



New Product Announcement

AP74502Q AP74502HQ

80V Low IQ Ideal Diode Controller Provides Enhanced Protection Against Reverse Battery and Overvoltage in 48V Systems

The automotive-compliant AP74502Q and AP74502HQ provide a simple, cost-effective protection solution for reverse-polarity and overvoltage conditions.

They drive two external back-to-back N-channel MOSFETs which, coupled with their OVLO pin, provides input overvoltage protection as well as limited inrush current control.

The AP74502Q has a peak gate drive source capability of 60 μ A, which provides a longer turn-on time and hence, inrush current limitation. The AP74502HQ has a 11mA peak gate drive source capacity.

The AP74502Q and AP74502HQ do not have reverse current blocking features and are suitable for input reverse polarity protection of loads that may return energy to the input supply. This includes automotive body control module motor loads.

The products' wide supply input range of 3.2V to 75V supports RVP and overvoltage protection in existing 12V and 24V battery systems, as well as the growing 48V automotive battery systems utilized in xEV vehicles. Their 3.2V operation capability ensures correct operation even in the severe cold-cranking conditions within automotive systems.

The AP74502Q and AP74502HQ are available in the industry-standard SOT28 package.

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

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The DIODES Advantage

The 80V-rated AP74502Q and AP74502HQ provide reverse battery polarity and overvoltage protection to increase robustness of off-battery automotive applications.

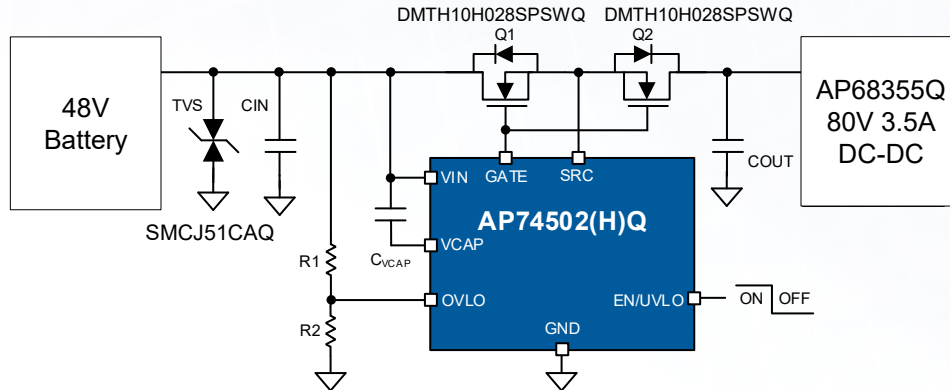
- **80V Maximum Input**
Protects 12V/ 24V/ 48V battery systems from overvoltage condition
- **Correct Operation Down 3.2V Across All Temperatures**
Supports severe cold-crank requirement in automotive systems
- **Drives Back-to-Back External N-MOSFETs with Overvoltage Detection**
Protects and isolates downstream systems from battery overvoltage conditions
- **Two Gate Drive Options**
Provides targeted inrush current control
- **AEC-Q100 Grade 1 Qualified with 150°C Maximum Junction Temperature**
Supports the -40°C to +125°C ambient temperature range

Applications

Automotive reverse battery protection in:

- Body control modules
- Infotainment
- Advanced driver assistance systems (ADAS)
- Exterior lighting
- USB charging

Typical Application



Automotive-Compliant Ideal Diode Portfolio

Part Number	Max. Voltage Rating	Operating Input Voltage	Peak-Gate Source Current	I_Q	Overvoltage Response Time	Ambient Temperature Range	Key Features*	Package
	V	V	mA	μA	μs	$^{\circ}C$		
AP74502Q	-80 to +80	3.2 to 75	0.06	62	0.6	-40 to +125	RPP, OVP, Inrush current protection	SOT28
AP74502HQ			11					
AP74700AQ	-65 to +70	3.2 to 65	11	80	-	-40 to +125	RCP, RVP with 48V specifications	SOT26, SOT28, SO-8
AP74700Q	-65 to +65	3.2 to 60	11	80	-	-40 to +125	RCP, RVP	SOT26
AP74701Q	-33 to +65	3.2 to 60	11	80	-	-40 to +125	RCP, RVP with $V_{DS-Clamp}$	SOT28

* RPP: Reverse Polarity Protection, OVP: Overvoltage Protection, RCP: Reverse Current Protection, RVP: Reverse Voltage Protection

Ordering Information

Orderable Part Number	Compliance (Only Automotive Supports PPAP)	Package	Moisture Sensitivity	Packing	
				Quantity	Carrier
AP74502QTA8-7	Automotive	SOT28	MSL-1	3,000	7" Tape & Reel
AP74502HQTA8-7	Automotive	SOT28	MSL-1	3,000	7" Tape & Reel