

TIP31C

Power transistors

General features

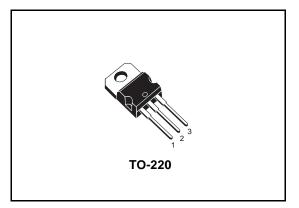
- New enhanced series
- High switching speed
- h_{FE} improved linearity
- h_{FE} Grouping

Applications

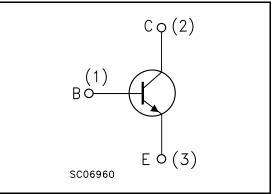
■ Linear and switching industrial application

Description

The TIP31C is a base island technology NPN power transistor in TO-220 plastic package with better performances than the industry standard TIP31C that make this device suitable for audio, power linear and switching applications. The PNP type is TIP32C.



Internal schematic diagram



Order codes

Part Number	Marking	Package	Packing
TIP31C Note: on page 4	TIP31C R TIP31C O TIP31C Y	TO-220	Tube

Contents

1	Electrical ratings 3
2	Electrical characteristics4
	2.1 Electrical characteristics (curve) 5
3	Package mechanical data 6
4	Revision history8



1 Absolute maximim ratings

Table 1.	Absolute	maximim	ratings
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Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage (I _E = 0)	100	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	100	V
V _{EBO}	Emitter-base voltage (I _C = 0)	5	V
Ι _C	Collector current	3	А
I _{CM}	Collector peak current	5	A
Ι _Β	Base current	1	А
Pror	Total dissipation at T _{case} = 25°C	40	W
P _{TOT}	Total dissipation at T _{amb} = 25°C	2	W
T _{stg}	Storage temperature	-65 to 150	°C
Т _Ј	Max. operating junction temperature	150	°C



2 Electrical characteristics

(T_{case} = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CEO}	Collector cut-off current $(I_B = 0)$	V _{CE} = 60V			0.3	mA
I _{EBO}	Emitter cut-off current ($I_C = 0$)	V _{EB} = 5V			1	mA
I _{CES}	Collector cut-off current (V _{BE} = 0)	V _{CE} = 100V			0.2	mA
V _{CEO(sus)} ⁽¹⁾	Collector-emitter sustaining voltage (I _B = 0)	I _C = 30mA	100			V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	I _C = 3A I _B = 375n	nA		1.2	V
$V_{BE(on)}^{(1)}$	Base-emitter voltage	$I_C = 3A$ $V_{CE} = 4$	4V		1.8	V
h _{FE} ⁽¹⁾	DC current gain	$I_{C} = 1A \qquad V_{CE} = 4$ $I_{C} = 3A \qquad V_{CE} = 4$ Group R Group O Group Y	4V 25 4V 10 20 40		24 44 50	

	Table 2.	Electrical	characteristics
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1. Pulsed duration = 300 ms, duty cycle $\ge 1.5\%$

Note:

Product is pre-selected in DC current gain (Group R, Group O and Group Y). STMicroelectronics reserves the right to ship each groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

2.1 Electrical characteristics (curve)

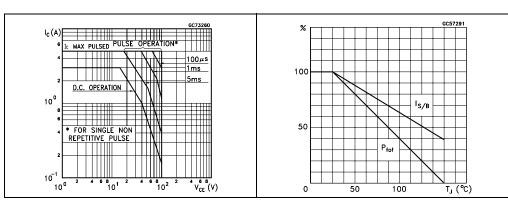


Figure 1. Safe Operating area Fi

Figure 2. Derating curves





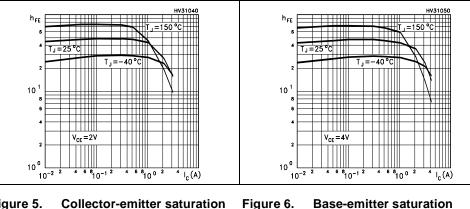


Figure 5. **Collector-emitter saturation** Figure 6. voltage voltage HV31090 V_{CE (sat)} (V) 6 V_{BE(sat} (V) h_{FE} =10 $h_{FE} = 10$ 1.4 T_J = - 40°C 1.2 10⁰ 1.0 1 0.8 T_J = 150 °C 10 <u>= 25 °C</u> 0.6 T_J =150 °C T_J=25°C, -40°C 0.4 10⁻² 0.2 10⁻² 10⁻¹ 10⁰ ່ ເ_C (A) I_c(A) 0.1 1

57

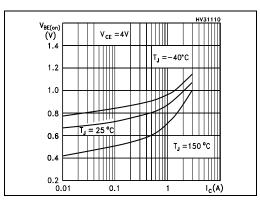


Figure 7. Base-emitter on voltage



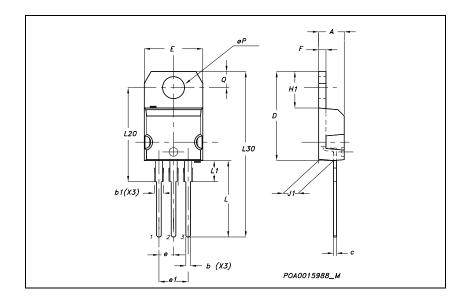
TIP31C

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com



DIM.		mm.			inch	
	MIN.	TYP	MAX.	MIN.	TYP.	MAX
А	4.40		4.60	0.173		0.18
b	0.61		0.88	0.024		0.034
b1	1.15		1.70	0.045		0.066
С	0.49		0.70	0.019		0.027
D	15.25		15.75	0.60		0.620
Е	10		10.40	0.393		0.409
е	2.40		2.70	0.094		0.106
e1	4.95		5.15	0.194		0.202
F	1.23		1.32	0.048		0.052
H1	6.20		6.60	0.244		0.256
J1	2.40		2.72	0.094		0.107
L	13		14	0.511		0.55
L1	3.50		3.93	0.137		0.154
L20		16.40			0.645	
L30		28.90			1.137	
øP	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



57

4 Revision history

Table 3. Revision history

Date	Revision	Changes
20-Apr-2006	1	New release



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57