



New Product Announcement

AL5836Q

Automotive-Compliant* Three-Channel PWM Controller with Fault Diagnostics for Automotive Exterior Lighting

The AL5836Q is a three-channel 50V PWM controller with independent output diagnostics driving multi-channel LED strings through exterior MOSFET or bipolar transistors for use in automotive front and rear lights.

For improved system robustness, its wide 3.5V to 50V input voltage range covers cold cranking and load dump conditions, and its bidirectional PWM inputs have a -40V to 50V common-mode voltage range.

Utilizing external LED driving transistors, the AL5836Q's internal power dissipation is minimized compared to traditional linear LED drivers. This makes it ideal for medium-to-high current automotive LED lighting applications.

The AL5836Q has three independent transistor drivers with individual PWM dimming capabilities and their own diagnostic detection, via the OS pins, for open-load, short-to-ground, and short-to-supply. The average current in each LED string is set by a resistor in series with the LED and PWM duty cycle.

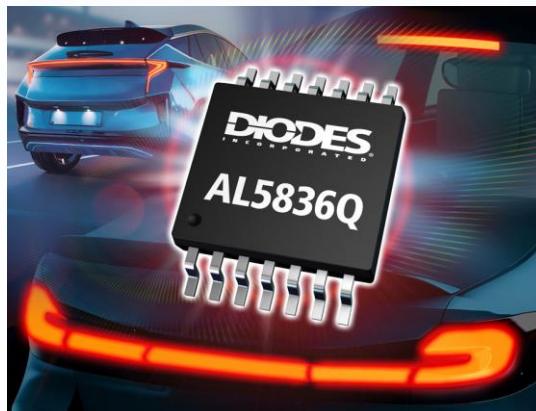
The AL5836Q has been qualified to AEC-Q100 grade 1, operating across the -40°C to +125°C ambient temperature range, and is available in the TSSOP-14 package.

*Automotive-compliant - AEC qualified, manufactured in facilities certified to IATF 16949, supporting PPAP documents.

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The DIODES Advantage

The AL5836Q three-channel 50V PWM controller with diagnostic fault detection provides a simple solution to automotive rear combination lights.

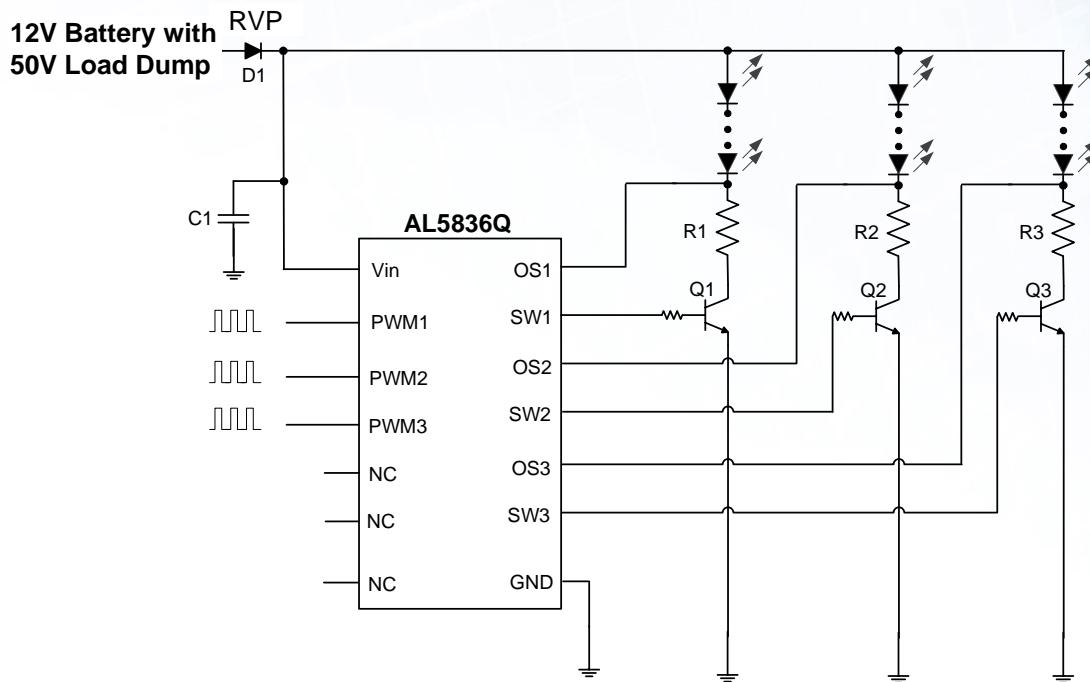
- **Three Pulse Width Modulation (PWM) Input Channels with Diagnostic Feedback**
Provide a robust multi-channel solution for rear LED light clusters
- **Drives External MOSFET and Bipolar Switches to Reduce Self-Heating**
Allows optimization of external components for LED current and ambient temperature
- **Diagnostic Detection of Open-Load, Short-to-Ground, Short-to-Supply, and Thermal Shutdown via PWM Pins**
Increases system robustness with comprehensive fault detection
- **Robust PWM I/O Pins—6kV HBM-ESD with Wide -40V to 50V Common-Mode Withstand**
Improved ability withstand to large transients

Applications

LED driving in exterior lights

- Rear light clusters (stop, tail, fog, turn)
- Center high-mounted stop lights (CHMSLs)
- Turn signals
- Daytime running lights (DRLs)
- Fog lights

Typical Application



Automotive-Compliant Adjustable-Current Linear LED Driver-Controllers

Part Number	Min. Supply Voltage	Max. Supply Voltage	Max. V _{OUT}	Number of Channels	Max. Drive Current/Channel	Accuracy	Dimming Method		Ambient Temperature Range	Fault Detection	Package
	V	V	V				mA	%	Analog	PWM	°C
AL5836Q	3.5	50	50	3	50	External	N	Y	-40 to +125	Open-LED, Short-VS, Short-GND	TSSOP-14
AL5814Q	4.5	60	External BJT/ MOSFET	1	15	±4	Y	Y	-40 to +125	Open-LED	MSOP-8EP
AL5816Q	4.5	60	External BJT/ MOSFET	1	15	±4	N	Y	-40 to +125	-	SOT25

Ordering Information

Orderable Part Number	Compliance (Only Automotive Supports PPAPs)	Package	Moisture Sensitivity	Packing	
				Quantity	Carrier
AL5836QT14-13	Automotive	TSSOP-14	MSL-1	2,500	13" Tape & Reel