2SD2138

Silicon NPN triple diffusion planar type darlington

For power amplification
Complementary to 2SB1418

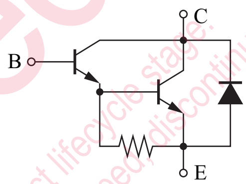
■ Features

- High forward current transfer ratio h_{FE} which has satisfactory linearity.
- Allowing supply with the radial taping

■ Package

- Code
  MT-4-A1
- Pin Name
  1. Base
  2. Collector
  3. Emitter

■ Internal Connection



■ Absolute Maximum Ratings $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector-base voltage (Emitter open)		V_{CBO}	60	V
Collector-emitter voltage (Base open)		V_{CEO}	60	V
Emitter-base voltage (Collector open)		V_{EBO}	5	V
Collector current		I_C	2	A
Peak collector current		I_{CP}	4	A
Collector power dissipation		P_C	15	W
	$T_C = 25°C$		2.0	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	–55 to +150	°C

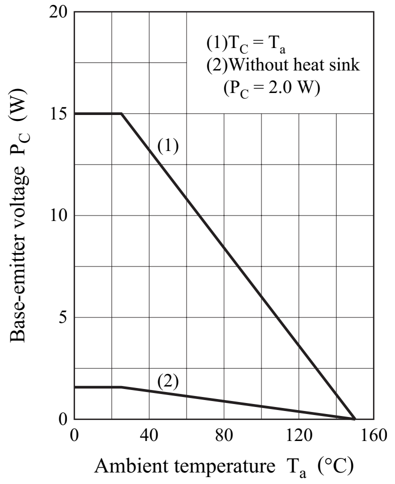
■ Electrical Characteristics $T_C = 25°C±3°C$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 30$ mA, $I_B = 0$	60			V
Base-emitter voltage	V_{BE}	$V_{CE} = 4$ V, $I_C = 2$ A			2.8	V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 60$ V, $I_E = 0$			100	μA
Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 30$ V, $I_B = 0$			100	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = 5$ V, $I_C = 0$			100	μA
Forward current transfer ratio	h_{FE1}	$V_{CE} = 4$ V, $I_C = 1$ A	1 000			—
	h_{FE2} *	$V_{CE} = 4$ V, $I_C = 2$ A	2 000		10 000	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2$ A, $I_B = 8$ mA			2.5	V
Transition frequency	f_T	$V_{CE} = 10$ V, $I_C = 0.5$ A, f = 1 MHz		20		MHz
Turn-on time	t_{on}	$I_C = 2$ A, $I_{B1} = 8$ mA, $I_{B2} = –8$ mA,		0.4		μs
Turn-off time	t_{off}	$V_{CC} = 50$ V		4		μs

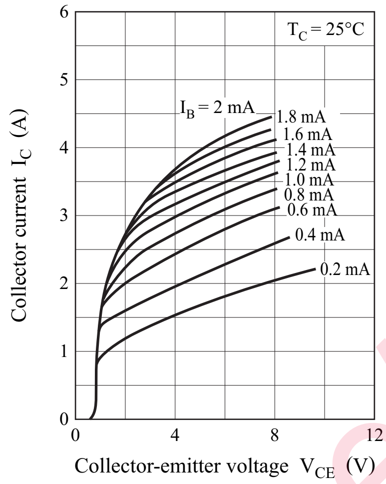
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
2. *: Rank classification

Rank	Q	P
h_{FE2}	2 000 to 5 000	4 000 to 10 000

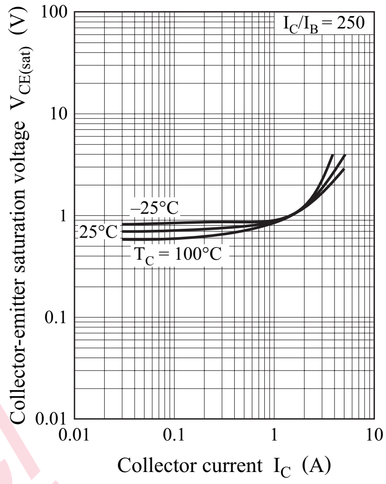
P_C — T_a



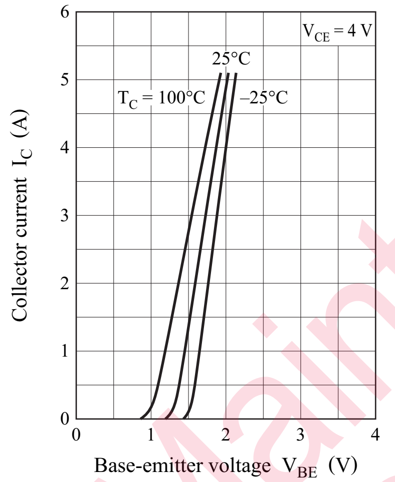
I_C — V_{CE}



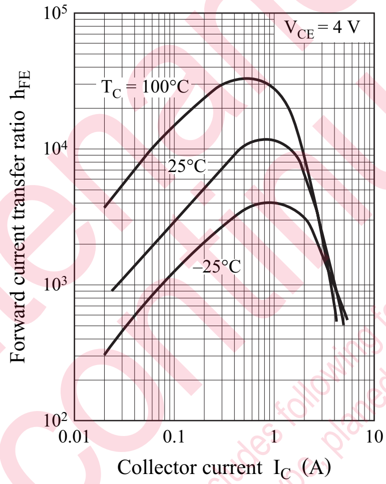
$V_{CE(sat)}$ — I_C



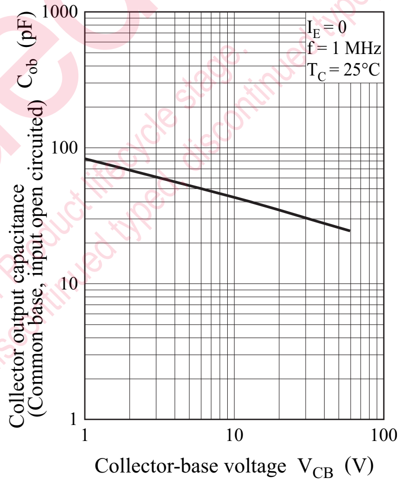
I_C — V_{BE}



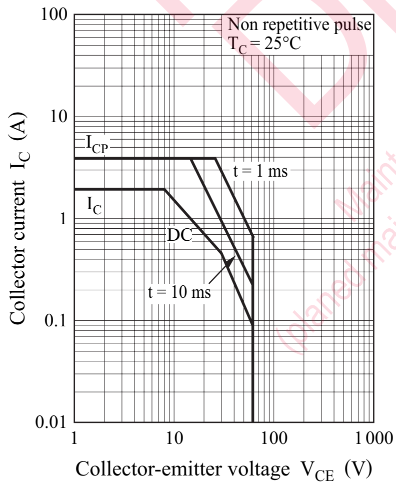
h_{FE} — I_C



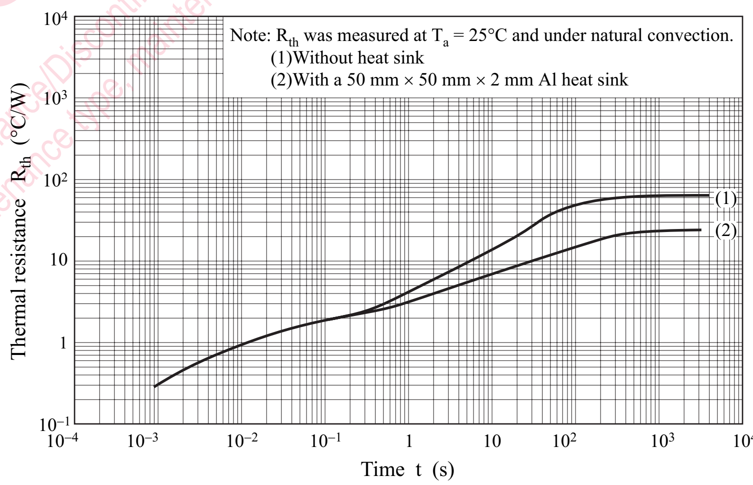
C_{ob} — V_{CB}



Safe operation area

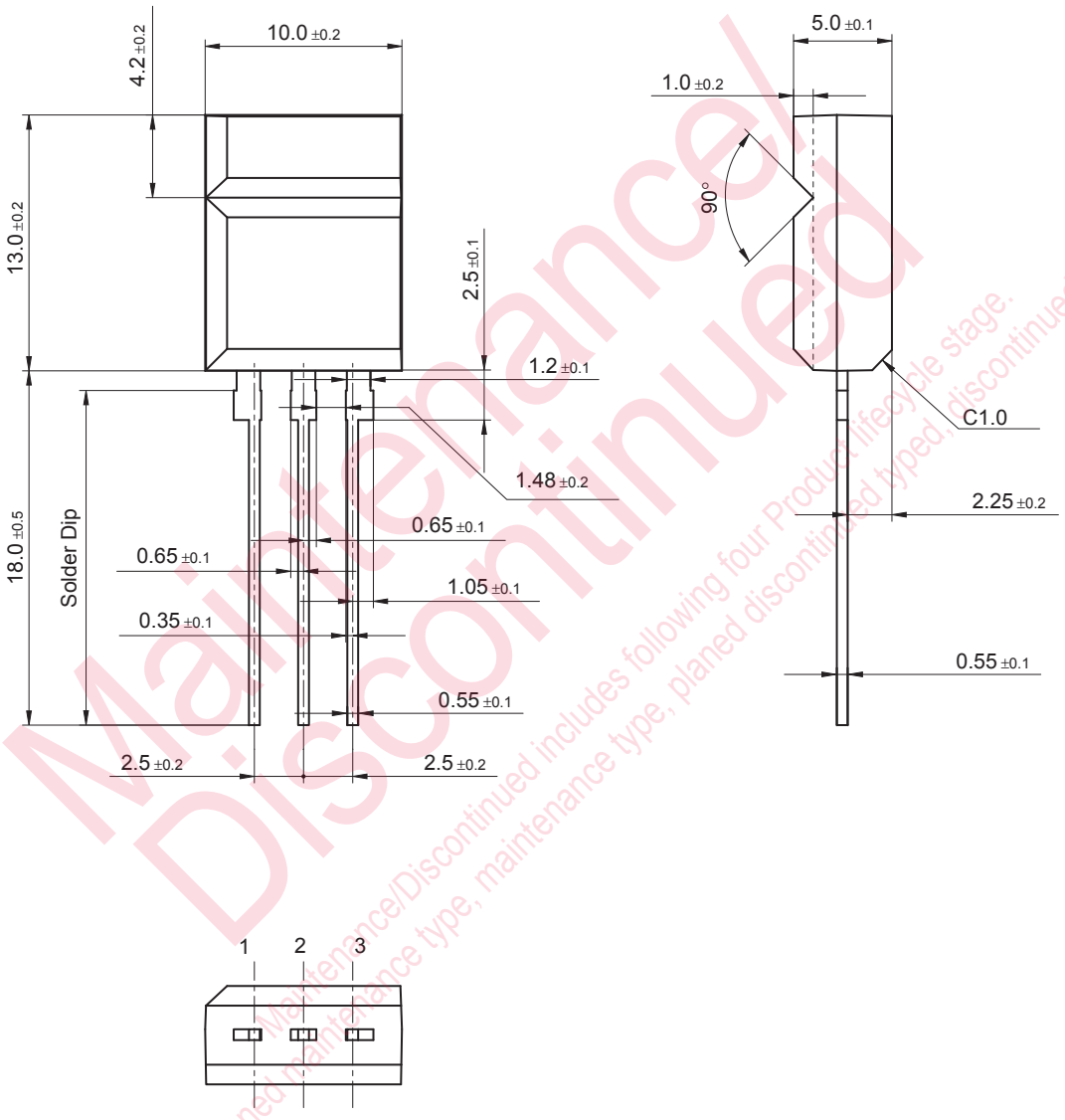


R_{th} — t



MT-4-A1

Unit: mm



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