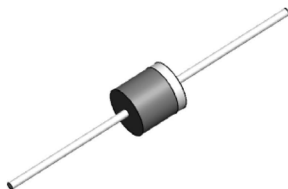


15KP

15000 W Transient voltage suppressor



Product features

- Low incremental surge resistance
- Excellent clamping capability
- 15,000 W peak pulse power capability at 10/1000 μ s waveform
- Typical I_R less than 2 μ A above 30 V
- Fast response time: typically less than 1.0 ps from 0 V to V_{BR} minimum
- High temperature reflow and wave soldering
- Plastic package meets UL 94 V-0 flammability rating
- Terminal: Solder plated leads, solderable per J-STD-02
- UL 497B recognized.
File No. : E198449 Guide QVGQ2

Applications

- Consumer electronics
- Telecommunications
- Computing and servers
- Appliances
- Industrial automation
- Mobile and wearables

Environmental compliance and general specifications



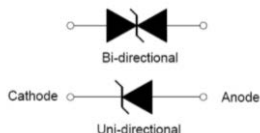
Ordering part number

15KP 280 C A
 Family name _____
 V_R voltage _____
 Bi-/Uni-Directional _____
 (Blank=Uni, C=Bi)
 Voltage (V_{BR}) tolerance _____

Alternate ordering part number

15KP E 280 C A
 Family name _____
 Eaton designator (optional) _____
 V_R voltage _____
 Bi-/Uni-Directional _____
 (Blank=Uni, C=Bi)
 Voltage (V_{BR}) tolerance _____

PIN configuration



Symbol



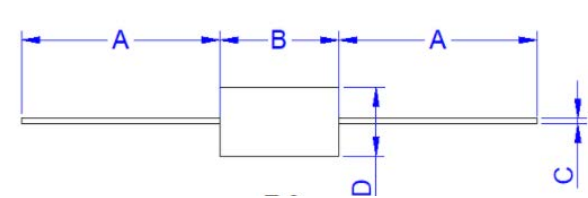
Powering Business Worldwide

Absolute maximum ratings

(+25 °C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage operating junction temperature range	T_{STG}/T_J	-55 to +175	°C
Steady state power dissipation at $T_L = +75\text{ °C}$	$P_{M(AV)}$	8.0	W
Peak pulse power dissipation on 10/1000 μs waveform	P_{PP}	15,000	W
Peak forward surge current, 8.3 ms single half sine-wave for unidirectional only	I_{FSM}	400	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	8.0	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	°C/W

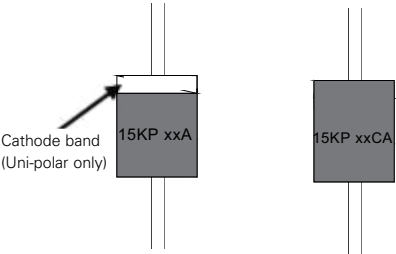
Mechanical parameters- mm



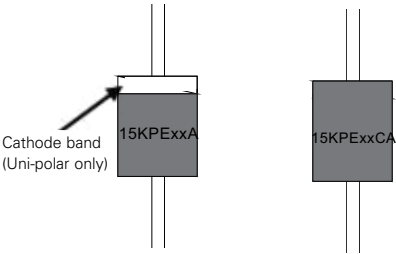
	Millimeters		Inches	
Dimension	Minimum	Maximum	Minimum	Maximum
A	25.40		1.000	
B	8.60	9.40	0.339	0.370
C	1.20	1.40	0.047	0.055
D	8.60	9.10	0.339	0.358

Part marking

Standard part number marking

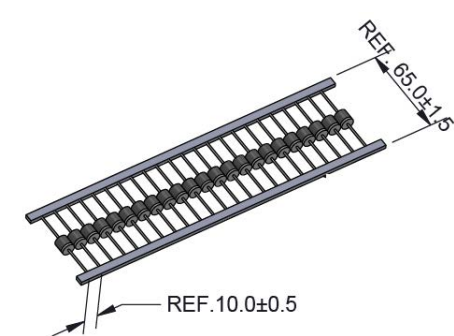


Alternate part number marking



Packaging information (mm)

300 parts per box.



Electrical characteristics (+25 °C)

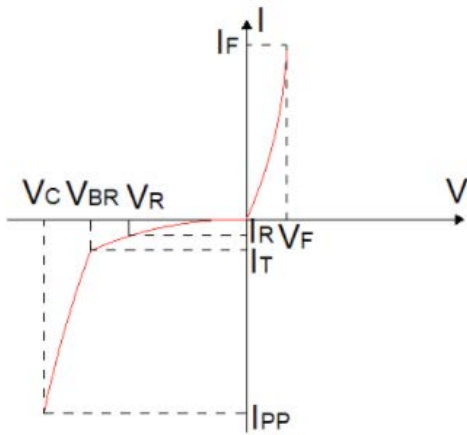
Part number		V_R	$I_R @ V_R$	$V_{BR} @ I_T$		I_T	$V_C @ I_{PP}$	I_{PP}
Uni-polar	Bi-polar	(V)	(μA)	min (V)	max (V)	(mA)	max (V)	(A)
15KP17A	15KP17CA	17	5000	18.9	20.9	50	29.3	515.4
15KP18A	15KP18CA	18	5000	20	22.1	50	30.9	488.7
15KP20A	15KP20CA	20	1500	22.2	24.5	20	34.3	440.2
15KP22A	15KP22CA	22	500	24.4	26.9	10	37.1	407
15KP24A	15KP24CA	24	150	26.7	29.5	5	40.7	371
15KP26A	15KP26CA	26	50	28.9	31.9	5	44	343.2
15KP28A	15KP28CA	28	25	31.1	34.4	5	47.5	317.9
15KP30A	15KP30CA	30	15	33.3	36.8	5	50.7	297.8
15KP33A	15KP33CA	33	2	36.7	40.6	5	54.7	276.1
15KP36A	15KP36CA	36	2	40	44.2	5	59.8	252.5
15KP40A	15KP40CA	40	2	44.4	49.1	5	65.8	229.5
15KP43A	15KP43CA	43	2	47.8	52.8	5	69.8	216.3
15KP45A	15KP45CA	45	2	50	55.3	5	72.8	207.4
15KP48A	15KP48CA	48	2	53.3	58.9	5	77.7	194.3
15KP51A	15KP51CA	51	2	56.7	62.7	5	82.9	182.1
15KP54A	15KP54CA	54	2	60	66.3	5	87.7	172.2
15KP58A	15KP58CA	58	2	64.4	71.2	5	93.8	161
15KP60A	15KP60CA	60	2	66.7	73.7	5	97.4	155
15KP64A	15KP64CA	64	2	71.1	78.6	5	104.2	144.9
15KP70A	15KP70CA	70	2	77.8	86	5	113.6	132.9
15KP75A	15KP75CA	75	2	83.3	92.1	5	122	123.8
15KP78A	15KP78CA	78	2	86.7	95.8	5	126.1	119.7
15KP85A	15KP85CA	85	2	94.4	104	5	137.6	109.7
15KP90A	15KP90CA	90	2	100	111	5	145.6	103.7
15KP100A	15KP100CA	100	2	111	123	5	161.3	93.6
15KP110A	15KP110CA	110	2	122	135	5	178.6	84.5
15KP120A	15KP120CA	120	2	133	147	5	192.3	78.5
15KP130A	15KP130CA	130	2	144	159	5	208.3	72.5
15KP150A	15KP150CA	150	2	167	185	5	241.9	62.4
15KP160A	15KP160CA	160	2	178	197	5	258.6	58.4
15KP170A	15KP170CA	170	2	189	209	5	272.7	55.4
15KP180A	15KP180CA	180	2	201	222	5	288.5	52.3
15KP200A	15KP200CA	200	2	224	247	5	319.1	47.3
15KP220A	15KP220CA	220	2	246	272	5	352.5	42.8
15KP240A	15KP240CA	240	2	268	292	5	384.6	39.3
15KP260A	15KP260CA	260	2	289	317	5	416.7	36.2
15KP280A	15KP280CA	280	2	311	341	5	454.5	33.2

Note: Standard part numbers listed

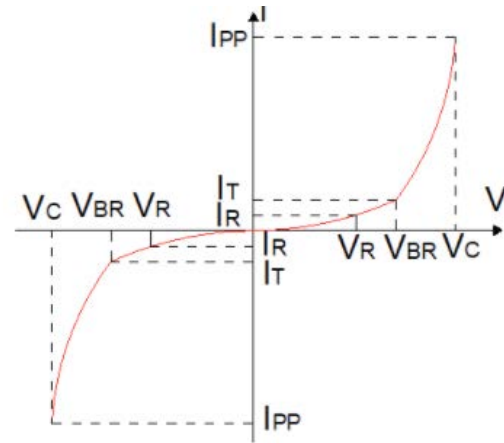
Alternate part numbers have the addition of an E. Example standard part number 15KP7A, Alternate part number 15KPE7A

Ratings and V-I characteristic curves (+25 °C unless otherwise noted)

V- I curve characteristics (Uni-directional)



V- I curve characteristics (Bi-directional)



Surge waveform: 10/1000 μ s

V_R : Stand-off voltage – Maximum voltage that can be applied

V_{BR} : Breakdown voltage

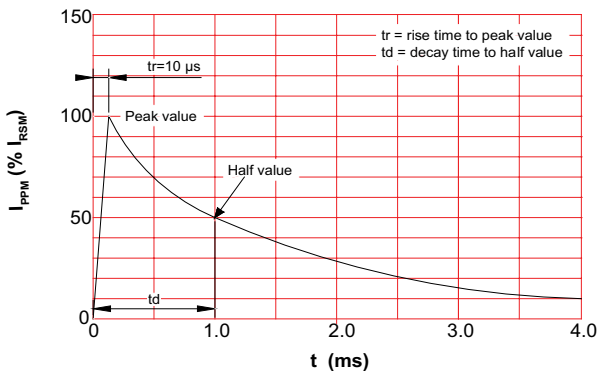
V_C : Clamping voltage – Peak voltage measured across the suppressor at a specified I_{PP}

I_R : Reverse leakage current

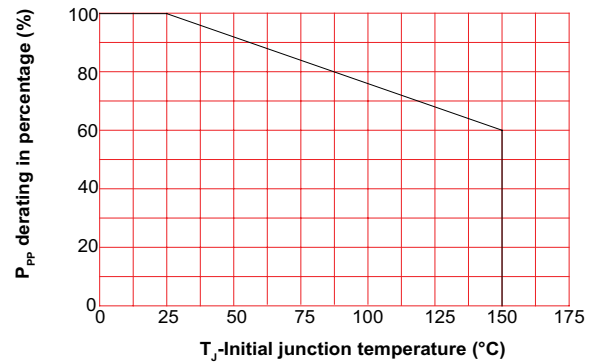
I_T : Test current

V_F : Forward voltage drop for Uni-directional TVS diode

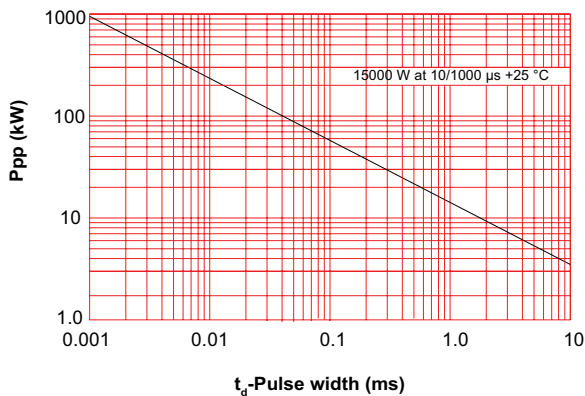
Pulse waveform



Pulse derating curve



Peak pulse power dissipation vs. pulse width



Solder reflow profile

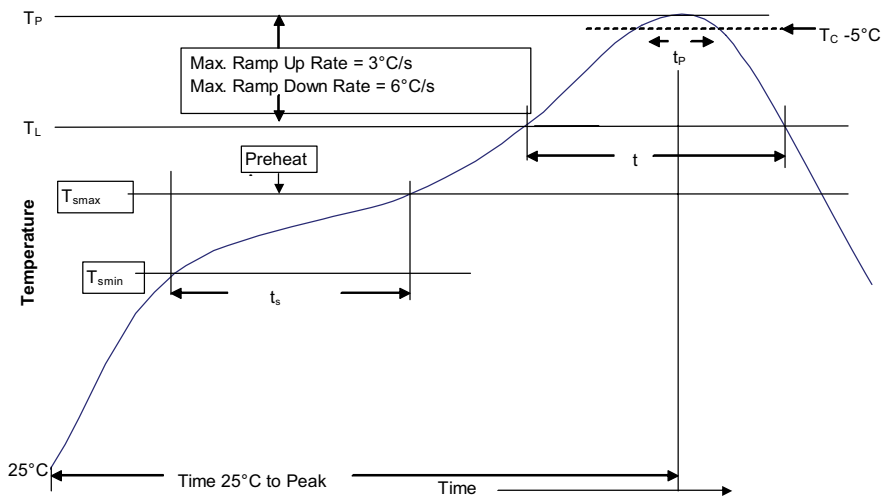


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

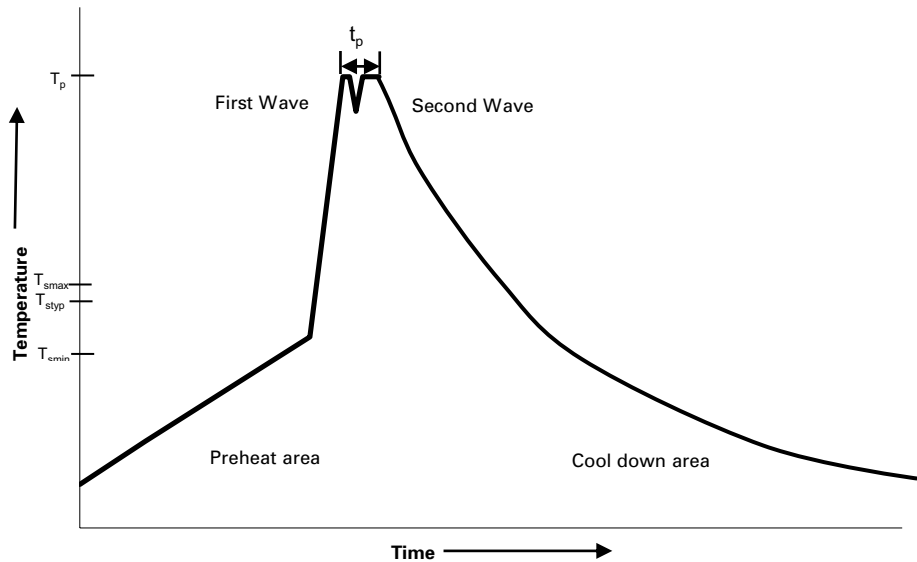
Package thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. (T_{smin})	100 °C	150 °C
• Temperature max. (T_{smax})	150 °C	200 °C
• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-180 seconds
Ramp up rate T_L to T_P	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time (t_L) maintained above T_L	60-150 seconds	60-150 seconds
Peak package body temperature (T_P)*	Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_C)	20 seconds*	40 seconds*
Ramp-down rate (T_P to T_L)	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

Wave solder profile



Reference EN 61760-1:2006

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat		
• Temperature min. (T_{smin})	100 °C	100 °C
• Temperature typ. (T_{styp})	120 °C	120 °C
• Temperature max. (T_{smax})	130 °C	130 °C
• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature	150 °C max.	150 °C max.
Peak temperature (T_p)*	235 °C – 260 °C	250 °C – 265 °C
Time at peak temperature (t_p)	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to 25 °C	4 minutes	4 minutes

Manual solder

+350 °C (4-5 seconds by soldering iron), generally manual/hand soldering is not recommended.

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