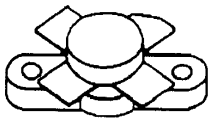
# MS1076

## RF & MICROWAVE TRANSISTORS
## HF SSB APPLICATIONS



.500 4LFL (M174)
epoxy sealed

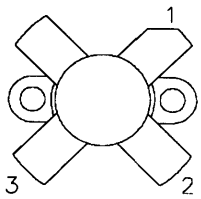
## Features

- 30 MHz
- 28 VOLTS
- GOLD METALLIZATION
- $P_{OUT}$ = 220 W PEP
- $G_P$ = 12 dB GAIN MINIMUM
- COMMON EMITTER CONFIGURATION

## DESCRIPTION:

**The MS1076 is a 28 volt epitaxial NPN silicon planar transistor designed primarily for SSB and VHF communications. This device utilizes an emitter ballasted die geometry for maximum ruggedness and reliability.**

PIN CONNECTION




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

## ABSOLUTE MAXIMUM RATINGS (Tcase = 25°C)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector - Base Voltage | 70 | V |
| $V_{CEO}$ | Collector - Emitter Voltage | 35 | V |
| $V_{EBO}$ | Emitter - Base Voltage | 4.0 | V |
| $I_C$ | Device Current | 16 | A |
| $P_{DISS}$ | Power Dissipation | 250 | W |
| $T_J$ | Junction Temperature | +200 | °C |
| $T_{STG}$ | Storage Temperature | - 65 to +150 | °C |

## Thermal Data

| | | | |
|---|---|---|---|
| $R_{TH(J-C)}$ | Junction - Case Thermal Resistance | 0.7 | °C/W |

Rev A: October 2009

# MS1076

## ELECTRICAL SPECIFICATIONS (Tcase = 25°C)

### STATIC

| Symbol | Test Conditions | Value | | | |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | Unit |
| $BV_{CES}$ | $I_C$ = 100 mA | 70 | --- | --- | V |
| $BV_{CEO}$ | $I_C$ = 200 mA | 35 | --- | --- | V |
| $BV_{EBO}$ | $I_E$ = 20 mA | 4.0 | --- | --- | V |
| $I_{CEO}$ | $V_{CE}$ = 30 V | --- | --- | 5 | mA |
| $I_{CES}$ | $V_{CE}$ = 35 V | --- | --- | 5 | mA |
| $H_{FE}$ | $V_{CE}$ = 5 V, $I_C$ = 7 A | 15 | --- | 60 | --- |

### DYNAMIC

| Symbol | Test Conditions | | | Value | | | |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Unit |
| $P_{OUT}$ | f = 30 MHz | $V_{CE}$ = 28 V | $I_{CQ}$ = 750 mA | 220 | --- | --- | WPEP |
| $G_P$ | f = 30 MHz | $V_{CE}$ = 28 V | $I_{CQ}$ = 750 mA | 12 | --- | --- | dB |
| $\eta_C$ | f = 30 MHz | $V_{CE}$ = 28 V | $I_{CQ}$ = 750 mA | 40 | --- | --- | % |
| IMD | f = 30 MHz | $V_{CE}$ = 28 V | $I_{CQ}$ = 750 mA | --- | --- | -30 | dBc |
| $C_{OB}$ | f = 1 MHz | $V_{CB}$ = 28 V | | --- | 450 | --- | pf |
| Conditions | f1 = 30.000 MHz | f2 = 30.001 MHz | | | | | |

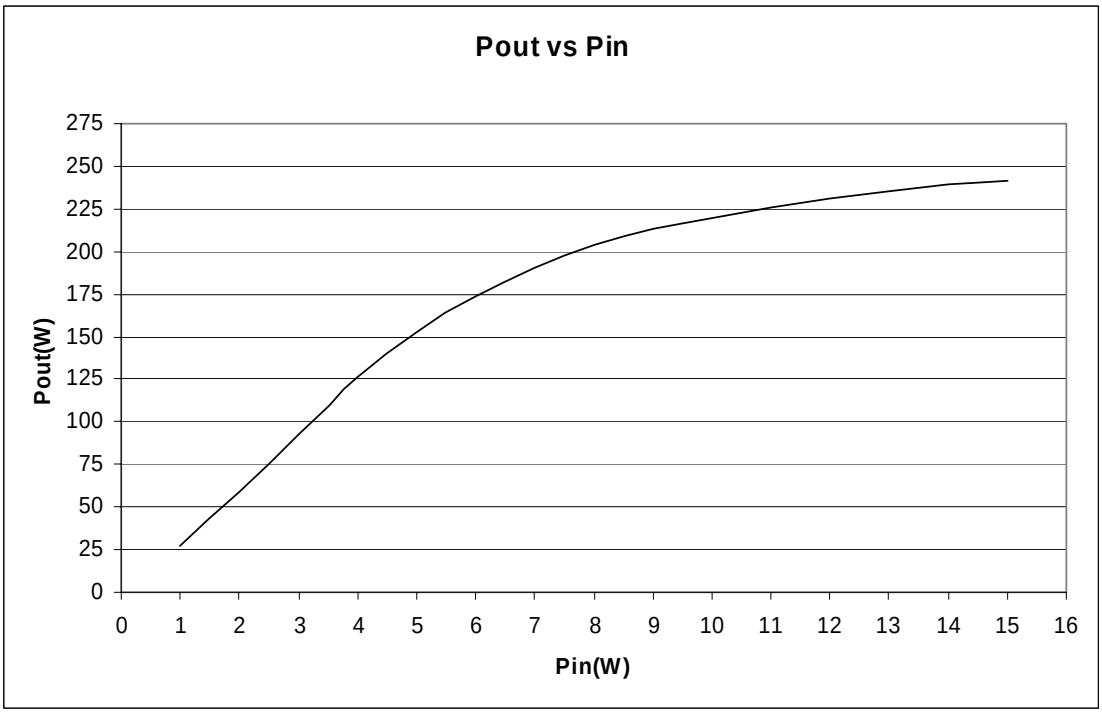
**HFE BINNING (marked on lid with appropriate letter):**

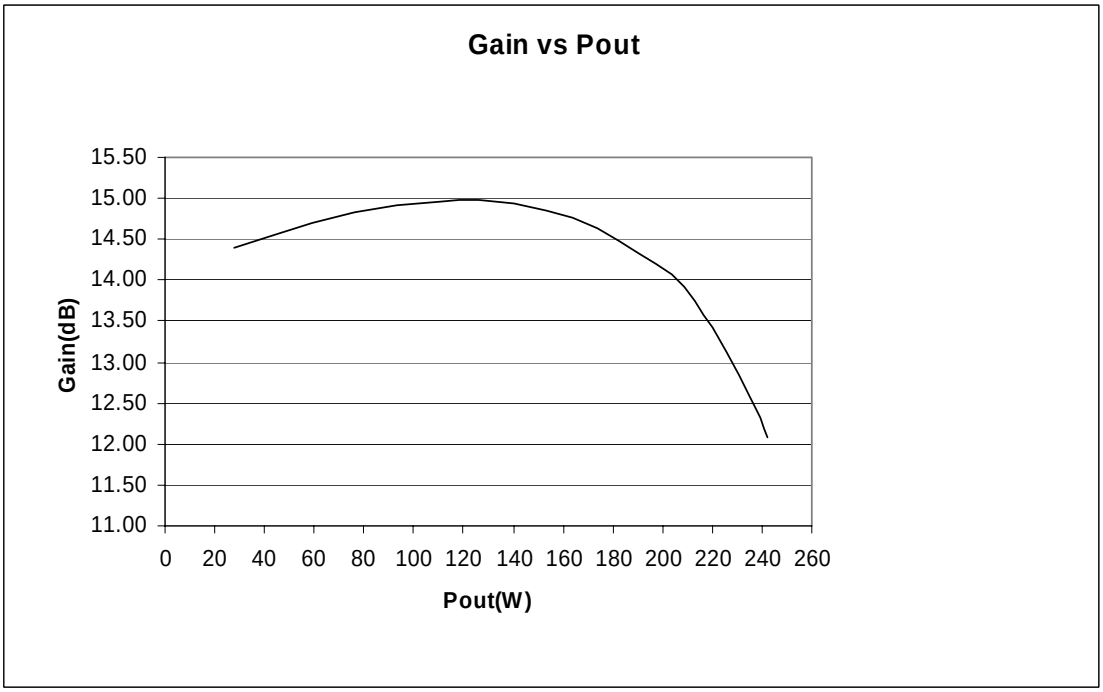
| | | |
|---|---|---|
| A = 15-19 | D = 27-32 | G = 45-50 |
| B = 19-22.5 | E = 32-38 | H = 50-55 |
| C = 22.5-27 | F = 38-45 | I = 55-60 |

## IMPEDANCE DATA

| FREQ | $Z_{IN}$ | $Z_{CL}$ |
|---|---|---|
| 30 MHz | 1.2 + j0.41 | 1.25 + j1.92 |

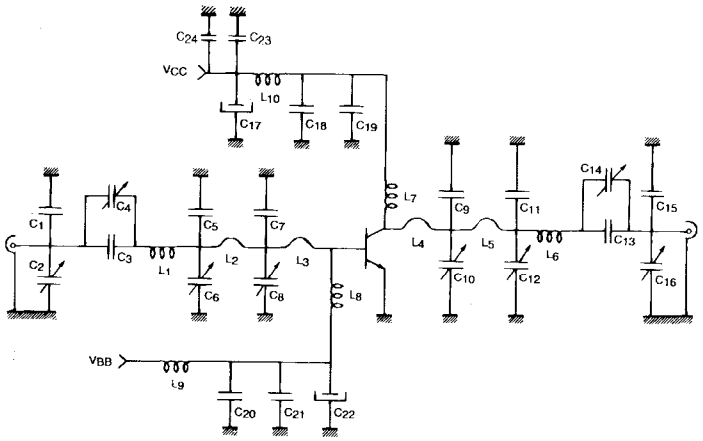
# TYPICAL PERFORMANCE



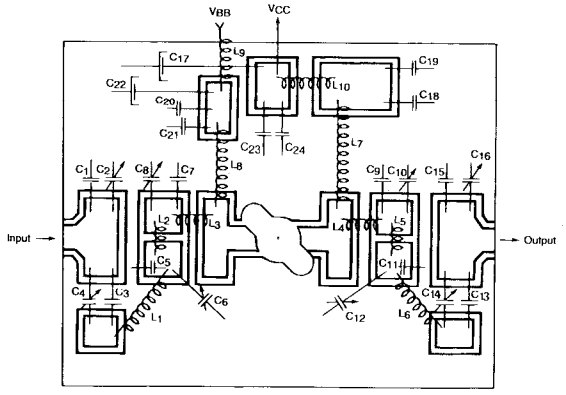
# TEST CIRCUIT

**TEST CIRCUIT**

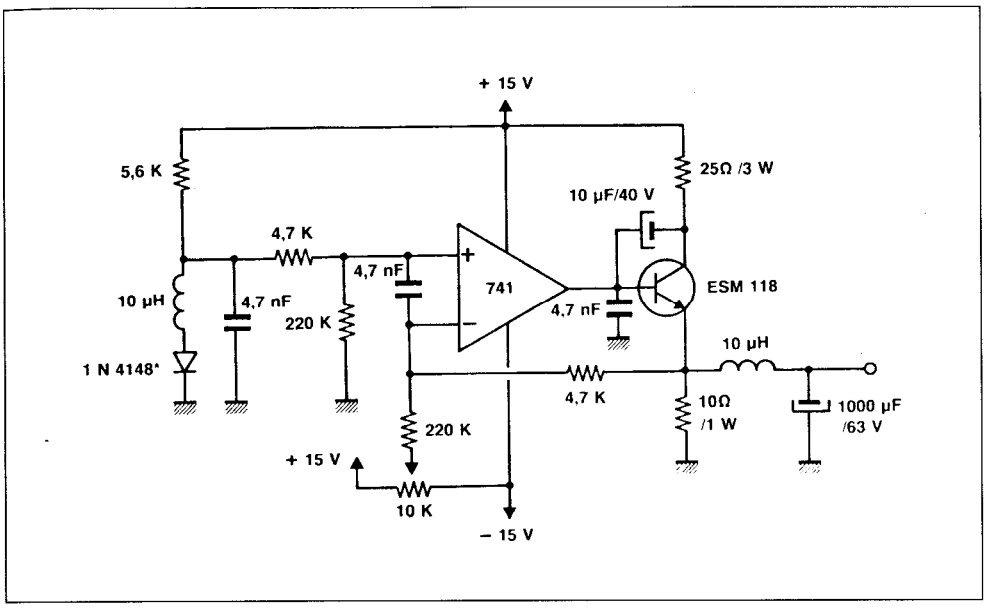



| | | |
|---|---|---|
| C1 | : | 180pF |
| C2, C4, C6, C8, C10, C12 | : | Arco 428 |
| C14, C16 | : | Arco 428 |
| C3 | : | 820pF |
| C5, C13 | : | 680pF |
| C7, C11 | : | 1.2nF |
| C9 | : | 1.5nF |
| C17, C22 | : | 470µF, 40V |
| C18 | : | 10nF |
| C19, C21 | | |
| C23 | : | 1nF |
| C20, C24 | : | 100nF, 63V |

| | | |
|---|---|---|
| L1 | : | 3 Turns, Diameter 10mm, 1.3mm Wire, Length 10mm |
| L2, L5 | : | Hair Pin Copper foil 40 x 5mm, 0.2mm Thick |
| L3, L4 | : | Hair Pin Copper Foil 10 x 5mm, 0.2mm Thick |
| L6 | : | 5 Turns, Diameter 10mm, 1.3mm Wire, Length 15mm |
| L7 | : | 3 Turns, Diameter 10mm, 1.3mm Wire, Length 25mm |
| L8 | : | Choke |
| L9 | : | Choke |
| L10 | : | Choke |

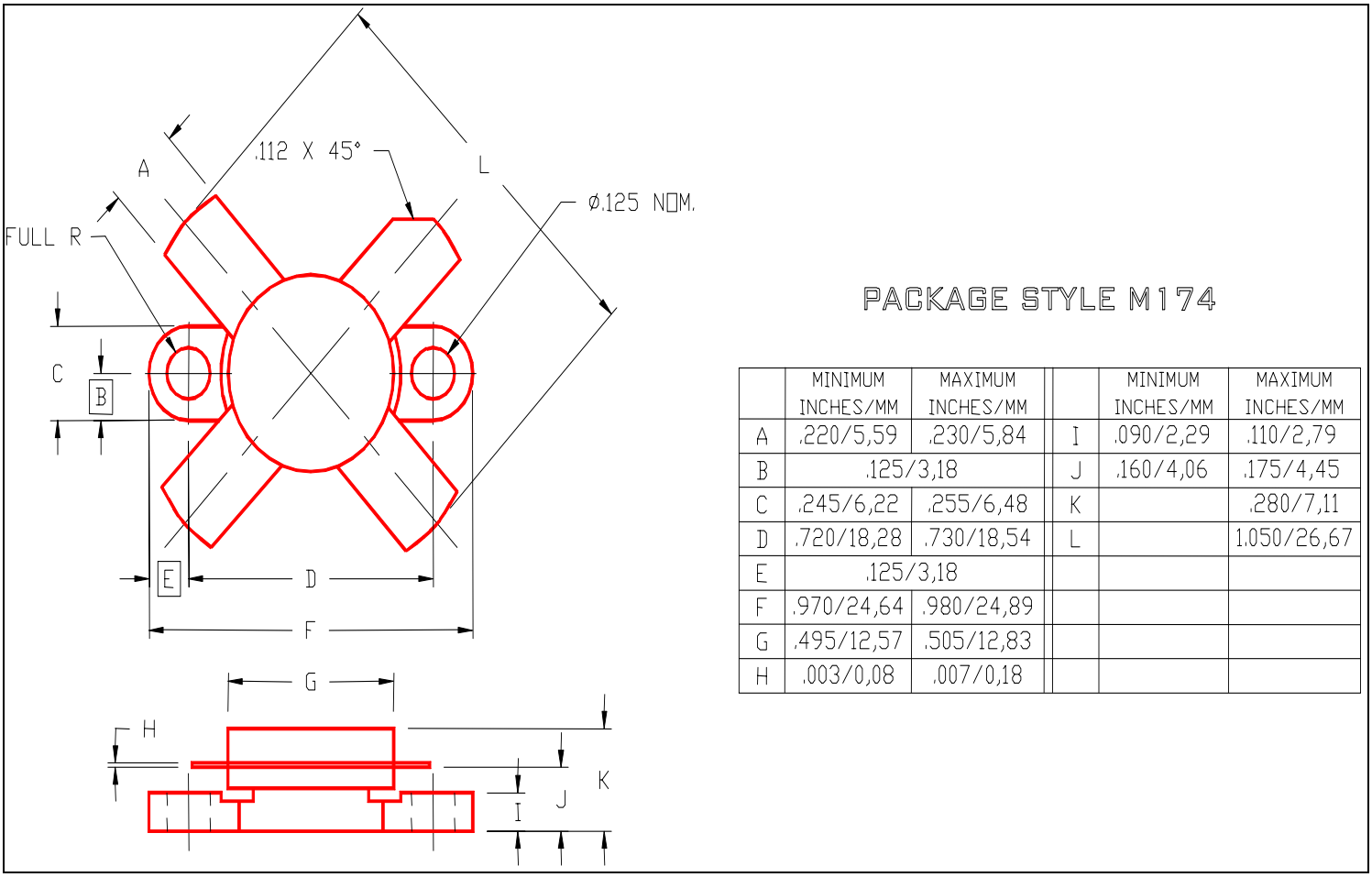


## BIAS CIRCUIT



**MS1076**

## PACKAGE MECHANICAL DATA




PACKAGE STYLE M174

| | MINIMUM INCHES/MM | MAXIMUM INCHES/MM | | MINIMUM INCHES/MM | MAXIMUM 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 | | | |