

## Description

Transil diodes provide high overvoltage protection by clamping action.

Their instantaneous response to transient overvoltages makes them particularly suited to protect voltage sensitive devices such as MOS technology and low voltage supplied IC's.

**Table 1: Order codes**

| Part number | Marking                       |
|-------------|-------------------------------|
| BZW06-xxxx  | See <a href="#">Table 4</a> . |

## Features

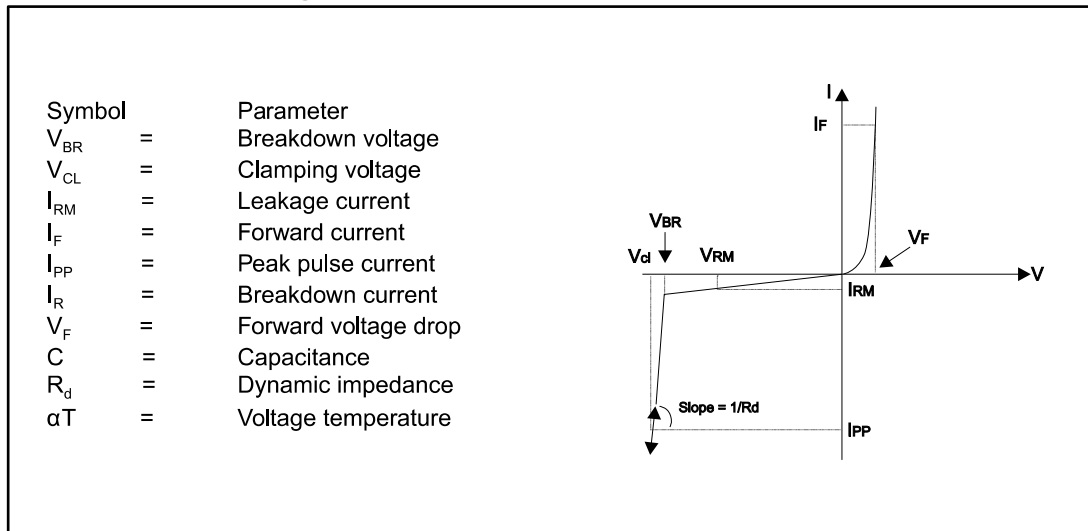
- 600 W peak pulse power (10/1000  $\mu$ s)
- Stand-off voltage range 5.8 to 376 V
- Unidirectional and bidirectional types
- Low clamping factor
- Fast response time
- UL recognized, file: E136224

# 1 Characteristics

**Table 2: Absolute maximum ratings ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

| Symbol    | Parameter   |   | Value       | Unit               |
|-----------|---|---|-------------|--------------------|
| $P_{pp}$  | Peak pulse power  | $T_j \text{ initial} = T_{amb}$                         | 600         | W                  |
| $P$       | Power dissipation on infinite heatsink                          | $T_{amb} = 75\text{ }^{\circ}\text{C}$                  | 1.7         |                    |
| $I_{FSM}$ | Non repetitive surge peak forward current                       | $t_p = 10\text{ ms}$<br>$T_j \text{ initial} = T_{amb}$ | 100         | A                  |
| $T_{stg}$ | Storage junction temperature range                              |   | -65 to +175 | $^{\circ}\text{C}$ |
| $T_j$     | Operating junction temperature range                            |   | -55 to +175 |                    |
| $T_L$     | Maximum temperature for soldering during 10 s at 5 mm from case |   | 260         |                    |

**Figure 1: Electrical characteristics (definitions)**



**Table 3: Thermal resistances**

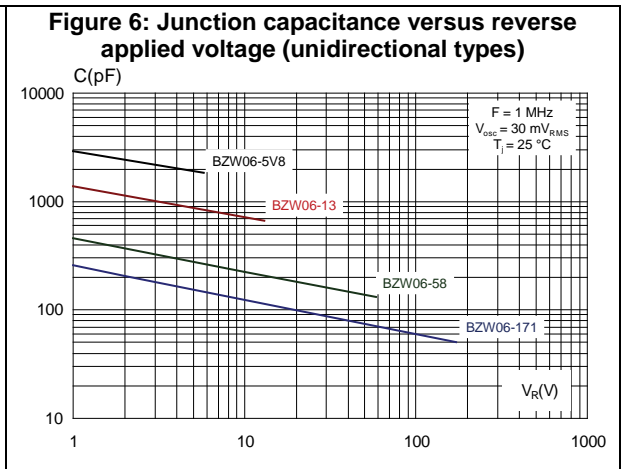
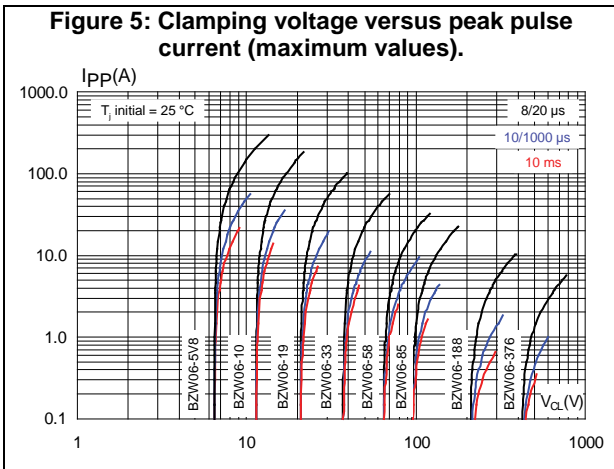
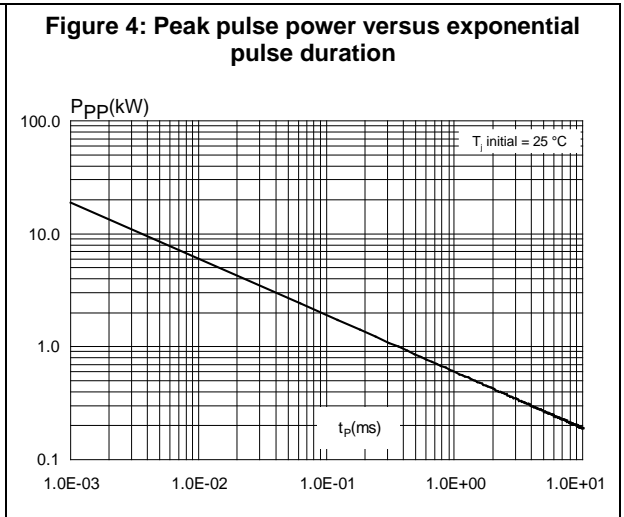
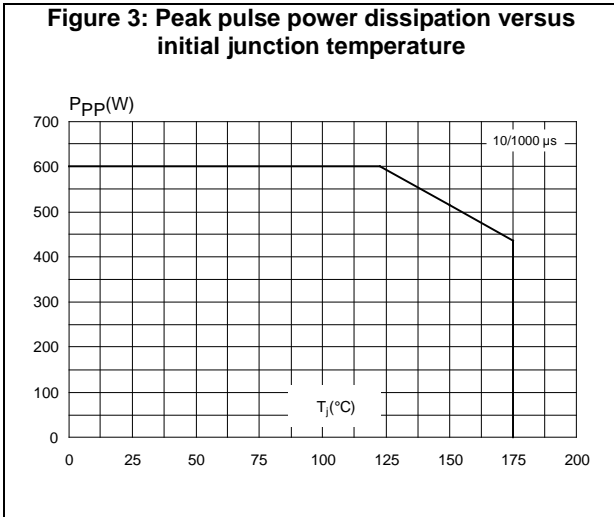
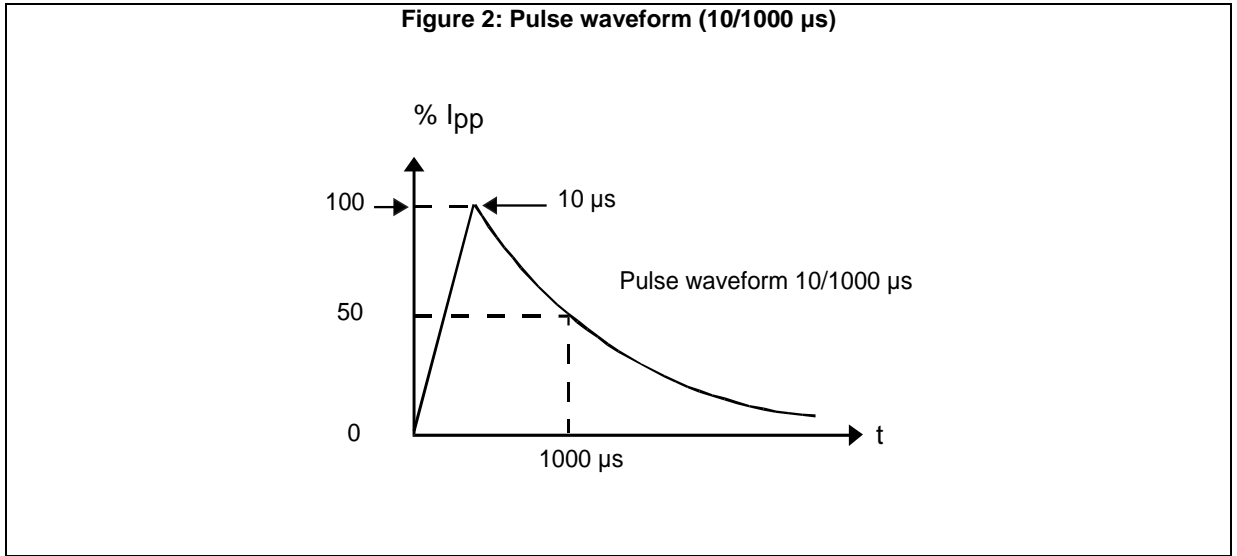
| Symbol        | Parameter   | Value | Unit                 |
|---------------|---|-------|----------------------|
| $R_{th(j-l)}$ | Junction to leads   | 60    | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | Junction to ambient on printed circuit. $L_{lead} = 10\text{ mm}$ | 100   |                      |

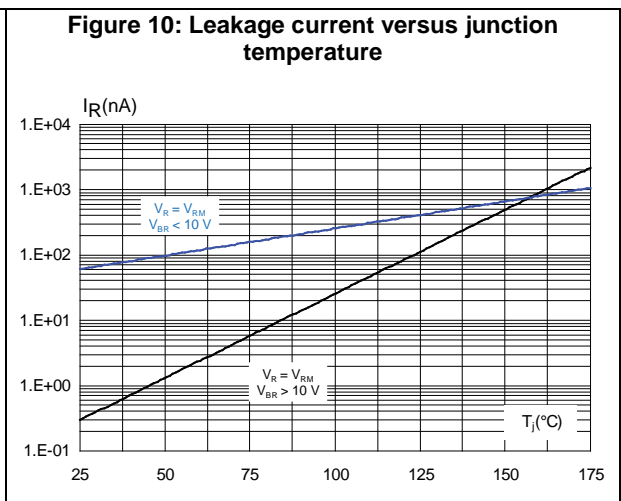
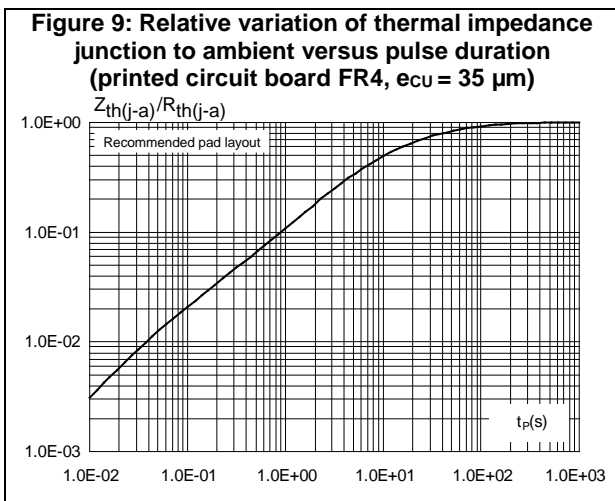
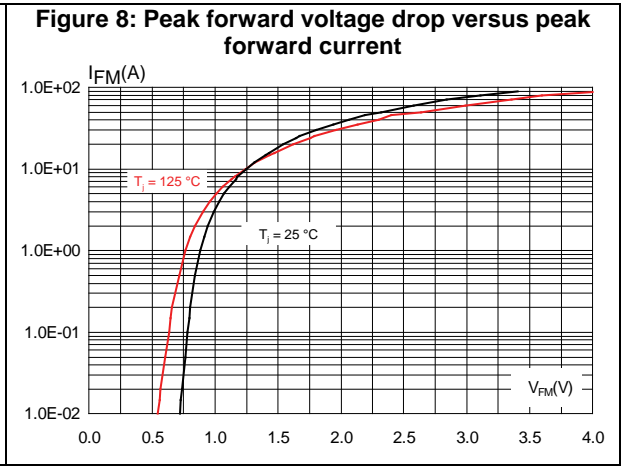
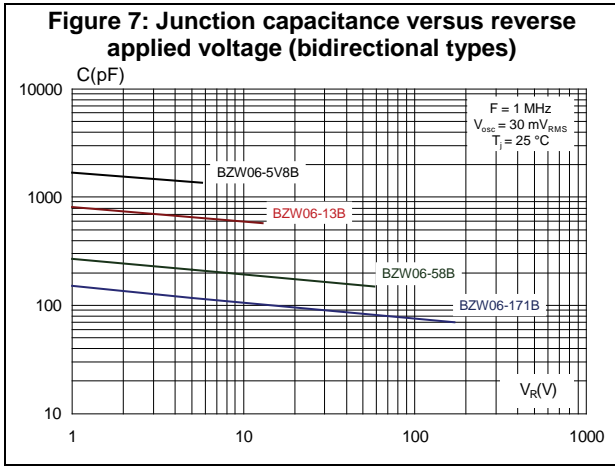
Table 4: Electrical characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )

| Types (marking) |               | $I_{RM}$ at $V_{RM}^{(1)}$ |      | $V_{BR}$ at $I_R^{(2)}$ |    | $V_{CL}$ at $I_{PP}$  |      | $V_{CL}$ at $I_{PP}$ |      | $\alpha T^{(3)}$           | $C^{(4)}$ |
|-----------------|---------------|----------------------------|------|-------------------------|----|-----------------------|------|----------------------|------|----------------------------|-----------|
|                 |               | Max.                       |      | Min.                    |    | Max.                  |      | Max.                 |      | Max.                       | Typ.      |
| Unidirectional  | Bidirectional | $\mu\text{A}$              | V    | V                       | mA | 10/1000 $\mu\text{s}$ |      | 8/20 $\mu\text{s}$   |      | $10^{-4}/^{\circ}\text{C}$ | pF        |
| BZW06-5V8       | BZW06-5V8B    | 20                         | 5.8  | 6.45                    | 10 | 10.5                  | 57.0 | 13.4                 | 298  | 5.7                        | 4000      |
| BZW06-6V4       | BZW06-6V4B    | 10                         | 6.4  | 7.13                    | 10 | 11.3                  | 53.0 | 14.5                 | 276  | 6.1                        | 3700      |
| BZW06-8V5       | BZW06-8V5B    | 1                          | 8.5  | 9.5                     | 1  | 14.5                  | 41   | 18.6                 | 215  | 7.3                        | 2800      |
| BZW06-10        | BZW06-10B     | 0.2                        | 10   | 11.4                    | 1  | 16.7                  | 36.0 | 21.7                 | 184  | 7.8                        | 2300      |
| BZW06-13        | BZW06-13B     | 0.2                        | 13   | 14.3                    | 1  | 21.2                  | 28.0 | 27.2                 | 147  | 8.4                        | 1900      |
| BZW06-15        | BZW06-15B     | 0.2                        | 15   | 17.1                    | 1  | 25.2                  | 24.0 | 32.5                 | 123  | 8.8                        | 1600      |
| BZW06-19        | BZW06-19B     | 0.2                        | 19   | 20.9                    | 1  | 30.6                  | 19.6 | 39.3                 | 102  | 9.2                        | 1350      |
| BZW06-20        | BZW06-20B     | 0.2                        | 20   | 22.8                    | 1  | 33.2                  | 18.0 | 42.8                 | 93   | 9.4                        | 1250      |
| BZW06-23        | BZW06-23B     | 0.2                        | 23   | 25.7                    | 1  | 37.5                  | 16.0 | 48.3                 | 83   | 9.6                        | 1150      |
| BZW06-26        | BZW06-26B     | 0.2                        | 26   | 28.5                    | 1  | 41.5                  | 14.5 | 53.5                 | 75   | 9.7                        | 1075      |
| BZW06-28        | BZW06-28B     | 0.2                        | 28   | 31.4                    | 1  | 45.7                  | 13.1 | 59                   | 68   | 9.8                        | 1000      |
| BZW06-31        | BZW06-31B     | 0.2                        | 31   | 34.2                    | 1  | 49.9                  | 12.0 | 64.3                 | 62   | 9.9                        | 950       |
| BZW06-33        | BZW06-33B     | 0.2                        | 33   | 37.1                    | 1  | 53.9                  | 11.1 | 69.7                 | 57   | 10.0                       | 900       |
| BZW06-37        | BZW06-37B     | 0.2                        | 36.8 | 40.9                    | 1  | 59.3                  | 10.1 | 76                   | 53   | 10.1                       | 850       |
| BZW06-40        | BZW06-40B     | 0.2                        | 40   | 44.7                    | 1  | 64.8                  | 9.3  | 84                   | 48   | 10.1                       | 800       |
| BZW06-48        | BZW06-48B     | 0.2                        | 48   | 53.2                    | 1  | 77.0                  | 7.8  | 100                  | 40   | 10.3                       | 700       |
| BZW06-58        | BZW06-58B     | 0.2                        | 58   | 64.6                    | 1  | 92.0                  | 6.5  | 121                  | 33   | 10.4                       | 625       |
| BZW06-70        | BZW06-70B     | 0.2                        | 70   | 77.9                    | 1  | 113                   | 5.3  | 146                  | 27.0 | 10.5                       | 550       |
| BZW06-85        | BZW06-85B     | 0.2                        | 85   | 95.0                    | 1  | 137                   | 4.4  | 178                  | 22.5 | 10.6                       | 500       |
| BZW06-102       | BZW06-102B    | 0.2                        | 102  | 114                     | 1  | 165                   | 3.6  | 212                  | 19.0 | 10.7                       | 450       |
| BZW06-128       | BZW06-128B    | 0.2                        | 128  | 143                     | 1  | 207                   | 2.9  | 265                  | 15.0 | 10.8                       | 400       |
| BZW06-154       | BZW06-154B    | 0.2                        | 154  | 171                     | 1  | 246                   | 2.4  | 317                  | 12.6 | 10.8                       | 360       |
| BZW06-171       | BZW06-171B    | 0.2                        | 171  | 190                     | 1  | 274                   | 2.2  | 353                  | 11.3 | 10.8                       | 350       |
| BZW06-188       | BZW06-188B    | 0.2                        | 188  | 209                     | 1  | 328                   | 1.85 | 388                  | 10.3 | 10.8                       | 330       |
| BZW06-213       | BZW06-213B    | 0.2                        | 213  | 237                     | 1  | 344                   | 1.75 | 442                  | 9.0  | 11.0                       | 310       |
| BZW06-256       | BZW06-256B    | 0.2                        | 256  | 285                     | 1  | 414                   | 1.45 | 529                  | 7.6  | 11.0                       | 290       |
| BZW06-273       | BZW06-273B    | 0.2                        | 273  | 304                     | 1  | 438                   | 1.40 | 564                  | 7.1  | 11.0                       | 280       |
| BZW06-299       | BZW06-299B    | 0.2                        | 299  | 332                     | 1  | 482                   | 1.25 | 618                  | 6.5  | 11.0                       | 271       |
| BZW06-342       | BZW06-342B    | 0.2                        | 342  | 380                     | 1  | 548                   | 1.1  | 706                  | 5.7  | 11.0                       | 360       |
| BZW06-376       | BZW06-376B    | 0.2                        | 376  | 418                     | 1  | 603                   | 1    | 776                  | 5.7  | 11.0                       | 350       |

**Notes:**(1) For bidirectional types having  $V_{RM} \leq 10\text{ V}$ ,  $I_{RM}$  is multiplied by 2(2) Pulse test :  $t_p < 50\text{ ms}$ (3) To calculate  $V_{BR}$  or  $V_{CL}$  versus junction temperature, use the following formulas: $V_{BR}$  at  $T_j = V_{BR}$  at  $25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_j - 25))$  or  $V_{CL}$  at  $T_j = V_{CL}$  at  $25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_j - 25))$ (4)  $V_R = 0\text{ V}$ ,  $F = 1\text{ MHz}$ . For bidirectional types, capacitance value is divided by 2

# 1.1 Characteristics (curves)

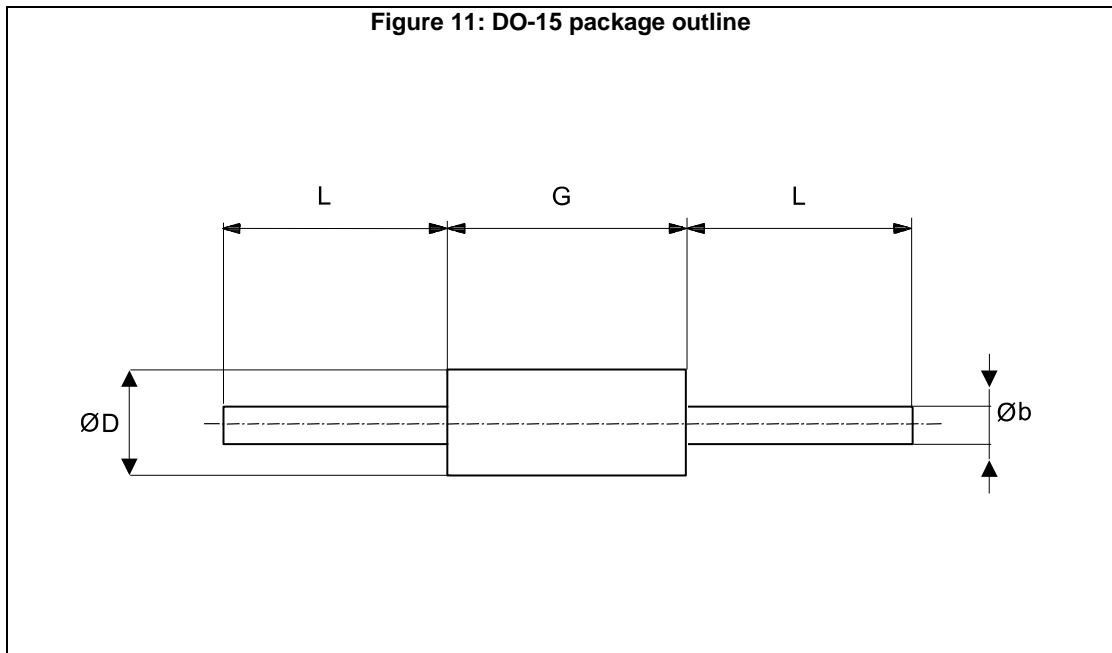




## 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

### 2.1 DO-15 package information



**Table 5: DO-15 package mechanical data**

| Ref. | Dimensions  |      |      |        |      |       |
|------|-------------|------|------|--------|------|-------|
|      | Millimeters |      |      | Inches |      |       |
|      | Min.        | Typ. | Max. | Min.   | Typ. | Max.  |
| b    | 0.71        | -    | 0.88 | 0.028  | -    | 0.035 |
| D    | 2.95        | -    | 3.53 | 0.116  | -    | 0.139 |
| G    | 6.05        | -    | 6.75 | 0.238  | -    | 0.266 |
| L    | 26          | -    | 31   | 1.024  | -    | 1.22  |

### 3 Ordering information

Figure 12: Ordering information scheme

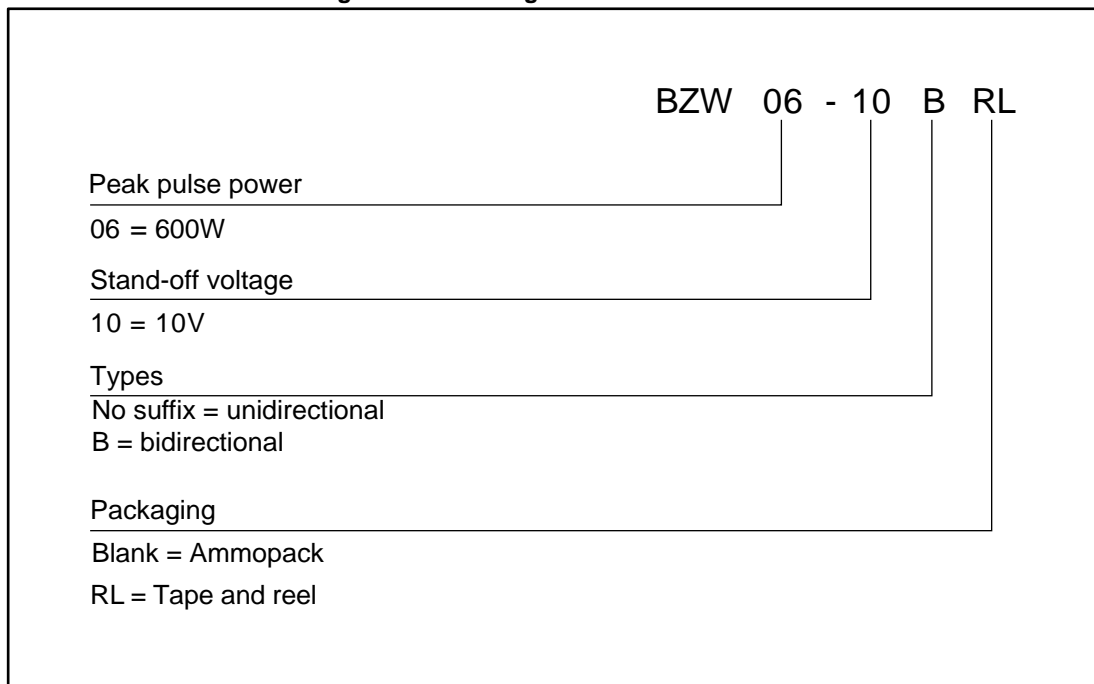


Table 6: Ordering information

| Order code   | Marking <sup>(1)</sup>      | Package | Weight | Base qty. | Delivery mode |
|--------------|-----------------------------|---------|--------|-----------|---------------|
| BZW-06xxxx   | See <a href="#">Table 4</a> | DO-15   | 0.4 g  | 1000      | Ammopack      |
| BZW-06xxxxRL |                             |         |        | 6000      | Tape and reel |

**Notes:**

<sup>(1)</sup>Marking: logo, data code, type, cathode band (for unidirectional types only)

## 4 Revision history

Table 7: Document revision history

| Date        | Revision | Changes  |
|-------------|----------|--|
| Feb-2003    | 3A       | Last update.   |
| 06-Apr-2017 | 4        | Updated <i>Table 2: "Absolute maximum ratings (<math>T_{amb} = 25\text{ °C}</math>)"</i> , <i>Table 4: "Electrical characteristics (<math>T_{amb} = 25\text{ °C}</math>)"</i> , <i>Section 5.1: "Characteristics (curves)"</i> and <i>Section 6.1: "DO-15 package information"</i> . |



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