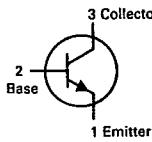


MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage (Applicable 0 to 10 mAdc)	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current — Continuous	I_C	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	2N3300 0.8 2N3302 4.56	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	3.0 17.2	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

2N3300
CASE 79-04, STYLE 1
TO-39 (TO-205AD)



T-27-09
T-27-19

2N3302

CASE 22-03, STYLE 1
TO-18 (TO-206AA)



**GENERAL PURPOSE
TRANSISTORS**

NPN SILICON

3

Refer to 2N218 for graphs.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage(1) ($I_C = 10 \text{ mAdc}, I_B = 0$)	$V_{CEO(\text{sus})}$	30	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	60	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current ($V_{CE} = 50 \text{ Vdc}, V_{BE} = 0$) ($V_{CE} = 50 \text{ Vdc}, V_{BE} = 0, T_A = 150^\circ\text{C}$)	I_{CES}	—	0.01 10	μAdc
Emitter Cutoff Current ($V_{BE} = 3.0 \text{ Vdc}, I_C = 0$)	I_{EBO}	—	10	nAdc
Base Current ($V_{CE} = 50 \text{ Vdc}, V_{BE} = 0$)	I_B	—	10	nAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 0.1 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$) ($I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$)(1) ($I_C = 150 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$)(1) ($I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$)(1) ($I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$)(1)	h_{FE}	35 50 75 50 100 50	— — — — 300 —	—
Collector-Emitter Saturation Voltage ($I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$) ($I_C = 300 \text{ mAdc}, I_B = 30 \text{ mAdc}$) ($I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$)	$V_{CE(\text{sat})}$	— — —	0.22 0.45 0.6	Vdc
Base-Emitter Saturation Voltage ($I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$) ($I_C = 300 \text{ mAdc}, I_B = 30 \text{ mAdc}$) ($I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$)	$V_{BE(\text{sat})}$	— — —	1.1 1.3 1.5	Vdc
Base Emitter Voltage ($I_C = 150 \text{ mA}, V_{CE} = 10 \text{ V}$)	$V_{BE(\text{on})}$	—	1.1 V	Max
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product ($I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$)	f_T	250	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 140 \text{ kHz}$)	C_{obo}	—	8.0	pF
Input Capacitance ($V_{BE} = 2.0 \text{ Vdc}, I_C = 0, f = 140 \text{ kHz}$)	C_{ibo}	—	20	pF
SWITCHING CHARACTERISTICS				
Turn-On Time ($V_{CC} = 25 \text{ Vdc}, I_C = 300 \text{ mAdc}, I_{B1} = 30 \text{ mAdc}$)	t_{on}	—	60	ns
Turn-Off Time ($V_{CC} = 25 \text{ Vdc}, I_C = 300 \text{ mAdc}, I_{B1} = I_{B2} = 30 \text{ mAdc}$)	t_{off}	—	150	ns

(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.