



**MAGNA
TEC**

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.

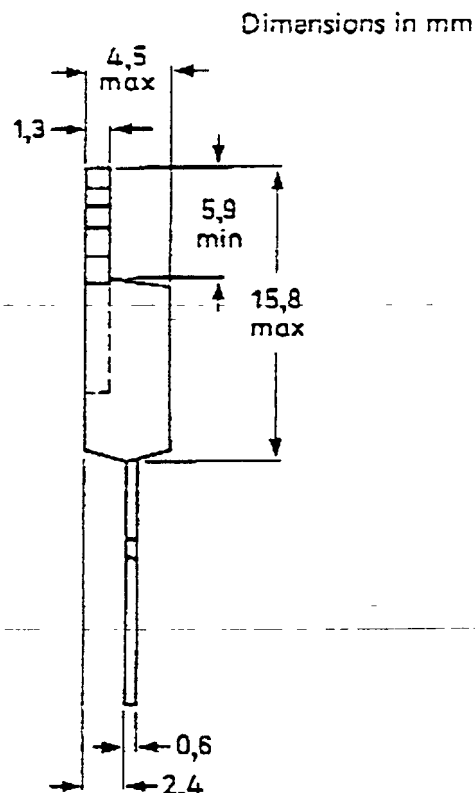
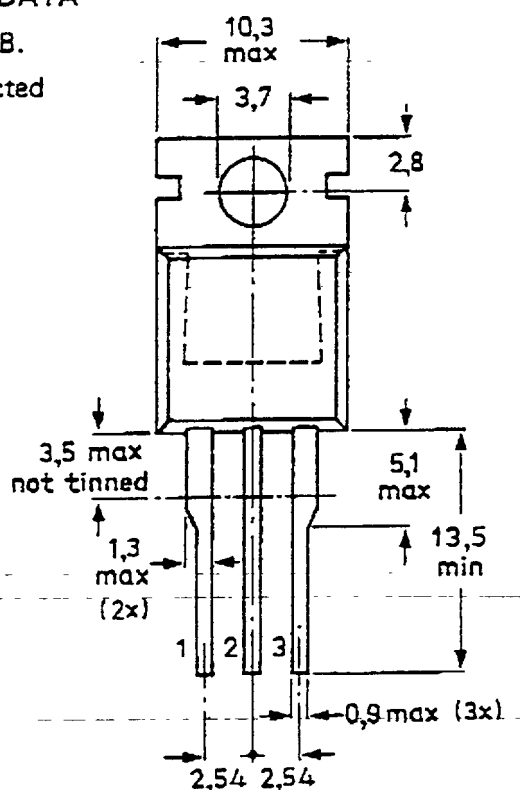
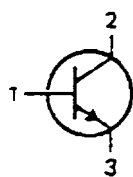
QUICK REFERENCE DATA

			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 $T_{mb} = 25^\circ\text{C}$	P_{Tot}	max.	125			W
Junction temperature	T_j	max.	150			$^\circ\text{C}$
D.C. current gain $I_C = 5\text{ A}; V_{CE} = 4\text{ V}$	h_{FE}	min.	40			

MECHANICAL DATA

Fig. 1 TO-220AB.

Collector connected
to case.



DT81; BDT83
DT85; BDT87



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 $T_{mb} = 25^\circ\text{C}$	P_{tot}	max.			125	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	$R_{th\ j-mb}$	=		1		K/W
From junction to ambient	$R_{th\ j-a}$	=		70		K/W

CHARACTERISTICS

$T_j = 25^\circ\text{C}$ 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 $I_C = 0; V_{EB} = 7\text{ V}$	I_{EBO}	<		0,1		mA
D.C. current gain*						
$I_C = 50\text{ mA}; V_{CE} = 10\text{ V}$	h_{FE}	>		40		
$I_C = 5\text{ A}; V_{CE} = 4\text{ V}$	h_{FE}	>		40		
Collector-emitter saturation voltage*						
$I_C = 5\text{ A}; I_B = 0,5\text{ A}$	V_{CEsat}	<		1		V*
$I_C = 7\text{ A}; I_B = 0,7\text{ A}$	V_{CEsat}	<		1,6		V*
Base-emitter voltage*						
$I_C = 5\text{ A}; V_{CE} = 4\text{ V}$	V_{BE}	<		1,5		V*
Transition frequency at $f = 1\text{ MHz}$ $I_C = 0,5\text{ A}; V_{CE} = 10\text{ V}$	f_T	typ.		10		MHz
Second breakdown collector current $V_{CE} = 50\text{ V}; t_p = 100\text{ ms}$	I_{SB}	>		2,5		A

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

BDT81; BDT83
BDT85; BDT87

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

t_{on}	$\approx$	$1 \mu\text{s}$
t_{off}	$\approx$	$2 \mu\text{s}$

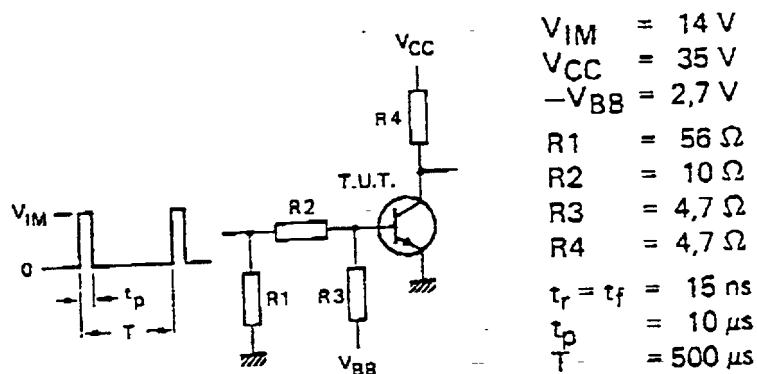


Fig. 2 Switching times test circuit.

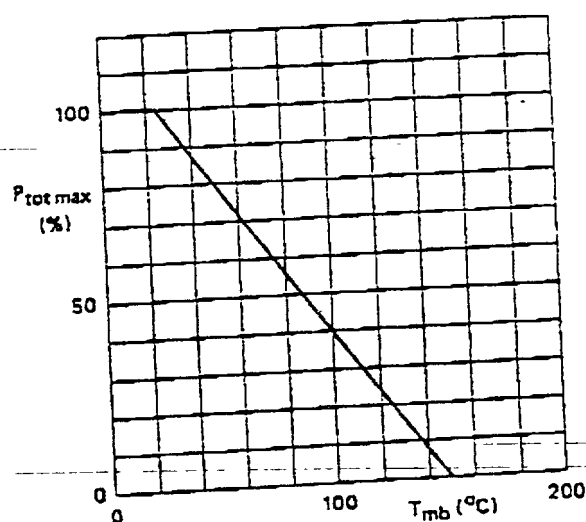


Fig. 3 Power derating curve.

BDT81; BDT83
BDT85; BDT87

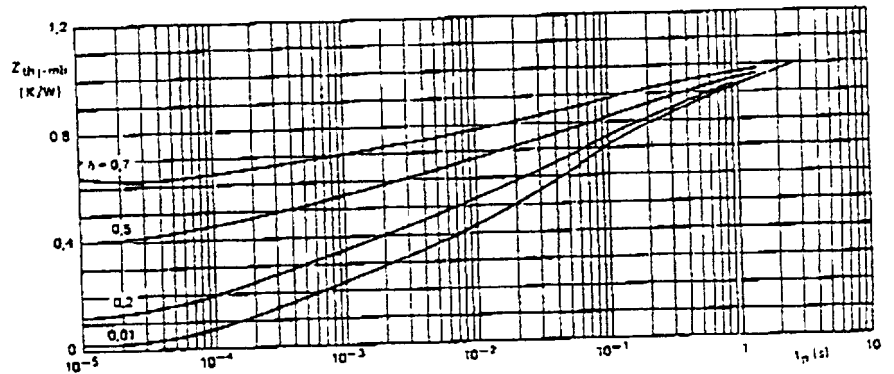


Fig. 5 Pulse power rating chart.

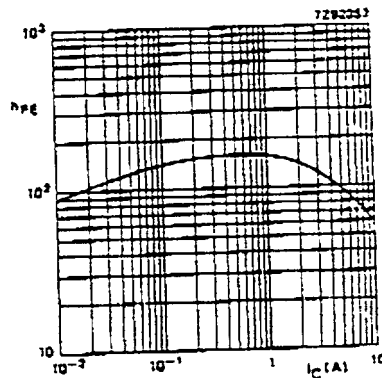


Fig. 6 Typical d.c. current gain;
 $T_{amb} = 25^\circ C$; $V_{CE} = 4 V$.

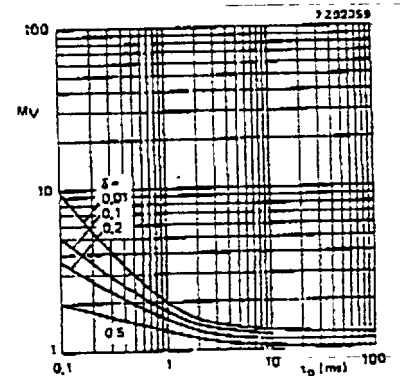


Fig. 7 Second-breakdown voltage multiplying factor at I_{Cmax} level.

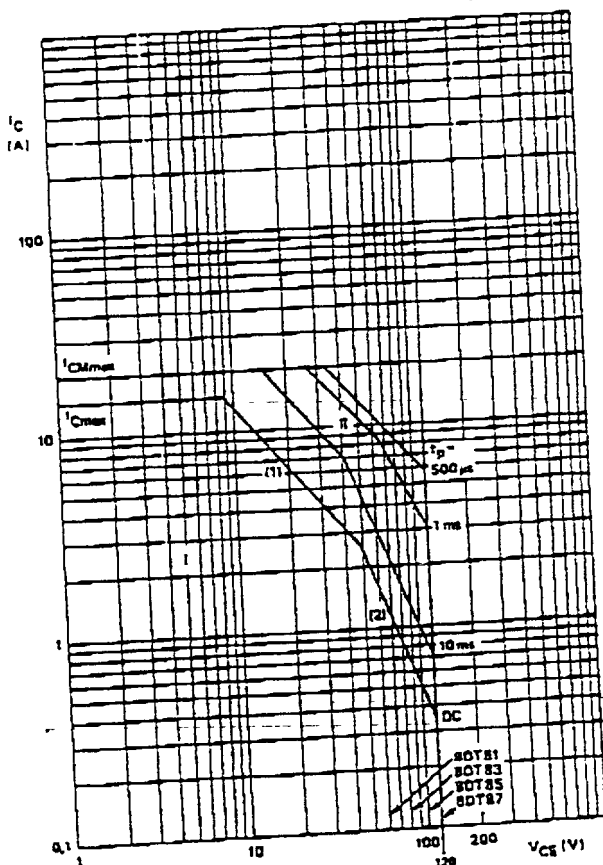


Fig. 4 Safe Operating Area; $T_{mb} = 25^\circ C$; $\delta = 0.01$.

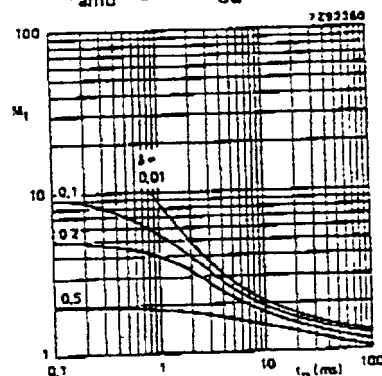


Fig. 8 Second-breakdown current multiplying factor at the V_{CE0max} level.

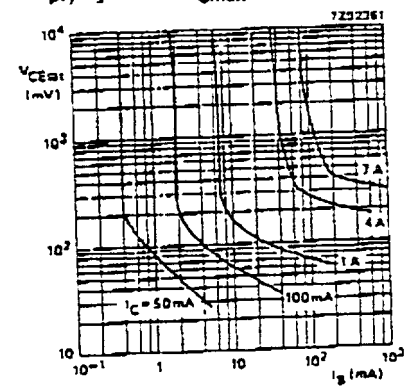


Fig. 9 Typical values collector-emitter saturation voltage.

Region of permissible d.c. operation.
(1) Permissible extension for repetitive pulse operation.
(1) $P_{tot max}$ and $P_{peak max}$ lines.
(1) $P_{tot max}$ and $P_{peak max}$ limits.