



We are the link
between the real and
the digital world.

CoolSiC™ MOSFET discrete products


Infineon's virtual show 2020



Infineon CoolSiC™ MOSFET – a revolution to rely on

The CoolSiC logo, consisting of the text "CoolSiC™" in a dark grey sans-serif font, enclosed within a thin dark grey circular border.

CoolSiC™

The background of the slide is a wide-angle photograph of a city skyline, likely Hong Kong, taken from an elevated position. The sun is setting or rising, creating a warm, golden glow over the city. The skyline is filled with numerous skyscrapers and buildings. In the foreground, there are green trees and a road with some vehicles.

Bringing reliable performance
to the broadest range of energy-
smart applications

Giving engineers a **pathway**
to achieve highest energy
efficiency and meet the most
stringent application requirements

Silicon carbide (SiC) - new options for power conversion solutions in an energy-smart world



Improve efficiency

Save space and weight

Reduce component count and board space

Enhance lifetime and reliability

Lower system cost

Reduce operational expenses

Reduce total cost of ownership

Note: Not all benefits can be leveraged equally in every system as some might be mutually exclusive

Silicon carbide material properties bring advantages for power electronics

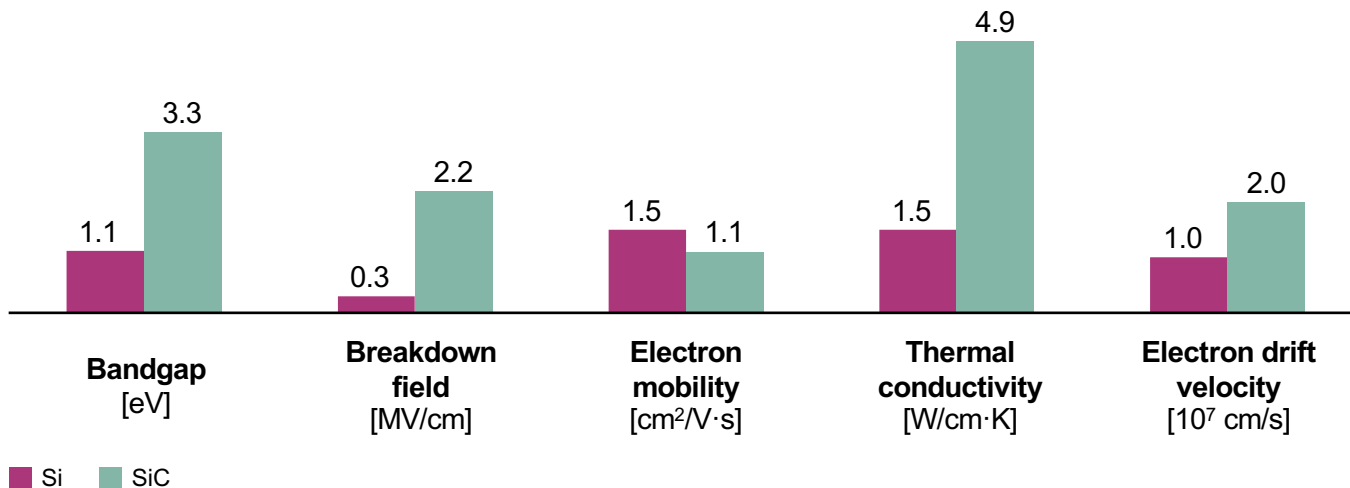
HIGHER VOLTAGE OPERATION

EXTENDED POWER DENSITY

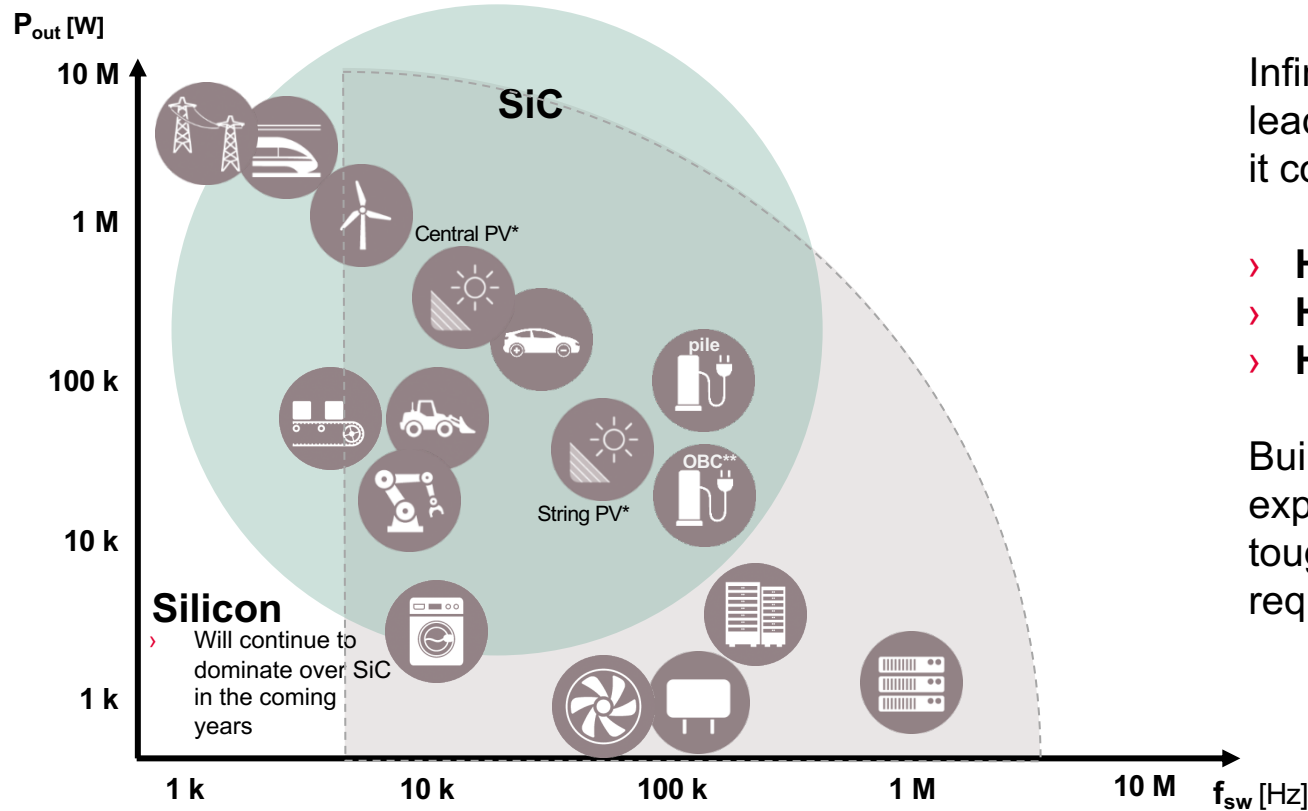
HIGHER FREQUENCY SWITCHING

THINNER ACTIVE LAYERS

IMPROVED HEAT DISSIPATION



Reliability and robustness assurance in SiC strongly linked to silicon mainstream technologies



Infineon is a proven, leading supplier when it comes to

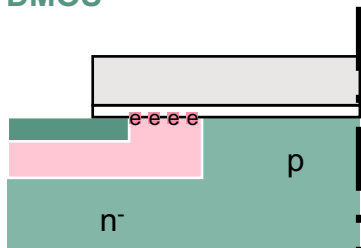
- › **High power**
- › **High reliability**
- › **High robustness**

Building on this experience, we set tough SiC MOSFET requirements

* PV = photovoltaic inverter;
** OBC = onboard charger

Opportunities with modern trench CoolSiC™ technology from Infineon

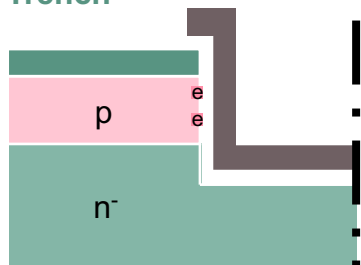
DMOS



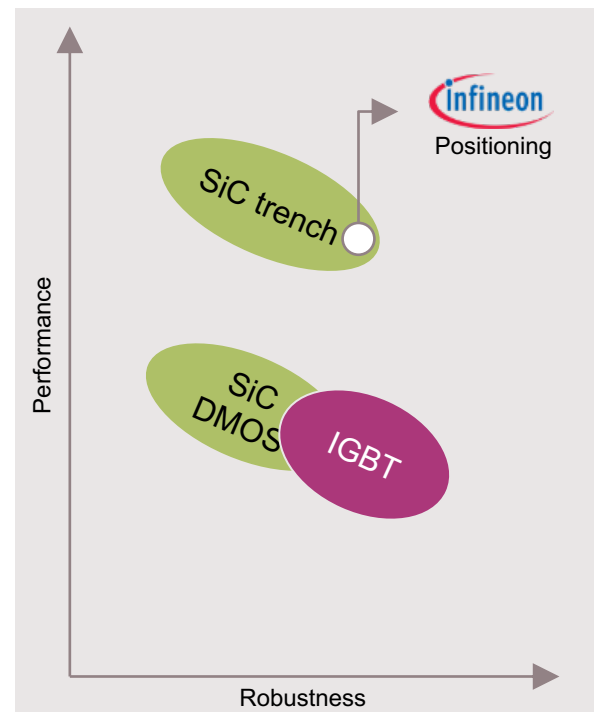
Strong trade-off between performance and gate oxide robustness in on-state

VS

Trench



Easier to reach performance targets without compromising gate oxide safe conditions



Best performance at robustness levels equivalent to IGBT-based systems

CoolSiC™ MOSFETs balance all levers key to application success

Performance

Static behavior

Dynamic behavior

Robustness, reliability & ease of use

Gate oxide reliability

IGBT-like FIT rates

Robustness against parasitic
turn-on

$V_{gs,th} > 4 \text{ V}$

Robust body diode

Rated for hard commutation

Ease of use

0 V turn-off V_{GS}

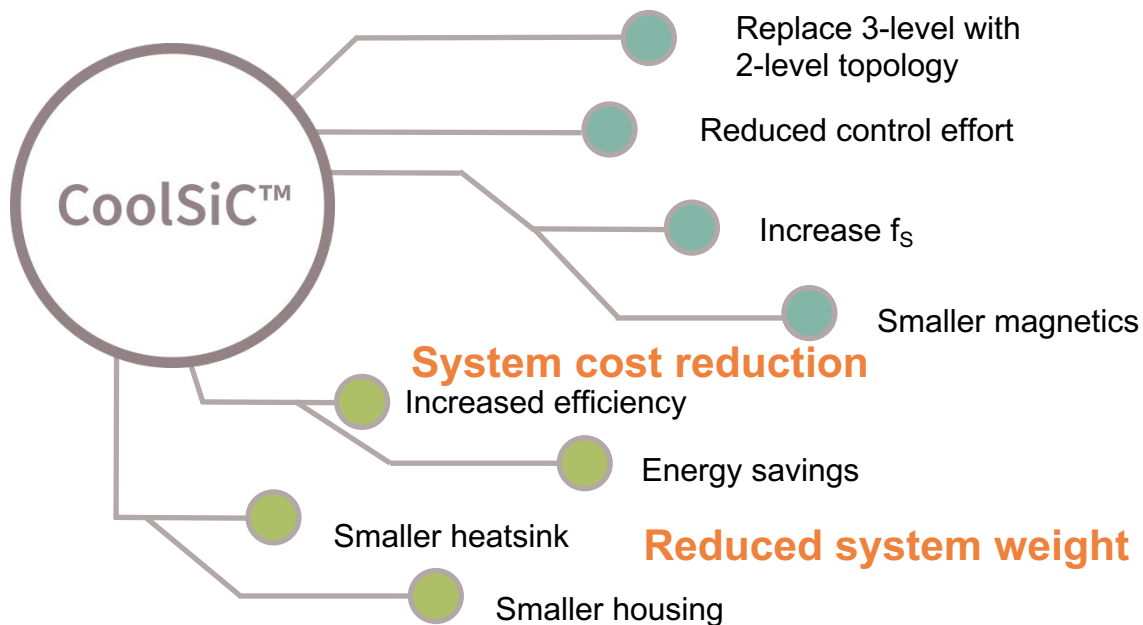
Wide V_{GS} range

Short-circuit capability







3 μs

CoolSiC™

Value proposition for CoolSiC™ MOSFETs



1200 V – 1700 V CoolSiC™ MOSFET portfolio and upcoming products

	$R_{DS(on)}$ [mΩ]	TO-247 3 	TO-247 4 	D ² PAK-7L  	D ² PAK-7L extended creepage  
1200 V	30	IMW120R030M1H	IMZ120R030M1H	IMBG120R030M1H	
	45	IMW120R045M1	IMZ120R045M1	IMBG120R045M1H	
	60	IMW120R060M1H	IMZ120R060M1H	IMBG120R060M1H	
	90	IMW120R90M1H	IMZ120R090M1H	IMBG120R090M1H	
	140	IMW120R140M1H	IMZ120R140M1H	IMBG120R140M1H	
	220	IMW120R220M1H	IMZ120R220M1H	IMBG120R220M1H	
	350	IMW120R350M1H	IMZ120R350M1H	IMBG120R350M1H	
1700 V	450				IMBF170R450M1
	650				IMBF170R650M1
	1000				IMBF170R1K0M1

Summary



CoolSiC™ solutions

As reliable as Si power transistors from Infineon

Outstanding performance and best ease of use

Comprehensive portfolio – all in mass production

This is the revolution you can rely on!

For more product information, please visit

Webpage: www.infineon.com/coolsic-mosfet

Forum: [www.infineonforums.com/forums/34-Silicon-Carbide-\(SiC\)-Forum](http://www.infineonforums.com/forums/34-Silicon-Carbide-(SiC)-Forum)



Part of your life. Part of tomorrow.