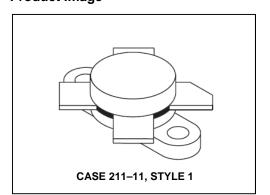


## The RF Line NPN Silicon Power Transistor 100W(PEP), 30MHz, 28V

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Designed primarily for application as a high–power linear amplifier from 2.0 **Product Image** 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



#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V <sub>CEO</sub>	20	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	45	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	3.0	Vdc
Collector Current — Continuous	Ic	20	Adc
Withstand Current — 10 s	_	30	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	290 1.66	Watts W/°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>0JC</sub>	0.6	°C/W

#### ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 50 mAdc, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	20	_	_	Vdc
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 200 mAdc, V <sub>BE</sub> = 0)	V <sub>(BR)CES</sub>	45	_	_	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = 200 mAdc, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	45	_	_	Vdc
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 10 mAdc, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	3.0	_	_	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 16 Vdc, V <sub>BE</sub> = 0, T <sub>C</sub> = 25°C)	I <sub>CES</sub>	_	_	10	mAdc

(continued)

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or tost data may be available. Commitment to produce in volume is not guaranteed.

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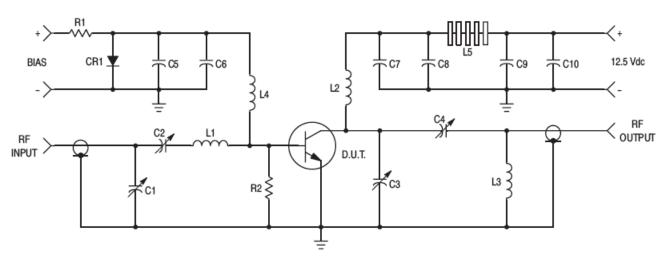
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#### ELECTRICAL CHARACTERISTICS - continued (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Тур	Max	Unit
ON CHARACTERISTICS	•	•			
DC Current Gain (I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE</sub>	10	70	_	_
DYNAMIC CHARACTERISTICS					
Output Capacitance (V <sub>CB</sub> = 12.5 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	_	550	800	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V <sub>CC</sub> = 12.5 Vdc, P <sub>out</sub> = 100 W, I <sub>C(max)</sub> = 10 Adc, I <sub>CQ</sub> = 150 mAdc, f = 30, 30.001 MHz)	GPE	10	12	_	dB
Collector Efficiency (V <sub>CC</sub> = 12.5 Vdc, P <sub>out</sub> = 100 W, I <sub>C(max)</sub> = 10 Adc, I <sub>CQ</sub> = 150 mA, f = 30, 30.001 MHz)	η	40	_	_	%
Intermodulation Distortion (1) (V <sub>CE</sub> = 12.5 Vdc, P <sub>out</sub> = 100 W, I <sub>C</sub> = 10 Adc, I <sub>CQ</sub> = 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  $\mu$ F, 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  $\Omega$ , 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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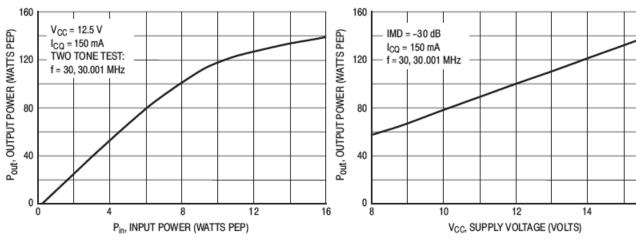


Figure 2. Output Power versus Input Power

Figure 3. Output Power versus Supply Voltage

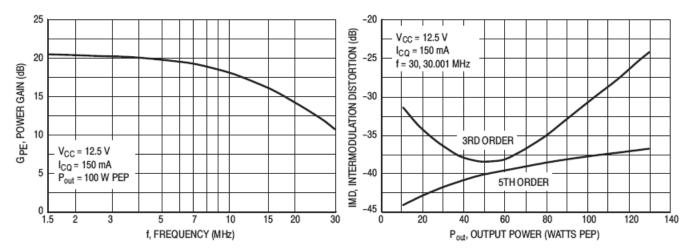


Figure 4. Power Gain versus Frequency

Figure 5. Intermodulation Distortion versus Output Power

typical. Mechanical outline has been fixed. Engineering samples Commitment to produce in volume is not guaranteed.

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### **MRF421**



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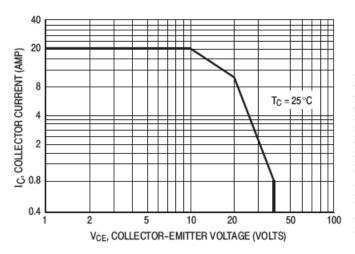


Figure 6. DC Safe Operating Area

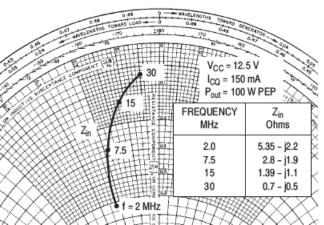


Figure 7. Series Equivalent Impedance

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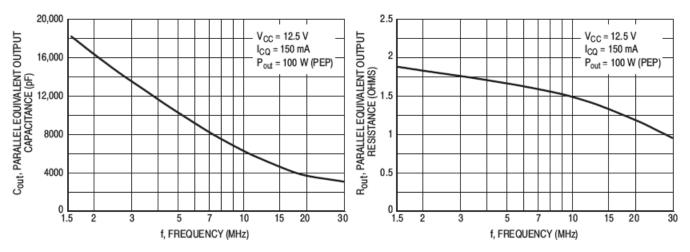
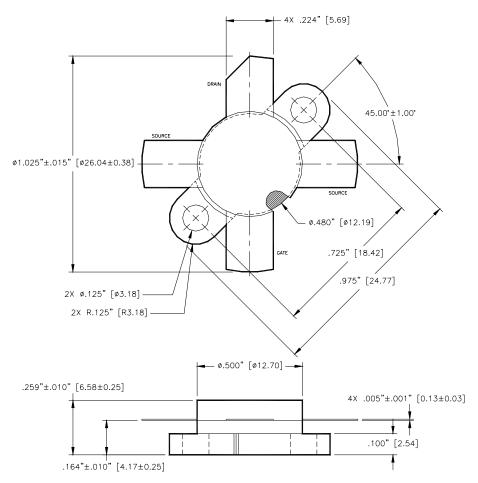


Figure 8. Output Capacitance versus Frequency

Figure 9. Output Resistance versus Frequency



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

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