

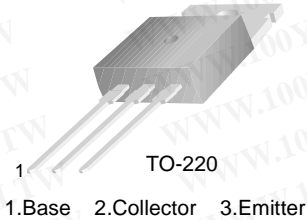
勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-54151736
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TIP31 Series(TIP31/31A/31B/31C)

Medium Power Linear Switching Applications

- Complementary to TIP32/32A/32B/32C



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 : TIP31	40	V
	: TIP31A	60	V
	: TIP31B	80	V
	: TIP31C	100	V
V_{CEO}	Collector-Emitter Voltage : TIP31	40	V
	: TIP31A	60	V
	: TIP31B	80	V
	: TIP31C	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 ($T_C=25^\circ\text{C}$)	40	W
P_C	Collector Dissipation ($T_a=25^\circ\text{C}$)	2	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 : TIP31 : TIP31A : TIP31B : TIP31C	$I_C = 30\text{mA}$, $I_B = 0$	40		V
			60		V
			80		V
			100		V
					V
I_{CEO}	Collector Cut-off Current : TIP31/31A : TIP31B/31C	$V_{CE} = 30\text{V}$, $I_B = 0$		0.3	mA
		$V_{CE} = 60\text{V}$, $I_B = 0$		0.3	mA
I_{CES}	Collector Cut-off Current : TIP31 : TIP31A : TIP31B : TIP31C	$V_{CE} = 40\text{V}$, $V_{EB} = 0$		200	μA
		$V_{CE} = 60\text{V}$, $V_{EB} = 0$		200	μA
		$V_{CE} = 80\text{V}$, $V_{EB} = 0$		200	μA
		$V_{CE} = 100\text{V}$, $V_{EB} = 0$		200	μA
					μA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 5\text{V}$, $I_C = 0$		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
$V_{BE(sat)}$	* Base-Emitter Saturation Voltage	$V_{CE} = 4\text{V}$, $I_C = 3\text{A}$		1.8	V
f_T	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}$, $I_C = 500\text{mA}$	3.0		MHz

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

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Typical Characteristics

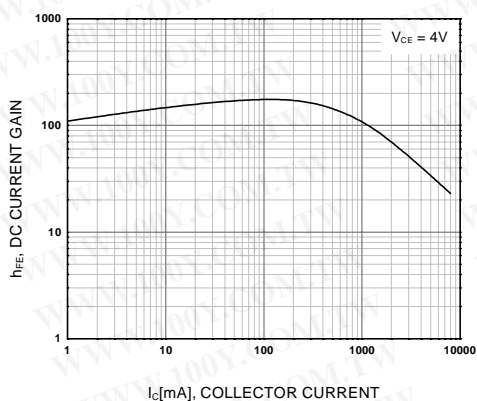


Figure 1. DC current Gain

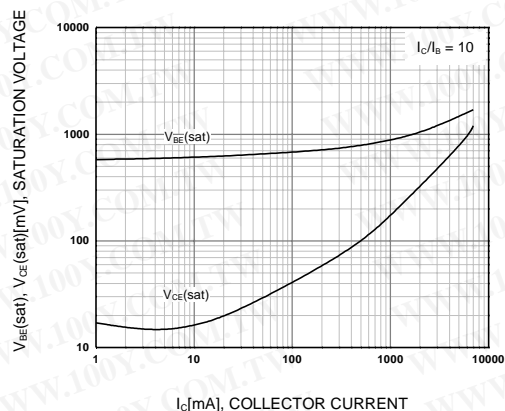
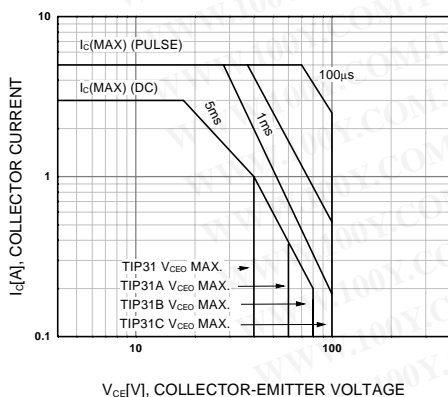
Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

Figure 3. Safe Operating Area

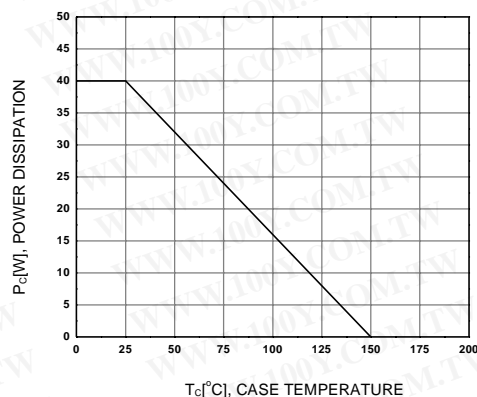
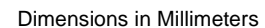


Figure 4. Power Derating

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TO-220



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