

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

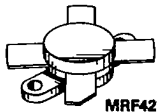
MAXIMUM RATINGS

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

CASE 211-11



MRF427

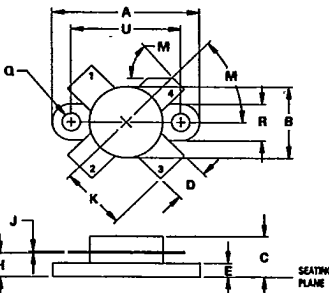
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.39	25.14	0.960	0.990
B	11.82	12.95	0.465	0.510
C	5.92	6.99	0.233	0.275
D	5.49	5.96	0.216	0.235
E	2.14	2.29	0.084	0.110
H	3.66	4.52	0.144	0.178
J	0.08	0.17	0.003	0.007
K	11.05	—	0.435	—
M	45° NOM	45° NOM	—	—
Q	2.93	3.30	0.115	0.130
R	6.25	6.47	0.246	0.255
U	18.29	18.54	0.720	0.730

STYLE 1:

- PIN 1. EMITTER
- 2. BASE
- 3. EMITTER
- 4. COLLECTOR

NOTES:

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

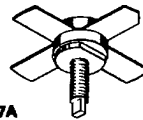


25 W (PEP) – 30 MHz

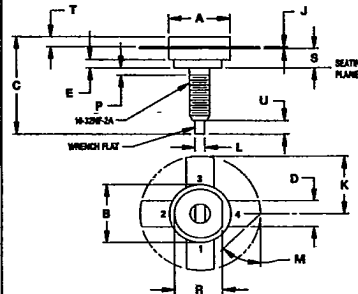
RF POWER TRANSISTOR

NPN SILICON

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MRF427A



STYLE 1:

- PIN 1. EMITTER
- 2. BASE
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- 4. COLLECTOR

NOTES:

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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.45	12.95	0.490	0.510
B	10.54	10.80	0.415	0.425
C	19.68	22.73	0.775	0.896
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	3.84	4.50	0.151	0.177
T	2.11	2.54	0.083	0.100
U	2.49	3.36	0.098	0.132

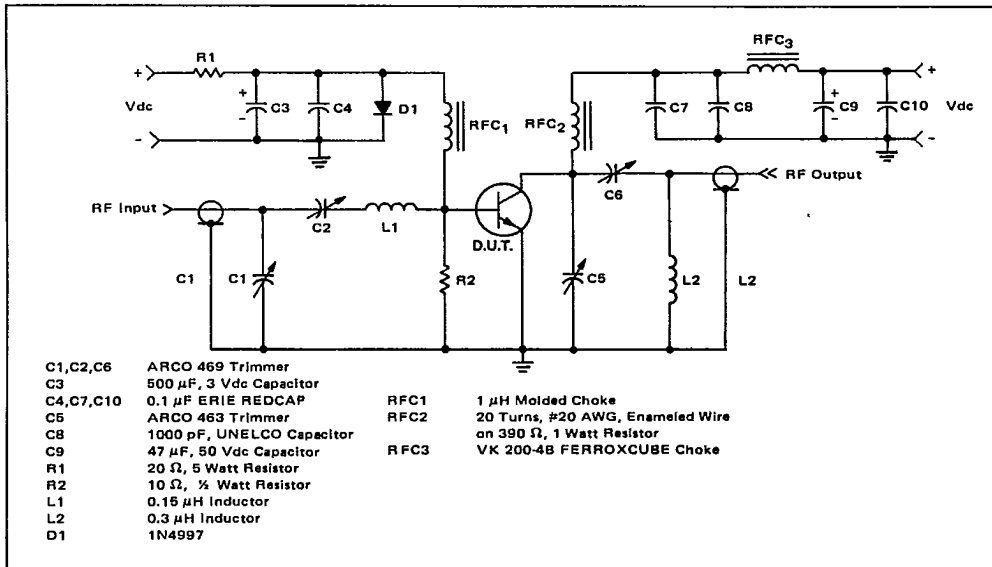
CASE 145A-10

T-33-13

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 200 mA, I _B = 0)	V _{(BR)CEO}	65	—	—	Vdc
Collector-Emitter Breakdown Voltage (I _C = 100 mA, V _{BE} = 0)	V _{(BR)CES}	110	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 100 mA, I _E = 0)	V _{(BR)CBO}	110	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 mA, I _C = 0)	V _{(BR)EBO}	4.0	—	—	Vdc
ON CHARACTERISTICS					
DC Current Gain (I _C = 500 mA, V _{CE} = 5.0 Vdc)	h _{FE}	15	—	90	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V _{CB} = 50 Vdc, I _E = 0, f = 1.0 MHz)	C _{ob}	—	—	60	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V _{CC} = 50 Vdc, P _{out} = 25 W(PEP), f = 30 MHz)	G _{pe}	18	20	—	dB
Intermodulation Distortion (V _{CC} = 50 Vdc, P _{out} = 25 W(PEP))	IMD	-34	-37	—	dB
Electrical Ruggedness (V _{CC} = 50 Vdc, P _{out} = 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 2 - OUTPUT POWER versus INPUT POWER

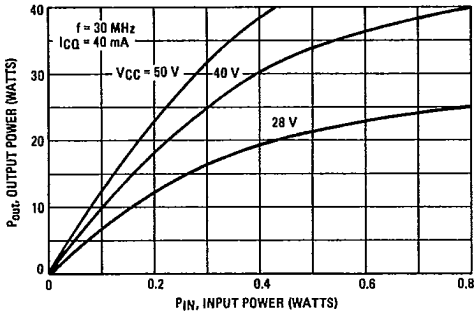


FIGURE 3 - POWER GAIN versus FREQUENCY

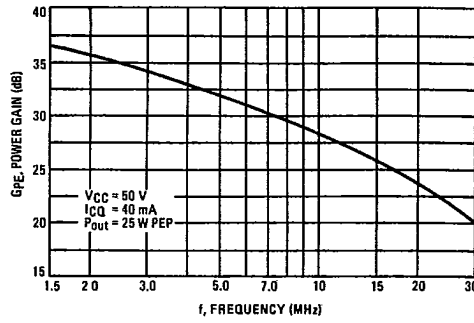


FIGURE 4 - INTERMODULATION DISTORTION versus OUTPUT POWER
VCC = 50 Vdc

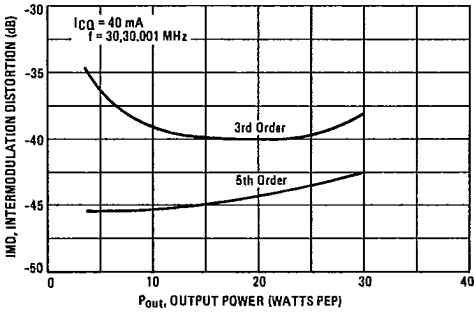


FIGURE 5 - INTERMODULATION DISTORTION versus OUTPUT POWER
VCC = 40 Vdc

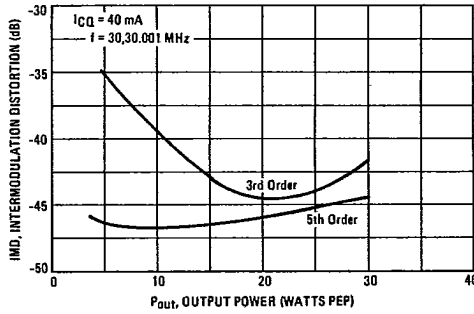


FIGURE 6 - OUTPUT RESISTANCE versus FREQUENCY

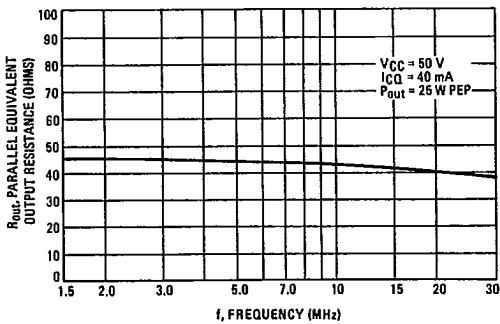
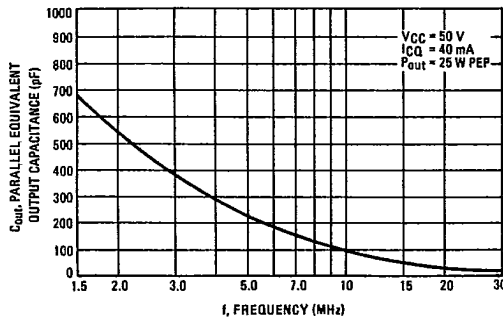


FIGURE 7 - OUTPUT CAPACITANCE versus FREQUENCY



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FIGURE 8 - OUTPUT POWER versus SUPPLY VOLTAGE

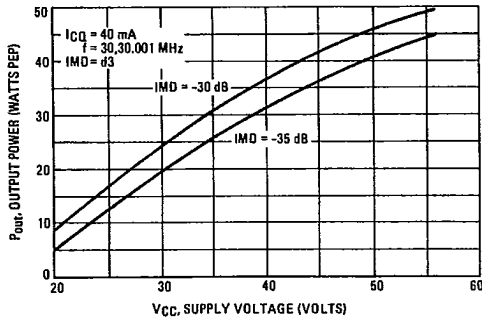


FIGURE 9 - DC SAFE OPERATING AREA

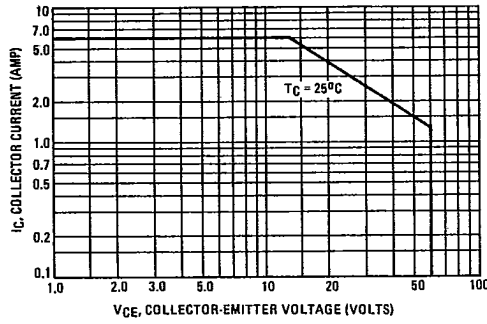


FIGURE 10 - SERIES EQUIVALENT IMPEDANCE

