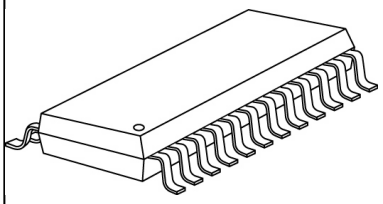
16-Channel Constant Current LED Sink Driver with Compulsory Open-circuit Detection and Current Gain

Features

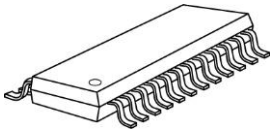
- 16 constant-current output channels
  Constant output current range: 3~45mA
  - 3-45mA @ 5V supply voltage
  - 3-30mA @ 3.3V supply voltage
- Compulsory LED open-circuit detection
  - Open-circuit LEDs can be detected
  - Full panel, data independent
  - Flicker-free error detection
- 64-step programmable current gain: from 12.5% to 200%
- Excellent output current accuracy,
  - Between channels: <±1.5% (typ.), and
  - Between ICs: <±3% (typ.)
- Fast response of output current
  - Min. output pulse width of $\overline{OE}$: 20ns
- Staggered delay of output, preventing from current surge
- 30MHz clock frequency
- Schmitt trigger input

Small Outline Package



GF: SOP24L-300-1.00

Shrink SOP



GP: SSOP24L-150-0.64

Product Description

MBI5034 is an enhanced 16-channel constant current LED sink driver with smart error detection and output current gain. MBI5034 succeeds MBI5026 and also exploits **PrecisionDrive™** technology to enhance the output characteristics. Furthermore, MBI5034 adopts **Share-I-O™** technology to be backward compatible with MBI5026, MBI5036 and MBI5039 in pin definition and has the functionality for compulsory LED open-circuit detection and current gain control in LED display systems.

MBI5034 contains a 16-bit shift register and a 16-bit output latch, which convert serial input data into parallel output format. At MBI5034 output stages, sixteen regulated current ports are designed to provide uniform and constant current sinks with small skew between ports for driving LEDs within a wide range of forward voltage (V_F) variations. Users may adjust the output current from 3mA to 45mA with an external resistor R_{ext}, which provides users flexibility in controlling the light intensity of LEDs. MBI5034 guarantees to endure maximum 17V at the output ports. Besides, the high clock frequency, up to 30MHz, also satisfies the system requirements of high volume data transmission.

With the open-circuit detection, MBI5034 can detect individual LED open-circuit error without extra components. Once the dedicated command is issued, all of the output ports will be turned on with small current. Since the turn-on duration and current are so small, the flicker will not be sensed by human eyes and the image quality will not be impacted. All of the channels are detected no matter the input data is zero or one.

Floor 6-4, No. 18, Pu-Ting Rd., Hsinchu, Taiwan 30077, ROC.
TEL: +886-3-579-0068, FAX: +886-3-579-7534, E-mail: info@mblock.com.tw

In addition, MBI5034 also allows users to adjust the output current level by setting a programmable configuration code. The code is sent into MBI5034 via the pin SDI. The falling edge of LE would latch the code in the shift register into a built-in 16-bit configuration register, instead of the output latch. The gain code would affect the voltage at the terminal R-EXT and control the output current regulator. The output current can be adjusted finely by a gain ranging from 12.5% to 200% in 64 steps.

With the **Share-I-O™** technique, MBI5034 could be a drop-in replacement of predecessors. The printed circuit board originally designed for MBI5026/36/39 may be also applied to MBI5034 only that the controllers have to be upgraded and $\overline{OE}$ needs to be controllable.