

# 2N2907A

## Small Signal Switching Transistor

### PNP Silicon

#### Features

- MIL-PRF-19500/291 Qualified
- Available as JAN, JANTX, and JANTXV

#### MAXIMUM RATINGS

| Rating  | Symbol         | Value       | Unit             |
|---|----------------|-------------|------------------|
| Collector–Emitter Voltage                           | $V_{CEO}$      | –60         | Vdc              |
| Collector–Base Voltage                              | $V_{CBO}$      | –60         | Vdc              |
| Emitter–Base Voltage                                | $V_{EBO}$      | –5.0        | Vdc              |
| Collector Current – Continuous                      | $I_C$          | –600        | mAdc             |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ | $P_T$          | 500         | mW               |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ | $P_T$          | 1.0         | W                |
| Operating and Storage Junction Temperature Range    | $T_J, T_{stg}$ | –65 to +200 | $^\circ\text{C}$ |

#### THERMAL CHARACTERISTICS

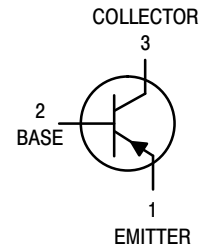
| Characteristic                          | Symbol          | Max | Unit                      |
|---|-----------------|-----|---------------------------|
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$ | 325 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction–to–Case    | $R_{\theta JC}$ | 150 | $^\circ\text{C}/\text{W}$ |

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.



ON Semiconductor®

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TO-18  
CASE 206AA  
STYLE 1

#### ORDERING INFORMATION

| Device        | Package | Shipping |
|---------------|---------|----------|
| JAN2N2907A    | TO-18   | Bulk     |
| JANTX2N2907A  |         |          |
| JANTXV2N2907A |         |          |

## 2N2907A

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

| Characteristic  | Symbol        | Min    | Max        | Unit                    |
|---|---------------|--------|------------|-------------------------|
| <b>OFF CHARACTERISTICS</b>  |               |        |            |                         |
| Collector–Emitter Breakdown Voltage<br>( $I_C = -10\text{ mAdc}$ )  | $V_{(BR)CEO}$ | -60    | -          | Vdc                     |
| Collector–Emitter Cutoff Current<br>( $V_{CE} = -50\text{ Vdc}$ )   | $I_{CES}$     | -      | -50        | nAdc                    |
| Collector–Base Cutoff Current<br>( $V_{CB} = -50\text{ Vdc}, I_E = 0$ )<br>( $V_{CB} = -60\text{ Vdc}, I_E = 0$ ) | $I_{CBO}$     | -<br>- | -10<br>-10 | nAdc<br>$\mu\text{Adc}$ |
| Emitter–Base Cutoff Current<br>( $V_{EB} = -4.0\text{ Vdc}$ )<br>( $V_{EB} = -5.0\text{ Vdc}$ )                   | $I_{EBO}$     | -<br>- | -50<br>-10 | nAdc<br>$\mu\text{Adc}$ |

### ON CHARACTERISTICS (Note 1)

|   |               |                               |                           |     |
|---|---------------|-------------------------------|---------------------------|-----|
| DC Current Gain<br>( $I_C = -0.1\text{ mAdc}, V_{CE} = -10\text{ Vdc}$ )<br>( $I_C = -1.0\text{ mAdc}, V_{CE} = -10\text{ Vdc}$ )<br>( $I_C = -10\text{ mAdc}, V_{CE} = -10\text{ Vdc}$ )<br>( $I_C = -150\text{ mAdc}, V_{CE} = -10\text{ Vdc}$ )<br>( $I_C = -500\text{ mAdc}, V_{CE} = -10\text{ Vdc}$ ) | $h_{FE}$      | 75<br>100<br>100<br>100<br>50 | -<br>450<br>-<br>300<br>- | -   |
| Collector–Emitter Saturation Voltage<br>( $I_C = -150\text{ mAdc}, I_B = -15\text{ mAdc}$ )<br>( $I_C = -500\text{ mAdc}, I_B = -50\text{ mAdc}$ )  | $V_{CE(sat)}$ | -<br>-                        | -0.4<br>-1.6              | Vdc |
| Base–Emitter Saturation Voltage<br>( $I_C = -150\text{ mAdc}, I_B = -15\text{ mAdc}$ )<br>( $I_C = -500\text{ mAdc}, I_B = -50\text{ mAdc}$ )   | $V_{BE(sat)}$ | -0.6<br>-                     | -1.3<br>-2.6              | Vdc |

### SMALL–SIGNAL CHARACTERISTICS

|  |            |     |     |    |
|--|------------|-----|-----|----|
| Magnitude of Small–Signal Current Gain<br>( $I_C = -20\text{ mAdc}, V_{CE} = -20\text{ Vdc}, f = 100\text{ MHz}$ ) | $ h_{fe} $ | 2.0 | -   | -  |
| Small–Signal Current Gain<br>( $I_C = -1.0\text{ mAdc}, V_{CE} = -10\text{ Vdc}, f = 1\text{ kHz}$ )               | $h_{fe}$   | 100 | -   | -  |
| Output Capacitance<br>( $V_{CB} = -10\text{ Vdc}, I_E = 0, 100\text{ kHz} \leq f \leq 1.0\text{ MHz}$ )            | $C_{obo}$  | -   | 8.0 | pF |
| Input Capacitance<br>( $V_{EB} = -2.0\text{ Vdc}, I_C = 0, 100\text{ kHz} \leq f \leq 1.0\text{ MHz}$ )            | $C_{ibo}$  | -   | 30  | pF |

### SWITCHING CHARACTERISTICS

|  |           |   |     |    |
|--|-----------|---|-----|----|
| Turn–On Time<br>(Reference Figure in MIL–PRF–19500/291)  | $t_{on}$  | - | 45  | ns |
| Turn–Off Time<br>(Reference Figure in MIL–PRF–19500/291) | $t_{off}$ | - | 300 | ns |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

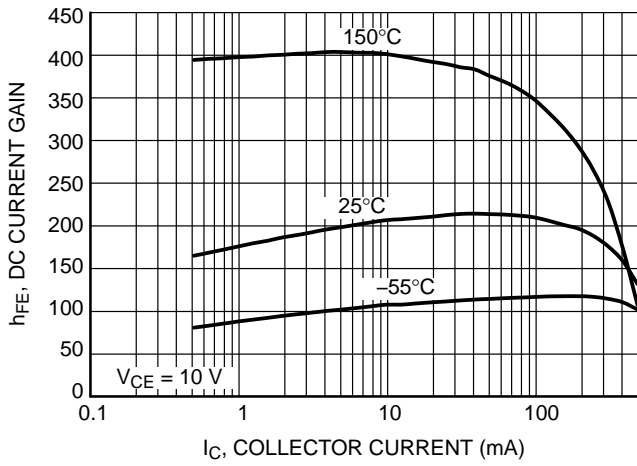


Figure 1. DC Current Gain

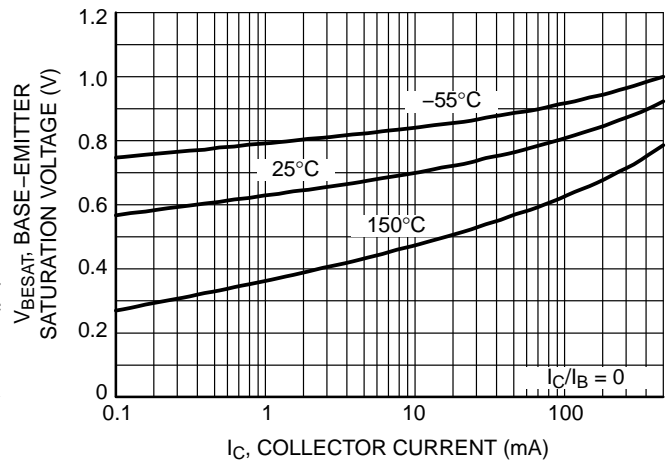


Figure 2. Base-Emitter Saturation Voltage

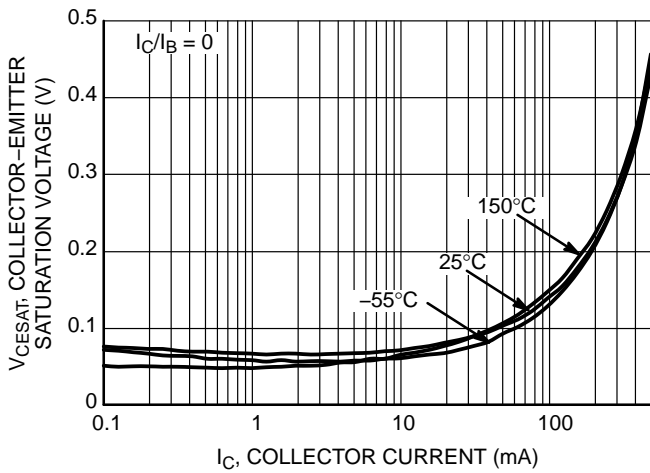


Figure 3. Collector-Emitter Saturation Voltage

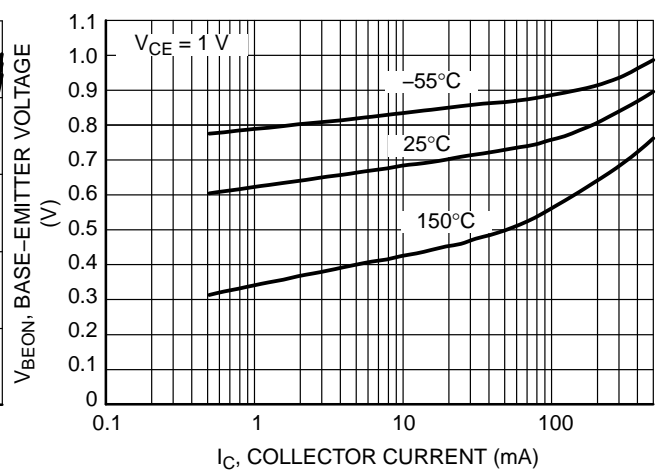


Figure 4. Base-Emitter Voltage

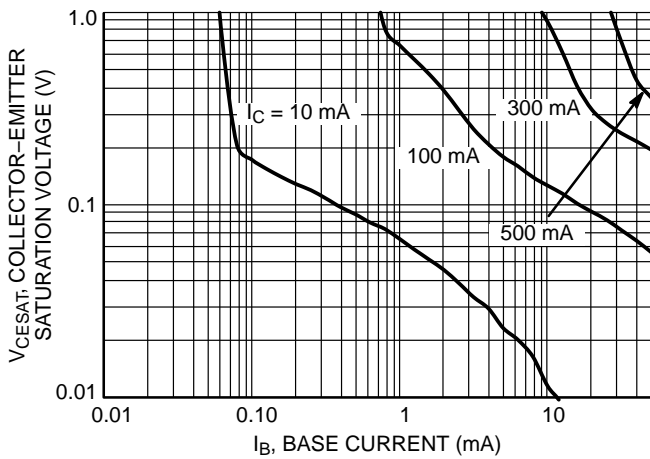


Figure 5. Collector Saturation Region

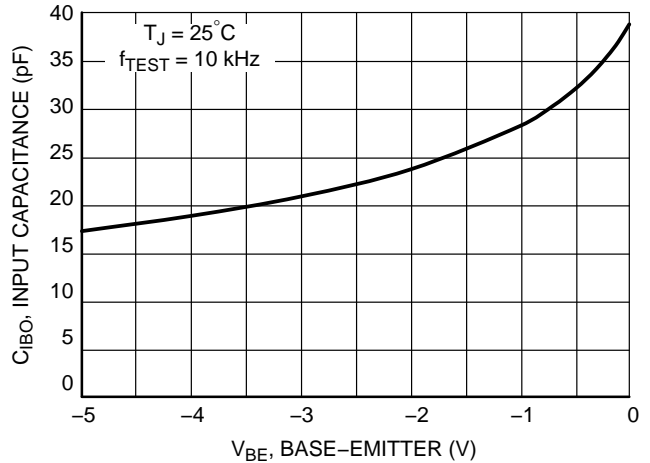


Figure 6. Input Capacitance

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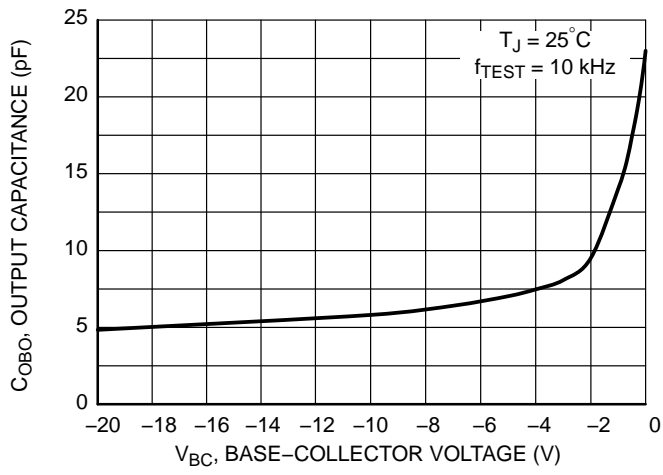


Figure 7. Output Capacitance

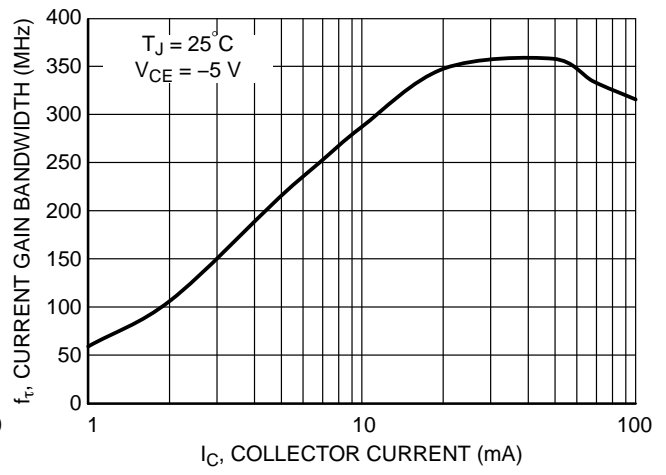
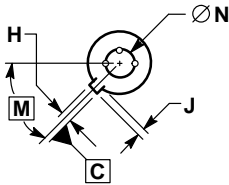
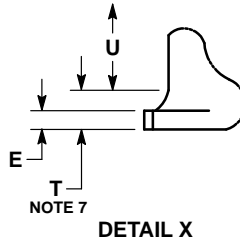
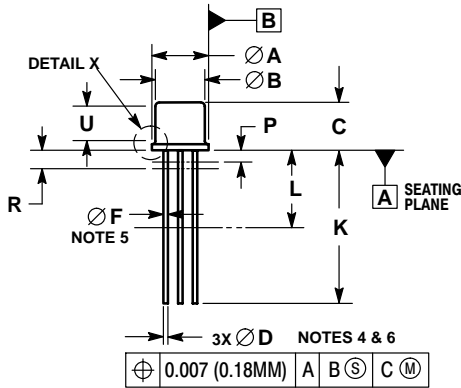


Figure 8. Current Gain Bandwidth Product

# 2N2907A

## PACKAGE DIMENSIONS

TO-18 3  
CASE 206AA  
ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION J MEASURED FROM DIAMETER A TO EDGE.
4. LEAD TRUE POSITION TO BE DETERMINED AT THE GAUGE PLANE DEFINED BY DIMENSION R.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L.
6. DIMENSION D APPLIES BETWEEN DIMENSION L AND K.
7. BODY CONTOUR OPTIONAL WITHIN ZONE DEFINED BY DIMENSIONS A, B, AND T.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 5.31        | 5.84  | 0.209     | 0.230 |
| B   | 4.52        | 4.95  | 0.178     | 0.195 |
| C   | 4.32        | 5.33  | 0.170     | 0.210 |
| D   | 0.41        | 0.53  | 0.016     | 0.021 |
| E   | ---         | 0.76  | ---       | 0.030 |
| F   | 0.41        | 0.48  | 0.016     | 0.019 |
| H   | 0.91        | 1.17  | 0.036     | 0.046 |
| J   | 0.71        | 1.22  | 0.028     | 0.048 |
| K   | 12.70       | 19.05 | 0.500     | 0.750 |
| L   | 6.35        | ---   | 0.250     | ---   |
| M   | 45° BSC     |       | 45° BSC   |       |
| N   | 2.54 BSC    |       | 0.100 BSC |       |
| P   | ---         | 1.27  | ---       | 0.050 |
| R   | 1.37 BSC    |       | 0.054 BSC |       |
| T   | ---         | 0.76  | ---       | 0.030 |
| U   | 2.54        | ---   | 0.100     | ---   |

STYLE 1:

1. EMITTER
2. BASE
3. COLLECTOR

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