

2SD2091

Transistor NPN, Darlington

Features

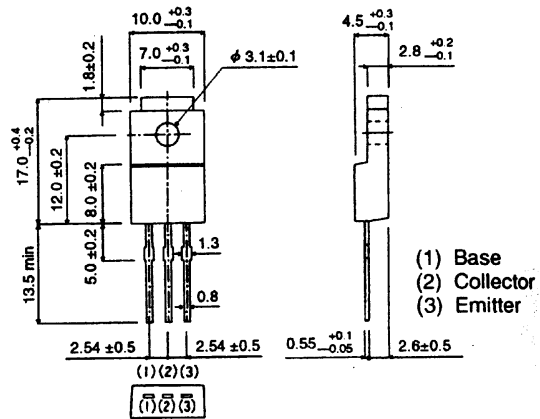
- available in TO-220FP (SC-67) package
- built-in 90 V Zener-diode between collector and base
- highly resistant to surge voltages
- large collector power dissipation: $P_C = 2 \text{ W}$ at $T_a = 25^\circ\text{C}$
- damper diode is incorporated
- built-in resistors between base and emitter
- easily insulated from the heat sink as the fin is molded

Applications

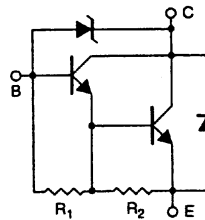
- low frequency power amplifier

Dimensions (Units : mm)

2SD2091 (TO-220FP)



Equivalent circuit



$R_1 \cong 3.5 \text{ k}\Omega$
 $R_2 \cong 300 \Omega$

B: Base
 C: Collector
 E: Emitter

Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	V_{CBO}	$90 \begin{smallmatrix} +20 \\ -10 \end{smallmatrix}$	V	
Collector-to-emitter voltage	V_{CEO}	$90 \begin{smallmatrix} +20 \\ -10 \end{smallmatrix}$	V	
Emitter-to-base voltage	V_{EBO}	6	V	
Collector current	I_C	2	A	Continuous (dc)
		3	A	Single pulse, $P_W = 100 \text{ ms}$
Collector dissipation	P_C	2	W	$T_a = 25^\circ\text{C}$
		20	W	$T_C = 25^\circ\text{C}$
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$	

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Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	BV_{CBO}	80		110	V	$I_C = 50 \mu\text{A}$
Collector-to-emitter breakdown voltage	BV_{CEO}	80		110	V	$I_C = 1 \text{ mA}$
Collector cutoff current	I_{CBO}			10	μA	$V_{CB} = 70 \text{ V}$
Emitter cutoff current	I_{EBO}			3	mA	$V_{EB} = 5 \text{ V}$
DC current gain	h_{FE}	1000		10000		$V_{CE} = 2 \text{ V}$, $I_C = 1 \text{ A}$, single pulse
Collector-to-emitter saturation voltage	$V_{CE(sat)}$			1.5	V	$I_C/I_B = 1 \text{ A}/1 \text{ mA}$
Transition frequency	f_T		80		MHz	$V_{CE} = 5 \text{ V}$, $I_E = -0.1 \text{ A}$, $f = 30 \text{ MHz}$, characteristics of built-in transistor
Output capacitance	C_{ob}		25		pF	$V_{CB} = 10 \text{ V}$, $I_E = 0 \text{ A}$, $f = 1 \text{ MHz}$

Electrical characteristic curves

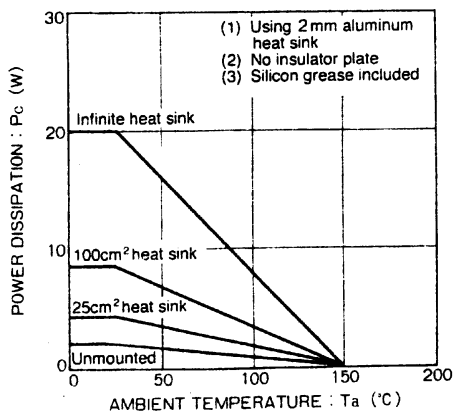


Figure 1

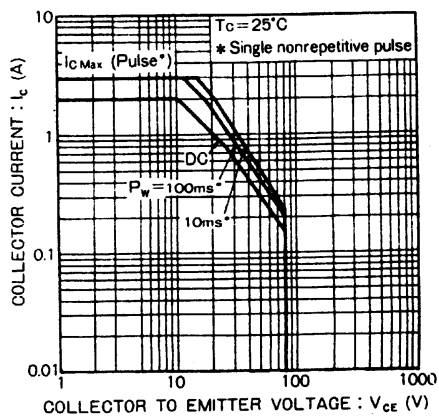


Figure 2

2SD2091 Transistor, NPN, 2SD series

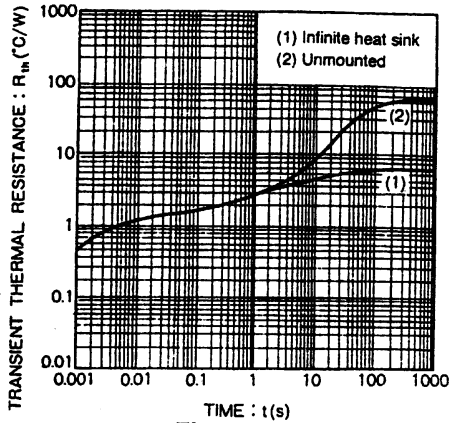


Figure 3

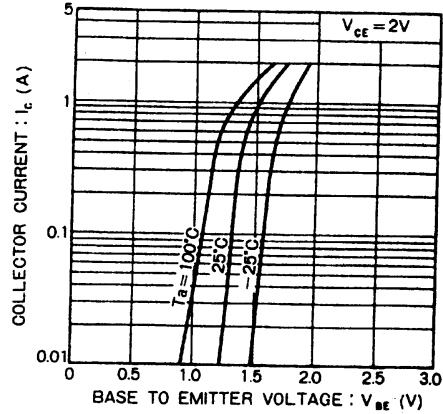


Figure 4

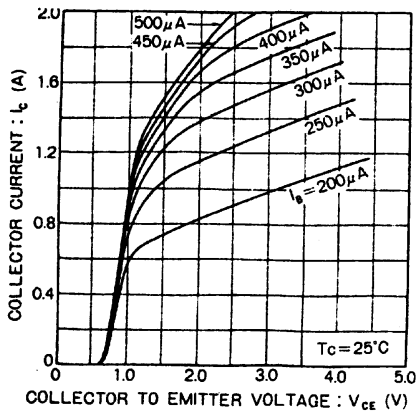


Figure 5

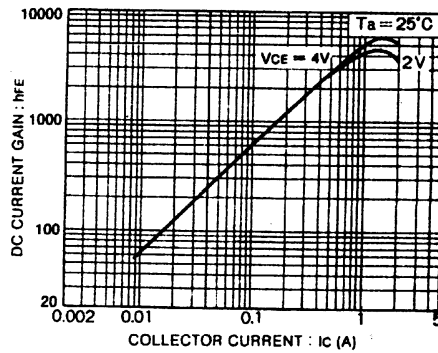


Figure 6

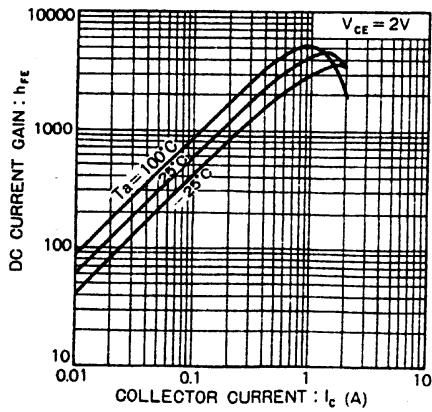


Figure 7

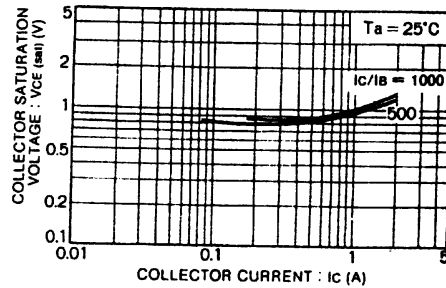


Figure 8

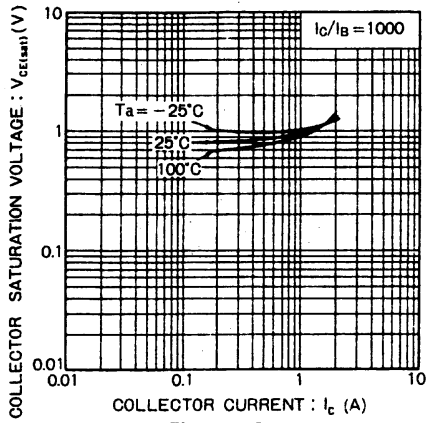


Figure 9

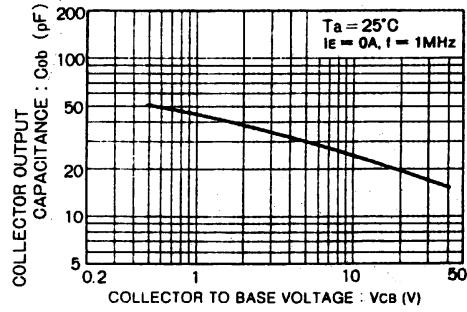


Figure 10

Ordering information

Package	Bulk
Code	
Basic order quantity	500
2SD2091, $h_{FE} = 1\text{ k} - 10\text{ k}$	★
★ = Standard, ☆ = Semi-standard, * = Special order	

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