

## NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/301

### DEVICES

**2N918      2N918UB**

**LEVELS  
 JAN  
 JANTX  
 JANTXV**

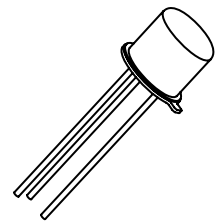
### ABSOLUTE MAXIMUM RATINGS ( $T_C = +25^\circ\text{C}$ unless otherwise noted)

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	$^\circ\text{C}$

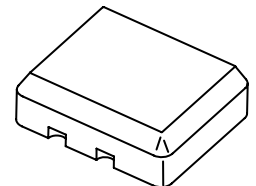
**Note:** 1) Derate linearly 1.14mW/ $^\circ\text{C}$  above  $T_A > 25^\circ\text{C}$

### 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 $I_C = 3\text{mAdc}$	$V_{(BR)CEO}$	15		Vdc
Collector-Base Cutoff Current $V_{CB} = 30\text{Vdc}$ $V_{CB} = 25\text{Vdc}$ $V_{CB} = 25\text{Vdc}; T_A = +150^\circ\text{C}$	$I_{CBO}$		1.0 10 1.0	$\mu\text{Adc}$ $\eta\text{Adc}$ $\mu\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 3.0\text{Vdc}$ $V_{EB} = 2.5\text{Vdc}$	$I_{EBO}$		10 10	$\mu\text{Adc}$ $\eta\text{Adc}$
Forward-Current Transfer Ratio $I_C = 0.5\text{mAdc}, V_{CE} = 10\text{Vdc}$ $I_C = 3.0\text{mAdc}, V_{CE} = 1.0\text{Vdc}$ $I_C = 10\text{mAdc}, V_{CE} = 10\text{Vdc}$ $I_C = 3.0\text{mAdc}, V_{CE} = 1.0\text{Vdc}; T_A = -55^\circ\text{C}$	$h_{FE}$	10 20 20 10	200	
Collector-Emitter Saturation Voltage $I_C = 10\text{mAdc}, I_B = 1.0\text{mAdc}$	$V_{CE(sat)}$		0.4	Vdc
Base-Emitter Voltage $I_C = 10\text{mAdc}, I_B = 1.0\text{mAdc}$	$V_{BE(sat)}$		1.0	Vdc



**TO-72  
 2N918**



**3 PIN  
 2N918UB**

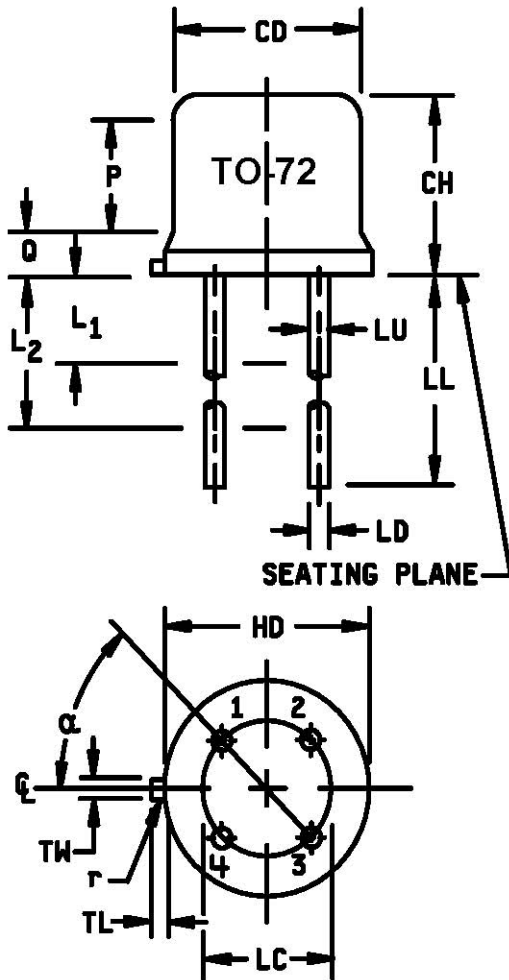
## DYNAMIC CHARACTERISTICS

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

### NOTES:

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

## PACKAGE DIMENSIONS



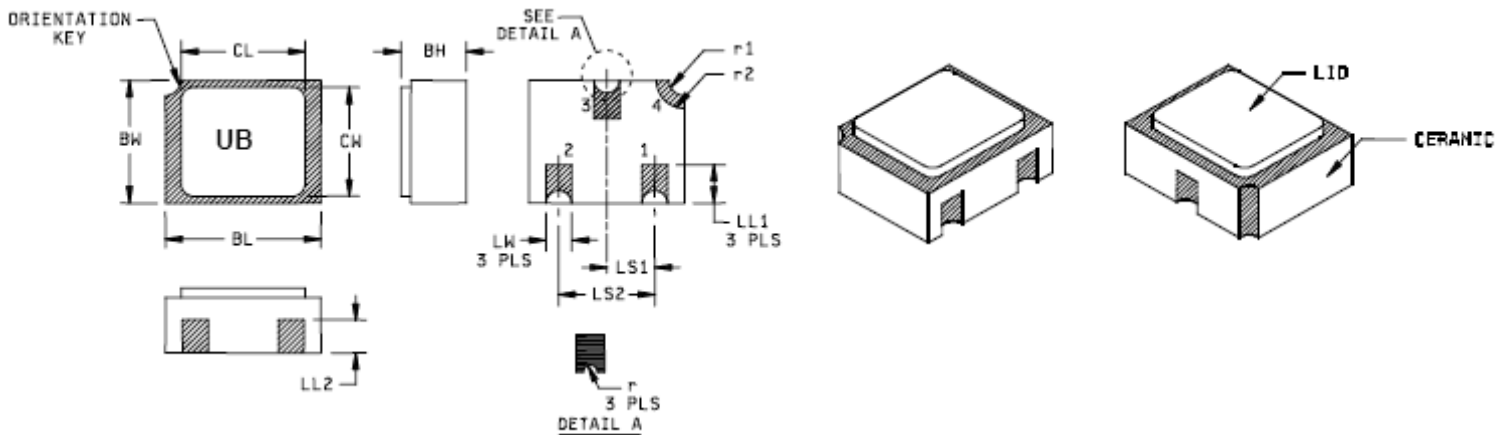
Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	5
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	5
LC	.100 TP		2.54 TP		7,8
LD	.016	.021	.406	.533	7,8
LL	.500	.750	12.70	19.05	7,8
LU	.016	.019	.406	.483	
L1		.050		1.27	
L2	.250		6.35		
P	.100		2.54		
Q		.040		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).

## PACKAGE DIMENSIONS



Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
BH	.046	.056	1.17	1.42	
BL	.115	.128	2.92	3.25	
BW	.085	.108	2.16	2.74	
CL		.128		3.25	
CW		.108		2.74	
LL <sub>1</sub>	.022	.038	0.56	0.97	
LL <sub>2</sub>	.017	.035	0.4	0.89	

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
LS <sub>1</sub>	.036	.040	0.91	1.02	
LS <sub>2</sub>	.071	.079	1.80	2.01	
LW	.016	.024	0.41	0.61	
r		.008		.203	
r1		.012		.305	
r2		.022		.559	

### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Hatched areas on package denote metallized areas.
4. Lid material: Kovar.
5. Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Shielding connected to the lid.
6. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.

**FIGURE 2.** Physical dimensions for 2N918UB, surface mount.