

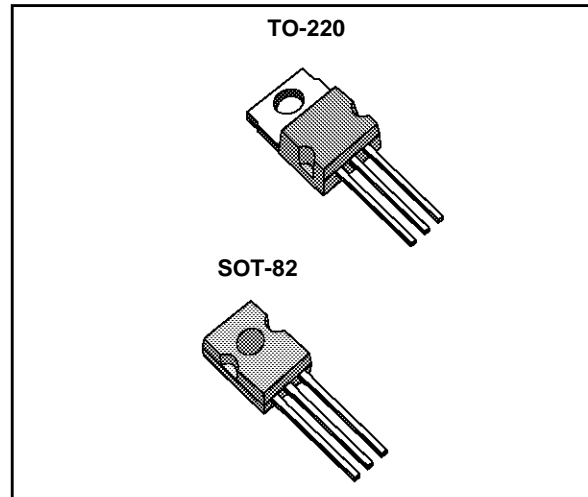
## LOW DROPOUT VOLTAGE REGULATORS

- OUTPUT VOLTAGE OF 5, 8.5 AND 10 V
- OUTPUT CURRENT UP TO 500 mA
- NO EXTERNAL COMPONENTS
- LOW DROP OUT VOLTAGE
- OVERVOLTAGE PROTECTION ( $\pm 100V$ )
- REVERSE VOLTAGE PROTECTION
- SHORT CIRCUIT PROTECTION
- CURRENT LIMITING
- THERMAL SHUTDOWN

### DESCRIPTION

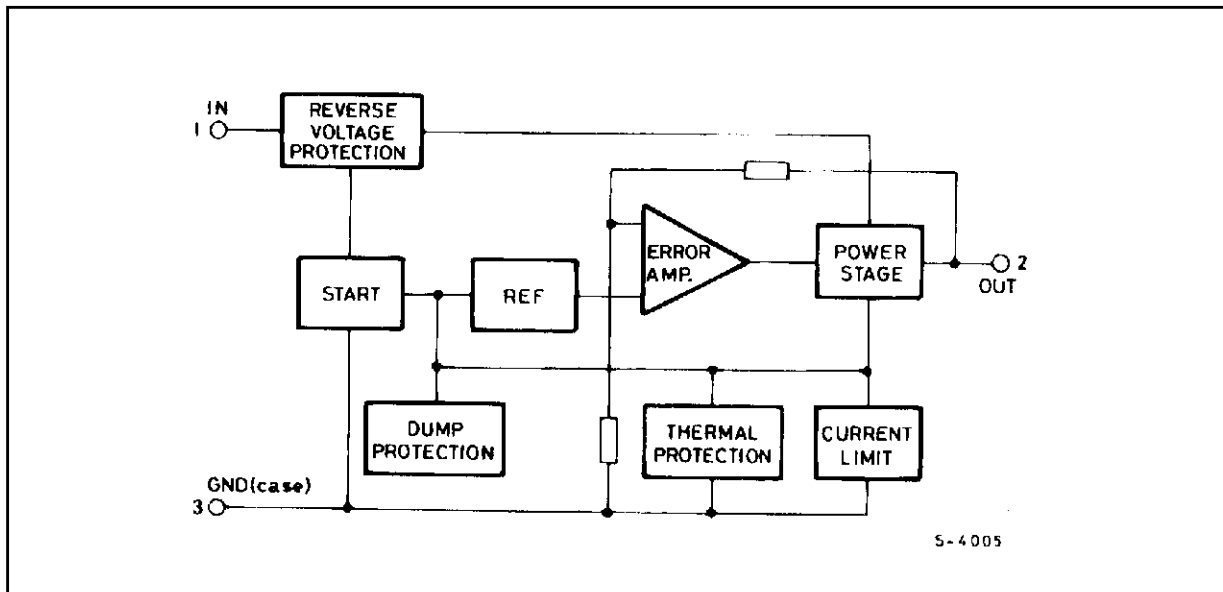
The L2600 series of three terminal positive regulators is specially designed to stabilize power supplies for instrumentation in vehicles with 12V battery. Available with output voltages equal to 5V, 8.5 V, 10V, they can supply an output current to 500mA.

These devices are protected against load dump and field decay transients ( $\pm 100V$ ), reverse battery, short circuit and thermal overload.

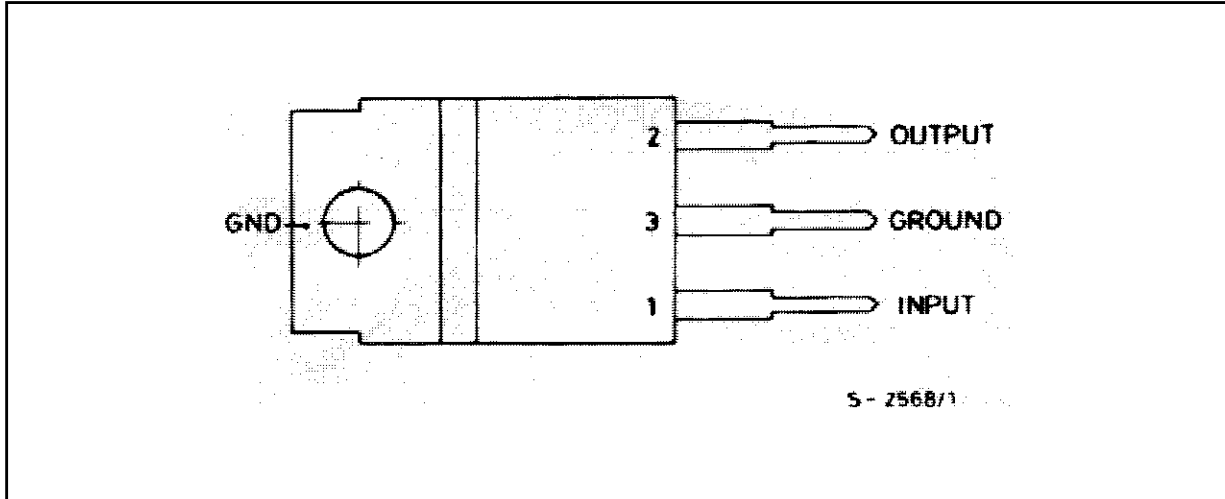


Order codes		Output Voltage
TO-220	SOT-82	
L2605V	L2605X	5 V
L2685V	L2685X	8.5 V
L2610V	L2610X	10 V

### BLOCK DIAGRAM



**PIN CONNECTION** (top view)



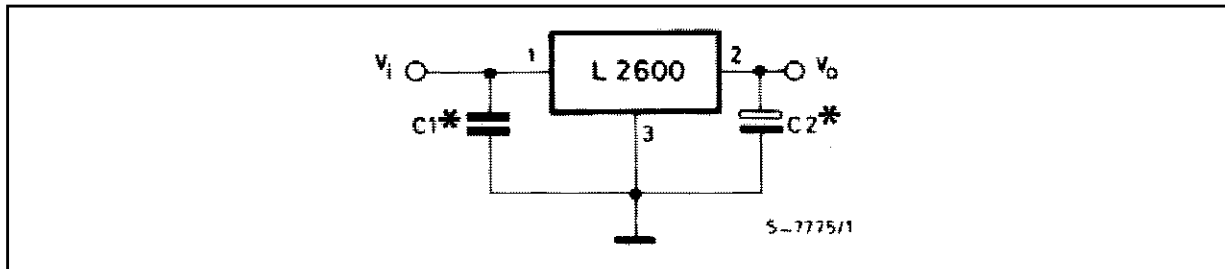
**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_i$	DC Input Voltage	35	V
	DC Input Reverse Voltage	-28	V
	Transient Input Overvoltage: Load Dump: $5\text{ms} \leq t_{\text{rise}} \leq 10\text{ms}$	+ 100	V
	$\tau_f$ Fall Time Costant = 100ms, $R_{\text{source}} \geq 0.5 \Omega$		
	Field Decay: $5\text{ms} \leq t_{\text{fall}} \leq 10\text{ms}$ $\tau_r$ Rise Time Costant = 33ms, $R_{\text{source}} \geq 10\Omega$	- 100	V
$P_D$	Power Dissipation	Internally Limited	
$T_j, T_{\text{stg}}$	Junction and Storage Temperature Range	- 55 to 150	$^{\circ}\text{C}$

**THERMAL DATA**

Symbol	Parameter		SOT-82	TO-220
$R_{\text{th-j-case}}$	Thermal resistance junction-case	Max	8 $^{\circ}\text{C/W}$	4 $^{\circ}\text{C/W}$
$R_{\text{th-j-amb}}$	Thermal resistance junction-ambient	Max	100 $^{\circ}\text{C/W}$	75 $^{\circ}\text{C/W}$

**APPLICATION CIRCUIT**



(\*) **Note** :  $C_1$  and  $C_2$  are only needed if the load capacitance exceeds 1000 pF, Recommended values are  $C_1 = 0.1 \mu\text{F}$  and  $C_2 \geq 100 \mu\text{F}$ .

**ELECTRICAL CHARACTERISTICS** ( $T_j = 25\text{ }^\circ\text{C}$ ,  $V_i = 14\text{V}$ , unless otherwise specified)

Symbol	Parameter	Test Condition		Min.	Typ.	Max.	Unit
$V_o$	Output Voltage	$I_o = 500\text{ mA}$	$V_i = 12\text{ to }16\text{ V (L2605)}$ $V_i = 12\text{ to }16\text{ V (L2685)}$ $V_i = 12\text{ to }16\text{ V (L2610)}$	4.80 8.15 9.60	5.00 8.50 10.00*	5.20 8.85 10.40	V
$V_i$	Operating Input Voltage	See Note (*)				28	V
$\frac{\Delta V_o}{V_o}$	Line Regulation	$I_o = 50\text{ mA}$	$V_i = 12\text{ to }20\text{ V}$		2	8	mV/V
$\frac{\Delta V_o}{V_o}$	Load Regulation	$V_i = 14\text{ V}$	$I_o = 50\text{ to }500\text{ mA}$		4	9	mV/V
$\Delta V_{i-o}$	Dropout Voltage	$I_o = 500\text{ mA}$				1.9	V
$I_d$	Quiescent Current	$I_o = 50\text{ mA}$			20	45	mA
$\frac{\Delta V_o}{\Delta T}$	Output Voltage Drift	$I_o = 50\text{ mA}$ $V_i = 14\text{ V}$	$T_{amb} = -12\text{ to }80\text{ }^\circ\text{C}$		-1		mV/°C
$I_{sc}$	Output Short Circuit Current				1.1	1.8	A
SVR	Supply Voltage Rejection	$V_i = 16$ $f = 100\text{ Hz}$	$V_i = 2\text{ V}$ $I_o = 500\text{ mA}$		60		dB
$R_o$	Output Resistance	$I_o = 500\text{ mA}$			0.05		$\Omega$
$e_N$	Output Noise Voltage	BW = 100 Hz to 10 KHz			20		$\mu\text{V}$

(\*) **Note:** For DC input voltage  $28\text{ V} < V_i < 35\text{ V}$  the device is not operating

**ELECTRICAL CHARACTERISTICS** ( $-40 \leq T_j \leq 125\text{ }^\circ\text{C}$  (note 2),  $V_i = 14\text{ V}$ , unless otherwise specified)

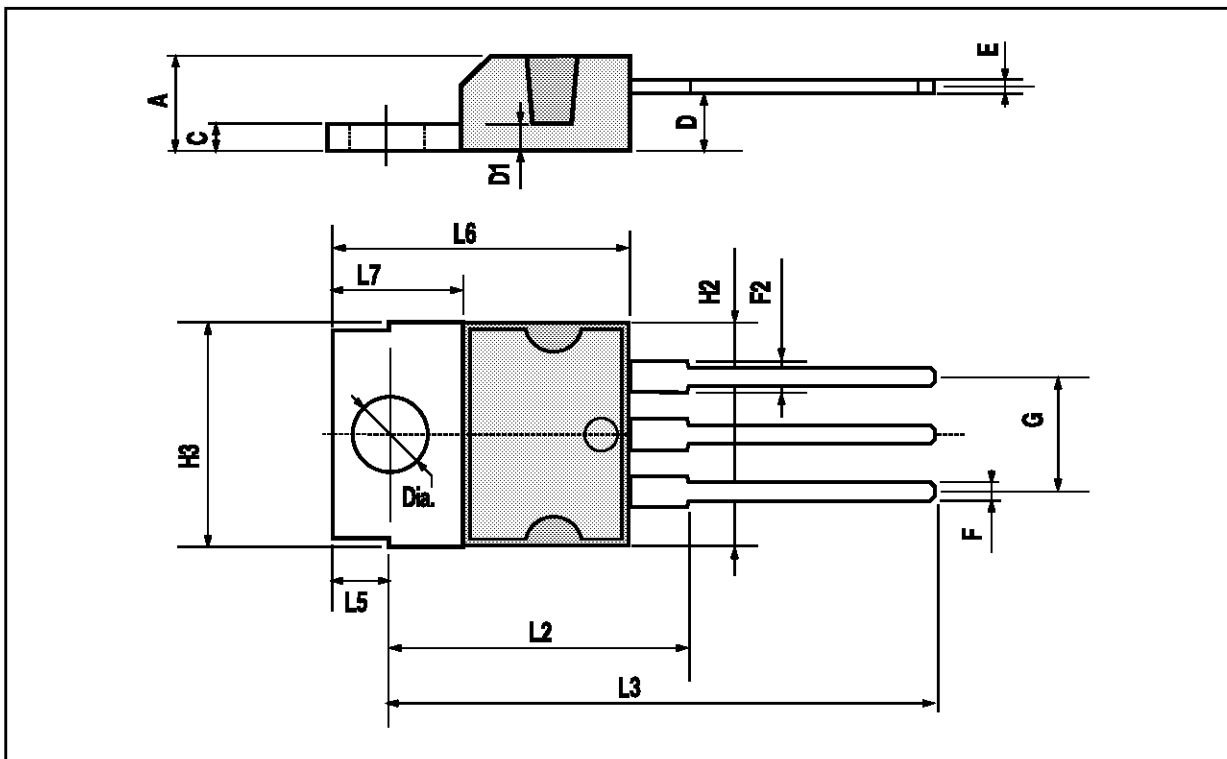
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$V_o$	Output Voltage	$I_o = 500\text{ mA}$	$V_i = 12.5\text{ to }16\text{ V (L2605)}$ $V_i = 12.5\text{ to }16\text{ V (L2685)}$ $V_i = 12.5\text{ to }16\text{ V (L2610)}$	4.70 8.00 9.40	5.00 8.50 10.00	5.30 9.00 10.60	V
$V_i$	Operating Input Voltage	See Note (°)				26	V
$\frac{\Delta V_o}{V_o}$	Line Regulation	$I_o = 50\text{ mA}$	$V_i = 12.5\text{ to }20\text{ V}$		3	12	mV/V
$\frac{\Delta V_o}{V_o}$	Load Regulation	$V_i = 14\text{ V}$	$I_o = 50\text{ to }500\text{ mA}$ ,	5	13		mV/V
$\Delta V_{i-o}$	Dropout Voltage	$I_o = 500\text{ mA}$				2.5	V
$I_d$	Quiescent Current	$I_o = 50\text{ mA}$			29	65	mA
$I_{sc}$	Output Short Circuit Current				1.1	2.1	A

**Notes:** (°). For a DC input voltage  $26\text{ V} < V_i < 35\text{ V}$  the device is not operating.

2. The limits are guaranteed by design correlation and statistical control on production samples over the indicated temperature and supply voltage ranges.

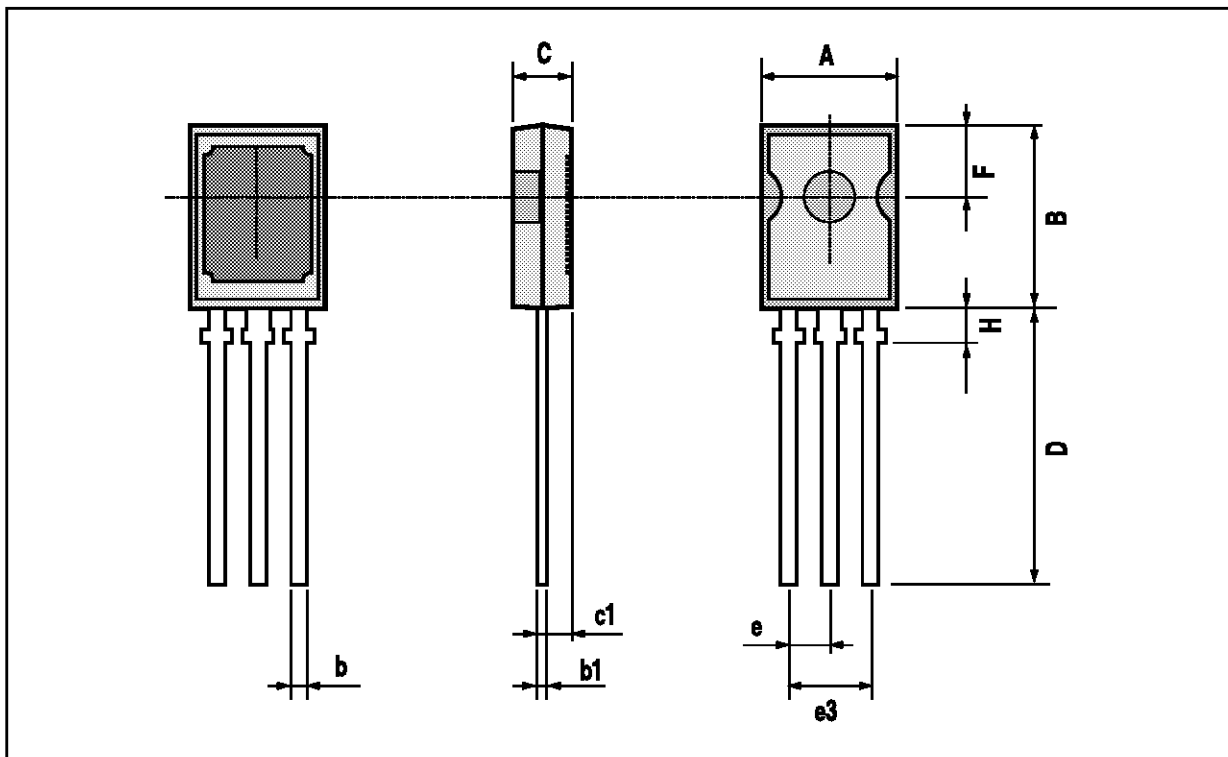
TO220 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F2	1.15		1.4	0.045		0.055
G	4.95	5.08	5.21	0.195	0.200	0.205
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L2		16.2			0.638	
L3	26.3	26.7	27.1	1.035	1.051	1.067
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152



## SOT82 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.094		0.106
c1		1.2			0.047	
D		15.7			0.618	
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
H			2.54		0.100	



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.