# Hybrid Electric Vehicle (HEV) Applications

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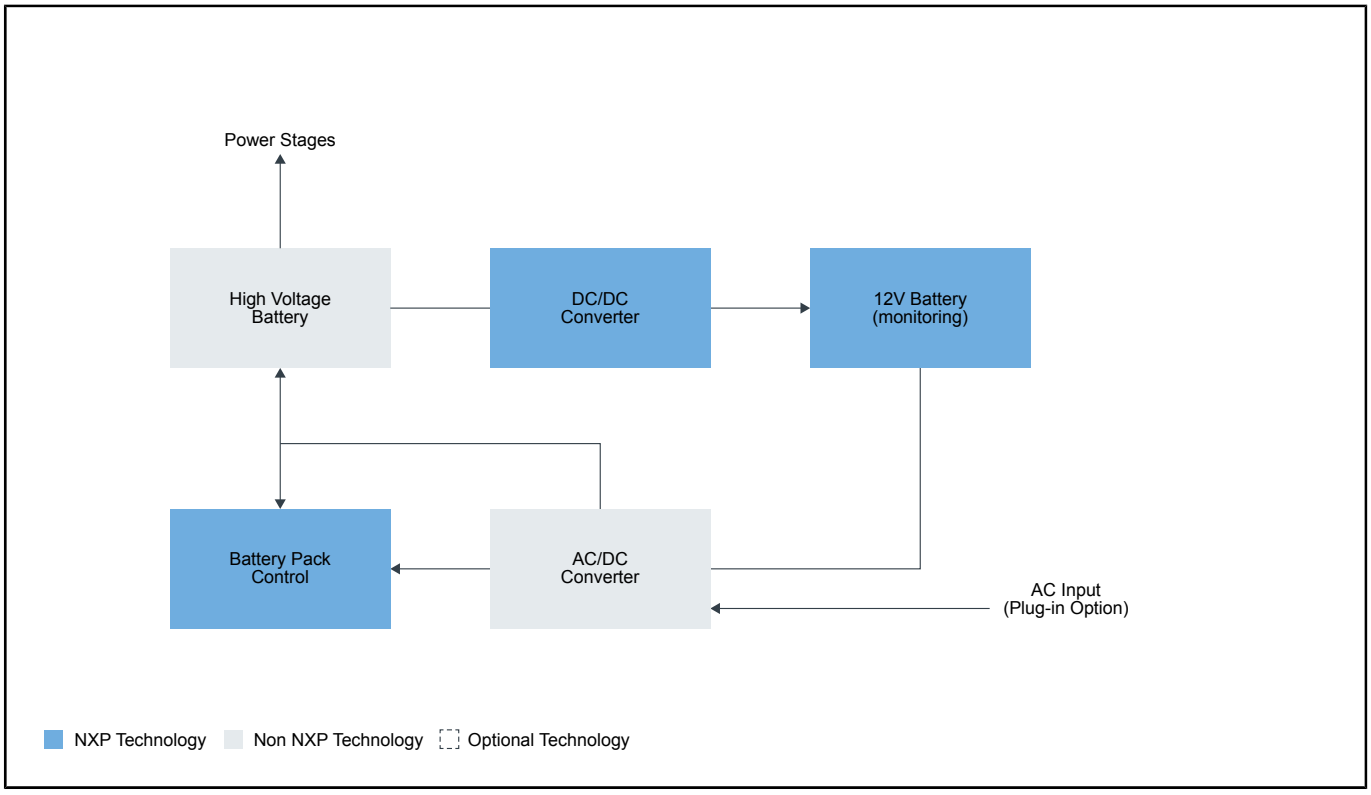
With the need for cleaner cars and fewer emissions, NXP has developed a portfolio that provides the building blocks for all the different electric vehicle types:

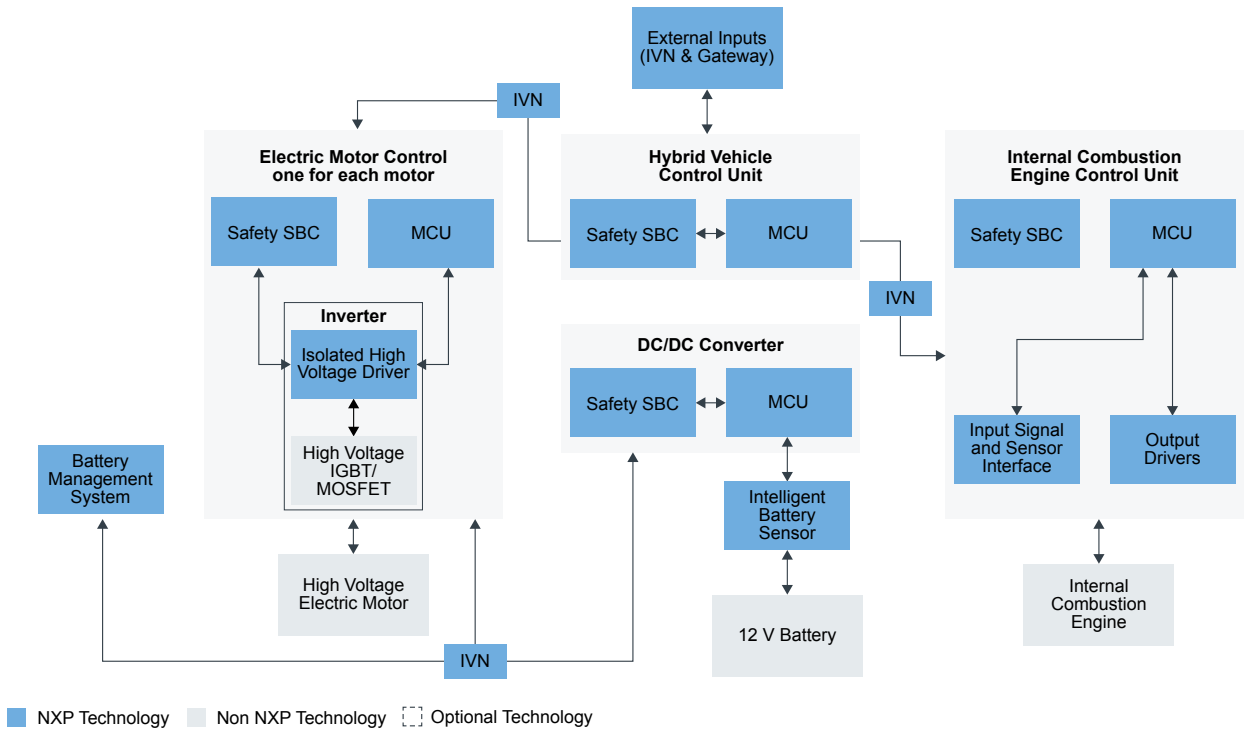
- Converter and charger: the AC-DC charger interfaces with the BMS to ensure a proper charge of electricity of the cells until it fulfills high-voltage requirements.
- Start/stop system: 8-, 16-bit MCUs with analog switches, system basis chips and transceivers to handle the high current and reliability.
- Hybrid control unit: controls power distribution, energy storage, engine and motor to enhance the efficiency of the HEV powertrain.

### Converter and Charger Block Diagram



| Recommended Products for Converter and Charger | |
|---|---|
| Battery Pack Control | • MPC560xB: Ultra-Reliable MPC56xB MCU for Automotive and Industrial General Purpose<br>• S12XE: Ultra-Reliable S12XE High-Performance Automotive and Industrial Microcontrollers<br>• S12XS: S12XS Automotive and Industrial Microcontrollers (MCUs)<br>• S12P: S12P Automotive and Industrial Microcontrollers (MCUs)<br>• S12G: Ultra-Reliable S12G General Purpose Automotive and Industrial Microcontrollers |
| 12 V Battery Monitoring | • MM912_637: Battery Sensor with LIN for 12 V Lead-Acid Batteries |
| DC/DC converter | • 56F824X_825X: Digital Signal Controller |

## Powertrain Block Diagram




| Recommended Products for Powertrain | |
|---|---|
| Safety SBC | • FS6600: Safety System Basis Chip for S32S2 Microcontroller, Fit for ASIL D<br>• FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver<br>• FS26: Safety System Basis Chip with Low Power Fit for ASIL D<br>• FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver |
| Gate Driver | • GD3162: Advanced High Voltage Isolated Gate Driver with Dynamic Gate Strength Control<br>• GD3160: Advanced High Voltage Isolated Gate Driver with Segmented Drive for SiC MOSFETs<br>• GD3100: Advanced High Voltage Isolated Gate Driver for IGBT and SiC MOSFETs |
| Microcontrollers (MCU) | • S32Z and S32E Real-Time Processors: S32Z and S32E Real-Time Processors<br>• S32K39-37: S32K39/37 Microcontrollers for Electrification Applications<br>• GreenBox 3 Real-Time Development Platform<br>• MPC574xP: Ultra-Reliable MPC574xP MCU for Automotive & Industrial Safety Applications |

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| | • MPC5777C: Ultra-Reliable MPC5777C MCU for Automotive and Industrial Engine Management<br>• MPC564xL: Ultra-Reliable Dual-Core 32-bit MCU for Automotive and Industrial Applications<br>• MPC5775B and MPC5775E Microcontrollers for Battery Management Systems (BMS) and Inverter Applications |
| Input Signal and Sensor Interface | • CD1020: Low-Cost 22-CH Multiple Switch Detect Interface |
| Output Drivers | • CD1020: Low-Cost 22-CH Multiple Switch Detect Interface |
| External Inputs (IVN & Gateway) | • MPC574xB-C-G: Ultra-Reliable MPC574xB/C/G MCUs for Automotive and Industrial Control and Gateway<br>• S32G2 Processors for Vehicle Networking |
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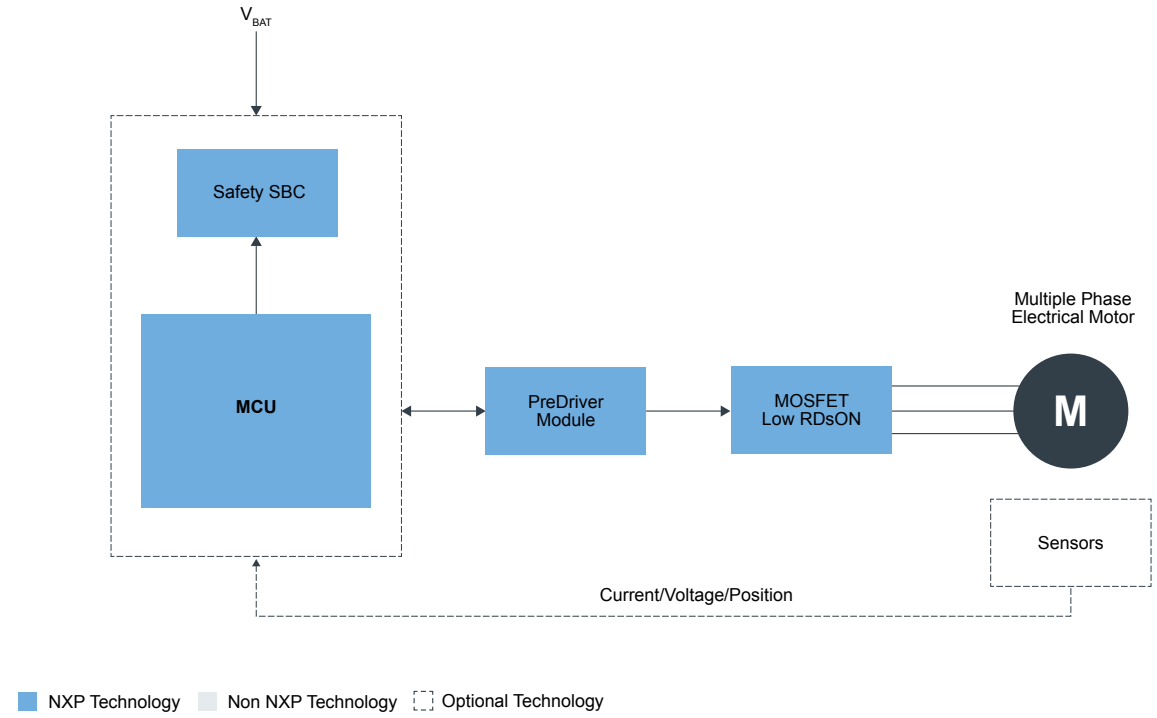
| Battery Management System | • Battery Management System (BMS): Battery Management System (BMS) |
| Battery Management System | • Battery Management System (BMS): Battery Management System (BMS) |

## Stop and Start System Block Diagram




| Recommended Products for Stop and Start System | |
|---|---|
| Microcontrollers (MCU) | • MPC560xB: Ultra-Reliable MPC56xB MCU for Automotive and Industrial General Purpose<br>• S12XE: Ultra-Reliable S12XE High-Performance Automotive and Industrial Microcontrollers<br>• S12XS: S12XS Automotive and Industrial Microcontrollers (MCUs) |

| | |
|---|---|
| | • S12P: S12P Automotive and Industrial Microcontrollers (MCUs)<br>• S12G: Ultra-Reliable S12G General Purpose Automotive and Industrial Microcontrollers<br>• S32 Automotive Platform: S32 Automotive Platform |
| Safety SBC | • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver<br>• FS26: Safety System Basis Chip with Low Power Fit for ASIL D<br>• FS6600: Safety System Basis Chip for S32S2 Microcontroller, Fit for ASIL D |
| CAN/LIN Transceiver | • CAN Transceivers: CAN Transceivers |
| Pre-Driver Module | • MC33937: 3-Phase Field Effect Transistor Pre-Driver |
| MOSFET Low RDs | • MC12XS2: 12 V Multipurpose Low RDSON eXtreme Switch |

View our complete solution for Hybrid Electric Vehicle (HEV) Applications.

**Note:** The information on this document is subject to change without notice.