

AXIAL LEADED TRANSIENT VOLTAGE SUPPRESSION DIODES



15000W Axial Leaded Transient Voltage Suppressors – 17V-280V

The 15KPA Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

FEATURES:

- Axial lead type devices for through hole design.
- 15kW peak pulse capability with at 10/1000μs waveform, repetition rate (duty cycles): 0.01%.
- Excellent clamping capability.
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94.
- IEC61000-4-2 +/-30kV both contact and air.
- IEC61000-4-4 50A(5/50nS)

APPLICATIONS:

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

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, P600.
- Lead: Axial leads, solderable per MIL-STD-202, method 208 guaranteed
- Polarity: Color band denotes cathode end.
- Mounting Position: Any.
- Approximate Weight: 2.10 grams.

ORDERING PART NUMBER

PART NUMBER	ORDERING PART NUMBER
ALP15KPAXXA&CA / CA	ALP15KPAXXA&CA / CA - SC

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak Pulse Power Dissipation by 10/1000 μs Test Waveform (Fig.3)	P_{PPM}	15000	W
Peak Pulse current with a 10/1000 μs Waveform	I_{PPM}	See Table 1	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only (Note 2)	V_F	3.5/5	V
Power Dissipation on Infinite Heat Sink at $T_L=50^\circ\text{C}$	P_D	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (Note 1)	I_{FSM}	400	A
Operating Temperature	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 to 150	$^\circ\text{C}$

Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.
2. 3.5V for single die, 5V for stack die

TYPICAL DEVICE CHARACTERISTICS - (TABLE 1)

ELECTRICAL CHARACTERISTICS PER LINE @ T _A =25°C Unless Otherwise Specified								
PART NUMBER (Note 1)	RATED STAND- OFF VOLTAGE V _{RWM} VOLTS	BREAKDOWN VOLTAGE V _{BR} @ I _T VOLTS		TEST CURRENT @ I _T mA	MAXIMUM CLAMPING VOLTAGE V _C @ I _{PP}		MAXIMUM REVERSE LEAKAGE I _R @ V _R (μA)	
		MIN	MAX		VOLTS	I _{PP} (A)	UNI	BI
ALP15KPA17A / CA	17.0	18.99	20.79	50	29.3	515.4	5000	10000
ALP15KPA18A / CA	18.0	20.11	22.01	50	30.9	488.7	5000	10000
ALP15KPA20A / CA	20.0	22.34	24.46	20	34.3	440.2	1500	3000
ALP15KPA22A / CA	22.0	24.57	26.91	10	37.1	407.0	500	1000
ALP15KPA24A / CA	24.0	26.81	29.35	5	40.7	371.0	150	300
ALP15KPA26A / CA	26.0	29.04	31.80	5	44.0	343.2	50	100
ALP15KPA28A / CA	28.0	31.28	34.24	5	47.5	317.9	25	50
ALP15KPA30A / CA	30.0	33.51	36.7	5	50.7	297.8	15	30
ALP15KPA33A / CA	33.0	36.9	40.4	5	54.7	276.1	2	2
ALP15KPA36A / CA	36.0	40.2	44.0	5	59.8	252.5	2	2
ALP15KPA40A / CA	40.0	44.7	48.9	5	65.8	229.5	2	2
ALP15KPA43A / CA	43.0	48.0	52.6	5	69.8	216.3	2	2
ALP15KPA45A / CA	45.0	50.3	55	5	72.8	207.4	2	2
ALP15KPA48A / CA	48.0	53.6	58.7	5	77.7	194.3	2	2
ALP15KPA51A / CA	51.0	57.0	62.4	5	82.9	182.1	2	2
ALP15KPA54A / CA	54.0	60.3	66.0	5	87.7	172.2	2	2
ALP15KPA58A / CA	58.0	64.8	70.9	5	93.8	161.0	2	2
ALP15KPA60A / CA	60.0	67.0	73.4	5	97.4	155.0	2	2
ALP15KPA64A / CA	64.0	71.5	78.3	5	104.2	144.9	2	2
ALP15KPA70A / CA	70.0	78.2	85.6	5	113.6	132.9	2	2
ALP15KPA75A / CA	75.0	83.8	91.7	5	122	123.8	2	2
ALP15KPA78A / CA	78.0	87.1	95.4	5	126.1	119.7	2	2
ALP15KPA85A / CA	85.0	94.9	104.0	5	137.6	109.7	2	2
ALP15KPA90A / CA	90.0	100.5	110.1	5	145.6	103.7	2	2
ALP15KPA100A / CA	100.0	111.7	122.3	5	161.3	93.6	2	2
ALP15KPA110A / CA	110.0	122.9	134.5	5	178.6	84.5	2	2
ALP15KPA120A / CA	120.0	134.0	146.8	5	192.3	78.5	2	2
ALP15KPA130A / CA	130.0	145.2	159.0	5	208.3	72.5	2	2
ALP15KPA150A / CA	150.0	167.6	183.5	5	241.9	62.4	2	2

ALP15KPA160A / CA	160.0	178.7	195.7	5	258.6	58.4	2	2
ALP15KPA170A / CA	170.0	189.9	207.9	5	272.7	55.4	2	2
ALP15KPA180A / CA	180.0	201.1	220.1	5	288.5	52.3	2	2
ALP15KPA200A / CA	200.0	223.4	244.6	5	319.1	47.3	2	2
ALP15KPA220A / CA	220.0	245.7	269.1	5	356	42.4	2	2
ALP15KPA240A / CA	240.0	268.1	293.5	5	384.6	39.3	2	2
ALP15KPA260A / CA	260.0	290.4	318.0	5	416.7	36.2	2	2
ALP15KPA280A / CA	280.0	312.8	342.4	5	454.5	33.2	2	2

NOTE

1. V_{BR} measured after I_T applied for 300 μ s, I_T =square wave pulse or equivalent
2. Surge current waveform per Fig. 3 and derated per Fig. 2
3. Part numbers with "CA" suffix are bidirectional devices, i.e., ALP15KPA17CA
4. For bidirectional type having V_{RWM} of 30 volts and less, the I_R limit is double.
5. All term and symbols are consistent with ANS/IEEE C62.35

TYPICAL DEVICE CHARACTERISTICS

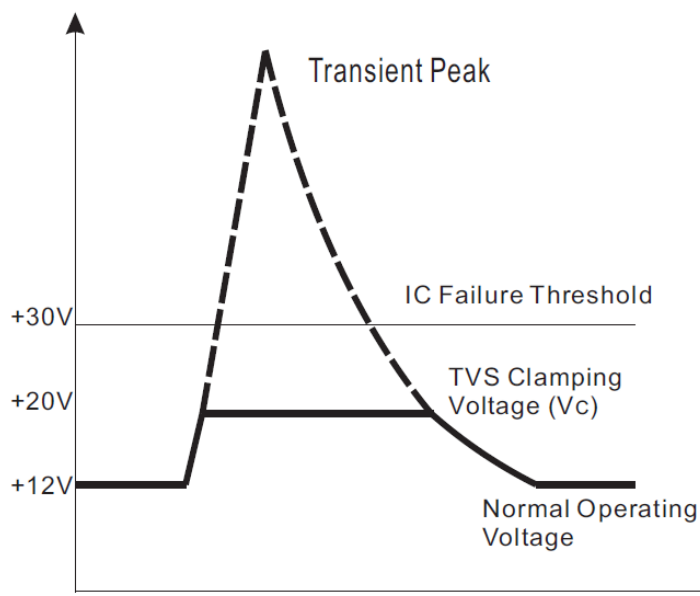


Fig. A – Transients of several thousand volts can be clamped to a safe level by the TVS

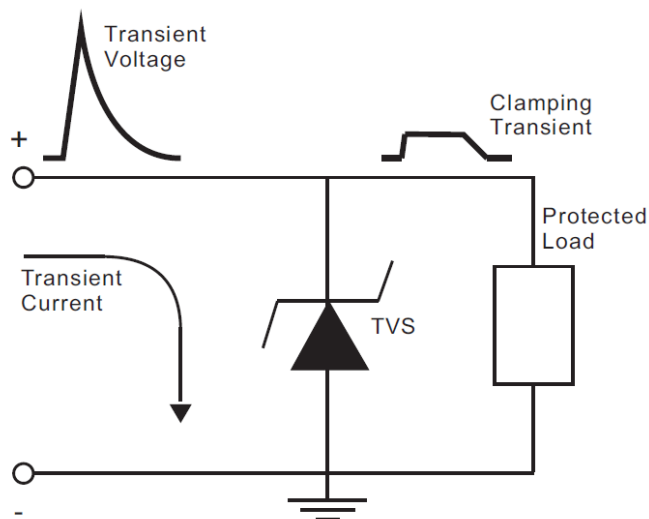


Fig. B – Transient current is diverted to ground thru TVS; the voltage seen by the protected load is limited to the clamping voltage level

RATING AND CHARACTERISTIC CURVES

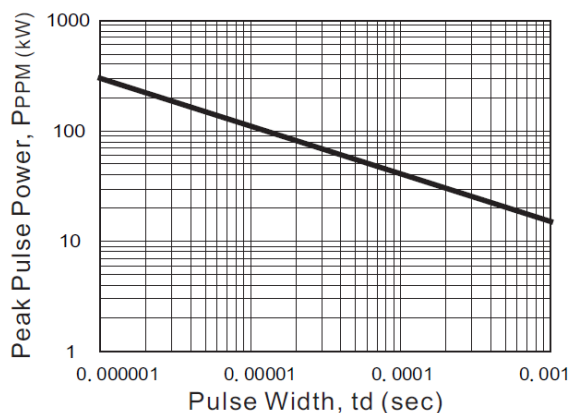


Fig1. PEAK PULSE POWER RATING CURVE

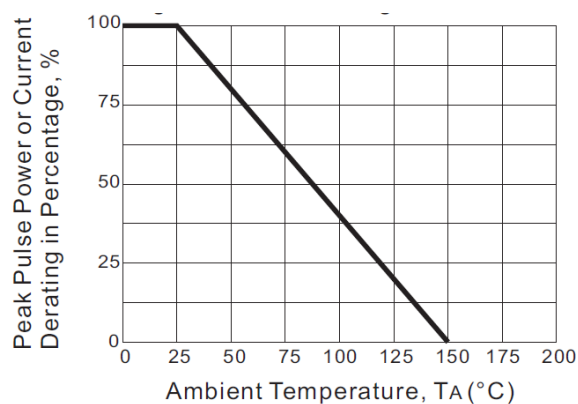


Fig2. PULSE DERATING CURVE

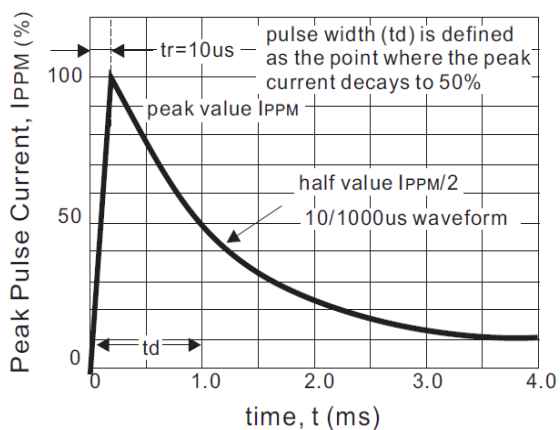


Fig3. PULSE WAVEFORM

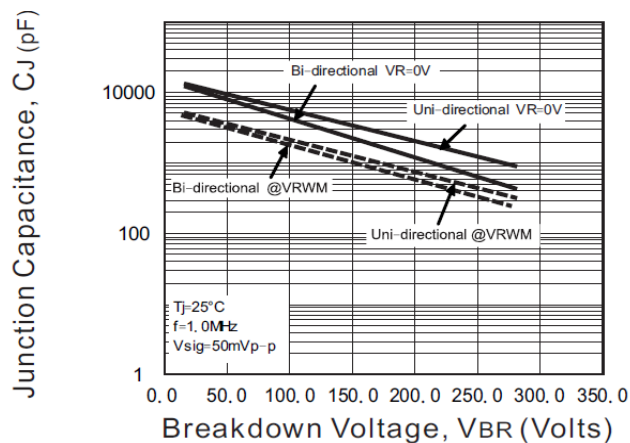


Fig4. TYPICAL JUNCTION CAPACITANCE

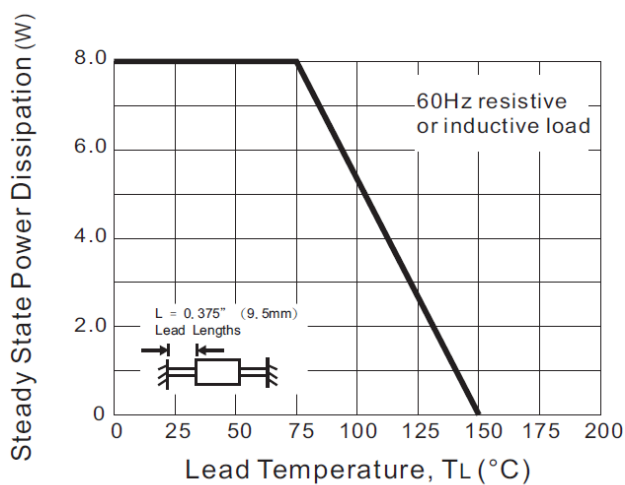


Fig5. STEADY STATE POWER DERATING CURVE

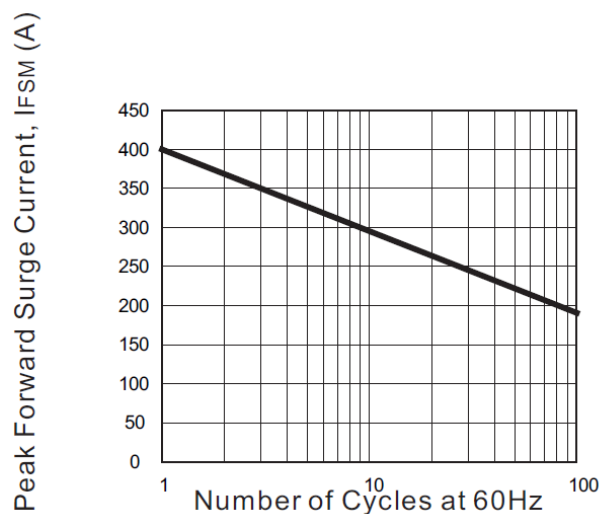
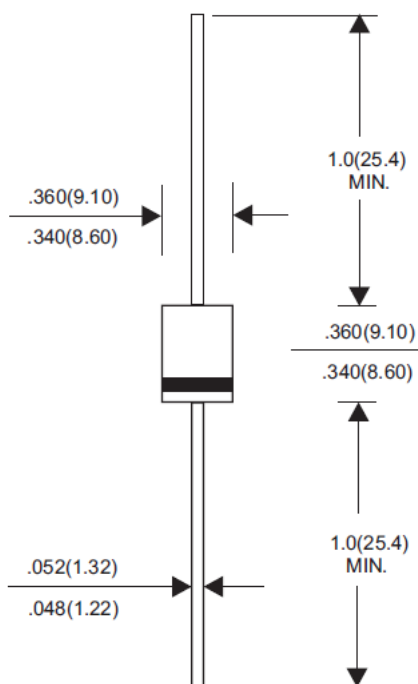


Fig6. MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

PACKAGE INFORMATION

PACKAGE OUTLINE

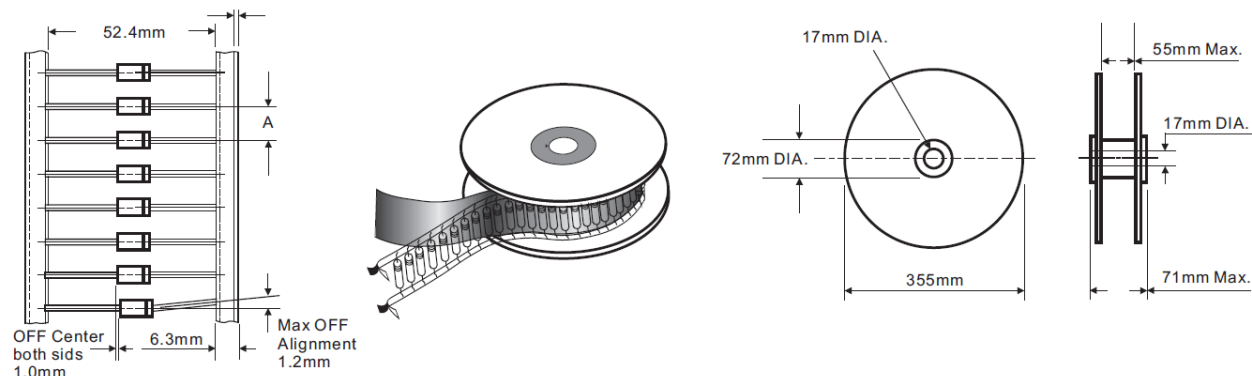


Dimensions in inches and (millimeters)

PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SYMBOL
Uni-Directional Pin1 Cathode Pin2 Anode	1  2	1  2
Bi-Directional		

TAPING & BULK SPECIFICATIONS FOR AXIAL DEVICES



REEL PACKING

DEVICE CASE TYPE	QTY 1 (PCS / REEL)	COMPONENT SPACING "A" in FIG. A	CARTON SIZE (m/m)	QTY 2 (PCS / CARTON)	APROX. CROSS WEIGHT (kg)
P600	1000	10 mm	360 * 340 * 370	4000	9.5

AMMO PACKING

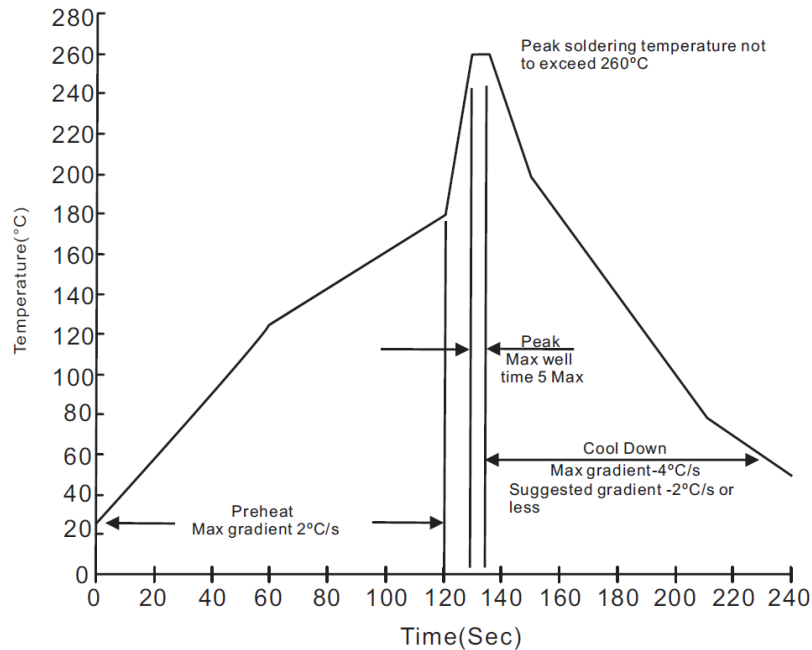
DEVICE CASE TYPE	QTY 1 (PCS / BOX)	INNER BOX SIZE (m/m)	CARTON SIZE (m/m)	QTY 2 (PCS / CARTON)	APROX. CROSS WEIGHT (kg)
P600	400	255 * 75 * 150	339 * 276 * 330	3200	9.2

BULK PACKING

DEVICE CASE TYPE	QTY 1 (PCS / BOX)	INNER BOX SIZE (m/m)	CARTON SIZE (m/m)	QTY 2 (PCS / CARTON)	APROX. CROSS WEIGHT (kg)
P600	250	194 * 84 * 20	355 * 320 * 280	6000	14.5

SOLDERING PARAMETERS

Lead Free temperature Profile wave-soldering



PRODUCT HIGH RELIABILITY TEST CAPABILITIES

ITEM	TEST CONDITIONS	STANDARD
Solder Resistance	At 260±5°C for 10±Sec, Immerse body into solder 1/16"±1/32"	MIL-STD-750D METHOD-2031
Solderability	At 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
Pull Test	2.0kg in axial lead direction for 10 sec.	MIL-STD-750D METHOD-2036
Bend Lead	2.0kg weight applied to each lead bending arc 90°±5° for 3 times	MIL-STD-750D METHOD-2036
High Temperature Reverse Bias	V _{RWM} =80% rate at T _J =150° for 168 hrs.	MIL-STD-750D METHOD-1038
Pressure Cooker	15P _{SIG} at T _A =121°C for 4Hrs	JESD22-A102
Temperature Cycling	-55°C to +125°C dwelled for 30min and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
Humidity	At T _A =85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
High Temperature Storage Life	At 175°C for 1000hrs.	MIL-STD-750D METHOD-1031



beyond boundaries...

ALP15KPAXXA/CA SERIES

CUSTOMER NOTE:

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



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