

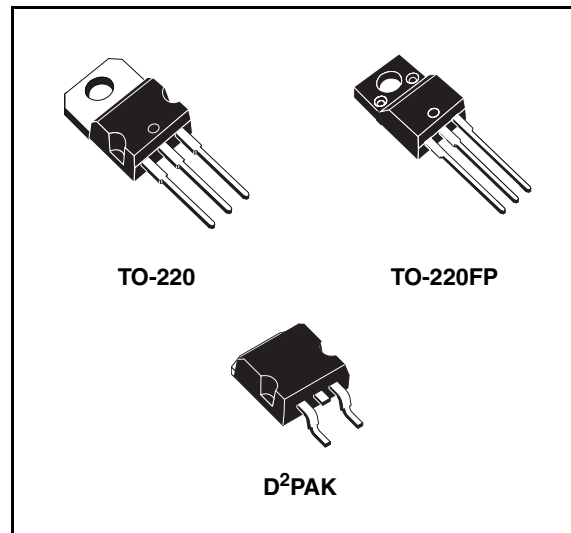
## Precision 1 A regulators

### Features

- Output current in excess of 1 A
- Output voltages of 5; 6; 8; 9; 12; 15; 24 V
- Thermal overload protection
- Output transition SOA protection
- 2 % Output voltage tolerance
- Guaranteed in extended temperature range

### Description

The L78xxAB L78xxAC series of three terminal positive regulators are available in TO-220, TO-220FP, 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 problem 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 1 A output current, although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltage and currents.



**Table 1. Device summary**

Order codes	
L7805AB	L7809AC
L7805AC	L7812AB
L7806AB	L7812AC
L7806AC	L7815AB
L7808AB	L7815AC
L7808AC	L7824AB
L7809AB	L7824AC

### 3 Maximum ratings

**Table 2. Absolute maximum ratings**

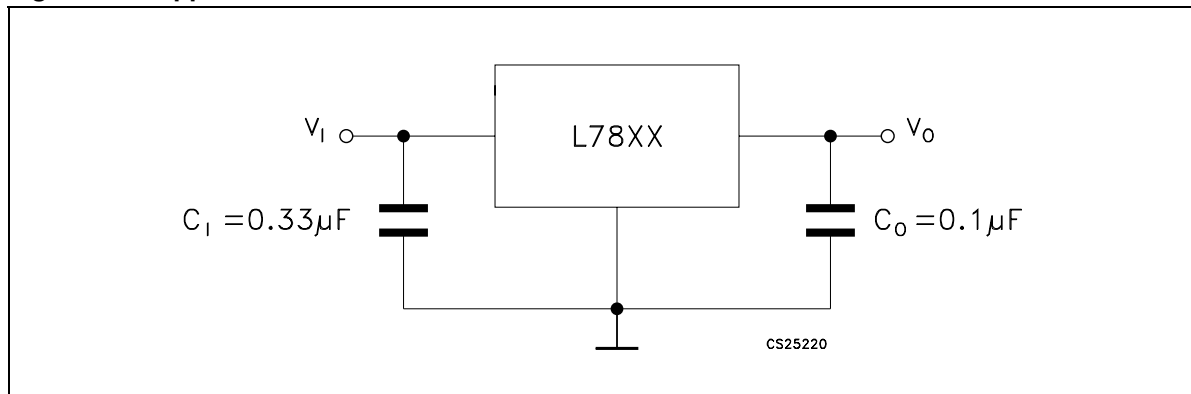
Symbol	Parameter	Value	Unit
$V_I$	DC input voltage	for $V_O= 5$ to $18V$	35
		for $V_O= 20, 24V$	40
$I_O$	Output current	Internally limited	mA
$P_D$	Power dissipation	Internally limited	mW
$T_{STG}$	Storage temperature range	-65 to 150	°C
$T_{OP}$	Operating junction temperature range	for L7800AC	0 to 150
		for L7800AB	-40 to 125

*Note: Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.*

**Table 3. Thermal data**

Symbol	Parameter	TO-220	TO-220FP	D <sup>2</sup> PAK	Unit
$R_{thJC}$	Thermal resistance junction-case	3	5	3	°C/W
$R_{thJA}$	Thermal resistance junction-ambient	50	60	62.5	°C/W

**Figure 4. Application circuit**



## 5 Electrical characteristics

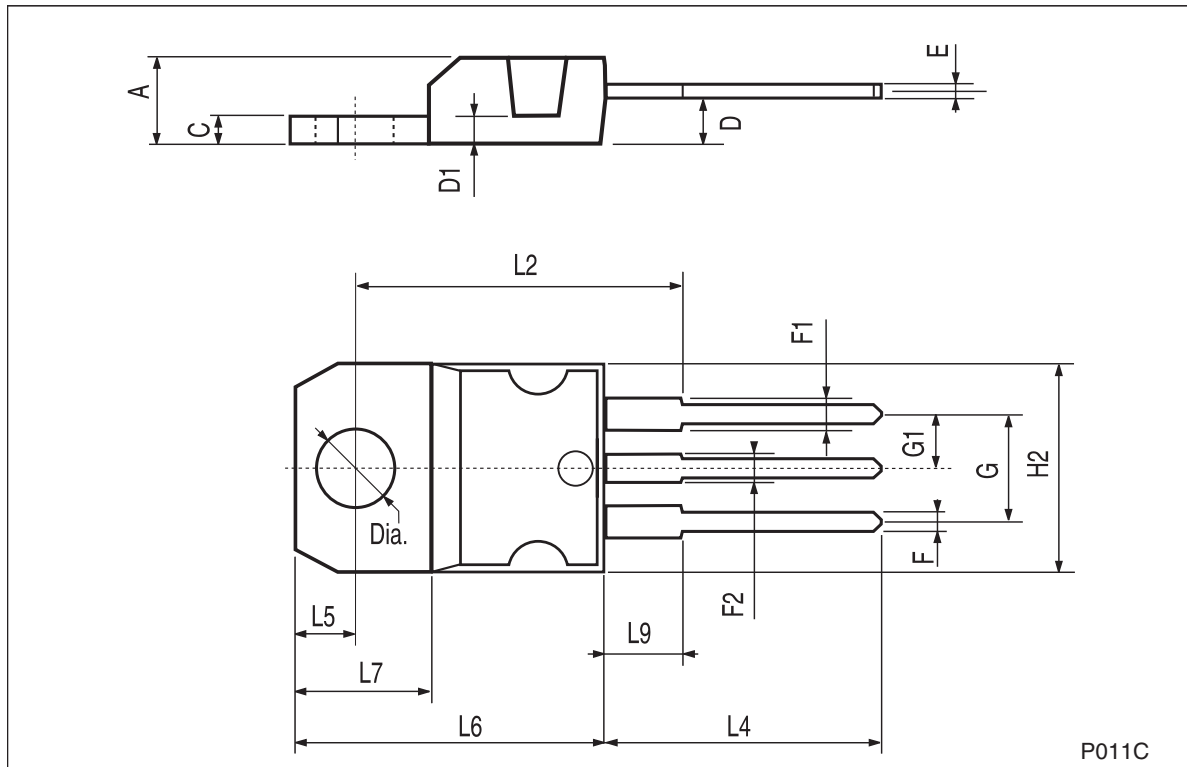
**Table 4. Electrical characteristics of L7805A** ( $V_I = 10\text{ V}$ ,  $I_O = 1\text{ A}$ ,  $T_J = 0\text{ to }150\text{ °C}$  (L7805AC),  $T_J = -40\text{ to }125\text{ °C}$  (L7805AB), unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$T_J = 25\text{ °C}$	4.9	5	5.1	V
$V_O$	Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $P_O \leq 15\text{ W}$ $V_I = 7.5\text{ to }20\text{ V}$	4.8	5	5.2	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = 7.5\text{ to }25\text{ V}$ , $I_O = 500\text{ mA}$		7	50	mV
		$V_I = 8\text{ to }12\text{ V}$		10	50	mV
		$V_I = 8\text{ to }12\text{ V}$ , $T_J = 25\text{ °C}$		2	25	mV
		$V_I = 7.3\text{ to }20\text{ V}$ , $T_J = 25\text{ °C}$		7	50	mV
$\Delta V_O^{(*)}$	Load regulation	$I_O = 5\text{ mA to }1\text{ A}$		25	100	mV
		$I_O = 5\text{ mA to }1.5\text{ A}$ , $T_J = 25\text{ °C}$		30	100	V
		$I_O = 250\text{ to }750\text{ mA}$		8	50	V
$I_q$	Quiescent current	$T_J = 25\text{ °C}$		4.3	6	mA
					6	mA
$\Delta I_q$	Quiescent current change	$V_I = 8\text{ to }25\text{ V}$ , $I_O = 500\text{ mA}$			0.8	mA
		$V_I = 7.5\text{ to }20\text{ V}$ , $T_J = 25\text{ °C}$			0.8	mA
		$I_O = 5\text{ mA to }1\text{ A}$			0.5	mA
SVR	Supply voltage rejection	$V_I = 8\text{ to }18\text{ V}$ , $f = 120\text{ Hz}$ , $I_O = 500\text{ mA}$		68		dB
$V_d$	Dropout voltage	$I_O = 1\text{ A}$ , $T_J = 25\text{ °C}$		2		V
eN	Output noise voltage	$T_A = 25\text{ °C}$ , $B = 10\text{ Hz to }100\text{ kHz}$		10		$\mu\text{V}/V_O$
$R_O$	Output resistance	$f = 1\text{ kHz}$		17		$\text{m}\Omega$
$I_{sc}$	Short circuit current	$V_I = 35\text{ V}$ , $T_A = 25\text{ °C}$		0.2		A
$I_{scp}$	Short circuit peak current	$T_J = 25\text{ °C}$		2.2		A
$\Delta V_O/\Delta T$	Output voltage drift			-1.1		$\text{mV}/\text{°C}$

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

## TO-220 mechanical data

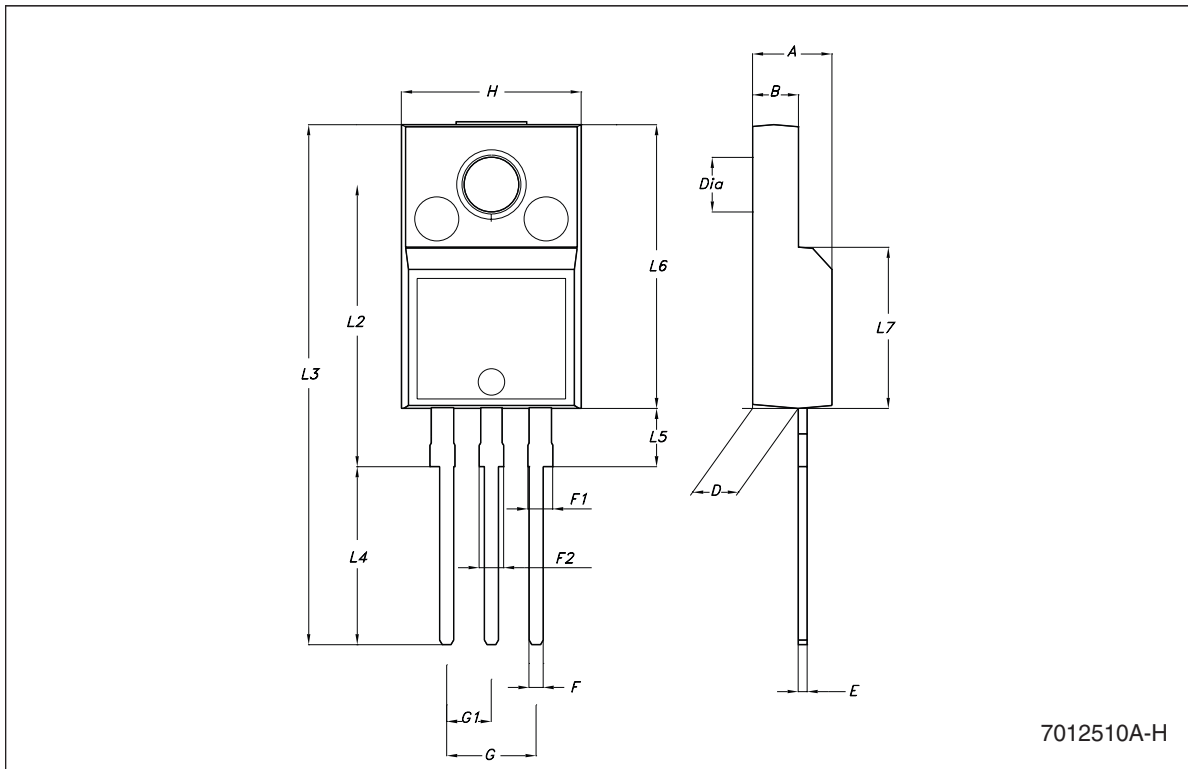
Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
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	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



P011C

**TO-220FP mechanical data**

Dim.	mm.			inch.		
	Min.	Typ	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.70	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.50	0.045		0.059
F2	1.15		1.50	0.045		0.059
G	4.95		5.2	0.194		0.204
G1	2.4		2.7	0.094		0.106
H	10.0		10.40	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L5	2.9		3.6	0.114		0.142
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
DIA.	3		3.2	0.118		0.126



7012510A-H

## 8 Order codes

Table 13. Order codes

Part number	Packaging			Output voltage
	TO-220	TO-220FP	D <sup>2</sup> PAK	
L7805AB	L7805ABV	L7805ABP	L7805ABD2T-TR	5 V
L7805AC	L7805ACV	L7805ACP	L7805ACD2T-TR	5 V
L7806AB	L7806ABV		L7806ABD2T-TR	6 V
L7806AC	L7806ACV		L7806ACD2T-TR	6 V
L7808AB	L7808ABV		L7808ABD2T-TR	8 V
L7808AC	L7808ACV		L7808ACD2T-TR	8 V
L7809AB	L7809ABV		L7809ABD2T-TR	9 V
L7809AC	L7809ACV		L7809ACD2T-TR	9 V
L7812AB	L7812ABV		L7812ABD2T-TR	12 V
L7812AC	L7812ACV		L7812ACD2T-TR	12 V
L7815AB	L7815ABV		L7815ABD2T-TR	15 V
L7815AC	L7815ACV		L7815ACD2T-TR	15 V
L7824AB	L7824ABV		L7824ABD2T-TR	24 V
L7824AC	L7824ACV			24 V