

BD243; BD243A  
BD243B; BD243C

T-33-11

### SILICON EPITAXIAL BASE POWER TRANSISTORS

N-P-N silicon transistors in a plastic envelope intended for use in general amplifier and switching applications. P-N-P complements are BD244; 244A; 244B; and BD244C.

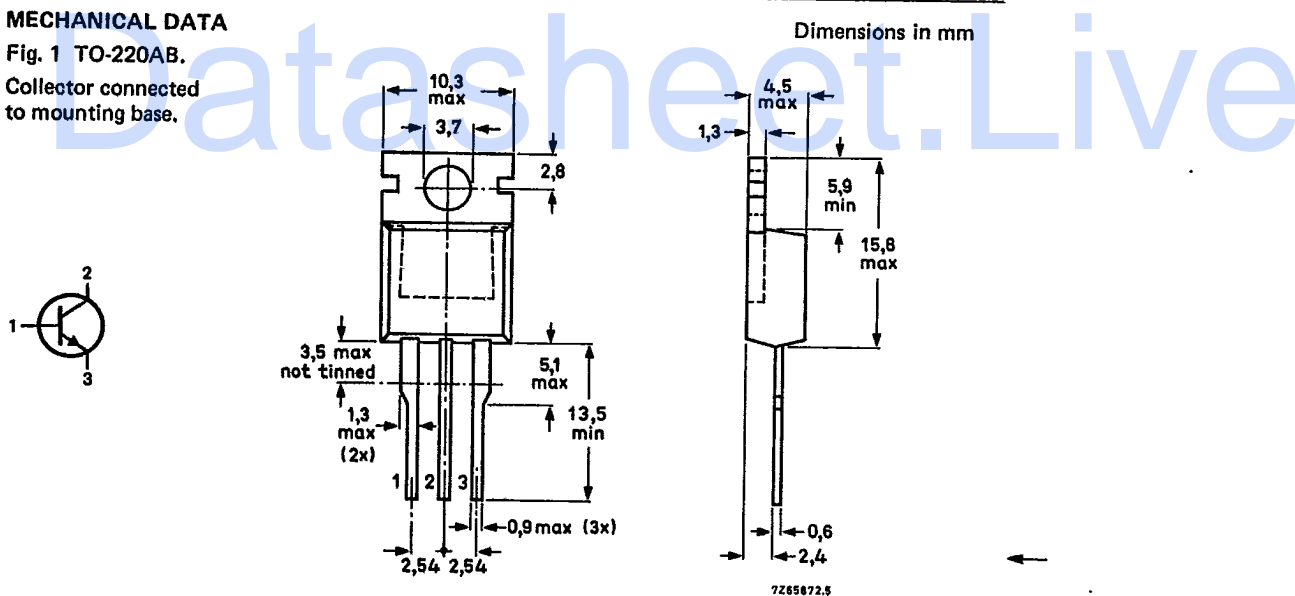
#### QUICK REFERENCE DATA

		BD243	A	B	C
Collector-base voltage	$V_{CBO}$	max. 45	60	80	100 V
Collector-emitter voltage	$V_{CEO}$	max. 45	60	80	100 V
Collector current (d.c.)	$I_C$	max.	8		A
Total power dissipation up to $T_{mb} = 25\text{ }^\circ\text{C}$	$P_{tot}$	max.	65		W
Junction temperature	$T_j$	max.	150		$^\circ\text{C}$
D.C. current gain	$h_{FE}$	>	15		
$I_C = 3\text{ A}; V_{CE} = 4\text{ V}$					
Transition frequency at $f = 1\text{ MHz}$	$f_T$	>	3		MHz
$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}$					

#### MECHANICAL DATA

Fig. 1 TO-220AB.

Collector connected to mounting base.



See also chapters Mounting instructions and Accessories.

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**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

		BD243	A	B	C
Collector-base voltage (open emitter)	$V_{CBO}$	max. 45	60	80	100 V
Collector-emitter voltage (open base)	$V_{CEO}$	max. 45	60	80	100 V
Collector-emitter voltage ( $R_{BE} = 100 \Omega$ )	$V_{CER}$	max. 55	70	90	115 V
Emitter-base voltage (open collector)	$V_{EBO}$	max.	5		V
Collector current (d.c.)	$I_C$	max.	8		A
Collector current (peak value)	$I_{CM}$	max.	12		A
Base-current (d.c.)	$I_B$	max.	3		A
Total power dissipation up to $T_{mb} = 25^\circ C$	$P_{tot}$	max.	65		W
Storage temperature	$T_{stg}$		-65 to +150		$^\circ C$
Junction temperature	$T_j$	max.	150		$^\circ C$

**THERMAL RESISTANCE**

From junction to mounting base	$R_{thj-mb}$	=	1,92	K/W
From junction to ambient in free air	$R_{thj-a}$	=	70	K/W

**CHARACTERISTICS**

$T_j = 25^\circ C$  unless otherwise specified

		BD243; A	BD243B; C
→ Collector cut-off current			
$I_B = 0; V_{CE} = 30 V$	$I_{CEO}$	< 0,2	— mA
$I_B = 0; V_{CE} = 60 V$	$I_{CEO}$	< —	0,2 mA
$V_{BE} = 0; V_{CE} = V_{CEOmax}$	$I_{CES}$	< 0,4	mA
→ Emitter cut-off current			
$I_C = 0; V_{EB} = 5 V$	$I_{EBO}$	< 0,5	mA
D.C. current gain*			
$I_C = 300 mA; V_{CE} = 4 V$	$h_{FE}$	> 30	
$I_C = 3 A; V_{CE} = 4 V$	$h_{FE}$	> 15	
Base-emitter voltage**			
$I_C = 6 A; V_{CE} = 4 V$	$V_{BE}$	< 2	V
Collector-emitter saturation voltage*			
$I_C = 6 A; I_B = 1 A$	$V_{CEsat}$	< 1,5	V
Turn off breakdown energy			
$L = 20 mH; I_{CC} = 2,5 A$	$E_{(BR)}$	> 62,5	mJ

\* Measured under pulse conditions:  $t_p \leq 300 \mu s; \delta < 0,02$ .

\*\*  $V_{BE}$  decreases by about 2,3 mV/K with increasing temperature.

Transition frequency at  $f = 1 \text{ MHz}$   
 $I_C = 0,5 \text{ A}; V_{CE} = 10 \text{ V}$

$f_T > 3 \text{ MHz}$

Switching times  
(between 10% and 90% levels)

$I_{Con} = 1 \text{ A}; I_{Bon} = -I_{Boff} = 0,1 \text{ A}$

Turn-on time

Turn-off time

$t_{on} \text{ typ. } 0,6 \mu\text{s}$   
 $t_{off} \text{ typ. } 2 \mu\text{s}$

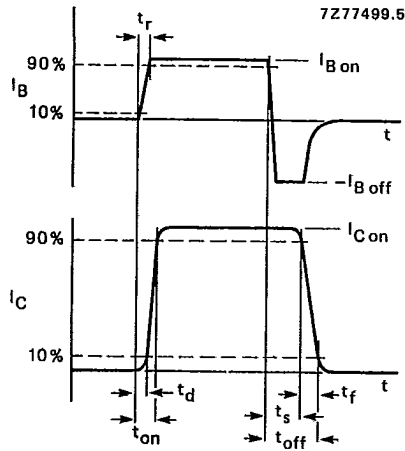


Fig. 2 Switching times waveforms.

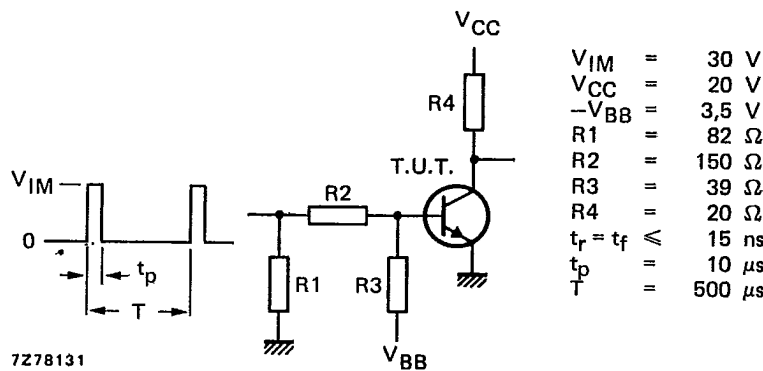


Fig. 3 Switching times test circuit.

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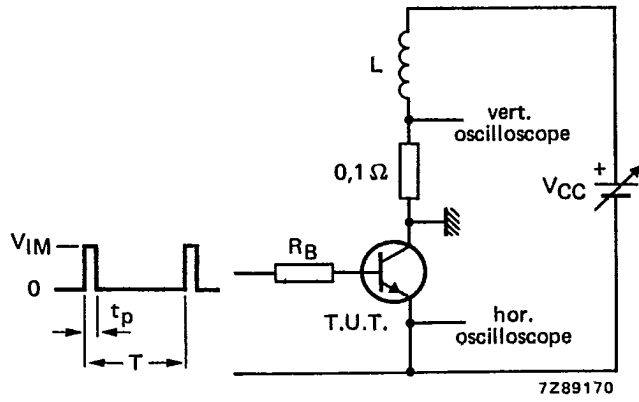


Fig. 4 Test circuit for turn-off breakdown energy.  
 $V_{IM} = 12 \text{ V}$ ;  $R_B = 270 \Omega$ ;  $I_{CC} = 2,5 \text{ A}$ ;  $t_p = 1 \text{ ms}$ ;  $\delta = 0,01$ .

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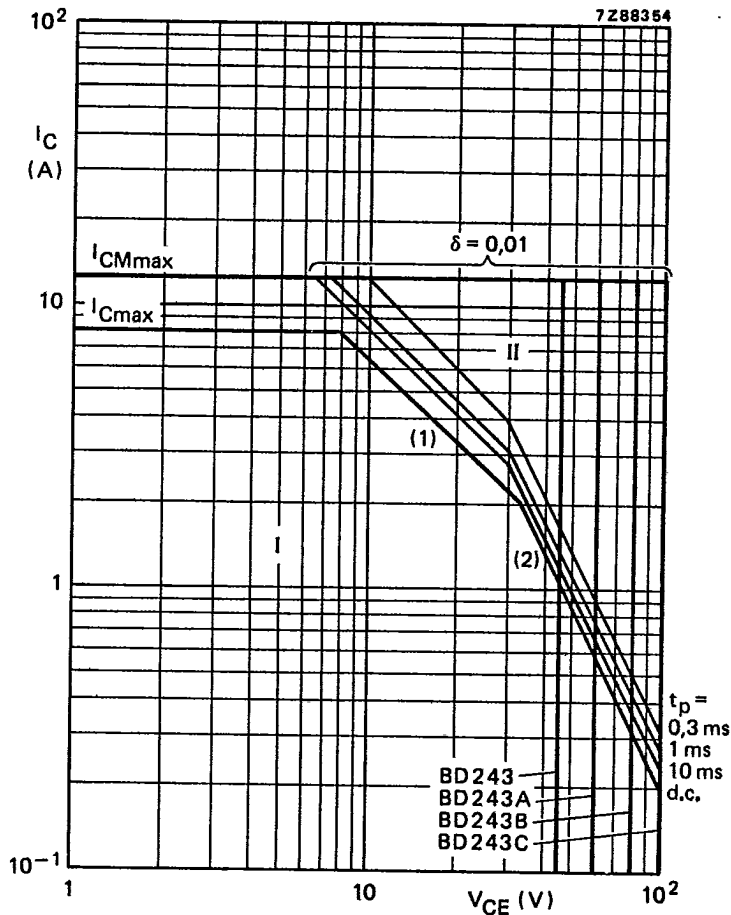


Fig. 5 Safe Operating Area;  $T_{mb} = 25\text{ }^{\circ}\text{C}$ .

- I Region of permissible d.c. operation.
- II Permissible extension for repetitive pulse operation.
- (1)  $P_{tot\ max}$  and  $P_{peak\ max}$  lines.
- (2) Second breakdown limits.

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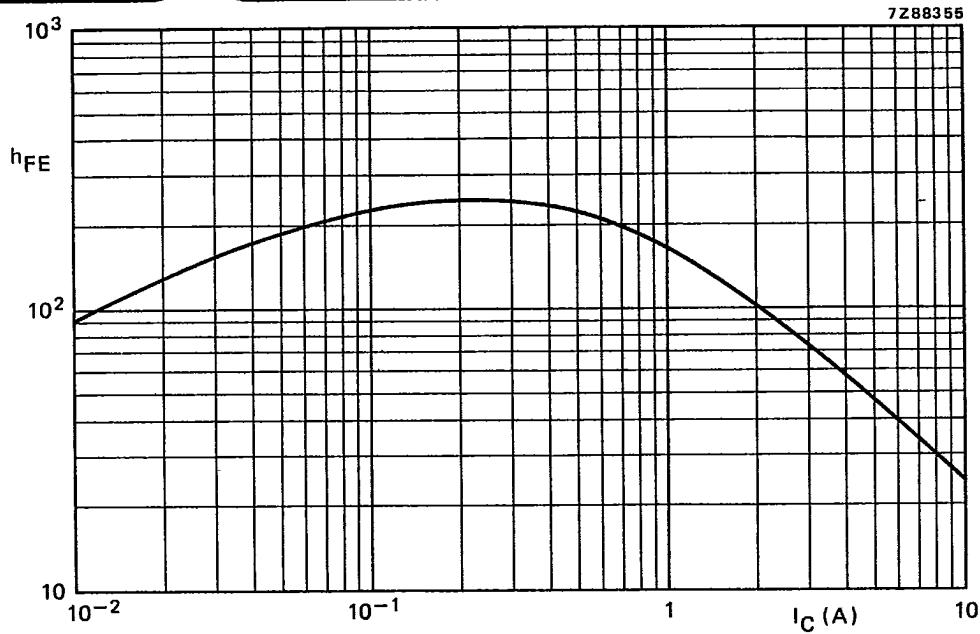


Fig. 6 Typical static forward current transfer ratio as a function of the collector current.  $V_{CE} = 4$  V,  $T_j = 25$  °C.

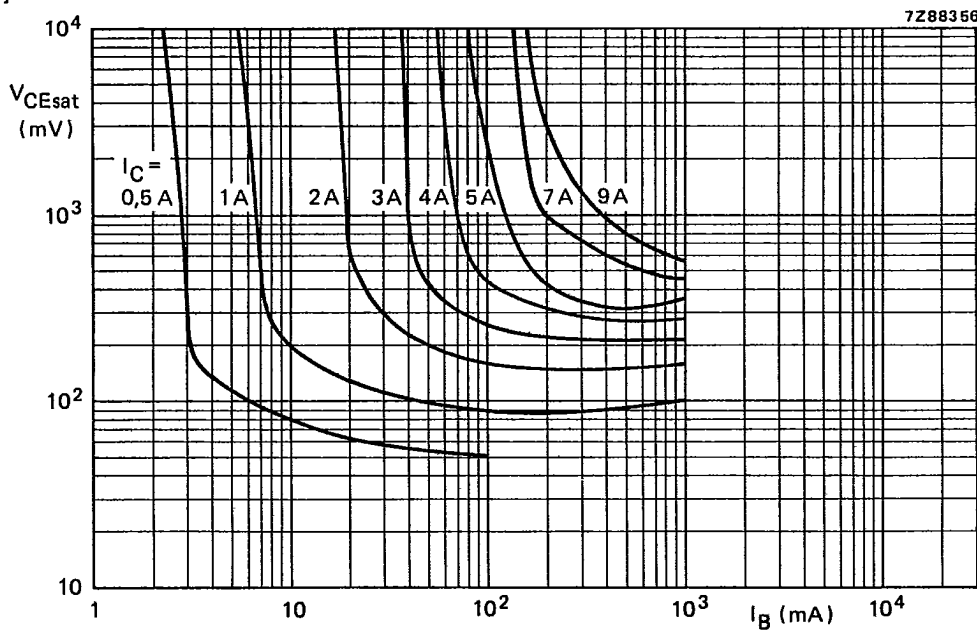


Fig. 7 Typical values collector-emitter saturation voltage at  $T_j = 25$  °C.