290-749 / +750

DARLINGTON POWER TRANSISTORS

P-N-P epitaxial base Darlington transistors for audio output stages and general amplifier and switching applications. N-P-N complements are BDV67A; B; C and D. Matched complementary pairs can be supplied.

QUICK REFERENCE DATA

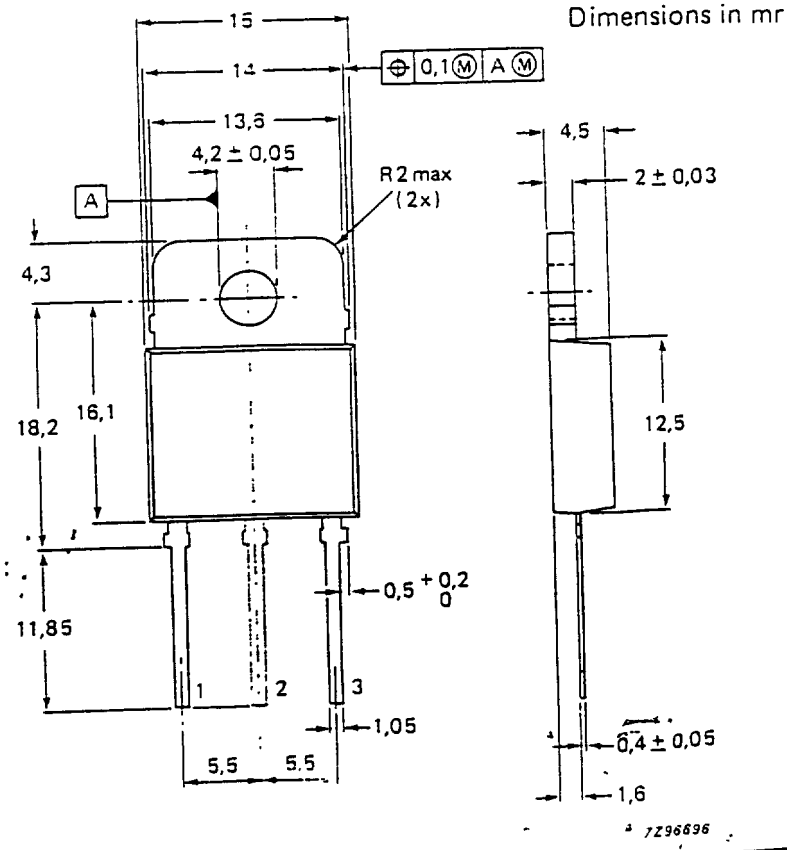
			BDV66A	B	C	D	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	100	120	140	160	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	80	100	120	150	V
Collector current (d.c.)	$-I_C$	max.		16			A
Collector current (peak value)	$-I_{CM}$	max.		20			A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.		175			W
Junction temperature	T_j	max.		150			°C
D.C. current gain							
$-I_C$ = 1 A; $-V_{CE}$ = 3 V	h_{FE}	typ.		3000			
$-I_C$ = 10 A; $-V_{CE}$ = 3 V	h_{FE}	>		1000			
Cut-off frequency							
$-I_C$ = 5 A; $-V_{CE}$ = 3 V	f_{hfe}	typ.		60			kHz

MECHANICAL DATA

Fig. 1 SOT-93

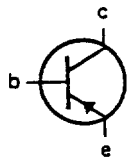
Collector connected to mounting base.

Dimensions in mr



Pinning

1 = base
2 = collector
3 = emitter



See also chapters Mounting instructions and Accessories.

CIRCUIT DIAGRAM

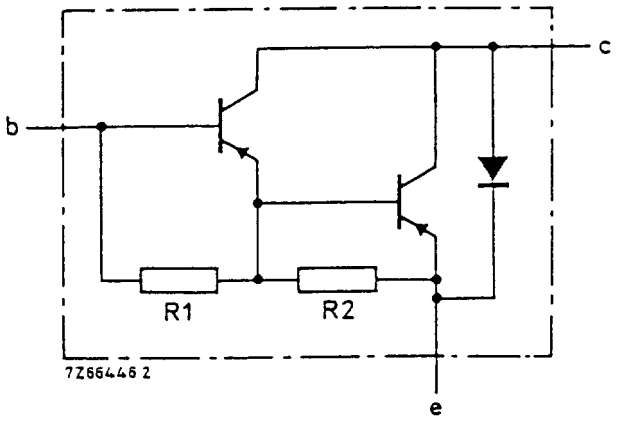


Fig. 2.
R1 typical 3 kΩ
R2 typical 80 Ω

RATINGS

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

			BDV66A	B	C	D	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	100	120	140	160	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	80	100	120	150	V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5	5	5	5	V
Collector current (d.c.)	$-I_C$	max.		16			A
Collector current (peak value)	$-I_{CM}$	max.		20			A
Base current (d.c.)	$-I_B$	max.		0,5			A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.		175			W
Storage temperature	T_{stg}			−65 to + 150			°C
Junction temperature*	T_j	max.		150			°C

THERMAL RESISTANCE

From junction to mounting base*	$R_{th\ j\text{-}mb}$	=	0,625	K/W

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

Collector cut-off currents

$I_E = 0; -V_{CB} = -V_{CBOmax}$	$-I_{CBO}$	<	1	mA
$I_E = 0; -V_{CB} = -½V_{CBOmax}; T_j$ = 150 °C	$-I_{CBO}$	<	4	mA
→ $I_B = 0; -V_{CE} = -½V_{CEOmax}$	$-I_{CEO}$	<	1	mA

Emitter cut-off current

$I_C = 0; -V_{EB}$ = 5 V	$-I_{EBO}$	<	5	mA

* Based on maximum average junction temperature in line with common industrial practice. The resulting higher junction temperature of the output transistor part is taken into account.

D.C. current gain*			
$-I_C$ = 1 A; $-V_{CE}$ = 3 V	h_{FE}	typ.	3000
$-I_C$ = 10 A; $-V_{CE}$ = 3 V	h_{FE}	>	1000
$-I_C$ = 16 A, $-V_{CE}$ = 3 V	h_{FE}	typ.	1000
Base-emitter voltage**			
$-I_C$ = 10 A; $-V_{CE}$ = 3 V	$-V_{BE}$	<	2,5 V
Collector-emitter saturation voltage*			
$-I_C$ = 10 A; $-I_B$ = 40 mA	$-V_{CEsat}$	<	2 V
Collector capacitance at f = 1 MHz			
$I_E = I_e = 0$; $-V_{CB}$ = 10 V	C_c	typ.	300 pF
Cut-off frequency			
$-I_C$ = 5 A; $-V_{CE}$ = 3 V	f_{hfe}	typ.	60 kHz
Diode, forward voltage			
I_F = 10 A	V_F	<	3 V
D.C. current gain ratio of matched complementary pairs			
$-I_C$ = 10 A; $-V_{CE}$ = 3 V	h_{FE1}/h_{FE2}	<	2,5
Small-signal current gain			
$-I_C$ = 5 A; $-V_{CE}$ = 3 V; f = 1 MHz	h_{fe}	typ.	40
Switching times			
$-I_{Con}$ = 10 A; $-I_{Bon} = I_{Boff}$ = 40 mA; V_{CC} = −12 V			
Turn-on time	t_{on}	typ.	1 μs
Turn-off time	t_{off}	typ.	3,5 μs

* Measured under pulse conditions: $t_p < 300$ μs; $\delta < 2\%$.

** $-V_{BE}$ decreases by about 3,6 mV/K with increasing temperature.

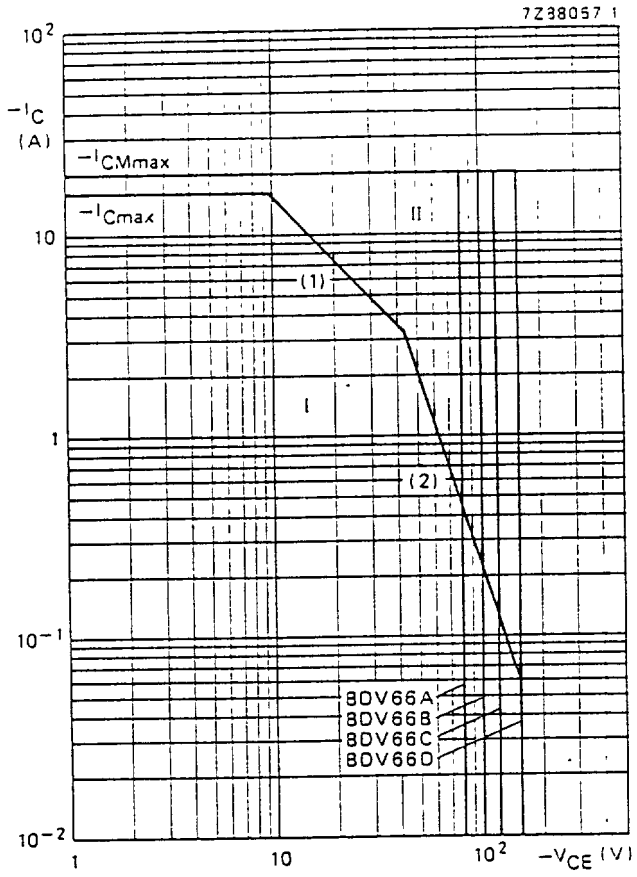


Fig. 3 Safe Operating AREa; $T_{mb} \leqslant 25\ ^{o}C$.

I Region of permissible d.c. operation.

II Permissible extension for repetitive pulse operation.

(1) $P_{tot\,max}$ line.

(2) Second breakdown limits.

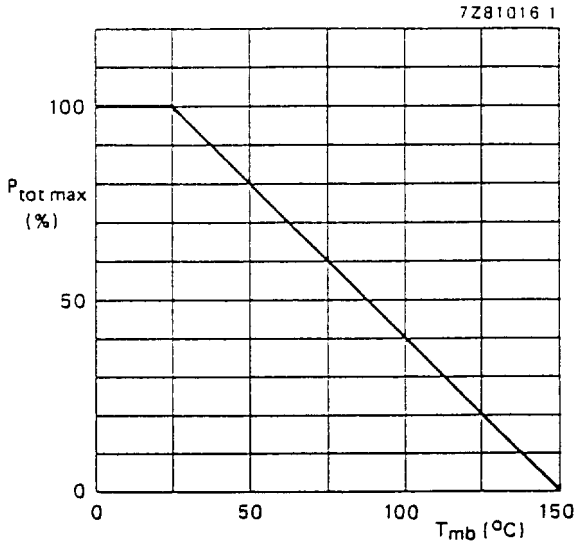


Fig. 4 Power derating curve.

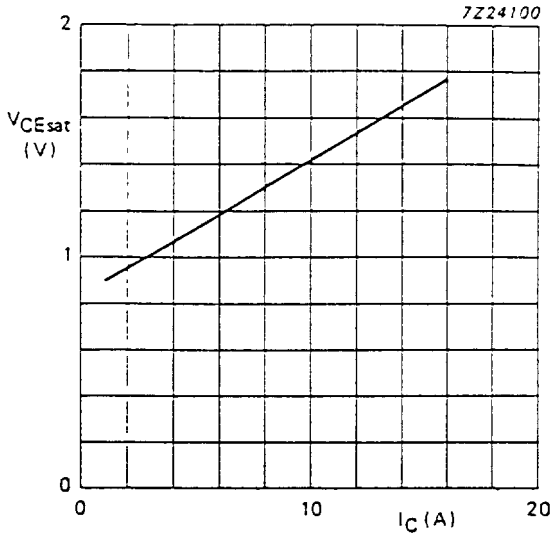


Fig. 5 Typical collector-emitter saturation voltage $-I_C/-I_B = 250$; $T_{mb} = 25\ ^oC$.

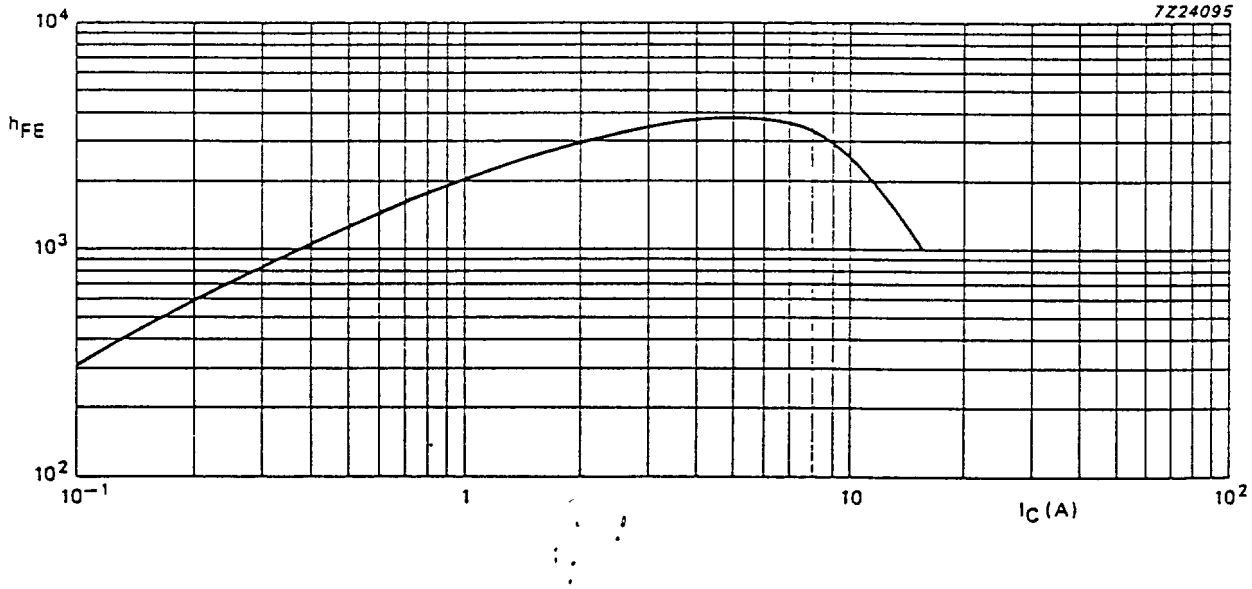


Fig. 6 Typical DC current gain $-V_{CE} = 3$ V; $T_j = 25\ ^oC$.