

290-531 to 555



BDT62; 62A
BDT62B; 62C

SILICON DARLINGTON POWER TRANSISTORS

P-N-P epitaxial base transistors in monolithic Darlington circuit for audio output stages and general amplifier and switching applications. TO-220 plastic envelope. N-P-N complements are BDT63, BDT63A, BDT63B and BDT63C.

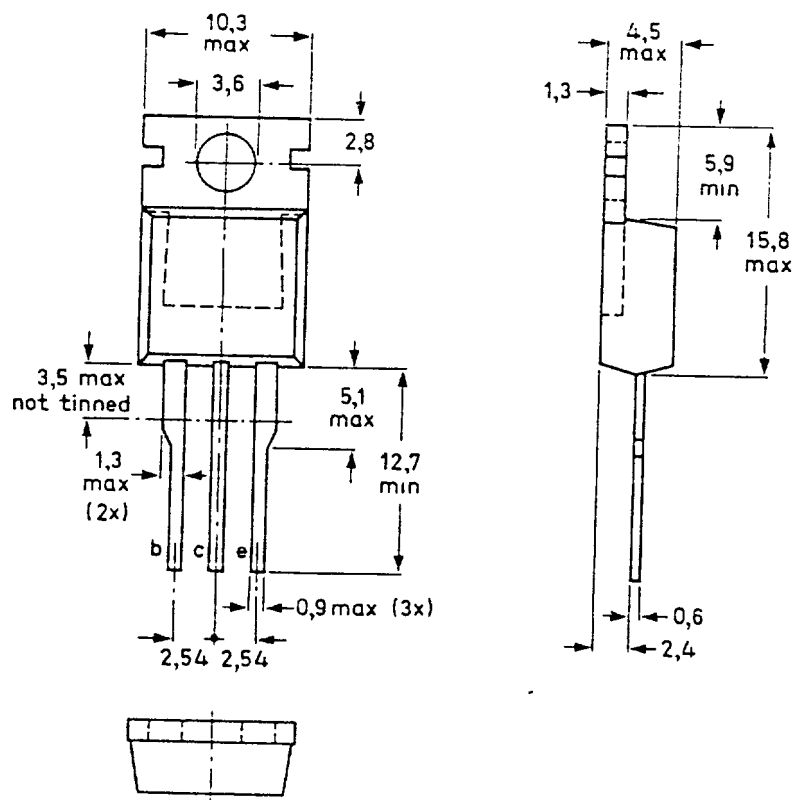
QUICK REFERENCE DATA

		BDT62	A	B	C
Collector-base voltage (open emitter)	$-V_{CBO}$ max.	60	80	100	120 V
Collector-emitter voltage (open base)	$-V_{CEO}$ max.	60	80	100	120 V
Collector current (d.c.)	$-I_C$ max.			10	A
Collector current (peak value) $t_p = 0,3 \text{ ms}; \delta = 10\%$	$-I_{CM}$ max.			15	A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot} max.			90	W
Junction temperature	T_J max.			150	$^\circ\text{C}$
D.C. current gain $-I_C = 3 \text{ A}; -V_{CE} = 3 \text{ V}$	$h_{FE} >$			1000	

MECHANICAL DATA

Fig. 1 TO-220AB.

Collector connected to mounting base.



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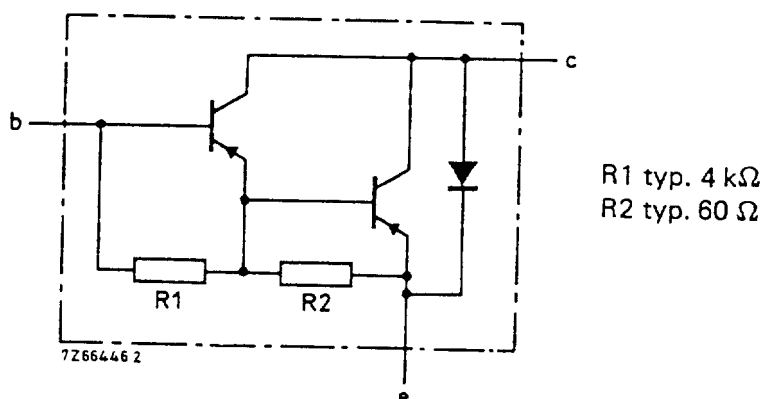


Fig. 2 Circuit diagram.

RATINGS

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

		BDT62	A	B	C
Collector-base voltage (open emitter)	$-V_{CBO}$ max	60	80	100	120 V
Collector-emitter voltage (open base)	$-V_{CEO}$ max.	60	80	100	120 V
Emitter-base voltage (open collector)	$-V_{EBO}$ max.		5		V
Collector current (d.c.)	$-I_C$ max.		10		A
Collector current (peak value) $t_p = 0,3$ ms, $\delta = 10\%$	$-I_{CM}$ max		15		A
Base current (d.c.)	$-I_B$ max.		250		mA
Total power dissipation up to $T_{mb} = 25$ °C	P_{tot} max.		90		W
Storage temperature	T_{stg}		-65 to + 150		°C
Junction temperature*	T_j max.		150		°C

THERMAL RESISTANCE*

From junction to mounting base	$R_{th j-mb}$ =	1,39	K/W
From junction to ambient (in free air)	$R_{th j-a}$ =	70	K/W

* Base on maximum average junction temperature in line with common industrial practice. The resulting higher junction temperature of the output transistor part is taken into account.

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CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

Collector cut-off current

$I_E = 0; -V_{CB} = -V_{CBOmax}$

$I_E = 0; -V_{CB} = -\frac{1}{2}V_{CBOmax}; T_j = 150\text{ }^{\circ}\text{C}$

$I_B = 0; -V_{CE} = -\frac{1}{2}V_{CEOmax}$

$-I_{CBO} < 0,2\text{ mA}$

$-I_{CBO} < 2\text{ mA}$

$-I_{CEO} < 0,5\text{ mA}$

Emitter cut-off current

$I_C = 0; -V_{EB} = 5\text{ V}$

$-I_{EBO} < 5\text{ mA}$

Forward bias second-breakdown collector current

$-V_{CE} = 40\text{ V}; t = 0,1\text{ s}; \text{non-repetitive}$

(without heatsink)

BDT62

BDT62A, B and C

$I_{(SB)} > 0,45\text{ A}$

$I_{(SB)} > 1,4\text{ A}$

D.C. current gain*

$-I_C = 3\text{ A}; -V_{CE} = 3\text{ V}$

$-I_C = 10\text{ A}; -V_{CE} = 3\text{ V}$

$h_{FE} > 1000$

$h_{FE} \text{ typ. } 200$

Base-emitter voltage*

$-I_C = 3\text{ A}; -V_{CE} = 3\text{ V}$

$-V_{BE} < 2,5\text{ V}$

Collector-emitter saturation voltage*

$-I_C = 3\text{ A}; -I_B = 12\text{ mA}$

$-I_C = 8\text{ A}; -I_B = 80\text{ mA}$

$-V_{CEsat} < 2\text{ V}$

$-V_{CEsat} < 2,5\text{ V}$

Cut-off frequency

$-I_C = 3\text{ A}; -V_{CE} = 3\text{ V}$

$f_{hfe} \text{ typ. } 100\text{ kHz}$

Collector capacitance

$-V_{CB} = 10\text{ V}; f = 1\text{ MHz}$

$C_{ob} \text{ typ. } 100\text{ pF}$

D.C. current gain ratio of matched complementary pairs

$-I_C = 3\text{ A}; -V_{CE} = 3\text{ V}$

$h_{FE1}/h_{FE2} < 2,5$

Small-signal current gain at $f = 1\text{ MHz}$

$-I_C = 3\text{ A}; -V_{CE} = 3\text{ V}$

$h_{fe} > 25$

* Measured under pulse conditions; $t_p < 300\text{ }\mu\text{s}$; $\delta < 2\%$

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CHARACTERISTICS (continued)

Diode, forward voltage

$$I_F = 3 \text{ A}$$

$$V_F < 2 \text{ V}$$

Switching times

(between 10% and 90% levels)

$$-I_{Con} = 3 \text{ A}; -I_{Bon} = I_{Boff} = 12 \text{ mA}$$

turn-on time

$$t_{on} \quad \text{typ. } 0,5 \text{ } \mu\text{s}$$

turn-off time

$$t_{off} \quad \text{typ. } 2,5 \text{ } \mu\text{s}$$

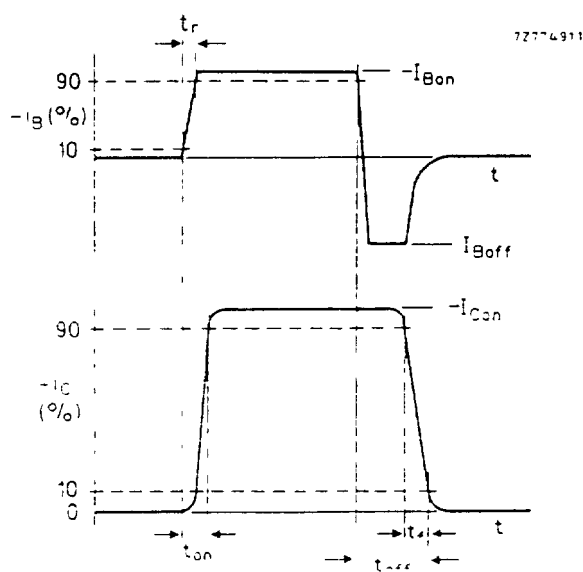


Fig. 3 Switching times waveforms.

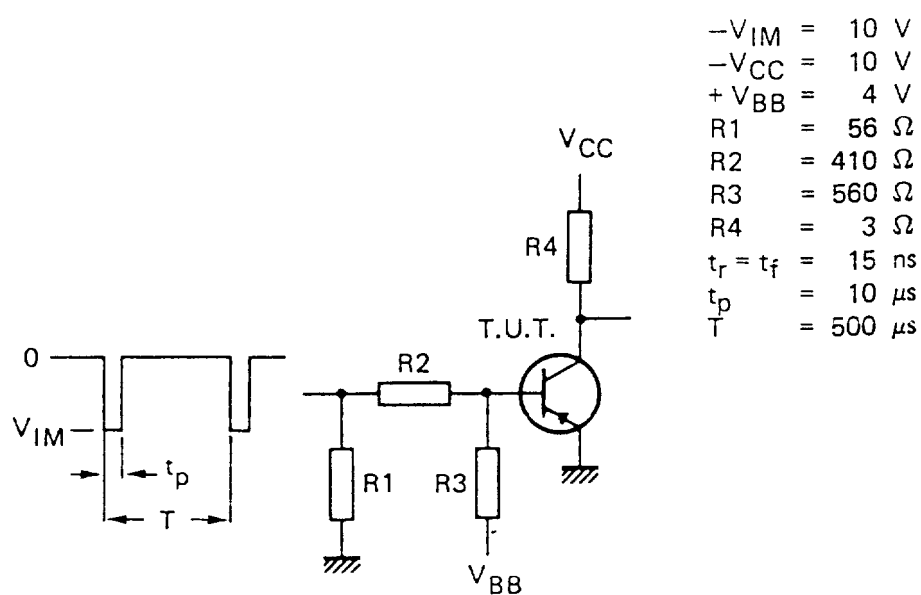


Fig. 4 Switching times test circuit.

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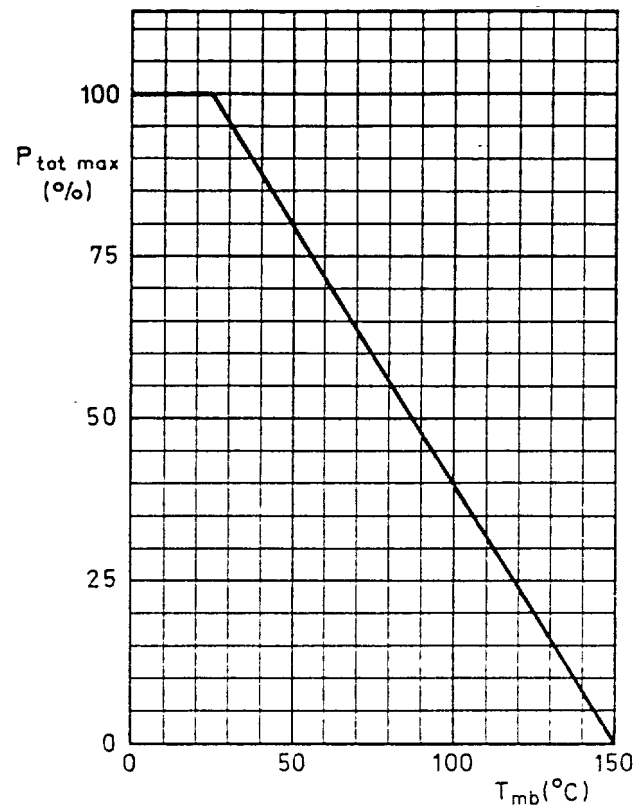


Fig. 5 Power derating curve.

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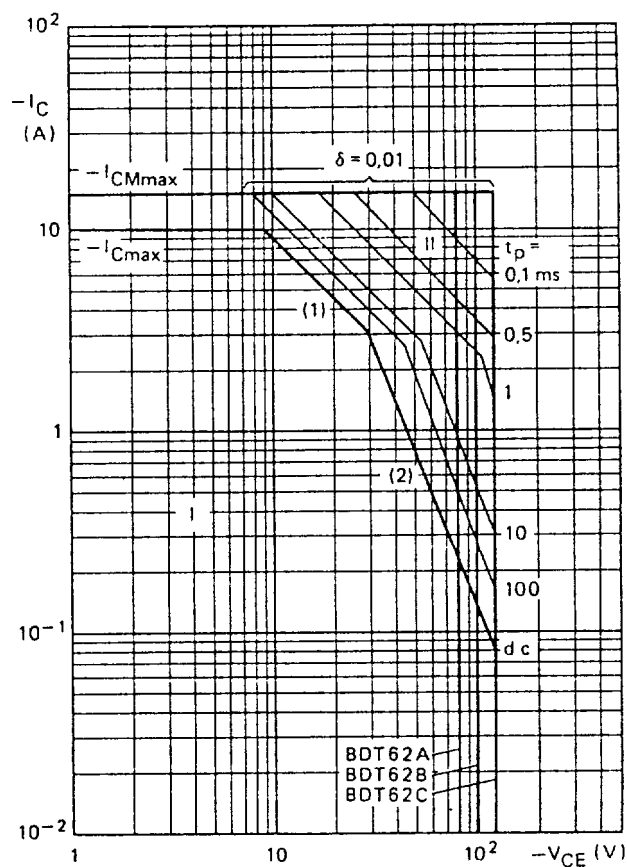


Fig. 7 Safe Operating ARea BDT62A, 62B and 62C, $T_{mb} = 25^\circ\text{C}$.

- 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 (independent of temperature).

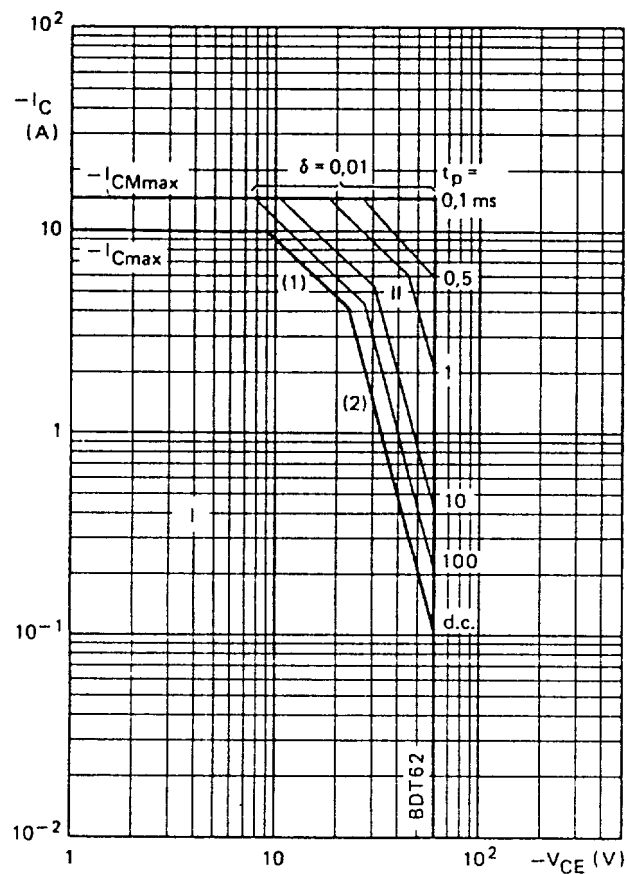


Fig 6 Safe Operating ARea BDT62; $T_{mb} = 25^\circ\text{C}$.

- 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 (independent of temperature)

BD162; 62A
BD162B; 62C

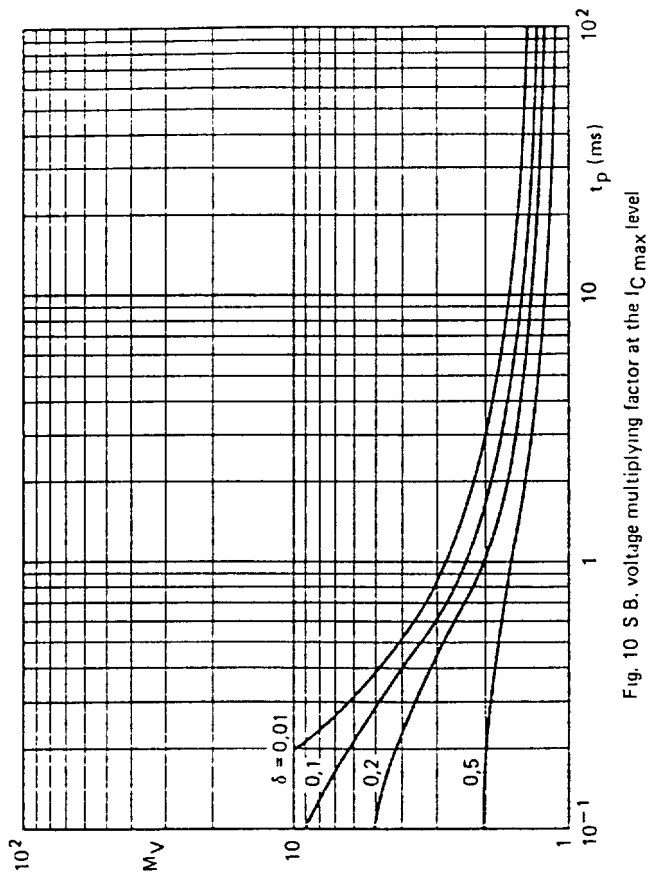


Fig. 10 S.B. voltage multiplying factor at the I_C max level

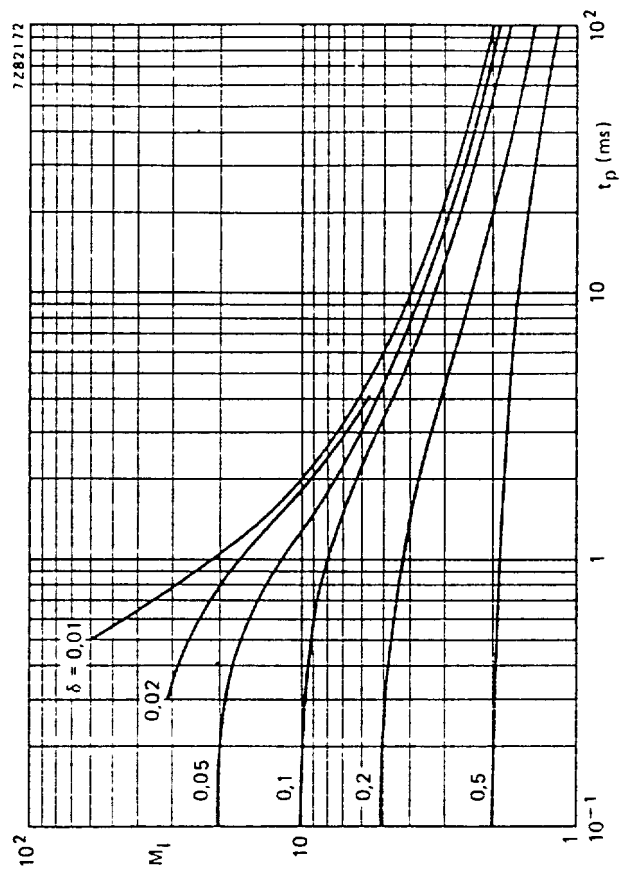


Fig. 11 S.B. current multiplying factor at the V_{CEO} max level.

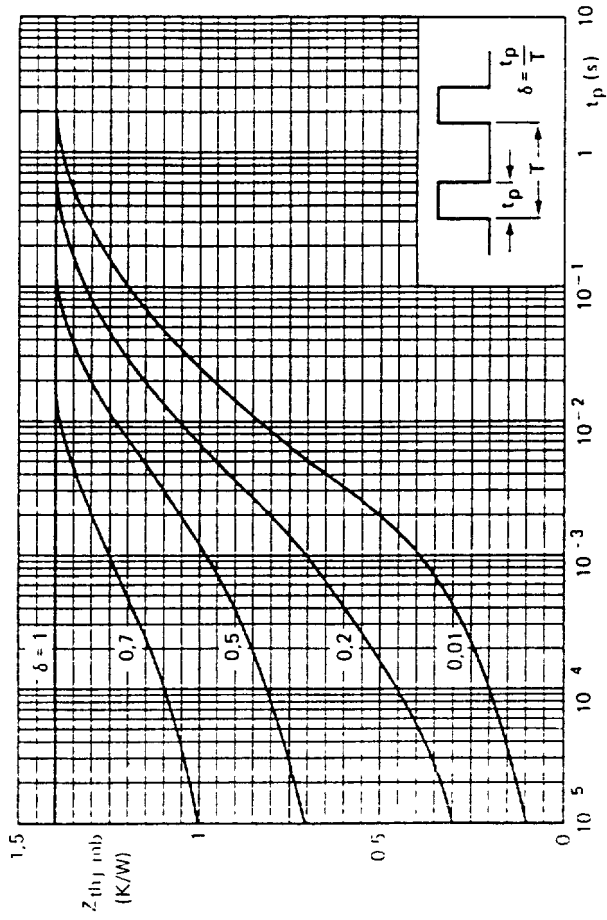


Fig. 8 Pulse power rating chart.

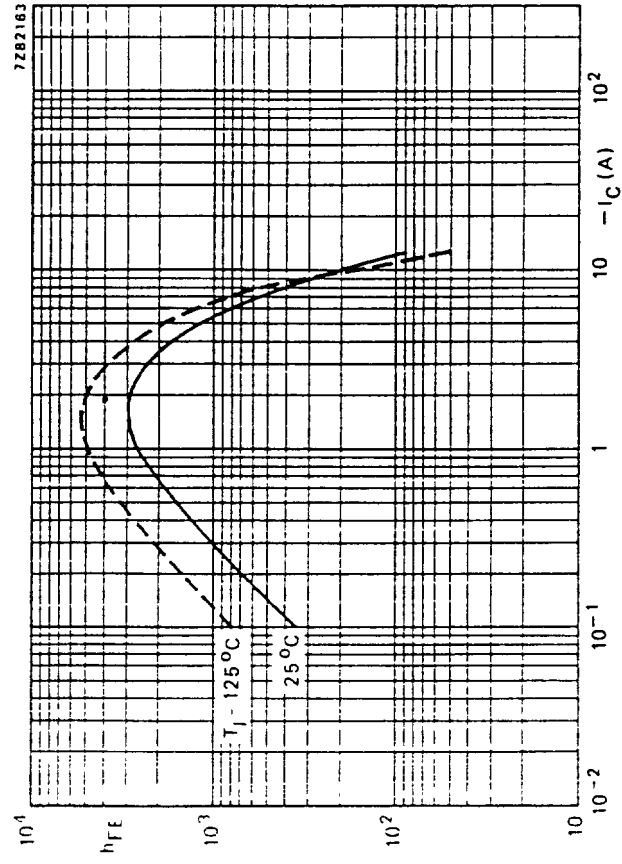


Fig. 9 Typical d.c. current gain at $-V_{CE} = 3$ V.

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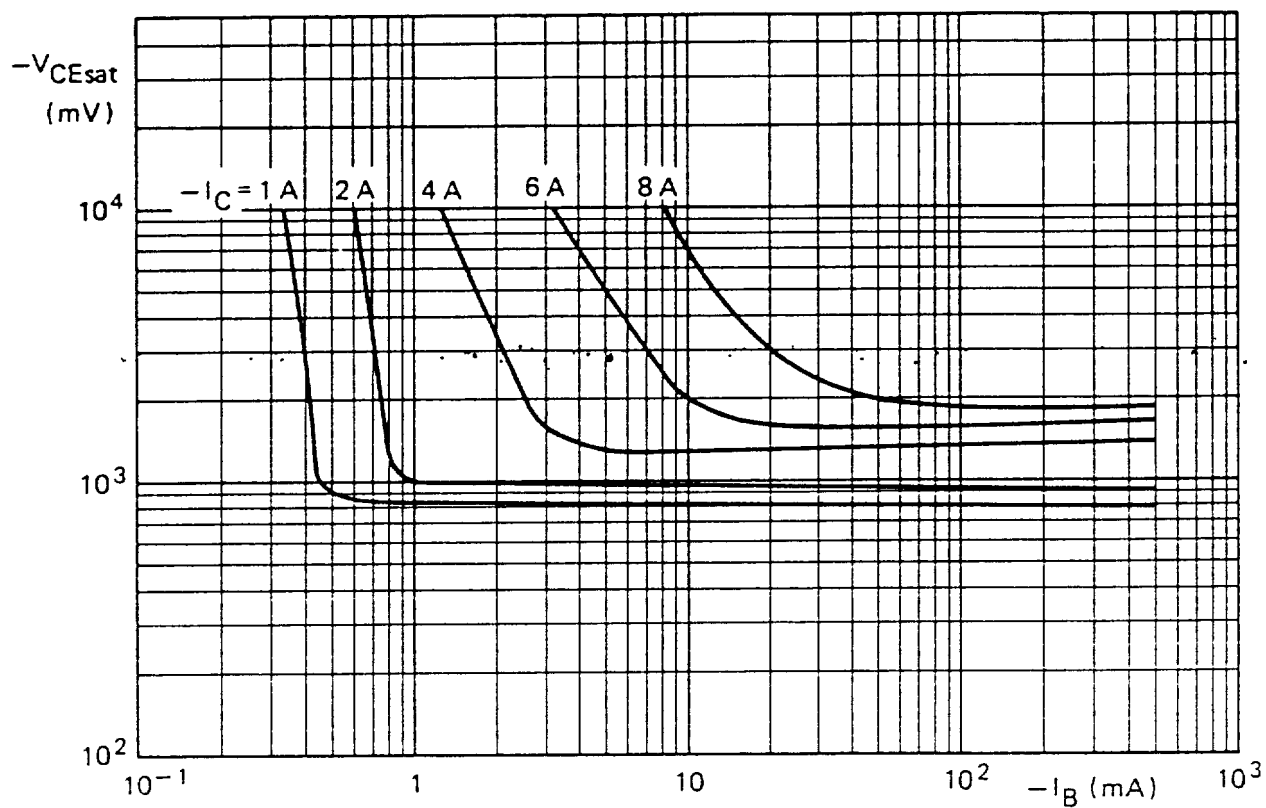


Fig. 12 Typical collector-emitter saturation voltage.

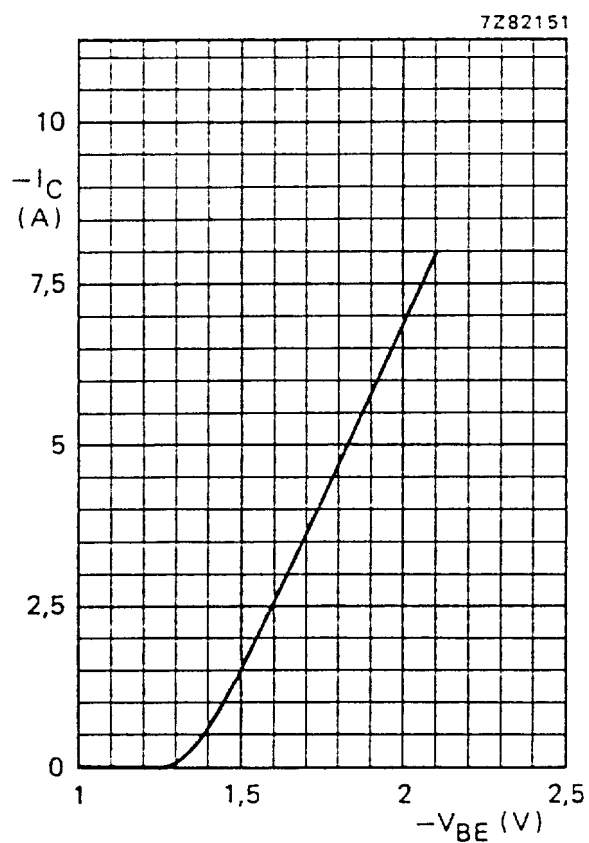


Fig. 13 Typical base emitter voltage as a function of the collector current.