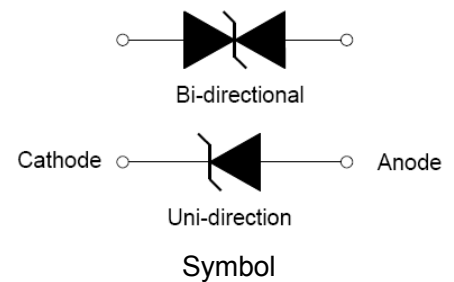


20KP Series 20KW Transient Voltage Suppressor

Rev.1.0

DESCRIPTION:

The 20KP 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 20 volts to 300 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 zener impedance.
- ✧ Excellent clamping capability.
- ✧ JEDEC R-6/P-600 Molded Plastic.
- ✧ Repetition rate (duty cycle): 0.01%.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature soldering: 260°C/10s at terminals.
- ✧ Glass passivated chip junction in R-6/P600 package.
- ✧ 20000W Peak Pulse power capability at 10×1000µs waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.

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

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000µs waveform	P_{PP}	20000	W
Peak pulse current of on 10/1000µs waveform	I_{PP}	See next table	A
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	8	W
Operating junction and Storage temperature range	T_{STG}, T_J	-55 to +125	$^{\circ}\text{C}$
Peak forward surge current, 8.3ms single half sine-wave	I_{FSM}	400	A

ELECTRICAL CHARACTERISTICS (T_A=25°C)

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	μA	min(V)	max(V)	mA	max(V)	A
20KP20A	20KP20CA	20.0	5000	22.20	24.50	5	36.8	543.5
20KP24A	20KP24CA	24.0	5000	26.70	29.50	5	41.2	485.4
20KP26A	20KP26CA	26.0	2000	28.90	31.90	5	44.7	447.4
20KP28A	20KP28CA	28.0	1000	31.10	34.40	5	48.0	416.7
20KP30A	20KP30CA	30.0	250	33.30	36.80	5	51.5	388.3
20KP32A	20KP32CA	32.0	150	35.74	38.40	5	54.3	368.3
20KP34A	20KP34CA	34.0	50	38.00	40.80	5	57.5	347.8
20KP36A	20KP36CA	36.0	20	40.20	44.20	5	61.5	325.2
20KP40A	20KP40CA	40.0	15	44.40	49.10	5	67.8	295.0
20KP44A	20KP44CA	44.0	2	49.10	52.80	5	72.7	275.1
20KP48A	20KP48CA	48.0	2	53.30	58.90	5	79.4	251.9
20KP52A	20KP52CA	52.0	2	58.10	62.40	5	85.8	233.1
20KP56A	20KP56CA	56.0	2	62.60	67.20	5	92.6	216.0
20KP60A	20KP60CA	60.0	2	66.70	73.70	5	97.6	204.9
20KP64A	20KP64CA	64.0	2	71.10	78.60	5	104.0	192.3
20KP68A	20KP68CA	68.0	2	76.00	81.60	5	110.0	181.8
20KP72A	20KP72CA	72.0	2	80.40	86.40	5	116.0	172.4
20KP80A	20KP80CA	80.0	2	89.40	96.00	5	130.0	153.8
20KP88A	20KP88CA	88.0	2	98.30	105.60	5	142.0	140.8
20KP96A	20KP96CA	96.0	2	107.20	115.20	5	155.0	129.0
20KP104A	20KP104CA	104.0	2	116.20	124.80	5	168.0	119.0
20KP112A	20KP112CA	112.0	2	125.10	134.40	5	182.0	109.9
20KP120A	20KP120CA	120.0	2	134.00	144.00	5	194.0	103.1
20KP132A	20KP132CA	132.0	2	147.40	158.40	5	213.0	93.9
20KP144A	20KP144CA	144.0	2	160.80	172.80	5	232.0	86.2
20KP160A	20KP160CA	160.0	2	178.70	185.0	5	258.0	77.5
20KP172A	20KP172CA	172.0	2	192.10	206.40	5	277.0	72.2
20KP180A	20KP180CA	180.0	2	201.10	216.00	5	291.0	68.7
20KP192A	20KP192CA	192.0	2	214.50	230.40	5	309.0	64.7
20KP204A	20KP204CA	204.0	2	227.90	244.80	5	329.0	60.8

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, 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	μA	min(V)	max(V)	mA	max(V)	A
20KP216A	20KP216CA	216.0	2	241.30	259.20	5	348.0	57.5
20KP232A	20KP232CA	232.0	2	259.10	278.40	5	374.0	53.5
20KP240A	20KP240CA	240.0	2	268.10	288.00	5	387.0	51.7
20KP256A	20KP256CA	256.0	2	286.00	307.20	5	412.0	48.5
20KP280A	20KP280CA	280.0	2	312.80	336.00	5	451.0	44.3
20KP300A	20KP300CA	300.0	2	335.10	360.00	5	483.0	41.4

① Surge waveform: 10/1000 μs

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

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

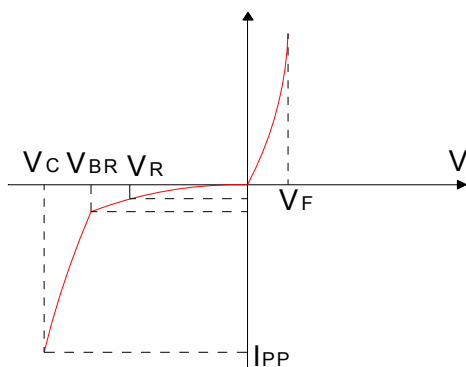


FIG.2:V- I curve characteristics (Bi-directional)

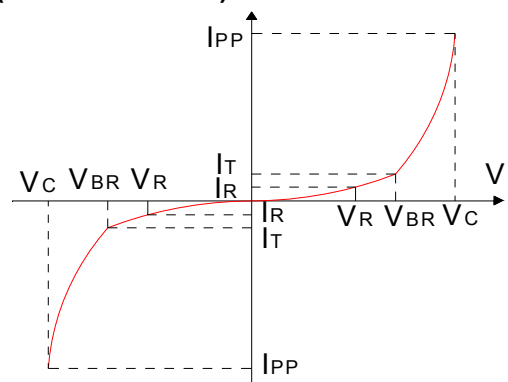


FIG.3: Pulse waveform

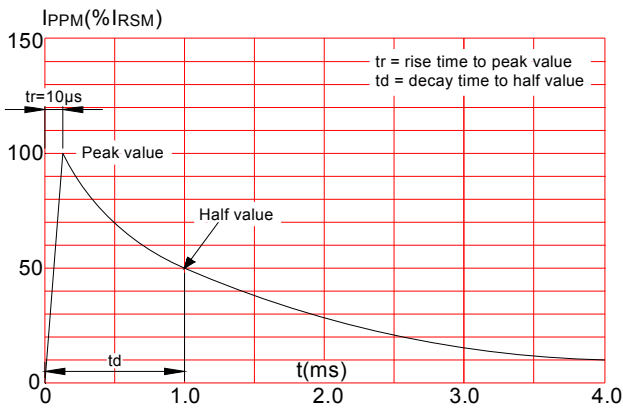
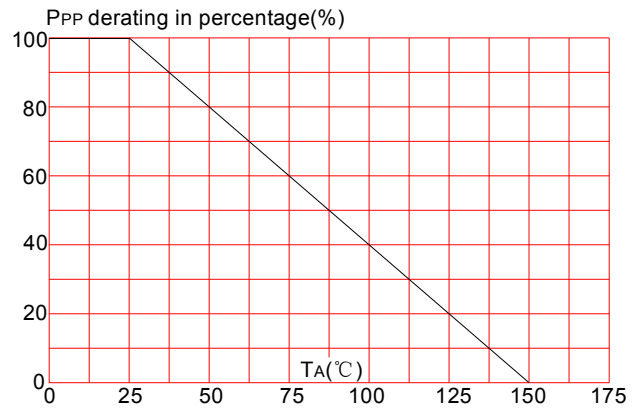


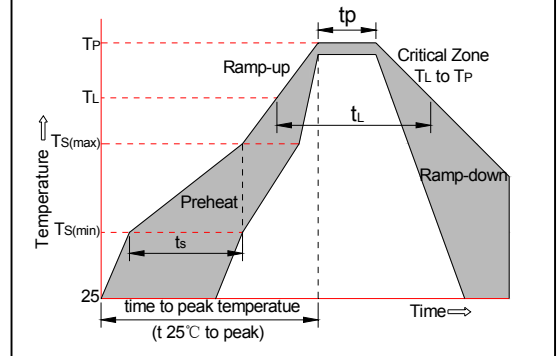
FIG.4: Pulse derating curve



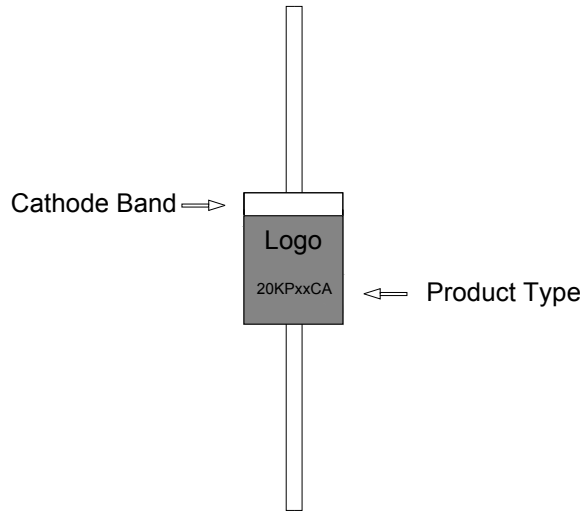
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see FIG.5)
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 (Liquid us 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)(Liquid us)	+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)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C

FIG.5: Reflow condition



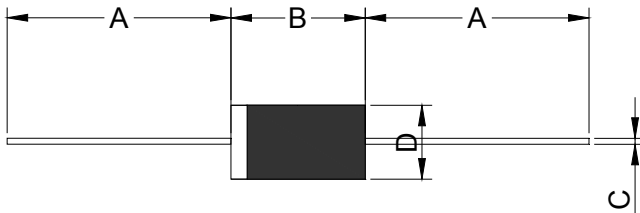
MARKING & ORDERING INFORMATION



20KP XX C A
 (1) (2) (3) (4)

(1) Series: 20000 watts series
 (2) Reverse Stand-off Voltage
 (3) Bi-directional
 (4) 5% V_{BR} Voltage tolerance

PACKAGE MECHANICAL DAT



Ref.	Dimensions			
	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	1.000	-	25.40	-
B	0.339	0.370	8.60	9.40
C	0.048	0.052	1.20	1.40
D	0.340	0.360	8.60	9.10

Part Number	Case Type	Quantity	Packing Option
20KPXXCA/A	R6/P600	300	Box