

TO-92S Plastic-Encapsulate Transistors

2SC3311A TRANSISTOR (NPN)

FEATURES

- Optimum for High-density Mounting
- Allowing Supply with the Radial Taping
- Complementary to 2SA1309A

TO - 92S

1. EMITTER
2. COLLECTOR
3. BASE



MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	50	V
V_{EBO}	Emitter-Base Voltage	7	V
I_C	Collector Current	0.1	A
P_C	Collector Power Dissipation	300	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	417	$^{\circ}\text{C}/\text{W}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 0.01\text{mA}, I_E = 0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 2\text{mA}, I_B = 0$	50			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 0.01\text{mA}, I_C = 0$	7			V
Collector cut-off current	I_{CBO}	$V_{CB} = 10\text{V}, I_E = 0$			0.1	μA
Collector cut-off current	I_{CEO}	$V_{CE} = 10\text{V}, I_B = 0$			1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 7\text{V}, I_C = 0$			0.1	μA
DC current gain	h_{FE}	$V_{CE} = 10\text{V}, I_C = 2\text{mA}$	160		460	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_B = 10\text{mA}$			0.3	V
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$		3.5		pF
Transition frequency	f_T	$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 200\text{MHz}$		150		MHz

CLASSIFICATION OF h_{FE}

RANK	Q	R	S
RANGE	160-260	210-340	290-460