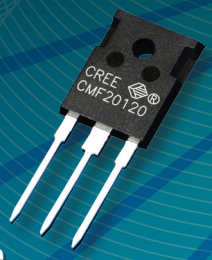
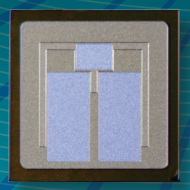
NEW

Z-FET™ CMF20120D

Industry's First SiC MOSFET

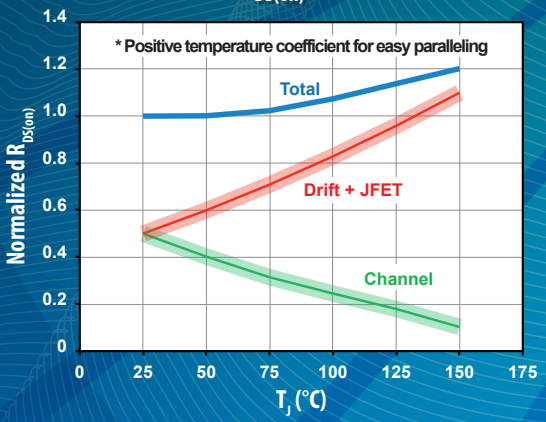




1200 V 80mΩ

- High-speed switching
- Low capacitances
- Only 20% increase in $R_{DS(ON)}$ over operating temperature range
- Easy to parallel

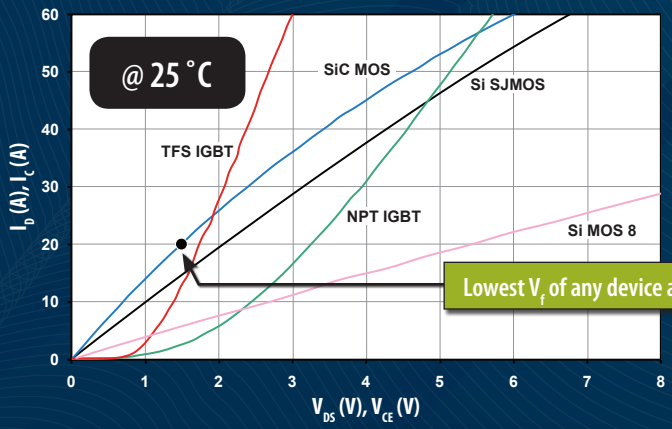
Normalized $R_{DS(on)}$ vs. Temperature

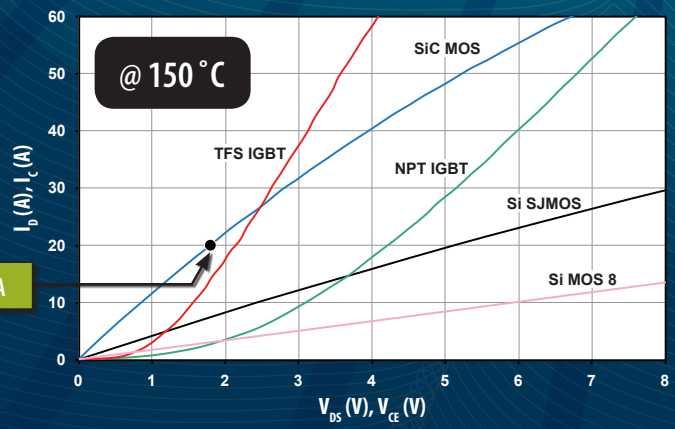


μ_{bulk} decreases with temp
$R_{drift+jfet}$ increases as expected

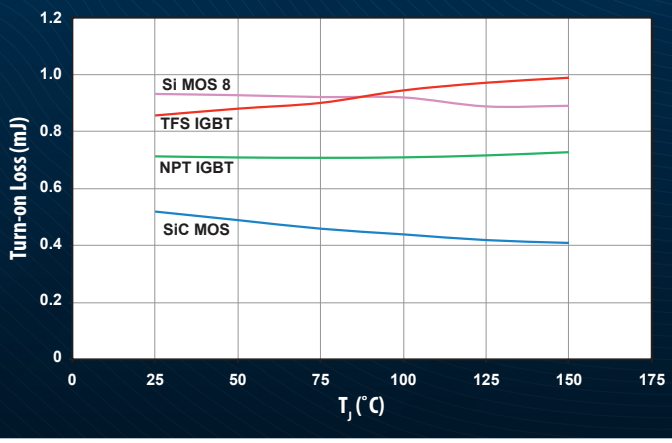
$\mu_{channel}$ increases with temp
$R_{channel}$ decreases with temp
- Reduces $R_{drift+jfet}$ TC effect on $R_{DS(on)}$ TC

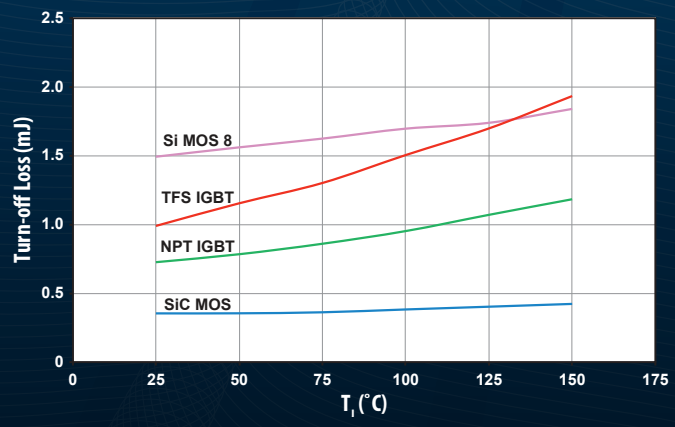
SiC Forward Characteristics vs Current Si Technology*





SiC Switching Characteristics vs Current Si Devices*





- Lowest switching loss in its class.
- Enables significantly higher switching frequencies with world-class efficiency.
- Reduced magnetics and filter size with significantly reduced cooling requirements.

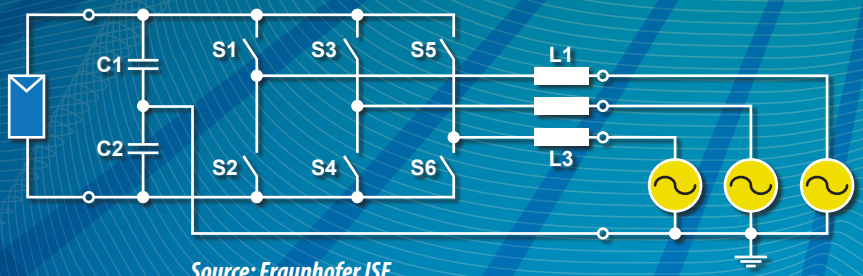
** Determined by Cree to be the most appropriate Si devices of comparable amperage rating.*

CREE®

Silicon Carbide MOSFET Application Example

Three Phase 7 kW / 400 V_{RMS} Solar Inverter

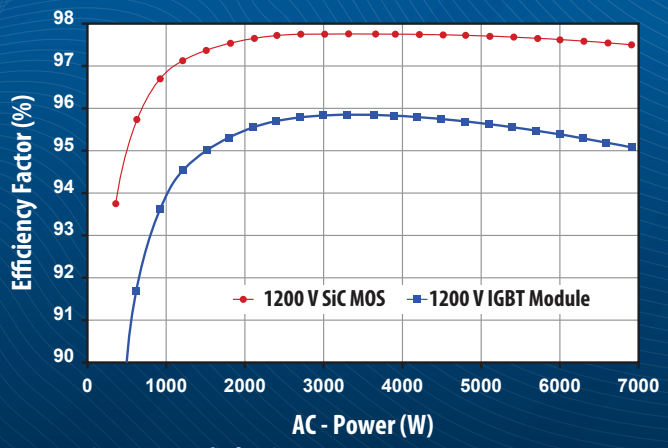
- F_{SW} = 16.6 kHz
- DC Link Voltage = 650 V
- Neutral Point Clamped B6 Topology (Fraunhofer ISE, Germany)



Source: Fraunhofer ISE

	Max. Efficiency	Euro. Efficiency
IGBT from Fairchild	η_{max} = 95.89%	η_{euro} = 95.07%
SiC MOSFET from Cree	η_{max} = 97.81%	η_{euro} = 97.43%
Efficiency Gain	$\Delta\eta_{max}$ = +1.92%	$\Delta\eta_{euro}$ = +2.36%

Source: Fraunhofer ISE



Source: Fraunhofer ISE

Per Fraunhofer ISE:

- European efficiency improvement of 2.36%.
- At rated power (7 kW) there is 175 W of power dissipation saved, or a 2.5% efficiency gain.
- At 25˚C ambient temperature, the heatsink temperature dropped from 93˚C with IGBTs to 50˚C with SiC MOSFETs.

Attain record efficiencies with significant reliability improvement over competing Si devices.

RoHS, REACH, and Halogen-Free compliant

CREE®