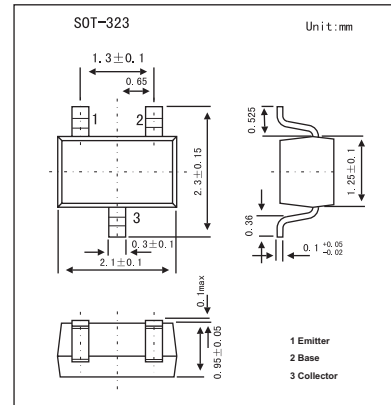


NPN Silicon Epitaxia

2SC4178

■ Features

- Micro package.
- High gain bandwidth product.
- Low output capacitance.

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

Parameter	Symbol	Rating	Unit
Collector-base voltage	V_{CB0}	30	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EB0}	4	V
Collector current	I_C	20	mA
Total power dissipation	P_T	150	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 30V, I_E = 0$			100	nA
DC current gain *	h_{FE}	$V_{CE} = 6V, I_C = 1.0mA$	40	90	180	
Collector-emitter saturation voltage *	$V_{CE(sat)}$	$I_C = 10mA, I_B = 1.0mA$		0.1	0.3	V
Gain bandwidth product	f_T	$V_{CE} = 6V, I_E = -1.0mA$	400	600		MHz
Output capacitance	C_{ob}	$V_{CE} = 6V, I_E = 0, f = 1MHz$		1.0		pF
Collector to base time constant	$C_c'rb'b$	$V_{CE} = 6V, I_E = -1.0mA, f = 31.9MHz$		12		ps
Noise figure	NF	$V_{CE} = 6V, I_E = -1.0mA, R_g = 50\Omega, f = 100MHz$		3		dB

■ hFE Classification

Marking	F12	F13	F14
hFE	40~80	60~120	90~180