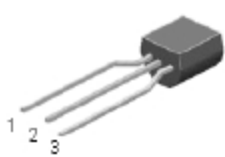


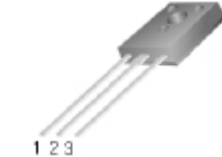
High Voltage NPN Transistor



TO-92

Pin Definition

1. Emitter
2. Collector
3. Base



TO-126

Pin Definition

1. Emitter
2. Collector
3. Base

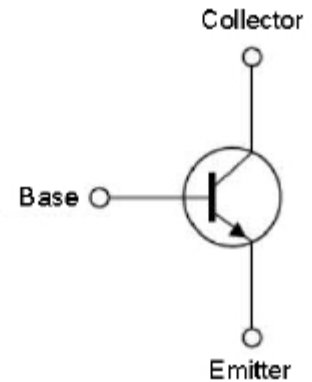
Features

- High Voltage
- Very High Switch Speed
- BV_{CEO} : 400V
- BV_{CBO} : 800V
- I_c : 1.5A
- $V_{CE(SAT)}$: 0.8V@ $I_c / I_B=0.5A / 0.1A$

Application

- Electronic Ballasts
- Adapter
- Lighting

INTERNAL SCHMATIC DIAGRAM



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

| Parameter | Symbol | Max Rating | Unit |
|--|--------|------------|------|
| Collector-Base Voltage | VCBO | 800 | V |
| Collector-Emitter Voltage | VCEO | 400 | V |
| Emitter-Base Voltage | VEBO | 9 | V |
| Collector Current(DC) | IC | 1.5 | A |
| Collector Current(Pulse) | ICP | 3 | A |
| Total Power Dissipation(TO92) | Ptot | 1.5 | W |
| Total Power Dissipation(TO126) | | 30 | |
| Junction Temperature | TJ | 150 | °C |
| Operating Junction and Storage Temperature Range | TSTG | -55 ~ +150 | °C |

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$)

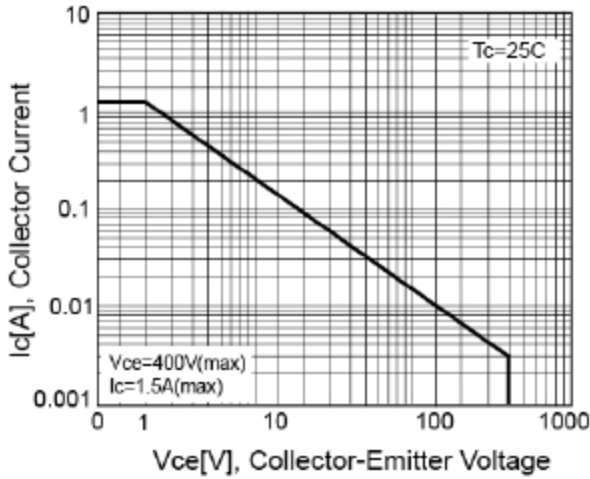
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|--------------------------------------|-----------|---|-----|------|-----|---------------|
| Collector-Base Voltage | BVCBO | $I_C = 1\text{mA}, I_B = 0$ | 700 | — | — | V |
| Collector-Emitter Breakdown Voltage | BVCEO | $I_C = 10\text{mA}, I_E = 0$ | 400 | — | — | V |
| Emitter- Base Breakdown Voltage | BVEBO | $I_E = 1\text{mA}, I_C = 0$ | 9 | — | — | V |
| Collector Cutoff Current | ICBO | $V_{CB} = 700\text{V}, I_E = 0$ | — | — | 1 | μA |
| Emitter Cutoff Current | IEBO | $V_{EB} = 9\text{V}, I_C = 0$ | — | — | 1 | μA |
| DC Current Gain | hFE1 | $V_{CE} = 5\text{V}, I_C = 1\text{mA}$ | 5 | — | 40 | |
| | hFE2 | $V_{CE} = 10\text{V}, I_C = 400\text{mA}$ | 20 | — | 40 | |
| | hFE3 | $V_{CE} = 5\text{V}, I_C = 1\text{A}$ | 5 | — | 40 | |
| Collector-Emitter Saturation Voltage | VCE(SAT1) | $I_C/I_B = 0.5\text{A} / 0.1\text{A}$ | — | 0.25 | 0.5 | V |
| | VCE(SAT2) | $I_C/I_B = 1.0\text{A} / 0.25\text{A}$ | — | 0.5 | 1 | |
| | VCE(SAT3) | $I_C/I_B = 1.5\text{A} / 0.5\text{A}$ | — | 1.2 | 3 | |
| Base-Emitter Saturation Voltage | VBE(SAT1) | $I_C/I_B = 0.5\text{A} / 0.1\text{A}$ | — | — | 1.2 | V |
| | VBE(SAT2) | $I_C/I_B = 1.0\text{A} / 0.25\text{A}$ | — | — | 1.4 | |

| Parameter | Symbol | Limit | Unit |
|--|----------|-------|--------------------|
| Junction to Ambient Thermal Resistance (TO92) | Rth(J-A) | 122 | $^\circ\text{C/W}$ |
| Junction to Ambient Thermal Resistance (TO126) | | 90 | |

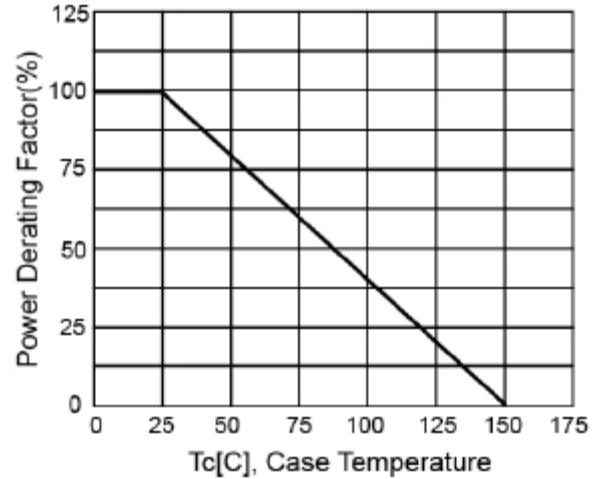
| | | | | | | |
|--------------|-----------|---|---|-----|-----|---------------|
| Rise Time | t_r | $V_{CC} = 125\text{V}, I_C = 500\text{A},$ $I_{B1} = I_{B2} = 0.2\text{A},$ $t_p = 25\mu\text{S}$ | — | 0.5 | 1 | μS |
| Storage Time | t_{STG} | | — | 2 | 4 | μS |
| Fall Time | t_f | | — | 0.4 | 0.7 | μS |

Electrical Characteristic Curves (Ta=25°C, unless otherwise noted)

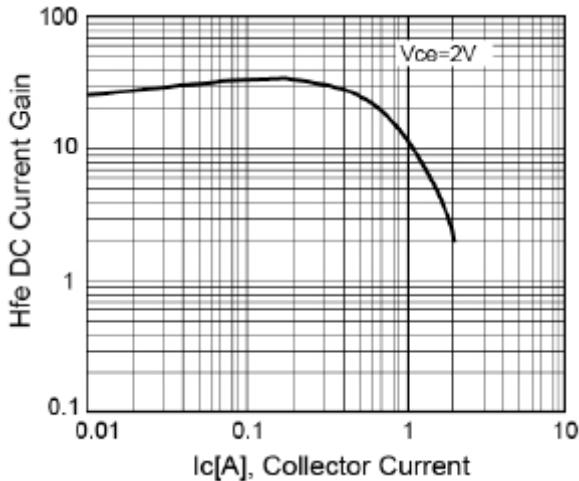
Safety Operating Area



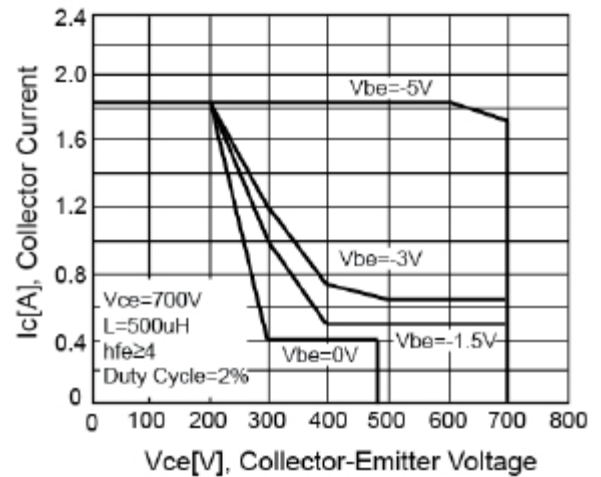
Power Derating



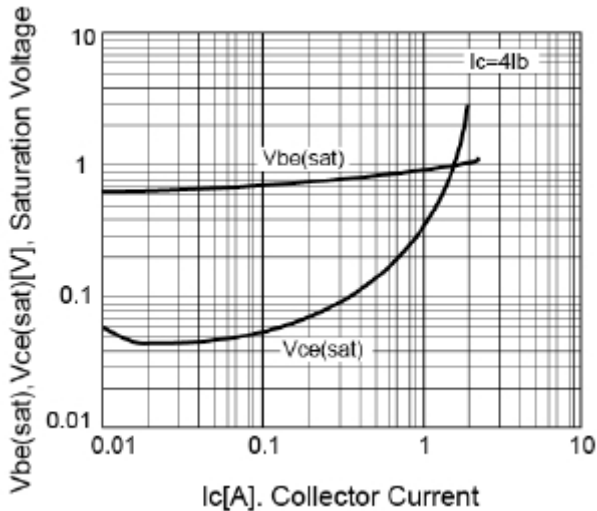
DC Current Gain



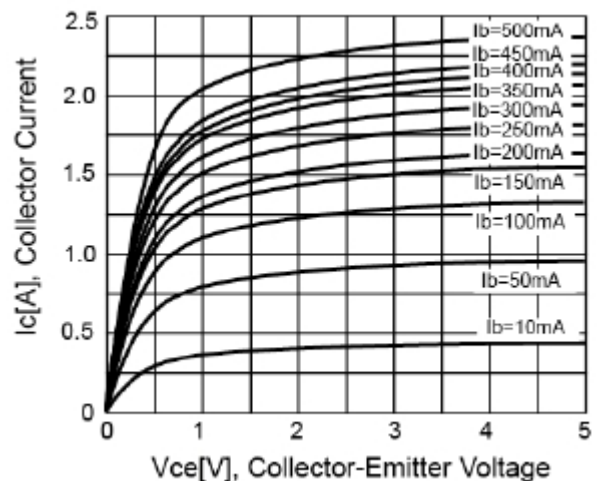
Reverse Bias SOA



VCE(SAT) V.S. VBE(SAT)



Static Characteristics



Ordering Information

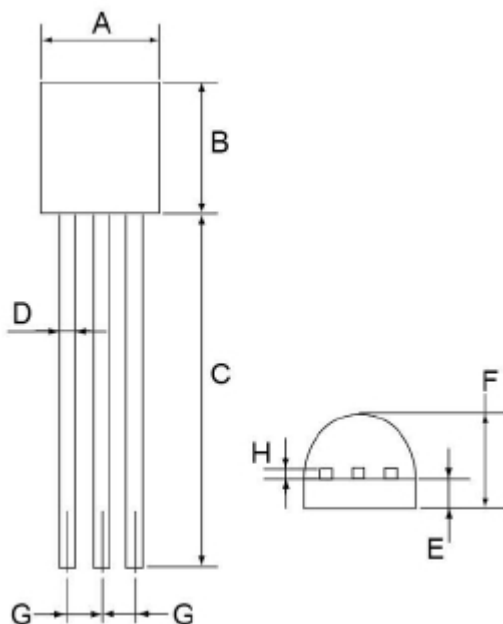
| Type NO | Marking | Package Code |
|---------|---------|--------------|
| WTBV47L | BV47 | TO-92 |

Marking and Pin Define



| First Line | WTC | Company Name | |
|-------------|--------|--------------------|--|
| Second Line | BV47 | Product Code | |
| Third Line | AK0 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-T0252, L-T092, M-T0126 |
| | | 6th (Spec Code) | (Reserve) |

TO-92 Package Dimension



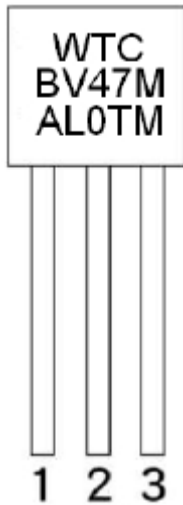
| DIM | TO-92 DIMENSION | | | |
|-----|-----------------|------|--------|-------|
| | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 4.0 | 4.7 | 0.157 | 0.185 |
| B | 4.3 | 4.8 | 0.169 | 0.189 |
| C | 12.8 | 13.8 | 0.522 | 0.56 |
| D | 0.4 | 0.5 | 0.015 | 0.020 |
| E | 1.05 | 1.28 | 0.41 | 0.5 |
| F | 3.05 | 3.7 | 0.12 | 0.146 |
| G | 1.27 | 1.31 | 0.05 | 0.051 |
| H | 0.29 | 0.43 | 0.011 | 0.017 |

Unit : mm

Ordering Information

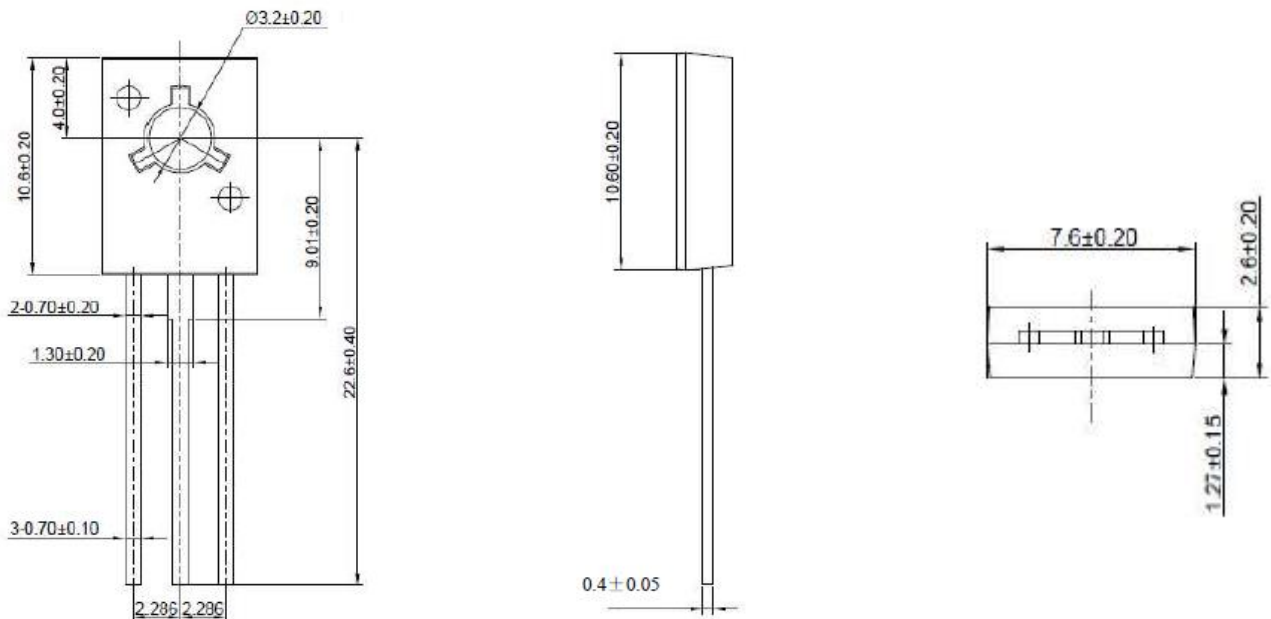
| Type NO | Marking | Package Code |
|---------|---------|--------------|
| WTBV47M | BV47M | TO-126 |

Marking and Pin Define



| | | | |
|-------------|-----------|--------------------|--|
| First Line | WTC | Company Name | |
| Second Line | BV47M | Product Code | |
| Third Line | A L O T M | 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 - TO252, L - TO92, M - TO126 |
| | | 6th (Spec Code) | (Reserve) |

TO-126 Package Dimension



Unit : mm