

2SD1645

Silicon NPN Epitaxial Planar Darlington Type

AF Amplifier

■ Features

- 60V Zener diode between built-in C and B, C and E
- Very small fluctuations in breakdown voltage
- Darlington connection
- High DC current gain (h_{FE})

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

Item	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	60 ± 10	V
Collector-emitter voltage	V_{CEO}	60 ± 10	V
Emitter-base voltage	V_{EBO}	5	V
Peak collector current	I_{CP}	1.5	A
Collector current	I_C	1.0	A
Collector power dissipation	P_C	1.2	W
		5.0*	
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

*with a $100 \times 100 \times 2$ Al heat sink at $T_a=25^\circ\text{C}$

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

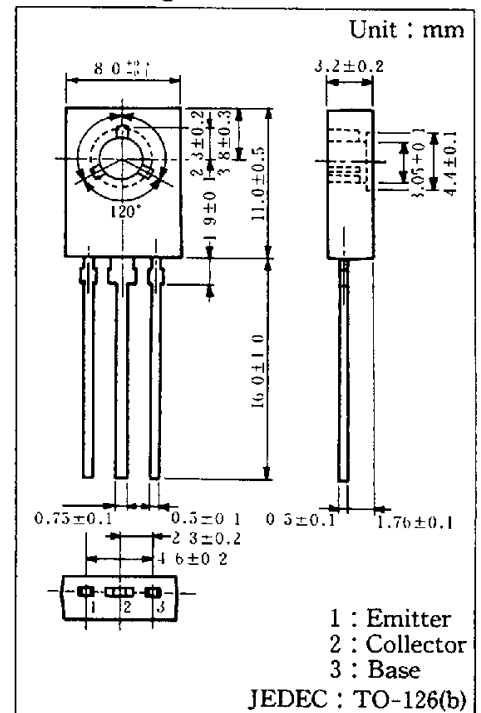
Item	Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	I_{CBO}	$V_{CB}=25\text{ V}, I_E=0$			1	μA
Emitter cutoff current	I_{EBO}	$V_{EB}=4\text{ V}, I_C=0$			1	μA
Collector-base voltage	V_{CBO}	$I_C=100\text{ }\mu\text{A}, I_E=0$	50		70	V
Collector-emitter voltage	V_{CEO}	$I_C=1\text{ mA}, I_B=0$	50		70	V
Emitter-base voltage	V_{EBO}	$I_E=100\text{ }\mu\text{A}, I_C=0$	5			V
DC current gain	h_{FE}^{*1}	$V_{CE}=10\text{ V}, I_C=1.0\text{ A}^{*2}$	4000		40000	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=1.0\text{ A}, I_B=1.0\text{ mA}^{*2}$			1.8	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=1.0\text{ A}, I_B=1.0\text{ mA}^{*2}$			2.2	V
Transition frequency	f_T	$V_{CB}=10\text{ V}, I_E=-50\text{ mA}, f=200\text{ MHz}$		150		MHz

*2 Pulse measurement

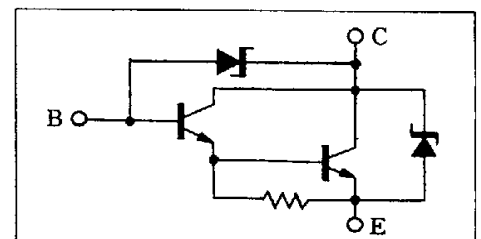
*1 h_{FE1} Classifications

Class	Q	R	S
h_{FE}	4000 ~ 10000	8000 ~ 20000	16000 ~ 40000

■ Package Dimensions

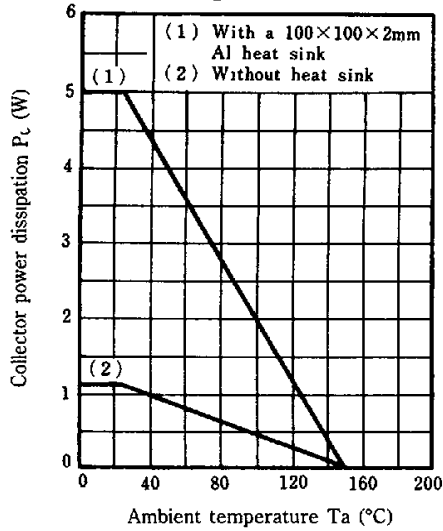


■ Inner Circuit

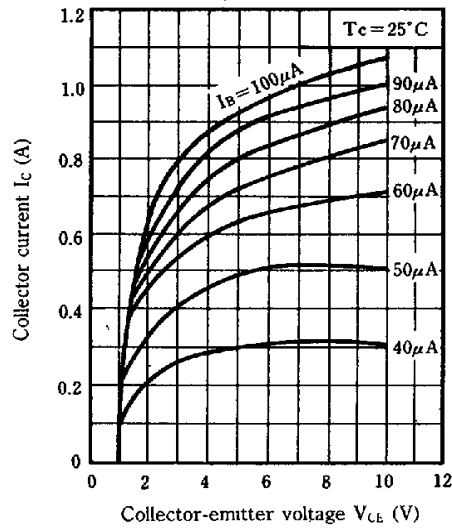


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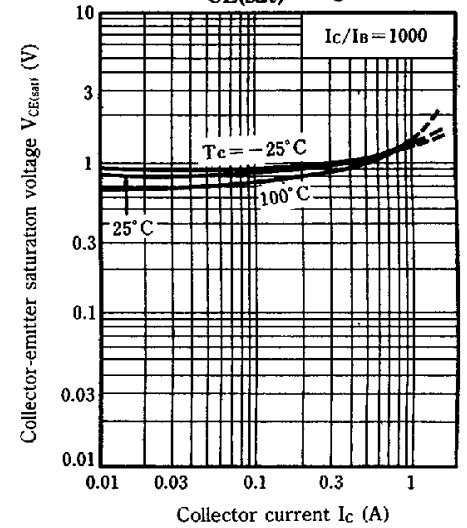
$P_C - T_a$



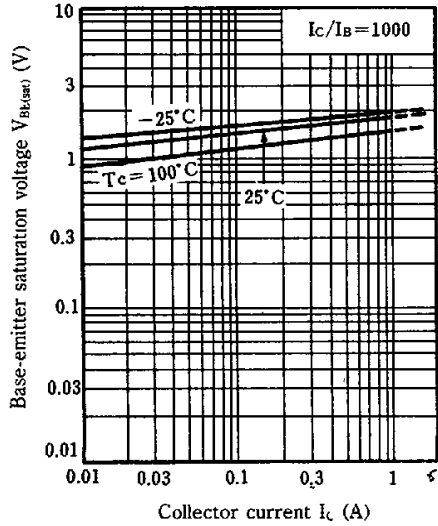
$I_C - V_{CE}$



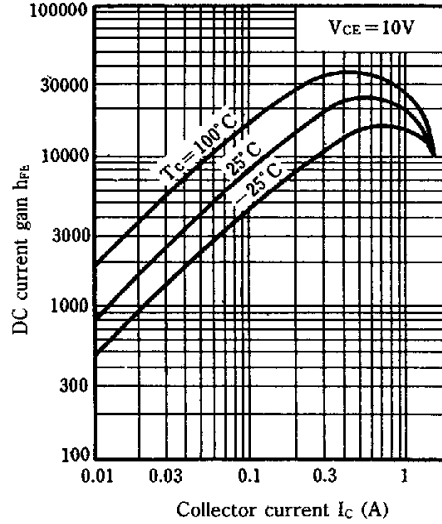
$V_{CE(sat)} - I_C$



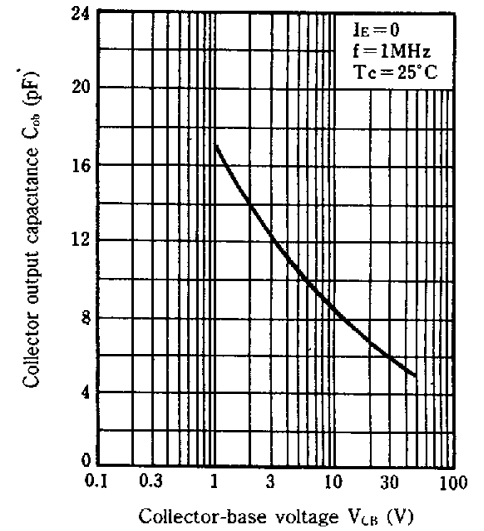
$V_{BE(sat)} - I_C$



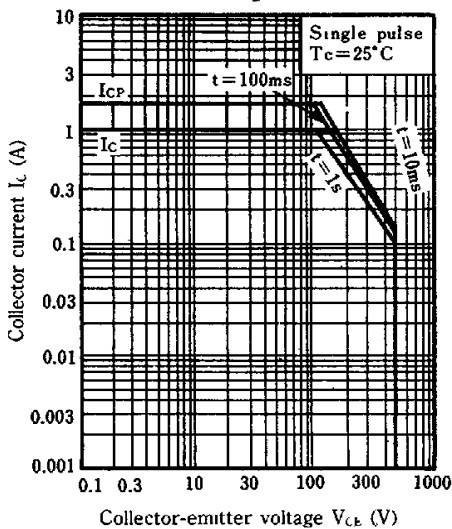
$h_{FE} - I_C$



$C_{ob} - V_{CB}$



Area of safe operation (ASO)



$R_{th(t)} - t$

