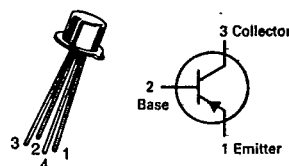


T-27-09
2N3307
2N3308

CASE 20-03, STYLE 10
 TO-72 (TO-206AF)



**GENERAL PURPOSE
 TRANSISTORS**

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	2N3307	2N3308	Unit
Collector-Emitter Voltage	V_{CEO}	35	25	Vdc
Collector-Emitter Voltage	V_{CES}	40	30	Vdc
Collector-Base Voltage	V_{CBO}	40	30	Vdc
Emitter-Base Voltage	V_{EBO}	3.0		Vdc
Collector Current — Continuous	I_C	50		mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	200 1.14		mW mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	300 1.71		mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 2.0 \text{ mA dc}, I_B = 0$)	$V_{(BR)CEO}$	35 25	— —	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 10 \mu\text{A dc}, V_{BE} = 0$)	$V_{(BR)CES}$	40 30	— —	Vdc
Collector-Base Breakdown Voltage(1) ($I_C = 10 \mu\text{A dc}, I_E = 0$)	$V_{(BR)CBO}$	40 30	— —	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{A dc}, I_C = 0$)	$V_{(BR)EBO}$	3.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 15 \text{ Vdc}$) ($V_{CB} = 15 \text{ Vdc}, T = 150^\circ\text{C}$)	I_{CBO}	— —	0.010 3.0	$\mu\text{A dc}$
ON CHARACTERISTICS				
DC Current Gain ($V_{CE} = 10 \text{ Vdc}, I_C = 2.0 \text{ mA dc}$)	h_{FE}	40 25	250 250	—
Collector-Emitter Saturation Voltage ($I_C = 3.0 \text{ mA dc}, I_B = 0.6 \text{ mA dc}$)	$V_{CE(sat)}$	—	0.4	Vdc
Base-Emitter Saturation Voltage ($I_C = 3.0 \text{ mA dc}, I_B = 0.6 \text{ mA dc}$)	$V_{BE(sat)}$	—	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product ($V_{CE} = 10 \text{ Vdc}, I_C = 2.0 \text{ mA dc}, f = 100 \text{ MHz}$)	f_T	300	1200	MHz
Maximum Frequency of Operation ($V_{CE} = 10 \text{ Vdc}, I_C = 2.0 \text{ mA dc}$)	f_{max}	Typical 2000		MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 0.1 \text{ MHz}$)	C_{obo}	— —	1.3 1.6	pF
Small-Signal Current Gain ($V_{CE} = 10 \text{ Vdc}, I_C = 2.0 \text{ mA dc}, f = 1 \text{ kHz}$)	h_{fe}	40 25	250 250	—
Collector Base Time Constant ($V_{CB} = 10 \text{ Vdc}, I_C = 2.0 \text{ mA dc}, f = 31.8 \text{ MHz}$)	$r_b'C_c$	2.0 2.0	15 20	ps

MOTOROLA SMALL-SIGNAL TRANSISTORS, FETs AND DIODES

2N3307, 2N3308

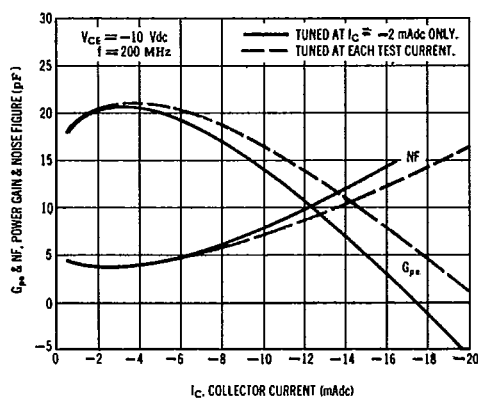
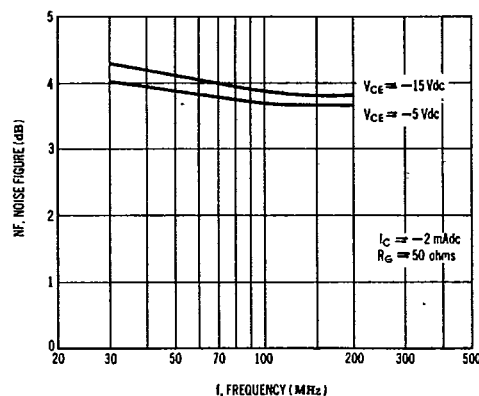
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ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
Noise Figure ($V_{CE} = 10\text{ Vdc}$, $I_C = 2.0\text{ mAdc}$, $f = 200\text{ MHz}$)	NF	—	4.5	dB
2N3307		—	6.0	
2N3308		—	6.0	

SWITCHING CHARACTERISTICS

Power Gain(2) ($V_{CE} = 10\text{ Vdc}$, $I_C = 2.0\text{ mAdc}$, $f = 200\text{ MHz}$)	G_p	17	—	dB
Power Gain (AGC)(2) ($V_{CE} = 5.0\text{ Vdc}$, $I_C = 20\text{ mAdc}$, $f = 200\text{ MHz}$)	G_p	—	0	dB
2N3307		—	—	
2N3308		—	—	

(1) C_{obo} is measured in guarded circuit such that the can capacitance is not included.(2) AGC is obtained by increasing I_C . The circuit remains adjusted for $V_{CE} = -10\text{ Vdc}$, $I_C = -2\text{ mAdc}$ operation.**FIGURE 1 — COMMON EMITTER AVERAGE SMALL POWER GAIN & NOISE FIGURE versus COLLECTOR CURRENT****FIGURE 2 — NOISE FIGURE versus FREQUENCY**

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