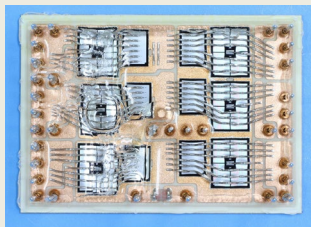
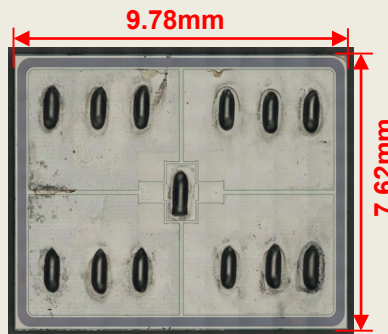


INFINEON EasyPACK™ 7th GEN. IGBT module STRUCTURE and PROCESS ANALYSIS REPORTS

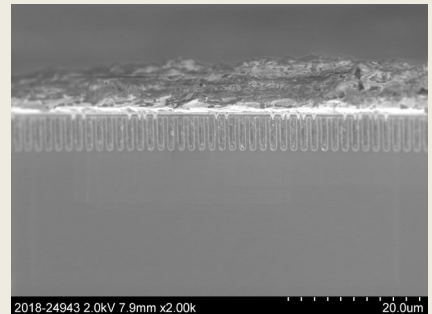
February 2020. LTEC Corporation released a detailed structure and process analysis reports of the S100R12W2T7_B11 7th Gen IGBT module.



Module



Die image



Cross section of the cell area

Product overview

The FS100R12W2T7_B11 is a 1200 V, 100A power module featuring a new high-density Micro Pattern Trench (MPT) design developed to reduce saturation voltage, $V_{ce(sat)}$ from 1.85V to 1.5V by (~19%) relative to 6th Generation device.

Summary of the analysis results

- The unit IGBT cell, formed by a set of seven trenches, and the electrical connection of these trenches is discussed.
- The effective process technology node is extracted from the trench pitch and contact opening. These are the minimum processing dimensions of the manufacturing process technology.
- The off-state collector leakage current of IGBT7 and IGBT6 transistors are measured. A significant difference in activation energy is confirmed.
- The breakdown voltages of the IGBT chip and the parallel-connected FWD are measured.

Structure analysis report: \$7,000 / Process analysis report: \$4,600

Note: The report price may change over time. For current price contact info@ltecusa.com.

18G-0017-1

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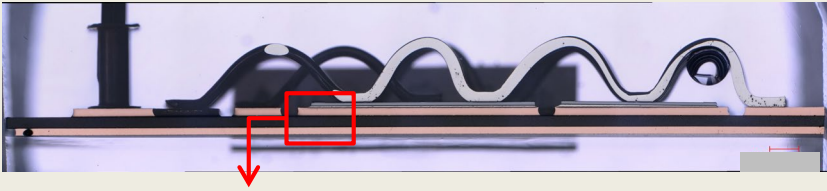


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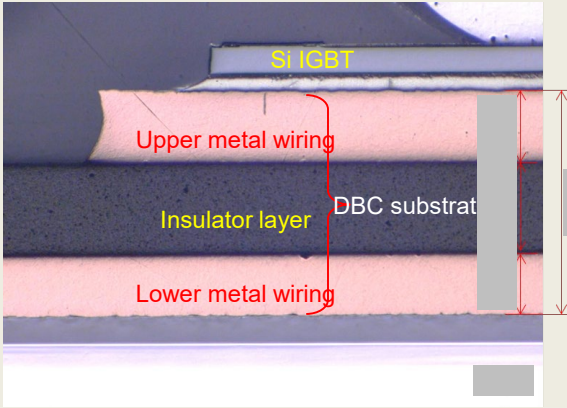
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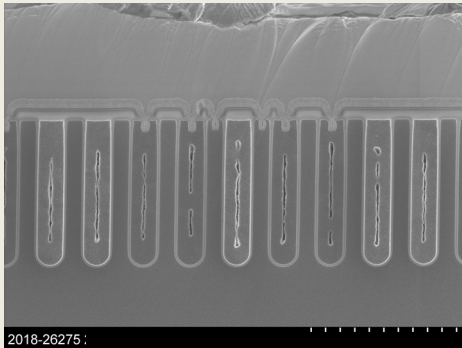
Excerpts from the Structure Analysis Report



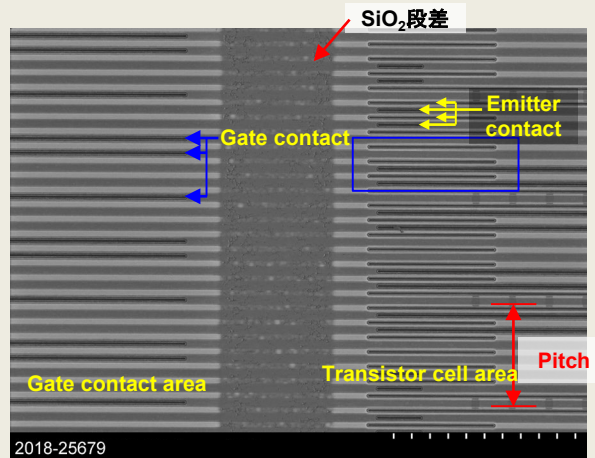
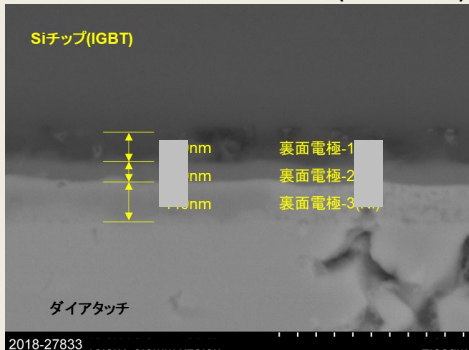
Module cross section



IGBT plane view



IGBT structure (Backside)



Plane SEM image (Gate area)

Excerpts from the Process Analysis Report

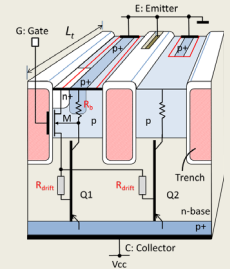
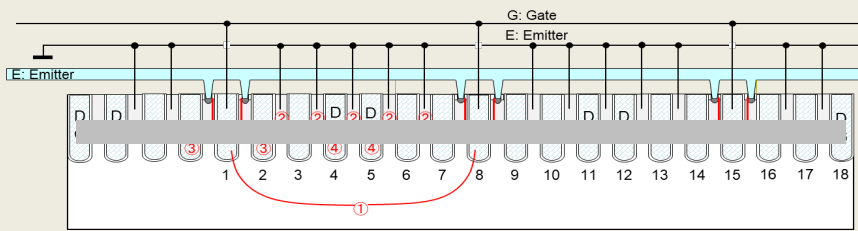
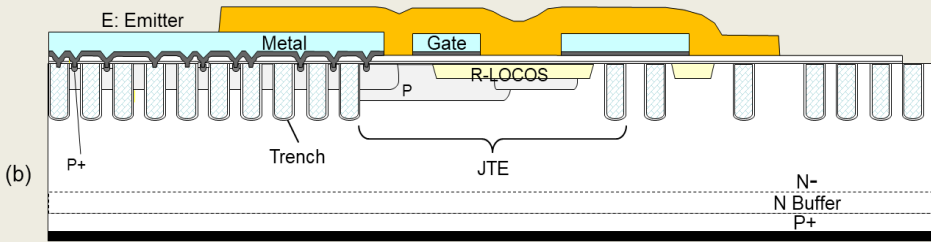
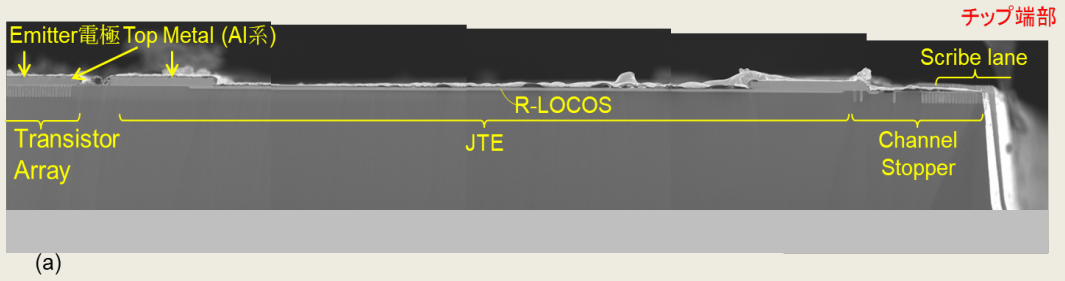
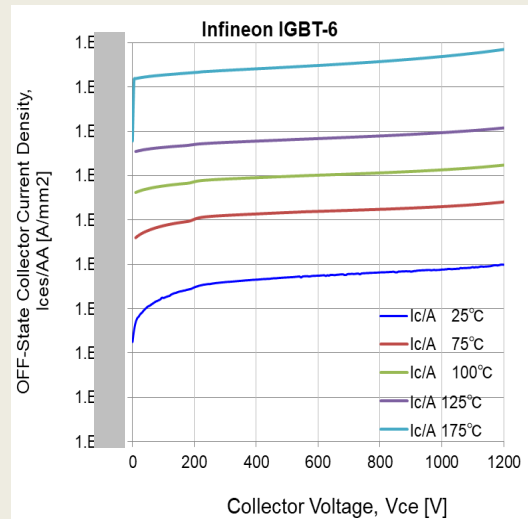
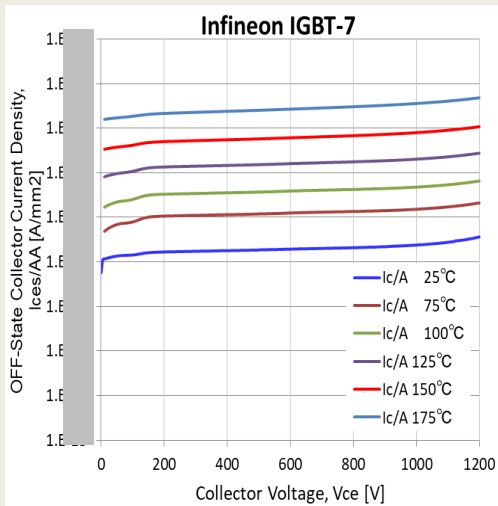


Fig.1-6-1 IGBT7 MPT cell array



Comparison of off-state collect current per cell area (IGBT7 & IGBT6)

Excerpts from the Structure Analysis Report (cont.)

Si IGBT front-end estimated wafer process flow

| マスク | プロセス工程 | コメント |
|-----|---------|--------------------------------|
| | ウェーハ | Si FZ N-type 基板 N-(~50-60Ωcm) |
| | 第1酸化 | 熱酸化 |
| | CVD SiN | LOCOS stack |
| MA | FOXコート | FOX: Field Oxide コーティング素子分離絶縁膜 |
| | | ss LOCOS |
| | | ension-1 (JT1) Mask |
| | | ension-2 (JT1) Mask |
| | | um |
| | | 化エッチング, ゲートSiO2 ~ |
| | | S |
| | PECVDデポ | ILD形成 |

Si IGBT process sequence cross-sectional view

