# SAMSUNG

## Automotive LED **T-series**

Top-contact LEDs suitable for cost-competitive headlamps



### Future Mobility Trend

LEDs enable more energy efficient and sleek headlamp design. However, LED headlamps are often found to be more expensive than conventional halogen lamps, hindering their widespread adoption. To increase the accessibility for LED headlamps, cost-effective LED solutions are important.

#### Feature

- Top-contact package designed for direct heat sink mount
- Ceramic-based package with excellent thermal management
- Large bottom pad entirely dedicated for heat dissipation

#### Benefit

- Lower lamp manufacturing costs by eliminating the need for high-performance PCB
- Long lifetime thanks to its superior thermal management performance

#### **Products Lineup**

| Color | Power<br>(W) | Number of<br>Chips | Dimension<br>(L x W x H mm) | LES Size<br>(mm) | Typ. Flux<br>(lm) | Efficacy<br>(lm/W) | Typ. Vf<br>(V) | Typ. Rth_el<br>(K/W) |
|-------|--------------|--------------------|-----------------------------|------------------|-------------------|--------------------|----------------|----------------------|
| White | 6            | 2                  | 3.5 x 3.75 x 0.729          | 2.13 x 1.03      | 760               | 127                | 6.3            | 1.5                  |
| White | 9            | 3                  | 4.6 x 3.75 x 0.729          | 3.23 x 1.03      | 1140              | 127                | 9.45           | 1.1                  |
| White | 12           | 4                  | 5.7 x 3.75 x 0.729          | 4.33 x 1.03      | 1659              | 138                | 12.6           | 0.8                  |
| White | 12           | 4                  | 5.7 x 3.75 x 0.729          | 4.33 x 1.03      | 1659              | 138                | 12.6           | 3.0                  |

@ 1.0A, 25°C, White (0.32, 0.33)

## Most Cost-reasonable Headlamps

Lower total lamp system cost with 'top-contact' type LEDs

### Application Demonstration

The T-series is designed as a series of top-contact type electrodes that allow LEDs to be directly mounted onto heatsinks. By allowing heat to dissipate directly through the heatsink, lamp manufacturing costs can be lowered for more accessible LED headlamps and EVs.

#### Lower manufacturing costs with top-contact type LED than conventional LED







**T-series** 

Ref. (C-series Gen3)

# Lower TCO with longer lifetime than halogen lamp



\* The replacement cost of the halogen lamp is converted into annual cost.

# I Higher design and color flexibility than halogen lamp



(Warm to cool white)

160 mm

Halogen Lamp (Warm white only)

## Most Cost-reasonable Headlamps

Superb headlamp performance and yet competitive price

### Light Distribution Demonstration

A headlamp using the T-series realizes outstanding performance requiring only 20% of power consumption and a 33% smaller lighting area compared to conventional halogen lamps. With a similar level of luminous input, the T-series headlamp delivers better flux on the road. The actual light distribution measurement shows that a headlamp with T-series LEDs performed well, more than satisfying the UNECE Reg. 112 for low beams with about 120% margin.

- Luminous Flux: 1500 lm
- Electrical Power: 10.1W
- Flux on the Road: 797 lm
- Optical Efficiency: 53%
- Maximum Intensity: 42,510 cd
- \* H [45,-45], V [10,-20] deg



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