



New Product Announcement

AP22654Q AP22655Q

Adjustable 3.5A, Automotive-Compliant, Current-Limited Power Switches Improve Durability of USB Ports

The AP22654Q and AP22655Q are single-channel, adjustable, current-limited switches optimized for automotive applications that require precision current limiting.

Their programmable current-limit threshold adjusts between 400mA and 3500mA (typical) via an external resistor, enabling them to support continuous load currents up to 3.1A.

The AP22654Q's active-low enable and AP22655Q's active-high enable both feature a low 50mΩ $R_{DS(on)}$ high-side MOSFET, which offers lower power dissipation and lower inline voltage drops.

Output rise and fall times are controlled, which helps minimize current surges during turn on/off, enabling them to be used in applications subject to heavy capacitive loads.

Both devices have a comprehensive suite of protection features including short-circuit, reverse-current blocking and limiting, overcurrent, overtemperature, and short-circuit protection, as well as under-voltage lockout functionality. Their open-drain Fault Flag has a 6ms deglitch time which prevents false overcurrent reporting.

Both are available in the TSOT26 (Type A1) package and support ambient temperatures from -40°C up to +125°C.

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

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The DIODES Advantage

The AP22654Q and AP22655Q, with their 3.5A adjustable current limit, provide robust automotive USB port protection.

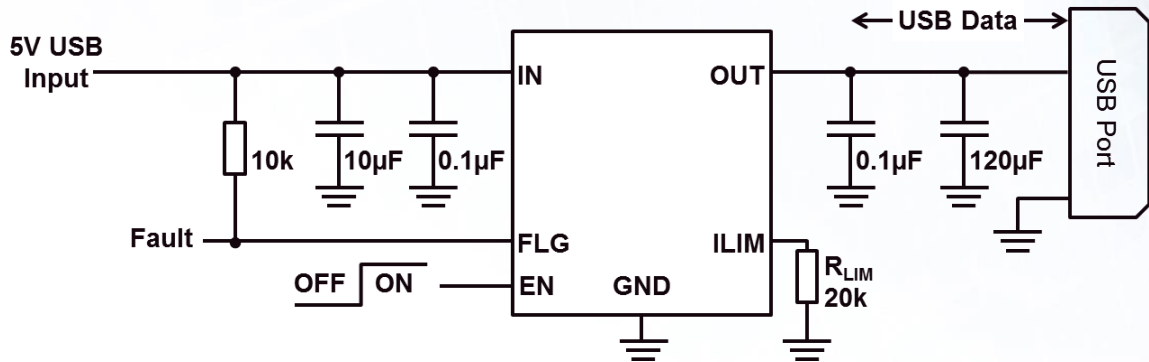
- Tight Tolerance Adjustable Current Limit from 0.4A to 3.5A**
 Implements a single device across platforms with one resistor change and allows closer matching of current limits to system requirements
- 50mΩ $R_{DS(ON)}$ High-Side MOSFET**
 Offers lower power dissipation and lower inline voltage drops
- Fast Short-Circuit Response Time: 5μs**
 Prevents unnecessary system shutdown or restart, which improves system robustness
- Reverse-Current Protection: Blocking During Shutdown and Current Limiting While Enabled**
 Protects system from reverse currents when peripherals are externally powered
- Robust Protection Features Set with Fault Reporting Overcurrent (Limiting), Output Overvoltage, and Thermal Shutdown**
 Improved robustness of USB ports

Applications

Automotive USB Port overcurrent protection:

- USB-C® port in infotainment
■ USB ports in rear cluster

Application Diagram



Automotive-Compliant Overcurrent Protected Switches

| Part Number | Enable Logic (Active) | Latches Off After Fault | Maximum Continuous Output Current | Maximum Current Limit | Minimum Operating Voltage | Maximum Operating Voltage | Quiescent Current @ 5.0V | $R_{DS(ON)}$ @ $V_{IN} = 5.0V$ | Output Discharge FET On-resistance | Reverse Voltage Protection (RVP) | Overcurrent Protection (OCP) | Ambient Temperature Range (°C) | Package |
|--------------------------|-----------------------|-------------------------|-----------------------------------|-----------------------|---------------------------|---------------------------|--------------------------|--------------------------------|------------------------------------|----------------------------------|------------------------------|--------------------------------|------------------|
| | | | A | A | V | V | µA | mΩ | mΩ | | | °C | |
| AP22653Q | High | No | 1.7 | 1.856 | 3 | 5.5 | 140 | 55 | 600 | Y | Y | -40 to +125 | SOT26 |
| AP22654Q | Low | No | 3.1 | 3.56 | 3 | 5.5 | 120 | 50 | 500 | Y | Y | -40 to +125 | TSOT26 (Type A1) |
| AP22655Q | High | No | | | | | | | | | | | |

Ordering Information

| Orderable Part Number | Compliance (Only Automotive Supports PPAP) | Package | Moisture Sensitivity | Tape Width | Carrier | |
|------------------------------|--|------------------|----------------------|------------|----------|----------------|
| | | | | | Quantity | Reel Size |
| AP22654QWU-7 | Automotive | TSOT26 (Type A1) | MSL-1 | 8mm | 3,000 | 7" Tape & Reel |
| AP22655QWU-7 | Automotive | | | | | |