

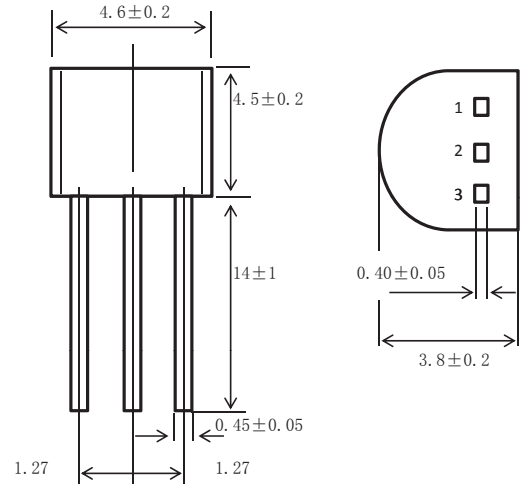
## TO-92 Plastic-Encapsulate Transistors

### FEATURE

- NPN Transistors

### MECHANICAL DATA

- Case style:TO-92 molded plastic
- Mounting position:any



## MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

| Symbol          | Parameter                               | Value      | Unit |
|-----------------|---|------------|------|
| $V_{CBO}$       | Collector-Base Voltage                  | -40        | V    |
| $V_{CEO}$       | Collector-Emitter Voltage               | -40        | V    |
| $V_{EBO}$       | Emitter-Base Voltage                    | -5         | V    |
| $I_C$           | Collector Current -Continuous           | -600       | mA   |
| $P_C$           | Collector Power dissipation             | 0.625      | W    |
| $T_J$           | Junction Temperature                    | 150        | °C   |
| $T_{stg}$       | Storage Temperature                     | -55 ~ +150 | °C   |
| $R_{\theta JA}$ | Thermal Resistance, junction to Ambient | 200        | °C/W |

### PACKAGE INFORMATION

| Device | Package | Shipping       |
|--------|---------|----------------|
| 2N4403 | TO-92   | 2000/Tape&Reel |

| Parameter                            | Symbol         | Test conditions                                     | Min   | Typ | Max   | Unit |
|--------------------------------------|----------------|---|-------|-----|-------|------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$  | $I_C=-100\mu A, I_E=0$                              | -40   |     |       | V    |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$  | $I_C=-1mA, I_B=0$                                   | -40   |     |       | V    |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$  | $I_E=-100\mu A, I_C=0$                              | -5    |     |       | V    |
| Collector cut-off current            | $I_{CBO}$      | $V_{CB}=-35V, I_E=0$                                |       |     | -100  | nA   |
| Emitter cut-off current              | $I_{EBO}$      | $V_{EB}=-5V, I_C=0$                                 |       |     | -100  | nA   |
| DC current gain                      | $h_{FE(1)}$    | $V_{CE}=-1V, I_C=0.1mA$                             | 30    |     |       |      |
|                                      | $h_{FE(2)}$    | $V_{CE}=-1V, I_C=1mA$                               | 60    |     |       |      |
|                                      | $h_{FE(3)}$    | $V_{CE}=-1V, I_C=10mA$                              | 100   |     |       |      |
|                                      | $h_{FE(4)}$    | $V_{CE}=-1V, I_C=150mA$                             | 100   |     | 300   |      |
|                                      | $h_{FE(5)}$    | $V_{CE}=-2V, I_C=500mA$                             | 20    |     |       |      |
| Collector-emitter saturation voltage | $V_{CE(sat)1}$ | $I_C=-150mA, I_B=-15mA$                             |       |     | -0.4  | V    |
|                                      | $V_{CE(sat)2}$ | $I_C=-500mA, I_B=-50mA$                             |       |     | -0.75 | V    |
| Base-emitter saturation voltage      | $V_{BE(sat)1}$ | $I_C=-150mA, I_B=-15mA$                             | -0.75 |     | -0.95 | V    |
|                                      | $V_{BE(sat)2}$ | $I_C=-500mA, I_B=-50mA$                             |       |     | -1.3  | V    |
| Transition frequency                 | $f_T$          | $V_{CE}=-10V, I_C=-20mA, f=100MHz$                  | 200   |     |       | MHz  |
| Collector capacitance                | $C_{ob}$       | $V_{CB}=-10V, I_E=0, f=100KHz$                      |       |     | 8.5   | pF   |
| Delay time                           | $t_d$          | $V_{CC}=-30V, I_C=-150mA$<br>$I_{B1}=-I_{B2}=-15mA$ |       |     | 15    | nS   |
| Rise time                            | $t_r$          |   |       |     | 20    | nS   |
| Storage time                         | $t_s$          |   |       |     | 225   | nS   |
| Fall time                            | $t_f$          |   |       |     | 30    | nS   |

