

Complementary power Darlington transistors

Preliminary data

Features

- Complementary NPN - PNP transistors
- Monolithic Darlington configuration

Applications

- Audio power amplifier
- DC-AC converter
- Low voltage DC motor drive
- General purpose switching applications

Description

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

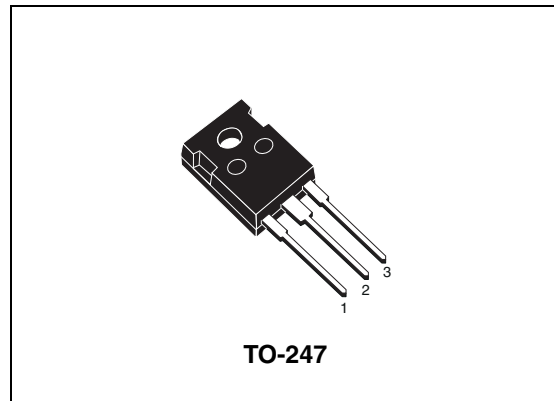


Figure 1. Internal schematic diagrams

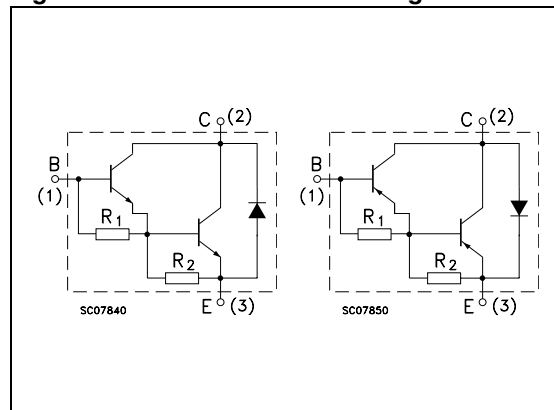


Table 1. Device summary

Order code	Marking	Package	Packaging
2STW100	2STW100	TO-247	Tube
2STW200	2STW200		

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		NPN	2STW100	
		PNP	2STW200	
V_{CBO}	Collector-emitter voltage ($I_E = 0$)		80	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)		80	V
I_C	Collector current		25	A
I_{CM}	Collector peak current ($t_P < 5$ ms)		40	A
I_B	Base current		6	A
I_{BM}	Base peak current ($t_P < 5$ ms)		10	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

Note: For PNP type voltage and current values are negative

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction-case max	0.96	°C/W

2 Electrical characteristics

$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$; unless otherwise specified.

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CE}} = 80\text{ V}$			0.5	mA
I_{CEV}	Collector cut-off current ($V_{\text{BE}} = -0.3\text{ V}$)	$V_{\text{CE}} = 80\text{ V}$			0.1	mA
I_{CEO}	Collector cut-off current ($I_{\text{B}} = 0$)	$V_{\text{CE}} = 60\text{ V}$			0.5	mA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 5\text{ V}$			2	mA
$V_{\text{CEQ(sus)}}^{(1)}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 50\text{ mA}$	80			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 5\text{ A}$ $I_{\text{B}} = 20\text{ mA}$ $I_{\text{C}} = 10\text{ A}$ $I_{\text{B}} = 40\text{ mA}$ $I_{\text{C}} = 20\text{ A}$ $I_{\text{B}} = 80\text{ mA}$			1.2 1.75 3.5	V V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 20\text{ A}$ $I_{\text{B}} = 80\text{ mA}$			3.3	V
$V_{\text{BE}}^{(1)}$	Base-emitter voltage	$I_{\text{C}} = 10\text{ A}$ $V_{\text{CE}} = 3\text{ V}$	1		3	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 5\text{ A}$ $V_{\text{CE}} = 3\text{ V}$ $I_{\text{C}} = 10\text{ A}$ $V_{\text{CE}} = 3\text{ V}$ $I_{\text{C}} = 20\text{ A}$ $V_{\text{CE}} = 3\text{ V}$	600 500 300		15000 12000 6000	
$V_{\text{F}}^{(1)}$	Diode forward voltage	$I_{\text{F}} = 10\text{ A}$		TBD		V
$I_{\text{s/b}}$	Second breakdown current	$V_{\text{CE}} = 25\text{ V}$ $t = 500\text{ ms}$		TBD		A

1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

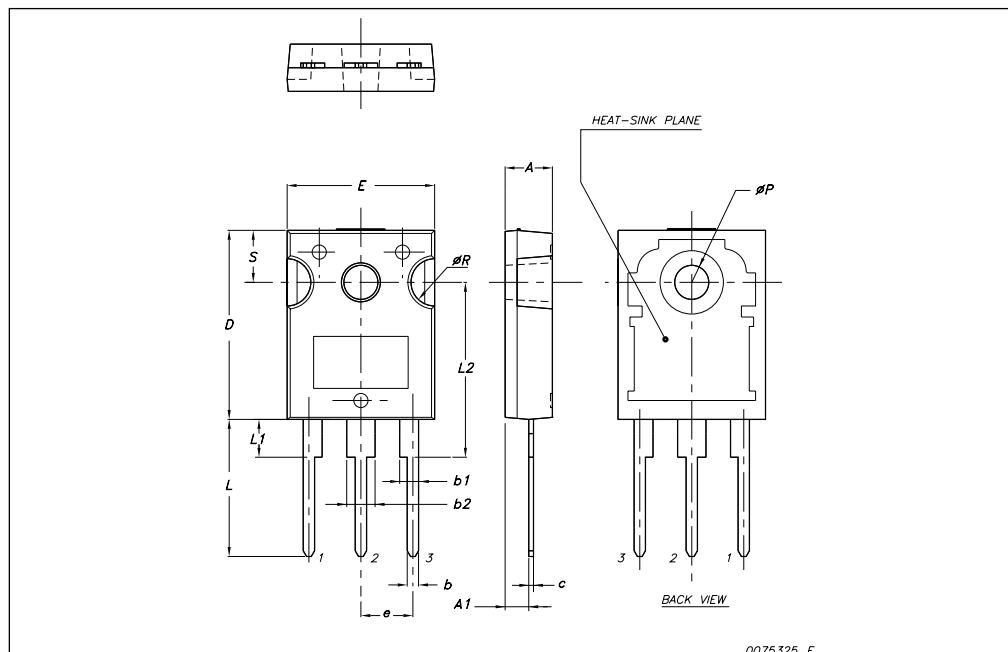
For PNP type voltage and current values are negative.

3 Package mechanical data

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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		5.45	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
øP	3.55		3.65
øR	4.50		5.50
S		5.50	



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
08-Mar-2010	1	First release.

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