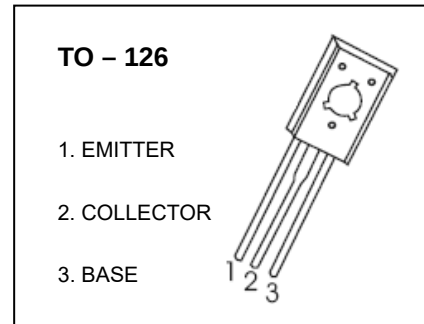
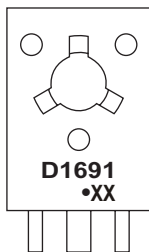
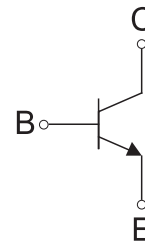


**TO-126 Plastic-Encapsulate Transistors****KSD1691** TRANSISTOR (NPN)**FEATURES**

- Low Collector-Emitter Saturation Voltage & Large Collector Current
- High Power Dissipation:  $P_C = 1.3W$  ( $T_a = 25^\circ C$ )

**MARKING**

D1691=Device code  
Solid dot= Green molding compound device, if none, the normal device  
XX=Code

**Equivalent Circuit****ORDERING INFORMATION**

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| KSD1691     | TO-126  | Bulk           | 200pcs/Bag    |
| KSD1691-TU  | TO-126  | Tube           | 60pcs/Tube    |

**MAXIMUM RATINGS ( $T_a = 25^\circ C$  unless otherwise noted)**

| Symbol         | Parameter                                          | Value   | Unit       |
|----------------|----------------------------------------------------|---------|------------|
| $V_{CBO}$      | Collector-Base Voltage                             | 60      | V          |
| $V_{CEO}$      | Collector-Emitter Voltage                          | 60      | V          |
| $V_{EBO}$      | Emitter-Base Voltage                               | 7       | V          |
| $I_C$          | Collector Current (DC)                             | 5       | A          |
| $P_C$          | Collector Power Dissipation ( $T_a = 25^\circ C$ ) | 1.3     | W          |
|                | Collector Power Dissipation ( $T_c = 25^\circ C$ ) | 20      | W          |
| $T_J, T_{stg}$ | Operation Junction and Storage Temperature Range   | -55-150 | $^\circ C$ |

## ELECTRICAL CHARACTERISTICS

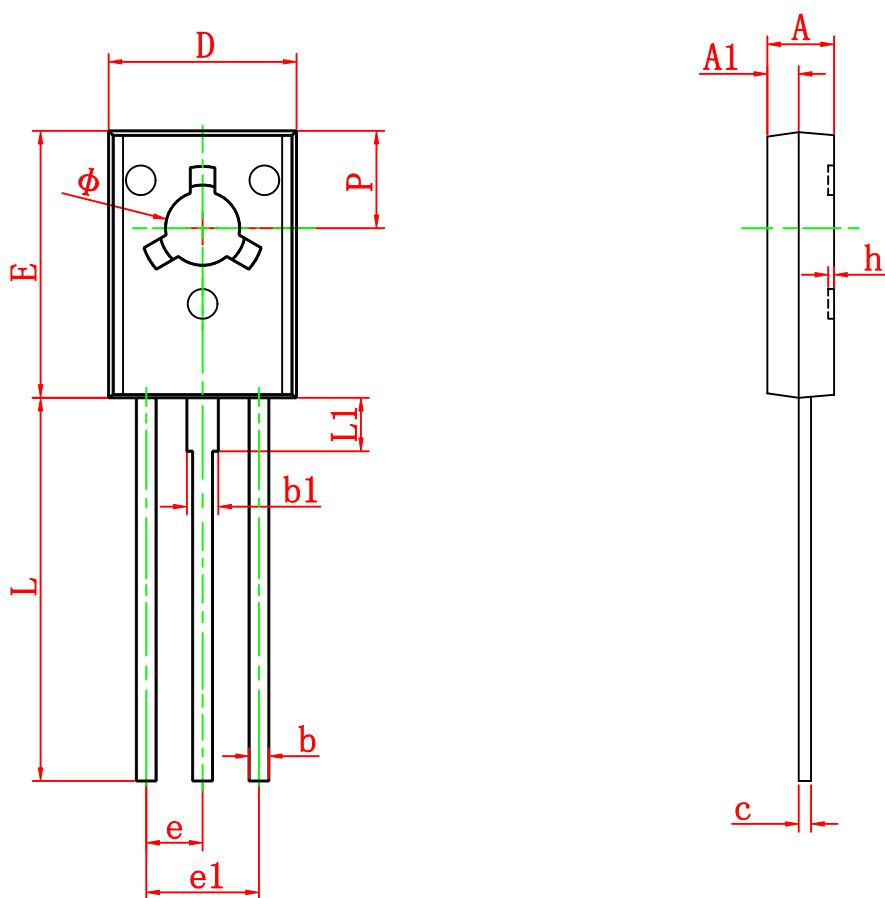
$T_a = 25^\circ\text{C}$  unless otherwise specified

| Parameter                            | Symbol        | Test conditions                                                                            | Min | Typ | Max | Unit          |
|--------------------------------------|---------------|--------------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}, I_E = 0$                                                            | 60  |     |     | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C = 1\text{mA}, I_B = 0$                                                                | 60  |     |     | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E = 100\mu\text{A}, I_C = 0$                                                            | 7   |     |     | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = 50\text{V}, I_E = 0$                                                             |     |     | 10  | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = 7\text{V}, I_C = 0$                                                              |     |     | 10  | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}$   | $V_{CE} = 1\text{V}, I_C = 2\text{A}$                                                      | 100 |     | 400 |               |
|                                      | $h_{FE(2)}$   | $V_{CE} = 1\text{V}, I_C = 0.1\text{A}$                                                    | 60  |     |     |               |
|                                      | $h_{FE(3)}$   | $V_{CE} = 1\text{V}, I_C = 5\text{A}$                                                      | 50  |     |     |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 2\text{A}, I_B = 0.2\text{A}$                                                       |     |     | 0.3 | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 2\text{A}, I_B = 0.2\text{A}$                                                       |     |     | 1.2 | V             |
| Turn ON Time                         | $t_{on}$      | $V_{CC} = 10\text{V}, I_C = 2\text{A},$<br>$I_{B1} = -I_{B2} = 0.2\text{A}, R_L = 5\Omega$ |     |     | 1   | $\mu\text{S}$ |
| Storage Time                         | $t_{stg}$     |                                                                                            |     |     | 2.5 | $\mu\text{S}$ |
| Fall Time                            | $t_f$         |                                                                                            |     |     | 1   | $\mu\text{S}$ |
| Transition frequency                 | $f_T$         | $V_{CE} = 5\text{V}, I_C = 1\text{A}$                                                      | 10  |     |     | MHz           |

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

| Rank  | O       | Y       | G       |
|-------|---------|---------|---------|
| Range | 100-200 | 160-320 | 200-400 |

## TO-126 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 2.500                     | 2.900  | 0.098                | 0.114 |
| A1     | 1.100                     | 1.500  | 0.043                | 0.059 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| b1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| c      | 0.450                     | 0.600  | 0.018                | 0.024 |
| D      | 7.400                     | 7.800  | 0.291                | 0.307 |
| E      | 10.600                    | 11.000 | 0.417                | 0.433 |
| e      | 2.290 TYP                 |        | 0.090 TYP            |       |
| e1     | 4.480                     | 4.680  | 0.176                | 0.184 |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| L      | 15.300                    | 15.700 | 0.602                | 0.618 |
| L1     | 2.100                     | 2.300  | 0.083                | 0.091 |
| P      | 3.900                     | 4.100  | 0.154                | 0.161 |
| Φ      | 3.000                     | 3.200  | 0.118                | 0.126 |