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System Solution Guide - Preview

48V Powernet Trends

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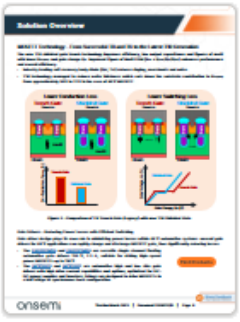
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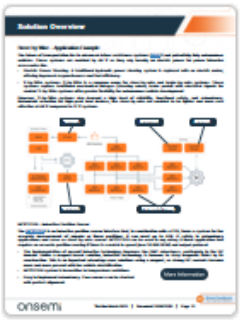
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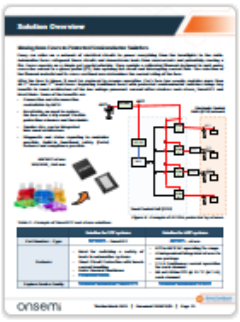
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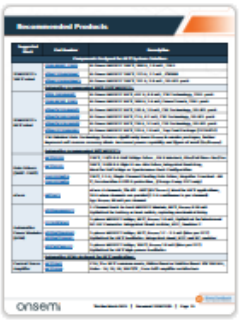
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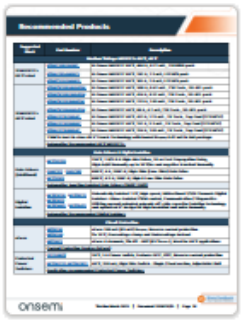

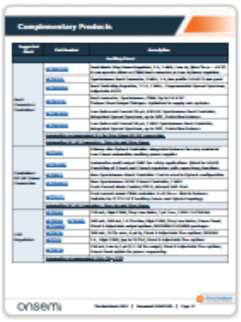

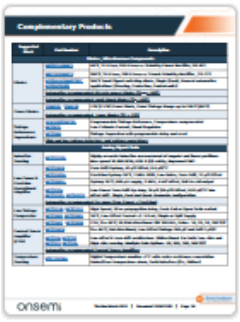

Block Diagram

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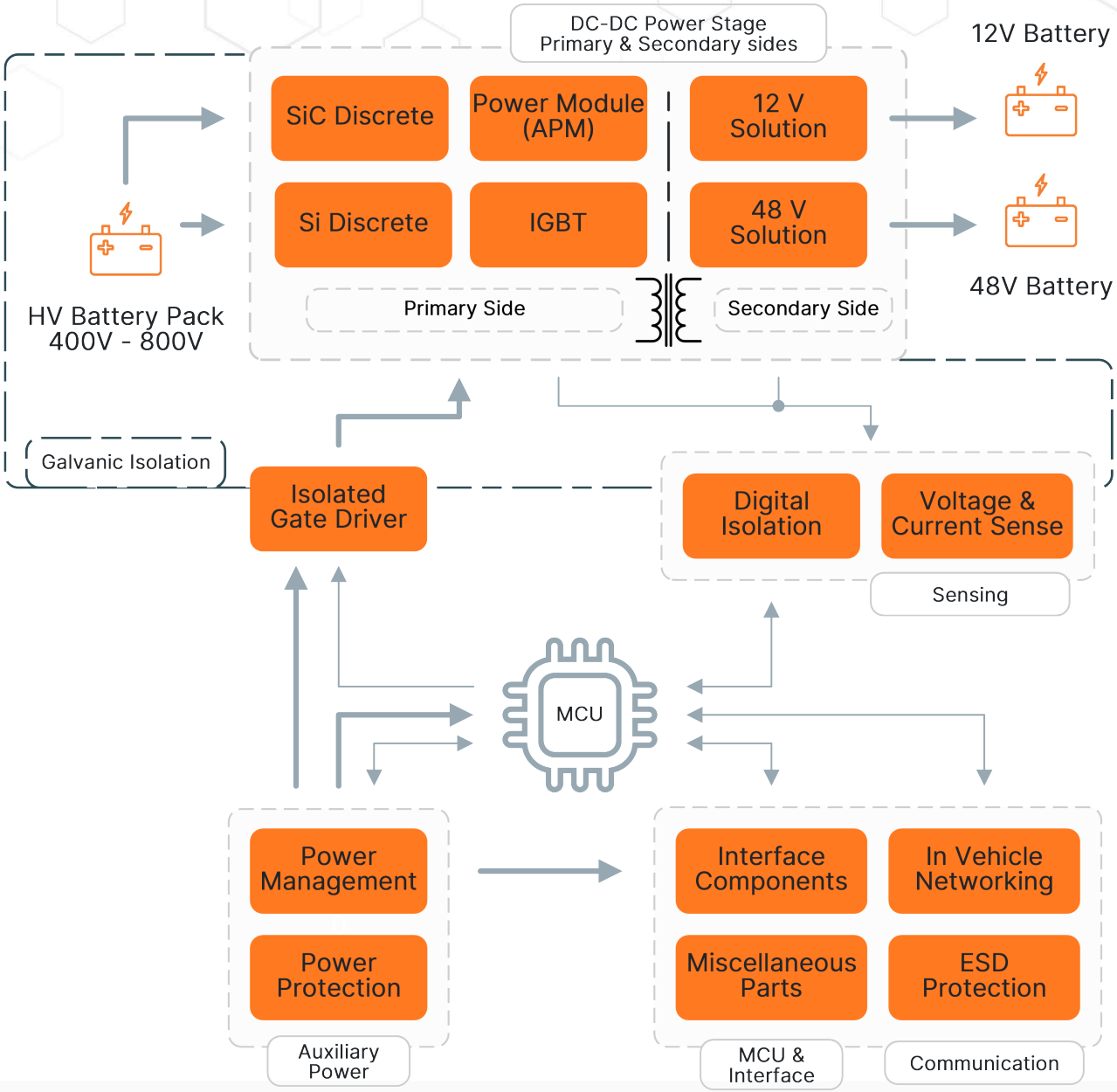
DC-DC Converter HV-48V/12V – Block Diagram

High-voltage (HV) to low-voltage (LV) DC-DC converter is a crucial component of the multi-voltage architecture in BEVs. **onsemi's** wide range of products for DC-DC converters, including sensors, controllers, and actuators, offer a scalable solution to deliver the required power to the vehicle's LV powernet. Open the block diagram below in **onsemi's** online interactive block diagram (IBD) tool and find components providing high-efficiency and high-power density options for HV to 48 V and HV to 12 V applications.



Use our Interactive Block Diagrams Tool

Open IBD Tool

48V Application Example

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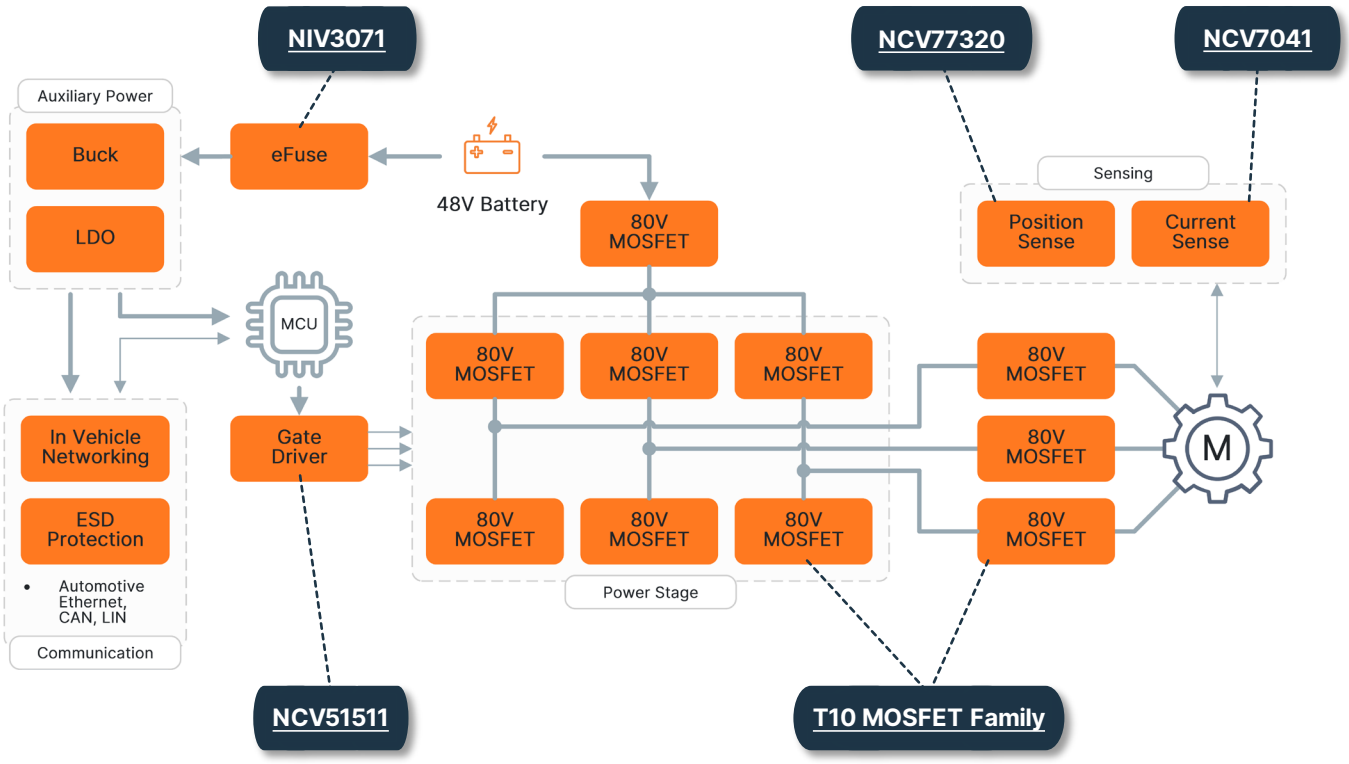
Steer by Wire – Application Example

The future of transportation lies in advanced driver-assistance systems (ADAS) and potentially fully autonomous vehicles. These systems are enabled by 48 V as they rely heavily on electric power for power intensive accessories like:

- **Electric Power Steering**: A traditional hydraulic power steering system is replaced with an electric motor, offering improved responsiveness and fuel efficiency.
- **X-by-Wire systems**: X-by-Wire is a common name for steer-by-wire and brake-by-wire systems. These systems replace traditional mechanical linkages (steering wheel, brake pedal) with electrical signals for control. X-by-Wire systems offer greater flexibility for autonomous vehicle development.

However, X-by-Wire systems also demand a high level of reliability, functional safety, and redundancy. Redundant actuation for high-peak load devices, like steer-by-wire are enabled to be lighter and more cost effective at 48 V compared to 12 V systems.



NCV77320 – Inductive Position Sensor

The NCV77320 is an inductive position sensor interface that, in combination with a PCB, forms a **system for the accurate measurement of angular or linear positions**. It can meet up to **ASIL D safety in redundancy applications** and serve as **steer-by-wire sensor.** NCV77320 can be used in any rotary & linear application that requires an accurate position sensing if there is a match in speed (max 10 800 RPM) and output protocol.

- The implementation of **onsemi** inductive technology improves the EMC robustness, particularly in the DC domain. Unlike a magnet-based solution, inductive technology is immune to stray magnetic fields by its construction. This is an important advantage over solutions using a magnet, as strong DC currents become more and more present with the vehicle electrification.
- NCV77320 system is insensitive to temperature variations.
- Easy to implement redundancy: Two sensors can be stacked with perfect alignment.

More Information

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