

## 阅读申明

- 1.本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
- 2.本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
- 3.本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描述上的差异，建议读者做出适当判断。
- 4.如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有“数据手册”字样。

## Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.
2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.
3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.
4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets" .

---

## *8-Bit Serial Input Constant-Current Latched LED Driver*

---

### **Last Time Buy**

This part is in production but has been determined to be LAST TIME BUY. This classification indicates that the product is obsolete and notice has been given. Sale of this device is currently restricted to existing customer applications. The device should not be purchased for new design applications because of obsolescence in the near future. Samples are no longer available.

Date of status change: November 1, 2010

Deadline for receipt of LAST TIME BUY orders: April 30, 2011

#### **Recommended Substitutions:**

*For existing customer transition, and for new customers or new applications, refer to the [A6279](#).*

---

NOTE: For detailed information on purchasing options, contact your local Allegro field applications engineer or sales representative.

---

*Allegro MicroSystems, Inc. reserves the right to make, from time to time, revisions to the anticipated product life cycle plan for a product to accommodate changes in production capabilities, alternative product availabilities, or market demand. The information included herein is believed to be accurate and reliable. However, Allegro MicroSystems, Inc. assumes no responsibility for its use; nor for any infringements of patents or other rights of third parties which may result from its use.*

---

## 8-Bit Serial Input Constant-Current Latched LED Driver

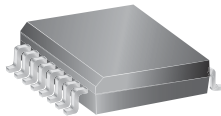
### Features and Benefits

- Up to 90 mA constant-current outputs
- Undervoltage lockout
- Low-power CMOS logic and latches
- High data-input rate
- Pin-compatible with TB62705CP

### Packages



16-pin DIP  
(A package)



16-pin SOICW  
(LW package)

Not to scale

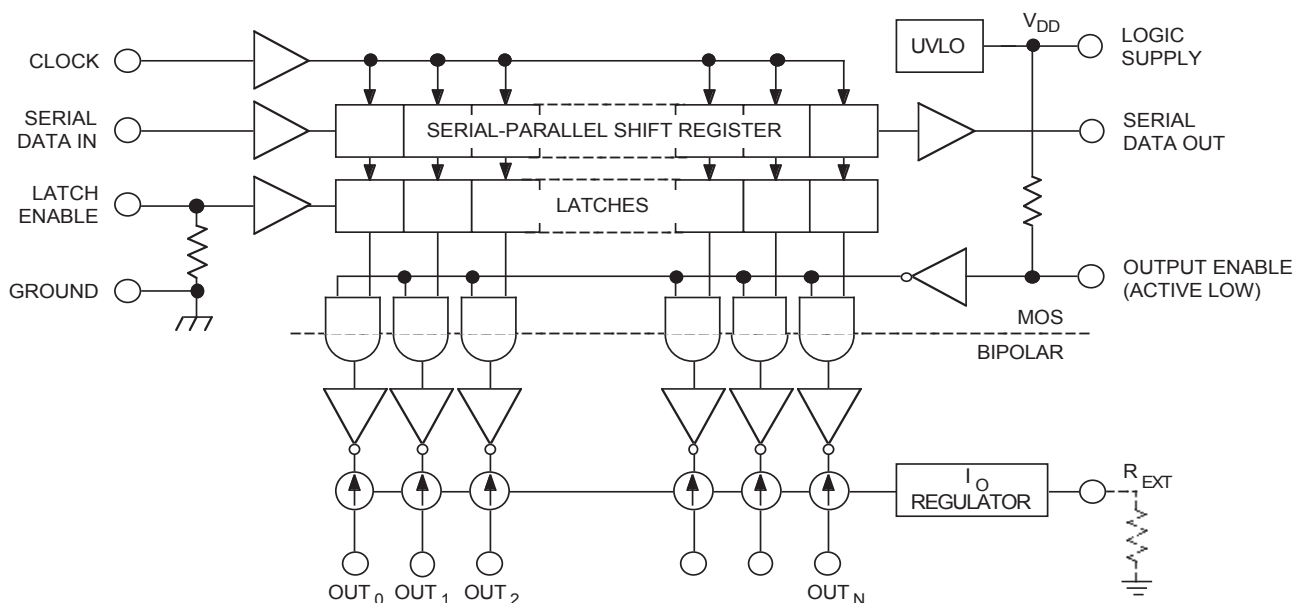
### Description

The A6275 is specifically designed for LED display applications. Each BiCMOS device includes an 8-bit CMOS shift register, accompanying data latches, and eight NPN constant-current sink drivers.

The CMOS shift register and latches allow direct interfacing with microprocessor-based systems. With a 5 V logic supply, typical serial data-input rates are up to 20 MHz. The LED drive current is determined by the user selection of a single resistor. A CMOS serial data output permits cascade connections in applications requiring additional drive lines. For inter-digit blanking, all output drivers can be disabled with an ENABLE input high. A similar 150 mA output device is available as the A6277; a similar 16-bit device is available as the A6276.

Two package styles are provided: a through-hole DIP (suffix A) and a surface-mount SOICW (suffix LW). Under normal applications, copper leadframes and low logic-power dissipation allow these devices to sink maximum rated current through all outputs continuously over the operating temperature range (90 mA, 0.9 V drop, 85°C). Both packages are lead (Pb) free, with 100% matte tin leadframe plating.

### Functional Block Diagram



Dwg. FP-013-3

# A6275

## Serial-Input Constant-Current Latched LED Driver with Open LED Detection and Dot Correction

### Selection Guide

Part Number	Package	Packing	Ambient Temperature (°C)
A6275EA-T	16-pin DIP	25 per tube	-40 to 85
A6275ELWTR-T	16-pin SOICW	1000 per reel	
A6275SLWTR-T	16-pin SOICW	1000 per reel	-20 to 85

### Absolute Maximum Ratings\*

Characteristic	Symbol	Notes	Rating	Units
Supply Voltage	$V_{DD}$		7.0	V
Input Voltage Range	$V_I$		-0.4 to $V_{DD} + 0.4$	V
Output Voltage Range	$V_O$		-0.5 to $V_{DD} + 17$	V
Output Current	$I_O$		90	mA
Ground Current	$I_{GND}$		750	mA
Operating Ambient Temperature	$T_A$	Range E	-40 to 85	°C
		Range S	-20 to 85	°C
Maximum Junction Temperature	$T_{J(max)}$		150	°C
Storage Temperature	$T_{stg}$		-55 to 150	°C

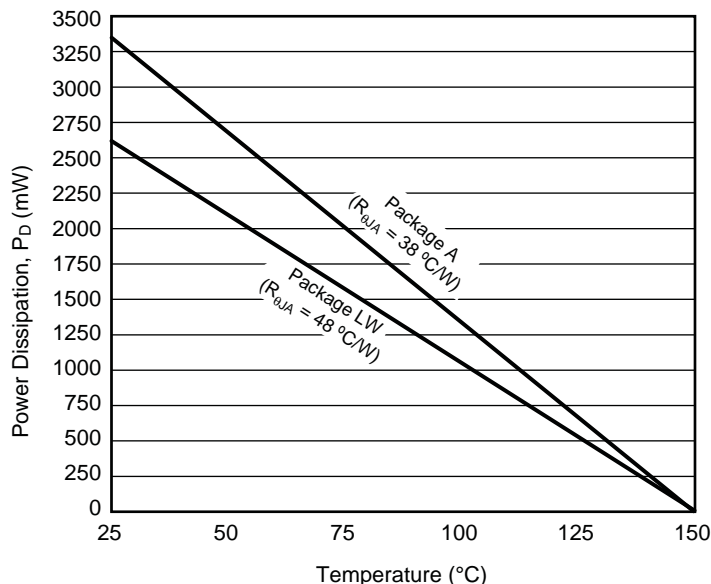
\*These CMOS devices have input static protection (Class 2) but are still susceptible to damage if exposed to extremely high static electrical charges.

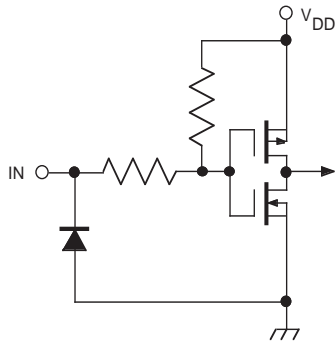
**Thermal Characteristics** may require derating at maximum conditions, see application information

Characteristic	Symbol	Test Conditions*	Value	Units
Package Thermal Resistance	$R_{\theta JA}$	Package A, 4-layer PCB based on JEDEC standard	38	°C/W
		Package LW, 4-layer PCB based on JEDEC standard	48	°C/W

\*Additional thermal information available on the Allegro website.

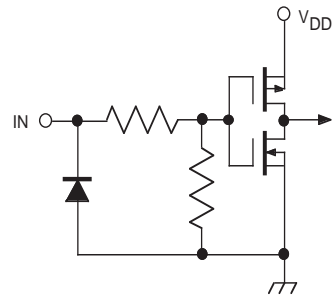
**Power Dissipation versus Ambient Temperature**





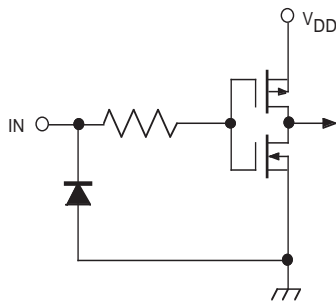
Dwg. EP-010-11

**OUTPUT ENABLE (active low)**



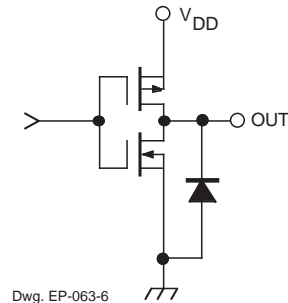
Dwg. EP-010-12

**LATCH ENABLE**



Dwg. EP-010-13

**CLOCK and SERIAL DATA IN**



Dwg. EP-063-6

**SERIAL DATA OUT**

**TRUTH TABLE**

Serial Data Input	Clock Input	Shift Register Contents						Serial Data Output	Latch Enable Input	Latch Contents						Output Enable Input	Output Contents					
		I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	...	I <sub>N-1</sub>	I <sub>N</sub>			I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	...	I <sub>N-1</sub>	I <sub>N</sub>		I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	...	I <sub>N-1</sub>	I <sub>N</sub>
H	⌋	H	R <sub>1</sub>	R <sub>2</sub>	...	R <sub>N-2</sub>	R <sub>N-1</sub>	R <sub>N-1</sub>														
L	⌋	L	R <sub>1</sub>	R <sub>2</sub>	...	R <sub>N-2</sub>	R <sub>N-1</sub>	R <sub>N-1</sub>														
X	⌋	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	...	R <sub>N-1</sub>	R <sub>N</sub>	R <sub>N</sub>														
		X	X	X	...	X	X	X	L	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	...	R <sub>N-1</sub>	R <sub>N</sub>							
		P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	...	P <sub>N-1</sub>	P <sub>N</sub>	P <sub>N</sub>	H	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	...	P <sub>N-1</sub>	P <sub>N</sub>	L	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	...	P <sub>N-1</sub>	P <sub>N</sub>
					...					X	X	X	...	X	X	H	H	H	...	H	H	

L = Low Logic (Voltage) Level    H = High Logic (Voltage) Level    X = Irrelevant    P = Present State    R = Previous State

**ELECTRICAL CHARACTERISTICS at  $T_A = +25^\circ\text{C}$ ,  $V_{DD} = 5\text{ V}$  (unless otherwise noted).**

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Unit
Supply Voltage Range	$V_{DD}$	Operating	4.5	5.0	5.5	V
Undervoltage Lockout	$V_{DD(UV)}$	$V_{DD} = 0 \rightarrow 5\text{ V}$	3.4	–	4.0	V
Output Current (any single output)	$I_O$	$V_{CE} = 0.7\text{ V}$ , $R_{EXT} = 250\ \Omega$	64.2	75.5	86.8	mA
		$V_{CE} = 0.7\text{ V}$ , $R_{EXT} = 470\ \Omega$	34.1	40.0	45.9	mA
Output Current Matching (difference between any two outputs at same $V_{CE}$ )	$\Delta I_O$	$0.4\text{ V} \leq V_{CE(A)} = V_{CE(B)} \leq 0.7\text{ V}$ : $R_{EXT} = 250\ \Omega$	–	$\pm 1.5$	$\pm 6.0$	%
		$R_{EXT} = 470\ \Omega$	–	$\pm 1.5$	$\pm 6.0$	%
Output Leakage Current	$I_{CEX}$	$V_{OH} = 15\text{ V}$	–	1.0	5.0	$\mu\text{A}$
Logic Input Voltage	$V_{IH}$		$0.7V_{DD}$	–	$V_{DD}$	V
	$V_{IL}$		GND	–	$0.3V_{DD}$	V
SERIAL DATA OUT Voltage	$V_{OL}$	$I_{OL} = 500\ \mu\text{A}$	–	–	0.4	V
	$V_{OH}$	$I_{OH} = -500\ \mu\text{A}$	4.6	–	–	V
Input Resistance	$R_I$	ENABLE Input, Pull Up	150	300	600	k $\Omega$
		LATCH Input, Pull Down	100	200	400	k $\Omega$
Supply Current	$I_{DD(OFF)}$	$R_{EXT} = \text{open}$ , $V_{OE} = 5\text{ V}$	–	0.8	1.4	mA
		$R_{EXT} = 470\ \Omega$ , $V_{OE} = 5\text{ V}$	3.5	6.0	8.0	mA
		$R_{EXT} = 250\ \Omega$ , $V_{OE} = 5\text{ V}$	6.5	11	15	mA
	$I_{DD(ON)}$	$R_{EXT} = 470\ \Omega$ , $V_{OE} = 0\text{ V}$	5.0	10	14	mA
		$R_{EXT} = 250\ \Omega$ , $V_{OE} = 0\text{ V}$	8.0	16	24	mA

Typical Data is at  $V_{DD} = 5\text{ V}$  and is for design information only.

**SWITCHING CHARACTERISTICS** at  $T_A = 25^\circ\text{C}$ ,  $V_{DD} = V_{IH} = 5\text{ V}$ ,  $V_{CE} = 0.4\text{ V}$ ,  $V_{IL} = 0\text{ V}$ ,  $R_{EXT} = 470\ \Omega$ ,  $I_O = 40\text{ mA}$ ,  $V_L = 3\text{ V}$ ,  $R_L = 65\ \Omega$ ,  $C_L = 10.5\text{ pF}$ .

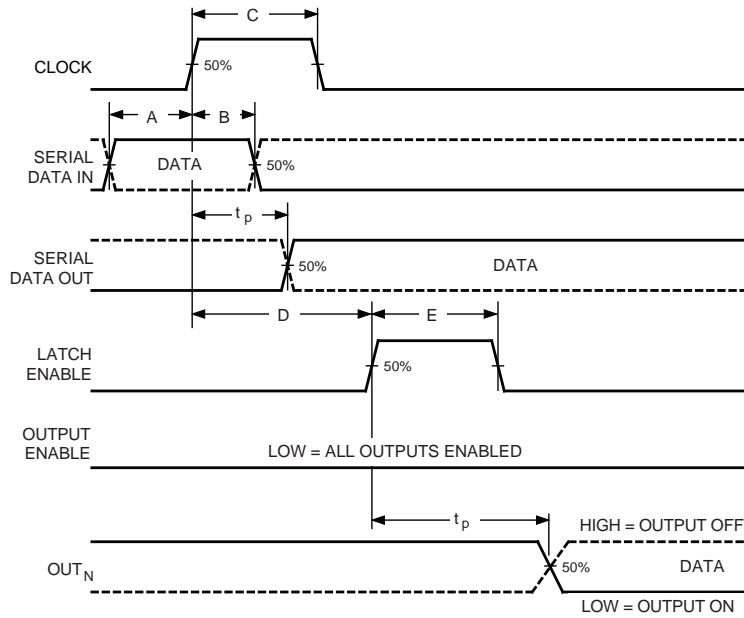
Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Unit
Propagation Delay Time	$t_{pHL}$	CLOCK-OUT <sub>n</sub>	–	350	1000	ns
		LATCH-OUT <sub>n</sub>	–	350	1000	ns
		ENABLE-OUT <sub>n</sub>	–	350	1000	ns
		CLOCK-SERIAL DATA OUT	–	40	–	ns
Propagation Delay Time	$t_{pLH}$	CLOCK-OUT <sub>n</sub>	–	300	1000	ns
		LATCH-OUT <sub>n</sub>	–	300	1000	ns
		ENABLE-OUT <sub>n</sub>	–	300	1000	ns
		CLOCK-SERIAL DATA OUT	–	40	–	ns
Output Fall Time	$t_f$	90% to 10% voltage	150	350	1000	ns
Output Rise Time	$t_r$	10% to 90% voltage	150	300	600	ns

## RECOMMENDED OPERATING CONDITIONS

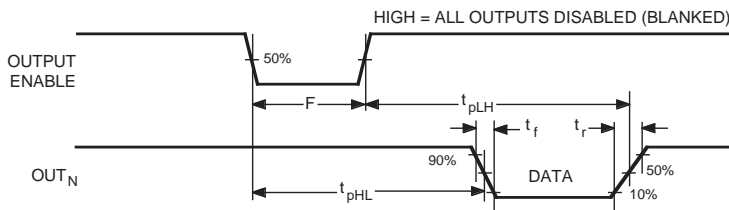
Characteristic	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	$V_{DD}$		4.5	5.0	5.5	V
Output Voltage	$V_O$		–	1.0	4.0	V
Output Current	$I_O$	Continuous, any one output	–	–	90	mA
	$I_{OH}$	SERIAL DATA OUT	–	–	-1.0	mA
	$I_{OL}$	SERIAL DATA OUT	–	–	1.0	mA
Logic Input Voltage	$V_{IH}$		$0.7V_{DD}$	–	$V_{DD} + 0.3$	V
	$V_{IL}$		-0.3	–	$0.3V_{DD}$	V
Clock Frequency	$f_{CK}$	Cascade operation	–	–	10	MHz

**TIMING REQUIREMENTS and SPECIFICATIONS**

(Logic Levels are  $V_{DD}$  and Ground)



Dwg. WP-029-1



Dwg. WP-030-1A

- A.** Data Active Time Before Clock Pulse (Data Set-Up Time),  $t_{su(D)}$  ..... **50 ns**
- B.** Data Active Time After Clock Pulse (Data Hold Time),  $t_{h(D)}$  ..... **20 ns**
- C.** Clock Pulse Width,  $t_{w(CK)}$  ..... **50 ns**
- D.** Time Between Clock Activation and Latch Enable,  $t_{su(L)}$  ..... **100 ns**
- E.** Latch Enable Pulse Width,  $t_{w(L)}$  ..... **100 ns**
- F.** Output Enable Pulse Width,  $t_{w(OE)}$  ..... **4.5  $\mu$ s**

NOTE: Timing is representative of a 10 MHz clock. Significantly higher speeds are attainable.  
Max. Clock Transition Time,  $t_r$  or  $t_f$  ..... **10  $\mu$ s**

Serial data present at the input is transferred to the shift register on the logic 0-to-logic 1 transition of the CLOCK input pulse. On succeeding CLOCK pulses, the registers shift data information towards the SERIAL DATA OUTPUT. The serial data must appear at the input prior to the rising edge of the CLOCK input waveform.

Information present at any register is transferred to the respective latch when the LATCH ENABLE is high (serial-to-parallel conversion). The latches continue to accept new data as

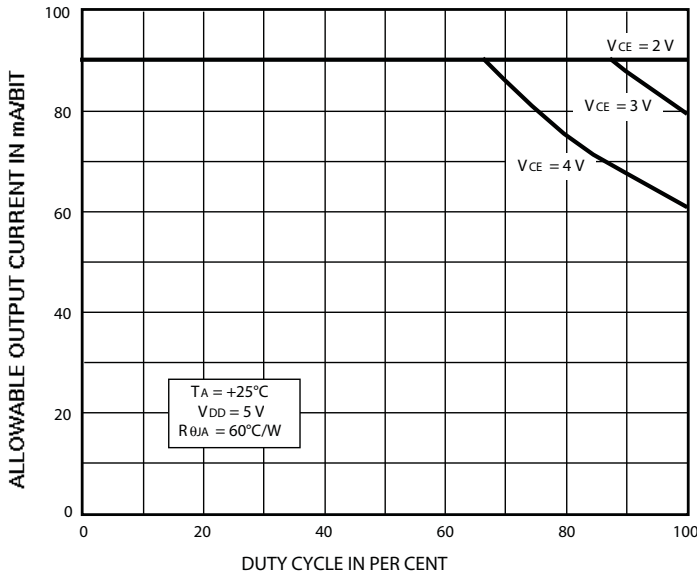
long as the LATCH ENABLE is held high. Applications where the latches are bypassed (LATCH ENABLE tied high) will require that the OUTPUT ENABLE input be high during serial data entry.

When the OUTPUT ENABLE input is high, the output sink drivers are disabled (OFF). The information stored in the latches is not affected by the OUTPUT ENABLE input. With the OUTPUT ENABLE input low, the outputs are controlled by the state of their respective latches.

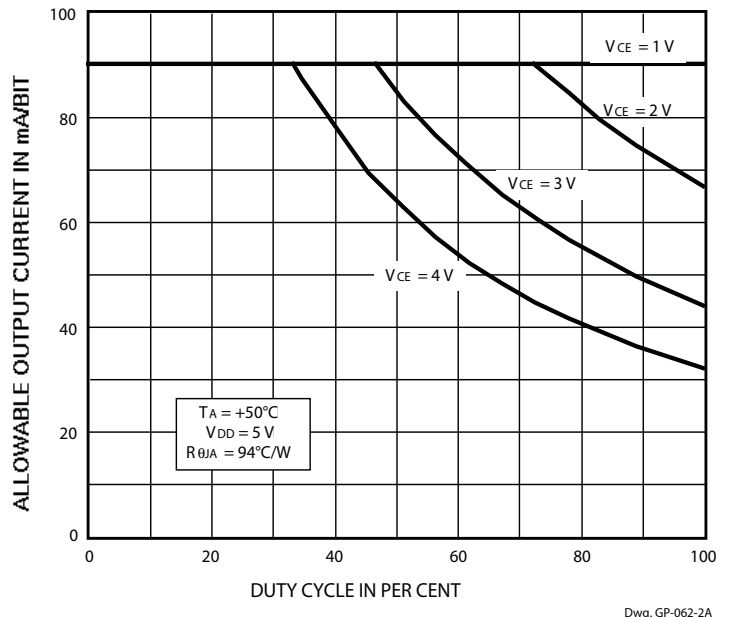
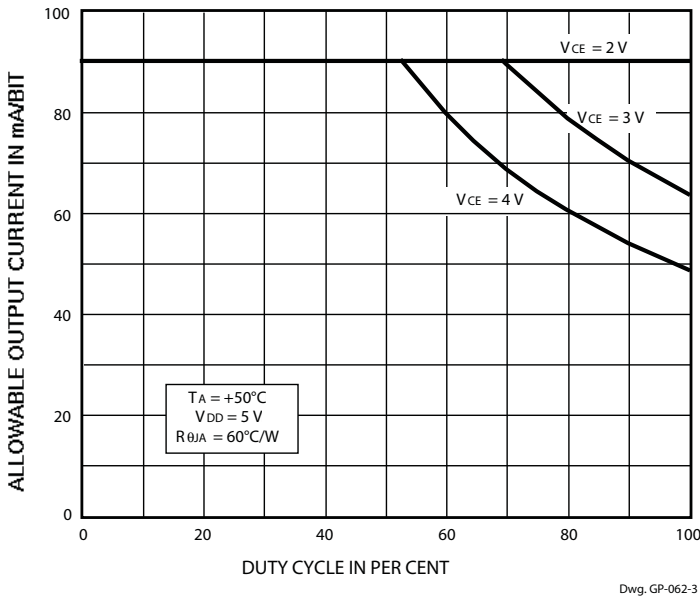
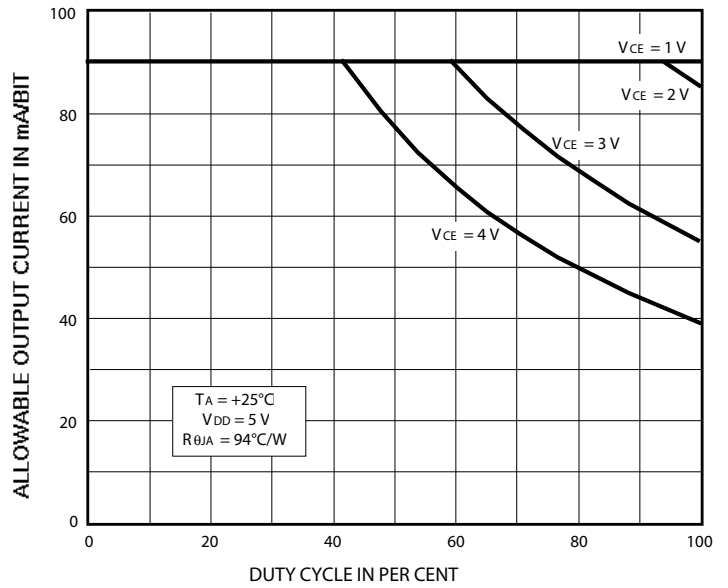


**ALLOWABLE OUTPUT CURRENT AS A FUNCTION OF DUTY CYCLE**

**A Package**

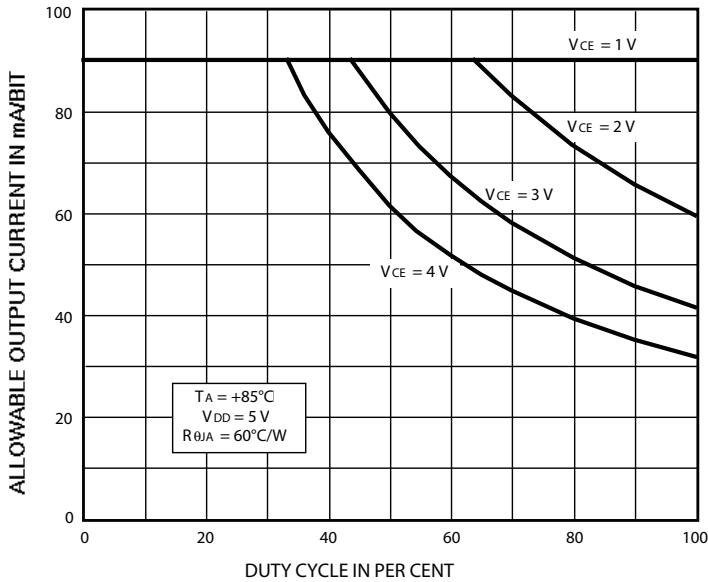


**LW Package**



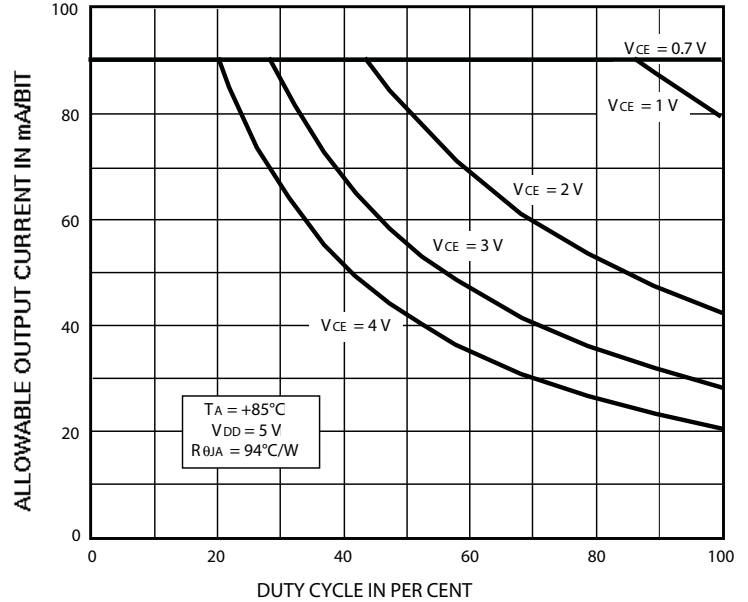
### ALLOWABLE OUTPUT CURRENT AS A FUNCTION OF DUTY CYCLE (cont.)

#### A Package



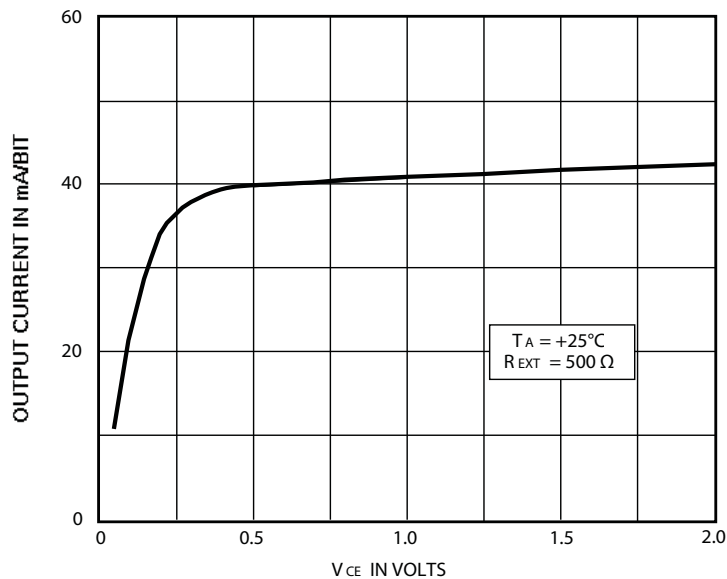
Dwg. GP-062-1

#### LW Package



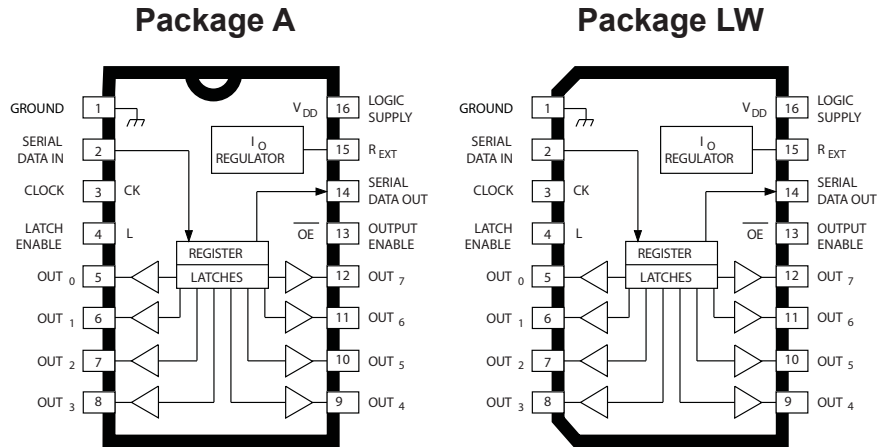
Dwg. GP-062A

### TYPICAL CHARACTERISTICS



Dwg. GP-063

**Pin-out Diagrams**

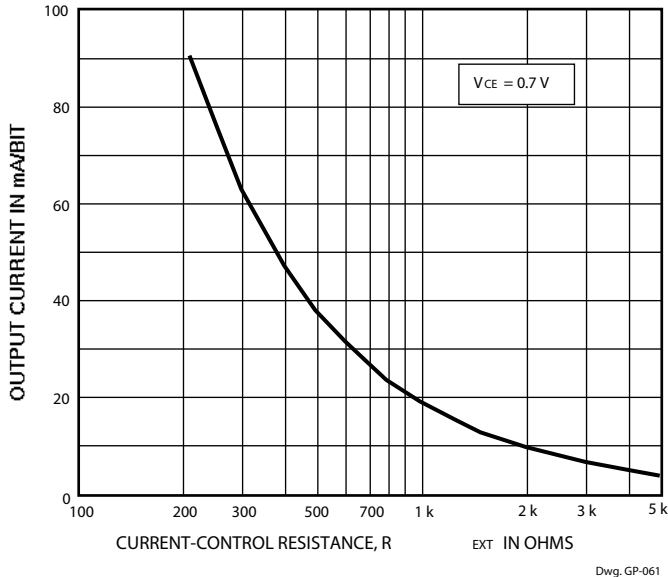


**TERMINAL DESCRIPTION**

Terminal No.	Terminal Name	Function
1	GND	Reference terminal for control logic.
2	SERIAL DATA IN	Serial-data input to the shift-register.
3	CLOCK	Clock input terminal for data shift on rising edge.
4	LATCH ENABLE	Data strobe input terminal; serial data is latched with high-level input.
5-12	OUT <sub>0-7</sub>	The eight current-sinking output terminals.
13	OUTPUT ENABLE	When (active) low, the output drivers are enabled; when high, all output drivers are turned OFF (blanked).
14	SERIAL DATA OUT	CMOS serial-data output to the following shift-register.
15	R <sub>EXT</sub>	An external resistor at this terminal establishes the output current for all sink drivers.
16	SUPPLY	(V <sub>DD</sub> ) The logic supply voltage (typically 5 V).

## Applications Information

The load current per bit ( $I_O$ ) is set by the external resistor ( $R_{EXT}$ ) as shown in the figure below.



**Package Power Dissipation ( $P_D$ ).** The maximum allowable package power dissipation is determined as

$$P_{D(max)} = (150 - T_A) / R_{\theta JA}$$

The actual package power dissipation is

$$P_{D(act)} = dc(V_{CE} \times I_O \times 8) + (V_{DD} \times I_{DD})$$

When the load supply voltage is greater than 3 V to 5 V, considering the package power dissipating limits of these devices, or if  $P_{D(act)} > P_{D(max)}$ , an external voltage reducer ( $V_{DROP}$ ) should be used.

**Load Supply Voltage ( $V_{LED}$ ).** These devices are designed to operate with driver voltage drops ( $V_{CE}$ ) of 0.4 V to 0.7 V with LED forward voltages ( $V_F$ ) of 1.2 V to 4.0 V. If higher voltages are dropped across the driver, package power dissipation will be increased significantly. To minimize package power dissipation, it is recommended to use the lowest possible load supply voltage or to set any series dropping voltage ( $V_{DROP}$ ) as

$$V_{DROP} = V_{LED} - V_F - V_{CE}$$

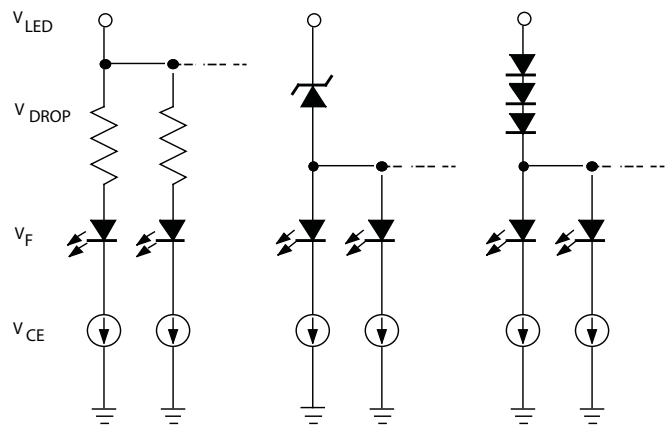
with  $V_{DROP} = I_o \times R_{DROP}$  for a single driver, or a Zener diode ( $V_Z$ ), or a series string of diodes (approximately

0.7 V per diode) for a group of drivers. If the available voltage source will cause unacceptable dissipation and series resistors or diode(s) are undesirable, a regulator such as the Sanken Series SAI or Series SI can be used to provide supply voltages as low as 3.3 V.

For reference, typical LED forward voltages are:

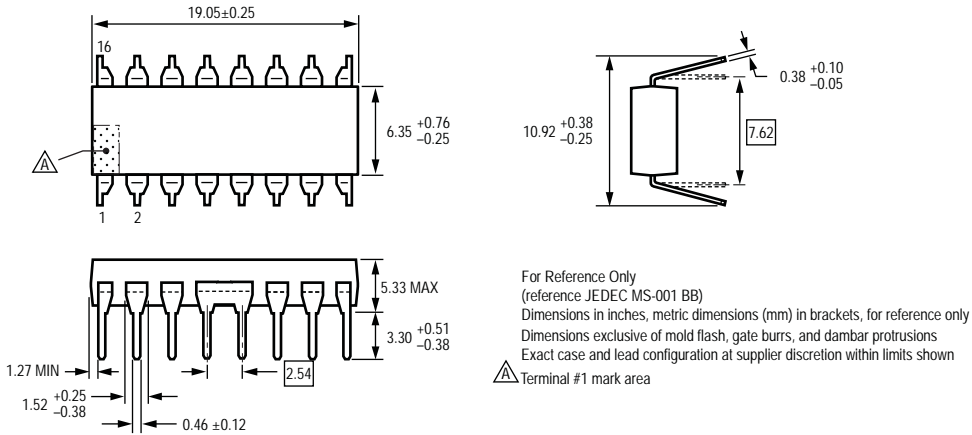
White	3.5 – 4.0 V
Blue	3.0 – 4.0 V
Green	1.8 – 2.2 V
Yellow	2.0 – 2.1 V
Amber	1.9 – 2.65 V
Red	1.6 – 2.25 V
Infrared	1.2 – 1.5 V

**Pattern Layout.** This device has a common logic-ground and power-ground terminal. If ground pattern layout contains large common-mode resistance, and the voltage between the system ground and the LATCH ENABLE or CLOCK terminals exceeds 2.5 V (because of switching noise), these devices may not operate correctly.

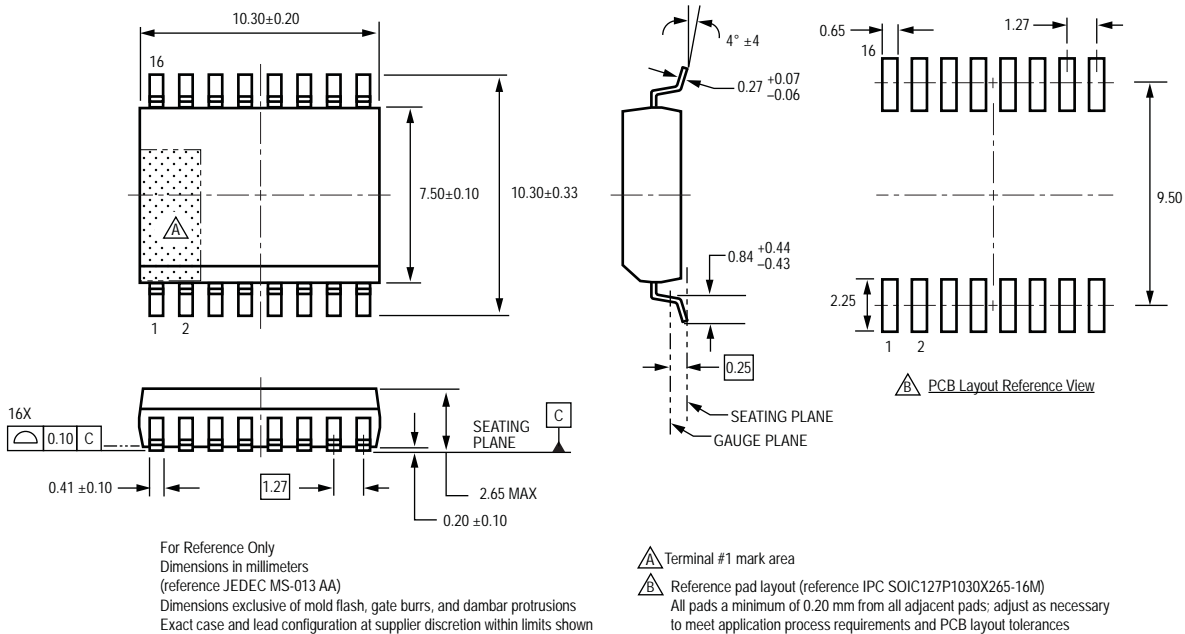


Dwg. EP-064

## Package A 16-Pin DIP



## Package LW 16-Pin SOICW



Copyright ©2000-2008, Allegro MicroSystems, Inc.

The products described here are manufactured under one or more U.S. patents or U.S. patents pending.

Allegro MicroSystems, Inc. reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the performance, reliability, or manufacturability of its products. Before placing an order, the user is cautioned to verify that the information being relied upon is current.

Allegro's products are not to be used in life support devices or systems, if a failure of an Allegro product can reasonably be expected to cause the failure of that life support device or system, or to affect the safety or effectiveness of that device or system.

The information included herein is believed to be accurate and reliable. However, Allegro MicroSystems, Inc. assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.

For the latest version of this document, visit our website:

[www.allegromicro.com](http://www.allegromicro.com)

