

## THREE-TERMINAL 3A-5V POSITIVE VOLTAGE REGULATORS

- OUTPUT CURRENT : 3A
- INTERNAL CURRENT AND THERMAL LIMITING
- TYPICAL OUTPUT IMPEDANCE : 0.01Ω
- MINIMUM INPUT VOLTAGE : 7.5V
- POWER DISSIPATION : 30W

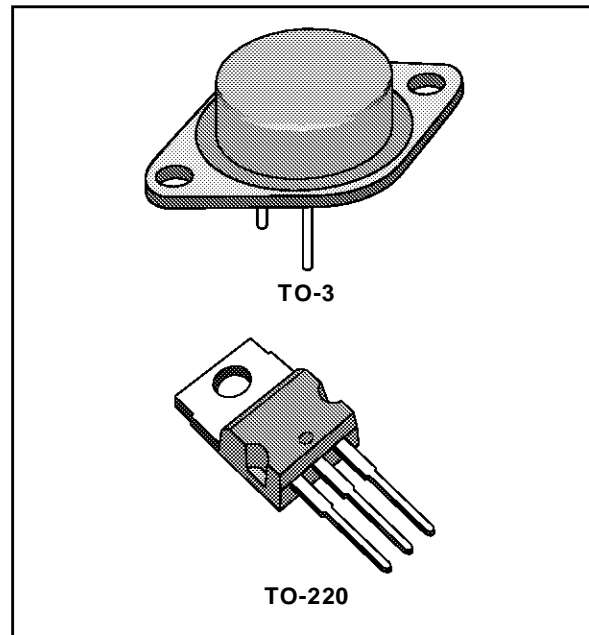
### DESCRIPTION

The LM123, LM223, LM323 are three-terminal positive voltage regulators with a preset 5V output and a load driving capability of 3A. New circuit design and processing techniques are used to provide the high output current without sacrificing the regulation characteristics of lower current devices.

The 3A regulator is virtually blowout proof.

Current limiting, power limiting and thermal shut-down provide the same high level of reliability obtained with these techniques in the LM209, 1A regulator.

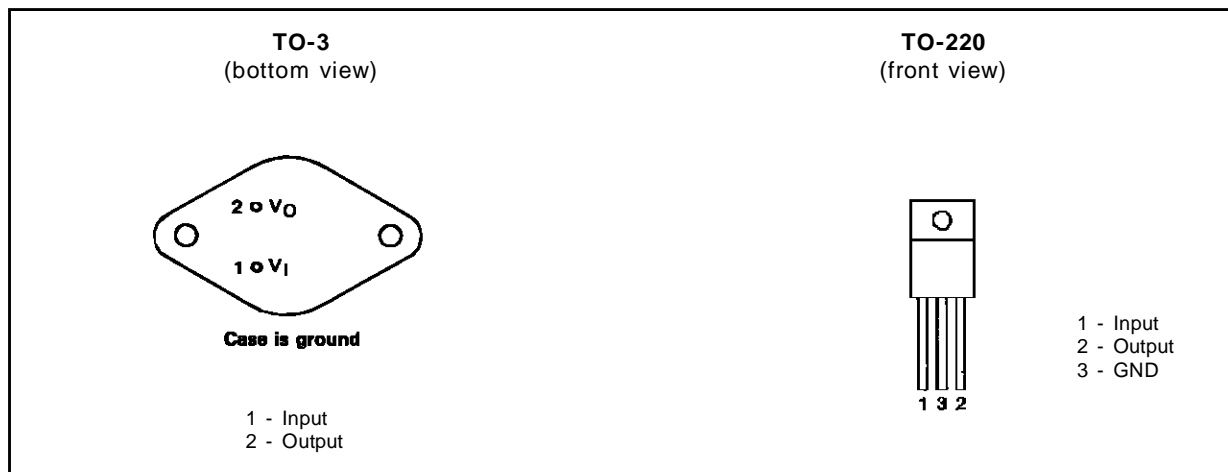
An overall worst case specification for the combined effects of input voltage, load current, ambient temperature, and power dissipation ensure that the LM123, LM223, LM323 will perform satisfactorily as a system element.



### ORDER CODES

Part Number	Temperature Range	Package	
		K	T
LM123	-55 °C to 150 °C	•	
LM223	-25 °C to 150 °C	•	
LM323	0 °C to 125 °C	•	•

### PIN CONNECTION



# LM123-LM223-LM323

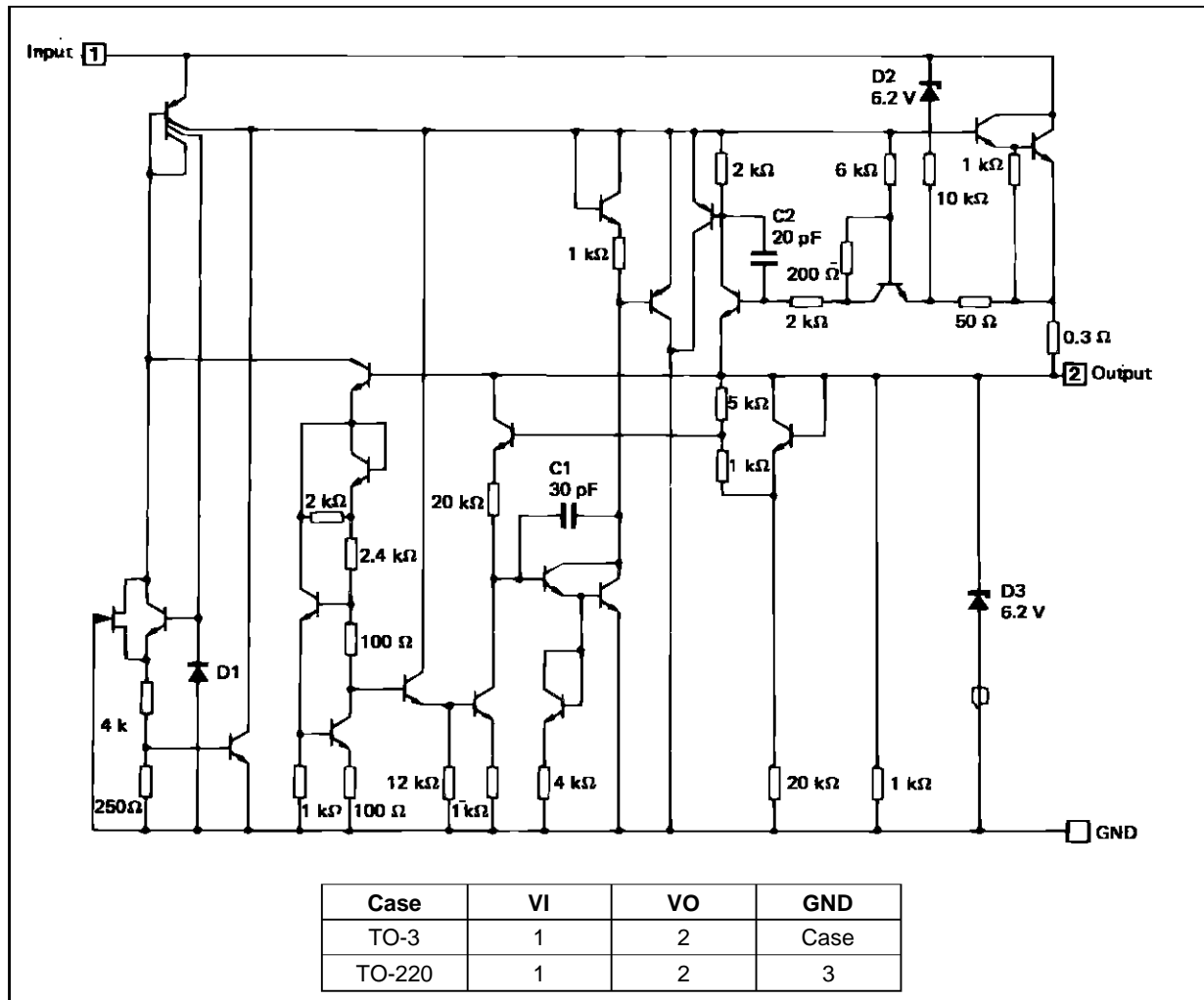
## ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
$V_i$	Input Voltage	20	V
$I_o$	Output Current	Internally Limited	
$P_{tot}$	Power Dissipation	Internally Limited	
$T_{oper}$	Operating Junction Temperature Range	LM123	-55 to 150
		LM223	-25 to 150
		LM323	0 to 125
$T_{stg}$	Storage Temperature Range	-65 to 150	$^{\circ}C$

## THERMAL CHARACTERISTICS

Symbol	Parameter	Typ.	Max.	Unit
$R_{thj-case}$	Junction-case Thermal Resistance	TO-3	2	$^{\circ}C/W$
		TO-220	3	
$R_{thj-amb}$	Junction-ambient Thermal Resistance	TO-3	35	$^{\circ}C/W$
		TO-220	50	

## SCHEMATIC DIAGRAM



**ELECTRICAL CHARACTERISTICS**

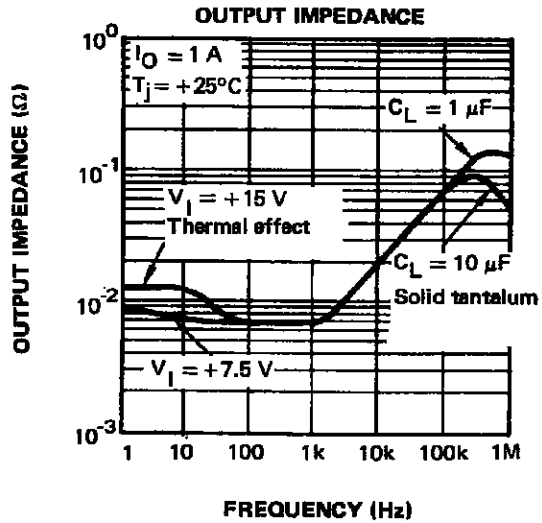
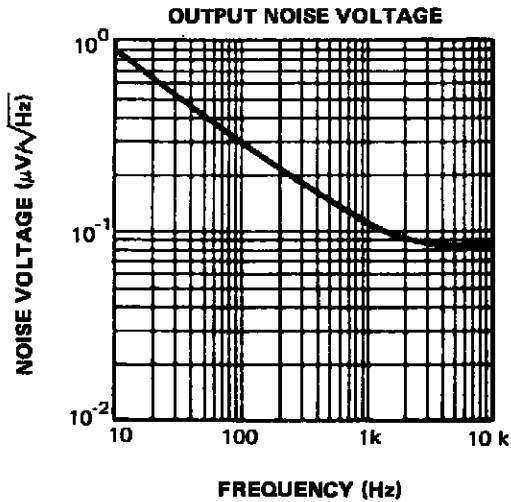
LM123:  $-55\text{ }^{\circ}\text{C} < T_j < 150\text{ }^{\circ}\text{C}$

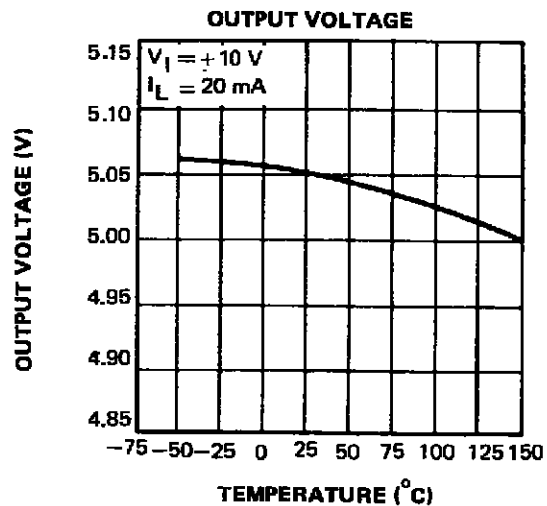
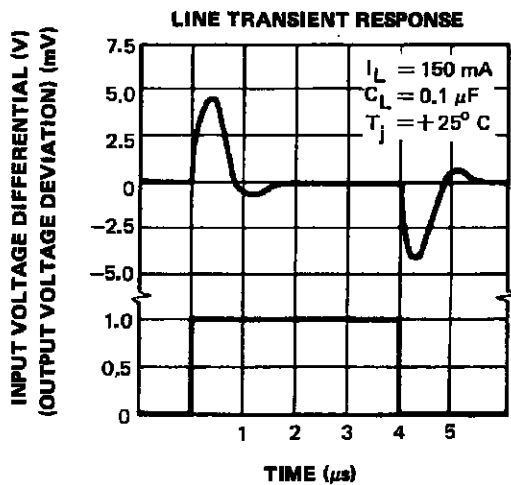
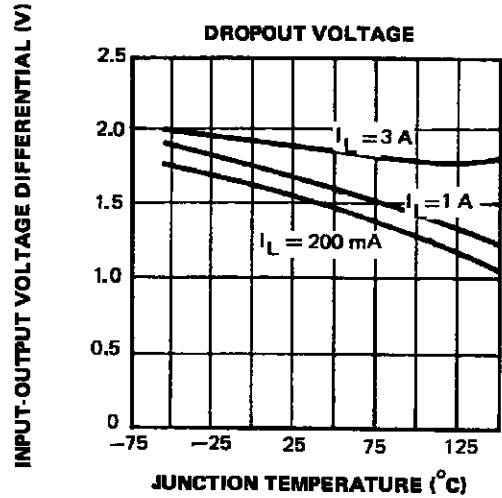
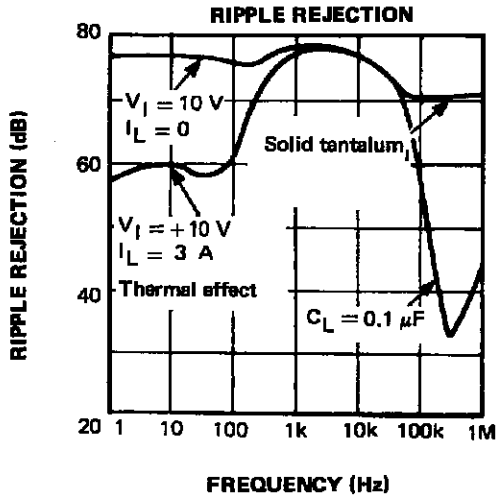
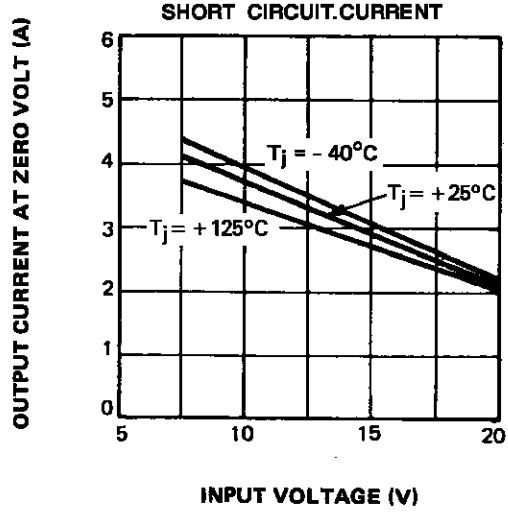
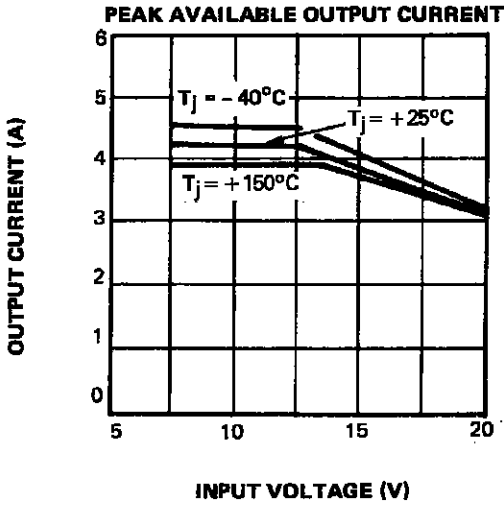
LM223:  $-25\text{ }^{\circ}\text{C} < T_j < 150\text{ }^{\circ}\text{C}$

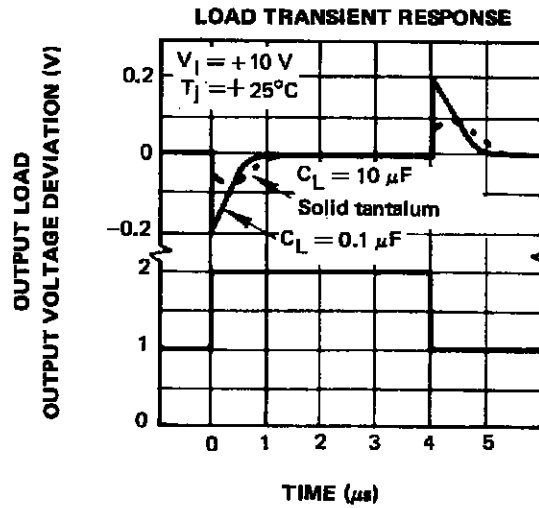
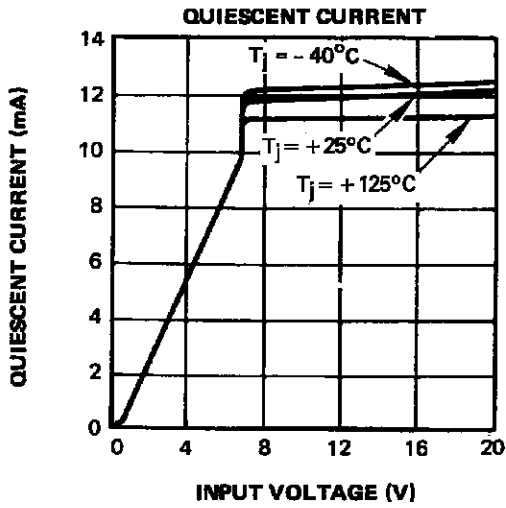
LM323:  $0\text{ }^{\circ}\text{C} < T_j < 150\text{ }^{\circ}\text{C}$

Symbol	Parameter	LM123/LM223			LM323			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_O$	Output Voltage Range (Note 2) $T_{amb} = 25\text{ }^{\circ}\text{C}$ , $V_I = 7.5\text{ V}$ , $I_O = 0$	4.7	5	5.3	4.8	5	5.2	V
$V_O$	Output Voltage Range (Note 2) $T_{min} \leq T_j \leq T_{max}$ , $P \leq P_{max}$ $7.5\text{ V} \leq V_I \leq 15\text{ V}$ , $0 \leq I_O \leq 3\text{ A}$	4.6		5.4	4.75		5.25	V
$K_{VI}$	Line Regulation (Note 3) $T_j = 25\text{ }^{\circ}\text{C}$ , $7.5\text{ V} \leq V_I \leq 15\text{ V}$		5	25		5	25	mV
$K_{VO}$	Load Regulation (Note 3) $T_j = 25\text{ }^{\circ}\text{C}$ , $V_I = 7.5\text{ V}$ , $0 \leq I_O \leq 3\text{ A}$		25	100		25	100	mV
$I_{IB}$	Quiescent Current $7.5\text{ V} \leq V_I \leq 15\text{ V}$ , $0 \leq I_O \leq 3\text{ A}$		12	20		12	20	mA
$V_{NO}$	Output Noise Voltage $T_{amb} = 25\text{ }^{\circ}\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ KHz}$		40			40		$\mu\text{V}_{rms}$
$I_{OS}$	Short Circuit Current Limit ( $T_j = 25\text{ }^{\circ}\text{C}$ ) $V_I = 15\text{ V}$ $V_I = 7.5\text{ V}$		3 4	4.5 5		3 4	4.5 5	A
$K_{VH}$	Long Term Stability			35			35	mV

- Notes :**
1. Although power dissipation is internally limited, specifications apply only for  $P \leq 30\text{ W}$ .
  2. Selected devices with tightened tolerance output voltage available.
  3. Load and line regulation are specified at constant junction temperature. Pulse testing is required with a pulse width  $\leq 1\text{ ms}$  and a duty cycle  $\leq 5\%$ .

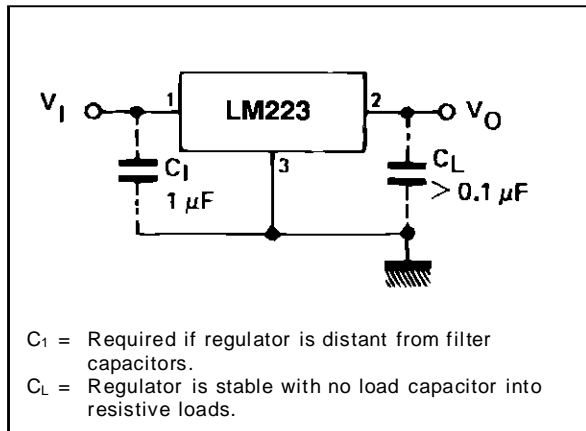




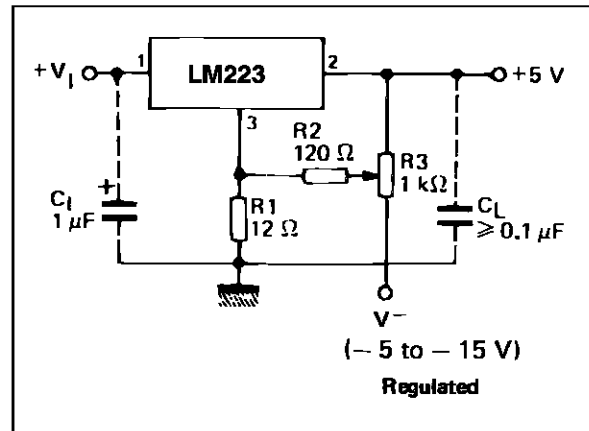


TYPICAL APPLICATIONS

BASIC 3A REGULATOR

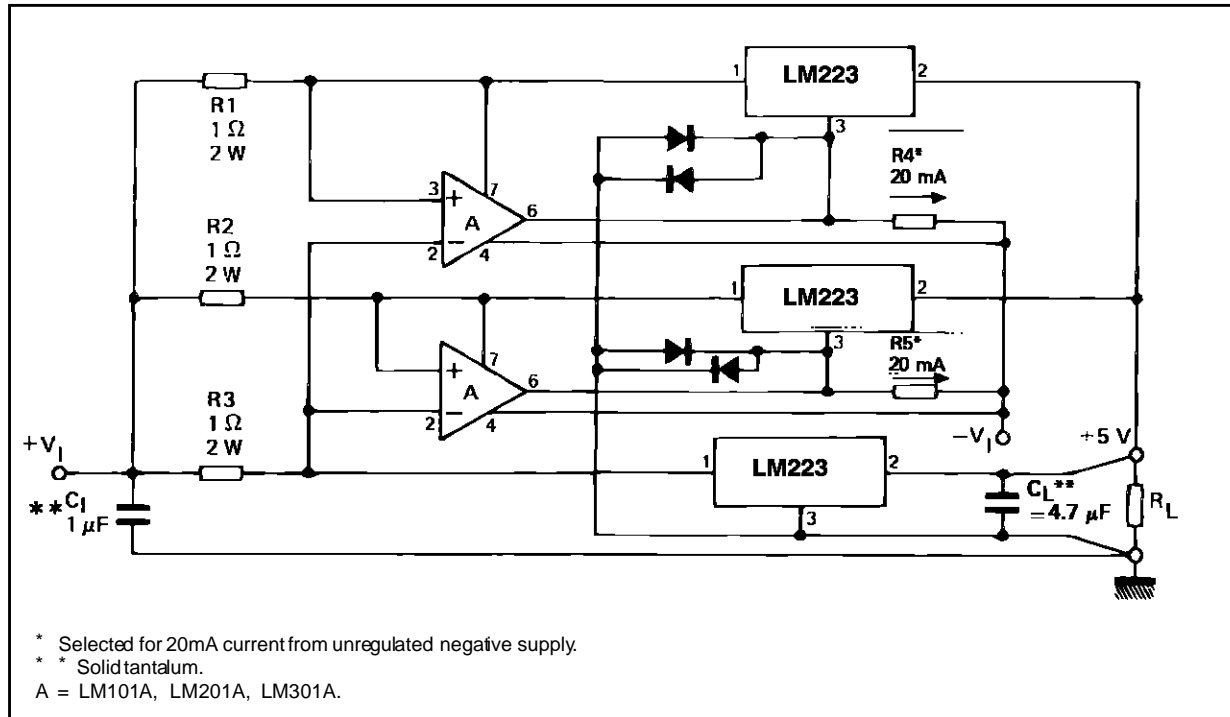


TRIMMING OUTPUT TO 5V

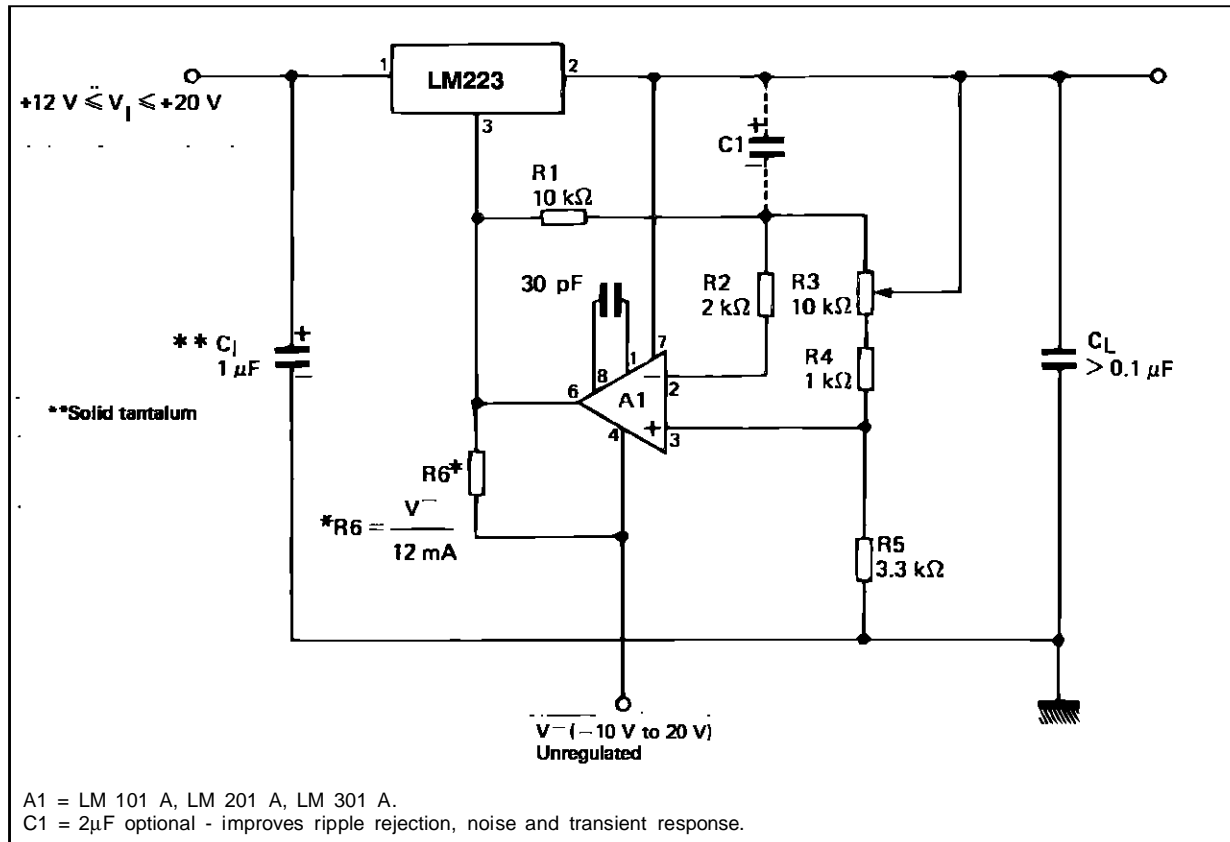


# LM123-LM223-LM323

## 10A REGULATOR WITH COMPLETE OVERLOAD PROTECTION

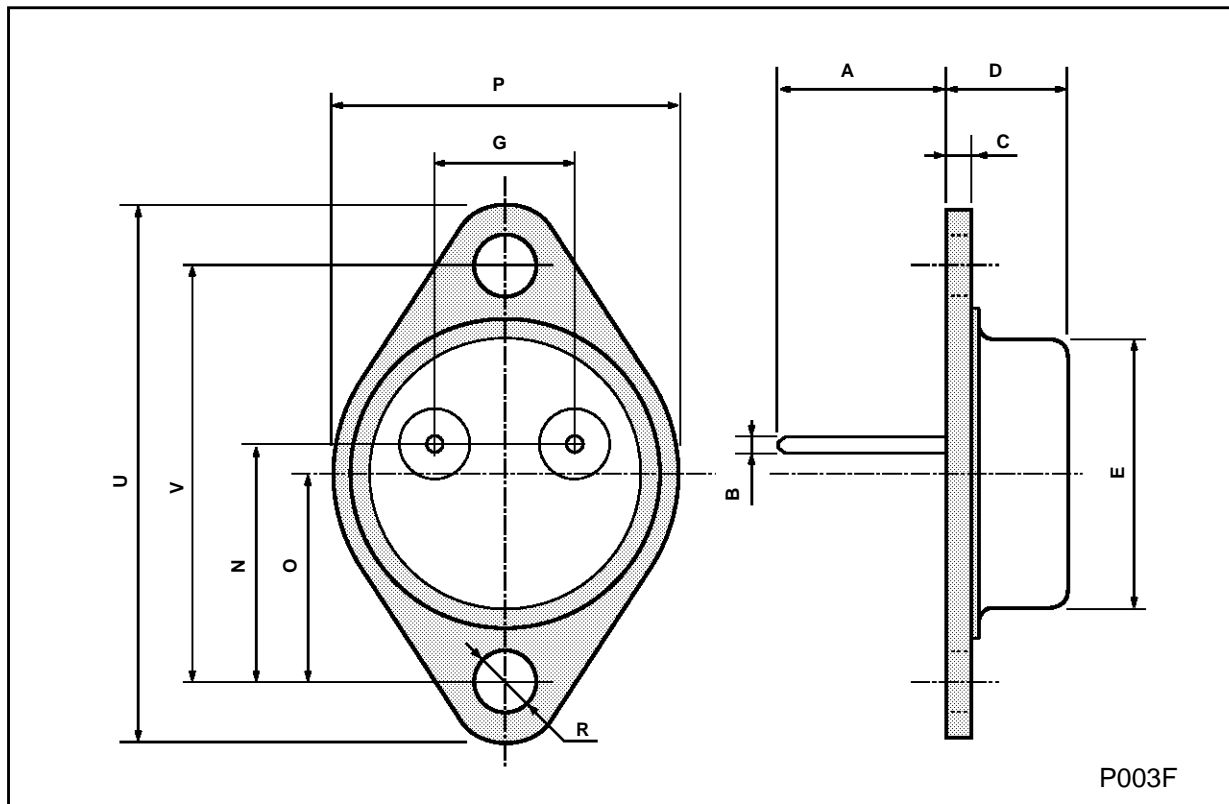


## ADJUSTABLE REGULATOR 0 – 10V/3A



**TO-3 MECHANICAL DATA**

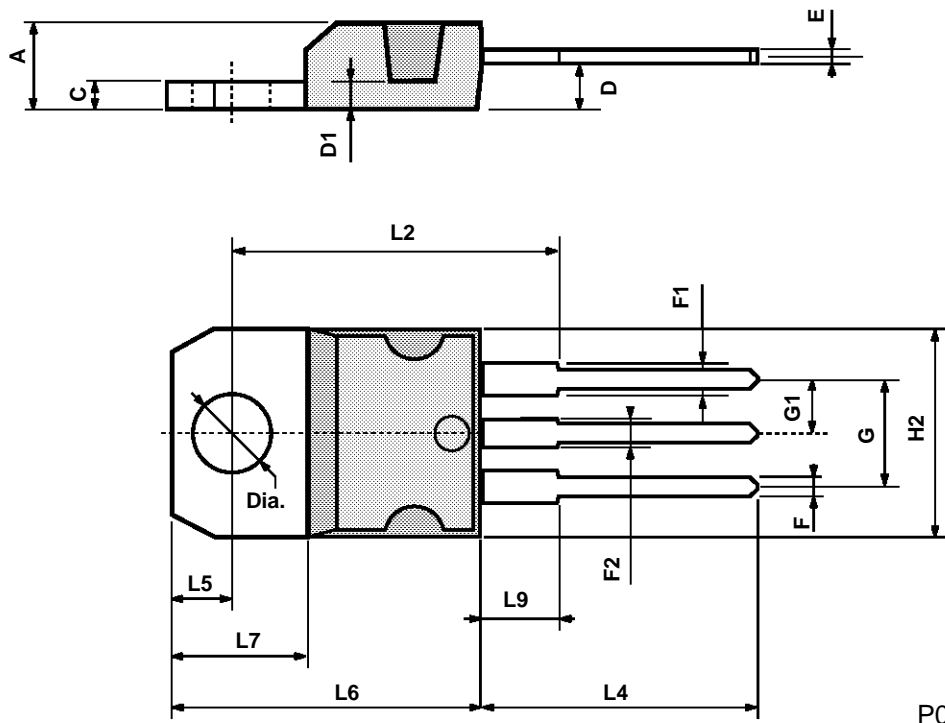
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	0.97		1.15	0.038		0.045
C	1.50		1.65	0.059		0.065
D	8.32		8.92	0.327		0.351
E	19.00		20.00	0.748		0.787
G	10.70		11.10	0.421		0.437
N	16.50		17.20	0.649		0.677
P	25.00		26.00	0.984		1.023
R	4.00		4.09	0.157		0.161
U	38.50		39.30	1.515		1.547
V	30.00		30.30	1.187		1.193



P003F

**TO-220 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.2		15.9	0.598		0.625
L7	6.2		6.6	0.244		0.260
L9	3.5		4.2	0.137		0.165
DIA.	3.75		3.85	0.147		0.151





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