

## LOW POWER PNP SILICON TRANSISTOR

Qualified per MIL-PRF-19500/177

### DEVICES

2N1131      2N1132  
 2N1131L    2N1132L

### LEVELS

JAN  
 JANTX  
 JANTXV

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

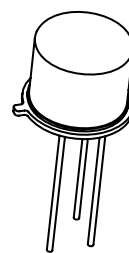
| Parameters / Test Conditions                                                                                        | Symbol         | Value       | Unit             |
|---------------------------------------------------------------------------------------------------------------------|----------------|-------------|------------------|
| Collector-Emitter Voltage                                                                                           | $V_{CEO}$      | 40          | Vdc              |
| Collector-Base Voltage                                                                                              | $V_{CBO}$      | 50          | Vdc              |
| Emitter-Base Voltage                                                                                                | $V_{EBO}$      | 5.0         | Vdc              |
| Collector Current                                                                                                   | $I_C$          | 600         | mAdc             |
| Total Power Dissipation<br>@ $T_A = +25^\circ\text{C}$ <sup>(1)</sup><br>@ $T_C = +25^\circ\text{C}$ <sup>(2)</sup> | $P_T$          | 0.6<br>2.0  | W                |
| Operating & Storage Junction Temperature Range                                                                      | $T_J, T_{stg}$ | -65 to +200 | $^\circ\text{C}$ |

### NOTES:

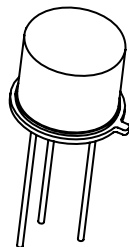
- 1/ Derate linearly 3.43mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$   
 2/ Derate linearly 11.4mW/ $^\circ\text{C}$  for  $T_C > +25^\circ\text{C}$

### 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>$I_C = 10\text{mAdc}$                               | $V_{(BR)CEO}$ | 40   |           | Vdc             |
| Collector-Base Breakdown Voltage<br>$I_C = 10\mu\text{Adc}$                                | $V_{(BR)CBO}$ | 50   |           | Vdc             |
| Emitter-Base Cutoff Current<br>$V_{EB} = 5.0\text{Vdc}$                                    | $I_{EBO}$     |      | 100       | $\mu\text{Adc}$ |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 50\text{Vdc}$ , $R_{BE} \leq 10\text{ ohms}$ | $I_{CER}$     |      | 10        | mAdc            |
| Collector-Base Cutoff Current<br>$V_{CB} = 50\text{Vdc}$<br>$V_{CB} = 30\text{Vdc}$        | $I_{CBO}$     |      | 10<br>1.0 | $\mu\text{Adc}$ |



TO-39  
 2N1131, 2N1132



TO-5  
 2N1131L, 2N1132L

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

| Parameters / Test Conditions                                                                                                                                                           | Symbol        | Min.                 | Max.     | Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------|----------|------|
| <b>ON CHARACTERISTICS <sup>(3)</sup></b>                                                                                                                                               |               |                      |          |      |
| Forward-Current Transfer Ratio<br>$I_C = 150\text{mA}$ , $V_{CE} = 10\text{Vdc}$<br>2N1131, L<br>2N1132, L<br>$I_C = 5.0\text{mA}$ , $V_{CE} = 10\text{Vdc}$<br>2N1131, L<br>2N1132, L | $h_{FE}$      | 20<br>30<br>15<br>25 | 45<br>90 |      |
| Collector-Emitter Saturation Voltage<br>$I_C = 150\text{mA}$ , $I_B = 15\text{mA}$                                                                                                     | $V_{CE(sat)}$ |                      | 1.3      | Vdc  |
| Base-Emitter Saturation Voltage<br>$I_C = 150\text{mA}$ , $I_B = 15\text{mA}$                                                                                                          | $V_{BE(sat)}$ |                      | 1.5      | Vdc  |

**DYNAMIC CHARACTERISTICS**

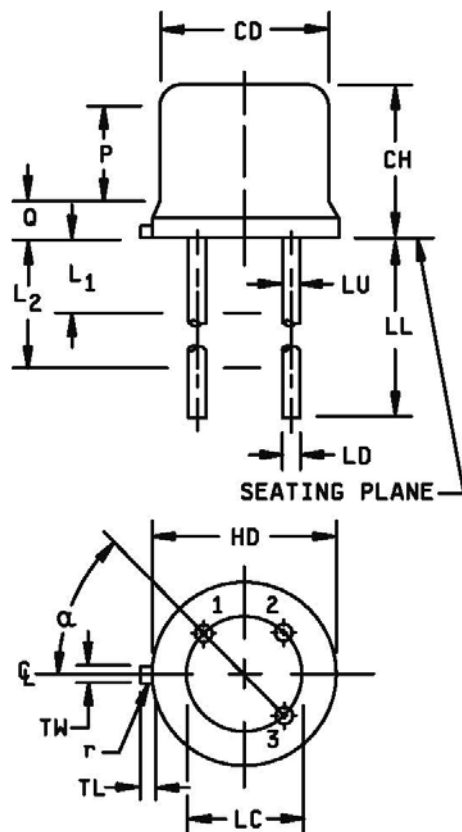
| Parameters / Test Conditions                                                                                                                                                                                                                                   | Symbol     | Min.                 | Max.       | Unit            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------|------------|-----------------|
| Small-Signal Short-Circuit Forward-Current Transfer Ratio<br>$I_C = 1.0\text{mA}$ , $V_{CE} = 5.0\text{Vdc}$ , $f = 1.0\text{kHz}$<br>2N1131, L<br>2N1132, L<br>$I_C = 5.0\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 1.0\text{kHz}$<br>2N1131, L<br>2N1132, L | $h_{fe}$   | 15<br>30<br>20<br>30 | 50<br>90   |                 |
| Small-Signal Open-Circuit Output Admittance<br>$I_C = 1.0\text{mA}$ , $V_{CE} = 5.0\text{Vdc}$ , $f = 1.0\text{kHz}$<br>$I_C = 5.0\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 1.0\text{kHz}$                                                                   | $h_{ob}$   |                      | 1.0<br>5.0 | $\mu\text{mho}$ |
| Small-Signal Short-Circuit Input Impedance<br>$I_C = 1.0\text{mA}$ , $V_{CE} = 5.0\text{Vdc}$ , $f = 1.0\text{kHz}$<br>$I_C = 5.0\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 1.0\text{kHz}$                                                                    | $h_{ib}$   | 25                   | 35<br>10   | $\Omega$        |
| Magnitude of Common Emitter Small-Signal Short Circuit Forward-Current Transfer Ratio<br>$I_C = 50\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 20\text{MHz}$<br>2N1131, L<br>2N1132, L                                                                          | $ h_{fe} $ | 2.5<br>3.0           | 20<br>20   |                 |
| Output Capacitance<br>$V_{CB} = 10\text{Vdc}$ , $I_E = 0$ , $100\text{kHz} \leq f \leq 1.0\text{MHz}$                                                                                                                                                          | $C_{obo}$  |                      | 4.5        | pF              |
| Input Capacitance<br>$V_{EB} = 0.5\text{Vdc}$ , $I_C = 0$ , $100\text{kHz} \leq f \leq 1.0\text{MHz}$                                                                                                                                                          | $C_{ibo}$  |                      | 80         | pF              |

**SWITCHING CHARACTERISTICS**

| Parameters / Test Conditions                                  | Symbol             | Min. | Max. | Unit |
|---------------------------------------------------------------|--------------------|------|------|------|
| Turn-On Time + Turn-Off Time<br>(See figure 2 of MIL-PRF-177) | $t_{on} + t_{off}$ |      | 50   | ns   |

(3) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## PACKAGE DIMENSIONS



| Symbol         | Dimensions |      |             |       | Note     |
|----------------|------------|------|-------------|-------|----------|
|                | Inches     |      | Millimeters |       |          |
|                | Min        | Max  | Min         | Max   |          |
| CD             | .305       | .335 | 7.75        | 8.51  |          |
| CH             | .240       | .260 | 6.10        | 6.60  |          |
| HD             | .335       | .370 | 8.51        | 9.40  |          |
| LC             | .200 TP    |      | 5.08 TP     |       | 6        |
| LD             | .016       | .021 | 0.41        | 0.53  | 7, 8     |
| LL             | .500       | .750 | 12.70       | 19.05 | 7, 8, 12 |
| LU             | .016       | .019 | 0.41        | 0.48  | 7, 8     |
| L <sub>1</sub> |            | .050 |             | 1.27  | 7, 8     |
| L <sub>2</sub> | .250       |      | 6.35        |       | 7, 8     |
| P              | .100       |      | 2.54        |       |          |
| Q              |            | .050 |             | 1.27  | 5        |
| TL             | .029       | .045 | 0.74        | 1.14  | 4        |
| TW             | .028       | .034 | 0.71        | 0.86  | 3        |
| r              |            | .010 |             | 0.25  | 10       |
| α              | 45° TP     |      | 45° TP      |       | 6        |

### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TW 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. CD shall not vary more than .010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
7. Leads at gauge plane .054 +.001, -.000 inch (1.37 +0.03, -0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC. The device may be measured by direct methods or by gauging procedure.
8. Dimension LU applies between L<sub>1</sub> and L<sub>2</sub>. Dimension LD applies between L<sub>2</sub> and LL minimum. Diameter is uncontrolled in and beyond LL minimum.
9. All three leads.
10. The collector shall be internally connected to the case.
11. Dimension r (radius) applies to both inside corners of tab.
12. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.
13. Lead 1 = emitter, lead 2 = base, lead 3 = collector.
14. \* For L-suffix or non-S-suffix devices (TO-5), dimension LL = 1.5 inches (38.10 mm) min. and 1.75 inches (44.45 mm) max. For non-L suffix types (TO-39), dimension LL = .5 inch (12.70 mm) min. and .750 inch (19.05 mm) max..

\* **FIGURE 1.** Physical dimensions 2N1131 and 2N1132 ( TO-39), 2N1131L and 2N1132L (TO-5).



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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