

48 volt ev architecture guide



Overview

Explore key design challenges when adopting 48V systems, including transient voltages, creepage/clearance requirements, EMC standards, and IC costs. Now, as an ever-growing list of accessories demand more power, automakers are beginning to shift to 48-volt architectures. The transition to 48 V applies. Gate Ctrl. © STMicroelectronics - All rights reserved. ST logo is a trademark or a registered trademark of STMicroelectronics International NV or its affiliates in the EU and/or other. Are you wondering about why 48V architecture is becoming so important, especially for electric cars (EVs)?

The answer is that there is a growing need for more power and better efficiency. While the world explored 12V architectures about two decades ago without significant traction. While traditional automobiles have relied on 12V electrical systems for decades, the latest generation of EVs is adopting a significant upgrade: 48V architecture. This change is especially prevalent in fully battery-powered electric vehicles (BEVs), where the higher energy requirements of modern.

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[The Evolution of 48-Volt Architecture in Electric Vehicles](#)

48-Volt technology has come a long way in the EV industry. Discover how it boosts efficiency, enhances performance, and leads to a cleaner future.

[How 48 V architectures are revolutionizing automotive design](#)

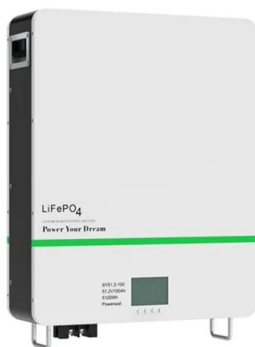
Now, as an ever-growing list of accessories demand more power, automakers are beginning to shift to 48-volt architectures. Replacing 12-volt systems with 48-volt systems increases

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[48V Architecture in EVs: Powering Next-Gen Mobility](#)

Explore how 48V architecture improves EV efficiency, reduces weight, supports ADAS, and enables software-defined vehicles with better power management.



[EV 48V new E/E structure introduction and MPS power solutions](#)

Saving wire and reduce wire power loss. This voltage range may occur due to (short term) return of electrical energy or maybe a control error. The system may operate only temporarily in this range. ...



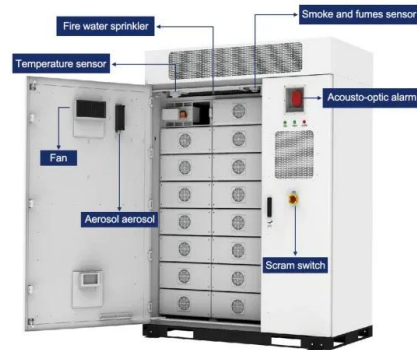
POWERING THE FUTURE

The electrical/electronic (E/E) architecture functions as the vehicle's neural network, coordinating the complex interactions between software, sensors, actuators, and safety systems.



48V vehicle power architecture

Agenda 48V system architecture 48-12V power conversion with GaN 48V power distribution and protection



48V Automotive Systems: Why Now?

Explore key design challenges when adopting 48V systems, including transient voltages, creepage/clearance requirements, EMC standards, and IC costs.



[The Resurgence of 48V Architectures in Automotive: Driving Efficiency](#)

While the world explored 12V architectures about two decades ago without significant traction, today's 48V systems are poised to reshape vehicle design, offering substantial advantages ...



[How emerging 48V systems impact automotive design](#)

In a recent report, *The Evolution of 48-Volt Architecture in Electric Vehicles*, Caresoft reinforces major 48V advantages and challenges while charting the progress of key EV manufacturers.

[Tesla shares 48V architecture with other automakers to move the](#)

48V architecture is a huge deal not because it enables any particular feature or capability for any one car, but because it will lead to a step change in how automakers wire, accessorize, and



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