

## Simple 90V, 25mA, Temperature Compensated, Constant Current, LED Driver IC

### Features

- ▶ 5.0V to 90V operating range ( $V_{A-B}$ )
- ▶ 25mA  $\pm 10\%$  at 5-90V
- ▶ 0.01% / °C typical temperature coefficient
- ▶ No external components (two terminal device)
- ▶ Can be paralleled for higher current

### Applications

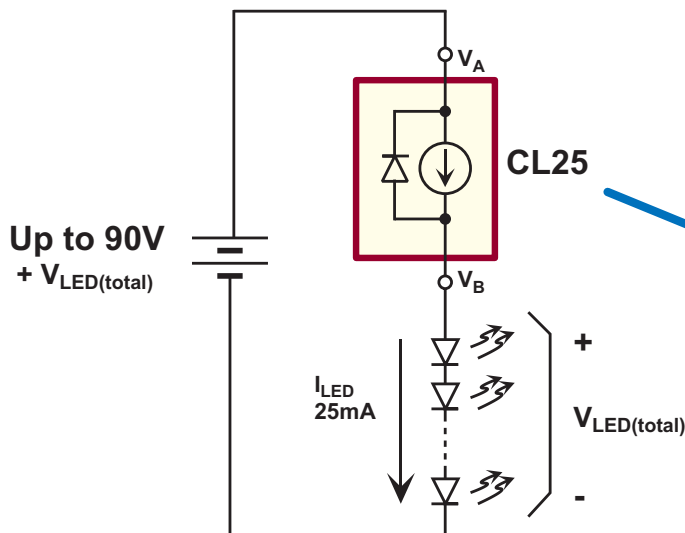
- ▶ LED channel lighting
- ▶ Industrial lamp indicators
- ▶ Accent lighting

### General Description

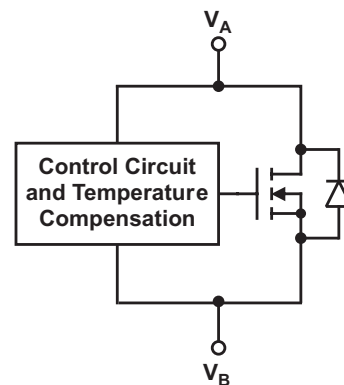
The Supertex CL25 is a high voltage, temperature compensated, constant current source. The device is trimmed to provide a constant current of 25mA  $\pm 10\%$  at an input voltage of 5-90V. No external components are required. The device can be used as a two terminal constant current source or constant current sink.

A typical application for the CL25 is to drive LEDs with a constant current of 25mA. They can also be used in parallel to provide higher currents such as 50mA, 75mA or 100mA. The device is available in TO-92 and TO-243AA (SOT-89) packaging.

### Typical Application Circuit



### Functional Circuit Diagram



## Ordering Information

| Device | Package Options |                   |
|--------|-----------------|-------------------|
|        | TO-92           | TO-243AA (SOT-89) |
| CL25   | CL25N3-G        | CL25N8-G          |

-G indicates package is RoHS compliant ('Green')



## Thermal Characteristics

| Package           | Power Dissipation @ $T_A = 25^\circ\text{C}$ | $\theta_{JC}$ °C/W | $\theta_{JA}$ °C/W |
|-------------------|--|--------------------|--------------------|
| TO-92             | 0.6W   | 125                | 170                |
| TO-243AA (SOT-89) | 1.3W*  | 15                 | 78*                |

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

## Absolute Maximum Ratings

| Parameter                             | Value           |
|---------------------------------------|-----------------|
| Operating voltage, $V_{A-B}$          | 100V            |
| Operating junction temperature, $T_J$ | -40°C to +125°C |
| Storage temperature, $T_S$            | -55°C to +150°C |

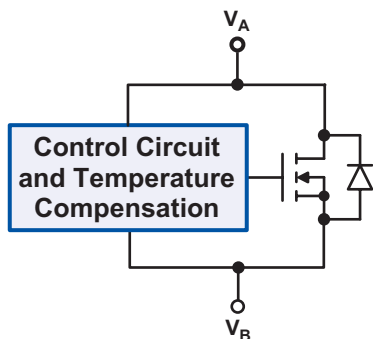
Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

## Electrical Characteristics

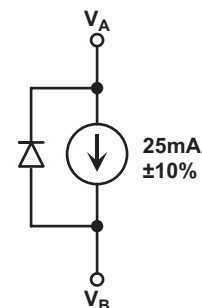
( $T_J=25^\circ\text{C}$  unless otherwise specified)

| Symbol                    | Parameter                         | Min  | Typ  | Max  | Units    | Conditions   |
|---------------------------|-----------------------------------|------|------|------|----------|--|
| $V_{A-B}$                 | Operating voltage                 | 5    | -    | 90   | V        | ---  |
| $I_{A-B}$                 | Current regulation                | 22.5 | 25   | 27.5 | mA       | $V_{A-B} = 5\text{V} - 90\text{V}$   |
| $\Delta I_{A-B}/\Delta T$ | $I_{A-B}$ temperature coefficient | -    | 0.01 | -    | %/°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  | °C       | ---  |
| $R_{A-B}$                 | Dynamic resistance                | -    | 300k | -    | $\Omega$ | ---  |

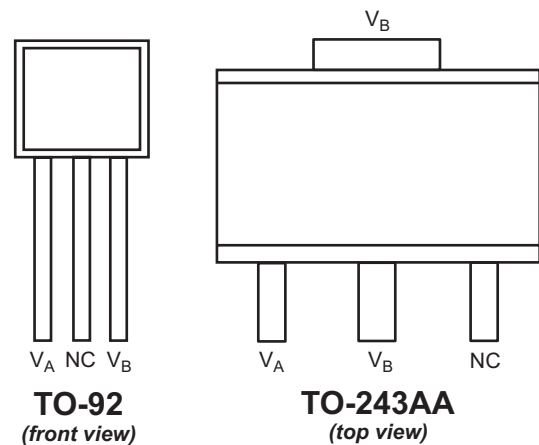
## Functional Circuit Diagram



## Equivalent Block Diagram

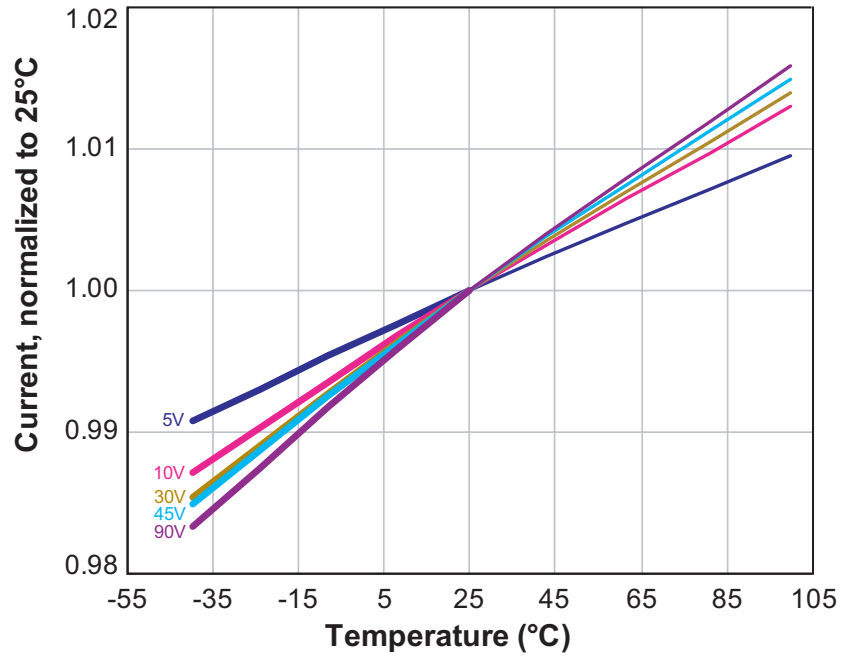


## Pin Configuration

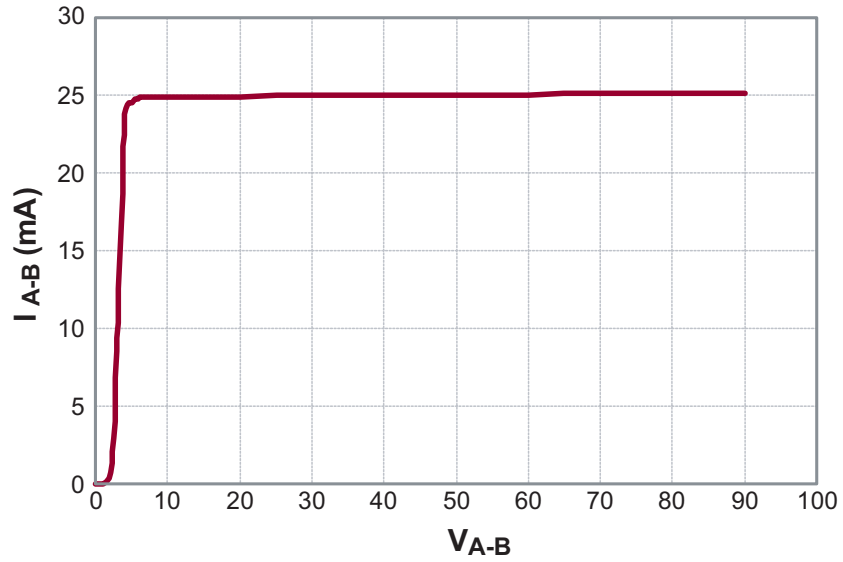


NC = No Connect

### Temperature Characteristics



### Output Current vs Voltage



CL25 for Multiple LED Strings



CL25 for Higher Current

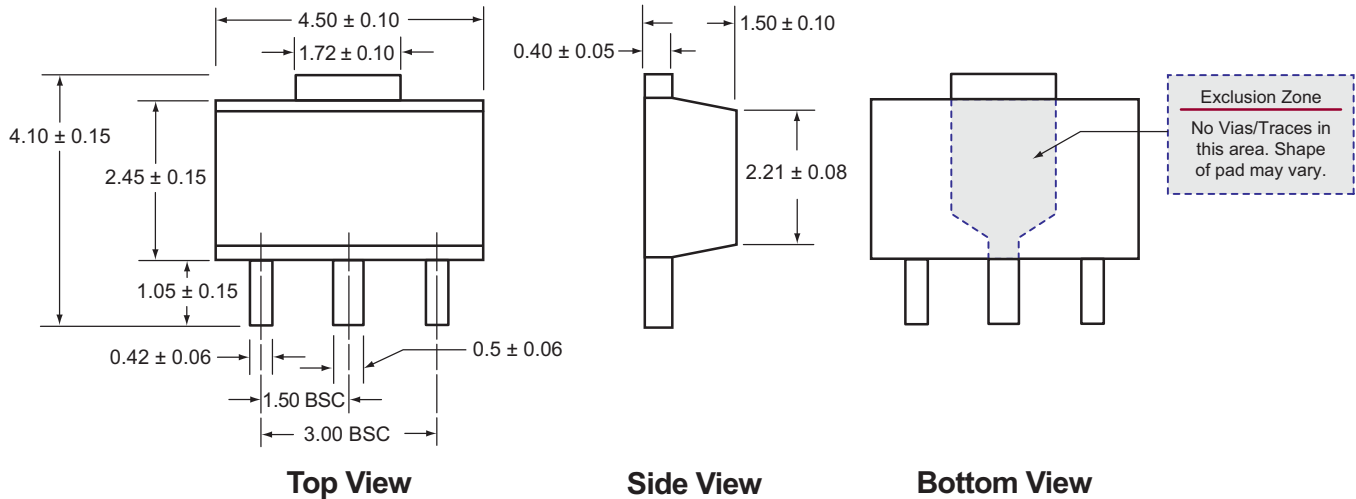


### 3-Lead TO-92 Package Outline (N3)



**Notes:**  
All dimensions are in millimeters; all angles in degrees.

### 3-Lead TO-243AA (SOT-89) Package Outline (N8)



**Notes:**  
All dimensions are in millimeters; all angles in degrees.

(The package drawings in this data sheet may not reflect the most current specifications. For the latest package outline information go to <http://www.supertex.com/packaging.html>.)

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