

FZ Series

LONG LIFE WITH EXTRA LOWER IMPEDANCE

長壽命極低阻抗品

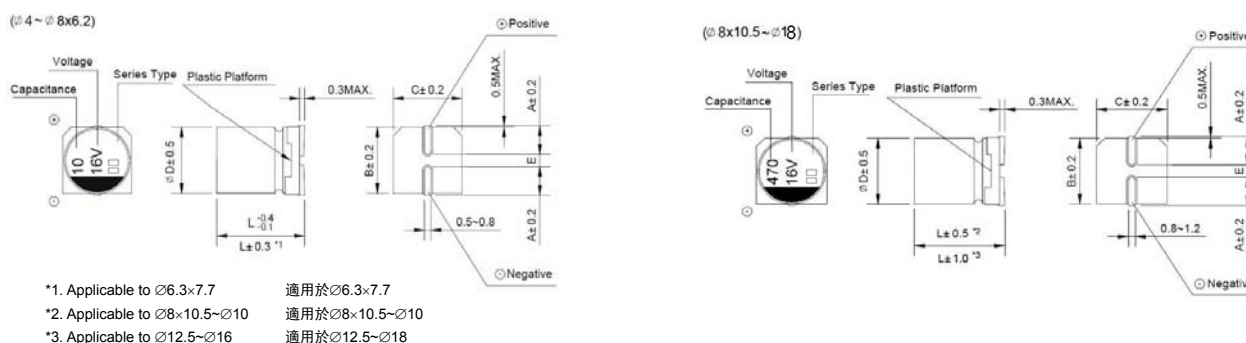
- Extra low impedance with temperature range -55 ~ +105°C
極低阻抗和適用於 -55 ~ +105°C 的溫度範圍
- Load life of 2000~5000 hours
負荷壽命 2000~5000 小時
- Impedance 5~25% less than KZ series
阻抗值比 KZ 系列低 5~25%
- Comply with the RoHS directive
符合 RoHS 指令



□ 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 ~ 4700μF																													
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
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																					
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></tr><tr><td></td><td>Z(-40°C) / Z(20°C)</td><td>3</td></tr><tr><td>ZT/Z20 (max.)</td><td>Z(-55°C) / Z(20°C)</td><td>4</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		Z(-40°C) / Z(20°C)	3	ZT/Z20 (max.)	Z(-55°C) / Z(20°C)	4																	
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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



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Rev:01

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□ DIMENSIONS (Unit: mm) 尺寸表

ØD × L	4 × 5.8	5 × 5.8	6.3 × 5.8/7.7	8 × 6.2	8 × 10.5	10 × 10.5	10 × 12.5	12.5 × 13.5	12.5 × 16	16 × 16.5	18 × 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		6.3			10			16		
µF		0J			1A			1C		
10	100							4 × 5.8	1.35	90
15	150							4 × 5.8	1.35	90
22	220	4 × 5.8	1.35	90	4 × 5.8	1.35	90	5 × 5.8 (4 × 5.8)	0.70 (1.35)	160 (90)
33	330	5 × 5.8 (4 × 5.8)	0.70 (1.35)	160 (90)	5 × 5.8 (4 × 5.8)	0.70 (1.35)	160 (90)	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)
47	470	5 × 5.8 (4 × 5.8)	0.70 (1.35)	160 (90)	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)
56	560	5 × 5.8	0.70	160	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240
68	680	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)	6.3 × 5.8	0.36	240	6.3 × 7.7 (6.3 × 5.8)	0.26 (0.36)	300 (240)
100	101	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)	6.3 × 7.7 (6.3 × 5.8)	0.26 (0.36)	300 (240)	6.3 × 7.7 (6.3 × 5.8)	0.26 (0.36)	300 (240)
150	151	6.3 × 5.8	0.36	240	6.3 × 7.7	0.26	300	6.3 × 7.7	0.26	300
220	221	6.3 × 7.7 (6.3 × 5.8) (8 × 6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3 × 5.8 6.3 × 7.7 (8 × 6.2)	0.36 0.26 (0.26)	240 300 (300)	8 × 10.5 (6.3 × 7.7)	0.16 (0.26)	600 (300)
330	331	6.3 × 7.7 (8 × 6.2)	0.26 (0.26)	300 (300)	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)
470	471	8 × 10.5	0.16	600	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)
680	681	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 10.5	0.08	850	10 × 12.5 (10 × 10.5)	0.07 (0.08)	950 (850)
1000	102	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 12.5 (10 × 10.5)	0.07 (0.08)	950 (850)	16 × 16.5 (12.5 × 16) (12.5 × 13.5)	0.05 (0.055) (0.06)	1450 (1200) (1100)
1500	152	10 × 12.5 (10 × 10.5)	0.07 (0.08)	950 (850)	12.5 × 13.5	0.06	1100	16 × 16.5	0.05	1450
2200	222	12.5 × 13.5	0.06	1100	12.5 × 16	0.055	1200	16 × 16.5	0.05	1450
3300	332	12.5 × 16	0.055	1200	16 × 16.5	0.05	1260	16 × 16.5	0.05	1450
4700	472	16 × 16.5	0.05	1450	16 × 16.5	0.05	1450	18 × 16.5	0.048	1500
6800	682	18 × 16.5	0.048	1500	18 × 16.5	0.048	1500	Case size ØD×L(mm) 尺寸	Impedance 阻 抗值	Ripple current 紋 波電流
8200	822	18 × 16.5	0.048	1500						

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

•Case size 尺寸 ØD×L(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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□ 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	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)						

WV Code 代碼	μF	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 (0.70)	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	800	12.5 × 16	0.26	550	18 × 16.5	0.15	850
330	331	16 × 16.5	0.082	800	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 100KHz

□ 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	Ø4 ~ Ø10	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
	Ø12.5 ~ Ø18	~ 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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