

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 Monitoring:

- 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 ISO 26262 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

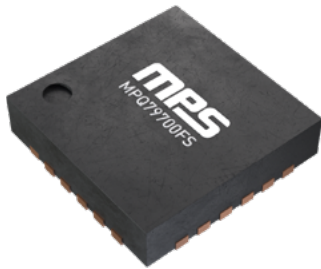
MPSafe™
ASIL-D

Meet ISO 26262 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 Sensing



MPQ70240FS-AEC1

MPSafe™ ASIL-B PMIC
for Camera Modules



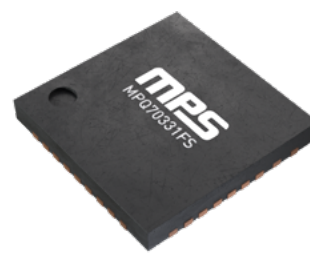
MPQ2967FS-AEC1

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 Safety Applications



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

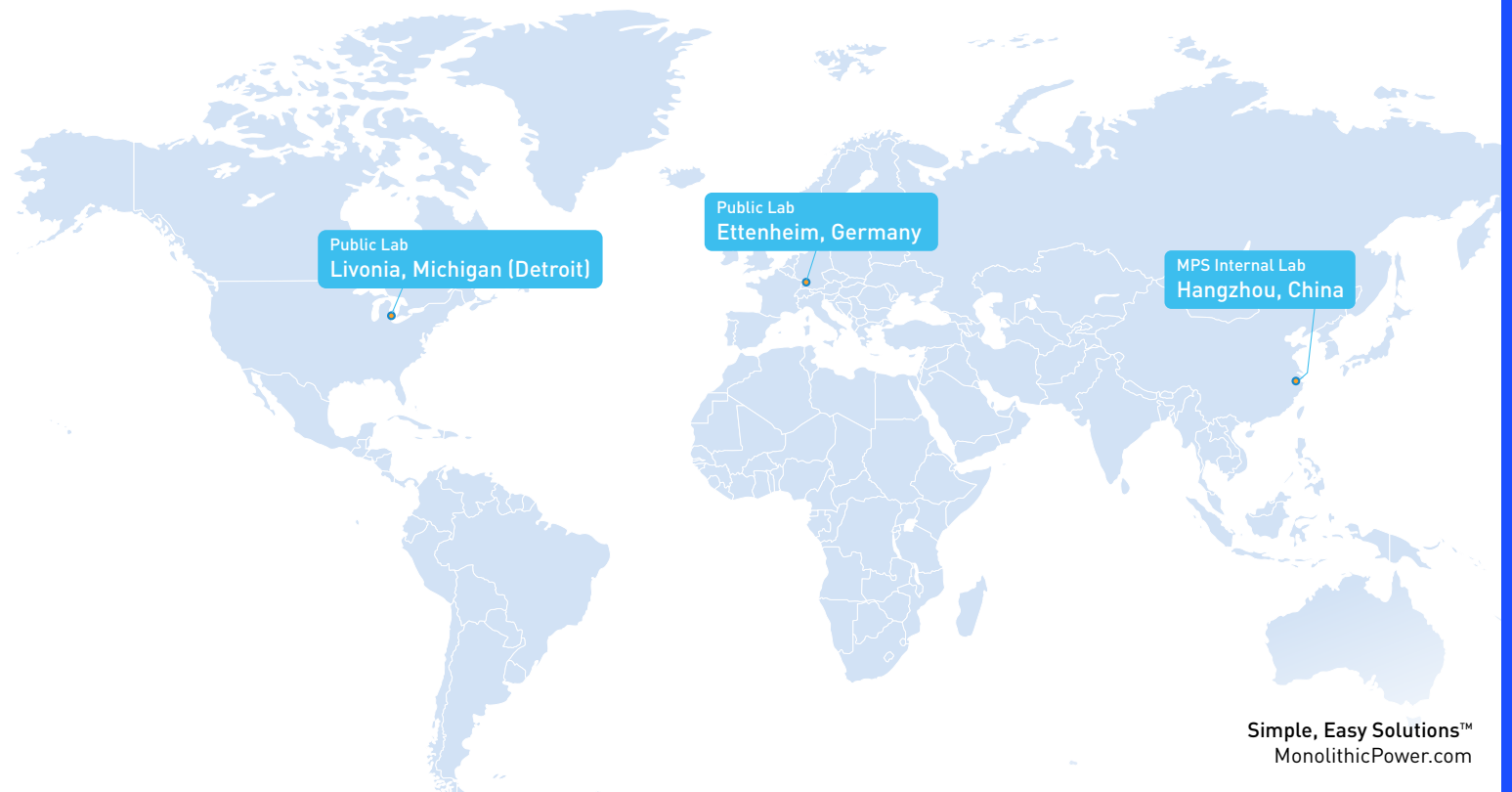
- Design Analysis and Optimization
- Testing
- Debugging

Chambers

- CISPR
- 3-Meter Chamber
- BCI



EMC Lab Locations



DC PM LR MS PS SAFE CP

ADAS



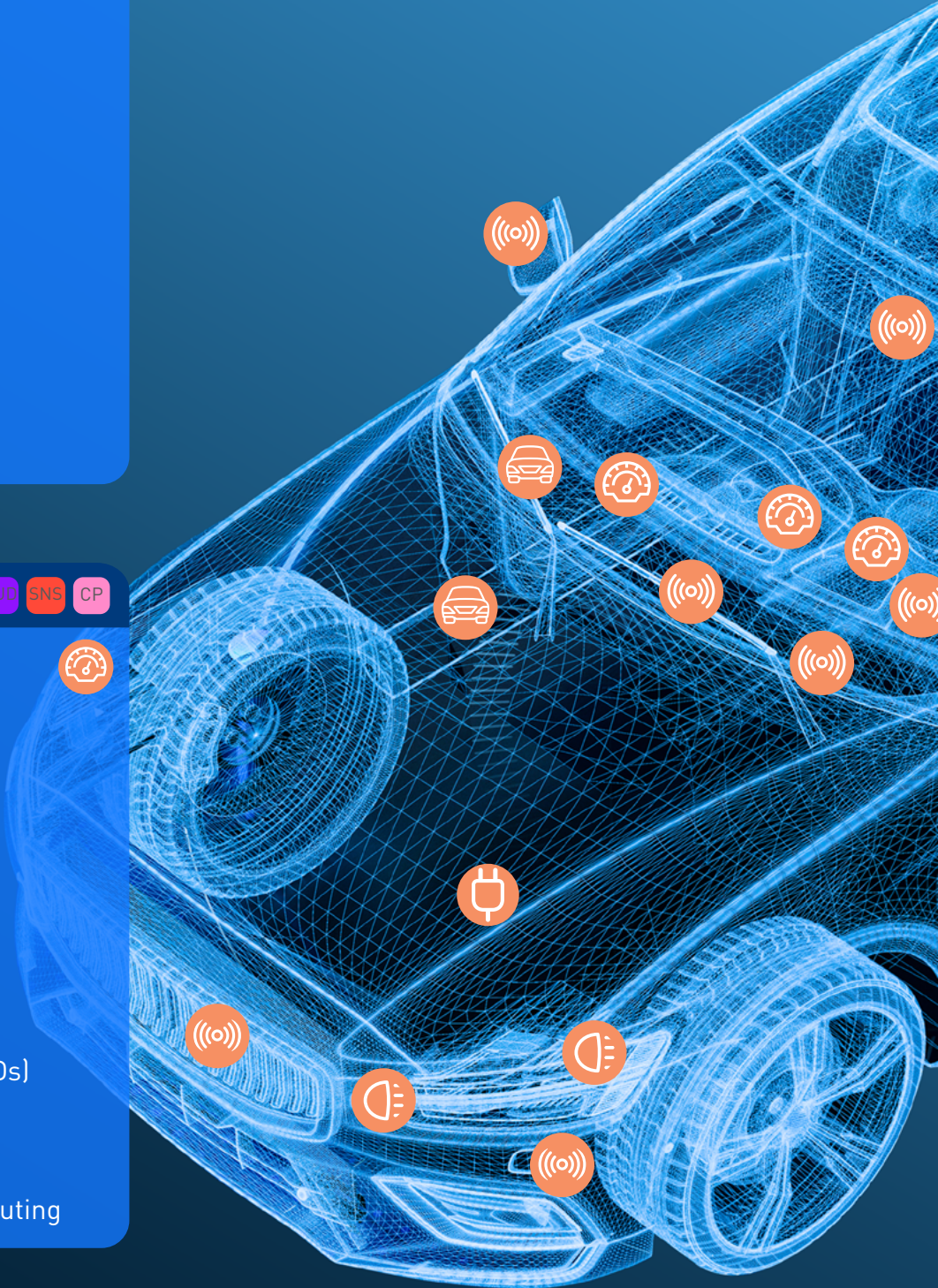
- 360° Cameras
- Front Cameras
- Backup Cameras
- Thermal Cameras
- Driver Monitoring
- Cabin Sensing
- Sensor Fusion
- Radar
- LiDAR
- Ultrasonic
- ADAS Computing

DC PM LR MS PS LED USB MD AUD SNS CP

Digital Cockpit



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



PRODUCT TYPES

Buck, Buck-Boost & Boost Converters

PMICs

Core Power

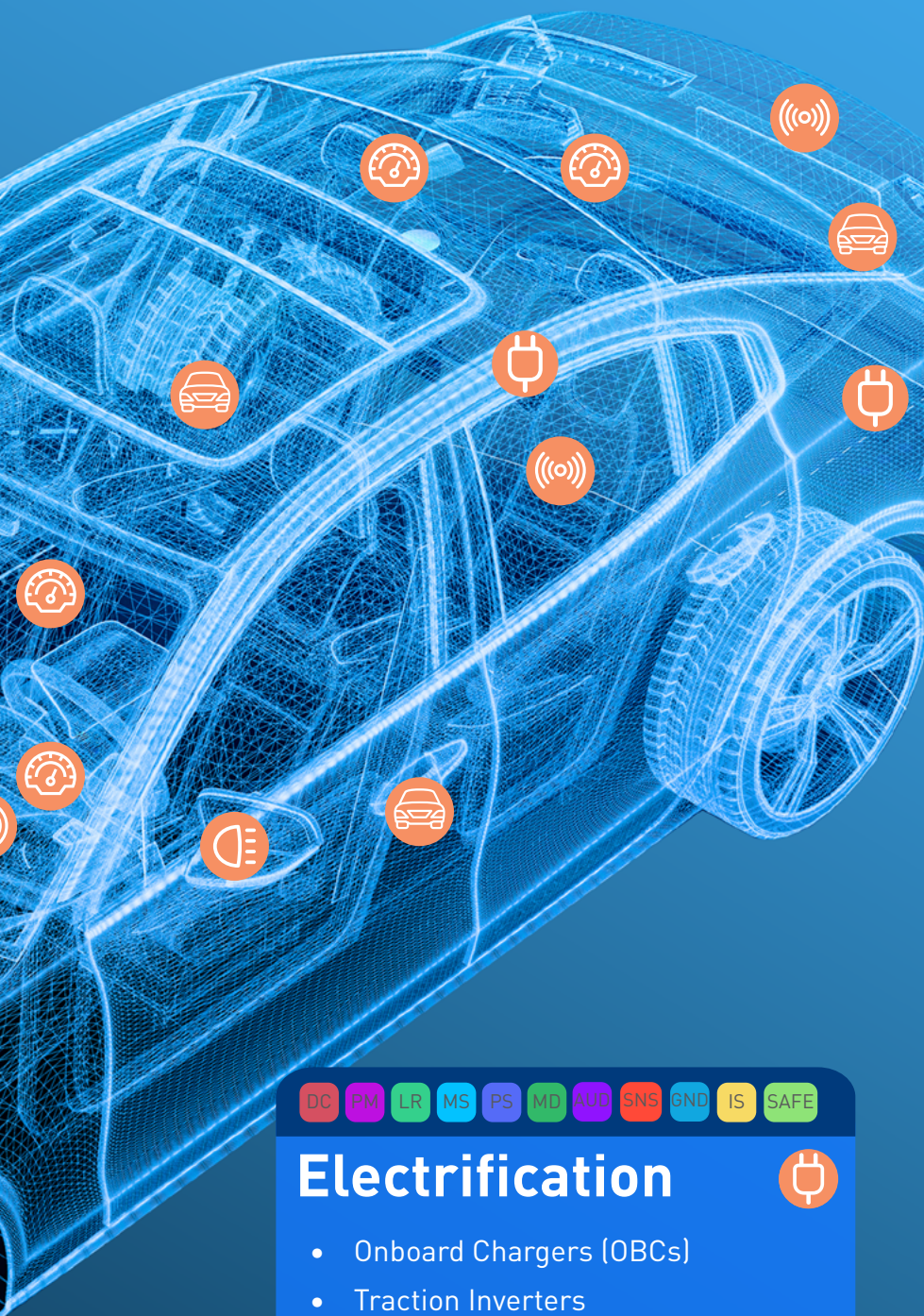
Linear Regulators

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 (OBCs)
- 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 Drivers 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.



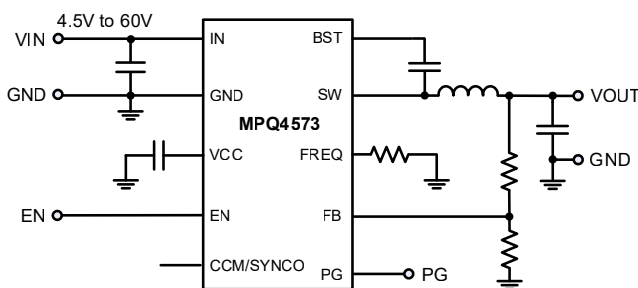
High Efficiency

EMI-Optimized

Compact Solution

MPQ4573-AEC1

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



Key Specifications:

4.5V to 60V Input Voltage	40 μ A Standby I_o	300kHz to 2.2MHz Switching Frequency	QFN-12 (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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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

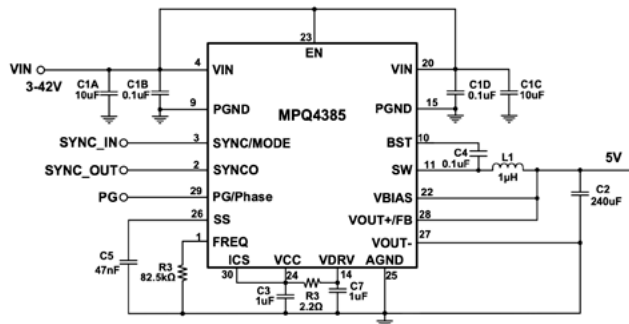
- Low quiescent current in standby mode (40 μ A)

Reduces Board Size and BOM

- Integrated compensation network
- Small QFN-12 (2.5mmx3mm) package

Additional Features

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

MPQ4385-AEC1 NEW**42V, 25A, 1kW, Multi-Phase, Sync Buck Converters with ZDP™ Control and Quiet FET™****Key Specifications:**

3.3V to 42V	200kHz to 2.5MHz	12A to 25A	TQFN-30 (5x6mm)
Input Voltage	Switching Frequency	Output Current	Package

Available in Pin-Compatible Family:

12A MPQ4385-3XYZ	15A MPQ4385-4XYZ	18A MPQ4385-8XYZ	20A MPQ4385-0XYZ
22A MPQ4385-2XYZ	25A Multi-Phase Up to 8 Phases, 1kW MPQ4385-5XY1		25A MPQ4385-5XY0

Features**Designed for Automotive Transients**

- 3.3V to 36V input voltage (V_{IN}) range
- Load dump up to 42V
- Low-dropout mode with soft recovery

Designed for High Performance and Reduced Component Overhead

- Zero-Delay PWM™ (ZDP™) control for extremely fast transient response and minimal output capacitance
- >3X better transient performance vs. peak current mode
- 200kHz to 2.5MHz configurable frequency
- Differential voltage sense for high-accuracy regulation
- ±1% output accuracy, ±1% PG accuracy

Cooler Thermals

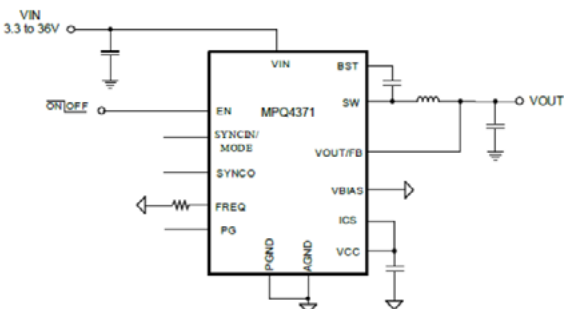
- Integrated low- $R_{DS(ON)}$ 5.3mΩ/3.3mΩ FETs using MPS's BCD process
- High efficiency (>95% at 25A)
- Thin QFN package to facilitate top side cooling

Scalable with Multiphase Capability

- Single 25A continuous output current, 30A peak output current
- Up to 200A, 1kW in multi-phase operation

Optimized for Low EMC/EMI

- Symmetric VIN pinout placement
- Low noise at high frequency bands using Quiet FET™ advanced switching technology
- Frequency spread spectrum (FSS) modulation
- Synchronizable to an external clock
- CISPR 25 Class 5 compliant
- Available in a Mesh-Connect™ TQFN-30 (5mmx6mm) package with wettable flanks

MPQ4371-AEC1 / MPQ4372-AEC1 NEW**42V, 11A to 6A, Zero-Delay PWM (ZDP™) Multi-Phase Sync Buck Converter****Key Specifications:**

3.3V to 42V	200kHz to 2.5MHz	11A to 6A	QFN-23 (4mmx5mm)
Input Voltage	Switching Frequency	Output Current	Package

Available in Pin-Compatible Family:

11A MPQ4371-1000	10A MPQ4371-0000	11A Multi-Phase MPQ4372-1001
8A MPQ4371-8000	6A MPQ4371-6000	

Features**Built to Handle Tough Automotive Transients**

- Load dump up to 42V, cold crank down to 3.3V
- Low-dropout (LDO) mode with soft recovery

Scalable and Multi-Phase Capability

- 11A to 6A output current versions in pin-compatible family
- Multi-phase capable up to 8 phases

Designed for High Performance and Reduced Component Overhead

- Zero-Delay PWM™ (ZDP™) control for extremely fast transient response and minimal output capacitance
- ±1% output accuracy
- 200kHz to 2.5MHz configurable frequency
- Internal soft start
- Output discharge from SW

Increased Battery Life

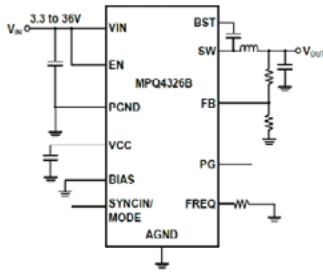
- 1.8µA shutdown current, 3.5µA standby current

Optimized for Low EMC/EMI

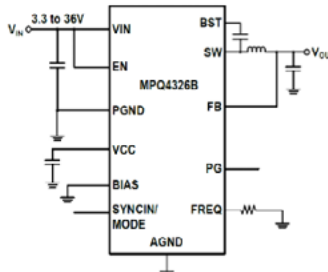
- Symmetric VIN pinout placement
- Low EMI at high frequency bands with Quiet FET™ advanced switching control technology
- Frequency spread spectrum (FSS) modulation

MPQ4326B-AEC1

42V, 7A to 3A, Ultra-Compact, Low- I_Q Buck Converter



Adjustable Output Version



Fixed Output Version

Key Specifications:

3.3V to 42V	350kHz to 2.5MHz	7A to 3A	QFN-14 (4mmx4mm)
Input Voltage	Switching Frequency	Output Current	Package

Available in Pin-Compatible Family:

7A	6A	5A
MPQ4326B-7XYZ	MPQ4326B-6XYZ	MPQ4326B-5XYZ
4A	3A	
MPQ4326B-4XYZ	MPQ4326B-3XYZ	

Features

Built to Handle Tough Automotive Transients

Load dump up to 42V, cold crank down to 3.3V
Low-dropout (LDO) mode with soft recovery

Increased Battery Life and High Efficiency

1 μ A shutdown current, 24 μ A standby current
Advanced asynchronous modulation (AAM) mode increases efficiency under light loads

Optimized for Low EMC/EMI and System Noise

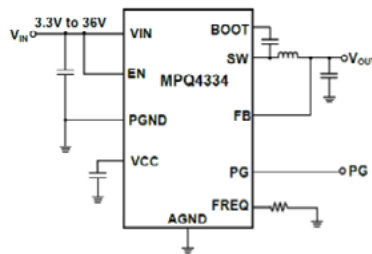
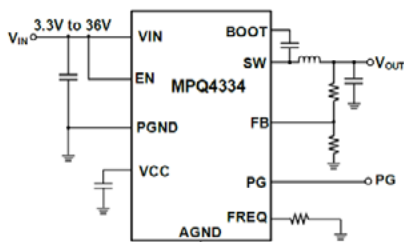
Frequency spread spectrum (FSS) modulation
Symmetric VIN pin placement
MeshConnect™ flip-chip packaging
350kHz to 2.5MHz configurable switching frequency (f_{sw})
Internal soft start
Output discharge from SW
50ns minimum on time

Protections

Power good (PG) output
Hiccup over-current protection (OCP)

MPQ4334 -AEC1 NEW

42V, 4A to 0.5A, Ultra-Compact, Low- I_Q Buck Converter



Key Specifications:

3.3V to 42V	200kHz to 2.5MHz	0.5A to 4A	GDE: QFN-12 (2x3mm) GLE: QFN-12 (3x4mm) GRHE: QFN-14 (2.5x3.5mm)
Input Voltage	Switching Frequency	Output Current	Package

Available in Pin-Compatible Family:

500mA	1A	2A
MPQ4334-0xxx	MPQ4334-1xxx	MPQ4334-2xxx
3A	4A	
MPQ4334-3xxx	MPQ4334-4xxx	

Features

Built to Handle Tough Automotive Transients

Load dump up to 42V, cold crank down to 3.3V

Designed for High Performance and Reduced Component Overhead

200kHz to 2.5MHz configurable switching frequency
Low-dropout mode with soft recovery
50ns minimum on time and 50ns minimum off time

High Efficiency for Increased Battery Life and Improved Thermals

Low quiescent current (I_Q , 20 μ A) and shutdown current (1 μ A)
Integrated low- $R_{DS(ON)}$ HS-FETs and LS-FETs (55m Ω /35m Ω)
95%+ system efficiency at 12V V_{IN}
Advanced asynchronous modulation (AAM) mode for higher efficiency at light loads

Built to Fit Space- and Cost-Limited Automotive Systems

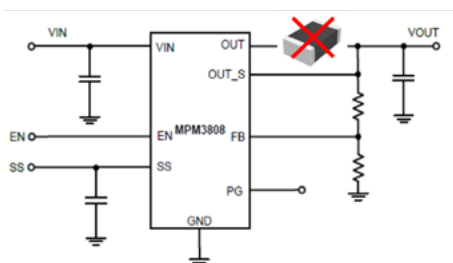
Scalable 1A to 4A output current versions in pin-compatible family
Compact 2mmx3mm, 3mmx4mm or 2.5mmx3.5mm package options
P2P with the MPQ4323-MPQ4320 and MPQ4324-WXYZ series

Optimized for EMI/EMC

Frequency spread spectrum (FSS)
Symmetric VIN
MeshConnect™ flip-chip package technology
Synchronizable to an external clock (order option)
Configurable switching frequency (Order option)

MPM3808-AEC1 Module Series

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

Features

Built to Fit 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 and Rich Protections

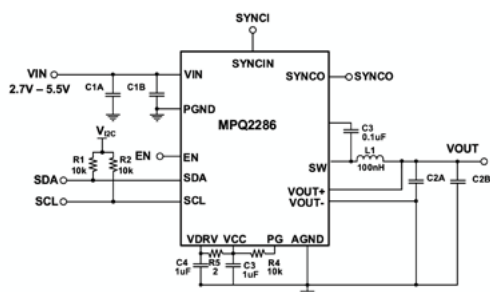
EN and power good (PG) for sequencing
Output discharge
Output over-voltage protection (OVP)

Available in Pin-Compatible Family:

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

MPQ2286-AEC1

6V, 16A to 6A, Zero-Delay PWM (ZDP™) Control Sync Buck Converter



Key Specifications:

2.7V to 6V	2MHz to 4MHz	16A to 6A	6mΩ/3mΩ	QFN-18 (3mmx4mm)
Input Voltage	Switching Frequency	Output Current	HS-FET/ LS-FET $R_{DS(ION)}$	Package

Available in Pin-Compatible Family:

6A	8A	10A
MPQ2283	MPQ2284	MPQ2285
12A	14A Peak	16A Peak
MPQ2286	MPQ2287	MPQ2288

Features

Built to Handle Tough Automotive Core Power Requirements

Zero-Delay PWM™ (ZDP™) control for extremely fast transient response
1% output accuracy
0.2V to 3.6V output voltage (V_{OUT}) setting range

Designed for High Performance and Reduced Component Overhead

ZDP™ control for minimal output capacitance and BOM cost
2MHz to 4MHz configurable switching frequency (f_{SW})

Optimized for Low Noise

Frequency spread spectrum (FSS)
Synchronization input/output
Differential V_{OUT} sense
MeshConnect™ flip-chip packaging

Rich Digital Protections

Soft start timing
Power good (PG) timing
Forced continuous conduction mode (FCCM) or advanced asynchronous modulation (AAM) mode
Configurable digital interface
Factory-programmable multi-page OTP memory
Output over-voltage protection (OVP) and under-voltage protection (UVP)
Short-circuit protection (SCP)
Thermal warning/thermal shutdown

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)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AM Mode	COT Control	100% Duty Cycle	Fixed Frequency	Wettable Flank 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	1.2	Int	-	✓	-	✓	✓	-	✓	QFN-12 (2.5x3x0.9)	Module with integrated inductor
MPM3808-AEC1	2.5	5.5	3	5	21	2400	65/35	1.2, 1.8	Ext	-	-	✓	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor
MPM3808C-AEC1	2.5	5.5	3	5	460	2400	65/35	1.2, 1.8	Ext	-	✓	-	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor
MPM3807-AEC1	2.5	5.5	2	3.5	21	2400	70/40	1.2, 1.8	Ext	-	-	✓	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor
MPM3807C-AEC1	2.5	5.5	2	3.5	460	2400	70/40	1.2, 1.8	Ext	-	✓	-	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor
MPM3806-AEC1	2.5	5.5	1	2.5	21	2400	75/45	1.2, 1.8	Ext	-	-	✓	✓	✓	✓	✓	QFN-15 (3x4x1.6)	Module with integrated inductor
MPM3806C-AEC1	2.5	5.5	1	2.5	460	2400	75/45	1.2, 1.8	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	1.2, 1.8	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	1.2, 1.8	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

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	FCM	AAW Mode	COI Control	Fixed Frequency	Adjustable 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
MPQ2180-AEC1	2.7	6	6	12.7	285	850 to 2200	38/21	0.8, 1	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
S MPQ2176-4000-AEC1	2.4	6	4	6	8	2200	12/8	-	Int	-	-	✓	✓	✓	✓	✓	QFN-7 (1.5x2.5)	-
S MPQ2176-4001-AEC1	2.4	6	4	6	8	2200	12/8	-	Int	-	✓	-	✓	✓	✓	✓	QFN-7 (1.5x2.5)	-
S MPQ2176-5000-AEC1	2.4	6	5	7	8	2200	12/8	-	Int	-	-	✓	✓	✓	✓	✓	QFN-7 (1.5x2.5)	-
S MPQ2176-5001-AEC1	2.4	6	5	7	8	2200	12/8	-	Int	-	✓	-	✓	✓	✓	✓	QFN-7 (1.5x2.5)	-
S MPQ2176-6000-AEC1	2.4	6	6	8	8	2200	12/8	-	Int	-	-	✓	✓	✓	✓	✓	QFN-7 (1.5x2.5)	-
S MPQ2176-6001-AEC1	2.4	6	6	8	8	2200	12/8	-	Int	-	✓	-	✓	✓	✓	✓	QFN-7 (1.5x2.5)	-
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
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

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)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AAM Mode	COT Control	100% Duty Cycle	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
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
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
N MPQ2283-AEC1	2.7	6	6	7	-	Adj	6/4	-	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page memory, selectable f _{SW} and V _{OUT}
N MPQ2284-AEC1	2.7	6	8	9.3	-	Adj	6/4	-	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page memory, selectable f _{SW} and V _{OUT}
N MPQ2285-AEC1	2.7	6	10	12	-	Adj	6/4	-	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page memory, selectable f _{SW} and V _{OUT}
MPQ2286-AEC1	2.7	6	12	15	-	Adj	6/4	-	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page memory, selectable f _{SW} and V _{OUT}
S MPQ2287-AEC1	2.7	6	14	17	-	Adj	6/4	-	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page memory, selectable f _{SW} and V _{OUT}
S MPQ2288-AEC1	2.7	6	16	19	-	Adj	6/4	-	Int	✓	✓	✓	-	-	✓	✓	QFN-18 (3x4)	Multi-page 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 _{F8} (V)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AAM Mode	COT 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)	-
N MPQ3524-0500-AEC1	3.3	22	0.5	1	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	-	✓	-	-	✓	QFN-12 (2x3)	-
N MPQ3524-0501-AEC1	3.3	22	0.5	1	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	-	-	✓	QFN-12 (2x3)	-
N MPQ3524-1000-AEC1	3.3	22	1	1.5	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	-	✓	-	-	✓	QFN-12 (2x3)	-

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_d (Typ) (μ A)	V_{FB} (V)	f_{sw} (kHz)	$R_{DS(on)}$ (m Ω)	Fixed Output Versions (V)	Soft Start							Package	Notes
	External Sync	FCCM	AAM Mode	COT Control								Fixed Frequency	Wettable Flank	QFN Option						
N MPQ3524-1001-AEC1	3.3	22	1	1.5	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	-	-	✓	QFN-12 (2x3)	-		
N MPQ3524-1500-AEC1	3.3	22	1.5	1.8	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	-	✓	-	-	✓	QFN-12 (2x3)	-		
N MPQ3524-1501-AEC1	3.3	22	1.5	1.8	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	-	-	✓	QFN-12 (2x3)	-		
N MPQ3524-2000-AEC1	3.3	22	2	2.7	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	-	✓	-	-	✓	QFN-12 (2x3)	-		
N MPQ3524-2001-AEC1	3.3	22	2	2.7	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	-	-	✓	QFN-12 (2x3)	-		
N MPQ3524-3000-AEC1	3.3	22	3	4.4	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	-	✓	-	-	✓	QFN-12 (2x3)	-		
N MPQ3524-3001-AEC1	3.3	22	3	4.4	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	-	-	✓	QFN-12 (2x3)	-		
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

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_d (Typ) (μ A)	V_{FB} (V)	f_{sw} (kHz)	$R_{DS(on)}$ (m Ω)	Fixed Output Versions (V)	Soft Start							Package	Notes
	External Sync	Spread Spectrum	FCCM	AAM Mode								Zero-Delay PWM (ZDP™)	Wettable Flank	QFN Option						
MPQ4320-AEC1	3.3	42	0.5	1.2	20	0.8	350 to 2500	70/50	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact		
MPQ4321-AEC1	3.3	42	1	2	20	0.8	350 to 2500	70/50	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact		
MPQ4322-AEC1	3.3	42	2	3.4	20	0.8	350 to 2500	70/50	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact		
MPQ4323-AEC1	3.3	42	3	5.8	20	0.8	350 to 2500	70/50	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact		
MPQ4324E-AEC1	3.3	42	3 (4 Peak)	6.5	20	0.8	350 to 2500	70/50	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (2x3)	MPQ4320 series, ultra-compact		

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 _O (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAM Mode	Zero-Delay PWM (ZDP™)	Wettable Flank QFN Option	Package	Notes
MPQ4323M-AEC1	3.3	42	3	5.8	20	0.8	350 to 2500	70/50	3.3, 5	Int	-	✓	✓	✓	-	✓	QFN-12 (3.5x3.5)	MPQ4320 series, ultra-compact, int. input capacitors
S MPQ4334-0XYZ-AEC1	3	40	0.5	1.35	20	0.85	200 to 2500	55/35	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4324 series
S MPQ4334-1XYZ-AEC1	3	40	1	2	20	0.85	200 to 2500	55/35	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4324 series
S MPQ4334-2XYZ-AEC1	3	40	2	3.4	20	0.85	200 to 2500	55/35	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4324 series
S MPQ4334-3XYZ-AEC1	3	40	3	5.8	20	0.85	200 to 2500	55/35	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4324 series
S MPQ4334-4XYZ-AEC1	3	40	4	6.5	20	0.85	200 to 2500	55/35	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4324 series
N MPQ4324-0500-AEC1	3.3	40	0.5	1	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N MPQ4324-0501-AEC1	3.3	40	0.5	1	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	✓	-	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N MPQ4324-1000-AEC1	3.3	40	1	1.5	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series

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) (μ A)	V_{FB} (V)	f_{sw} (kHz)	$R_{DS(on)}$ (m Ω)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAV Mode	Zero-Delay PWM (ZDP™)	Writeable Frank QFN Option	Package	Notes
N	MPQ4324-1001-AEC1	3.3	40	1	1.5	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	✓	-	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-1500-AEC1	3.3	40	1.5	1.8	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-1501-AEC1	3.3	40	1.5	1.8	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	✓	-	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-2000-AEC1	3.3	40	2	2.7	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-2001-AEC1	3.3	40	2	2.7	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	✓	-	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-3000-AEC1	3.3	40	3	4.4	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-3001-AEC1	3.3	40	3	4.4	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	✓	-	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series
N	MPQ4324-4000-AEC1	3.3	40	4 Peak	5	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	-	✓	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 series

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 Mode	Zero-Delay PWM (ZDP™)	Wettable Flank QFN Option	Package	Notes
N	MPQ4324-4001-AEC1	3.3	40	4 peak	5	20	0.8	350 to 2500	70/50	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	-	✓	✓	-	-	✓	QFN-12 (2x3), QFN-12 (3x4), QFN-14 (2.5x3.5)	Pin-compatible with MPQ4334 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 memory
	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
	MPQ4341-AEC1	3.3	42	5	7.7	3.0	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase, ultra-low I _Q
	MPQ4345-AEC1	3.3	42	2	5.8	3.0	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
	MPQ4346-AEC1	3.3	42	3	5.8	3.0	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
	MPQ4347-AEC1	3.3	42	4	7.7	3.0	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
	MPQ4348-AEC1	3.3	42	5	7.7	3.0	-	350 to 2500	60/35	3.3, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Single-phase, ultra-low I _Q
N	MPQ4340A-2XYZ-AEC1	3.3	42	2	4.4	3	0.6	350 to 2500	60/35	1, 1.1, 1.8, 2.5, 3, 3.3, 3.8, 4, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase capable
N	MPQ4340A-3XYZ-AEC1	3.3	42	3	4.4	3	0.6	350 to 2500	60/35	1, 1.1, 1.8, 2.5, 3, 3.3, 3.8, 4, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase capable
N	MPQ4340A-4XYZ-AEC1	3.3	42	4	5.9	3	0.6	350 to 2500	60/35	1, 1.1, 1.8, 2.5, 3, 3.3, 3.8, 4, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase capable
N	MPQ4340A-5XYZ-AEC1	3.3	42	5	5.9	3	0.6	350 to 2500	60/35	1, 1.1, 1.8, 2.5, 3, 3.3, 3.8, 4, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase capable
N	MPQ4340A-6XYZ-AEC1	3.3	42	6	7.2	3	0.6	350 to 2500	60/35	1, 1.1, 1.8, 2.5, 3, 3.3, 3.8, 4, 5	Ext	✓	✓	✓	✓	✓	✓	QFN-17 (3x4)	Multi-phase capable
	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
	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
	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

Buck Regulators

40V to 50V Synchronous Buck with Frequency Spread Spectrum

	Part Number	V_{in} (Min) (V)		I_{out} (A)	I_{sw} Limit (Typ) (A)	I_o (Typ) (mA)	V_{FB} (V)	f_{sw} (kHz)	$R_{DS(on)}$ (mΩ)	Fixed Output Versions (V)		Soft Start	External Sync	Spread Spectrum	FCCM	AAM Mode	Zero-Delay PWM (ZDP™)	Wettable Flank QFN Option	Package	Notes
		Max	Abs Max							Ext	Int	✓	✓	✓	✓	✓	✓	✓		
	MPQ4317-AEC1	3.3	50	7	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	
	MPQ4480-AEC1	4.2	40	6	17/22	1000	1	235 to 2200	20/15	-	Int	✓	✓	-	-	-	✓	QFN-25 (4x5)	Adjustable line drop compensation	
N	MPQ8856-AEC1 (Hybrid)	4	40	5	11	400	0.825	450/1000	20	-	Int	-	✓	-	-	-	✓	QFN-16 (3x3)	Low-side int., supports 100% duty cycle and PMBus interface	
S	MPQ8857-AEC1	4	40	5	11	400	0.825	450/1000	20/18	-	Int	-	✓	-	-	-	✓	QFN-16 (3x3)	Supports 100% duty cycle and PMBus interface	
	MPM3551-AEC1	3.3	42	3	5.8	20	0.8	2200	70/50	-	Int	-	✓	-	✓	-	✓	QFN-20 (4x6)	Module with integrated inductor	
	MPM3551C-AEC1	3.3	42	3	5.8	1200	0.8	2200	70/50	-	Int	-	✓	✓	-	-	✓	QFN-20 (4x6)	Module with integrated inductor	
	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	
	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	
N	MPQ4327-AEC1	3.3	36	7	11	20	0.8	200 to 2500	45/25	-	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	Ultra-compact, low I_o	
	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	
N	MPQ4326B-3000-AEC1	3.3	36	3	4.4	20	0.8	200 to 2500	45/25	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	-	
N	MPQ4326B-4000-AEC1	3.3	36	4	5	20	0.8	200 to 2500	45/25	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	-	
N	MPQ4326B-5000-AEC1	3.3	36	5	6	20	0.8	200 to 2500	45/25	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	-	
N	MPQ4326B-6000-AEC1	3.3	36	6	7.5	20	0.8	200 to 2500	45/25	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	-	
N	MPQ4326B-7000-AEC1	3.3	36	7	8	20	0.8	200 to 2500	45/25	1, 1.8, 2.5, 3, 3.3, 3.8, 5	Int	✓	✓	✓	✓	-	✓	QFN-14 (4x4)	-	
N	MPQ4371-6000-AEC1	3.3	42	6	7.2	3.5	0.6	200 to 2500	21.5/10	1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	-	
N	MPQ4371-8000-AEC1	3.3	42	8	9.6	3.5	0.6	200 to 2500	21.5/10	1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	-	

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) (μ A)	V_{FB} (V)	f_{SW} (kHz)	$R_{DS(ON)}$ (m Ω)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAM Mode	Zero-Delay PWM (ZDP™)	Wettable Flank QFN Option	Package	Notes
N	MPQ4371-0000-AEC1	3.3	42	10	12	3.5	0.6	200 to 2500	21.5 /10	1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	-	
N	MPQ4371-1000-AEC1	3.3	42	11	13.2	3.5	0.6	200 to 2500	21.5 /10	1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	-	
S	MPQ4372-AEC1	3.3	42	11	13.2	3.5	0.6	200 to 2500	21.5 /10	1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-23 (4x5)	Multi-phase	
S	MPQ4385-5XYZ-AEC1	3.3	40	25	37	14	0.8	200 to 2500	5.25/3.35	0.8, 1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-32 (5x6)	Multi-phase	
S	MPQ4385-2XYZ-AEC1	3.3	40	22	33	14	0.8	200 to 2500	5.25/3.35	0.8, 1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-32 (5x6)	Multi-phase	
S	MPQ4385-0XYZ-AEC1	3.3	40	20	30	14	0.8	200 to 2500	5.25/3.35	0.8, 1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-32 (5x6)	Multi-phase	
S	MPQ4385-8XYZ-AEC1	3.3	40	18	27	14	0.8	200 to 2500	5.25/3.35	0.8, 1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-32 (5x6)	Multi-phase	
S	MPQ4385-4XYZ-AEC1	3.3	40	15	22.5	14	0.8	200 to 2500	5.25/3.35	0.8, 1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-32 (5x6)	Multi-phase	
S	MPQ4385-3XYZ-AEC1	3.3	40	12	18	14	0.8	200 to 2500	5.25/3.35	0.8, 1, 1.2, 1.8, 2.5, 3.3, 3.8, 5	Int	✓	✓	✓	✓	✓	✓	QFN-32 (5x6)	Multi-phase	

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) (μ A)	V_{FB} (V)	f_{SW} (kHz)	$R_{DS(ON)}$ (m Ω)	Fixed Output Versions (V)	Soft Start	External Sync	Spread Spectrum	FCCM	AAM Mode	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_Q	
	MPQ4418-AEC1	4	40	0.6	5.6	600	0.792	410	90/55	-	Int	✓	-	✓	-	✓	-	TSOT23-8	MPQ4420 series	
	MPQ4418A-AEC1	4	40	0.6	1.7	600	0.792	410	90/55	-	Int	✓	-	✓	-	✓	-	TSOT23-8	MPQ4420 series	

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	ALM Mode	Fixed Frequency	Wettable Flank QFN Option	Package	Notes
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
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
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 _O , 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 _O , 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 _O , 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 _O
MPQ4436B-AEC1	3.3	50	6	13	18	0.815	2200	48/20	3.3, 5	Ext	✓	-	✓	✓	✓	✓	QFN-20 (4x4)	Multi-phase, low I _O

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_Q (Typ) (μ A)	V_{FB} (V)	f_{SW} (kHz)	$R_{DS(ON)}$ (m Ω)	Fixed Output Versions (V)	Soft Start	External Sync	FCCM	AAM Mode	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
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
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
N MPM3901-AEC1	4.5	65	1	1.95	40	0.8	200 to 2200	250/45	-	Int	-	✓	✓	-	✓	QFN-12 (2.5x3)	Low- I_Q , compact module with an integrated inductor
N MPQ8880A-AEC1	4	60	4.5	5.5	8	0.15/0.6/0.999/1.5	150 to 2200	60/43	-	Int	✓	✓	✓	✓	✓	QFN-20 (4x5)	Prog. soft-start time, PG, multi-phase

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_Q (Typ) (μ A)	V_{FB} (V)	f_{SW} (kHz)	$R_{DS(ON)}$ (m Ω)	Soft Start	External Sync	FCCM	AAM Mode	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

Buck Controllers

Part Number	V_{IN} (Min) (V)	V_{IN} (Abs. Max) (V)	I_O (Typ) (µA)	I_{SO} Limit (Typ) (A)	V_{FB} (V)	f_{SW} (kHz)	Fixed Output Versions	Soft Start	External Sync	FCCM	AAM Mode	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%)
S MPQ2923-AEC1	3.6	42	20	2.2	1.2	200 to 2200	1.2, 1.8, 2.5, 3.3, 3.8, 5, 12, 15, 18	Ext	✓	✓	✓	✓	✓	QFN-24 (4x4)	Spread spectrum, multi-phase
S MPQ9934-AEC1	5.5	85	400	8 (Max)	0.17/0.5/ 0.667/ 1.2/1.6	100 to 1000	-	Ext	-	✓	✓	Prog.	✓	QFN-23 (4x4)	Multi-phase, GaN driver capability

Buck Regulators

Non-Synchronous Buck

Part Number	V_{IN} (Min) (V)	V_{IN} (Abs. Max) (V)	I_{OUT} (A)	I_{SO} Limit (Typ) (A)	I_O (Typ) (µA)	V_{FB} (V)	f_{SW} (kHz)	$R_{ESR(OM)}$ (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 soft start
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 & Buck-Boost Regulators

MPS offers a 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.



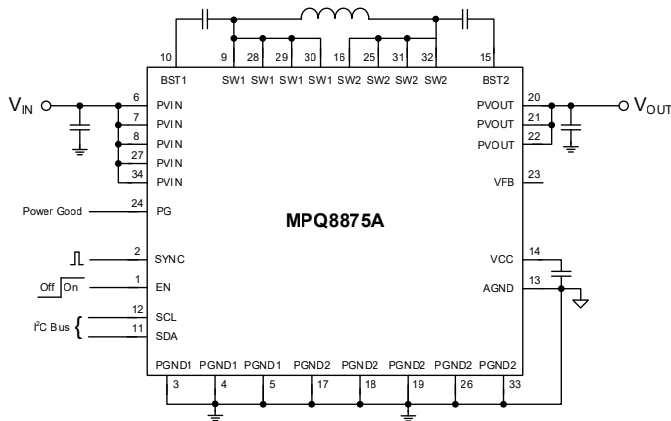
High Efficiency

EMI-Optimized

Compact Solution

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
- Frequency spread spectrum (FSS) 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 (V_{OUT}) options

Additional Features

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

Key Specifications:

4.2V to 42V	2x 10mΩ 2x 25mΩ	200kHz to 1MHz	QFN-34 (4mmx5mm)
Input Voltage	Built-In FETs	Switching Frequency	Package

Available in Pin-Compatible Family:

20W MPQ8873	30W MPQ8875A
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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 _Q (Typ) (µA)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	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 prog. 4-switch converter with advanced protections
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 prog. 4-switch converter with advanced protections
P MPQ8874-xxxx-AEC1	4	42	1 to 30	4	20	200 to 2200	Buck 20/40, Boost 40/20	I ² C	✓	✓	✓	QFN-22 (4x5)	-
S MPQ8872-xxxx-AEC1	4	42	1 to 30	2	20	200 to 2200	Buck 20/40, Boost 40/20	I ² C	✓	✓	✓	QFN-22 (4x5)	-
S MPQ8835A-xxxx-AEC1	3	40	1 to 24	6	130	280/420/600/1000	Buck 12/16, Boost 7/7	I ² C	✓	✓	✓	QFN-19 (4x5)	-
MPQ4262-AEC1 (Hybrid)	3.6	40	1 to 36	5	130	280/420/600	20/14	I ² C	✓	✓	✓	QFN-20 (3x5)	100W, two int. FETs, 98% peak efficiency
MPQ4263-AEC1	3.6	40	1 to 36	5	135	280/420/600	20/14	I ² C	✓	✓	✓	QFN-20 (3x5)	100W, two int. FETs, 98% peak efficiency, high-side current sense
N MPQ4232-AEC1	4.3	40	1 to 22	5	130	280/420/600/1000	10/14 /6/6	I ² C	✓	✓	✓	QFN-19 (4x5)	22V/5A, 4-switch converter with advanced protection
S MPQ4232A-AEC1	3	40	1 to 24	6	130	280/420/600/1000	Buck: 12/16 Boost: 7/7	I ² C	✓	✓	✓	QFN-19 (4x5)	36V/5A, 4-switch converter with advanced protection, P2P with MPQ4232-AEC1

BOOST REGULATORS | AUTOMOTIVE

Boost Regulators Synchronous Boost

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	V _{OUT} (Max) (V)	I _{SP} Limit (Typ) (A)	I _O (Typ) (µA)	I _{SP} (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	Current Limit (A)	R _{DS(on)} (mΩ)	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
MPQ3413-AEC1	1.8	4	5	3.6	8	0.1	-	2.2	3.6	80/70	5	✓	-	TSOT23-5	-
MPQ3414B-AEC1	2.8	4	5	3.6	8	0.1	-	2.2	3.6	80/70	5	✓	-	TSOT23-5	Mode
S MPQ3414C-AEC1	2.8	4	5	3.6	8	0.1	-	2.2	3.6	80/70	5	✓	-	TSOT23-5	Sync/mode
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
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
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
N 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
N MPQ3438-xxxx-AEC1	0.8	10	16	2	150	2	1	2600	2	6/9.5	Adj	✓	✓	QFN-8 (1.5x2)	-

Boost Regulators

Boost Controllers

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _Q (Typ) (µA)	I _{SW} (Typ) (µA)	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	45	40	15	Adj	250 to 2500	2	Adj	✓	✓	✓	QFN-21 (5x5)	Multi-phase capable, spread spectrum, digitally prog. I ² C/SPI
S MPQ3446-AEC1	6	60	60	15	Adj	250 to 2500	2	Adj	✓	✓	✓	QFN-21 (5x5)	Multi-phase capable, spread spectrum, digitally prog. I ² C/SPI
S MPQ3447-AEC1	6	85	60	15	Adj	250 to 2500	2	Adj	✓	✓	✓	QFN-21 (5x5)	Multi-phase capable, spread spectrum, digitally prog. I ² C/SPI

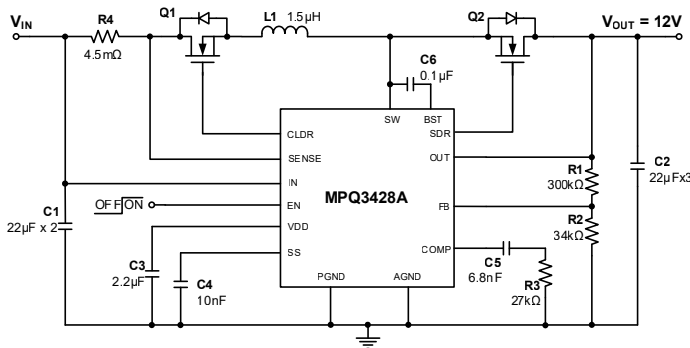
Boost Regulators

Non-Synchronous Boost

Part Number	V _{IN} (Min) (V)	V _{SW} (Max) (V)	V _{OUT} (Max) (V)	I _{SW} Limit (Typ) (A)	I _Q (Typ) (µA)	V _{FB} (V)	f _{SW} (kHz)	R _{DS(on)} (mΩ)	Soft Start	OVP	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)	Prog. UVLO and EN hysteresis
MPQ3425-AEC1	3.1	22	55	5	650	1.225	300 to 2000	90	Ext	✓	✓	QFN-14 (3x4)	Prog. UVLO and EN hysteresis
MPQ3452-AEC1	3.1	22	22	5	650	1.225	300 to 2000	90	Ext	✓	✓	QFN-14 (3x4)	Prog. UVLO and EN hysteresis

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-22 (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

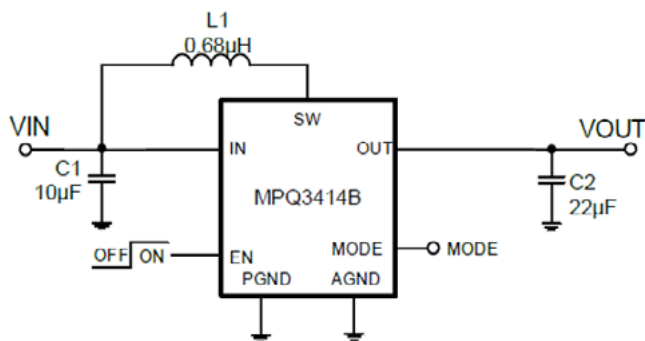
Integrated compensation network
Fixed output voltage options

Additional Features

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

MPQ3414B-AEC1

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



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

Protections

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

Key Specifications:

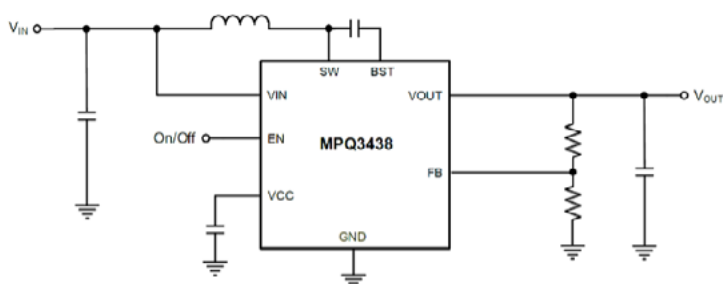
2.8V to 3.6V	5V	0.25 to 0.5A	2.2MHz	TSOT23-8
Input Voltage	Output Voltage	Output Current	Switching Frequency	Package

Available in Pin-Compatible Family:

MPQ3413	250mA
MPQ3414B	500mA

MPQ3438-AEC1 NEW

10V In, 16V Out, 2A Compact Boost Converter



Key Specifications:

2.7V to 10V	Up to 16V	2.6MHz	2A	QFN-8 (1.5mmx2mm)
Input Voltage	Output Voltage	Switching Frequency	Output Current	Package

Available PSM or FCCM in Pin-Compatible Family:

Power-Save Mode (PSM) under Light Loads MPQ3438-0000	Forced Continuous Conduction Mode (FCCM) MPQ3438-0001
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Features

Flexible Input and Output Operating Range

- 2.7V to 10V start-up input voltage, 0.8V to 10V operating input voltage
- 2A, 16V output voltage (V_{OUT}) range

Designed for High Power Efficiency and Performance

- Adaptive constant-on-time (COT) for fast transient response
- Power-save mode (PSM) at light loads
- >88% efficiency
- Automatic pass-through mode when V_{IN} > V_{OUT}
- Internal soft start and compensation

Cost Effective and Compact System

- 2.6MHz Fixed high switching frequency
- Integrated low R_{dson} LS/HS MOSFETs (55mΩ/100mΩ)
- Small QFN-8 (1.5mmx2mm) package

Protection

- Configurable under-voltage lockout (UVLO) and hysteresis
- Over-temperature protection (OTP), input and output over-voltage protection (OVP), and over-current protection (OCP)
- Thermal shutdown

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.

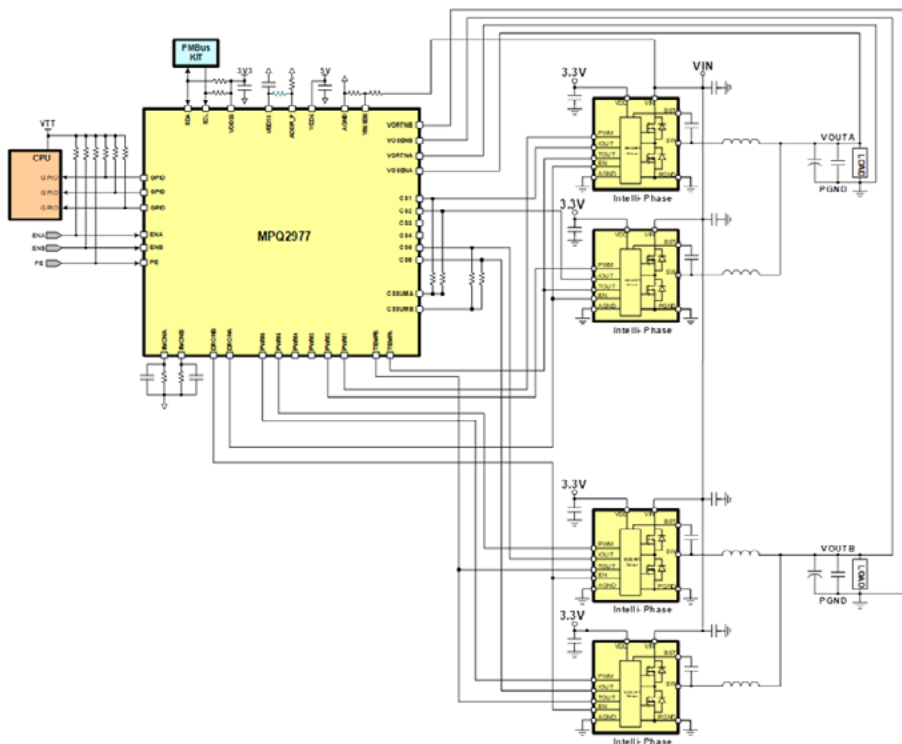


High Efficiency

Fast Transient Response

Compact Solutions

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

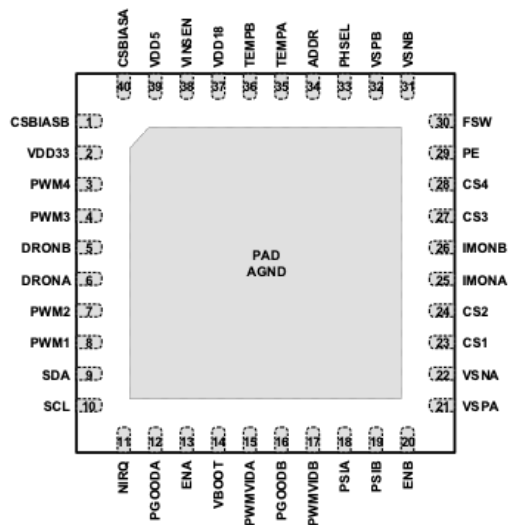
- Monolithic design means fewer components and improved robustness
- Reduced switching losses and higher efficiency
- Superior current-sense accuracy

Fewer External Components

- Lower cost
- More compact design

MPQ2967FS-AEC1

2-Rail, 4-Phase Digital Controller



QFN-40
(6mmx6mm), 0.5mm Pitch

Customer Benefits

Proven design for Nvidia Orin and other ADAS platforms
 Constant-on-time (COT) pulse-width modulation (PWM) scheme offering fast transient response to reduce C_{OUT}
 Digital control for flexibility, optimized tuning, and design cycles

Features

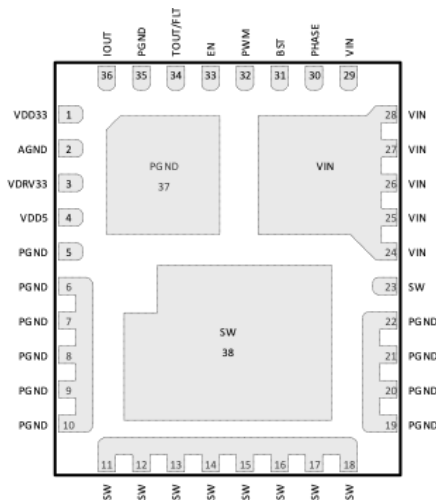
Programming and monitoring
 PWM-VID interface compliant
 Built-in MTP to store custom configurations
 Automatic loop compensation, automatic phase-shedding, and phase-to-phase active current balancing
 Input voltage (V_{IN}), output voltage (V_{OUT}), output current (I_{OUT}), and regulator temperature monitoring
 Protections include under-voltage lockout (UVLO), over-voltage protection (OVP), under-voltage protection (UVP), over-current protection (OCP), and over-temperature protection (OTP)
 Runtime register cyclic redundancy check (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

50A Intelli-Phase™ DrMOS



LGA
(5mmx6mm)

Customer Benefits

Proven design for Nvidia Orin and other ADAS platforms
 Monolithic design offers higher switching frequency (f_{sw}) to reduce inductor and capacitor size
 Optimized process technology for best efficiency to extend EV battery range

Features

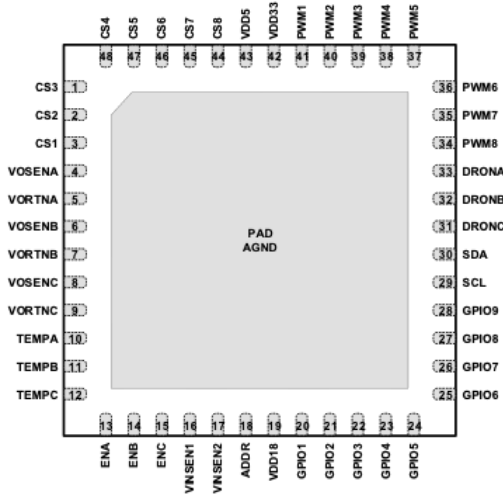
Wide 3V to 22V operating input voltage (V_{IN}) range
 5V VDD input
 VDRV33 and VDD33 supported by internal LDO
 Current-sensing with Accu-Sense™
 Temperature-sensing
 Accepts tri-state pulse-width modulation (PWM) input
 Current-limit protection
 Over-temperature protection (OTP)
 Fault reporting

Applications

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

MPQ2946

3-Rail, 8-Phase Digital Controller



QFN-48
(7mmx7mm), 0.5mm Pitch

Customer Benefits

Advanced COT PWM (ACP™) for lower output capacitance and predictable EMI
Digital control for flexibility, optimized tuning, and fast design cycles

Features

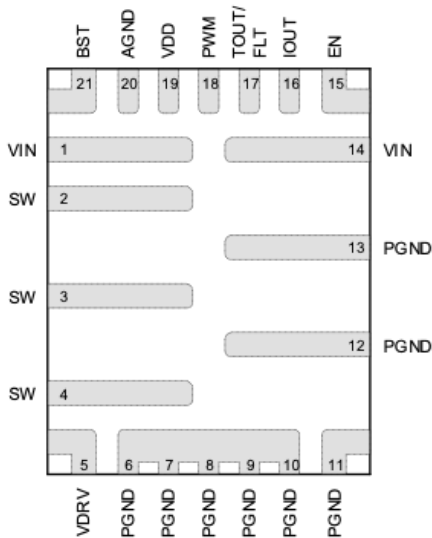
- Digital interface for programming and monitoring
- Built-in MTP to store custom configurations
- Automatic loop compensation, automatic phase-shedding, and phase-to-phase active current balancing
- Digital load-line regulation
- Input voltage (V_{IN}), output voltage (V_{OUT}), output current (I_{OUT}), and regulator temperature monitoring
- Protections include under-voltage lockout (UVLO), over-voltage protection (OVP), under-voltage protection (UVP), over-current protection (OCP), and over-temperature protection (OTP)
- Separate EN for each rail
- Separate V_{IN} sensing
- 9 programmable, general-purpose, open-drain output pins

Applications

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

MPQ86760-AEC1

45A Intelli-Phase™ DrMOS



LGA
(4mmx5mm)

Customer Benefits

For 3.3V/5V inputs and monolithic design enable higher switching frequency (f_{sw}) to reduce passive component size and cost
Optimized process technology for best efficiency to extend EV battery range

Features

- 3V to 6V operating input voltage (V_{IN}) range
- 3.3V VDRV/VDD input
- 45A continuous output current (I_{OUT})
- Current-sensing with Accu-Sense™
- Temperature-sensing
- Accepts tri-state pulse-width modulation (PWM) input
- Current-limit protection
- Over-temperature protection (OTP)
- Fault reporting
- Ultra-low quiescent current (I_Q)

Applications

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

AUTOMOTIVE COMPUTE SOC CORE POWER | AUTOMOTIVE

Automotive Compute SoC Core Power Multi-Phase Digital Controllers

Part Number	Control Method	System Interface	Memory Type	Memory Type		V _{CC} (Typ) (V)	I _Q (Typ) (mA)	f _{SW} (Max) (kHz)	Wettable Flank QFN Option	Package	Notes
				# of Rails	# of Phases						
MPQ2977-AEC1	Digital	Digital Interface/I ² C	MTP	2	6	5	15	1250	✓	TQFN-40 (6x6)	-
MPQ2967-AEC1	Digital	Digital Interface/I ² C	MTP	2	4	5	20	2000	✓	TQFN-40 (6x6)	MPSafe™, ASIL-D
MPQ2946-AEC1	Digital	Digital Interface/I ² C	MTP	3	8	5	20	2000	✓	TQFN-48 (7x7)	-
S MPQ29125-AEC1	Digital	Digital Interface/I ² C	MTP	3	8	3.3	13	2000	-	TQFN-52 (6x6)	-
S MPQ29164-AEC1	Digital	Digital Interface/I ² C	MTP	2	6	3.3	8	2000	✓	TQFN-48 (6x6)	-
S MPQ72957-AEC1	Digital	Digital Interface/I ² C	MTP	4	8	5	20	2000	✓	TQFN-48 (7x7)	MPSafe™, ASIL-D
S MPQ72963-AEC1	Digital	Digital Interface/I ² C	MTP	3	9	5	25	2000	✓	TQFN-48 (7x7)	MPSafe™, ASIL-D
S MPQ29270-AEC1	Digital	Digital Interface/I ² C	MTP	3	11	5	35	2000	✓	TQFN-56 (8x8)	-

Automotive Compute SoC Core Power Intelli-Phase™ DrMOS

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Load Current (A)	V _{CC} (Typ) (V)	I _Q (Typ) (mA)	Integrated Current Sense	Integrated Temp Sense	Fault Indicator	Wettable Flank QFN Option	Package
N MPQ86960-A-AEC1	3	22	50	5	25	✓	✓	✓	-	LGA-38 (5x6)
N MPQ86760-AEC1	3	6	45	3.3	25	✓	✓	✓	✓	QFN-21 (4x5)
S MPQ86970-AEC1	3	22	50	5	25	✓	✓	✓	-	LGA-41 (5x6)
S MPQ86761-AEC1	3	6	60	3.3	25	✓	✓	✓	✓	QFN-21 (3.5x6)
S MPQ86725-AEC1	3	6	25	3.3	25	✓	✓	✓	✓	QFN-17 (3.5x6)
S MPQ86770-AEC1	3	6	45	3.3	25	✓	✓	✓	-	LGA-30 (4x5)
S MPQ86771-AEC1	3	6	45	3.3	25	✓	✓	✓	-	LGA-38 (5x6)

Automotive Compute SoC Core Power Intelli-Phase™ PoLs

Part Number	Control Method	System Interface	Memory Type	V _{IN} (Min) (V)		V _{IN} (Max) (V)		Load Current (A)	V _{CC} (Typ) (V)	I _Q (Typ) (mA)	Integrated Current Sense	Integrated Temp Sense	f _{SW} (Max) (kHz)	Wettable Flank QFN Option	Package	Notes
				V _{IN} (Min) (V)	V _{IN} (Max) (V)	V _{IN} (Min) (V)	V _{IN} (Max) (V)									
S MPQ29240-AEC1	Digital	Digital Interface/I ² C	MTP	4	22	40	3.3	25	✓	✓	1000	✓	QFN-27 (5x6)	-		
S MPQ29230-AEC1	Digital	Digital Interface/I ² C	MTP	4	22	30	3.3	25	✓	✓	1000	✓	QFN-27 (5x6)	-		
S MPQ29261-AEC1	Digital	-	-	4.5	22	18	3.3	20	✓	✓	800	✓	QFN-19 (3x4)	-		
S MPQ81811-AEC1	Digital	-	-	2.5	22	8	3.3	4	✓	✓	900	-	QFN-13 (2x3)	-		

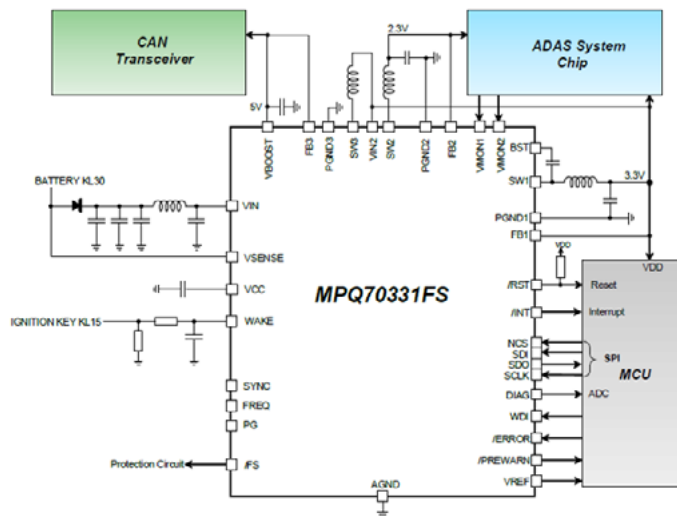
PMICs

MPS's automotive PMICs make it easy to manage multiple power rails with integrated system power sequencing and digital configuration 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

ASIL-D, 42V, 3-Channel PMIC Optimized for Safety Applications



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 (f_{sw})
(Reduced external component size)

Delivers Mission-Critical Safety

ISO 26262 functional safety rating of ASIL-D
Interrupt pin to MCU or SoC
Integrated voltage supervisor with
under-voltage (UV) and over-voltage (OV) monitoring
Watchdog (windowed or Q&A)
Analog and digital built-in self-testing (BIST)
Multi-page one-time programmable (MOTP) memory
SPI interface with cyclic redundancy check (CRC)
Auxiliary voltage monitor
Clock monitoring
Over-current protection (OCP), thermal warning
and shutdown

Optimized for EMI/EMC

Up to 2.5MHz f_{sw}
Frequency spread spectrum (FSS)

Key Specifications:

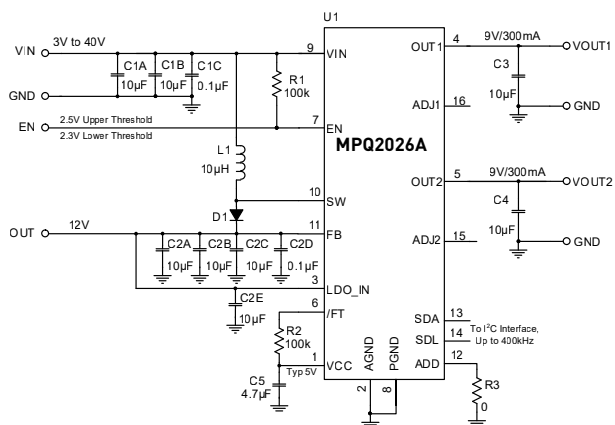
4.5V to 42V	ASIL-D	QFN-34 (6mmx6mm)
Input Voltage	Functional Safety Rating	Package

3 Outputs:

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

MPQ2026A-AEC1

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 for all regulator outputs
Frequency spread spectrum (FSS)

Minimizes External Circuits
No external resistor network required for output voltage (V_{OUT}) settings

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

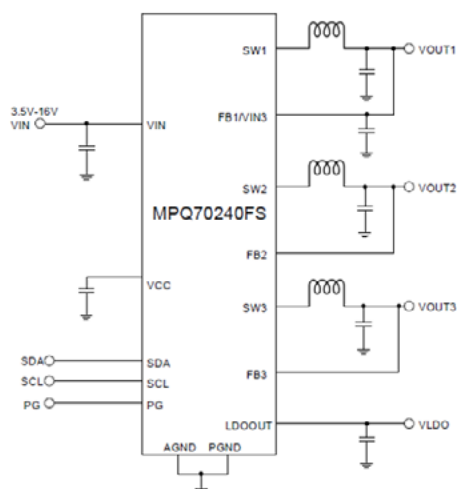
Key Specifications:

3V to 40V Input Voltage	32µA I_o in Standby Mode	400kHz to 2.2MHz Switching Frequency	QFN-16 (4mmx4mm) Package	2A Pre-Boost	300mA LDO 1	300mA LDO 2
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3 Outputs:

MPQ70240FS-AEC1 NEW

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 (f_{SW})
Frequency spread spectrum (FSS)
Symmetrical input capacitors
MeshConnect™ flip-chip package

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

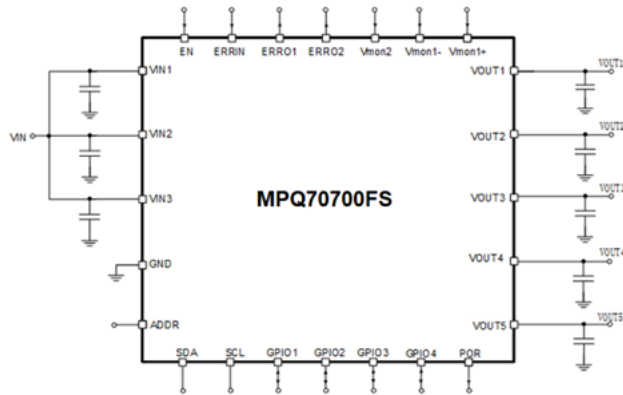
Programmability for Flexibility in Application
I²C-compliant interface

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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MPQ70700FS-AEC1

MPSafe™, 5.5V, 5-Channel PMIC



Key Specifications:

2.7V to 5.5V Input Voltage	100mV @ 300mA Load Dropout Voltage	5x 350mA Output Current
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MPQ70700FS (ASIL-D) MPQ70701FS (ASIL-B) Versions	TQFN-24 (5mmx5mm) Package
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Features

Do More with Less

- 5 low-dropout (LDO) regulators
- Configurable outputs: 0.75V, 0.9V, 1.8V, 3.3V, 5V, or more
- 3 independent input pins to increase LDO efficiency
- 4 GPIO pins: Sync with other PMICs to achieve different power sequences
- Configurable as an input for different operation modes
- Integrated power sequencing

Built for Mission-Critical Safety Applications

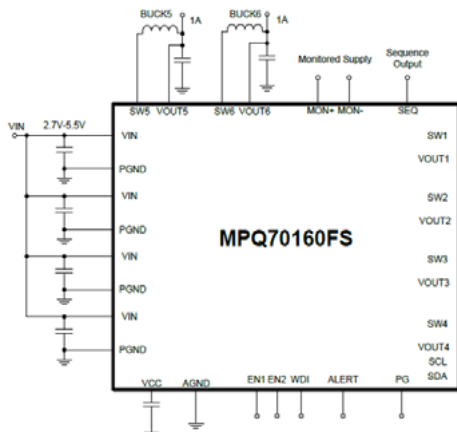
- MPSafe™: ISO 26262 Functional Safety rating of ASIL-D
- Integrated monitor with under-voltage (UV) and over-voltage (OV) monitoring on all channels
- 2 auxiliary voltage monitors, including 1 differential monitor
- Analog and digital built-in self-testing (BIST)
- Cyclic redundancy check (CRC) for communication, memory, and OTP
- Clock monitoring
- Over-current protection (OCP), thermal warning, and shutdown

Programmability for Flexibility in Application

- Multi-page one-time programmable (MOTP) memory
- I²C interface with PEC for sequential read and write

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 (UV) and over-voltage (OV) monitoring
- Watchdog (windowed or Q&A)
- Analog and digital built-in self-testing (BIST)
- Cyclic redundancy check (CRC) for communication, memory, and OTP
- Auxiliary voltage monitor and clock monitoring
- Over-current protection (OCP), thermal warning and shutdown

Programmability for Flexibility in Application

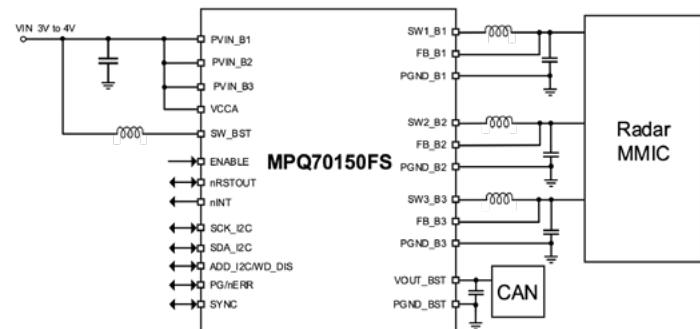
- Multi-page one-time programmable (MOTP) memory
- I²C-compliant interface

Optimized for EMI/EMC

- 2MHz switching frequency (f_{sw})
- Frequency spread spectrum (FSS)
- 180° phase-shift between bucks 1/3/6 and bucks 2/4/5

MPQ70150FS

MPSafe™ 5.5V, 18MHz Radar PMIC



Key Specifications:

3V to 5V | **3x 3A + 500mA**
 Input Voltage | Output Current

43mΩ/25mΩ (Buck) | **QFN-28 (5mmx5mm)**
100mΩ (Boost) | **Wettable Flank**
 MOSFET $R_{DS(ON)}$ | Package

Applications

Long-Range Radar | Mid-Range Radar | Short-Range Radar

Features

Optimized for Radar MMIC Loads

- Three configurable step-down DC/DC regulators
- Configurable 0.9V to 1.9V output voltage (V_{OUT})
- Output current (I_{OUT}) rated up to 3A
- 5V boost regulator up to 500mA
- Integrated low- $R_{DS(ON)}$ MOSFETs using advanced MPS's BCD process
- Minimal external BOM overhead

Focused Attention on EMI/EMC, Noise and Output Ripple Reduction

- Configurable switching frequency (f_{sw}) up to 18MHz (no need for a lossy LDO-based architecture and minimizes output filters)
- Frequency spread spectrum (FSS) with optional pseudo-random pattern
- Excellent load step performance compared to current mode control

Achieve Functional Safety Goals

- MPSafe™ – ISO 26262 functional safety rating of ASIL-B
- Built-in self-testing (BIST)
- Configurable sequencing and monitoring
- Watchdog timer
- Protection features

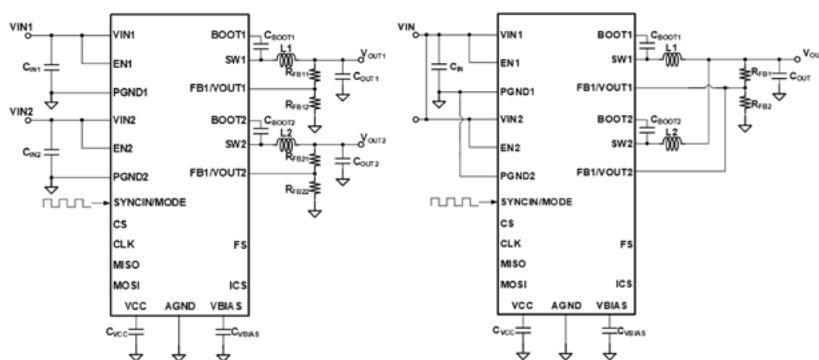
Vast Flexibility through Digital Programmability

- Dynamically adjust V_{OUT} , f_{sw} , current slew rate, protection thresholds, and more
- I²C interface with optional packet error checking (PEC)

MPQ73350FS

NEW

MPSafe™ 42V Digital Dual Buck



Key Specifications:

3.5V to 42V | **21.4mΩ / 9mΩ**
 Input Voltage | MOSFET $R_{DS(ON)}$

QFN-28 (5mmx6mm)
Wettable Flank
 Package

MPQ73350FS (ASIL-B)
 MPQ73351FS (ASIL-D)
 MPQ4390 (QM)

Versions

Applications

Advanced driver-assistance systems (ADAS)
 Automotive infotainment

Features

Built to Handle Tough Automotive Transients

- Load dump up to 42V, cold crank down to 3V
- Zero-Delay PWM™ (ZDP™) Control

Enables High Power Density

- 14A (20A with heatsink) output current (I_{OUT}) with 2 channels in parallel
- 7A (10A with heatsink) I_{OUT} for each channel
- Integrated ultra-low $R_{DS(ON)}$ MOSFETs using MPS's advanced BCD process
- Meshconnect™ flip-chip package

Designed for Functional Safety Requirements

- Device is rated for a ISO 26262 functional safety grade up to ASIL-D
- Built in self-testing (BIST)
- 8-bit analog-to-digital converter (ADC) monitors I_{OUT} , output voltage (V_{OUT}), and input voltage (V_{IN})
- Individual PG for each channel and /FS pin
- Open/short-circuit, under-voltage protection (UVP), over-voltage protection (OVP), latch-off over-current protection (OCP), and thermal shutdown (TSD)

Ideal for Off-Battery Applications

- Low quiescent current (I_Q) and shutdown current
- Selectable AAM mode or FCCM

Optimized for EMI/EMC

- Frequency spread spectrum (FSS)
- 250kHz to 2.5MHz switching frequency (f_{sw})

Vast Flexibility through Digital Programmability

- Adjust parameters including voltage, slew rate, switching frequency, protection thresholds, and more
- I²C/SPI interface with optional cyclic redundancy check (CRC)

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)	Adj Power Sequencing	Frequency Spread Spectrum	MPSafe™ (Functional Safety)	Interface	Wettable Flank QFN Option	Package	Notes
N	MPQ70430FS-AEC1	4.5	65	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
N	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
N	MPQ70332FS-AEC1	4.5	42	3	2 Bucks, 1 Boost	Buck: 2/1.5 Boost: 0.25	2.5	-	✓	✓	SPI	✓	QFN-34 (6x6)	ASIL-B independent voltage supervisor, power FET leakage monitoring, extensive protections, battery failure pre-warning
N	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
S	MPQ70336FS-AEC1	3.1	42	5	1 Buck, 4 Voltage Monitors	Buck: 4	2.5	✓	✓	✓	I ² C	✓	TQFN-25 (3x6)	ASIL-D, 4x voltage monitors with 2 single-ended and 2 differential inputs
S	MPQ70340FS-AEC1	3.5	40	3	3 Bucks	Buck: 0.6/0.6/1	2.2	✓	✓	✓	I ² C	✓	QFN-15 (2.5x3.5)	ASIL-B, for camera modules powered off-battery
S	MPQ73350FS-AEC1	4	40	2	2 Bucks	Buck: 7/10 (w/ Heatsink)	2.2	✓	✓	✓	SPI/I ² C	✓	QFN-28 (5x6)	ASIL-B, digital, dual outputs, ADC for diagnostics
S	MPQ73351FS-AEC1	4	40	2	2 Bucks	Buck: 7/10 (w/ Heatsink)	2.2	✓	✓	✓	SPI/I ² C	✓	QFN-28 (5x6)	ASIL-D, digital, dual outputs, ADC for diagnostics
	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}
	MPQ2024A-AEC1	3	40	2	2 LDOs	LDO: 0.3/0.3	2.2	✓	✓	-	I ² C	✓	QFN-16 (4x4)	Digitally programmable V _{OUT}
	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 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, for camera modules powered over coaxial cable
N	MPQ70241FS-AEC1	3.5	18	4	3 Bucks, 1 LDO	Buck: 1/0.6/1.2 LDO: 0.2	2.2	✓	✓	✓	I ² C	✓	QFN-15 (2.5x3.5)	ASIL-B, for camera modules, uprated current, powered over coaxial cable
N	MPQ7929-AEC1	3.5	18	4	3 Bucks, 1 LDO	Buck: 1/0.6/1.2 LDO: 0.2	2.2	✓	✓	✓	I ² C	✓	QFN-15 (2.5x3.5)	For camera modules, uprated current, 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)	For camera modules powered over coaxial cable

	Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	# of Channels	Configuration	Current Ratings (A)	f _{SW} (Max) (MHz)	Multi-Phase Outputs	Frequency Spread Spectrum	MPSafe™ (Functional Safety)	Interface	Wettable Flank QFN Option	Package	Notes
N	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, ext. voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
N	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, ext. voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
N	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, ext. voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
N	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, ext. voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
S	MPQ70170FS-AEC1	2.8	5.5	9	5 Bucks, 4 LDOs	Buck: 4/4/4/4/2 LDO: 0.35/0.35/0.35/0.35	2	✓	✓	✓	I ² C	✓	QFN-56 (8x8)	ASIL-D, 13x GPIOs, user-configurable state machine system OVP, DrMOS mode, Q&A watchdog timer
S	MPQ70171FS-AEC1	2.8	5.5	9	5 Bucks, 4 LDOs	Buck: 4/4/4/4/2 LDO: 0.35/0.35/0.35/0.35	2	✓	✓	✓	I ² C	✓	QFN-56 (8x8)	ASIL-B, 13x GPIOs, user-configurable state machine system OVP, DrMOS mode, Q&A watchdog timer
S	MPQ7907-AEC1	2.8	5.5	9	5 Bucks, 4 LDOs	Buck: 4/4/4/4/2 LDO: 0.35/0.35/0.35/0.35	2	✓	✓	✓	I ² C	✓	QFN-56 (8x8)	QM, 13x GPIOs, user-configurable state machine system OVP, DrMOS mode, Q&A watchdog timer
S	MPQ70700FS-AEC1	2.8	5.5	5	5 LDOs	LDO: 0.35/0.35/0.35/0.35/0.35	-	-	-	✓	I ² C	✓	TQFN-24 (5x5)	ASIL-D, Q&A watchdog timer, 2x ext. voltage monitoring, 4x GPIOs, prog. sequencing, adj. V _{OUT} , UVP/OVP and OCP, thermal shutdown
S	MPQ70701FS-AEC1	2.8	5.5	5	5 LDOs		-	-	-	✓	I ² C	✓	TQFN-24 (5x5)	ASIL-B, Q&A watchdog timer, 2x ext. voltage monitoring, 4x GPIOs, prog. sequencing, adj. V _{OUT} , UVP/OVP and OCP, thermal shutdown
S	MPQ7970-AEC1	2.8	5.5	5	5 LDOs	LDO: 0.35/0.35/0.35/0.35/0.35	-	-	-	✓	I ² C	✓	TQFN-24 (5x5)	Q&A watchdog timer, 2x ext. voltage monitoring, 4x GPIOs, prog. sequencing, adj. V _{OUT} , UVP/OVP and OCP, thermal shutdown
S	MPQ70150FS-AEC1	3	6	4	3 Bucks, 1 Boost	Buck: 3/3/3 Boost: 0.5	18	-	✓	✓	I ² C	✓	QFN-28 (5x5)	ASIL-B, ultra-low noise optimized for radars, advanced spread spectrum, window or Q&A watchdog timer, mount ID, ext. voltage monitoring
S	MPQ70152FS-AEC1	3	6	4	2 Bucks, 1 Boost	Buck: 3/3 Boost: 0.5	18	-	✓	✓	I ² C	✓	QFN-28 (5x5)	ASIL-B, ultra-low noise optimized for radars, advanced spread spectrum, window or Q&A watchdog timer, mount ID, ext. voltage monitoring
S	MPQ70153FS-AEC1	3	6	4	3 Bucks	Buck: 3/3/3	18	-	✓	✓	I ² C	✓	QFN-28 (5x5)	ASIL-B, ultra-low noise optimized for radars, advanced spread spectrum, window or Q&A watchdog timer, mount ID, ext. voltage monitoring
	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 prog., selectable time slot sequencing, extensive adj. and protections for bucks, dedicated RTC for LDOs, COT
S	MPQ74201-AEC1	2.7	5.5	6	4 Bucks, 2 LDOs	Buck: 6/6/6/6 LDO: 0.4/0.4	3	✓	-	✓	I ² C	✓	QFN-29 (5x5)	ASIL-D, watchdog, MOTP memory with 4 user-selectable OTP pages via PRESET pin

PMICs 5V PMICs

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	# of Channels	Configuration	Current Ratings (A)	f _{sw} (Max) (MHz)	Multi-Phase Outputs	Frequency Spread Spectrum	MP-Safe™ (Functional Safety)	Interface	Wettable Flank QFN Option	Package	Notes
MPQ7930-AEC1	2.7	5.5	6	6 Bucks	Buck: 3/3/4/4/1/1	2	✓	✓	-	I ² C	✓	QFN-32 (5x5)	Prog. sequencing, integrated adj. 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)	Prog. sequencing, integrated adj. 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)	Q&A watchdog timer, prog. sequencing, ext. voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown
S MPQ7933-AEC1	2.7	5.5	6	6 Bucks	Buck: 1/1/2/2/1/1	2	✓	✓	-	I ² C	✓	QFN-32 (5x5)	Q&A watchdog timer, prog. sequencing, ext. voltage monitoring, hiccup UVP/OVP and OCP, thermal shutdown

Linear Regulators & DDR Memory

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 excellent power supply rejection in a compact size.



LINEAR REGULATORS | AUTOMOTIVE

Linear Regulators 5V LDO

Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (mA)	Load Reg (%/mA)	PSRR @ 1kHz (dB)	V _{FB} (V)	I _Q (Typ) (µA)	Enable Pin	Adjustable Option (V)	Fixed-Output Versions (V)	Power Good	Package
MPQ20056-AEC1	2.5	5.5	250	0.0003	63	0.8	150	✓	0.8 to 5	1.8, 2.5, 3.3	-	QFN-8 (2x2), TSOT23-5
P MPQ20033-AEC1	1.6	5.5	300	0.002	70	0.5	26	✓	0.5 to 5	0.75, 0.8, 0.85, 1, 1.2, 1.8, 2.5, 2.8, 3.3	✓	QFN-8 (3x3), QFN-8 (2x2), QFN-6 (2x2), TSOT23-5, SOT563
MPQ8904-AEC1	2.5	6.5	500	0.005	26	0.5	140	✓	0.5 to 5	-	✓	QFN-8 (2x3)
P MPQ20032-AEC1	1.6	5.5	500	0.002	70	0.5	26	✓	0.5 to 5	0.75, 0.8, 0.85, 1, 1.2, 1.8, 2.5, 2.8, 3.3	✓	QFN-8 (3x3), QFN-8 (2x2), QFN-6 (2x2), TSOT23-5, SOT563
P MPQ20031-AEC1	1.6	5.5	1000	0.002	70	0.5	26	✓	0.5 to 5	0.75, 0.8, 0.85, 1, 1.2, 1.8, 2.5, 2.8, 3.3	✓	QFN-8 (3x3), QFN-8 (2x2), QFN-6 (2x2)
MPQ20051-AEC1	2.5	5.5	1000	0.0003	63	0.8	130	✓	0.8 to 5	-	-	QFN-8 (3x3)

Linear Regulators

40V LDO

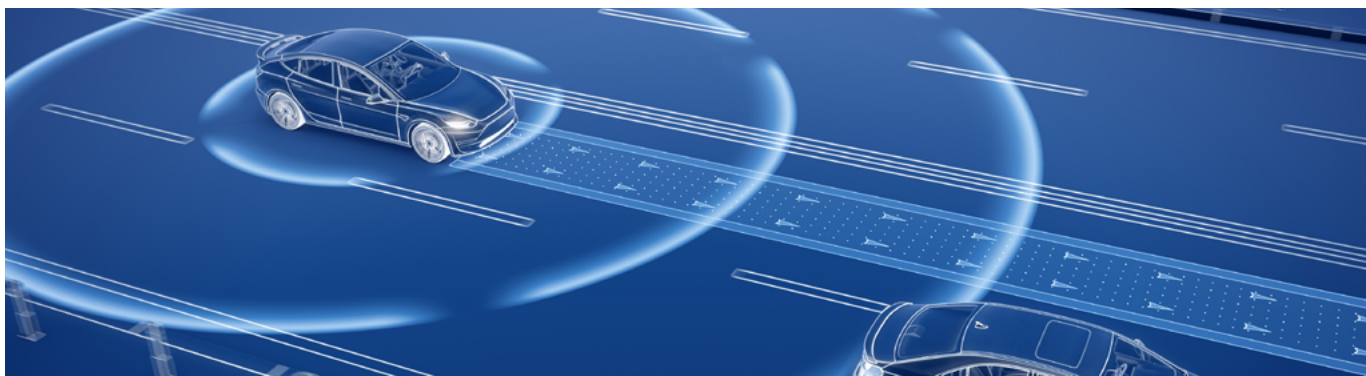
Part Number	V _{IN} (Min) (V)	V _{IN} (Max) (V)	I _{OUT} (mA)	Load Reg (%/mA)	PSRR @ 1kHz (dB)	V _{FB} (V)	I _Q (Typ) (µA)	Enable Pin	Adjustable Option (V)	Fixed-Output Versions (V)	Power Good	Package
MPQ2016-AEC1	4	40	30	0.003	65	1.23	12	✓	1.2 to 24	-	-	QFN-8 (2x3)
MPQ2013A-AEC1	2.5	40	150	0.005	41	1.215	3.2	✓	1.215 to 15	QFN-8: 3.3, 2.5, 5, 1.8 QFN-6: 3.3, 5	-	QFN-6 (2x2), QFN-8 (3x3)
MPQ2013D-AEC1	2.5	40	100	0.005	41	1.215	3.2	✓	1.215 to 15	2.5, 3.3, 5	-	TSOT23-4
MPQ2019-AEC1	3	40	300	0.04	45	1.25	10	✓	1.2 to 15	3.3, 5	✓	SOIC-8EP
N MPQ2019A-AEC1	3	40	300	0.04	45	1.25	10	✓	1.2 to 36	-	✓	SOIC-8EP
MPQ2022A-AEC1	3	40	300	0.3	53	1	35	✓	1 to 13.6	-	✓	QFN-16 (4x4)
S MPQ2023-AEC1	4.5	40	300	0.3	80	1	20	✓	1 to 13.6	-	✓	QFN-16 (4x4), QFN-14 (3x3)
MPQ2024A-AEC1	3	40	300	0.3	53	1	35	✓	1 to 13.6	-	✓	QFN-16 (4x4)
MPQ2026A-AEC1	3	40	300	0.3	53	1	35	✓	1 to 13.6	-	✓	QFN-16 (4x4)
S MPQ71000FS-AEC1	4.5	40	300	0.3	80	1	20	✓	1 to 13.6	-	✓	QFN-16 (4x4), QFN-14 (3x3)
MPQ20082-AEC1	3	40	300	0.04	45	1.25	10	✓	1.2 to 15	3.3, 5	✓	MSOP-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, VTT _{REG} (mV)	Driver (V)	Package	Notes
MPQ20073-AEC1	1.3	6	2	30	3.3	MSOP-8E	DDR2/3 termination regulator

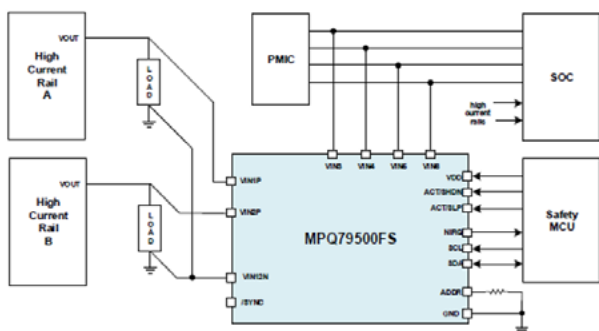
Monitoring & Supervision

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



MPQ79500FS-AEC1 NEW

6-Channel, ASIL-D Voltage Monitor



Key Specifications:

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

Features

Built for Mission-Critical Safety

- Built-in self-testing (BIST)
- SPFM: 99% coverage, LFM: 90% coverage
- Cyclic redundancy check (CRC) 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

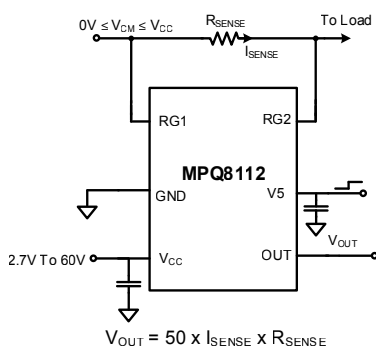
- 2 differential inputs for monitoring high-current rails
- 4 single-ended inputs for monitoring low-current rails
- Over-voltage and under-voltage monitoring

Scalability

- SYNC output to enable multiple devices to synchronize

MPQ8112-AEC1 NEW

60V, High-Side Current-Sense Amplifier



Key Specifications:

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

Features

Built to Handle Tough Automotive Transients

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

Great Current-Sense Performance

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

Extends Battery Life

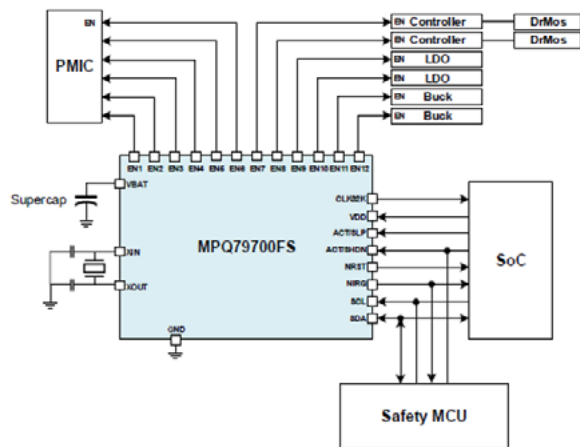
- 0.2µA typical shutdown current
- 300µA typical supply current

Reduces Board Size

- Small footprint

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 (BIST)
- SPFM: 99% coverage, LFM: 90% coverage
- Cyclic redundancy check (CRC) 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

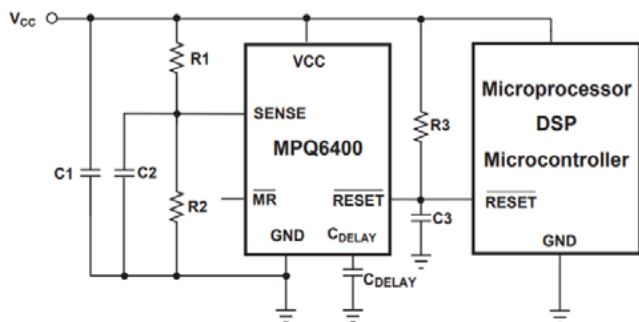
- 32kHz crystal oscillator driver
- Real-time clock (RTC) | Time-slot based sequencing

Application Flexibility and Survivability

- Configurable 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 Input Voltage	1 Channels	2.93V Adjustable Voltage Threshold	QFN-6 (2mmx2mm), TSOT23-6 Packages
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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 (I_Q)
- 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	1	1.8	5.5	2.93	±1.0	1.6	2ms to 10s	QFN-6 (2x2)	Capacitor-set delay, reset output to MCU
MPQ6400-01-AEC1	1	1.8	5.5	Adj	±1.0	1.6	2ms to 10s	QFN-6 (2x2)	Capacitor-set delay, reset output to MCU
N MPQ79500FS-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, ASIL-D voltage monitor with prog. features via I ² C
N MPQ79501FS-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, ASIL-B voltage monitor with prog. features via I ² C
S MPQ79504FS-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, ASIL-B voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79505FS-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, ASIL-D voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79520FS-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, 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™, ASIL-B voltage monitor with prog. features via I ² C
S MPQ79524FS-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, ASIL-B voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79525FS-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™, ASIL-D voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79530FS-AEC1	3	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-D voltage monitor with prog. features via I ² C
S MPQ79531FS-AEC1	3	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-B voltage monitor with prog. features via I ² C
S MPQ79534FS-AEC1	3	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-B voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79535FS-AEC1	3	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-D voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79540FS-AEC1	1	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-D voltage monitor with prog. features via I ² C
S MPQ79541FS-AEC1	1	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-B voltage monitor with prog. features via I ² C
S MPQ79544FS-AEC1	1	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-B voltage monitor with prog. features via I ² C, watchdog timer
S MPQ79545FS-AEC1	1	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	MPSafe™ ASIL-D voltage monitor with prog. features via I ² C, watchdog timer
S MPQ7940-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C
S MPQ7940W-AEC1	6	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C, watchdog timer
S MPQ7942-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C
S MPQ7942W-AEC1	5	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C, watchdog timer
S MPQ7943-AEC1	3	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C
S MPQ7943W-AEC1	3	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C, watchdog timer
S MPQ7944-AEC1	1	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C
S MPQ7944W-AEC1	1	2.7	5.5	Adj	±0.5	560	Adj	QFN-16 (3x3)	QM voltage monitor with prog. features via I ² C, watchdog timer

Watchdog Timers

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

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™, ASIL-D, prog. features via I ² C
S MPQ79701FS-AEC1	12	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-B, prog. features via I ² C
S MPQ79710FS-AEC1	10	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-D, prog. features via I ² C
S MPQ79711FS-AEC1	10	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-B, prog. features via I ² C
S MPQ79720FS-AEC1	8	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-D, prog. features via I ² C
S MPQ79721FS-AEC1	8	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-B, prog. features via I ² C
S MPQ79730FS-AEC1	6	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-D, prog. features via I ² C
S MPQ79731FS-AEC1	6	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	MPSafe™, ASIL-B, prog. features via I ² C
S MPQ7960-AEC1	12	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM, prog. features via I ² C
S MPQ7961-AEC1	10	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM, prog. features via I ² C
S MPQ7962-AEC1	8	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM, prog. features via I ² C
S MPQ7963-AEC1	6	2.7	5.5	✓	✓	✓	✓	QFN-24 (4x4)	QM, prog. features via I ² C

Current-Sense Monitors

Part Number	Common-Mode Voltage (Max) (V)	Common-Mode Voltage (Min) (V)	Supply Voltage (Max) (V)	Supply Voltage (Min) (V)	Input Offset (±) (Max) (mV)	Voltage Gain (V/V)	Gain Error (Max) (%)	Common-Mode Rejection (Min) (dB)	Bandwidth (Typ) (kHz)	I _Q (Max) (µA)	Package	Notes
MPQ8112-AEC1	60	2.7	60	2.7	1	50	2	65	300	360	TSOT-23-6	-
MPQ8112A-AEC1	60	2.7	60	2.7	1	Adjustable	2	65	300	360	TSOT-23-6	-
MPQ8113-AEC1	60	2.7	60	2.7	1	50	2	65	300	360	TSOT-23-6	Adjustable maximum output voltage
MPQ8113A-AEC1	60	2.7	60	2.7	1	Adjustable	2	65	300	360	TSOT-23-6	Adjustable maximum output voltage

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.



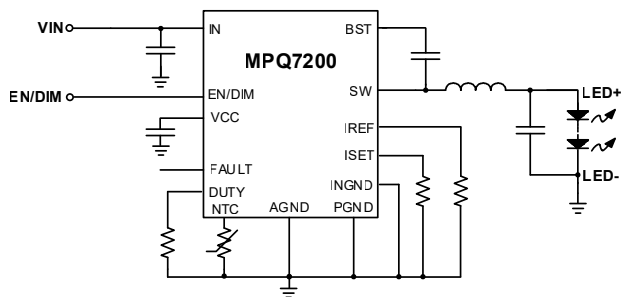
Flexible Dimming Modes

Compact Package

Modular Design

MPQ7200-AEC1

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	MOSFET $R_{DS(ON)}$	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

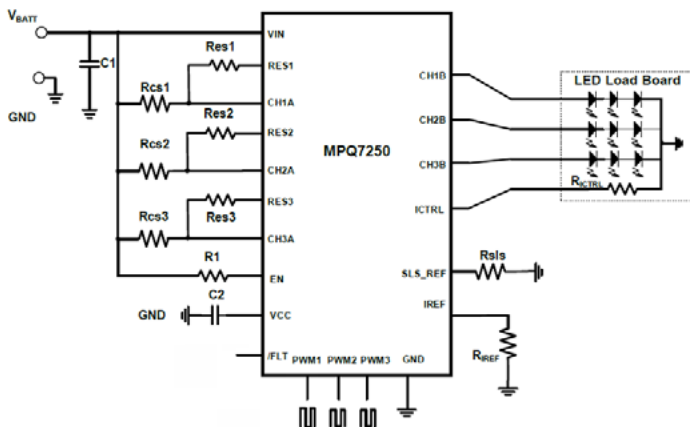
Constant frequency hysteretic control yields fast transient response without loop compensation

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

MPQ7250-AEC1

3-Channel Current Source LED Driver



Key Specifications:

4.5V to 20V	3	200mA per Channel	QFN-20 (4mmx4mm) Wettable Flank
Input Voltage	Channels	Current	Package

Applications

Reverse Lights | Rear Fog Lights | Side Markers | Puddle Lights

Features

Built to Handle Tough Automotive Transients

Load dump up to 40V
Cold crank down to 4.5V

Designed for Automotive LED applications

Class-leading brightness with capability to drive 3 channels at 200mA simultaneously
PWM dimming: 3x inputs from 100Hz to 1kHz
Analog dimming
LED binning resistor pin for manufacturing ease

Excellent Thermal Performance

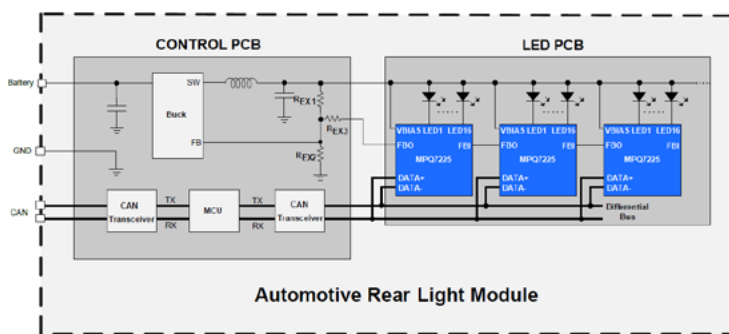
External shunt resistors for thermal load balancing
300mV current-sink headroom at 200mA

Built for Safety-Oriented Systems

Single LED short (SLS) detection
Fault pin for system protection and diagnostics
Protection suite includes LED open, LED short-to-ground, thermal shutdown
Latch-off or hiccup fault modes
Assists system design to achieve a functional safety grade of ASIL-B
AEC-Q100 Qualified

MPQ7225-AEC1

16-Channel Current Sink LED Driver



Key Specifications:

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

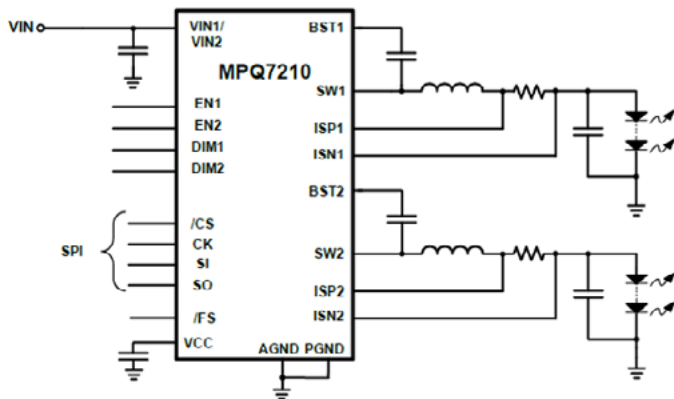
2Mbps UART or differential interface (CAN-compatible)
12-bit PWM or 6-bit analog dimming

Optimized for EMI/EMC

Configurable phase shift and slew rate
Frequency spread spectrum (FFS) via internal clock
Selectable pulse-width modulation (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 NEW**60V, Synchronous, Dual Buck LED Driver****Key Specifications:**

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

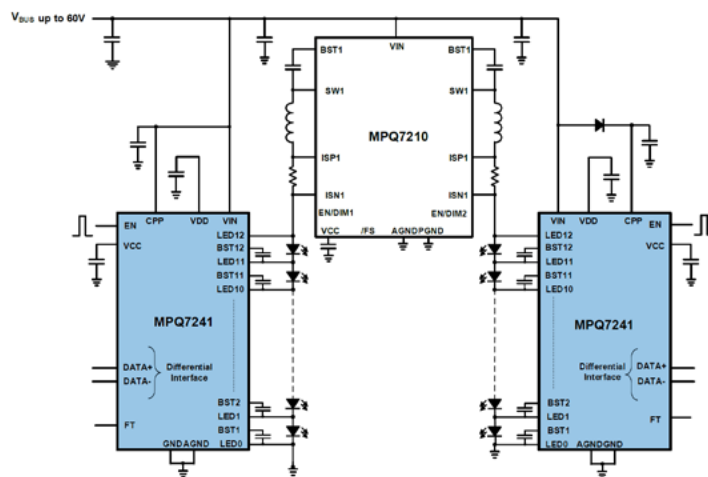
±3% LED current accuracy
10-bit analog-to-digital converter (ADC) to monitor the input voltage (V_{IN}), output voltage (V_{OUT}), V_{CC} , and T_J
Two-step dimming with range of duty cycle options, including 100% duty cycle
Fast transient response
Fault pins for LED open/short, under-voltage protection (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 (FSS)

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
Input Voltage	Channels	Current	(6mmx6mm)
			Package

Versions:

MPQ7240	SPI Interface
MPQ7241	CAN-Compatible (Differential) Interface

Features**Built to Handle Tough Automotive Transients**

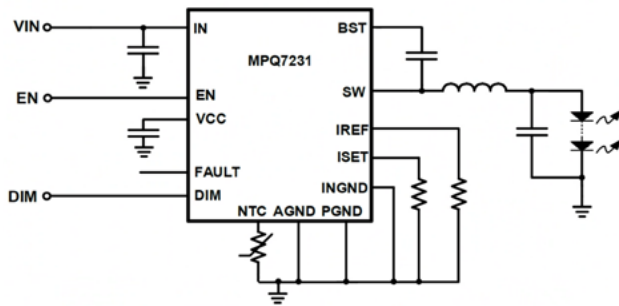
Load dump up to 60V, cold crank down to 4.5V

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

MPQ7231-AEC1 NEW

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



Key Specifications:

6V to 42V Input Voltage	3A/2.4MHz (Buck) 2.4A/1.15MHz (Buck-Boost) Output Current/Switching Frequency	QFN-19 (3mmx4mm) Package
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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 (UVP), over-voltage protection (OVP), over-current protection (OCP) 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 (FSS)

LED LIGHTING | AUTOMOTIVE

Backlighting

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	Wettable Flank QFN Option	Package	Notes
MPQ3362-AEC1	3	42	Boost	1	-	200 to 2200	PWM, Analog	Open, Short	-	-	-	TSOT23-8	4A current limit, low $R_{DS(ON)}$ soft start
N MPQ3359-AEC1	3.5	42	Boost/SEPIC	4	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	PWM	✓	QFN-20 (3x4)	Separated PWM and analog dimming pin
N MPQ3359A-AEC1	3.5	42	Boost/SEPIC	1/2 /3/4	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	PWM	✓	QFN-20 (3x4)	Separated PWM and analog dimming pin
MPQ3364-AEC1	3.5	42	Boost/SEPIC	4	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4)	Three selectable IC addresses
S MPQ3365-AEC1	3.5	42	Boost/SEPIC	4	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4)	Three selectable IC addresses, I ² C dimming
S MPQ3365A-AEC1	3.5	42	Boost/SEPIC	5	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4)	Three selectable IC addresses, I ² C dimming
MPQ3386-AEC1	4.5	30	Boost	6	30	625 or 1250	PWM, Analog	Open, Short	3%	-	✓	QFN-24 (4x4)	-
MPQ3387L-AEC1	3	30	Boost	6	45	500 or 1250	PWM, Mixed	Open, Short	3%	-	-	QFN-24 (4x4)	-
MPQ3369-AEC1	3.5	42	Boost/SEPIC	6	100	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4), TSSOP-28EP	Spread spectrum, thermal derating, fault pin, rich protection features
MPQ3367-AEC1	3.5	42	Boost/SEPIC	6	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4), TSSOP-28EP	Spread spectrum, thermal derating, fault pin, rich protection features
MPQ3367A-AEC1	3.5	42	Boost/SEPIC	6	150	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4)	MPQ3367-AEC1 features, three prog. addresses
S MPQ3359C-AEC1	3.5	42	Boost/SEPIC	4	160	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	PWM	✓	QFN-20 (3x4)	External FET, separated PWM and analog dimming
S MPQ3366C-AEC1	3.8	42	Boost/SEPIC	6	200	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4)	External FET, four selectable IC addresses, I ² C dimming
S MPQ3368-AEC1	3.8	42	Boost/SEPIC	8	200	200 to 2200	PWM, Analog, Mixed	Open, Short	2.5%	I ² C	✓	QFN-24 (4x4)	External FET, four selectable IC addresses, I ² C dimming

LED LIGHTING | AUTOMOTIVE

RGB LED Drivers

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
MPQ3323B-AEC1	4.5	16	Linear	4	320	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	Independent channel control, daisy-chainable, digital config.
MPQ3324-AEC1	4	16	Linear	8	100	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	Independent channel control, daisy-chainable, digital config.
MPQ3326-AEC1	4	16	Linear	16	50	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	I ² C input logic voltage: (V _{IL_MAX} : 0.4V, V _{IH_MIN} : 1.3V)
MPQ3326-AEC1-C03Q	4	16	Linear	16	50	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	I ² C input logic voltage: (V _{IL_MAX} : 0.4V, V _{IH_MIN} : 1.3V)
MPQ3326A-AEC1	4.5	16	Linear	16	80	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	I ² C input logic voltage: (V _{IL_MAX} : 0.4V, V _{IH_MIN} : 1.3V)
MPQ3326B-AEC1	4.5	16	Linear	16	80	PWM, Analog	Open, Short	2%	I ² C	✓	QFN-24 (4x4)	I ² C input logic voltage: (V _{IL_MAX} : 0.8V, V _{IH_MIN} : 1.5V)
MPQ3322-AEC1	3.5	22	Linear	24	100	PWM, Analog	Open, Short	3%	CAN	✓	QFN-24 (4x4)	LED current slew rate, phase shift, adaptive voltage feedback, failsafe mode
MPQ3621-AEC1	3	11	Linear	48	50	PWM, Analog	Open, Short	3%	SPI	✓	QFN-24 (4x4)	LED current slew rate, phase shift, adaptive voltage feedback
MPQ3321-AEC1	3	22	Linear	48	80	PWM, Analog	Open, Short	3%	SPI	✓	QFN-24 (4x4)	LED current slew rate, phase shift, adaptive voltage feedback
MPQ3327-AEC1	3.5	20	Switch	-	-	-	-	-	SPI, GPIO	✓	QFN-14 (3x3)	8A, 4 switching line scan driver for local dimming, combined with the MPQ3321 for scanning scheme

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
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
S MPQ7232-AEC1	4.2	40	Buck	6	5%	45/30	PWM	2400	Open, Short	✓	✓	✓	QFN-15 (3x4)	10Hz to 2kHz PWM dimming frequency, compatible with 30FPS/60FPS/120FPS dimming
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
S MPQ76230FS-AEC1	4.5	40	Pre-Boost + Buck	10	5%	25/25	PWM	420, 2200	Open, Short	✓	✓	✓	QFN-21 (4x4)	MPSafe™, ASIL-C, ADC for diagnostics, 2-stage design enables device to be powered off, power over coaxial DMS application

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
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 SCP
MPQ24833-B-AEC1	4.5	55	Buck, Buck-Boost, Boost	3	6	150	PWM, Analog	420	Open, Short	-	-	-	SOIC-8E	Output SCP
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
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
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
N MPQ7210-AEC1	4.5	65	Dual Buck	2	3.5	235/235	PWM, Analog	220, 420, 1000	Short	✓	✓	✓	QFN-26 (5x5)	Dual outputs, UVP, OCP, failsafe (FS) pin, SPI interface
P MPQ7212-AEC1	4.5	70	Dual Buck	2	3.5	200/150	PWM, Analog	220, 420, 800, 1100, 2200	Open, Short	✓	✓	-	TQFP-48 (7x7)	Dual outputs, UVP, OCP, up to 7x MPIO pins, SPI or UART interface, top-side cooling, 48V compatible
P MPQ7213-AEC1	4.5	70	Triple Buck	3	3.5	200/150	PWM, Analog	220, 420, 800, 1100, 2200	Open, Short	✓	✓	-	TQFP-48 (7x7)	Triple outputs, UVP, OCP, up to 6x MPIO pins, SPI or UART interface, top-side cooling, 48V compatible
P MPQ76100FS-AEC1	4.5	70	Dual Buck	2	3.5	200/150	PWM, Analog	220, 420, 800, 1100, 2200	Open, Short	✓	✓	-	TQFP-48 (7x7)	MPSafe™, ASIL-B, dual outputs, UVP, OCP, up to 7x MPIO pins, SPI or UART interface, top-side cooling, 48V compatible
P MPQ76130FS-AEC1	4.5	70	Triple Buck	3	3.5	200/150	PWM, Analog	220, 420, 800, 1100, 2200	Open, Short	✓	✓	-	TQFP-48 (7x7)	MPSafe™, ASIL-B, triple outputs, UVP, OCP, up to 6x MPIO pins, SPI or UART interface, top-side cooling, 48V compatible
S MPQ76350FS-AEC1	4	40	Dual Buck	7	13	21/9	-	410, 1000, 2200	-	✓	✓	✓	QFN-28 (5x6)	MPSafe™, ASIL-B, digital, constant-voltage dual outputs, ADC for diagnostics, UART or SPI digital interface
S MPQ76352FS-AEC1	4	40	Buck	7	13	21/9	-	410, 1000, 2200	-	✓	✓	✓	QFN-28 (5x6)	MPSafe™, ASIL-B, digital, constant-voltage single output, ADC for diagnostics, UART or SPI digital interface

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
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
S MPQ7222 -AEC1	3.5	22	Linear	24	100	-	PWM, Analog	Open, Short	✓	3%	Differential Interface	✓	QFN-40 (6x6)	Current sink LED driver, adaptive feedback control (AFC), 12-bit PWM or 6-bit analog dimming, safety suite
MPQ7225 -AEC1	2.5	20	Linear	16	200	-	PWM, Analog	Open, Short	✓	5%	Differential Interface	✓	QFN-32 (5x6)	Current sink LED driver, adaptive feedback control (AFC), 12-bit PWM or 6-bit analog dimming, safety suite
S MPQ7250 -AEC1	4.5	40	Linear	3	200	-	PWM	Open, Short	-	5%	-	✓	QFN-20 (4x4)	Current sink LED driver, 3x independent PWM pins, shunt resistors for thermal sharing, single LED short, LED binning resistor input
P MPQ76300FS -AEC1	3.5	28	Linear	24	100	-	PWM, Analog	Open, Short	✓	3%	UART	-	TQFP-48 (7x7)	MPSafe™, ASIL-B current sink LED driver, adaptive digital feedback control, limp home mode, ADC, enhanced UART protocol
P MPQ7241U -AEC1	4.5	65	Matrix Manager	12	1500	-	PWM, Analog	Open, Short	-	-	Differential Interface	✓	QFN-40 (6x6)	12 dimming switches, 10-bit or 8-bit PWM dimming, LED open/short protection, thermal shutdown
P MPQ76400FS -AEC1	4.5	65	Matrix Manager	16	1600	-	PWM, Analog	Open, Short	-	-	UART	-	TQFP-48 (7x7)	MPSafe™, ASIL-B, 16 dimming switches, built-in charge pump, 20V switch to switch handling, 4x LED groupings, limp home mode

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	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
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
S MPQ7232 -AEC1	4.2	40	Buck	6	5%	45/30	PWM	2400	Open, Short	✓	✓	✓	QFN-15 (3x4)	10Hz to 2kHz PWM dimming frequency, compatible with 30FPS/60FPS/120FPS dimming
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
S MPQ76230FS -AEC1	4.5	40	Pre-Boost + Buck	10	5%	25/25	PWM	420, 2200	Open, Short	✓	✓	✓	QFN-21 (4x4)	MPSafe™, ASIL-C, ADC for diagnostics, 2-stage design enables device to be powered off, power over coaxial DMS application

Display Power & Control

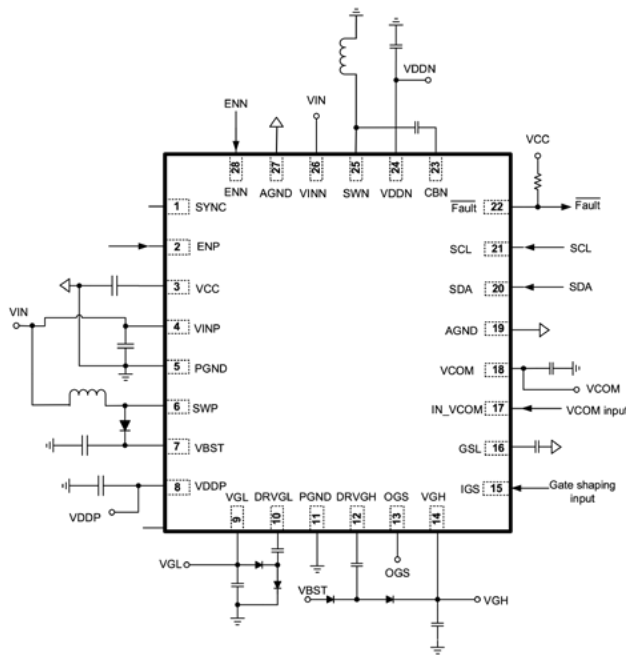
MPS display power and control backlight drivers provide a wide range of display power options of all your lighting display needs. With superior LED current regulation and highly integrated PMICs, you can be confident in high efficiency, high accuracy, deep dimming, small ripple, audible noise elimination, and increased protections.



Instrument | HUD | LCD Bias | LCD Backlighting | Interior Ambient | Local Dimming

MPQ5613

4-Channel LCD Bias with Gate Voltage Shaping and VCOM Buffer



Features

Key Features

- 2.7V to 12V input voltage (V_{IN}) range
- 2.5A current limit for boost, 2.5A Current Limit for Buck-Boost
- 250mΩ MOSFET for boost
- 200mΩ/300mΩ power MOSFET for sync buck-boost
- Available in a QFN-28 (4mmx5mm) package with wettable flanks

4 Outputs with Gate Voltage Shaping and VCOM Buffer

- Boost: 2.7 to 21.9V (VDDP)
- Buck-boost: 0 to -15.9V (VDDN)
- Adjustable positive charge pump, 5V to 43.2V, 50mA (VGH)
- Adjustable negative charge pump, 0V to -15.9V, 50mA (VGL)
- Gate voltage shaping with configurable falling time
- VCOMP buffer, -13.21V to 19.8V, 25mA
- I²C interface with one-time programmable (OTP) memory

Optimized for EMI/EMC

- Configurable switching frequency (f_{sw}), up to 3MHz
- Frequency spread spectrum (FSS)
- Frequency synchronization and interleaved (180°) buck-boost and boost control

Integrated Protection Features

- Input and output disconnect
- Configurable power-on/off sequence
- Cycle-by-cycle over-current protection (OCP), under-voltage lockout (UVLO), and fault flag

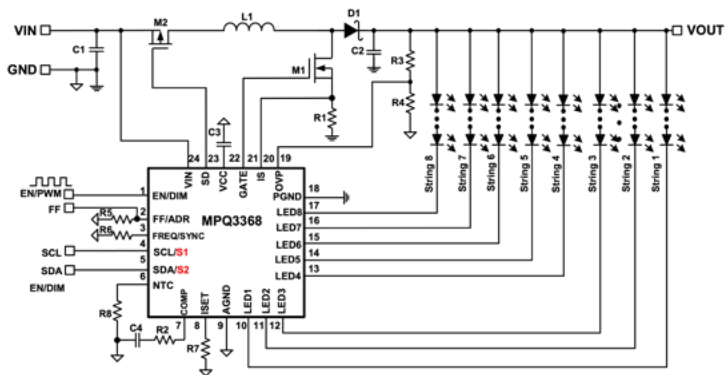
Applications:

Car Navigation Displays | TFT LCD Displays

MPQ3368

NEW

8-Channel, 200mA LED Controller



Applications:

>15" LCD Panel Backlighting

Features

Key Features

- 3.8V to 36V input voltage (V_{IN}) range
- 8 channels, max 200mA per channel
- 2.5% current matching
- Analog, pulse-width modulation (PWM), or mixed dimming via the I²C interface or PWM signal
- 10000:1 dimming ratio at $f_{DIM} < 200\text{Hz}$
- 10-bit analog dimming, 15-bit PWM dimming
- 4 selectable IC addresses support cascading
- Available in a QFN-24 (4mmx4mm) package with wettable flanks

Optimized for EMI/EMC

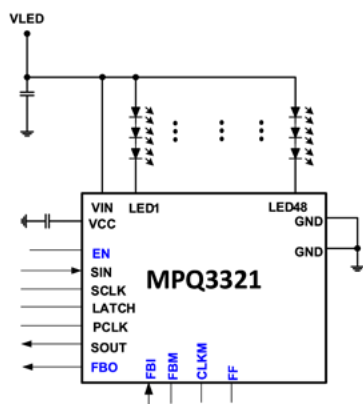
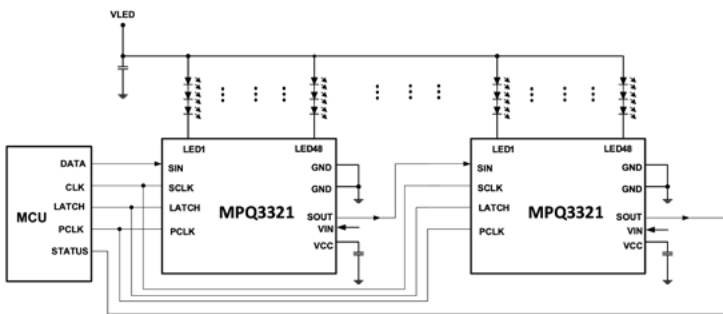
- External sync SW function
- Configurable switching frequency (f_{SW}) up to 2MHz
- Phase shift between LED channels
- Frequency spread spectrum (FSS)

Integrated Protection Features

- Disconnect V_{OUT} from V_{IN}
- Configurable LED short threshold
- Configurable over-voltage protection (OVP) threshold
- LED short/open, over-temperature protection (OTP), over-current protection (OCP), and inductor short protection
- Negative temperature coefficient (NTC) function to reflect external temperature
- Fault Indicator Signal Output

MPQ3321

48-Channel Current Source LED Driver



Applications:

Automotive LCD Backlighting with Local Dimming | Mini LED LCDs
Tablet/Notebook LCD Backlighting | General LCD Backlighting

Features

Key Features

- 3V to 22V input voltage (V_{IN}) range
- 48 channels, max 80mA per channel
- <3% current accuracy
- 20V voltage rating
- Independent 16-bit PWM dimming
- Independent 7-bit Analog dimming
- Adaptive voltage feedback function
- 25MHz serial interface
- Supports daisy-chaining for multiple ICs
- Available in a QFN-68 (8mmx8mm) package with wettable flanks

Optimized for EMI/EMC

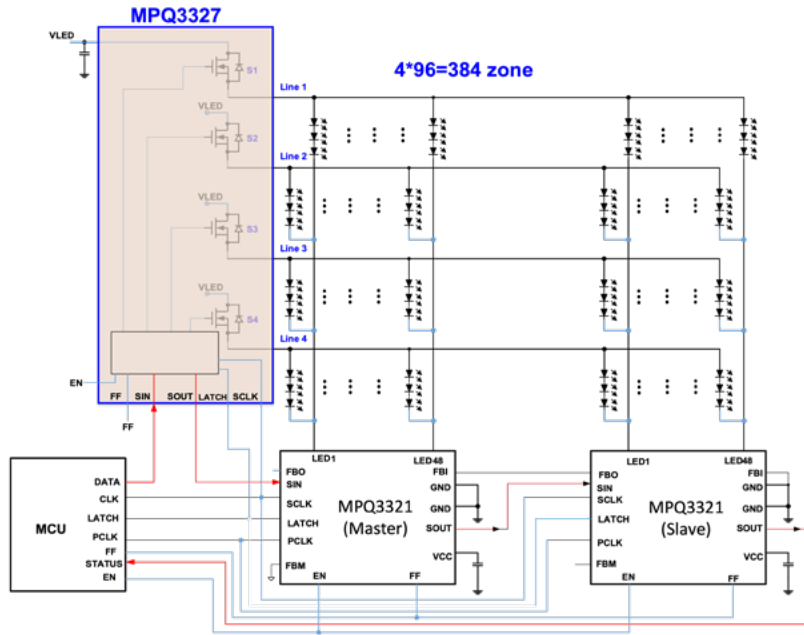
- Configurable LED current slew rate
- Phase shift

Integrated Protection Features

- LED short/open protection
- Over-temperature protection (OTP)
- Fault status indicator register

MPQ3327

8A, 4-Line Scan Switch Solution



Features

Key Features

- 3.5V to 20V input voltage (V_{IN}) range
- Internal 4-line scan switching
- 20V SW voltage rating, $100m\Omega R_{DS(ON)}$
- 8A max current (depending on thermals)
- Fast discharge function
- Flexible extended SW line-scan
- 25MHz clock with daisy-chain
- Available in an FCQFN-16 (3mmx3mm) package with wettable flanks

Integrated Protection Features

- SW open/short protection
- Fault indicator signal output
- Free short for adjacent pins
- Over-temperature protection (OTP)

Applications:

- Automotive LCD Backlighting with Local Dimming
- Mini LED LCDs

USB & Wireless Charging

MPS automotive USB chargers are fully integrated USB charging solutions combining high-efficiency DC/DC 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 & WIRELESS CHARGING | AUTOMOTIVE

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)	USB PD	Battery Short Protection	Frequency Spread Spectrum	Int USB Switch	Line Drop Compensation	I ² C	EN Shutdown Discharge	Load-Shedding Send Alert	Package	Notes
MPQ4272-AEC1 (Dual)	1	40	6 2x (3A)	0.3	Selectable	✓	✓	✓	✓	✓	✓	✓	✓	QFN-21 (4x5)	Dual-channel
N MPQ8880A-AEC1	4	60	4.5	0.093/ 0.008	Adjustable	✓	-	✓	-	-	✓	✓	-	QFN-20 (4x5)	Supports PD3.1 EPR 240W and AVS
S MPQ4583-AEC1	4.5	95	0.8	0.009	400	✓	-	✓	-	-	-	✓	-	QFN-19 (3x5)	Ultra-low I _O
S MPQ9934-AEC1 (Controller)	5.5	85	30	0.4	Adjustable	✓	-	✓	-	✓	-	✓	-	QFN-23 (4x4)	GaN driver capability

USB PD Solutions

All-in-One USB PD Solutions

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)	Type-A Mode	Load-Shedding	Battery Short Protection	Int USB Switch	Line Drop Compensation	USB Discharge	Package	Notes
MPQ4242-AEC1	4	40	Single	3	0.1	Selectable	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	QFN-22 (4x5)	Buck-boost int., supports PD3.0/QC4+ BC1.2/QC3+FCP protocols
MPQ4242B-AEC1	4	40	Single	3	0.1	Selectable	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	QFN-22 (4x5)	Buck-boost int., supports PD3.1/QC4+ BC1.2/QC3+FCP protocols
MPQ4241-AEC1	4.5	24	Single	3	0.15	Selectable	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	QFN-21 (3x4)	Buck int., supports PD3.1/QC4+ BC1.2/QC3+FCP protocols

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	Int USB Switch	Line Drop Compensation	I ² C	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
MPQ4262-AEC1 (Hybrid)	3.6	40	5	0.13	Selectable	✓	✓	✓	-	✓	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency
MPQ4263-AEC1 (Hybrid)	3.6	40	5	0.135	Selectable	✓	✓	✓	-	✓	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency, high-side current sense
N MPQ4232-AEC1	4.3	40	5	0.13	Selectable	✓	✓	✓	-	✓	✓	✓	✓	QFN-19 (4x5)	22V, 60W, 4-switch converter with advanced protection, 1V to 22V V _{OUT} range
S MPQ4232A-AEC1	3	40	6	0.13	Selectable	✓	✓	✓	-	✓	✓	✓	✓	QFN-19 (4x5)	36V, 60W, 4-switch converter, 1V to 24V V _{OUT} range, P2P with MPQ4232-AEC1

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	BC 1.2 DCP (Beta)	1.2V/1.2V DCP	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
MPQ5031-AEC1 (PD)	4.5	5.5	Single	5	0.1	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓	-	QFN-20 (4x4)	USB PD 3.0+ PPS controller, meets PowerShare specs
N 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
N MPF52000-AEC2	4.6	5.5	Dual	-	0.007	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓	-	QFN-24 (4x4)	USB PD3.1, MCU-based controller
N MPF52001-AEC2	4.6	5.5	Single	-	0.007	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓	-	QFN-24 (4x4)	USB PD3.1, MCU-based controller, supports DP
N MPF52003-AEC2	4.6	5.5	Triple	-	0.007	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓	-	QFN-40 (5x5)	USB PD3.1, MCU-based controller

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) (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	Type-C DFP (w/o PD)	Type-A Mode	Load-Shedding	Battery Short Protection	Low-Dropout Mode	Frequency Spread Spectrum	Int USB Switch	Line Drop Compensation	EN Shutdown Discharge	USB Discharge	Fault Indication	Wettable Flank QFN Option	Package	Notes
MPQ4475-E-AEC1	7	40	Single	2.5	1.6	Selectable	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-25 (4x4)	Prog. line drop compensation
MPQ4228-AEC1	4.2	40	Single	3	-	Selectable	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-22 (4x4)	Type-C 5V/3A, DFP port
MPQ4228-Q-AEC1	4.2	40	Single	3	-	Selectable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-22 (4x4)	-
S MPQ4251-AEC1	6	36	Single	3	0.3	420	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-19 (3x5)	Smaller size, cost-effective

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) (V)	Dual/Single Ports	I _{OUT} (A)	I _Q (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	Int 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
N MPQ4253-AEC1	6	40	Dual	3 (x2)	0.054	Selectable	✓	✓	✓	✓	✓ (Type-C)	-	✓	✓	✓	✓	QFN-26 (5x5)	Low I _Q
N 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
S MPQ4252-AEC1	6	36	Dual	3 (x2)	0.3	420	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-19 (3x5)	Smaller size, cost-effective
S 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) (V)	Dual/Single Ports	I _{OUT} (A)	I _Q (Typ) (mA)	BC 1.2 CDP (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	Int USB Switch	Line Drop Compensation	USB Discharge	Package	Notes
MPQ4485-AEC1	6	40	Dual	3 (x2)	-	450	✓ (USB2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	QFN-26 (5x5)	FCCM

All-In-One Data Port Products

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

MPQ4228-C-AEC1	4.2	40	Single	3	-	Selectable	✓	-	-	-	✓	✓	✓	✓	✓	✓	QFN-22 (4x4)	Supports CDP mode	
MPQ4483-AEC1	4.2	40	Single	3	-	Selectable	✓	✓	-	-	✓	-	✓ (Adj CC Limit)	✓ (Adj)	✓	-	✓	QFN-25 (4x5)	Supports BC1.2 DCP and CDP modes, bidirectional USB 2.0 high-speed data switch, 3.55A/3.75A CC I _{OUT} limit
MPQ4483-FD-AEC1	4.2	40	Single	3	-	Adjustable	✓	✓	-	-	✓	-	✓ (Adj CC Limit)	✓ (Adj)	✓	-	✓	QFN-25 (4x5)	Supports BC1.2 DCP and CDP modes, bidirectional USB 2.0 high-speed data switch, 3.55A/3.75A CC I _{OUT} limit
S MPQ4229-C-AEC1	4.2	40	Single	3	-	Selectable	✓	-	-	-	✓	✓	✓	✓ (Adj)	✓	✓	✓	QFN-22 (4x4)	P2P with MPQ4228-C, up to 1.5V line drop comp.

USB Type-C/A Port Controllers and Buck Products

Buck Only

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

USB Type-C/A Port Controllers and Buck Products

USB Type-C/A Charging Port Controllers

Part Number	V _{IN} (Min) (V)	V _{IN} (Abs Max) (V)	Dual/Single Ports	I _{OUT} (A)	I _Q (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

Full-Bridge Power Stages for Highly Integrated Wireless Power Transmitters

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 _Q (Typ) (mA)	Buck V _{IN} (Min) (V)	Buck V _{IN} (Abs Max) (V)	Buck I _{OUT} (A)	Amplifier Accuracy	Frequency Spread Spectrum	Package	Notes
N MPQ4280-AEC1	4.7	40	15	Selectable	0.9	1	40	0.5	1%	-	QFN-22 (4x5)	Integrated 36V buck and 5V/65mA LDO
S MPQ4282-AEC1	1	32	20	Selectable	0.08	4.5	40	1.5	1%	✓	QFN-27 (4x5)	Integrated 1.5A buck

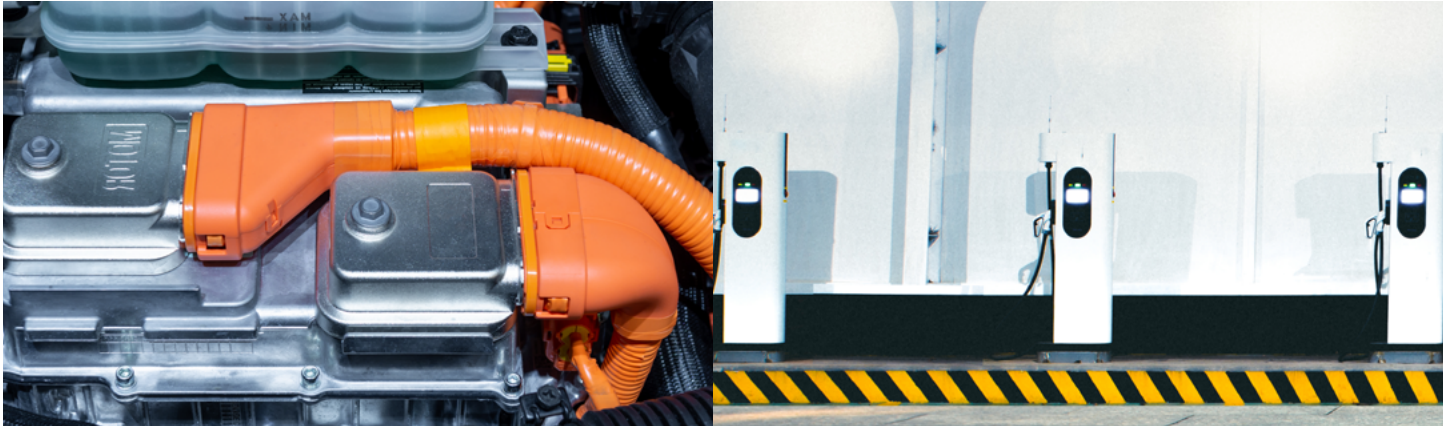
Wireless Charging Solutions

Step-Down/Step-Up Converters

Part Number	V _{IN} (Min) (V)	V _{IN} (Abs Max) (V)	I _{OUT} (A)	I _Q (Typ) (mA)	f _{SW} (kHz)	Battery Short Protection	Frequency Spread Spectrum	Line Drop Compensation	I ² C	EN Shutdown Discharge	Load-Shedding Send Alert	Package	Notes
MPQ4262-AEC1 (Hybrid)	3.6	40	5	0.13	Selectable	✓	✓	✓	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency
MPQ4263-AEC1 (Hybrid)	3.6	40	5	0.13	Selectable	✓	✓	✓	✓	✓	✓	QFN-20 (3x5)	36V, 100W, two int. FETs, 98% peak efficiency, high-side current sense
N MPQ4232-AEC1	4.3	40	5	0.13	Selectable	✓	✓	✓	✓	✓	✓	QFN-19 (4x5)	22V/5A, 60W, 4-switch converter with advanced protection
S MPQ4232A-AEC1	3	40	6	0.13	Selectable	✓	✓	✓	✓	✓	✓	QFN-19 (4x5)	36V/6A, 60W, 4-switch converter, P2P with MPQ4232-AEC1

MPS Electrification Solutions

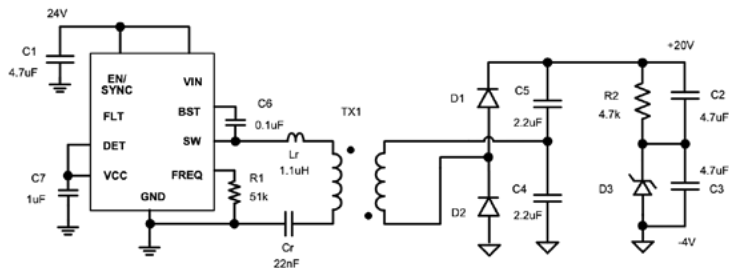
MPS offers a full family of isolated and non-isolated solutions for designing high-power electrification devices, from 11kW to 22kW onboard chargers to 300kW+ traction inverters. Choose from isolated gate driver power supplies — which can reduce solution size by over 40% — to isolated gate drivers optimized 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 (f_{sw}) 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

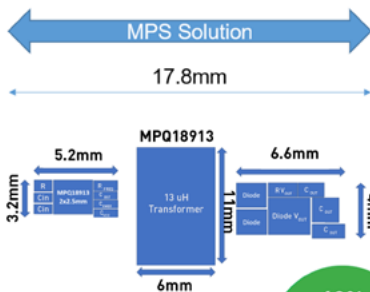
Up to 6W
Power

500kHz to 5MHz
Switching Frequency

QFN-10 (2mmx2.5mm)
Package

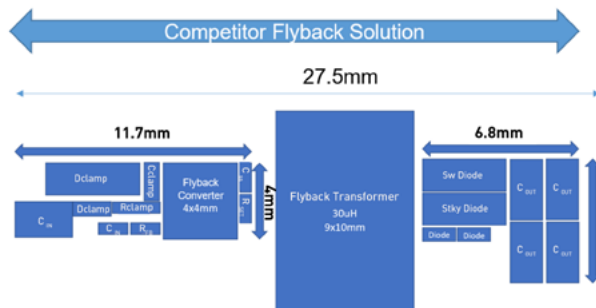


Automatic Resonant Frequency Detection
Frequency Spread Spectrum
LLC Resonant Topology
Features



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

40%
Smaller
Solution
Size!



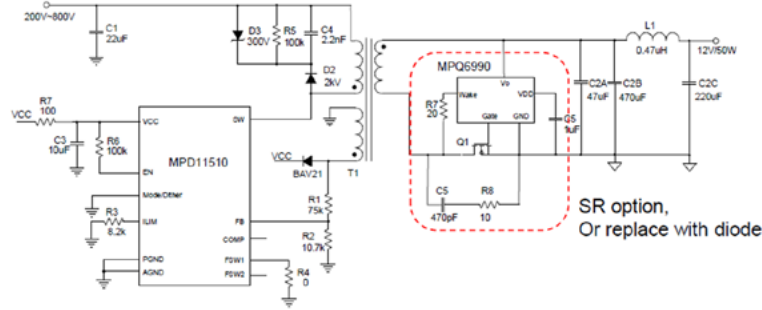
Solution Size: **180mm²**
Total Area: **275mm²**
Components: **26**

Applications

- IGBT/SiC Gate Driver Bias
- Traction Inverters
- Onboard Chargers (OBCs)
- DC Fast-Charging Stations

MPDQ11510-AEC1

1200V Flyback Converter with Integrated SiC MOSFET



Features

Optimized Solution Size

Integrated 1700V SiC device (1.2Ω SiC FET for <50W designs)
 60% fewer components vs. discrete flyback converter
 89% peak efficiency with 800V_{IN}/15V_{OUT}

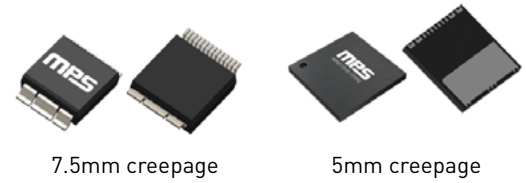
Ideal for 400V to 800V Systems

QFN package with 5mm creepage
 SOIC-28 WB package with 7.5mm creepage

Key Specifications:

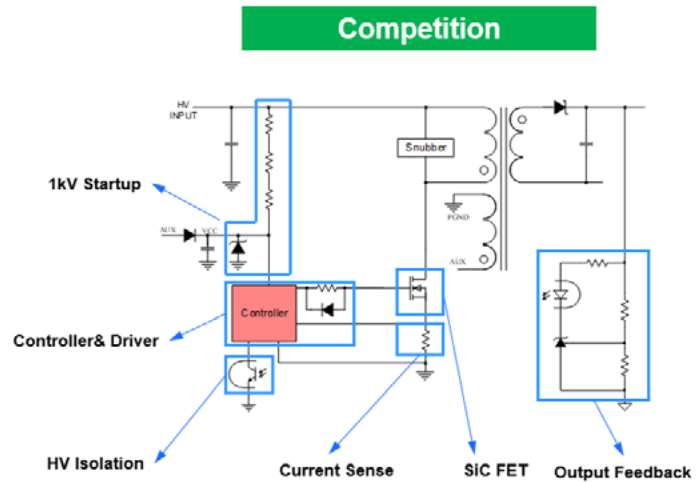
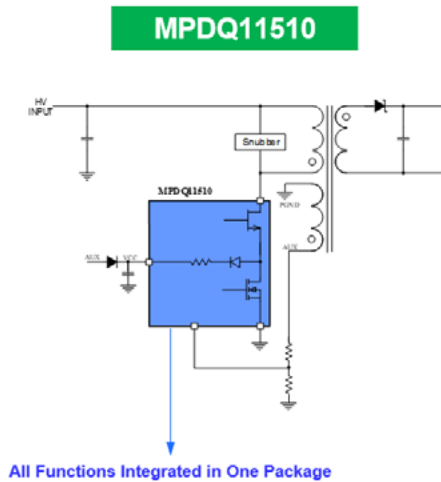
20V to 1200V Input Voltage	Up to 50W Power	Up to 140kHz Switching Frequency
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QFN-12 (10mmx10mm), SOIC-28 WB Packages	PSR or SSR Feedback Spread Spectrum Built-In HV Start-Up Features
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Applications

Traction Inverters, Auxiliary Power Supplies | Battery Management Systems
 DC/DC Converters | Energy Storage Systems (ESS)



MPQ18831/51/71-AEC1

Dual-Channel Isolated Gate Driver Family

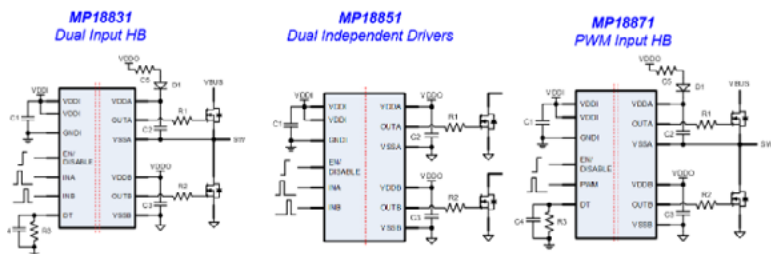
Features

Flexible Design

- Design systems for 2.5kV to 5kV of 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

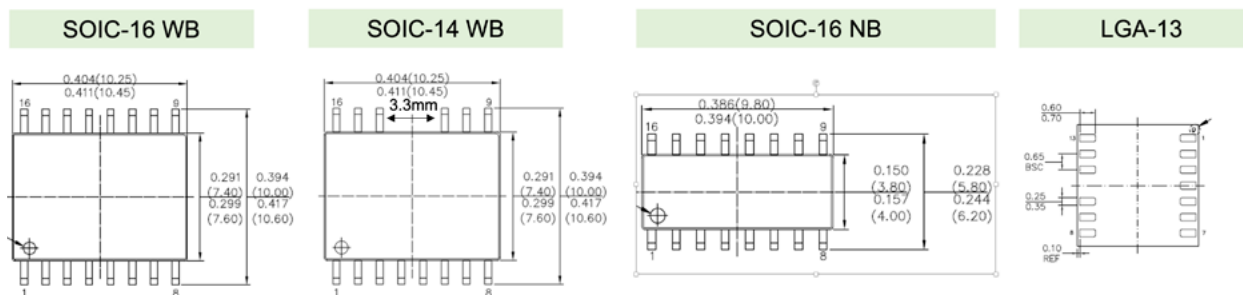
Ideal for 400V to 800V Systems

- Achieves up to 5kV of reinforced isolation
- 4A/8A sink-source current enables usage of high-power FETs for higher efficiency



Key Specifications:

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



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 Drivers

Part Number	Isolation Rating (kV RMS)	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	SiC FET, IGBT, MOSFET, GaN FET	4	8	5/8/10/12	2.8 to 5.5	30	SOIC-16 NB, 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	SiC FET, IGBT, MOSFET, GaN 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 MPQ18871-AEC1	2.5/3/5	PWM Input Half-Bridge	2	100	SiC FET, IGBT, MOSFET, GaN 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	SiC FET, IGBT, MOSFET, GaN 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, fault reporting
P MPQ18815-AEC1	5	Single-Channel Gate Driver	1	100	SiCFET, IGBT, MOSFET	4	4	12/15/17	2.8 to 5.5	30	SOIC-16 WB	Desat. detection, active Miller clamp, soft turn-off, external buffer, AEC-Q100, UL1577 and VDE-0884 certified

Isolated Power Supplies

Part Number	Topology	Device Type	Output Power (W)	V _{IN} (Min) (V)	V _{IN} (Max) (V)	V _{OUT} (Typ) (V)	Integrated Transformer	Package Type	Isolation Voltage (kV DC)	# of Outputs	Package Size: WxL (mm)	Notes
P MPQ6007-AEC1	Flyback	Converter	10	4.5	42	12 to 24	-	QFN-11	5+ (Dependent on Transformer Design)	1, More Possible	3x3	Automotive active clamp primary-side regulated flyback, ultra-low EMI
P MPDQ11510GRDE-171P2-AEC1	Flyback	Converter	15 to 50	20	1200	12 to 24	-	QFN-22	5+ (Dependent on Transformer Design)	1, More Possible	10x10	Automotive flyback converter with integrated 1700V SiC FET, 5mm creepage
P MPDQ11510GY-171P2-AEC1	Flyback	Converter	15 to 50	20	1200	12 to 24	-	SOIC-28 WB	5+ (Dependent on Transformer Design)	1, More Possible	7.85x7.5	Automotive flyback converter with integrated 1700V SiC FET, 7.5mm creepage
N MPQ18913-AEC1	LLC Resonant	Converter	6	5	35	20	-	QFN-10	5+ (Dependent on Transformer Design)	1, More Possible	2x2.5	5MHz high-frequency SiC/IGBT bias supply, automatic resonant frequency detection
N MID1W2424AGYE-AEC1	LLC Resonant	Isolated Module	1.5	5	35	24	✓	SOIC-16 WB	5	1	10.3x10.3x2.5	24V _{IN} , 1.5W, automotive isolated power module for SiC bias supplies
N MIE1W0505BGY-AEC1	LLC Resonant	Isolated Module	1	2.6	5.5	5/3.3	✓	SOIC-16 WB	3	1	10.3x10.3x2.5	5V _{IN} , 1W, automotive isolated power module

Digital Isolators

	Part Number	Total Channel Count	# of Channels (Forward/Reverse)	Isolation Rating (kV _{RMS})	Data Rate	Propagation Delay (Typ) (ns)	Min CMTI (kV/ps)	Surge Voltage Level (V _{PK})	V _{IN} (Min) (V)	V _{IN} (Max) (V)	Package	Notes
N	MPQ27911-AEC1	2	1/1	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-8 WB, SOIC-8 NB	AEC-Q100
N	MPQ27920-AEC1	2	2/0	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-8 WB, SOIC-8 NB	AEC-Q100
N	MPQ27922-AEC1	4	2/2	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100
N	MPQ27931-AEC1	4	3/1	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100
N	MPQ27940-AEC1	4	4/0	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100
N	MPQ27933-AEC1	6	3/3	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100
N	MPQ27942-AEC1	6	4/2	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100
N	MPQ27951-AEC1	6	5/1	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100
N	MPQ27960-AEC1	6	6/0	3.75/5	150	13	100	5300/8000	2.5	5.5	SOIC-16 WB, SOIC-16 NB	AEC-Q100

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
	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
P	MPQ1919-AEC1	3.7	5.5	100	8	1	2	5	0.005	0.005	0.020	✓	FCQFN-15 (3x3)	Smart HB GaN driver with desat.
	MPQ1922-AEC1	4	15	100	15	1	3	4	Adj	Adj	0.3	✓	SOIC-8E, QFN-10 (4x4)	Int. current-sense amp, 9ns to 15ns rise/fall (2.2nF load)
	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
N	MPQ18024-AEC1	9	16	110	18	1	4.7	6	0.015	0.009	0.02	-	SOIC-8	-

Motor Drivers

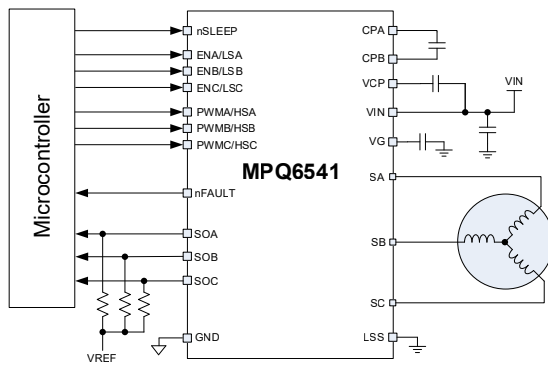
MPS offers a comprehensive portfolio of automotive motor driver solutions, including H-bridges, half-bridge drivers and pre-drivers, three-phase motor drivers, and more. Our solutions are engineered for maximum design flexibility, such as scalable product families that can drive single- to multiple-output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



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

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
- Available in a TQFN-26 (6mmx6mm) package

Additional Features

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

Key Specifications:

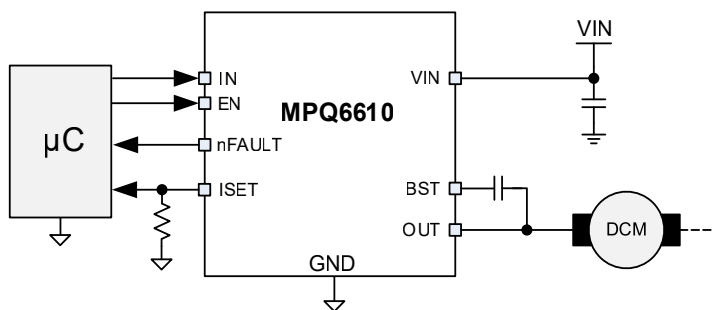
4.75V to 42V Input Voltage	1 μ A I_o in Sleep Mode	14.5m Ω Built-In FETs	TQFN-26 (6mmx6mm) Package
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Available in Pin-Compatible Family:

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

55V, 3A, Half-Bridge Power Driver



Features

Built to Handle Tough Automotive Transients

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

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

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

Reduces Board Size and BOM

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

Additional Features

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

Key Specifications:

4V to 55V Input Voltage	14.5mΩ Built-In FETs	SOT23-8 Package
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MOTOR DRIVERS | AUTOMOTIVE

Integrated BLDC Motor Drivers

Part Number	Supply Voltage (Min) (V)	Supply Voltage (Max) (V)	# of Half-Bridges	$R_{DS(ION)}$ (HS + LS) (mΩ)	Typ. Shutdown I_b (µA)	Peak Output Current (A)	Input Control Interface	Wettable Flank Option	Package	Notes
MPQ6517B-AEC1	3.3	16	2	850	-	2	PWM	-	TSOT23-6, TSOT23-6-SL	Single-phase BLDC, integrated Hall sensor, prog. speed curve, open-loop control
N MPQ6653-AEC1	5.5	35	2	960	75 (Standby)	1.2	PWM/DC	-	TSOT23-6, TSOT23-6-SL	Single-phase BLDC, integrated Hall sensor, prog. speed curve, open-/closed-loop control
N MPQ6653A-AEC1	3.5	35	2	960	120 (Standby)	1.2	PWM/DC	-	TSOT23-6, TSOT23-6-SL, TQFN-6 (2x3)	Single-phase BLDC, integrated Hall sensor, prog. speed curve, open-/closed-loop control
N MPQ6631H-AEC1	3.6	35	3	160	130 (Standby)	3	PWM/DC	✓	TQFN-26 (3x4)	3-phase BLDC, prog. speed curve, open-/closed-loop control, 1/3 Hall inputs
N MPQ6634-AEC1	4.5	35	3	500	40 (Standby)	2	PWM/DC	✓	TQFN-12 (3x4)	3-phase BLDC, sensorless, prog. speed curve, open-/closed-loop control
S MPQ6547-AEC1	4	30	3	110	1 (RMS)	1.5 (RMS)	PWM	✓	QFN-18 (3x4)	Three-phase power stage
MPQ6541-AEC1	4.75	40	3	30	1 (RMS)	8 (RMS)	PWM/ENBL	✓	TQFN-26 (6x6)	Three-phase power stage, PWM/ENBL inputs, int. current-sense amp
MPQ6541A-AEC1	4.5	40	3	30	1 (RMS)	8 (RMS)	HS/LS	✓	TQFN-26 (6x6)	Three-phase power stage, HS/LS inputs, int. current-sense amp

Single/Multi Half-Bridge Drivers (Integrated MOSFET)

Part Number	Supply Voltage (Min) (V)	Supply Voltage (Max) (V)	# of Half-Bridges	R _{DS(on)} (HS + LS) (mΩ)	Typ Shutdown I _q (µA)	Peak Output Current (A)	Input Control Interface	Wettable Flank Option	Package	Notes
MPQ6610-AEC1	4	55	1	220	1300	3	EN/IN	-	TSOT23-8, SOIC-8	Power driver
MPQ8039-AEC1	7.5	28	1	100	2.5	9	PWM	-	SOIC-8E	General-purpose, high frequency, for audio amps wireless charging, etc.
MPQ6614-AEC1	5	35	2	500	0.1	3	IN1/IN2	✓	QFN-8 (2x3)	H-bridge DC motor driver
MPQ6519-AEC1	3	28	2	130	2	5	PWM	-	QFN-19 (4x4)	H-bridge current regulator
N MPQ6619-AEC1	2.7	28	2	130	1	5	IN1/IN2	✓	QFN-19 (4x4)	H-bridge DC motor driver
N MPQ6612A-AEC1	4	40	2	103	2.8	5 (RMS)	IN1/IN2	✓	QFN-18 (3x4)	H-bridge with current sense, IN1 and IN2 inputs
N MPQ6612A-D-AEC1	4	40	2	103	2.8	5 (RMS)	ENBL/DIR	✓	QFN-18 (3x4)	H-bridge with current sense, ENBL and DIR inputs
S MPQ6611-AEC1	2.7	32	2	40	1	8 (RMS)	SPI	✓	QFN-20 (4x4)	H-bridge with programmable slew rate
S MPQ6611H-AEC1	2.7	32	2	40	1	8 (RMS)	Prog Control Modes	✓	QFN-20 (4x4)	H-bridge with 3 configurable input logics and programmable slew rate
MPQ6615-AEC1	4.75	40	2	22	1	8 (RMS)	Prog Control Modes	✓	TQFN-26 (6x6)	H-bridge motor driver, int. current sense amp
MPQ6523-AEC1	7	28	3	1100	1.5	0.9	SPI	✓	QFN-24 (4x4)	Independent half-bridge control, comprehensive protections, serial data interface up to 3MHz
MPQ6524-AEC1	7	28	4	1100	1.5	0.9	SPI	✓	QFN-24 (4x4)	Independent half-bridge control, comprehensive protections
MPQ6526-AEC1	7	28	6	1100	1.8	0.9	SPI	✓	QFN-24 (4x4), QFN-24 (5x5)	Independent half-bridge control, comprehensive protections
MPQ6626-AEC1	5.5	40	6	1300	1	0.8	SPI	-	TSSOP-28EP	Independent half-bridge control, comprehensive protections, SPI interface up to 5MHz
MPQ6628-AEC1	5.5	40	8	1300	1	0.8	SPI	-	TSSOP-28EP	Independent half-bridge control, comprehensive protections, SPI interface up to 5MHz
MPQ6527-AEC1	5.5	40	10	1300	1	0.8	SPI	-	TSSOP-28EP	Independent half-bridge control, comprehensive protections, SPI interface up to 5MHz

Stepper Motor Drivers

Part Number	Supply Voltage (Min) (V)	Supply Voltage (Max) (V)	# of Half-Bridges	R _{DS(on)} (HS + LS) (mΩ)	Typ Shutdown I _q (µA)	Peak Output Current (A)	Step Mode	Input Control Interface	Wettable Flank Option	Package	Notes
S MPQ6605D-AEC1	4.5	60	-	LS: 350	2	1.5	-	Parallel	-	QFN-24 (4x4)	4-channel, low-side driver
S MPQ6606-AEC1	4.5	60	-	LS: 700	-	0.75	-	SPI	-	TSSOP-20EP	8-channel, low-side driver
S MPQ6609-AEC1	4	36	4	580	1	1	1, 1/2, 1/4, 1/8, 1/16, 1/32	SPI	✓	QFN-18 (3x4)	Bipolar stepper, int. current sense, rotor stall detection, BEMF measurement
N MPQ6600L-AEC1	4.5	35	4	365	2.5	1.5	1, 1/2, 1/4, 1/8	Indexer	✓	QFN-24 (4x4)	Bipolar, microstepping, int. current sense and latch-off

Pre-Drivers

	Part Number	Supply Voltage (Min) (V)		Supply Voltage (Max) (V)		# of Half-Bridges	Source Current (A)	Sink Current (A)	Input Control Interface	Wettable Flank Option	Package	Notes
				V _{SW} (Max) (V)								
S	MPQ6590A-AEC1	7.5	80	80	-	1	1	ENBL/ON	✓	QFN-11 (3x4)	High-side MOSFET driver	
	MPQ1922-AEC1	5	15	100	1	3	4	INH/INL	✓	QFN-22 (4x5)	Gate driver, int. current-sense amp, interlock function	
	MPQ1923-AEC1	5	17	100	1	7	8	INH/INL	-	QFN-10 (4x4), QFN-8 (4x4)	High-frequency gate driver, 7.2ns/5.5ns rise/fall (1nF load)	
	MPQ6528-AEC1	5	60	60	2	0.8	1	EN/PWM	✓	QFN-28 (4x5)	H-bridge gate driver	
N	MPQ6641-AEC1	6	40	40	2	0.8	1	EN/IN, SPI	✓	QFN-32 (5x5)	H-bridge pre-driver with SPI and internal current-sense amp	
N	MPQ6530-AEC1	5	60	60	3	0.8	1	EN/PWM	✓	QFN-28 (4x5)	For BLDC motors	
	MPQ6531-AEC1	5	60	60	3	0.8	1	HS/LS	✓	QFN-28 (4x5)	For BLDC motors	
	MPQ6532-AEC1	5	60	60	3	0.8	1	PWM/DIR, 3 Hall Inputs	✓	QFN-28 (4x5)	Hall inputs, for BLDC	
	MPQ6533-AEC1	6	40	40	3	0.8	1	EN/IN, SPI	✓	QFN-32 (5x5)	Three-channel LDO regulator, current-sense amp	
S	MPQ6633A-AEC1	5	50	50	3	0.7	1.1	HS/LS	✓	QFN-34 (4x5)	Integrated 50mA, 2% accurate LDO and 1-channel current-sense amp	
S	MPQ6633B-AEC1	5	50	50	3	0.7	1.1	HS/LS	✓	QFN-48 (6x6)	Integrated 50mA, 2% accurate LDO and 3-channel current-sense amp	
N	MPQ6539-AEC1	8	80	80	3	0.8	1	HS/LS	-	QFN-28 (4x5)	Internal LDO for external NPN, 1-channel current-sense amp, prog. OCP	
S	MPQ6632-AEC1	6	50	55	3	1	1	PWM/DC	✓	QFN-32 (4x4)	Prog. speed curve, open-/closed-loop control, 1/3 channel Hall inputs	
S	MPQ6635-AEC1	6	35	40	3	1	1	PWM/DC	✓	QFN-28 (5x5)	Prog. speed curve, open-/closed-loop control, sensorless	

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.



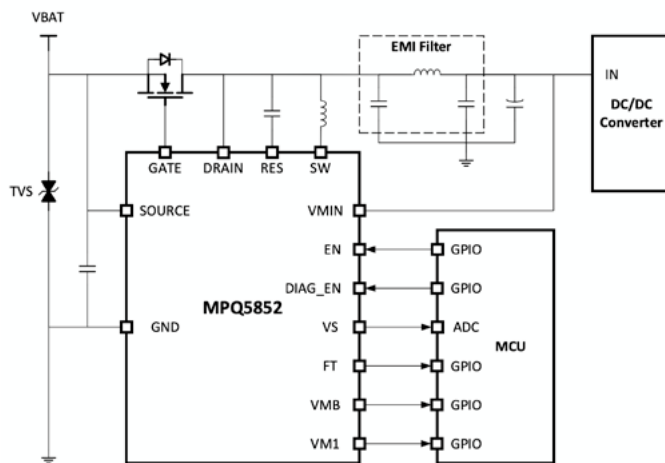
Integrated Safety Features

Small Solution Size

Fast Protection Response

MPQ5852-AEC1

42V, Ideal Diode Controller with Reverse Protection and 2 Voltage Monitors



Key Specifications:

0V to 42V
Input Voltage

4 μ A
 I_q in Standby Mode

QFN-13 (3mmx3mm)
Package

Features

Built to Handle Tough Automotive Transients
Load dump up to 42V, cold crank down to 0V

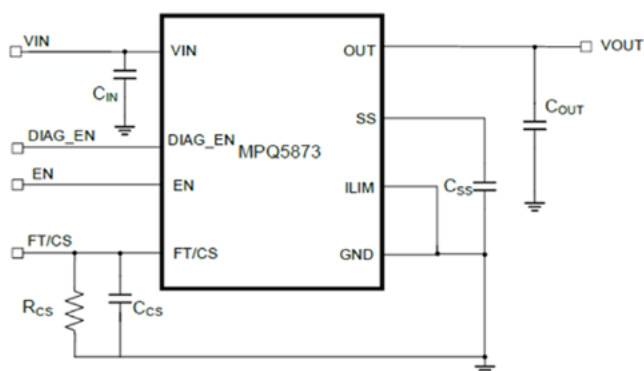
Cooler Thermals
Smaller switching loss with strong gate drive
20mV low dropout

Extends Vehicle Battery Life
Low 4 μ A shutdown current
Low 30 μ A supply current
DIAG_EN for low quiescent current (I_q) option

Additional Features
Designed to meet similar system cost to TVS diode discrete architecture
Strong gate driver ability: 170mA pull-up/430mA pull-down current
Extremely fast response rectifies AC frequency up to 100kHz
Meets stringent ISO 16750 requirements
Fault (FT) indicator for DRAIN over-voltage (OV) with high accuracy
Two high-accuracy under-voltage (UV) indicators for battery and downstream input voltage (V_{IN}) monitoring
High-accuracy battery voltage sensing supports 3.3V/1.8V MCUs

MPQ5873-AEC1

42V, 60mΩ, 3A to 1A, Single-Channel Smart Switch



Features

Built to Handle Tough Automotive Transients

Load dump up to 42V, cold crank down to 3.5V
Adjustable start-up slew rate to help reduce inrush current during start-up

Cooler Thermals

60mΩ on resistance

High-Accuracy Current-Sense Capability

±4% at 1A and ±6% at 300mA

Full Protection and Diagnostics

Can achieve accurate diagnostics in real time without additional calibration

Additional Features

Supports internal and external current limiting
Adjustable start-up slew rate
Ability to distinguish different fault conditions
Selectable input over-voltage protection (OVP) threshold

Key Specifications:

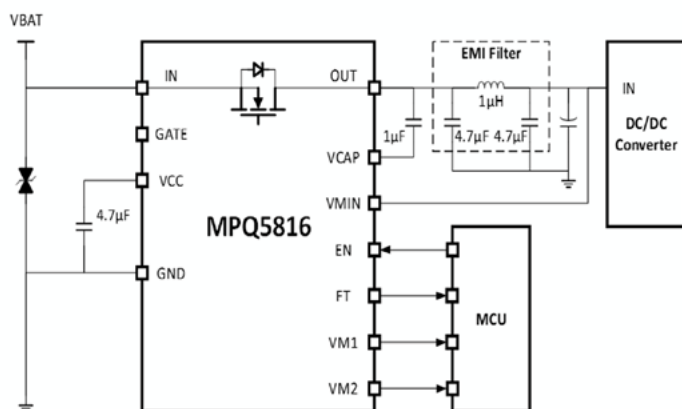
3.5V to 42V Input Voltage	0.5μA Standby Current	QFN-8 (2mmx2.5mm) Package
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Available in Pin-Compatible Family:

1A MPQ5871	2A MPQ5872	3A MPQ5873
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MPQ5816

42V, Integrated Ideal Diode Controller with Reverse Protection and UV Indicator



Key Specifications:

0V to 42V Input Voltage	4μA Shutdown Current	QFN-21 (3mmx4mm) Package
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Features

Built to Handle Tough Automotive Transients

Load dump up to 42V, cold crank down to 0V
-40V reverse voltage blocking

Cooler Thermals

10mΩ on resistance for 9A applications
Smaller switching loss with strong gate drive

Extends Vehicle Battery Life

Low 4μA shutdown current

Additional Features

Extremely fast response rectifies AC frequency up to 100kHz
Internal charge pump with 10mA pull-up/200mA pull-down current
Meets stringent ISO 16750 requirements
Fault indicator for output over-voltage (OV), over-temperature (OT), and over-current (OC) conditions
Two under-voltage (UV) indicators for battery and load monitoring
High-accuracy battery voltage sensing supports 1.8V/3.3V MCUs

LOAD SWITCHES | AUTOMOTIVE

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	Notes
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)	-
MPQ5074-AEC1	3	5.5	3	10	0.22	✓	✓	✓	QFN-13 (2.5x3)	-
N MPQ5075A-AEC1	3	5.5	5	10	0.22	✓	✓	✓	QFN-13 (2.5x3)	-
MPQ5077A-AEC1	3	5.5	7	10	0.22	✓	✓	✓	QFN-13 (2.5x3)	-

Load Switches

POC (16V) 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	ASIL-B	Wettable Flank QFN Option	Package	Notes
S MPQ5862-AEC1	5	26.5	1.5	90	0.005	✓	-	✓	QFN-17 (3x4)	2-ch, smart HSS, ±3% high-accuracy current-sensing, full diagnostics and protections
S MPQ5864-AEC1	5	26.5	0.8	200	0.005	✓	✓	✓	QFN-17 (3x4)	4-ch, smart HSS, ±3% high-accuracy current-sensing, full diagnostics and protections
S MPQ77220FS-AEC1	5	26.5	1.5	90	0.005	✓	-	✓	QFN-17 (3x4)	2-ch, smart HSS, ±3% high-accuracy current-sensing, full diagnostics and protections, ASIL-B, ISO 26262 compliant
N MPQ77240FS-AEC1	5	26.5	0.8	200	0.005	✓	✓	✓	QFN-17 (3x4)	4-ch, smart HSS, ±3% high-accuracy current-sensing, full diagnostics and protections, ASIL-B, ISO 26262 compliant

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
S MPQ5816-AEC1	3	42	-40	110/2000	200	4	✓	-	QFN-21 (3x4)	Integrated diode, low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO 16750-2 compliant
S MPQ5817-AEC1	3	42	-36	110/2000	200	4	✓	-	QFN-21 (4x5)	Integrated diode, low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO 16750-2 compliant
S MPQ5836-AEC1	3	55	-36	110/2000	200	4	✓	-	QFN-21 (3x4)	Integrated diode, low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO 16750-2 compliant
MPQ5850-AEC1	3	42	-36	170/430	20	4	✓	✓	TSOT23-8	Low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO 16750-2 compliant
N MPQ5852-AEC1	3	42	-36	170/430	20	4	✓	✓	QFN-13 (3x3)	Low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO 16750-2 compliant, two voltage monitors
S MPQ5857-AEC1	4.5	42	-42	800/1300	20	8	✓	✓	QFN-16 (3x4)	Back-to-back FET control, AC rectification up to 100kHz, OCP/OVP and monitoring, ISO 7637 and ISO 16750 compliant
P MPQ5858-AEC1	4.5	80	-80	800/1300	20	8	✓	✓	QFN-16 (3x4)	Low-voltage start-stop transient operation, AC rectification up to 100kHz, ISO 16750-2 compliant, 2 voltage monitors

Analog Switches

Part Number	V_{IK} (Min) (V)	V_{IK} (Max) (V)	Switch Current (A)	$R_{DS(ON)}$ (m Ω)	I_Q (Typ) (mA)	t_{ON}/t_{OFF} (ns)	Bandwidth (MHz)	Wettable Flank QFN Option	Package	Notes
MPQ2735-AEC1	1.65	5.5	0.1	0.25	1	29/23	50	-	QFN-10 (2x2)	Low-voltage, 0.45 Ω dual SPDT analog switches, separate control inputs

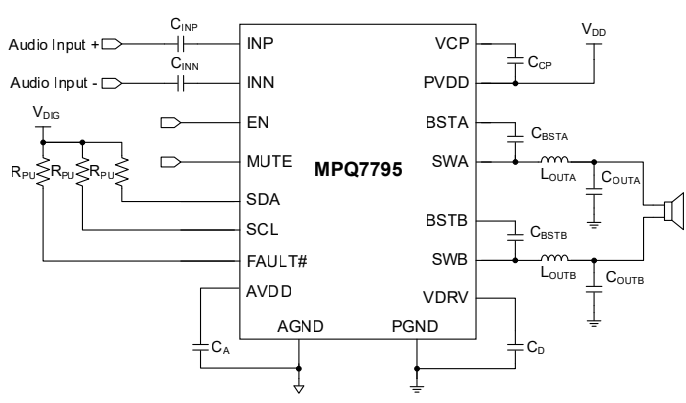
Class-D Audio

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} , 8 Ω load, 10% THD+N, 470kHz)
- 90.8% efficiency (14.4V V_{IN} , 8 Ω 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 (0.2 μ A)

Reduces Board Size and BOM

- Tiny QFN-24 (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	0.2 μ A I_Q in Standby Mode	24.5W into 4 Ω @ 14.4V _{IN} Power	150m Ω Built-In FETs
QFN-24 (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
MPQ7795-AEC1	3.9	42	24.5 @ 14.4V, 4Ω Load	150	6.5	330kHz to 2.2MHz	92 @ 470kHz, 90 @ 2MHz	0.09 @ 1W, 470kHz	71 @ 100Hz	102	115	Mono, BTL	✓	✓	✓	I ² C	✓	QFN-24 (4x4)	Low EMI, mono BTL with diagnostics
MPQ7790-AEC1	5.5	18	9 @ 12V, 8Ω Load	300	5	300kHz	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's position and current 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 & CURRENT SENSORS | AUTOMOTIVE

Integrated Current Sensors

	Part Number	Current Range (A)	V _{CC} (V)	Over-Temperature Accuracy	Temp Range (°C)	Isolation Voltage (V _{RMS})	Working Voltage (V _{DC})	Reinforced Isolation (V _{RMS})	Bandwidth (kHz)	Over-Current Detection (OCD)	Voltage Reference	Primary Conductor Resistance	UL Certification	Package	Notes
N	MCQ1805	±5, ±10, ±20, ±30, ±40, ±50	3.3, 5	2.5%	-40 to +125	3000	500	-	100	✓	-	0.9	✓ + TUV	SOIC-8	AEC-Q100, coreless, ratiometric analog output, immune to external magnetic field gradients
N	MCQ1806	±5, ±10, ±20, ±30, ±40, ±50	3.3, 5	2.5%	-40 to +125	3000	500	-	100	-	-	0.9	✓	SOIC-8	AEC-Q100, coreless, ratiometric analog output
S	MCQ1810	±5, ±10, ±20, ±30, ±40, ±50, ±65, ±80, ±100	3.3, 5	2%	-40 to +150	5000	1100	560	350	✓	✓	0.3	Planned	SOIC-10W	AEC-Q100, coreless, 0.3mΩ low primary conductor resistance, bi- or unidirectional sensing, ratiometric or absolute analog output, OCD with 1μs response time
S	MCQ1812	±5, ±10, ±20, ±30, ±40, ±50, ±65, ±80	3.3, 5	2%	-40 to +150	5000	1100	560	350	✓	✓	1.0	Planned	SOIC-16W	AEC-Q100, coreless, bi- or unidirectional sensing, ratiometric or absolute analog output, prog. OCD with 1μs response time
S	MCQ1814	±5, ±10, ±20, ±30, ±40, ±50, ±65, ±80	3.3, 5	2%	-40 to +150	5000	1100	560	350	✓	✓	1.0	Planned	SOIC-16W	AEC-Q100, coreless, bi- or unidirectional sensing, ratiometric or absolute analog output, prog. OCD with 1μs response time
N	MCQ1823	±5, ±10, ±20, ±30, ±40, ±50	3.3, 5	2.5%	-40 to +125	100	N/A	-	120	✓	-	0.6	✓	QFN-12 (3x3)	AEC-Q100, coreless, bi- or unidirectional sensing, ratiometric or absolute analog output, immune to external magnetic field gradients
S	MCQ2803	±50, ±100, ±150, ±200, ±250, ±300, ±400	3.3, 5	3.5%	-40 to +150	5000	1000	475	250	-	-	0.1	Planned	5-Pin THM, 5-Pin SMT	AEC-Q100, bi- or unidirectional sensing, ratiometric or absolute analog output
S	MCQ2804	±50, ±100, ±150, ±200	3.3, 5	3.5%	-40 to +150	5000	1000	475	100	✓	-	0.1	Planned	6-Pin THM, 6-Pin SMT	AEC-Q100, bi- or unidirectional sensing, ratiometric or absolute analog output, OCD with 1μs response time
S	MCQ2805	±50, ±100, ±150, ±200, ±250, ±300, ±400	3.3, 5	3.5%	-40 to +150	5000	1000	475	250	✓	-	0.1	Planned	6-Pin THM, 6-Pin SMT	AEC-Q100, bi- or unidirectional sensing, ratiometric or absolute analog output, OCD with 1μs response time

MagVector™ 3D Magnetic Position Sensors

	Part Number	Data Length	Interface	Supply Voltage (V)	Supply Current (mA)	Sensing Range (mT)	Conversion Time (μs)	Temperature Range (°C)	Package	Notes
P	MVQ310	12-Bit	I ² C, SPI	3.3	25nA to 2.5	±125 or ±250	40	-40 to +150	TSOT23-6	AEC-Q100, digital component output, selectable operating power modes and sensing axis

POSITION & CURRENT SENSORS | AUTOMOTIVE

MagAlpha™ Magnetic Position Sensors

Part Number	±3σ Resolution	Interface	Supply Voltage (V)		Supply Current (mA)	Sensing Range (mT)	Cutoff Frequency (Hz)	Latency at Constant Speed (µs)	Magnetic Field Detection	Temperature Range (°C)	Package	Wettable Flanks	Notes
MAQ430	12-Bit	SPI, UVW, ABZ	3 to 3.6	11.7	30+ (No Upper Limit)	390	8	-	-40 to +150	QFN-16 (3x3)	✓	AEC-Q100	
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)	✓	AEC-Q100	
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)	✓	AEC-Q100, prog. filter	
N MAQ600	12-Bit to 15-Bit	SPI, ABZ, PWM, UVW, SSI	3 to 3.6	7	20+ (No Upper Limit)	75 to 17k	0	✓	-40 to +125	QFN-16 (3x3)	✓	AEC-Q100, TMR front-end, high accuracy & BW, 0.6° INL (<0.1° INL through user calibration with 32-word lookup table), no speed error	
N MAQ800	8-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	
N MAQ820	8-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	
N MAQ850	8-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	

MagDiff™ Magnetic Position Sensors with Stray Field Immunity

Part Number	±3σ Resolution	Interface	Supply Voltage (V)		Supply Current (mA)	Sensing Range (mT)	Cutoff Frequency (Hz)	Latency at Constant Speed (µs)	Magnetic Field Detection	Temperature Range (°C)	Package	Wettable Flanks	Notes
S MAQ79010	10-Bit to 14.5-Bit	SPI, SSI, I ² C, UVW, SENT, ABZ	3.3V, 5V	12	8+ (No Upper Limit)	12 to 100k	0	✓	-40 to +150	QFN-16 (3x3)	✓	AEC-Q100, ASIL-B compliant, robust against parasitic stray fields >4kA/m DC, or 5mT	
P MAQ79016	10-Bit to 14.5-Bit	SPI, SSI, I ² C, UVW, SENT, ABZ	Up to 26V	12	8+ (No Upper Limit)	12 to 100k	0	✓	-40 to +150	QFN-16 (3x3)	✓	AEC-Q100, ASIL-B compliant, 26V with reverse polarity protection, robust against parasitic stray fields >4kA/m DC, or 5mT	
S MAQ900	10-Bit to 14.5-Bit	SPI, SSI, I ² C, UVW, SENT, ABZ	3.3V, 5V	12	8+ (No Upper Limit)	12 to 100k	0	✓	-40 to +150	QFN-16 (3x3)	✓	AEC-Q100, robust against parasitic stray fields >4kA/m DC, or 5mT	

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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

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