

# 2SD2178

## Silicon NPN epitaxial planar type

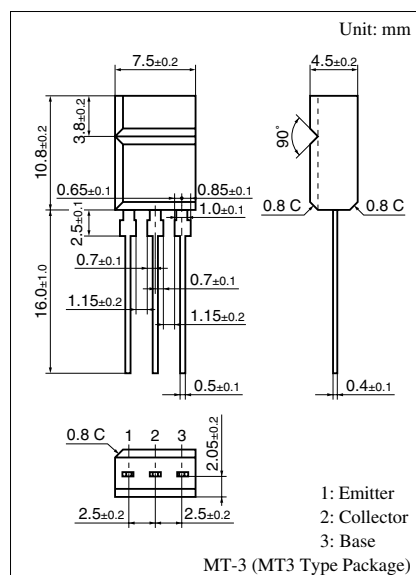
For low-frequency output amplification

### ■ Features

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

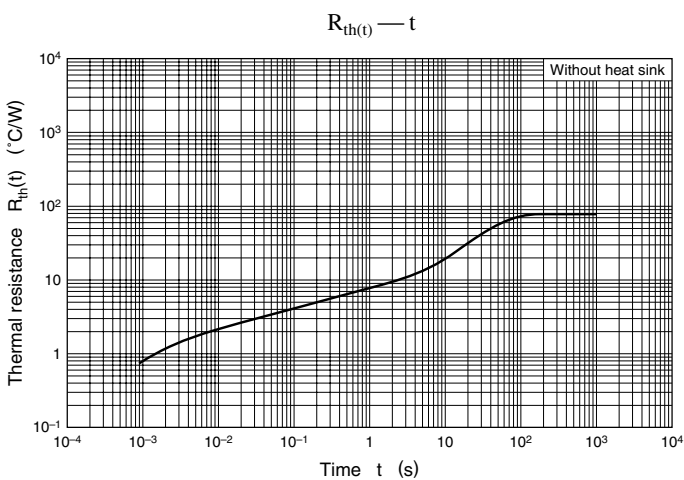
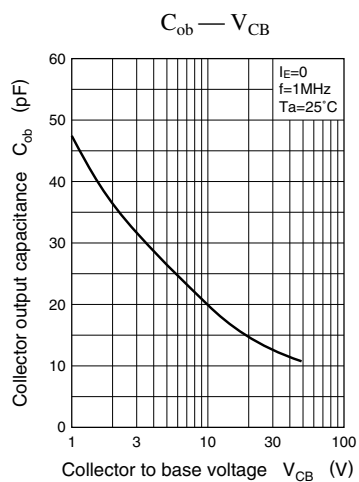
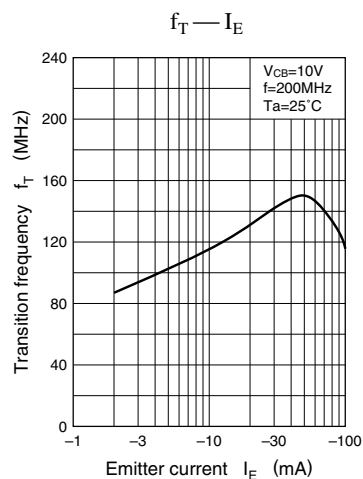
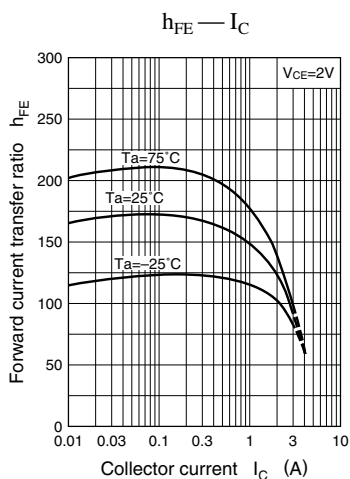
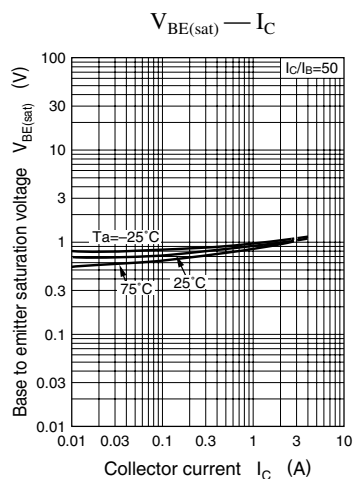
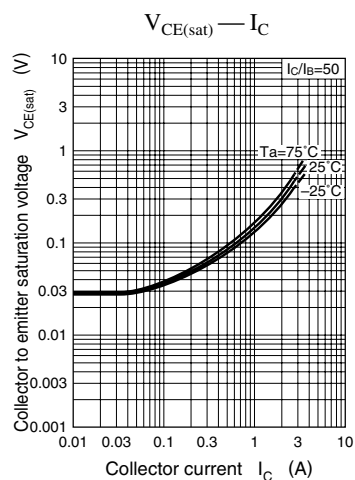
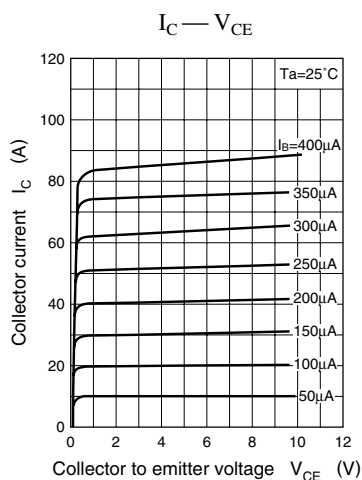
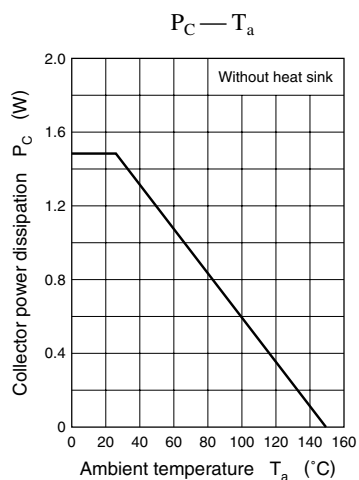


### ■ Electrical Characteristics $T_C = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 20\text{ V}, I_E = 0$			0.1	$\mu\text{A}$
Collector to base voltage	$V_{CBO}$	$I_C = 10\text{ }\mu\text{A}, I_E = 0$	50			V
Collector to emitter voltage	$V_{CEO}$	$I_C = 1\text{ mA}, I_B = 0$	50			V
Emitter to base voltage	$V_{EBO}$	$I_E = 10\text{ }\mu\text{A}, I_C = 0$	5			V
Forward current transfer ratio	$h_{FE1}^*$	$V_{CE} = 2\text{ V}, I_C = 200\text{ mA}$	120		340	
	$h_{FE2}$	$V_{CE} = 2\text{ V}, I_C = 1.0\text{ A}$	80			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1\text{ A}, I_B = 50\text{ mA}$		0.15	0.3	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1\text{ A}, I_B = 50\text{ mA}$		0.9	1.2	V
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}, I_E = -50\text{ mA}, f = 200\text{ MHz}$		150		MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$		23	35	pF

Note) \*: Rank classification

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



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