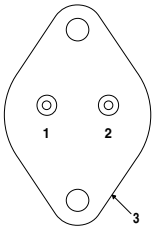
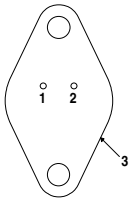
LM120A-05
LM120-05
LM7905A
LM7905

1.5 AMP NEGATIVE VOLTAGE REGULATOR



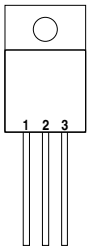
Pin 1 – Ground
Pin 2 – V_{OUT}
Case – V_{IN}

K Package – TO–3



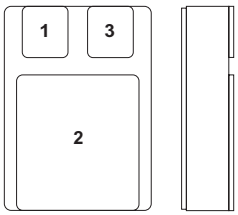
Pin 1 – Ground
Pin 2 – V_{OUT}
Case – V_{IN}

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 ±1% output voltage tolerance at room temperature.

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

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°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. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

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LM120A-05
LM120-05
LM7905A
LM7905

Parameter		Test Conditions		LM7905A LM120A–05 Min.	LM7905A LM120A–05 Typ.	LM7905A LM120A–05 Max.	LM7905 , LM120–05 LM120–05 Min.	LM7905 , LM120–05 LM120–05 Typ.	LM7905 , LM120–05 LM120–05 Max.	Units
V_O	Output Voltage	I_O = 500mA	V_{IN} = -10V	-4.95	-5	-5.05	-4.9	-5	-5.1	V
		I_O = 5mA to I_{MAX} $P_D \le P_{MAX}$	V_{IN} = -7.5V to -20V T_J = -55 to 150°C	-4.85		-5.15	-4.8		-5.2	
ΔV_O	Line Regulation	I_O = 0.5 I_{MAX}	V_{IN} = -7V to -25V		3	10		3	25	mV
			V_{IN} = -7.5V to -20V T_J = -55 to 150°C		3	10		3	50	
		V_{IN} = -8V to -12V			1	4		1	25	
		$I_O \le I_{MAX}$	T_J = -55 to 150°C		1	12		2	50	
ΔV_O	Load Regulation	V_{IN} = -10V	I_O = 5mA to 1.5A		25	35		25	100	mV
			I_O = 5mA to I_{MAX} T_J = -55 to 150°C		25	35		25	100	
I_Q	Quiescent Current	$I_O \le 0.5\ I_{MAX}$			1	1.9		1	1.9	mA
		V_{IN} = -10V	T_J = -55 to 150°C		1	2		1	2	
ΔI_Q	Quiescent Current Change	I_O = 5mA to I_{MAX}			0.2	0.4		0.2	0.4	mA
		V_{IN} = -10V	T_J = -55 to 150°C		0.2	0.5		0.2	0.5	
V_N	Output Noise Voltage	f = 10Hz to 100kHz V_{IN} = -10V			100			100		µV
$\frac{\Delta V_{IN}}{\Delta V_O}$	Ripple Rejection	f = 120Hz	$I_O \le I_{MAX}$	58			54			dB
		V_{IN} = -8V to -18V	$I_O \le 0.5\ I_{MAX}$ T_J = -55 to 150°C	58			54			
	Dropout Voltage	$I_O = I_{MAX}$			1.4			1.4		V
R_O	Output Resistance	f = 1 kHz			5			5		mΩ
I_{sc}	Short Circuit Current	V_{IN} = -35V			0.6	1.2		0.6	1.2	A
I_{pk}	Peak Output Current Average	V_{IN} = -10V			2.4	3.3		2.4	3.3	
Temperature Coefficient of V_O		I_O = 5mA			0.2			0.2		mV/°C
Input Voltage required to maintain line regulation		$I_O \le I_{MAX}$		-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 ($t_p \le$ 10ms, $\delta \le$ 5%). Output voltage changes due to changes in internal temperature must be taken into account separately.

2) Test Conditions unless otherwise stated: P_{MAX} = 10W for SMD , P_{MAX} = 20W for all other package devices

I_{MAX} = 1.0A , T_J = 25°C

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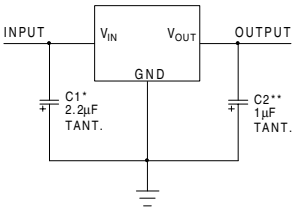
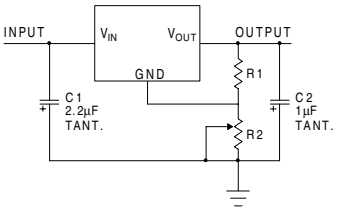
APPLICATIONS INFORMATION



Fixed Output Regulator

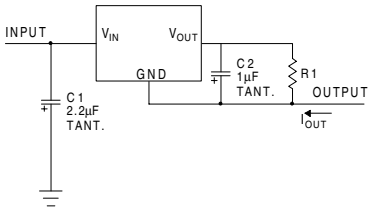
* Required if the regulator is located far from the power supply.

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



Adjustable Output Regulator

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



Current Regulator

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

Order Information

Part Number	K–Pack (TO–3)	R–Pack (TO–66)	G/IG–Pack (TO–257)	SMD–Pack SMD1	Temp. Range
LM7905A	✔	✔	✔	✔	-55 to +150°C
LM7905	✔	✔	✔	✔	”
LM120A-05	✔	✔	✔	✔	”
LM120-05	✔	✔	✔	✔	”

Note:
To order, add the package identifier to the part number.
eg. LM7905AK
LM120SMD-05

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