

# 1A Low Dropout Positive Voltage Regulator

## LM1117-XXXXF3

### Features

- Adjustable or Fixed Output
- Output Current of 1A
- Low Dropout, 1.4V max at 1A Output Current
- Good Noise Rejection
- Output Current Limiting
- Built-in Thermal Shutdown
- Fast Transient Response

### Description

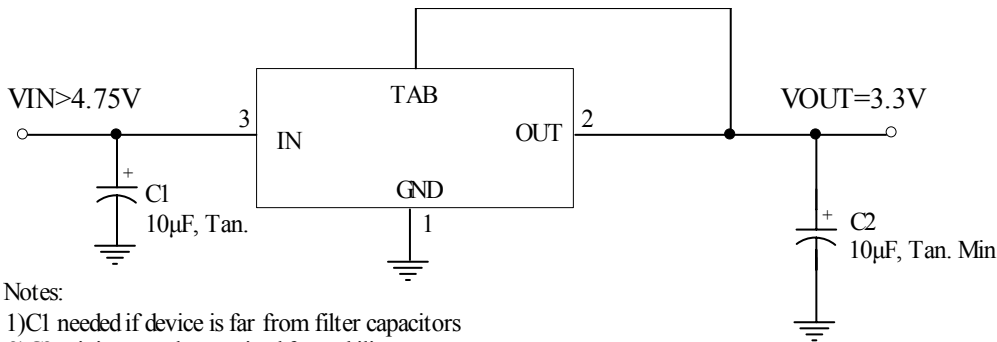
The LM1117 series of positive adjustable and fixed regulators are designed to provide 1A with high efficiency. All internal circuitry is designed to operate down to 1.4V input to output differential. The product is specifically designed to provide well-regulated supply for low-voltage IC application such as high-speed bus termination and low current 3.3V logic supply, and other applications such as VGA cards.

### Applications

- High Efficiency Linear Regulators
- Post Regulators for Switching Supplies
- Adjustable Power Supply

### Typical Application Data

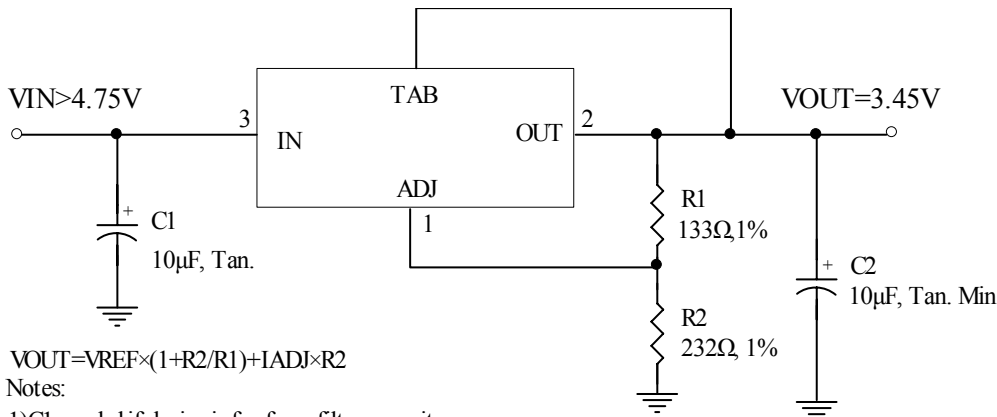
#### Fixed Voltage Regulator



Notes:

- 1)C1 needed if device is far from filter capacitors
- 2)C2 minimum value required for stability

#### Adjustable Voltage Regulator

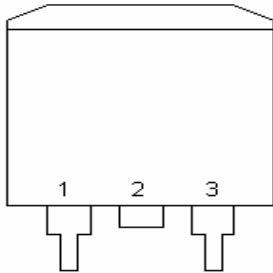


$$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$$

Notes:

- 1)C1 needed if device is far from filter capacitors
- 2)C2 minimum value required for stability

### Package Information



TO-263

| Pin | Name    |
|-----|---------|
| 1   | ADJ/GND |
| 2   | OUTPUT  |
| 3   | INPUT   |

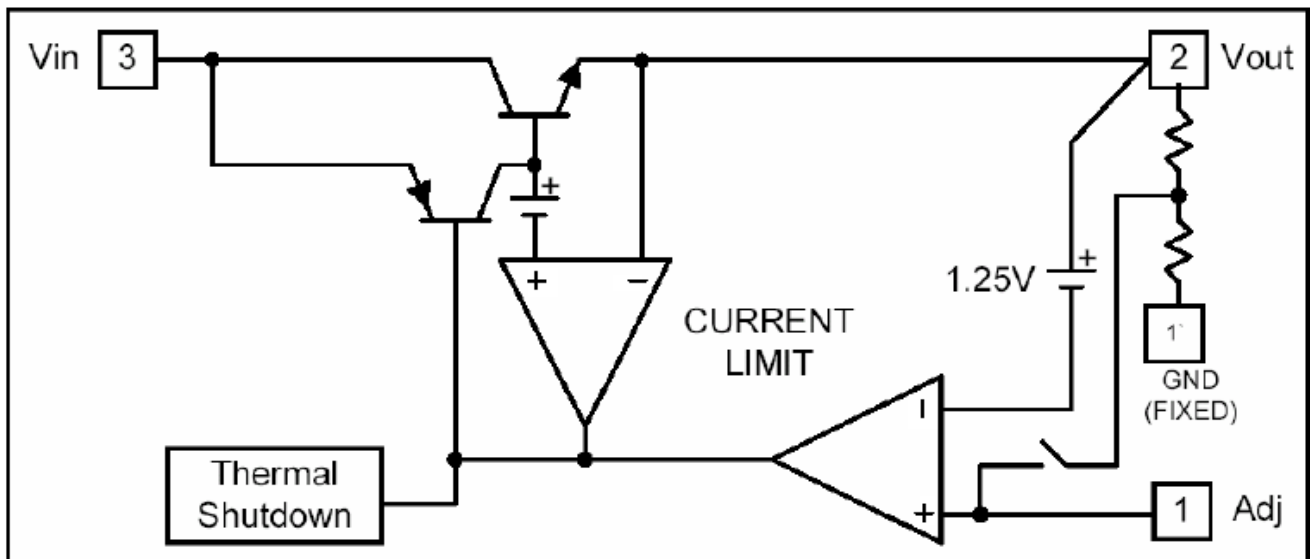
### Absolute Maximum Ratings

| Symbol    | Parameter                            | Maximum    | Units |
|-----------|--------------------------------------|------------|-------|
| $P_D$     | Power Dissipation                    | 1150       | mW    |
| $V_{IN}$  | Input Voltage                        | -0.3 ~ +15 | V     |
| $T_{OPR}$ | Operating Junction Temperature Range | 0 ~ +125   | °C    |
| $T_{STG}$ | Storage Temperature                  | -65 ~ +150 | °C    |
| $T_{MJ}$  | Maximum Junction Temperature         | 150        | °C    |

### Device Selection Guide

| Device     | Output Voltage |
|------------|----------------|
| LM1117-ADJ | Adjustable     |
| LM1117-1.5 | 1.5V           |
| LM1117-1.8 | 1.8V           |
| LM1117-2.5 | 2.5V           |
| LM1117-3.3 | 3.3V           |
| LM1117-5.0 | 5.0V           |

### Block Diagram



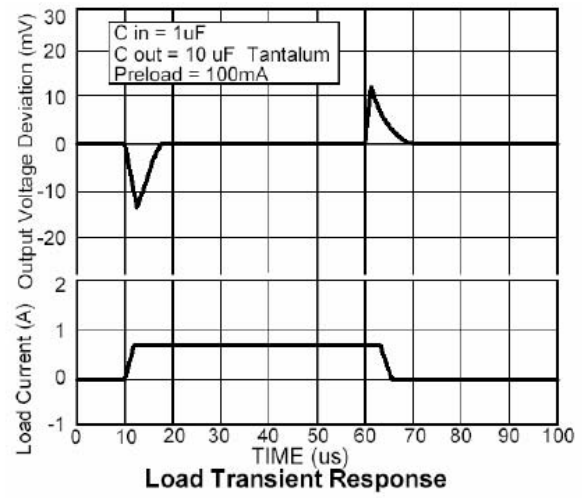
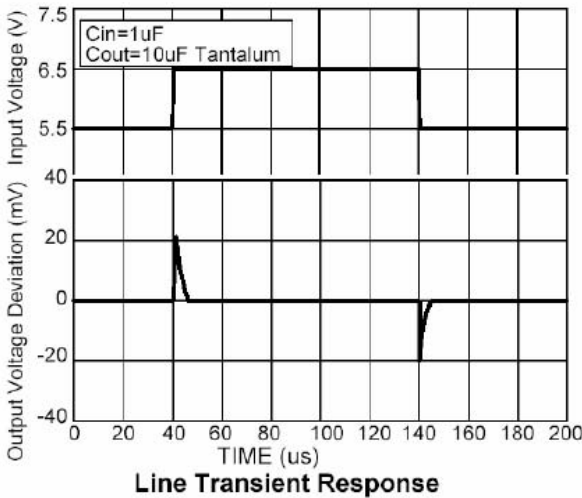
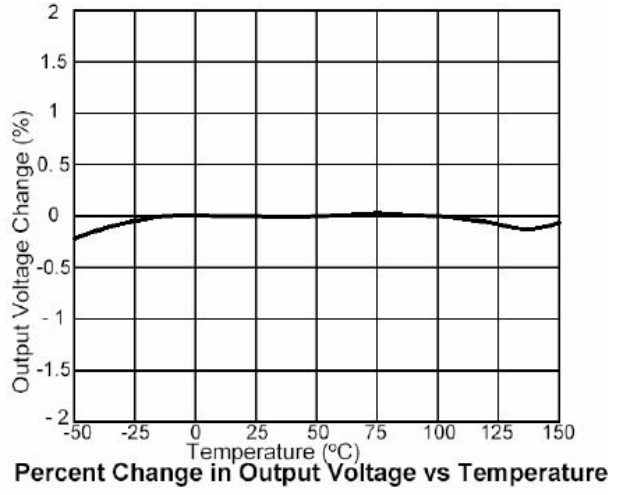
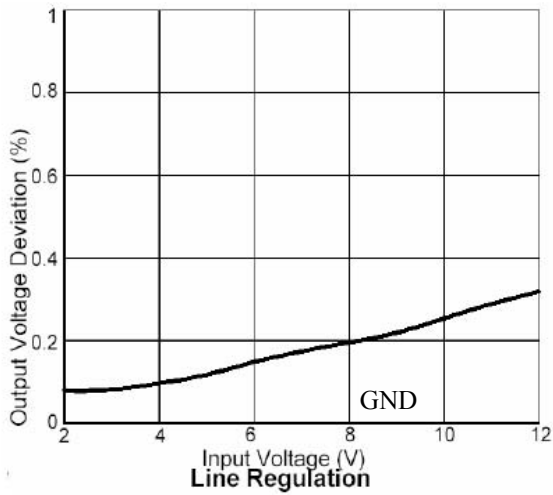
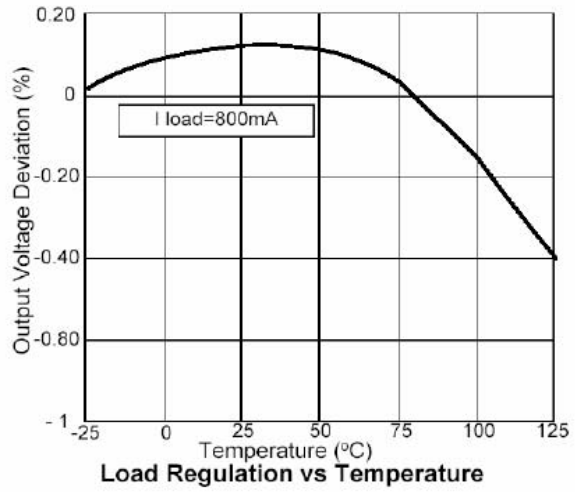
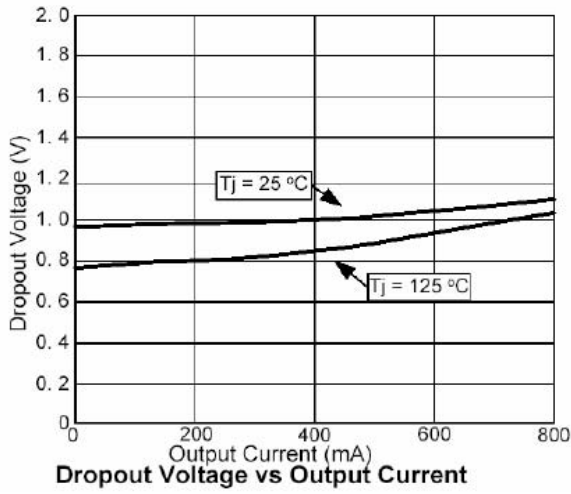


**Electrical Characteristics @  $I_o=10mA, T_J=25^\circ C$ , unless otherwise specified**

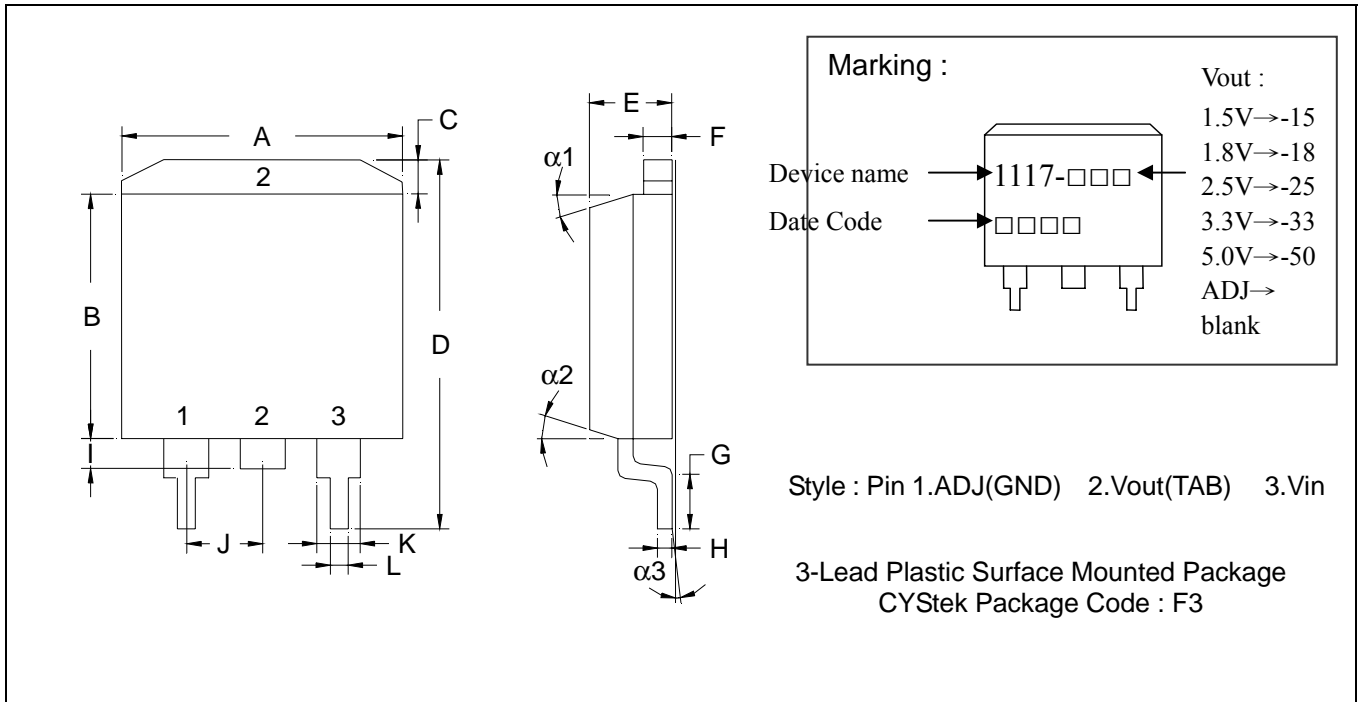
| Parameter   | Device        | Test Conditions  | Min   | Typ      | Max   | Units        |
|---|---------------|--|-------|----------|-------|--------------|
| Reference voltage   | Adj version   | $V_{IN}-V_{OUT}=1.5V$  | 1.225 | 1.250    | 1.275 | V            |
| Output Voltage  | LM1117-1.5    | $3.0V \leq V_{IN} \leq 12V$                                    | 1.470 | 1.500    | 1.530 | V            |
|   | LM1117-1.8    | $3.3V \leq V_{IN} \leq 12V$                                    | 1.764 | 1.800    | 1.836 | V            |
|   | LM1117-2.5    | $4.0V \leq V_{IN} \leq 12V$                                    | 2.450 | 2.500    | 2.550 | V            |
|   | LM1117-3.3    | $4.8V \leq V_{IN} \leq 12V$                                    | 3.235 | 3.300    | 3.365 | V            |
|   | LM1117-5.0    | $6.5V \leq V_{IN} \leq 12V$                                    | 4.900 | 5.000    | 5.100 | V            |
| Line Regulation   | All version   | $V_{OUT}+1.5V \leq V_{IN} \leq 12V$                            | -     | -        | 0.2   | %            |
| Load Regulation<br>(Note 1, 2)  | LM1117-ADJ    | $V_{IN}=3.3V, V_{adj}=0, 10mA \leq I_o \leq 1A$                | -     | -        | 1     | %            |
|   | LM1117-1.5    | $V_{IN}=3.0V, 0mA \leq I_o \leq 1A$                            | -     | 12       | 15    | mV           |
|   | LM1117-1.8    | $V_{IN}=3.3V, 0mA \leq I_o \leq 1A$                            | -     | 15       | 18    | mV           |
|   | LM1117-2.5    | $V_{IN}=4.0V, 0mA \leq I_o \leq 1A$                            | -     | 20       | 25    | mV           |
|   | LM1117-3.3    | $V_{IN}=5.0V, 0mA \leq I_o \leq 1A$                            | -     | 26       | 33    | mV           |
|   | LM1117-5.0    | $V_{IN}=8.0V, 0mA \leq I_o \leq 1A$                            | -     | 40       | 50    | mV           |
| Dropout Voltage<br>( $V_{IN}-V_{OUT}$ )                                   | All version   | $I_o=1A (\Delta V_{OUT}=1\%V_{OUT})$                           | -     | 1.3      | 1.4   | V            |
| Current Limit   | All version   | $V_{IN}-V_{OUT}=5V$  | 1.1   | -        | -     | A            |
| Minimum Load Current  | Adj version   | $V_{IN}=5V$  | -     | 5        | 10    | mA           |
| Adjust Pin Current  | Adj version   | $V_{IN}=12V, I_o=10mA$   | -     | 50       | 100   | $\mu A$      |
| Quiescent Current   | Fixed version | $V_{IN}=12V, I_o=0mA$  | -     | -        | 12    | mA           |
| Thermal Regulation  | All version   | $T_A=25^\circ C, 30ms$ pulse                                   | -     | 0.008    | 0.04  | %/W          |
| Ripple Rejection  | All version   | $f=120Hz, V_{IN}=V_{OUT}+3V, I_o=1A, C_{OUT}=25\mu F$ tantalum | -     | 60       | 70    | dB           |
| Temperature Stability   | All version   | $I_o=10mA$   | -     | 0.5      | -     | %            |
| Thermal Resistance,<br>Junction to Ambient<br>(No heat sink, no air flow) | All version   |  | -     | 85       | -     | $^\circ C/W$ |
| Thermal Resistance,<br>Junction to Case                                   | All version   | Control Circuitry/ Power transistor                            | -     | 0.65/2.7 | -     | $^\circ C/W$ |

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.  
 2. Line and load regulation are guaranteed up to the maximum power dissipation of 15W. 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.

**Characteristic Curves**



**TO-263 Dimension**



\*:Typical

| DIM | Inches |        | Millimeters |       | DIM        | Inches |         | Millimeters |       |
|-----|--------|--------|-------------|-------|------------|--------|---------|-------------|-------|
|     | Min.   | Max.   | Min.        | Max.  |            | Min.   | Max.    | Min.        | Max.  |
| A   | 0.3800 | 0.4050 | 9.65        | 10.29 | I          | 0.0500 | 0.0700  | 1.27        | 1.78  |
| B   | 0.3300 | 0.3700 | 8.38        | 9.40  | J          | -      | *0.1000 | -           | *2.54 |
| C   | -      | 0.0550 | -           | 1.40  | K          | 0.0450 | 0.0550  | 1.14        | 1.40  |
| D   | 0.5750 | 0.6250 | 14.61       | 15.88 | L          | 0.0200 | 0.0390  | 0.51        | 0.99  |
| E   | 0.1600 | 0.1900 | 4.06        | 4.83  | $\alpha 1$ | -      | -       | 6°          | 8°    |
| F   | 0.0450 | 0.0550 | 1.14        | 1.40  | $\alpha 2$ | -      | -       | 6°          | 8°    |
| G   | 0.0900 | 0.1100 | 2.29        | 2.79  | $\alpha 3$ | -      | -       | 0°          | 5°    |
| H   | 0.0180 | 0.0290 | 0.46        | 0.74  |            |        |         |             |       |

**Notes :** 1.Controlling dimension : millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material :**

- Lead : 42 Alloy ; solder plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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