

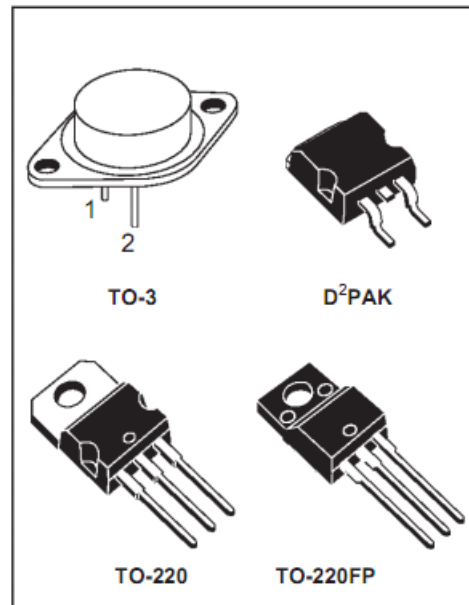


## POSITIVE VOLTAGE REGULATORS

- OUTPUT CURRENT UP TO 1.5 A
- OUTPUT VOLTAGES OF 5; 5.2; 6; 8; 8.5; 9; 12; 15; 18; 24V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- OUTPUT TRANSITION SOA PROTECTION

### DESCRIPTION

The L7800 series of three-terminal positive regulators is available in TO-220 TO-220FP TO-3 and D<sup>2</sup>PAK packages and several fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

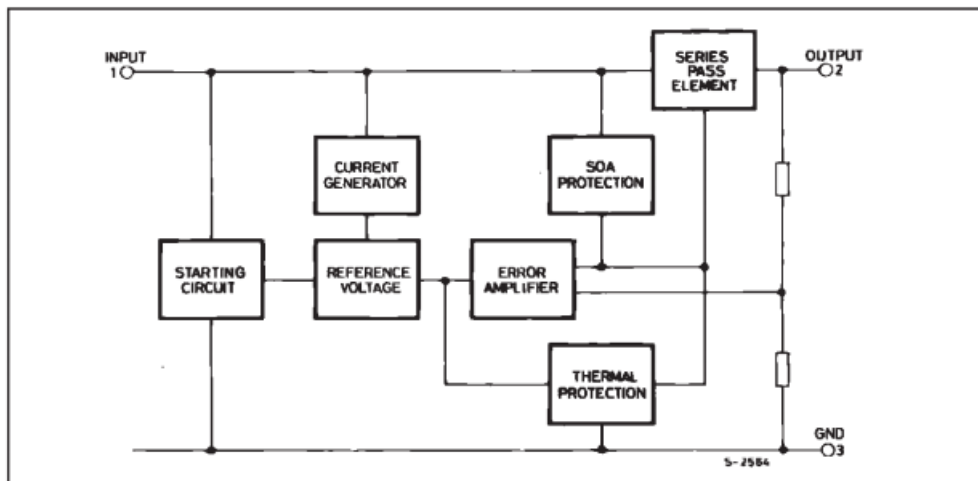


### L7800

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_i$	DC Input Voltage (for $V_O = 5$ to 18V) (for $V_O = 20, 24V$ )	35	V
		40	V
$I_o$	Output Current	Internally limited	
$P_{tot}$	Power Dissipation	Internally limited	
$T_{op}$	Operating Junction Temperature Range (for L7800) (for L7800C)	-55 to 150	°C
		0 to 150	°C
$T_{stg}$	Storage Temperature Range	-65 to 150	°C

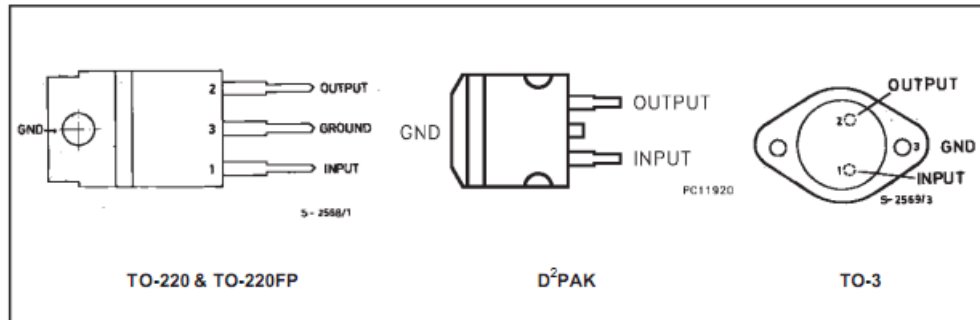
#### BLOCK DIAGRAM



### THERMAL DATA

Symbol	Parameter		D <sup>2</sup> PAK	TO-220	TO-220FP	TO-3	Unit
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	3	3	5	4	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient	Max	62.5	50	60	35	°C/W

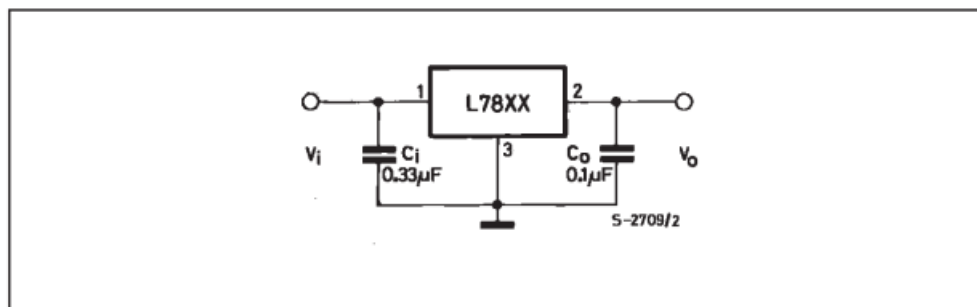
### CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



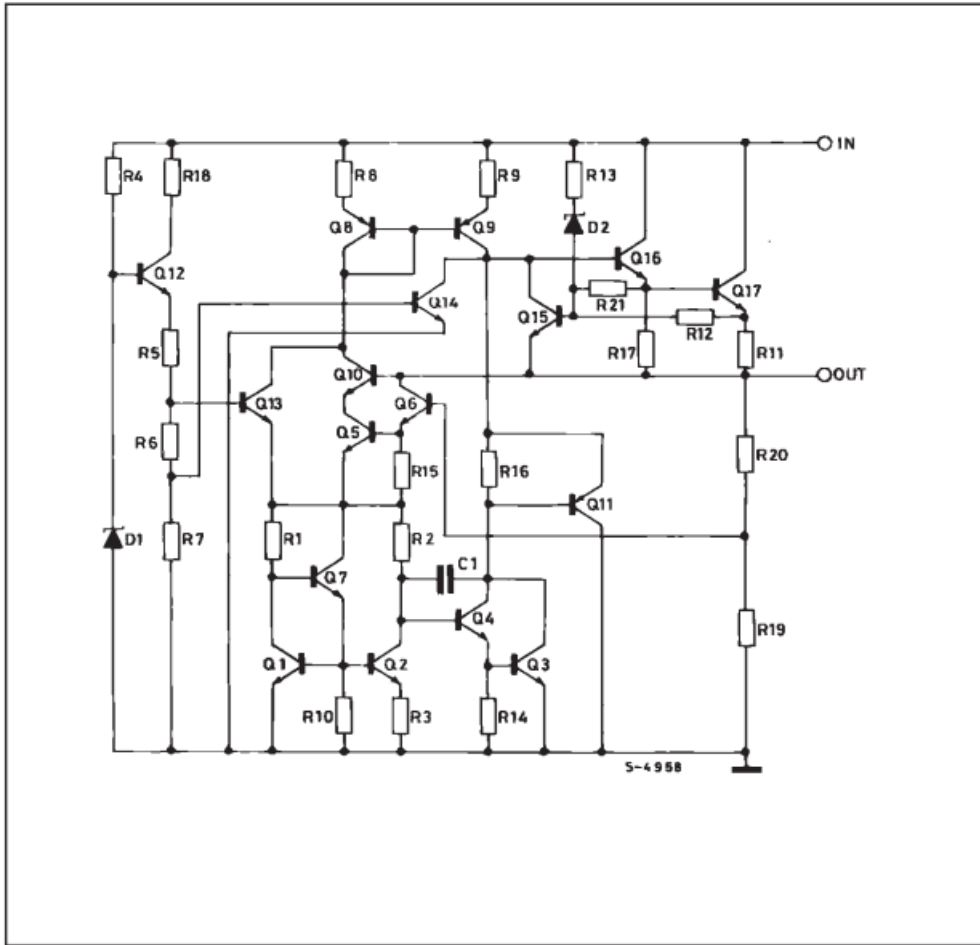
Type	TO-220	D <sup>2</sup> PAK (*)	TO-220FP	TO-3	Output Voltage
L7805				L7805T	5V
L7805C	L7805CV	L7805CD2T	L7805CP	L7805CT	5V
L7852C	L7852CV	L7852CD2T	L7852CP	L7852CT	5.2V
L7806				L7806T	6V
L7806C	L7806CV	L7806CD2T	L7806CP	L7806CT	6V
L7808				L7808T	8V
L7808C	L7808CV	L7808CD2T	L7808CP	L7808CT	8V
L7885C	L7885CV	L7885CD2T	L7885CP	L7885CT	8.5V
L7809C	L7809CV	L7809CD2T	L7809CP	L7809CT	9V
L7812				L7812T	12V
L7812C	L7812CV	L7812CD2T	L7812CP	L7812CT	12V
L7815				L7815T	15V
L7815C	L7815CV	L7815CD2T	L7815CP	L7815CT	15V
L7818				L7818T	18V
L7818C	L7818CV	L7818CD2T	L7818CP	L7818CT	18V
L7820				L7820T	20V
L7820C	L7820CV	L7820CD2T	L7820CP	L7820CT	20V
L7824				L7824T	24V
L7824C	L7824CV	L7824CD2T	L7824CP	L7824CT	24V

(\*) AVAILABLE IN TAPE AND REEL WITH "TR" SUFFIX

### APPLICATION CIRCUIT

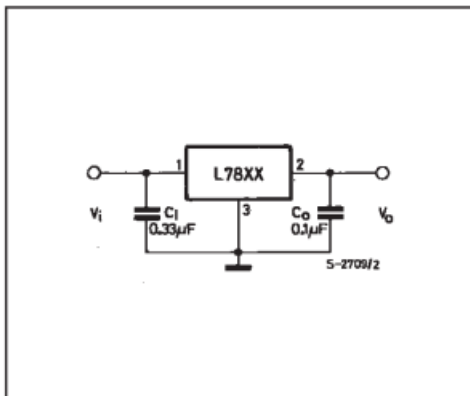


**SCHEMATIC DIAGRAM**



**TEST CIRCUITS**

**Figure 1 : DC Parameter**



**Figure 2 : Load Regulation.**

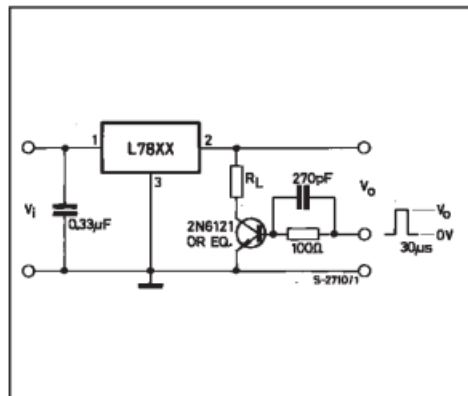
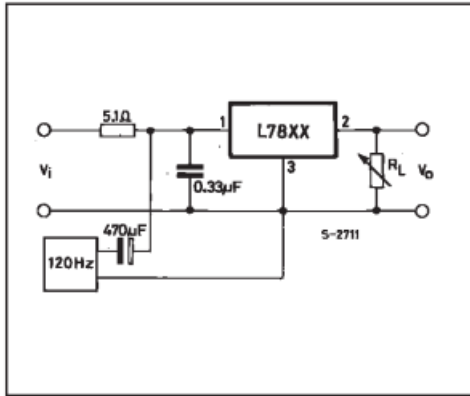


Figure 3 : Ripple Rejection.



**ELECTRICAL CHARACTERISTICS FOR L7805** (refer to the test circuits,  $T_j = -55$  to  $150$  °C,  $V_i = 10V$ ,  $I_o = 500$  mA,  $C_i = 0.33$  μF,  $C_o = 0.1$  μF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_o$	Output Voltage	$T_j = 25$ °C	4.8	5	5.2	V
$V_o$	Output Voltage	$I_o = 5$ mA to $1$ A $P_o \leq 15$ W $V_i = 8$ to $20$ V	4.65	5	5.35	V
$\Delta V_o^*$	Line Regulation	$V_i = 7$ to $25$ V $T_j = 25$ °C $V_i = 8$ to $12$ V $T_j = 25$ °C		3 1	50 25	mV mV
$\Delta V_o^*$	Load Regulation	$I_o = 5$ to $1500$ mA $T_j = 25$ °C $I_o = 250$ to $750$ mA $T_j = 25$ °C			100 25	mV mV
$I_d$	Quiescent Current	$T_j = 25$ °C			6	mA
$\Delta I_d$	Quiescent Current Change	$I_o = 5$ to $1000$ mA			0.5	mA
$\Delta I_d$	Quiescent Current Change	$V_i = 8$ to $25$ V			0.8	mA
$\frac{\Delta V_o}{\Delta T}$	Output Voltage Drift	$I_o = 5$ mA		0.6		mV/°C
eN	Output Noise Voltage	B = $10$ Hz to $100$ KHz $T_j = 25$ °C			40	μV/V <sub>O</sub>
SVR	Supply Voltage Rejection	$V_i = 8$ to $18$ V $f = 120$ Hz	68			dB
$V_d$	Dropout Voltage	$I_o = 1$ A $T_j = 25$ °C		2	2.5	V
$R_o$	Output Resistance	$f = 1$ KHz		17		mΩ
$I_{sc}$	Short Circuit Current	$V_i = 35$ V $T_j = 25$ °C		0.75	1.2	A
$I_{scp}$	Short Circuit Peak Current	$T_j = 25$ °C	1.3	2.2	3.3	A