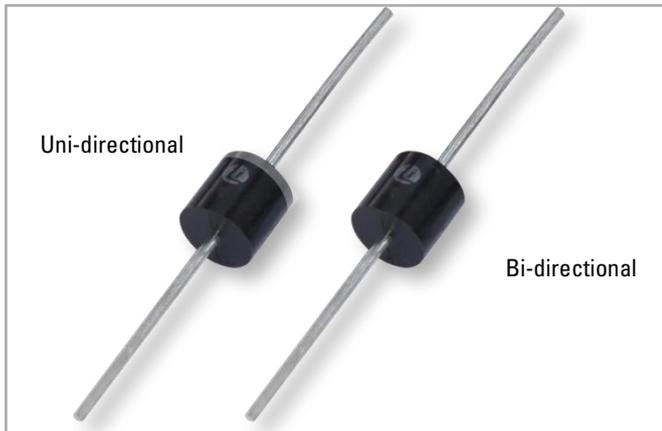


10KP Series

Axial Leaded – 10000W



Additional Information



Resources



Accessories



Samples

Maximum Ratings and Thermal Characteristics

($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 μs Waveform(Fig.1) (Note 1)-Single Die Parts	P_{PPM}	10000	W
Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	P_D	8	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 2)	I_{FSM}	400	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only	V_F	5.0	V
Operating Temperature Range	T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	8	$^\circ\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T_J (initial) $=25^\circ\text{C}$ per Fig.2.
2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

Description

The 10KP series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

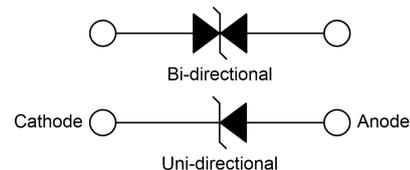
Features

- 10000W peak pulse power capability at 10/1000 μs waveform, repetition rate (duty cycles):0.01%
- Glass passivated chip junction in P600 package
- Fast response time:typically less than 1.0ps from 0 Volts to V_B min
- Excellent clamping capability
- Typical failure mode is a short circuit
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Low incremental surge resistance
- Typical I_R less than 2 μA when $V_R > 24\text{V}$
- High temperature to reflow soldering guaranteed: 260 $^\circ\text{C}/20\sim 40\text{sec.}/0.375''(9.5\text{mm})$ lead length, 5 lbs., (2.3kg) tension
- $V_B @ T_J = V_B @ 25^\circ\text{C} \times (1 + \alpha \times (T_J - 25))$ (α : Temperature Coefficient, typical value is 0.1%)
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD 609A.01)

Applications

TVS components are ideal for the protection of I/O interfaces, V_{CC} bus and other vulnerable circuits used in telecom, computer, industrial ICT equipment and consumer electronic applications.

Functional Diagram



10KP Series

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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_R
Uni.	Bi.	$V_R(V)$	$V_{B Min.}(V)$	$V_{B Max.}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
10KP11A	10KP11CA	11.0	12.2	13.5	50	18.2	549.5	3000
10KP12A	10KP12CA	12.0	13.3	14.7	50	19.9	502.5	2000
10KP13A	10KP13CA	13.0	14.4	15.9	50	21.5	465.1	1000
10KP14A	10KP14CA	14.0	15.6	17.2	50	23.2	431.0	800
10KP15A	10KP15CA	15.0	16.7	18.5	5	24.4	409.8	500
10KP16A	10KP16CA	16.0	17.8	19.7	5	26.0	384.6	100
10KP17A	10KP17CA	17.0	18.9	20.9	5	27.6	362.3	45
10KP18A	10KP18CA	18.0	20.0	22.1	5	29.2	342.5	20
10KP20A	10KP20CA	20.0	22.2	24.5	5	32.4	308.6	5
10KP22A	10KP22CA	22.0	24.4	26.9	5	35.5	281.7	3
10KP24A	10KP24CA	24.0	26.7	29.5	5	38.9	257.1	2
10KP26A	10KP26CA	26.0	28.9	31.9	5	42.1	237.5	2
10KP28A	10KP28CA	28.0	31.1	34.4	5	45.4	220.3	2
10KP30A	10KP30CA	30.0	33.3	36.8	5	48.4	206.6	2
10KP33A	10KP33CA	33.0	36.7	40.6	5	53.3	187.6	2
10KP36A	10KP36CA	36.0	40.0	44.2	5	58.1	172.1	2
10KP40A	10KP40CA	40.0	44.4	49.1	5	64.5	155.0	2
10KP43A	10KP43CA	43.0	47.8	52.8	5	69.4	144.1	2
10KP45A	10KP45CA	45.0	50.0	55.3	5	72.7	137.6	2
10KP48A	10KP48CA	48.0	53.3	58.9	5	77.4	129.2	2
10KP51A	10KP51CA	51.0	56.7	62.7	5	82.4	121.4	2
10KP54A	10KP54CA	54.0	60.0	66.3	5	87.1	114.8	2
10KP58A	10KP58CA	58.0	64.4	71.2	5	93.6	106.8	2
10KP60A	10KP60CA	60.0	66.7	73.7	5	96.8	103.3	2
10KP64A	10KP64CA	64.0	71.1	78.6	5	103.0	97.1	2
10KP70A	10KP70CA	70.0	77.8	86.0	5	113.0	88.5	2
10KP75A	10KP75CA	75.0	83.3	92.1	5	121.0	82.6	2
10KP78A	10KP78CA	78.0	86.7	95.8	5	126.0	79.4	2
10KP85A	10KP85CA	85.0	94.4	104.0	5	137.0	73.0	2
10KP90A	10KP90CA	90.0	100.0	111.0	5	146.0	68.5	2
10KP100A	10KP100CA	100.0	111.0	123.0	5	162.0	61.7	2
10KP110A	10KP110CA	110.0	122.0	135.0	5	177.0	56.5	2
10KP120A	10KP120CA	120.0	133.0	147.0	5	193.0	51.8	2
10KP130A	10KP130CA	130.0	144.0	159.0	5	209.0	47.8	2
10KP150A	10KP150CA	150.0	167.0	185.0	5	243.0	41.2	2
10KP160A	10KP160CA	160.0	178.0	197.0	5	259.0	38.6	2
10KP170A	10KP170CA	170.0	189.0	209.0	5	275.0	36.4	2
10KP180A	10KP180CA	180.0	201.0	221.0	5	292.0	34.2	2
10KP190A	10KP190CA	190.0	211.0	233.0	5	310.0	32.3	2
10KP200A	10KP200CA	200.0	224.0	246.0	5	329.2	30.4	2
10KP210A	10KP210CA	210.0	237.0	258.0	5	349.5	28.6	2
10KP220A	10KP220CA	220.0	246.0	270.0	5	371.1	26.9	2
10KP250A	10KP250CA	250.0	279.0	306.0	5	425.0	23.5	2

Notes:

For bidirectional type having V_R of 20 volts and less, the I_R limit is double.

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Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1:
Peak Pulse Power Rating Curve

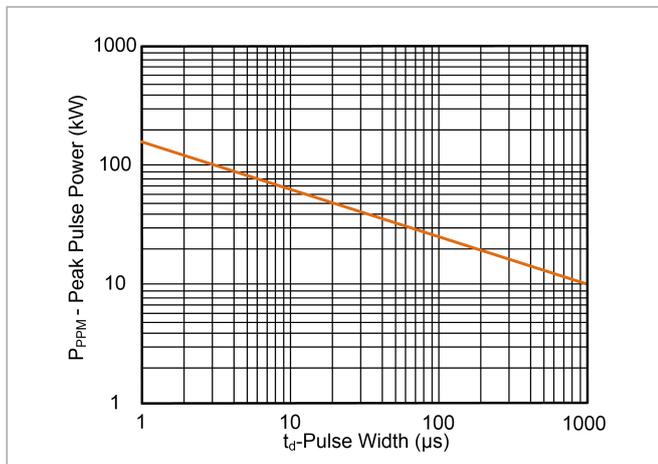


Figure 2:
Pulse Derating Curve

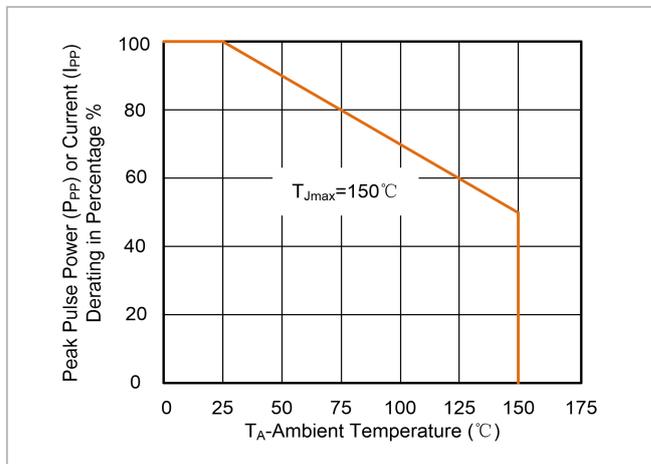


Figure 3:
Pulse Waveform

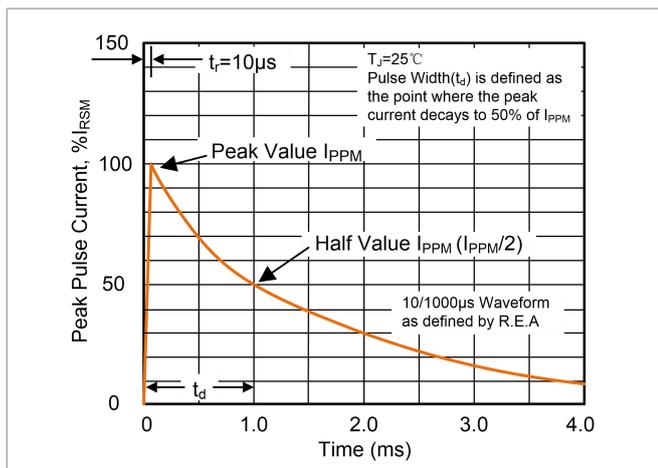


Figure 4:
Typical Junction Capacitance

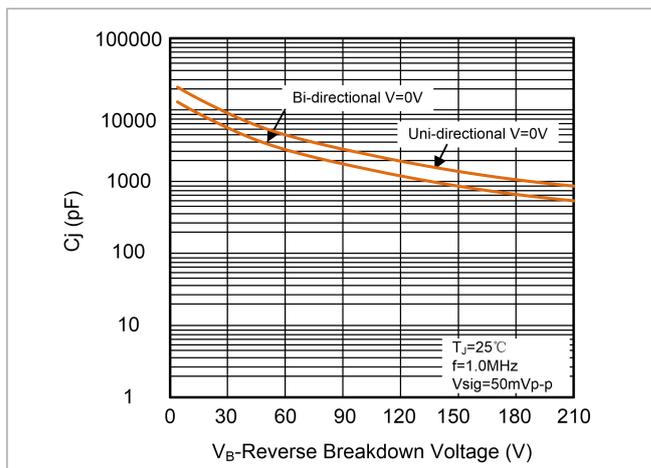


Figure 5:
Steady State Power Dissipation Derating Curve

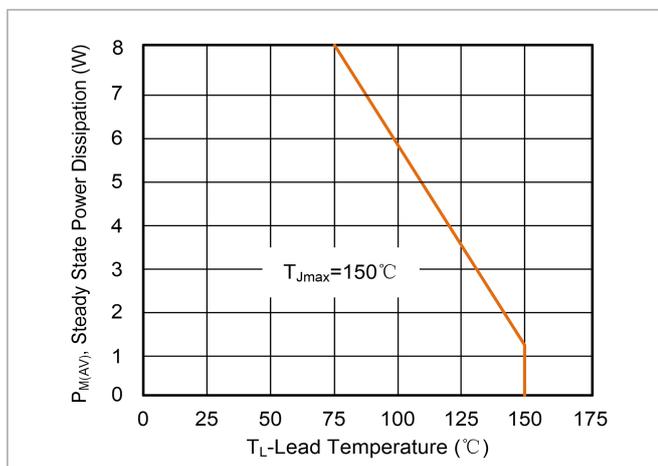
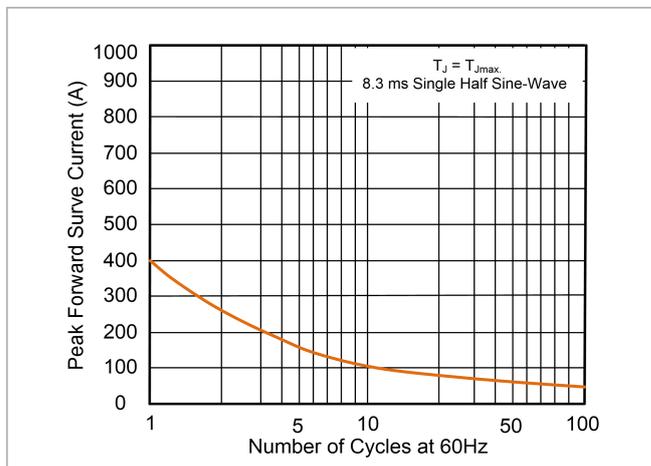


Figure 6:
Maximum Non-Repetitive Forward Surge Current Uni-Directional

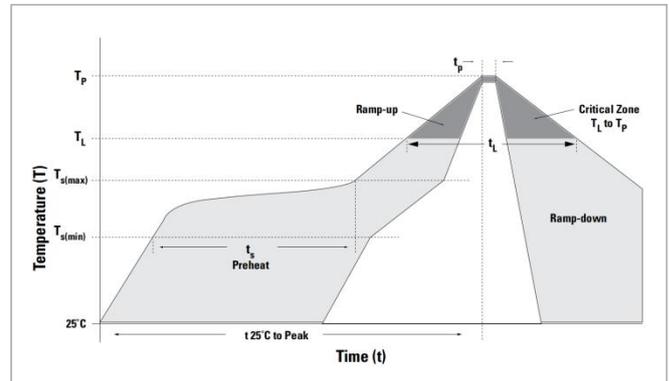


10KP Series

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Soldering Parameters

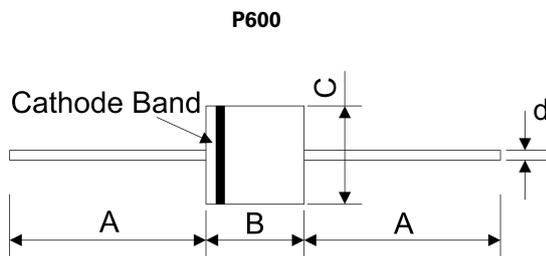
Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min ($T_{S \min}$)	150°C
	-Temperature Max ($T_{S \max}$)	200°C
	-Time (min to max) (t_s)	60 – 180 secs
Average ramp-up rate(Liquidus Temp (T_L) to peak)		3°C/second max.
$T_{S \max}$ to T_L-Ramp-up Rate		3°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (min to max) (t_L)	60-150 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual Peak Temperature (t_p)		20-40 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature		8 minutes max.
Do not exceed		260°C



Flow/Wave Soldering (Solder Dipping)

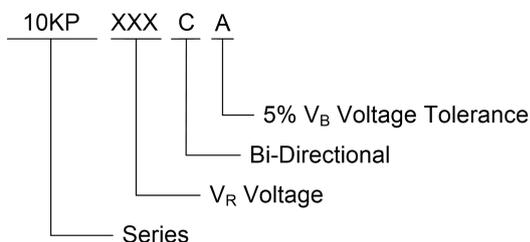
Peak Temperature :	265°C
Dipping Time :	10 seconds (max.)
Soldering :	1 time

Dimensions

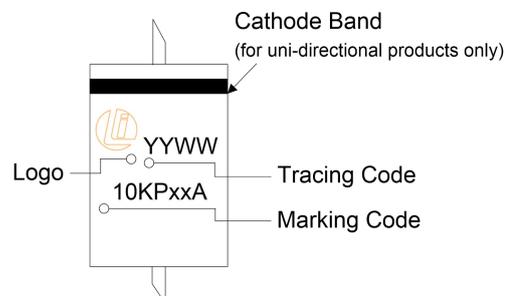


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	8.60	9.10	0.340	0.360
C	8.60	9.10	0.340	0.360
d	1.19	1.35	0.047	0.053

Part Numbering System



Part Marking System



10KP Series

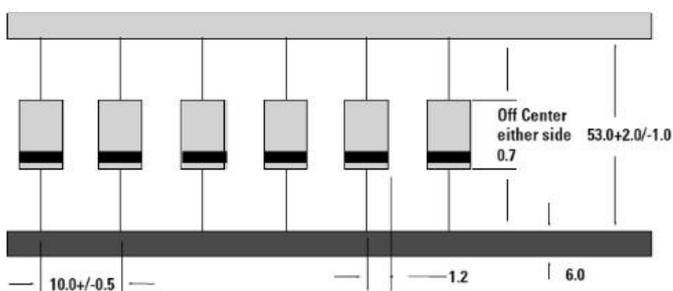
Axial Leaded – 10000W

Packaging

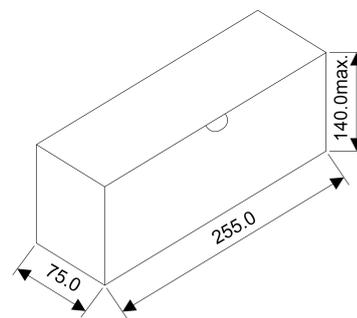
Part number	Component Package	Quantity	Packaging Option	Packaging Specification
10KPxxxXX/L/BOX	P600	300	Tape & Box	EIA STD RS-296
10KPxxxXX/L/TR13	P600	800	Tape & Reel	EIA STD RS-296

Tape/Box/Reel Specification

Tape (Unit: mm)

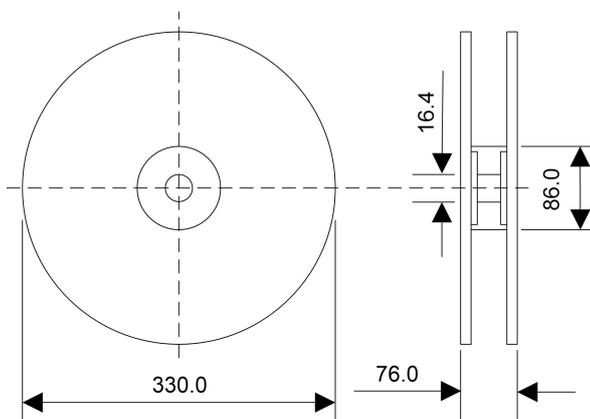


Box (Unit: mm)



Quantity: 300pcs/box

Reel (Unit: mm)



Quantity: 800pcs/reel