MRF426

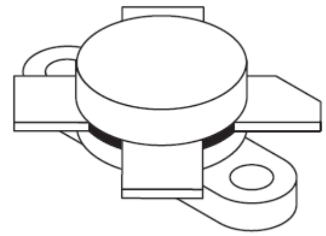
The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

M/A-COM Products
Released - Rev. 05202009

Designed for high gain driver and output linear amplifier stages in 1.5 to 30 MHz HF/SSB equipment.

- Specified 28 V, 30 MHz characteristics —
  - Output power = 25 W (PEP)
  - Minimum gain = 22 dB
  - Efficiency = 35%
- Intermodulation distortion @ 25 W (PEP) —IMD = –30 dB (max)
- 100% tested for load mismatch at all phase angles with 30:1 VSWR
- Class A and AB characterization
- BLX 13 equivalent

Product Image



CASE 211–07, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	35	Vdc
Collector–Base Voltage	V_{CBO}	65	Vdc
Emitter–Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	3.0	Adc
Withstand Current — 5 s	—	6.0	Adc
Total Device Dissipation @ T_C = 25°C (1) Derate above 25°C	P_D	70 0.4	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	°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)	$V_{(BR)CEO}$	35	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 50 mAdc, I_E = 0)	$V_{(BR)CBO}$	65	—	—	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

NOTE: (continued)
1. This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.

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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 = 1.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	10	35	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 30 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	60	80	pF
FUNCTIONAL TESTS (SSB)					
Common–Emitter Amplifier Gain (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA)	G_{PE}	22	25	—	dB
Collector Efficiency (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA)	η	35	—	—	%
Intermodulation Distortion (2) (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA)	$IMD_{(d3)}$	—	–35	–30	dB
Load Mismatch (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA, VSWR 30:1 at All Phase Angles)	ψ	No Degradation in Output Power			
CLASS A PERFORMANCE					
Intermodulation Distortion (2) and Power Gain (V_{CC} = 28 Vdc, P_{out} = 8.0 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 1.2 Adc)	G_{PE} $IMD_{(d3)}$ $IMD_{(d5)}$	— — —	23.5 –40 –55	— — —	dB

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

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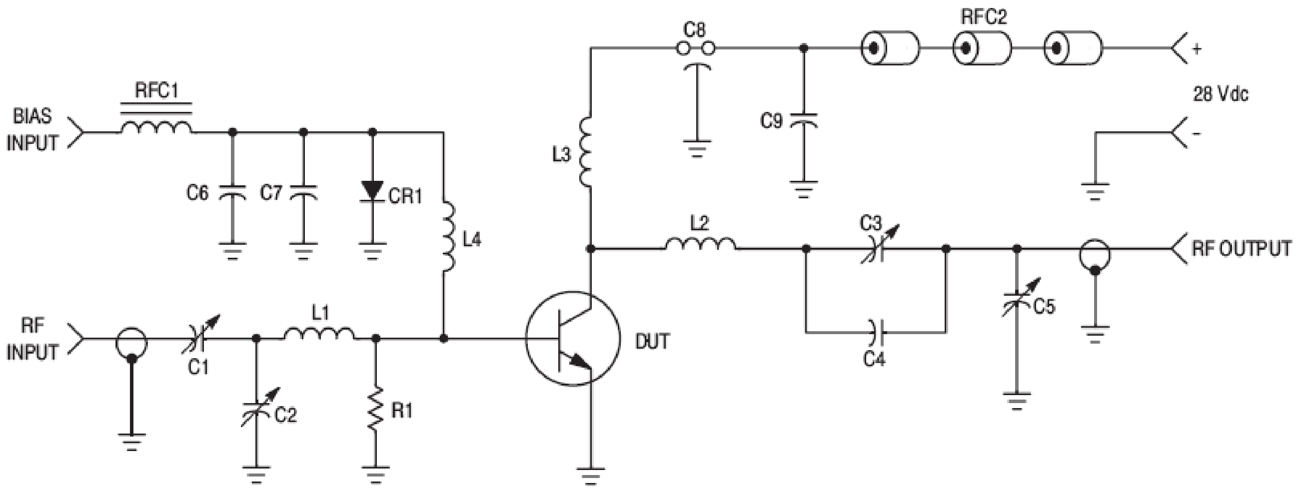

C1, C2 — ARCO 469, 190–780 pF
C3, C4 — ARCO 464, 25–280 pF
C5 — 120 pF Dipped Mica
C6, C7 — 100 μF, 15 Vdc
C8 — 680 pF F.T. Allen Bradley
C9 — 1.0 μF 35 V Tantalum
CR1 — 1N4997

L1 — 3 Turns #16 0.25″ ID
L2 — 6 Turns #16 0.5″ ID
L3 — 7 Turns #20 0.38″ ID
L4 — 10 μH Molded Choke Delevan
RFC1 — Ferroxcube VK200/20–4B
RFC2 — 3–Ferroxcube 5653065–3B
RF — Input/Output Connectors UG53 A/μ
R1 — 10 Ω 1/2 Watt 10%

Adjust Bias (Base) for I_{CQ} = 20 mA with No RF Applied

Figure 1. 30 MHz Linear Test Circuit

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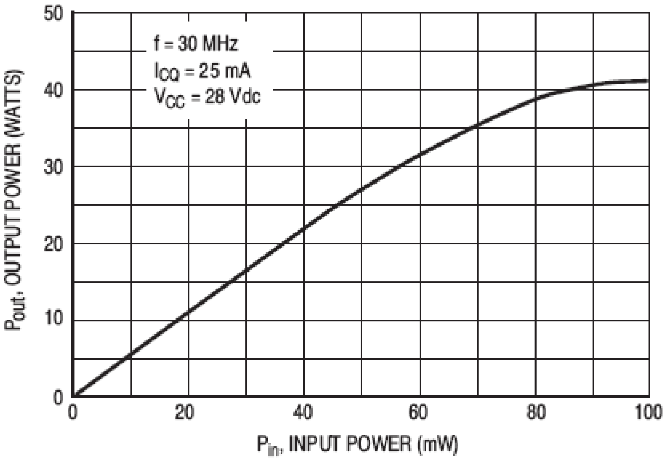

Figure 2. Output Power versus Input Power

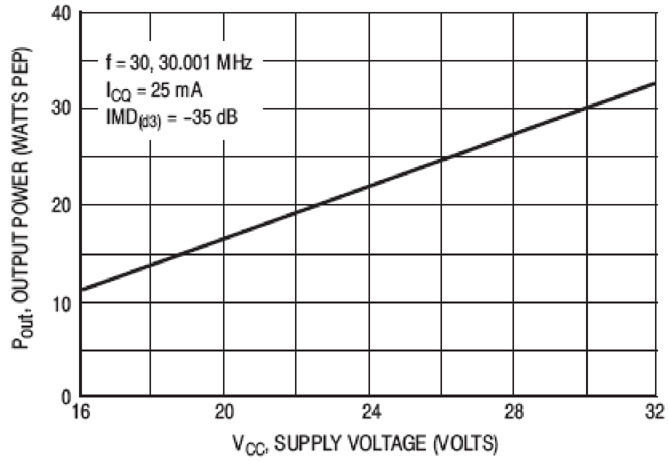

Figure 3. Output Power versus Supply Voltage

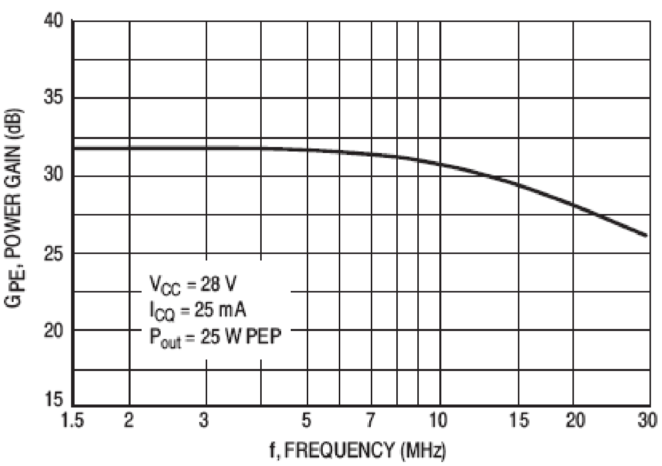

Figure 4. Power Gain versus Frequency

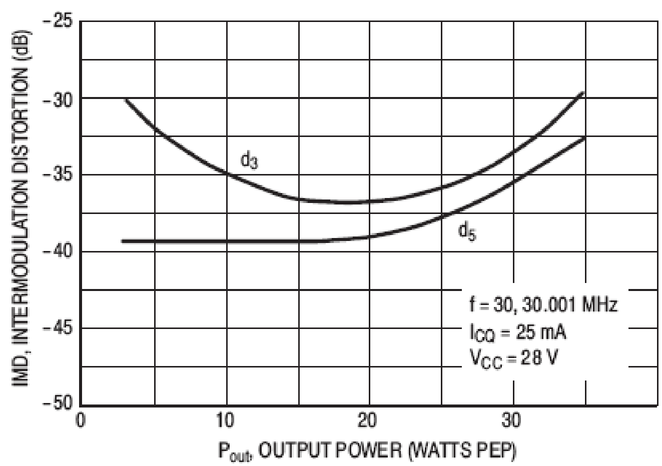

Figure 5. Intermodulation Distortion versus Output Power

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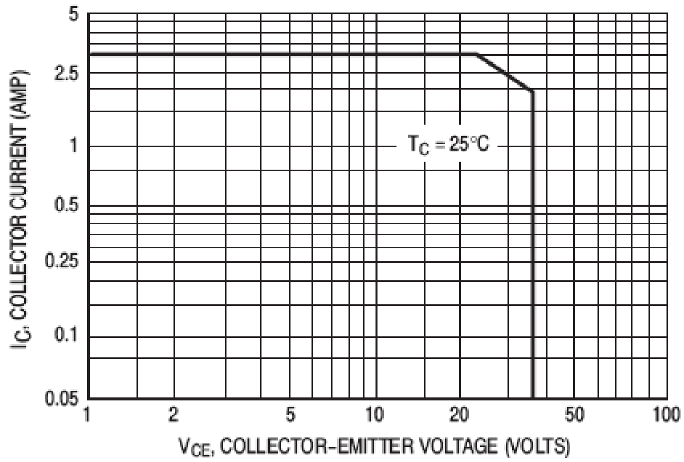

Figure 6. DC Safe Operating Area

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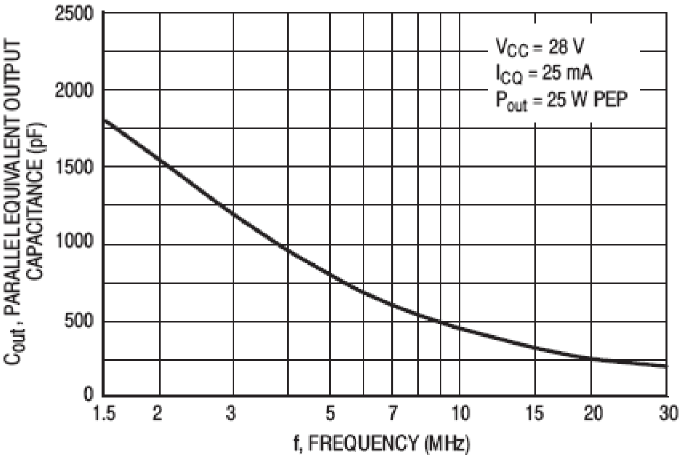

Figure 7. Output Capacitance versus Frequency

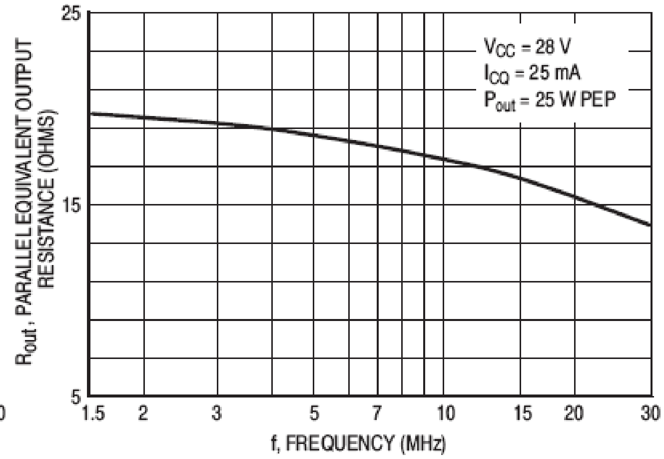

Figure 8. Output Resistance versus Frequency

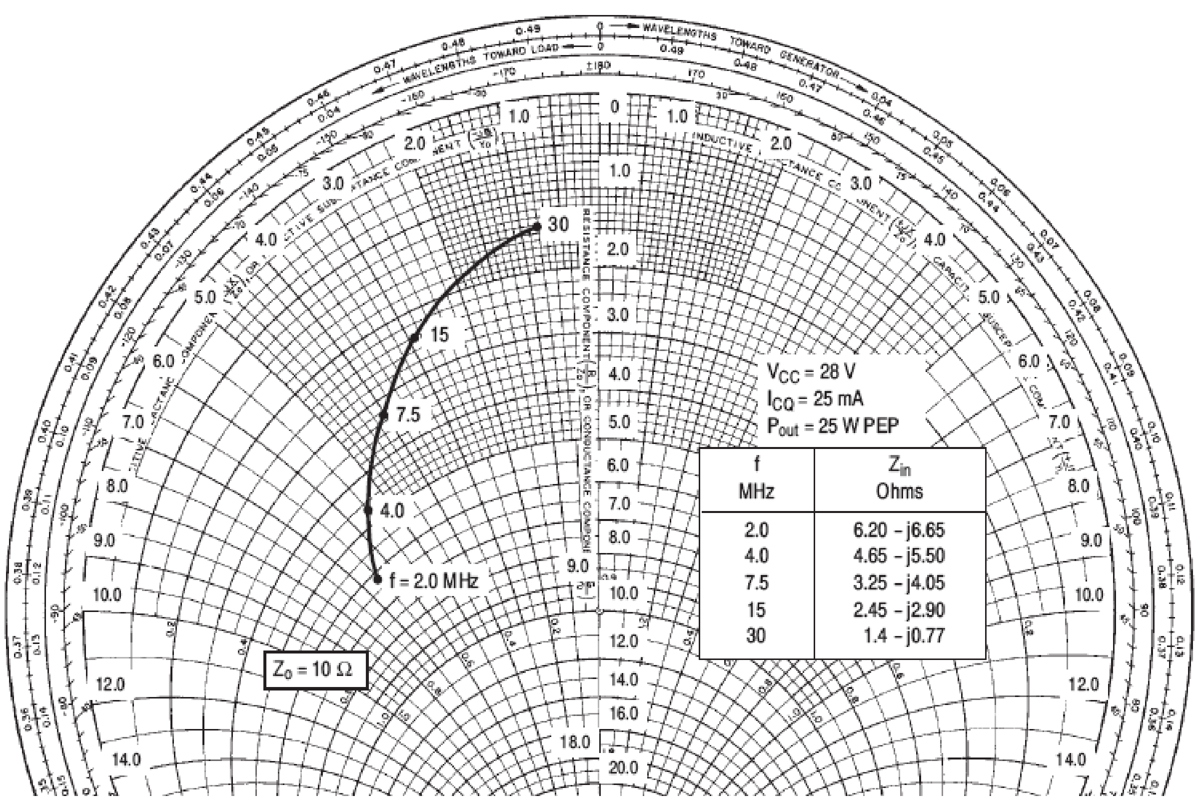

Figure 9. Series Equivalent Input Impedance

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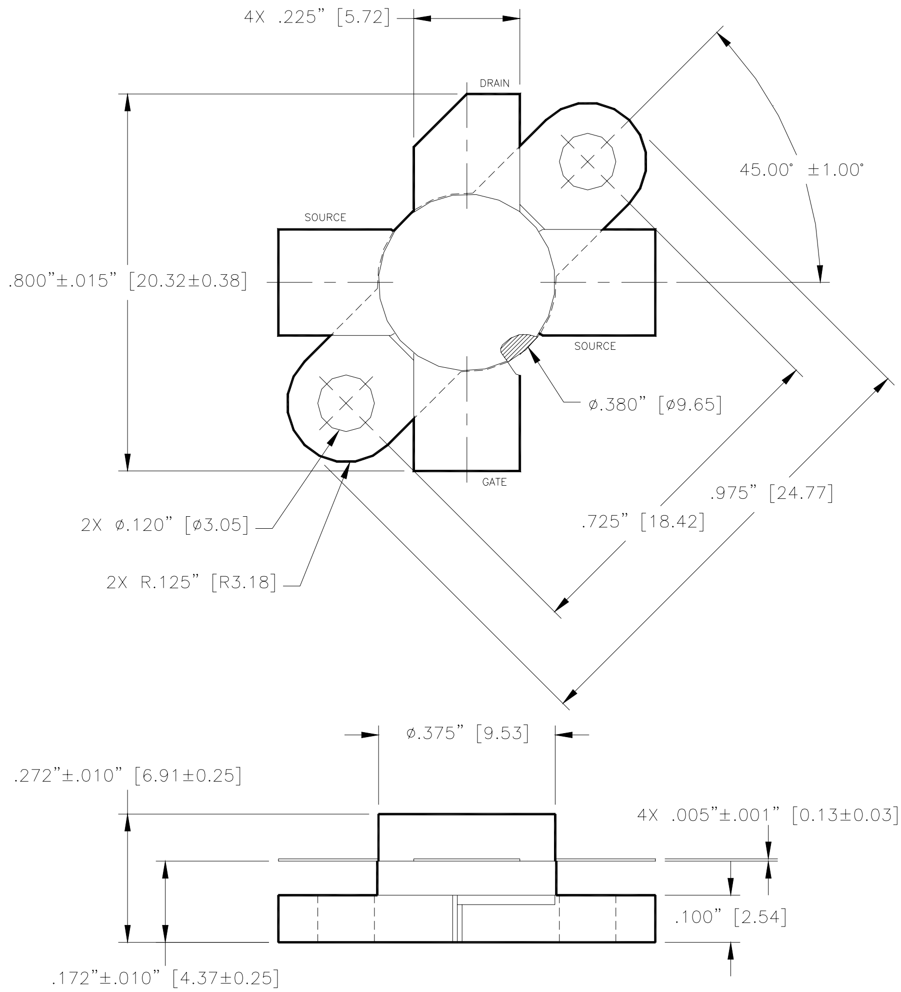

Unless otherwise noted, tolerances are inches ±.005" [millimeters ±0.13mm]

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