



QDPAK Package Type

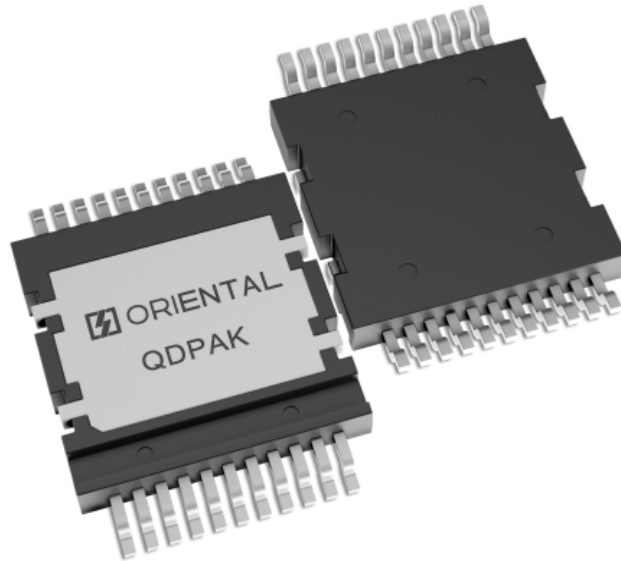
东微半导体 QDPAK 封装已正式量产。作为一种先进的顶部散热表贴功率半导体封装，它在保留表面贴装技术自动化生产优势的基础上，显著提升了散热性能。该封装的核心优势在于将传统的单一底部 PCB 散热路径，升级为“顶部散热器”的散热方案，从而彻底解决了高功率密度设计中的热管理瓶颈。在结构上，其塑封体厚度控制在 2.3mm，确保了与 TOLL、TOLT 等主流封装在 PCB 板上的高度兼容性，为系统布局提供了便利。

Oriental Semiconductor 's QDPAK Package Now in Mass Production

As an advanced top-cooling surface-mount power semiconductor package, it retains the automated production advantages of surface mount technology (SMT) while significantly enhancing heat dissipation performance.

The core advantage of this package lies in upgrading the traditional single PCB bottom-side heat dissipation path to a **top heat sink** cooling solution, thereby completely addressing the thermal management bottleneck in high-power-density designs.

In terms of structure, its plastic package body thickness is controlled at 2.3mm, ensuring high compatibility with mainstream packages such as TOLL and TOLT on PCB boards and facilitating system layout.



东微的 SJ、SiC、IGBT 产品都有此封装产品，其核心优势如下：

1. 卓越的顶部散热能力

- **低热阻**：封装顶部可以直接通过导热膏与外部散热器紧密接触。这创建了一条**极低热阻**的路径，使芯片产生的热量能够直接、高效地散发到环境中。
- **应对高功率密度**：对于硅基（Si）和宽禁带半导体（如碳化硅 SiC 和氮化镓 GaN）器件，其开关频率和电流密度越来越高，导致局部发热严重。QDPAK 的顶部散热设计是管理这种高热流密度的关键。

2. 分离的源极引脚



- **开尔文源极**: 专门用于栅极驱动回路。这种设计将高功率的主回路与敏感的栅极驱动回路分离开来, 极大地减少了源极寄生电感。
 - **减少开关损耗**: 更低的环路电感意味着更小的电压过冲和更快的开关速度, 从而显著降低开关损耗。
 - **抑制栅极振荡**: 提高了栅极驱动的稳定性和防止误导通。
 - **提升效率**: 尤其在高频开关应用中, 对整体系统效率的提升非常明显。
- 3. **表面贴装兼容性**
 - 表贴封装, 可以与自动化贴片机和回流焊工艺兼容, 便于大规模、低成本的生产制造。

This Package is Available for Oriental Semiconductor 's SJ, SiC and IGBT Products, with Its Core Advantages as Follows:

1. Superior Top-side Heat Dissipation Capability

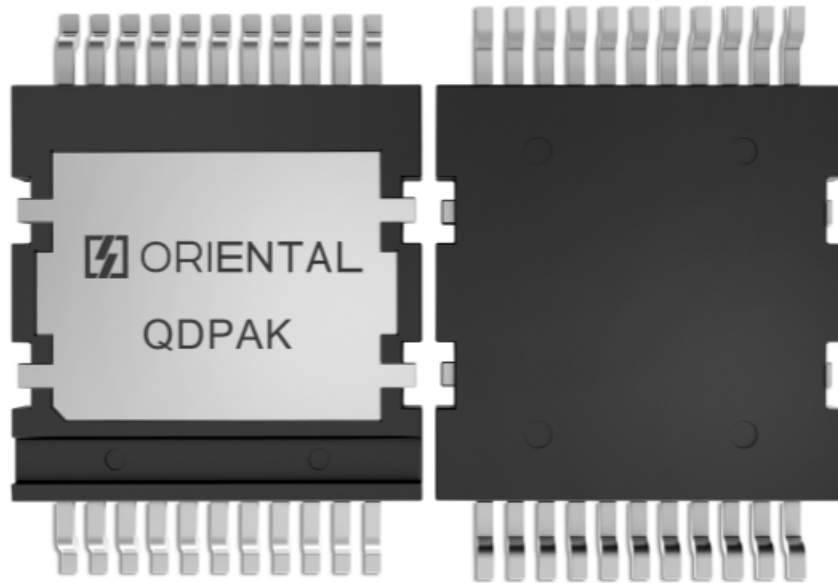
- **Low Thermal Resistance**: The top of the package can be in direct and tight contact with external heat sinks via thermal grease. This creates an ultra-low thermal resistance path, enabling the heat generated by the chip to be dissipated directly and efficiently into the environment.
- **High Power Density Support**: For silicon-based (Si) and wide-bandgap semiconductor devices (such as silicon carbide (SiC) and gallium nitride (GaN)), their switching frequencies and current densities are continuously increasing, leading to severe local heating. The top-side heat dissipation design of QDPAK is the key to managing such high heat flux density.

2. Separated Source Pins

- **Kelvin Source**: Dedicated to the gate drive loop. This design isolates the high-power main loop from the sensitive gate drive loop, significantly reducing source parasitic inductance.
 - **Reduced Switching Losses**: Lower loop inductance results in smaller voltage overshoot and faster switching speed, thus remarkably cutting down switching losses.
 - **Suppressed Gate Oscillation**: Improves the stability of gate driving and prevents false turn-on.
 - **Enhanced Efficiency**: The improvement in overall system efficiency is particularly notable in high-frequency switching applications.

3. Surface Mount Compatibility

- As a surface-mount package, it is compatible with automated placement machines and reflow soldering processes, facilitating large-scale and low-cost manufacturing.



典型应用场景

- **汽车电子**：主驱动逆变器、车载充电机、DC-DC 转换器。
- **服务器与数据中心**
- **工业与通信**：高频大功率开关电源、电信设备电源、光伏逆变器。

工业电机驱动与变频器。

Typical Application Scenarios

- Automotive Electronics: Main drive inverters, on-board chargers, DC-DC converters.
- Servers and Data Centers
- Industrial and Telecommunications: High-frequency and high-power switching power supplies, telecom equipment power supplies, photovoltaic inverters.
- Industrial Motor Drives and Frequency Converters