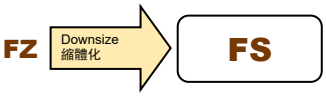
FS Series

CHIP TYPE, LONG LIFE WITH ULTRA-LOW ESR
貼片式，長壽命，超低等效串聯電阻品





- Ultra-low ESR
  超低等效串聯電阻
- Endurance 2000~5000 hours
  耐久性 2000~5000 小時
- Miniature (size smaller than FZ series)
  縮體型（尺寸比 FZ 系列小）
- RoHS & REACH compliant, Halogen-free
  符合 RoHS 與 REACH，無鹵

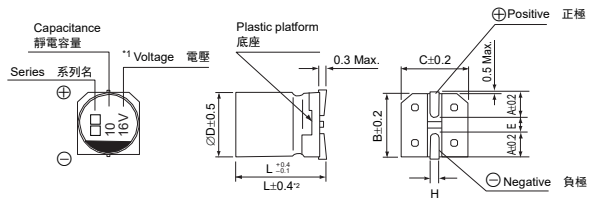


☐ SPECIFICATIONS 特性表

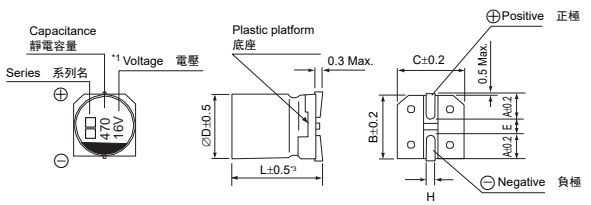
Items 項目	Characteristics 主要特性
Category Temperature Range 工作溫度範圍	-55 ~ +105°C
Voltage Range 額定工作電壓範圍	6.3 ~ 50V
Capacitance Range 靜電容量範圍	10 ~ 2200μF
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C
Leakage Current 漏電流	Leakage current ≤0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage at 20°C) 漏電流 ≤0.01CV 或 3μA，取較大值（在 20°C 環境中施加額定工作電壓 2 分鐘後） C: Nominal capacitance (μF) 標稱靜電容量, V: Rated voltage (V) 額定電壓
Dissipation Factor (tan δ) 損耗角正切	Measurement frequency 測試頻率: 120Hz, Temperature 温度: 20°C Rated Voltage (V) 額定工作電壓 | 6.3 | 10 | 16 | 25 | 35 | 50 tan δ (max.) 最大損耗角正切 | 0.26 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10
Stability at Low Temperature 低溫特性	Measurement frequency 測試頻率: 120Hz Rated Voltage (V) 額定工作電壓 | 6.3 ~ 16 | 25 ~ 50 Impedance Ratio 阻抗比 ZT/Z20 (max.) Z(-25°C) / Z(+20°C) | 2 | 2 Z(-40°C) / Z(+20°C) | 3 | 3 Z(-55°C) / Z(+20°C) | 4 | 3
Endurance 耐久性	When the capacitors are restored to 20°C after 5000 hrs. (2000 hrs. for ∅4~∅6.3×7.7) 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（∅4~∅6.3×7.7 為 2000 小時）後，待電容器恢復至 20°C 時進行測量，電容器的特性符合下表要求。 Capacitance Change 靜電容量變化率 | Within ±35% of initial value 初始值的±35%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
Shelf Life 高溫貯存特性	When the capacitors are restored to 20°C after leaving under no load at 105°C for 1000 hours, they meet the specified value for endurance characteristics listed above. 在 105°C 環境中無負荷放置 1000 小時後，待電容器恢復至 20°C 時進行測量，電容器的特性符合耐久性特性中所列的規定值。
Resistance to Soldering Heat 耐焊接熱特性 (Please refer page 25 for soldering conditions) (焊接條件請查閱第 25 頁)	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要求。 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
Marking 標識	Black print on the case top. 鋁殼頂部黑字印刷。

☐ DRAWING 外形圖 (Unit: mm)

(∅4~∅6.3×7.7)



(∅8×10.5~∅10)



*1. Voltage mark for 6.3V is [6V]
*2. Applicable to ∅6.3×7.7
*3. Applicable to ∅8×10.5~∅10

6.3V 的產品標識為 [6V]
適用於∅6.3×7.7
適用於∅8×10.5~∅10

Dimension table in next page.
尺寸表見下一頁。

Note: All design and specifications are for reference only and is subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.
注：以上所提供的設計及特性參數僅供參考，任何修改不作預先通知。如果在使用上有疑問，請在採購前與我們聯繫，以便提供技術上的協助。

FS 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 10.5	10 x 10.5
A	2.0	2.2	2.6	3.0	3.3
B	4.3	5.3	6.6	8.4	10.4
C	4.3	5.3	6.6	8.4	10.4
E ± 0.2	1.0	1.4	1.9	3.1	4.7
L	5.8	5.8	5.8/7.7	10.5	10.5
H	0.5~0.8	0.5~0.8	0.5~0.8	0.8~1.2	0.8~1.2

☐ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

WV / Code 代碼 / μF		6.3			10			16		
		0J			1A			1C		
47	470							4 × 5.8	0.85	160
68	680				4 × 5.8	0.85	160	5 × 5.8	0.36	240
100	101	4 × 5.8	0.85	160				5 × 5.8	0.36	240
150	151				5 × 5.8	0.36	240	6.3 × 5.8	0.26	300
220	221	5 × 5.8	0.36	240	6.3 × 5.8	0.26	300	6.3 × 5.8	0.26	300
330	331	6.3 × 5.8	0.26	300	6.3 ×7.7	0.16	600	6.3 ×7.7	0.16	600
470	471	6.3 × 7.7	0.16	600	6.3 ×7.7	0.16	600			
680	681	6.3 × 7.7	0.16	600				8 × 10.5	0.08	850
820	821							8 × 10.5	0.08	850
1000	102				8 × 10.5	0.08	850	10 × 10.5	0.06	1190
1200	122							10 × 10.5	0.06	1190
1500	152	8 × 10.5	0.08	850	10 × 10.5	0.06	1190	Case size 尺寸	ESR 等效串聯電阻	Ripple current 紋波電流
2200	222	10 × 10.5	0.06	1190						

WV / Code 代碼 / μF		25			35			50		
		1E			1V			1H		
10	100							5 × 5.8 (4 × 5.8)	0.88 (2.30)	165 (85)
22	220	4 × 5.8	0.85	160	4 × 5.8	0.85	160	5 × 5.8	0.88	165
33	330	4 × 5.8	0.85	160	5 × 5.8	0.36	240			
47	470	5 × 5.8	0.36	240	5 × 5.8	0.36	240	6.3 × 5.8	0.68	195
68	680	5 × 5.8	0.36	240	6.3 × 5.8	0.26	300			
100	101	6.3 × 5.8	0.26	300	6.3 × 5.8	0.26	300	6.3 × 7.7	0.34	350
150	151	6.3 × 7.7	0.16	600	6.3 × 7.7	0.16	600			
220	221	6.3 × 7.7	0.16	600				8 × 10.5	0.18	670
330	331	6.3 × 7.7	0.16	600	8 × 10.5	0.08	850	10 × 10.5	0.12	900
390	391				8 × 10.5	0.08	850			
470	471	8 × 10.5	0.08	850						
560	561	8 × 10.5	0.08	850	10 × 10.5	0.06	1190			
680	681				10 × 10.5	0.06	1190			
820	821	10 × 10.5	0.06	1190				Case size 尺寸	ESR 等效串聯電阻	Ripple current 紋波電流
1000	102	10 × 10.5	0.06	1190						

•Case size 尺寸 ∅D×L(mm), ESR 等效串聯電阻 (Ω) at 20°C, 100KHz, Ripple current 紋波電流 (mA rms) at 105°C, 100KHz

☐ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 紋波電流頻率補償系數

Frequency 頻率		50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient 系數	10 ~ 68μF	0.35	0.50	0.64	0.83	1.00
	100 ~ 2200μF	0.40	0.55	0.70	0.85	1.00

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5~10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. 鋁電解電容器在疊加紋波電流後會引起發熱，溫度每上升 5~10°C 壽命會減半。若要保持長壽命性能，請在使用過程中適當降低紋波電流。

- Taping specifications are given in page 19. 編帶標準請查閱第 19 頁。
- Soldering conditions and recommended land size are given in page 25. 焊接條件及推薦安裝尺寸請查閱第 25 頁。
- Please refer to page 20 for the minimum package quantity. 最小包裝數量請查閱第 20 頁。
- Please refer to page 18 for the Part Number System. 產品編碼規則請查閱第 18 頁。

Note: All design and specifications are for reference only and is subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.
注：以上所提供的設計及特性參數僅供參考，任何修改不作預先通知。如果在使用上有疑問，請在採購前與我們聯繫，以便提供技術上的協助。