

2SD1316

Silicon NPN Triple-Diffused Planar Darlington Type

Medium Speed Power Switching

■ Features

- 30V 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_{CB0}	30 ± 5	V
Collector-emitter voltage	V_{CE0}	30 ± 5	V
Emitter-base voltage	V_{EB0}	5	V
Peak collector current	I_{CP}	4	A
Collector current	I_C	2	A
Collector power dissipation	P_C	35	W
		1.3	
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	-55 ~ +150	°C

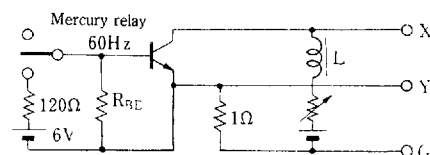
■ Electrical Characteristics (Tc=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	I_{CB0}	$V_{CB} = 25V, I_E = 0$			100	μA
Emitter cutoff current	I_{EB0}	$V_{EB} = 5V, I_C = 0$			2	mA
Collector-emitter voltage	V_{CE0}	$I_C = 5mA, I_B = 0$	25		35	V
DC current gain	h_{FE1}	$V_{CE} = 4V, I_C = 1A$	1000			
	h_{FE2}^{*1}	$V_{CE} = 4V, I_C = 2A$	1000		10000	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2A, I_B = 8mA$			2.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 2A, I_B = 8mA$			2.5	V
Transition frequency	f_T	$V_{CE} = 10V, I_C = 0.5A, f = 1MHz$		20		MHz
Turn-on time	t_{on}	$I_C = 2A, I_{B1} = 8mA, I_{B2} = -8mA$ $V_{CC} = 20V$		0.4		μs
Storage time	t_{stg}			3		μs
Fall time	t_f			1		μs
Energy handling capability	$E_{s/b}^{*2}$	$I_C = 1.45A, L = 100mH, R_{BE} = 100 \Omega$	100			mJ

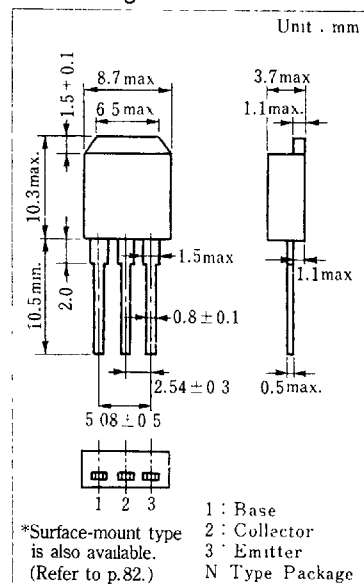
*1 h_{FE2} Classifications

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

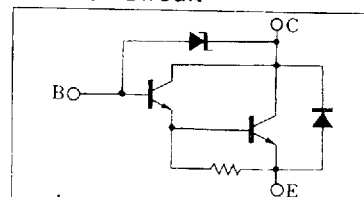
*2 $E_{s/b}$ Test method



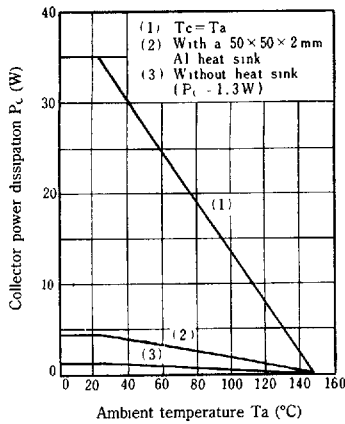
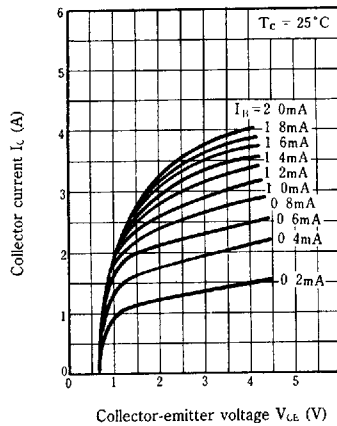
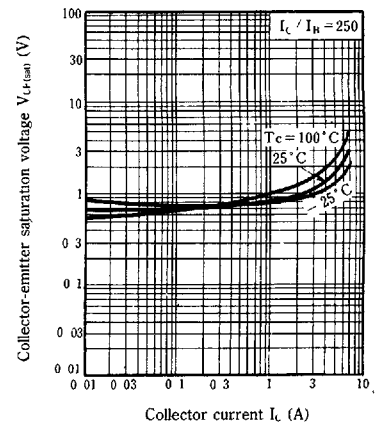
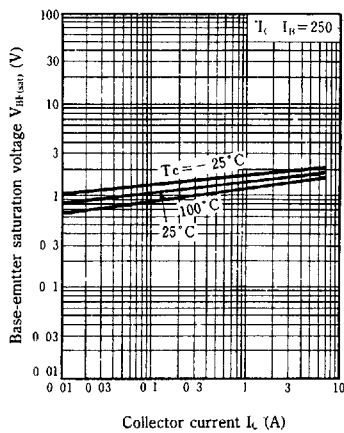
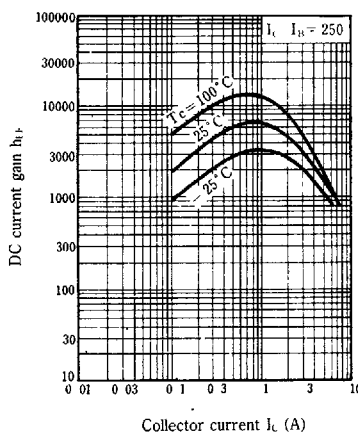
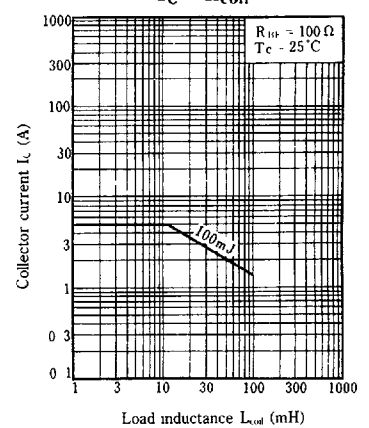
■ Package Dimensions



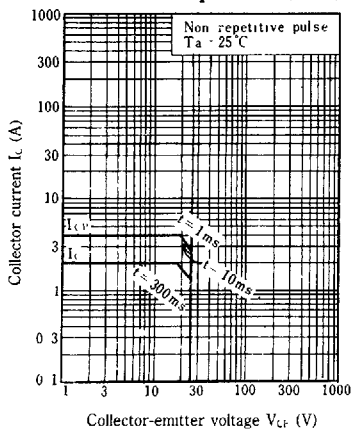
■ Inner Circuit



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

Area of safe operation (ASO)

 $R_{th(t)} - t$ 