SILICON EPITAXIAL-BASE POWER TRANSISTOR

PNP transistor in a SOT32 plastic envelope intended for use in audio output and general purpose amplifier applications. BD720 is equivalent to BD440. NPN complements are BD719; 721; 723 and BD724.

QUICK REFERENCE DATA

			BD720	BD722	BD724	BD726	
Collector-base voltage	$-V_{CBO}$	max.	60	80	100	120	V
Collector-emitter voltage	$-V_{CEO}$	max.	60	80	100	120	V
Emitter-base voltage	$-V_{EBO}$	max.	5	5	5	5	V
Collector current (DC)	$-I_C$	max.	4	4	4	4	A
(peak value)	$-I_{CM}$	max.	7	7	7	7	A
Junction temperature	T_j	max.	150	150	150	150	°C
DC current gain $I_C = -2$ A; $V_{CE} = -4$ V	h_{FE}	min.	20	20	20	20	
Transition frequency $I_C = -0{,}5$ A; $V_{CE} = -4$ V	f_T	min.	3	3	3	3	MHz

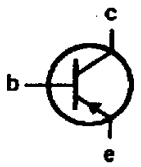
MECHANICAL DATA

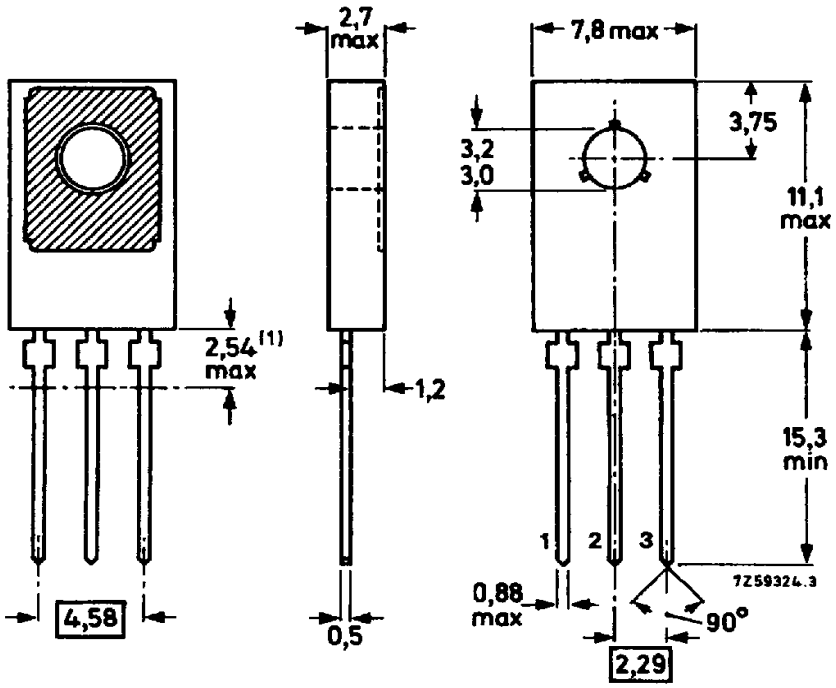
Dimensions in mm

Fig. 1 TO-126 (SOT32).

Collector connected to metal part of mounting surface

Pinning
1 = emitter
2 = collector
3 = base





(1) Within this region the cross-section of the leads is uncontrolled.

RATINGS

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

			BD720	BD722	BD724	BD726	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	60	80	100	120	V
Collector-emitter voltage	$-V_{CEO}$	max.	60	80	100	120	V
Emitter-base voltage	$-V_{EBO}$	max.	5	5	5	5	V
Collector current							
DC value	$-I_C$	max.		4			A
peak value	$-I_{CM}$	max.		7			A
Base current (DC)	$-I_B$	max.		1			A
Total power dissipation up to $T_{mb} = 25\ ^oC$	P_{tot}	max.		36			W
Storage temperature	T_{stg}			−65 to + 150			°C
Junction temperature	T_j	max.		150			°C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j\text{-}a}$	max.	100	K/W
From junction to mounting base	$R_{th\ j\text{-}mb}$	max.	3.5	K/W

CHARACTERISTICS

$T_j = 25\ ^oC$ unless otherwise specified

			BD720	BD722	BD724	BD726	
Collector cut-off current							
$I_E = 0; -V_{CB} = -V_{CBO}$	$-I_{CBO}$	max.	50	50	50	50	μA
$I_E = 0; -V_{CB} = -½\ V_{CBO}$	$-I_{CBO}$	max.	1	1	1	1	mA
$T_j = 150\ ^oC;$ $I_B = 0; -V_{CE} = -½\ V_{CEO}$	$-I_{CEO}$	max.	0.1	0.1	0.1	0.1	mA
Emitter cut-off current							
$I_C = 0; -V_{EB} = 5\ V$	$-I_{EBO}$	max.	0.2	0.2	0.2	0.2	mA
DC current gain (1)							
$-I_C = 0.5\ A; -V_{CE} = 4\ V$	h_{FE}	min.	40	40	40	40	
$-I_C = 2\ A; -V_{CE} = 4\ V$	h_{FE}	min.	20	20	20	20	
Base-emitter voltage (1) (2)							
$-I_C = 2\ A; -V_{CE} = 4\ V$	$-V_{BE}$	max.	1.4	1.4	1.4	1.4	V
Collector-emitter saturation voltage (1)							
$-I_C = 2\ A; -I_B = 0.2\ A$	$-V_{CEsat}$	max.	1	1	1	1	V

(1) $t_p = 300\ \mu s; \delta < 2\%$.
(2) V_{BE} decreases by about 2.3 mV/K with increasing temperature.

			BD720	BD722	BD724	BD726	
Transition frequency at f = 1 MHz							
$-I_C$ = 0.5 A; $-V_{CE}$ = 4 V	f_t	min.	3	3	3	3	MHz
Switching times							
$-I_{Con}$ = 1 A;							
$-I_{Bon} = I_{Boff}$ = 0.1 A							
Turn-on time	t_{on}	typ.	0.1	0.1	0.1	0.1	μs
Turn-off time	t_{off}	typ.	0.4	0.4	0.4	0.4	μs

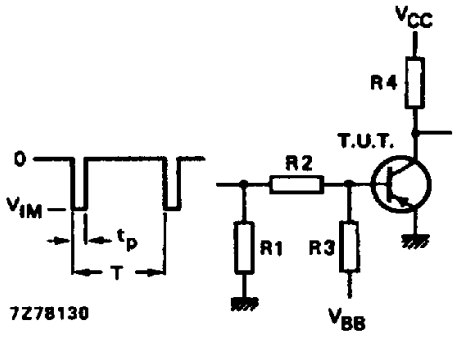


Fig. 2 Switching times test circuit.

$-V_{IM}$ = 30 V
$-V_{CC}$ = 20 V
$+V_{BB}$ = 3.5 V
R1 = 82 Ω
R2 = 150 Ω
R3 = 39 Ω
R4 = 20 Ω
$t_r = t_f$ = 15 ns
t_p = 10 μs
T = 500 μs

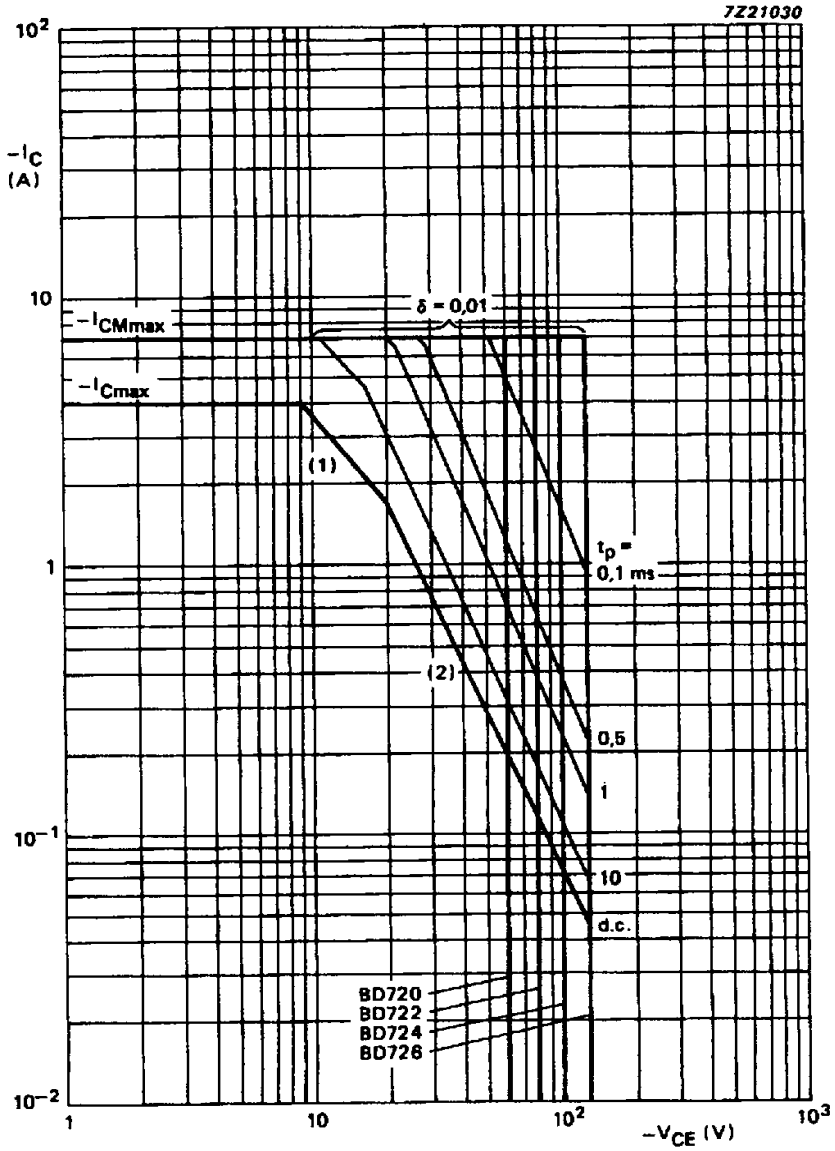


Fig. 3 Safe Operating Area, T_{mb} = 25 °C.

(1) $P_{tot\ max}$ line.
(2) Second-breakdown limits.

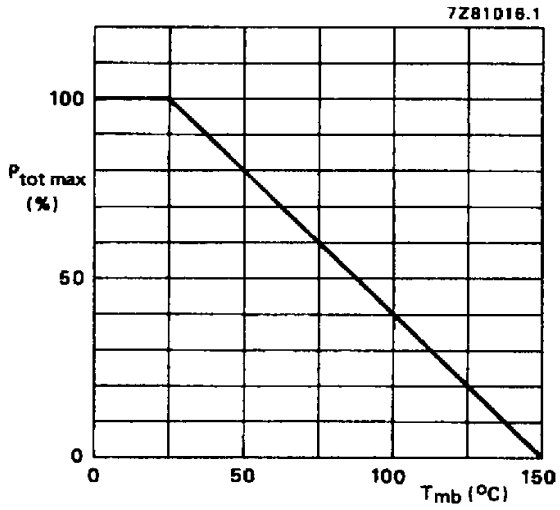


Fig. 4 Power derating curve.

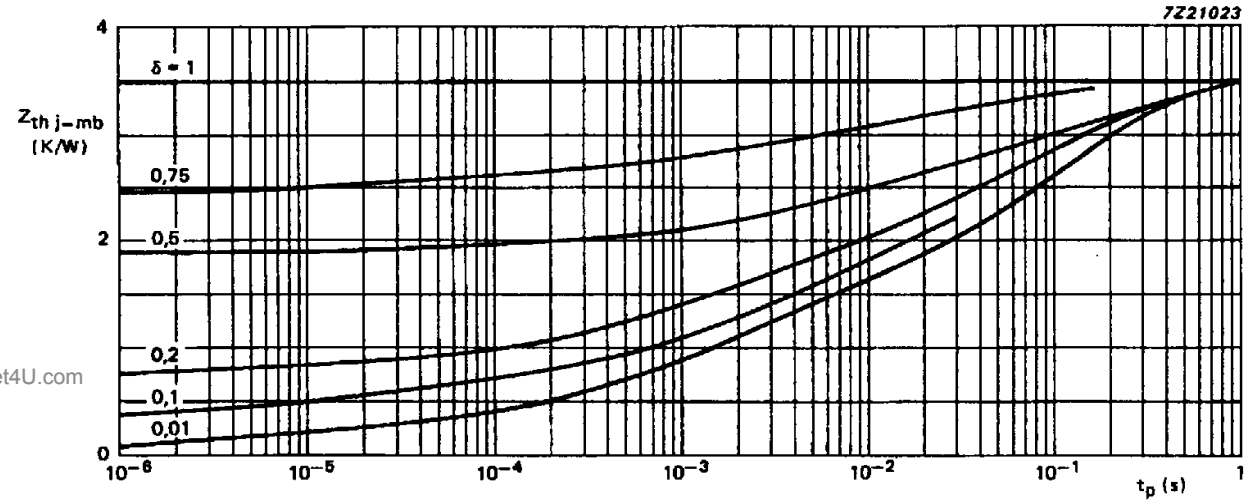


Fig. 5 Pulse power rating chart.

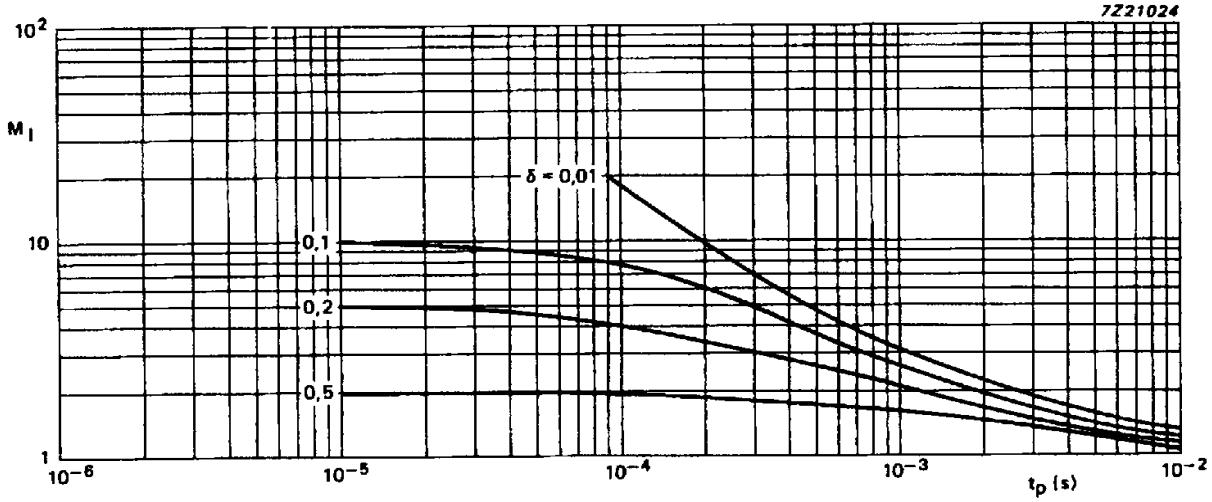


Fig. 6 Second breakdown current multiplying factor at $V_{CEO\ max}$ level.

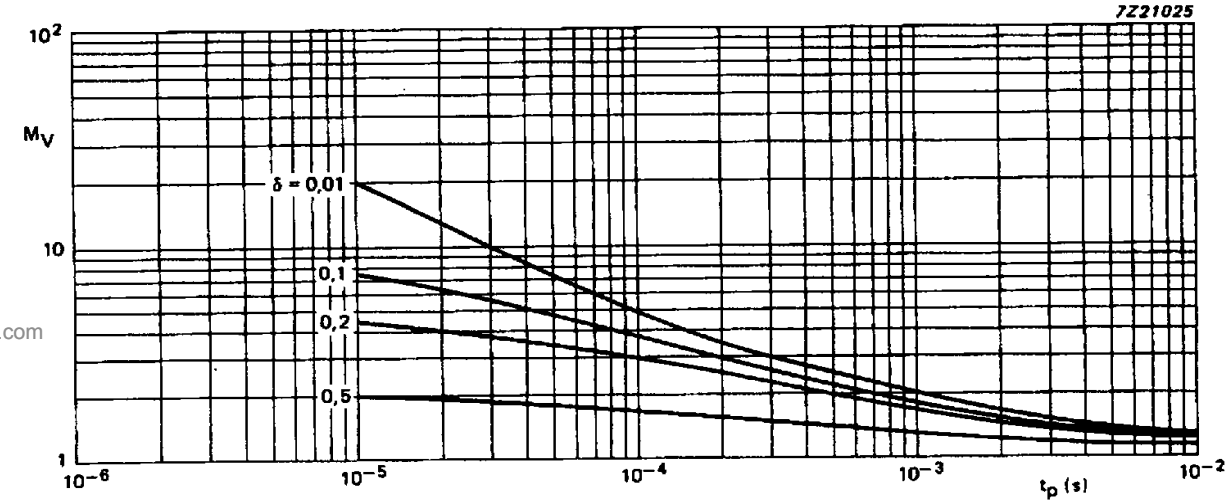


Fig. 7 Second breakdown voltage multiplying factor at $I_{C\ max}$ level.

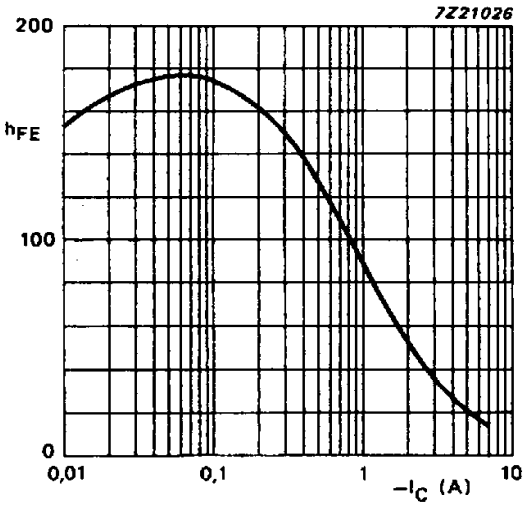


Fig. 8 Typical DC current gain. T_j = 25 °C; V_{CE} = 4 V.

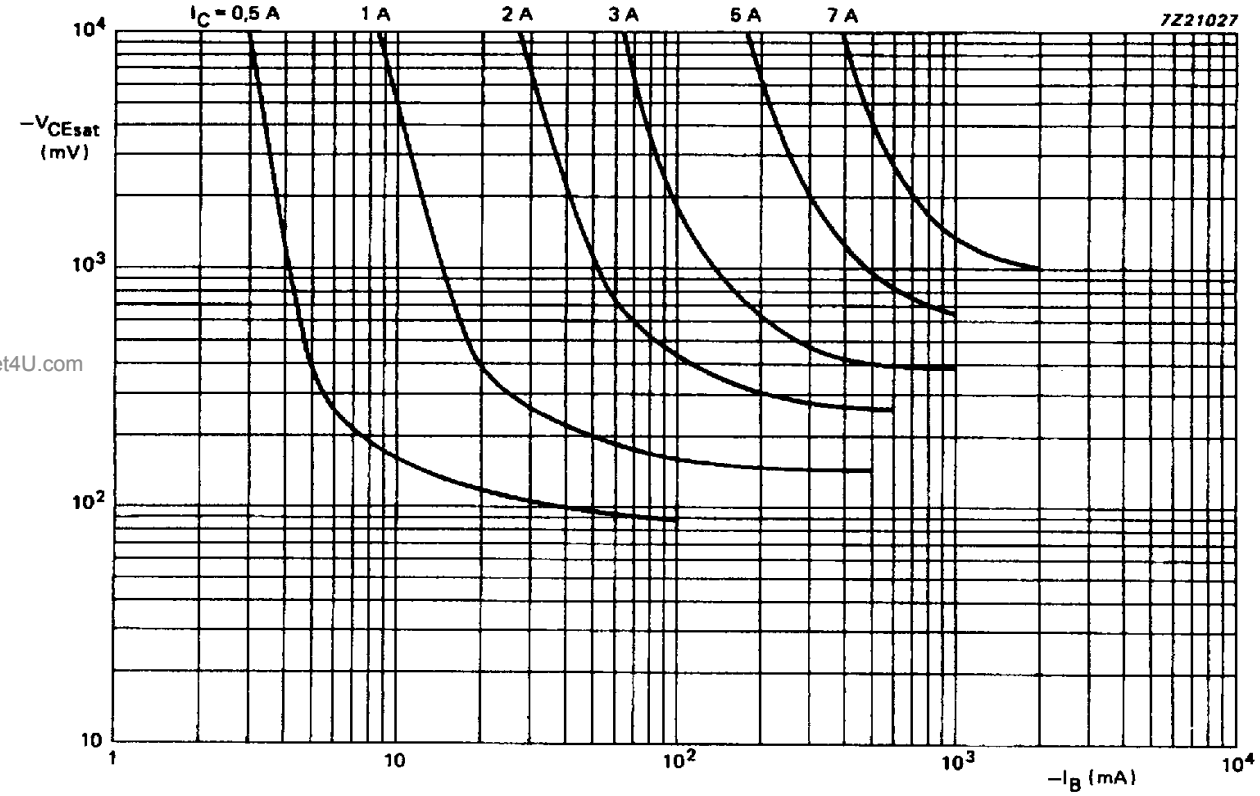


Fig. 9 Typical values collector-emitter saturation. T_j = 25 °C.

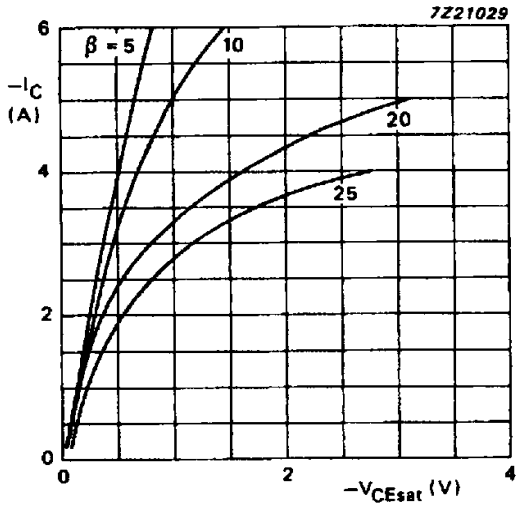


Fig. 10 Typical collector-emitter saturation voltage versus collector current (h_{FE} constant). T_j = 25 °C.

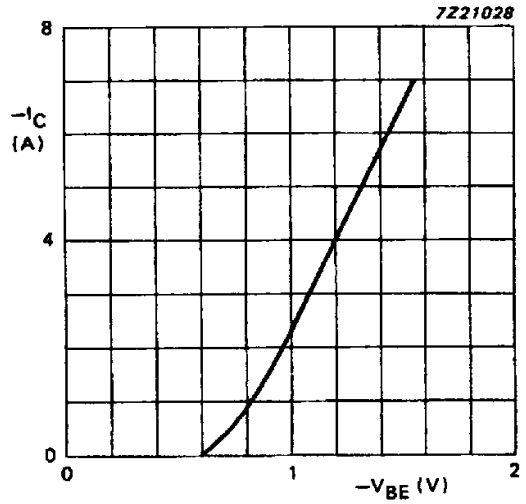


Fig. 11 Collector current. V_{CE} = 4 V; T_j = 25 °C.