San'an G5 1200V SiC Schottky Barrier Diodes

Better Candidate for High Efficiency, Miniaturization, and High Surge

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Author: Yang Qinghai, You Chunlin, Zhang Jianshan, Senior Application Engineer

In high-power applications, silicon carbide Schottky barrier diodes (SiC SBDs) have advantages over silicon-based devices in terms of higher breaking-down voltage, better thermal stability, and no reverse charge recovery. San'an's 5th generation (G5) 1200V SiC SBD develops based on the 2nd generation (G2) device with a series of optimizations such as reduced the forward voltage (V_F) ,thermal resistance ($R_{th(j-c)}$) and improved the non-repetitive forward current (I_{FSM}), contributing to a more efficient and compact design with ultra-high surge current capability. San'an 1200V G5 is RoHS certified and meets the standards for industrial applications.

FEATURES

- High-reliability MPS Structure
- High Surge Current Capability
- Thin-wafer Platform
- Zero Reverse Recovery
- Lower V_F
- Optimized Thermal Management
- RoHS Certified

BENEFITS

- ✓ Candidate for High Surge Capability Design
- ✓ Enabled System Level Efficiency
- ✓ Higher Power Density In Class
- ✓ Reduced Cooling Requirements
- ✓ Improved System Reliability
- ✓ Optimized Versions of G2 1200V SiC SBD

As shown in Figures 1 and 2, San'an 1200V G2 SiC SBD adopts MPS structure (MPS: Merged Pin-schottky; PIN: Positive-Intrinsic-Negative), the device of which has excellent surge current capability, and G5 SiC SBD optimizes the PIN ratio on the original MPS structure of G2 to enhance the surge capability. Moreover, the 1200V G5 SiC SBD adopts San'an' s thin-wafer platform to reduce wafer thickness by more than 50%, optimizing the V_F and $R_{th(j-c)}$ of the device with effect.

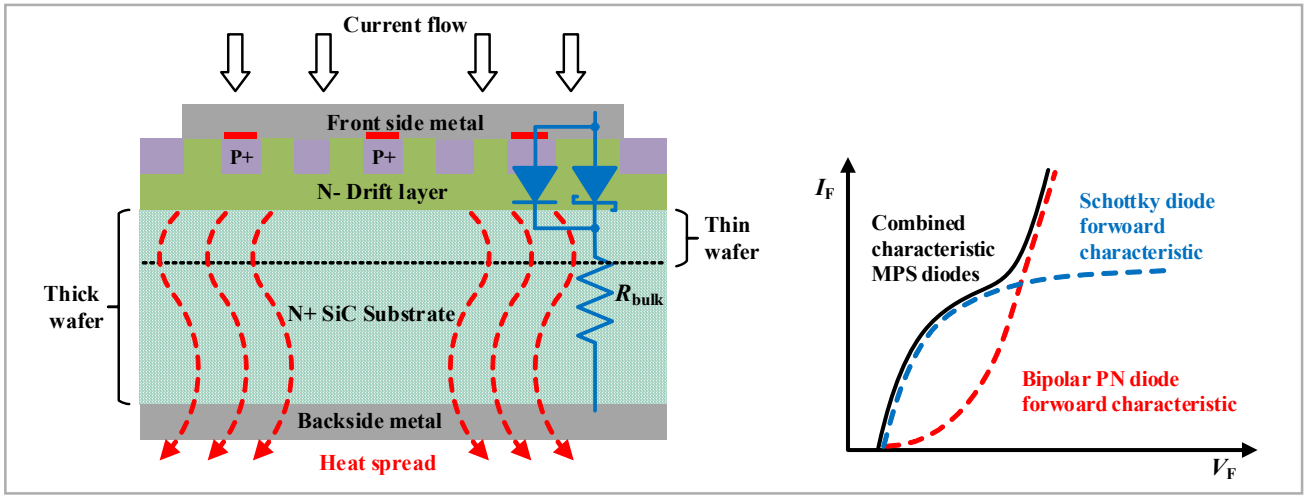

Fig 1:Schematic diagram of MPS structured SiC SBD with thin-wafer (Left) and *I-V* curve (Right)

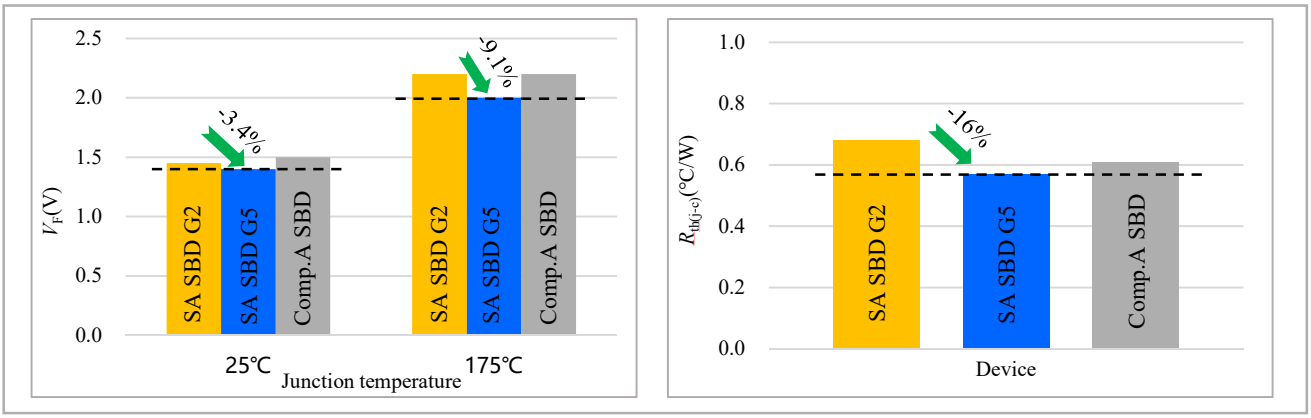

Fig 2:Comparison of V_F (Left) and $R_{th(j-c)}$ (Right) of 1200V 20A SiC SBD

Non-repetitive forward current (I_{FSM}) is an important parameter represents the surge capability of devices. Devices with high I_{FSM} can withstand higher current pulse and prevent device failure. Taking the 1200V 20A SiC SBD device as an example application in Figure 3, San'an G5 optimized the device's surge capability, with an I_{FSM} value about 14% higher than G2, and even more than 58% higher than competitors. This implies that G5 can withstand higher surge current and better meet design requirements in systems with high surge currents.

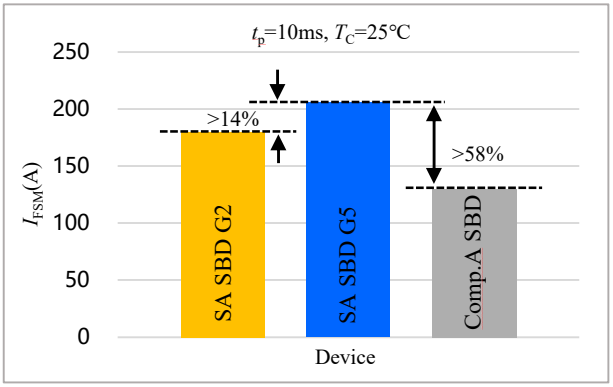

Fig 3:Comparison of I_{FSM} (1200V 20A SiC SBD)

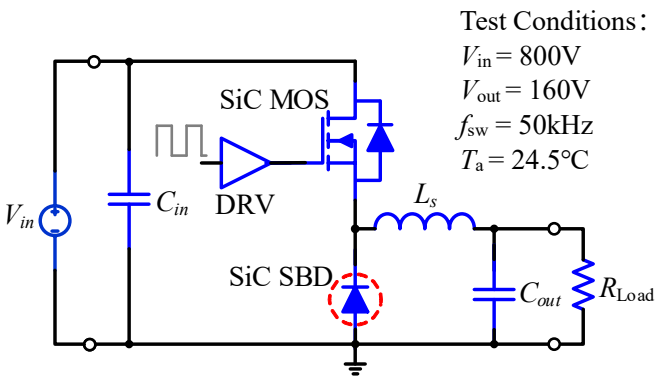

Fig 4:Testing Circuit of Buck Converter

San'an G5 not only greatly enhances the surge capability but also the loss and heat dissipation of the device. Figure 4 shows the comparative test of San'an 1200V SiC SBD on Buck converter, and the results are shown in Figure 5. G5 reduces the V_F and $R_{th(j-c)}$ of the diode, in addition to cutting down the conduction loss of the device and bettering system power efficiency, it also effectively boosts the heat dissipation capacity and stability of the device for supporting higher power field and it can simplify the heat dissipation design for a more compact system design.

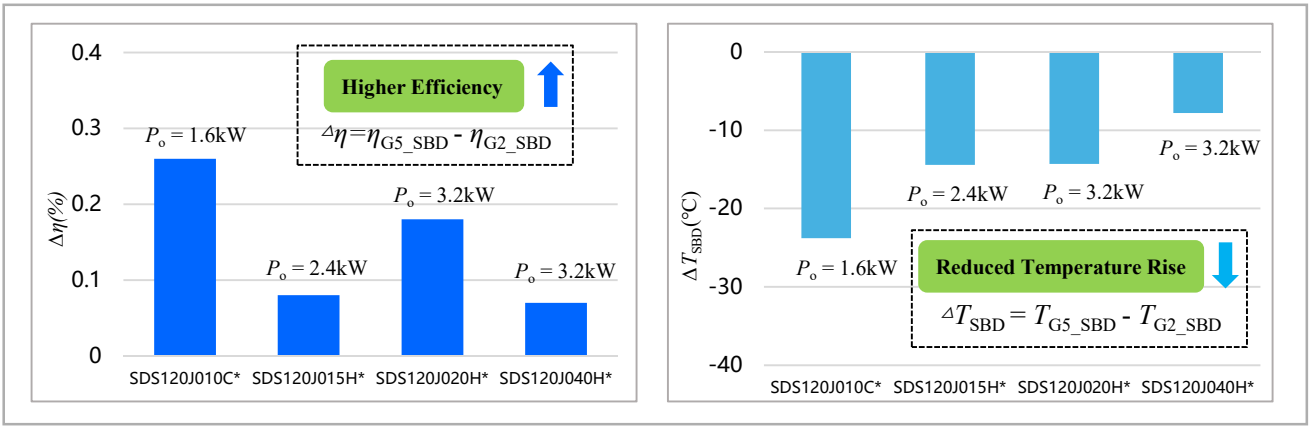

Fig 5:Comparison of Efficiency (Left) and Temperature Rise (Right) of 1200V SiC SBD G5 and G2

San’an 1200V G5 has applied a series of optimizations based on the prime performance of G2. While meliorating its ability to withstand higher surge currents, it further optimizes device losses and heat dissipation, achieving a more efficient, compact, and highly surge capability design. San’an Semiconductor is deeply involving in the technological innovation of SiC power devices, constantly iterating and refining device performance, and committed to providing high-quality products that can meet customer needs.

San'an 1200V SiC SBD G5 Series

I_F(A)	TO220-2L	TO247-2L	TO247-3L	Baredie
View				
10	SDS120J010C5			SDS120J010B5
15		SDS120J015H5		SDS120J015B5
20		SDS120J020H5	SDS120J020G5	SDS120J020B5
30		SDS120J030H5	SDS120J030G5	SDS120J030B5
40		SDS120J040H5 SDS120J040J5	SDS120J040G5	SDS120J040B5

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Industry application