



## Surface Mount PNP Silicon VHF-UHF Amplifier Transistors

Qualified per MIL-PRF-19500/426

Qualified Levels:  
JAN, JANTX,  
and JANTXV

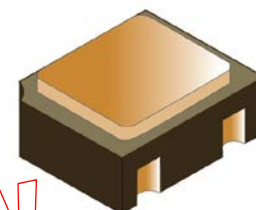
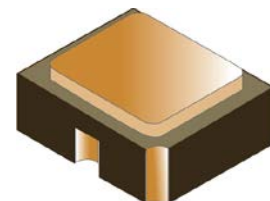
### DESCRIPTION

The 2N4957UB 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 TO-72 leaded 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




**UB Package**

### APPLICATIONS / BENEFITS

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

Also available in:

 **TO-72 Package**  
(leaded top hat)  
[2N4957](#)

### MAXIMUM RATINGS @ T<sub>A</sub> = +25 °C

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T <sub>J</sub> and T <sub>STG</sub>	-65 to +200	°C
Collector-Emitter Voltage	V <sub>CEO</sub>	-30	V
Collector-Base Voltage	V <sub>CBO</sub>	-30	V
Emitter-Base Voltage	V <sub>EBO</sub>	-3	V
Total Power Dissipation <sup>(1)</sup>	P <sub>T</sub>	200	mW
Collector Current	I <sub>C</sub>	-30	mA

**Notes:** 1. Derate linearly 1.14 mW/°C for T<sub>A</sub> > +25 °C

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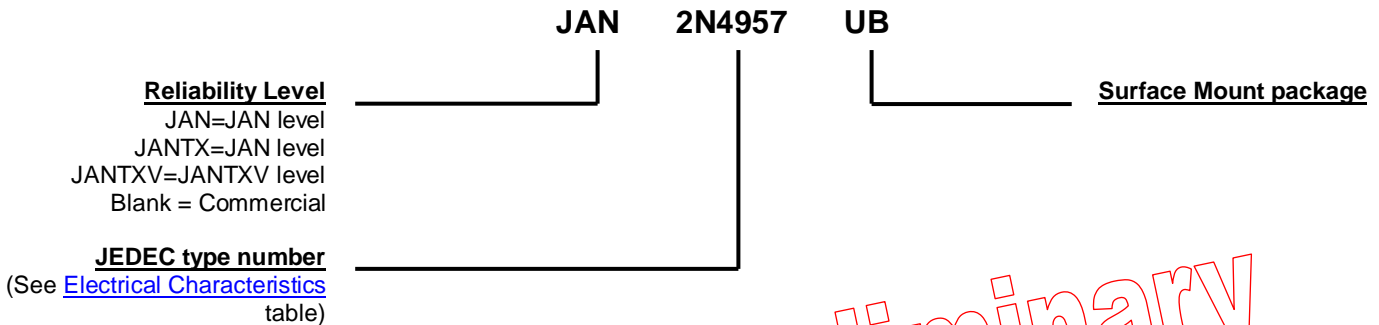
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**MECHANICAL and PACKAGING**

- CASE: Ceramic
- TERMINALS: Gold plating over nickel underplate
- MARKING: Part number, date code, manufacturer's ID
- POLARITY: PNP, see case outline on last page
- TAPE & REEL option: Standard per EIA-418D. Consult factory for quantities
- WEIGHT: < 0.04 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 $I_C = -1.0 \text{ mA}$ , $I_B = 0$ , Bias condition D	$V_{(BR)CEO}$	-30	-	V
Collector to Base Cutoff Current $V_{CB} = -20 \text{ V}$ , $I_E = 0$ , Bias condition D $V_{CB} = -30 \text{ V}$ , Bias condition D	$I_{CBO}$	-	-100 -100	nA $\mu\text{A}$
Emitter to Base Cutoff Current $V_{EB} = -3 \text{ V}$ , Bias condition D	$I_{EBO}$	-	-100	$\mu\text{A}$

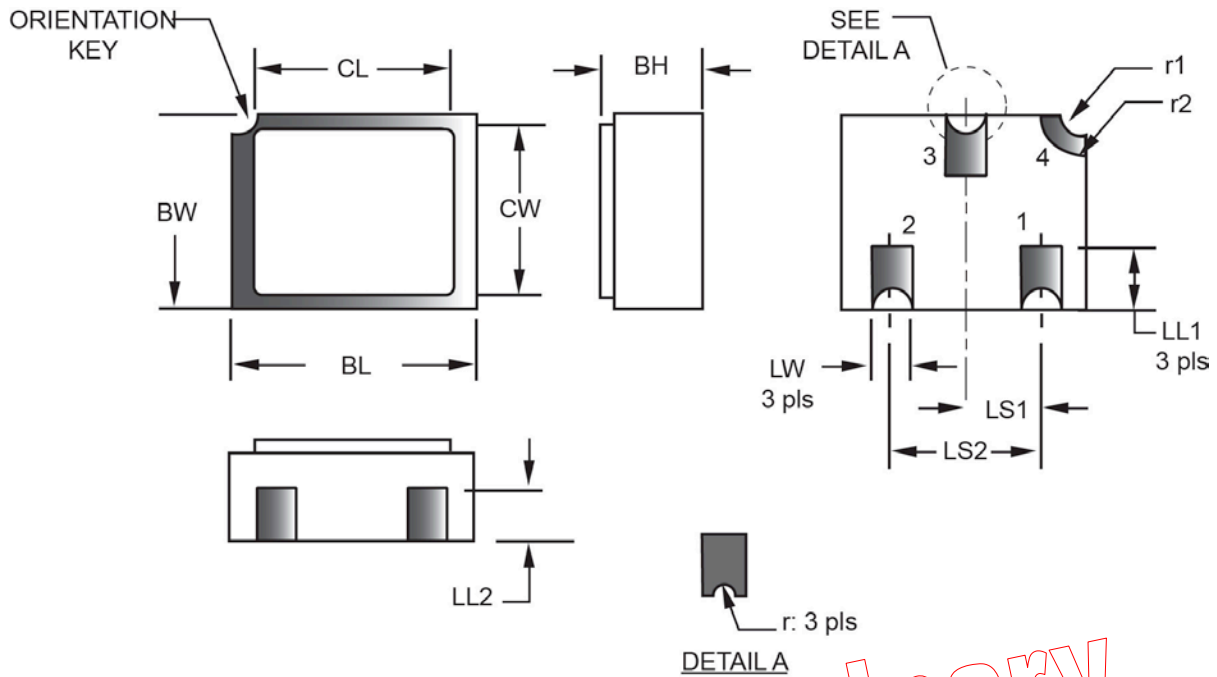
**ON CHARACTERISTICS**

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

**DYNAMIC CHARACTERISTICS**

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

Preliminary

**PACKAGE DIMENSIONS**


Preliminary

Symbol	Dimensions				Note	Symbol	Dimensions				Note
	inch		millimeters				inch		millimeters		
	Min	Max	Min	Max			Min	Max	Min	Max	
<b>BH</b>	0.046	0.056	1.17	1.42		<b>LS1</b>	0.036	0.040	0.91	1.02	
<b>BL</b>	0.115	0.128	2.92	3.25		<b>LS2</b>	0.071	0.079	1.80	2.01	
<b>BW</b>	0.085	0.108	2.16	2.74		<b>LW</b>	0.16	0.24	0.41	0.61	
<b>CL</b>	-	0.128	-	3.25		<b>r</b>	-	0.008	-	0.20	
<b>CW</b>	-	0.108	-	2.74		<b>r1</b>	-	0.012	-	0.31	
<b>LL1</b>	0.022	0.038	0.56	0.97		<b>r2</b>	-	0.022	-	0.056	
<b>LL2</b>	0.017	0.035	0.43	0.89							

**NOTES:**

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