

T-37-17

**1.8W PNP GENERAL PURPOSE  
SMALL SIGNAL TRANSISTORS**

**2N2906  
2N2907**

These transistors are silicon planar epitaxial pnp devices conforming to JEDEC TO-18, BS SO-132A and IEC C7/B11 outlines.

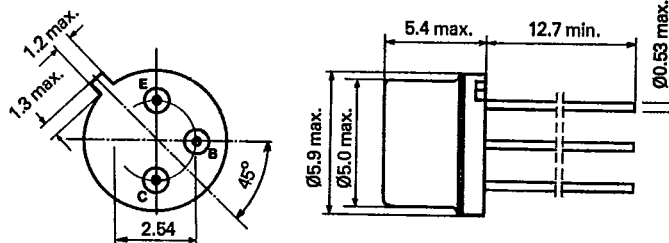
They are designed for high speed saturated switching and general purpose applications.

**QUICK REFERENCE DATA**

|   | 2N2906 | 2N2907 |
|---|--------|--------|
| V <sub>CB0</sub> max.   | 60V    |        |
| V <sub>CE0</sub> max.   | 40V    |        |
| V <sub>CE(sat)</sub> max. at I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA and<br>T <sub>amb</sub> = 25°C | 1.6V   |        |
| I <sub>C</sub> max.   | 600mA  |        |
| h <sub>FE</sub> min. at V <sub>CE</sub> = 10V, I <sub>C</sub> = 150mA and<br>T <sub>amb</sub> = 25°C      | 40     | 100    |
| P <sub>tot</sub> max. at T <sub>amb</sub> = 25°C  | 0.4W   |        |

**Outline and Dimensions**

JEDEC TO-18  
BS SO-132A  
IEC C7/B11



All dimensions in millimetres  
For detail dimensions see Page 4

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In the interest of improved product design, changes to this specification may be made at any time.



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RATINGS 81C 00120 D

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The ratings quoted are limiting values of operating and environmental conditions and are in accordance with the absolute maximum rating system defined in BS 3494 (Part 1) and IEC Publication 134.

**Voltage Ratings**

|                  |   |     |
|------------------|---|-----|
| V <sub>CB0</sub> | Collector-base voltage at I <sub>E</sub> = 0    | 60V |
| V <sub>CE0</sub> | Collector-emitter voltage at I <sub>B</sub> = 0 | 40V |
| V <sub>EBO</sub> | Emitter-base voltage at I <sub>C</sub> = 0      | 5V  |

**Current Rating**

|                |                                |       |
|----------------|--------------------------------|-------|
| I <sub>C</sub> | Collector current (continuous) | 600mA |
|----------------|--------------------------------|-------|

**Power Ratings**

|                  |                          |      |
|------------------|--------------------------|------|
| P <sub>tot</sub> | Total power dissipation  |      |
|                  | T <sub>amb</sub> = 25°C  | 0.4W |
|                  | T <sub>case</sub> = 25°C | 1.8W |

**Thermal Ratings**

|                  |                                      |                 |
|------------------|--------------------------------------|-----------------|
| T <sub>j</sub>   | Operating junction temperature range | -65°C to +200°C |
| T <sub>stg</sub> | Storage temperature range            | -65°C to +200°C |

**CHARACTERISTICS****Electrical Characteristics**

|                       |   | Min. | Typ. | Max.         |
|-----------------------|---|------|------|--------------|
| I <sub>CB0</sub>      | Collector-base cut-off current<br>V <sub>CB</sub> = 50V, I <sub>E</sub> = 0 and T <sub>amb</sub> = 25°C<br>V <sub>CB</sub> = 50V, I <sub>E</sub> = 0 and T <sub>amb</sub> = 150°C               |      |      | 20nA<br>20μA |
| I <sub>CEX</sub>      | Collector-emitter cut-off current at<br>V <sub>CE</sub> = 30V, V <sub>BE</sub> = 0.5V and T <sub>amb</sub> = 25°C   |      |      | 50nA         |
| I <sub>BEX</sub>      | Base-emitter cut-off current at<br>V <sub>BE</sub> = 0.5V, V <sub>CE</sub> = 30V and T <sub>amb</sub> = 25°C  |      |      | 50nA         |
| V <sub>CB0</sub>      | Collector-base voltage at<br>I <sub>C</sub> = 10μA, I <sub>E</sub> = 0 and T <sub>amb</sub> = 25°C  | 60V  |      |              |
| V <sub>CE0(sus)</sub> | *Collector-emitter sustaining voltage at<br>I <sub>C</sub> = 10mA, I <sub>B</sub> = 0 and T <sub>amb</sub> = 25°C   | 40V  |      |              |
| V <sub>EBO</sub>      | Emitter-base voltage at<br>I <sub>C</sub> = 0, I <sub>E</sub> = 10μA and T <sub>amb</sub> = 25°C  | 5V   |      |              |
| V <sub>BE(sat)</sub>  | *Base-emitter saturation voltage<br>I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA and T <sub>amb</sub> = 25°C<br>I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA and T <sub>amb</sub> = 25°C      |      |      | 1.3V<br>2.6V |
| V <sub>CE(sat)</sub>  | *Collector-emitter saturation voltage<br>I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA and T <sub>amb</sub> = 25°C<br>I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA and T <sub>amb</sub> = 25°C |      |      | 0.4V<br>1.6V |

**1.8W PNP GENERAL PURPOSE  
SMALL SIGNAL TRANSISTORS**

2N2906

2N2907

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**Electrical Characteristics (continued)**

|  |  | Min.   | Typ.   | Max. |  |
|--|--|--|--------|------|--|
| h <sub>FE</sub>  | Static value of common emitter forward current transfer ratio<br>V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.1mA and T <sub>amb</sub> = 25°C |  |        |      |  |
|  |  | 2N2906   | 20     |      |  |
|  |  | 2N2907   | 35     |      |  |
|  |  | V <sub>CE</sub> = 10V, I <sub>C</sub> = 1.0mA and T <sub>amb</sub> = 25°C  |        |      |  |
|  |  | 2N2906   | 25     |      |  |
|  |  | 2N2907   | 50     |      |  |
|  |  | V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA and T <sub>amb</sub> = 25°C   |        |      |  |
|  |  | 2N2906   | 35     |      |  |
|  |  | 2N2907   | 75     |      |  |
|  |  | V <sub>CE</sub> = 10V, I <sub>C</sub> = 150mA* and T <sub>amb</sub> = 25°C |        |      |  |
|  |  | 2N2906   | 40     | 120  |  |
|  |  | 2N2907   | 100    | 300  |  |
| V <sub>CE</sub> = 10V, I <sub>C</sub> = 500mA* and T <sub>amb</sub> = 25°C |  |  |        |      |  |
| 2N2906   | 20   |  |        |      |  |
| 2N2907   | 30   |  |        |      |  |
| f <sub>T</sub>   | Transition frequency at<br>V <sub>CE</sub> = 20V, I <sub>C</sub> = 50mA, f = 100MHz and<br>T <sub>amb</sub> = 25°C                         |  | 200MHz |      |  |
| C <sub>EBO</sub>   | Emitter-base capacitance at<br>V <sub>EB</sub> = 2V, I <sub>C</sub> = 0, f = 100 kHz and<br>T <sub>amb</sub> = 25°C                        |  |        | 30pF |  |
| C <sub>CB0</sub>   | Collector-base capacitance at<br>V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 100 kHz and<br>T <sub>amb</sub> = 25°C                     |  |        | 8pF  |  |

\*Pulsed; t<sub>p</sub> = 300 μs; duty cycle 1%

**Switching Times**

(I<sub>C</sub> = 150mA, I<sub>B1</sub> = -I<sub>B2</sub> = 15mA, V<sub>CC</sub> = 30V (t<sub>d</sub> and t<sub>r</sub>) or 6V (t<sub>s</sub> and t<sub>f</sub>) and T<sub>amb</sub> = 25°C)

|                |              | Min. | Typ. | Max. |
|----------------|--------------|------|------|------|
| t <sub>d</sub> | Delay time   |      |      | 10ns |
| t <sub>r</sub> | Rise time    |      |      | 40ns |
| t <sub>s</sub> | Storage time |      |      | 80ns |
| t <sub>f</sub> | Fall time    |      |      | 30ns |

**Thermal Characteristics**

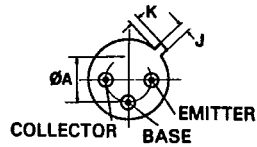
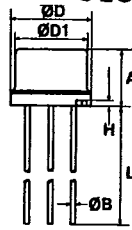
|                         |  | Min. | Typ. | Max.          |
|-------------------------|--|------|------|---------------|
| R <sub>th(j-case)</sub> | Thermal resistance (junction to case)    |      |      | 97.3 deg C/W  |
| R <sub>th(j-amb)</sub>  | Thermal resistance (junction to ambient) |      |      | 437.5 deg C/W |

5423243 LEDEX INC, LUCAS PRODUCTS

**MECHANICAL DETAILS**  
**Outline and Dimensions**

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| Ref. | Millimetres |      | Inches     |       | Notes |
|------|-------------|------|------------|-------|-------|
|      | Min.        | Max. | Min.       | Max.  |       |
| A    | 4.32        | 5.33 | 0.170      | 0.210 |       |
| ØA   | 2.54 nom.   |      | 0.100 nom. |       |       |
| ØB   | 0.41        | 0.53 | 0.016      | 0.021 |       |
| ØD   | 5.31        | 5.84 | 0.209      | 0.230 |       |
| ØD1  | 4.52        | 4.95 | 0.178      | 0.195 |       |
| H    | 0.13        | 0.76 | 0.005      | 0.030 |       |
| J    | 0.92        | 1.16 | 0.036      | 0.046 |       |
| K    | 0.71        | 1.21 | 0.028      | 0.048 |       |
| L    | 12.7        | —    | 0.500      | —     |       |

**Notes**

- The transistors conform to BS SO-132A, IEC C7/B11 and JEDEC TO-18 outlines.
- The millimetre dimensions are derived from the inch dimensions.

Weight 0.3 gramme.

**INSTALLATION NOTES**

The emitter, base and collector leads are identified on the transistor outline.  
 Note the collector is connected also to the case.

The leads must not be bent within 0.06in (1.5mm) of the seals.

When soldering, a thermal shunt should be used to protect the transistor.

The transistor leads may be dip-soldered at a temperature of 240°C for 10 seconds up to a point 0.04in (1mm) from the seals.

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**Lucas Electrical Limited** · **Electronics and Systems Division**  
 Mere Green Road · Sutton Coldfield · West Midlands B75 5BN