PHILIPS INTERNATIONAL 56E D 7110826 0043392 911 PHIN

T-33-29

DARLINGTON POWER TRANSISTORS

NPN epitaxial base Darlington transistors for audio output stages and general amplifier and switching applications. PNP complements are BDV66A, B, C and D. Matched complementary pairs can be supplied.

QUICK REFERENCE DATA

			BDV67A	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 (DC)	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.		200			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

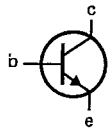
Dimensions in mm

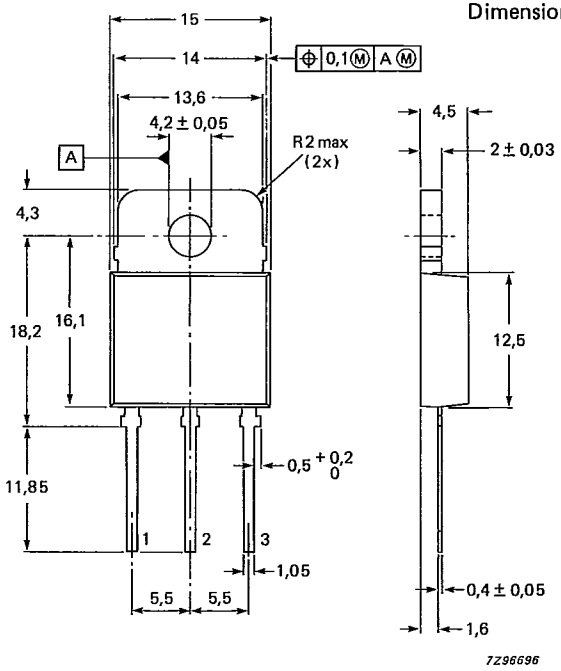
Fig. 1 SOT-93.

Collector connected to mounting-base.

Pinning:

1 = base
2 = collector
3 = emitter





See also chapters Mounting instructions and Accessories.

CIRCUIT DIAGRAM

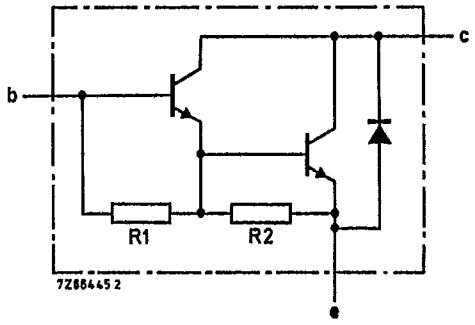


Fig. 2.
R1 typical 3 kΩ
R2 typical 80 Ω

RATINGS

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

			BDV67A	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.		200			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
Turn-off breakdown energy with inductive load (see also Fig. 3).			
I_{Con} = 6,3 A; $-I_{Boff}$ = 0; t_p = 1 ms; T = 100 ms	$E_{(BR)}$	>	150 mJ
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

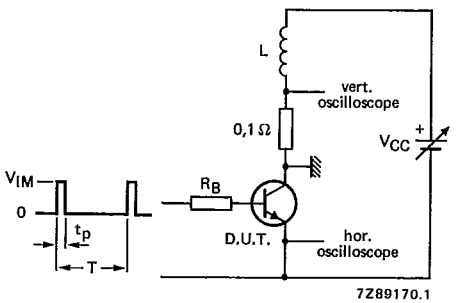


Fig. 3 Test circuit; V_1 = 12 V; R_B = 270 Ω.

* Measured under pulse conditions: $t_p < 300$ μs; $\delta < 2\%$.
** V_{BE} decreases by about 3,6 mV/K with increasing temperature.

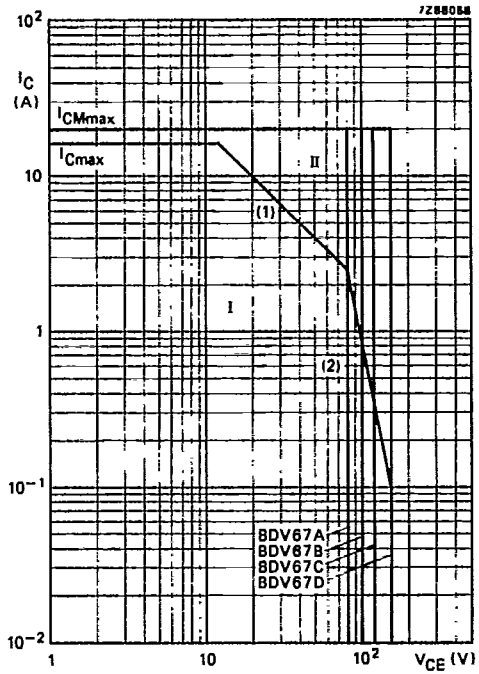


Fig. 4 Safe Operating Area; $T_{mb} \leq 25$ °C.

I Region of permissible DC operation.
II Permissible extension for repetitive operation.

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

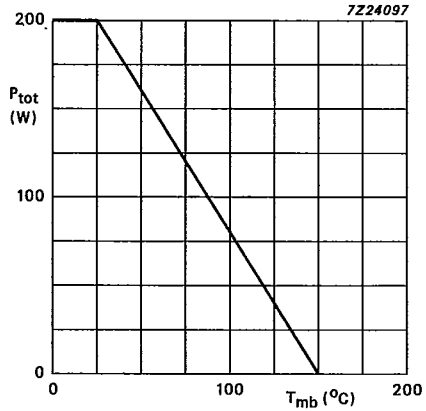


Fig. 5 Power derating curve.

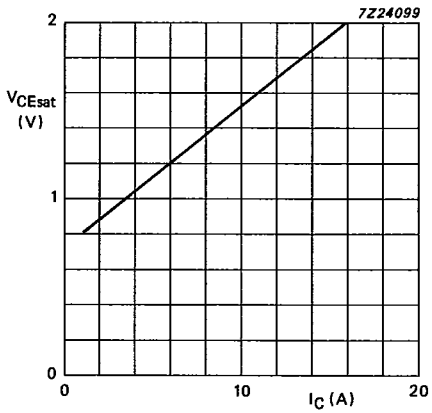


Fig. 6 Typical collector-emitter saturation voltage at T_{mb} = 25 °C; I_C/I_B = 250.

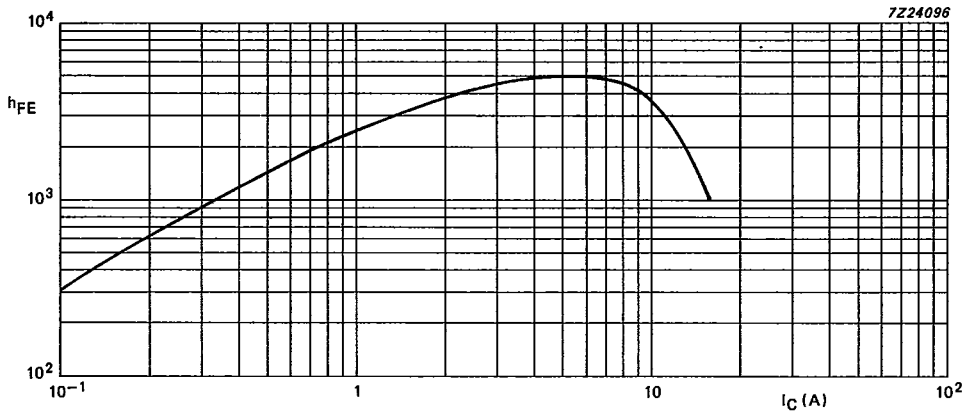


Fig. 7 Typical DC current gain at V_{CE} = 3 V.