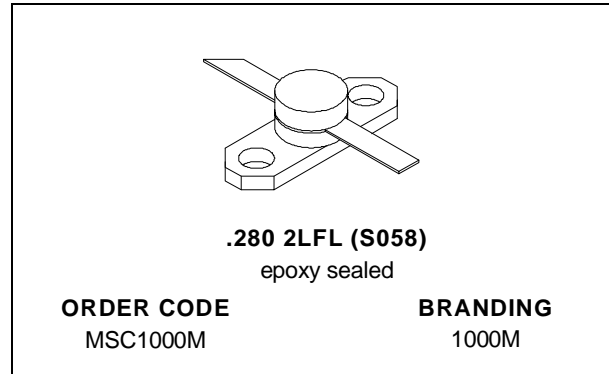


## RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

- RUGGEDIZED VSWR  $\infty:1$
- INPUT MATCHING
- LOW THERMAL RESISTANCE
- CLASS A OPERATION
- $P_{OUT} = 0.6$  W MIN. WITH 10.8 dB GAIN

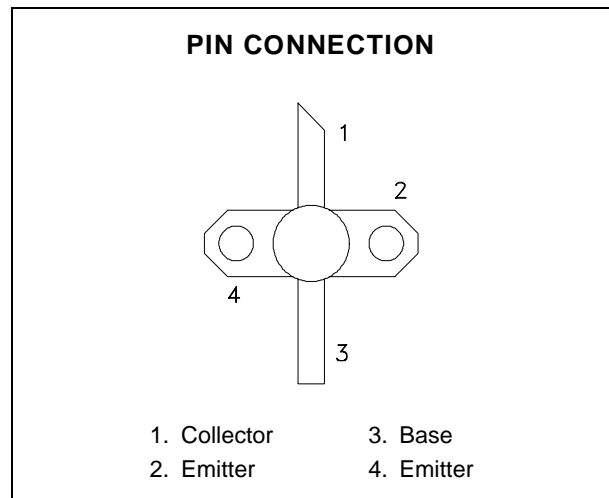


### DESCRIPTION

The MSC1000M is a Class A, common emitter transistor with an emitter ballasted Matrix geometry specifically designed for DME/IFF driver applications.

This device is capable of withstanding a  $\infty:1$  load VSWR at any phase angle under full rated conditions. Low RF thermal resistance and semi-automatic wire bonding techniques ensure high reliability and product consistency.

The MSC1000M is housed in the IMPAC™ package with internal input matching.



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

| Symbol     | Parameter                                  | Value        | Unit        |
|------------|--|--------------|-------------|
| $P_{DISS}$ | Power Dissipation* (See Safe Area)         | —            | W           |
| $I_C$      | Device Current*                            | 300          | mA          |
| $V_{CE}$   | Collector-Emitter Bias Voltage*            | 20           | V           |
| $T_J$      | Junction Temperature (Pulsed RF Operation) | 200          | $^{\circ}C$ |
| $T_{STG}$  | Storage Temperature                        | - 65 to +150 | $^{\circ}C$ |

### THERMAL DATA

|               |                                   |    |               |
|---------------|-----------------------------------|----|---------------|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance* | 35 | $^{\circ}C/W$ |
|---------------|-----------------------------------|----|---------------|

\*Applies only to rated RF amplifier operation

# MSC1000M

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

### STATIC

| Symbol     | Test Conditions |               | Value |      |      | Unit |
|------------|-----------------|---------------|-------|------|------|------|
|            |                 |               | Min.  | Typ. | Max. |      |
| $BV_{CBO}$ | $I_C = 1mA$     | $I_E = 0mA$   | 50    | —    | —    | V    |
| $BV_{EBO}$ | $I_E = 1mA$     | $I_C = 0mA$   | 3.5   | —    | —    | V    |
| $BV_{CEO}$ | $I_C = 5mA$     | $I_B = 0mA$   | 20    | —    | —    | V    |
| $I_{CES}$  | $V_{CE} = 28V$  |               | —     | —    | 1.0  | mA   |
| $h_{FE}$   | $V_{CE} = 5V$   | $I_C = 100mA$ | 15    | —    | 120  | —    |

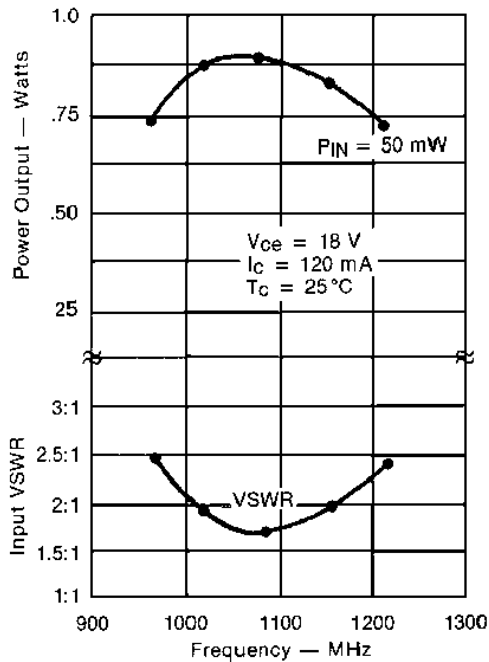
### DYNAMIC

| Symbol    | Test Conditions       |                  |                 | Value |      |      | Unit |
|-----------|-----------------------|------------------|-----------------|-------|------|------|------|
|           |                       |                  |                 | Min.  | Typ. | Max. |      |
| $P_{OUT}$ | $f = 1025 - 1150 MHz$ | $P_{IN} = 50 mW$ | $V_{CE} = 18 V$ | 0.6   | 0.85 | —    | W    |
| $G_P$     | $f = 1025 - 1150 MHz$ | $P_{IN} = 50 mW$ | $V_{CE} = 18 V$ | 10.8  | 12.3 | —    | dB   |

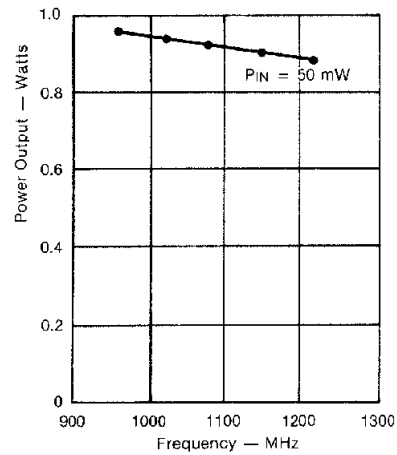
Note: Pulse Width =  $10\mu Sec$   $I_C = 120mA$   
 Duty Cycle = 1%

### TYPICAL PERFORMANCE

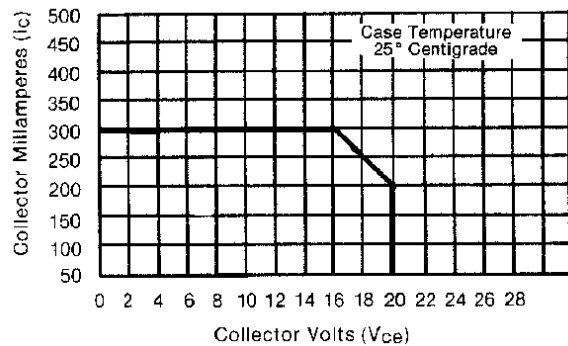
#### BROADBAND POWER AMPLIFIER



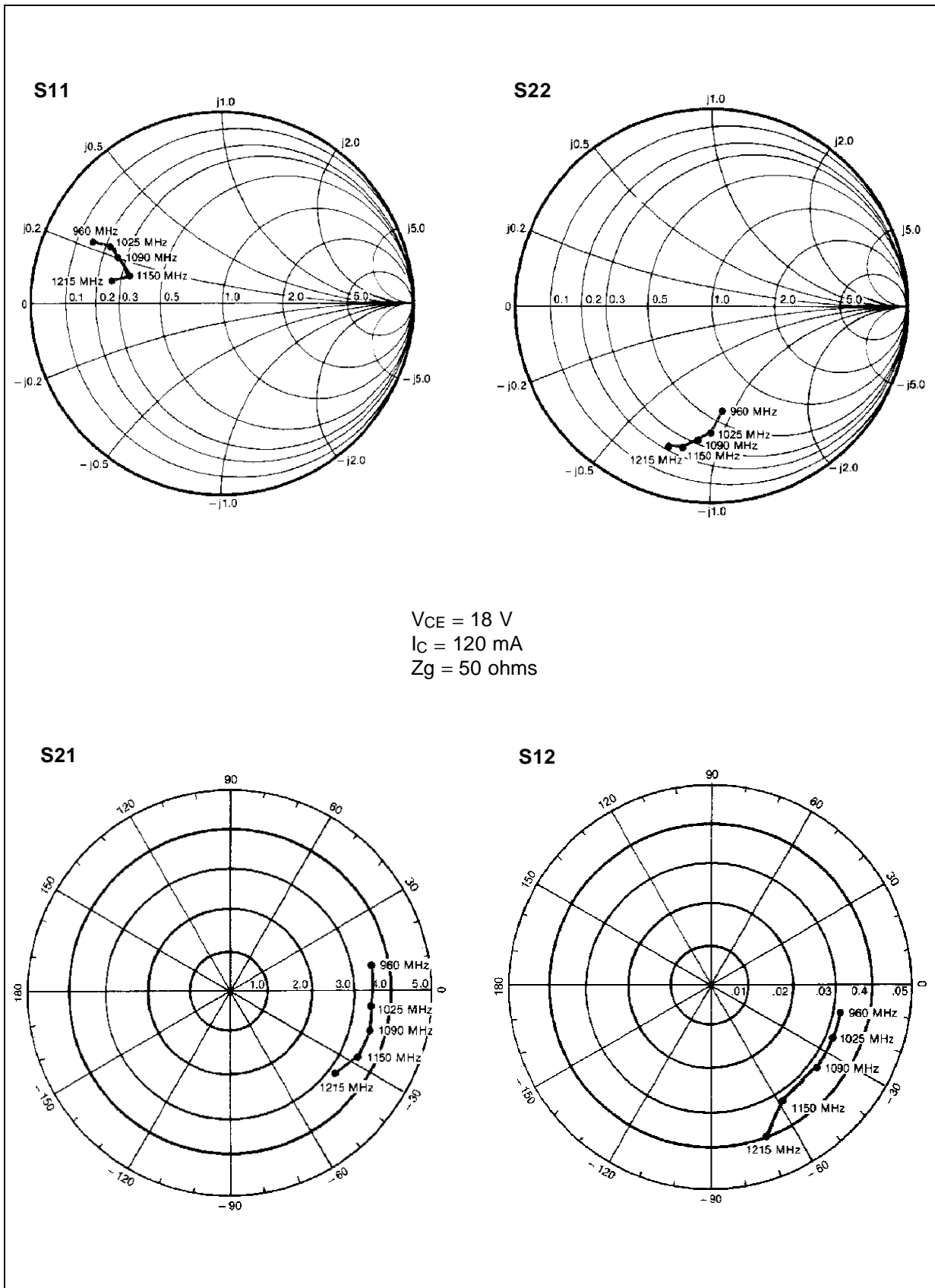
#### NARROWBAND POWER OUTPUT vs FREQUENCY



#### MAXIMUM OPERATING AREA for FORWARD BIAS OPERATION



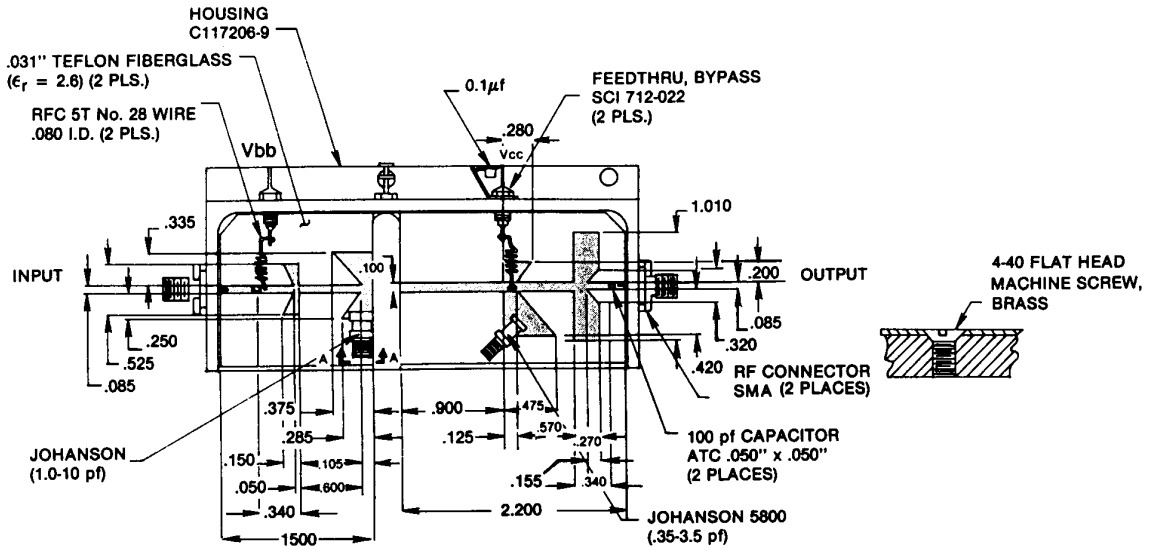
TYPICAL S-PARAMETERS



**MSC1000M**

**TEST CIRCUIT**

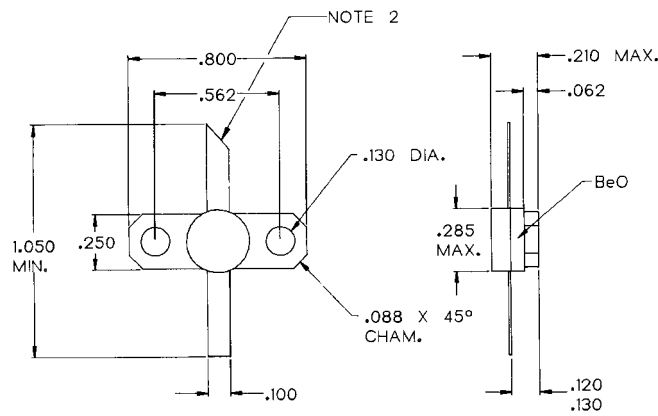
Ref.: Dwg No. C127297



All dimensions are in inches.

**PACKAGE MECHANICAL DATA**

Ref.: Dwg. No.: J135039B



- NOTES:
1. ALL TOLERANCE  $\pm .010$  EXCEPT WHERE NOTED; DIMENSIONS IN INCHES.
  2. COLLECTOR LEAD SLANT CUT.

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