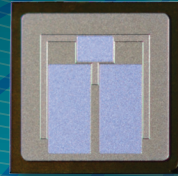
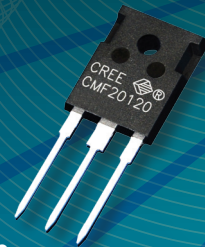


NEW

Z-FET™ CMF20120D

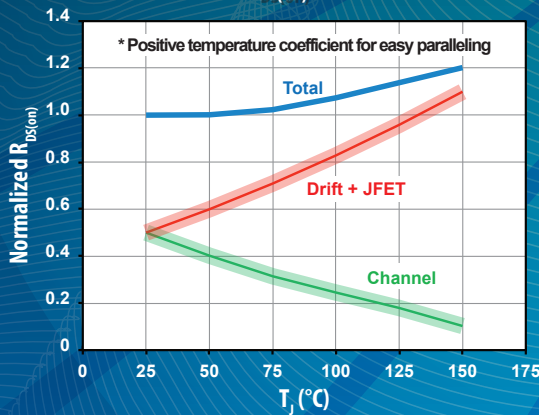
Industry's First SiC MOSFET



1200 V 80mΩ

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

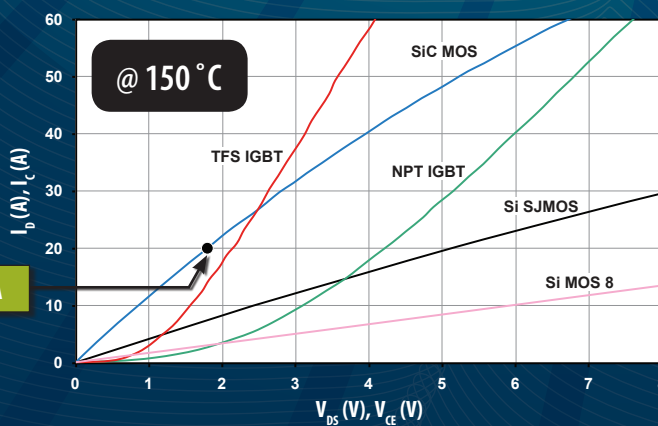
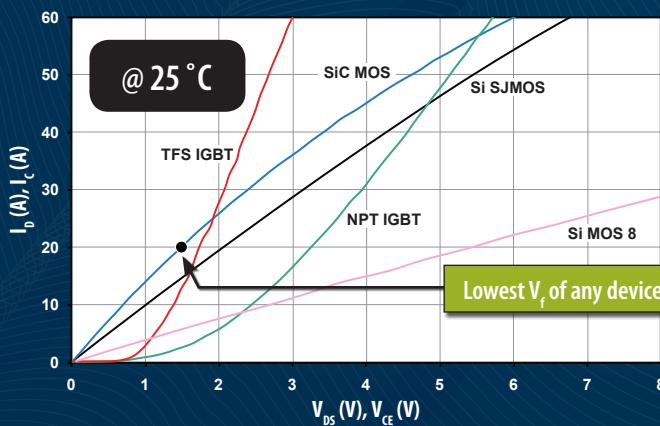
Normalized $R_{DS(on)}$ vs. Temperature



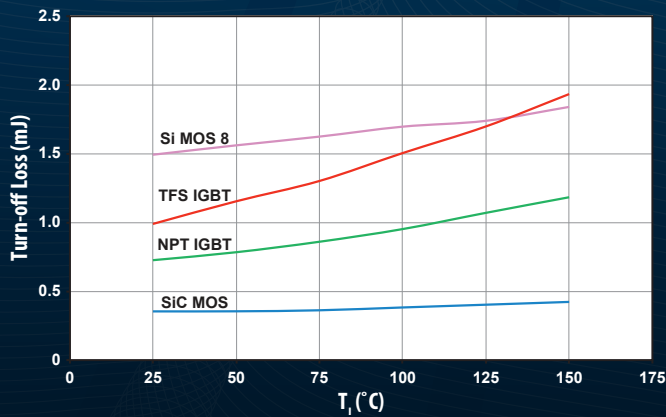
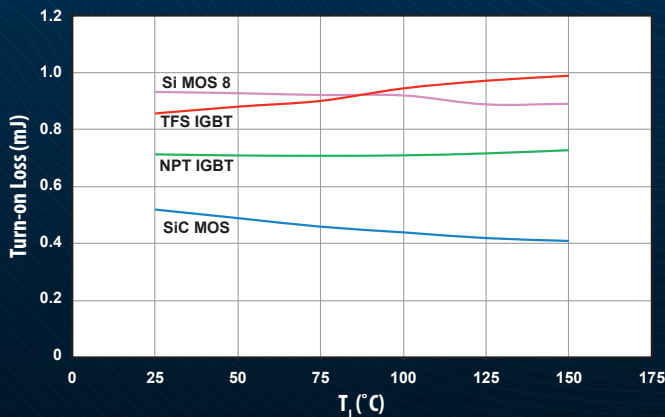
μ_{bulk} decreases with temp
 $R_{drift+jfet}$ increases as expected

$\mu_{channel}$ 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.

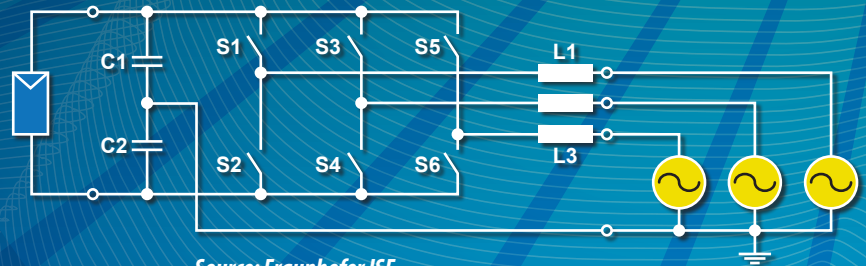
* Determined by Cree to be the most appropriate Si devices of comparable amperage rating.



Silicon Carbide MOSFET Application Example

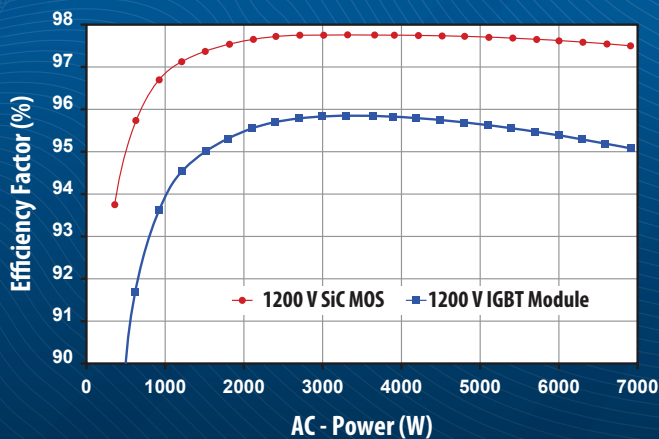
Three Phase 7 kW / 400 V_{RMS} Solar Inverter

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



	Max. Efficiency	Euro. Efficiency
IGBT from Fairchild	$\eta_{max} = 95.89\%$	$\eta_{euro} = 95.07\%$
SiC MOSFET from Cree	$\eta_{max} = 97.81\%$	$\eta_{euro} = 97.43\%$
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

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