



# AP1120

## DUAL 1A LOW DROPOUT POSITIVE REGULATOR

### Features

- 1.3V maximum dropout at full load current
- Fast transient response
- Output current limiting for each channel
- Built-in thermal shutdown each channel
- Good noise rejection
- Dual output ch1=3.3V, ch2=2.5V (1.8V for B version)
- Lead-Free Package: SOP-8L
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)

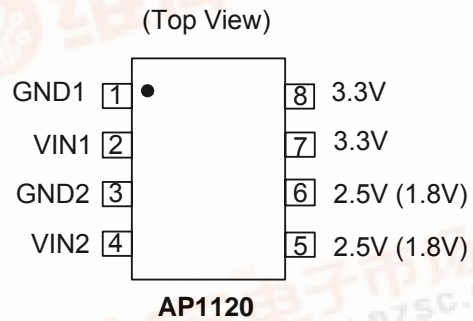
### General Description

AP1120 series are low dropout positive regulator to provide 1A 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/2.5V or 3.3V/1.8V logic supply. AP1120 series are guaranteed to have <1.3V dropout at full load current making it ideal to provide well regulated outputs dual channels with up to 18V input supply.

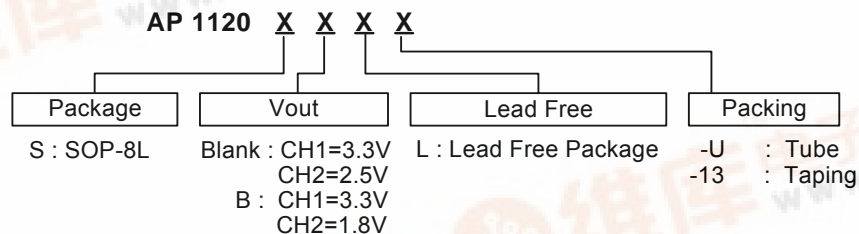
### Applications

- PC peripheral
- Communication

### Connection Diagram



### Ordering Information



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

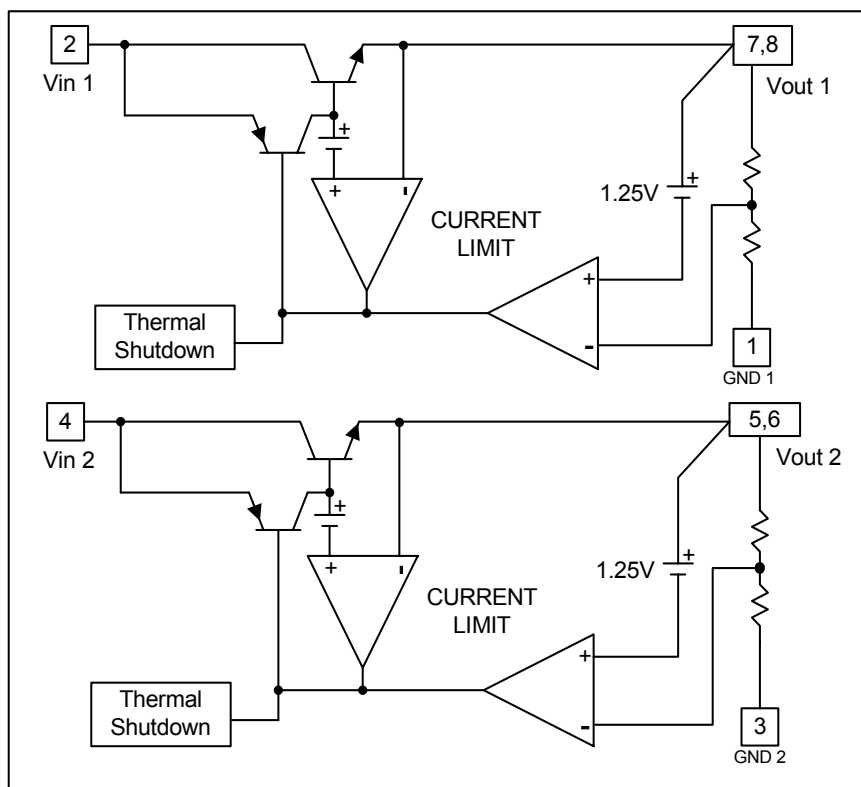
Device	Package Code	Packaging (Note 2)	Tube		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
AP1120S	S	SOP-8L	100	-U	2500/Tape & Reel	-13

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>.

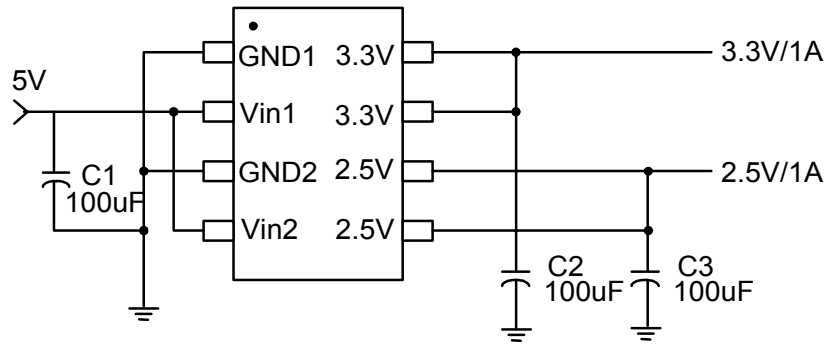
**Pin Descriptions**

NAME	FUNCTION
GND1/2	Ground
3.3V(Vout1)	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.
2.5V/1.8V (Vout2)	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.
VIN1/2	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.

**Block Diagram**



**Typical Circuit**



(3.3V/2.5V Dual output )

**Absolute Maximum Ratings**

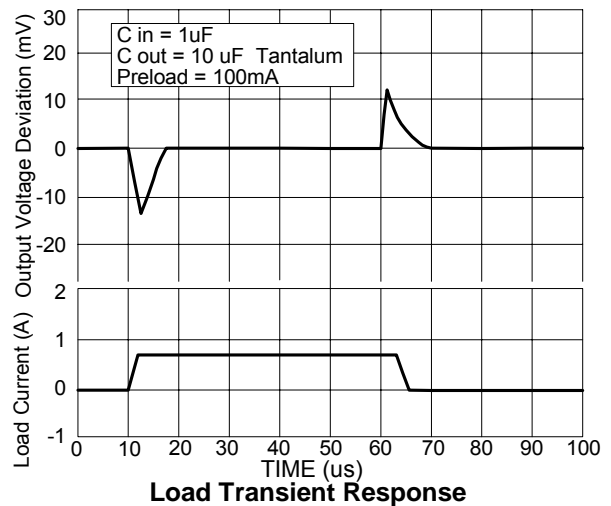
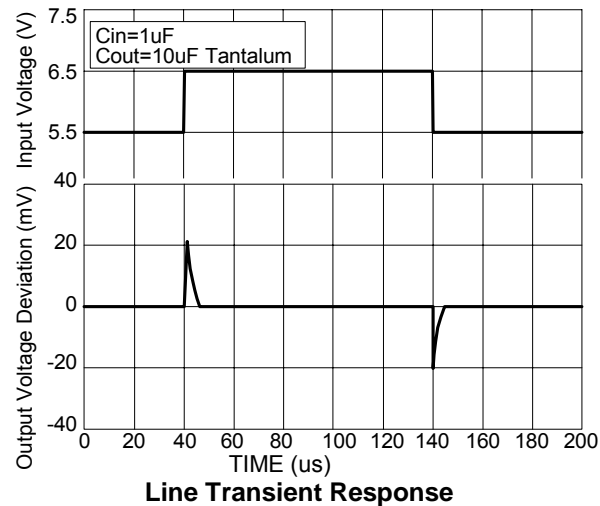
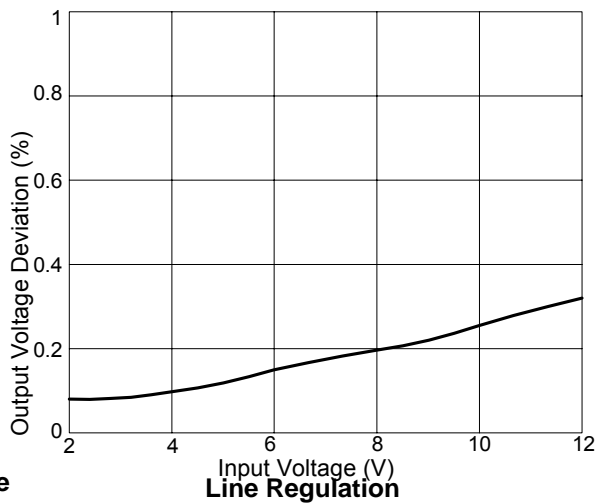
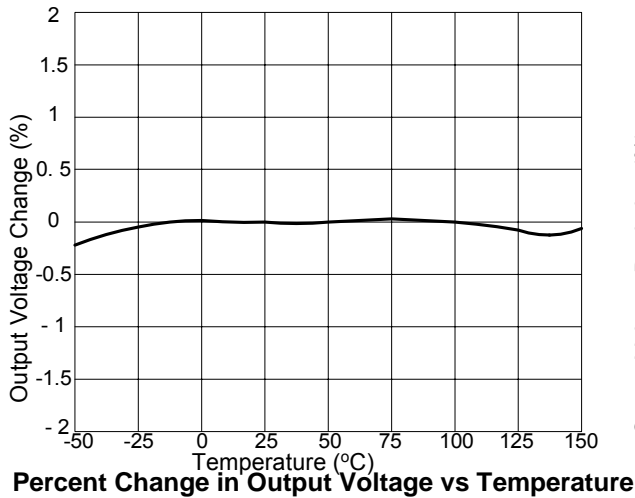
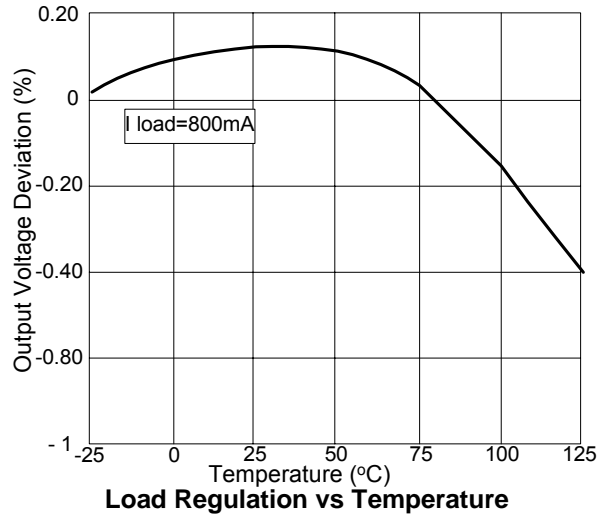
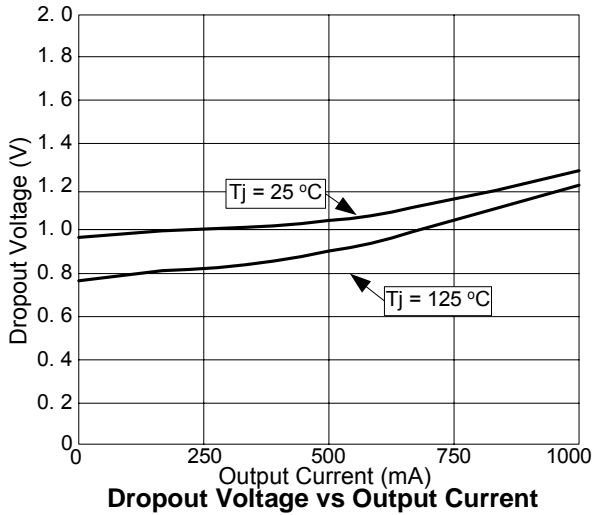
Symbol	Parameter	Rating	Unit
$V_{IN}$	DC Supply Voltage	-0.3 to 18 V	V
$P_D$	Power Dissipation	Internally Limited	
$T_{ST}$	Storage Temperature	-65 to +150	°C
$T_{OP}$	Operating Junction Temperature Range	0 to +150	°C

### Electrical Characteristics (Under Operating Conditions)

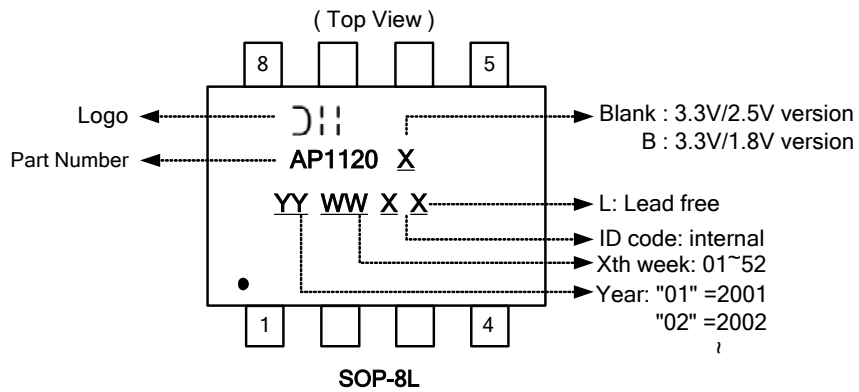
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	AP1120(B) - $V_{OUT1}$ $I_{OUT} = 10\text{mA}$ , $T_A = 25^\circ\text{C}$ , $4.8\text{V} \leq V_{IN} \leq 12\text{V}$	3.235	3.300	3.365	V
	AP1120 - $V_{OUT2}$ $I_{OUT} = 10\text{mA}$ , $T_A = 25^\circ\text{C}$ , $4\text{V} \leq V_{IN} \leq 12\text{V}$	2.450	2.500	2.550	V
	AP1120B - $V_{OUT2}$ $I_{OUT} = 10\text{mA}$ , $T_A = 25^\circ\text{C}$ , $4\text{V} \leq V_{IN} \leq 12\text{V}$	1.764	1.800	1.836	V
Line Regulation	$I_O = 10\text{mA}$ , $V_{OUT} + 1.5\text{V} < V_{IN} < 12\text{V}$ , $T_A = 25^\circ\text{C}$			0.2	%
Load Regulation	AP1120 series $V_{OUT1}$ $V_{IN} = 5\text{V}$ , $0 \leq I_{OUT} \leq 1\text{A}$ , $T_A = 25^\circ\text{C}$ (Note 3, 4)		26	33	mV
	AP1120 series $V_{OUT2}$ $V_{IN} = 4\text{V}$ , $0\text{mA} < I_O < 1\text{A}$ , $T_A = 25^\circ\text{C}$ (Note 3, 4)		20	25	mV
Dropout Voltage ( $V_{IN} - V_{OUT}$ )	$I_{OUT} = 1\text{A}$ , $\Delta V_{OUT} = 0.1\% V_{OUT}$		1.3	1.4	V
Current Limit	( $V_{IN} - V_{OUT}$ ) = 5V	1.1			A
Minimum Load Current	$0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$ (Note 5)		5	10	mA
Thermal Regulation	$T_A = 25^\circ\text{C}$ , 30ms pulse		0.008	0.04	%/W
Ripple Rejection	$F = 120\text{Hz}$ , $C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 1\text{A}$		60	70	dB
Temperature Stability	$I_O = 10\text{mA}$		0.5		%
$\theta_{JA}$ Thermal Resistance Junction-to-Ambient (No heat sink; No air flow)	SOP-8L: Control Circuitry/Power Transistor (Note 6)				$^\circ\text{C/W}$
	CH1 or CH2 only CH1 & CH2 and PD1=PD2		50 45		
$\theta_{JC}$ Thermal Resistance Junction-to-Case	SOP-8L: Control Circuitry/Power Transistor (Note 6)				$^\circ\text{C/W}$
	CH1 or CH2 only CH1 & CH2 and PD1=PD2		20 12		

- 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 15W. Power dissipation is determined by the input/output differentially 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 that requires maintaining regulation. At 12V input/output differential the device is guaranteed to regulate if the output current is greater than 10mA.
  - $V_{out1}$  and  $V_{out2}$  are connected to the PCB copper area 5.5mm\*5.5mm separately. If you need large PD or lower  $T_c$  &  $T_j$ , please connect to the large copper area >> 5.5mm\*5.5mm (like 10mm\*10mm).

**Typical Performance Characteristics**

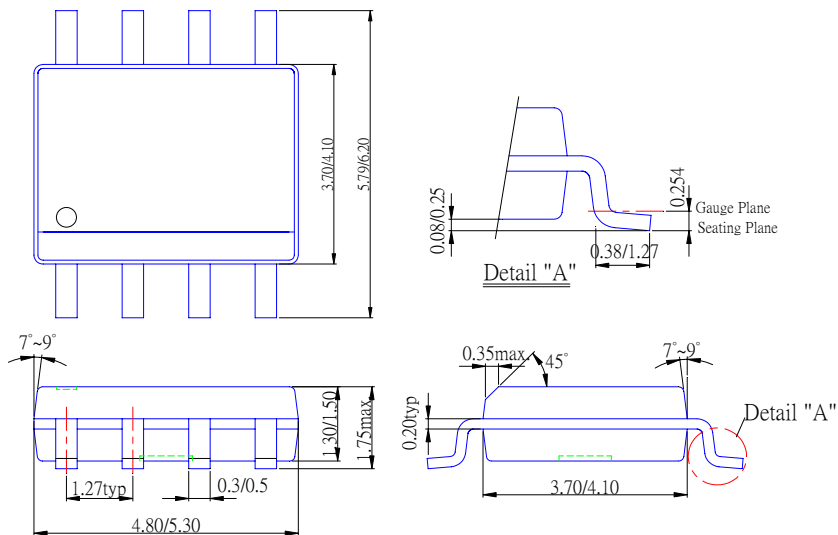


**Marking Information**



**Package Information**

Package Type: SOP-8L



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