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 for Lead Free and “Green” Products (Note 1)

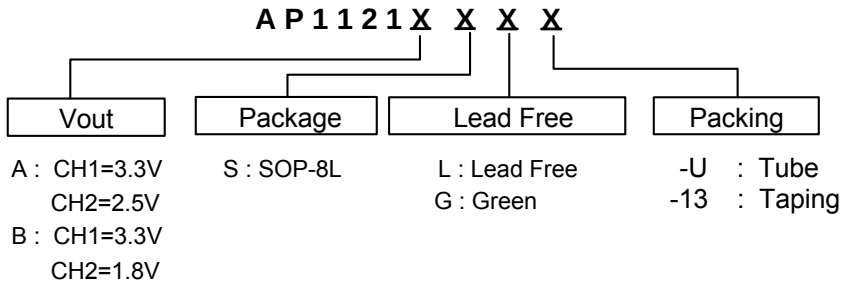
General Description

AP1121 is a 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. AP1121 is a 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

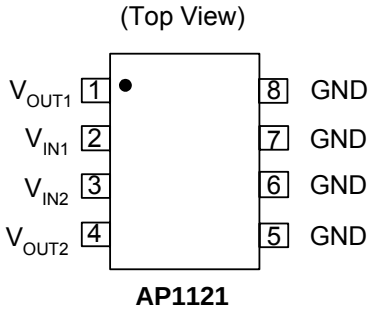


Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

Device (Note 2)	Package Code	Packaging	Tube/Bulk		13” Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
AP1121AS	S	SOP-8L	100	-U	2500/Tape & Reel	-13
AP1121BS	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.

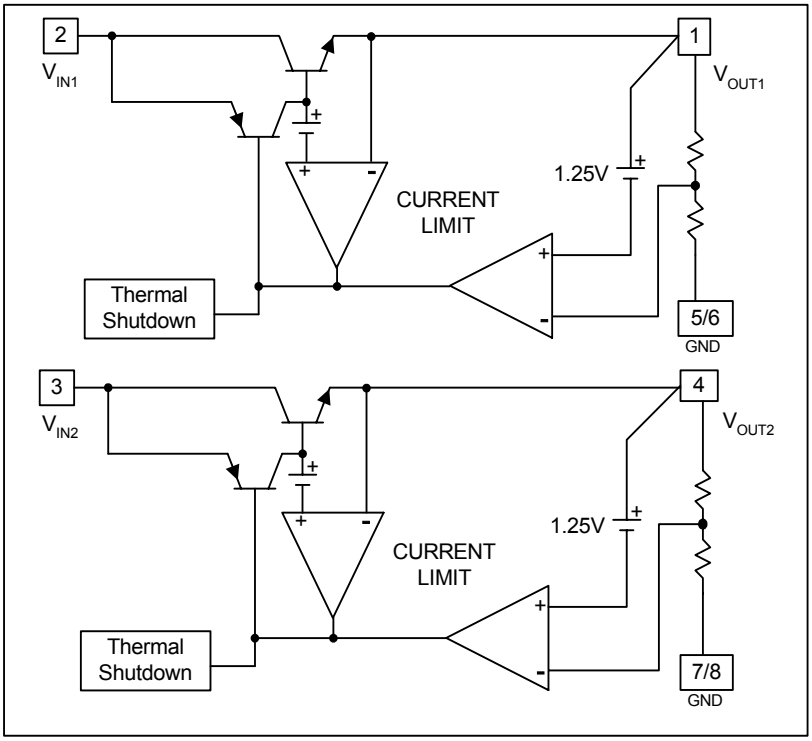
Pin Assignments



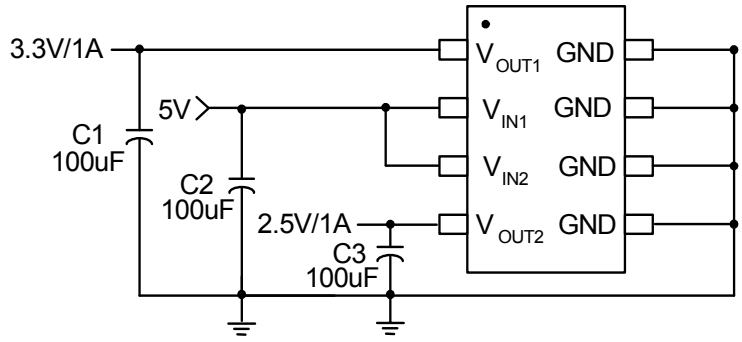
Pin Descriptions

NAME	Descriptions
GND	Ground
3.3V(V_{OUT1})	The output of the regulator. A minimum of 10uF capacitor (0.15Ω ≤ ESR ≤ 20Ω) 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 (0.15Ω ≤ ESR ≤ 20Ω) is connected from this pin to ground.

Block Diagram



Typical Application Circuit



(3.3V/2.5V Dual output)

Absolute Maximum Ratings

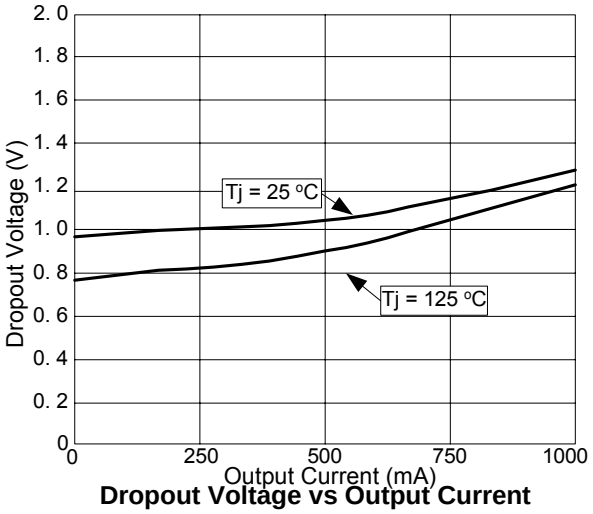
Symbol	Parameter	Rating	Unit
V_{IN}	DC Supply Voltage	-0.3 to 18 V	V
T_{ST}	Storage Temperature	-65 to +150	°C
T_{OP}	Operating Junction Temperature Range	0 to +125	°C
T_M	Maximum Junction Temperature	150	°C

Electrical Characteristics (Under Operating Conditions)

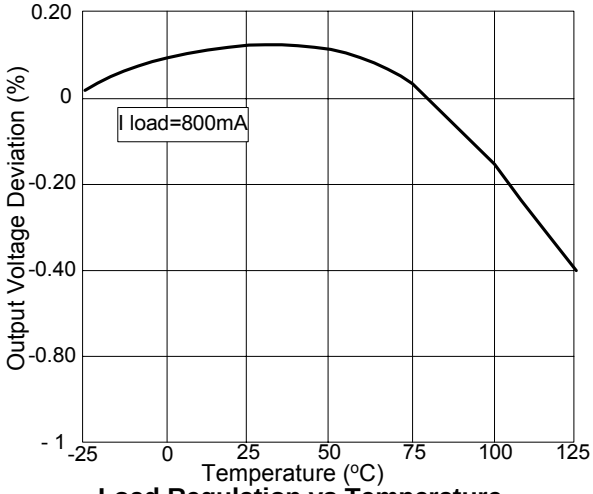
PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	AP1121_ - V_{OUT1}	I_{OUT} = 10mA, T_A = 25°C, 4.8V≤V_{IN}≤12V	3.235	3.300	3.365	V
	AP1121A - V_{OUT2}	I_{OUT} = 10mA, T_A = 25°C, 4V≤V_{IN}≤12V	2.450	2.500	2.550	V
	AP1121B - V_{OUT2}	I_{OUT} = 10mA, T_A = 25°C, 4V≤V_{IN}≤12V	1.764	1.800	1.836	V
Line Regulation	I_O = 10mA, V_{OUT} +1.5V<V_{IN}<12V, T_A = 25°C				0.2	%
Load Regulation	AP1121 series V_{OUT1}	V_{IN} = 5V, 0≤I_{OUT} ≤1A, T_A = 25°C (Note 3, 4)		26	33	mV
	AP1121 series V_{OUT2}	V_{IN} = 4V, 0mA<Io<1A, T_A = 25°C (Note 4, 5)		20	25	mV
Dropout Voltage (V_{IN}-V_{OUT})	I_{OUT} = 1A, ΔV_{OUT} = 0.1%V_{OUT}			1.3	1.4	V
Current Limit	(V_{IN}-V_{OUT}) = 5V		1. 1			A
Minimum Load Current	0°C≤Tj≤125°C (Note 5)			5	10	mA
Thermal Regulation	T_A = 25 °C, 30ms pulse			0.008	0.04	%/W
Ripple Rejection	F = 120Hz, C_{OUT} = 25uF Tantalum, I_{OUT} = 1A			60	70	dB
Temperature Stability	I_O = 10mA			0.5		%
θ_{JA} Thermal Resistance Junction-to-Ambient (No heat sink; No air flow)	SOP8: Control Circuitry/Power Transistor (Note 6) CH1 or CH2 only CH1 & CH2 and PD1 = PD2			177 158		°C/W
θ_{JC} Thermal Resistance Junction-to-Case	SOP8: Control Circuitry/Power Transistor (Note 6) CH1 or CH2 only CH1 & CH2 and PD1 = PD2			29 19		°C/W

Note: 3. 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.
4. 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.
5. 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.
6. Vout1 and Vout2 are connected to the PCB copper area 5.5mm*5.5mm separately. If you need large PD or lower Tc & Tj, please connect to the large copper area >> 5.5mm*5.5mm (like 10mm*10mm).

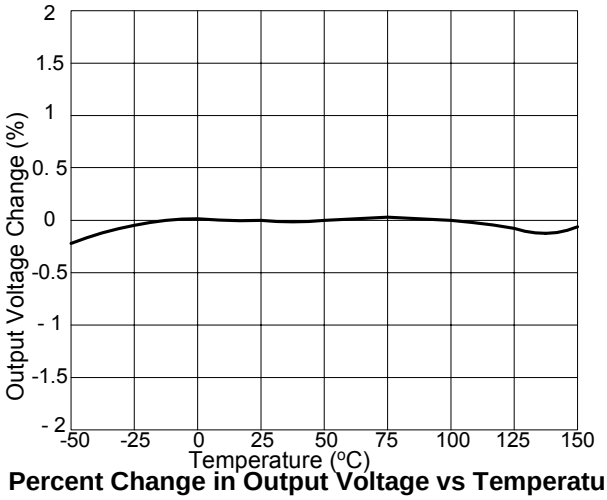
Typical Performance Characteristics



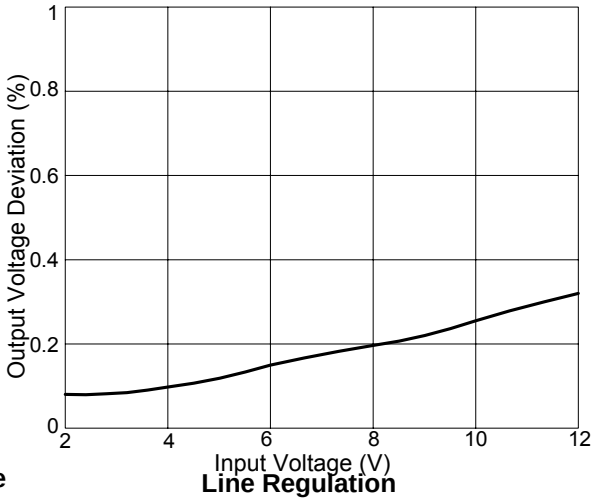
Dropout Voltage vs Output Current



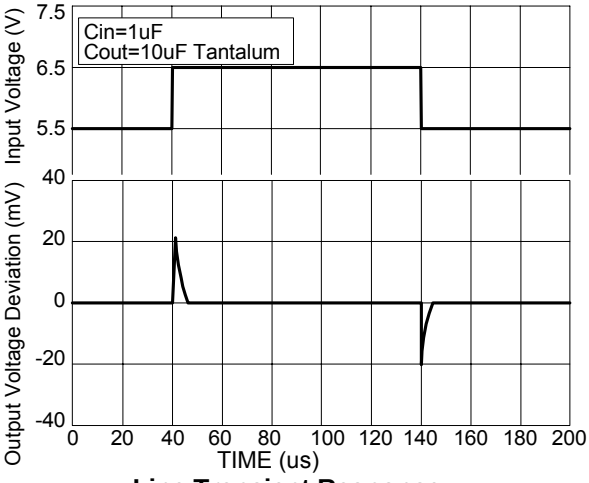
Load Regulation vs Temperature



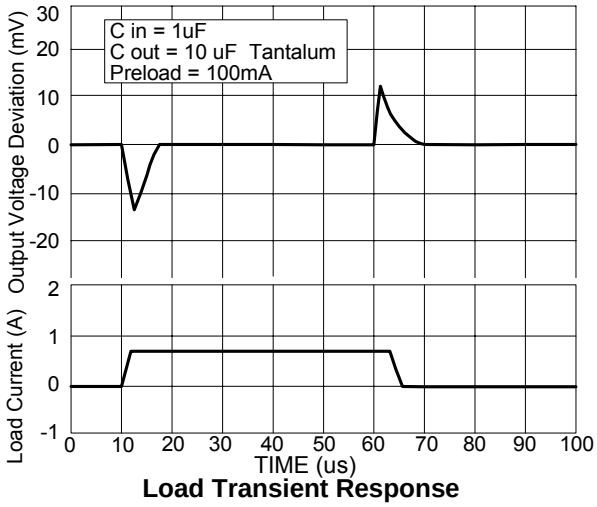
Percent Change in Output Voltage vs Temperature



Line Regulation



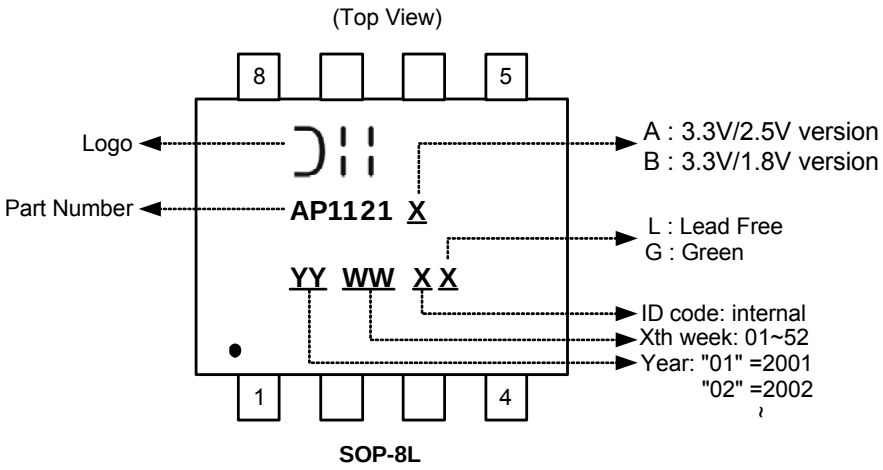
Line Transient Response



Load Transient Response

Marking Information

SOP-8L

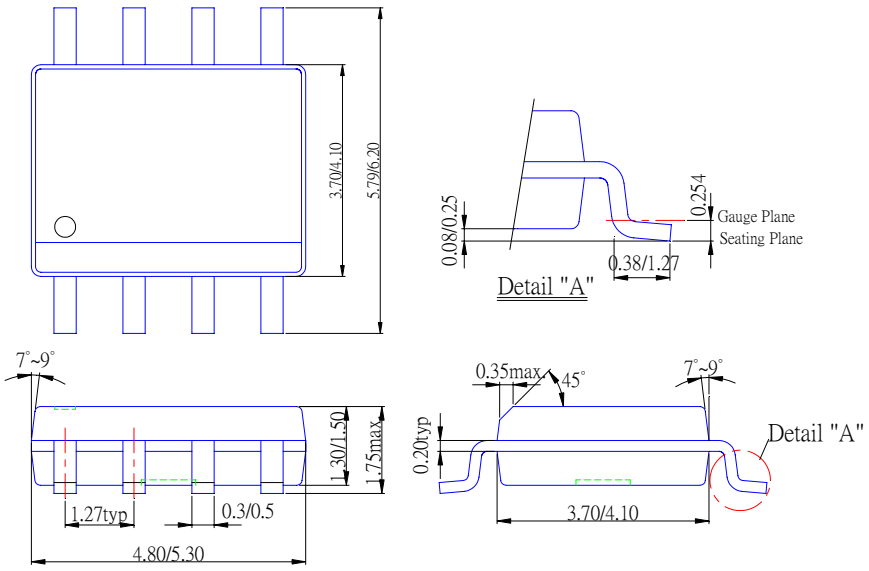


SOP-8L

Device	Package	Identification Code
AP1121AS	SOP-8L	AP1121
AP1121BS	SOP-8L	AP1121

Package Information

Package Type: SOP-8L



IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.