

**MOTOROLA SEMICONDUCTOR TECHNICAL DATA**

MOTOROLA SC XSTRS/R F

**MRF427  
MRF427A**

**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 = 25 W(PEP)  
Minimum Gain = 18 dB
- Intermodulation Distortion @ 25 W(PEP) –  
IMD = -34 dB (Min)
- 100% Tested for Load Mismatch at all Phase Angles with 30:1 VSWR

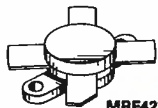
**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	65	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	110	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	4.0	Vdc
Collector Current – Continuous	I <sub>C</sub>	6.0	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	80 0.457	Watts W/°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>	2.19	°C/W

**CASE 211-11**



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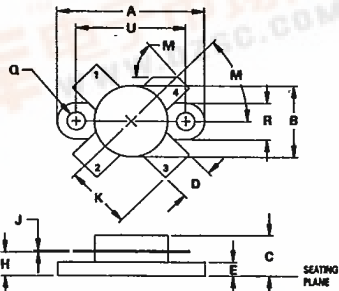
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.39	25.14	0.960	0.990
B	11.82	12.95	0.465	0.510
C	5.82	6.98	0.229	0.275
D	5.49	5.96	0.216	0.235
E	2.14	2.29	0.084	0.110
H	3.66	4.52	0.144	0.178
J	0.08	0.17	0.003	0.007
K	11.05	—	0.435	—
M	45° NOM	—	45° NOM	—
Q	2.93	3.30	0.115	0.130
R	6.25	6.47	0.246	0.255
U	18.29	18.54	0.720	0.730

**STYLE 1:**

- PIN 1. EMITTER
- BASE
- EMITTER
- COLLECTOR

**NOTES:**

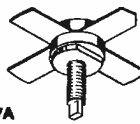
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.



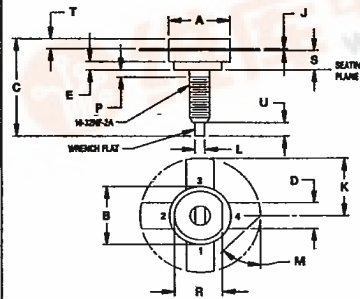
25 W (PEP) – 30 MHz

**RF POWER TRANSISTOR  
NPN SILICON**

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MRF427A



**STYLE 1:**

- PIN 1. EMITTER
- BASE
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**NOTES:**

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.45	12.95	0.490	0.510
B	10.54	10.90	0.415	0.425
C	19.68	22.73	0.775	0.895
D	5.46	5.97	0.215	0.235
E	1.83	—	0.072	—
J	0.08	0.18	0.003	0.007
K	12.45	—	0.490	—
L	1.65	1.90	0.065	0.075
M	45° NOM	—	45° NOM	—
P	—	1.27	—	0.050
R	9.73	10.06	0.383	0.396
S	3.54	4.50	0.151	0.177
T	2.11	2.54	0.083	0.100
U	2.43	3.26	0.096	0.132

CASE 145A-10

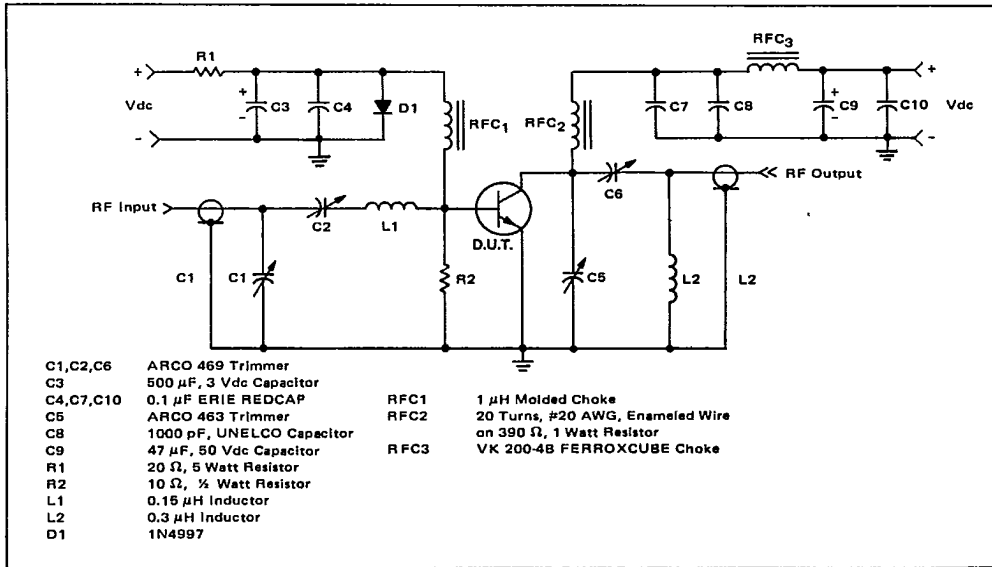


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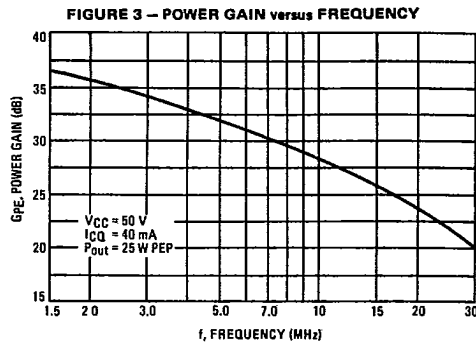
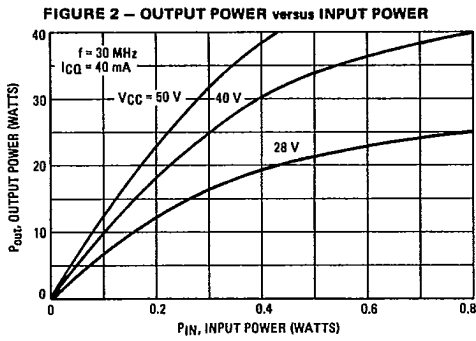
ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 200 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	65	—	—	V <sub>dc</sub>
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 100 mA <sub>dc</sub> , V <sub>BE</sub> = 0)	V <sub>(BR)CES</sub>	110	—	—	V <sub>dc</sub>
Collector-Base Breakdown Voltage (I <sub>C</sub> = 100 mA <sub>dc</sub> , I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	110	—	—	V <sub>dc</sub>
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 mA <sub>dc</sub> , I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	4.0	—	—	V <sub>dc</sub>
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 500 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> )	h <sub>FE</sub>	15	—	90	—
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance (V <sub>CB</sub> = 50 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	—	—	60	pF
<b>FUNCTIONAL TESTS</b>					
Common-Emitter Amplifier Power Gain (V <sub>CC</sub> = 50 V <sub>dc</sub> , P <sub>out</sub> = 25 W(PEP), f = 30 MHz)	G <sub>pe</sub>	18	20	—	dB
Intermodulation Distortion (V <sub>CC</sub> = 50 V <sub>dc</sub> , P <sub>out</sub> = 25 W(PEP))	IMD	-34	-37	—	dB
Electrical Ruggedness (V <sub>CC</sub> = 50 V <sub>dc</sub> , P <sub>out</sub> = 25 W(PEP), f = 30 MHz, VSWR 30:1) All Phase Angles	—	No Degradation in Output Power			

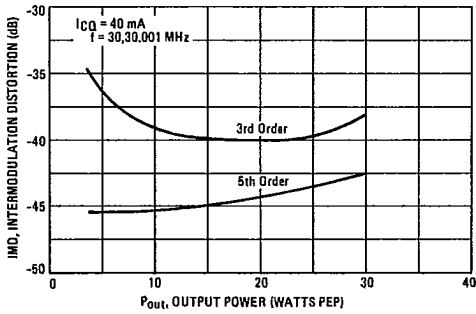
FIGURE 1 - 30 MHz TEST CIRCUIT SCHEMATIC



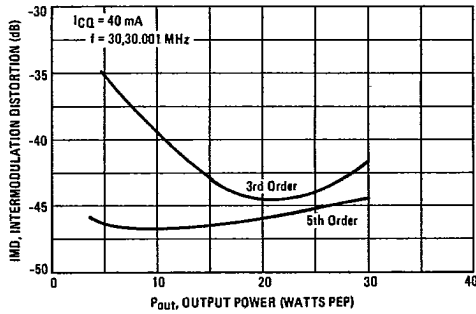
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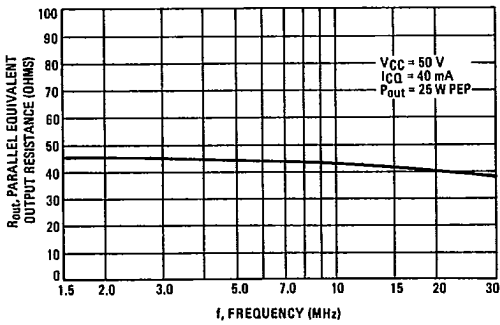
**FIGURE 4 – INTERMODULATION DISTORTION versus OUTPUT POWER**  
 $V_{CC} = 50 \text{ Vdc}$



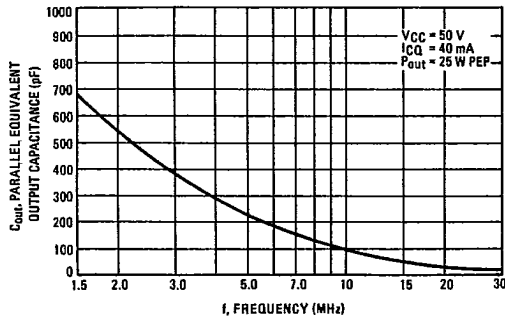
**FIGURE 5 – INTERMODULATION DISTORTION versus OUTPUT POWER**  
 $V_{CC} = 40 \text{ Vdc}$



**FIGURE 6 – OUTPUT RESISTANCE versus FREQUENCY**



**FIGURE 7 – OUTPUT CAPACITANCE versus FREQUENCY**



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FIGURE 8 - OUTPUT POWER versus SUPPLY VOLTAGE

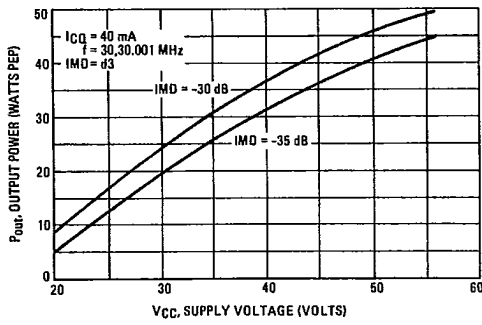


FIGURE 9 - DC SAFE OPERATING AREA

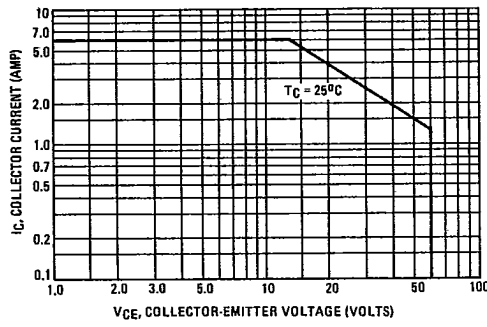


FIGURE 10 - SERIES EQUIVALENT IMPEDANCE

