

MRF230 (SILICON)

The RF Line

NPN SILICON RF POWER TRANSISTORS

... designed for 12.5 Volt, mid-band large-signal amplifier applications in industrial and commercial FM equipment operating in the 40 to 100 MHz range.

- Specified 12.5 Volt, 90 MHz Characteristics –
Output Power = 1.5 Watts
Minimum Gain = 10 dB
Efficiency = 55%
- 100% Tested for Load Mismatch at all Phase Angles with 30:1 VSWR
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Characterized with Parallel Equivalent Large-Signal Impedance Parameters

MAXIMUM RATINGS

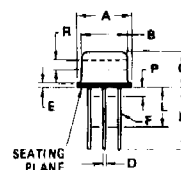
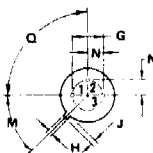
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	18	V _{dc}
Collector-Base Voltage	V _{CBO}	36	V _{dc}
Emitter-Base Voltage	V _{EB0}	4.0	V _{dc}
Collector Current – Continuous	I _C	0.5	A _{dc}
Total Device Dissipation @ T _C = 25°C (1)	P _D	5.0	Watts
Derate above 25°C		28.6	mW/°C
Storage Temperature Range	T _{stg}	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	35	°C/W

(1) These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as Class C RF Amplifiers.

1.5 W – 90 MHz
RF POWER
TRANSISTOR
NPN SILICON



STYLE 1
PIN 1. EMITTER
2. BASE
3. COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	5.10	6.80	0.240	0.260
D	0.406	0.533	0.016	0.021
E	0.229	3.18	0.009	0.125
F	0.406	0.463	0.016	0.019
G	4.83	5.33	0.190	0.210
H	0.711	0.864	0.028	0.034
J	0.737	1.02	0.029	0.040
K	12.70	–	0.500	–
L	6.35	–	0.250	–
M	45° NOM	–	45° NOM	–
P	–	1.27	–	0.050
Q	30° NOM	–	30° NOM	–
R	2.54	–	0.100	–

All JEDEC dimensions and notes apply.

CASE 79-02
TO-39

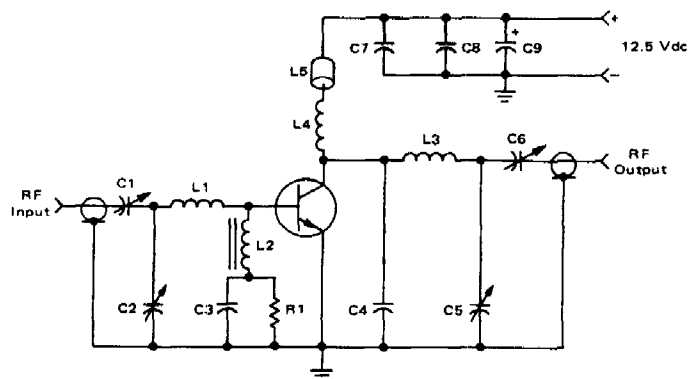
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MRF230 (continued)

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 25\text{ mAdc}$, $I_B = 0$)	BV_{CEO}	18	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 25\text{ mAdc}$, $V_{BE} = 0$)	BV_{CES}	36	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.25\text{ mAdc}$, $I_C = 0$)	BV_{EBO}	4.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	0.5	mAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 250\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	5.0	—	—
DYNAMIC CHARACTERISTICS				
Output Capacitance ($V_{CB} = 12.5\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	25	pF
FUNCTIONAL TESTS (Figure 1)				
Common-Emitter Amplifier Power Gain ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.5\text{ W}$, $f = 90\text{ MHz}$)	G_{PE}	10	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.5\text{ W}$, $f = 90\text{ MHz}$)	η	55	—	%
Load Mismatch ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.5\text{ W}$, $f = 90\text{ MHz}$, $T_C \leq 25^{\circ}\text{C}$)	—	$V_{SWR} > 30:1$ Through All Phase Angles in 3 Second Interval After Which Devices Will Meet G_{PE} Test Limits		

FIGURE 1 — 90 MHz TEST CIRCUIT SCHEMATIC



C1 5.0-80 pF, ARCO 462
 C2, C6 25-280 pF, ARCO 464
 C3 250 pF UNELCO
 C4 10 pF UNELCO
 C5 9.0-180 pF, ARCO 463
 C7 1000 pF UNELCO
 C8 0.47 μF ERIE Disc Ceramic

C9 20 μF , 15 Vdc TANTALUM
 L1 2 Turns, #18 AWG, 3/8" I.D., 3/8" Long
 L2 2.5 Turns, #20 AWG, on Ferrite Bead,
 FERROXCUBE 56-590-65-3B
 L3 3 Turns, #18 AWG, 3/8" I.D., 1/2" Long
 L4 0.68 μH , 9230-16 MILLER Molded Choke
 L5 Ferrite Bead, FERROXCUBE 56-590-65-3B
 R1 4.7 OHM, 1/2 W, 10% Carbon

Input/Output Connectors — Type BNC