BDW83C

NPN power Darlington transistor

Datasheet — production data

Features

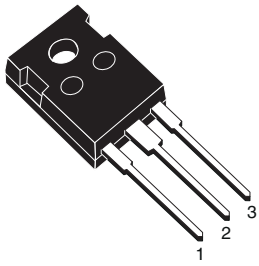
- High current capability
- Fast switching speed
- High DC current gain

Applications

- Linear and switching industrial equipment

Description

The BDW83C is an epitaxial-base NPN power monolithic Darlington transistor mounted in TO-247 plastic package. It is intended for use in power linear and switching applications.



TO-247

Figure 1. Internal schematic diagram

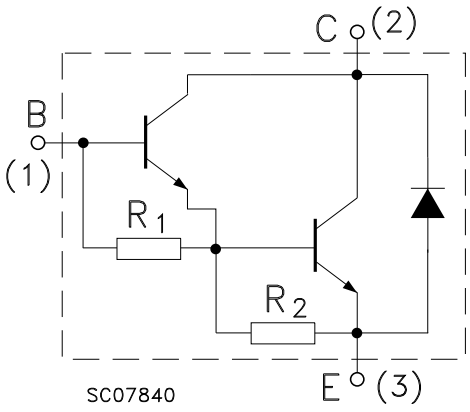


Table 1. Device summary

Order code	Marking	Package	Packaging
BDW83C	BDW83C	TO-247	Tube

1 Absolute maximum ratings

Table 2. Absolute maximum 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	15	A
I_{CM}	Collector peak current (t_p < 5ms)	40	A
I_B	Base current	0.5	A
P_{TOT}	Total dissipation at $T_c \leq 25$ °C	130	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case max	0.96	°C/W

2 Electrical characteristics

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

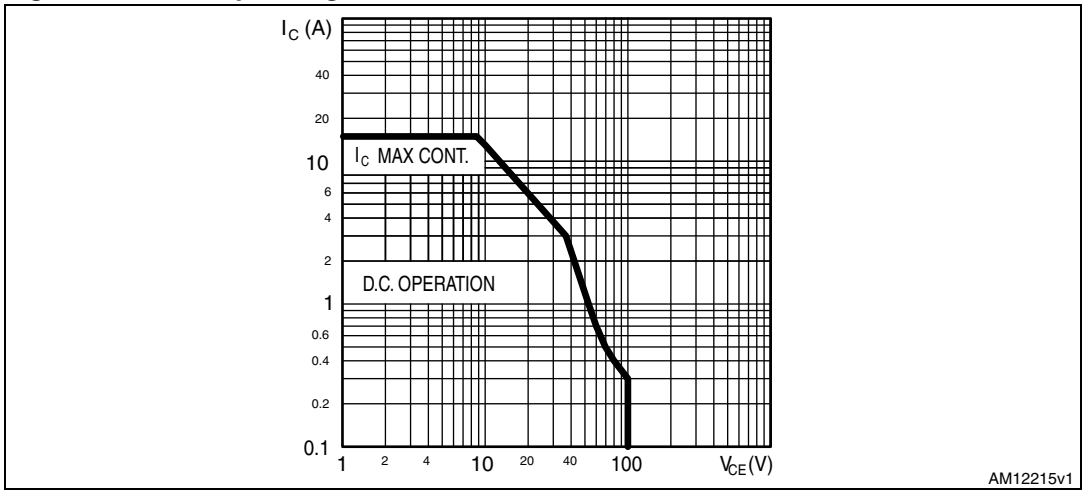
Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 100 V V_{CB} = 100 V T_C = 150°C			500 5	µA mA
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 40 V			1	mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			2	mA
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 30 mA	100			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 6 A I_B = 12 mA I_C = 15 A I_B = 150 mA			2.5 4	V V
$V_{BE(on)}$ (1)	Base-emitter on voltage	I_C = 6 A V_{CE} = 3 V			2.5	V
h_{FE} (1)	DC current gain	I_C = 6 A V_{CE} = 3 V I_C = 15 A V_{CE} = 3 V	750 100		20000	
V_F	Diode forward voltage	I_F = 10 A			4	V
t_{on} t_{off}	Resistive load Turn-on time Turn-off time	V_{CC} = 30 V I_C = 10 A I_{B1} = -I_{B2} = 40 mA		0.9 6		µs µs

1. Pulsed duration = 300 µs, duty cycle ≤1.5%.

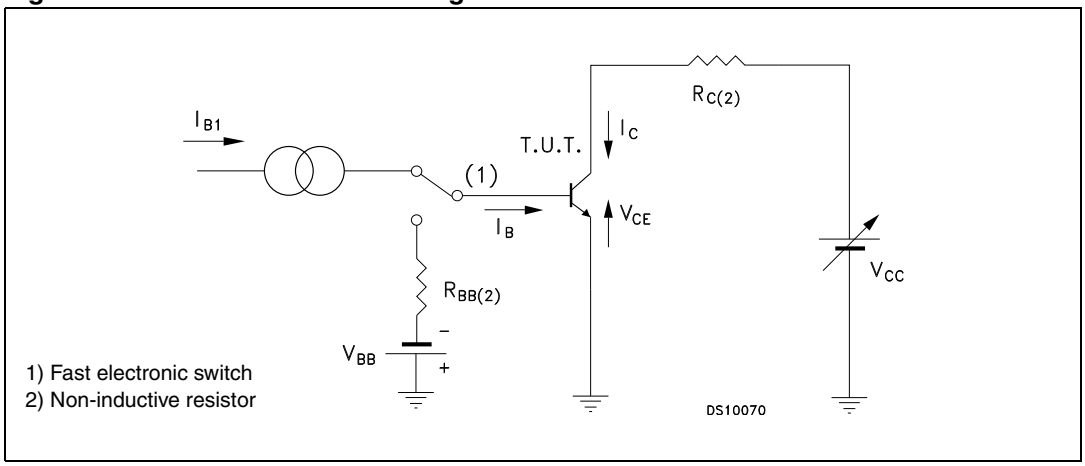
3 Electrical characteristics (curve)

Figure 2. Safe operating area



3.1 Test circuit

Figure 3. Resistive load switching test circuit



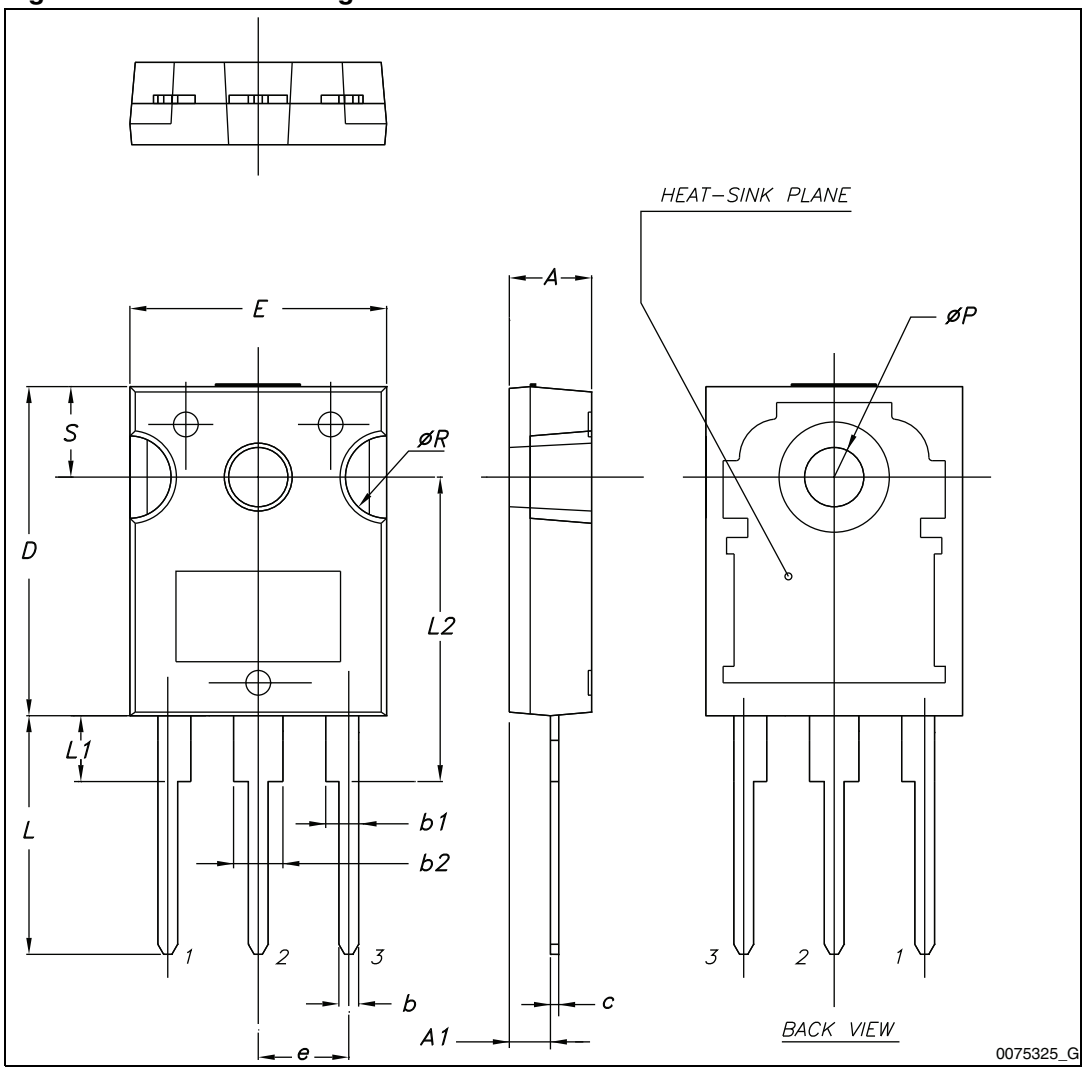
4 Package mechanical data

In order 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.

Table 5. TO-247 mechanical data

Dim.	mm.		
	Min.	Typ.	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e	5.30	5.45	5.60
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
∅P	3.55		3.65
∅R	4.50		5.50
S	5.30	5.50	5.70

Figure 4. TO-247 drawing



5 Revision history

Table 6. Document revision history

Date	Revision	Changes
02-Jan-2000	4	
16-Nov-2007	5	Package change from TO-218 to TO-247.
02-May-2012	6	– Added: *Figure 2: Safe operating area* – Updated: mechanical data

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