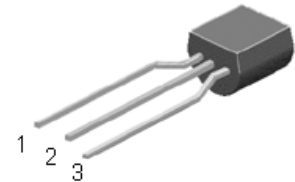


High Voltage NPN Power Transistor

**Features**

- High Voltage
- Very High Switch Speed
- $V_{CEO} : 400V$
- $V_{CBO} : 700V$
- $I_c : 0.6A$
- $V_{CE(SAT)} : 1.5V@I_c / I_B=200mA / 20mA$
- Silicon Triple Diffused Type



**TO-92**

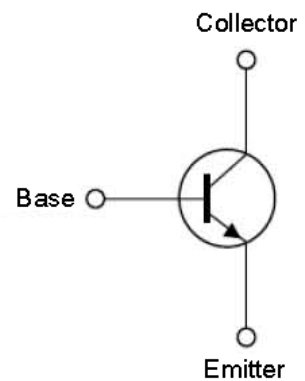
**Pin Definition**

1. Emitter
2. Collector
3. Base

**Application**

- Electronic Ballasts
- Adapter
- Lighting

**INTERNAL SCHEMATIC DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS (  $T_c = 25^{\circ}C$  )**

| Parameter  | Symbol | Max Rating | Unit        |
|--|--------|------------|-------------|
| Collector-Base Voltage                           | VCBO   | 700        | V           |
| Collector-Emitter Voltage                        | VCEO   | 400        | V           |
| Emitter-Base Voltage                             | VEBO   | 9          | V           |
| Collector Current(DC)                            | IC     | 0.6        | A           |
| Collector Current(Pulse)                         | ICP    | 1.2        | A           |
| Total Power Dissipation                          | PD     | 1.0        | W           |
| Junction Temperature                             | TJ     | 150        | $^{\circ}C$ |
| Operating Junction and Storage Temperature Range | TSTG   | -55 ~ +150 | $^{\circ}C$ |

### ELECTRICAL CHARACTERISTICS ( T<sub>c</sub> = 25°C )

| Parameter                            | Symbol    | Test Condition       | Min | Typ  | Max | Unit |
|--------------------------------------|-----------|----------------------|-----|------|-----|------|
| Collector-Base Voltage               | BVCBO     | IC = 1mA, IB=0       | 700 | –    | –   | V    |
| Collector-Emitter Breakdown Voltage  | BVCEO     | IC = 1mA, IE=0       | 400 | –    | –   | V    |
| Emitter- Base Breakdown Voltage      | BVEBO     | IE = 1mA, IC=0       | 9   | –    | –   | V    |
| Collector Cutoff Current             | ICBO      | VCB = 700V, IE=0     | –   | –    | 1   | μA   |
| Emitter Cutoff Current               | IEBO      | VEB = 7V, IC=0       | –   | –    | 1   | μA   |
| DC Current Gain                      | hFE1      | VCE = 10V, IC=10mA   | 15  | –    | 40  |      |
|                                      | hFE2      | VCE = 10V, IC=100mA  | 25  | –    | 40  |      |
|                                      | hFE3      | VCE = 10V, IC=280mA  | 12  | –    | 24  |      |
| Collector-Emitter Saturation Voltage | VCE(SAT1) | IC/IB = 50mA / 10mA  | –   | 0.2  | 0.4 | V    |
|                                      | VCE(SAT2) | IC/IB = 100mA / 10mA | –   | 0.45 | 1   |      |
|                                      | VCE(SAT3) | IC/IB = 200mA / 20mA | –   | 1    | 1.5 |      |
| Base-Emitter Saturation Voltage      | VBE(SAT1) | IC/IB = 50mA / 10mA  | –   | –    | 1   | V    |
|                                      | VBE(SAT2) | IC/IB = 100mA / 10mA | –   | –    | 1.2 |      |

### Dynamic

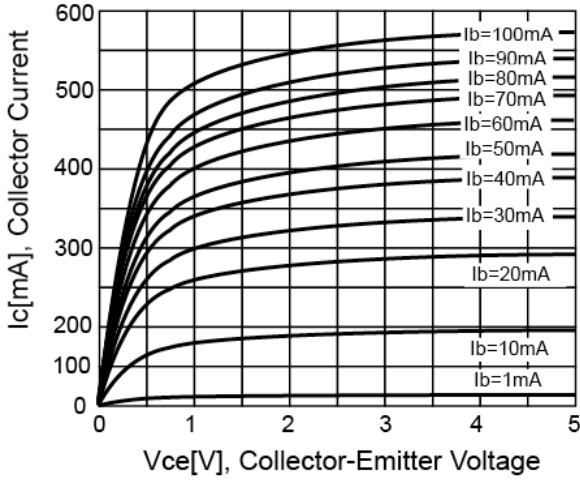
|                    |                 |                   |   |    |   |     |
|--------------------|-----------------|-------------------|---|----|---|-----|
| Frequency          | f <sub>r</sub>  | VCE=10V, IC=0.1A  | 4 | –  | – | MHz |
| Output Capacitance | C <sub>ob</sub> | VCB=10V, f=01.MHz | – | 21 | – | pF  |

### Resistive Load Switching Time (Ratings)

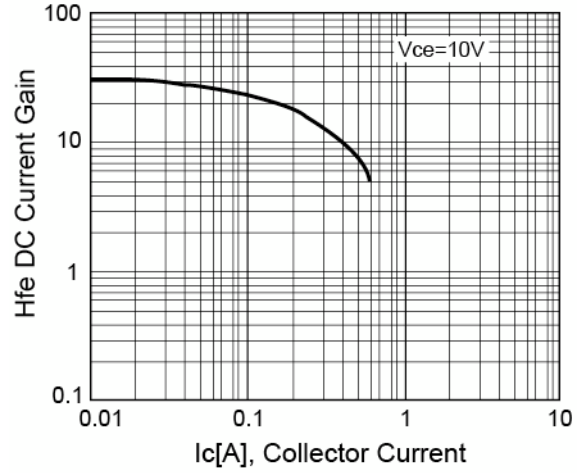
|              |                  |  |   |     |     |    |
|--------------|------------------|--|---|-----|-----|----|
| Rise Time    | t <sub>r</sub>   | V <sub>cc</sub> =125V, IC=100mA,<br>IB1 = IB2 = 20mA,<br>t <sub>p</sub> = 25uS | – | 1.1 | –   | uS |
| Storage Time | t <sub>STG</sub> |  | – | 2   | 4   | uS |
| Fall Time    | t <sub>f</sub>   | Duty Cycle ≤ 1%  | – | 0.2 | 0.7 | uS |

## Electrical Characteristic Curves

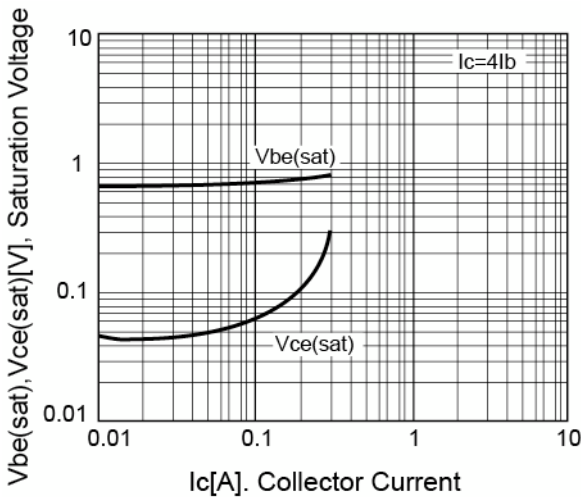
Static Characteristics



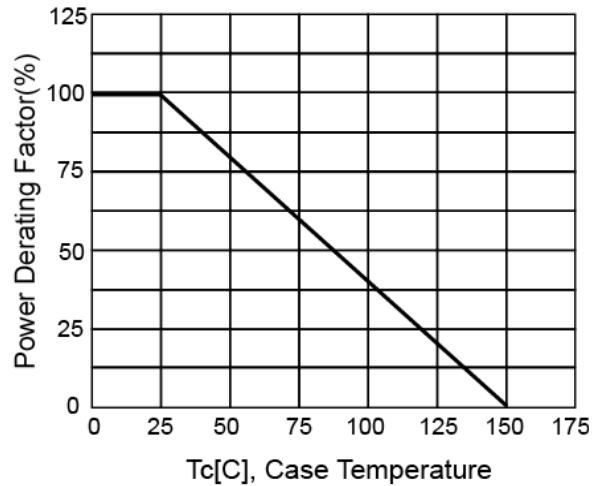
DC Current Gain



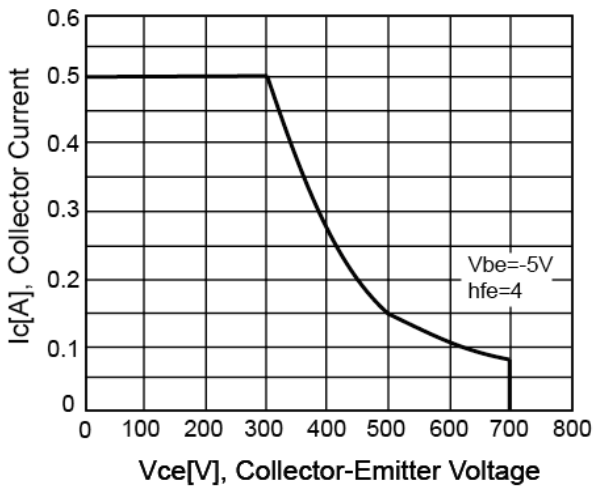
$V_{ce(sat)}$  v.s.  $V_{be(sat)}$



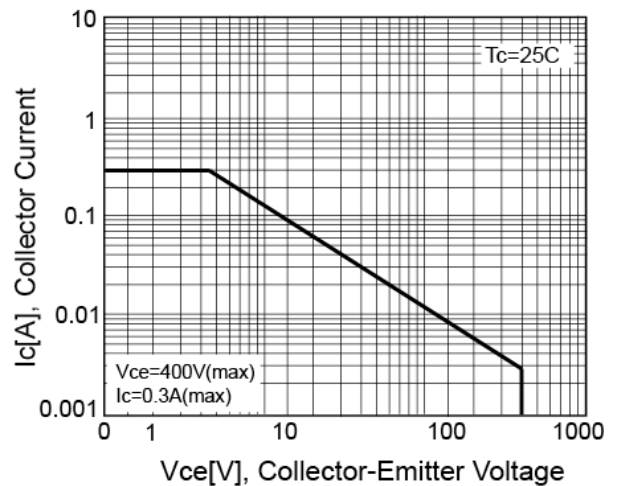
Power Derating



Reverse Bias SOA



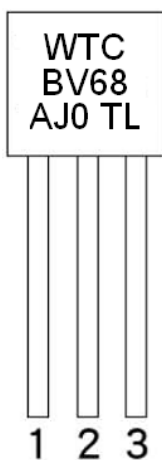
Safety Operating Area



### Ordering Information

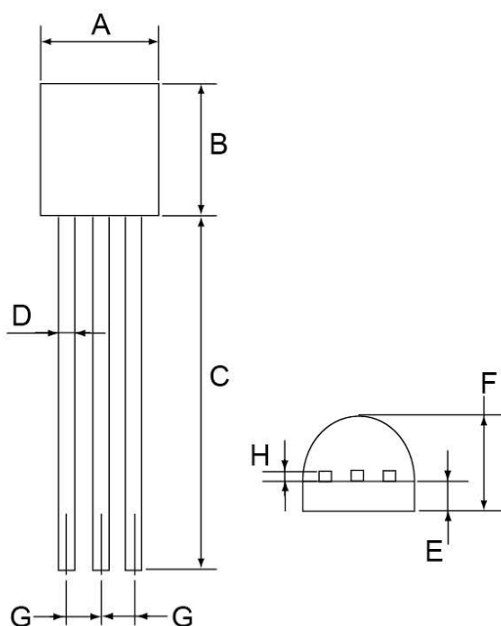
| Type NO | Marking | Package Code |
|---------|---------|--------------|
| WTBV68  | BV68    | TO-92        |

### Marking and Pin Define



|             |        |                    |  |
|-------------|--------|--------------------|--|
| First Line  | WTC    | Company Name       |  |
| Second Line | BV68   | Product Code       |  |
| Third Line  | AJ0 TL | 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



| TO-92 DIMENSION |             |      |            |       |
|-----------------|-------------|------|------------|-------|
| DIM             | MILLIMETERS |      | INCHES     |       |
|                 | MIN         | MAX  | MIN        | MAX   |
| A               | 4.3         | 4.7  | 0.169      | 0.185 |
| B               | 4.3         | 4.7  | 0.169      | 0.185 |
| C               | 13.53(typ)  |      | 0.532(typ) |       |
| D               | 0.39        | 0.49 | 0.015      | 0.019 |
| E               | 1.18        | 1.28 | 0.046      | 0.5   |
| F               | 3.3         | 3.7  | 0.13       | 0.146 |
| G               | 1.27        | 1.31 | 0.05       | 0.051 |
| H               | 0.33        | 0.43 | 0.013      | 0.017 |