

# 2SD2178

## Silicon NPN epitaxial planar type

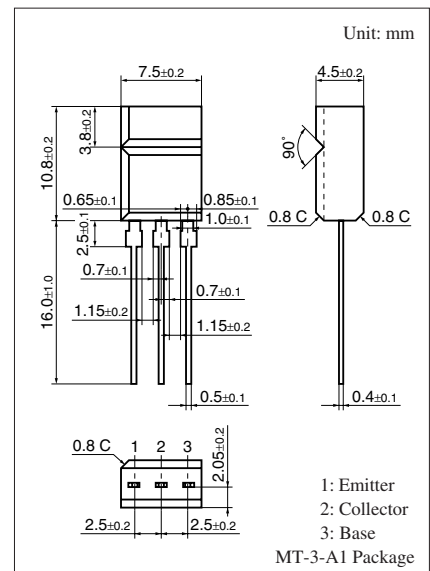
For low-frequency output amplification

### ■ Features

- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- Large collector current  $I_C$

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

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	50	V
Collector-emitter voltage (Base open)	$V_{CEO}$	50	V
Emitter-base voltage (Collector open)	$V_{EBO}$	5	V
Collector current	$I_C$	2	A
Peak collector current	$I_{CP}$	3	A
Collector power dissipation	$P_C$	1.5	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$



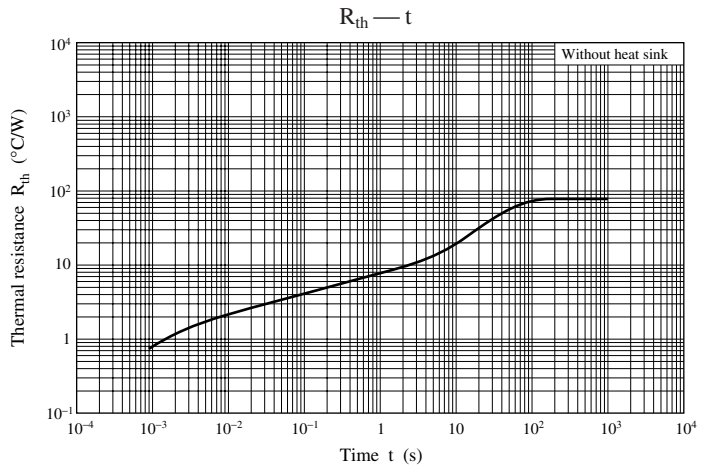
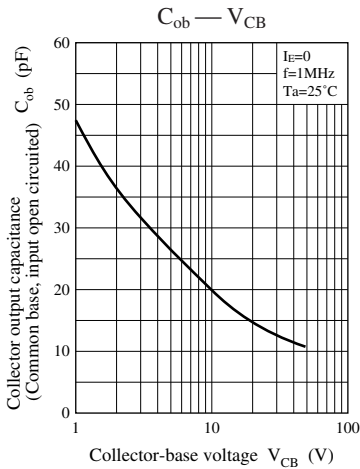
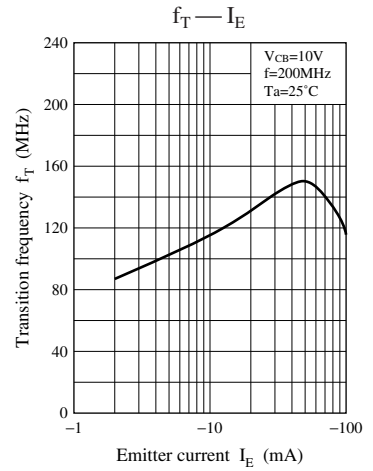
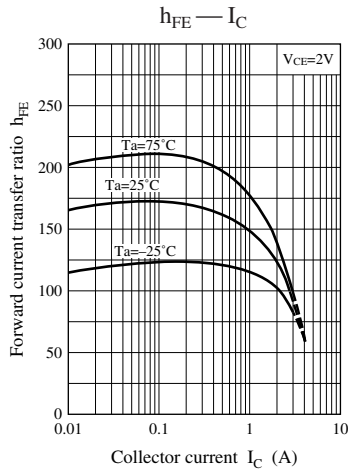
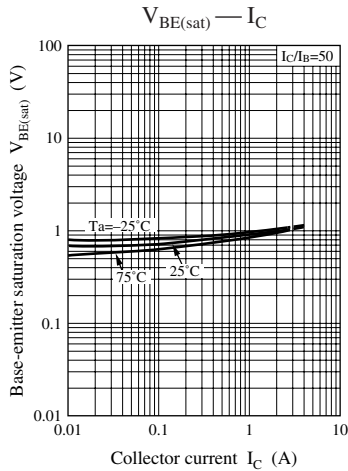
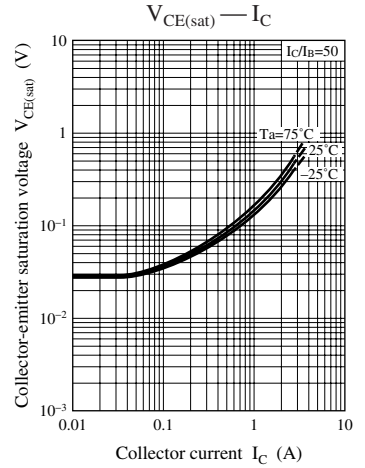
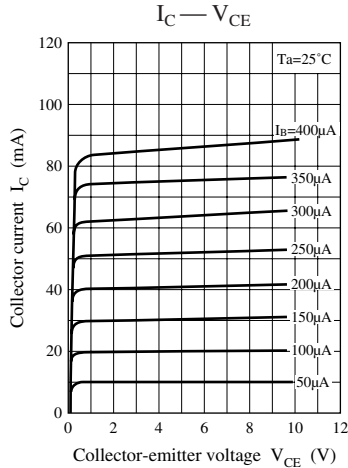
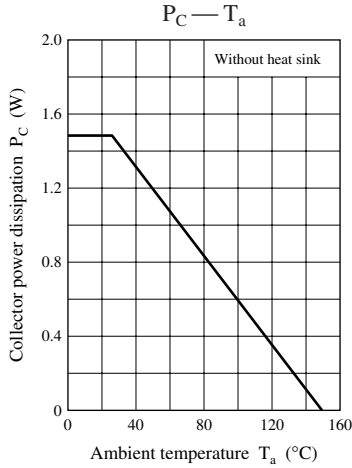
### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	$I_C = 10 \mu\text{A}$ , $I_E = 0$	50			V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = 1 \text{ mA}$ , $I_B = 0$	50			V
Emitter-base voltage (Collector open)	$V_{EBO}$	$I_E = 10 \mu\text{A}$ , $I_C = 0$	5			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = 20 \text{ V}$ , $I_E = 0$			0.1	$\mu\text{A}$
Forward current transfer ratio	$h_{FE1}^*$	$V_{CE} = 2 \text{ V}$ , $I_C = 200 \text{ mA}$	120		340	—
	$h_{FE2}$	$V_{CE} = 2 \text{ V}$ , $I_C = 1 \text{ A}$	80			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1 \text{ A}$ , $I_B = 50 \text{ mA}$		0.15	0.30	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1 \text{ A}$ , $I_B = 50 \text{ mA}$		0.9	1.2	V
Transition frequency	$f_T$	$V_{CB} = 10 \text{ V}$ , $I_E = -50 \text{ mA}$ , $f = 200 \text{ MHz}$		150		MHz
Collector output capacitance (Common base, input open circuited)	$C_{ob}$	$V_{CB} = 10 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$		23	35	pF

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. \*: Rank classification

Rank	R	S
$h_{FE1}$	120 to 240	170 to 340



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