

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

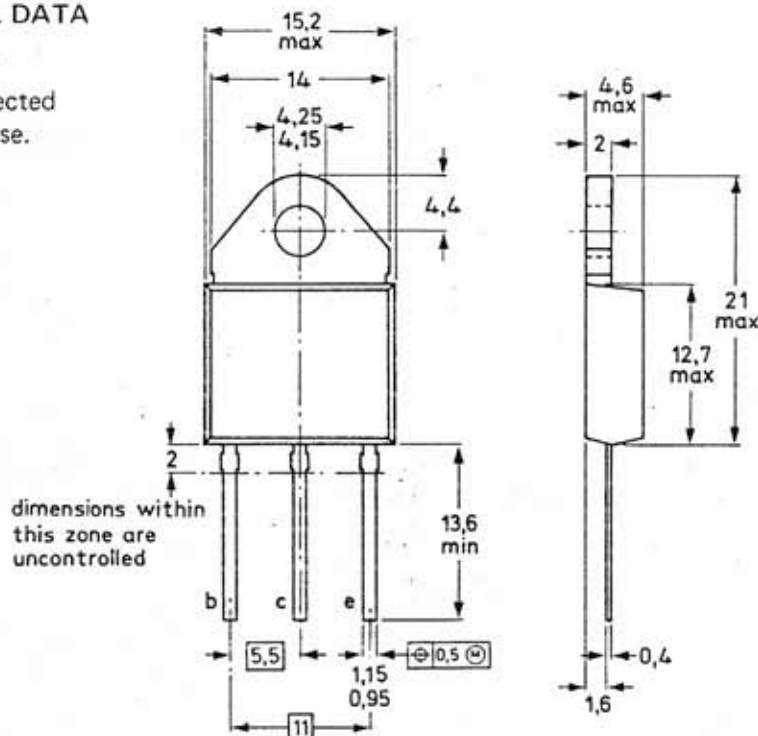
		BDV64 A B C				
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	60	80	100	120 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	60	80	100	120 V
Collector current (peak value)	$-I_{CM}$	max.		20		A
Total power dissipation up to $T_{mb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.		125		W
Junction temperature	T_j	max.		150		$^{\circ}\text{C}$
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		
Cut-off frequency						
$-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$	f_{hfe}	typ.		100		kHz

MECHANICAL DATA

Fig. 1 SOT-93.

Collector connected to mounting base.

Dimensions in mm



BDV64; 64A
BDV64B; 64C



CIRCUIT DIAGRAM

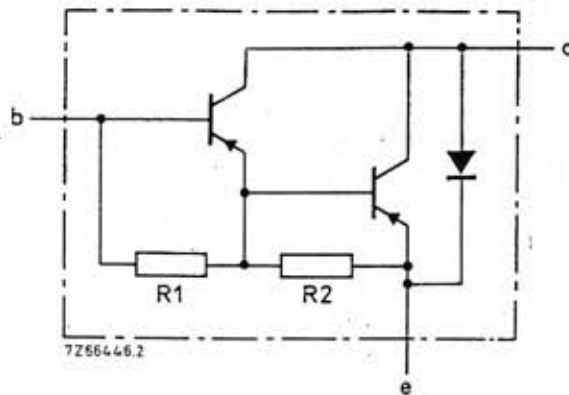


Fig. 2.
R1 typical 5 kΩ
R2 typical 80 Ω.

RATINGS

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

			BDV64	A	B	C	
Collector-base voltage (open emitter)	$-V_{CB0}$	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

$I_E = 0; -V_{CB} = -V_{CB0max}$	$-I_{CBO}$	<		400			μA
$I_E = 0; -V_{CB} = -\frac{1}{2}V_{CB0max}; T_j = 150\text{ }^\circ\text{C}$	$-I_{CBO}$	<		2			mA
$I_B = 0; -V_{CE} = -\frac{1}{2}V_{CEOmax}$	$-I_{CEO}$	<		1			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.

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CHARACTERISTICS

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

D.C. current gain*

$-I_C = 1\text{ A}; -V_{CE} = 4\text{ V}$

$-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$

$-I_C = 10\text{ A}; -V_{CE} = 4\text{ V}$

Base-emitter voltage*

$-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$

Collector-emitter saturation voltage*

$-I_C = 5\text{ A}; -I_B = 20\text{ mA}$

Collector capacitance at $f = 1\text{ MHz}$

$I_E = I_e = 0; -V_{CB} = 10\text{ V}$

Cut-off frequency

$-I_C = 5\text{ A}; -V_{CE} = 4\text{ V}$

Diode, forward voltage

$I_F = 5\text{ A}$

$I_F = 12\text{ A}$

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

Fall time

Turn-off time

h_{FE}	typ.	1500
h_{FE}	>	1000
h_{FE}	typ.	1000
$-V_{BE}$	<	2,5 V**
$-V_{CEsat}$	<	2 V
C_c	typ.	200 pF
f_{hfe}	typ.	100 kHz
V_F	typ.	1,8 V
V_F	typ.	2 V
t_{on}	typ.	0,5 μs
t_f	typ.	1,0 μs
t_{off}	typ.	2,0 μs

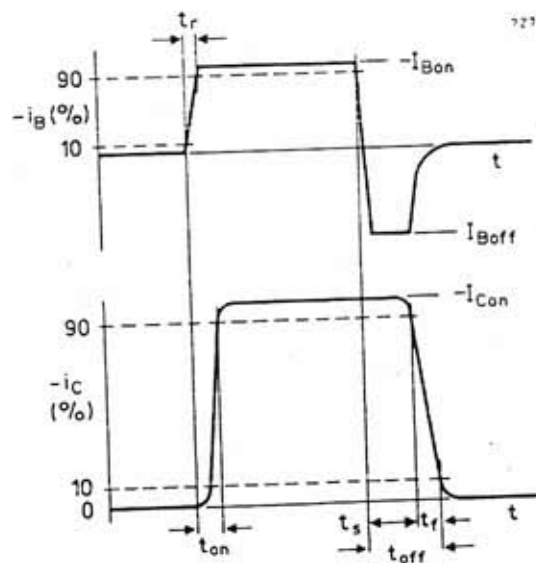


Fig. 3 Waveforms.

* 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.

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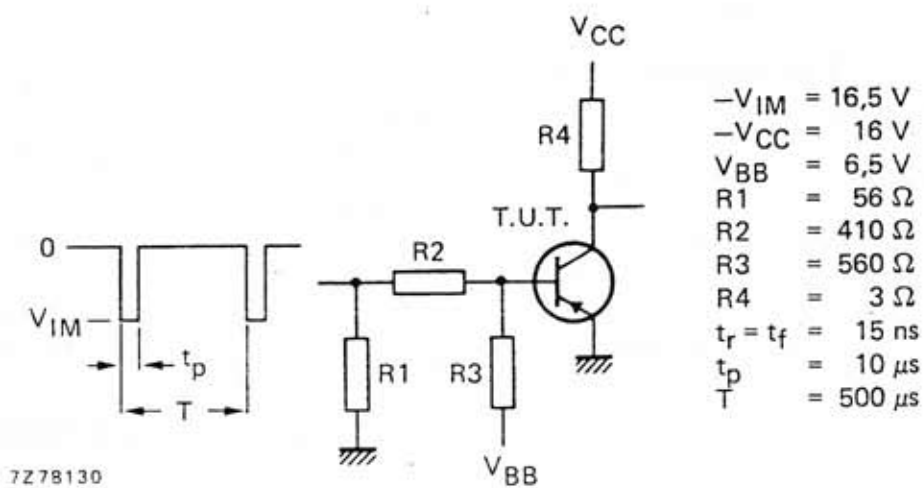


Fig. 4 Switching times test circuit.

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BDV64B; 64C

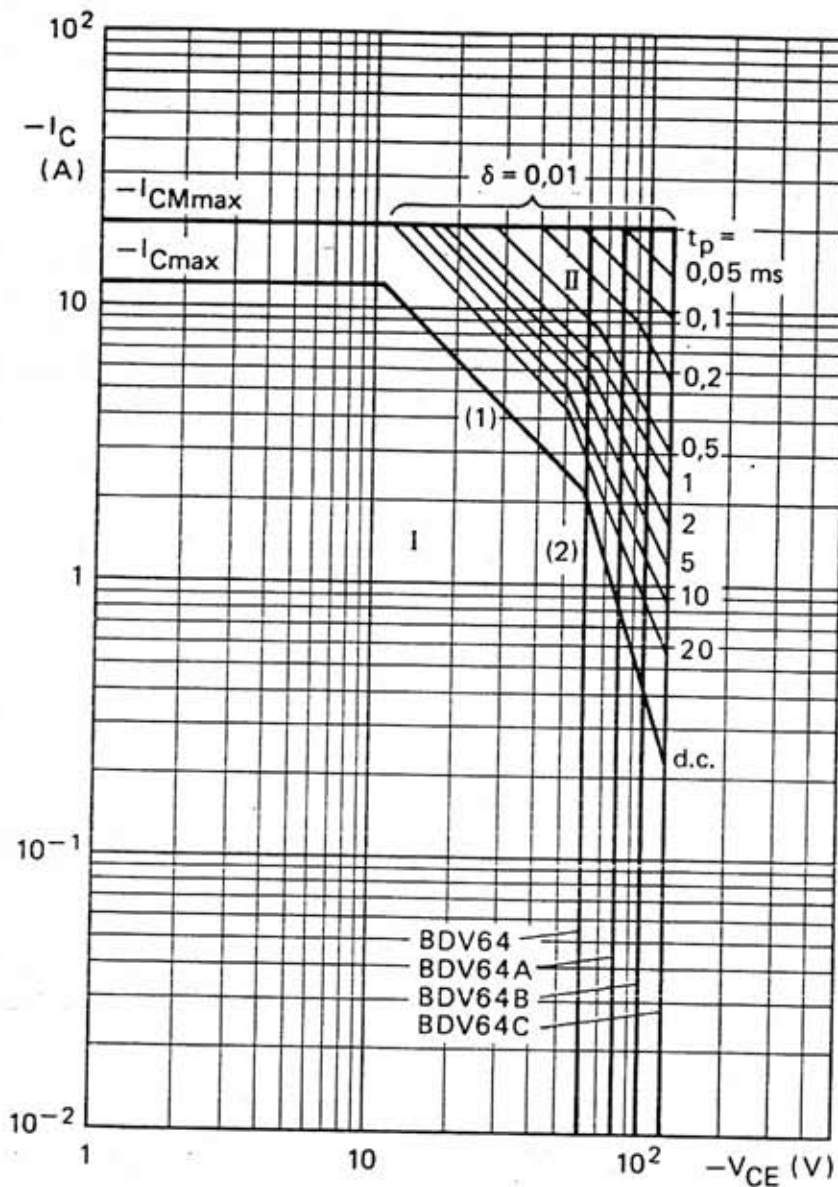


Fig. 5 Safe Operating Area; $T_{mb} \leq 25 \text{ }^\circ\text{C}$.

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 (independent of temperature).

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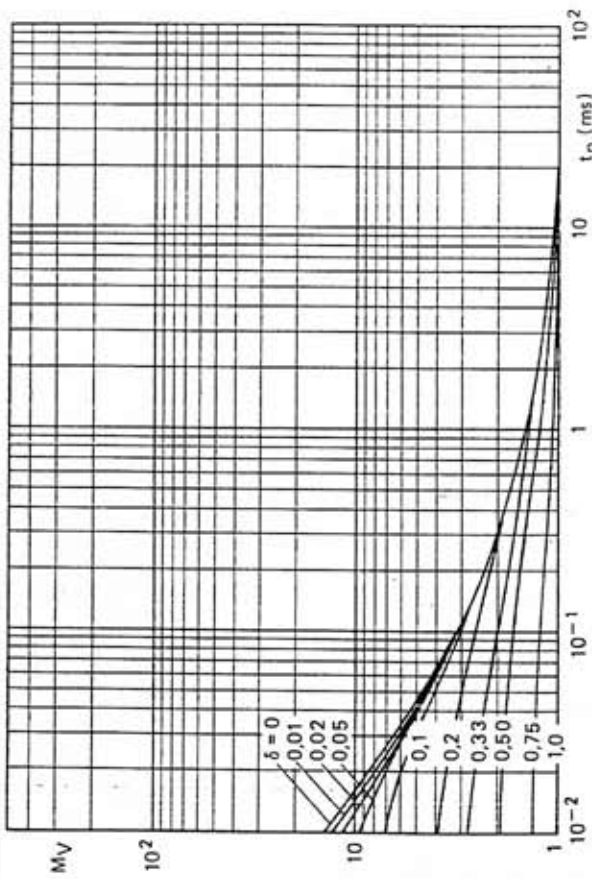


Fig. 8. S.B. voltage multiplying factor at the $-I_{Cmax}$ level.

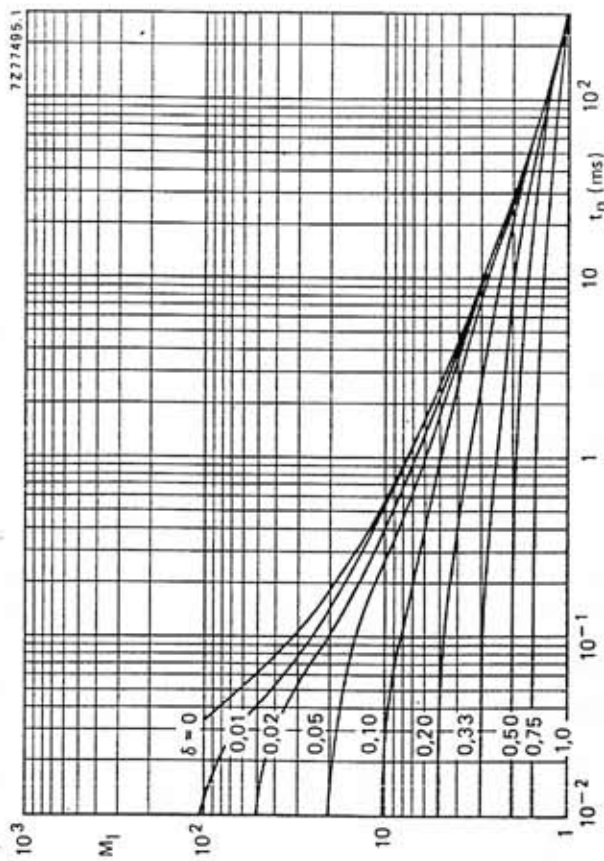


Fig. 9. S.B. current multiplying factor at the $-V_{CE0max}$ level (100 V).

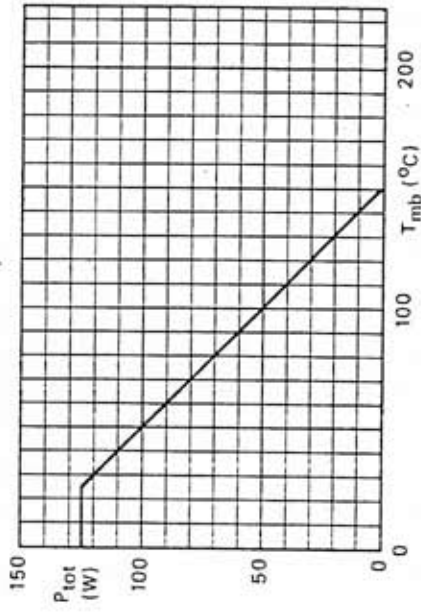


Fig. 6. Power derating curve.

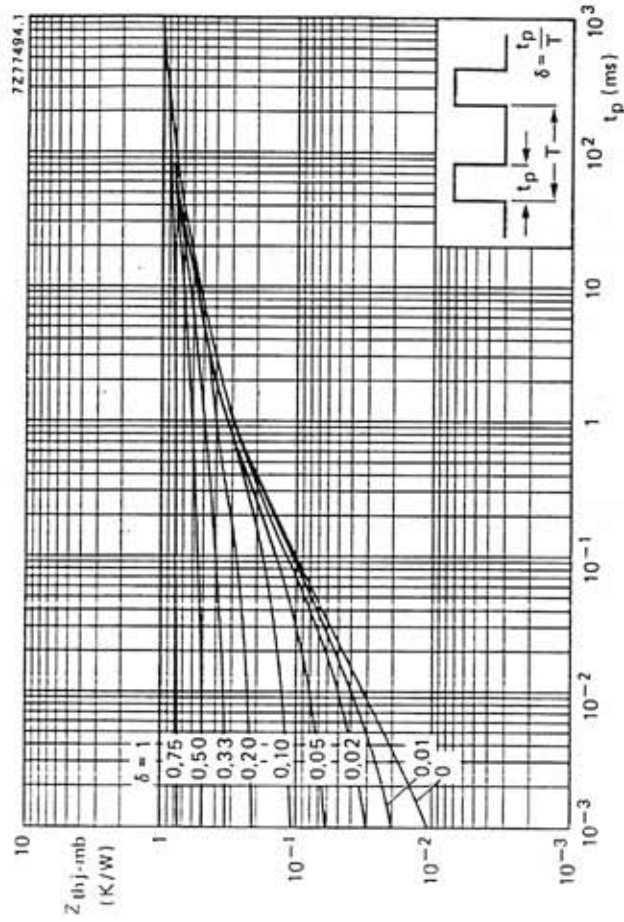


Fig. 7. Pulse power rating chart.

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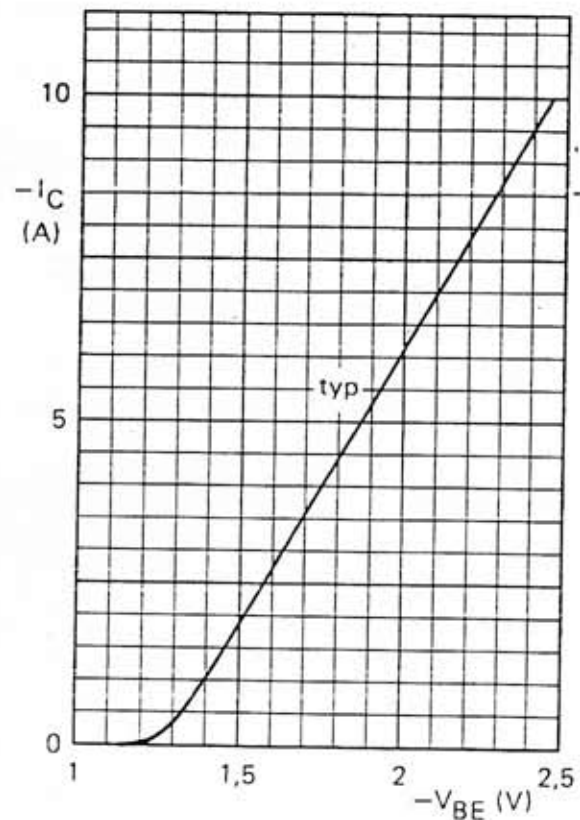


Fig. 10 $-V_{CE} = 4 \text{ V}; T_j = 25 \text{ }^\circ\text{C}.$

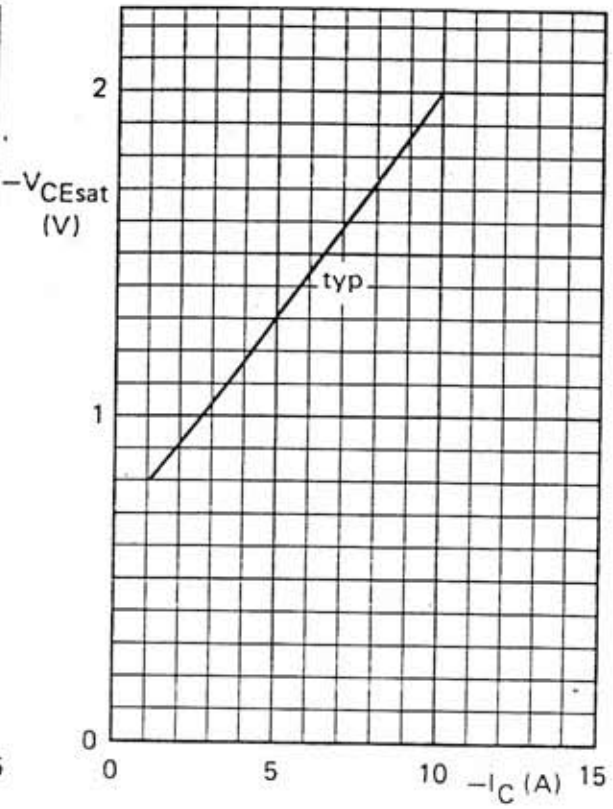


Fig. 11 $-I_C/I_B = 250; T_j = 25 \text{ }^\circ\text{C}.$

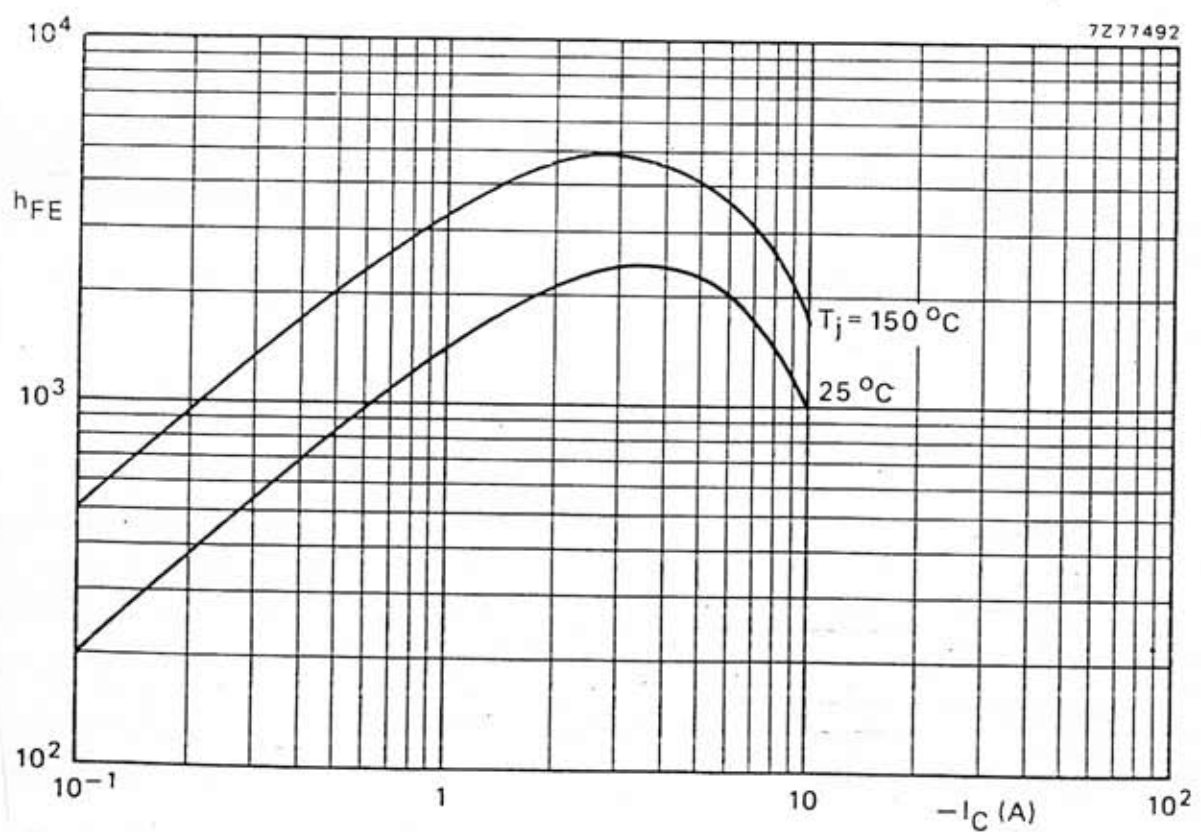


Fig. 12 Typical values; $-V_{CE} = 4 \text{ V}.$