

# **Automotive 48v power supply systems**





## Overview

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A 48-volt DC electrical system voltage is a relatively low-voltage electrical system that is increasingly used in vehicles. It began in the 2010s as a way to increase the propulsion and battery recharge during braking for fuel savings in internal combustion engine vehicles, especially mild hybrid vehicles.

Traditionally, vehicle low voltage applications were powered by a 12-volt system. In the 1990s, an attempt by a cross-industry standards group to specify a .

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A 48V system can provide more power, improve , and allow up to an 85% decrease in cable mass. 12-volt systems can provide only 3.5 kilowatts, while a 48 V power could achieve 15 to 20 kW or even 50 kW. 48 volts is below the level.



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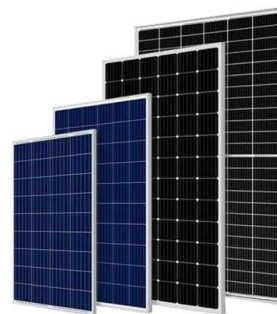


### Rewiring the Road--Harnessing the Power of 48V , Molex

The shift to 48V electrical systems is not just redefining automotive power -- it's driving innovation that unlocks new levels of performance. Discover how advanced connector solutions are ...

### The future of automotive power is 48V

In the automotive market, 48V power supply technology is rapidly expanding, both for fully electric and hybrid vehicles and mild hybrids. Vicor is approaching the power conversion sector by producing modular solutions and providing a high level of integration and scalability to the converters.



### Model-based analysis and evaluation of 48 V automotive power supply

The introduction of 48 V power supply systems into automotive vehicles may lead to critical arcs when a 48 V connection is interrupted (series arc) or shorted to ground or 12 V (parallel arc) and opened again. The high energy dissipation in the arc might damage connectors or even cause fire. The energy dissipation during arc events strongly depend on the power network. In order ...

### Bridging 12V and 48V in dual-battery automotive systems

As shown in Figure 1, a bi-directional power supply bridges the 12 V and 48 V systems. The



result is a lighter-weight vehicle that's more fuel efficient and emits less carbon dioxide. The 48 V system saves weight in the wiring harness.



### Automotive Electric Power Supply Systems Conference 2024

Over the past decade, the electric power supply event has been at the forefront of exploring innovations in 48V technology. Just when the automotive industry thought the 48V story was over and western OEMs agreed that it didn't make sense to have 48-volts on a

### Modelling of Arc Faults in 48 V Automotive Power Supply Systems

Modelling of Arc Faults in 48 V Automotive Power Supply Systems Michael Kiffmeier, Selcuk Önal, Carina Austermann, Stephan Frei TU Dortmund University Dortmund, Germany michael.kiffmeier@tu-dortmund Abstract -- As a new voltage ...



### 48V Ecosystem and Power Packaging Trends

telecom power supplies are designed at -48V, these power supply units are not compatible with the 5G needs. The absolute power losses from the power supply cable in 4G system tends to be smaller as the power requirements are on the order of 1 kW



### 48V Technology on the Automotive Horizon

Electrical components in luxury cars are nearing the limit of a 12V power supply, and the step up to 48V is inevitable to support connectivity and advanced electrical functions and safety features. 48V power supply systems have not always been considered cost

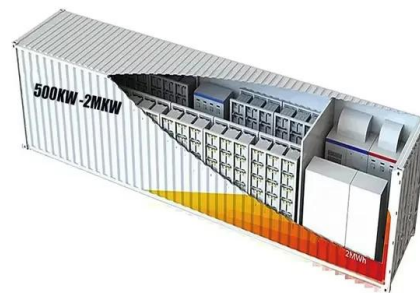


### **Presenting Automotive 48V Power Supply Systems , Vicor ...**

Vicor Corporation will present at the 7th International 48V Power Supply Systems conference in Berlin, Germany November 11 - 14, 2019. The 4-day conference will highlight the latest innovations in automotive power electronics and battery technology developments from top OEMs, tier-ones and innovative technology providers like Vicor that enable OEMs to achieve ...

### **48V Low-voltage Power Distribution Network (PDN) Architecture ...**

The design and control of brake-by-wire systems therefore need to be matched with higher-voltage automotive power supplies (e.g., 48V). For autonomous driving at L3 and above, the redundant EPS system has new requirements for 48V steering motors which can provide a quicker response to 48V systems.



### **The shift to 48V in automotive systems: What you need to know**

The complex electronic architectures of hybrid and electric vehicles have required engineers to rethink power requirements. Here's why 48V DC systems are key to ...



### Vicor's 48V Power Architecture Supports 12V ...

Vicor's 48V zonal power modules provide automakers the ability to reduce the thickness of wiring in vehicles to 10-gauge while delivering high power to devices that need it. But they can also supply 12 volts to those legacy devices that ...



### 48-V automotive systems: Why now?

In the early 1900s, the automotive industry used a 6-V rail to provide power, until the power demands of the electrical/electronic (E/E) systems forced the market to move to 12 V. Now, today's feature-rich vehicles are pushing the limits of 12-V rails, driving automakers to 48 V, which raises challenges but also opportunities.

### EV 48V new E/E structure introduction and MPS power solutions

48V battery/supper cap Power Architecture #1 -2 batteries, 48V and 12V o More weight and cost:  
1) 12V/48V battery 2) 2 high power DCDC system 3) Less Flexible to upgrade  
Disadvantage: Advantage: o Easy to implement o Keep 12V Zonal structure, add a





## How 48V systems are supporting fully electric vehicles ...

This guide includes comprehensive support for automotive electronic design engineers looking to source the most suitable power components for 48V systems. This includes details of the APMs for 6-phase ...



## Overview of 48-Volt Systems in the Automotive Industry

An emerging trend in automotive electrical infrastructure is the development and implementation of 48-volt systems. This article deals with the history of the system's development and the rationale for this new architecture. There is a companion article entitled 48-Volt Systems and Connectors: QA with an Expert in a separate article in this issue.



## The shift to 48V in automotive systems: What you need to know

The increased currents and voltages used in 48V systems will inevitably lead to a more electrically noisy environment. Some manufacturers are already working on ways to counter this problem. For example, Panasonic's EEH-ZE series hybrid aluminium electrolytic capacitors (left) have been designed for use in filtering the inputs and outputs of power ...



## 1. A history of automotive electric power supply systems

The report includes: o a comprehensive history of automotive power supply systems, charting the development of electrical systems, via the promise of 42-volts to the ...



### **Agenda , Innovations in Automotive Electric Power Supply**

For the last ten years, Automotive IQ's power supply event has focused on innovation in 48V technology. While there are still some corner cases on 48V, most notably Tesla's Cybertruck release, the industry's main interest is in high-voltage power supply architecture, 400V, 800V and higher. Automotive IQ's Vehicle Electrical Power Supply Systems returns to Germany in ...

### **Automotive 48-volt Technology , part of Automotive 48-volt ...**

The introduction of 48-volt technology enables traditionally parasitic applications that run off the engine to be replaced with electrically driven systems, resulting in improvements in performance and efficiency. In the first of a series of reports produced jointly by ABOUT Automotive and SAE International, this comprehensive Executive Report analyses ...



### **48V/12V Dual Battery Automotive Systems Require Bi-Directional ...**

vehicles, as auto manufacturers strive to meet increasingly stringent CO2 emissions targets. Typically, the 12V bus will continue to power the ignition, lighting, infotainment and audio systems. The 48V bus will supply active chassis systems, air conditioning



### 48-V Systems: What You Need to Know as ...

Why automakers are finally migrating from 12- to 48-V automotive accessory power systems. An overview of the technical challenges automakers and their suppliers must overcome.



### **A Modular Approach to 48V Automotive Power ...**

EEPower's exclusive digital content partner, Bodo's Power Systems, caught up with Vicor's Greg Green, Director of Automotive Marketing, and Maury Wood, VP of Strategic Marketing, to discuss high-density, high ...

### 48 Volt Power Supply: Standards & Challenges

In advance of the 2nd International Conference on Automotive 48 Volt Power Supply Systems, project manager Simone Lange, interviewed Andreas Klinkig with Volkswagen AG, Germany. Mr. Klinkig will host a workshop on LV148 resp. VDA 320: the 48 Volt standard on the road to a global use by OEMs and suppliers.





### How 48V systems are supporting fully electric vehicles

For this reason, the Tier 1 and Tier 2 automotive supply chain is rapidly transitioning to 48V subsystems. A 48V power architecture is needed to support advanced driver assistance systems (ADAS) that require more power, such as steer-by-wire and brake-by-



### Vicor's 48V Power Architecture Supports 12V Systems , Automotive

Electric power module supplier Vicor Corp. is pointing out that automakers can enjoy the benefits of 48V electric systems in their vehicles without immediately replacing the many familiar 12V devices employed in their cars. Tesla's new CyberTruck has entirely



### Automotive-grade power modules enable 48V power systems for ...

Vicor has released three automotive-grade power modules for 48V EV systems, which deliver industry-leading power density, and support automotive OEMs and tier one production in 2025. The BCM6135, DCM3735 and PRM3735 use AEC-Q100 certified Vicor-designed ICs and have completed the PPAP process with automotive customers.



### 48V Technology on the Automotive Horizon

48V electronic architecture has been looming on the automotive horizon for a few years, and rapid growth is expected over the next five years as manufacturers strive to ...





### 48-Volt Electrical Systems

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## 1. A history of automotive electric power supply systems

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## Automotive HV Power Supply Systems 2023 » DGE

Automotive IQ announces the revival of its long-standing 48V Power Supply Systems conference, making a return to Munich after a hiatus of four years. The conference has been fully rebranded as the Automotive HV Power Supply Systems Conference 2023, in order to accurately reflect the current driving factors, challenges, and opportunities, including:

## Media Alert , Automotive 48V Power Supply Systems Conference ...

Designing 48V Decentralized Power Architectures at the 7th International 48V Power Supply Systems conference in Berlin, Germany Media Alert , Automotive 48V Power Supply Systems Conference , Vicor Vicor ???? 2019 ? 11 ? 11 ?? 14 ????????????????? 48V ???????



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