



TO-220 Plastic-Encapsulated Transistors

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

FEATURES

Power dissipation

$$P_{CM}: 2 \text{ W (Tamb=25}^\circ\text{C)}$$

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

