8-bit x 3 Constant Current LED Sink Driver

Features

- 24 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 -50 mA
- Fast response of output current,
  $\overline{OE}$ (min.): 200 ns @I_{out} < 60mA
  $\overline{OE}$ (min.): 400 ns @I_{out} = 60~100mA
- 25MHz clock frequency
- Schmitt trigger input
- 5V supply voltage

Current Accuracy		Conditions
Between Channels	Between ICs	
< ±3%	< ±6%	I_{OUT} = 10 ~ 50 mA, V_{DS} = 0.8V

Product Description

MBI5368 is designed for LED display applications. As an enhancement of its predecessor, MBI5001, MBI5368 exploits PrecisionDrive™ technology to enhance its output characteristics. MBI5368 contains three 8-bit constant-current drivers in one package. Each driver contains a serial buffer and data latches, which convert serial input data into parallel output format. At MBI5368 output stage, twenty-four regulated current ports are designed to provide uniform and constant current sinks for driving LEDs within a large range of Vf variations.

MBI5368 provides users with great flexibility and device performance while using MBI5368 in their system design for LED display applications, e.g. LED panels. Users may adjust the output current from 5 mA to 60 mA through an external resistor R_{ext}, which gives users flexibility in controlling the light intensity of LEDs. MBI5368 guarantees to endure maximum 17V at the output ports. The high clock frequency up to 25 MHz also satisfies the system requirements of high volume data transmission.

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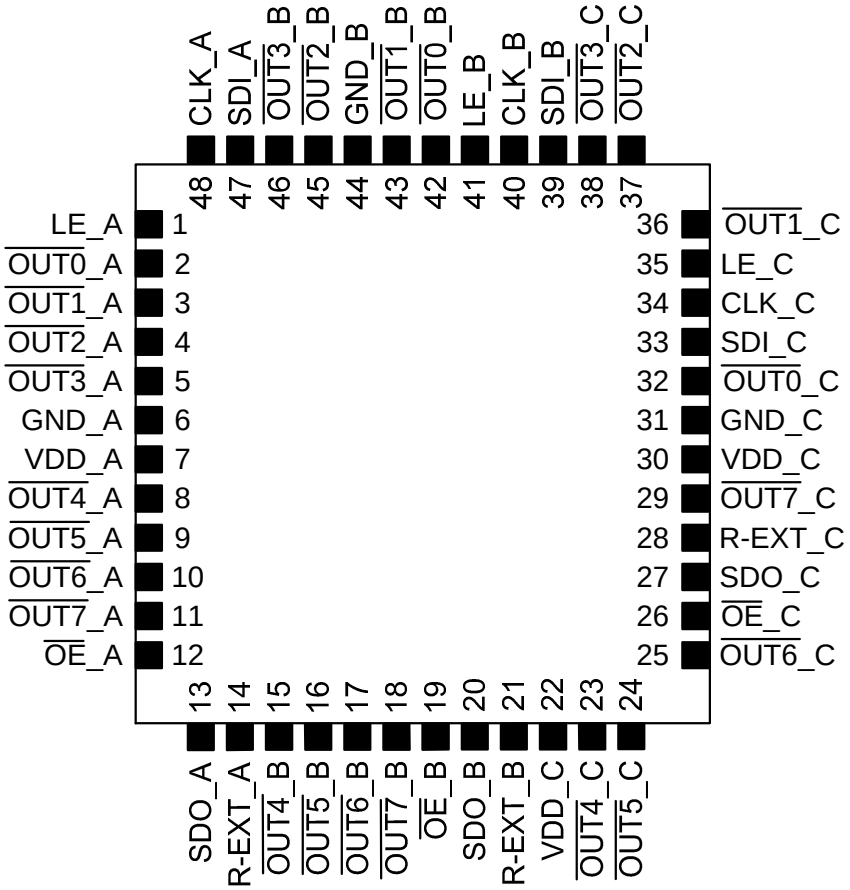
Pin Configuration

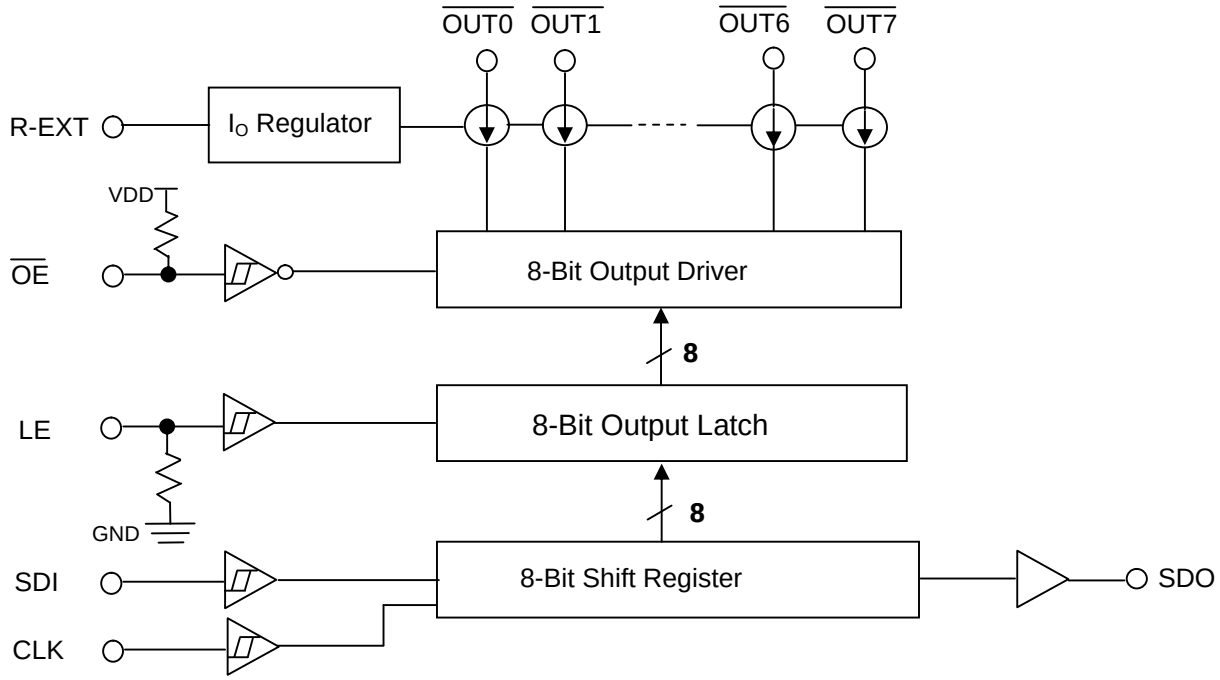


MBI5368 LQFP

Terminal Description

Pin Name	Function
GND_A, GND_B, GND_C	Ground terminal for control logic and current sinks
SDI_A, SDI_B, SDI_C	Serial-data input to the shift register
CLK_A, CLK_B, CLK_C	Clock input terminal for data shift on rising edge
LE_A, LE_B, LE_C	Data strobe input terminal Serial data is transferred to the respective latch when LE is high. The data is latched when LE goes low.
$\overline{OUT0}$_A~$\overline{OUT7}$_A, $\overline{OUT0}$_B~$\overline{OUT7}$_B, $\overline{OUT0}$_C~$\overline{OUT7}$_C	Constant current output terminals
$\overline{OE}$_A, $\overline{OE}$_B, $\overline{OE}$_C	Output enable terminal When (active) low, the output drivers are enabled; when high, all output drivers are turned OFF (blanked).
SDO_A, SDO_B, SDO_C	Serial-data output to the following SDI of next driver IC
R-EXT_A, R-EXT_B, R-EXT_C	Input terminal used to connect an external resistor for setting up output current for all output channels
VDD_A, VDD_B, VDD_C	5V supply voltage terminal

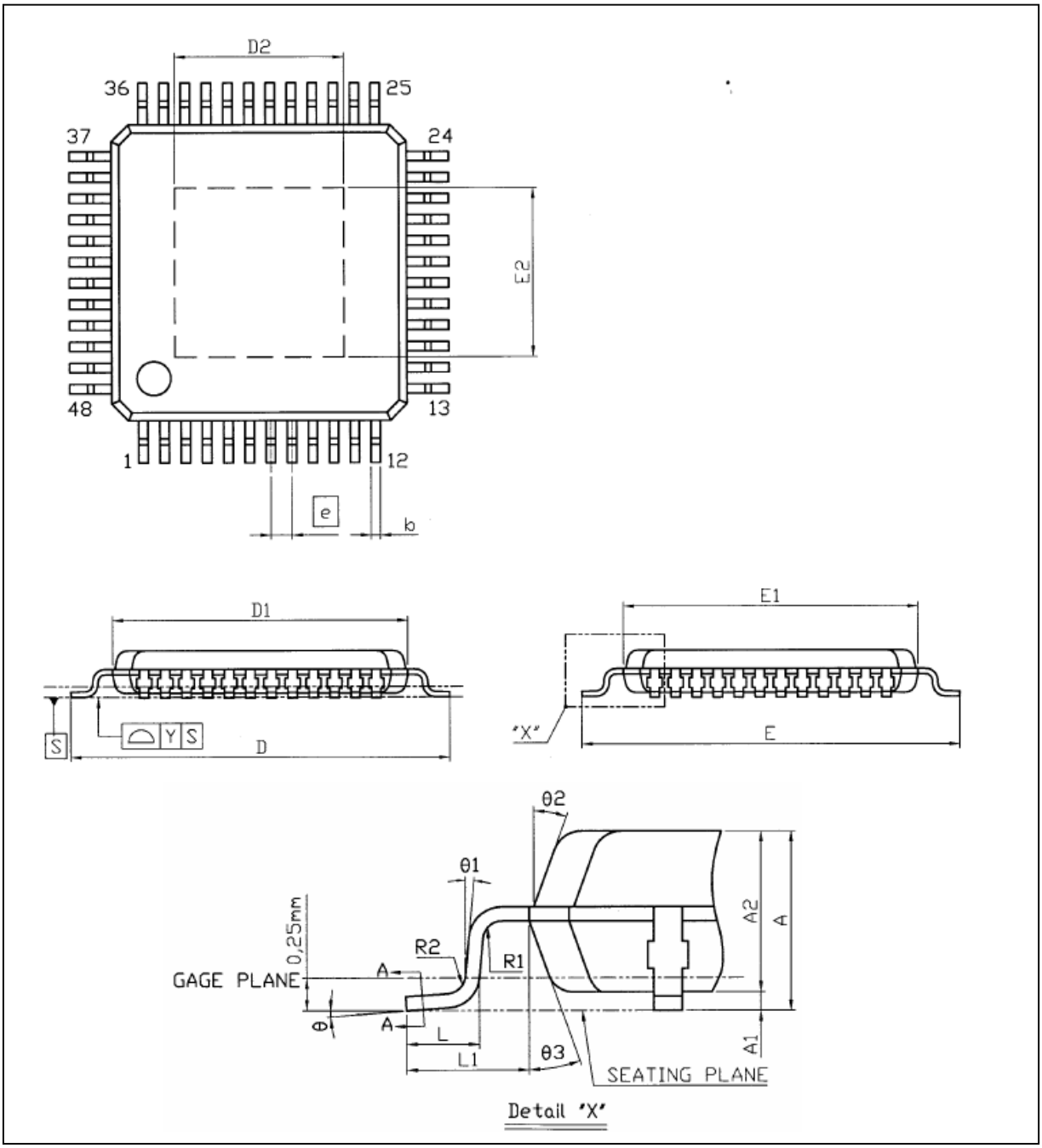
Block Diagram Each of the 8-bit LED Driver



Maximum Ratings

Characteristic		Symbol	Rating	Unit
Supply Voltage		V_{DD}	0 ~ 7.0	V
Input Voltage		V_{IN}	-0.4 ~ V_{DD}+0.4	V
Output Current		I_{OUT}	+50	mA
Output Voltage		V_{DS}	-0.5 ~ +20.0	V
Clock Frequency		F_{CLK}	25	MHz
GND Terminal Current		I_{GND}	1000	mA
Power Dissipation (On PCB, Ta=25°C)	LQFP – type	P_D	-	W
Operating Temperature		T_{opr}	-40 ~ +85	°C
Storage Temperature		T_{stg}	-55 ~ +150	°C

Package Outline



MBI5368 LQFP Outline Drawing

Symbol	Dimension (mm)			Dimension (MIL)		
	Min.	Normal	Max.	Min.	Normal	Max.
A			1.60			63
A1	0.05		0.15	2		6
A2	1.35	1.40	1.45	53	55	57
b	0.17	0.22	0.27	7	9	11
D		9.00 BSC			354 BSC	
D1		7.00 BSC			276 BSC	
D2	4	4.5	5	157	177	197
E		9.00 BSC			354 BSC	
E1		7.00 BSC			276 BSC	
E2	4	4.5	5	157	177	197
e		0.50 BSC			20 BSC	
L	0.45	0.60	0.75	18	24	30
L1		1.00 REF			39 REF	
R1	0.08			3		
R2	0.08		0.20	3		8
θ	0°	3.5°	7°	0°	3.5°	7°
θ1	0°			0°		
θ2	11°	12°	13°	11°	12°	13°
θ3	11°	12°	13°	11°	12°	13°