



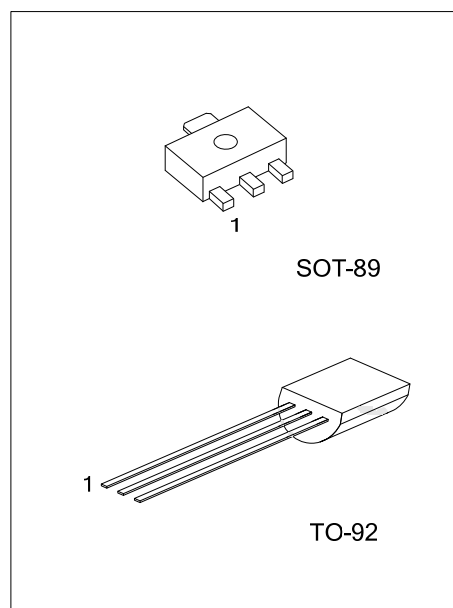
## PN2907A

## PNP SILICON TRANSISTOR

### PNP GENERAL PURPOSE AMPLIFIER

#### DESCRIPTION

This UTC **PN2907A** is designed for use as a general purpose amplifier and switch requiring collector currents to 600 mA.



#### ORDERING INFORMATION

| Ordering Number |                | Package | Pin Assignment |   |   | Packing   |
|-----------------|----------------|---------|----------------|---|---|-----------|
| Lead Free       | Halogen Free   |         | 1              | 2 | 3 |           |
| -               | PN2907AG-AB3-R | SOT-89  | B              | C | E | Tape Reel |
| PN2907AL-T92-B  | PN2907AG-T92-B | TO-92   | E              | B | C | Tape Box  |
| PN2907AL-T92-K  | PN2907AG-T92-K | TO-92   | E              | B | C | Bulk      |

Note: Pin Assignment: E: Emitter C: Collector B: Base

|                                                                                                |                                                                                                                                         |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <p>PN2907AG-AB3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p> | <p>(1) B: Tape Box, K: Bulk, R: Tape Reel</p> <p>(2) AB3: SOT-89, T92: TO-92</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|

#### MARKING

| SOT-89                                                | TO-92                                                                                                      |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <p>□□□□</p> <p>PN2907AG</p> <p>1</p> <p>Data Code</p> | <p>UTC</p> <p>PN2907</p> <p>A□ □□</p> <p>1</p> <p>L: Lead Free</p> <p>G: Halogen Free</p> <p>Data Code</p> |

### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified.)

| PARAMETER                      |        | SYMBOL           | RATINGS    | UNIT |
|--------------------------------|--------|------------------|------------|------|
| Collector-Emitter Voltage      |        | V <sub>CEO</sub> | -60        | V    |
| Collector-Base Voltage         |        | V <sub>CBO</sub> | -60        | V    |
| Emitter-Base Voltage           |        | V <sub>EBO</sub> | -5         | V    |
| Collector Current (Continuous) |        | I <sub>C</sub>   | -600       | mA   |
| Collector Current (Peak)       |        | I <sub>CM</sub>  | -900       | mA   |
| Power Dissipation              | SOT-89 | P <sub>D</sub>   | 350        | mW   |
|                                | TO-92  |                  | 625        | mW   |
| Junction Temperature           |        | T <sub>J</sub>   | +150       | °C   |
| Storage Temperature            |        | T <sub>STG</sub> | -40 ~ +150 | °C   |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.  
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### ■ THERMAL DATA

| PARAMETER                               |        | SYMBOL        | RATINGS | UNIT |
|-----------------------------------------|--------|---------------|---------|------|
| Thermal resistance, junction to Ambient | SOT-89 | $\theta_{JA}$ | 104     | °C/W |
|                                         | TO-92  |               | 200     | °C/W |

### ■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified.)

| PARAMETER                                   | SYMBOL               | TEST CONDITIONS                                                                                       | MIN | TYP | MAX          | UNIT     |
|---------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------|-----|-----|--------------|----------|
| OFF CHARACTERISTICS                         |                      |                                                                                                       |     |     |              |          |
| Collector-Emitter Breakdown Voltage         | BV <sub>CEO</sub>    | I <sub>C</sub> =-10mA, I <sub>B</sub> =0                                                              | -60 |     |              | V        |
| Collector-Base Breakdown Voltage            | BV <sub>CBO</sub>    | I <sub>C</sub> =-10μA, I <sub>E</sub> =0                                                              | -60 |     |              | V        |
| Emitter-Base Breakdown Voltage              | BV <sub>EBO</sub>    | I <sub>E</sub> =-10μA , I <sub>C</sub> =0                                                             | -5  |     |              | V        |
| Base Cutoff Current                         | I <sub>B</sub>       | V <sub>CB</sub> =-30V, V <sub>EB</sub> =-0.5V                                                         |     |     | -50          | nA       |
| Collector Cutoff Current                    | I <sub>CEX</sub>     | V <sub>CE</sub> =-30V, V <sub>BE</sub> =-0.5V                                                         |     |     | -50          | nA       |
| Collector Cutoff Current                    | I <sub>CBO</sub>     | V <sub>CB</sub> =-50V, I <sub>E</sub> =0<br>V <sub>CB</sub> =-50V, I <sub>E</sub> =0, Ta=150°C        |     |     | -0.02<br>-20 | μA<br>μA |
| ON CHARACTERISTICS                          |                      |                                                                                                       |     |     |              |          |
| DC Current Gain                             | h <sub>FE</sub>      | I <sub>C</sub> =-0.1mA, V <sub>CE</sub> =-10V                                                         | 75  |     |              |          |
|                                             |                      | I <sub>C</sub> =-1.0 mA, V <sub>CE</sub> =-10V                                                        | 100 |     |              |          |
|                                             |                      | I <sub>C</sub> =-10 mA, V <sub>CE</sub> =-10V                                                         | 100 |     |              |          |
|                                             |                      | I <sub>C</sub> =-150 mA, V <sub>CE</sub> =-10V (Note)                                                 | 100 |     | 300          |          |
|                                             |                      | I <sub>C</sub> =-500 mA, V <sub>CE</sub> =-10V (Note)                                                 | 50  |     |              |          |
| Collector-Emitter Saturation Voltage (Note) | V <sub>CE(SAT)</sub> | I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA<br>I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA        |     |     | -0.4<br>-1.6 | V<br>V   |
| Base-Emitter Saturation Voltage             | V <sub>BE(SAT)</sub> | I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA (Note)<br>I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA |     |     | -1.3<br>-2.6 | V<br>V   |
| SMALL SIGNAL CHARACTERISTICS                |                      |                                                                                                       |     |     |              |          |
| Current Gain – Bandwidth Product            | f <sub>T</sub>       | I <sub>C</sub> =-50mA, V <sub>CE</sub> =-20V, f=100MHz                                                | 200 |     |              | MHz      |
| Output Capacitance                          | C <sub>ob</sub>      | V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=100kHz                                                    |     |     | 8            | pF       |
| Input Capacitance                           | C <sub>ib</sub>      | V <sub>EB</sub> =-2V, I <sub>C</sub> =0, f=100kHz                                                     |     |     | 30           | pF       |
| SWITCHING CHARACTERISTICS                   |                      |                                                                                                       |     |     |              |          |
| Turn-on Time                                | t <sub>ON</sub>      | V <sub>CC</sub> =-30V, I <sub>C</sub> =-150mA<br>I <sub>B1</sub> =-15mA                               |     |     | 45           | ns       |
| Delay Time                                  | t <sub>DLY</sub>     |                                                                                                       |     |     | 10           | ns       |
| Rise Time                                   | t <sub>R</sub>       |                                                                                                       |     |     | 40           | ns       |
| Turn-off Time                               | t <sub>OFF</sub>     | V <sub>CC</sub> =-6V, I <sub>C</sub> =-150mA<br>I <sub>B1</sub> =I <sub>B2</sub> =-15mA               |     |     | 100          | ns       |
| Storage Time                                | t <sub>S</sub>       |                                                                                                       |     |     | 80           | ns       |
| Fall Time                                   | t <sub>F</sub>       |                                                                                                       |     |     | 30           | ns       |

Note: Pulse Test: Pulse Width ≤ 300ms, Duty Cycle ≤ 2.0%

### ■ TEST CIRCUITS

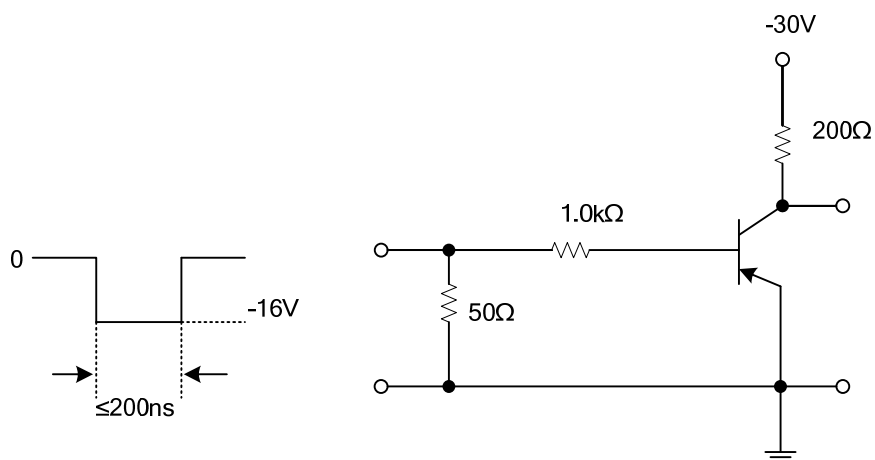


Fig. 1 Saturated Turn-On Switching Time Test Circuit

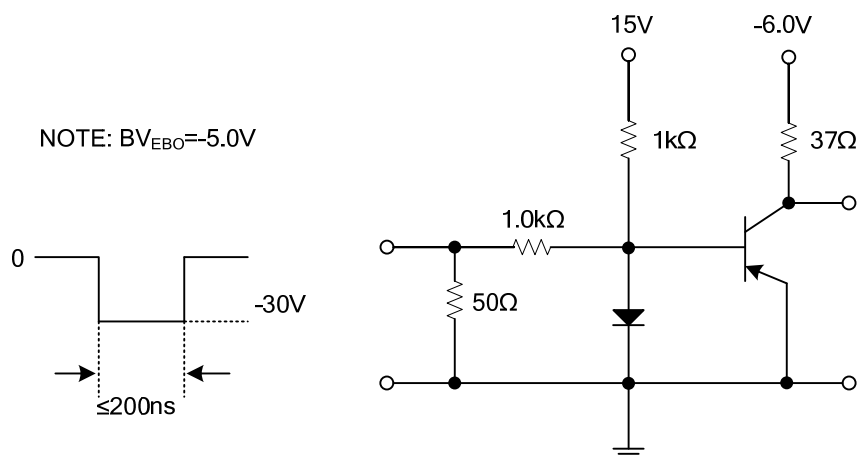
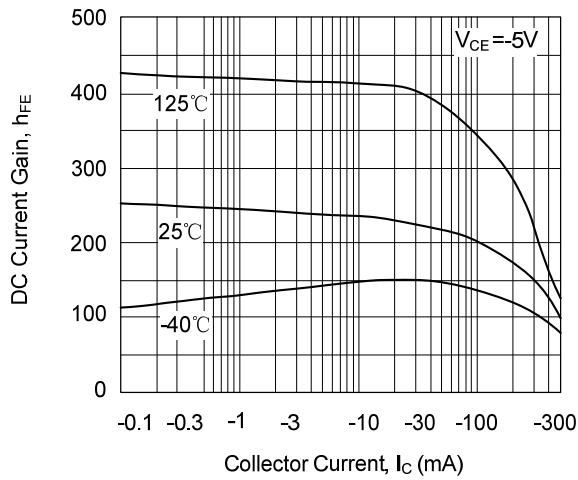


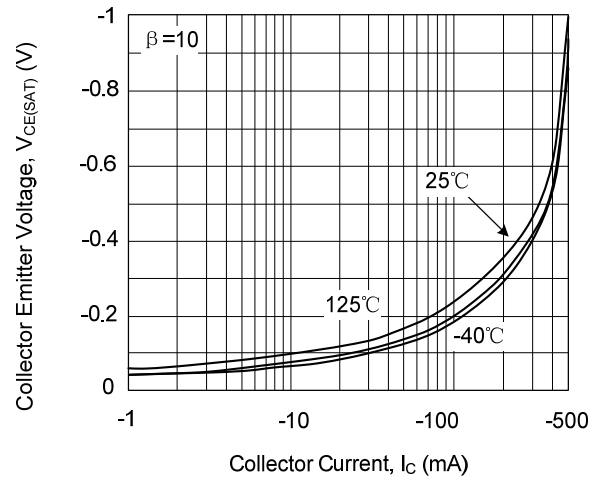
Fig. 2 Saturated Turn-Off Switching Time Test Circuit

## ■ TYPICAL CHARACTERISTICS

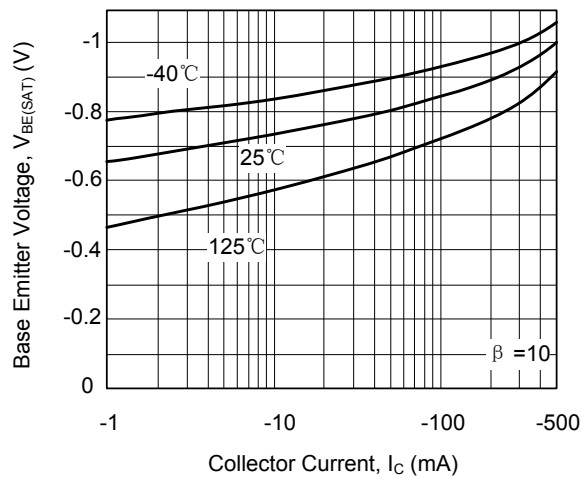
Typical Pulsed Current Gain vs. Collector Current



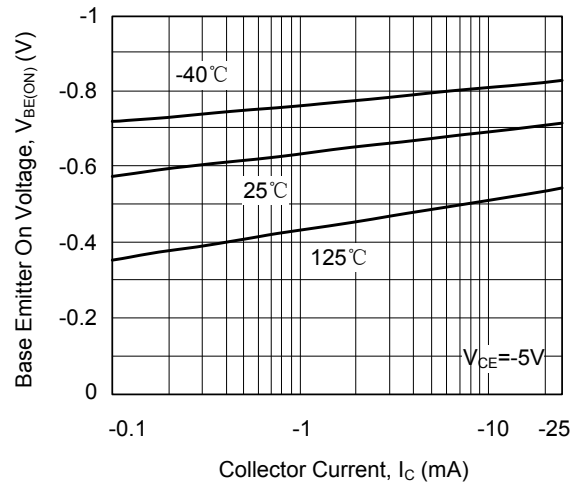
Collector-Emitter Saturation Voltage vs. Collector Current

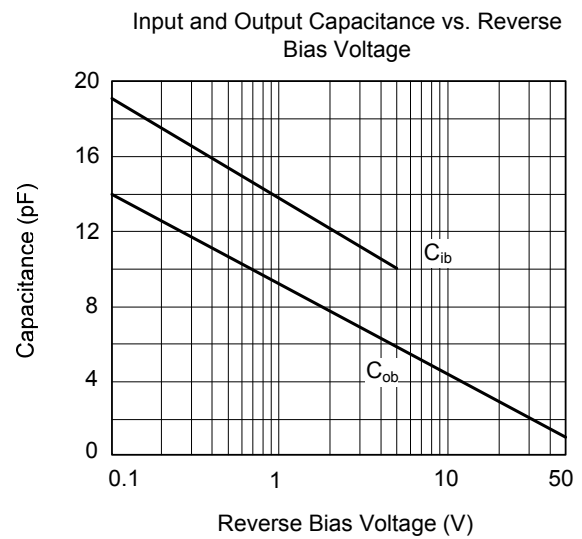
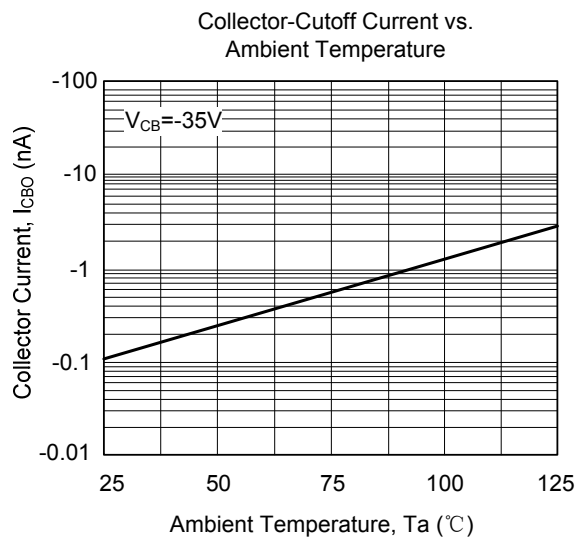


Base-Emitter Saturation Voltage vs. Collector Current

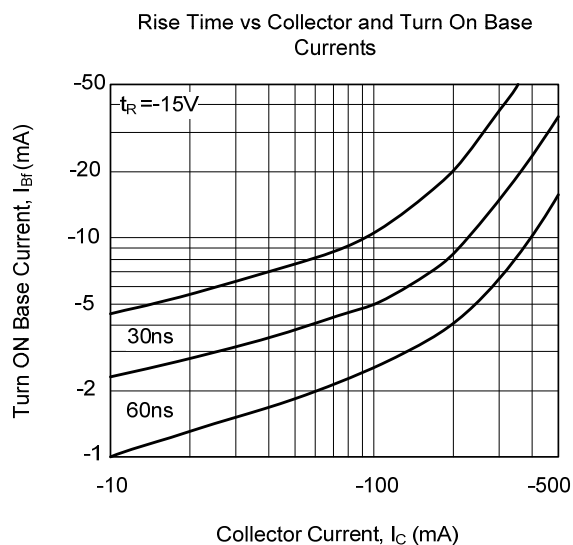
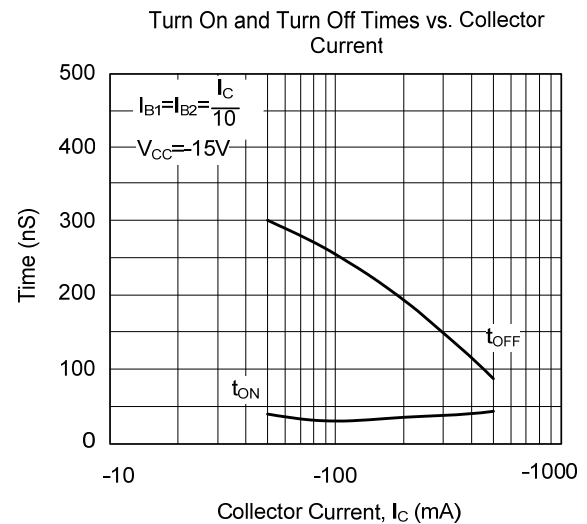
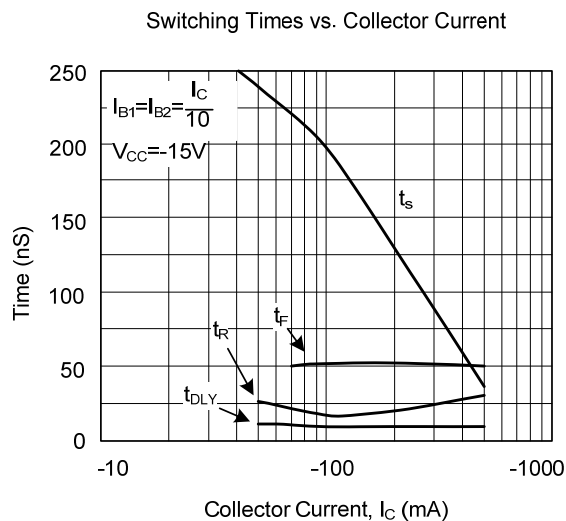


Base Emitter ON Voltage vs. Collector Current

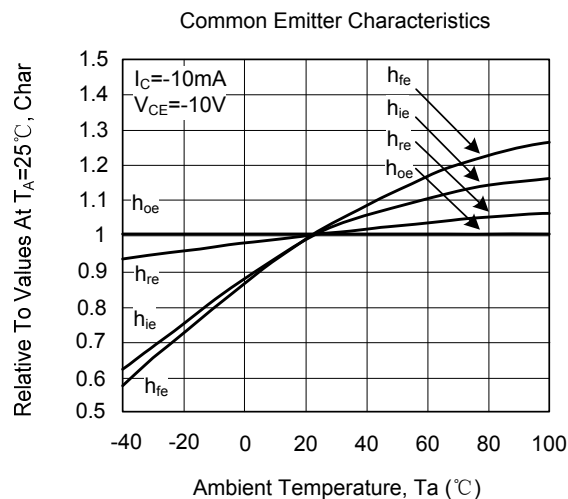
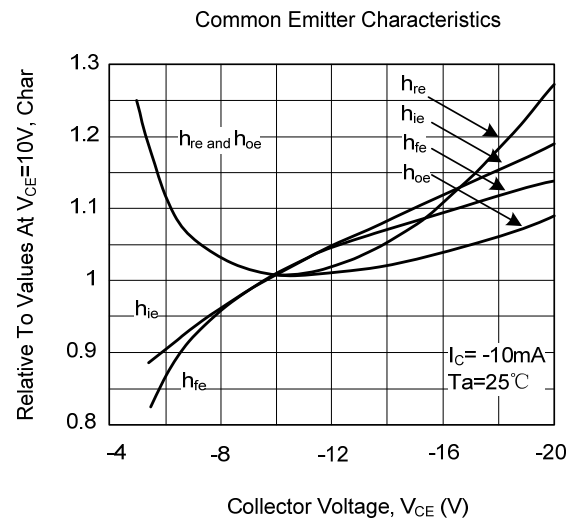
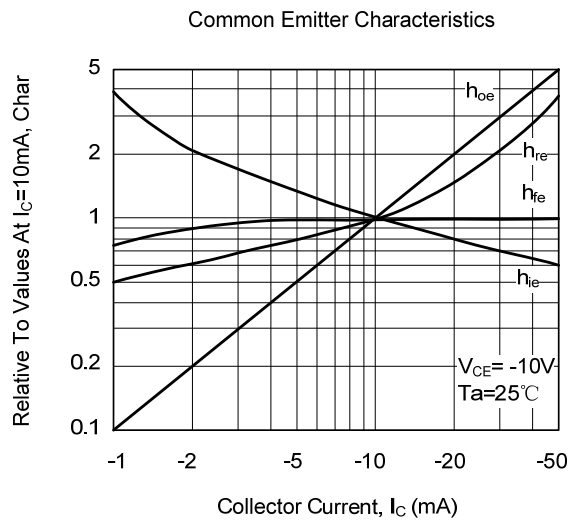




## ■ TYPICAL CHARACTERISTICS(Cont.)



## ■ TYPICAL CHARACTERISTICS FOR COMMON EMITTER (f=1kHz)



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