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

Features

- 5.0V to 90V operating range (VA-B)
- 20mA ±10% at 5V-90V
- 0.01% / °C Typical Temperature Coefficient
- Available in TO-243AA (SOT-89), TO-252 (D-PAK), & TO-92 packages
- Can be paralleled for higher current

Applications

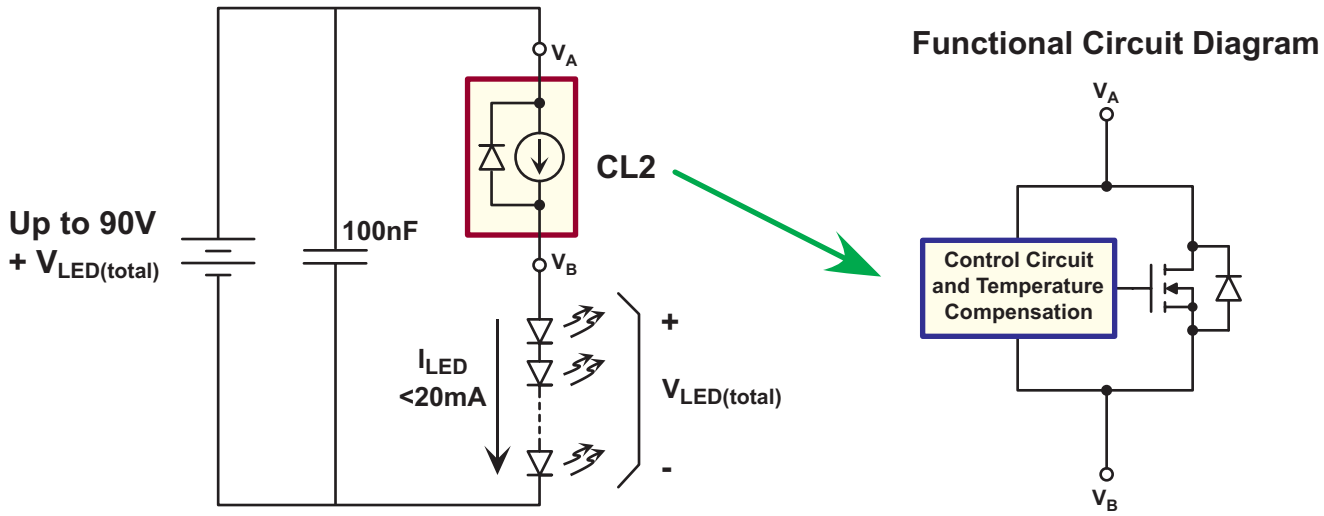
- LED driver
- Industrial lamp indicators
- Signage
- Accent lighting
- Automotive
- Constant current source
- Constant current sink

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±10% at an input voltage of 5-90V. 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

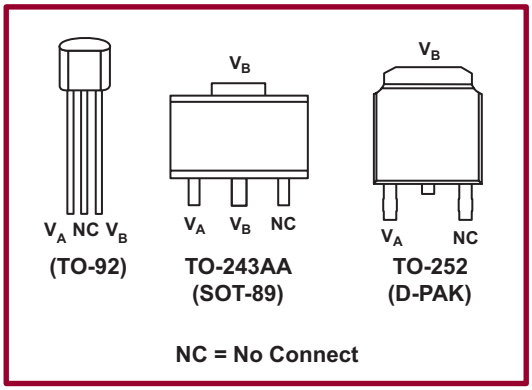


Ordering Information

Device	Package Options		
	TO-92	TO-243AA (SOT-89)	TO-252 (D-PAK)
CL2	CL2N3	CL2N8	CL2K4-G
	CL2N3-G	CL2N8-G	

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

Pin Configurations



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.

Thermal Characteristics

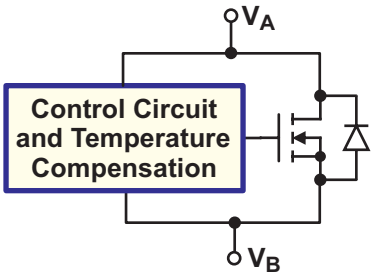
Package	Power Dissipation @T_A = 25°C	θ_{JC} °C/W	θ_{JA} °C/W
TO-92	0.6W	125	170
TO-243AA	1.3W*	15	78*
TO-252	2.0W*	6.0	50*

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

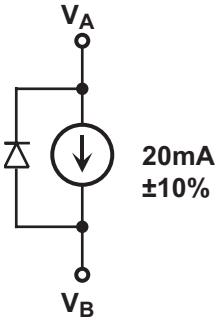
Electrical Characteristics *(T_J = 25°C unless otherwise specified)*

Symbol	Parameter	Min	Typ	Max	Units	Conditions
V_{A-B}	Operating voltage	-	-	90	V	---
I_{A-B}	Current regulation	18.0	20	22	mA	V_{A-B} = 5V - 90V
$\Delta I_{A-B}/\Delta T$	I_{A-B} temperature coefficient	-	0.01	-	%/°C	V_{A-B} = 45V, T_J = -40°C to +100°C
T_J	Operating junction temperature	-40	-	125	°C	---
R_{A-B}	Dynamic resistance	-	300k	-	Ω	---

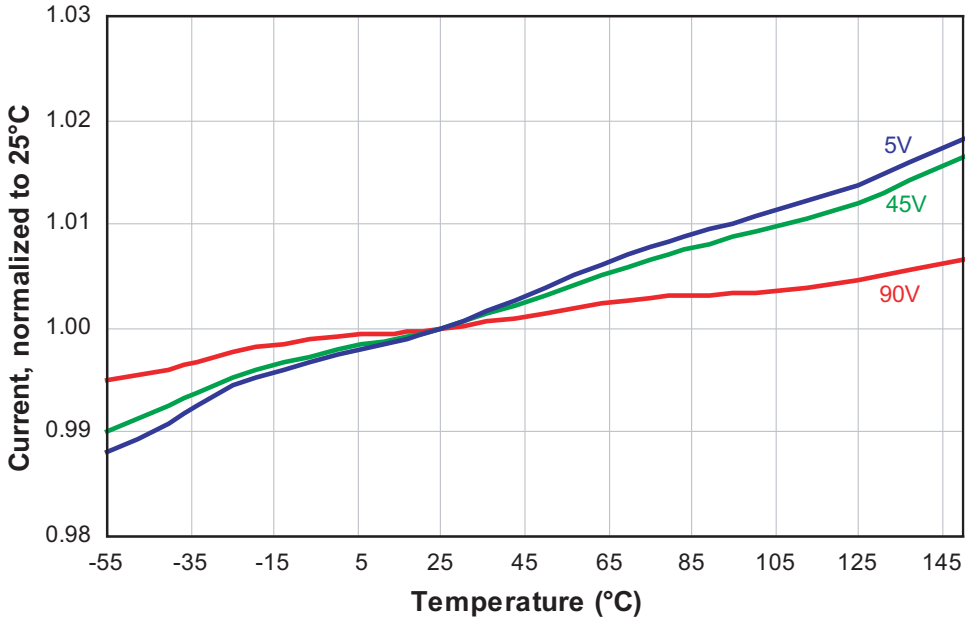
Functional Circuit Diagram



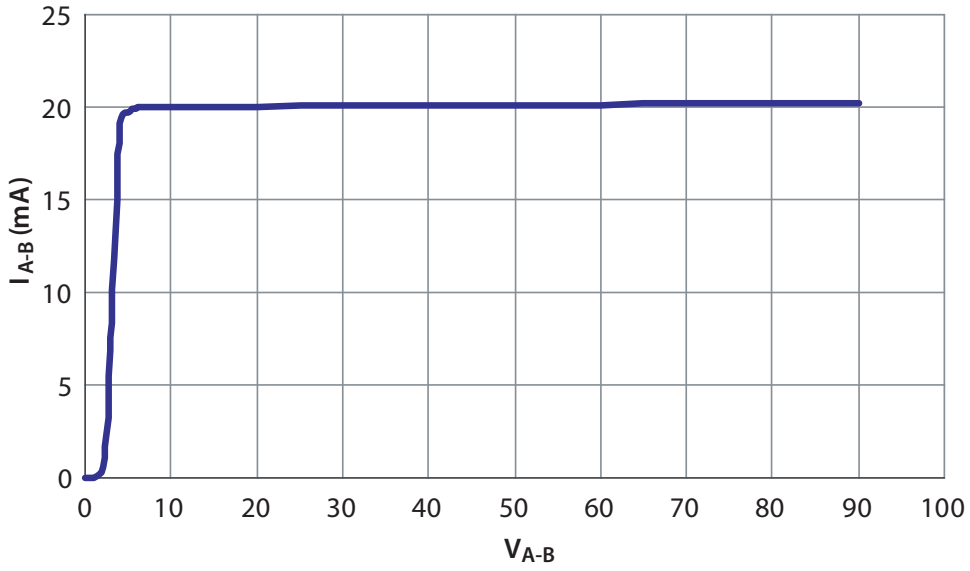
Equivalent Block Diagram



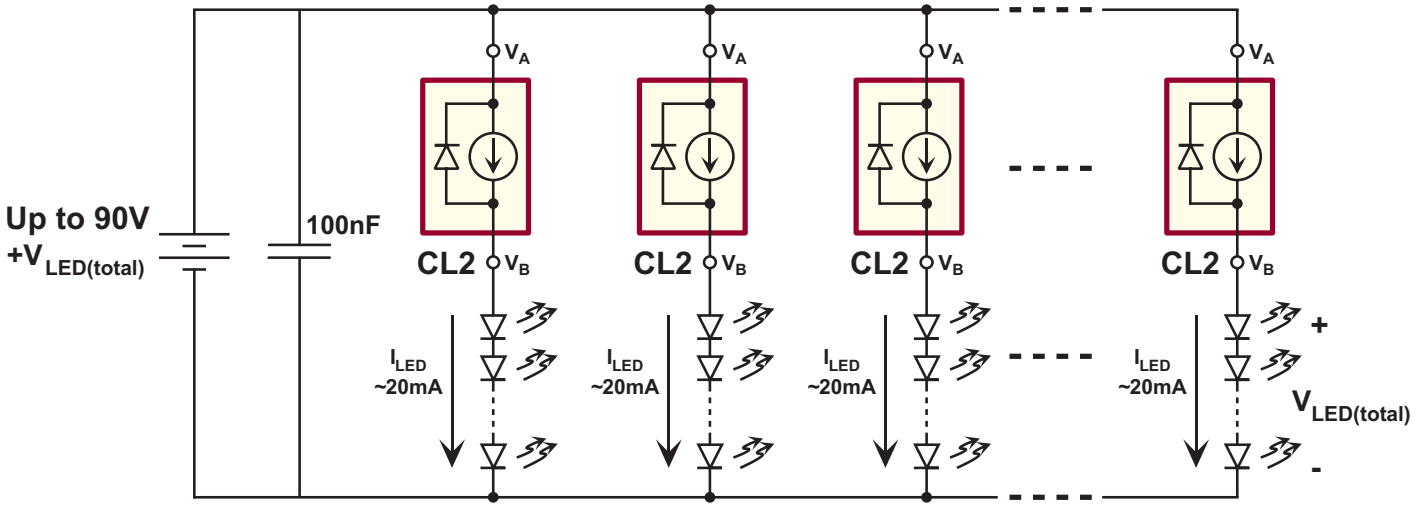
Temperature Characteristics



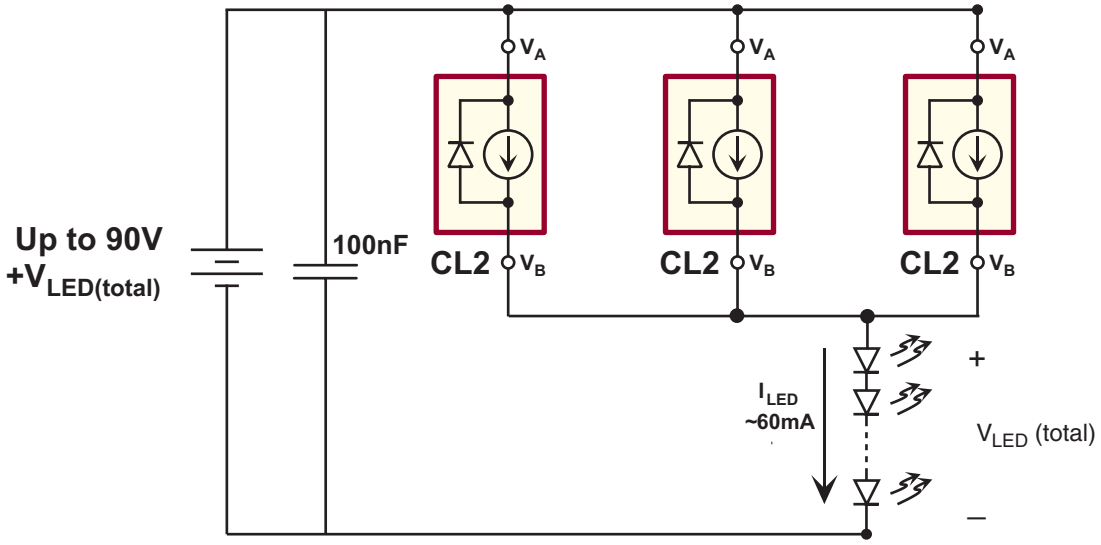
Output Current vs Voltage



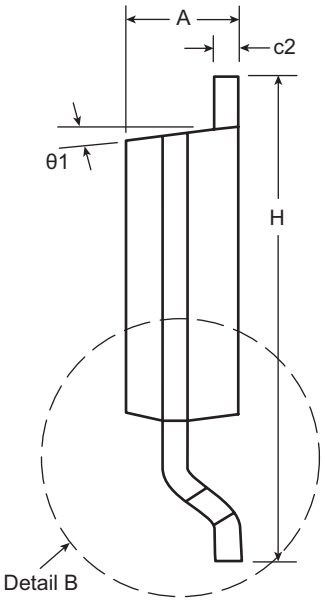
CL2 for Multiple LED Strings



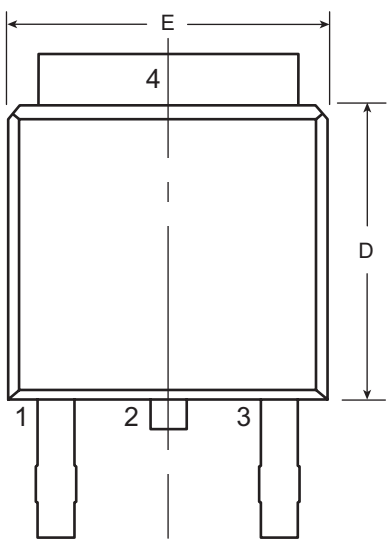
CL2 for Higher Current



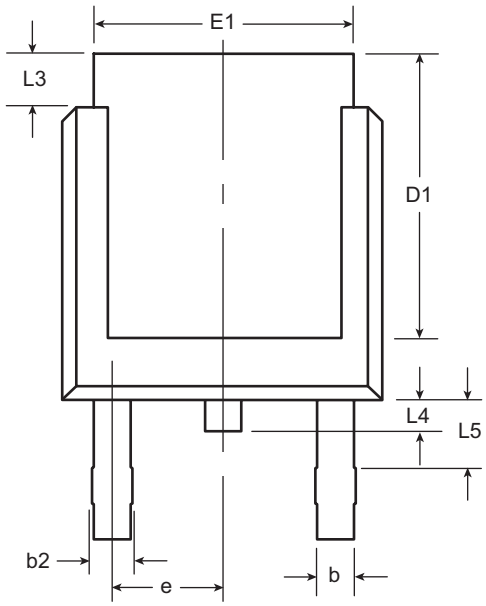
3-Lead TO-252 D-PAK Package Outline (K4)



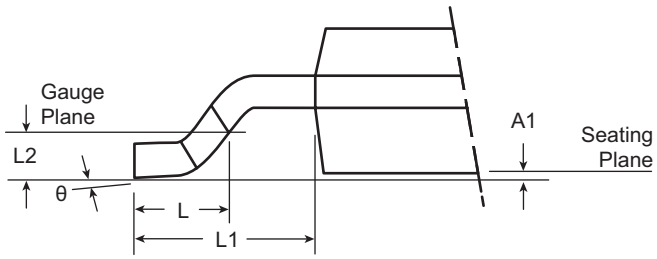
Side View



Front View



Rear View



Detail B

Notes:

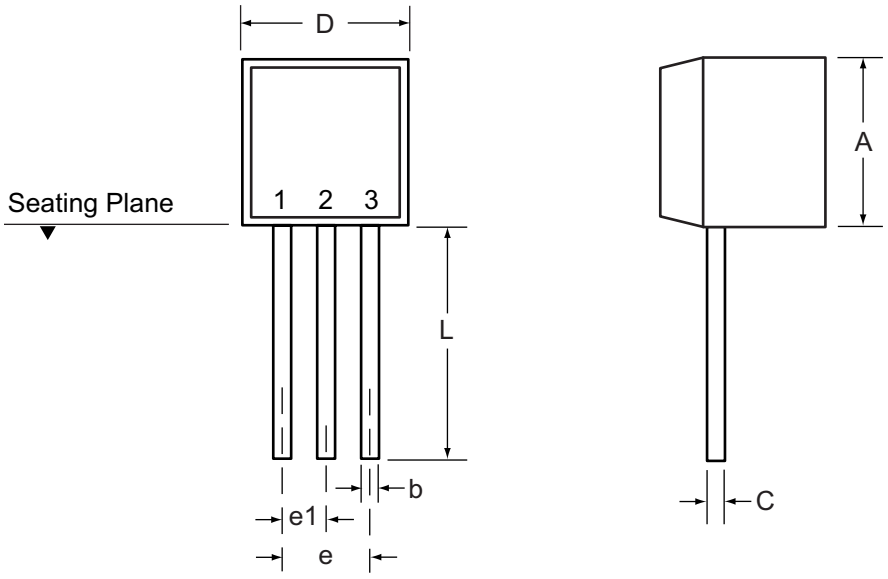
1. 4 terminal locations are shown, only 3 are functional. Lead number 2 was removed.

Symbol		A	A1	b	b2	c2	D	D1	E	E1	e	H	L	L1	L2	L3	L4	L5	θ	θ1
Dimension (inches)	MIN	.086	-	.025	.030	.018	.235	.205	.250	.170	.090 BSC	.370	.055	.108 REF	.020 BSC	.035	-	.045	0°	0°
	NOM	-	-	-	-	-	.240	-	-	-		-	.060			-	-	-	-	-
	MAX	.094	.005	.035	.045	.035	.245	-	.265	-		.410	.070			.050	.040	.060	10°	15°

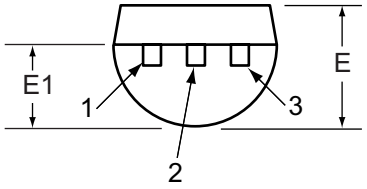
JEDEC Registration TO-252, Variation AA, Issue E, June 2004.

Drawings not to scale.

3-Lead TO-92 Package Outline (N3)



Front View **Side View**

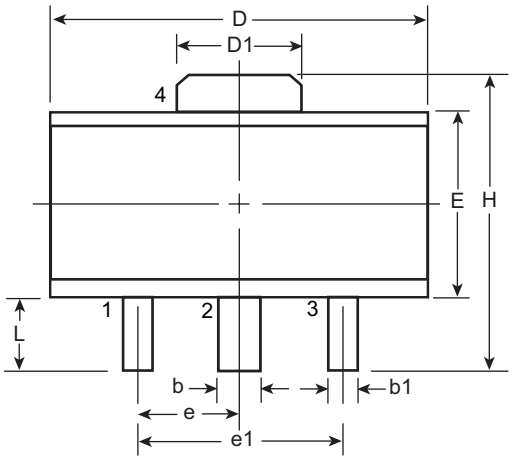


Bottom View

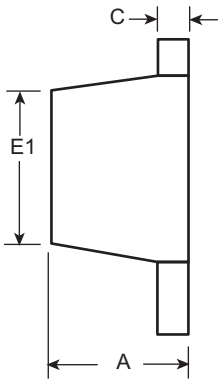
Symbol		A	b	C	D	E	E1	e	e1	L
Dimension (inches)	MIN	.170	.014	.014	.175	.125	.800	.095	.045	.500
	NOM	-	-	-	-	-	-	-	-	-
	MAX	.210	.022	.022	.205	.165	.105	.105	.055	-

Drawings not to scale.

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



Top View



Side View

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**.*

(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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