

290-683

BDV64; 64A
BDV64B; 64C

SILICON DARLINGTON POWER TRANSISTORS

P-N-P epitaxial base transistors in monolithic Darlington circuit for audio output stages and general amplifier and switching applications. N-P-N complements are BDV65, 65A, 65B and 65C.

QUICK REFERENCE DATA

			BDV64	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.		12		A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot}	max.		125		W
Junction temperature	T_j	max.		150		$^\circ\text{C}$
DC current gain				1000		
$-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$	h_{FE}	$>$				
Cut-off frequency				100		kHz
$-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$	f_{hfe}	typ.				

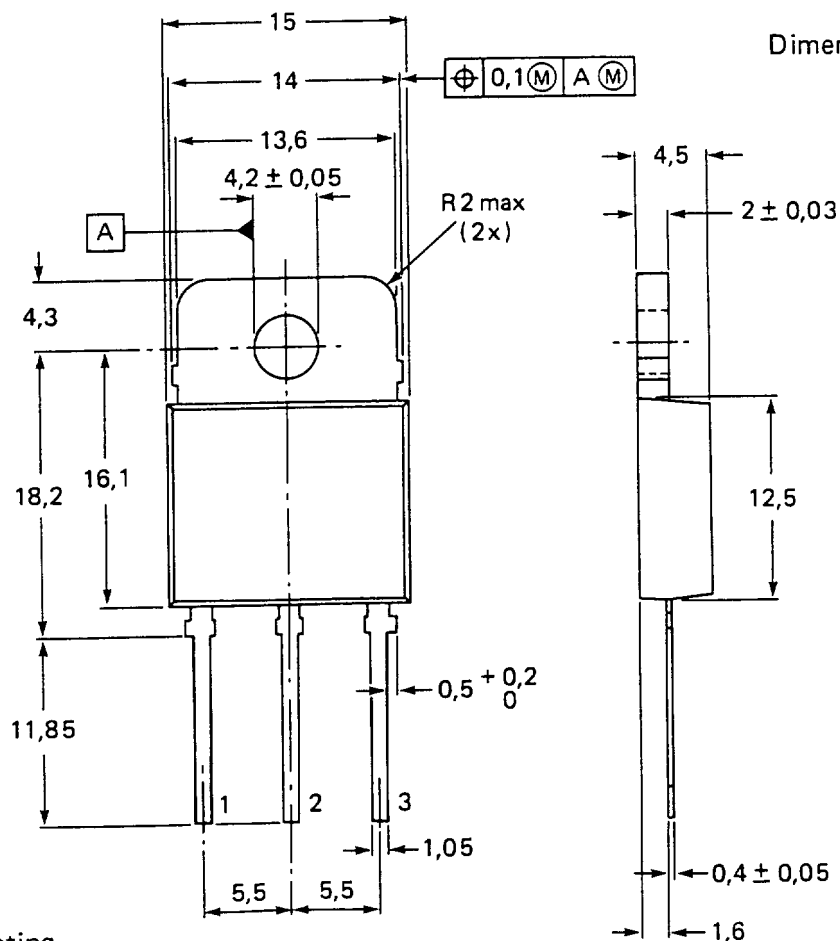
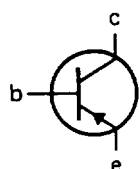
MECHANICAL DATA

Fig. 1 SOT-93.

Collector connected
to mounting base.

Pinning

- 1 = base
2 = collector
3 = emitter



See also chapters Mounting
instructions and Accessories.

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CIRCUIT DIAGRAM

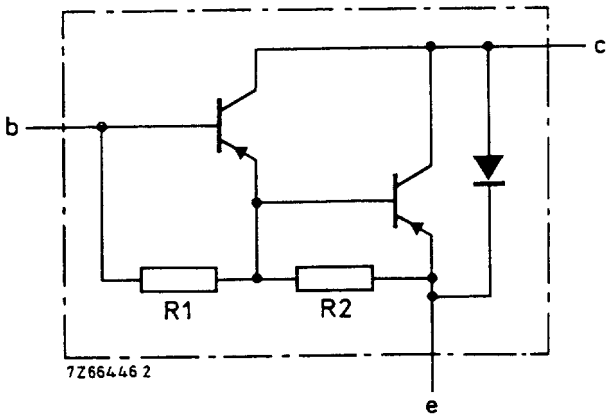


Fig. 2.
R1 typical 5 kΩ
R2 typical 80 Ω.

RATINGS

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

			BDV64	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	5	5	5 V
Collector current (d.c.)	$-I_C$	max.		12		A
Collector current (peak value)	$-I_{CM}$	max.		20		A
Base current (d.c.)	$-I_B$	max.		0,5		A
Total power dissipation up to $T_{mb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.		125		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	$R_{th\ j-mb}$	=	1	K/W*
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CHARACTERISTICS

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

Collector cut-off currents

$I_E = 0; -V_{CB} = -V_{CBOmax}$	$-I_{CBO}$	<	400	μA
$I_E = 0; -V_{CB} = -\frac{1}{2}V_{CBOmax}; T_j = 150\text{ }^{\circ}\text{C}$	$-I_{CBO}$	<	2	mA
$I_B = 0; -V_{CE} = -\frac{1}{2}V_{CEOmax}$	$-I_{CEO}$	<	0,2	mA

Emitter cut-off current

$I_C = 0; -V_{EB} = 5\text{ V}$	$-I_{EBO}$	<	5	mA
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* Based 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.

CHARACTERISTICS

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

D.C. current gain*

 $-I_C = 1\text{ A}; -V_{CE} = 4\text{ V}$ h_{FE} typ. 1500 $-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$ h_{FE} > 1000 $-I_C = 10\text{ A}; -V_{CE} = 4\text{ V}$ h_{FE} typ. 1000

Base-emitter voltage*

 $-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$ $-V_{BE}$ < 2,5 V**

Collector-emitter saturation voltage*

 $-I_C = 5\text{ A}; -I_B = 20\text{ mA}$ $-V_{CEsat}$ < 2 VCollector capacitance at $f = 1\text{ MHz}$ $I_E = I_e = 0; -V_{CB} = 10\text{ V}$ C_C typ. 200 pF

Cut-off frequency

 $-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$ f_{hfe} typ. 100 kHz

Diode, forward voltage

 $I_F = 5\text{ A}$ V_F typ. 1,8 V $I_F = 12\text{ A}$ V_F typ. 2 V

Switching times (see also Fig. 4)

 $-I_{Con} = 5\text{ A}; -I_{Bon} = I_{Boff} = 20\text{ mA}; V_{CC} = -16\text{ V}$

Turn-on time

 t_{on} typ. 0,5 μs

Fall time

 t_f typ. 1,0 μs

Turn-off time

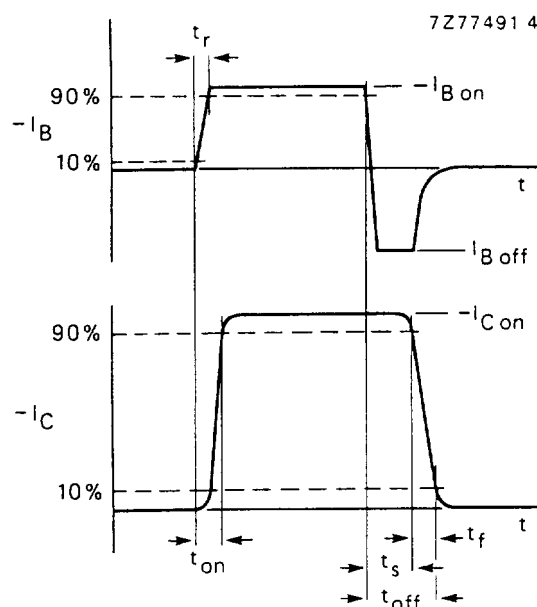
 t_{off} typ. 2,0 μs 

Fig. 3 Waveforms.

* Measured under pulse conditions: $t_p < 300\text{ }\mu\text{s}$; $\delta < 2\%$.** $-V_{BE}$ decreases by about 3,6 mV/K with increasing temperature

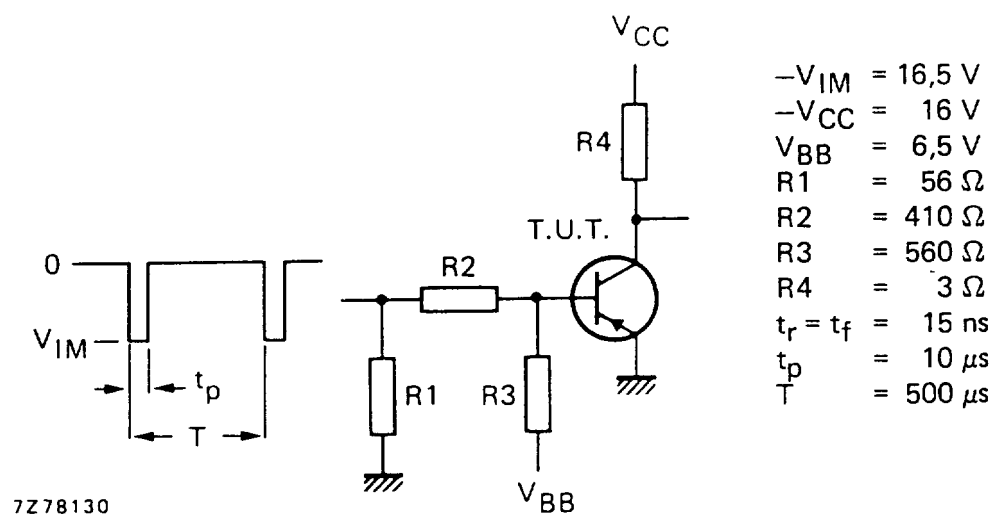


Fig. 4 Switching times test circuit.

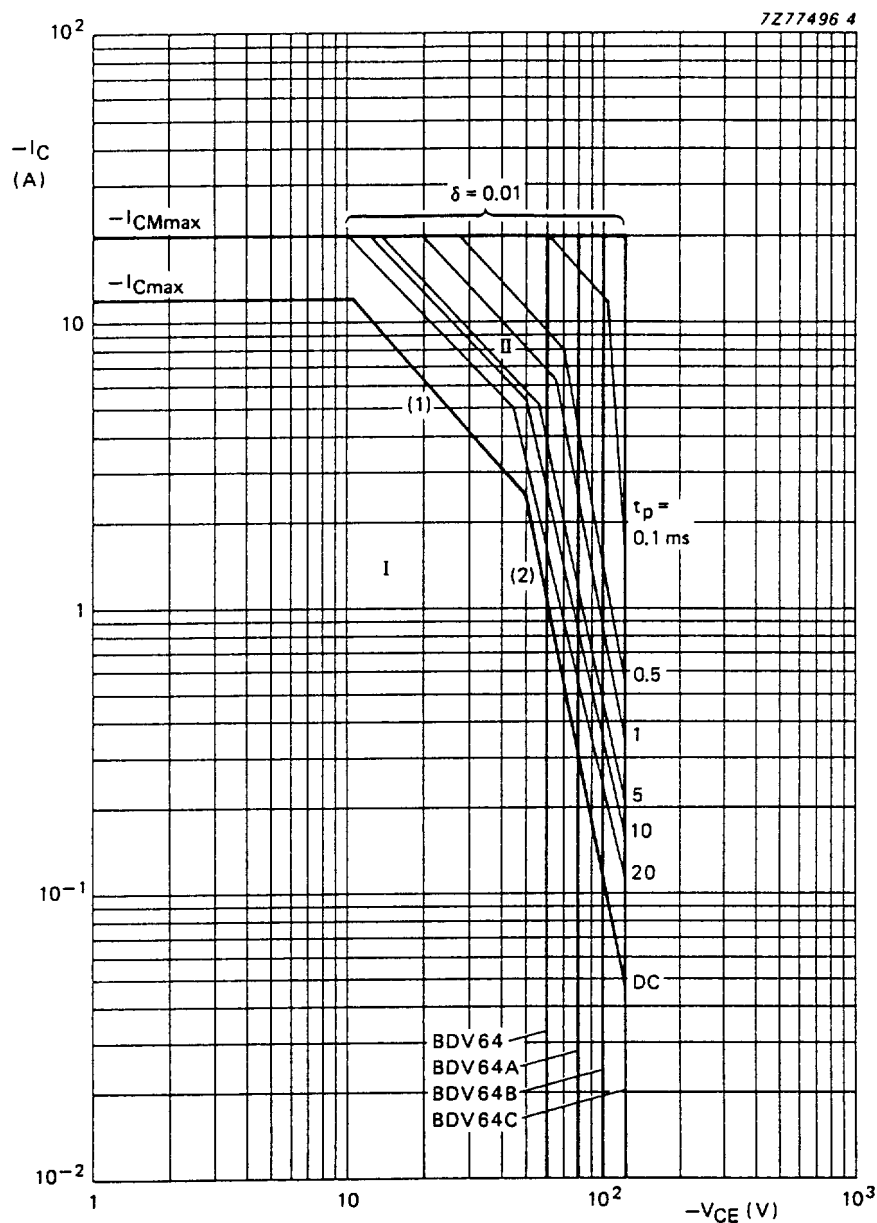


Fig. 5 Safe Operating Area; $T_{mb} \leq 25^\circ\text{C}$.

- 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.

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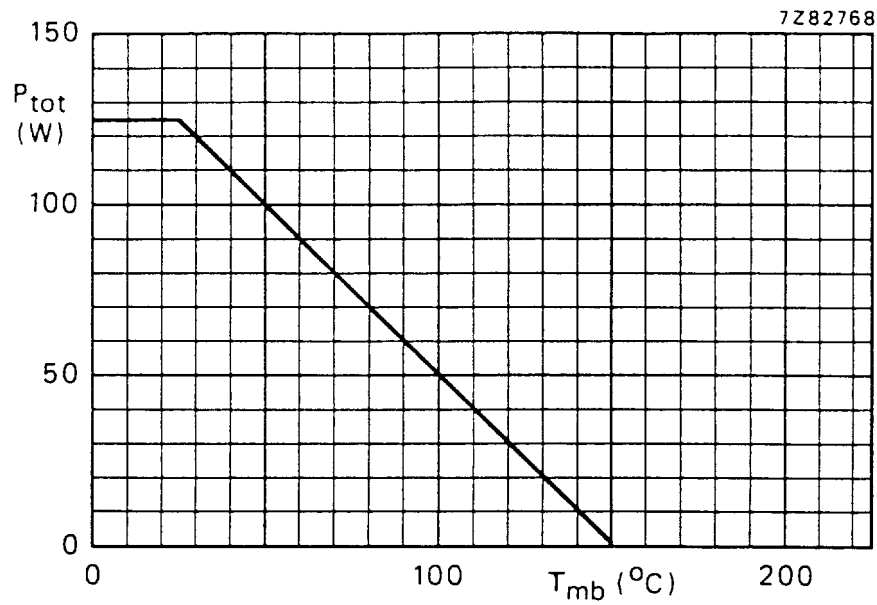


Fig. 6 Power derating curve.

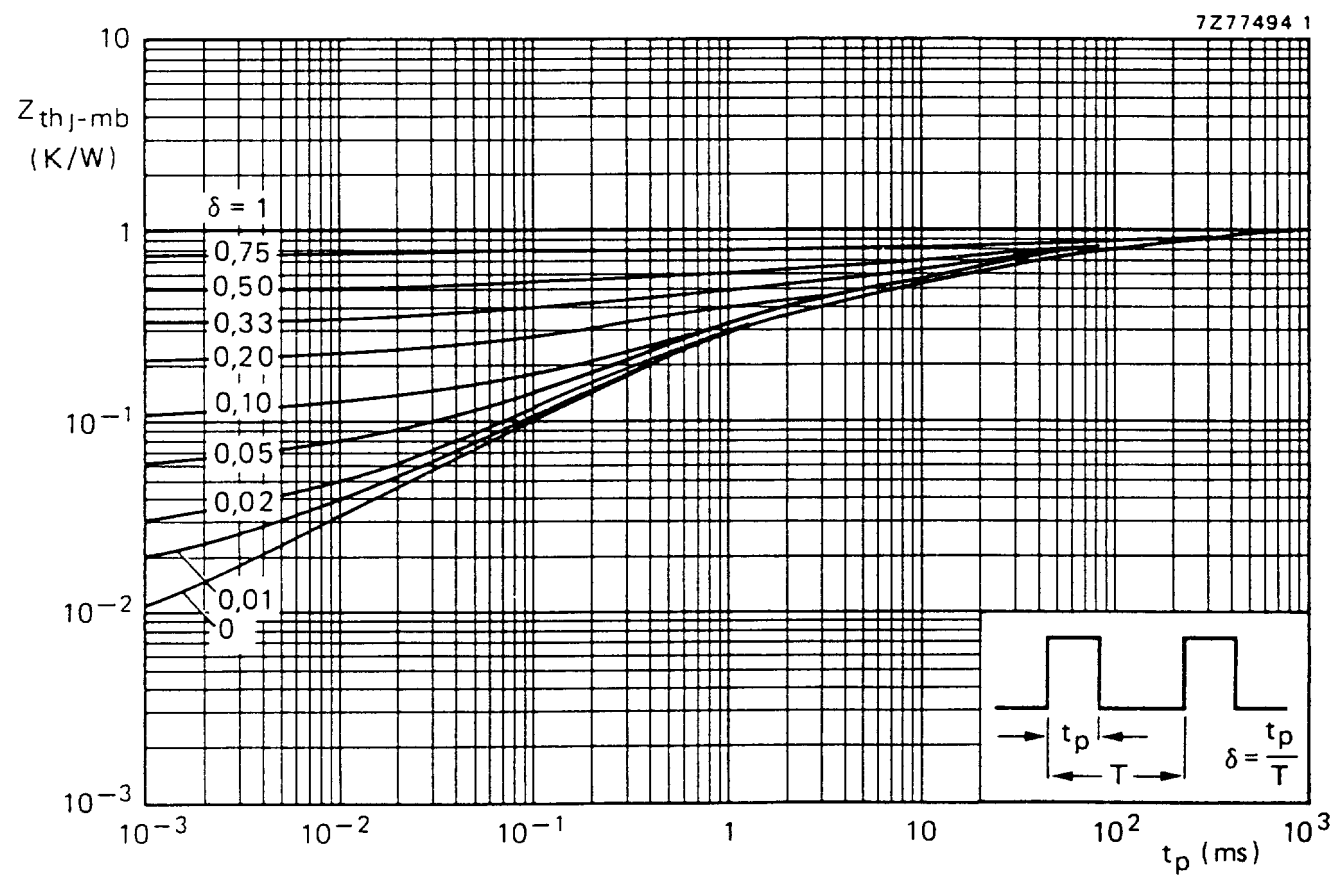
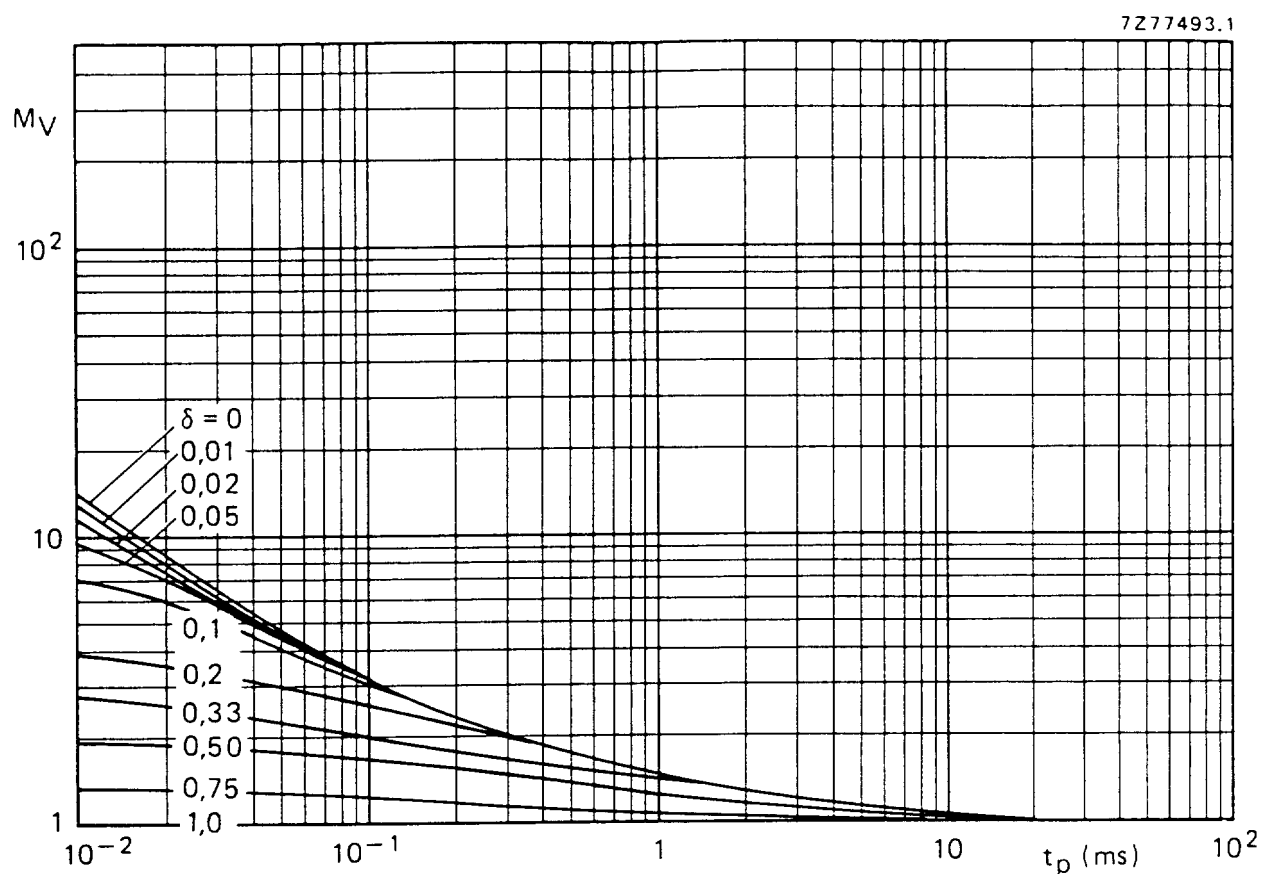
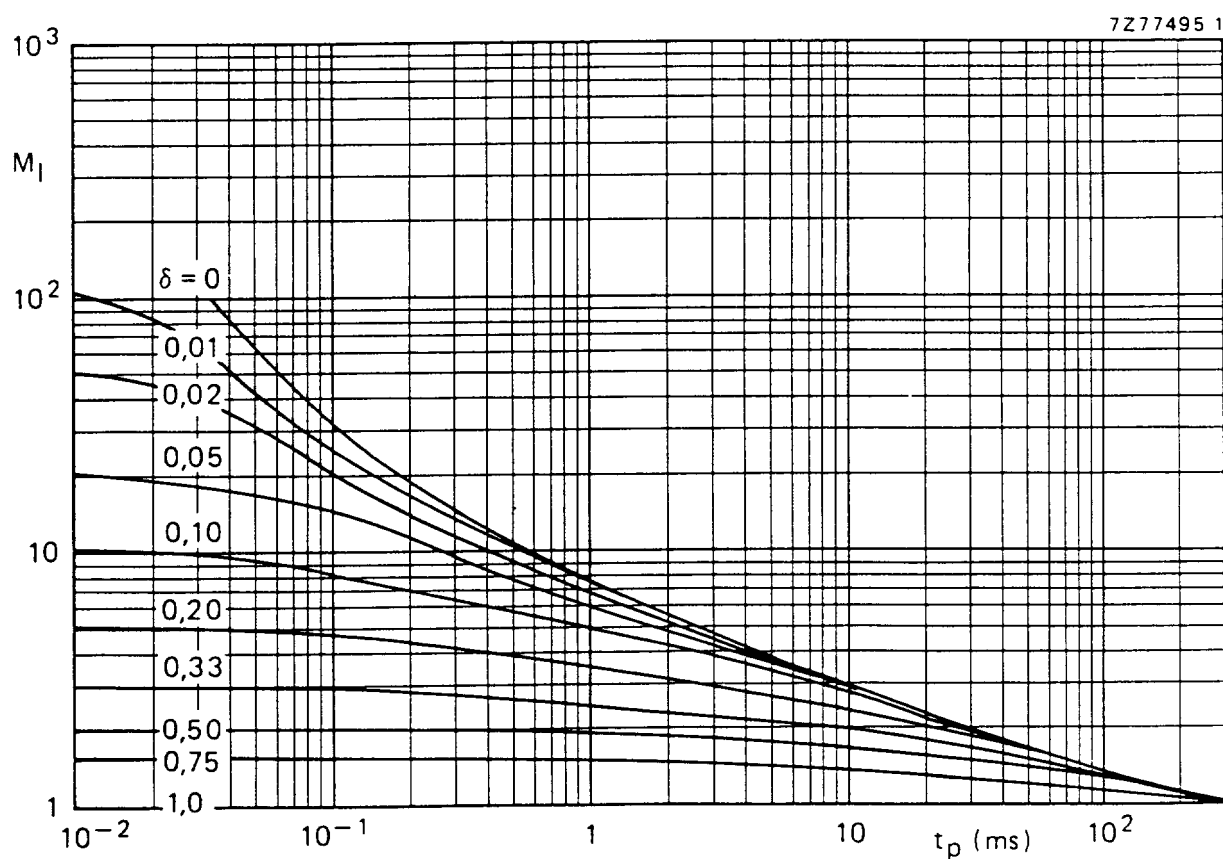


Fig. 7 Pulse power rating chart.

Fig. 8 S.B. voltage multiplying factor at the $-I_{Cmax}$ level.Fig. 9 S.B. current multiplying factor at the $-V_{CEOmax}$ level (100 V).

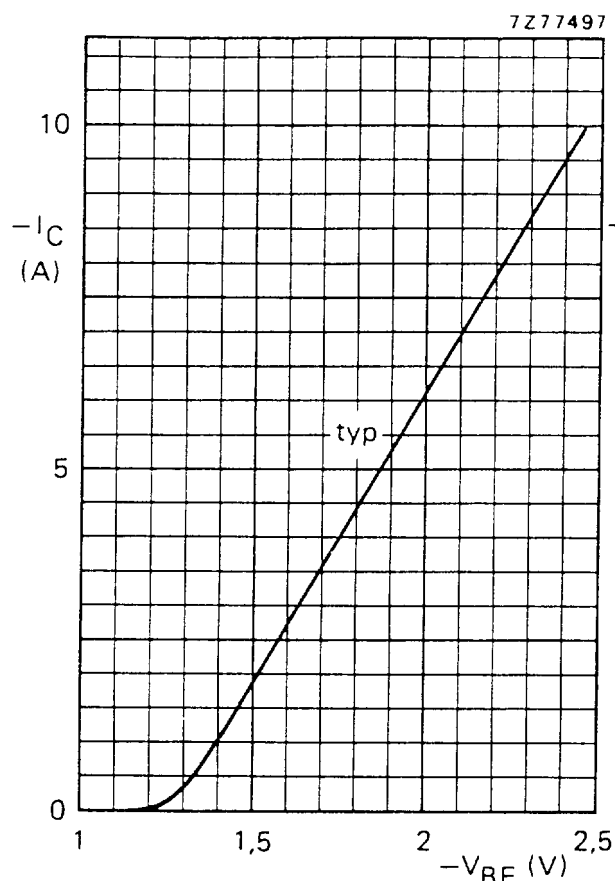


Fig. 10 $-V_{CE} = 4 \text{ V}$; $T_J = 25^\circ\text{C}$.

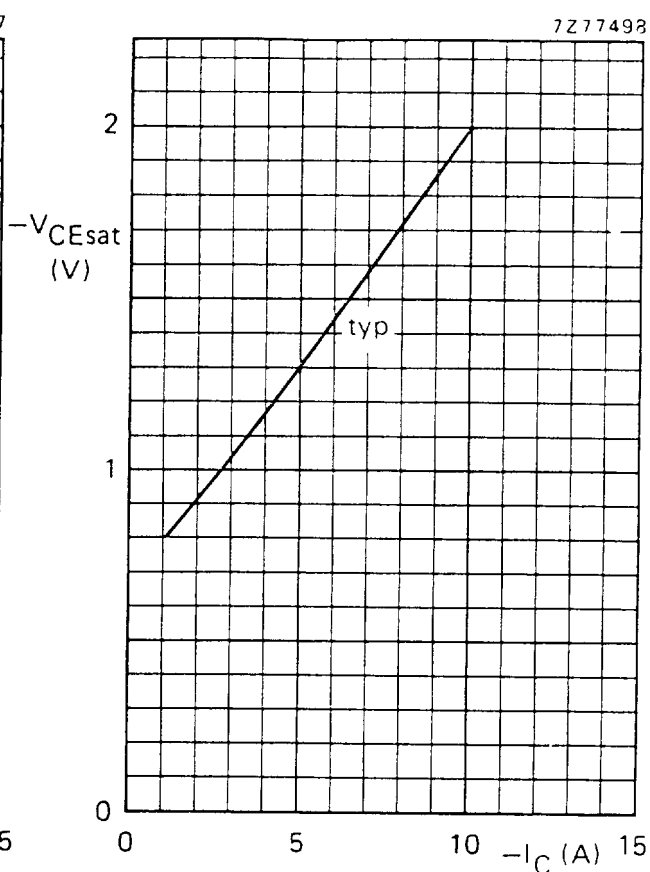


Fig. 11 $-I_C/I_B = 250$; $T_J = 25^\circ\text{C}$.

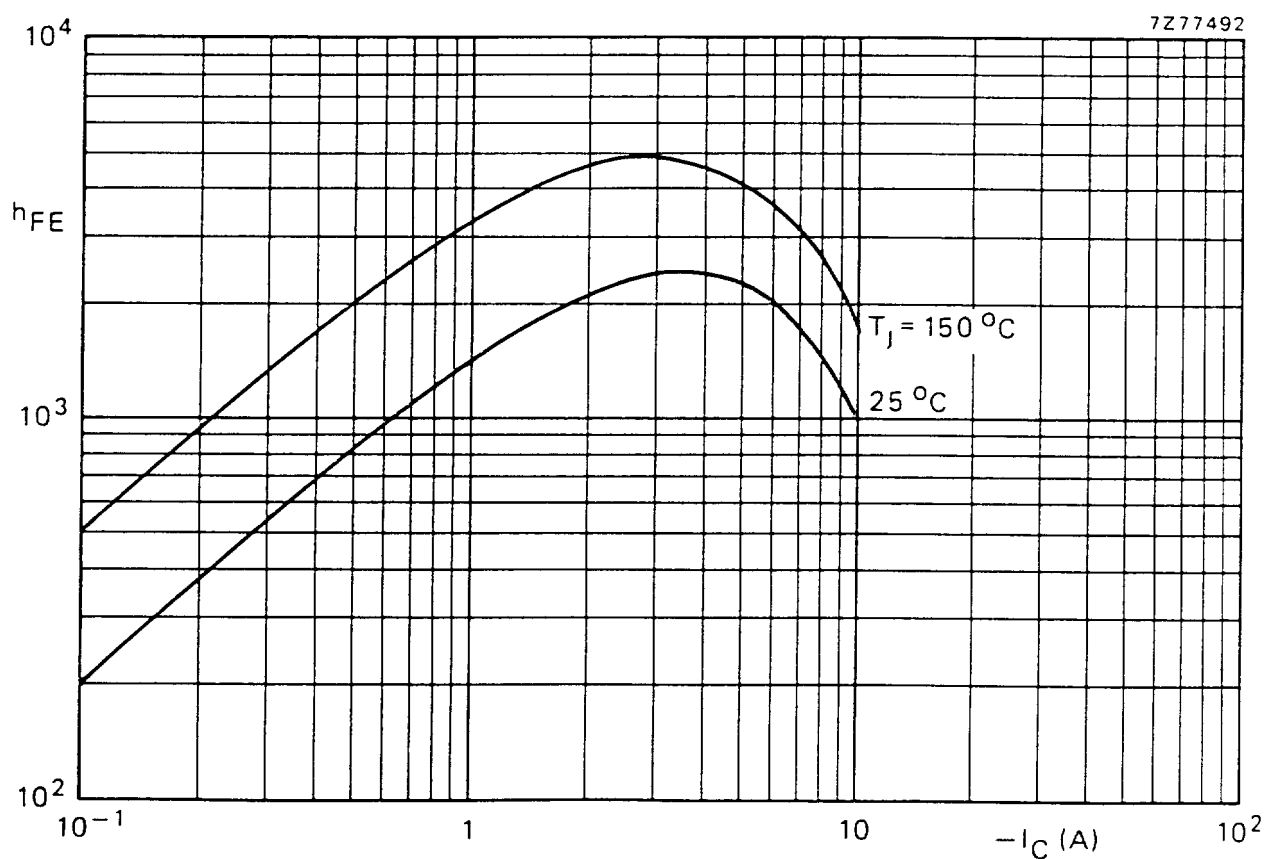


Fig. 12 Typical values; $-V_{CE} = 4 \text{ V}$.