

2SD2138, 2SD2138A

Silicon NPN triple diffusion planar type Darlington

For power amplification

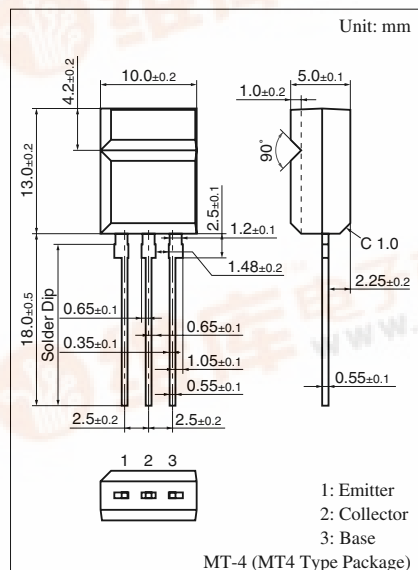
Complementary to 2SB1418 and 2SB1418A

■ Features

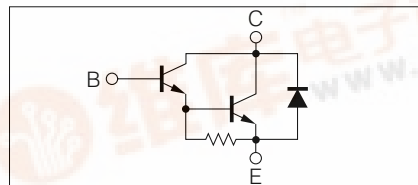
- High forward current transfer ratio h_{FE} which has satisfactory linearity
- Allowing supply with the radial tapering

■ 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



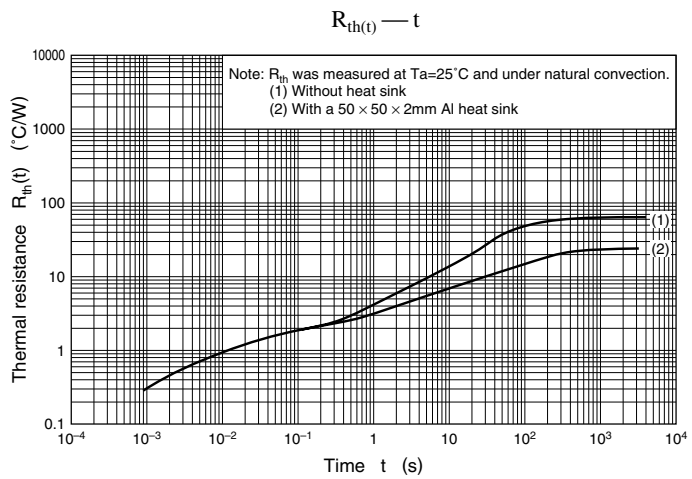
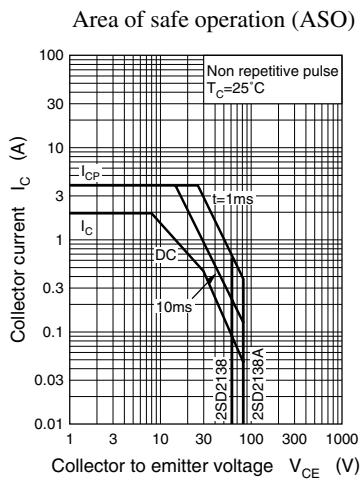
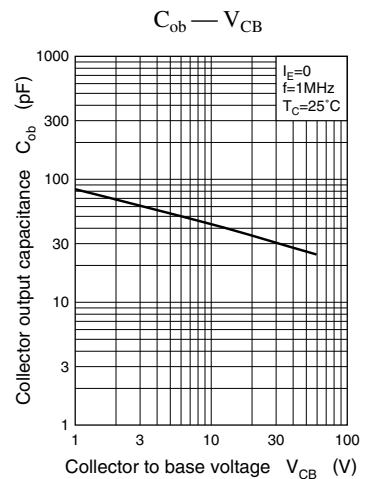
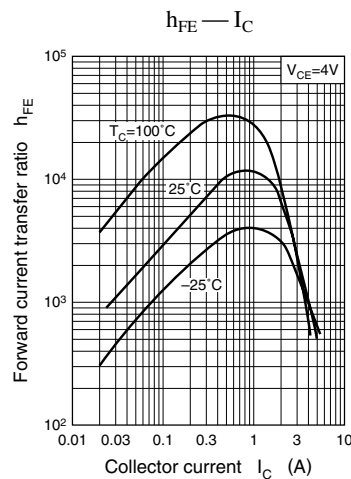
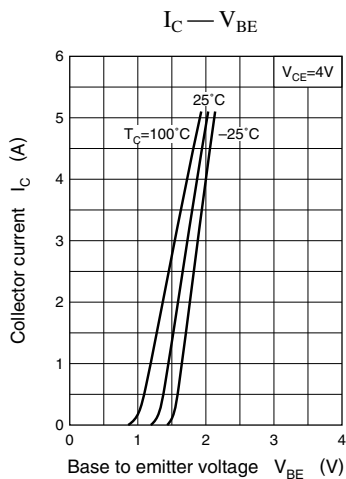
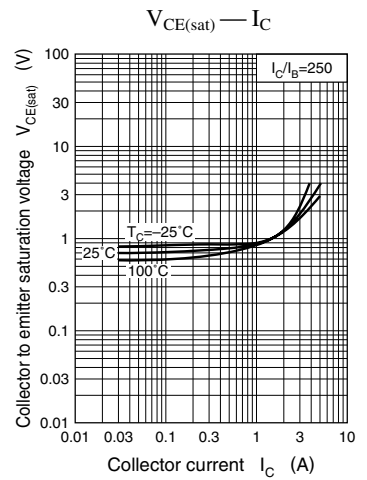
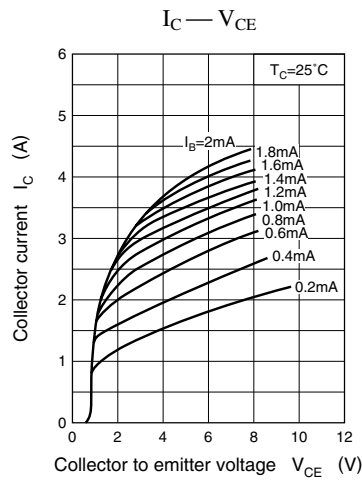
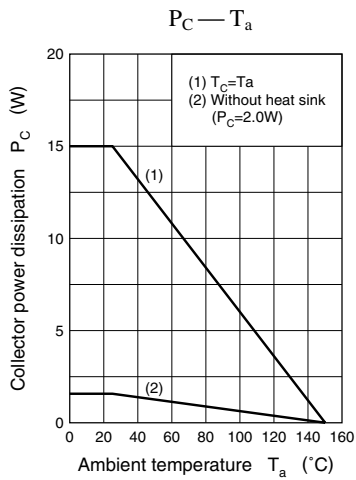
■ Electrical Characteristics $T_C = 25^\circ\text{C}$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SD2138	I_{CBO}	$V_{CE} = 60 \text{ V}, I_E = 0$			100	μA
	2SD2138A		$V_{CE} = 80 \text{ V}, I_E = 0$			100	
Collector cutoff current	2SD2138	I_{CEO}	$V_{CE} = 30 \text{ V}, I_B = 0$			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	V_{CEO}	$I_C = 30 \text{ mA}, I_B = 0$	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}	$I_C = 2 \text{ A}, I_{B1} = 8 \text{ mA}, I_{B2} = -8 \text{ mA},$		0.4		μs
Turn-off time		t_{off}	$V_{CC} = 50 \text{ V}$		4		μs

(Note) Rank classification

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





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