

# 2SD1748, 2SD1748A

Silicon NPN triple diffusion planar type Darlington

For low-frequency power amplification  
Complementary to 2SB1178 and 2SB1178A

## Features

- High forward current transfer ratio  $h_{FE}$
- High-speed switching
- I type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	60	V
2SD1748A		80	
Collector to emitter voltage	$V_{CEO}$	60	V
2SD1748A		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	$P_C$	15	W
		1.3	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

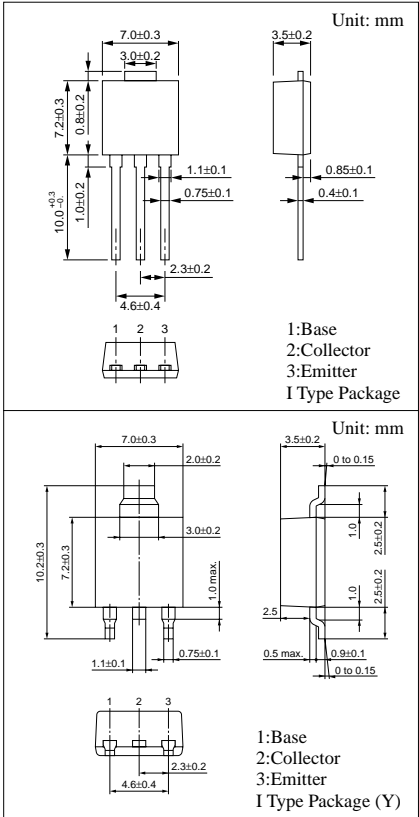
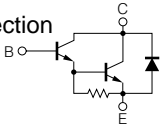
## Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

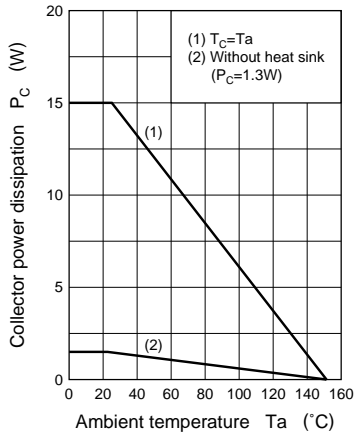
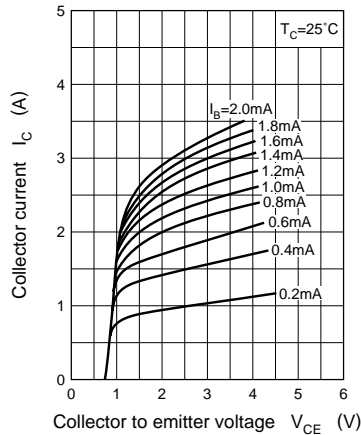
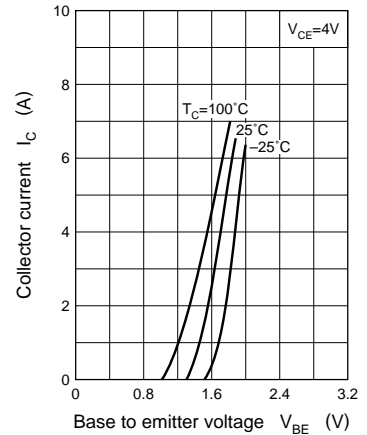
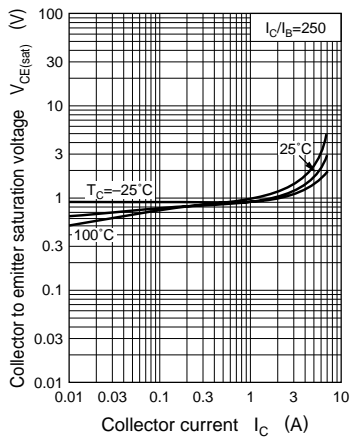
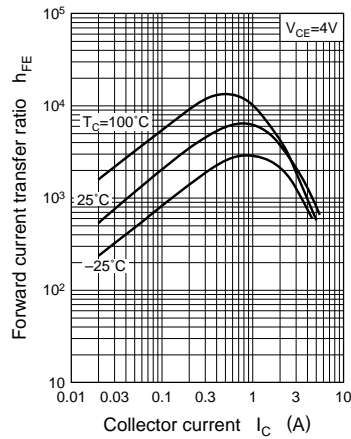
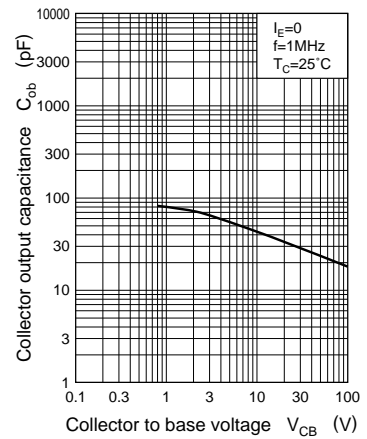
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 60\text{V}, I_E = 0$			1	mA
		$V_{CB} = 80\text{V}, I_B = 0$			1	
Collector cutoff current	$I_{CEO}$	$V_{CE} = 30\text{V}, I_B = 0$			2	mA
		$V_{CE} = 40\text{V}, I_B = 0$			2	
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$			2	mA
Collector to emitter voltage	$V_{CEO}$	$I_C = 30\text{mA}, I_B = 0$	60			V
			80			
Forward current transfer ratio	$h_{FE1}$	$V_{CE} = 4\text{V}, I_C = 1\text{A}$	1000			
	$h_{FE2}^*$	$V_{CE} = 4\text{V}, I_C = 2\text{A}$	2000		10000	
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	$t_{on}$	$I_C = 2\text{A}, I_{B1} = 8\text{mA}, I_{B2} = -8\text{mA}, V_{CC} = 50\text{V}$		0.5		$\mu\text{s}$
Storage time	$t_{stg}$			4		$\mu\text{s}$
Fall time	$t_f$			1		$\mu\text{s}$

\* $h_{FE2}$  Rank classification

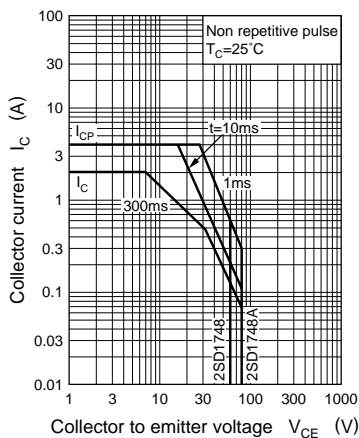
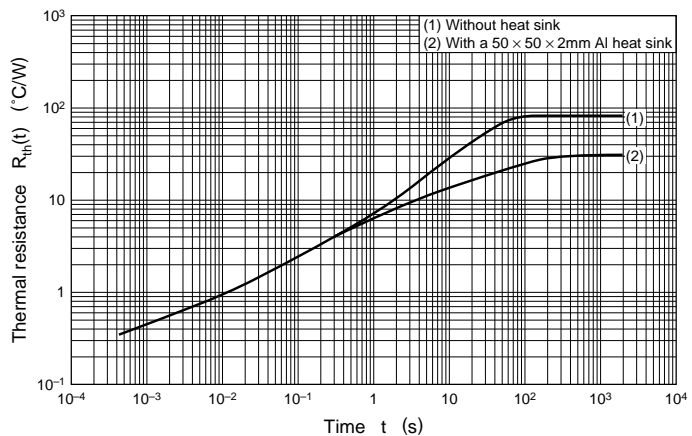
Rank	Q	P
$h_{FE2}$	2000 to 5000	4000 to 10000

Internal Connection



$P_C - T_a$  $I_C - V_{CE}$  $I_C - V_{BE}$  $V_{CE(sat)} - I_C$  $h_{FE} - I_C$  $C_{ob} - V_{CB}$ 

Area of safe operation (ASO)

 $R_{th(t)} - t$ 

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