

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)

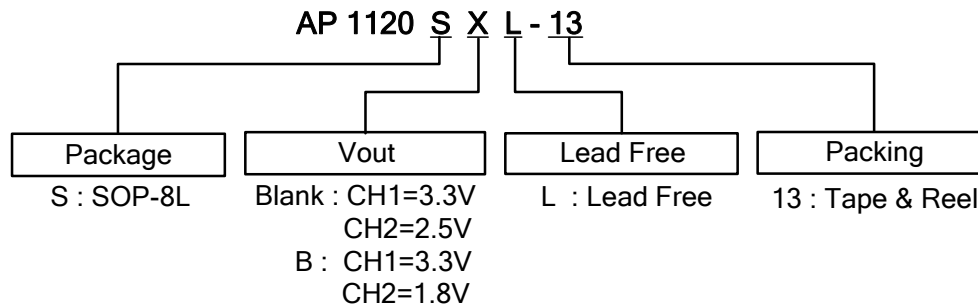
General Description

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.

Applications

- PC peripheral
- Communication

Ordering Information

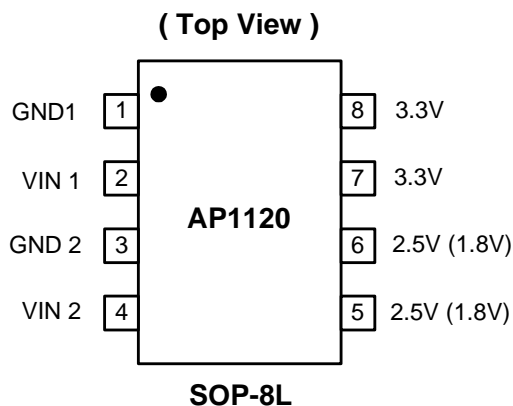


| Device | Package Code | Packaging (Note 2) | 13" Tape and Reel | |
|--------------|--------------|--------------------|-------------------|--------------------|
| | | | Quantity | Part Number Suffix |
| AP1120SXL-13 | S | SOP-8L | 2500/Tape & Reel | -13 |



- 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.
 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>.

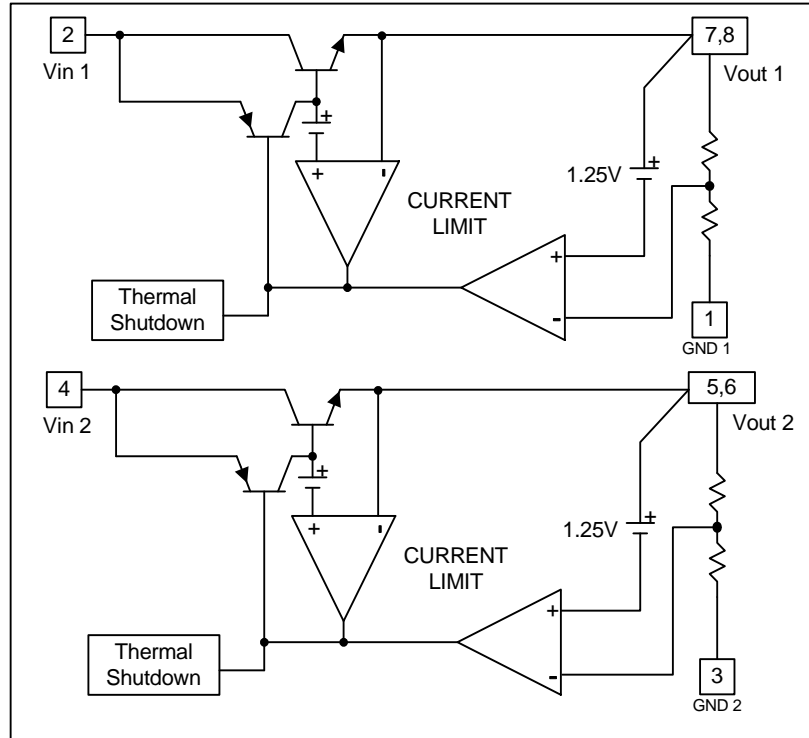
Pin Assignments



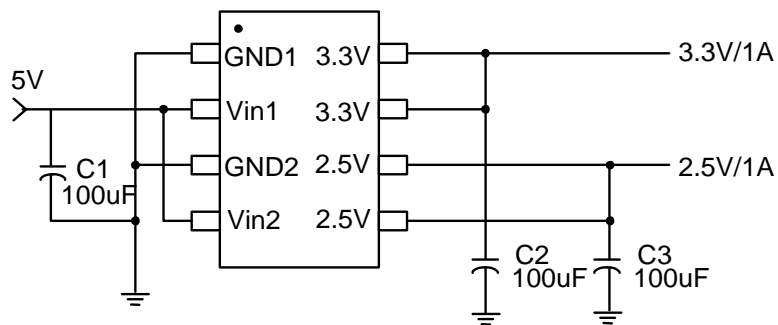
Pin Descriptions

| Pin Name | Description |
|-------------------|---|
| 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) | |
| 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

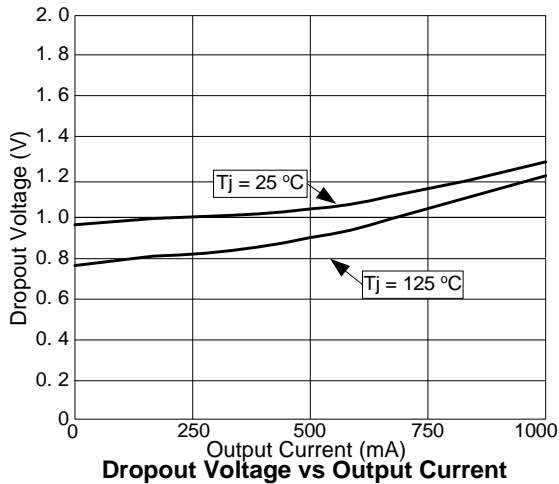
| Symbol | Parameter | Rating | Unit |
|----------|--------------------------------------|--------------------|------|
| V_{IN} | DC Supply Voltage | -0.3 to 18 V | V |
| P_D | Power Dissipation | Internally Limited | |
| T_{ST} | Storage Temperature | -65 to +150 | °C |
| T_{OP} | Operating Junction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

Electrical Characteristics (Under Operating Conditions)

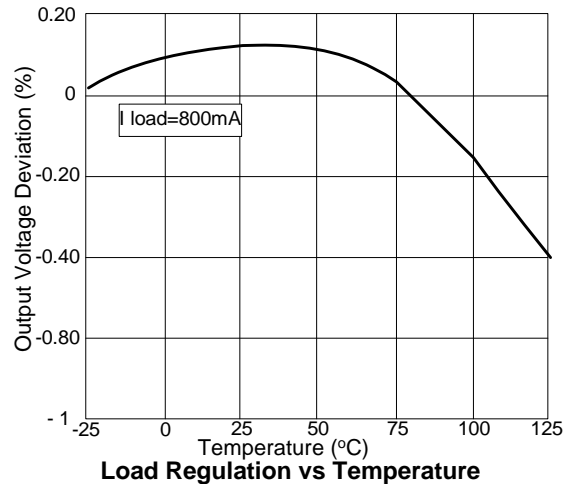
| Parameter | Conditions | Min | Typ. | Max | Unit | |
|--|--|---|----------|-------|-------|----|
| Output Voltage | AP1120(B) - V_{OUT1} | $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $4.8\text{V} \leq V_{IN} \leq 12\text{V}$ | 3.235 | 3.300 | 3.365 | V |
| | AP1120 - V_{OUT2} | $I_{OUT} = 10\text{mA}$, $T_A = 25^\circ\text{C}$, $4\text{V} \leq V_{IN} \leq 12\text{V}$ | 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 | $(V_{IN} - V_{OUT}) = 5\text{V}$ | 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 | | % | |
| θ_{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 | | 50 45 | | °C/W | |
| θ_{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:
- 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).

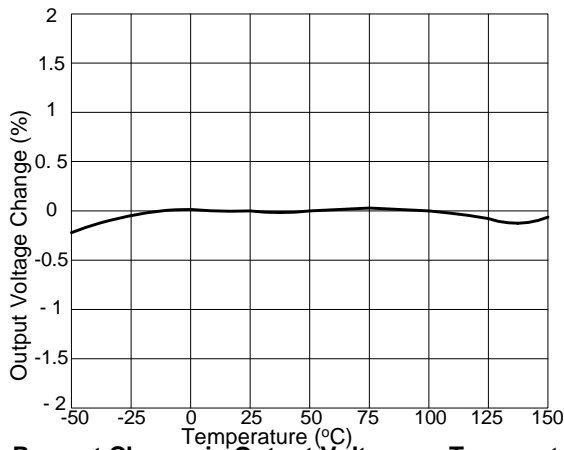
Typical Performance Characteristics



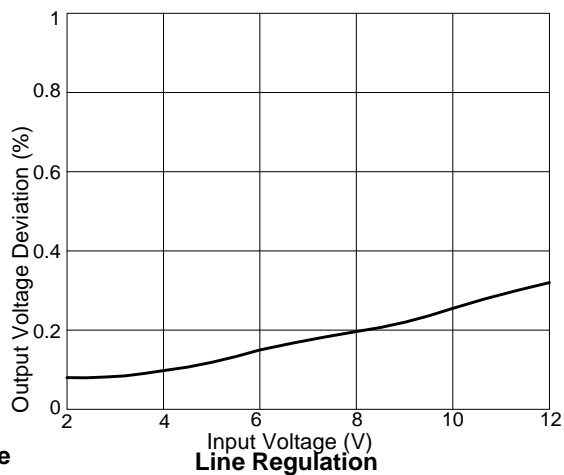
Dropout Voltage vs Output Current



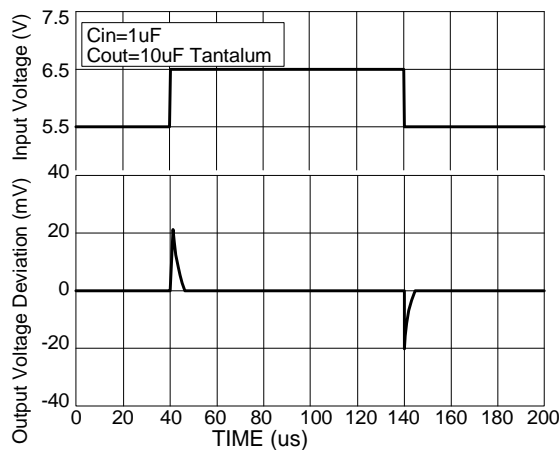
Load Regulation vs Temperature



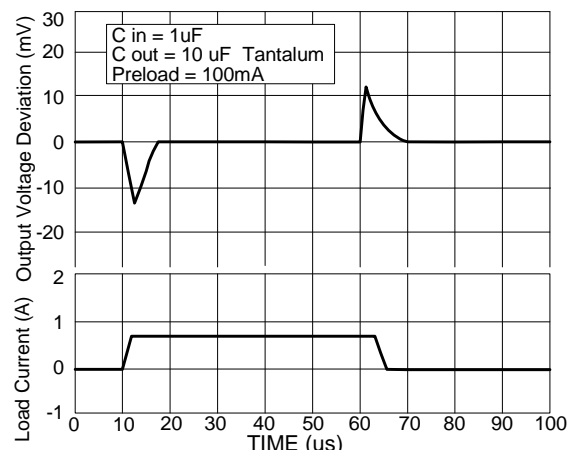
Percent Change in Output Voltage vs Temperature



Line Regulation



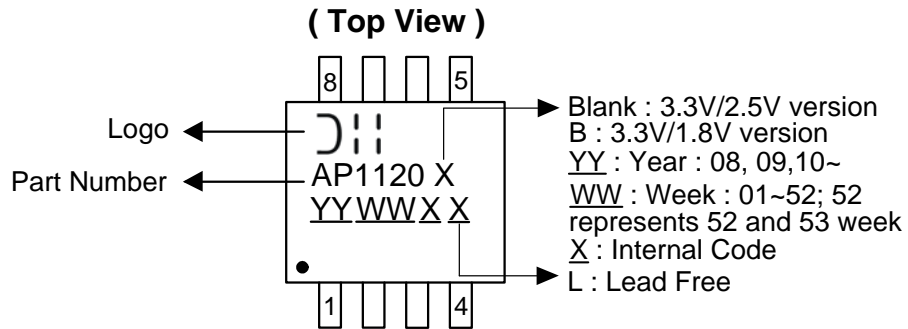
Line Transient Response



Load Transient Response

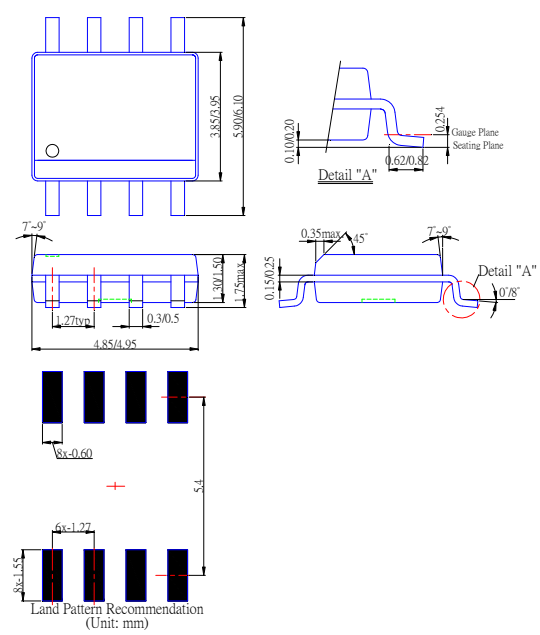
Marking Information

(1) SOP-8L



Package Information (All Dimensions in mm)

(1) Package type: SOP-8L



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