

# 2SD1198, 2SD1198A

Silicon NPN epitaxial planar type darlington

For low-frequency amplification

## Features

- Forward current transfer ratio  $h_{FE}$  is designed high, which is appropriate to the driver circuit of motors and printer bammer:  $h_{FE} = 4000$  to  $40000$ .
- A shunt resistor is omitted from the driver.
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

## Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Ratings	Unit
Collector to base voltage	2SD1198	$V_{CBO}$	30	V
	2SD1198A		60	
Collector to emitter voltage	2SD1198	$V_{CEO}$	25	V
	2SD1198A		50	
Emitter to base voltage		$V_{EBO}$	5	V
Peak collector current		$I_{CP}$	1.5	A
Collector current		$I_C$	1	A
Collector power dissipation		$P_C^*$	1	W
Junction temperature		$T_j$	150	°C
Storage temperature		$T_{stg}$	-55 ~ +150	°C

\* Printed circuit board: Copper foil area of 1cm<sup>2</sup> or more, and the board thickness of 1.7mm for the collector portion

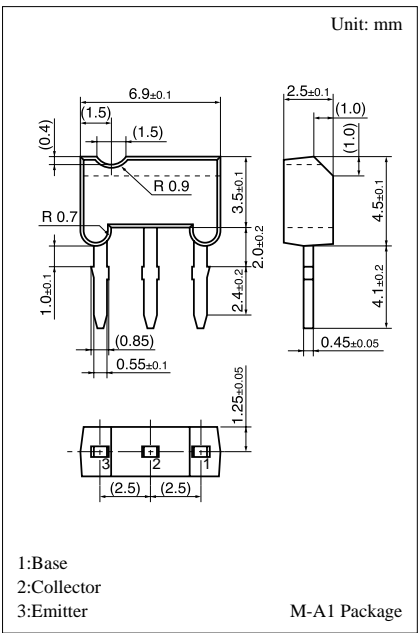
## Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	2SD1198 2SD1198A	$I_{CBO}$	$V_{CB} = 25V, I_E = 0$		100	nA
			$V_{CB} = 45V, I_E = 0$		100	
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 4V, I_C = 0$			100	nA
Collector to base voltage	2SD1198 2SD1198A	$V_{CBO}$	$I_C = 100\mu A, I_B = 0$		30	V
					60	
Collector to emitter voltage	2SD1198 2SD1198A	$V_{CEO}$	$I_C = 1mA, I_B = 0$		25	V
					50	
Emitter to base voltage	$V_{EBO}$	$I_E = 100\mu A, I_C = 0$	5			V
Forward current transfer ratio	$h_{FE}^{*1}$	$V_{CE} = 10V, I_C = 1A^{*2}$	4000		40000	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1A, I_B = 1mA^{*2}$			1.8	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1A, I_B = 1mA^{*2}$			2.2	V
Transition frequency	$f_T$	$V_{CB} = 10V, I_E = -50mA, f = 200MHz$		150		MHz

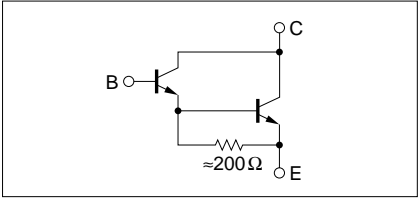
\*<sup>1</sup> $h_{FE}$  Rank classification

Rank	Q	R	S
$h_{FE}$	4000 ~ 10000	8000 ~ 20000	16000 ~ 40000

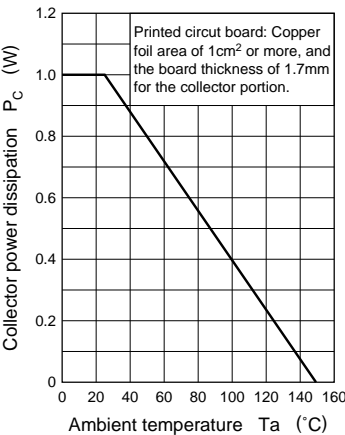
\*<sup>2</sup> Pulse measurement



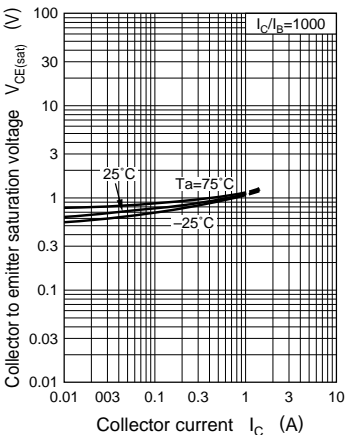
## Internal Connection



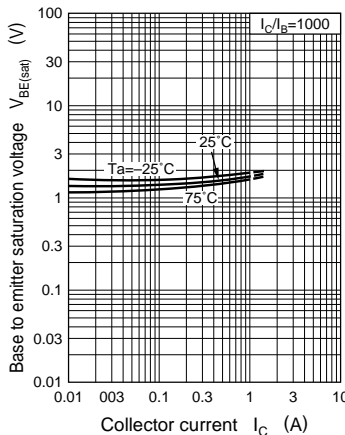
$P_C - T_a$



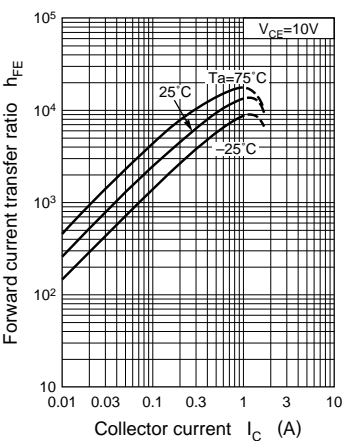
$V_{CE(sat)} - I_C$



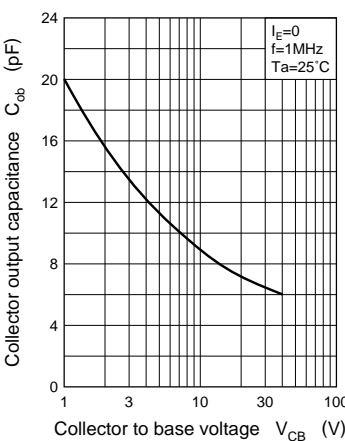
$V_{BE(sat)} - I_C$



$h_{FE} - I_C$



$C_{ob} - V_{CB}$



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