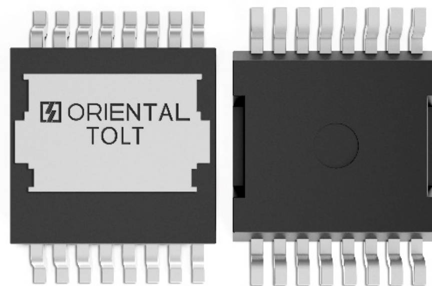
TOLT

1、散热方式：
TOLT 采用顶部散热设计，热量直接从芯片（Junction）传导至封装外壳（Case），再通过热界面材料（TIM）传递至散热器，散热路径较短，相比传统底部散热的 TOLL 封装，热阻降低约 30%，能更高效地散热，尤其适用于高功率密度场景。

1. Heat Dissipation Method

The TOLT package adopts a top-side heat dissipation design. Heat is conducted directly from the junction to the package case, and then transferred to the heatsink via the thermal interface material (TIM). It features a shorter heat dissipation path and achieves approximately a 30% reduction in thermal resistance compared with the conventional bottom-side cooled TOLL package, enabling more efficient heat dissipation. It is particularly suitable for high-power-density applications.



2、结构特点：
封装顶部为裸露金属，用于散热，底部通过鸥翼型导线连接漏极和源极，实现高电流承载。
裸露焊盘为无铅设计，符合环保要求。
集成开尔文引脚配置，可降低开关损耗，支持多键合线设计，能承载更高电流（如 150A 持续电流）。

2. Structural Features

The top of the package is exposed metal for heat dissipation, while the bottom connects the drain and source via gull-wing leads to achieve high current-carrying capacity.

The exposed pad features a lead-free design, complying with environmental protection requirements.

It integrates a Kelvin pin configuration, which can reduce switching losses. The package also supports a multi-wire bonding design, enabling it to carry higher currents (e.g., 150A continuous current).

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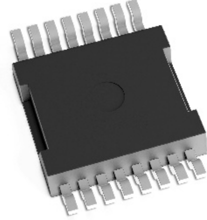
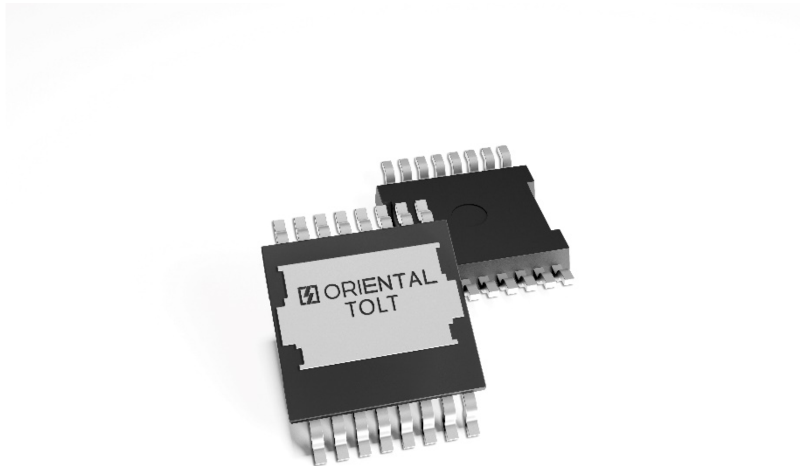


3、电气性能优势：
寄生电感低至 1.2nH 以下，减少高频开关时的电磁干扰（EMI）。
导通电阻（Rds(on)）较 TOLL 封装降低约 22%，提升能效。
支持高功率密度设计，同等工况下结温可降低 36%，延长器件寿命。
3. Advantages in Electrical Performance
The parasitic inductance is as low as below 1.2nH, which reduces electromagnetic interference (EMI) during high-frequency switching.
The on-resistance (Rds(on)) is approximately 22% lower than that of the TOLL package, improving energy efficiency.
It supports high-power-density designs. Under the same operating conditions, the junction temperature can be reduced by 36%, extending the service life of the device.



4、应用场景：
主要用于对热性能要求高的领域，如：

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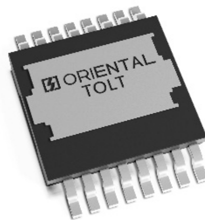
电动脚踏车、轻型电动车（LEV）、电动工具的电池管理系统。
高功率工业电源（3kW+）、车载充电系统（OBC）、直流快充桩、储能 PCS 系统。
AI 服务器冗余电源、5G 基站供电模块等高功率密度场景。

4. Application Scenarios

It is mainly used in fields with high thermal performance requirements, such as:

- Battery Management Systems (BMS) for electric bicycles, light electric vehicles (LEV) and power tools.
- High-power industrial power supplies (3kW+), on-board charging systems (OBC), DC fast charging piles, and energy storage PCS systems.
- High-power-density scenarios including redundant power supplies for AI servers and power supply modules for 5G base stations.



5、尺寸与兼容性:

封装尺寸通常为 9.9×15×2.3mm，厚度较薄（2.3mm），支持全自动 SMT 工艺，兼容现有 PCB 布局，可减少布板面积，提升功率密度。

5. Dimensions and Compatibility

The package dimensions are typically 9.9×15×2.3 mm with a slim profile of 2.3 mm in thickness. It supports full-automated SMT processes, is compatible with existing PCB layouts, helps reduce PCB footprint and improves power density.

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