

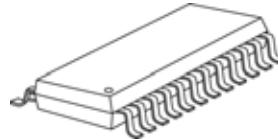


## 16-Channel Constant Current LED Driver With 12-Bit PWM Control

### Features

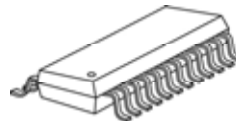
- Backward compatible with MBI5026 in package
- 16 constant-current output channels
- 12-bit color depth PWM control
- Scrambled-PWM technology to improve refresh rate
- Compulsory open circuit detection to detect individual LED errors  
Full panel, data independent  
Silent error detection with 0.1mA
- 8-bit programmable output current gain
- Over temperature warning/protection
- Constant output current range: 3~90mA  
8~90mA at 5.0V supply voltage  
3~70mA at 3.3V supply voltage
- Output current accuracy:  
between channels:  $<\pm 1.5\%$  (typ.), and  
between ICs:  $<\pm 3\%$  (typ.)
- Staggered delay of output, preventing from current surge
- Maximum data clock frequency: 30MHz
- Schmitt trigger input
- 3.0V-5.5V supply voltage

#### Small Outline Package



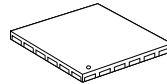
GF: SOP24L-300-1.00

#### Thin Shrink SOP



GTS: TSSOP24L-173-0.65

#### Quad Flat No-Lead



GFN: QFN24L-4\*4-0.5

### Product Description

MBI5031 is designed for LED video applications using internal Pulse Width Modulation (PWM) control with 12-bit color depth. MBI5031 features a 16-bit shift register which converts serial input data into each pixel 12bits gray scale of output port. At MBI5031 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 MBI5031 can be further programmed to 256 gain steps for LED global brightness adjustment.

With Scrambled-PWM (S-PWM) technology, MBI5031 enhances Pulse Width Modulation by scrambling the "on" time into several "on" periods. The enhancement equivalently increases the visual refresh rate. When building a 12-bit color depth video, S-PWM reduces the flickers and improves the fidelity. MBI5031 offloads the signal timing generation of the host controller which just needs to feed data into drivers. MBI5031 drives the corresponding LEDs to the brightness specified by image data. With MBI5031, all output channels can be built with 12-bit color depth (4,096 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 12-bit image data.