

2SD1319

Silicon NPN Triple-Diffused Planar Darlington Type

Medium Speed Power Switching

Features

- 60V Zener diode built-in between C and B
- Very small fluctuation in breakdown voltages
- Large energy handling capability
- High speed switching
- "N Type" package configuration with a cooling fin for direct soldering on PC board of a small-size electronic equipment

Absolute Maximum Ratings (Tc=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}	4	A
Collector current	I_C	2	A
Collector power dissipation	$T_c = 25^\circ\text{C}$ $T_a = 25^\circ\text{C}$	P_C	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 ~ +150	°C

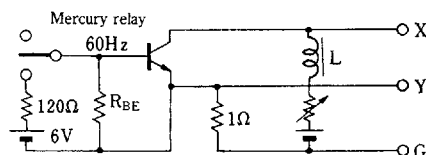
Electrical Characteristics (Tc=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 50\text{ V}, I_E = 0$			100	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 5\text{ V}, I_C = 0$			2	mA
Collector-emitter voltage	V_{CEO}	$I_C = 5\text{ mA}, I_B = 0$	50		70	V
DC current gain	h_{FE1}	$V_{CE} = 4\text{ V}, I_C = 1\text{ A}$	1000			
	h_{FE2}^{*1}	$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$	1000		10000	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2\text{ A}, I_B = 8\text{ mA}$			2.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 2\text{ A}, I_B = 8\text{ mA}$			2.5	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}	$I_C = 2\text{ A}, I_{B1} = 8\text{ mA}, I_{B2} = -8\text{ mA}$ $V_{CC} = 50\text{ V}$		0.4		μs
Storage time	t_{stg}			3		μs
Fall time	t_f			1		μs
Energy handling capability	$E_{s/b}^{*2}$	$I_C = 0.71\text{ A}, L = 100\text{ mH}, R_{BE} = 100\ \Omega$	25			mJ

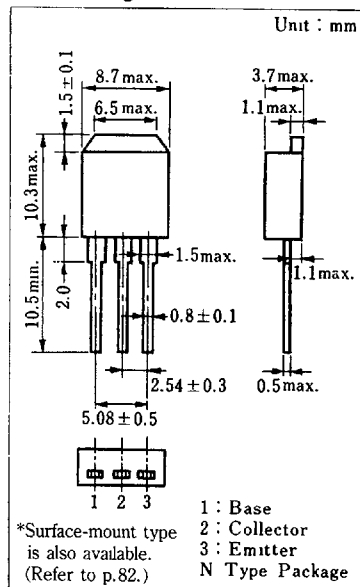
*1 h_{FE2} Classifications

Class	R	Q	P
h_{FE2}	1000 ~ 2500	2000 ~ 5000	4000 ~ 10000

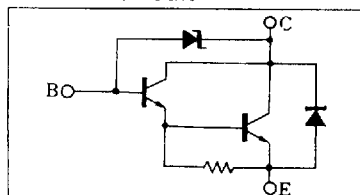
*2 $E_{s/b}$ Test method

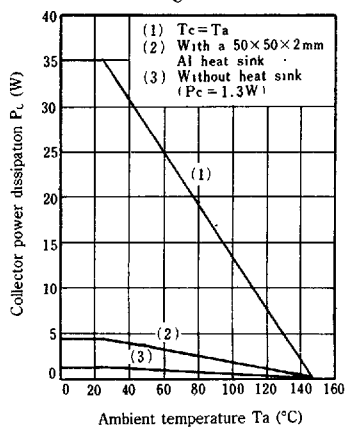
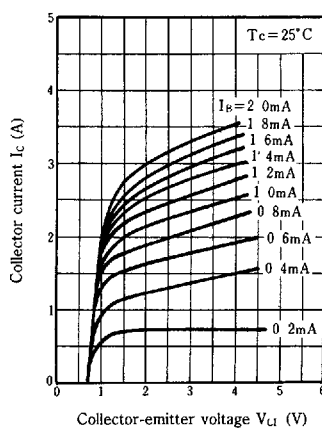
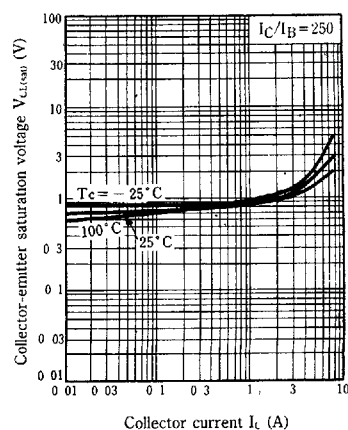
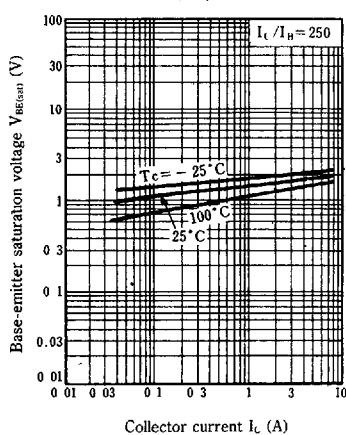
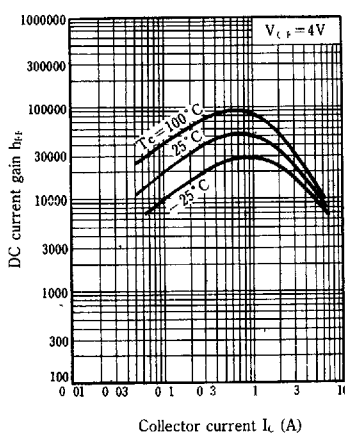
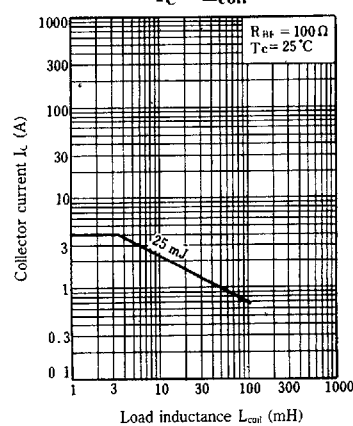


Package Dimensions

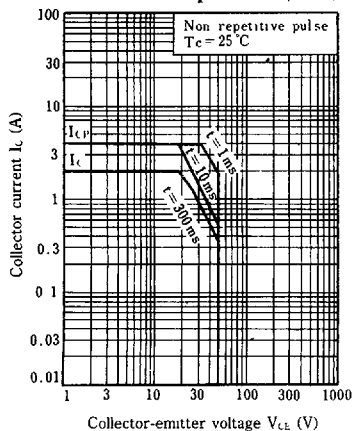


Inner Circuit



$P_C - T_a$  $I_C - V_{CE}$  $V_{CE(sat)} - I_C$  $V_{BE(sat)} - I_C$  $h_{FE} - I_C$  $I_C - L_{coil}$ 

Area of safe operation (ASO)

 $R_{th(t)} - t$ 