

**MOTOROLA**  
**SEMICONDUCTOR**  
**TECHNICAL DATA**

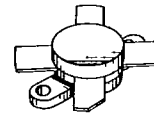
MOTOROLA SC XSTRS/R F

**PT9780**
**The RF Line**  
**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  $\infty:1$  VSWR
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

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



.500 SOE F  
CASE 211-11, STYLE 1

**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	40	V <sub>dc</sub>
Collector-Base Voltage	V <sub>CBO</sub>	70	V <sub>dc</sub>
Emitter-Base Voltage	V <sub>EBO</sub>	4	V <sub>dc</sub>
Collector Current — Continuous	I <sub>C</sub>	20	A <sub>dc</sub>
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	350 2	Watts W/°C
Operating Junction Temperature	T <sub>J</sub>	200	°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	0.5	°C/W

**ELECTRICAL CHARACTERISTICS**

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 50 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	40	—	—	V <sub>dc</sub>
Collector-Base Breakdown Voltage (I <sub>C</sub> = 100 mA, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	70	—	—	V <sub>dc</sub>
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 5 mA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	4	—	—	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 28 V, V <sub>BE</sub> = 0)	I <sub>CES</sub>	—	—	25	mA <sub>dc</sub>

**ON CHARACTERISTICS**

DC Current Gain (I <sub>C</sub> = 1 A, V <sub>CE</sub> = 5 V)	h <sub>FE</sub>	10	—	100	—
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**DYNAMIC CHARACTERISTICS**

Output Capacitance (V <sub>CB</sub> = 28 V, I <sub>E</sub> = 0, f = 1 MHz)	C <sub>ob</sub>	—	290	—	pF
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(continued)

MOTOROLA RF DEVICE DATA

2-1130

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
<b>FUNCTIONAL TESTS</b>					
Common-Emitter Amplifier Power Gain ( $V_{CE} = 28\text{ V}$ , $P_{out} = 100\text{ W PEP}$ , $f = 28\text{ MHz}$ , $I_{CQ} = 100\text{ mA}$ )	GPE	14	—	—	dB
Load Mismatch ( $V_{CE} = 28\text{ V}$ , $P_{out} = 100\text{ W PEP}$ , $f = 28\text{ MHz}$ , Load VSWR = $\infty:1$ , All Phase Angles)	$\psi$	No Degradation in Output Power			
Intermodulation Distortion ( $V_{CE} = 28\text{ Vdc}$ , $P_{out} = 100\text{ W PEP}$ , $I_{CQ} = 100\text{ mA}$ , $f = 28\text{ MHz}$ )	IMD	—	—	-32	dB



TYPICAL CHARACTERISTICS

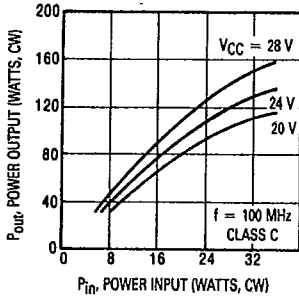


Figure 1. Power Output versus Power Input  
 $f = 100\text{ MHz}$

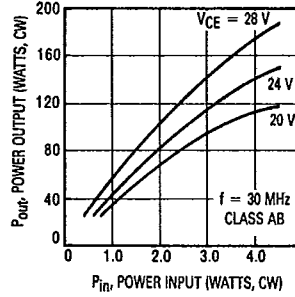


Figure 2. Power Output versus Power Input  
 $f = 30\text{ MHz}$

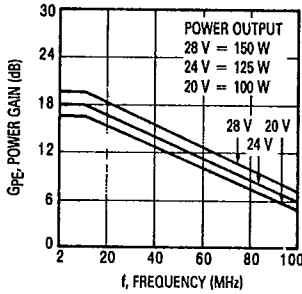


Figure 3. Power Gain versus Frequency

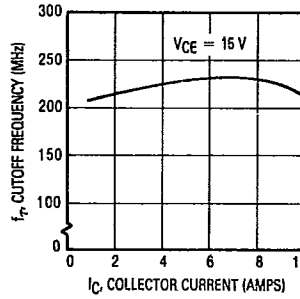


Figure 4. Cutoff Frequency versus Current

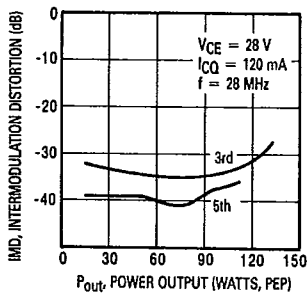


Figure 5. IMD versus Power Output

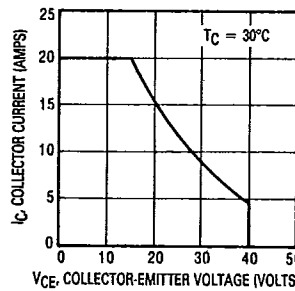


Figure 6. DC Safe Operating Area

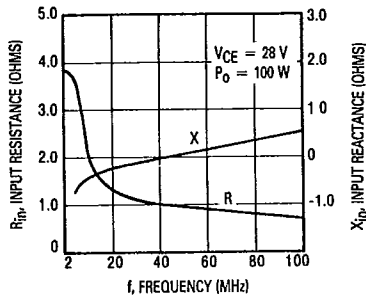


Figure 7. Series Input Impedance versus Frequency

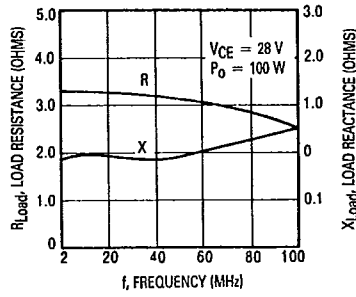


Figure 8. Series Load Impedance versus Frequency

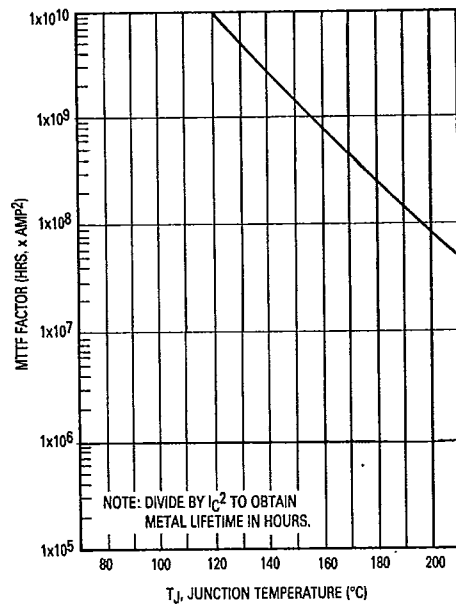


Figure 9. MTTF Factor versus Junction Temperature

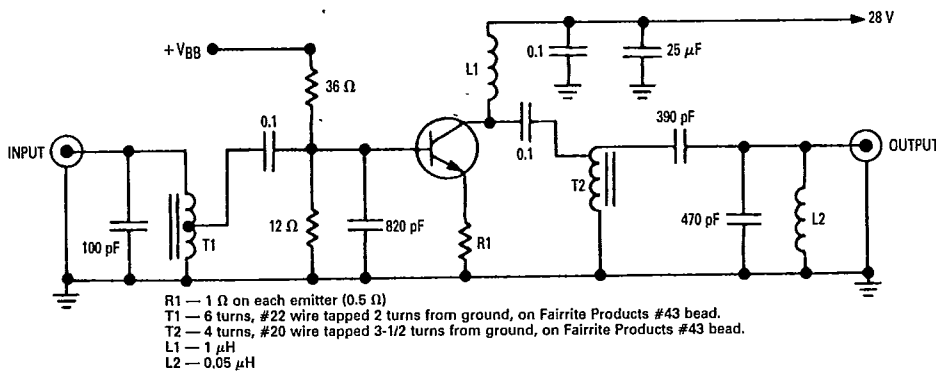


Figure 10. 28 MHz Test Circuit