Silicon devices such as IGBTs are benefiting from mature infrastructure and processes. New device generations are coming to the market. In addition to performance improvements, Si IGBT costs will further be reduced thanks to a 12-inch Si wafer transition that will make the competition with WBG materials even tougher.

Si IGBT players offer different approaches for device design, depending on the targeted electrical performance and applications. Most of them have adopted the Field-Stop (FS) trench structure.

In this report, System Plus Consulting presents an overview of the state of the art of 31 Si IGBT transistors of eight voltage classes from 11 main IGBT market players. The report highlights differences in device design and manufacturing processes, and their impact on device size and production cost.

Detailed physical analysis is performed for 17 IGBTs. For devices previously analyzed by System Plus Consulting, please refer to the corresponding reports for the full technology analysis. Cost simulations are detailed for all 31 IGBTs. It includes their estimated manufacturing cost with breakdowns, and their selling price.

Finally, this report provides exhaustive physical, technological and manufacturing cost comparisons of the analyzed Si IGBTs, and a current density and die Ampere cost comparisons with SiC Transistors.

COMPLETE TEARDOWN WITH
• Detailed optical and SEM photos
• Precise measurements
• Manufacturing process flow of selected technologies
• Supply chain evaluation
• Manufacturing cost analysis
• Estimated selling price
• Comparisons of technology design parameters and performance
• Comparisons of costs
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