

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

T-33-13  
**2N6084**  
**MRF224**

**The RF Line**

**NPN SILICON RF POWER TRANSISTORS**

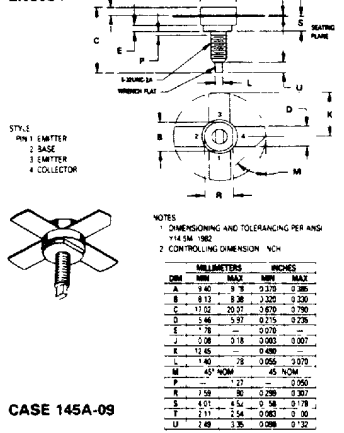
... designed for 12.5 Volt VHF large-signal amplifier applications required in commercial and industrial equipment operating to 300 MHz

- Specified 12.5 Volt, 175 MHz Characteristics —
  - Output Power = 40 W
  - Minimum Gain = 4.5 dB
  - Efficiency = 70%

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**40 W — 175 MHz**  
**RF POWER**  
**TRANSISTORS**  
**NPN SILICON**

2N6084

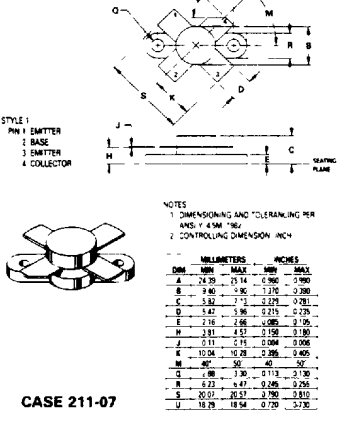


**\*MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	18	Vdc
Collector-Base Voltage	V <sub>CB0</sub>	36	Vdc
Emitter-Base Voltage	V <sub>EB0</sub>	4.0	Vdc
Collector Current — Continuous	I <sub>C</sub>	7.0	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C(2)	P <sub>D</sub>	80	Watts
Derate above 25°C		46	W/°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +200	°C
Stud Torque(1)	—	6.5	in.lb.

\*Indicates JEDEC Registered Data for 2N6084  
(1) For Repeated Assembly Use 5 in. lb.  
(2) These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as RF amplifiers.

MRF224



\*ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 100 mA dc, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	18	—	—	Vdc
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 20 mA dc, V <sub>BE</sub> = 0)	V <sub>(BR)CES</sub>	36	—	—	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 mA dc, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	40	—	—	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 15 Vdc, V <sub>BE</sub> = 0, T <sub>C</sub> = +55°C)	I <sub>CES</sub>	—	—	10	mA dc
Collector Cutoff Current (V <sub>CB</sub> = 15 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	—	—	2.5	mA dc
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 10 mA dc, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE</sub>	5.0	—	—	—
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance (V <sub>CB</sub> = 15 Vdc, I <sub>E</sub> = 0, f = 0.1 MHz)	C <sub>ob</sub>	—	170	200	pF
<b>FUNCTIONAL TEST</b>					
Common Emitter Amplifier Power Gain (P <sub>out</sub> = 40 W, V <sub>CC</sub> = 12.5 Vdc, f = 175 MHz)	G <sub>PE</sub>	4.5	—	—	dB
Collector Efficiency (P <sub>out</sub> = 40 W, V <sub>CC</sub> = 12.5 Vdc, f = 175 MHz)	η	70	—	—	%

\*Indicates JEDEC Registered Data for 2N6084

FIGURE 1 - 175 MHz TEST CIRCUIT

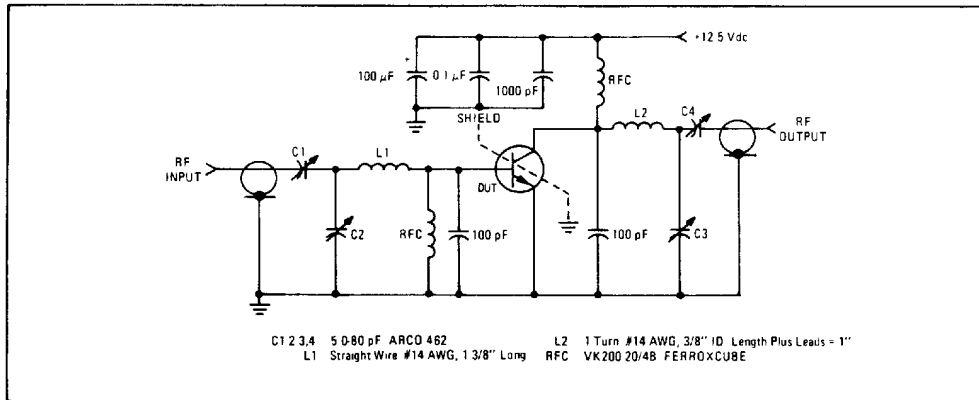


FIGURE 2 - OUTPUT POWER versus INPUT POWER

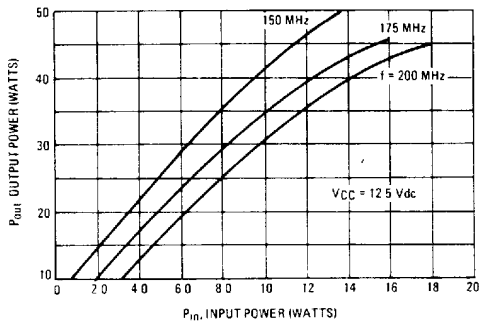


FIGURE 3 - OUTPUT POWER versus SUPPLY VOLTAGE

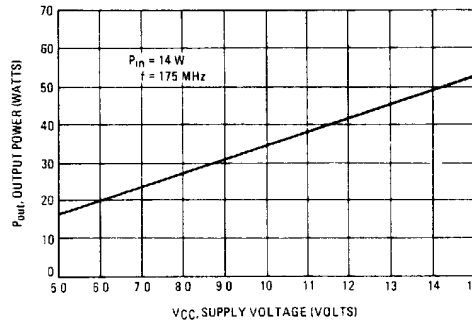


FIGURE 4 - SERIES EQUIVALENT IMPEDANCE

