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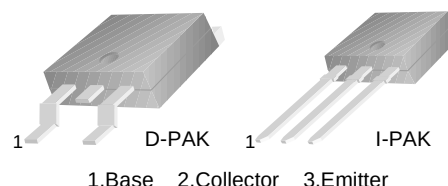
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# KSH117

## D-PAK for Surface Mount Applications

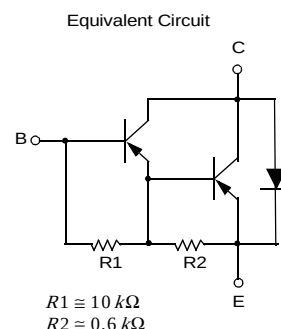
- High DC Current Gain
- Built-in a Damper Diode at E-C
- Lead Formed for Surface Mount Applications (No Suffix)
- Straight Lead (I-PAK, " - I " Suffix)
- Electrically Similar to Popular TIP117



## PNP 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 | $^\circ\text{C}$ |



### 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             | $V_{CB} = -100\text{V}, I_E = 0$                                                                                                      |                    | - 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                      | $V_{CE} = -3\text{V}, V_{EB} = -0.5\text{A}$<br>$V_{CE} = -3\text{V}, V_{EB} = -2\text{A}$<br>$V_{CE} = -3\text{V}, I_C = -4\text{A}$ | 500<br>1000<br>200 | 12K        |               |
| $V_{CE(sat)}$  | *Collector-Emitter Saturation Voltage | $I_C = -2\text{A}, I_B = -8\text{mA}$<br>$I_C = -4\text{A}, I_B = -40\text{mA}$                                                       |                    | - 2<br>- 3 | V<br>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>$f = 0.1\text{MHz}$                                                                                |                    | 200        | pF            |

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

## Typical Characteristics

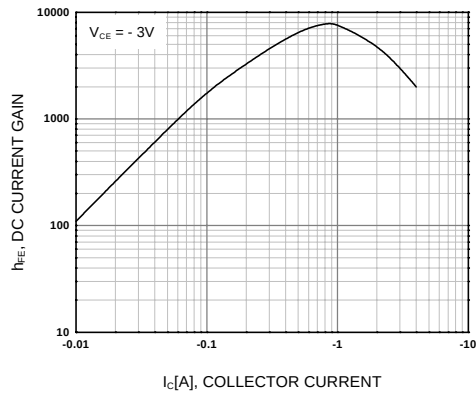


Figure 1. DC current Gain

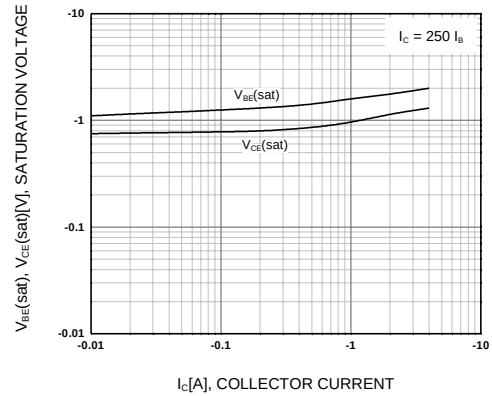


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

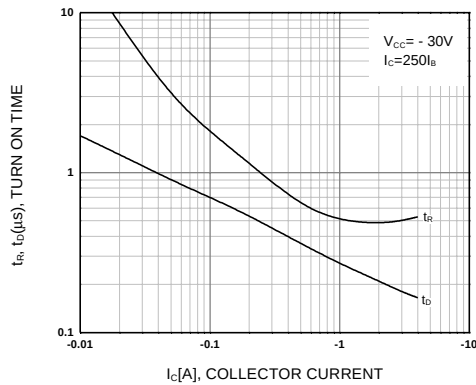


Figure 3. Collector Output Capacitance

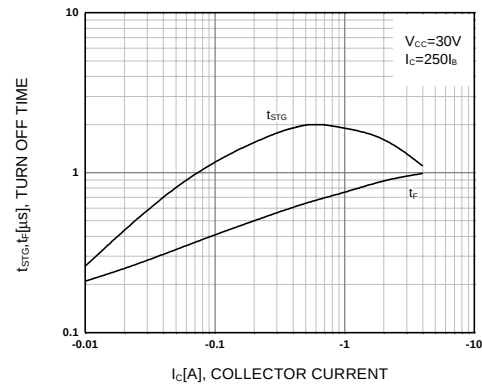


Figure 4. Turn On Time

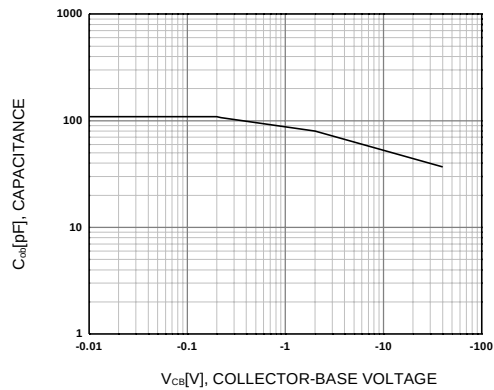


Figure 5. Turn Off Time

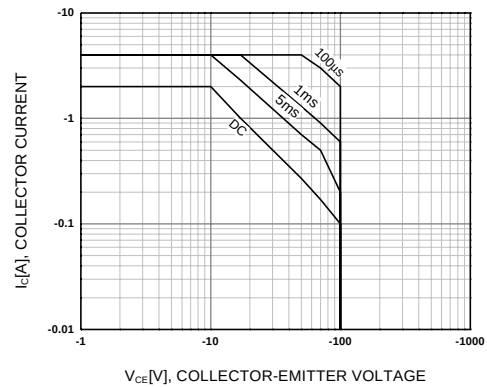
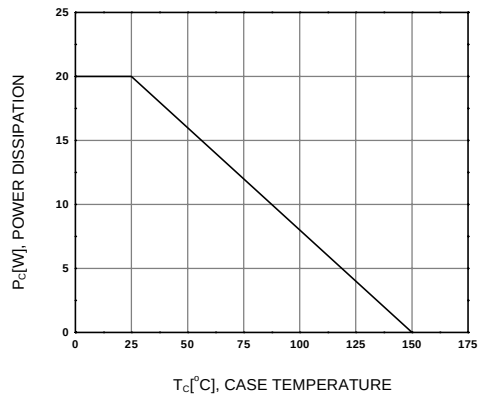
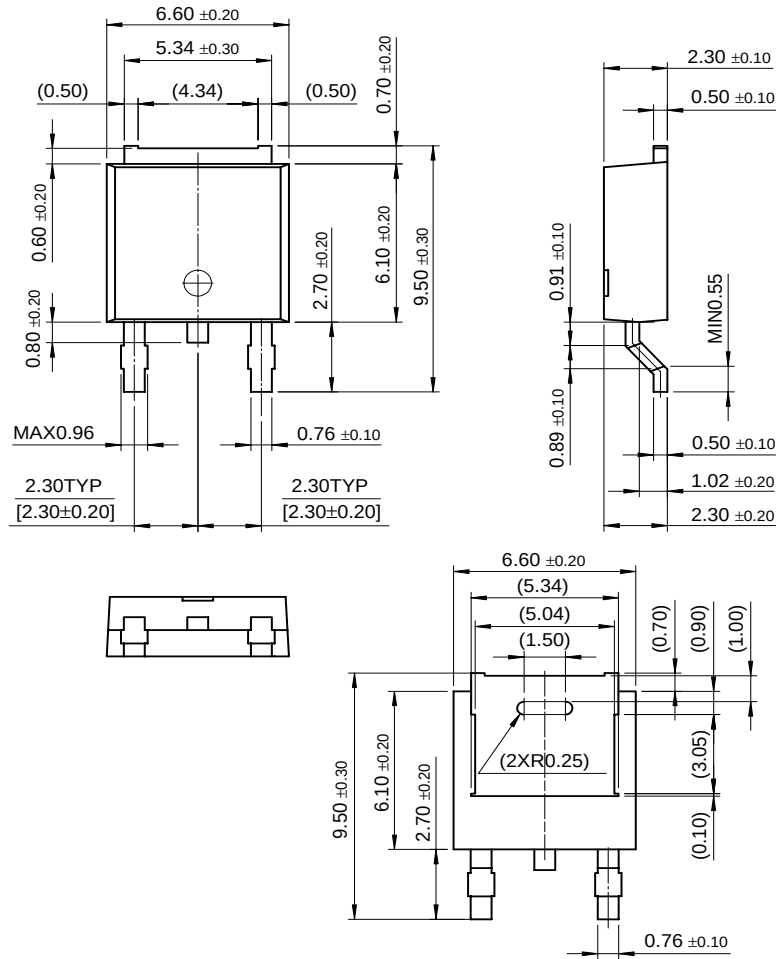


Figure 6. Safe Operating Area

**Typical Characteristics** (Continued)**Figure 7. Power Derating**

# Package Dimensions

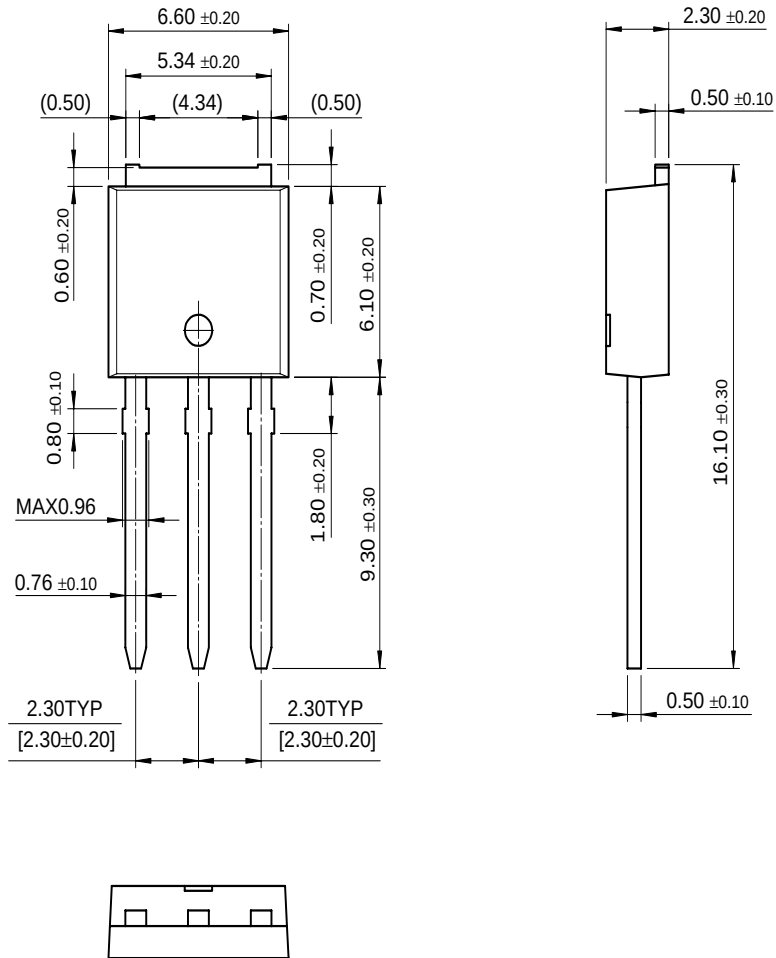
## D-PAK



Dimensions in Millimeters

# Package Dimensions (Continued)

## I-PAK



Dimensions in Millimeters

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| Bottomless <sup>™</sup>                          | FAST <sup>®</sup>               | LittleFET <sup>™</sup>         | Power247 <sup>™</sup>           | SuperSOT <sup>™</sup> -3    |
| CoolFET <sup>™</sup>                             | FAST <sup>™</sup>               | MicroFET <sup>™</sup>          | PowerTrench <sup>®</sup>        | SuperSOT <sup>™</sup> -6    |
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