LED Bulbs and Modules
Standardized LED solutions for mass market are now on the road

Designing a LED lighting solution has never been so easy with LED bulbs and modules. Standardized interfaces allow for minimal effort in design phase, faster proliferation and roll-out, by still enabling a wide styling flexibility. All signaling functions, as well as front fog, can now be addressed thanks to the complete product range we are offering.

FEATURES AND BENEFITS

- Powerful light from a small source provides design freedom for meeting various styling needs compared to conventional solutions
- Turnkey solutions with integrated heat sink and driver
- Easy thermal management enables compact luminaire design
- Standard interface allows for minimal effort in product proliferation
- Easy to mount and replace when needed thanks to its standard interface

PRIMARY APPLICATIONS

- External car lighting applications
- Regulated LxN bulbs: All signaling and front fog functions
- Standard LED Modules: Rear fog and backup functions
In this demonstrator, we are highlighting how designs based on LED Bulbs or Modules can be easily realized.

LED solutions are now at your fingertips for mass market adoption!

Rear fog and backup modules:

- Standard modules for rear fog and backup functions, meeting ECE R38 and ECE R23 with minimal design effort
- Easy mechanical integration into your rear combination lamps or bumper leading to a fully sealed solution
- Same mechanical footprint between modules for an easy adaptation to different hand drive sides
- No electronic drivers required for direct operation on board net
- Standalone in thermal management
- Industry standard connector types

Compact front turn using LED bulb

- High luminous flux from a single bulb, enabling various styling possibilities
- Easy integration in your systems for a real plug-and-play solution:
  - Thermal management at bulb level
  - Fully sealed application
  - Standard electrical connection
  - Regulated and replaceable bulb
- Same advantages apply for other signaling functions realized with LED bulbs, including front fog application
- Already on the road on many platforms

### Regulated LED bulbs - LxN family

<table>
<thead>
<tr>
<th>Function</th>
<th>Stop/tail</th>
<th>Stop/tail, rear fog</th>
<th>DRL, reverse light</th>
<th>Front fog</th>
<th>Turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminous flux [lm]</td>
<td>80 / 6</td>
<td>120</td>
<td>350</td>
<td>355</td>
<td>280</td>
</tr>
<tr>
<td>Voltage range</td>
<td>9 V - 16 V</td>
<td>9 V - 16 V</td>
<td>9 V - 16 V</td>
<td>9 V - 16 V</td>
<td>9 V - 16 V</td>
</tr>
<tr>
<td>Typ. power consumption at 13.5V [W]</td>
<td>3 / 0.75</td>
<td>2.5</td>
<td>4.8</td>
<td>4.8</td>
<td>6</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-40°C to 85°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Standardized modules

<table>
<thead>
<tr>
<th>Rear fog module</th>
<th>Backup module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear fog</td>
<td>Reverse light</td>
</tr>
<tr>
<td>ECE R38</td>
<td>ECE R23</td>
</tr>
<tr>
<td>9 V - 16 V</td>
<td>9 V - 16 V</td>
</tr>
<tr>
<td>1.9 (RF75)</td>
<td>1.5 (RF92)</td>
</tr>
<tr>
<td>2.5</td>
<td>-40°C to 85°C</td>
</tr>
</tbody>
</table>

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