

Toshiba : TL1F1-LW1

First GaN on Silicon LED produced on 8" Substrate

System Plus Consulting – December 2013

***The first GaN on Silicon LED by Toshiba on the market
New in this LED: Silicon substrate, bonding without gold,
MESA structure, thinned epitaxial structure***

Toshiba has recently released its first GaN on Silicon LED in a 6450 standard package with several new features.

The TL1F1 LED are produced on a cheap 8" silicon substrate in a standard power silicon facility from Toshiba. The integration in a standard facility has been facilitated by a smart bonding process without gold.

Moreover, a significant work has been done to thin the epitaxial layer in GaN. The thickness of the GaN layer is close to thicknesses measured on Sapphire LED.

A low current density per sq cm is obtained, estimated at 20A/cm², lower than sapphire LED. But the second generation GaN on Si LED produces 30% more lumen.

This report provides a complete teardown of the LED die and the package with:

- Detailed photos
- Material analysis
- Detailed structure of dies and package
- Manufacturing process flow
- In-depth economical analysis
- Manufacturing cost breakdown
- Selling price estimation

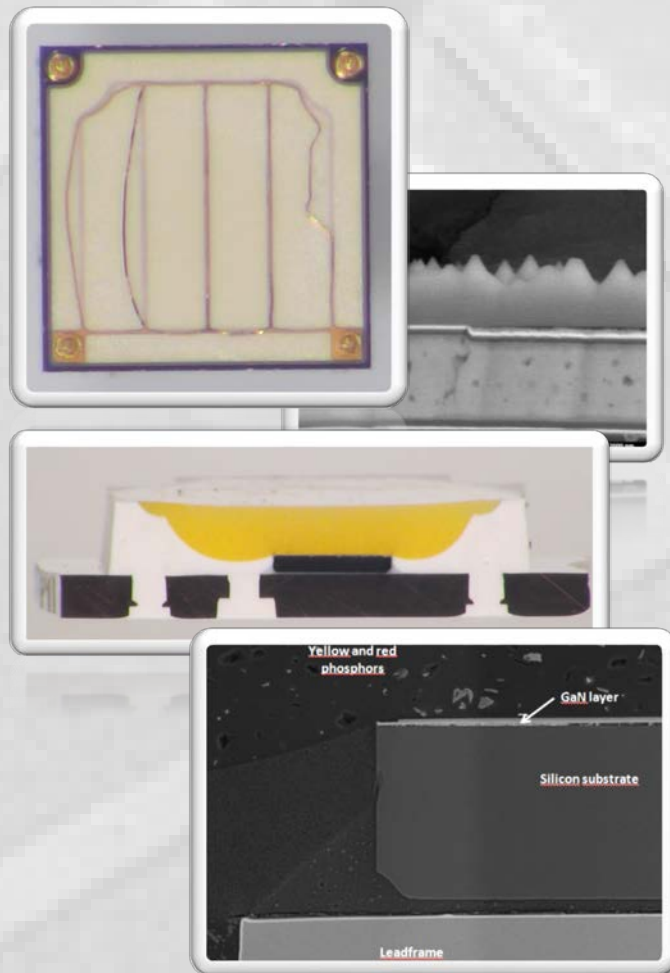


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SP14151

Full Reverse Costing report: EUR 2,990*

Technology Analysis** report: EUR 1,990

*For price in dollars please use the day's exchange rate

*All reports are delivered electronically in pdf format

*For French customer, add 20% for VAT

** Technology Analysis report contains only Physical Analysis & Manufacturing Process Flow

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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.

COSTING SERVICES

- ✓ **On demand Reverse Costing studies** are performed on ICs, ASICs, MEMs, Power Devices, ECUs, electronic boards and full electronic systems.
- ✓ **The catalog of available reports** includes cost analyzes on MEMS, LEDs, Modules and Electronic systems.

All these analyses are performed using in-house developed, proprietary costing tools and their technological databases.

COSTING TOOLS

« Purchaser » tools

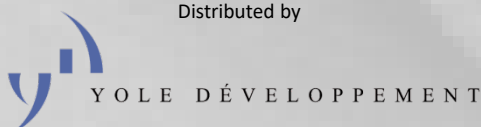
- ✓ IC Price+ to estimate the cost of any integrated circuit
- ✓ Power Price+ for any power component or module
- ✓ PCB Price+ for printed circuit boards
- ✓ SYS.Cost+ for electronic boards and systems

Cost Simulation Tools, process flow based

- ✓ MEMS CoSim+
- ✓ LED CoSim+
- ✓ Power CoSim+
- ✓ 3D Package CoSim+
- ✓ Sapphire CoSim+

Other costing models can be developed according to customer specifications

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