

290.762

BDV67A; B
BDV67C; D

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_{CB0}	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 $T_{mb} = 25\text{ }^\circ\text{C}$	P_{tot}	max.		200		W
Junction temperature	T_j	max.		150		$^\circ\text{C}$
D.C. current gain						
$I_C = 1\text{ A}; V_{CE} = 3\text{ V}$	h_{FE}	typ.		3000		
$I_C = 10\text{ A}; V_{CE} = 3\text{ V}$	h_{FE}	>		1000		
Cut-off frequency						
$I_C = 5\text{ A}; V_{CE} = 3\text{ V}$	f_{hfe}	typ.		60		kHz

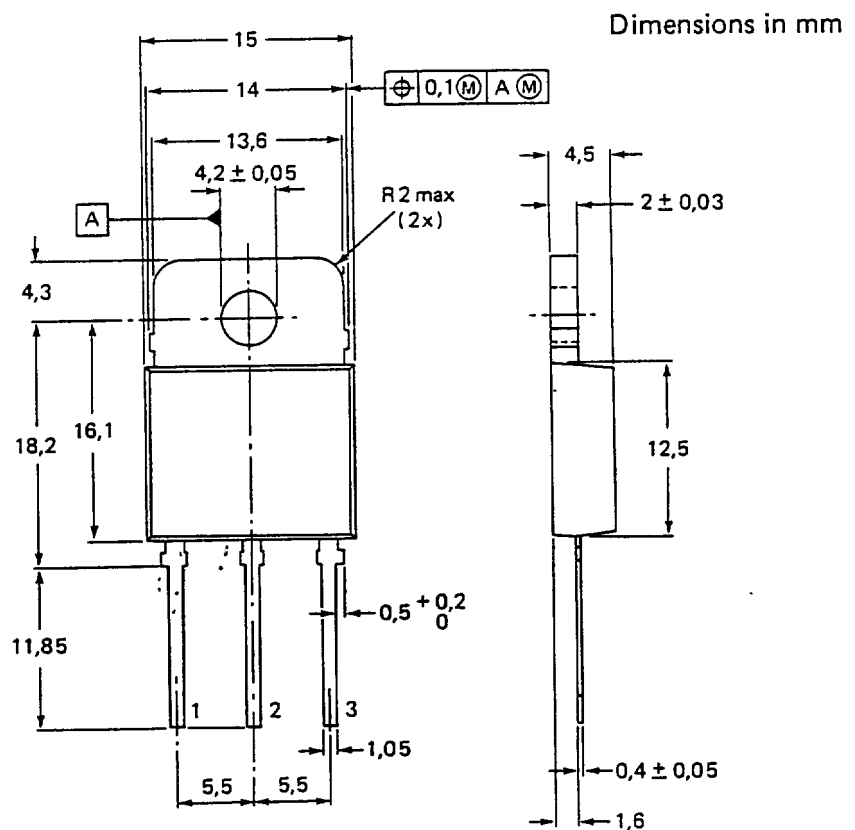
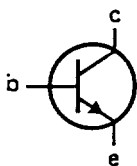
MECHANICAL DATA

Fig. 1 SOT-93.

Collector connected to mounting-base.

Pinning:

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



See also chapters Mounting instructions and Accessories.

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CIRCUIT DIAGRAM

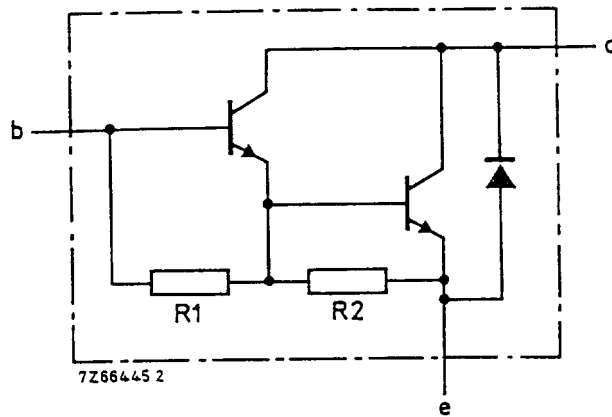


Fig. 2.
R1 typical 3 kΩ
R2 typical 80 Ω

RATINGS

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

		BDV67A				B	C	D
Collector-base voltage (open emitter)	V_{CB0}	max.	100	120	140	160	V	
Collector-emitter voltage (open base)	V_{CE0}	max.	80	100	120	150	V	
Emitter-base voltage (open collector)	V_{EB0}	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 $T_{mb} = 25\text{ °C}$	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	$R_{th\ j-mb}$	=	0,625	K/W
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CHARACTERISTICS

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

Collector cut-off currents

$I_E = 0; V_{CB} = V_{CB0max}$	I_{CB0}	<	1	mA
$I_E = 0; V_{CB} = \frac{1}{2}V_{CB0max}; T_j = 150\text{ °C}$	I_{CB0}	<	4	mA
$I_B = 0; V_{CE} = \frac{1}{2}V_{CE0max}$	I_{CE0}	<	1	mA

Emitter cut-off current

$I_C = 0; V_{EB} = 5\text{ V}$	I_{EBO}	<	5	mA
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* 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*	h_{FE}	typ. 3000
$I_C = 1\text{ A}; V_{CE} = 3\text{ V}$	h_{FE}	> 1000
$I_C = 10\text{ A}; V_{CE} = 3\text{ V}$	h_{FE}	typ. 1000
$I_C = 16\text{ A}; V_{CE} = 3\text{ V}$		
Base-emitter voltage**	V_{BE}	< 2,5 V
$I_C = 10\text{ A}; V_{CE} = 3\text{ V}$		
Collector-emitter saturation voltage*	V_{CEsat}	< 2 V
$I_C = 10\text{ A}; I_B = 40\text{ mA}$		
Collector capacitance at $f = 1\text{ MHz}$	C_c	typ. 300 pF
$I_E = I_e = 0; V_{CB} = 10\text{ V}$		
Cut-off frequency	f_{hfe}	typ. 60 kHz
$I_C = 5\text{ A}; V_{CE} = 3\text{ V}$		
Diode, forward voltage	V_F	< 3 V
$I_F = 10\text{ A}$		
D.C. current gain ratio of matched complementary pairs	h_{FE1}/h_{FE2}	< 2,5
$I_C = 10\text{ A}; V_{CE} = 3\text{ V}$		
Small-signal current gain	h_{fe}	typ. 40
$I_C = 5\text{ A}; V_{CE} = 3\text{ V}; f = 1\text{ MHz}$		
Turn-off breakdown energy with inductive load (see also Fig. 3).	$E(BR)$	> 150 mJ
$I_{Con} = 6,3\text{ A}; -I_{Boff} = 0; t_p = 1\text{ ms}; T = 100\text{ ms}$		
Switching times		
$I_{Con} = 10\text{ A}; I_{Bon} = -I_{Boff} = 40\text{ mA}; V_{CC} = 12\text{ V}$	t_{on}	typ. 1 μs
Turn-on time	t_{off}	typ. 3,5 μs
Turn-off time		

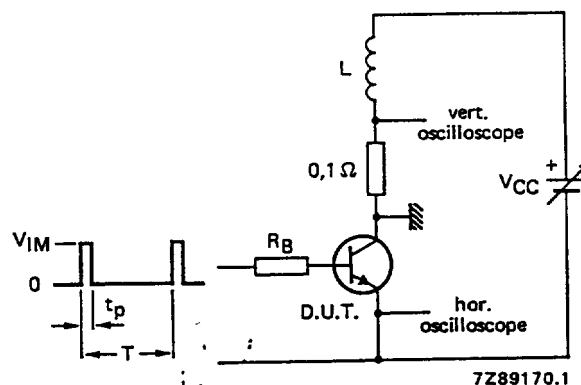


Fig. 3 Test circuit; $V_1 = 12\text{ V}; R_B = 270\ \Omega$.

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

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

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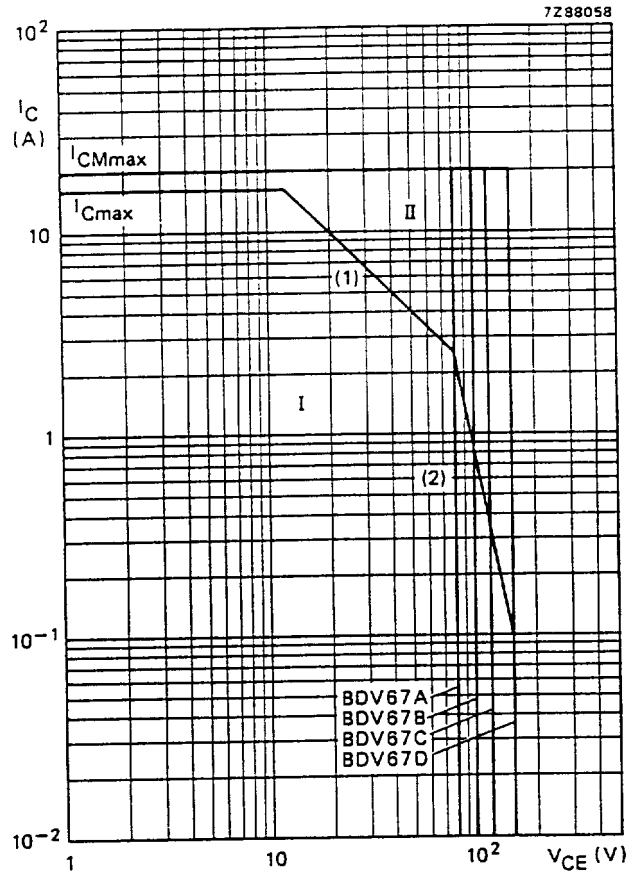


Fig. 4 Safe Operating Area; $T_{mb} \leq 25^\circ C$.

- I Region of permissible DC operation.
- II Permissible extension for repetitive operation.
- (1) P_{tot} max line.
- (2) Second breakdown limits.

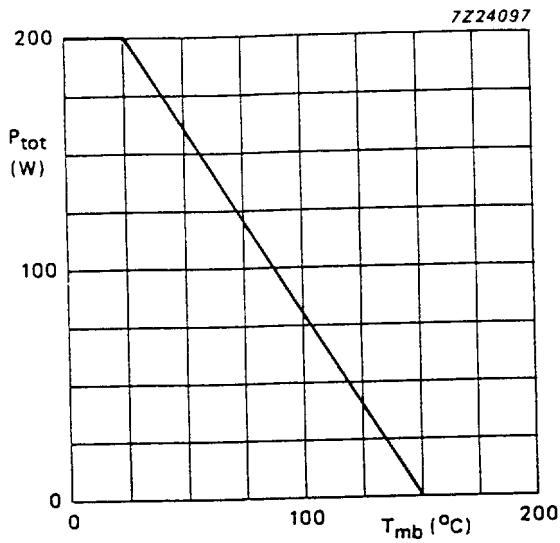


Fig. 5 Power derating curve.

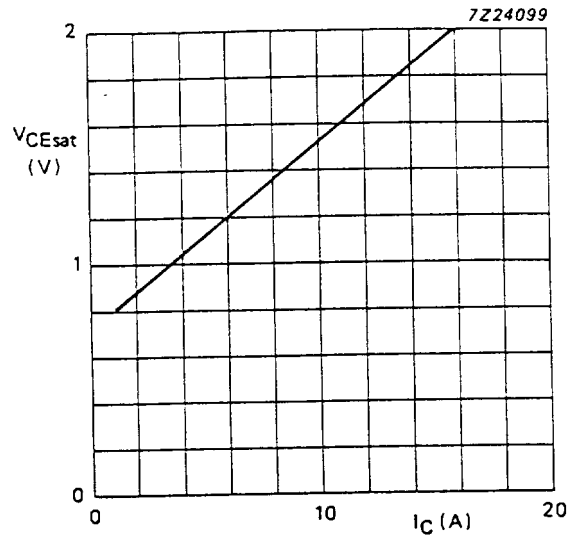


Fig. 6 Typical collector-emitter saturation voltage at $T_{mb} = 25^\circ\text{C}$; $I_C/I_B = 250$.

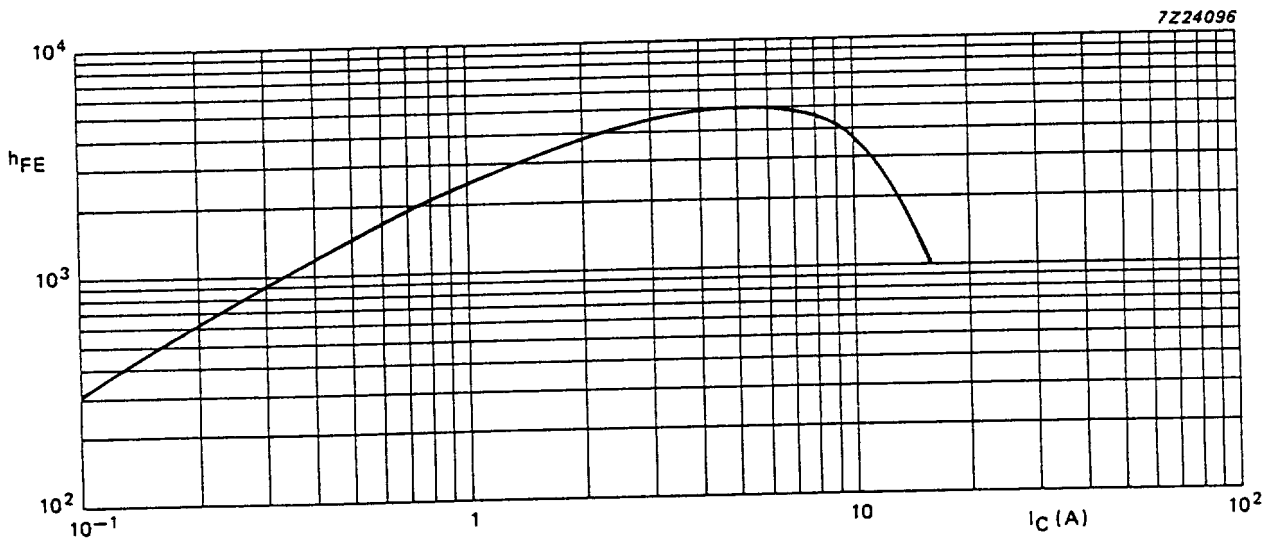


Fig. 7 Typical DC current gain at $V_{CE} = 3\text{ V}$.