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## LED Drivers Support Dynamic Automotive Lighting From Front To Rear

<u>Texas Instruments'</u> three new high-performance LED drivers make scalable LED-based systems approachable to carmakers across the globe. From static headlights, to customizable dynamic features—swiping turn, animated daytime running lights (DRL) and adaptive driving beams—the TPS92520-Q1 and TPS92682-Q1 address the most common headlight design challenges, according to the vendor. Meanwhile, the TPS929120-Q1 LED driver is said to solve the most common rear light design challenges.

The TPS92520-Q1 is described as the industry's first monolithic dual synchronous buck LED driver with SPI, offering best-in-class power density and up to 2.2-MHz switching frequency. The TPS92520-Q1, with adaptive on-time average-current-mode control, is designed to be compatible with shunt FET dimming techniques and LED matrix manager-based dynamic beam headlamps. The high-performance LED driver can independently modulate LED current using both analog or PWM dimming techniques (Fig. 1).

The TPS92682-Q1 is a dual-channel, peak current-mode controller with an SPI communication interface. With programmable CC or CV output modes, designers can add one IC to their component library so that their LED drivers don't have to evolve with their roadmap (Fig. 2).

By using an industrial-standard CAN physical layer, the UART-based FlexWire interface of the TPS929120-Q1 simplifies long distance off-board communication without impacting EMC. The TPS929120-Q1 is a 12-channel, 40-V high-side LED driver that controls the 8-bit output current and 12-bit PWM duty cycles. A configurable watchdog also automatically sets fail-safe states when the MCU connection is lost, and, with programmable EEPROM, the TPS929120-Q1 can flexibly be set for different application scenarios (Fig. 3).

For more information, see <u>ti.com/product/TPS92520-Q1</u>, <u>ti.com/product/TPS92682-Q1</u> and <u>ti.com/product/TPS929120-Q1</u>.



*Fig. 1. The TPS92520-Q1 is a monolithic dual synchronous buck LED driver with wide a 4.5-V to 65-V operating input voltage range that can independently power two strings of series-connected LEDs. With its adaptive on-time average current mode control, this driver IC is designed to be compatible with shunt FET dimming techniques and LED matrix manager-based dynamic beam headlamps.* 





*Fig. 2. The TPS92682-Q1 is a dual-channel, peak current-mode controller with an SPI communication interface. The device is programmable to operate in constant-voltage (CV) or constant-current (CC) modes. In CV mode, this controller can be programmed to operate as two independent or dual-phase boost voltage regulators.* 



*Fig.3. The TPS929120 is a 12-channel 40-V highside LED driver. By using an industrial-standard CAN physical layer, the UART-based FlexWire interface of this LED driver easily accomplishes long distance off-board communication without impacting EMC.*