5th generation 1200V thinQ siC Schottky diodes

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Infineon Technologies AG expands the comprehensive SiC portfolio introducing the 5th generation1200V thinQ! SiC Schottky diodes. The new 1200V SiC diodes feature ultra-low forward voltage even at operating temperatures, more than 100 percent improved surge current capability and excellent thermal behavior. These features result in significant efficiency improvement and robust operation in solar inverters, Uninterruptible Power Supplies (UPS), 3-phase SMPS (Switch Mode Power Supplies) and motor drives.

The "Generation 5" SiC diodes use a new compact chip design, realized by merged pn junction engineering in the Schottky cell-field. This enables a smaller differential resistance per chip area. As a result, a reduction of the diode losses by up to 30 percent compared to the previous generation can be achieved; for example in a front-end boost stage for a 3-phase solar inverter operating at 20kHz with full load.

At a junction temperature of 150 °C, the typical forward voltage is only 1.7V, which is 30 percent less compared to the previous generation. This represents the lowest forward voltage available on the market for 1200V SiC diodes. Therefore, the new SiC diodes are especially well suited for applications operating at relatively high load like UPS systems. Moreover, the system efficiency is improved even under low switching frequencies.

Depending on the diode ampere rating, a surge current capability now rated up to 14 times the nominal current ensures robust diode operation

during application surge current events. This enables the elimination of a by-pass diode, thus reducing the complexity and system costs.

"The new Generation 5 SiC diodes underlines Infineon's goal to deliver products that offer customers the opportunity to get the highest efficiency out of their designs. With the reduced diode losses, a wider range of switching frequencies can be addressed while reliability is extended due to the increased surge current capability," says Roland Stele, Marketing Director IGBT and SiC Power Discretes at Infineon Technologies. "The latest generation of Infineon's SiC Schottky diodes is a big step forward to exploit the full potential of the promising SiC material."

Implementing the new 1200V thinQ!SiC Schottky diodes in combination with Infineon's best-in-class 1200V Highspeed3 IGBT in boost and Power Factor Correction (PFC) boost topologies brings significant benefits on system level. Not only the losses in the diode are reduced, but also the performance of the Highspeed3 IGBT is improved due to reduced turn-on losses (which lead to smaller heat sink or increased efficiency) and lower EMI (smaller cost-effective EMI filter) compared to solutions using conventional Si diodes.

Provided by Inifineon