

# 300mA Low Dropout Positive Voltage Regulator

## General Description

The RT9162 is a positive low dropout regulator designed for applications requiring low dropout performance at full rated current. The device is available in fixed output voltages of 3.3V and 3.5V. The RT9162 provides excellent regulation over line, load, and temperature variations.

The other features include low dropout performance at a maximum of 1.3V at 300mA, fast transient response, internal current limiting, and thermal shutdown protection of the output devices. The RT9162 is a three-terminal regulator compatible with industrial 78XX series and available in surface mount SOT-89 packages.

## Ordering Information

RT9162-□□□□

- Package Type
  - ZL : TO-92 (L-Type)
  - ZT : TO-92 (T-Type)
  - X : SOT-89
  - XL : SOT-89 (L-Type)
- Operating Temperature Range
  - C : Commercial Standard
  - P : Pb Free with Commercial Standard
- Output Voltage
  - 33 : 3.3V
  - 35 : 3.5V

Note :

RichTek Pb-free products are :

- RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- Suitable for use in SnPb or Pb-free soldering processes.
- 100%matte tin (Sn) plating.

## Marking Information

For marking information, contact our sales representative directly or through a RichTek distributor located in your area, otherwise visit our website for detail.

## Features

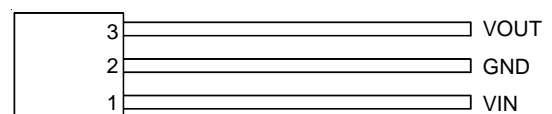
- Low Dropout, Maximum 1.3V at 300mA
- Fast Transient Response
- $\pm 2\%$  Total Output Regulation
- 0.4% Line Regulation
- 0.4% Load Regulation
- SOT-89 and TO-92 Packages
- RoHS Compliant and 100% Lead (Pb)-Free

## Applications

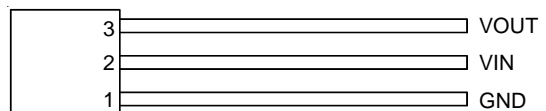
- 5V to 3.3V Linear Regulator
- Low Voltage Microcontroller, DSF, ..... etc. Power Supply
- Linear Regulator for LAN Card and CD-ROM

## Pin Configurations

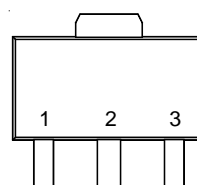
(TOP VIEW)



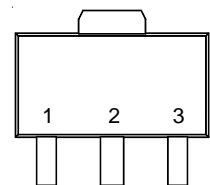
RT9162-33CZL  
RT9162-35CZL  
TO-92



RT9162-33CZT  
RT9162-35CZT  
TO-92

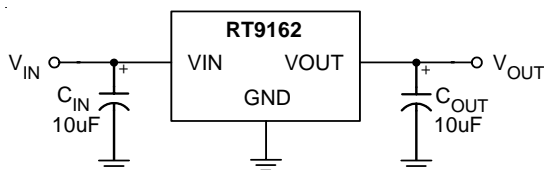


RT9162-33CX  
RT9162-35CX  
SOT-89



RT9162-33CXL  
RT9162-35CXL  
SOT-89

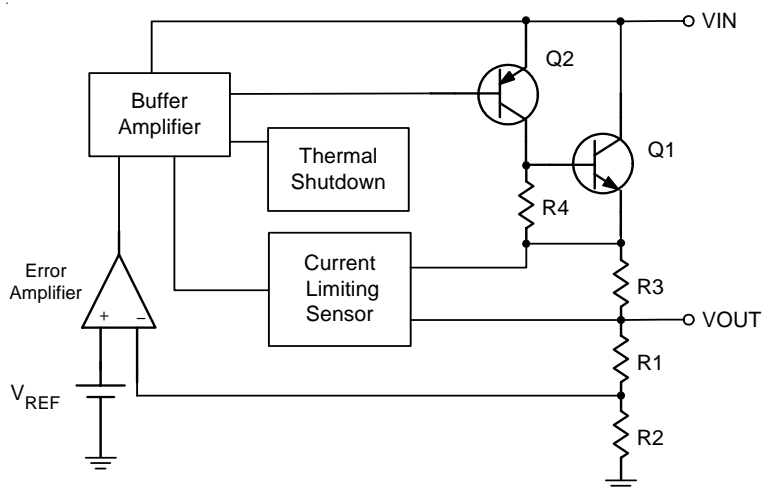
## Typical Application Circuit



## Functional Pin Description

Pin Name	Pin Function
VOUT	Output Voltage
GND	Ground
VIN	Power Input

## Function Block Diagram



**Absolute Maximum Ratings**

- Input Voltage ----- 15V
- Power Dissipation,  $P_D$  @  $T_A = 25^\circ\text{C}$ 
  - TO-92 ----- 0.625W
  - SOT-89 ----- 0.571W
- Package Thermal Resistance (Note4)
  - TO-92,  $\theta_{JA}$  -----  $160^\circ\text{C/W}$
  - SOT-89,  $\theta_{JA}$  -----  $175^\circ\text{C/W}$
- Operating Junction Temperature Range -----  $-40^\circ\text{C}$  to  $125^\circ\text{C}$
- Storage Temperature Range -----  $-65^\circ\text{C}$  to  $150^\circ\text{C}$

**Electrical Characteristics**

( $V_{IN} = 5.0\text{V}$ ,  $T_A = 25^\circ\text{C}$ , unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage (Note 1)	RT9162-33	$V_{OUT}$		3.235	3.300	3.365	V
	RT9162-35			3.430	3.500	3.570	
Line Regulation (Note 1)		$\Delta V_{LINE}$	$V_{IN} = 5\text{V}-15\text{V}$	--	0.1	0.4	%
Load Regulation (Note 1)		$\Delta V_{LOAD}$	$I_L = 0 - 300\text{mA}$	--	0.2	0.4	%
Dropout Voltage (Note 2)		$V_{DROP}$	$\Delta V_{OUT} = 1\%$	--	1.2	1.3	V
Current Limit		$I_{LIM}$		400	--	--	mA
Quiescent Current		$I_Q$		--	4.5	8	mA
Temperature Coefficient		$T_C$		--	0.005	--	%/ $^\circ\text{C}$
Temperature Stability		$T_S$		--	0.5	--	%
RMS Output Noise (Note 3)				--	0.003	--	%/ $V_{OUT}$

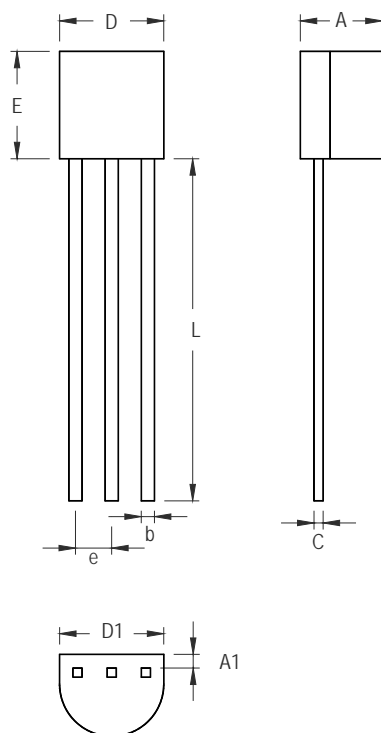
**Note 1.** Low duty cycle pulse testing with Kelvin connections required.

**Note 2.** The dropout voltage is defined as  $V_{IN} - V_{OUT}$ , which is measured when  $V_{OUT}$  is  $V_{OUT(NORMAL)} - 100\text{mV}$ .

**Note 3.** Bandwidth of 10 Hz to 10 kHz.

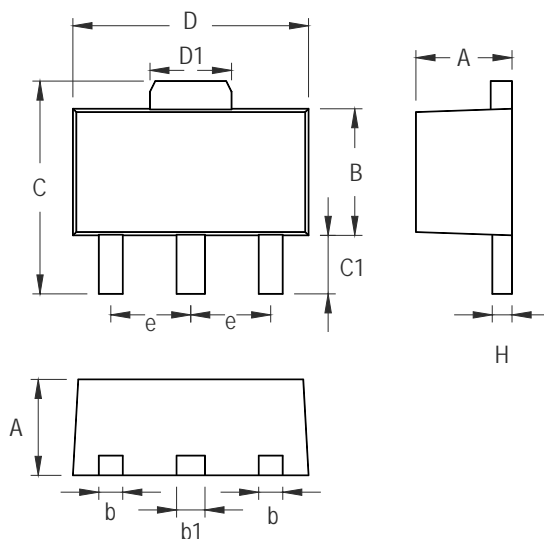
**Note 4.**  $\theta_{JA}$  is measured in the natural convection at  $T_A = 25^\circ\text{C}$  on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

## Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.175	4.191	0.125	0.165
A1	1.143	1.372	0.045	0.054
b	0.406	0.533	0.016	0.021
C	0.406	0.533	0.016	0.021
D	4.445	5.207	0.175	0.205
D1	3.429	5.029	0.135	0.198
E	4.318	5.334	0.170	0.210
e	1.143	1.397	0.045	0.055
L	12.700		0.500	

**3-Lead TO-92 Plastic Package**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.397	1.600	0.055	0.063
b	0.356	0.483	0.014	0.019
B	2.388	2.591	0.094	0.102
b1	0.406	0.533	0.016	0.021
C	3.937	4.242	0.155	0.167
C1	0.787	1.194	0.031	0.047
D	4.394	4.597	0.173	0.181
D1	1.397	1.753	0.055	0.069
e	1.448	1.549	0.057	0.061
H	0.356	0.432	0.014	0.017

**3-Lead SOT-89 Surface Mount Package**

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