

## ZV Series

### Features

- ◆ Low impedance 100 KHz
- ◆ Reflow soldering is available
- ◆ Available for high density mounting
- ◆ Endurance 2000~5000 hrs at 105°C
- ◆ RoHS Compliant



### Specifications

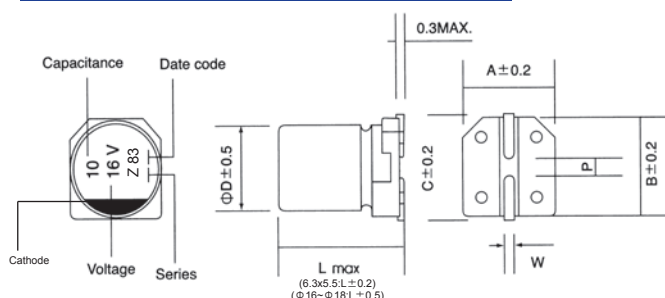
Item	Performance Characteristics																					
Operating Temperature Range	-55~ +105°C																					
Rated Voltage Range	6.3~50 VDC																					
Capacitance Range	2.2 to 6800 $\mu$ F																					
Capacitance Tolerance	$\pm 20\%$ (120Hz, +20°C)																					
Leakage Current (+20°C, max.)	$I \leq 0.01$ CV or 3 ( $\mu$ A) After 2 minutes whichever is greater measured with rated working voltage applied.																					
Dissipation Factor ( $\tan \delta$ , at 20°C , 120Hz)	<table border="1"> <tr> <td>Working voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>D.F.(%)max</td> <td>26</td> <td>19</td> <td>16</td> <td>14</td> <td>14</td> <td>12</td> </tr> </table>	Working voltage(VDC)	6.3	10	16	25	35	50	D.F.(%)max	26	19	16	14	14	12							
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D.F.(%)max	26	19	16	14	14	12																
Low Temperature Characteristics (at 120Hz)	Impedance ratio max																					
	<table border="1"> <tr> <td>Rated voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Z-25°C / Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C / Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(VDC)	6.3	10	16	25	35	50	Z-25°C / Z+20°C	4	3	2	2	2	2	Z-40°C / Z+20°C	8	6	4	3	3	3
	Rated voltage(VDC)	6.3	10	16	25	35	50															
Z-25°C / Z+20°C	4	3	2	2	2	2																
Z-40°C / Z+20°C	8	6	4	3	3	3																
Endurance	Test conditions Duration time :2000 Hrs Ambient temperature :+105°C Applied voltage :Rated DC working voltage After test requirement at +105°C: Capacitance change :Within $\pm 25\%$ of the initial value Dissipation factor :Less than 200% of specified value Leakage current :Less than the initial specified value																					
Shelf Life	Test conditions Duration time :1000 Hrs Ambient temperature :+105°C Applied voltage :None After test requirement at +20°C : Same limits as Endurance. Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes.																					
Resistance to soldering heat	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristic requirements listed under.																					
	<table border="1"> <tr> <td>Leakage current</td> <td>Less than specified value</td> </tr> <tr> <td>Capacitance change</td> <td>Within <math>\pm 10\%</math> of initial value</td> </tr> <tr> <td><math>\tan \delta</math></td> <td>Less than specified value</td> </tr> </table>	Leakage current	Less than specified value	Capacitance change	Within $\pm 10\%$ of initial value	$\tan \delta$	Less than specified value															
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### Multiplier for Ripple Current vs. Frequency

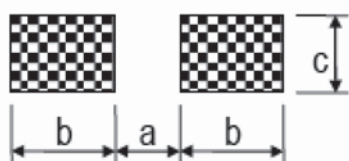
CAP( $\mu$ F)\Frequency(Hz)	60(50)	120	500	1K	10K	50K-100K
CAP $\leq 10$	0.47	0.59	0.76	0.85	0.97	1.0
10 < CAP	0.52	0.65	0.80	0.89	0.97	1.0

$\phi$ D	L	A	B	C	W	P
4	5.5	4.3	4.3	4.9	0.5~0.8	1.0
5	5.5	5.3	5.3	5.9	0.5~0.8	1.4
6.3	5.5	6.6	6.6	7.2	0.5~0.8	2.2
6.3	6.1	6.6	6.6	7.2	0.5~0.8	2.2
6.3	7.7	6.6	6.6	7.2	0.5~0.8	2.2
8	6.5	8.3	8.3	9.0	0.5~0.8	2.3
8	10.5	8.3	8.3	9.0	0.7~1.1	3.1
10	10.5	10.3	10.3	11.0	0.7~1.1	4.5
12.5	14	13.0	13.0	13.9	1.0~1.4	4.5
16	17	17.0	17.0	18.0	1.0~1.4	6.6
16	21.5	17.0	17.0	18.0	1.0~1.4	6.6
18	16.5	19.0	19.0	20.0	1.0~1.4	6.6
18	21.5	19.0	19.0	20.0	1.0~1.4	6.6

### Diagram of Dimensions:(unit:mm)



## Recommended land pattern:(unit:mm)



Φ DxL	a	b	c
4xall	1	2.6	1.6
5xall	1.4	3	1.6
6.3xall	2.1	3.5	1.6
8xL(height ≤6.5)	2.1	4.5	1.6
8xL(height >6.5)	2.8	4.2	1.9
10xall	4.3	4.4	1.9
12.5xall	4.3	5.8	2.5
16xall	6	6.5	3.5
18xall	6	7.5	3.5

## Case Size

WV (Vdc)	Cap (uF)	Size (mm)	Ripple current (mArms/105°C /100KHz)	Max ESR 20°C 100KHz(Ω)
6.3	22	4x5.5	53	3.50
6.3	27	4x5.5	65	3.20
6.3	33	4x5.5	80	2.80
6.3	33	5x5.5	82	2.60
6.3	47	4x5.5	82	2.40
6.3	47	5x5.5	85	2.20
6.3	56	5x5.5	94	1.70
6.3	68	5x5.5	100	1.60
6.3	68	6.3x5.5	120	1.30
6.3	100	5x5.5	110	1.50
6.3	100	6.3x5.5	160	1.100
6.3	150	6.3x5.5	170	0.950
6.3	150	6.3x7.7	195	0.85
6.3	220	6.3x5.5	195	0.60
6.3	220	6.3x7.7	210	0.57
6.3	330	6.3x7.7	230	0.51
6.3	330	8x6.5	250	0.49
6.3	470	8x10.5	380	0.45
6.3	680	8x10.5	420	0.42
6.3	1000	8x10.5	470	0.28
6.3	1000	10x10.5	500	0.25
6.3	1200	10x10.5	530	0.20
6.3	1500	10x10.5	570	0.170
6.3	3300	12.5x14	900	0.15
6.3	6800	16x17	1030	0.1
10	22	4x5.5	80	2.60
10	27	5x5.5	85	2.40
10	33	4x5.5	85	2.30
10	33	5x5.5	110	2.10
10	47	5x5.5	130	2.00
10	47	6.3x5.5	160	1.50
10	56	6.3x5.5	180	1.45
10	68	6.3x5.5	195	1.40
10	68	6.3x7.7	210	1.30
10	100	5x5.5	183	1.30
10	100	6.3x5.5	210	1.30
10	100	6.3x7.7	230	1.20
10	150	6.3x5.5	220	1.00
10	150	8x6.5	240	0.80
10	220	6.3x7.7	245	0.60
10	220	8x6.5	255	0.55
10	330	8x10.5	400	0.36
10	470	8x10.5	470	0.32
10	680	10x10.5	620	0.29
10	1000	10x10.5	670	0.25
10	2200	12.5x14	900	0.15
10	4700	16x17	1030	0.11
16	10	4x5.5	65	5.00

WV (Vdc)	Cap (uF)	Size (mm)	Ripple current (mArms/105°C /100KHz)	Max ESR 20°C 100KHz(Ω)
16	15	4x5.5	70	4.60
16	22	4x5.5	83	3.00
16	22	5x5.5	110	2.60
16	27	5x5.5	135	1.90
16	33	5x5.5	160	2.20
16	33	6.3x5.5	170	1.50
16	47	5x5.5	170	2.00
16	47	6.3x5.5	185	1.50
16	56	6.3x5.5	195	1.30
16	68	6.3x5.5	205	1.20
16	68	6.3x7.7	210	1.10
16	68	8x6.5	220	1.00
16	100	6.3x5.5	210	1.10
16	100	6.3x7.7	220	0.90
16	150	6.3x7.7	225	0.80
16	150	8x6.5	240	0.70
16	220	6.3x7.7	250	0.75
16	220	8x6.5	260	0.66
16	330	8x10.5	470	0.34
16	470	8x10.5	520	0.30
16	680	10x10.5	600	0.26
16	1200	12.5x14	900	0.15
16	1500	12.5x14	900	0.15
16	3300	16x17	1030	0.11
25	4.7	4x5.5	53	5.00
25	6.8	4x5.5	58	4.50
25	10	4x5.5	74	3.70
25	10	5x5.5	80	2.60
25	15	5x5.5	100	2.20
25	15	6.3x5.5	115	1.80
25	22	5x5.5	128	1.70
25	22	6.3x5.5	140	1.50
25	27	6.3x5.5	145	1.40
25	33	5x5.5	145	1.40
25	33	6.3x5.5	175	1.30
25	47	6.3x5.5	180	1.20
25	47	6.3x7.7	195	0.80
25	47	8x6.5	220	0.75
25	56	6.3x5.5	195	1.15
25	68	6.3x5.5	200	1.10
25	68	6.3x7.7	210	0.75
25	68	8x6.5	230	0.70
25	100	6.3x7.7	220	0.75
25	100	8x6.5	250	0.70
25	150	8x10.5	420	0.50
25	220	8x10.5	480	0.30
25	220	10x10.5	500	0.28
25	330	8x10.5	510	0.26

WV (Vdc)	Cap (uF)	Size (mm)	Ripple current (mA <sub>rms</sub> /105°C /100KHz)	Max ESR 20°C 100KHz(Ω)
25	470	10x10.5	570	0.18
25	1000	12.5x14	900	0.15
25	2200	16x17	1030	0.11
35	2.2	4x5.5	53	5
35	3.3	4x5.5	53	5
35	4.7	4x5.5	53	5
35	6.8	4x5.5	65	4
35	6.8	5x5.5	85	3
35	10	4x5.5	90	4
35	10	5x5.5	98	3
35	10	6.3x5.5	110	2
35	15	5x5.5	120	2
35	15	6.3x5.5	140	2
35	22	5x5.5	140	1
35	22	6.3x5.5	150	1
35	27	6.3x5.5	165	1
35	33	6.3x5.5	185	1
35	33	6.3x7.7	210	1
35	33	8x6.5	230	1
35	47	6.3x5.5	200	1
35	47	6.3x7.7	220	1
35	47	8x6.5	240	1
35	56	6.3x7.7	230	1
35	68	6.3x7.7	240	0.7
35	68	8x6.5	250	0.68
35	100	6.3x7.7	270	0.67
35	100	8x10.5	350	0.50

WV (Vdc)	Cap (uF)	Size (mm)	Ripple current (mA <sub>rms</sub> /105°C /100KHz)	Max ESR 20°C 100KHz(Ω)
35	150	8x10.5	430	0.45
35	220	8x10.5	450	0.25
35	330	10x10.5	570	0.23
35	470	12.5x14	900	0.15
35	680	12.5x14	900	0.15
35	1500	16x17	1030	0.11
50	2.2	4x5.5	53	5.00
50	3.3	4x5.5	53	5.000
50	4.7	4x5.5	53	5.000
50	6.8	5x5.5	65	4.00
50	10	5x5.5	90	3.50
50	10	6.3x5.5	100	2.50
50	15	6.3x5.5	130	1.80
50	22	6.3x5.5	140	1.50
50	27	6.3x7.7	160	1.35
50	33	6.3x7.7	170	0.80
50	33	8x6.5	180	0.75
50	47	6.3x7.7	200	0.79
50	47	8x6.5	220	0.72
50	56	8x10.5	260	0.680
50	68	8x10.5	300	0.60
50	100	8x10.5	310	0.6
50	150	10x10.5	540	0.28
50	220	10x10.5	570	0.26
50	330	12.5x14	620	0.25
50	1000	16x17	820	0.20