

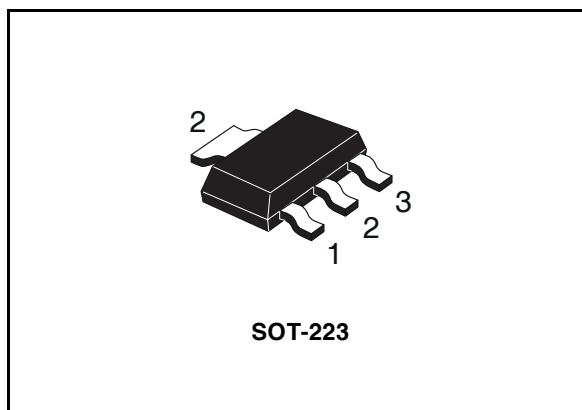
## Low power NPN Transistor

### General features

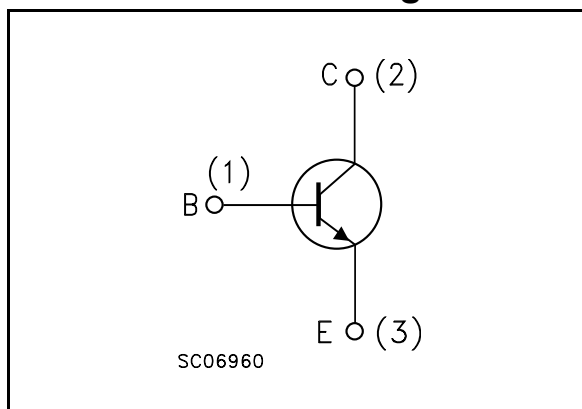
- Silicon epitaxial planar NPN medium voltage transistor
- SOT-223 plastic package for surface mounting circuits
- Available in tape & reel packing
- In compliance with the 2002/93/EC European Directive
- The PNP complementary type is BCP53-16

### Applications

- Medium voltage load switch transistor
- Output stage for audio amplifiers circuits
- Automotive post-voltage regulation



### Internal schematic diagram



### Order codes

Part Number	Marking	Package	Packing
BCP56-16	BCP5616	SOT-223	Tape & reel

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# 1 Electrical ratings

**Table 1. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	100	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	80	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	5	V
$I_C$	Collector current	1	A
$I_{CM}$	Collector peak current ( $t_P < 5\text{ms}$ )	1.5	A
$I_B$	Base current	0.1	A
$I_{BM}$	Base peak current ( $t_P < 5\text{ms}$ )	0.2	A
$P_{tot}$	Total dissipation at $T_{amb} = 25^\circ\text{C}$	1.6	W
$T_{stg}$	Storage temperature	-65 to 150	$^\circ\text{C}$
$T_J$	Max. operating junction temperature	150	$^\circ\text{C}$

**Table 2. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	Thermal resistance junction-ambient <sup>(1)</sup> max	78	$^\circ\text{C/W}$

1. Device mounted on PCB area of  $1\text{ cm}^2$ .

## 2 Electrical characteristics

( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise specified)

**Table 3. Electrical characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 30\text{V}$ $V_{\text{CB}} = 30\text{V}; T_{\text{j}} = 125^{\circ}\text{C}$			100 10	nA $\mu\text{A}$
$V_{(\text{BR})\text{CEO}}^{(2)}$	Collector-emitter breakdown voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 20\text{mA}$	80			V
$V_{(\text{BR})\text{CBO}}$	Collector-base breakdown voltage ( $I_{\text{E}} = 0$ )	$I_{\text{C}} = 100\mu\text{A}$	100			V
$V_{(\text{BR})\text{EBO}}$	Emitter-base breakdown voltage ( $I_{\text{C}} = 0$ )	$I_{\text{E}} = 10\mu\text{A}$	5			V
$V_{\text{CE(sat)}}^{(2)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 500\text{mA}$ $I_{\text{B}} = 50\text{mA}$			0.5	V
$V_{\text{BE(on)}}^{(2)}$	Base-emitter on voltage	$I_{\text{C}} = 500\text{mA}$ $V_{\text{CE}} = 2\text{V}$			1	V
$h_{\text{FE}}^{(2)}$	DC current gain	$I_{\text{C}} = 5\text{mA}$ $V_{\text{CE}} = 2\text{V}$ $I_{\text{C}} = 150\text{mA}$ $V_{\text{CE}} = 2\text{V}$ $I_{\text{C}} = 500\text{mA}$ $V_{\text{CE}} = 2\text{V}$	40 100 25		250	

Note (2) Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$

## 2.1 Electrical characteristics (curves)

Figure 1. DC current gain

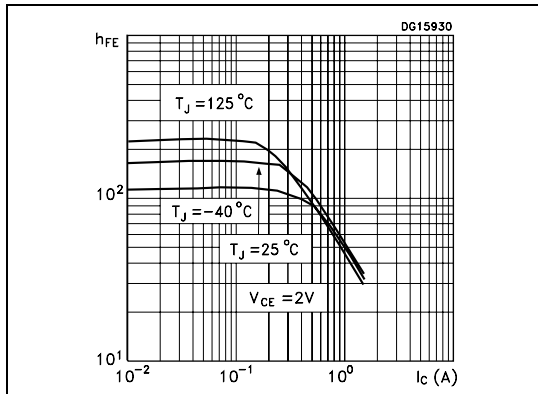


Figure 2. Collector-emitter saturation voltage

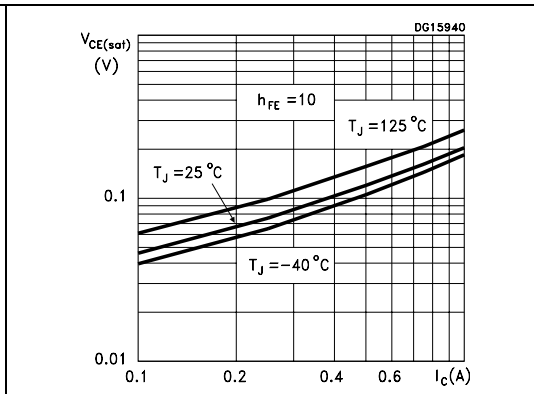
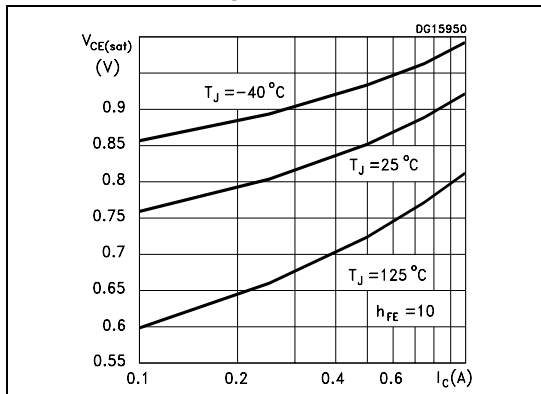


Figure 3. Base-emitter saturation voltage

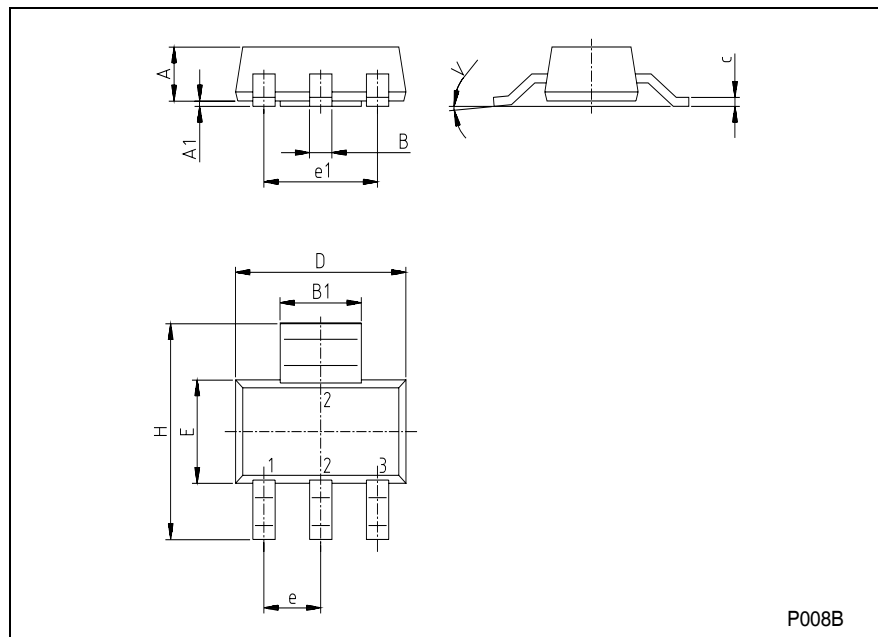


### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

## SOT-223 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.80			0.071
B	0.60	0.70	0.80	0.024	0.027	0.031
B1	2.90	3.00	3.10	0.114	0.118	0.122
c	0.24	0.26	0.32	0.009	0.010	0.013
D	6.30	6.50	6.70	0.248	0.256	0.264
e		2.30			0.090	
e1		4.60			0.181	
E	3.30	3.50	3.70	0.130	0.138	0.146
H	6.70	7.00	7.30	0.264	0.276	0.287
V			10°			10°
A1		0.02				



## 4 Revision history

**Table 4. Revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
02-Sep-2004	1	Initial release.
26-May-2006	2	New template
14-Jun-2006	3	Three curves has been added on page 5.

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