

# GL1117A

## 1A Low Dropout Positive Adjustable or Fixed-Mode Regulator

### Description

The GL1117A is a low dropout at positive adjustable or fixed-mode regulator with minimum of 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 logic supply. GL1117A is also well suited for other applications such as VGA cards. GL1117A is guaranteed to have lower than 1.4V dropout at full load current making it ideal to provide well-regulated outputs of 1.25 to 5.0 with 6.4V to 15V input supply.

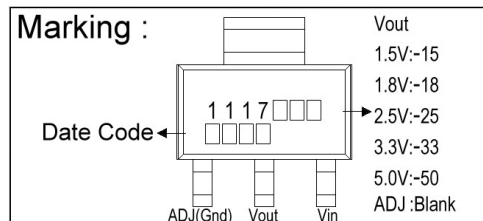
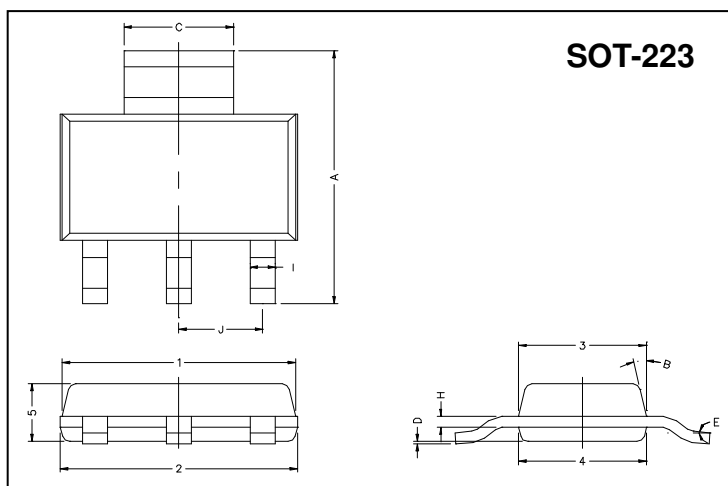
### Features

- 1.4V maximum dropout full load current
- Fast transient response
- Output current limiting
- Built-in thermal shutdown
- Good noise rejection
- 3-Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 3.3V, 5.0V

### Applications

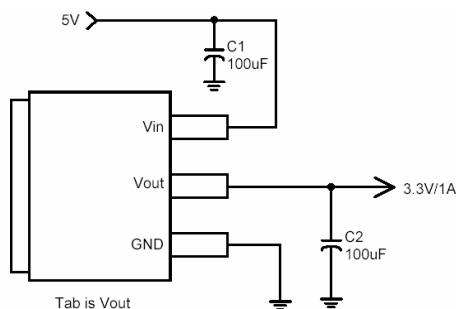
- PC peripheral
- Communication

### Package Dimensions

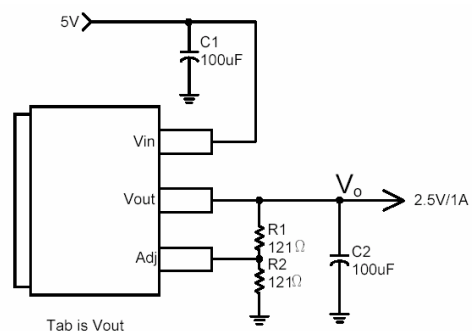


| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 6.70       | 7.30 | B    | 13° TYP.   |      |
| C    | 2.90       | 3.10 | J    | 2.30 REF.  |      |
| D    | 0.02       | 0.10 | 1    | 6.30       | 6.70 |
| E    | 0°         | 10°  | 2    | 6.30       | 6.70 |
| I    | 0.60       | 0.80 | 3    | 3.30       | 3.70 |
| H    | 0.25       | 0.35 | 4    | 3.30       | 3.70 |
|      |            |      | 5    | 1.40       | 1.80 |

### Typical Circuit



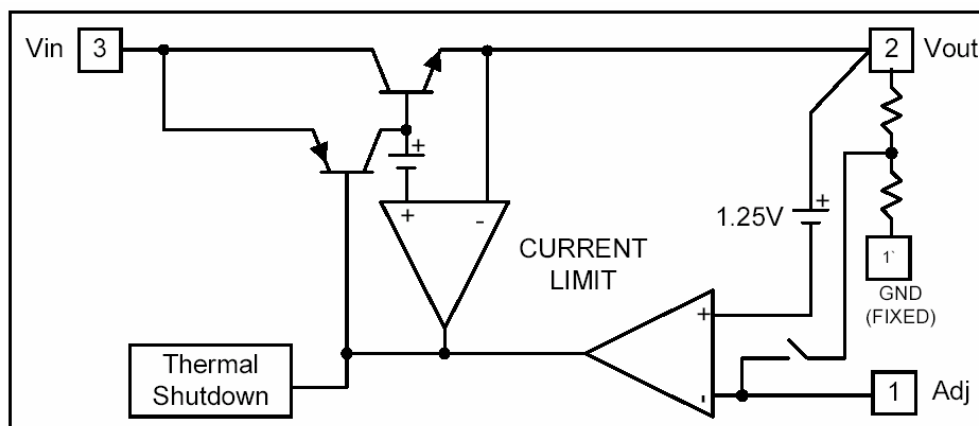
( 5V/3.3V fixed output )



( 5V/2.5V ADJ output )

$$\text{Note: } V_o = V_{\text{REF}} * \left(1 + \frac{R_2}{R_1}\right)$$

## Block Diagram



## Pin Descriptions

| Name      | I/O | Pin# | Function                                                                                                                                                                                                                                                                                                             |
|-----------|-----|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Adj (GND) |     | 1    | A resistor divider from this pin to the Vout pin and ground sets the output voltage (Ground only for fixed mode)                                                                                                                                                                                                     |
| Vout      | O   | 2    | The output of the regulator. A minimum of 10uF capacitor must be connected from this pin to ground to insure stability.                                                                                                                                                                                              |
| Vin       | I   | 3    | The input pin of regulator. Typically a large storage capacitor is connected from this pin to ground to insure that the input voltage does not sag below the minimum dropout voltage during the load transient response. This pin must always be 1.3V higher than Vout in order for the device to regulate properly. |

## Absolute Maximum Ratings

| Symbol          | Parameter                            | Ratings            | Unit |
|-----------------|--------------------------------------|--------------------|------|
| V <sub>in</sub> | DC Supply Voltage                    | -0.3 to 15         | V    |
| P <sub>D</sub>  | Power Dissipation                    | Internally Limited |      |
| T <sub>ST</sub> | Storage Temperature                  | -65 ~ + 150        | °C   |
| T <sub>OP</sub> | Operating Junction Temperature Range | 0 ~ + 125          | °C   |
| T <sub>MJ</sub> | Maximum Junction Temperature         | 150                | °C   |

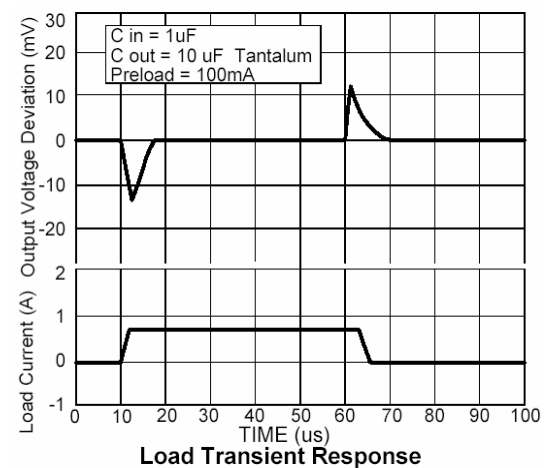
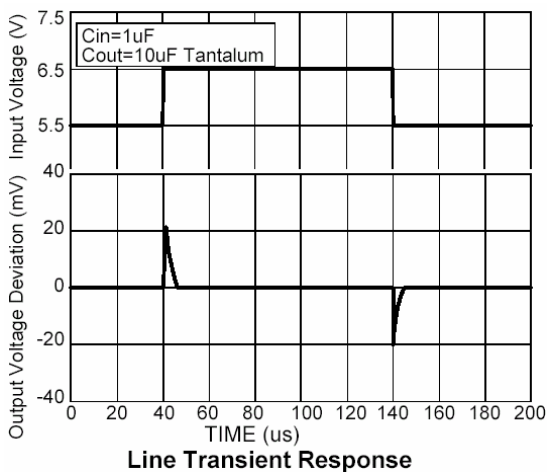
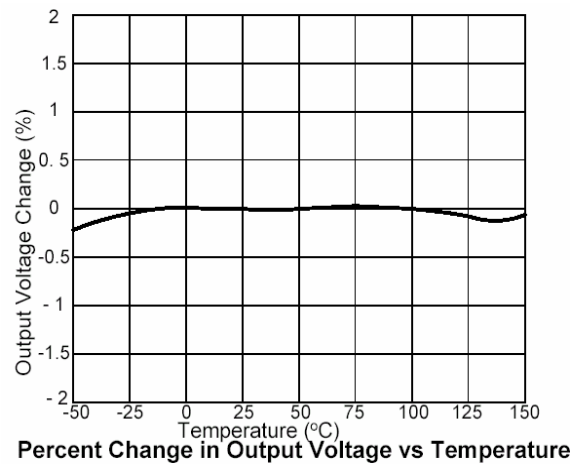
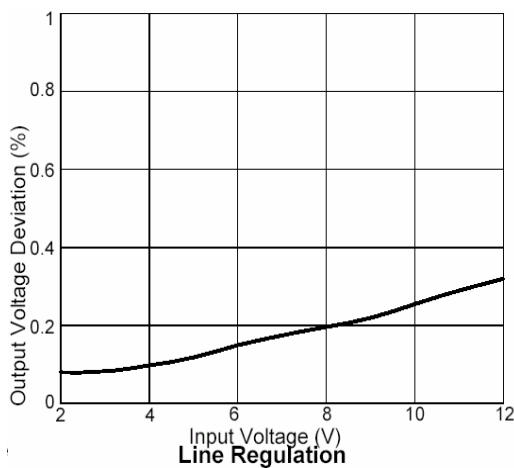
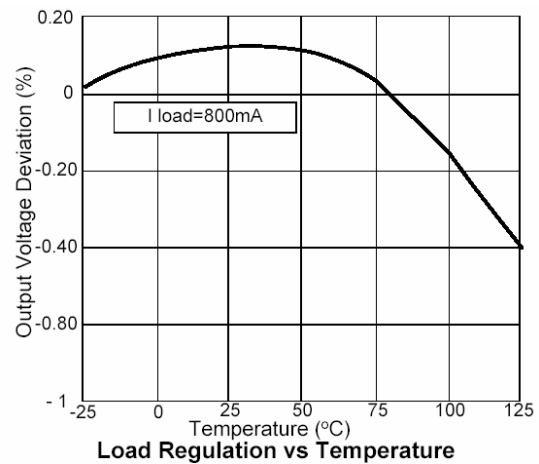
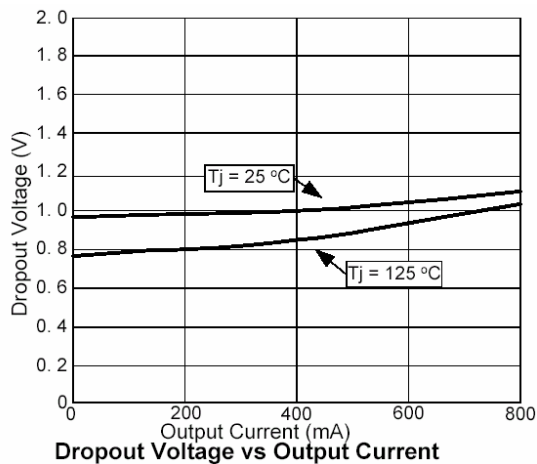
**Electrical Characteristics**

| Parameter                                                                             | Conditions                                                               |                                                                                                     | MIN   | TYP   | MAX   | UNIT               |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------|-------|-------|--------------------|
| Reference Voltage                                                                     | GL1117AAdj                                                               | $I_o=10\text{mA}$ , $T_j=25^\circ\text{C}$ , $(V_{in}-V_{out})=1.5\text{V}$                         | 1.225 | 1.250 | 1.275 | V                  |
| Output Voltage                                                                        | GL1117A-1.5                                                              | $I_o=10\text{mA}$ , $T_j=25^\circ\text{C}$ , $3.0\text{V}\leq V_{in}\leq 12\text{V}$                | 1.470 | 1.500 | 1.530 | V                  |
|                                                                                       | GL1117A-1.8                                                              | $I_o=10\text{mA}$ , $T_j=25^\circ\text{C}$ , $3.3\text{V}\leq V_{in}\leq 12\text{V}$                | 1.764 | 1.800 | 1.836 | V                  |
|                                                                                       | GL1117A-2.5                                                              | $I_o=10\text{mA}$ , $T_j=25^\circ\text{C}$ , $4.0\text{V}\leq V_{in}\leq 12\text{V}$                | 2.450 | 2.500 | 2.550 | V                  |
|                                                                                       | GL1117A-3.3                                                              | $I_o=10\text{mA}$ , $T_j=25^\circ\text{C}$ , $4.8\text{V}\leq V_{in}\leq 12\text{V}$                | 3.235 | 3.300 | 3.365 | V                  |
|                                                                                       | GL1117A-5.0                                                              | $I_o=10\text{mA}$ , $T_j=25^\circ\text{C}$ , $6.5\text{V}\leq V_{in}\leq 12\text{V}$                | 4.900 | 5.000 | 5.100 | V                  |
| Line Regulation                                                                       | GL1117A-XXX                                                              | $I_o=10\text{mA}$ , $V_{out}+1.5\text{V}<V_{in}<12\text{V}$ , $T_j=25^\circ\text{C}$                | -     | -     | 0.2   | %                  |
| Load Regulation                                                                       | GL1117AAdj                                                               | $V_{in}=3.3\text{V}$ , $V_{adj}=0$ , $0\text{mA}<I_o<1\text{A}$ , $T_j=25^\circ\text{C}$ (Note 1,2) | -     | -     | 1     | %                  |
|                                                                                       | GL1117A-1.5                                                              | $V_{in}=3.0\text{V}$ , $0\text{mA}<I_o<1\text{A}$ , $T_j=25^\circ\text{C}$ (Note 1,2)               | -     | 12    | 15    | mV                 |
|                                                                                       | GL1117A-1.8                                                              | $V_{in}=3.3\text{V}$ , $0\text{mA}<I_o<1\text{A}$ , $T_j=25^\circ\text{C}$ (Note 1,2)               | -     | 15    | 18    | mV                 |
|                                                                                       | GL1117A-2.5                                                              | $V_{in}=4.0\text{V}$ , $0\text{mA}<I_o<1\text{A}$ , $T_j=25^\circ\text{C}$ (Note 1,2)               | -     | 20    | 25    | mV                 |
|                                                                                       | GL1117A-3.3                                                              | $V_{in}=5.0\text{V}$ , $0\text{mA}<I_o<1\text{A}$ , $T_j=25^\circ\text{C}$ (Note 1,2)               | -     | 26    | 33    | mV                 |
|                                                                                       | GL1117A-5.0                                                              | $V_{in}=8.0\text{V}$ , $0\text{mA}<I_o<1\text{A}$ , $T_j=25^\circ\text{C}$ (Note 1,2)               | -     | 40    | 50    | mV                 |
| Dropout Voltage<br>( $V_{in}-V_{out}$ )                                               | GL1117A-XXX                                                              | $I_o=1\text{A}$ , $(\Delta V_{out}=0.1\% V_{out})$                                                  | -     | 1.3   | 1.4   | V                  |
| Current Limit                                                                         | GL1117A-XXX                                                              | $V_{in}-V_{out}=5\text{V}$                                                                          | 1.1   | -     | -     | A                  |
| Minimum Load Current                                                                  | Adjustable model                                                         | $V_{in}=5\text{V}$                                                                                  | -     | 5     | 10    | mA                 |
| Adjust Pin Current                                                                    | Adjustable model                                                         | $V_{in}=12\text{V}$ , $I_o=10\text{mA}$                                                             | -     | 50    | 100   | $\mu\text{A}$      |
| Quiescent Current                                                                     | fixed model                                                              | $V_{in}=12\text{V}$ , $I_o=0\text{mA}$                                                              | -     | -     | 12    | 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, $I_{out}=1\text{A}$ |                                                                                                     |       |       |       |                    |
|                                                                                       | GL1117A-XXX                                                              | $V_{in}=V_{out}+3\text{V}$                                                                          | -     | 60    | 70    | dB                 |
| Temperature Stability                                                                 | $I_o=10\text{mA}$                                                        |                                                                                                     | -     | 0.5   | -     | %                  |
| $\theta_{JA}$ Thermal Resistance<br>Junction-to-Ambient(No<br>heat sink ;No air flow) |                                                                          |                                                                                                     | -     | 117   | -     | $^\circ\text{C/W}$ |
| $\theta_{JC}$ Thermal Resistance<br>Junction-to-Case                                  | Control Circuitry/Power Transistor                                       |                                                                                                     | -     | 15    | -     | $^\circ\text{C/W}$ |

Note 1: 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.

Note 2: Line and load regulation are guaranteed up to the maximum power dissipation of 3W. Power dissipation is determined by the difference in input and output and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

## Characteristics Curve

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