MRF421

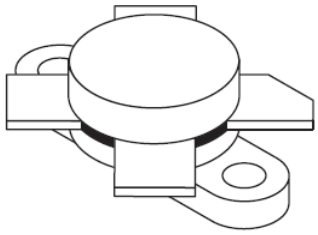
The RF Line NPN Silicon Power Transistor 100W(PEP), 30MHz, 28V

M/A-COM Products
Released - Rev. 07.07

Designed primarily for application as a high–power linear amplifier from 2.0 to 30 MHz.

- Specified 12.5 V, 30 MHz characteristics —
  Output power = 100 W (PEP)
  Minimum gain = 10 dB
  Efficiency = 40%
- Intermodulation distortion @ 100 W (PEP) — IMD = –30 dB (min.)
- 100% tested for load mismatch at all phase angles with 30:1 VSWR

Product Image



CASE 211–11, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	20	Vdc
Collector–Base Voltage	V_{CBO}	45	Vdc
Emitter–Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	20	Adc
Withstand Current — 10 s	—	30	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	290 1.66	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.6	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 50 mAdc, I_B = 0)	$V_{(BR)CEO}$	20	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 200 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	45	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 200 mAdc, I_E = 0)	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 16 Vdc, V_{BE} = 0, T_C = 25°C)	I_{CES}	—	—	10	mAdc

(continued)

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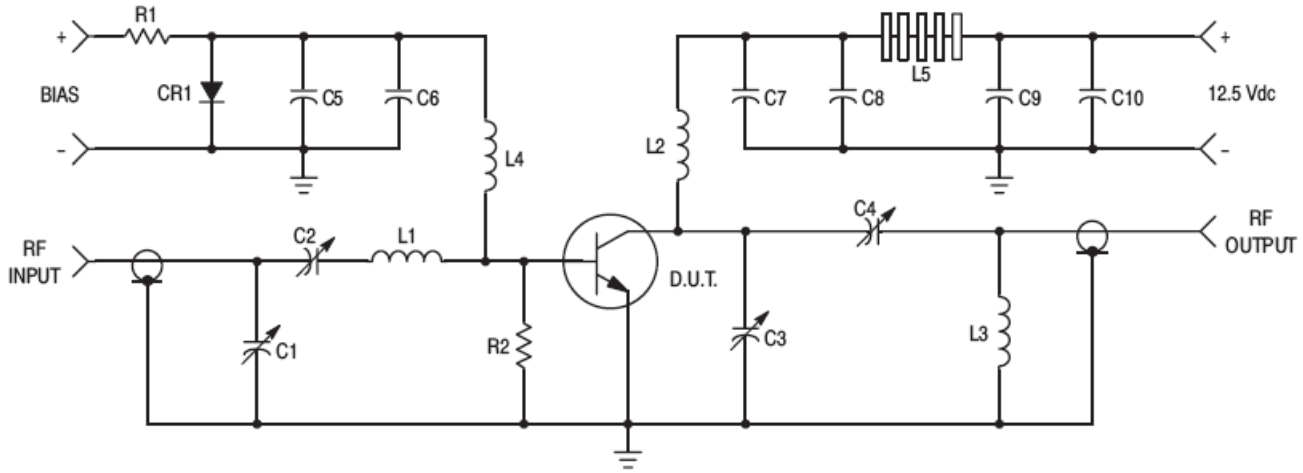
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ELECTRICAL CHARACTERISTICS – continued (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I_C = 5.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	10	70	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 12.5 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	550	800	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CC} = 12.5 Vdc, P_{out} = 100 W, $I_{C(max)}$ = 10 Adc, I_{CQ} = 150 mAdc, f = 30, 30.001 MHz)	G_{PE}	10	12	—	dB
Collector Efficiency (V_{CC} = 12.5 Vdc, P_{out} = 100 W, $I_{C(max)}$ = 10 Adc, I_{CQ} = 150 mA, f = 30, 30.001 MHz)	η	40	—	—	%
Intermodulation Distortion (1) (V_{CE} = 12.5 Vdc, P_{out} = 100 W, I_C = 10 Adc, I_{CQ} = 150 mA, f = 30, 30.001 MHz)	IMD	—	–33	–30	dB

NOTE:
1. To proposed EIA method of measurement. Reference peak envelope power.



C1, C2, C4 — 170–780 pF, ARCO 469
C3 — 80–480 pF, ARCO 466
C5, C7, C10 — ERIE 0.1 µF, 100 V
C6 — MALLORY 500 µF @ 15 V Electrolytic
C9 — 100 µF, 15 V Electrolytic
C8 — 1000 pF, 350 V UNDERWOOD
R1 — 10 Ω, 25 Watt Wirewound

R2 — 10 Ω, 1.0 Watt Carbon
CR1 — 1N4997
L1 — 3 Turns, #16 Wire, 5/16″ I.D., 5/16″ Long
L2 — 12 Turns, #16 Enameled Wire Closewound, 1/4″ I.D.
L3 — 1–3/4 Turns, 1/8″ Tubing, 3/8″ I.D., 3/8″ Long
L4 — 10 µH Molded Choke
L5 — 10 Ferrite Beads — FERROXCUBE #56–590–65/3B

Figure 1. 30 MHz Test Circuit Schematic

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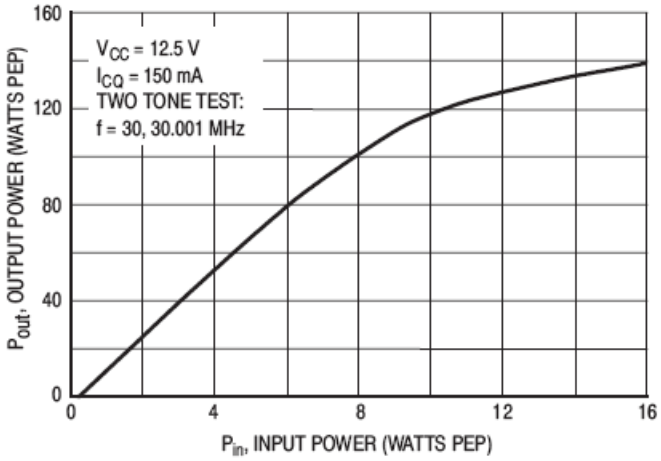


Figure 2. Output Power versus Input Power

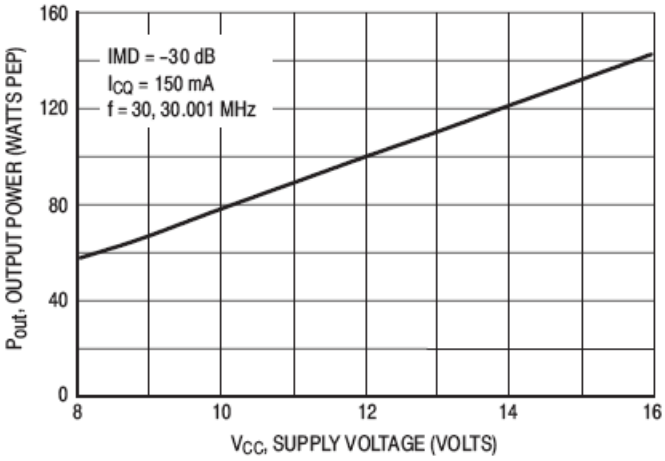


Figure 3. Output Power versus Supply Voltage

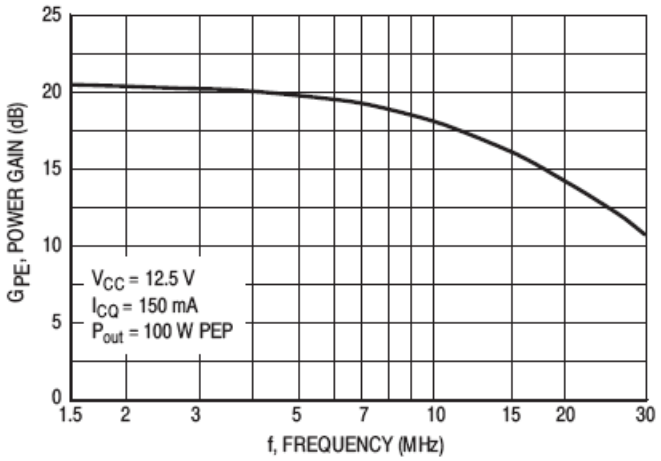


Figure 4. Power Gain versus Frequency

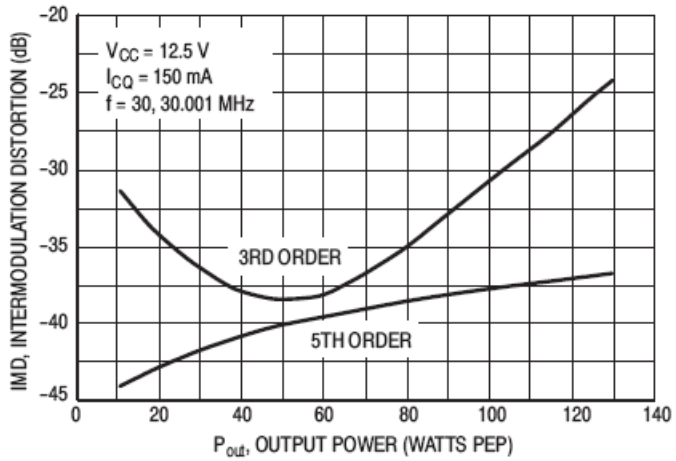


Figure 5. Intermodulation Distortion versus Output Power

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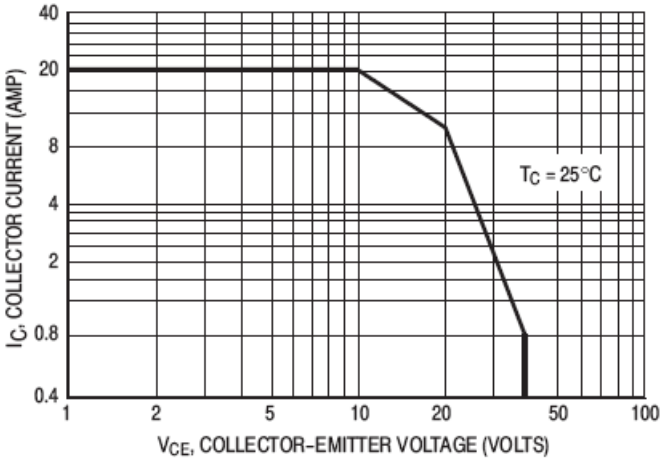


Figure 6. DC Safe Operating Area

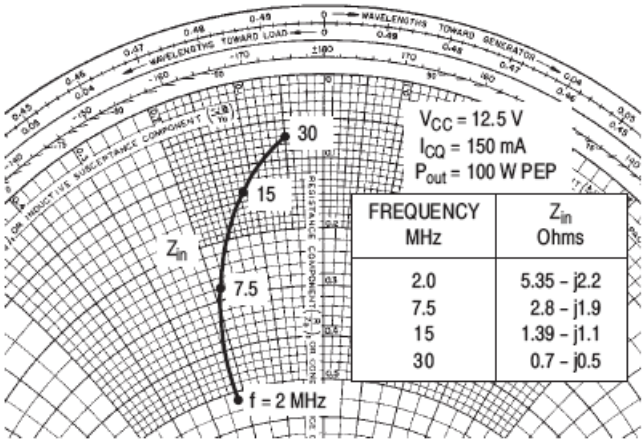


Figure 7. Series Equivalent Impedance

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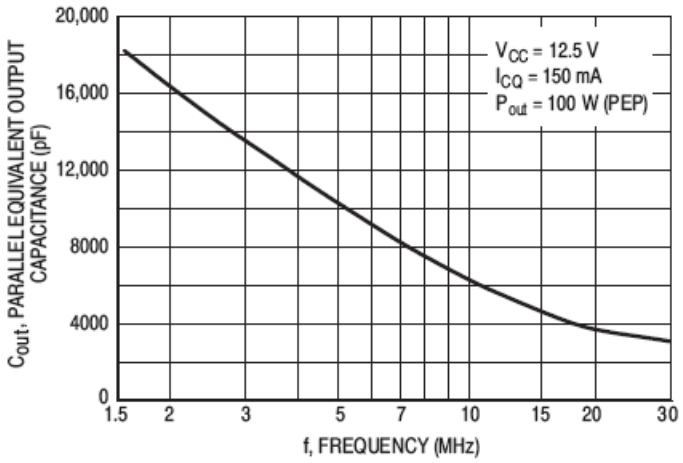


Figure 8. Output Capacitance versus Frequency

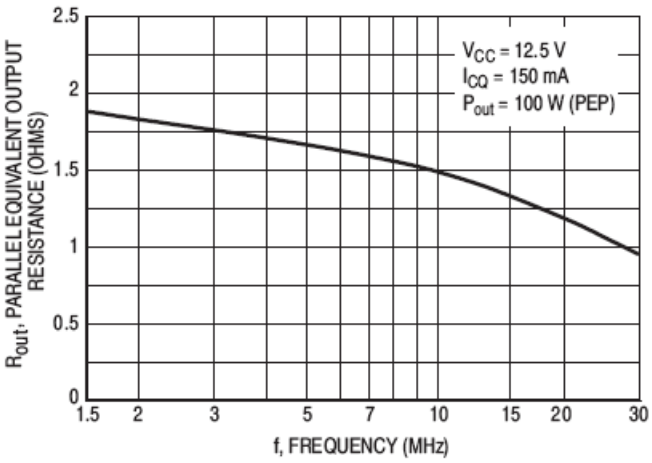
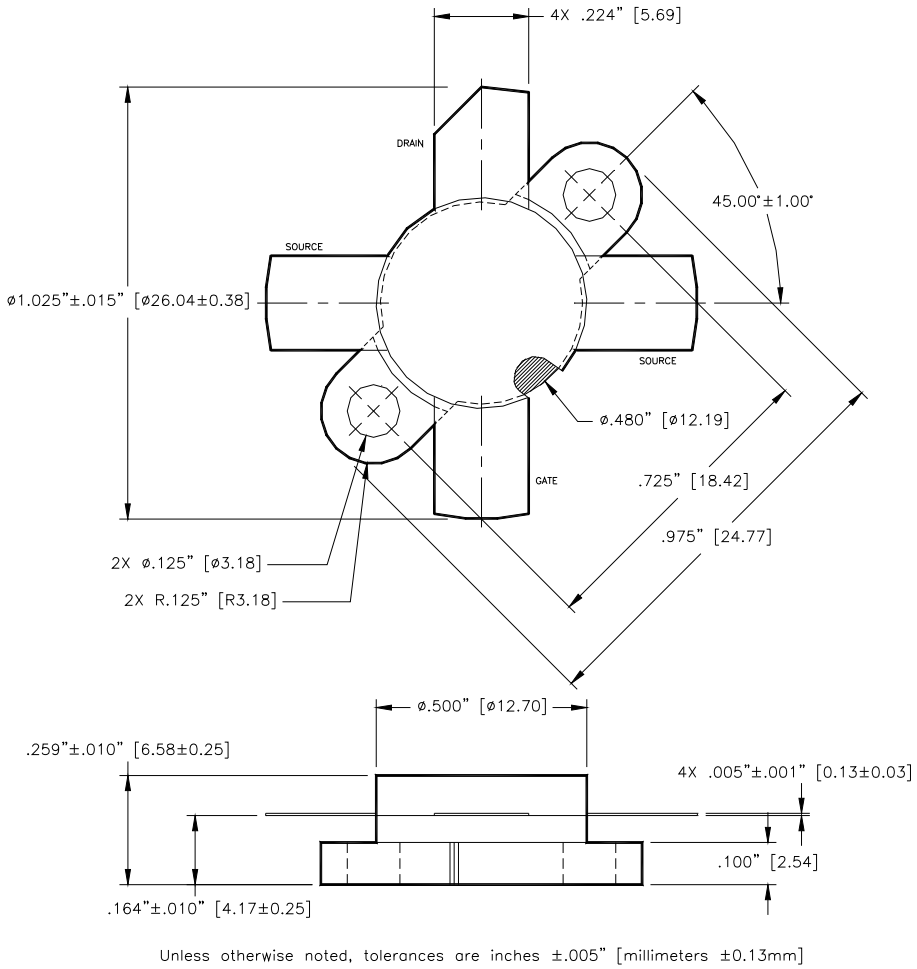


Figure 9. Output Resistance versus Frequency



Unless otherwise noted, tolerances are inches ±.005" [millimeters ±0.13mm]

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