

## NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/301

### DEVICES

**2N918      2N918UB**

**LEVELS  
 JAN  
 JANTX  
 JANTXV**

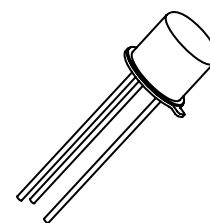
### ABSOLUTE MAXIMUM RATINGS ( $T_C = +25^\circ\text{C}$ unless otherwise noted)

| Parameters / Test Conditions                                       | Symbol               | Value       | Unit             |
|--|----------------------|-------------|------------------|
| Collector-Emitter Voltage  | $V_{CEO}$            | 15          | Vdc              |
| Collector-Base Voltage   | $V_{CBO}$            | 30          | Vdc              |
| Emitter-Base Voltage   | $V_{EBO}$            | 3.0         | Vdc              |
| Collector Current  | $I_C$                | 50          | mAdc             |
| Total Power Dissipation @ $T_A = +25^\circ\text{C}$ <sup>(1)</sup> | $P_T$                | 200         | mW               |
| Operating & Storage Junction Temperature Range                     | $T_{op}$ & $T_{stg}$ | -65 to +200 | $^\circ\text{C}$ |

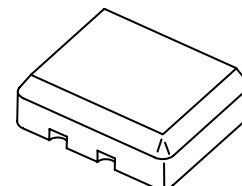
**Note:** 1) Derate linearly 1.14mW/ $^\circ\text{C}$  above  $T_A > 25^\circ\text{C}$

### ELECTRICAL CHARACTERISTICS ( $T_A = +25^\circ\text{C}$ , unless otherwise noted)

| Parameters / Test Conditions   | Symbol        | Min.                 | Max.             | Unit   |
|--|---------------|----------------------|------------------|--|
| <b>OFF CHARACTERISTICS</b>   |               |                      |                  |  |
| Collector-Emitter Breakdown Voltage<br>$I_C = 3\text{mAdc}$  | $V_{(BR)CEO}$ | 15                   |                  | Vdc  |
| Collector-Base Cutoff Current<br>$V_{CB} = 30\text{Vdc}$<br>$V_{CB} = 25\text{Vdc}$<br>$V_{CB} = 25\text{Vdc}; T_A = +150^\circ\text{C}$   | $I_{CBO}$     |                      | 1.0<br>10<br>1.0 | $\mu\text{Adc}$<br>$\eta\text{Adc}$<br>$\mu\text{Adc}$ |
| Emitter-Base Cutoff Current<br>$V_{EB} = 3.0\text{Vdc}$<br>$V_{EB} = 2.5\text{Vdc}$  | $I_{EBO}$     |                      | 10<br>10         | $\mu\text{Adc}$<br>$\eta\text{Adc}$                    |
| Forward-Current Transfer Ratio<br>$I_C = 0.5\text{mAdc}, V_{CE} = 10\text{Vdc}$<br>$I_C = 3.0\text{mAdc}, V_{CE} = 1.0\text{Vdc}$<br>$I_C = 10\text{mAdc}, V_{CE} = 10\text{Vdc}$<br>$I_C = 3.0\text{mAdc}, V_{CE} = 1.0\text{Vdc}; T_A = -55^\circ\text{C}$ | $h_{FE}$      | 10<br>20<br>20<br>10 | 200              |  |
| Collector-Emitter Saturation Voltage<br>$I_C = 10\text{mAdc}, I_B = 1.0\text{mAdc}$  | $V_{CE(sat)}$ |                      | 0.4              | Vdc  |
| Base-Emitter Voltage<br>$I_C = 10\text{mAdc}, I_B = 1.0\text{mAdc}$  | $V_{BE(sat)}$ |                      | 1.0              | Vdc  |



**TO-72  
 2N918**



**3 PIN  
 2N918UB**

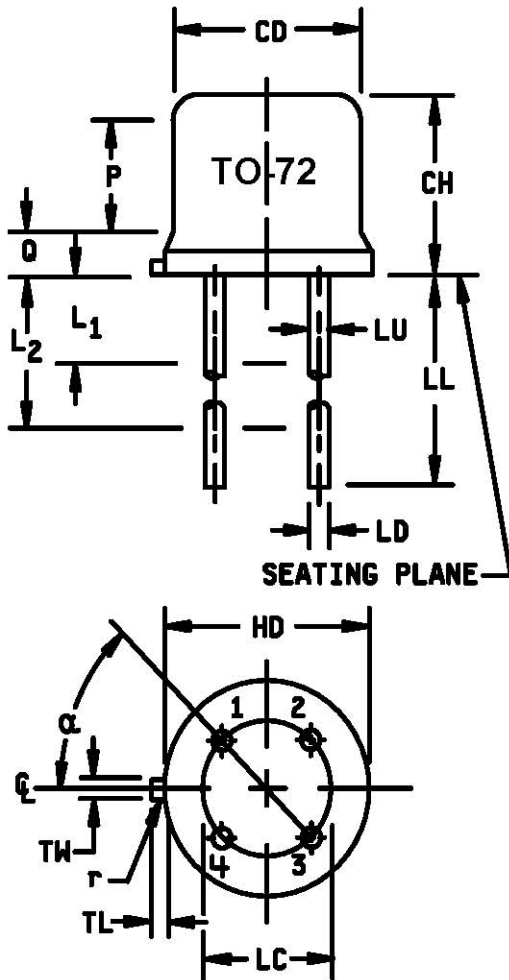
## DYNAMIC CHARACTERISTICS

| Parameters / Test Conditions  | Symbol                   | Min. | Max.       | Unit |
|---|--------------------------|------|------------|------|
| Magnitude of Small-Signal Short-Circuit - Forward Current Transfer Ratio<br>$I_C = 4\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 100\text{MHz}$  | $ h_{fe} $               | 6.0  | 18         |      |
| Output Capacitance<br>$V_{CB} = 0\text{Vdc}$ , $I_E = 0$ , $100\text{kHz} \leq f \leq 1.0\text{MHz}$<br>$V_{CB} = 10\text{Vdc}$ , $I_E = 0$ , $100\text{kHz} \leq f \leq 1.0\text{MHz}$ | $C_{obo1}$<br>$C_{obo2}$ |      | 3.0<br>1.7 | pF   |
| Input Capacitance<br>$V_{EB} = 0.5\text{Vdc}$ , $I_C = 0$ , $100\text{kHz} \leq f \leq 1.0\text{MHz}$   | $C_{ibo}$                |      | 2.0        | pF   |
| Noise Figure (1)<br>$V_{CE} = 6\text{V}$ , $I_C = 1.0\text{mA}$ , $f = 60\text{MHz}$<br>$g_s = 2.5\text{mmho}$  | NF                       |      | 6.0        | dB   |
| Small-Signal Power Gain (1)<br>$V_{CB} = 12\text{V}$ , $I_C = 6.0\text{mA}$ , $f = 200\text{MHz}$   | $G_{pe}$                 | 15   |            | dB   |
| Collector-Base Time Constant (1)<br>$V_{CB} = 10\text{V}$ , $I_E = -4.0\text{mA}$ , $f = 79.8\text{MHz}$  | $R_{b'CC}$               |      | 25         | ps   |
| Oscillator Power Output (1)<br>$V_{CB} = 1.5\text{V}$ , $I_C = 8.0\text{mA}$ , $f \geq 500\text{MHz}$   | $P_o$                    | 30   |            | mW   |
| Collector Efficiency<br>$V_{CB} = 15\text{V}$ , $I_C = 8.0\text{mA}$ , $f > 500\text{MHz}$  | $\eta$                   | 25   |            | %    |

### NOTES:

(1) For more detail see MIL-PRF-19500/301

## PACKAGE DIMENSIONS



| Symbol   | Dimensions |      |             |       | Note |
|----------|------------|------|-------------|-------|------|
|          | Inches     |      | Millimeters |       |      |
|          | Min        | Max  | Min         | Max   |      |
| CD       | .178       | .195 | 4.52        | 4.95  | 5    |
| CH       | .170       | .210 | 4.32        | 5.33  |      |
| HD       | .209       | .230 | 5.31        | 5.84  | 5    |
| LC       | .100 TP    |      | 2.54 TP     |       | 7,8  |
| LD       | .016       | .021 | .406        | .533  | 7,8  |
| LL       | .500       | .750 | 12.70       | 19.05 | 7,8  |
| LU       | .016       | .019 | .406        | .483  |      |
| L1       |            | .050 |             | 1.27  |      |
| L2       | .250       |      | 6.35        |       |      |
| P        | .100       |      | 2.54        |       |      |
| Q        |            | .040 |             | 1.02  | 5    |
| TL       | .028       | .048 | .71         | 1.22  |      |
| TW       | .036       | .046 | .91         | 1.17  |      |
| r        |            | .007 |             | .18   |      |
| $\alpha$ | 45° TP     |      |             |       |      |

### NOTES:

1. Dimension are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TH shall be held for a minimum length of .011 inch (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  $.054 +.001 - .000$  inch ( $1.37 +0.025 -0.00$  mm) below seating plane shall be within .007 inch (0.18mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
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).

**FIGURE 1.** Physical dimensions for 2N918 (TO-72).