



Power-lines Protection Multilayer Chip Varistor



Notice

1. In order to improve this catalog, specifications may be changed without prior notice, please consult our sales representative or product engineer before ordering;
2. Due to the limitation of length, this catalog provides only the main product information.
3. We can produce any special specifications products according to customers' requests.



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1. Identification (Part Number)

QV **0806** **P** **241** **K** **T** **201**
 ① ② ③ ④ ⑤ ⑥ ⑦

① Type	
QV	Chip Varistor

③ Application Code	
P	Power-lines Protection

④ Varistor Voltage @ 1mA	
241	240V
471	470V

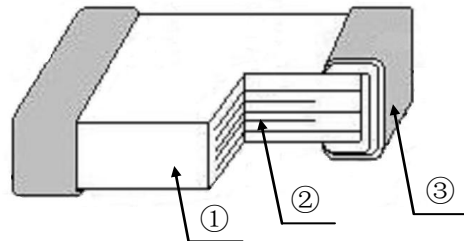
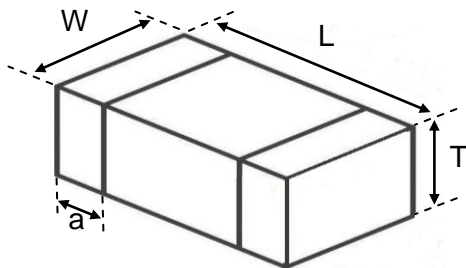
⑥ Packaging	
T	Tape
B	Bulk

② External Dimension L×W×T (mm)	
0806	2.20×1.80×2.00
1206	3.20×1.60×1.60
1210	3.20×2.50×1.7.
1812	4.50×3.20×2.50

⑤ Tolerance of Varistor Voltage	
K	±10%

⑦ Max. Surge Current @8/20μs	
500	50A
201	200A

2. Structure and Dimensions



Type	L (mm)	W (mm)	T (mm)	a (mm)
0806	2.2 +0.2/-0.2	1.8 +0.2/-0.2	2.0 Max.	0.50±0.30
1206	3.2 +0.6/-0.4	1.8 +0.2/-0.2	2.0 Max.	0.50±0.30
1210	3.2 +0.6/-0.4	2.5 +0.4/-0.2	2.6 Max.	0.50±0.30
1812	4.5 +0.6/-0.2	3.2 +0.5/-0.2	3.5 Max.	0.60±0.30

Part	①	②	③
Component	ZnO Semiconductor Ceramics for Chip Varistor	Internal Electrode (Ag or Ag-Pd)	Terminal Electrode (Ag/Ni/Sn three layers)



3. Features

- SMD type suitable for high density mounting
- Excellent clamping ratio and strong capability of voltage surge suppression
- High voltage varistor, suitable for AC circuit

4. Applications

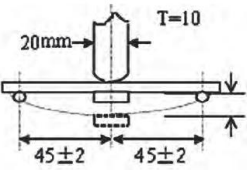
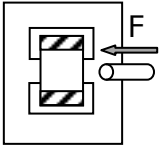
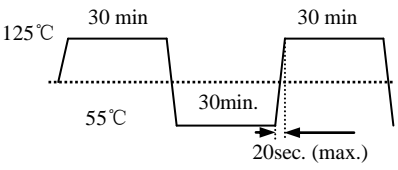
- Used for Power supply, Network Interface, LED lighting.
- Able to replace part of leaded Varistor.

5. Electrical Characteristics

Part No.	Max. Working Voltage		Varistor Voltage @ 1mA DC	Max. Clamping Voltage (8/20μs)		Max. Surge Current	Operating ambient temperature
	V _{AC} (V)	V _{DC} (V)	V _{1mA} (V)	V _c (V)	I _c (A)	I _p (A)	°C
QV0806P241KT201	150	200	240±10%	350	2	200	-55~+125
QV0806P431KT101	275	350	430±10%	630	2	100	
QV1206P241KT301	150	200	240±10%	350	2	300	
QV1206P431KT151	275	350	430±10%	630	2	150	
QV1210P471KT201	300	385	470±10%	700	5	200	
QV1210P471KT301	300	385	470±10%	700	5	300	
QV1812P471KT501	300	385	470±10%	700	5	500	



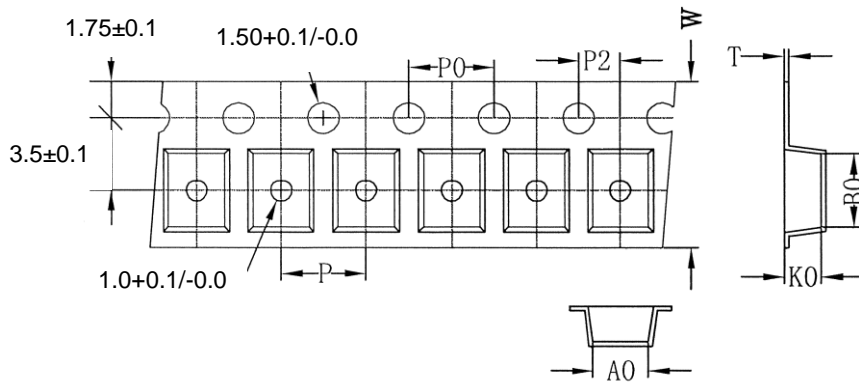
6. Reliability Test

No	Items	/Test conditions / Methods	Requirements
1	Bending Resistance	Warp: 2mm Speed<0.5mm/s Duration: 10s 	① No visible mechanical damage. ② $ \Delta V_{1mA}/V_{1mA} \leq 5\%$.
2	Terminal Strength	Speed<0.5mm/s Apply force: 10N Duration: 10±1s 	No removal or split of the termination
3	Solderability	Solder temperature: 240±5°C; Dipping Duration: 3±0.3s;	① No visible mechanical damage. ② Wetting coverage $\geq 90\%$
4	Resistance to Soldering Heat	Solder temperature: 260±5°C; Dipping Duration: 5±1s;	
5	Thermal Shock	High and low temperatures Transform for 100 Cycles. 	① No visible mechanical damage. ② $ \Delta V_{1mA}/V_{1mA} \leq 10\%$.
6	Damp Heat	Temperature: 60±2°C Humidity: 90% ~ 95% RH. Duration: 1000±24 h.	
7	High Temp. Storage	Temperature: 125±2°C Duration: 1000±24 h.	
8	High Temp. Load	Temperature: 125±2°C Loading Voltage: V _{AC} . Duration: 1000±24 h.	① No visible mechanical damage. ② $ \Delta V_{1mA}/V_{1mA} \leq 10\%$.
9	Damp Heat Load	Temperature: 60±2°C Humidity: 90% ~ 95% RH. Loading Voltage: V _{AC} . Duration: 1000±24 h.	
10	Maximum Surge Current	Pulse waveform: 8/20 us Number of hit: each 1 time of +/- polarity Applied current: maximum surge current (I _p)	



7. Packaging

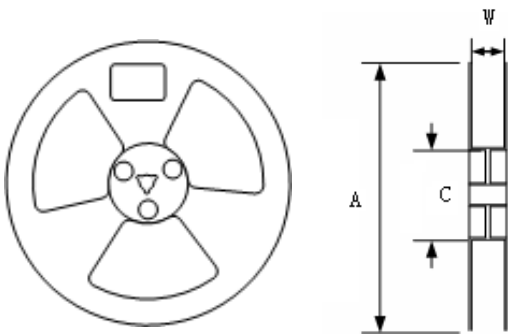
7.1 Carrier tape dimensions



Unit: mm

Type	A0 (±0.2)	B0 (±0.2)	K0 Max.	T Max.	W (±0.3)	P0 (±0.2)	P (±0.2)	P2 (±0.2)
0806	2.1	2.5	2.5	0.30	8.0	4.0	4.0	2.0
1206	2.1	3.6	2.5	0.30	8.0	4.0	4.0	2.0
1210	3.1	3.8	3.0	0.30	8.0	4.0	4.0	2.0
1812	3.8	5.0	3.8	0.30	12.0	4.0	8.0	2.0

7.2 Taping reel dimensions



Type	Spec.	Dimensions(mm)		
		A	W	C
0806	7"	178±2	8.4+2.0/-0.0	58±2
1206	7"	178±2	8.4+2.0/-0.0	58±2
1210	7"	178±2	8.4+2.0/-0.0	58±2
1812	13"	330±2	12.4+2.0/-0.0	100±2

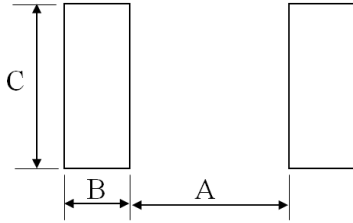
7.3 Packaging quantity

Type	Tape	Quantity (pcs/reel)
0806	Embossed Tape	2K
1206		2K
1210		1.5K
1812		3K



8. Soldering Recommendation

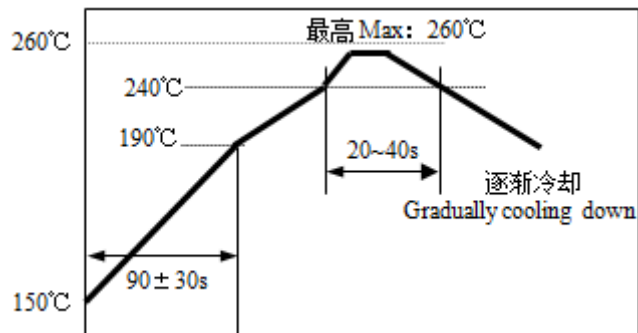
8.1 Recommended Land pattern



Type	A (mm)	B (mm)	C (mm)
0806	1.4~1.8	0.8~1.2	1.8~2.2
1206	1.9~2.3	1.2~1.6	1.8~2.2
1210	1.9~2.3	1.2~1.6	2.6~3.0
1812	2.8~3.2	1.5~1.9	3.4~3.8

8.2 Recommended Soldering Profile

- Pb Free Solder Paste: Sn/Ag/Cu (96.5/3.0/0.5).
- Max time at max temp: 10sec.
- Allowed Reflow time: 2x Max.





9. Notes & Warnings

9.1 Storage

1. Storage temperature in original packaging: $-10\sim+40^{\circ}\text{C}$.
2. Relative Humidity: $\leq 70\% \text{RH}$.
3. Keep away from corrosive atmosphere and sunlight.
4. Period of Storage: 12 Months.
5. Shall not be operated and stored under the following environmental condition:
 - (1) Corrosive or deoxidized atmospheres (such as chlorine, sulfureted hydrogen, ammonia, sulfuric acid, nitric oxide and so on)
 - (2) Volatile or inflammable atmospheres
 - (3) Dusty condition
 - (4) Excessive high or low pressure condition
 - (5) Humid site
 - (6) Places with brine, oil, chemical liquid or organic solvent
 - (7) Intense vibration
 - (8) Places with analogously deleterious

9.2 Usage

1. The ceramic body of the QV series varistors is fragile, no excessive pressure or impact shall be exerted on it.
2. The QV series varistors shall not be operated beyond the specified “Operating ambient temperature” range.