

## 贴片线性调整器 NSP-1117系列 1A LOW DROPOUT LINEAR REGULATOR

## ※ GENERAL DESCRIPTION

The NSP-1117 is a series of low dropout three-terminal regulators with a dropout of 1.15V at 1A output Current.

The NSP-1117 series provides Current limiting and thermal shutdown. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within 1%. Current limit is trimmed to ensure specified output Current and controlled short-circuit Current. On-chip thermal shutdown provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.

The NSP-1117 has an adjustable version, that can provide the output voltage from 1.25V to 5V with only 2 external resistors.

The NSP-1117 series is available in the industry standard SOT-223,SOT-89,TO-220,TO-252 and TO-263 power packages.

## ※ FEATURES

- ❖ Low Dropout Voltage: 1.15V at 1A Output Current
- ❖ Trimmed Current Limit
- ❖ On-Chip Thermal Shutdown
- ❖ Three-Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 3.3V, 5V
- ❖ Operation junction Temperature: 0 °C to 125°C

## ※ APPLICATIONS

- ❖ PC Motherboard
- ❖ LCD Monitor
- ❖ Graphic Card
- ❖ DVD-Video player
- ❖ NIC/Switch
- ❖ Telecom Modem
- ❖ ADSL Modem
- ❖ Printer and other peripheral Equipment

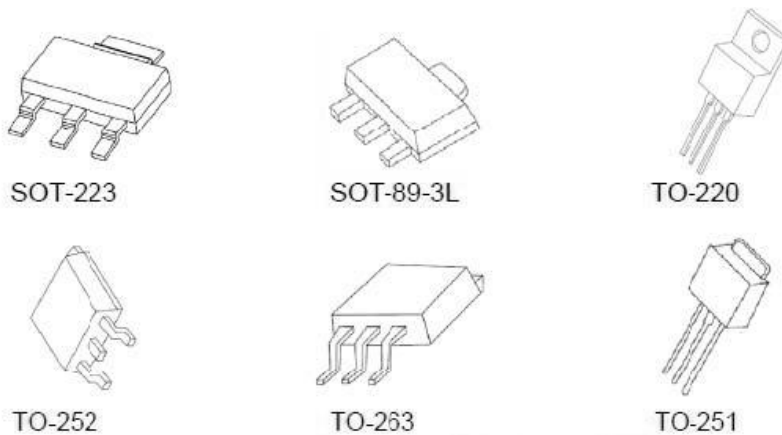


Figure 1. Package Types of NSP-1117

※ PIN CONFIGURATIONS

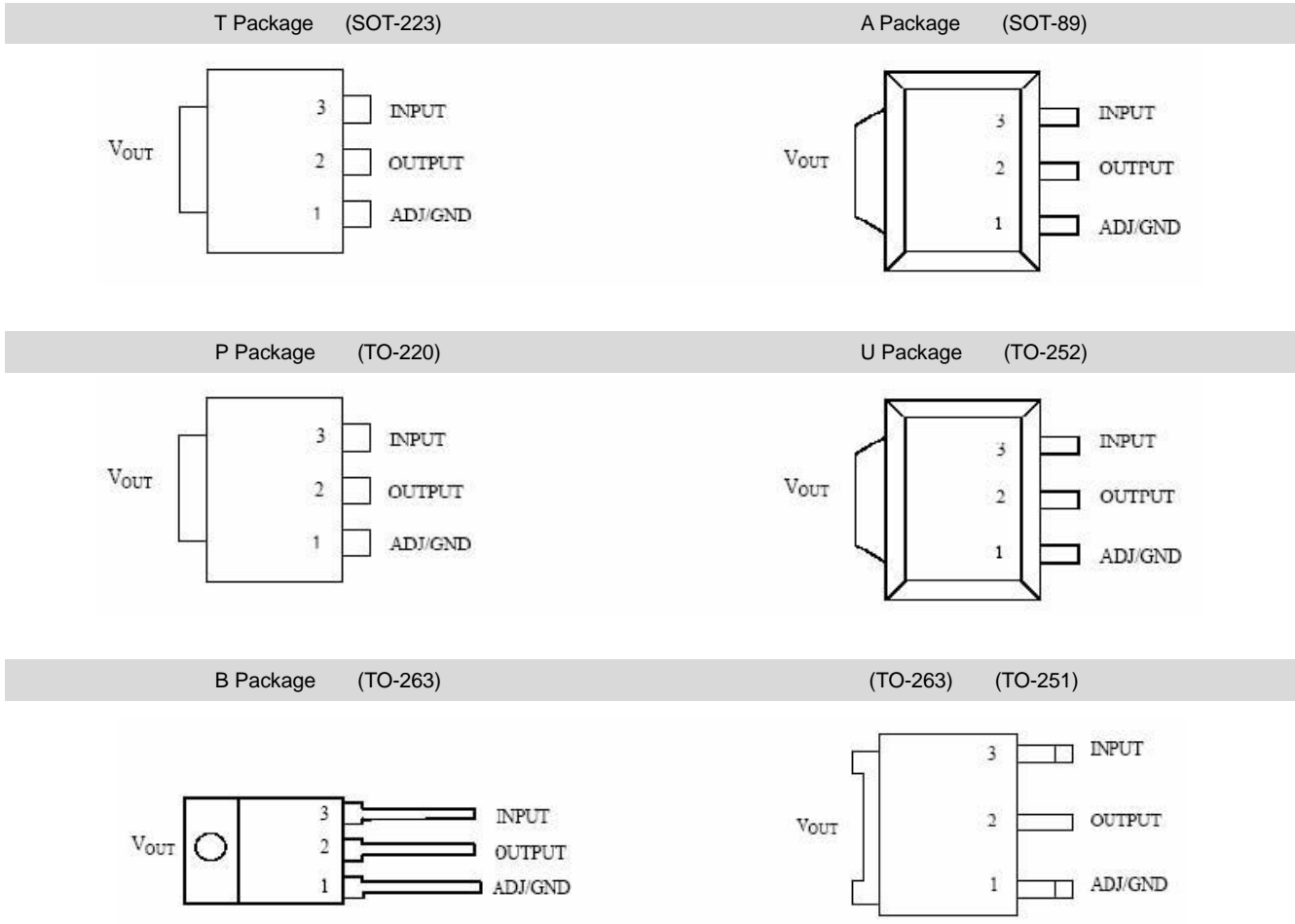


Figure 2. Pin Configurations of NSP-1117

※ FUNCTIONAL BLOCK DIAGRAM

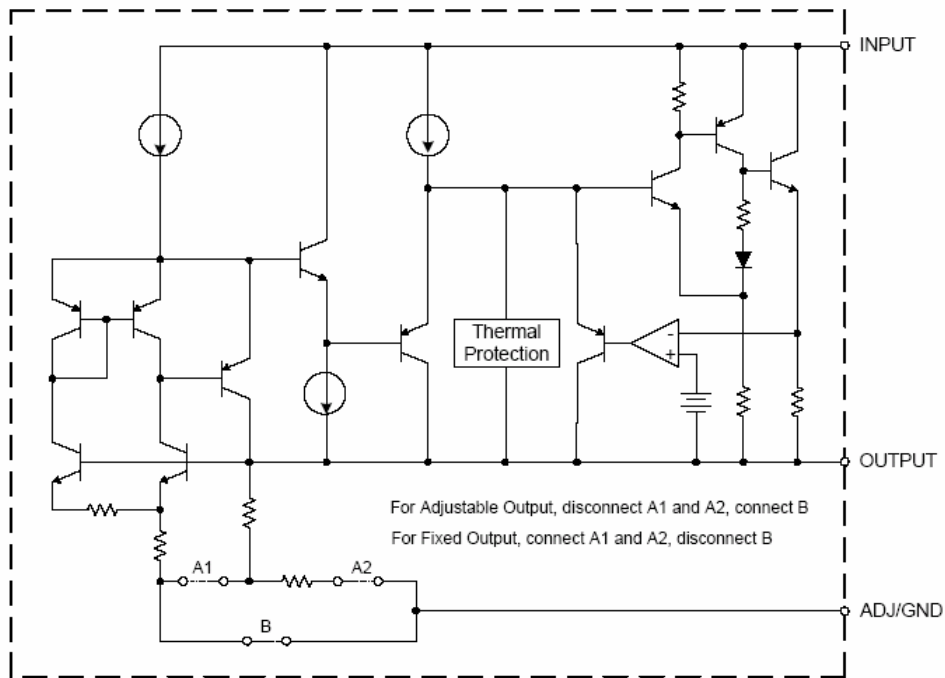
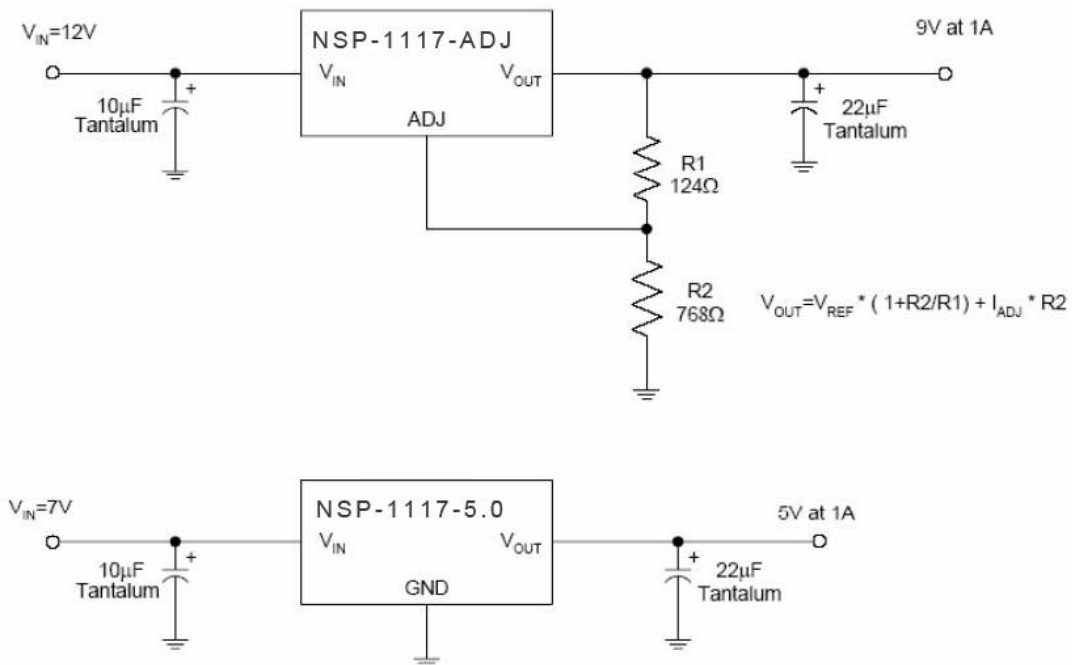


Figure 3. Functional Block Diagram of NSP-1117

※ Typical Applications



## ※ ORDERING INFORMATION

Package	Operating Junction Temperature Range	Part Number
SOT-89	0 to 125°C	NSP-1117-ADJ
TO-252		NSP-1117-1.5
TO-263		NSP-1117-1.8
SOT-223		NSP-1117-2.5
TO-220		NSP-1117-3.3
TO-251		NSP-1117-5.0

## ※ ABSOLUTE MAXIMUM RATINGS (NOTE 1)

Parameter	Value	Unit
V <sub>IN</sub>	20	V
Maximum Junction Temperature	150	°C
Storage Temperature Range	-65 to 150	°C
Lead Temperature (Soldering, 10sec.)	300	°C
ESD (Machine Model)	600	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Parameter	Min	Max	Unit
V <sub>IN</sub>		15	V
Operating Junction Temperature Range	0	125	°C

## ※ ELECTRICAL CHARACTERISTICS

Operating Conditions:  $V_{IN} \leq 10V$ ,  $T_J = 25^\circ C$  unless otherwise specified.

Parameter	Conditions	Min	Typ	Max	Unit
Reference Voltage	NSP-1117-ADJ $I_{OUT} = 10mA$ , $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$ , $1.4V \leq V_{IN} - V_{OUT} \leq 8V$ , $P \leq$ Maximum power Dissipation	1.238	1.250	1.262	V
		1.225	1.250	1.270	
Output Voltage	NSP-1117-1.5, $I_{OUT} = 10mA$ , $V_{IN} = 3.5V$ $10mA \leq I_{OUT} \leq 1A$ , $3.0V \leq V_{IN} \leq 10V$	1.485	1.5	1.515	V
	NSP-1117-1.8, $I_{OUT} = 10mA$ , $V_{IN} = 3.8V$ $10mA \leq I_{OUT} \leq 1A$ , $3.2V \leq V_{IN} \leq 10V$	1.782	1.8	1.818	V
	NSP-1117-2.5, $I_{OUT} = 10mA$ , $V_{IN} = 4.5V$ $10mA \leq I_{OUT} \leq 1A$ , $3.9V \leq V_{IN} \leq 10V$	2.475	2.5	2.525	V
	NSP-1117-3.3, $I_{OUT} = 10mA$ , $V_{IN} = 5.0V$ $10mA \leq I_{OUT} \leq 1A$ , $4.75V \leq V_{IN} \leq 10V$	3.267	3.3	3.333	V
	NSP-1117-5.0, $I_{OUT} = 10mA$ , $V_{IN} = 7.0V$ $10mA \leq I_{OUT} \leq 1A$ , $6.5V \leq V_{IN} \leq 12V$	4.950	5.0	5.050	V
			4.900	5.0	5.100
Line Regulation	NSP-1117-ADJ $I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		0.035	0.2	%
	NSP-1117-1.5 $I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	6	mV
	NSP-1117-1.8 $I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	6	mV
	NSP-1117-2.5 $I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	6	mV
	NSP-1117-3.3 $I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	6	mV
	NSP-1117-5.0 $I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	10	mV
Load Regulation	NSP-1117-ADJ $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$		0.2	0.4	%
	NSP-1117-1.5 $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$		1	10	mV
	NSP-1117-1.8 V $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$		1	10	mV
	NSP-1117-2.5 V $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$		1	10	mV
	NSP-1117-3.3 V $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$		1	10	mV
	NSP-1117-5.0 V $V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 1A$		1	15	mV

## ※ ELECTRICAL CHARACTERISTICS (CONTINUED)

Operating Conditions:  $V_{IN} \leq 10V$ ,  $T_J = 25^\circ C$  unless otherwise specified

Parameter	Conditions	Min	Typ	Max	Unit
Dropout Voltage	$\Delta V_{REF} = 1\%$ , $I_{OUT} = 0.1A$		1.00	1.1	V
	$\Delta V_{REF} = 1\%$ , $I_{OUT} = 0.5A$		1.08	1.18	V
	$\Delta V_{REF} = 1\%$ , $I_{OUT} = 1.0A$		1.15	1.25	V
Current Limit	$V_{IN} - V_{OUT} = 2V$	1.25	1.35		A
Adjust Pin Current			60	120	$\mu A$
Adjust Pin Current Change	$1.4V \leq V_{IN} - V_{OUT} \leq 10V$ , $10mA \leq I_{OUT} \leq 1A$		0.2	5	$\mu A$
Minimum Load Current (ADJ)	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$ (ADJ only)		1.7	5	mA
Quiescent Current	$V_{IN} = V_{OUT} + 1.25V$		5	10	mA
Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 22 \mu F$ Tantalum, $V_{IN} - V_{OUT} = 3V$ , $I_{OUT} = 1A$	60	75		dB
Temperature Stability			0.5		%
Long-Term Stability	$T_A = 125^\circ C$ , 1000hrs		0.3		%
RMS Output Noise (% of $V_{OUT}$ )	$T_A = 25^\circ C$ , $10Hz \leq f \leq 10KHz$		0.003		%
Thermal Resistance, Junction to Case *	SOT-89		25		$^\circ C/W$
	SOT-223		15		
	TO-252/251		10		
	TO-220		4.5		
	TO-263		4		
Thermal Shutdown	Junction Temperature		150		$^\circ C$
Thermal Shutdown Hysteresis			25		$^\circ C$

\* With package soldering to copper area over backside ground plane or internal power plane RQJA can vary from 46 . C/W to >90.C/W depending on mounting technique and the size of the copper area.