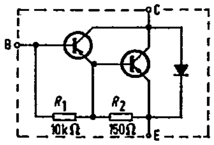
PNP Silicon Darlington Transistors

BD 644
BD 646
BD 648
BD 650

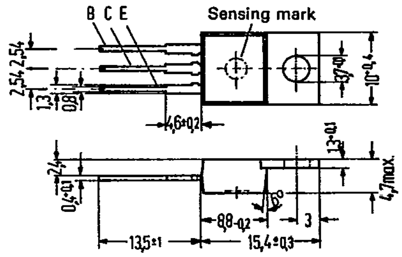
Epibase power darlington transistors (62.5W)

BD 644, BD 646, BD 648, and BD 650 are monolithic PNP silicon epibase power darlington transistors with diode and resistors in a TO 220 AB plastic package (TOP-66). The collectors of the two transistors are electrically connected to the metallic mounting area. These darlington transistors for AF applications are outstanding for particularly high current gain. Together with BD 643, BD 645, BD 647, and BD 649, they are particularly suitable for use as complementary AF push-pull output stages.



Type	Ordering code
BD 644	Q62702-D230
BD 644/BD 643 paired	Q62702-D235
BD 646	Q62702-D232
BD 646/BD 645 paired	Q62702-D236
BD 648	Q62702-D234
BD 648/BD 647 paired	Q62702-D237
BD 650	Q62702-D375
BD 650/BD 649 paired	Q62702-D376
Insulating nipple	Q62901-B55
Mica washer	Q62901-B52
Spring washer A 3 DIN 137	Q62902-B63

Dimensional drawings in preparation.



Approx. weight 18 g. Dimensions in mm

Maximum ratings		BD 644	BD 646	BD 648	BD 650	
Collector-emitter voltage	$-V_{CEO}$	45	60	80	100	V
Collector-base voltage	$-V_{CBO}$	45	60	80	100	V
Base-emitter voltage	$-V_{EBO}$	5	5	5	5	V
Collector current	$-I_C$	8	8	8	8	A
Collector peak current ($t < 10$ ms)	$-I_{CM}$	12	12	12	12	A
Base current	$-I_B$	150	150	150	150	mA
Storage temperature range	T_{stg}		−55 to +150			°C
Junction temperature	T_j	150	150	150	150	°C
Total power dissipation ($T_{case} \leq 25$ °C, $-V_{CE} \leq 10$ V)	P_{tot}	62,5	62,5	62,5	62,5	W
Thermal resistance						
Junction to ambient air	R_{thJA}	≦80	≦80	≦80	≦80	K/W
Junction to case[1]	R_{thJC}	≦2	≦2	≦2	≦2	K/W

1) For insulated mounting: If the mica washer Q62901-B 52 (50 to 90 μm) and the insulating nipple Q62901-B 55 are used this value increases by 4 K/W, and with grease by 2 K/W.

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Static characteristics (T_{amb} = 25°C)

		BD 644	BD 646	BD 648	BD 650	
Collector cutoff current						
($V_{CB} = V_{CBmax}$)	$-I_{CBO}$	<0.2	<0.2	<0.2	<0.2	mA
($V_{CB} = V_{CBmax}$; T_{amb} = 100°C)	$-I_{CBO}$	<2	<2	<2	<2	mA
Collector cutoff current ($V_{CE} = 0.5\ V_{CEmax}$)	$-I_{CEO}$	<0.5	<0.5	<0.5	<0.5	mA
Emitter cutoff current (V_{EB} = 5 V)	$-I_{EBO}$	<5	<5	<5	<5	mA
Collector-emitter breakdown voltage (I_C = 100 mA)[1]	$-V_{(BR)CEO}$	>45	>60	>80	>100	V
Collector-base breakdown voltage (I_E = 5 mA)	$-V_{(BR)CBO}$	>45	>60	>80	>100	V
Emitter-base breakdown voltage (I_E = 2 mA)	$-V_{(BR)EBO}$	>5	>5	>5	>5	V
DC current gain						
($-I_C$ = 0.5 A; $-V_{CE}$ = 3 V)	h_{FE}	1500	1500	1500	1500	–
($-I_C$ = 3 A; $-V_{CE}$ = 3 V)	h_{FE}	>750	>750	>750	>750	–
($-I_C$ = 6 A; $-V_{CE}$ = 3 V)	h_{FE}	750	750	750	750	–
Base-emitter forward voltage ($-I_C$ = 3 A; $-V_{CE}$ = 3 V)	$-V_{BE}$	<2.5	<2.5	<2.5	<2.5	V
Collecor-emitter saturation voltage ($-I_C$ = 3 A; $-I_B$ = 12 mA)	$-V_{CEsat}$	<2	<2	<2	<2	V
Forward voltage of the protective diode at I_F = 3 A	V_F	1.8	1.8	1.8	1.8	V

Dynamic characteristics (T_{amb} = 25°C)

Transition frequency ($-I_C$=3A; $-V_{CE}$=3V, f=1MHz)	f_T	7 (>1)	7 (>1)	7 (>1)	7 (>1)	MHz
Cutoff frequency in common emitter configuration ($-I_C$ = 3 A; $-V_{CE}$ = 3 V)	f_{hfe}	60	60	60	60	kHz

1) t = 200 µs, duty cycle 1%

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Total perm. power dissipation versus temperature
$P_{tot} = f(T_{case})$; V_{CE} = parameter
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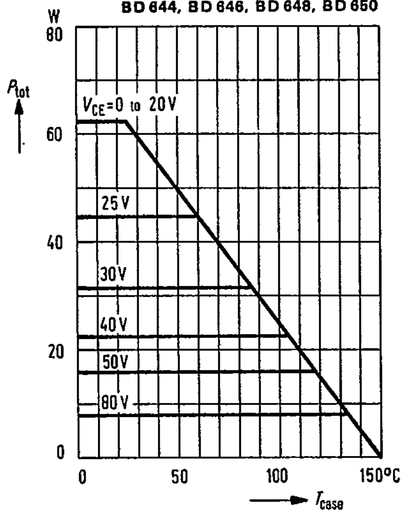

Permissible pulse load
$r_{thJC} = f(t)$; v = parameter
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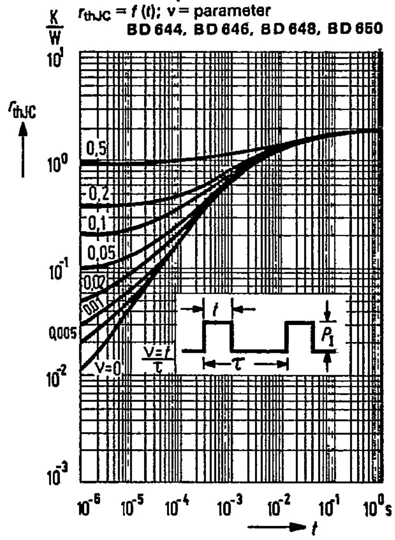

Permissible operating range
$I_C = f(V_{CE})$; T_{case} = 25°C, v = 0.01
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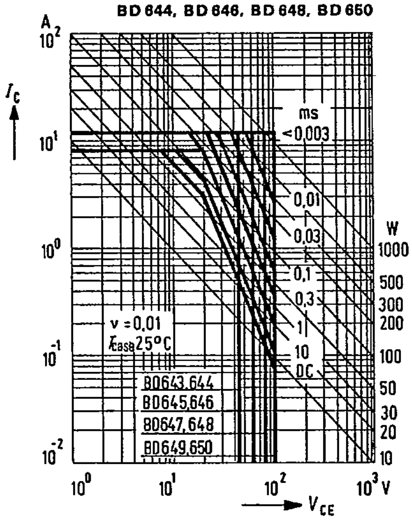

DC current gain $h_{FE} = f(I_C)$
V_{CE} = 3 V; T_{case} = 25°C
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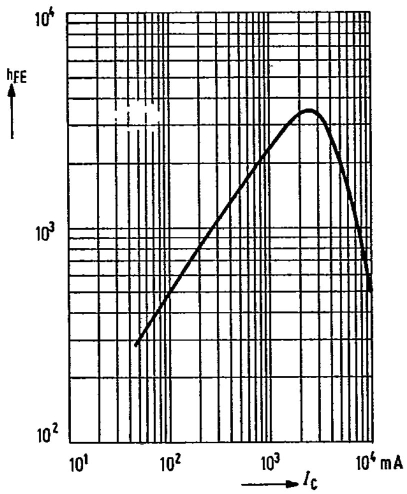

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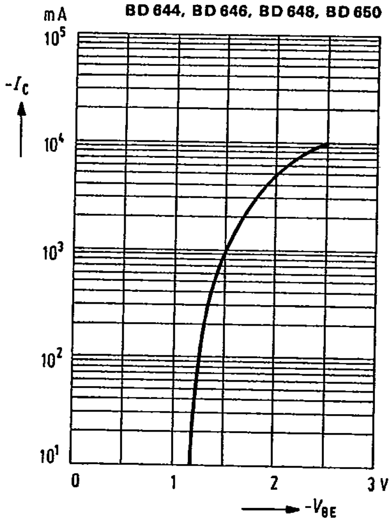
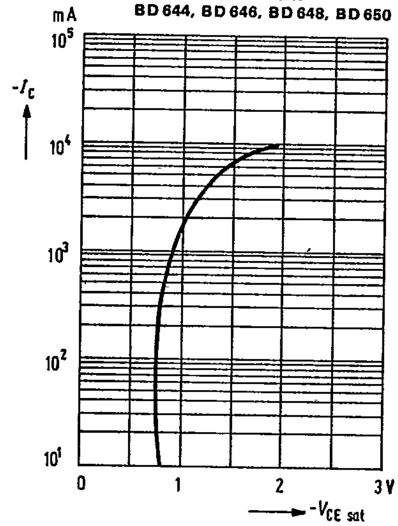
Collector current $I_C = f(V_{BE})$
$-V_{CE} = 3$ V; $T_{case} = 25$ °C



Collector-emitter saturation voltage
$V_{CEsat} = f(I_C)$; $h_{FE} = 250$; $T_{case} = 25$ °C



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