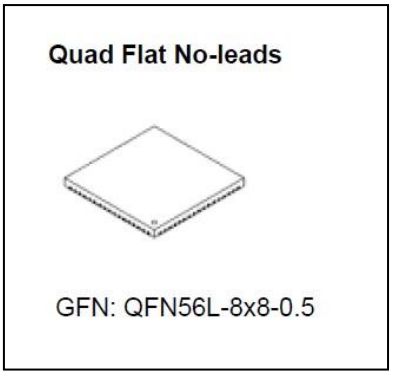
48-Channel PWM Constant Current LED Driver for 1:32 Time-Multiplexing Applications

Features



- 3V-5.5V supply voltage
- 48 constant current output channels
- Constant output current range:
  - 0.5~20mA @ 5V supply voltage
  - 0.5~10mA @ 3.3V supply voltage
- Excellent output current accuracy:
  Between channels:： <±2.5％(Max.)
  Between ICs: <±3％(Max.)
- Built-in 48K-bit SRAM to support time-multiplexing for 1 ~ 32 scans
- Flexible PWM control to improve visual refresh rate,
  -16/15/14/13 bit grayscale mode with programmable scrambling
- Global current gain control:
  - Gain range: 100%~200%, step increment: 14.4%
- 128 steps R/G/B/ individual current gain control
- Integrating ghost elimination circuit
- Premium low grayscale improvement technique
- LED failure isolation
  - LED failure induced cross elimination
- LED status monitoring:
  - LED open detection with programmable threshold levels
  - LED short detection with programmable threshold levels
- Smart power saving mode
- GCLK multiplier technology
- Maximum DCLK frequency: 30MHz
- Package MSL Level : 3

Product Description

MBI5353 is designed for LED video applications using internal Pulse Width Modulation (PWM) control with selectable 16 /15 /14 / 13-bit color depth. MBI5353 features a 48-bit shift register which converts serial input data into each pixel's gray scale of the output port. The forty-eight regulated current ports are designed to provide uniform and constant current sinks for driving LEDs with a wide range of V_F variations. The output current can be preset through an external resistor. The innovative architecture with embedded SRAM is designed to support up to 1:32 time-multiplexing applications. Users only need to send the whole frame data once and to store in the embedded SRAM of the LED driver, instead of sending every time when the scan line is changed. It helps to save the data bandwidth and to achieve high grayscale with very low data clock rate. With scan-type Scrambled-PWM (S-PWM) technology, MBI5353 enhances PWM by scrambling the "on" time of each scan line into several "on" periods and sequentially drives each scan line for a short "on" period. The enhancement equivalently increases the visual refresh rate of scan-type LED displays. In addition, the innovative GCLK multiplier technique doubles visual refresh rate.

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MBI5353 drives the corresponding LEDs to the brightness specified by image data. With MBI5353, all output channels can be built with 16-bit color depth (65,536 gray scales). When building a 16-bit color depth video, S-PWM technology reduces the flickers and improves the image fidelity.

Through compulsory error detection, MBI5353 detects individual LED for open-circuit errors without extra components. MBI5353 equips an innovative cross elimination function, and it solves the cross phenomenon induced by failure LEDs. Besides, integrated ghost elimination circuit eases the ghost problems. To further reduce power consumption of LED display, a built-in smart power saving mode will shut driver IC down when grayscale data is zero.