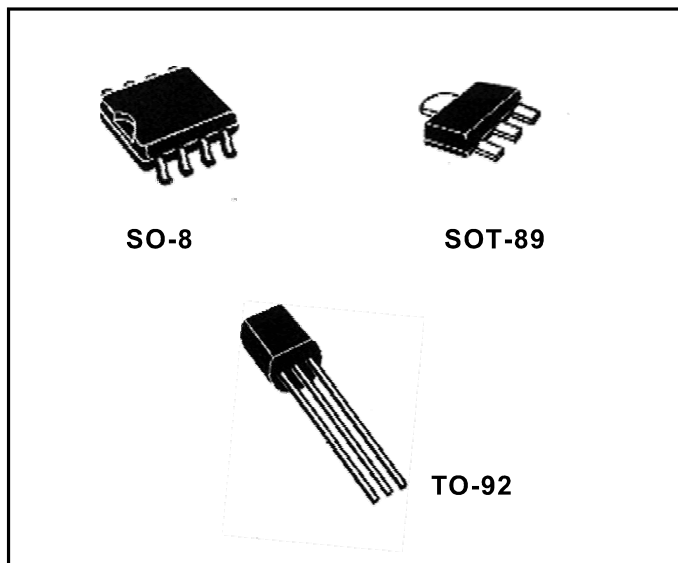


The LM79L00 Series negative voltage regulators are inexpensive, easy-to-use devices suitable for numerous applications requiring up to 100mA. Like the higher powered LM7900 Series negative regulators, this series features thermal shutdown and current limiting, making them remarkably rugged. In most applications, no external components are required for operation.

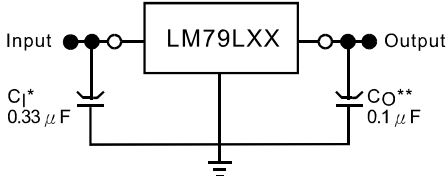
The LM7900 devices are useful for on-card regulation or any other application where a regulated negative voltage at a modest current level is needed. These regulators offer substantial advantage over the common resistor/zenor diode approach.

## FEATURES

- No External Components Required.
- Internal Short-Circuit Current Limiting.
- Internal Thermal Overload Protection.
- Low Cost.
- Complementary Positive Regulators Offered. (LM78L00 Series)



### Standard Application



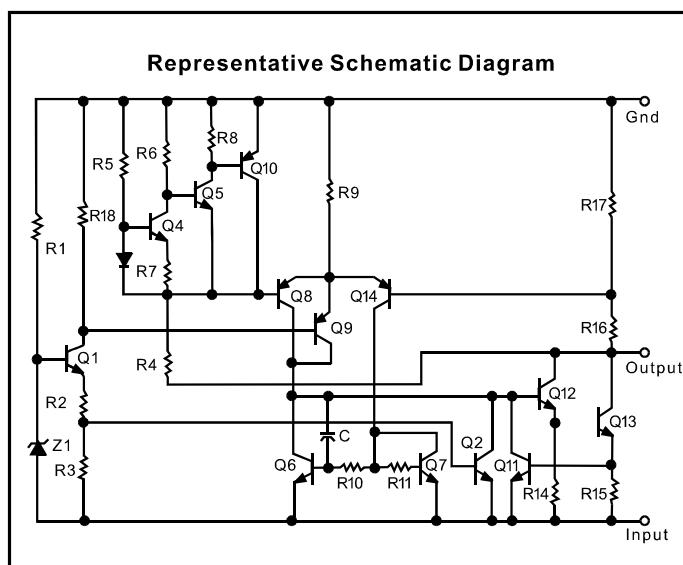
$C_1^*$   
 $0.33 \mu F$

$C_0^{**}$   
 $0.1 \mu F$

A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the ripple voltage.

\* $C_1$  is required if regulator is located an appreciable distance from the power supply filter.

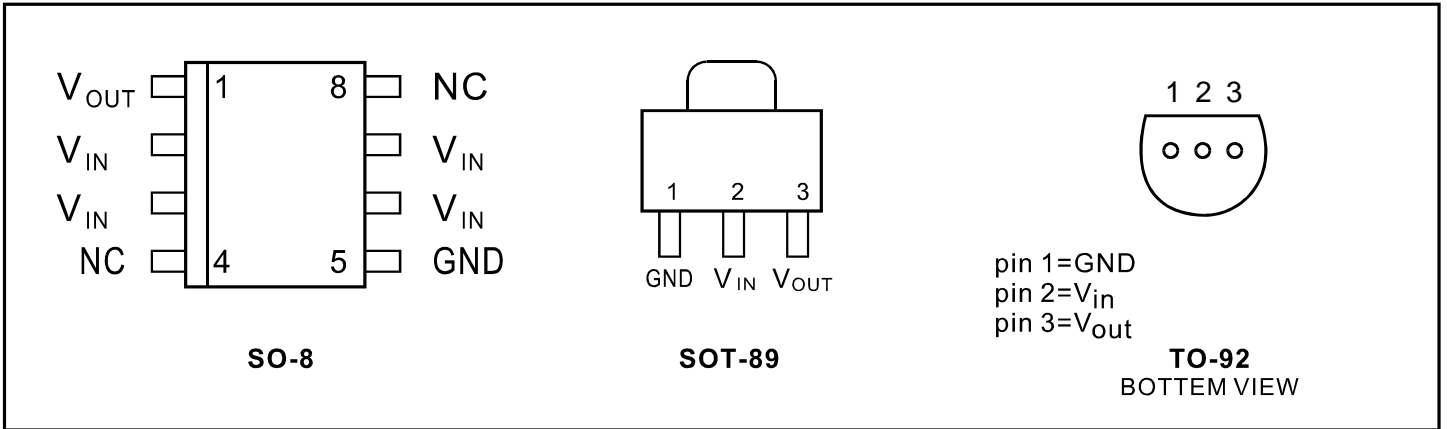
\*\* $C_0$  improves stability and transient response.



### ORDERING INFORMATION

<i>Device</i>	<i>Operating Temperature Range</i>	<i>Package</i>
LM79LxxLP	$0^\circ \sim +125^\circ \text{C}$	TO-92
LM79LxxD	$0^\circ \sim +125^\circ \text{C}$	SOP-8
LM79LxxH	$0^\circ \sim +125^\circ \text{C}$	SOT-89

## CONNECTION DIAGRAM (top view)



## ABSOLUTE MAXIMUM RATINGS OVER OPERATING TEMPERATURE RANGE (unless otherwise noted)

Characteristics	LM79L05 THRU LM79L10	LM79L12 THRU LM79L18	LM79L24	UNIT
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	UNIT
Input voltage, $V_I$	LM79L05	-7	-20	V
	LM79L06	-8	-20	
	LM79L08	-10.5	-23	
	LM79L09	-11.5	-24	
	LM79L10	-12.5	-25	
	LM79L12	-14.5	-27	
	LM79L15	-17.5	-30	
	LM79L18	-20.5	-33	
	LM79L24	-26.5	-39	
Output current, $I_O$			100	mA
Operating virtual junction temperature, $T_J$		0	125	°C

## LM79L05 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -10V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L05			UNIT
			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	-5.25	
	$I_O = 1mA$ to 70mA,		-4.75	-5	-5.25	
Input regulation	$V_I = -7V$ to -20V	25°C		32	150	mV
	$V_I = -8V$ to -20V			26	100	
Ripple rejection	$V_I = -8V$ to -18V, $f = 120Hz$	25°C	41	49		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		15	60	mV
	$I_O = 1mA$ to 40mA			8	30	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		42		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		3.8	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	

## LM79L06 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -12V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L06			UNIT
			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	-6.3	
	$I_O = 1mA$ to 70mA,		-7.6	-6	-6.3	
Input regulation	$V_I = -8V$ to -20V	25°C		35	175	mV
	$V_I = -9V$ to -20V			29	125	
Ripple rejection	$V_I = -9V$ to -19V, $f = 120Hz$	25°C	40	48		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		16	80	mV
	$I_O = 1mA$ to 40mA			9	40	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		46		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		3.9	6	mA
		125°C			5.5	
Bias current change	$V_I = -9V$ to -20V	0°C to 125°C			1.5	
	$I_O = 1mA$ to 40mA				0.1	

## LM79L08 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -14V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L08			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-7.7	-8	-8.3	V
	$I_O = 1mA$ to 40 mA, $V_I = -11.5V$ to -23V	0°C to 125°C	-7.6	-8	-8.4	
	$I_O = 1mA$ to 70mA,		-7.6	-8	-8.4	
Input regulation	$V_I = -10.5V$ to -23V	25°C		42	175	mV
	$V_I = -11V$ to -23V			36	125	
Ripple rejection	$V_I = -13V$ to -23V, $f = 120Hz$	0°C to 125°C	37	46		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		18	80	mV
	$I_O = 1mA$ to 40mA			10	40	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		54		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4	6	mA
		125°C			5.5	
Bias current change	$V_I = -11V$ to -13V	0°C to 125°C			1.5	
	$I_O = 1mA$ to 40mA				0.1	

## LM79L09 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -15V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L09			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-8.6	-9	-9.4	V
	$I_O = 1mA$ to 40 mA, $V_I = -12V$ to -24V	0°C to 125°C	-8.55	-9	-9.45	
	$I_O = 1mA$ to 70mA,		-8.55	-9	-9.45	
Input regulation	$V_I = -12V$ to -24V	25°C		45	175	mV
	$V_I = -13V$ to -24V			40	125	
Ripple rejection	$V_I = -15V$ to -25V, $f = 120Hz$	0°C to 125°C	38	45		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		19	90	mV
	$I_O = 1mA$ to 40mA			11	40	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		58		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.1	6	mA
		125°C			5.5	
Bias current change	$V_I = -13V$ to -24V	0°C to 125°C			1.5	
	$I_O = 1mA$ to 40mA				0.1	

## LM79L10 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -17V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L10			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-9.6	-10	-10.4	V
	$I_O = 1mA$ to 40 mA, $V_I = -13V$ to -25V	0°C to 125°C	-9.5	-10	-10.5	
	$I_O = 1mA$ to 70mA,		-9.5	-10	-10.5	
Input regulation	$V_I = -13V$ to -25V	25°C		51	175	mV
	$V_I = -14V$ to -25V			42	125	
Ripple rejection	$V_I = -15V$ to -25V, $f = 120Hz$	0°C to 125°C	37	44		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		20	90	mV
	$I_O = 1mA$ to 40mA			11	40	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		62		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.2	6	mA
		125°C			5.5	
Bias current change	$V_I = -14V$ to -25V	0°C to 125°C			1.5	
	$I_O = 1mA$ to 40mA				0.1	

## LM79L12 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -19V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L12			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-11.5	-12	-12.5	V
	$I_O = 1mA$ to 40 mA, $V_I = -14V$ to -27V	0°C to 125°C	-11.4	-12	-12.6	
	$I_O = 1mA$ to 70mA,		-11.4	-12	-12.6	
Input regulation	$V_I = -14.5V$ to -27V	25°C		55	250	mV
	$V_I = -16V$ to -27V			49	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		22	100	mV
	$I_O = 1mA$ to 40mA			13	50	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		70		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.3	6.5	mA
		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	

## LM79L15 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -23V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L15			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-14.4	-15	-15.6	V
	$I_O = 1mA$ to 40 mA, $V_I = -17.5V$ to -30V	0°C to 125°C	-14.25	-15	-15.75	
	$I_O = 1mA$ to 70mA,		-14.25	-15	-15.75	
Input regulation	$V_I = -17.5V$ to -30V	25°C		65	300	mV
	$V_I = -19V$ to -30V			58	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 100KHz	25°C		82		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.6	6.5	mA
		125°C			6	
Bias current change	$V_I = -19V$ to -30V	0°C to 125°C			1.5	
	$I_O = 1mA$ to 40mA				0.1	

## LM79L18 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -26V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L18			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-17.3	-18	-18.7	V
	$I_O = 1mA$ to 40 mA, $V_I = -20.5V$ to -33V	0°C to 125°C	-17.1	-18	-18.9	
	$I_O = 1mA$ to 70mA,		-17.1	-18	-18.9	
Input regulation	$V_I = -20.5V$ to -33V	25°C		70	360	mV
	$V_I = -22V$ to -33V			64	300	
Ripple rejection	$V_I = -23V$ to -31.5V, $f = 120Hz$	0°C to 125°C	32	36		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		27	180	mV
	$I_O = 1mA$ to 40mA			19	90	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		89		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.7	6.5	mA
		125°C			6	
Bias current change	$V_I = -22V$ to -33V	0°C to 125°C			1.5	
	$I_O = 1mA$ to 40mA				0.1	

## LM79L24 ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE, $V_I = -33V, I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*		LM79L24			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-23	-24	-25	V
	$I_O = 1mA$ to 40 mA, $V_I = -27V$ to -38V	0°C to 125°C	-22.8	-24	-25.2	
	$I_O = 1mA$ to 70mA,		-22.8	-24	-25.2	
Input regulation	$V_I = -27V$ to -38V	25°C		95	480	mV
	$V_I = -28V$ to -38V			78	400	
Ripple rejection	$V_I = -29V$ to -35V, $f = 120Hz$	0°C to 125°C	30	33		dB
Output regulation	$I_O = 1mA$ to 100mA	25°C		41	240	mV
	$I_O = 1mA$ to 40mA			28	120	
Output noise voltage	$f = 10Hz$ to 100KHz	25°C		97		$\mu V$
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.8	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  $0.33 \mu\text{F}$  capacitor across the input and a  $0.1 \mu\text{F}$  capacitor across the output.

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

