MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

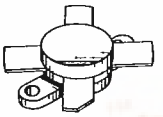
PT9780

The RF Line
SSB Power Transistor

14 dB
2–30 MHz
100 WATTS PEP
28 VOLTS
SSB POWER
TRANSISTOR

. . . designed primarily for wideband, large-signal output and driver amplifier stages in the 2 to 30 MHz frequency range.

- Designed for Class AB Linear Power Amplifiers
- Specified 28 Volt, 28 MHz Characteristics:
  Output Power — 100 Watts PEP
  Power Gain — 14 dB Min, Class AB
- 100% Tested for Load Mismatch at All Phase Angles with ∞:1 VSWR
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors



.500 SOE F
CASE 211-11, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CBO}	70	Vdc
Emitter-Base Voltage	V_{EBO}	4	Vdc
Collector Current — Continuous	I_C	20	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	350 2	Watts W/°C
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 50 mA, I_B = 0)	$V_{(BR)CEO}$	40	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 100 mA, I_E = 0)	$V_{(BR)CBO}$	70	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 5 mA, I_C = 0)	$V_{(BR)EBO}$	4	—	—	Vdc
Collector Cutoff Current (V_{CE} = 28 V, V_{BE} = 0)	I_{CES}	—	—	25	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1 A, V_{CE} = 5 V)	h_{FE}	10	—	100	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 28 V, I_E = 0, f = 1 MHz)	C_{ob}	—	290	—	pF

(continued)

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V_{CE} = 28 V, P_{out} = 100 W PEP, f = 28 MHz, I_{CQ} = 100 mA)	G_{PE}	14	—	—	dB
Load Mismatch (V_{CE} = 28 V, P_{out} = 100 W PEP, f = 28 MHz, Load VSWR = ∞:1, All Phase Angles)	ψ	No Degradation in Output Power			
Intermodulation Distortion (V_{CE} = 28 Vdc, P_{out} = 100 W PEP, I_{CQ} = 100 mA, f = 28 MHz)	IMD	—	—	−32	dB

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TYPICAL CHARACTERISTICS

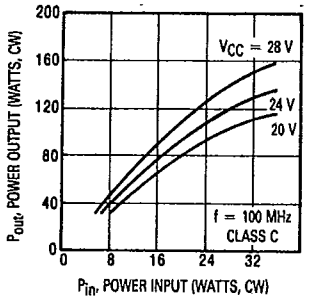


Figure 1. Power Output versus Power Input f = 100 MHz

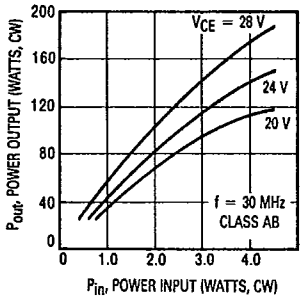


Figure 2. Power Output versus Power Input f = 30 MHz

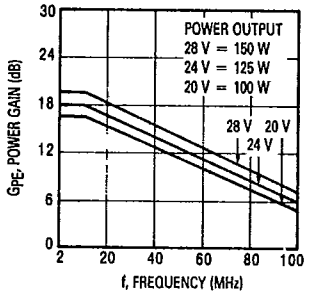


Figure 3. Power Gain versus Frequency

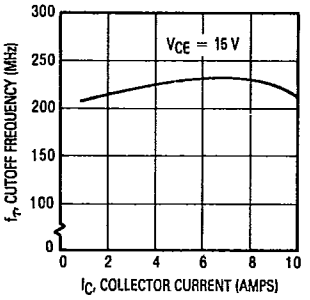


Figure 4. Cutoff Frequency versus Current

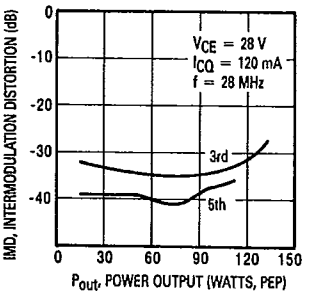


Figure 5. IMD versus Power Output

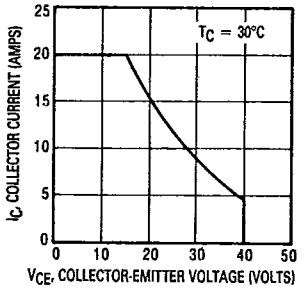


Figure 6. DC Safe Operating Area

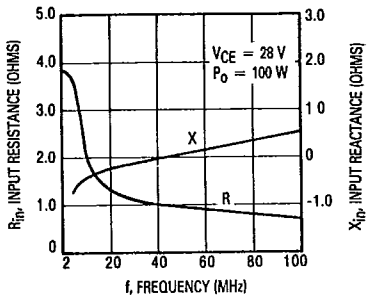


Figure 7. Series Input Impedance versus Frequency

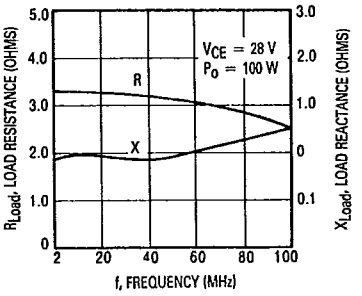


Figure 8. Series Load Impedance versus Frequency

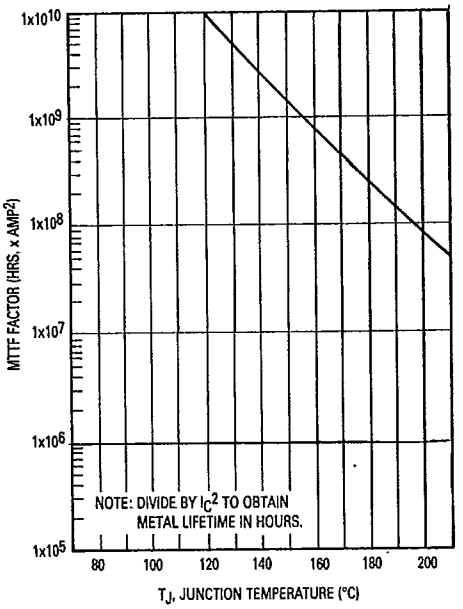
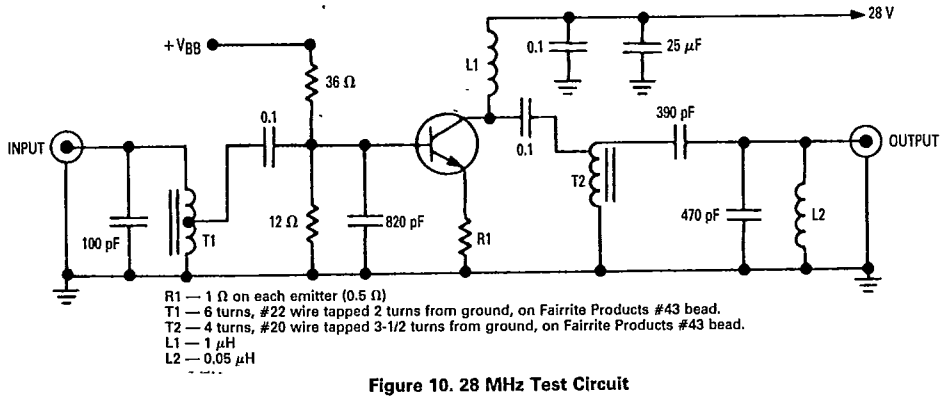


Figure 9. MTTF Factor versus Junction Temperature



R1 — 1 Ω on each emitter (0.5 Ω)
T1 — 6 turns, #22 wire tapped 2 turns from ground, on Fairrite Products #43 bead.
T2 — 4 turns, #20 wire tapped 3-1/2 turns from ground, on Fairrite Products #43 bead.
L1 — 1 μH
L2 — 0.05 μH

Figure 10. 28 MHz Test Circuit