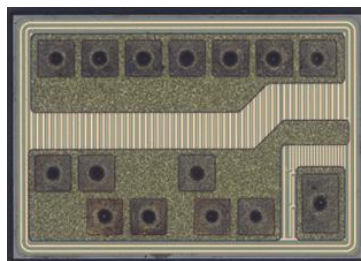


GaN FET(650V) : Infineon IGLR65R140D2 Package and GaN FET Structure Analysis Report



Package



GaN FET die

Report Overview

Infineon released a new generation of high-voltage discrete GaN transistors, “CoolGaN Transistor 650V G5.”

CoolGaN Transistor 650V G5 offers superior switching performance and low on-resistance compared with major competitors’ products and Infineon’s previous generations.

LTEC have conducted a structure analysis of this product and released the following report, which clarifies the features of its planar layout and cross-sectional structure.

Product Features

Product type: IGLR65R140D2 $V_{DS}=650V$ $I_D=23A$ $R_{DS(on)} = 140m\Omega$

Released data: Apr. 2025

Datasheet : https://www.infineon.com/dgdl/Infineon-IGLR65R140D2-DataSheet-v01_00-EN.pdf?fileId=8ac78c8c8eeb092c018f0a205a196246

Manufactured in own fab compatible with 200mm (8 inch) wafers

Analysis result summary

1. Package Structure Analysis Report (23 pages)

Analysis of materials such as bonding wires and die attach, and measurement of film thickness of each layer.

2. GaN FET Structure Analysis Report (79 pages)

Planar structure analysis confirmed that the layout efficiency (AA (transistor area))/A (die area)) has improved to 65% (42% for the IGT60R190D1S).

In terms of cross-sectional structure, changes have been confirmed, including a change in the global wiring material from the previous product.

TEM Cross section analysis was used to conduct detailed observations of the GaN epi layer and gate structure, and a comparison was made with the previous product.

Report price

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

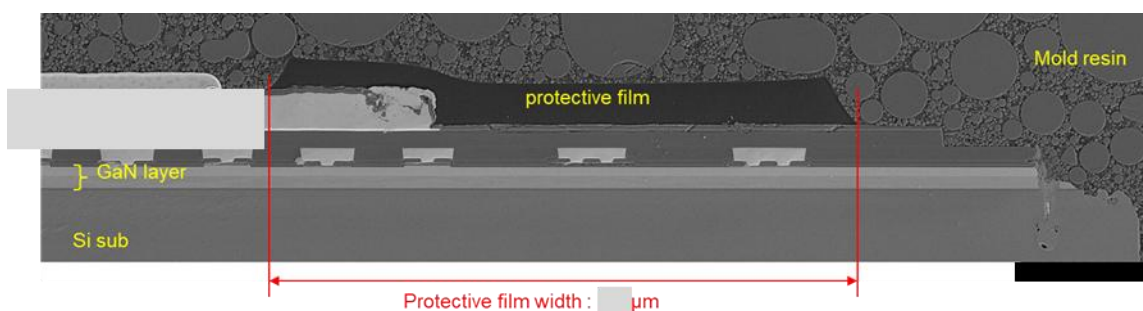
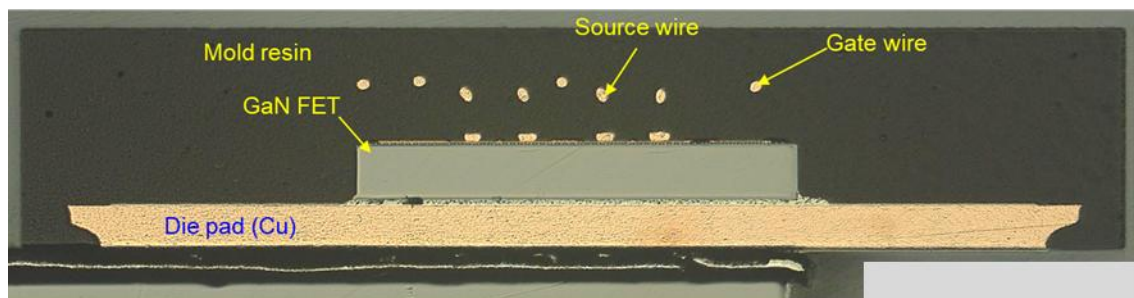
1. Package Structure Analysis Report Table of Contents

【Table of Contents】			Page
1	Device Summary		
	Table 1: Device Summary	...	3
1-1	Summary of analysis results	...	4
2	Package analysis		
2-1	Appearance	...	7-8
2-2	Die Observation	...	9
2-3	Package Cross Section Structure Analysis	...	10-23

2. GaN FET Structure Analysis Report Table of Contents

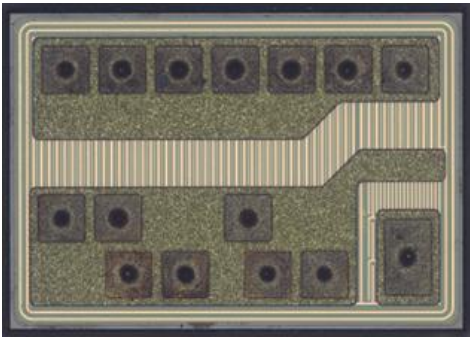
【Table of Contents】			Page
1	Device Summary		
	Table 1: Device Summary	...	3
1-1.	Summary of Analysis Results	...	4
	Table.1-1-1:Device Structure (GaN FET)	...	5
	Table.1-1-2:Device Structure: Layer Materials and Film Thickness (GaN FET)	...	6
1-2.	Infineon GaN Transistor Structure and Operating Principles	...	7
2	Plane Structure Analysis	...	8
2-1.	Plane OM Structure Analysis	...	9-31
2-2.	Plane SEM Structure Analysis	...	32-35
3	Cross Section SEM Structure Analysis	...	37-49
4	Cross Section TEM Structure Analysis	...	50-59
5	TEM-EDX Analysis	...	60-76
6	Appendix	...	77-79

① Excerpt from Package Analysis Report

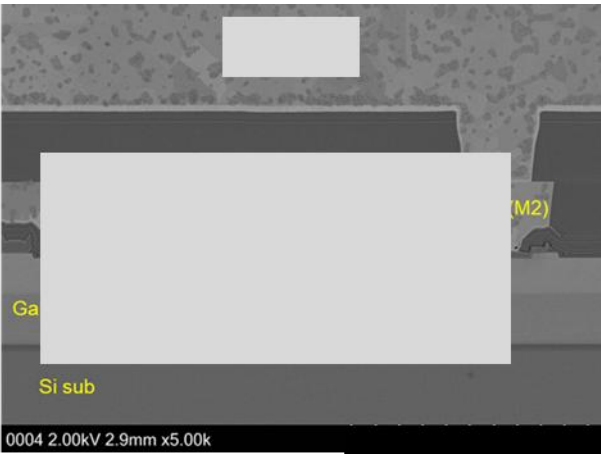


Package Cross Section Structure Analysis

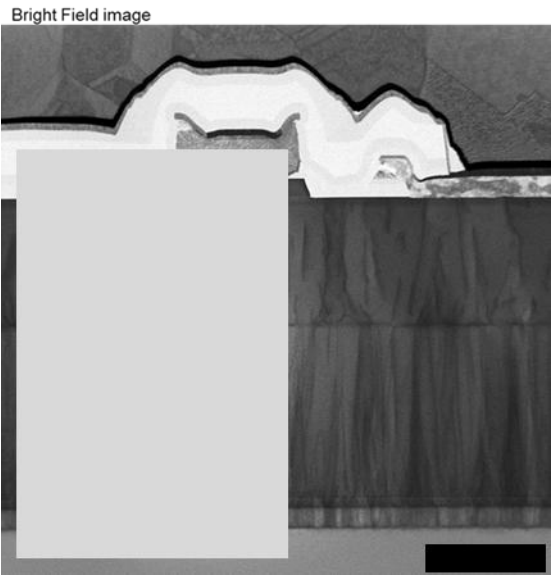
② Excerpt from GaN FET Structure Analysis Report



Die image
(Top Metal layer)



Cell array Cross section SEM image



Cell array Cross section TEM image
(GaN-Epi layer)



Die edge Cross section SEM image