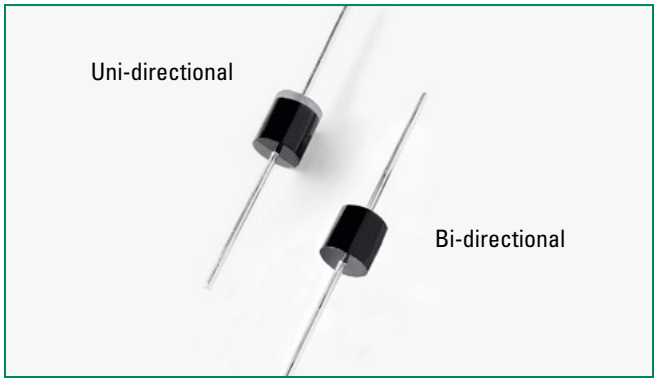
30KPA Series

HF RoHS



Agency Approvals

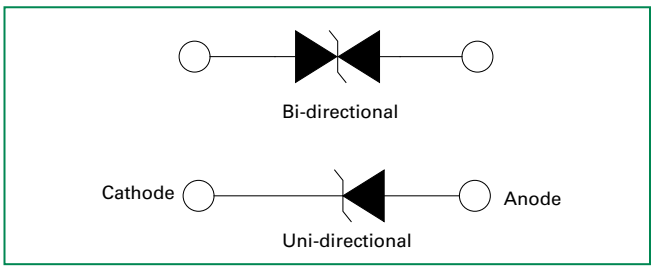
AGENCY	AGENCY FILE NUMBER
®	E230531

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10x1000µs Test Waveform (Fig.1) (Note 1)	P_{PPM}	30000	W
Steady State Power Dissipation on Inifinite Heat Sink at T_L=75°C (Fig. 5)	P_D	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (Note 2)	I_{FSM}	400	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C
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

Notes:
1. Non-repetitive current pulse , per Fig. 4 and derated above T_A = 25°C per Fig. 3.
2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

Functional Diagram



Description

The 30KPA Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

- Typical maximum temperature coefficient ΔV_{BR} = 0.1% × V_{BR}@25°C × ΔT
- Glass passivated chip junction in P600 package
- 30000W peak pulse capability at 10×1000µs waveform, repetition rate (duty cycles):0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- Low incremental surge resistance
- Typical I_R less than 2µA above 73V
- High temperature soldering guaranteed: 260°C/40 seconds / 0.375",(9.5mm) lead length, 5 lbs., (2.3kg) tension
- Plastic package has underwriters laboratory flammability classification 94V-O
- Matte tin lead–free plated
- Halogen free and RoHS compliant

Applications

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

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Transient Voltage Suppression Diodes

Axial Leaded – 30000W > 30KPA series

Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T MIN	Test Current I_T (mA)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (μ A)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Agency Approval ®
30KPA28A	30KPA28CA	28	31.28	50	606.0	5000	50.0	X
30KPA30A	30KPA30CA	30	33.51	50	548.9	5000	55.2	X
30KPA33A	30KPA33CA	33	36.90	50	517.9	5000	58.5	X
30KPA36A	30KPA36CA	36	40.20	50	490.3	5000	61.8	X
30KPA39A	30KPA39CA	39	43.60	20	450.9	2000	67.2	X
30KPA42A	30KPA42CA	42	46.90	10	420.8	1000	72.0	X
30KPA43A	30KPA43CA	43	48.00	10	415.1	1000	73.0	X
30KPA45A	30KPA45CA	45	50.30	5	391.5	250	77.4	X
30KPA48A	30KPA48CA	48	53.60	5	371.3	150	81.6	X
30KPA51A	30KPA51CA	51	57.00	5	350.7	50	86.4	X
30KPA54A	30KPA54CA	54	60.30	5	331.5	20	91.4	X
30KPA58A	30KPA58CA	58	64.80	5	327.9	20	92.4	X
30KPA60A	30KPA60CA	60	67.00	5	297.1	15	102.0	X
30KPA64A	30KPA64CA	64	71.50	5	291.3	10	104.0	X
30KPA66A	30KPA66CA	66	73.70	5	283.2	2	107.0	X
30KPA70A	30KPA70CA	70	78.20	5	278.0	2	109.0	X
30KPA71A	30KPA71CA	71	79.30	5	271.7	2	111.5	X
30KPA72A	30KPA72CA	72	80.40	5	265.8	2	114.0	X
30KPA75A	30KPA75CA	75	83.80	5	253.8	2	119.4	X
30KPA78A	30KPA78CA	78	87.10	5	234.9	2	129.0	X
30KPA84A	30KPA84CA	84	93.80	5	217.7	2	139.2	X
30KPA90A	30KPA90CA	90	100.50	5	207.0	2	146.4	X
30KPA96A	30KPA96CA	96	107.20	5	194.2	2	156.0	X
30KPA102A	30KPA102CA	102	113.90	5	183.0	2	165.6	X
30KPA108A	30KPA108CA	108	120.60	5	172.9	2	175.2	X
30KPA120A	30KPA120CA	120	134.00	5	155.9	2	194.4	X
30KPA132A	30KPA132CA	132	147.40	5	142.3	2	213.0	X
30KPA144A	30KPA144CA	144	160.80	5	135.8	2	223.2	X
30KPA150A	30KPA150CA	150	167.60	5	129.8	2	233.4	X
30KPA156A	30KPA156CA	156	174.30	5	123.7	2	245.0	X
30KPA160A	30KPA160CA	160	178.70	5	120.0	2	252.6	X
30KPA168A	30KPA168CA	168	187.70	5	111.2	2	272.4	X
30KPA170A	30KPA170CA	170	189.90	5	110.2	2	275.0	X
30KPA180A	30KPA180CA	180	201.10	5	104.3	2	290.4	X
30KPA198A	30KPA198CA	198	221.20	5	94.7	2	319.8	X
30KPA216A	30KPA216CA	216	241.30	5	86.9	2	348.6	X
30KPA240A	30KPA240CA	240	268.10	5	78.3	2	387.0	X
30KPA258A	30KPA258CA	258	288.20	5	72.8	2	416.4	X
30KPA260A	30KPA260CA	260	290.40	5	72.8	2	416.0	X
30KPA270A	30KPA270CA	270	301.60	5	69.5	2	436.2	X
30KPA280A	30KPA280CA	280	312.80	5	65.3	2	464.0	X
30KPA288A	30KPA288CA	288	321.70	5	64.5	2	469.9	X
30KPA300A	30KPA300CA	300	334.00	5	62.0	2	484.0	

For bidirectional type having V_{RWM} of 60 volts and less, the I_R limit is double.

For parts without A , the V_{BR} is + 10% and Vc is 5% higher than with A parts.

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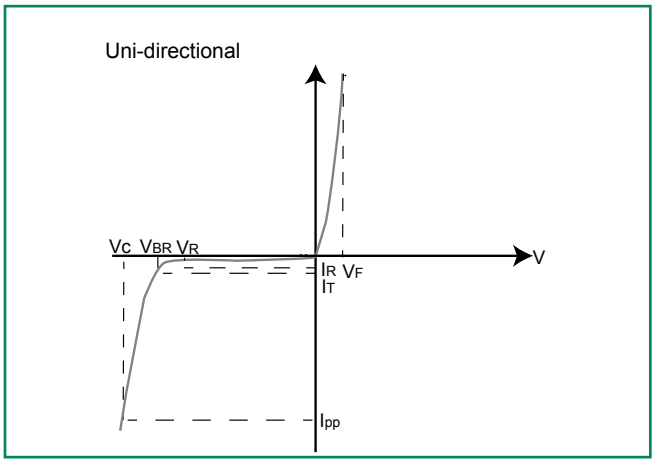
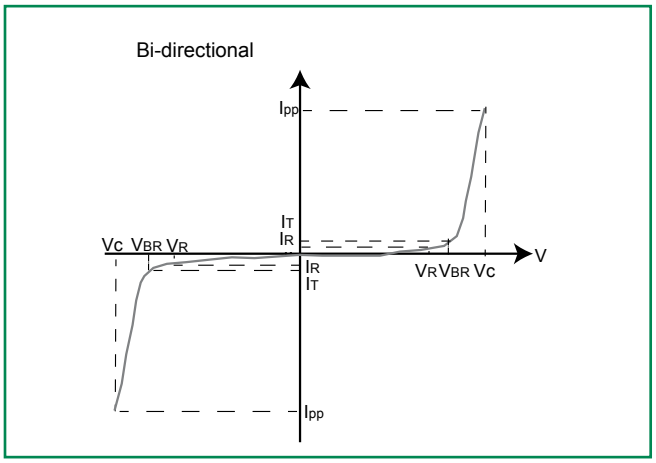
I-V Curve Characteristics





P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation
V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation
V_{BR} Breakdown Voltage -- Maximum current that flows though the TVS at a specified test current (I_T)
V_C Clamping Voltage -- Peak voltage measured across the suppressor at a specified Ippm (peak impulse current)
I_R Reverse Leakage Current -- Current measured at V_R
V_F Forward Voltage Drop for Uni-directional

Ratings and Characteristic Curves (T_A=25°C unless otherwise noted)

Figure 1 - TVS Transients Clamping Waveform

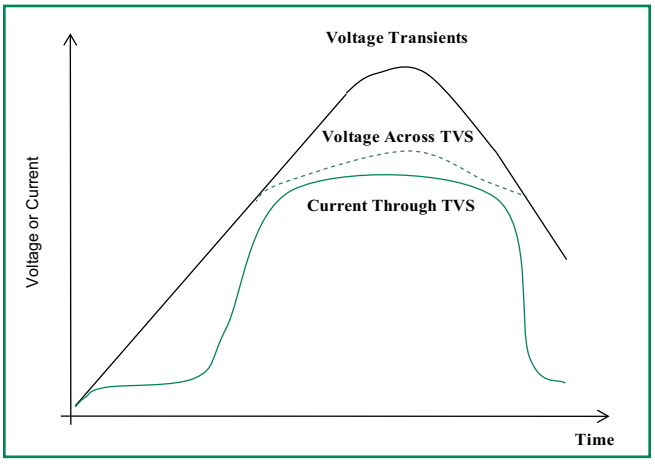
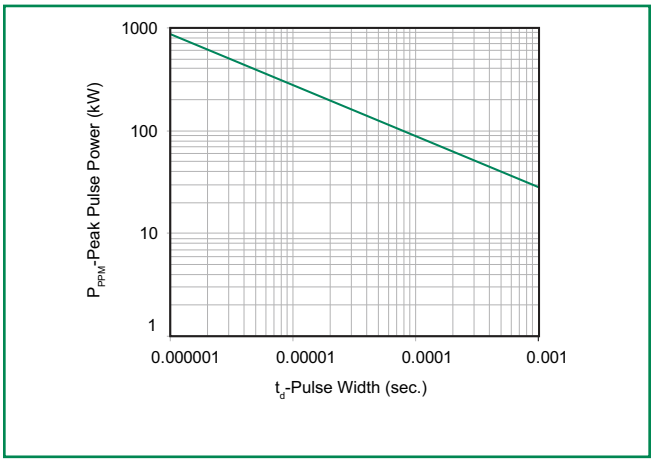


Figure 2 - Peak Pulse Power Rating Curve



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Ratings and Characteristic Curves (T_A=25°C unless otherwise noted) (Continued)

Figure 3 - Pulse Derating Curve

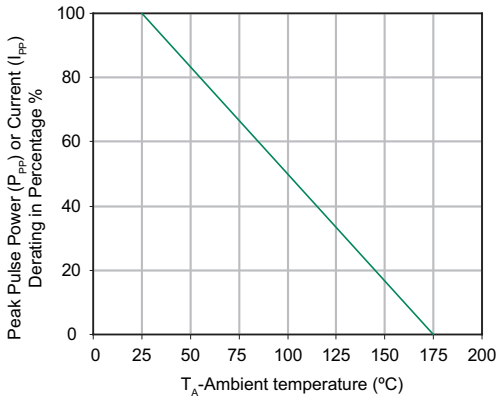


Figure 4 - Pulse Waveform

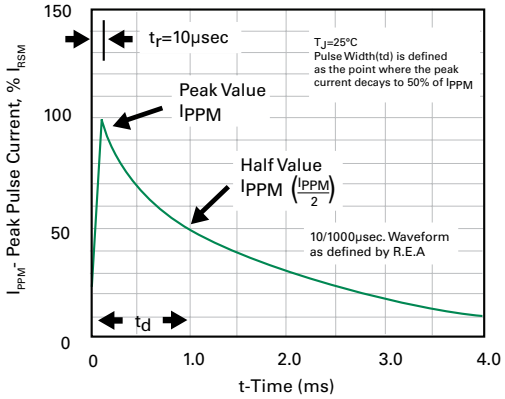


Figure 5 - Typical Junction Capacitance

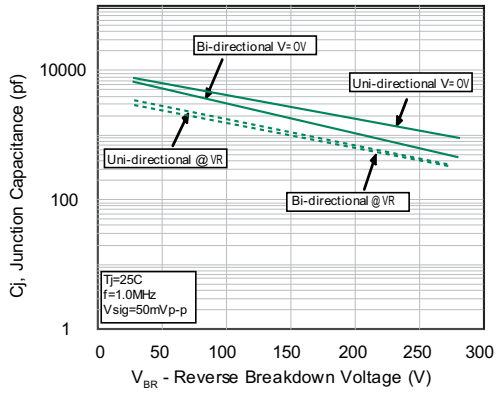


Figure 6 - Steady State Power Derating Curve

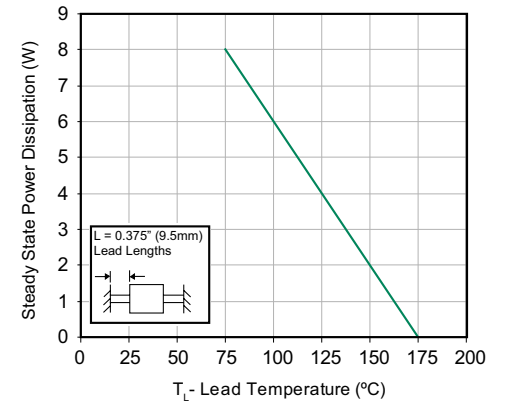
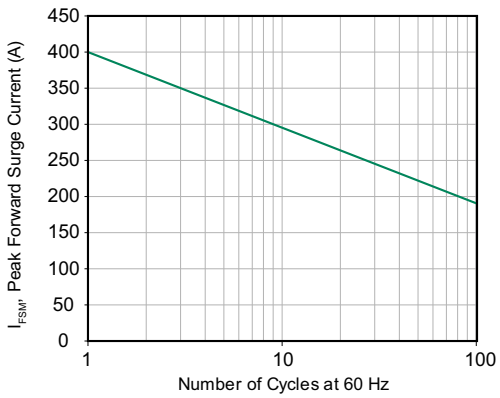


Figure 7 - Maximum Non-Repetitive Peak Forward Surge Current



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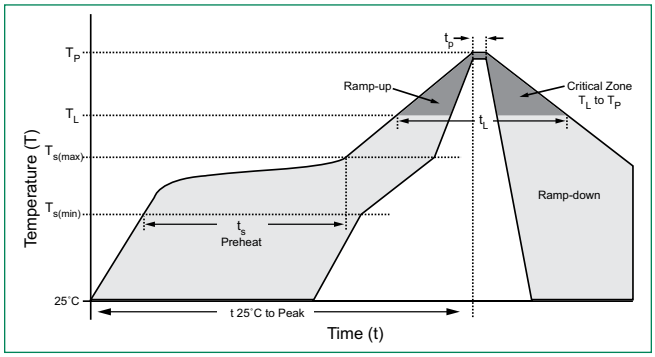
Soldering Parameters

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_s)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °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 (T_P)		8 minutes Max.
Do not exceed		280°C



Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

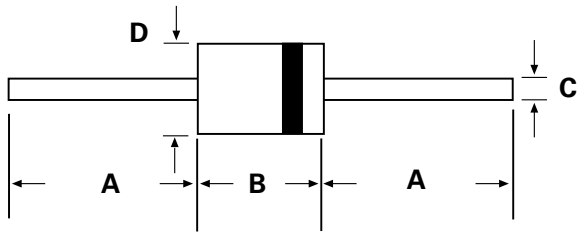
Physical Specifications

Weight	0.07oz., 2.5g
Case	P600 molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Terminal	Matte Tin axial leads, solderable per JESD22-B102D.

Environmental Specifications

Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

Dimensions



P600

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.340	0.360	8.60	9.10
C	0.048	0.052	1.22	1.32
D	0.340	0.360	8.60	9.10

30KPA Series

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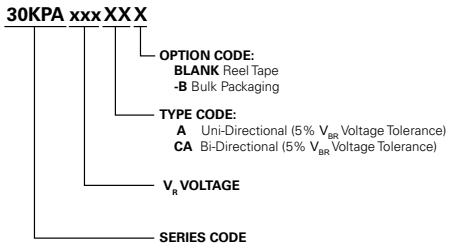
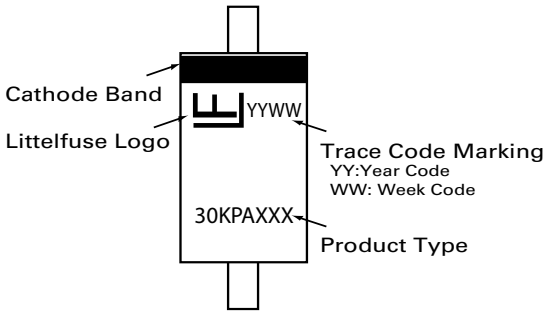
Transient Voltage Suppression Diodes

Axial Leaded – 30000W > 30KPA series

Part Numbering System



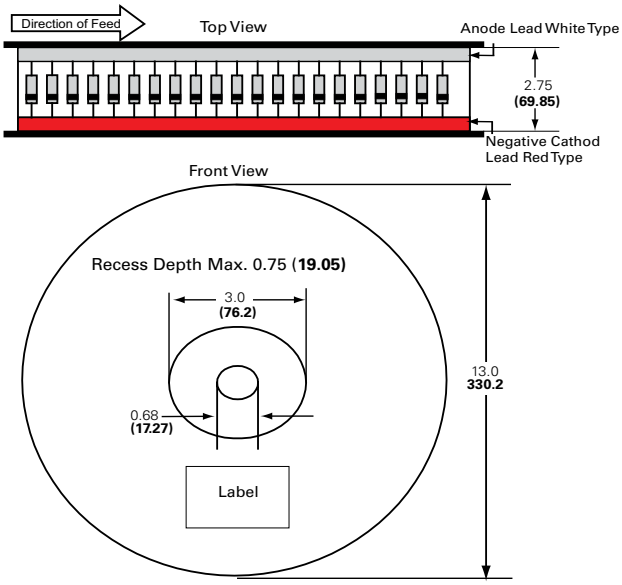
Part Marking System

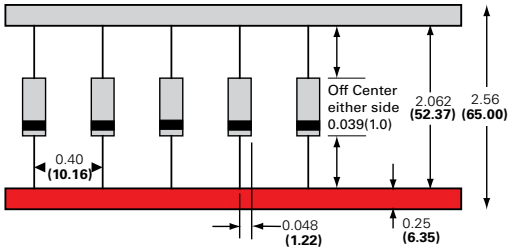


Packing Options

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
30KPAxxxXX	P600	800	Tape & Reel	EIA STD RS-296E
30KPAxxxXX-B	P600	100	Bulk	Littelfuse Concord Packing Spec. DM-0016

Tape and Reel Specification





Dimensions are in inches/**mm**

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