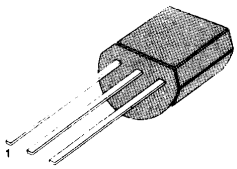
3-TERMINAL 0.1A NEGATIVE VOLTAGE REGULATORS

These regulators employ internal current limiting and thermal shutdown, making them essentially indestructible.

T0-92



1: GND 2: Input 3: Output

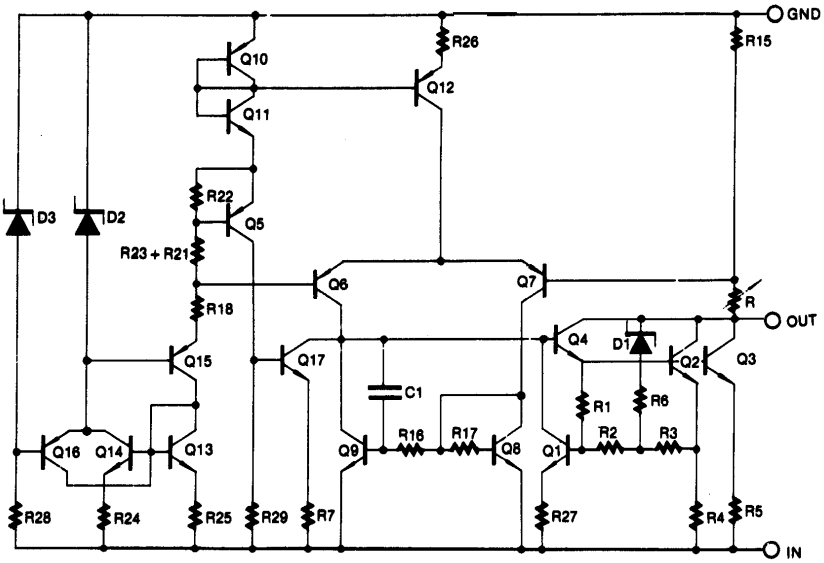
FEATURES

- Output current up to 100mA
- No external components
- Internal thermal over load protection
- Internal short circuit current limiting

ORDERING INFORMATION

Device	Package	Operating Temperature
KA79LXXAZ	TO - 92	0 ~ + 125℃

SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_A = 25℃, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input Voltage (-5V) (-12V to -18V) (-24V)	V_I	-30 -35 -40	V_{DC}
Operating Temperature Range	T_{OPR}	0 ~ + 125	℃
Storage Temperature Range	T_{STG}	-65 ~ + 150	℃

KA79L05A ELECTRICAL CHARACTERISTICS

(V_I = -10V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF, 0℃ ≤ T_J ≤ + 125℃, unless otherwise specified)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_J = +25℃		- 4.8	- 5.0	- 5.2	V
Line Regulation		ΔV_O	T_J =25℃	-7.0V ≥ V_I ≥ -20V		15	150	mV
				-8V ≥ V_I ≥ -20V			100	
Load Regulation		ΔV_O	T_J =25℃	1.0mA ≤ I_O ≤ 100mA		20	60	mV
				1.0mA ≤ I_O ≤ 40mA		10	30	
Output Voltage		V_O	-7.0V > V_I > -20V, 1.0mA ≤ I_O ≤ 40mA		- 4.75		- 5.25	V
			V_I = -10V, 1.0mA ≤ I_O ≤ 70mA		- 4.75		- 5.25	
Quiescent Current		I_Q	T_J = +25℃			2.0	6.0	mA
			T_J = +125℃				5.5	
Quiescent Current Change	With Line	ΔI_Q	-8V ≥ V_I ≥ -20V				1.5	mA
	With Load		1.0mA ≤ I_O ≤ 40mA				0.1	
Output Noise Voltage		V_N	T_A = 25℃, 10Hz ≤ f ≤ 100KHz			30		μV
Ripple Rejection		RR	f = 120Hz, -8V ≥ V_I ≥ -18V T_J = +25℃		41	60		dB
Dropout Voltage		V_D	T_J = +25℃			1.7		V

* Load and line regulation are specified at constant junction temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

KA79L12A ELECTRICAL CHARACTERISTICS

(V_I = -19V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF, 0℃ ≤ T_J ≤ +125℃, unless otherwise specified)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_J = +25℃		-11.5	-12.0	-12.5	V
Line Regulation		ΔV_O	T_J =25℃	-14.5V ≥ V_I ≥ -27V			250	mV
				-16V ≥ V_I ≥ -27V			200	
Load Regulation		ΔV_O	T_J =25℃	1.0mA ≤ I_O ≤ 100mA			100	mV
				1.0mA ≤ I_O ≤ 40mA			50	
Output Voltage		V_O	-14.5V > V_I > -27V, 1.0mA ≤ I_O ≤ 40mA		-11.4		-12.6	V
			V_I = -19V, 1.0mA ≤ I_O ≤ 70mA		-11.4		-12.6	
Quiescent Current		I_Q	T_J = +25℃				6.5	mA
			T_J = +125℃				6.0	
Quiescent Current Change	With Line	ΔI_Q	-16V ≥ V_I ≥ -27V				1.5	mA
	With Load		1.0mA ≤ I_O ≤ 40mA				0.1	
Output Noise Voltage		V_N	T_A = 25℃, 10Hz ≤ f ≤ 100KHz			80		μV
Ripple Rejection		RR	f = 120Hz, -150V ≥ V_I ≥ -25V T_J = +25℃		37	42		dB
Dropout Voltage		V_D	T_J = +25℃			1.7		V

*Load and line regulation are specified at constant junction temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

KA79L15A ELECTRICAL CHARACTERISTICS

(V_I = -23V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF, 0℃ ≤ T_J ≤ +125℃, unless otherwise specified)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_J = +25℃		-14.4	-15.0	-15.6	V
Line Regulation		ΔV_O	T_J =25℃	-17.5V ≥ V_I ≥ -30V			300	mV
				-27V ≥ V_I ≥ -30V			250	
Load Regulation		ΔV_O	T_J =25℃	1.0mA ≤ I_O ≤ 100mA			150	mV
				1.0mA ≤ I_O ≤ 40mA			75	
Output Voltage		V_O	-17.5V > V_I > -30V, 1.0mA ≤ I_O ≤ 40mA		-14.25		-15.75	V
			V_I = -23V, 1.0mA ≤ I_O ≤ 70mA		-14.25		-15.75	
Quiescent Current		I_Q	T_J = +25℃				6.5	mA
			T_J = +125℃				6.0	
Quiescent Current Change	With Line	ΔI_Q	-20V ≥ V_I ≥ -30V				1.5	mA
	With Load		1.0mA ≤ I_O ≤ 40mA				0.1	
Output Noise Voltage		V_N	T_A = 25℃, 10Hz ≤ f ≤ 100KHz			90		μV
Ripple Rejection		RR	f = 120Hz, -18.5V ≥ V_I ≥ -28.5V T_J = +25℃		34	39		dB
Dropout Voltage		V_D	T_J = +25℃			1.7		V

*Load and line regulation are specified at constant junction temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

KA79L18A ELECTRICAL CHARACTERISTICS

(V_I = -27V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF, 0℃ ≤ T_J ≤ +125℃, unless otherwise specified)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_J = +25℃		-17.3	-18.0	-18.7	V
Line Regulation		ΔV_O	T_J =25℃	-20.7V ≥ V_I ≥ -33V			325	mV
				-21V ≥ V_I ≥ -33V			275	
Load Regulation		ΔV_O	T_J =25℃	1.0mA ≤ I_O ≤ 100mA			170	mV
				1.0mA ≤ I_O ≤ 40mA			85	
Output Voltage		V_O	-20.7V > V_I > -33V, 1.0mA ≤ I_O ≤ 40mA		-17.1		-18.9	V
			V_I = -1.0V, 1.0mA ≤ I_O ≤ 70mA		-17.1		-18.9	
Quiescent Current		I_Q	T_J = +25℃				6.5	mA
			T_J = +125℃				6.0	
Quiescent Current Change	With Line	ΔI_Q	-21V ≥ V_I ≥ -33V				1.5	mA
	With Load		1.0mA ≤ I_O ≤ 40mA				0.1	
Output Noise Voltage		V_N	T_A = 25℃, 10Hz ≤ f ≤ 100KHz			150		μV
Ripple Rejection		RR	f = 120Hz, -23V ≥ V_I ≥ -33V T_J = +25℃		33	48		dB
Dropout Voltage		V_D	T_J = +25℃			1.7		V

*Load and line regulation are specified at constant junction temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

KA79L24A ELECTRICAL CHARACTERISTICS

(V_I = -33V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF, 0℃ ≤ T_J ≤ +125℃, unless otherwise specified)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_J = +25℃		-23	-24	-25	V
Line Regulation		ΔV_O	T_J =25℃	-27V ≥ V_I ≥ -38V			350	mV
				-28V ≥ V_I ≥ -38V			300	
Load Regulation		ΔV_O	T_J =25℃	1.0mA ≤ I_O ≤ 100mA			200	mV
				1.0mA ≤ I_O ≤ 40mA			100	
Output Voltage		V_O	-27V > V_I > -38V, 1.0mA ≤ I_O ≤ 40mA		-22.8		-25.2	V
			V_I = -33V, 1.0mA ≤ I_O ≤ 70mA		-22.8		-25.2	
Quiescent Current		I_Q	T_J = +25℃				6.5	mA
			T_J = +125℃				6.0	
Quiescent Current Change	With Line	ΔI_Q	-28V ≥ V_I ≥ -38V				1.5	mA
	With Load		1.0mA ≤ I_O ≤ 40mA				0.1	
Output Noise Voltage		V_N	T_A = 25℃, 10Hz ≤ f ≤ 100KHz			200		μV
Ripple Rejection		RR	f = 120Hz, -29V ≥ V_I ≥ -35V T_J = +25℃		31	47		dB
Dropout Voltage		V_D	T_J = +25℃			1.7		V

*Load and line regulation are specified at constant junction temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

TYPICAL APPLICATIONS

Design Considerations

The KA79LXXA Series of fixed voltage regulators are designed with Thermal Overload Protection that shuts down the circuit when subjected to an excessive power overload condition. Internal Short-Circuit Protection that limits the maximum current the circuit will pass.

In many low current applications, compensation capacitors are not required. However, it is recommended that the regulator input be bypassed with a capacitor if the regulator is connected to the power supply filter with long wire lengths, or if the output load capacitance is large. An input bypass capacitor should be selected to provide good high - frequency characteristics to insure stable operation under all load conditions. A 0.33 μF or larger tantalum, mylar, or other capacitor having low internal impedance at high frequencies should be chosen. The bypass capacitor should be mounted with the shortest possible leads directly across the regulator's input terminals. Normally good construction techniques should be used to minimize ground loops and lead resistance drops since the regulator has no external sense lead. Bypassing the output is also recommended.

Fig. 1 POSITIVE AND NEGATIVE REGULATOR

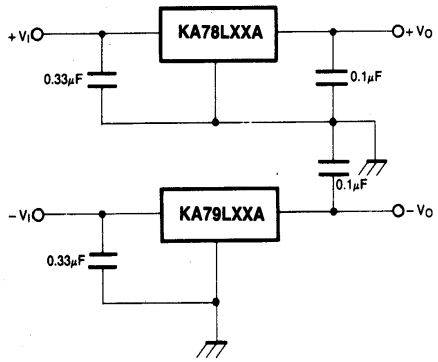
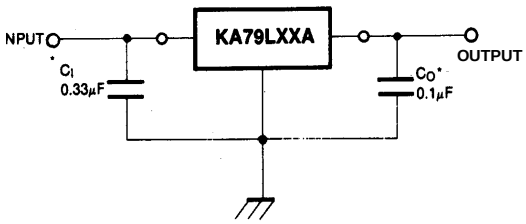


Fig. 2 TYPICAL APPLICATION



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 input ripple voltage.

* = C_1 is required if regulator is located an appreciable distance from power supply filter.
* * = C_O improves stability and transient response.

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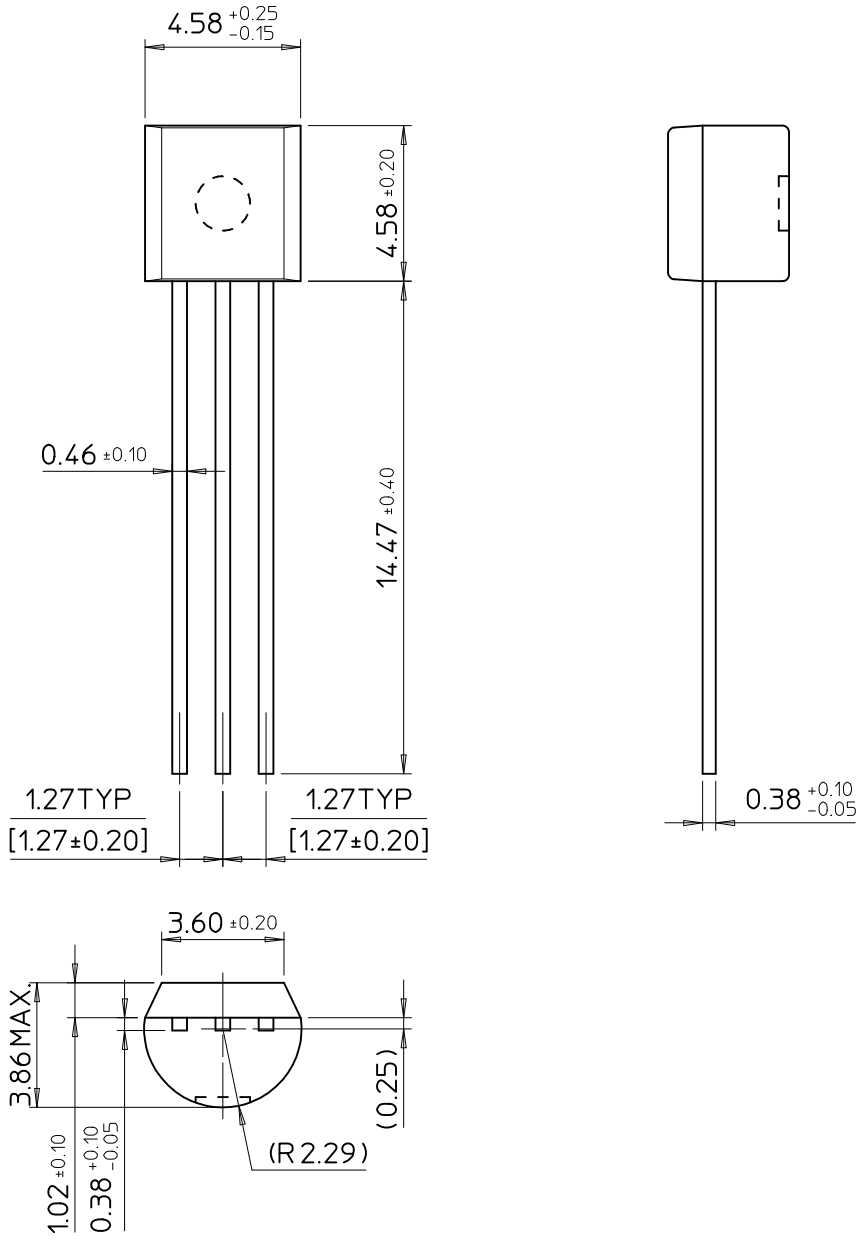
Dimensions in Milimeters



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