

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

Features

- ▶ 5.0 to 90V operating range (V_{A-B})
- ▶ 20mA $\pm 10\%$ at 5.0 - 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

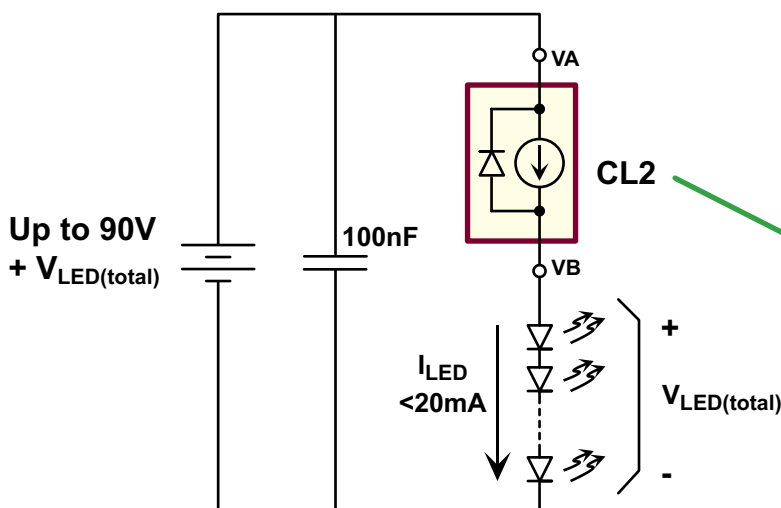
- ▶ LED driver
- ▶ Industrial lamp indicators
- ▶ Signage
- ▶ Accent lighting
- ▶ Automotive
- ▶ Constant current source
- ▶ Constant current sink

General Description

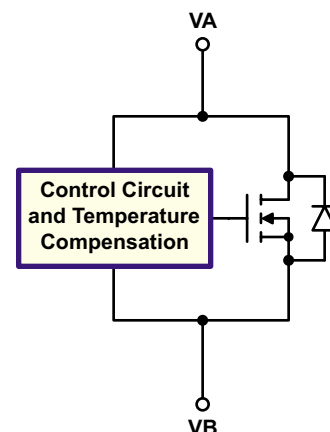
The Supertex CL2 is a high voltage, temperature compensated, constant current source. The device is trimmed to provide a constant current of 20mA $\pm 10\%$ at an input voltage of 5.0 - 90V. The device can be used as a two terminal constant current source or constant current sink.

A typical application for the CL2 is to drive LEDs with a constant current of 20mA. Multiple CL2s can also be used in parallel to provide higher currents such as 40mA, 60mA or 80mA. The device is available in TO-243AA (SOT-89), TO-252 (D-PAK), and TO-92 packages.

Typical Application Circuit



Functional Circuit Diagram



Ordering Information

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

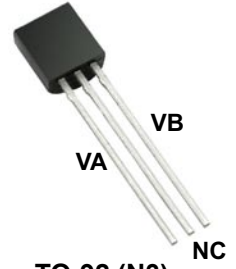
-G indicates package is RoHS compliant ('Green')



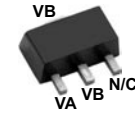
Pin Configurations



TO-252 (D-PAK) (K4)



TO-92 (N3)



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

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

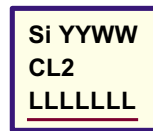
Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

Thermal Characteristics

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

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

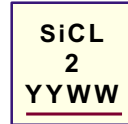
Product Marking



YY = Year Sealed
WW = Week Sealed
L = Lot Number
_____ = "Green" Packaging

TO-252 (D-PAK) (K4)

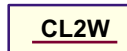
Package may or may not include the following marks: Si or



YY = Year Sealed
WW = Week Sealed
_____ = "Green" Packaging

TO-92 (N3)

Package may or may not include the following marks: Si or



W = Code for week sealed
_____ = "Green" Packaging

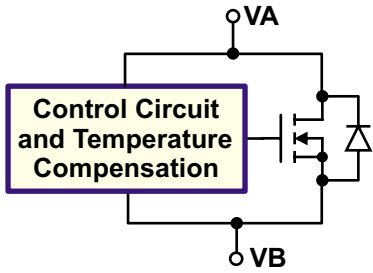
TO-243AA (SOT-89) (N8)

Package may or may not include the following marks: Si or

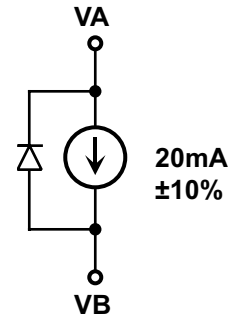
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Sym	Parameter	Min	Typ	Max	Units	Conditions
V_{A-B}	Operating voltage	5.0	-	90	V	---
I_{A-B}	Current regulation	18.0	20	22	mA	$V_{A-B} = 5.0\text{V} - 90\text{V}$
$\Delta I_{A-B} / \Delta T$	I_{A-B} temperature coefficient	-	0.01	-	%/°C	$V_{A-B} = 45\text{V}, T_J = -40^\circ\text{C} \text{ to } +100^\circ\text{C}$
T_J	Operating junction temperature	-40	-	125	°C	---
R_{A-B}	Dynamic resistance	-	300k	-	Ω	---

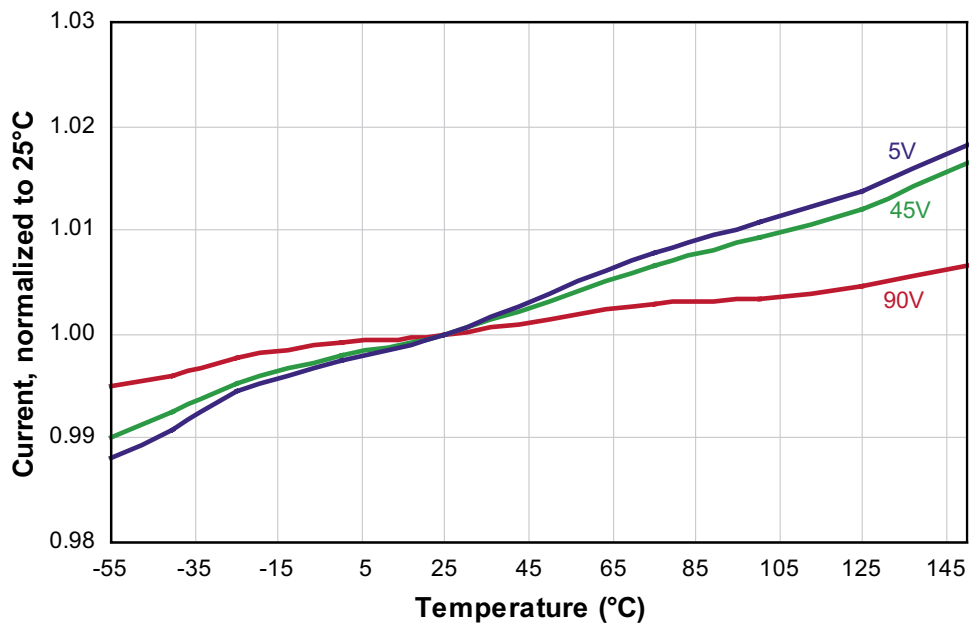
Functional Circuit Diagram



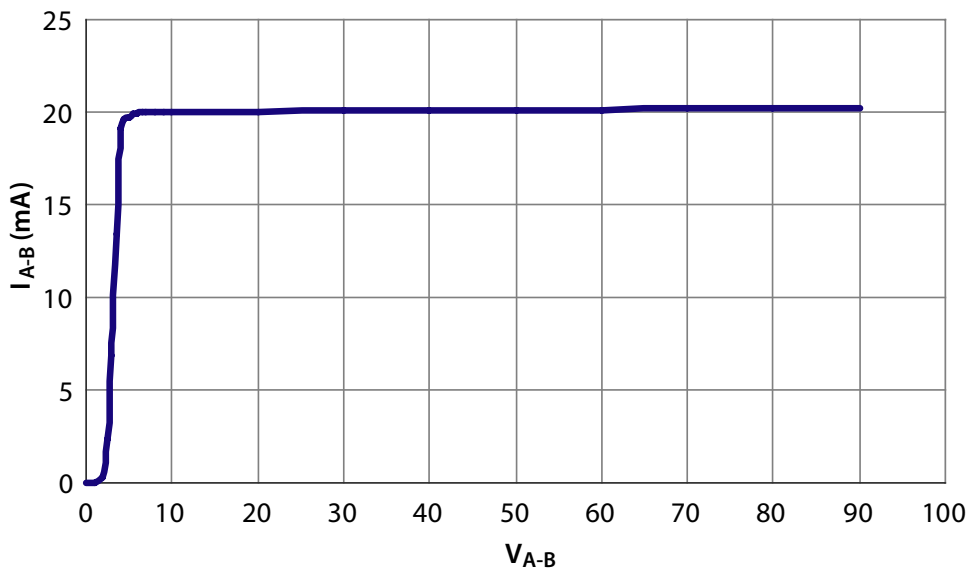
Equivalent Block Diagram



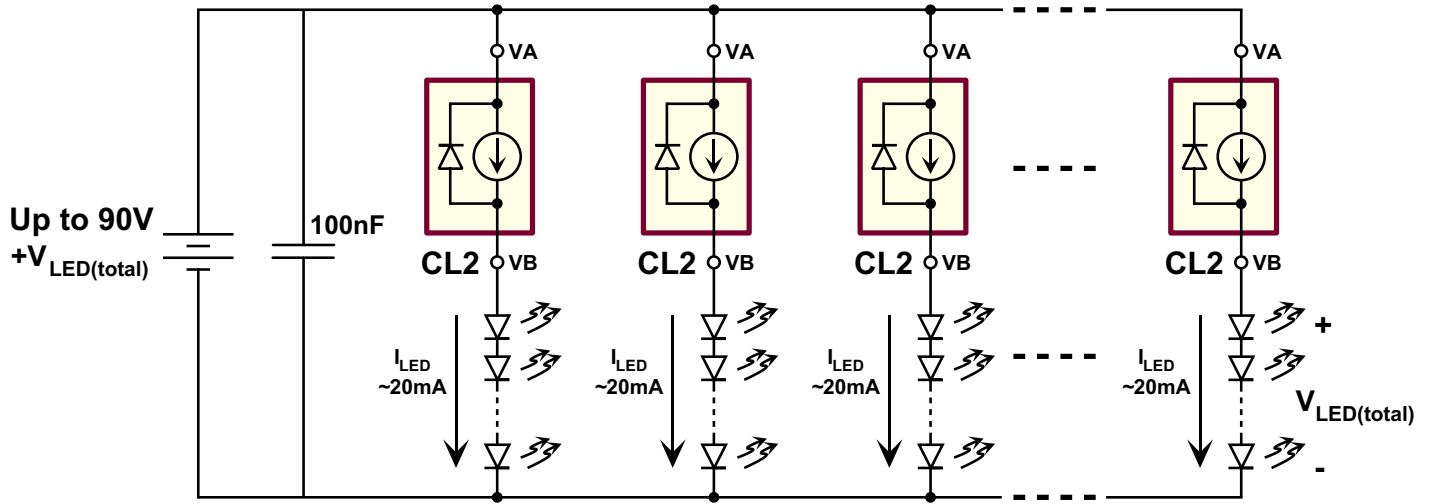
Temperature Characteristics



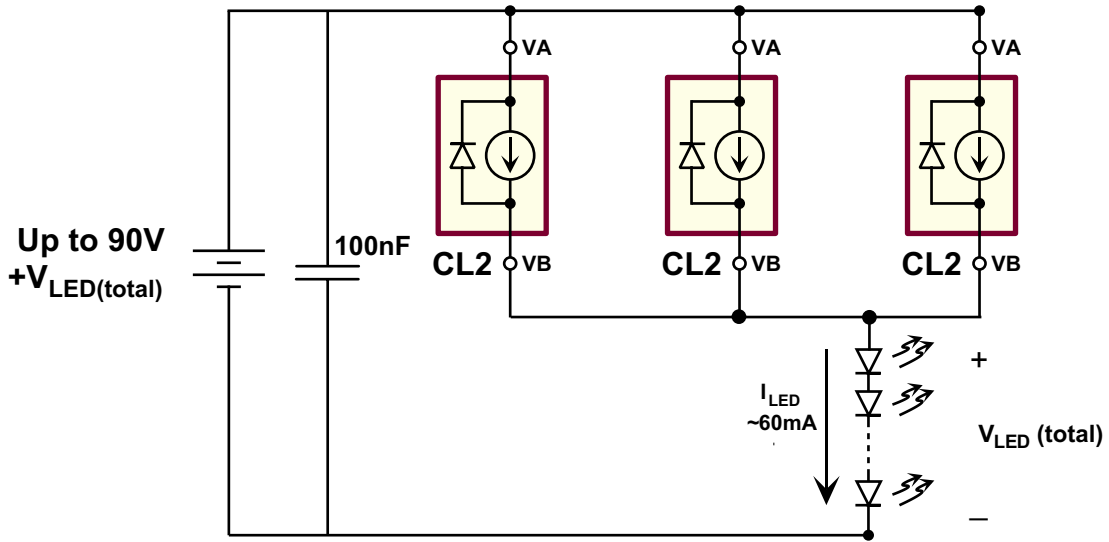
Output Current vs Voltage



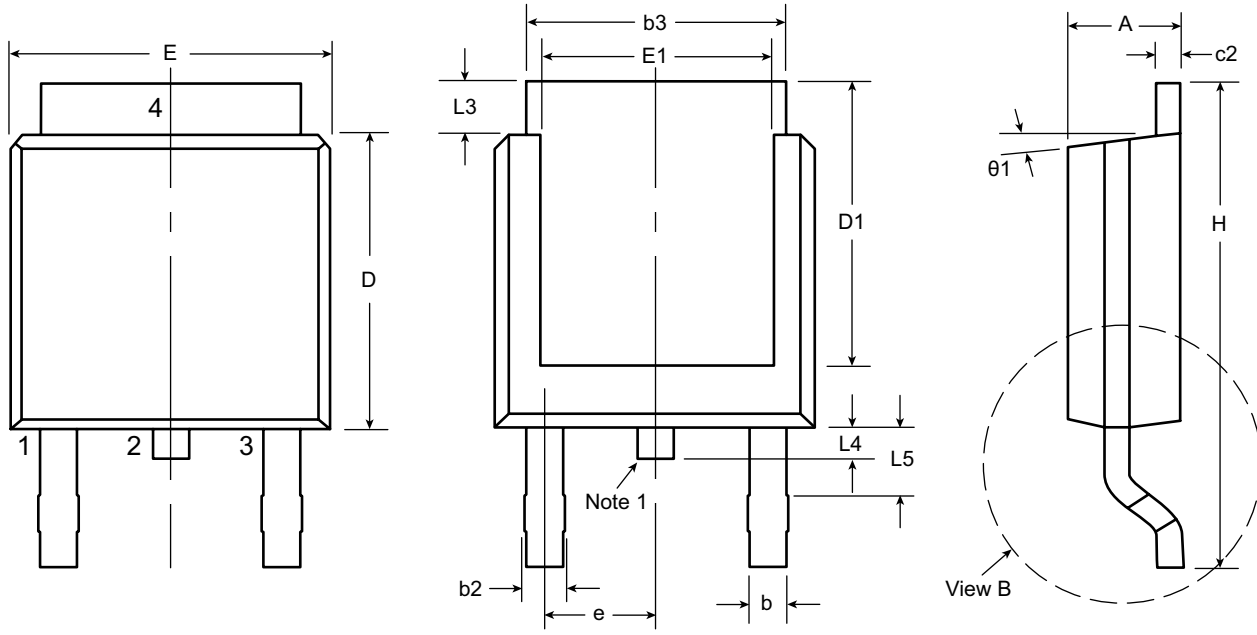
CL2 for Multiple LED Strings



CL2 for Higher Current



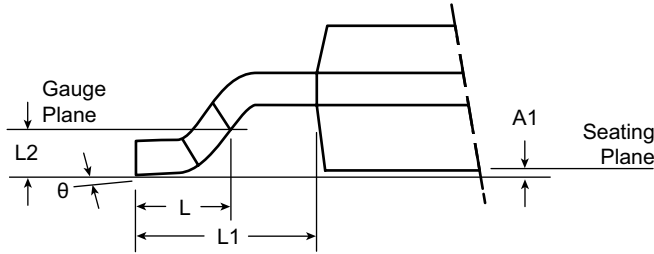
3-Lead TO-252 D-PAK Package Outline (K4)



Front View

Rear View

Side View



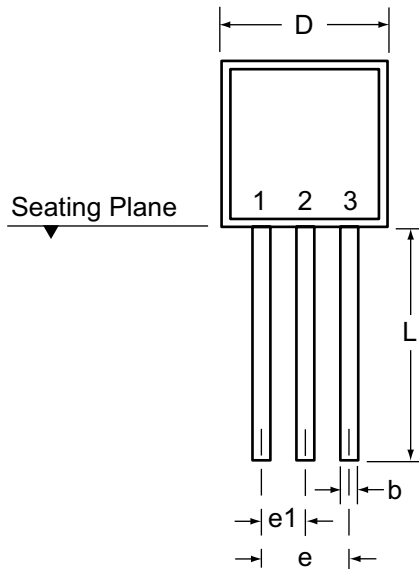
View B

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

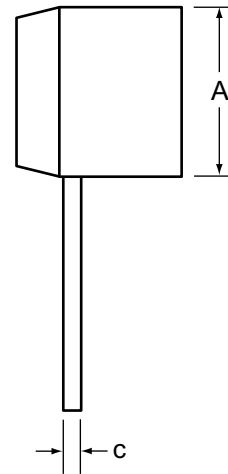
Symbol	A	A1	b	b2	b3	c2	D	D1	E	E1	e	H	L	L1	L2	L3	L4	L5	θ	θ1		
Dimension (inches)	MIN	.086	.000*	.025	.030	.195	.018	.235	.205	.250	.170	.370	.055	.108 REF	.020 BSC	.035	.025*	.045	0°	0°		
	NOM	-	-	-	-	-	.240	-	-	-	.090 BSC	-	.060			-	-	-	-	-	-	-
	MAX	.094	.005	.035	.045	.215	.035	.245	.217*	.265	.182*	.410	.070			-	-	.050	.040	.060	10°	15°

JEDEC Registration TO-252, Variation AA, Issue E, June 2004.
 * This dimension is not specified in the JEDEC drawing.
Drawings not to scale.
 Supertex Doc. #: DSPD-3TO252K4, Version E041309.

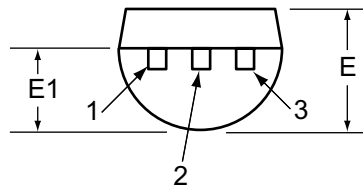
3-Lead TO-92 Package Outline (N3)



Front View



Side View



Bottom View

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

JEDEC Registration TO-92.

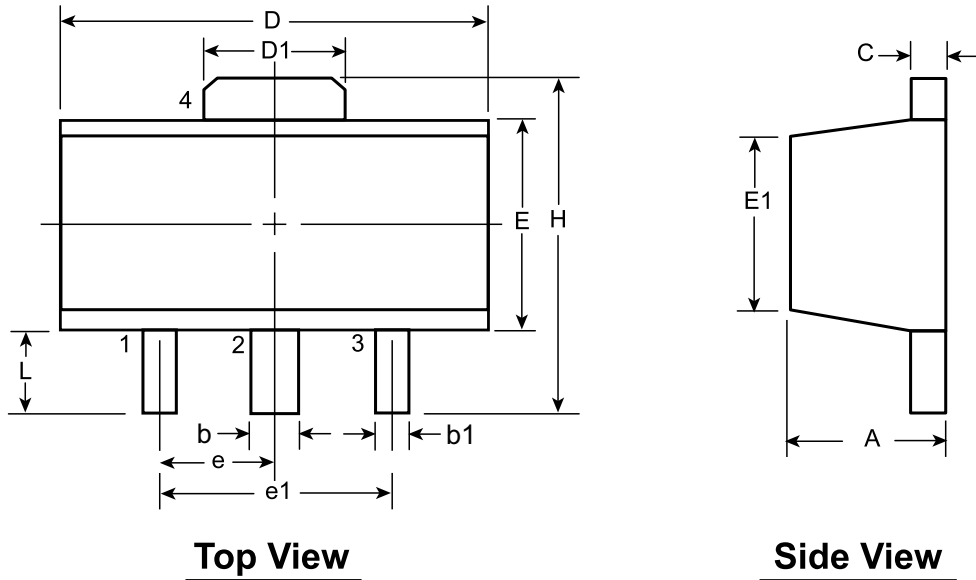
* This dimension is not specified in the JEDEC drawing.

† This dimension differs from the JEDEC drawing.

Drawings not to scale.

Supertex Doc.#: DSPD-3TO92N3, Version E041009.

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	2.00†	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.

† This dimension differs from the JEDEC drawing

Drawings not to scale.

Supertex Doc. #: DSPD-3TO243AAN8, Version E051509.

(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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