

SILICON PLANAR EPITAXIAL POWER TRANSISTORS

N-P-N silicon transistors, in a plastic TO-202 envelope, recommended for use in television circuits and audio applications.

P-N-P complements are BD840, BD842 and BD844.

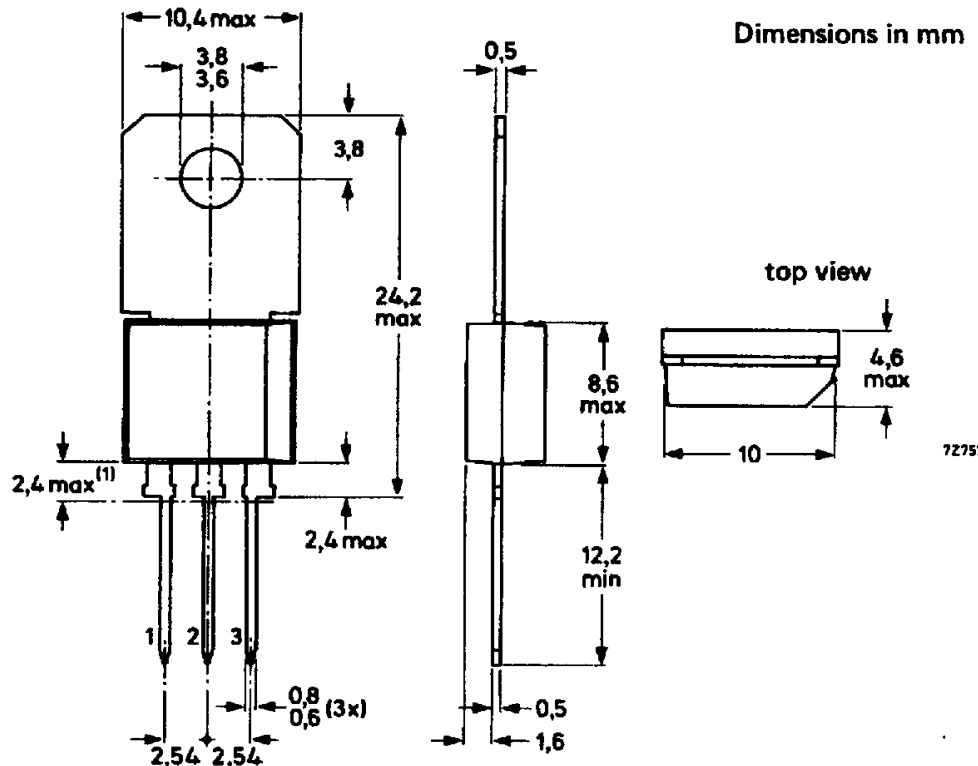
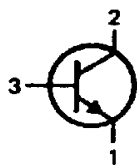
QUICK REFERENCE DATA

		BD839	BD841	BD843	
Collector-base voltage (open emitter)	V_{CBO}	max. 45	60	100	V
Collector-emitter voltage (open base)	V_{CEO}	max. 45	60	80	V
Collector-emitter voltage ($R_{BE} = 1\text{ k}\Omega$)	V_{CER}	max. 45	60	100	V
Collector current (peak value)	I_{CM}	max.	3		A
Total power dissipation					
$T_{amb} = 25\text{ }^\circ\text{C}$ (free air)	P_{tot}	max.	2		W
$T_{mb} = 25\text{ }^\circ\text{C}$	P_{tot}	max.	10		W
Junction temperature	T_j	max.	150		$^\circ\text{C}$
D.C. current gain					
$I_C = 1\text{ A}; V_{CE} = 2\text{ V}$	h_{FE}	>	25		
Transition frequency at $f = 35\text{ MHz}$					
$I_C = 50\text{ mA}; V_{CE} = 5\text{ V}$	f_T	typ.	125		MHz

MECHANICAL DATA

Fig. 1 TO-202.

Collector connected to mounting base.



(1) Plastic flash allowed within this zone.

RATINGS

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

		BD839	BD841	BD843	
Collector-base voltage (open emitter)	V_{CBO}	max. 45	60	100	V
Collector-emitter voltage (open base)	V_{CEO}	max. 45	60	80	V
Collector-emitter voltage ($R_{BE} = 1\text{ k}\Omega$)	V_{CER}	max. 45	60	100	V
Emitter-base voltage (open collector)	V_{EBO}	max. 5	5	5	V
Collector current (d.c.)	I_C	max.	1,5		A
Collector current (peak value)	I_{CM}	max.	3		A
Total power dissipation					
$T_{amb} = 25\text{ }^\circ\text{C}$ (free air)	P_{tot}	max.	2		W
$T_{mb} = 25\text{ }^\circ\text{C}$	P_{tot}	max.	10		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 ambient in free air	$R_{th\ j-a}$	=	62,5		K/W
From junction to mounting base	$R_{th\ j-mb}$	=	12,5		K/W

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

Collector cut-off current

 $I_E = 0; V_{CB} = 30\text{ V}$ $I_{CBO} < 100\text{ nA}$ $I_E = 0; V_{CB} = 30\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $I_{CBO} < 10\text{ }\mu\text{A}$

Emitter cut-off current

 $I_C = 0; V_{EB} = 5\text{ V}$ $I_{EBO} < 10\text{ }\mu\text{A}$

Base-emitter voltage*

 $I_C = 1\text{ A}; V_{CE} = 2\text{ V}$ $V_{BE} < 1,3\text{ V}$

Collector-emitter saturation voltage

 $I_C = 1\text{ A}; I_B = 0,1\text{ A}$ $V_{CEsat} < 0,8\text{ V}$

D.C. current gain

 $I_C = 5\text{ mA}; V_{CE} = 2\text{ V}$ $h_{FE} > 25$ $I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$ $h_{FE} > 40\text{ to }250$ $I_C = 1\text{ A}; V_{CE} = 2\text{ V}$ $h_{FE} > 25$ Transition frequency at $f = 35\text{ MHz}$ $I_C = 50\text{ mA}; V_{CE} = 5\text{ V}$ $f_T \text{ typ. } 125\text{ MHz}$

D.C. current gain ratio of

BD839/BD840, BD841/BD842, BD843/BD844

 $|I_C| = 150\text{ mA}; |V_{CE}| = 2\text{ V}$ $h_{FE1}/h_{FE2} \text{ typ. } 1,3$ $h_{FE1}/h_{FE2} < 1,6$ * V_{BE} decreases by about $2,3\text{ mV/K}$ with increasing temperature.

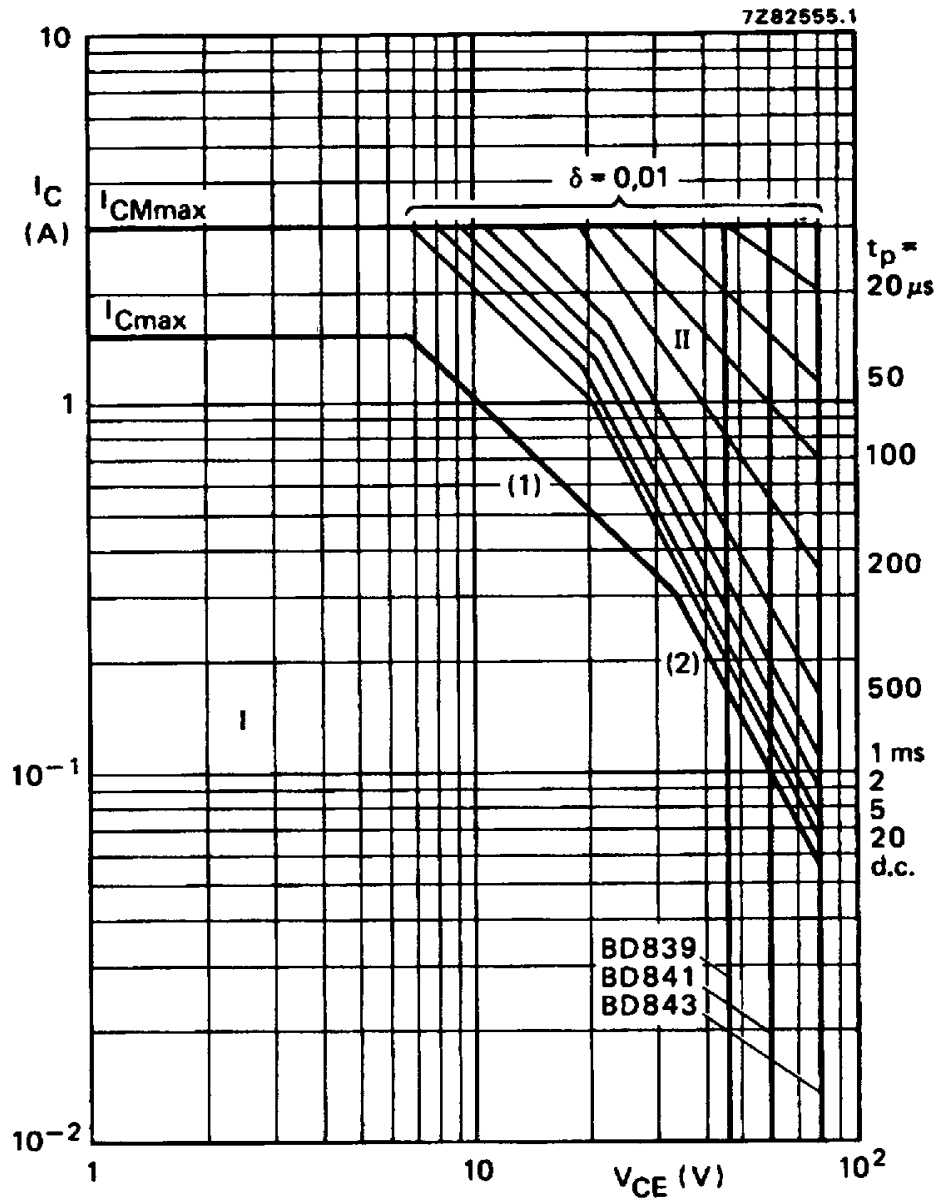


Fig. 2 Safe Operating Area, $T_{mb} \leq 25^\circ C$.

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.

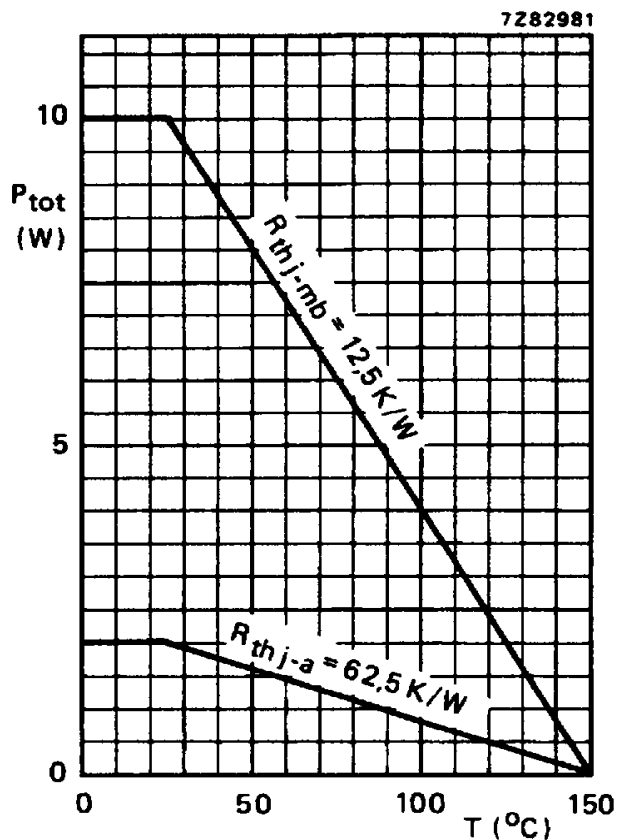


Fig. 3 Power derating curve.

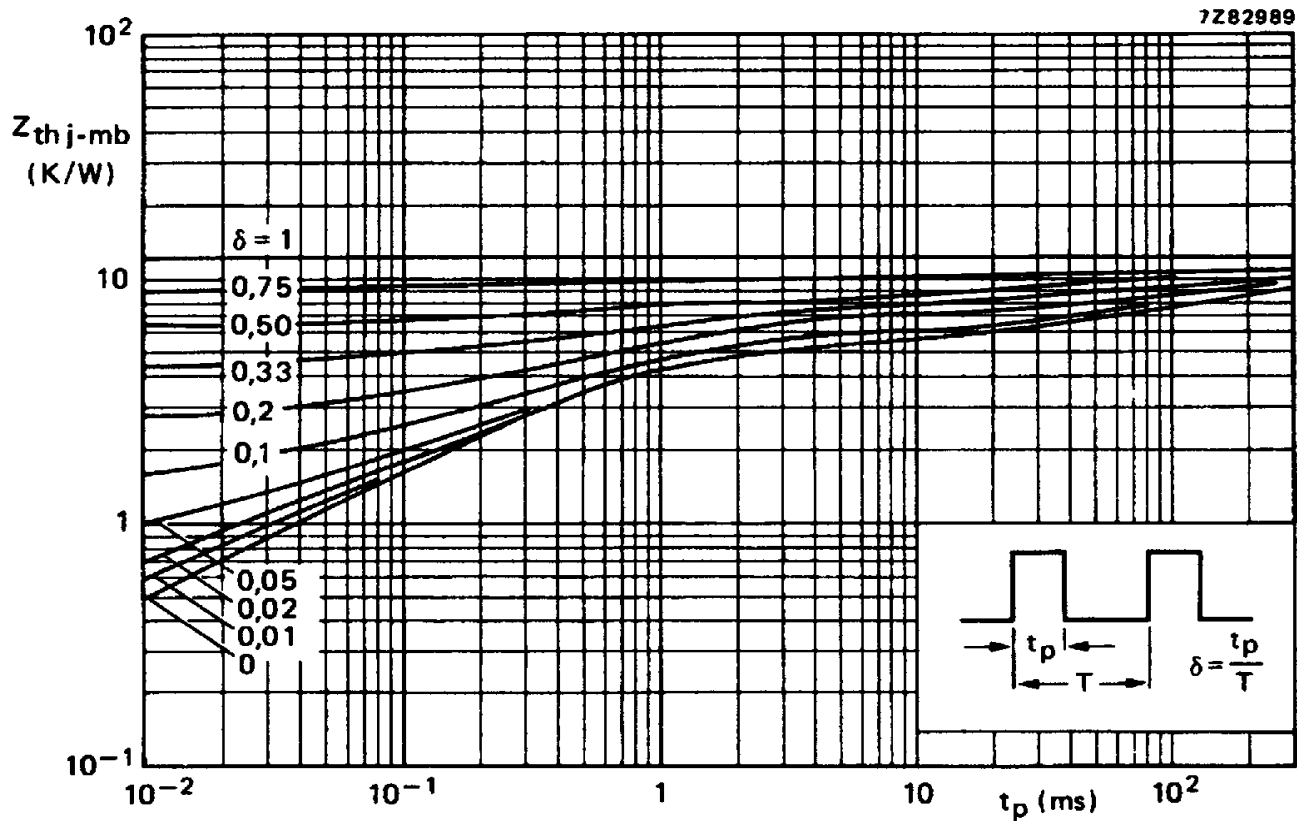


Fig. 4 Pulse power rating chart.

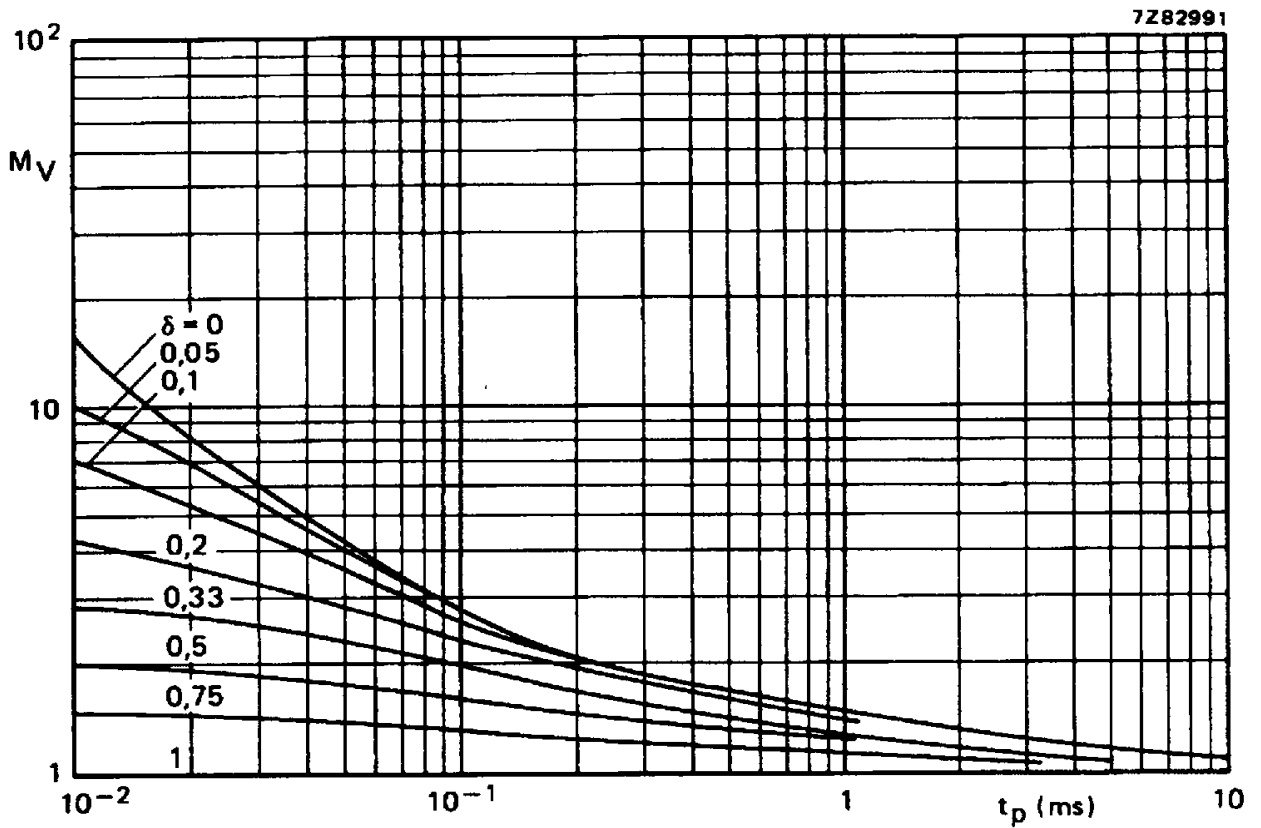


Fig. 5 S.B. voltage multiplying factor at the I_{Cmax} level.

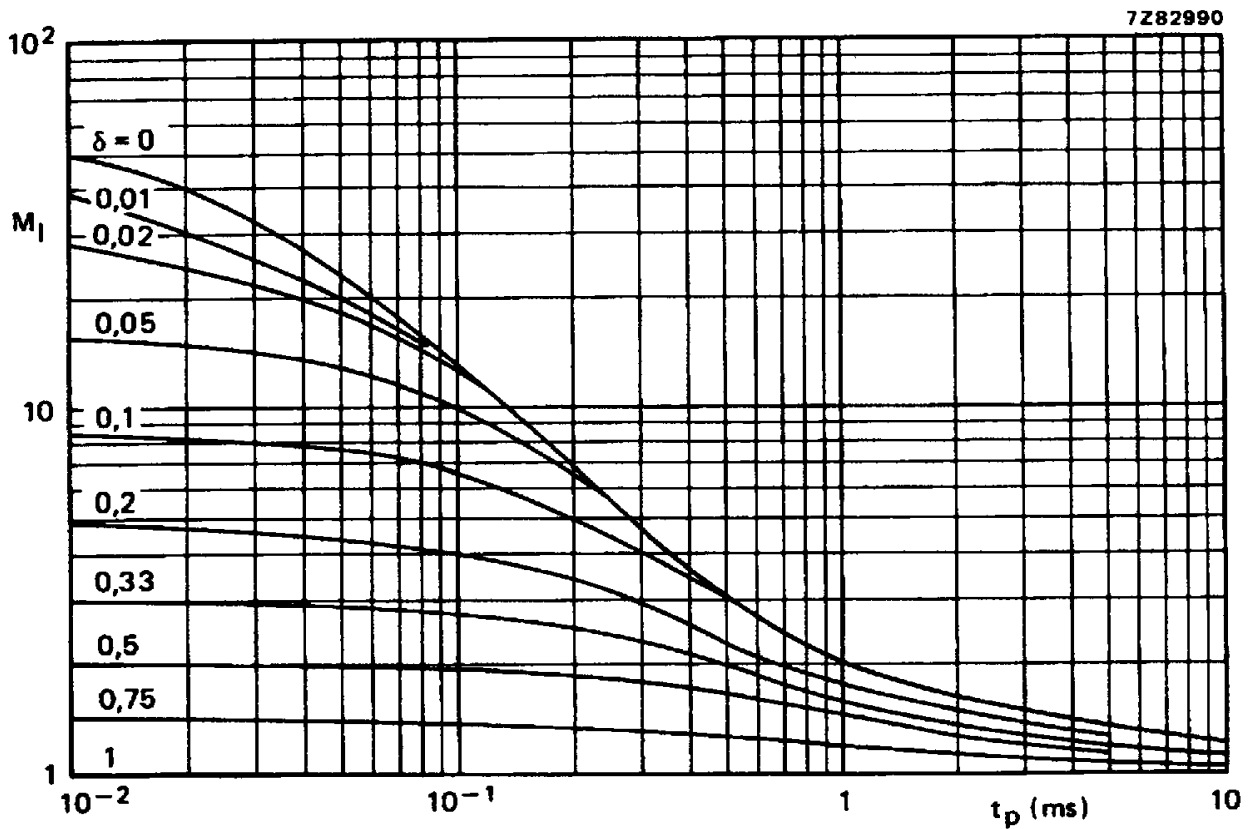


Fig. 6 S.B. current multiplying factor at the V_{CE0max} level.

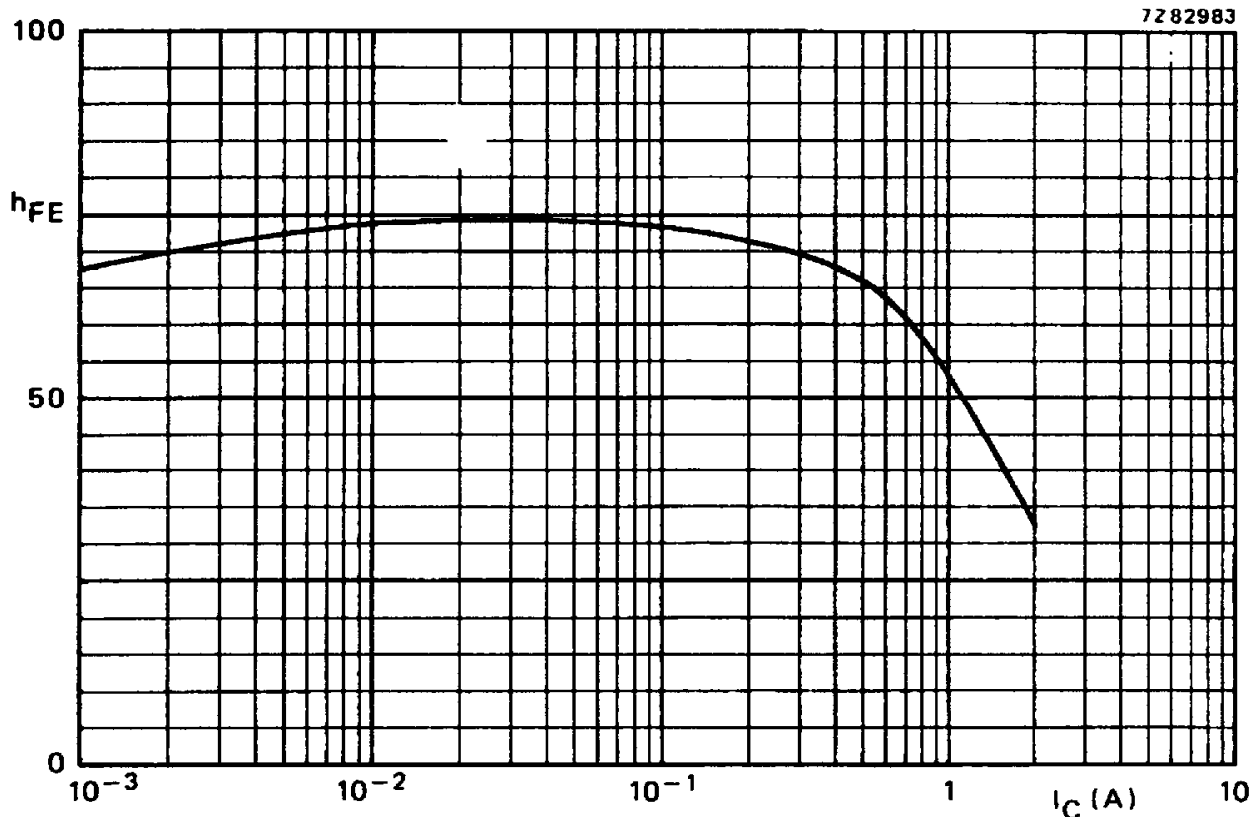


Fig. 7 Typical values d.c. current gain. $V_{CE} = 2\text{ V}$; $T_{amb} = 25\text{ }^\circ\text{C}$.

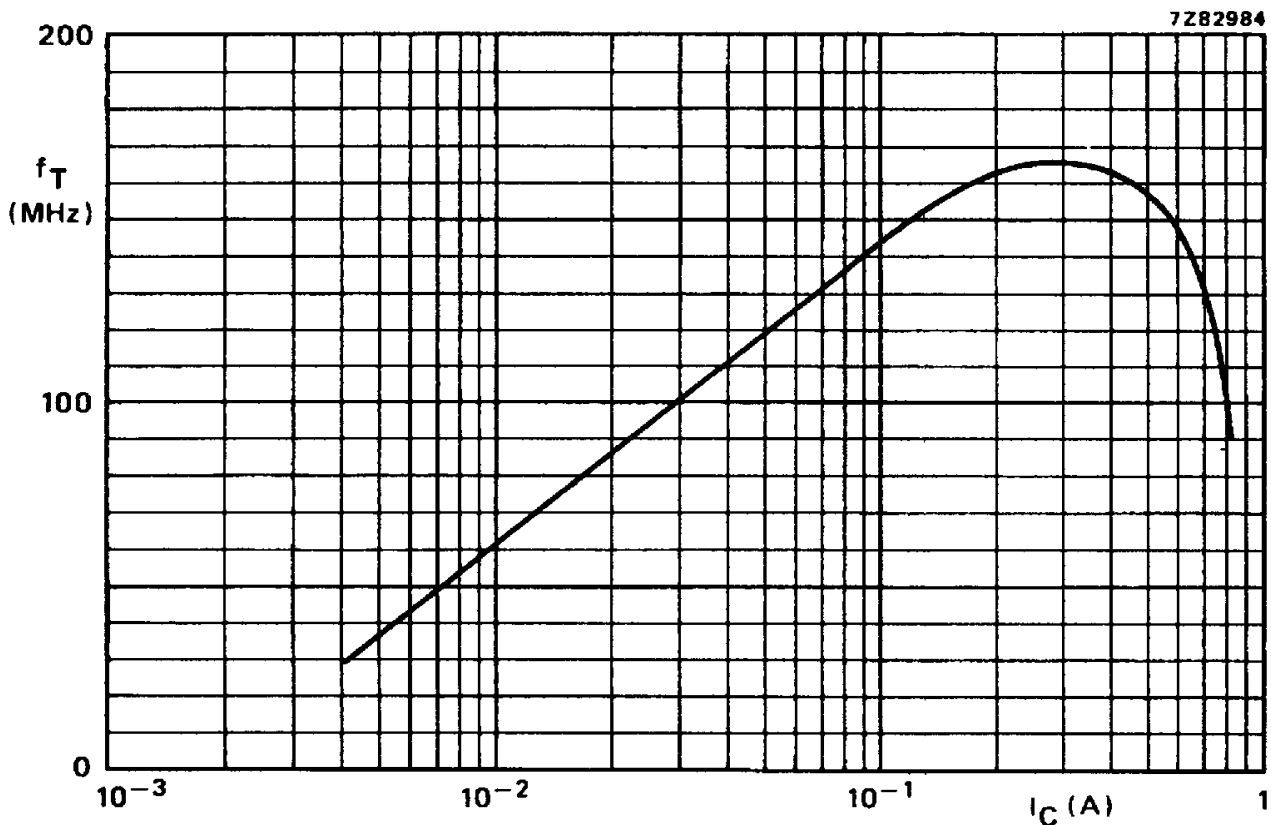


Fig. 8 Typical values transition frequency. $V_{CE} = 5\text{ V}$; $T_{amb} = 25\text{ }^\circ\text{C}$; $f = 35\text{ MHz}$.

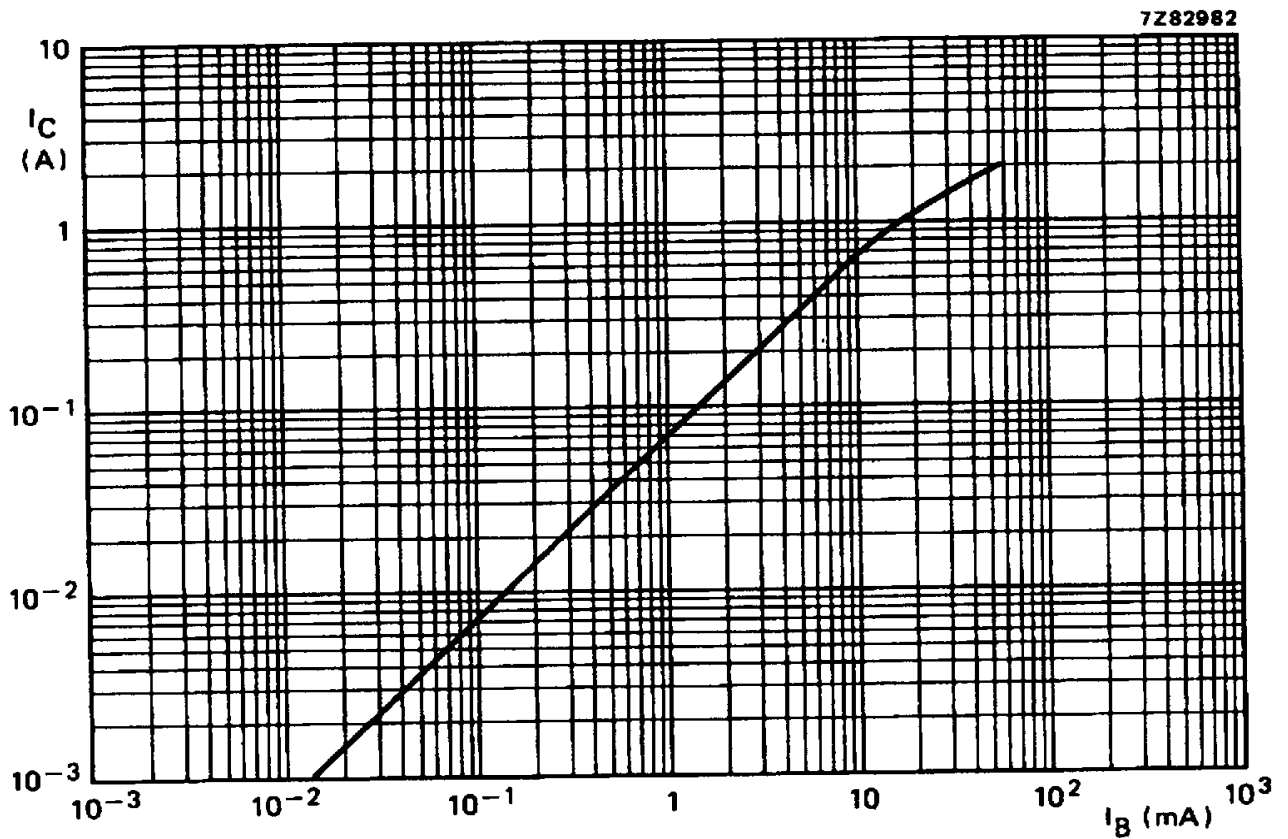


Fig. 9 Typical values at $V_{CE} = 2\text{ V}$; $T_{amb} = 25\text{ }^\circ\text{C}$.

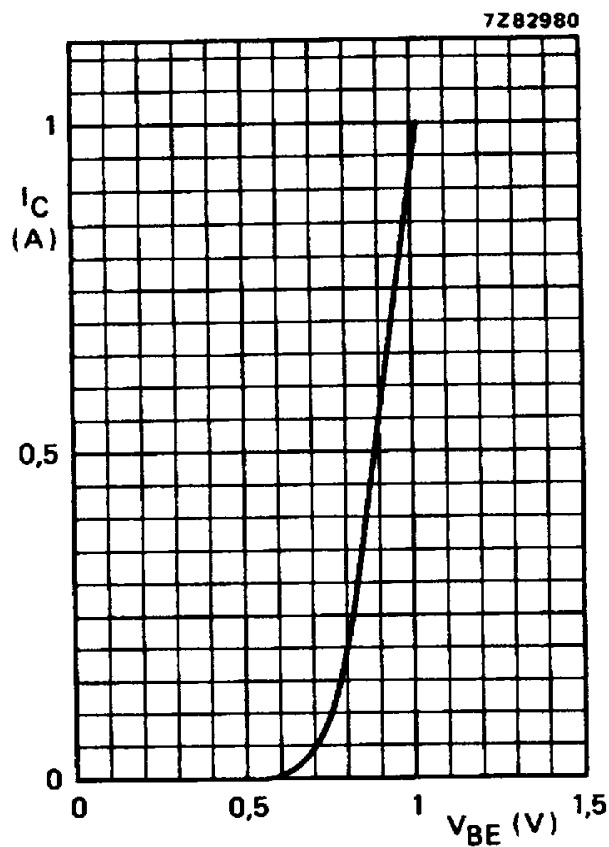


Fig. 10 Typical values. $V_{CE} = 2\text{ V}$; $T_{amb} = 25\text{ }^\circ\text{C}$.