

Power transistors

General features

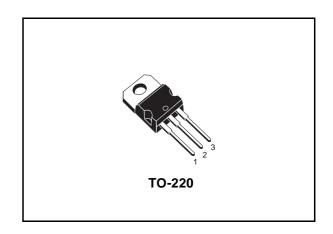
- New enhanced series
- High switching speed
- h_{FE} improved linearity
- h_{FE} Grouping

Applications

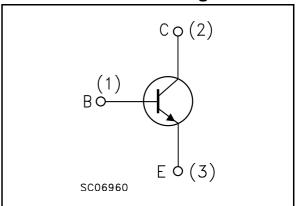
■ Linear and switching industrial application

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 TIP31C

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1 Absolute maximim ratings

Table 1. Absolute maximim ratings

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
I _C	Collector current	3	Α
I _{CM}	Collector peak current	5	А
I _B	Base current	1	А
P _{TOT}	Total dissipation at $T_{case} = 25^{\circ}C$ Total dissipation at $T_{amb} = 25^{\circ}C$	40 2	W W
T _{stg}	Storage temperature	-65 to 150	°C
TJ	Max. operating junction temperature	150	°C

Electrical characteristics TIP31C

2 Electrical characteristics

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

Table 2. Electrical characteristics

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	$I_{C} = 3A$ $I_{B} = 375mA$	A .		1.2	V
V _{BE(on)} ⁽¹⁾	Base-emitter voltage	$I_C = 3A$ $V_{CE} = 4$	/		1.8	V
h _{FE} ⁽¹⁾	DC current gain	$I_C = 1A$ $V_{CE} = 4V$ $I_C = 3A$ $V_{CE} = 4V$ Group R Group O			24 44	
		Group Y	40		50	

^{1.} Pulsed duration = 300 ms, duty cycle \geq 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.

TIP31C Electrical characteristics

2.1 Electrical characteristics (curve)

Figure 1. Safe Operating area

Figure 2. Derating curves

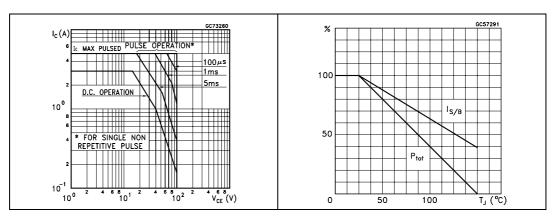


Figure 3. DC-current gain

Figure 4. DC-current gain

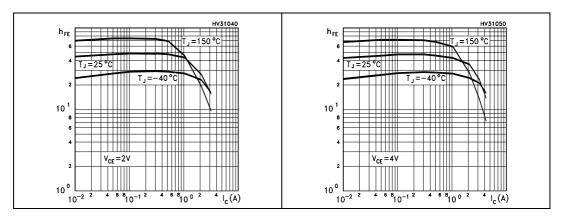
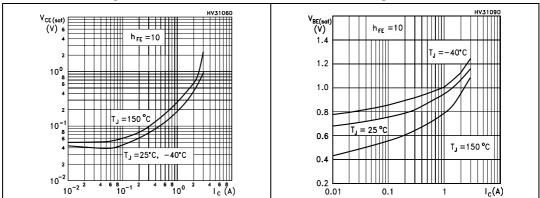
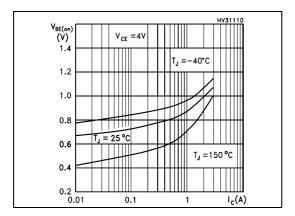


Figure 5. Collector-emitter saturation Figure 6. Base-emitter saturation voltage



Electrical characteristics TIP31C

Figure 7. Base-emitter on voltage



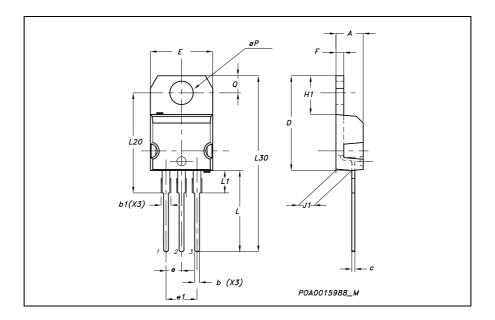
3 Package mechanical data

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

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TO 220	MECHANICAL	DATA
- 1 ()=ソン()	MECHANICAL	

DIM	mm.			inch			
DIM.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.	
Α	4.40		4.60	0.173		0.181	
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		0.551	
L1	3.50		3.93	0.137		0.154	
L20		16.40			0.645		
L30		28.90			1.137		
øΡ	3.75		3.85	0.147		0.151	
Q	2.65		2.95	0.104		0.116	



TIP31C Revision history

4 Revision history

Table 3. Revision history

Date	Revision	Changes
20-Apr-2006	1	New release

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