



Micro Commercial Components



Micro Commercial Components  
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CA 91311  
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## Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Through Hole Package
- 150 C Junction Temperature
- Voltage and Current are negative for PNP transistors
- Halogen free available upon request by adding suffix "-HF"

## Mechanical Data

- Case: TO-92, Molded Plastic
- Polarity: indicated as above.

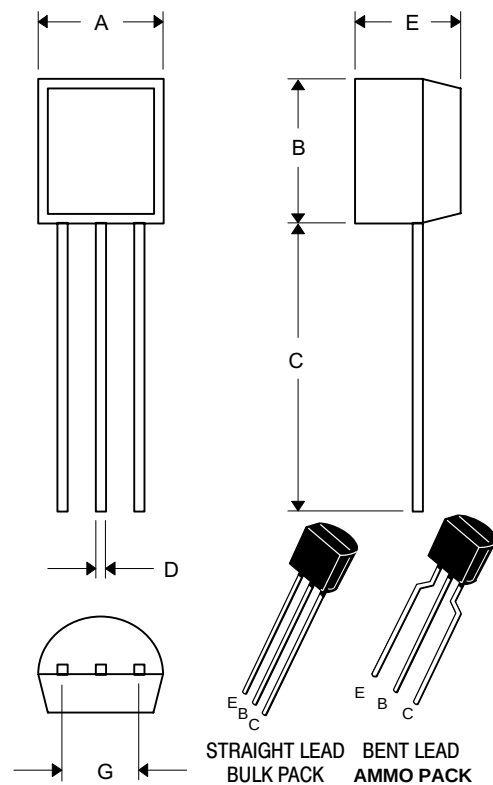
## Maximum Ratings @ 25°C Unless Otherwise Specified

| Charateristic                                                   | Symbol          | Value             | Unit       |
|-----------------------------------------------------------------|-----------------|-------------------|------------|
| Collector-Emitter Voltage<br>2N6515<br>2N6519<br>2N6517, 2N6520 | $V_{CEO}$       | 250<br>300<br>350 | V          |
| Collector-Base Voltage<br>2N6515<br>2N6519<br>2N6517, 2N6520    | $V_{CBO}$       | 250<br>300<br>350 | V          |
| Emitter-Base Voltage<br>2N6515-6517<br>2N6519-6520              | $V_{EBO}$       | 6.0<br>5.0        | V          |
| Base Current                                                    | $I_B$           | 250               | mA         |
| Collector Current(DC)                                           | $I_C$           | 500               | mA         |
| Power Dissipation@TA=25°C                                       | $P_d$           | 0.625<br>5.0      | W<br>mW/°C |
| Power Dissipation@TC=25°C                                       | $P_d$           | 1.5<br>12         | W<br>mW/°C |
| Thermal Resistance, Junction to Ambient Air                     | $R_{\theta JA}$ | 200               | °C/W       |
| Thermal Resistance, Junction to Case                            | $R_{\theta JC}$ | 83.3              | °C/W       |
| Operating & Storage Temperature                                 | $T_j, T_{STG}$  | -55~150           | °C         |

# NPN 2N6515, 2N6517 PNP 2N6519, 2N6520

## High Voltage Transistor 625mW

### TO-92



| DIMENSIONS |        |      |       |      |               |
|------------|--------|------|-------|------|---------------|
| DIM        | INCHES |      | MM    |      | NOTE          |
|            | MIN    | MAX  | MIN   | MAX  |               |
| A          | .175   | .185 | 4.45  | 4.70 |               |
| B          | .175   | .185 | 4.45  | 4.70 |               |
| C          | .500   | ---  | 12.70 | ---  |               |
| D          | .016   | .020 | 0.41  | 0.63 |               |
| E          | .135   | .145 | 3.43  | 3.68 |               |
| G          | .095   | .105 | 2.42  | 2.67 | Straight Lead |
|            | .173   | .220 | 4.40  | 5.60 | Bent Lead     |

\* For ammo packing detailed specification, click here to visit our website of product packaging for details.

# NPN 2N6515 2N6517

# PNP 2N6519 2N6520

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Characteristic                                                                                                                                                                                                                                                           | Symbol               | Min               | Max                         | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------|-----------------------------|------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                                                                                                                                               |                      |                   |                             |      |
| Collector-Emitter Breakdown Voltage <sup>(1)</sup><br>(I <sub>C</sub> = 1.0 mAdc, I <sub>B</sub> = 0)                                                                                                                                                                    | V <sub>(BR)CEO</sub> | 250<br>300<br>350 | —<br>—<br>—                 | Vdc  |
| Collector-Base Breakdown Voltage<br>(I <sub>C</sub> = 100 μAdc, I <sub>E</sub> = 0)                                                                                                                                                                                      | V <sub>(BR)CBO</sub> | 250<br>300<br>350 | —<br>—<br>—                 | Vdc  |
| Emitter-Base Breakdown Voltage<br>(I <sub>E</sub> = 10 μAdc, I <sub>C</sub> = 0)                                                                                                                                                                                         | V <sub>(BR)EBO</sub> | 6.0<br>5.0        | —<br>—                      | Vdc  |
| Collector Cutoff Current<br>(V <sub>CB</sub> = 150 Vdc, I <sub>E</sub> = 0)<br>(V <sub>CB</sub> = 200 Vdc, I <sub>E</sub> = 0)<br>(V <sub>CB</sub> = 250 Vdc, I <sub>E</sub> = 0)                                                                                        | I <sub>CBO</sub>     | —<br>—<br>—       | 50<br>50<br>50              | nAdc |
| Emitter Cutoff Current<br>(V <sub>EB</sub> = 5.0 Vdc, I <sub>C</sub> = 0)<br>(V <sub>EB</sub> = 4.0 Vdc, I <sub>C</sub> = 0)                                                                                                                                             | I <sub>EBO</sub>     | —<br>—            | 50<br>50                    | nAdc |
| <b>ON CHARACTERISTICS<sup>(1)</sup></b>                                                                                                                                                                                                                                  |                      |                   |                             |      |
| DC Current Gain<br>(I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc)                                                                                                                                                                                                 | h <sub>FE</sub>      | 35<br>30<br>20    | —<br>—<br>—                 | —    |
| (I <sub>C</sub> = 10 mAdc, V <sub>CE</sub> = 10 Vdc)                                                                                                                                                                                                                     |                      | 50<br>45<br>30    | —<br>—<br>—                 | —    |
| (I <sub>C</sub> = 30 mAdc, V <sub>CE</sub> = 10 Vdc)                                                                                                                                                                                                                     |                      | 50<br>45<br>30    | 300<br>270<br>200           | —    |
| (I <sub>C</sub> = 50 mAdc, V <sub>CE</sub> = 10 Vdc)                                                                                                                                                                                                                     |                      | 45<br>40<br>20    | 220<br>200<br>200           | —    |
| (I <sub>C</sub> = 100 mAdc, V <sub>CE</sub> = 10 Vdc)                                                                                                                                                                                                                    |                      | 25<br>20<br>15    | —<br>—<br>—                 | —    |
| Collector-Emitter Saturation Voltage<br>(I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 1.0 mAdc)<br>(I <sub>C</sub> = 20 mAdc, I <sub>B</sub> = 2.0 mAdc)<br>(I <sub>C</sub> = 30 mAdc, I <sub>B</sub> = 3.0 mAdc)<br>(I <sub>C</sub> = 50 mAdc, I <sub>B</sub> = 5.0 mAdc) | V <sub>CE(sat)</sub> | —<br>—<br>—<br>—  | 0.30<br>0.35<br>0.50<br>1.0 | Vdc  |
| Base-Emitter Saturation Voltage<br>(I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 1.0 mAdc)<br>(I <sub>C</sub> = 20 mAdc, I <sub>B</sub> = 2.0 mAdc)<br>(I <sub>C</sub> = 30 mAdc, I <sub>B</sub> = 3.0 mAdc)                                                               | V <sub>BE(sat)</sub> | —<br>—<br>—       | 0.75<br>0.85<br>0.90        | Vdc  |
| Base-Emitter On Voltage<br>(I <sub>C</sub> = 100 mAdc, V <sub>CE</sub> = 10 Vdc)                                                                                                                                                                                         | V <sub>BE(on)</sub>  | —                 | 2.0                         | Vdc  |

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

# NPN 2N6515 2N6517 PNP 2N6519 2N6520



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

| Characteristic                                                                                                              | Symbol    | Min | Max       | Unit          |
|-----------------------------------------------------------------------------------------------------------------------------|-----------|-----|-----------|---------------|
| <b>SMALL-SIGNAL CHARACTERISTICS</b>                                                                                         |           |     |           |               |
| Current-Gain — Bandwidth Product <sup>(1)</sup><br>( $I_C = 10\text{ mA}$ , $V_{CE} = 20\text{ V}$ , $f = 20\text{ MHz}$ )  | $f_T$     | 40  | 200       | MHz           |
| Collector-Base Capacitance<br>( $V_{CB} = 20\text{ V}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )                                 | $C_{cb}$  | —   | 6.0       | pF            |
| Emitter-Base Capacitance<br>( $V_{EB} = 0.5\text{ V}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )                                  | $C_{eb}$  | —   | 80<br>100 | pF            |
| <b>SWITCHING CHARACTERISTICS</b>                                                                                            |           |     |           |               |
| Turn-On Time<br>( $V_{CC} = 100\text{ V}$ , $V_{BE(off)} = 2.0\text{ V}$ , $I_C = 50\text{ mA}$ , $I_{B1} = 10\text{ mA}$ ) | $t_{on}$  | —   | 200       | $\mu\text{s}$ |
| Turn-Off Time<br>( $V_{CC} = 100\text{ V}$ , $I_C = 50\text{ mA}$ , $I_{B1} = I_{B2} = 10\text{ mA}$ )                      | $t_{off}$ | —   | 3.5       | $\mu\text{s}$ |

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

# NPN 2N6515 2N6517 PNP 2N6519 2N6520



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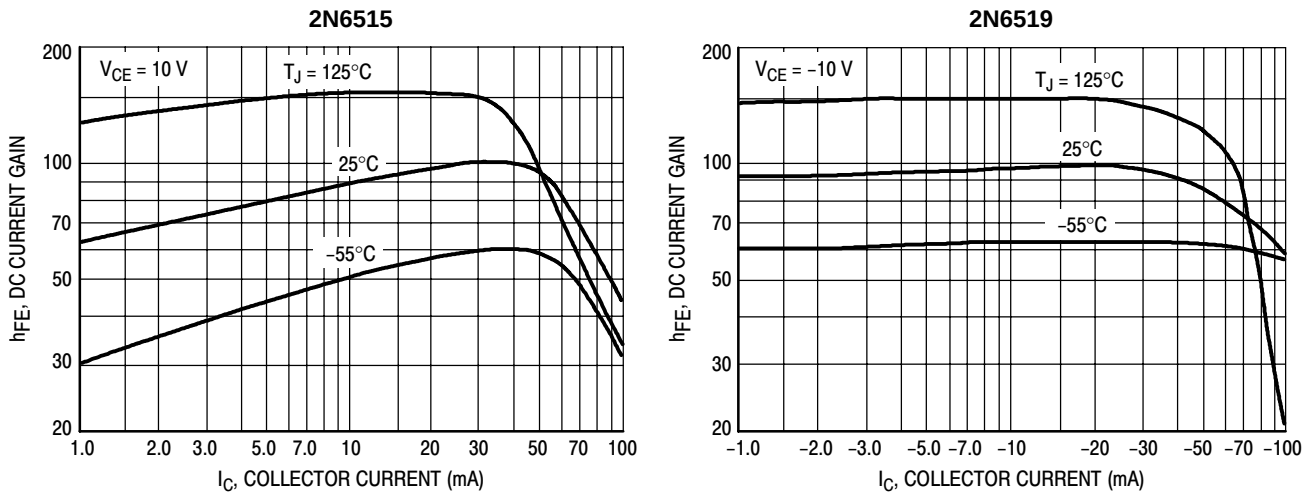


Figure 1. DC Current Gain

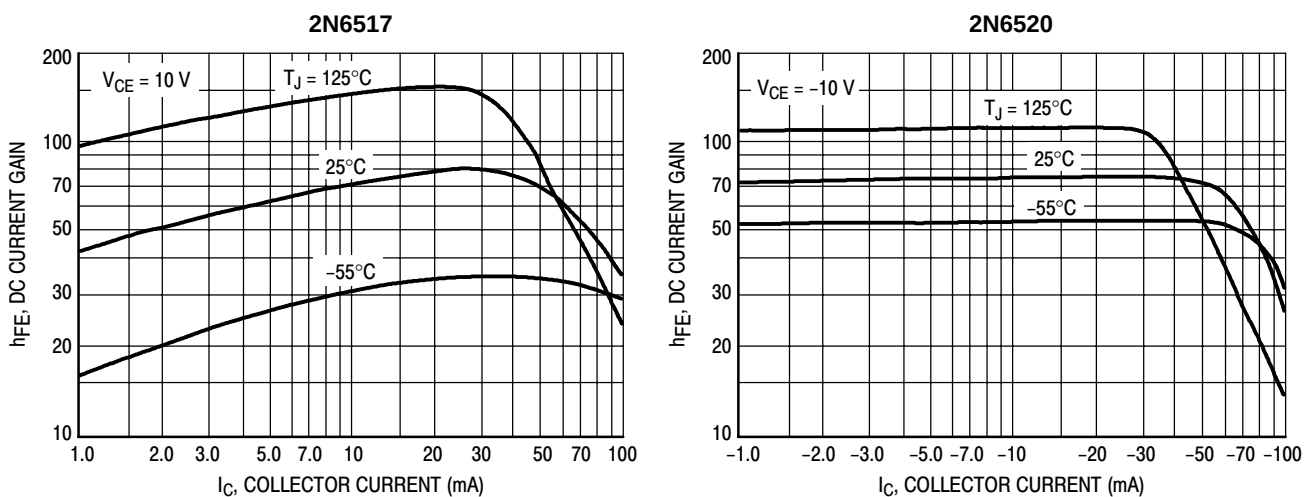


Figure 2. DC Current Gain

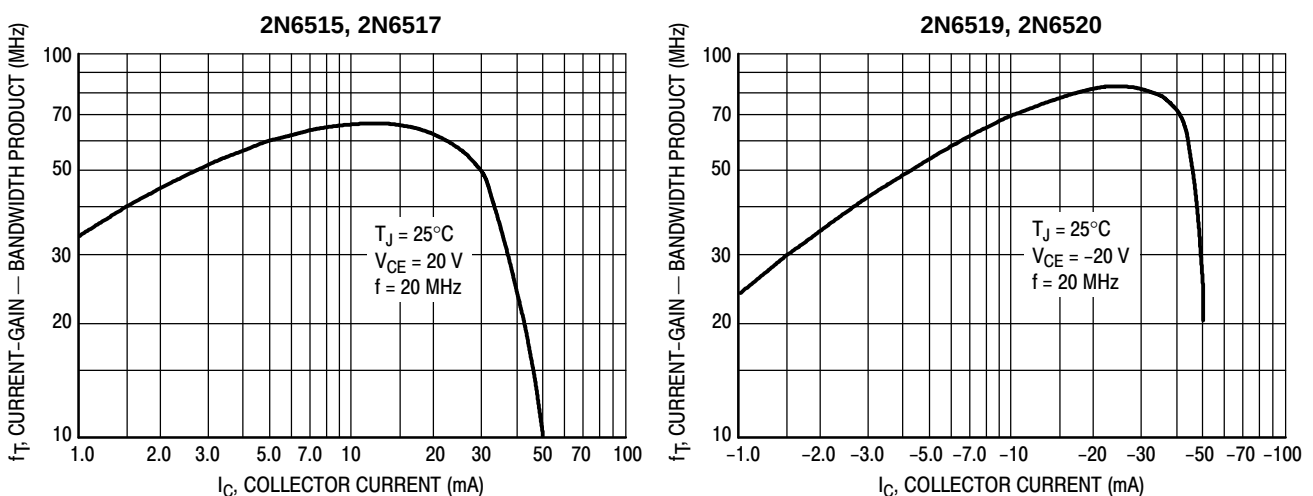


Figure 3. Current-Gain — Bandwidth Product

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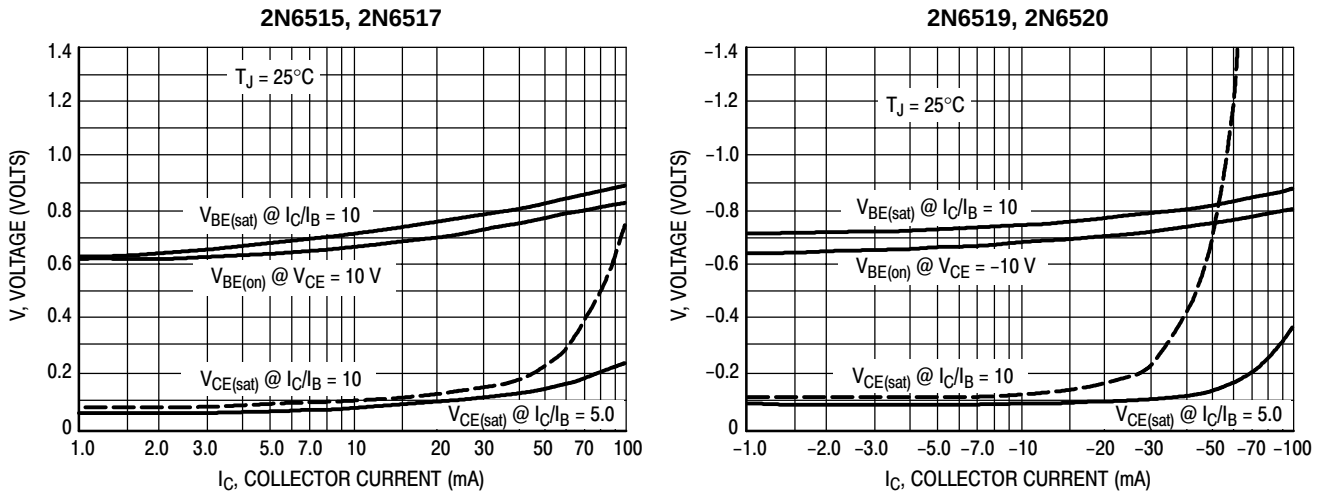


Figure 4. "On" Voltages

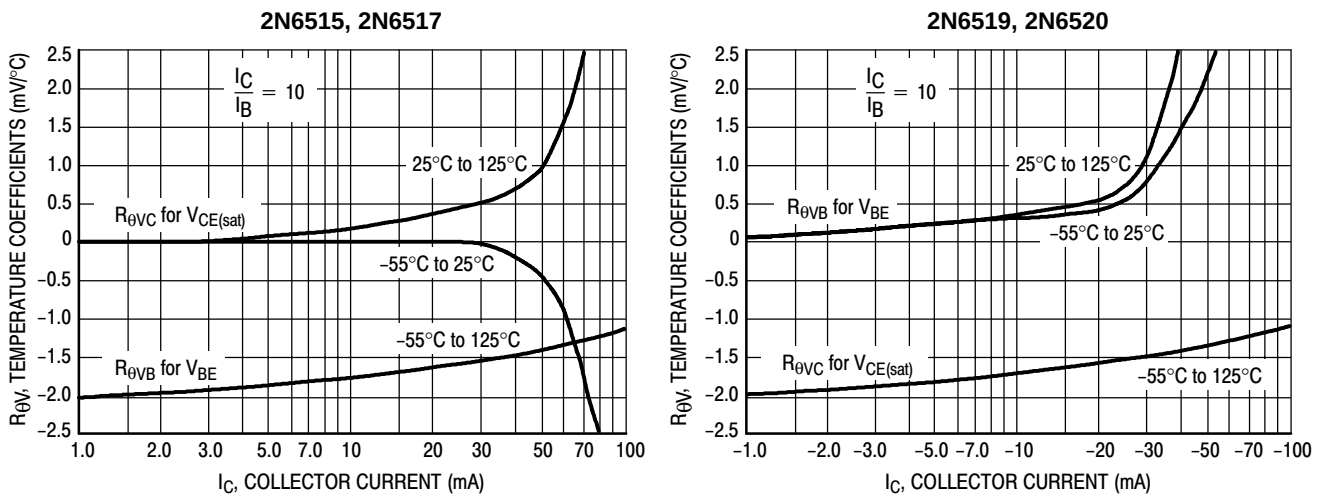


Figure 5. Temperature Coefficients

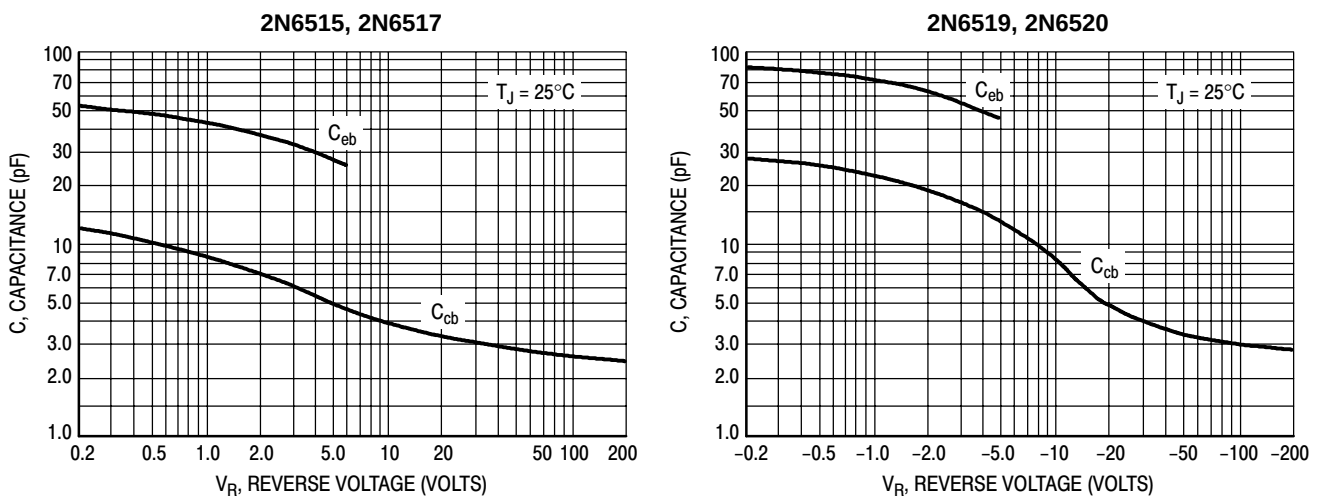


Figure 6. Capacitance

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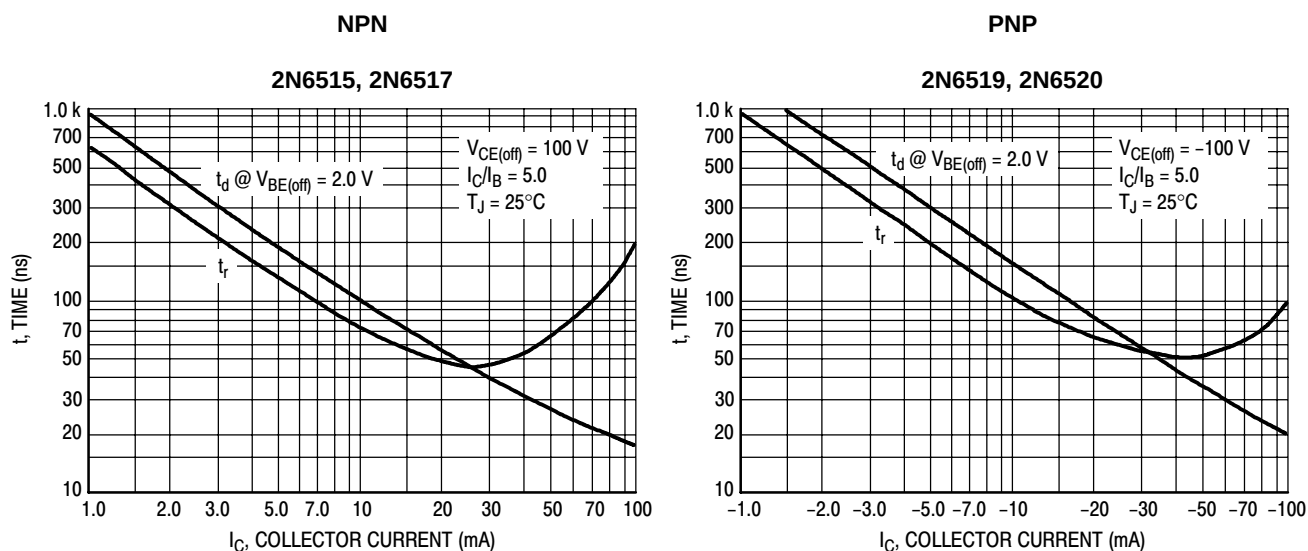


Figure 7. Turn-On Time

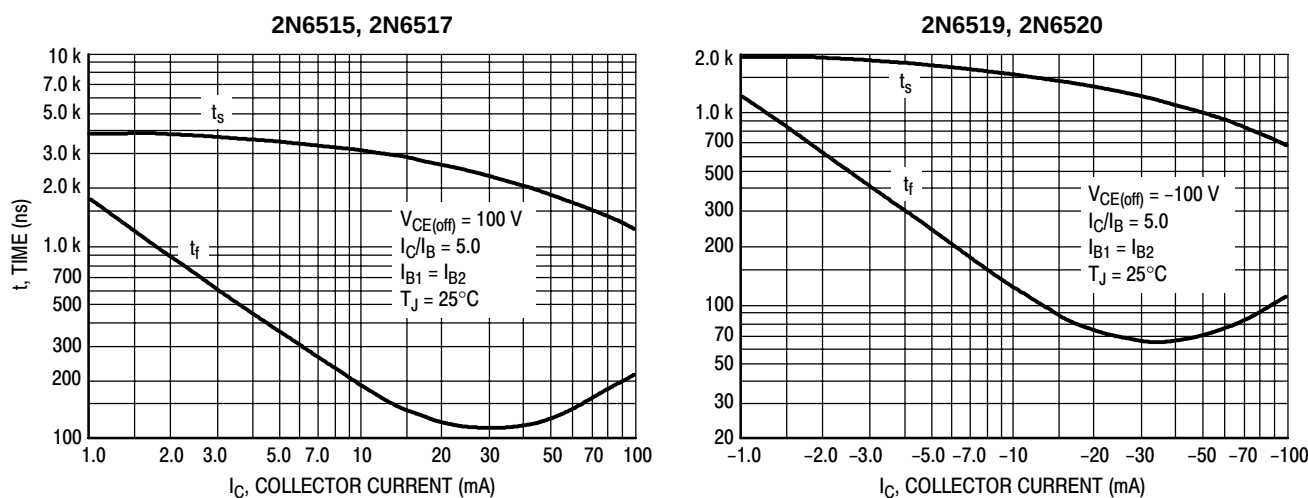


Figure 8. Turn-Off Time

## Ordering Information :

| Device         | Packing                     |
|----------------|-----------------------------|
| Part Number-AP | Ammo Packing: 20Kpcs/Carton |
| Part Number-BP | Bulk: 100Kpcs/Carton        |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-BP-HF

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