

Transient Voltage Suppressors (TVS) Data Sheet

Features

- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 20000W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.05%
- Fast response time
- Typical I_R less than 2μA above 40V.
- High Temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



Mechanical Data

- Case: Moulded plastic over glass passivated junction
- Terminal: Plated Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any
- Weight: 2.40g

Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

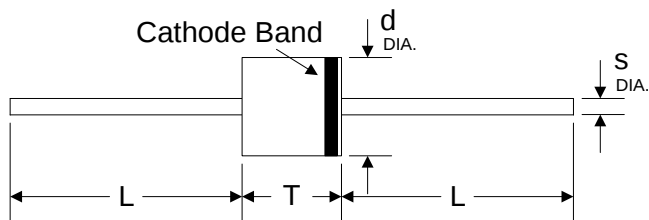
Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000μs waveform (Note1, Fig.1)	P_{PPM}	Minimum 20000	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at $T_L=75^{\circ}\text{C}$ (Fig.5)	$P_{M(AV)}$	8.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6)	I_{FSM}	400	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	8	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	°C/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^{\circ}\text{C}$ per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

Dimensions (P600)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	25.40	-	1.000	-
T	8.60	9.10	0.340	0.360
d	8.60	9.10	0.340	0.360
s	1.19	1.32	0.047	0.052



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

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
20KPA20A	20KPA20CA	20.0	22.34~24.94	50	36.8	548.9	5000
20KPA24A	20KPA24CA	24.0	26.81~29.93	50	41.2	490.3	5000
20KPA26A	20KPA26CA	26.0	29.04~32.42	50	44.7	451.9	2000
20KPA28A	20KPA28CA	28.0	31.28~34.92	50	48.0	420.8	1000
20KPA30A	20KPA30CA	30.0	33.51~37.41	5	51.5	392.2	250
20KPA32A	20KPA32CA	32.0	35.74~39.90	5	54.3	372.0	150
20KPA34A	20KPA34CA	34.0	38.00~42.42	5	57.5	351.3	50
20KPA36A	20KPA36CA	36.0	40.20~44.88	5	61.5	328.5	20
20KPA40A	20KPA40CA	40.0	44.70~49.90	5	67.8	297.9	15
20KPA44A	20KPA44CA	44.0	49.10~54.81	5	72.7	277.9	2
20KPA48A	20KPA48CA	48.0	53.60~59.83	5	79.4	254.4	2
20KPA52A	20KPA52CA	52.0	58.10~64.86	5	85.8	235.4	2
20KPA56A	20KPA56CA	56.0	62.60~69.88	5	92.6	218.1	2
20KPA60A	20KPA60CA	60.0	67.00~74.79	5	97.6	207.0	2
20KPA64A	20KPA64CA	64.0	71.50~79.82	5	104.0	194.2	2
20KPA68A	20KPA68CA	68.0	76.00~84.84	5	110.0	183.6	2
20KPA72A	20KPA72CA	72.0	80.40~89.75	5	116.0	174.1	2
20KPA80A	20KPA80CA	80.0	89.40~99.80	5	130.0	155.4	2
20KPA88A	20KPA88CA	88.0	98.30~109.73	5	142.0	142.3	2
20KPA96A	20KPA96CA	96.0	107.20~119.67	5	155.0	130.3	2
20KPA104A	20KPA104CA	104.0	116.20~129.72	5	168.0	120.2	2
20KPA112A	20KPA112CA	112.0	125.10~139.65	5	182.0	111.0	2
20KPA120A	20KPA120CA	120.0	134.00~149.59	5	194.0	104.1	2

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
20KPA132A	20KPA132CA	132.0	147.40~164.54	5	213.0	94.8	2
20KPA144A	20KPA144CA	144.0	160.80~179.50	5	232.0	87.1	2
20KPA160A	20KPA160CA	160.0	178.70~199.49	5	258.0	78.3	2
20KPA172A	20KPA172CA	172.0	192.10~214.44	5	277.0	72.9	2
20KPA180A	20KPA180CA	180.0	201.10~224.49	5	291.0	69.4	2
20KPA192A	20KPA192CA	192.0	214.50~239.45	5	309.0	65.4	2
20KPA204A	20KPA204CA	204.0	227.90~254.41	5	329.0	61.4	2
20KPA216A	20KPA216CA	216.0	241.30~269.37	5	348.0	58.0	2
20KPA232A	20KPA232CA	232.0	259.10~289.24	5	374.0	54.0	2
20KPA240A	20KPA240CA	240.0	268.10~299.28	5	387.0	52.2	2
20KPA256A	20KPA256CA	256.0	286.00~319.27	5	412.0	49.0	2
20KPA280A	20KPA280CA	280.0	312.80~349.18	5	451.0	44.8	2
20KPA300A	20KPA300CA	300.0	335.10~374.08	5	483.0	41.8	2

Notes: For bidirectional type having V_{RWM} of 40V and less, the I_R limit is double.

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

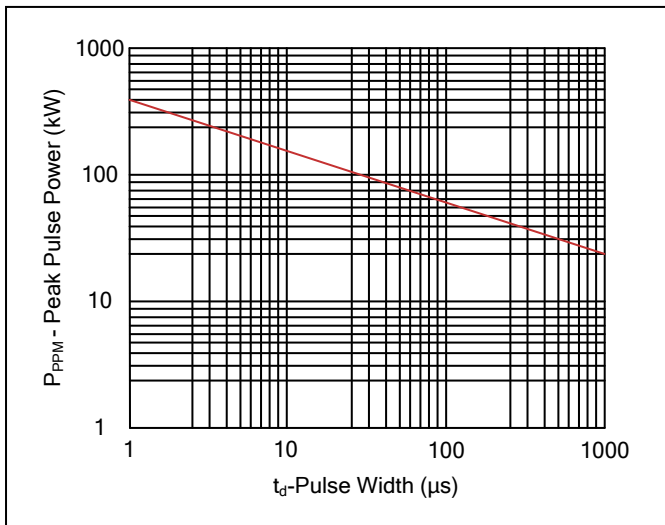


Figure 2. Pulse Derating Curve

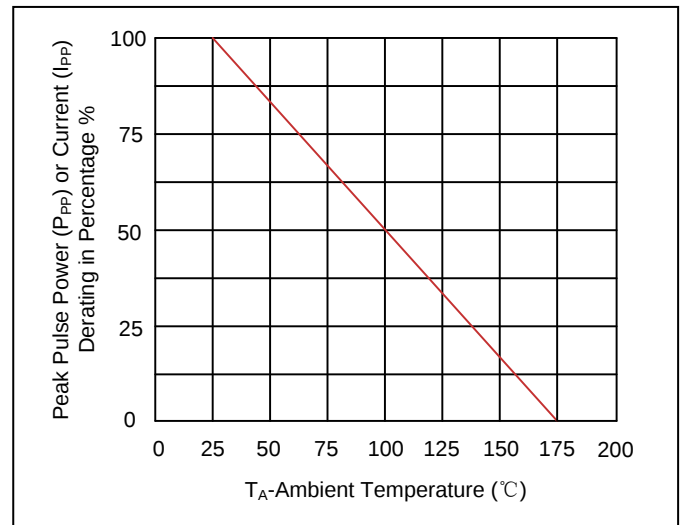


Figure 3. Pulse Waveform

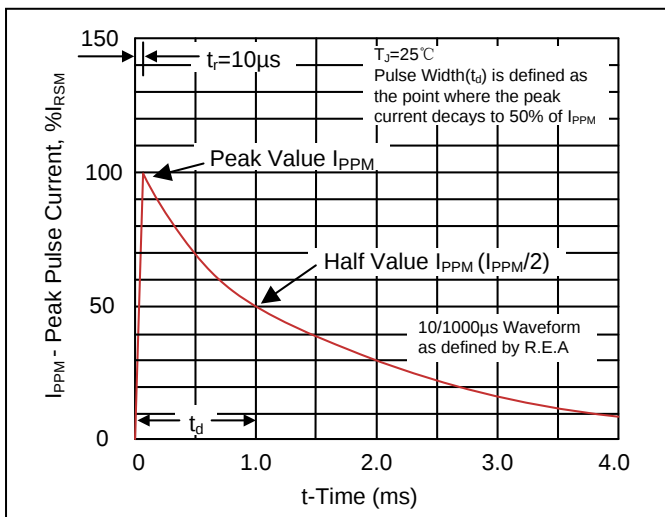


Figure 4. AC Line Protection Application

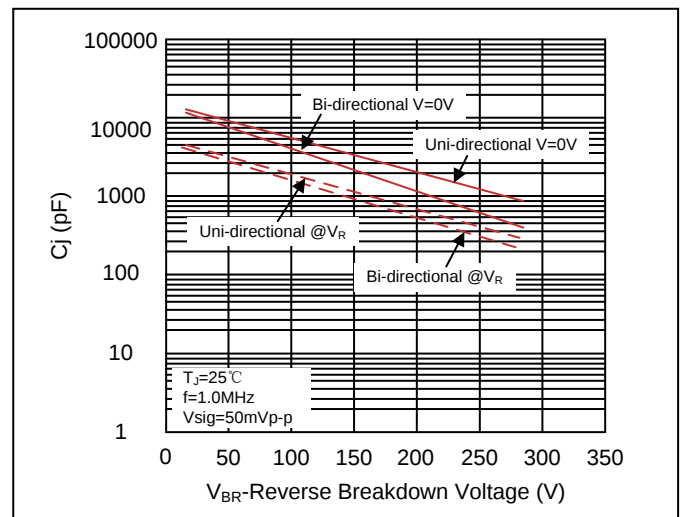


Figure 5. Steady State Power Dissipation Derating Curve

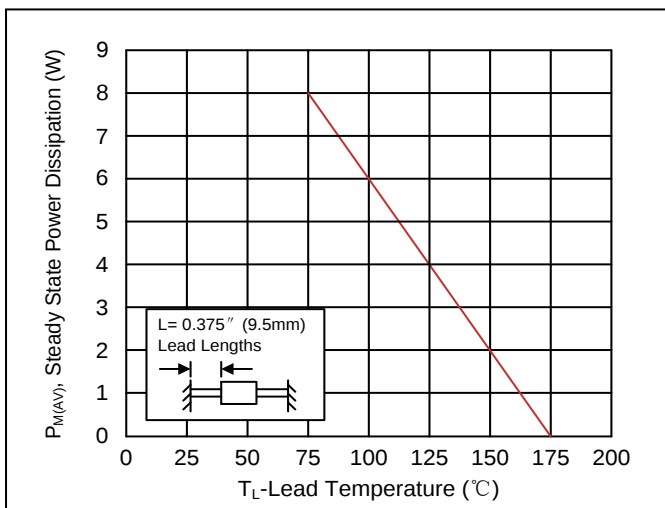
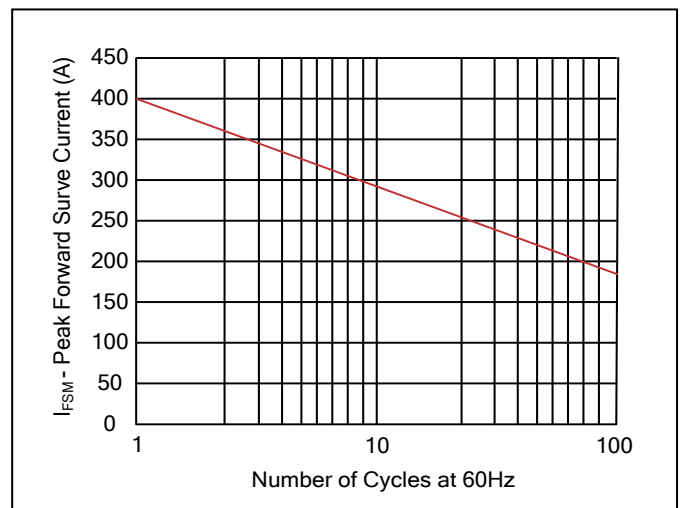
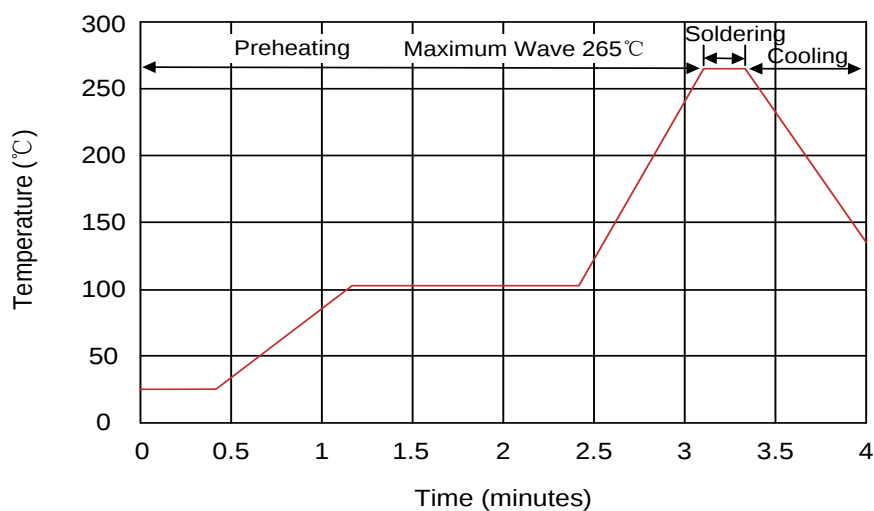


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



Recommended Soldering Conditions

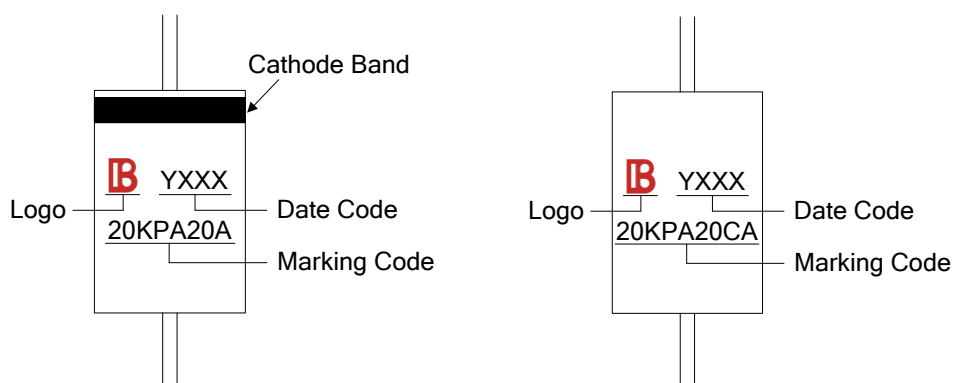
Wave Soldering



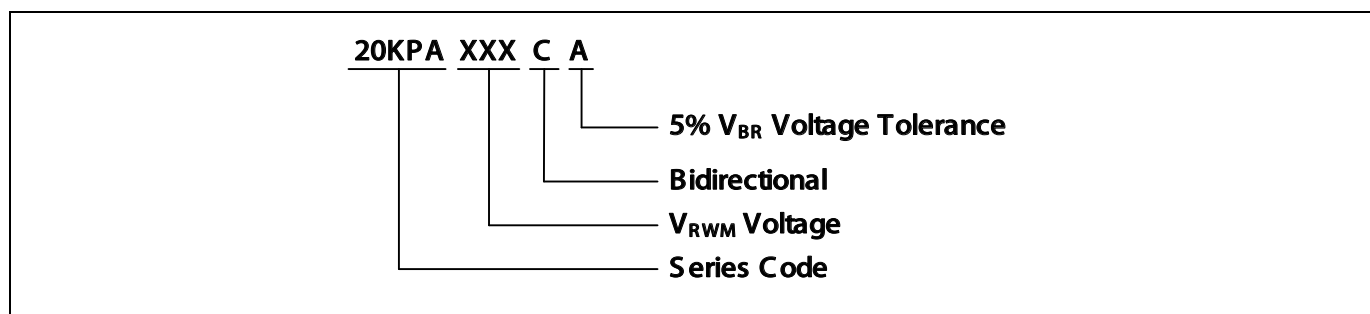
Recommended Conditions

Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

Marking Code



Part Number Code

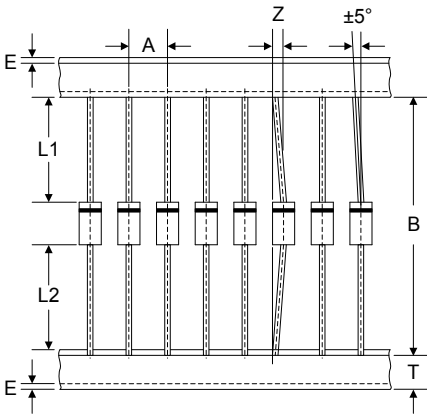
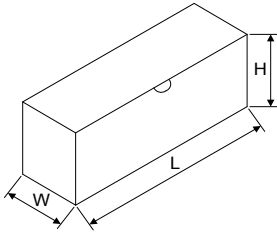


Ordering Code for Different Package

Box package: Add suffix "/B" at the end of the part number, such as 20KPA40A/B

Reel package: Add suffix "/TR13" at the end of the part number, such as 20KPA300CA/TR13

Packaging

Tape		Symbol	Dimension (mm)
	A	10.0±0.5	
	B	53.0±1.0	
	Z	1.2Max.	
	T	6.0±0.4	
	E	0.8Max.	
	L1-L2	1.0Max.	
Box		L	250.0±5.0
		W	75.0±5.0
		H	114.0±5.0
	Quantity: 300PCS		
Reel	D	330.0±3.0	
	D0	16.4±2.0	
	D1	86.0±2.0	
	W1	76.0±3.0	
	Quantity: 800PCS		