

150mA 3-Terminal Positive Regulator

General Description

The RT9165 is a positive low dropout regulator designed for applications requiring low dropout performance at full rated current. The device is available in fixed output voltage of 5.0V or 8.0V. The RT9165 provides excellent regulation over line, load, and temperature variations.

The other features include low dropout performance at a maximum of 1.3V at 150mA, fast transient response, internal current limiting, and thermal shutdown protection of the output devices. The RT9165 is a three-terminal regulator compatible with industrial LM78L05/L08 and available in surface mount SOT-89 package.

Applications

- 5V or 8V Output Linear Regulator
- Consumer Equipment Power Supply

Ordering Information

RT9165-□□□□

- Package type
Z : TO-92
X : SOT-89
- Operating temperature range
C: Commercial standard
- Output voltage
Default : 5V
80 : 8.0V

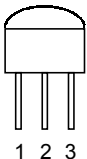
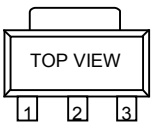
Marking Information

Part Number	Marking
RT9165-CZ	RTBA
RT9165-CX	AN
RT9165-80CX	CV

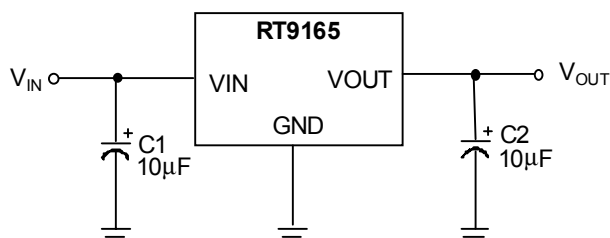
Features

- Low Dropout, Maximum 1.3V at 150mA
- Fast Transient Response
- $\pm 3\%$ Total Output Regulation
- 0.5% Line Regulation
- 0.5% Load Regulation
- SOT-89 and TO-92 Packages

Pin Configurations

Part Number	Pin Configurations
RT9165-CZ (Plastic TO-92)	 1. VOUT 2. GND 3. VIN
RT9165-□□CX (Plastic SOT-89)	 1. VOUT 2. GND 3. VIN

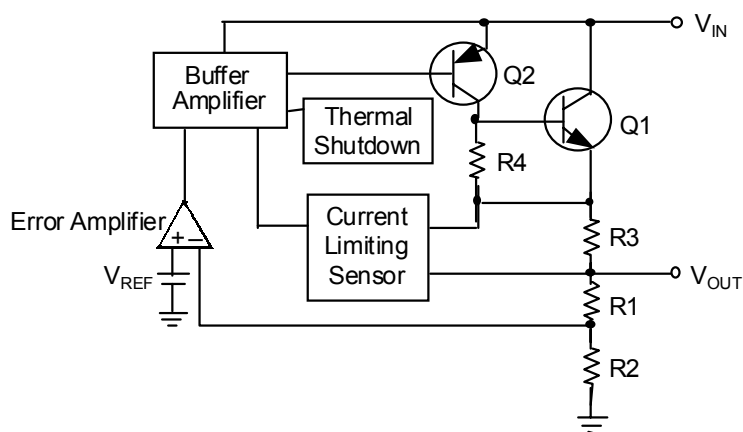
Typical Application Circuit



Pin Description

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

Function Block Diagram



Absolute Maximum Ratings

- Input Voltage V_{IN} 16V
- Power Dissipation
 TO-92 0.6W
 SOT-89 0.5W
- Operating Junction Temperature Range -40°C to 125°C
- Storage Temperature Range -50°C to 150°C

Electrical Characteristics

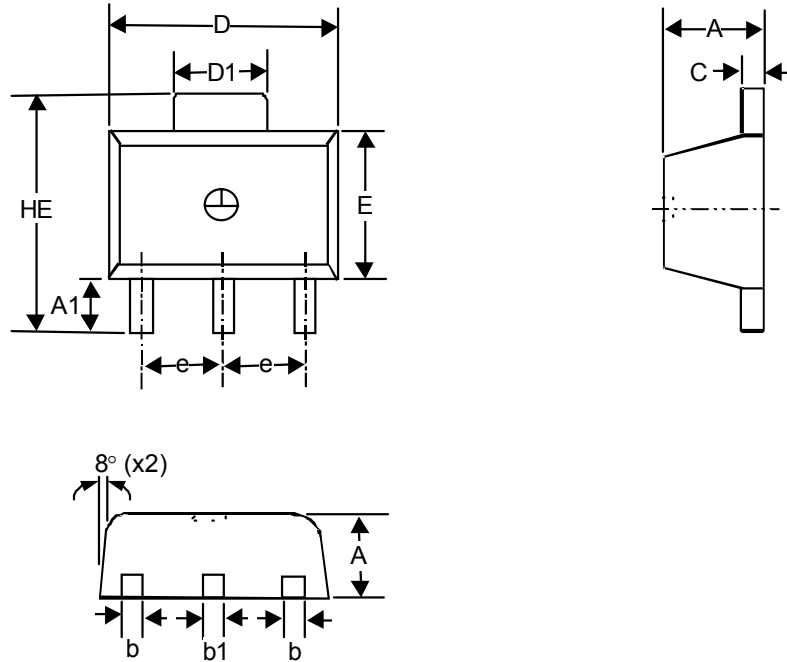
($V_{IN} = 7.0\text{V}$, $T_A = 25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage ⁽¹⁾	RT9165		$V_{IN} = V_{OUT} + 2\text{V}$	4.850	5.000	5.150	V
	RT9165-80			7.760	8.000	8.240	
Line Regulation ⁽¹⁾			$V_{IN} = 7\text{V}-16\text{V}$	—	0.1	0.5	%
Load Regulation ⁽¹⁾			$I_L = 0\sim 150\text{mA}$	—	0.2	0.5	%
Dropout Voltage ⁽²⁾			$\Delta V_{OUT} = 1\%$	—	1.2	1.3	V
Current Limit			--	300	—	—	mA
Quiescent Current			--	—	4.5	8	mA
Temperature Coefficient			--	—	0.005	—	$\%/^{\circ}\text{C}$
Temperature Stability			--	—	0.5	—	%
RMS Output Noise ⁽³⁾			--	—	0.003	—	$\%/V_{OUT}$

Notes:

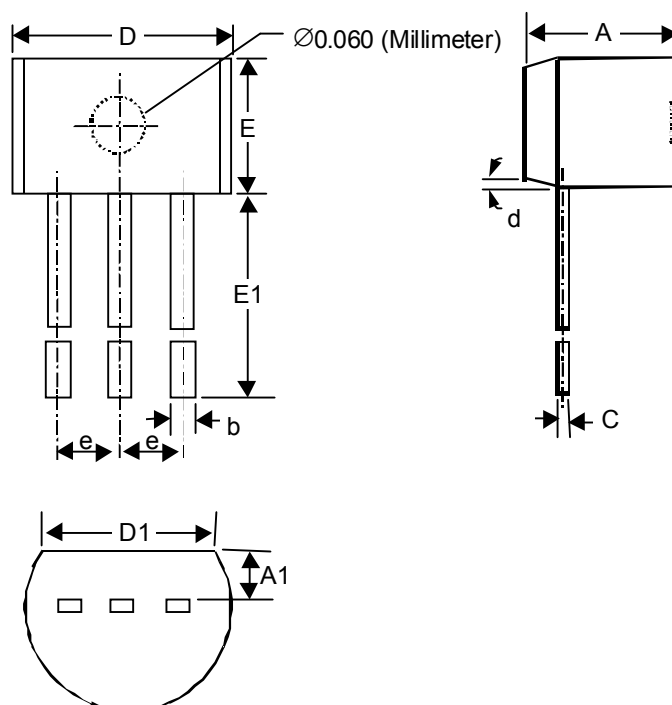
- (1) Low duty cycle pulse testing with Kelvin connections required.
- (2) Dropout voltage is defined as the input to output differential at which the output voltage drops 1% below the value measured with a 2V differential.
- (3) Bandwidth of 10 Hz to 10 kHz.

Package Information



Symbols	Dimensions In Millimeters			Dimensions In Inches		
	Min	Typ	Max	Min	Typ	Max
A	1.40	1.50	1.60	0.055	0.059	0.063
A1	0.90	1.00	1.10	0.035	0.039	0.043
b	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.42	0.53	0.016	0.018	0.020
C	0.38	0.40	0.43	0.014	0.015	0.017
D	4.20	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
HE	--	--	4.25	--	--	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e	1.45	1.50	1.55	0.057	0.059	0.061

3-Lead SOT-89 Surface Mount



Symbols	Dimensions In Millimeters			Dimensions In Inches		
	Min	Typ	Max	Min	Typ	Max
A	3.48	3.56	3.61	0.137	0.140	0.142
A1	--	1.30	--	--	0.051	--
C	--	0.38	--	--	0.015	--
D	4.19	4.45	4.70	0.165	0.175	0.185
D1	--	4.29	--	--	0.169	--
E	3.99	4.24	4.50	0.157	0.167	0.177
E1	14.00	--	--	0.551	--	--
b	--	0.38	--	--	0.015	--
e	--	1.27	--	--	0.050	--
δ	--	5°	--	--	5°	--

3-Lead TO-92 Package

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