

### TRANSIL

TRANSIENT VOLTAGE SUPPRESSOR DIODES ESPECIALLY USEFUL IN PROTECTING INTEGRATED CIRCUITS, MOS, HYBRIDS AND OTHER VOLTAGE - SENSITIVE SEMICONDUCTORS AND COMPONENTS.

- HIGH SURGE CAPABILITY : 3 kW/1 ms expo.  
36 kW/8-20  $\mu$ s expo.
- VERY FAST CLAMPING TIMES : 1 ps
- LARGE VOLTAGE RANGE : 12,1 V → 486 V

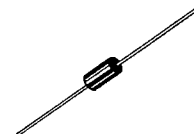
DIODES ECRETEUSES ADAPTEES A LA PROTECTION DES CIRCUITS INTEGRES, MOS, CIRCUITS HYBRIDES, AUTRES SEMICONDUCTEURS ET COMPOSANTS SENSIBLES AUX SURTENSIONS.

- GRANDE CAPACITE DE SURCHARGE : 3 kW/1 ms expo.  
36 kW/8-20  $\mu$ s expo.
- TEMPS D'ECRETAGE TRES RAPIDE : 1 ps
- GAMME DE TENSION ETENDUE : 12,1 V → 486 V

**P<sub>p</sub> : 3 kW/1 ms expo.**  
**36 kW/8-20  $\mu$ s expo.**

**V<sub>RM</sub> : 12,1V → 486**

Case  
Boîtier : DO 27A plastic (CB-197)



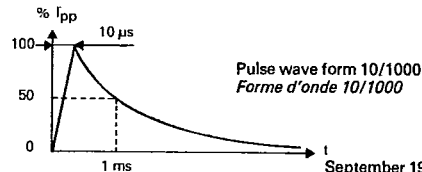
### ABSOLUTE RATINGS (LIMITING VALUES) VALEURS LIMITES ABSOLUES D'UTILISATION

|                                                                                                                                                             |                                              |                                    |                     |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------|---------------------|----------|
| Peak pulse power for 1 ms exponential pulse<br><i>Puissance de crête pour une onde exponentielle de 1 ms</i>                                                | T <sub>J</sub> initial = 25°C<br>(cf note 1) | P <sub>p</sub>                     | 3                   | kW       |
| Power dissipation on infinite heatsink<br><i>Dissipation de puissance sur radiateur infini</i>                                                              | T <sub>amb</sub> = 75°C                      | P                                  | 5                   | W        |
| Non repetitive surge peak forward current<br><i>Courant direct non répétitif de surcharge accidentelle</i>                                                  | T <sub>J</sub> initial = 25°C<br>t = 10 ms   | I <sub>FSM</sub>                   | 250                 | A        |
| Storage and junction temperatures<br><i>Températures de jonction et de stockage</i>                                                                         |                                              | T <sub>J</sub><br>T <sub>stg</sub> | 175<br>- 65 → + 175 | °C<br>°C |
| Maximum lead temperature for soldering during 10 s at 4 mm from case<br><i>Température maximum de soudure des connexions pendant 10 s à 4 mm du boîtier</i> |                                              | T <sub>L</sub>                     | 230                 | °C       |

Junction - connexions thermal resistance on infinite heatsink (L<sub>lead</sub> = 10 mm)  
*Résistance thermique jonction - connexions sur radiateur infini (L<sub>connex.</sub> = 10 mm)*

R<sub>th</sub> (j-c) 20 °C/W

Note 1 : For surges upper than the maximum values, the diode will present a short-circuit anode-cathode.  
*Pour des surcharges supérieures aux valeurs maximales, la diode présentera un court-circuit anode-cathode.*



BZW 30-12 → BZW 30-486

**ELECTRICAL CHARACTERISTICS**  
**CARACTERISTIQUES ELECTRIQUES**

59C 02666

DT-11-23

Stand-off voltage :  $V_{RM}$   
Tension de veille :  $V_{RM}$

Breakdown voltage :  $V_{BR}$   
Tension d'avalanche :  $V_{BR}$

Clamping voltage :  $V_{CL}$   
Tension d'écrêtage :  $V_{CL}$

Peak pulse current :  $I_{pp}$   
Courant de crête :  $I_{pp}$

Temperature coefficient of  $V_{BR}$  :  $\propto T$   
Coefficient de température de  $V_{BR}$  :  $\propto T$

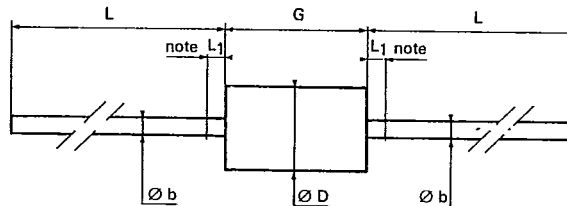
Capacitance :  $C$   
Capacité :  $C$

Clamping time (0 Volt to  $V_{BR}$ ) :  $t_{clamping} < 1 \text{ ps}$   
Temps de réponse (0 Volt à  $V_{BR}$ ) :  $t_{clamping} < 1 \text{ ps}$

| Unidirectional types | I <sub>RM</sub> @ V <sub>RM</sub> |      | V(BR)* @ I <sub>R</sub> |     |      |      | V(CL) @ I <sub>pp</sub><br>max<br>1 ms expo |      | V(CL) @ I <sub>pp</sub><br>max<br>8-20 μs expo |      | αT max                 | C typ<br>V <sub>R</sub> = 0<br>f = 1 MHz |
|----------------------|-----------------------------------|------|-------------------------|-----|------|------|---------------------------------------------|------|------------------------------------------------|------|------------------------|------------------------------------------|
|                      | (μA)                              | (V)  | min                     | nom | max  | (mA) | (V)                                         | (A)  | (V)                                            | (A)  | (10 <sup>-4</sup> /°C) | (pF)                                     |
| BZW 30-12            | 500                               | 12,1 | 13,5                    | 15  | 16,5 | 1    | 23,4                                        | 128  | 28,4                                           | 1267 | 6,1                    | 9600                                     |
| BZW 30-13            | 200                               | 13   | 14,4                    | 16  | 17,6 | 1    | 25                                          | 120  | 30,2                                           | 1192 | 6,5                    | 8700                                     |
| BZW 30-15            | 50                                | 14,6 | 16,2                    | 18  | 19,8 | 1    | 27,5                                        | 109  | 35,8                                           | 1005 | 6,8                    | 7400                                     |
| BZW 30-16            | 10                                | 16,2 | 18                      | 20  | 22   | 1    | 30                                          | 100  | 39                                             | 923  | 7,3                    | 6500                                     |
| BZW 30-18            | 5                                 | 17,8 | 19,8                    | 22  | 24,2 | 1    | 32,3                                        | 93   | 42,4                                           | 849  | 7,5                    | 5700                                     |
| BZW 30-19            | 5                                 | 19,4 | 21,6                    | 24  | 26,4 | 1    | 34,5                                        | 87   | 45,4                                           | 793  | 7,8                    | 5100                                     |
| BZW 30-22            | 5                                 | 21,8 | 24,3                    | 27  | 29,7 | 1    | 38                                          | 79   | 50                                             | 720  | 8,1                    | 4400                                     |
| BZW 30-24            | 5                                 | 24,3 | 27                      | 30  | 33   | 1    | 44,1                                        | 68   | 58                                             | 620  | 8,4                    | 3900                                     |
| BZW 30-27            | 5                                 | 26,8 | 29,7                    | 33  | 36,3 | 1    | 46,9                                        | 64   | 61                                             | 590  | 8,6                    | 3500                                     |
| BZW 30-29            | 5                                 | 29,1 | 32,4                    | 36  | 39,6 | 1    | 53,1                                        | 56,5 | 68                                             | 529  | 8,8                    | 3100                                     |
| BZW 30-32            | 5                                 | 31,6 | 35,1                    | 39  | 42,9 | 1    | 58,3                                        | 51,5 | 76                                             | 474  | 9,0                    | 2850                                     |
| BZW 30-35            | 5                                 | 34,8 | 38,7                    | 43  | 47,3 | 1    | 63,8                                        | 47   | 84                                             | 428  | 9,2                    | 2550                                     |
| BZW 30-38            | 5                                 | 38,1 | 42,3                    | 47  | 51,7 | 1    | 69,8                                        | 43   | 88                                             | 409  | 9,4                    | 2300                                     |
| BZW 30-41            | 5                                 | 41,3 | 45,9                    | 51  | 56,1 | 1    | 73,7                                        | 40,7 | 96                                             | 375  | 9,6                    | 2100                                     |
| BZW 30-45            | 5                                 | 45,4 | 50,4                    | 56  | 61,6 | 1    | 77,9                                        | 38,5 | 106                                            | 339  | 9,7                    | 1850                                     |
| BZW 30-50            | 5                                 | 50,2 | 55,8                    | 62  | 68,2 | 1    | 87                                          | 34,5 | 116                                            | 310  | 9,7                    | 1700                                     |
| BZW 30-55            | 5                                 | 55,1 | 61,2                    | 68  | 74,8 | 1    | 95,2                                        | 31,5 | 128                                            | 281  | 9,8                    | 1500                                     |
| BZW 30-61            | 5                                 | 60,7 | 67,5                    | 75  | 82,5 | 1    | 108                                         | 27,7 | 140                                            | 257  | 9,9                    | 1350                                     |
| BZW 30-66            | 5                                 | 66,4 | 73,8                    | 82  | 90,2 | 1    | 119                                         | 25,2 | 154                                            | 234  | 10,0                   | 1250                                     |
| BZW 30-74            | 5                                 | 73,7 | 81,9                    | 91  | 100  | 1    | 135                                         | 22,2 | 170                                            | 212  | 10,1                   | 1100                                     |
| BZW 30-81            | 5                                 | 81   | 90                      | 100 | 110  | 1    | 147                                         | 20,4 | 188                                            | 191  | 10,2                   | 1000                                     |
| BZW 30-89            | 5                                 | 89,2 | 99                      | 110 | 121  | 1    | 161                                         | 18,6 | 204                                            | 176  | 10,3                   | 900                                      |
| BZW 30-97            | 5                                 | 97,2 | 108                     | 120 | 132  | 1    | 178                                         | 16,9 | 222                                            | 162  | 10,4                   | 820                                      |
| BZW 30-105           | 5                                 | 105  | 117                     | 130 | 143  | 1    | 186                                         | 16,1 | 240                                            | 150  | 10,4                   | 760                                      |
| BZW 30-121           | 5                                 | 121  | 135                     | 150 | 165  | 1    | 216                                         | 13,9 | 278                                            | 129  | 10,5                   | 650                                      |
| BZW 30-130           | 5                                 | 130  | 144                     | 160 | 176  | 1    | 231                                         | 13,0 | 296                                            | 122  | 10,5                   | 600                                      |
| BZW 30-138           | 5                                 | 138  | 153                     | 170 | 187  | 1    | 242                                         | 12,4 | 314                                            | 115  | 10,5                   | 570                                      |
| BZW 30-146           | 5                                 | 146  | 162                     | 180 | 198  | 1    | 263                                         | 11,4 | 334                                            | 108  | 10,6                   | 540                                      |
| BZW 30-162           | 5                                 | 162  | 180                     | 200 | 220  | 1    | 288                                         | 10,4 | 370                                            | 97   | 10,6                   | 490                                      |
| BZW 30-175           | 5                                 | 175  | 198                     | 220 | 242  | 1    | 316                                         | 9,5  | 406                                            | 89   | 10,7                   | 440                                      |
| BZW 30-202           | 5                                 | 202  | 225                     | 250 | 275  | 1    | 361                                         | 8,3  | 456                                            | 79   | 10,7                   | 390                                      |
| BZW 30-243           | 5                                 | 243  | 270                     | 300 | 330  | 1    | 429                                         | 7,0  | 554                                            | 65   | 10,8                   | 325                                      |
| BZW 30-283           | 5                                 | 283  | 315                     | 350 | 385  | 1    | 500                                         | 6,0  | 646                                            | 56   | 10,8                   | 290                                      |
| BZW 30-324           | 5                                 | 324  | 360                     | 400 | 440  | 1    | 575                                         | 5,2  | 740                                            | 48   | 10,8                   | 250                                      |
| BZW 30-405           | 5                                 | 405  | 450                     | 500 | 550  | 1    | 720                                         | 4,2  | 925                                            | 39   | 10,8                   | 210                                      |
| BZW 30-486           | 5                                 | 486  | 540                     | 600 | 660  | 1    | 860                                         | 3,5  | 1110                                           | 32   | 10,8                   | 180                                      |

\* Pulse test  
Mesure en impulsion  $t_p \leq 50 \text{ ms}$   $\delta < 2 \%$

**CASE DESCRIPTION**  
**DESCRIPTION DU BOITIER**



| Ref.           | Millimètres |      | Inches |        | Note                                                                                                                              |
|----------------|-------------|------|--------|--------|-----------------------------------------------------------------------------------------------------------------------------------|
|                | Min.        | Max. | Min.   | Max.   |                                                                                                                                   |
| Ø b            | —           | 1,28 | —      | 0.0504 | The lead diameter Ø b is not controlled over zone L <sub>1</sub> .<br>- Zone à l'intérieur de laquelle le Ø b n'est pas contrôlé. |
| Ø D            | —           | 5,10 | —      | 0.2008 |                                                                                                                                   |
| G              | —           | 9,80 | —      | 0.3859 |                                                                                                                                   |
| L <sub>1</sub> | 26,0        | —    | 1.024  | —      |                                                                                                                                   |
| L              | —           | 1,25 | —      | 0.0492 |                                                                                                                                   |

Cooling method : by convection (method A)  
Mode de refroidissement : par convection (mode A)  
Marking : type number ; white band indicates cathode  
Marquage : n° de type ; anneau blanc côté cathode

Weight : 1 g  
Poids

BZW 30-12 → BZW 30-486

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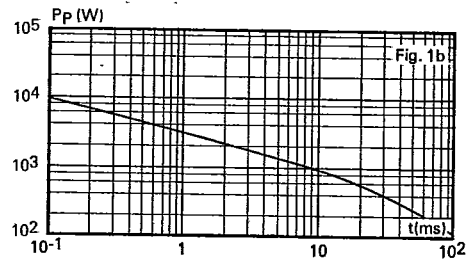
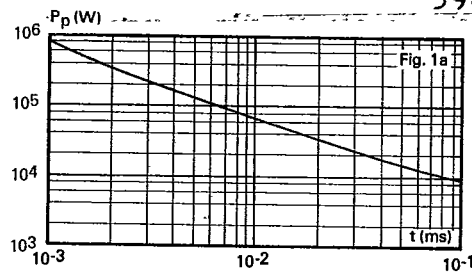


Fig. 1a-1b — Peak pulse power versus exponential pulse duration.

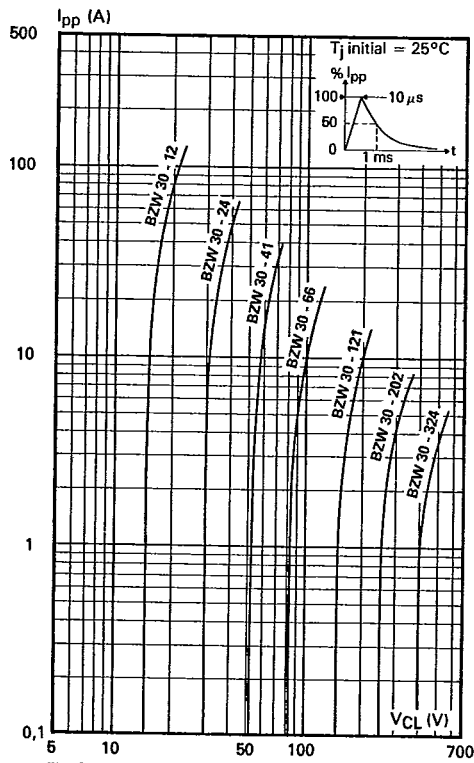


Fig. 2 — Peak pulse current versus clamping voltage (exponential waveform  $t = 1$  ms).

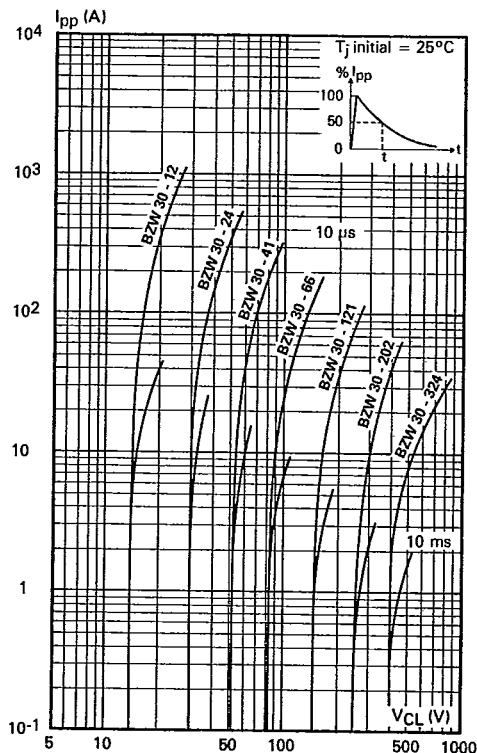


Fig. 3 — Peak pulse current versus clamping voltage (exponential waveform  $t = 10 \mu s$  and  $10$  ms)

Note: The curves of figures 2 and 3 are specified for a junction temperature of  $25^\circ\text{C}$  before surge. The given results may be extrapolated for other junction temperatures by using the following formula:

$$\Delta V(\text{BR}) = \alpha T \cdot V(\text{BR}) \times [T_j - 25] \times V(\text{BR})$$

For intermediate voltages, extrapolate the given results.

BZW 30-12 → BZW 30-486

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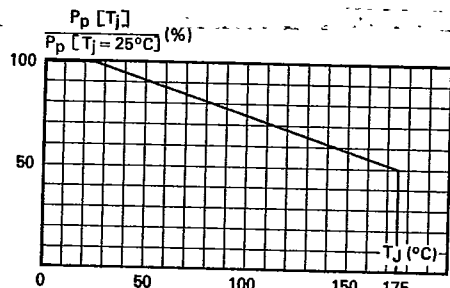


Fig. 4 — Allowable power dissipation versus junction temperature.

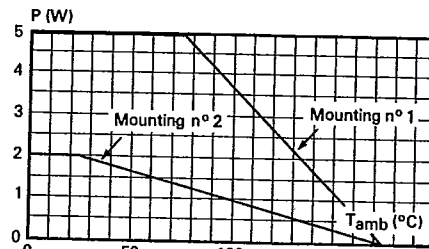


Fig. 5 — Power dissipation versus ambient temperature

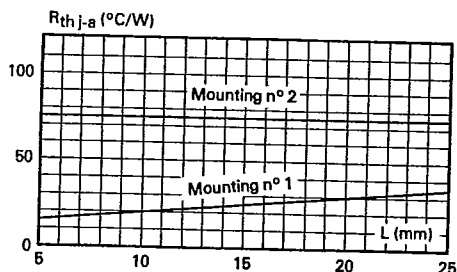


Fig. 6 — Thermal resistance junction-ambient versus lead length.

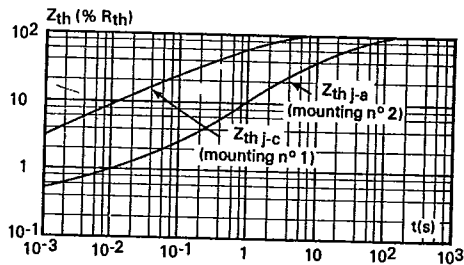
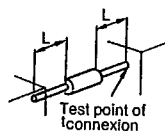


Fig. 7 — Transient thermal impedance junction — connexions for mounting n° 1 and junction — ambient for mounting n° 2 versus pulse duration (L = 10 mm).

Mounting n° 1:  
INFINITE HEATSINK



Mounting n° 2:  
PRINTED CIRCUIT

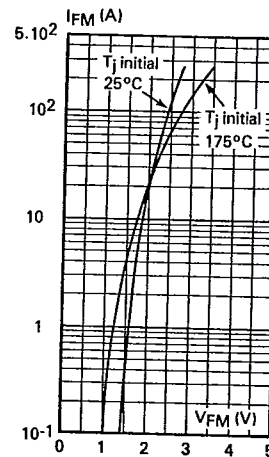
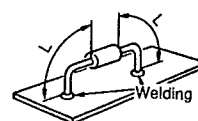


Fig. 8 — Peak forward current versus peak forward voltage drop (typical values)

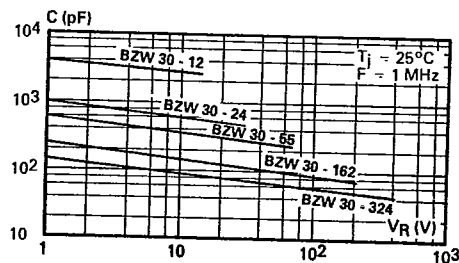


Fig. 9 — Capacitance versus reverse applied voltage (typical values).