

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

### Features

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

### Applications

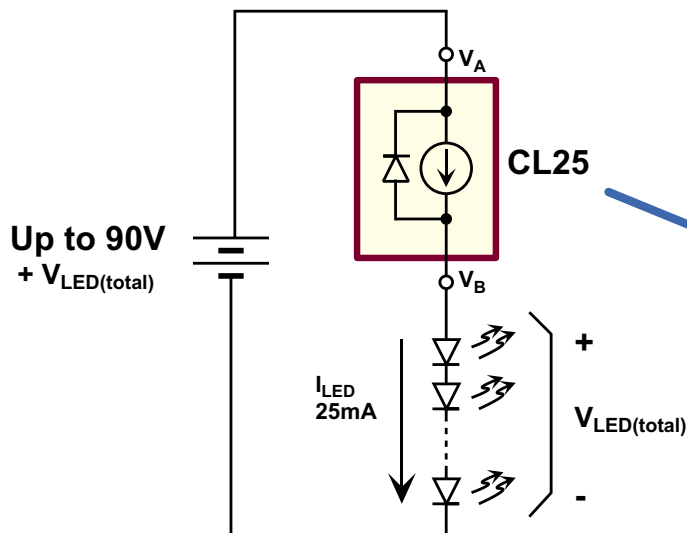
- ▶ LED channel lighting
- ▶ Industrial lamp indicators
- ▶ Accent lighting

### General Description

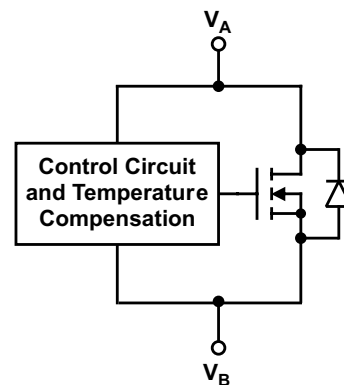
The Supertex CL25 is a high voltage, temperature compensated, constant current source. The device is trimmed to provide a constant current of 25mA  $\pm 10\%$  at an input voltage of 5.0 - 90V. No external components are required. The device can be used as a two terminal constant current source or constant current sink.

A typical application for the CL25 is to drive LEDs with a constant current of 25mA. Multiple CL25s 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")

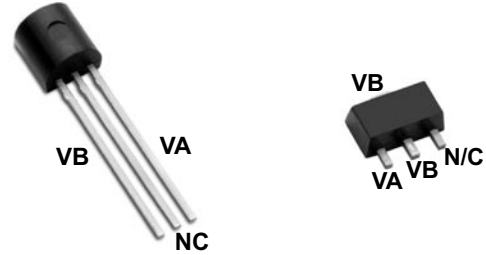


## Thermal Characteristics

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

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

## Pin Configuration



TO92 (N3)

TO-243AA (SOT-89) (N8)

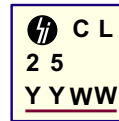
NC = No Connect

## Absolute Maximum Ratings

Parameter	Value
Operating voltage, V <sub>A-B</sub>	100V
Operating junction temperature, T <sub>J</sub>	-40°C to +125°C
Storage temperature, T <sub>S</sub>	-55°C to +150°C

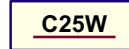
Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

## Product Marking



YY = Year Sealed  
WW = Week Sealed  
\_\_\_\_\_ = "Green" Packaging

TO-92 (N3)



W = Code for week sealed  
\_\_\_\_\_ = "Green" Packaging

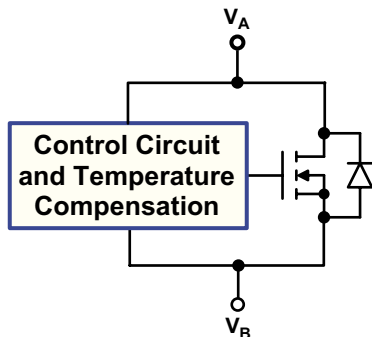
TO-243AA (SOT-89) (N8)

## Electrical Characteristics

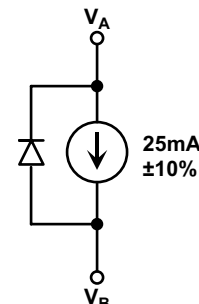
(T<sub>A</sub> = 25°C unless otherwise specified)

Sym	Parameter	Min	Typ	Max	Units	Conditions
V <sub>A-B</sub>	Operating voltage	5.0	-	90	V	---
I <sub>A-B</sub>	Current regulation	22.5	25	27.5	mA	V <sub>A-B</sub> = 5.0V - 90V
ΔI <sub>A-B</sub> /ΔT	I <sub>A-B</sub> temperature coefficient	-	0.01	-	%/°C	V <sub>A-B</sub> = 45V, T <sub>J</sub> = -40°C to +100°C
T <sub>J</sub>	Operating junction temperature	-40	-	125	°C	---
R <sub>A-B</sub>	Dynamic resistance	-	300	-	kΩ	---

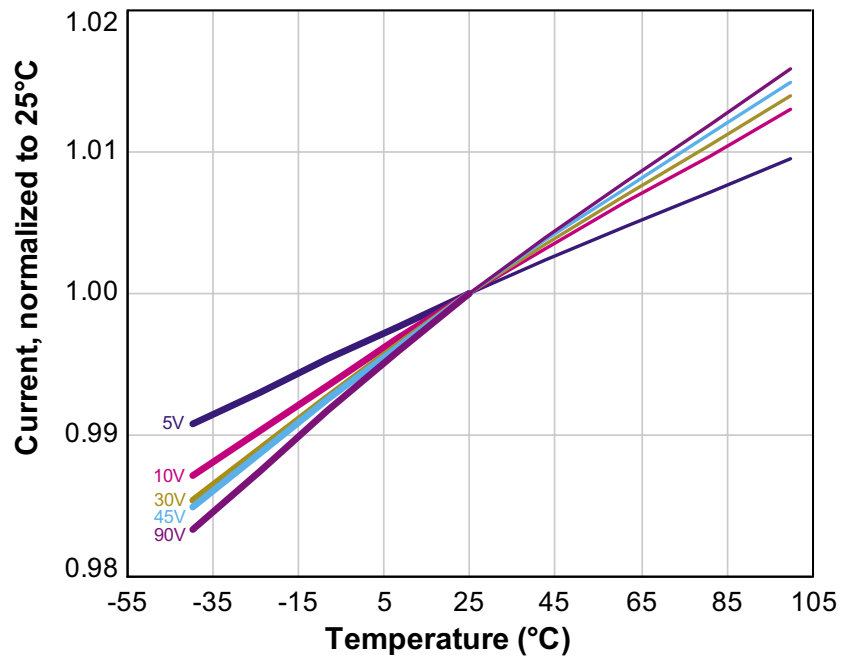
## Functional Circuit Diagram



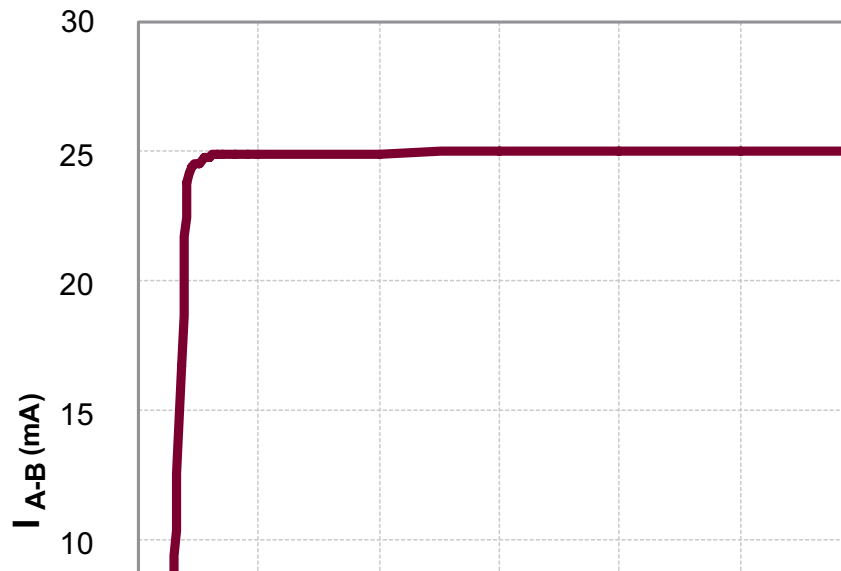
## Equivalent Block Diagram



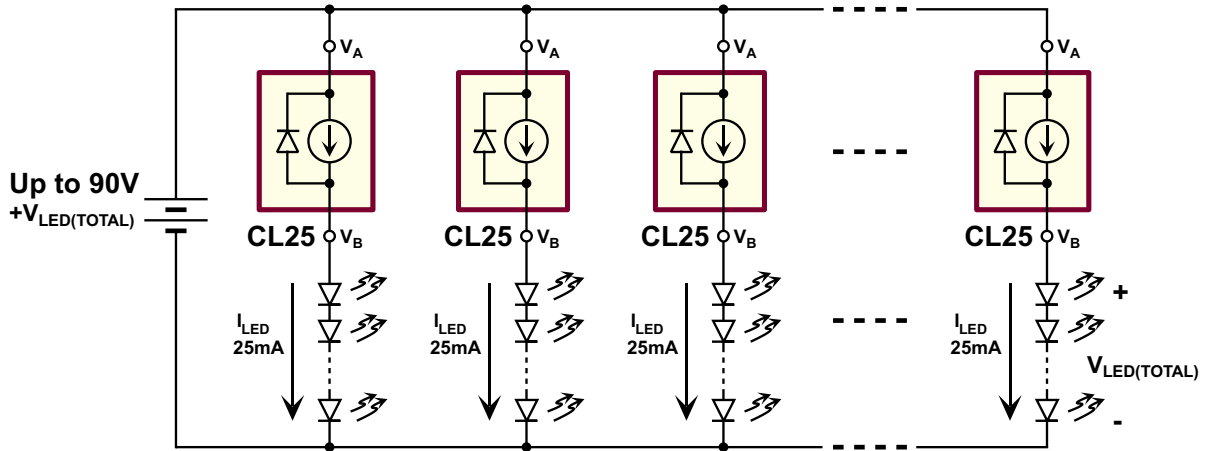
### Temperature Characteristics



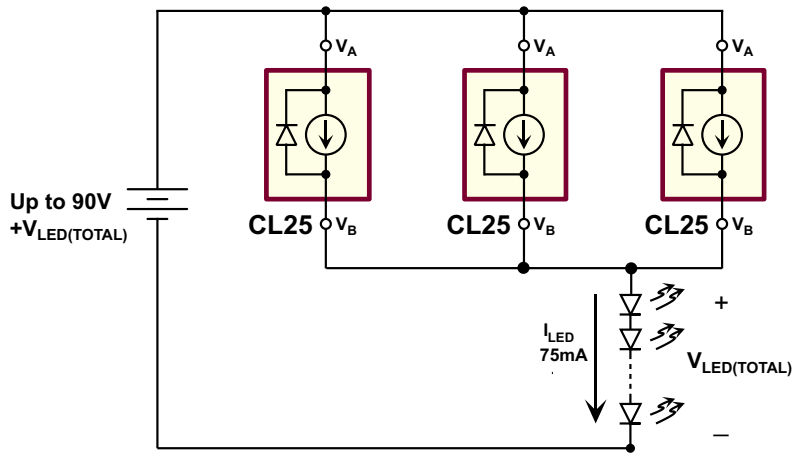
### Output Current vs Voltage



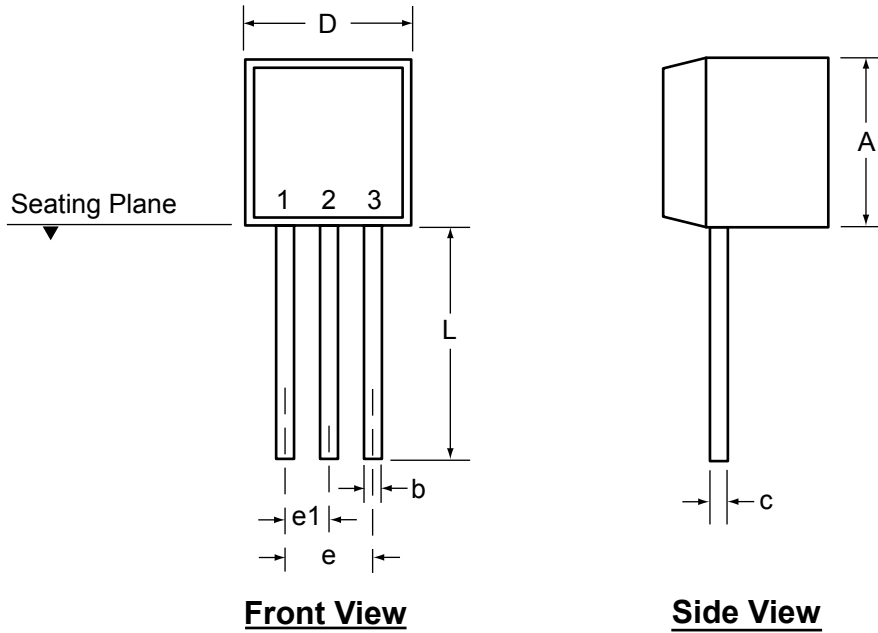
### CL25 for Multiple LED Strings



### CL25 for Higher Current



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



Symbol	A	b	c	D	E	E1	e	e1	L	
Dimensions (inches)	MIN	.170	.014 <sup>†</sup>	.014 <sup>†</sup>	.175	.125	.080	.095	.045	.500
	NOM	-	-	-	-	-	-	-	-	-
	MAX	.210	.022 <sup>†</sup>	.022 <sup>†</sup>	.205	.165	.105	.105	.055	.610*

JEDEC Registration TO-92.

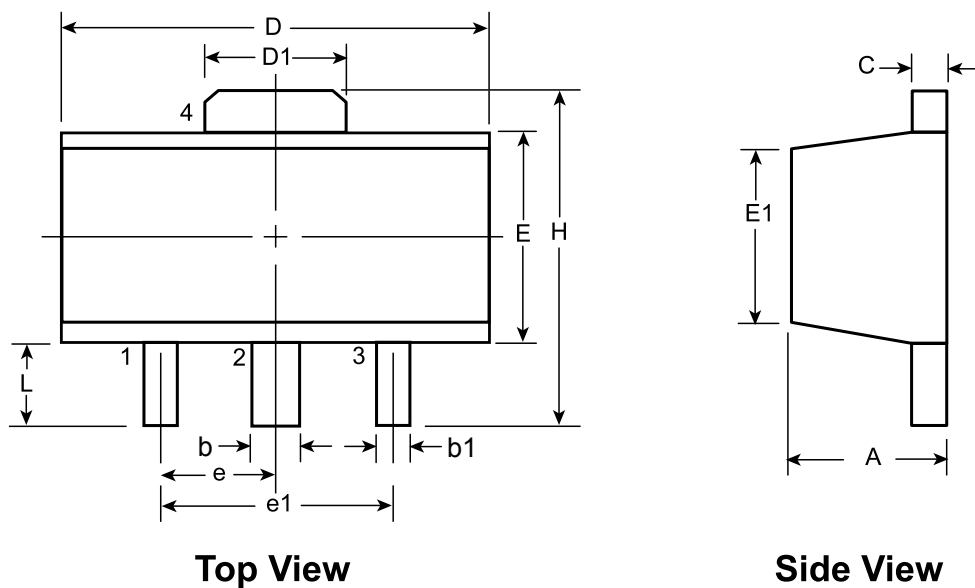
\* This dimension is not specified in the original JEDEC drawing. The value listed is for reference only.

† This dimension is a non-JEDEC dimension.

Drawings not to scale.

Supertex Doc.#: DSPD-3TO92N3, Version D080408.

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



Symbol	A	b	b1	C	D	D1	E	E1	e	e1	H	L		
Dimensions (mm)	MIN	1.40	0.44	0.36	0.35	4.40	1.62	2.29	2.13	1.50 BSC	3.00 BSC	3.94	0.89	
	NOM	-	-	-	-	-	-	-	-			-	-	-
	MAX	1.60	0.56	0.48	0.44	4.60	1.83	2.60	2.29			4.25	1.20	

JEDEC Registration TO-243, Variation AA, Issue C, July 1986.

Drawings not to scale.

Supertex Doc. #: DSPD-3TO243AAN8, Version D070908.

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