Microsemi

RF PRODUCTS DIVISION

# SD1012-03

## RF & MICROWAVE TRANSISTORS

**PRODUCT PREVIEW**

## DESCRIPTION

The SD1012-03 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for VHF communications in the 36 – 175 MHz frequency range. Emitter ballasting is employed to achieve excellent ruggedness under severe load mismatch conditions.

**IMPORTANT:** For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

## KEY FEATURES

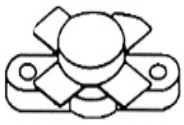
- 175 MHz
- 12.5 Volts
- Efficiency 50%
- Common Emitter
- $P_{OUT}$ = 6 W Min.
- $G_P$ = 9 dB Gain

## APPLICATIONS/BENEFITS

- VHF Mobile Applications

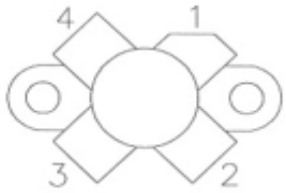
## ABSOLUTE MAXIMUM RATINGS ($T_{CASE}$ = 25°C)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 36 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 18 | V |
| $V_{CES}$ | Collector-Emitter Voltage | 36 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 4.0 | V |
| $I_C$ | Device Current | 1.8 | A |
| $P_{DISS}$ | Power Dissipation (+25°C) | 20 | W |
| $T_J$ | Junction Temperature | +200 | °C |
| $T_{STG}$ | Storage Temperature | -65 to +150 | °C |



.380 4LFL (M113)
epoxy sealed

PIN CONNECTION




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

## THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance | 8.75 | °C/W |

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SD1012-03

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*Microsemi*
RF Products Division
140 Commerce Drive, Montgomeryville PA 18936, (215) 631-9840, Fax: (215) 631-9855

## STATIC ELECTRICAL SPECIFICATIONS ($T_{CASE}$ = 25°C)

| Symbol | Test Conditions | SD1012-03 | | | Units |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| $BV_{CES}$ | $I_C$ = 5 mA | 36 | — | — | V |
| $BV_{CEO}$ | $I_C$ = 10 mA | 18 | — | — | V |
| $BV_{EBO}$ | $I_E$ = 1 mA | 4.0 | — | — | V |
| $I_{CES}$ | $V_{CB}$ =15 V | — | — | 1.0 | mA |
| $h_{FE}$ | $V_{CE}$ = 5 V $I_C$ = 250 mA | 5 | — | — | — |

## DYMANIC ELECTRICAL SPECIFICATIONS ($T_{CASE}$ = 25°C)

| Symbol | Test Conditions | SD1012-03 | | | Units |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| $P_{OUT}$ | f = 175 MHz $P_{IN}$ = 0.75 W $V_{CC}$ = 12.5 V | 6.0 | — | — | W |
| $\eta_C$ | f = 175 MHz $P_{IN}$ = 0.75 W $V_{CC}$ = 12.5 V | 50 | — | — | % |
| $G_P$ | f = 175 MHz $P_{IN}$ = 0.75 W $V_{CC}$ = 12.5 V | 9.0 | — | — | dB |
| $C_{OB}$ | f = 1 MHz $V_{CB}$ = 15 V | — | — | 20 | pF |

## IMPEDANCE DATA

| Freq. | $Z_{IN}$ (Ω) | $Z_{CL}$ (Ω) |
|---|---|---|
| 150 MHz | 4.90 + j 3.46 | 11.4 + j 4.56 |
| 175 MHz | 4.32 + j 3.04 | 13.0 + j 7.81 |

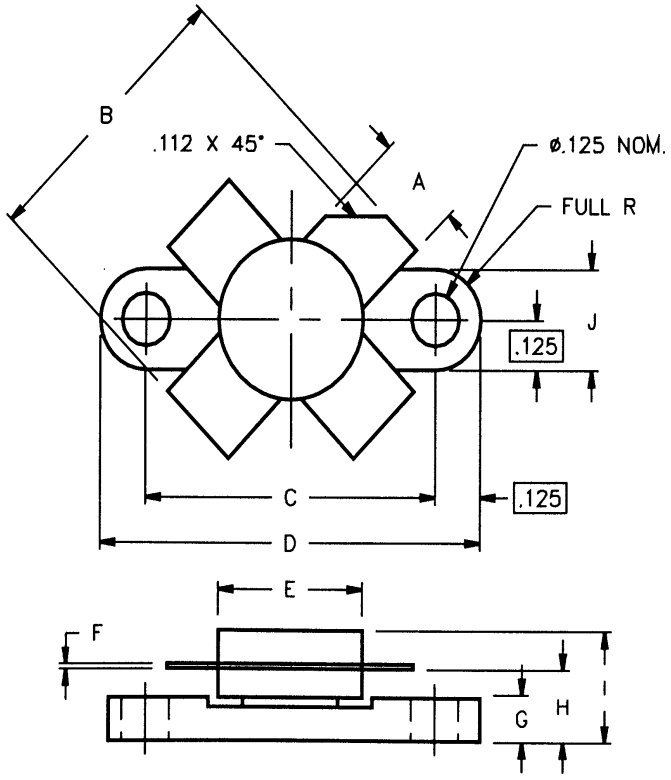
$V_{CC}$ = 12.5 V
$P_{IN}$ = 1 W



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## PACKAGE STYLE M 113




| | MINIMUM INCHES/MM | MAXIMUM INCHES/MM | | MINIMUM INCHES/MM | MAXIMUM INCHES/MM |
|---|---|---|---|---|---|
| A | .220/5,59 | .230/5,84 | I | | .260/7,11 |
| B | .785/19,94 | | J | .240/6,10 | .255/6,48 |
| C | .720/18,29 | .730/18,54 | | | |
| D | .970/24,64 | .980/24,89 | | | |
| E | | .385/9,78 | | | |
| F | .004/0,10 | .006/0,15 | | | |
| G | .085/2,16 | .105/2,67 | | | |
| H | .160/4,06 | .180/4,57 | | | |



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