

# 2SD1478, 2SD1478A

Silicon NPN epitaxial planer 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  $20000$ .
- A shunt resistor is omitted from the driver.

## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	2SD1478	30	V
	2SD1478A	60	
Collector to emitter voltage	2SD1478	25	V
	2SD1478A	50	
Emitter to base voltage	$V_{EBO}$	5	V
Peak collector current	$I_{CP}$	750	mA
Collector current	$I_C$	500	mA
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 ~ +150	°C

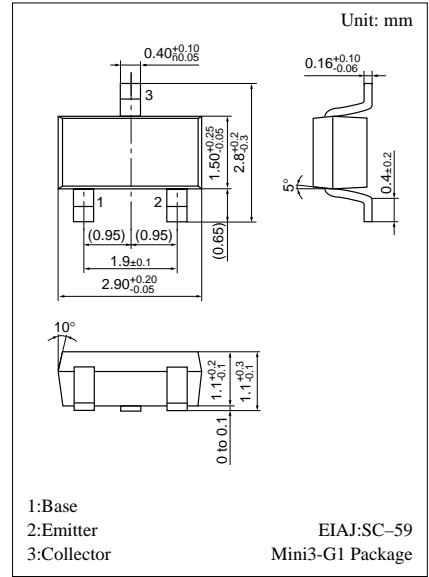
## Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 25V, I_E = 0$			100	nA
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 4V, I_C = 0$			100	nA
Collector to base voltage	2SD1478	$I_C = 100\mu A, I_E = 0$	30			V
	2SD1478A		60			
Collector to emitter voltage	2SD1478	$I_C = 1mA, I_B = 0$	25			V
	2SD1478A		50			
Emitter to base voltage	$V_{EBO}$	$I_E = 100\mu A, I_C = 0$	5			V
Forward current transfer ratio	$h_{FE}^{*1}$	$V_{CE} = 10V, I_C = 500mA^{*2}$	4000		20000	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 500mA, I_B = 0.5mA^{*2}$			2.5	V
Base to emitter voltage	$V_{BE(sat)}$	$I_C = 500mA, I_B = 0.5mA^{*2}$			3.0	V
Transition frequency	$f_T$	$V_{CB} = 10V, I_E = -50mA, f = 200MHz$		200		MHz

\*1 $h_{FE1}$  Rank classification

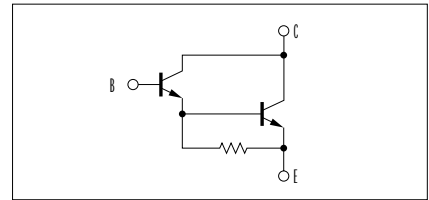
\*2 Pulse measurement

Rank	Q	R
$h_{FE1}$	4000 ~ 10000	8000 ~ 20000
Marking	2SD1478	2NQ
Symbol	2SD1478A	2OR

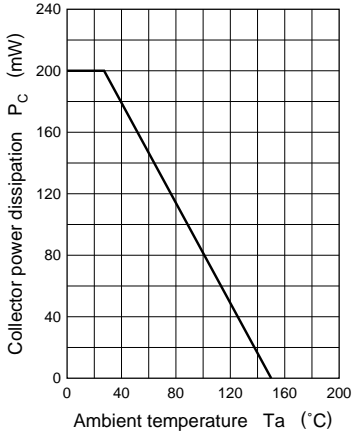


Marking symbol : 2N(2SD1478)  
2O(2SD1478A)

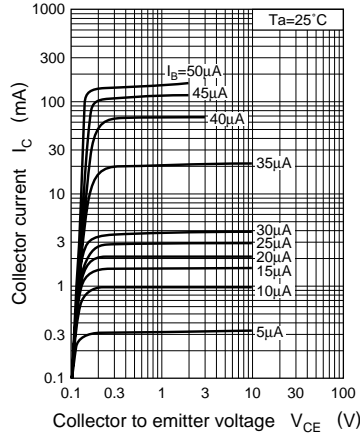
Internal Connection



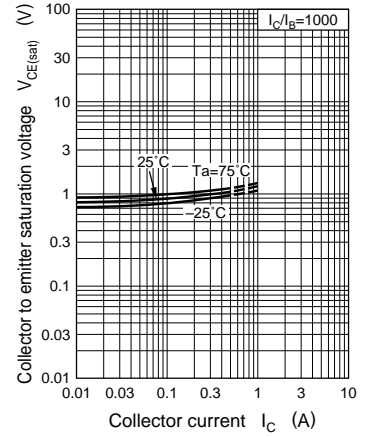
$P_C - T_a$



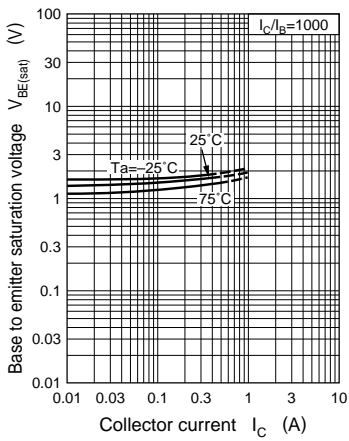
$I_C - V_{CE}$



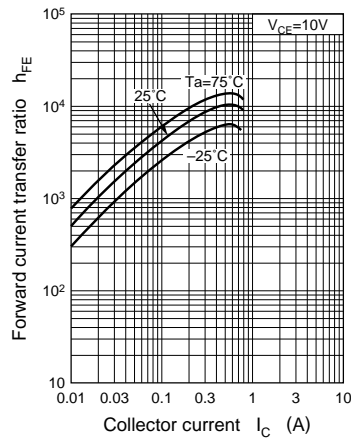
$V_{CE(sat)} - I_C$



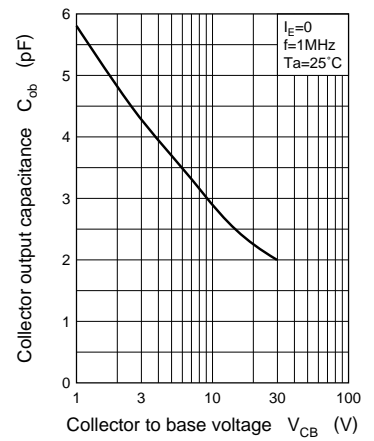
$V_{BE(sat)} - I_C$



$h_{FE} - I_C$



$C_{ob} - V_{CB}$



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