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BDV66A;  
BDV66C;

## 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 $T_{mb} = 25^\circ\text{C}$	$P_{tot}$ max.		175		W
Junction temperature	$T_j$ max.		150		$^\circ\text{C}$
D.C. current gain			3000		
$-I_C = 1\text{ A}; -V_{CE} = 3\text{ V}$	$h_{FE}$ typ.		1000		
$-I_C = 10\text{ A}; -V_{CE} = 3\text{ V}$	$h_{FE}$ >				
Cut-off frequency			60		kHz
$-I_C = 5\text{ A}; -V_{CE} = 3\text{ V}$	$f_{hfe}$ typ.				

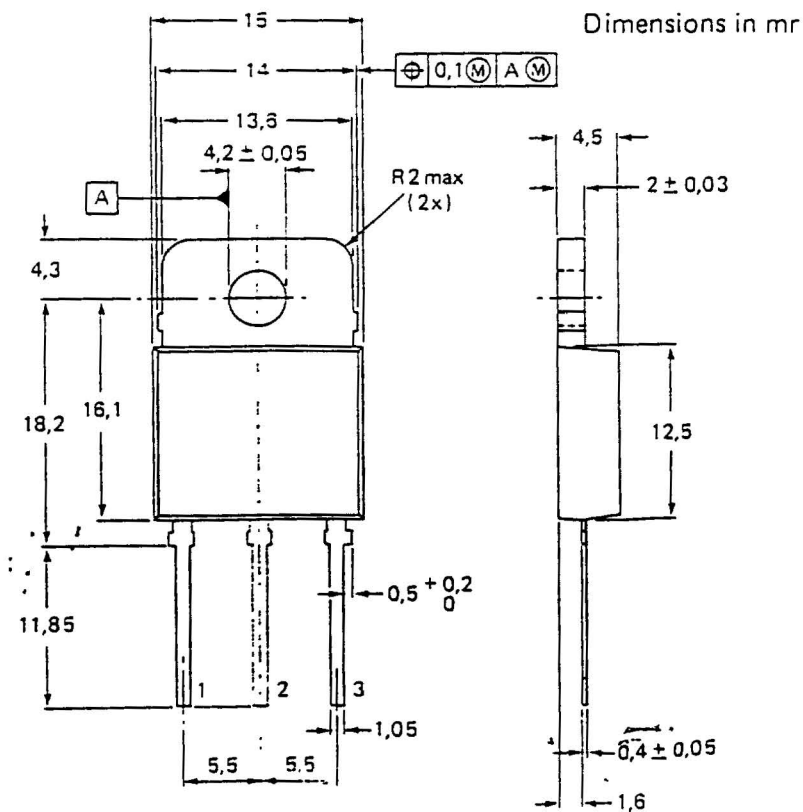
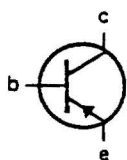
### MECHANICAL DATA

Fig. 1 SOT-93

Collector connected to mounting base.

#### Pinning

- 1 = base
- 2 = collector
- 3 = emitter



See also chapters Mounting instructions and Accessories.

BDV66A; B  
BDV66C; D

CIRCUIT DIAGRAM

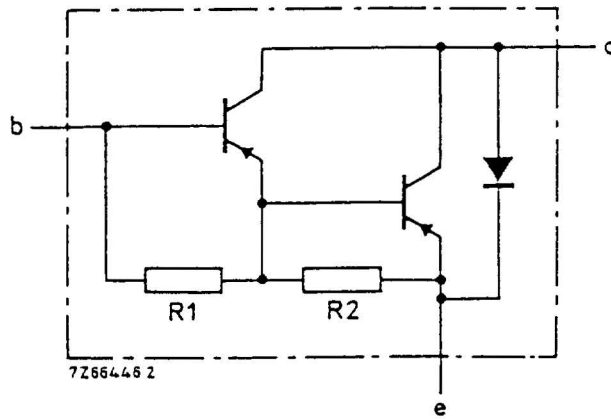


Fig. 2.  
R1 typical 3 kΩ  
R2 typical 80 Ω

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 $T_{mb} = 25\text{ }^\circ\text{C}$	$P_{tot}$ max.		175		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*	$R_{th\ j-mb} =$	0,625	K/W
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CHARACTERISTICS

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

Collector cut-off currents

$I_E = 0; -V_{CB} = -V_{CBOmax}$	$-I_{CBO} <$	1	mA
$I_E = 0; -V_{CB} = -\frac{1}{2}V_{CBOmax}; T_j = 150\text{ }^\circ\text{C}$	$-I_{CBO} <$	4	mA
$I_B = 0; -V_{CE} = -\frac{1}{2}V_{CEOmax}$	$-I_{CEO} <$	1	mA
Emitter cut-off current	$-I_{EBO} <$	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 <sub>C</sub> = 1 A; -V <sub>CE</sub> = 3 V	h <sub>FE</sub>	typ.	3000
-I <sub>C</sub> = 10 A; -V <sub>CE</sub> = 3 V	h <sub>FE</sub>	>	1000
-I <sub>C</sub> = 16 A; -V <sub>CE</sub> = 3 V	h <sub>FE</sub>	typ.	1000
Base-emitter voltage**			
-I <sub>C</sub> = 10 A; -V <sub>CE</sub> = 3 V	-V <sub>BE</sub>	<	2,5 V
Collector-emitter saturation voltage*			
-I <sub>C</sub> = 10 A; -I <sub>B</sub> = 40 mA	-V <sub>CEsat</sub>	<	2 V
Collector capacitance at f = 1 MHz			
I <sub>E</sub> = I <sub>e</sub> = 0; -V <sub>CB</sub> = 10 V	C <sub>c</sub>	typ.	300 pF
Cut-off frequency			
-I <sub>C</sub> = 5 A; -V <sub>CE</sub> = 3 V	f <sub>hfe</sub>	typ.	60 kHz
Diode, forward voltage			
I <sub>F</sub> = 10 A	V <sub>F</sub>	<	3 V
D.C. current gain ratio of matched complementary pairs			
-I <sub>C</sub> = 10 A; -V <sub>CE</sub> = 3 V	h <sub>FE1</sub> /h <sub>FE2</sub>	<	2,5
Small-signal current gain			
-I <sub>C</sub> = 5 A; -V <sub>CE</sub> = 3 V; f = 1 MHz	h <sub>fe</sub>	typ.	40
Switching times			
-I <sub>Con</sub> = 10 A; -I <sub>Bon</sub> = I <sub>Boff</sub> = 40 mA; V <sub>CC</sub> = -12 V			
Turn-on time	t <sub>on</sub>	typ.	1 μs
Turn-off time	t <sub>off</sub>	typ.	3,5 μs

\* Measured under pulse conditions: τ<sub>p</sub> < 300 μs; δ < 2%.\*\* -V<sub>BE</sub> decreases by about 3,6 mV/K with increasing temperature.

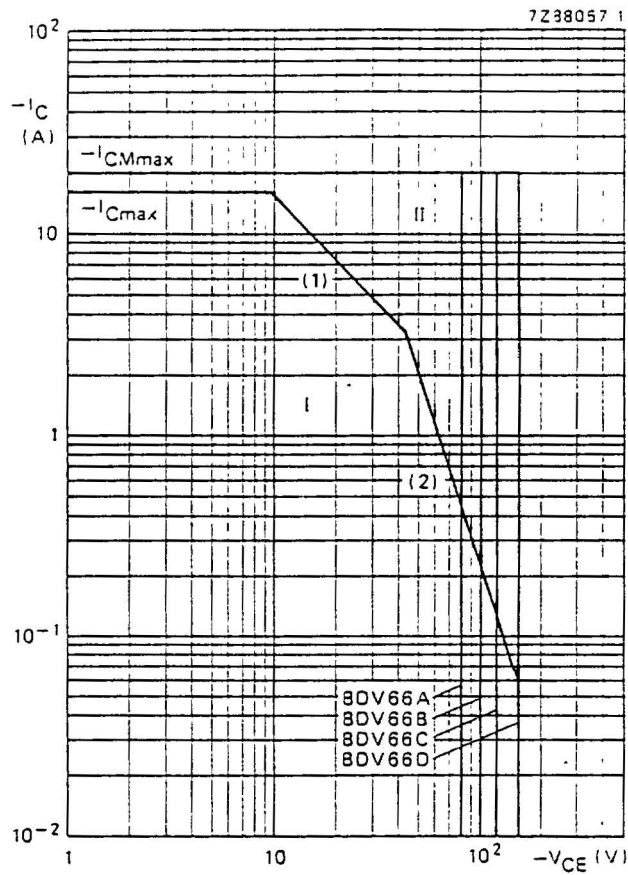


Fig. 3 Safe Operating Area;  $T_{mb} \leq 25^\circ\text{C}$ .

I Region of permissible d.c. operation.

II Permissible extension for repetitive pulse operation.

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

(2) Second breakdown limits.

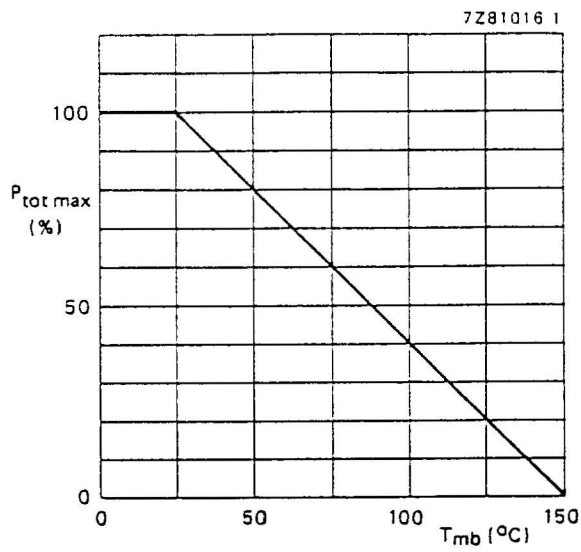


Fig. 4 Power derating curve.

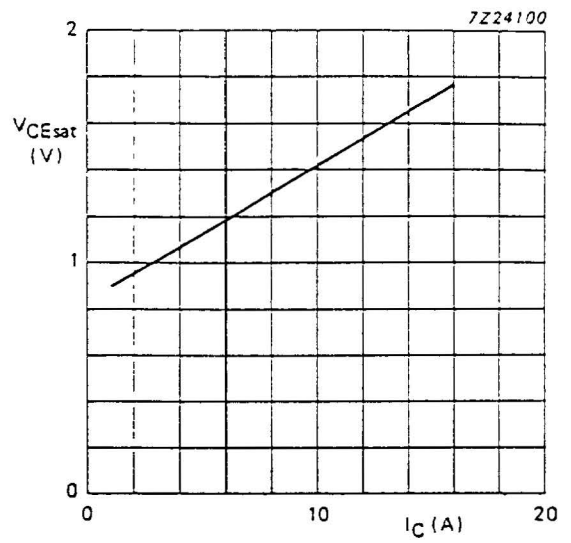


Fig. 5 Typical collector-emitter saturation voltage  $-I_C/-I_B = 250$ ;  $T_{mb} = 25$  °C.

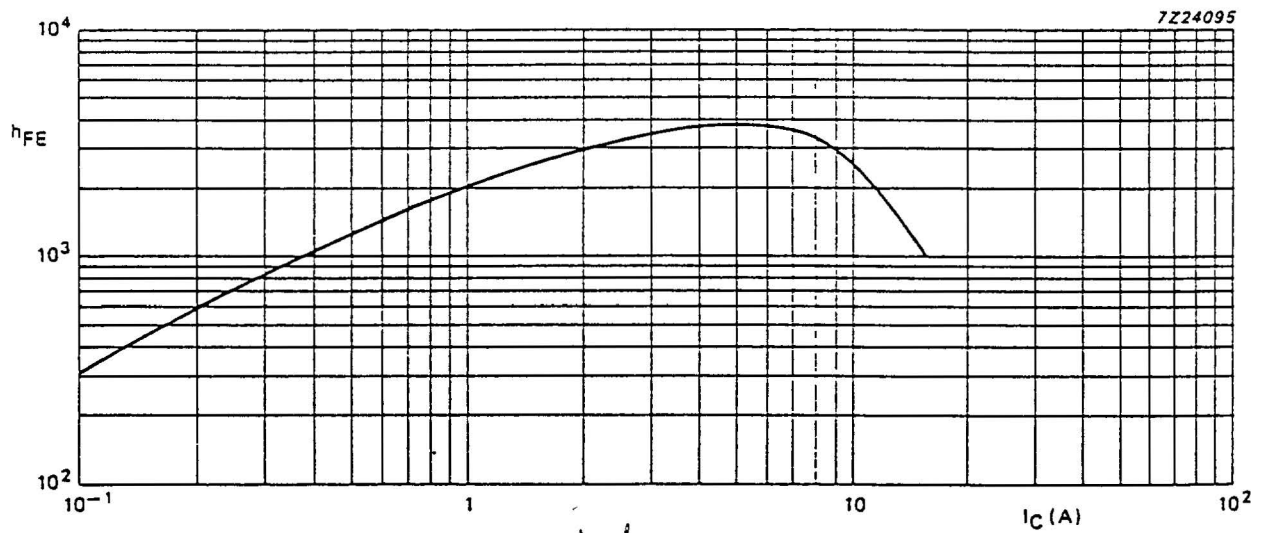


Fig. 6 Typical DC current gain  $-V_{CE} = 3$  V;  $T_j = 25$  °C.