NEW RELEASE

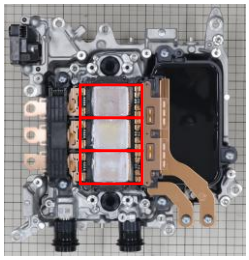
LTEC Corporation
Your most experienced partner in IP protection

SiC Power Module : DENSO (Equipped on SUBARU SOLTERRA) Module, SiC MOSFET, Electrical Characterization Report

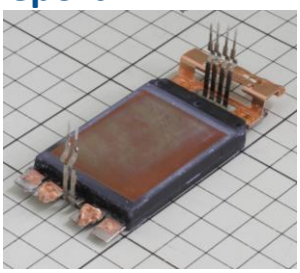


SUBARU SOLTERA

https://www.subaru.jp/solterra/



Inverter core module



Power Module

Report Overview

In November 2025, the updated model of the SUBARU SOLTERRA was released. The vehicle is equipped with a new eAxle manufactured by BluE Nexus, which features DENSO's new inverter core module. In this module, the arrangement of the power modules has been changed from a vertical layout to a flat horizontal layout, and a new double-sided cooling module with a built-in insulated substrate (SiC MOSFET) has been adopted. Focusing on this new DENSO module and the integrated SiC MOSFET, this reports aim to clarify their technical details.

Product Features

Product numbe: unknown, Inverter system voltage : 400V, Vehicle Release date: 2025

eAxle (FRONT) Motor Output: 165 kW

Torque: 268 Nm,

Estimated Maximum Operating Voltage (Vdss): 700–750 V

Analysis result summary

(1) Module Structure Analysis Report (47 pages)

(2) SiC MOSFET Overview Analysis Report (12 pages)

(3) SiC MOSFET Structure Analysis Report (63 pages)

(4) SiC MOSFET Electrical Characteristics Evaluation Report (20 pages)

Please refer to the next page for further details.

Report No : 25G-0772-4,5,6,7 Released day : 2026.07.01

LTEC Corporation
4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845 Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/

Analysis result summary

(1) Module Structure Analysis Report (47 pages) : 25G-0772-4

- A double-sided cooling module that uses resin insulated substrates on both sides.
- A heat-dissipating insulating sheet containing BN filler is used for the insulation layer of the resin insulated substrate, resulting in an extremely thin insulation layer compared to standard ones.

(2) SiC MOSFET Overview Analysis Report (12 pages) : 25G-0772-5

- Die image, saize, confirmation of basic cell structures, and a simplified structural comparison with the company's conventional products have been conducted.

(3) SiC MOSFET Structure Analysis Report (63 pages) : 25G-0772-6

- A trench gate structure is adopted for the cell structure. Additionally, a P-shield is formed at the bottom of the trench, resulting in a design that differs from conventional DENSO SiC MOSFETs.
- Junction Termination Extension (JTE) and guard rings are utilized for the edge termination structure.
- A temperature-sensing diode is integrated within the die.

(4) SiC MOSFET Electrical Characteristics Evaluation Report (20 pages) : 25G-0772-7

- BVdss, C-Vds, Idss-Vds-T, Igss-Vgs.
- Based on the correlation between electrical characteristics and device structure, the components of on-resistance (Ron) are analyzed, and the impurity profile of the epitaxial (Epi) layer is extracted.

Report price

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

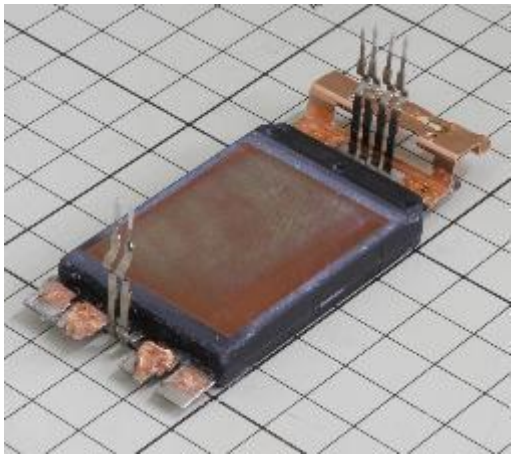
Report No : 25G-0772-4,5,6,7 Released day : 2026.07.01

LTEC Corporation
4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845 Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/

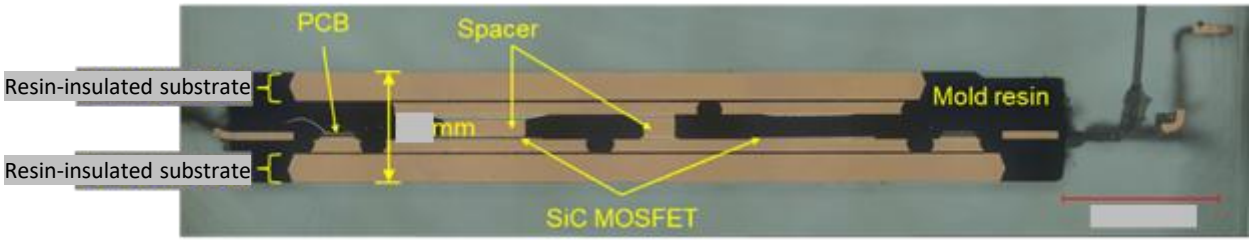
(1) Module Structure Analysis Report　Table of Contents

【Table of Contents 】		Page
1	Device Summary	
	Table1-1 ： Device Summary ・・・	3
1-1.	Summary of Analysis Results ・・・	4
	Table1-2: Module Structure Overview ・・・	5
2	Module Analysis	
2-1.	Appearance ・・・	7
2-2.	Internal Layout Observation ・・・	13
2-3.	Die Image ・・・	19
2-4.	Module Structure Observation ・・・	20
2-5.	Comparison of Denso Module Structures ・・・	46

(1) Excerpt from Module Structure Analysis Report



Power Module



Power module cross-section

Report No : 25G-0772-4,5,6,7　Released day : 2026.07.01

LTEC Corporation
4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845　Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/

(2) SiC MOSFET Overview Analysis Report　Table of Contents

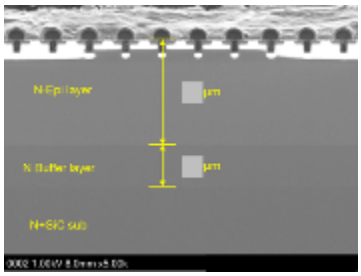
【Table of Contents】			Page
	Background and Analysis Results	・・・	3
1	Device Summary		
	Table1-1:Device Summary	・・・	4
1-1.	Summary of Analysis Results	・・・	5
	Table1-2: Device Structure：SiC MOSFET	・・・	6
	Table1-3: Device Structure：Layer Materials and Thicknesses		
2	SiC MOSFET Die Overview Analysis		
2-1.	Module Appearance	・・・	8
2-2.	Die Image	・・・	9
2-3.	Cell Array Cross-Sectional Analysis	・・・	10
3	Comparison with the Company's Other SiC MOSFETs	・・・	12

(3) SiC MOSFET 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: Device Structure：SiC MOSFET	・・・	6
	Table1-3: Device Structure：Layer Materials and Thicknesses	・・・	7
2	Module Analysis		
2-1.	Module Appearance	・・・	9
3	SiC MOSFET Die Structure Analysis		
3-1.	Plan-view Structure Analysis (OM)	・・・	13
3-2.	Plan-view Structure Analysis (SEM)	・・・	28
3-3.	Cell Array Cross-Sectional Analysis	・・・	35
3-4.	Die Peripheral Cross-Sectional Structure Analysis	・・・	45
3-5.	Temperature Sensing Diode Structure Analysis	・・・	53
4	SiC MOSFET Die Backside Structure Analysis (Annealing Marks)	・・・	61
5	Comparison with the Company's Other SiC MOSFETs	・・・	63



SiC MOSFET　Die image



SiC MOSFET Epi Layer thickness

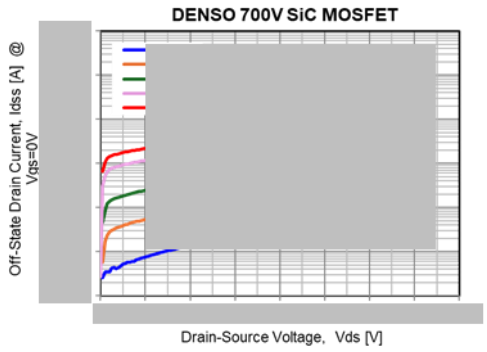
Report No : 25G-0772-4,5,6,7　Released day : 2026.07.01

LTEC Corporation
4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845　Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/

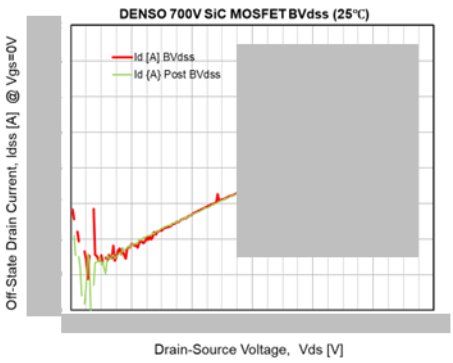
(4) SiC MOSFET Electrical Characteristics Evaluation Report　Table of Contents

Table of Contents			Page
1	Executive Summary	・・・	3
1-1.	DENSO 700V 2nd Generation (Gen2) Trench-Gate SiC MOSFET ： Device Structure Overview	・・・	4
1-2	DENSO SiC Trench Gate MOSFET Structural Evolution	・・・	5
1-3.	SiC MOSFET Die Image and Thickness	・・・	6
1-4.	DENSO 700V SiC MOSFET Power Card Electrical Evaluation	・・・	7
2	Device Structure and Electrical Characteristics Analysis	・・・	8
2-1.	Id-Vds Characteristics and RON Extraction	・・・	9
2-2.	Off-State Drain Current (Idss) vs. Drain Voltage (Vds) （Activation Energy (Ea) with Device Temperature as a Parameter）	・・・	10
2-3.	Comparison of Leakage Current across Manufacturers	・・・	11
2-4.	Off-State Breakdown Voltage (BVdss) Characteristics	・・・	12
2-5.	Capacitance (Ciss, Coss, Crss) - Vds Characteristics	・・・	13
2-6.	Device Structure and Electrical Characteristics Analysis: On-Resistance	・・・	14
2-7.	N-Epi Layer Impurity Concentration Analysis	・・・	17
2-8.	Breakdown Voltage BVdss	・・・	18
2-9.	Temperature Sensing Diode I-V Characteristics	・・・	19
3	References	・・・	20

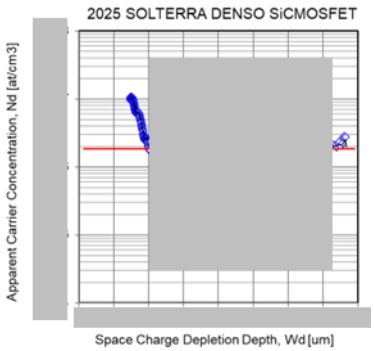
(4) Excerpt from SiC MOSFET Electrical Characteristics Evaluation Report



Idss-Vdss



BVdss



Impurity concentration profile from capacitance measurement results

Report No : 25G-0772-4,5,6,7　Released day : 2026.07.01

LTEC Corporation
4-42-8 Higashiarioka, Itami-shi, Hyogo 664-0845　Phone.+81-72-787-7385
mail contact2@ltec.biz
HP https://www.ltec-biz.com/