

MRF627

The RF Line

0.5 W - 470 MHz

**HIGH FREQUENCY
TRANSISTOR**

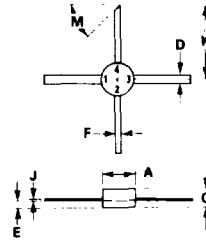
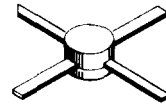
NPN SILICON

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NPN SILICON HIGH FREQUENCY TRANSISTOR

... designed for 12.5 Volt UHF large-signal amplifier applications in industrial and commercial FM equipment operating in the 407 to 512 MHz range. Ideally suited for requirements that specify optimum performance in a limited space.

- Specified 12.5 Volt, 470 MHz Characteristics —
 - Output Power = 0.5 Watts
 - Minimum Gain = 10 dB
 - Efficiency = 60%



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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	20	V _{dc}
Collector-Base Voltage	V _{CBO}	30	V _{dc}
Emitter-Base Voltage	V _{EBO}	3.5	V _{dc}
Collector-Current - Continuous	I _C	150	mA _{dc}
Total Device Dissipation @ T _C = 25°C Derate Above 25°C	P _D	2.5 35	Watts mW/°C
Storage Temperature Range	T _{stg}	- 65 to + 150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	28.5	°C/W

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.08	5.59	0.200	0.220
C	2.41	3.30	0.095	0.130
D	1.40	1.65	0.055	0.065
E	1.02	1.27	0.040	0.050
F	0.64	0.89	0.025	0.035
J	0.08	0.18	0.003	0.007
K	11.05	—	0.435	—
M	45°	NOM	45°	NOM

CASE 305A-01

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 5.0 mA _{dc} , I _B = 0)	V _{(BR)CEO}	20	—	—	V _{dc}
Collector-Base Breakdown Voltage (I _C = 0.1 mA _{dc} , I _E = 0)	V _{(BR)CBO}	30	—	—	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 0.1 mA _{dc} , I _C = 0)	V _{(BR)EBO}	3.5	—	—	V _{dc}
Collector Cutoff Current (V _{CE} = 12 V _{dc} , I _B = 0)	I _{CEO}	—	—	1.0	mA _{dc}
Emitter Cutoff Current (V _{BE} = 3.5 V _{dc} , I _C = 0)	I _{EBO}	—	—	1.0	mA _{dc}
ON CHARACTERISTICS					
DC Current Gain (I _C = 50 mA _{dc} , V _{CE} = 10 V _{dc})	h _{FE}	15	—	150	—
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product (I _C = 50 mA _{dc} , V _{CE} = 12.5 V _{dc} , f = 200 MHz) (I _C = 100 mA _{dc} , V _{CE} = 12.5 V _{dc} , f = 200 MHz) (I _C = 150 mA _{dc} , V _{CE} = 12.5 V _{dc} , f = 200 MHz)	f _T	—	2.5 2.7 2.6	—	GHz
Output Capacitance (V _{CB} = 12.5 V _{dc} , I _E = 0, f = 1.0 MHz)	C _{ob}	—	3.0	3.5	pF
Input Capacitance (V _{BE} = 1.0 V _{dc} , I _C = 0, f = 1.0 MHz)	C _{ib}	—	8.8	—	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V _{CC} = 12.5 V _{dc} , P _{out} = 0.5 W, f = 470 MHz)	G _{PE}	10	12	—	dB
Collector Efficiency (V _{CC} = 12.5 V _{dc} , P _{out} = 0.5 W, f = 470 MHz)	η	—	60	—	%
Series Equivalent Input Impedance (V _{CC} = 12.5 V _{dc} , P _{out} = 0.5 W, f = 470 MHz)	Z _{in}	—	6.0-j4.0	—	Ohms
Series Equivalent Output Impedance (V _{CC} = 12.5 V _{dc} , P _{out} = 0.5 W, f = 470 MHz)	Z _{out}	—	45-j28	—	Ohms

FIGURE 1 — OUTPUT POWER versus INPUT POWER

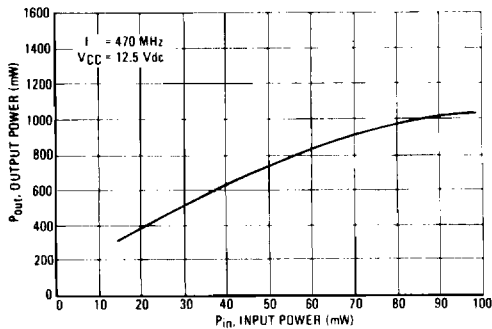
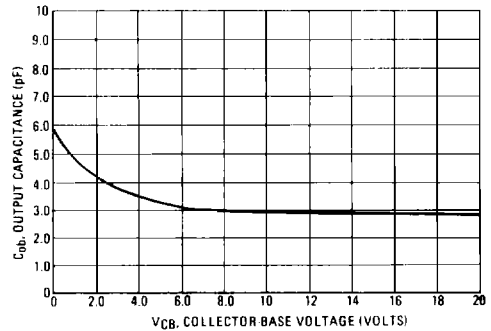


FIGURE 2 — OUTPUT CAPACITANCE versus COLLECTOR BASE VOLTAGE



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FIGURE 3 — 470 MHz TEST CIRCUIT SCHEMATIC

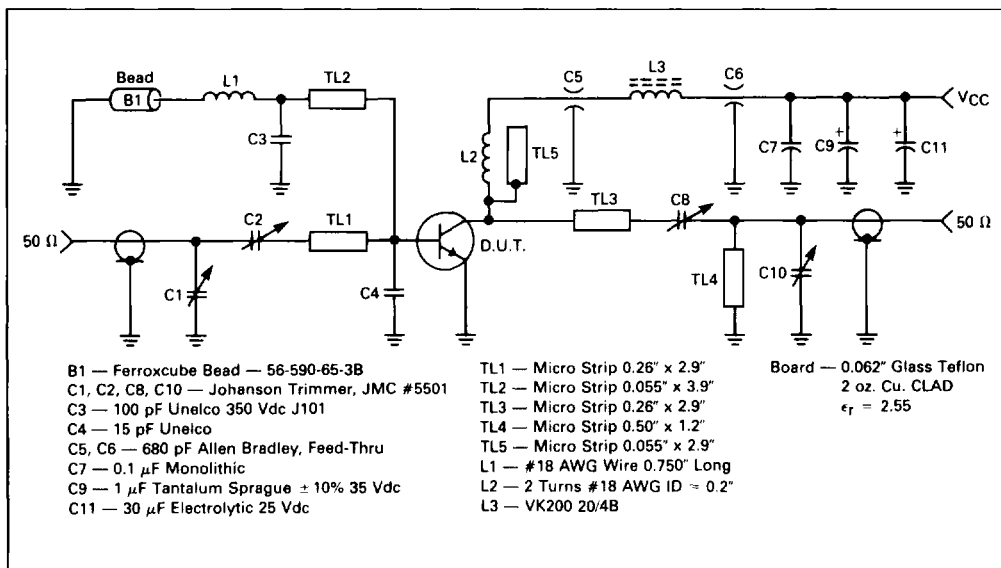
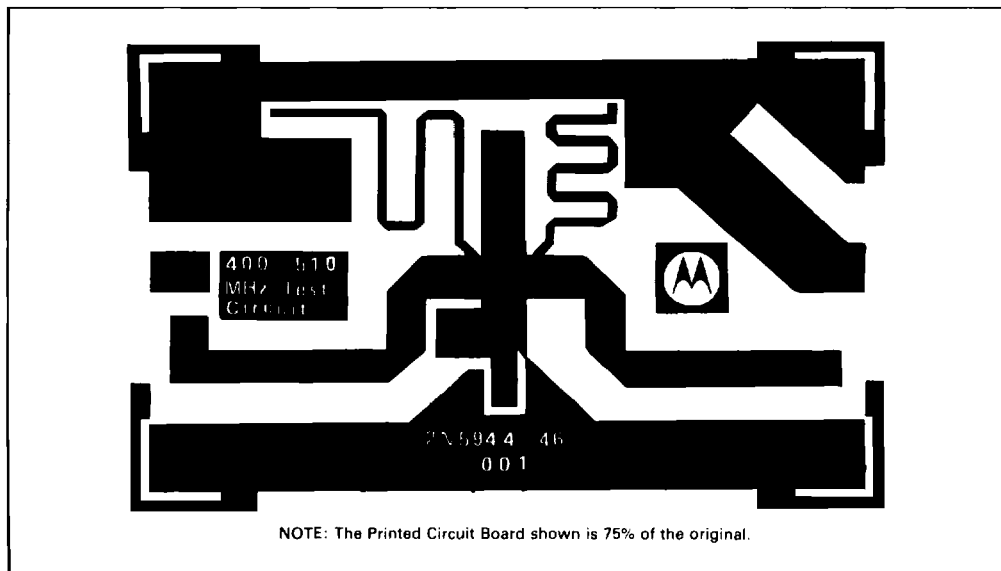


FIGURE 4 — 470 MHz TEST CIRCUIT LAYOUT



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FIGURE 5 – TYPICAL S_{11} and S_{22} versus FREQUENCY

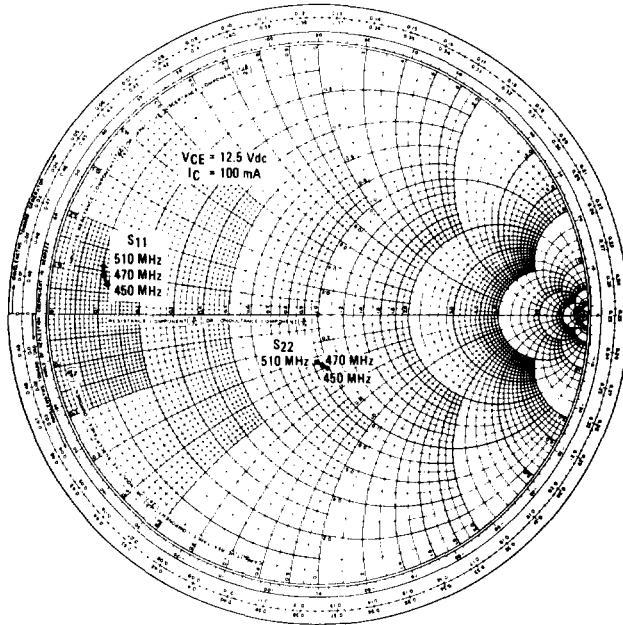


FIGURE 6 – TYPICAL S_{12} versus FREQUENCY

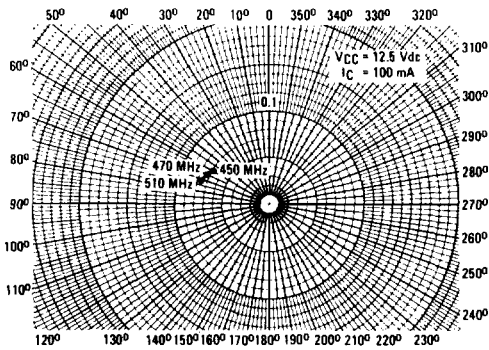


FIGURE 7 – TYPICAL S_{21} versus FREQUENCY

