SMD(V-chip) Aluminum Electrolytic

CAPACITOR

貼片鋁電解電容器

NP ELECTRONICS CO., LIMITED

CONTENTS 目录

Caution for Safety:

安全注意事項:

■To use the product correctly and safety, please read “General Information for Application” very carefully.

■The products are designed and manufactured chiefly for general electronic appliances. In case that you are going to apply then for medical equipment, aircraft, space equipment, or the same kind that requires high safety, you are required to confirm application through your own testing and own judgment.

■All design and specifications in this catalogue are for reference only. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.

■爲了正確安全地使用產品，請在使用前仔細閱讀“鋁電解電容器使用注意事項”；

■本產品目錄中所登載的產品是爲一般電子設備用而設計和製造的，如果要用於醫療設備、宇航設備等需要高度安全性的設備，必須事先對適合性做充分的測試；

■本產品目錄中所提供的設計及特性參數僅供參考。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。

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SERIES TABLE 產品系列表

■ Chip Type Aluminum Electrolytic Capacitors 貼片式鋁電解電容器

Type 類型		Series 系列	Features 特性	標準型	超小型	低阻抗	長壽命	Operating Temperature Range (°C) 使用温度範圍	Rate Voltage Range (V.D.C.) 額定工作電壓範圍	Capacitance Range (μF) 靜電容量範圍	Load Life (Hours) 負荷壽命 (小時)	頁碼
	Low Impedance低阻抗型	**VE** **RVE**	Low impedance 片式\低阻抗品			●		-55~+105	6.3~50	1~4700	1000~2000	3-5
		VZ **RVZ**	Extra low impedance 片式\極低阻抗品			●		-55~+105	6.3~50	4.7~4700	1000~3000	6-8
		VL	5000 hours load life 5000小時長壽命品				●	-55~+105	6.3~100	0.1~3300	3000~5000	9-11

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VE 、RVE Series

LOW IMPEDANCE

低阻抗品

- Low impedance with temperature range -55 ~ +105°C
  低阻抗和適用於 -55 ~ +105°C 的溫度範圍
- Load life of 1000 ~ 2000 hours
  負荷壽命 1000 ~ 2000 小時
- 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 使用温度範圍	-55 ~ +105°C
Voltage Range 額定工作電壓範圍	6.3 ~ 63V
Capacitance Range 靜電容量範圍	1 ~ 4700μF
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C
Leakage Current 漏電流	Leakage current (∅4~∅10) ≦0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (∅12.5~∅16) ≦0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (∅4~∅10) ≦0.01CV 或 3μA，取較大值（施加額定工作電壓 2 分鐘後） 漏電流 (∅12.5~∅16) ≦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 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	∅4~∅10	0.22	0.19	0.16	0.14	0.12	0.12
	∅12.5~∅16	0.26	0.22	0.18	0.16	0.14	0.12

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	10	16	25	35	50
Impedance Ratio 阻抗比 ZT/Z20 (max.)	∅4~∅10	Z(-25°C) / Z(20°C)	2	2	2	2	2	2
		Z(-55°C) / Z(20°C)	5	4	4	3	3	3
	∅12.5~∅16	Z(-25°C) / Z(20°C)	3	3	2	2	2	2
		Z(-55°C) / Z(20°C)	10	8	6	4	3	3

Load Life
高溫負荷特性

After 2000 hrs. (1000 hrs. for ∅4~∅6.3×5.4) 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 2000 小時（∅4~∅6.3×5.4 為 1000 小時）後，電容器的特性符合下表的要求。

Capacitance Change 靜電容量變化率	Within ±20% of initial value 初始值的±20%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

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。

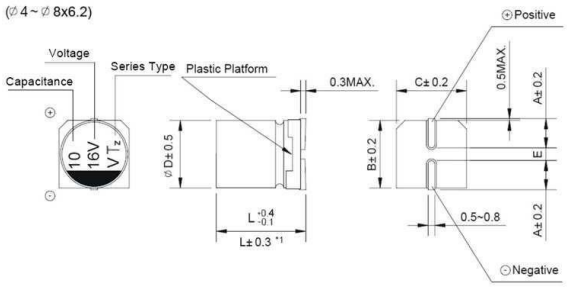
Resistance to Soldering Heat
耐焊接熱特性

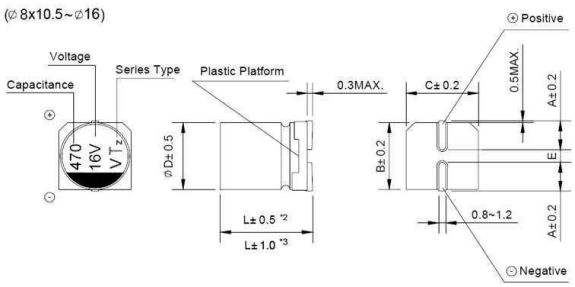
After reflow soldering and restored at room temperature, they meet the characteristics listed below.
經過回流焊並冷卻至室溫後，電容器的特性符合下表的要求。

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

☐ DRAWING (Unit: mm) 外形圖





*1. Applicable to ∅6.3×7.7 適用於∅6.3×7.7
*2. Applicable to ∅8×10.5~∅10 適用於∅8×10.5~∅10
*3. Applicable to ∅12.5~∅16 適用於∅12.5~∅16

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VE 、RVE Series

☐ 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 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
A	1.9	2.2	2.6	2.6	3.3	3.2	3.2	3.2	4.7	4.7	5.5
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
E ± 0.2	1.0	1.3	2.2	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	6.2	10.5	10.5	13.5	13.5	16.0	16.5

☐ 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 / μF 代碼		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) (8 x 6.2)	0.30 (0.6) (0.6)	450 (230) (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	0.30	450	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	10x 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 × 12.5 (10 × 10.5)	0.13 (0.15)	750 (670)	12.5 × 13.5 (10 × 12.5)	0.11 (0.13)	820 (750)	12.5 × 13.5	0.11	820
2200	222	12.5 × 13.5 (10 × 12.5)	0.11 (0.13)	820 (750)	12.5 × 16	0.09	950	16 × 16.5 (12.5 × 16)	0.08 (0.09)	1260 (950)
3300	332	12.5 × 16 (12.5 × 13.5)	0.09 (0.11)	950 (820)	16 × 16.5	0.08	1260	16 x 16.5	0.08	1260
4700	472	16 × 16.5	0.08	1260	16 × 16.5	0.08	1260			

WV / Code / μF 代碼		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 5.4	1.0	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 0.6	450 (260)	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 紋波電流

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VE 、RVE Series

☐ 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 / μF / 代碼		25			35			50		
		1E			1V			1H		
220	221	8 x 10.5	0.30	450	10 x 10.5 (8 x 10.5)	0.15 (0.30)	670 (450)	10 x 10.5	0.30	500
330	331	10 x 10.5 (8 x 10.5)	0.15 (0.30)	670 (450)	10 x 10.5	0.15	670	16 × 16.5 (12.5 × 13.5) (10 × 12.5)	0.12 (0.20) (0.25)	1060 (650) (580)
470	471	10 x 10.5	0.15	670	10 x 10.5	0.15	670	16 × 16.5 (12.5 × 16)	0.12 (0.15)	1060 (700)
680	681	10 x 12.5	0.13	750	12.5 × 13.5 (10 × 12.5)	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 紋波電流
2200	222	16 × 16.5	0.08	1260						

☐ 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	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

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VZ 、RVZ Series

EXTRA LOWER IMPEDANCE

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
- Impedance 40~60% less than VE&RVE series
  阻抗值比 VE&RVE 系列低 40~60%
- 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 使用温度範圍	-55 ~ +105°C
Voltage Range 額定工作電壓範圍	6.3 ~ 50V
Capacitance Range 靜電容量範圍	4.7 ~ 4700μF
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C
Leakage Current 漏電流	Leakage current (∅4~∅10) ≦0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (∅12.5~∅16) ≦0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (∅4~∅10) ≦0.01CV 或 3μA，取較大值（施加額定工作電壓 2 分鐘後） 漏電流 (∅12.5~∅16) ≦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 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	∅4~∅10	0.22	0.19	0.16	0.14	0.12	0.12
	∅12.5~∅16	0.26	0.22	0.18	0.16	0.14	0.12

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	10	16	25	35	50
Impedance Ratio 阻抗比 ZT/Z20 (max.)	∅4~∅10	Z(-25°C) / Z(20°C)	2	2	2	2	2	2
		Z(-55°C) / Z(20°C)	5	4	4	3	3	3
	∅12.5~∅16	Z(-25°C) / Z(20°C)	3	3	2	2	2	2
		Z(-55°C) / Z(20°C)	10	8	6	4	3	3

Load Life
高溫負荷特性

After 3000 hrs. (2000 hrs. for ∅4~∅6.3×5.4) 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 3000 小時（∅4~∅6.3×5.4 為 2000 小時）後，電容器的特性符合下表的要求。

Capacitance Change 靜電容量變化率	Within ±25% of initial value 初始值的±25%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

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。

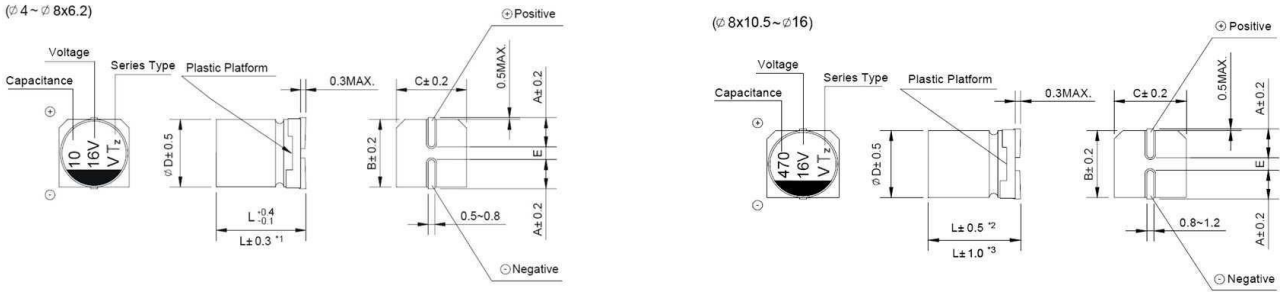
Resistance to Soldering Heat
耐焊接熱特性

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。

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 標示	Black print on the case top. 鋁殼頂部黑字印刷。

☐ DRAWING (Unit: mm) 外形圖



*1. Applicable to ∅6.3×7.7 適用於∅6.3×7.7
*2. Applicable to ∅8×10.5~∅10 適用於∅8×10.5~∅10
*3. Applicable to ∅12.5~∅16 適用於∅12.5~∅16

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VZ 、RVZ Series

☐ 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 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
A	1.9	2.2	2.6	2.6	3.3	3.2	3.2	3.2	4.7	4.7	5.5
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
E ± 0.2	1.0	1.3	2.2	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	6.2	10.5	10.5	13.5	13.5	16.0	16.5

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

WV / μF / Code 代碼		6.3			10			16		
		0J			1A			1C		
10	100							4 × 5.4	1.8	80
15	150							4 × 5.4	1.8	80
22	220	4 × 5.4	1.8	80	4 × 5.4	1.8	80	5 × 5.4 (4 × 5.4)	0.76 (1.8)	150 (80)
33	330	5 × 5.4 (4 × 5.4)	0.76 (1.8)	150 (80)	5 × 5.4 (4 × 5.4)	0.76 (1.8)	150 (80)	6.3 × 5.4 （5 × 5.4）	0.44 （0.76）	230 (150)
47	470	5 × 5.4 (4 × 5.4)	0.76 (1.8)	150 (80)	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)
56	560	5 × 5.4	0.76	150	6.3 × 5.4	0.44	230	6.3 × 5.4	0.44	230
68	680	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)	6.3 × 5.4	0.44	230	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.34 (0.44) (0.34)	280 (230) (280)
100	101	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.34 (0.44) (0.34)	280 (230) (280)
150	151	6.3 × 5.4	0.44	230	6.3 × 7.7	0.34	280	6.3 × 7.7	0.34	280
220	221	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 × 7.7 (8 × 6.2)	0.34 (0.34)	280 (280)	8 × 10.5 (6.3 × 7.7)	0.17 (0.34)	450 (280)
330	331	6.3 × 7.7 (8 × 6.2)	0.34 (0.34)	280 (280)	8 × 10.5	0.17	450	10 × 10.5 (8 × 10.5)	0.09 (0.17)	670 (450)
470	471	8 × 10.5	0.17	450	8 × 10.5	0.17	450	10 × 10.5 (8 × 10.5)	0.09 (0.17)	670 (450)
680	681	10 × 10.5 (8 × 10.5)	0.09 (0.17)	670 (450)	10 × 10.5	0.09	670	10 × 12.5 (10 × 10.5)	0.075 (0.09)	800 (670)
1000	102	10 × 10.5 (8 × 10.5)	0.09 (0.17)	670 (450)	10 × 10.5	0.09	670	16 × 16.5 (12.5 × 16) (12.5 × 13.5)	0.055 (0.06) (0.065)	1350 (1050) (900)
1500	152	10 × 12.5 (10 × 10.5)	0.075 (0.09)	800 (670)	12.5 × 13.5	0.065	900	16 × 16.5	0.055	1350
2200	222	12.5×13.5	0.065	900	12.5×16	0.060	1050	16×16.5	0.055	1350
3300	332	12.5×16	0.060	1050	16×16.5	0.055	1350			
4700	472	16×16.5	0.055	1350						

WV / μF / Code 代碼		25			35			50		
		1E			1V			1H		
4.7	4R7				4 × 5.4	1.8	80	5 × 5.4 (4 × 5.4)	1.52 (3.0)	85 (60)
10	100	4 × 5.4	1.8	80	5 × 5.4 (4 × 5.4)	0.76 (1.8)	150 (80)	6.3 × 5.4 (5 × 5.4)	0.88 (1.52)	165 (85)
15	150	5 × 5.4	0.76	150	5 × 5.4	0.76	150	6.3 × 5.4	0.88	165
22	220	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.68 (0.88) (0.68)	185 (165) (185)
33	330	6.3 × 5.4 (5 × 5.4)	0.44 (0.76)	230 (150)	6.3 × 5.4 (8 × 6.2)	0.44 (0.34)	230 (280)	6.3 × 7.7 (8 × 6.2)	0.68 (0.68)	185 (185)
47	470	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 × 7.7 (8 × 6.2)	0.68 (0.68)	185 (185)
56	560	6.3 × 7.7 (6.3 × 5.4)	0.34 (0.44)	280 (230)	6.3 × 7.7	0.34	280	8 × 10.5 (6.3 × 7.7)	0.34 (0.68)	350 (185)
68	680	6.3 × 7.7	0.34	280	6.3 × 7.7	0.34	280	8 × 10.5	0.34	350
100	101	6.3 × 7.7 (8 × 6.2)	0.34 (0.34)	280 (280)	8 × 10.5	0.17	450	10 × 10.5 (8 × 10.5)	0.18 (0.34)	670 (350)
150	151	8 × 10.5 (6.3 × 7.7)	0.17 (0.34)	450 (280)	10 × 10.5	0.09	670	10 × 10.5 Case size ∅D×L(mm) 尺寸	0.18 Impedance (Ω) at 20°C 100KHz 阻抗值	670 Ripple current (mA rms) at 105°C 100KHz 紋波電流

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VZ 、RVZ Series

☐ 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 / μF / 代碼		25			35			50		
		1E			1V			1H		
220	221	8 × 10.5	0.17	450	10 × 10.5	0.09	670	10 × 12.5 (10 × 10.5)	0.16 (0.18)	750 (670)
330	331	10 × 10.5 (8 × 10.5)	0.09 (0.17)	670 (450)	10 × 10.5	0.09	670	12.5×13.5	0.14	800
470	471	10 × 12.5 (10 × 10.5)	0.075 (0.09)	800 (670)	12.5×13.5 (10×12.5)	0.065 (0.075)	900 (800)	16×16.5 (12.5×16)	0.10 (0.12)	1150 (900)
680	681	12.5×13.5	0.065	900	12.5×16 (12.5×13.5)	0.060 (0.065)	1050 (900)			
1000	102	16×16.5 (12.5×16)	0.055 (0.060)	1350 (1050)	16×16.5	0.055	1350	Case size ∅D×L(mm) 尺寸	Impedance (Ω) at 20°C 100KHz 阻抗值	Ripple current (mA rms) at 105°C 100KHz 紋波電流
1500	152	16×16.5	0.055	1350						

☐ 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 ~ ∅16	~ 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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VL Series

5000 HOURS LONG LIFE ASSURANCE

5000 小時長壽命品

- Wide temperature range -55 ~ +105°C
  適用於 -55 ~ +105°C 的寬溫範圍
- Load life of 3000~5000 hours
  負荷壽命 3000~5000 小時
- 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	0.1 ~ 1500μF
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C
Leakage Current 漏電流	Leakage current (∅4~∅10) ≦0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (∅12.5~∅16) ≦0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (∅4~∅10) ≦0.01CV 或 3μA，取較大值（施加額定工作電壓 2 分鐘後） 漏電流 (∅12.5~∅16) ≦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 温度: 20°C

Rated Voltage (V) 額定工作電壓		6.3	10	16	25	35	50~100
tan δ (max.) 最大損耗角正切	∅4~∅10	0.28	0.24	0.20	0.16	0.13	0.12
	∅12.5~∅16	0.38	0.34	0.30	0.26	0.22	0.18

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	10	16	25	35	50~100
Impedance Ratio 阻抗比 ZT/Z20 (max.)	∅4~∅10	Z(-25°C) / Z(20°C)	3	3	2	2	2	2
		Z(-55°C) / Z(20°C)	8	5	4	3	3	3
	∅12.5~∅16	Z(-25°C) / Z(20°C)	5	4	3	2	2	2
		Z(-55°C) / Z(20°C)	12	10	8	5	4	3

Load Life
高溫負荷特性

After 5000 hrs. (3000 hrs. for ∅4~∅6.3×5.8 & ∅8×6.2) 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（∅4~∅6.3×5.8 和∅8×6.2 為 3000 小時）後，電容器的特性符合下表的要求。

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	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

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。

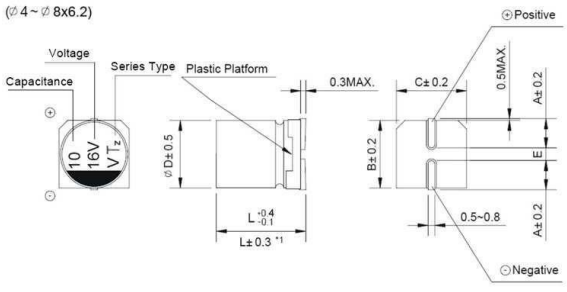
Resistance to Soldering Heat
耐焊接熱特性

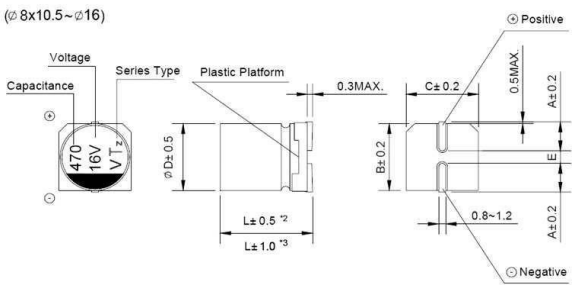
After reflow soldering and restored at room temperature, they meet the characteristics listed below.
經過回流焊並冷卻至室溫後，電容器的特性符合下表的要求。

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 標示 — Black print on the case top. 鋁殼頂部黑字印刷。

☐ DRAWING (Unit: mm) 外形圖





*1. Applicable to ∅6.3×7.7 適用於∅6.3×7.7
*2. Applicable to ∅8×10.5~∅10 適用於∅8×10.5~∅10
*3. Applicable to ∅12.5~∅16 適用於∅12.5~∅16

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VL Series

☐ DIMENSIONS (Unit: mm) 尺寸表

∅D x L	4 x 5.8	5 x 5.8	6.3 x 5.8	6.3 x 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
A	1.9	2.2	2.6	2.6	3.3	3.2	3.2	3.2	4.7	4.7	5.5
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
E ± 0.2	1.0	1.3	2.2	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	6.2	10.5	10.5	13.5	13.5	16.0	16.5

☐ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT 規格尺寸及最大允許紋波電流

WV / μF / Code 代碼		6.3		10		16		25	
		0J		1A		1C		1E	
10	100					4 × 5.8	18	5 × 5.8	27
22	220	4 × 5.8	22	5 × 5.8	30	5 × 5.8	30	6.3 × 5.8	44
33	330	5 × 5.8	35	5 × 5.8	36	6.3 × 5.8	48	6.3 × 5.8	50
47	470	5 × 5.8	38	6.3 × 5.8	50	6.3 × 5.8	50	6.3 × 7.7 (8 × 6.2)	63 (63)
100	101	6.3 × 5.8	69	6.3 × 7.7 (8 × 6.2)	81 (81)	6.3 × 7.7 (8 × 6.2)	81 (81)	8 × 10.5	116
150	151	6.3 × 7.7 (8 × 6.2)	85 (85)	8 × 10.5	125	8 × 10.5	125	10 × 10.5	320
220	221	6.3 × 7.7 (8 × 6.2)	120 (120)	8 × 10.5	141	10 × 10.5	216	10 × 10.5 (8x10.5)	320 (180)
330	331	8 × 10.5	290	10 × 10.5	290	10 × 10.5	290	10 × 10.5	320
470	471	10 × 10.5	320	10 × 10.5	320	10 × 10.5	320	12.5 × 13.5 (10 × 12.5)	400 (350)
680	681	10 × 10.5	320	10 × 10.5	320	10 × 12.5	420	12.5 × 13.5	415
1000	102	10 × 10.5	410	10×12.5	390	12.5 × 13.5	550	12.5 × 13.5	460
1500	152	10 × 12.5	450	12.5 × 13.5	480	12.5 × 13.5	650	12.5 × 16	700
2200	222	12.5 × 13.5	680	12.5 × 16 (12.5 × 13.5)	750 (510)	16 × 16.5	800		
3300	332	12.5 × 16 (12.5 × 13.5)	850 (800)	16 × 16.5	800			Case size 尺寸	Ripple current 紋波電流

WV / μF / Code 代碼		35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4 × 5.8	1.0				
0.22	R22			4 × 5.8	2.6				
0.33	R33			4 × 5.8	3.2				
0.47	R47			4 × 5.8	5				
1	010			4 × 5.8	8				
2.2	2R2			4 × 5.8	12				
3.3	3R3			4 × 5.8	17			6.3 × 7.7 (8 × 6.2)	30 (30)
4.7	4R7	4 × 5.8	16	5 × 5.8	22			8 × 10.5	50
10	100	5 × 5.8	27	6.3 × 5.8	32	6.3 × 7.7 (8 × 6.2)	45 (45)	8 × 10.5	55
22	220	6.3 × 5.8	44	6.3 × 7.7 (8 × 6.2)	58 (58)	8 × 10.5	65	10 × 10.5	70
33	330	6.3 × 7.7 (8 × 6.2)	57 (57)	8 × 10.5	140	10 × 10.5	80	10 × 10.5	80
47	470	8 × 10.5	92	10 × 10.5	310	10 × 10.5	90	12.5 × 13.5 (10 × 12.5)	250 (150)
100	101	10 × 10.5	151	10 × 10.5	310	10 × 12.5	150	12.5 × 13.5	300
150	151	10 × 10.5	290	10 × 10.5	310			16 × 16.5 (12.5 × 16) (12.5 × 13.5)	600 (420) (380)
220	221	10 × 10.5	375	12.5 × 13.5 （10 × 12.5）	340 (320)	12.5 × 13.5	470		
330	331	12.5 × 13.5 (10 × 12.5)	380 (375)	12.5 × 16 (12.5 × 13.5)	600 (500)	16 × 16.5 (12.5 × 16)	650 (550)		
470	471	12.5 × 13.5	520	16 × 16.5	700				
680	681	12.5 × 13.5	550						
1000	102	16 × 16.5 (12.5 × 16)	750 (600)					Case size 尺寸	Ripple current 紋波電流

◗Case size ∅D×L(mm), ripple current (mA rms) at 105°C 120Hz ●尺寸∅D×L(mm)，紋波電流(mA rms)於 105°C 120Hz

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☐ 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		0.70	1.00	1.17	1.36	1.50
	∅12.5 ~ ∅16	~ 68μF	0.75	1.00	1.35	1.57	2.00
		100 ~ 470μF	0.80	1.00	1.23	1.34	1.50
		680 ~ 3300μF	0.85	1.00	1.10	1.13	1.15