

SILICON EPITAXIAL BASE POWER TRANSISTORS

P-N-P silicon transistors in a plastic envelope intended for use in audio output stages and general purpose amplifiers. N-P-N complements are BD943; 945 and 947.

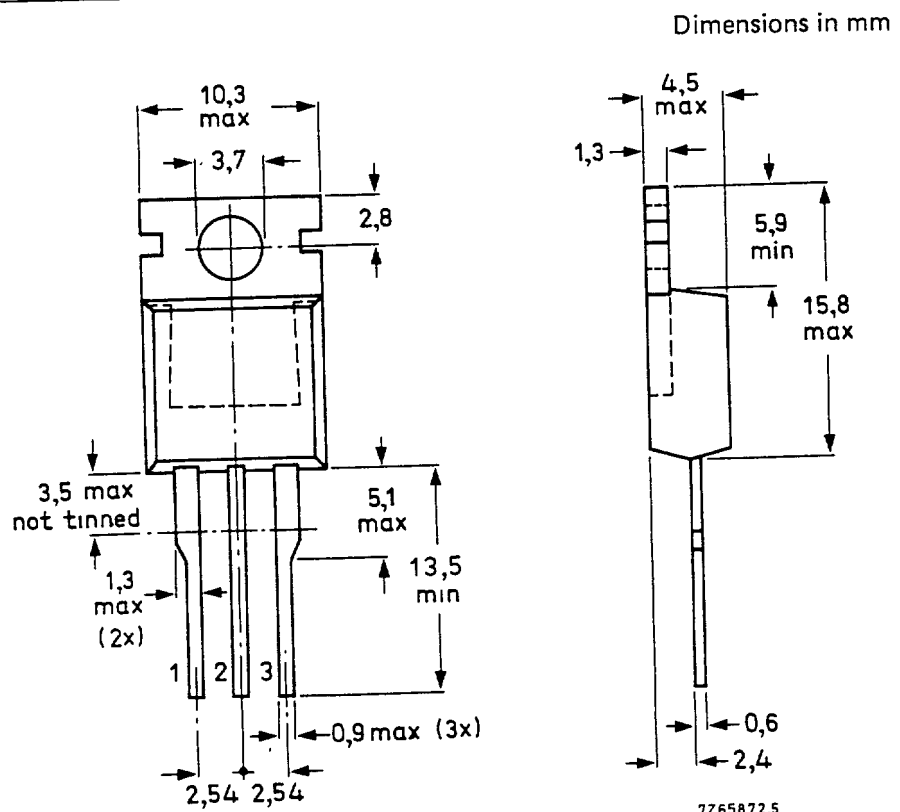
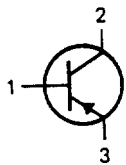
QUICK REFERENCE DATA

			BD944	946	948
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	22	32	45 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	22	32	45 V
Collector current (d.c.)	$-I_C$	max.		5	A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot}	max.		40	W
Junction temperature	T_j	max.		150	$^\circ\text{C}$
D.C. current gain				25	
$-I_C = 10\text{ mA}; -V_{CE} = 5\text{ V}$	h_{FE}	>		85 to 475	
$-I_C = 500\text{ mA}; -V_{CE} = 1\text{ V}$	h_{FE}	>		50	50
$-I_C = 2\text{ A}; -V_{CE} = 1\text{ V}$	h_{FE}	>		50	40
Transition frequency at $f = 1\text{ MHz}$	f_T	>		3	MHz
$-I_C = 250\text{ mA}; -V_{CE} = 1\text{ V}$					

MECHANICAL DATA

Fig. 1 TO-220AB.

Collector connected to mounting base.



See also chapters Mounting instructions and Accessories.

BD944
BD946
BD948

RATINGS

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

			BD944	946	948
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	22	32	45 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	22	32	45 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.		5	V
Collector current (d.c.)	$-I_C$	max.		5	A
Collector current (peak value)	$-I_{CM}$	max.		8	A
Base current (d.c.)	$-I_B$	max.		1	A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot}	max.		40	W
Storage temperature	T_{stg}		-65 to + 150		$^\circ\text{C}$
Junction temperature	T_j	max.		150	$^\circ\text{C}$

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j-mb}$	=		3,12	K/W
From junction to ambient (in free air)	$R_{th\ j-a}$	=		70	K/W

CHARACTERISTICS

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

→ Collector cut-off current										
$I_E = 0; -V_{CB} = -V_{CBOmax}$	$-I_{CBO}$	<		50	μA					
$I_E = 0; -V_{CB} = -V_{CBOmax}; T_j = 150^\circ\text{C}$	$-I_{CBO}$	<		1	mA					
$I_B = 0; -V_{CE} = 15\text{ V}; \text{BD944}$ $-V_{CE} = 20\text{ V}; \text{BD946}$ $-V_{CE} = 25\text{ V}; \text{BD948}$	$-I_{CEO}$	<		0,1	mA					
						→ Emitter cut-off current				
						$-I_C = 0; -V_{EB} = 5\text{ V}$	$-I_{EBO}$	<		0,2
D.C. current gain (note 1)										
$-I_C = 10\text{ mA}; -V_{CE} = 5\text{ V}$	h_{FE}	>		25						
$-I_C = 500\text{ mA}; -V_{CE} = 1\text{ V}$	h_{FE}			85 to 475						
$-I_C = 2\text{ A}; -V_{CE} = 1\text{ V}$	h_{FE}	>	50	50	40					
$-I_C = 3\text{ A}; -V_{CE} = 1\text{ V}$	h_{FE}	>	-	-	30					
Base-emitter voltage (notes 1 and 2)										
$-I_C = 2\text{ A}; -V_{CE} = 1\text{ V}$	$-V_{BE}$	<	1,1	1,1	- V					
$-I_C = 3\text{ A}; -V_{CE} = 1\text{ V}$	$-V_{BE}$	<	-	-	1,3 V					
Collector-emitter saturation voltage (note 1)										
$-I_C = 2\text{ A}; -I_B = 0,2\text{ A}$	$-V_{CEsat}$	<	0,5	0,5	- V					
$-I_C = 3\text{ A}; -I_B = 0,3\text{ V}$	$-V_{CEsat}$	<	-	-	0,7 V					

Notes

1. Measured under pulse conditions; $t_p \leq 300\ \mu\text{s}$, $\delta < 2\%$.
2. V_{BE} decreases by about 2,3 mV/K with increasing temperature.

Silicon epitaxial base power transistors

BD944
BD946
BD948

Knee voltage *

$-I_C = 2 \text{ A}; -I_B = \text{value for which}$

$-I_C = 2,2 \text{ A and } -V_{CE} = 1 \text{ V}$

Transition frequency at $f = 1 \text{ MHz}$

$-I_C = 250 \text{ mA}; -V_{CE} = 1 \text{ V}$

$-V_{CEK} < 0,8 \text{ V}$

$f_T > 3 \text{ MHz}$

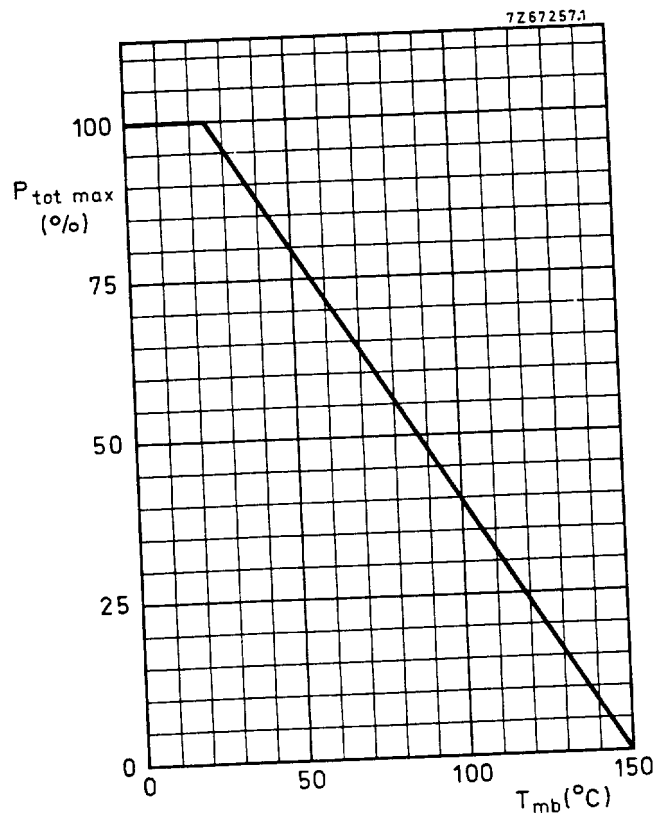


Fig. 2 Power derating curve.

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

BD944
 BD946
 BD948

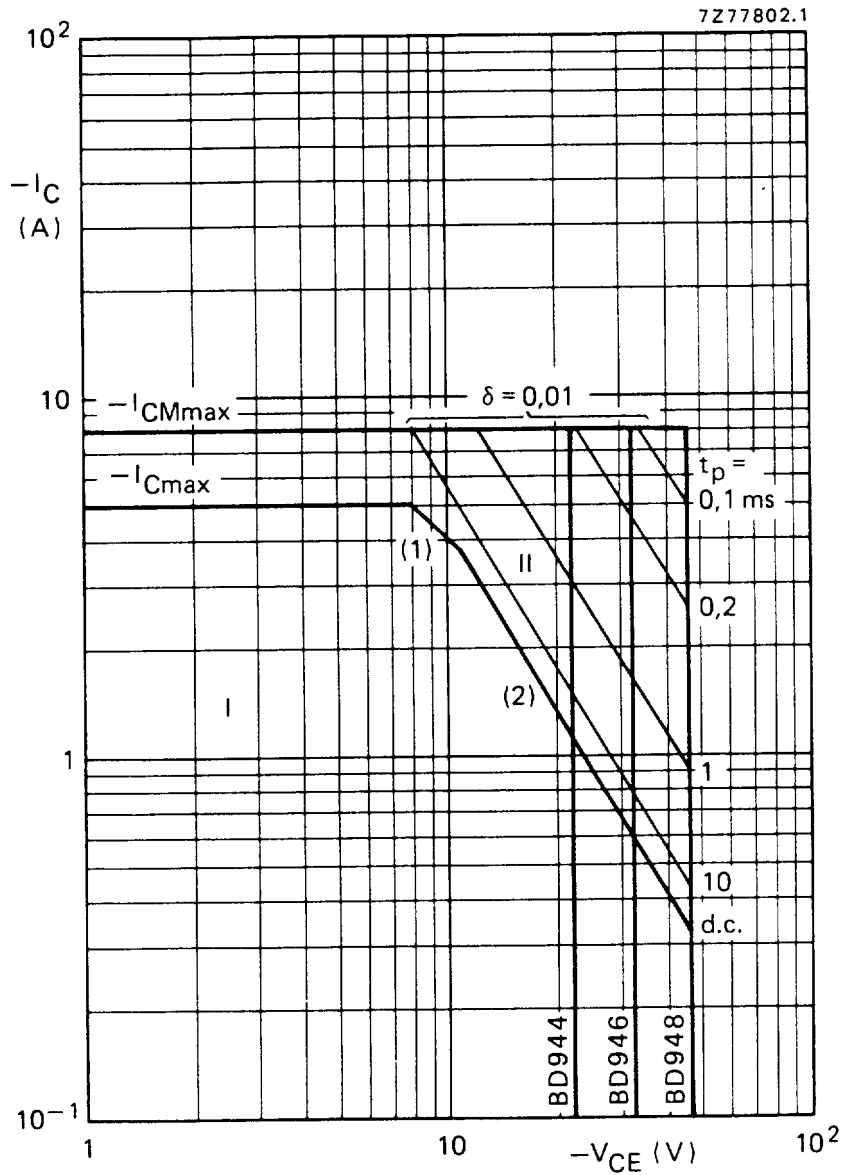


Fig. 3 Safe Operating Area, $T_{mb} = 25^\circ\text{C}$.

I Region of permissible d.c. operation.

II Permissible extension for repetitive pulse operation.

(1) $P_{tot \text{ max}}$ and $P_{peak \text{ max}}$ lines.

(2) Second-breakdown limits.

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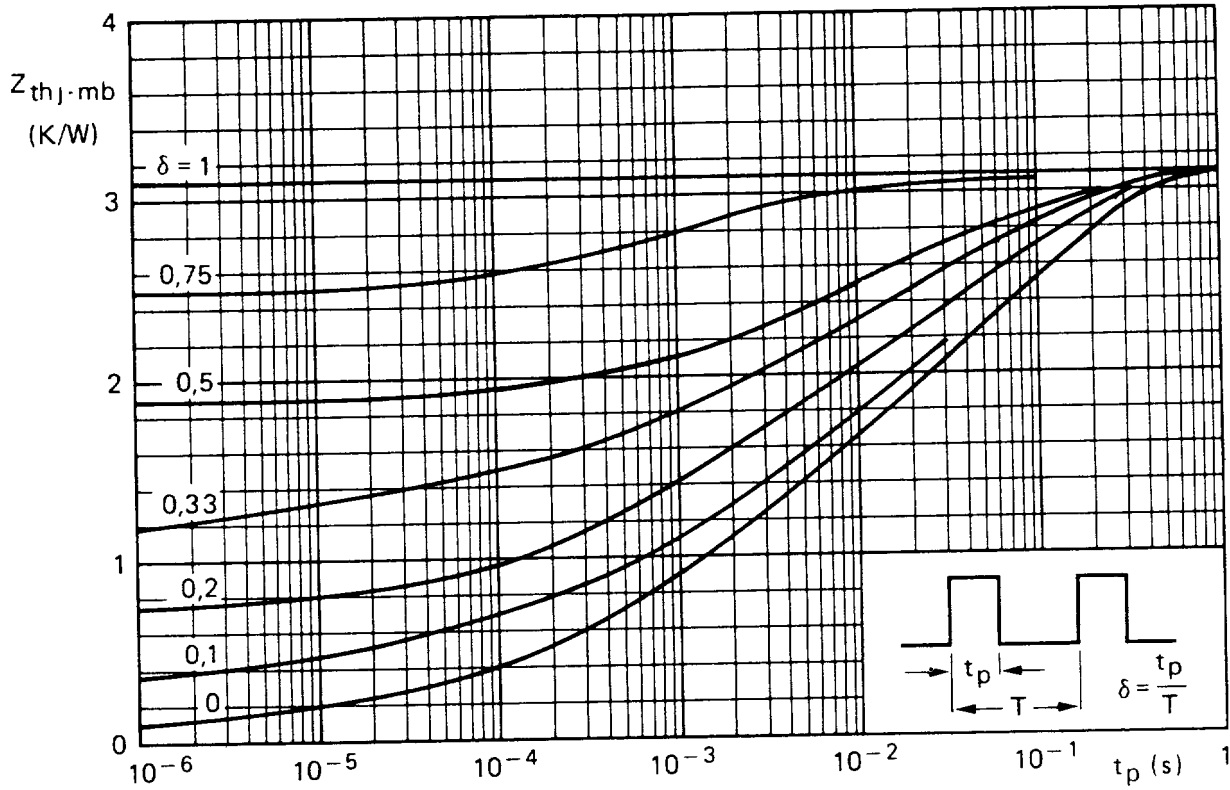


Fig. 4 Pulse power rating chart.

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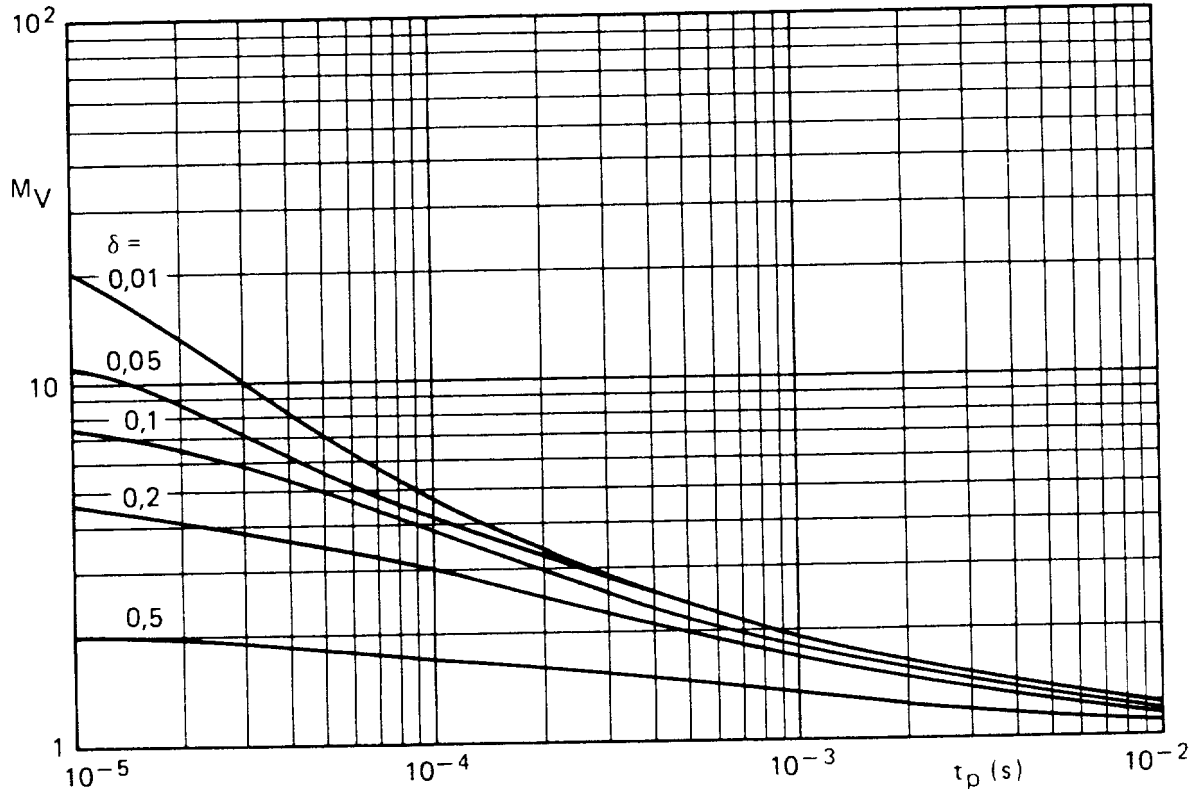


Fig. 5 S.B. voltage multiplying factor at the $-I_{Cmax}$ level.

BD944
BD946
BD948

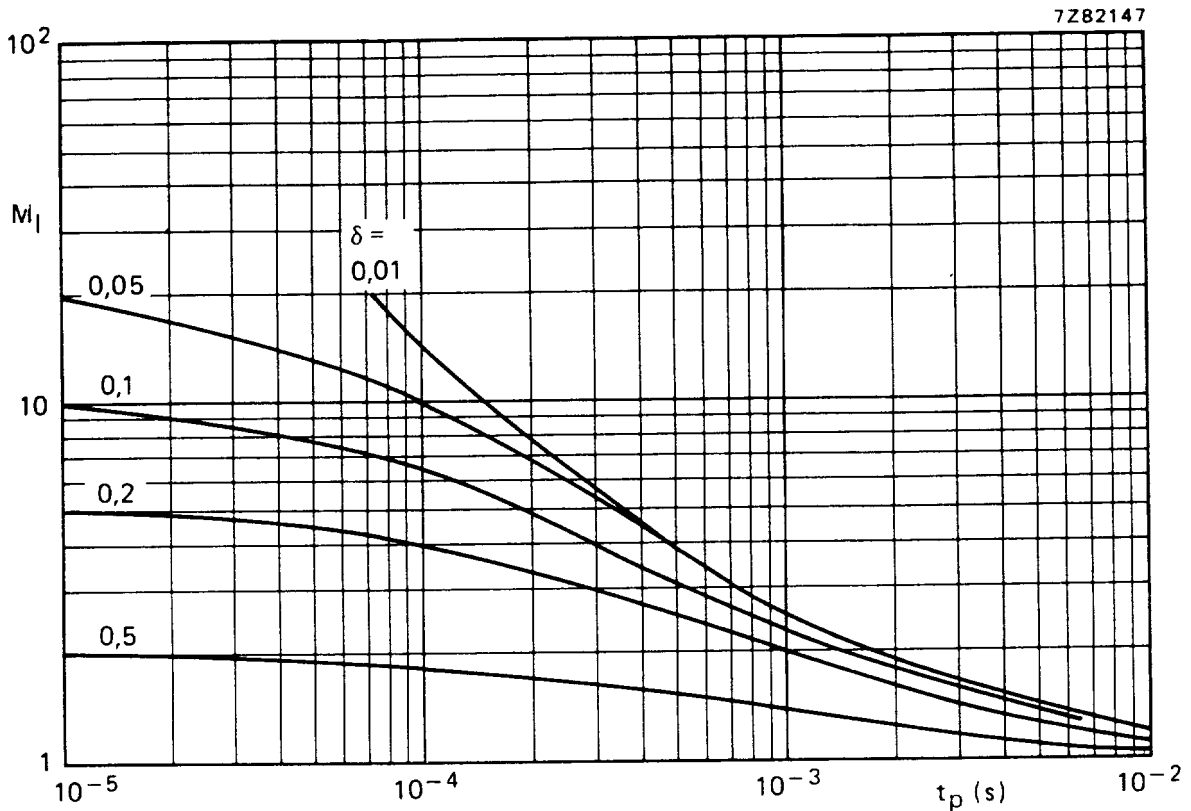


Fig. 6 S.B. current multiplying factor at the $-V_{CE0max}$ level for BD944/946.

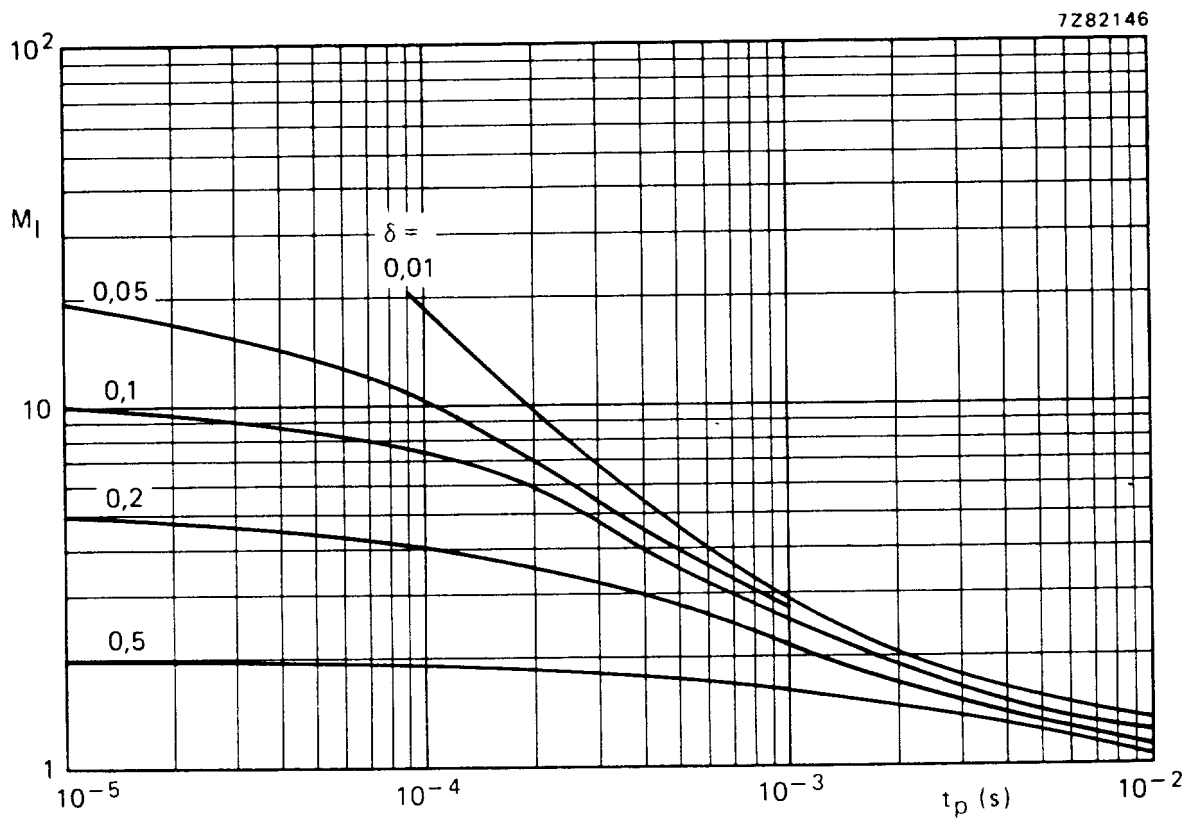


Fig. 7 S.B. current multiplying factor at the $-V_{CE0max}$ level for BD948.

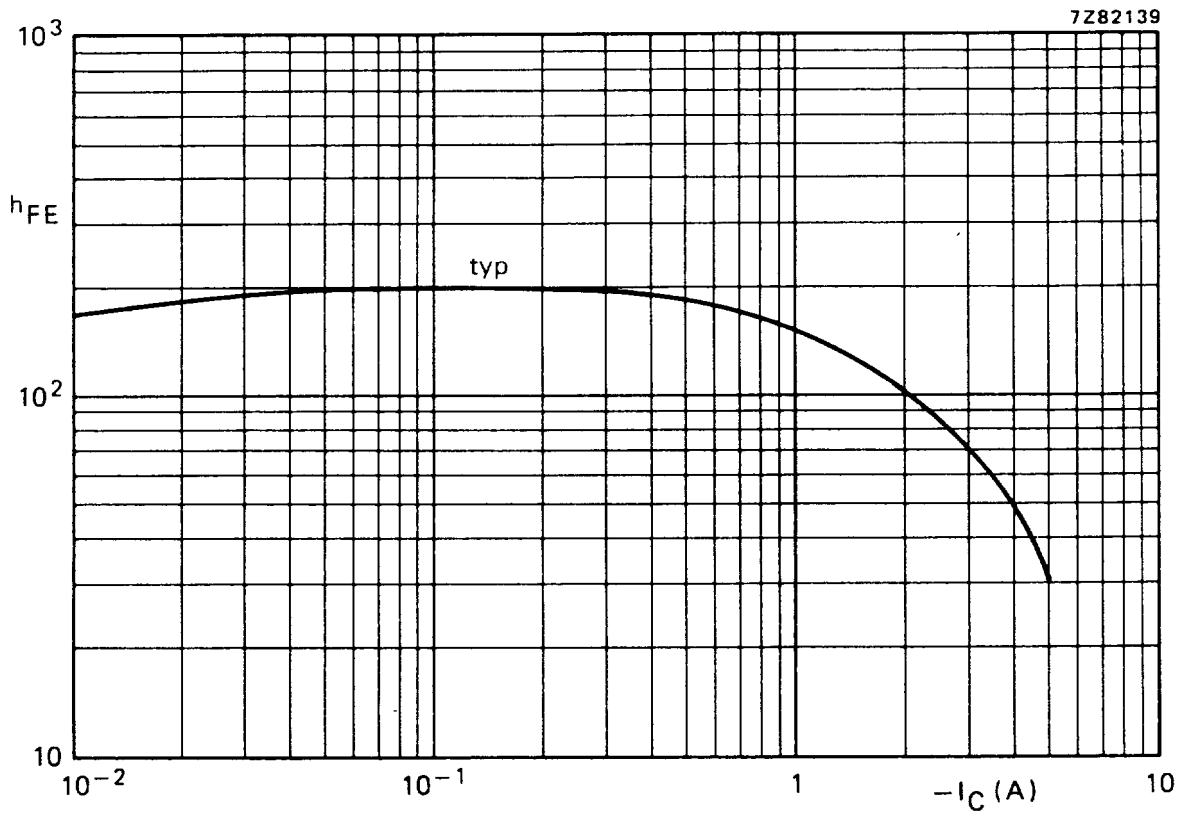


Fig. 8 Typical d.c. current gain at $-V_{CE} = 1$ V; $T_j = 25$ °C.