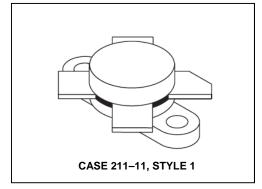


The RF Line NPN Silicon Power Transistor 150W(PEP), 30MHz, 28V

M/A-COM Products Released - Rev. 07.07

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



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	Ic	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 _{0JC}	0.6	°C/W

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

Characteristic	Symbol	Min	Тур	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)

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

Characteristic	Symbol	Min	Тур	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)	GPE	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 V_{dc} , 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)

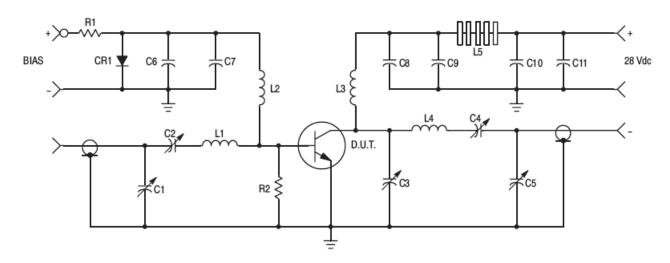
NOTE:

^{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 μ F, 100 V

C7 — MALLORY 500 μF, 15 V Electrolytic

C9 - UNDERWOOD 1000 pF, 350 V

C10 — 10 μ F, 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

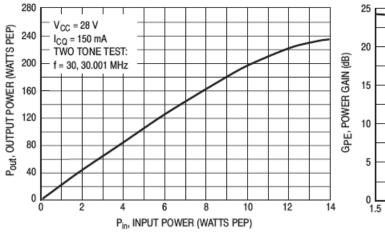
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25 20 15 10 V_{CC} = 28 V I_{CQ} = 150 mA P_{out} = 150 W PEP 0 1.5 2 3 5 7 10 15 20 30 f, FREQUENCY (MHz)

Figure 2. Output Power versus Input Power

Figure 3. Power Gain versus Frequency

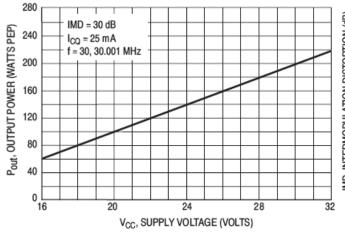


Figure 4. Linear Output Power versus Supply Voltage

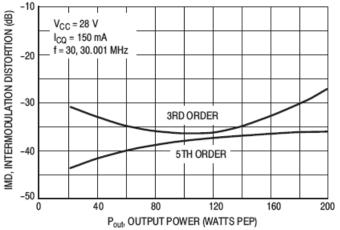


Figure 5. Intermodulation Distortion versus Output Power

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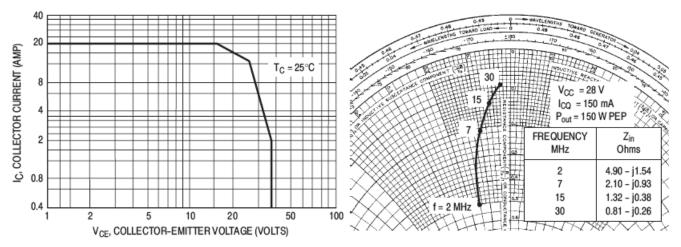


Figure 6. DC Safe Operating Area

Figure 7. Series Input Impedance

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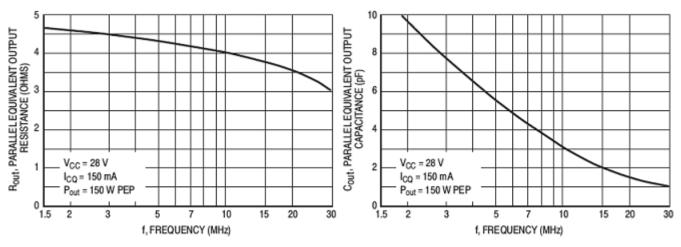
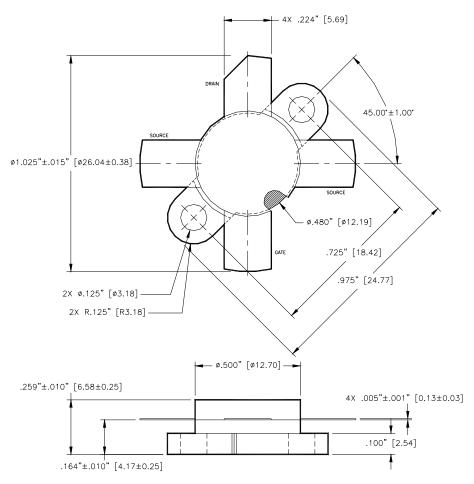


Figure 8. Output Resistance versus Frequency

Figure 9. Output Capacitance versus Frequency



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

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