Product brief

Performance Boost at Low Cost

CoolSiC™ Hybrid Discrete with SiC technology for e-Mobility

Best cost-performance is the most important aspect for auxiliary applications in electric vehicles and hybrid vehicles. Therefore, Infineon has developed a hybrid of 650V TRENCHSTOP™ 5 AUTO fast-switching IGBT and CoolSiC™ Schottky Diode to enable a cost-efficient performance boost for fast switching automotive applications such as On-Board Charger, PFC, DC-DC and DC-AC.

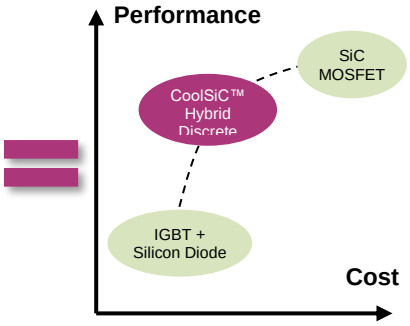
The combination of a best-in-class fast-switching IGBT with a very reliable SiC Diode builds a perfect cost-performance trade-off for hard-switching topologies. Due to the Q_{rr}-free unipolar CoolSiC™ Schottky Diode, the E_{on} of the IGBT will be reduced significantly by up to 40% over silicon-only solutions. This makes the hybrid the first-choice for system-cost-sensitive hard commutation applications, such as Totem Pole topology in Automotive On-Board Charger applications. This results in better margin for low-complexity design-in activities.

TRENCHSTOP™ 5 IGBT
F5 Fast-Switching IGBT

- 650V class
- Performance-optimized IGBT for fast-switching
- Fast IGBT in the portfolio with MOFET like switching behavior
- Best-in-class fast-switching IGBT technology
- Mature technology used by many customers successfully

CoolSiC™ Diode Gen 5
SiC Schottky Diode

- 650V class
- Excellent Figure of Merit (Qc x VF)
- No reverse recovery charge
- High operating temperature ($T_{j,max}$ = 175°C)
- Robust against surge currents



Key features

- 650V TRENCHSTOP™ 5 IGBT + CoolSiC™ Schottky Diode Gen5
- Best-in-class switching and conduction losses
- No reverse & forward recovery charge
- High operating temp: $T_{j,max}$ = 175°C
- Robust against surge currents
- Low gate charge Qg Available from 15A up to 50A

Key benefits

- Highest reliability against environmental conditions
- Increased system efficiency
- Best performance/cost ratio for hard switching topologies (e.g. Totem Pole)
- Supporting bi-directional On-Board Charger designs

Key applications

- On-Board Charger
- PFC
- DC-DC

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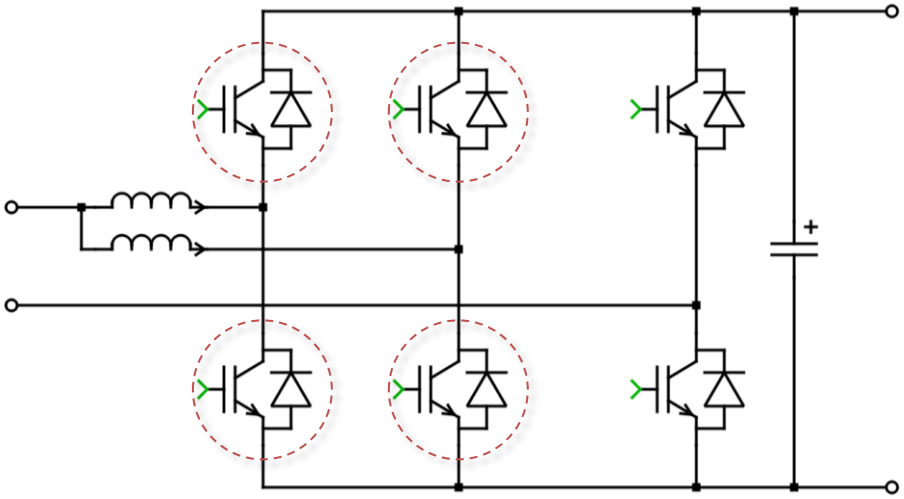
Application Diagram

The example shows an interleaved Totem Pole PFC topology. The CoolSiC™ Hybrid Discrete for Automotive can be used for the 4 IGBTs on the left side, whereas the remaining two IGBTs are slow switching at 50/60Hz.



Product portfolio 650 V CoolSiC™ Hybrid Discrete for Automotive (PG-TO247-3)

Sales Product	SP Number	Switching frequency [kHz]	V_{CE} [V]	$V_{CE,sat}$ [V]	I_C [A]		Qc [µC]
					25 °C	100 °C	
AIKW50N65RF5	SP001724852	50-120	650	1.6	80.0	46.0	0.03

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