2SD1645

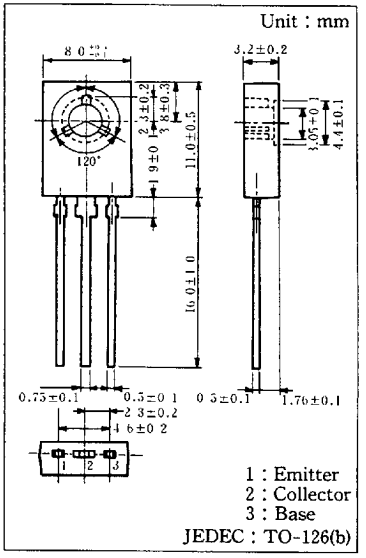
Silicon NPN Epitaxial Planar Darlington Type

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})

■ Package Dimensions

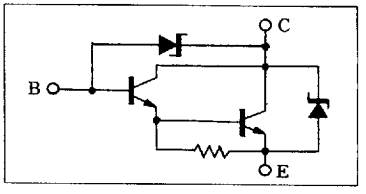


■ Absolute Maximum Ratings (Ta=25°C)

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	℃
Storage temperature	T_{stg}	−55～+150	℃

*with a 100×100×2 Al heat sink at Ta=25°C

■ Inner Circuit



■ Electrical Characteristics (Tc=25°C)

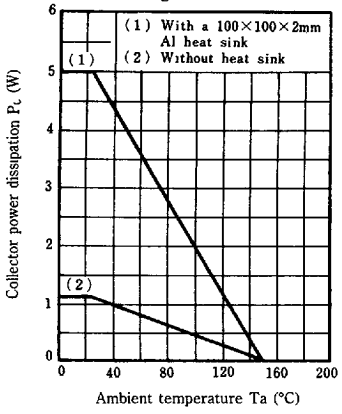
Item	Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	I_{CBO}	V_{CB}=25 V, I_E=0			1	μA
Emitter cutoff current	I_{EBO}	V_{EB}=4 V, I_C=0			1	μA
Collector-base voltage	V_{CBO}	I_C=100 μA, I_E=0	50		70	V
Collector-emitter voltage	V_{CEO}	I_C=1 mA, I_B=0	50		70	V
Emitter-base voltage	V_{EBO}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

*2 Pulse measurement

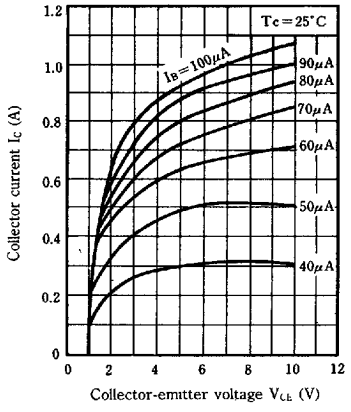
*1h_{FE1} Classifications

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

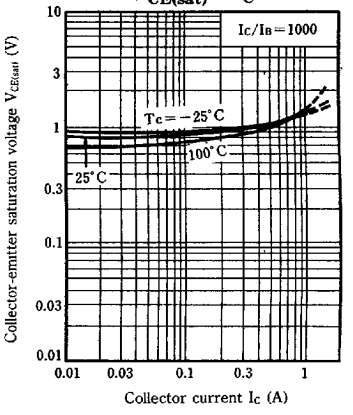
$P_C - Ta$



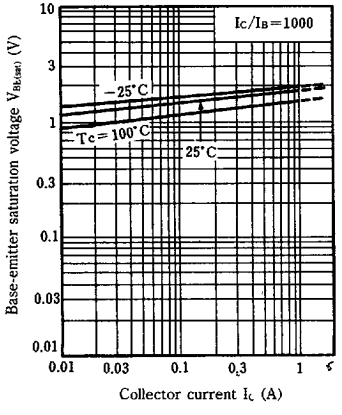
$I_C - V_{CE}$



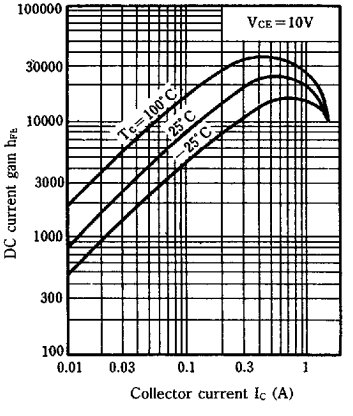
$V_{CE(sat)} - I_C$



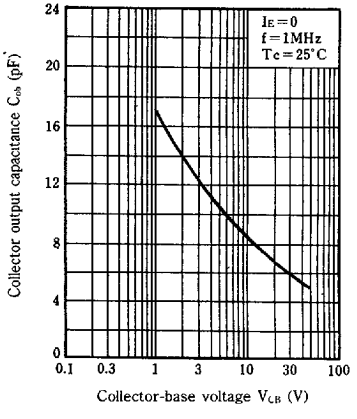
$V_{BE(sat)} - I_C$



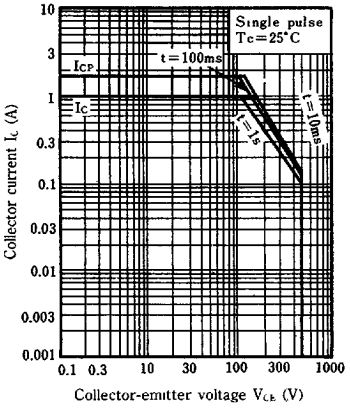
$h_{FE} - I_C$



$C_{ob} - V_{CB}$



Area of safe operation (ASO)



$R_{th(t)} - t$