



# H1117E Series

1A LOW DROPOUT POSITIVE VOLTAGE REGULATOR

## Features

- Low Dropout Voltage 1.2V at 1A
- Adjustable or Fixed Voltage
- Maximum Line Regulation 0.45%
- Maximum Load Regulation 0.4%
- Adjust Pin Current Less Than 90  $\mu$ A
- Over Current Protection
- Thermal Protection

## Applications

- High Efficiency Linear Regulators
- 5V to 3.3V Voltage Converter
- Battery Charger

## General Description

The H1117E is a 1A low-dropout positive voltage regulator. It is available in fixed and adjustable output voltage versions. Over current and thermal protection are integrated onto the chip. Output current will decrease while it reaches the pre-set current or temperature limit. The dropout voltage is specified at 1.2V Maximum at full rated output current. H1117E Series provides excellent regulation over variations due to changes in line, load and temperature. H1117E is three terminal regulator and available in popular packages.

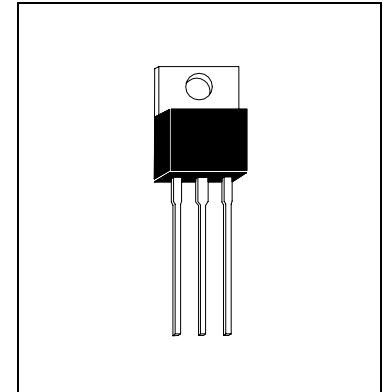
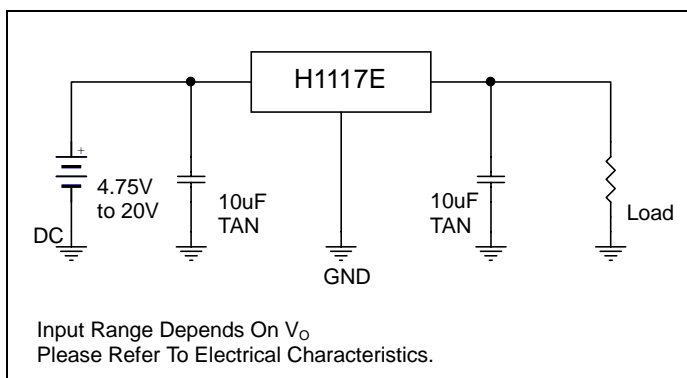
## Device Selection Guide

Device	Output Voltage	Package
H1117E(Adj)	1.3V to 4V	TO-220AB
H1117-3.3E	3.3	

## Absolute Maximum Ratings

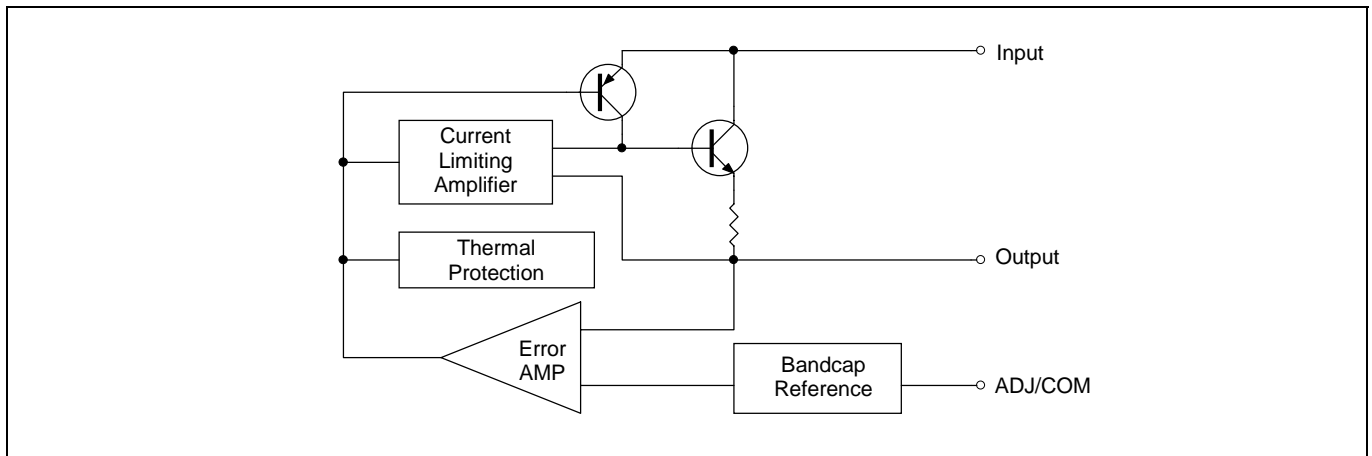
Parameter	Symbol	Maximum	Units
Input Voltage	$V_{IN}$	20	V
Power Dissipation	$P_D$	Internally Limited	W
Thermal Resistance Junction To Case TO-220AB	$\theta_{JC}$	3	$^{\circ}$ C/W
Thermal Resistance Junction To Ambient TO-220AB	$\theta_{JA}$	50	$^{\circ}$ C/W
Operating Junction Temperature Range	$T_j$	0 To 125	$^{\circ}$ C
Storage Temperature Range	$T_{STG}$	-65 To 150	$^{\circ}$ C
Lead Temperature (Soldering) 10 Sec	$T_{LEAD}$	260	$^{\circ}$ C

## Typical Application





### Block Diagram



### Electrical Characteristics

H1117E (adj version)

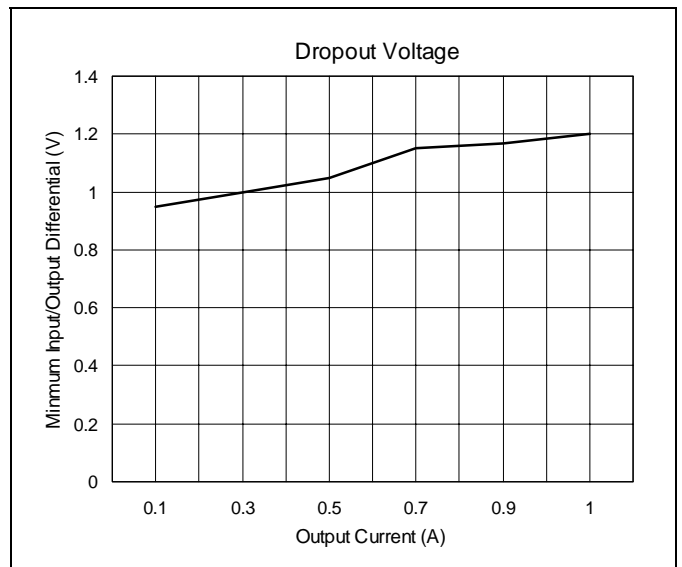
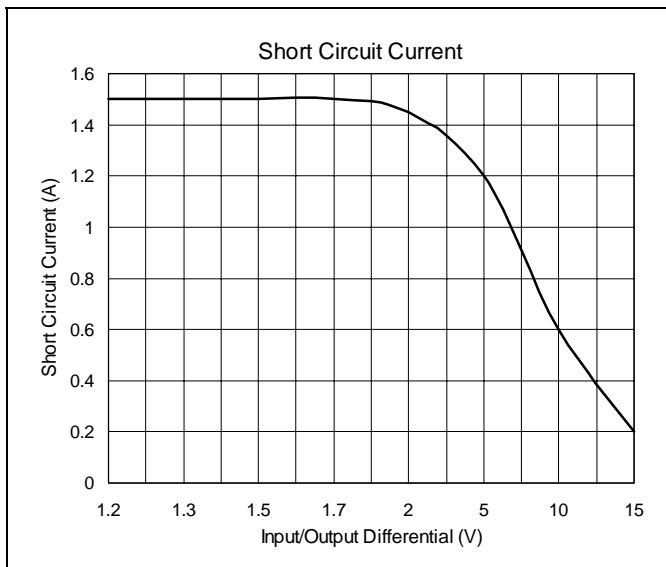
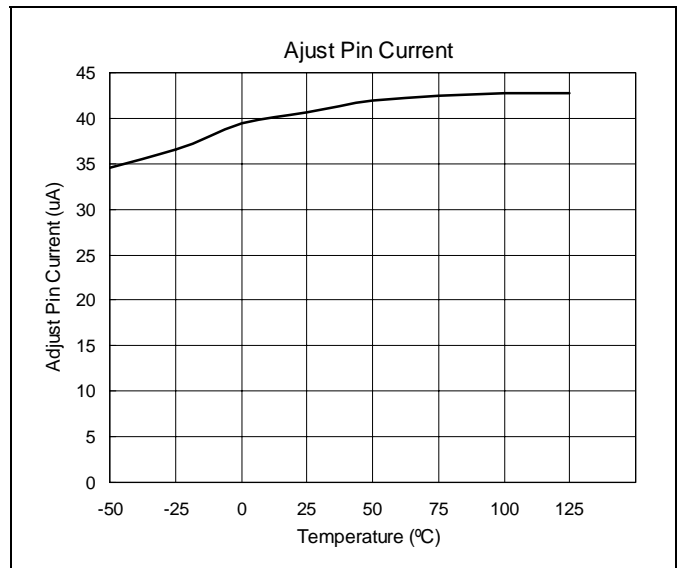
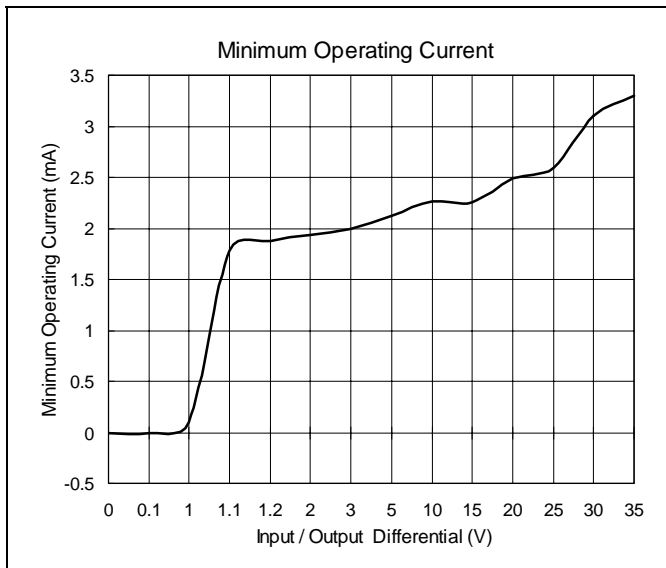
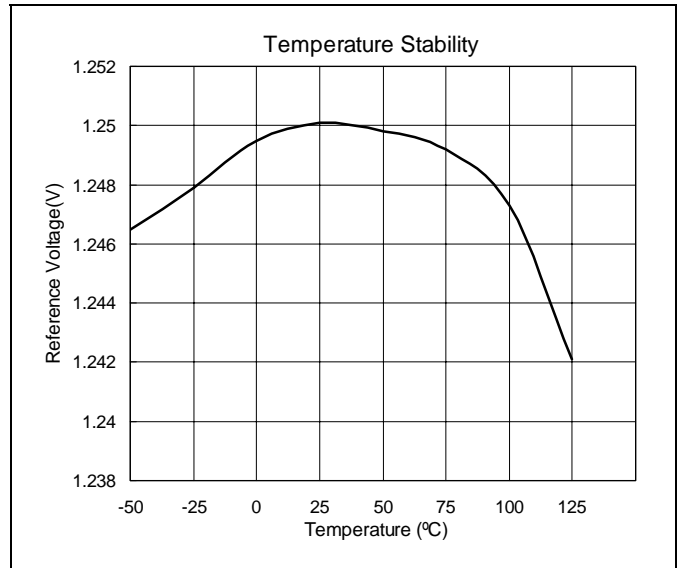
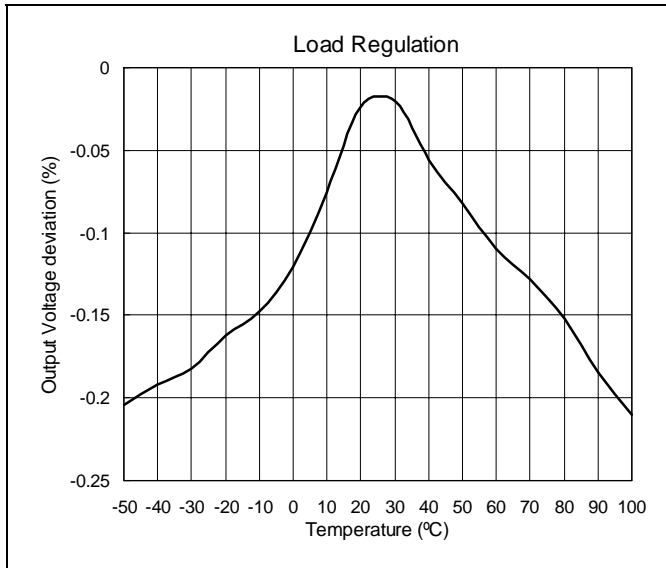
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reference Voltage	$V_{REF}$	$V_{IN}=5V, I_O=10mA, T_j=25^\circ C$	1.238	1.25	1.262	V
		$V_{IN}=5V, I_O=10mA, \text{Over Temp.}$	1.225	1.25	1.275	
Line Regulation	$Reg_{LINE}$	$V_{IN}=4.75\sim 20V, I_O=10mA, T_j=25^\circ C$	-	-	0.3	%
		$V_{IN}=4.75\sim 20V, I_O=10mA, \text{Over Temp.}$	-	-	0.45	
Load Regulation	$Reg_{LOAD}$	$V_{IN}=5V, I_O=10mA\sim 1A, T_j=25^\circ C$	-	0.05	0.3	%
		$V_{IN}=5V, I_O=10mA\sim 1A, \text{Over Temp.}$	-	0.2	0.4	
Dropout Voltage	$V_D$	$I_O=10mA\sim 1A, \text{Over Temp.}, \Delta V_O=\pm 1\%$	-	1	1.2	V
Current Limit	$I_S$	$V_{IN}=2.75\sim 7V, \text{Over Temp.}$	1	-	-	A
Temperature Coeff.	$T_C$	$V_{IN}=2.75\sim 7V, I_O=10mA\sim 1A$	-	0.005	-	$\%/^\circ C$
Adjust Pin Current	$I_{adj}$	$V_{IN}=2.75\sim 7V, I_O=10mA\sim 1A, T_j=25^\circ C$	-	55	-	uA
		$V_{IN}=2.75\sim 7V, I_O=10mA\sim 1A, \text{Over Temp.}$	-	-	90	
Adjust Pin Current Change	$\Delta I_{adj}$	$V_{IN}=2.75\sim 7V, I_O=10mA\sim 1A, \text{Over Temp.}$	-	0.2	5	
Temperature Stability	$T_S$	$V_{IN}=5V, I_O=100mA, \text{Over Temp.}$	-	0.5	-	%
Minimum Load Current	$I_O$	$V_{IN}=5V$	-	5	10	mA
RMS Output Noise	$V_N$	$T_j=25^\circ C$	-	0.003	-	%
Ripple Rejection Ratio	$R_A$	$V_{IN}=5V, I_O=1A, \text{Over Temp.}$	60	72	-	dB

H1117-3.3E

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage	$V_O$	$V_{IN}=5V, I_O=0A, T_j=25^\circ C$	3.270	3.3	3.333	V
		$V_{IN}=5V, I_O=0A, \text{Over Temp.}$	3.234	3.3	3.366	
Line Regulation	$Reg_{LINE}$	$V_{IN}=4.75\sim 20V, I_O=0A, T_j=25^\circ C$	-	-	0.3	%
		$V_{IN}=4.75\sim 20V, I_O=0A, \text{Over Temp.}$	-	-	0.45	
Load Regulation	$Reg_{LOAD}$	$V_{IN}=5V, I_O=0A\sim 1A, T_j=25^\circ C$	-	0.05	0.3	%
		$V_{IN}=5V, I_O=0A\sim 1A, \text{Over Temp.}$	-	0.2	0.4	
Dropout Voltage	$V_D$	$I_O=0A\sim 1A, \text{Over Temp.}, \Delta V_O=\pm 1\%$	-	1	1.2	V
Current Limit	$I_S$	$V_{IN}=4.75\sim 7V, \text{Over Temp.}$	1	-	-	A
Quiescent Current	$I_Q$	$V_{IN}=5V, I_O=0A\sim 1A, \text{Over Temp.}$	-	12	13	mA
Temperature Coeff.	$T_C$	$V_{IN}=4.75\sim 7V, I_O=0A\sim 1A$	-	0.005	-	$\%/^\circ C$
Temperature Stability	$T_S$	$V_{IN}=5V, I_O=100mA, \text{Over Temp.}$	-	0.5	-	%
RMS Output Noise	$V_N$	$T_j=25^\circ C$	-	0.003	-	%
Ripple Rejection Ratio	$R_A$	$V_{IN}=5V, I_O=1A, \text{Over Temp.}$	60	72	-	dB

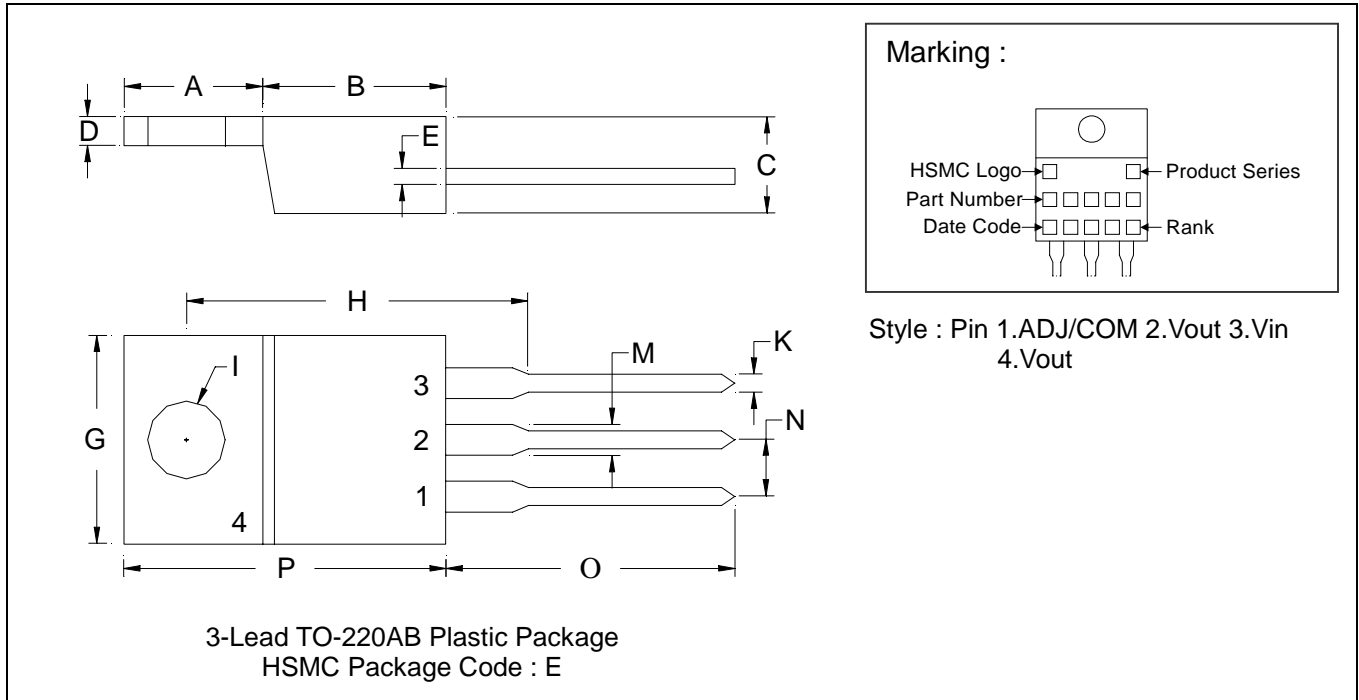


### Characteristics Curve





## TO-220AB Dimension



\*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.2197	0.2949	5.58	7.49	I	-	*0.1508	-	*3.83
B	0.3299	0.3504	8.38	8.90	K	0.0295	0.0374	0.75	0.95
C	0.1732	0.185	4.40	4.70	M	0.0449	0.0551	1.14	1.40
D	0.0453	0.0547	1.15	1.39	N	-	*0.1000	-	*2.54
E	0.0138	0.0236	0.35	0.60	O	0.5000	0.5618	12.70	14.27
G	0.3803	0.4047	9.66	10.28	P	0.5701	0.6248	14.48	15.87
H	-	*0.6398	-	*16.25					

- Notes : 1.Dimension and tolerance based on our Spec. dated Sep. 07,1997.  
 2.Controlling dimension : millimeters.  
 3.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 4.If there is any question with packing specification or packing method, please contact your local HSMC sales office.

**Material :**

- Lead : 42 Alloy ; solder plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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