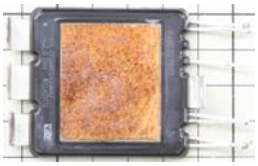
SiC, IGBT Power Module：Infineon (Equipped on KIA EV9 Long Range) Module, SiC MOSFET, Si IGBT Analysis Report

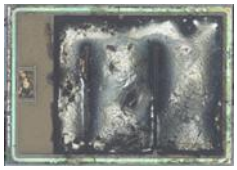


KIA EV9

https://www.kia.com/us/en/ev9



SiC Power Module



SiC MOSFET



Si IGBT Power Module



Si IGBT

Report Overview

The EV9, an electric vehicle from South Korea's leading automaker Kia (KIA), is the company's first dedicated EV SUV, unveiled in March 2023. The vehicle's rear inverter features the Infineon HybridPACK DSC SiC power module (*), which utilizes double-sided cooling technology, alongside an Infineon IGBT power module.

LTEC have recently released a module structural analysis report that clarifies the packaging structure and materials of each module, as well as an overview analysis report on the integrated SiC MOSFETs and Si IGBTs.

(※) DSC : Double Side Cooling

Product Features

SiC Power Module　Datasheet

- Part Number：FF06MR12A04MA2　V_{DSS} = 1200V、I_D = 190A、$R_{DS(on)}$ = 5.56mΩ
- Release：2023

IGBT Power Module

- Part Number ：FT215R12A5P1　V_{CE} = 1200V(Estimated)、Ic = 215A(Estimated)
- Release：2023

Report No：25G-0292-1,2,3,4　Release day：2025.09.26

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Analysis result summary

(1) SiC Power Module Structure Analysis Report (30 pages) : 25G-0292-1
It utilizes a double-sided cooling package, and the analysis covers the thickness and materials of each insulating substrate.

(2) IGBT Power Module Structure Analysis Report (33 pages) : 25G-0292-2
Cu/AlSi/Cu spacers are utilized, featuring materials that differ from those in conventional Infineon IGBT modules.

(3) SiC MOSFET Overview Analysis Report (15 pages): 25G-0292-3
The vehicle is equipped with the company's SiC MOSFETs, which feature Cu (copper) for the front electrodes.

(4) IGBT Overview Analysis Report (21 pages): 25G-0292-4
The module is equipped with two types of Si IGBTs with different chip sizes.

Report price

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

Report No : 25G-0292-1,2,3,4 Release day : 2025.09.26

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(1) SiC Power Module Structure Analysis Report　Table of Contents

【Table of contents】			Page
1	Device Summary		
	Table1-1:Device Summary	・・・	3
1-1.	Summary of Analysis Results	・・・	4
	Table1-2: Module Overview	・・・	5
2	Module Observation		
2-1.	Appearance	・・・	7
2-2.	Die Observation	・・・	9
2-3.	Module Cross-Sectional Structural Analysis	・・・	10

(2) IGBT Power Module Structure Analysis Report　Table of Contents

【Table of contents】			Page
1	Device Summary		
	Table1-1:Device Summary	・・・	3
1-1.	Summary of Analysis Results	・・・	4
	Table1-2: Module Overview	・・・	5
2	Module Observation		
2-1.	Appearance	・・・	7
2-2.	Internal Layout Observation	・・・	9
2-3.	Die Observation	・・・	12
2-4.	Module Cross-Sectional Structural Analysis	・・・	14

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(3) SiC MOSFET Overview Analysis Report　Table of Contents

【Table of contents】			Page
1		Device Summary	
		Table1-1:Device Summary	・・・ 3
	1-1.	Summary of Analysis Results	・・・ 4
		Table1-2: Device Structure: SiC MOSFET	
		Table1-3: Device Structure: Layer Materials and Thicknesses	・・・ 5
2		Module Observation	
	2-1.	Appearance	・・・ 7
3		SiC MOSFET Die Overview analysis	
	3-1.	Plan-view Structure Analysis (OM)	・・・ 10
	3-2.	Cell Array Cross-Sectional Analysis	・・・ 11
	3-3.	Peripheral Area Cross-Sectional Analysis	・・・ 12
4		Comparison with SiC MOSFETs in the Company's HybridPACK Drive G2	・・・ 13

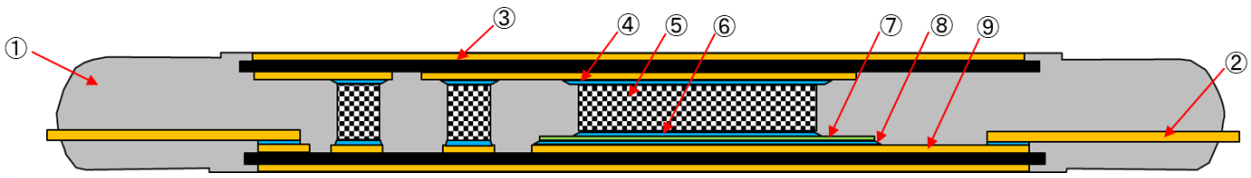
(4) IGBT Overview Analysis Report　Table of Contents

【Table of contents】			Page
1		Device Summary	
		Table1-1:Device Summary	・・・ 3
	1-1.	Summary of Analysis Results	・・・ 4
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2		Module Observation	
	2-1.	Appearance	・・・ 7
	2-2.	Internal Layout Observation	・・・ 9
3		Si IGBT Die Overview analysis	
	3-1.	Plan-view Structure Analysis (OM)	・・・ 11
	3-2.	Cell Array Cross-Sectional Analysis	・・・ 13
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4		Comparison with the company's Si IGBT (Estimation of IGBT process generation)	
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Excerpt from (1) SiC Power Module Structure Analysis Report

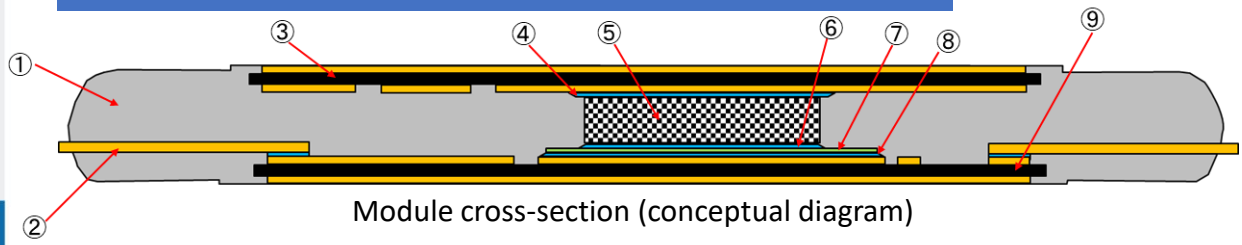


Module cross-section (conceptual diagram)

Table: Module overview

番号	測定箇所	測長	材料
1			
2			
2-1			
2-2			
3			
3-1			
3-2			
3-3			
4			
5			
6			
7			
7-1			
7-2			
7-3			
7-4			
7-5			
7-6			
7-7			
8			
9			
9-1			
9-2			
9-3			

Excerpt from (2) IGBT Power Module Structure Analysis Report



Module cross-section (conceptual diagram)

Table: Module overview

番号	測定箇所	測長	材料
1			
2			
2-1			
2-2			
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9-1			
9-2			
9-3			

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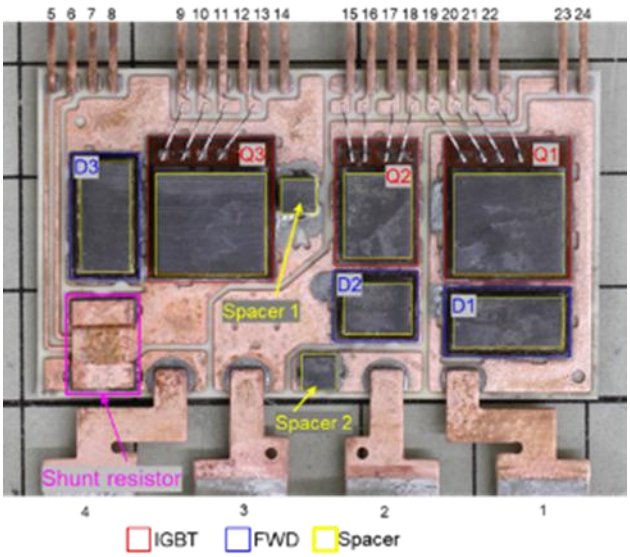
Excerpt from (3) SiC MOSFET Overview Analysis Report

HybridPACK Drive G2 SiC MOSFET
(24G-0211-3)

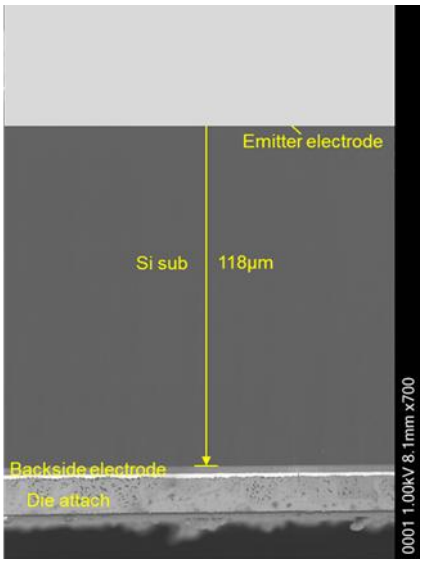
KIA EV9 SiC MOSFET

	FS02MR12A8MA2B	FF06MR12A04MA2
Die size A (mm x mm)		
Transistor active AA (mm²)		
On-resistance per die RON / Vgs (mΩ/V)		
On-resistance per unit area RON x AA (mΩ・mm²)		

Excerpt from (4) IGBT Overview Analysis Report



Internal Layout



Cell Array Cross-Sectional SEM image

Report No : 25G-0292-1,2,3,4 Release day : 2025.09.26

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