



Automotive-Compliant Ideal-Diode-Controller Provides Fast Reverse Voltage Protection for ECU Power Rails

The automotive-compliant DIODES AP74700Q provides a simple, efficient, and fast-response solution for automotive reverse voltage protection (RVP) circuits.

The part's wide 3.2V to 65V input range, coupled with its -65V reverse voltage withstand, enables the AP74700Q to provide highly efficient reverse voltage protection in 12V, 24V, and 48V automotive battery systems.

The AP74700Q drives an external N-channel MOSFET (optimized for the required load current); and keeps the MOSFET's drain-source voltage continuously monitored and regulated to approximately 20mV.

When a reverse current is detected (equivalent to $<-10\text{mV}$ between ANODE to CATHODE), V_{GATE} is internally connected to the ANODE pin, rapidly turning off the external MOSFET within $0.75\mu\text{s}$.

The $\pm 65\text{V}$ rating of the AP74700Q coupled with a suitable TVS enables it to support designs for automotive ISO 7637 protection.

The AP74700Q is available in the SOT26 package.

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

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The DIODES Advantage

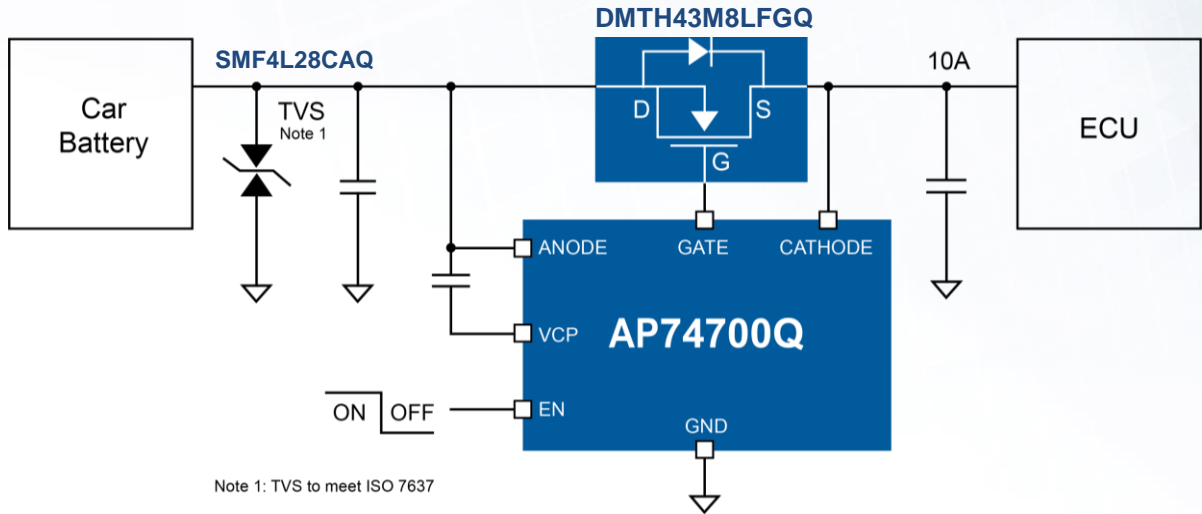
Automotive-compliant ideal diode controller reduces power loss in reverse voltage protection circuits.

- **Input Voltage Range from 3.2V to 65V with -65V Reverse Voltage Withstand**
Supports RVP in 12V, 24V, and 48V systems
- **Drives External N-MOSFET**
Provides cost-performance optimization based on load current/temperature range with improved RVP performance
- **20mV ANODE to CATHODE Forward Voltage Drop Control**
Reduces power loss and temperature rise in RVP circuits
- **Fast 0.75 μs Turn-Off Times to Detected Reverse Voltages**
Prevents uncontrolled reverse currents from damaging the system
- **AEC-Q100 Grade 1 Qualified with 150°C Maximum Junction Temperature**
Supports -40°C to +125°C ambient temperature range

Applications

- Infotainment RVP
- ADAS RVP
- Automotive exterior lighting RVP
- Motor drive RVP

Application Circuit



Automotive-Compliant Ideal Diode Controller

Part Number	Input Voltage Range (V)	Maximum Reverse Voltage (V)	Nominal Forward V_{AC} Voltage (mV)	Quiescent Current (μA)	Reverse Response Time (μs)	Operating Temperature Range ($^{\circ}C$)	FET	Package
AP74700Q	3.2 to 65	-65	20	80	0.75	-40 to +125	External N-MOSFET	SOT26

Ordering Information

Orderable Part Number	Package	Moisture Sensitivity	Packing	
			Quantity	Carrier
AP74700QWU-7	SOT26	MSL-1	3,000	7" Tape and Reel