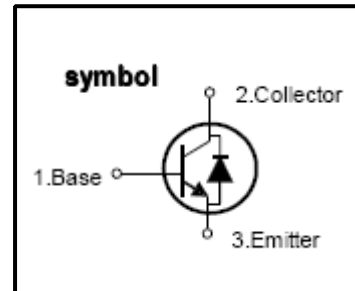# WINSEMI
**MICROELECTRONICS**

# WBR13003D1

## High Voltage Fast-Switching NPN Power Transistor

### Features

◆ Very High Switching Speed

◆ High Voltage Capability

◆ Wide Reverse Bias SOA

◆ Built-in freewheeling diode

symbol
2. Collector
1. Base
3. Emitter

TO-126
B
C
E

### General Description

This Device is designed for high voltage, High speed switching characteristics required such as lighting system, switching mode power supply.
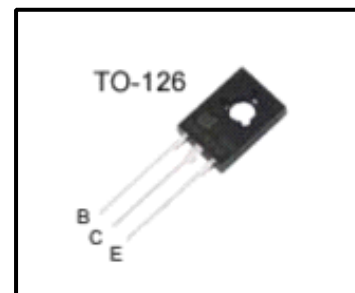
### Absolute Maximum Ratings

| Symbol | Parameter | Test Conditions | Value | Units |
|--------|-----------|-----------------|-------|-------|
| $V_{CES}$ | Collector-Emitter Voltage | $V_{BE} = 0$ | 700 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | $I_C = 1mA$ | 400 | V |
| $V_{EBO}$ | Emitter-Base Voltage | $I_E = 0.1mA$ | 9 | V |
| $I_C$ | Collector Current | | 1.5 | A |
| $I_{CP}$ | Collector pulse Current | | 3.0 | A |
| $I_B$ | Base Current | | 0.75 | A |
| $I_{BM}$ | Base Peak Current | $t_P = 5ms$ | 1.5 | A |
| $P_C$ | Total Dissipation at Tc = 25℃ | | 20 | W |
| $T_J$ | Operation Junction emperature | | 150 | ℃ |
| $T_{STG}$ | Storage Temperature | | -55 ~ 150 | ℃ |

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## Electrical Characteristics (Tc = 25°C)

| Symbol | Parameter | Test Conditions | Value | | | Units |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| BV$_{CBO}$ | Collector-Base Breakdown Voltage | Ic=1mA,Ib=0 | 700 | | | V |
| BV$_{CEO}$ | Collector-Base Breakdown Voltage | Ic=10mA,Ib=0 | 400 | - | - | V |
| V$_{CE(sat)}$ | Collector-Emitter Saturation Voltage | Ic=200mA,Ib=100mA | - | - | 1.6 | V |
| V$_{BE(sat)}$ | Base-Emitter Saturation Voltage | Ic=200mA,Ib=100mA | - | - | 1.2 | V |
| I$_{CBO}$ | Collector-Base Cutoff Current | Vcb=600V,Ie=0mA | - | - | 0.1 | mA |
| I$_{CEO}$ | Collector-Emitter Cutoff Current | Vce=400V,Ib=0mA | - | - | 0.1 | mA |
| I$_{EBO}$ | Emitter- Base Cutoff Current | Veb=9V,Ic=0mA | - | - | 0.1 | mA |
| h$_{FE}$ | DC Current Gain | Vce=20V,Ic=20mA | 10 | - | 40 | |
| | | Vce=5V, Ic=1mA | 9 | - | - | |
| tr | Rise Time | | - | - | 1 | μs |
| ts | Storage Time | IC=0.1A | 3 | - | 5 | |
| tf | Fall Time | | - | | 1 | |

**Note:**

Pulse Test : Pulse width 300, Duty cycle 2%

*Steady, keep you advance*

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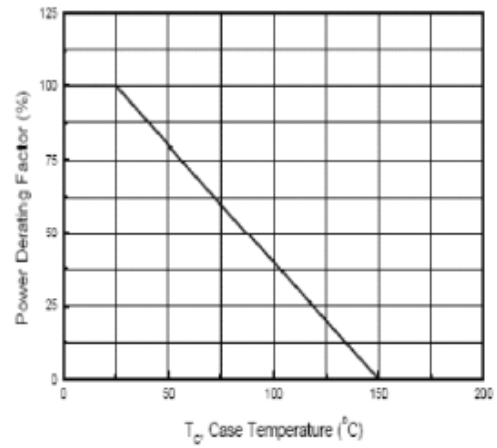MICROELECTRONICS
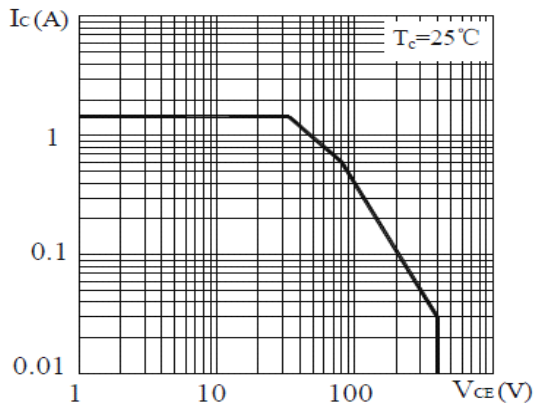
IC[A],COLLECTOR CURRENT

**Fig.1DC Current Gain**

**Fig.2 Power Derating**
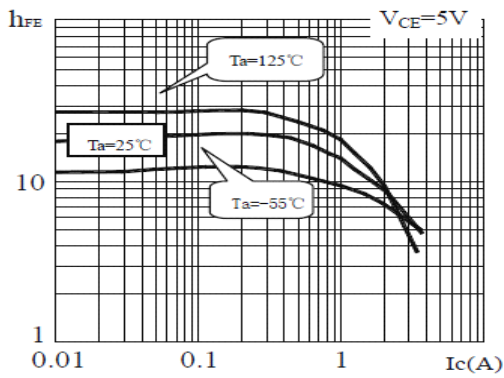
$h_{FE}$ - $I_C$
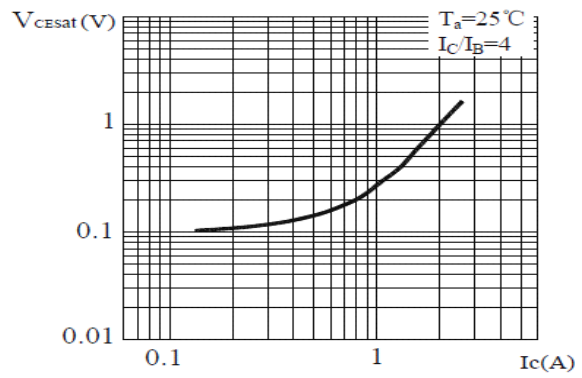
$V_{CEsat}$ - $I_C$

$V_{BEsat}$ - $I_C$

*Steady, keep you advance*
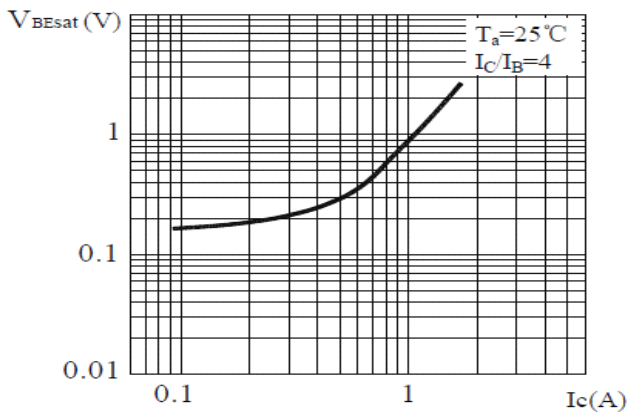
## TO-126 Package Dimension

Unit: mm

*Steady, keep you advance*