

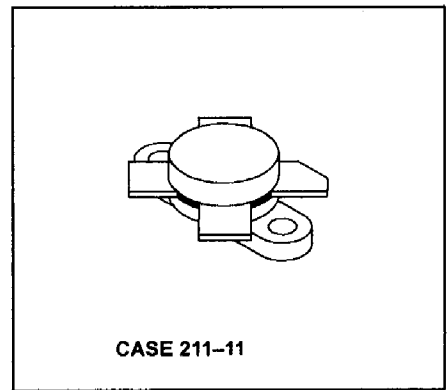
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**The RF Line
 NPN Silicon
 RF Power Transistor**

Designed primarily for high-voltage applications as a high-power linear amplifier from 2.0 to 30 MHz. Ideal for marine and base station equipment.

- Specified 50 Volt, 30 MHz Characteristics
 Output Power = 250 W
 Minimum Gain = 12 dB
 Efficiency = 45%
- Intermodulation Distortion @ 250 W (PEP) —
 IMD = -30 dB (Max)
- 100% Tested for Load Mismatch at all Phase Angles with 3:1 VSWR



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	50	Vdc
Collector-Base Voltage	V _{CBO}	100	Vdc
Emitter-Base Voltage	V _{EBO}	4.0	Vdc
Collector Current — Continuous	I _C	16	Adc
Withstand Current — 10 s	—	20	Adc
Total Device Dissipation @ T _C = 25°C (1) Derate above 25°C	P _D	290 1.67	Watts W/°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	0.6	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I _C = 200 mAdc, I _B = 0)	V _{(BR)CEO}	50	—	—	Vdc
Collector-Emitter Breakdown Voltage (I _C = 100 mAdc, V _{BE} = 0)	V _{(BR)CES}	100	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 100 mAdc, I _E = 0)	V _{(BR)CBO}	100	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 mAdc, I _C = 0)	V _{(BR)EBO}	4.0	—	—	Vdc

NOTE:

1. P_D is a measurement reflecting short term maximum condition. See SOAR curve for operating conditions.

(continued)



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

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C = 5.0 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$)	h_{FE}	10	30	—	—
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DYNAMIC CHARACTERISTICS

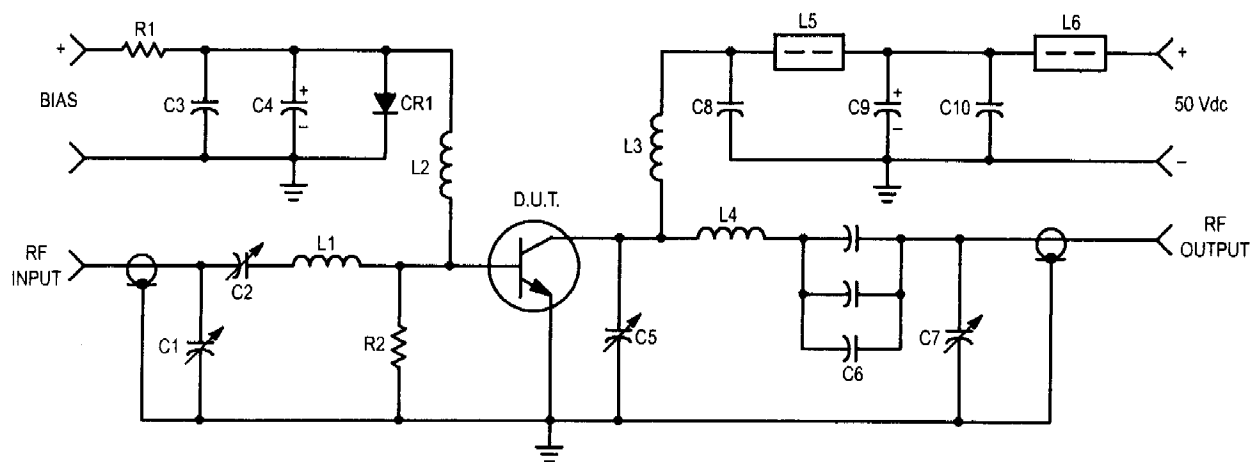
Output Capacitance ($V_{CB} = 50 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	—	350	450	pF
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FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain ($V_{CC} = 50 \text{ Vdc}$, $P_{out} = 250 \text{ W CW}$, $f = 30 \text{ MHz}$, $I_{CQ} = 250 \text{ mA}$)	G_{pE}	12	14	—	dB
Collector Efficiency ($V_{CC} = 50 \text{ Vdc}$, $P_{out} = 250 \text{ W}$, $f = 30 \text{ MHz}$, $I_{CQ} = 250 \text{ mA}$)	η	—	45 65	—	% (PEP) % (CW)
Intermodulation Distortion (2) ($V_{CE} = 50 \text{ Vdc}$, $P_{out} = 250 \text{ W (PEP)}$, $I_{CQ} = 250 \text{ mA}$, $f = 30 \text{ MHz}$)	IMD	—	-33	-30	dB
Electrical Ruggedness ($V_{CC} = 50 \text{ Vdc}$, $P_{out} = 250 \text{ W CW}$, $f = 30 \text{ MHz}$, VSWR 3:1 at all Phase Angles)	ψ	No Degradation in Output Power			

NOTE:

2. To Mil-Std-1311 Version A, Test Method 2204, Two Tone, Reference each Tone.



C1, C2, C5, C7 — 170–780 pF, Arco 469
 C3, C8, C9 — 0.1 μF , 100 V Erie
 C4 — 500 μF @ 6.0 V
 C6 — 360 pF, 3 x 120 pF 3.0 kV in parallel
 C10 — 10 μF , 100 V
 R1 — 10 Ω , 10 Watt
 R2 — 10 Ω , 1.0 Watt

CR1 — 1N4997 or equivalent
 L1 — 3 Turns, #16 Wire, 0.4" I.D., 0.3" Long
 L2 — 0.8 μH , Ohmite Z-235 or equivalent
 L3 — 12 Turns, #16 Enameled Wire Closewound 0.25" I.D.
 L4 — 4 Turns, 1/8" Copper Tubing, 0.6" I.D., 1.0" Long
 L5, L6 — 2.0 μH , Fair-Rite 2643021801 Ferrite bead each or equivalent

Figure 1. 30 MHz Test Circuit Schematic