

## Complementary power Darlington transistors

Preliminary data

### Features

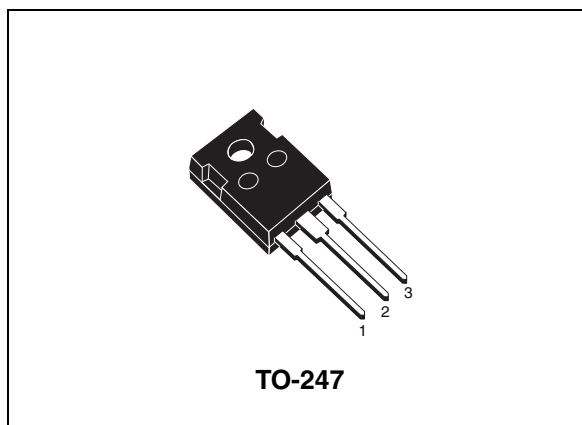
- Complementary NPN - PNP transistors
- Monolithic Darlington configuration

### Applications

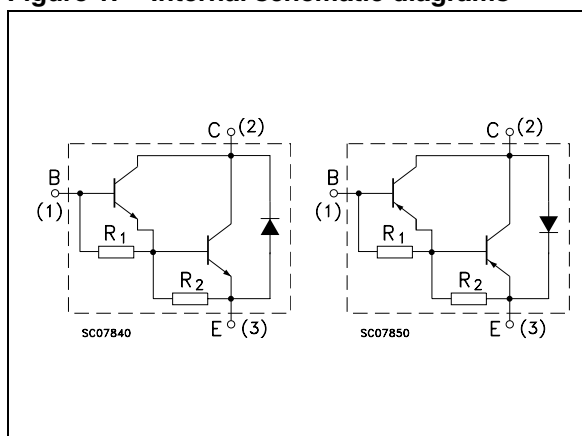
- Audio power amplifier
- DC-AC converter
- Low voltage DC motor drive
- General purpose switching applications

### 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

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

**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CE}} = 80\text{ V}$			0.5	mA
$I_{\text{CEV}}$	Collector cut-off current ( $V_{\text{BE}} = -0.3\text{ V}$ )	$V_{\text{CE}} = 80\text{ V}$			0.1	mA
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 60\text{ V}$			0.5	mA
$I_{\text{EBO}}$	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  $\leq 2\%$ .

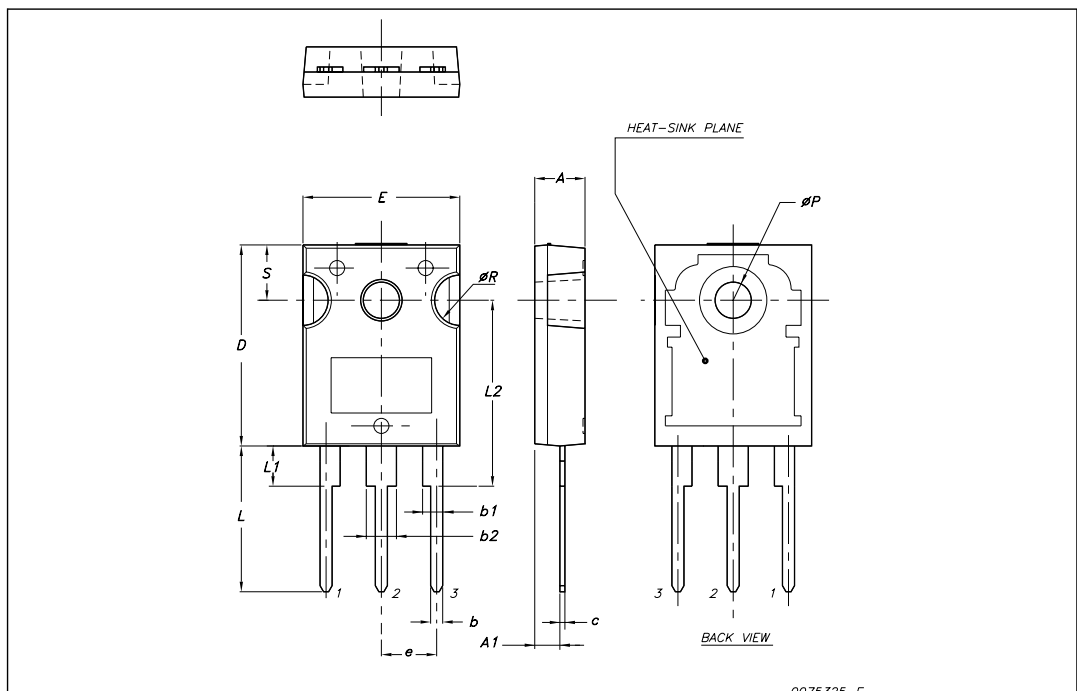
*For PNP type voltage and current values are negative.*

### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

## 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	
$\varnothing P$	3.55		3.65
$\varnothing R$	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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