The RF Line

NPN Silicon

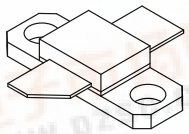
RF Power Transistor

MRF16030

30 WATTS, 1.6 GHz
RF POWER TRANSISTOR
NPN SILICON

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 = 30 Watts
  Minimum Gain = 7.5 dB, @ 30 Watts
  Minimum Efficiency = 40% @ 30 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.



CASE 395C–01, STYLE 2

MAXIMUM RATINGS (T_J = 25°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	4.0	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	103 0.58	Watts °C/W
Storage Temperature Range	T_{stg}	–65 to +150	°C

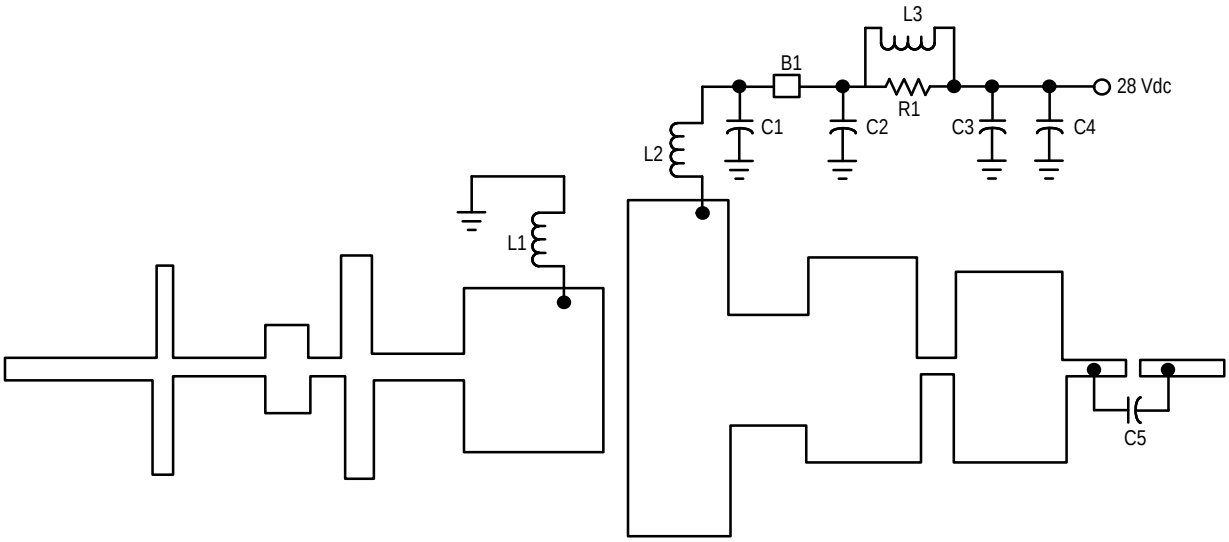
THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case (1) (2)	$R_{\theta JC}$	1.7	°C/W

(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°C unless otherwise noted)

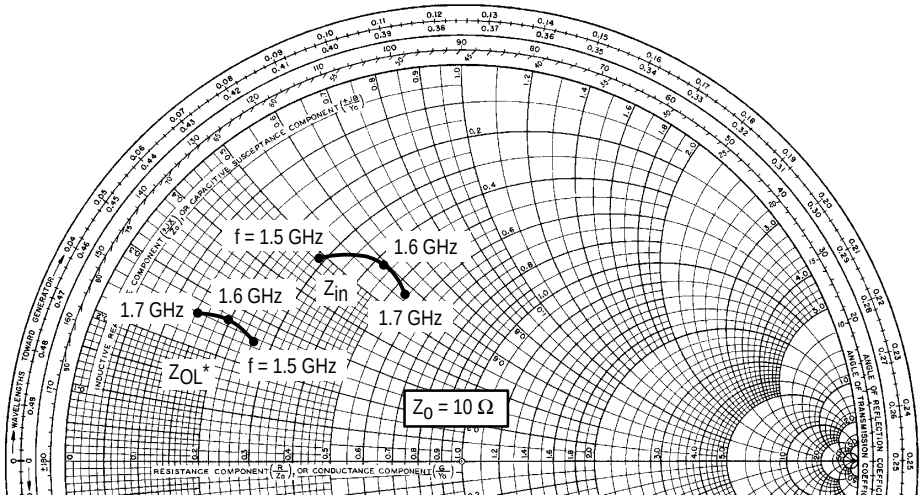
Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	55	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 100 mAdc, I_E = 0)	$V_{(BR)CBO}$	55	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 28 Vdc, V_{BE} = 0)	I_{CES}	—	—	10	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_{CE} = 1.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	20	35	80	—
FUNCTIONAL TESTS					
Collector–Base Amplifier Power Gain (V_{CC} = 28 Vdc, P_{out} = 30 Watts, f = 1600/1640 MHz)	G_{pe}	7.5	7.7	—	dB
Collector Efficiency (V_{CC} = 28 Vdc, P_{out} = 30 Watts, f = 1600/1640 MHz)	η	40	45	—	%
Input Return Loss (V_{CC} = 28 Vdc, P_{out} = 30 Watts, f = 1600/1640 MHz)	I_{RL}	8.0	—	—	dB
Output Mismatch Stress V_{CC} = 28 Vdc, P_{out} = 30 Watts, f = 1600 MHz, Load VSWR = 3:1, All phase angles at frequency of test	Ψ	No Degradation in Output Power			



Board Material – Teflon® Glass Laminate Dielectric
Thickness = 0.30″, ε_r = 2.55″, 2.0 oz. Copper

B1	Fair Rite Bead on #24 Wire	C4	47 μF, 50 V, Electrolytic
C1, C5	100 pF, B Case, ATC Chip Cap	L1, L2	3 Turns, #18, 0.133″ ID, 0.15″ Long
C2	0.1 μF, Dipped Mica Cap	L3	9 Turns, #24 Enamel
C3	0.1 μF, Chip Cap	R1	82 Ω, 1.0 W, Carbon

Figure 1. MRF16030 Test Fixture Schematic



V_{CC} = 28 Vdc, P_{out} = 30 W

f MHz	Z_{in} Ohms	Z_{OL}* Ohms
1500	3.05 + j 4.88	2.66 + j 2.53
1600	4.32 + j 6.00	1.79 + j 2.80
1700	5.62 + j 5.79	1.51 + j 2.64

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

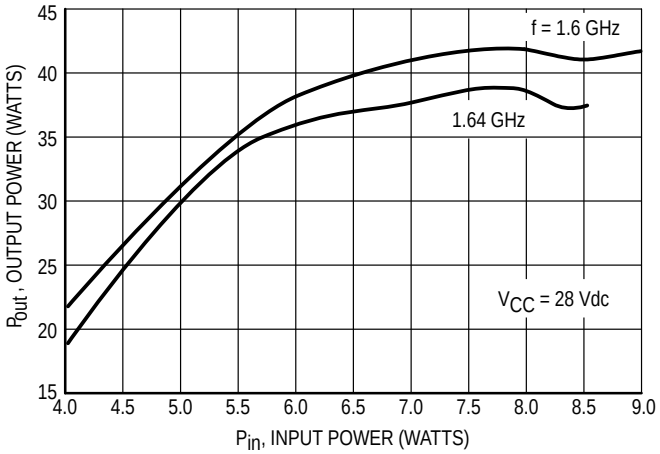
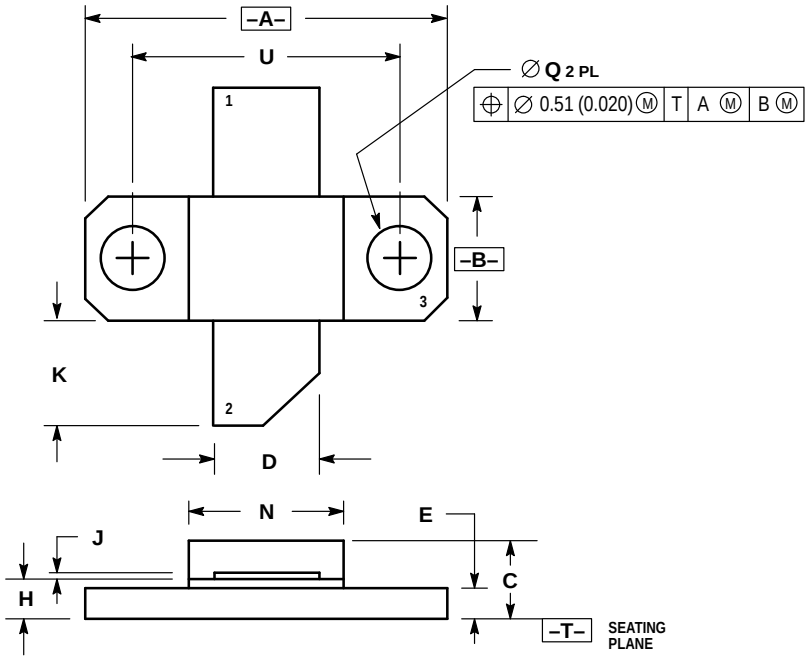


Figure 3. Output Power versus Input Power

PACKAGE DIMENSIONS



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

	INCHES		MILLIMETERS	
DIM	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

How to reach us:

USA / EUROPE / Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303–675–2140 or 1–800–441–2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
– US & Canada ONLY 1–800–774–1848

INTERNET: http://motorola.com/sps

JAPAN: Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4–32–1,
Nishi–Gotanda, Shinagawa–ku, Tokyo 141, Japan. 81–3–5487–8488

ASIA / PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298