SiC MOSFET(1200V) : Three U.S. Companies (Alpha and Omega, Vishay, MCC) Overview and Comparative Analysis Report

Report Overview

The SiC power device market is projected to see continuous growth, driven by the expanding EV market as well as increasing adoption in industrial equipment, renewable energy, power infrastructure, and AI data centers.

While major U.S. SiC manufacturers include Wolfspeed, onsemi, and Navitas Semiconductor (GeneSiC), other manufacturers have also been strengthening their development and product deployment of SiC power devices in recent years. Therefore, understanding each company's technical capabilities and device structures has become increasingly important.

In this newly released report, we focus on three highly anticipated companies following the major U.S. SiC manufacturers, analyzing their product and technical overviews. Furthermore, we evaluate the actual performance of the devices and compare their structures—including RonA, cell structure, and cell pitch—to clarify the characteristics and positioning of each company's SiC MOSFET technology.

Product Features

No.	Manufacturer	Product type	Ron (mΩ)	Released data
1	Alpha and Omega	AOM020V120X2Q	20	Dec. 2023
2	Vishay	MXP120A080FW	80	Jul. 2024
3	MCC (Micro Commercial Components)	SICW080N120Y4	77	Oct. 2022

AOM020V120X2Q：https://www.aosmd.com/sites/default/files/res/datasheets/AOM020V120X2Q.pdf
MXP120A080FW：https://www.vishay.com/docs/92811/mxp120a080fw.pdf
SICW080N120Y4 ：https://www.mccsemi.com/pdf/products/SICW080N120Y4(TO-247-4).pdf

Analysis result summary

Overview and Comparative Analysis Report (32 pages)

- The specific on-resistance per transistor area (RonA) for the three products evaluated in this report is presented in a trend table to clarify the market positioning of each manufacturer(see P. 3).Furthermore, by comparing the datasheet values per chip size with those of products from major manufacturers, we confirmed that the switching loss value of the AOS product has specific characteristics.
- The report includes cross-sectional analysis of the cell structures for the three products, comparing parameters such as cell pitch and epitaxial layer thickness.

It also outlines technical concerns and key characteristics identified during the analysis.

Note: Detailed structural analysis reports for each product (Alpha and Omega Semiconductor, Vishay, and MCC) are currently under planning. Please contact us for details.

Report price

Delivered one week after order placement. Please contact us for report pricing.

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LTEC Corporation
4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845 Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/

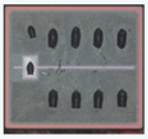
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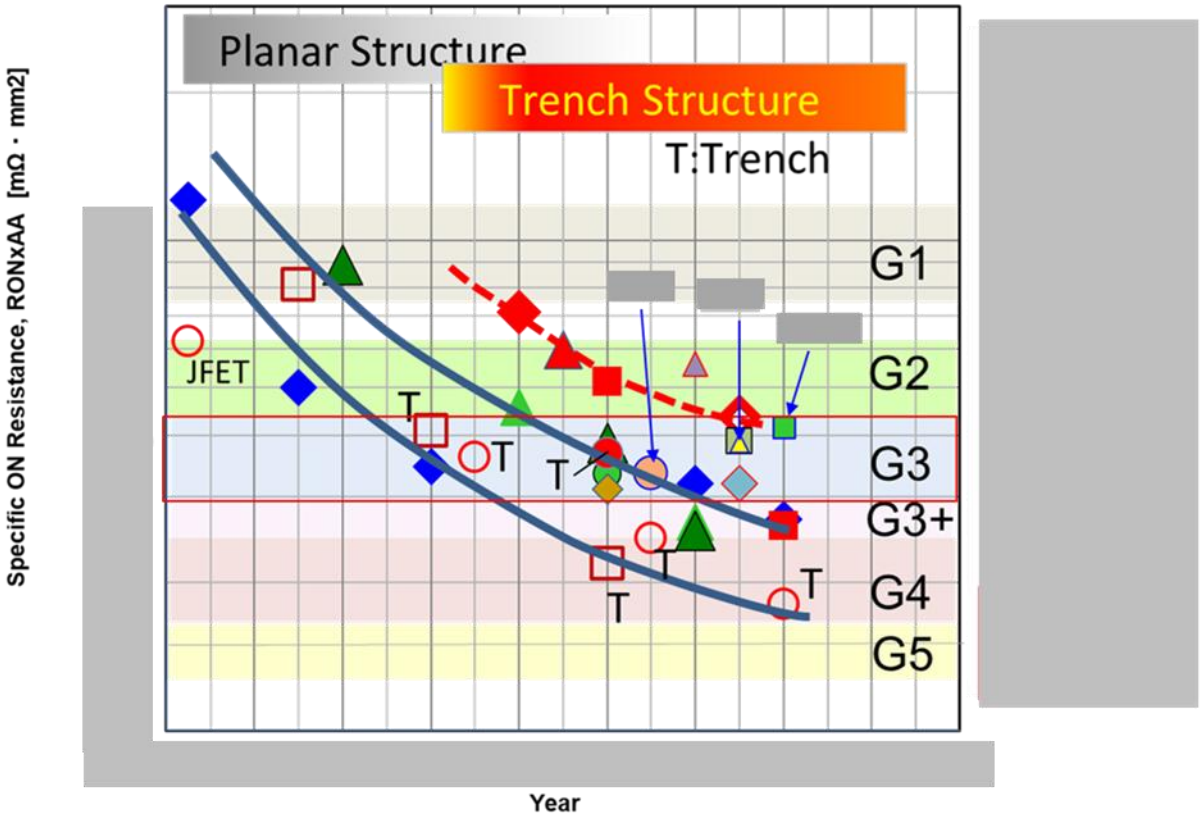
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4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845 Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/

Excerpt from Overview and Comparative Analysis Report

	US Products				EU Products
Manufacturer	AOS	Vishay	MCC	Wolfspeed	STMicro
Product name	AOM020V120X2Q	MXP120A080FW	SICW080N120Y4	E4M0013120K	SCT040W120G3AG
Qualification	Automotive	Industrial	Industrial	Automotive	Automotive
Package type	TO-247	TO-247	TO-247	TO-247	HiP247
Substrate			SiC		
Drain-Source Voltage, Vdss			1200V		
Drain Current, Id （Tc＝25℃）					
ON resistance, RON					
Die size, A [mm2]					
Transistor active area, AA「mm2」					
Intrinsic RON x AA (transistor area) [mΩ･mm2]					
Die image					

Comparison of U.S. SiC MOSFETs



Specific On-Resistance (RON x A) Figure of Merit (FOM) Trends

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