

# Silicon Carbide: A Green-tinted Revolution

Material, devices, applications and challenges in between.

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Silicon Carbide is a semiconductor material with unique properties which make it suitable for power electronics applications. Simply put, SiC devices (transistors, diodes) are able to operate with lower losses and at higher temperatures than silicon devices. The sought-after properties, permitting this advantage – dielectric breakdown field strength, electron saturation velocity, wide energy band gap, and thermal conductivity are also linked to the challenges encountered in manufacturing SiC devices. Numerous hurdles need to be overcome to manufacture SiC devices, such as crystal growth by sublimation, cutting material with 9.5 rating on Mohs scale and almost no diffusion of dopants. Despite these challenges, the ability of SiC to deliver high performance devices is unparalleled and worth every effort.



Fig. 1 Powder SiC



Fig. 2 SiC boule grown by PVT and cut to size

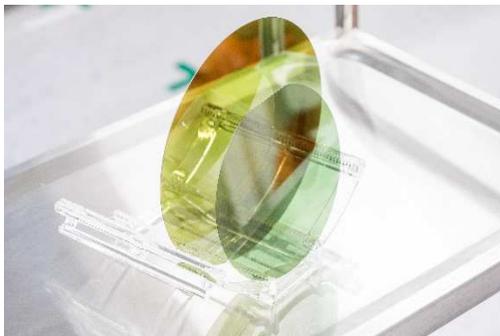


Fig. 3 Polished SiC wafer

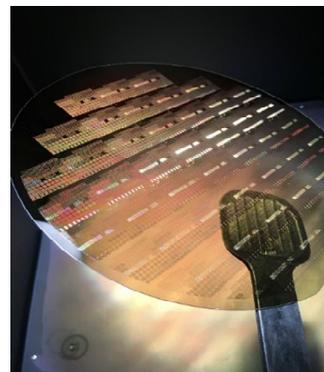


Fig. 4 SiC wafer with devices prior to metallization