



## PNP Silicon VHF-UHF Amplifier Transistors

Qualified per MIL-PRF-19500/426

Qualified Levels:  
JAN, JANTX,  
and JANTXV

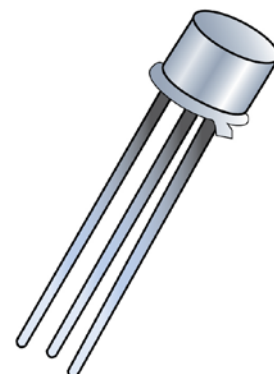
### DESCRIPTION

The 2N4957 is a military qualified silicon PNP amplifier transistor designed for VHF-UHF equipment and other high-reliability applications. Common applications include high gain low noise amplifier; oscillator, and mixer applications. It is also available in a low-profile UB surface mount package.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- JEDEC registered 2N4957
- JAN, JANTX, and JANTXV military qualified versions are available per MIL-PRF-19500/426 (See [part nomenclature](#) for all available options)
- RoHS compliant version available (commercial grade only)



**TO-72 Package**

Also available in:

 **UB Package**  
(surface mount)  
[2N4957UB](#)

### APPLICATIONS / BENEFITS

- Low-power, ultra-high frequency transistor
- Leaded metal TO-72 package

### MAXIMUM RATINGS @ $T_A = +25^\circ\text{C}$

| Parameters/Test Conditions             | Symbol              | Value       | Unit             |
|----------------------------------------|---------------------|-------------|------------------|
| Junction and Storage Temperature       | $T_J$ and $T_{STG}$ | -65 to +200 | $^\circ\text{C}$ |
| Collector-Emitter Voltage              | $V_{CEO}$           | -30         | V                |
| Collector-Base Voltage                 | $V_{CBO}$           | -30         | V                |
| Emitter-Base Voltage                   | $V_{EBO}$           | -3          | V                |
| Total Power Dissipation <sup>(1)</sup> | $P_T$               | 200         | mW               |
| Collector Current                      | $I_C$               | -30         | mA               |

**Notes:** 1. Derate linearly 1.14 mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$

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### MECHANICAL and PACKAGING

- CASE: Ni plated kovar, Ni cap
- TERMINALS: Gold over nickel plated kovar leads, solder dipped. RoHS compliant versions are available without solder dip on commercial grade only.
- MARKING: Manufacturer's ID, date code, part number
- POLARITY: PNP, see case outline on last page
- WEIGHT: Approximately 0.322 grams
- See [Package Dimensions](#) on last page.

### PART NOMENCLATURE



### SYMBOLS & DEFINITIONS

| Symbol    | Definition                                                                                                                                                                                                                      |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_B$     | Base current: The value of the dc current into the base terminal.                                                                                                                                                               |
| $I_C$     | Collector current: The value of the dc current into the collector terminal.                                                                                                                                                     |
| $I_E$     | Emitter current: The value of the dc current into the emitter terminal.                                                                                                                                                         |
| $T_A$     | Ambient temperature: The air temperature measured below a device, in an environment of substantially uniform temperature, cooled only by natural air convection and not materially affected by reflective and radiant surfaces. |
| $T_C$     | Case temperature: The temperature measured at a specified location on the case of a device.                                                                                                                                     |
| $V_{CB}$  | Collector-base voltage: The dc voltage between the collector and the base.                                                                                                                                                      |
| $V_{CBO}$ | Collector-base voltage, base open: The voltage between the collector and base terminals when the emitter terminal is open-circuited.                                                                                            |
| $V_{CEO}$ | Collector-emitter voltage, base open: The voltage between the collector and the emitter terminals when the base terminal is open-circuited.                                                                                     |
| $V_{EB}$  | Emitter-base voltage: The dc voltage between the emitter and the base.                                                                                                                                                          |
| $V_{EBO}$ | Emitter-base voltage, collector open: The voltage between the emitter and base terminals with the collector terminal open-circuited.                                                                                            |

**ELECTRICAL CHARACTERISTICS @  $T_C = +25^{\circ}\text{C}$** 
**OFF CHARACTERISTICS**

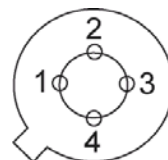
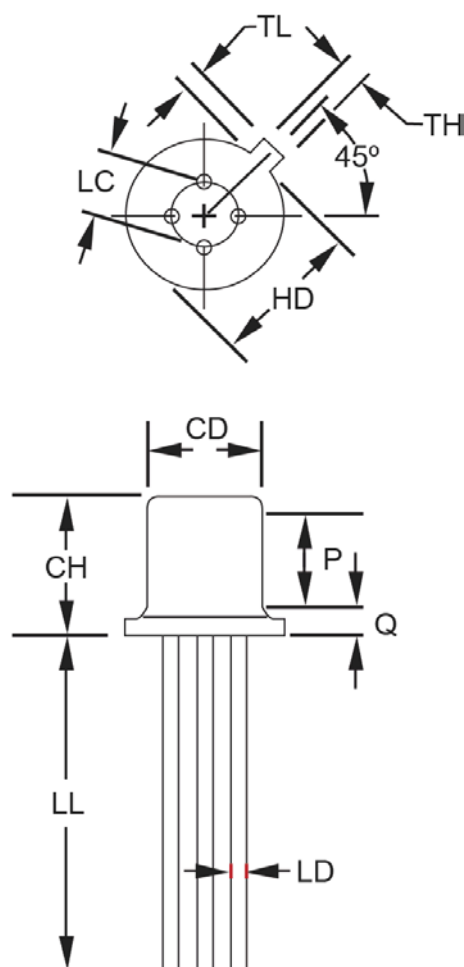
| Test Conditions                                                                                                                          | Symbol        | Value |              | Unit                |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------|--------------|---------------------|
|                                                                                                                                          |               | Min.  | Max.         |                     |
| Collector-Emitter Breakdown Voltage<br>$I_C = -1.0\text{ mA}$ , $I_B = 0$ , Bias condition D                                             | $V_{(BR)CEO}$ | -30   | -            | V                   |
| Collector to Base Cutoff Current<br>$V_{CB} = -20\text{ V}$ , $I_E = 0$ , Bias condition D<br>$V_{CB} = -30\text{ V}$ , Bias condition D | $I_{CBO}$     | -     | -100<br>-100 | nA<br>$\mu\text{A}$ |
| Emitter to Base Cutoff Current<br>$V_{EB} = -3\text{ V}$ , Bias condition D                                                              | $I_{EBO}$     | -     | -100         | $\mu\text{A}$       |

**ON CHARACTERISTICS**

| Test Conditions                                                                                                                                                                                                                                                              | Symbol   | Value                |      | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------|------|------|
|                                                                                                                                                                                                                                                                              |          | Min.                 | Max. |      |
| Forward Current transfer ratio<br>$I_C = -0.5\text{ mA}$ , $V_{CE} = -10\text{ V}$<br>$I_C = -2.0\text{ mA}$ , $V_{CE} = -10\text{ V}$<br>$I_C = -5.0\text{ mA}$ , $V_{CE} = -10\text{ V}$<br>$I_C = -5.0\text{ mA}$ , $V_{CE} = -10\text{ V}$ , $T_A = -55^{\circ}\text{C}$ | $h_{FE}$ | 15<br>20<br>30<br>10 | 165  |      |

**DYNAMIC CHARACTERISTICS**

| Test Conditions                                                                                                                                                  | Symbol     | Value |      | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|------|------|
|                                                                                                                                                                  |            | Min.  | Max. |      |
| Magnitude of common emitter small signal short circuit forward current transfer ratio<br>$V_{CE} = -10\text{ V}$ , $I_E = -2.0\text{ mA}$ , $f = 100\text{ MHz}$ | $ h_{fe} $ | 12    | 36   |      |
| Collector-base time constant<br>$I_E = -2.0\text{ mA}$ , $V_{CB} = -10.0\text{ V}$ , $f = 63.6\text{ MHz}$                                                       | $r_b'C_c$  | 1.0   | 8.0  | ps   |
| Collector to Base – feedback capacitance<br>$I_E = 0\text{ mA}$ , $V_{CB} = -10\text{ V}$ , $100\text{ kHz} \leq f \leq 1\text{ MHz}$                            | $C_{cb}$   |       | 0.8  | pF   |
| Noise Figure (50 Ohms)<br>$I_C = -2.0\text{ mA}$ , $V_{CE} = -10\text{ V}$ , $f = 450\text{ MHz}$ , $R_L = 50\ \Omega$                                           | NF         |       | 3.5  | dB   |
| Small Signal Power Gain (common emitter)<br>$I_C = -2.0\text{ mA}$ , $V_{CE} = -10\text{ V}$ , $f = 450\text{ MHz}$                                              | $G_{pe}$   | 17    | 25   | dB   |

**PACKAGE DIMENSIONS**


| Ltr | Dimensions |       |             |       | Notes |
|-----|------------|-------|-------------|-------|-------|
|     | Inch       |       | Millimeters |       |       |
|     | Min        | Max   | Min         | Max   |       |
| TL  | 0.028      | 0.048 | 0.071       | 1.22  |       |
| TH  | 0.036      | 0.046 | 0.091       | 1.17  |       |
| HD  | 0.209      | 0.230 | 5.31        | 5.84  | 5     |
| CD  | 0.178      | 0.195 | 4.52        | 4.95  | 5     |
| LD  | 0.016      | 0.021 | 0.410       | 0.53  | 7, 8  |
| LC  | 0.100 TP   |       | 2.54 TP     |       | 7, 8  |
| CH  | 0.170      | 0.210 | 4.32        | 5.33  |       |
| LL  | 0.500      | 0.750 | 12.70       | 19.05 | 7, 8  |
| P   | 0.100      |       | 2.54        |       |       |
| Q   | -          | 0.040 | -           | 1.02  | 5     |
|     |            |       |             |       |       |
| 1   | Emitter    |       |             |       |       |
| 2   | Base       |       |             |       |       |
| 3   | Collector  |       |             |       |       |
| 4   | Case       |       |             |       |       |

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for information only.
3. Beyond r (radius) maximum, TH shall be held for a minimum length of 0.011 (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. Leads at gauge plane 0.054 +0.001 -0.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within 0.007 inch (0.18mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC. The device may be measured by direct methods.
7. Dimension LU applies between L1 and L2. Dimension LD applies between L2 and LL minimum. Diameter is uncontrolled in L1 and beyond LL minimum.
8. All four leads.
9. Dimension r (radius) applies to both inside corners of tab.
10. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.
11. Lead 1 = emitter, lead 2 = base, lead 3 = collector, lead 4 = case (electrically connected).

## Данный компонент на территории Российской Федерации

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