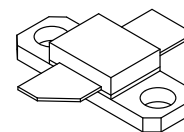


**The RF Line**  
**NPN Silicon**  
**RF Power Transistor**

**MRF16006**

**6.0 WATTS, 1.6 GHz**  
**RF POWER TRANSISTOR**  
**NPN SILICON**



**CASE 395C-01, STYLE 2**

Designed for 28 Volt microwave large-signal, common base, Class-C CW amplifier applications in the range 1600 – 1640 MHz.

- Specified 28 Volt, 1.6 GHz Class-C Characteristics  
Output Power = 6 Watts  
Minimum Gain = 7.4 dB, @ 6 Watts  
Minimum Efficiency = 40% @ 6 Watts
- Characterized with Series Equivalent Large-Signal Parameters from 1500 MHz to 1700 MHz
- Silicon Nitride Passivated
- Gold Metallized, Emitter Ballasted for Long Life and Resistance to Metal Migration
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

**MAXIMUM RATINGS** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CES}$	60	Vdc
Emitter-Base Voltage	$V_{EBO}$	4.0	Vdc
Collector-Current	$I_C$	1.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	26 0.15	Watts W/ $^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

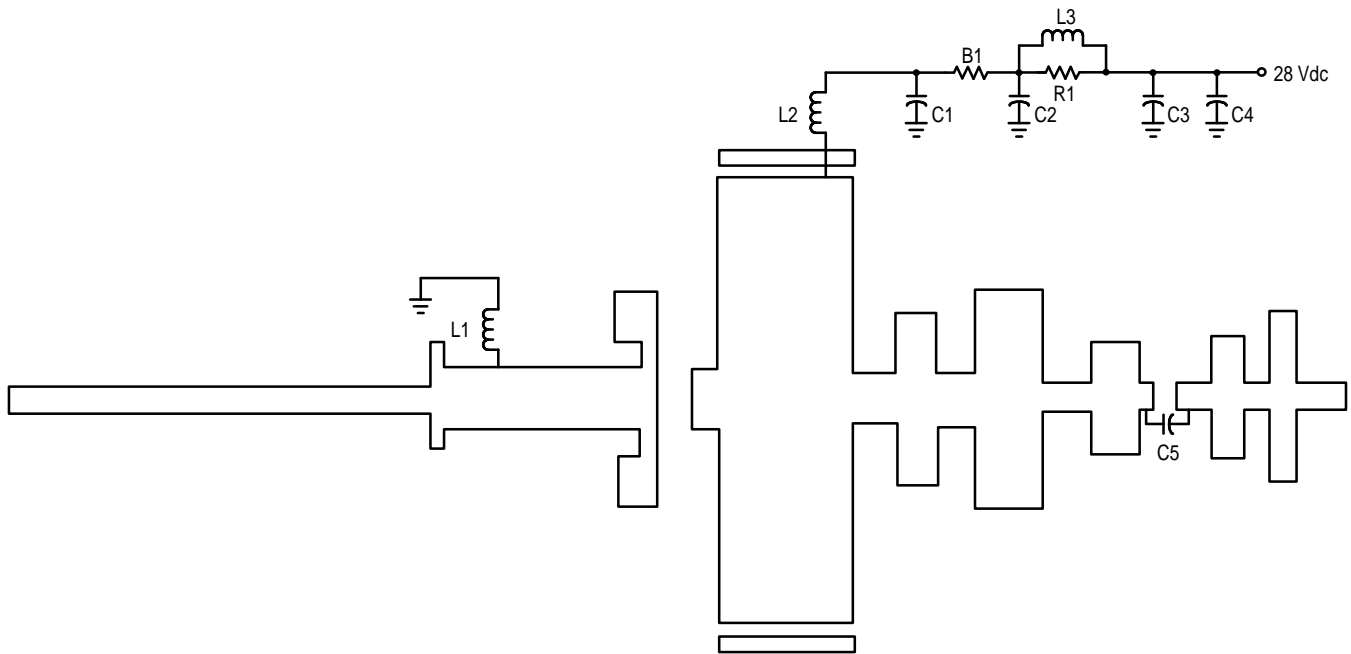
Thermal Resistance — Junction to Case (1) (2)	$R_{\theta JC}$	6.8	$^\circ\text{C/W}$
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(1) Thermal measurement performed using CW RF operating condition.

(2) Thermal resistance is determined under specified RF operating conditions by infrared measurement techniques.

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

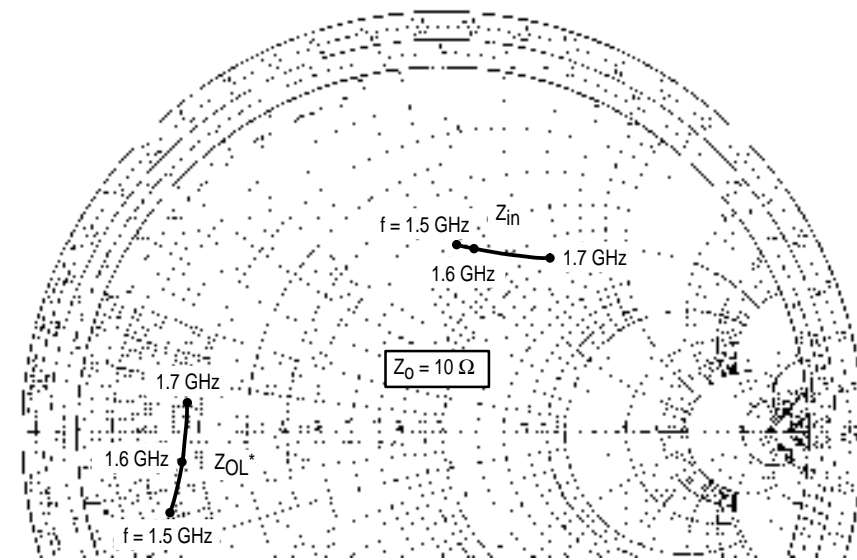
Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage ( $I_C = 40\text{ mA}_{dc}$ , $V_{BE} = 0$ )	$V_{(BR)CES}$	55	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 40\text{ mA}_{dc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	55	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 2.5\text{ mA}_{dc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CE} = 28\text{ Vdc}$ , $V_{BE} = 0$ )	$I_{CES}$	—	—	2.5	mA <sub>dc</sub>
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_{CE} = 0.2\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$h_{FE}$	20	—	80	—
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance ( $V_{CB} = 28\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	11	—	—	pf
<b>FUNCTIONAL TESTS</b>					
Common–Base Amplifier Power Gain ( $V_{CC} = 28\text{ Vdc}$ , $P_{out} = 6\text{ Watts}$ , $f = 1600/1640\text{ MHz}$ )	$G_{pe}$	7.4	—	—	dB
Collector Efficiency ( $V_{CC} = 28\text{ Vdc}$ , $P_{out} = 6\text{ Watts}$ , $f = 1600/1640\text{ MHz}$ )	$\eta$	40	45	—	%
Return Loss ( $V_{CC} = 28\text{ Vdc}$ , $P_{out} = 6\text{ Watts}$ , $f = 1600/1640\text{ MHz}$ )	$I_{RL}$	—	8.0	—	dB
Output Mismatch Stress ( $V_{CC} = 28\text{ Vdc}$ , $P_{out} = 6\text{ Watts}$ , $f = 1600\text{ MHz}$ , Load VSWR = 3:1 all phase angles at frequency of test)	$\psi$	No Degradation in Output Power			



Board Material – Teflon® Glass Laminate Dielectric  
 Thickness – 0.30",  $\epsilon_r = 2.55$ ", 2.0 oz. Copper

- |        |                              |        |                                      |
|--------|------------------------------|--------|--------------------------------------|
| B1     | Fair Rite Bead on #24 Wire   | C4     | 47 $\mu$ F, 50 V, Electrolytic Cap   |
| C1, C5 | 100 pF, B Case, ATC Chip Cap | L1, L2 | 3 Turns, #18, 0.133" ID, 0.15" Long  |
| C2     | 0.1 $\mu$ F, Dipped Mica Cap | L3     | 9 Turns, #24 Enamel                  |
| C3     | 0.1 $\mu$ F, Chip Cap        | R1     | 82 $\Omega$ , 1.0 W, Carbon Resistor |

Figure 1. MRF16006 Test Fixture Schematic

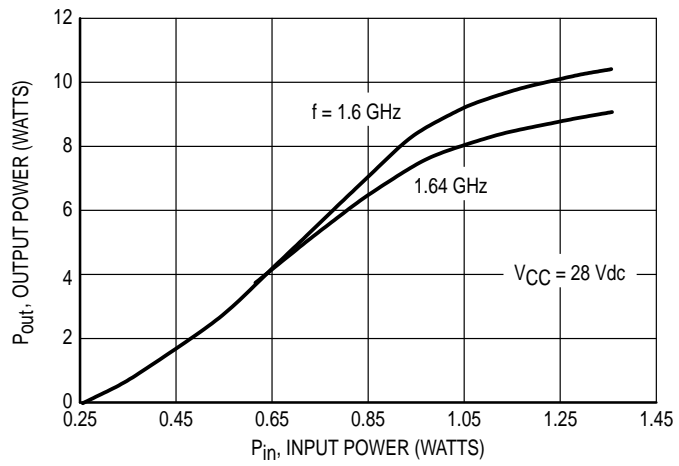


$V_{CC} = 28$  Vdc,  $P_{out} = 6$  W

f MHz	$Z_{in}$ Ohms	$Z_{OL}^*$ Ohms
1500	6.28 + j 8.53	1.22 - j 1.37
1600	7.04 + j 9.00	1.58 - j 0.53
1700	9.55 + j 12.86	1.71 + j 0.39

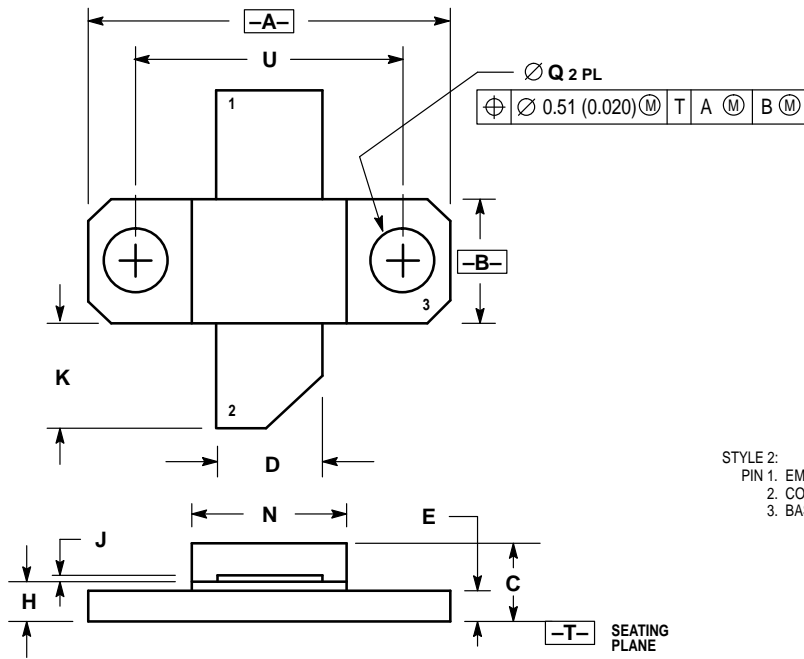
$Z_{OL}^*$  = Conjugate of the optimum load impedance into which the device output operates at a given output power, voltage and frequency.

Figure 2. Series Equivalent Input/Output Impedance



**Figure 3. Output Power versus Input Power**

# PACKAGE DIMENSIONS




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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.739	0.750	18.77	19.05
B	0.240	0.260	6.10	6.60
C	0.165	0.198	4.19	5.03
D	0.215	0.225	5.46	5.72
E	0.055	0.070	1.40	1.78
H	0.079	0.091	2.01	2.31
J	0.004	0.006	0.10	0.15
K	0.210	0.240	5.33	6.10
N	0.315	0.330	8.00	8.38
Q	0.125	0.135	3.18	3.42
U	0.560 BSC		14.23 BSC	

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

**CASE 395C-01  
 ISSUE A**

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MRF16006/D

