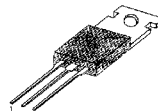


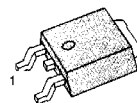
3-TERMINAL 0.5A NEGATIVE VOLTAGE REGULATORS

The LM79MXX series of 3-Terminal medium current negative voltage regulators are monolithic integrated circuits designed as fixed voltage regulators. These regulators employ internal current limiting, thermal shutdown and safe-area compensation making them essentially indestructible.

TO-220



D-PAK



1: GND 2: Input 3: Output

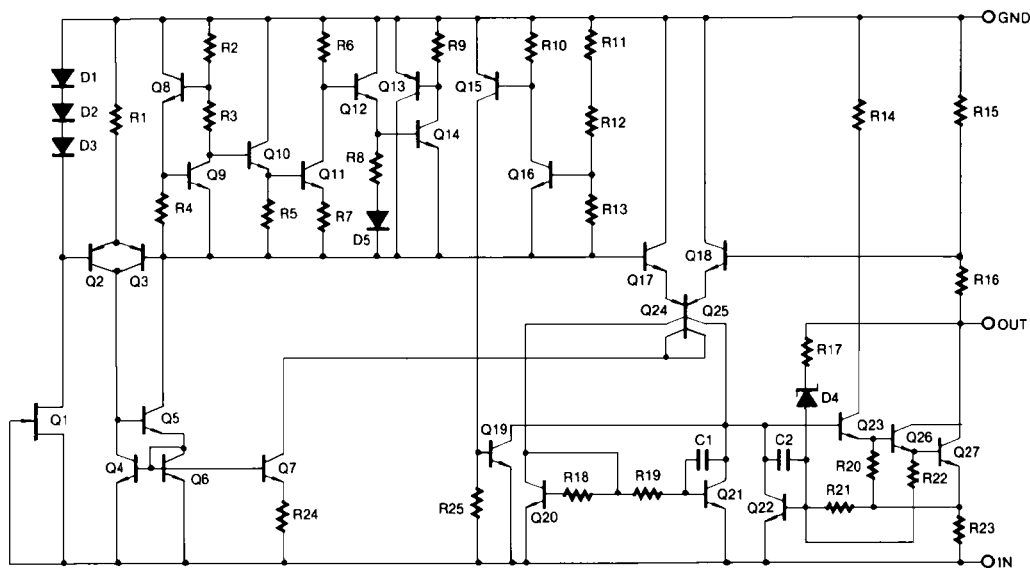
FEATURES

- No external components required
- Output current in excess of 0.5A
- Internal thermal-overload
- Internal short circuit current limiting
- Output transistor safe-area compensation
- Output Voltages of -5V, -6V, -8V, -12V, -15V, -18V and -24V

ORDERING INFORMATION

Device	Package	Operating Temperature
LM79MXX	TO-220	0 ~ +125 °C
LM79MXXR	D-PAK	0 ~ +125 °C

SCHEMATIC DIAGRAM



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

Characteristic	Symbol	Value	Unit
Input Voltage(for $V_O = -5\text{V}$ to -18V) (for $V_O = -24\text{V}$)	V_I	-35	V
	V_I	-40	V
Thermal Resistance Junction-Cases	$R_{\theta JC}$	5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-Air	$R_{\theta JA}$	65	$^{\circ}\text{C}/\text{W}$
Operating Temperature Range	T_{OPR}	$0 \sim +125$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$65 \sim +125$	$^{\circ}\text{C}$

LM79MO5/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = 10\text{V}$, unless otherwise specified, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$)

Characteristic	Symbol	Test condition	MIN	TYP	MAX	Unit
Output Voltage	V_O	$T_J = +25\text{ }^{\circ}\text{C}$	-4.8	-5	-5.2	V
		$I_O = 5$ to 350mA	-4.75	-5	-5.25	
		$V_I = -7$ to -25V				
Line Regulation	ΔV_O	$T_J = +25\text{ }^{\circ}\text{C}$		7.0	50	mV
		$V_I = -7$ to -25V $V_I = -8$ to -25V		2.0	30	
Load Regulation	ΔV_O	$I_O = 5\text{mA}$ to 500mA $T_J = 25\text{ }^{\circ}\text{C}$		30	100	mV
Quiescent Current	I_Q	$T_J = 25\text{ }^{\circ}\text{C}$		3.0	6.0	mA
Quiescent Current Change	ΔI_Q	$I_O = 5$ to 350mA			0.4	mA
		$I_O = 200\text{mA}$			0.4	
		$V_I = -8\text{V}$ to -25V				
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		-0.2		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz}$, 100KHz $T_J = +25\text{ }^{\circ}\text{C}$		40		μV
Ripple Rejection	RR	$f = 120\text{Hz}$ $V_I = -8$ to -18V	54	60		dB
Dropout Voltage	V_D	$T_J = +25\text{ }^{\circ}\text{C}$, $I_O = 500\text{mA}$		1.1		V
Short Circuit Current	I_{SC}	$T_J = +25\text{ }^{\circ}\text{C}$, $V_I = -35\text{V}$		140		mA
Peak Current	I_{PK}	$T_J = +25\text{ }^{\circ}\text{C}$		650		mA

* 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.

LM79MO6/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = -11\text{V}$, unless otherwise specified)

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^{\circ}\text{C}$	- 5.75	- 6.0	- 6.25	V
		$I_O = 5 \text{ to } 350\text{mA}$				
		$V_I = -8.0 \text{ to } -25\text{V}$	- 5.7	- 6.0	- 6.3	
Line Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		7.0	60	mV
		$V_I = -8 \text{ to } -25\text{V}$		2.0	40	
Load Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		30	120	mV
Quiescent Current	I_Q	$T_J = +25^{\circ}\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5 \text{ to } 350\text{mA}$			0.4	mA
		$V_I = -8\text{V} \text{ to } -25\text{V}$			0.4	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		0.4		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz} \text{ to } 100\text{KHz}, T_A = +25^{\circ}\text{C}$		50		μV
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -9 \text{ to } -19\text{V}$	54	60		dB
Dropout Voltage	V_D	$I_O = 500\text{mA}, T_J = +25^{\circ}\text{C}$		1.1		V
Short Circuit Current	I_{SC}	$V_I = -35\text{V}, T_J = +25^{\circ}\text{C}$		140		mA
Peak Current	I_{PK}	$T_J = +25^{\circ}\text{C}$		650		mA

* 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.

LM79MO8/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = -14\text{V}$, unless otherwise specified)

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^{\circ}\text{C}$	- 7.7	- 8.0	- 8.3	V
		$I_O = 5 \text{ to } 350\text{mA}$				
		$V_I = -10.5 \text{ to } -25\text{V}$	- 7.6	- 8.0	- 8.4	
Line Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		7.0	80	mV
		$V_I = -10.5 \text{ to } -25\text{V}$		2.0	50	
Load Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		30	160	mV
Quiescent Current	I_Q	$T_J = +25^{\circ}\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5 \text{ to } 350\text{mA}$			0.4	mA
		$V_I = -8\text{V} \text{ to } -25\text{V}$			0.4	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		-0.6		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz} \text{ to } 100\text{KHz}, T_A = +25^{\circ}\text{C}$		60		μV
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -9 \text{ to } -19\text{V}$	54	59		dB
Dropout Voltage	V_D	$I_O = 500\text{mA}, T_J = +25^{\circ}\text{C}$		1.1		V
Short Circuit Current	I_{SC}	$V_I = -35\text{V}, T_J = +25^{\circ}\text{C}$		140		mA
Peak Current	I_{PK}	$T_J = +25^{\circ}\text{C}$		650		mA

* 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.

LM79M12/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = -19\text{V}$, unless otherwise specified)

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^{\circ}\text{C}$	-11.5	-12	-12.5	V
		$I_O = 5$ to 350mA				
		$V_I = -14.5$ to -30V	-11.4	-1.2	-12.6	
Line Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		8.0	80	mV
		$V_I = -14.5$ to -30V		3.0	50	
Load Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		30	240	mV
Quiescent Current	I_Q	$T_J = +25^{\circ}\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5$ to 350mA			0.4	mA
		$V_I = -14.5\text{V}$ to -30V			0.4	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		-0.8		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz}$ to 100KHz , $T_A = +25^{\circ}\text{C}$		75		μV
Ripple Rejection	RR	$f = 120\text{Hz}$, $V_I = -15$ to -25V	54	60		dB
Dropout Voltage	V_D	$I_O = 500\text{mA}$, $T_J = +25^{\circ}\text{C}$		1.1		V
Short Circuit Current	I_{SC}	$V_I = -35\text{V}$, $T_J = +25^{\circ}\text{C}$		140		mA
Peak Current	I_{PK}	$T_J = +25^{\circ}\text{C}$		650		mA

* 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.

LM79M15/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = -23\text{V}$, unless otherwise specified)

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^{\circ}\text{C}$	-14.4	-15	-15.6	V
		$I_O = 5$ to 350mA				
		$V_I = -17.5$ to -30V	-14.25	-15	-15.75	
Line Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		9.0	80	mV
		$V_I = -17.5$ to -30V		5.0	50	
Load Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		30	240	mV
Quiescent Current	I_Q	$T_J = +25^{\circ}\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5$ to 350mA			0.4	mA
		$V_I = -17.5\text{V}$ to -28V			0.4	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		-1.0		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz}$ to 100KHz , $T_A = +25^{\circ}\text{C}$		90		μV
Ripple Rejection	RR	$f = 120\text{Hz}$, $V_I = -18.5$ to -28.5V	54	59		dB
Dropout Voltage	V_D	$I_O = 500\text{mA}$, $T_J = +25^{\circ}\text{C}$		1.1		V
Short Circuit Current	I_{SC}	$V_I = -35\text{V}$, $T_J = +25^{\circ}\text{C}$		140		mA
Peak Current	I_{PK}	$T_J = +25^{\circ}\text{C}$		650		mA

* 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.

LM79M18/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = -27\text{V}$, unless otherwise specified)

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^{\circ}\text{C}$	- 17.3	- 18	- 18.7	V
		$I_O = 5 \text{ to } 350\text{mA}$				
		$V_I = -21 \text{ to } -33\text{V}$	- 17.1	- 18	- 18.9	
Line Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		9.0	80	mV
		$V_I = -21 \text{ to } -33\text{V}$		5.0	80	
Load Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		30	360	mV
Quiescent Current	I_Q	$T_J = +25^{\circ}\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5 \text{ to } 350\text{mA}$			0.4	mA
		$V_I = -21\text{V} \text{ to } -33\text{V}$			0.4	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		-1.0		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz} \text{ to } 100\text{KHz}, T_A = +25^{\circ}\text{C}$		110		μV
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -22 \text{ to } -32\text{V}$	54	59		dB
Dropout Voltage	V_D	$I_O = 500\text{mA}, T_J = +25^{\circ}\text{C}$		1.1		V
Short Circuit Current	I_{SC}	$V_I = -35\text{V}, T_J = +25^{\circ}\text{C}$		140		mA
Peak Current	I_{PK}	$T_J = +25^{\circ}\text{C}$		650		mA

* 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.

LM79M24/R ELECTRICAL CHARACTERISTICS(Refer to test circuit, $0^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$, $I_O = 350\text{mA}$, $V_I = -33\text{V}$, unless otherwise specified)

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^{\circ}\text{C}$	- 23	- 24	- 25	V
		$I_O = 5 \text{ to } 350\text{mA}$				
		$V_I = -27 \text{ to } -38\text{V}$	- 22.8	- 24	- 25.2	
Line Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		9.0	80	mV
		$V_I = -27 \text{ to } -38\text{V}$		5.0	70	
Load Regulation	ΔV_O	$T_J = +25^{\circ}\text{C}$		30	300	mV
Quiescent Current	I_Q	$T_J = +25^{\circ}\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_O = 5 \text{ to } 350\text{mA}$			0.4	mA
		$V_I = -27\text{V} \text{ to } -38\text{V}$			0.4	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		-1.0		mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz} \text{ to } 100\text{KHz}, T_A = +25^{\circ}\text{C}$		180		μV
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -28 \text{ to } -38\text{V}$	54	58		dB
Dropout Voltage	V_D	$I_O = 500\text{mA}, T_J = +25^{\circ}\text{C}$		1.1		V
Short Circuit Current	I_{SC}	$V_I = -35\text{V}, T_J = +25^{\circ}\text{C}$		140		mA
Peak Current	I_{PK}	$T_J = +25^{\circ}\text{C}$		650		mA

* 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

Bypass capacitors are recommended for stable operation of the KA79MXX series of regulators over the input voltage and output current ranges. Output bypass capacitors will improve the transient response of the regulator.

The bypass capacitors, (2μF on the input, 1μF on the output) should be ceramic or solid tantalum which have good high frequency characteristics. If aluminum electrolytics are used, their values should be 10μF or larger. The bypass capacitors should be mounted with the shortest leads, and if possible, directly across the regulator terminals.

Fig. 1 Fixed Output Regulator

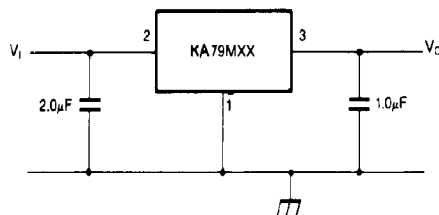
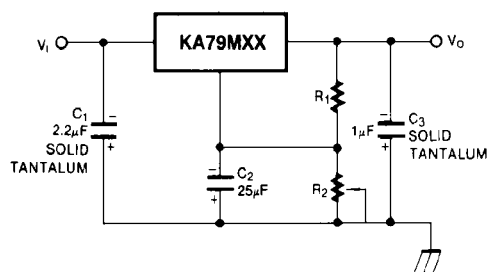


Fig. 2 Variable Output

**Note**

1. Required for stability. For value given, capacitor must be solid tantalum. 25μF aluminum electrolytic may be substituted.
2. C₂ improves transient response and ripple rejection. Do not increase beyond 50μF.

$$V_{OUT} = V_{SET} \left(\frac{R_1 + R_2}{R_1} \right)$$

Select R₂ as follows

KA79M 05: 300Ω, KA79M12: 750Ω, KA79M15: 11Ω

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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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