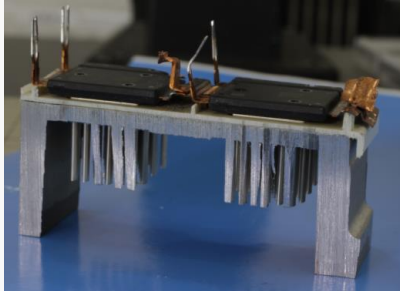


## ST Micro's SiC power module in the Tesla Model3 motor inverter – detailed structure analysis report

**November 2018.** LTEC Corporation released a detailed structure analysis report of the SiC power module found within the TESLA Model3 motor inverter.



Power Module (Top view)

### Key findings (SiC Module)

The following technologies are used in this design to realize highly reliability, heat resistance, and excellent heat dissipation characteristics.

- Active Metal brazed Copper (AMC) substrate
- Ag sintering to attach the die to the AMC substrate
- Use of Cu clip to reduce ON-resistance and parasitic inductance

### Key analysis results (SiC MOSFET)

- Maximum operating voltage is estimated to be 650 V based on N epi-layer thickness
- Junction Termination Extension (JTE) is used to reduce electric field at the die edge
- Use of N<sub>1</sub> buffer layer between the N<sub>1</sub> epi layer and the N<sup>+</sup> substrate
- Good current density margin even at high temperature operation

This 121-page report includes

1. SiC Module construction analysis (Package, X-ray observation, cross section and EDX analysis)
2. SiC MOSFET plan view and layout analysis
3. SiC MOSFET Cross-sectional structure analysis (cell array and die-edge configuration)

Note: The report price decreases over time. Contact [info@ltecusa.com](mailto:info@ltecusa.com) for current price.

**18G-0025-1**



Power module package identification

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