

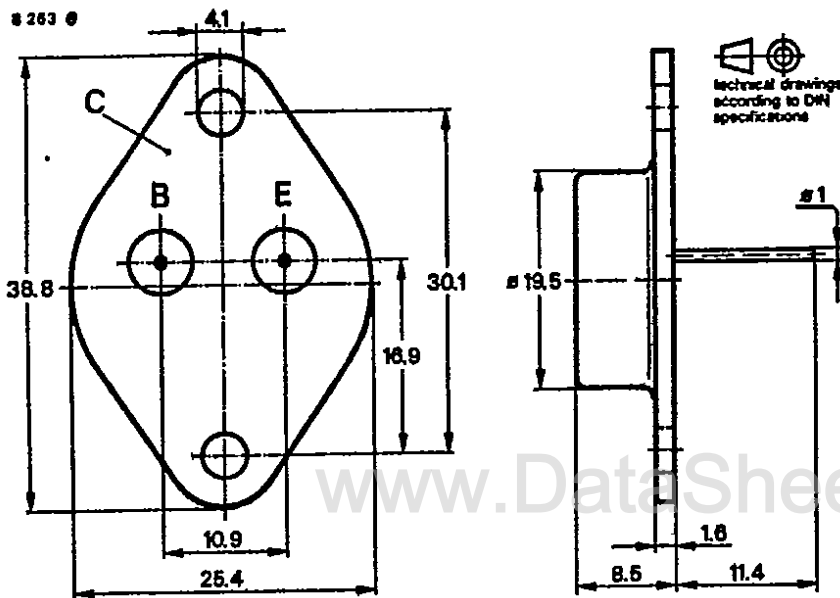
# Silicon NPN Power Transistor

T-33-11

**Applications:** Switching mode power supply

**Features:**

- In triple diffusion technique
- Glass passivation
- High reverse voltage
- Short switching time
- Power dissipation 62 W

**Dimensions in mm**


Collector connected with case

 Standard metal case  
 3 B 2 DIN 41 872  
 JEDEC TO 3  
 Weight max. 20 g

**Accessories**

Isolating washer No. 569524

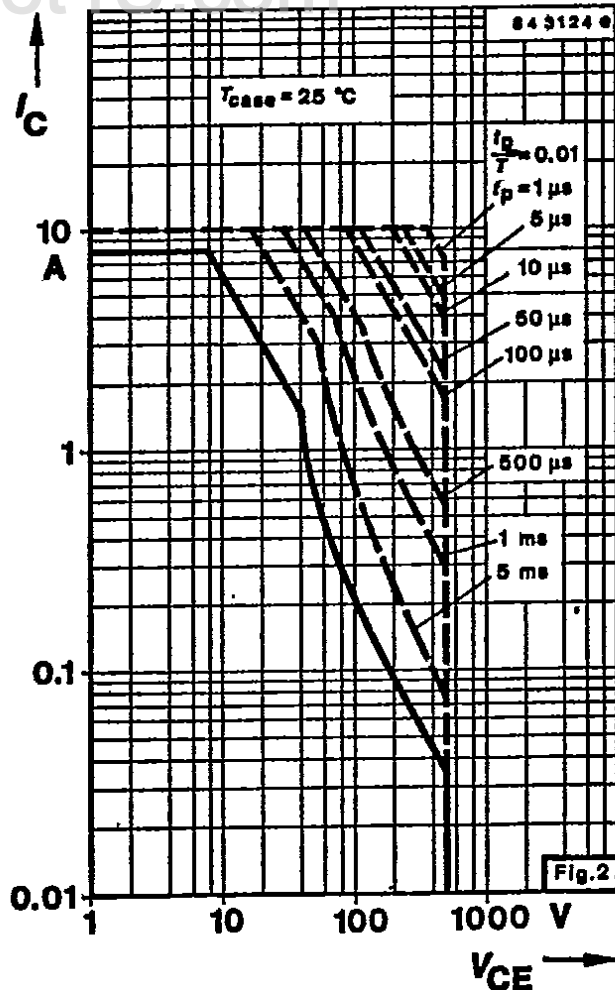
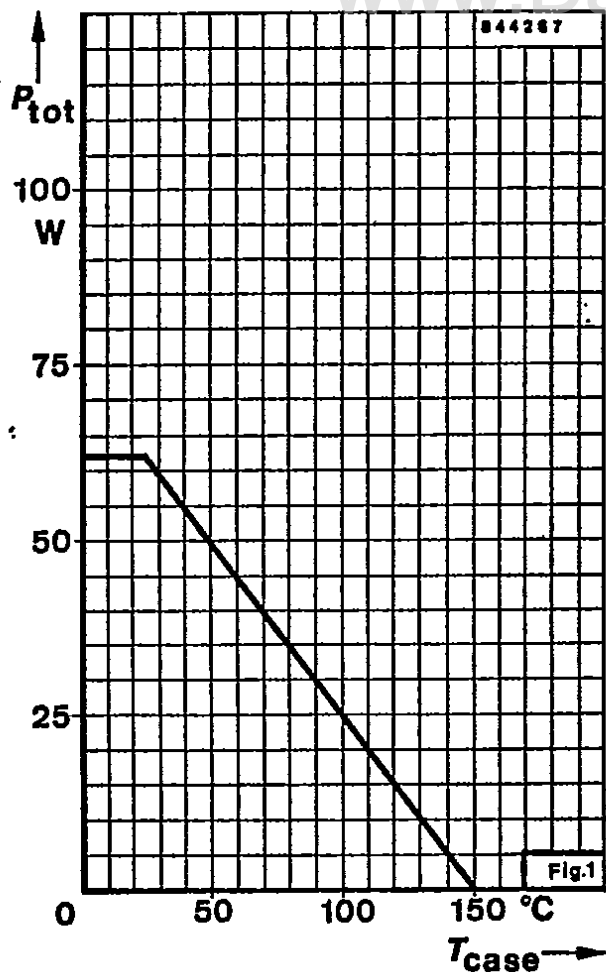
**Absolute maximum ratings**

Collector emitter voltage	$V_{CEO}$	480	V
	$V_{CES}$	1100	V
	$V_{CER}$	1100	V
Collector peak current	$I_{CM}$	10	A
Collector current	$I_C$	8	A
Base current	$I_{BM}$	4	A
	$-I_{BM}$	4	A
Total power dissipation	$P_{tot}$	62	W
$T_{case} \leq 25^\circ C$	$T_j$	150	$^\circ C$
Junction temperature	$T_{stg}$	-65 ... +150	$^\circ C$
Storage temperature range			

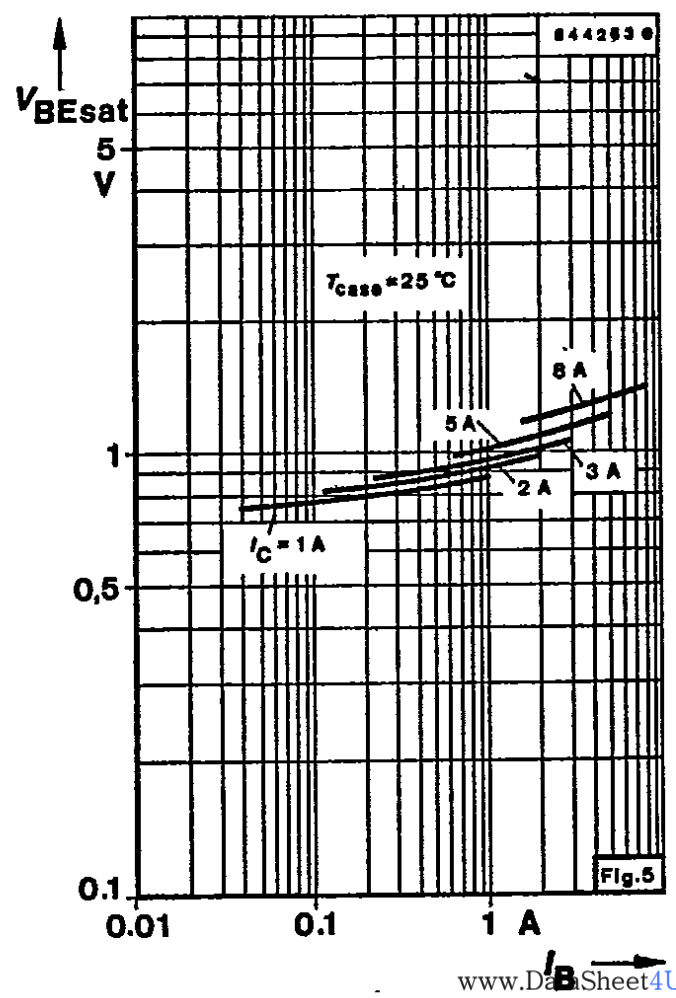
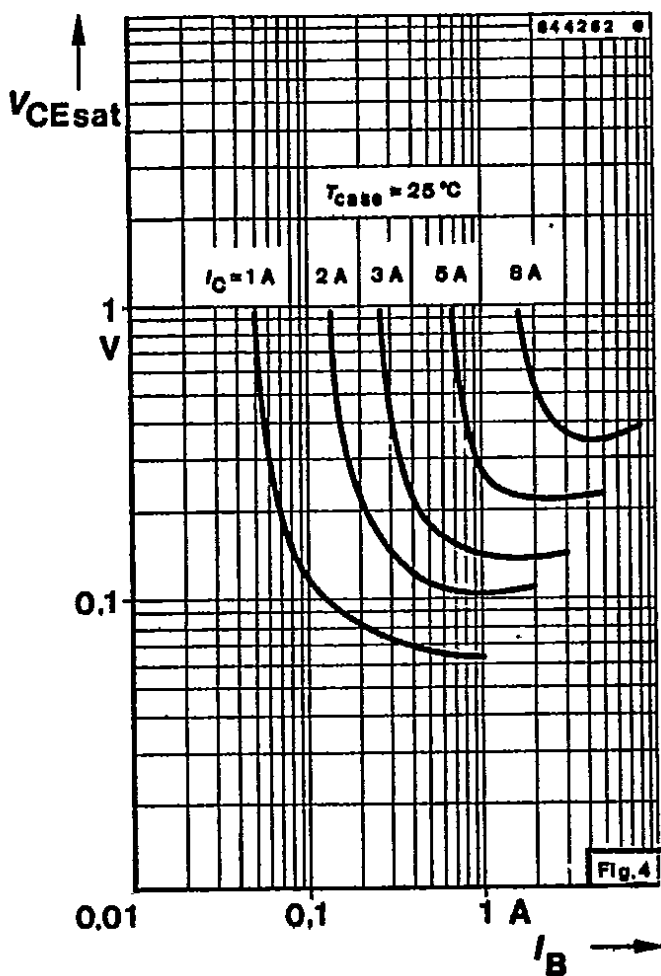
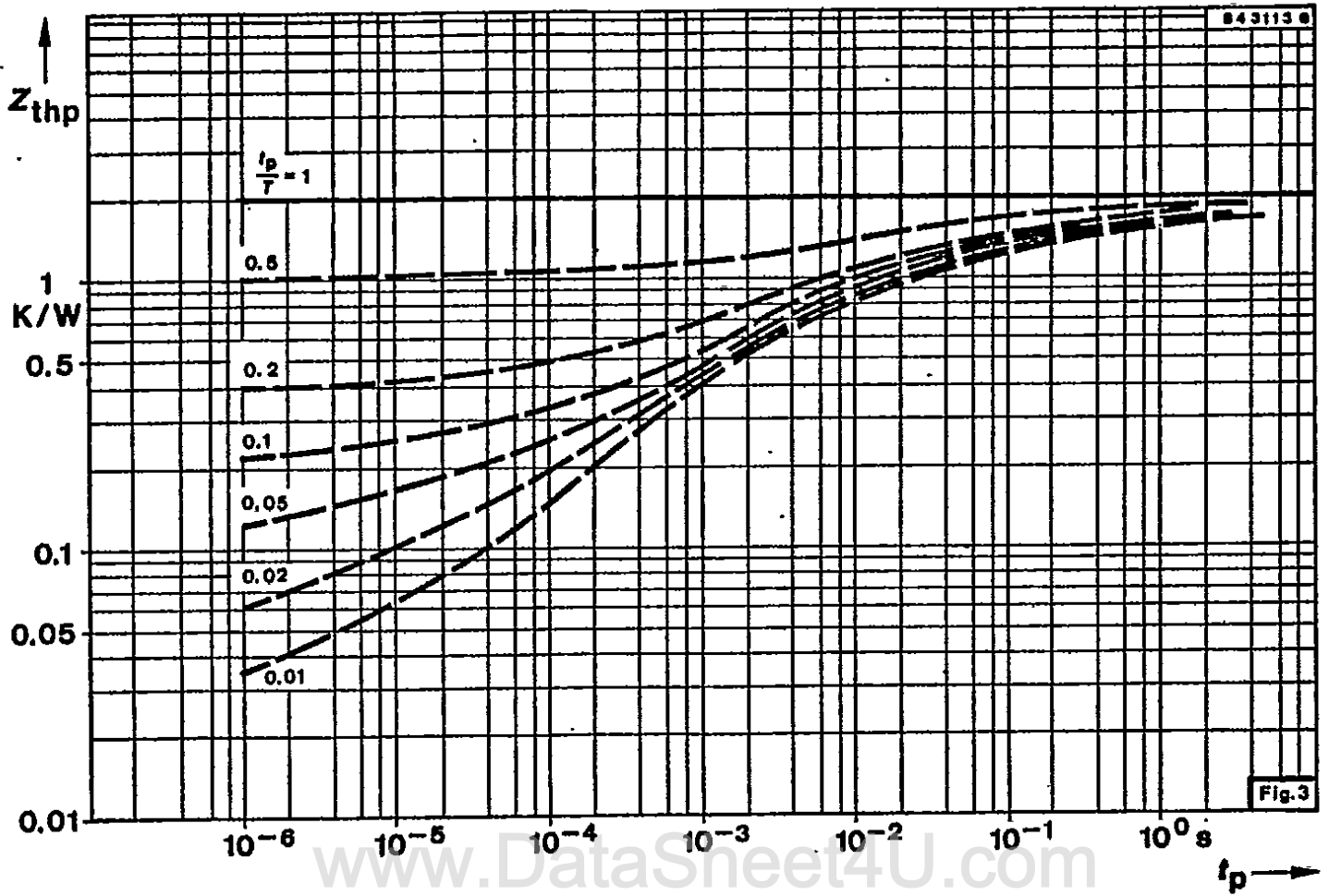
**Maximum thermal resistance**

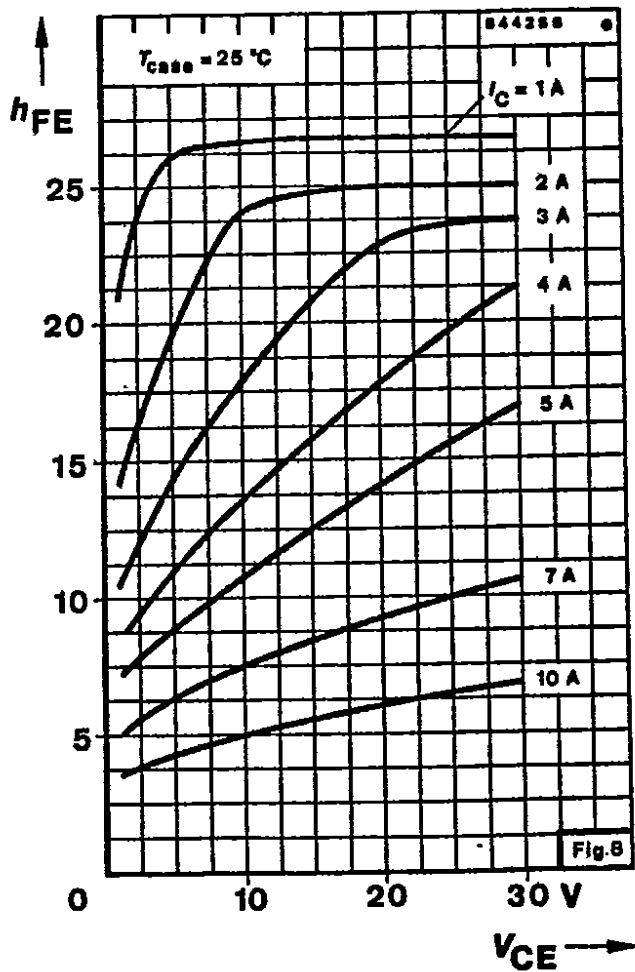
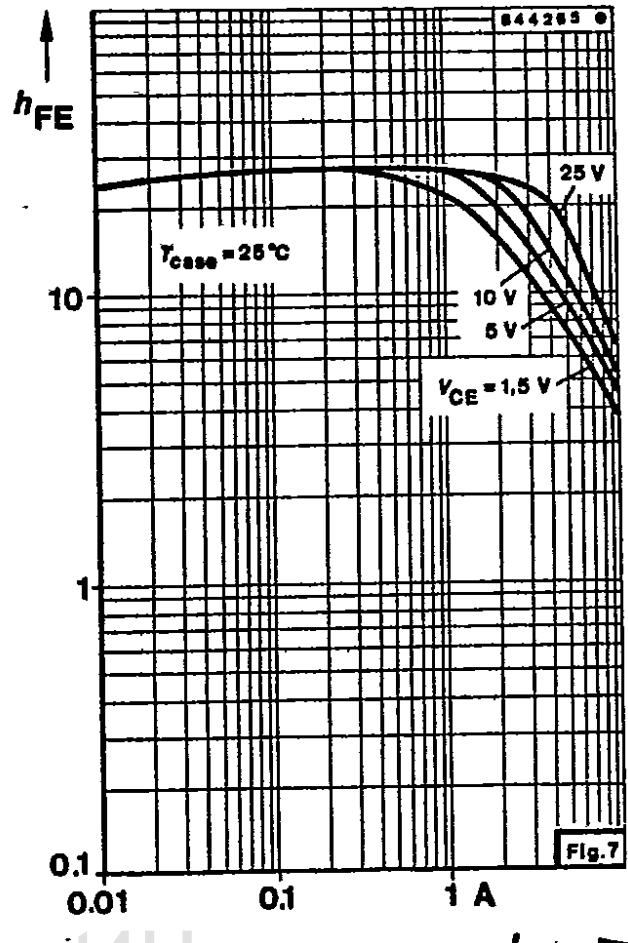
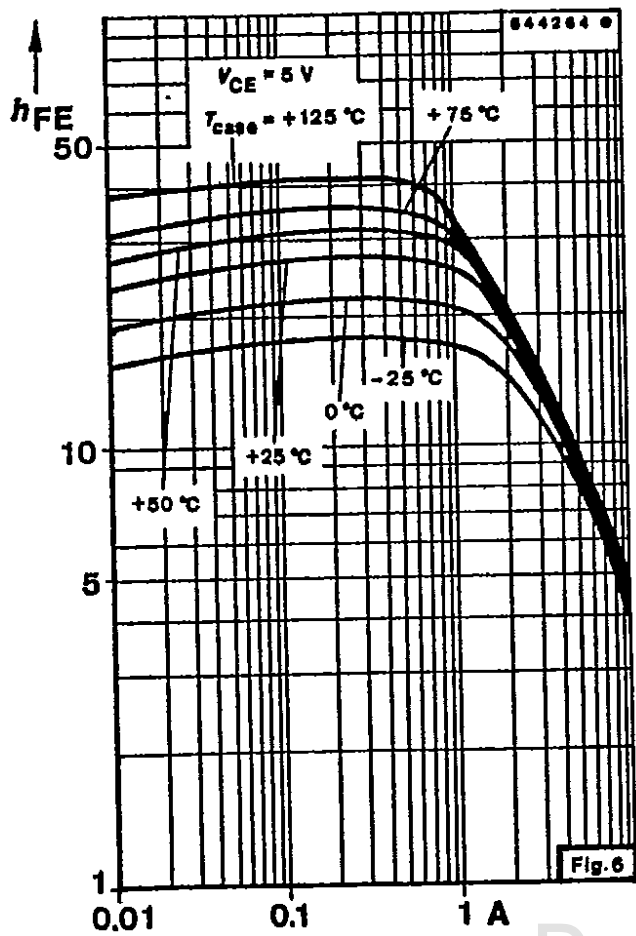
Junction case	$R_{thJC}$	2	K/W
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Characteristics	Min.	Typ.	Max.
$T_{case} = 25^{\circ}C$ , unless otherwise specified			
Collector cut-off current			
$V_{CE} = 1100 V$			1 mA
$T_j = 125^{\circ}C, V_{CE} = 1100 V$			2 mA
Collector-emitter breakdown voltage			
$I_C = 100 mA, L_C = 125 mH$	$V_{(BR)CEO}^{1)}$	480	V
Emitter-base breakdown voltage			
$I_C = 4 A, I_B = 1 A$	$V_{(BR)EBO}$	6	V
Base saturation voltage			
$I_C = 4 A, I_B = 0.8 A$	$V_{BEsat}^{1)}$		2 V
DC forward current transfer ratio			
$V_{CE} = 5 V, I_C = 1 A$	$h_{FE}$	10	
$V_{CE} = 5 V, I_C = 4 A$	$h_{FE}$	5.5	
Gain bandwidth product			
$V_{CE} = 10 V, I_C = 500 mA, f = 1 MHz$	$f_T$	10	MHz
Switching characteristics $I_C = 4 A, I_{B1} = -I_{B2} = 1.25 A, t_p = 20 \mu s$			
Fall time	$t_f^{2)}$		1 $\mu s$
Turn-off time	$t_{off}$		4 $\mu s$



<sup>1)</sup>  $\frac{t_p}{T} \geq 0.01, t_p = 0.1 ms$ ; <sup>2)</sup> By using retrace capacitor at switching-off inductive load





### Family of curves

Besides the static (d. c.) and dynamic (a. c.) characteristics, family of curves are given for specified operating conditions. They show the typical interdependence of individual characteristics. Partly are given the scattering limits. They signify that at least 95% of the delivery lies inside these tolerances.

### 6.6. Additional informations

#### Preliminary specifications

This heading indicates that some information on the device concerned may be subject to slight changes.

#### Not for new developments

This heading indicates that the device concerned should not be used in equipment under development, it is, however, available for present production.

## 7. Taping and reeling

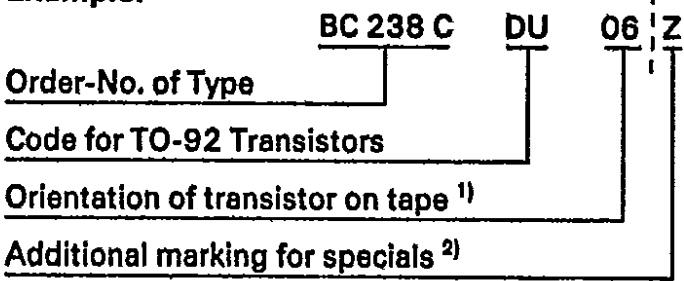
### 7.1. Taping of TO-92 transistors

Standard reeling: Taped on reel, reeled together with a paper film.

#### 7.1.1. Order Numbers

Add the taping-code to the order number.

Example:



<sup>1)</sup> 06 = View on flat side of transistor, view on gummed tape

05 = View on round side of transistor, view on gummed tape

<sup>2)</sup> Additional marking "0": Taping without paper film

Additional marking "Z": Zigzag folded tape in special box. Marking for orientation of transistor not necessary, because box can be opened on top or bottom.

Example for order No.: BC 237 C DU Z

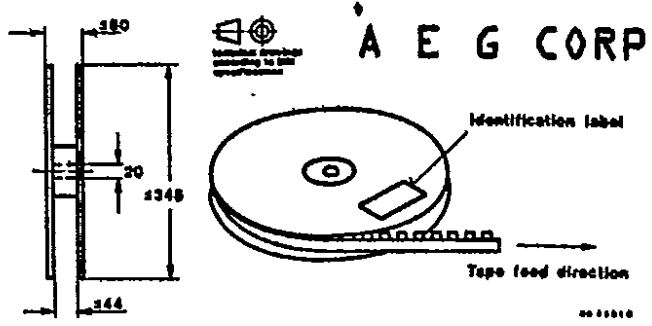


Fig. 7.1. Dimensions of reel in mm

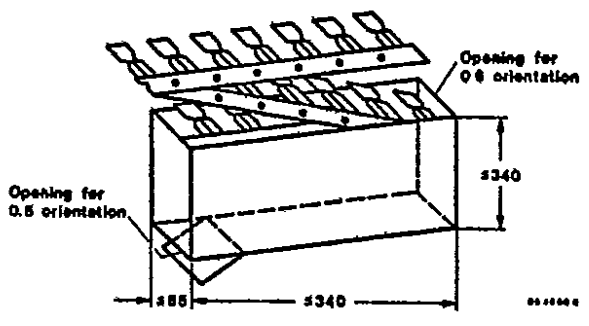


Fig. 7.2. Dimension of box for Zigzag folding in mm

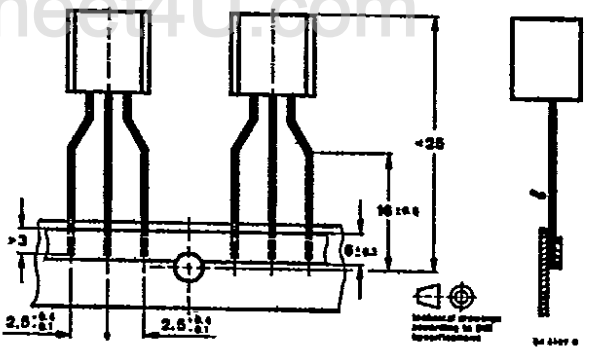


Fig. 7.3. Dimensions of tape in mm

#### 7.1.2 Quantity of devices

1 000 devices per reel  
2 000 devices per folded tape in special box.

### 7.2 Taped transistors in SOT 23 and SOT 143 case

a) Standard taping  
Designation is attached with code GS 08 in case of standard taping. Example for normal version transistors as standard taped: BF 569-GS08.

Example for R-version transistors as standard taped: BF 569 R-GS 08.

In case of standard taping, the transistor orientation on the tape is shown in Fig. 7.4 and Fig. 7.5.

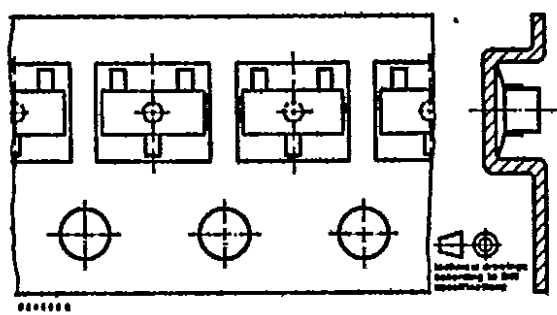


Fig. 7.4 Standard taped SOT 23

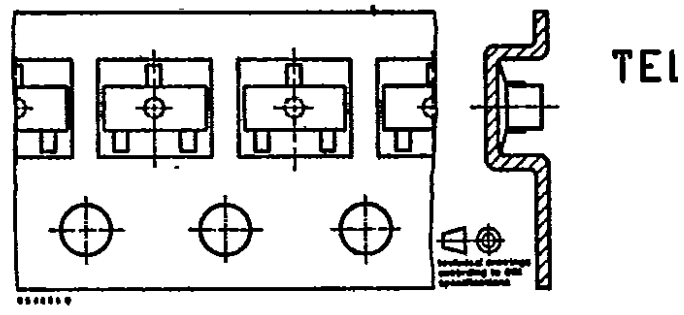


Fig. 7.6 Reverse taped SOT 23

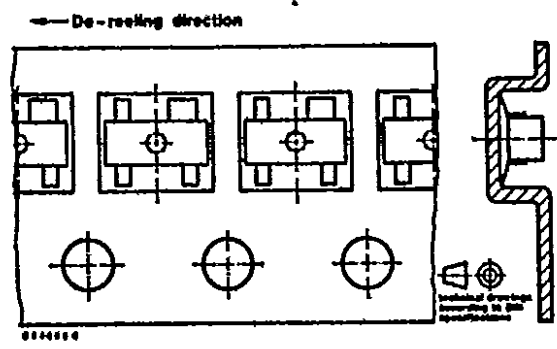


Fig. 7.5 Standard taped SOT 143

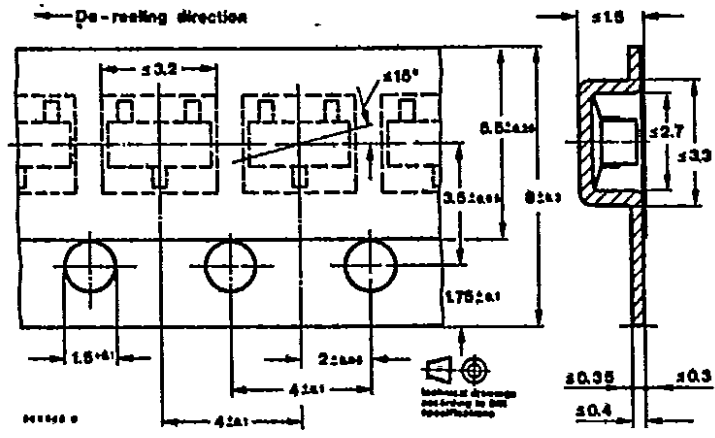


Fig. 7.7 Dimensions of tape in mm

b) Reverse taping

Designation is attached with code GS 07 in case of reverse taping. Example for normal version transistors as reverse taped: BF 569 R-GS 07. Example for R-version transistors as reverse taping: BF 569 R-GS 07.

In case of reverse taping, the transistor orientation on the tape is shown in Fig. 6. Regarding MOF-FET and MES-FET devices, reverse taping is at present not available.

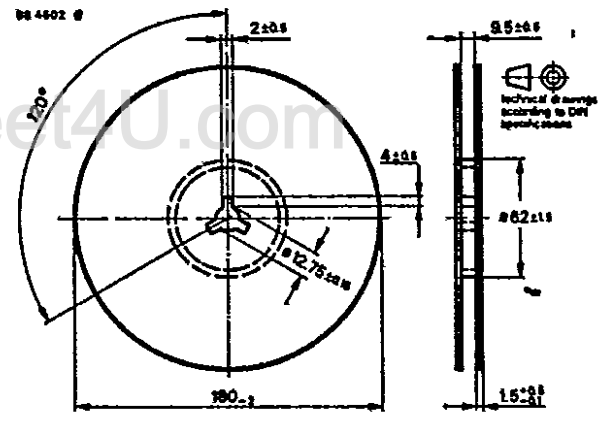


Fig. 7.8 Dimensions of reel in mm

8. Accessories

Number	Fig.	Designation
119880	8.1.	Isolating washer thickness 60 µm
564542	8.2.	Isolating washer thickness 50 µm
912884	8.3	Isolating washer thickness 50 µm
191131	8.4	Isolating washer thickness 50 µm
191140	8.5	Mounting clip
569524	8.6	Isolating washer thickness 100 µm + 50 µm

7.2.2 Quantity of devices  
3000 devices per reel

- For case
- 12 A 3 DIN 41 869 JEDEC TO 126 (SOT 32)
  - 14 A 3 DIN 41 869 JEDEC TO 220 (SOT 78)
  - 15 A 3 DIN 41 869 (TOP3) for clip mounting
  - 15 A 3 DIN 41 869 (TOP3) for screw mounting
  - 15 A 3 DIN 41 869 (TOP3)
  - 3 B 2 DIN 41 872 JEDEC TO 3
- Devices with high reverse voltage