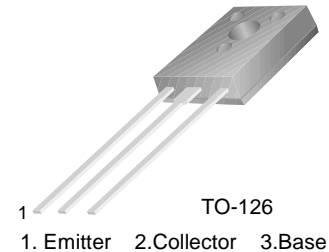


# KSD1691

KSD1691

## Feature

- Low Collector-Emitter Saturation Voltage & Large Collector Current
- High Power Dissipation:  $P_C = 1.3W$  ( $T_a = 25^\circ C$ )
- Complementary to KSB1151



## NPN Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

| Symbol    | Parameter                                    | Value      | Units      |
|-----------|--|------------|------------|
| $V_{CBO}$ | 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          |
| $I_{CP}$  | *Collector Current (Pulse)                   | 8          | A          |
| $I_B$     | Base Current (DC)                            | 1          | A          |
| $P_C$     | Collector Dissipation ( $T_a = 25^\circ C$ ) | 1.3        | W          |
| $P_C$     | Collector Dissipation ( $T_C = 25^\circ C$ ) | 20         | W          |
| $T_J$     | Junction Temperature                         | 150        | $^\circ C$ |
| $T_{STG}$ | Storage Temperature                          | - 55 ~ 150 | $^\circ C$ |

\*  $PW \leq 10ms$ , duty Cycle  $\leq 50\%$

### Electrical Characteristics $T_C = 25^\circ C$ unless otherwise noted

| Symbol                              | Parameter                             | Test Condition  | Min.            | Typ. | Max. | Units   |
|-------------------------------------|---------------------------------------|---|-----------------|------|------|---------|
| $I_{CBO}$                           | Collector Cut-off Current             | $V_{CB} = 50V, I_E = 0$   |                 |      | 10   | $\mu A$ |
| $I_{EBO}$                           | Emitter Cut-off Current               | $V_{EB} = 7V, I_C = 0$  |                 |      | 10   | $\mu A$ |
| $h_{FE1}$<br>$h_{FE2}$<br>$h_{FE3}$ | *DC Current Gain                      | $V_{CE} = 1V, I_C = 0.1A$<br>$V_{CE} = 1V, I_C = 2A$<br>$V_{CE} = 1V, I_C = 5A$ | 60<br>100<br>50 |      | 400  |         |
| $V_{CE(sat)}$                       | *Collector-Emitter Saturation Voltage | $I_C = 2A, I_B = 0.2A$  |                 | 0.1  | 0.3  | V       |
| $V_{BE(sat)}$                       | *Base-Emitter Saturation Voltage      | $I_C = 2A, I_B = 0.2A$  |                 | 0.9  | 1.2  | V       |
| $t_{ON}$                            | Turn ON Time                          | $V_{CC} = 10V, I_C = 2A$<br>$I_{B1} = - I_{B2} = 0.2A$<br>$R_L = 5\Omega$       |                 | 0.2  | 1    | $\mu s$ |
| $t_{STG}$                           | Storage Time                          |   |                 | 1.1  | 2.5  | $\mu s$ |
| $t_F$                               | Fall Time                             |   |                 | 0.2  | 1    | $\mu s$ |

\* Pulse test:  $PW \leq 50\mu s$ , duty Cycle  $\leq 2\%$  Pulsed

## $h_{FE}$ Classification

| Classification | O         | Y         | G         |
|----------------|-----------|-----------|-----------|
| $h_{FE 2}$     | 100 ~ 200 | 160 ~ 320 | 200 ~ 400 |

## Typical Characteristics

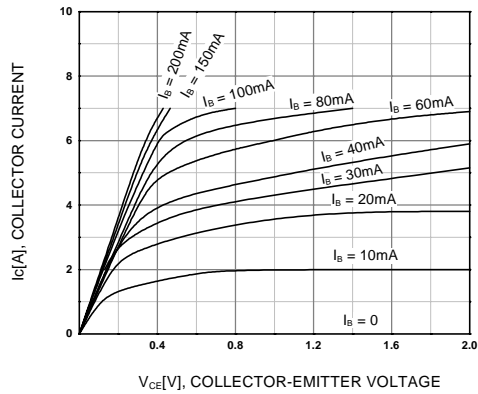


Figure 1. Static Characteristic

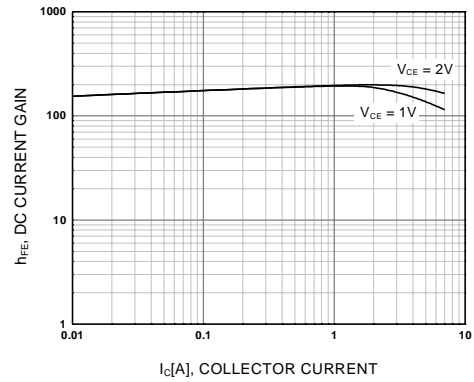


Figure 2. DC current Gain

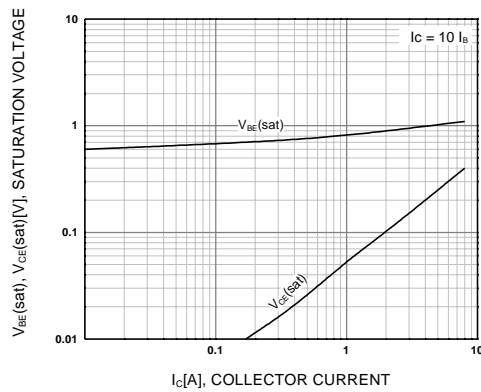


Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

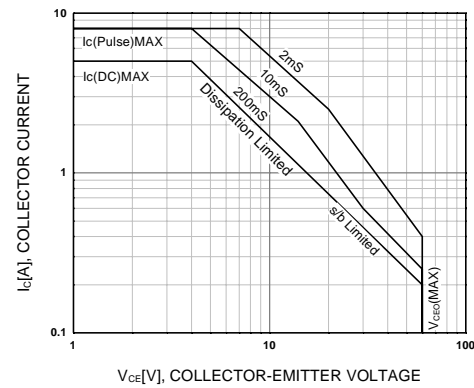


Figure 4. Forward Bias Safe Operating Area

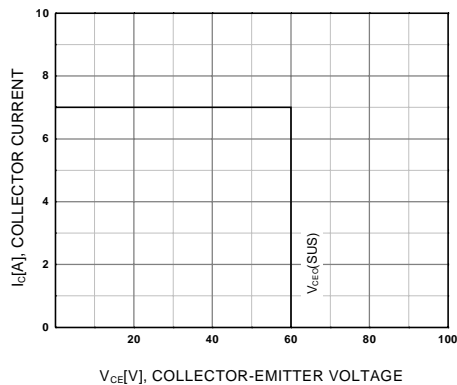


Figure 5. Reverse Bias Safe Operating Area

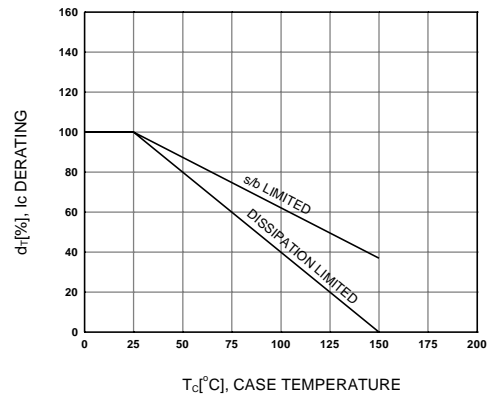
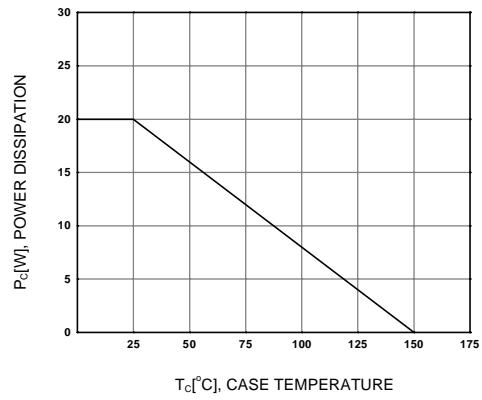


Figure 6. Derating Curve of Safe Operating Areas

## Typical Characteristics (Continued)



**Figure 7. Power Derating**

Technical drawing of the 2.28TYP connector showing front, side, and top views with dimensions.

**Front View Dimensions:**

- Top width:  $8.00 \pm 0.30$
- Top height:  $3.90 \pm 0.10$
- Central hole diameter:  $\phi 3.20 \pm 0.10$
- Overall height:  $14.20 \text{ MAX}$
- Bottom width:  $13.06 \pm 0.30$
- Pin #1 width:  $0.75 \pm 0.10$
- Pin #2 width:  $1.60 \pm 0.10$
- Pin #3 width:  $0.75 \pm 0.10$

**Side View Dimensions:**

- Top width:  $3.25 \pm 0.20$
- Overall height:  $16.10 \pm 0.20$
- Internal height:  $11.00 \pm 0.20$
- Pin #1 offset:  $(1.00)$
- Pin #2 offset:  $(0.50)$
- Pin #3 offset:  $1.75 \pm 0.20$
- Bottom width:  $0.50^{+0.10}_{-0.05}$

**Top View Dimensions:**

- Pin #1 width:  $2.28 \text{ TYP}$  [ $2.28 \pm 0.20$ ]
- Pin #2 width:  $2.28 \text{ TYP}$  [ $2.28 \pm 0.20$ ]

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Rev. A, February 2000

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