

2SD2209

Silicon NPN triple diffusion planar type Darlington

For power amplification and switching

■ Features

- I type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

■ Absolute Maximum Ratings (T_C=25°C)

Parameter	Symbol	Ratings	Unit	
Collector to base voltage	V _{CBO}	100±15	V	
Collector to emitter voltage	V _{CEO}	100±15	V	
Emitter to base voltage	V _{EBO}	5	V	
Peak collector current	I _{CP}	8	A	
Collector current	I _C	4	A	
Collector power dissipation	P _C	T _C =25°C	15	W
		T _a =25°C		
Junction temperature	T _j	150	°C	
Storage temperature	T _{stg}	-55 to +150	°C	

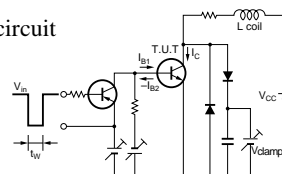
■ Electrical Characteristics (T_C=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I _{CBO}	V _{CB} = 85V, I _E = 0			100	μA
Emitter cutoff current	I _{EBO}	V _{EB} = 5V, I _C = 0			2	mA
Collector to emitter voltage	V _{CEO}	I _C = 5mA, I _B = 0	85		115	V
Forward current transfer ratio	h _{FE1}	V _{CE} = 3V, I _C = 0.5A	1000			
	h _{FE2} ^{*1}	V _{CE} = 3V, I _C = 3A	1000		10000	
Collector to emitter saturation voltage	V _{CE(sat)}	I _C = 3A, I _B = 12mA			2	V
		I _C = 5A, I _B = 20mA			4	
Base to emitter saturation voltage	V _{BE(sat)}	I _C = 3A, I _B = 12mA			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 = 3A, I _{B1} = 12mA, I _{B2} = -12mA, V _{CC} = 50V			0.3	μs
Storage time	t _{stg}		3.0	μs		
Fall time	t _f		1.0	μs		
Energy handling capability	E _{s/b} ^{*2}	I _C = 1A, L = 100mH, R _{BE} = 100Ω		50		mJ

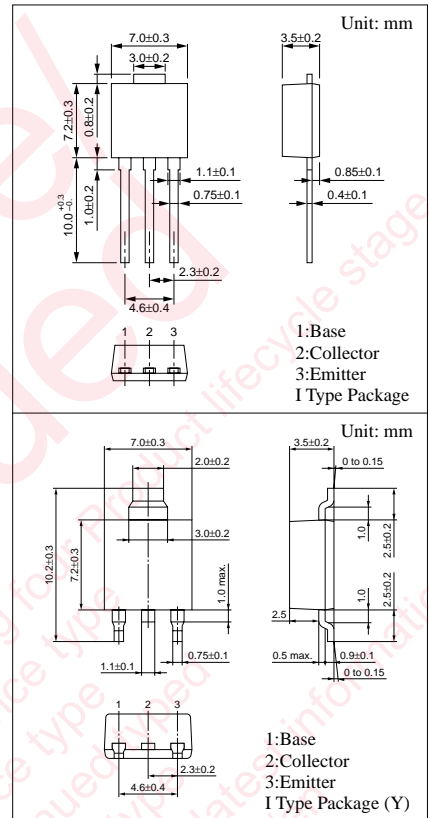
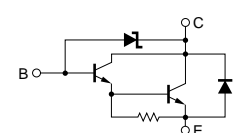
^{*1}h_{FE2} Rank classification

Rank	Q	P
h _{FE2}	1000 to 5000	2000 to 10000

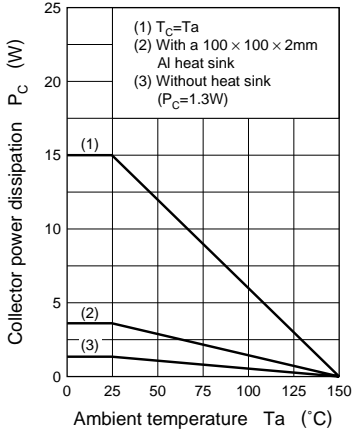
^{*2}E_{s/b} Test circuit



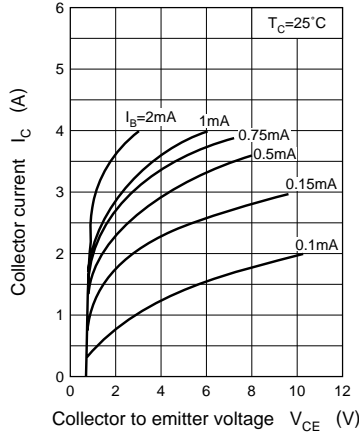
Internal Connection



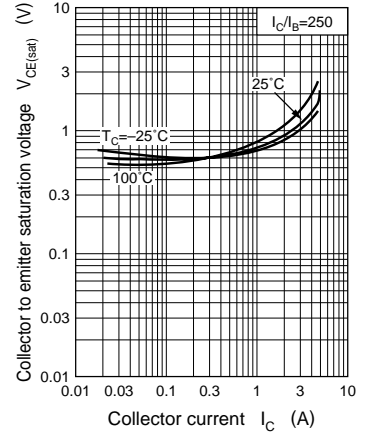
$P_C - T_a$



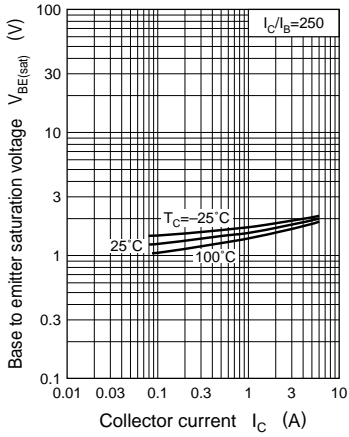
$I_C - V_{CE}$



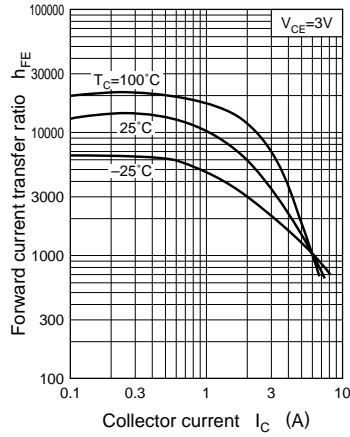
$V_{CE(sat)} - I_C$



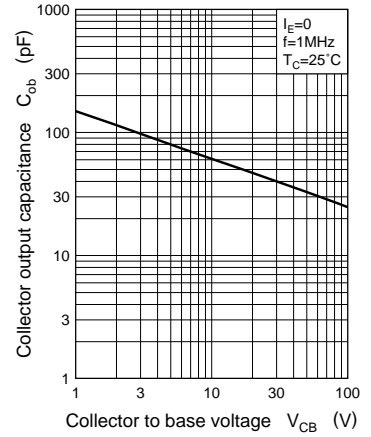
$V_{BE(sat)} - I_C$



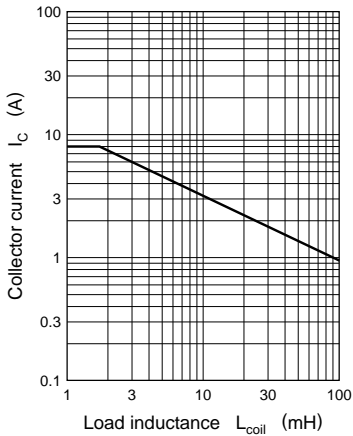
$h_{FE} - I_C$



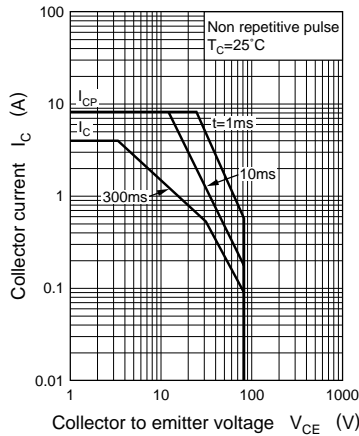
$C_{ob} - V_{CB}$

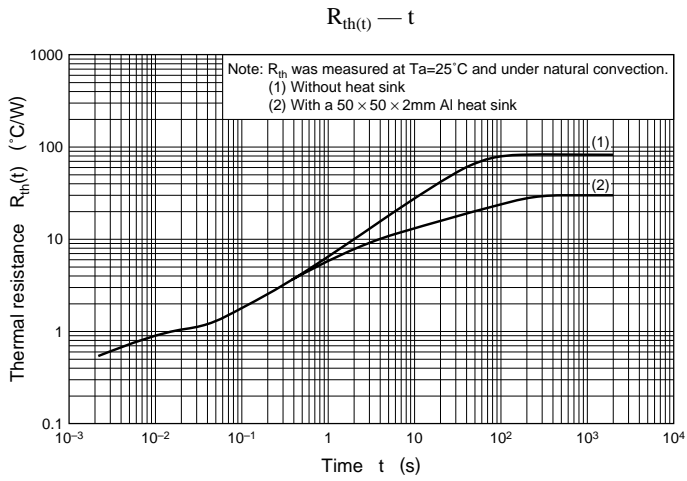


$I_C - L_{coil}$



Area of safe operation (ASO)





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