

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 $+150^{\circ}\text{C}$

Junction Temperature 150 °C Maximum

Maximum Power Dissipation ($T_a = 25^\circ\text{C}$)

Total Power Dissipation 1.0 W

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

V_{CB0} Collector to Base Voltage **-80 V**

V_{CEQ} Collector to Emitter Voltage -80 V

V_{EBQ} 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 $\leq 300 \mu s$, Duty Cycle $\leq 10 \%$

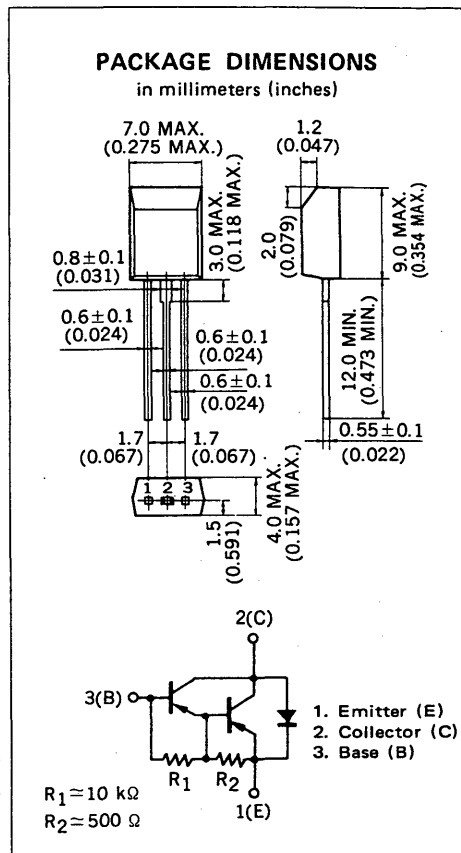
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
hFE1	DC Current Gain	1000			—	$V_{CE} = -2.0 \text{ V}$, $I_C = -0.5 \text{ A}$
hFE2	DC Current Gain	2000		30000	—	$V_{CE} = -2.0 \text{ V}$, $I_C = -1.0 \text{ A}$
t_{on}	Turn-On Time		0.5		μs	$I_C = -1.0 \text{ A}$, $R_L = 50 \Omega$ $I_{B1} = -I_{B2} = -1.0 \text{ mA}$, $V_{CC} = -50 \text{ V}$ See Test Circuit
t_{stg}	Storage Time		1.0		μs	
t_f	Fall Time		1.0		μs	
I_{CBO}	Collector Cutoff Current			-10	μA	$V_{CB} = -80 \text{ V}$, $I_E = 0$
I_{CER}	Collector Cutoff Current			-1.0	mA	$V_{CE} = -80 \text{ V}$, $R_{BE} = 51 \Omega$, $T_a = 125^\circ\text{C}$
I_{CEX1}	Collector Cutoff Current			-10	μA	$V_{CE} = -80 \text{ V}$, $V_{BE(\text{off})} = -1.5 \text{ V}$
I_{CEX2}	Collector Cutoff Current			-1.0	mA	$V_{CE} = -80 \text{ V}$, $V_{BE(\text{off})} = -1.5 \text{ V}$, $T_a = 125^\circ\text{C}$
I_{EBO}	Emitter Cutoff Current			-1.0	mA	$V_{EB} = -5.0 \text{ V}$, $I_C = 0$
$V_{CE(\text{sat})}$	Collector Saturation Voltage			-1.5	V	$I_C = -1.0 \text{ A}$, $I_B = -1.0 \text{ mA}$
$V_{BE(\text{sat})}$	Base Saturation Voltage			-2.0	V	
f_T	Gain Bandwidth Product		80		MHz	$V_{CE} = -10 \text{ V}$, $I_E = 1.0 \text{ A}$

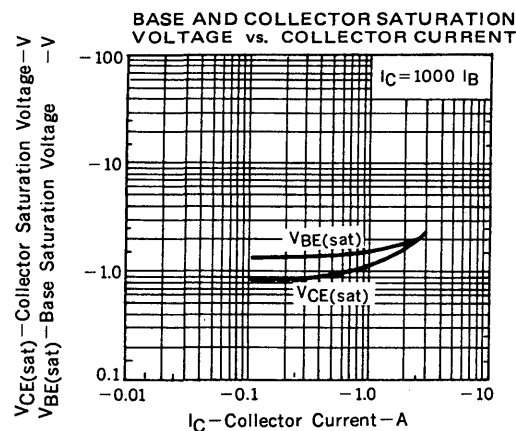
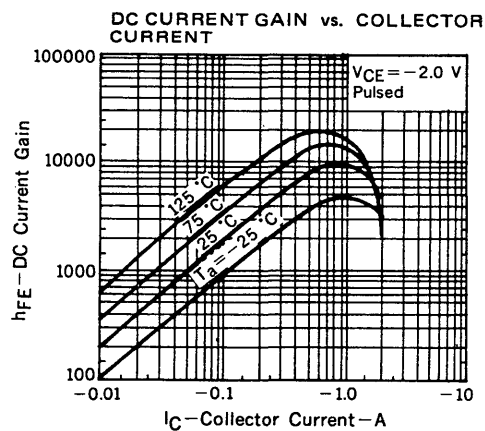
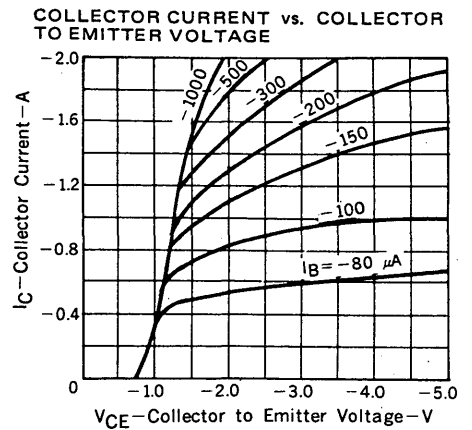
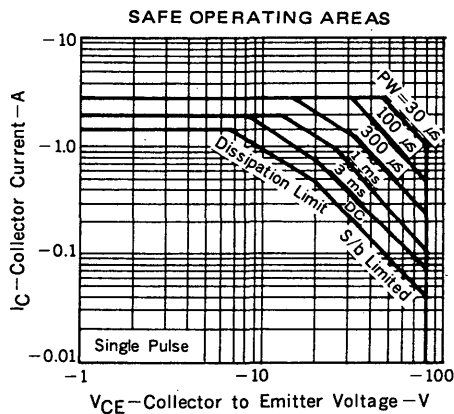
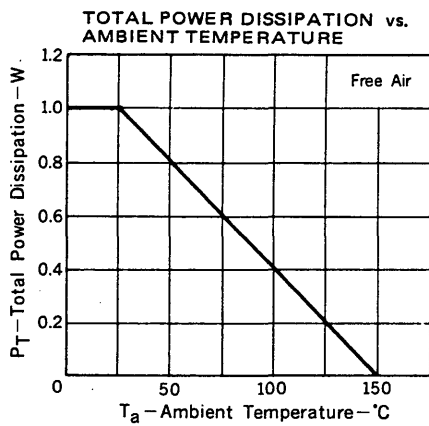
Classification of h_{FE2}

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

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



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



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

