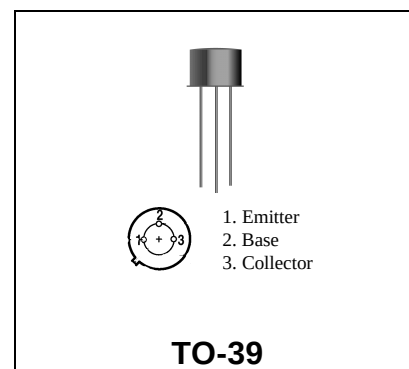


## RF & MICROWAVE DISCRETE LOW POWER TRANSISTORS

### Features

- Silicon NPN, To-39 packaged VHF/UHF Transistor
- $F_{tau} = 3.0 \text{ GHz (typ) @ 300MHz, 14v, 90mA,}$
- $G_{U \text{ max}} = 12.5\text{dB (typ) @ 300 MHz, 15v, 40mA}$
- $|S_{21}|^2 = 12.5\text{dB (typ) @ 300 MHz, 15v, 40mA}$



### DESCRIPTION:

Silicon NPN transistor, designed for VHF and UHF equipment. Applications include amplifier; pre-driver, driver, and output stages. Also suitable for oscillator and frequency-multiplier functions.

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

| Symbol    | Parameter              | Value | Unit |
|-----------|------------------------|-------|------|
| $V_{CEO}$ | Collector-Emitter      | 20    | Vdc  |
| $V_{CBO}$ | Collector-Base Voltage | 35    | Vdc  |
| $V_{EBO}$ | Emitter-Base Voltage   | 3.0   | Vdc  |
| $I_C$     | Collector Current      | 200   | mA   |

### Thermal Data

|       |                                                                                        |             |                               |
|-------|----------------------------------------------------------------------------------------|-------------|-------------------------------|
| $P_D$ | Total Device Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | 1.0<br>5.71 | Watts<br>mW/ $^\circ\text{C}$ |
|-------|----------------------------------------------------------------------------------------|-------------|-------------------------------|

ELECTRICAL SPECIFICATIONS (Tcase = 25°C)

STATIC  
(off)

| Symbol | Test Conditions                                        | Value |      |      | Unit |
|--------|--------------------------------------------------------|-------|------|------|------|
|        |                                                        | Min.  | Typ. | Max. |      |
| BVCEO  | Collector-Emitter Breakdown Voltage<br>(IC = 5.0 mAdc) | 20    | -    | -    | Vdc  |
| BVEBO  | Emitter-Base Breakdown Voltage<br>(IC = 0.1 mAdc)      | 3.0   | -    | -    | Vdc  |
| BVCBO  | Collector-Base Breakdown Voltage<br>(IC = 1.0 mAdc)    | 30    | -    | -    | Vdc  |
| ICBO   | Collector-Base<br>(VCB = 10 Vdc)                       | -     | 50   | -    | μA   |

(on)

|     |                                                  |    |   |     |   |
|-----|--------------------------------------------------|----|---|-----|---|
| HFE | DC Current Gain<br>(IC = 50 mAdc, VCE = 5.0 Vdc) | 50 | - | 200 | - |
|-----|--------------------------------------------------|----|---|-----|---|

DYNAMIC

| Symbol         | Test Conditions                                                               | Value |      |      | Unit |
|----------------|-------------------------------------------------------------------------------|-------|------|------|------|
|                |                                                                               | Min.  | Typ. | Max. |      |
| f <sub>T</sub> | Current-Gain - Bandwidth Product<br>(IC = 90 mAdc, VCE = 14 Vdc, f = 300 MHz) | -     | 3.0  | -    | GHz  |
| CCB            | Collector Base Capacitance<br>VCB = 10V, IE = 0, f = 1.0MHz                   |       | 3.0  |      | pF   |

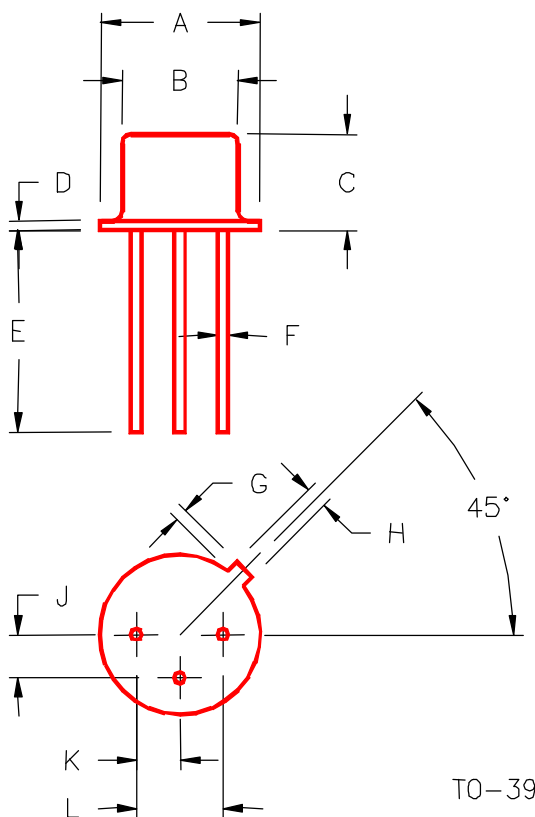
FUNCTIONAL

| Symbol       | Test Conditions             |                                           | Value |      |      | Unit |
|--------------|-----------------------------|-------------------------------------------|-------|------|------|------|
|              |                             |                                           | Min.  | Typ. | Max. |      |
| $G_{U \max}$ | Maximum Unilateral Gain (1) | IC = 40 mAdc, VCE = 15Vdc,<br>f = 300 MHz | -     | 12.5 | -    | dB   |
| MAG          | Maximum Available Gain      | IC = 40 mAdc, VCE = 15Vdc,<br>f = 300 MHz | -     | 13.5 | -    | dB   |
| $ S_{21} ^2$ | Insertion Gain              | IC = 40 mAdc, VCE = 15Vdc,<br>f = 300 MHz | 10    | 11.5 | -    | dB   |

**Table 1. Common Emitter S-Parameters, @ VCE = 15 V, IC = 40 mA**

| f<br>(MHz) | S11  |               | S21   |               | S12  |               | S22  |               |
|------------|------|---------------|-------|---------------|------|---------------|------|---------------|
|            | S11  | $\angle \phi$ | S21   | $\angle \phi$ | S12  | $\angle \phi$ | S22  | $\angle \phi$ |
| 100        | .096 | 107           | 10.28 | 103           | .053 | 84            | .479 | -40           |
| 200        | .129 | 114           | 5.58  | 89            | .104 | 83            | .361 | -49           |
| 300        | .165 | 108           | 3.94  | 79            | .160 | 76            | .356 | -56           |
| 400        | .185 | 115           | 3.04  | 71            | .192 | 74            | .388 | -71           |
| 500        | .237 | 115           | 2.64  | 67            | .246 | 75            | .384 | -79           |
| 600        | .247 | 112           | 2.42  | 60            | .288 | 71            | .408 | -82           |
| 700        | .247 | 113           | 2.26  | 54            | .326 | 69            | .417 | -84           |
| 800        | .238 | 118           | 2.06  | 48            | .334 | 67            | .432 | -87           |
| 900        | .260 | 119           | 1.97  | 47            | .369 | 71            | .420 | -91           |
| 1000       | .246 | 116           | 2.06  | 43            | .405 | 67            | .444 | -92           |

PACKAGE STYLE M246



T0-39

|   | MINIMUM<br>INCHES/MM | MAXIMUM<br>INCHES/MM |   | MINIMUM<br>INCHES/MM | MAXIMUM<br>INCHES/MM |
|---|----------------------|----------------------|---|----------------------|----------------------|
| A | .350/8,89            | .370/9,40            | J | .095/2,41            | .105/2,67            |
| B | .315/8,00            | .335/8,51            | K | .095/2,41            | .105/2,67            |
| C | .240/6,10            | .260/6,60            | L | .190/4,83            | .210/5,33            |
| D | .015/0,38            | .045/1,14            |   |                      |                      |
| E | .500/12,70           |                      |   |                      |                      |
| F | .016/0,41            | .019/0,48            |   |                      |                      |
| G | .029/0,74            | .040/1,02            |   |                      |                      |
| H | .028/0,71            | .034/0,86            |   |                      |                      |