MRF422

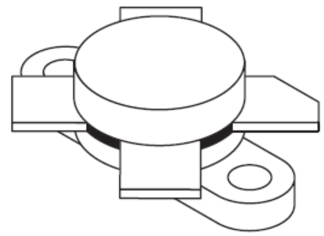
The RF Line NPN Silicon Power Transistor
150W(PEP), 30MHz, 28V

M/A-COM Products
Released - Rev. 07.07

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

- Specified 28 V, 30 MHz characteristics —
  Output power = 150 W (PEP)
  Minimum gain = 10 dB
  Efficiency = 40%
- Intermodulation distortion @ 150 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}	40	Vdc
Collector–Base Voltage	V_{CBO}	85	Vdc
Emitter–Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	20	Adc
Withstanding 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 = 200 mAdc, I_B = 0)	$V_{(BR)CEO}$	35	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	85	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 100 mAdc, I_E = 0)	$V_{(BR)CBO}$	85	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 28 Vdc, V_{BE} = 0, T_C = 25°C)	I_{CES}	—	—	20	mAdc

(continued)

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.

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}	15	30	120	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 28 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	420	—	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CC} = 28 Vdc, P_{out} = 150 W (PEP), $I_{C(max)}$ = 6.7 Adc, I_{CQ} = 150 mAdc, f = 30, 30.001 MHz)	G_{PE}	10	13	—	dB
Collector Efficiency (V_{CC} = 28 Vdc, P_{out} = 150 W (PEP), $I_{C(max)}$ = 6.7 Adc, I_{CQ} = 150 mAdc, f = 30, 30.001 MHz)	η	—	45	—	%
Intermodulation Distortion (1) (V_{CE} = 28 Vdc, P_{out} = 150 W (PEP), I_C = 6.7 Adc, I_{CQ} = 150 mAdc, f = 30, 30.001 MHz)	IMD	—	–33	–30	dB
Output Power (V_{CE} = 28 Vdc, f = 30 MHz)	P_{out}	150	—	—	Watts (PEP)

NOTE:
1. To Mil–Std–1311 Version A, Test Method 2204, Two Tone, Reference each Tone.

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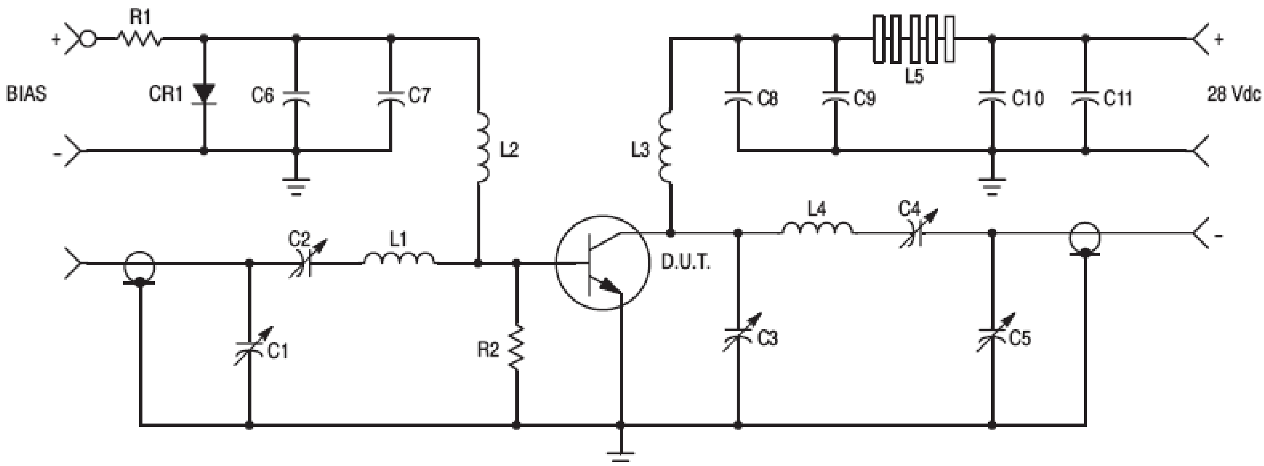


C1, C2, C3, C5 — 170–680 pF, ARCO 469
C4 — 80–480 pF, ARCO 466
C6, C8, C11 — ERIE 0.1 µF, 100 V
C7 — MALLORY 500 µF, 15 V Electrolytic
C9 — UNDERWOOD 1000 pF, 350 V
C10 — 10 µF, 50 V Electrolytic
R1 — 10 Ω, 25 Watt Wire Wound
R2 — 10 Ω, 1.0 Watt Carbon
CR1 — 1N4997

L1 — 3 Turns, #16 Wire, 5/16″ I.D., 5/16″ Long
L2 — 10 µH Molded Choke
L3 — 12 Turns, #16 Enameled Wire, Close Wound, 1/4″ Dia.
L4 — 5 Turns, 1/8″ Copper Tubing
L5 — 10 Ferrite Beads — FERROXCUBE #56–590–65/3B

Figure 1. 30 MHz Test Circuit Schematic

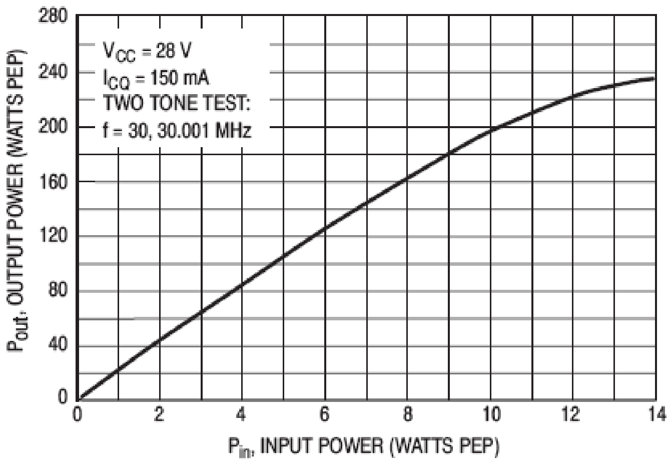


Figure 2. Output Power versus Input Power

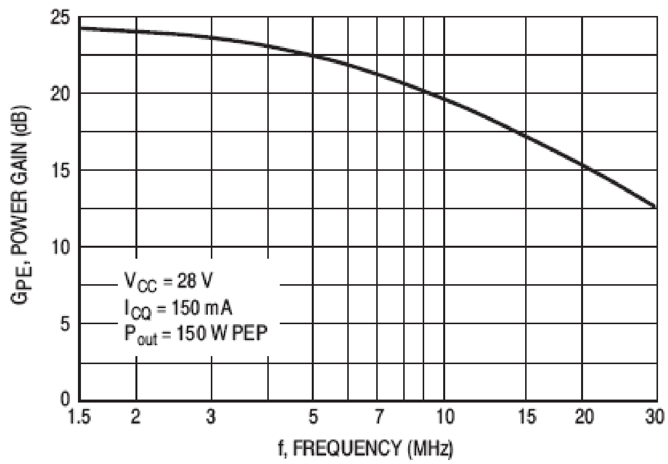


Figure 3. Power Gain versus Frequency

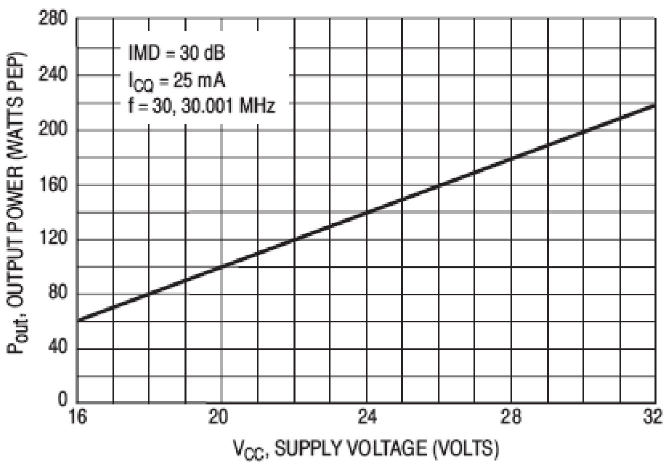


Figure 4. Linear Output Power versus Supply Voltage

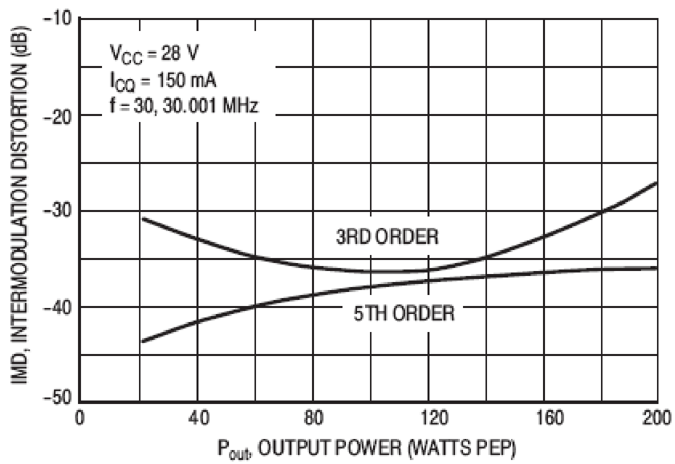


Figure 5. Intermodulation Distortion versus Output Power

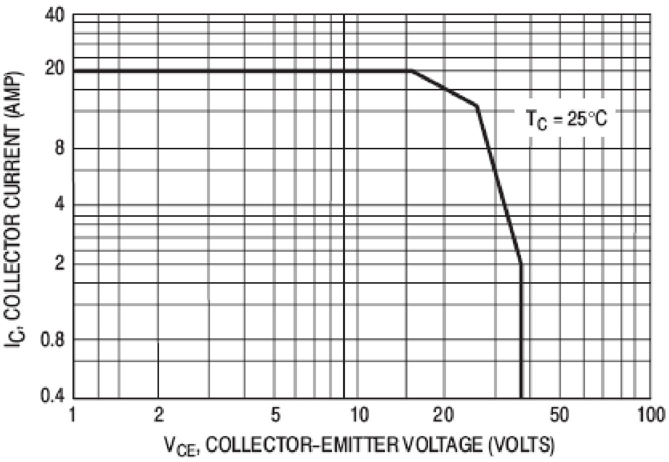


Figure 6. DC Safe Operating Area

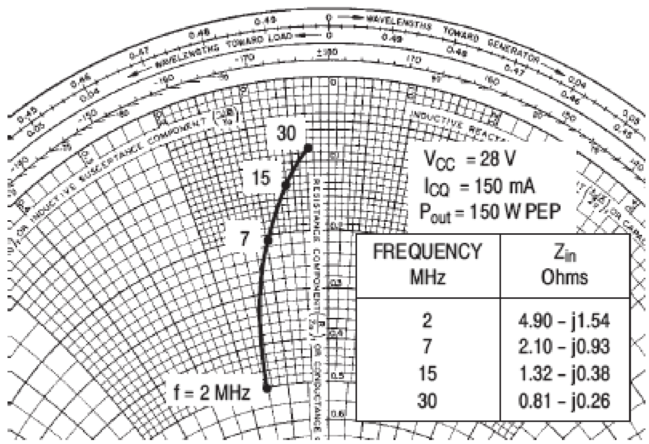


Figure 7. Series Input Impedance

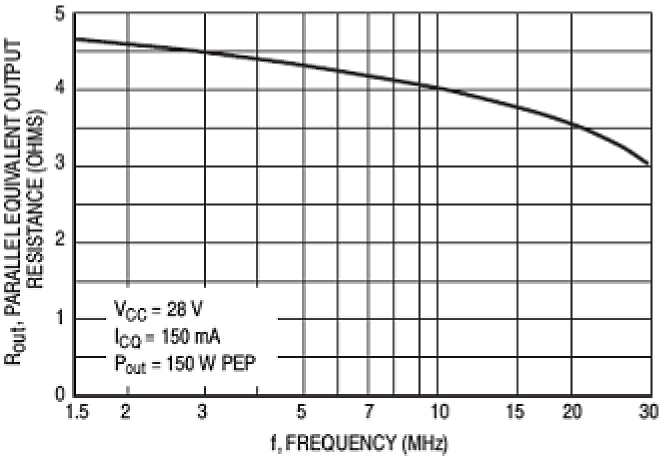


Figure 8. Output Resistance versus Frequency

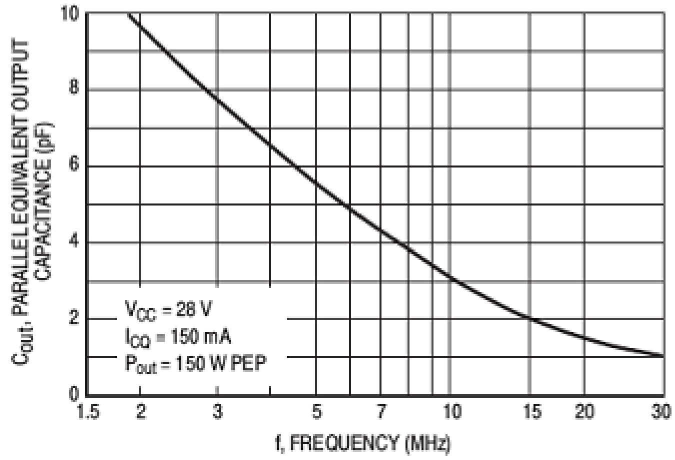
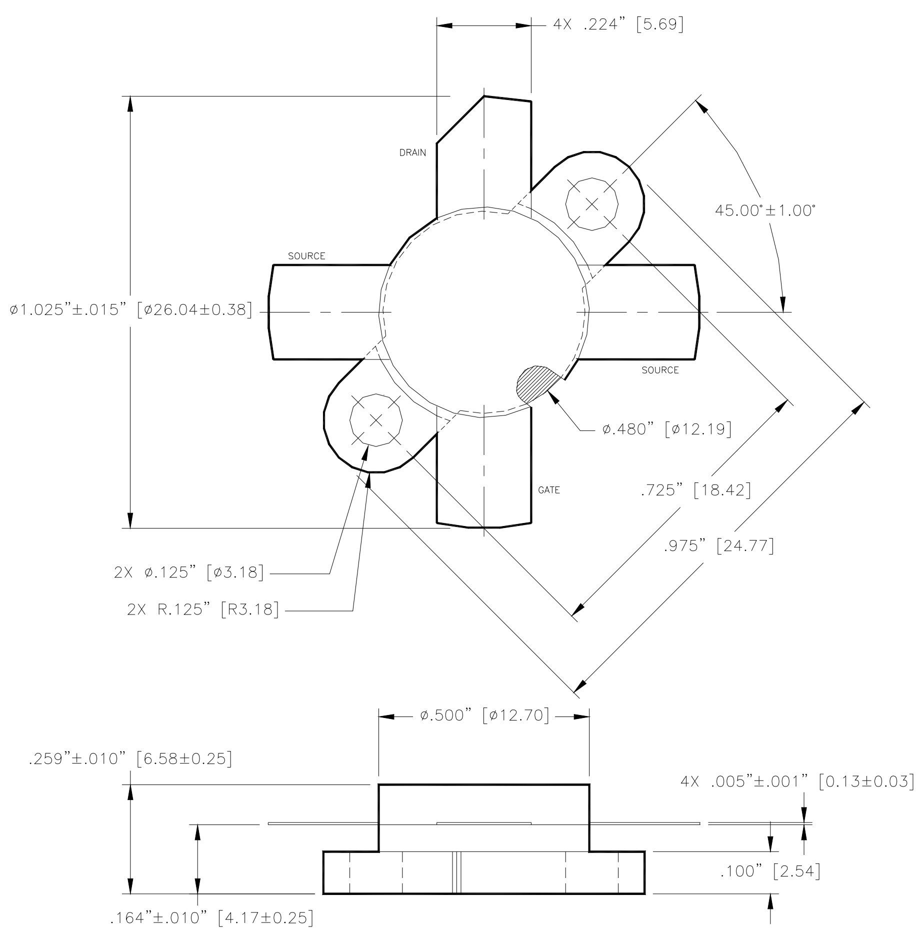


Figure 9. Output Capacitance versus Frequency



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

AMEYA360

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