MAGNA TEC

290-786

BD944
BD946
BD948

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

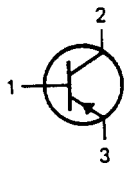
			BD944	946	948	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	22	32	45	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	22	32	45	V
Collector current (d.c.)	$-I_C$	max.		5		A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.		40		W
Junction temperature	T_j	max.		150		°C
D.C. current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

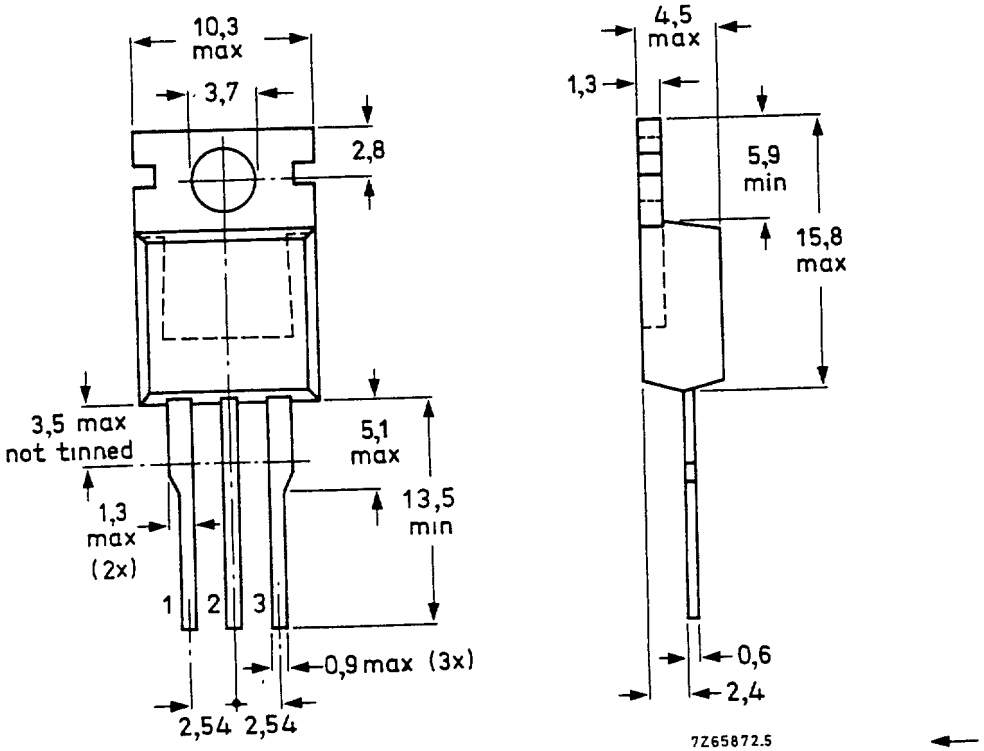
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-220AB.

Collector connected to mounting base.





See also chapters Mounting instructions and Accessories.

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 °C	P_{tot}	max.		40		W
Storage temperature	T_{stg}		−65 to + 150			°C
Junction temperature	T_j	max.		150		°C

THERMAL RESISTANCE

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

CHARACTERISTICS

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

Notes

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

Knee voltage * $-I_C = 2$ A; $-I_B$ = value for which $-I_C = 2{,}2$ A and $-V_{CE} = 1$ V	$-V_{CEK}$	<	0,8 V
Transition frequency at f = 1 MHz $-I_C = 250$ mA; $-V_{CE} = 1$ V	f_T	>	3 MHz

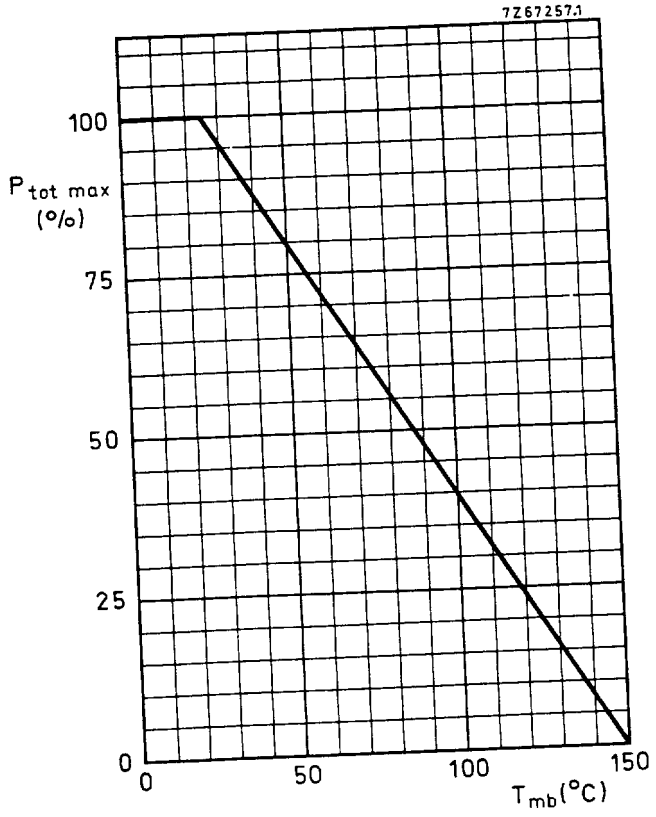


Fig. 2 Power derating curve.

* Measured under pulse conditions; $t_p \leqslant 300\ \mu s$; $\delta < 2\%$.

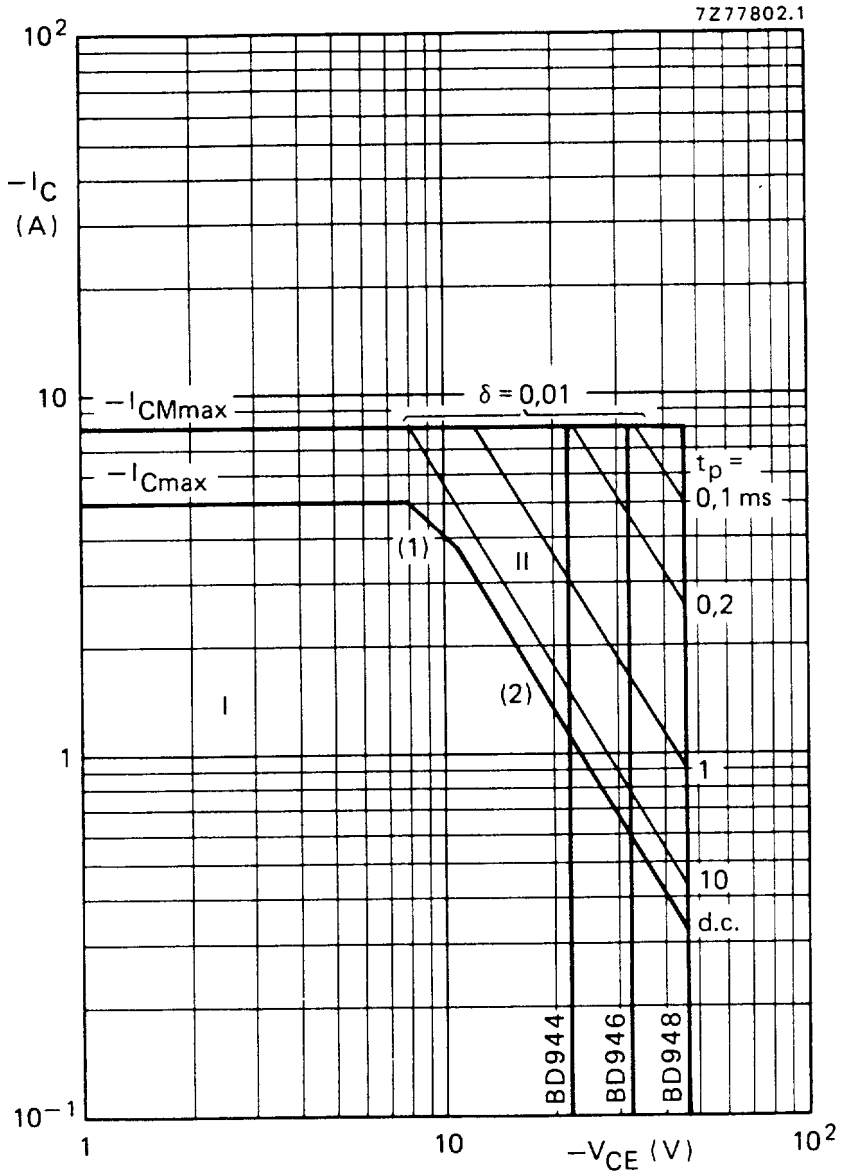


Fig. 3 Safe Operating ARea, T_{mb} = 25 °C.

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.

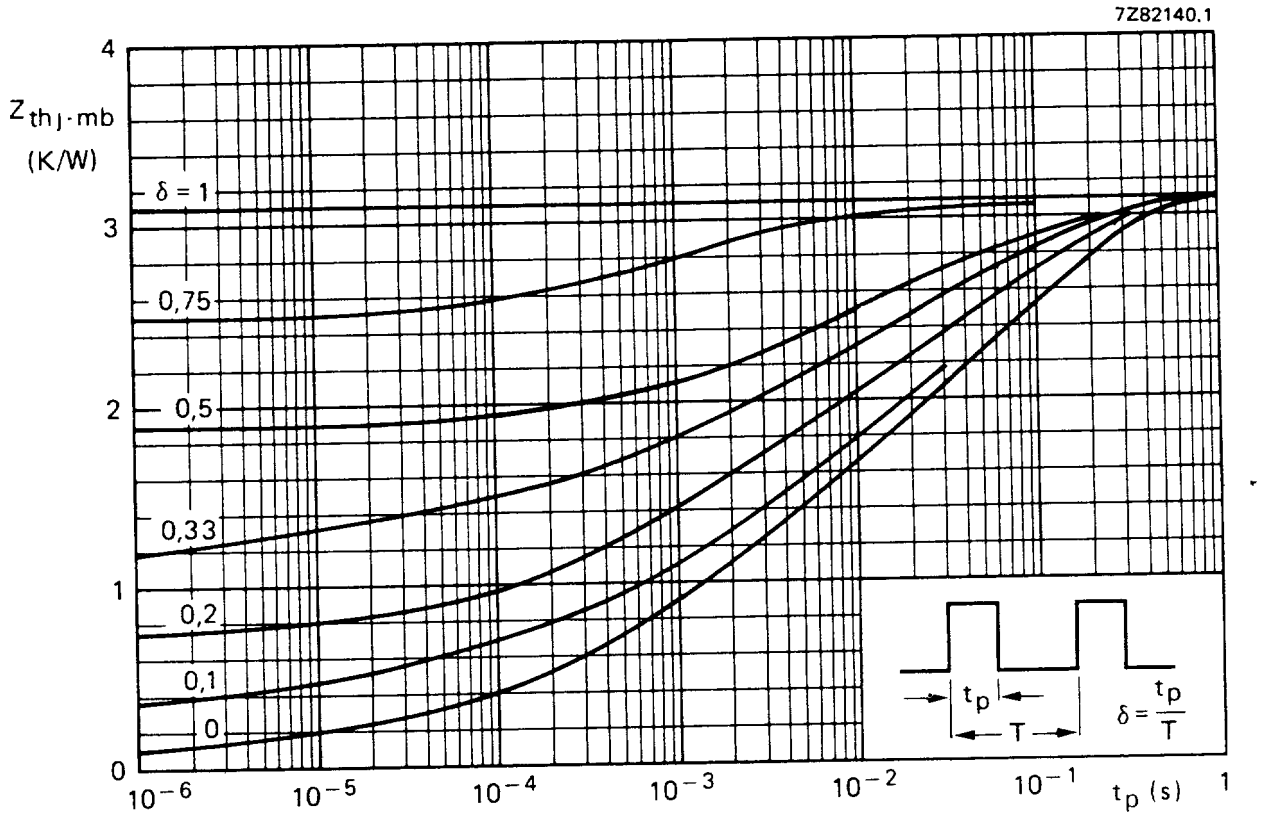


Fig. 4 Pulse power rating chart.

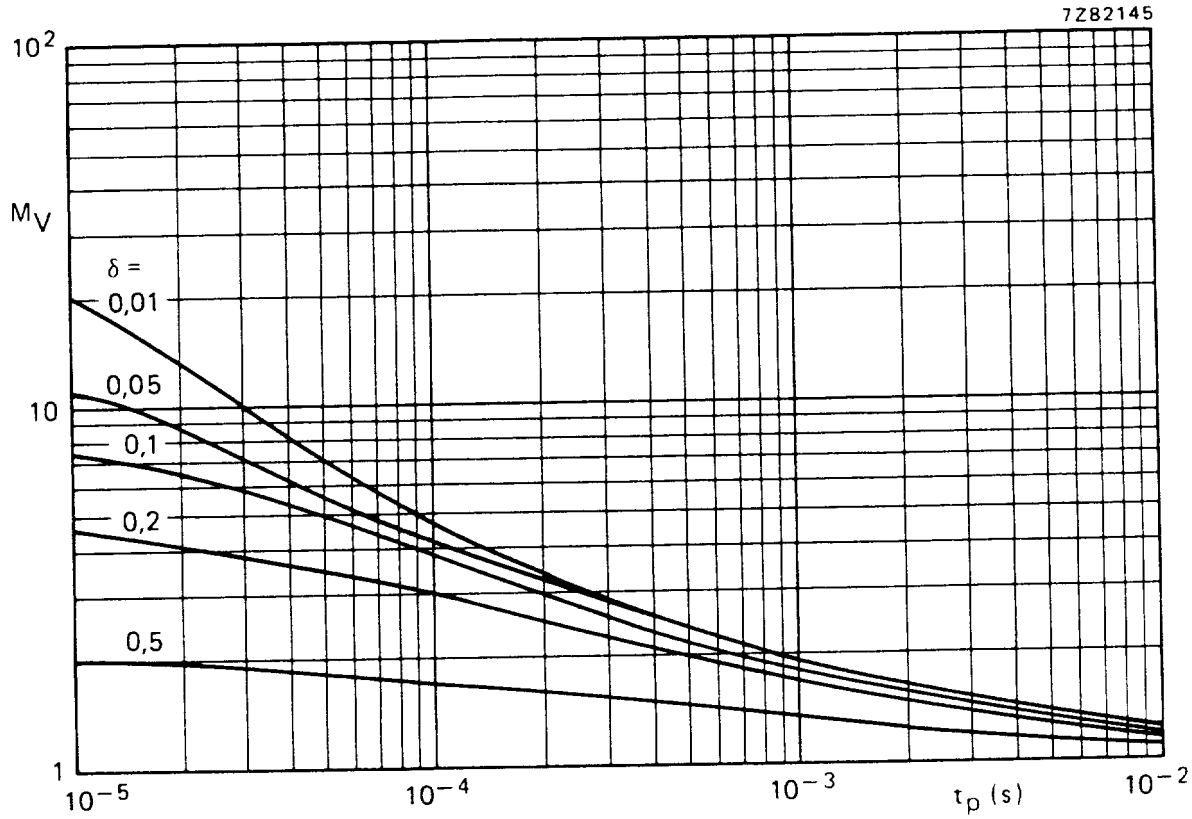


Fig. 5 S.B. voltage multiplying factor at the $-I_{Cmax}$ level.

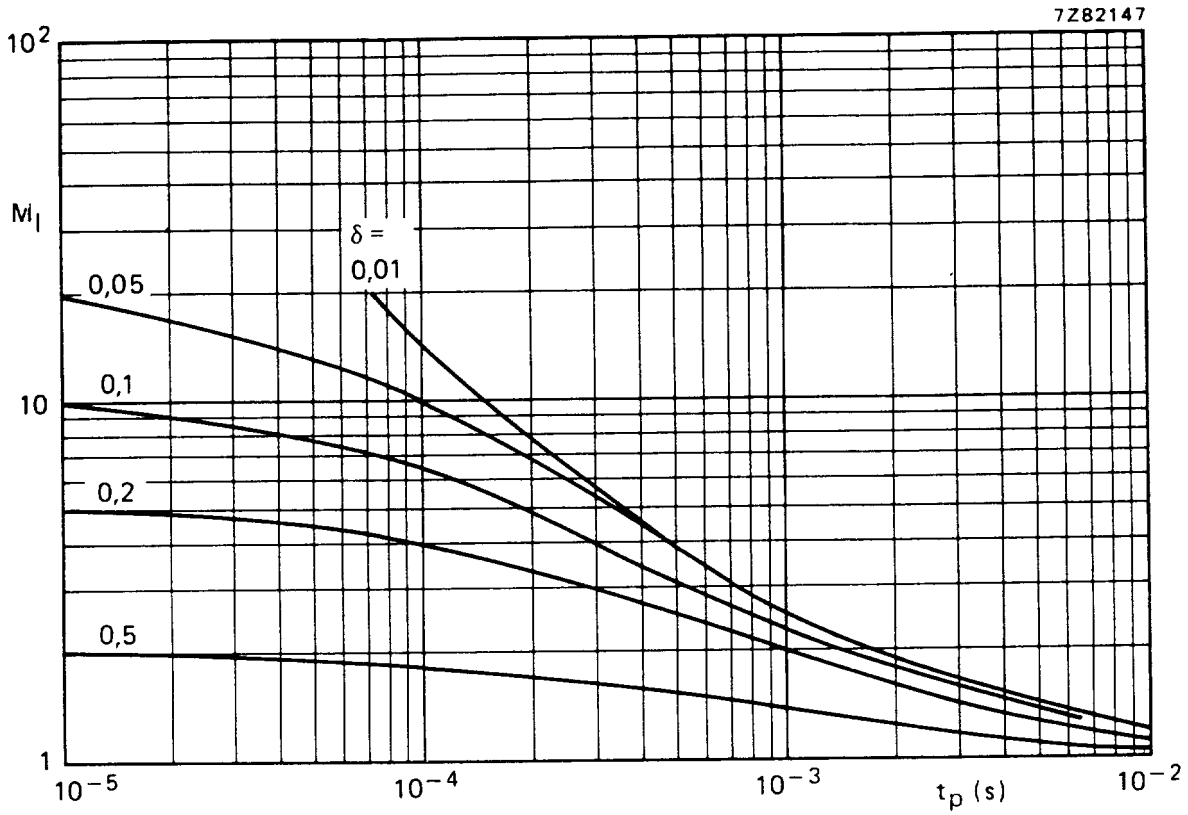


Fig. 6 S.B. current multiplying factor at the $-V_{CEOmax}$ level for BD944/946.

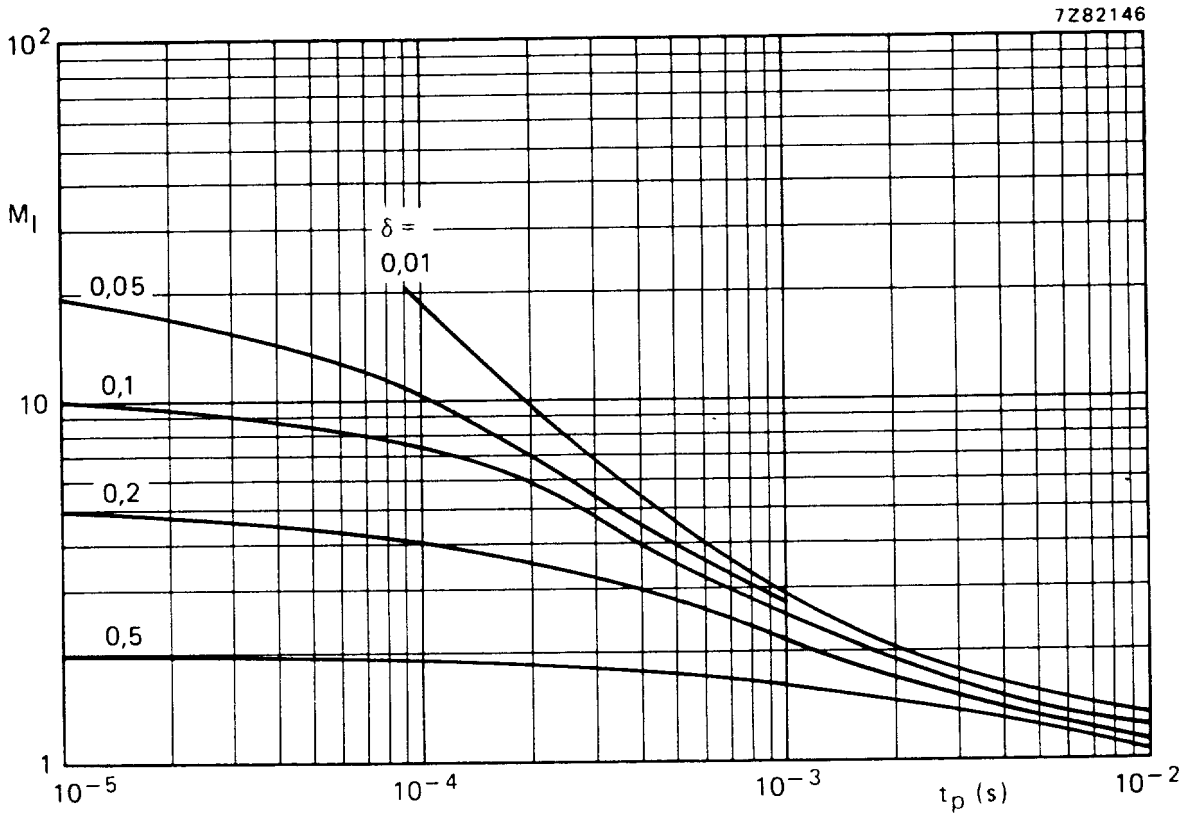


Fig. 7 S.B. current multiplying factor at the $-V_{CEOmax}$ level for BD948.

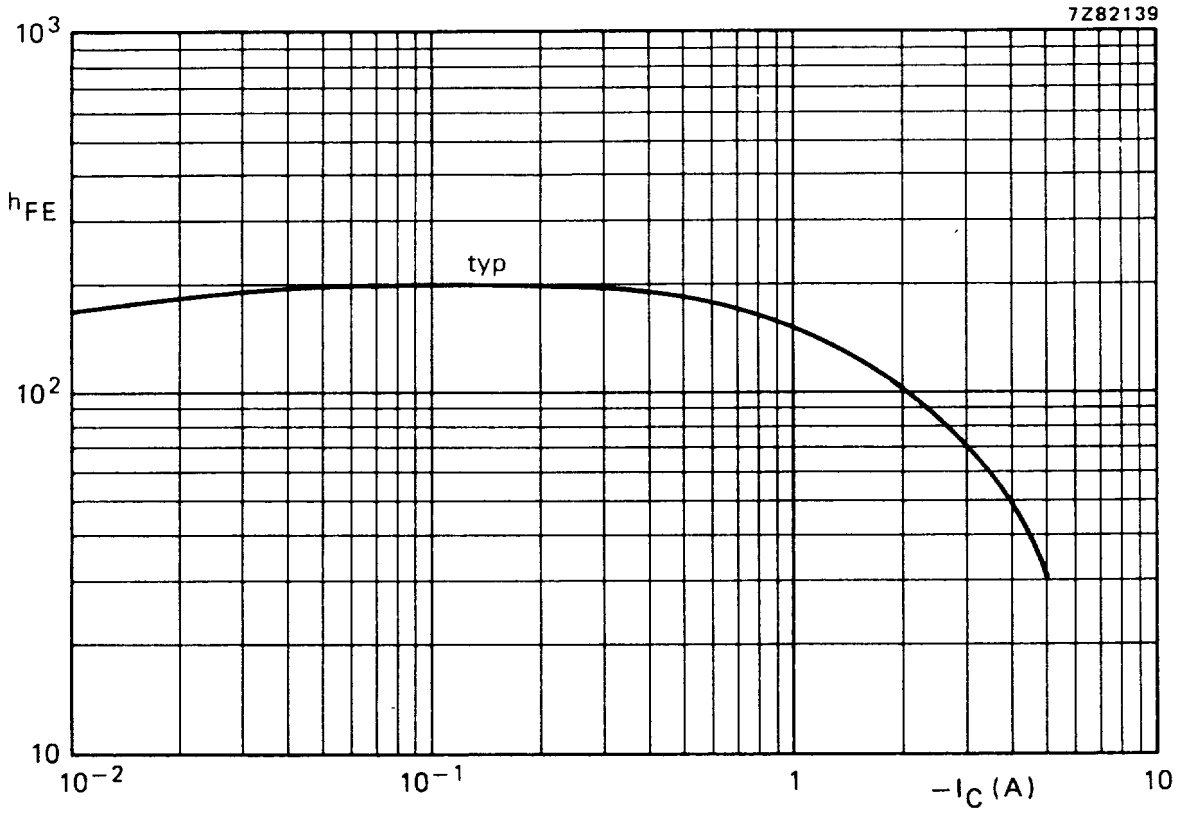


Fig. 8 Typical d.c. current gain at $-V_{CE}$ = 1 V; T_j = 25 °C.