

Description

PJ1117ST Series is a low-dropout three-terminal Linear regulator circuit with positive voltage output. It is divided into two versions, Fixed voltage output version and Adjustable voltage output version: The fixed output voltage is 1.2V、 1.8V、 2.5V、 3.3V、 5V and the adjustable version can provide the output voltage from 1.25V to 12V with only 2 external resistors.

Features

- Range of operation input voltage : Max.15V
- Current limiting function
- Thermal Shutdown
- Operation Ambient Temperature : -40~85°C

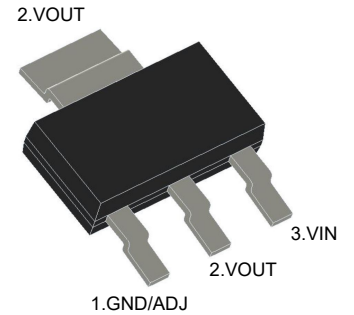
Applications

- LCD Monitor and LCD TV
- DVD Decode Boar
- ADSL Modem

Functional Pin Description

Pin Name	Pin Function
GND/ADJ	Ground/Adjustable Pin
VOUT	Output Voltage
VIN	Power Input Voltage

SOT-223

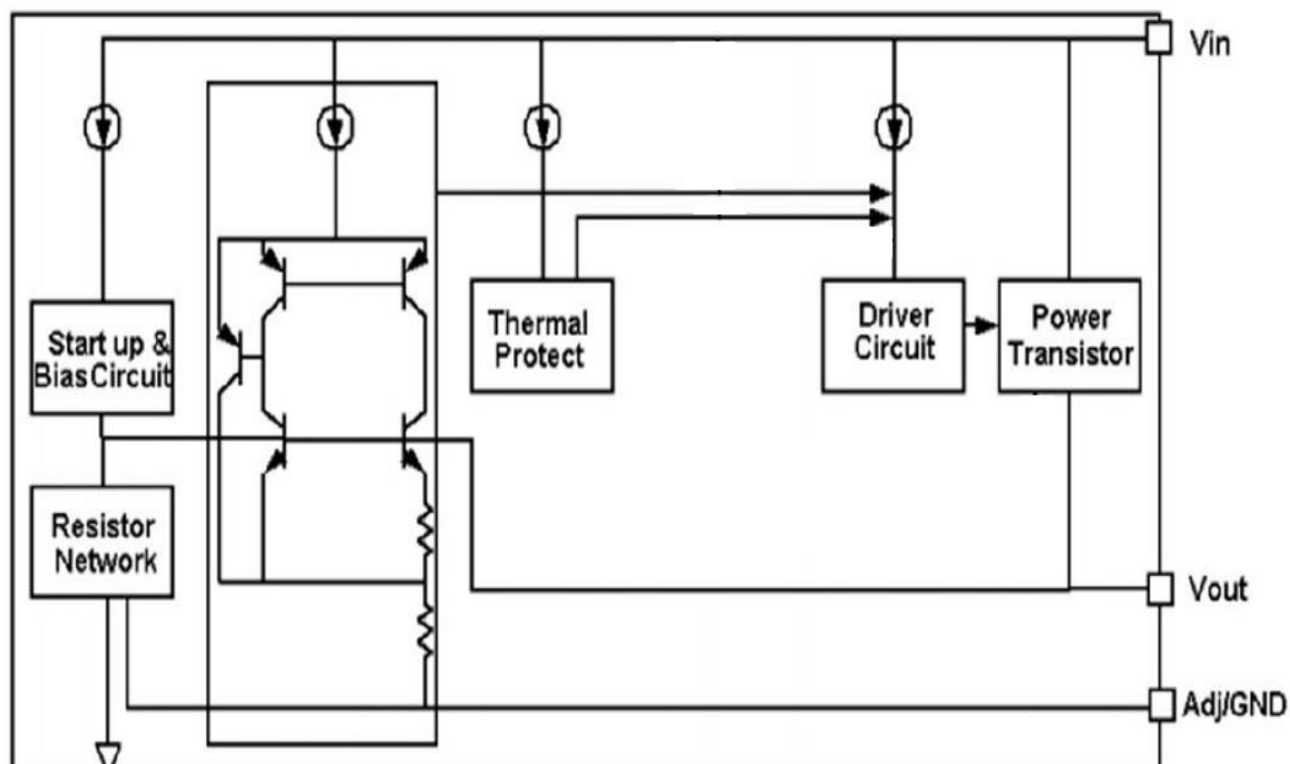


Ordering Information

PJ1117ST-□□

- Fixed Voltage Output Version
12 : 1.2V 18 : 1.8V 25 : 2.5V 33 : 3.3V 50 : 5.0V
- Adjustable Voltage Output Version
ADJ : 1.25V~12V
- Package Type
ST : SOT-223

Function Block Diagram





Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{IN}	18	V
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-40 to +150	°C
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	20	°C/W

Note: These are stress ratings only. Stresses exceeding the range specified under Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Recommended Maximum Input Voltage	V_{IN}	15	V
Recommended Operating Junction Temperature	T_{opr}	-40 to +85	°C



Fixed Voltage Output Version

Electrical Characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	ΔV_{OUT}	$0 \leq I_{\text{OUT}} \leq 1\text{A}, V_{\text{IN}} = V_{\text{OUT}} + 2\text{V}$	-2	--	+2	%
Quiescent Current	I_{Q}	$V_{\text{OUT}} = 1.2\text{V}$ $I_{\text{OUT}} = 0\text{mA}, V_{\text{IN}} = 10\text{V}$	--	2	5	mA
		$1.8\text{V} \leq V_{\text{OUT}} \leq 5\text{V}$ $I_{\text{OUT}} = 0\text{mA}, V_{\text{IN}} = 12\text{V}$	--	2	5	mA
Dropout Voltage	V_{DROP}	$I_{\text{OUT}} = 100\text{mA}$	--	1.15	1.3	V
		$I_{\text{OUT}} = 1\text{A}$	--	1.3	1.5	V
Line Regulation	ΔV_{LINE}	$V_{\text{OUT}} = 1.2\text{V}$ $I_{\text{OUT}} = 10\text{mA}, 2.7\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	--	0.03	0.2	%/ V
		$1.8\text{V} \leq V_{\text{OUT}} \leq 5\text{V}$ $I_{\text{OUT}} = 10\text{mA}, V_{\text{OUT}} + 1.5\text{V} \leq V_{\text{IN}} \leq 12\text{V}$	--	0.03	0.2	
Load Regulation	ΔV_{LOAD}	$10\text{mA} \leq I_{\text{OUT}} \leq 1\text{A}, V_{\text{IN}} = V_{\text{OUT}} + 1.5\text{V}$	--	--	36	mV
Temperature coefficient	$\Delta V/\Delta T$		--	+100	--	ppm

Adjustable Voltage Output Version (PJ1117ST-ADJ)

Electrical Characteristics

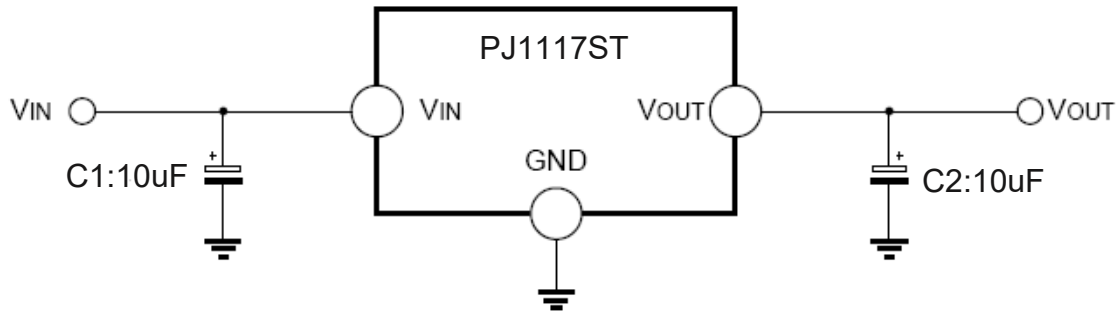
($T_A=25^{\circ}\text{C}$, unless otherwise noted.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reference voltage	V_{ref}	$10\text{mA} \leq I_{\text{OUT}} \leq 1\text{A}, V_{\text{IN}} = 3.25\text{V}$	1.225	1.25	1.275	V
Line Regulation	ΔV_{LINE}	$I_{\text{OUT}} = 10\text{mA}, 2.75\text{V} \leq V_{\text{IN}} \leq 12\text{V}$	--	0.03	0.2	%/ V
Load Regulation	ΔV_{LOAD}	$10\text{mA} \leq I_{\text{OUT}} \leq 1\text{A}, V_{\text{IN}} = 2.75\text{V}$	--	2	8	mV
Minimum load current	I_{min}		--	2	10	mA
Adjust pin current	I_{adj}	$10\text{mA} \leq I_{\text{OUT}} \leq 1\text{A}, V_{\text{IN}} = 5\text{V}$	--	55	120	μA
Iadj change	I_{change}	$10\text{mA} \leq I_{\text{OUT}} \leq 1\text{A}, V_{\text{IN}} = 5\text{V}$	--	0.2	10	μA

Typical Application Circuit

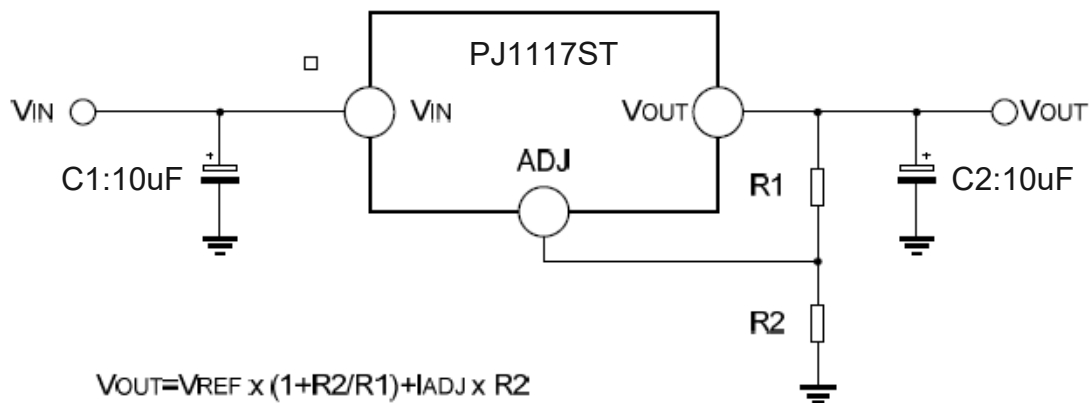
PJ1117ST Series has an adjustable version and six fixed versions (1.2V, 1.8V, 2.5V, 3.3V and 5V)

Fixed Voltage Output Version



1. Recommend using 10uF tan capacitor as bypass capacitor (C1) for all application circuit.
2. Recommend using 10uF tan capacitor to assure circuit stability.

Adjustable Voltage Output Version

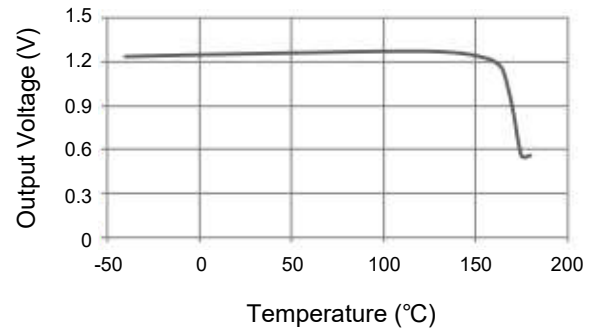
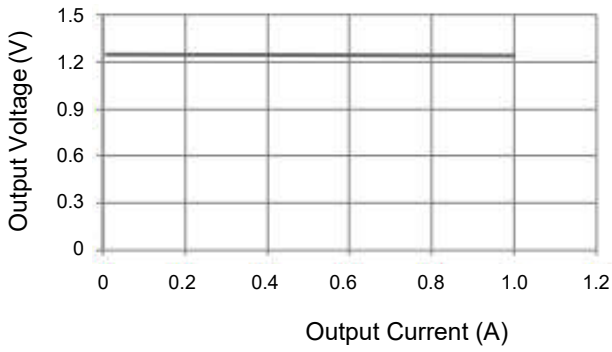
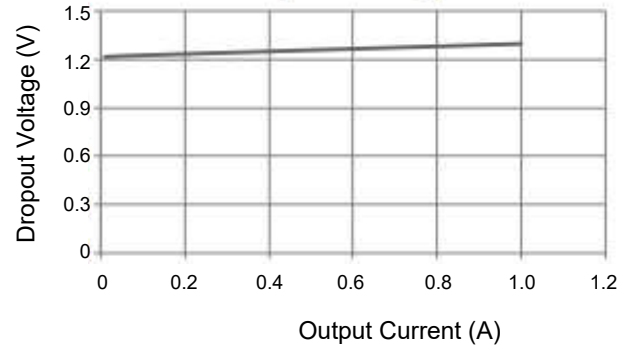
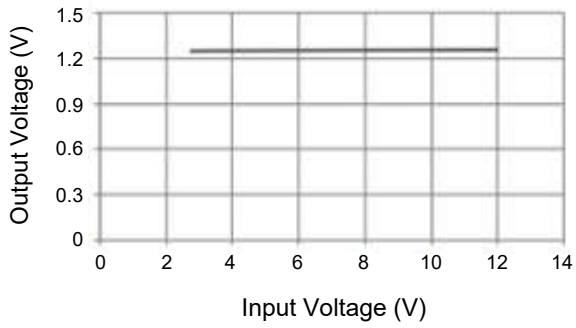


The output voltage of adjustable version follows the equation: $V_{OUT} = 1.25 \times (1 + R2/R1) + I_{Adj} \times R2$. We can ignore I_{Adj} because I_{Adj} (about 50uA) is much less than the current of $R1$ (about 2~10mA).

- (1). To meet the minimum load current (>10mA) requirement, $R1$ is recommended to be 125ohm or lower. As PJ1117ST-ADJ can keep itself stable at load current about 2mA, $R1$ is not allowed to be higher than 625Ω.
- (2). Using a bypass capacitor (CADJ) between the ADJ pin and ground can improve ripple rejection. This bypass capacitor prevents ripple from being amplified as the output voltage is increased. The impedance of CADJ should be less than $R1$ to prevent ripple from being amplified. As $R1$ is normally in the range of 100Ω~500Ω, the value of CADJ should satisfy this equation: $1/(2\pi \times f_{ripple} \times CADJ) < R1$.



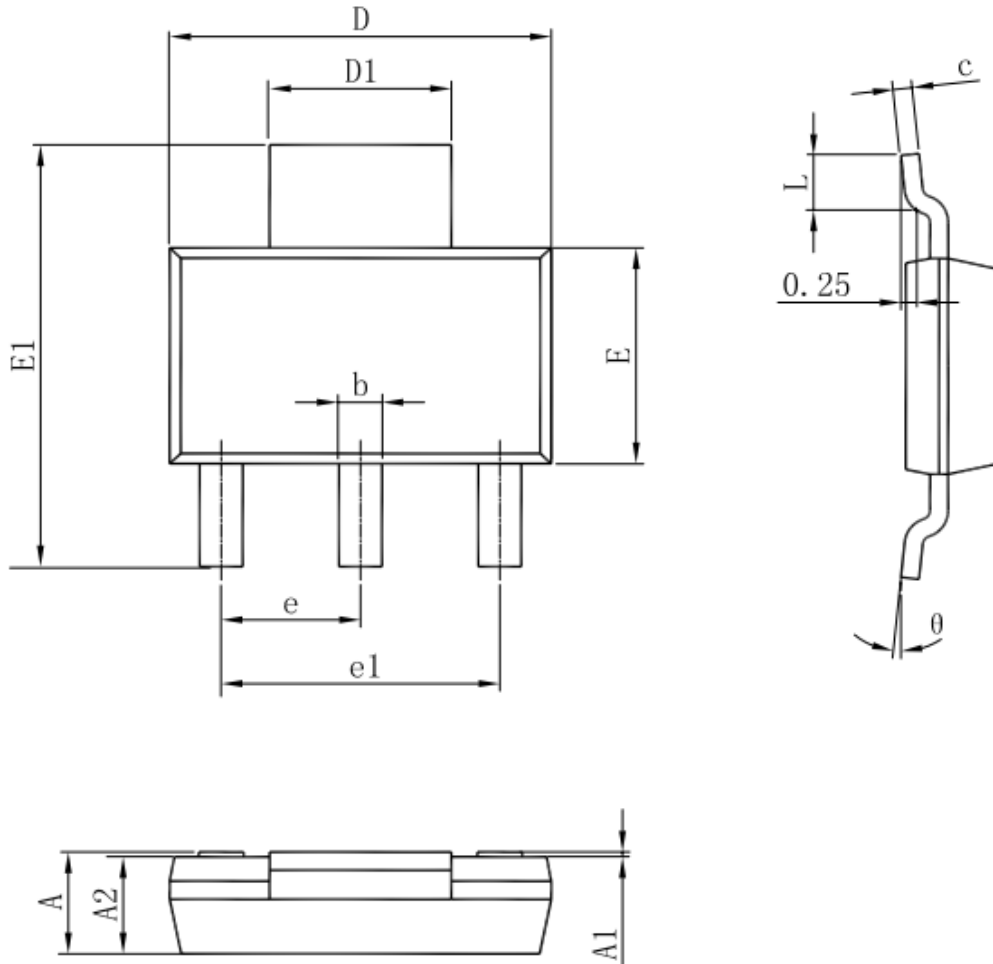
Typical Characteristics Curves



Package Outline

SOT-223

Dimensions in mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°