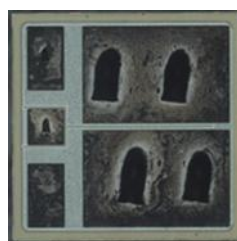


SiC MOSFET (1200V) : Silan Microelectronics SCDP120R013N2P4B Overview, Structure, Electrical Characteristics Analysis Reports



Package



SiC MOSFET die

Report

Silan Microelectronics is a semiconductor manufacturer headquartered in Hangzhou, China, and has been rapidly increasing its presence in the power semiconductor field, primarily focusing on SiC, in recent years.

The company has established a mass-production system for 6-inch SiC wafers with a monthly capacity of 9,000 units, and it is reported that an 8-inch SiC production line is scheduled to become operational in 2025.

The company is also steadily enhancing its technical capabilities in the development and manufacturing of SiC MOSFETs, positioning itself as one of China's leading manufacturers.

This report presents a planar and cross-section structure analysis of the company's SiC MOSFETs, along with a performance comparison with major competitors, revealing the characteristics of its design and process technologies and its current technological level. It also serves as benchmark data for understanding the capabilities of China's top manufacturer.

Product Features

Product type: SCDP120R013N2P4B $V_{DS}=1200V$, $I_D=138A$, $R_{DS(ON)}=13.5m\Omega$
 Released data: 2025 (Datasheet updated)

Datasheet : <https://www.fet.discoveree.io/datasheet.php?view=pdf&file=silan/scdp120r013n2p4b.pdf>

Analysis result

- ① **Overview Analysis Report (15 pages)**
- ② **Structure Analysis Report (73 pages)**

Ron×AA of this product has been found to be comparable to the latest generation products from major manufacturers, and also to the latest generation products from China. However, some concerns have been identified regarding the cell structure and outer perimeter structure.

- ③ **Electrical Characteristics Analysis Report (18 pages)**

Refer to the Table of Contents on page 5 for evaluation items.

Based on the electrical characterization results, we have estimated the epitaxial layer impurity concentration and performed a component analysis of the on-resistance.

Furthermore, the gate leak current measurements suggest that the gate oxide layer is thin and that there are challenges regarding its reliability.

Report price

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

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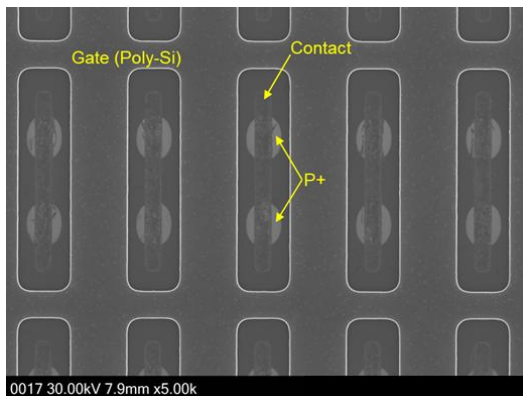
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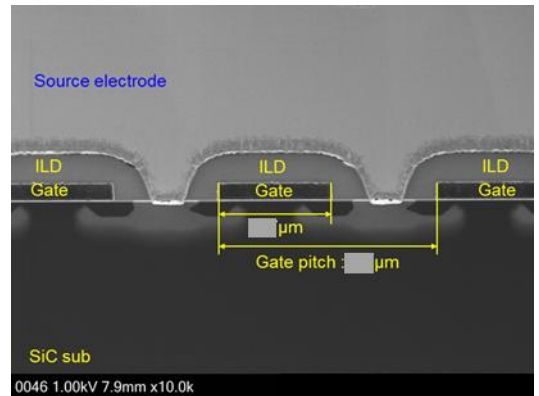
① Excerpt from Overview Analysis Report

		Silan SCDP120R013N2P4B	Inventchip IV3Q12013T4Z (Gen3)	Wolfspeed E4M0013120K (Gen4)
ON resistance: RON	(mΩ) / Vgs (V)			
ON resistance per unit area RONxAA	mΩ · mm ²			
Die size	mm x mm = mm ²			
Transistor active area AA	mm ²			
Cell source - source pitch, P	μm			
Turn-on Switching Loss, Eon Vds=800V	μJ			
Eon/AA	μJ/mm ²			
Turn-off Switching Loss, Eoff	μJ			
Eoff/AA	μJ/mm ²			
Total Switching Loss, Etotal	μJ			
Etotal/AA	μJ/mm ²			

② Excerpt from Structure Analysis Report



Cell array Planar SEM image



Cell array Cross-section SEM image

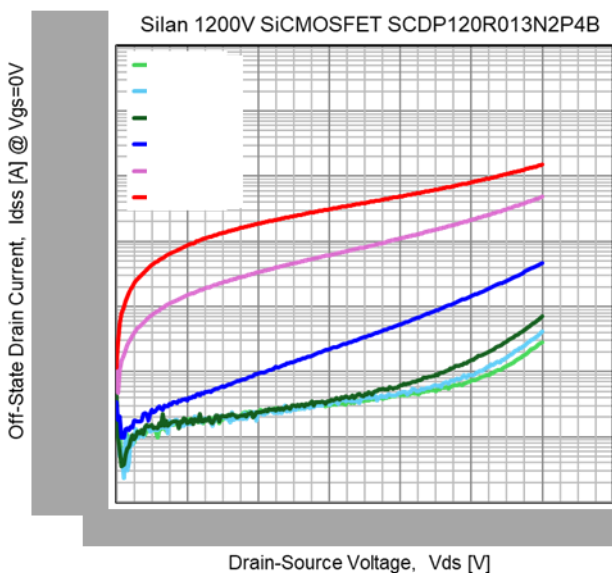


Die Peripheral Cross-Section SEM image

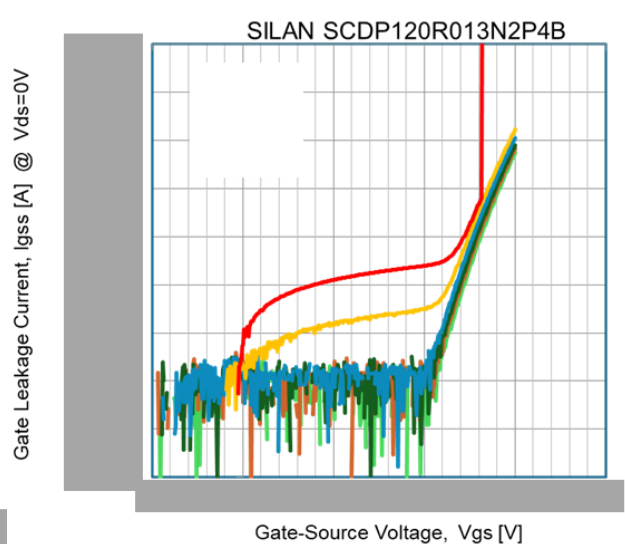
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Drain current Idss characteristics



Gate leakage current Igss characteristics