Solutions for Renewable Energy Systems

Energy-efficient components for high system reliability

[www.infineon.com/highpower]
Increasing energy demand

ACCORDING TO THE INTERNATIONAL ENERGY ASSOCIATION, the worldwide demand for electrical energy is growing every year and consumption will increase by more than 60% in the next 20 years.

INCREASED ENVIRONMENTAL AWARENESS and limited fossil energy resources require the use of renewable energy today.
Grid quality with converters

FOR DECENTRALIZED ENERGY GENERATION SYSTEMS, power semiconductor devices play a key role in power converters. Power converters enable the connection of an individual energy generation system to the electric grid and ensure high quality of grid voltage and frequency, even with regionally different grid codes.
Power converter solution

DC to AC power converter solution with optional voltage step-up

Application examples
- Photovoltaic
- Battery storage
- Fuel cells

AC to AC power converter solution

Application examples
- Wind energy
- Combined heat and power
- Small hydroelectricity
- Micro turbines
Applications and configurations

Output Power

Low-power Modules  Medium-power Modules  High-power Modules  Stacks and Assemblies  Thyristors and Diodes

0.5 kW  Inverter Output Power  7 MW

Typical module and stack configurations

sixpack + NTC  bridge + NTC  twopack  fourpack  sixpack + chopper  Single phase 3-level
Highest efficiency in any detail

THE INFINEON PRODUCT PORTFOLIO provides components for the highest energy efficiency.

THE INFINEON IGBT with trench gate and field stop structure has dramatically improved the performance of IGBTs in terms of Vcesat values and switching losses. This feature has made power switches more efficient, and Infineon is able to build modules with up to 50% higher power density.

The following benefits are provided to our customers:
- Industrialy-leading 150°C maximal operating junction temperature
- Improved performance with respect to switching loss and Vcesat
- Optimized efficiency by using our own CoolMOS™ and silicon carbide technologies

WE HAVE A GLOBAL TEAM of experienced application engineers providing advanced and cost-effective reference solutions and design support for our customers, thereby facilitating and shortening their time-to-market.
Highest reliability around the world

**INFINEON HAS BEEN WORKING CONTINUOUSLY** on extending the lifetime of power modules.

FOR EXAMPLE, the new EconoPACK™ 4 and the PrimePACK™ IGBT modules from Infineon will continue setting the worldwide industry standards. These modules have features that improve their reliability, such as ultrasonic welded load terminals and enhanced thermal cycling capability and they are manufactured using Infineon’s zero defect processes.

![Graph showing thermal cycling capability](image)

**Thermal-cycling capability of PrimePACK™ in comparison to standard high-power modules**