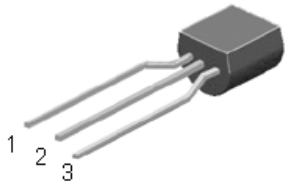
# High Voltage NPN Power Transistor with Diode

## Features

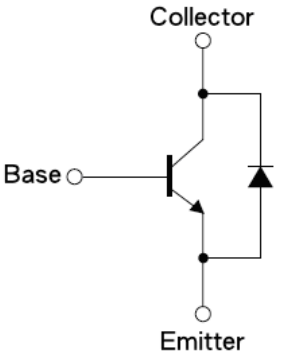
- High Voltage
- $BV_{CEO}$ : 400V
- $BV_{CBO}$ : 800V
- $I_C$ : 2A
- Silicon Triple Diffused Type
- NPN Silicon Transistor with Diode
- Free-wheeling Diode Inside
- Low Variable Storage-time Spread
- Low Base Drive Requirement
- Half Bridge Light Ballast Application




TO-92

Pin Definition
1. Emitter
2. Collector
3. Base

INTERNAL SCHMATIC DIAGRAM




## Application

- Electronic Ballasts
- Adapter
- Lighting

## ABSOLUTE MAXIMUM RATINGS ( Tc = 25℃ )

| Parameter | Symbol | Max rating | Unit |
|---|---|---|---|
| Collector-Base Voltage | VCBO | 800 | V |
| Collector-Emitter Voltage | VCEO | 400 | V |
| Emitter-Base Voltage | VEBO | 10 | V |
| Collector Current (DC) | $I_C$ | 2 | A |
| Collector Current (Pulse) | | 4 | A |
| Base Current (DC) | $I_B$ | 0.5 | A |
| Base Current (Pulse) | | 1 | A |
| Total Power Dissipation ( TO-92 ) | PD | 1.5 | W |
| Junction Temperature | TJ | +150 | ℃ |
| Operating Junction and Storage Temperature Range | TSTG | -65 ~ +150 | ℃ |

## ELECTRICAL CHARACTERISTICS ( Tc = 25℃ )

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Voltage | BVCBO | IC = 1mA, IB=0 | 700 | – | – | V |
| Collector-Emitter Breakdown Voltage | BVCEO | IC = 10mA, IE=0 | 400 | – | – | V |
| Emitter- Base Breakdown Voltage | BVEBO | IE = 1mA, IC=0 | 10 | – | – | V |
| Collector Cutoff Current | ICBO | VCB = 700V, IE=0 | – | – | 1 | μA |
| Emitter Cutoff Current | IEBO | VEB = 9V, IC=0 | – | – | 1 | μA |
| DC Current Gain | hFE1 | VCE = 5V, IC=10mA | 10 | – | – | |
| | hFE2 | VCE = 5V, IC=400mA | 10 | – | 30 | |
| | hFE3 | VCE = 5V, IC=1A | 5 | – | – | |
| Collector-Emitter Saturation Voltage | VCE(SAT1) | IC = 0.5A, IB =0.1A | – | – | 0.5 | V |
| | VCE(SAT2) | IC = 1A, IB =0.25A | – | 1.1 | 1.5 | |
| Base-Emitter Saturation Voltage | VBE(SAT1) | IC = 0.5A, IB =0.1A | – | – | 1.1 | V |
| | VBE(SAT2) | IC = 1A, IB =0.25A | – | – | 1.2 | V |

## Resistive Load Switching Time (Ratings)

| | | | | | | |
|---|---|---|---|---|---|---|
| Rise Time | $t_r$ | Vcc=250V, IC=1A, IB1=0.2A, IB2 = 0.2A, tp = 25uS Duty Cycle < 1% | – | 0.5 | 0.7 | uS |
| Storage Time | $t_{STG}$ | | – | 0.5 | 0.9 | uS |
| Fall Time | $t_f$ | | – | 0.2 | 0.4 | uS |

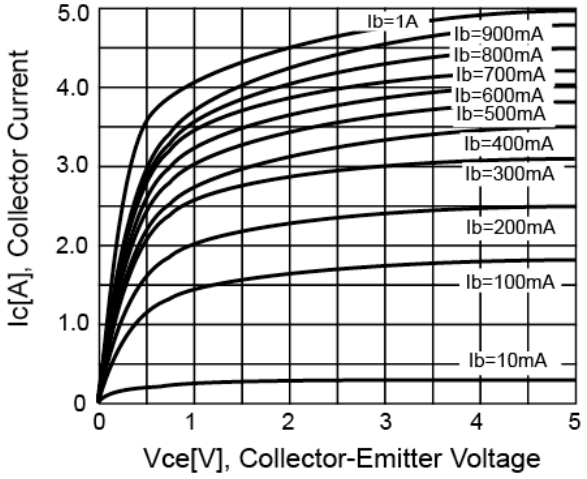
Note: Pulse Duration = 300uS, duty cycle ≦ 2%

## Thermal Performance

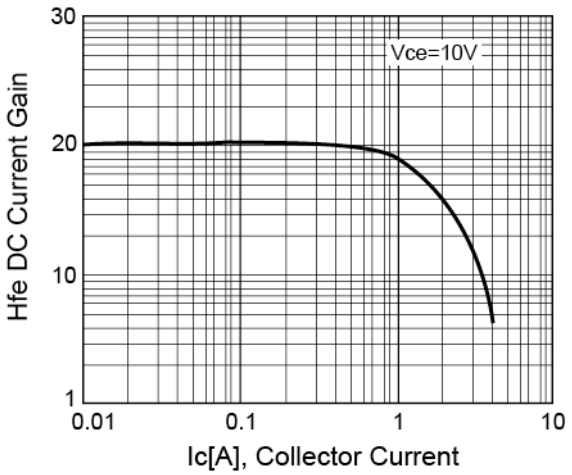
| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Junction to Case Thermal Resistance | RΘ JC | 83.3 | ₀C/W |
| Junction to Ambient Thermal Resistance | RΘ JA | 200 | ₀C/W |

## Electrical Characteristic Curves

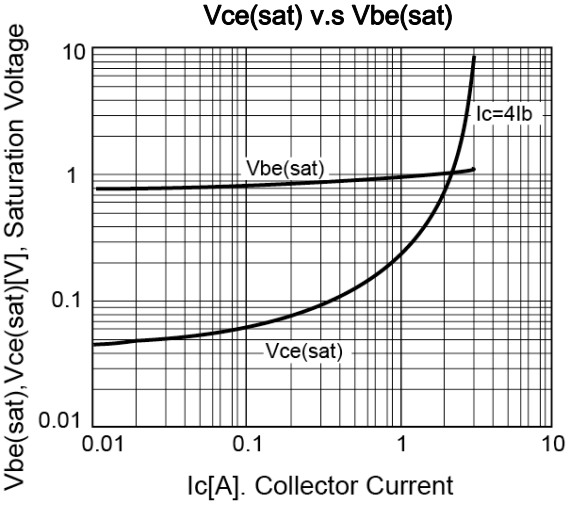
Static Characteristics



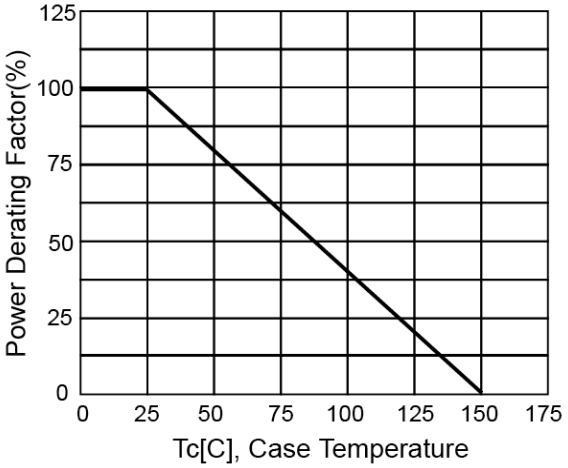

DC Current Gain



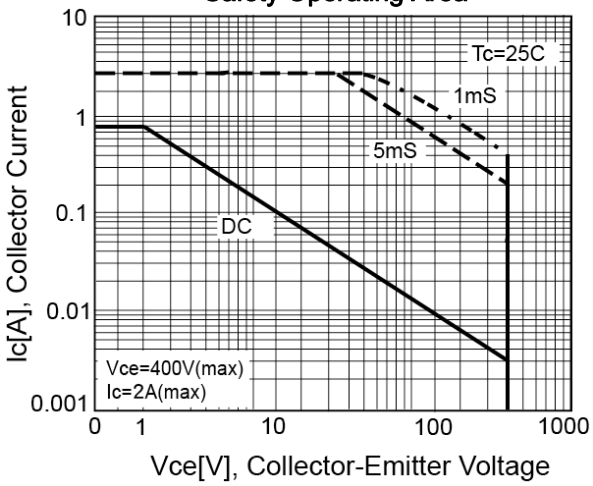

Vce(sat) v.s Vbe(sat)




Power Derating



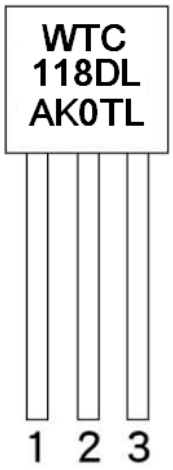

Safety Operating Area



## Ordering Information

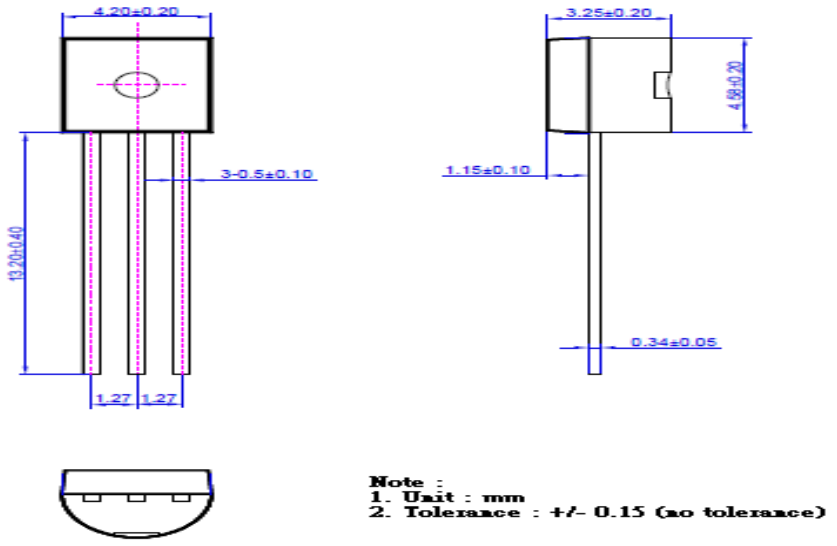
| Type NO | Marking | Package Code |
|---|---|---|
| WTBV118DL | 118DL | TO-92 |

## Marking and Pin Define




| | | | |
|---|---|---|---|
| First Line | WTC | Company Name | |
| Second Line | 118DL | Product Code | |
| Third Line | AK0TL | 1st (Year Code) | A-2010 B-2011 C-2012 ... |
| | | 2nd (Month Code) | A-Jan, B-Feb, C-Mar, D-Apr, E-May, F-Jun, G-Jul, H-Aug, I-Sep, J-Oct, K-Nov, L-Dec |
| | | 3rd (Lot Code) | 0~1 , A~9 |
| | | 4th (Product Code) | M-MOS, T-Transistor |
| | | 5th (Package Code) | D-TO-252, L-TO-92 |
| | | 6th (Spec Code) | (Reserve) |

## TO-92 Package Dimension




Note :
1. Unit : mm
2. Tolerance : +/- 0.15 (no tolerance)