

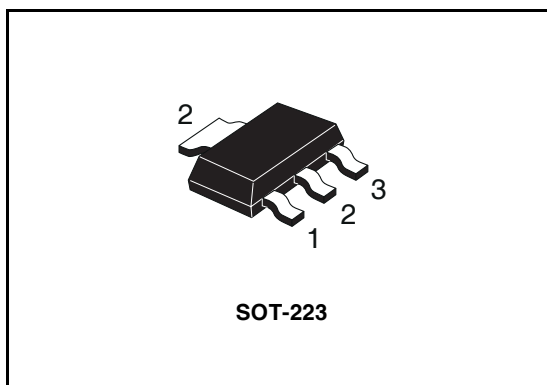
Low power NPN Transistor

General features

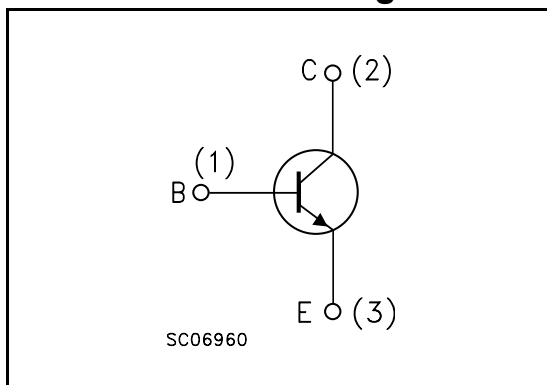
- Silicon epitaxial planar NPN medium voltage transistor
- SOT-223 plastic package for surface mounting circuits
- Available in tape & reel packing
- In compliance with the 2002/93/EC European Directive
- The PNP complementary type is BCP53-16

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 ⁽¹⁾ max	78	$^\circ\text{C/W}$

1. Device mounted on PCB area of 1 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_{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 μA
$V_{(\text{BR})\text{CEO}}^{(2)}$	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 μs , duty cycle $\leq 1.5\%$

2.1 Electrical characteristics (curves)

Figure 1. DC current gain

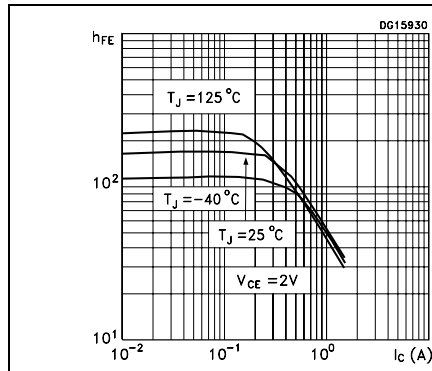


Figure 2. Collector-emitter saturation voltage

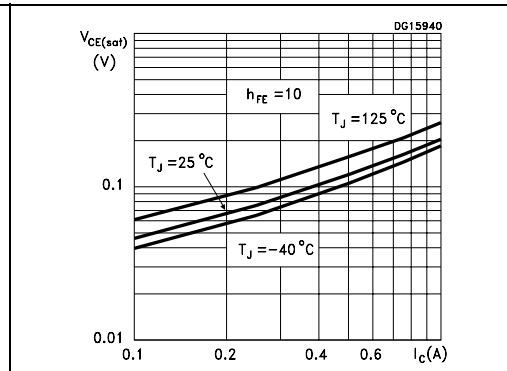
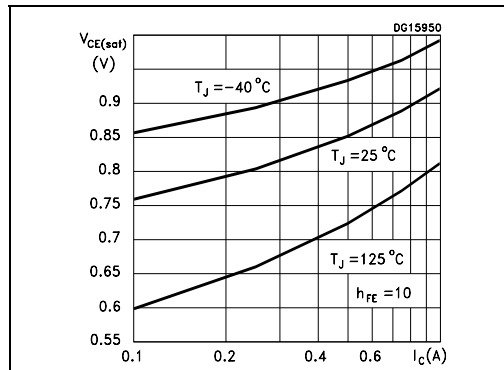


Figure 3. Base-emitter saturation voltage



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

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				

The diagram illustrates the mechanical specifications of the SOT-223 package through three views: top, side, and bottom. The top view shows dimensions A (maximum height), A1 (lead thickness), B (lead width), B1 (body width), c (lead thickness), D (body length), and e (pitch). The side view shows dimension H (total height) and c (lead height). The bottom view shows dimension E (body height), H (total height), and e (pitch). The lead angle V is specified as 10°. The reference number P008B is located in the bottom right corner of the diagram area.

4 Revision history

Table 4. Revision history

Date	Revision	Changes
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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