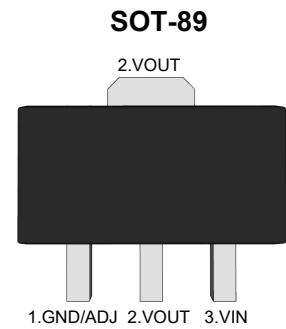## Description

PJ1117SQ 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.

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2.VOUT
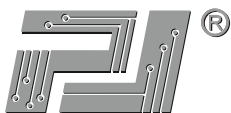
1.GND/ADJ 2.VOUT 3.VIN

Features

- Maximum output current is 1.0A

- 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
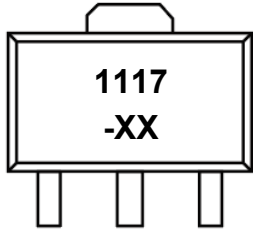
- ADSL Modem

Functional Pin Description

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

Ordering Information
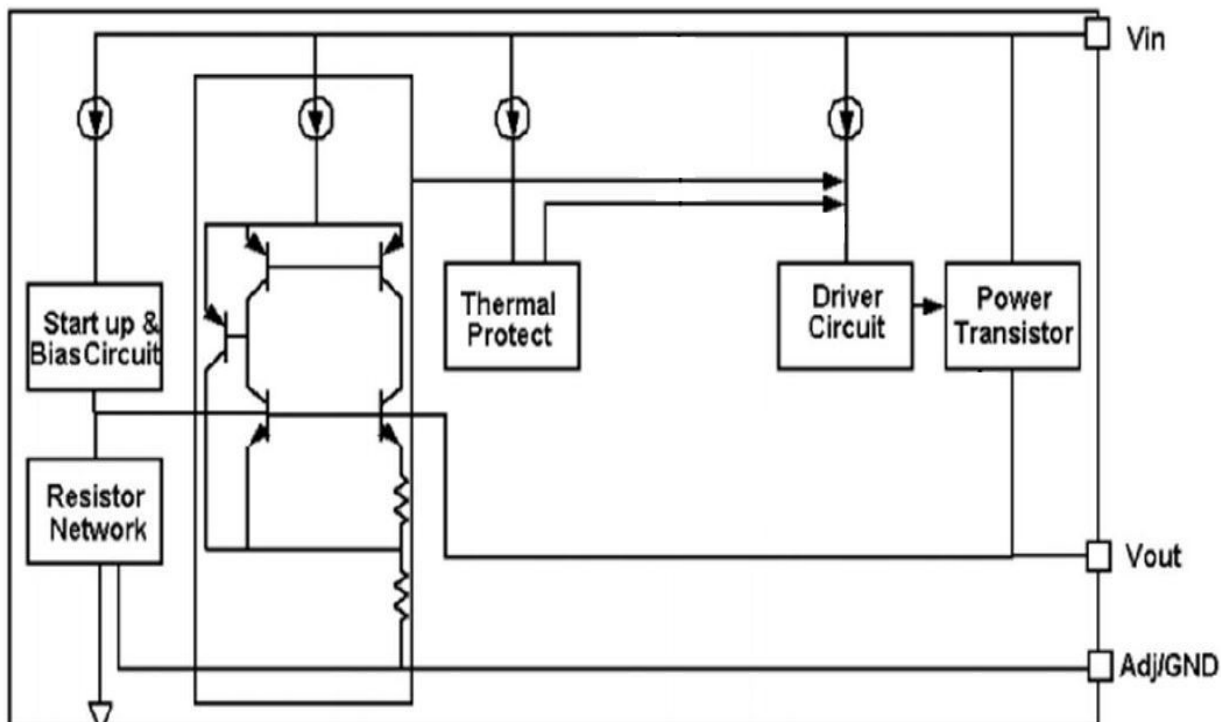
PJ1117SQ-□□

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
SQ : SOT-89

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan Note	MSL Level	Marking Code
PJ1117SQ-1.2	SOT-89	7/13	1000/3000	RoHS & Green	MSL1	**1117 -XX** XX:Output Voltage e.g. 1.2:1.2V; ADJ:Adjustable Voltage
PJ1117SQ-1.8						
PJ1117SQ-2.5						
PJ1117SQ-3.3						
PJ1117SQ-5.0						
PJ1117SQ-ADJ						

Note:

RoHS：PJ defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials.

Green：PJ defines "Green" to mean Halogen-Free and Antimony-Free.

Function Block Diagram

Absolute Maximum Ratings [Note1]

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter		Symbol	Rating	Unit
Supply Voltage		V_{IN}	18	V
Maximum Output Current		I_{OUT}	1	A
Power Dissipation [Note2]	T_C=25°C	P_D	Internally Limited	--
Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-40 to +150	°C
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	45	°C/W

Note:
1. 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.
2. The Power Dissipation is : $P_D=(T_{J(MAX)}-T_C)/R_{\theta JC}$

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℃ , unless otherwise noted.)

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

Adjustable Voltage Output Version

Electrical Characteristics

(T_A=25℃ , unless otherwise noted.)

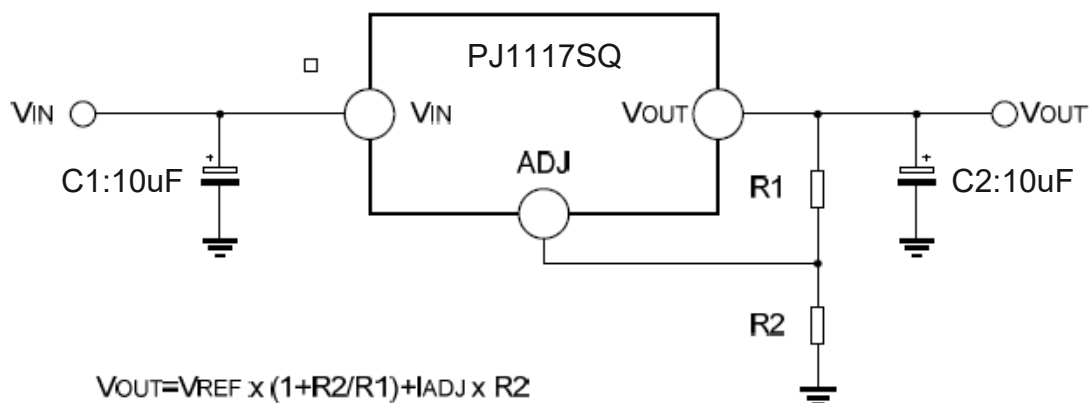| Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reference voltage	V_{ref}	10mA≤I_{OUT}≤1A , V_{IN}=3.25V	1.225	1.25	1.275	V
Line Regulation	ΔV_{LINE}	I_{OUT}=10mA, 2.75V≤V_{IN}≤12V	--	0.03	0.2	%/V
Load Regulation	ΔV_{LOAD}	10mA≤I_{OUT}≤1A,V_{IN}=2.75V	--	2	8	mV
Minimum load current	I_{min}		--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

Typical Application Circuit

PJ1117SQ 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

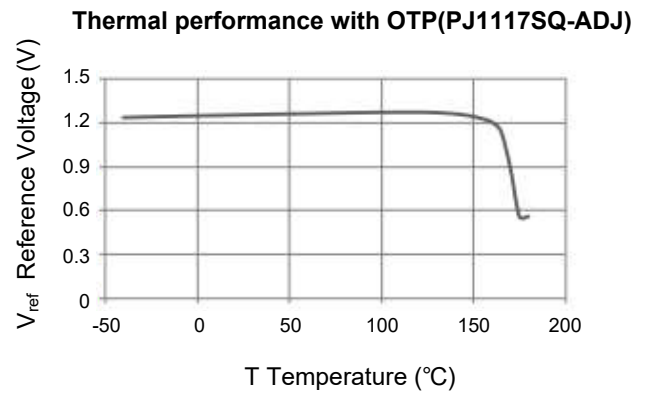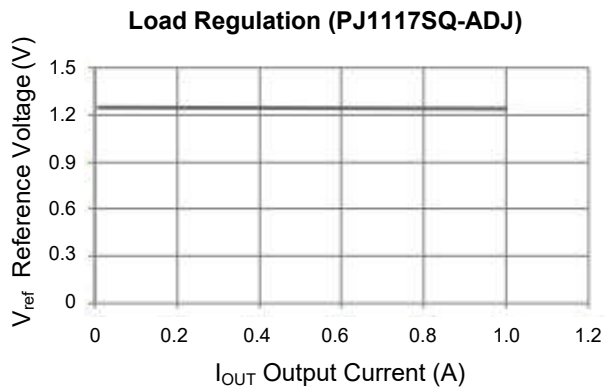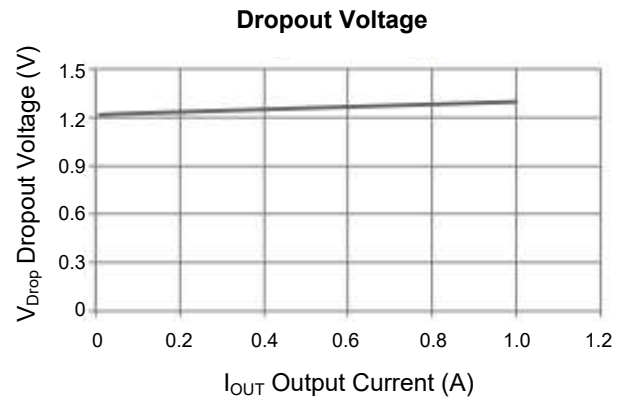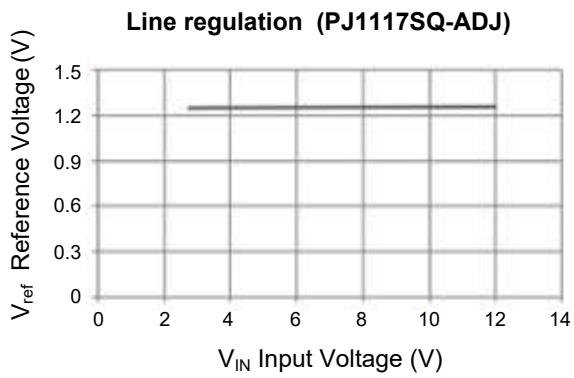$$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$$

The output voltage of adjustable version follows the equation: $V_{OUT} = 1.25 \times (1 + R2/R1) + I_{Adj} \times R2$. We can ignore IAdj 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 PJ1117SQ-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: $1/(2\pi \times fripple \times CADJ) < R1$.

Typical Characteristics Curves

Line regulation (PJ1117SQ-ADJ)

Dropout Voltage

Load Regulation (PJ1117SQ-ADJ)

Thermal performance with OTP(PJ1117SQ-ADJ)

Package Outline

SOT-89

Dimensions in mm