MRF229
MRF230

MRF229
CASE 79-03, STYLE 5

MRF230
CASE 79-02, STYLE 1
TO-39 (TO-205AD)

HIGH FREQUENCY TRANSISTOR

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	18	Vdc
Collector-Base Voltage	V_{CBO}	36	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	0.5	Adc
Total Device Dissipation @ T_C = 25°C(1) Derate above 25°C	P_D	5.0 28.6	Watts mW/°C
Storage Temperature	T_{stg}	−65 to +200	°C

THERMAL CHARACTERISTICS

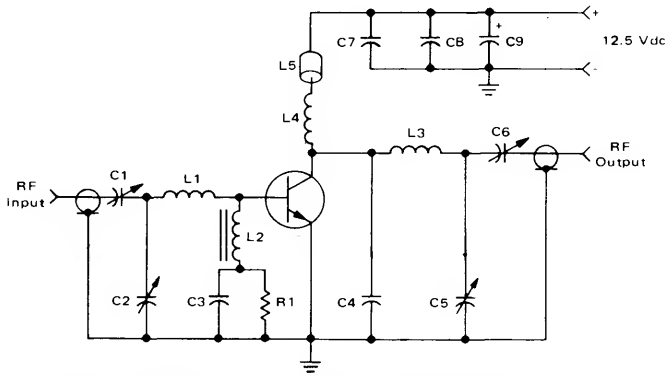
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	35	°C/W

(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.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 25 mAdc, I_B = 0)	$V_{(BR)CEO}$	18	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 25 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	36	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 0.25 mAdc, I_C = 0)	$V_{(BR)EBO}$	4.0	—	Vdc
Collector Cutoff Current (V_{CB} = 15 Vdc, I_E = 0)	I_{CBO}	—	0.5	mAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = 250 mAdc, V_{CE} = 5.0 Vdc)	h_{FE}	5.0	—	—
SMALL SIGNAL CHARACTERISTICS				
Output Capacitance (V_{CB} = 12.5 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	—	25	pF
FUNCTIONAL TEST (FIGURE 1)				
Common-Emitter Amplifier Power Gain (V_{CC} = 12.5 Vdc, P_{out} = 1.5 W, f = 90 MHz)	G_{PE}	10	—	dB
Collector Efficiency (V_{CC} = 12.5 Vdc, P_{out} = 1.5 W, f = 90 MHz)	η	55	—	%
Load Mismatch (V_{CC} = 12.5 Vdc, P_{out} = 1.5 W, f = 90 MHz, $T_C \leq$ 25°C)	—	VSWR > 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	C9	20 µF, 15 Vdc TANTALUM
C2,C6	25-280 pF, ARCO 464	L1	2 Turns, #18 AWG, 3/8" I.D. 3/8" Long
C3	250 pF UNELCO	L2	2.5 Turns, #20 AWG, on Ferrite Bead. FERROXCUBE 56-590-65-3B
C4	10 pF UNELCO	L3	3 Turns, #18 AWG, 3/8" I.D., 1/2" Long
C5	9.0-180 pF, ARCO 463	L4	0.68 µH, 9230-16 MILLER Molded Choke
C7	1000 pF UNELCO	L5	Ferrite Bead, FERROXCUBE 56-590-65-3B
C8	0.47 µF ERIE Disc Ceramic	R1	4.7 OHM, 1/2 W, 10% Carbon

Input/Output Connectors – Type 8NC

FIGURE 2 – OUTPUT POWER versus INPUT POWER

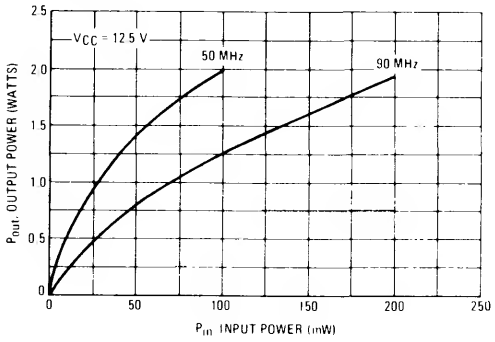


FIGURE 3 – OUTPUT POWER versus FREQUENCY

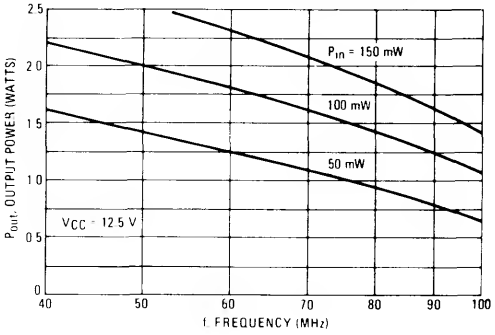


FIGURE 4 – OUTPUT POWER versus SUPPLY VOLTAGE

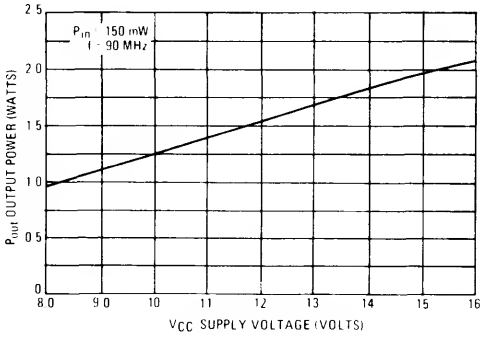
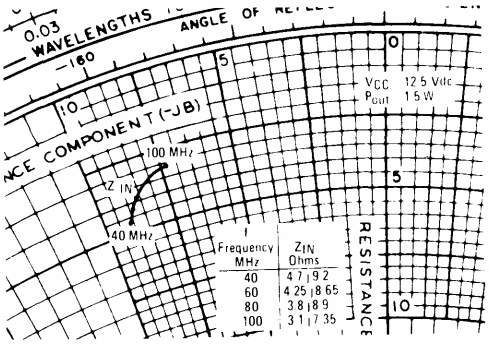


FIGURE 5

SERIES EQUIVALENT INPUT IMPEDANCE



SERIES EQUIVALENT OUTPUT IMPEDANCE

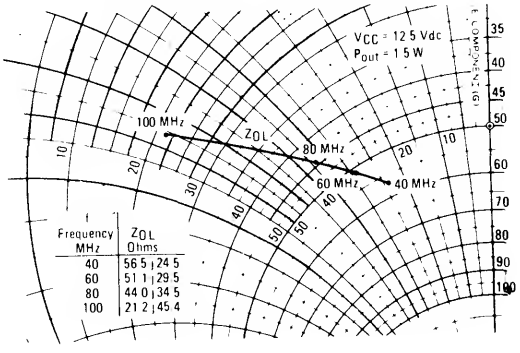


FIGURE 6 – PARALLEL EQUIVALENT INPUT RESISTANCE versus FREQUENCY

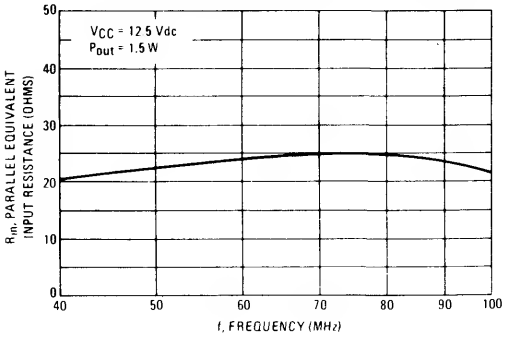


FIGURE 7 – PARALLEL EQUIVALENT INPUT CAPACITANCE versus FREQUENCY

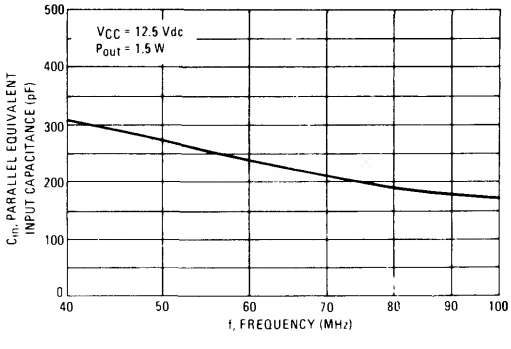


FIGURE 8 – PARALLEL EQUIVALENT OUTPUT RESISTANCE versus FREQUENCY

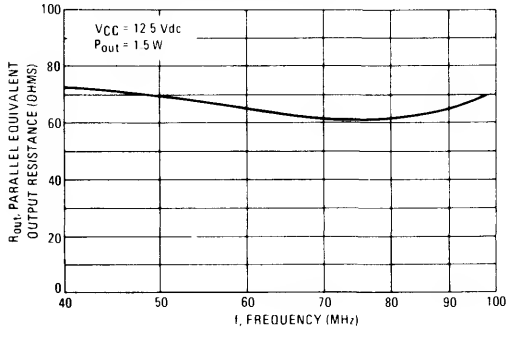


FIGURE 9 – PARALLEL EQUIVALENT OUTPUT CAPACITANCE versus FREQUENCY