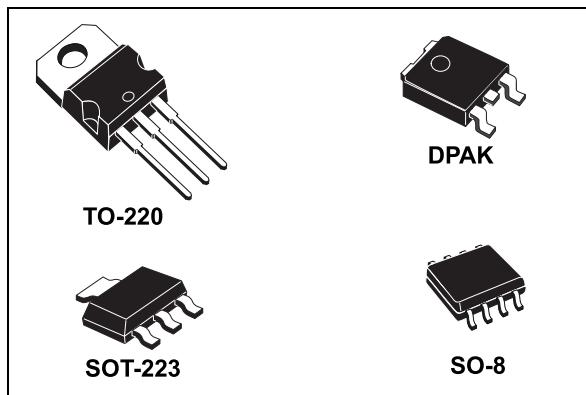


Adjustable and fixed low drop positive voltage regulator

Datasheet - production data



flows mostly into the load. Only a very common 10 μF minimum capacitor is needed for stability. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within $\pm 1\%$ at 25 °C. The adjustable LD1117 is pin to pin compatible with the other standard. Adjustable voltage regulators maintaining the better performances in terms of drop and tolerance.

Features

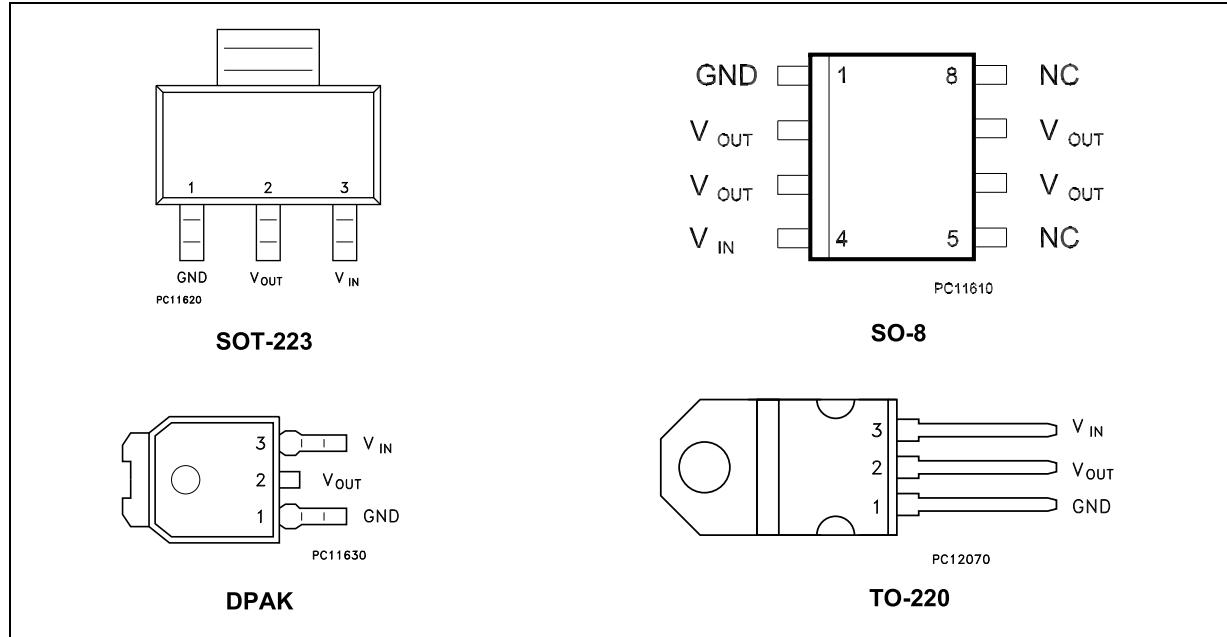
- Low dropout voltage (1 V typ.)
- 2.85 V device performances are suitable for SCSI-2 active termination
- Output current up to 800 mA
- Fixed output voltage of: 1.2 V, 1.8 V, 2.5 V, 3.3 V, 5.0 V
- Adjustable version availability ($V_{\text{REF}} = 1.25\text{ V}$)
- Internal current and thermal limit
- Available in $\pm 1\%$ (at 25 °C) and 2 % in full temperature range
- Supply voltage rejection: 75 dB (typ.)

Description

The LD1117 is a low drop voltage regulator able to provide up to 800 mA of output current, available even in adjustable version ($V_{\text{REF}} = 1.25\text{ V}$). Concerning fixed versions, are offered the following output voltages: 1.2 V, 1.8 V, 2.5 V, 2.85 V, 3.3 V and 5.0 V. The device is supplied in: SOT-223, DPAK, SO-8 and TO-220. The SOT-223 and DPAK surface mount packages optimize the thermal characteristics even offering a relevant space saving effect. High efficiency is assured by NPN pass transistor. In fact in this case, unlike than PNP one, the quiescent current

2 Pin configuration

Figure 2. Pin connections (top view)



Note: The TAB is connected to the V_{OUT}.

3 Maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit	
$V_{IN}^{(1)}$	DC input voltage	15	V	
P_{TOT}	Power dissipation	12	W	
T_{STG}	Storage temperature range	-40 to +150	°C	
T_{OP}	Operating junction temperature range	for C version	-40 to +125	°C
		for standard version	0 to +125	°C

1. Absolute maximum rating of $V_{IN} = 18$ V, when I_{OUT} is lower than 20 mA.

Table 2. Thermal data

Symbol	Parameter	SOT-223	SO-8	DPAK	TO-220	Unit
R_{thJC}	Thermal resistance junction-case	15	20	8	5	°C/W
R_{thJA}	Thermal resistance junction-ambient	110	55	100	50	°C/W

4 Schematic application

Figure 3. Application circuit (for 1.2 V)

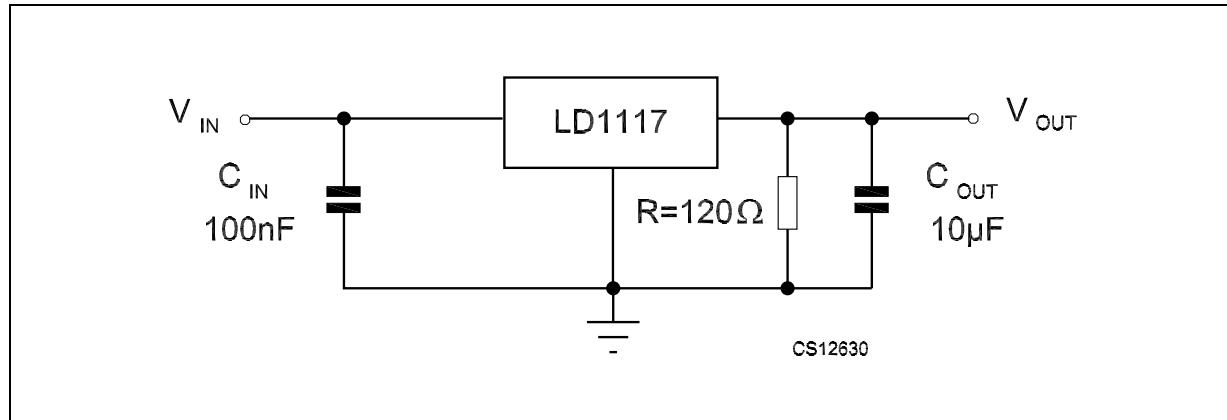
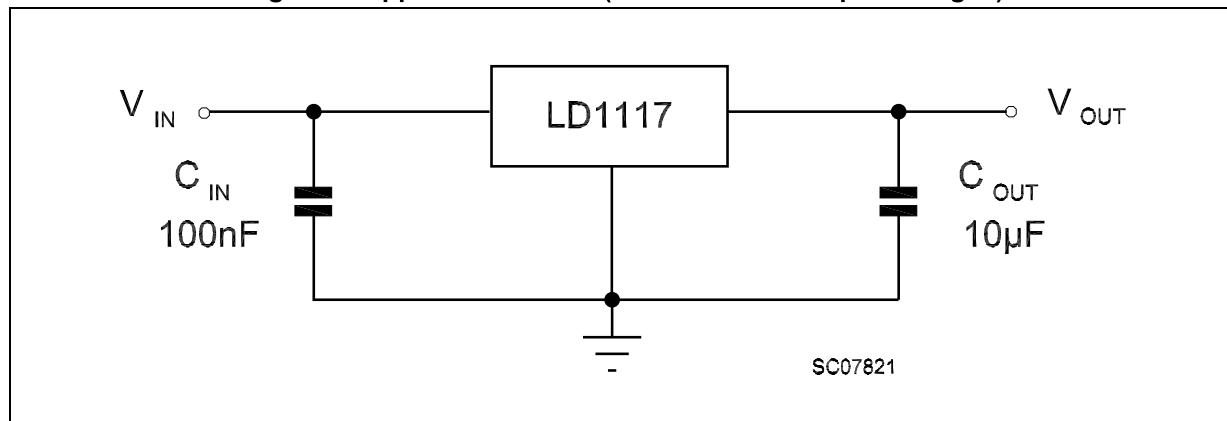


Figure 4. Application circuit (for other fixed output voltages)



Refer to the test circuits, $T_J = 0$ to 125°C , $C_O = 10 \mu\text{F}$, unless otherwise specified.

Table 8. Electrical characteristics of LD1117 (adjustable)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
V_{ref}	Reference voltage	$V_{\text{in}} - V_O = 2 \text{ V}$, $I_O = 10 \text{ mA}$, $T_J = 25^\circ\text{C}$	1.238	1.25	1.262	V
V_{ref}	Reference voltage	$I_O = 10$ to 800 mA , $V_{\text{in}} - V_O = 1.4$ to 10 V	1.225		1.275	V
ΔV_O	Line regulation	$V_{\text{in}} - V_O = 1.5$ to 13.75 V , $I_O = 10 \text{ mA}$		0.035	0.2	%
ΔV_O	Load regulation	$V_{\text{in}} - V_O = 3 \text{ V}$, $I_O = 10$ to 800 mA		0.1	0.4	%
ΔV_O	Temperature stability			0.5		%
ΔV_O	Long term stability	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
V_{in}	Operating input voltage				15	V
I_{adj}	Adjustment pin current	$V_{\text{in}} \leq 15 \text{ V}$		60	120	μA
ΔI_{adj}	Adjustment pin current change	$V_{\text{in}} - V_O = 1.4$ to 10 V , $I_O = 10$ to 800 mA		1	5	μA
$I_{O(\text{min})}$	Minimum load current	$V_{\text{in}} = 15 \text{ V}$		2	5	mA
I_O	Output current	$V_{\text{in}} - V_O = 5 \text{ V}$, $T_J = 25^\circ\text{C}$	800	950	1300	mA
eN	Output noise (% V_O)	$B = 10 \text{ Hz}$ to 10 kHz , $T_J = 25^\circ\text{C}$		0.003		%
SVR	Supply voltage rejection	$I_O = 40 \text{ mA}$, $f = 120 \text{ Hz}$, $T_J = 25^\circ\text{C}$ $V_{\text{in}} - V_O = 3 \text{ V}$, $V_{\text{ripple}} = 1 \text{ V}_{\text{PP}}$	60	75		dB
V_d	Dropout voltage	$I_O = 100 \text{ mA}$		1	1.1	V
		$I_O = 500 \text{ mA}$		1.05	1.15	
		$I_O = 800 \text{ mA}$		1.10	1.2	
	Thermal regulation	$T_a = 25^\circ\text{C}$, 30 ms Pulse		0.01	0.1	%/W