

**NPN Silicon Darlington Transistors**

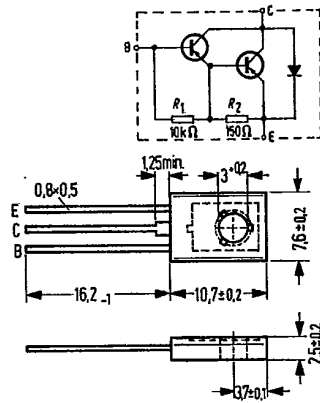
**BD 675**  
**BD 677**  
**BD 679**

SIEMENS AKTIENGESELLSCHAFT 25C 04395 D

**Epibase power darlington transistors (40 W)**

BD 675, BD 677, and BD 679 are monolithic NPN silicon epibase power darlington transistors with diode and resistors in a TO 126 plastic package (12 A 3 DIN 41869, sheet 4). 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 676, BD 678, and BD 680 they are especially suitable for complementary AF push-pull output stages and color TV correction stages.

| Type                 | Ordering code |
|----------------------|---------------|
| BD 675               | Q62702-D238   |
| BD 677               | Q62702-D240   |
| BD 679               | Q62702-D242   |
| BD 675/BD 676 paired | Q62702-D244   |
| BD 677/BD 678 paired | Q62702-D245   |
| BD 679/BD 680 paired | Q62702-D246   |
| Mica washer          | Q62902-B62    |
| Spring washer        | Q62902-B63    |
| A 3 DIN 137          |               |



Approx. weight 0.5 g. Dimensions in mm

**Maximum ratings**

|   | BD 675    | BD 677 | BD 679      |     |    |
|---|-----------|--------|-------------|-----|----|
| Collector-emitter voltage   | $V_{CE0}$ | 45     | 60          | 80  | V  |
| Collector-base voltage  | $V_{CB0}$ | 45     | 60          | 80  | V  |
| Base-emitter voltage  | $V_{EBO}$ | 5      | 5           | 5   | V  |
| Collector current   | $I_C$     | 4      | 4           | 4   | A  |
| Collector-peak current ( $t \leq 1$ ms)                                 | $I_{CM}$  | 7      | 7           | 7   | A  |
| Base current  | $I_B$     | 0.1    | 0.1         | 0.1 | A  |
| Storage temperature   | $T_{stg}$ |        | -55 to +150 |     | °C |
| Junction temperature  | $T_j$     | 150    | 150         | 150 | °C |
| Total power dissipation<br>( $T_{case} \leq 25$ °C; $V_{CE} \leq 20$ V) | $P_{tot}$ | 40     | 40          | 40  | W  |

**Thermal resistance**

|                         |                 |       |       |       |     |
|-------------------------|-----------------|-------|-------|-------|-----|
| Junction to ambient air | $R_{thJA}^{1)}$ | <100  | <100  | <100  | K/W |
| Junction to case        | $R_{thJC}$      | <3.12 | <3.12 | <3.12 | K/W |

1) Transistor fixing with M 3 screw, starting torque  $MA \leq 0.5$  to 0.8 Nm. If a 50  $\mu$  mica washer (ungreased) is used, the thermal resistance increases by 8 K/W and in case of a greased one by 4 K/W. Below the screw head, a washer or a spring washer should be used.

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Static characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

|  |               | BD 675 | BD 677      | BD 679      |    |
|--|---------------|--------|-------------|-------------|----|
| Collector cutoff current<br>( $V_{CB} = V_{CBmax}$ )                                     | $I_{CBO}$     | <0.2   | <0.2        | <0.2        | mA |
| ( $V_{BC} = V_{CBmax}$ ; $T_{amb} = 100^{\circ}\text{C}$ )                               | $I_{CBO}$     | <2     | <2          | <2          | mA |
| Collector cutoff current<br>( $V_{CE} = 0.5 V_{CEmax}$ )                                 | $I_{CEO}$     | <0.5   | <0.5        | <0.5        | mA |
| Emitter cutoff current<br>( $V_{EB} = 5\text{ V}$ )                                      | $I_{EBO}$     | <5     | <5          | <5          | mA |
| Collector-emitter breakdown<br>voltage ( $I_C = 100\text{ mA}$ ) <sup>1)</sup>           | $V_{(BR)CEO}$ | >45    | >60         | >80         | V  |
| Collector-base breakdown<br>voltage ( $I_C = 1\text{ mA}$ )                              | $V_{(BR)CBO}$ | >45    | >60         | >80         | V  |
| Emitter-base breakdown<br>voltage ( $I_E = 5\text{ mA}$ )                                | $V_{(BR)EBO}$ | >5     | >5          | >5          | V  |
| Collector emitter saturation voltage<br>( $I_C = 50\text{ mA}$ ; $V_{CE} = 3\text{ V}$ ) | $h_{FE}$      | 750    | 750         | 750         | -  |
| ( $I_C = 1.5\text{ A}$ ; $V_{CE} = 3\text{ V}$ )   | $h_{FE}$      | >750   | >750 (3000) | >750 (3000) | -  |
| ( $I_C = 4\text{ A}$ ; $V_{CE} = 3\text{ V}$ )   | $h_{FE}$      | 1000   | 1000        | 1000        | -  |
| Base-emitter forward voltage<br>( $I_C = 1.5\text{ A}$ ; $V_{CE} = 3\text{ V}$ )         | $V_{BE}$      | <2.5   | <2.5        | <2.5        | V  |
| Collector-emitter saturation voltage<br>( $I_C = 1.5\text{ A}$ ; $I_B = 30\text{ mA}$ )  | $V_{CEsat}$   | <2.5   | <2.5        | <2.5        | V  |
| Forward voltage of the protective<br>diode at $I_F = 3\text{ A}$                         | $V_F$         | 1.8    | 1.8         | 1.8         | V  |

Dynamic characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

|   |           |        |        |        |     |
|---|-----------|--------|--------|--------|-----|
| Transition frequency<br>( $I_C = 1.5\text{ A}$ ; $V_{CE} = 3\text{ V}$ ; $f = 1\text{ MHz}$ )           | $f_T$     | 7 (>1) | 7 (>1) | 7 (>1) | MHz |
| Cutoff frequency in common<br>emitter configuration<br>( $I_C = 1.5\text{ A}$ ; $V_{CE} = 3\text{ V}$ ) | $f_{hfe}$ | 60     | 60     | 60     | kHz |

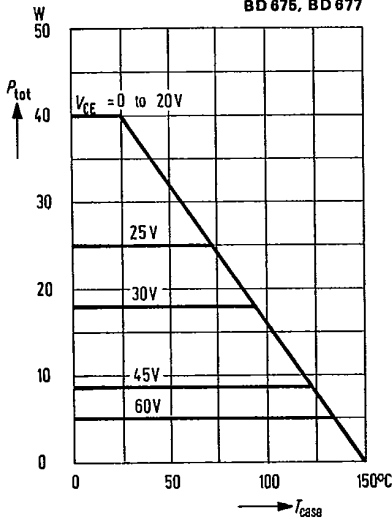
1)  $t = 200\text{ }\mu\text{s}$ , duty cycle 1%.

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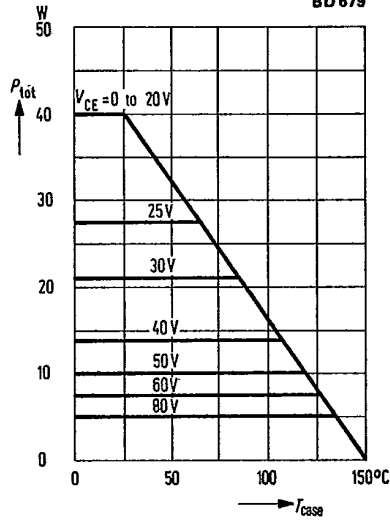
Total perm. power dissipation  
 versus temperature  
 $P_{tot} = f(T_{case}); V_{CE} = \text{parameter}$

BD 675, BD 677



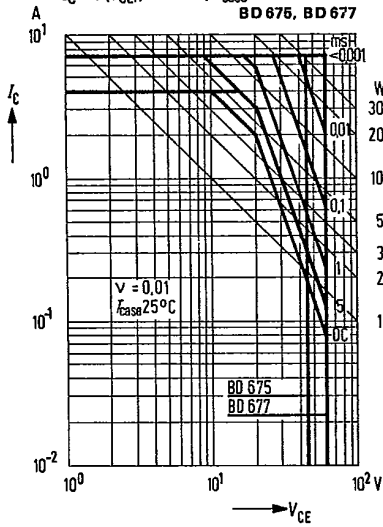
Total perm. power dissipation  
 versus temperature  
 $P_{tot} = f(T_{case}); V_{CE} = \text{parameter}$

BD 679



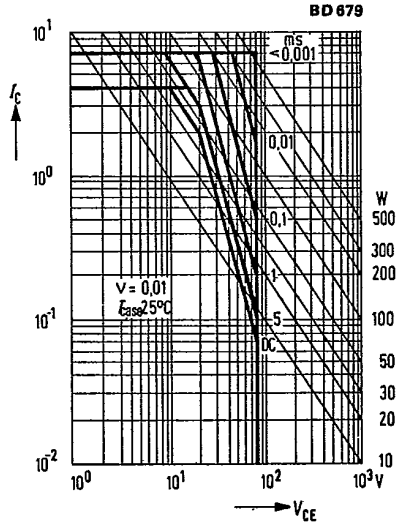
Permissible operating range  
 $I_C = f(V_{CE}); v = 0.01; T_{case} = 25^\circ\text{C}$

BD 675, BD 677



Permissible operating range  
 $I_C = f(V_{CE}); v = 0.01; T_{case} = 25^\circ\text{C}$

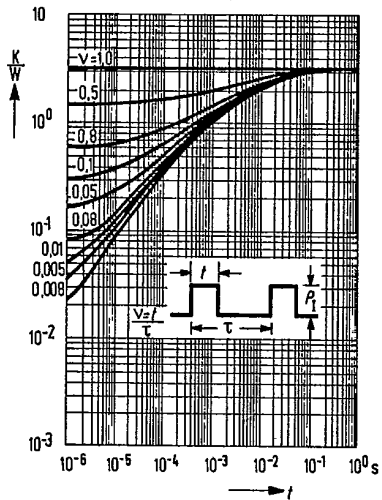
BD 679



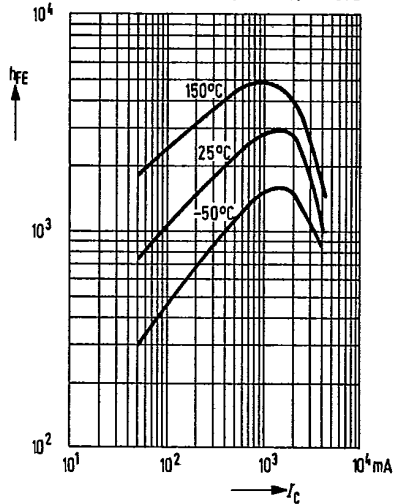
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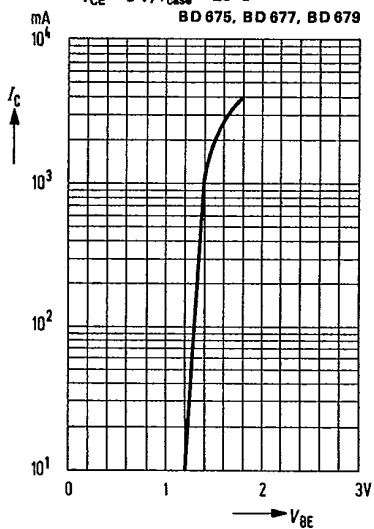
Permissible pulse load  
 $P_{thJC} = f(t)$ ;  $v =$  parameter  
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DC current gain  $h_{FE} = f(I_C)$   
 $-V_{CE} = 3V$   
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Collector current  $I_C = f(V_{BE})$   
 $-V_{CE} = 3V; T_{case} = 25^\circ C$   
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Collector-emitter saturation voltage  
 $V_{CEsat} = f(I_C); h_{FE} = 100; T_{case} = 25^\circ C$   
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