Featured Products

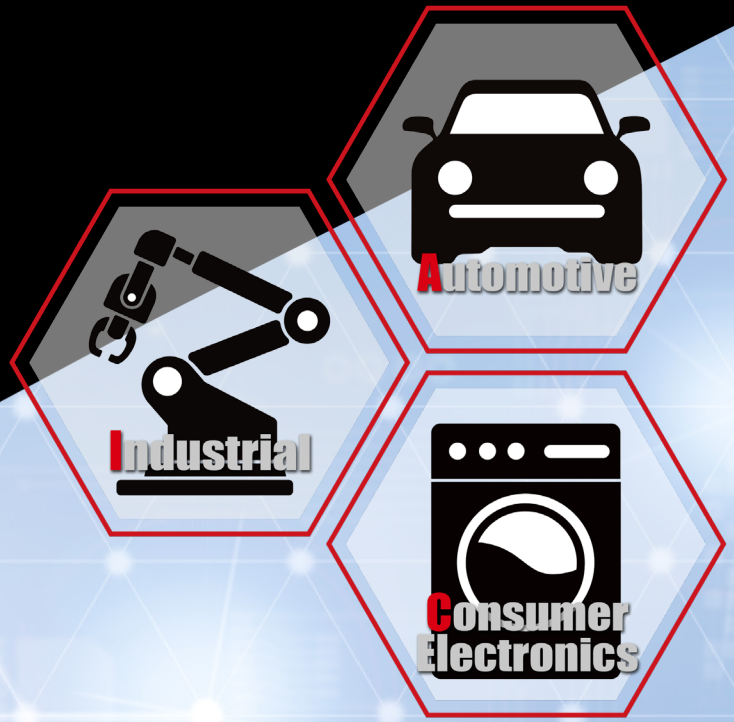
Electronics for the Future

ROHM SEMICONDUCTOR

High accuracy current sensing with negative voltage tolerance improve application reliability

AEC-Q100 Qualified Automotive Current Sense Amps

BD1422xG-C（12V/24V Systems）
BD1423xFVJ-C（12V/24V/48V Systems）



Overview of AEC-Q100 Qualified Automotive Current Sense Amps

The BD1422xG-C and BD1423xFVJ-C are high accuracy current sense amps qualified under the AEC-Q100 automotive standard. Features include a wide input voltage range from −14V, which provides excellent negative voltage tolerance supporting counter-electromotive voltage and reverse connection, up to 80V, making them ideal for various automotive applications.

Features

- **Broad lineup of automotive current sense amps meets the growing demand for automotive applications**

  Shunt resistor-based current sense amps enhance reliability in automotive systems

- **Supports automotive applications with a wide input voltage range from −14V up to +80V**

  The wide input voltage range manages steep undershoots, counter-electromotive force, and reverse connections, ensuring robust measurement and device protection

- **Achieves greater accuracy and space savings by integrating peripheral components**

  Eliminates the need for gain-setting resistors, capacitors, and circuit protection zener diodes, leading to improved accuracy and space efficiency

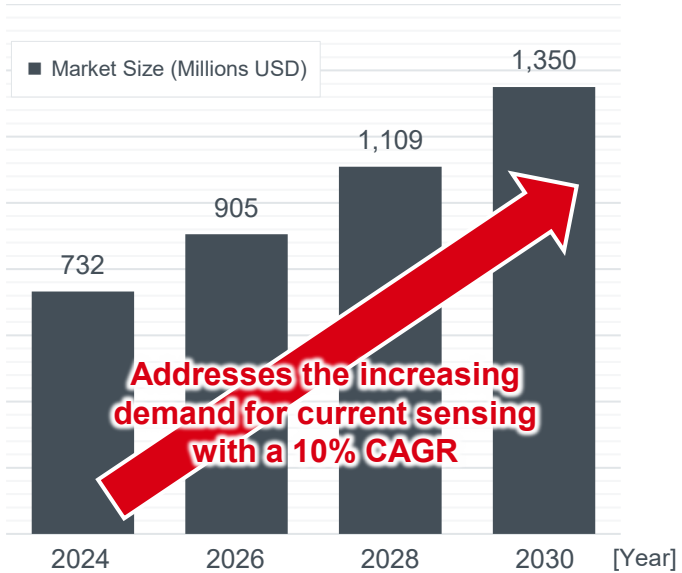
BD1422xG-C
SSOP6
2.9×2.8×Max1.25mm

BD1423xFVJ-C
TSSOP-B8J
3.0×4.9×Max1.1mm

ComfySIL Functional Safety

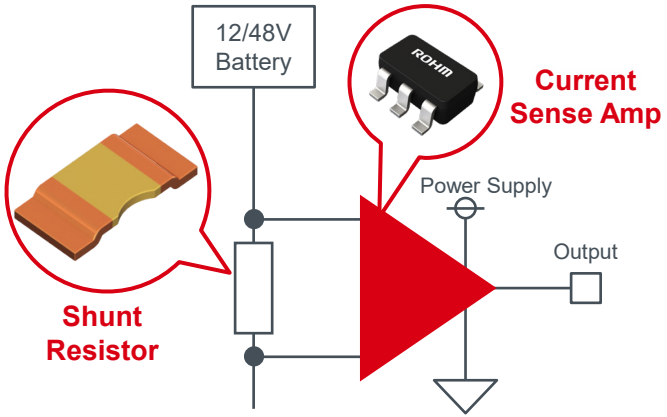
Broad lineup of automotive current sense amps meets the growing demand for automotive applications

Market Forecast for Automotive Current Sense Amps*



*ROHM March 2025 study

Automotive Current Sensing Circuit Example



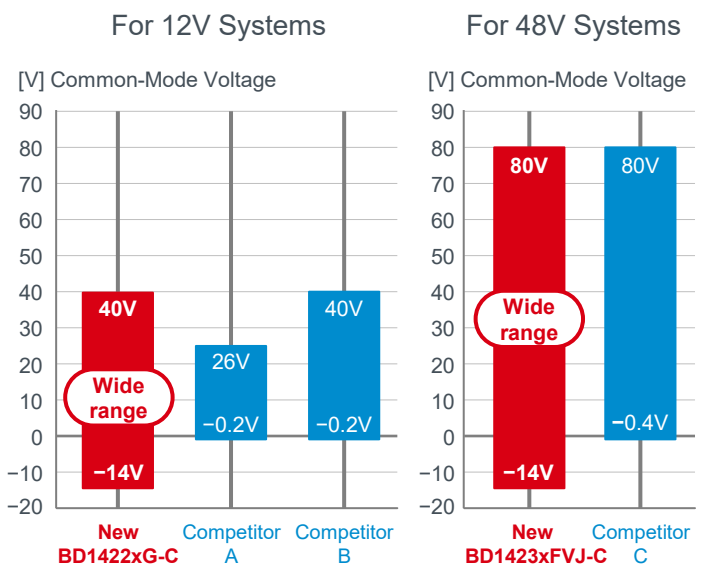
Provides an optimized automotive current sensing solution by combining a shunt resistor with current sense amp

▶ ROHM Automotive Current Sensing Solution Circuit Examples

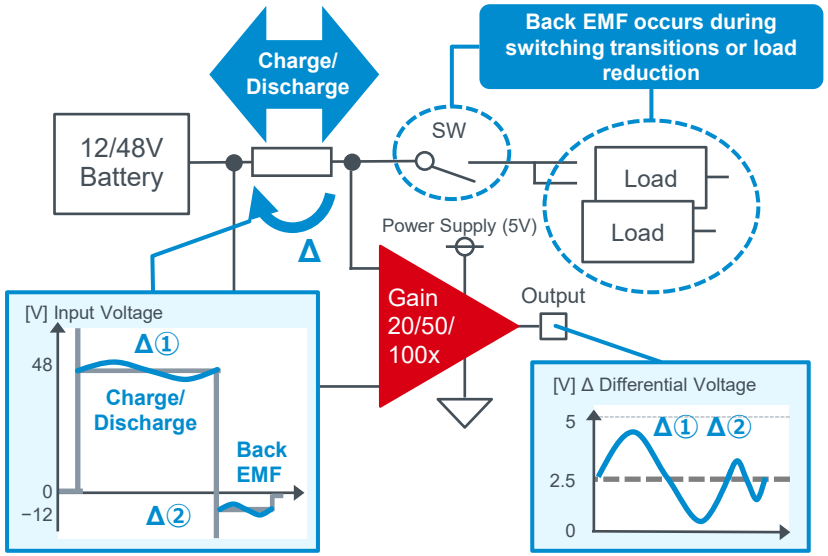
Shunt resistor-based current sense amps contribute to improved reliability in automotive systems

Supports automotive applications with a wide input voltage range from −14V up to +80V

Comparison of Common-Mode Voltage Range vs Equivalent Competitor Products



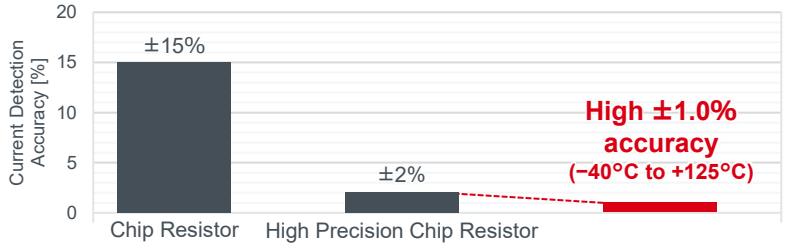
Mechanism of Counter-Electromotive Voltage (Back EMF) Generation



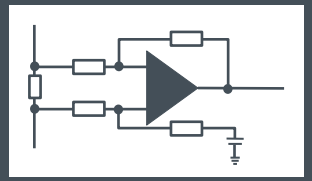
A wide input voltage range supports back electromotive force and reverse connections, ensuring robust measurement and device protection

Achieves greater accuracy and space savings by integrating peripheral components

Comparison of Current Detection Accuracy vs Op Amp Circuit Method (ΔT=100°C)

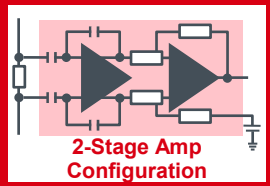


Op Amp Circuit Method
Op Amp + Discrete Components



Gain resistor specifications significantly affect accuracy

ROHM's New Product
Current Sense Amp IC



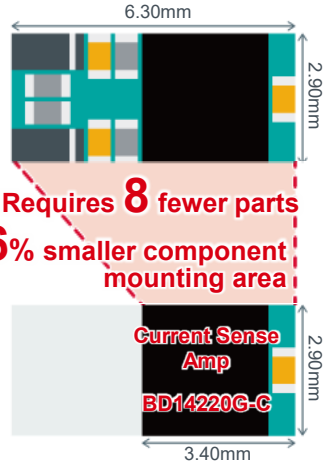
Gain-setting resistors are internally matched within the IC to improve accuracy

Current detection accuracy for conventional configurations is calculated using the worst-case values for each resistor

Comparison of the Component Count vs Op Amp Circuit Method

Op Amp Circuit Method
Op Amp + Discrete Components

Component Mounting Area:
18.27mm²
10 components + Shunt resistor



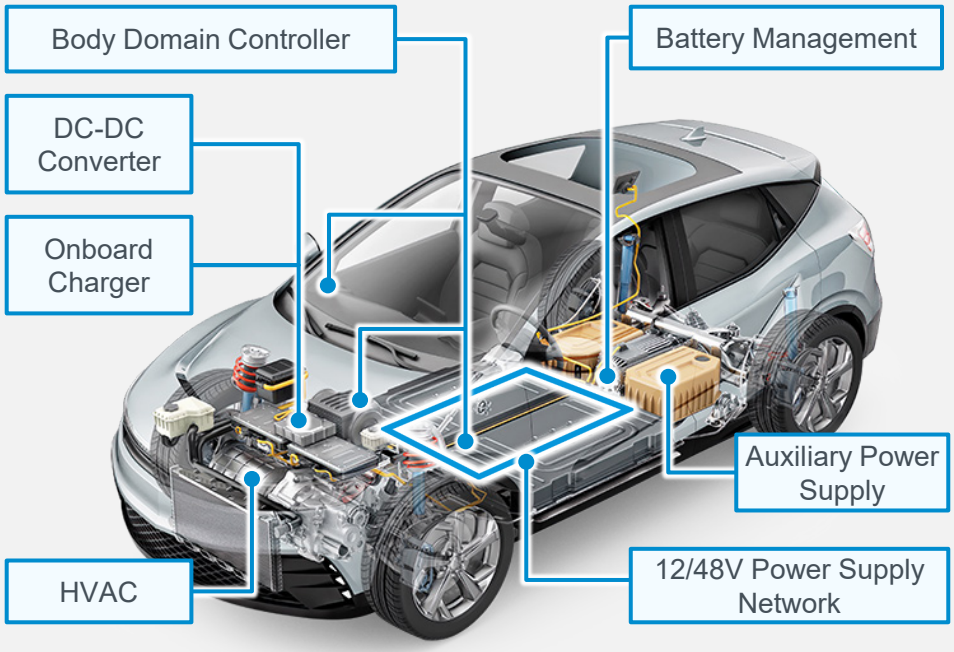
ROHM's New Product
Current Sense Amp IC Configuration

Component Mounting Area:
9.86mm²
2 components + Shunt resistor

*Example considering actual placement with component size +0.05mm.
Op amp/current sense amp: SSOP6, resistors/capacitors: 1005 size,
diodes: 1608 size, shunt resistors are excluded from area comparison calculation

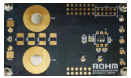
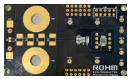
Eliminates the need for gain-setting resistors, capacitors, and circuit protection Zener diodes, resulting in improved accuracy and space savings

Application Examples



Compatible with a wide range of automotive 12V/48V battery applications

Current Sense Amp Lineup

Part No.	ch	Common-Mode Voltage V_{CM} [V]	Gain [V/V]	Gain Accuracy G_{ERR} (Max) [%]	Offset Voltage V_{OS} (Max) [mV]	Supply Voltage V_{DD}[V]	Current Consumption I_{DD}[μA]	Operating Temperature Topr [°C]	Package [mm]	ComfySIL™ Functional Safety Category	Automotive-Grade AEC-Q100	Evaluation Boards	Appearance
New BD14220G-C	1	−14.0 to +40.0	25	±1.0	±0.5	2.7 to 5.5	240	−40 to +125	 SSOP6 2.9×2.8×Max1.25	FS supported*	YES	BD14220G-EVK-001	
New BD14221G-C			50									BD14221G-EVK-001	
New BD14222G-C			100									BD14222G-EVK-001	
New BD14230FVJ-C	1	−14.0 to +80.0	20	±1.0	±0.5	2.7 to 18	300	−40 to +125	 TSSOP-B8J 3.0×4.9×Max1.1	FS supported*	YES	BD14230FVJ-EVK-001	
New BD14231FVJ-C			50									BD14231FVJ-EVK-001	
New BD14232FVJ-C			100									BD14232FVJ-EVK-001	
☆BD14230FJ-C			20						 SOP-J8 4.9×6.0×Max1.65			BD14230FJ-EVK-001	—
☆BD14231FJ-C			50									BD14231FJ-EVK-001	
☆BD14232FJ-C			100									BD14232FJ-EVK-001	
BD14210G-LA	1	−0.2 to +26.0	20	±1.0	±0.6	2.7 to 5.5	170	−40 to +125	SSOP6 2.9×2.8×Max1.25	—	—	BD14210G-EVK-001	
BD14211G-LA			50									BD14211G-EVK-001	
BD14215FVJ-LA	2	−0.2 to +26.0	20	±1.0	±0.6	2.7 to 5.5	310	−40 to +125	TSSOP-B8J 3.0×4.9×Max1.1	—	—	—	—

☆Under Development

Click on the icon to access the product page and the icon to view the datasheet on ROHM's website.

* FS Supported: ICs developed for automotive use that can support safety analysis related to functional safety.

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