TYPE TIS125
N-P-N SILICON TRANSISTOR

BULLETIN NO. DL-S 7211738, MAY 1972

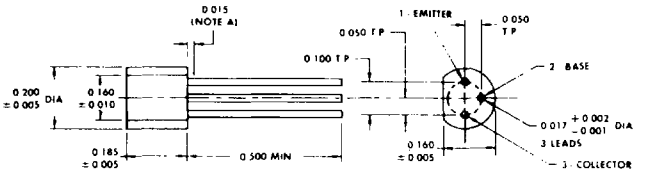
HIGH-FREQUENCY SILECT† TRANSISTORS‡ DESIGNED FOR COMMON-BASE VHF APPLICATIONS

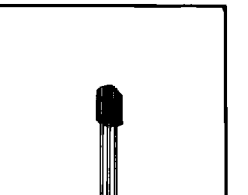
- Low Feedback Capacitance, C_{ce}
- Specified Forward-AGC Characteristics

Rugged, One-Piece Construction with Standard TO-18 100-mil Pin Circle

mechanical data

This transistor is encapsulated in a plastic compound specifically designed for this purpose, using a highly mechanized process developed by Texas Instruments. The case will withstand soldering temperatures without deformation. This device exhibits stable characteristics under high-humidity conditions and is capable of meeting MIL-STD-202C, Method 106B. The transistor is insensitive to light.





NOTES: A. Lead diameter is not controlled in this area.
B. Leads having maximum diameter (0.019) shall be within 0.007 of their true positions measured in the gaging plane 0.054 below the seating plane of the device relative to a maximum-diameter package.
C. All dimensions are in inches.

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

Collector-Base Voltage	40 V
Collector-Emitter Voltage (See Note 1)	30 V
Emitter-Base Voltage	4 V
Continuous Collector Current	50 mA
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 2)	250 mW
Storage Temperature Range	−65°C to 150°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	260°C

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

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10 μA, I_E = 0		40		V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = 10 mA, I_B = 0,	See Note 3	30		V
I_{CBO}	Collector Cutoff Current	V_{CB} = 10 V, I_E = 0			50	nA
		V_{CB} = 10 V, I_E = 0,	T_A = 85°C		5	μA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 4 V, I_C = 0			10	μA
h_{FE}	Static Forward Current Transfer Ratio	V_{CE} = 10 V, I_C = 4 mA		30		
V_{BE}	Base-Emitter Voltage	V_{CE} = 10 V, I_C = 4 mA			0.8	V
$\lvert h_{fe} \rvert$	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 10 V, I_C = 4 mA,	f = 100 MHz	4.5		
C_{ce}	Collector-Emitter Capacitance	V_{CE} = 10 V, I_B = 0, See Note 4	f = 1 MHz,		0.3	pF

NOTES: 1. This value applies when the base-emitter diode is open-circuited.
2. Derate linearly to 150°C free-air temperature at the rate of 2 mW/°C.
3. This parameter must be measured using pulse techniques. t_w = 300 μs, duty cycle ≤ 2%.
4. C_{ce} measurement employs a three-terminal capacitance bridge incorporating a guard circuit. The base is connected to the guard terminal of the bridge.

†Trademark of Texas Instruments
‡U.S. Patent No. 3,439,238

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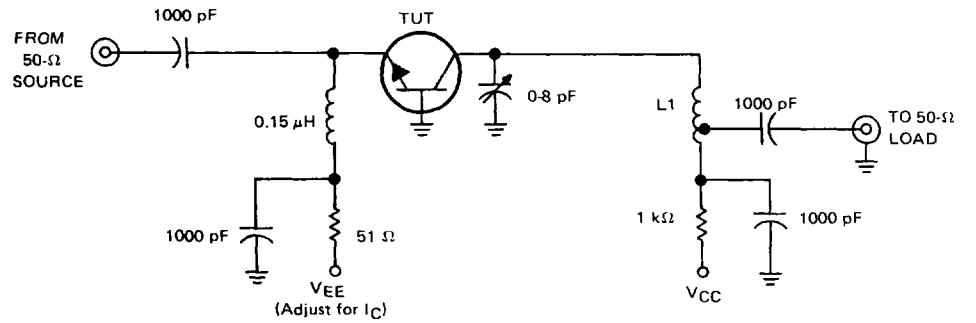
operating characteristics at 25°C free-air temperature

	PARAMETER	TEST CONDITIONS	MIN	MAX	UNIT
F	Spot Noise Figure	V_{CC} = 10 V, I_C = 3 mA, R_G = 50 Ω, f = 200 MHz, See Figure 1		3.5	dB
G_{pb}	Unneutralized Small-Signal Common-Base Insertion Power Gain	V_{CC} = 10 V, I_C = 3 mA, f = 200 MHz, See Figure 1	17	23	dB
I_C	Collector Current for 30-dB Gain Reduction	V_{CC} = 10 V, f = 200 MHz, ΔG_{pb} = −30 dB†, See Figure 1	5	7.5	mA

†ΔG_{pb} is defined as the change in G_{pb} from the value at I_C = 3 mA.

PARAMETER MEASUREMENT INFORMATION



L1: 6T #16, ¼ inch ID, tapped 3/4 turn from end nearer V_{CC}.

FIGURE 1–200 MHz POWER GAIN, NOISE FIGURE, AND GAIN CONTROL TEST CIRCUIT

TYPICAL CHARACTERISTICS

SMALL-SIGNAL COMMON-BASE
INSERTION POWER GAIN
vs
COLLECTOR CURRENT

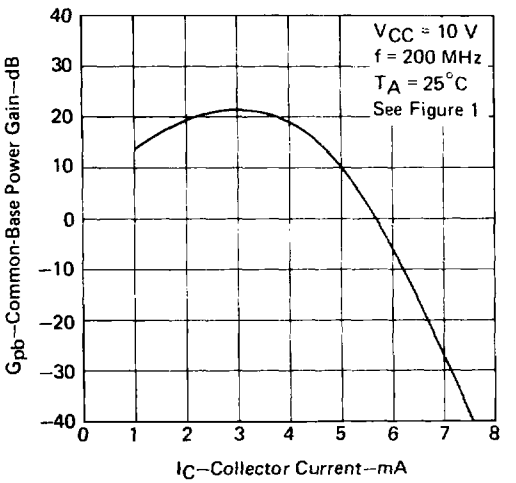


FIGURE 2

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