

2SD2138, 2SD2138A

Silicon NPN triple diffusion planar type Darlington

For power amplification

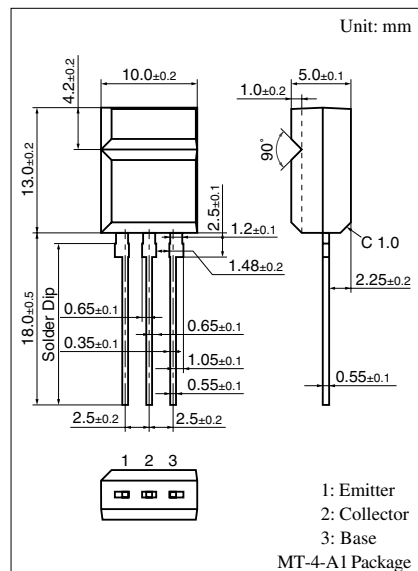
Complementary to 2SB1418 and 2SB1418A

■ Features

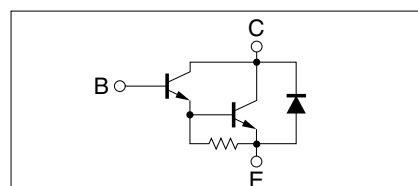
- High forward current transfer ratio h_{FE} which has satisfactory linearity
- Allowing supply with the radial tapering

■ Absolute Maximum Ratings $T_C = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit	
Collector to base voltage	2SD2138	V_{CBO}	60	V
	2SD2138A		80	
Collector to emitter voltage	2SD2138	V_{CEO}	60	V
	2SD2138A		80	
Emitter to base voltage	V_{EBO}	5	V	
Peak collector current	I_{CP}	4	A	
Collector current	I_C	2	A	
Collector power dissipation	$T_C = 25^\circ\text{C}$	P_C	15	W
	$T_a = 25^\circ\text{C}$		2	
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	



Internal Connection

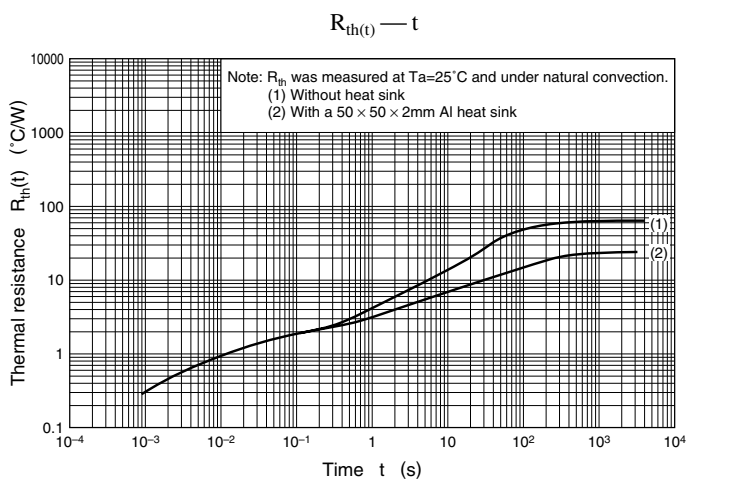
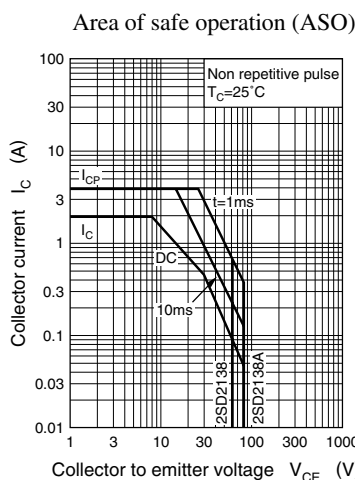
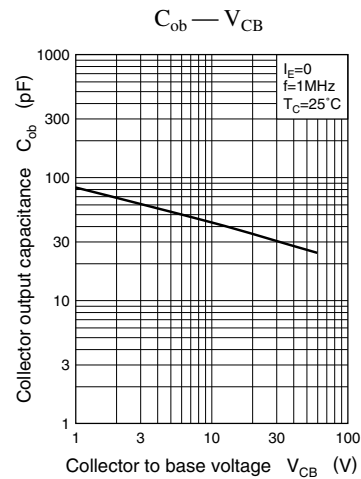
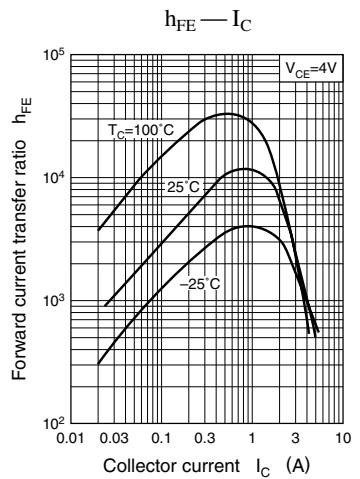
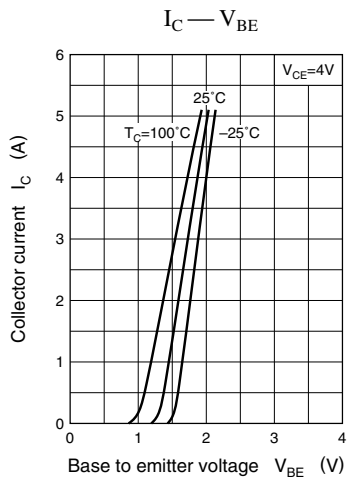
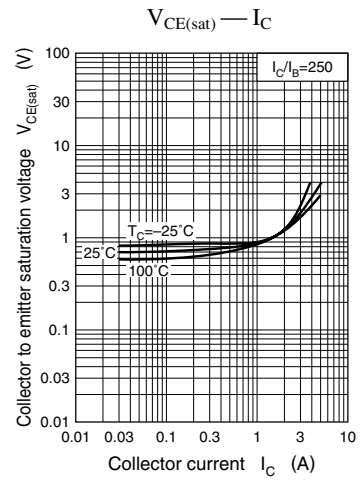
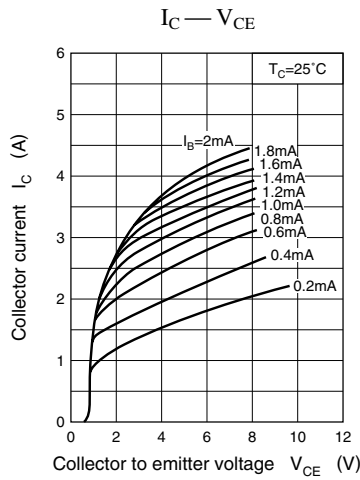
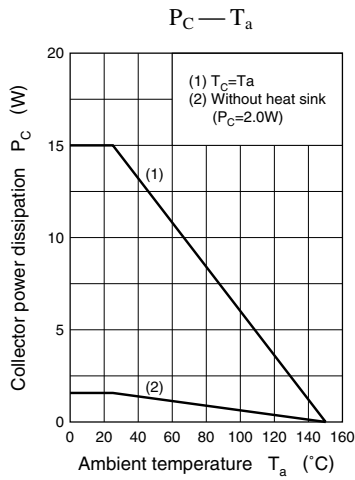


■ Electrical Characteristics $T_C = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SD2138	$V_{CE} = 60\text{ V}, I_E = 0$			100	μA
	2SD2138A	$V_{CE} = 80\text{ V}, I_E = 0$			100	
Collector cutoff current	2SD2138	$V_{CE} = 30\text{ V}, I_B = 0$			100	μA
	2SD2138A	$V_{CE} = 40\text{ V}, I_B = 0$			100	
Emitter cutoff current	I_{EBO}	$V_{EB} = 5\text{ V}, I_C = 0$			100	μA
Collector to emitter voltage	2SD2138	$I_C = 30\text{ mA}, I_B = 0$	60			V
	2SD2138A		80			
Forward current transfer ratio	h_{FE1}	$V_{CE} = 4\text{ V}, I_C = 1\text{ A}$	1 000			
	h_{FE2}^*	$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$	2 000		10 000	
Base to emitter voltage	V_{BE}	$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$			2.8	V
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2\text{ A}, I_B = 8\text{ mA}$			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
Turn-off time	t_{off}			4		μs

Note) *: Rank classification

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



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