

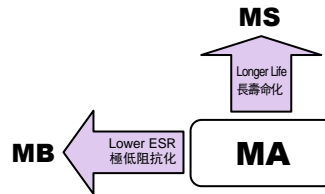
MA Series

CHIP TYPE, STANDARD

貼片式, 標準品



- Operating with wide temperature range -55~+105°C
適用於 -55~+105°C 的寬溫範圍
- Low ESR, high ripple current
低阻抗, 高紋波電流
- Load life of 2000 hours
負荷壽命 2000 小時
- RoHS & REACH compliant, Halogen-free
符合 RoHS 與 REACH, 無鹵

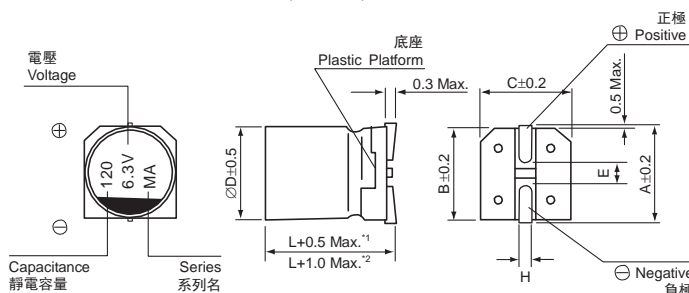


□ SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性			
Operation Temperature Range 使用溫度範圍	-55 ~ +105°C			
Voltage Range 額定工作電壓範圍	2.5 ~ 25V			
Capacitance Range 靜電容量範圍	3.3 ~ 1500µF			
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C			
Leakage Current 漏電流 (*1)	≤Specified value (after 2 minutes application of rated voltage at 20°C). ≤規範值(在 20°C 環境中施加額定工作電壓 2 分鐘後)。			
Dissipation Factor (tan δ) 損耗角正切	≤Specified value at 120Hz, 20°C. ≤規範值(在 20°C 120Hz 環境下)。			
ESR 阻抗值 (*2)	≤Specified value at 100KHz, 20°C. ≤規範值(在 20°C 100KHz 環境下)。			
Stability at Low Temperature 低溫特性	Measurement frequency 測試頻率: 100KHz			
	<table border="1"> <tr> <td>Impedance Ratio 阻抗比 Z(+105°C)/Z(20°C)</td> <td>≤1.25</td> </tr> <tr> <td>ZT/Z20 (max.)</td> <td>≤1.25</td> </tr> </table>	Impedance Ratio 阻抗比 Z(+105°C)/Z(20°C)	≤1.25	ZT/Z20 (max.)
Impedance Ratio 阻抗比 Z(+105°C)/Z(20°C)	≤1.25			
ZT/Z20 (max.)	≤1.25			
Damp Heat (Steady State) 穩態濕熱	When the capacitors are restored to 20°C after the rated voltage is applied for 1000 hours at 60°C, 90% RH, they meet the characteristics listed below. 在 60°C 和相對濕度 90%環境下施加額定工作電壓 1000 小時並冷卻至 20°C 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 為初始值的±20%以內 (*3)		
	Dissipation Factor 損耗角正切	150% or less of initial specified value 不大於規範值的 150%		
	ESR 阻抗值 (*2)	150% or less of initial specified value 不大於規範值的 150%		
	Leakage Current 漏電流	Initial specified value or less 不大於規範值		
Endurance 耐久性	After 2000 hours 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 為初始值的±20%以內 (*3)		
	Dissipation Factor 損耗角正切	150% or less of initial specified value 不大於規範值的 150%		
	ESR 阻抗值 (*2)	150% or less of initial specified value 不大於規範值的 150%		
	Leakage Current 漏電流	Initial specified value or less 不大於規範值		
Resistance to Soldering Heat 耐焊接熱特性 <small>(Please refer page 22 for soldering conditions) (焊接條件請查閱第 22 頁)</small>	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 (*3)		
	Dissipation Factor 損耗角正切	130% or less of initial specified value 不大於規範值的 130%		
	ESR 阻抗值 (*2)	130% or less of initial specified value 不大於規範值的 130%		
	Leakage Current 漏電流	Initial specified value or less 不大於規範值		
Marking 標識	Red print on the case top. 鋁殼頂部紅色字體印刷。			

(*1) If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105°C. 如未能確定, 在 105°C 環境下連續施加額定工作電壓 120 分鐘後測量漏電流。
 (*2) Should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform. 測試應為靠近突出底座的兩個端子的末端。
 (*3) The value before test of examination of resistance to soldering. 焊接測試前的值。

□ DRAWING 外形圖 (Unit: mm)



*1. Applicable to Ø5-Ø8 適用於Ø5-Ø8
 *2. Applicable to Ø10 and above 適用於Ø10和Ø10以上

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

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□ DIMENSIONS 尺寸表 (Unit: mm)

∅D × L	4 × 5.5	5 × 6	6.3 × 5.5/6	8 × 7	8 × 12	10 × 8/10	10 × 12.7
A	5.0	6.0	7.3	9.0	9.0	11.0	11.0
B	4.3	5.3	6.6	8.3	8.3	10.3	10.3
C	4.3	5.3	6.6	8.3	8.3	10.3	10.3
E	1.0	1.6	2.1	3.2	3.2	4.6	4.6
L	5.5	6.0	5.5/6.0	7.0	12.0	8.0/10.0	12.7
H	0.5~0.8	0.5~0.8	0.5~0.8	0.8~1.1	0.8~1.1	0.8~1.1	0.8~1.1

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

WV (V)		2.5 (0E)					4 (0G)				
Cap. 容量 (μF)	Parameter 參數	Case size ∅D×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流	Case size ∅D×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流
		33	330						4 × 5.5	0.12	26.4
100	101	6.3 × 6	0.12	50	22	2600	6.3 × 5.5 (6.3 × 6)	0.12 (0.12)	80 (80)	22 (22)	2600 (2600)
150	151						6.3 × 5.5 (5 × 6) (6.3 × 6)	0.12 (0.12) (0.12)	120 (300) (120)	22 (30) (22)	2800 (2000) (2800)
220	221	6.3 × 5.5 (6.3 × 6)	0.12 (0.12)	110 (110)	20 (20)	2800 (2800)	8 × 7	0.12	176	21	3200
330	331						8 × 7	0.12	264	21	3400
470	471	8 × 7	0.12	235	20	3300	10 × 8	0.12	376	17	4200
560	561						8 × 12	0.12	448	13	4520
680	681						10 × 8	0.12	544	17	4400
820	821	10 × 8	0.12	410	17	4400	10 × 10	0.12	656	13	4800
1200	122						10 × 12.7	0.12	960	10	5500
1500	152	10 × 10 (10 × 12.7)	0.12 (0.12)	750 (750)	13 (12)	4700 (5440)					

WV (V)		6.3 (0J)					10 (1A)				
Cap. 容量 (μF)	Parameter 參數	Case size ∅D×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流	Case size ∅D×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流
		4.7	4R7						4 × 5.5	0.12	9.4
6.8	6R8						4 × 5.5	0.12	13.6	240	670
10	100						4 × 5.5	0.12	20	220	700
15	150						4 × 5.5	0.12	30	200	700
22	220	4 × 5.5	0.12	27.72	200	700					
33	330						5 × 6	0.12	66	35	1500
47	470	5 × 6	0.12	59.22	35	1600	5 × 6 (6.3 × 6)	0.12 (0.12)	94 (94)	26 (26)	2600 (2600)
56	560						6.3 × 5.5 (6.3 × 6)	0.12 (0.12)	112 (112)	25 (25)	2500 (2500)
82	820	6.3 × 5.5 (6.3 × 6)	0.12 (0.12)	103 (103)	23 (23)	2600 (2600)					
100	101	6.3 × 5.5 (5 × 6) (6.3 × 6)	0.12 (0.12) (0.12)	126 (315) (126)	23 (25) (23)	2800 (2200) (2800)					
120	121	6.3 × 6	0.12	151	23	3000	8 × 7	0.12	240	23	3000
150	151	8 × 7	0.12	189	22	3200	8 × 7 (10 × 8)	0.12 (0.12)	300 (300)	23 (21)	3200 (3300)
220	221	8 × 7	0.12	277	22	3400					
270	271						8 × 12 (10 × 8)	0.12 (0.12)	540 (540)	13 (20)	4500 (3600)
330	331	10 × 8	0.12	416	18	4200	8 × 12 (10 × 8)	0.12 (0.12)	660 (660)	14 (20)	4000 (3700)
470	471	8 × 12 (10 × 8) (10 × 10)	0.12 (0.12) (0.12)	592 (592) (592)	12 (18) (16)	5300 (4300) (4600)	10 × 10 (10 × 12.7)	0.12 (0.12)	940 (940)	16 (12)	4600 (5300)
560	561						10 × 10 (10 × 12.7)	0.12 (0.12)	1120 (1120)	15 (13)	4800 (5230)
680	681	10 × 10 (10 × 12.7)	0.12 (0.12)	857 (857)	14 (10)	5000 (5500)					
820	821	10 × 12.7	0.12	1033	10	5800					

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

WV (V)		16 (1C)					20 (1D)				
Cap. 容量 (μF)	Parameter 參數	Case size ØD×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流	Case size ØD×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流
3.3	3R3	4 × 5.5	0.12	7.04	260	660					
10	100						4 × 5.5	0.12	40	120	900
22	220	5 × 6	0.12	70.4	45	1210	6.3 × 5.5 (6.3 × 6)	0.12 (0.12)	88 (88)	50 (50)	1700 (1700)
33	330	6.3 × 6	0.12	106	31	2400					
39	390	6.3 × 5.5 (6.3 × 6)	0.12 (0.12)	125 (125)	31 (31)	2400 (2400)	8 × 7	0.12	156	45	2000
47	470						8 × 7	0.12	188	45	2000
56	560	8 × 7	0.12	179	30	2900	10 × 8	0.12	224	40	2400
68	680						10 × 8	0.12	272	40	2600
82	820	8 × 7	0.12	262	28	3200	10 × 8	0.12	328	40	2600
100	101	10 × 8	0.12	320	27	3300	8 × 12	0.12	400	22	3200
120	121						10 × 10	0.12	480	35	2800
150	151	10 × 8 (6.3 × 6.5)	0.12 (0.12)	480 (480)	25 (30)	3500 (2900)	10 × 12.7	0.12	600	20	4320
180	181	8 × 12 (10 × 8)	0.12 (0.12)	576 (576)	16 (25)	4400 (3600)					
220	221	10 × 10 (10 × 12.7)	0.12 (0.12)	704 (704)	20 (14)	3900 (5050)					
330	331	10 × 12.7	0.12	1056	14	5000					

WV (V)		25 (1E)				
Cap. 容量 (μF)	Parameter 參數	Case size ØD×L (mm) 尺寸	Dissipation factor (tan δ) 損耗角正切	Leakage current (μA) 漏電流	ESR (mΩ) max. 20°C, 100KHz 阻抗值	Ripple current (mA rms) 105°C, 100KHz 紋波電流
6.8	6R8	6.3 × 6	0.12	34	80	1200
10	100	8 × 7	0.12	50	60	1600
22	220	10 × 8	0.12	110	50	2200
33	330	8 × 12	0.12	165	30	2800
47	470	8 × 12 (10 × 10)	0.12 (0.12)	235 (235)	30 (45)	3000 (2400)
56	560	10 × 12.7	0.12	280	28	3800
100	101	8 × 7	0.12	500	25	3000

- Taping specifications are given in page 12. 編帶標準請查閱第 12 頁。
- Soldering conditions and recommended land size are given in page 15. 焊接條件及推薦安裝尺寸請查閱第 15 頁。
- Please refer to page 13 for the minimum package quantity. 最小包裝數量請查閱第 13 頁。
- Please refer to page 10 for the Part Number System. 產品編碼規則請查閱第 10 頁。

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