Silicon diffused power transistors — BUX84; BUX85

High-voltage, high-speed, glass-passivated npn power transistors in TO-220 envelopes, intended for use in converters, inverters, switching regulators, motor control systems and switching applications.

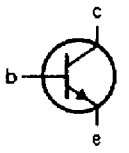
QUICK REFERENCE DATA

			BUX84	BUX85	
Collector-emitter voltage (peak value; V_{BE} = 0)	V_{CESM}	max.	800	1000	V
Collector-emitter voltage (open base)	V_{CEO}	max.	400	450	V
Collector-emitter saturation voltage	V_{CEsat}	max.	1		V
Collector current (DC)	I_C	max.	2		A
Collector current (peak value)	I_{CM}	max.	3		A
Total power dissipation up to T_{mb} = 50 °C	P_{tot}	max.	40		W
Fall time	t_f	max.	0,4		μs

MECHANICAL DATA

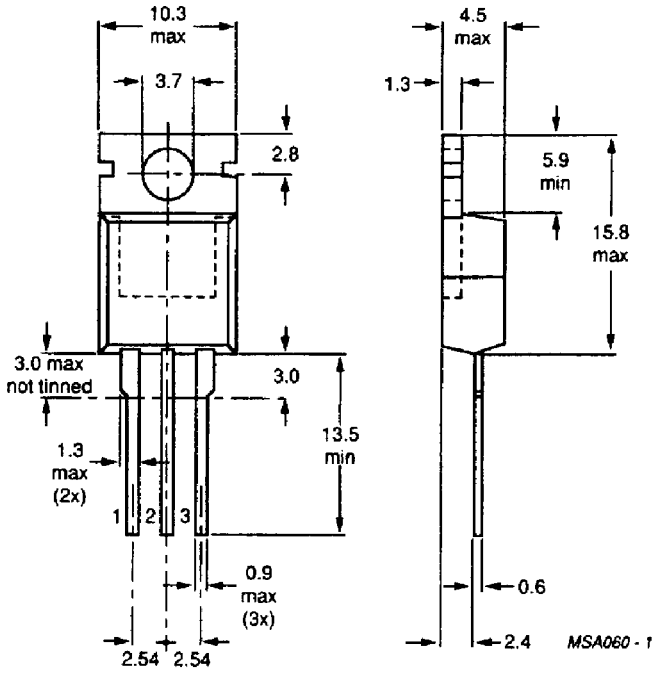
Dimensions in mm

Fig. 1 TO-220AB.



Pinning;

1 = base
2 = collector
3 = emitter



Collector connected to tab

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RATINGS Limiting values in accordance with the Absolute Maximum System (IEC134)

			BUX84	BUX85	
Collector-emitter voltage (peak value; V_{BE} = 0)	V_{CESM}	max	800	1000	V
Collector-emitter voltage (open base)	V_{CEO}	max	400	450	V
Collector current (DC)	I_C	max	2		A
Collector current (peak value) t_p = 2 ms	I_{CM}	max	3		A
Base current (DC)	I_B	max	0,75		A
Base current (peak value)	I_{BM}	max	1		A
Reverse base current (peak value) *	$-I_{BM}$	max	1		A
Total power dissipation up to T_{mb} = 50 °C	P_{tot}	max	40		W
Storage temperature range	T_{stg}		−65 to +150		°C
Junction temperature	T_j	max	150		°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	2,5	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 **				
$V_{CEM} = V_{CESMmax}$; V_{BE} = 0	I_{CES}	max.	200	μA
$V_{CEM} = V_{CESMmax}$; V_{BE} = 0; T_j = 125 °C	I_{CES}	max.	1,5	mA
DC current gain				
I_C = 5 mA; V_{CE} = 5 V	h_{FE}	min.	15	
I_C = 100 mA; V_{CE} = 5 V	h_{FE}	min.	20	
	h_{FE}	typ.	50	
	h_{FE}	max.	100	

* Turn-off current.
** Measured with a half-sinewave voltage (curve tracer).

Emitter cut-off current

$I_C = 0$; $V_{EB} = 5$ V	I_{EBO}	max.	1	mA

Saturation voltages

$I_C = 0{,}3$ A; $I_B = 30$ mA	V_{CEsat}	max.	0,8	V
$I_C = 1$ A; $I_B = 0{,}2$ A	V_{CEsat}	max.	1,0	V
$I_C = 1$ A; $I_B = 0{,}2$ A	V_{BEsat}	max.	1,1	V

Collector-emitter sustaining voltage

$I_C = 100$ mA; $I_{Boff} = 0$; L = 25 mH

			BUX84	BUX85	
$V_{CEOsust}$	min.	400	450	V

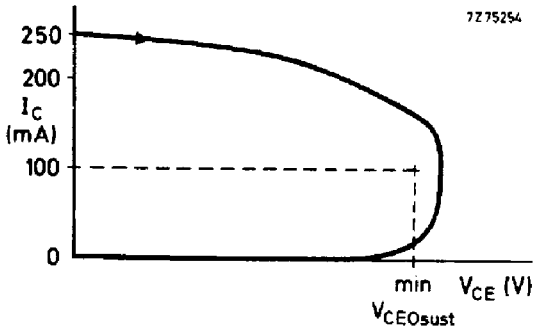


Fig. 2 Oscilloscope display for sustaining voltage.

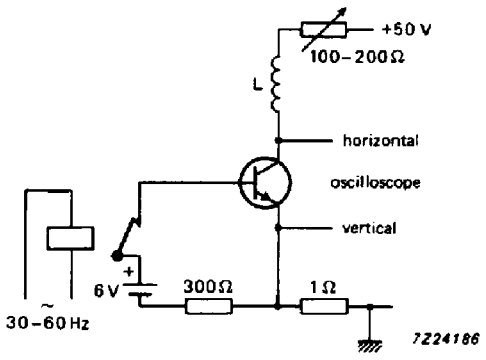


Fig. 3 Test circuit for $V_{CEOsust}$.

CHARACTERISTICS (continued) T_j = 25 °C unless otherwise specified

Transition frequency at f = 1 MHz

I_C = 0,2 A; V_{CE} = 10 V — f_T typ 20 MHz

Switching times

I_{Con} = 1 A; V_{CC} = 250 V

I_{Bon} = 0,2 A; $-I_{Boff}$ = 0,4 A

Turn-on time	t_{on}	typ 0,2	µs
		max. 0,5	µs
Turn-off: Storage time	t_s	typ 2	µs
		max. 3,5	µs
Fall time	t_f	typ 0,4	µs
Fall time, T_{mb} = 95 °C	t_f	max. 1,4	µs

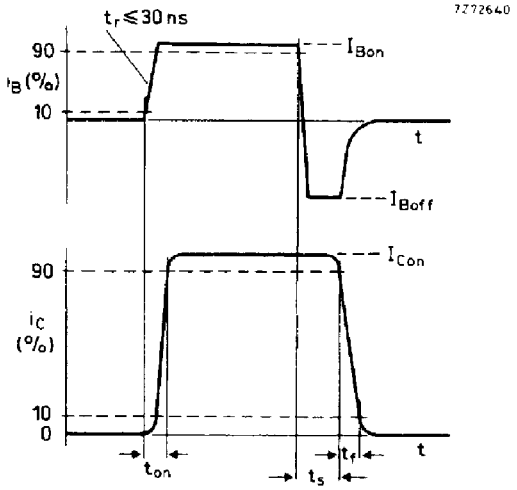
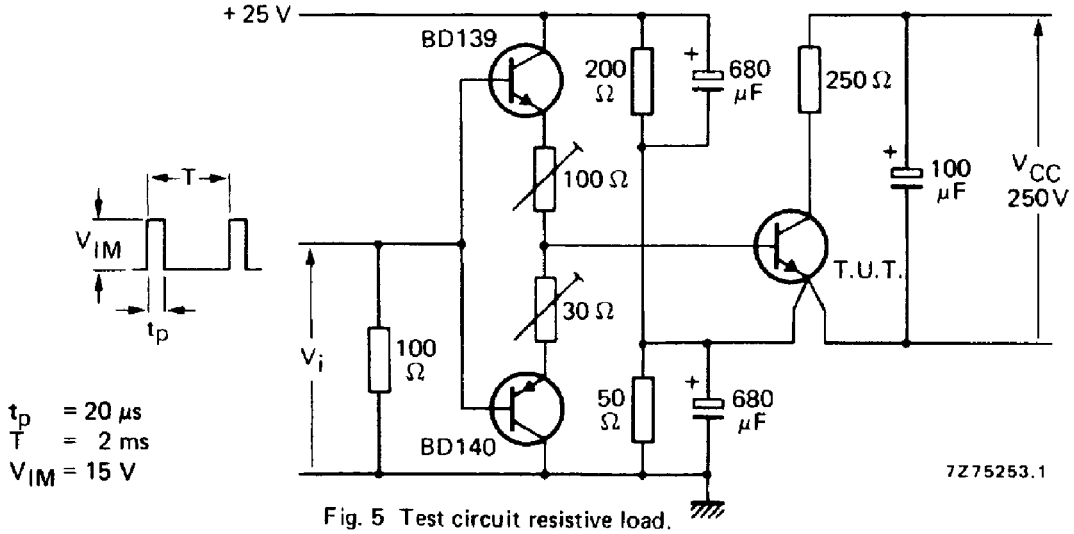
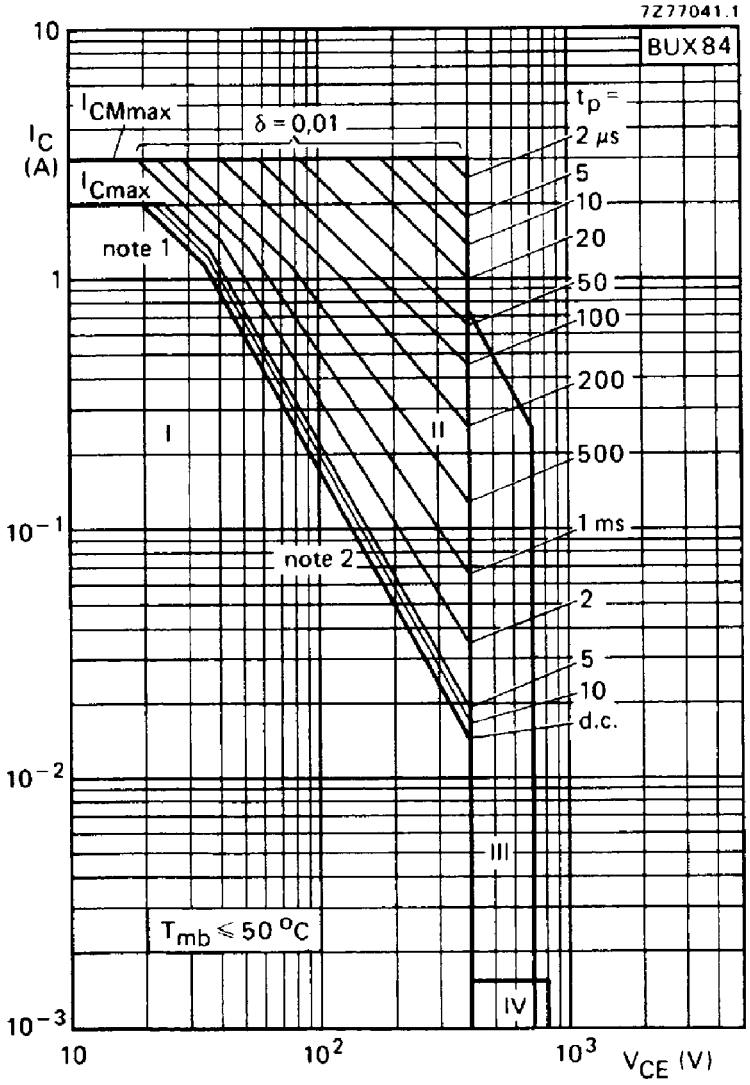


Fig. 4 Switching times waveforms with resistive load.



t_p = 20 µs
T = 2 ms
V_{IM} = 15 V

Fig. 5 Test circuit resistive load.



1. $P_{tot\ max}$ and $P_{peak\ max}$ lines.
2. Second-breakdown limits.

I Region of permissible DC operation

II Permissible extension for repetitive pulse operation

III Area of permissible operation during turn-on in single transistor converters, provided $R_{BE} \leq 100\ \Omega$ and $t_p \leq 0{,}6\ \mu s$

IV Repetitive pulse operation in this region is permissible, provided $V_{BE} \leq 0$ and $t_p \leq 2$ ms

Fig. 6 Safe operating area.

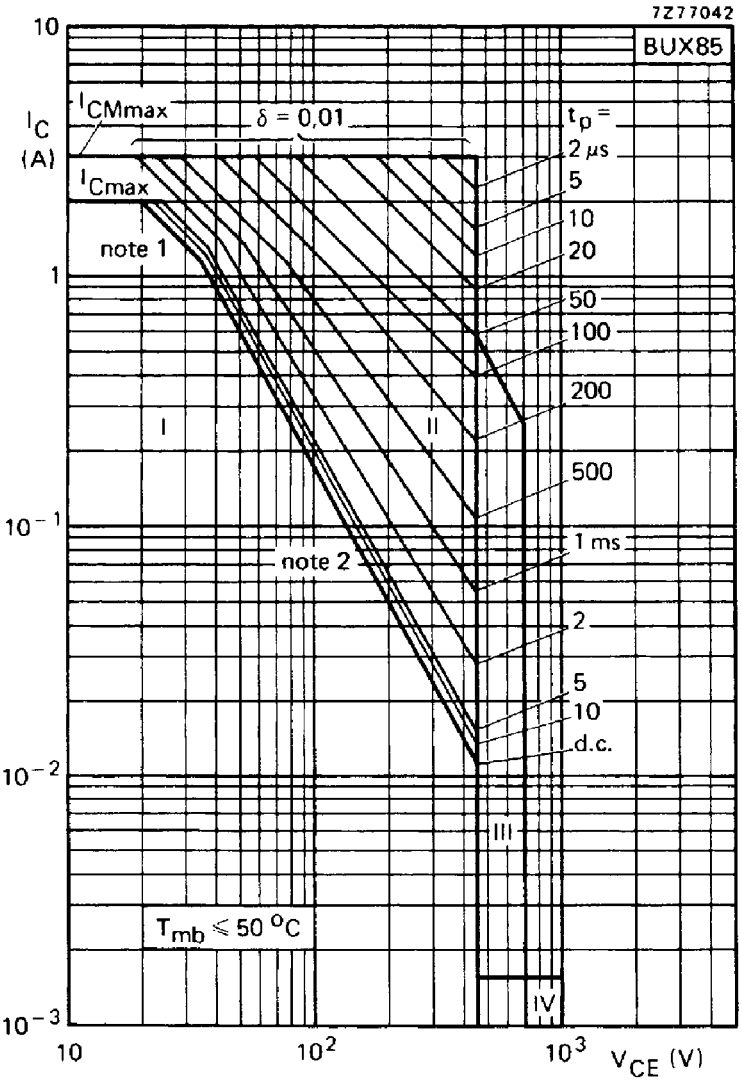


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Fig. 7 Safe operating area.

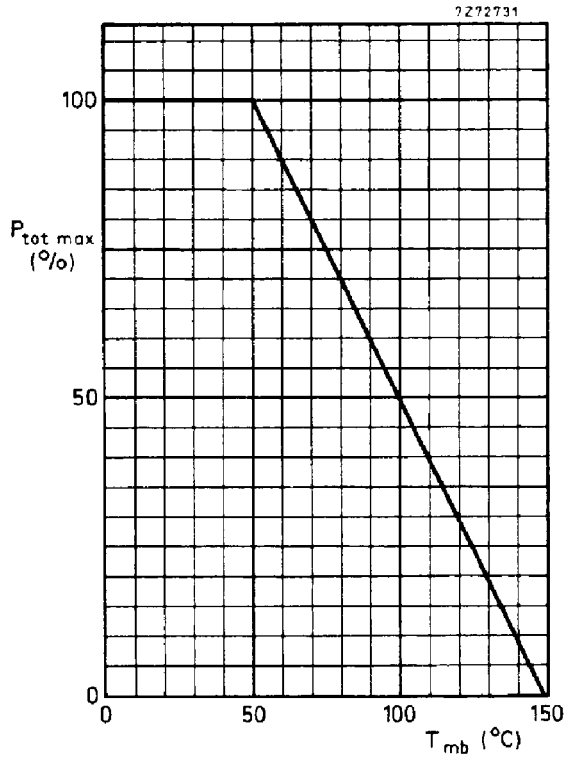

Fig. 8 Power derating curve.

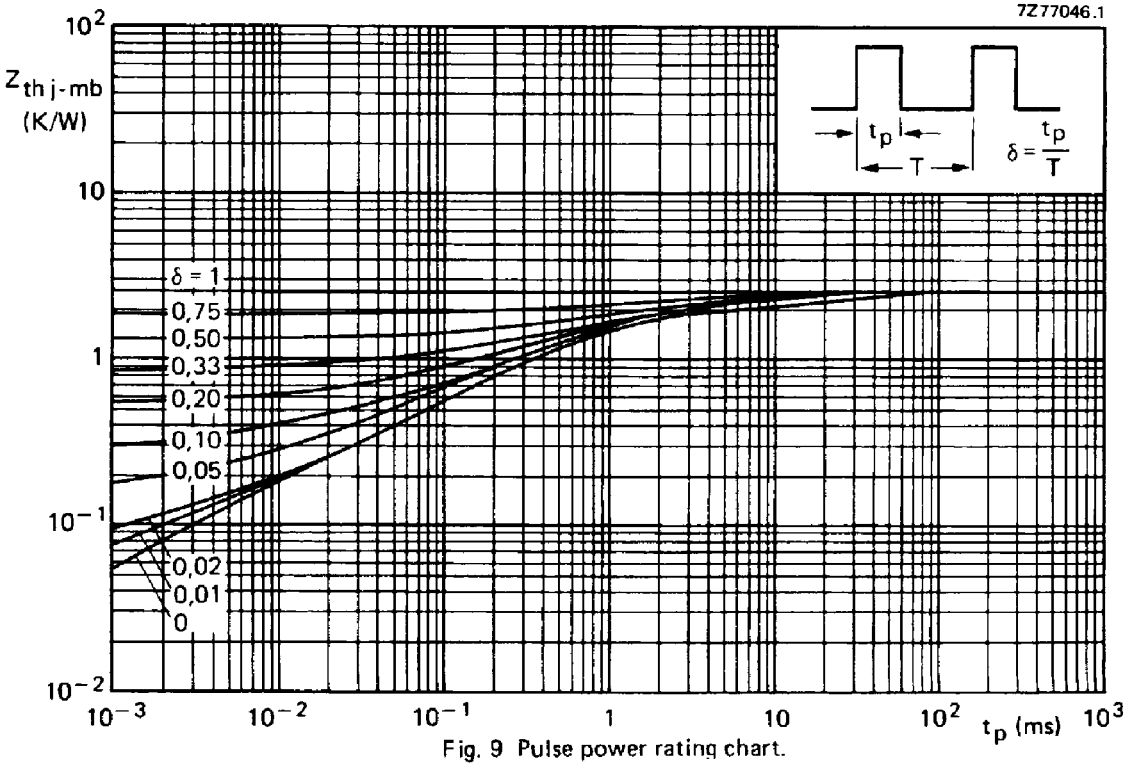

Fig. 9 Pulse power rating chart.

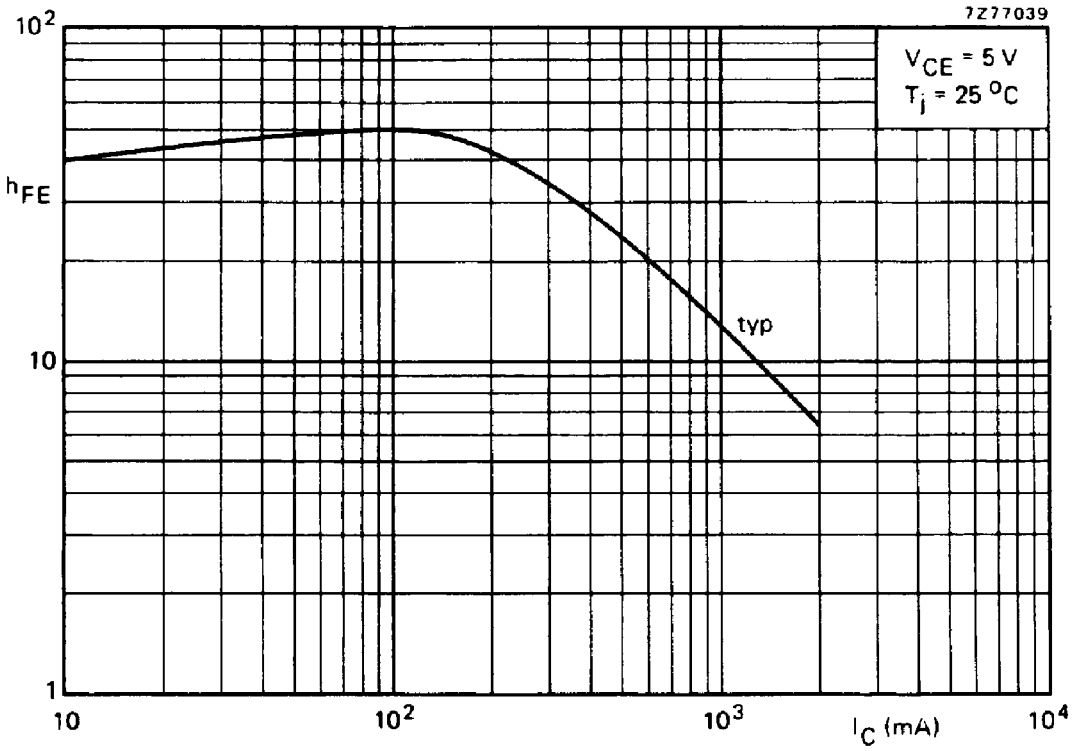

Fig. 10 Typical DC current gain.

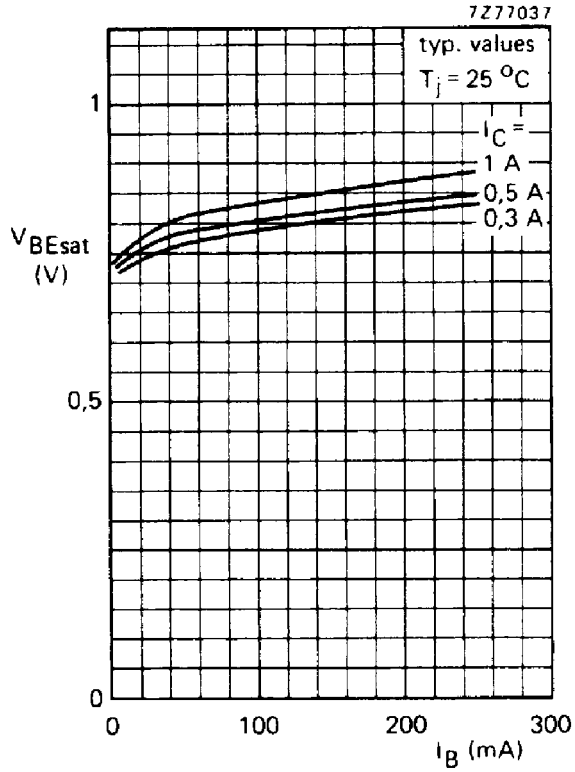

Fig. 11 Typical values saturation voltage, T_j = 25 °C.

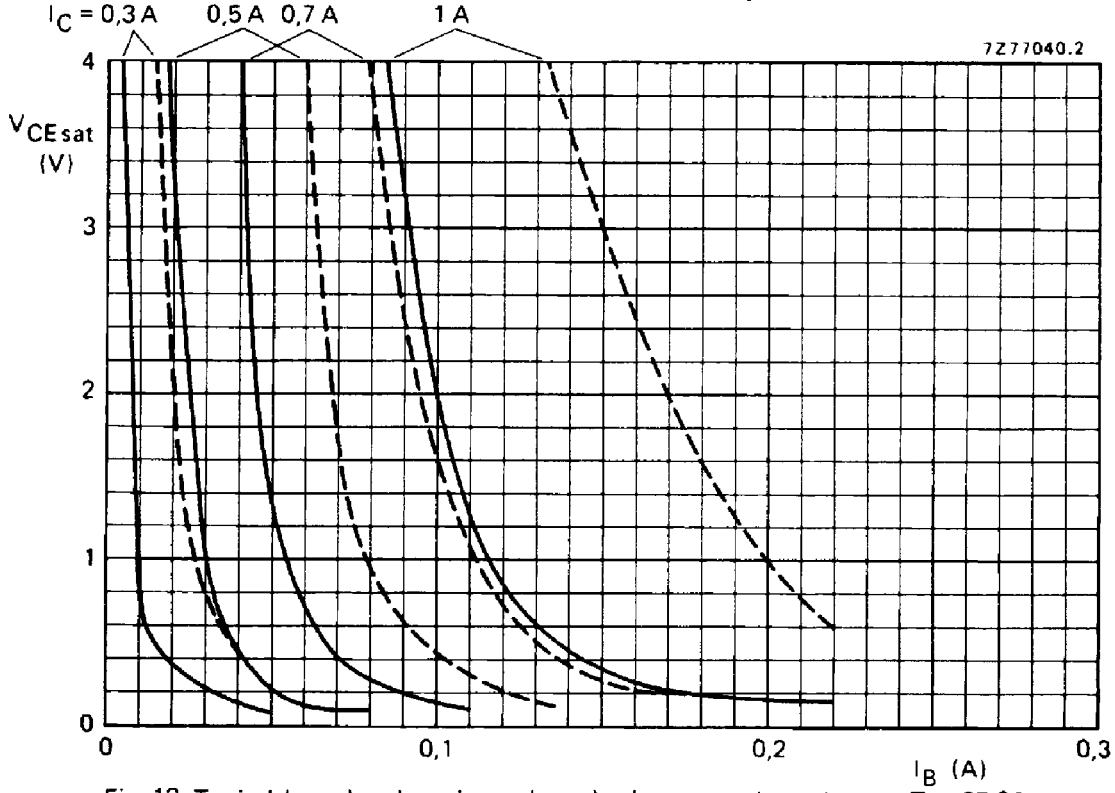

Fig. 12 Typical (——) and maximum (– – –) values saturation voltage at T_j = 25 °C.