

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.

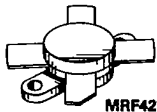
- Specified 50 Volt, 30 MHz Characteristics —
Output Power = 25 W(PEP)
Minimum Gain = 18 dB
- Intermodulation Distortion @ 25 W(PEP) —
IMD = -34 dB (Min)
- 100% Tested for Load Mismatch at all Phase Angles with 30:1 VSWR

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 @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	80 0.457	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.19	$^\circ\text{C/W}$

CASE 211-11


MRF427

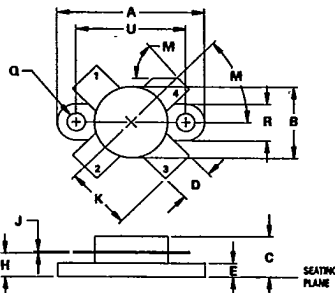
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.39	25.14	0.960	0.990
B	11.82	12.95	0.465	0.510
C	5.92	6.99	0.233	0.275
D	5.49	5.96	0.216	0.235
E	2.14	2.29	0.084	0.110
H	3.66	4.52	0.144	0.178
J	0.08	0.17	0.003	0.007
K	11.05	—	0.435	—
M	45° NOM	45° NOM	—	—
Q	2.93	3.30	0.115	0.130
R	6.25	6.47	0.246	0.255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

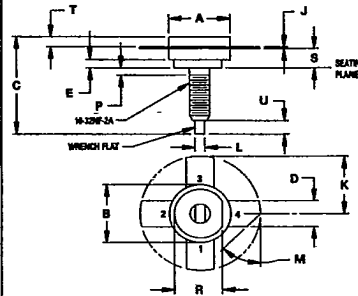


25 W (PEP) — 30 MHz

RF POWER
TRANSISTOR

NPN SILICON

MRF427A


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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

MOTOROLA RF DEVICE DATA

2-615

T-33-13

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 200\text{ mAdc}$, $I_E = 0$)	$V_{(BR)CEO}$	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 ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 25\text{ W(PEP)}$)	IMD	-34	-37	—	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			

FIGURE 1 — 30 MHz TEST CIRCUIT SCHEMATIC

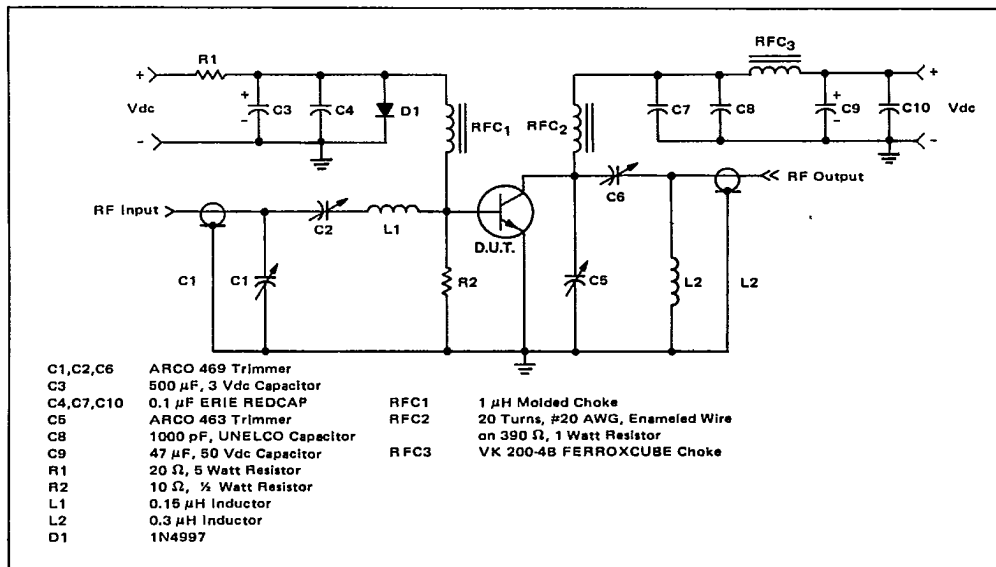


FIGURE 2 — OUTPUT POWER versus INPUT POWER

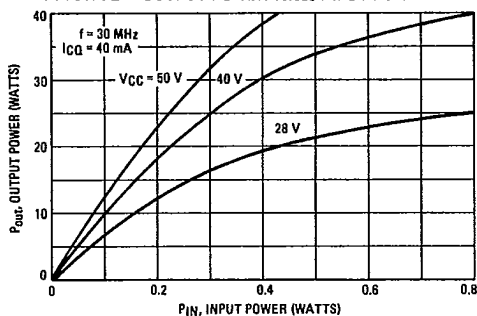


FIGURE 3 — POWER GAIN versus FREQUENCY

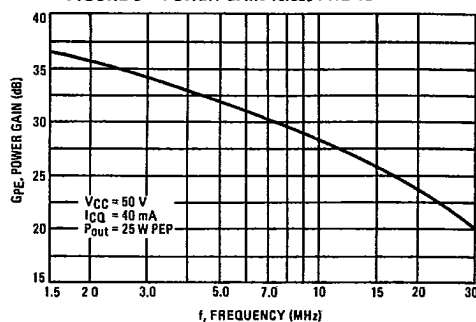
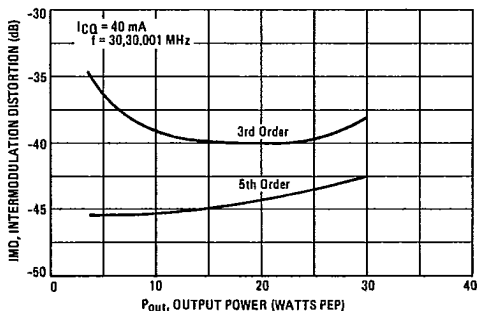
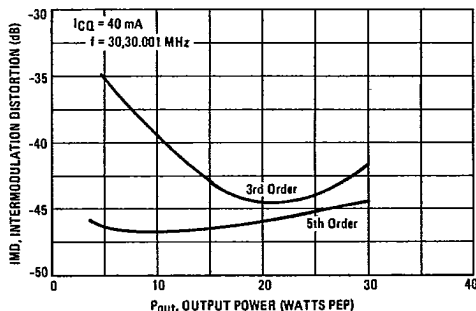
FIGURE 4 — INTERMODULATION DISTORTION versus OUTPUT POWER
 $V_{CC} = 50$ VdcFIGURE 5 — INTERMODULATION DISTORTION versus OUTPUT POWER
 $V_{CC} = 40$ Vdc

FIGURE 6 — OUTPUT RESISTANCE versus FREQUENCY

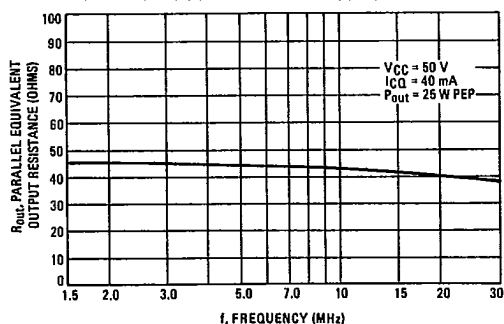


FIGURE 7 — OUTPUT CAPACITANCE versus FREQUENCY

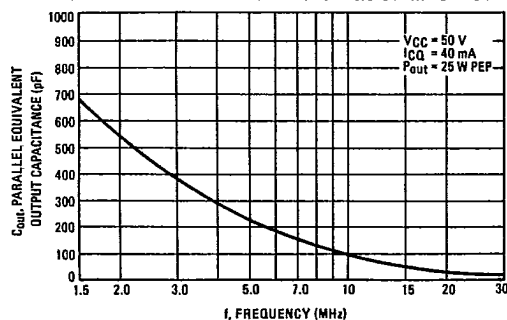


FIGURE 8 - OUTPUT POWER versus SUPPLY VOLTAGE

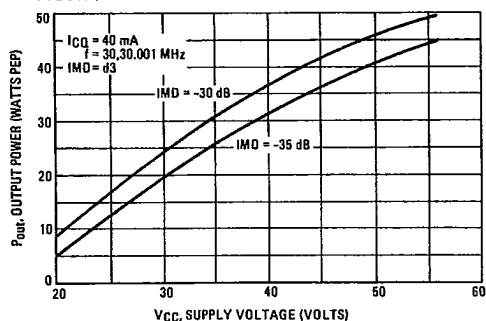


FIGURE 9 - DC SAFE OPERATING AREA

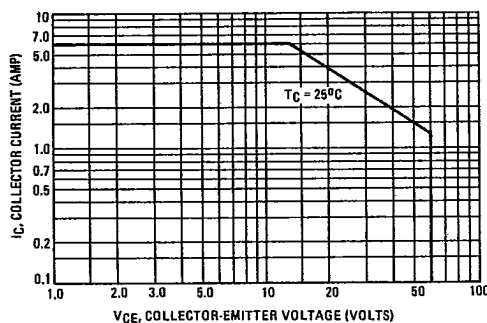


FIGURE 10 - SERIES EQUIVALENT IMPEDANCE

