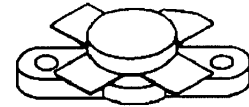


# MS1051

## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

### Features

- 30 MHz
- 12.5 VOLTS
- P<sub>OUT</sub> = 100 WATTS
- G<sub>PE</sub> = 12.0 dB MINIMUM
- IMD = -30 dBc
- GOLD METALLIZATION
- COMMON EMITTER CONFIGURATION

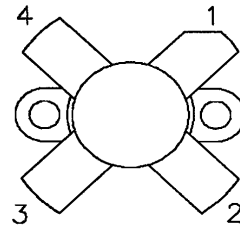


.500 4LFL (M174)  
epoxy sealed

### DESCRIPTION:

The MS1051 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for HF communications. This device utilizes state-of-the-art diffused emitter ballasting to achieve extreme ruggedness under severe operating conditions.

### PIN CONNECTION



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

### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)

| Symbol            | Parameter                 | Value       | Unit |
|-------------------|---------------------------|-------------|------|
| V <sub>CBO</sub>  | Collector-Base Voltage    | 36          | V    |
| V <sub>CEO</sub>  | Collector-Emitter Voltage | 18          | V    |
| V <sub>EBO</sub>  | Emitter-Base Voltage      | 4.0         | V    |
| I <sub>C</sub>    | Device Current            | 20          | A    |
| P <sub>DISS</sub> | Power Dissipation         | 290         | W    |
| T <sub>J</sub>    | Junction Temperature      | +200        | °C   |
| T <sub>STG</sub>  | Storage Temperature       | -65 to +150 | °C   |

### THERMAL DATA

|                      |                                  |     |      |
|----------------------|----------------------------------|-----|------|
| R <sub>TH(J-C)</sub> | Thermal Resistance Junction-case | 0.6 | °C/W |
|----------------------|----------------------------------|-----|------|

Revision B, January 2010

**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>36</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>36</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>18</b>  | ---  | ---        | <b>V</b>  |
| <b>BV<sub>EBO</sub></b> | <b>I<sub>E</sub> = 20mA</b> <b>I<sub>C</sub> = 0mA</b>  | <b>4.0</b> | ---  | ---        | <b>V</b>  |
| <b>I<sub>CES</sub></b>  | <b>V<sub>CE</sub> = 15V</b> <b>I<sub>C</sub> = 0mA</b>  | ---        | ---  | <b>20</b>  | <b>mA</b> |
| <b>h<sub>FE</sub></b>   | <b>V<sub>CE</sub> = 5V</b> <b>I<sub>C</sub> = 5mA</b>   | <b>10</b>  | ---  | <b>200</b> | ---       |

**DYNAMIC**

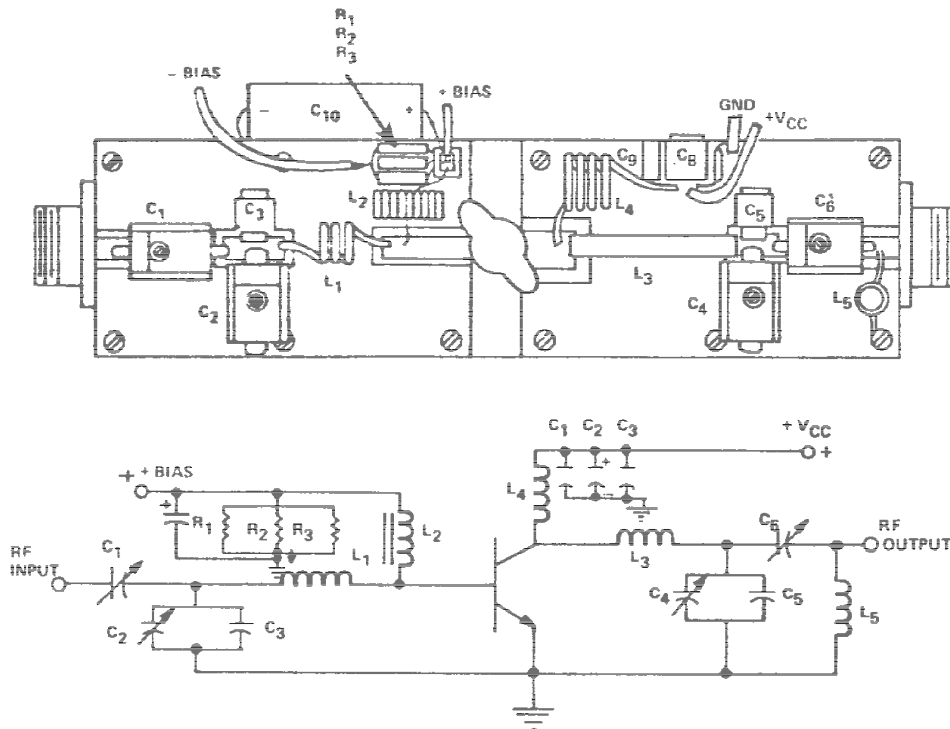
| Symbol                  | Test Conditions   | Value      |            |            | Unit       |
|-------------------------|---|------------|------------|------------|------------|
|                         |   | Min.       | Typ.       | Max.       |            |
| <b>P<sub>OUT</sub></b>  | <b>f = 30 MHz</b> <b>V<sub>CE</sub> = 12.5 V</b> <b>I<sub>CQ</sub> = 150mA</b>                  | <b>100</b> | ---        | ---        | <b>W</b>   |
| <b>G<sub>P</sub></b>    | <b>f = 30 MHz</b> <b>V<sub>CE</sub> = 12.5 V</b> <b>I<sub>CQ</sub> = 150mA</b>                  | <b>11</b>  | <b>13</b>  | ---        | <b>dB</b>  |
| <b>IMD<sub>3</sub>*</b> | <b>P<sub>OUT</sub> = 100 W PEP</b> <b>V<sub>CE</sub> = 12.5 V</b> <b>I<sub>CQ</sub> = 150mA</b> | ---        | ---        | <b>-30</b> | <b>dBc</b> |
| <b>C<sub>OB</sub></b>   | <b>f = 1 MHz</b> <b>V<sub>CB</sub> = 12.5 V</b>   | ---        | <b>400</b> | ---        | <b>pf</b>  |

Conditions: f1 = 30.000MHz    f2 = 30.001MHz

**IMPEDANCE DATA**

| FREQ   | $Z_{IN}(\Omega)$ | $Z_{CL}(\Omega)$ |
|--------|------------------|------------------|
| 30 MHz | $0.57 + j 0.78$  | $0.80 + j 0.43$  |

$P_{OUT} = 100$  WPEP,  $V_{CE} = 12.5$  V

**TEST CIRCUIT**


C1 : 9 - 180pF Arco 463  
 C2 : 5 - 380pF Arco 465  
 C3 : 200pF Arco 465  
 C4, C6 : 170pF Arco 469  
 C7 : 0.1 $\mu$ F Ceramic Disc  
 C5, C8 : 1000pF Unelco  
 C9 : 10 $\mu$ F Electrolytic, 35Vdc  
 C10 : 1000 $\mu$ F Electrolytic, 35Vdc

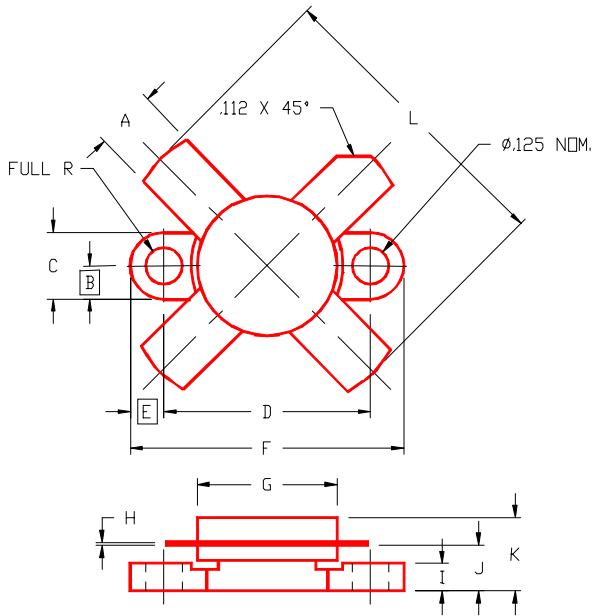
L3 : Copper Strap 1/4" Widht, Length 1 1/2, Height 1/2"  
 L4 : 4 Turns, #16 AWG, Enameled Wire 3/8" I.D.  
 L5 : 5 Turns, #18 AWG on 1/4" I.D. Coil Form Length 1/2", Ferrite Slug

R1, R2, R3 : 1.5 Ohm, 1 Watt Carbon

L1 : 2 1/2 Turns, #14 AWG, I.D. Loose Wound  
 L2 : 16 Turns, #16 AWG, Enameled Wire on Micrometals Torroid #T-94

# MS1051

## PACKAGE MECHANICAL DATA



PACKAGE STYLE M174

|   | MINIMUM<br>INCHES/MM | MAXIMUM<br>INCHES/MM |   | MINIMUM<br>INCHES/MM | MAXIMUM<br>INCHES/MM |
|---|----------------------|----------------------|---|----------------------|----------------------|
| A | .220/5,59            | .230/5,84            | I | .090/2,29            | .110/2,79            |
| B | .125/3,18            |                      | J | .160/4,06            | .175/4,45            |
| C | .245/6,22            | .255/6,48            | K |                      | .280/7,11            |
| D | .720/18,28           | .730/18,54           | L |                      | 1.050/26,67          |
| E | .125/3,18            |                      |   |                      |                      |
| F | .970/24,64           | .980/24,89           |   |                      |                      |
| G | .495/12,57           | .505/12,83           |   |                      |                      |
| H | .003/0,08            | .007/0,18            |   |                      |                      |