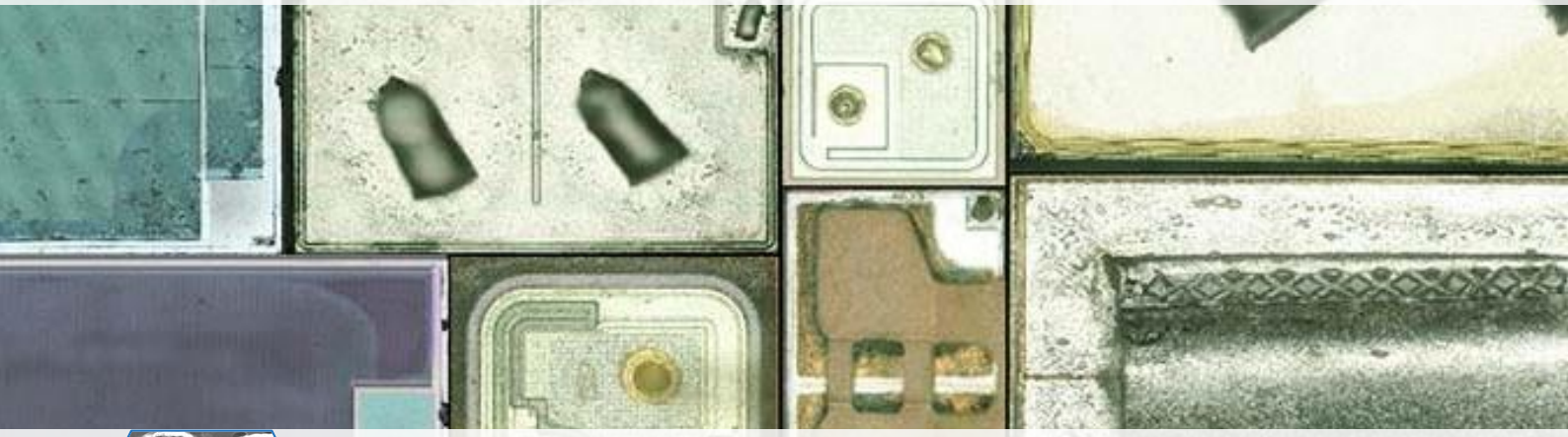
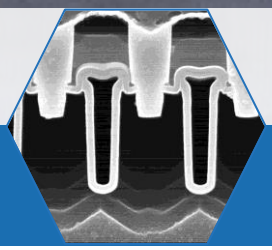
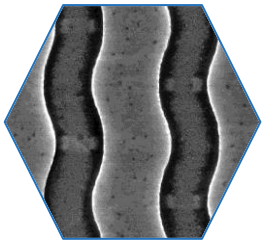
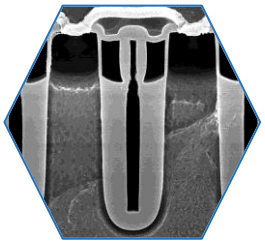




Automotive Low-Voltage Si MOSFET Comparison 2021

Exhaustive technology and cost comparisons of 11 AEC-Q101 Si MOSFETs from Infineon, ON Semiconductor, STMicroelectronics, Toshiba, Nexperia, Rohm, Diodes Incorporated, and Taiwan Semiconductor.





Title: Automotive Low-Voltage Si MOSFET Comparison 2021

Pages: 167

Date: July 2021

Format: PDF & Excel file

Price: EUR 6,490

Reference: SPR21582

New environmental regulations targeting carbon neutrality by 2050 by some governments play in favor of faster vehicle electrification. Power electronics is a key technology for this transition. Power semiconductors of various voltage ranges can be found in any EV. Low voltage MOSFETs are already present in petrol-powered cars. The growing demand for all electrification types increases the need for DC/DC conversion from 48-12 V or 400-12 V. Moreover, more infotainment and communication will also favor the automotive-qualified MOSFET market.

Silicon MOSFETs benefit from mature infrastructure and processes. Meanwhile, new device generations are coming to the market. In addition to performance improvements, Si MOSFET die costs will be further reduced thanks to a 12-inch silicon wafer transition that will make their cost increasingly competitive.

System Plus Consulting presents an overview of the state of the art of 11 automotive-qualified AEC-Q101 Si MOSFETs of four voltage classes: 40 V, 50 V, 60 V, and 100 V. They are from eight manufacturers: Infineon, ON Semiconductor, STMicroelectronics, Toshiba, Nexperia, Rohm, Diodes Incorporated, and Taiwan Semiconductor. Some of these manufacturers have been highlighted during data analysis performed on systems analyzed in our Automotive Tracks.

This report highlights differences in their technology parameters and design, and its impact on production cost. It provides detailed optical and SEM pictures from the device's opened-package down to the microscopic level of transistor design. The focus of the report is on chip technology, and hence the devices are analyzed and costs are simulated at wafer and die levels.

Finally, this report provides exhaustive physical, technological and manufacturing cost comparisons of the analyzed devices for the different voltage classes.

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- Manufacturing wafer and die cost analysis
- Estimated bare die selling price
- Comparisons of technology design parameters and electric performances including figures of merit, current density, etc.
- Comparisons of cost including wafer cost, die cost, die cost per Ampere

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Tom Herve *has joined System Plus Consulting as a Microelectronic Laboratory Technician in order to strengthen the laboratory team. In 2020, Tom was graduated from the University of Blois where he obtained a Technical degree (DUT) in Physical Measurements. He previously worked on different subject among which precipitation of zinc oxide.*

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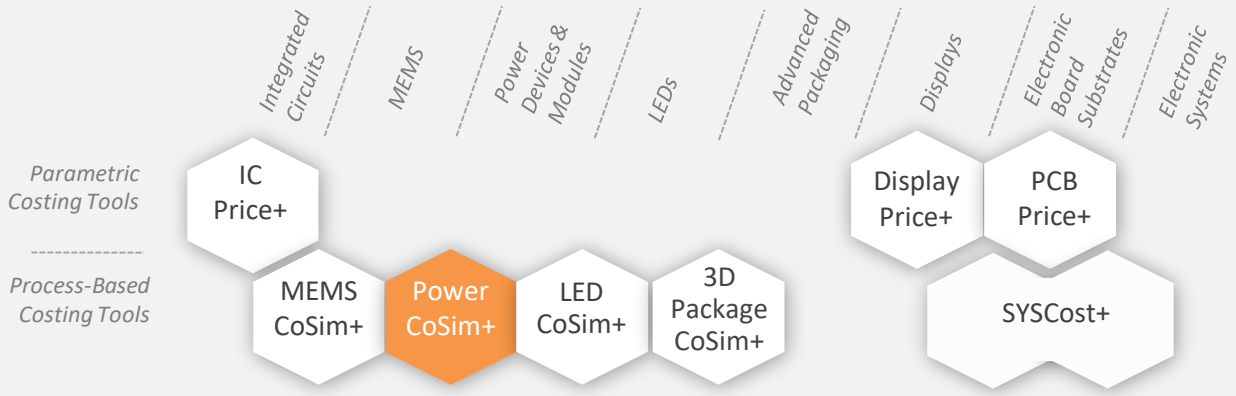

Our analysis is performed with our costing tool Power CoSim+.

System Plus Consulting offers powerful costing tools to evaluate the production cost and selling price from single chip to complex structures.

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