

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

The RF Line
UHF Linear Power Transistors

The TP5002/S are NPN gold metallized transistors using diffused ballast resistors for reliability and ruggedness. They are specifically designed as low power drivers, having high gain and can be operated in Class A, B or C.

- 380–512 MHz
- 1.5 W — P_{out}
- 24 V — V_{CC}
- High Gain — 13 dB Min, Class A (@ 470 MHz)

**TP5002-
 TP5002S**

**1.5 W — 380 to 512 MHz
 UHF LINEAR
 POWER TRANSISTORS
 NPN SILICON**

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	45	Vdc
Emitter-Base Voltage	V _{EBO}	3.5	Vdc
Total Device Dissipation (at T _C = 25°C Derate above 25°C)	P _D	7 0.045	Watts W/°C
Operating Junction Temperature	T _J	200	°C
Storage Temperature Range	T _{stg}	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (T _C = 70°C)	R _{θJC}	21	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Base Breakdown Voltage (I _C = 2 mA, I _E = 0)	V _{(BR)CBO}	45	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 2.0 mA, I _C = 0)	V _{(BR)EBO}	4.0	—	—	Vdc
Collector Cutoff Current (V _{CB} = 24 V, I _E = 0)	I _{CBO}	—	—	0.5	mAdc

ON CHARACTERISTICS

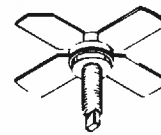
DC Current Gain (I _C = 100 mA, V _{CE} = 5 V)	h _{FE}	15	—	120	—
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DYNAMIC CHARACTERISTICS

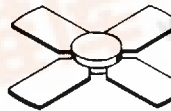
Output Capacitance (V _{CB} = 28 V, I _E = 0, f = 1 MHz)	C _{ob}	—	—	4.5	pF
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FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain (V _{CE} = 23 V, P _{out} = 1.5 W, f = 470 MHz, I _C = 200 mA)	G _{PE}	13	—	—	dB
Saturated Output Power (V _{CE} = 23 V, f = 470 MHz, I _C = 200 mA)	P _{sat}	—	2.2	—	W



CASE 244C-01, STYLE 1
(.280 SOE)
TP5002



CASE 249A-01, STYLE 1
(.290 SOE S)
TP5002S



TYPICAL CHARACTERISTICS

T-33-05

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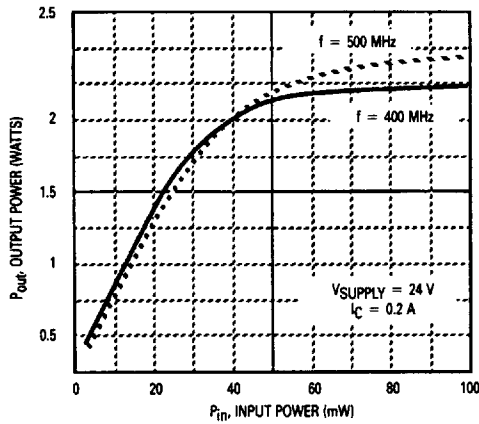


Figure 1. Output Power versus Input Power

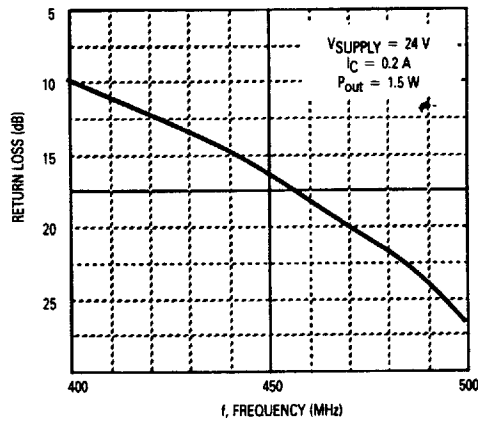


Figure 2. Return Loss versus Frequency

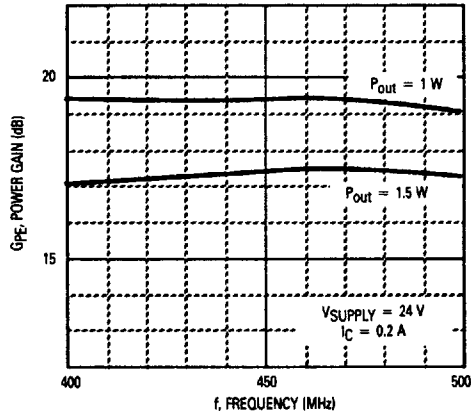


Figure 3. Power Gain versus Frequency

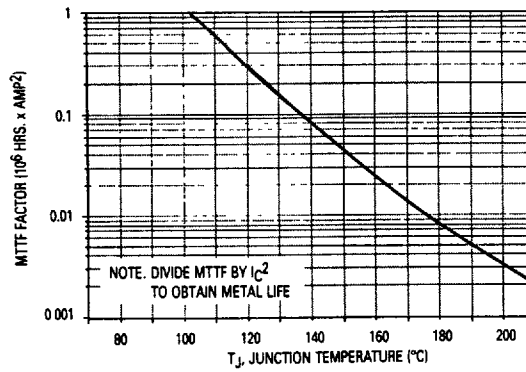


Figure 4. MTTF Factor versus Junction Temperature

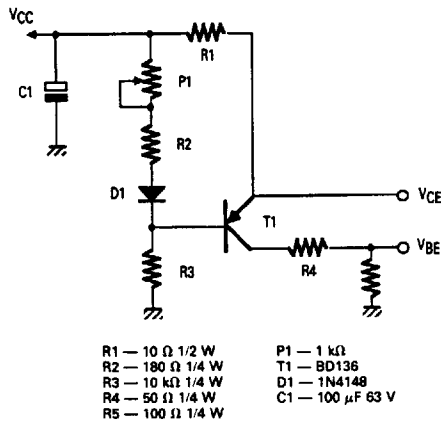


Figure 5. Class A Bias Circuit

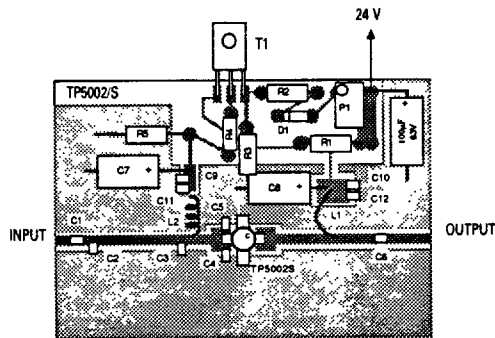


Figure 6. Component Layout

