

PN2907A

Preferred Device

General Purpose Transistor

PNP Silicon



ON Semiconductor™

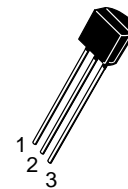
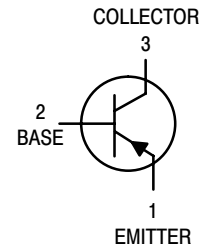
<http://onsemi.com>

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 @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | Watts mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –55 to +150 | $^\circ\text{C}$ |

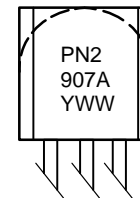
THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--------------------------------------------|-----------------|------|---------------------------|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |



TO-92
CASE 29
STYLE 1

MARKING DIAGRAM



PN2907A = Device Code
Y = Year
WW = Work Week

ORDERING INFORMATION

| Device | Package | Shipping |
|-------------|---------|------------------|
| PN2907A | TO-92 | 5000 Units/Box |
| PN2907ARLRA | TO-92 | 2000/Tape & Reel |

Preferred devices are recommended choices for future use and best overall value.

PN2907A

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------|--------------|------------------|
| Collector–Emitter Breakdown Voltage (Note 1.) (I _C = –10 mA _{dc} , I _B = 0) | V _{(BR)CEO} | –60 | – | V _{dc} |
| Collector–Base Breakdown Voltage (I _C = –10 μA _{dc} , I _E = 0) | V _{(BR)CBO} | –60 | – | V _{dc} |
| Emitter–Base Breakdown Voltage (I _E = –10 μA _{dc} , I _C = 0) | V _{(BR)EBO} | –5.0 | – | V _{dc} |
| Collector Cutoff Current (V _{CE} = –30 V _{dc} , V _{EB(off)} = –0.5 V _{dc}) | I _{CEX} | – | –50 | nA _{dc} |
| Collector Cutoff Current (V _{CB} = –50 V _{dc} , I _E = 0) (V _{CB} = –50 V _{dc} , I _E = 0, T _A = 150°C) | I _{CBO} | – – | –0.01 –10 | μA _{dc} |
| Base Current (V _{CE} = –30 V _{dc} , V _{EB(off)} = –0.5 V _{dc}) | I _B | – | –50 | nA _{dc} |

ON CHARACTERISTICS

| | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|-------------------------|-----------------|
| DC Current Gain (I _C = –0.1 mA _{dc} , V _{CE} = –10 V _{dc}) (I _C = –1.0 mA _{dc} , V _{CE} = –10 V _{dc}) (I _C = –10 mA _{dc} , V _{CE} = –10 V _{dc}) (I _C = –150 mA _{dc} , V _{CE} = –10 V _{dc}) (Note 1.) (I _C = –500 mA _{dc} , V _{CE} = –10 V _{dc}) (Note 1.) | h _{FE} | 75 100 100 100 50 | – – – 300 – | – |
| Collector–Emitter Saturation Voltage (Note 1.) (I _C = –150 mA _{dc} , I _B = –15 mA _{dc}) (I _C = –500 mA _{dc} , I _B = –50 mA _{dc}) | V _{CE(sat)} | – – | –0.4 –1.6 | V _{dc} |
| Base–Emitter Saturation Voltage (Note 1.) (I _C = –150 mA _{dc} , I _B = –15 mA _{dc}) (I _C = –500 mA _{dc} , I _B = –50 mA _{dc}) | V _{BE(sat)} | – – | –1.3 –2.6 | V _{dc} |

SMALL–SIGNAL CHARACTERISTICS

| | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|-----|-----|
| Current–Gain – Bandwidth Product (Notes 1. and 2.), (I _C = –50 mA _{dc} , V _{CE} = –20 V _{dc} , f = 100 MHz) | f _T | 200 | – | MHz |
| Output Capacitance (V _{CB} = –10 V _{dc} , I _E = 0, f = 1.0 MHz) | C _{obo} | – | 8.0 | pF |
| Input Capacitance (V _{EB} = –2.0 V _{dc} , I _C = 0, f = 1.0 MHz) | C _{ibo} | – | 30 | pF |

SWITCHING CHARACTERISTICS

| | | | | | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---|-----|----|
| Turn–On Time | (V _{CC} = –30 V _{dc} , I _C = –150 mA _{dc} , I _{B1} = –15 mA _{dc}) (Figures 1 and 5) | t _{on} | – | 45 | ns |
| Delay Time | | t _d | – | 10 | ns |
| Rise Time | | t _r | – | 40 | ns |
| Turn–Off Time | (V _{CC} = –6.0 V _{dc} , I _C = –150 mA _{dc} , I _{B1} = I _{B2} = 15 mA _{dc}) (Figure 2) | t _{off} | – | 100 | ns |
| Storage Time | | t _s | – | 80 | ns |
| Fall Time | | t _f | – | 30 | ns |

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
2. f_T is defined as the frequency at which |h_{fe}| extrapolates to unity.

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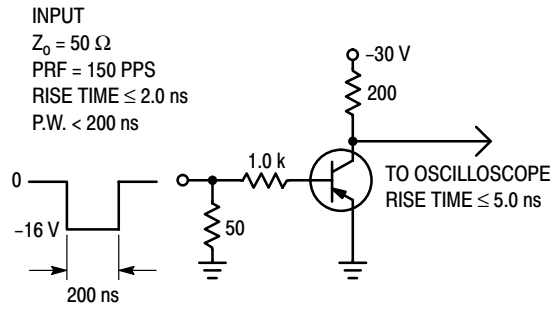


Figure 1. Delay and Rise Time Test Circuit

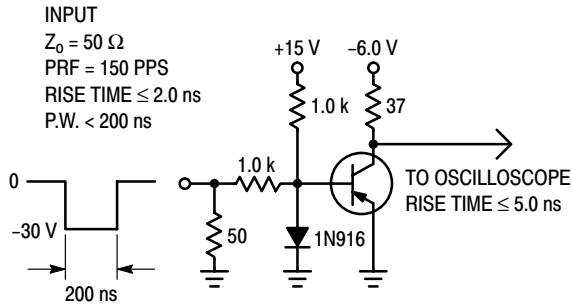


Figure 2. Storage and Fall Time Test Circuit

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TYPICAL CHARACTERISTICS

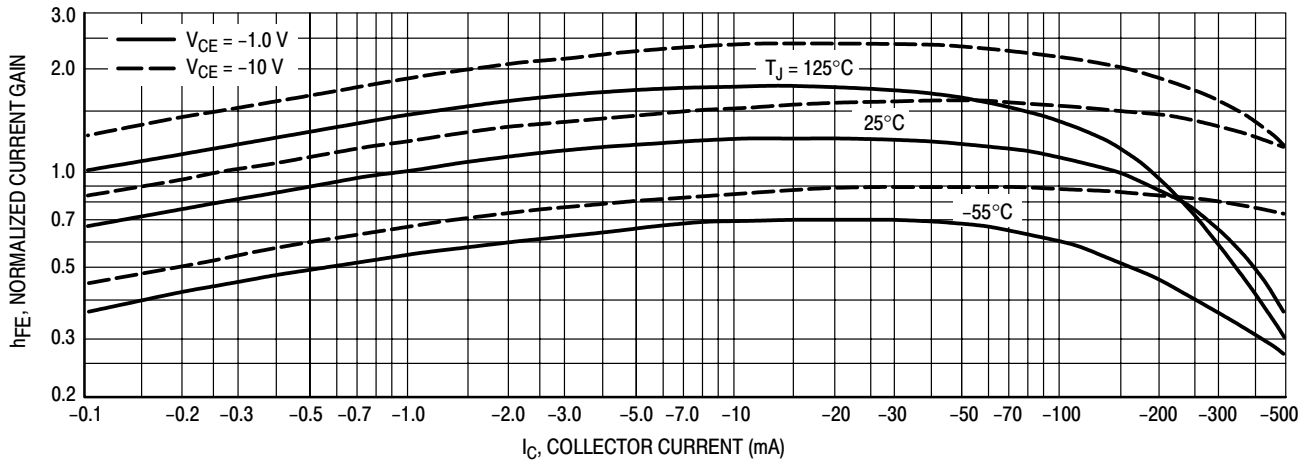


Figure 3. DC Current Gain

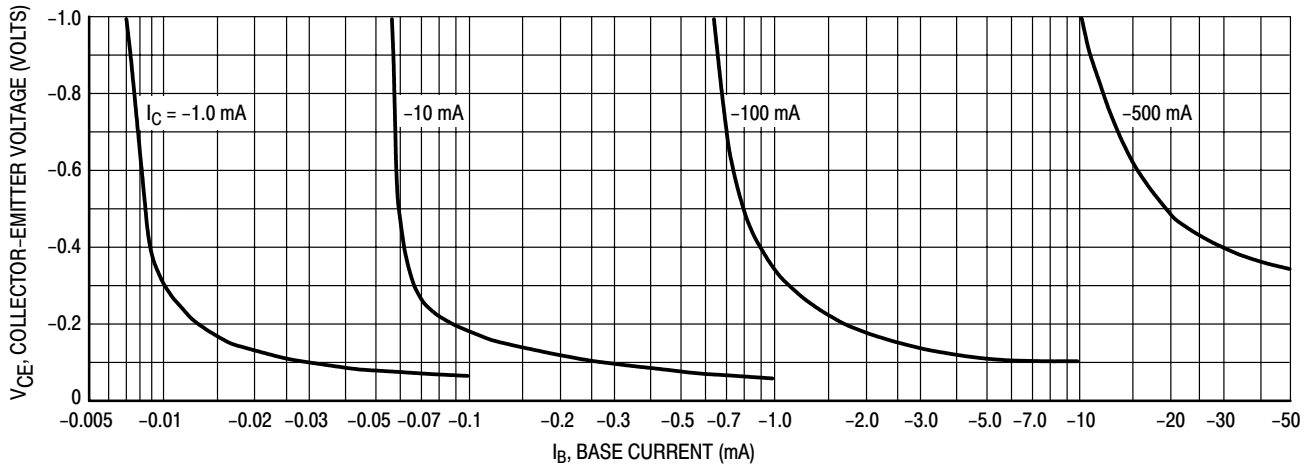


Figure 4. Collector Saturation Region

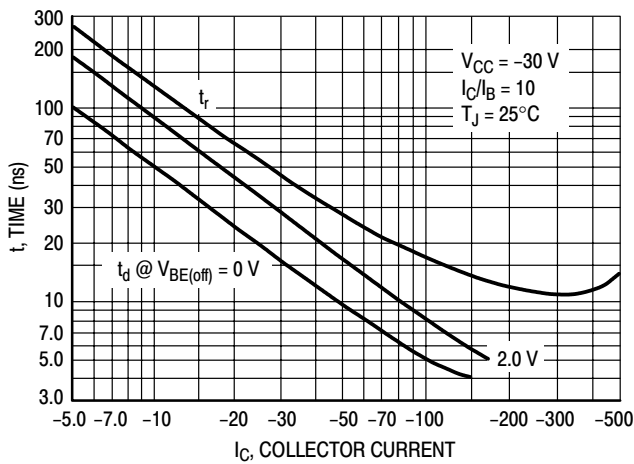


Figure 5. Turn-On Time

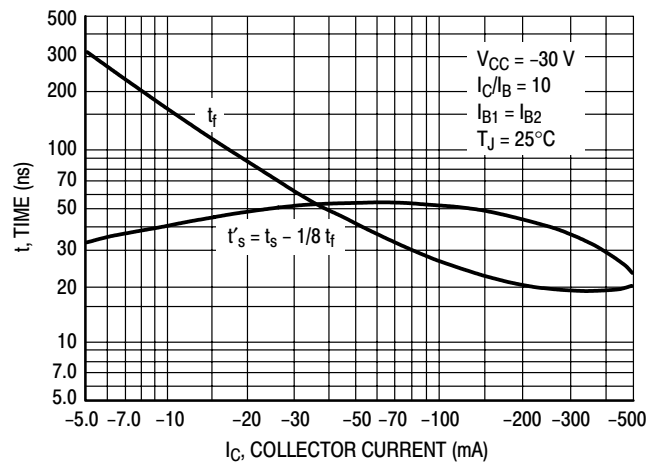


Figure 6. Turn-Off Time

TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

$V_{CE} = 10 \text{ Vdc}$, $T_A = 25^\circ\text{C}$

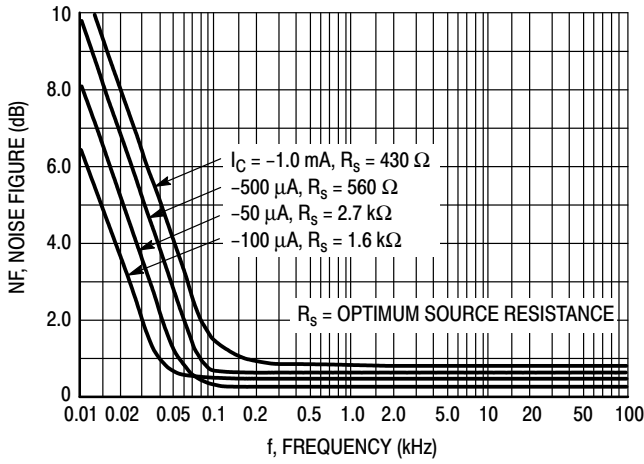


Figure 7. Frequency Effects

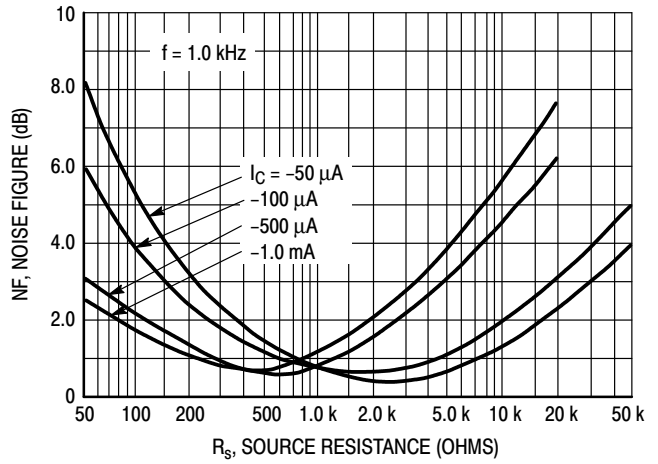


Figure 8. Source Resistance Effects

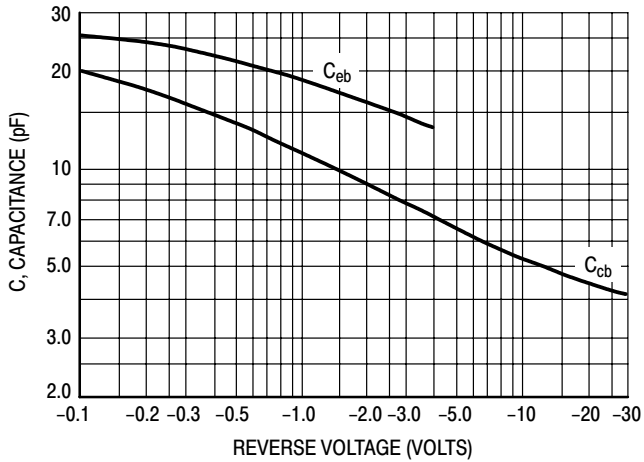


Figure 9. Capacitances

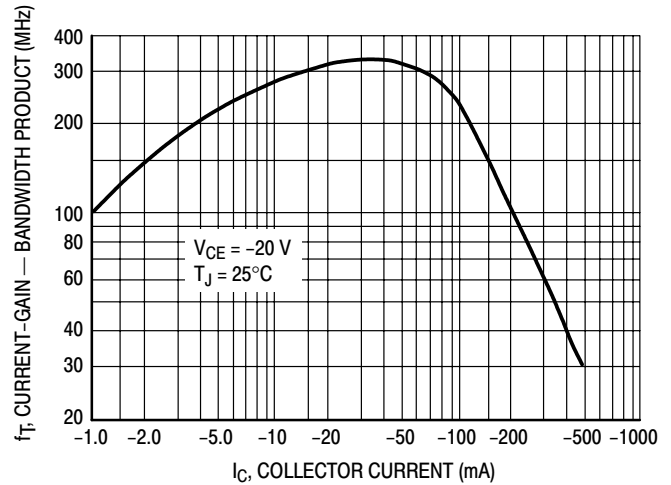


Figure 10. Current-Gain — Bandwidth Product

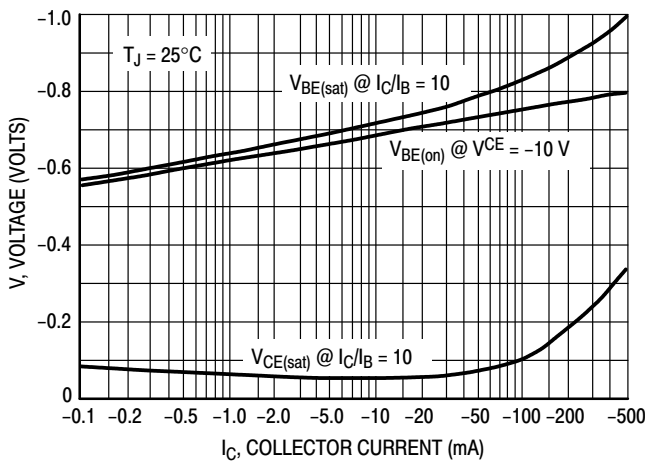


Figure 11. "On" Voltage

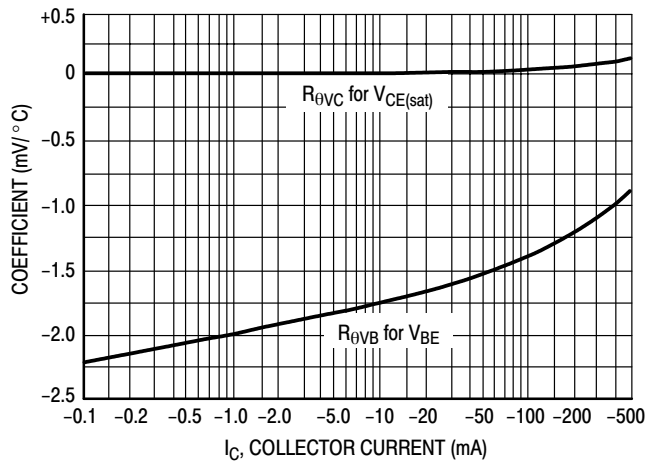
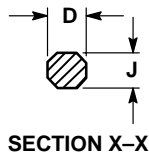
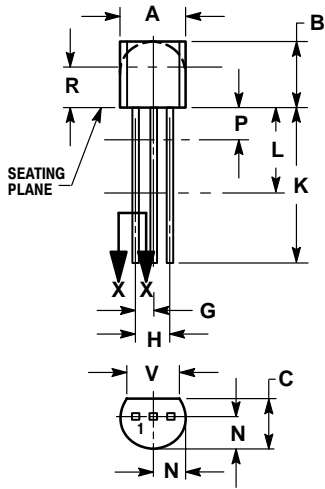


Figure 12. Temperature Coefficients

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PACKAGE DIMENSIONS

TO-92
TO-226AA
CASE 29-11
ISSUE AL



NOTES:


1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.021 | 0.407 | 0.533 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.115 | --- | 2.93 | --- |
| V | 0.135 | --- | 3.43 | --- |

STYLE 1:

- PIN 1. EMITTER
2. BASE
3. COLLECTOR

Notes

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