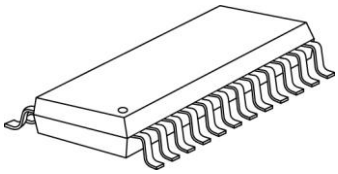
16-Channel PWM Constant Current LED Driver For Time-multiplexing Applications

Features

- 3V-5.5V supply voltage
- Constant output current range: 3~45mA
  - 3~45mA @ 5V supply voltage
  - 3~30mA @ 3.3V supply voltage
- Backward compatible with MBI5026 and MBI5030 in package
- 16 constant current output channels
- Built-in 4K-bit SRAM to support time-multiplexing for 1 ~ 8 scans
- 16-bit /14-bit color depth PWM control
- Scan-type Scrambled-PWM technology to improve visual refresh rate
- 6-bit programmable output current gain
- Excellent output current accuracy:
  Between channels: <±1.5% (typ.), and
  Between ICs: <±3% (typ.),
- Staggered delay of output to reduce EMI
- Maximum data clock frequency: 30MHz
- Schmitt trigger input

Small Outline Package



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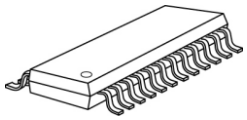
Shrink SOP



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Product Description

MBI5050 is designed for LED video applications using internal Pulse Width Modulation (PWM) control with selectable 16-bit / 14-bit color depth. MBI5050 features a 16-bit shift register which converts serial input data into each pixel's gray scale of the output port. Sixteen 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. Moreover, the preset current of MBI5050 can be further programmed to 64-step for LED global brightness adjustment.

The innovative architecture with embedded SRAM is designed to support up to 8:1 time-multiplexing applications. User only needs 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 save the data bandwidth and achieve high grayscale with very low data clock rate.

With scan-type Scrambled-PWM (S-PWM) technology, MBI5050 enhances Pulse Width Modulation 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. MBI5050 drives the corresponding LEDs to the brightness specified by image data. With MBI5050, all output channels can be built with 16-bit color depth (65,536 gray scales). Each LED's brightness can be calibrated enough from minimum to maximum brightness with compensated gamma correction or LED deviation information inside the 16-bit image data. When building a 16-bit color depth video, S-PWM technology reduces the flickers and improves the image fidelity. Also, MBI5050 offloads the signal timing generation of the host controller which just needs to feed data into drivers.

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