

FZ Series

LONG LIFE WITH EXTRA LOWER IMPEDANCE

長壽命極低阻抗品

- Extra low impedance with temperature range -55 ~ +105°C
極低阻抗和適用於 -55 ~ +105°C 的溫度範圍
- Load life of 2000~5000 hours
負荷壽命 2000~5000 小時
- Impedance 5~25% less than KZ series
阻抗值比 KZ 系列低 5~25%
- Comply with the RoHS directive
符合 RoHS 指令

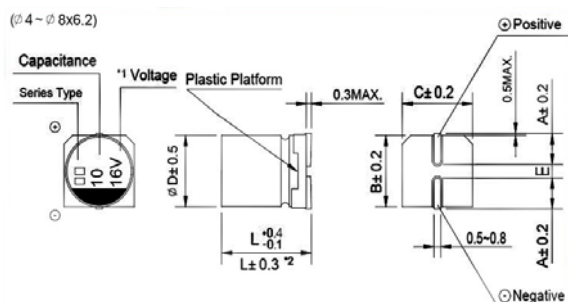


□ SPECIFICATIONS 特性表

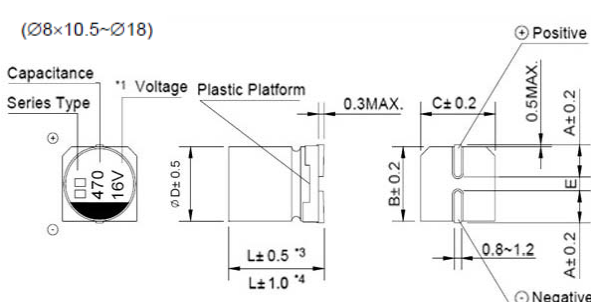
Items 項目	Characteristics 主要特性																													
Operation Temperature Range 使用溫度範圍	-55 ~ +105°C																													
Voltage Range 額定工作電壓範圍	6.3 ~ 100V																													
Capacitance Range 靜電容量範圍	3.3 ~ 8200μF																													
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C																													
Leakage Current 漏電流	Leakage current (Ø4~Ø10) ≦0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (Ø12.5~Ø18) ≦0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (Ø4~Ø10) ≦0.01CV 或 3μA, 取較大值（施加額定工作電壓 2 分鐘後） 漏電流 (Ø12.5~Ø18) ≦0.03CV 或 4μA, 取較大值（施加額定工作電壓 1 分鐘後）																													
Dissipation Factor (tan δ) 損耗角正切	Measurement frequency 測試頻率: 120Hz, Temperature 溫度: 20°C <table><tr><td>Rated Voltage (V) 額定工作電壓</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63~80</td><td>100</td></tr><tr><td>tan δ (max.)</td><td>Ø4~Ø10</td><td>0.26</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.08</td><td>0.07</td></tr><tr><td>最大損耗角正切</td><td>Ø12.5~Ø18</td><td>0.26</td><td>0.19</td><td>0.18</td><td>0.16</td><td>0.14</td><td>0.10</td><td>0.08</td><td>0.07</td></tr></table>	Rated Voltage (V) 額定工作電壓	6.3	10	16	25	35	50	63~80	100	tan δ (max.)	Ø4~Ø10	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.07	最大損耗角正切	Ø12.5~Ø18	0.26	0.19	0.18	0.16	0.14	0.10	0.08	0.07
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Stability at Low Temperature 低溫特性	Measurement frequency 測試頻率: 120Hz <table><tr><td>Rated Voltage (V) 額定工作電壓</td><td>6.3~16</td><td>25~100</td></tr><tr><td>Impedance Ratio 阻抗比</td><td>Z(-25°C) / Z(20°C)</td><td>2</td><td>2</td></tr><tr><td></td><td>Z(-40°C) / Z(20°C)</td><td>3</td><td>3</td></tr><tr><td>ZT/Z20 (max.)</td><td>Z(-55°C) / Z(20°C)</td><td>4</td><td>3</td></tr></table>	Rated Voltage (V) 額定工作電壓	6.3~16	25~100	Impedance Ratio 阻抗比	Z(-25°C) / Z(20°C)	2	2		Z(-40°C) / Z(20°C)	3	3	ZT/Z20 (max.)	Z(-55°C) / Z(20°C)	4	3														
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Load Life 高溫負荷特性	After 5000 hrs. (2000 hrs. for Ø4~Ø6.3×5.4 Ø6.3×7.7&Ø8×6.2) application of the rated voltage at 105°C, they meet the characteristics listed below. 在 105°C 環境中施加額定工作電壓 5000 小時（Ø4~Ø6.3×5.4 Ø6.3×7.7 和Ø8×6.2 為 2000 小時）後，電容器的特性符合下表的要求。 <table><tr><td>Capacitance Change 靜電容量變化率</td><td>Within ±30% of initial value 初始值的±30%以內</td></tr><tr><td>Dissipation Factor 損耗角正切</td><td>300% or less of initial specified value 不大於規範值的 300%</td></tr><tr><td>Leakage Current 漏電流</td><td>initial specified value or less 不大於規範值</td></tr></table>	Capacitance Change 靜電容量變化率	Within ±30% of initial value 初始值的±30%以內	Dissipation Factor 損耗角正切	300% or less of initial specified value 不大於規範值的 300%	Leakage Current 漏電流	initial specified value or less 不大於規範值																							
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Shelf Life 高溫貯存特性	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 105°C 環境中無負荷放置 1000 小時後，電容器的特性符合高溫負荷特性中所列的規定值。																													
Resistance to Soldering Heat 耐焊接熱特性	After reflow soldering and restored at room temperature, they meet the characteristics listed below. 經過回流焊並冷卻至室溫後，電容器的特性符合下表的要求。 <table><tr><td>Capacitance Change 靜電容量變化率</td><td>Within ±10% of initial value 初始值的±10%以內</td></tr><tr><td>Dissipation Factor 損耗角正切</td><td>initial specified value or less 不大於規範值</td></tr><tr><td>Leakage Current 漏電流</td><td>initial specified value or less 不大於規範值</td></tr></table>	Capacitance Change 靜電容量變化率	Within ±10% of initial value 初始值的±10%以內	Dissipation Factor 損耗角正切	initial specified value or less 不大於規範值	Leakage Current 漏電流	initial specified value or less 不大於規範值																							
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Leakage Current 漏電流	initial specified value or less 不大於規範值																													
Marking 標示	Black print on the case top. 鋁殼頂部黑字印刷。																													

□ DRAWING (Unit: mm) 外形圖

適用於∅6.3×7.7



- *1. Voltage mark for 6.3V is [6V] 6.3V 的產品標識為 [6V]
- *2. Applicable to ∅6.3×7.7 適用於∅6.3×7.7
- *3. Applicable to ∅8×10.5~∅10 適用於∅8×10.5~∅10
- *4. Applicable to ∅12.5~∅18 適用於∅12.5~∅18



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FZ Series

□ DIMENSIONS (Unit: mm) 尺寸表

ØD x L	4 x 5.8	5 x 5.8	6.3 x 5.8/7.7	8 x 6.2	8 x 10.5	10 x 10.5	10 x 12.5	12.5 x 13.5	12.5 x 16	16 x 16.5	18 x 16.5/18.5
A	2.0	2.2	2.6	3.3	3.0	3.2	3.2	4.6	4.6	5.8	6.2
B	4.3	5.3	6.6	8.3	8.3	10.3	10.3	12.8	12.8	17.0	19.0
C	4.3	5.3	6.6	8.3	8.3	10.3	10.3	12.8	12.8	17.0	19.0
E ± 0.2	1.0	1.5	2.1	2.2	3.1	4.6	4.6	4.6	4.6	6.4	6.4
L	5.4	5.4	5.4/7.7	6.2	10.5	10.5	12.5	13.5	16.0	16.5	16.5/18.5

□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE 規格尺寸及最大允許紋波電流及阻抗值

WV Code 代碼 µF		6.3			10			16		
		0J			1A			1C		
10	100							4 x 5.8	1.35	90
15	150							4 x 5.8	1.35	90
22	220	4 x 5.8	1.35	90	4 x 5.8	1.35	90	5 x 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)
33	330	5 x 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)	5 x 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)
47	470	5 x 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)
56	560	5 x 5.8	0.70	160	6.3 x 5.8	0.36	240	6.3 x 5.8	0.36	240
68	680	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 x 5.8	0.36	240	6.3 x 7.7 (6.3 x 5.8)	0.26 (0.36)	300 (240)
100	101	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 x 7.7 (6.3 x 5.8)	0.26 (0.36)	300 (240)	6.3 x 7.7 (6.3 x 5.8)	0.26 (0.36)	300 (240)
150	151	6.3 x 5.8	0.36	240	6.3 x 7.7	0.26	300	6.3 x 7.7	0.26	300
220	221	6.3 x 7.7 (6.3 x 5.8) (8 x 6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3 x 5.8 6.3 x 7.7 (8 x 6.2)	0.36 0.26 (0.26)	240 300 (300)	8 x 10.5 (6.3 x 7.7)	0.16 (0.26)	600 (300)
330	331	6.3 x 7.7 (8 x 6.2)	0.26 (0.26)	300 (300)	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)
470	471	8 x 10.5	0.16	600	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)
680	681	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 x 10.5	0.08	850	10 x 12.5 (10 x 10.5)	0.07 (0.08)	950 (850)
1000	102	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 x 12.5 (10 x 10.5)	0.07 (0.08)	950 (850)	16 x 16.5 (12.5 x 16) (12.5 x 13.5)	0.05 (0.055) (0.06)	1450 (1200) (1100)
1500	152	10 x 12.5 (10 x 10.5)	0.07 (0.08)	950 (850)	12.5 x 13.5	0.06	1100	16 x 16.5	0.05	1450
2200	222	12.5x13.5	0.06	1100	12.5x16	0.055	1200	16x16.5	0.05	1450
3300	332	12.5x16	0.055	1200	16x16.5	0.05	1450	16x16.5	0.05	1450
4700	472	16x16.5	0.05	1450	16x16.5	0.05	1450	18 x 16.5	0.048	1500
6800	682	18 x 16.5	0.048	1500	18 x 16.5	0.048	1500	Case size ØDxL(mm) 尺寸	Impedance 阻 抗值	Ripple current 紋波電流
8200	822	18 x 16.5	0.048	1500						

WV Code 代碼 µF		25			35			50		
		1E			1V			1H		
4.7	4R7				4 x 5.8	1.35	90	5 x 5.8 (4 x 5.8)	1.52 (2.9)	85 (60)
10	100	4 x 5.8	1.35	90	5 x 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)	6.3 x 5.8 (5 x 5.8) 8 x 10.5	0.88 (1.52) 0.68	165 (85) 195
15	150	5 x 5.8	0.70	160	5 x 5.8	0.70	160	6.3 x 5.8	0.88	165
22	220	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 x 7.7 (6.3 x 5.8) (8 x 6.2) 8 x 10.5	0.68 (0.88) (0.68) 0.68	195 (165) (195) 195
33	330	6.3 x 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 x 5.8 (8 x 6.2)	0.36 (0.26)	240 (300)	6.3 x 7.7 (8 x 6.2)	0.68 (0.68)	195 (195)
47	470	6.3 x 7.7 (6.3 x 5.8) (8 x 6.2) 8 x 10.5	0.26 (0.36) (0.26) 0.26	300 (240) (300) 300	6.3 x 7.7 (6.3 x 5.8) (8 x 6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3 x 7.7 (8 x 6.2)	0.68 (0.68)	195 (195)
56	560	6.3 x 7.7 (6.3 x 5.8)	0.26 (0.36)	300 (240)	6.3 x 7.7	0.26	300	8 x 10.5	0.34	350
68	680	6.3 x 7.7	0.26	300	6.3 x 7.7	0.26	300	8 x 10.5	0.34	350
100	101	6.3 x 7.7 (8 x 6.2) 8 x 10.5	0.26 (0.26) 0.26	300 (300) 300	8 x 10.5	0.16	600	10 x 10.5 (8 x 10.5)	0.18 (0.34)	670 (350)
150	151	8 x 10.5 (6.3 x 7.7)	0.16 (0.26)	600 (300)	10 x 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 x 10.5	0.18	670
								Case size ØDxL(mm) 尺寸	Impedance 阻 抗值	Ripple current 紋波電流

•Case size 尺寸 ØDxL(mm), impedance 阻抗值 (Ω) at 20°C 100KHz, ripple current 紋波電流(mA rms) at 105°C 100KHz

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Rev:09

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□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE 規格尺寸及最大允許紋波電流及阻抗值

μF	WV Code 代碼	25			35			50		
		1E			1V			1H		
220	221	8 × 10.5	0.16	600	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 12.5 (10 × 10.5)	0.14 (0.18)	780 (670)
330	331	(10 × 10.5) 8 × 10.5	0.08 (0.16)	850 (600)	10 × 10.5	0.08	850	12.5 × 13.5	0.12	900
470	471	10 × 13.5 (10 × 10.5)	0.07 (0.09)	950 (850)	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	0.06 (0.07) (0.10)	1100 (1000) (950)	16 × 16.5 (12.5 × 16) (12.5 × 13.5)	0.08 (0.10) (0.08)	1250 (1050) (1100)
680	681	12.5 × 13.5	0.06	1100	12.5 × 16 (12.5 × 13.5)	0.055 (0.06)	1200 (1100)	16 × 16.5	0.073	1250
1000	102	16 × 16.5 (12.5 × 16) (12.5 × 13.5)	0.05 (0.055) (0.06)	1450 (1200) (1100)	16 × 16.5	0.05	1450	18 × 18.5 (16 × 16.5) (18 × 16.5)	0.073 (0.08) (0.073)	1250 (1000) (1250)
1500	152	16 × 16.5	0.05	1450	16 × 16.5	0.048	1500	18 × 16.5	0.066	1500
2200	222	16 × 16.5	0.05	1450	18 × 18.5	0.038	1750	Case size 尺寸	Impedance 阻抗值	Ripple current 紋波電流
3300	333	18 × 16.5 (18 × 18.5)	0.048 (0.048)	1500 (1500)						

μF	WV Code 代碼	63			80			100		
		1J			1K			2A		
470	471	10 × 12.5 (10 × 10.5)	0.07 (0.08)	950 (850)	12.5 × 13.5 (10 × 12.5)	0.06 (0.07)	1100 (950)	16 × 16.5 (12.5 × 16)	0.08 (0.10)	1250 (1050)
680	681	12.5 × 13.5	0.06	1100	12.5 × 13.5 12.5 × 16	0.06 0.055	1100 1200			
1000	102	16 × 16.5 (12.5 × 16)	0.05 (0.055)	1450 (1200)	16 × 16.5	0.05	1450			
1500	152	16 × 16.5	0.05	1450						
3.3	3R3				5 × 5.8	5.0	25			
4.7	4R7	5 × 5.8	3.0	50	6.3 × 5.8	3.0	40			
10	100	6.3 × 7.7 (6.3 × 5.8)	1.2 (1.5)	120 (80)	6.3 × 7.7 (8 × 6.2)	2.4 (2.4)	60 (80)	8 × 10.5	1.3	130
22	220	8 × 10.5 6.3 × 7.7 (8 × 6.2)	0.65 (1.2) (1.2)	250 (120) (120)	8 × 10.5	1.3	130	10 × 10.5 (8 × 10.5)	0.7 (1.3)	200 (130)
33	330	8 × 10.5	0.65	250	8 × 10.5	1.3	130	10 × 10.5	0.7	200
47	470	8 × 10.5	0.65	250	10 × 10.5	0.7	200	12.5 × 13.5 (10 × 12.5)	0.32 (0.60)	500 (250)
68	680	12.5 × 13.5 (8 × 10.5)	0.16 (0.65)	800 (250)	12.5 × 13.5	0.32	500	12.5 × 13.5	0.32	500
100	101	12.5 × 13.5 (10 × 10.5)	0.16 (0.35)	800 (400)	12.5 × 13.5	0.32	500	16 × 16.5 (12.5 × 16) 12.5 × 13.5	0.17 (0.26) 0.32	795 (550) 500
150	151	12.5 × 13.5 (10 × 10.5)	0.16 (0.25)	800 (650)	12.5 × 13.5	0.32	500	16 × 16.5 (12.5 × 16)	0.17 (0.26)	650 (550)
220	221	12.5 × 13.5	0.16 (0.25)	800 (650)	12.5 × 16	0.26	550	18 × 16.5	0.15	850
330	331	16 × 16.5	0.082	1400	16 × 16.5	0.17	795	18 × 16.5	0.15	850
470	471	16 × 16.5	0.082	900	18 × 16.5	0.15	850	18 × 18.5	0.15	950
680	681	18 × 16.5	0.08	1150	18 × 18.5	0.15	950	Case size 尺寸	Impedance 阻抗值	Ripple current 紋波電流
1000	102	18 × 18.5	0.06	1250						

•Case size 尺寸 $\varnothing D \times L$ (mm), impedance 阻抗值 (Ω) at 20°C 100KHz, ripple current 紋波電流(mA rms) at 105°C 100KH

□ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 紋波電流頻率補償係數

Frequency 頻率			50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient 係數	$\varnothing 4 \sim \varnothing 10$	4.7 ~ 68μF	0.35	0.50	0.64	0.83	1.00
		100 ~ 1500μF	0.40	0.55	0.70	0.85	1.00
	$\varnothing 12.5 \sim \varnothing 16$	~ 68μF	0.40	0.55	0.70	0.85	1.00
		100 ~ 680μF	0.45	0.65	0.80	0.90	1.00
		1000 ~ 4700μF	0.65	0.85	0.95	1.00	1.00

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