

LOW IMPEDANCE
低阻抗品

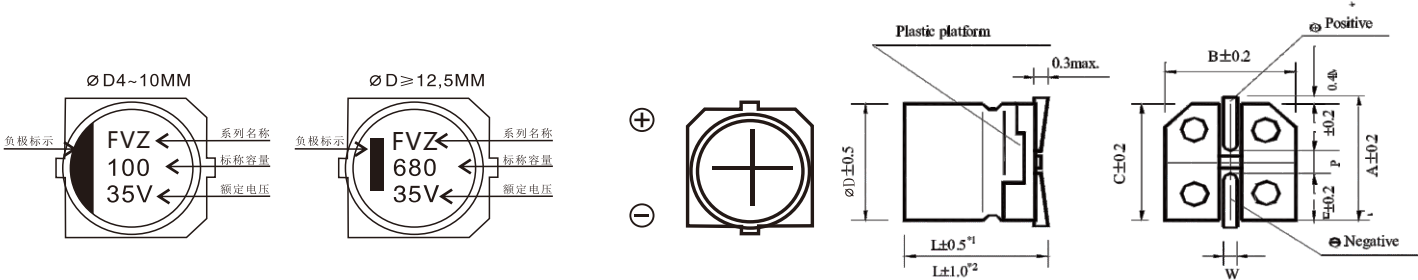
- Low impedance with temperature range -55~+105℃
低阻抗和适用于-55~+105℃的温度范围
- Load life of 2000 hours
负荷寿命2000 小时
- Comply with the RoHS directive
符合 RoHS 指令



SPECIFICATIONS 特性表

Items 项目	Characteristics 主要特性																																															
Operation Temperature Range 使用温度范围	-55 ~ +105℃																																															
Voltage Range 额定工作电压范围	6.3 ~ 50V																																															
Capacitance Range 静电容量范围	1 ~ 4700 μF																																															
Capacitance Tolerance 静电容量允许偏差	± 20% at 120Hz, 20℃																																															
Leakage Current 漏电流	Leakage current (Ø4~Ø10) ≤ 0.01CV or 3 μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (Ø12.5~Ø16) ≤ 0.03CV or 4 μA, whichever is greater (after 1 minute application of rated voltage) 漏电流 (Ø4~Ø10) ≤ 0.01CV 或 3 μA, 取较大值 (施加额定工作电压 2 分钟后) 漏电流 (Ø12.5~Ø16) ≤ 0.03CV 或 4 μA, 取较大值 (施加额定工作电压 1 分钟后)																																															
Dissipation Factor (tan δ) 损耗角正切	Measurement frequency 测试频率: 120Hz, Temperature 温度: 20℃ <table><tr><td colspan="2">Rated Voltage (V) 额定工作电压</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td rowspan="2">tan δ(max.) 最大损耗角正切</td><td>Ø4~Ø10</td><td>0.22</td><td>0.20</td><td>0.18</td><td>0.16</td><td>0.14</td><td>0.12</td></tr><tr><td>Ø12.5~Ø16</td><td>0.26</td><td>0.22</td><td>0.18</td><td>0.16</td><td>0.14</td><td>0.12</td></tr></table>								Rated Voltage (V) 额定工作电压		6.3	10	16	25	35	50	tan δ(max.) 最大损耗角正切	Ø4~Ø10	0.22	0.20	0.18	0.16	0.14	0.12	Ø12.5~Ø16	0.26	0.22	0.18	0.16	0.14	0.12																	
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Stability at Low Temperature 低温特性	Measurement frequency 测试频率: 120Hz <table><tr><td colspan="3">Rated Voltage (V) 额定工作电压</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td rowspan="4">Impedance Ratio 阻抗比 ZT/Z20 (max.)</td><td rowspan="2">Ø4~Ø10</td><td>Z(-25℃) / Z(20℃)</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-55℃) / Z(20℃)</td><td>5</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td></tr><tr><td rowspan="2">Ø12.5~Ø16</td><td>Z(-25℃)/Z(20℃)</td><td>3</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-55℃) / Z(20℃)</td><td>10</td><td>8</td><td>6</td><td>4</td><td>3</td><td>3</td></tr></table>								Rated Voltage (V) 额定工作电压			6.3	10	16	25	35	50	Impedance Ratio 阻抗比 ZT/Z20 (max.)	Ø4~Ø10	Z(-25℃) / Z(20℃)	2	2	2	2	2	2	Z(-55℃) / Z(20℃)	5	4	4	3	3	3	Ø12.5~Ø16	Z(-25℃)/Z(20℃)	3	3	2	2	2	2	Z(-55℃) / Z(20℃)	10	8	6	4	3	3
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		Z(-55℃) / Z(20℃)	10	8	6	4	3	3																																								
Load Life 高温负荷特性	After 2000 hrs. application of the rated voltage at 105℃, they meet the characteristics listed below. 在 105℃ 环境中施加额定工作电压2000 小时后, 电容器的特性符合下表的要求。 <table><tr><td>Capacitance Change 静电容量变化率</td><td>Within ± 30% of initialvalue 初始值的 ±30%以内</td></tr><tr><td>Dissipation Factor 损耗角正切</td><td>200% or less of initial specified value 不大于规范值的200%</td></tr><tr><td>Leakage Current 漏电流</td><td>initial specified value or less 不大于规范值</td></tr></table>								Capacitance Change 静电容量变化率	Within ± 30% of initialvalue 初始值的 ±30%以内	Dissipation Factor 损耗角正切	200% or less of initial specified value 不大于规范值的200%	Leakage Current 漏电流	initial specified value or less 不大于规范值																																		
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Shelf Life 高温贮存特性	After leaving capacitors under no load at 105℃ for 1000 hours, they meet the specified value for load life characteristics listed above. 在105℃ 环境中无负荷放置1000 小时后, 电容器的特性符合高温负荷特性中所列的规定值。																																															
Resistance to Soldering Heat 耐焊接热特性	After reflow soldering and restored at room temperature, they meet the characteristics listed below. 经过回流焊并冷却至室温后, 电容器的特性符合下表的要求。 <table><tr><td>Capacitance Change 静电容量变化率</td><td>Within ± 10% of initial value 初始值的 ±10%以内</td></tr><tr><td>Dissipation Factor 损耗角正切</td><td>initial specified value or less 不大于规范值</td></tr><tr><td>Leakage Current 漏电流</td><td>initial specified value or less 不大于规范值</td></tr></table>								Capacitance Change 静电容量变化率	Within ± 10% of initial value 初始值的 ±10%以内	Dissipation Factor 损耗角正切	initial specified value or less 不大于规范值	Leakage Current 漏电流	initial specified value or less 不大于规范值																																		
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Leakage Current 漏电流	initial specified value or less 不大于规范值																																															
Marking 标识	Black print on the case top. 铝壳顶部黑字印刷。																																															

DRAWING (Unit: mm) 外形图



*1. Applicable to Ø4~Ø10×13.5 适用于 Ø4~Ø10×13.5
*2. Applicable to Ø12.5~Ø16 适用于 Ø12.5~Ø16
* A pressure relief vent is attached to products over ØD=8×10.5
* ØD=8×10.5以上产品有缓压防爆阀

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□ DIMENSIONS (Unit: mm) 尺寸表

D x L	4 x 5.4	5 x 5.4	6.3 x 5.4	6.3 x 7.7	8 x 10.5	10 x 10.5	10 x 13.5	12.5 x 13.5	12.5 x 16	16 x 16.5
A	5.1	6.1	7.3	7.3	9.2	11.2	11.2	13.8	13.8	18.0
B	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0
P ± 0.2	1.0	1.3	2.2	2.2	3.1	4.4	4.4	4.4	4.4	6.7
L	5.4	5.4	5.4	7.7	10.5	10.5	13.5	13.5	16.0	16.5

□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT& IMPEDANCE 规格尺寸及最大允许纹波电流及阻抗值

μF	WV Code 代码	6.3			10			16		
		0J			1A			1C		
10	100							4 x 5.4	3.0	60
15	150							5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)
22	220	4 x 5.4	3.0	60	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)
33	330	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)
47	470	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)
68	680	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)	6.3 x 5.4	1.0	140	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)
100	101	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)
150	151	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)	6.3 x 7.7	0.6	230
220	221	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)	6.3 x 7.7	0.6	230	8 x 10.5 (6.3 x 7.7)	0.30 (0.6)	450 (230)
330	331	6.3 x 7.7	0.6	230	8 x 10.5	0.30	450	10 x 10.5 (8 x 10.5)	0.15 (0.30)	670 (450)
470	471	8 x 10.5 (6.3 x 7.7)	0.30 (0.60)	450 (230)	8 x 10.5	0.30	450	10 x 10.5 (8 x 10.5)	0.15 (0.30)	670 (450)
680	681	8 x 10.5	0.30	450	10 x 10.5	0.15	670	10 x 10.5	0.15	670
1000	102	10 x 10.5 (8 x 10.5)	0.15 (0.30)	670 (450)	10 x 10.5	0.15	670	10 x 10.5	0.15	670
1500	152	10 x 13.5 (10 x 10.5)	0.13 (0.15)	750 (670)	12.5 x 13.5 (10 x 13.5)	0.11 (0.13)	820 (750)	12.5 x 13.5	0.11	820
2200	222	12.5 x 13.5 (10 x 13.5)	0.11 (0.13)	820 (750)	12.5 x 16	0.09	950	16 x 16.5 (12.5 x 16)	0.08 (0.09)	1260 (950)
3300	332	12.5 x 16 (12.5 x 13.5)	0.09 (0.11)	950 (820)	16 x 16.5	0.08	1260	16 x 16.5	0.08	1260
4700	472	16 x 16.5	0.08	1260	16 x 16.5	0.08	1260			

μF	WV Code 代码	25			35			50		
		1E			1V			1H		
1	010				4 x 5.4	3.0	60	4 x 5.4	5.0	30
1.5	1R5				4 x 5.4	3.0	60	4 x 5.4	5.0	30
2.2	2R2				4 x 5.4	3.0	60	4 x 5.4	5.0	30
3.3	3R3				4 x 5.4	3.0	60	4 x 5.4	5.0	30
4.7	4R7	4 x 5.4	3.0	60	4 x 5.4	3.0	60	5 x 5.4	3.0	50
6.8	6R8	4 x 5.4	3.0	60	5 x 5.4	1.8	95	6.3 x 5.4	2.0	70
10	100	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)	5 x 5.4 (4 x 5.4)	1.8 (3.0)	95 (60)	6.3 x 5.4	2.0	70
15	150	6.3 x 5.4	1.8	95	5 x 5.4	1.8	95	6.3 x 5.4	2.0	70
22	220	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)	6.3 x 7.7 (6.3 x 5.4)	1.0 (2.0)	120 (70)
33	330	6.3 x 5.4 (5 x 5.4)	1.0 (1.8)	140 (95)	6.3 x 7.7 (6.3 x 5.4)	0.60 (1.0)	230 (140)	6.3 x 7.7	1.0	120
47	470	6.3 x 7.7 (6.3 x 5.4)	0.6 (1.0)	230 (140)	6.3 x 7.7 (6.3 x 5.4)	0.60 (1.0)	230 (140)	6.3 x 7.7	1.0	120
68	680	6.3 x 7.7	0.6	230	6.3 x 7.7	0.60	230	8 x 10.5	0.60	300
100	101	6.3 x 7.7	0.6	230	8 x 10.5 (6.3 x 7.7)	0.30 (0.60)	450 (230)	8 x 10.5	0.60	300
150	151	8 x 10.5 (6.3 x 7.7)	0.30 (0.6)	450 (230)	8 x 10.5	0.30	450	10 x 10.5	0.30	500
								Case size ∅D×L(mm) 尺寸	Impedance (Ω) at 20°C, 100KHz 阻抗值	Ripple current (mA rms) at 105°C, 100KHz 纹波电流

•Case size ∅D×L(mm), ripple current (mA rms) at 105°C, 100KHz, Impedance (Ω) at 20°C 100KHz •尺寸∅D×L(mm), 纹波电流(mA rms) 于105°C, 100KHz, 阻抗值(Ω)于20°C 100KHz

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□ DIMENSIONS& MAXIMUM PERMISSIBLE RIPPLE CURRENT& IMPEDANCE 规格尺寸及最大允许纹波电流及阻抗值

WV Code μF 代码	25			35			50			
	1E			1V			1H			
220	221	8 × 10.5	0.30	450	10 × 10.5 (8 × 10.5)	0.15 (0.30)	670 (450)	10 × 10.5	0.30	500
330	331	10 × 10.5 (8 × 10.5)	0.15 (0.30)	670 (450)	10 × 10.5	0.15	670	16 × 16.5 (12.5 × 13.5) (10 × 13.5)	0.12 (0.20) (0.25)	1060 (650) (580)
470	471	10 × 10.5	0.15	670	10 × 13.5 (10 × 10.5)	0.13 (0.15)	750 (670)	16 × 16.5 (12.5 × 16)	0.12 (0.15)	1060 (700)
680	681	10 × 13.5	0.13	750	12.5 × 13.5 (10 × 13.5)	0.11 (0.13)	820 (750)	16 × 16.5	0.12	1060
1000	102	16 × 16.5 (12.5 × 13.5)	0.08 (0.11)	1260 (820)	16 × 16.5 (12.5 × 16)	0.08 (0.09)	1260 (950)			
1500	152	12.5 × 16	0.09	950	16 × 16.5	0.08	1260	Case size ∅D×L(mm) 尺寸	Impedance (Ω) at 20°C, 100KHz 阻抗值	Ripple current (mA rms) at 105°C, 100KHz 纹波电流
2200	222	16 × 16.5	0.08	1260						

●Case size ∅D×L(mm), ripple current (mA rms) at 105°C, 100KHz, Impedance (Ω) at 20°C 100KHz ●尺寸∅D×L(mm), 纹波电流(mA rms) 于105°C, 100KHz,阻抗值(Ω)于20°C 100KHz

□ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 纹波电流频率补偿系数

Frequency 频率			50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient 系数	∅4 ~ ∅10	1 ~ 68μF	0.35	0.50	0.64	0.83	1.00
		100 ~ 2200μF	0.40	0.55	0.70	0.85	1.00
	∅12.5 ~ ∅16	~ 680μF	0.45	0.65	0.80	0.90	1.00
		1000 ~ 4700μF	0.65	0.85	0.95	1.00	1.00

- The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime wiht every 5°C rise.When long life performance is required in actual use,the rms ripple current has to be reduced.
- 铝电解电容器由于在纹波电流叠加时自我发热，温度上升而老化，每升温5°C寿命减少一半；要想保持长寿命请在使用过程中降低纹波电流。

- Taping specifications are given in page 20 "Taping Specifications". 编带标准请参阅第 20 页 “编带标准”。
- Please refer to page 21 "Package Quantity" for the minimum package quantity. 最小包装数量请参阅第 21页 “包装数量”。

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