

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
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 and C Power Amplifiers
- Specified 28 Volt, 28 MHz Characteristics:
 - Output Power — 50 Watts PEP
 - Power Gain — 14 dB Min, Class AB
- 100% Tested for Load Mismatch at All Phase Angles with $\infty:1$ VSWR
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

PT9783
PT9783A
14 dB
2-30 MHz
50 WATTS PEP
28 VOLTS
SSB POWER
TRANSISTORS
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	10	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	175 1	Watts W/ $^\circ\text{C}$
Operating Junction Temperature	T_J	200	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 50\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	40	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 5\text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	70	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 2.5\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	4	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 28\text{ V}$, $V_{BE} = 0$)	I_{CES}	—	—	25	mAdc

ON CHARACTERISTICS

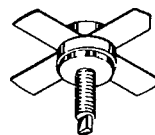
DC Current Gain ($I_C = 1\text{ A}$, $V_{CE} = 5\text{ V}$)	h_{FE}	10	—	100	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 28\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$)	C_{ob}	—	150	—	pF
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FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain ($V_{CE} = 28\text{ V}$, $P_{out} = 50\text{ W PEP}$, $f = 28\text{ MHz}$, $I_{CQ} = 60\text{ mA}$)	G_{PE}	14	—	—	dB
Load Mismatch ($V_{CE} = 28\text{ V}$, $P_{out} = 50\text{ W PEP}$, $f = 28\text{ MHz}$, Load VSWR = $\infty:1$, All Phase Angles)	ψ	No Degradation in Output Power			
Intermodulation Distortion ($V_{CE} = 28\text{ Vdc}$, $P_{out} = 50\text{ W PEP}$, $I_{CQ} = 60\text{ mA}$, $f = 28\text{ MHz}$)	IMD	—	—	-32	dB



.380 SOE
CASE 145D-01, STYLE 1
PT9783A



.380 SOE F
CASE 211-07, STYLE 1
PT9783

TYPICAL CHARACTERISTICS

T-33-15

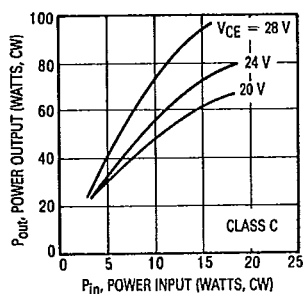
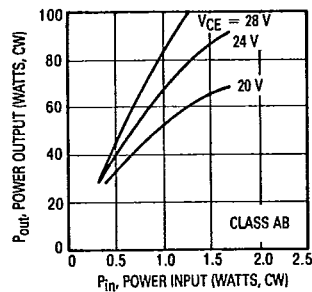
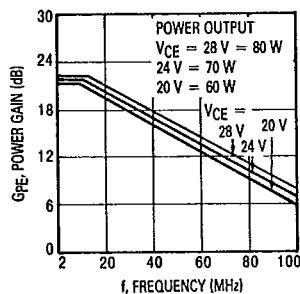
Figure 1. Power Output versus Power Input
 $f = 100 \text{ MHz}$ Figure 2. Power Output versus Power Input
 $f = 30 \text{ MHz}$ 

Figure 3. Power Gain versus Frequency

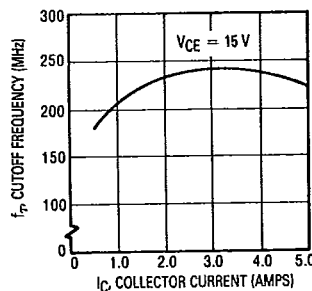


Figure 4. Cutoff Frequency versus Current

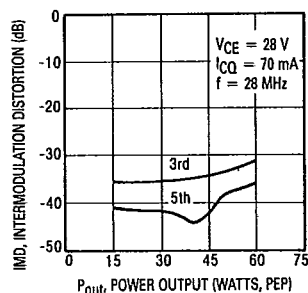


Figure 5. IMD versus Power Output

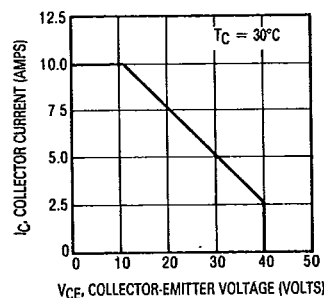


Figure 6. DC Safe Operating Area

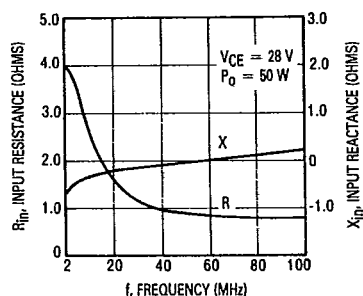


Figure 7. Series Input Impedance versus Frequency

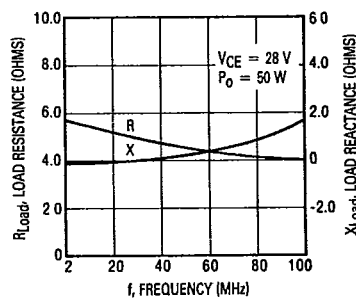


Figure 8. Series Load Impedance versus Frequency

T-33-15

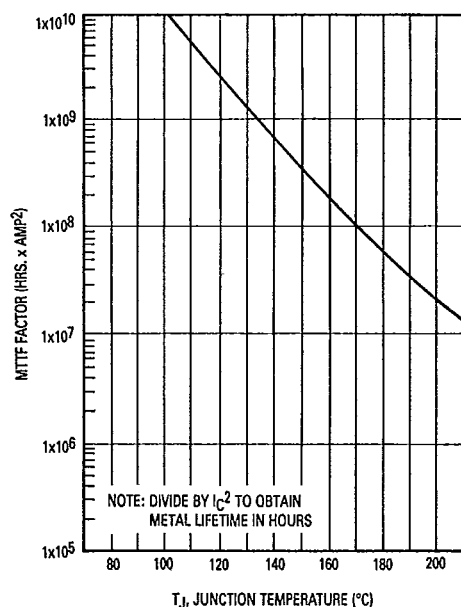


Figure 9. MTTF Factor versus Junction Temperature

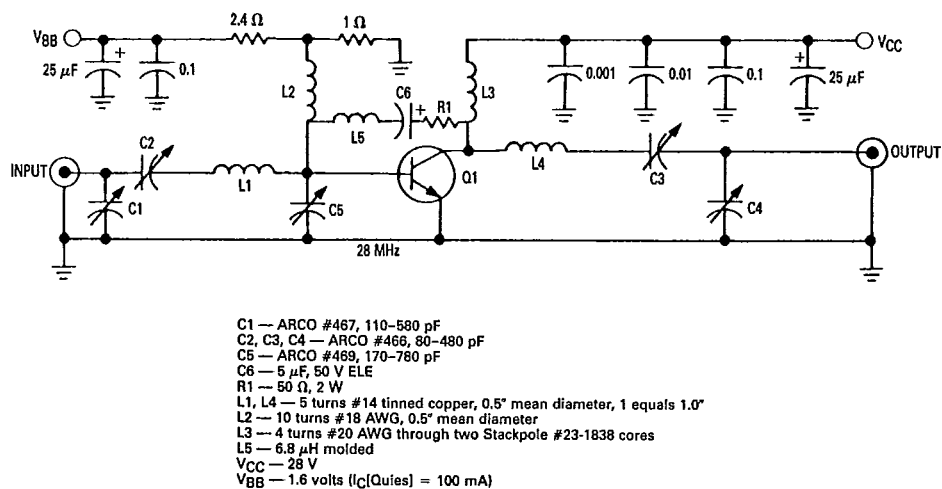


Figure 10. 28 MHz Test Circuit