



TO-92 Plastic-Encapsulate Transistors

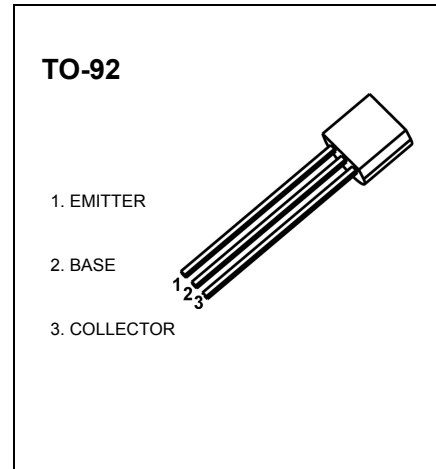
S9013 TRANSISTOR (NPN)

FEATURES

- Complementary to S9012
- Excellent h_{FE} linearity

MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Value | Units |
|-----------|-------------------------------|---------|------------------|
| V_{CBO} | Collector-Base Voltage | 40 | V |
| V_{CEO} | Collector-Emitter Voltage | 25 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current -Continuous | 500 | mA |
| P_C | Collector Dissipation | 625 | mW |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature | -55-150 | $^\circ\text{C}$ |



ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|---|-----|-----|-----|---------------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}, I_E = 0$ | 40 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C = 1\text{mA}, I_B = 0$ | 25 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E = 100\mu\text{A}, I_C = 0$ | 5 | | | V |
| Collector cut-off current | I_{CBO} | $V_{CB} = 40\text{V}, I_E = 0$ | | | 0.1 | μA |
| Collector cut-off current | I_{CEO} | $V_{CE} = 20\text{V}, I_E = 0$ | | | 0.1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 5\text{V}, I_C = 0$ | | | 0.1 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE} = 1\text{V}, I_C = 50\text{mA}$ | 64 | | 400 | |
| | $h_{FE(2)}$ | $V_{CE} = 1\text{V}, I_C = 500\text{mA}$ | 40 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 500\text{mA}, I_B = 50\text{mA}$ | | | 0.6 | V |
| Base-emitter voltage | $V_{BE(sat)}$ | $I_C = 500\text{mA}, I_B = 50\text{mA}$ | | | 1.2 | V |
| Transition frequency | f_T | $V_{CE} = 6\text{V}, I_C = 20\text{mA}, f = 30\text{MHz}$ | 150 | | | MHz |

CLASSIFICATION OF $h_{FE(1)}$

| Rank | D | E | F | G | H | I | J |
|-------|-------|--------|--------|---------|---------|---------|---------|
| Range | 64-91 | 78-112 | 96-135 | 112-166 | 144-202 | 190-300 | 300-400 |

Typical Characteristics

S9013

Static Characteristic

