

## Simple 90V 20mA Temperature Compensated Constant Current LED Driver IC

### Features

- ❑ 5.0V to 90V operating range ( $V_{A-B}$ )
- ❑ 20mA  $\pm 10\%$  at 5-90V
- ❑ 0.01% / °C Typical Temperature Coefficient
- ❑ TO-243AA (SOT-89), TO-252 (D-PAK), & TO-92 packages
- ❑ No external components (two terminal device)
- ❑ Can be paralleled for higher current

### Applications

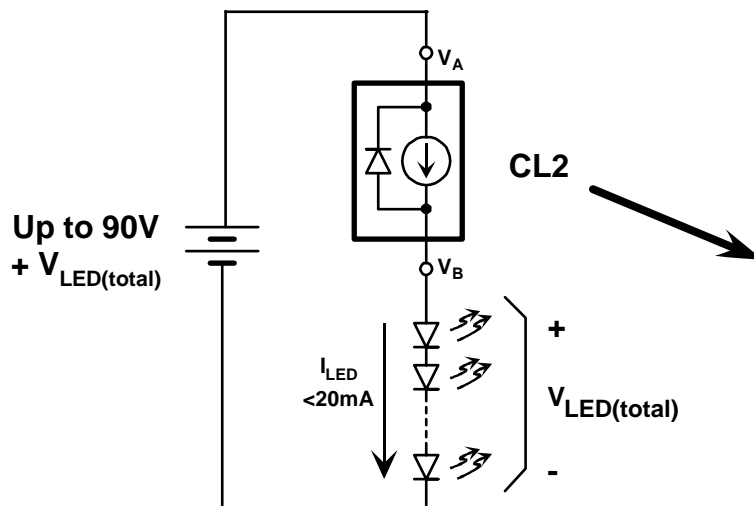
- ❑ LED driver
- ❑ Industrial lamp indicators
- ❑ Signage
- ❑ Accent lighting
- ❑ Automotive
- ❑ Constant current source
- ❑ Constant current sink

### General Description

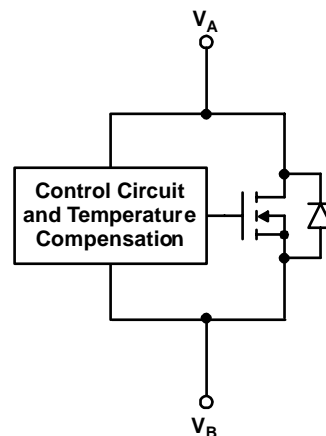
The Supertex CL2 is a high voltage, temperature compensated, constant current source. The device is trimmed to provide a constant current of 20mA $\pm 10\%$  at an input voltage of 5-90V. No external components are required. The device can be used as a two terminal constant current source or constant current sink.

A typical application for the CL2 is to drive LEDs with a constant current of 20mA. They can also be used in parallel to provide higher currents such as 40mA, 60mA or 80mA. The device is available in SOT-89, TO-252 (D-PAK), and TO-92 packages.

### Typical Application Circuit



### Functional Circuit Diagram



## Ordering Information

Order Number / Package		
TO-92	TO-243AA*	TO-252
CL2N3	CL2N8	CL2K4

\*Same as SOT-89 product supplied on 2000 piece tape reels.

## Thermal Characteristics

Package	Power Dissipation @ T <sub>A</sub> = 25°C	θ <sub>JC</sub> °C/W	θ <sub>JA</sub> °C/W
TO-92	0.6W	125	170
TO-243AA (SOT-89)	1.3W*	15	78*
TO-252 (D-PAK)	2.0W*	6.0	50*

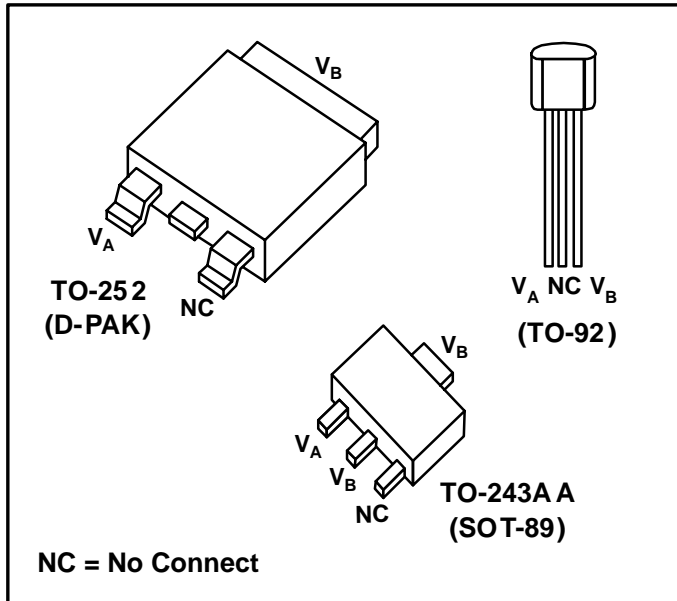
\* Mounted on FR4 board; 25mm x 25mm x 1.57mm.

## Absolute Maximum Ratings\*

V <sub>A-B</sub> , Operating Voltage	100V
T <sub>J</sub> , Operating Junction Temperature	-40°C to +125°C
T <sub>s</sub> , Storage Temperature	-55°C to +150°C

\*Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability.

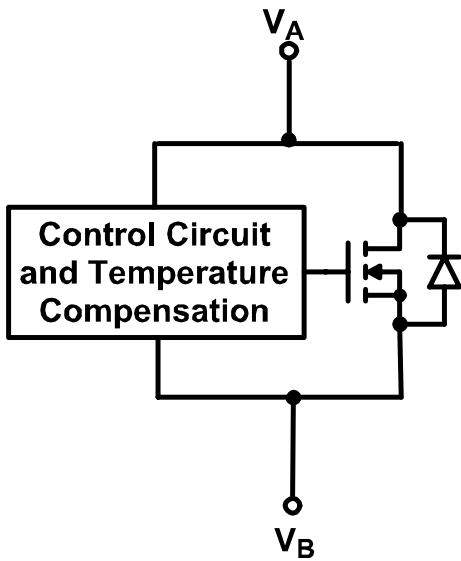
## Package Options



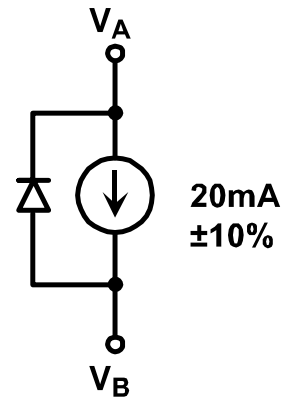
**Electrical Characteristics** (@  $T_J = 25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$V_{A-B}$	Maximum operating voltage			90	V	
$I_{A-B}$	Current regulation	18.0	20.0	22.0	mA	$V_{A-B} = 5-90\text{V}$
$\Delta I_{A-B}/\Delta T$	$I_{A-B}$ temperature coefficient		0.01		%/ $^\circ\text{C}$	$V_{A-B} = 45\text{V}$ , $T_J = -40^\circ\text{C}$ to $100^\circ\text{C}$
$T_J$	Operating junction temperature	-40		125	$^\circ\text{C}$	
$R_{A-B}$	Dynamic resistance		300k		$\Omega$	

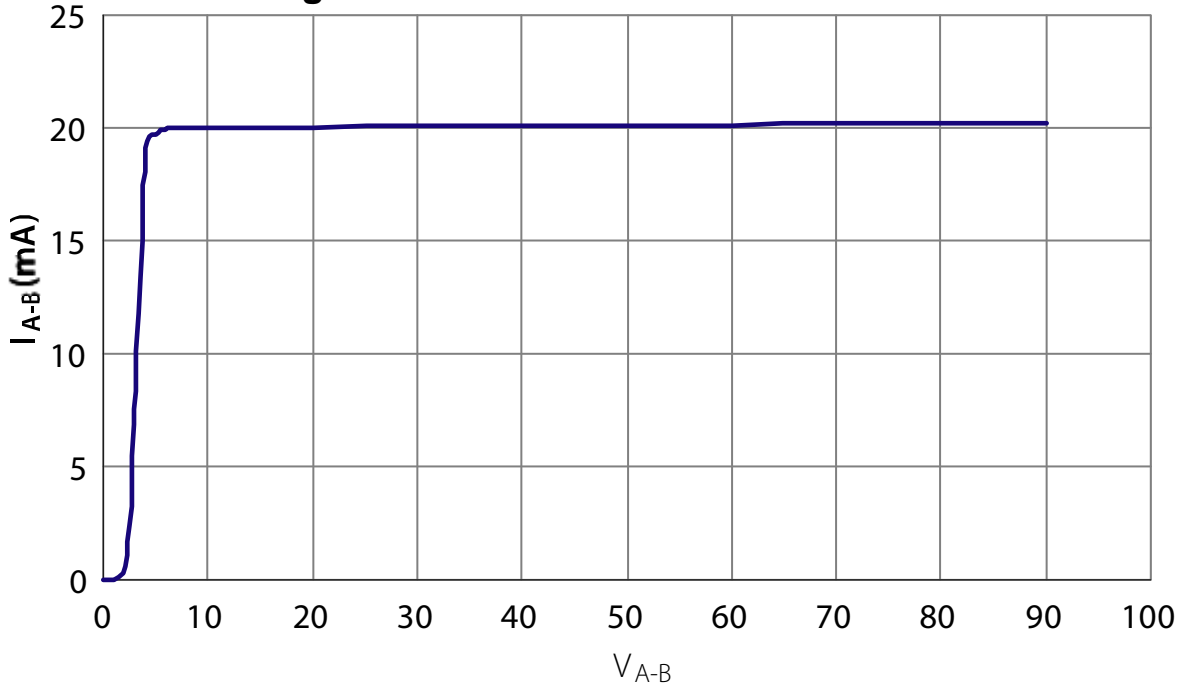
**Functional Circuit Diagram**



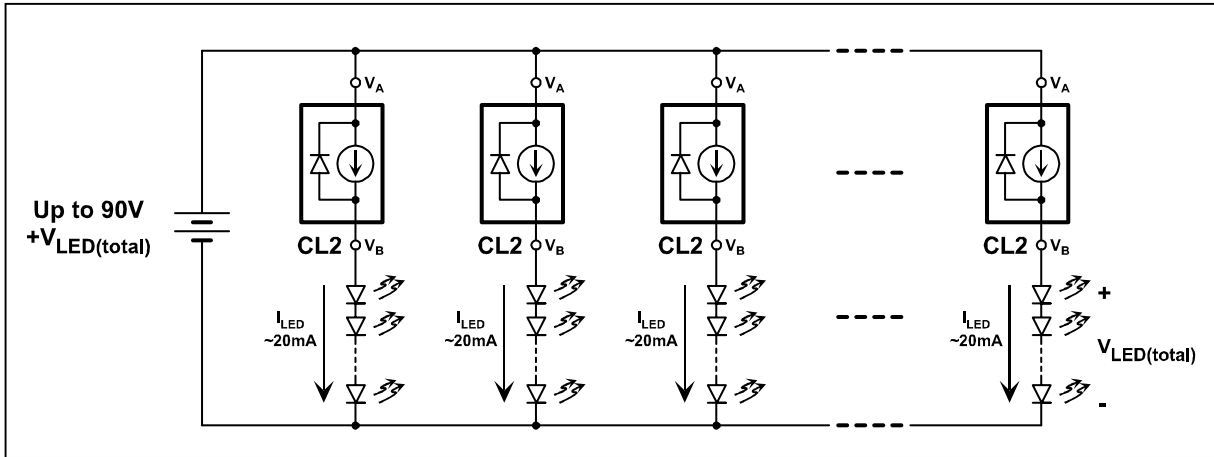
**Equivalent Block Diagram**



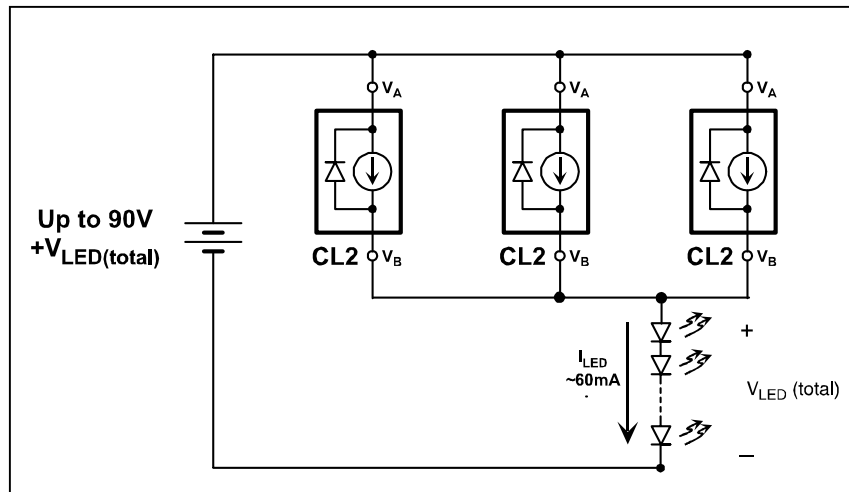
**Output Current vs. Voltage**



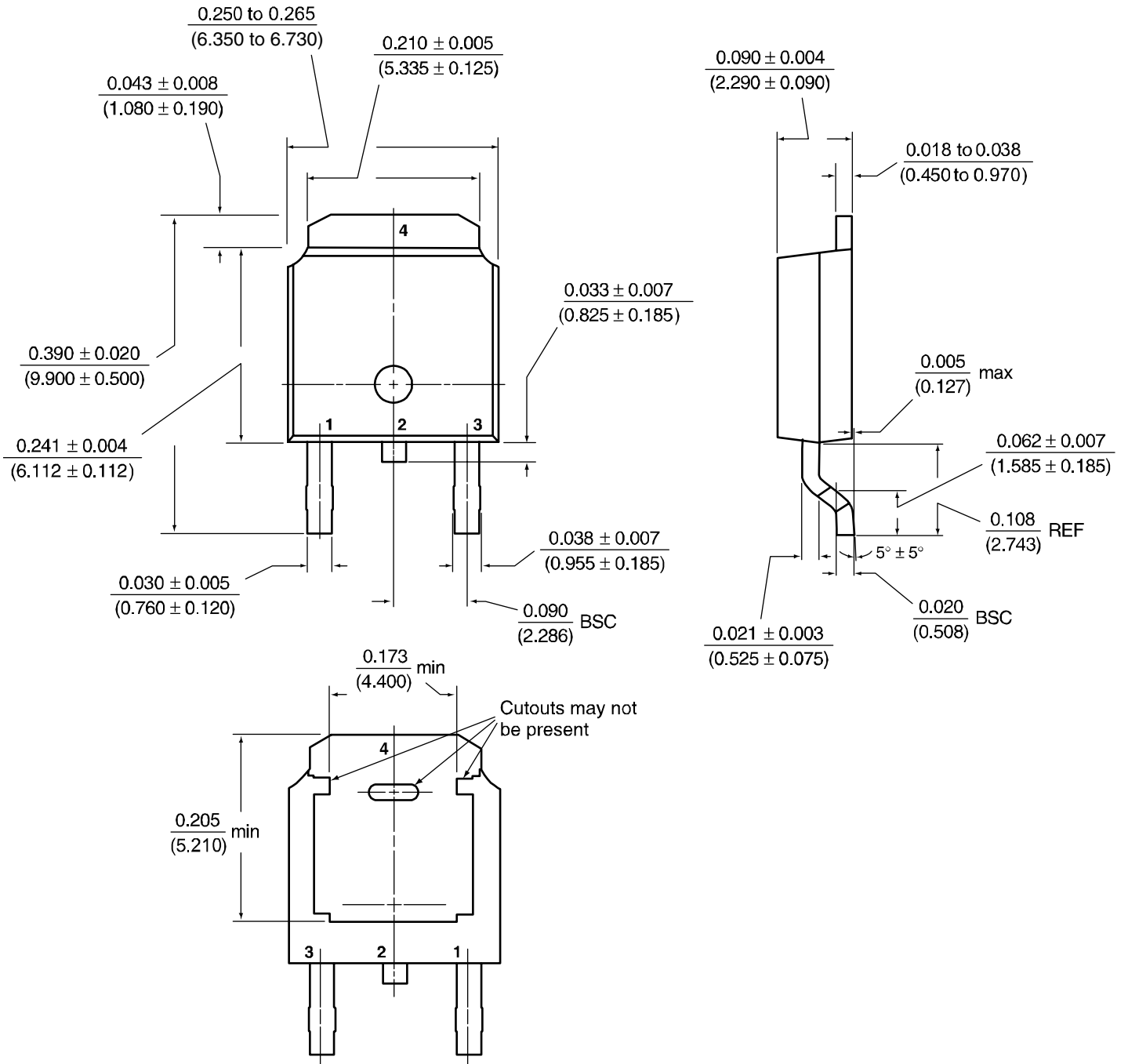
### CL2 for Multiple LED Strings



### CL2 for Higher Current

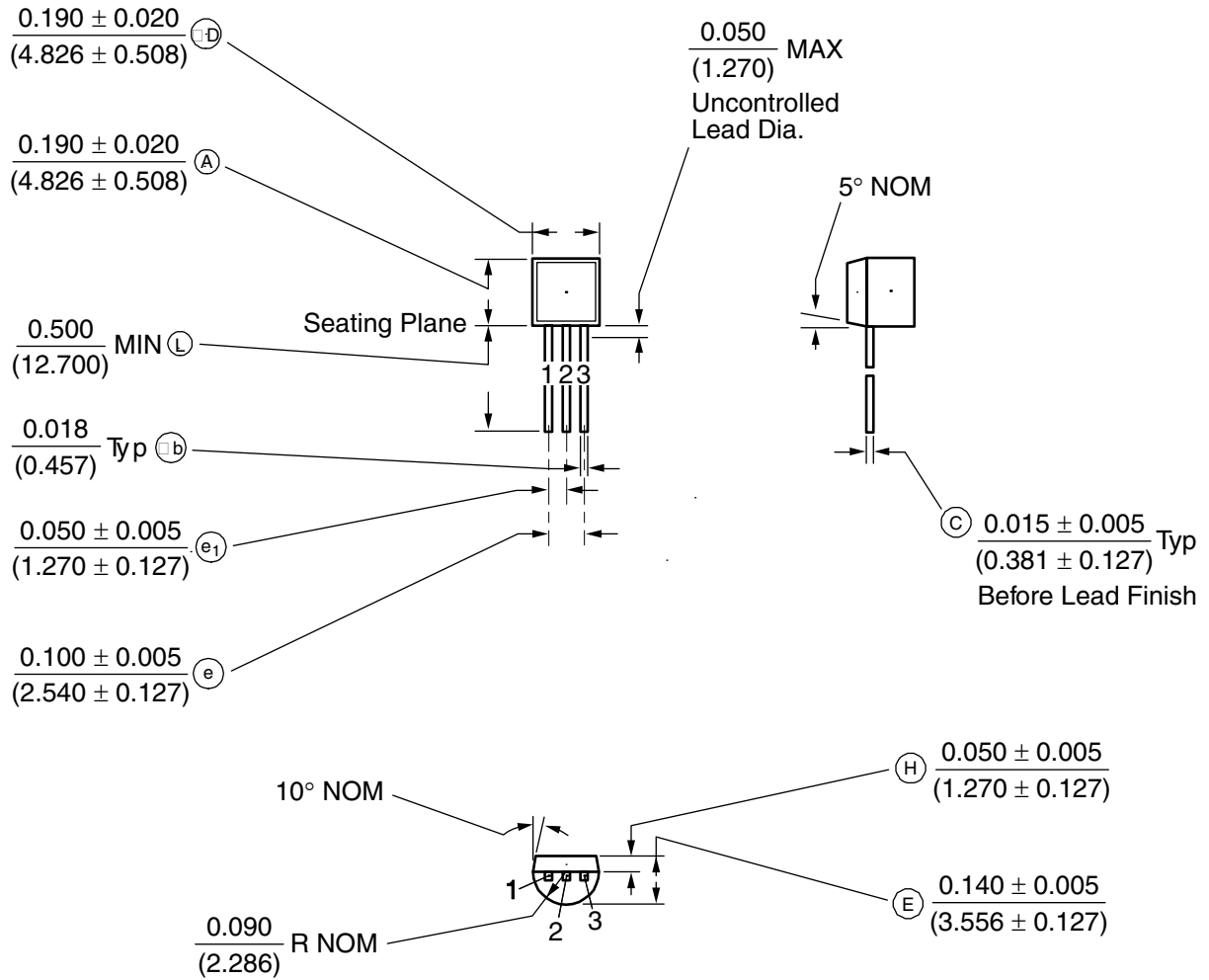


### 3 Lead TO-252 (D-PAK) Package (K4)



Measurement Legend =  $\frac{\text{Dimensions in Inches}}{\text{(Dimensions in Millimeters)}}$

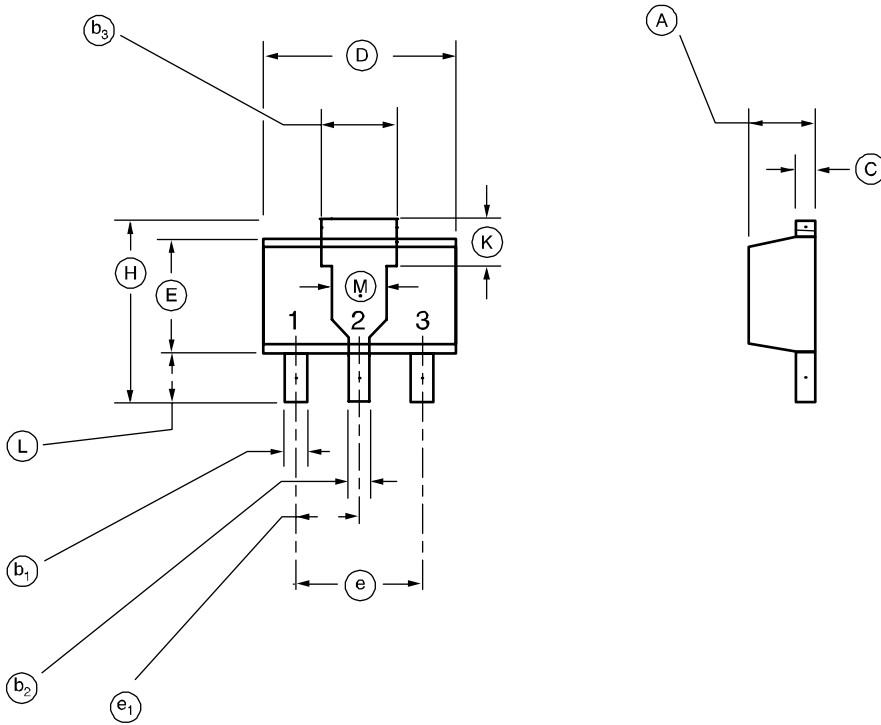
# 3 Lead TO-92 Plastic Package (N3)



Note: Circle (e.g. (B)) indicates JEDEC Reference.

Measurement Legend =  $\frac{\text{Dimensions in Inches}}{\text{(Dimensions in Millimeters)}}$

### 3-LEAD TO-243AA (SOT-89) Surface Mount Package (N8)



Dimensions				
Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	0.055	0.063	1.40	1.60
b1	0.014	0.019	0.35	0.48
b2	0.017	0.023	0.44	0.58
b3	0.064	0.072	1.62	1.83
C	0.014	0.017	0.35	0.44
D	0.173	0.181	4.40	4.60
E	0.090	0.102	2.29	2.60
e	.118BSC		3.00BSC	
e1	.059BSC		1.15BSC	
H	0.156	0.167	3.90	4.25
L	0.035	0.047	0.88	1.20
K	0.037	0.040	0.93	1.05
M	0.047	0.049	1.20	1.25

**Supertex inc.** does not recommend the use of its products in life support applications and will not knowingly sell its products for use in such applications unless it receives an adequate "products liability indemnification insurance agreement". **Supertex** does not assume responsibility for use of devices described and limits its liability to the replacement of the devices determined defective due to workmanship. No responsibility is assumed for possible omissions or inaccuracies. Circuitry and specifications are subject to change without notice. For the latest product specifications, refer to the **Supertex** website: <http://www.supertex.com>. For complete liability information on all **Supertex** products, refer to the most current databook or to the Legal/ Disclaimer page on the **Supertex** website.