

### 產品特點 Features

Directly mountable on printed circuit board without holders.  
Smaller in sizes than ordinary capacitors.  
Terminal spacing fixed at 10mm for PC board plug in.  
Aluminum case designed with explosion-proof vent.  
直接插入安裝，無需支架，  
同容量下，比其它電容尺寸小，  
PC板插入脚距為10mm，  
帶防爆閥鋁制外殼。



### 規格書 SPECIFICATIONS

項目 Item	特性參數 Characteristics					
使用溫度範圍 Operating Temperature Range	-40 to +85°C	-25 to +85°C				
額定電壓範圍 Rated Working Voltage Range	10 to 250V	315 to 500V				
容量範圍 Nominal Capacitance Range	56 to 82000 µF					
容量允許偏差 Capacitance Tolerance	± 20% at 120Hz, +20°C					
漏電流 Leakage Current	$I \leq 3\sqrt{CV} (\mu A)$ after 5 minutes application of rated working voltage at +20°C					
損耗角正切值(20°C, 120Hz) tan δ (120Hz, +20°C)	Working Voltage (V)	10    16    25    35    50    63    80    100				
	tan δ (max.)	0.55    0.50    0.45    0.40    0.35    0.30    0.25    0.20				
	Working Voltage (V)	160~250    315~420    450~500				
	tan δ (max.)	0.15    0.15    0.20				
For capacitance value > 33000 µF, add following calculated value: $\frac{(\text{rated capacitance}) - 33000 \mu F}{10000 \mu F} \times 0.1$						
低溫特性 Low Temperature Characteristics	Impedance ratio max. at 120Hz					
	Working Voltage (V)	10~100	160~250	315~385	400~450	500
	Z-25°C / Z+20°C	4	3	5	8	8
	Z-40°C / Z+20°C	15	15			
高溫負荷特性 High Temperature Loading	85°C條件下施加額定電壓與額定紋波2000H後取出，待產品恢復至常溫後測試 Test time : 2,000 hours Test temperature : +85°C Test conditions: Rated DC working voltage with rated ripple current Post test requirements at +20°C					
	Leakage current	≤ Initial specified value				
	Cap. change	within ± 20% of the initial measured value				
	tan δ	≤ 200% of the initial specified value				
高溫貯存特性 Shelf Life	85°C不加電壓貯存1000H，然後取出恢復到常溫後測試 At +85°C no voltage applied after 1,000 hours and then being stabilized at +20°C the capacitors shall meet the following limits					
	Leakage current	≤ Initial specified value				
	Cap. change	within ± 15% of the initial measured value				
	tan δ	≤ 150% of the initial specified value				
參考國際標準 Industrial Standard	JIS C - 5101-4 (IEC 60384-4)					

牛角電解電容

### 紋波電流修正係數 RIPPLE CURRENT MULTIPLIER

Frequency Coefficient

Coefficient \ Rated Voltage	60	120	1k	10k~50k
10~100V	0.90	1.00	1.15	1.25
160~250V	0.80	1.00	1.15	1.47
315~500V	0.80	1.00	1.15	1.47

一覽表 Standard

Voltage (Code)		10V		16V		25V		35V		
Cap. (μF)	Code	Case Size	Ripple Current							
2700	278							20×25	1.76	
3300	338							20×30	2.14	
3900	398							20×30	2.28	
								22×25	2.22	
4700	478					20×25	2.18	20×35	2.46	
						22×30		2.46		
						25×25		2.43		
5600	568					20×30	2.33	22×35	2.79	
						22×25	2.31	25×30	2.75	
6800	688			20×25	2.33	20×35	2.56	22×40	2.97	
							22×30	2.56	25×30	2.89
							30×25		3.09	
8200	828			20×30	2.56	20×40	2.91	22×45	3.47	
				22×25	2.56	22×30	2.86	25×35	3.33	
						25×25	2.78	30×30	3.29	
10000	109	20×25	2.22	20×35	2.85	22×35	3.31	22×50	3.75	
					22×30	2.89	25×30	3.16	25×40	3.65
12000	129	20×30	2.44	20×40	3.20	22×40	3.77	25×45	4.15	
		22×25	2.41	22×30	3.13	25×35	3.63	30×35	4.14	
				25×25	3.01	30×25	3.80	35×30	4.27	
15000	159	20×35	2.90	22×35	3.69	22×50	4.21	30×40	4.80	
		22×30	2.88	25×30	3.64	25×40	4.10	35×35	4.95	
		25×25	2.88	30×25	3.73	30×30	4.00			
18000	189	20×40	3.31	22×40	3.98	25×45	4.68	30×45	5.30	
		22×35	3.22	25×35	3.98	30×35	4.66	35×40	5.71	
		25×30	3.08	30×30	3.88	35×30	4.68			
22000	229	22×40	3.79	22×50	4.52	30×40	5.33	35×45	6.38	
		25×30	3.66	25×40	4.44	35×35	5.26			
		30×25	3.53	30×30	4.38					
27000	279	22×45	4.04	25×45	4.98	30×45	6.02	35×50	6.90	
		25×35	4.04	30×35	4.95	35×40	6.02			
		30×30	3.99	35×30	4.82					
33000	339	22×50	4.58	25×50	5.49	35×45	6.75			
		25×40	4.56	30×40	5.60					
		30×30	4.58	35×30	5.46					
39000	399	25×45	5.29	30×45	6.21	35×50	7.56			
		30×35	5.21	35×35	6.12					
		35×30	5.50							
47000	479	25×50	5.78	30×50	6.93					
		30×40	5.78	35×40	6.89					
		35×35	5.55							
56000	569	30×45	6.59	35×45	7.69					
		35×35	6.40							
68000	689	30×50	7.50							
		35×40	7.48							
82000	829	35×50	8.50							

Maximum Allowable Ripple Current (Arms) at 85°C 120Hz  
 在85°C 120Hz條件的最大紋波值

Case Size Φ D x L (mm)  
 尺寸 Φ D x L (mm)

牛角電解電容

一覽表 Standard

Voltage (Code)		50V		63V		80V		100V	
Cap. (μF)	Code	Case Size	Ripple Current						
680	687							20 × 25	1.66
820	827							20 × 30	1.85
								22 × 25	1.86
1000	108					20 × 25	1.56	20 × 35	2.02
								22 × 30	2.02
1200	128					20 × 30	1.80	20 × 40	2.12
						22 × 25	1.77	22 × 30	2.12
								25 × 25	2.11
1500	158			20 × 25	1.69	20 × 35	2.10	22 × 35	2.45
						22 × 30	2.01	25 × 30	2.47
1800	188	20 × 25	1.70	20 × 30	2.04	20 × 40	2.30	22 × 40	2.77
				22 × 25	1.90	22 × 30	2.11	25 × 35	2.81
						25 × 25	2.26	30 × 25	2.65
2200	228	20 × 30	2.07	20 × 35	2.40	22 × 40	2.53	22 × 45	3.15
		22 × 25	1.93	22 × 30	2.35	25 × 30	2.53	25 × 40	3.21
				25 × 25	2.30	30 × 25	2.56	30 × 30	3.17
2700	278	20 × 35	2.21	20 × 40	2.52	22 × 45	2.93	25 × 45	3.66
		22 × 30	2.21	22 × 35	2.50	25 × 35	2.93	30 × 35	3.65
				25 × 30	2.52	30 × 30	2.91	35 × 30	3.77
3300	338	20 × 40	2.41	22 × 40	2.72	22 × 50	3.23	25 × 50	4.15
		22 × 30	2.41	25 × 30	2.74	25 × 40	3.29	30 × 40	4.18
		25 × 25	2.38	30 × 25	2.78	30 × 30	3.25	35 × 35	4.07
3900	398	22 × 35	2.72	22 × 45	3.09	25 × 45	3.62	30 × 45	4.67
		25 × 30	2.68	25 × 35	3.13	30 × 35	3.70	35 × 35	4.61
				30 × 30	3.09				
4700	478	22 × 40	3.02	22 × 50	3.69	25 × 50	4.28	30 × 50	5.26
		25 × 30	3.07	25 × 40	3.59	30 × 40	4.23	35 × 40	5.23
		30 × 25	3.01	30 × 30	3.54	35 × 30	4.12		
5600	568	22 × 45	3.43	25 × 45	4.01	30 × 45	4.70	35 × 45	5.88
		25 × 35	3.47	30 × 35	4.00	35 × 35	4.64		
		30 × 30	3.43	35 × 30	3.75				
6800	688	22 × 50	3.94	25 × 50	4.52	30 × 50	5.27	35 × 50	6.01
		25 × 40	3.87	30 × 40	4.55	35 × 40	5.24		
		30 × 35	3.93	35 × 30	4.44				
8200	828	25 × 45	4.44	30 × 45	5.12	35 × 45	5.89		
		30 × 35	4.47	35 × 35	5.05				
		35 × 30	4.41						
10000	109	30 × 40	5.08	30 × 50	5.78	35 × 50	6.63		
		35 × 35	4.92	35 × 40	5.75				
12000	129	30 × 50	5.72	35 × 45	6.47				
		35 × 40	5.69						
15000	159	35 × 45	6.56						
18000	189	35 × 50	7.14						

Maximum Allowable Ripple Current (Arms) at 85°C 120Hz  
在85°C 120Hz條件的最大紋波值

Case Size Φ D x L (mm)  
尺寸 Φ D x L (mm)

牛角電解電容

一覽表 Standard

Voltage (Code)		160V		180V		200V		220V	
Cap. (μF)	Code	Case Size	Ripple Current						
180	187							20 × 25	1.11
220	227					20 × 25	1.19	20 × 25	1.23
								22 × 25	1.30
270	277	20 × 25	1.28	20 × 25	1.29	20 × 30	1.39	20 × 30	1.46
						22 × 25	1.37	22 × 25	1.42
330	337	20 × 25	1.55	20 × 30	1.77	20 × 30	1.56	20 × 35	1.64
				22 × 25	1.49	22 × 25	1.51	22 × 30	1.59
								25 × 25	1.59
390	397	20 × 30	1.63	20 × 30	1.84	20 × 35	1.74	20 × 40	1.79
		22 × 25	1.63	22 × 25	1.84	22 × 30	1.73	22 × 35	1.80
						25 × 25	1.71	25 × 25	1.75
470	477	20 × 35	1.90	20 × 35	1.91	20 × 40	2.03	22 × 35	2.06
		22 × 30	1.86	22 × 30	1.91	22 × 30	1.97	25 × 30	2.08
		25 × 25	1.86	25 × 25	2.08	25 × 30	1.95	30 × 25	2.16
560	567	20 × 40	2.14	20 × 40	2.15	22 × 40	2.18	22 × 40	2.22
		22 × 30	2.15	22 × 35	2.25	25 × 30	2.15	25 × 35	2.38
		25 × 30	2.15	25 × 25	2.25	30 × 25	2.15	30 × 25	2.18
680	687	22 × 40	2.35	22 × 35	2.48	22 × 45	2.48	22 × 45	2.62
		25 × 30	2.33	25 × 30	2.50	25 × 35	2.48	25 × 40	2.56
		30 × 25	2.33	30 × 25	2.46	30 × 30	2.48	30 × 30	2.52
820	827	22 × 45	2.68	22 × 40	2.86	22 × 50	2.81	25 × 45	2.91
		25 × 35	2.65	25 × 35	2.75	25 × 40	2.79	30 × 35	2.84
		30 × 30	2.64	30 × 25	2.69	30 × 30	2.75	35 × 30	2.79
1000	108	22 × 50	3.02	25 × 40	3.06	25 × 45	3.28	25 × 50	3.53
		25 × 40	3.00	30 × 30	3.10	30 × 35	3.15	30 × 40	3.36
		30 × 30	2.96			35 × 30	3.25	35 × 30	3.29
1200	128	25 × 45	3.43	25 × 45	3.63	25 × 50	3.61	30 × 45	3.72
		30 × 35	3.41	30 × 35	3.55	30 × 40	3.61	35 × 35	3.68
		35 × 30	3.40	35 × 30	3.49	35 × 35	3.57		
1500	158	30 × 40	3.96	30 × 40	4.10	30 × 45	4.13	35 × 40	4.10
		35 × 35	3.94	35 × 35	4.02	35 × 40	4.06		
1800	188	30 × 45	4.31	30 × 45	4.55	35 × 45	4.59	35 × 45	4.52
		35 × 35	4.28	35 × 35	4.54				
2200	228	35 × 40	4.96	35 × 40	4.83	35 × 50	5.25		
2700	278	35 × 50	5.57	35 × 50	5.30				

Maximum Allowable Ripple Current (Arms) at 85°C 120Hz  
在85°C 120Hz條件的最大紋波值

Case Size Φ D x L (mm)  
尺寸 Φ D x L (mm)

牛角電解電容

一覽表 Standard

Voltage (Code)		250V		315V		350V		385V	
Cap. (μF)	Code	Case Size	Ripple Current						
68	686							20 × 25	0.68
82	826							20 × 30	0.74
								22 × 25	0.76
100	107							20 × 30	0.86
								22 × 30	0.89
120	127					20 × 30	0.96	20 × 35	0.96
						22 × 25	1.04	22 × 30	0.98
								25 × 25	1.02
150	157			20 × 30	1.00	20 × 30	1.10	20 × 40	1.10
						22 × 30	1.20	22 × 35	1.12
						25 × 25	1.22	25 × 30	1.14
180	187	20 × 25	1.20	20 × 35	1.13	20 × 35	1.24	22 × 40	1.27
				22 × 30	1.29	22 × 30	1.34	25 × 35	1.30
				25 × 25	1.38	25 × 25	1.37	30 × 25	1.37
220	227	20 × 30	1.26	20 × 40	1.29	22 × 35	1.47	22 × 45	1.42
		22 × 25	1.24	22 × 35	1.41	25 × 30	1.53	25 × 35	1.48
				25 × 30	1.47	30 × 25	1.54	30 × 30	1.49
270	277	20 × 30	1.42	22 × 40	1.70	22 × 40	1.70	25 × 40	1.61
		22 × 30	1.50	25 × 30	1.70	25 × 35	1.73	30 × 35	1.64
						30 × 25	1.80		
330	337	20 × 35	1.68	22 × 45	1.91	22 × 45	1.87	25 × 50	1.80
		22 × 30	1.66	25 × 35	1.94	25 × 40	1.97	30 × 40	1.85
		25 × 25	1.61	30 × 30	1.98	30 × 30	2.03	35 × 30	1.87
390	397	20 × 40	1.92	22 × 50	2.07	25 × 40	2.14	30 × 40	2.05
		22 × 35	1.88	25 × 40	2.11	30 × 35	2.23	35 × 35	2.07
		25 × 30	1.88	30 × 30	2.15	35 × 30	2.30		
470	477	22 × 40	2.15	25 × 45	2.39	30 × 35	2.53	30 × 50	2.26
		25 × 35	2.15	30 × 35	2.38	35 × 30	2.55	35 × 40	2.26
		30 × 25	2.04	35 × 30	2.36				
560	567	22 × 45	2.48	30 × 40	2.63	30 × 40	2.73	35 × 45	2.59
		25 × 35	2.35	35 × 35	2.69	35 × 35	2.75		
		30 × 30	2.35						
680	687	25 × 40	2.67	30 × 45	2.80	35 × 40	3.15	35 × 50	2.80
		30 × 35	2.71	35 × 40	3.05				
820	827	25 × 50	3.01	30 × 50	3.28	35 × 45	3.47		
		30 × 35	2.98	35 × 45	3.45				
		35 × 30	2.96						
1000	108	30 × 45	3.56	35 × 50	3.57	35 × 50	3.60		
		35 × 35	3.48						
1200	128	30 × 50	3.99						
		35 × 40	3.84						
1500	158	35 × 45	4.33						
1800	188	35 × 50	4.54						

Maximum Allowable Ripple Current (Arms) at 85°C 120Hz  
在85°C 120Hz條件的最大紋波值

Case Size Φ D × L (mm)  
尺寸 Φ D × L (mm)

牛角電解電容

一覽表 Standard

Voltage (Code)		400V		420V		450V		500V	
Cap. (μF)	Code	Case Size	Ripple Current						
56	566					20 × 25	0.61		
68	686	20 × 25	0.75	20 × 25	0.70	20 × 30	0.70		
						22 × 25	0.71		
82	826	20 × 30	0.82	20 × 30	0.80	20 × 35	0.80		
		22 × 25	0.84	22 × 25	0.85	22 × 25	0.86		
100	107	20 × 30	0.95	20 × 35	0.90	20 × 35	0.88	25 × 25	0.80
		22 × 30	0.99	22 × 30	0.97	22 × 30	0.95	30 × 25	0.90
		25 × 25	0.99	25 × 25	0.98	25 × 25	0.97		
120	127	20 × 35	1.07	20 × 35	1.04	20 × 40	0.99	25 × 30	0.89
		22 × 30	1.09	22 × 30	1.07	22 × 35	1.07		
		25 × 25	1.13	25 × 25	1.08	25 × 30	1.09	30 × 25	0.90
				30 × 25	1.12				
150	157	20 × 40	1.22	20 × 45	1.17	22 × 40	1.18	25 × 35	1.07
		22 × 35	1.24	22 × 35	1.21	25 × 30	1.25		
		25 × 30	1.27	25 × 30	1.26	30 × 25	1.29		
				30 × 25	1.30				
180	187	22 × 40	1.41	22 × 40	1.33	22 × 45	1.32	30 × 35	1.30
		25 × 30	1.44	25 × 35	1.42	25 × 35	1.40		
		30 × 25	1.52	30 × 25	1.48	30 × 30	1.45		
220	227	22 × 45	1.58	22 × 45	1.55	25 × 40	1.59	25 × 45	1.40
		25 × 35	1.64	25 × 35	1.58	30 × 30	1.64		
		30 × 30	1.66	30 × 30	1.65	35 × 30	1.66		
270	277	25 × 40	1.79	25 × 40	1.74	25 × 45	1.73	25 × 50	1.60
		30 × 30	1.82	30 × 35	1.90	30 × 35	1.89	30 × 40	1.55
				35 × 30	1.94	35 × 30	1.90		
330	337	25 × 45	2.00	25 × 50	2.20	30 × 40	2.12	30 × 45	1.80
		30 × 35	2.05	30 × 35	1.98	35 × 35	2.15		
		35 × 30	2.05	35 × 35	2.17				
390	397	30 × 40	2.26	30 × 40	2.22	30 × 45	2.35	30 × 50	2.10
		35 × 35	2.28	35 × 35	2.27	35 × 40	2.38		
470	477	30 × 45	2.51	30 × 45	2.50	35 × 45	2.68		
		35 × 40	2.54	35 × 40	2.61				
560	567	35 × 40	2.85	35 × 45	2.95				
680	687	35 × 50	3.10						

Maximum Allowable Ripple Current (Arms) at 85°C 120Hz  
在85°C 120Hz條件的最大紋波值

Case Size Φ D x L (mm)  
尺寸 Φ D x L (mm)

牛角電解電容