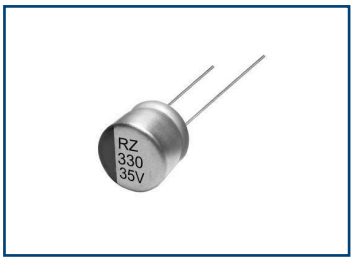
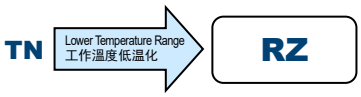
RZ Series

SLEEVELESS, LONG LIFE WITH ULTRA-LOW ESR
無膠管，長壽命，超低等效串聯電阻品





- Ultra-low ESR with temperature range -55~+105°C
  超低等效串聯電阻和適用於-55~+105°C 的溫度範圍
- Endurance 2000~5000 hours
  耐久性 2000~5000 小時
- Sleeveless
  無膠管
- RoHS & REACH compliant, Halogen-free
  符合 RoHS 與 REACH，無鹵



☐ SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性
Operation Temperature Range 使用温度範圍	-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 ≤0.01CV or 3μA (∅4~∅10), whichever is greater (after 2 minutes application of rated voltage at 20°C) Leakage current ≤0.03CV or 4μA (∅12.5~∅18), whichever is greater (after 1 minute application of rated voltage at 20°C) 漏電流 ≤0.01CV 或 3μA (∅4~∅10)，取較大值（在 20°C 環境中施加額定工作電壓 2 分鐘後） 漏電流 ≤0.03CV 或 4μA (∅12.5~∅18)，取較大值（在 20°C 環境中施加額定工作電壓 1 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	63~80	100
tan δ (max.) 最大損耗角正切	∅4~∅10	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.07
	∅12.5~∅18	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

Rated Voltage (V) 額定工作電壓		6.3 ~ 16	25 ~ 100
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~∅6.3×5.8) 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~∅6.3×5.8 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。

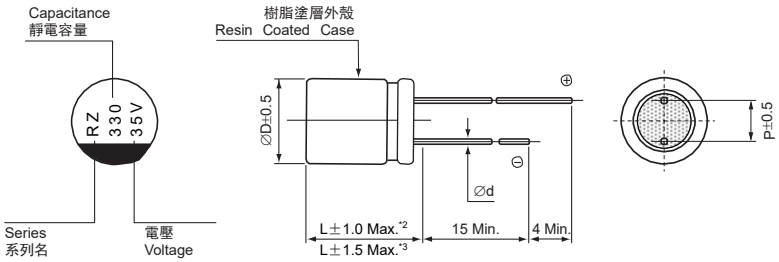
Capacitance Change 靜電容量變化率	Within ±30% of initial value 初始值的±30%以內
Dissipation Factor 損耗角正切	200% or less of initial specified value 不大於規範值的 200%
Leakage Current 漏電流	initial specified value or less 不大於規範值

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。

Marking 標識: Black print on the case top. 鋁殼頂部黑字印刷。

☐ DRAWING 外形圖 (Unit: mm)



*1. Voltage mark for 6.3V is [6V]
*2. Applicable to ∅∅4~∅8
*3. Applicable to ∅10 and above

6.3V 的產品標識為 [6V]
適用於∅4~∅8
適用於∅10 和∅10 以上

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

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RZ Series

☐ DIMENSIONS (Unit: mm) 尺寸表

ØD x L	4 x 5	5 x 5	6.3 x 5/7	8 x 10	10 x 10/13	12.5 x 13/16	16 x 16	18 x 16/18
P	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Ød	0.45	0.45	0.45	0.5	0.6	0.6	0.8	0.8
L	5.0	5.0	5.0/7.0	10.0	10.0/13.0	13.0/16.0	16.0	16.0/18.0

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

WV / Code 代碼 / µF		6.3			10			16		
		0J			1A			1C		
10	100							4 × 5	1.35	90
15	150							4 × 5	1.35	90
22	220	4 × 5	1.35	90	4 × 5	1.35	90	5 × 5	0.76	160
33	330	5 × 5 (4 × 5)	0.76 (1.35)	160 (90)	5 × 5	0.76	160	6.3 × 5	0.44	240
47	470	5 × 5 (4 × 5)	0.76 (1.35)	160 (90)	6.3 × 5	0.44	240	6.3 × 5 (5 × 5)	0.44 (0.76)	240 (160)
56	560	5 × 5	0.76	160	6.3 × 5	0.44	240	6.3 × 5	0.44	240
68	680	6.3 × 5	0.44	240	6.3 × 5	0.44	240	6.3 × 7 (6.3 × 5)	0.34 (0.44)	300 (240)
100	101	6.3 × 5	0.44	240	6.3 × 7	0.34	300	6.3 × 7 (6.3 × 5)	0.34 (0.44)	300 (240)
150	151	6.3 × 5	0.44	240	6.3 × 7	0.34	300	6.3 × 7	0.34	300
220	221	6.3 × 7 (6.3 × 5)	0.34 (0.44)	300 (240)	6.3 × 7	0.34	300	8 × 10 (6.3 × 7)	0.17 (0.34)	600 (300)
330	331	8 × 10	0.17	600	10 × 10 (8 × 10)	0.09 (0.17)	850 (600)	10 × 10 (8 × 10)	0.08 (0.17)	850 (600)
470	471	8 × 10	0.17	600	10 × 10 (8 × 10)	0.09 (0.17)	850 (600)	10 × 10 (8 × 10)	0.09 (0.17)	850 (600)
680	681	10 × 10 (8 × 10)	0.09 (0.17)	850 (600)	10 × 10	0.09	850	10 × 13 (10 × 10)	0.07 (0.09)	950 (850)
1000	102	10 × 10 (8 × 10)	0.09 (0.17)	850 (600)	10 × 13 (10 × 10)	0.07 (0.09)	950 (850)	12.5 × 16 (12.5 × 13)	0.055 (0.06)	1200 (1100)
1500	152	10 × 13	0.09	950	12.5 × 13	0.06	1100	16 × 16	0.05	1450
2200	222	12.5 × 13	0.06	1100	12.5 × 16	0.055	1200	16 × 16	0.05	1450
3300	332	12.5 × 16 (12.5 × 13)	0.055 (0.06)	1200 (1100)	16 × 16	0.05	1260	16 × 16	0.05	1450
4700	472	16 × 16	0.05	1450	16 × 16	0.05	1450	18 × 16	0.048	1500
6800	682	18 × 16	0.048	1500	18 × 16	0.048	1500	Case size 尺寸	ESR 等效串聯電阻	Ripple current 紋波電流
8200	822	18 × 16	0.048	1500						

WV / Code 代碼 / µF		25			35			50		
		1E			1V			1H		
4.7	4R7				4 × 5	1.35	90	5 × 5	1.52	85
10	100	4 × 5	1.35	90	5 × 5	0.76	160	6.3 × 5 (5 × 5)	0.88 (1.35)	165 (115)
15	150	5 × 5	0.76	160	5 × 5	0.76	160	6.3 × 5	0.88	165
22	220	6.3 × 5 (5 × 5)	0.44 (0.76)	240 (160)	6.3 × 5	0.44	240	6.3 × 7 (6.3 × 5)	0.68 (0.88)	195 (165)
33	330	6.3 × 5	0.44	240	6.3 × 5	0.44	240	6.3 × 7	0.68	195
47	470	6.3 × 7 (6.3 × 5)	0.34 (0.44)	300 (240)	6.3 × 7 (6.3 × 5)	0.34 (0.88)	300 (165)	8 × 10 (6.3 × 7)	0.34 (0.68)	350 (195)
56	560	6.3 × 7	0.34	300	6.3 × 7	0.34	300	8 × 10	0.34	350
68	680	6.3 × 7	0.34	300	8 × 10	0.17	600	8 × 10	0.34	350
100	101	8 × 10 (6.3 × 7)	0.17 (0.34)	600 (300)	8 × 10	0.17	600	10 × 10 (8 × 10)	0.18 (0.34)	670 (350)
150	151	8 × 10 (6.3 × 7)	0.16 (0.34)	600 (300)	10 × 10 (8 × 10)	0.09 (0.16)	850 (600)	10 × 13 (10 × 10)	0.14 (0.18)	780 (670)
220	221	8 × 10	0.17	600	10 × 10 (8 × 10)	0.09 (0.16)	850 (600)	10 × 13.5 (10 × 10.5)	0.14 (0.26)	780 (750)
330	331	10 × 10 (8 × 10)	0.09 (0.17)	850 (600)	10 × 13 (10 × 10)	0.07 (0.10)	950 (850)	12.5 × 13	0.12	900
470	471	10 × 13 (10 × 10)	0.07 (0.09)	950 (850)	12.5 × 13 (10 × 13) (10 × 10)	0.06 (0.07) (0.10)	1100 (1000) (950)	16 × 16 (12.5 × 16) (12.5 × 13)	0.08 (0.10) (0.08)	1250 (1050) (1100)
680	681	12.5 × 13	0.06	1100	12.5 × 16 (12.5 × 13)	0.055 (0.06)	1200 (1100)	16 × 16	0.073	1250
1000	102	16 × 16 (12.5 × 16) (12.5 × 13)	0.05 (0.055) (0.06)	1450 (1200) (1100)	16 × 16	0.05	1450	18 × 18 (16 × 16) (18 × 16)	0.073 (0.08) (0.073)	1250 (1000) (1250)
1500	152	16 × 16	0.05	1450	16 × 16	0.048	1500	18 × 16	0.066	1500
2200	222	16 × 16	0.05	1450	18 × 18	0.038	1750	Case size 尺寸	ESR 等效串聯電阻	Ripple current 紋波電流
3300	333	18 × 16 (18 × 18)	0.048 (0.048)	1500 (1500)						

•Case size 尺寸 ØD×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

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

WV / Code 代碼 / μF		63			80			100		
		1J			1K			2A		
3.3	3R3				5 × 5	5.00	25			
4.7	4R7	5 × 5	3.00	50	6.3 × 5	3.00	40			
10	100	6.3 × 7 (6.3 × 5)	1.20 (1.50)	120 (80)	6.3 × 7	2.40	60	8 × 10	1.30	130
22	220	8 × 10 (6.3 × 7)	0.65 (1.20)	250 (120)	8 × 10	1.30	130	10 × 10 (8 × 10)	0.70 (1.30)	200 (160)
33	330	8 × 10	0.65	250	10 × 10	0.70	200	10 × 13	0.70	200
47	470	10 × 10 (8 × 10)	0.50 (0.65)	300 (250)	10 × 13	0.45	300	12.5 × 13	0.32	500
68	680	12.5 × 13 (10 × 10)	0.16 (0.50)	800 (300)	12.5 × 13	0.32	500	12.5 × 13	0.32	500
100	101	12.5 × 13 (10 × 13) (10 × 10)	0.16 (0.25) (0.50)	800 (400) (300)	12.5 × 13 (10 × 13)	0.32 (0.18)	500 (750)	16 × 16 (12.5 × 16) (12.5 × 13)	0.17 (0.26) (0.32)	795 (550) (500)
150	151	12.5 × 13 (10 × 13)	0.16 (0.25)	800 (650)	12.5 × 13	0.32	500	16 × 16 (12.5 × 16)	0.17 (0.26)	650 (550)
220	221	12.5 × 13	0.16	800	12.5 × 16 (12.5 × 13)	0.26 (0.12)	550 (900)	18 × 16	0.15	850
330	331	16 × 16	0.082	900	16 × 16	0.17	795	18 × 16	0.15	850
470	471	16 × 16	0.082	900	18 × 16	0.15	850	18 × 18	0.15	950
680	681	18 × 16	0.08	1150	18 × 18	0.15	950	Case size 尺寸	ESR 等效串聯電阻	Ripple current 紋波電流
1000	102	18 × 18	0.06	1250						

•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	∅4 ~ ∅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
	∅12.5 ~ ∅18	~ 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

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。

- Please refer to page 21 "Taping Specifications" & page 23 "Lead Forming & Cutting" about the taped or formed product spec. 編帶與引線成型標準請查閱第 21 頁"編帶標準"及第 23 頁"引線成型與剪腳"。
- Please refer to page 22 "Packaging Specifications" for the minimum package quantity. 最小包裝數量請查閱第 22 頁"包裝標準"。
- Please refer to page 18 for the Part Number System. 產品編碼規則請查閱第 18 頁。

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