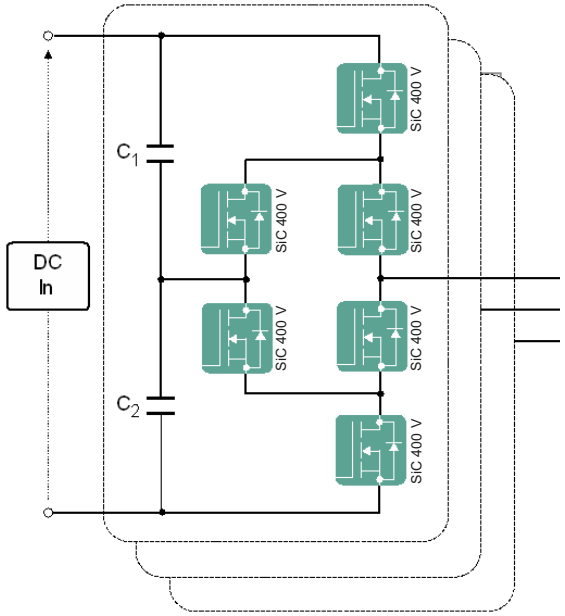


CoolSiC™ MOSFET 400 V G2
Inverters: Solar, ESS and motor control

May 24

public

Topology example: 3L-ANPC



S1, S4, S5, S6	– CoolSiC™ higher performance
S2, S3	– CoolSiC™ higher performance, CoolMOS™ S7 lower cost
Driver	– EiceDRIVER™ 2EDF7275F

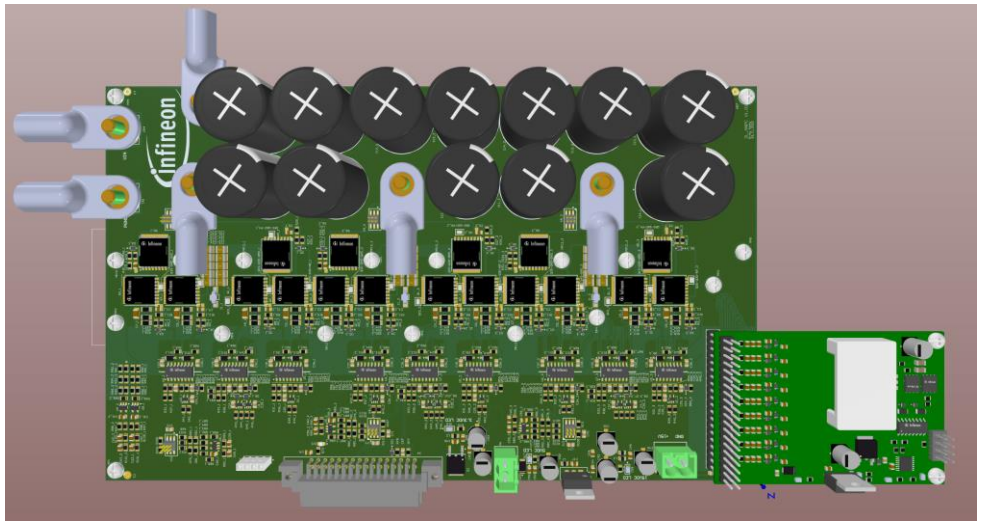
	Application	System Power	Package	CoolSiC™ $R_{DS(on)}$ range
	String / hybrid inverters /ESS	7 kW → 22 kW	TOLL, D2PAK-7	11 - 45 mΩ
Forklift	Motor Inverters	7 kW → 30 kW	TOLL, D2PAK-7	11 - 45 mΩ

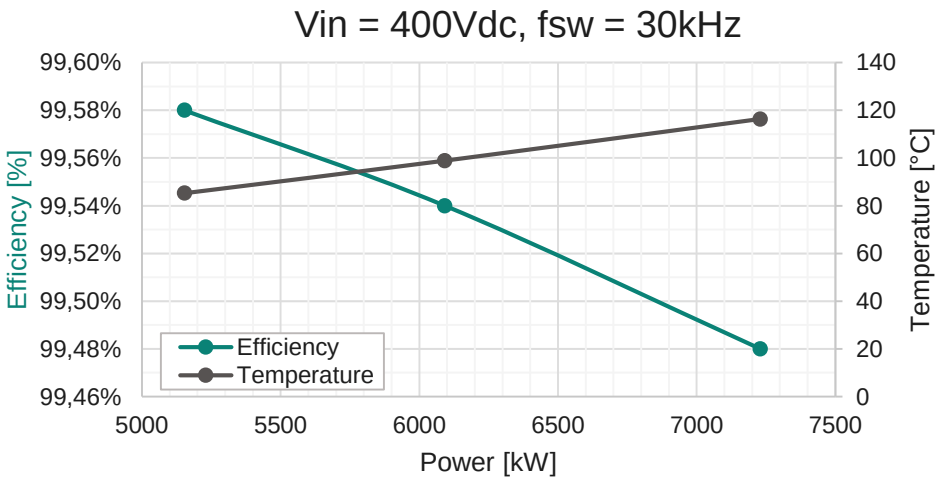
CoolSiC™ MOSFET 400 V G2 value proposition in 3L-ANPC

- 400 V SiC enables 3L topologies (ANPC) with blocking voltage capability of $800V_{DC}$
- Higher V_{BUS} improves efficiency & power density, reduces PCB copper, and eliminates paralleling
- Inductor size reduction due to inherent lower current ripple of multilevel topology
- Better EMI performance due to inherent lower dv/dt of the topology
- Better thermal management due to heat spreading over 18 MOSFETs

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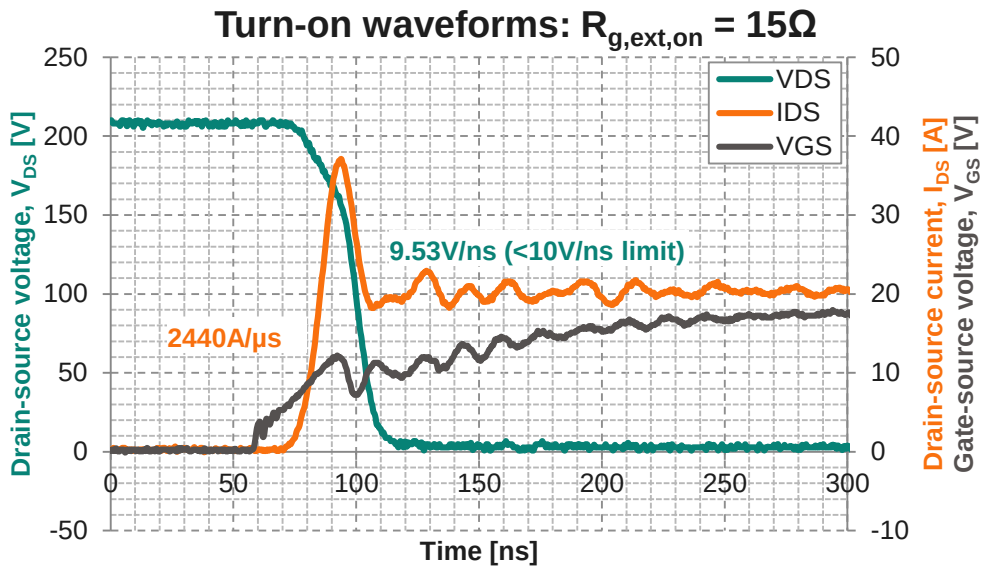
Technology Demonstrator:
3L-ANPC w/ V_{BUS} = 400V

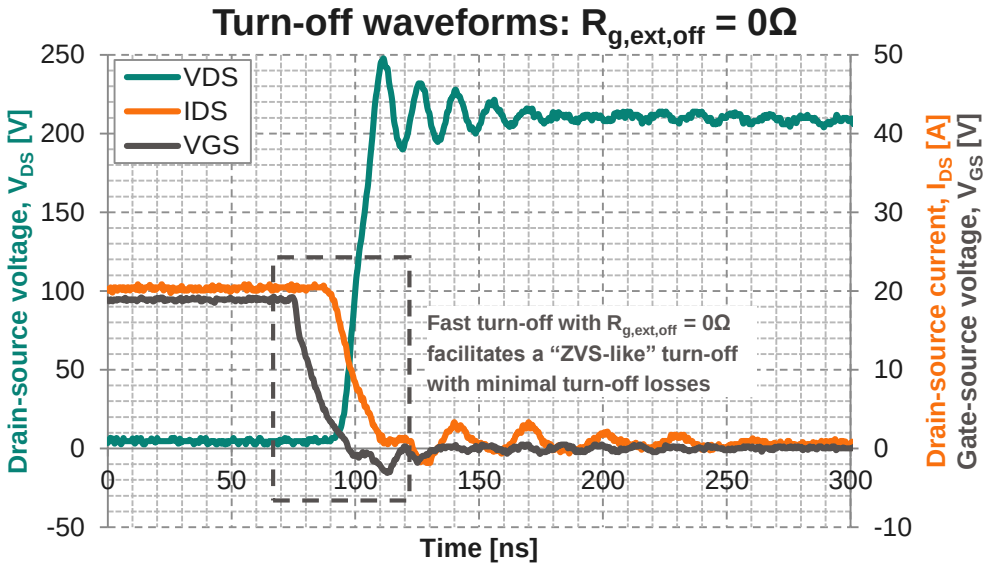




>99.5% inverter efficiency despite a <10V/ns dv/dt limit!

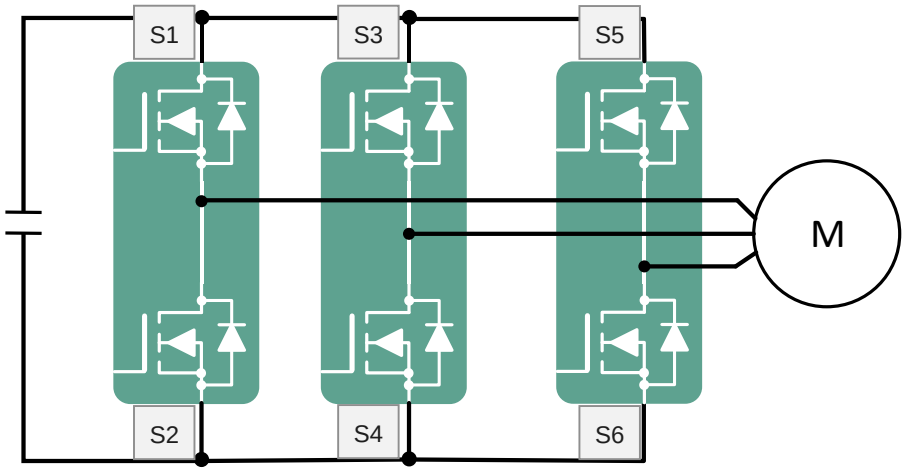
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Topology example: B6 inverter



S1, S2, S3, S4, S5, S6	– CoolSiC™ highest performance
Driver	– EiceDRIVER™ 2EDF7275F

	Application	System Power	Package	CoolSiC™ $R_{DS(on)}$ range
Forklift	Motor Inverters	3-10 kW	TOLL, D2PAK-7	11-45 mΩ

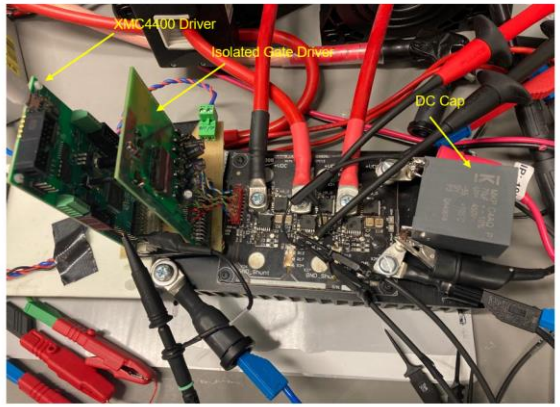
CoolSiC™ G2 400V MOSFET value proposition in B6

- Perfect fit for bus voltages up to 300 V. 288 V_{DC} vs 48V_{DC} comparison shows **up to 38% higher power** output with CoolSiC™ 400V compared to 80V best-in-class Si MOSFET.
- Increasing the system voltage yields increase in the system efficiency & power density
- Improved current sharing for parallelling applications, with potentially eliminating the need for paralleling
- System cost benefit of high voltage system primarily due to heavy copper reduction

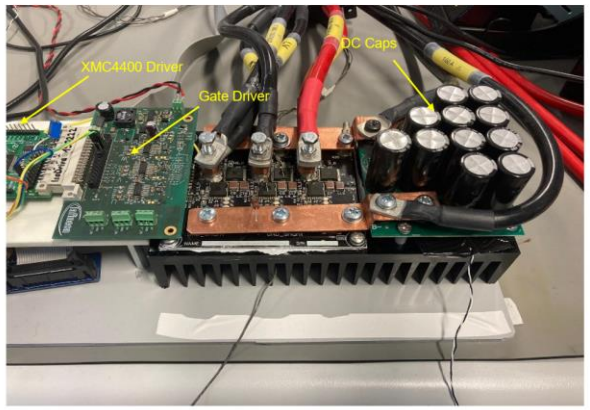
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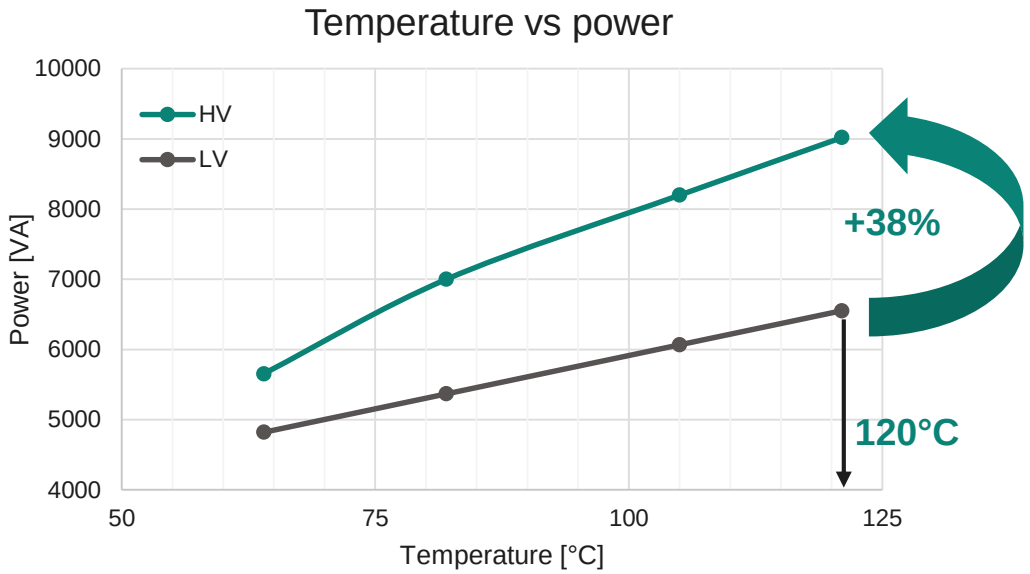
288 V HV vs 48 V LV drive benchmarking

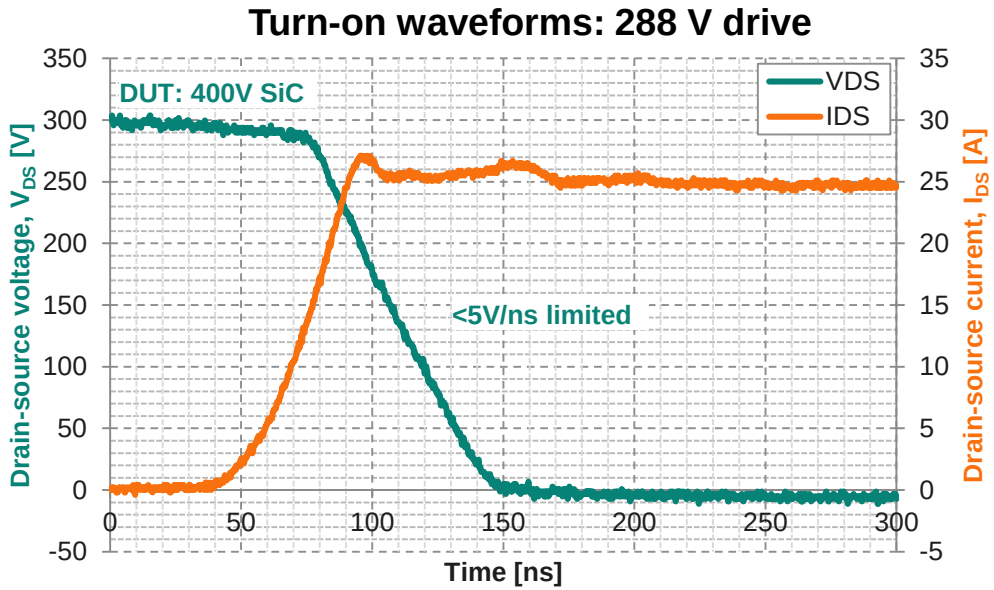
HV DRIVE SYSTEM

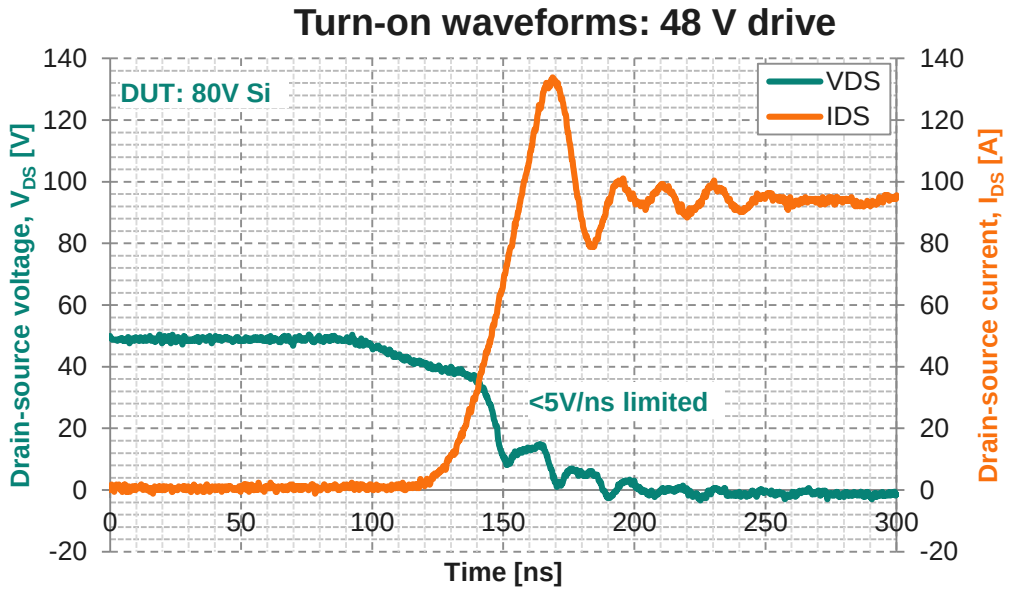


LV DRIVE SYSTEM









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