

3A Bus Termination Regulator

General Description

The RT9173/A regulator is designed to convert voltage supplies ranging from 1.8V to 6V into a desired output voltage which adjusted by two external resistors, voltage divider. The regulator is capable of sourcing or sinking up to 3A of current while regulating an output voltage to within 2% or less.

The RT9173/A, used in conjunction with series termination resistors, provides an excellent voltage source for active termination schemes of high speed transmission lines as those seen in high speed memory buses and distributed backplane designs. The voltage output of the regulator can be used as a termination voltage for DDR.

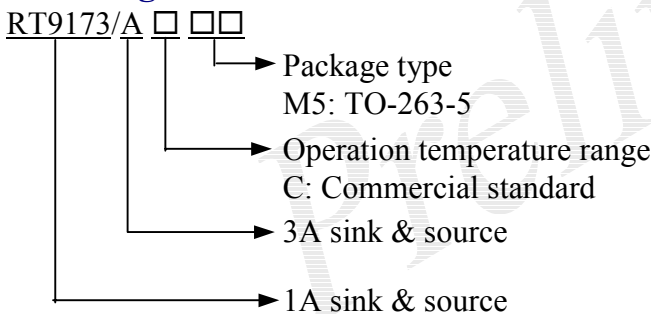
Features

- Power TO-263-5 Package.
- Capable of Sourcing and Sinking Current 3A
- Current-limiting Protection
- Thermal Protection
- Integrated Power MOSFETs.
- Generates Termination Voltages for SSTL-2
- High Accuracy Output Voltage at Full-load
- Adjustable VOUT by External Resistors
- Minimum External Components
- Shutdown for Standby or Suspend Mode
Operation with High-impedance Output
- Soft-start Function

Applications

- Computers
- Disk Drives
- CD-ROM
- Supply Splitter

Ordering Information



Pin Configuration

Part Number	Pin Configuration													
RT9173/ACM5 (Plastic TO-263-5)		<table border="1"> <thead> <tr> <th>Pin</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VIN</td> </tr> <tr> <td>2</td> <td>GND</td> </tr> <tr> <td>3</td> <td>VCNTL</td> </tr> <tr> <td>4</td> <td>REFEN</td> </tr> <tr> <td>5</td> <td>VOUT</td> </tr> </tbody> </table>	Pin	Name	1	VIN	2	GND	3	VCNTL	4	REFEN	5	VOUT
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1	VIN													
2	GND													
3	VCNTL													
4	REFEN													
5	VOUT													

Absolute Maximum Ratings

- Input Voltage Range 7V
- Power Dissipation Internally Limited
- ESD Rating 3KV
- Storage Temperature Range -50°C to 150°C
- Lead Temperature (Soldering, 5 seconds) 260°C
- Package Thermal Resistance
TO-263 (θ_{JC}) 2°C/W

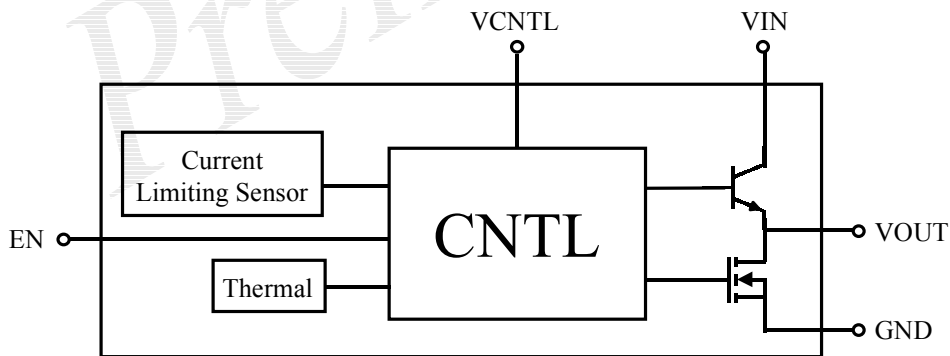
Electrical Characteristics

Limits in standard typeface are for $T_J = 25^\circ\text{C}$, unless otherwise specified:

$V_{IN} = 2.5\text{V}$, $V_{CNTL} = 3.3\text{V}$, $V_{REFEN} = 1.25\text{V}$, $C_{OUT} = 10\mu\text{F}$ (Ceramic)

Parameter	Test Conditions	Min.	Typ.	Max.	Units	
Output Offset Voltage, V_{OS}	Figure 1.	-15	0	15	mV	
Load Regulation, ΔV_{OUT}	$I_L: -3\text{A} \rightarrow 3\text{A}$, Figure 1.	-2	0	+2	%	
Input Voltage Range	V_{IN}	Keep $V_{CNTL} \geq V_{IN}$ in operation power on and power off sequences	1.8	2.5	6	V
	V_{CNTL}			3.3	6	V
Current In Shutdown Mode, I_{SHDN}	$V_{REFEN} < 0.4\text{V}$, $R_L = 10\text{K}\Omega$, Figure 2.		30	60	μA	
Peak Output Current	RT9173	1.5	3		A	
	RT9173A	3.5	5			
Short Circuit Protection						
Current Limit, I_{CL}	RT9173	Figure 3,4	1.5	2	A	
	RT9173A	Figure 3,4	3.5	4		
Over Temperature Protection						
Shutdown Threshold	Guaranteed by design		150		$^\circ\text{C}$	
Thermal Shutdown Hysteresis			50		$^\circ\text{C}$	
Shutdown Function						
Shutdown threshold trigger	Output = High, Figure 5	0.8			V	
	Output = Low, Figure 5			0.4		

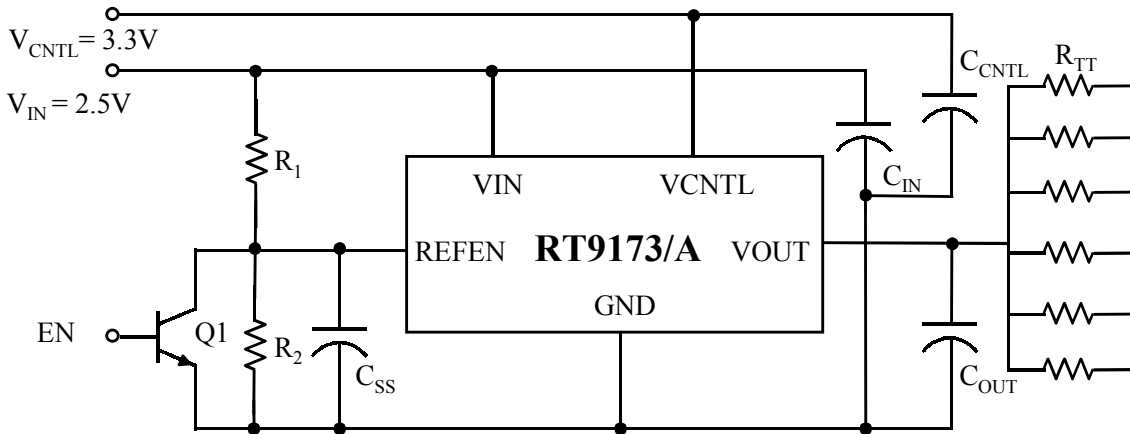
Function Block Diagram



Pin Description

Pin Name	Pin Function
VIN	Input Supply
GND	Ground
VCNTL	Gate Drive Voltage
REFEN	Reference Voltage Input and Chip Enable
VOUT	Output Voltage (equals to $\frac{1}{2} V_{IN}$ if $R_1 = R_2$.)

Typical Applications



$R_1 = R_2 = 100K\Omega$, $R_{TT} = 50\Omega / 33\Omega / 25\Omega$
 $C_{OUT, min} = 10\mu F$ (ceramic), $C_{SS} = 1\mu F$, $C_{IN} = 100\mu F$, $C_{CNTL} = 47\mu F$

Test Circuits

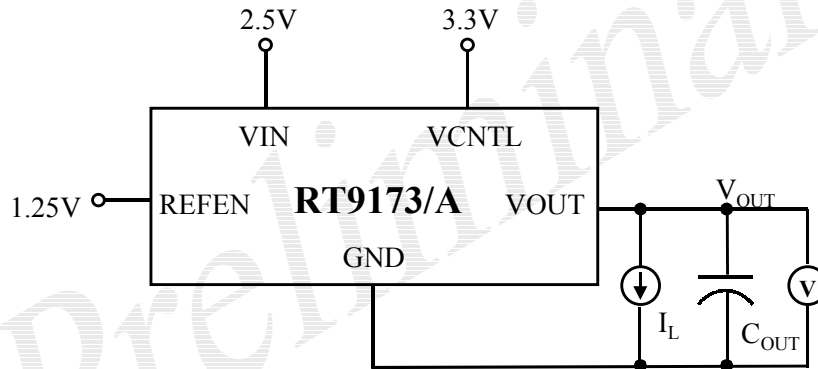


Figure 1: Output Voltage Tolerance, ΔV_{OUT}

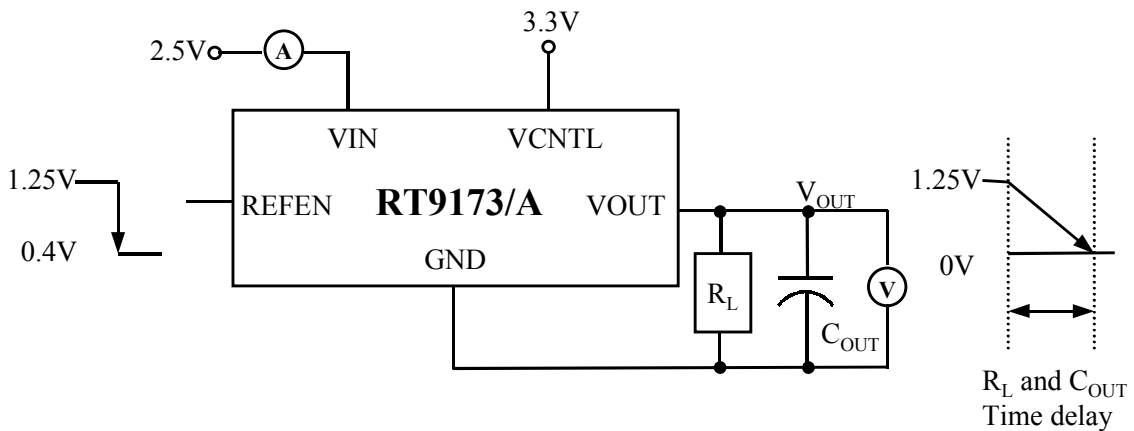


Figure 2: Current in Shutdown Mode, I_{shdn}

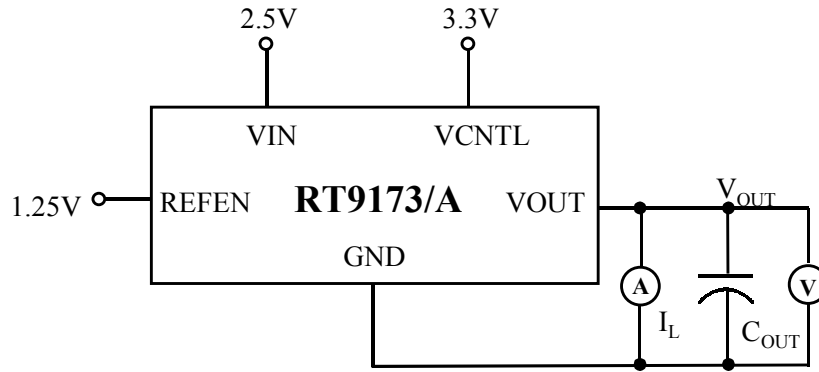


Figure 3: Current Limit for High Side, I_{CLHIGH}

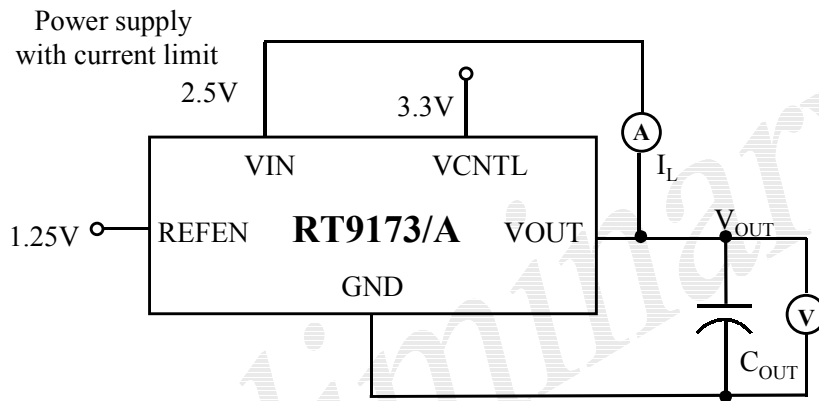


Figure 4: Current Limit for Low Side, I_{CLLOW}

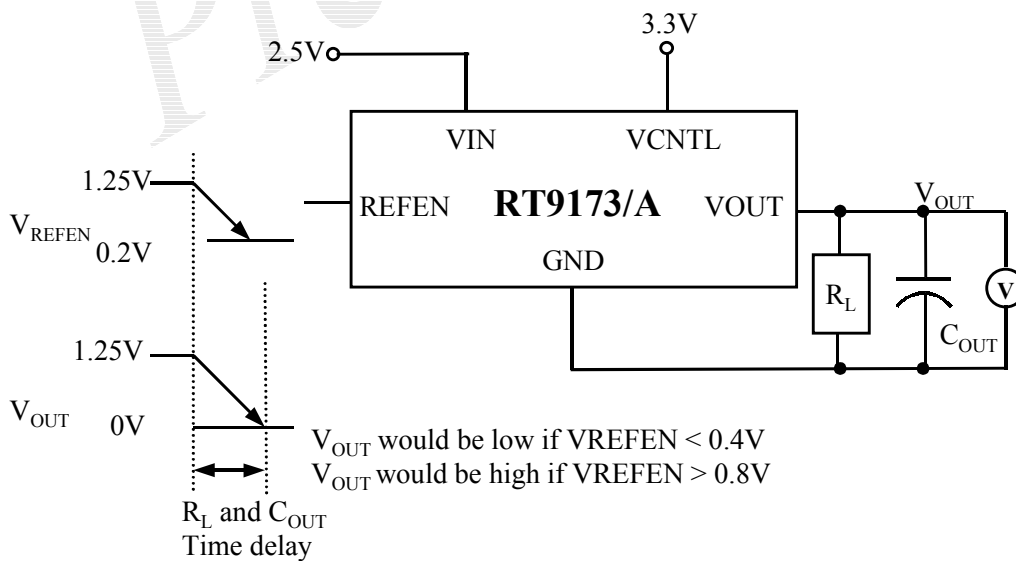
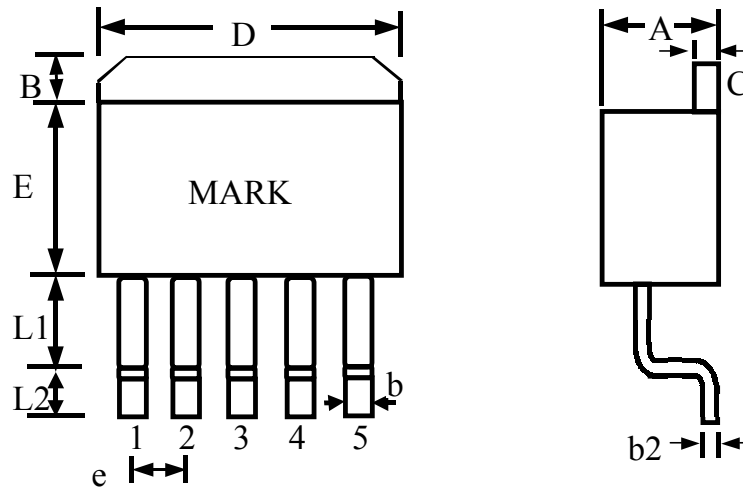


Figure 5: REFEN Pin Shutdown Threshold, $V_{trigger}$

Package Information



Symbol	Dimensions In Inches			Dimensions In Millimeters		
	Min	Norm	Max	Min	Norm	Max
D	0.3921	0.4000	0.4079	9.96	10.16	10.36
B	0.0783	0.0862	0.0941	1.99	2.19	2.39
E	0.3307	0.3386	0.3465	8.40	8.60	8.80
A	0.1724	0.1803	0.1882	4.38	4.58	4.78
C	0.0465	0.0504	0.0543	1.18	1.28	1.38
L1	0.1169	0.1248	0.1327	2.97	3.17	3.37
L2	0.0602	0.0681	0.0760	1.53	1.73	1.93
b	0.0280	0.0319	0.0358	0.71	0.81	0.91
b2	0.0110	0.0150	0.0189	0.28	0.38	0.48
e	--	0.0669	--	--	1.70	--

5-Lead TO-263 Plastic Surface Mount Package