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TI exhibited the newest automotive exterior lighting solutions at the 13th Auto Lamp Industry Development Technical Forum and Fourth Shanghai International Auto Lamp Exhibition (ALE) on March 28-29 in Shanghai. ALE Shanghai is an annual automotive lamp show at which the top innovators and companies share the most updated technologies around automotive exterior lighting.

TI had three demos at ALE: an automotive rear combination lamp (RCL) taillight demo featuring the TPS92830-Q1 LED controller, a sequential lighting/ambient lighting demo using the TLC6C5712-Q1 LED driver and a next-generation adaptive frontlight system (AFS) light-emitting diode (LED) matrix headlight.

As automotive exterior lighting becomes more sophisticated, most of the new requirements are focused around supporting animations, styling or pixel-brightness control to enhance road safety. Our demos showed the capabilities of TI devices to help customers build on required features in both headlights and RCLs.

As shown in [Figure 1](#), the automotive RCL taillight demo featuring the TPS92830-Q1 LED controller showed different kinds of signal functions that the linear-based TPS92830-Q1 device can support (such as turn, tail and stop), with both analog dimming and pulse-width modulation (PWM) dimming. The demo also highlighted the TPS92830-Q1's integrated diagnostic and thermal-protection features.



Figure 1. Automotive RCL Taillight Demo Featuring the TPS92830-Q1 LED Controller

The sequential lighting/ambient lighting demo using the TLC6C5712-Q1 LED driver exhibited the ability to achieve differentiated styling with red-green-blue (RGB) color mixing ([Figure 2](#)). The TLC6C5712 supports diversified automotive applications with independently controlled brightness and color for each LED or lighting bar (through either analog or PWM dimming), and a 12-bit constant-current sink architecture. The device has built-in diagnostic features to improve robustness of the lighting system.



Figure 2. Sequential/ambient Lighting Using the TLC6C5712-Q1 LED Driver

Finally, as shown as [Figure 3](#), the next-generation AFS LED matrix headlight demo enables necessary intelligent headlight functions such as dynamic beam shaping, glare-free high beams, light customization and animation for welcome lights and/or sequential turn lights. It showcases the TI-designed lighting control unit (LCU) as a complete LED driver and lighting management solution for headlights, with the TPS92518HV-Q1 as the constant-current source to drive LEDs and the TPS92662-Q1 as the LED matrix manager to control an individual pixel light's brightness through shunt-field effect transistor (FET) PWM dimming.



Figure 3. A Next-generation AFS LED Matrix Headlight Using the TPS92518HV-Q1 and TPS92662-Q1

TI has many other devices to help build innovative, robust and high-performance solutions in automotive exterior lighting applications. ALE Shanghai is definitely one of the most important events that connects TI and automotive lighting industry gurus. TI is continuing to define, design and make products that are adapting to the challenging standards for automotive exterior lighting needs.

For more information on TI's LED portfolio visit ti.com/LED

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