓	✓	-	✓	-	✓	QFN-15 (2x3)	-	
S MPQ2242-AEC1	2.7	6	2	3.5	42	2100	35/25	Ext	-	✓	✓	-	✓	-	✓	QFN-15 (2x3)	-	

BUCK REGULATORS | AUTOMOTIVE

Buck Regulators 5V Synchronous Buck

	Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (A)	I _{SW} Limit (Typ) (A)	I _O (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AAM	CDT Control	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
S	MPQ2243-AEC1	2.7	6	3	6	42	2100	35/25	Ext	-	✓	✓	-	✓	-	✓	QFN-15 (2x3)	-
S	MPQ2244-AEC1	2.7	6	4	6	42	2100	35/25	Ext	-	✓	✓	-	✓	-	✓	QFN-15 (2x3)	-
S	MPQ2246-AEC1	2.7	6	6	9.5	42	2100	35/25	Ext	-	✓	✓	-	✓	-	✓	QFN-15 (3x3)	-
S	MPQ2284-AEC1	2.7	6	8	10	-	Adj	6/4	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page OTP memory, selectable f _{SW} and V _{OUT}
S	MPQ2285-AEC1	2.7	6	10	14	-	Adj	6/4	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page OTP memory, selectable f _{SW} and V _{OUT}
S	MPQ2286-AEC1	2.7	6	12	18	-	Adj	6/4	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page OTP memory, selectable f _{SW} and V _{OUT}

Buck Regulators 18V to 24V Synchronous Buck

	Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _{SW} Limit (Typ) (A)	I _O (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Soft Start	External Sync	FCCM	CDT Control	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
	MPQ4409-AEC1	4	24	0.9	1	600	0.807	450 to 2200	90/50	Int	✓	✓	-	✓	✓	QFN-13 (2.5x3)	-
S	MPQ3520-AEC1	3	22	1	2.9	463	0.6	2200	260/120	Int	-	✓	-	✓	✓	QFN-8 (2x2)	-
N	MPQ8861-AEC1	2.85	18	12	14	420	0.6	500 to 1250	15/4.5	Ext	-	-	✓	✓	✓	QFN-14 (3x4)	Can be used for 5V/3.3V input or regulated 12V _{IN} , integrated telemetry for voltage and current readout

BUCK REGULATORS | AUTOMOTIVE

Buck Regulators 40V to 50V Synchronous Buck with Frequency Spread Spectrum

	Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _{SW} Limit (Typ) (A)	I _Q (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAM	Zero-Delay PWM	Webtable Frank QFN Option	Package	Notes
N	MPQ4320-AEC1	3.3	42	0.5	1.2	20	0.8	350 to 2500	65/45	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact
N	MPQ4321-AEC1	3.3	42	1	2	20	0.8	350 to 2500	65/45	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact
N	MPQ4322-AEC1	3.3	42	2	3.4	20	0.8	350 to 2500	65/45	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact
	MPQ4312-AEC1	3.3	50	2	5.5	18	0.815	350 to 530	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	MPQ4312 series
N	MPQ4323E-AEC1	3.3	42	3	5.8	20	0.8	350 to 2500	65/45	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact
N	MPQ4324E-AEC1	3.3	42	3 (4 Peak)	6.5	20	0.8	350 to 2500	65/45	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact
N	MPQ4323M-AEC1	3.3	42	3	5.8	20	0.8	350 to 2500	65/45	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (3.5x3.5)	MPQ4320 series, ultra-compact, int. input capacitors
	MPQ4313-AEC1	3.3	50	3	5.5	18	0.815	350 to 530	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	MPQ4312 series
N	MPQ8883-AEC1	3.5	45	3	5	600	0.8	250 to 2500	95/50	-	Int	-	✓	✓	✓	-	-	QFN-16 (3x3)	Many features configurable via I ² C and OTP memory
N	MPQ4340-AEC1	3.3	42	4	7.7	2.5	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase, ultra-low I _Q
N	MPQ4341-AEC1	3.3	42	5	7.7	3	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase, ultra-low I _Q
N	MPQ4345-AEC1	3.3	42	2	5.8	3	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
N	MPQ4346-AEC1	3.3	42	3	5.8	3	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
N	MPQ4347-AEC1	3.3	42	4	7.7	3	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
N	MPQ4348-AEC1	3.3	42	5	7.7	3	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q

Buck Regulators

40V to 50V Synchronous Buck with Frequency Spread Spectrum

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _{SW} Limit (Typ) (A)	I _O (Typ) (μA)	V _{FB} (V)	f _{SW} (kHz)	R _{REG} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAM	Zero-Delay PWM	Adjustable Frank QFN Option	Package	Notes
MPQ4314-AEC1	3.3	50	4	8	18	0.815	350 to 530	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	MPQ4312 series
MPQ4315-AEC1	3.3	50	5	8	18	0.815	350 to 530	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	MPQ4312 series
MPQ4316-AEC1	3.3	50	6	13	18	0.815	350 to 530	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	MPQ4312 series
MPQ4436A-AEC1	3.3	50	6	13	18	0.815	420	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	Multi-phase, low I _O
S MPQ4275-AEC1	4	40	6	10	750	0.792	200 to 2400	50/30	-	Int	✓	✓	✓	✓	-	✓	QFN-16 (3x4)	36V, 6A, buck with PG indication
N MPQ4480-AEC1	4.2	40	6	17/22	1000	1	235 to 2200	20/15	-	Int	✓	✓	-	-	-	✓	QFN-25 (4x5)	Adjustable line drop compensation
MPQ4317-AEC1	3.3	50	7	13	18	0.815	350 to 530	48/20	3.3, 5	Ext	✓	✓	✓	✓	-	✓	QFN-20 (4x4)	MPQ4312 series
S MPM3551-AEC1	3.3	42	3	5.8	20	0.8	2200	70/50	-	Int	-	✓	-	✓	-	✓	QFN-20 (4x6)	Module with integrated inductor
S MPM3551C-AEC1	3.3	42	3	5.8	1200	0.8	2200	70/50	-	Int	-	✓	✓	-	-	✓	QFN-20 (4x6)	Module with integrated inductor
S MPQ4325-AEC1	3.3	36	5	8.5	20	0.8	200 to 2500	45/25	-	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	Ultra-compact, low I _O
S MPQ4326-AEC1	3.3	36	6	10	20	0.8	200 to 2500	45/25	3.3	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	Ultra-compact, low I _O
S MPQ4327-AEC1	3.3	36	7	11	20	0.8	200 to 2500	45/25	-	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	Ultra-compact, low I _O
S MPQ4328-AEC1	3.3	36	4	6.4	20	0.8	200 to 2500	45/25	-	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	Ultra-compact, low I _O
S MPQ4371GVE-8001-AEC1	3.3	42	8	13.8	3.5	0.6	200 to 2500	21.5/10	-	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	Multi-phase, ultra-low I _O
S MPQ4371GVE-8000-AEC1	3.3	42	8	13.8	3.5	0.6	200 to 2500	21.5/10	-	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	Single-phase, ultra-low I _O
S MPQ4371GVE-9001-AEC1	3.3	42	10	17.2	3.5	0.6	200 to 2500	21.5/10	-	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	Multi-phase, ultra-low I _O
S MPQ4371GVE-9000-AEC1	3.3	42	10	17.2	3.5	0.6	200 to 2500	21.5/10	-	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	Single-phase, ultra-low I _O

BUCK REGULATORS | AUTOMOTIVE

Buck Regulators

40V to 50V Synchronous Buck without Frequency Spread Spectrum

Part Number	V _{in} (Min) (V)	V _{in} (ABS Max) (V)	I _{out} (A)	I _{sw} Limit (Typ) (A)	I _o (Typ) (µA)	V _{FB} (V)	f _{sw} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft-Start	External Sync	Spread Spectrum	FCCM	AMM	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
MPM3509B-AEC1	4	40	0.6	5	700	0.807	400	90/50	-	Int	✓	-	✓	-	✓	✓	QFN-17 (3x5x1.6)	Ultra-compact module, int. inductor, BST/VCC capacitors
MPQ9846-AEC1	3.3	40	0.6	1.2	14	0.8	350 to 2500	125/115	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	Compact, low I _o
MPQ4418-AEC1	4	40	0.6	5.6	600	0.792	410	90/55	-	Int	✓	-	✓	-	✓	-	TSOT23-8	MPQ4420 series
N MPQ4418A-AEC1	4	40	0.6	1.7	600	0.792	410	90/55	-	Int	✓	-	✓	-	✓	-	TSOT23-8	MPQ4420 series
MPM3509-AEC1	4	40	0.9	3	600	0.807	2200	90/50	-	Int	✓	-	✓	-	✓	✓	QFN-17 (3x5x1.6)	Ultra-compact module, int. inductor, BST/VCC capacitors
N MPQ4419-AEC1	4	40	1	5.6	600	0.792	410	90/55	-	Int	✓	-	✓	-	✓	-	TSOT23-8	MPQ4420 series
MPQ4431-AEC1	3.3	40	1	2.5	10	0.8	350 to 2500	90/80	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ4430 series, low I _o , low-dropout mode
MPQ9840-AEC1	3.3	40	1	5.6	14	0.8	350 to 2500	90/40	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ9840 series, low I _o , low-dropout mode
MPM3515-AEC1	4	40	1.5	4	600	0.807	2200	90/50	-	Int	✓	-	✓	-	✓	✓	QFN-17 (3x5x1.6)	Ultra-compact module, int. inductor, BST/VCC capacitors
MPQ4415M-AEC1	4	40	1.5	4	600	0.8	450 to 2200	90/50	-	Int	✓	-	✓	-	✓	✓	QFN-13 (2.5x3)	Integrated input capacitor
MPQ4415A-AEC1	4	40	1.5	4	600	0.8	450 to 2200	90/50	-	Int	✓	-	✓	-	✓	✓	QFN-13 (2.5x3)	-
MPQ4420H-AEC1	4	40	2	4.2	500	0.792	410	90/55	-	Int	✓	-	-	✓	✓	-	TSOT23-8	MPQ4420 series
MPQ4420A-AEC1	4	40	2	5.6	600	0.792	410	90/55	-	Int	✓	-	✓	-	✓	-	TSOT23-8	MPQ4420 series
MPQ4432-AEC1	3.3	40	2.2	5.2	10	0.8	350 to 2500	90/40	3.8, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ4430 series, low I _o , low-dropout mode
MPQ9841-AEC1	3.3	40	2.2	2.5	14	0.8	350 to 2500	90/80	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ9840 series, low I _o , low-dropout mode
MPQ4433-AEC1	3.3	40	3	5.8	10	0.8	350 to 2500	90/40	5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ4430 series, low I _o , low-dropout mode

BUCK REGULATORS | AUTOMOTIVE

Buck Regulators

40V to 50V Synchronous Buck without Frequency Spread Spectrum

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _{sw} Limit (Typ) (A)	I _Q (Typ) (µA)	V _{FB} (V)	f _{sw} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAM	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
MPQ9842-AEC1	3.3	40	3	5	14	0.8	350 to 2500	90/40	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ9840 series, low I _Q , low-dropout mode
MPQ4423H-AEC1	4	40	3	4.4	500	0.792	410	85/55	-	Int	✓	-	-	✓	✓	✓	QFN-8 (3x3)	-
MPQ4423A-AEC1	4	40	3	5.7	600	0.792	410	85/55	-	Int	✓	-	✓	-	✓	-	QFN-8 (3x3)	-
MPQ4430-AEC1	3.3	40	3.5	5.8	10	0.8	350 to 2500	90/40	3.8, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ4430 series, low I _Q , low-dropout mode
MPQ9843-AEC1	3.3	40	3.5	5.6	14	0.8	350 to 2500	125/55	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-16 (3x4)	MPQ9840 series, low I _Q , low-dropout mode
MPQ4473-AEC1	4.5	40	3.5	6.6	500	0.815	200 to 1000	40/20	-	Ext	✓	-	-	-	-	-	QFN-20 (3x4)	Constant-on-time (COT) control
MPQ4470-AEC1	4.5	40	5	8	500	0.815	100 to 1000	40/20	-	Ext	✓	-	-	-	-	-	QFN-20 (3x4)	Constant-on-time (COT) control
MPQ4470A-AEC1	4.5	40	5	8	500	0.815	100 to 1000	40/20	-	Ext	✓	-	-	-	-	-	QFN-20 (3x4)	Constant-on-time (COT) control
MPQ4436-AEC1	3.3	50	6	13	18	0.815	420	48/20	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-20 (4x4)	Multi-phase, low I _Q
N MPQ4436B-AEC1	3.3	50	6	13	18	0.815	2200	48/20	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-20 (4x4)	Multi-phase, low I _Q

Buck Regulators

Buck Controllers

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _Q (Typ) (µA)	I _{sp} (Typ) (µA)	V _{FB} (V)	f _{sw} (kHz)	Soft Start	External Sync	FCCM	AAM	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
MPQ2908A-AEC1	4	60	750	0.5	0.8	100 to 1000	Ext	✓	✓	✓	✓	✓	TSSOP-20EP, QFN-20 (3x4)	High max duty cycle (99.5%)
MPQ2918-AEC1	4	40	750	0.5	0.8	100 to 1000	Ext	✓	✓	✓	✓	✓	TSSOP-20EP, QFN-20 (3x4)	High max duty cycle (99.5%)

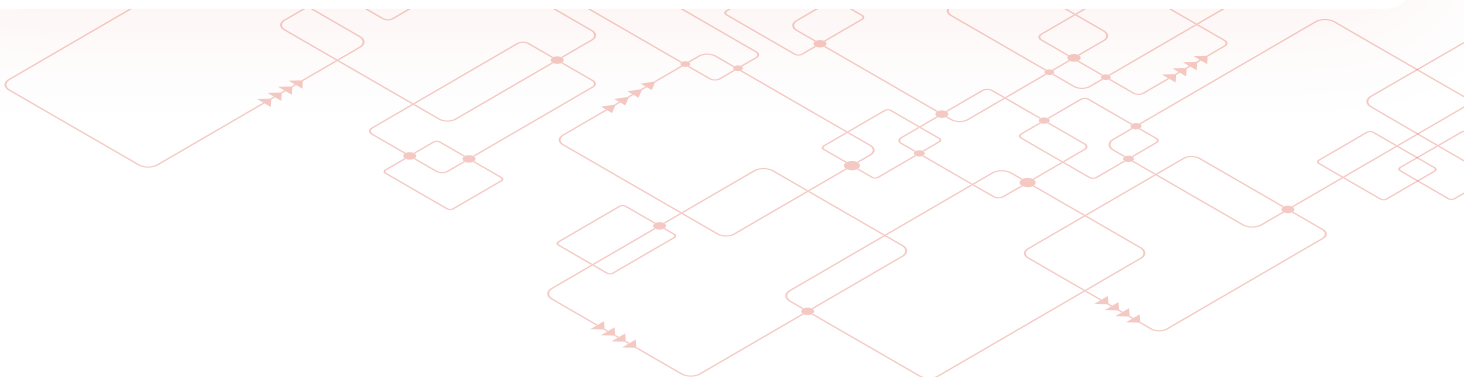
BUCK REGULATORS | AUTOMOTIVE

Buck Regulators 60V to 80V Synchronous Buck

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _{sw} Limit (Typ) (A)	I _a (Typ) (μA)	V _{FB} (V)	f _{sw} (kHz)	R _{DS(ON)} (mΩ)	Soft Start	External Sync	FCCM	AAM	Hysteretic Control	Fixed Frequency	Package	Notes
MPQ4569-AEC1	4.5	80	0.3	0.72	20	1	-	1200/450	Ext	-	-	✓	✓	-	QFN-10 (3x3), SOIC-8E	Prog. soft start
MPQ4569A-AEC1	4.5	80	0.3	0.72	20	1	-	1200/500	Ext	-	-	✓	✓	-	QFN-10 (3x3)	Prog. soft start, default enable on
MPQ2420-AEC1	4.5	80	0.3	0.72	20	1	-	1200/450	Ext	-	-	✓	✓	-	TSSOP-16EP	Int. separate windowed watchdog die
MPQ2420A-AEC1	4.5	80	0.3	0.72	20	1	-	1200/450	Ext	-	-	✓	✓	-	TSSOP-16EP	Int. separate windowed watchdog die, default enable on
N MPQ4576-AEC1	4.5	65	0.6	1.95	40	0.8	200 to 2200	250/45	Int	-	✓	✓	-	✓	QFN-12 (2.5x3)	MPQ4572 series, low I _Q , compact
MPQ4571-AEC1	4.5	65	1	1.95	40	0.8	200 to 2200	250/45	Int	-	✓	✓	-	✓	QFN-12 (2.5x3)	MPQ4572 series, low I _Q , compact
MPQ4572-AEC1	4.5	65	2	3.5	40	0.8	200 to 2200	250/45	Int	-	✓	✓	-	✓	QFN-12 (2.5x3)	MPQ4572 series, low I _Q , compact
N MPQ4573-AEC1	4.5	65	2.5	3.5	40	0.8	200 to 2200	250/45	Int	-	✓	✓	-	✓	QFN-12 (2.5x3)	MPQ4572 series, low I _Q , compact
MPQ4570-AEC1	4.5	60	3	5.7	520	1	100 to 1000	90/70	Ext	✓	-	✓	-	✓	TSSOP-20EP	Prog. soft-start time, external sync

Buck Regulators >100V Synchronous Buck

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _{sw} Limit (Typ) (A)	I _a (Typ) (μA)	V _{FB} (V)	R _{DS(ON)} (mΩ)	Soft Start	FCCM	Hysteretic Control	Package	Notes
MPQ4590-AEC1	7.5	700	0.4	0.66	200	2.55	13.5	Int	✓	✓	SOIC-8	Primary-side CV control, supports buck, buck-boost, boost, and flyback topologies

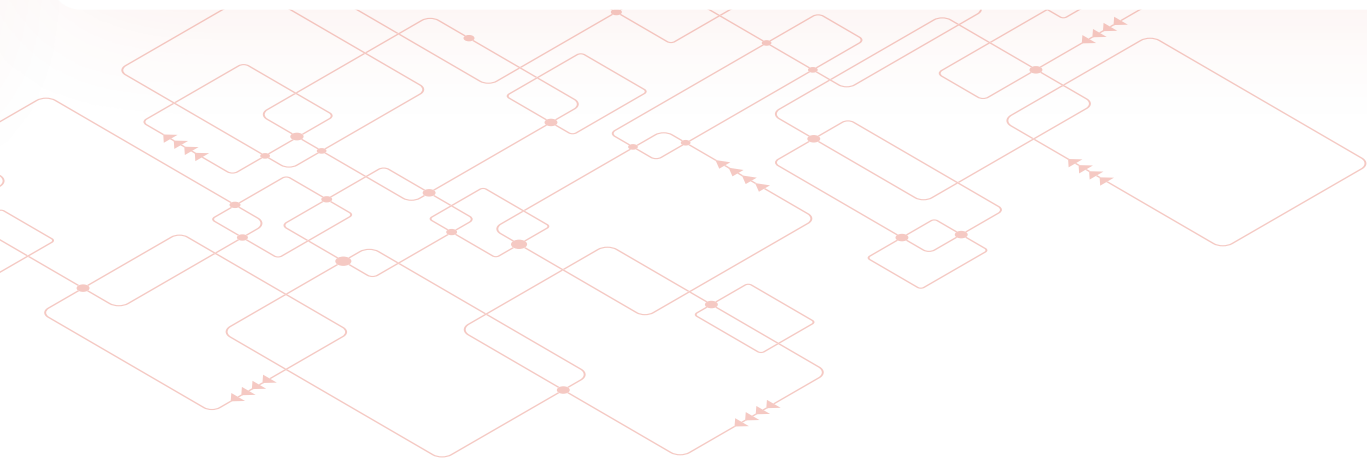


BUCK REGULATORS | AUTOMOTIVE

Buck Regulators

Non-Synchronous Buck

Part Number	V_{in} (Min) (V)		V_{in} (ABS Max) (V)	I_{out} (A)	I_{sw} Limit (Typ) (A)	I_o (Typ) (µA)	V_{FB} (V)	f_{sw} (kHz)	$R_{DS(on)}$ (mΩ)	Fixed Output Versions	Soft Start	External Sync	FCCM	Fixed Frequency	Package	Notes
MPQ2459-AEC1	4.5	60	0.5	1.25	730	0.812	480	1000	-	Int	-	✓	✓	TSOT23-6	Superior light-load efficiency	
MPQ2451-AEC1	3.3	40	0.6	1	130	0.794	2000	500	3.3, 5	Int	-	-	✓	TSOT23-6L, QFN-6L	Internal comp. and SS	
MPQ2454-AEC1	3.3	40	0.6	1.8	60	0.8	350 to 2300	200	-	Ext	✓	-	✓	QFN-10 (3x3), MSOP-10EP	Superior light-load efficiency	
MPQ4558-AEC1	3.8	60	1	1.9	140	0.8	200 to 2000	250	-	Int	-	-	✓	QFN-10 (3x3), SOIC-8E	Superior light-load efficiency	
MPQ4559-AEC1	3.8	60	1.5	2.3	140	0.8	200 to 2000	250	-	Int	-	-	✓	QFN-10 (3x3), SOIC-8E	Superior light-load efficiency	
MPQ4561-AEC1	3.8	60	1.5	2.5	140	0.795	250 to 2000	300	-	Ext	-	-	✓	QFN-10 (3x3)	Superior light-load efficiency	
MPQ4560-AEC1	3.8	60	2	3.2	140	0.797	250 to 2000	250	-	Int	-	-	✓	QFN-10 (3x3), SOIC-8E	Superior light-load efficiency	
MPQ4462-AEC1	3.8	40	3.5	5.5	120	0.792	250 to 4000	150	-	Int	-	-	✓	QFN-10 (3x3), SOIC-8E	Superior light-load efficiency	
MPQ4467-AEC1	3.3	40	2.5	5.8	10	0.8	350 to 2500	90	-	Ext	✓	-	✓	QFN-16 (3x4)	Low-dropout, selectable in-phase or 180° out-of-phase	
MPQ4468-AEC1	3.3	40	3.5	5.8	10	0.8	350 to 2500	90	-	Ext	✓	-	✓	QFN-16 (3x4)	Low-dropout, selectable in-phase or 180° out-of-phase	
MPQ4469-AEC1	3.3	40	5	7.7	10	0.8	350 to 2500	110	-	Ext	✓	-	✓	QFN-20 (4x5)	Low-dropout, selectable in-phase or 180° out-of-phase	
MPQ2362-AEC1	4.75	25	Dual 2	3.4	2000	1.222	380	180	-	Int	✓	✓	✓	TSSOP-20	Dual output	

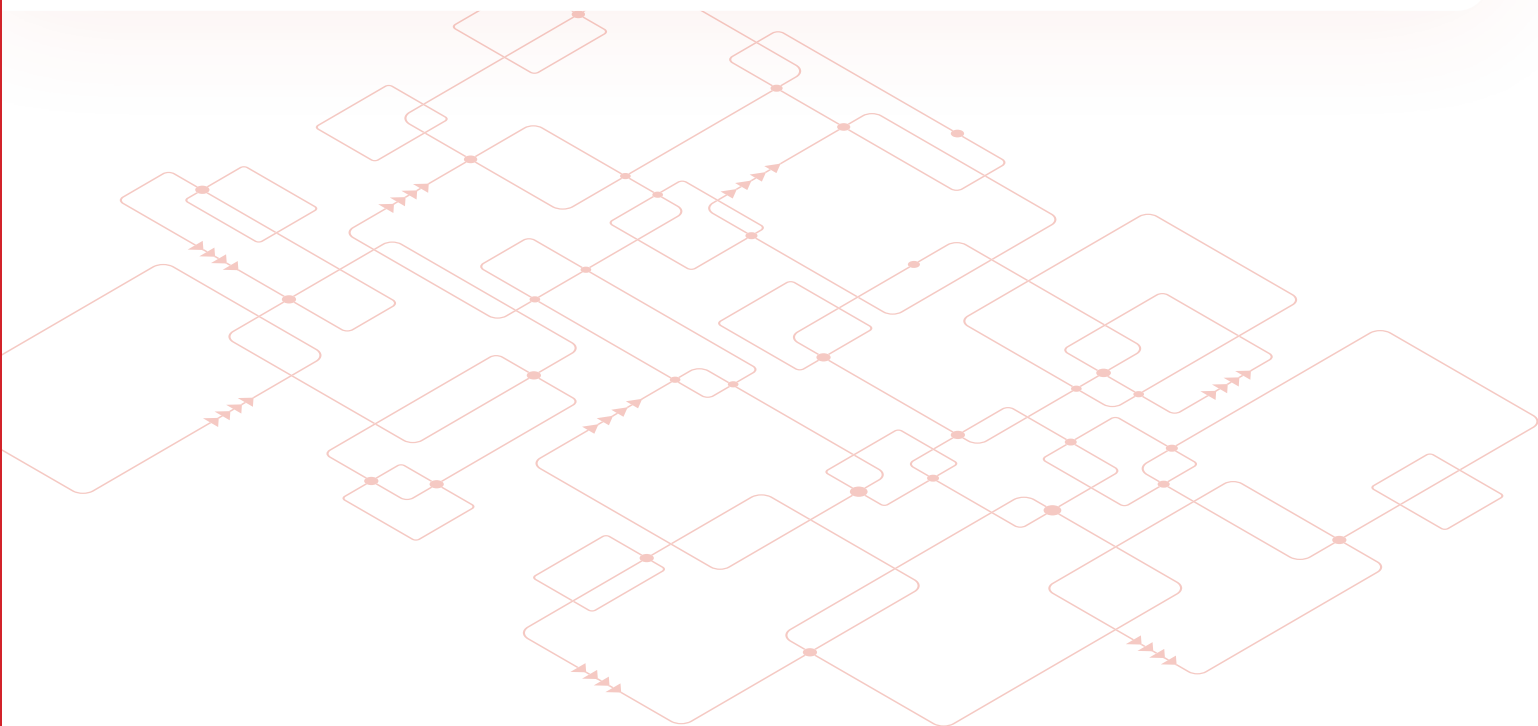


BOOST REGULATORS | AUTOMOTIVE

Boost Regulators

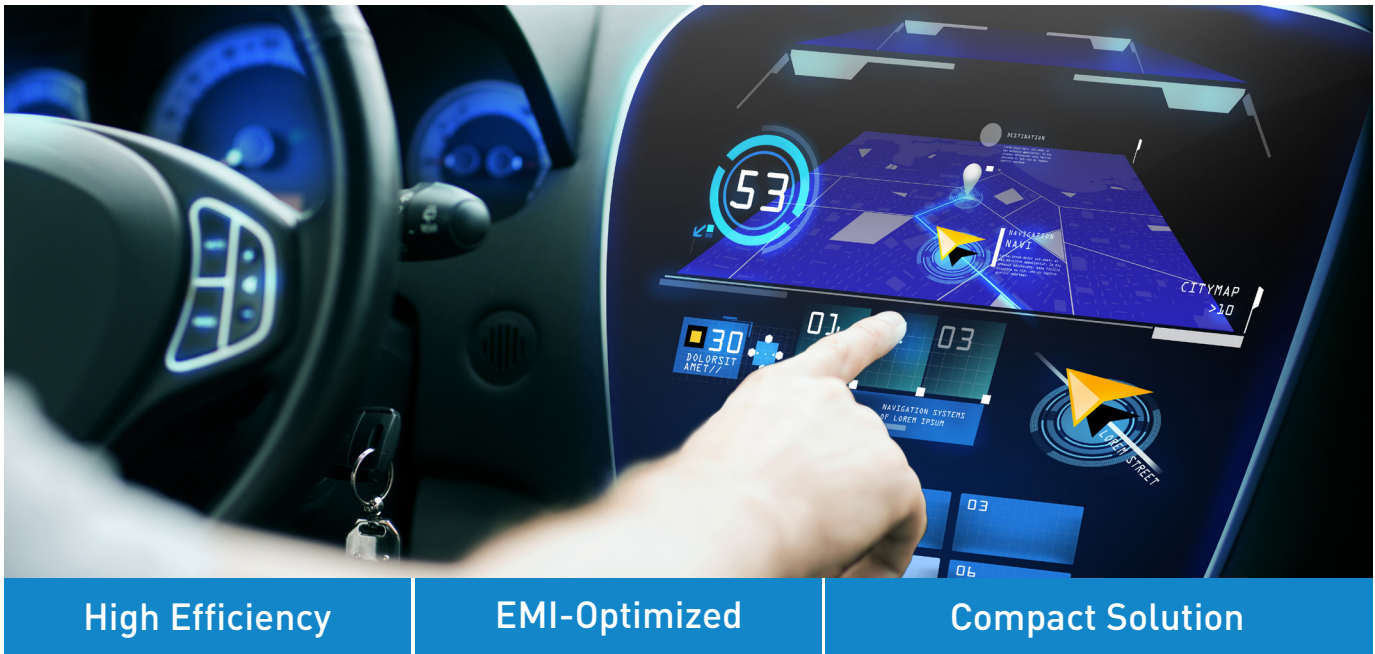
Synchronous Boost

Part Number	V_{in} (Min) (V)	V_{in} (Max) (V)	V_{out} (Max) (V)	I_{sw} Limit (Typ) (A)	I_o (Typ) (μ A)	I_{sp} (Typ) (μ A)	V_{rs} (V)	f_{sw} (kHz)	Current Limit (A)	$R_{s(ohm)}$ (m Ω)	Output (V)	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
MPQ3410-AEC1	1.8	6	6	1.3	360	0.15	1.19	550	1.3	530/300	Adj	✓	-	TSOT23-5	Output to input disconnect
N MPQ3413-AEC1	1.8	3.6	5	3.6	8	0.1	-	2.2	3.6	80/70	5	✓	-	TSOT23-5	-
N MPQ3414B-AEC1	2.8	3.6	5	3.6	8	0.1	-	2.2	3.6	80/70	5	✓	-	TSOT23-5	-
MPQ3428A-AEC1	3	20	22	25	110	1	1.225	600	25	18	Adj	✓	-	QFN-22 (3x4)	Input disconnect function, external high-side gate drive
MPQ3431A-AEC1	0.8	13	16	21	450	25	1	450	25	6/9.5	Adj	✓	✓	QFN-13 (3x4)	Prog. input current limit, supports 40W peak power load from 3.3V, selectable PSM and FCCM, adaptive COT
N MPQ3431C-AEC1	0.8	13	16	Adj	450	25	1	450	10	6/9.5	Adj	✓	✓	QFN-13 (3x4)	Prog. internal switch peak current limit, supports 40W peak power load
N MPQ3432-AEC1	0.8	13	16	10	450	25	1	600	10	6/9.5	Adj	✓	✓	QFN-13 (3x4)	Prog. internal switch peak current limit, supports 40W peak power load
S MPQ3433-AEC1	0.8	13	16	15	450	25	1	450	15	6/9.5	Adj	✓	✓	QFN-13 (3x4)	Prog. input current limit, supports 40W peak power load from 3.3V, selectable PSM and FCCM, adaptive COT



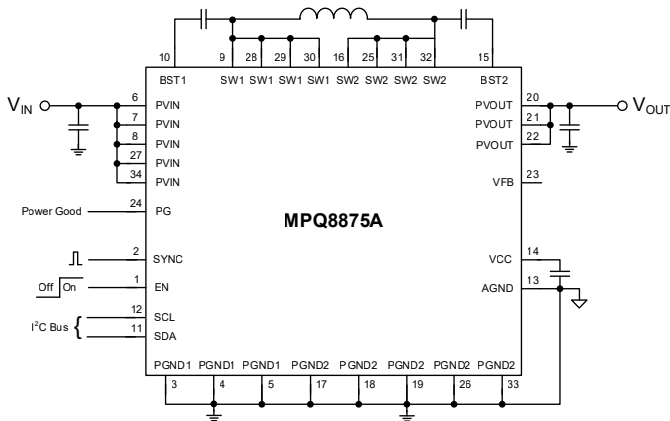
Boost & Buck-Boost Regulators

MPS offers a full variety of DC/DC step-up solutions designed to operate directly from a 12V/24V battery or at the point of load. Choose from power-dense integrated converters with low- $R_{DS(ON)}$ MOSFETs, or flexible controllers with external MOSFETs to easily address high current requirements. Our solutions help address common automotive design challenges such as cold crank, EMI limits, and operation above or below the AM band.



MPQ8875A-xxxx-AEC1

36V, 5A, 4-Switch, Synchronous Buck-Boost Converter with I²C Interface



Features

Built to Handle Tough Automotive Transients

- Load dump up to 42V
- Cold crank down to 4.2V

Cooler Thermals

- 98% efficiency (11.6V_{OUT}, 1A load, 450kHz)
- Low-ohmic MPS BCD FET technology

Low-Noise EMI/EMC

- Symmetric V_{IN} package design
- Spread spectrum frequency modulation
- MeshConnect™ flip-chip packaging
- Operates outside of AM radio band

Extends Vehicle Battery Life

- Low shutdown current in standby mode (2μA)

Reduces Board Size and BOM

- Integrated compensation network
- Fixed output voltage options

Additional Features

- External clock sync
- Power good (PG) output
- Cycle-by-cycle current limiting
- Programmable input under-voltage lockout (UVLO)
- Output over-voltage protection (OVP)

Key Specifications:

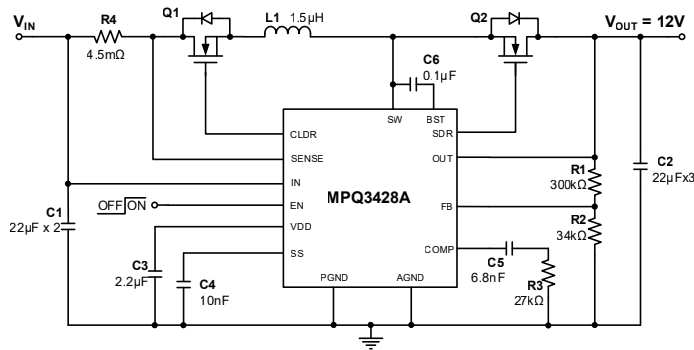
4.2V to 42V	2x 10mΩ 2x 25mΩ	200kHz to 1MHz	QFN (4mmx5mm)
Input Voltage	Built-In FETs	Switching Frequency	Package

Available in Pin-Compatible Family:

20W	30W
MPQ8873	MPQ8875A

MPQ3428A-AEC1

20V, 19A, Synchronous Boost Converter with Input Disconnect Function



Key Specifications:

3V to 20V Input Voltage	<1μA Shutdown Current	18mΩ Built-In FETs	QFN (3mmx4mm) Package
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Features

Cooler Thermals

- 94% efficiency (4.2V to 12V, 2A)
- Low-ohmic MPS BCD FET technology

Low-Noise EMI/EMC

- MeshConnect™ flip-chip packaging
- Operates outside of AM radio band

Reduces Board Size and BOM

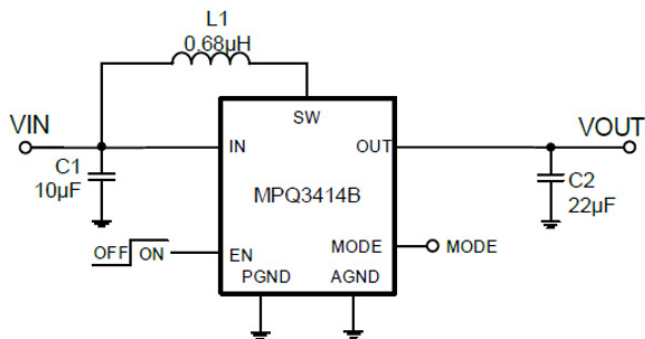
- Integrated compensation network
- Fixed output voltage options

Additional Features

- 19A internal switch current limit or externally programmable input current limit
- Supports external disconnect FET
- Cycle-by-cycle current limiting
- Programmable input under-voltage lockout (UVLO)
- Output over-voltage protection (OVP)

MPQ3414B-AEC1

4V_{IN}, 5V_{OUT}, 0.5A Synchronous Boost Converter



Key Specifications:

2.8V to 3.6V Input Voltage	5V Output Voltage	0.25 to 0.5A Output Current	2.2MHz Switching Frequency	TSOT23-8 Package
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Features

Excellent System Power Efficiency

- True output disconnection to allow 0V_{OUT} for zero shutdown current
- <1μA shutdown current
- Inrush current limiting at start-up

Protection

- Overload protection (OLP) and short-circuit protection (SCP)
- Over-voltage protection (OVP)
- Thermal shutdown

Available in Pin-Compatible Family:

MPQ3413	250mA
MPQ3414B	500mA

BUCK-BOOST REGULATORS | AUTOMOTIVE

Buck-Boost Converters

Part Number	V_{IN} (Min) (V)	V_{IN} (Max) (V)	V_{OUT} (Max) (V)	I_{OUT} (Typ) (A)	I_O (Typ) (μ A)	f_{SW} (kHz)	$R_{DS(ON)}$ (m Ω)	Interface	Spread Spectrum	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
MPQ8873-xxxx-AEC1	2.2	36	0.5 to 30	3	180	200 to 1000	2x 10/25	I ² C	✓	✓	✓	QFN-34 (4x5)	20W, OTP-prog. 4-switch converter with advanced protection
MPQ8875A-xxxx-AEC1	2.2	36	0.5 to 30	5	180	200 to 1000	2x 10/25	I ² C	✓	✓	✓	QFN-34 (4x5)	30W, OTP-prog. 4-switch converter with advanced protection
N MPQ4262/A-AEC1 (Hybrid)	3.6	40	1 to 36	5	130	280/420/600	20/14.5	I ² C	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency, I ² C

BUCK-BOOST REGULATORS | AUTOMOTIVE

Boost Regulators Boost Controllers

Part Number	V_{IN} (Min) (V)	V_{IN} (Max) (V)	I_O (Typ) (μ A)	I_{SW} (Typ) (μ A)	V_{FB} (V)	f_{SW} (kHz)	Gate Drive (A)	Soft Start	Sync	OVP	Wettable Flank QFN Option	Package	Notes
MPQ3910A-AEC1	5	35	288	1	1.237	30 to 400	1	Ext	✓	✓	-	MSOP-10	Peak current mode, light-load operation, supports >10A, OVP, SCP, OTP
S MPQ3445-AEC1	3.5	40	40	8	Adj	250 to 2500	2	Adj	✓	✓	✓	QFN-21 (5x5)	Multi-phase capability, spread spectrum, I ² C/SPI digitally programmable

Boost Regulators Non-Synchronous Boost

Part Number	V_{IN} (Min) (V)	V_{SW} (Max) (V)	I_{OUT} (Max) (V)	I_{SW} Limit (Typ) (A)	I_O (Typ) (μ A)	V_{FB} (V)	f_{SW} (kHz)	$R_{DS(ON)}$ (m Ω)	Soft Start	OCP	Wettable Flank QFN Option	Package	Notes
MPQ3426-AEC1	3.2	45	35	8.5	650	1.225	300 to 2000	90	Ext	✓	✓	QFN-14 (3x4)	Programmable UVLO and EN hysteresis
N MPQ3425-AEC1	3.1	22	55	5	650	1.225	300 to 2000	90	Ext	✓	✓	QFN-14 (3x4)	Programmable UVLO and EN hysteresis
N MPQ3452-AEC1	3.1	22	22	5	650	1.225	300 to 2000	90	Ext	✓	✓	QFN-14 (3x4)	Programmable UVLO and EN hysteresis

Automotive Compute Core Power

MPS offers best-in-class power conversion solutions for the core power rails of automotive SoCs, CPUs, and GPUs. The portfolio includes multi-phase digital controllers, Intelli-Phase™ DrMOS power stages, and high-current power converters. Our solutions offer scalability, programmability, and comprehensive monitoring and protection features to power the most advanced high-performance computing for automotive applications, such as ADAS and infotainment.

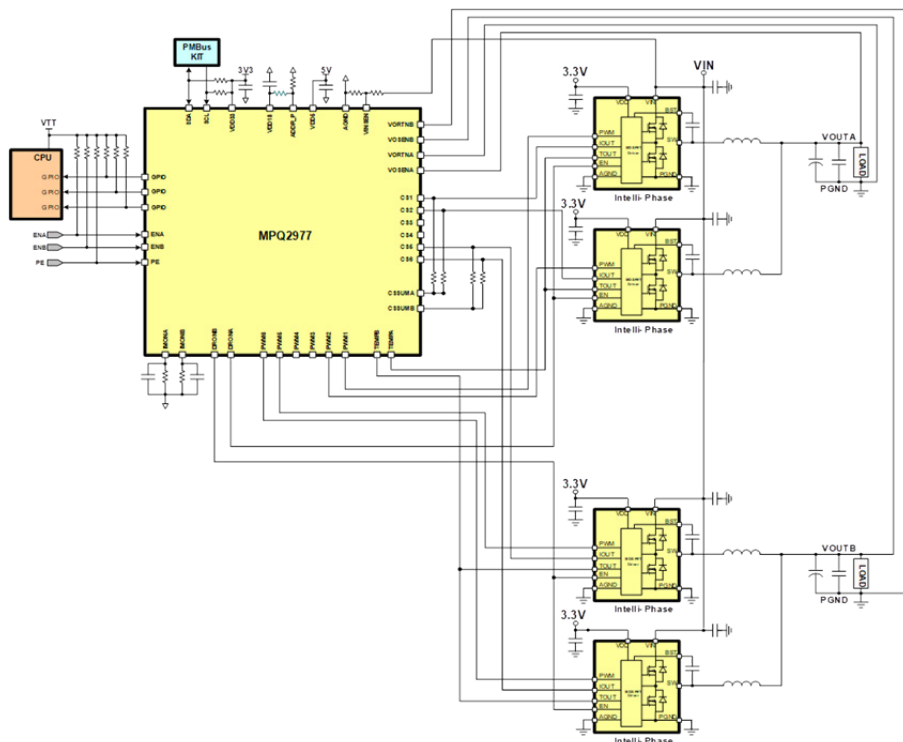


High Efficiency

Fast Transient Response

Compact Solution

Digital Multi-Phase Controllers + Intelli-Phase™ DrMOS to Power SoC Core Rails



Features

Digital Control

- Easy compensation
- Fast transient response
- Better current balancing
- Programmability and flexibility
- Real-time monitoring and reporting
- Comprehensive protection features

Monolithic DrMOS

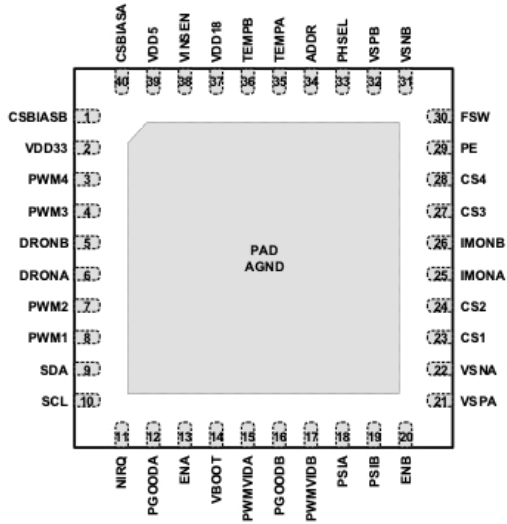
- Monolithic design means fewer components and improved robustness
- Reduced switching losses and higher efficiency
- Superior current-sensing accuracy

Fewer External Components

- Lower cost
- More compact design

MPQ2967FS-AEC1 NEW SAMPLING

2-Rail, 4-Phase Digital Controller



QFN-40
(6mmx6mm), 0.5mm Pitch

Customer Benefits

Proven design for NVIDIA Orin ADAS platform
 COT PWM scheme offering fast transient response to reduce C_{OUT}
 Digital control for flexibility, optimized tuning, and design cycles

Features

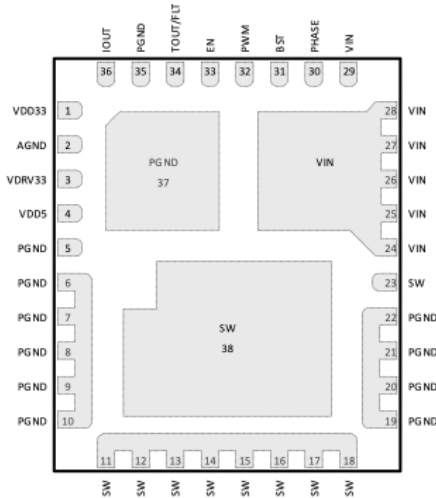
- Programming and monitoring
- PWM-VID interface compliant
- Built-in MTP to store custom configurations
- Automatic loop compensation, automatic phase-shedding, and phase-to-phase active current balancing
- Input voltage, output voltage, output current, and regulator temperature monitoring
- Protections include UVLO, OVP, UVP, OCP, and OTP
- Runtime register CRC, and PEC mismatch check
- Separate EN for each rail

Applications

Low-voltage and high-current rails for ADAS and infotainment SoCs, CPUs, and GPUs

MPQ86960-AEC1 NEW SAMPLING

50A Intelli-Phase™ DrMOS



LGA
(5mmx6mm)

Customer Benefits

Proven design for NVIDIA Orin ADAS platform
 Monolithic design offers higher switching frequency to reduce inductor and capacitor size
 Optimized process technology for best efficiency to extend EV battery range

Features

- Wide 3V to 22V operating input voltage range
- 5V VDD input
- VDRV33 and VDD33 supported by internal LDO
- Current-sensing with Accu-Sense™
- Temperature-sensing
- Accept tri-state PWM input
- Current limit protection
- Over-temperature protection (OTP)
- Fault reporting

Applications

Low-voltage and high-current rails for ADAS and infotainment SoCs, CPUs, and GPUs

AUTOMOTIVE COMPUTE POWER | AUTOMOTIVE

Automotive Compute Core Power

Multi-Phase Digital Controllers

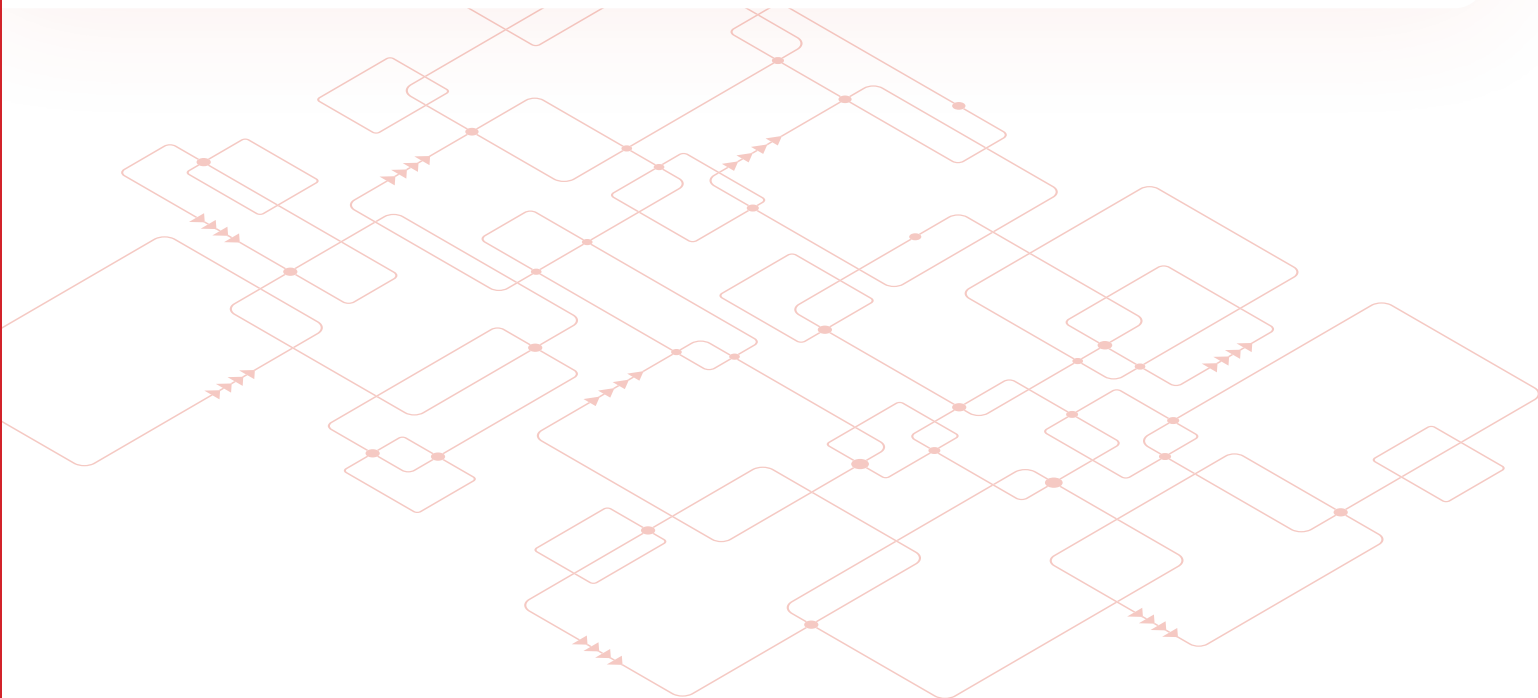
Part Number	Control Method	System Interface	Memory Type	# of Rails	# of Phases	V _{CC} (Typ) (V)	f _{SW} (Max) (kHz)	Wettable Flank QFN Option	Package	Notes
N MPQ2977-AEC1	Digital Control	I ² C	MTP	2	6	5	1250	✓	TQFN-40 (6x6)	-
N MPQ2967FS-AEC1	Digital Control	I ² C	MTP	2	4	5	2000	✓	TQFN-40 (6x6)	MPSafe™ ASIL-D digital controller

AUTOMOTIVE COMPUTE POWER | AUTOMOTIVE

Automotive Compute Core Power

Intelli-Phase™ DrMOS

Part Number	V _M (Min) (V)	V _M (Max) (V)	Load Current (A)	V _{CC} (Typ) (V)	Integrated Current Sense	Integrated Temp Sense	Fault Indicator	Wettable Flank QFN Option	Package
N MPQ86940-AEC1	3	22	40	3.3	✓	✓	✓	✓	QFN-21 (4x5)
N MPQ86960-AEC1	3	22	50	5	✓	✓	✓	-	LGA-38 (5x6)

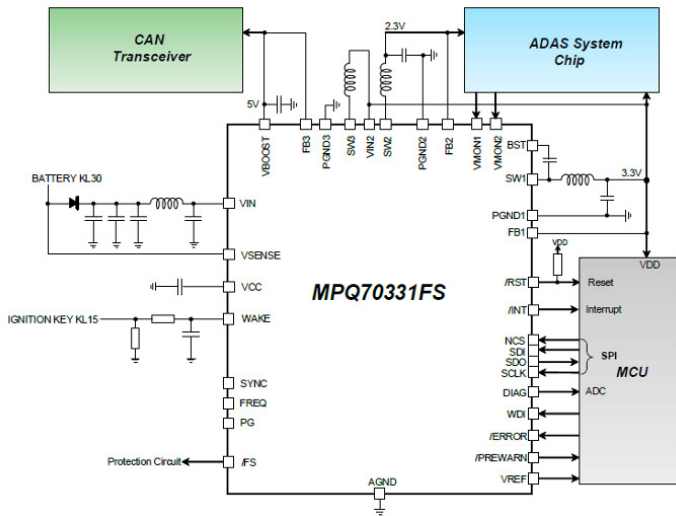


PMIC

MPS's automotive PMICs make it easy to manage multiple power rails with integrated system power sequencing and digital programming capabilities via I²C and SPI interfaces, as well as OTP/MTP memory. During development, system requirements may change; with our starter development/evaluation kits (EVKT/PKTs), customers can easily use MPS products to evaluate, make changes to programming, and finalize specs in a timely manner. Some of our PMICs also support multi-phase (parallel) capability to allow design scalability and minimize the number of BOM components.



MPQ70331FS-AEC1 SAMPLING ASIL-D, 42V, 3-Channel PMIC Optimized for Radar



Key Specifications:

4.5V to 42V	ASIL-D	QFN-34 (6mmx6mm)
Input Voltage	Functional Safety Rating	Package

3 Outputs:

2A	1.5A	250mA
HV Buck	LV Buck	LV Boost

Features

Built to Handle Tough Automotive Transients
Load dump up to 42V, cold crank down to 4.5V

Do More With Less
HV buck + 1.5A LV buck + 250mA LV boost converter
Up to 2.5MHz switching frequency (reduced external component size)

Delivers Mission-Critical Safety
ISO26262 functional safety rating of ASIL-D

Interrupt pin to MCU or SoC

Integrated voltage supervisor with under-voltage and over-voltage monitoring

Watchdog (windowed or Q&A)

Analog and digital built-in self-testing

Multi-page one-time programmable (MOTP) memory

SPI with cyclic redundancy check

Auxiliary voltage monitor

Clock monitoring

Over-current protection (OCP), thermal warning and shutdown

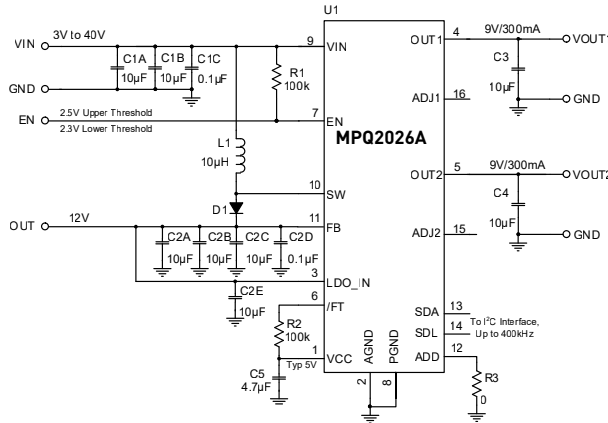
Optimized for EMI/EMC

Up to 2.5MHz switching frequency

Frequency spread spectrum

MPQ2026A-AEC1 NEW

40V, Dual LDOs with Pre-Boost Stage



Features

Built to Handle Tough Automotive Transients
Load dump up to 45V, cold crank down to 3V

Optimized for EMI/EMC
Soft start feature for all regulator outputs
Frequency spread spectrum

Minimized external circuits
No external resistor network required for output voltage settings

Vast Flexibility through Digital Programmability
I²C interface
ADC for LDO output voltages and load currents
Multi-page one-time programmable (MOTP) memory

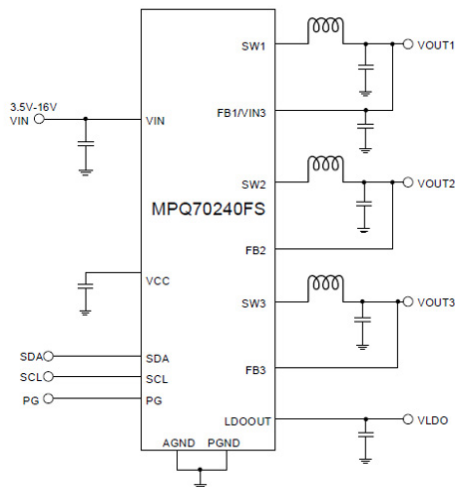
Key Specifications:

3V to 40V Input Voltage	32µA I _q in Standby Mode	400kHz to 2.2MHz Switching Frequency	QFN (4mmx4mm) Package	2A Pre-Boost	300mA LDO 1	300mA LDO 2
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3 Outputs:

MPQ70240FS-AEC1 SAMPLING

ASIL-B, 20V, 4-Channel PMIC Optimized for Cameras



Features

Optimized for Compact Automotive Camera Modules
Ideal topology with 2x 600mA MV bucks + 1A LV buck + LDO
Minimized external components for smaller footprint

Superior system efficiency: 9V to 1.8V with a buck powered directly over coaxial
Industry-leading compact 2.5mmx3.5mm package

Optimized for EMI/EMC
2.2MHz switching frequency
Frequency spread spectrum
Symmetrical input capacitors
MeshConnect™ flip-chip package

Protection Suite
Under-voltage lockout (UVLO), over-current protection (OCP), over-voltage protection (OVP), and thermal shutdown

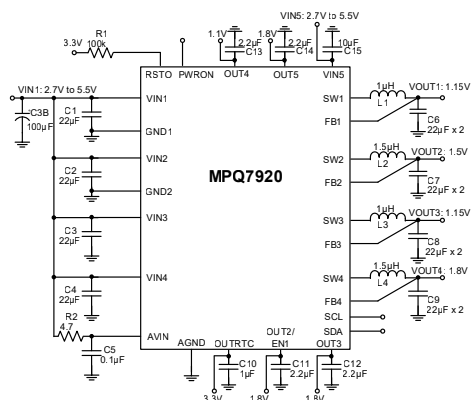
Programmability for Flexibility in Application
I²C-compliant interface

Key Specifications:

3.5V to 16V Input Voltage	600mA 2x MV Bucks	1A LV Buck	200mA LV LDO	ASIL-B Functional Safety Rating	QFN-15 (2.5mmx3.5mm) Package
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MPQ7920-AEC1 NEW

5V PMIC with 4 Buck Converters and 5 LDOs



Key Specifications:

2.7V to 5.5V Input Voltage	1.1MHz to 2.75MHz Switching Frequency	QFN (3.5mmx4.5mm) Package
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Buck Outputs:

4.5A Buck 1	4.5A Buck 2	2.5A Buck 3	2A Buck 4
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Features

High Power Density and Flexibility

4 step-down converters (4.5A/4.5A/2.5A/2A) capable of parallel operation

4 low-noise LDOs with separate V_{IN}

1 RTC dedicated LDO

Configurable power-on and power-off sequence

Low-Noise EMI/EMC

MeshConnect™ flip-chip packaging

Linear converter minimizes noise

Switching converters operate outside of AM radio band

Interleaving operation reduces EMI

Reduces Board Size and BOM

9 voltage outputs in a single package

High-frequency operation allows use of small passive components

Internal feedback divider

Additional Features

Dedicated RTC LDO

Programmable with high flexibility

MTP for default configuration

Internal adjustable soft start

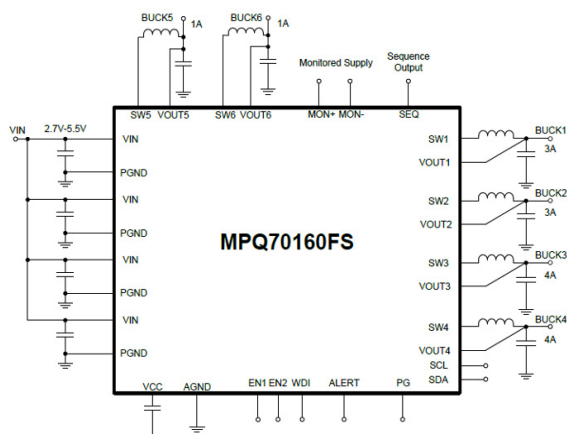
Over-current protection (OCP)

Over-voltage protection (OCP)

Thermal shutdown

MPQ70160FS-AEC1 SAMPLING

ASIL-D, 5.5V, 6-Channel PMIC



Key Specifications:

2.7V to 5.5V Input Voltage	0.2V to 3.6V (Adj) Output Voltage	ASIL-D Functional Safety Rating	QFN-32 (5mmx5mm) Package
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Features

Do More With Less

6 integrated synchronous buck regulators

Multi-phase capable

Integrated power sequencing

Soft start and soft shutdown

Built for Mission-Critical Safety

Interrupt pin to MCU or SoC

Integrated voltage supervisor with under-voltage and over-voltage monitoring

Watchdog (windowed or Q&A)

Analog and digital built-in self-testing

Cyclic redundancy check for communication, memory, and OTP

Auxiliary voltage monitor and clock monitoring

Over-current protection (OCP), thermal warning and shutdown

Programmability for Flexibility in Application

Multi-page one-time programmable (MOTP) memory

I²C-compliant interface

Optimized for EMI/EMC

2MHz switching frequency, frequency spread spectrum

180° phase-shift between bucks 1/3/6 and bucks 2/4/5

PMICS | AUTOMOTIVE

PMICs

40V PMICs

	Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	# of Channels	Configuration	Current Ratings (A)	f _{SW} (Max) (MHz)	ADC	Frequency Spread Spectrum	MPSafe (Functional Safety)	Interface	Wettable Flank QFN Option	Package	Notes
S	MPQ70331FS-AEC1	4.5	42	3	2 Bucks, 1 Boost	Buck: 2/1.5 Boost: 0.25	2.5	-	✓	✓	SPI	✓	QFN-34 (6x6)	ASIL-D, independent voltage supervisor, power FET leakage monitoring, extensive protections, battery failure pre-warning
S	MPQ7902-AEC1	4.5	42	3	2 Bucks, 1 Boost	Buck: 2/1.5 Boost: 0.25	2.5	-	✓	✓	SPI	✓	QFN-34 (6x6)	Independent voltage supervisor, power FET leakage monitoring, extensive protections, battery failure pre-warning
N	MPQ2026A-AEC1	3	40	3	2 LDOs, 1 Pre-Boost	LDO: 0.3/0.3 Pre-Boost: 2.5	2.2	✓	✓	-	I ² C	✓	QFN-16 (4x4)	Powers phantom active antenna supplies and ADAS modules, pre-boost enables cold/warm crank operation, digitally prog. V _{OUT}
S	MPQ2024A-AEC1	3	40	2	2 LDOs	LDO: 0.3/0.3	2.2	✓	✓	-	I ² C	✓	QFN-16 (4x4)	Digitally programmable V _{OUT}
S	MPQ2022A-AEC1	3	40	2	1 LDO, 1 Pre-Boost	LDO: 0.3 Pre-Boost: 2.5	2.2	✓	✓	-	I ² C	✓	QFN-16 (4x4)	Powers phantom active antenna supplies and ADAS modules, pre-boost enables cold/warm crank operation, digitally prog. V _{OUT}

PMICS | AUTOMOTIVE

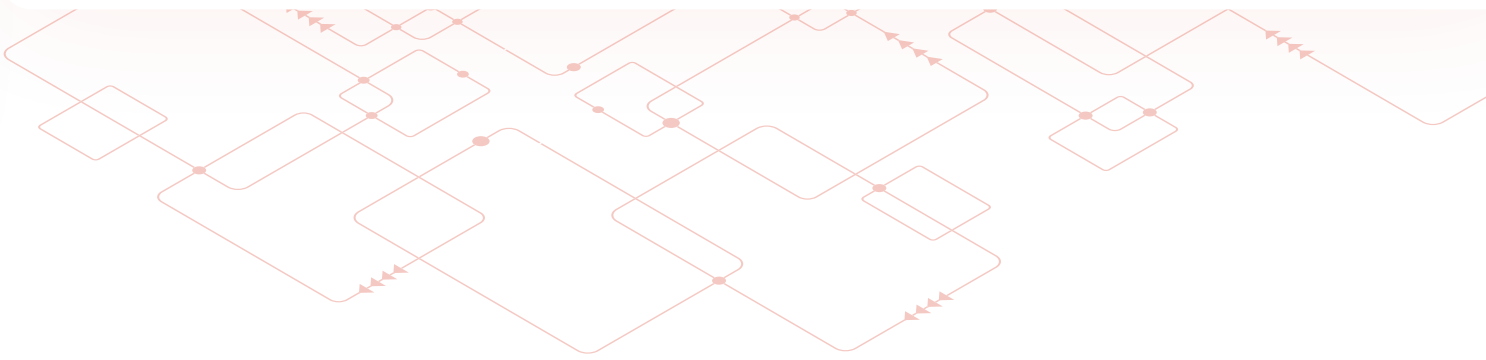
PMICs

18V PMICs

	Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	# of Channels	Configuration	Current Ratings (A)	f _{SW} (Max) (MHz)	Adj Power Sequencing	Frequency Spread Spectrum	MPSafe (Functional Safety)	Interface	Wettable Flank QFN Option	Package	Notes
N	MPQ70240FS-AEC1	3.5	18	4	3 Bucks, 1 LDO	Buck: 0.6/0.6/1 LDO: 0.2	2.2	✓	✓	✓	I ² C	✓	QFN-15 (2.5x3.5)	ASIL-B PMIC for camera modules powered over coaxial cable
N	MPQ7928-AEC1	3.5	18	4	3 Bucks, 1 LDO	Buck: 0.6/0.6/1 LDO: 0.2	2.2	✓	✓	-	I ² C	✓	QFN-15 (2.5x3.5)	QM PMIC for camera modules powered over coaxial cable

PMICs 5V PMICs

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	# of Channels	Configuration	Current Ratings (A)	f _{sw} (Max) (MHz)	Frequency Spread	Multi-Phase Outputs	MP-Safe (Functional Safety)	Interface	Wettable Flank QFN Option	Package	Notes
S MPQ70160FS-AEC1	2.7	5.5	6	6 Bucks	Buck: 3/3/4/4/1/1	2	✓	✓	✓	I ² C	✓	QFN-32 (5x5)	ASIL-D, Q&A watchdog timer, prog. sequencing, external voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
S MPQ70161FS-AEC1	2.7	5.5	6	6 Bucks	Buck: 1/1/2/2/1/1	2	✓	✓	✓	I ² C	✓	QFN-32 (5x5)	ASIL-D, Q&A watchdog timer, prog. sequencing, external voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
S MPQ70165FS-AEC1	2.7	5.5	6	6 Bucks	Buck: 3/3/4/4/1/1	2	✓	✓	✓	I ² C	✓	QFN-32 (5x5)	ASIL-B, Q&A watchdog timer, prog. sequencing, external voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
S MPQ70166FS-AEC1	2.7	5.5	6	6 Bucks	Buck: 1/1/2/2/1/1	2	✓	✓	✓	I ² C	✓	QFN-32 (5x5)	ASIL-B, Q&A watchdog timer, prog. sequencing, external voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
MPQ7920-AEC1	2.7	5.5	9	4 Bucks, 5 LDOs	Buck: 4.5/4/2.5/2 LDO: 0.3/0.3/0.3/0.3/0.01	2.75	-	-	-	I ² C	✓	QFN-16 (4x4)	MTP programmable, selectable time slot sequencing, extensive adjustability and protections for bucks, dedicated RTC for LDOs, COT
N MPQ7930-AEC1	2.7	5.5	6	6 Bucks	Buck: 3/3/4/4/1/1	2	✓	✓	-	I ² C	✓	QFN-32 (5x5)	QM, prog. sequencing, integrated and adjustable compensation network, hiccup UVP/OVP and OCP, thermal shutdown
N MPQ7931-AEC1	2.7	5.5	6	6 Bucks	Buck: 1/1/2/2/1/1	2	✓	✓	-	I ² C	✓	QFN-32 (5x5)	QM, prog. sequencing, integrated and adjustable compensation network, hiccup UVP/OVP and OCP, thermal shutdown
S MPQ7932-AEC1	2.7	5.5	6	6 Bucks	Buck: 3/3/4/4/1/1	2	✓	✓	-	I ² C	✓	QFN-32 (5x5)	QM, Q&A watchdog timer, prog. sequencing, external voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown



Linear Regulators

MPS low-dropout (LDO) regulators are a great fit for lower-current automotive subsystems that need to minimize battery drain. Our LDOs are designed to run directly off of 12V batteries or 5V power rails, and offer great power supply rejection in a compact size.



LINEAR REGULATORS | AUTOMOTIVE

5V LDOs

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (mA)	Load Reg (%)	PSRR @ 1kHz (dB)	V _{FB} (V)	I _Q (Typ) (µA)	Enable Pin	Adjustable Option (V)	Fixed Output Versions	Power Good	Package
MPQ20056-AEC1	2.5	5.5	250	0.0003	63	0.8	10	✓	0.8 to 5	1.8, 2.5, 3.3	-	QFN-8 (2x2), TSOT23-5
MPQ8904-AEC1	2.5	6.5	500	0.005	26	0.496	7	✓	0.5 to 5	-	✓	QFN-8 (2x3)
MPQ20051-AEC1	2.5	5.5	1000	0.0003	63	0.8	-	✓	0.8 to 5	-	-	QFN-8 (3x3)

40V LDOs

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (mA)	Load Reg (%)	PSRR @ 1kHz (dB)	V _{FB} (V)	I _Q (Typ) (µA)	Enable Pin	Adjustable Option (V)	Fixed Output Versions	Power Good	Package
MPQ2016-AEC1	4	40	30	0.003	65	1.23	12	✓	1.2 to 24	-	-	QFN-8 (2x3)
MPQ2013AGJE-C672-AEC1	2.5	40	100	0.005	41	1.215	3.2	✓	1.215 to 15	3.3, 2.5, 5	-	TSOT23-4
MPQ2013A-AEC1	2.5	40	150	0.005	41	1.215	3.3	✓	1.215 to 15	QFN-8: 3.3, 2.5, 5, 1.8 QFN-6: 3.3, 5	-	QFN-6 (2x2), QFN-8 (3x3)
MPQ2019-AEC1	3	40	300	0.04	45	1.25	10	✓	1.2 to 15	3.3, 5	✓	SOIC-8EP
MPQ2029-AEC1	3	40	450	0.04	45	1.25	10	✓	1.2 to 15	-	✓	SOIC-8EP

DDR MEMORY POWER | AUTOMOTIVE

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (mA)	Accuracy for VTT _{REF} (mV)	Driver (V)	Package	Notes
MPQ20073-AEC1	1.3	6	2	30	3.3	MSOP-8E	DDR2/3 termination regulator

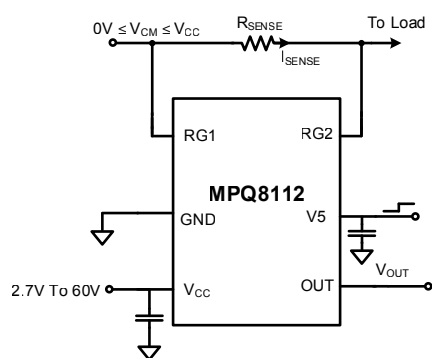
Monitoring & Supervision

MPS automotive monitoring and supervisory ICs offer an easy way to enhance system oversight using minimal board space. Our power good supervisors accurately monitor for correct supply voltage conditions, while our watchdog timers help ensure that system microcontrollers are operating correctly. Power sequencers are used for complex systems that require precision enabling and disabling of multiple voltage rails.



MPQ8112-AEC1 NEW

60V, High-Side Current-Sense Amplifier



Features

Built to Handle Tough Automotive Transients

- Load dump up to 60V
- Cold crank down to 2.7V

Great Current-Sensing Performance

- ±1% current-sense gain accuracy
- High current-sensing capabilities
- 700kHz bandwidth

Extends Battery Life

- 0.2µA typical shutdown current
- 300µA typical supply current

Reduces Board Size

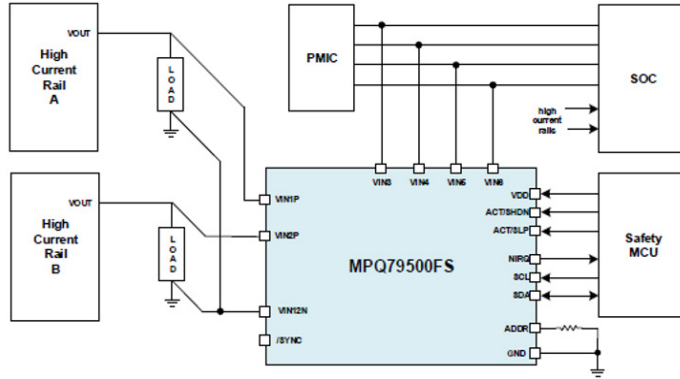
- Small footprint

Key Specifications:

2.7V to 60V	0V to 60V	±1%	700kHz	TSOT23-6
Input Voltage	Common Mode Input Range	Current-Sense Gain Accuracy	Bandwidth	Package

MPQ79500FS-AEC1 NEW

6-Channel ASIL-D Voltage Monitor



Key Specifications:

2.7V to 5.5V Input Voltage	6 Channels	ASIL-D Functional Safety Rating	QFN-16 (3mmx3mm) Package
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Features

Built for Mission-Critical Safety

- Built-in self-testing
- SPFM: 99% coverage, LFM: 90% coverage
- Cyclic redundancy check protection on registers
- Write protection on critical safety registers
- I²C interface includes packet error checking (PEC)
- Multi-page OTP memory with error correction checking (ECC)
- Power sequence recording | Thermal warning and shutdown
- Interrupt output pin

Class-Leading Accuracy and Resolution

- >1V: voltage threshold accuracy of ±0.5% max
- <1V: voltage threshold accuracy of ±5mV max
- 5mV steps (0.2V to 1.475V) | 20mV steps (0.8V to 5.5V)

Monitors SoC Power Rails with a Wide Range of Requirements

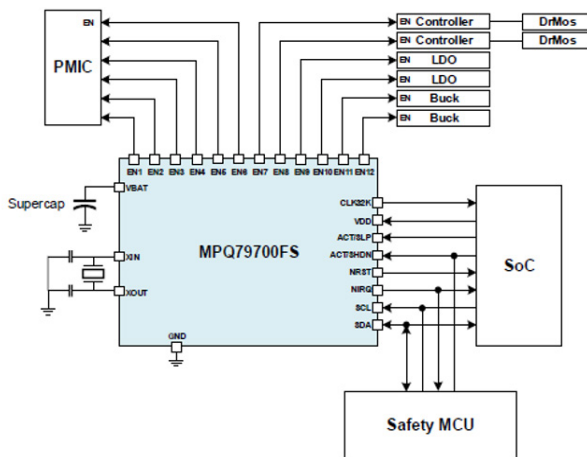
- 2 differential inputs for monitoring high-current rails
- 4 single-ended inputs for monitoring low-current rails
- Over-voltage and under-voltage monitoring

Scalability

- SYNC output to enable multiple devices to synchronize

MPQ79700FS-AEC1 NEW

12-Channel ASIL-D Power Sequencer



Key Specifications:

2.7V to 5.5V Input Voltage	12 Channels	ASIL-D Functional Safety Rating	QFN-24 (3mmx3mm) Package
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Features

Built for Mission-Critical Safety

- Built-in self-testing
- SPFM: 99% coverage, LFM: 90% coverage
- Cyclic redundancy check protection on registers
- Window watchdog
- Write protection on critical safety registers
- I²C interface includes packet error checking (PEC)
- Multi-page OTP memory with error correction checking (ECC)
- Power sequence recording | Thermal warning and shutdown
- System reset signal

Ensure High Accuracy when Sequencing System Power Rails

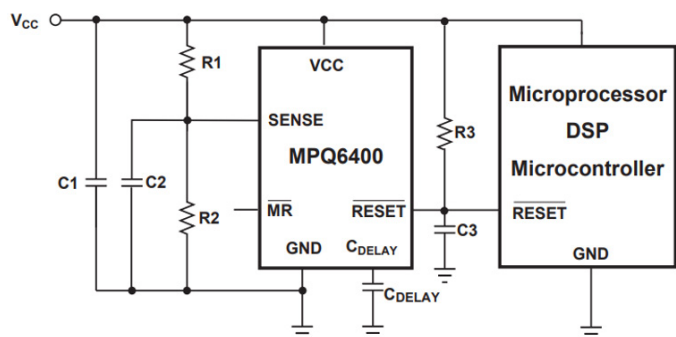
- 32kHz crystal oscillator driver
- Real-time clock (RTC) | Time-slot based sequencing

Application Flexibility and Survivability

- Programmable sequencer order, I²C address, and watchdog timing
- Backup battery input

MPQ6400-AEC1

1-Channel Voltage Supervisor (Reset IC)



Key Specifications:

1.8V to 5.5V	1	2.93V Adjustable	QFN-6 (2mmx2mm) TSOT23-6
Input Voltage	Channel	Voltage Threshold	Package

Features

Precision and Accuracy

- Monitors voltage rails down to 0.4V
- ±1% max voltage threshold accuracy

Application Flexibility

- Dedicated sense pin
- Fixed and adjustable thresholds available
- Adjustable reset time delay (2.1ms to 10s) via an external capacitor

Additional Features

- Low 1.6µA quiescent current
- Open-drain output
- Manual reset input

MONITORING & SUPERVISION | AUTOMOTIVE

Voltage Supervisors & Monitors (Reset ICs)

Part Number	# of Channels	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Reset Threshold (V)	Threshold Accuracy (%)	I _Q (Typ) (µA)	Reset Delay	Package	Notes
MPQ6400-33-AEC1	6	1.8	5.5	2.93	±1	1.6	2ms to 10s	QFN-6 (2x2)	Capacitor-set delay, reset output to MCU
MPQ6400-01-AEC1	1	1.8	5.5	Adj	±1	1.6	2ms to 10s	QFN-6 (2x2)	-
N MPQ79500FS-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ 6-channel ASIL-D voltage monitor with prog. features via I ² C
S MPQ79501FS-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ 6-channel ASIL-B voltage monitor with prog. features via I ² C
S MPQ79520FS-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ 5-channel ASIL-D voltage monitor with prog. features via I ² C
S MPQ79521FS-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ 5-channel ASIL-B voltage monitor with prog. features via I ² C
S MPQ7940-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM 6-channel voltage monitor with prog. features via I ² C
S MPQ7942-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM 5-channel voltage monitor with prog. features via I ² C

Watchdog Supervisors

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Reset Threshold (V)	Short Window Mode	Long Window Mode	Disable Input	I _Q (Typ) (µA)	Package
MPQ6411-AEC1	4.5	5.5	4.5	✓	✓	✓	16	SOIC-8
MPQ6411-33-AEC1	3	3.6	2.9	✓	✓	✓	10	SOIC-8

MONITORING & SUPERVISION | AUTOMOTIVE

Current-Sense Monitors

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Output Mode	Gain	I _Q (Typ) (µA)	PSRR (dB)	Bandwidth (kHz)	Package	Notes
MPQ8112-AEC1	2.7	60	Voltage	Fixed 50V/V	300	90	700	TSOT-23	-
MPQ8112A-AEC1	2.7	60	Current	Adj	300	90	700	TSOT-23	-
MPQ8113-AEC1	2.7	60	Voltage	Fixed 50V/V	300	90	700	TSOT-23	Feature to limit max V _{OUT}
MPQ8113A-AEC1	2.7	60	Current	Adj	300	90	700	TSOT-23	Feature to limit max V _{OUT}

Power Sequencers

Part Number	# of Channels	V _{IN} (Min) (V)	V _{IN} (Max) (V)	32kHz Crystal Oscillator Driver	RTC	System Reset Signal	Watchdog Timer	Package	Notes
N MPQ79700FS-AEC1	12	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™ 12-channel ASIL-D power sequencer with prog. features via I ² C
S MPQ79701FS-AEC1	12	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™ 12-channel ASIL-B power sequencer with prog. features via I ² C
S MPQ79710FS-AEC1	10	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™ 10-channel ASIL-D power sequencer with prog. features via I ² C
S MPQ79711FS-AEC1	10	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™ 10-channel ASIL-B power sequencer with prog. features via I ² C
S MPQ79720FS-AEC1	8	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™ 8-channel ASIL-D power sequencer with prog. features via I ² C
S MPQ79721FS-AEC1	8	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™ 8-channel ASIL-B power sequencer with prog. features via I ² C
S MPQ7960-AEC1	12	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM 12-channel power sequencer with prog. features via I ² C
S MPQ7961-AEC1	10	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM 10-channel power sequencer with prog. features via I ² C
S MPQ7962-AEC1	8	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM 8-channel power sequencer with prog. features via I ² C

LED Lighting

MPS offers robust, cost-effective LED drivers to address all types of automotive lighting needs, from headlamps to tail lights and everything inside. Most drivers integrate flexible dimming modes and fault detection features, and come in compact packages to help designers achieve cutting-edge lighting form factors.



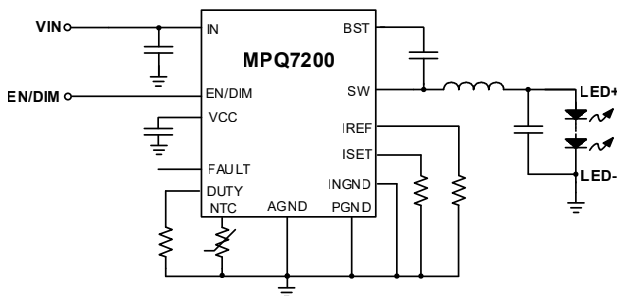
Flexible Dimming Modes

Compact Package

Modular Design

MPQ7200-AEC1 NEW

42V, 1.2A Buck-Boost or 3A Buck Synchronous LED Driver



Key Specifications:

6V to 42V	44mΩ/40mΩ	2.3MHz Buck 1.15MHz Buck-Boost	QFN-19 (3mmx4mm)
Input Voltage	$R_{DS(ON)}$ for FETs	Switching Frequency	Package

Features

Built for a Wide Range of Automotive LED Applications

LED driver with integrated MOSFETs

Configurable LED current without sensing resistor

Requires a Minimal Number of External Components

Highly integrated functions

High-efficiency synchronous operation

Enhanced EMI Reduction Layout Technique for Low EMI

Cost-saving 2-layer PCB layout possible to achieve CISPR 25

Full Suite of Protection Features

Over-current protection (OCP)

Output over-voltage protection (OVP)
and under-voltage protection (UVP)

Thermal derating and shutdown

LED short detector for GND

Battery logic fault indicator

Fast Control Loop

Constant frequency hysteretic control yields fast transient response without loop compensation

Additional Features

PWM dimming (dimming frequency from 100Hz to 2kHz)

Internal 500Hz 2-step dimming with configurable duty cycle

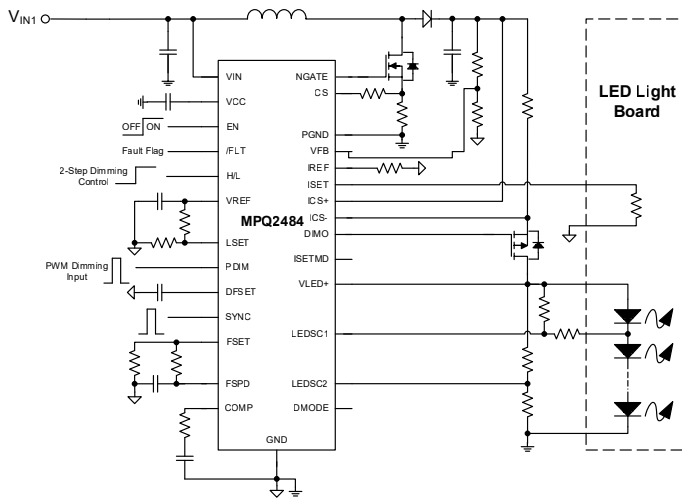
Configurable thermal derating via NTC remote temp sensing

Internal soft start

Configurable LED current without sensing resistor

MPQ2484-AEC1 NEW

Multiple-Topology LED Controller



Key Specifications:

4.5V to 45V	Max 75V	<5 μ A	<1mA	TSSOP-28EP
Input Voltage	Boost Output	Shutdown Current	I_o	Package

Features

Built to Handle Tough Automotive Transients

Load dump up to 45V

Cold crank down to 4.5V

Multiple Topologies

Boost | Buck-boost | Buck

Low-Noise EMI/EMC

Spread spectrum frequency modulation

Programmable or synchronizable switching frequency

Safety Oriented

Cycle-by-cycle current limiting

Output over-voltage protection (OVP)

Open-LED protection

LED string anode/cathode short to battery/ground protection

One or more LEDs short protection

Over-temperature protection (OTP) and thermal shutdown

Fault flag output

Additional Features

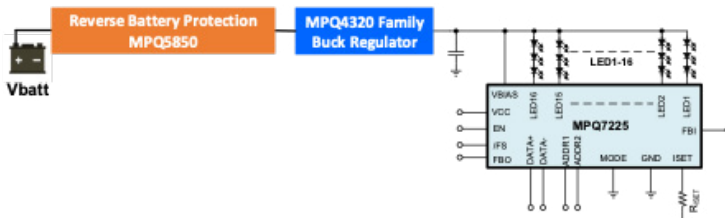
Multiple dimming modes

2-step dimming set via the H/L pin

External PWM dimming set via the PDIM pin

MPQ7225-AEC1 NEW

16-Channel Current Sink LED Driver



Key Specifications:

2.5V to 18V	16	200mA	QFN-32
Input Voltage	Channels	per Channel Current	(5mmx6mm) Package

Versions:

MPQ7224	w/o Interface
MPQ7225	Differential Interface
MPQ7228	UART Interface

Features

Class-Leading Brightness

Capable of individually driving all 16 channels at 200mA simultaneously

Ease of Scalability

Cascade up to 16 ICs to support up to 256 channels

Capable of 6 LEDs per channel, supporting up to 1536 LEDs total

Pin-programmable device address

Excellent Thermal Performance

Adaptive feedback control (AFC) dynamically optimizes pre-regulator output

300mV current sink headroom at 200mA

Robust Communication

2Mbps UART or differential interface (CAN-compatible)

12-bit PWM or 6-bit analog dimming

Optimized for EMI/EMC

Configurable phase shift and slew rate

Frequency spread spectrum (internal clock)

Selectable PWM dimming frequency

Safety-Oriented

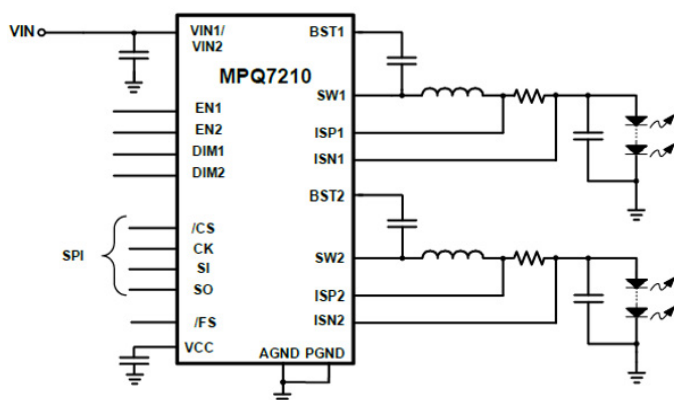
Can aid a system design to achieve functional safety

Thermal warning, LED open/short, and pin open/short protections

Failsafe pin and fault registers for system protection and diagnostics

MPQ7210-AEC1 SAMPLING

60V, Synchronous, Dual Buck LED Driver



Key Specifications:

4.5V to 60V	2A Dual Buck 4A Single Buck	QFN-24 (5mmx5mm)
Input Voltage	Output Voltage	Package

Versions:

MPQ7210	220kHz or 440kHz Switching Frequency
MPQ7211	1.1MHz or 2.2MHz Switching Frequency

Features

Built to Handle Tough Automotive Transients

- Load dump up to 60V
- Cold crank down to 4.5V

Do More With Less

- Integrated low- $R_{DS(ON)}$ 44mΩ HS-FETs and 40mΩ LS-FETs
- Configurable 4A dual buck or 2A single buck
- Minimal external BOM overhead

Built for LED Applications

- ±3% LED current accuracy
- 10-bit ADC to monitor V_{IN} , V_{OUT} , V_{CC} , and T_J
- Two-step dimming with range of duty cycle options, including 100% duty cycle
- Fast transient response

- Fault pins for LED open/short, under-voltage protection (UVP), over-voltage protection (OVP), over-current protection (OCP) with latch, TD, and thermal shutdown

Optimized for EMI/EMC

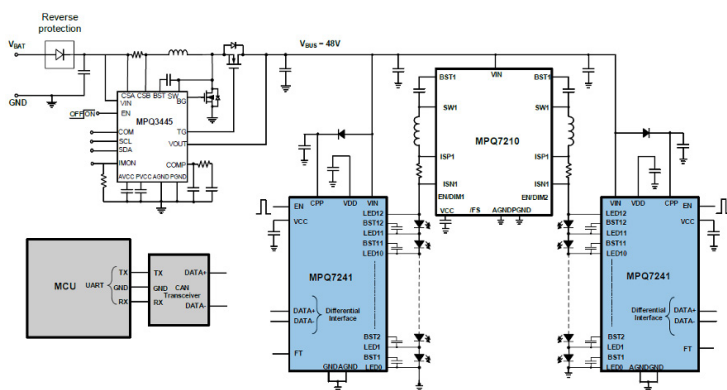
- Fixed-frequency band-band control
- Frequency spread spectrum

Vast Flexibility with Digital Interface (SPI)

- Configurable current limit and interrupt mask
- PWM dimming (12-bit): 100Hz to 2kHz
- Analog dimming (8-bit): 0% to 100%

MPQ7241-AEC1 SAMPLING

60V, 12-Channel LED Matrix Manager



Key Specifications:

4.5V to 60V	12	1.5A	QFN-40 (6mmx6mm)
Input Voltage	Channels	Current	Package

Features

Built to Handle Tough Automotive Transients

- Load dump up to 60V, cold crank down to 4.5V

Ease of Scalability

- 12 integrated, independently controllable dimming switches
- PWM dimming (normal mode/10-bit): 100Hz to 2kHz
- PWM dimming (fast mode/8-bit): up to 100kHz
- Fade transition option

- Two-step dimming with range of duty cycle options, including 100% duty cycle

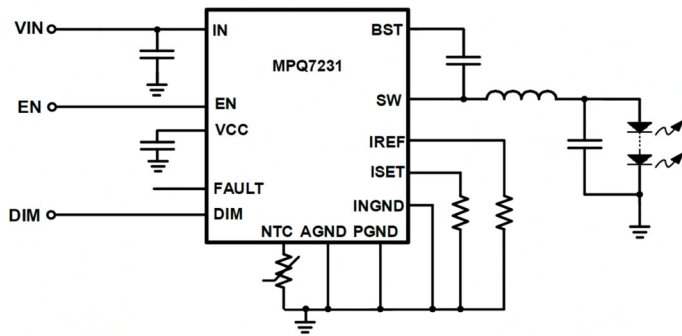
- Fault pins for LED open/short and thermal shutdown

Versions:

MPQ7240	SPI Interface
MPQ7241	CAN-Compatible (Differential) Interface

MPQ7231-AEC1 SAMPLING

42V, Synchronous, Buck or Buck-Boost Infrared LED Driver



Key Specifications:

6V to 42V	3A / 2.4MHz (Buck) 2.4A / 1.15MHz (Buck-Boost)	QFN-19 (3mmx4mm)
Input Voltage	Output Current / Switching Frequency	Package

Features

Built to Handle Tough Automotive Transients
Load dump up to 42V, cold crank down to 6V

Optimized for Eye Safety

- Can aid a system design to achieve functional safety
- LED current limit
- Configurable dimming on-time limit (1ms/3ms/5ms)
- PWM dimming: 10Hz to 2kHz (30/60/120FPS compatible)
- Fast transient response
- Fault pin for LED open/short, under-voltage protection, over-voltage protection, over-current protection with latch, thermal derating, and thermal shutdown
- Thermal derating via NTC remote temperature sensing

Do More With Less

- Integrated low- $R_{DS(ON)}$ 44mΩ HS-FETs and 40mΩ LS-FETs
- Integrated current sense (no need for external resistor)
- Configurable LED current

Optimized for EMI/EMC

- Fixed-frequency band-band control
- Frequency spread spectrum

LED LIGHTING | AUTOMOTIVE

Backlight

Part Number	V_{IN} (Min) (V)	V_{IN} (ABS Max) (V)	Topology	# of Channels	I_{OUT} per Channel (mA)	f_{SW} (kHz)	Dimming Modes	LED Protection	Channel Current Matching (%)	Interface	Package	Notes
MPQ3386-AEC1	4.5	30	Boost	6	30	625 or 1250	PWM, Analog	Open, Short	3%	-	QFN-24 (4x4)	3% current-matching accuracy
MPQ3387L-AEC1	3	30	Boost	6	45	500 or 1250	PWM, Mix	Open, Short	3%	-	QFN-24 (4x4)	3% current-matching accuracy
MPQ3362-AEC1	3	42	Boost	1	-	200 to 2200	PWM, Analog	Open, Short	-	-	TSOT23-8	4A current limit, low $R_{DS(ON)}$ soft start
MPQ3364-AEC1	3.5	42	Boost	4	150	200 to 2200	PWM, Analog, Mix	Open, Short	2.5%	I ² C	QFN-24 (4x4)	Three selectable IC addresses
MPQ3367-AEC1	3.5	42	Boost	6	150	200 to 2200	PWM, Analog, Mix	Open, Short	2.5%	I ² C	QFN-24 (4x4), TSSOP-28EP	I ² C, spread spectrum, thermal derating, fault pin, rich protection features
MPQ3367A-AEC1	3.5	42	Boost	6	150	200 to 2200	PWM, Analog, Mix	Open, Short	2.5%	I ² C	QFN-24 (4x4)	MPQ3367-AEC1 features, three prog. addresses
MPQ3369-AEC1	3.5	42	Boost	6	100	200 to 2200	PWM, Analog, Mix	Open, Short	2.5%	I ² C	QFN-24 (4x4), TSSOP-28EP	Spread spectrum, thermal derating, fault pin, rich protection features

Tell-Tale

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Topology	# of Channels	I _{OUT} per Channel (mA)	Dimming Modes	LED Protection	Channel Current Matching (%)	Interface	Wettable Flank QFN Option	Package	Notes
MPQ3324-AEC1	4	18	Linear	8	100	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	Independent channel control, daisy-chainable, digital configuration
MPQ3326-AEC1	4	18	Linear	16	50	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	Independent channel control, daisy-chainable, digital configuration
N MPQ3326A-AEC1	4	18	Linear	16	80	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	Independent channel control, daisy-chainable, digital configuration

Multi-Channel LED Drivers & Matrix Managers for Dynamic Lighting

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Topology	# of Channels	I _{OUT} per Channel (mA)	f _{SW} (kHz)	Dimming Modes	LED Protection	Spread Spectrum	Channel-to-Channel Current Accuracy (%)	Interface	Wettable Flank QFN Option	Package	Notes
MPQ7220-AEC1	3.5	40	Boost + Linear	6	100	200, 400, 1000, 2200	PWM, Analog	Open, Short	✓	2.5%	-	-	QFN-24 (4x4), TSSOP-28EP	External sync SW function disconnects V _{OUT} from V _{IN} , cycle-by-cycle current limit
N MPQ7221-AEC1	4	18	Linear	16	80	-	PWM, Analog	Open, Short	-	2%	I ² C	✓	QFN-24 (4x4)	6-bit analog dimming per channel, 12-bit PWM dimming per channel, refresh signal output
N MPQ7225-AEC1	2.5	20	Linear	16	200	-	PWM, Analog	Open, Short	✓	5%	Differential Interface	✓	QFN-32 (5x6)	16-channel current sink LED driver, adaptive feedback control (AFC), 12-bit PWM or 6-bit analog dimming, safety suite
S MPQ7240-AEC1	4.5	65	Matrix Manager	12	1500	-	PWM, Analog	Open, Short	-	-	SPI	✓	QFN-40 (6x6)	12 independently controlled LED dimming switches, 10-bit or 8-bit PWM dimming, LED open/short protection, thermal shutdown
S MPQ7241-AEC1	4.5	65	Matrix Manager	12	1500	-	PWM, Analog	Open, Short	-	-	Differential Interface	✓	QFN-40 (6x6)	12 independently controlled LED dimming switches, 10-bit or 8-bit PWM dimming, LED open/short protection, thermal shutdown

LED LIGHTING | AUTOMOTIVE

LED Drivers For Illumination & Signaling

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	Topology	Max Current (A)	Current Limit (Typ) (A)	R _{DS(on)} (mΩ)	Dimming Modes	f _{sw} (kHz)	LED Protection	Spread Spectrum	Fault Pin	Wettable Flank QFN Option	Package	Notes
MPQ2484-AEC1	4.5	45	Buck, Boost, Buck-Boost	Controller	Adj	-	PWM, Analog	100 to 2200	Open, Short	✓	-	-	TSSOP-28EP	Cycle-by-cycle current limit, output OVP, fault flag output
S MPQ7210-AEC1	4.5	65	Dual Buck	2	Adj	235/235	PWM, Analog	220, 420, 1000	Short	✓	✓	✓	QFN-26 (5x5)	Dual buck outputs, UVP, OCP, failsafe (FS) pin, SPI interface
MPQ2489-AEC1	6	55	Low-Side Buck	1.4	Adj	500	PWM, Analog	200 to 600	Open, Short	-	-	-	QFN-6 (3x3)	-
MPQ2483A-AEC1	4.5	55	Buck, Buck-Boost	2.5	3	280	PWM, Analog	250 to 1350	Open, Short	-	-	-	QFN-10 (3x3), SOIC-14	Output short-circuit protection
MPQ24833-B-AEC1	4.5	55	Buck, Buck-Boost, Boost	3	6	150	PWM, Analog	420	Open, Short	-	-	-	SOIC-8E	Output short-circuit protection
MPM6010-AEC1	4	40	Buck	1.5	4	85/50	PWM	2200	Open, Short	-	✓	✓	QFN-17 (3x5x1.6)	Module with int. inductor and BST/VCC capacitors, sync operation, output OCP
MPQ4425A-AEC1	4	40	Buck	1.5	4	85/50	PWM	2200	Open, Short	-	✓	✓	QFN-13 (2.5x3)	Synchronous operation, output OCP
MPQ4425B-AEC1	4	40	Buck	1.5	4	85/50	PWM	410	Open, Short	-	✓	✓	QFN-13 (2.5x3)	Synchronous operation, output OCP
N MPQ4425C-AEC1	4	40	Buck	1.5	4	85/50	PWM	2200	Open, Short	-	✓	✓	QFN-13 (2.5x3)	Alternative fault indicator behavior at EN off and soft-start time
MPQ7200-AEC1	6	42	Buck, Buck-Boost	3 (buck) 1.2 (buck-boost)	6	44/40	PWM	2300 Buck, 1500 Buck-Boost	Open, Short	✓	✓	✓	QFN-19 (3x4)	Int. current-sense resistor, band-band control loop, OCP with latch, OVP, thermal shutdown
MPQ7200A-AEC1	6	42	Buck, Buck-Boost	3 (buck) 1.2 (buck-boost)	6	44/40	PWM	410	Open, Short	✓	✓	✓	QFN-19 (3x4)	Int. current-sense resistor, band-band control loop, OCP with latch, OVP, thermal shutdown

Infrared (IR) LED Drivers For Driver Monitoring Systems

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	Topology	Max Current (A)	LED Current Accuracy (%)	R _{DS(on)} (mΩ)	Dimming Modes	f _{SW} (kHz)	LED Protection	Spread Spectrum	Fault Pin	Wettable Flank QFN Option	Package	Notes
MPQ7230-AEC1	6	50	Buck, Buck-Boost	3 (buck) 2.4 (buck-boost)	5%	44/40	PWM	410	Open, Short	✓	✓	✓	QFN-19 (3x4)	Integrated current-sense resistor, fast transient response
S MPQ7231-AEC1	6	50	Buck, Buck-Boost	3 (buck) 2.4 (buck-boost)	5%	44/40	PWM	1150, 2400	Open, Short	✓	✓	✓	QFN-19 (3x4)	Dimming on-time limit (1ms/3ms/5ms) for eye safety, low dimming frequency to 10Hz, int. current-sense resistor
MPQ7235-AEC1	4	40	Buck	3	5%	85/50	PWM	2200	Open, Short	-	✓	✓	QFN-13 (2.5x3)	10Hz to 2kHz PWM dimming frequency, compatible with 30FPS/60FPS/120FPS dimming

USB & Wireless Charging

MPS automotive USB chargers are fully integrated USB charging solutions combining high-efficiency DC/DC step-down converters and current limit switches, with the option of single- or dual-output Type-A and Type-C ports. These advanced charging port products incorporate many common protocols, such as USB Type-C (15W), USB Type-C power delivery, DCP, CDP, and BC1.2. They are engineered to help automotive customers design compact and thermally optimized USB charge ports for use throughout the vehicle.



Low EMI

High Efficiency

Thermally Optimized

USB PD Solutions

Buck for USB PD

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	I _{OUT} (A)	I _O (Typ) (mA)	f _{SW} (kHz)	Supports USB PD	Battery Short Protection	Frequency Spread Spectrum	Line Drop Compensation	I ² C Interface	EN Shutdown Discharge	Load-Shedding Send Alert	Package	Notes
N MPQ4272-AEC1 (Dual)	1	40	6 2x (3A)	0.3	Selectable	✓	✓	✓	✓	✓	✓	✓	QFN-21 (4x5)	Dual-channel, spread spectrum, I ² C

USB & WIRELESS CHARGING | AUTOMOTIVE

USB PD Solutions

Buck-Boost for USB PD

Part Number	V _{IN} (Min) (V)	V _{IN} (Abs Max) (V)	I _{OUT} (A)	I _O (Typ) (mA)	f _{SW} (kHz)	USB PD	Battery Short Protection	Frequency Spread Spectrum	Line Drop Compensation	I ² C Interface	EN Shutdown Discharge	Load-Shedding Send Alert	Package	Notes
MPQ4214-AEC1 (Controller)	4	45	-	-	Selectable	✓	✓	✓	-	✓	✓	-	QFN-27 (5x5)	Sync, FCCM
MPQ4210-AEC1 (Controller)	4	45	-	-	Selectable	✓	✓	✓	-	✓	✓	-	QFN-27 (5x5)	Output current monitoring
N MPQ4262-AEC1 (Hybrid)	3.6	40	5	0.13	Selectable	✓	✓	✓	✓	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency, I ² C

USB PD Solutions

Controllers for USB PD

Part Number	V _{IN} (Min) (V)	V _{IN} (Abs Max) (V)	Dual/Single Ports	I _{OUT} (A)	I _O (Typ) (mA)	BC 1.2 DCP (Data)	BC 1.2 DCP	1.2V/1.2V Mode	Divider Mode 3	QC2.0/QC3.0	Type-C DFP (w/o PD)	Type-A Mode	Load-Shedding	Battery Short Protection	Line Drop Compensation	USB Discharge	Wettable Flank QFN Option	Package	Notes
N MPQ5031-AEC1 (PD)	4.5	5.5	Single	5	0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-20 (4x4)	USB PD 3.0+ PPS controller, meets PowerShare specs
S MPQ5038-AEC1 (PD)	4.5	5.5	Single	5	0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-20 (4x4)	USB PD 3.0+ PPS controller, 7 LDOs, P2P with MPQ5031, meets PowerShare specs

USB PD Solutions

All-In-One USB PD Solutions (Integrated Buck-Boost & PD Controllers)

Part Number	V _{IN} (Min) (V)	V _{IN} (Abs Max) (V)	Dual/Single Ports	I _{OUT} (A)	I _O (Typ) (mA)	f _{SW} (kHz)	BC 1.2 DCP	1.2V/1.2V Mode	Divider Mode 3	QC2.0/QC3.0	FCP Mode	Type-C DFP (w/o PD)	Load-Shedding	Battery Short Protection	Line Drop Compensation	USB Discharge	Package	Notes
N MPQ4242-AEC1	4	40	Single	3	0.1	Selectable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-22 (4x5)	Supports PD3.0/QC4+ BC1.2/QC3+FCP protocols

USB & WIRELESS CHARGING | AUTOMOTIVE

All-In-One USB Type-C/A Charging-Only Port Solutions

Dual USB Type-C/A Charging Port Solutions (Buck with Integrated CLS, Protocol Detection)

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	Dual/Single Ports	I _{OUT} (A)	I _d (Typ) (mA)	f _{SW} (kHz)	BC 1.2 DCP	1.2V/1.2V Mode	Divider Mode 3	Type-C DFP (w/o PD)	Type-A Mode	Load-Shedding	Frequency Spread Spectrum	Internal USB Switch	Line Drop Compensation	USB Discharge	Package	Notes
MPQ4487A-AEC1	6	40	Dual	3 (x2)	1	Selectable	-	-	-	✓	✓	✓	✓	✓	✓	✓	QFN-26 (5x5)	Meets latest MFI3.3 specs
MPQ4488B-AEC1	6	40	Dual	3 (x2)	1	Adjustable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-26 (5x5)	Meets latest MFI3.3 specs
MPQ4253-AEC1	6	40	Dual	3 (x2)	0.054	Selectable	✓	✓	✓	✓	✓	(Type-C)	-	✓	✓	✓	QFN-26 (5x5)	Low I _d
MPQ4276-AEC1	6	40	Dual	3 (x2)	0.8	Adjustable	-	-	-	✓	-	✓	-	✓	✓	✓	QFN-26 (5x5)	USB 1/2 fault indication, PFM mode, EN and FAULT pins for USB 1/2
MPQ4253B-AEC1	6	40	Dual	3 (x2)	0.054	Selectable	✓	✓	✓	✓	✓	(Type-C)	-	✓	✓	✓	QFN-26 (5x5)	MFI OCP current > 4.8A
MPQ4252	6	36	Dual	3 (x2)	0.3	420	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-19 (3x5)	Smaller size, cost-effective
MPQ4257	6	36	Dual	3 (x2)	0.3	420	-	-	-	✓	✓	✓	✓	✓	✓	✓	QFN-16 (3x4)	Separate enable control and fault indication, smaller size, cost-effective

All-In-One Data Port Products

Dual USB Type-C/A Charging Data Ports (Buck with Integrated CLS, USB 2.0 Data Switch, Protocol Detection)

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	Dual/Single Ports	I _{OUT} (A)	I _d (Typ) (mA)	f _{SW} (kHz)	BC 1.2 DCP	1.2V/1.2V Mode	Divider Mode 3	Type-C DFP (w/o PD)	Type-A Mode	Load-Shedding	Int USB Switch	Line Drop Compensation	USB Discharge	Package	Notes
MPQ4485-AEC1	6	40	Dual	3 (x2)	-	450	✓ (USB2)	✓	✓	✓	✓	✓	✓	✓	✓	QFN-26 (5x5)	FCCM

USB & WIRELESS CHARGING | AUTOMOTIVE

All-In-One USB Type-C/A Charging-Only Port Solutions

Single USB Type-C/A Charging Port Solutions (Buck with Integrated CLS, Protocol Detection)

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	Dual/Single Ports	I _{OUT} (A)	I _a (Typ) (mA)	f _{SW} (kHz)	BC 1.2 DCP	1.2V/1.2V Mode	Divider Mode 3	QC2.0	QC3.0	Type-C DFP (w/o PD)
MPQ4475-E-AEC1	7	40	Single	2.5	1.6	Selectable	✓	✓	✓	-	-	-
MPQ4491-AEC1	7	40	Single	2.5	1.6	Selectable	✓	✓	✓	-	-	-
MPQ4228-AEC1	4.2	40	Single	3	-	Selectable	✓	✓	✓	-	-	✓
N MPQ4228-Q-AEC1	4.2	40	Single	3	-	Selectable	✓	✓	✓	✓	✓	✓
MPQ4482-AEC1	4	40	Single	3	0.8	Selectable	✓	✓	✓	-	-	✓
MPQ4482-Q-AEC1	4	40	Single	3	0.8	Selectable	✓	✓	✓	✓	✓	✓
S MPQ4251	6	36	Single	3	0.3	420	✓	✓	✓	-	-	✓

All-In-One Data Port Products

Single USB Type-C/A Charging Data Ports (Buck + Integrated CLS, USB 2.0 Data Switch, Protocol Detection)

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	Dual/Single Ports	I _{OUT} (A)	f _{SW} (kHz)	BC 1.2 DCP	BC 1.2 DCP	Type-C DFP (w/o PD)	Type-A Mode
N MPQ4228-C-AEC1	4.2	40	Single	3	Selectable	✓	-	✓	✓
MPQ4483-AEC1	4.2	40	Single	3	Selectable	✓	✓	-	✓
MPQ4483-FD-AEC1	4.2	40	Single	3	Adjustable	✓	✓	-	✓

Type-A Mode	Load-Shedding	Battery Short Protection	Frequency Spread Spectrum	Int USB Switch	Line Drop Compensation	EN Shutdown Discharge	USB Discharge	Fault Indication	Wettable Flank QFN Option	Package	Notes
✓	-	-	✓	✓	✓	✓	✓	✓	-	QFN-25 (4x4)	Prog. line drop compensation
✓	-	-	-	✓	✓	✓	✓	-	-	QFN-25 (4x4)	Auto-detection, cable compensation
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-22 (4x4)	Type-C 5V/3A, DFP port
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-22 (4x4)	Supports QC2.0/3.0
✓	✓	✓	-	✓	✓	-	✓	-	✓	QFN-22 (4x4)	3.55A/2.75A USB current limit with FCCM
✓	✓	✓	-	✓	✓	-	✓	-	✓	QFN-22 (4x4)	Accurate USB current limit with FCCM
✓	✓	✓	✓	✓	✓	-	✓	-	✓	QFN-19 (3x5)	Smaller size, cost-effective

Load-Shedding	Battery Short Protection	Low-Dropout Mode	Frequency Spread Spectrum	Int USB Switch	Line Drop Compensation	EN Shutdown Discharge	USB Discharge	Wettable Flank QFN Option	Package	Notes
✓	✓	-	✓	✓ (Adj)	✓	✓	✓	✓	QFN-22 (4x4)	Supports CDP mode
-	✓	✓	-	✓ (Adj CC Limit)	✓ (Adj)	✓	-	✓	QFN-25 (4x5)	Supports BC1.2 DCP and CDP modes, bidirectional USB 2.0 high-speed data switch, LDO mode, 3.55A/3.75A CC I_{OUI} limit
-	✓	✓	✓	✓ (Adj CC Limit)	✓ (Adj)	✓	-	✓	QFN-25 (4x5)	Supports BC1.2 DCP and CDP modes, bidirectional USB 2.0 high-speed data switch, LDO mode, 3.55A/3.75A CC I_{OUI} limit

USB & WIRELESS CHARGING | AUTOMOTIVE

USB Type-C/A Port Controllers & Buck Products Buck Only

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	I _{OUT} (A)	I _O (Typ) (mA)	f _{SW} (kHz)	Battery Short Protection	Low-Dropout Mode	Int USB Switch	Line Drop Compensation	EM Shutdown Discharge	Wettable Flank QFN Option	Package	Notes
MPQ4480-AEC1	4.2	40	6	1	Selectable	✓	✓	✓ (Adj CC Limit)	✓	✓	✓	QFN-25 (4x5)	-
N MPQ4423C-AEC1	4	40	6	0.75	Selectable	-	-	-	-	✓	✓	QFN-16 (3x4)	-
S MPQ4275	4	40	6	0.75	Selectable	-	-	-	-	✓	✓	QFN-16 (3x4)	PG, adj. I _{LIMIT}

USB Type-C/A Port Controllers & Buck Products USB Type-C/A Charging Port Controllers

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	Dual/Single Ports	I _{OUT} (A)	I _O (Typ) (mA)	BC 1.2 DCP (Data)	BC 1.2 DCP	1.2V/1.2V Mode	Divider Mode 3	QC2.0/QC3.0	Type-C DFP (w/o PD)	Type-A Mode	Load-Shedding	Battery Short Protection	Int USB Switch	Line Drop Compensation	USB Discharge	Fault Indication	Client Mode	Wettable Flank QFN Option	Package	Notes
MPQ5029-AEC1	2.7	24	Single	3	0.155	-	✓	✓	✓	✓	✓	✓	✓	✓	(Adj)	(Adj)	✓	-	-	✓	QFN-14 (2x3)	NTC pin for thermal management, adj. OVP threshold, input OV shutdown protection
MPQ5029-C-AEC1	3	24	Single	3	0.175	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-14 (2x3)	-

Wireless Charging Solutions Step-Down/Step-Up Converters

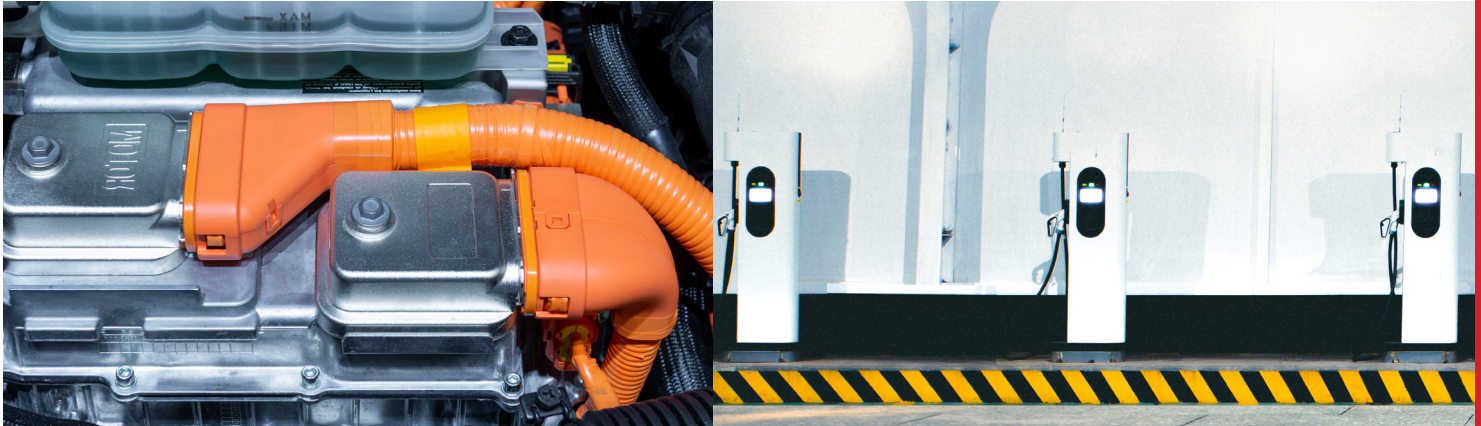
Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max)	I _{OUT} (A)	I _O (Typ) (mA)	f _{SW} (kHz)	Battery Short Protection	Frequency Spread Spectrum	Line Drop Compensation	I ² C Interface	EM Shutdown Discharge	Load-Shedding Send Alert	Package	Notes
N MPQ4262-AEC1 (Hybrid)	3.6	40	5	0.13	Selectable	✓	✓	✓	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency, I ² C

Wireless Charging Solutions Full-Bridge Power Stage for Highly Integrated Wireless Power Transmitter

Part Number	H-Bridge V _{IN} (Min) (V)	H-Bridge V _{IN} (ABS Max) (V)	H-Bridge I _{OUT} (A)	H-Bridge f _{SW} (kHz)	I _O (Typ) (mA)	Buck V _{IN} (Min) (V)	Buck V _{IN} (ABS Max) (V)	Buck I _{OUT} (A)	Amplifier Accuracy	Package	Notes
S MPQ4280-AEC1	4.7	40	15	Selectable	0.9	1	40	0.5	15	QFN-22 (4x5)	Integrated 36V buck and 5V/65mA LDO

MPS Electrification Solutions

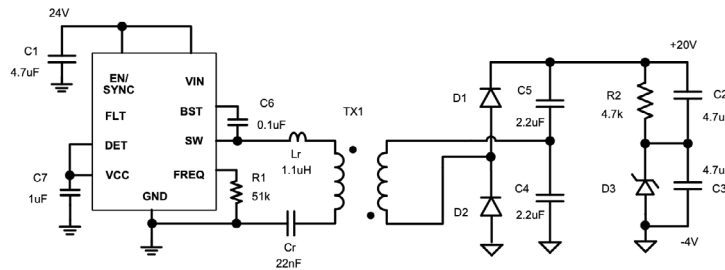
MPS offers a full family of isolated and non-isolated solutions for designing high-power electrification devices, from 11kW to 22kW onboard chargers to 300kW+ traction inverters. Choose from isolated gate driver power supplies — which can reduce solution size by over 40% — to isolated gate drivers optimized for driving higher power, or even current-sensing solutions. MPS offers a full suite of solutions for electric vehicles (EVs) that can meet reinforced isolation requirements.



Iso. Gate Driver Bias Supplies	Isolated Gate Drivers	Isolated Current-Sensing	Digital Isolators	Half-Bridge Gate Drivers	Off-Battery Power	Voltage Monitors and Watchdogs
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MPQ18913-AEC1 NEW

6W, LLC Transformer Driver for Isolated Bias Supplies



Features

Optimized Solution Size

5MHz switching frequency minimizes transformer and capacitor size

40% reduction in total solution size vs. flyback solution

20% fewer components than a flyback solution

Ideal for 800V+ Systems

Achieves 5kV reinforced isolation with low interwinding capacitance (2pF to 6pF)

Utilizes leakage inductance as part of the resonant tank

Key Specifications:

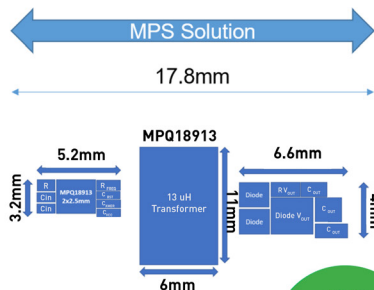
5V to 30V
Input Voltage

Up to 6W
Power

500kHz to 5MHz
Switching Frequency

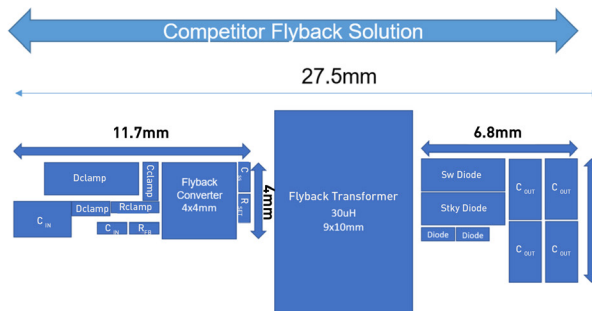
QFN-10 (2mmx2.5mm)
Package

Automatic Resonant Frequency Detection
Frequency Spread Spectrum
LLC Resonant Topology
Features



Solution Size: **109mm²**
Total Area: **196mm²**
Components: **21**

40%
Smaller
Solution
Size!



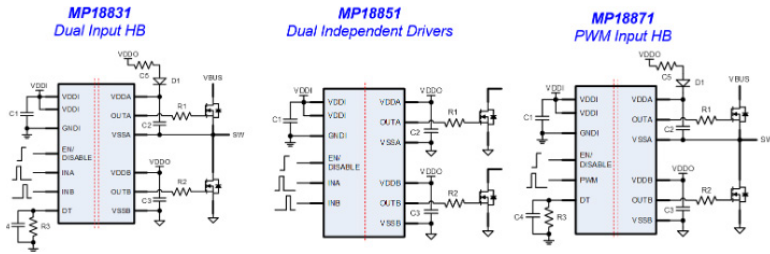
Solution Size: **180mm²**
Total Area: **275mm²**
Components: **26**

Applications

- IGBT/SiC gate driver bias
- Traction inverters
- Onboard chargers
- DC fast charging stations

MPQ18831/51/71-AEC1

Dual-Channel Isolated Gate Driver Family



Features

Flexible Design

Design systems for 2.5kV up to 5kV reinforced isolation

Wide driver bias range enables more flexibility for FET selection

Can support SiC, GaN, or IGBT

P2P product to enable a more robust supply chain

Ideal for 400V to 800V Systems

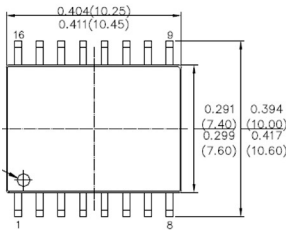
Achieves up to 5kV reinforced isolation

4A/8A sink-source current enables usage of high-power FETs for higher efficiency

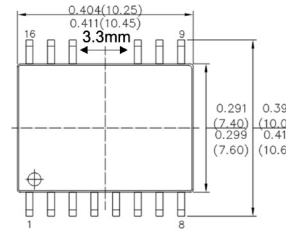
Key Specifications:

4A Source 8A Sink	>100kV/μs	Up to 5kV	SOIC-16 WB SOIC-14 WB SOIC-16 NB LGA-13 (5mmx5mm)
Source/Sink Current	CMTI	Isolation	Package

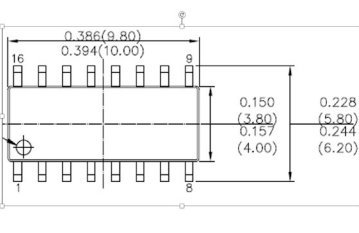
SOIC-16 WB



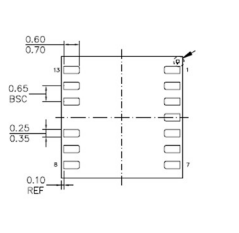
SOIC-14 WB



SOIC-16 NB



LGA-13



Package	Isolation Rating
SOIC-16 WB/SOIC-14 WB	5k V _{rms}
SOIC-16 NB	3k V _{rms}
LGA-13	2.5k V _{rms}

ELECTRIFICATION | AUTOMOTIVE

Isolated Gate Driver Bias Supplies

Part Number	Topology	Switching Frequency	Output Power (W)	V _{in} (Min) (V)	V _{in} (Max) (V)	V _{out} (Typ) (V)	Spread Spectrum	Package Type	Isolation Voltage (kV _{iso})	# of Outputs	Package Size: WxL (mm)	Notes
N MPQ18913-AEC1	LLC Resonant	500kHz to 5MHz	6	5	35	20	✓	QFN-10	5	1, More Possible	2x2.5	5MHz high-frequency SiC/IGBT bias supply, automatic resonant frequency detection

ELECTRIFICATION | AUTOMOTIVE

Electrification Solutions & Isolated Products Isolated Gate Drivers

Part Number	Isolation Rating (kVrms)	Configuration Type	# of Channels	CMTI (Min) (kV/ps)	Power-Switch Type	Peak Source Current (A)	Peak Sink Current (A)	UVLO (V)	Input VDDI (V)	Driver Output (Max) (V)	Package	Notes
N MPQ18831-AEC1	2.5/3/5	Dual-Input Half-Bridge	2	100	GaN FET, IGBT, MOSFET, SiC FET	4	8	5/8/10/12	2.8 to 5.5	30	SOIC-16 NB, SOIC-14 WB, SOIC-16 WB, LGA-13,	AEC-Q100, UL1577 certified, VDE-0884/CQC in progress
N MPQ18851-AEC1	2.5/3/5	Dual-Input, Independent Dual-Channel	2	100	GaN FET, IGBT, MOSFET, SiC FET	4	8	5/8/10/12	2.8 to 5.5	30	SOIC-16 NB, SOIC-14 WB, LGA-13, SOIC-16 WB	AEC-Q100, UL1577 certified, VDE-0884/CQC in progress
N MPQ18871-AEC1	2.5/3/5	PWM Input Half-Bridge	2	100	GaN FET, IGBT, MOSFET, SiC FET	4	8	5/8/10/12	2.8 to 5.5	30	SOIC-16 NB, LGA-13, SOIC-16 WB	AEC-Q100, UL1577 certified, VDE-0884/CQC in progress
N MPQ18811-AEC1	3/5	Single-Channel Gate Driver	1	100	GaN FET, IGBT, MOSFET, SiC FET	6	10	5/8/10/12/15	2.8 to 5.5	30	SOIC-8 NB, SOIC-8 WB, SOIC-14 NB	AEC-Q100, UL1577 certified, VDE-0884/CQC in progress

Non-Isolated Gate Drivers (Half-Bridge)

Part Number	V _{in} (Min) (V)	V _{in} (Max) (V)	V _{sw} (Max) (V)	HS Gate Drive (Max) (V)	# of Channels	Peak Pull-Up Current (A)	Peak Pull-Down Current (A)	Rise Time (ps)	Fall Time (ps)	Turn-Off/On Delay (ps)	Wettable Flank Option	Package	Notes
N MPQ1907-AEC1	4.5	20	105	18	1	2.5	3.5	0.012	0.009	0.018	-	QFN-10 (3x3)	100V H-bridge gate driver
N MPQ1918-AEC1	3.6	5.5	100	8	1	1.6	5	0.005	0.003	0.020	✓	FCQFN-14 (3x3)	100V half-bridge GaN/MOSFET driver
N MPQ1922-AEC1	4	15	100	15	1	3	4	20	20	20	✓	SOIC-8E, QFN-10 (4x4)	Gate driver, int. current-sense amp, 9ns to 15ns rise/fall (2.2nF load)
N MPQ1923-AEC1	5	17	100	17	1	7	8	0.0072	0.0055	0.02	✓	QFN-10 (4x4), QFN-8 (4x4), SOIC-8	High-frequency gate driver
N MPQ18024-AEC1	9	16	110	18	1	4.7	6	0.015	0.009	0.02	-	SOIC-8	-

Motor Drivers

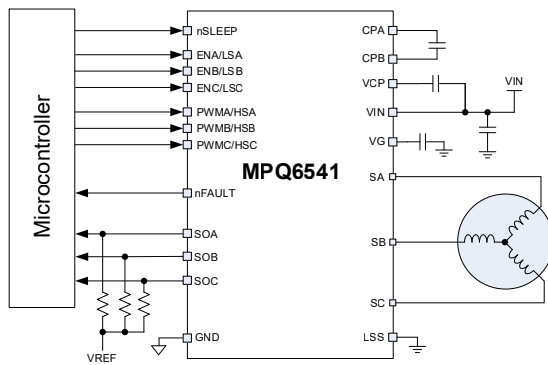
MPS offers a comprehensive portfolio of automotive motor driver solutions, including H-bridges, half-bridge drivers and pre-drivers, three-phase motor drivers, and more. Our solutions are engineered for maximum design flexibility, such as scalable product families that can drive single- to multiple-output channels.



Built-In Diagnostics	Small Solution Size	High-Voltage Operation
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MPQ6541-AEC1 SAMPLING

45V, 8A, Three-Phase Power Stage



Features

Built to Handle Tough Automotive Transients

- Load dump up to 48V
- Cold crank down to 4.75V

Current Capability and $R_{DS(ON)}$

- 8A continuous output current
- High-side and low-side max $R_{DS(ON)} = 50m\Omega @ 125^\circ C$

Reduces Board Size and BOM

- Integrated bidirectional current-sense amplifiers
- Three integrated half-bridge drivers
- FCQFN (6mmx6mm) package

Key Specifications:

4.75V to 42V Input Voltage	1 μ A I_o in Sleep Mode	14.5m Ω Built-In FETs	QFN (6mmx6mm) Package
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Additional Features

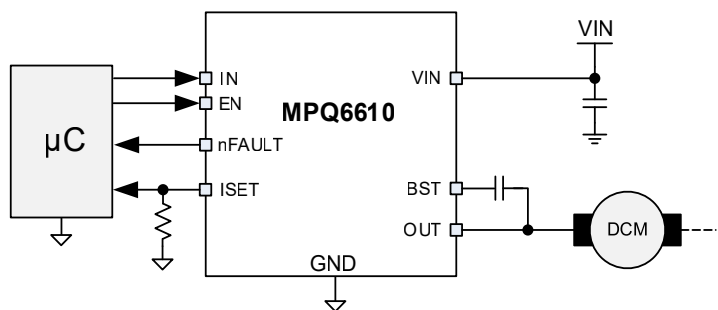
- Thermal shutdown protection
- Over-current protection (OCP)
- Under-voltage lockout (UVLO)
- Over-voltage protection (OVP)

Available in Pin-Compatible Family:

PWM & ENBL Inputs MPQ6541	High-Side & Low-Side Inputs MPQ6541A
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MPQ6610-AEC1 NEW

55V, 3A, Half-Bridge Power Driver



Key Specifications:

4V to 55V Input Voltage	14.5mΩ Built-In FETs	SOT23-8 Package
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Features

Built to Handle Tough Automotive Transients

Load dump up to 65V
Cold crank down to 4V

Current Capability and $R_{DS(ON)}$

3A maximum output current
High-side and low-side max $R_{DS(ON)} = 456m\Omega @ 125^\circ C$

Reduces Board Size and BOM

Integrated high-side and low-side current-sense circuit
Cycle-by-cycle current regulation/limiting
Integrated half-bridge driver
TSOT23-8 package

Additional Features

Thermal shutdown protection
Over-current protection (OCP)
Under-voltage lockout (UVLO)
Over-voltage protection (OVP)

MOTOR DRIVERS | AUTOMOTIVE

Half-Bridge Gate Drivers

	Part Number	V_{IN} (Min) (V)	V_{IN} (Max) (V)	V_{SW} (Max) (V)	HS Gate Drive (Max) (V)	# of Channels	Peak Pull-Up Current (A)	Peak Pull-Down Current (A)	Rise Time (ns)	Fall Time (ns)	Turn-Off/On Delay (ns)	Wettable Flank Option	Package	Notes
N	MPQ1922-AEC1	4	15	100	15	1	3	4	0.002	0.002	0.02	✓	SOIC-8E, QFN-10 (4x4)	Gate driver, int. current-sense amp, 9ns to 15ns rise/fall (2.2nF load)
N	MPQ1923-AEC1	5	17	100	17	1	7	8	0.0072	0.0055	0.02	✓	QFN-10 (4x4), QFN-8 (4x4), SOIC-8	High-frequency gate driver
	MPQ6528-AEC1	5	60	60	60	2	0.8	1	-	-	700	✓	QFN-28 (4x5)	H-bridge gate driver

Three-Phase Pre-Drivers

	Part Number	V_{IN} (Min) (V)	V_{IN} (Max) (V)	V_{SW} (Max) (V)	HS Gate Drive (Max) (V)	# of Channels	Peak Pull-Up Current (A)	Peak Pull-Down Current (A)	Turn-Off/On Delay (ns)	Wettable Flank Option	Package	Notes
	MPQ6531-AEC1	5	60	60	60	3	0.8	1	880	✓	QFN-28 (4x5)	For BLDC motors
	MPQ6532-AEC1	5	60	60	60	3	0.8	1	880	✓	QFN-28 (4x5)	Hall inputs, for BLDC
	MPQ6533-AEC1	6	40	-	-	3	0.8	1	-	✓	QFN-32 (5x5)	Three-channel, automotive, LDO regulator, current-sense amp

MOTOR DRIVERS | AUTOMOTIVE

Half-Bridge Drivers (Integrated MOSFET)

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	# of Channels	R _{DS(on)} (mΩ)	Standby I _Q (Typ)	Peak Output Current (A)	Rise Time (µs)	Fall Time (µs)	Turn-Off/On Delay (µs)	Open-Load Detection	Serial Interface	Wettable Flank Option	Package	Notes
MPQ8039-AEC1	7.5	28	1	100	2.5	9	0.02	0.02	0.07	-	-	✓	SOIC-8E	General-purpose, high frequency, for audio amps wireless charging, etc.
MPQ6519-AEC1	3	28	2	130	370	5	0.2	0.2	-	✓	-	-	QFN-19 (4x4)	H-bridge current regulator
MPQ6523-AEC1	7	40	3	1100	1.5	0.9	20	20	60	✓	✓	✓	QFN-24 (4x4)	Independent half-bridge control, comprehensive protections, daisy-chainable, serial data interface up to 3MHz
MPQ6524-AEC1	7	40	4	1100	1.5	0.9	20	20	60	✓	✓	✓	QFN-24 (4x4)	Independent half-bridge control, comprehensive protections, daisy-chainable
MPQ6526-AEC1	7	40	6	1100	1.8	0.9	20	20	60	✓	✓	✓	QFN-24 (4x4), QFN-24 (5x5)	Independent half-bridge control, comprehensive protections, daisy-chainable
MPQ6527-AEC1	5.5	40	10	1300	1	0.8	27	20	75	✓	✓	-	TSSOP-28EP	Independent half-bridge control, comprehensive protections, daisy-chainable, SPI interface up to 5MHz
MPQ6610-AEC1	4	55	1	220	1300	3	-	-	-	✓	-	-	TSOT23-8, SOIC-8	Power driver
S MPQ6612A-AEC1	4	45	2	100	20	5	0.2	0.2	0.1	-	-	✓	QFN-18 (3x4)	H-bridge with current sense, IN1 and IN2 inputs
S MPQ6615-AEC1	4.75	45	2	18	3000	12	-	-	-	-	-	✓	TQFN-26 (6x6)	H-bridge motor driver, int. current sense
MPQ6626-AEC1	5.5	40	6	1300	1	0.8	27	20	75	✓	✓	-	TSSOP-28EP	Independent half-bridge control, comprehensive protections, daisy-chainable, SPI interface up to 5MHz
MPQ6628-AEC1	5.5	40	8	1300	1	0.8	27	20	75	✓	✓	-	TSSOP-28EP	Independent half-bridge control, comprehensive protections, daisy-chainable, SPI interface up to 5MHz

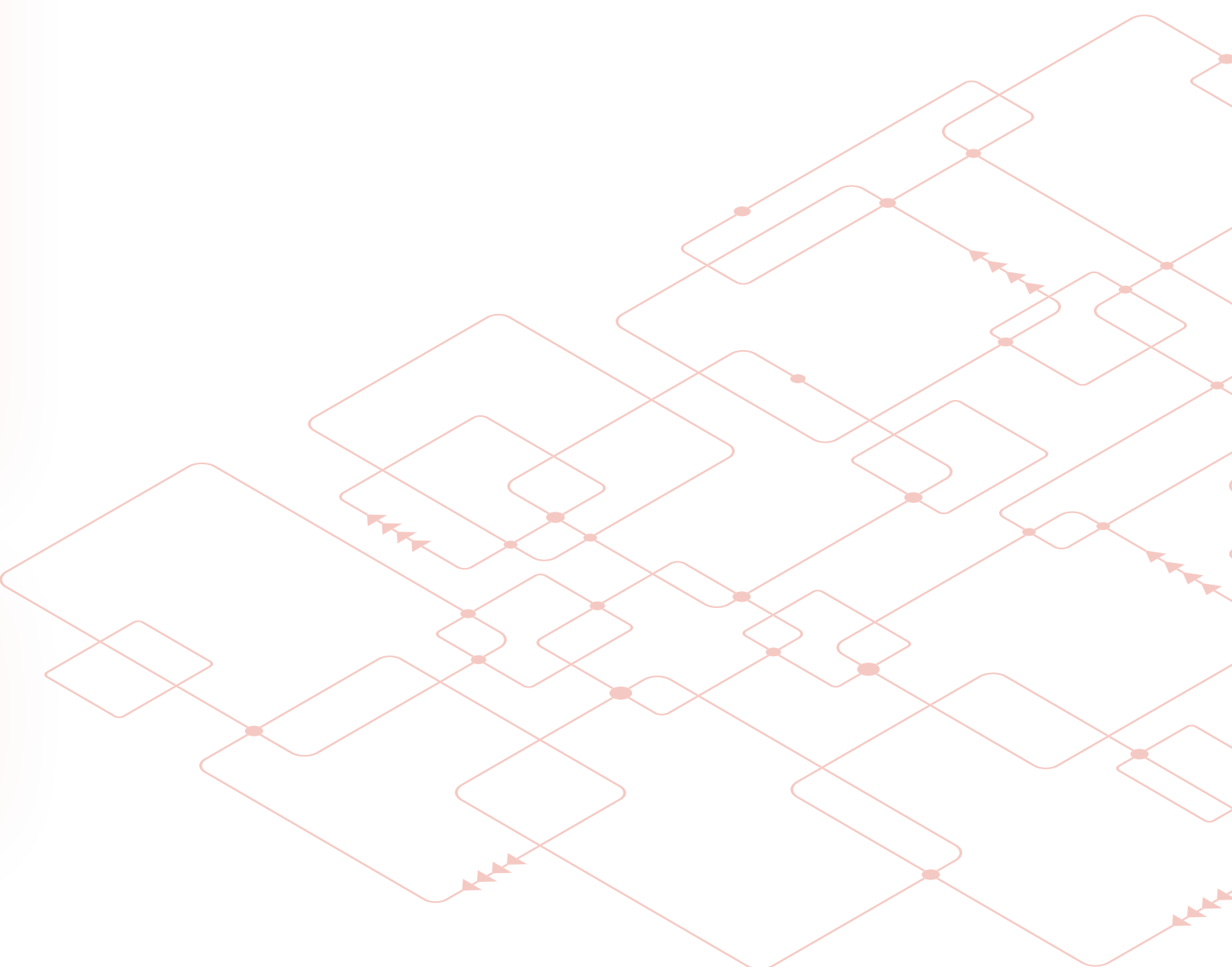
Stepper Motor Drivers

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	# of Channels	R _{DS(on)} (mΩ)	Standby I _Q (Typ)	Peak Output Current (A)	Step Mode	Control Interface	Wettable Flank Option	Package	Notes
S MPQ6600L-AEC1	4.5	35	2	365	1500	1.5	1, 1/2, 1/4, 1/8	Indexer	✓	QFN-24 (4x4)	Bipolar, microstepping, int. current sense and latch-off

MOTOR DRIVERS | AUTOMOTIVE

Integrated BLDC Motor Drivers

Part Number	V_{IN} (Min) (V)	V_{IN} (ABS Max) (V)	# of Channels	$R_{DS(ON)}$ (m Ω)	Standby I_o (Typ)	Peak Output Current (A)	Control Interface	Wettable Flank Option	Package	Notes
MPQ6541-AEC1	4.75	45	3	29	4000	8	PWM/ENBL	✓	TQFN-26 (6x6)	Three-phase power stage, PWM/ENBL inputs, int. current sense
MPQ6541A-AEC1	4.5	35	3	29	4000	8	HS/LS	✓	TQFN-26 (6x6)	Three-phase power stage, HS/LS inputs, int. current sense



Load Switches

Automotive load switches enable precise power distribution control throughout the vehicle, and can protect against unwanted events, such as over-voltage and over-current faults.



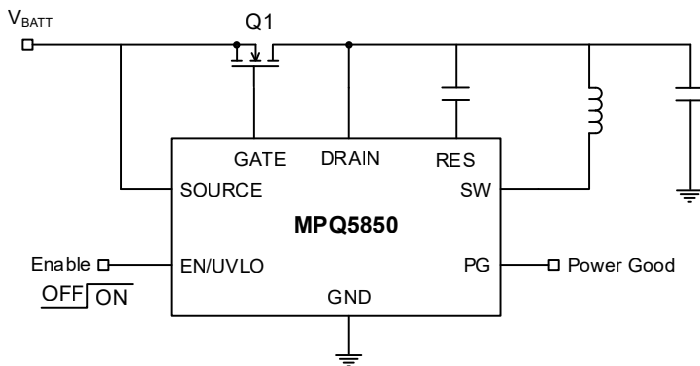
Integrated Safety Features

Small Solution Size

Fast Protection Response

MPQ5850-AEC1 NEW

42V Smart Diode Controller with -40V Reverse Protection



Key Specifications:

3V to 42V
Input Voltage

3.5 μ A
 I_o in Standby Mode

TSOT23
Package

Features

Built to Handle Tough Automotive Transients

Load dump up to 42V
Cold crank down to 3V

Extends Vehicle Battery Life

Low quiescent current in standby mode (3.5 μ A)

Reduces Board Size and BOM

TSOT23 (2mmx3mm) package

Additional Features

Rectifies AC frequency up to 100kHz
-40V blocking voltage

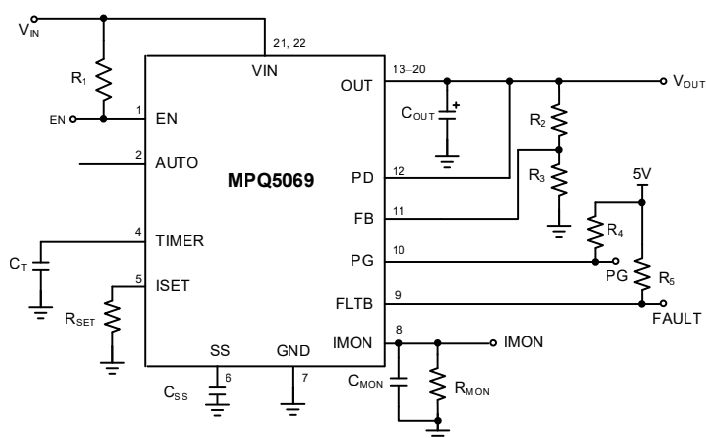
20mV ultra-low dropout

Strong gate drive ability: 330mA pull-up/
560mA pull-down

Integrated boost converter

MPQ5069-AEC1

7mΩ Protection Switch with Current Monitor



Key Specifications:

5V to 39V Input Voltage	10μA I _q in Standby Mode	7mΩ Built-In FETs	QFN (3mmx5mm) Package
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Available in Pin-Compatible Family:

6A MPQ5066	8A MPQ5068	10A MPQ5069
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Features

Built to Handle Tough Automotive Transients

Load dump up to 39V
Cold crank down to 5V

Cooler Thermals

Less than 35°C T_J rise at 10A output current
98.7% efficiency (12V_{IN}, 10A load)
Low-ohmic MPS BCD FET technology

Extends Vehicle Battery Life

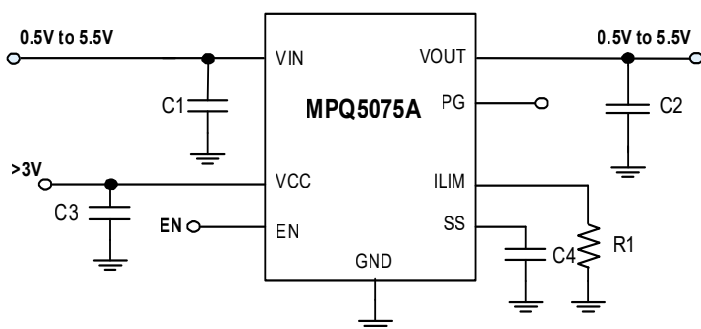
Low quiescent current in standby mode (10μA)

Additional Features

Fast response (<200ns) for short protection
Adjustable current limit (5A to 15A)
Output current-sensing
PG and FLT to indicate device status
Adjustable start-up slew rate

MPQ5075A-AEC1 NEW

5.5V, 5A, Low-R_{DS(ON)} Load Switch with Configurable Current Limit



Key Specifications:

0.5V to 5.5V Input Voltage	1μA I _q in Standby Mode	10mΩ Built-In FETs	QFN (2.5mmx3mm) Package
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Available in Pin-Compatible Family:

3A MPQ5074	5A MPQ5075A	7A MPQ5077
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Features

Wide Operation Range

0.5V to 5V operation input voltage range

Cooler Thermals

Low-ohmic MPS BCD FET technology

Extends Vehicle Battery Life

Low quiescent current in standby mode (1μA)

Reduces Board Size and BOM

QFN (2.5mmx3mm) package

Additional Features

Configurable current limit
Output discharge
PG to indicate device status
Adjustable start-up slew rate

LOAD SWITCHES | AUTOMOTIVE

Analog Switches

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Switch Current (A)	R _{DS(on)} (mΩ)	I _Q (Typ) (mA)	t _{ON} /t _{OFF} (ns)	Bandwidth (MHz)	Package	Notes
MPQ2735-AEC1	1.65	5.5	0.1	0.25	1	29/23	50	QFN-10 (2x2)	Low-voltage, 0.45Ω dual SPDT analog switches, separate control inputs

Load Switches 5V Load Switches

Part Number	V _{CC} (Min) (V)	V _{CC} (Max) (V)	Load Current (A)	R _{DS(on)} (mΩ)	I _Q (Typ) (mA)	Adj Current Limit	Power Good	Wettable Flank QFN Option	Package
MPQ5071-AEC1	3	5.5	0.5	50	0.18	✓	✓	-	QFN-12 (2x2)
MPQ5072-AEC1	3	5.5	1	50	0.18	✓	✓	-	QFN-12 (2x2)
MPQ5073-AEC1	3	5.5	2	50	0.18	✓	✓	-	QFN-12 (2x2)
N MPQ5074-AEC1	3	5.5	3	10	0.22	✓	✓	✓	QFN-12 (2.5x3)
N MPQ5075A-AEC1	3	5.5	5	10	0.22	✓	✓	✓	QFN-12 (2.5x3)
N MPQ5077A-AEC1	3	5.5	7	10	0.22	✓	✓	✓	QFN-12 (2.5x3)

Load Switches 40V Load Switches

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	Load Current (A)	R _{DS(on)} (mΩ)	I _Q (Typ) (mA)	Adj Current Limit	Fault Pin	Wettable Flank QFN Option	Package	Notes
MPQ5066-AEC1	6	38	6	7	1	✓	✓	-	QFN-22 (3x5)	ISO16750-1 compliant
MPQ5068-AEC1	6	38	8	7	1	✓	✓	-	QFN-22 (3x5)	ISO16750-1 compliant
MPQ5069-AEC1	6	38	10	7	1	✓	✓	-	QFN-22 (3x5)	ISO16750-1 compliant
S MPQ5871-AEC1	5	42	1	50	0.2	✓	✓	✓	QFN-8 (2x2.5)	Single-channel, smart HSS, ±3% high-accuracy current-sensing
S MPQ5872-AEC1	5	42	2	50	0.2	✓	✓	✓	QFN-8 (2x2.5)	Single-channel, smart HSS, ±3% high-accuracy current-sensing

Reverse Battery Protection Controllers

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	Reverse Battery (V)	Min Gate Drive Current (mA)	Forward Voltage Drop (mV)	Shutdown I _Q (Typ) (μA)	Power Good	Int Boost Converter	Package	Notes
N MPQ5850-AEC1	3	42	-36	170/430	20	4	✓	✓	TSOT23-8	Low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO16750-2 compliant
S MPQ5857-AEC1	3.3	42	-42	800/1300	20	8	✓	✓	QFN-16	Back-to-back FET control, AC rectification up to 100kHz, OCP/OVP and monitoring, ISO7637/ISO16750 compliant

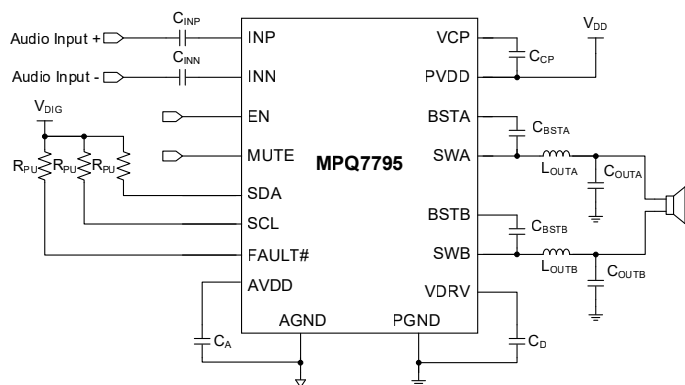
Class-D Audio

MPS's Class-D audio solutions provide highly efficient, innovative, easy-to-use amplifiers that increase performance and reliability. Find Class-D audio solutions for your e-call, cluster, virtual engine sound, and other automotive audio power projects.



MPQ7795-AEC1 NEW

2.2MHz, 24.5W, Low-EMI, Mono BTL Class-D Audio Amplifier with Diagnostics



Features

Built to Handle Tough Automotive Transients

- Load dump up to 42V
- Cold crank down to 4.5V

Cooler Thermals

- Less than 55°C T_J rise at 2A/2.2MHz
- Less than 45°C T_J rise at 2A/470kHz
- 92.6% efficiency (14.4V V_{IN}, 8Ω load, 10% THD+N, 470kHz)
- 90.8% efficiency (14.4V V_{IN}, 8Ω load, 10% THD+N, 2.2MHz)
- Low-ohmic MPS BCD FET technology

Low-Noise EMI/EMC

- Operates outside of AM radio band

Extends Vehicle Battery Life

- Low quiescent current in standby mode (0.2μA)

Reduces Board Size and BOM

- Tiny QFN (4mmx4mm) package
- Supports small output inductors and capacitors

Additional Features

- 2.2MHz audio product
- Load diagnostics
- Speaker protection with adjustable power limiter
- Selectable audio gain
- Start-up/shutdown pop elimination

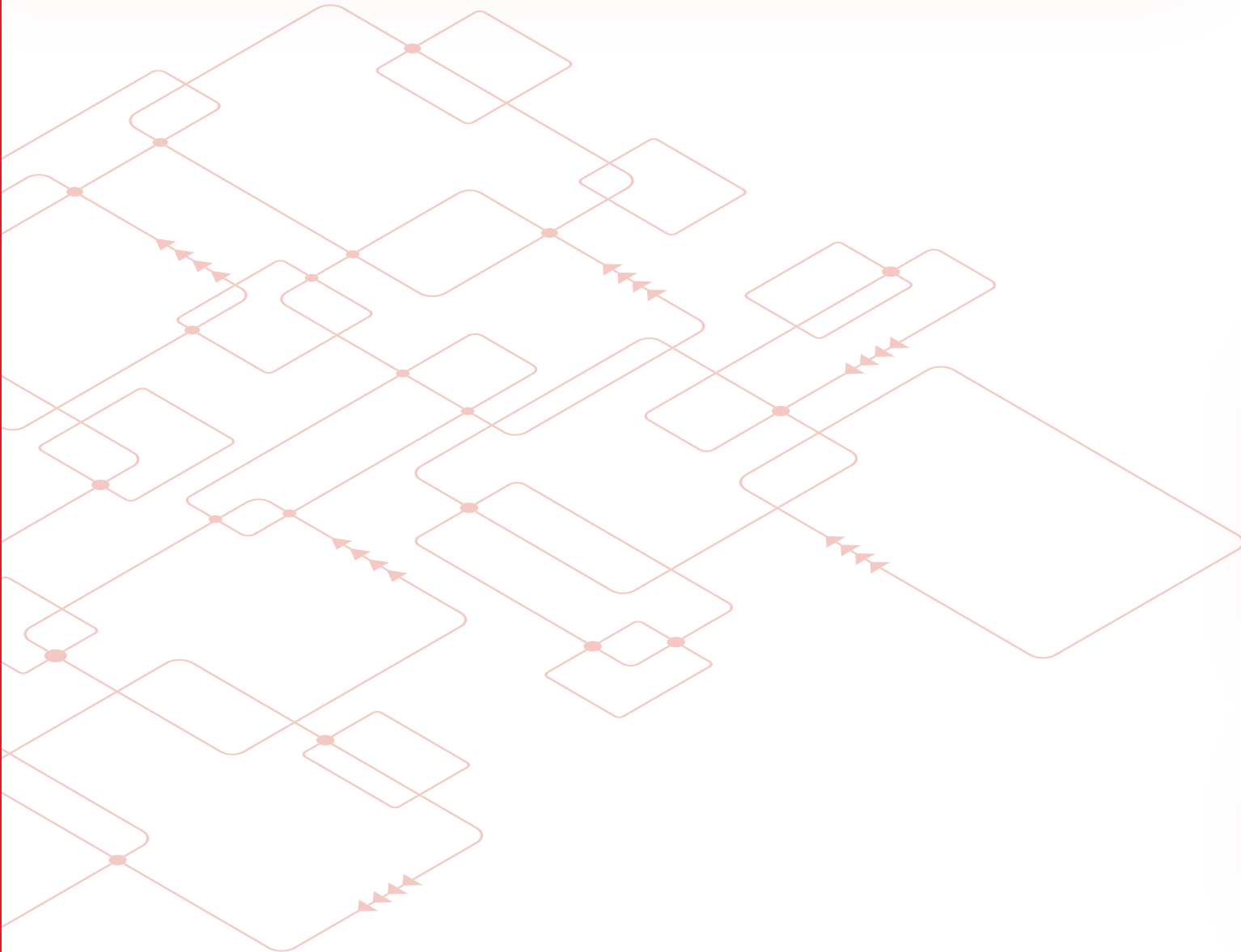
Key Specifications:

3.3V to 42V Input Voltage	0.2μA I _q in Standby Mode	24.5W into 4Ω @ 14.4V _{IN} Power	150mΩ Built-In FETs
QFN (4mmx4mm) Package	71dB PSRR @ 100Hz	102dB SNR	330kHz, 384kHz, 470kHz, 2.2MHz Selectable Switching Frequency

CLASS-D AUDIO AMPLIFIERS | AUTOMOTIVE

Class-D Audio Amplifiers

Part Number	V _{IN} (Min) (V)	V _{IN} (ABS Max) (V)	P _{OUT} (W)	R _{DS(ON)} (mΩ)	Idle Current (Typ) (mA)	f _{SW} (kHz)	Efficiency (%)	THD+N at 1kHz Input (%)	PSRR (dB)	SNR (dB)	Output Noise (μV)	Type	Load Diagnostic	Selectable Gain	Power Limiter	Digital Interface	Wettable Flank QFN Option	Package	Notes
N MPQ7795-AEC1	3.9	42	24.5 @ 14.4V, 4Ω Load	150	6.5	330 to 2.2MHz	92 @ 470kHz, 90 @ 2MHz	0.09 @ 1W, 470kHz	71 @ 100Hz	102	115	Mono, BTL	✓	✓	✓	I ² C	✓	QFN-24 (4x4)	2.2MHz, low EMI, mono BTL with diagnostics
MPQ7790-AEC1	5.5	18	9 @ 12V, 8Ω Load	300	5	300	90	0.15 @ 5W (8Ω), 300kHz	50	102	115	Mono, BTL	-	✓	✓	-	-	TSSOP-20EP	Low EMI, analog input, for mono speaker in bridge-tied load configuration



Position & Current Sensors

MPS MagAlpha sensors provide highly reliable, contactless angle sensing for position or speed control in automotive systems. Compact size, multiple angle output formats, and support for end-of-shaft and side-shaft magnet topology aid the implementation of cost-effective angle-sensing solutions. Typical applications include rotary controls in cabin user interfaces and motorized electronic actuators in vehicle body applications.



Contactless Sensing

High Reliability

Flexible Magnet Positioning

POSITION AND CURRENT SENSORS | AUTOMOTIVE

Coreless Integrated Current Sensors

Part Number	Current Range (A)	V _{CC} (V)	Over-Temp Accuracy	Temperature Range (°C)	Isolation Voltage (Vrms)	Working Voltage (Voc)	Bandwidth (kHz)	Over-Current Detection	Primary Conductor Resistance (mΩ)	UL Certification	Package	Notes
S MCQ1806	±5, ±10, ±20, ±30, ±40, ±50	3.3, 5	2.5%	-40 to +125	3000	500	100	-	0.9	✓	SOIC-8	AEC-Q100, 5A to 50A range, analog output, immune to external magnetic fields
S MCQ1823	±5, ±10, ±20, ±30, ±40, ±50	3.3, 5	2.5%	-40 to +125	100	-	120	✓	0.6	✓	QFN-12 (3x3)	AEC-Q100, bidirectional and unidirectional sensing, analog output, immune to external magnetic fields

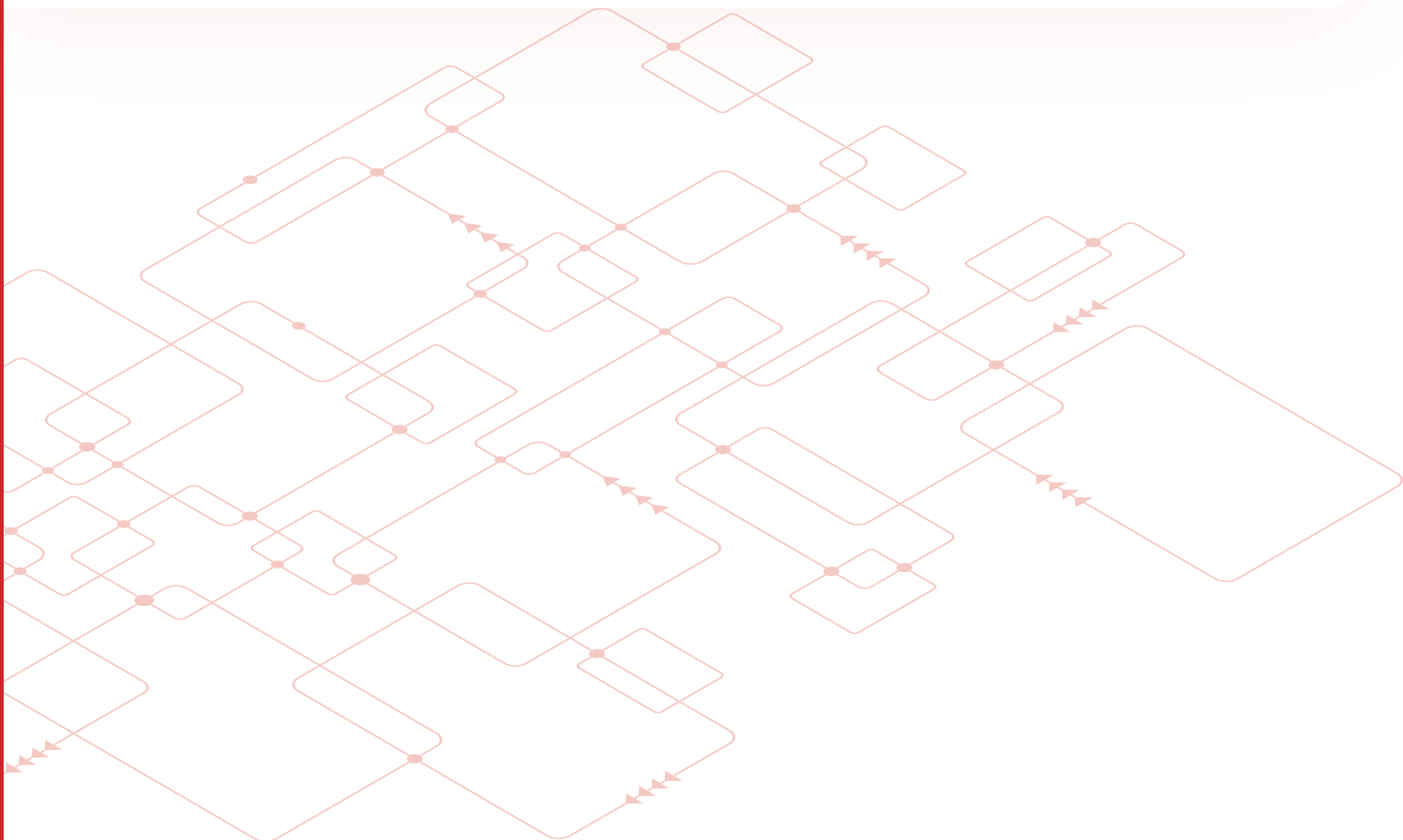
MagVector™ 3D Magnetic Position Sensor

Part Number	Data Length	Interface	Supply Voltage (V)	Supply Current (mA)	Supply Current (mI)	Conversion Time (µs)	Temperature Range (°C)	Package	Notes
S MVQ300	12-bit	I ² C, SPI	3.3	10nA to 2.5	±125 or ±250	40	-40 to +125	TSOT23-6	3D magnetic sensor, digital component output, selectable operation mode

POSITION AND CURRENT SENSORS | AUTOMOTIVE

MagAlpha™ Magnetic Position Sensors

Part Number	±3σ Resolution	Interface	Supply Voltage (V)	Supply Current (mA)	Sensing Range (mI)	Cutoff Frequency (Hz)	Latency at Constant Speed (µs)	Magnetic Field Detection	Temperature Range (°C)	Package	Notes
S MAQ600	14.5-bit	SPI, ABZ, PWM, UVW, SSI	3 to 3.6	7	20 to 200	21000	0	-	-40 to +125	QFN-16 (3x3)	High-accuracy and BW, 0.5° (0.1° INL, no speed error (zero latency), wettable flanks
MAQ430	12-bit	SPI, UVW, ABZ	3 to 3.6	11.7	30+ (No Upper Limit)	390	8	✓	-40 to +150	QFN-16 (3x3)	Automotive angle sensor, wettable flanks
MAQ470	12-bit	SPI, SSI, PWM, ABZ	3 to 3.6	11.7	30+ (No Upper Limit)	390	8	✓	-40 to +150	QFN-16 (3x3)	Automotive angle sensor, wettable flanks
MAQ473	10-bit to 14-bit	SPI, SSI, PWM, ABZ	3 to 3.6	11.7	30+ (No Upper Limit)	23 to 6k	8	✓	-40 to +150	QFN-16 (3x3)	Automotive angle sensor, programmable filter, wettable flanks
S MAQ800	8-bit to 12.5-bit	SPI, SSI	3 to 3.6	11.7	30+ (No Upper Limit)	90	4000	✓	-40 to +125	QFN-16 (3x3)	Optimized for automotive HMI applications, SSI output, wettable flanks
S MAQ820	9-bit to 13-bit	SPI, ABZ	3 to 3.6	11.7	30+ (No Upper Limit)	90	4000	✓	-40 to +125	QFN-16 (3x3)	Optimized for automotive HMI applications, SSI output
S MAQ850	8-bit to 12.5-bit	SPI, PWM	3 to 3.6	11.7	30+ (No Upper Limit)	90	4000	✓	-40 to +125	QFN-16 (3x3)	Optimized for automotive HMI applications, SSI output, wettable flanks



GET EV READY

We offer a wide variety of EV Kits & EV Boards to meet all of your power design needs.

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Wide input voltage range
- ✓ **Superior Performance**
Robust special features
- ✓ **Increased Reliability**
Full protection features

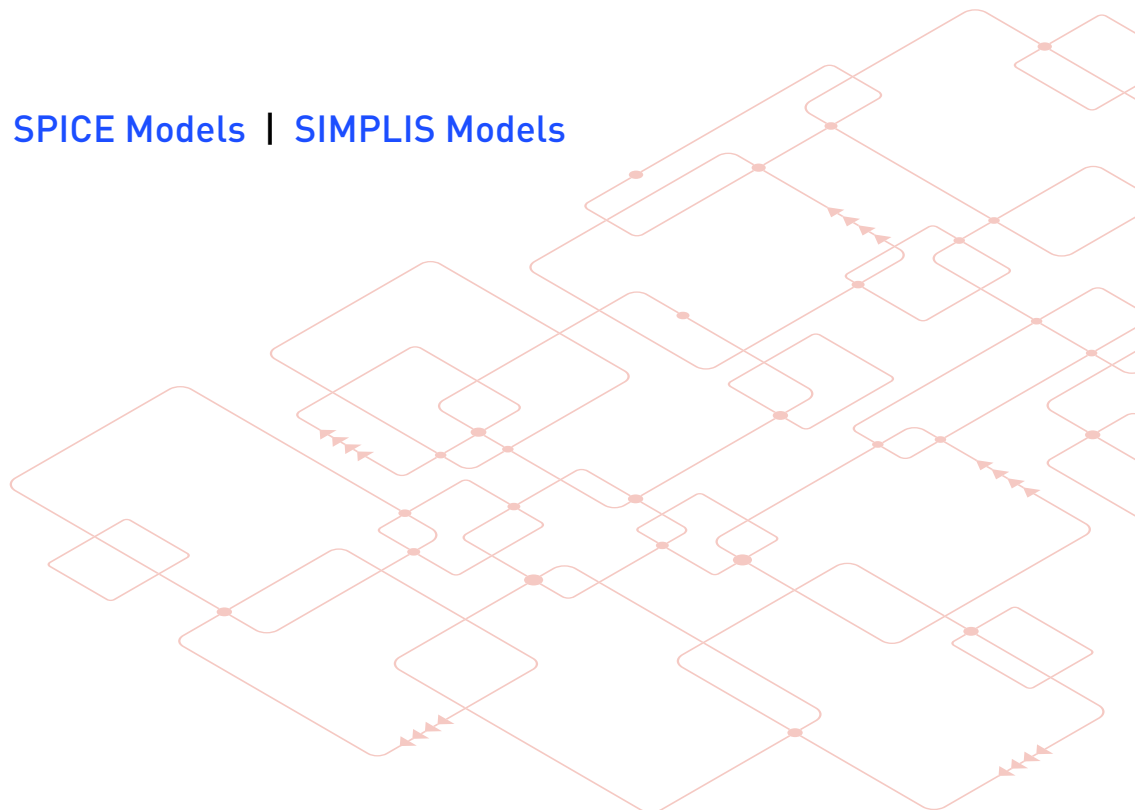
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ABOUT MONOLITHIC POWER SYSTEMS

Who we are

We are creative thinkers. We break boundaries. We take technology to new levels. As a leading international semiconductor company, Monolithic Power Systems (MPS) creates cutting-edge solutions to improve the quality of life with green, easy-to-use products.

What we do

We make power design fun! With our innovative proprietary technology processes, we thrive on reimagining and redefining the possibilities of high-performance power solutions in industrial applications, telecom infrastructures, cloud computing, automotive, and consumer applications.

Where we come from

It started with a vision. Michael Hsing, pioneering engineer and CEO, founded Monolithic Power Systems, Inc. in 1997 with the belief that an entire power system could be integrated onto a single chip. Under his leadership, MPS has succeeded not only in developing a monolithic power module that truly integrates an entire power system in a single package, but also it continues to defy industry expectations with its patented groundbreaking technologies.

Our values

We cultivate creativity

As a company, we believe in creating an environment that encourages and challenges our employees to collaborate and think outside the box to excel beyond their preconceived capabilities.

We do not accept the status quo

We do not believe in limitations. It is not about what is, but what can be. Possibilities are endless at MPS.

We are passionate about sustainability

It's about the future. From materials to finances, we are committed to conservation. We will not tolerate waste in an effort to improve and preserve the quality of life.

We are committed to providing innovative products to our customers

Let us do the heavy lifting. We relentlessly strive to make system design versatile and effortless to meet our customers' specific needs. We'll do the work, so our customers can have the fun!

CONTACT & ORDERING

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San Jose

Regional Headquarters

Lausanne

Ettenheim

Barcelona

Chengdu

Hangzhou

Taiwan

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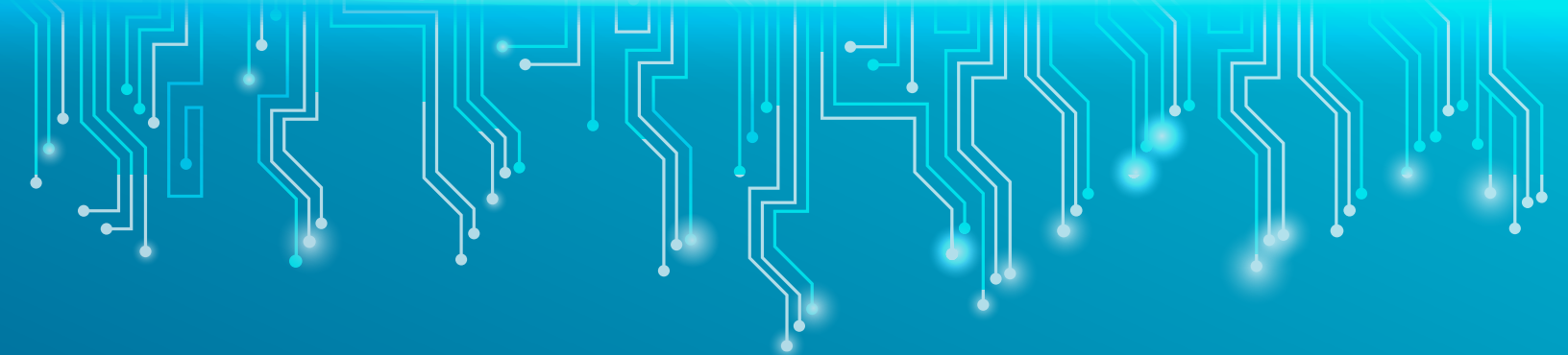
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