

Infineon masters it all – for you

Experience the difference in power with CoolMOS™, CoolSiC™, and CoolGaN™

Infineon is the leader in the power semiconductor market and currently the only manufacturer mastering all power technologies while offering the broadest product and technology portfolio of silicon (such as SJ MOSFETs, IGBTs), silicon carbide (such as Schottky diodes and MOSFETs) and gallium-nitride-based (e-mode HEMT) devices, covering bare die, discretes, and modules.

Equipped with a 300-millimeter wafer fab for power semiconductors, Infineon is best positioned to fully seize the growth opportunities in the power semiconductor industry.

With its high-quality and highly efficient products, Infineon is setting new standards for energy efficiency, power density and ease-of-use. CoolMOS™ SJ MOSFET products boast outstanding figures of merit in terms of conduction, switching and driving losses. CoolSiC™ and CoolGaN™ enable extremely efficient and compact system designs that meet future demands for greener and better performing products. Additionally, a comprehensive portfolio of gate-driver ICs for silicon and wide-bandgap technologies unlock the full potential of the switches.

The 600 V/650 V class of power products is the area where CoolMOS™, CoolSiC™, and CoolGaN™ will coexist, delivering a specific value proposition depending on application requirements.

Silicon (Si)

- Targeting voltages ranging from 25 V to 1.7 kV
- The mainstream technology
- Suitable from low to high power

Silicon carbide (SiC)

- Targeting voltages ranging from 650 V to 3.3 kV
- High power from moderate to high switching frequency

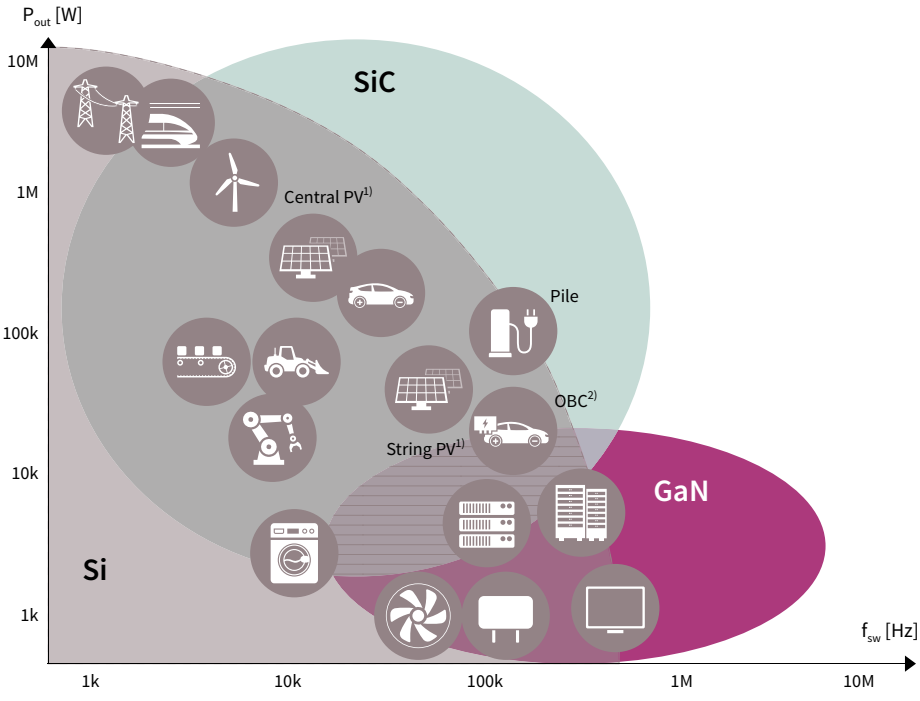
Gallium nitride (GaN)

- Targeting voltages ranging from 80 V to 650 V
- Medium power at highest switching frequency

600 V/650 V segment

- CoolMOS™, CoolSiC™, and CoolGaN™ set industry technology benchmark to address any applications with pioneering performance

Silicon, silicon carbide and gallium nitride



1) PV = photovoltaic inverter
2) OBC = on-board charger

www.infineon.com/coolmos www.infineon.com/coolsic www.infineon.com/coolgan

The 600 V/650 V segment: CoolMOS™, CoolSiC™, and CoolGaN™

In the 600 V/650 V power domain, Si, SiC and GaN power semiconductors have the justification to coexist. Depending on application requirements, CoolMOS™, CoolSiC™, and CoolGaN™ have a unique value proposition enabling the highest levels of system performance.

CoolMOS™ Superjunction MOSFETs

Technology features

- Best-in-class $R_{DS(on)}$/package
- Innovative package concepts
- Low switching losses (E_{oss}) and gate charge (Q_g)

Customer benefits

- Best price/performance ratio for most efficiency requirements
- Largest SJ MOSFET portfolio in the market
- Mature, stable and well-established

CoolSiC™ MOSFETs

Technology features

- Commutation-robust fast-body diode with low reverse recovery (Q_{rr})
- Superior gate-oxide reliability
- Excellent thermal, avalanche and short circuit capability
- Works with standard drivers

Customer benefits

- High performance combined with robustness and ease-of-use
- High ruggedness, especially at high temperature and in harsh environments
- Smaller system size

CoolGaN™ HEMTs

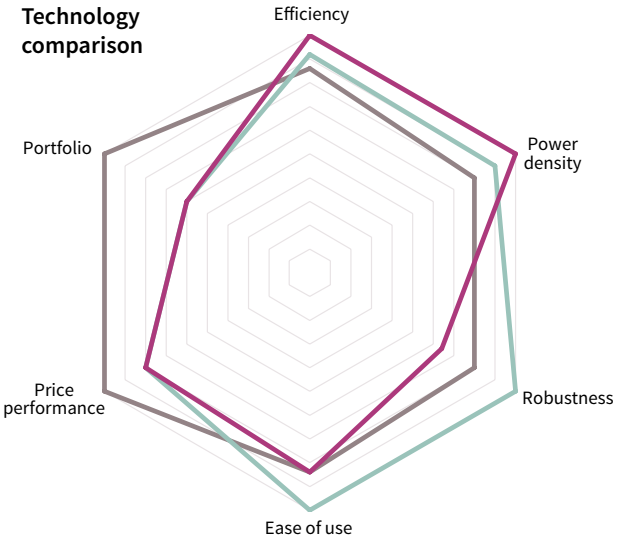
Technology features

- Commutation-robust fast-body diode with zero reverse recovery (Q_{rr})
- Best in FOMs (figures-of-merit)
- Fast (and nearly-lossless) switching

Customer benefits

- Highest efficiency and highest power density
- Operating at highest switching frequencies
- Enables system integration

Technology comparison



	CoolMOS™	CoolSiC™	CoolGaN™
Efficiency	★★★★☆	★★★★★	★★★★★
Frequency	★★★★☆	★★★★★	★★★★★
Power density	★★★★☆	★★★★★	★★★★★
Efficiency at maximum power density	★★★☆☆	★★★★☆	★★★★★
Robustness	★★★★☆	★★★★★	★★★☆☆
High temperature operations	★★★★☆	★★★★★	★★★★☆
Fit for bidirectional topologies	★★★☆☆	★★★★★	★★★★★
Ease-of-use	★★★★☆	★★★★★	★★★★☆
Price performance[1]	★★★★★	★★★☆☆	★★★☆☆
Portfolio granularity	★★★★★	★★★☆☆	★★★☆☆

[1] Price performance is greatly dependent on the application

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