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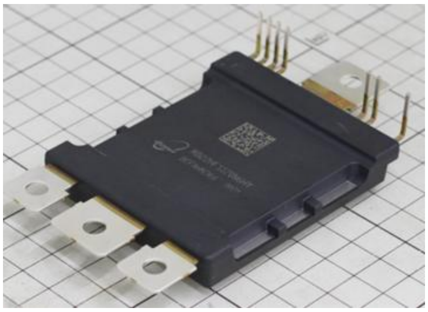
NEW RELEASE

SiC power Module (1200V)：StarPower MD22HFS120N6HY Module, SiC MOSFET Analysis Reports


Module


SiC MOSFET Die

Report Overview

June 2024, Chinese company StarPower Semiconductor announced a SiC power module for 800V EV drive.This module features extremely low on-resistance using 1200V SiC MOSFETs, making it usable even in 800V onboard power supply environments.

Its molded, single-sided cooling structure, solid copper base plate with PINFIN structure, and AMB (Si3N4) substrate demonstrate the company‘s commitment to current trends and reliability.

This report clarifies the features of this product through an analysis of the module's structure, an overview of the SiC MOSFETs mounted, and a structural analysis.

Product Features

Product type: MD22HFS120N6HY V_{DSS}=1200V、I_D=648A、$R_{DS(ON)}$=2.12mΩ
Released data: June 2024

Datasheet：https://www.powersemi.com/Upload/Products/202407//pdf/MD22HFS120N6HY.pdf

- Half-bridge module 2 in 1-package
- Applications: Hybrid and electric vehicles, motor drive inverters

Analysis result summary

① Module Structure Analysis Report (44 pages)

- Cu pad is formed on the source bonding area of SiC MOSFET.
- Ag sinter is used to connect SiC MOSFET to AMB substrate and aforementioned pad.

② SiC MOSFET Overview Analysis Report (15 pages)

- The Ron x AA of this product is comparable to STMicroelectronics’ 3rd-generation SiC MOSFETs.

③ SiC MOSFET Structure Analysis Report (53 pages)

- The gate oxide film is thinner than that of a typical planar SiC MOSFET.

Report price

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

Report No：25G-0386-1,2,3 Release day：2026.03.13

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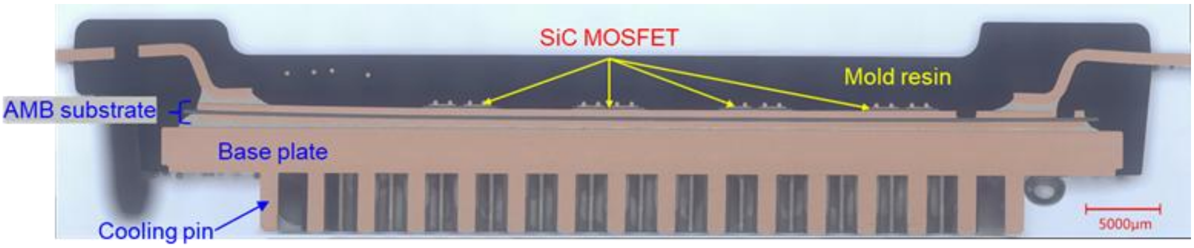
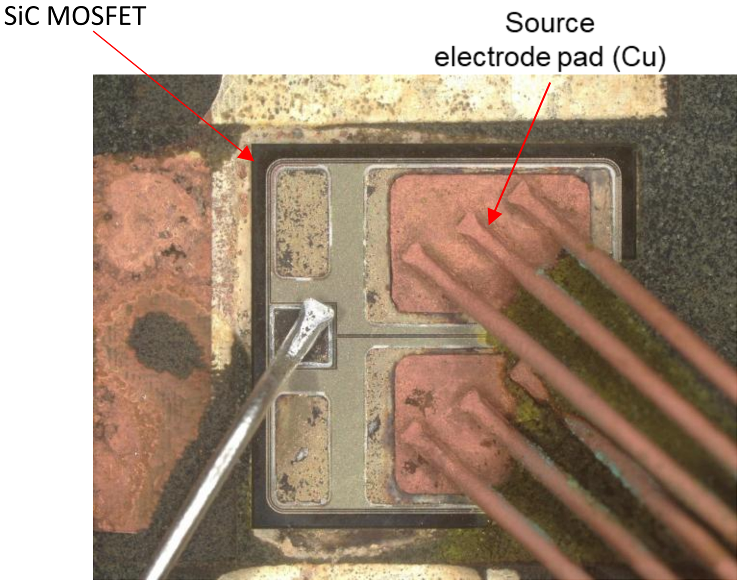
1 Device Summary

2 Module Analysis

① Excerpt from Module Structure Analysis Report



Module Cross-section OM image



Internal Module Observation

Report No：25G-0386-1,2,3　Release day：2026.03.13

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② Excerpt from SiC MOSFET Overview Analysis Report

Table : Device structure

	StarPower MD22HFS120N6HY	StarPower DM400S12TDRB	Silan SCDP120R013N2P4B	STMicro SCT040W120G3AG
Die size A (mm x mm = mm^2)	[redacted]	[redacted]	[redacted]	[redacted]
Transistor area AA (mm^2)	[redacted]	[redacted]	[redacted]	[redacted]
Ron (mΩ / Vgs(V))	[redacted]	[redacted]	[redacted]	[redacted]
Ron x AA (mΩ・mm^2)	[redacted]	[redacted]	[redacted]	[redacted]
Transistor cell configuration	[redacted]	[redacted]	[redacted]	[redacted]
Cell pitch P (μm)	[redacted]	[redacted]	[redacted]	[redacted]
Gate oxide film	[redacted]	[redacted]	[redacted]	[redacted]

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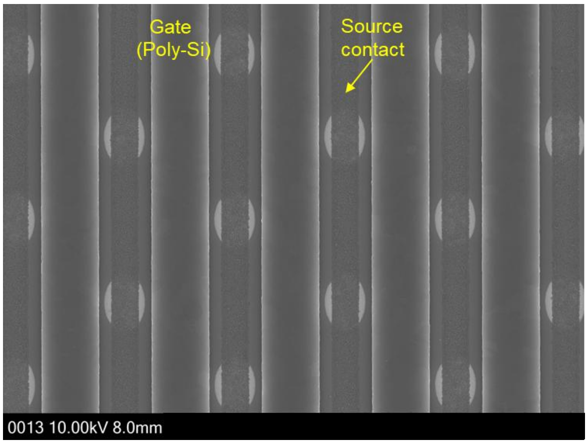
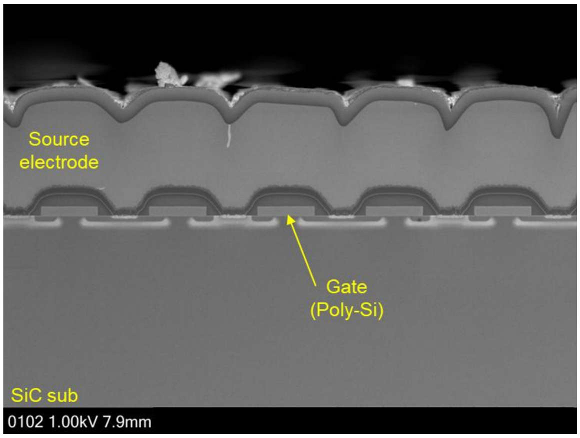


Cell array plane SEM image
(Poly-Si layer)



Cell array cross-section SEM image

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