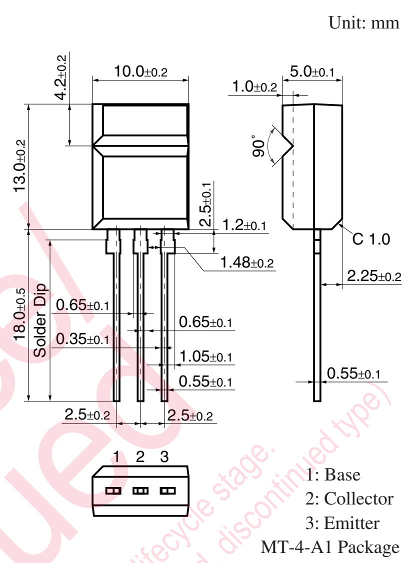
2SD2139

Silicon NPN triple diffusion planar type

For high-speed switching and high current amplification ratio



■ Features

- High forward current transfer ratio h_{FE}
- Satisfactory linearity of forward current transfer ratio h_{FE}
- Allowing supply with the radial taping

■ Absolute Maximum Ratings $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector-base voltage (Emitter open)		V_{CBO}	80	V
Collector-emitter voltage (Base open)		V_{CEO}	60	V
Emitter-base voltage (Collector open)		V_{EBO}	6	V
Collector current		I_C	3	A
Peak collector current		I_{CP}	6	A
Base current		I_B	1	A
Collector power dissipation		P_C	15	W
	$T_a = 25°C$		2.0	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

■ Electrical Characteristics $T_C = 25°C \pm 3°C$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 25$ mA, $I_B = 0$	60			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 80$ V, $I_E = 0$			100	µA
Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 40$ V, $I_B = 0$			100	µA
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = 6$ V, $I_C = 0$			100	µA
Forward current transfer ratio *	h_{FE}	$V_{CE} = 4$ V, $I_C = 0.5$ A	500		2 500	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2$ A, $I_B = 0.05$ A			1.0	V
Transition frequency	f_T	$V_{CE} = 12$ V, $I_C = 0.2$ A, f = 10 MHz		50		MHz

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
2. ∗: Rank classification

Rank	Q	P	O
h_{FE}	500 to 1 000	800 to 1 500	1 200 to 2 500

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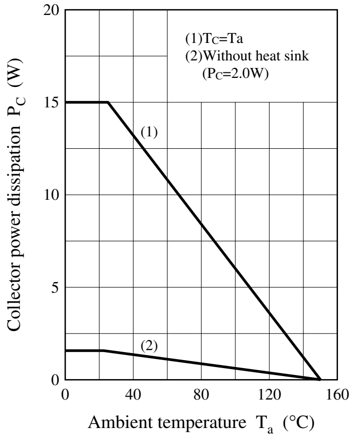
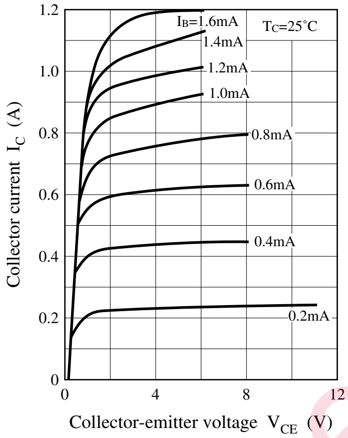
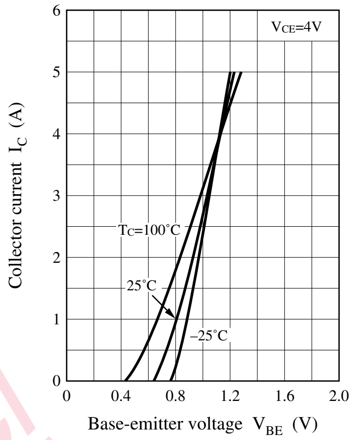
P_C — T_a



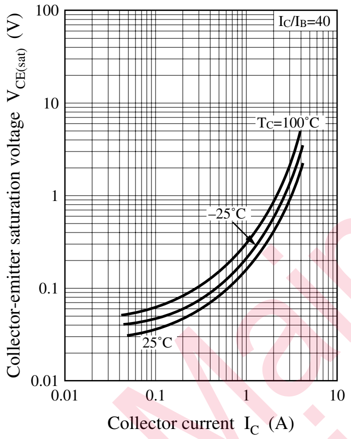
I_C — V_{CE}



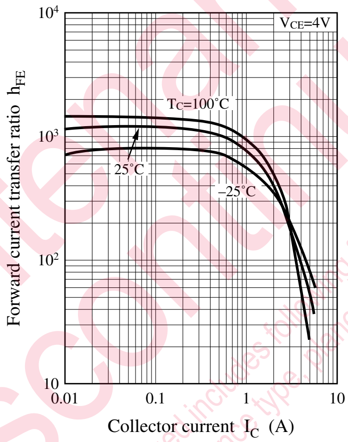
I_C — V_{BE}



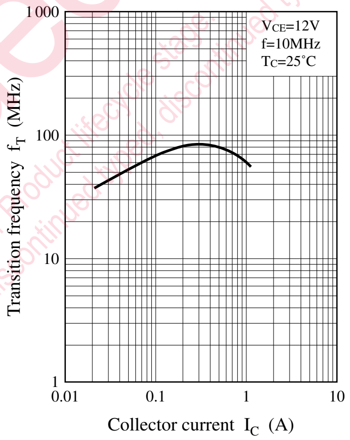
$V_{CE(sat)}$ — I_C



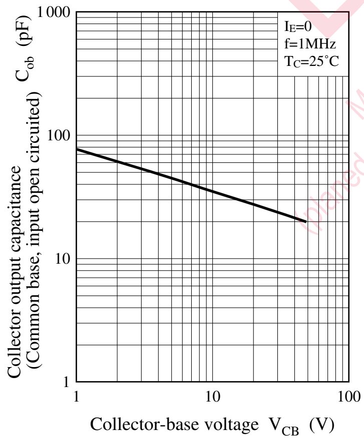
h_{FE} — I_C



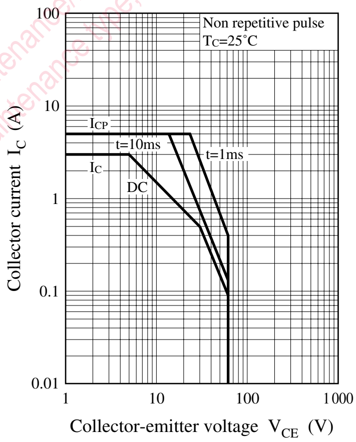
f_T — I_C



C_{ob} — V_{CB}



Safe operation area



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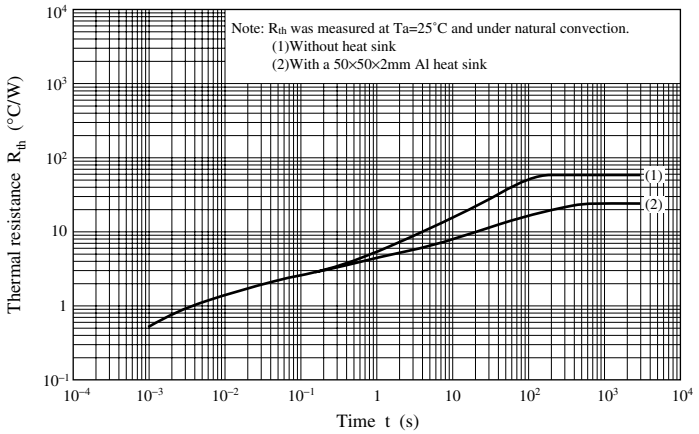
R_{th} — t



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