

# PNP General-Purpose Transistor

## PN2907

### Description

This device is designed for use with general-purpose amplifiers and switches requiring collector currents to 500 mA.

These devices are Pb-Free, Halogen Free/BFR Free, Beryllium Free and are RoHS compliant.

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 1, 2)

| Symbol         | Parameter                                        | Value       | Unit             |
|----------------|--------------------------------------------------|-------------|------------------|
| $V_{CEO}$      | Collector-Emitter Voltage                        | -40         | V                |
| $V_{CBO}$      | Collector-Base Voltage                           | -60         | V                |
| $V_{EBO}$      | Emitter-Base Voltage                             | -5.0        | V                |
| $I_C$          | Collector Current – Continuous                   | -800        | mA               |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

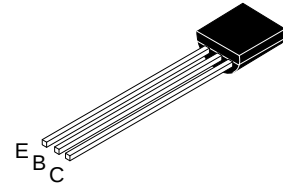
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
- These are steady-state limits. **onsemi** should be consulted on applications involving pulsed or low-duty cycle operations.

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

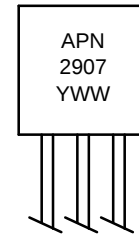
| Symbol          | Parameter                               | Max<br>(Note 3) | Unit                 |
|-----------------|-----------------------------------------|-----------------|----------------------|
| $P_D$           | Total Device Dissipation                | 625             | mW                   |
|                 | Derate Above $25^\circ\text{C}$         | 5.0             | mW/ $^\circ\text{C}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case    | 83.3            | $^\circ\text{C/W}$   |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 200             | $^\circ\text{C/W}$   |

- PCB size: FR-4 76 x 114 x 1.57 mm<sup>3</sup> (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.



TO-92 3 4.825x4.76  
CASE 135AN

### MARKING DIAGRAM



PN2907 = Specific Device Code  
A = Assembly Site  
Y = Year of Production  
WW = Work Week Number

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# PN2907

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

| Symbol                     | Parameter                                    | Conditions                                                      | Min  | Max | Unit          |
|----------------------------|----------------------------------------------|-----------------------------------------------------------------|------|-----|---------------|
| <b>OFF CHARACTERISTICS</b> |                                              |                                                                 |      |     |               |
| $V_{(BR)CEO}$              | Collector-Emitter Breakdown Voltage (Note 4) | $I_C = -10\text{ mA}$ , $I_B = 0$                               | -40  | -   | V             |
| $V_{(BR)CBO}$              | Collector-Base Breakdown Voltage             | $I_C = -10\text{ }\mu\text{A}$ , $I_E = 0$                      | -60  | -   | V             |
| $V_{(BR)EBO}$              | Emitter-Base Breakdown Voltage               | $I_E = -10\text{ }\mu\text{A}$ , $I_C = 0$                      | -5.0 | -   | V             |
| $I_{CEX}$                  | Collector Cut-Off Current                    | $V_{CE} = -30\text{ V}$ , $V_{EB} = -0.5\text{ V}$              | -    | -50 | nA            |
| $I_{BL}$                   | Base Cut-Off Current                         | $V_{CE} = -30\text{ V}$ , $V_{EB} = -0.5\text{ V}$              | -    | -50 | nA            |
| $I_{CBO}$                  | Collector Cut-Off Current                    | $V_{CB} = -50\text{ V}$ , $I_E = 0$                             | -    | -20 | nA            |
|                            |                                              | $V_{CB} = -50\text{ V}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$ | -    | -20 | $\mu\text{A}$ |

## ON CHARACTERISTICS (Note 4)

|               |                                      |                                                  |     |      |   |
|---------------|--------------------------------------|--------------------------------------------------|-----|------|---|
| $h_{FE}$      | DC Current Gain                      | $V_{CE} = -10\text{ V}$ , $I_C = -0.1\text{ mA}$ | 35  | -    |   |
|               |                                      | $V_{CE} = -10\text{ V}$ , $I_C = -1.0\text{ mA}$ | 50  | -    |   |
|               |                                      | $V_{CE} = -10\text{ V}$ , $I_C = -10\text{ mA}$  | 70  | -    |   |
|               |                                      | $V_{CE} = -10\text{ V}$ , $I_C = -150\text{ mA}$ | 100 | 300  |   |
|               |                                      | $V_{CE} = -10\text{ V}$ , $I_C = -500\text{ mA}$ | 30  | -    |   |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = -150\text{ mA}$ , $I_B = -15\text{ mA}$   | -   | -0.4 | V |
|               |                                      | $I_C = -500\text{ mA}$ , $I_B = -50\text{ mA}$   | -   | -1.6 |   |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_C = -150\text{ mA}$ , $I_B = -15\text{ mA}$   | -   | -1.3 | V |
|               |                                      | $I_C = -500\text{ mA}$ , $I_B = -50\text{ mA}$   | -   | -2.6 |   |

## SMALL SIGNAL CHARACTERISTICS

|          |                           |                                                                        |   |    |    |
|----------|---------------------------|------------------------------------------------------------------------|---|----|----|
| $C_{ob}$ | Output Capacitance        | $V_{CB} = -10\text{ V}$ , $f = 1.0\text{ MHz}$                         | - | 8  | pF |
| $C_{ib}$ | Input Capacitance         | $V_{EB} = -2.0\text{ V}$ , $f = 1.0\text{ MHz}$                        | - | 30 | pF |
| $h_{fe}$ | Small-Signal Current Gain | $I_C = -50\text{ mA}$ , $V_{CE} = -20\text{ V}$ , $f = 100\text{ MHz}$ | 2 | -  |    |

## SWITCHING CHARACTERISTICS

|           |               |                                                                                          |   |     |    |
|-----------|---------------|------------------------------------------------------------------------------------------|---|-----|----|
| $t_{on}$  | Turn-On Time  | $V_{CC} = -30\text{ V}$ , $I_C = -150\text{ mA}$ ,<br>$I_{B1} = -15\text{ mA}$           | - | 45  | ns |
| $t_d$     | Delay Time    |                                                                                          | - | 10  | ns |
| $t_r$     | Rise Time     |                                                                                          | - | 40  | ns |
| $t_{off}$ | Turn-Off Time | $V_{CC} = -6.0\text{ V}$ , $I_C = -150\text{ mA}$ ,<br>$I_{B1} = I_{B2} = -15\text{ mA}$ | - | 100 | ns |
| $t_s$     | Storage Time  |                                                                                          | - | 80  | ns |
| $t_f$     | Fall Time     |                                                                                          | - | 30  | ns |

4. Pulse test: pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

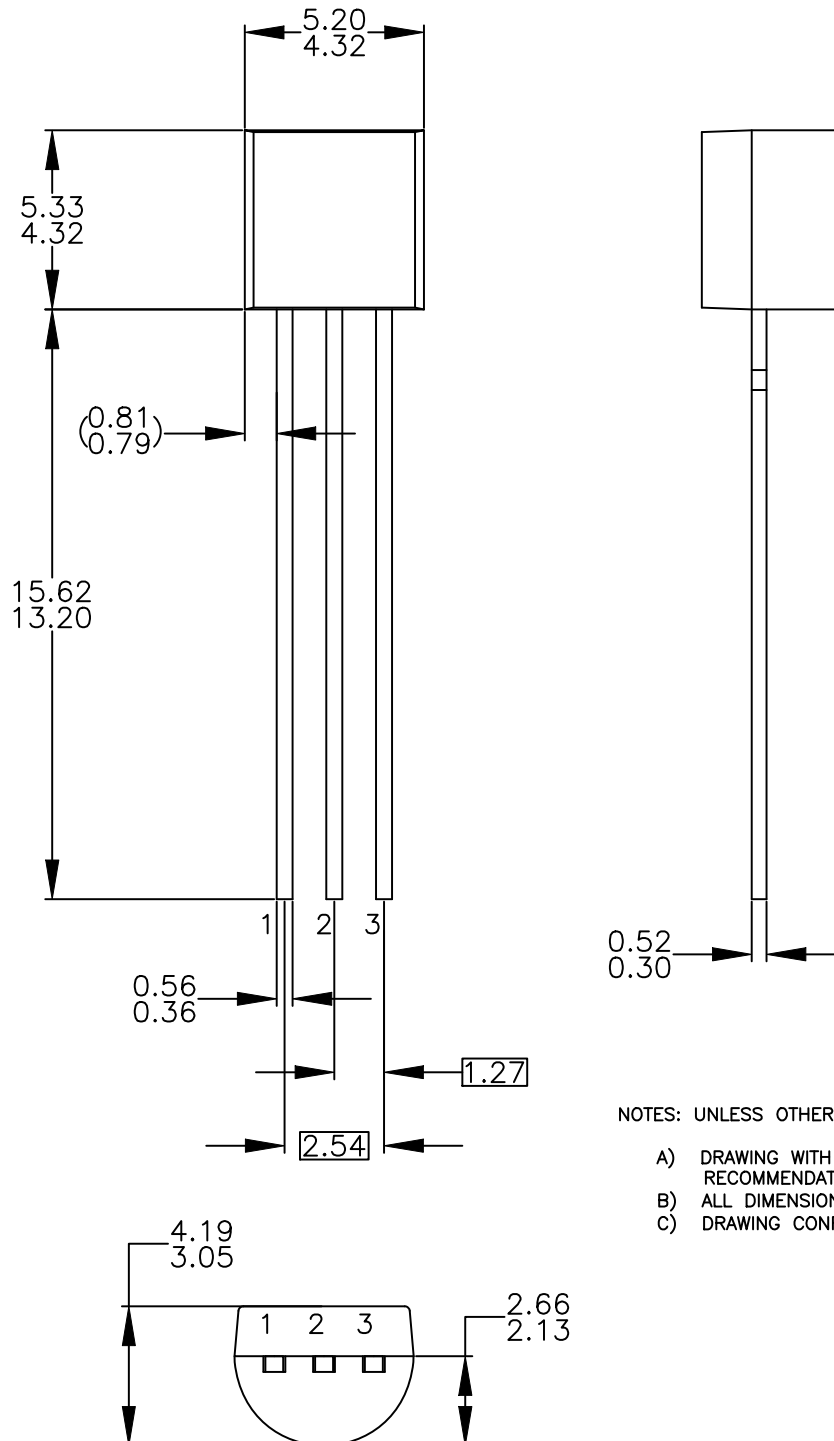
## ORDERING INFORMATION

| Part Number | Top Mark | Package                         | Shipping           |
|-------------|----------|---------------------------------|--------------------|
| PN2907BU    | PN2907   | TO-92 3 4.825x4.76<br>(Pb-Free) | 10000 Units / Bulk |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

**TO-92 3 4.825x4.76**  
**CASE 135AN**  
**ISSUE O**

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-2009.

|                         |                           |                                                                                                                                                                                     |
|-------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>TO-92 3 4.825X4.76</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                                  |

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