NXP provides a new level of flexibility & scalability

NXP System Solutions for Intelligent Automotive Exterior Lighting

NXP offers a broad portfolio to address the increasing demands of advanced automotive lighting applications. This solution provides a cost-effective, flexible and scalable architecture allowing platform designs to be quickly developed.

OVERVIEW
LED technology has evolved to enable advanced automotive lighting applications by providing small form factors, higher power levels, longer lifetime and lower power consumption. Intelligent LED applications such as Glare Free High Beam, Adaptive Driving Beam, Dynamic Signaling and Rear lighting, make our roads safer to drive. These systems require efficient, robust, flexible & scalable cost effective electronics to enable the full benefits of LEDs in automotive applications.

NXP’s highly integrated LED Drivers and Controllers are specifically designed to maximize the performance and efficiency of lighting electronics. The ICs combine our deep understanding of LED performance with our world-class automotive A-BCD mixed-signal high voltage technology.

NXP FEATURED PRODUCTS
- ASLx500/7 Boost converters
- ASLx416/7 Buck drivers
- ASL5xxx Matrix LED controller
- UJA116x System Basis Chip
- TJA1057 CAN Transceiver
- S32K Microcontroller

TARGET APPLICATIONS:
- Advanced front lighting systems
- Matrix/pixel high/low beam (ADB/GFHB)
- Dynamic signaling (Front/Rear)
- Dynamic Daytime Running Lights

LIGHTING APPLICATIONS DIAGRAM
ASLx50y MULTI-PHASE BOOST CONVERTERS

Lower system cost
- Programmable internal gate driver voltage regulator
- Integrated oscillator
- Space-saving, pin-compatible HVQFN32 package

Easy configurability
- Wide operating input voltage range from +5.5 V to +40 V
- Two programmable regulated output voltages from 10 – 80 V (3 % accuracy)

Improved robustness & improved performance
- SPI interface for control & diagnostics
- Low quiescent current <5 uA
- Low electro magnetic emission (EME) and high electro magnetic immunity

ASLX41y MULTI-CHANNEL BUCK DRIVER

Lower system cost
- A highly integrated multi-channel programmable hysteretic constant current buck converter
- Integrated PWM dimming

Easy configurability
- Diagnostics with external MCU
- PWM dimming to 100% with 0.1% resolution
- Programmable output current to 1.5A, using the SPI interface
- Wide output voltage range to 70V

Improved robustness & improved performance
- SPI interface for control & diagnostics
- External MOSFETs for better thermal management
- Constant current to LEDs independent of input voltage
- LED open and short-to-ground fault detection

Part number | Description | Package
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ASL1500 | 1-phase boost converter | HVQFN32
ASL1507 | 1-phase boost converter with limp home mode | HVQFN32
ASL2500 | 2-phase boost converter | HVQFN32
ASL2507 | 2-phase boost converter with limp home mode | HVQFN32
ASL4500 | 4-phase boost converter | HVQFN32
ASL4501 | 4-phase boost converter with enhanced phase mismatch | HVQFN32
ASL2416 | 2-channel LED buck driver | HVQFN32
ASL2417 | 2-channel LED buck driver with limp home mode | HVQFN32
ASL3416 | 3-channel LED buck driver | HVQFN32
ASL3417 | 3 channel LED buck driver with limp home mode | HVQFN32
ASL5008 | 0.8 A Max Current Smart PWM Matrix Led Controller | HLQFP48
ASL5015 | 1.5 A Max Current Smart PWM Matrix Led Controller | HLQFP48
ASL5108 | 0.8 A Max Current Direct PWM Matrix Led Controller | HLQFP48
ASL5115 | 1.5 A Max Current Direct PWM Matrix Led Controller | HLQFP48

Board | Description
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ASL45XASLX41 | Evaluation board for LED drivers
ASL5115EVBMST | Master evaluation board Matrix IC direct
ASL5115EVBSLAV | Slave evaluation board Matrix IC direct
ASL5015EVBMST | Master evaluation board Matrix IC smart
ASL5015EVBSLAV | Slave evaluation board Matrix IC smart
S32K144EVB-Q100 | S32K144 microcontroller evaluation board

ASL5xxx MATRIX LED CONTROLLER

Lower system cost
- Built in non-volatile memory
- Limp Home Mode capability
- Single smart charge pump
- Integrated oscillator

Easy configurability
- Max current up to 0.8 A or 1.5 A per switch
- 12-bit resolution PWM & SMART PWM
- Support on-board / off-board architectures
- 12 integrated switches in 4 floating blocks of 3 switches each
- Possible serial and parallel configuration of the switches

Improved robustness & improved performance
- Internal switches with only 100 mΩ Rdson
- Only 2.1 K/W Rth between junction and base
- CAN or CAN-FD communication protocol
- Direct NTC & ID resistor input
- Single LED open/short detection & diagnostics with bypass feature
- Full IC and external components diagnostic
- QM(B) - Safety documentation to support up to ASIL B system level