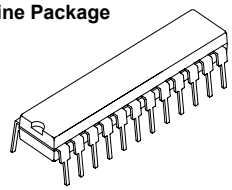
# 16-Bit Constant Current LED Sink Driver with Open/Short Circuit Detection

## Features

- Open-/Short-Circuit Detection Mode to detect individual LED errors
- 16 constant-current output channels
- Constant output current invariant to load voltage change
- Excellent output current accuracy:
  between channels: <±3% (max.), and
  between ICs: <±6% (max.)
- Output current adjusted through an external resistor
- Constant output current range: 5-90 mA
- Fast response of output current, $\overline{OE}$ (min.): 200 ns
- 25MHz clock frequency
- Schmitt trigger input
- 5V supply voltage
- Optional for “Pb-free & Green” Package

| Current Accuracy | | Conditions |
|---|---|---|
| Between Channels | Between ICs | |
| < ±3% | < ±6% | $I_{OUT}$ = 10 ~ 60 mA |

**Dual In-Line Package**



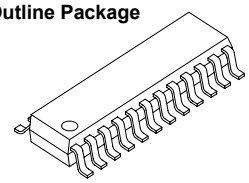
CN: P-DIP24-300-2.54

GN: P-DIP24-300-2.54

CNS: SP-DIP24-300-1.78

GNS: SP-DIP24-300-1.78

**Small Outline Package**



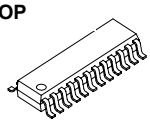
CD: SOP24-300-1.27

GD: SOP24-300-1.27

CF: SOP24-300-1.00

GF: SOP24-300-1.00

**Shrink SOP**



CP\CPA: SSOP24-150-0.64

GP\GPA: SSOP24-150-0.64


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

# Product Description

MBI5027 succeeds MBI5026 and is designed for LED displays with Open-/Short-circuit Detection extension. MBI5027 exploits PrecisionDrive™ technology to enhance its output characteristics. MBI5027 contains a 16-bit shift register and data latches, which convert serial input data into parallel output format. At MBI5027 output stage, sixteen regulated current ports are designed to provide uniform and constant current sinks for driving LEDs within a wide range of $V_F$ variations.

While MBI5027 is used in their system design for LED display applications, e.g. LED panels, it provides users with great flexibility and device performance. Users may adjust the output current from 5 mA to 90 mA through an external resistor, $R_{ext}$, which gives users flexibility in controlling the light intensity of LEDs. MBI5027 guarantees to endure maximum 17V at the output port. The high clock frequency, 25 MHz, also satisfies the system requirements of high volume data transmission.

MBI5027 exploits the idea of Share-I-O™ technology to extend its performance；in addition, MBI5027 is backward compatible with MBI5026 in both electrical characteristics and package aspect. With Share-I-O™ technology, users can let MBI5027 enter a special function mode, an Open-/Short-circuit Detection mode. In an Open-/Short-circuit Detection mode, users can set a specific sequence of signals on LE(ED1), $\overline{OE}$ (ED2) and CLK input pins. For Short-Circuit Detection mode, however, in addition to the previous steps, users need bias insufficiently LED loads, this step that can make sure to distinguish LED loads with normal current from ones with short error. In Open-/Short-circuit Detection mode, MBI5027 detects the status of individual LED connected to MBI5027. The status will be saved in the built-in shift register. Then, a system controller may read, through SDO pin, the error status from the register to know whether LEDs are properly lit or not. By setting another sequence of signals on LE(ED1), $\overline{OE}$ (ED2) and CLK input pins, MBI5027 may resume to a Normal mode and perform as MBI5026. In **Application Information**, users can get detailed ideas about how MBI5027 works in the Open-/Short-circuit Detection mode.

By means of the Share-I-O™ technique, an additionally effective function, Open-/Short-circuit Detection, can be added to LED drivers, MBI5027, without any extra pins. Thus, MBI5027 could be a drop-in replacement of MBI5026. The printed circuit board originally designed for MBI5026 may be also applicable for MBI5027.

For MBI5027, Pin LE and $\overline{OE}$ can respectively offer two functions:

| Device Type | Pin Name | Function description |
|---|---|---|
| CN\CNS\CD\CF\CP<br>GN\GNS\GD\GF\GP | Pin4 | LE + Error Detection |
| CPA<br>GPA | Pin10 | LE + Error Detection |
| CN\CNS\CD\CF\CP<br>GN\GNS\GD\GF\GP | Pin21 | $\overline{OE}$ +Error Detection |
| CPA<br>GPA | Pin3 | $\overline{OE}$ +Error Detection |