

### General Description

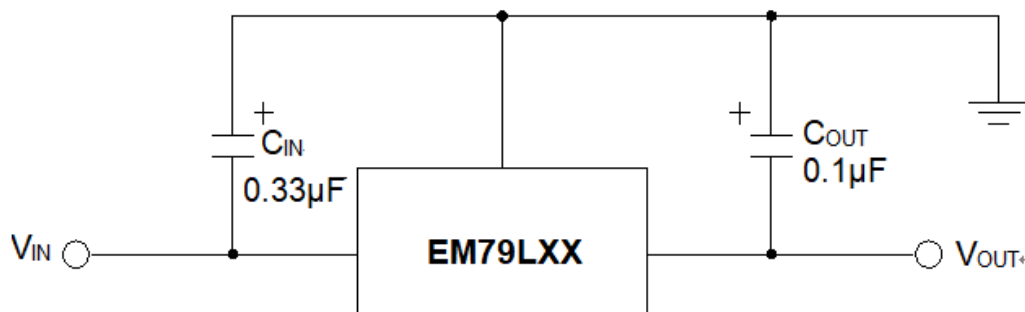
The EM79L series of fixed-voltage monolithic integrated circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators.

Each of these regulators can deliver up to 100mA 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 diodes-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

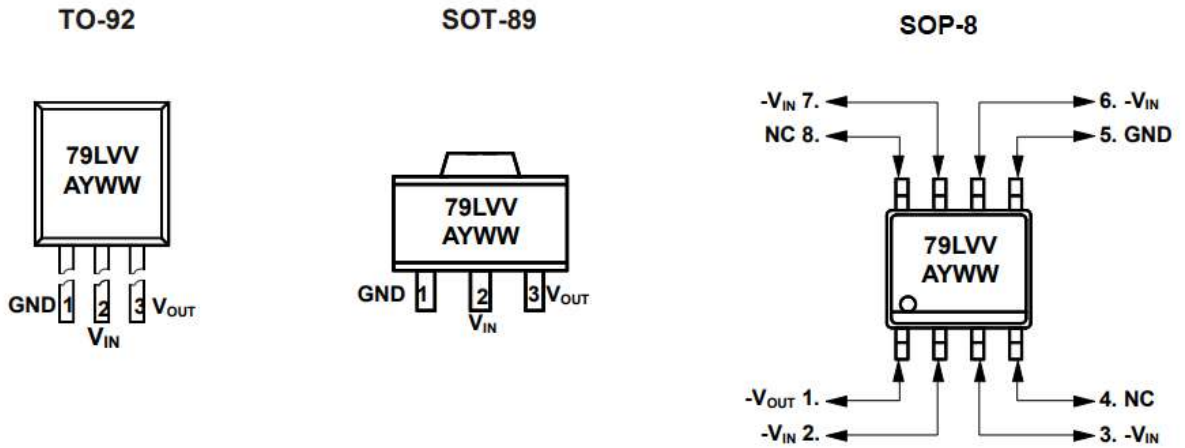
### Features

- Maximum output current up to 100mA
- Fixed output voltage options: -5V, -6V, -8V, -9V, -12V, -15V, -18V and -24V
- No external components required
- Internal thermal overload protection
- Internal short circuit current limiting
- Available in TO-92, SOT-89 and SOP-8 packages

### Typical Application Circuit

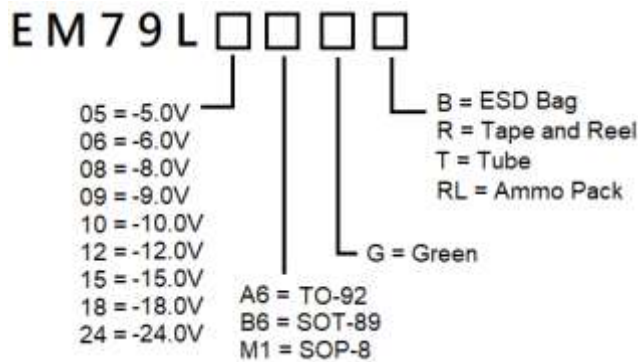


### Marking Information and Pin Configurations (Top View)



VV: Output Voltage Codes (05: -5.0V, ...12:-12V)  
 A: Assembly/Test Site Code  
 Y: Year  
 WW: Week

### Ordering Information



Ordering Number	V <sub>OUT</sub>	Package	Shipping
EM79L00A6GB	<b>00</b> = -5.0V -6.0V -8.0V -9.0V -10.0V -12.0V -15.0V -18.0V -24.0V	TO-92	1,000 Units/ESD Bag
EM79L00A6GRL		TO-92	2,000 Units/Ammo Pack (Tape)
EM79L00B6GR		SOT-89	1,000 Units/Tape and Reel
EM79L00M1GT		SOP-8	100 Units/Tube
EM79L00M1GR		SOP-8	2,500 Units/Tape & Reel



## Absolute Maximum Ratings

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage	EM79L05 to EM79L09	$V_I$	30	V
	EM79L12 to EM79L18		35	
	EM79L24		40	
Operating Ambient Temperature		$T_A$	0 to 125	°C
Storage Temperature		$T_{stg}$	- 60 to 150	°C

## Recommended Operating Conditions

PARAMETER		SYMBOL	Min	Max	UNITS
Input Voltage	EM79L05	$V_I$	-7	-20	V
	EM79L06		-8	-20	
	EM79L08		-10.5	23	
	EM79L09		-12	-24	
	EM79L12		-14.5	-27	
	EM79L15		-17.5	-30	
	EM79L18		-20.5	-33	
	EM79L24		-27	-38	
Output Current		$I_O$		100	mA
Operating Ambient Temperature		$T_A$	0	125	°C



**EM79L05 Electrical Characteristics ( $V_I = -10V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition		Min	Typ	Max	Unit
Output Voltage		25°C	-4.8	-5.0	-5.2	V
	$I_O = 1mA$ to 40mA $V_I = -7V$ to -20V	0°C to 125°C	-4.75	-5.0	-5.25	
	$I_O = 1mA$ to 70mA		-4.75	-5.0	-5.25	
Input Regulation	$V_I = -7V$ to -20V	25°C		15	150	mV
	$V_I = -8V$ to -20V			12	100	
Ripple Rejection	$V_I = -8V$ to -18V, $f = 120KHz$	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 100KHz	25°C		40		μV
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	mA
	$I_O = 1mA$ to 40mA				0.1	

**EM79L06 Electrical Characteristics ( $V_I = -11V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition		Min	Typ	Max	Unit
Output Voltage		25°C	-5.75	-6.0	-6.25	V
	$I_O = 1mA$ to 40mA $V_I = -8V$ to -20V	0°C to 125°C	-5.70	-6.0	-6.30	
	$I_O = 1mA$ to 70mA		-5.70	-6.0	-6.30	
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 -18V, $f = 120KHz$	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 100KHz	25°C		44		μV
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	mA
	$I_O = 1mA$ to 40mA				0.1	



**EM79L08 Electrical Characteristics ( $V_I = -14V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition		Min	Typ	Max	Unit
Output Voltage		25°C	-7.7	-8.0	-8.3	V
	$I_O = 1mA$ to 40mA $V_I = -10.5V$ to -23V	0°C to 125°C	-7.6	-8.0	-8.4	
	$I_O = 1mA$ to 70mA		-7.6	-8.0	-8.4	
Input Regulation	$V_I = -10.5V$ to -23V	25°C		42	200	mV
	$V_I = -11V$ to -23V			36	150	
Ripple Rejection	$V_I = -13V$ to -23V, $f = 120KHz$	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 100KHz	25°C		54		µV
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	

**EM79L09 Electrical Characteristics ( $V_I = -16V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition		Min	Typ	Max	Unit
Output Voltage		25°C	-8.6	-9.0	-9.4	V
	$I_O = 1mA$ to 40mA $V_I = -12V$ to -24V	0°C to 125°C	-8.55	-9.0	-9.45	
	$I_O = 1mA$ to 70mA		-8.55	-9.0	-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 -24V, $f = 120KHz$	25°C	40	45		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 100KHz	25°C		62		µV
Dropout Voltage		25°C		1.7		V
Bias Current		25°C			6.2	mA
		125°C			5.7	
Bias Current Change	$V_I = -13V$ to -24V	0°C to 125°C			1.5	mA
	$I_O = 1mA$ to 40mA				0.1	





**EM79L12 Electrical Characteristics ( $V_I = -19V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition	Min	Typ	Max	Unit	
Output Voltage		25°C	-11.5	-12	-12.5	V
	$I_O = 1mA$ to 40mA $V_I = -14V$ to -27V	0°C to 125°C	-11.4	-12	-12.6	
	$I_O = 1mA$ to 70mA		-11.4	-12	-12.6	
Input Regulation	$V_I = -14V$ to -27V	25°C		50	250	mV
	$V_I = -16V$ to -27V			40	200	
Ripple Rejection	$V_I = -15V$ to -25V, $f = 120KHz$	25°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 100KHz	25°C		80		µV
Dropout Voltage		25°C		1.7		V
Bias Current		25°C			6.5	mA
		125°C			6	
Bias Current Change	$V_I = -16V$ to -27V	0°C to 125°C			1.5	mA
	$I_O = 1mA$ to 40mA				0.1	

**EM79L15 Electrical Characteristics ( $V_I = -23V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition	Min	Typ	Max	Unit	
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	-15.75	
	$I_O = 1mA$ to 70mA		-14.25	-15	-15.75	
Input Regulation	$V_I = -17.5V$ to -30V	25°C		60	300	mV
	$V_I = -19V$ to -30V			50	250	
Ripple Rejection	$V_I = -18.5V$ to -28.5V, $f = 120KHz$	25°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		90		µV
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	mA
	$I_O = 1mA$ to 40mA				0.1	



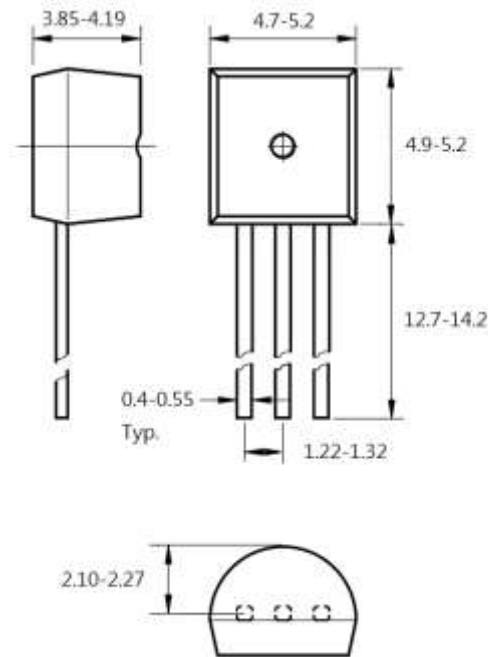
**EM78M18 Electrical Characteristics ( $V_I = -26V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition		Min	Typ	Max	Unit
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	-18.9	
	$I_O = 1mA$ to 70mA		-17.1	-18	-18.9	
Input Regulation	$V_I = -20.5V$ to -33V	25°C		70	325	mV
	$V_I = -22V$ to -33V			60	275	
Ripple Rejection	$V_I = -21.5V$ to -31.5V, $f = 120KHz$	25°C	33	49		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 100KHz	25°C		150		µV
Dropout Voltage		25°C		1.7		V
Bias Current		25°C			6.5	mA
		125°C			6	
Bias Current Change	$V_I = -22V$ to -33V	0°C to 125°C			1.5	mA
	$I_O = 1mA$ to 40mA				0.1	

**EM78M24 Electrical Characteristics ( $V_I = -32V$ ,  $I_O = 40mA$  unless otherwise noted)**

Parameter	Test Condition		Min	Typ	Max	Unit
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	-24	-25.2	
	$I_O = 1mA$ to 70mA		-22.8	-24	-25.2	
Input Regulation	$V_I = -27V$ to -38V	25°C		90	350	mV
	$V_I = -29V$ to -39V			75	300	
Ripple Rejection	$V_I = -29V$ to -35V, $f = 120KHz$	25°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 100KHz	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	mA
	$I_O = 1mA$ to 40mA				0.1	

Package Outline Dimensions – TO 92



Dimensions are in millimeters

Package Outline Dimensions – SOP-8

