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[Diodes Incorporated](#)  
[AP1121ASL-13](#)

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# AP1121

## 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 for each channel
- Good noise rejection
- Dual output ch1 = 3.3V, ch2 = 2.5V (ch2 = 1.8V for version B)
- SOP-8L: Available in "Green" Molding Compound (No Br, Sb)  
Lead Free Finish/ RoHS Compliant (Note 1)

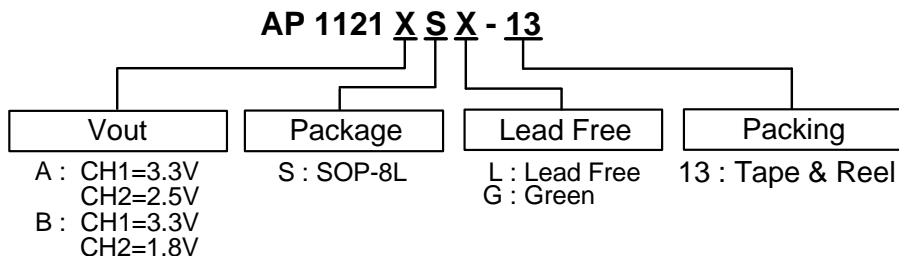
### General Description

AP1121 is a low dropout positive regulator which provides 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. AP1121 is 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

### Ordering Information



Device	Package Code	Packaging (Note 2)	13" Tape and Reel	
			Quantity	Part Number Suffix
AP1121XSL-13	S	SOP-8L	2500/Tape & Reel	-13
AP1121XSG-13	S	SOP-8L	2500/Tape & Reel	-13

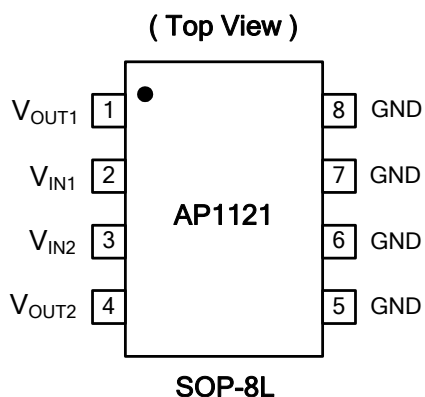
Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/products/lead\\_free.html](http://www.diodes.com/products/lead_free.html).  
 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.



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### Pin Assignments



### Pin Descriptions

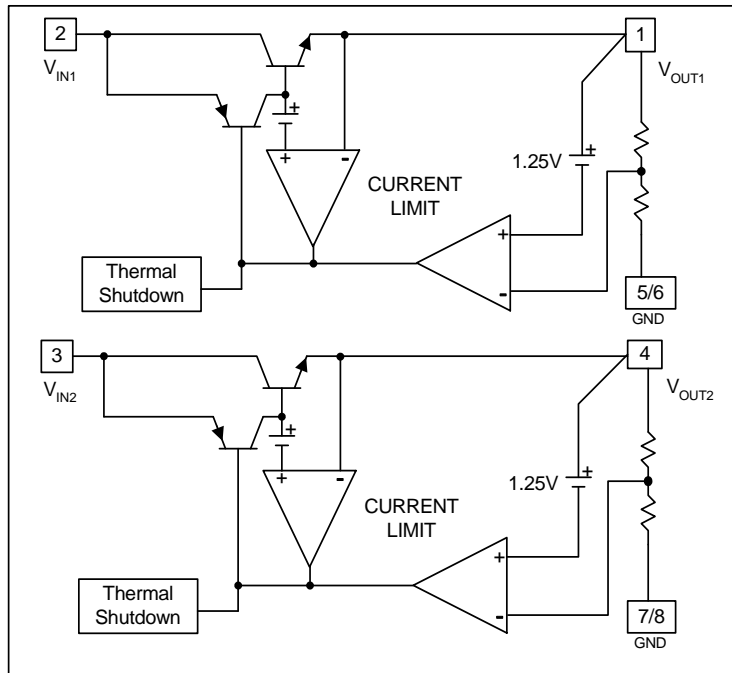
Pin Name	Descriptions
GND	Ground
3.3V( $V_{OUT1}$ )	The output of the regulator. A minimum of 10uF capacitor ( $0.15\Omega \leq ESR \leq 20\Omega$ ) must be connected from this pin to ground to insure stability.
2.5V/1.8V ( $V_{OUT2}$ )	
$V_{IN}$	The input pin of regulator. Typically a large storage capacitor ( $0.15\Omega \leq ESR \leq 20\Omega$ ) is connected from this pin to ground.



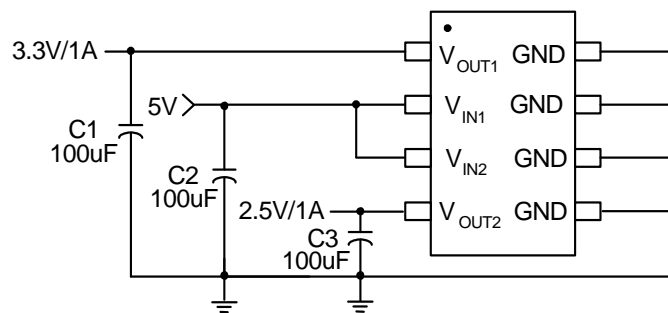
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## DUAL 1A LOW DROPOUT POSITIVE REGULATOR

### Block Diagram



### Typical Application Circuit



(3.3V/2.5V Dual output )



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### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
$V_{IN}$	DC Supply Voltage	-0.3 to 18 V	V
$T_{ST}$	Storage Temperature	-65 to +150	°C
$T_{OP}$	Operating Junction Temperature Range	0 to +125	°C
$T_M$	Maximum Junction Temperature	150	°C

### Electrical Characteristics (Under Operating Conditions)

Parameter	Conditions	Min	Typ.	Max	Unit
Output Voltage	AP1121_ - $V_{OUT1}$ $I_{OUT} = 10mA, T_A = 25^\circ C,$ $4.8V \leq V_{IN} \leq 12V$	3.235	3.300	3.365	V
	AP1121A - $V_{OUT2}$ $I_{OUT} = 10mA, T_A = 25^\circ C,$ $4V \leq V_{IN} \leq 12V$	2.450	2.500	2.550	V
	AP1121B - $V_{OUT2}$ $I_{OUT} = 10mA, T_A = 25^\circ C,$ $4V \leq V_{IN} \leq 12V$	1.764	1.800	1.836	V
Line Regulation	$I_O = 10mA, V_{OUT} + 1.5V < V_{IN} < 12V, T_A = 25^\circ C$			0.2	%
Load Regulation	AP1121 series $V_{OUT1}$ $V_{IN} = 5V, 0 \leq I_{OUT} \leq 1A,$ $T_A = 25^\circ C$ (Note 3, 4)		26	33	mV
	AP1121 series $V_{OUT2}$ $V_{IN} = 4V, 0mA < I_O < 1A,$ $T_A = 25^\circ C$ (Note 4, 5)		20	25	mV
Dropout Voltage ( $V_{IN} - V_{OUT}$ )	$I_{OUT} = 1A, \Delta V_{OUT} = 0.1\% V_{OUT}$		1.3	1.4	V
Current Limit	( $V_{IN} - V_{OUT}$ ) = 5V	1.1			A
Minimum Load Current	$0^\circ C \leq T_J \leq 125^\circ C$ (Note 5)		5	10	mA
Thermal Regulation	$T_A = 25^\circ C, 30ms$ pulse		0.008	0.04	%/W
Ripple Rejection	$F = 120Hz, C_{OUT} = 25\mu F$ Tantalum, $I_{OUT} = 1A$		60	70	dB
Temperature Stability	$I_O = 10mA$		0.5		%
$\theta_{JA}$ Thermal Resistance Junction-to-Ambient (No heat sink; No air flow)	SOP-8L: Control Circuitry/Power Transistor (Note 6) CH1 or CH2 only CH1 & CH2 and PD1 = PD2		177 158		°C/W
$\theta_{JC}$ Thermal Resistance Junction-to-Case	SOP-8L: Control Circuitry/Power Transistor (Note 6) CH1 or CH2 only CH1 & CH2 and PD1 = PD2		29 19		°C/W

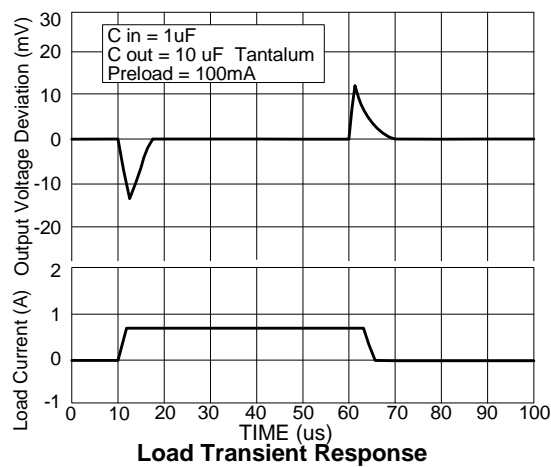
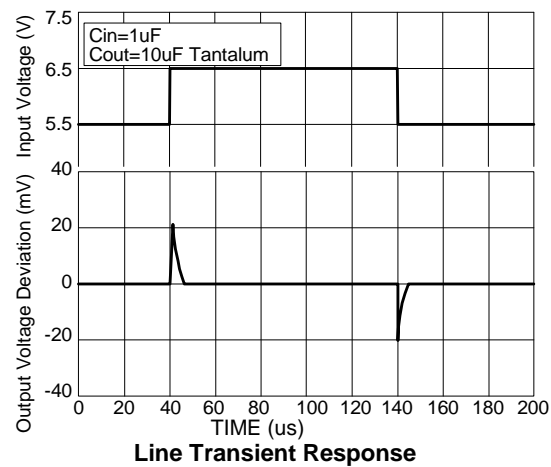
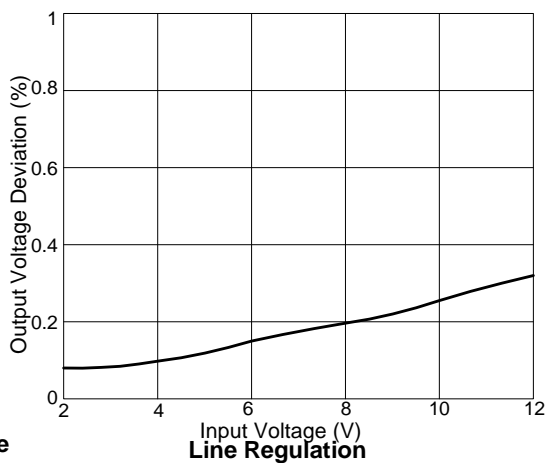
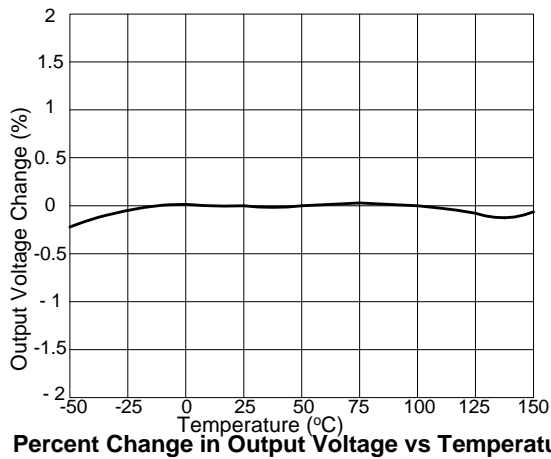
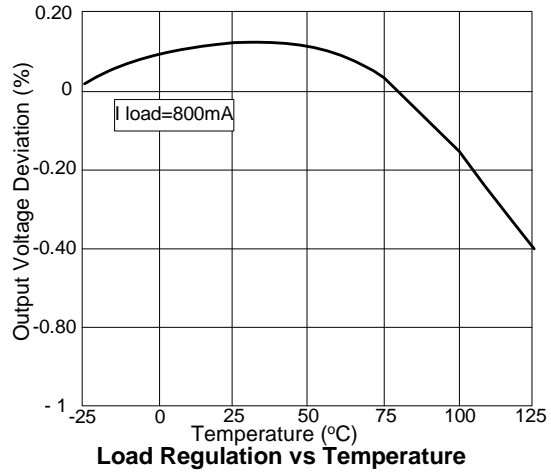
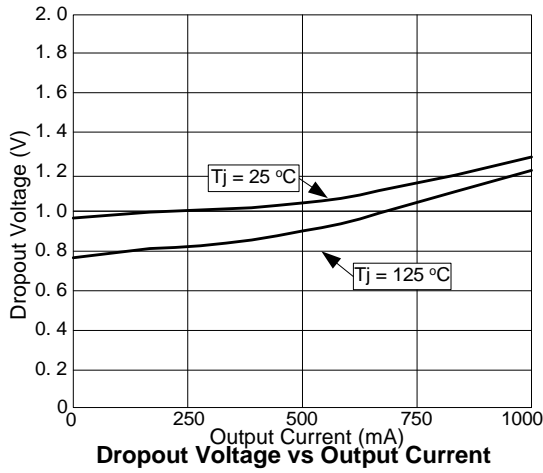
- Notes:
- See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.
  - Line and load regulation 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).



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### Typical Performance Characteristics



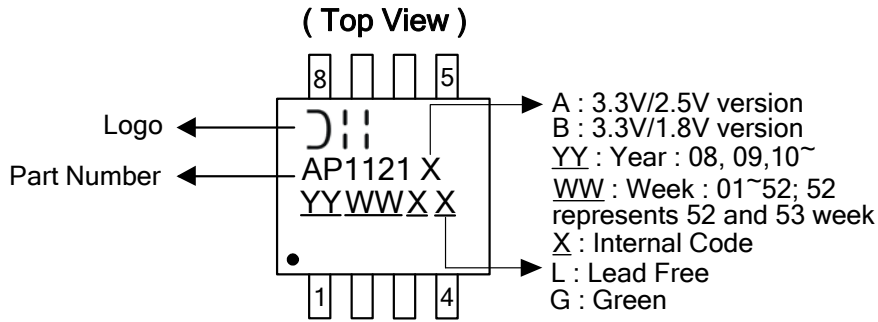


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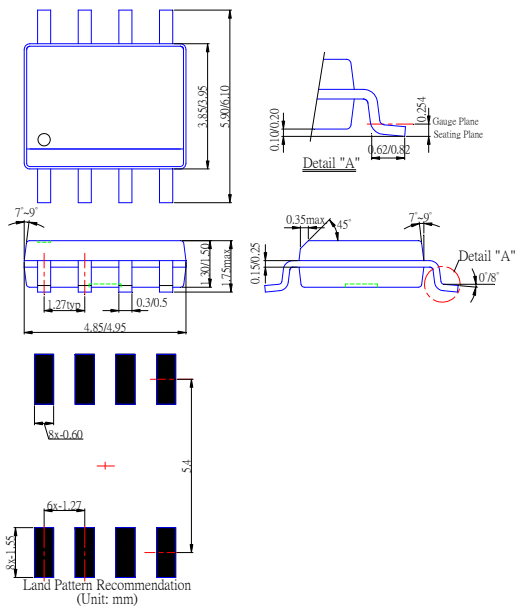
### Marking Information

(1) SOP-8L



### Package Information

(1) Package type: SOP-8L





**AP1121**

**DUAL 1A LOW DROPOUT POSITIVE REGULATOR**

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