

Features

- 1.3V Maximum Dropout at Full Load Current
- Fast Transient Response
- Output Current Limiting
- Built-in Thermal Shutdown
- Good Noise Rejection
- 3-Terminal Adjustable or Fixed 1.5V / 1.8V / 2.5V / 2.8V / 3.0V / 3.3V / 3.5V / 5.0V
- Package: SOT89-3L
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)

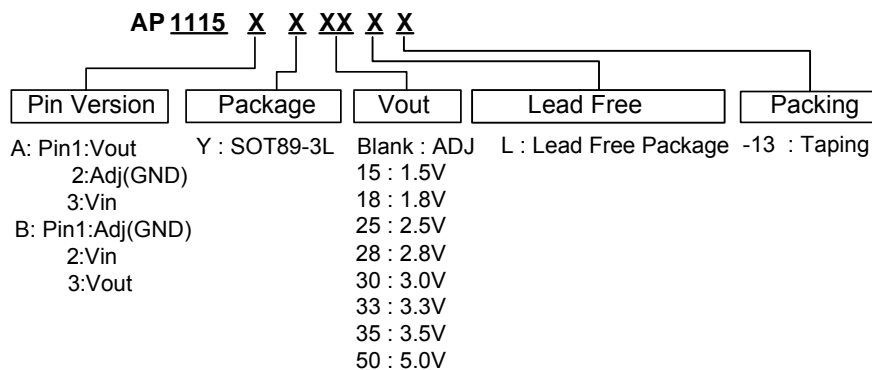
General Description

AP1115 is a low dropout positive adjustable or fixed mode regulator with 0.6A output current capability. The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current 3.3V logic supply. AP1115 is also well suited for other applications such as VGA cards. AP1115 is guaranteed to have <1.3V dropout at full load current making it ideal to provide well regulated outputs of 1.25V to 5V with up to 18V input supply.

Applications

- PC Peripheral
- Communication

Ordering Information



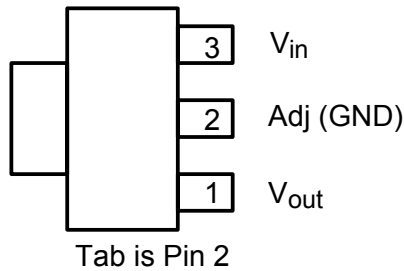
Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

Device	Package Code	Packaging (Note 2)	13" Tape and Reel		Ammo Box		Bulk	
			Quantity	Quantity	Part Number Suffix	Part Number Suffix	Quantity	Part Number Suffix
AP1115XY	Y	SOT89-3L	2500/Tape & Reel	-13	NA	NA	NA	NA

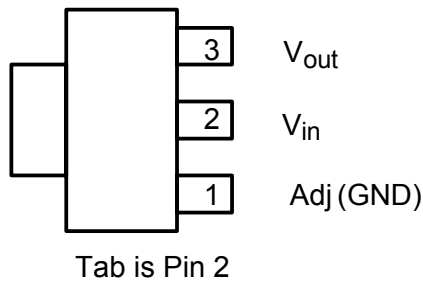
Note: 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

Connection Diagram (Top View)

AP1115A-3 PIN SOT89-3L



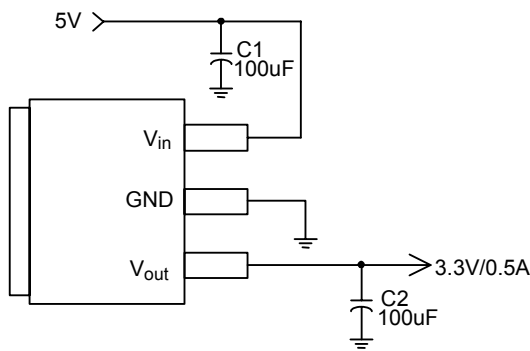
AP1115B-3 PIN SOT89-3L



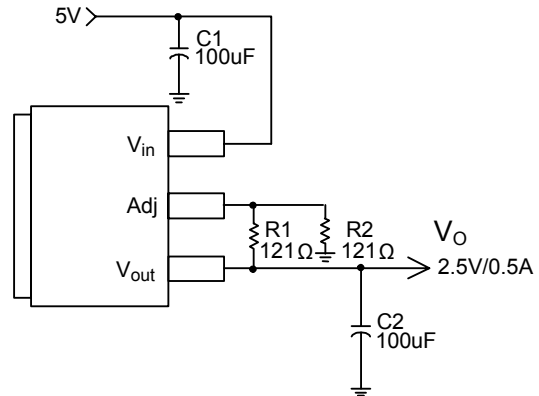
Pin Descriptions

NAME	I/O	FUNCTION
Adj (GND)	I	A resistor divider from this pin to the V_{out} pin and ground sets the output voltage (Ground only for Fixed-Mode).
V_{out}	O	The output of the regulator. A minimum of 10uF capacitor ($0.15\Omega \leq ESR \leq 20\Omega$) must be connected from this pin to ground to insure stability.
V_{in}	I	The input pin of regulator. Typically a large storage capacitor ($0.15\Omega \leq ESR \leq 20\Omega$) is connected from this pin to ground to insure that the input voltage does not sag below the minimum dropout voltage during the load transient response. This pin must always be 1.3V higher than V_{out} in order for the device to regulate properly.

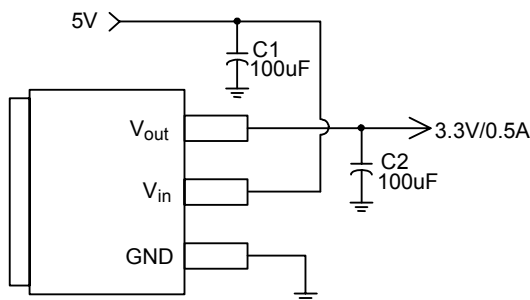
Typical Circuit



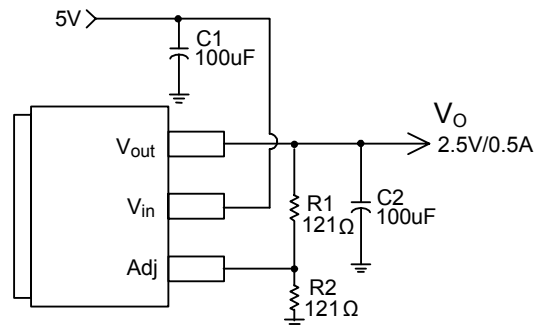
AP1115A (5V/3.3V Fixed Output)



AP1115A (5V/2.5V Adj Output)



AP1115B (5V/3.3V Fixed Output)



AP1115B (5V/2.5V Adj Output)

Note: $V_o = V_{REF} * (1 + \frac{R_2}{R_1})$

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V _{IN}	DC Supply Voltage	-0.3 to 18 V	V
P _D	Power Dissipation	Internally Limited	
T _{ST}	Storage Temperature	-65 to +150	°C
T _{OP}	Operating Junction Temperature Range	0 to +150	°C

Electrical Characteristics (Under Operating Conditions)

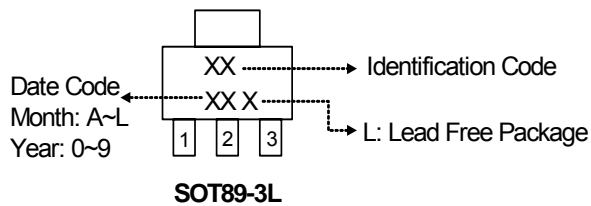
PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	AP1115-ADJ $T_A = 25^\circ\text{C}$, $(V_{IN} - V_{OUT}) = 1.5\text{V}$ $I_O = 10\text{mA}$	1.225	1.250	1.275	V
Output Voltage	AP1115-1.5 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $3\text{V} \leq V_{IN} \leq 12\text{V}$	1.470	1.500	1.530	V
	AP1115-1.8 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $3.3\text{V} \leq V_{IN} \leq 12\text{V}$	1.764	1.800	1.836	V
	AP1115-2.5 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $4\text{V} \leq V_{IN} \leq 12\text{V}$	2.450	2.500	2.550	V
	AP1115-2.8 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $4.3\text{V} \leq V_{IN} \leq 12\text{V}$	2.744	2.800	2.856	V
	AP1115-3.0 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $4.5\text{V} \leq V_{IN} \leq 12\text{V}$	2.940	3.000	3.060	V
	AP1115-3.3 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $4.8\text{V} \leq V_{IN} \leq 12\text{V}$	3.235	3.300	3.365	V
	AP1115-3.5 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $5\text{V} \leq V_{IN} \leq 12\text{V}$	3.430	3.500	3.570	V
	AP1115-5.0 $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $6.5\text{V} \leq V_{IN} \leq 12\text{V}$	4.900	5.000	5.100	V
Line Regulation	AP1115-XXX $I_O = 10\text{mA}$, $V_{OUT} + 1.5\text{V} < V_{IN} < 15\text{V}$, $T_A = 25^\circ\text{C}$	-	-	0.2	%
Load Regulation	AP1115-ADJ $V_{IN} = 3.3\text{V}$, $V_{adj} = 0.0\text{mA} < I_O < 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	-	1	%
	AP1115-1.5 $V_{IN} = 3\text{V}$, $0\text{mA} < I_O < 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	12	15	mV
	AP1115-1.8 $V_{IN} = 3.3\text{V}$, $0\text{mA} < I_O < 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	15	18	mV
	AP1115-2.5 $V_{IN} = 4\text{V}$, $0\text{mA} < I_O < 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	20	25	mV
	AP1115-2.8 $V_{IN} = 4.3\text{V}$, $0\text{mA} < I_O < 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	22	28	mV
	AP1115-3.0 $V_{IN} = 5\text{V}$, $0 \leq I_{OUT} \leq 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	23	30	mV
	AP1115-3.3 $V_{IN} = 5\text{V}$, $0 \leq I_{OUT} \leq 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	26	33	mV
	AP1115-3.5 $V_{IN} = 5\text{V}$, $0 \leq I_{OUT} \leq 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	28	35	mV
	AP1115-5.0 $V_{IN} = 8\text{V}$, $0 \leq I_{OUT} \leq 0.6\text{A}$, $T_A = 25^\circ\text{C}$ (Note 3, 4)	-	40	50	mV
Dropout Voltage ($V_{IN} - V_{OUT}$)	AP1115-ADJ/1.5/1.8 2.5/2.8/3.0/3.3/3.5/5.0 $I_{OUT} = 0.6\text{A}$, $\Delta V_{OUT} = 0.1\%V_{OUT}$	-	1.1	1.3	V
Current Limit	AP1115-ADJ/1.5/1.8 2.5/2.8/3.0/3.3/3.5/5.0 $(V_{IN} - V_{OUT}) = 5\text{V}$	0.7	-	-	A
Minimum Load Current (Note 5)	AP1115-XXX $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$	-	5	10	mA
Thermal Regulation	$T_A = 25^\circ\text{C}$, 30ms pulse	-	0.008	0.04	%/W

- Note:
- See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.
 - Line and load regulation are guaranteed up to the maximum power dissipation of 5W. Power dissipation is determined by the input/output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.
 - Quiescent current is defined as the minimum output current required to maintain regulation. At 12V input/output differential the device is guaranteed to regulate if the output current is greater than 10mA.

Electrical Characteristics (Continued) (Under Operating Conditions)

PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Ripple Rejection	$f = 120\text{Hz}, C_{\text{OUT}} = 25\mu\text{F Tantalum}, I_{\text{OUT}} = 0.6\text{A}$				
	AP1115-XXX $V_{\text{IN}} = V_{\text{OUT}} + 3\text{V}$	-	60	70	dB
Temperature Stability	$I_{\text{O}} = 10\text{mA}$	-	0.6	-	%
θ_{JA}	Thermal Resistance Junction-to-Ambient (No heat sink; No air flow)		300	-	$^{\circ}\text{C/W}$
θ_{JC}	SOT89-3L: Control Circuitry/Power Transistor Thermal Resistance Junction-to-Case	-	100	-	$^{\circ}\text{C/W}$

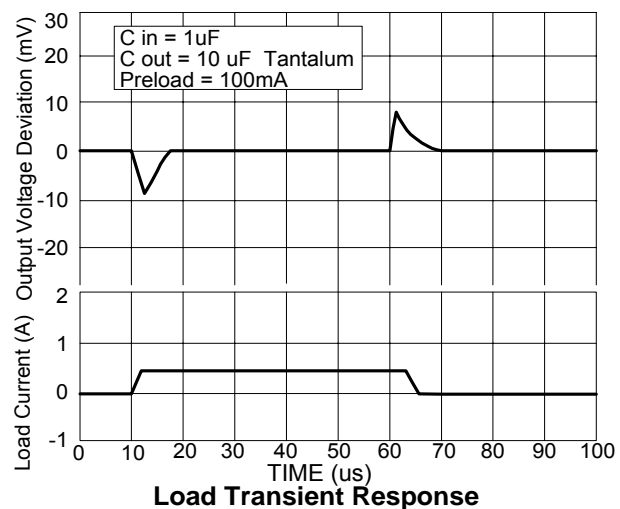
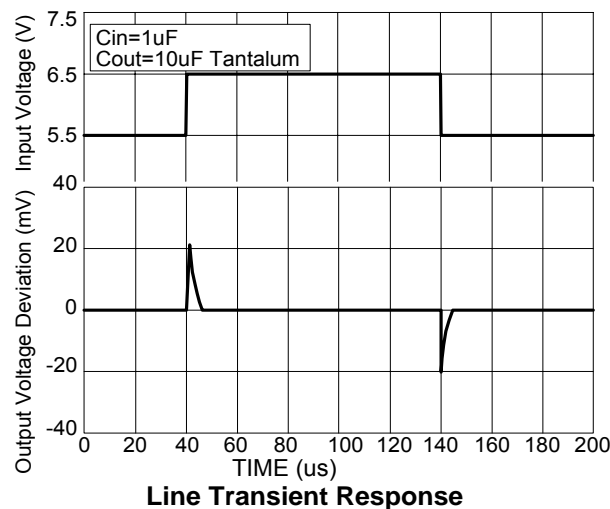
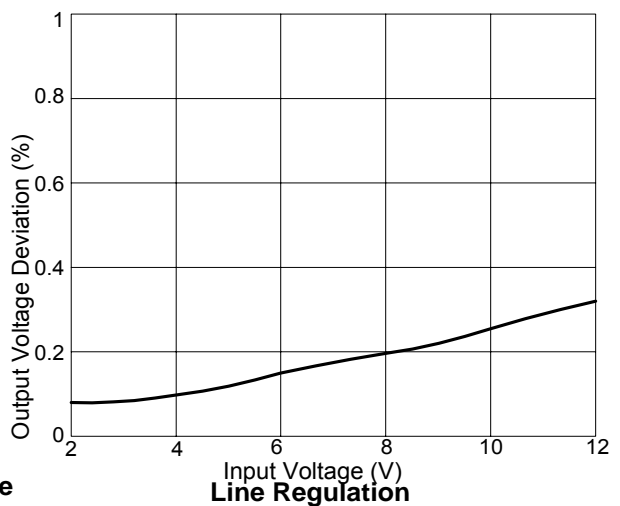
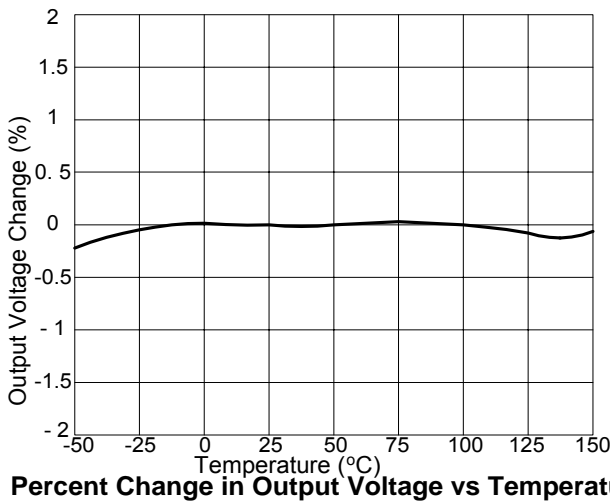
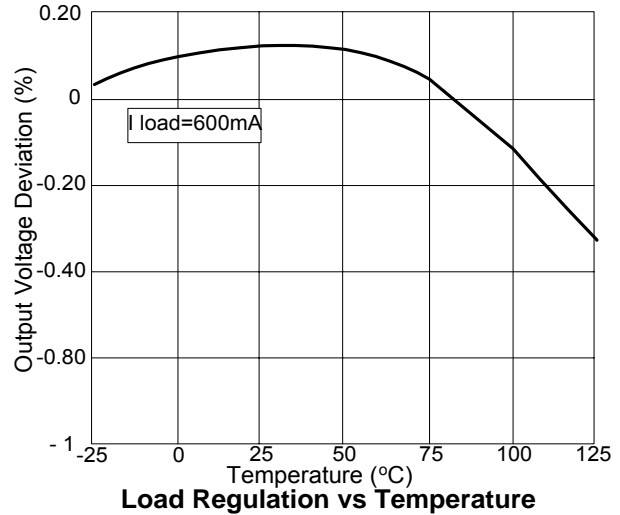
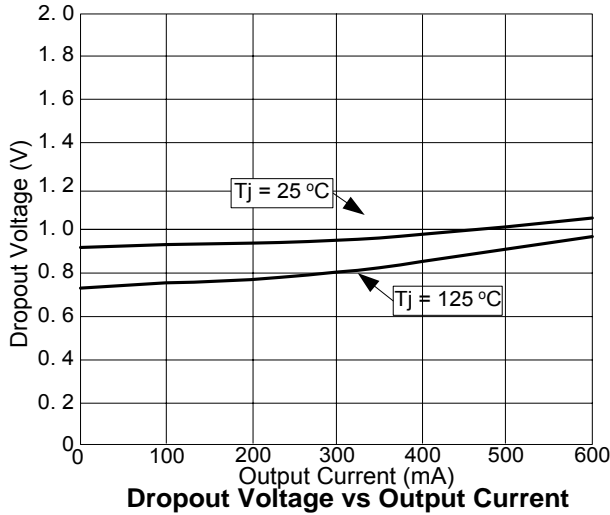
Marking Information



Identification Code

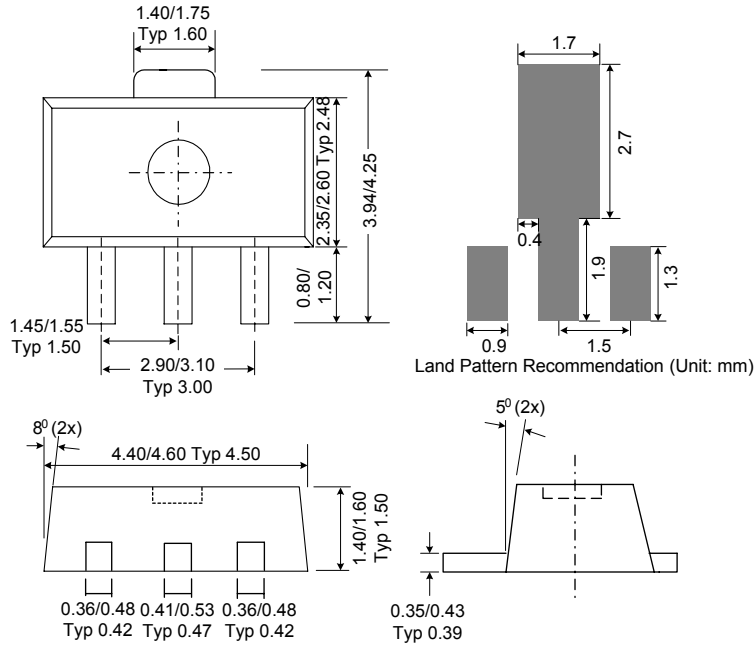
Output version	Part Number	
	AP1115A	AP1115B
ADJ	JO	JU
1.5V	JP	JV
1.8V	JQ	JW
2.5V	JR	JX
2.8V	JC	JD
3.0V	JM	JN
3.3V	JS	JY
3.5V	JK	JL
5.0V	JT	JZ

Typical Performance Characteristics



Package Information

(1) Package Type: SOT89-3L



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