SILICON DIFFUSED POWER TRANSISTORS

High-speed switching n-p-n transistors in a metal envelope intended for use in converters, inverters, switching regulators and switching control amplifiers.

QUICK REFERENCE DATA

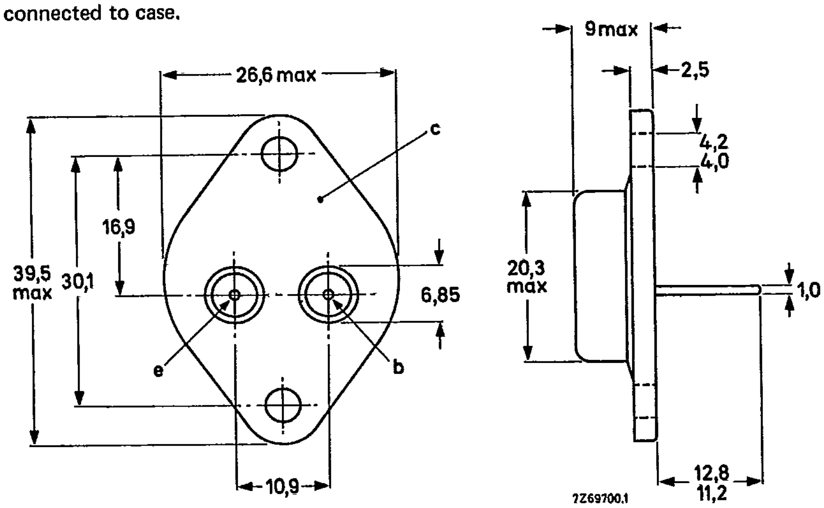
			BDY90	BDY91	BDY92	
Collector-base voltage (open emitter)	V_{CBO}	max.	120	100	80	V
Collector-emitter voltage (open base)	V_{CEO}	max.	100	80	60	V
Collector current (peak value)	I_{CM}	max.		15		A
Total power dissipation up to $T_{mb} = 70\ ^oC$	P_{tot}	max.		40		W
Collector-emitter saturation voltage $I_C = 10$ A; $I_B = 1$ A	V_{CEsat}	<		1		V
Fall time $I_C = 5$ A; $I_B = -I_{BM} = 0,5$ A; $V_{CC} = 30$ V	t_f	<		0,2		µs
Transition frequency at f = 5 MHz $I_C = 0,5$ A; $V_{CE} = 5$ V	f_T	typ.		70		MHz

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-3.

Collector connected to case.



See also chapters Mounting instructions and Accessories.

RATINGS

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

			BDY90	BDY91	BDY92	
Collector-base voltage (open emitter)	V_{CBO}	max.	120	100	80	V
Collector-emitter voltage (V_{EB} = 1,5 V)	V_{CEX}	max.	120	100	80	V
Collector-emitter voltage (open base)	V_{CEO}	max.	100	80	60	V
Emitter-base voltage (open collector)	V_{EBO}	max.	6	6	6	V
Collector current (d.c.)	I_C	max.		10		A
Collector current (peak value)	I_{CM}	max.		15		A
Base current (d.c.)	I_B	max.		2		A
Base current (peak value)	I_{BM}	max.		3		A
Emitter current (d.c.)	$-I_E$	max.		11		A
Emitter current (peak value)	$-I_{EM}$	max.		15		A
Total power dissipation up to T_{mb} = 70 °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	$R_{th\ j\text{-}mb}$	=	2,0	K/W

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector cut-off current				
V_{EB} = 1,5 V; V_{CE} = V_{CEXmax};	I_{CEX}	<	1	mA
V_{EB} = 1,5 V; V_{CE} = V_{CEXmax}; T_{mb} = 150 °C	I_{CEX}	<	3	mA
Saturation voltages				
I_C = 5 A; I_B = 0,5 A	V_{CEsat}	<	0,5	V
	V_{BEsat}	<	1,2	V
I_C = 10 A; I_B = 1 A	V_{CEsat}	<	1,0	V
	V_{BEsat}	<	1,5	V

CHARACTERISTICS

D.C. current gain			
$I_C = 1$ A; $V_{CE} = 2$ V	h_{FE}	>	35
$I_C = 5$ A; $V_{CE} = 5$ V	h_{FE}		30 to 120
$I_C = 10$ A; $V_{CE} = 5$ V	h_{FE}	>	20
Transition frequency at f = 5 MHz			
$I_C = 0{,}5$ A; $V_{CE} = 5$ V	f_T	typ.	70 MHz
Switching times			
Turn on time			
$I_C = 5$ A; $I_B = -I_{BM} = 0{,}5$ A; $V_{CC} = 30$ V	t_{on}	<	0,35 µs
Turn off time			
$I_C = 5$ A; $I_B = -I_{BM} = 0{,}5$ A; $V_{CC} = 30$ V storage time	t_s	<	1,3 µs
fall time	t_f	<	0,2 µs

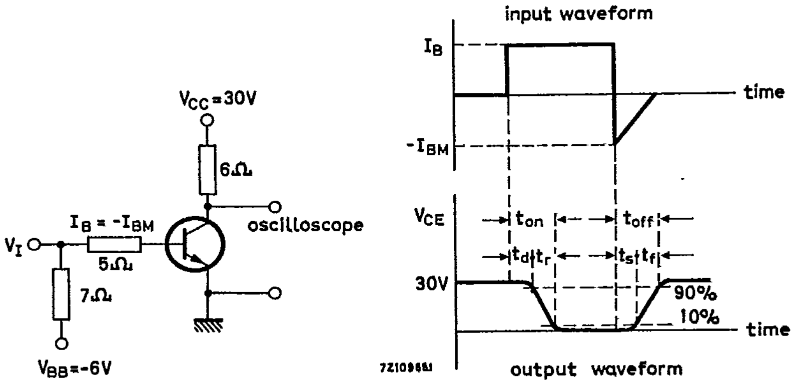


Fig. 2 Test circuit and waveforms.

Pulse generator:

Rise time	t_r	< 50 ns		Pulse duration	t_p	= 20 µs
Fall time	t_f	< 50 ns		Duty cycle	δ	= 0,02

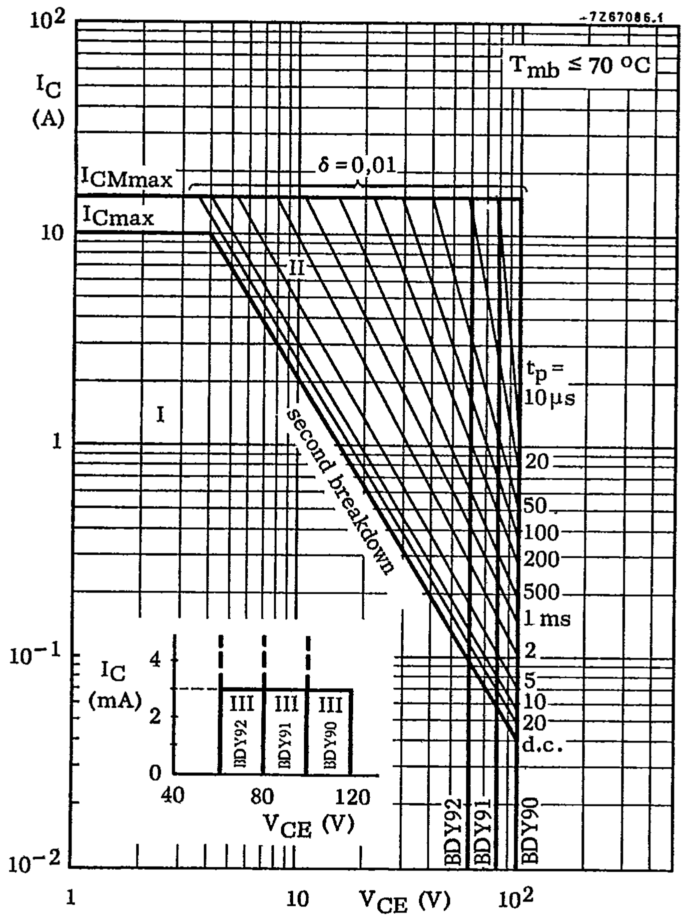


Fig. 3 Safe Operating ARea (Regions I and II forward biased).

I Region of permissible d.c. operation
II Permissible extension for repetitve pulse operation
III Repetitive pulse operation in this region is allowable, provided $-V_{BE} \geq 1,5$ V

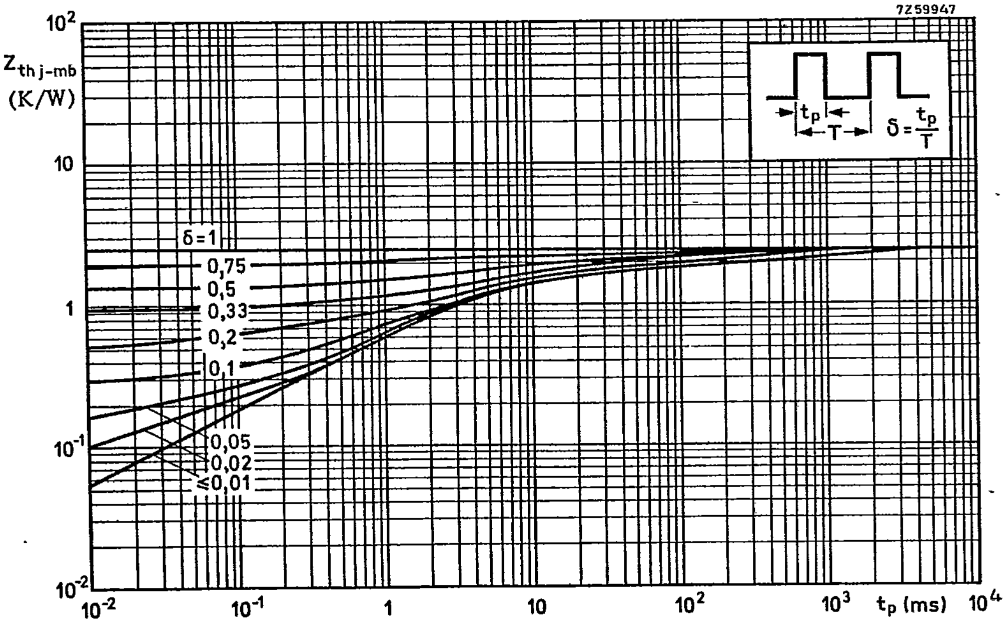


Fig. 4 Pulse power rating chart.

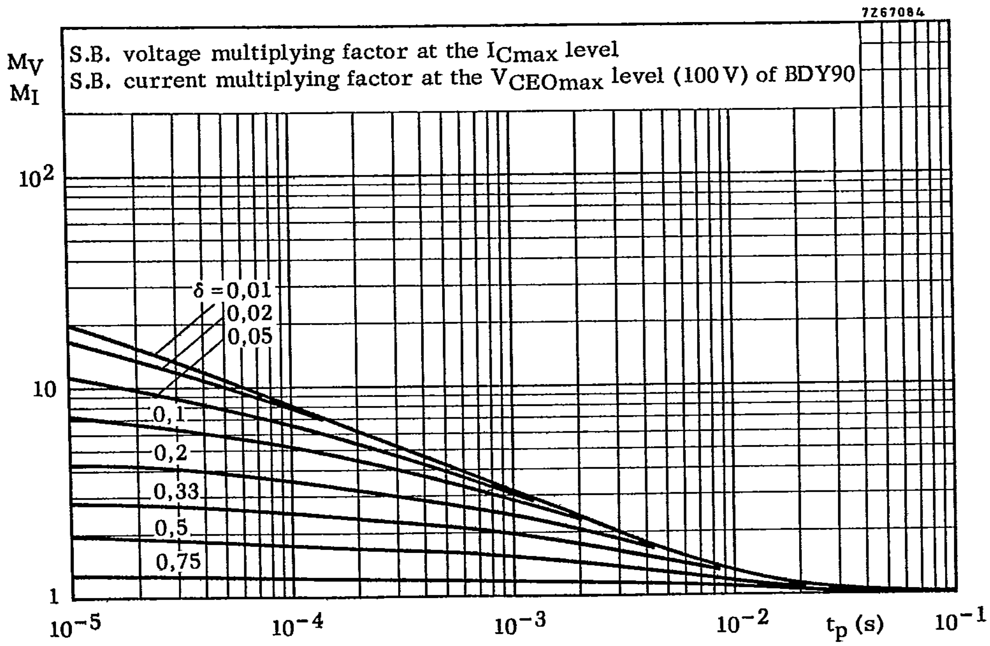


Fig. 5 S.B. voltage multiplying factor at the I_C max level.
S.B. current multiplying factor at the BDY90 V_{CEOmax} level (100 V).

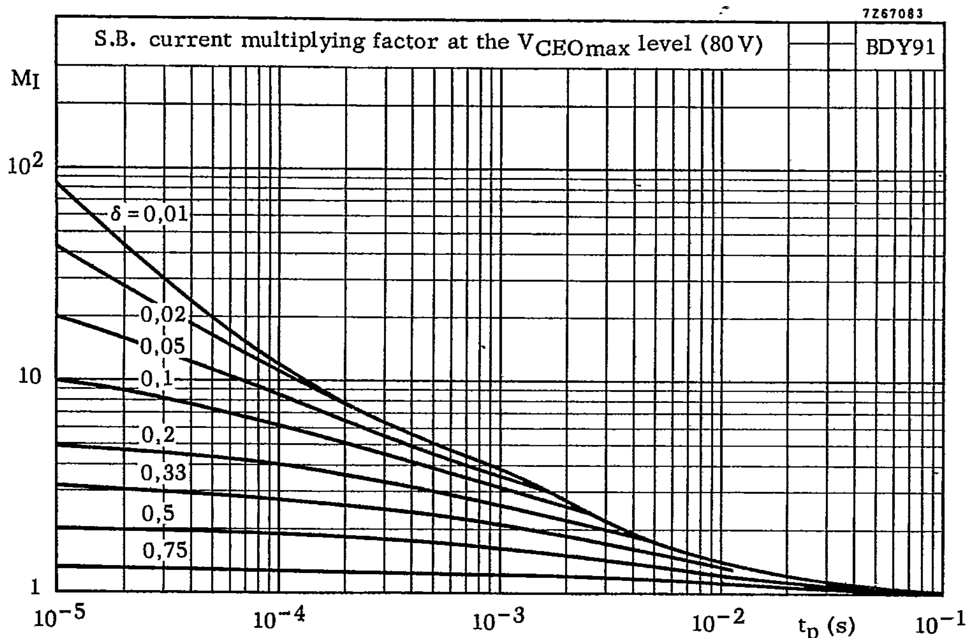


Fig. 6 S.B. current multiplying factor.

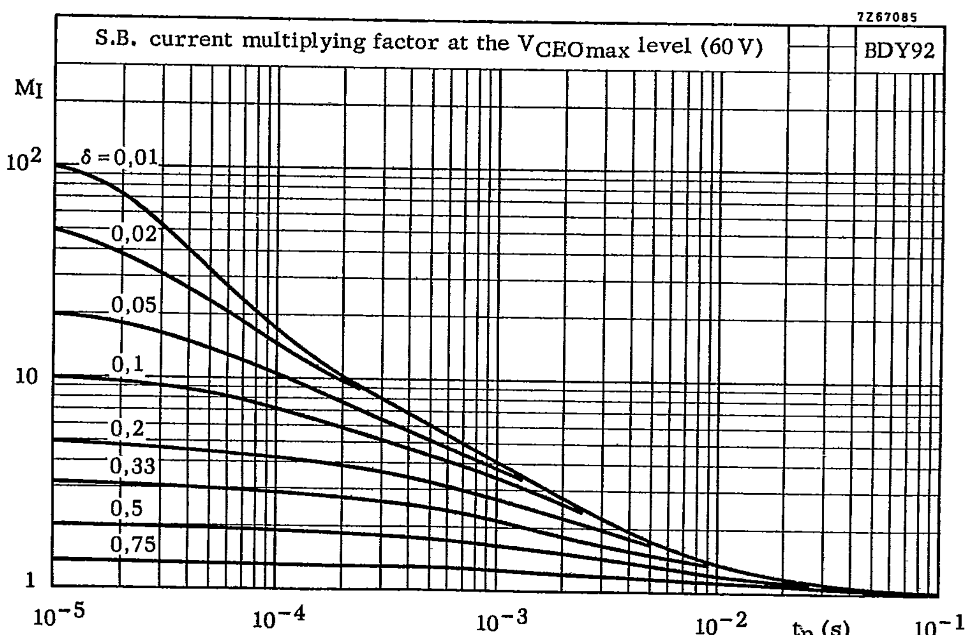


Fig. 7 S.B. current multiplying factor.

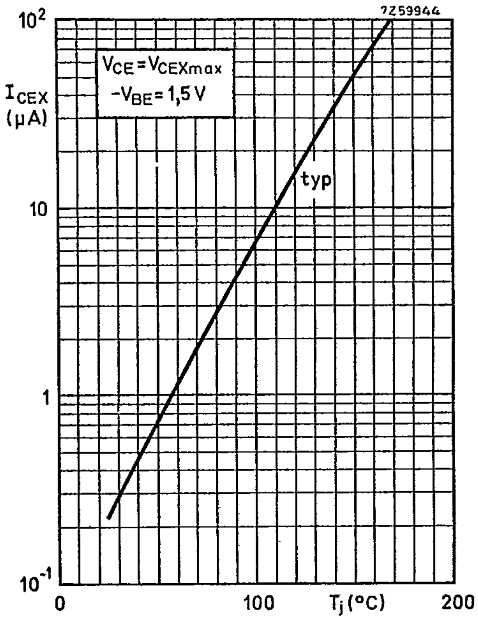


Fig. 8 Collector-emitter current.

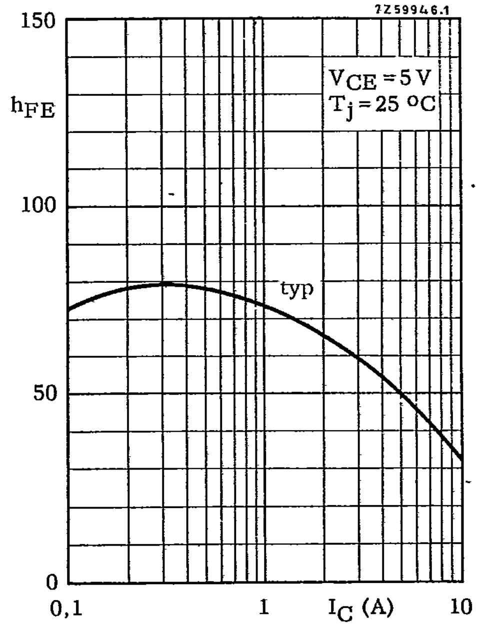


Fig. 9 D.C. current gain.

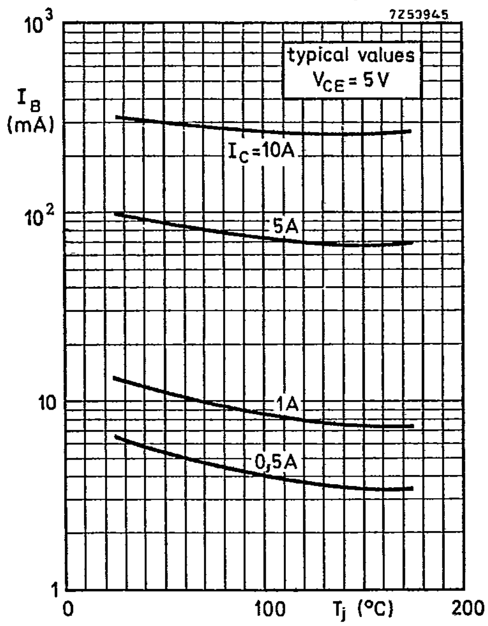


Fig. 10 Typical base current.

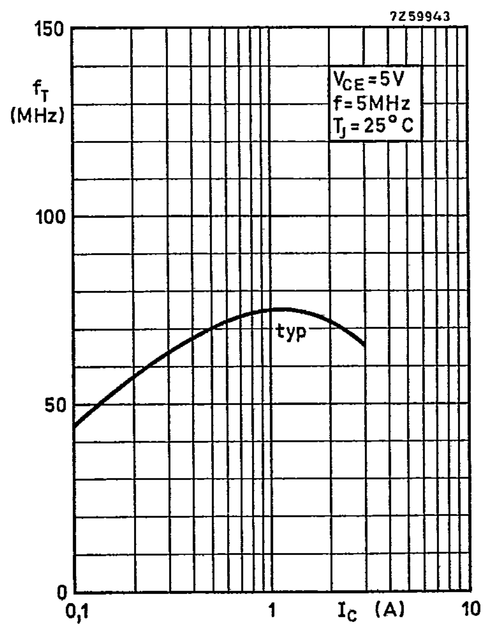


Fig. 11 Transition frequency.

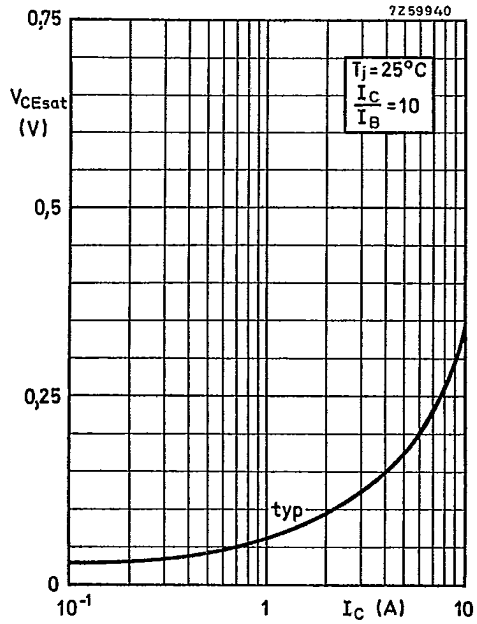


Fig. 12 Collector-emitter saturation voltage as a function of collector current.

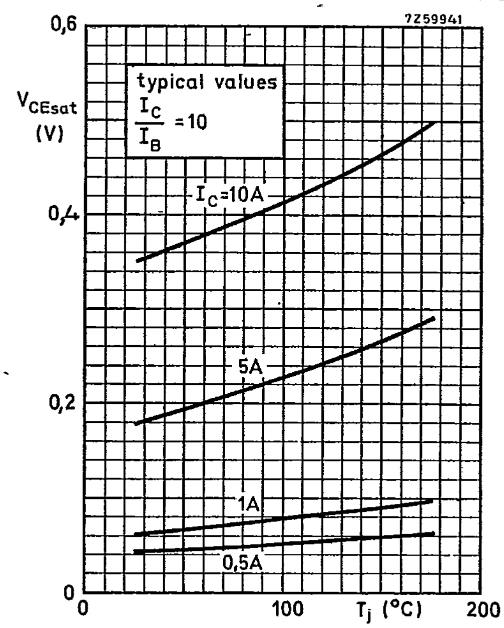


Fig. 13 Collector-emitter saturation voltage as a function of junction temperature.

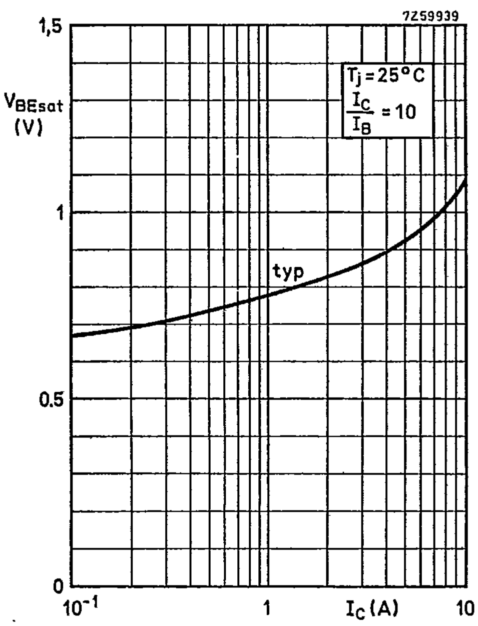


Fig. 14 Typical base-emitter saturation voltage.

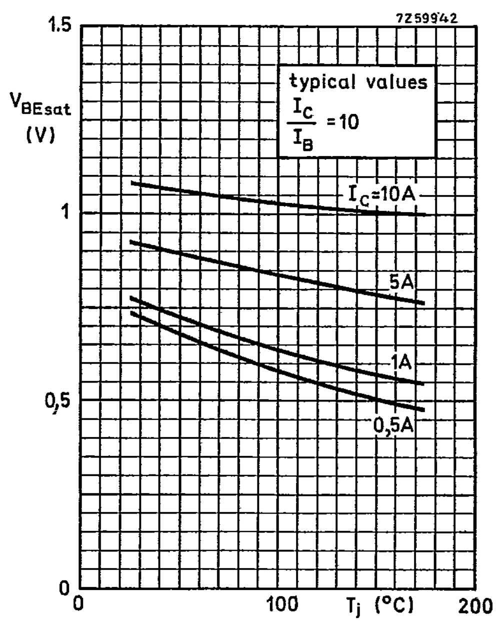


Fig. 15 Typical base-emitter saturation voltage.