

## MS1008

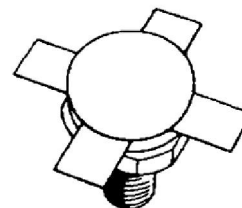
### RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

#### Features

- 30 MHz
- 50 VOLTS
- IMD = -30 dB
- $P_{OUT} = 150$  WATTS
- $G_P = 14$  dB MINIMUM
- COMMON EMITTER CONFIGURATION

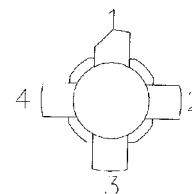
#### DESCRIPTION:

The MS1008 is a 50V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions.



**.550 4L STUD (M164)**  
epoxy sealed

#### PIN CONNECTION



- |              |            |
|--------------|------------|
| 1. Collector | 3. Base    |
| 2. Emitter   | 4. Emitter |

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

| Symbol     | Parameter                 | Value       | Unit        |
|------------|---------------------------|-------------|-------------|
| $V_{CBO}$  | Collector-Base Voltage    | 110         | V           |
| $V_{CEO}$  | Collector-Emitter Voltage | 55          | V           |
| $V_{EBO}$  | Emitter-Base Voltage      | 4.0         | V           |
| $I_C$      | Device Current            | 10          | A           |
| $P_{DISS}$ | Power Dissipation         | 233         | W           |
| $T_J$      | Junction Temperature      | +200        | $^{\circ}C$ |
| $T_{STG}$  | Storage Temperature       | -65 to +150 | $^{\circ}C$ |

#### Thermal Data

|               |                                  |      |               |
|---------------|----------------------------------|------|---------------|
| $R_{TH(J-C)}$ | Junction-Case Thermal Resistance | 0.75 | $^{\circ}C/W$ |
|---------------|----------------------------------|------|---------------|

Rev A 11/2005

## ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)

### STATIC

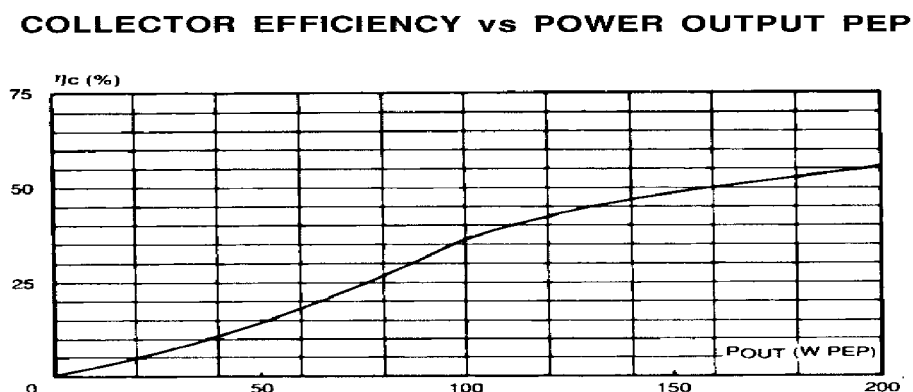
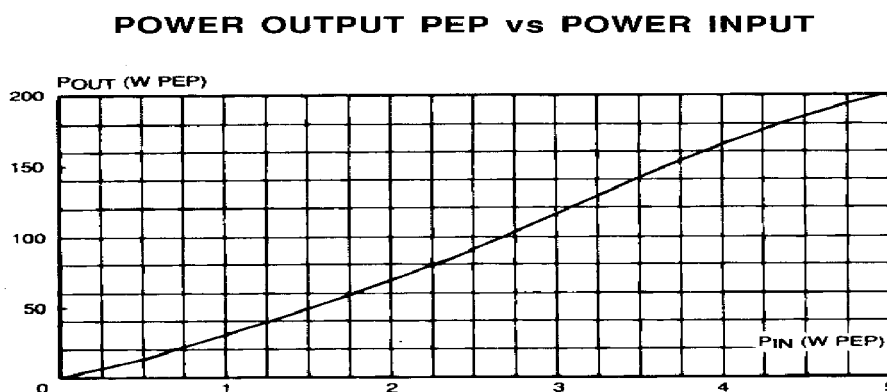
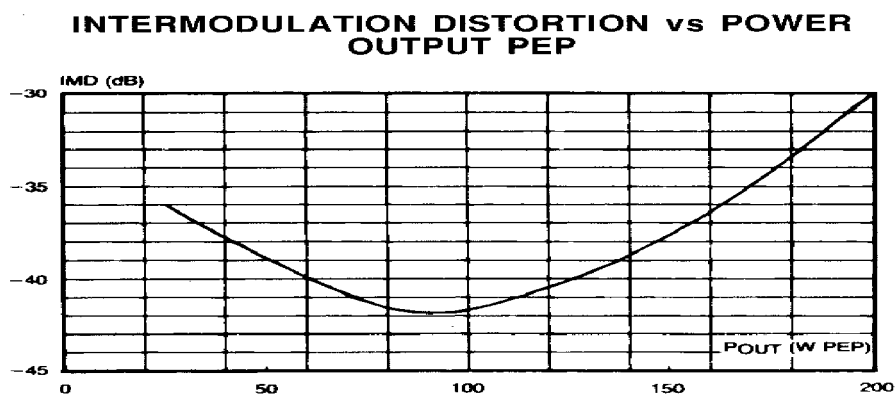
| Symbol                         | Test Conditions              |                             | Value      |      |           | Unit      |
|--------------------------------|------------------------------|-----------------------------|------------|------|-----------|-----------|
|                                |                              |                             | Min.       | Typ. | Max.      |           |
| <b>BV<sub>CBO</sub></b>        | <b>I<sub>C</sub> = 100mA</b> | <b>I<sub>E</sub> = 0mA</b>  | <b>110</b> | ---  | ---       | <b>V</b>  |
| <b>BV<sub>CES</sub></b>        | <b>I<sub>C</sub> = 100mA</b> | <b>V<sub>BE</sub> = 0V</b>  | <b>110</b> | ---  | ---       | <b>V</b>  |
| <b>BV<sub>CEO</sub></b>        | <b>I<sub>C</sub> = 100mA</b> | <b>I<sub>B</sub> = 0mA</b>  | <b>55</b>  | ---  | ---       | <b>V</b>  |
| <b>BV<sub>EBO</sub></b>        | <b>I<sub>E</sub> = 10mA</b>  | <b>I<sub>C</sub> = 0mA</b>  | <b>4.0</b> | ---  | ---       | <b>V</b>  |
| <b>I<sub>CEO</sub></b>         | <b>V<sub>CE</sub> = 30V</b>  | <b>I<sub>E</sub> = 0 mA</b> | ---        | ---  | <b>5</b>  | <b>mA</b> |
| <b>I<sub>CES</sub></b>         | <b>V<sub>CE</sub> = 60V</b>  | <b>I<sub>E</sub> = 0mA</b>  | ---        | ---  | <b>5</b>  | <b>mA</b> |
| <b>h<sub>FE</sub></b>          | <b>V<sub>CE</sub> = 6V</b>   | <b>I<sub>C</sub> = 1.4A</b> | <b>15</b>  | ---  | <b>50</b> | ---       |
| <b>h<sub>FE</sub>, MS1008A</b> | <b>V<sub>CE</sub> = 6V</b>   | <b>I<sub>C</sub> = 1.4A</b> | <b>20</b>  |      | <b>30</b> |           |

### DYNAMIC

| Symbol                 | Test Conditions                  |                              |                               | Value      |      |            | Unit        |
|------------------------|----------------------------------|------------------------------|-------------------------------|------------|------|------------|-------------|
|                        |                                  |                              |                               | Min.       | Typ. | Max.       |             |
| <b>P<sub>OUT</sub></b> | <b>f = 30 MHz</b>                | <b>V<sub>CE</sub> = 50V</b>  | <b>I<sub>CQ</sub> = 150mA</b> | <b>150</b> | ---  | ---        | <b>WPEP</b> |
| <b>G<sub>P</sub></b>   | <b>P<sub>OUT</sub> = 150WPEP</b> | <b>V<sub>CE</sub> = 50V</b>  | <b>I<sub>CQ</sub> = 150mA</b> | <b>14</b>  | ---  | ---        | <b>dB</b>   |
| <b>IMD</b>             | <b>P<sub>OUT</sub> = 150WPEP</b> | <b>V<sub>CE</sub> = 50V</b>  | <b>I<sub>CQ</sub> = 150mA</b> | ---        |      | <b>-30</b> | <b>dBc</b>  |
| <b>η<sub>C</sub></b>   | <b>P<sub>OUT</sub> = 150WPEP</b> | <b>V<sub>CE</sub> = 50V</b>  | <b>I<sub>CQ</sub> = 150mA</b> | <b>37</b>  | ---  | ---        | <b>%</b>    |
| <b>C<sub>OB</sub></b>  | <b>f = 1 MHz</b>                 | <b>V<sub>CB</sub> = 50 V</b> |                               | ---        | ---  | <b>220</b> | <b>pF</b>   |

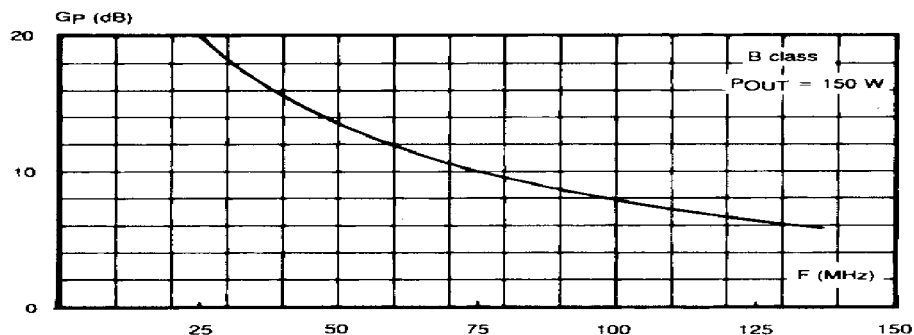
Conditions: **f<sub>1</sub> = 30.000MHz** **f<sub>2</sub> = 30.001MHz**

## TYPICAL PERFORMANCE

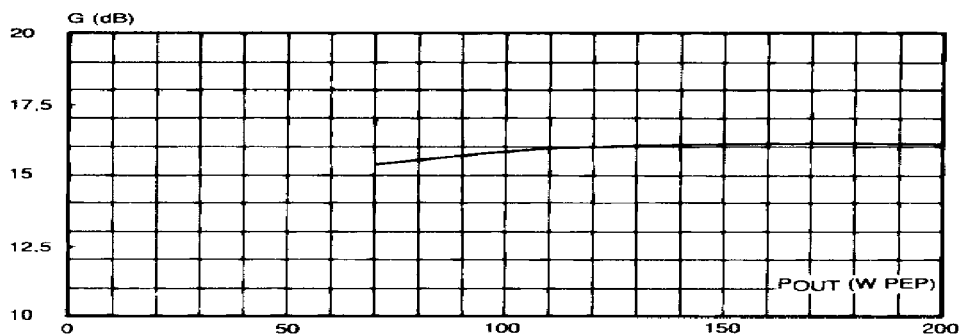


## TYPICAL PERFORMANCE

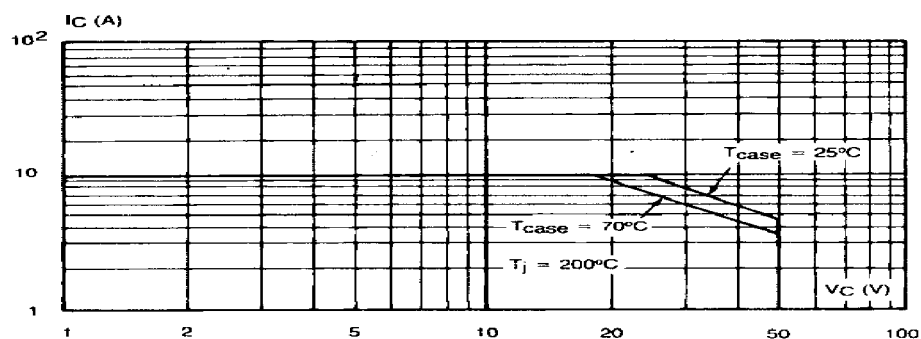
**POWER GAIN vs FREQUENCY**



**POWER GAIN vs POWER OUTPUT PEP**

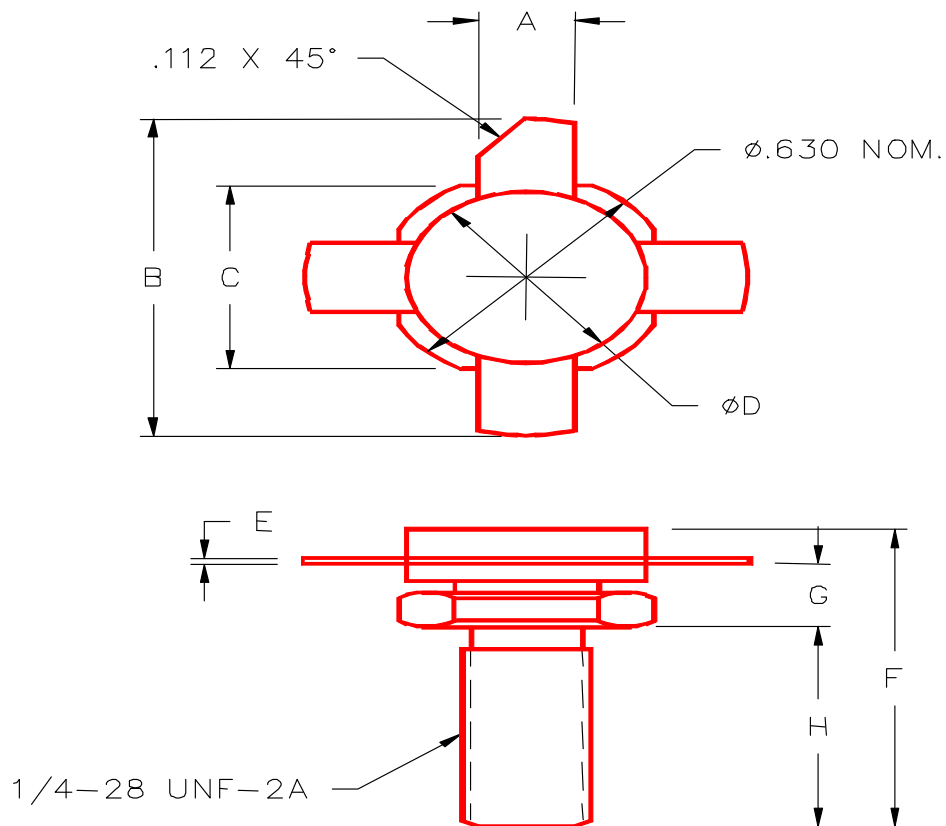


**SAFE OPERATING AREA**



## PACKAGE MECHANICAL DATA

### PACKAGE STYLE M164



|   | MINIMUM<br>INCHES/MM | MAXIMUM<br>INCHES/MM |  | MINIMUM<br>INCHES/MM | MAXIMUM<br>INCHES/MM |
|---|----------------------|----------------------|--|----------------------|----------------------|
| A | .220/5,59            | .230/5,84            |  |                      |                      |
| B |                      | 1.050/26,67          |  |                      |                      |
| C | .545/13,84           | .555/14,10           |  |                      |                      |
| D | .495/12,57           | .505/12,83           |  |                      |                      |
| E | .003/0,08            | .007/0,18            |  |                      |                      |
| F |                      | .810/20,57           |  |                      |                      |
| G | .185/4,70            | .198/5,03            |  |                      |                      |
| H | .497/12,62           | .530/13,46           |  |                      |                      |

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