TYPES 2N3570, 2N3571, 2N3572
N-P-N SILICON TRANSISTORS

BULLETIN NO. DL-S 7311956, MARCH 1973

FOR LOW-NOISE VHF/UHF AMPLIFIER, OSCILLATOR, AND MIXER APPLICATIONS

2N3570 Features:

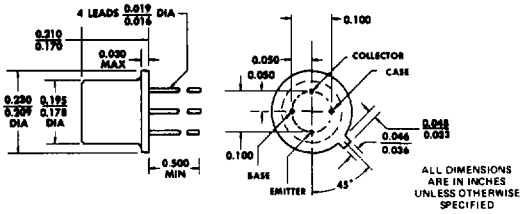
- Low Noise Figure . . . 7 dB Max at 1 GHz
- High f_T . . . 1.5 GHz Min
- Low $r_b'C_c$ . . . 8 ps Max

description

These transistors are ideally suited for such applications as amplifiers, oscillators, and mixers. The guaranteed minimum gain-bandwidth products range from 1 to 1.5 GHz. Guaranteed minimum calculated f_{max} ranges from 1.7 to 2.7 GHz†. These features coupled with low noise figure ensure VHF through L-band amplifier and oscillator capability.

*mechanical data

THE ACTIVE ELEMENTS ARE ELECTRICALLY INSULATED FROM THE CASE



ALL JEDEC TO-72 DIMENSIONS AND NOTES ARE APPLICABLE

*absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)

	2N3570	2N3571	2N3572
Collector-Base Voltage	30 V	25 V	25 V
Collector-Emitter Voltage (See Note 1)	15 V	15 V	13 V
Emitter-Base Voltage	3 V	3 V	3 V
Continuous Collector Current	50 mA		
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 2)	200 mW		
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 3)	350 mW		
Storage Temperature Range	−65°C to 200°C		
Lead Temperature 1/16 Inch from Case for 10 Seconds	300°C		

NOTES: 1. These values apply between 0 and 15 mA collector current when the base-emitter diode is open-circuited.
2. Derate linearly to 200°C free-air temperature at the rate of 1.14 mW/°C.
3. Derate linearly to 200°C case temperature at the rate of 2 mW/°C.

†Maximum Frequency of Oscillation may be calculated from the equation: $f_{max}\ (MHz) = 200\sqrt{\frac{|h_{fe}| \times f_{meas}\ (MHz)}{r_b'C_c\ (ps)}}$

*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

USES CHIP N28

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N-P-N SILICON TRANSISTORS

*electrical characteristics at 25°C free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS†	2N3570		2N3571		2N3572		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 1 μA, I_E = 0	30		25		25		V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = 2 mA, I_B = 0, See Note 4	15		15		13		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 μA, I_C = 0	3		3		3		V
I_{CBO}	Collector Cutoff Current	V_{CB} = 6 V, I_E = 0		10		10		10	nA
		V_{CB} = 6 V, I_E = 0, T_A = 150°C		1		1		1	μA
h_{FE}	Static Forward Current Transfer Ratio	V_{CE} = 6 V, I_C = 5 mA	20	150	20	200	20	300	
h_{fe}	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 6 V, I_C = 5 mA, f = 1 kHz	20	200	20	250	20	350	
$\|h_{fe}\|$	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 6 V, I_C = 5 mA, f = 400 MHz	3.75	6	3	6	2.5	6	
C_{cb}	Collector-Base Capacitance	V_{CB} = 6 V, I_E = 0, f = 1 MHz, See Note 5		0.75		0.85		0.85	pF
$r_b'C_c$	Collector-Base Time Constant	V_{CB} = 6 V, I_E = −5 mA, f = 79.8 MHz	1	8	1	10	1	13	ps

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*operating characteristics at 25°C free-air temperature

PARAMETER		TEST CONDITIONS†	2N3570		2N3571		2N3572		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
F	Spot Noise Figure	V_{CB} = 6 V, I_E = −2 mA, R_G = 50 Ω, f = 1 GHz		7					dB
		V_{CB} = 6 V, I_E = −2 mA, R_G = 100 Ω, f = 450 MHz				4		6	dB

operating characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS	2N3570			UNIT
			MIN	TYP	MAX	
P_O	Oscillator Power Output	V_{CC} = 20 V, I_C = 15 mA, f = 1 GHz, See Figure 1		60		mW

NOTES: 4. This parameter must be measured using pulse techniques. t_w = 300 μs, duty cycle ≤ 2%.

5. C_{cb} measurement employs a three-terminal capacitance bridge incorporating a guard circuit. The emitter and case are connected to the guard terminal of the bridge.

†The fourth lead (case) is grounded for all measurements except C_{cb} and Oscillator Power Output.

PARAMETER MEASUREMENT INFORMATION

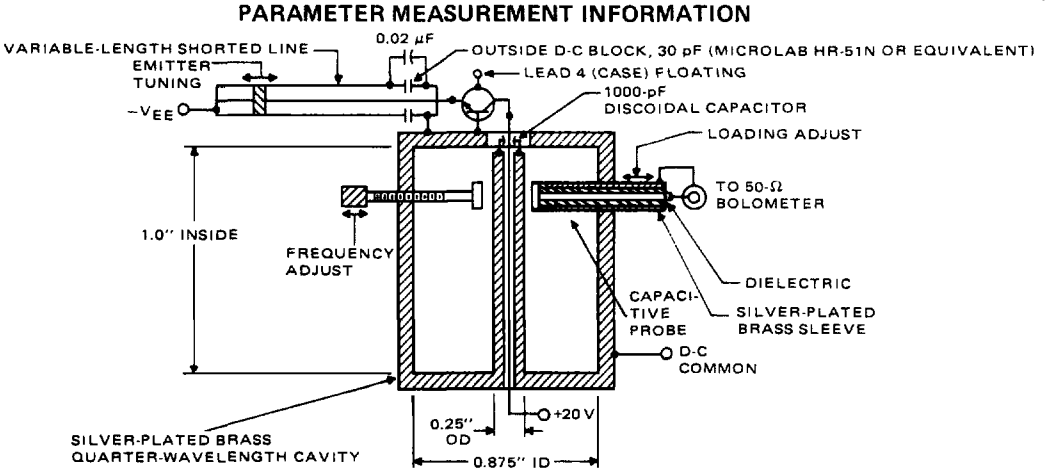

FIGURE 1—1-GHz OSCILLATOR POWER OUTPUT TEST CIRCUIT

*JEDEC registered data

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