

Chip Varistor for Power-lines Protection

1. Identification (Part Number)

MLV 0806 P 241 K R 201
 ① ② ③ ④ ⑤ ⑥ ⑦

① Type	
Reel	Chip Varistor

③ Application Code	
P	Power-lines Protection

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

⑥ Packaging	
R	Reel
B	Bulk

② External Dimension L×W	
0806	2.0×1.6
1206	3.2×1.6
1210	3.2×2.5
1812	4.5×3.2
2220	5.7×5.0

⑤ Tolerance of Varistor Voltage	
K	±10%

⑦ Current @8/20μs	
RA	2.5KV Max. Ring Wave Voltage
201	200A

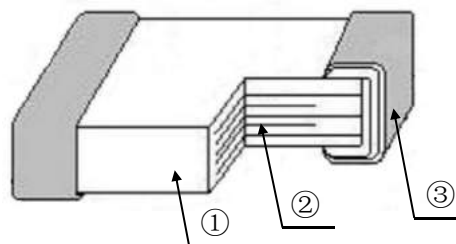
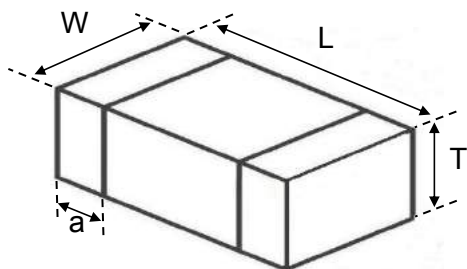
Features

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

Applications

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

2. Structure and Dimensions



Type	L (mm)	W (mm)	T (mm)	a (mm)
0604	1.65 +0.15/-0.15	1.05 +0.15/-0.15	1.20 Max.	0.25±0.15
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
2220	6.0 +0.7/-0.3	5.3 +0.5/-0.3	3.6 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. Electrical Characteristics

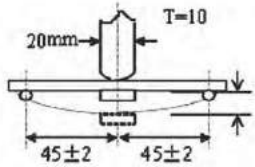
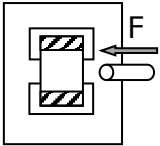
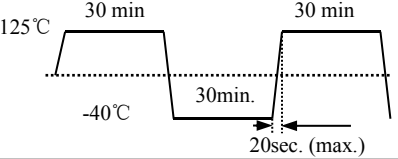
I. MLV0604P

Part No.	Max. Working Voltage		Varistor Voltage @1mA DC $V_{1mA}(V)$	Max. Clamping Voltage (8/20 μ s)		Max. Ring Wave Voltage (@30 Ω) $V_{Ring\ wave}$	Operation Ambient Temperature
	$V_{AC}(V)$	$V_{DC}(V)$		$V_c(V)$	$I_c(A)$		
MLV0604P271KR201	175	225	270 \pm 10%	450	1	201	-40 \sim +125 $^{\circ}C$

II. MLV0806P~MLV2220P

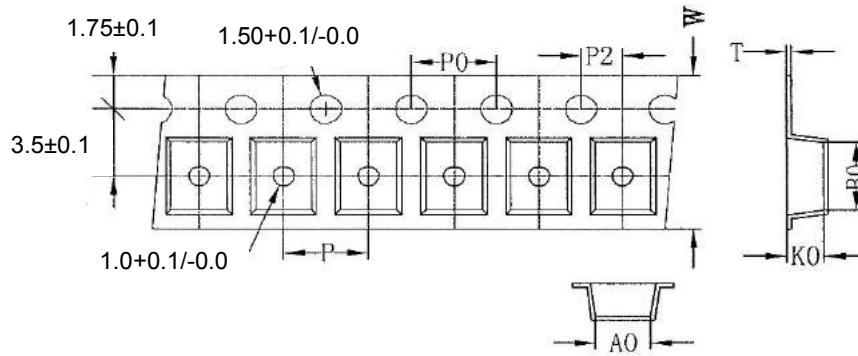
Part No.	Max. Working Voltage		Varistor Voltage @1mA DC $V_{1mA}(V)$	Max. Clamping Voltage (8/20 μ s)		Peak Current (8/20 μ s) $I_p(A)$	Operation Ambient Temperature
	$V_{AC}(V)$	$V_{DC}(V)$		$V_c(V)$	$I_c(A)$		
MLV0806P241KR201	150	200	240 \pm 10%	395	1	200	-40 \sim +125 $^{\circ}C$
MLV0806P271KR201	175	225	270 \pm 10%	450	1	200	-40 \sim +125 $^{\circ}C$
MLV0806P431KR101	275	350	430 \pm 10%	705	1	100	-40 \sim +125 $^{\circ}C$
MLV0806P471KR101	300	385	470 \pm 10%	775	1	100	-40 \sim +125 $^{\circ}C$
MLV1206P271KR301	175	225	270 \pm 10%	450	1	300	-40 \sim +125 $^{\circ}C$
MLV1206P431KR101	275	350	430 \pm 10%	705	1	100	-40 \sim +125 $^{\circ}C$
MLV1206P431KR201	275	350	430 \pm 10%	705	1	200	-40 \sim +125 $^{\circ}C$
MLV1206P471KR101	300	385	470 \pm 10%	775	1	100	-40 \sim +125 $^{\circ}C$
MLV1206P511KR101	320	410	510 \pm 10%	850	1	100	-40 \sim +125 $^{\circ}C$
MLV1210P471KR401	300	385	470 \pm 10%	775	2.5	400	-40 \sim +125 $^{\circ}C$
MLV1210P511KR301	320	410	510 \pm 10%	850	2.5	300	-40 \sim +125 $^{\circ}C$
MLV1210P561KR201	350	460	560 \pm 10%	950	2.5	200	-40 \sim +125 $^{\circ}C$
MLV1812P471KR601	300	385	470 \pm 10%	775	5	600	-40 \sim +125 $^{\circ}C$
MLV2220P471KR601	300	385	470 \pm 10%	775	10	600	-40 \sim +125 $^{\circ}C$

4. 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;	No visible damage Wetting coverage≥90%
4	Resistance to Soldering Heat	Solder temperature: 260±5°C; Dipping Duration: 5±1s;	① No visible mechanical damage. ② $ \Delta V_{1mA} / V_{1mA} \leq 10\%$.
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	High Temp. Storage	Temperature: 125±2°C Duration: 1000±24 h.	① No visible mechanical damage. ② $ \Delta V_{1mA} / V_{1mA} \leq 10\%$.
7	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\%$.
8	Damp Heat Load	Temperature: 40±2°C Humidity: 90% ~ 95% RH. Loading Voltage: V _{AC} . Duration: 500±24 h.	① No visible mechanical damage. ② $ \Delta V_{1mA} / V_{1mA} \leq 10\%$.
9	Maximum Surge Current	Pulse waveform: 8/20 us Number of hit: each 1 time of +/- polarity Applied current: maximum surge current (I _p)	① No visible mechanical damage. ② $ \Delta V_{1mA} / V_{1mA} \leq 10\%$.

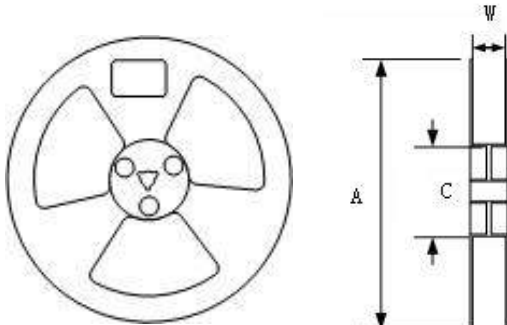
5. Packaging

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)
0604	1.3	2.1	1.3	0.30	8.0	4.0	4.0	2.0
0806	2.1	2.5	2.1	0.30	8.0	4.0	4.0	2.0
1206	2.1	3.8	2.1	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
2220	5.3	6.2	4.5	0.30	12.0	4.0	8.0	2.0

2. Taping reel dimensions



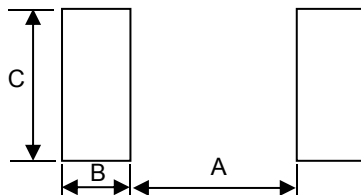
Type	Spec.	Dimensions(mm)		
		A	W	C
0604	7"	178±2	8.4+2.0/-0.0	58±2
0806	7"	178±2	8.4+2.0/-0.0	58±2
1206	7"	178±2	8.4+2.0/-0.0	58±2
1210	7"	178±2	8.4+2.0/-0.0	58±2
1812	13"	330±2	12.4+2.0/-0.0	100±2
2220	13"	330±2	12.4+2.0/-0.0	100±2

3. Packaging quantity

Type	Tape	Quantity (pcs/reel)
0604	Embossed Tape	3K
0806		2K
1206		2K
1210		1K
1812		500
2220		500

6. Soldering Recommendation

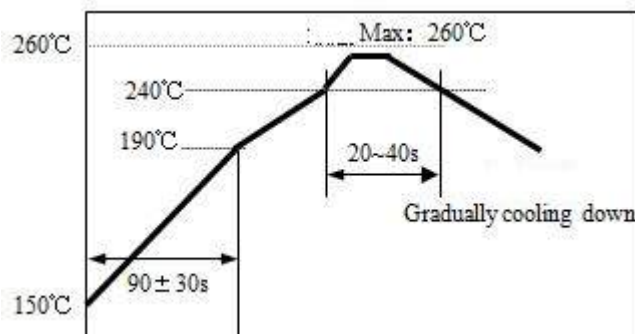
1. Recommended Land pattern



Type	A (mm)	B (mm)	C (mm)
0604	1.0~1.3	0.9~1.2	1.1~1.4
0806	1.2~1.6	0.8~1.2	1.6~2.2
1206	1.8~2.5	1.2~1.8	1.5~2.0
1210	1.8~2.5	1.3~2.0	2.2~3.0
1812	2.5~3.3	1.5~2.2	3.0~3.8
2220	4.1~4.9	1.5~2.2	5.7~6.4

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.



7. Notes & Warnings

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

Usage

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