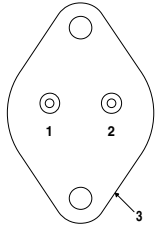
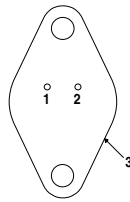


## 1.5 AMP NEGATIVE VOLTAGE REGULATOR



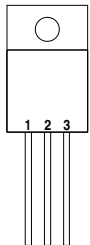
Pin 1 – Ground  
Pin 2 –  $V_{OUT}$   
Case –  $V_{IN}$

**K Package – TO-3**



Pin 1 – Ground  
Pin 2 –  $V_{OUT}$   
Case –  $V_{IN}$

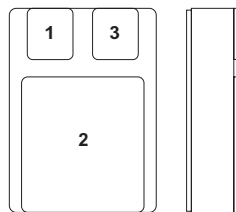
**R Package – TO-66**



Pin 1 – Ground  
Pin 2 –  $V_{IN}$   
Pin 3 –  $V_{OUT}$   
Case –  $V_{IN}$

**G Package – TO-257**  
**IG Package – TO-257\***

\* isolated Case on IG package



Pin 1 – Ground  
Pin 2 –  $V_{IN}$   
Pin 3 –  $V_{OUT}$

**SMD Package – SMD1**  
Ceramic Surface Mount

### FEATURES

- OUTPUT VOLTAGE OF -5V
- 0.7% / V LINE REGULATION AVAILABLE
- 0.5% / A LOAD REGULATION AVAILABLE
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- OUTPUT TRANSISTOR SOA PROTECTION
- 1% VOLTAGE TOLERANCE OPTION  
(-A VERSIONS)

### DESCRIPTION

The A suffix devices provide 0.7% / V line regulation, 0.5% / A load regulation and  $\pm 1\%$  output voltage tolerance at room temperature.

Protection features include Safe Operating Area current limiting and thermal shutdown.

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$ unless otherwise stated)

$V_I$	DC Input Voltage	35V
$P_D$	Power Dissipation	Internally limited
$T_j$	Operating Junction Temperature Range	-55 to 150°C
$T_{stg}$	Storage Temperature	-65 to 150°C

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

Parameter	Test Conditions	LM7905A LM120A-05			LM7905 , LM120-05 LM120-05			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>O</sub> Output Voltage	I <sub>O</sub> = 500mA V <sub>IN</sub> = -10V	-4.95	-5	-5.05	-4.9	-5	-5.1	V
	I <sub>O</sub> = 5mA to I <sub>MAX</sub> P <sub>D</sub> ≤ P <sub>MAX</sub> V <sub>IN</sub> = -7.5V to -20V T <sub>J</sub> = -55 to 150°C	-4.85		-5.15	-4.8		-5.2	
ΔV <sub>O</sub> Line Regulation	I <sub>O</sub> = 0.5 I <sub>MAX</sub> V <sub>IN</sub> = -7V to -25V V <sub>IN</sub> = -7.5V to -20V T <sub>J</sub> = -55 to 150°C	3		10	3		25	mV
		3		10	3		50	
	V <sub>IN</sub> = -8V to -12V I <sub>O</sub> ≤ I <sub>MAX</sub> T <sub>J</sub> = -55 to 150°C	1		4	1		25	
ΔV <sub>O</sub> Load Regulation	V <sub>IN</sub> = -10V I <sub>O</sub> = 5mA to 1.5A I <sub>O</sub> = 5mA to I <sub>MAX</sub> T <sub>J</sub> = -55 to 150°C	25		35	25		100	mV
		25		35	25		100	
I <sub>Q</sub> Quiescent Current	I <sub>O</sub> ≤ 0.5 I <sub>MAX</sub> V <sub>IN</sub> = -10V T <sub>J</sub> = -55 to 150°C	1		1.9	1		1.9	mA
		1		2	1		2	
ΔI <sub>Q</sub> Quiescent Current Change	I <sub>O</sub> = 5mA to I <sub>MAX</sub> V <sub>IN</sub> = -10V T <sub>J</sub> = -55 to 150°C	0.2		0.4	0.2		0.4	mA
		0.2		0.5	0.2		0.5	
V <sub>N</sub> Output Noise Voltage	f = 10Hz to 100kHz V <sub>IN</sub> = -10V	100			100			μV
ΔV <sub>IN</sub> / ΔV <sub>O</sub> Ripple Rejection	f = 120Hz V <sub>IN</sub> = -8V to -18V I <sub>O</sub> ≤ I <sub>MAX</sub>	58			54			dB
	I <sub>O</sub> ≤ 0.5 I <sub>MAX</sub> T <sub>J</sub> = -55 to 150°C	58			54			
Dropout Voltage	I <sub>O</sub> = I <sub>MAX</sub>	1.4			1.4			V
R <sub>O</sub> Output Resistance	f = 1 kHz	5			5			mΩ
I <sub>sc</sub> Short Circuit Current	V <sub>IN</sub> = -35V	0.6		1.2	0.6		1.2	A
I <sub>pk</sub> Peak Output Current Average	V <sub>IN</sub> = -10V	2.4		3.3	2.4		3.3	
Temperature Coefficient of V <sub>O</sub>	I <sub>O</sub> = 5mA	0.2			0.2			mV / °C
Input Voltage required to maintain line regulation	I <sub>O</sub> ≤ I <sub>MAX</sub>	-7.3			-7.3			V

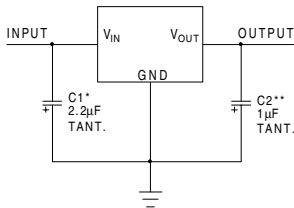
1) All characteristics are measured with a capacitor across the input of 0.22μF and a capacitor across the output of 0.1μF.  
 All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques (t<sub>p</sub> ≤ 10ms, δ ≤ 5%). Output voltage changes due to changes in internal temperature must be taken into account separately.

2) Test Conditions unless otherwise stated: P<sub>MAX</sub> = 10W for SMD , P<sub>MAX</sub> = 20W for all other package devices

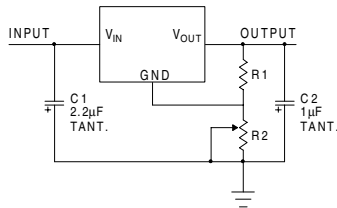
$$I_{MAX} = 1.0A , T_J = 25^{\circ}C$$

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## APPLICATIONS INFORMATION

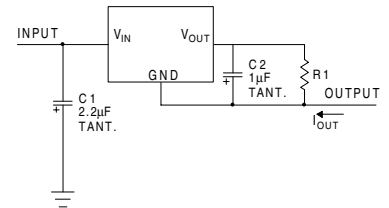


**Fixed Output Regulator**



**Adjustable Output Regulator**

$$V_{OUT} \approx V_{REG} \frac{(R1+R2)}{R1}$$



**Current Regulator**

$$I_{OUT} = \frac{V_{REG}}{R1} + I_Q$$

\* Required if the regulator is located far from the power supply.

\*\* Required for stability. 25µF electrolytic may be substituted.

## Order Information

Part Number	K-Pack (TO-3)	R-Pack (TO-66)	G/IG-Pack (TO-257)	SMD-Pack SMD1	Temp. Range	<b>Note:</b> To order, add the package identifier to the part number. eg. LM7905AK LM120SMD-05
LM7905A	✓	✓	✓	✓	-55 to +150°C	
LM7905	✓	✓	✓	✓	"	
LM120A-05	✓	✓	✓	✓	"	
LM120-05	✓	✓	✓	✓	"	