NEW RELEASE

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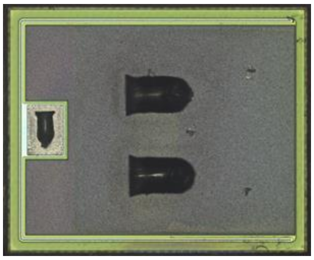
SiC Cascode JFET (750V) : onsemi Gen4 UJ4C075018K4S Overview and Structure Analysis Report

Package



SiC JFET die

Report overview

In January 2025, Onsemi acquired Qorvo's SiC JFET business, including its subsidiary United Silicon Carbide (UnitedSiC), with the aim of complementing Onsemi's SiC power product lineup and expanding into the AI data center power supply unit and EV markets.

SiC JFETs have low on-resistance per die area and are capable of high-speed switching (up to 1 MHz), making them a promising device for miniaturizing and improving the efficiency of power supplies for AI data center racks. Global leader Infineon also announced (in May 2025) that it will add SiC JFET product family. Therefore, LTEC believe it will be important to investigate future trends in SiC JFETs.

The subject of this analysis, UJ4C075018K4S, is a Gen4 (currently the latest) product from onsemi (Qorvo), and a report has been released revealing its features and details.

Product features

Product type: UJ4C075018K4S V_{DS}=750V、I_D=120A、$R_{DS(ON)}$=18mΩ、
Product released day：March 2025 (Datasheet)

Datasheet：https://www.onsemi.jp/download/data-sheet/pdf/uj4c075018k4s-d.pdf

- Gen4 Normally-on SiC JFET transistor
- Applications: EV charging, switching power supplies, PV inverters, etc.

Analysis result summary

① Overview Analysis Report (14 pages)

- It confirmed that the on-resistance per area of the JFET die, Ron x AA, is less than half that of a typical SiC MOSFET.

② Structure Analysis Report (87 pages)

- Structure comparison with the company's previous generation product confirmed that the cell pitch, channel length, etc. were reduced by approximately 50%.
- It also conduct cell cross-section structure analysis of a cascode-connected Si power MOSFET.

Report price

Delivery within one week after ordering.　Please contact us for pricing.

Report No：25R-0258-1,2　Release day：2025.09.12

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① Overview Analysis Report

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② Structure Analysis Report

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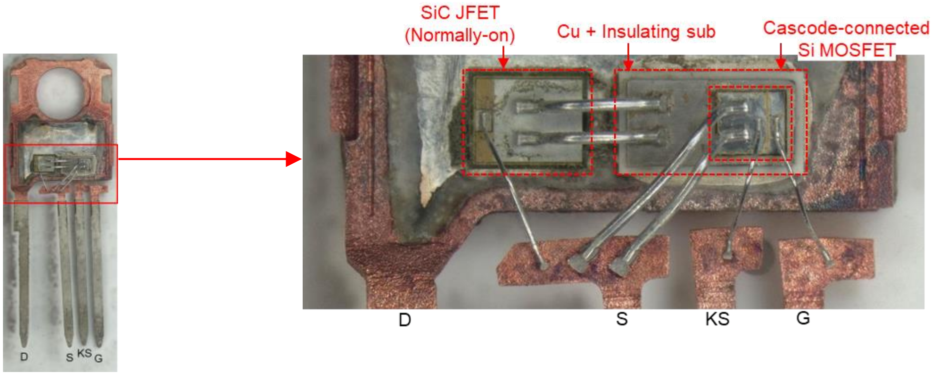
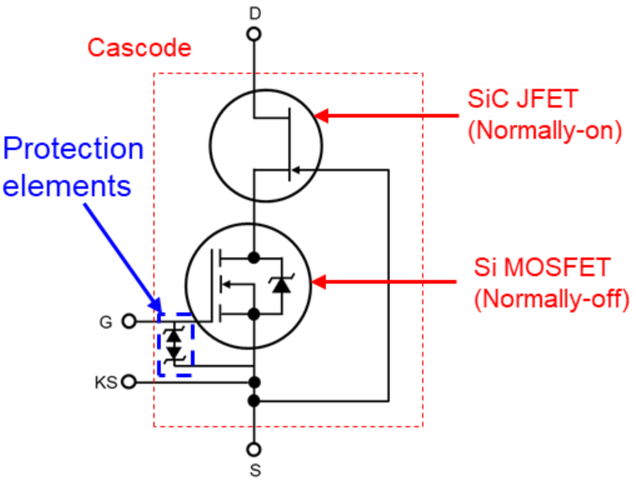
Excerpt from the Overview Analysis Report ①

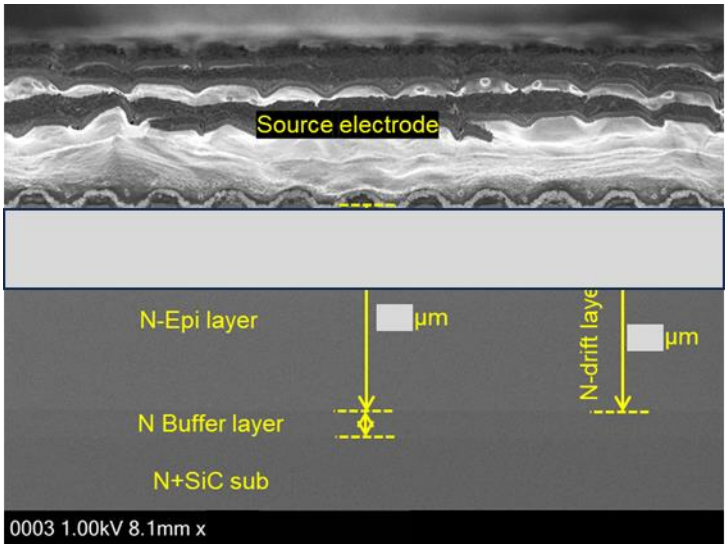
Excerpt from the Structure Analysis Report ②



Package internal layout



Equivalent circuit diagram



SiC JFET cell cross-sectional structure (SEM)

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