

DESCRIPTION The 2SB1093 is a darlington transistor including a dumper diode at C-E.

It is suitable for general driving use, such as hammer, solenoid, lamp or motor.

FEATURES

- High DC current gain.
- High current capability, wide ASO and low collector saturation voltage.
- Includes a dumper diode at C-E.
- A complementary pair with NEC's 2SD1579.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature -55 to $+150$ °C

Junction Temperature 150 °C Maximum

Maximum Power Dissipation ($T_a = 25$ °C)

Total Power Dissipation 1.0 W

Maximum Voltages and Currents ($T_a = 25$ °C)

V_{CBO} Collector to Base Voltage -80 V

V_{CEO} Collector to Emitter Voltage -80 V

V_{EBO} Emitter to Base Voltage -8.0 V

I_C Collector Current (DC) ∓ 1.5 A

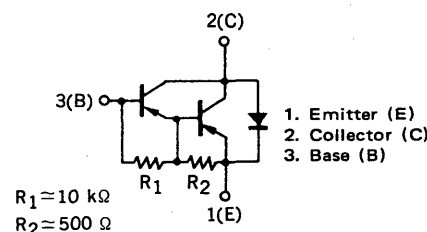
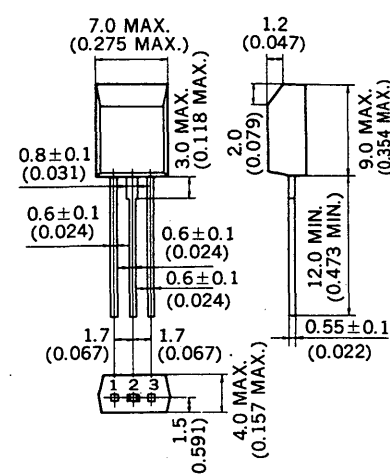
I_C Collector Current (Pulse)* ∓ 3.0 A

I_B Base Current (DC) -0.15 A

*PW ≤ 300 μ s, Duty Cycle ≤ 10 %

PACKAGE DIMENSIONS

in millimeters (inches)



ELECTRICAL CHARACTERISTICS ($T_a = 25$ °C)

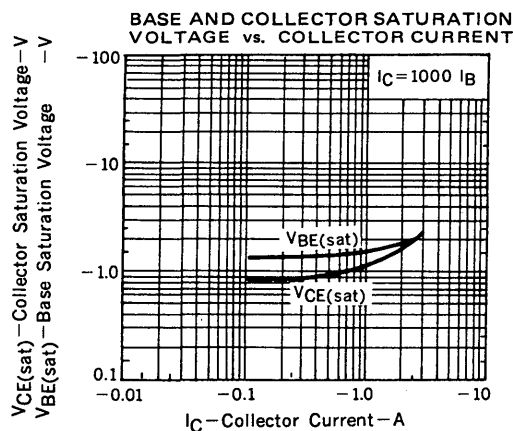
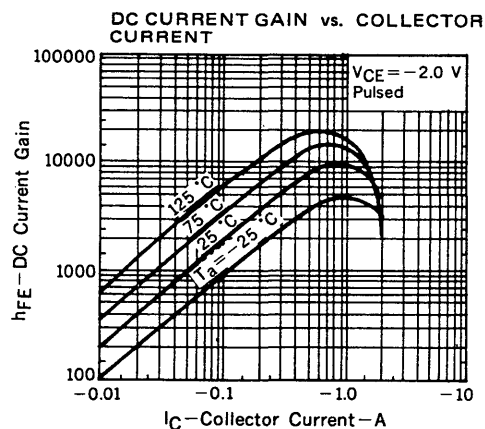
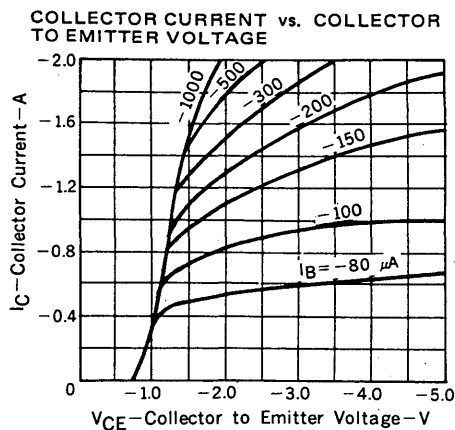
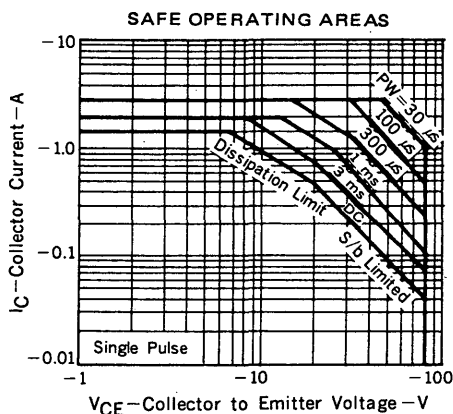
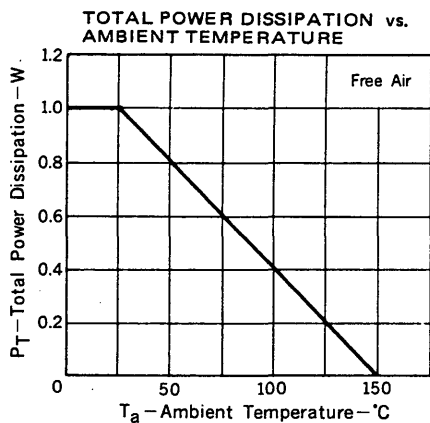
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE1}	DC Current Gain	1000			—	$V_{CE} = -2.0$ V, $I_C = -0.5$ A
h_{FE2}	DC Current Gain	2000		30000	—	$V_{CE} = -2.0$ V, $I_C = -1.0$ A
t_{on}	Turn-On Time		0.5		μ s	$I_C = -1.0$ A, $R_L = 50$ Ω $I_{B1} = -I_{B2} = -1.0$ mA, $V_{CC} = -50$ V See Test Circuit
t_{stg}	Storage Time		1.0		μ s	
t_f	Fall Time		1.0		μ s	
I_{CBO}	Collector Cutoff Current			-10	μ A	$V_{CB} = -80$ V, $I_E = 0$
I_{CER}	Collector Cutoff Current			-1.0	mA	$V_{CE} = -80$ V, $R_{BE} = 51$ Ω , $T_a = 125$ °C
I_{CEX1}	Collector Cutoff Current			-10	μ A	$V_{CE} = -80$ V, $V_{BE(off)} = -1.5$ V
I_{CEX2}	Collector Cutoff Current			-1.0	mA	$V_{CE} = -80$ V, $V_{BE(off)} = -1.5$ V, $T_a = 125$ °C
I_{EBO}	Emitter Cutoff Current			-1.0	mA	$V_{EB} = -5.0$ V, $I_C = 0$
$V_{CE(sat)}$	Collector Saturation Voltage			-1.5	V	$I_C = -1.0$ A, $I_B = -1.0$ mA
$V_{BE(sat)}$	Base Saturation Voltage			-2.0	V	
f_T	Gain Bandwidth Product		80		MHz	$V_{CE} = -10$ V, $I_E = 1.0$ A

Classification of h_{FE2}

Rank	M	L	K
Range	2000 — 5000	4000 — 10000	8000 — 30000

Test Conditions: $V_{CE} = -2.0$ V, $I_C = -1.0$ A

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



SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CURCUIT

