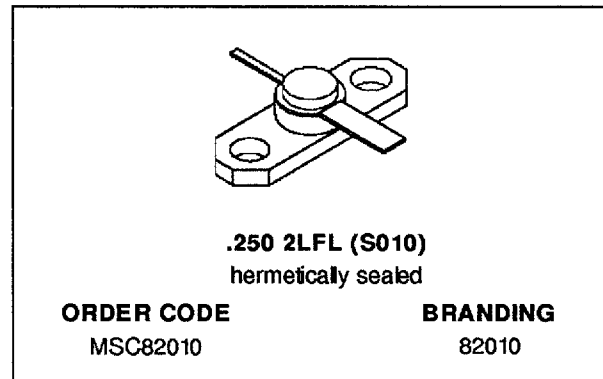


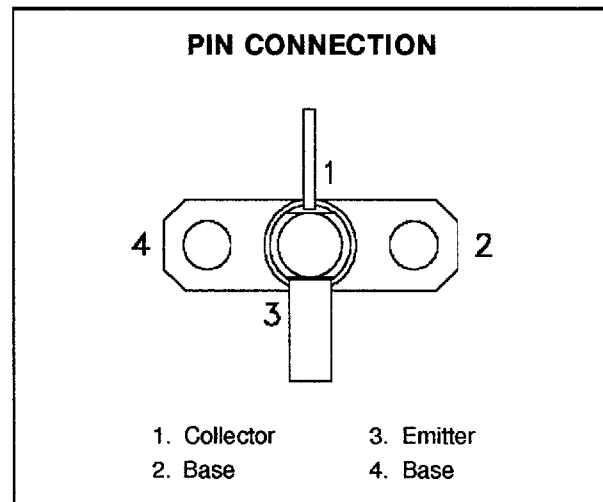
**RF & MICROWAVE TRANSISTORS
GENERAL PURPOSE AMPLIFIER APPLICATIONS**

- EMITTER BALLASTED
- VSWR CAPABILITY $\infty:1$ @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 10$ W MIN. WITH 5.2 dB GAIN @ 2.0 GHz



DESCRIPTION

The MSC82010 is a common base hermetically sealed silicon NPN microwave transistor utilizing a fishbone emitter ballasted geometry with a refractory/gold metallization system. This device is capable of withstanding an infinite load VSWR at any phase angle under rated conditions. The MSC82010 was designed for Class C amplifier applications in the 1.0 - 2.0 GHz frequency range.



ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$)

| Symbol | Parameter | Value | Unit |
|------------|---------------------------|--------------|-------------|
| P_{DISS} | Power Dissipation* | 35 | W |
| I_C | Device Current* | 1.5 | A |
| V_{CC} | Collector-Supply Voltage* | 35 | V |
| T_J | Junction Temperature | 200 | $^{\circ}C$ |
| T_{STG} | Storage Temperature | - 65 to +200 | $^{\circ}C$ |

THERMAL DATA

| | | | |
|---------------|-----------------------------------|-----|---------------|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance* | 5.0 | $^{\circ}C/W$ |
|---------------|-----------------------------------|-----|---------------|

*Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATIONS ($T_{case} = 25^{\circ}C$)

STATIC

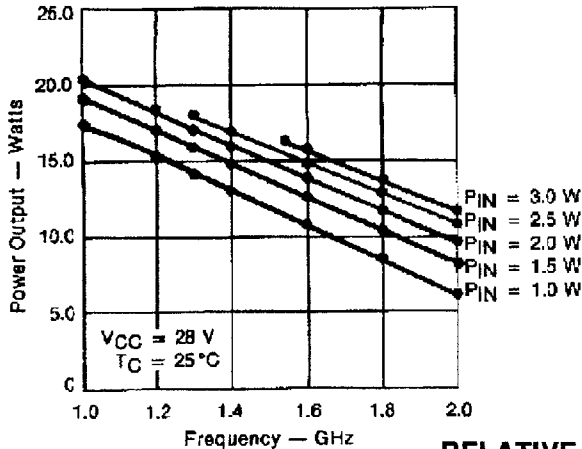
| Symbol | Test Conditions | | Value | | | Unit |
|------------|-----------------|---------------------|-------|------|------|------|
| | | | Min. | Typ. | Max. | |
| BV_{CBO} | $I_C = 5mA$ | $I_E = 0mA$ | 45 | — | — | V |
| BV_{EBO} | $I_E = 1mA$ | $I_C = 0mA$ | 3.5 | — | — | V |
| BV_{CER} | $I_C = 15mA$ | $R_{BE} = 10\Omega$ | 45 | — | — | V |
| I_{CBO} | $V_{CB} = 28V$ | | — | — | 5.0 | mA |
| h_{FE} | $V_{CE} = 5V$ | $I_C = 1000mA$ | 15 | — | 120 | — |

DYNAMIC

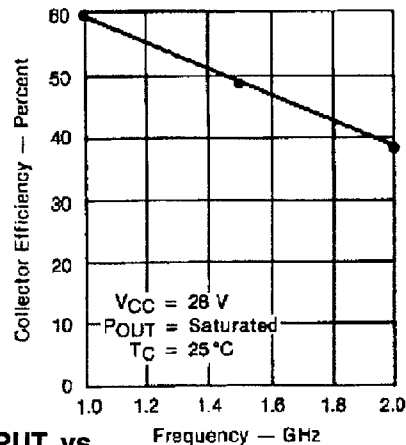
| Symbol | Test Conditions | | | Value | | | Unit |
|-----------|-----------------|------------------|-----------------|-------|------|------|------|
| | | | | Min. | Typ. | Max. | |
| P_{OUT} | $f = 2.0 GHz$ | $P_{IN} = 3.0 W$ | $V_{CC} = 28 V$ | 10 | 11.5 | — | W |
| η_c | $f = 2.0 GHz$ | $P_{IN} = 3.0 W$ | $V_{CC} = 28 V$ | 35 | 38 | — | % |
| GP | $f = 2.0 GHz$ | $P_{IN} = 3.0 W$ | $V_{CC} = 28 V$ | 5.2 | 5.8 | — | dB |
| C_{OB} | $f = 1 MHz$ | $V_{CB} = 28 V$ | | — | — | 19 | pF |

TYPICAL PERFORMANCE

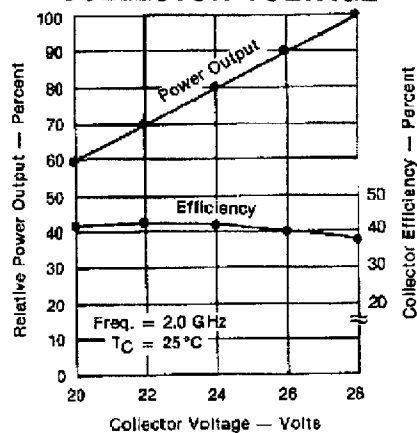
POWER OUTPUT vs FREQUENCY



COLLECTOR EFFICIENCY vs FREQUENCY

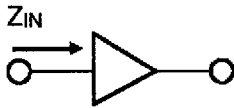


RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE

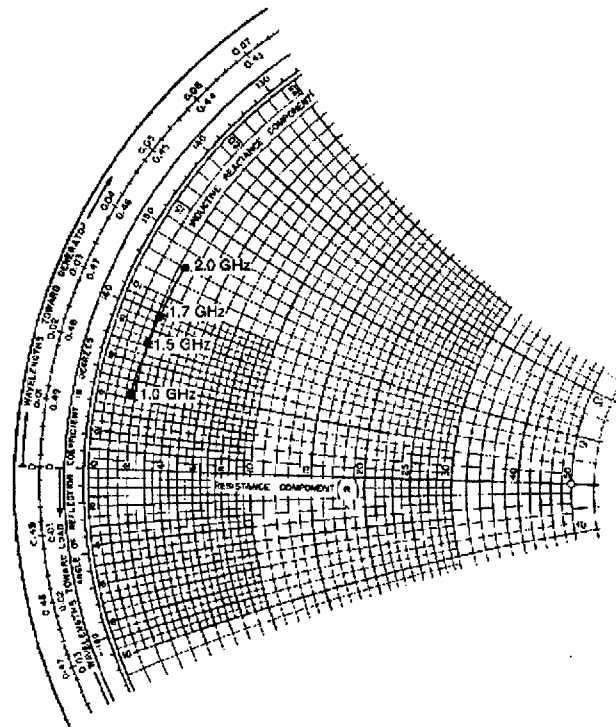


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

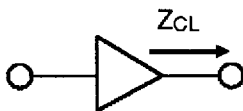


$P_{IN} = 3.0 \text{ W}$
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms

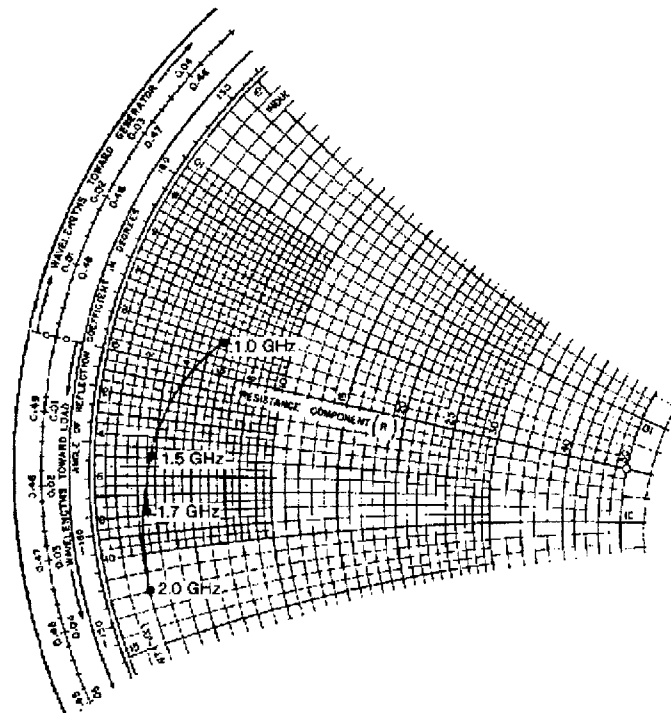


| FREQ. | $Z_{IN} (\Omega)$ | $Z_{CL} (\Omega)$ |
|---------|-------------------|-------------------|
| 1.0 GHz | $1.7 + j 4.2$ | $5.7 + j 1.9$ |
| 1.5 GHz | $2.0 + j 7.2$ | $2.8 - j 5.0$ |
| 1.7 GHz | $2.2 + j 8.8$ | $2.5 - j 7.8$ |
| 2.0 GHz | $2.4 + j 12.0$ | $2.0 - j 12.0$ |

TYPICAL COLLECTOR LOAD IMPEDANCE



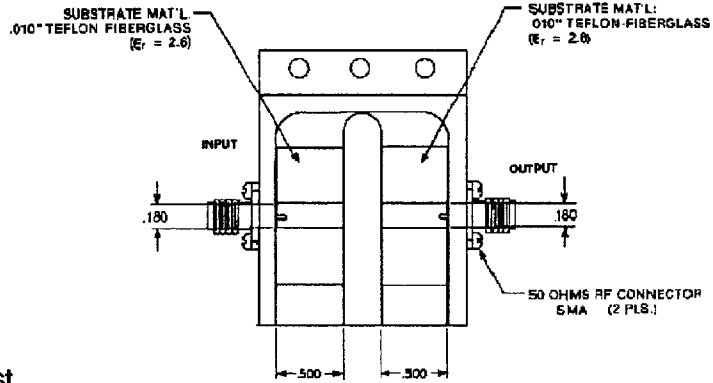
$P_{OUT} = \text{Saturated}$
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms



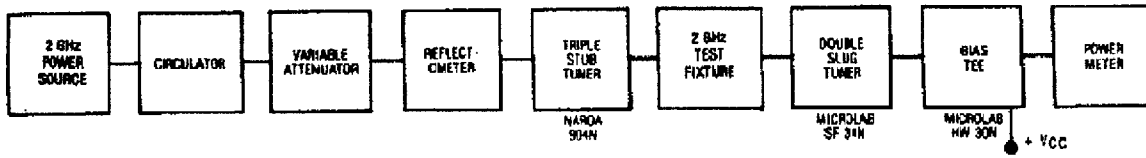
TEST CIRCUIT

Ref.: Dwg. No. C125518

All dimensions are in inches.
Frequency 2.0 GHz

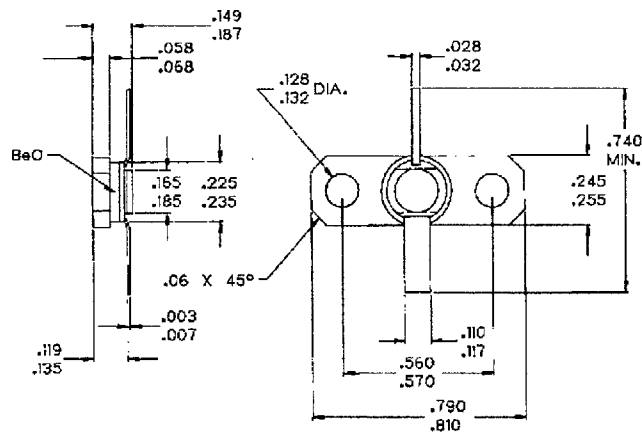


RF Amplifier Power Output Test



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135021C



NOTES:
1. ALL TOLERANCE \pm .010 EXCEPT WHERE NOTED;
DIMENSIONS IN INCHES.