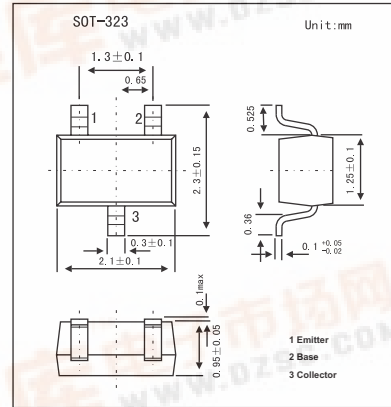


SMD Type Transistors

NPN Silicon Epitaxia  
2SC4178

■ Features

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



■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	30	V
Collector-emitter voltage	V <sub>CEO</sub>	20	V
Emitter-base voltage	V <sub>EB0</sub>	4	V
Collector current	I <sub>C</sub>	20	mA
Total power dissipation	P <sub>T</sub>	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = 30V, I <sub>E</sub> =0			100	nA
DC current gain *	h <sub>FE</sub>	V <sub>CE</sub> = 6V, I <sub>C</sub> = 1.0mA	40	90	180	
Collector-emitter saturation voltage *	V <sub>CE(sat)</sub>	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1.0mA		0.1	0.3	V
Gain bandwidth product	f <sub>T</sub>	V <sub>CE</sub> = 6V, I <sub>E</sub> = -1.0mA	400	600		MHz
Output capacitance	C <sub>ob</sub>	V <sub>CE</sub> = 6V, I <sub>E</sub> = 0, f = 1MHz		1.0		pF
Collector to base time constant	C <sub>c'rb'b</sub>	V <sub>CE</sub> = 6V, I <sub>E</sub> = -1.0mA, f = 31.9MHz		12		ps
Noise figure	N <sub>F</sub>	V <sub>CE</sub> = 6V, I <sub>E</sub> = -1.0mA, R <sub>g</sub> = 50Ω, f = 100MHz		3		dB

■ hFE Classification

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

