290-634

MAGNA TEC

BDT81; BDT83 SILICON POWER TRANSISTORS
BDT85; BDT87

N-P-N epitaxial base transistors in a TO-220 plastic envelope, designed for use in audio output stages and general amplifier and switching applications.

P-N-P complements are BDT82, BDT84, BDT86 and BDT88.

QUICK REFERENCE DATA

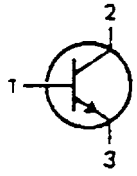
			BDT81	BDT83	BDT85	BDT87	
Collector-base voltage (open emitter)	V_{CBO}	max.	60	80	100	120	V
Collector-emitter voltage (open base)	V_{CEO}	max.	60	80	100	120	V
Emitter-base voltage (open collector)	V_{EBO}	max.	7	7	7	7	V
Collector current (d.c.)	I_C	max.		15			A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.		125			W
Junction temperature	T_j	max.		150			°C
D.C. current gain I_C = 5 A; V_{CE} = 4 V	h_{FE}	min.		40			

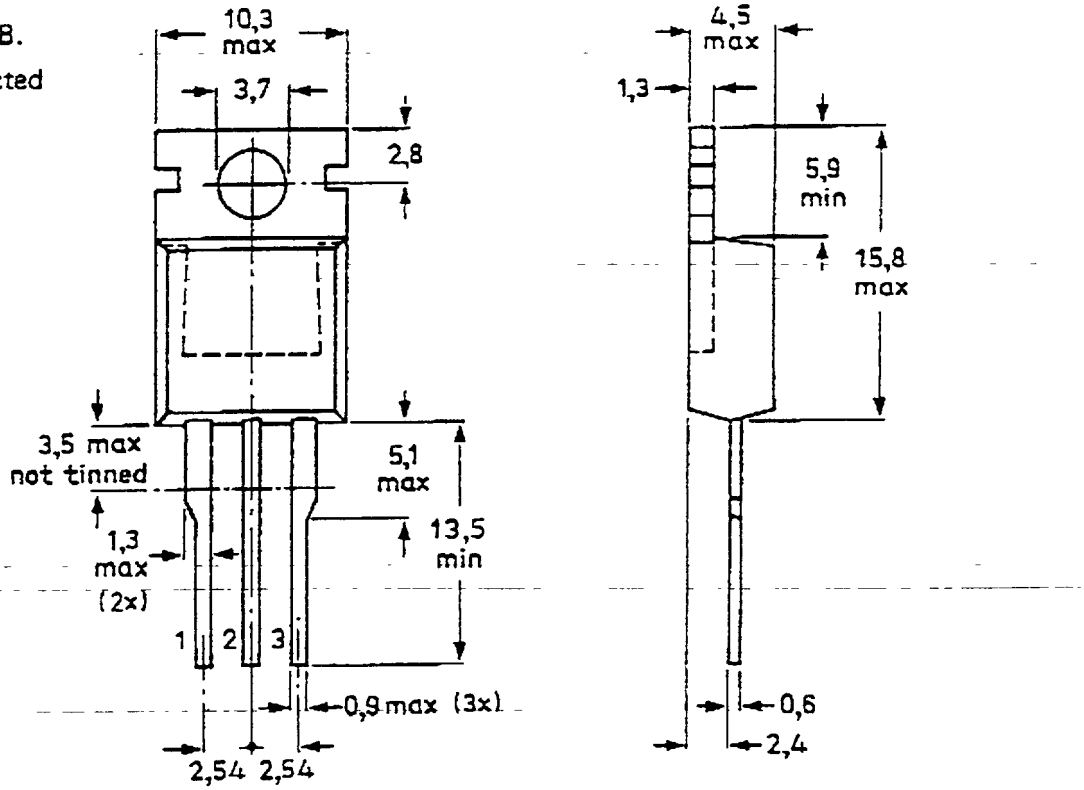
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-220AB.

Collector connected to case.





DT81; BDT83
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RATINGS

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

			BDT81	BDT83	BDT85	BDT87	
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
Emitter-base voltage (open collector)	V_{EBO}	max.	7	7	7	7	V
Collector current (d.c.)	I_C	max.		15			A
Collector current (peak value)	I_{CM}	max.		20			A
Base current (d.c.)	I_B	max.		4			A
Total power dissipation up to $T_{mb} = 25\ ^oC$	P_{tot}	max.		125			W
Storage temperature	T_{stg}			−65 to + 150			°C
Junction temperature	T_j	max.		150			°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	1	K/W
From junction to ambient	$R_{th\ j\text{-}a}$	=	70	K/W

CHARACTERISTICS

$T_j = 25\ ^oC$ unless otherwise specified

Collector cut-off current				
$I_E = 0$; $V_{CB} = V_{CBOmax}$	I_{CBO}	<	0,2	mA
$V_{BE} = 0$; $V_{CE} = 0{,}8\ V_{CBOmax}$	I_{CES}	<	1	mA
Emitter cut-off current				
$I_C = 0$; $V_{EB} = 7$ V	I_{EBO}	<	0,1	mA
D.C. current gain*				
$I_C = 50$ mA; $V_{CE} = 10$ V	h_{FE}	>	40	
$I_C = 5$ A; $V_{CE} = 4$ V		>	40	
Collector-emitter saturation voltage*				
$I_C = 5$ A; $I_B = 0{,}5$ A	V_{CEsat}	<	1	V*
$I_C = 7$ A; $I_B = 0{,}7$ A		<	1,6	V*
Base-emitter voltage*				
$I_C = 5$ A; $V_{CE} = 4$ V	V_{BE}	<	1,5	V*
Transition frequency at f = 1 MHz				
$I_C = 0{,}5$ A; $V_{CE} = 10$ V	f_T	typ.	10	MHz
Second breakdown collector current				
$V_{CE} = 50$ V; $t_p = 100$ ms	I_{SB}	>	2,5	A

* Measured under pulse conditions: $t_p \leqslant 300\ \mu s$; $\delta \leqslant 2\%$.

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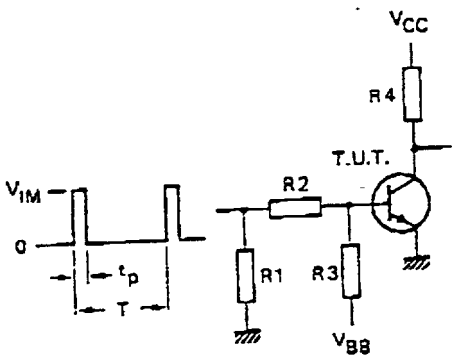
Switching times (see Fig. 2)
$I_C = 7$ A; $I_{B1} = -I_{B2} = 0{,}7$ A

t_{on}	≤	1 μs
t_{off}	≤	2 μs



V_{IM} = 14 V
V_{CC} = 35 V
$-V_{BB}$ = 2,7 V
R1 = 56 Ω
R2 = 10 Ω
R3 = 4,7 Ω
R4 = 4,7 Ω
$t_r = t_f$ = 15 ns
t_p = 10 μs
T = 500 μs

Fig. 2 Switching times test circuit.

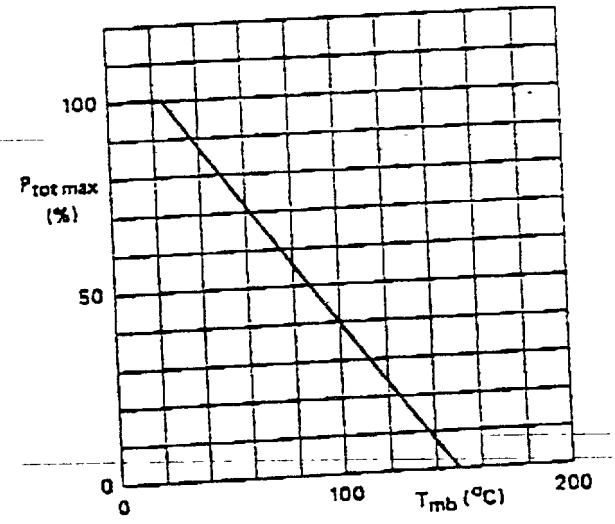


Fig. 3 Power derating curve.

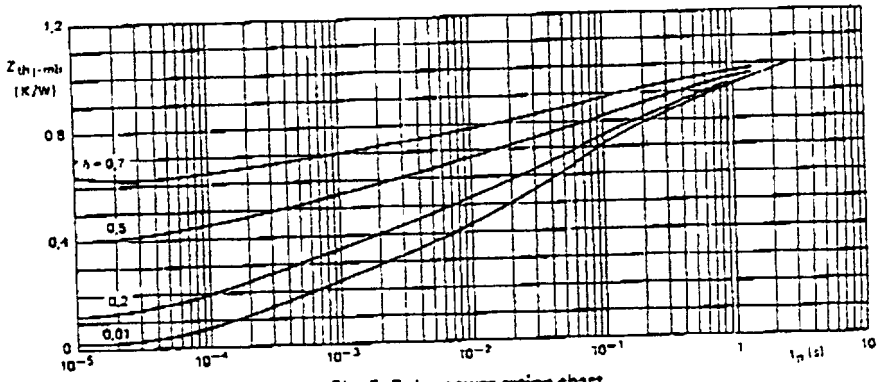


Fig. 5 Pulse power rating chart.

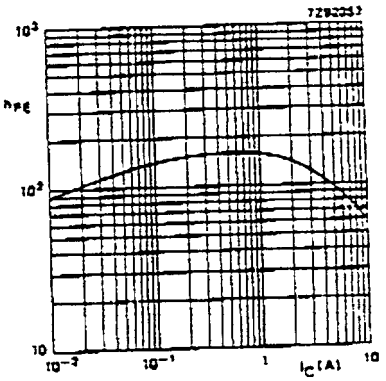


Fig. 6 Typical d.c. current gain; T_{amb} = 25 °C; V_{CE} = 4 V.

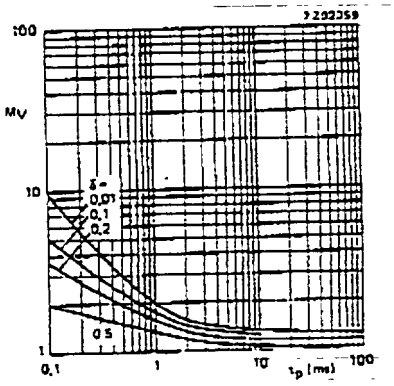


Fig. 7 Second-breakdown voltage multiplying factor at I_{Cmax} level.

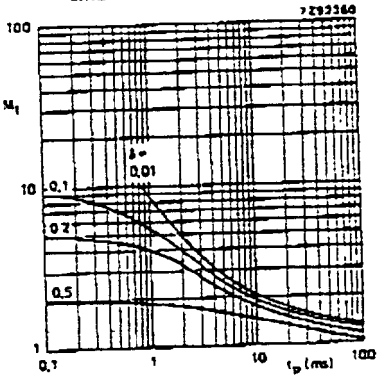


Fig. 8 Second-breakdown current multiplying factor at the V_{CEOmax} level.

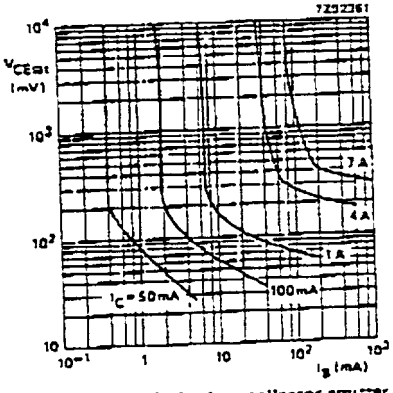


Fig. 9 Typical values collector-emitter saturation voltage.

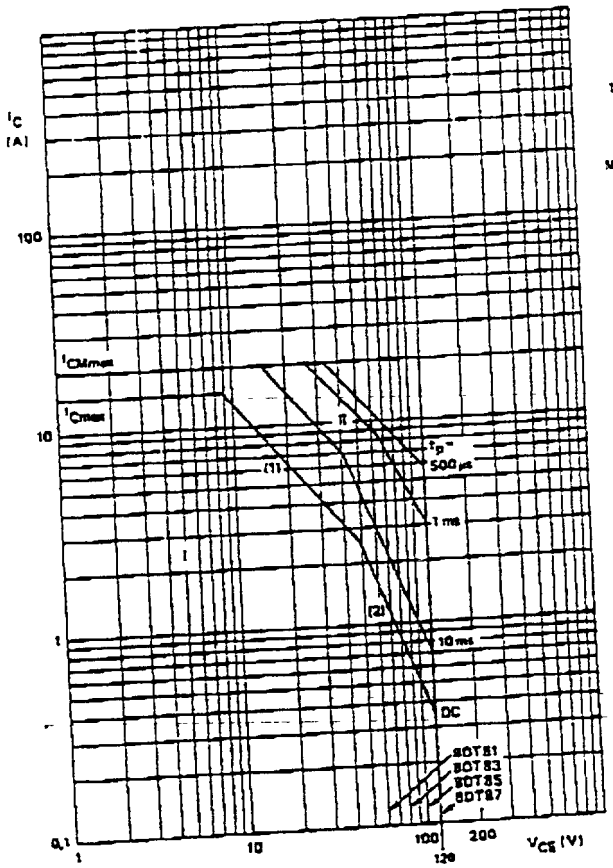


Fig. 4 Safe Operating Area; T_{mb} = 25 °C; δ = 0,01.

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.