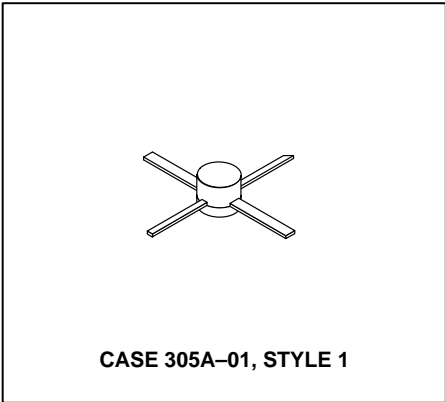


The RF Line  
**NPN Silicon**  
**High-Frequency Transistor**

... designed for wideband amplifier, driver or oscillator applications in military, mobile, and aircraft radio.

- Specified 28 Volt, 400 MHz Characteristics —  
Output Power = 1.0 Watt  
Power Gain = 15 dB Min  
Efficiency = 45% Typ
- Emitter Ballast and Low Current Density for Improved MTBF
- Common Emitter for Improved Stability



**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V <sub>CEO</sub>	30	Vdc
Collector–Base Voltage	V <sub>CB0</sub>	40	Vdc
Emitter–Base Voltage	V <sub>EBO</sub>	3.0	Vdc
Collector Current — Continuous	I <sub>C</sub>	150	mAdc
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	6.1 35	Watts mW/°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>θJC</sub>	28.5	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	30	—	—	Vdc
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 5.0 mAdc, V <sub>BE</sub> = 0)	V <sub>(BR)CES</sub>	35	—	—	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = 0.1 mAdc, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	35	—	—	Vdc
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 1.0 mAdc, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	3.0	—	—	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 20 Vdc, I <sub>B</sub> = 0)	I <sub>CEO</sub>	—	—	1.0	mAdc

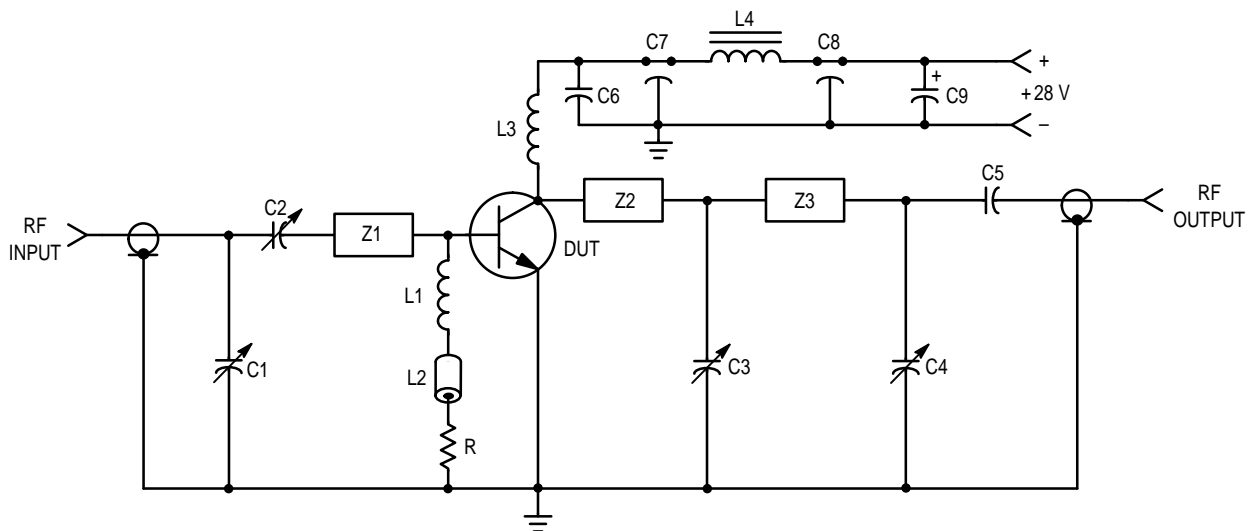
(continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 100 \text{ mA dc}$ , $V_{CE} = 10 \text{ V dc}$ )	$h_{FE}$	20	60	150	—
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain — Bandwidth Product ( $I_C = 100 \text{ mA dc}$ , $V_{CE} = 20 \text{ V dc}$ , $f = 200 \text{ MHz}$ )	$f_T$	—	2.5	—	GHz
Output Capacitance ( $V_{CB} = 28 \text{ V dc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{ob}$	—	3.5	5.0	pF
<b>FUNCTIONAL TESTS</b>					
Common–Emitter Amplifier Power Gain (1) ( $V_{CC} = 28 \text{ V dc}$ , $P_{out} = 1.0 \text{ W}$ , $f = 400 \text{ MHz}$ )	$G_{pe}$	15	16	—	dB
Collector Efficiency ( $V_{CC} = 28 \text{ V dc}$ , $P_{out} = 1.0 \text{ W}$ , $f = 400 \text{ MHz}$ )	$\eta$	—	45	—	%
Series Equivalent Input Impedance ( $V_{CC} = 28 \text{ V dc}$ , $P_{out} = 1.0 \text{ W}$ , $f = 400 \text{ MHz}$ )	$Z_{in}$	—	$6.4 - j4.8$	—	Ohms
Series Equivalent Output Impedance ( $V_{CC} = 28 \text{ V dc}$ , $P_{out} = 1.0 \text{ W}$ , $f = 400 \text{ MHz}$ )	$Z_{out}$	—	$75 - j45$	—	Ohms

NOTE:

- Class C



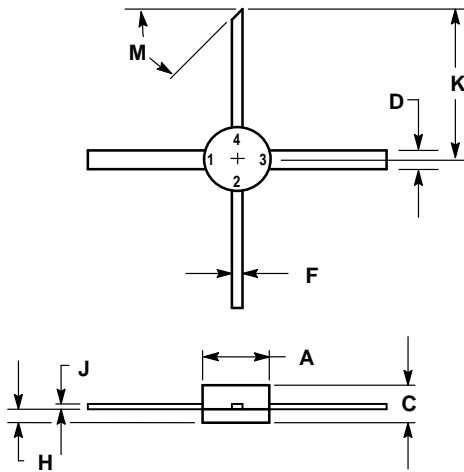
C1, C2, C4 — 1.0–20 pF JOHANSON 9063  
 C3 — 1.0–10 pF JOHANSON  
 C5 — 150 pF Chip  
 C6 — 0.1  $\mu\text{F}$   
 C7, C8 — 680 pF Feedthru  
 C9 — 1.0  $\mu\text{F}$  TANTALUM

L1, L3 — 5 Turns, AWG #20, 1/4" I.D.  
 L2 — Ferrite Bead, FERROXCUBE  
 No. 56–590–65/4B  
 L4 — FERROXCUBE VK200–20/4B  
 Input/Output Connectors — Type N  
 Board — Glass Teflon,  $\epsilon = 2.56$ ,  $t = 0.062$ "

R — 4.7 Ohms, 1/4 W  
 Z1 — 2.0" x 0.1" MICROSTRIP LINE  
 Z2, Z3 — 2.6" x 0.1" MICROSTRIP LINE

**Figure 1. 400 MHz Power Gain Test Circuit**

## PACKAGE DIMENSIONS




- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.200	0.220	5.08	5.59
C	0.095	0.130	2.41	3.30
D	0.055	0.065	1.40	1.65
F	0.025	0.035	0.64	0.89
H	0.040	0.050	1.02	1.27
J	0.003	0.007	0.08	0.18
K	0.435	—	11.05	—
M	45 °REF		45 °REF	

- STYLE 1:  
 PIN 1. EMITTER  
 2. BASE  
 3. EMITTER  
 4. COLLECTOR

**CASE 305A-01  
 ISSUE A**

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MRF313/D