

2A Fixed and Adjustable Low Dropout Positive Voltage Regulators

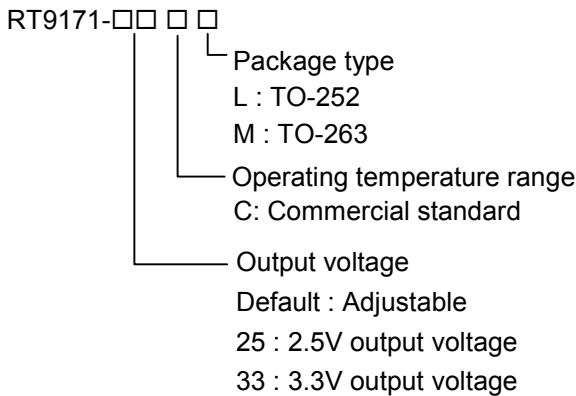
General Description

The RT9171 is a high performance positive voltage regulator designed for applications requiring low dropout at fully rated current. Additionally, the RT9171 provides excellent regulation over variations in line and load. Outstanding features include low dropout performance at rated current, fast transient response, internal current-limiting, and thermal-shutdown protection of the output device. The RT9171 three-terminal regulator offers fixed 2.5V and 3.3V output voltages, and adjustable voltage options available in TO-252 and TO-263 packages.

Applications

- Active SCSI Termination
- Low Voltage Microcontrollers
- Switching Power Supply Post-Regulator

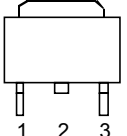
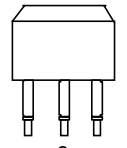
Ordering Information



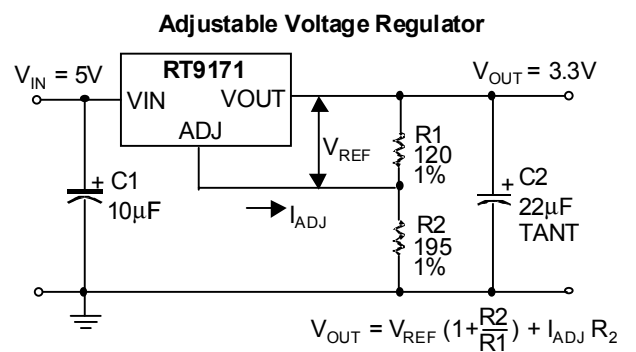
Features

- Low Dropout, 1.6V Max.
- Full Current Rating Over Line and Temperature
- Fast Transient Response
- ±1 % Output Voltage Accuracy
- Adjustable and Fixed Output Voltage
- TO- 252 and TO- 263 Packages

Pin Configurations

Part Number	Pin Configurations
RT9171-□□CL (Plastic TO-252)	 <p>TOP VIEW</p> <ol style="list-style-type: none"> 1. ADJ/GND 2. VOUT (TAB) 3. VIN
RT9171-□□CM (Plastic TO-263)	 <p>TOP VIEW</p> <ol style="list-style-type: none"> 1. ADJ/GND 2. VOUT (TAB) 3. VIN

Typical Application Circuit



- (1) C1 needed if device is far from filter capacitors.
- (2) C2 required for stability.

Pin Description

Pin Name	Pin Function
ADJ / GND	Adjust Output or Ground
VOUT	Output Voltage
VIN	Power Input

Absolute Maximum Ratings

• Input Voltage	9V
• Operating Junction Temperature Range	-40°C to 125°C
• Storage Temperature Range	-65°C to 150°C
• Lead Temperature (Soldering, 10 sec.)	260°C
• Package Thermal Resistance	
TO-252, θ_{JC}	15°C/W
TO-252, θ_{JA}	56°C/W
TO-263, θ_{JC}	8°C/W
TO-263, θ_{JA}	19.4°C/W

Electrical Characteristics

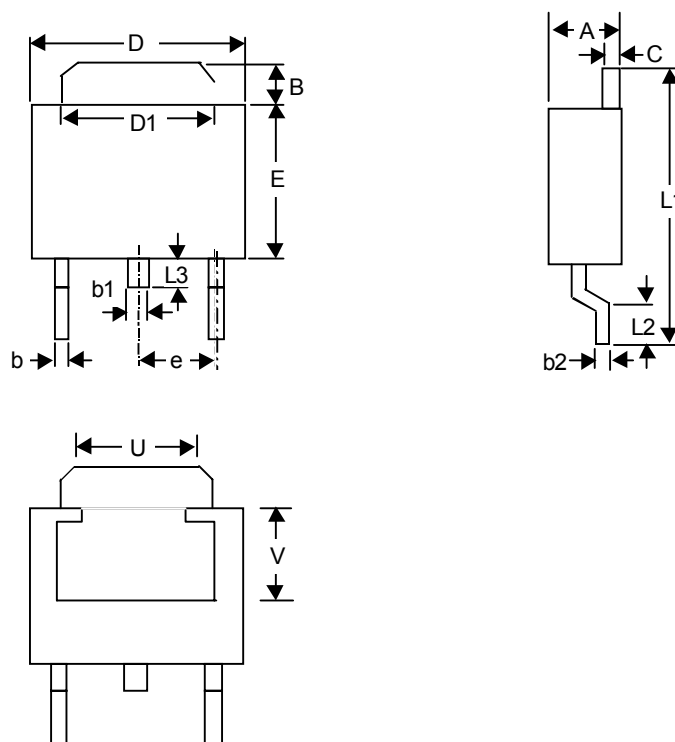
($T_A = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units	
Reference Voltage ⁽¹⁾	RT9171	V_{REF}	$I_{OUT} = 10\text{mA}$, $(V_{IN} - V_{OUT}) = 2\text{V}$ $T_A = 25^\circ\text{C}$	1.238	1.250	1.262	V
			$10\text{mA} < I_{OUT} < 2\text{A}$, $1.6\text{V} < V_{IN} - V_{OUT} < 9\text{V}$	1.225	1.250	1.270	
Output Voltage	RT9171-25	V_{OUT}	$V_{IN} = V_{OUT} + 2\text{V}$, $I_{OUT} = 10\text{mA}$	2.475	2.5	2.525	V
	RT9171-33			3.267	3.3	3.333	
Line Regulation ⁽¹⁾	ΔV_{LINE}	$I_{OUT} = 10\text{mA}$ $1.6\text{V} \leq V_{IN} - V_{OUT}$ to $V_{IN} = 9\text{V}$	--	0.1	0.3	%	
Load Regulation ⁽¹⁾	ΔV_{LOAD}	$(V_{IN} - V_{OUT}) = 2\text{V}$, $0\text{mA} \leq I_{OUT} \leq 2\text{A}$	--	0.2	0.4	%	
Dropout Voltage ⁽²⁾	V_{DROP}	$I_{OUT} = 100\text{mA}$	--	1.1	1.2	V	
		$I_{OUT} = 2\text{A}$	--	1.4	1.6		
Current Limit	I_{LIMIT}	$V_{IN} = 5\text{V}$	2.2	3	--	A	
Minimum Load Current	RT9171	$(V_{IN} - V_{OUT}) = 2\text{V}$	--	5	10	mA	
Ripple Rejection	PSRR	$f_{RIPPLE} = 120\text{Hz}$, $(V_{IN} - V_{OUT}) = 2\text{V}$, $V_{RIPPLE} = 1V_{P-P}$	--	72	--	dB	
Adjust Pin Current	I_{ADJ}		--	65	120	μA	
Adjust Pin Current Change	ΔI_{ADJ}	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $V_{IN} = 5\text{V}$	--	0.2	5	μA	

Notes: (1) Low duty cycle pulse testing with Kelvin connections.

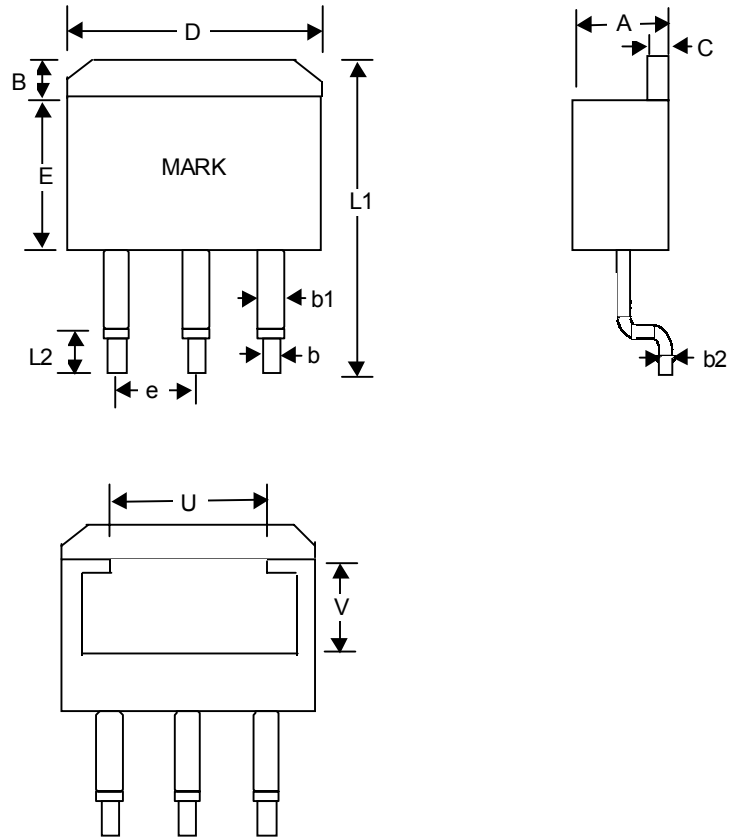
(2) ΔV_{OUT} and $\Delta V_{REF} = 1\%$.

Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.184	2.388	0.086	0.094
B	0.889	2.032	0.035	0.080
b	0.508	0.889	0.020	0.035
b1	1.016 Ref.		0.040 Ref.	
b2	0.457	0.584	0.018	0.023
C	0.457	0.584	0.018	0.023
D	6.350	6.731	0.250	0.265
D1	5.207	5.461	0.205	0.215
E	5.334	6.223	0.210	0.245
e	2.108	2.438	0.083	0.096
L1	9.398	10.414	0.370	0.410
L2	0.508	--	0.020	--
L3	0.635	1.016	0.025	0.040
U	3.810 Ref.		0.150 Ref.	
V	3.048 Ref.		0.120 Ref.	

3-Lead TO-252 Plastic Surface Mount Package



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.064	4.826	0.160	0.190
B	1.143	1.676	0.045	0.066
b	0.660	0.914	0.026	0.036
b1	1.143	1.397	0.045	0.055
b2	0.305	0.584	0.012	0.023
C	1.143	1.397	0.045	0.055
D	9.652	10.668	0.380	0.420
E	8.128	9.652	0.320	0.380
e	2.286	2.794	0.090	0.110
L1	14.605	15.875	0.575	0.625
L2	2.286	2.794	0.090	0.110
U	6.223 Ref.		0.245 Ref.	
V	7.620 Ref.		0.300 Ref.	

3-Lead TO- 263 Surface Mount

RICHTEK TECHNOLOGY CORP.

Headquarter

6F, No. 35, Hsintai Road, Chupei City

Hsinchu, Taiwan, R.O.C.

Tel: (8863)5510047 Fax: (8863)5537749

RICHTEK TECHNOLOGY CORP.

Taipei Office (Marketing)

8F-1, No. 137, Lane 235, Paochiao Road, Hsintien City

Taipei County, Taipei, R.O.C.

Tel: (8862)89191466 Fax: (8862)89191465

Email: marketing@richtek-ic.com.tw