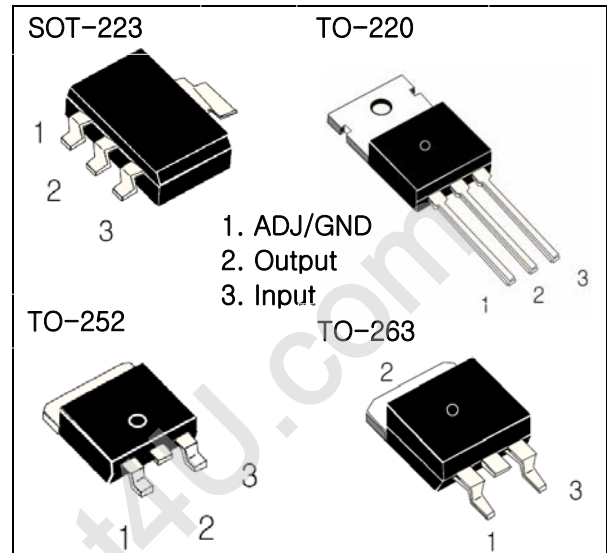


1.0A Low Dropout Positive Voltage Regulator IL1117-xx

Features

- Adjustable and Fixed of 1.2, 1.25, 1.5, 1.8, 2.5, 2.85, 3.3, 5.0V
- Space saving SMD types of SOT-223
- 1.2V Drop-out Voltage
- 1.0A Output Current
- Line Regulation Typically at 0.2% max
- Current Limiting and Thermal Protection



General Description

The IL1117 is a series of low dropout voltage regulators which can provide up to 1A of output current. The IL1117 is available in seven fixed voltage, 1.2, 1.25, 1.5, 1.8, 2.5, 2.85, 3.3 and 5.0V. Additionally it is also available in adjustable version. On chip precision trimming adjusts the reference/output voltage to within $\pm 2\%$. Current limit is also trimmed to ensure specified output current and controlled short-circuit current. The IL1117 series is available in SOT-223 packages. A minimum of 10uF tantalum capacitor is required at the output to improve the transient response and stability.

Applications

- Post Regulator for switching DC/DC Converter
- High Efficiency Linear Regulator
- Battery Chargers
- PC Add on Card
- Motherboard clock supplies
- LCD Monitor
- Set-top Box

Absolute Maximum Ratings

- Maximum Input Voltage ~ 15.0V
- Operating Junction Temperature Range $-25^{\circ}\text{C} \sim 125^{\circ}\text{C}$
- Storage Temperature Range $-50^{\circ}\text{C} \sim 150^{\circ}\text{C}$

Electrical Characteristics

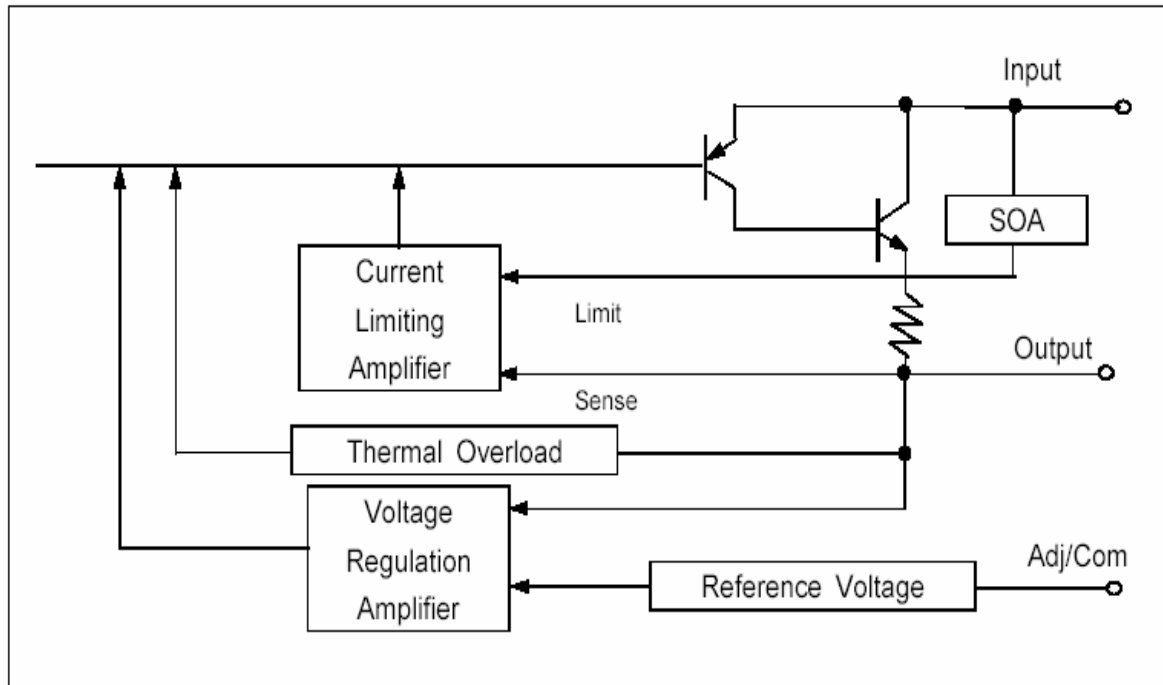
($V_{in} = 5V$, $C_o = 10\mu F$, $T_a = 25^\circ C$, unless otherwise specified)

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNIT |
|--|---|-------|----------------------|----------------------|--------------------|
| OUTPUT VOLTAGE | $T_j = -25^\circ C$ to $+125^\circ C$ | | | | |
| IL1117-1.2 | $I_o = 10mA$ to $1.0A$, $V_{in} = 2.7$ to $12.0V$ | 1.176 | 1.200 | 1.224 | V |
| IL1117-1.25 (Adjustable) | $I_o = 10mA$ to $1.0A$, $V_{in} = 2.8$ to $12.0V$ | 1.225 | 1.250 | 1.280 | |
| IL1117-1.5 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.0$ to $12.0V$ | 1.470 | 1.500 | 1.530 | |
| IL1117-1.8 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.3$ to $12.0V$ | 1.764 | 1.800 | 1.836 | |
| IL1117-2.5 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.0$ to $12.0V$ | 2.450 | 2.500 | 2.550 | |
| IL1117-2.85 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.4$ to $12.0V$ | 2.790 | 2.850 | 2.910 | |
| IL1117-3.3 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.8$ to $12.0V$ | 3.240 | 3.300 | 3.360 | |
| IL1117-5.0 | $I_o = 10mA$ to $1.0A$, $V_{in} = 6.5$ to $15.0V$ | 4.900 | 5.000 | 5.100 | |
| LINE REGULATION | | | | | |
| IL1117-1.2 | $I_o = 10mA$ to $1.0A$, $V_{in} = 2.7$ to $12.0V$ | | 0.1 | 0.2 | % |
| IL1117-1.25 (Adjustable) | $I_o = 10mA$ to $1.0A$, $V_{in} = 2.8$ to $12.0V$ | | 2.0 | 7.0 | mV |
| IL1117-1.5 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.0$ to $12.0V$ | | 2.0 | 7.0 | mV |
| IL1117-1.8 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.3$ to $12.0V$ | | 2.0 | 7.0 | mV |
| IL1117-2.5 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.0$ to $12.0V$ | | 2.0 | 7.0 | mV |
| IL1117-2.85 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.4$ to $12.0V$ | | 2.0 | 7.0 | mV |
| IL1117-3.3 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.8$ to $12.0V$ | | 3.0 | 7.0 | mV |
| IL1117-5.0 | $I_o = 10mA$ to $1.0A$, $V_{in} = 6.5$ to $15.0V$ | | 4.0 | 10.0 | mV |
| LOAD REGULATION | | | | | |
| IL1117-1.2 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.2V$ | | 0.2 | 0.4 | % |
| IL1117-1.25 (Adjustable) | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.3V$ | | 3.0 | 10.0 | mV |
| IL1117-1.5 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.5V$ | | 3.0 | 10.0 | mV |
| IL1117-1.8 | $I_o = 10mA$ to $1.0A$, $V_{in} = 3.8V$ | | 3.0 | 10.0 | mV |
| IL1117-2.5 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.5V$ | | 3.0 | 10.0 | mV |
| IL1117-2.85 | $I_o = 10mA$ to $1.0A$, $V_{in} = 4.85V$ | | 3.0 | 10.0 | mV |
| IL1117-3.3 | $I_o = 10mA$ to $1.0A$, $V_{in} = 5.3V$ | | 4.0 | 12.0 | mV |
| IL1117-5.0 | $I_o = 10mA$ to $1.0A$, $V_{in} = 7.0V$ | | 5.0 | 15.0 | mV |
| DROPOUT VOLTAGE (2) | | | | | |
| All Models | $I_o = 800mA$ $I_o = 1A$ $I_o = 1A$ ($T_j = -25^\circ C$ to $+125^\circ C$.) | | 1.10 1.20 1.20 | 1.20 1.30 1.55 | V |
| CURRENT LIMIT | $V_{in} = 5V$ | 1000 | 1250 | 1600 | mA |
| MINIMUM LOAD CURRENT | | | | | |
| Adjustable Models | $V_{in} = 13.75V$ | | | 5 | mA |
| QUIESCENT CURRENT | $V_{in} = 5V$ | | 5.2 | 10 | mA |
| Adjust Pin Current vs Load Current, IL1117 | $I_o = 10mA$, $V_{in} = 1.4$ to $10V$ $I_o = 10mA$ to $1A$, $V_{in} = 1.4$ to $10V$ | | 50 0.5 | 120 5 | μA μA |
| TEMPERATURE DRIFT | $T_j = -25^\circ C$ to $+125^\circ C$ | | 0.5 | | % |
| RMS Output Noise | Bandwidth of $10Hz$ to $10kHz$ at $25^\circ C$ | | 0.003 | | % V_o |
| Ripple Rejection Ratio | $120Hz$ input Ripple(C_{adj} for ADJ) = $25\mu F$ $V_{in} - V_o = 5V$, $I_o = 1.0A$ $T_j = -25^\circ C$ to $+125^\circ C$ | 60 | 72 | | dB |

NOTES: (1) IL1117-x adjustable versions require a minimum load current for $\pm 3\%$ regulation.

(2) Dropout voltage is the input voltage minus output voltage that produces a 1% decrease in output voltage.

Block Diagram



Application Information

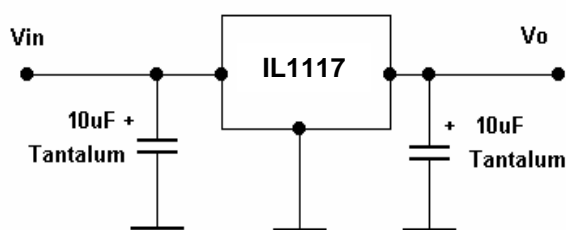


FIGURE 1. Fixed-Voltage Model
—Basic Connections.

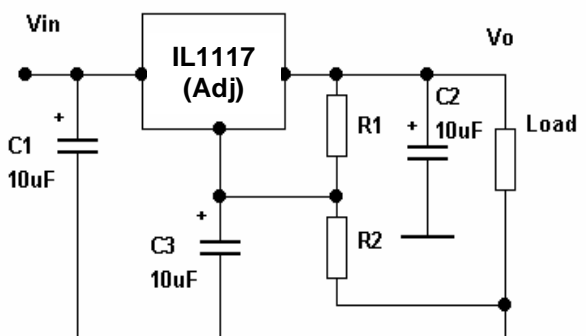
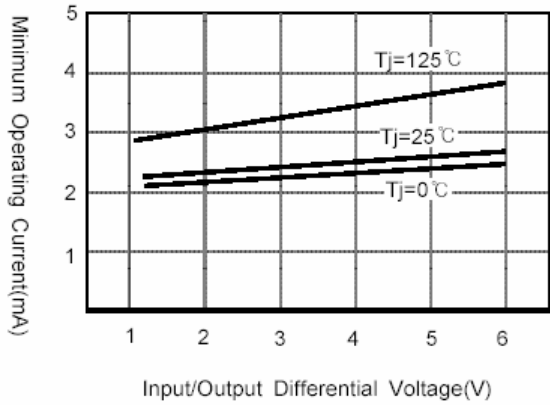


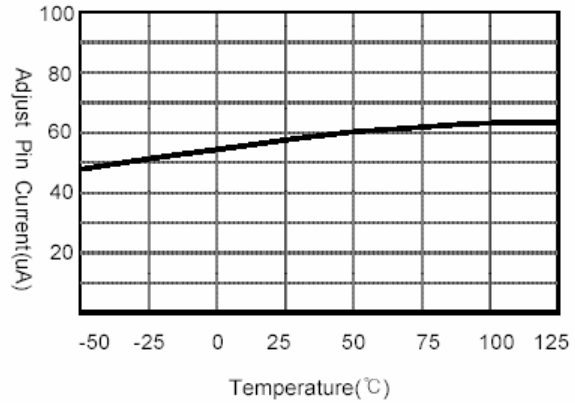
FIGURE 2. Adjustable-Voltage Model
--Basic Connections.

TYPICAL PERFORMANCE CHARACTERISTICS

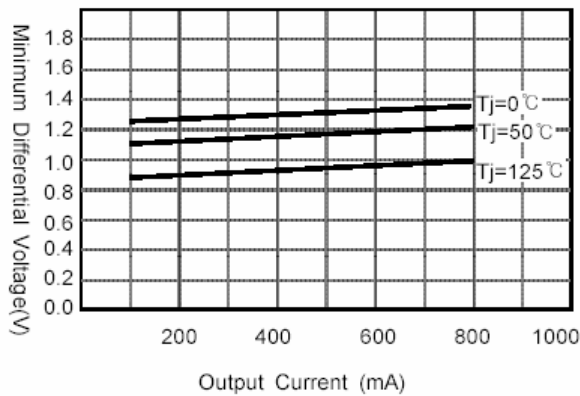
Minimum Load Current(Adjustable)



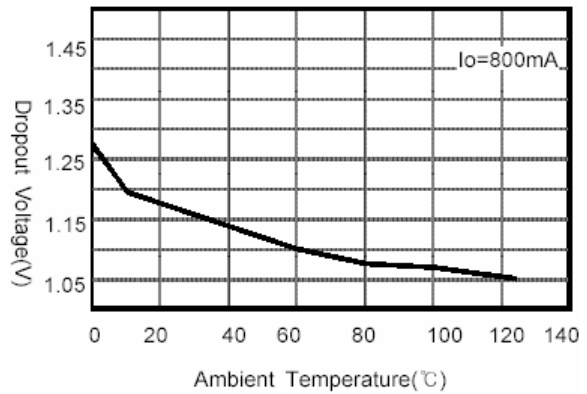
Adjust Pin Current



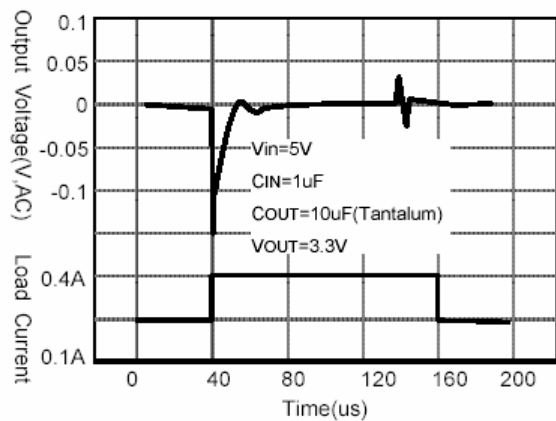
Dropout Voltage



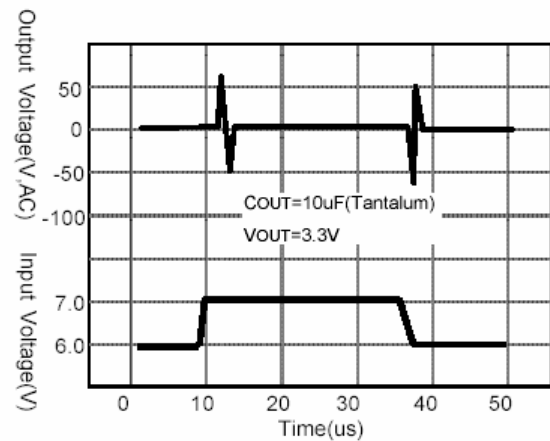
Dropout Voltage - Temperature



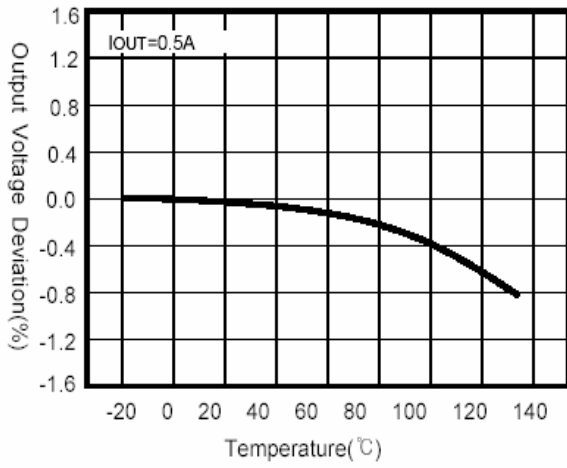
Load Transient Response



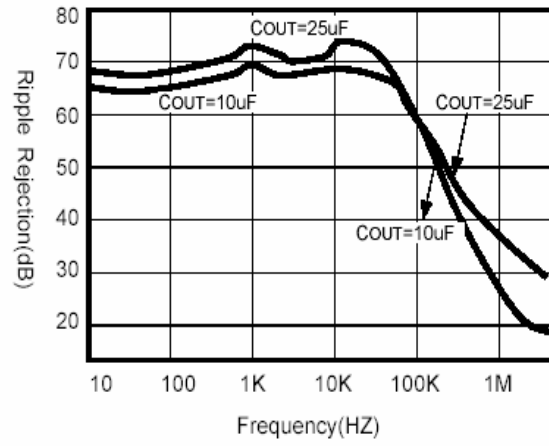
Line Transient Response



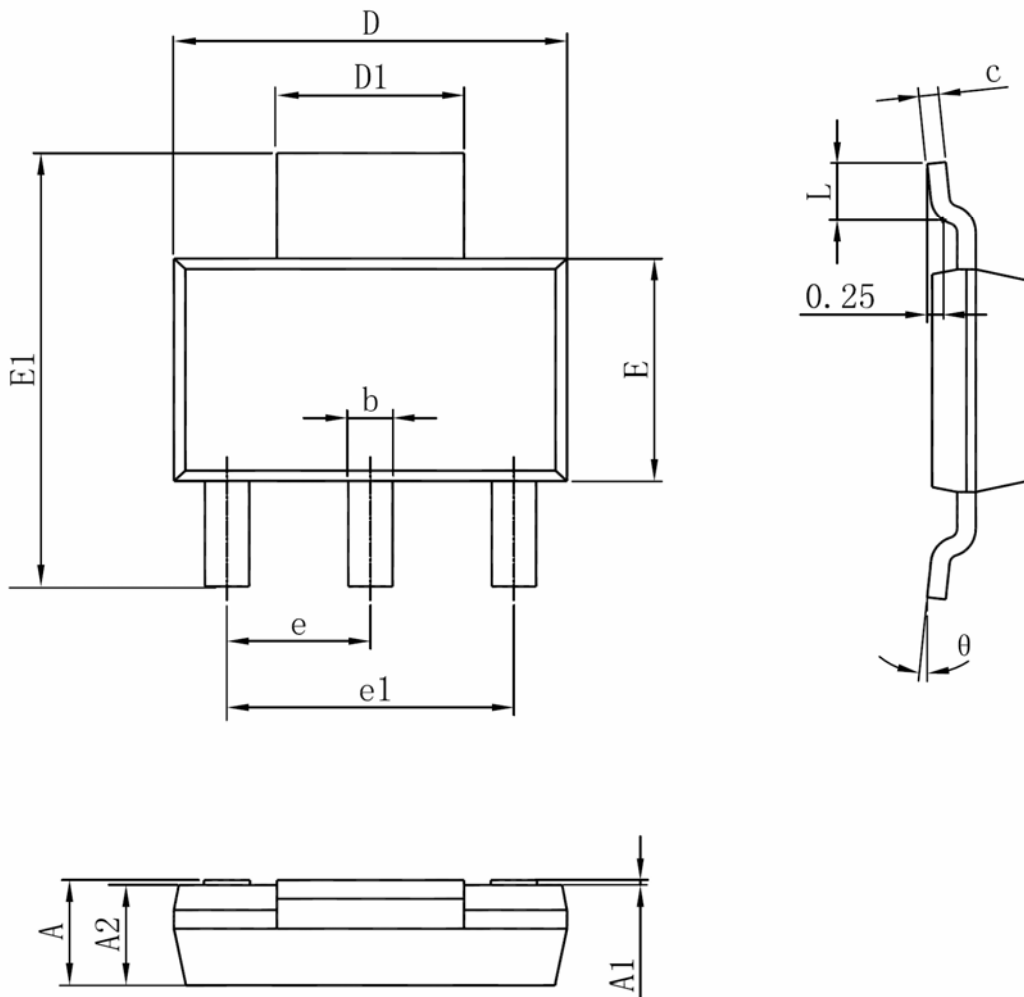
Temperature Stability



Ripple Rejection(with Cadj 25uF)

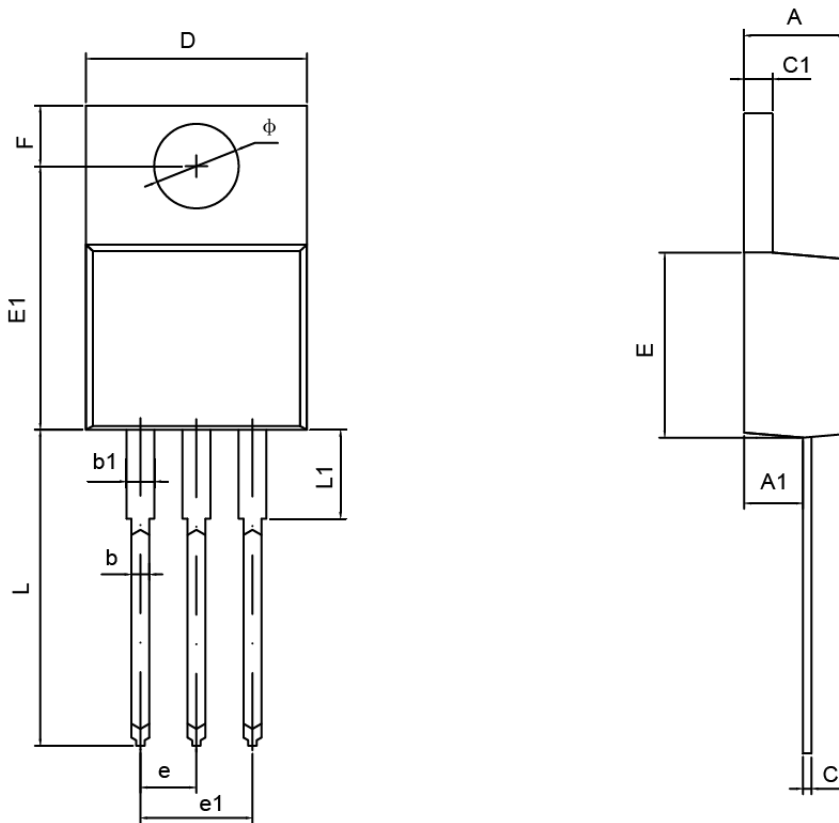


SOT-223 PACKAGE OUTLINE DIMENSIONS



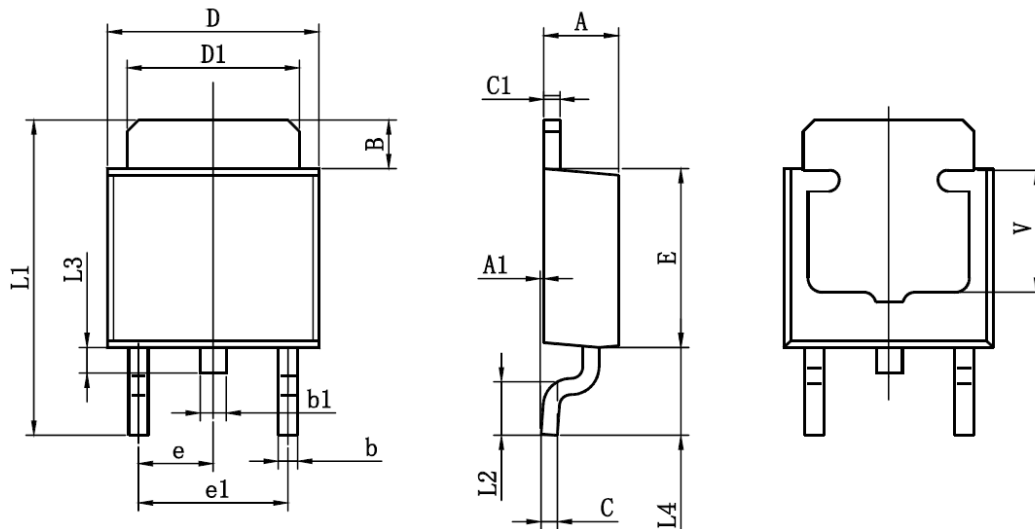
| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.520 | 1.800 | 0.060 | 0.071 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.500 | 1.700 | 0.059 | 0.067 |
| b | 0.660 | 0.820 | 0.026 | 0.032 |
| c | 0.250 | 0.350 | 0.010 | 0.014 |
| D | 6.200 | 6.400 | 0.244 | 0.252 |
| D1 | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 3.300 | 3.700 | 0.130 | 0.146 |
| E1 | 6.830 | 7.070 | 0.269 | 0.278 |
| e | 2.300(BSC) | | 0.091(BSC) | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L | 0.900 | 1.150 | 0.035 | 0.045 |
| θ | 0° | 10° | 0° | 10° |

TO-220-3L PACKAGE OUTLINE DIMENSIONS



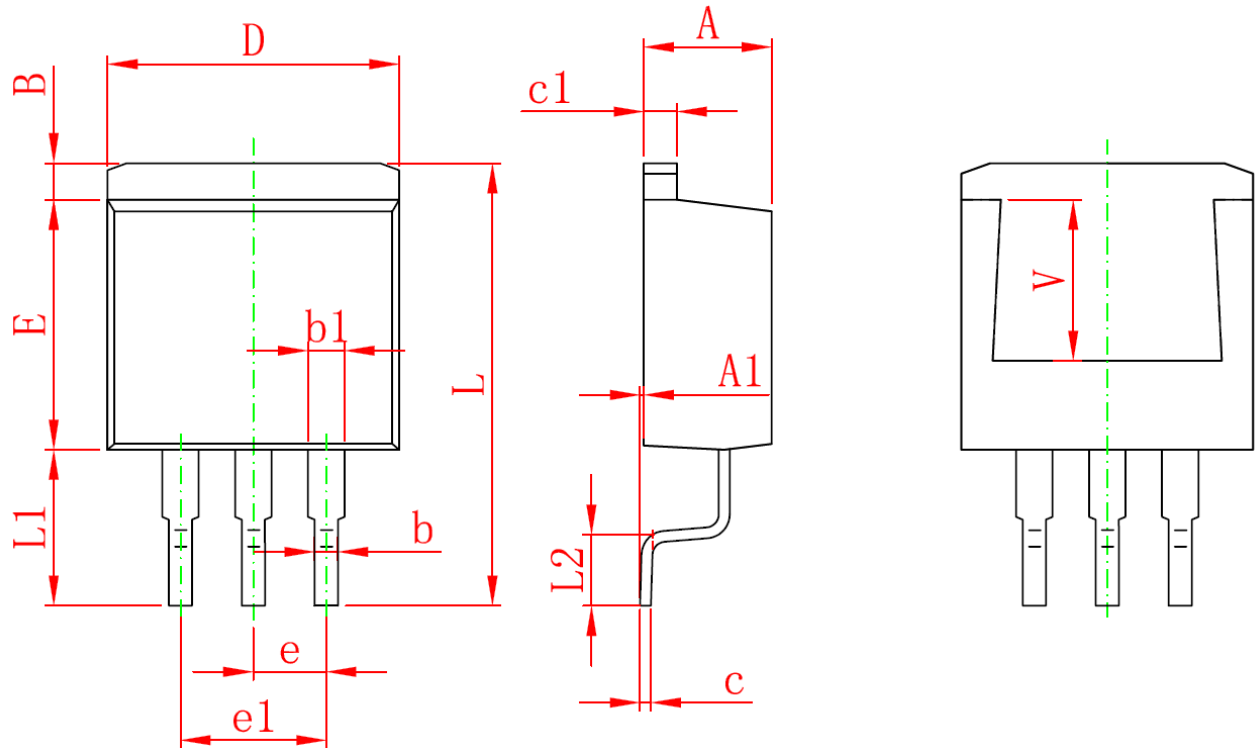
| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.470 | 4.670 | 1.176 | 0.184 |
| A1 | 2.520 | 2.820 | 0.099 | 0.111 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.710 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| E1 | 12.060 | 12.460 | 0.475 | 0.491 |
| e | 2.540TYP | | 0.100TYP | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| F | 2.590 | 2.890 | 0.102 | 0.114 |
| L | 13.400 | 13.800 | 0.528 | 0.543 |
| L1 | 3.560 | 3.960 | 0.140 | 0.156 |
| ϕ | 3.790 | 3.890 | 0.149 | 0.153 |

TO-252-2L PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| B | 1.350 | 1.650 | 0.053 | 0.065 |
| b | 0.500 | 0.700 | 0.020 | 0.028 |
| b1 | 0.700 | 0.900 | 0.028 | 0.035 |
| c | 0.430 | 0.580 | 0.017 | 0.023 |
| c1 | 0.430 | 0.580 | 0.017 | 0.023 |
| D | 6.350 | 6.650 | 0.250 | 0.262 |
| D1 | 5.200 | 5.400 | 0.205 | 0.213 |
| E | 5.400 | 5.700 | 0.213 | 0.224 |
| e | 2.300TYP | | 0.091TYP | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L1 | 9.500 | 9.900 | 0.374 | 0.390 |
| L2 | 1.400 | 1.780 | 0.055 | 0.070 |
| L3 | 0.650 | 0.950 | 0.026 | 0.037 |
| L4 | 2.550 | 2.900 | 0.100 | 0.114 |
| V | 3.80REF | | 0.150REF | |

TO-263-3L PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.470 | 4.670 | 0.176 | 0.184 |
| A1 | 0.000 | 0.150 | 0.000 | 0.006 |
| B | 1.170 | 1.370 | 0.046 | 0.054 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| e | 2.540 TYP | | 0.100 TYP | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| L | 15.050 | 15.450 | 0.593 | 0.608 |
| L1 | 5.080 | 5.480 | 0.200 | 0.216 |
| L2 | 2.340 | 2.740 | 0.092 | 0.108 |
| V | 5.600 REF | | 0.220 REF | |