

2SD2221

Silicon NPN triple diffusion planar type Darlington

For power amplification

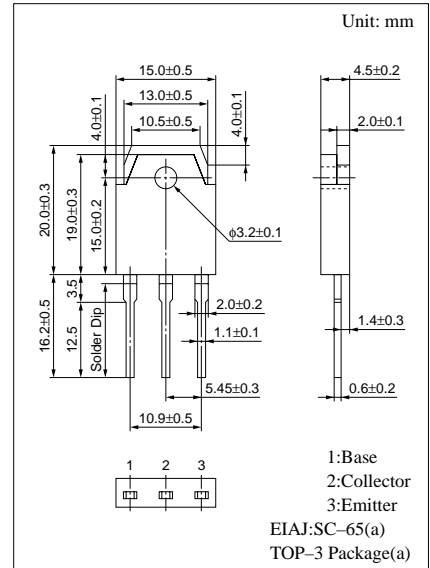
Complementary to 2SB1469

Features

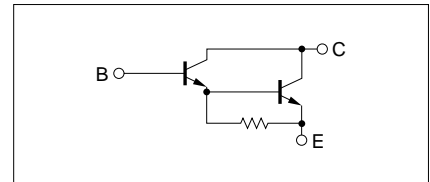
- Optimum for 90W HiFi output
- High forward current transfer ratio h_{FE} : 5000 to 30000
- Low collector to emitter saturation voltage $V_{CE(sat)}$: <2.5V

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	160	V
Collector to emitter voltage	V_{CEO}	140	V
Emitter to base voltage	V_{EBO}	5	V
Peak collector current	I_{CP}	15	A
Collector current	I_C	8	A
Collector power dissipation	P_C	$T_C=25^\circ\text{C}$	100
		$T_a=25^\circ\text{C}$	2.5
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$



Internal Connection



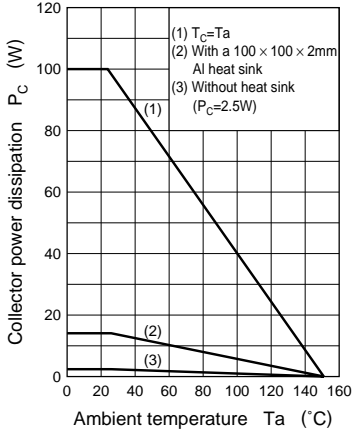
Electrical Characteristics ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 160\text{V}, I_E = 0$			100	μA
	I_{CEO}	$V_{CE} = 140\text{V}, I_B = 0$			100	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$			100	μA
Collector to emitter voltage	V_{CEO}	$I_C = 30\text{mA}, I_B = 0$	140			V
Forward current transfer ratio	h_{FE1}	$V_{CE} = 5\text{V}, I_C = 1\text{A}$	2000			
	h_{FE2}^*	$V_{CE} = 5\text{V}, I_C = 7\text{A}$	5000		30000	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 7\text{A}, I_B = 7\text{mA}$			2.5	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = 7\text{A}, I_B = 7\text{mA}$			3.0	V
Transition frequency	f_T	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}, f = 1\text{MHz}$		20		MHz
Turn-on time	t_{on}	$I_C = 7\text{A}, I_{B1} = 7\text{mA}, I_{B2} = -7\text{mA}, V_{CC} = 50\text{V}$		2.0		μs
Storage time	t_{stg}			6.0		μs
Fall time	t_f			1.2		μs

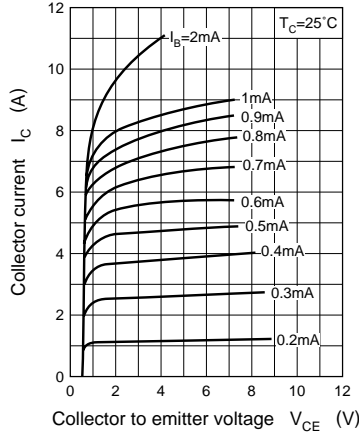
* h_{FE2} Rank classification

Rank	Q	P
h_{FE2}	5000 to 15000	8000 to 30000

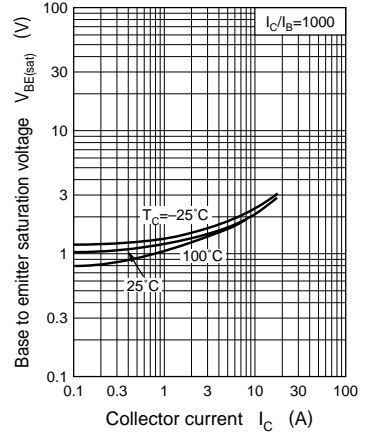
$P_C - T_a$



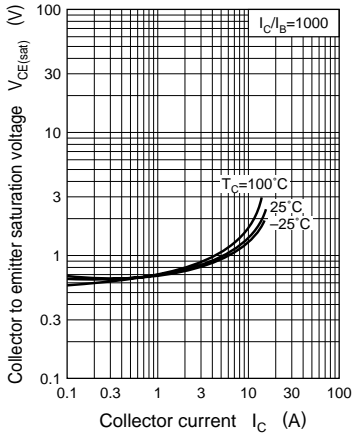
$I_C - V_{CE}$



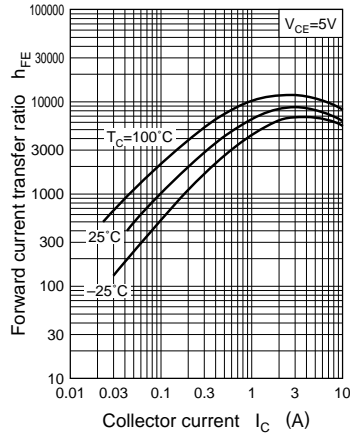
$V_{BE(sat)} - I_C$



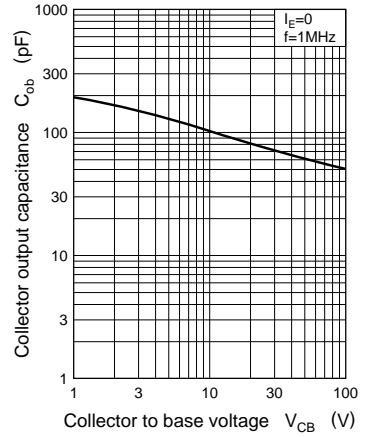
$V_{CE(sat)} - I_C$



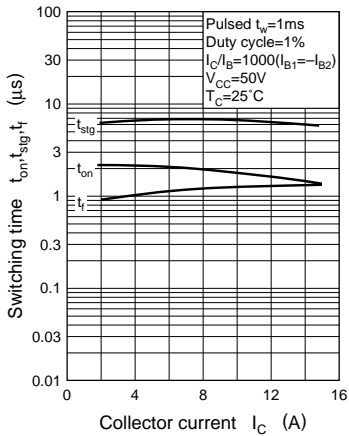
$h_{FE} - I_C$



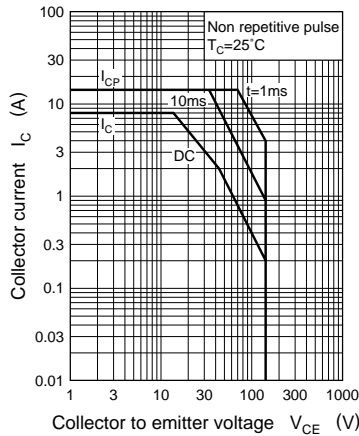
$C_{ob} - V_{CB}$



$t_{on}, t_{stg}, t_f - I_C$



Area of safe operation (ASO)



$$R_{th(t)} - t$$

