

## Low voltage NPN power Darlington transistor

### Features

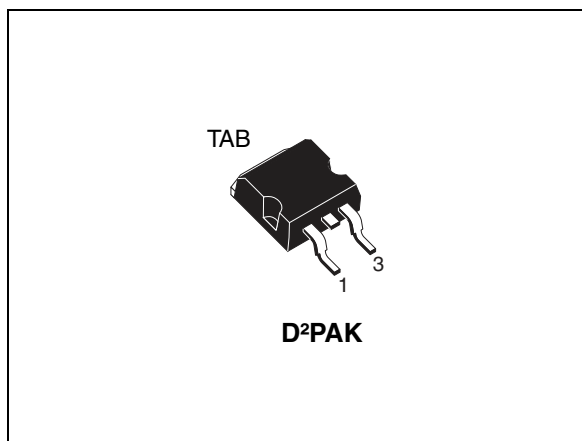
- Good  $h_{FE}$  linearity
- High  $f_T$  frequency
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

### Application

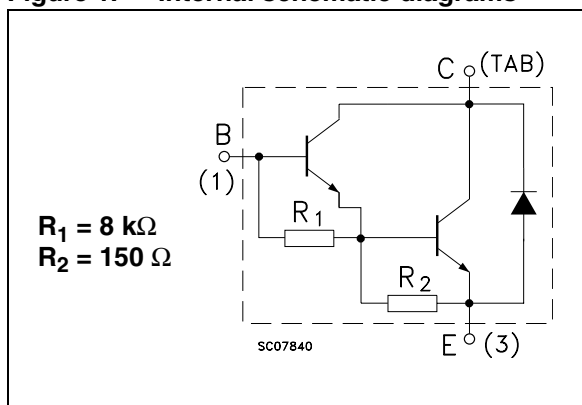
- Linear and switching industrial equipment

### Description

The device is 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
2STBN15D100T4	BN15D100	D <sup>2</sup> PAK	Tape and reel

# 1 Electrical 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	12	A
$I_{CM}$	Collector peak current	15	A
$I_B$	Base current	0.2	A
$P_{TOT}$	Total dissipation at $T_{case} = 25\text{ °C}$	70	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
$R_{thJC}$	Thermal resistance junction-case max.	1.8	°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 ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 100\text{ V}$		-	100	$\mu\text{A}$
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 50\text{ V}$		-	100	$\mu\text{A}$
$I_{\text{EBO}}$	Emitter cut-off current ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5\text{ V}$	0.12	-	2	mA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 100\text{ mA}$	100	-		V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 0.5\text{ A}$ $I_{\text{B}} = 1\text{ mA}$		-	1.5	V
		$I_{\text{C}} = 4\text{ A}$ $I_{\text{B}} = 4\text{ mA}$		-	1.3	V
$V_{\text{BE(on)}}^{(1)}$	Base-emitter on voltage	$I_{\text{C}} = 3\text{ A}$ $V_{\text{CE}} = 3\text{ V}$		-	2.5	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 3\text{ A}$ $V_{\text{CE}} = 3\text{ V}$	750	-		
$V_{\text{F}}$	Diode forward voltage	$I_{\text{F}} = 3\text{ A}$		-	2.5	V

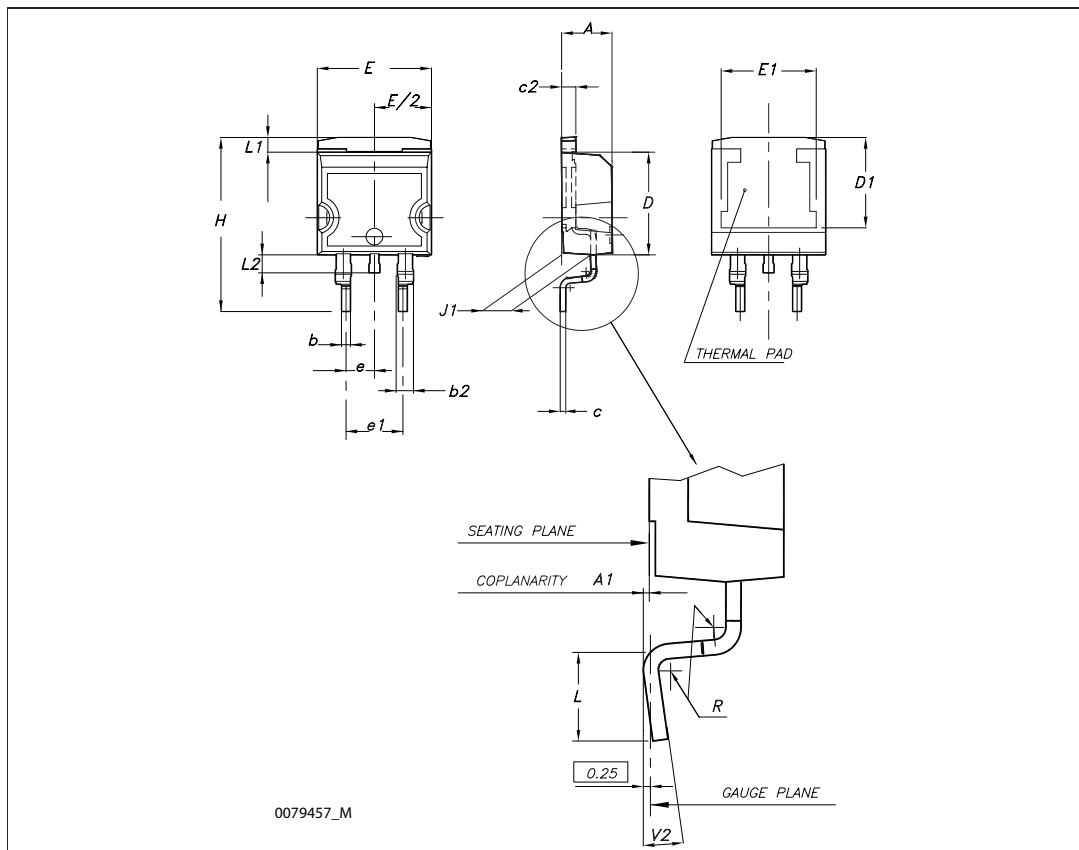
1. Pulse test: pulse duration  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

### 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.

**D<sup>2</sup>PAK (TO-263) mechanical data**

Dim	mm			inch		
	Min	Typ	Max	Min	Typ	Max
A	4.40		4.60	0.173		0.181
A1	0.03		0.23	0.001		0.009
b	0.70		0.93	0.027		0.037
b2	1.14		1.70	0.045		0.067
c	0.45		0.60	0.017		0.024
c2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1	7.50			0.295		
E	10		10.40	0.394		0.409
E1	8.50			0.334		
e		2.54			0.1	
e1	4.88		5.28	0.192		0.208
H	15		15.85	0.590		0.624
J1	2.49		2.69	0.099		0.106
L	2.29		2.79	0.090		0.110
L1	1.27		1.40	0.05		0.055
L2	1.30		1.75	0.051		0.069
R		0.4			0.016	
V2	0°		8°	0°		8°



## 4 Revision history

**Table 5. Document revision history**

Date	Revision	Changes
01-Sep-2009	1	First release.
19-Jan-2010	2	Modified <a href="#">Table 1 on page 1</a> .

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