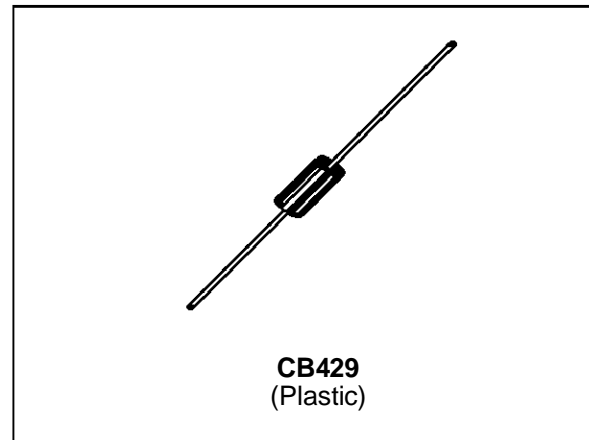


**FEATURES**

- PEAK PULSE POWER= 1500 W @ 1ms
- BREAKDOWN VOLTAGE RANGE :  
From 6V8 to 440 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 transients 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
$P_p$	Peak pulse power dissipation		1500	W
$P$	Power dissipation on infinite heatsink	$T_{lead} = 75^{\circ}\text{C}$	5	W
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature		- 65 to + 175 175	$^{\circ}\text{C}$ $^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10 s.		230	$^{\circ}\text{C}$

**THERMAL RESISTANCES**

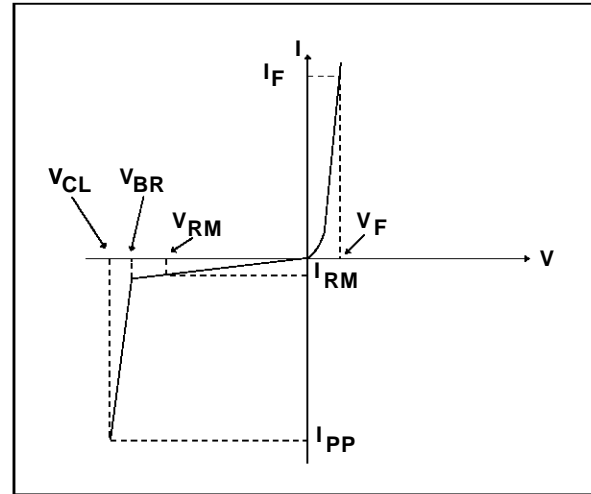
Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to leads on infinite heatsink		20	$^{\circ}\text{C/W}$
$R_{th(j-a)}$	Junction to ambient on printed circuit.	$L_{lead} = 10\text{ mm}$	75	$^{\circ}\text{C/W}$

## 1.5KExx

### ELECTRICAL CHARACTERISTICS

( $T_{amb} = 25^{\circ}\text{C}$ )

Symbol	Parameter
$V_{RM}$	Stand-off voltage
$V_{BR}$	Breakdown voltage
$V_{CL}$	Clamping voltage
$I_{RM}$	Leakage current @ $V_{RM}$
$I_{PP}$	Peak pulse current
$\alpha T$	Voltage temperature coefficient



Types		$I_{RM}$ @ $V_{RM}$ max		$V_{BR}$ @ $I_R$ min nom max				$V_{CL}$ @ $I_{PP}$ max		$V_{CL}$ @ $I_{PP}$ max		$\alpha T$ max	$C$ typ
				note2				10/1000 $\mu$ s		8/20 $\mu$ s		note3	note4
Unidirectional	Bidirectional	$\mu$ A	V	V	V	V	mA	V	A	V	A	$10^{-4}/^{\circ}\text{C}$	pF
1.5KE6V8P	1.5KE6V8CP	1000	5.8	6.45	6.8	7.48	10	10.5	143	13.4	746	5.7	9500
1.5KE6V8A	1.5KE6V8CA	1000	5.8	6.45	6.8	7.14	10	10.5	143	13.4	746	5.7	9500
1.5KE7V5P	1.5KE7V5CP	500	6.4	7.13	7.5	8.25	10	11.3	132	14.5	690	6.1	8500
1.5KE7V5A	1.5KE7V5CA	500	6.4	7.13	7.5	7.88	10	11.3	132	14.5	690	6.1	8500
1.5KE8V2P	1.5KE8V2CP	200	7.02	7.79	8.2	9.02	10	12.1	124	15.5	645	6.5	8000
1.5KE8V2A	1.5KE8V2CA	200	7.02	7.79	8.2	8.61	10	12.1	124	15.5	645	6.5	8000
1.5KE9V1P	1.5KE9V1CP	50	7.78	8.65	9.1	10	1	13.4	112	17.1	585	6.8	7500
1.5KE9V1A	1.5KE9V1CA	50	7.78	8.65	9.1	9.55	1	13.4	112	17.1	585	6.8	7500
1.5KE10P	1.5KE10CP	10	8.55	9.5	10	11	1	14.5	103	18.6	538	7.3	7000
1.5KE10A	1.5KE10CA	10	8.55	9.5	10	10.5	1	14.5	103	18.6	538	7.3	7000
1.5KE11P	1.5KE11CP	5	9.4	10.5	11	12.1	1	15.6	96	20.3	493	7.5	6400
1.5KE11A	1.5KE11CA	5	9.4	10.5	11	11.6	1	15.6	96	20.3	493	7.5	6400
1.5KE12P	1.5KE12CP	5	10.2	11.4	12	13.2	1	16.7	90	21.7	461	7.8	6000
1.5KE12A	1.5KE12CA	5	10.2	11.4	12	12.6	1	16.7	90	21.7	461	7.8	6000
1.5KE13P	1.5KE13CP	5	11.1	12.4	13	14.3	1	18.2	82	23.6	423	8.1	5500
1.5KE13A	1.5KE13CA	5	11.1	12.4	13	13.7	1	18.2	82	23.6	423	8.1	5500
1.5KE15P	1.5KE15CP	5	12.8	14.3	15	16.5	1	21.2	71	27.2	368	8.4	5000
1.5KE15A	1.5KE15CA	5	12.8	14.3	15	15.8	1	21.2	71	27.2	368	8.4	5000
1.5KE16P	1.5KE16CP	5	13.6	15.2	16	17.6	1	22.5	67	28.9	346	8.6	4700
1.5KE16A	1.5KE16CA	5	13.6	15.2	16	16.8	1	22.5	67	28.9	346	8.6	4700
1.5KE18P	1.5KE18CP	5	15.3	17.1	18	19.8	1	25.2	59.5	32.5	308	8.8	4300
1.5KE18A	1.5KE18CA	5	15.3	17.1	18	18.9	1	25.2	59.5	32.5	308	8.8	4300
1.5KE20P	1.5KE20CP	5	17.1	19	20	22	1	27.7	54	36.1	277	9.0	4000
1.5KE20A	1.5KE20CA	5	17.1	19	20	21	1	27.7	54	36.1	277	9.0	4000

## 1.5KExx

Types		$I_{RM}$ @ $V_{RM}$ max		$V_{BR}$ @ $I_R$ min nom max				$V_{CL}$ @ $I_P$ max		$V_{CL}$ @ $I_P$ max		$\alpha T$ max	$C$ typ
Unidirectional	Bidirectional	$\mu A$	V	V	V	V	mA	V	A	V	A	$10^{-4}/^{\circ}C$	pF
				note2				10/1000 $\mu s$	8/20 $\mu s$		note3	note4	
1.5KE22P	1.5KE22CP	5	18.8	20.9	22	24.2	1	30.6	49	39.3	254	9.2	3700
1.5KE22A	1.5KE22CA	5	18.8	20.9	22	23.1	1	30.6	49	39.3	254	9.2	3700
1.5KE24P	1.5KE24CP	5	20.5	22.8	24	26.4	1	33.2	45	42.8	234	9.4	3500
1.5KE24A	1.5KE24CA	5	20.5	22.8	24	25.2	1	33.2	45	42.8	234	9.4	3500
1.5KE27P	1.5KE27CP	5	23.1	25.7	27	29.7	1	37.5	40	48.3	207	9.6	3200
1.5KE27A	1.5KE24CA	5	23.1	25.7	27	28.4	1	37.5	40	48.3	207	9.6	3200
1.5KE30P	1.5KE30CP	5	25.6	28.5	30	33	1	41.5	36	53.5	187	9.7	2900
1.5KE30A	1.5KE30CA	5	25.6	28.5	30	31.5	1	41.5	36	53.5	187	9.7	2900
1.5KE33P	1.5KE33CP	5	28.2	31.4	33	36.3	1	45.7	33	59.0	169	9.8	2700
1.5KE33A	1.5KE33CA	5	28.2	31.4	33	34.7	1	45.7	33	59.0	169	9.8	2700
1.5KE36P	1.5KE36CP	5	30.8	34.2	36	39.6	1	49.9	30	64.3	156	9.9	2500
1.5KE36A	1.5KE36CA	5	30.8	34.2	36	37.8	1	49.9	30	64.3	156	9.9	2500
1.5KE39P	1.5KE39CP	5	33.3	37.1	39	42.9	1	53.9	28	69.7	143	10.0	2400
1.5KE39A	1.5KE39CA	5	33.3	37.1	39	41.0	1	53.9	28	69.7	143	10.0	2400
1.5KE43P	1.5KE43CP	5	36.8	40.9	43	47.3	1	59.3	25.3	76.8	130	10.1	2200
1.5KE43A	1.5KE43CA	5	36.8	40.9	43	45.2	1	59.3	25.3	76.8	130	10.1	2200
1.5KE47P	1.5KE47CP	5	40.2	44.7	47	51.7	1	64.8	23.2	84	119	10.1	2050
1.5KE47A	1.5KE47CA	5	40.2	44.7	47	49.4	1	64.8	23.2	84	119	10.1	2050
1.5KE51P	1.5KE51CP	5	43.6	48.5	51	56.1	1	70.1	21.4	91	110	10.2	1950
1.5KE51A	1.5KE51CA	5	43.6	48.5	51	53.6	1	70.1	21.4	91	110	10.2	1950
1.5KE56P	1.5KE56CP	5	47.8	53.2	56	61.6	1	77	19.5	100	100	10.3	1800
1.5KE56A	1.5KE56CA	5	47.8	53.2	56	58.8	1	77	19.5	100	100	10.3	1800
1.5KE62P	1.5KE62CP	5	53.0	58.9	62	68.2	1	85	17.7	111	90	10.4	1700
1.5KE62A	1.5KE62CA	5	53.0	58.9	62	65.1	1	85	17.7	111	90	10.4	1700
1.5KE68P	1.5KE68CP	5	58.1	64.6	68	74.8	1	92	16.3	121	83	10.4	1550
1.5KE68A	1.5KE68CA	5	58.1	64.6	68	71.4	1	92	16.3	121	83	10.4	1550
1.5KE75P	1.5KE75CP	5	64.1	71.3	75	82.5	1	103	14.6	134	75	10.5	1450
1.5KE75A	1.5KE75CA	5	64.1	71.3	75	78.8	1	103	14.6	134	75	10.5	1450
1.5KE82P	1.5KE82CP	5	70.1	77.9	82	90.2	1	113	13.3	146	69	10.5	1350
1.5KE82A	1.5KE82CA	5	70.1	77.9	82	86.1	1	113	13.3	146	69	10.5	1350
1.5KE91P	1.5KE91CP	5	77.8	86.5	91	100	1	125	12	162	62	10.6	1250
1.5KE91A	1.5KE91CA	5	77.8	86.5	91	95.5	1	125	12	162	62	10.6	1250
1.5KE100P	1.5KE100CP	5	85.5	95.0	100	110	1	137	11	178	56	10.6	1150
1.5KE100A	1.5KE100CA	5	85.5	95.0	100	105	1	137	11	178	56	10.6	1150
1.5KE110P	1.5KE110CP	5	94.0	105	110	121	1	152	9.9	195	51	10.7	1050
1.5KE110A	1.5KE110CA	5	94.0	105	110	116	1	152	9.9	195	51	10.7	1050
1.5KE120P	1.5KE120CP	5	102	114	120	132	1	165	9.1	212	47	10.7	1000
1.5KE120A	1.5KE120CA	5	102	114	120	126	1	165	9.1	212	47	10.7	1000

## 1.5KExx

Types		$I_{RM}$ @ $V_{RM}$ max		$V_{BR}$ @ $I_R$ min nom max				$V_{CL}$ @ $I_{PP}$ max		$V_{CL}$ @ $I_{PP}$ max		$\alpha T$ max	$C$ typ
Unidirectional	Bidirectional	$\mu A$	V	V	V	V	mA	V	A	V	A	$10^{-4}/^{\circ}C$	pF
1.5KE130P	1.5KE130CP	5	111	124	130	143	1	179	8.4	230	43	10.7	950
1.5KE130A	1.5KE130CA	5	111	124	130	137	1	179	8.4	230	43	10.7	950
1.5KE150P	1.5KE150CP	5	128	143	150	165	1	207	7.2	265	38	10.8	850
1.5KE150A	1.5KE150CA	5	128	143	150	158	1	207	7.2	265	38	10.8	850
1.5KE160P	1.5KE160CP	5	136	152	160	176	1	219	6.8	282	35	10.8	800
1.5KE160A	1.5KE160CA	5	136	152	160	168	1	219	6.8	282	35	10.8	800
1.5KE170P	1.5KE170CP	5	145	161	170	187	1	234	6.4	301	33	10.8	750
1.5KE170A	1.5KE170CA	5	145	161	170	179	1	234	6.4	301	33	10.8	750
1.5KE180P	1.5KE180CP	5	154	171	180	198	1	246	6.1	317	31.5	10.8	725
1.5KE180A	1.5KE180CA	5	154	171	180	189	1	246	6.1	317	31.5	10.8	725
1.5KE200P	1.5KE200CP	5	171	190	200	220	1	274	5.5	353	28	10.8	675
1.5KE200A	1.5KE200CA	5	171	190	200	210	1	274	5.5	353	28	10.8	675
1.5KE220P	1.5KE220CP	5	188	109	220	242	1	328	4.6	388	26	10.8	625
1.5KE220A	1.5KE220CA	5	188	209	220	231	1	328	4.6	388	26	10.8	625
1.5KE250P	1.5KE250CP	5	213	237	250	275	1	344	5.0	442	23	11	560
1.5KE250A	1.5KE250CA	5	213	237	250	263	1	344	5.0	442	23	11	560
1.5KE280P	1.5KE280CP	5	239	266	280	208	1	384	5.0	494	20	11	520
1.5KE280A	1.5KE280CA	5	239	266	280	294	1	384	5.0	494	20	11	520
1.5KE300P	1.5KE300CP	5	256	285	300	330	1	414	5.0	529	19	11	500
1.5KE300A	1.5KE300CA	5	256	285	300	315	1	414	5.0	529	19	11	500
1.5KE320P	1.5KE320CP	5	273	604	320	352	1	438	4.5	564	18	11	460
1.5KE320A	1.5KE320CA	5	273	604	320	336	1	438	4.5	564	18	11	460
1.5KE350P	1.5KE350CP	5	299	332	350	385	1	482	4.0	618	16	11	430
1.5KE350A	1.5KE350CA	5	299	332	350	368	1	482	4.0	618	16	11	430
1.5KE400P	1.5KE400CP	5	342	380	400	440	1	548	4.0	706	14	11	390
1.5KE400A	1.5KE400CA	5	342	380	400	420	1	548	4.0	706	14	11	390
1.5KE440P	1.5KE440CP	5	376	418	440	484	1	603	3.5	776	13	11	360
1.5KE440A	1.5KE440CA	5	376	418	440	462	1	603	3.5	776	13	11	360

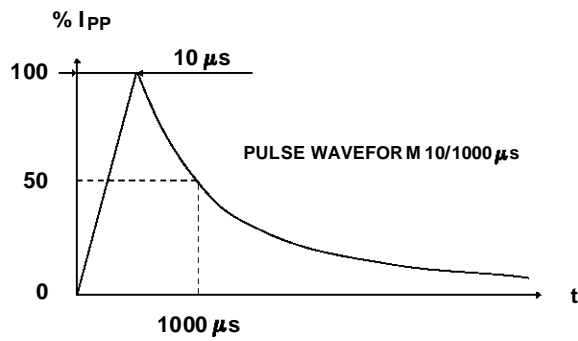
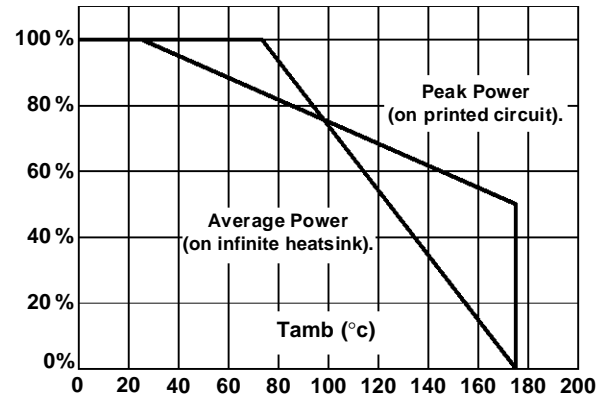


Fig. 1: Power dissipation derating versus ambient temperature



- Note 1 :** For surges greater than the maximum values, the diode will present a short-circuit Anode - Cathode.
- Note 2 :** Pulse test: t<sub>p</sub> < 50 ms.
- Note 3 :**  $\Delta V_{BR} = \alpha T * (T_{amb} - 25) * V_{BR}(25^{\circ}C)$ .
- 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.

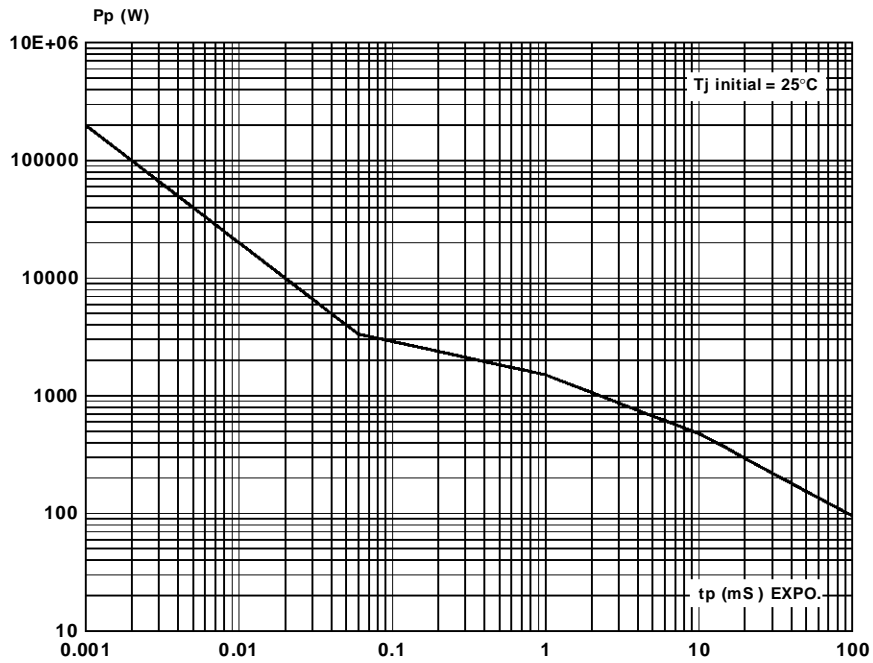
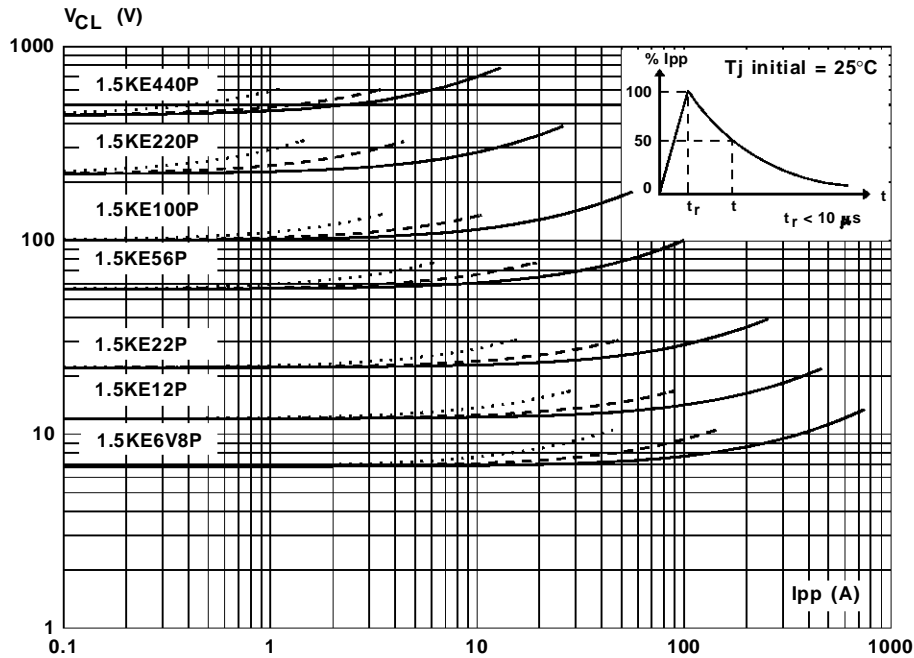


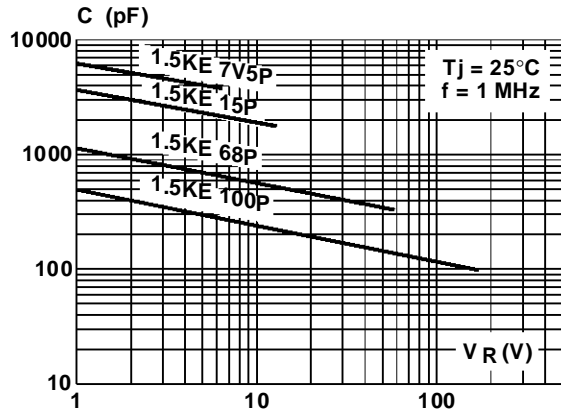
Fig. 3 : Clamping voltage versus peak pulse current.  
 Exponential waveform  $t_p = 20 \mu s$  \_\_\_\_\_  
 $t_p = 1 ms$  -----  
 $t_p = 10 ms$  .....



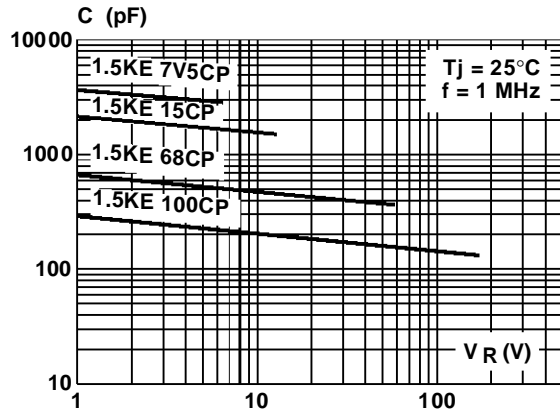
**Note :** The curves of the figure 3 are specified for a junction temperature of 25 °C before surge.  
 The given results may be extrapolated for other junction temperatures by using the following formula :  
 $\Delta V_{BR} = \alpha T * (T_{amb} - 25) * V_{BR}(25^{\circ}C)$ .  
 For intermediate voltages,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

# 1.5KExx

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

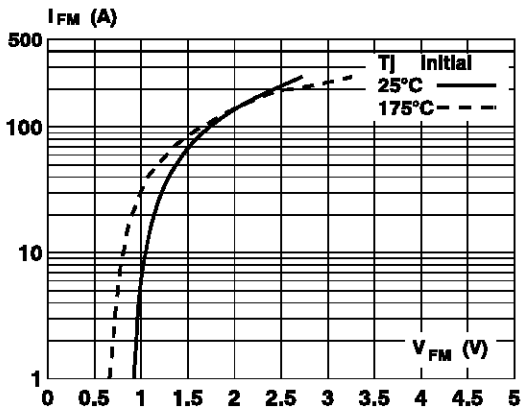


**Fig. 4b** : Capacitance versus reverse applied voltage for bidirectional types (typical values).

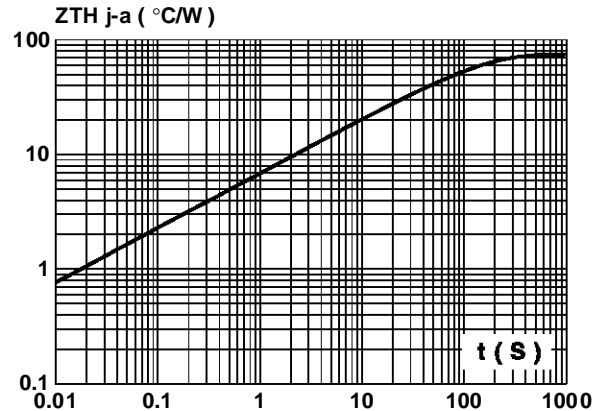


**Fig. 5** : Peak forward voltage drop versus peak forward current (typical values for unidirectional types).

**Note :** For units with V<sub>BR</sub> > 200 V  
V<sub>F</sub> is twice than shown.

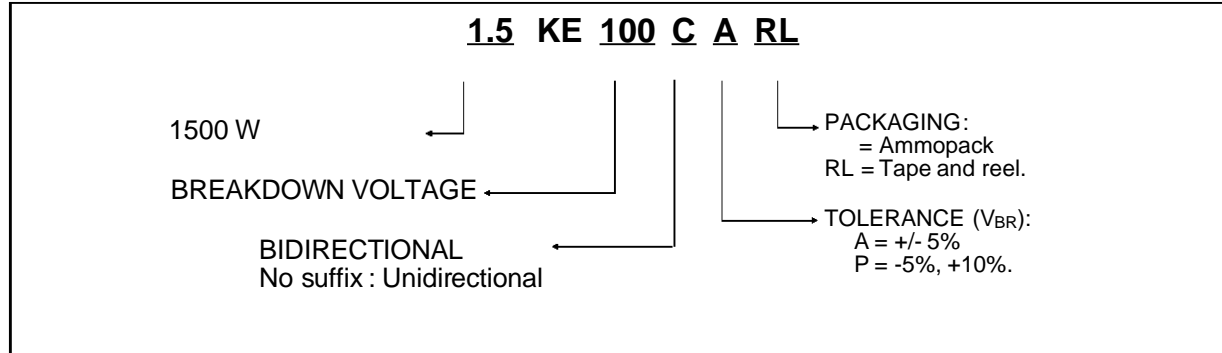


**Fig. 6** : Transient thermal impedance junction-ambient versus pulse duration. For a mounting on PC Board with L<sub>lead</sub> = 10mm.



# 1.5KExx

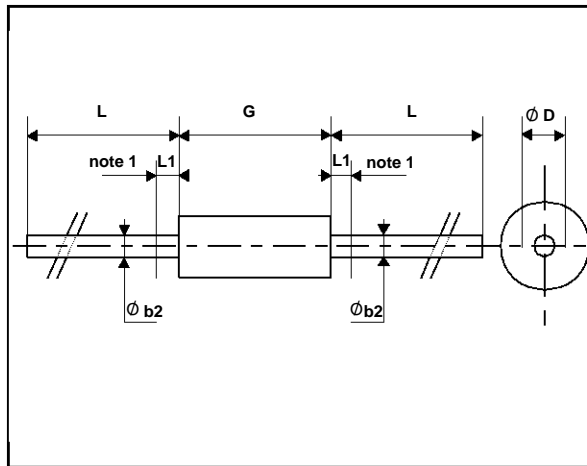
## ORDER CODE



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

## PACKAGE MECHANICAL DATA

CB429 (Plastic)



Weight = 0.85 g.

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

Axial Diode CD429 = Products Supplied in Tape and Reel.  
 - RL = tape and reel  
 - No suffix = tape

REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
Ø b2		1.06		0.042	1 - The lead diameter Ø b2 is not controlled over zone L1
Ø D		5.1		0.20	
G		9.8		0.386	
L	26		1.024		
L1		1.27		0.050	

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