

**DESCRIPTION** The 2SB1150 is a darlington transistor built-in a zener diode at B-C and a dumper diode at E-C.

It is suitable for use to operate from IC without predriver, such as hammer driver.

### FEATURES

- High DC Current Gain.
- Built-in a Zener Diode at B-C and a Dumper Diode at E-C.
- Low Collector Saturation Voltage.
- High Power Dissipation:  $P_T = 1.3 \text{ W}$  (at  $T_a = 25^\circ \text{C}$ )

### ABSOLUTE MAXIMUM RATINGS

#### Maximum Temperatures

Storage Temperature . . . . .  $-55$  to  $+150^\circ \text{C}$

Junction Temperature . . . . .  $+150^\circ \text{C}$  Maximum

#### Maximum Power Dissipations

Total Power Dissipation ( $T_a = 25^\circ \text{C}$ ) . . . . .  $1.3 \text{ W}$

Total Power Dissipation ( $T_c = 25^\circ \text{C}$ ) . . . . .  $15 \text{ W}$

#### Maximum Voltages and Currents ( $T_a = 25^\circ \text{C}$ )

$V_{CBO}$  Collector to Base Voltage . . . . .  $-60 \pm 10 \text{ V}$

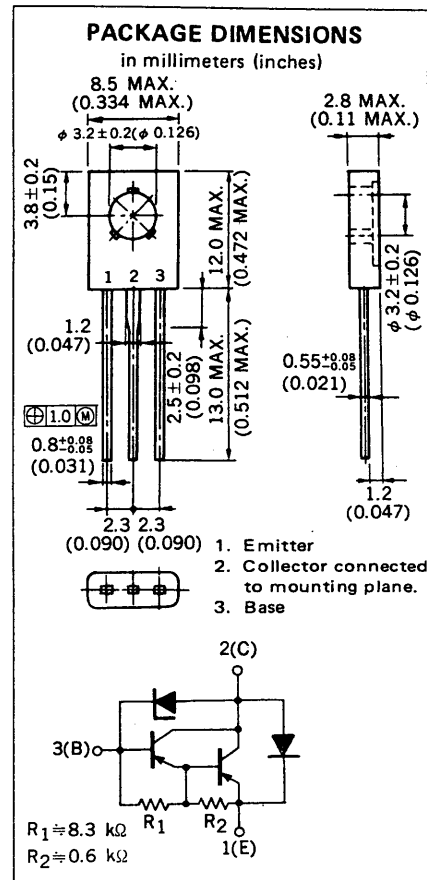
$V_{CEO}$  Collector to Emitter Voltage . . . . .  $-60 \pm 10 \text{ V}$

$V_{EBO}$  Emitter to Base Voltage . . . . .  $-8.0 \text{ V}$

$I_{C(DC)}$  Collector Current . . . . .  $\pm 3.0 \text{ A}$

$I_{C(pulse)}$  Collector Current . . . . .  $\pm 5.0 \text{ A}$

\*  $PW \leq 10 \text{ ms}$ , Duty Cycle  $\leq 50 \%$



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

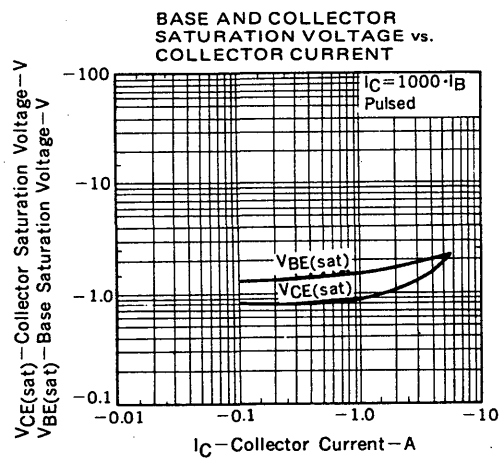
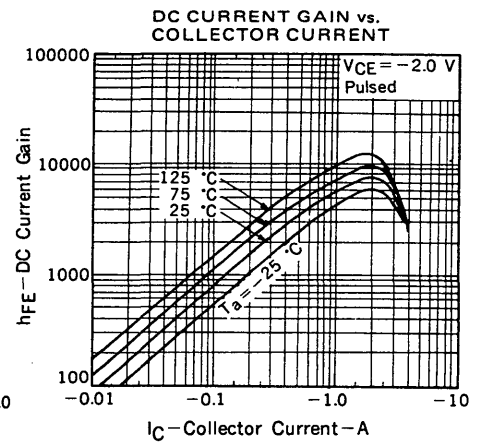
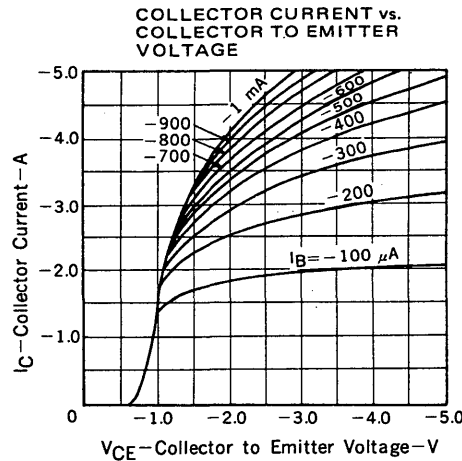
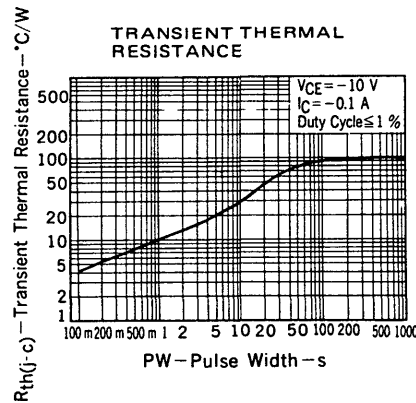
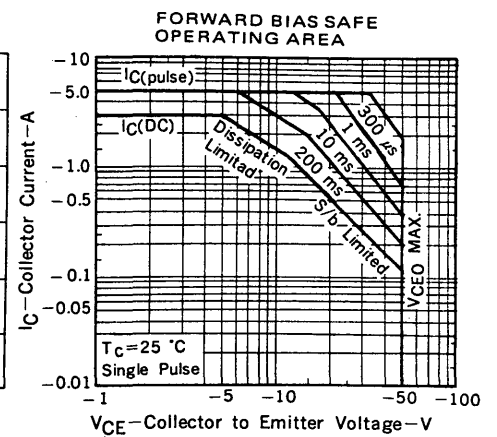
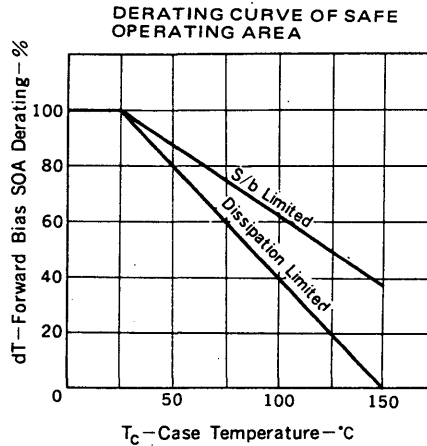
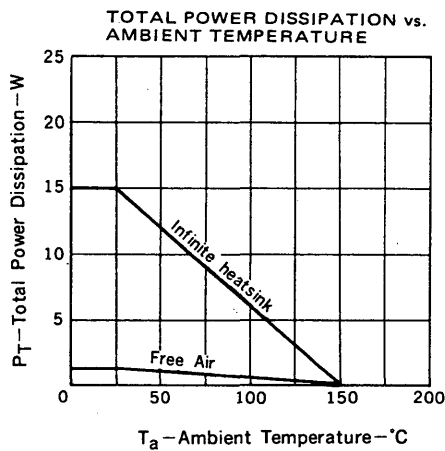
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$h_{FE1}^{**}$	DC Current Gain	2000		15000	—	$V_{CE} = -2.0 \text{ V}$ , $I_C = -1.5 \text{ A}$
$h_{FE2}^{**}$	DC Current Gain	1000			—	$V_{CE} = -2.0 \text{ V}$ , $I_C = -3.0 \text{ A}$
$V_{CBO}$	Collector to Base Voltage	$-50$	$-60$	$-70$	V	$I_C = -1.0 \text{ mA}$ , $I_E = 0$
$V_{CEO}$	Collector to Emitter Voltage	$-50$	$-60$	$-70$	V	$I_C = -10 \text{ mA}$ , $R_{BE} = \infty$
$t_{on}$	Turn On Time		0.5		$\mu\text{s}$	$I_C = 1.5 \text{ A}$ , $R_L = 27 \Omega$ $I_{B1} = -I_{B2} = 1.5 \text{ mA}$ , $V_{CC} \cong 40 \text{ V}$
$t_{stg}$	Storage Time		2.0		$\mu\text{s}$	
$t_f$	Fall Time		1.0		$\mu\text{s}$	
$I_{CBO}$	Collector Cutoff Current			$-10$	$\mu\text{A}$	$V_{CB} = -40 \text{ V}$ , $I_E = 0$
$I_{EBO}$	Emitter Cutoff Current			$-1.0$	mA	$V_{EB} = -5.0 \text{ V}$ , $I_C = 0$
$V_{CE(sat)}^{**}$	Collector Saturation Voltage		$-0.9$	$-1.2$	V	$I_C = -1.5 \text{ A}$ , $I_B = -1.5 \text{ mA}$
$V_{BE(sat)}^{**}$	Base Saturation Voltage		$-1.5$	$-2.0$	V	$I_C = -1.5 \text{ A}$ , $I_B = -1.5 \text{ mA}$

\*\* Pulsed /  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2 \%$

#### Classification of $h_{FE1}$

Rank	M	L	K
Range	2000 to 5000	3000 to 7000	5000 to 15000

Test Conditions:  $V_{CE} = -2.0 \text{ V}$ ,  $I_C = -1.5 \text{ A}$

TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )SWITCHING TIME ( $t_{on}$ ,  $t_{stg}$ ,  $t_f$ ) TEST CIRCUIT