

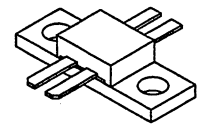
The RF Line
NPN Silicon
RF Power Transistor

MRF6403

The MRF6403 is designed for 1.8 GHz Personal Communications Network (PCN) base station applications. It incorporates high value emitter ballast resistors, gold metallizations and offers a high degree of reliability and ruggedness.

25 W, 1.88 GHz
RF POWER TRANSISTOR
NPN SILICON

- To be used in Class AB for PCN and Cellular Radio
- Specified 26 Volts, 1.88 GHz Characteristics
 - Output Power — 25 Watts
 - Gain — 6.5 dB Typ
 - Efficiency — 43% Typ



CASE 395
STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CER}	40	Vdc
Collector-Base Voltage	V_{CBO}	45	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Collector-Current — Continuous	I_C	2.5	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	70 0.4	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	T_J	200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (1)	$R_{\theta JC}$	2.5	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$, $R_{BE} = 75\ \Omega$)	$V_{(BR)CER}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 5\text{ mAdc}$)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10\text{ mAdc}$)	$V_{(BR)CBO}$	45	—	—	Vdc
Collector-Emitter Leakage ($V_{CE} = 26\text{ V}$, $R_{BE} = 75\ \Omega$)	I_{CER}	—	—	5	mA

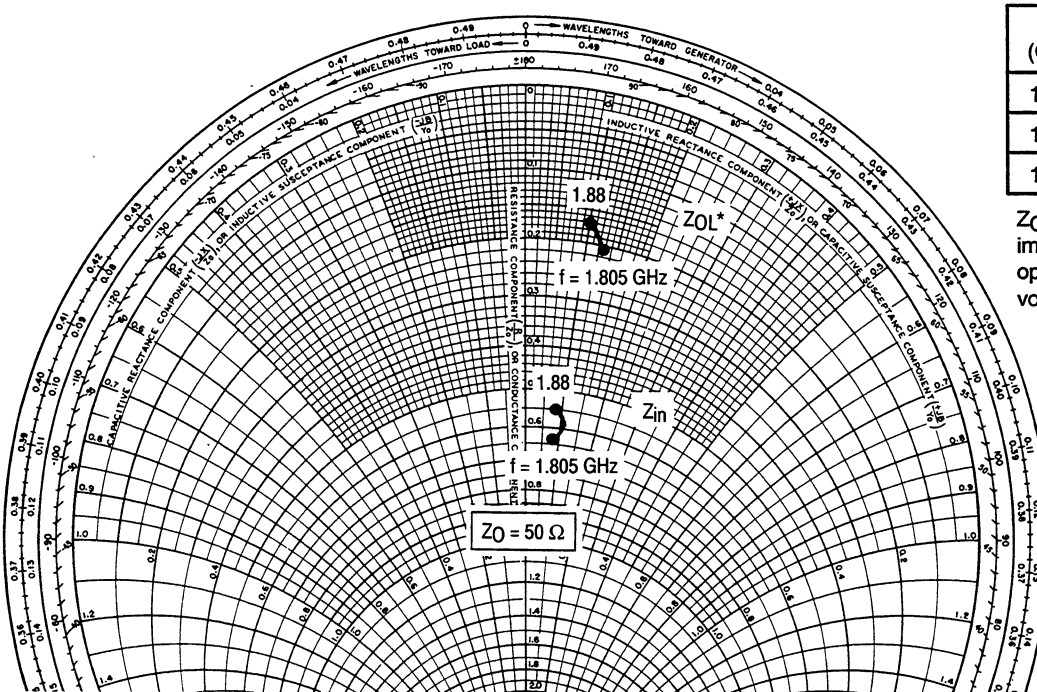
(1) Thermal resistance is determined under specified RF operating condition.

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 0.2 \text{ Adc}$, $V_{CE} = 20 \text{ Vdc}$)	h_{FE}	30	—	120	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (each side) ($V_{CB} = 26 \text{ V}$, $I_E = 0$, $f = 1 \text{ MHz}$)	C_{ob}	—	15	—	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CC} = 26 \text{ V}$, $P_{out} = 25 \text{ W}$, $I_{CQ} = 200 \text{ mA}$, $f = 1.88 \text{ GHz}$)	G_p	—	6.5	—	dB
Collector Efficiency ($V_{CC} = 26 \text{ V}$, $P_{out} = 25 \text{ W}$, $f = 1.88 \text{ GHz}$)	η	38	43	—	%



f (GHz)	Z_{in} (Ω)	Z_{OL}^* (Ω)
1.805	$33.7 + j5.6$	$9.8 + j7.7$
1.845	$31.5 + j5.4$	$9.3 + j7$
1.880	$29.5 + j5.1$	$8.9 + j6.4$

Z_{OL}^* : conjugate of optimum load impedance into which the device operates at a given output power, voltage, current and frequency.

Figure 1. Series Equivalent Input and Output Impedances

TYPICAL CHARACTERISTICS

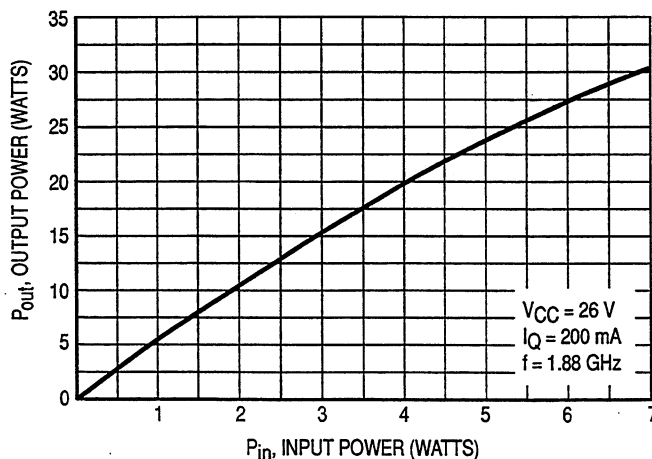
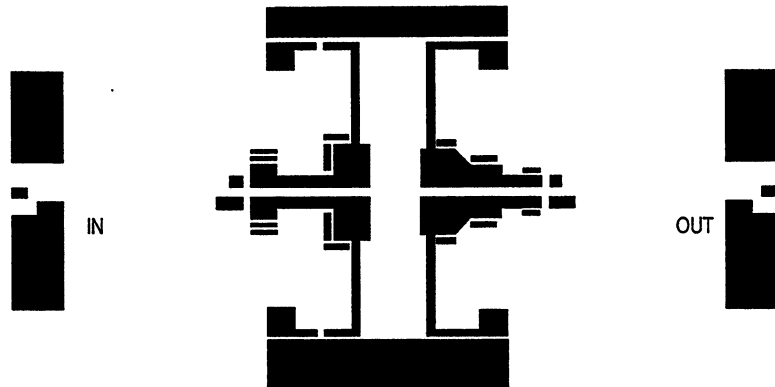


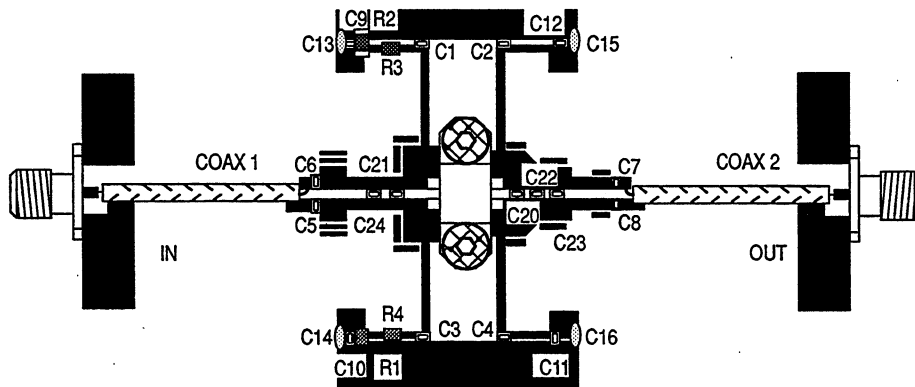
Figure 2. Output Power versus Input Power



TEFLON® GLASS 0.5 mm — DOUBLE SIDE 35 μm Cu.

SCALE 1:1

Figure 3. Photomaster

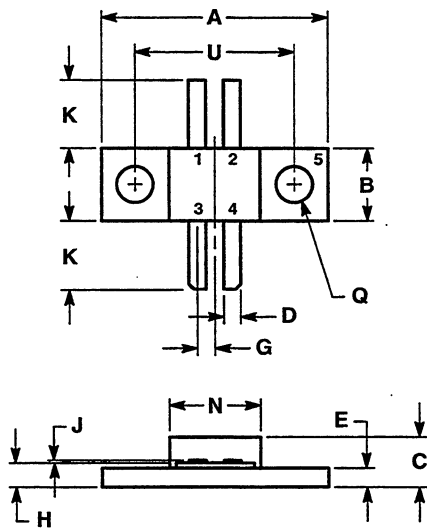


SCALE 1:1

Figure 4. Components View

C1 to C8	68 pF, ATC Chip Capacitor 100A
C9 to C12	330 pF, Chip Capacitor 0805
C13 to C16	4.7 μF, 35 V, Capacitor
C20	1.3 pF, ATC Chip Capacitor 100A
C21 to C23	1 pF, ATC Chip Capacitor 100A
C24	0.5 pF, ATC Chip Capacitor 100A
R1, R2	56 Ω, Chip Resistor 1206
R3, R4	2.2 Ω, Chip Resistor 0805
Coax 1, Coax 2	50 Ω Coaxial, l = 27 mm

OUTLINE DIMENSIONS



NOTES:


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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.795	0.805	20.19	20.45
B	0.255	0.265	6.48	6.73
C	0.161	0.189	4.09	4.80
D	0.055	0.065	1.40	1.65
E	0.055	0.065	1.40	1.65
G	0.055	0.065	1.40	1.65
H	0.075	0.095	1.90	2.41
J	0.003	0.006	0.08	0.15
K	0.170	0.220	4.32	5.59
N	0.260	0.266	6.60	6.76
Q	0.125	0.135	3.18	3.42
U	0.552	0.572	14.03	14.52

STYLE 1:

- PIN 1. BASE
2. BASE
3. COLLECTOR
4. COLLECTOR
5. EMITTER

CASE 395-02

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