



## TO-220 Plastic-Encapsulated Transistors

### TIP31/31A/31B/31C TRANSISTOR (NPN)

#### FEATURES

Power dissipation

$$P_{CM}: 2 \text{ W (Tamb=25°C)}$$

Collector current

$$I_{CM}: 3 \text{ A}$$

Collector-base voltage

$$V_{(BR)CBO}: \begin{array}{ll} \text{TIP31:} & 40 \text{ V} \\ \text{TIP31A:} & 60 \text{ V} \\ \text{TIP31B:} & 80 \text{ V} \\ \text{TIP31C:} & 100 \text{ V} \end{array}$$

Operating and storage junction temperature range

$$T_J, T_{stg}: -55^\circ\text{C to } +150^\circ\text{C}$$

#### ELECTRICAL CHARACTERISTICS (Tamb=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage 31 31A 31B 31C	$V_{(BR)CBO}$	$I_C = 100 \mu\text{A}, I_E = 0$	40 60 80 100		V
Collector-emitter breakdown voltage 31 31A 31B 31C	$V_{(BR)CEO}$	$I_C = 30 \text{ mA}, I_B = 0$	40 60 80 100		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100 \mu\text{A}, I_C = 0$	5		V
Collector cut-off current 31 31A 31B 31C	$I_{CBO}$	$V_{CB} = 40\text{V}, I_E = 0$ $V_{CB} = 60\text{V}, I_E = 0$ $V_{CB} = 80\text{V}, I_E = 0$ $V_{CB} = 100\text{V}, I_E = 0$		0.2	mA
Collector cut-off current 31/31A 31B/31C	$I_{CEO}$	$V_{CE} = 30\text{V}, I_B = 0$ $V_{CE} = 60\text{V}, I_B = 0$		0.3 0.3	mA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$		1	mA
DC current gain	$h_{FE(1)}$	$V_{CE} = 4\text{V}, I_C = 3\text{A}$	10	50	
	$h_{FE(2)}$	$V_{CE} = 4\text{V}, I_C = 1\text{A}$	25		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 375\text{mA}$		1.2	V
Base-emitter voltage	$V_{BE(on)}$	$V_{CE} = 4\text{V}, I_C = 3\text{A}$		1.8	V
Transition frequency	$f_T$	$V_{CE} = 10\text{V}, I_C = 500\text{mA}$	3		MHz

