

Packaging / Marking Information

SMD Chips (ZV, ZVX, ZVE, AV) Series

- Tape & Reel Specifications
- Case Size Dimensions
- Recommended Soldering Pad Dimensions

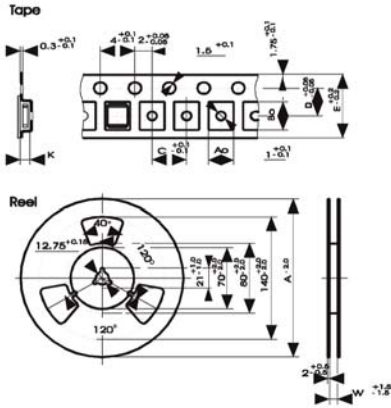
Leaded Devices (ZV, AV, MV OV) Series

- Tape & Reel Specifications
- Ammo Pack Dimensions
- Lead Style Information
- Marking Information

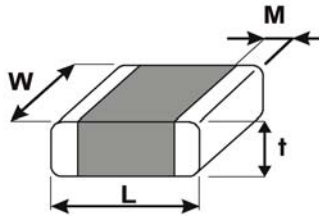
Packaging Information – ZV/ZVX/ZVE/AV SMD Series

Tape and Reel Specification

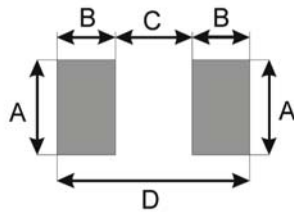
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Tape / Reel Dimensions								
Case Size								
Parameters	0603	0805	1206	1210	1812	2220	3225	Unit
A ₀	1.2 0.047	1.6 0.063	1.9 0.075	2.9 0.114	3.75 0.148	5.6 0.220	7.0 0.276	mm inches
B ₀	1.9 0.075	2.4 0.094	3.75 0.148	3.7 0.146	5.0 0.197	6.25 0.246	8.7 0.343	mm inches
C	4.0 0.157	4.0 0.157	4.0 0.157	4.0 0.157	8.0 0.315	8.0 0.315	12.0 0.472	mm inches
D	3.5 0.138	3.5 0.138	3.5 0.138	3.5 0.138	5.5 0.217	5.5 0.217	7.5 0.295	mm inches
E	8.4 0.331	8.4 0.331	8.4 0.331	8.4 0.331	12.4 0.488	12.4 0.488	16.4 0.646	mm inches
K _{MAX}	1.1 0.043	1.1 0.043	1.8 0.071	2.0 0.079	2.0 0.079	2.0 0.079	3.7 0.146	mm inches
W	8.4 0.331	8.4 0.331	8.4 0.331	8.4 0.331	12.4 0.488	12.4 0.488	16.4 0.646	mm inches
A	180/330 7/13	180/330 7/13	180/330 7/13	180/330 7/13	180/330 7/13	180/330 7/13	330 13	mm inches



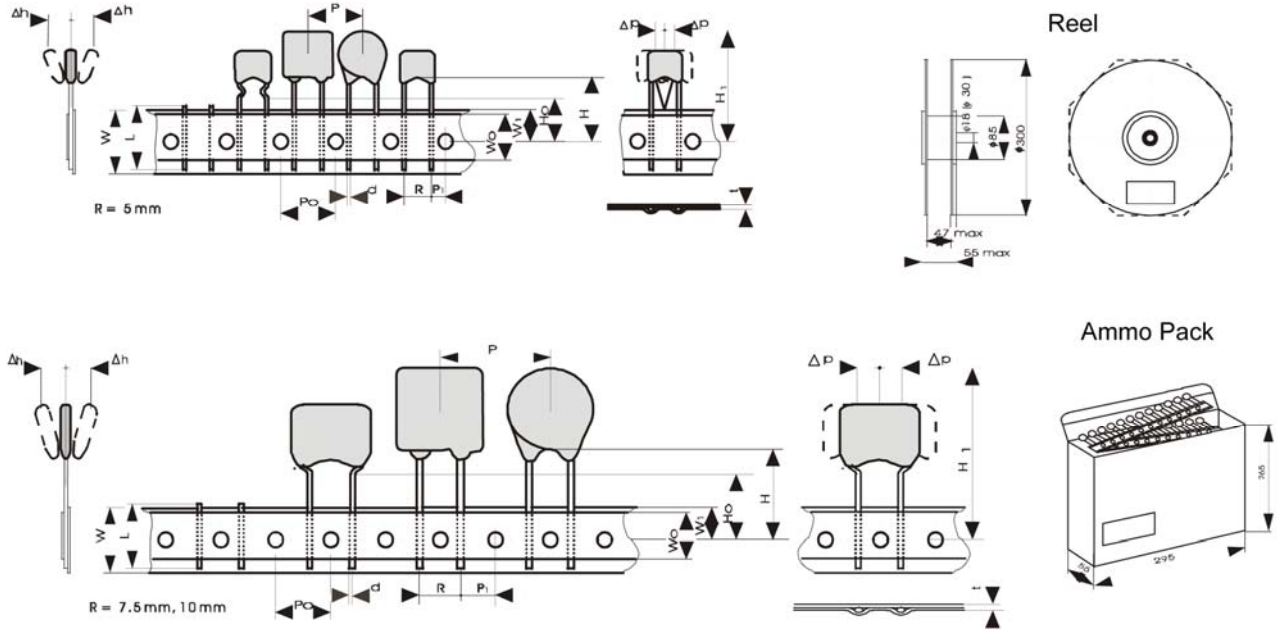
Case Size Dimensions					
Size	L Length	W Width	t Thickness	M Land Length	Unit
0603	1.60 ± 0.15 0.063 ± 0.006	0.80 ± 0.10 0.031 ± 0.004	1.0 max. 0.040 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches
0805	2.00 ± 0.20 0.079 ± 0.008	1.25 ± 0.15 0.049 ± 0.006	1.1 max. 0.043 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches
1206	3.20 ± 0.30 0.126 ± 0.012	1.60 ± 0.20 0.063 ± 0.008	1.6 max. 0.063 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches
1210	3.20 ± 0.30 0.126 ± 0.012	2.50 ± 0.25 0.100 ± 0.010	1.8 max. 0.070 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches
1812	4.50 ± 0.35 0.177 ± 0.014	3.20 ± 0.30 0.126 ± 0.012	1.9 max. 0.075 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches
2220	5.70 ± 0.40 0.224 ± 0.016	5.00 ± 0.40 0.197 ± 0.016	1.9 max. 0.075 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches
3225	8.00 ± 0.50 0.315 ± 0.020	6.30 ± 0.40 0.248 ± 0.016	2.0 max. 0.079 max.	0.50 ± 0.25 0.020 ± 0.01	mm inches



Recommended Soldering Pad Dimensions					
Size	A	B	C	D	Unit
0603	1.0 0.039	1.0 0.039	1.0 0.039	3.0 0.118	mm inches
0805	1.4 0.055	1.2 0.047	1.0 0.039	3.4 0.134	mm inches
1206	1.8 0.071	1.2 0.047	2.1 0.083	4.5 0.177	mm inches
1210	2.8 0.110	1.2 0.047	2.1 0.083	4.5 0.177	mm inches
1812	3.6 0.142	1.5 0.059	3.0 0.118	6.0 0.236	mm inches
2220	5.5 0.217	1.5 0.059	4.2 0.165	7.2 0.283	mm inches
3225	6.8 0.268	1.5 0.059	6.5 0.256	9.5 0.374	mm inches

Packaging Information – ZV/AV Ledged Series Tape & Reel Specification

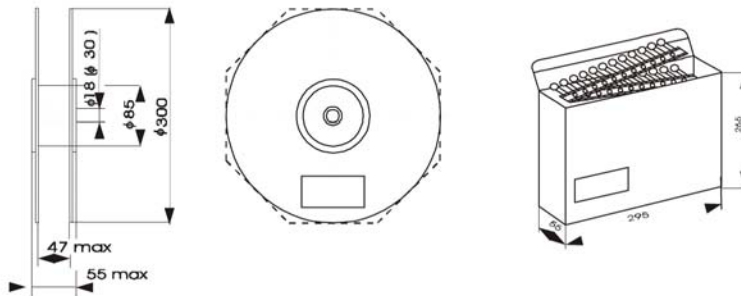
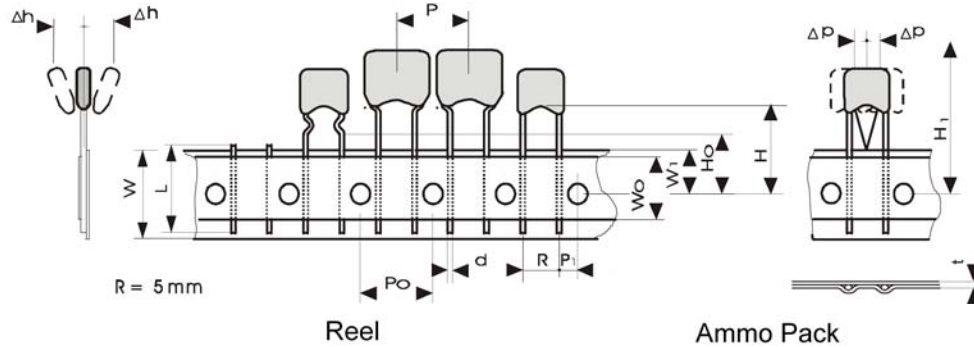
Conforms to IEC Publication 286-2



Ammo Pack Dimensions							
Symbol	Parameters	ZV 05	ZV 07	ZV 10	ZV 14	ZV 20	Unit
		AV 602 / 802 / 902		AV 903 / 1103			
W	Tape Width	18 +1.0/-0.5 0.71 +0.04/-0.02	18 +1.0/-0.5 0.71 +0.04/-0.02	18 +1.0/-0.5 0.71 +0.04/-0.02	18 +1.0/-0.5 0.71 +0.04/-0.02	18 +1.0/-0.5 0.71 +0.04/-0.02	mm inches
W ₀	Hold Down Tape Width	12 min. 0.47 min.	12 min. 0.47 min.	12 min. 0.47 min.	12 min. 0.47 min.	12 min. 0.47 min.	mm inches
W ₁	Hold Position	9 +0.75/0.5 0.35 +0.03/0.02	9 +0.75/0.5 0.35 +0.03/0.02	9 +0.75/0.5 0.35 +0.03/0.02	9 +0.75/0.5 0.35 +0.03/0.02	9 +0.75/0.5 0.35 +0.03/0.02	mm inches
t	Total Tape Thickness	0.9 max. 0.04 max.	0.9 max. 0.04 max.	0.9 max. 0.04 max.	0.9 max. 0.04 max.	0.9 max. 0.04 max.	mm inches
P	Pitch of Component	12.7 ± 1.0 0.5 ± 0.04	12.7 ± 1.0 0.5 ± 0.04	12.7 ± 1.0 0.5 ± 0.04	12.7 ± 1.0 0.5 ± 0.04	12.7 ± 1.0 0.5 ± 0.04	mm inches
P ₀	Feed Hold Pitch	12.7 ± 0.2 0.5 ± 0.01	12.7 ± 0.2 0.5 ± 0.01	12.7 ± 0.2 0.5 ± 0.01	12.7 ± 0.2 0.5 ± 0.01	12.7 ± 0.2 0.5 ± 0.01	mm inches
P ₁	Feed Hold Center to Pitch	3.81 ± 0.7 0.15 ± 0.03	3.81 ± 0.7 0.15 ± 0.03	8.89 ± 0.8 0.35 ± 0.03	8.89 ± 0.8 0.35 ± 0.03	7.62 ± 0.8 0.30 ± 0.03	mm inches
R	Lead Spacing	5.08 +0.6/-0.1 0.2 +0.02/-0.004	5.08 +0.6/-0.1 0.2 +0.02/-0.004	7.62 +0.6/-0.1 0.3 +0.02/-0.004	7.62 +0.6/-0.1 0.3 +0.02/-0.004	10.16 +0.6/-0.1 0.4 +0.02/-0.004	mm inches
ΔP	Component Alignment	± 1.3 max ± 0.05 max	± 1.3 max ± 0.05 max	± 2.0 max. ± 0.08 max.	± 2.0 max. ± 0.08 max.	± 2.0 max. ± 0.08 max.	mm inches
Δh	Component Alignment	± 2.0 max ± 0.08 max	± 2.0 max ± 0.08 max	Depends on t _{max}	Depends on t _{max}	Depends on t _{max}	mm inches
d	Wire Diameter	0.6 ± 0.05 0.024 ± 0.002	0.6 ± 0.05 0.024 ± 0.002	0.8 ± 0.05 0.031 ± 0.002	0.8 ± 0.05 0.031 ± 0.002	0.8 ± 0.05 0.031 ± 0.002	mm inches
D ₀	Feed Hold Diameter	4 ± 0.2 0.16 ± 0.01	4 ± 0.2 0.16 ± 0.01	4 ± 0.2 0.16 ± 0.01	4 ± 0.2 0.16 ± 0.01	4 ± 0.2 0.16 ± 0.01	mm inches
H	Height from Tape Center to Component Base	18 +2.0/-0.0 0.71 ± 0.0	18 +2.0/-0.0 0.71 ± 0.0	18 +2.0/-0.0 0.71 ± 0.0	18 +2.0/-0.0 0.71 ± 0.0	18 +2.0/-0.0 0.71 ± 0.0	mm inches
H ₀	Seating Plane Height	16 ± 0.5 0.63 ± 0.02	16 ± 0.5 0.63 ± 0.02	16 ± 0.5 0.63 ± 0.02	16 ± 0.5 0.63 ± 0.02	16 ± 0.5 0.63 ± 0.02	mm inches
H ₁	Component Height	32.2 max 1.27 max	32.2 max 1.27 max	38.5 max. 1.52 max.	40.0 max. 1.57 max.	46.5 max. 1.83 max	mm inches
L	Length of Clipped Lead	11 max. 0.43 max	11 max. 0.43 max	11 max. 0.43 max	11 max. 0.43 max	11 max. 0.43 max	mm inches

Packaging Information – MV/OV Ledged Dual Function Series Tape & Reel Specification

Conforms to IEC Publication 286-2



Ammo Pack Dimensions

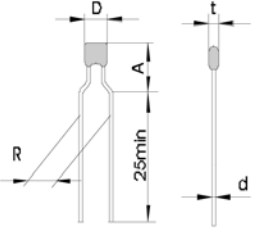
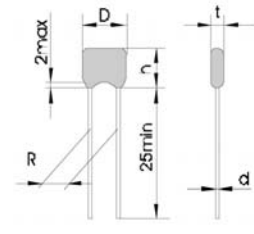
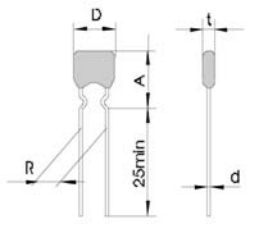
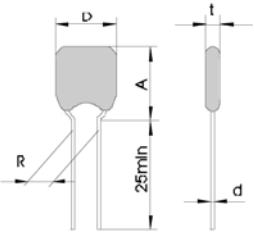
Symbol	Parameters	Model Sizes		Unit
		MV 6 x 9 mm	OV 7.3 x 9.0 / 7.8 x 12 mm	
W	Tape Width	18 +1.0/-0.5 0.71 +0.04/-0.02	18 +1.0/-0.5 0.71 +0.04/-0.02	mm inches
W ₀	Hold Down Tape Width	12 min. 0.47 min.	12 min. 0.47 min.	mm inches
W ₁	Hold Position	9 +0.75/0.5 0.35 +0.03/0.02	9 +0.75/0.5 0.35 +0.03/0.02	mm inches
t	Total Tape Thickness	0.9 max. 0.04 max.	0.9 max. 0.04 max.	mm inches
P	Pitch of Component	12.7 ± 1.0 0.5 ± 0.04	12.7 ± 1.0 0.5 ± 0.04	mm inches
P ₀	Feed Hold Pitch	12.7 ± 0.2 0.5 ± 0.01	12.7 ± 0.2 0.5 ± 0.01	mm inches
P ₁	Feed Hold Center to Pitch	3.81 ± 0.7 0.15 ± 0.03	3.81 ± 0.7 0.15 ± 0.03	mm inches
R	Lead Spacing	5.08 +0.6/-0.1 0.2 +0.02/-0.004	5.08 +0.6/-0.1 0.2 +0.02/-0.004	mm inches
ΔP	Component Alignment	± 1.3 max ± 0.05 max	± 1.3 max ± 0.05 max	mm inches
Δh	Component Alignment	± 2.0 max ± 0.08 max	± 2.0 max ± 0.08 max	mm inches
d	Wire Diameter	0.6 ± 0.05 0.024 ± 0.002	0.6 ± 0.05 0.024 ± 0.002	mm inches
D ₀	Feed Hold Diameter	4 ± 0.2 0.16 ± 0.01	4 ± 0.2 0.16 ± 0.01	mm inches
H	Height from Tape Center to Component Base	18 +2.0/-0.0 0.71 ± 0.0	18 +2.0/-0.0 0.71 ± 0.0	mm inches
H ₀	Seating Plane Height	16 ± 0.5 0.63 ± 0.02	16 ± 0.5 0.63 ± 0.02	mm inches
H ₁	Component Height	32.2 max 1.27 max	32.2 max 1.27 max	mm inches
L	Length of Clipped Lead	11 max. 0.43 max	11 max. 0.43 max	mm inches

Lead Style Information – ZV/AV Ledged Series

Lead Style (Version) / Lead Spacing						
Product Series / Range	Dimensions			Unit	Version 1	Version 5
	R	h	A			
ZV 2M...40K 05	5 0.197		7 0.276	mm inch		
ZV 2M...40K 07	5 0.197		8 0.315	mm inch		
ZV 4M...40K 10	5 0.197		9 0.354	mm inch		
AV 14K...30K 602 003	5 0.197		8 0.315	mm inch		
ZV 4M...40K 14	5 0.197	9 0.354	12 0.472	mm inch		
AV 14K...30K 802 006	5 0.197	9 0.354	12 0.472	mm inch		
ZV 4M...40K 20	5 0.197		12 0.472	mm inch		
AV 14K...30K 902 012...025	5 0.197		12 0.472	mm inch		
AV 14K...30K 1103 50	7.5 0.295		12 0.472	mm inch		
AV 25...35K 20...40 050...100	10 0.394	24 0.945		mm inch		

Contact Factory for additional lead styles (i.e.: clipped leads, crimped leads).

Lead Style Information – MV/OV Leaded Series

Lead Style (Version) / Lead Spacing						
Product Series / Range	Dimensions			Unit	Version 1	Version 5
	R	h	A			
MV 2M...95K 103 MV 2M...95K 104 MZ MV 2M...95K 105	5 0.197		9 0.354	mm inch		
OV 14K...40K 474 MZ OV 14K...40K 105 MZ 801 OV 14K...40K 155 MZ	5 0.197	9 0.354	12 0.472	mm inch		
OV 14K...40K 474 MZ OV 14K...40K 105 MZ 122 OV 14K...40K 155 MZ	5 0.197		12 0.472	mm inch		

Contact Factory for additional lead styles (i.e.: clipped leads, crimped leads).

Marking Information ZV/AV Leaded Series

Leaded Varistor Marking

ZV Series:

For Model Sizes 05, 07

14 Z 5

14 = V_{RMS}
Z = First Letter of Series
5 = Model Size

For Model Size 10

ZV 40

K 10

ZV = Series Name
40 = V_{RMS}
K = V_N Tolerance
10 = Model Size

For Model Sizes 14, 20

KEKO

ZV 11

K 20

KEKO = Trade name
ZV = Series Name
11 = V_{RMS}
K = V_N Tolerance
20 = Model Size

AV Series:

For Model Size 602

20 A 003

20 = V_{RMS}
A = First Letter of Series
003 = W_{LD} Code: 3 Joules

For Model Size 802

AV 17 K

802 006

AV = Series Name
17 = V_{RMS}
K = V_N Tolerance
802 = Model Size
006 = W_{LD} Code: 6 Joules

For Model Sizes 902, 1103

KEKO

AV 30 K

1103 050

KEKO = Trade name
AV = Series Name
30 = V_{RMS}
K = V_N Tolerance
1103 = Model Size
050 = W_{LD} Code: 50 Joules

For Model Sizes 20, 40

KEKO

AV 25 K

20 050

KEKO = Tradename
AV = Series Name
25 = V_{RMS}
K = V_N Tolerance
20 = Model Size
050 = W_{LD} Code: 50 Joules

Marking Information – MV/OV Leaded Series

Leaded Varistor Marking

MV Series:

For Model Size 6 x 9mm

MV 14 K

103 Z

MV = Series Name

14 = V_{RMS}

K = V_N Tolerance

103 = Capacitance Code

Z = Dielectric Code: Z for Z5U/Y5V

OV Series:

For Model Sizes 7.3 x 9 & 7.8 x 9mm

KEKO

OV 20 K

474 MZ

122

KEKO = Tradename

OV = Series Name

20 = V_{RMS}

K = V_N Tolerance

474 = Capacitance Code

M = Capacitance Tolerance

Z = Dielectric Code: Z for Z5U/Y5V

122 = Current Code: 801 for 800A
122 for 1200A