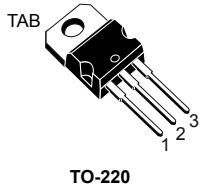


Complementary power Darlington transistors

Features



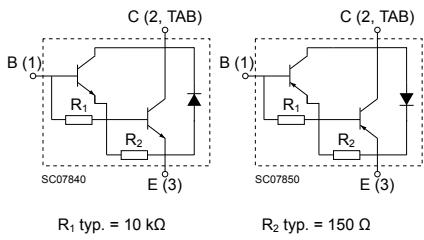
TO-220

- Good h_{FE} linearity
- High f_T frequency
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

Application

- Audio amplifiers
- Linear and switching industrial equipment

Description



These devices are manufactured in planar technology with “base island” layout and monolithic Darlington configuration.



Product status links

[BDX53B](#)[BDX53C](#)[BDX54C](#)

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value			Unit
		NPN	BDX53B	BDX53C	
		PNP		BDX54C	
V _{CBO}	Collector-base voltage ($I_E = 0$ A)		80	100	V
V _{CEO}	Collector-emitter voltage ($I_B = 0$ A)		80	100	V
V _{EBO}	Collector-base voltage ($I_C = 0$ A)			5	V
I _C	Collector current			8	A
I _{CM}	Collector peak current			12	A
I _B	Base current			0.2	A
P _{TOT}	Total power dissipation at $T_C = 25$ °C			60	W
T _{stg}	Storage temperature range			-65 to 150	°C
T _J	Maximum operating junction temperature			150	°C

Note: For PNP types voltage and current values are negative.

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R _{thJC}	Thermal resistance, junction-to-case	2.08	°C/W

2 Electrical characteristics

$T_C = 25^\circ\text{C}$ unless otherwise specified.

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current	$V_{CB} = 80\text{ V}$, $I_E = 0\text{ A}$ for BDX53B	-	-	0.2	mA
		$V_{CB} = 100\text{ V}$, $I_E = 0\text{ A}$ for BDX53C, BDX54C	-	-	0.2	mA
I_{CEO}	Collector cut-off current	$V_{CE} = 40\text{ V}$, $I_B = 0\text{ A}$ for BDX53B	-	-	0.5	mA
		$V_{CE} = 50\text{ V}$, $I_B = 0\text{ A}$ for BDX53C, BDX54C	-	-	0.5	mA
I_{EBO}	Emitter cut-off current	$V_{EB} = 5\text{ V}$, $I_C = 0\text{ A}$	-	-	2	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage	$I_C = 100\text{ mA}$, $I_B = 0\text{ A}$ for BDX53B	80	-	-	V
		$I_C = 100\text{ mA}$, $I_B = 0\text{ A}$ for BDX53C, BDX54C	100	-	-	V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 3\text{ A}$, $I_B = 12\text{ mA}$	-	-	2	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 3\text{ A}$, $I_B = 12\text{ mA}$	-	-	2.5	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 3\text{ A}$, $V_{CE} = 3\text{ V}$	750	-	-	-
$V_F^{(1)}$	Diode forward voltage	$I_F = 3\text{ A}$	-	1.8	2.5	V
		$I_F = 8\text{ A}$	-	2.5	-	V

1. Pulse test: pulse duration = 300 μs , duty cycle 1.5 %.

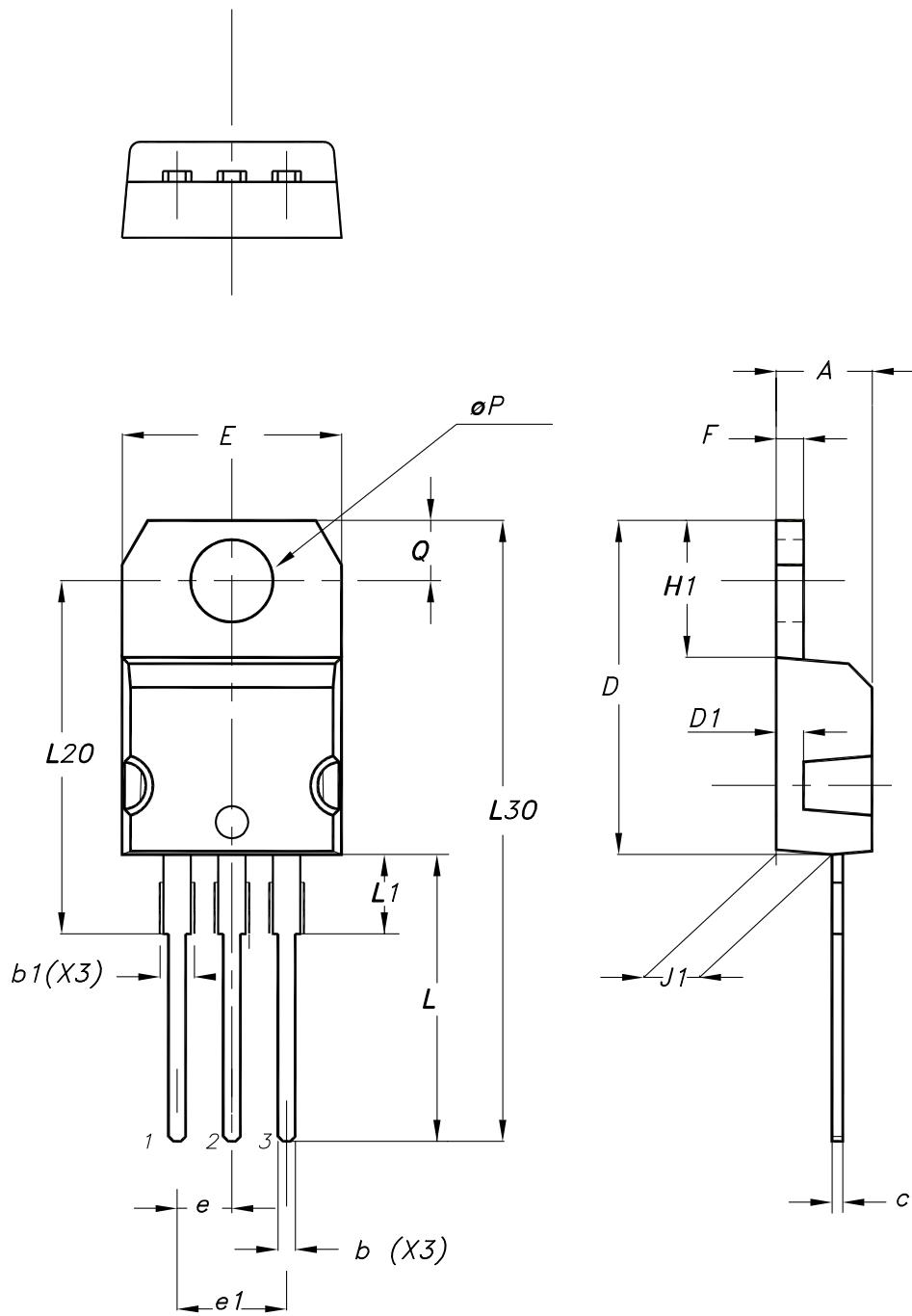
Note: For PNP types voltage and current values are negative.

3 Package information

To meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions, and product status are available at: www.st.com. ECOPACK is an ST trademark.

3.1 TO-220 type A package information

Figure 1. TO-220 type A package outline



0015988_typeA_Rev_24

Table 4. TO-220 type A package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.55
c	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10.00		10.40
e	2.40		2.70
e1	4.95		5.15
F	1.23		1.32
H1	6.20		6.60
J1	2.40		2.72
L	13.00		14.00
L1	3.50		3.93
L20		16.40	
L30		28.90	
øP	3.75		3.85
Q	2.65		2.95
Slug flatness		0.03	0.10

4 Ordering information

Table 5. Order codes

Order codes	Marking	Polarity	Package	Packing
BDX53B	BDX53B	NPN	TO-220	Tube
BDX53C	BDX53C	NPN		
BDX54C	BDX54C	PNP		

Revision history

Table 6. Document revision history

Date	Revision	Changes
23-Oct-2007	4	Technology change from epibase to planar (PCN APMPWR/07/2417 and APM-PWR/07/2615)
17-Jul-2025	5	Removed order code BDX54B. Updated Table 1. Absolute maximum ratings and Section 3: Package information . Minor text changes.

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