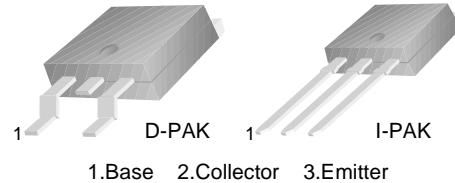


KSH31/31C

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



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

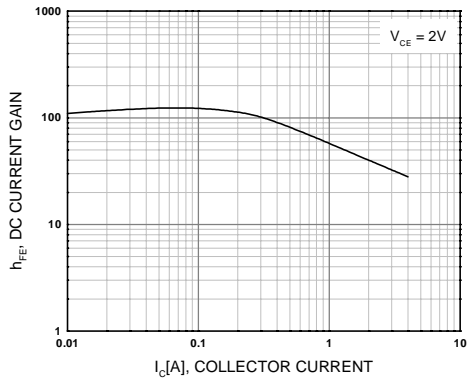


Figure 1. DC current Gain

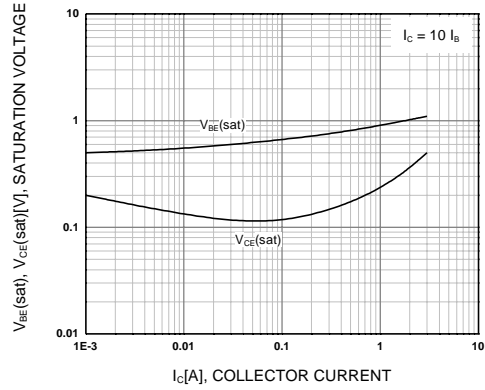


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

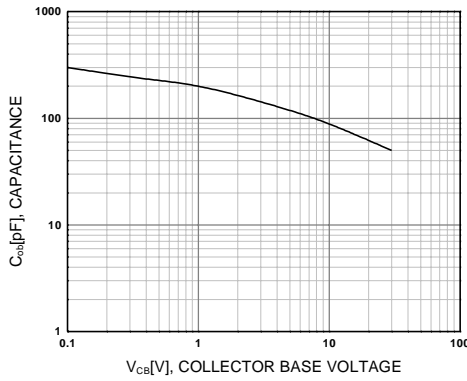


Figure 3. Collector Capacitance

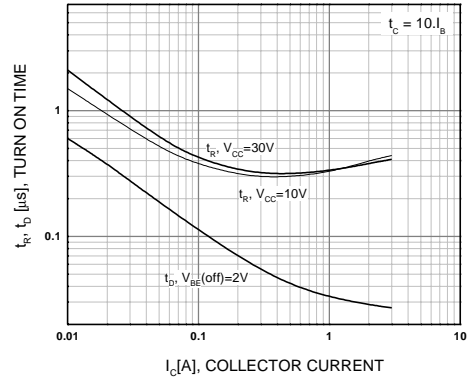


Figure 4. Turn On Time

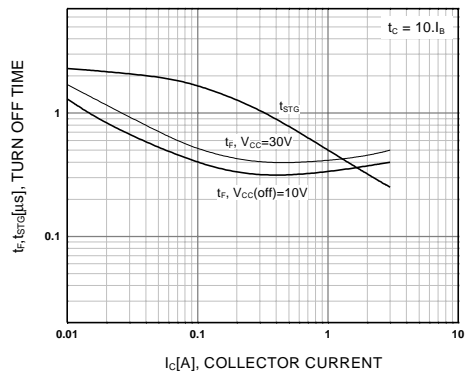


Figure 5. Turn Off Time

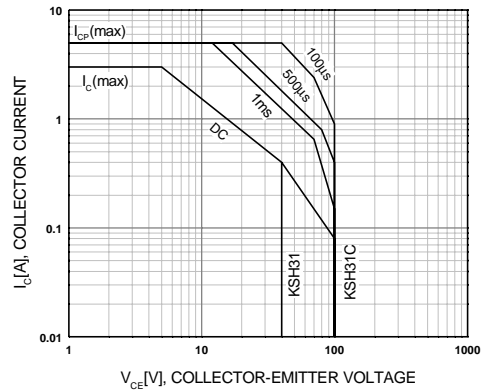


Figure 6. Safe Operating

Typical Characteristics (Continued)

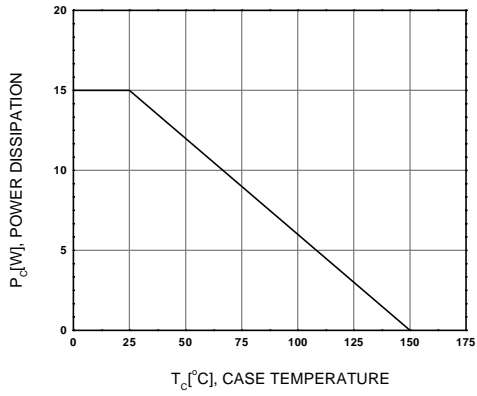


Figure 7. Power Derating

Package Dimensions

KSH31/31C

D-PAK



Dimensions in Millimeters

Package Dimensions (Continued)

I-PAK



Dimensions in Millimeters

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