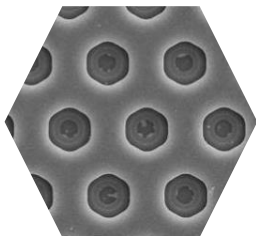
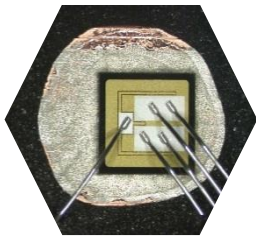


1200V Silicon IGBT vs SiC MOSFET Comparison 2018



Technology and cost analysis of thirteen silicon IGBTs and eight SiC MOSFETs from eight different manufacturers shows their potential.



Silicon (Si)-based IGBTs have been on the market for more than 30 years. The technology has quickly evolved, reducing the costs and improving performance at the same time. As Si devices approach their physical limits, wide-band-gap devices, in particular made from silicon carbide (SiC), have emerged on the market, offering better performance thanks to their intrinsic properties.

SiC MOSFETs and Si IGBTs are in competition in various applications in the 1200V range. As of 2018, the SiC MOSFET market is still small compared to that for Si IGBTs due to lack of maturity and high cost. However, market acceptance is increasing as the technology improves, costs fall and more device manufacturers enter the market.

We highlight the differences in design and manufacturing processes, and their impact on device size and production cost.

We have analysed different Si and SiC devices from Infineon, STMicroelectronics, Fuji, ON Semiconductor, Mitsubishi, Rohm, Wolfspeed and Littelfuse. The report includes detailed optical and Scanning Electron Microscope pictures of the transistor design, cross sections and epitaxy.

This report provides design information, an estimated production cost for every transistor and compares the different components available on the market.

Title: 1200V Si IGBT vs SiC MOSFET Comparison 2018

Pages: 225

Date: September 2018

Format: PDF & Excel file



In this report, System Plus Consulting presents an overview of the state of the art of 1200V Si IGBTs and SiC MOSFETs.

COMPLETE TEARDOWN WITH

- Detailed photos and identification
- Scanning electron microscope and energy-dispersive X-Ray analyses of transistor structures
- Scanning electron microscopy analysis of epitaxy layers
- Manufacturing process flow
- In-depth economic analysis
- Manufacturing cost breakdown
- Estimated sales price
- Comparison between 20 different devices

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- 1200V SiC MOSFET

System Plus Consulting Services

AUTHORS



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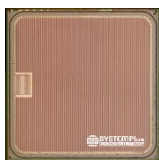
Elena holds a Master in Nano-technologies and a PhD in Power Electronics.



Véronique Le Troadec has joined System Plus Consulting as a laboratory engineer. Coming from Atmel Nantes, she has extensive knowledge in failure analysis of components

and in deprocessing of integrated circuits.

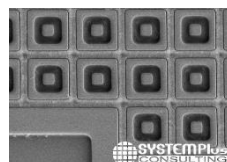
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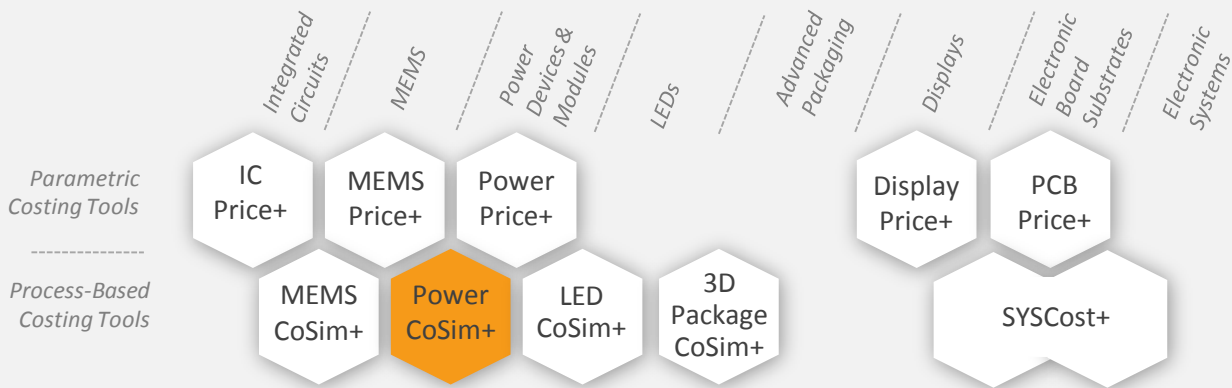
Infineon FS820R08A6P2B

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The newest HybridPACK Drive power module from Infineon with EDT2 IGBT technology.

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Process based costing tool used to evaluate the manufacturing cost per wafer using your own inputs or using the predefined parameters included in the tool.

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