

T-33-09

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

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

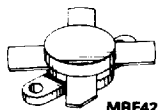
MAXIMUM RATINGS

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

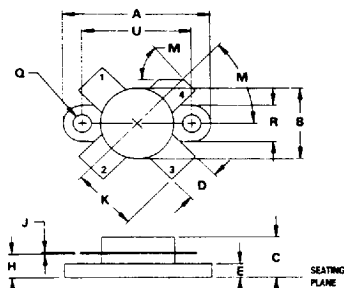
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.39	25.14	0.960	0.990
B	11.92	12.95	0.465	0.510
C	5.82	6.96	0.229	0.275
D	5.49	5.96	0.216	0.235
E	2.14	2.79	0.084	0.110
H	3.86	4.52	0.144	0.178
J	0.08	0.17	0.003	0.007
K	11.05	—	0.435	—
M	45	NOM	45	NOM
Q	2.93	3.30	0.115	0.130
R	6.25	6.47	0.246	0.255
U	18.29	18.54	0.720	0.730

STYLE 1

- PIN 1 EMITTER
2 BASE
3 EMITTER
4 COLLECTOR

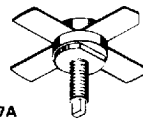
NOTES

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

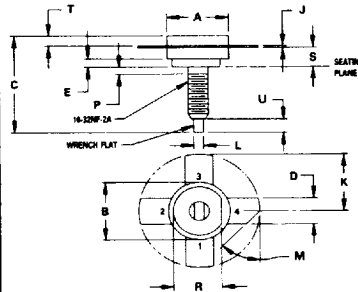


25 W (PEP) – 30 MHz

RF POWER TRANSISTOR
NPN SILICON



MRF427A



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.

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	0.896
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	3.35	0.098	0.132

CASE 145A-10

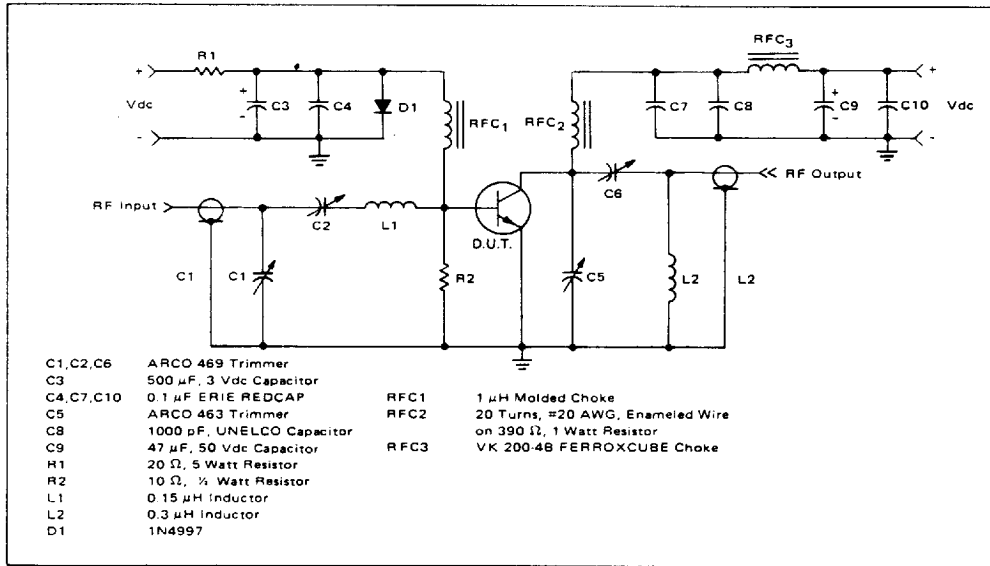
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ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 200 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	65	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 100 \text{ mAdc}, V_{BE} = 0$)	$V_{(BR)CES}$	110	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \text{ mAdc}, I_E = 0$)	$V_{(BR)CBO}$	110	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \text{ mAdc}, I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 500 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	15	—	90	—
DYNAMIC CHARACTERISTICS					
Output Capacitance ($V_{CB} = 50 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C_{ob}	—	—	60	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CC} = 50 \text{ Vdc}, P_{out} = 25 \text{ W(PEP)}, f = 30 \text{ MHz}$)	G_{pe}	18	20	—	dB
Intermodulation Distortion (1) ($V_{CC} = 50 \text{ Vdc}, P_{out} = 25 \text{ W(PEP)}$)	IMD	—	-37	-34	dB
Electrical Ruggedness ($V_{CC} = 50 \text{ Vdc}, P_{out} = 25 \text{ W(PEP)}, f = 30 \text{ MHz},$ VSWR 30:1) All Phase Angles	—	No Degradation in Output Power			

(1) To Mil-Std-1311 Version A, Test Method 2204B, Two Tone, Reference each Tone.

FIGURE 1 — 30 MHz TEST CIRCUIT SCHEMATIC



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FIGURE 2 - OUTPUT POWER versus INPUT POWER

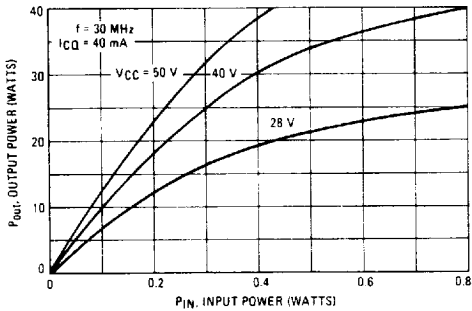


FIGURE 3 - POWER GAIN versus FREQUENCY

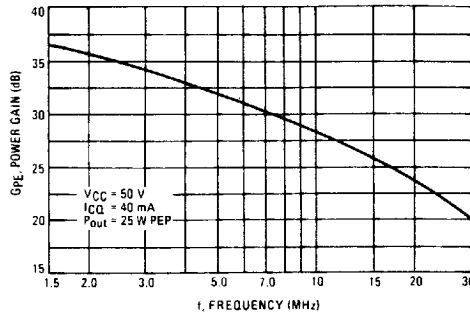


FIGURE 4 - INTERMODULATION DISTORTION versus OUTPUT POWER
VCC = 50 Vdc

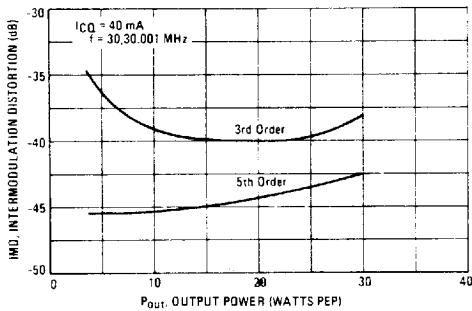


FIGURE 5 - INTERMODULATION DISTORTION versus OUTPUT POWER
VCC = 40 Vdc

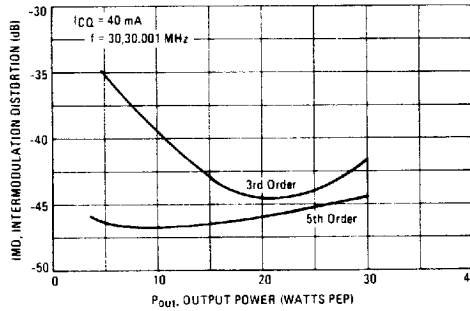


FIGURE 6 - OUTPUT RESISTANCE versus FREQUENCY

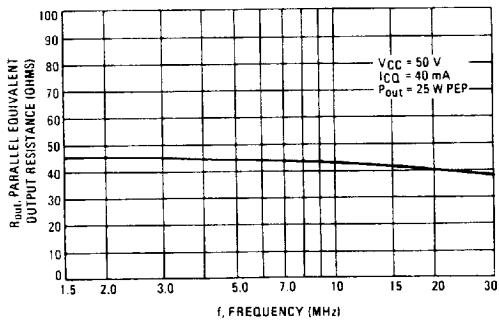
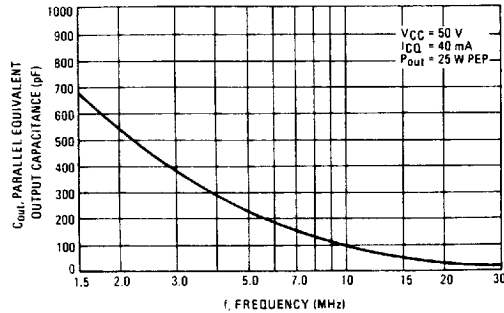


FIGURE 7 - OUTPUT CAPACITANCE versus FREQUENCY



MRF427, MRF427A

MOTOROLA SC (XSTRS/R F)

46E D

6367254 0094649 3

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FIGURE 8 - OUTPUT POWER versus SUPPLY VOLTAGE

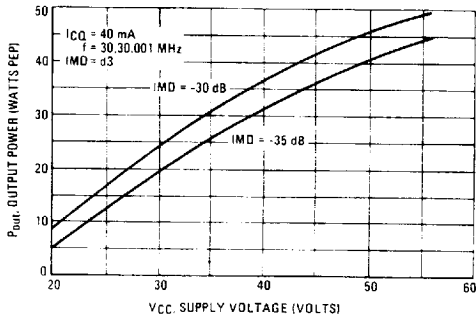


FIGURE 9 - DC SAFE OPERATING AREA

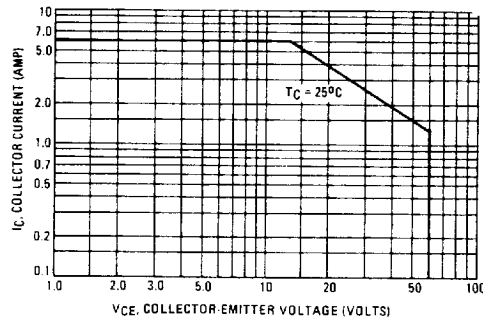
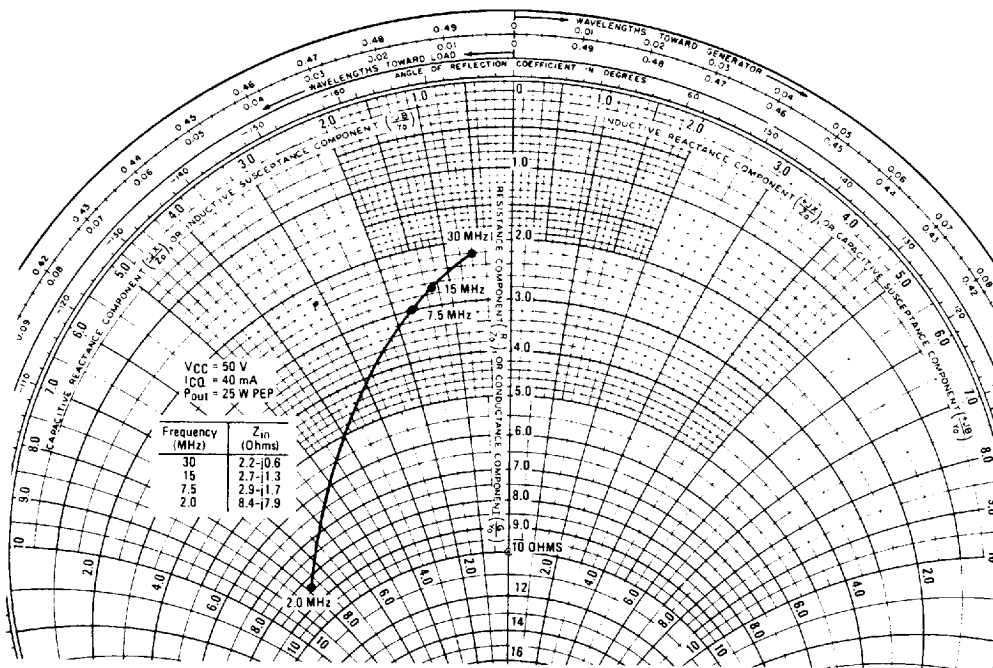


FIGURE 10 - SERIES EQUIVALENT IMPEDANCE



MOTOROLA RF DEVICE DATA

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