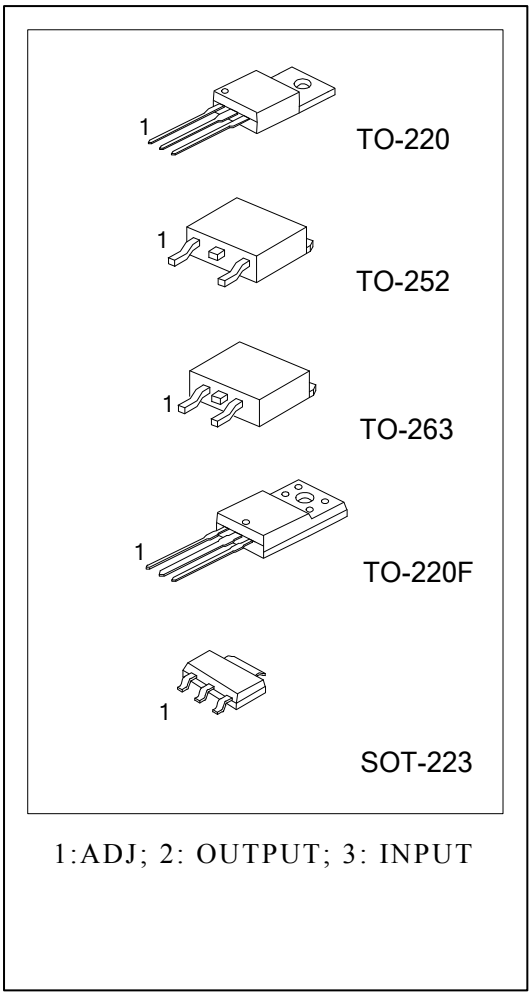
# HIGH CURRENT ADJUSTABLE VOLTAGE REGULATOR BL317B

## DESCRIPTION

The BL317B is an adjustable 3-terminal positive voltage regulator, designed to supply more than 1.5A of output current with voltage adjustable from1.3V ~ 37V.




1:ADJ; 2: OUTPUT; 3: INPUT

## FEATURES

- Output current up to 1.5A
- Output voltage adjustable from 1.3V to 37V
- Internal short circuit protection
- Internal over temperature protection
- Safe-Area compensation for output transistor

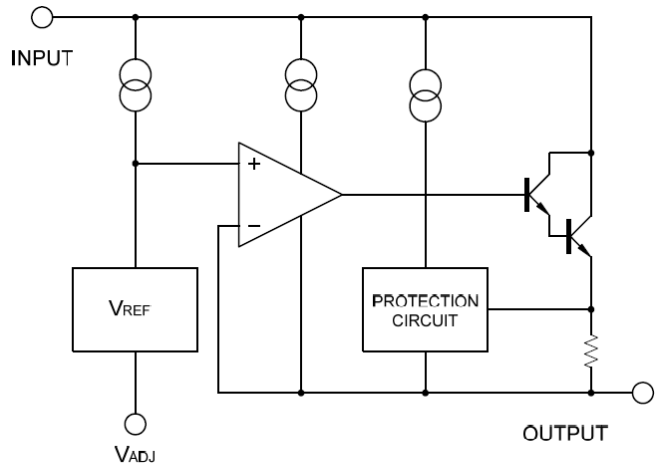
## APPLICATIONS

- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD Player
- Network Interface Card/Switch
- Telecom Equipment
- Printer and other Peripheral Equipment

## ORDERING INFORMATION

| Device | Package | Shipping |
|---|---|---|
| BL317BT | TO-220 | Tube |
| BL317BF | TO-220F | Tube |
| BL317BY-B | TO-252 | 2500pcs/Reel |
| BL317BY-T | TO-252 | 80pcs/Tube |
| BL317BK | TO-263-2L | Reel |
| BL317BS | SOT-223 | Reel |

## BLOCK DIAGRAM




## ABSOLUTE MAXIMUM RATINGS (Ta= 25 °C) *

| Characteristic | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Input - Output Voltage Difference | Vin-Vout | | 40 | V |
| Power Dissipation | Pd | Internal limited | | |
| Operating Temperature Range | TOPR | -15 | 125 | °C |
| Storage temperature | $T_S$ | -65 | 150 | °C |
| Lead temperature (soldering, 10sec) | $T_{LEAD}$ | | 260 | °C |

*: Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

## ELECTRICAL CHARACTERISTICS

（VI-VO=5V,0°C <Tj<125°C,IO=500mA,IMAX=1.5A,PMAX=20W ,unless otherwise specified）

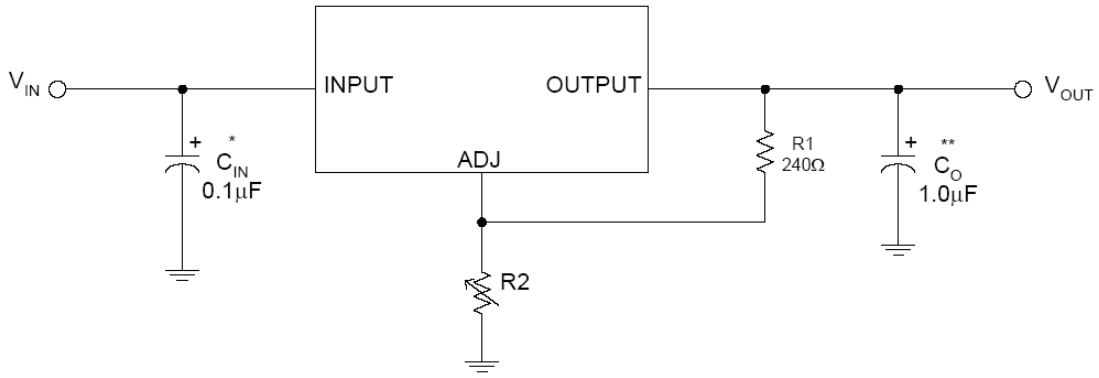
| Parameter | Symbol | Test conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Line Regulation | ΔVO | Ta=25°C,3V≤VI-VO≤40V | | | 0.01 | 0.04 | %/V |
| | | Ta=0-125°C,3V≤VI-VO≤40V | | | 0.02 | 0.07 | |
| Load Regulation | ΔVO | Ta=25°C<br>10mA≤IO≤IMAX | VO≤6V | | 18 | 25 | mV |
| | | | VO≤5V | | 0.4 | 0.5 | %/VO |
| | | 10mA≤IO≤IMAX<br>Ta=0-125°C | VO≤5V | | 40 | 70 | mV |
| | | | VO≤6V | | 0.8 | 1.5 | %/VO |
| Adjustable Pin current | IADJ | | | | 46 | 100 | μA |
| Adjustable Pin Current Change | ΔIADJ | 2.5V≤VI-VO≤40V,<br>10 mA≤Io≤IMAX,PD≤PMAX | | | 2.0 | 5 | μA |
| Reference Voltage | VREF | 3V≤VI-VO≤40V,<br>10 mA≤IO≤IMAX,PD≤PMAX | | 1.20 | 1.25 | 1.30 | V |
| Temperature Stability | STT | | | | 0.7 | | %/VO |
| Minimum Load Current for regulation | IL(MIN) | VI-VO=40V | | | 3.5 | 10 | mA |
| Maximum output Current | IO(MAX) | VI-VO≤15V,PD≤PMAX | | 1.5 | 2.2 | | A |
| | | VI-VO≤40V,PD≤PMAX,<br>Ta=25°C | | 0.15 | 0.4 | | |
| RMS Noise v.s. % of Vout | eN | TA=25°C,10HZ≤f≤10KHZ | | | 0.003 | 0.01 | %/VO |
| Ripple Rejection | RR | VO=10V,f=120HZ,CADJ=0 | | | 60 | | dB |
| | | VO=10V,f=120HZ,CADJ=10μF | | 66 | 75 | | |
| Long-term Stability, TJ=THIGH | ST | TA=25°C,1000 hr | | | 0.3 | 1 | % |

Note: Testing with low duty pulse should be used to avoid heating effect.

## THERMAL DATA

| Parameter | | Symbol | RATING | UNITS |
|---|---|---|---|---|
| Junction- to-Ambient | TO-252 | θJA | 112 | ℃/W |
| | TO-220 | | 54 | |
| | TO-220F | | 44 | |
| | TO-263 | | 64 | |
| | SOT-223 | | 165 | |
| Junction- to-Case | TO-252 | θJC | 12 | ℃/W |
| | TO-220 | | 5 | |
| | TO-220F | | 5 | |
| | TO-263 | | 5 | |
| | SOT-223 | | 23 | |

## APPLICATION CIRCUIT




* = $C_{IN}$ is required if the regulator is located near power supply filter.

**= $C_O$ is needed for stability and it improves transient response.

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

Since $I_{ADJ}$ is controlled to less than 100μA, the error associated with this term is negligible in most applications.

## CHARACTERISTICS CURVES

Fig.1. Load Regulation vs temperature

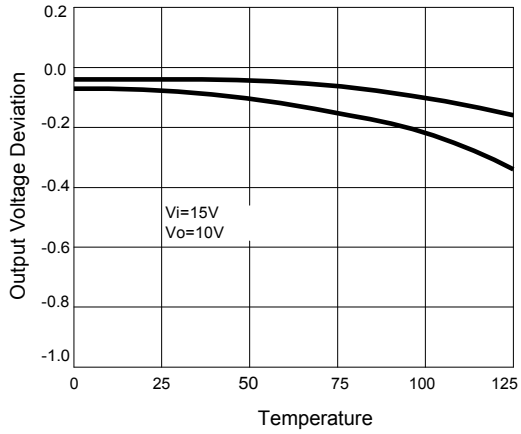



Fig.2 Adjustment Current vs Temperature

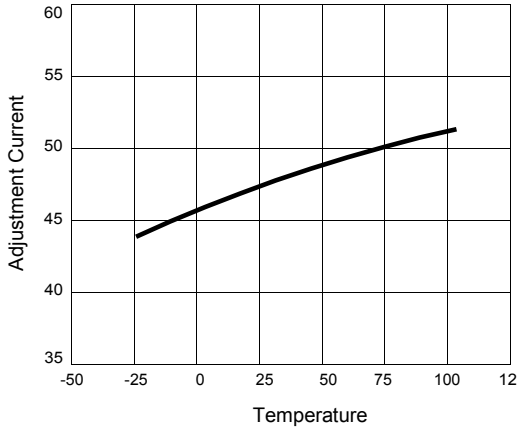



Fig.3. Dropout Voltage vs Input-Output Voltage Difference

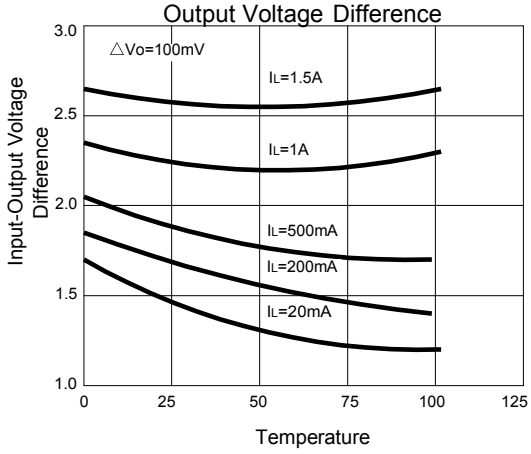
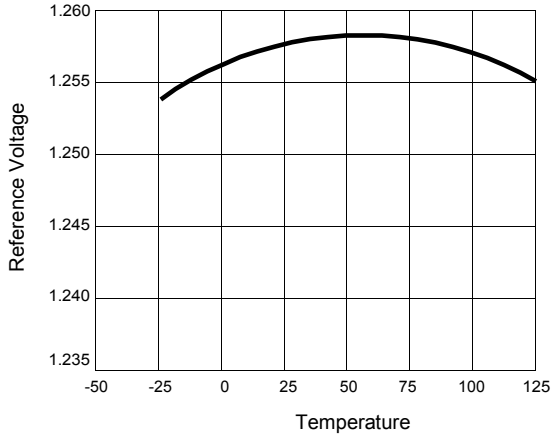
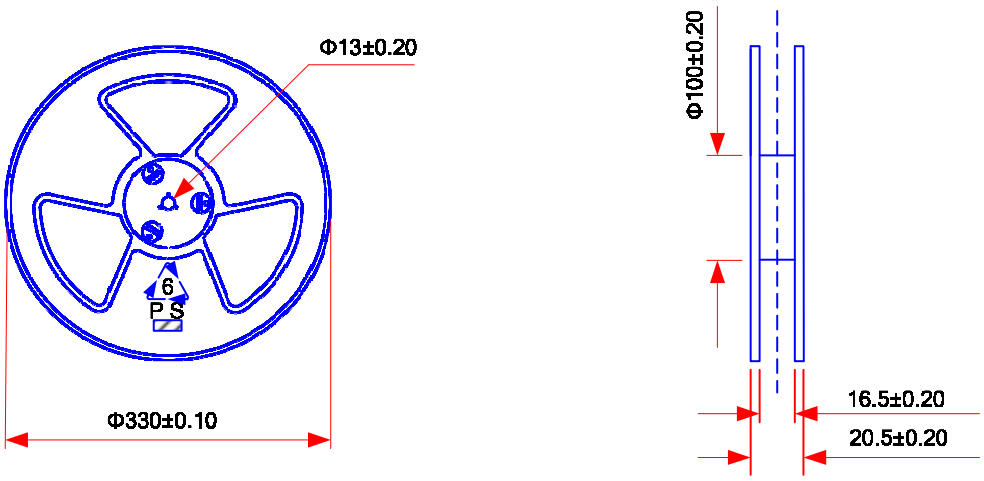



Fig.4 Reference Voltage vs Temperature



Taping reel dimension：

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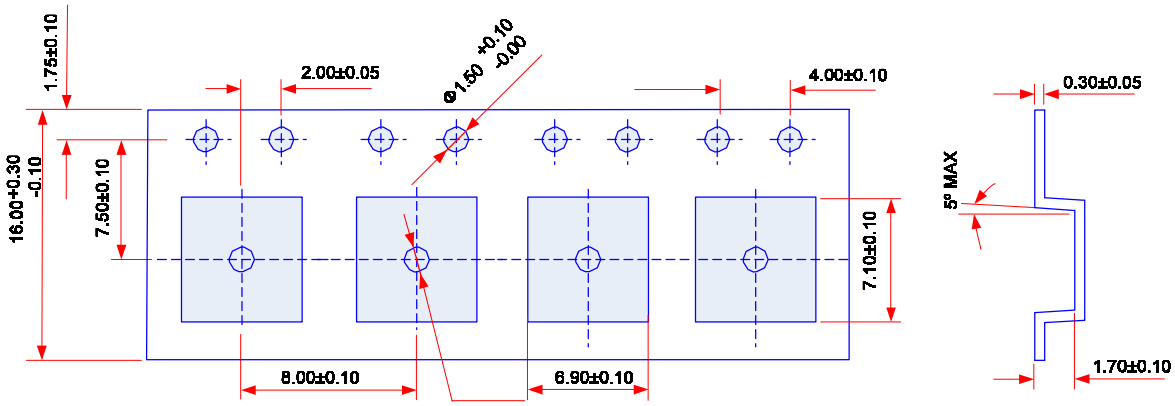
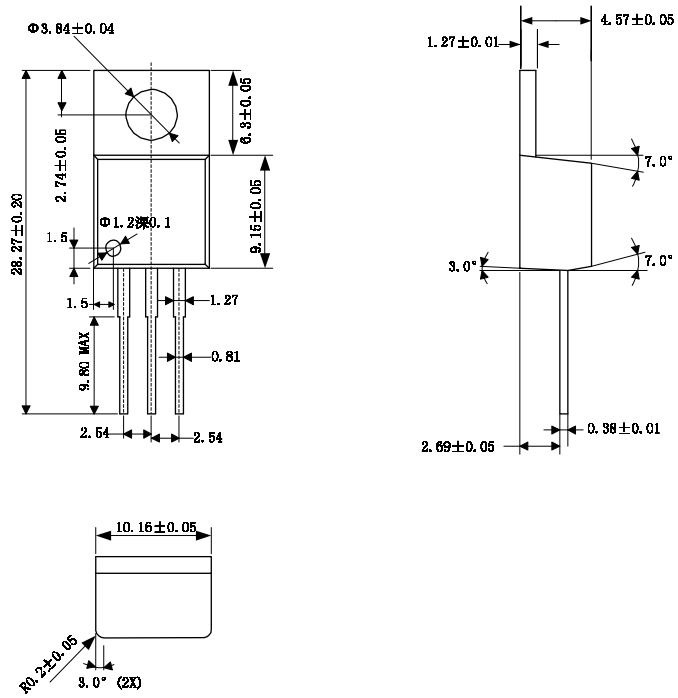
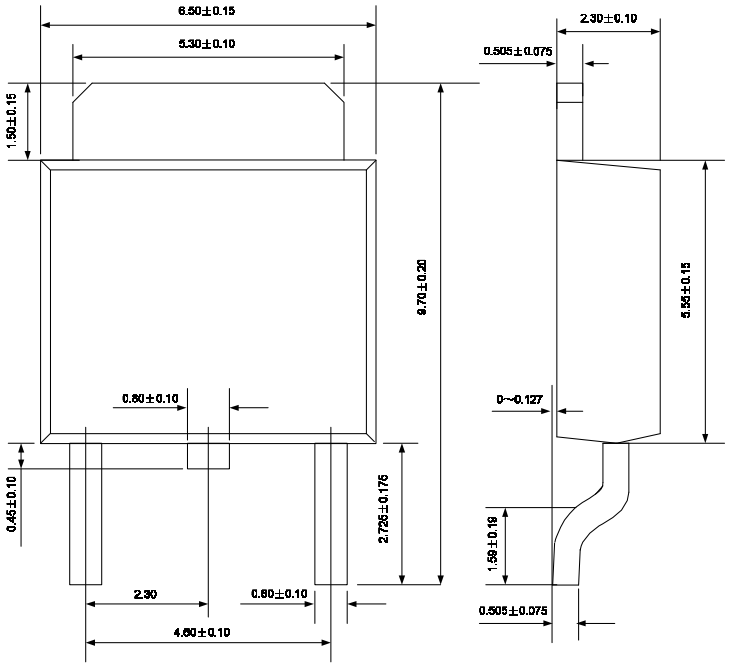


## PACKAGE DIMENSIONS

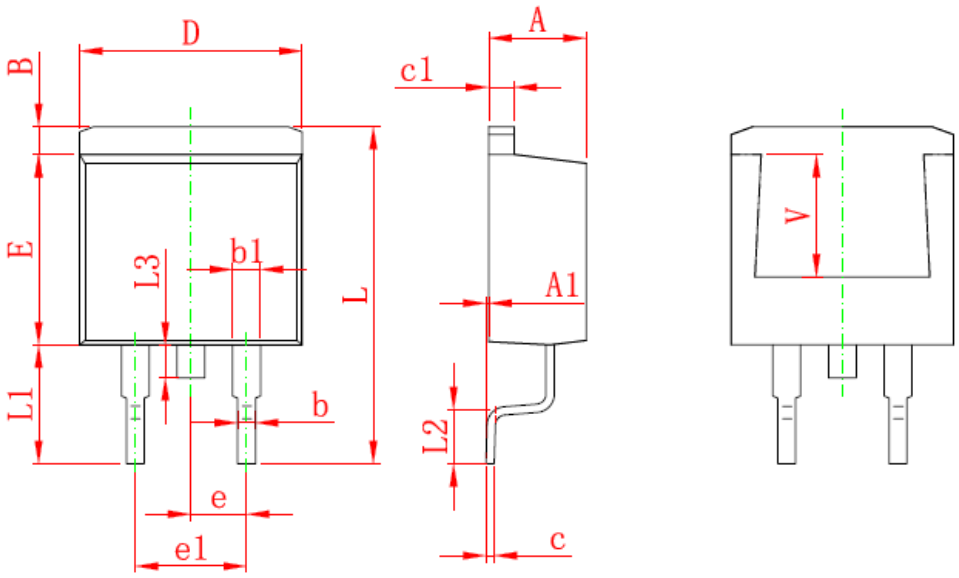
TO-220
Unit: mm




TO-252
Unit: mm

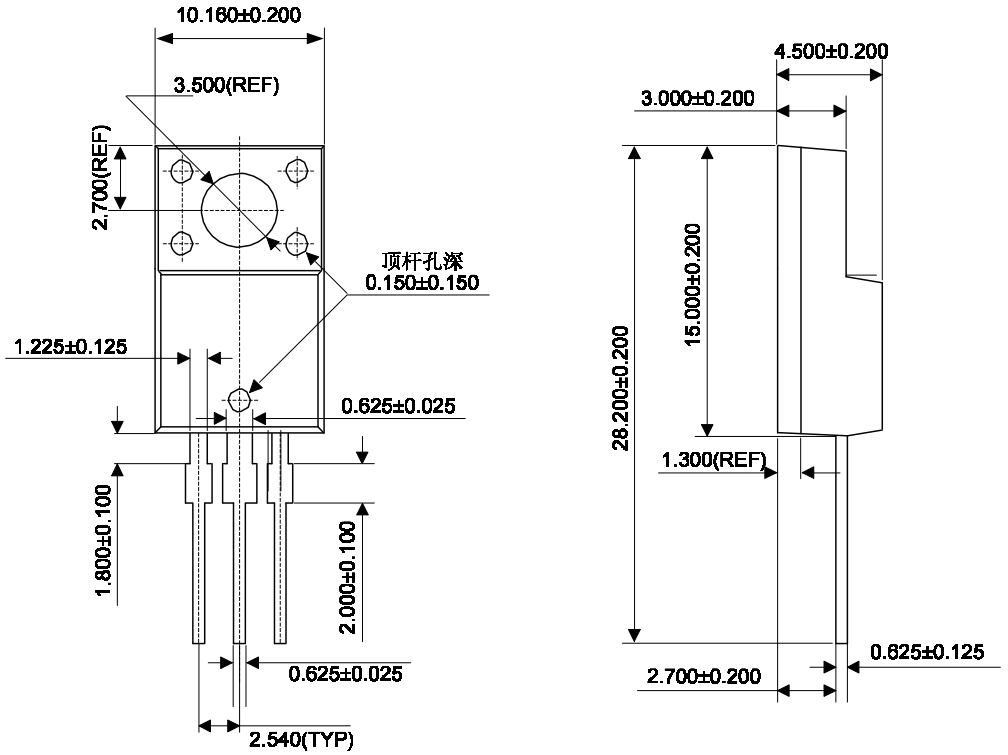


TO-263
Unit: mm




| 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 |
| L3 | 1.300 | 1.700 | 0.051 | 0.067 |
| V | 5.600 REF | | 0.220 REF | |

TO-220F
Unit: mm



SOT-223
Unit: mm