

25C D ■ 8235605 0004440 7 ■ SIEG T-33-21

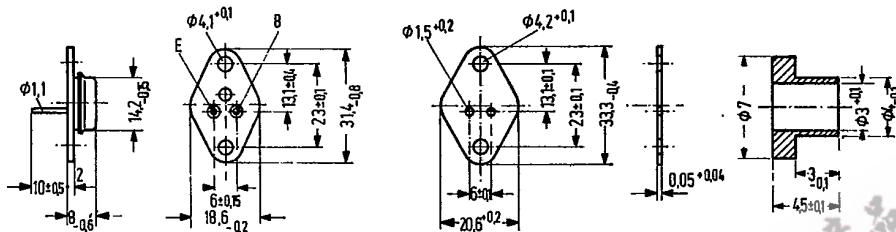
# PNP Silicon Planar Transistors

BDX 27  
BDX 28  
BDX 29  
BDX 30

SIEMENS AKTIENGESELLSCHAFT 04440 D

BDX 27, BDX 28, BDX 29, and BDX 30 are epitaxial PNP silicon power transistors in SOT 9 case (9 A 2 DIN 41875). The collector is electrically connected to the case. The transistors are particularly suitable for use in high Q AF output stages and for switching applications.

| Type      | Ordering code   | Type              | Ordering code   |
|-----------|-----------------|-------------------|-----------------|
| BDX 27    | Q62702-D162     | BDX 29            | Q62702-D160     |
| BDX 27-6  | Q62702-D162-V6  | BDX 29-6          | Q62702-D160-V6  |
| BDX 27-10 | Q62702-D162-V10 | BDX 29-10         | Q62702-D160-V10 |
| BDX 27-16 | Q62702-D162-V16 | BDX 30            | Q62702-D163     |
| BDX 28    | Q62702-D159     | BDX 30-6          | Q62702-D163-V6  |
| BDX 28-6  | Q62702-D159-V6  | BDX 30-10         | Q62702-D163-V10 |
| BDX 28-10 | Q62702-D159-V10 | Mica washer       | Q62902-B16-A    |
| BDX 28-16 | Q62702-D159-V16 | Insulating nipple | Q62902-B50      |



Approx. weight 8.3 g. Dimensions in mm

Mica washer  
dry:  $R_{th} = 2.5 \text{ K/W}$   
greased:  $R_{th} = 1 \text{ K/W}$

Insulating nipple scale 2:1

## Maximum ratings

| Maximum ratings                                                                         |            | BDX 27      | BDX 28 | BDX 29 | BDX 30 |    |
|-----------------------------------------------------------------------------------------|------------|-------------|--------|--------|--------|----|
| Collector-emitter voltage                                                               | $-V_{CEO}$ | 40          | 60     | 80     | 125    | V  |
| Collector-emitter voltage                                                               | $-V_{CES}$ | 40          | 60     | 80     | 125    | V  |
| Collector-base voltage                                                                  | $-V_{CBO}$ | 40          | 60     | 80     | 125    | V  |
| Emitter-base voltage                                                                    | $-V_{EBO}$ | 5           | 5      | 5      | 5      | V  |
| Collector peak current<br>( $t \leq 1\text{ ms}$ )                                      | $-I_{CM}$  | 7           | 7      | 7      | 7      | A  |
| Collector current                                                                       | $-I_C$     | 5           | 5      | 5      | 5      | A  |
| Emitter current                                                                         | $-I_E$     | 6           | 6      | 6      | 6      | A  |
| Base current                                                                            | $-I_B$     | 1           | 1      | 1      | 1      | A  |
| Junction temperature                                                                    | $T_j$      | 200         | 200    | 200    | 200    | °C |
| Storage temperature range                                                               | $T_{stg}$  | -65 to +200 |        |        |        | °C |
| Total power dissipation<br>( $T_{case} < 45^{\circ}\text{C}$ ; $V_{CE} < 13\text{ V}$ ) | $P_{tot}$  | 50          | 50     | 50     | 50     | W  |

## Thermal resistance

|                         |            |            |            |            |            |     |
|-------------------------|------------|------------|------------|------------|------------|-----|
| Junction to ambient air | $R_{thJA}$ | $\leq 85$  | $\leq 85$  | $\leq 85$  | $\leq 85$  | K/W |
| Junction to case        | $R_{thJC}$ | $\leq 3.5$ | $\leq 3.5$ | $\leq 3.5$ | $\leq 3.5$ | K/W |

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BDX 27  
BDX 28  
BDX 29  
BDX 30Static characteristics ( $T_{\text{case}} = 25^{\circ}\text{C}$ )

|                                                                                                                                             |                              | BDX 27 | BDX 28 | BDX 29 | BDX 30 |               |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|--------|--------|--------|---------------|
| Collector-emitter breakdown voltage<br>( $I_C = -50 \text{ mA}$ )                                                                           | $-V_{(\text{BR})\text{CEO}}$ | >40    | >60    | >80    | >125   | V             |
| Collector-emitter breakdown voltage<br>( $I_C = 0.1 \text{ mA}$ )                                                                           | $-V_{(\text{BR})\text{CES}}$ | >40    | >60    | >80    | >125   | V             |
| Emitter-base breakdown voltage<br>( $I_E = -10 \mu\text{A}$ )                                                                               | $-V_{(\text{BR})\text{EBO}}$ | >5     | >5     | >5     | >5     | V             |
| Collector cutoff current<br>( $-V_{\text{CE}} = 40 \text{ V}$ )                                                                             | $-I_{\text{CBO}}$            | <1     | -      | -      | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 40 \text{ V}; T_{\text{case}} = 150^{\circ}\text{C}$ )                                                                  | $-I_{\text{CBO}}$            | <100   | -      | -      | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 60 \text{ V}$ )                                                                                                         | $-I_{\text{CBO}}$            | -      | <1     | -      | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 60 \text{ V}; T_{\text{case}} = 150^{\circ}\text{C}$ )                                                                  | $-I_{\text{CBO}}$            | -      | <100   | -      | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 80 \text{ V}$ )                                                                                                         | $-I_{\text{CBO}}$            | -      | -      | <1     | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 80 \text{ V}; T_{\text{case}} = 150^{\circ}\text{C}$ )                                                                  | $-I_{\text{CBO}}$            | -      | -      | <100   | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 125 \text{ V}$ )                                                                                                        | $-I_{\text{CBO}}$            | -      | -      | -      | <1     | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 125 \text{ V}; T_{\text{case}} = 150^{\circ}\text{C}$ )                                                                 | $-I_{\text{CBO}}$            | -      | -      | -      | <100   | $\mu\text{A}$ |
| Collector cutoff current<br>( $-V_{\text{CE}} = 40 \text{ V}; -V_{\text{BE}} = 0.2 \text{ V};$<br>$T_{\text{case}} = 100^{\circ}\text{C}$ ) | $-I_{\text{CEX}}$            | <300   | -      | -      | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 60 \text{ V}; -V_{\text{BE}} = 0.2 \text{ V};$<br>$T_{\text{case}} = 100^{\circ}\text{C}$ )                             | $-I_{\text{CEX}}$            | -      | <300   | -      | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 80 \text{ V}; -V_{\text{BE}} = 0.2 \text{ V};$<br>$T_{\text{case}} = 100^{\circ}\text{C}$ )                             | $-I_{\text{CEX}}$            | -      | -      | <300   | -      | $\mu\text{A}$ |
| ( $-V_{\text{CE}} = 100 \text{ V}; -V_{\text{BE}} = 0.2 \text{ V};$<br>$T_{\text{case}} = 100^{\circ}\text{C}$ )                            | $-I_{\text{CEX}}$            | -      | -      | -      | <300   | $\mu\text{A}$ |

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BDX 27

BDX 28

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## Static characteristics

|                                                                                            |              | BDX 27 | BDX 28 | BDX 29 | BDX 30 |               |
|--------------------------------------------------------------------------------------------|--------------|--------|--------|--------|--------|---------------|
| Emitter cutoff current<br>( $-V_{EB} = 4\text{ V}$ )                                       | $-I_{EBO}$   | <1     | <1     | <1     | <1     | $\mu\text{A}$ |
| Base-emitter forward voltage<br>( $-I_C = 1\text{ A}$ ; $-V_{CE} = 1\text{ V}$ )           | $-V_{BE}$    | <1.1   | <1.1   | <1.1   | <1.1   | V             |
| ( $-I_C = 5\text{ A}$ ; $-V_{CE} = 2\text{ V}$ )                                           | $-V_{BE}$    | <1.7   | <1.7   | <1.7   | <1.7   | V             |
| Collector-emitter saturation<br>voltage<br>( $-I_C = 1\text{ A}$ ; $-I_B = 0.1\text{ A}$ ) | $-V_{CEsat}$ | <0.5   | <0.5   | <0.5   | <0.5   | V             |
| ( $-I_C = 3\text{ A}$ ; $-I_B = 0.3\text{ A}$ )                                            | $-V_{CEsat}$ | <1.0   | <1.0   | <1.0   | <1.0   | V             |

The transistors are grouped according to the DC current gain  $h_{FE}$  and marked by numerals of the German DIN R 5 standard.

| Type           |                | BDX 27<br>BDX 28<br>BDX 29 | BDX 27<br>BDX 28<br>BDX 29 | BDX 27<br>BDX 28<br>BDX 28 |
|----------------|----------------|----------------------------|----------------------------|----------------------------|
| $h_{FE}$ group |                | 6                          | 10                         | 16                         |
| $-I_C$<br>mA   | $-V_{CE}$<br>V | $h_{FE}$<br>$I_C/I_B$      | $h_{FE}$<br>$I_C/I_B$      | $h_{FE}$<br>$I_C/I_B$      |
| 10             | 1              | 40 (>30)                   | 115 (>55)                  | 180 (>80)                  |
| 1000           | 1              | 63 (40-100)                | 100 (63-160)               | 160 (100-250)              |
| 3000           | 2              | 32 (>20)                   | 55 (>20)                   | 85 (>20)                   |
| 5000           | 2              | 20 (>10)                   | 55 (>20)                   | 85 (>20)                   |

| Type           |   | BDX 30       | BDX 30       |
|----------------|---|--------------|--------------|
| $h_{FE}$ group |   | 6            | 10           |
| 10             | 1 | 70 (>30)     | 115 (>30)    |
| 1000           | 1 | 63 (>40-100) | 100 (63-160) |
| 3000           | 2 | 32 (>15)     | 55 (>15)     |
| 5000           | 2 | 20 (>7)      | 55 (>7)      |

|                                                                                                              |           | BDX 27 | BDX 28 | BDX 29 | BDX 30 |               |
|--------------------------------------------------------------------------------------------------------------|-----------|--------|--------|--------|--------|---------------|
| Transition frequency<br>( $-I_C = 200\text{ mA}$ ; $-V_{CE} = 10\text{ V}$ ;<br>$f = 20\text{ MHz}$ )        | $f_T$     | 50     | 50     | 50     | 50     | MHz           |
| Output capacitance<br>( $-V_{CB} = 10\text{ V}$ )                                                            | $C_{ob}$  | 130    | 130    | 100    | 100    | pF            |
| Switching times:<br>Operating point:<br>( $-I_C = 2\text{ A}$ ; $-I_{B1}$ approx. $I_{B2} = 200\text{ mA}$ ) | $t_{on}$  | <0.5   | <0.5   | <0.5   | <0.5   | $\mu\text{s}$ |
| ( $-I_C = 2\text{ A}$ ; $-I_{B1}$ approx. $I_{B2} = 200\text{ mA}$ )                                         | $t_{off}$ | <2     | <2     | <2     | <2     | $\mu\text{s}$ |

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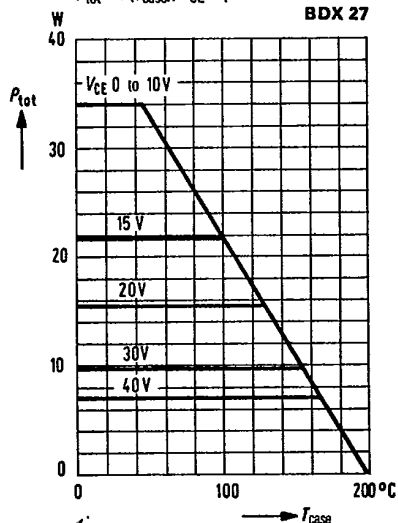
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BDX 28  
BDX 29  
BDX 30

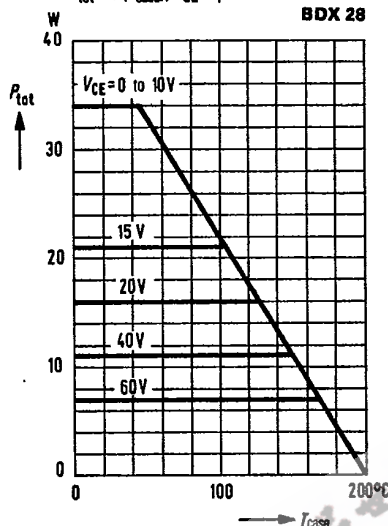
Total perm. power dissipation  
versus temperature  
 $P_{tot} = f(T_{case}); V_{CE} = \text{parameter}$

BDX 27



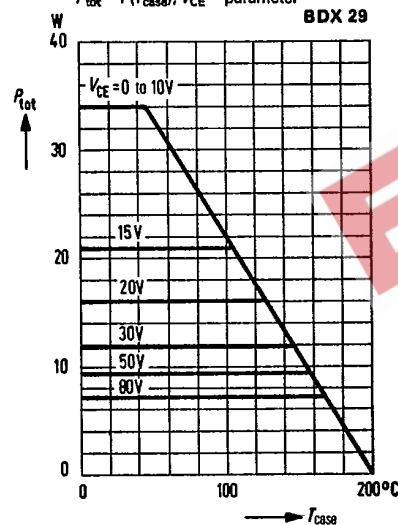
Total perm. power dissipation  
versus temperature  
 $P_{tot} = f(T_{case}); V_{CE} = \text{parameter}$

BDX 28



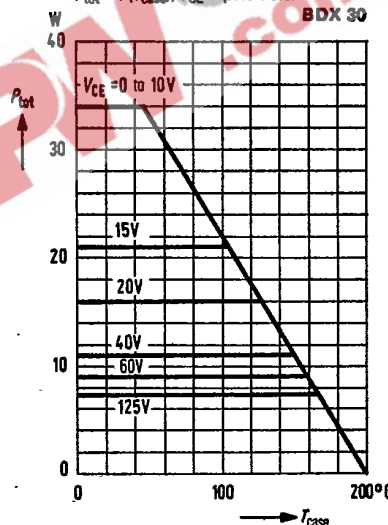
Total perm. power dissipation  
versus temperature  
 $P_{tot} = f(T_{case}); V_{CE} = \text{parameter}$

BDX 29



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

BDX 30



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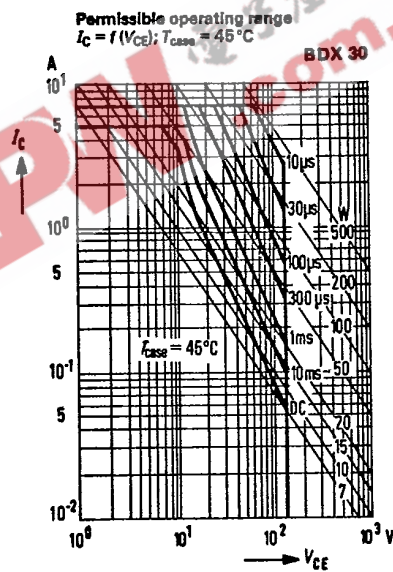
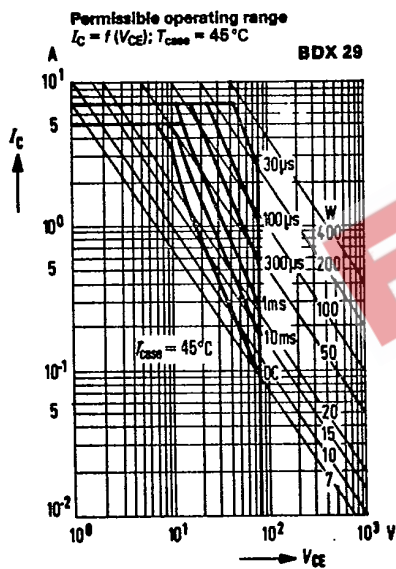
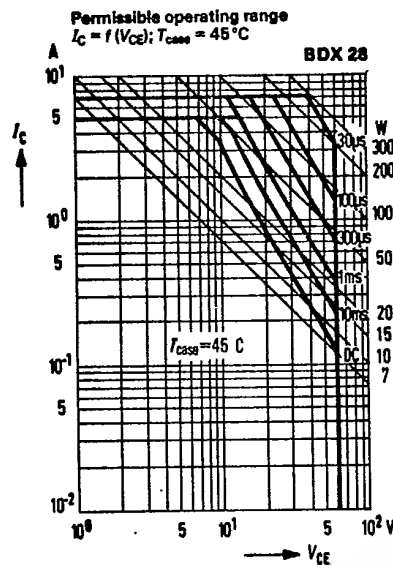
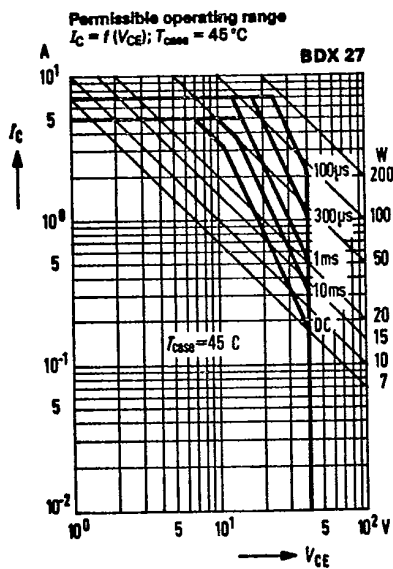
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BDX 27  
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BDX 29  
BDX 30



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BDX 28  
BDX 29  
BDX 30

