Key Features

- Application Controller
  - 32-bit CPU
  - SWD debug
  - Flash 64 KB with ECC
  - RAM 8 KB with ECC
- Clock
  - Internal 256 kHz low frequency RC
  - Internal 32 MHz high-frequency clock is divided down to a maximum of 16 MHz as the system clock
- Power management
  - Supply voltage 6-18V
  - LDO 5.0V (capless): I/Os
  - LDO 1.5V (capless): CPU Core
  - Low power standby mode can be woken up by LIN
- One 12-bit ADC
  - Measuring Chip temperature
  - Measuring Battery voltage
  - Measuring LED voltage using dedicated 2mA current source
  - Measuring GPIO voltage
  - Judging LEDs abnormal states: short to battery, short to GND, open state
- LED driver
  - 16-bit resolution
  - 0% - 100% duty cycle
  - Supporting phase deviation
  - Supporting adjusting slew rate to reduce EMI
  - Max 60mA constant current with 120uA step
  - 2mA constant current used to measure LED voltage
  - PWM edge-triggered ADC to measure LED voltage
- Safety protection
  - Battery over/under voltage reset/interrupt
  - Chip over temperature reset/interrupt
  - LIN bus short to GND detection
  - LIN bus over current protection
  - ECC error injection for RAM/Flash to check ECC soft handler
  - FLASH write/read protection
- GPIO x 2
  - General 5V input/output
  - Edge detect interrupt
  - Can be used as UART TX, RX
  - GPIO3 toggles automatically when LEDCTRL or Timer count overflows
- Timer
  - 24-bit SysTick timer
  - Three general-purpose timers
  - One window watchdog timer
- Communication interfaces
  - One LIN controller with two LIN Transceiver compatible with SAE J2602 / LIN2.2
  - Supporting auto-addressing
- Other Features
  - Full automotive qualification AEC-Q100 Grade1
  - Supporting driving high-current LEDs with an external DC-DC converter while measuring LED voltage.
- Package Options
  - DFN12
  - QFN20

Applications

- Connected interior light
- Ambient light applications

Description

The RJL9123x IC is a highly integrated automotive-grade solution engineered for intelligent LED lighting systems in vehicles. Operating within a 6-18V supply range directly from automotive batteries, it features three high-voltage constant-current outputs with PWM dimming capabilities for dynamic brightness control. The device incorporates dual LIN transceivers with auto-addressing functionality to optimize in-vehicle network communication and a precision 12-bit ADC for real-time temperature compensation and safety monitoring. Designed to meet stringent automotive requirements, this all-in-one platform ensures reliable operation, adaptive performance, and robust fault tolerance in harsh automotive environments, making it ideal for advanced lighting applications such as ambient lighting systems.

Device Information

Ordering P/N	*Package*	*Body Size*
RJL91231-QDNR	DFN12	3X3
RJL91232-QQNR	QFN20	4X4

RJMICRO CONFIDENTIAL

Copyright © 2025, RJMICRO