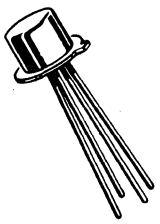
2N3283 thru 2N3286 (GERMANIUM)



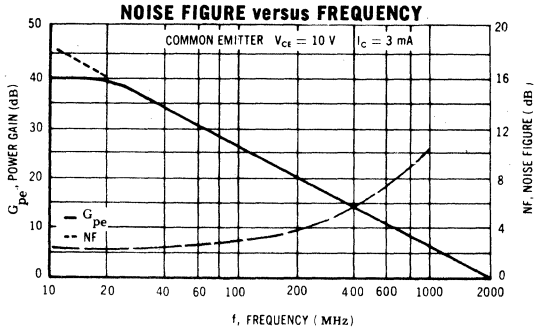
CASE 20
(TO-72)

PNP germanium epitaxial mesa transistors for TV and FM, RF and IF amplifier, oscillator and general purpose high-gain, low-noise amplifier applications.

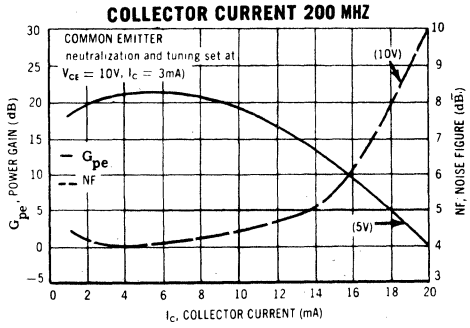
MAXIMUM RATINGS

Rating	Symbol	2N3283 2N3284	2N3285 2N3286	Unit
Collector-Emitter Voltage	V_{CES}	25	20	Vdc
Collector-Base Voltage	V_{CB}	25	20	Vdc
Emitter-Base Voltage	V_{EB}	0.5		Vdc
Collector Current	I_C	50		mAdc
Total Device Dissipation @ T_A = 25°C	P_D	100		mW
Derate above 25°C		1.33		mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +100		°C

NEUTRALIZED POWER GAIN AND NOISE FIGURE versus FREQUENCY



POWER GAIN AND NOISE FIGURE versus COLLECTOR CURRENT 200 MHZ



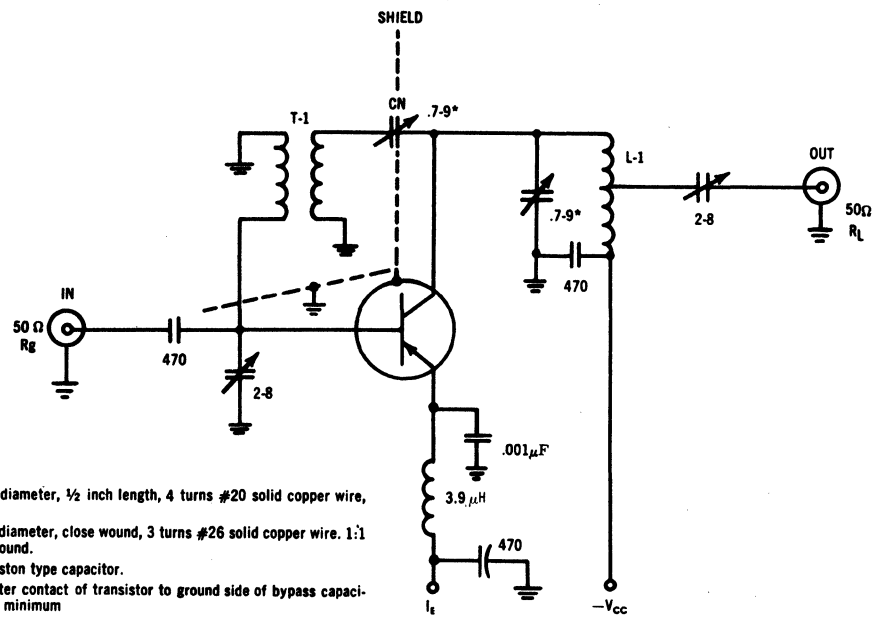
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 100 μAdc, V_{BE} = 0) 2N3283, 2N3284	BV_{CES}	25	30	-	Vdc
2N3285, 2N3286		20	25	-	
Collector Cutoff Current (V_{CB} = 10 Vdc, I_E = 0)	I_{CBO}	-	2.0	10	μAdc
Emitter Cutoff Current (V_{BE} = 0.5 Vdc, I_C = 0)	I_{EBO}	-	-	100	μAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 3.0 mAdc, V_{CE} = 10 Vdc) 2N3283, 2N3284	h_{FE}	10	30	-	-
2N3285, 2N3286		5.0	15	-	
DYNAMIC CHARACTERISTICS					
Current-Gain—Bandwidth Product (I_C = 3.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	f_T	250	400	800	MHz
Maximum Frequency of Oscillation (I_C = 3.0 mAdc, V_{CE} = 10 Vdc)	f_{max}	-	2000	-	MHz
Output Capacitance* (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{ob}*	-	1.0	1.5	pF
Small-Signal Current Gain (I_C = 3.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{fe}				-
2N3283, 2N3284		10	-	200	
2N3285, 2N3286		5.0	-	200	
Collector-Base Time Constant (I_E = 3.0 mAdc, V_{CB} = 10 Vdc, f = 31.8 MHz)	$r_b'C_c$	-	10	25	ps
Noise Figure (I_C = 3.0 mAdc, V_{CE} = 10 Vdc, f = 200 MHz)	NF				dB
2N3283		-	4.0	5.0	
2N3284		-	5.0	6.0	
2N3286		-	5.0	-	
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V_{CE} = 10 Vdc, I_C = 3.0 mAdc, f = 200 MHz)	G_{pe}				dB
2N3283, 2N3284		16	20	23	
2N3286		14	-	-	
Power Gain (AGC)** (V_{CE} = 5.0 Vdc, I_C = 20 mAdc, f = 200 MHz, Figure 1)	G_{pe}(AGC)**				dB
2N3283		-	-	0	
2N3284		-	0	-	
Power Output (V_{EE} = 12 Vdc, f = 247 MHz) 2N3285	P_{out}	2.0	-	-	mW

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

** AGC is obtained by increasing I_C. The circuit remains adjusted for V_{CE} = 10 Vdc and I_C = 3.0 mAdc operation.

FIGURE 1 — 200 MHz POWER GAIN AND NOISE FIGURE TEST CIRCUIT



NOTES:

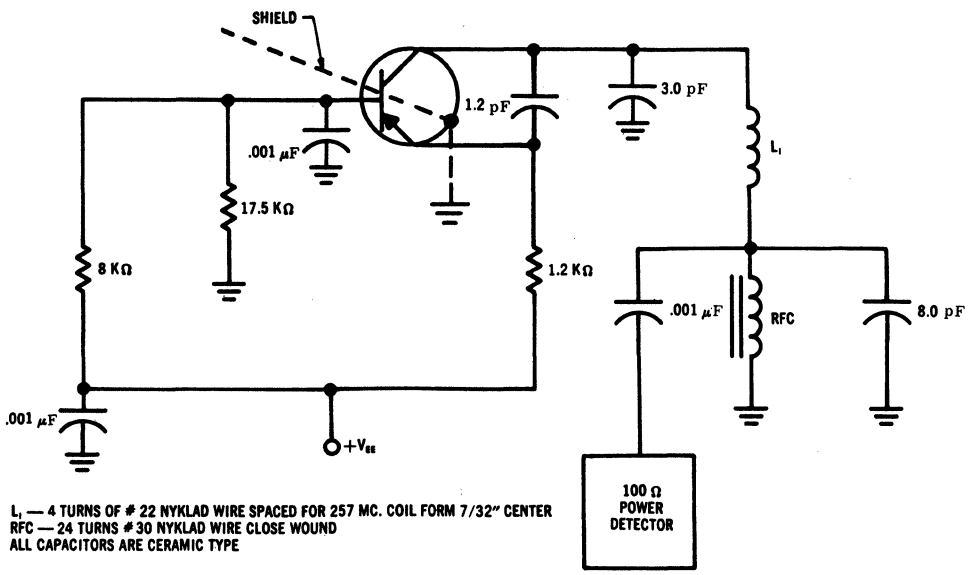
L-1 ¼ inch inside diameter, ½ inch length, 4 turns #20 solid copper wire, center tapped.

T-1 ¼ inch inside diameter, close wound, 3 turns #26 solid copper wire. 1:1 ratio bi-filler wound.

* High Quality piston type capacitor.

Distance from emitter contact of transistor to ground side of bypass capacitor should be kept minimum

FIGURE 2 — 257 MHz OSCILLATOR POWER OUTPUT TEST CIRCUIT



L_1 — 4 TURNS OF # 22 NYKLAD WIRE SPACED FOR 257 MC. COIL FORM 7/32" CENTER
RFC — 24 TURNS # 30 NYKLAD WIRE CLOSE WOUND
ALL CAPACITORS ARE CERAMIC TYPE