

## Description

This series of fixed-voltage monolithic integrated-circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. Each of these regulators can deliver up to 100 mA of output current. The internal limiting and thermal shutdown features of these regulators make them essentially immune to overload. When used as a replacement for a Zener diode-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

## Features

- 3-Terminal Regulators
- Output Current Up to 100 mA
- No External Components
- Internal Thermal Overload Protection
- Internal Short-Circuit Limiting

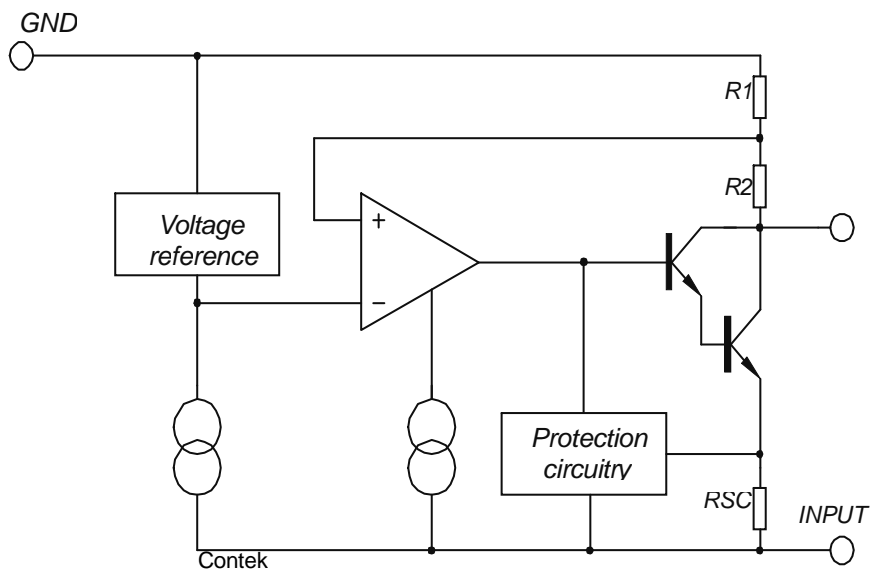


Package TO-92  
(top view)



## Internal Block Diagram

## Package



## Absolute Maximum Ratings

over operating temperature range (unless otherwise noted)

Parameter	79L05A thru 79L08A	79L12A THRU 79L18A	79L24A	Units
Input voltage	-30	-35	-40	V
Operating free-air, case, or virtual junction temperature range	0 to 150	0 to 150	0 to 150	°C
Storage temperature range	-65 to 150	-65 to 150	-65 to 150	
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds	260	260	260	

## Recommended Operating Conditions

Parameter	Min	Max	Units	
Input voltage $V_i$	79L05A	-7	-20	V
	79L06A	-8	-20	
	79L08A	-10.5	-23	
	79L12A	-14.5	-27	
	79L15A	-17.5	-30	
	79L18A	-20.5	-33	
	79L24A	-27	-38	
Output current, $I_o$		100	mA	
Operating virtual junction temperature, $T_j$	0	125	°C	

## Device Selection Guide

Output Voltage	Device
-5 V	79L05A
-6 V	79L06A
-8 V	79L08A
-12 V	79L12A
-15 V	79L15A
-18 V	79L18A
-24 V	79L24A

## Electrical Characteristics 79L05A

Electrical characteristics at specified virtual junction temperature,  $V_i = -10V, I_o = 40mA$  (unless otherwise noted)

Parameter	Test conditions*	79L05A			Units	
		Min	Typ	Max		
Output voltage**	25°C	-4.8	-5	-5.2	V	
	$I_o = 1mA$ to 40 mA, $V_i = -7V$ to -20V	0°C to 125°C	-4.75			-5.25
			-4.75			-5.25
Input regulation	$V_i = -7V$ to -20V		15	150	mV	
	$V_i = -8V$ to -20V		12	100		
Ripple rejection	$V_i = -8V$ to -18V, $f = 120Hz$	25°C	41	49	dB	
Output regulation	$I_o = 1mA$ to 100mA	25°C		20	60	mV
	$I_o = 1mA$ to 40mA			10	30	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		40	µV	
Dropout voltage		25°C		1.7	V	
Bias current		25°C		6	mA	
		125°C		5.5		
Bias current change	$V_i = -8V$ to -20V	0°C to 125°C		1.5		
	$I_o = 1mA$ to 40mA			0.1		

## Electrical Characteristics 79L06A

Electrical characteristics at specified virtual junction temperature,  $V_I = -11V$ ,  $I_O = 40mA$  (unless otherwise noted)

Parameter	Test conditions*	79L06A			Units	
		Min	Typ	Max		
Output voltage**		25°C	-5.75	-6	-6.25	V
	$I_O = 1mA$ to 40 mA, $V_I = -8V$ to -20V	0°C to 125°C	-5.7		-6.3	
	$I_O = 1mA$ to 70mA,					
Input regulation	$V_I = -8V$ to -20V	25°C		20	175	mV
	$V_I = -9V$ to -20V			15	125	
Ripple rejection	$V_I = -9V$ to -19V, $f = 120Hz$	25°C	40	48		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		21	80	mV
	$I_O = 1mA$ to 40mA			11	40	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		44		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C			6	mA
		125°C			5.5	
Bias current change	$V_I = -9V$ to -20V	0°C to 125°C			1.5	mA
	$I_O = 1mA$ to 40mA				0.1	

\* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33 $\mu F$  capacitor across the input and a 0.1  $\mu F$  capacitor across the output.

\*\* This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Electrical Characteristics 79L08A

Electrical characteristics at specified virtual junction temperature,  $V_I = -14V$ ,  $I_O = 40mA$  (unless otherwise noted)

Parameter	Test conditions*	79L08A			Units	
		Min	Typ	Max		
Output voltage**		25°C	-7.7	-8	-8.3	V
	$I_O = 1mA$ to 40 mA, $V_I = -10.5V$ to -23V	0°C to 125°C	-7.6		-8.4	
	$I_O = 1mA$ to 70mA,					
Input regulation	$V_I = -10.5V$ to -23V	25°C		42	200	mV
	$V_I = -11V$ to -23V			36	150	
Ripple rejection	$V_I = -11V$ to -21V, $f = 120Hz$	25°C	37	46		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		30	100	mV
	$I_O = 1mA$ to 40mA			15	50	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		54		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C			6	mA
		125°C			5.5	
Bias current change	$V_I = -11V$ to -23V	0°C to 125°C			1.5	mA
	$I_O = 1mA$ to 40mA				0.1	

## Electrical Characteristics 79L12A

Electrical characteristics at specified virtual junction temperature,  $V_i = -19V, I_o = 40mA$  (unless otherwise noted)

Parameter	Test conditions*		79L12A			Units
			Min	Typ	Max	
Output voltage**		25°C	-11.5	-12	-12.5	V
	$I_o = 1mA$ to 40mA, $V_i = -14.5V$ to -27V	0°C to 125°C	-11.4		-12.6	
	$I_o = 1mA$ to 70mA		-11.4		-12.6	
Input regulation	$V_i = -14.5V$ to -27V	25°C		50	250	mV
	$V_i = -16V$ to -27V			40	200	
Ripple rejection	$V_i = -15V$ to -25V, $f = 120Hz$	0°C to 125°C	37	42		dB
Output regulation	$I_o = 1mA$ to 100mA	25°C		24	100	mV
	$I_o = 1mA$ to 40mA			15	50	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C			80	
Bias current	$\mu V$ Dropout voltage			25°C	1.7	mA
	V Bias current			25°C		
	6.5	125°C			6	
Bias current change	$V_i = -16V$ to -27V	0°C to 125°C			1.5	
	$I_o = 1mA$ to 40mA				0.1	

\* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a  $0.33\mu F$  capacitor across the input and a  $0.1\mu F$  capacitor across the output.

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## Electrical Characteristics 79L15A

Electrical characteristics at specified virtual junction temperature,  $V_i = -23V, I_o = 40mA$  (unless otherwise noted)

Parameter	Test conditions*		79L15A			Units
			Min	Typ	Max	
Output voltage**		25°C	-14.4	-15	-15.6	V
	$I_o = 1mA$ to 40mA, $V_i = -17.5V$ to -30V	0°C to 125°C	-14.25		-15.75	
	$I_o = 1mA$ to 70mA		-14.25		-15.75	
Input regulation	$V_i = -17.5V$ to -30V	25°C		65	300	mV
	$V_i = -20V$ to -30V			50	250	
Ripple rejection	$V_i = -18.5V$ to -28.5V, $f = 120Hz$	0°C to 125°C	34	39		dB
Output regulation	$I_o = 1mA$ to 100mA	25°C		25	150	mV
	$I_o = 1mA$ to 40mA			15	75	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		90		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_i = -20V$ to -30V	0°C to 125°C			1.5	
	$I_o = 1mA$ to 40mA				0.1	

## Electrical Characteristics 79L18A

Electrical characteristics at specified virtual junction temperature,  $V_i = -26V, I_o = 40mA$  (unless otherwise noted)

Parameter	Test conditions*		79L18A			Units
			Min	Typ	Max	
Output voltage**		25°C	-17.3	-18	-18.7	V
	$I_o = 1mA$ to 40mA, $V_i = -20.5V$ to -33V	0°C to 125°C	-17.1		-18.9	
			$I_o = 1mA$ to 70mA	-17.1		
Input regulation	$V_i = -20.5V$ to -33V	25°C		70	325	mV
	$V_i = -21V$ to -33V			60	275	
Ripple rejection	$V_i = -23V$ to -33V, $f = 120Hz$	0°C to 125°C	33	48		dB
Output regulation	$I_o = 1mA$ to 100mA	25°C		27	170	mV
	$I_o = 1mA$ to 40mA			19	85	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		150		µV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_i = -21V$ to -33V	0°C to 125°C			1.5	
	$I_o = 1mA$ to 40mA				0.1	

\* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33µF capacitor across the input and a 0.1 µF capacitor across the output.

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## Electrical Characteristics 79L24A

Electrical characteristics at specified virtual junction temperature,  $V_i = -33V, I_o = 40mA$  (unless otherwise noted)

Parameter	Test conditions*		79L24A			Units
			Min	Typ	Max	
Output voltage**		25°C	-23	-24	-25	V
	$I_o = 1mA$ to 40mA, $V_i = -27V$ to -38V	0°C to 125°C	-22.8		-25.2	
			$I_o = 1mA$ to 70mA	-22.8		
Input regulation	$V_i = -27V$ to -38V	25°C		90	350	mV
	$V_i = -28V$ to -38V			75	300	
Ripple rejection	$V_i = -29V$ to -35V, $f = 120Hz$	0°C to 125°C	31	47		dB
Output regulation	$I_o = 1mA$ to 100mA	25°C		40	200	mV
	$I_o = 1mA$ to 40mA			25	100	
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		200		µV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_i = -28V$ to -38V	0°C to 125°C			1.5	
	$I_o = 1mA$ to 40mA				0.1	

\* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33µF capacitor across the input and a 0.1 µF capacitor across the output.

\*\* This specification applies only for dc power dissipation permitted by absolute maximum ratings.

**Ordering Information**

<b>ORDERING NUMBER</b>	<b>PACKAGE</b>	<b>MARKING</b>
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