Technical Article

The Ins and Outs of Automotive Rear-lighting Design

Arun T. Vemuri

Imagine driving in the early 1900s. Drivers relied on hand signals and shouts, plus a little bit of guesswork, to predict the actions of other cars on the road.

Thanks to modern rear-lighting solutions, drivers can better predict the actions of other drivers in all environments, making driving safer. We've advanced from kerosene lamps to incandescent light bulbs to the more reliable and efficient LEDs and organic LEDs. As technologies advance, so too have the number of light sources in vehicles – from a single bulb to multiple pixelated designs. Figure 1 offers some examples.

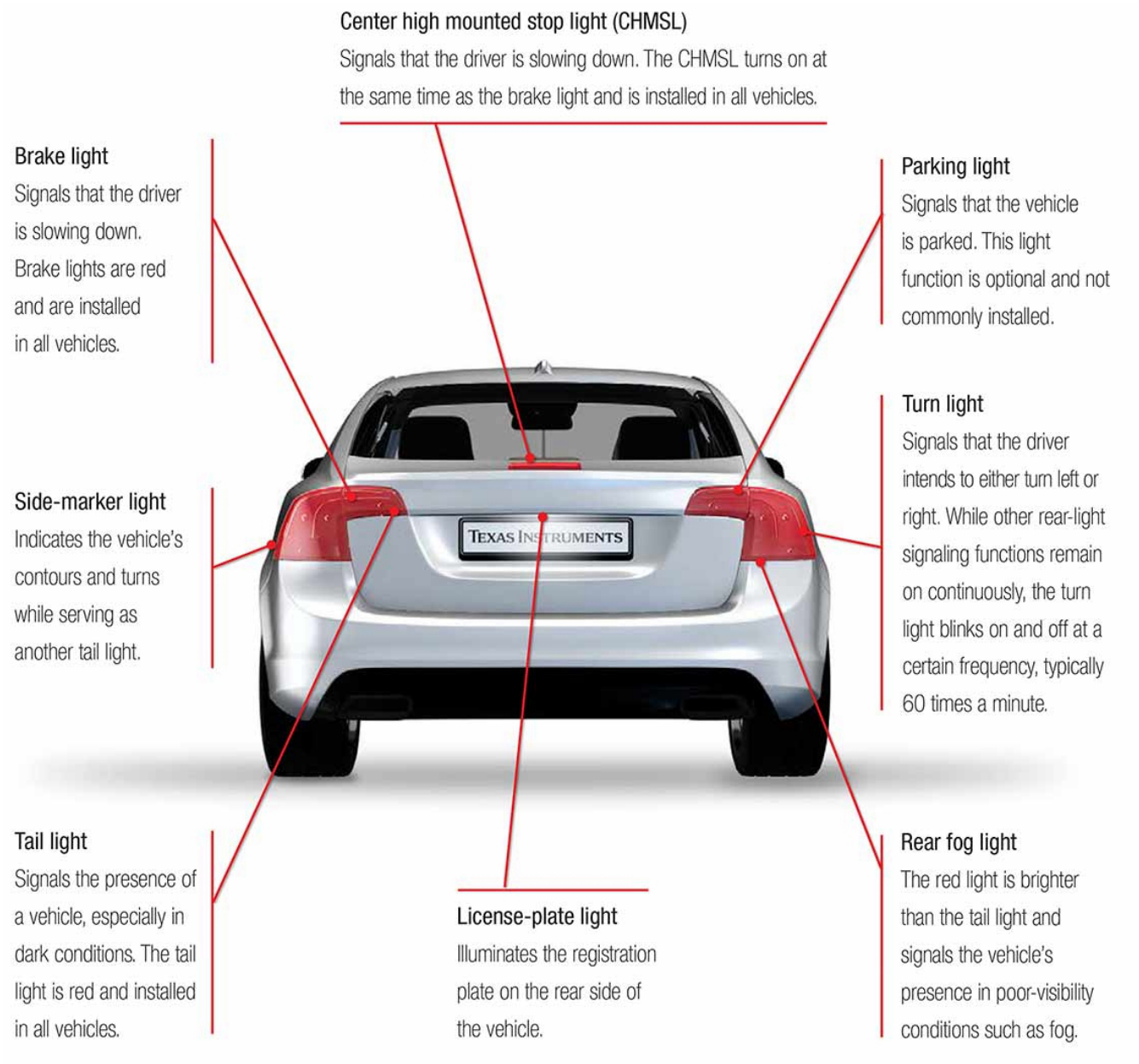

Figure 1. Components of a Rear-lighting System

As rear-lighting systems become more complex, designers must consider a number of design challenges, from power and thermal management to electromagnetic interference compatibility to fault detection and protection.

I recently wrote a white paper, Trends and topologies for automotive rear lighting systems, that discusses solutions to these challenges.

With the continued evolution of these systems, we can make the road a safer place for drivers and pedestrians alike.

Additional Resources

- Get started on your design with TI's interactive block diagram for exterior rear light systems.
- View TI's interactive block diagram for digital interface LED driving module rear light systems.
- Review the automotive dual stage (SEPIC + Linear) static LED driver module reference design for rear lights.
- Review the EMC-compliant, automotive stop light and tail light reference design.
- Read about center high-mounted stop lamp designs on our blog.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265