

Toshiba TK31E60W

4thgen DTMOS 600V Super-Junction MOSFET

Reverse Costing Analysis – February 2013

***The first Deep Trench Super-Junction MOSFET from Toshiba:
30% more efficient than the previous generation
with innovative trench gate***

The new generation Superjunction MOSFET from Toshiba has several new features.

First, the superjunction is not manufactured with a standard multi-epitaxy process but using a new **deep trench filling process**. This technique allows to narrow the pitch and results in a $R_{ds(on)}$ 30% lower. Moreover, the process simplification reduces the manufacturing cost by more than 20%.

Second, a **trench gate** replaces the traditional gate. The trench gate allows a greater reduction in the pitch and the $R_{ds(on)}$.

The DTMOS-4 MOSFET are targeted for power switching applications and offer a better power efficiency.

This report provides a **reverse costing analysis** of this power transistor with:

- Detailed photos & Material analysis
- Step by step manufacturing Process Flow
- Cost breakdown by process steps
- Final manufacturing cost
- Selling price estimation

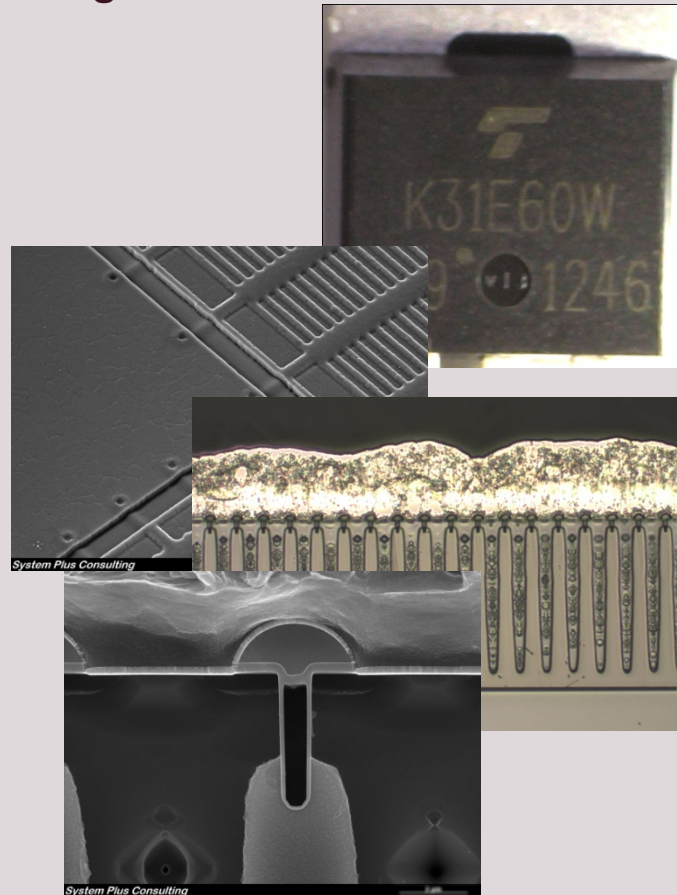


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System Plus Consulting specializes in the **cost analysis** of electronics, from **semiconductor devices** to **electronic systems**, and has developed a complete range of services and costing tools to provide **in-depth production cost studies** and to estimate the **objective selling price** of a product.

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- ✓ **The catalog of available reports** includes cost analyzes on MEMS, LEDs, Modules and Electronic systems.

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COSTING TOOLS

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- ✓ IC Price+ to estimate the cost of any integrated circuit
- ✓ Power Price+ for any power component or module
- ✓ PCB Price+ for printed circuit boards
- ✓ SYS.Cost for electronic boards and systems

Cost Simulation Tools, process flow based

- ✓ MEMS CoSim+
- ✓ LED CoSim+
- ✓ Power CoSim+
- ✓ TSV CoSim+ (thru silicon vias)
- ✓ Sapphire CoSim+

Other costing models can be developed according to customer specifications