



UNI-AND BIDIRECTIONAL TRANSIENT VOLTAGE SUPPRESSORS

- HIGH SURGE CAPABILITY :
600 W / 1 ms EXPO
- VERY FAST CLAMPING TIME :
1 ps FOR UNIDIRECTIONAL TYPES
5 ns FOR BIDIRECTIONAL TYPES
- LARGE VOLTAGE RANGE :
5.8 V → 376 V
- ORDER CODE :
TYPE NUMBER FOR UNIDIRECTIONAL
TYPES. TYPE NUMBER + SUFFIX B FOR
BIDIRECTIONAL TYPES



DESCRIPTION

Transient voltage suppressor diodes especially useful in protecting integrated circuits, MOS, hybrids and other voltage-sensitive semiconductors and components.

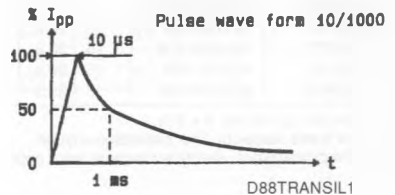
ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------------|--|--------------------------------------|--------------------|----------|
| P_p | Peak Pulse Power for 1 ms Exponential Pulse | T_j Initial = 25 °C See note 1 | 600 | W |
| P | Power Dissipation on Infinite Heatsink | $T_{amb} = 50$ °C | 1.7 | W |
| I_{FSM} | Non Repetitive Surge Peak Forward Current for Unidirectional Types | T_j Initial = 25 °C $t = 10$ ms | 100 | A |
| T_{sig} T_j | Storage and Operating Junction Temperature Range | | - 55 to 150 150 | °C °C |
| T_L | Maximum Lead Temperature for Soldering During 10 s at 4 mm from Case | | 230 | °C |

THERMAL RESISTANCE

| Symbol | Parameter | Value | Unit |
|---------------|--|-------|------|
| $R_{Th(j-l)}$ | Junction-leads on Infinite Heatsink for $L_{lead} = 10$ mm | 60 | °C/W |

Note : 1. For surges upper than the maximum values, the diode will present a short-circuit anode-cathode.



ELECTRICAL CHARACTERISTICS (T_J = 25 °C)

| Symbol | Parameter | | Value |
|-----------------------|--|----------------------|------------|
| V _{RM} | Stand-off Voltage | | See tables |
| V _(BR) | Breakdown Voltage | | |
| V _(CL) | Clamping Voltage | | |
| I _{pp} | Peak Pulse Current | | |
| α _T | Temperature Coefficient of V _(BR) | | |
| C | Capacitance | | |
| t _{clamping} | Clamping Time (0 volt to V _(BR)) | Unidirectional Types | 1 ps max. |
| | | Bidirectional Types | 5 ns max. |

| Types | | I _{RM} @ V _{RM} max. | | V _(BR) * @ I _R | | | V _(CL) @ I _{pp} max. | | V _(CL) @ I _{pp} max. | | α _T max. | C** typ. V _R =0 f=1 MHz | |
|----------------|---------------|--|------|--------------------------------------|------|------|--|------|--|------|---------------------|------------------------------------|------|
| Unidirectional | Bidirectional | (μA) | (V) | min. | nom. | max. | (mA) | (V) | (A) | (V) | (A) | (10 ⁻⁴ /°C) | (pF) |
| BZW06P5V8 | BZW06P5V8B | 1000 | 5.8 | 6.45 | 6.8 | 7.48 | 10 | 10.5 | 57 | 13.4 | 261 | 5.7 | 4000 |
| BZW06-5V8 | BZW06-5V8B | 1000 | 5.8 | 6.45 | 6.8 | 7.14 | 10 | 10.5 | 57 | 13.4 | 261 | 5.7 | 4000 |
| BZW06P6V4 | BZW06P6V4B | 500 | 6.4 | 7.13 | 7.5 | 8.25 | 10 | 11.3 | 53 | 14.5 | 241 | 6.1 | 3700 |
| BZW06-6V4 | BZW06-6V4B | 500 | 6.4 | 7.13 | 7.5 | 7.88 | 10 | 11.3 | 53 | 14.5 | 241 | 6.1 | 3700 |
| BZW06P7V0 | BZW06P7V0B | 200 | 7.02 | 7.79 | 8.2 | 9.02 | 10 | 12.1 | 50 | 15.5 | 226 | 6.5 | 3400 |
| BZW06-7V0 | BZW06-7V0B | 200 | 7.02 | 7.79 | 8.2 | 8.61 | 10 | 12.1 | 50 | 15.5 | 226 | 6.5 | 3400 |
| BZW06P7V8 | BZW06P7V8B | 50 | 7.78 | 8.65 | 9.1 | 10 | 1 | 13.4 | 45 | 17.1 | 205 | 6.8 | 3100 |
| BZW06-7V8 | BZW06-7V8B | 50 | 7.78 | 8.65 | 9.1 | 9.55 | 1 | 13.4 | 45 | 17.1 | 205 | 6.8 | 3100 |
| BZW06P8V5 | BZW06P8V5B | 10 | 8.55 | 9.5 | 10 | 11 | 1 | 14.5 | 41 | 18.6 | 387 | 7.3 | 2800 |
| BZW06-8V5 | BZW06-8V5B | 10 | 8.55 | 9.5 | 10 | 10.5 | 1 | 14.5 | 41 | 18.6 | 387 | 7.3 | 2800 |
| BZW06P9V4 | BZW06P9V4B | 5 | 9.4 | 10.5 | 11 | 12.1 | 1 | 15.6 | 38 | 20.3 | 355 | 7.5 | 2500 |
| BZW06-9V4 | BZW06-9V4B | 5 | 9.4 | 10.5 | 11 | 11.6 | 1 | 15.6 | 38 | 20.3 | 355 | 7.5 | 2500 |
| BZW06P10 | BZW06P10B | 5 | 10.2 | 11.4 | 12 | 13.2 | 1 | 16.7 | 36 | 21.7 | 332 | 7.8 | 2300 |
| BZW06-10 | BZW06-10B | 5 | 10.2 | 11.4 | 12 | 12.6 | 1 | 16.7 | 36 | 21.7 | 332 | 7.8 | 2300 |
| BZW06P11 | BZW06P11B | 5 | 11.1 | 12.4 | 13 | 14.3 | 1 | 18.2 | 33 | 23.6 | 305 | 8.1 | 2150 |
| BZW06-11 | BZW06-11B | 5 | 11.1 | 12.4 | 13 | 13.7 | 1 | 18.2 | 33 | 23.6 | 305 | 8.1 | 2150 |
| BZW06P13 | BZW06P13B | 5 | 12.8 | 14.3 | 15 | 16.5 | 1 | 21.2 | 28 | 27.2 | 265 | 8.4 | 1900 |
| BZW06-13 | BZW06-13B | 5 | 12.8 | 14.3 | 15 | 15.8 | 1 | 21.2 | 28 | 27.2 | 265 | 8.4 | 1900 |
| BZW06P14 | BZW06P14B | 5 | 13.6 | 15.2 | 16 | 17.6 | 1 | 22.5 | 27 | 28.9 | 249 | 8.6 | 1800 |
| BZW06-14 | BZW06-14B | 5 | 13.6 | 15.2 | 16 | 16.8 | 1 | 22.5 | 27 | 28.9 | 249 | 8.6 | 1800 |
| BZW06P15 | BZW06P15B | 5 | 15.3 | 17.1 | 18 | 19.8 | 1 | 25.2 | 24 | 32.5 | 222 | 8.8 | 1600 |
| BZW06-15 | BZW06-15B | 5 | 15.3 | 17.1 | 18 | 18.9 | 1 | 25.2 | 24 | 32.5 | 222 | 8.8 | 1600 |
| BZW06P17 | BZW06P17B | 5 | 17.1 | 19 | 20 | 22 | 1 | 27.7 | 22 | 36.1 | 199 | 9.0 | 1500 |
| BZW06-17 | BZW06-17B | 5 | 17.1 | 19 | 20 | 21 | 1 | 27.7 | 22 | 36.1 | 199 | 9.0 | 1500 |
| BZW06P19 | BZW06P19B | 5 | 18.8 | 20.9 | 22 | 24.2 | 1 | 30.6 | 20 | 39.3 | 183 | 9.2 | 1350 |
| BZW06-19 | BZW06-19B | 5 | 18.8 | 20.9 | 22 | 23.1 | 1 | 30.6 | 20 | 39.3 | 183 | 9.2 | 1350 |
| BZW06P20 | BZW06P20B | 5 | 20.5 | 22.8 | 24 | 26.4 | 1 | 33.2 | 18 | 42.8 | 168 | 9.4 | 1250 |
| BZW06-20 | BZW06-20B | 5 | 20.5 | 22.8 | 24 | 25.2 | 1 | 33.2 | 18 | 42.8 | 168 | 9.4 | 1250 |
| BZW06P23 | BZW06P23B | 5 | 23.1 | 25.7 | 27 | 29.7 | 1 | 37.5 | 16 | 48.3 | 149 | 9.6 | 1150 |
| BZW06-23 | BZW06-23B | 5 | 23.1 | 25.7 | 27 | 28.4 | 1 | 37.5 | 16 | 48.3 | 149 | 9.6 | 1150 |
| BZW06P26 | BZW06P26B | 5 | 25.6 | 28.5 | 30 | 33 | 1 | 41.4 | 14.5 | 53.5 | 134 | 9.7 | 1075 |
| BZW06-26 | BZW06-26B | 5 | 25.6 | 28.5 | 30 | 31.5 | 1 | 41.4 | 14.5 | 53.5 | 134 | 9.7 | 1075 |
| BZW06P28 | BZW06P28B | 5 | 28.2 | 31.4 | 33 | 36.3 | 1 | 45.7 | 13.1 | 59 | 122 | 9.8 | 1000 |
| BZW06-28 | BZW06-28B | 5 | 28.2 | 31.4 | 33 | 34.7 | 1 | 45.7 | 13.1 | 59 | 122 | 9.8 | 1000 |
| BZW06P31 | BZW06P31B | 5 | 30.8 | 34.2 | 36 | 39.6 | 1 | 49.9 | 12 | 64.3 | 112 | 9.9 | 950 |
| BZW06-31 | BZW06-31B | 5 | 30.8 | 34.2 | 36 | 37.8 | 1 | 49.9 | 12 | 64.3 | 112 | 9.9 | 950 |
| BZW06P33 | BZW06P33B | 5 | 33.3 | 37.1 | 39 | 42.9 | 1 | 53.9 | 11.1 | 69.7 | 103 | 10.0 | 900 |

* Pulse test t_p ≤ 50 ms δ < 2 %.

** Divide these values by 2 for bidirectional types.

For bidirectional types, electrical characteristics apply in both directions.

| Types | | I _{RM} @ V _{RM} max. | | V _(BR) * @ I _R (V) | | | V _(CL) @ I _{pp} max. 1 ms expo | | V _(CL) @ I _{pp} max. 8-20 μs expo | | α _T max. | C** typ. V _R =0 f=1 MHz | |
|----------------|---------------|---|------|---|------|------|--|------|---|------|------------------------|---|------|
| Unidirectional | Bidirectional | (μA) | (V) | min. | nom. | max. | (mA) | (V) | (A) | (V) | (A) | (10 ⁻⁴ °C) | (pF) |
| BZW06-33 | BZW06-33B | 5 | 33.3 | 37.1 | 39 | 41 | 1 | 53.9 | 11.1 | 69.7 | 103 | 10.0 | 900 |
| BZW06P37 | BZW06P37B | 5 | 36.8 | 40.9 | 43 | 47.3 | 1 | 59.3 | 10.1 | 76.8 | 94 | 10.1 | 850 |
| BZW06-37 | BZW06-37B | 5 | 36.8 | 40.9 | 43 | 45.2 | 1 | 59.3 | 10.1 | 76.8 | 94 | 10.1 | 850 |
| BZW06P40 | BZW06P40B | 5 | 40.2 | 44.7 | 47 | 51.7 | 1 | 64.8 | 9.3 | 84 | 86 | 10.1 | 800 |
| BZW06-40 | BZW06-40B | 5 | 40.2 | 44.7 | 47 | 49.4 | 1 | 64.8 | 9.3 | 84 | 86 | 10.1 | 800 |
| BZW06P44 | BZW06P44B | 5 | 43.6 | 48.5 | 51 | 56.1 | 1 | 70.1 | 8.6 | 91 | 79 | 10.2 | 750 |
| BZW06-44 | BZW06-44B | 5 | 43.6 | 48.5 | 51 | 53.6 | 1 | 70.1 | 8.6 | 91 | 79 | 10.2 | 750 |
| BZW06P48 | BZW06P48B | 5 | 47.8 | 53.2 | 56 | 61.6 | 1 | 77 | 7.8 | 100 | 72 | 10.3 | 700 |
| BZW06-48 | BZW06-48B | 5 | 47.8 | 53.2 | 56 | 58.8 | 1 | 77 | 7.8 | 100 | 72 | 10.3 | 700 |
| BZW06P53 | BZW06P53B | 5 | 53 | 58.9 | 62 | 68.2 | 1 | 85 | 7.1 | 111 | 65 | 10.4 | 650 |
| BZW06-53 | BZW06-53B | 5 | 53 | 58.9 | 62 | 65.1 | 1 | 85 | 7.1 | 111 | 65 | 10.4 | 650 |
| BZW06P58 | BZW06P58B | 5 | 58.1 | 64.6 | 68 | 74.8 | 1 | 92 | 6.5 | 121 | 59.5 | 10.4 | 625 |
| BZW06-58 | BZW06-58B | 5 | 58.1 | 64.6 | 68 | 71.4 | 1 | 92 | 6.5 | 121 | 59.5 | 10.4 | 625 |
| BZW06P64 | BZW06P64B | 5 | 64.1 | 71.3 | 75 | 82.5 | 1 | 103 | 5.8 | 134 | 53.5 | 10.5 | 575 |
| BZW06-64 | BZW06-64B | 5 | 64.1 | 71.3 | 75 | 78.8 | 1 | 103 | 5.8 | 134 | 53.5 | 10.5 | 575 |
| BZW06P70 | BZW06P70B | 5 | 70.1 | 77.9 | 82 | 90.2 | 1 | 113 | 5.3 | 146 | 49 | 10.5 | 550 |
| BZW06-70 | BZW06-70B | 5 | 70.1 | 77.9 | 82 | 86.1 | 1 | 113 | 5.3 | 146 | 49 | 10.5 | 550 |
| BZW06P78 | BZW06P78B | 5 | 77.8 | 86.5 | 91 | 100 | 1 | 125 | 4.8 | 162 | 44.5 | 10.6 | 525 |
| BZW06-78 | BZW06-78B | 5 | 77.8 | 86.5 | 91 | 95.5 | 1 | 125 | 4.8 | 162 | 44.5 | 10.6 | 525 |
| BZW06P85 | BZW06P85B | 5 | 85.5 | 95 | 100 | 110 | 1 | 137 | 4.4 | 178 | 40.5 | 10.6 | 500 |
| BZW06-85 | BZW06-85B | 5 | 85.5 | 95 | 100 | 105 | 1 | 137 | 4.4 | 178 | 40.5 | 10.6 | 500 |
| BZW06P94 | BZW06P94B | 5 | 94 | 105 | 110 | 121 | 1 | 152 | 3.9 | 195 | 37 | 10.7 | 470 |
| BZW06-94 | BZW06-94B | 5 | 94 | 105 | 110 | 116 | 1 | 152 | 3.9 | 195 | 37 | 10.7 | 470 |
| BZW06P102 | BZW06P102B | 5 | 102 | 114 | 120 | 132 | 1 | 165 | 3.6 | 212 | 34 | 10.7 | 450 |
| BZW06-102 | BZW06-102B | 5 | 102 | 114 | 120 | 126 | 1 | 165 | 3.6 | 212 | 34 | 10.7 | 450 |
| BZW06P111 | BZW06P111B | 5 | 111 | 124 | 130 | 143 | 1 | 179 | 3.4 | 230 | 31.5 | 10.7 | 420 |
| BZW06-111 | BZW06-111B | 5 | 111 | 124 | 130 | 137 | 1 | 179 | 3.4 | 230 | 31.5 | 10.7 | 420 |
| BZW06P128 | BZW06P128B | 5 | 128 | 143 | 150 | 165 | 1 | 207 | 2.9 | 265 | 27.2 | 10.8 | 400 |
| BZW06-128 | BZW06-128B | 5 | 128 | 143 | 150 | 158 | 1 | 207 | 2.9 | 265 | 27.2 | 10.8 | 400 |
| BZW06P136 | BZW06P136B | 5 | 136 | 152 | 160 | 176 | 1 | 219 | 2.7 | 282 | 25.5 | 10.8 | 380 |
| BZW06-136 | BZW06-136B | 5 | 136 | 152 | 160 | 168 | 1 | 219 | 2.7 | 282 | 25.5 | 10.8 | 380 |
| BZW06P145 | BZW06P145B | 5 | 145 | 161 | 170 | 187 | 1 | 234 | 2.6 | 301 | 24 | 10.8 | 370 |
| BZW06-145 | BZW06-145B | 5 | 145 | 161 | 170 | 179 | 1 | 234 | 2.6 | 301 | 24 | 10.8 | 370 |
| BZW06P154 | BZW06P154B | 5 | 154 | 171 | 180 | 198 | 1 | 246 | 2.4 | 317 | 22.7 | 10.8 | 360 |
| BZW06-154 | BZW06-154B | 5 | 154 | 171 | 180 | 189 | 1 | 246 | 2.4 | 317 | 22.7 | 10.8 | 360 |
| BZW06P171 | BZW06P171B | 5 | 171 | 190 | 200 | 220 | 1 | 274 | 2.2 | 353 | 20.4 | 10.8 | 350 |
| BZW06-171 | BZW06-171B | 5 | 171 | 190 | 200 | 210 | 1 | 274 | 2.2 | 353 | 20.4 | 10.8 | 350 |
| BZW06P188 | BZW06P188B | 5 | 188 | 209 | 220 | 242 | 1 | 301 | 2 | 388 | 18.6 | 10.8 | 330 |
| BZW06-188 | BZW06-188B | 5 | 188 | 209 | 220 | 231 | 1 | 301 | 2 | 388 | 18.6 | 10.8 | 330 |
| BZW06P213 | BZW06P213B | 5 | 213 | 237 | 250 | 275 | 1 | 344 | 2 | 442 | 19 | 11 | 310 |
| BZW06-213 | BZW06-213B | 5 | 213 | 237 | 250 | 263 | 1 | 344 | 2 | 442 | 19 | 11 | 310 |
| BZW06P239 | BZW06P239B | 5 | 239 | 266 | 280 | 308 | 1 | 384 | 2 | 494 | 18 | 11 | 300 |
| BZW06-239 | BZW06-239B | 5 | 239 | 266 | 280 | 294 | 1 | 384 | 2 | 494 | 18 | 11 | 300 |
| BZW06P256 | BZW06P256B | 5 | 256 | 285 | 300 | 330 | 1 | 414 | 1.6 | 529 | 14 | 11 | 290 |
| BZW06-256 | BZW06-256B | 5 | 256 | 285 | 300 | 315 | 1 | 414 | 1.6 | 529 | 14 | 11 | 290 |
| BZW06P273 | BZW06P273B | 5 | 273 | 304 | 320 | 352 | 1 | 438 | 1.6 | 564 | 14 | 11 | 280 |
| BZW06-273 | BZW06-273B | 5 | 273 | 304 | 320 | 336 | 1 | 438 | 1.6 | 564 | 14 | 11 | 280 |
| BZW06P299 | BZW06P299B | 5 | 299 | 332 | 350 | 385 | 1 | 482 | 1.6 | 618 | 14 | 11 | 270 |
| BZW06-299 | BZW06-299B | 5 | 299 | 332 | 350 | 368 | 1 | 482 | 1.6 | 618 | 14 | 11 | 270 |
| BZW06P342 | BZW06P342B | 5 | 342 | 380 | 400 | 440 | 1 | 548 | 1.3 | 706 | 11 | 11 | 360 |
| BZW06-342 | BZW06-342B | 5 | 342 | 380 | 400 | 420 | 1 | 548 | 1.3 | 706 | 11 | 11 | 360 |
| BZW06P376 | BZW06P376B | 5 | 376 | 418 | 440 | 484 | 1 | 603 | 1.3 | 776 | 11 | 11 | 350 |
| BZW06-376 | BZW06-376B | 5 | 376 | 418 | 440 | 462 | 1 | 603 | 1.3 | 776 | 11 | 11 | 350 |

* Pulse test t_p ≤ 50 ms δ < 2 %.

** Divide these values by 2 for bidirectional types.

For bidirectional types, electrical characteristics apply in both directions.



Fig. 1 - Peak pulse power versus exponential pulse duration.

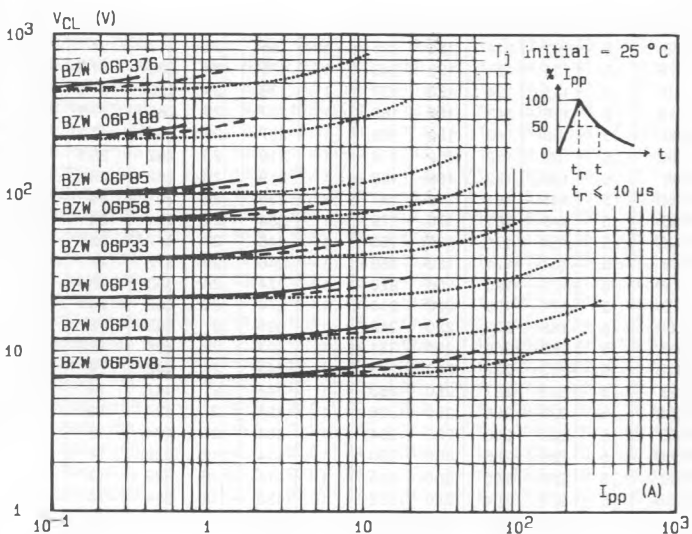


Fig. 2 - Clamping voltage versus peak pulse current.
 exponential waveform $t = 20\ \mu\text{s}$
 $t = 1\ \text{ms}$ ----
 $t = 10\ \text{ms}$ ———

Note : The curves of the figure 2 are specified for a junction temperature of 25°C before surge. The given results may be extrapolated for other junction temperatures by using the following formula : $\Delta V(BR) = \alpha_T (V(BR)) \times [T_j - 25] \times V(BR)$
 For intermediate voltages, extrapolate the given results.

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Fig.3 - Allowable power dissipation versus junction temperature.



Fig.4 - Power dissipation versus ambient temperature.



Fig.5 - Thermal resistance versus lead length.

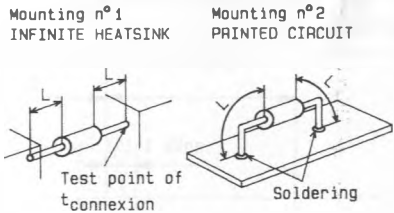


Fig.6 - Transient thermal impedance junction-ambient for mounting n°2 versus pulse duration ($L = 10$ mm).

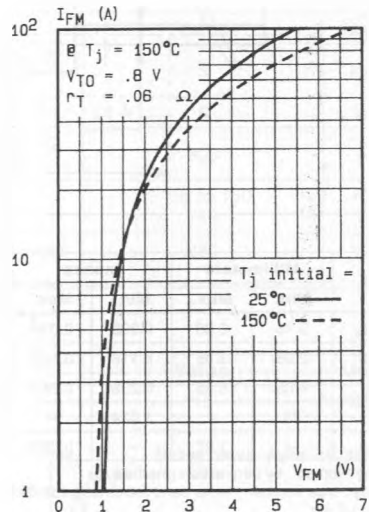


Fig.7 - Peak forward current versus peak forward voltage drop (typical values for unidirectional types).

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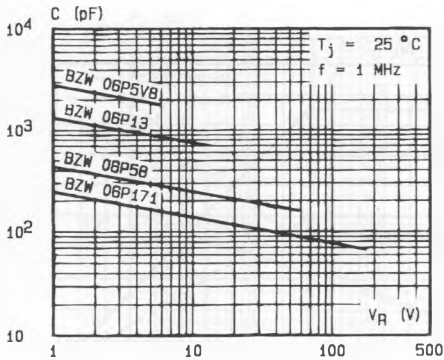


Fig.8a - Capacitance versus reverse applied voltage for unidirectional types (typical values).

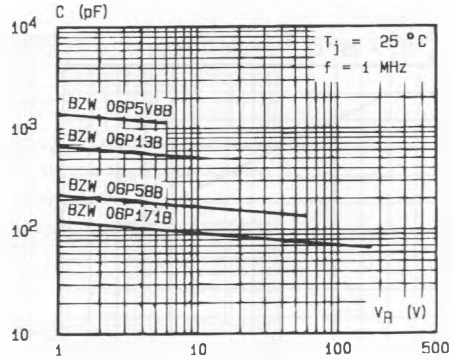


Fig.8b - Capacitance versus reverse applied voltage for bidirectional types (typical values).

D88BZW06P6

PACKAGE MECHANICAL DATA

F 126 Plastic



| Ref. | Millimeters | | Inches | | Notes |
|------------------|-------------|------|--------|-------|---|
| | Min. | Max. | Min. | Max. | |
| ∅ b ₂ | 0.76 | 0.86 | 0.029 | 0.034 | 1 - The lead diameter ∅ b ₂ is not controlled over zone L ₁ . 2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.59" (15 mm). |
| ∅ D | 2.95 | 3.05 | 0.116 | 0.120 | |
| G | 6.05 | 6.35 | 0.238 | 0.250 | |
| L | 26 | - | 1.024 | - | |
| L ₁ | - | 1.27 | - | 0.050 | |

Cooling method : by convection (method A).

Marking : type number ; white band indicates cathode for unidirectional types.

Weight : 0.4 g