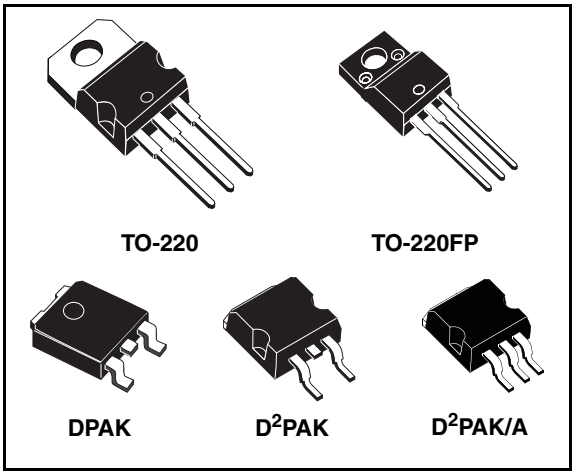
LD1085xx

3 A low drop positive voltage regulator adjustable and fixed

Features

- Typical dropout 1.3 V (at 3 A)
- Three terminal adjustable or fixed output voltage 1.5 V, 1.8 V, 2.5 V, 3.3 V, 5 V, 12 V.
- Automotive Grade product: adjustable V_{OUT} only in TO-220 Full Pack package
- Guaranteed output current up to 3 A
- Output tolerance ± 1 % at 25°C and ± 2 % in full temperature range
- Internal power and thermal limit
- Wide operating temperature range -40 °C to 125 °C
- Package available: TO-220, TO-220FP, DPAK, D^2PAK, D^2PAK/A
- Pinout compatibility with standard adjustable VREG



Description

The LD1085xx is a low drop voltage regulator able to provide up to 3 A of output current. Dropout is guaranteed at a maximum of 1.2 V at the maximum output current, decreasing at lower loads. The LD1085xx is pin to pin compatible with the older 3-terminal adjustable regulators, but has better performances in term of drop and output tolerance.

A 2.85 V output version is suitable for SCSI-2 active termination. Unlike PNP regulators, where a part of the output current is wasted as quiescent current, the LD1085xx quiescent current flows into the load, so increase efficiency. Only a 10 µF minimum capacitor is need for stability.

The device is supplied in TO-220, TO-220FP, DPAK, D^2PAK and D^2PAK/A. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within ± 1 % at 25 °C.

The LD1085xx is available as Automotive Grade in TO-220FP package only, for the option of adjustable output voltage whose commercial part number is shown in the *Table 11* (order codes). This device is qualified according to the specification AEC-Q100 of the Automotive market, in the temperature range -40 °C to 125 °C, and the statistical tests PAT, SYL, SBL are performed.

Table 1. Device summary

Part numbers	
LD1085XX	LD1085XX25
LD1085XX15	LD1085XX33
LD1085XX18	LD1085XX50

3 Maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_I	DC input voltage	30	V
I_O	Output current	Internally limited	mA
P_D	Power dissipation	Internally limited	mW
T_{STG}	Storage temperature range	-55 to +150	°C
T_{OP}	Operating junction temperature range	-40 to +125	°C

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	DPAK	D^2PAK D^2PAK/A	Unit
R_{thJC}	Thermal resistance junction-case	3	5	8	3	°C/W
R_{thJA}	Thermal resistance junction-ambient	50	60	100	62.5	°C/W

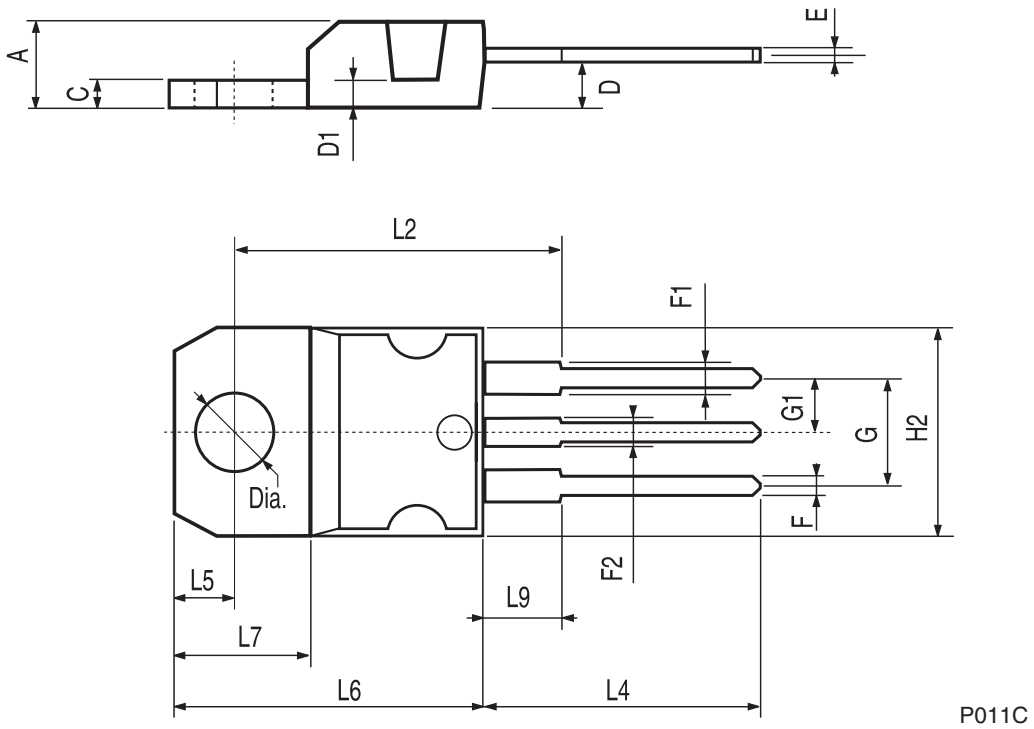
Table 9. Electrical characteristics of LD1085#
(V_I = 4.25 V, C_I = C_O =10 µF, T_A = -40 to 125 °C, unless otherwise specified).

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 10 mA T_J = 25°C	1.237	1.25	1.263	V
		I_O = 10 mA to 3 A, V_I = 2.85 to 30 V	1.225	1.25	1.275	V
ΔV_O	Line regulation	I_O = 10 mA, V_I = 2.85 to 16.5 V, T_J = 25°C		0.015	0.2	%
		I_O = 10 mA, V_I = 2.85 to 16.5 V		0.035	0.2	%
ΔV_O	Load regulation	I_O = 10 mA to 3 A, T_J = 25°C		0.1	0.3	%
		I_O = 0 to 3 A		0.2	0.4	%
V_d	Dropout voltage	I_O = 3 A		1.3	1.5	V
$I_{O(min)}$	Minimum load current	V_I = 30 V		3	10	mA
I_{sc}	Short circuit current	V_I - V_O = 5 V	5.5	6.5		A
		V_I - V_O = 25 V	0.5	0.7		A
	Thermal regulation	T_A = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF,C_{ADJ} = 25 µF, I_O = 3 A, V_I = 6.25 ± 3 V	60	72		dB
I_{ADJ}	Adjust pin current	V_I = 4.25 V, I_O = 10 mA		55	120	µA
ΔI_{ADJ}	Adjust pin current change (1)	I_O = 10 mA to 3 A, V_I = 2.85 to 16.5 V		0.2	5	µA
eN	RMS output noise voltage (% of V_O)	T_A = 25°C, f =10 Hz to 10 kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000 Hrs		0.5		%

1. See short-circuit current curve for available output current at fixed dropout.

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



8 Order codes

Table 11. Order codes

Packages					Output voltage
TO-220	TO-220FP	D^2PAK	DPAK (T&R)	D^2PAK/A (T&R)	
			LD1085DT15R		1.5 V
		LD1085D2T18R	LD1085DT18R	LD1085D2M18R	1.8 V
				LD1085D2M25R	2.5 V
		LD1085D2T33R		LD1085D2M33R	3.3 V
LD1085V50					5.0 V
LD1085V	LD1085P	LD1085D2T-R		LD1085D2M-R	ADJ
	LD1085PY (1)				ADJ

1. Automotive Grade products.