

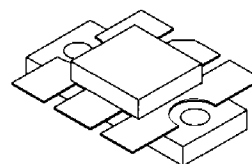
The RF Line NPN Silicon RF Power Transistor

... designed primarily for wideband large-signal output and driver amplifier stages in the 100 to 500 MHz frequency range.

- Specified 28 Volt, 400 MHz Characteristics —
Output Power = 100 Watts
Minimum Gain = 7.0 dB
Efficiency = 50% (Min)
- Built-In Matching Network for Broadband Operation Using Double Match Technique
- 100% Tested for Load Mismatch at all Phase Angles with 3:1 VSWR
- Gold Metallization System for High Reliability

MRF329

100 W, 100 to 500 MHz
CONTROLLED "Q"
BROADBAND RF POWER
TRANSISTOR
NPN SILICON



CASE 333-04, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	30	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous — Peak	I_C	9.0 12	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) Derate above 25°C	P_D	270 1.54	Watts 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 (2)	$R_{\theta JC}$	0.65	$^\circ\text{C/W}$

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 ($I_C = 80\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	30	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 80\text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 8.0\text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc

NOTES:

- This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.
- Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.

(continued)



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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS (continued)

Collector-Base Breakdown Voltage ($I_C = 80\text{ mAdc}$, $I_E = 0$)	$V_{(BR)CBO}$	60	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 30\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	5.0	mAdc

ON CHARACTERISTICS

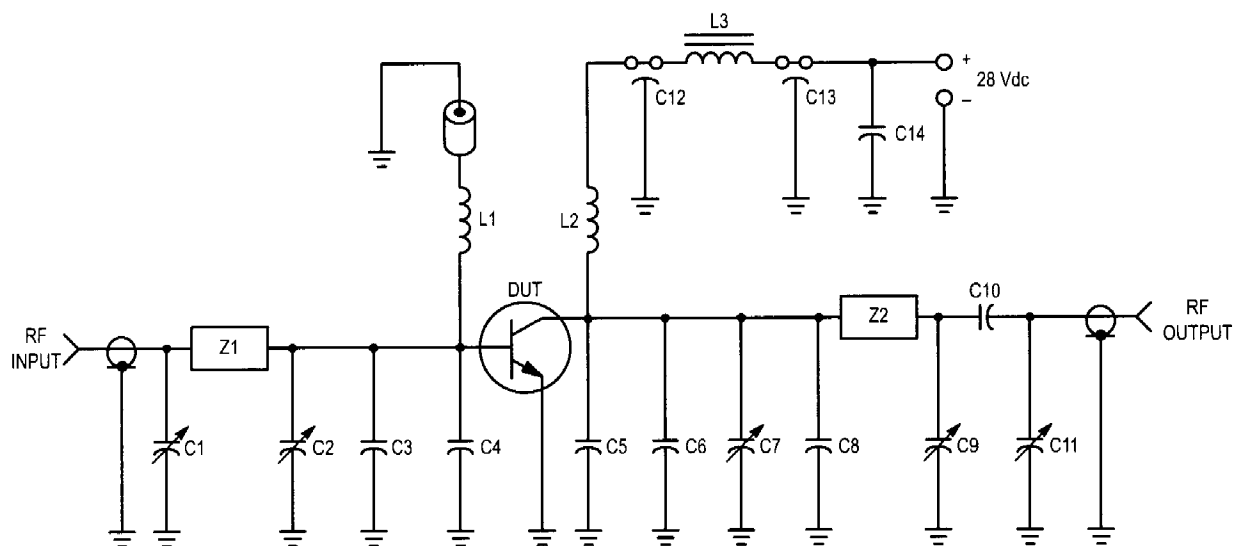
DC Current Gain ($I_C = 4.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	20	—	80	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 28\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	95	125	pF
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FUNCTIONAL TESTS (Figure 1)

Common-Emitter Amplifier Power Gain ($V_{CC} = 28\text{ Vdc}$, $P_{out} = 100\text{ W}$, $f = 400\text{ MHz}$)	G_{PE}	7.0	9.7	—	dB
Collector Efficiency ($V_{CC} = 28\text{ Vdc}$, $P_{out} = 100\text{ W}$, $f = 400\text{ MHz}$)	η	50	60	—	%
Load Mismatch ($V_{CC} = 28\text{ Vdc}$, $P_{out} = 100\text{ W}$, $f = 400\text{ MHz}$, $VSWR = 3:1$ all angles)	ψ	No Degradation in Output Power			



C1, C2, C7, C9 — 1.0–20 pF Johanson (JMC 5501)
 C3, C4 — 36 pF 100 mil Chip Cap (ATC)
 C5, C6 — 50 pF 100 mil Chip Cap (ATC)
 C8 — 30 pF 100 mil Chip Cap (ATC)
 C10 — 2.0–150 pF 100 mil Chip Caps in Parallel (ATC)
 C11 — 1.0–10 pF Johanson (JMC 5201)
 C12, C13 — 1000 pF UNELCO Feedthru
 C14 — 0.1 μF Erie Redcap

L1 — 0.15 μH Molded Choke with Ferrite Bead
 (Ferroxcube #56–590–65/4B) on Ground End
 L2 — 4 Turns #18 AWG, 1/4" ID
 L3 — Ferroxcube VK200–19/4B
 Z1 — Microstrip Line 2300 mils L x 210 mils W
 Z2 — Microstrip Line 2300 mils L x 280 mils W
 Board — Glass Teflon, $t = 0.062"$, $\epsilon_r = 2.56$

Figure 1. 400 MHz Test Circuit