

1A LOW DROPOUT POSITIVE VOLTAGE REGULATOR

General Description

The WR1117A series of positive adjustable and fixed regulators is designed to provide 1A with high efficiency. All the internal circuitry is designed to operate down to 1.4V input-to-output differential. On-chip trimming adjusts the reference voltage to 2%. The internal current limit circuitry allows the stress on both the regulator and the power source circuitry to be minimized under overload conditions.

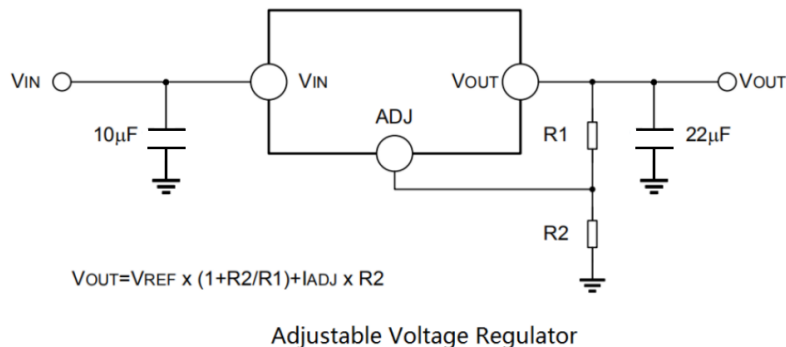
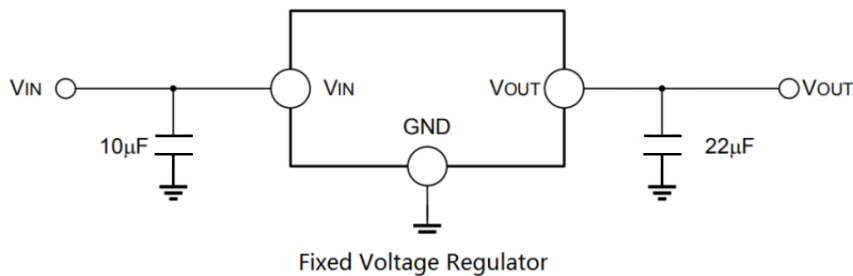
Features

- Adjustable or fixed output
- Output current of 1A
- Low dropout -1.3V typ. at 1A output current
- 100% thermal limit burn-in
- Current limit protect
- Fast transient response
- Operating temperature: -40°C ~125°C

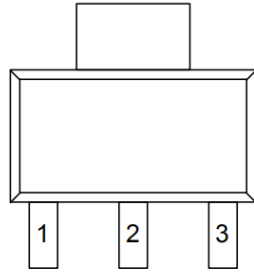
Applications

- High efficiency linear regulators
- Post regulators for switching supplies
- Adjustable power supply

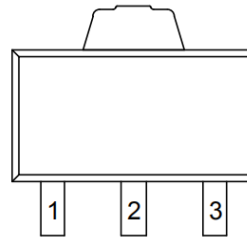
Typical Application



Pin Configuration



SOT223-3



SOT89-3

Pin Description

Pin Number	Pin Name	Pin Function
1	ADJ/GND	Adjust pin for adjustable output option. Ground pin for fixed output option.
2, TAB	VOUT	Output voltage pin for the regulator.
3	VIN	Input voltage pin for the regulator.

Absolute Maximum Ratings

Parameter		Rating	Unit
Input Voltage		25	V
Operating Junction Temperature		150	°C
Storage Temperature		-65 to 150	°C
Power Dissipation	SOT89-3	0.57	W
	SOT223-3	1.05	
Thermal resistance	SOT89-3	175	°C /W
	SOT223-3	95	
Lead Temperature (Soldering, 5 sec)		260	°C
Minimum ESD rating (HBM)		2	kV

Recommended Operating Conditions

Parameter		Rating	Unit
Input Voltage		13	V
Operating Junction Temperature		-40 to 125	°C

Electrical Characteristics

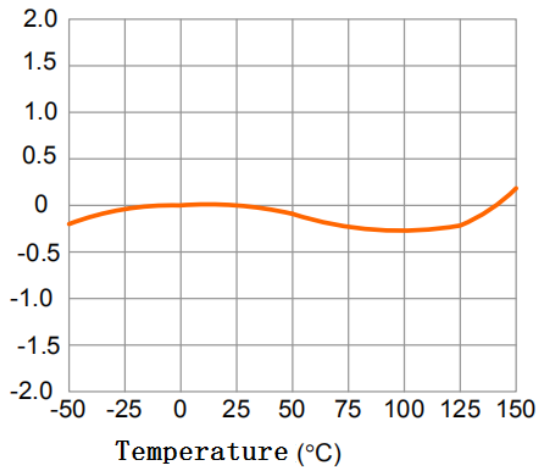
($T_A = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{REF}	Reference voltage	WR1117A-ADJ, $I_{OUT}=10\text{mA}$, $V_{IN}-V_{OUT}=2\text{V}$, $T_J = 25^\circ\text{C}$ $10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $1.4\text{V} \leq V_{IN}-V_{OUT} \leq 10\text{V}$	1.231 1.225	1.250 1.250	1.268 1.275	V
V_{OUT}	Output voltage	WR1117A-12, $I_{OUT}=10\text{mA}$, $V_{IN}=3.2\text{V}$, $T_J = 25^\circ\text{C}$ $10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $3.0\text{V} \leq V_{IN} \leq 10\text{V}$	1.176 1.152	1.200 1.200	1.224 1.248	V
		WR1117A-15, $I_{OUT}=10\text{mA}$, $V_{IN}=3.5\text{V}$, $T_J = 25^\circ\text{C}$ $10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $3.0\text{V} \leq V_{IN} \leq 10\text{V}$	1.477 1.470	1.500 1.500	1.522 1.530	V
		WR1117A-18, $I_{OUT}=10\text{mA}$, $V_{IN}=3.8\text{V}$, $T_J = 25^\circ\text{C}$ $0 \leq I_{OUT} \leq 1\text{A}$, $3.2\text{V} \leq V_{IN} \leq 10\text{V}$	1.773 1.746	1.800 1.800	1.827 1.854	V
		WR1117A-25, $I_{OUT}=10\text{mA}$, $V_{IN}=4.5\text{V}$, $T_J = 25^\circ\text{C}$ $0 \leq I_{OUT} \leq 1\text{A}$, $3.9\text{V} \leq V_{IN} \leq 10\text{V}$	2.462 2.450	2.500 2.500	2.538 2.550	V
		WR1117A-33, $I_{OUT}=10\text{mA}$, $V_{IN}=5\text{V}$, $T_J = 25^\circ\text{C}$ $0 \leq I_{OUT} \leq 1\text{A}$, $4.75\text{V} \leq V_{IN} \leq 10\text{V}$	3.250 3.235	3.300 3.300	3.349 3.365	V
		WR1117A-50, $I_{OUT}=10\text{mA}$, $V_{IN}=7\text{V}$, $T_J = 25^\circ\text{C}$ $0 \leq I_{OUT} \leq 1\text{A}$, $6.5\text{V} \leq V_{IN} \leq 12\text{V}$	4.925 4.900	5.000 5.000	5.075 5.100	V
TS_{OUT}	Output voltage temperature stability		-	0.3	-	%
LNR	Line regulation	$V_{INMIN} \leq V_{IN} \leq 12\text{V}$ $V_{OUT}=\text{Fixed}/\text{ADJ}$, $I_{OUT}=10\text{mA}$	-	9	18	mV
LDR	Load regulation	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$ $V_{OUT}=\text{Fixed}/\text{ADJ}$	-	10	18	mV
V_{DO}	Dropout voltage	$I_{OUT} = 100\text{mA}$ $I_{OUT} = 500\text{mA}$ $I_{OUT} = 800\text{mA}$ $I_{OUT} = 1\text{A}$	-	1.00 1.05 1.20 1.30	1.20 1.25 1.30 1.50	V
I_Q	Quiescent current	$4.25\text{V} \leq V_{IN} \leq 6.5\text{V}$	-	5	10	mA

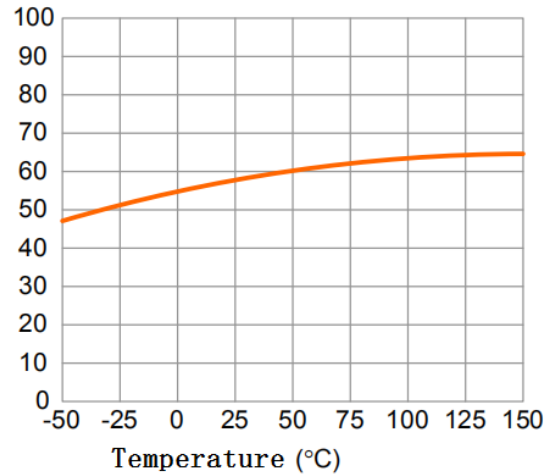
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
PSRR	Power supply rejection rate	$f_{\text{RIPPLE}}=120\text{Hz}$, $V_{\text{IN}}-V_{\text{OUT}}=3\text{V}$, $V_{\text{RIPPLE}}=1\text{V}_{\text{PP}}$	60	75	-	dB
I_{ADJ}	Adjust pin current		-	60	120	μA
ΔI_{ADJ}	I_{ADJ} change	$0 \leq I_{\text{OUT}} \leq 800\text{mA}$, $1.4\text{V} \leq V_{\text{IN}}-V_{\text{OUT}} \leq 10\text{V}$	-	0.2	5	μA
T_{SD}	Thermal shutdown temperature		-	150	-	$^{\circ}\text{C}$
I_{LIMIT}	Current limit		-	-	2.5	A
	Temperature stability		-	0.5	-	%
	Long term stability	$T_{\text{A}} = 125^{\circ}\text{C}, 1000\text{Hrs}$	-	0.3	-	%
V_{NO}	RMS output noise	% of V_{OUT} , $10\text{Hz} \leq f \leq 10\text{kHz}$	-	0.003	-	%

Typical Performance Characteristics

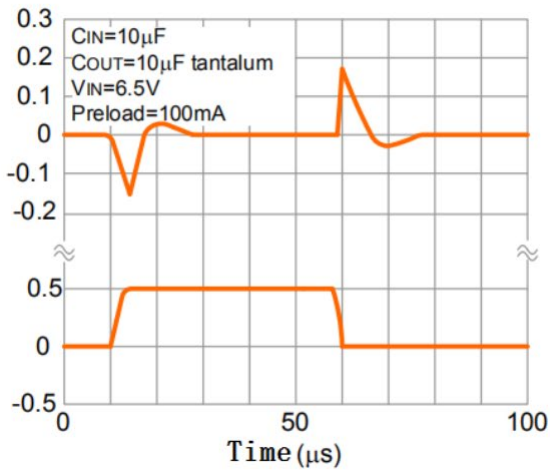
Temperature stability



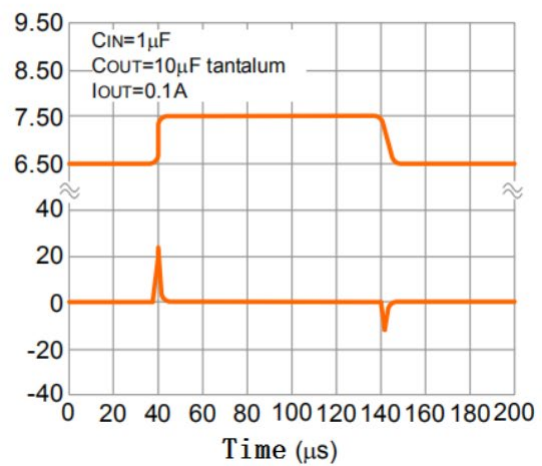
Adjust pin current



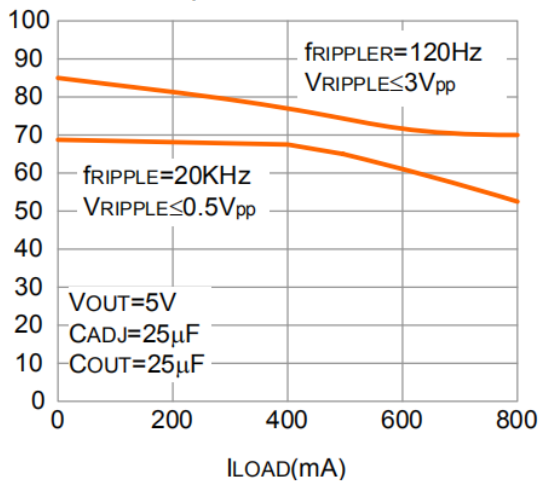
Load transient response ($V_{OUT}=5V$)



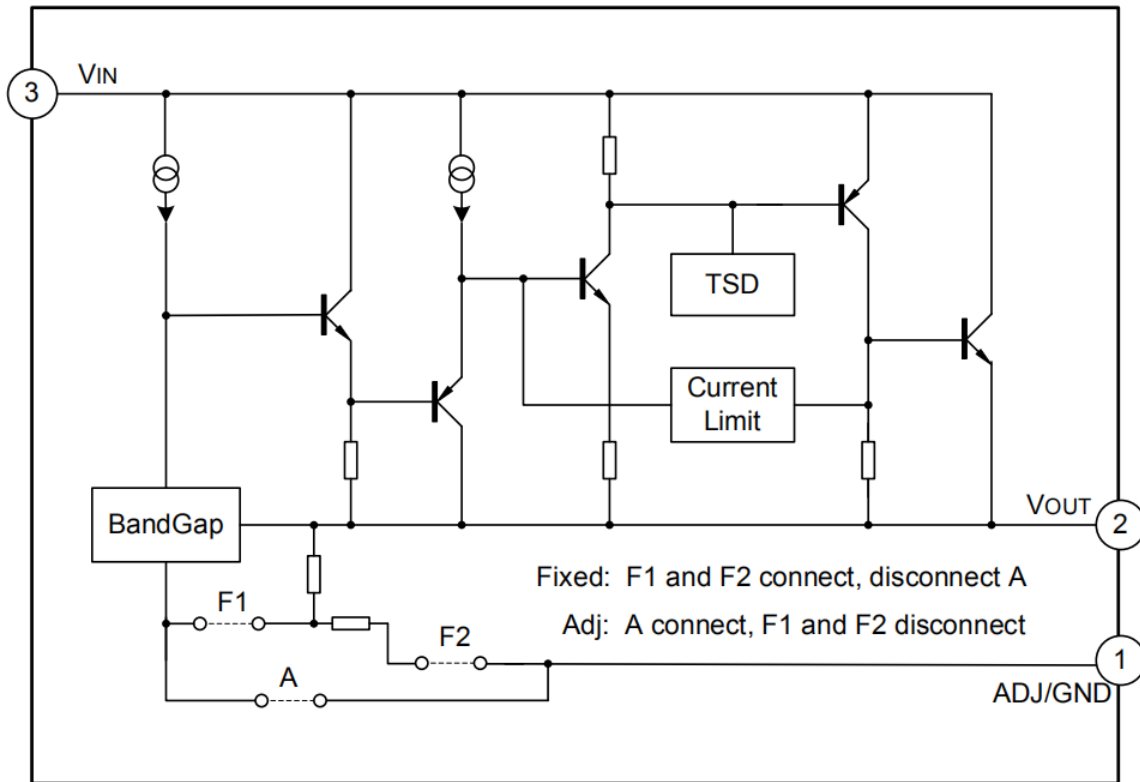
Line transient response ($V_{OUT}=5V$)



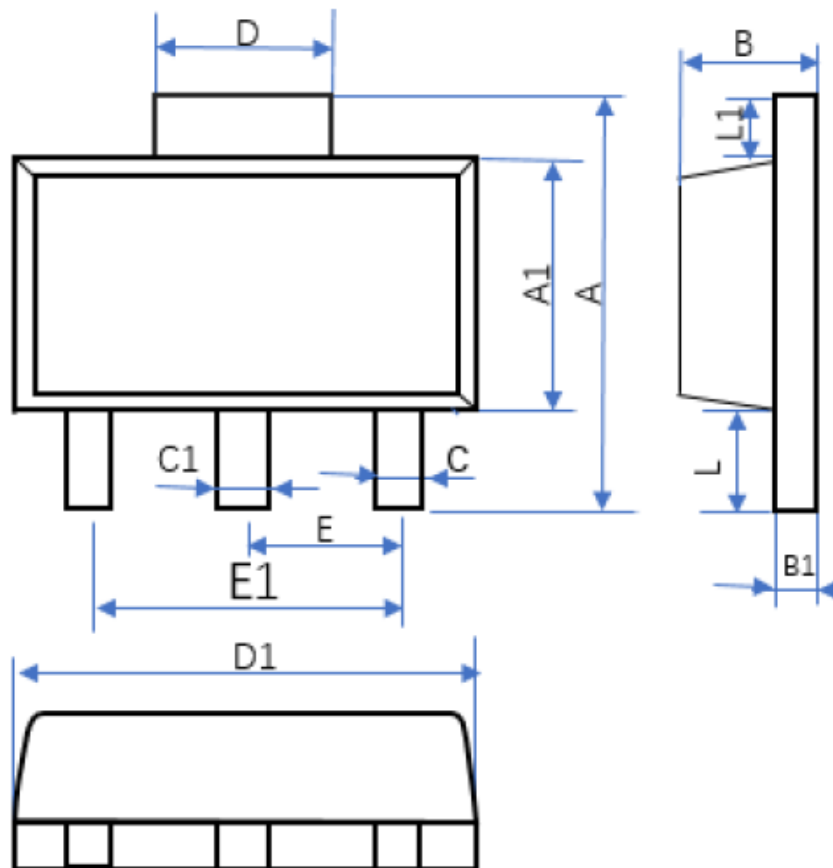
PSRR (dB) VS Current



Block Diagram

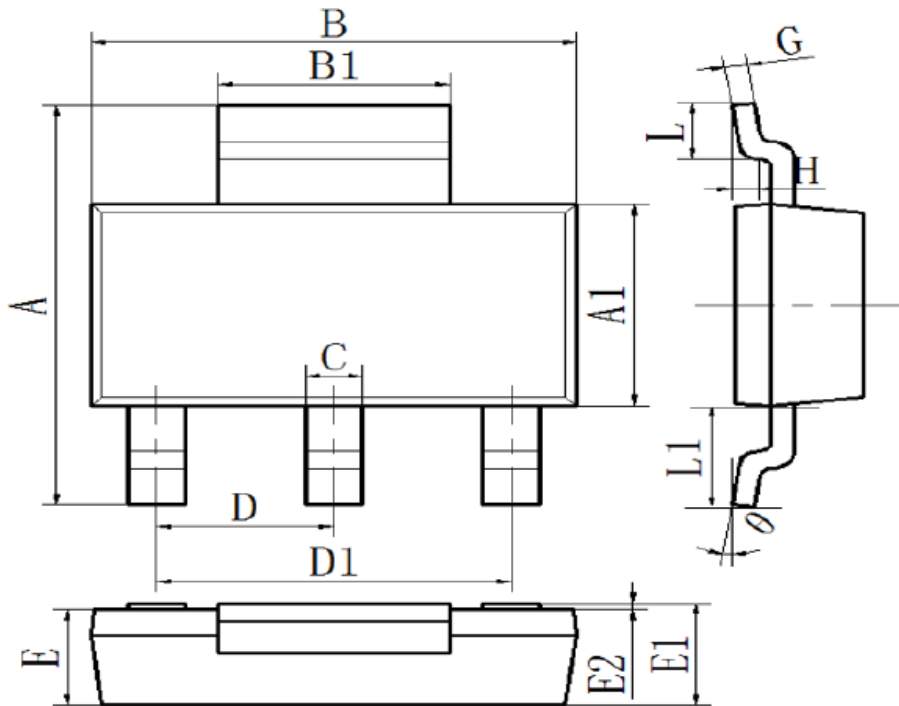


Package Information



SOT89-3

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	3.95	4.10	4.25
A1	2.45	2.50	2.55
B	1.44	1.49	1.54
B1	0.35	0.40	0.45
C	0.35	0.40	0.45
C1	0.45	0.50	0.55
D	1.65	1.70	1.75
D1	4.45	4.50	4.55
E	1.45	1.50	1.55
E1	2.95	3.00	3.05
L	0.95	1.02	1.09
L1	0.55	0.60	0.65



SOT 223-3

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	6.71	6.95	7.19
A1	3.4	3.5	3.6
B	6.2	6.4	6.6
B1	2.9	3.0	3.1
C	0.66	0.74	0.82
D	2.25	2.3	2.35
D1	4.5	4.6	4.7
E	1.45	1.6	1.75
E1	1.51	1.66	1.81
E2	0.02	0.08	0.14
G	0.25	0.3	0.35
H	0.20	0.25	0.30
L	0.75	0.95	1.15
L1	1.65	1.75	1.85
θ	0	4	8

Ordering Information

Part Number	Output Voltage	Package	Packing Quantity
WR1117A-ADA70R	ADJ	SOT223-3	2.5k/Reel
WR1117A-12A70R	1.2V	SOT223-3	2.5k/Reel
WR1117A-15A70R	1.5V	SOT223-3	2.5k/Reel
WR1117A-18A70R	1.8V	SOT223-3	2.5k/Reel
WR1117A-25A70R	2.5V	SOT223-3	2.5k/Reel
WR1117A-33A70R	3.3V	SOT223-3	2.5k/Reel
WR1117A-50A70R	5.0V	SOT223-3	2.5k/Reel
WR1117A-ADA20R	ADJ	SOT89-3	1k/Reel
WR1117A-12A20R	1.2V	SOT89-3	1k/Reel
WR1117A-15A20R	1.5V	SOT89-3	1k/Reel
WR1117A-18A20R	1.8V	SOT89-3	1k/Reel
WR1117A-25A20R	2.5V	SOT89-3	1k/Reel
WR1117A-33A20R	3.3V	SOT89-3	1k/Reel
WR1117A-50A20R	5.0V	SOT89-3	1k/Reel


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Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time

Users should verify