MRF16030

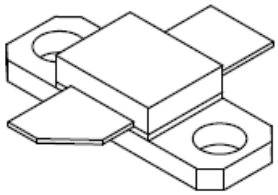
The RF Line NPN Silicon Power Transistor
30W, 1.6GHz, 28V

M/A-COM Products
Released - Rev. 07.07

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

- Specified 28 V, 1.6 GHz Class C characteristics
  - Output power = 30 W
  - Minimum gain = 7.5 dB, @ 30 W
  - Minimum efficiency = 40% @ 30 W
- Characterized with series equivalent large–signal parameters from 1500 MHz to 1700 MHz
- Silicon nitride passivated
- Gold metalized, emitter ballasted for long life and resistance to metal migration

Product Image



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.

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- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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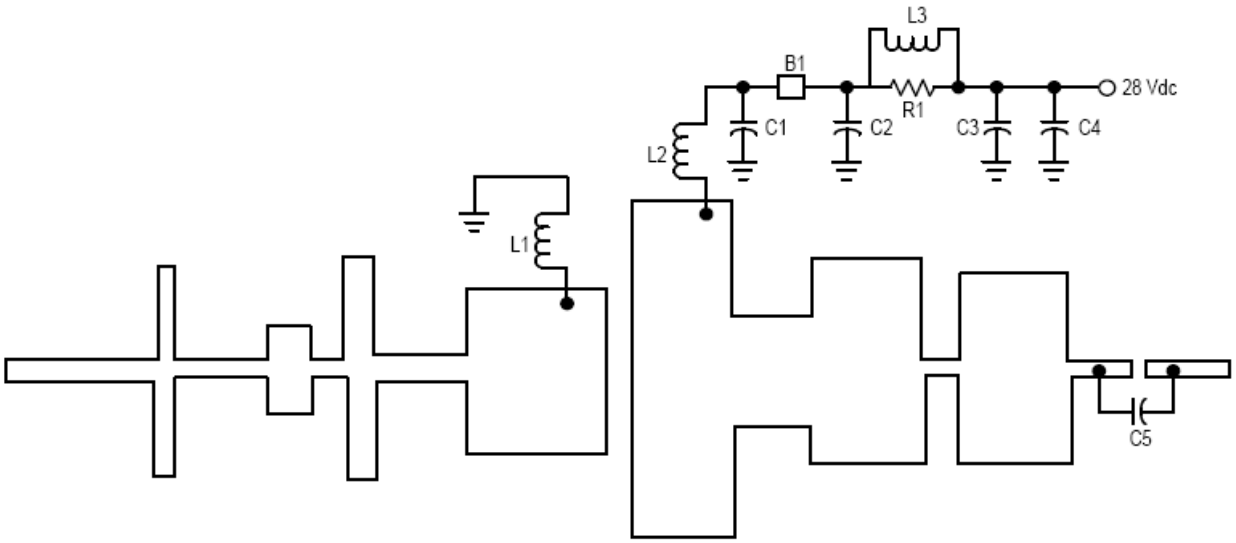
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 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			

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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

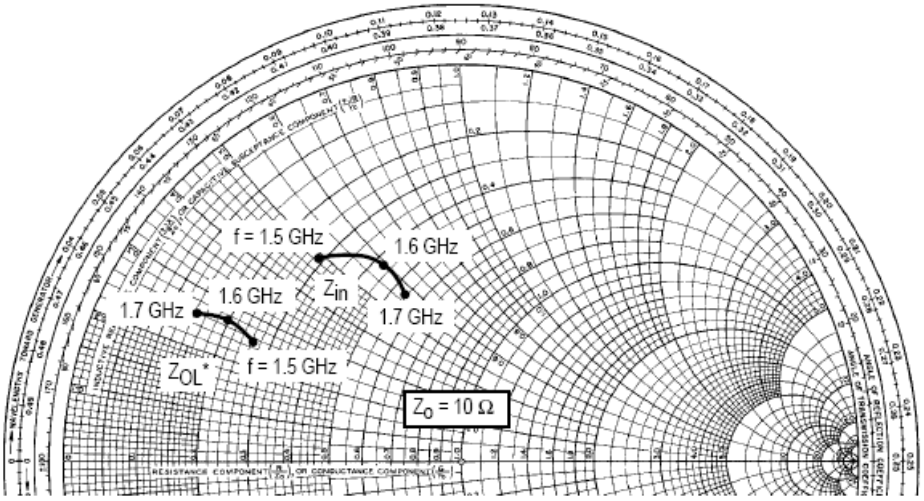
Figure 1. MRF16030 Test Fixture Schematic

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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

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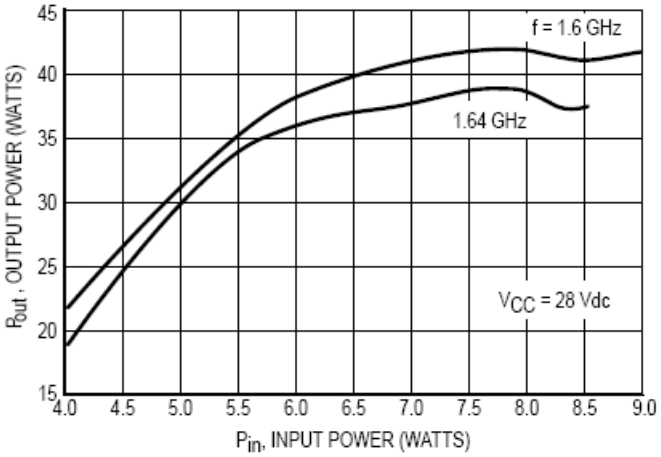


Figure 3. Output Power versus Input Power

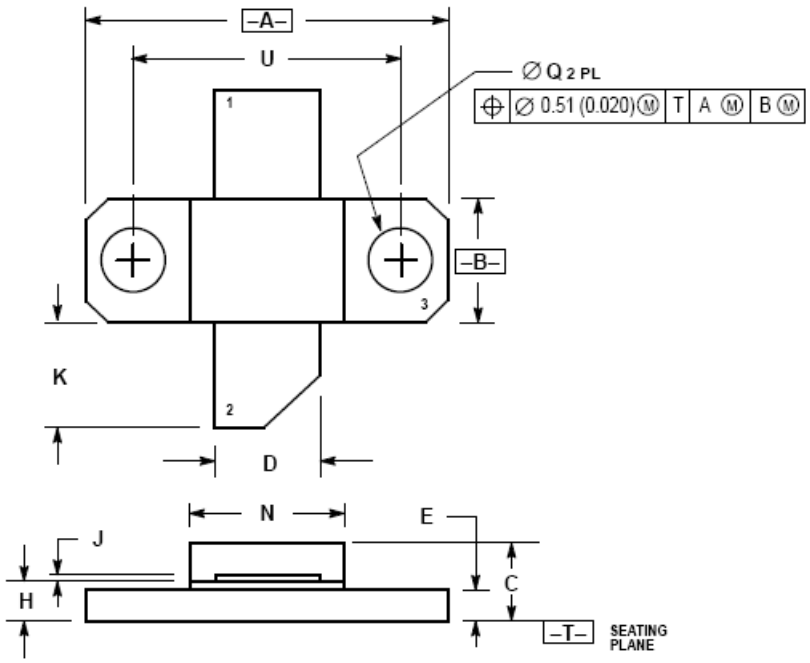
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PACKAGE DIMENSIONS



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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