APPLICATION BRIEF

Photovoltaic (PV) Inverter

Empowering Smart, Connected, and Secure Solar energy.

Rising demand for energy-depleted natural resources and climate change call for more efficient ways of generating, transmitting, storing, and consuming energy. With Infineon's power, control, connectivity, and security solutions, we enable energy-efficient Photovoltaic Inverter solutions for our customers and partners to shape a greener future.

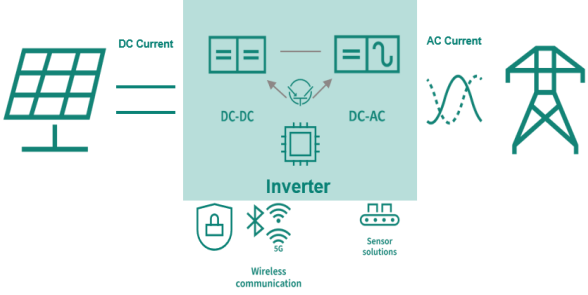
PV (Solar*) panels supply power as direct current (DC), which gets converted to alternating current (AC) before feeding into the grid to be consumed locally or transmitted to the point of use. PV inverters convert DC to AC. Infineon offers flexible solutions to develop PV Power Optimizers, Micro, String, and Central inverters as part of Residential, Commercial, and Utility scale applications.
Infineon provides optimized solutions that lower cost per watt and transmit power with minimal losses in a wide range of PV inverter generations (classic, hybrid, and smart). Infineon's control, connectivity, and security devices address the growing trend to standardize the communication interface between PV inverters and all other smart appliances.

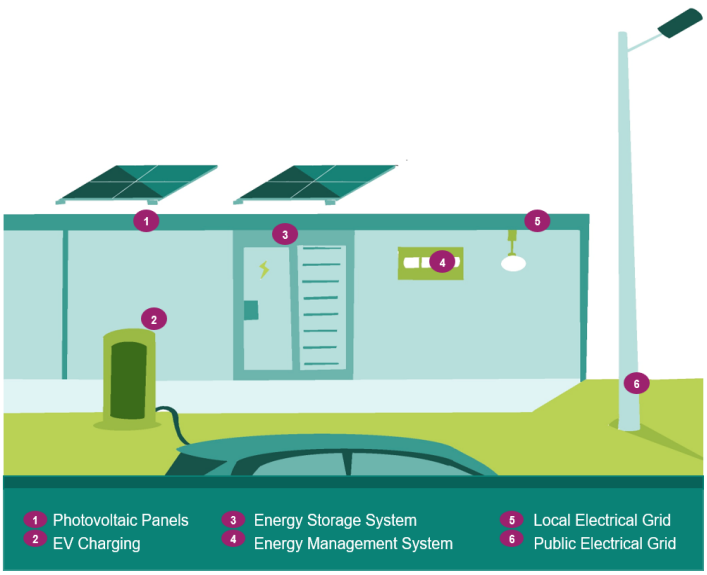
Our wide range of offerings makes it possible to provide a comprehensive inverter solution that empowers functional building blocks such as power, sensors, control, connectivity, and security. The XMC™ microcontroller products support high-performance power conversion and feature configurable analog peripherals like VADC, comparators, and HRPWM. They provide the apt performance for MPPT and power control loop calculations. Infineon's PSoC™ microcontroller solutions function as communication controllers with an HMI interface and are also best suited to establish PLC communication in a power optimizer. Infineon's Modus Toolbox software provides easy integration that reduces design effort and enables fast time-to-market inverter models.

Key features

- **Best-in-class power semiconductors** which include discrete MOSFETs, IGBTs and gate drivers
- PSoC™ & XMC™ Industrial MCU's feature
  - Optimized peripherals for **power conversion**
  - XMC 7000 performance and high pinout package allows **multi-panel integration** in micro Inverters.
- Infineon's AIROC™ Wi-Fi Combos and Standalone Bluetooth provide **robust and reliable connection.**
- **Tamper resistant** protection and with OPTIGA™ security line.
- **High precision** current measurements with XESINV™ sensors

The future of green PV(Solar) energy enables smart grids that consist of Energy Storage Systems (ESS), Energy Management Systems (EMS), establishing local and public grids.



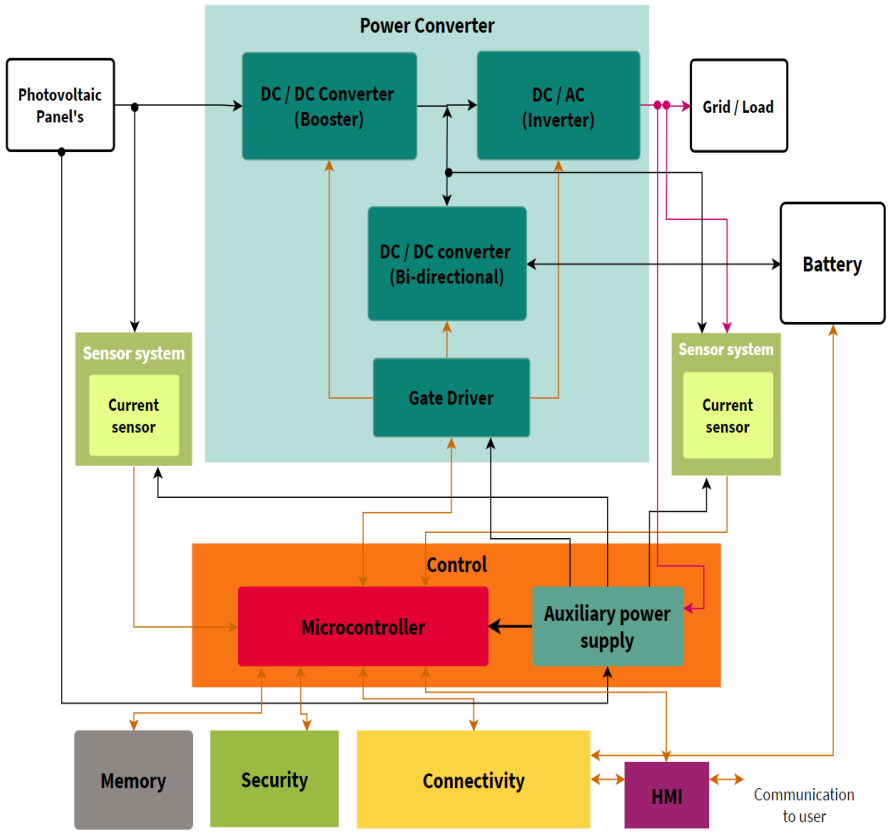


https://www.infineon.com/solar

Infineon's AIROC™ wireless connectivity portfolio for Wi-Fi provides a reliable connection to a grid gateway and facilitates remote monitoring between the inverter, ESS, and EMS systems. Our standalone Bluetooth® devices provide easy configuration and establish local access to PV Inverter. The OPTIGA™ Trust and TPM security products present a tamper-resistant solution to match growing security requirements in a smart grid. Our complete system solution enables lower system costs through best-in-class discrete sensors (XENSIVTM), power semiconductors (OptiMOS™, CoolMOS™, CoolSiC™, CoolGaN™, Discrete IGBTs, Easy Modules, Econo, PrimePACK™, CoolSET™) and Gate driver (EiceDRIVER™). Backed by our end-to-end application expertise, we offer the best product combinations to achieve leading power density in PV inverter applications.

Our wide portfolio ensures a perfect match for a wide range of solar applications and bolsters our vision of driving decarbonization and digitalization, Together. Here at Infineon, we make life easier, safer, and greener.

PV Inverter Block Diagram



Microcontroller

- XMC™
- PSoC™

Wi-Fi and Bluetooth Connectivity

- AIROC™ Wi-Fi/Bluetooth Combo
- AIROC™ Standalone Bluetooth

Security

- OPTIGA™ Trust
- OPTIGA™ TPM

Power

- OptiMOS™ - LV FET
- CoolMOS™ - HV FET
- CoolSiC™ - SiC FET
- CoolGaN™ - GaN FET
- Discrete IGBTs
- Easy Modules
- Econo
- PrimePACK™
- CoolSET™
- EiceDRIVER™

Memory

- EXCELON™ F-RAM

Sensor

- XENSIV™

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