MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

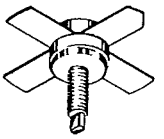
PT9784
PT9784A

15 dB
2–30 MHz
75 WATTS PEP
13.5 VOLTS
SSB POWER
TRANSISTORS

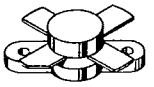
The RF Line
SSB Power Transistors

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

- Designed for Class A, AB or C Power Amplifiers
- Specified 13.5 Volt, 28 MHz Characteristics:
  Output Power — 75 Watts PEP
  Power Gain — 15 dB Min, Class AB
- 100% Tested for Load Mismatch at All Phase Angles with ∞:1 VSWR
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors



.380 SOE
CASE 145D-01, STYLE 1
PT9784A



.380 SOE F
CASE 211-07, STYLE 1
PT9784

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	20	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4	Vdc
Collector Current — Continuous	I_C	15	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	175 0.572	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	$R_{\theta JC}$	1.75	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage (I_C = 100 mA, I_E = 0)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 6 mA, I_C = 0)	$V_{(BR)EBO}$	4	—	—	Vdc
Collector Cutoff Current (V_{CE} = 13.5 V, V_{BE} = 0)	I_{CES}	—	—	10	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1 A, V_{CE} = 5 V)	h_{FE}	25	—	150	—
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V_{CE} = 13.5 V, P_{out} = 75 W PEP, f = 28 MHz)	G_{PE}	15	—	—	dB
Load Mismatch (V_{CE} = 13.5 V, P_{out} = 75 W PEP, f = 28 MHz, Load VSWR = ∞:1, All Phase Angles)	ψ	No Degradation in Output Power			
Intermodulation Distortion (V_{CE} = 13.5 Vdc, P_{out} = 75 W PEP, f = 28 MHz)	IMD	—	−32	—	dB

TYPICAL CHARACTERISTICS

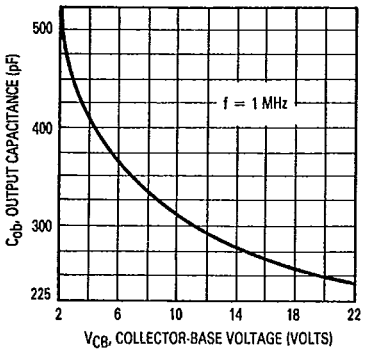


Figure 1. Output Capacitance versus Voltage

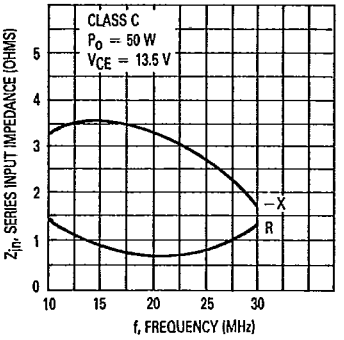


Figure 2. Series Input Impedance versus Frequency

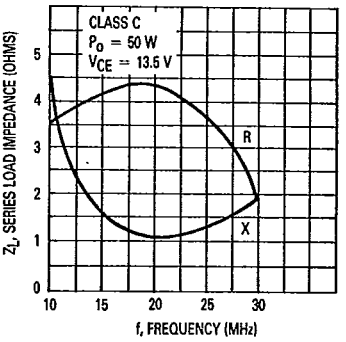
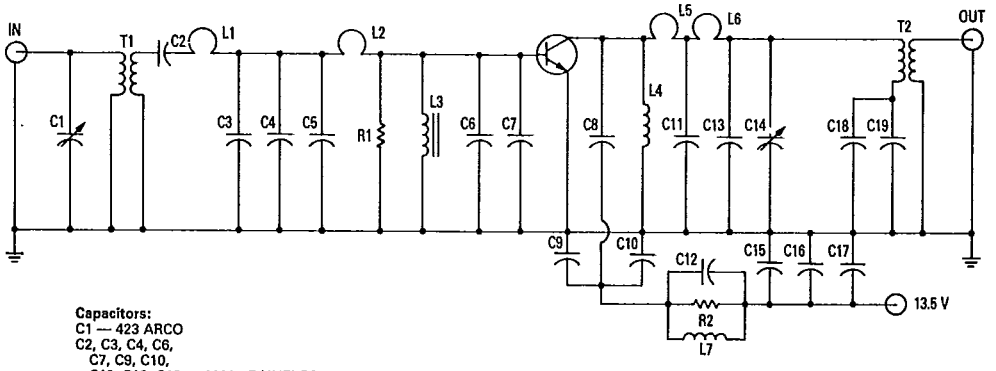


Figure 3. Series Load Impedance versus Frequency

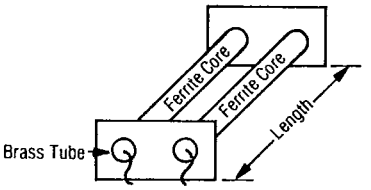


Capacitors:
C1 — 423 ARCO
C2, C3, C4, C6, C7, C9, C10, C13, C18, C19 — 1000 pF UNELCO
C5 — 500 pF UNELCO
C8 — 400 pF UNELCO
C11 — 250 pF UNELCO
C12, C15 — 0.1 Disc.
C14 — 469 ARCO
C16 — 0.01 Disc.
C17 — 25 MFD, 35 Volts

Resistors:
R1 — 51 Ohms
R2 — 16 Ohms 2 W

Coils:
L1 — #18 AWG, 1-3/8" Long, Looped 3/8" Curve
L2 — #18 AWG, 1-1/8" Long, Looped 1/4" Curve
L3 — 2-1/2 T, #24 AWG, Looped thru Ferroxcube VK21107-3B
L4 — 8 T, #18 AWG, 2 ID, 5/8" Long
L5 — #18 AWG, 1/4" Long, straight
L6 — #18 AWG, 1/2" Long, Looped 3/8" Curve
L7 — 10 T, #20 AWG, Enamel, Wrapped around 16 Ohm, 2 Watt resistor

Transformers:
T1 — Primary — 4 T, #22 AWG, Teflon insulated
Secondary — Brass Tube, Length — 11/16"
T2 — Primary — Brass Tube, Secondary — 3 T, #22 AWG
Teflon Insulated, Length — 1-1/4"



CORE MATERIAL
CN20 (C-1-2)

Figure 4. 28 MHz Test Circuit