High Brightness LED Matrix Manager with EMI Improvement

Descriptions

The CPSQ5462 LED matrix controller enables comprehensive and flexible lighting systems by offering precise control at the pixel level for LEDs. The device consists of four subsets, each with three integrated switches connected in series, allowing for the bypassing of specific LEDs.

The CPSQ5462 device features a multi-drop capable UART serial interface, allowing it to be controlled and managed by a MCU. This serial interface is compatible with CAN transceiver hardware, which reinforces the robustness of the physical communication layer. Moreover, the device includes an I2C communication interface, enabling the reading and writing of data to an external EEPROM.

The onboard 8-bit ADC aids in system strategies such as temperature monitoring. Each LED's phase shift and pulse width can be programmed independently. The frequency of PWM is programmable, and multiple devices can be synchronized. Additionally, the device allows for the configuration of a programmable slew rate limit during PWM dimming transitions, which helps to reduce EMI.

The device includes open LED protection with a user-configurable threshold, and it can report open and short circuit faults in the LEDs through the serial interface.

Features

- AEC-Q100 Qualified for Automotive Applications
- Grade 1: -40°C to 125°C Ambient Operating Temperature
- Device HBM Classification Level H1C
- Device CDM Classification Level C5
- Input Voltage Range: 4.5 V to 60 V
- 12 Integrated Bypass Switches
- Four Sub-Strings of Three Series Switches
- 20 V Maximum Across Switch
- 62 V Maximum Switch to GND
- Multi-Drop UART Communication Interface
- Up to 31 Addressable Devices
- Compatible with CAN Physical Layer
- Eight-bit ADC with Two MUXed Inputs
- Crystal Oscillator Driver
- A special pin for hardware configuration of the CLK/SYNC/TX buffer drive strength
- A special register for XTALO buffer strength programming
- External EEPROM I2C Interface
- Programmable 10-bit PWM Dimming
- Individual Phase Shift and Pulse Width
- Device-to-Device Synchronization
- LED Open and Short Detection and Protection
- RoHS compliant.Pb-Free and Halogen-Free

Applications

- Automotive headlight systems
- High-Brightness LED Matrix Systems
- ADB or Glare-Free High Beam