



New Product Announcement

AH396xQ AH397xQ

ISO 26262-Ready, Automotive-Compliant, Dual Hall-Effect Latch with Speed and Direction Outputs

The AH396xQ and AH397xQ are automotive-compliant, high-voltage, high-sensitivity, dual Hall-effect sensors designed for applications needing accurate speed and direction sensing.

Operating over the wide 2.7V to 27V supply range, these sensors support a wide range of demanding applications. A chopper-stabilized architecture and internal bandgap regulator helps mitigate switch point drift.

The AH3965Q, AH3966Q, AH3967Q, AH3975Q, AH3976Q, and AH3977Q provide speed and direction outputs while the AH3968Q and AH3978Q have two independent latch outputs at Q1 and Q2.

The ISO 26262-ready AH397xQ integrates self-diagnostics which monitor internal blocks and enter a safe-mode when an error is detected. The devices' built-in thermal protection shuts down the chip if its temperature rises to an abnormal value and will automatically restart once the junction temperature drops below a safe value.

For robustness and protection, the AH39xxQ has a reverse blocking diode with a Zener clamp on the supply. If its supply voltage falls too low, the undervoltage lock protection is triggered, freezing it and preventing incorrect magnetic measurements.

All devices are available in the industry-standard TSOT25 package.

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

The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.

All other trademarks are the property of their respective owners.

© 2023 Copyright Diodes Incorporated. All Rights Reserved.



The DIODES Advantage

This dual Hall-effect latch family is suitable for automotive applications requiring accurate speed and direction sensing.

- Precise and Stable Switch Points Across Operating Range**
 Maintains integrity of switch points, ensuring correct system operation
- Wide 2.7V to 27V Operating Voltage Range**
 Supports the automotive battery range
- Reverse Voltage Protection of -18V with 40V Load Dump Capability**
 Meets the needs of automotive applications
- High 5kV HBM, 2kV CDM ESD Ratings Exceed Automotive Requirements**
 Improves reliability and robustness
- ISO 26262-Ready AH397xQ Built-In Self-Diagnostic with Dedicated Safe Mode**
 Supports functional-safety applications as a Safety Element out of Context (SEooC)

Applications

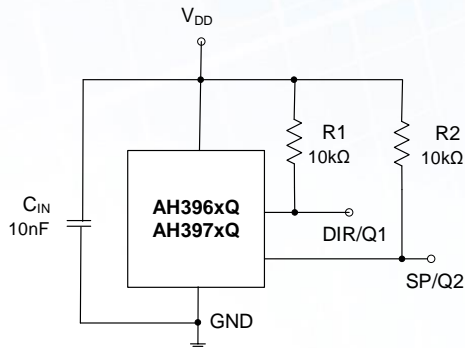
- Power closures with anti-pitch features
- Rotation speed & direction detection
- Angular position detection
- Knob controls
- Linear speed & direction detection



New Product Announcement

AH396xQ AH397xQ

Typical Application Circuit

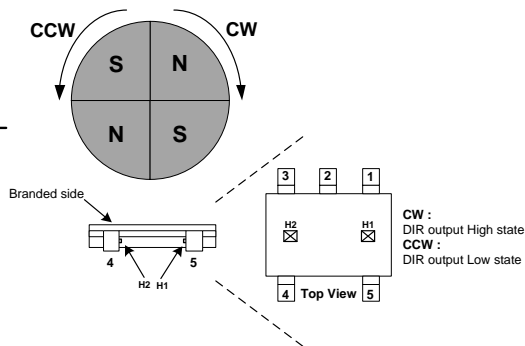
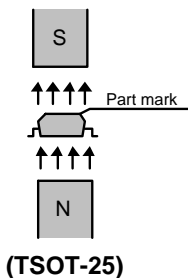
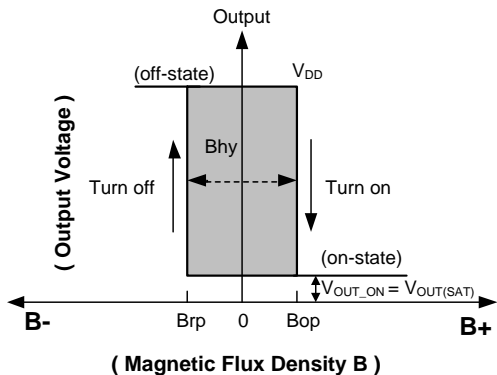


Automotive Dual Hall-Effect Latch Switch Product Portfolio

Part Number		Operating Voltage*	Supply Current	ESD HBM	Operating Point Bop (Gauss)			Release Point Brp (Gauss)†			Output				Temp. Range	Package
Self-Diagnostics	No				V	mA	kV	Min	Typ	Max	Min	Typ	Max	Q1		
AH3975Q	AH3965Q	2.7 to 27	4.7	5	-10	10	30	-30	-10	10			V	V	-40 to +150	TSOT25 (Type A1)
AH3976Q	AH3966Q				8	25	42	-42	-25	-8			V	V		
AH3977Q	AH3967Q				50	75	100	-100	-75	-50			V	V		
AH3978Q	AH3968Q				50	75	100	-100	-75	-50	V	V				

* Operating voltage range is between VDD and GND pins.

† Negative numbers mean North polarity flux density



Ordering Information

Orderable Part Number	Compliance (Only Automotive Supports PPAP)	Self-Diagnostics	Package Code	Packaging	Moisture Sensitivity	Packing	
						Quantity	Carrier
AH3965Q-WT-7	Automotive	None	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3966Q-WT-7	Automotive	None	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3967Q-WT-7	Automotive	None	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3968Q-WT-7	Automotive	None	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3975Q-WT-7	Automotive	Yes	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3976Q-WT-7	Automotive	Yes	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3977Q-WT-7	Automotive	Yes	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel
AH3978Q-WT-7	Automotive	Yes	WT	TSOT25 (Type A1)	MSL-1	3,000	7" Tape & Reel