

# 1 Characteristics

**Table 1. Absolute maximum ratings ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

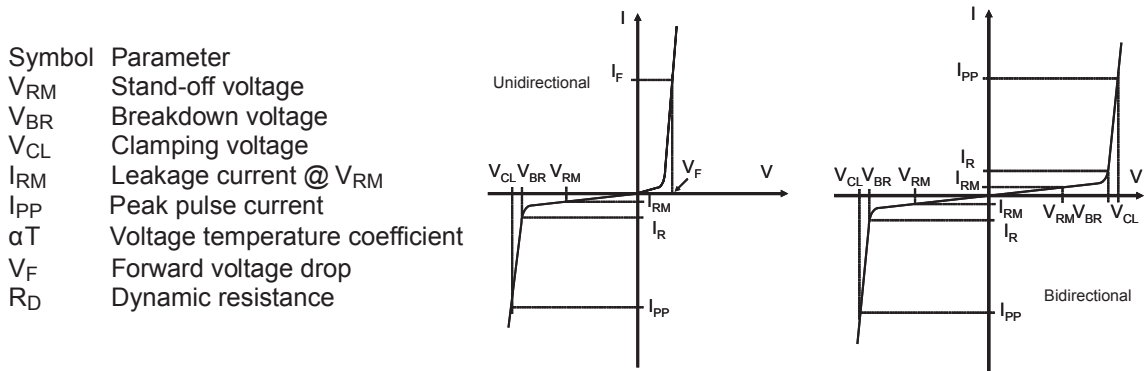
Symbol	Parameter	Value	Unit
$P_{PP}$	Peak pulse power dissipation <sup>(1)</sup>	5000	W
$P$	Power dissipation on infinite heatsink	6.5	W
$I_{FSM}$	Non repetitive surge peak forward current for unidirectional types	500	A
$T_{stg}$	Storage temperature range	-65 to +175	$^{\circ}\text{C}$
$T_{op}$	Maximum operating junction temperature	175	$^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10 s at 5 mm from case.	260	$^{\circ}\text{C}$

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

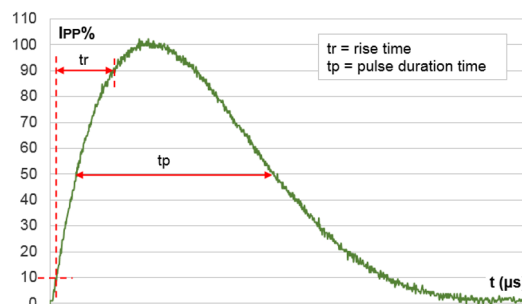
**Table 2. Thermal resistance parameter**

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads	15	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient on printed circuit. $L_{lead} = 10\text{ mm}$	65	$^{\circ}\text{C}/\text{W}$

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



**Figure 2. Pulse definition for electrical characteristics**



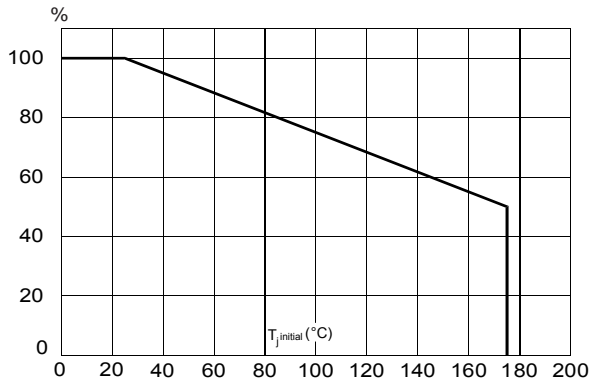
**Table 3. Electrical characteristics - values ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

Order code		$I_{RM} @ V_{RM}$ max.		$V_{BR} @ I_R^{(1)}$ min.		$V_{CL} @ I_{PP}$ 10/1000 $\mu\text{s}$ max.		$V_{CL} @ I_{PP}$ 8/20 $\mu\text{s}$ max.		$\alpha T^{(2)}$	$C^{(3)}$ typ.
Unidirectional	Bidirectional	$\mu\text{A}$	V	V	mA	V	A	V	A	$10^{-4}/^{\circ}\text{C}$	pF
BZW50-10	BZW50-10B	5	10	11.1	1	18.8	266	23.4	2564	7.8	24000
BZW50-12	BZW50-12B	5	12	13.3	1	22	227	28	2143	8.4	18500
BZW50-15	BZW50-15B	5	15	16.6	1	26.9	186	35	1714	8.8	13500
BZW50-18	BZW50-18B	5	18	20	1	32.2	155	41.5	1446	9.2	11500
BZW50-22	BZW50-22B	5	22	24.4	1	39.4	127	51	1177	9.6	8500
BZW50-27	BZW50-27B	5	27	30	1	48.3	103	62	968	9.8	7000
BZW50-33	BZW50-33B	5	33	36.6	1	59	85	76	789	10	5750
BZW50-39	BZW50-39B	5	39	43.3	1	69.4	72	90	667	10.1	4800
BZW50-47	BZW50-47B	5	47	52	1	83.2	60.1	108	556	10.3	4100
BZW50-56	BZW50-56B	5	56	62.2	1	99.6	50	129	465	10.4	3400
BZW50-68	BZW50-68B	5	68	75.6	1	121	41	157	382	10.5	3000
BZW50-82	BZW50-82B	5	82	91	1	145	34	189	317	10.6	2600
BZW50-100	BZW50-100B	5	100	111	1	179	28	228	263	10.7	2300
BZW50-120	BZW50-120B	5	120	133	1	215	23	274	219	10.8	1900
BZW50-150	BZW50-150B	5	150	166	1	269	19	343	175	10.8	1700
BZW50-180	BZW50-180B	5	180	200	1	322	16	410	146	10.8	1500

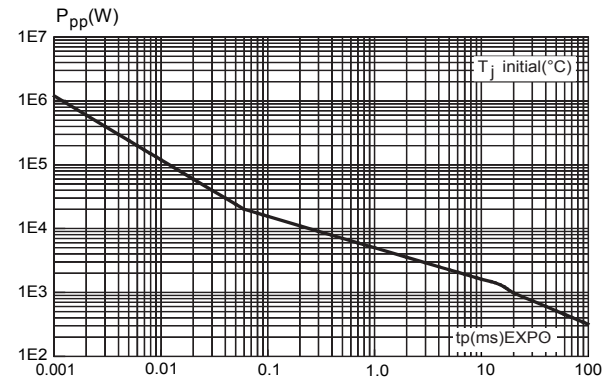
1. Pulse test:  $t_p < 50\text{ ms}$ .
2. To calculate  $V_{BR}$  versus  $T_j$ :  $V_{BR}$  at  $T_j = V_{BR}$  at  $25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_j - 25))$
3.  $V_R = 0\text{ V}$ ,  $F = 1\text{ MHz}$ . For bidirectional types, capacitance value is divided by 2.

## 1.1 Characteristics (curves)

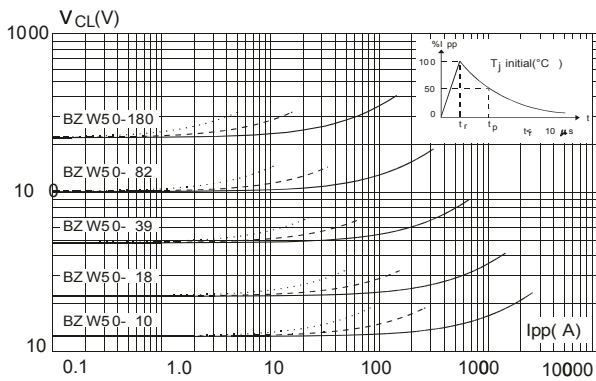
**Figure 3. Peak power dissipation vs. initial junction temperature (printed circuit board)**



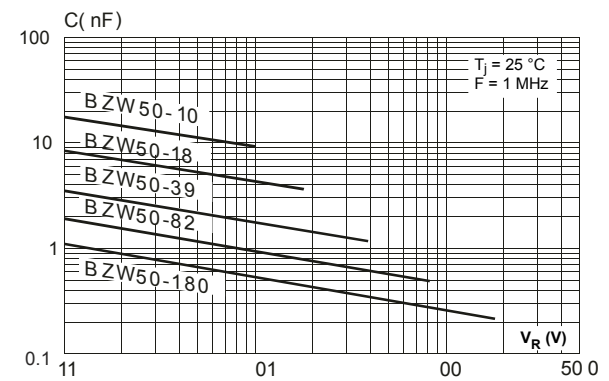
**Figure 4. Peak pulse power versus exponential pulse duration**



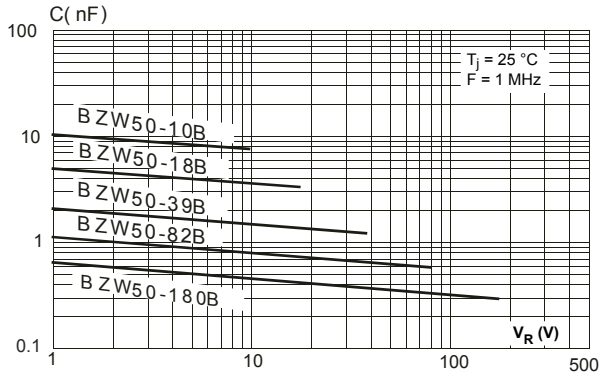
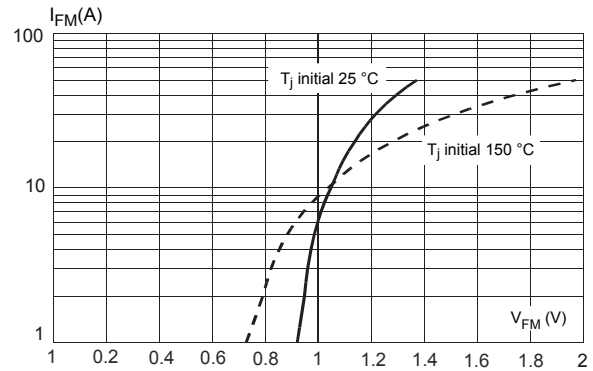
**Figure 5. Clamping voltage vs. peak pulse current**



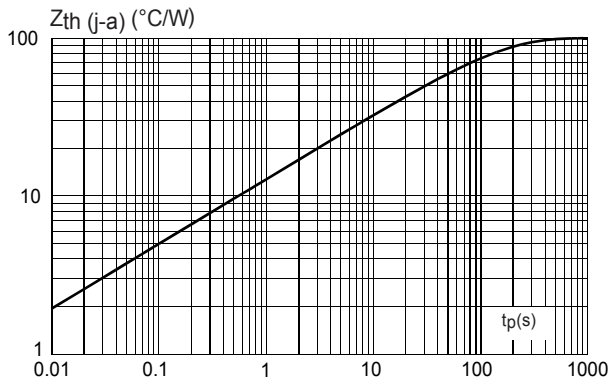
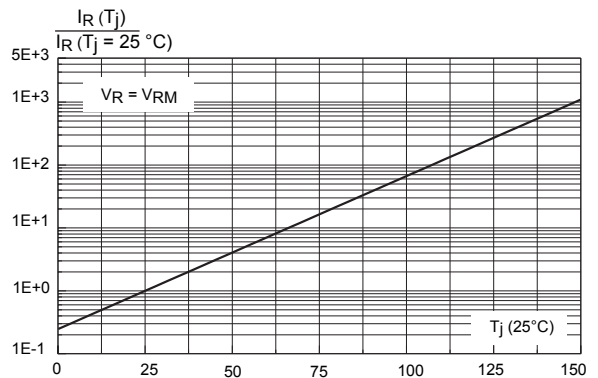
**Figure 6. Capacitance vs. reverse applied voltage for unidirectional types (typical values)**



**Note:** The curves in [Figure 5. Clamping voltage vs. peak pulse current](#) 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:  $\Delta V_{BR} = \alpha T \times [T_{amb} - 25] \times V_{BR}(25^{\circ}\text{C})$ . For intermediate voltages, extrapolate the given results.

**Figure 7. Capacitance vs. reverse applied voltage for bidirectional types (typical values)**

**Figure 8. Peak forward voltage drop vs. peak forward current for unidirectional types (typical value)**


Note: For Figure 8. Peak forward voltage drop vs. peak forward current for unidirectional types (typical value), multiply by 2 for units with  $V_{BR} > 220$  V.

**Figure 9. Transient thermal impedance junction to ambient vs. pulse duration**

**Figure 10. Relative variation of leakage current vs. junction temperature**


## 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 R6 package information

Figure 11. R6 package outline

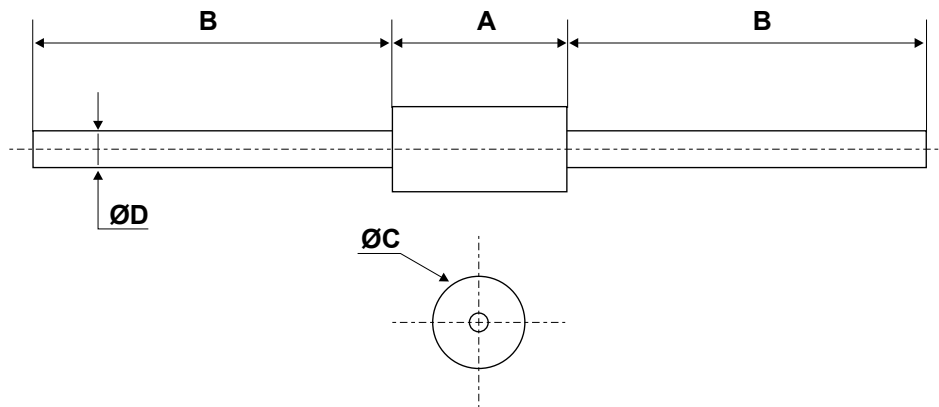


Table 4. R6 package mechanical data

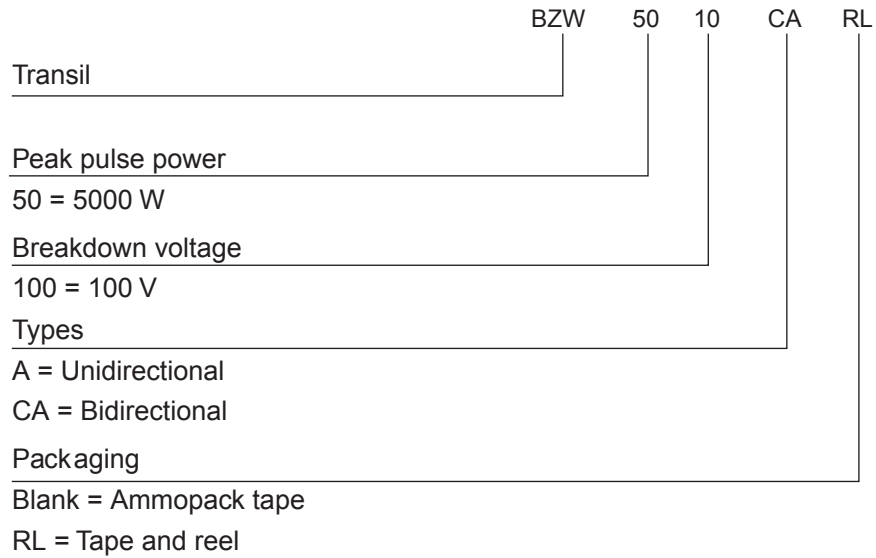
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.		Typ.	Max.
A	8.6	-	9.1	0.338	-	0.358
B	25.4	-		1	-	
C	8.6	-	9.1	0.338	-	0.358
D	1.20	-	1.30	0.047	-	0.051

**Table 5. Marking**

Unidirectional order code	Marking	Bidirectional order code	Marking
BZW50-10	BZW50-10	BZW50-10B	BZW50-10B
BZW50-12	BZW50-12	BZW50-12B	BZW50-12B
BZW50-15	BZW50-15	BZW50-15B	BZW50-15B
BZW50-18	BZW50-18	BZW50-18B	BZW50-18B
BZW50-22	BZW50-22	BZW50-22B	BZW50-22B
BZW50-27	BZW50-27	BZW50-27B	BZW50-27B
BZW50-33	BZW50-33	BZW50-33B	BZW50-33B
BZW50-39	BZW50-39	BZW50-39B	BZW50-39B
BZW50-47	BZW50-47	BZW50-47B	BZW50-47B
BZW50-56	BZW50-56	BZW50-56B	BZW50-56B
BZW50-68	BZW50-68	BZW50-68B	BZW50-68B
BZW50-82	BZW50-82	BZW50-82B	BZW50-82B
BZW50-100	BZW50-100	BZW50-100B	BZW50-100B
BZW50-120	BZW50-120	BZW50-120B	BZW50-120B
BZW50-150	BZW50-150	BZW50-150B	BZW50-150B
BZW50-180	BZW50-180	BZW50-180B	BZW50-180B

### 3 Ordering information

**Figure 12. Ordering information scheme**



**Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
BZW50xxxx	See <a href="#">Table 5. Marking</a>	R6	2.050 g	1000	Ammopack
BZW50xxxxB				100	Tape and reel
BZW50xxxxRL					
BZW50xxxxBRL					

1. Logo, date code, type code, cathode band (for unidirectional types only).

## Revision history

**Table 7. Document revision history**

Date	Revision	Changes
Feb-2003	1	Last update.
14-Dec-2012	2	Updated ECOPACK statement.
25-May-2018	3	Updated title description. Updated <a href="#">Figure 2. Pulse definition for electrical characteristics</a> and <a href="#">Figure 12. Ordering information scheme</a> .



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