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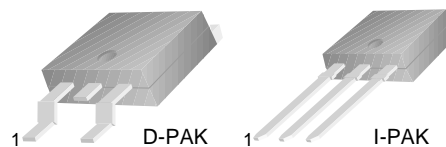
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# KSH31/31C

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	$\mu\text{A}$
	: KSH31C	$V_{CE} = 60\text{V}, I_B = 0$		50	$\mu\text{A}$
$I_{CES}$	Collector Cut-off Current				
	: KSH31	$V_{CE} = 40\text{V}, V_{BE} = 0$		20	$\mu\text{A}$
	: KSH31C	$V_{CE} = 100\text{V}, V_{BE} = 0$		20	$\mu\text{A}$
$I_{EBO}$	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

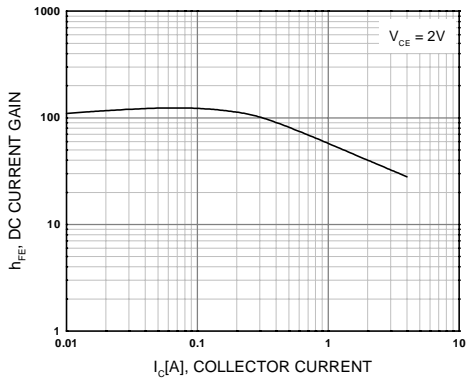


Figure 1. DC current Gain

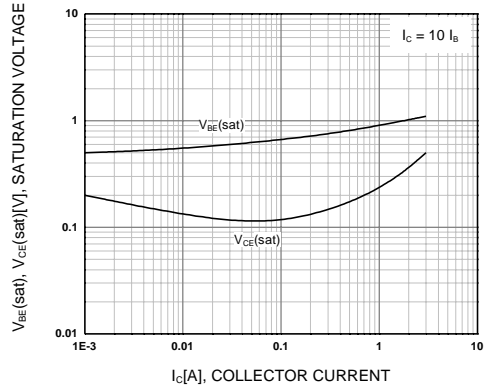


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

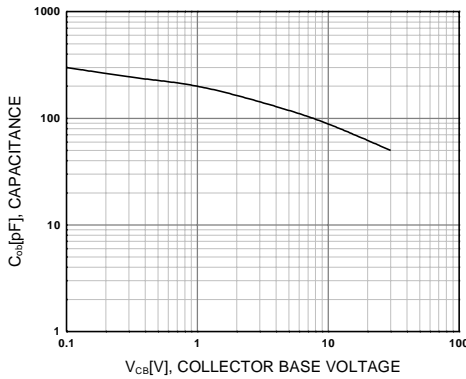


Figure 3. Collector Capacitance

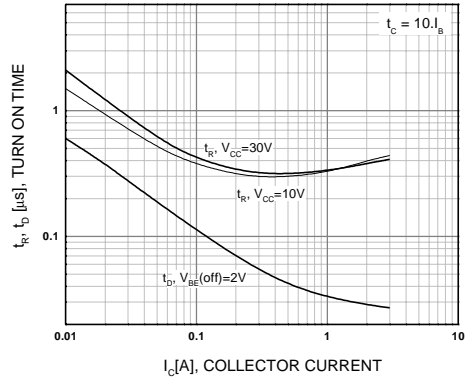


Figure 4. Turn On Time

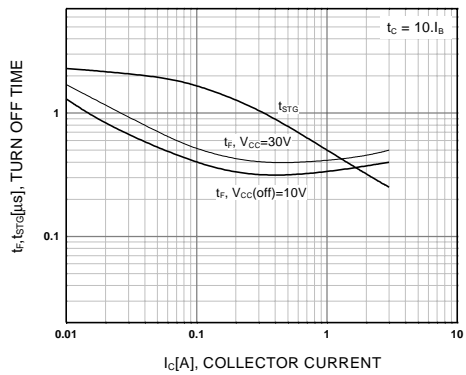


Figure 5. Turn Off Time

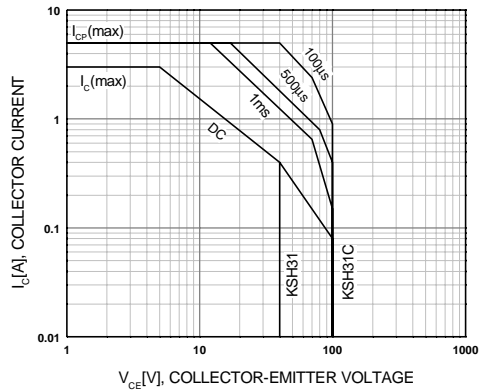


Figure 6. Safe Operating

### Typical Characteristics (Continued)

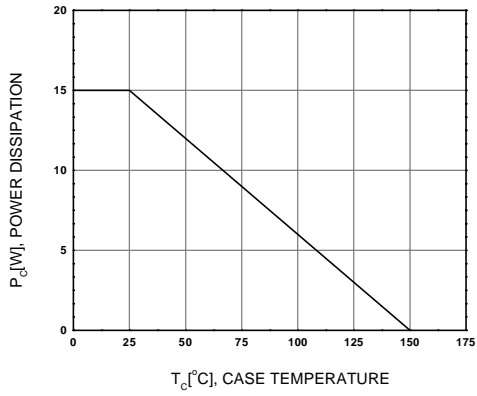
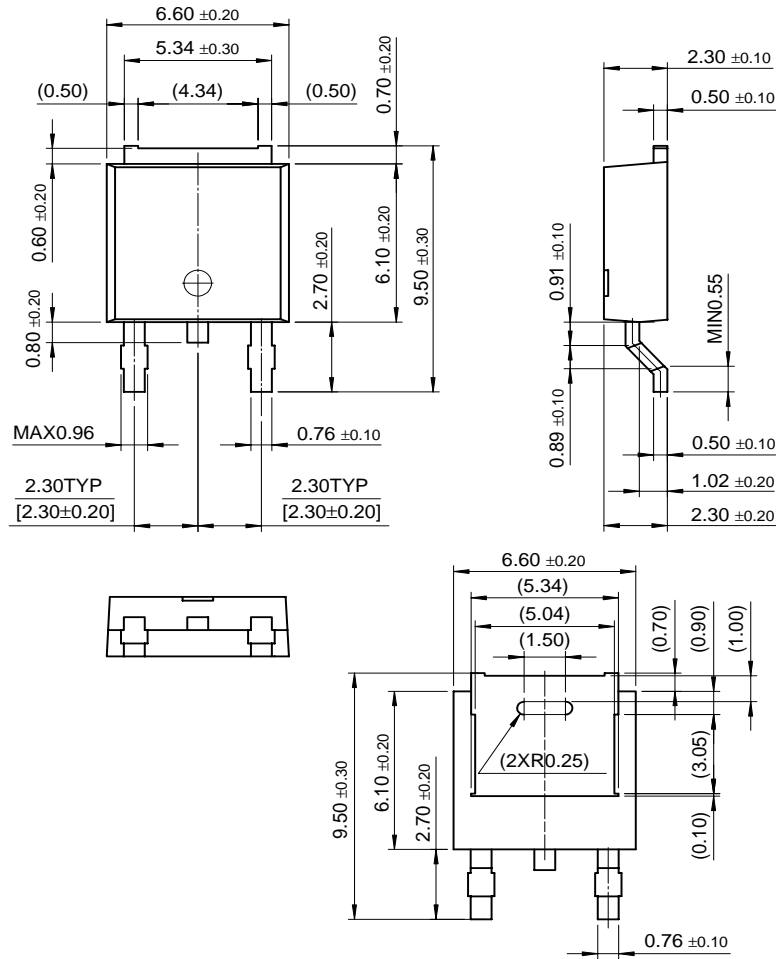


Figure 7. Power Derating

# Package Dimensions

KSH31/31C

## D-PAK



Dimensions in Millimeters

Package Dimensions (Continued)

I-PAK



Dimensions in Millimeters

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