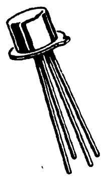
2N3291 thru 2N3294 (SILICON)



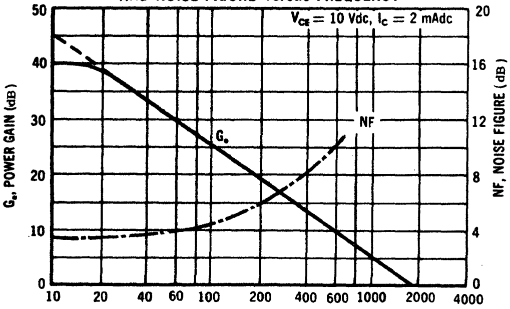
CASE 20
(TO-72)

NPN silicon annular transistor for TV and FM mixer, RF and IF amplifier and general-purpose, low-noise, high-gain amplifier applications.

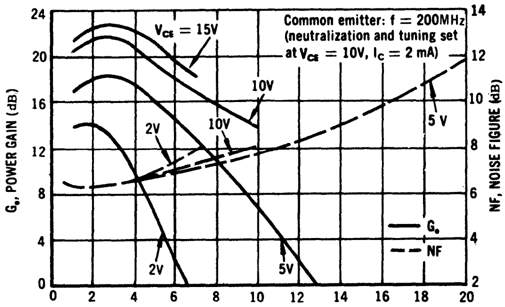
MAXIMUM RATINGS

Rating	Symbol	2N3291 2N3292	2N3293 2N3294	Unit
Collector - Base Voltage	V_{CB}	25	20	Volts
Collector - Emitter Voltage	V_{CES}	25	20	Volts
Emitter - Base Voltage	V_{EB}	3.0	3.0	Volts
Collector Current	I_C	50	50	mA
Power Dissipation at 25°C Case Above 25°C derate 1.71 mW/°C	P_D	300	300	mW
Power Dissipation at 25°C Amb. Above 25°C derate 1.14 mW/°C	P_D	200	200	mW
Junction Temperature	T_J	+200	+200	°C
Storage Temperature Range	T_{stg}	←— -65 to +200 —→		°C

NEUTRALIZED POWER GAIN AND NOISE FIGURE versus FREQUENCY



POWER GAIN AND NOISE FIGURE versus COLLECTOR CURRENT



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	I_C = 25 μAdc, V_{BE} = 0 2N3291, 2N3292 2N3293, 2N3294	 25 20	 35 30	 — —	Vdc
Collector Cutoff Current	I_{CBO}	V_{CB} = 10 Vdc, I_E = 0	—	.01	0.1	μAdc
Emitter Cutoff Current	I_{EBO}	V_{EB} = 0.5 Vdc, I_C = 0	—	—	100	μAdc
DC Forward Current Transfer Ratio	h_{FE}	V_{CE} = 10 Vdc, I_C = 2 mAdc	10	—	—	—
AC Current Gain	h_{fe}	V_{CE} = 10 Vdc, I_C = 2 mAdc, f = 1 kHz	10	—	200	—
Output Capacitance	C_{ob}	V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz, Note 1	—	1.0	2.0	pF
AC Current Gain	$\|h_{fe}\|$	V_{CE} = 10 Vdc, I_C = 2 mAdc f = 100 MHz	2.5	6.0	12	—
Collector-Base Time Constant	$r_b'C_c$	V_{CB} = 10 Vdc, I_C = 2 mAdc f = 31.8 MHz	—	15	30	ps
Maximum Frequency of Oscillation	f_{max}	V_{CE} = 10 Vdc, I_C = 2 mA	—	2000	—	MHz
2N3291						
Power Gain	G_e	V_{CE} = 10 Vdc, I_C = 2 mAdc, f = 200 MHz	16	20	24	dB
Noise Figure	NF		—	6.0	8.0	dB
Power Gain (AGC)	G_e	Note 2 V_{CE} = 5 Vdc, I_C = 20 mAdc f = 200 MHz	—	—	0	dB
2N3292						
Power Gain	G_e	V_{CE} = 10 Vdc, I_C = 2 mAdc f = 200 MHz	16	20	24	dB
Noise Figure	NF		—	7.0	9.0	dB
Power Gain (AGC)	G_e	Note 2 V_{CE} = 5 Vdc, I_C = 20 mAdc f = 200 MHz	—	0	—	dB
2N3293						
Power Output	P_{out}	V_{EE} = -11 Vdc, f = 257 MHz	2.0	—	—	mW
2N3294						
Power Gain	G_e	V_{CE} = 10 Vdc, I_C = 2 mAdc f = 200 MHz	14	—	—	dB
Noise Figure	NF		—	7.0	—	dB

Note 1. C_{ob} is measured in guarded circuit such that the can capacitance is not included.

Note 2. AGC is obtained by increasing I_C. The circuit remains adjusted for V_{CE} = 10 Vdc, I_C = 2 mAdc operation.