Linear, Fixed Constant Current LED Driver

Features

- 20mA ±10% constant current drive
- 1.0V dropout
- 90V rating for transient immunity
- Temperature compensated
- 4.75 - 90V supply range

Applications

- Specialty lighting
- Low voltage signage

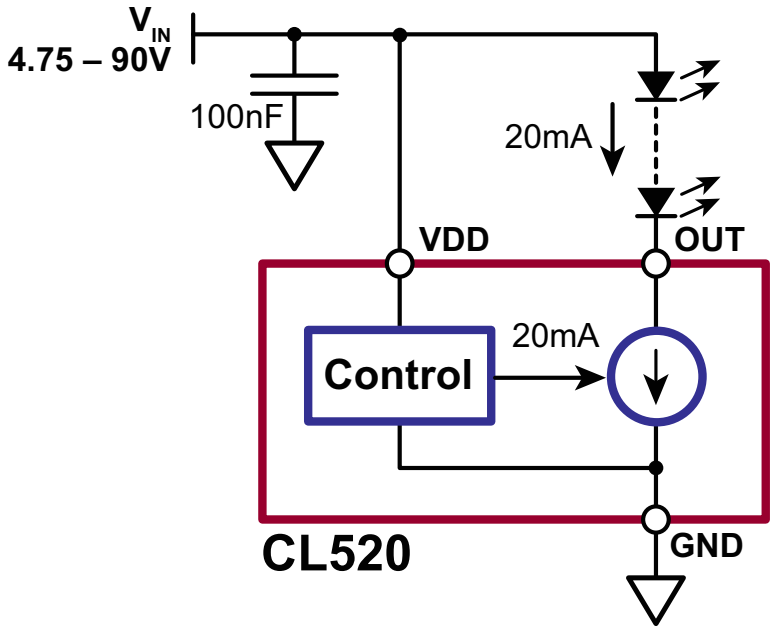
General Description

The CL520 is a fixed, linear current regulator designed for driving LEDs at 20mA. With a maximum rating of 90V, it is able to withstand transients without the need for additional transient protection circuitry. It is ideally suited for applications employing single or multiple LEDs.

The minimum dropout voltage of 1.0V accomodates extra LEDs, permits lower supply voltages, and provides more efficient operation.

The CL520 is offered in TO-252(D-PAK) and TO-92 packages.

Typical Application Circuit



Ordering Information

Part Number	Package Options	Packing
CL520K4-G	TO-252 (D-PAK)	2000/Reel
CL520N3-G	TO-92	1000/Bag
CL520N3-G P002	TO-92	2000/Reel
CL520N3-G P003	TO-92	2000/Reel
CL520N3-G P005	TO-92	2000/Reel
CL520N3-G P013	TO-92	2000/Reel
CL520N3-G P014	TO-92	2000/Reel

-G denotes a lead (Pb)-free / RoHS compliant package
Refer to 'P0xx' Tape & Reel Specs for P002, P003, P005, P013, and P014 TO-92 Taping Specifications and Winding Styles

Absolute Maximum Ratings

Parameter	Value
Supply voltage, V_{DD}	-0.5V to +100V
Output voltage, V_{OUT}	-0.5V to +100V
Operating junction temperature	-40°C to +125°C
Storage temperature	-65°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..

Typical Thermal Resistance

Package	θ_{ja}
TO-252 (D-PAK)	81°C/W*
TO-92	132°C/W*

** Mounted on JEDEC test PCB (2s 2p)*

Pin Configurations



TO-252 (D-PAK)



TO-92

Product Marking



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

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

TO-252 (D-PAK)



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

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

TO-92

Recommended Operating Conditions *(all voltages with respect to GND pin)*

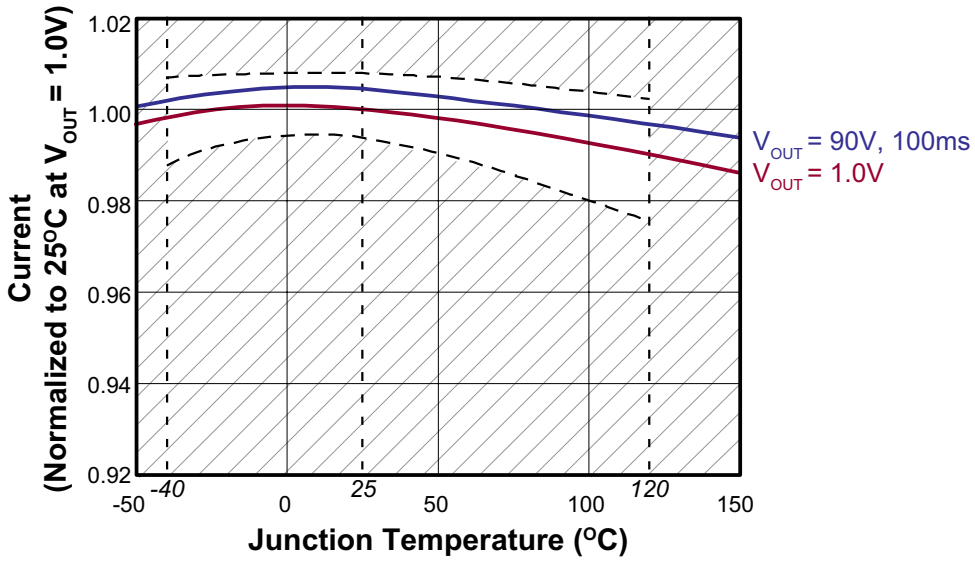
Sym	Parameter	Min	Typ	Max	Units	Conditions
V_{DD}	Supply voltage	4.75	-	90	V	---
V_{OUT}	Voltage at OUT pin[1]	1.0	-	90	V	---
T_J	Junction temperature	-40	-	125	°C	---
C_{DD}	V_{DD} bypass capacitor	100	-	-	nF	

Electrical Characteristics

(Over recommended operating conditions. T_A = 25°C unless otherwise specified. All voltages with respect to GND pin)

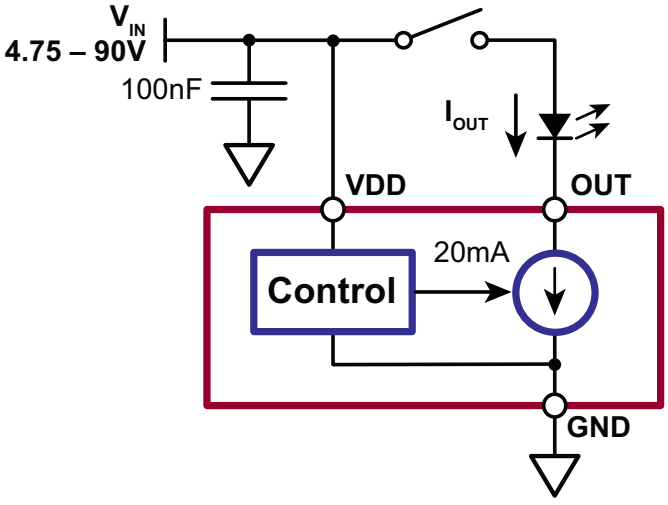
Sym	Parameter	Min	Typ	Max	Units	Conditions
I_{DD}	Current into VDD pin	-	-	1.0	mA	---
I_{OUT}	Current into OUT pin	18	20	22	mA	1.0V < V_{OUT} < 90V
		-	-	22		V_{OUT} <1.0V
$I_{OUT(OFF)}$	Current into OUT pin with VDD pin open	-	-	10	µA	V_{DD} = open
$V_{DD(OFF)}$	Voltage at VDD to shut off LED current	-	-	1.0	V	I_{OUT} < 10µA
t_{ON}	VDD applied on time	-	-	100	µs	---
t_{OFF}	VDD removed off time	-	-	100	µs	---

Temperature Effects



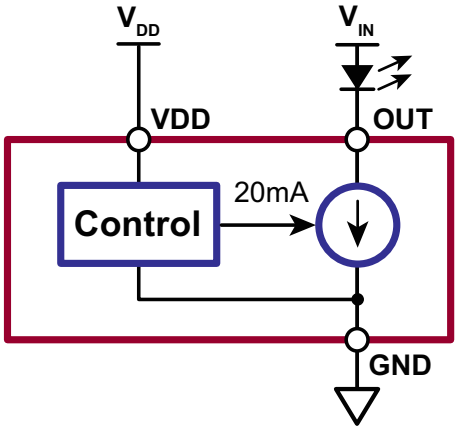
Application Circuits

Switched LED



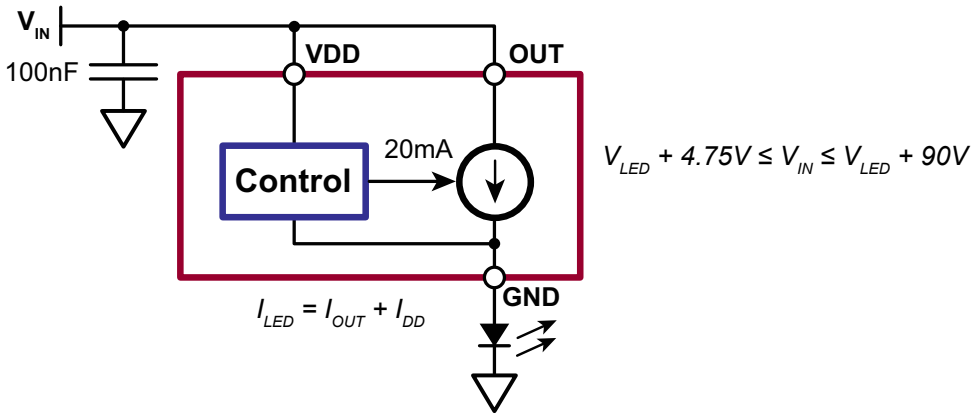
Seperate LED Supply

(V_{OUT} may be higher or lower than V_{DD}.)



Application Circuits

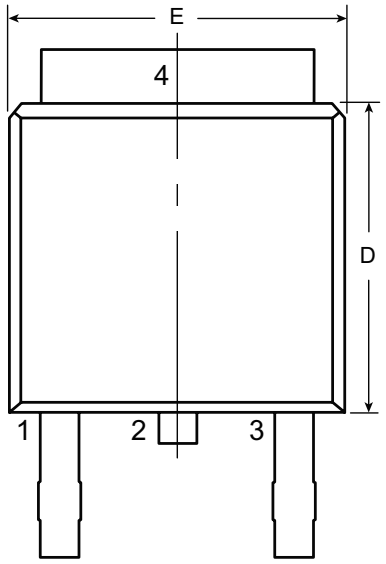
Ground Referenced LEDs



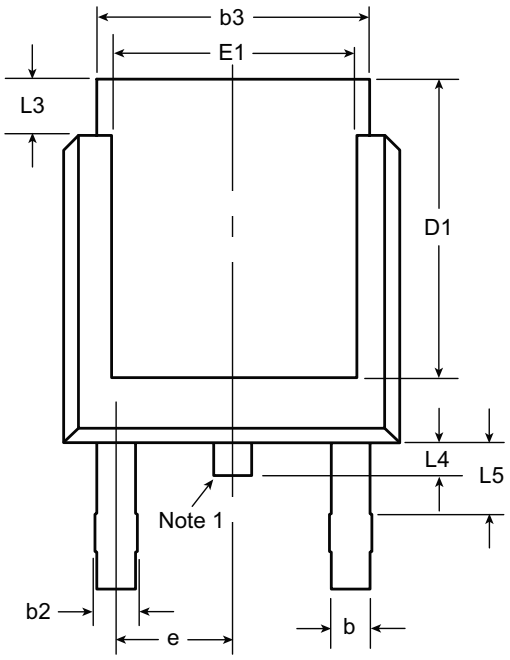
Pin Description

Pin #		Name	Description
TO-252 D-PAK (K4)	TO-92 (N3)		
1	1	VDD	Supply voltage for the CL520. Bypass locally with a 100nF capacitor to ground.
3	2	OUT	Constant current output (sink).
4	3	GND	Circuit common.

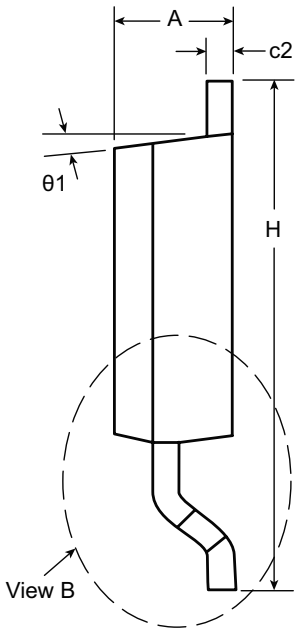
3-Lead TO-252 D-PAK Package Outline (K4)



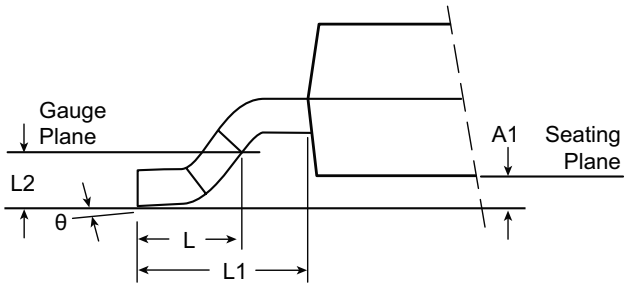
Front View



Rear View



Side View



View B

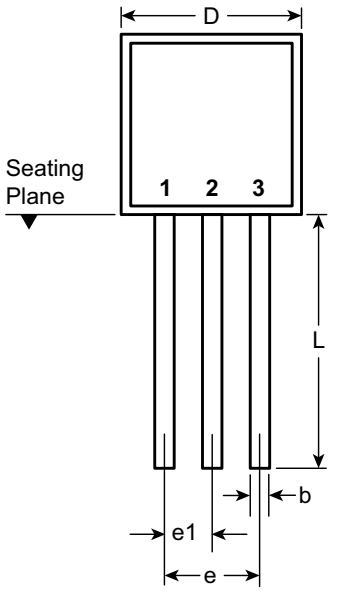
Note:

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

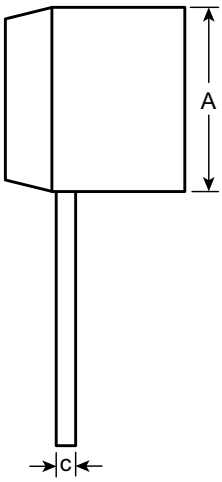
Symbol		A	A1	b	b2	b3	c2	D	D1	E	E1	e	H	L	L1	L2	L3	L4	L5	θ	θ1
Dimen-sion (inches)	MIN	.086	.000*	.025	.030	.195	.018	.235	.205	.250	.170	.090 BSC	.370	.055	.108 REF	.020 BSC	.035	.025*	.045	0^0	0^0
	NOM	-	-	-	-	-	-	.240	-	-	-		-	.060			-	-	-	-	-
	MAX	.094	.005	.035	.045	.215	.035	.245	.217*	.265	.182*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

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.*

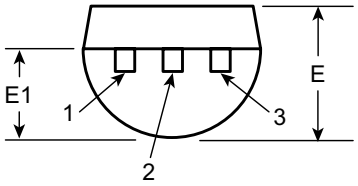
3-Lead TO-92 Package Outline (N3)



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.*

(The package drawing(s) 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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