

# 2SB1178, 2SB1178A

Silicon PNP Epitaxial Planar Darlington Type

AF Power Amplifier

Complementary Pair with 2SD1748, 2SD1748A

### ■ Features

- High DC current gain ( $h_{FE}$ )
- High speed switching
- "I Type" package configuration with a cooling fin for direct soldering on PC board of a small-size electronic equipment

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

Item	Symbol	Value	Unit
Collector-base voltage	2SB1178	-60	V
	2SB1178A	-80	
Collector-emitter voltage	2SB1178	-60	V
	2SB1178A	-80	
Emitter-base voltage	$V_{EBO}$	-5	V
Peak collector current	$I_{CP}$	-4	A
Collector current	$I_C$	-2	A
Collector power dissipation	$T_c=25^\circ\text{C}$	15	W
	$T_a=25^\circ\text{C}$	1.3	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 ~ +150	$^\circ\text{C}$

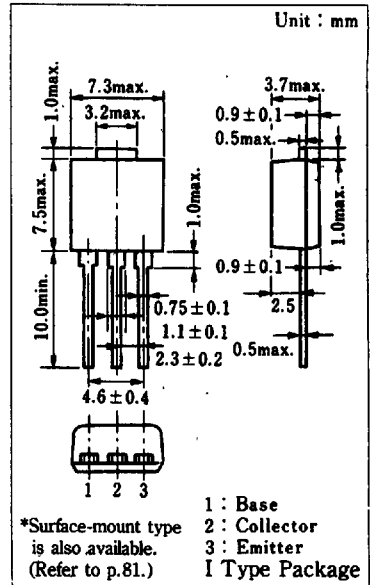
### ■ Electrical Characteristics ( $T_c=25^\circ\text{C}$ )

Item	Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	2SB1178	$V_{CB} = -60\text{V}, I_E = 0$			-1	mA
	2SB1178A	$V_{CB} = -80\text{V}, I_E = 0$			-1	
Collector cutoff current	2SB1178	$V_{CE} = -30\text{V}, I_B = 0$			-2	mA
	2SB1178A	$V_{CE} = -40\text{V}, I_B = 0$			-2	
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -5\text{V}, I_C = 0$			-2	mA
Collector-emitter voltage	2SB1178	$I_C = -30\text{mA}, I_B = 0$	-60			V
	2SB1178A		-80			
DC current gain	$h_{FE1}$	$V_{CE} = -4\text{V}, I_C = -1\text{A}$	1000			
	$h_{FE2}^*$	$V_{CE} = -4\text{V}, I_C = -2\text{A}$	1000		10000	
Base-emitter voltage	$V_{BE}$	$V_{CE} = -4\text{V}, I_C = -2\text{A}$			-2.8	V
Collector-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	$t_{on}$	$I_C = -2\text{A}$		0.4		$\mu\text{s}$
Storage time	$t_{stg}$	$I_{B1} = -8\text{mA}, I_{B2} = 8\text{mA}$		1.5		$\mu\text{s}$
Collector current fall time	$t_f$	$V_{CC} = -50\text{V}$		0.5		$\mu\text{s}$

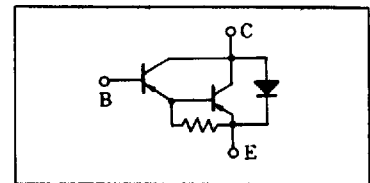
### \* $h_{FE2}$ Classifications

Class	R	Q	P
$h_{FE2}$	1000 ~ 2500	2000 ~ 5000	4000 ~ 10000

### ■ Package Dimensions



### ■ Inner Circuit



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