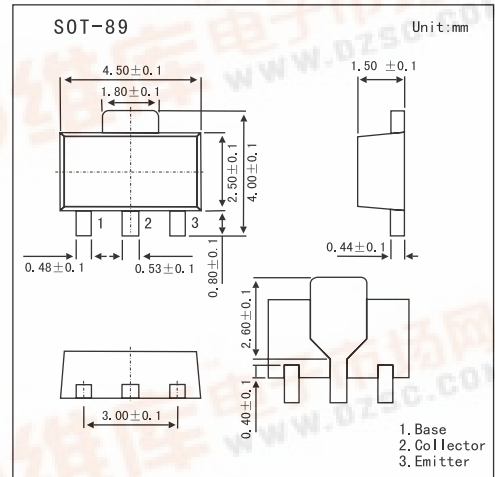


SMD Type Transistors

NPN Epitaxial Planar Silicon Transistor  
2SD1999

■ Features

- Low saturation voltage.
- Contains diode between collector and emitter.
- Contains bias resistance between base and emitter.
- Large current capacity.
- Small-sized package making it easy to provide highdensity, small-sized hybrid ICs.



■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	25	V
Collector-emitter voltage	V <sub>CEO</sub>	20	V
Emitter-base voltage	V <sub>EBO</sub>	6	V
Collector current	I <sub>c</sub>	4	A
Collector current (pulse)	I <sub>CP</sub>	6	A
Collector dissipation	P <sub>c</sub>	1.5	W
Jumction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Collector cutoff current	I <sub>cBO</sub>	V <sub>CB</sub> = 20V , I <sub>E</sub> = 0			1.0	μA
DC current Gain	h <sub>FE</sub>	V <sub>CE</sub> = 2V , I <sub>c</sub> = 0.5A	70			
		V <sub>CE</sub> = 2V , I <sub>c</sub> = 3A	50			
Gain bandwidth product	f <sub>T</sub>	V <sub>CE</sub> = 2V , I <sub>c</sub> = 0.5A		200		MHz
Output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V , f = 1MHz		45		pF
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>c</sub> = 3A , I <sub>B</sub> = 150mA		0.25	0.5	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>c</sub> = 3V , I <sub>B</sub> = 150mA			1.5	V
Collector-to-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>c</sub> = 10μA , I <sub>E</sub> = 0	25			V
Collector-to-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>c</sub> = 10μA , R <sub>BE</sub> = ∞	25			V
		I <sub>c</sub> = 10mA , R <sub>BE</sub> = ∞	20			
Diode forward voltage	V <sub>F</sub>	I <sub>F</sub> = 0.5A			1.5	V
Base-emitter resistance	R <sub>BE</sub>			1.5		kΩ

■ Marking

Marking	DN
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