

CREE - Xlamp XR-C Reverse Costing Report

System Plus Consulting - September 2010

Physical Analysis of the Device Step by Step Reconstruction of the Process Flow Cost of Manufacturing and Estimation of Selling Price

System Plus Consulting is proud to publish the reverse costing report of the Xlamp XR-C Cool White LED supplied by Cree. Based on a complete teardown process, the report provides an estimation of the production cost as well as the selling price of the component.

- The XLAMP XR-C Cool White series have a maximum brightness of 87.4lm with a consumption of 1.22W at 350mA.
- The component is provided in a specific 2-pins package, compatible with SMT process.
- It can be used in a wide range of lighting applications, including color-changing lighting, portable and personal lighting, outdoor and indoor directional lighting, commercial lighting and emergency-vehicle lighting.

This report provides complete teardown of the LED with:

- Detailed photos
- Material analysis
- Schematic assembly description
- Manufacturing Process Flow
- In-depth economical analysis
- Manufacturing cost breakdown
- Selling price estimation

SYSTEMPlus
Reverse Costing
Package Opening

Top view with lens removed

Silicone and phosphor removed

The hollow glass lens is filled with a silicone compound and is inserted into a metal ring that is attached to the substrate with a glass-particle filled adhesive.

LED die / protection die attach : AuSn solder.
Protection die / substrate attach : AuSn Solder.

LED die surface analysis showing layers: GaN (3.7µm), Pt, W, Ti, Ni, AuSn, Ag, W, Ti, Si.

te step in the
the region of the
metal is Ni. Ag is
12 task, providing the
p-contact and enhanced reflectivity. The
metals of the stack are too thin to be
resolved with SEM-EDX. They contain
mostly Pt, Ti, W

(Medium Yield Estimation)

Category	Percentage
Other FE Yield	90%
Salary	13%
Materials	28%
Equipment	15%
Clean Room	4%

• The main part of the other front-end cost is due to the yield losses cost (~40%) in the "Medium Yield" version. This is due to the yield (85% for the medium scenario) and to the high cost of the SiC epi-substrate (~\$708).

• The materials are also important (~28% in the "Medium Yield" version). The gold used for the contacts is mainly responsible of this value.

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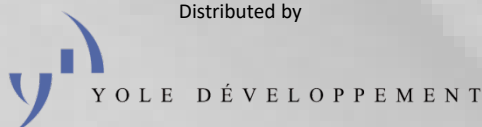
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