# 2N2894 (SILICON)

CASE 22
(TO-18)



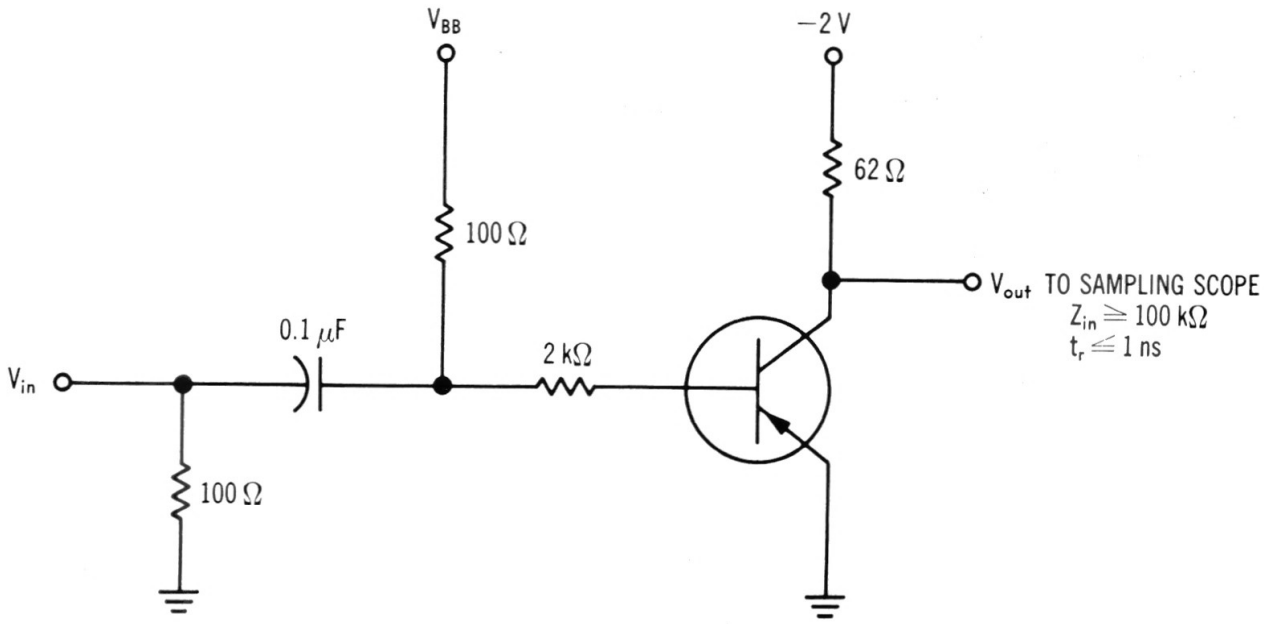
PNP silicon annular transistor designed for low-level, high-speed switching applications.

## MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Emitter Voltage * | $V_{CEO}$* | 12 | Vdc |
| Collector-Base Voltage | $V_{CB}$ | 12 | Vdc |
| Emitter-Base Voltage | $V_{EB}$ | 4 | Vdc |
| Collector Current-Continuous | $I_C$ | 200 | mAdc |
| Total Device Dissipation @ $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 360<br>2.06 | mW<br>mW/°C |
| Total Device Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 1200<br>6.85 | mW<br>mW/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | -65 to +200 | °C |

*Applicable from 0.01 to 10 mAdc.

## FIGURE 1 — SWITCHING TIME TEST CIRCUIT



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

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Collector-Emitter Sustaining Voltage* ($I_C$ = 10 mAdc, $I_B$ = 0) | $BV_{CEO(sus)}$* | 12 | — | Vdc |
| Collector-Emitter Breakdown Voltage ($I_C$ = 10 μAdc, $V_{BE}$ = 0) | $BV_{CES}$ | 12 | — | Vdc |
| Collector-Base Breakdown Voltage ($I_C$ = 10 μAdc, $I_E$ = 0) | $BV_{CBO}$ | 12 | — | Vdc |
| Emitter-Base Breakdown Voltage ($I_E$ = 100 μAdc, $I_C$ = 0) | $BV_{EBO}$ | 4 | — | Vdc |
| Collector-Cutoff Current ($V_{CE}$ = 6 Vdc, $V_{BE}$ = 0) | $I_{CES}$ | — | 80 | nAdc |
| Collector-Cutoff Current ($V_{CB}$ = 6 Vdc, $I_E$ = 0, $T_A$ = 125°C) | $I_{CBO}$ | — | 10 | μAdc |
| Base Current ($V_{CE}$ = 6 Vdc, $V_{BE}$ = 0) | $I_B$ | — | 80 | nAdc |
| **ON CHARACTERISTICS** | | | | |
| DC Current Gain* | $h_{FE}$* | | | — |
| ($I_C$ = 10 mAdc, $V_{CE}$ = 0.3 Vdc) | | 30 | — | |
| ($I_C$ = 30 mAdc, $V_{CE}$ = 0.5 Vdc) | | 40 | 150 | |
| ($I_C$ = 30 mAdc, $V_{CE}$ = 0.5 Vdc, $T_A$ = -55°C) | | 17 | — | |
| ($I_C$ = 100 mAdc, $V_{CE}$ = 1.0 Vdc) | | 25 | — | |
| Collector-Emitter Saturation Voltage* | $V_{CE(sat)}$* | | | Vdc |
| ($I_C$ = 10 mAdc, $I_B$ = 1 mAdc) | | — | 0.15 | |
| ($I_C$ = 30 mAdc, $I_B$ = 3 mAdc) | | — | 0.2 | |
| ($I_C$ = 100 mAdc, $I_B$ = 10 mAdc) | | — | 0.5 | |
| Base-Emitter Saturation Voltage* | $V_{BE(sat)}$* | | | Vdc |
| ($I_C$ = 10 mAdc, $I_B$ = 1 mAdc) | | 0.78 | 0.98 | |
| ($I_C$ = 30 mAdc, $I_B$ = 3 mAdc) | | 0.85 | 1.2 | |
| ($I_C$ = 100 mAdc, $I_B$ = 10 mAdc) | | — | 1.7 | |
| **DYNAMIC CHARACTERISTICS** | | | | |
| Current-Gain—Bandwidth Product ($I_C$ = 30 mAdc, $V_{CE}$ = 10 Vdc, f = 100 MHz) | $f_T$ | 400 | — | MHz |
| Output Capacitance ($V_{CB}$ = 5 Vdc, $I_E$ = 0, f = 140 kHz) | $C_{ob}$ | — | 6.0 | pF |
| Input Capacitance ($V_{BE}$ = -0.5 Vdc, $I_C$ = 0, f = 140 kHz) | $C_{ib}$ | — | 6.0 | pF |
| Turn-On Time, Figure 1 ($V_{CC}$ = 2 Vdc, $V_{BE(off)}$ = 3 Vdc, $I_C$ = 30 mAdc, $I_{B1}$ = 1.5 mAdc) | $t_{on}$ | — | 60 | ns |
| Turn-Off Time, Figure 1 ($V_{CC}$ = 2 Vdc, $I_C$ = 30 mAdc, $I_{B1}$ = $I_{B2}$ = 1.5 mAdc) | $t_{off}$ | — | 90 | ns |

*Pulse Test: Pulse Width = 300 μs; Duty Cycle = 1%