

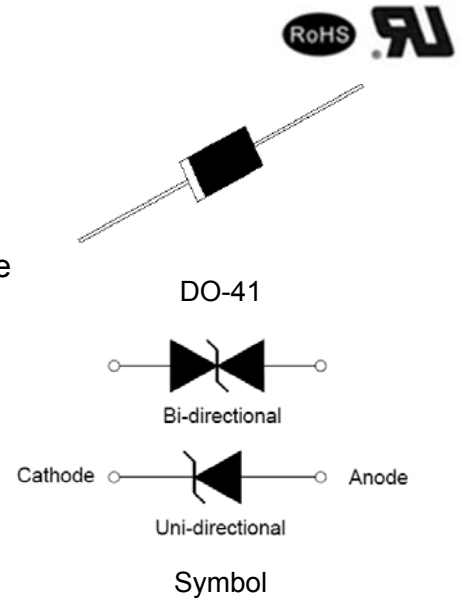


P4KExx(C)AS Series 400W Transient Voltage Suppress

Rev.1.1

DESCRIPTION:

The P4KExx(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.



FEATURES

- ✧ Low incremental surge resistance.
- ✧ Excellent clamping capability.
- ✧ Typical I_R less than $1\mu A$ above 12V.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature wave soldering: $260^\circ C/10s$ at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ 400W peak pulse power capability at 10/1000 μs waveform.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of $260^\circ C$.
- ✧ 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) $\pm 30kV$ (air), $\pm 30kV$ (contact).

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	$^\circ C$
Peak pulse power dissipation at 10/1000 μs waveform	P_{PP}	400	W
Steady state power dissipation at $T_L=75^\circ C$	$P_{M(AV)}$	1.5	W
Maximum instantaneous forward voltage at 25A for unidirectional	V_F	5.0	V
Peak forward surge current, 8.3ms single half sine-wave for unidirectional only(NOTE 1)	I_{FSM}	60	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	60	$^\circ C/W$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	$^\circ C/W$

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

Part Number		V_R	$I_R@V_R$	$V_{BR}@I_T$		I_T	$V_C@I_{PP}$	$I_{PP}^{\text{①}}$
Uni-Polar	Bi-Polar	V	max(μA)	min(V)	max(V)	mA	max(V)	A
P4KE6.8AS	P4KE6.8CAS	5.8	150	6.45	7.14	10	10.5	39.0
P4KE7.5AS	P4KE7.5CAS	6.4	100	7.13	7.88	10	11.3	36.3
P4KE8.2AS	P4KE8.2CAS	7.02	50	7.79	8.61	10	12.1	33.9
P4KE9.1AS	P4KE9.1CAS	7.78	20	8.65	9.55	1	13.4	30.6
P4KE10AS	P4KE10CAS	8.55	10	9.50	10.50	1	14.5	28.3
P4KE11AS	P4KE11CAS	9.4	5	10.50	11.60	1	15.6	26.3
P4KE12AS	P4KE12CAS	10.2	2	11.40	12.60	1	16.7	24.6
P4KE13AS	P4KE13CAS	11.1	1	12.40	13.70	1	18.2	22.5
P4KE15AS	P4KE15CAS	12.8	1	14.30	15.80	1	21.2	19.3
P4KE16AS	P4KE16CAS	13.6	1	15.20	16.80	1	22.5	18.2
P4KE18AS	P4KE18CAS	15.3	1	17.10	18.90	1	25.2	16.1
P4KE20AS	P4KE20CAS	17.1	1	19.00	21.00	1	27.7	14.8
P4KE22AS	P4KE22CAS	18.8	1	20.90	23.10	1	30.6	13.4
P4KE24AS	P4KE24CAS	20.5	1	22.80	25.20	1	33.2	12.3
P4KE27AS	P4KE27CAS	23.1	1	25.70	28.40	1	37.5	10.9
P4KE30AS	P4KE30CAS	25.6	1	28.50	31.50	1	41.4	9.9
P4KE33AS	P4KE33CAS	28.2	1	31.40	34.70	1	45.7	9.0
P4KE36AS	P4KE36CAS	30.8	1	34.20	37.80	1	49.9	8.2
P4KE39AS	P4KE39CAS	33.3	1	37.10	41.00	1	53.9	7.6
P4KE43AS	P4KE43CAS	36.8	1	40.90	45.20	1	59.3	6.9
P4KE47AS	P4KE47CAS	40.2	1	44.70	49.40	1	64.8	6.3
P4KE51AS	P4KE51CAS	43.6	1	48.50	53.60	1	70.1	5.8
P4KE56AS	P4KE56CAS	47.8	1	53.20	58.80	1	77.0	5.3
P4KE62AS	P4KE62CAS	53.0	1	58.90	65.10	1	85.0	4.8
P4KE68AS	P4KE68CAS	58.1	1	64.60	71.40	1	92.0	4.5
P4KE75AS	P4KE75CAS	64.1	1	71.30	78.80	1	103.0	4.0
P4KE82AS	P4KE82CAS	70.1	1	77.90	86.10	1	113.0	3.6

ELECTRICAL CHARACTERISTICS (T_A=25°C, 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
P4KE91AS	P4KE91CAS	77.8	1	86.50	95.50	1	125.0	3.3
P4KE100AS	P4KE100CAS	85.5	1	95.00	105.0	1	137.0	3.0
P4KE110AS	P4KE110CAS	94.0	1	105.0	116.0	1	152.0	2.7
P4KE120AS	P4KE120CAS	102.0	1	114.0	126.0	1	165.0	2.5

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°C, unless otherwise noted)

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

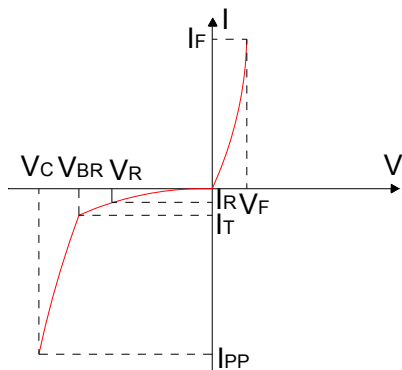


FIG.2: V- I curve characteristics (Bi-directional)

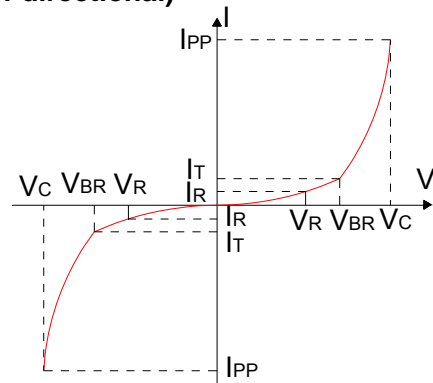


FIG.3: Pulse waveform

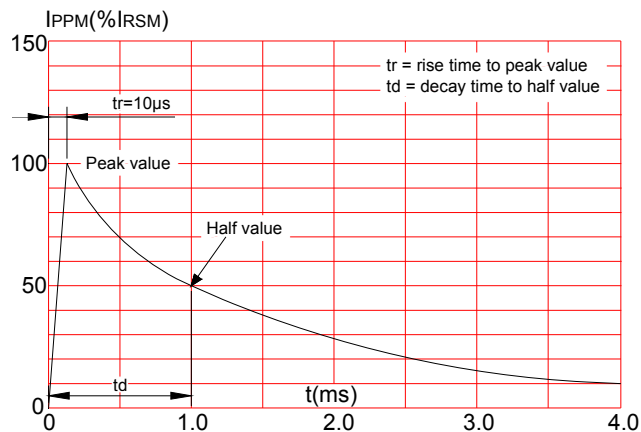
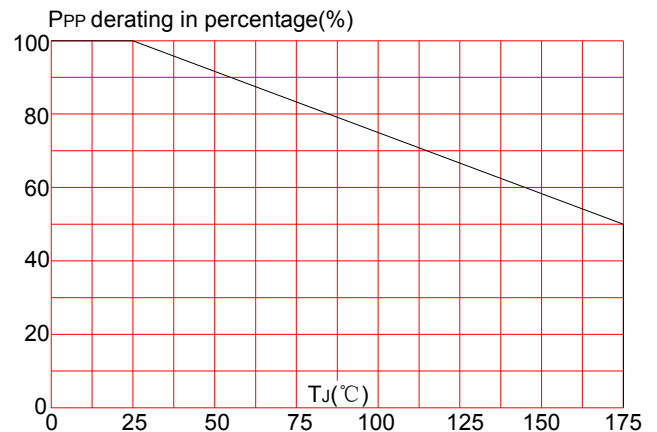
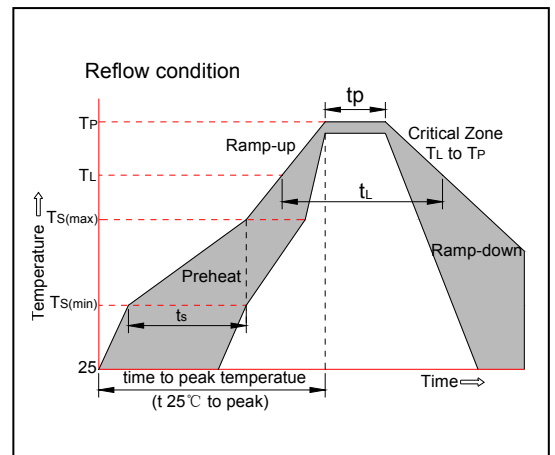


FIG.4: Pulse derating curve



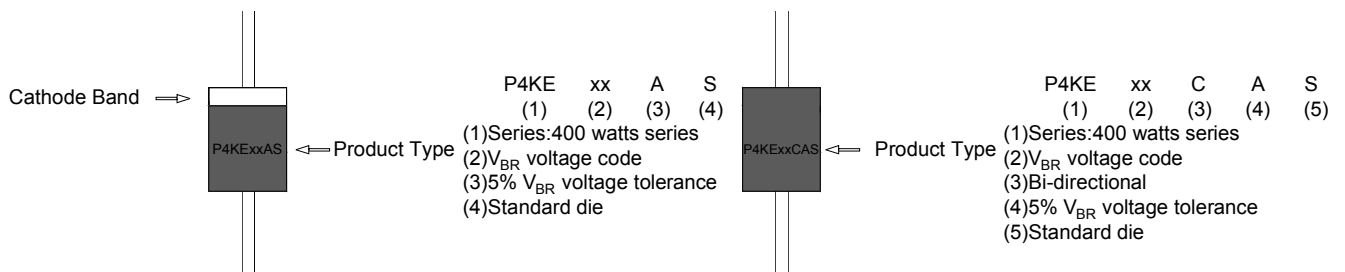
SOLDERING PARAMETERS

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



Flow/Wave Soldering(Solder Dipping)	
Peak Temperature	260°C
Dipping Time	10 seconds
Soldering	1 time

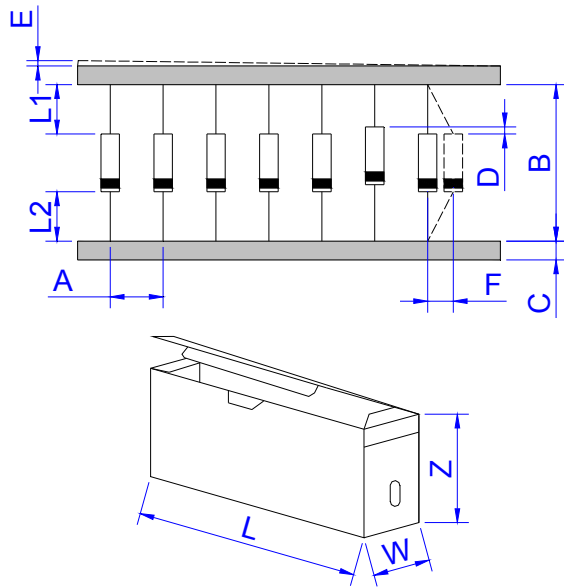
MARKING & ORDERING INFORMATION



PACKAGE MECHANICAL DATA

<p>DO-41</p>	Ref.	Dimensions			
		Millimeters		Inches	
		Min.	Max.	Min.	Max.
	A	25.40	-	1.000	-
B	4.90	5.30	0.193	0.209	
C	0.69	0.89	0.027	0.035	
D	2.40	2.80	0.095	0.110	

TAPE AND BOX SPECIFICATION-DO-41



Ref.	Dimensions	
	Millimeters	Inches
A	5.0±0.5	0.197±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	255±5.0	10.039±0.197
Z	145±5.0	5.709±0.197

PART No.	UNIT WEIGHT (g/PCS) typ.	PER BOX (PCS)	PER CARTON (PCS)	DESCRIPTION
P4KExxAS/CAS	0.28	5,000	50,000	Box

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