

New Product Announcement

ZXCT21xQ

High-Precision Current Monitor for Accurate High-Side and Low-Side Current Measurement in Automotive Applications

The automotive-compliant ZXCT21xQ current monitor family are single-stage instrumentation amplifiers designed to accurately measure very small sense voltages across a wide range of common-mode voltages.

Applications include current sensing of power rail/load currents in BLDC motor control, high-power DC-DC converters, realtime reporting of state-of-health in critical equipment, and battery-charging equipment.

Their low offset voltage $(\pm 30\mu V)$ with zerodrift core (typical $\pm 100nV/^{\circ}C$) enables current sensing across the shunt with maximum full-scale voltage drops as low as 10mV. This allows the use of small-value sense resistors to monitor large currents to reduce a power loss caused by the measurement.

The ZXCT21xQ family has six fixed voltage gain options in 50V/V, 75V/V, 100V/V, 200V/V, 500V/V, and 1000V/V. They can measure voltage across shunts at common-mode voltages from -0.1V to 26V, independent of supply voltage.

These devices operate from a 2.7V to 26V power supply, independent of commonmode sense voltage, consuming a maximum of 100µA supply current.

All versions are AEC-Q100 grade 1 qualified, supports a -40°C to +125°C temperature range, and are available in the industry-standard SOT363 package.

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

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

© 2023 Copyright Diodes Incorporated. All Rights Reserved.



The DIODES Advantage

This family supports high-precision current sensing of large currents that utilize small sense resistors and voltages to mitigate power loss.

- Offset Voltage as Low as ±30µV Minimizes errors when using low-value sense resistors
- Gain Error as Low as 0.5% Maintains accurate gain control across temperature and common-mode voltage
- Common-Mode Range -0.1 to 26V Accurately measures high-side and low-side currents, including short-circuited loads
- Wide Operating Voltage Range of 2.7 to 26V Provides options for powering separately or from monitored supply
- Robust ESD Capability (HBM: 5kV, CDM: 1.5kV) Improves system reliability

Applications

Current sensing in:

- BLDC motor controls
- E-compressors
- ADAS power supplies
- EV on-board charger (OBC)
- xEV high-voltage DC-DC converters
- Valve controls
- Body control modules
- USB and wireless charging
- BMS charging and discharging

diodes.com -



New Product Announcement

ZXCT21xQ

Typical Application



Output pin is a voltage proportional to the load current. It can then be processed with an ADC.

Uni-directional current sensing

V_{OUT} = (I_{LOAD} x R_{SENSE}) x Gain

Bi-directional current sensing

V_{OUT} = (I_{LOAD} x R_{SENSE}) x Gain + V_{REF}

Automotive-Compliant Precision Current Monitor Portfolio

Part Number	Common-Mode Input Voltage ⁽¹⁾	Supply Voltage	Gain	Gain Error	Maximum V _{os}	CMRR	Ambient Temperature Range	Package
	v	v		%	μV	dB	°C	
ZXCT210Q	-0.3 to 26	2.7 to 26	200	±0.8, ±0.5	±35, ±30	100	-40 to +125	SOT363
ZXCT211Q			500		±35, ±30	100		
ZXCT212Q			1000		±35, ±30	100		
ZXCT213Q			50		±100, ±95	95		
ZXCT214Q			100		±75, ±60	100		
ZXCT215Q			75		±75, ±60	100		

Note 1. Independent of supply voltage

Ordering Information

Orderable	Compliance	Gain Error (%)	Package Code	Deekere	Moisture	Packing	
Part Number	Supports PPAP)			Раскаде	Sensitivity	Quantity	Carrier
ZXCT21xQADW-7	Automotive	0.8	DW	SOT363	MSL-1	3,000	7" Tape & Reel
ZXCT21xQBDW-7	Automotive	0.8	DW	SOT363	MSL-1	3,000	7" Tape & Reel
ZXCT21xQCDW-7	Automotive	0.5	DW	SOT363	MSL-1	3,000	7" Tape & Reel