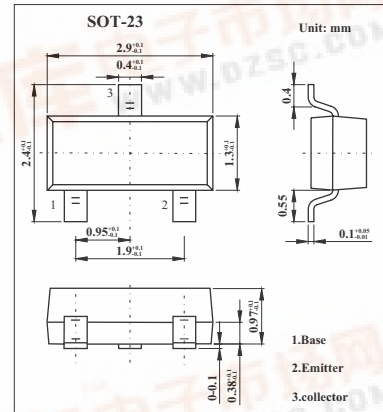


SMD Type Transistors

PNP Eitaxial Silicon Transistor  
2SA1978

■ Features

- High  $f_T$  ( $f_T=5.5\text{GHz TYP}$ ).
- High gain  $|S_{21e}|^2=10.0\text{dB TYP}$ .@ $f=1.0\text{GHz}, V_{ce}=-10\text{V}, I_c=-15\text{mA}$
- High-speed switching characteristics



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

Parameter	Symbol	Rating	Unit
Collector-base voltage	$V_{CB0}$	-20	V
Collector-emitter voltage	$V_{CEO}$	-12	V
Emitter-base voltage	$V_{EBO}$	-3.0	V
Collector current	$I_c$	-50	mA
Total power dissipation	$P_T$	200	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Collector cutoff current	$I_{cB0}$	$V_{CB} = -10\text{V}$			-10	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -2\text{V}$			-10	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE} = -10\text{V}, I_c = -15\text{mA}$	20	40	100	
Gain bandwidth product	$f_T$	$V_{CE} = -10\text{V}, I_c = -15\text{mA}$	4.0	5.5		GHz
Collector capacitance	$C_{re}^*$	$V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$		0.5	1	pF
Insertion Power Gain	$ S_{21e} ^2$	$V_{ce} = -10\text{V}, I_c = -15\text{mA}, f = 1.0\text{GHz}$	8.0	10.0		dB
Noise Figure	NF	$V_{ce} = -10\text{V}, I_c = -3\text{mA}, f = 1\text{GHz}$		2.0	3	dB

\*.Measured by a 3-terminal bridge. Emitter and Case should be connected to the guard terminal.

■  $h_{FE}$  Classification

Marking	T93
Rank	FB
$h_{FE}$	20~100

