

DARLINGTON POWER TRANSISTORS

P-N-P Darlington for audio output stages and general amplifier and switching applications. In a TO-3 envelope. N-P-N complements are BDX69, BDX69A, BDX69B and BDX69C.

QUICK REFERENCE DATA

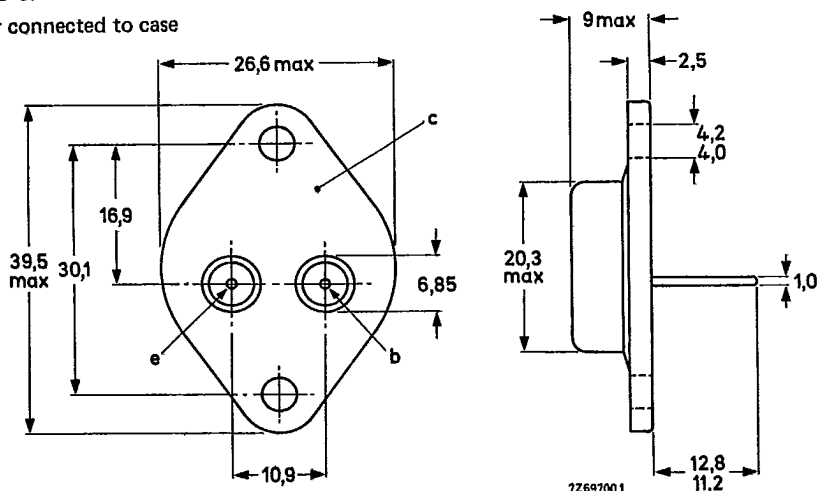
		BDX68	68A	68B	68C	
Collector-base voltage (open emitter)	$-V_{CBO}$ max.	60	80	100	120	V
Collector-emitter voltage (open base)	$-V_{CEO}$ max.	60	80	100	120	V
Collector current (peak value)	$-I_{CM}$ max.	40				A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot} max.	200				W
Junction temperature	T_j max.	200				$^\circ\text{C}$
D.C. current gain						
$-I_C = 5\text{ A}; -V_{CE} = 3\text{ V}$	h_{FE} typ.	3000				
$-I_C = 20\text{ A}; -V_{CE} = 3\text{ V}$	h_{FE} >	1000				
Cut-off frequency						
$-I_C = 10\text{ A}; -V_{CE} = 3\text{ V}$	f_{hfe} typ.	60				kHz

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-3.

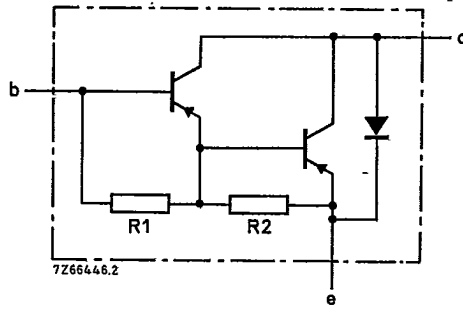
Collector connected to case



See also chapters Mounting instructions and Accessories.

BDX68; 68A
BDX68B; 68C

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R1 typ. 1,5 kΩ
R2 typ. 40 Ω

Fig. 2 Circuit diagram.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BDX68	68A	68B	68C	
Collector-base voltage (open emitter)	$-V_{CB0}$	max.	60	80	100	120	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	60	80	100	120	V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5	5	5	5	V
Collector current (d.c.)	$-I_C$	max.		25			A
Collector current (peak value)	$-I_{CM}$	max.		40			A
Base current	$-I_B$	max.		500			mA
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot}	max.		200			W
Storage temperature	T_{stg}			-65 to +200			$^\circ\text{C}$
Junction temperature*	T_j	max.		200			$^\circ\text{C}$

THERMAL RESISTANCE *

From junction to mounting base	$R_{th\ j-mb}$	=		0,875			K/W
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* Based on maximum average junction temperature in line with common industrial practice. The resulting higher junction temperature of the output transistor part is taken into account.

Darlington power transistors

BDX68; 68A
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CHARACTERISTICS

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

Collector cut-off current

$$I_E = 0; -V_{CB} = -V_{CB0\max} \quad -I_{CBO} < 2\text{ mA}$$

$$I_E = 0; -V_{CB} = -\frac{1}{2}V_{CB0\max}; T_j = 200\text{ }^\circ\text{C} \quad -I_{CBO} < 10\text{ mA}$$

$$I_B = 0; -V_{CE} = -\frac{1}{2}V_{CE0\max} \quad -I_{CEO} < 6\text{ mA}$$

Emitter cut-off current

$$I_C = 0; -V_{EB} = 5\text{ V} \quad -I_{EBO} < 10\text{ mA}$$

D.C. current gain*

$$-I_C = 5\text{ A}; -V_{CE} = 3\text{ V} \quad h_{FE} \text{ typ. } 3000$$

$$-I_C = 20\text{ A}; -V_{CE} = 3\text{ V} \quad h_{FE} > 1000$$

$$-I_C = 30\text{ A}; -V_{CE} = 3\text{ V} \quad h_{FE} \text{ typ. } 1000$$

Base-emitter voltage*

$$-I_C = 20\text{ A}; -V_{CE} = 3\text{ V} \quad -V_{BE} < 2,5\text{ V}$$

Collector-emitter saturation voltage*

$$-I_C = 20\text{ A}; -I_B = 80\text{ mA} \quad -V_{CEsat} < 2\text{ V}$$

Collector capacitance at $f = 1\text{ MHz}$

$$I_E = I_B = 0; -V_{CB} = 10\text{ V} \quad C_C \text{ typ. } 600\text{ pF}$$

Cut-off frequency

$$-I_C = 10\text{ A}; -V_{CE} = 3\text{ V} \quad f_{hfe} \text{ typ. } 60\text{ kHz}$$

Small-signal current gain

$$-I_C = 10\text{ A}; -V_{CE} = 3\text{ V}; f = 1\text{ MHz} \quad h_{fe} \text{ typ. } 20$$

Diode, forward voltage

$$I_F = 20\text{ A} \quad V_F \text{ typ. } 2,0\text{ V}$$

Switching times

(between 10% and 90% levels)

$$-I_{Con} = 20\text{ A}; -I_{Bon} = I_{Boff} = 80\text{ mA} \quad \text{turn-on time} \quad t_{on} \text{ typ. } 1\text{ }\mu\text{s}$$

$$\text{turn-off time} \quad t_{off} \text{ typ. } 3,5\text{ }\mu\text{s}$$

* Measured under pulse conditions: $t_p < 300\text{ }\mu\text{s}$, $\delta < 2\%$.

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BDX68B; 68C

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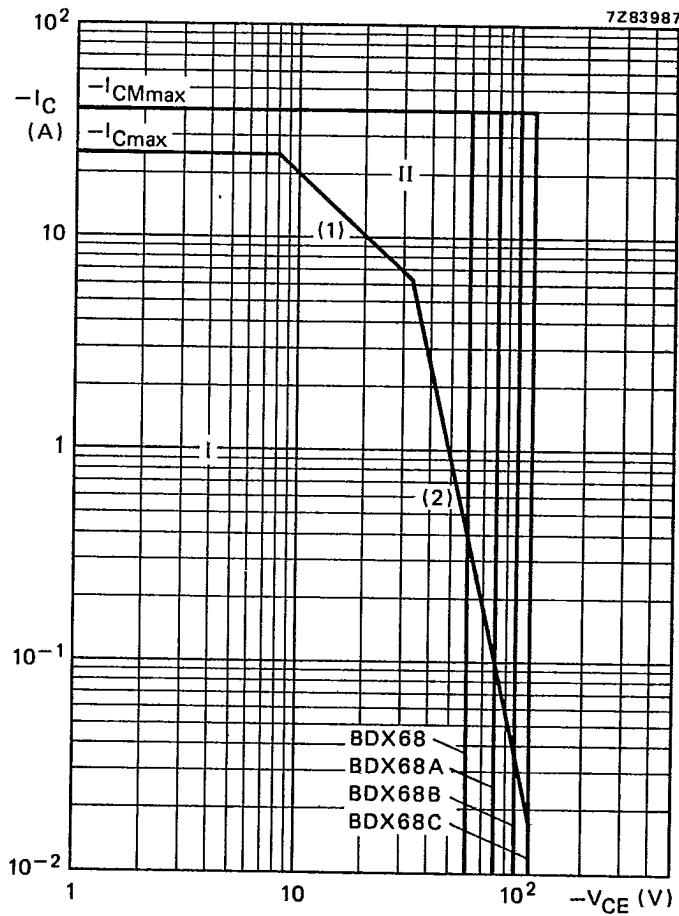


Fig. 3 Safe Operating Area.

- I Region of permissible d.c. operation.
- II Permissible extension for repetitive pulse operation.
- (1) P_{tot} max and P_{tot} peak max lines.
- (2) Second breakdown limits.