TIP31A

Power transistors

General features

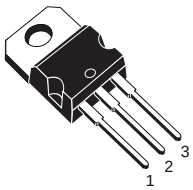
- New enhanced series
- High switching speed
- h_{FE} improved linearity

Applications

- Linear and switching industrial application

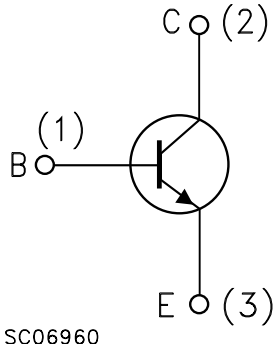
Description

The TIP31A is a base island technology NPN power transistor in TO-220 plastic package with better performances than the industry standard TIP31A that make this device suitable for audio, power linear and switching applications. The PNP type is TIP32A.



TO-220

Internal schematic diagram



Order codes

Part Number	Marking	Package	Packing
TIP31A	TIP31A	TO-220	Tube

Contents

1 Absolute maximim ratings

Table 1. Absolute maximim ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	60	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	60	V
V_{EBO}	Emitter-base voltage (I_C = 0)	5	V
I_C	Collector current	3	A
I_{CM}	Collector peak current	5	A
I_B	Base current	1	A
P_{TOT}	Total dissipation at T_{case} = 25°C Total dissipation at T_{amb} = 25°C	40 2	W W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

2 Electrical characteristics

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

Table 2. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 30 V			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} = 60V			0.2	mA
$V_{CEO(sus)}$(1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 30mA	60			V
$V_{CE(sat)}$(1)	Collector-emitter saturation voltage	I_C = 3A I_B = 375mA			1.2	V
$V_{BE(on)}$(1)	Base-emitter voltage	I_C = 3A V_{CE} = 4V			1.8	V
h_{FE}(1)	DC current gain	I_C = 1A V_{CE} = 4V I_C = 3A V_{CE} = 4V	25 10		 50	

1. Pulsed duration = 300 ms, duty cycle ≥ 1.5%

2.1 Electrical characteristics (curve)

Figure 1. Safe Operating area

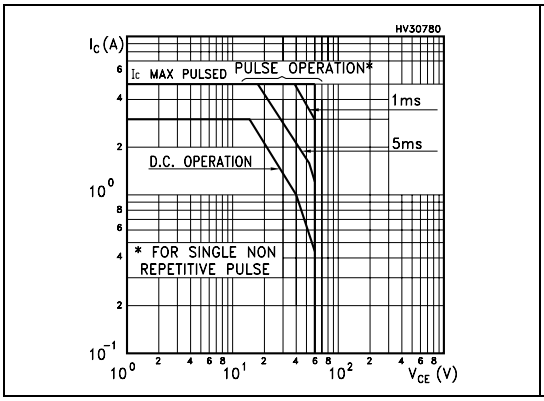


Figure 2. Derating curves

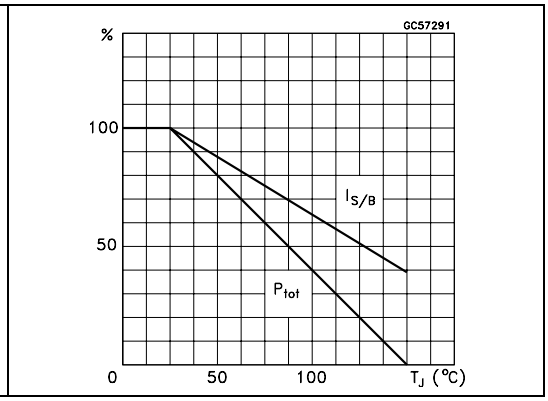


Figure 3. DC-current gain

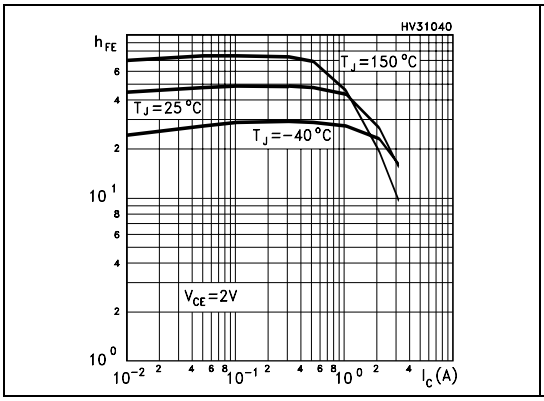


Figure 4. DC-current gain

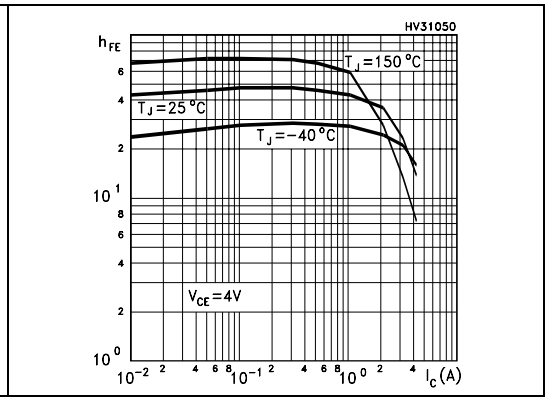


Figure 5. Collector-emitter saturation voltage

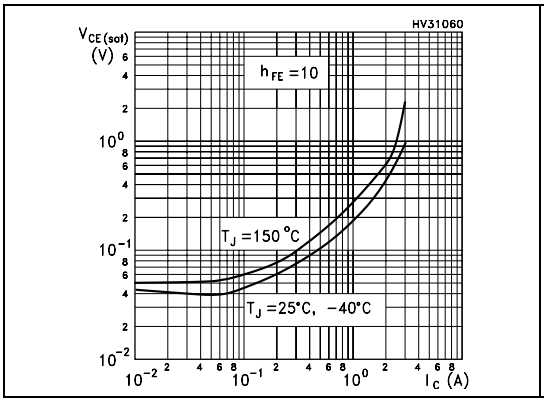


Figure 6. Base-emitter saturation voltage

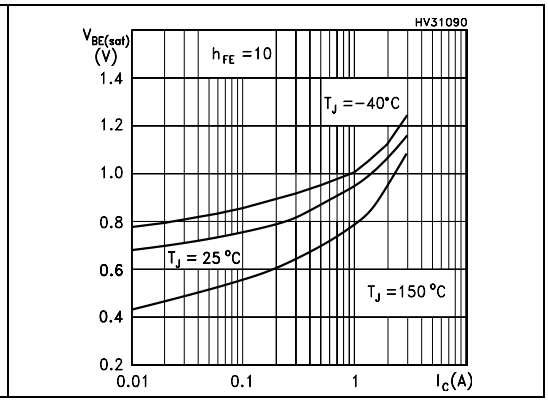
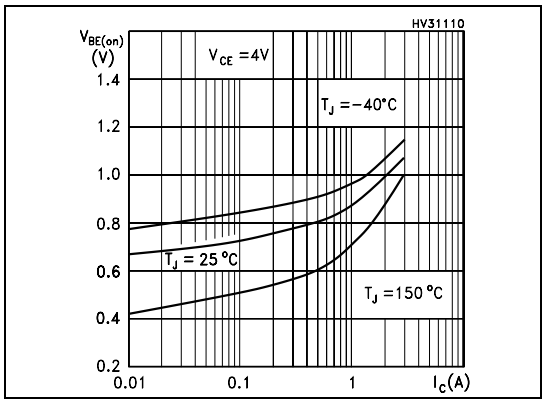


Figure 7. Base-emitter on voltage

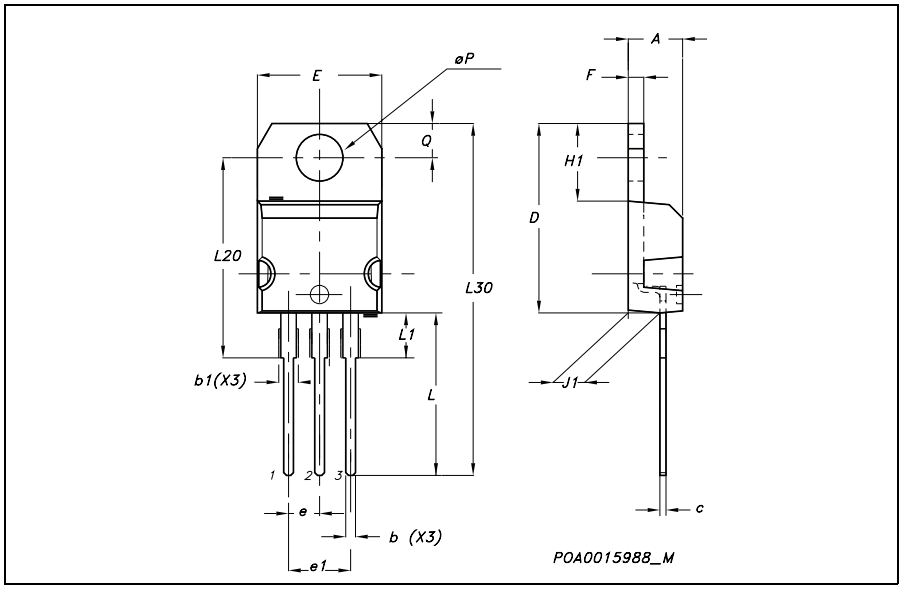


3 Package mechanical data

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

TO-220 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	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
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.60		0.620
E	10		10.40	0.393		0.409
e	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	
øP	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



4 Revision history

Table 3. Revision history

Date	Revision	Changes
20-Apr-2006	1	New release

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