



# BZW06-5V8/376 BZW06-5V8B/376B

TRANSIL™

## FEATURES

- PEAK PULSE POWER : 600 W (10/1000 $\mu$ s)
- STAND-OFF VOLTAGE RANGE :  
From 5.8V to 376 V
- UNI AND BIDIRECTIONAL TYPES
- LOW CLAMPING FACTOR
- FAST RESPONSE TIME
- UL RECOGNIZED

## 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.



## ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$P_{PP}$	Peak pulse power dissipation (see note 1)	$T_j \text{ initial} = T_{amb}$ 600	W
P	Power dissipation on infinite heatsink	$T_{amb} = 75^{\circ}\text{C}$ 1.7	W
$I_{FSM}$	Non repetitive surge peak forward current for unidirectional types	$t_p = 10\text{ms}$ $T_j \text{ initial} = T_{amb}$ 100	A
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature	- 65 to + 175 175	$^{\circ}\text{C}$ $^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10s a 5mm from case.	230	$^{\circ}\text{C}$

**Note 1** : For a surge greater than the maximum values, the diode will fail in short-circuit.

## THERMAL RESISTANCES

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

## BZW06-xx

### ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25°C)

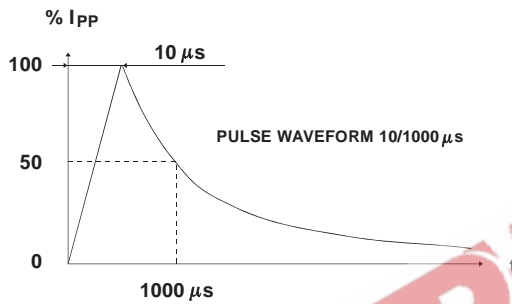
Symbol	Parameter
V <sub>RM</sub>	Stand-off voltage
V <sub>BR</sub>	Breakdown voltage
V <sub>CL</sub>	Clamping voltage
I <sub>RM</sub>	Leakage current @ V <sub>RM</sub>
I <sub>PP</sub>	Peak pulse current
αT	Voltage temperature coefficient
V <sub>F</sub>	Forward voltage drop



Types		I <sub>RM</sub> @ V <sub>RM</sub>		V <sub>BR</sub> @ I <sub>R</sub>		V <sub>CL</sub> @ I <sub>PP</sub>		V <sub>CL</sub> @ I <sub>PP</sub>		αT	C
		max		min		max		max		max	typ
				note2		10/1000μs		8/20μs		note3	note4
Unidirectional	Bidirectional	μA	V	V	mA	V	A	V	A	10 <sup>-4</sup> /°C	pF
BZW06-5V8	BZW06-5V8B	1000	<b>5.8</b>	<b>6.45</b>	<b>10</b>	<b>10.5</b>	<b>57.0</b>	<b>13.4</b>	<b>298</b>	<b>5.7</b>	<b>4000</b>
BZW06-6V4	BZW06-6V4B	500	6.4	7.13	10	11.3	53.0	14.5	276	6.1	3700
BZW06-8V5	BZW06-8V5B	10	8.5	9.5	1	14.5	41	18.6	215	7.3	2800
BZW06-10	BZW06-10B	5	10.2	11.4	1	16.7	36.0	21.7	184	7.8	2300
BZW06-13	BZW06-13B	5	12.8	14.3	1	21.2	28.0	27.2	147	8.4	1900
BZW06-15	BZW06-15B	1	<b>15.3</b>	<b>17.1</b>	<b>1</b>	<b>25.2</b>	<b>24.0</b>	<b>32.5</b>	<b>123</b>	<b>8.8</b>	<b>1600</b>
BZW06-19	BZW06-19B	1	18.8	20.9	1	30.6	19.6	39.3	102	9.2	1350
BZW06-20	BZW06-20B	1	20.5	22.8	1	33.2	18.0	42.8	93	9.4	1250
BZW06-23	BZW06-23B	1	<b>23.1</b>	<b>25.7</b>	<b>1</b>	<b>37.5</b>	<b>16.0</b>	<b>48.3</b>	<b>83</b>	<b>9.6</b>	<b>1150</b>
BZW06-26	BZW06-26B	1	<b>25.6</b>	<b>28.5</b>	<b>1</b>	<b>41.5</b>	<b>14.5</b>	<b>53.5</b>	<b>75</b>	<b>9.7</b>	<b>1075</b>
BZW06-28	BZW06-28B	1	<b>28.2</b>	<b>31.4</b>	<b>1</b>	<b>45.7</b>	<b>13.1</b>	<b>59.0</b>	<b>68</b>	<b>9.8</b>	<b>1000</b>
BZW06-31	BZW06-31B	1	<b>30.8</b>	<b>34.2</b>	<b>1</b>	<b>49.9</b>	<b>12.0</b>	<b>64.3</b>	<b>62</b>	<b>9.6</b>	<b>950</b>
BZW06-33	BZW06-33B	1	<b>33.3</b>	<b>37.1</b>	<b>1</b>	<b>53.9</b>	<b>11.1</b>	<b>69.7</b>	<b>57</b>	<b>10.0</b>	<b>900</b>
BZW06-40	BZW06-40B	1	40.2	44.7	1	64.8	9.3	84	48	10.1	800
BZW06-48	BZW06-48B	1	47.8	53.2	1	77.0	7.8	100	40	10.3	700
BZW06-58	BZW06-58B	1	58.1	64.6	1	92.0	6.5	121	33	10.4	625
BZW06-70	BZW06-70B	1	70.1	77.9	1	113	5.3	146	27.0	10.5	550
BZW06-85	BZW06-85B	1	85.5	95.0	1	137	4.4	178	22.5	10.6	500
BZW06-102	BZW06-102B	1	102	114	1	165	3.6	212	19.0	10.7	450
BZW06-128	BZW06-128B	1	128	143	1	207	2.9	265	15.0	10.8	400
BZW06-154	BZW06-154B	1	154	171	1	246	2.4	317	12.6	10.8	360
BZW06-171	BZW06-171B	1	171	190	1	274	2.2	353	11.3	10.8	350

Types		I <sub>RM</sub> @ V <sub>RM</sub>		V <sub>BR</sub> @ I <sub>R</sub>		V <sub>CL</sub> @ I <sub>PP</sub>		V <sub>CL</sub> @ I <sub>PP</sub>		αT	C
				min	mA	max	A	max	A	max	typ
Unidirectional	Bidirectional	μA	V	V	mA	V	A	V	A	10 <sup>-4</sup> /°C	pF
BZW06-188	BZW06-188B	1	188	209	1	328	2.0	388	10.3	10.8	330
BZW06-213	BZW06-213B	1	231	237	1	344	2.0	442	9.0	11.0	310
BZW06-256	BZW06-256B	1	256	285	1	414	1.6	529	7.6	11.0	290
BZW06-273	BZW06-273B	1	273	304	1	438	1.6	564	7.1	11.0	280
BZW06-299	BZW06-299B	1	299	332	1	482	1.6	618	6.5	11.0	270
BZW06-342	BZW06-342B	1	<b>342</b>	<b>380</b>	1	<b>548</b>	<b>1.3</b>	<b>706</b>	<b>5.7</b>	<b>11.0</b>	<b>360</b>
BZW06-376	BZW06-376B	1	<b>376</b>	<b>418</b>	1	<b>603</b>	<b>1.3</b>	<b>776</b>	<b>5.7</b>	<b>11.0</b>	<b>350</b>

Fig. 1: Peak pulse power dissipation versus initial junction temperature (printed circuit board).



- Note 2 : Pulse test: t<sub>p</sub> < 50 ms.
- Note 3 : ΔV<sub>BR</sub> = αT \* (T<sub>amb</sub> - 25) \* V<sub>BR</sub>(25°C)
- Note 4 : V<sub>R</sub> = 0 V, F = 1 MHz. For bidirectional types, capacitance value is divided by 2.

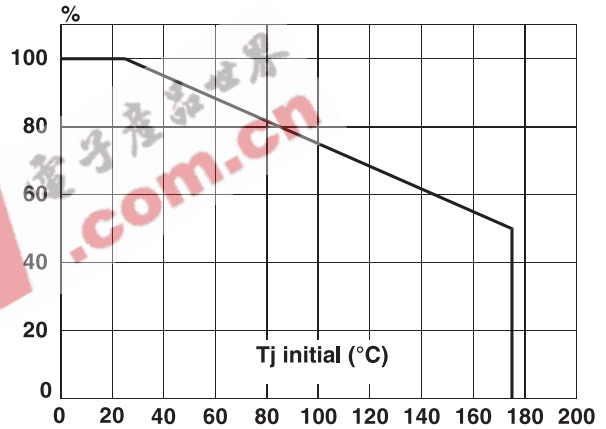


Fig. 2 : Peak pulse power versus exponential pulse duration.

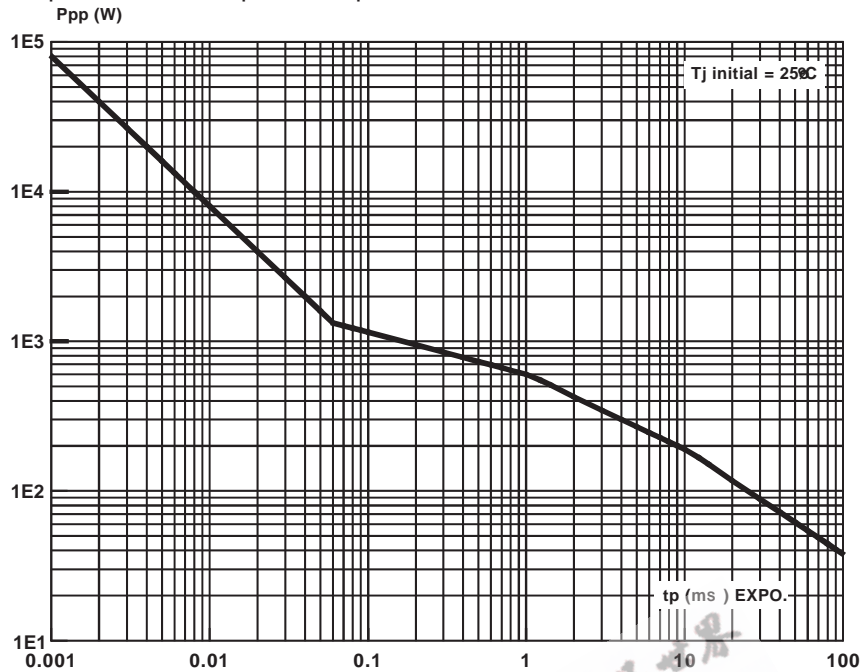
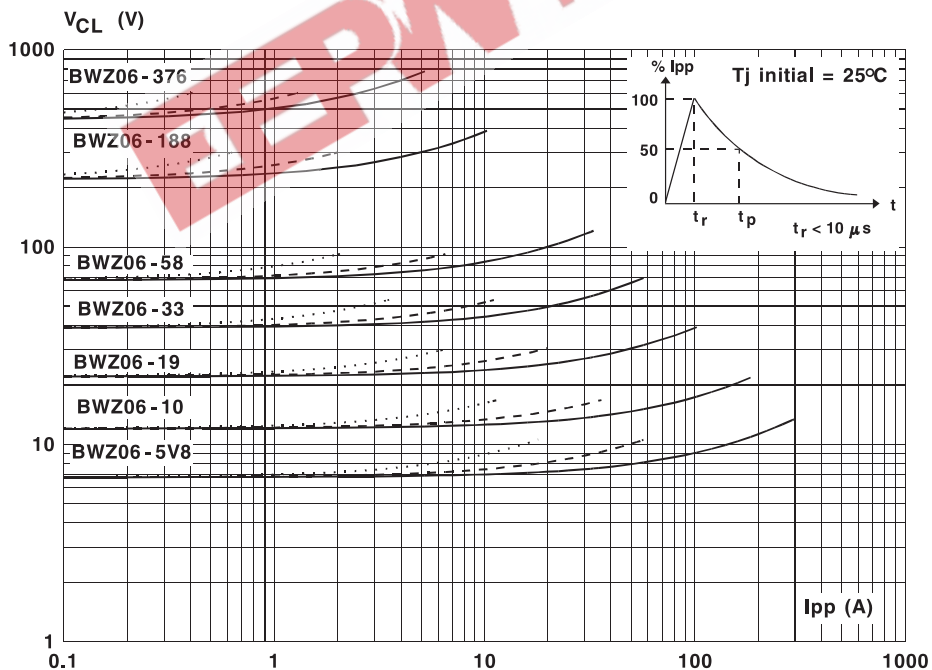


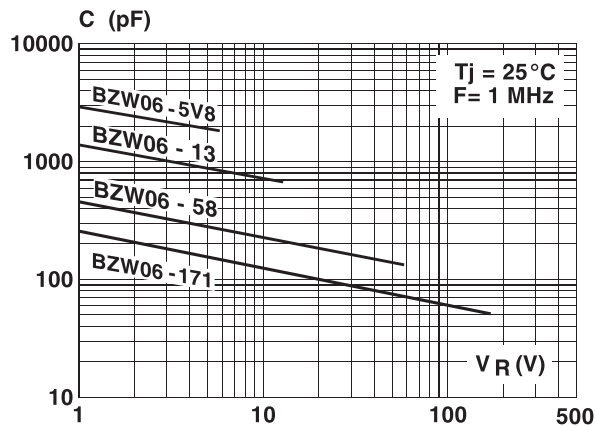
Fig. 3 : Clamping voltage versus peak pulse current.

Exponential waveform  $t_p = 20 \mu\text{s}$  \_\_\_\_\_  
 $t_p = 1 \text{ ms}$  \_\_\_\_\_  
 $t_p = 10 \text{ m}$  .....

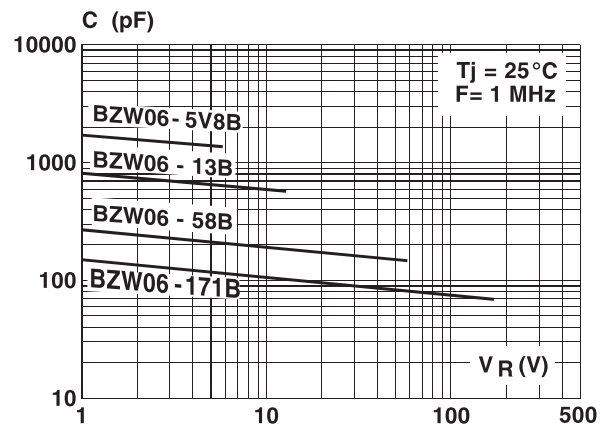


**Note :** The curves of the figure 3 are specified for a junction temperature of  $25^\circ\text{C}$  before surge.  
 The given results may be extrapolated for other junction temperatures by using the following formula :  
 $\Delta V_{BR} = \alpha \cdot T \cdot (T_{amb} - 25) \cdot V_{BR} (25^\circ\text{C})$ .  
 For intermediate voltages, extrapolate the given results.

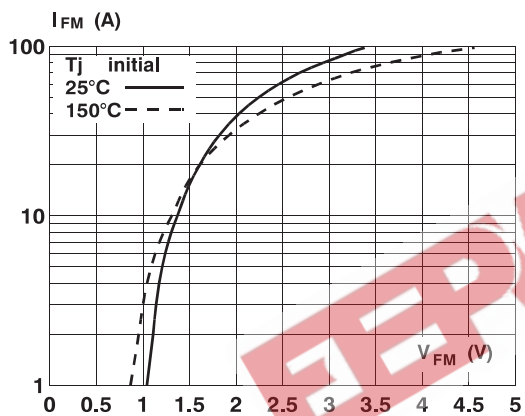
**Fig. 4a** : Capacitance versus reverse applied voltage for unidirectional types (typical values).



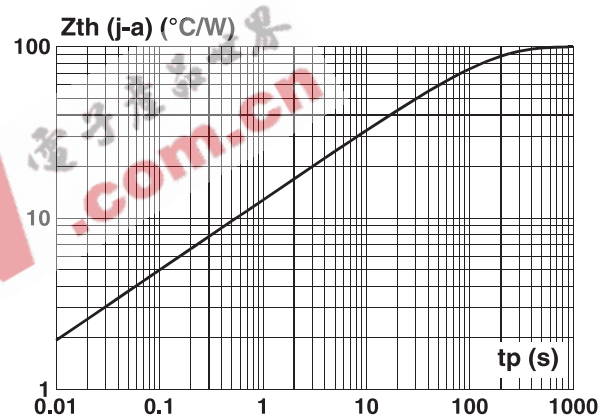
**Fig. 4b** : Capacitance versus reverse applied voltage for bidirectional types (typical values).



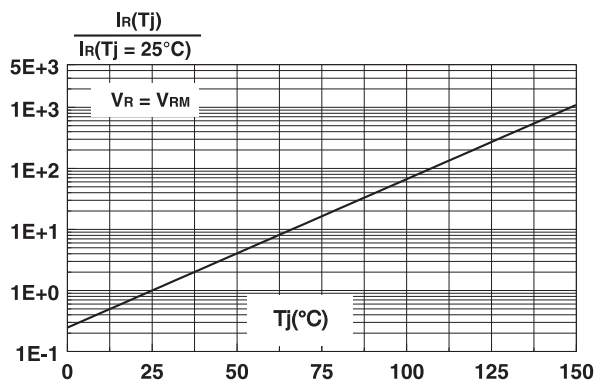
**Fig. 5** : Peak forward voltage drop versus peak forward current (typical values for unidirectional types).



**Fig. 6** : Transient thermal impedance junction ambient versus pulse duration (For FR4 PC Board with L lead = 10mm).

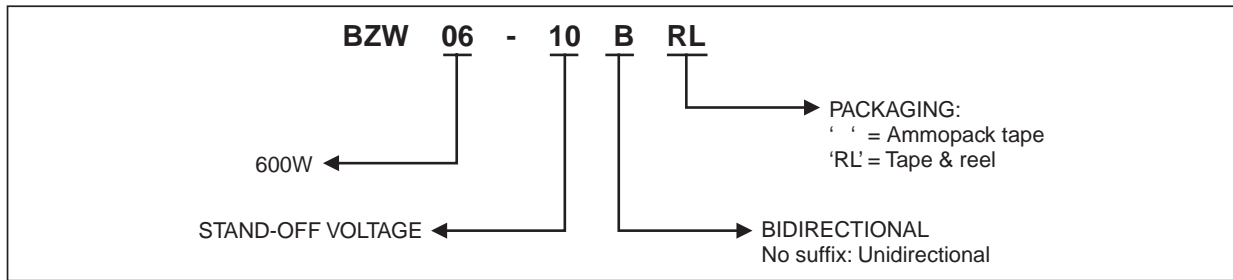


**Fig. 7** : Relative variation of leakage current versus junction temperature.



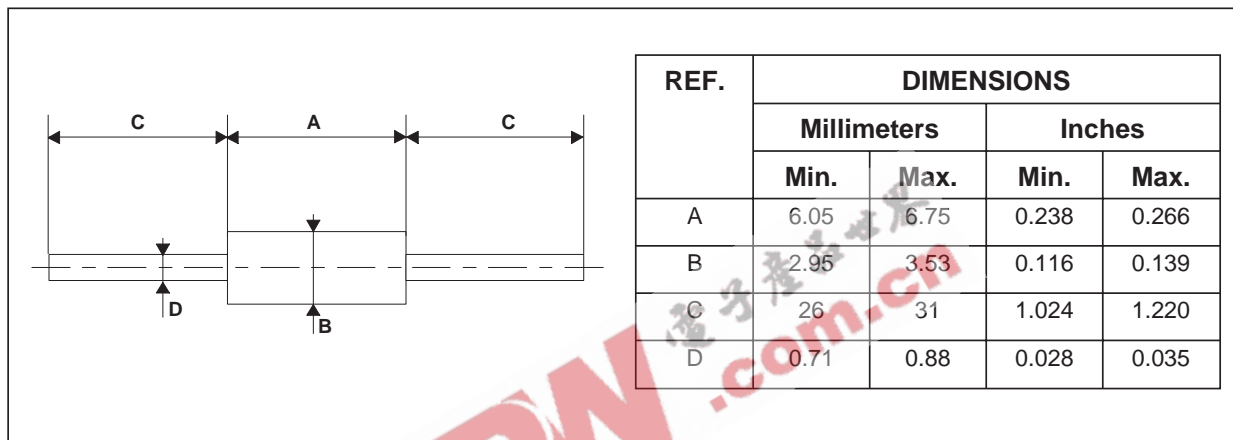
**BZW06-xx**

**ORDER**



**MARKING** : Logo, Date Code, Type Code, Cathode Band (for unidirectional types only).

**PACKAGE MECHANICAL DATA**  
 DO-15 (Plastic)



**Packaging** : standard packaging is in tape and reel.

**Weight** = 0.4 g.

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