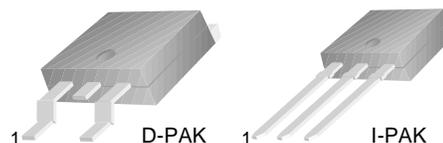


KSH31/31C

General Purpose Amplifier Low Speed Switching Applications

- Lead Formed for Surface Mount Application (No Suffix)
- Straight Lead (I-PAK, "- I" Suffix)
- Electrically Similar to Popular TIP31 and TIP31C



1.Base 2.Collector 3.Emitter

NPN Epitaxial Silicon Transistor

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

| Symbol | Parameter | Value | Units |
|-----------|--|------------|------------------|
| V_{CBO} | Collector-Base Voltage | | |
| | : KSH31 | 40 | V |
| | : KSH31C | 100 | V |
| V_{CEO} | Collector-Emitter Voltage | | |
| | : KSH31 | 40 | V |
| | : KSH31C | 100 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current (DC) | 3 | A |
| I_{CP} | Collector Current (Pulse) | 5 | A |
| I_B | Base Current | 1 | A |
| P_C | Collector Dissipation ($T_C=25^\circ\text{C}$) | 15 | W |
| | Collector Dissipation ($T_a=25^\circ\text{C}$) | 1.56 | 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 | | | | |
| | : KSH31 | $I_C = 30\text{mA}, I_B = 0$ | 40 | | V |
| | : KSH31C | | 100 | | V |
| I_{CEO} | Collector Cut-off Current | | | | |
| | : KSH31 | $V_{CE} = 40\text{V}, I_B = 0$ | | 50 | μA |
| | : KSH31C | $V_{CE} = 60\text{V}, I_B = 0$ | | 50 | μA |
| I_{CES} | Collector Cut-off Current | | | | |
| | : KSH31 | $V_{CE} = 40\text{V}, V_{BE} = 0$ | | 20 | μA |
| | : KSH31C | $V_{CE} = 100\text{V}, V_{BE} = 0$ | | 20 | μA |
| I_{EBO} | Emitter Cut-off Current | $V_{BE} = 5\text{V}, I_C = 0$ | | 1 | mA |
| h_{FE} | * DC Current Gain | $V_{CE} = 4\text{V}, I_C = 1\text{A}$ | 25 | | |
| | | $V_{CE} = 4\text{V}, I_C = 3\text{A}$ | 10 | 50 | |
| $V_{CE(sat)}$ | * Collector-Emitter Saturation Voltage | $I_C = 3\text{A}, I_B = 375\text{mA}$ | | 1.2 | V |
| $V_{BE(on)}$ | * Base-Emitter On Voltage | $V_{CE} = 4\text{A}, I_C = 3\text{A}$ | | 1.8 | V |
| f_T | Current Gain Bandwidth Product | $V_{CE} = 10\text{V}, I_C = 500\text{mA}$ | 3 | | MHz |

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

Typical Characteristics

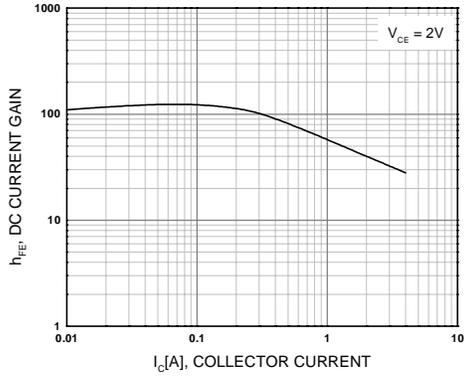


Figure 1. DC current Gain

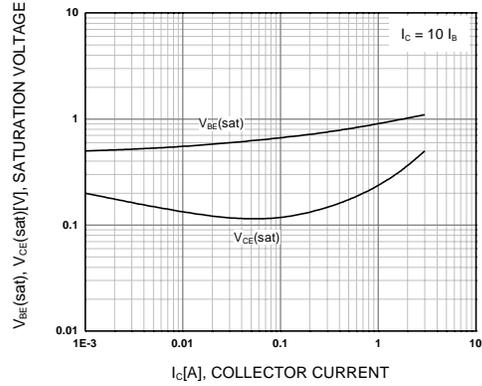


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

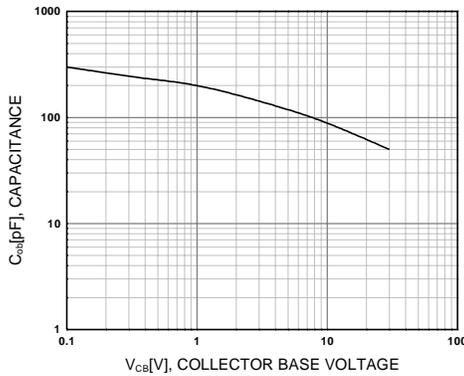


Figure 3. Collector Capacitance

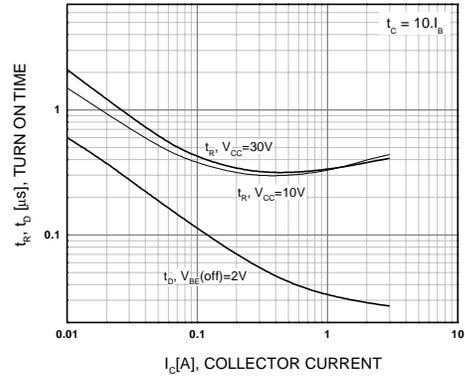


Figure 4. Turn On Time

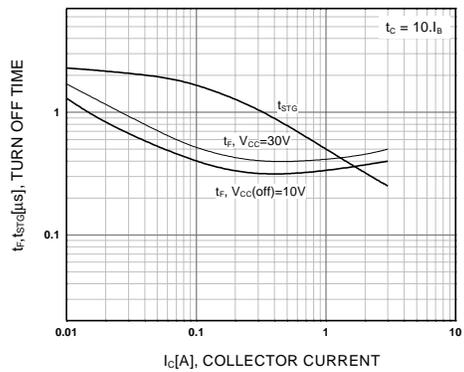


Figure 5. Turn Off Time

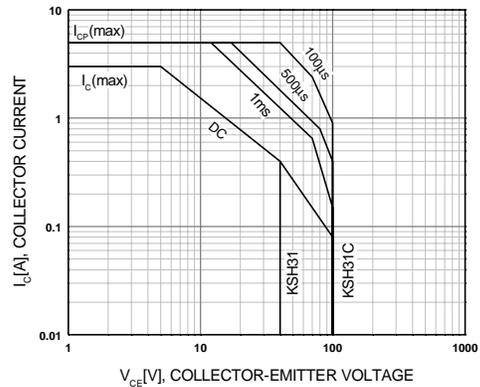


Figure 6. Safe Operating

Typical Characteristics (Continued)

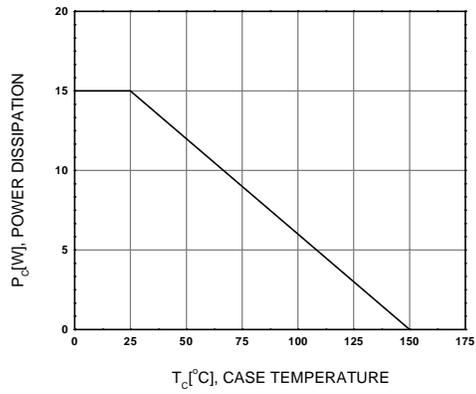
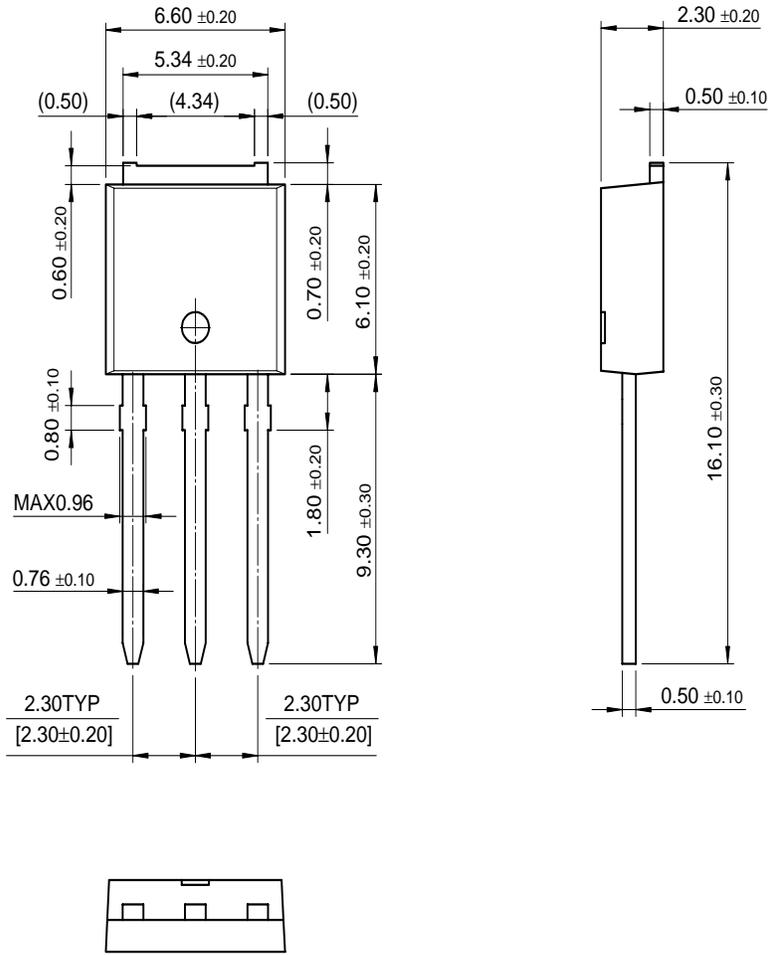


Figure 7. Power Derating

Package Dimensions (Continued)

I-PAK



Dimensions in Millimeters

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