

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

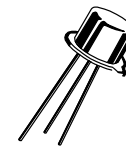
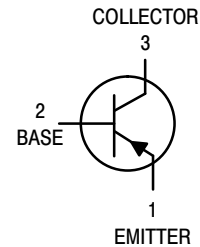
| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|---------------------------|
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$ | 325 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction–to–Case | $R_{\theta JC}$ | 150 | $^\circ\text{C}/\text{W}$ |

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.



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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 |
|---|---------------|--------|------------|-------------------------|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Breakdown Voltage ($I_C = -10\text{ mAdc}$) | $V_{(BR)CEO}$ | -60 | - | Vdc |
| Collector–Emitter Cutoff Current ($V_{CE} = -50\text{ Vdc}$) | I_{CES} | - | -50 | nAdc |
| Collector–Base Cutoff Current ($V_{CB} = -50\text{ Vdc}, I_E = 0$) ($V_{CB} = -60\text{ Vdc}, I_E = 0$) | I_{CBO} | - - | -10 -10 | nAdc μAdc |
| Emitter–Base Cutoff Current ($V_{EB} = -4.0\text{ Vdc}$) ($V_{EB} = -5.0\text{ Vdc}$) | I_{EBO} | - - | -50 -10 | nAdc μAdc |

ON CHARACTERISTICS (Note 1)

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

SMALL–SIGNAL CHARACTERISTICS

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

SWITCHING CHARACTERISTICS

| | | | | |
|--|-----------|---|-----|----|
| Turn–On Time (Reference Figure in MIL–PRF–19500/291) | t_{on} | - | 45 | ns |
| Turn–Off Time (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 μs , Duty Cycle $\leq 2.0\%$.

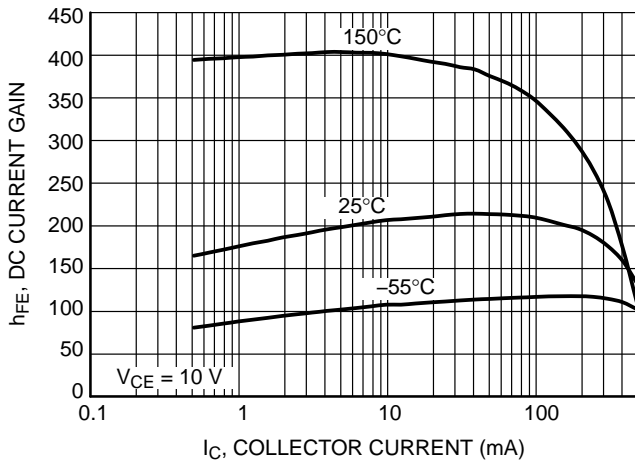


Figure 1. DC Current Gain

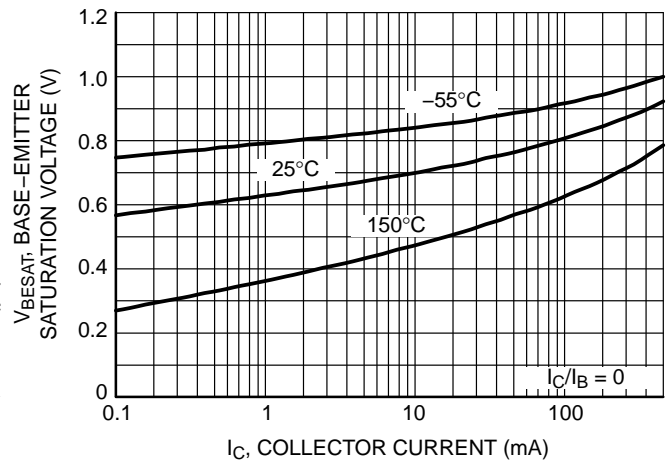


Figure 2. Base-Emitter Saturation Voltage

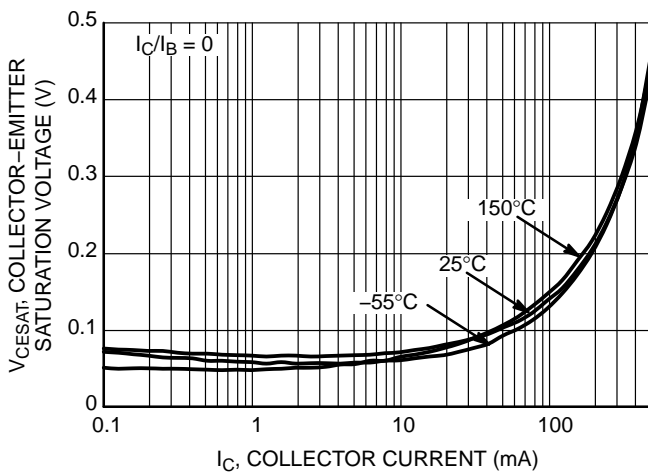


Figure 3. Collector-Emitter Saturation Voltage

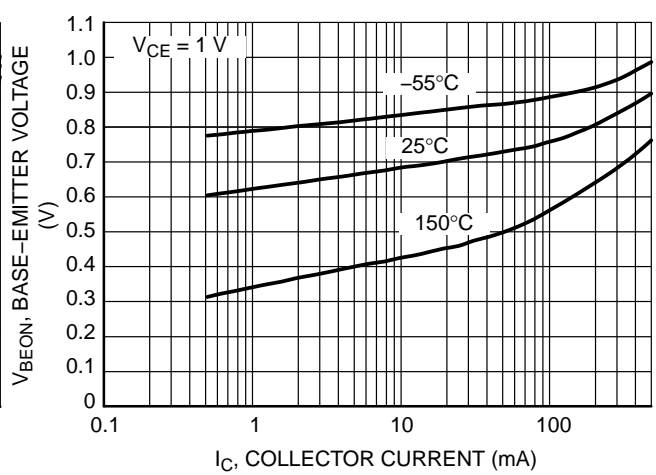


Figure 4. Base-Emitter Voltage

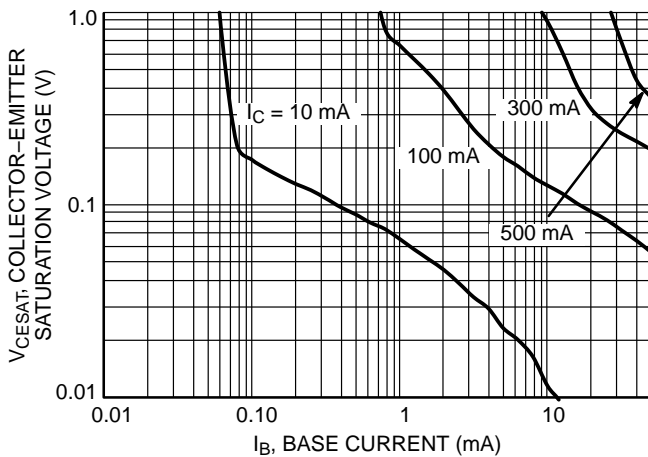


Figure 5. Collector Saturation Region

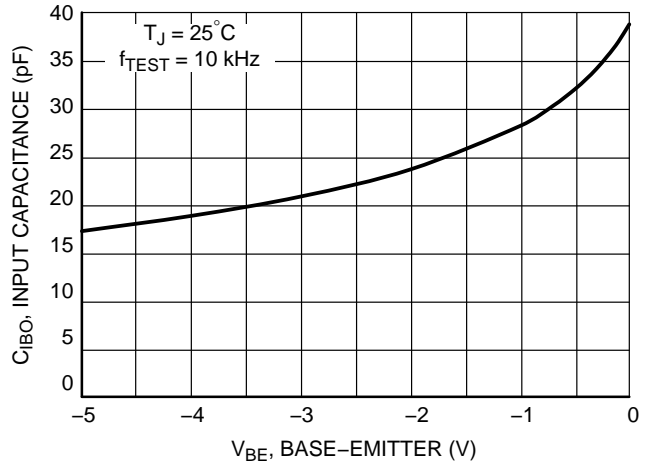


Figure 6. Input Capacitance

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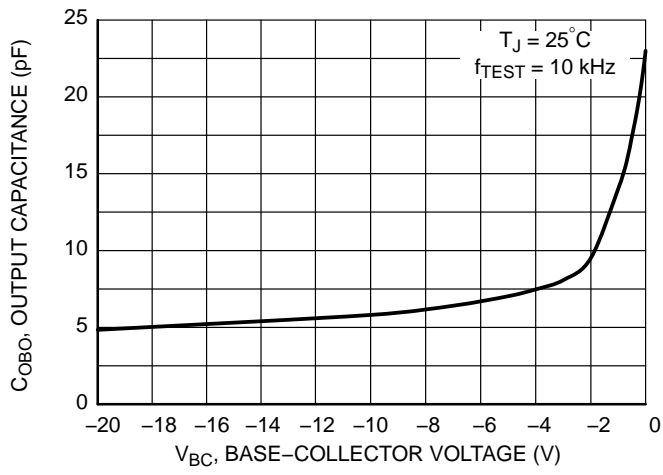


Figure 7. Output Capacitance

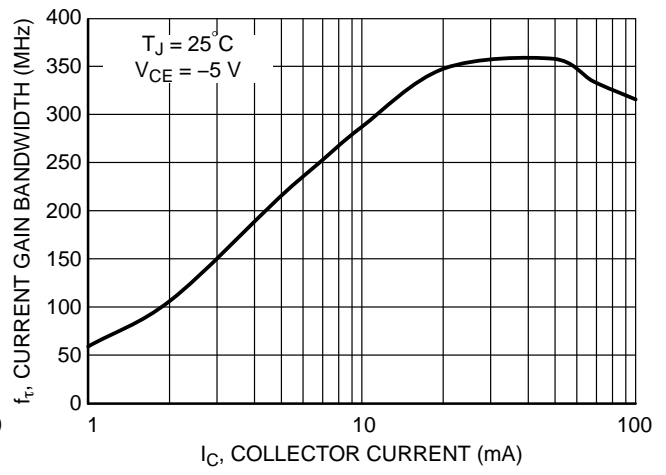


Figure 8. Current Gain Bandwidth Product

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

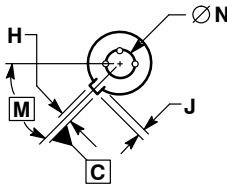
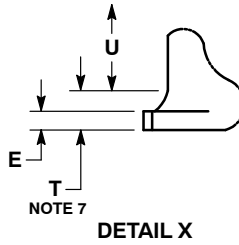
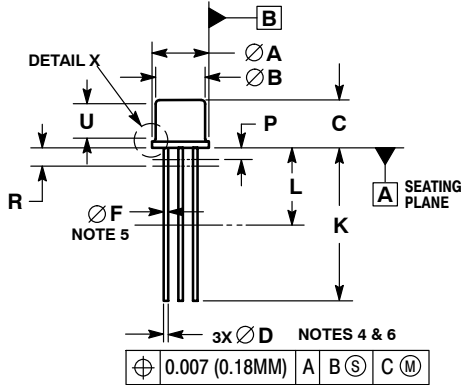
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SCALE 1:1

TO-18 CASE 206AA ISSUE A

DATE 21 AUG 2012



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:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 2:
PIN 1. SOURCE, SUBSTRATE & CASE
2. GATE
3. DRAIN

STYLE 3:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 4:
PIN 1. SOURCE
2. DRAIN
3. GATE & CASE

STYLE 5:
PIN 1. EMITTER
2. BASE 1
3. BASE 2

STYLE 6:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 7:
PIN 1. ANODE
2. BASE
3. CATHODE

STYLE 8:
PIN 1. GATE
2. ANODE 1
3. ANODE 2

STYLE 9:
PIN 1. ANODE 2
2. ANODE 1
3. GATE
(CONNECTED TO CASE)

STYLE 10:
PIN 1. BASE
2. EMITTER
3. BASE

STYLE 11:
PIN 1. DRAIN
2. GATE
3. SOURCE, SUBSTRATE

STYLE 12:
PIN 1. SOURCE
2. GATE
3. DRAIN (CASE)

| | | |
|------------------|--------------|---|
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