

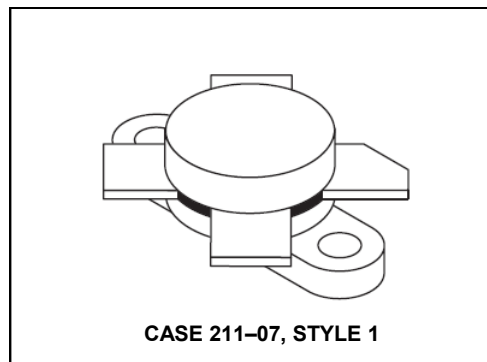
The RF Line NPN Silicon Power Transistor 25W(PEP), 30MHz, 28V

Rev. V1

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



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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 @ $T_C = 25^\circ\text{C}$ (1) Derate above 25°C	P_D	70 0.4	Watts $\text{W}/^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	35	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 50 \text{ mAdc}$, $I_E = 0$)	$V_{(BR)CBO}$	65	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 28 \text{ Vdc}$, $V_{BE} = 0$)	I_{CES}	—	—	10	mAdc

NOTE:

- This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.

(continued)

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ELECTRICAL CHARACTERISTICS — continued ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C = 1.0 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	10	35	—	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 30 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	—	60	80	pF
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FUNCTIONAL TESTS (SSB)

Common-Emitter Amplifier Gain ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 25 \text{ W (PEP)}$, $f_1 = 30 \text{ MHz}$, $f_2 = 30.001 \text{ MHz}$, $I_{CQ} = 25 \text{ mA}$)	G_{PE}	22	25	—	dB
Collector Efficiency ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 25 \text{ W (PEP)}$, $f_1 = 30 \text{ MHz}$, $f_2 = 30.001 \text{ MHz}$, $I_{CQ} = 25 \text{ mA}$)	η	35	—	—	%
Intermodulation Distortion (2) ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 25 \text{ W (PEP)}$, $f_1 = 30 \text{ MHz}$, $f_2 = 30.001 \text{ MHz}$, $I_{CQ} = 25 \text{ mA}$)	$IMD_{(d3)}$	—	-35	-30	dB
Load Mismatch ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 25 \text{ W (PEP)}$, $f_1 = 30 \text{ MHz}$, $f_2 = 30.001 \text{ MHz}$, $I_{CQ} = 25 \text{ mA}$, VSWR 30:1 at All Phase Angles)	ψ	No Degradation in Output Power			

CLASS A PERFORMANCE

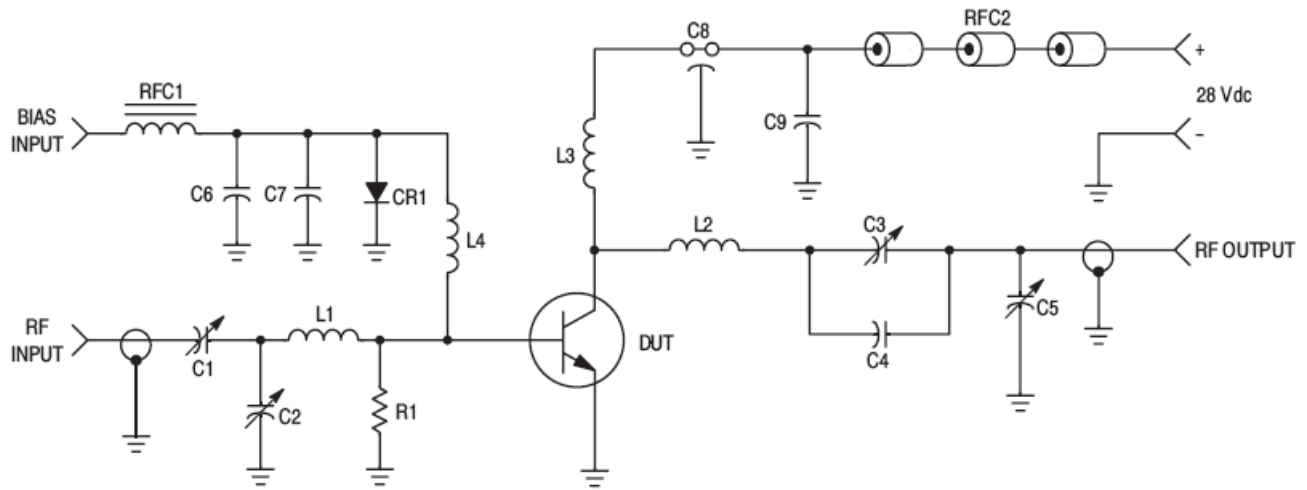
Intermodulation Distortion (2) and Power Gain ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 8.0 \text{ W (PEP)}$, $f_1 = 30 \text{ MHz}$, $f_2 = 30.001 \text{ MHz}$, $I_{CQ} = 1.2 \text{ Adc}$)	G_{PE}	—	23.5	—	dB
	$IMD_{(d3)}$	—	-40	—	
	$IMD_{(d5)}$	—	-55	—	

NOTE:

- 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 μ F, 15 Vdc
 C8 — 680 pF F.T. Allen Bradley
 C9 — 1.0 μ F 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 μ H 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%

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

Figure 1. 30 MHz Linear Test Circuit

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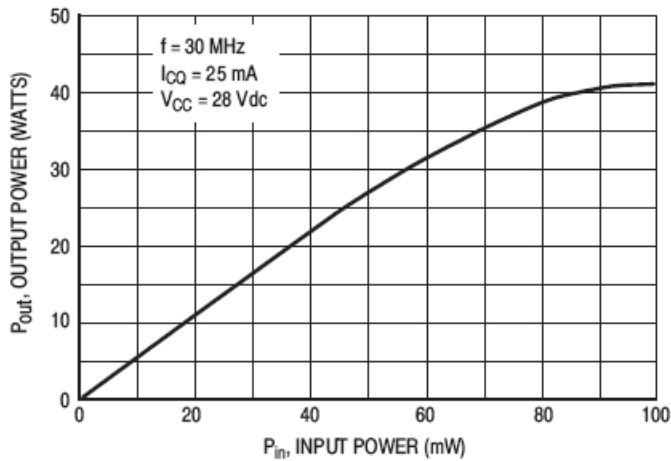


Figure 2. Output Power versus Input Power

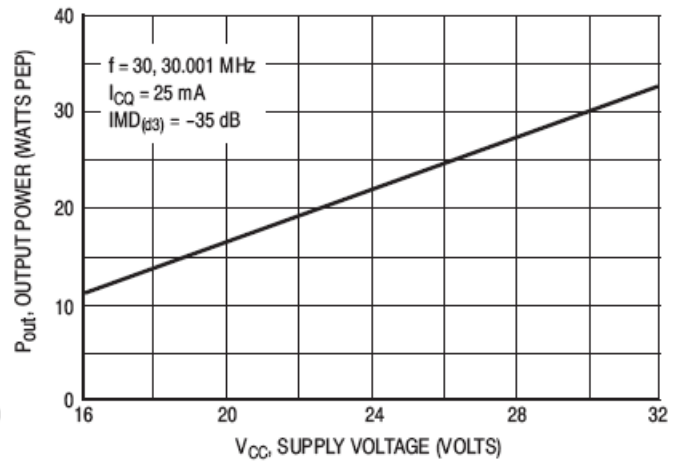


Figure 3. Output Power versus Supply Voltage

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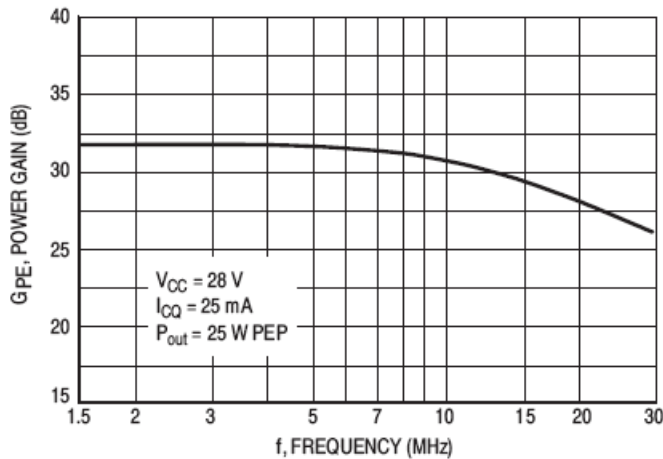


Figure 4. Power Gain versus Frequency

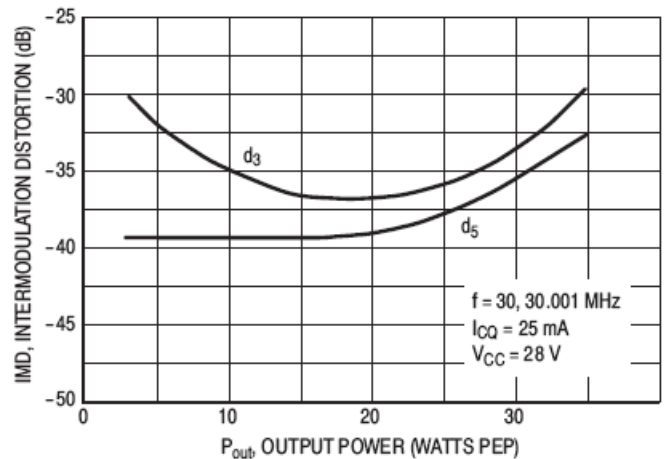


Figure 5. Intermodulation Distortion versus Output Power

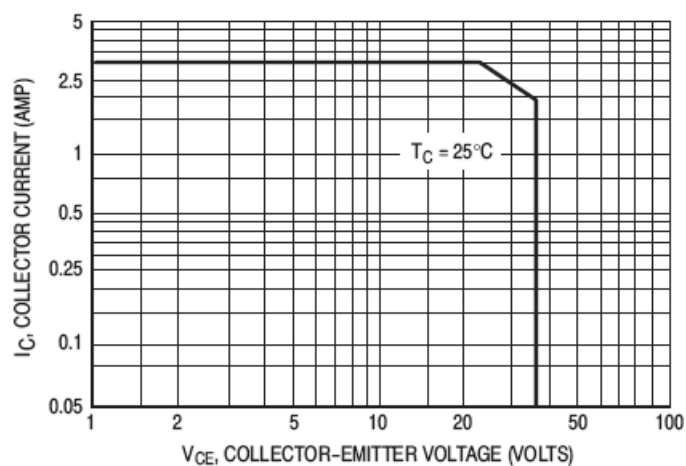


Figure 6. DC Safe Operating Area

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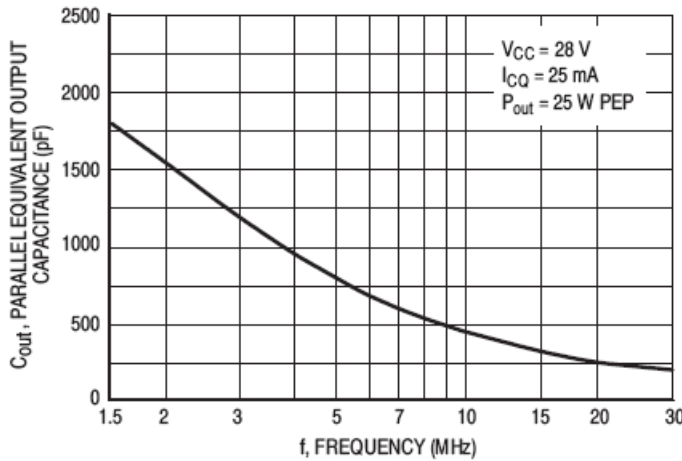


Figure 7. Output Capacitance versus Frequency

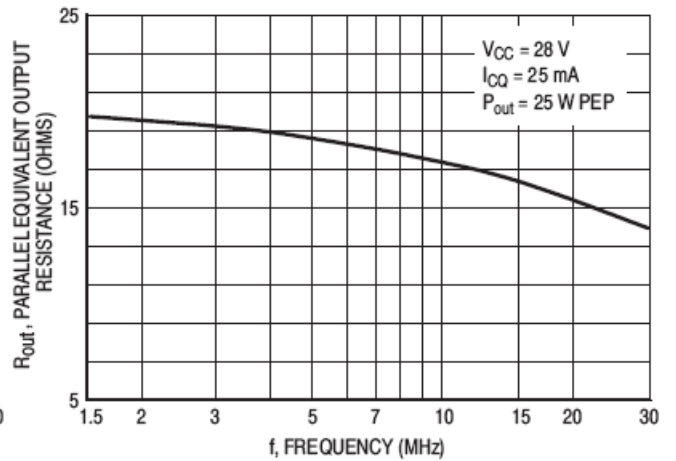


Figure 8. Output Resistance versus Frequency

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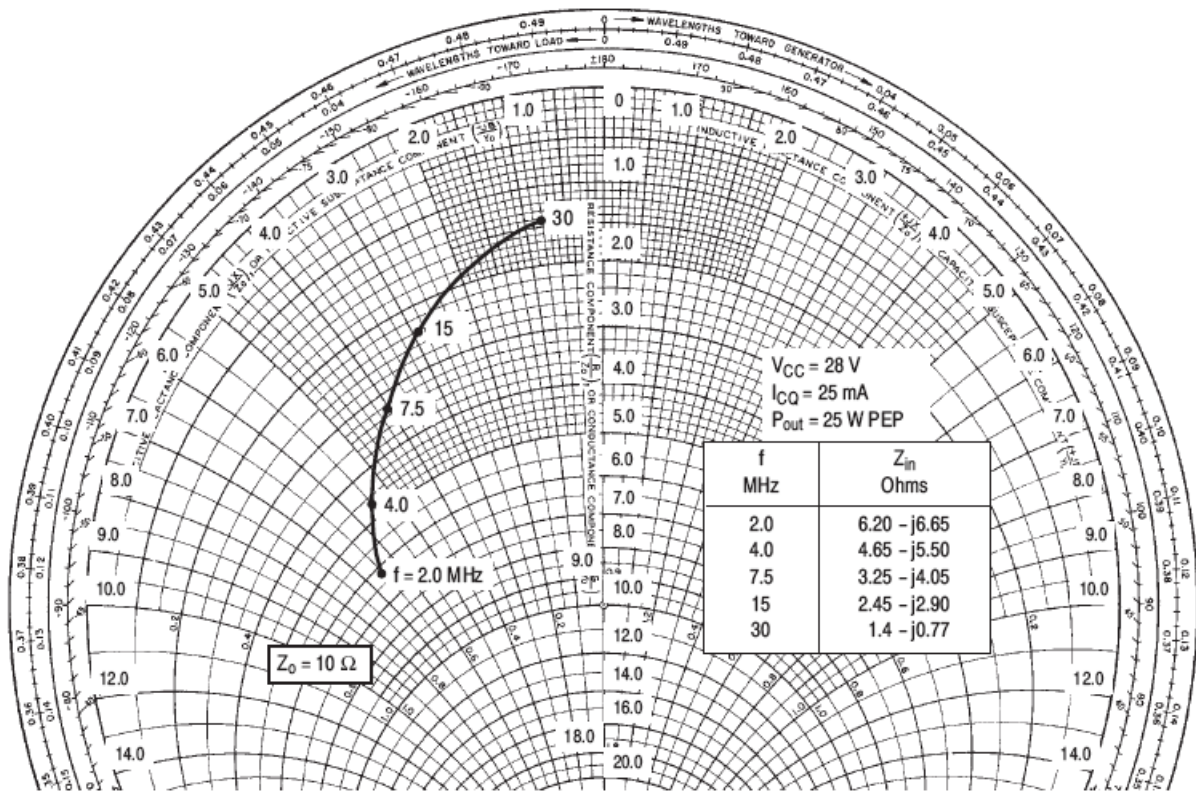


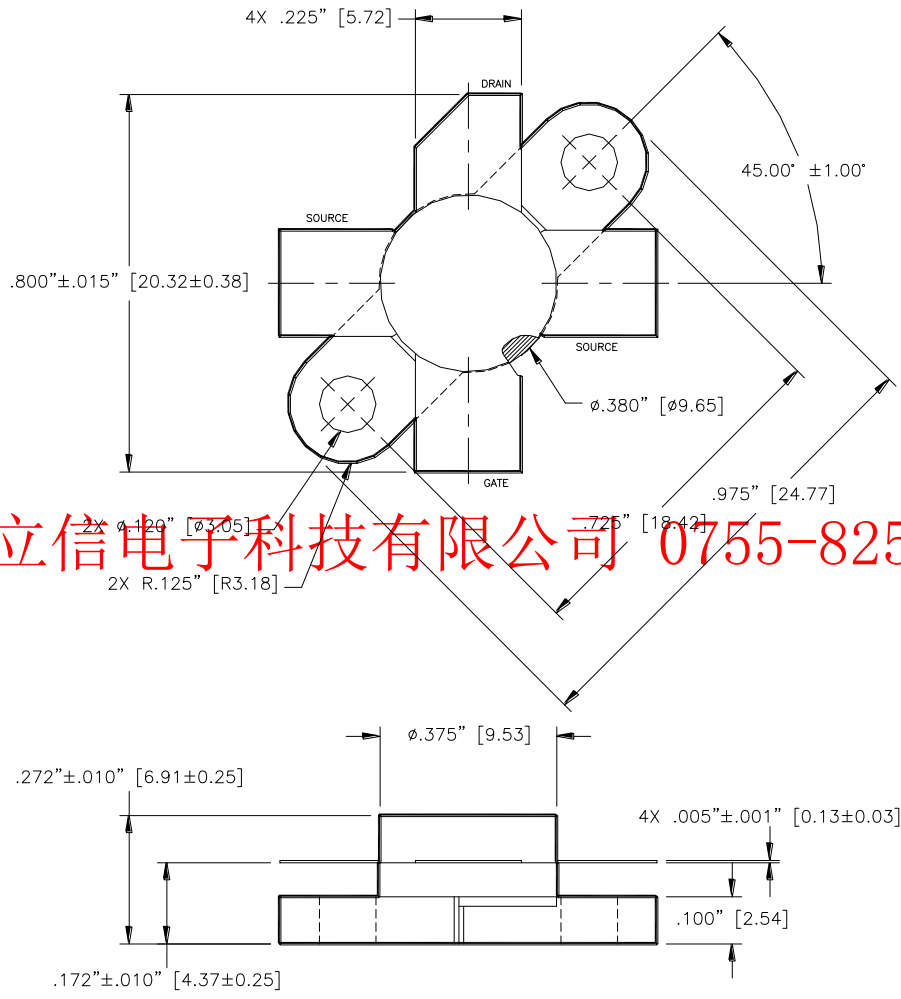
Figure 9. Series Equivalent Input Impedance

MRF426



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Unless otherwise noted, tolerances are inches $\pm .005$ [millimeters ± 0.13 mm]

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