APPLICATION BRIEF

DC EV Charging Solutions

Comprehensive offering from power and control to sensor and secure connectivity

Along with the increasing number of electric vehicles on the market and the pressure from governments to reduce vehicle emissions, there is a growing need for more efficient charging solutions.

As various consumer studies show, the acceptance of electromobility considerably depends on the availability and duration of the charging process, DC EV-chargers are an attractive choice because they allow much faster charging than the standard AC EV ones that many EV owners have at home.

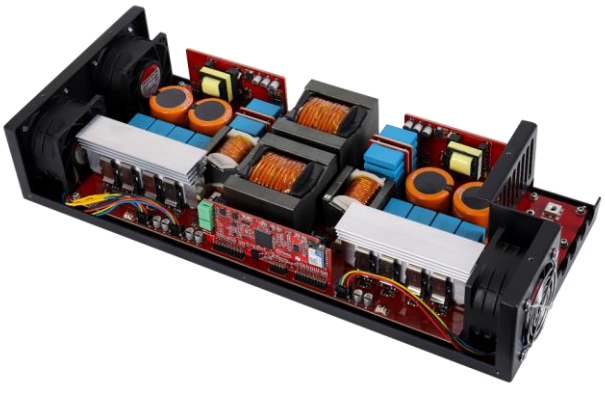
Currently, a 150 kW DC charger can put a 200 km charge on an EV in around 15 minutes, this is already comparable to refueling a conventional car. Furthermore, as fast charging and battery technologies improve and evolve, the charging time will continue to drop even further.

As a global leader in power electronics, Infineon enables bringing energy efficient DC EV-charger designs to market, with high performance components and in-depth technical support. Covering power ranges from kilowatts to megawatts with its broad portfolio of high-quality power semiconductors, microcontrollers, gate drivers, security, safety, connectivity, and authentication solutions.

The CoolMOS™ and CoolSiC™ MOSFETs, together with EiceDRIVER™ gate drivers, for example, are ideal in a wide range of DC EV-charging designs. Their unmatched advantages include high-frequency operation, high power density and reduced switching losses, enabling high efficiency levels in any battery charging system.

The **XMC™** and **PSOC™** microcontrollers are the matching system control components for EV charging designs. While Infineon's **AIROC™** Wi-Fi & combos portfolio integrates Wi-Fi and Bluetooth® in a single-chip solution, future proofing designs for connectivity requirements. **OPTIGA™** products complement the EV charging portfolio, ensuring data protection and security.

For more information visit: infineon.com/ev-charging



Purchase the reference design for 11 kW SiC bi-directional DC/DC converter board for EV Charging and ESS applications : REF-DAB11KIZSICSYS

Features and benefits

High performance MCUs for power conversion

- High core performance in XMC4400 for 11 kW and XMC7000 for 50 kW fits power conversion requirement. PSOC™ Control C3 for higher switching frequency
- Analog peripheral set fits application power conversion demands: ADC and PWM
- Multiple connectivity interfaces UART, I2C, SPI

Wi-Fi

- Robust and reliable connection from EV charger to gateway or directly to the Internet
- Remote monitoring of charge
- Allows future use case of connecting EV charger with ESS/Solar panels and energy gateway
- Connect to ESS to enable energy selling use case

Bluetooth®

- Simplify connection and initial configuration for EV charger
- Support local monitoring via Bluetooth
- High performance radios (range, stability, throughput)

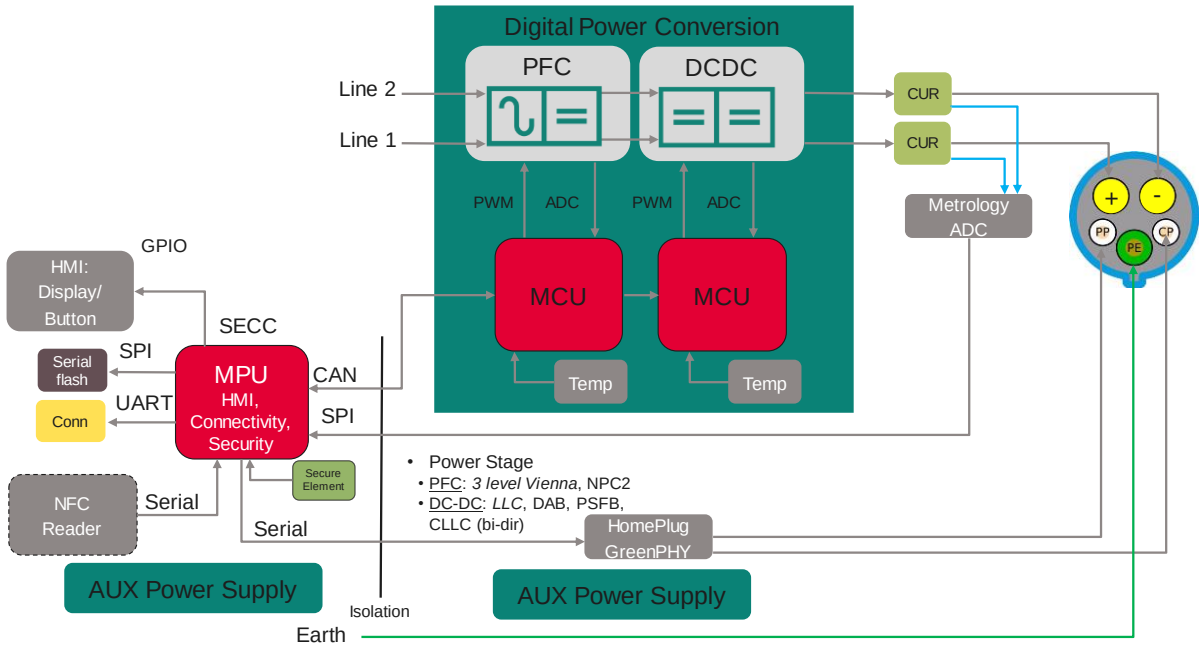
Hardware Security

- Enable OCPP and ISO15118 support
- Key provisioning during lifecycle
- Uncompromised security, to match future residential safety requirements
- Authentication of equipment (Trust)
- Tamper-resistance: protection of physical attacks

Reference designs

- 11 kW reference design with XMC4400

APPLICATION BRIEF



Functional Block	Product	Product Family	Benefits
Power conversion	Easy Power Modules	EasyPIM™ EasyPACK™, EasyDUAL™	From 6 A up to 200 A at 600 V / 650 V / 1200 V Flexible and scalable power module solution
	IGBT Discretes EiceDRIVER™ Gate drivers for SiC MOSFETs, & IGBTs with various safety features	TRENCHSTOP™ IGBT7 CoolSiC™ CoolMOS™ CoolGaN™	Highly efficient power conversion for reducing system size by up to 50 percent and reduced cooling efforts Scalability across various platforms for upgrading system power charger levels on demand
System control	Microcontroller	XMC4000 XMC7000 PSOC™ C3 PSOC™ 4 Traveo™	High performance in XMC4400 for 11 kW and XMC7000 for 50 kW, analog peripherals, multiple connectivity and interfaces fit power conversion requirements For Power Control Loop, higher switching frequency CAPSENSE™ for HMI and general control and processing For advanced HMI
Connectivity	Wireless connectivity	AIROC™ Wi-Fi and Wi-Fi+Bluetooth® Combo AIROC™ Bluetooth®	IEEE 802.11a/b/g/n/ac/ax Wi-Fi and Bluetooth® 5.x in a single-chip solutions for remote and local monitoring and configuration, with technical support through global network of IoT partners, including module offerings
	CAN transceiver	Automotive CAN Transceivers	Broad portfolio with scalable feature set: with/without bus wake up, Sleep Mode versions, different speeds from 1Mbit/s to 8Mbit/s
Security	OPTIGA™	OPTIGA™ TPM OPTIGA™ Trust M OPTIGA™ Authenticate	Security solutions for communication and host firmware update Enable OCPP and ISO15118 Support Authentication of equipment (Trust), Tamper-resistance for physical attacks
Sensing	XENSIV™ magnetic current sensor	XENSIV™ magnetic current sensor	Bidirectional high precision current sensing
External memory	Memories	EXCELON™ HYPERRAM™ SEMPER™	Broad range of unmatched quality and long-term supply products spanning NOR Flash, pSRAM, SRAM, nvSRAM, and F-RAM with densities ranging from 4 Kbit to 4 Gbit

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