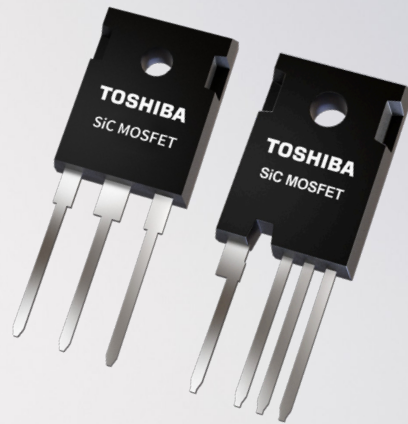


SiC Snacks

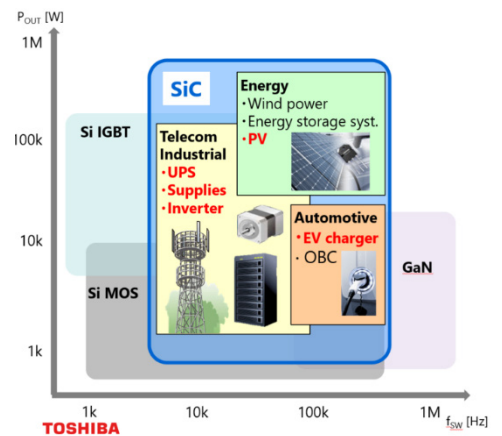
Bite Sized Benefits

Switching Capabilities



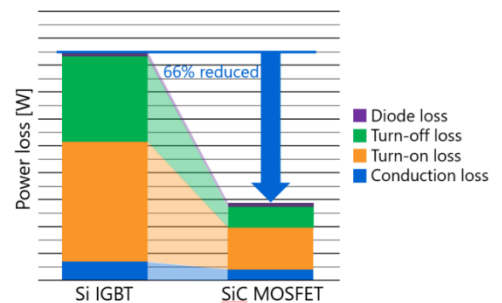
What does it mean?

One of the stand-out characteristics that SiC MOSFETs offer over silicon-based IGBTs is their far superior switching capabilities - coming as close as the industry has been able to, so far, to an ideal switch arrangement. Reaching MHz frequencies, these wide bandgap devices are orders of magnitude faster in this respect. They are able to rapidly respond to changes in current (di/dt) or voltage (dv/dt), transitioning from the off to the on state in a short timeframe. Switching occurs once their defined V_{th} has been reached, but they can successfully block voltages below this (making them invaluable in high-power switching applications). Since their switching periods are very short, they exhibit minimum switching losses during that time. Because of the enhanced switching capabilities associated with them, Toshiba's SiC MOSFETs are addressing opportunities in electric vehicle charging hardware, telecommunications network infrastructure, renewable energy generation equipment and high-power industrial systems.



What's the benefit?

The elevated switching speeds of SiC MOSFETs are advantageous for numerous reasons. With switching losses being reduced, the amount of accompanying thermal management is substantially less. In addition, the associated passive components (inductors and capacitors) being incorporated into the design can be smaller and will also be less expensive to procure. Consequently, SiC-based switching implementations will not only save valuable space, but also keep the overall bill-of-material (BoM) costs involved down.



- High switching frequencies
- Reduced size of passive components and cooling system
- EMC needs to be handled
- BOM cost reduction