

SILICON EPITAXIAL BASE POWER TRANSISTORS

PNP silicon transistors in a plastic envelope intended for use in output stages of audio and television amplifier circuits where high peak powers can occur. NPN complements are TIP29 series.

QUICK REFERENCE DATA

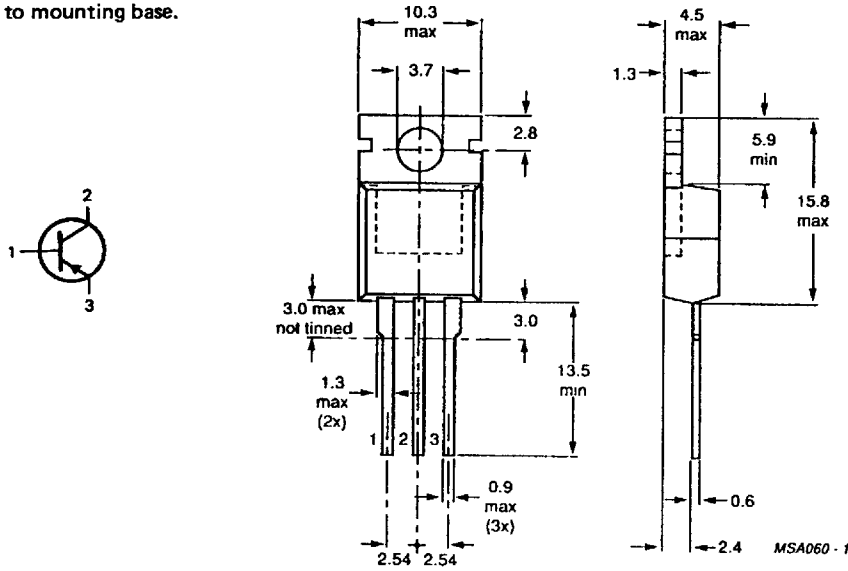
		TIP30			
		A	B	C	
Collector-base voltage	$-V_{CBO}$	max. 80	100	120	140 V
Collector-emitter voltage	$-V_{CEO}$	max. 40	60	80	100 V
Collector current (d.c.)	$-I_C$	max. 1			A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	P_{tot}	max. 30			W
Junction temperature	T_j	max. 150			$^\circ\text{C}$
D.C. current gain		15 to 75			
$-I_C = 1\text{ A}; -V_{CE} = 4\text{ V}$	h_{FE}				
Transition frequency		3 MHz			
$-I_C = 200\text{ mA}; -V_{CE} = 10\text{ V}$	f_T	>			

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-220.

Collector connected to mounting base.



See also chapters Mounting Instructions and Accessories.

RATINGS

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

			TIP30	A	B	C	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	80	100	120	140	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	40	60	80	100	V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5				V
Collector current (d.c.)	$-I_C$	max.	1				A
Collector current (peak value)	$-I_{CM}$	max.	3				A
Base current (d.c.)	$-I_B$	max.	0,4				A
Total power dissipation up to $T_{mb} = 25\text{ }^\circ\text{C}$	P_{tot}	max.	30				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	$R_{th\ j-mb}$	=	4,17			K/W
From junction to ambient in free air	$R_{th\ j-a}$	=	70			K/W

CHARACTERISTICS

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

			TIP30;A	TIP30B;C		
Collector cut-off current						
$-I_B = 0; -V_{CE} = 30\text{ V}$	$-I_{CEO}$	<	0,1	-	mA	
$-I_B = 0; -V_{CE} = 60\text{ V}$	$-I_{CEO}$	<	-	0,1	mA	
$-V_{BE} = 0; -V_{CE} = -V_{CEOmax}$	$-I_{CES}$	<	0,2		mA	
Emitter cut-off current						
$I_C = 0; -V_{EB} = 5\text{ V}$	$-I_{EBO}$	<	0,2		mA	
D.C. current gain*						
$-I_C = 200\text{ mA}; -V_{CE} = 4\text{ V}$	h_{FE}	>	40			
$-I_C = 1\text{ A}; -V_{CE} = 4\text{ V}$	h_{FE}	>	15 to 75			
Base-emitter voltage*						
$-I_C = 1\text{ A}; -V_{CE} = 4\text{ V}$	$-V_{BE}$	<	1,3		V	
Collector-emitter saturation voltage*						
$-I_C = 1\text{ A}; -I_B = 0,125\text{ A}$	$-V_{CEsat}$	<	0,7		V	
Collector-emitter breakdown voltage*						
$I_B = 0; -I_C = 30\text{ mA}$	$-V_{(BR)CEO}$	>	TIP30	A	B	C
			40	60	80	100
Small-signal current gain						
$-I_C = 0,2\text{ A}; -V_{CE} = 10\text{ V}; f = 1\text{ kHz}$	$ h_{fe} $	>	20			
Turn off breakdown energy						
$L = 20\text{ mH}; I_{CC} = 1,22\text{ A}$	$E_{(BR)}$	>	15			mJ

* Measured under pulse conditions: $t_D \leq 300\text{ }\mu\text{s}; \delta < 2\%$.

Transition frequency at $f = 1 \text{ MHz}$

$-I_C = 200 \text{ mA}; -V_{CE} = 10 \text{ V}$

$f_T > 3 \text{ MHz}$

Switching times

$-I_{Con} = 1 \text{ A}; -I_{Bon} = I_{Boff} = 0,1 \text{ A}$

turn-on time

t_{on} typ. $0,3 \mu\text{s}$

turn-off time

t_{off} typ. $1 \mu\text{s}$

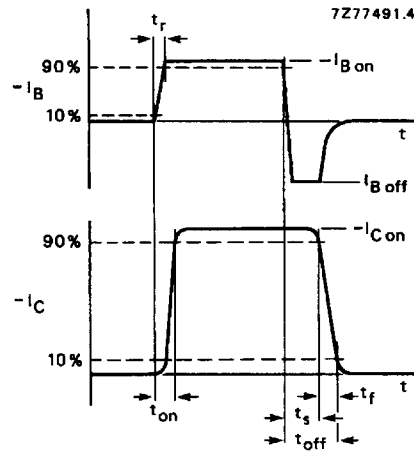


Fig. 2 Switching times waveforms.

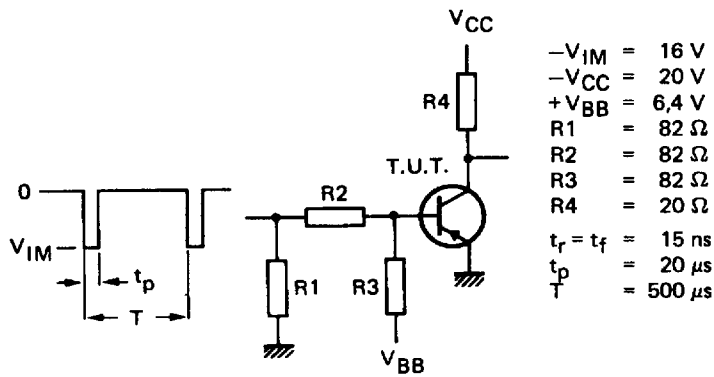


Fig. 3 Switching times test circuit.

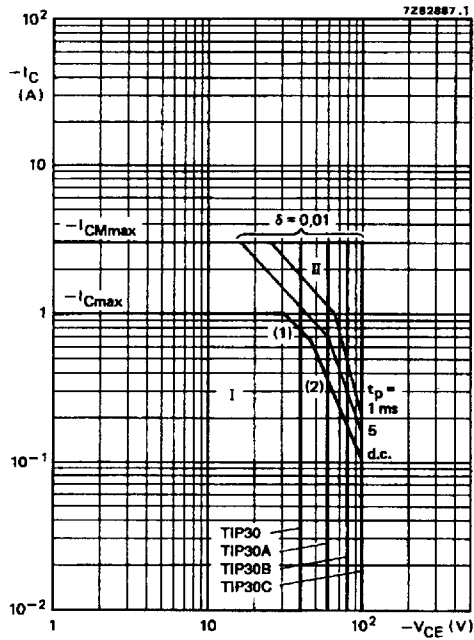


Fig. 4 Safe Operating Area; $T_{mb} = 25^{\circ}\text{C}$.

- 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.

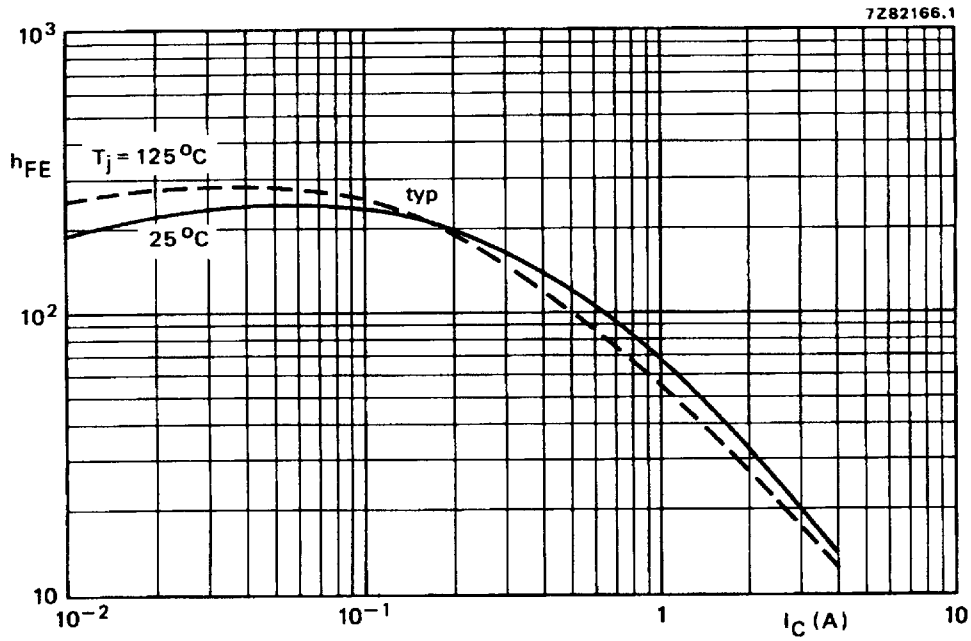


Fig. 5 Typical static forward current transfer ratio as a function of the collector current. $-V_{CE} = 4$ V.