# TO-92S Plastic-Encapsulate Transistors

**TO – 92S**

1. EMITTER
2. COLLECTOR
3. BASE


## KSD1020 TRANSISTOR (NPN)

### FEATURES

- General Purpose Switching Application

### APPLICATIONS

- Audio Frequency Amplifier

### MAXIMUM RATINGS ($T_a$=25℃ unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 30 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 25 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5 | V |
| $I_C$ | Collector Current | 0.7 | A |
| $P_C$ | Collector Power Dissipation | 350 | mW |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient | 357 | ℃/W |
| $T_j$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -55~+150 | ℃ |

### ELECTRICAL CHARACTERISTICS ($T_a$=25℃ unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Collector-base breakdown voltage** | $V_{(BR)CBO}$ | $I_C$= 0.1mA,$I_E$=0 | 30 | | | V |
| **Collector-emitter breakdown voltage** | $V_{(BR)CEO}$ | $I_C$=10mA,$I_B$=0 | 25 | | | V |
| **Emitter-base breakdown voltage** | $V_{(BR)EBO}$ | $I_E$=0.1mA,$I_C$=0 | 5 | | | V |
| **Collector cut-off current** | $I_{CBO}$ | $V_{CB}$=30V,$I_E$=0 | | | 0.1 | μA |
| **Collector cut-off current** | $I_{CEO}$ | $V_{CE}$=20V,$I_B$=0 | | | 0.1 | μA |
| **Emitter cut-off current** | $I_{EBO}$ | $V_{EB}$=5V,$I_C$=0 | | | 0.1 | μA |
| **DC current gain** | $h_{FE(1)}$* | $V_{CE}$=1V, $I_C$=100mA | 120 | | 400 | |
| | $h_{FE(2)}$ | $V_{CE}$=1V, $I_C$=700mA | 35 | | | |
| **Collector-emitter saturation voltage** | $V_{CE(sat)}$ | $I_C$=700mA,$I_B$=70mA | | | 0.4 | V |
| **Base-emitter saturation voltage** | $V_{BE\ (sat)}$ | $I_C$=700mA,$I_B$=70mA | | | 1.2 | V |
| **Base-emitter voltage** | $V_{BE}$ | $V_{CE}$=6V, $I_C$=10mA | 0.6 | | 0.7 | V |
| **Collector output capacitance** | $C_{ob}$ | $V_{CB}$=6V,$I_E$=0, f=1MHz | | | 25 | pF |
| **Transition frequency** | $f_T$ | $V_{CE}$=6V,$I_C$=10mA | 50 | | | MHz |

*Pulse test

### CLASSIFICATION OF $h_{FE(1)}$

| RANK | Y | G |
|---|---|---|
| RANGE | 120-240 | 200-400 |