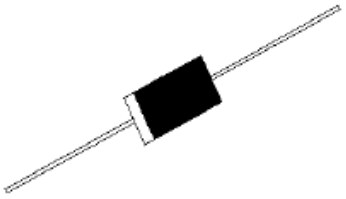
1.5KExx(C)AS Series 1500W Transient Voltage Suppressor

Rev.1.1

DESCRIPTION:

The 1.5KExx(C)AS series of high current uni/bi-directional transient suppressors are designed for A.C. line protection and high power DC bus clamping applications. These devices offer uni/bi-directional port protection from 6.8 volts to 120 volts. They provide a clamping voltage lower than the avalanche voltage. Therefore, any voltage rise due to increased current conduction is contained to a minimum, providing the best possible protection level. They can also be connected in series and/or parallel to create very high capacity protection solutions.



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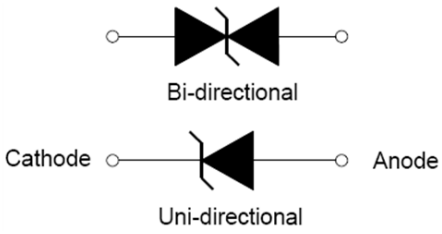


Symbol

FEATURES:

- ✧ Low incremental surge resistance.
- ✧ Excellent clamping capability.
- ✧ Color band denoted cathode except bidirectional.
- ✧ Typical I_R less than 1μA above 12V.
- ✧ High temperature wave soldering: 265℃/10s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ 1500W peak pulse power capability at 10/1000μs waveform.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260℃.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ UL 497B item recognized. (File No.:E480698).
- ✧ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).

ABSOLUTE MAXIMUM RATINGS(T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	℃
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	6.5	W
Peak pulse power dissipation at 10/1000μs waveform	P_{PP}	1500	W
Maximum instantaneous forward voltage at 100A for unidirectional	V_F	5.0	V

ABSOLUTE MAXIMUM RATINGS(T_A=25℃, RH=45%-75%, unless otherwise noted, continued)

Parameter	Symbol	Value	Unit
Peak forward surge current, 8.3ms single half sine-wave(NOTE 1)	I_{FSM}	200	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	℃/W

Notes：

1．Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

ELECTRICAL CHARACTERISTICS(T_A=25℃)

Part Number		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	V	max(μA)	min(V)	max(V)	mA	max(V)	A
1.5KE6.8AS	1.5KE6.8CAS	5.8	300	6.45	7.14	10	10.5	144.8
1.5KE7.5AS	1.5KE7.5CAS	6.4	150	7.13	7.88	10	11.3	134.5
1.5KE8.2AS	1.5KE8.2CAS	7.02	100	7.79	8.61	10	12.1	125.6
1.5KE9.1AS	1.5KE9.1CAS	7.78	50	8.65	9.55	1	13.4	113.4
1.5KE10AS	1.5KE10CAS	8.55	20	9.50	10.50	1	14.5	104.8
1.5KE11AS	1.5KE11CAS	9.4	5	10.50	11.60	1	15.6	97.4
1.5KE12AS	1.5KE12CAS	10.2	2	11.40	12.60	1	16.7	91.0
1.5KE13AS	1.5KE13CAS	11.1	1	12.40	13.70	1	18.2	83.5
1.5KE15AS	1.5KE15CAS	12.8	1	14.30	15.80	1	21.2	71.7
1.5KE16AS	1.5KE16CAS	13.6	1	15.20	16.80	1	22.5	67.6
1.5KE18AS	1.5KE18CAS	15.3	1	17.10	18.90	1	25.2	60.3
1.5KE20AS	1.5KE20CAS	17.1	1	19.00	21.00	1	27.7	54.9
1.5KE22AS	1.5KE22CAS	18.8	1	20.90	23.10	1	30.6	49.7
1.5KE24AS	1.5KE24CAS	20.5	1	22.80	25.20	1	33.2	45.8
1.5KE27AS	1.5KE27CAS	23.1	1	25.70	28.40	1	37.5	40.5
1.5KE30AS	1.5KE30CAS	25.6	1	28.50	31.50	1	41.4	36.7
1.5KE33AS	1.5KE33CAS	28.2	1	31.40	34.70	1	45.7	33.3
1.5KE36AS	1.5KE36CAS	30.8	1	34.20	37.80	1	49.9	30.5
1.5KE39AS	1.5KE39CAS	33.3	1	37.10	41.00	1	53.9	28.2
1.5KE43AS	1.5KE43CAS	36.8	1	40.90	45.20	1	59.3	25.6

ELECTRICAL CHARACTERISTICS(T_A=25℃, continued)

Part Number		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	V	max(μA)	min(V)	max(V)	mA	max(V)	A
1.5KE47AS	1.5KE47CAS	40.2	1	44.70	49.40	1	64.8	23.5
1.5KE51AS	1.5KE51CAS	43.6	1	48.50	53.60	1	70.1	21.7
1.5KE56AS	1.5KE56CAS	47.8	1	53.20	58.80	1	77.0	19.7
1.5KE62AS	1.5KE62CAS	53.0	1	58.90	65.10	1	85.0	17.9
1.5KE68AS	1.5KE68CAS	58.1	1	64.60	71.40	1	92.0	16.5
1.5KE75AS	1.5KE75CAS	64.1	1	71.30	78.80	1	103.0	14.8
1.5KE82AS	1.5KE82CAS	70.1	1	77.90	86.10	1	113.0	13.5
1.5KE91AS	1.5KE91CAS	77.8	1	86.50	95.50	1	125.0	12.2
1.5KE100AS	1.5KE100CAS	85.5	1	95.00	105.0	1	137.0	11.1
1.5KE110AS	1.5KE110CAS	94.0	1	105.0	116.0	1	152.0	10.0
1.5KE120AS	1.5KE120CAS	102.0	1	114.0	126.0	1	165.0	9.2

① Surge waveform: 10/1000μs

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

RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

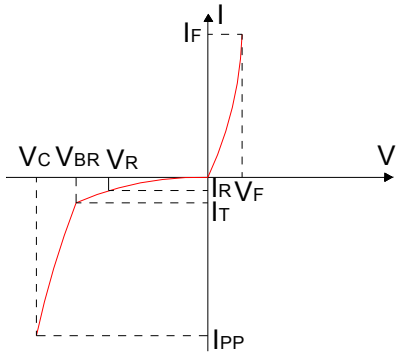


FIG.2:V- I curve characteristics (Bi-directional)

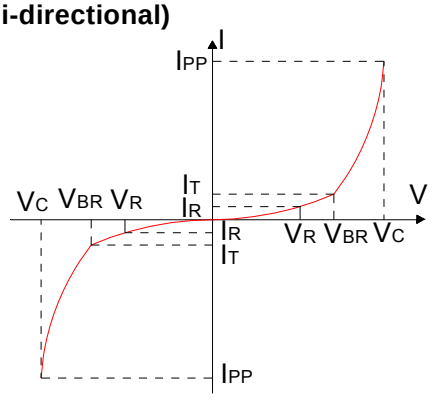


FIG.3: Pulse waveform

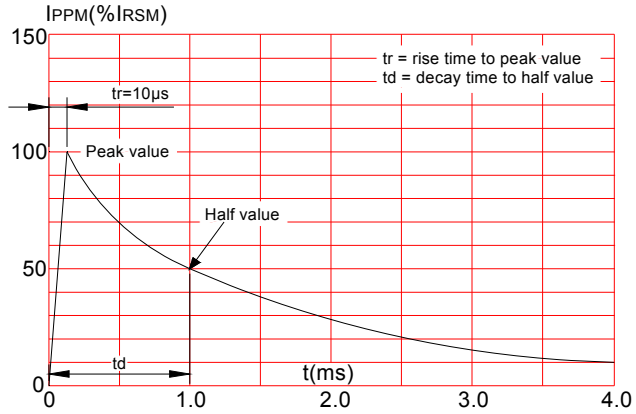
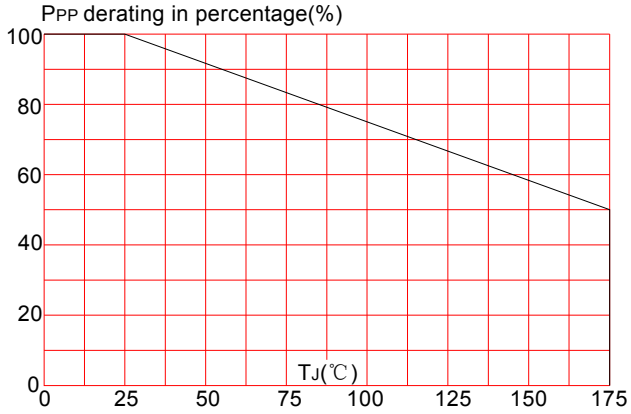
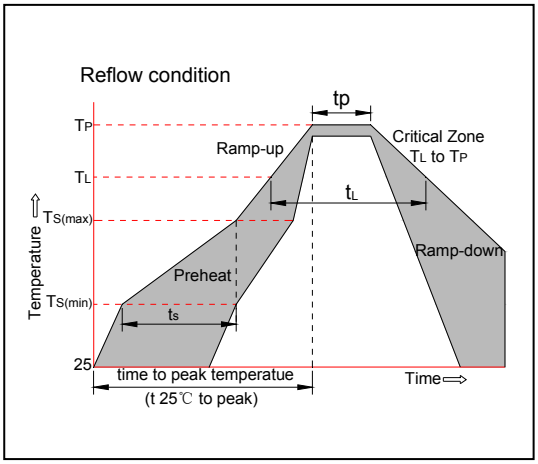


FIG.4: Pulse derating curve



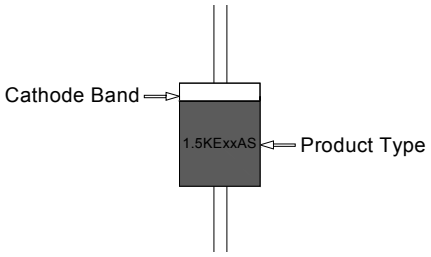
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

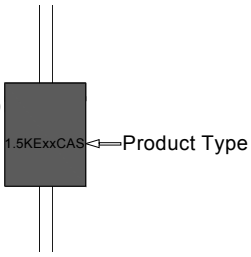


Flow/Wave Soldering(Solder Dipping)	
Peak temperature	265℃
Dipping time	10 sec.
Soldering	1 time

MARKING & ORDERING INFORMATION

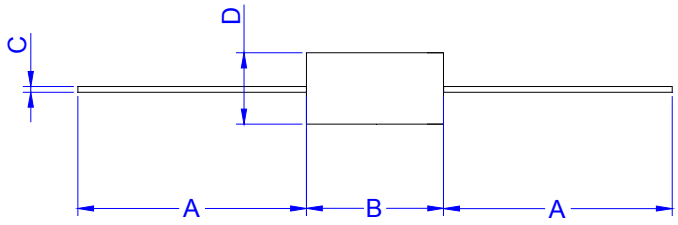


1.5KE xx A S
(1) (2) (3) (4)
(1)Series: 1500 watts series
(2)V_{BR} voltage code
(3)5% V_{BR} voltage tolerance
(4)Standard die



1.5KE xx C A S
(1) (2) (3) (4) (5)
(1)Series: 1500 watts series
(2)V_{BR} voltage code
(3)Bi-directional
(4)5% V_{BR} voltage tolerance
(5)Standard die

PACKAGE MECHANICAL DATA



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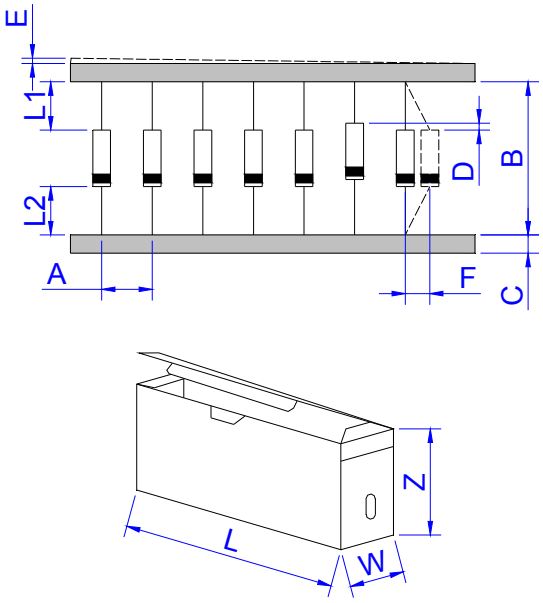
Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	7.20	9.60	0.283	0.378
C	0.96	1.20	0.038	0.047
D	4.80	5.40	0.189	0.213

TAPE AND BOX SPECIFICATION-DO-27



Ref.	Dimensions	
	Millimeters	Inches
A	10.0±0.5	0.394±0.020
B	53.0±1.5	2.087±0.059
C	6.0±0.5	0.236±0.020
D	1.2(MAX)	0.047(MAX)
E	0.8(MAX)	0.031(MAX)
F	1.5(MAX)	0.059(MAX)
|L1-L2|	1.0(MAX)	0.039(MAX)
W	80±5.0	3.150±0.197
L	250±5.0	9.843±0.197
Z	115±5.0	4.528±0.197

PART No.	UNIT WEIGHT (g/PCS) typ.	PER BOX (PCS)	PER CARTON (PCS)	DESCRIPTION
1.5KExxAS/CAS	1.11	1,000	10,000	Box

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