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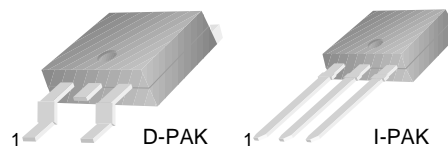
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## KSH112

### D-PAK for Surface Mount Applications

- High DC Current Gain
- Built-in a Damper Diode at E-C
- Lead Formed for Surface Mount Applications (No Suffix)
- Straight Lead (I-PAK, "- I" Suffix)
- Electrically Similar to Popular TIP112



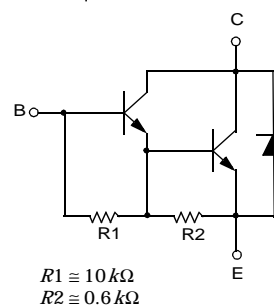
1.Base 2.Collector 3.Emitter

### NPN Silicon Darlington Transistor

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

| Symbol    | Parameter  | Value      | Units            |
|-----------|--|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           | 100        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                        | 100        | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 5          | V                |
| $I_C$     | Collector Current (DC)                           | 2          | A                |
| $I_{CP}$  | Collector Current (Pulse)                        | 4          | A                |
| $I_B$     | Base Current                                     | 50         | mA               |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 20         | W                |
|           | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 1.75       | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 65 ~ 150 | $^\circ\text{C}$ |

Equivalent Circuit



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

| Symbol         | Parameter                              | Test Condition  | Min. | Max. | Units         |
|----------------|--|---|------|------|---------------|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage   | $I_C = 30\text{mA}, I_B = 0$                          | 100  |      | V             |
| $I_{CEO}$      | Collector Cut-off Current              | $V_{CE} = 50\text{V}, I_B = 0$                        |      | 20   | $\mu\text{A}$ |
| $I_{CBO}$      | Collector Cut-off Current              | $V_{CB} = 100\text{V}, I_B = 0$                       |      | 20   | $\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                | $V_{EB} = 5\text{V}, I_C = 0$                         |      | 2    | mA            |
| $h_{FE}$       | * DC Current Gain                      | $V_{CE} = 3\text{V}, I_C = 0.5\text{A}$               | 500  |      |               |
|                |  | $V_{CE} = 3\text{V}, I_C = 2\text{A}$                 | 1000 | 12K  |               |
|                |  | $V_{CE} = 3\text{V}, I_C = 4\text{A}$                 | 200  |      |               |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage | $I_C = 2\text{A}, I_B = 8\text{mA}$                   |      | 2    | V             |
|                |  | $I_C = 4\text{A}, I_B = 40\text{mA}$                  |      | 3    | V             |
| $V_{BE(sat)}$  | * Base-Emitter Saturation Voltage      | $I_C = 4\text{A}, I_B = 40\text{mA}$                  |      | 4    | V             |
| $V_{BE(on)}$   | * Base-Emitter On Voltage              | $V_{CE} = 3\text{A}, I_C = 2\text{A}$                 |      | 2.8  | V             |
| $f_T$          | Current Gain Bandwidth Product         | $V_{CE} = 10\text{V}, I_C = 0.75\text{A}$             | 25   |      | MHz           |
| $C_{ob}$       | Output Capacitance                     | $V_{CB} = 10\text{V}, I_E = 0$<br>$f = 0.1\text{MHz}$ |      | 100  | pF            |

\* Pulse Test:  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

# Typical Characteristics

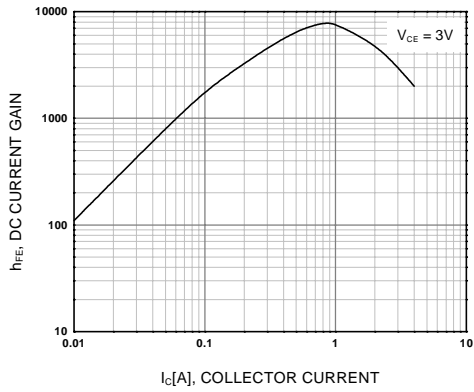


Figure 1. DC current Gain

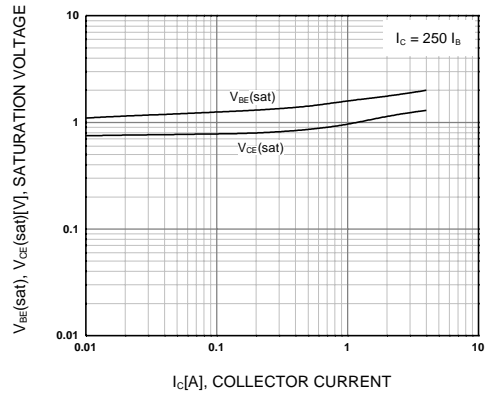


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

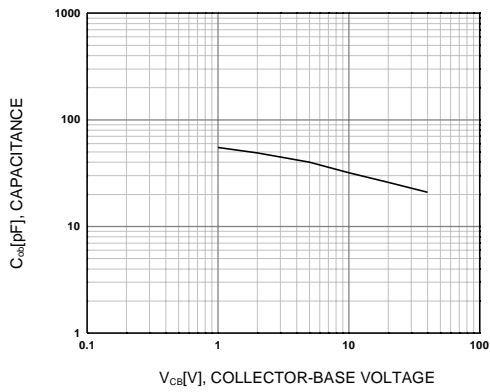


Figure 3. Collector Output Capacitance

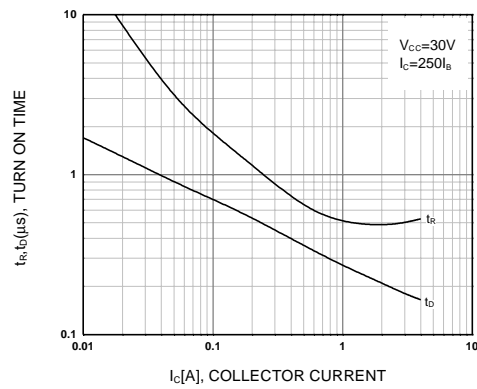


Figure 4. Turn On Time

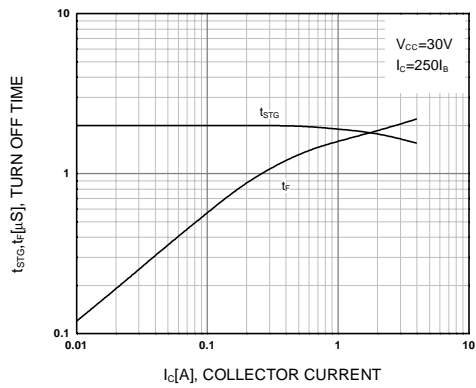


Figure 5. Turn Off Time

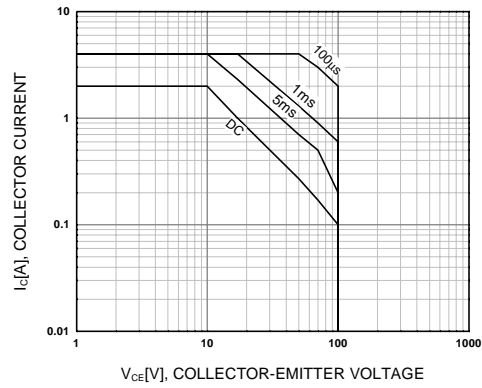


Figure 6. Safe Operating Area

# Typical Characteristics (Continued)

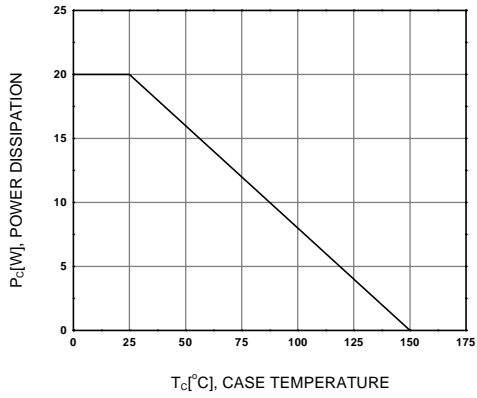
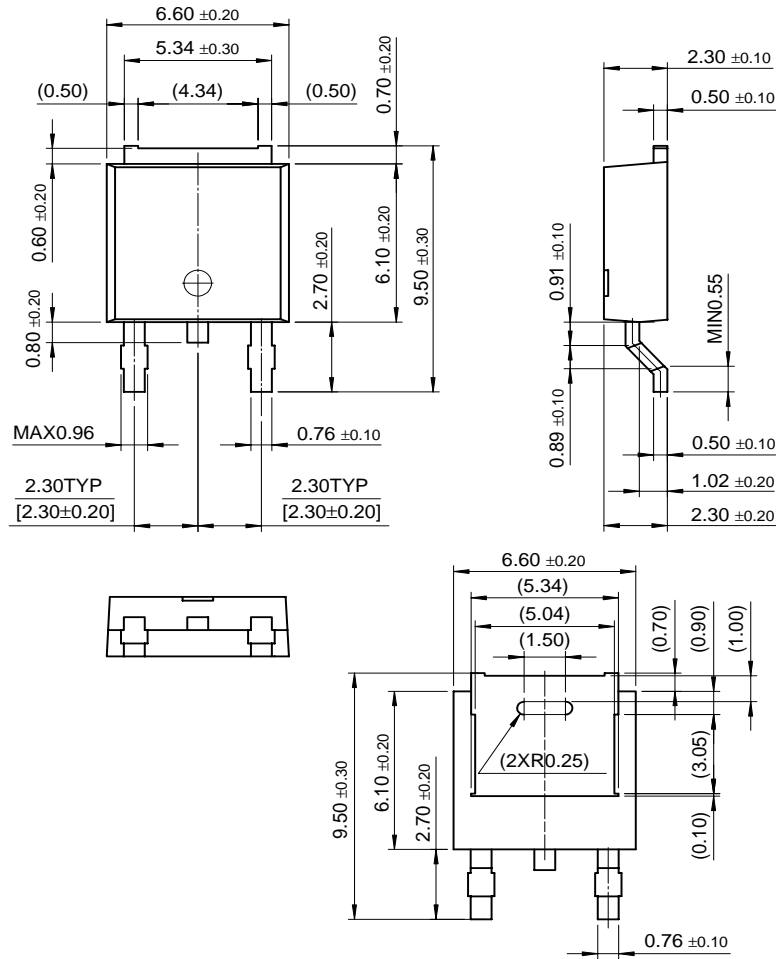


Figure 7. Power Derating

# Package Dimensions

KSH112

## D-PAK



Dimensions in Millimeters

# Package Dimensions (Continued)

## I-PAK



Dimensions in Millimeters

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