

### **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 (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.



http://www.diodes.com/products/lead\_free.html.

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



# AP1120

### **DUAL 1A LOW DROPOUT POSITIVE REGULATOR**

### **Pin Assignments**



# Pin NameDescriptionGND1/2Ground3.3V (Vout1)The output of the regulator. A minimum of 10 uF capacitor $(0.15\Omega \le \text{ESR} \le 20\Omega)$ must be connected from this pin to ground to insure stability.VIN1/2The input pin of regulator. Typically a large storage capacitor $(0.15\Omega \le \text{ESR} \le 20\Omega)$ is connected from this pin to ground.



# **Block Diagram**





### **Absolute Maximum Ratings**

Symbol	Parameter Rating		Unit	
V <sub>IN</sub>	DC Supply Voltage	-0.3 to 18 V	V	
P <sub>D</sub>	Power Dissipation	Internally Limited		
T <sub>ST</sub>	Storage Temperature	-65 to +150	°C	
T <sub>OP</sub>	Operating Junction Temperature Range	0 to +150	°C	

### Electrical Characteristics (Under Operating Conditions)

Parameter	Conditions		Min	Тур.	Max	Unit
	AP1120(B) - V <sub>OUT1</sub>	$I_{OUT} = 10mA, T_A = 25^{\circ}C, 4.8V \le V_{IN} \le 12V$	3.235	3.300	3.365	V
Output Voltage	AP1120 - V <sub>OUT2</sub>	$  I_{OUT} = 10 m A, T_A = 25^{\circ}C, \\ 4V \leq V_{IN} \leq 12V $	2.450	2.500	2.550	V
	AP1120B - V <sub>OUT2</sub>	$\begin{split} I_{OUT} &= 10 m A, \ T_A = 25^o C, \\ 4 V &\leq V_{IN} \leq 12 V \end{split}$	1.764	1.800	1.836	V
Line Regulation	$I_0=10mA, V_{OUT}+1.5V < V_{IN} < 12V, T_A = 25^{\circ}C$				0.2	%
Load Regulation	AP1120 series	$V_{IN} = 5V, 0 \le I_{OUT} \le 1A,$ $T_A = 25^{\circ}C \text{ (Note 3, 4)}$		26	33	mV
	AP1120 series	V <sub>IN</sub> =4V, 0mA <lo<1a, T<sub>A</sub> =25°C (Note 3, 4)</lo<1a, 		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			А	
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 <sub>OUT</sub> =25uF Tantalum, I <sub>OUT</sub> =1A		Tantalum, I <sub>OUT</sub> =1A		60	70	dB
Temperature Stability	Temperature Stability I <sub>0</sub> =10mA			0.5		%
$\theta_{JA}$ Thermal Resistance SOP-8L: Control Circuitry/Power Transistor (Note 6) Junction-to-Ambient (No heat sink; No air flow) CH1 or CH2 only CH1 & CH2 and PD1=PD2				50 45		<sup>o</sup> C/W
$\theta_{\rm JC}$ Thermal Resistance Junction-to-Case	SOP-8L: Control Circuitry/Power Transistor (Note 6) CH1 or CH2 only CH1 & CH2 and PD1=PD2			20 12		°C/W

Notes: 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

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**



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# **Marking Information**

### (1) SOP-8L







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