

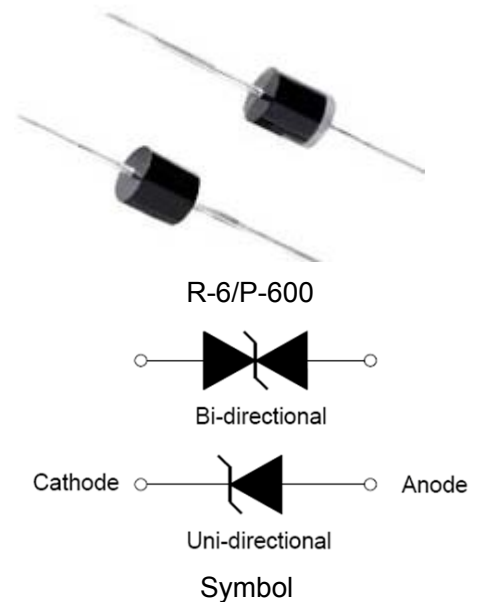


20KP Series 20KW Transient Voltage Suppressor

Rev.2.2

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 incremental surge resistance.
- ✧ Excellent clamping capability.
- ✧ JEDEC R-6/P-600 molded plastic.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature soldering: 265°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($T_A=25^{\circ}C$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000μs waveform	P_{PP}	20000	W
Steady state power dissipation at $T_L=75^{\circ}C$	$P_{M(AV)}$	8.0	W
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	°C
Peak forward surge current, 8.3ms single half sine-wave for unidirectional only	I_{FSM}	400	A
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

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	μA	min(V)	max(V)	mA	max(V)	A
20KP20A	20KP20CA	20.0	5000	22.20	24.50	50	36.8	548.9
20KP24A	20KP24CA	24.0	5000	26.70	29.50	50	41.2	490.3
20KP26A	20KP26CA	26.0	2000	28.90	31.90	50	44.7	451.9
20KP28A	20KP28CA	28.0	1000	31.10	34.40	50	48.0	420.8
20KP30A	20KP30CA	30.0	250	33.30	36.80	5	51.5	392.2
20KP32A	20KP32CA	32.0	150	35.74	38.40	5	54.3	372.0
20KP34A	20KP34CA	34.0	50	38.00	40.80	5	57.5	351.3
20KP36A	20KP36CA	36.0	20	40.20	44.20	5	61.5	328.5
20KP40A	20KP40CA	40.0	15	44.40	49.10	5	67.8	297.9
20KP44A	20KP44CA	44.0	2	49.10	52.80	5	72.7	277.9
20KP48A	20KP48CA	48.0	2	53.30	58.90	5	79.4	254.4
20KP52A	20KP52CA	52.0	2	58.10	62.40	5	85.8	235.4
20KP56A	20KP56CA	56.0	2	62.60	67.20	5	92.6	218.1
20KP60A	20KP60CA	60.0	2	66.70	73.70	5	97.6	207.0
20KP64A	20KP64CA	64.0	2	71.10	78.60	5	104.0	194.2
20KP68A	20KP68CA	68.0	2	76.00	81.60	5	110.0	183.6
20KP72A	20KP72CA	72.0	2	80.40	86.40	5	116.0	174.1
20KP80A	20KP80CA	80.0	2	89.40	96.00	5	130.0	155.4
20KP88A	20KP88CA	88.0	2	98.30	105.60	5	142.0	142.3
20KP96A	20KP96CA	96.0	2	107.20	115.20	5	155.0	130.3
20KP104A	20KP104CA	104.0	2	116.20	124.80	5	168.0	120.2
20KP112A	20KP112CA	112.0	2	125.10	134.40	5	182.0	111.0
20KP120A	20KP120CA	120.0	2	134.00	144.00	5	194.0	104.1
20KP132A	20KP132CA	132.0	2	147.40	158.40	5	213.0	94.8
20KP144A	20KP144CA	144.0	2	160.80	172.80	5	232.0	87.1
20KP160A	20KP160CA	160.0	2	178.70	185.0	5	258.0	78.3
20KP172A	20KP172CA	172.0	2	192.10	206.40	5	277.0	72.9
20KP180A	20KP180CA	180.0	2	201.10	216.00	5	291.0	69.4
20KP192A	20KP192CA	192.0	2	214.50	230.40	5	309.0	65.4
20KP204A	20KP204CA	204.0	2	227.90	244.80	5	329.0	61.4

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	58.0
20KP232A	20KP232CA	232.0	2	259.10	278.40	5	374.0	54.0
20KP240A	20KP240CA	240.0	2	268.10	288.00	5	387.0	52.2
20KP256A	20KP256CA	256.0	2	286.00	307.20	5	412.0	49.0
20KP280A	20KP280CA	280.0	2	312.80	336.00	5	451.0	44.8
20KP300A	20KP300CA	300.0	2	335.10	360.00	5	483.0	41.8

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)

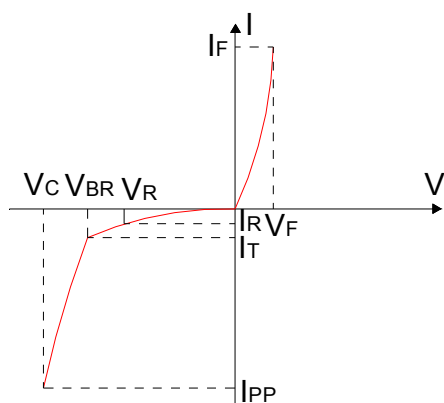


FIG.2:V- I curve characteristics (Bi-directional)

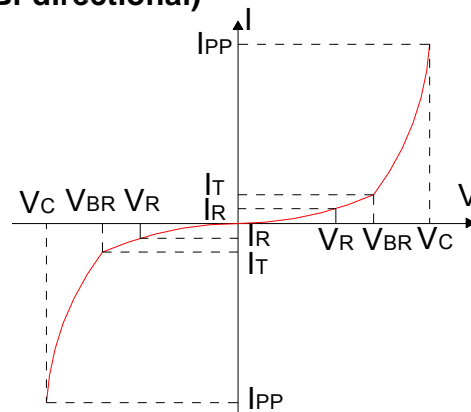


FIG.3: Pulse waveform

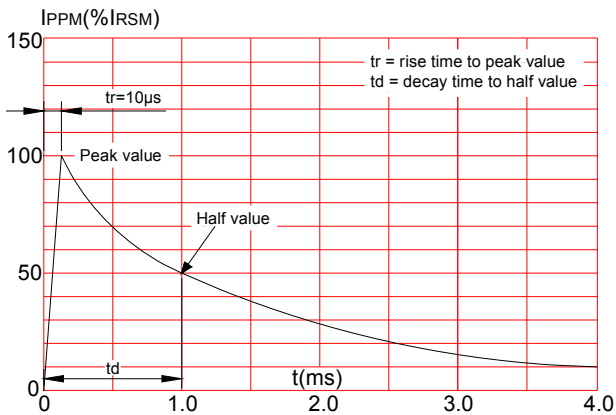
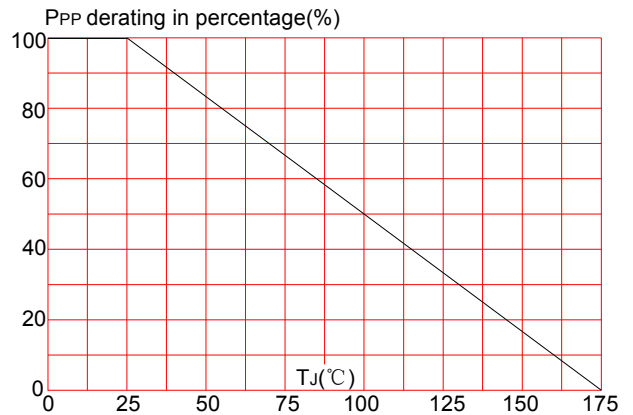
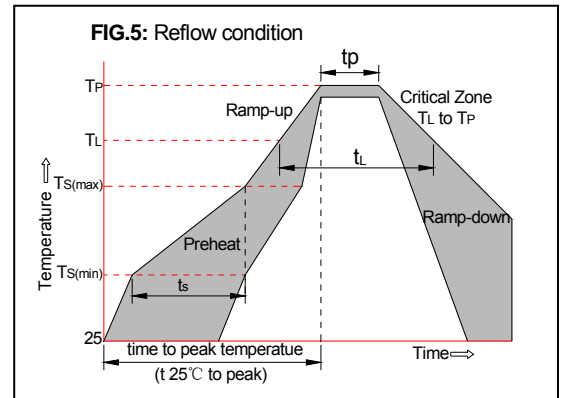


FIG.4: Pulse derating curve



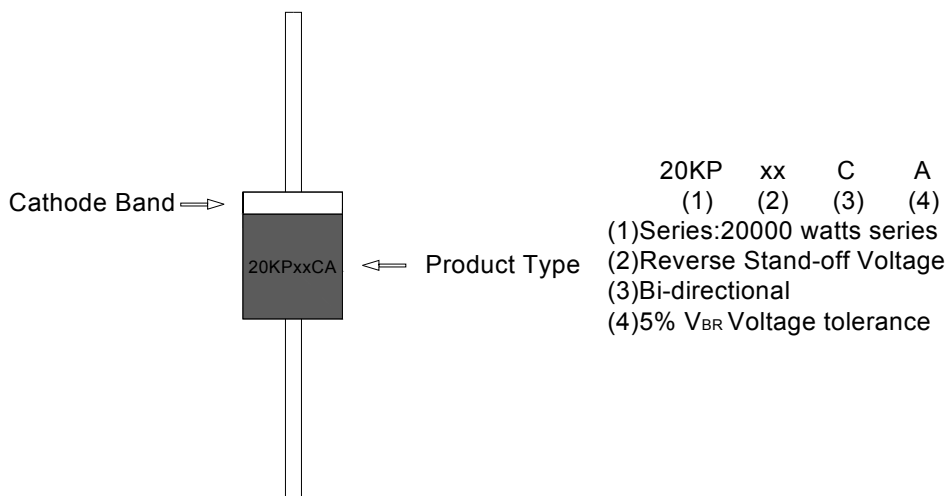
SOLDERING PARAMETERS

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 (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)		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

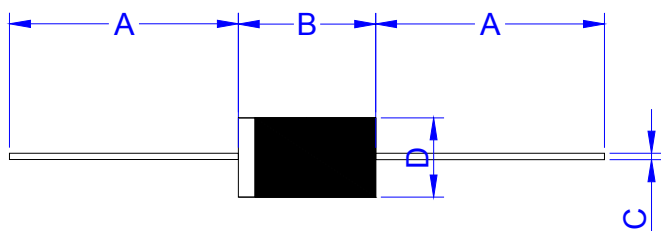


Flow/Wave Soldering(Solder Dipping)	
Peak temperature	265°C
Dipping time	10 sec.
Soldering	1 time

MARKING & ORDERING INFORMATION



PACKAGE MECHANICAL DATA



Ref.	Dimensions			
	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	1.000	-	25.40	-
B	0.339	0.370	8.60	9.40
C	0.047	0.055	1.20	1.40
D	0.339	0.358	8.60	9.10

Part Number	UNIT WEIGHT (g/PCS) typ	Case Type	Quantity	Packing Option
20KPxxA/CA	3.58	R6/P600	300	Box

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