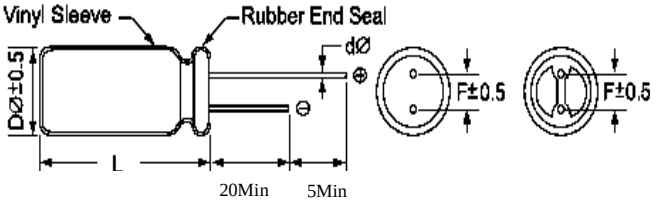
■ Characteristics 特 性

- Endurance : 105℃ 1000 hours
  高溫負荷性 : 105℃帶負荷壽命1000小時.
- For general purpose coupling , decoupling , by pass , and filtering circuit in entertainment electronics .
  一般適用於耦合、去耦、旁路、濾波電路的娛樂電子學.
- For detailed specifications , please refer to Engineering Bulletin No. 2030
  詳情請參照工程標準No.2030.

Item 項目	Characteristics 特性參數
Category Temperature Range 額定工作溫度範圍	-40～+105℃ -25～+105℃
Rated Voltage Range 額定電壓範圍	6.3～100V DC 160～450V DC
Rated Capacitance Range 容量範圍	0.1～10000μF
Capacitance Tolerance 電容量允許差	±20%(M) at 120Hz , 25℃
Leakage Current (Max) 洩漏電流	I ≦ 0.01CV or 3μA (6.3 ~100VDC) I ≦ 0.03CV + 10μA (160 ~ 450VDC) whichever is greater.(After 2 minutes application of rated voltage at 25℃)
Dissipation Factor (Max) 損失因數	Measurement frequency : 120Hz , Temperature : 25℃ Rated Voltage (V) 6.3 10 16 25 35 50 63 100 160 200 250 350 400 450 DF(%) 24 20 17 15 12 10 10 8 20 20 20 25 25 25 For capacitor whose capacitance excceds 1000 μF. The value of DF(%) is increased by 2% for every addition of 1000μF.
Low Temperature Stability Impedance Ratio (Max) 低溫特性阻抗比	Measurement frequency : 120Hz Rated Voltage (V) 6.3 10 16 25-100 160-250 350-450 -25 ℃ / +20℃ 4 3 2 2 4 4 -40 ℃ / +20℃ 8 6 4 3 6 8
Load Life (Endurance) 高溫負荷	After apply rated voltage with rated ripple current for 1000 hrs at 105℃ , the capacitors shall meet the following requirements. +105℃對電容器施加額定電壓1000小時，經恢復後，特性參數滿足以下要求 Capacitance Change 電容量變化: Within ±20 % of initial value ≦初測值的±20% Dissipation Factor 損耗角正切: 200% or less of initial specified value ≦規格值的2倍 Leakage Current 洩漏電流: initial specified value or less ≦規格值
Shelf Life 高溫貯存特性	After leaving capacitors under no load at 105℃ for 500 hours. the capacitors shall meet the following requirements. 在+105℃的環境下存放500小時，經恢復後，特性參數滿足以下要求 Capacitance Change 電容量變化: Within ±20 % of initial value ≦初測值的±20% Dissipation Factor 損耗角正切: 200% or less of initial specified value ≦規格值的2倍 Leakage Current 洩漏電流: 200% or less of initial specified value ≦規格值的2倍
Else 其他	the capacitors with JISC5141 . 其他參數滿足國際 JIS C5141 標準。

■ Diagram of Dimensions 外形圖

Unit : mm



ΦD	5	6	8	10	12	13	16	18	22
F	2.0	2.5	3.5	5.0	5.0	5.0	7.5	7.5	10
Φd	0.5		0.6				0.8		

L≦12 L+1.5max
13≦L≦15 $L^{+1.0}_{-0.5}$
L≧16 L+2.0max

■ Multiplier for Ripple Current 紋波電流係數

● Frequency coefficient 頻率倍加係數

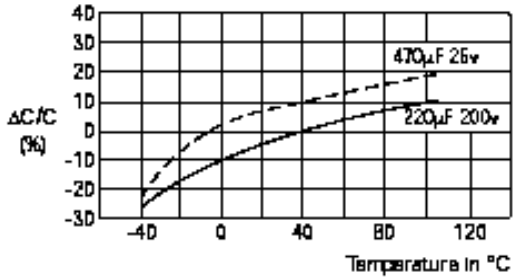
Freq.(Hz) / VDC / Cap.(μF)	120	300	1K	10K-100K
6.3-100V Below 68μF	1.0	1.20	1.30	1.45
6.3-100V 100-680μF	1.0	1.10	1.15	1.25
6.3-100V 1000-22000μF	1.0	1.05	1.10	1.15
160-450V All Cap.(μF)	1.0	1.05	1.10	1.50

● Temperature coefficient 温度倍加系数

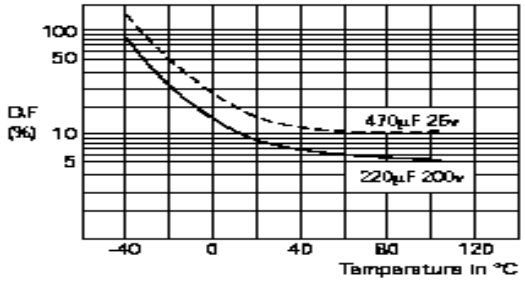
温度(℃) Temperature (℃)	65	85	105
因子 Factor	1.8	1.4	1.0

■ Temperature Characteristics

● Capacitance Change

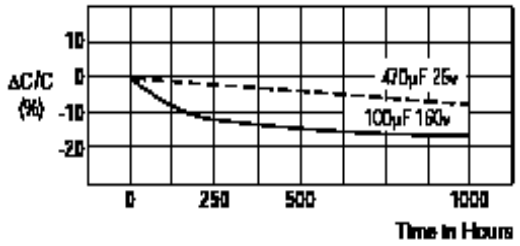


● Dissipation Factor Change

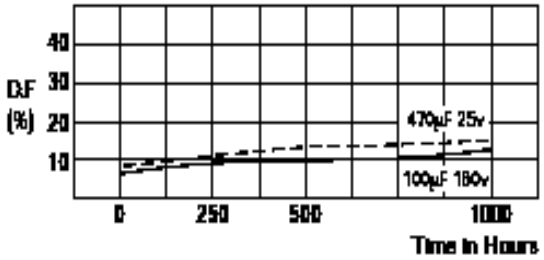


■ Load Life

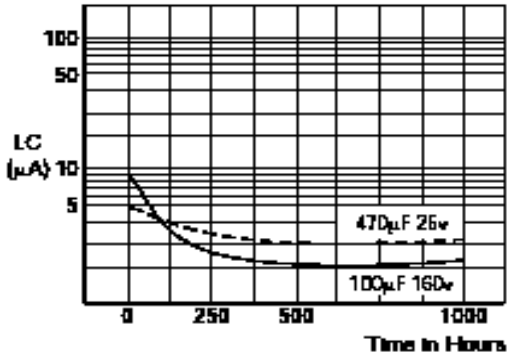
● Capacitance Change



● Dissipation Factor Change



● Leakage Current Change



■ Dimensions, Rated Ripple Current 铝壳尺寸和纹波电流（max）

WV / μF	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
0.47						5×11	5×11	5×11	5×11	5×11	5×11	6.3×11	6.3×11	6.3×11
						6.3	8	11	8.2	8.2	8.2	8.1	8.1	8.1
1						5×11	5×11	5×11	5×11	5×11	6.3×11	6.3×11	8×12	8×12
						13	20	16	12	12	14	12	14	14
2.2						5×11	5×11	5×11	6.3×11	6.3×11	6.3×11	8×12	8×12	10×17
						22	30	24	20	20	20	21	24	24
3.3						5×11	5×11	5×11	6.3×11	6.3×11	8×12	8×12	8×12	10×20
						27	40	30	25	25	30	29	33	33
4.7				5×11	5×11	5×11	5×11	5×11	8×12	8×12	8×12	8×12	8×12	10×20
				27	29	32	34	36	35	35	40	39	39	43
10			5×11	5×11	5×11	5×11	5×11	6.3×11	10×12	10×12	10×16	10×12	10×12	13×20
			37	39	42	47	49	59	59	59	66	63	63	73
22		5×11	5×11	5×11	5×11	5×11	6.3×11	8×12	10×16	10×20	10×20	13×21	13×21	13×25
		49	55	58	63	69	83	105	98	108	108	109	120	135
33	5×11	5×11	5×11	5×11	5×11	6.3×11	6.3×11	10×12	10×20	13×20	13×20	16×25	13×25	16×30
	55	60	67	71	77	96	101	146	133	154	154	165	165	178
47	5×11	5×11	5×11	5×11	6.3×11	6.3×11	8×12	10×16	13×20	13×20	13×21	16×30	16×35	16×35
	65	71	80	85	105	115	144	196	183	183	202	213	228	228
100	5×11	5×11	6.3×11	6.3×11	6×11	6×11	10×14	10×20	16×25	16×25	16×30	18×40	22×35	22×35
	95	104	132	142	152	162	239	316	331	331	359	355	398	398
					8×12	8×12								
					182	199								
220	6.3×11	6.3×11	6.3× 11	8×12	8×14	10×17	10×20	13×25	18×35	18×40	22×35			
	176	196	234	250	307	380	442	599	608	646	681			
330	6.3×11	8×12	8×12	8×12	10×16	10×20	13×20	16×25	22×35	22×35				
	196	256	286	348	425	513	627	824	834	834				
470	6.3×11	6.3×11	8×11	8×14	10×16	13×21	13×25	16×32	22×40	22×41				
	279	306	389	470	507	710	825	1,055	1,065	1465				
		8×11		10×13										
		326		500										
680						10×20	12.5*25							
						825	1100							
1,000	8×12	8×14	10×17	10×17	13×21	13×25	16×30	22×35						
	463	573	641	875	945	1,141	1,465	1,988						
1500			10×20											
			700											
2,200	10×12	13×20	13×21	13×25	16×25	18×35	22×35							
	822	1,035	1,145	1,338	1,609	2,151	2,515							
3,300	13×20	13×20	13×25	16×25	16×35	18×40	22×40							
	1,124	1,035	1,197	1,738	2,137	2,894	3,003							
4,700	13×20	13×25	13×26	16×26	18×40	22×40								
	1,275	1,506	1,835	2,226	2,652	3,134								
6,800	16×25	16×25	16×32	18×40	22×40									
	1,789	1,901	2,362	2,781	3,241									
10,000	16×30	16×35	18×40	22×35										
	2,144	2,414	2,892	3,144										

■ Electrical characteristic 電氣特性

Scope 範圍	Assurance method contents 保證方式項目
Capacitance 靜電容量	★ Measured in accordance with MIL-STD-105E No6 of JIS C5141 依據 JIS C5141 標準第 6 項規定 MIL-STD-105E . ★ Capacitance tolerance : -20%~+20% 120Hz 25℃ 容差：-20%~+20% 120Hz 25℃
leakage Current 洩漏電流	★ Measured in accordance with JIS C5141 依據 JIS C5141 標準 ★ After 2 minutes application of rated voltage at 25℃ , Leakage Current : 在 25℃ , 額定電壓充電 2 分種後，漏電流(取大者) : I≦0.01CV or 3μA (6.3 ~ 100VDC) I ≦0.03CV + 10μA (160V ~ 450VDC) whichever is greater
Dissipation Factor (DF / Tan δ) 損失因數 (散逸因數)	★ Measured in accordance with JIS C 5141 依據 JIS C5141 標準 ★ Measurement frequency : 120Hz , Temperature : 25℃ 測試頻率 : 120Hz , 溫度 : 25℃ . ★ The tan δ max value at 25℃,test in accordance value standard series, For CAP .of more than 1000μF,add 0.02 for every increase of 1000μF 在 25℃測試 , 散逸因數正切最大值應符合本公司各系列規定所示值，且容值每增加 1000μF,正切值上升 0.02 .
Surge Voltage 湧浪電壓 (突波電壓)	★ Measured in accordance with JIS C5141 依據 JIS C5141 標準 ★ The capacitor may be subjected for short periods not exceeding approximately 30 seconds at room temperature with voltage applied through a series resistance of 1000ohm without discharge . 電容器接 1K 電阻器，在常溫下，以每 5±0.5 分鐘為一週期，每一週期加湧浪電壓 300 秒，經 1000 週期後測定其值，應符合下要求：

Rated Voltage (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
DF(%)	24	20	17	15	12	10	10	8	20	20	20	25	25	25

Rated voltage(V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Surge voltage(V)	8	13	20	32	44	63	79	125	200	250	300	400	450	500

Capacitance Change	Less than ±20 % of initial value
Dissipation Factor	Less than 200% of initial specified value
Leakage Current	Less than initial specified value

■ Mechanical Characteristics 機械特性

Scope 範圍	Assurance method contents 保證方式項目
Terminal Strength 端子強度 Pull Test 拉力試驗	★ Measured in accordance with JIS C 5141 依據 JIS C5141 標準 ★ Add a prescriptive load in the terminal end of capacitor, become perpendicular appearance with capacitor body, after 10 ± 0.5 seconds , the capacitor terminal can't have already break or other strange appearance. 將電容器端子末端加規定之荷重 , 使其與電容器本體成垂直狀態 , 經 10±0.5 秒後，端子不可有斷裂或其他異狀。
Bending test 弯曲度试验	★ Measured in accordance with JIS C 5141 依據 JIS C5141 標準 ★ Add a prescriptive load in the terminal end of capacitor , and keep capacitor main body with perpendicular appearance , then main body to the horizontal direction incline 90 ℃ , again replies to the original position , again faces the reversed direction incline 90℃, Again replies to the original position , this for one frequency, do so two frequencies(each frequency time is 5 seconds), the capacitor terminal can't have already break or other strange appearance . 將電容器端子末端加規定之荷重 , 且保持電容器本體成垂直狀態，然後將本體向水準方向傾斜 90℃，再回復至原位置，再朝反方向傾斜 90℃，再回復至原位置，此為一周率，如此做二周率（每周率時間為 5 秒鐘），端子不可有斷裂或其他異狀。

Terminal diameter (mm)	Weight (Kg)
≦0.5	0.5
0.6~0.8	1
≧0.8	2.5

* That with diameter of lead wire less than 0.5mm and case size less than 10mm be capable of with -standing steady pull of 0.5kg for a period of 10 seconds .
* That with diameter of lead wire between 0.6-0.8mm be capable of withstanding steady pull of 1kg for a period of 10 seconds .
* That with diameter of lead wire larger than 0.8mm be capable of withstanding steady pull of 2.5kg for a period of 10 seconds .

Terminal diameter (mm)	Weight (Kg)
≦0.5	0.5
0.6~0.8	1
≧0.8	2.5

* That with diameter of lead wire less than 0.5mm can be given a weight of 0.25kg .
* That with diameter of lead wire between 0.6-0.8mm can be given a weight of 0.5kg .
* That with diameter of lead wire larger than 0.8mm can be given a weight of 1.0kg .

■ Mechanical Characteristics 機械特性

Scope 範圍	Assurance method contents 保證方式項目
Solder heat resistance 焊锡耐热性	★ Measured in accordance with JIS C 5141 依据 JIS C5141 標準 ★ The capacitor terminal CP line must be immersed Tin solution main body 1.5 mm or 2 mm in 265±5℃ . Then takes out after 10±5 seconds . The following specifications shall be satisfied when the capacitor lays the normal temperature (25℃) for 1 hour , within 2 hours , Again determines its value : 将电容器端子 CP 线浸入 265±5℃ ， 锡溶液本体 1.5-2m/m，经 10±5 秒钟后取出，于常温下放置 1 小时以下，2 小时以内，再测定其值： Capacitance Change: Less than ±10 % of initial value Dissipation Factor: Less than initial specified value Leakage Current: Less than initial specified value Appearance: No remarkable defect.
Solder ability 焊锡附著性	★ Measured in accordance with JIS C 5141 依据 JIS C5141 標準 ★ The capacitor terminal CP line must be immersed Tin solution main body 1.5 mm or 2 mm in 230±5℃. Then takes out after 2±0.5 seconds. It plunges the part to be supposed to have 3/4 above new tin at least. 将电容器端子 CP 线浸入 230±5℃ ， 锡溶液本体 1.5-2mm 處 ， 经 2±0.5 秒钟后取出,其浸入部份至少应有 3/4 以上新锡。
Explosion-proof Construction 防爆試驗	★ Rubber stopper or the aluminum shell base of the capacitor has guards against explosions the facility ,But nominal diameter below 8mm,(Including Φ8) cannot exempt supposes the explosion-proof structure. 電容器之橡皮塞或鋁殼底部備有防爆設施，但標稱直徑在 8mm 以下，（不含Φ8）可免設防爆構造。 ★ Inspection procedure：Adds on counter rated voltage 1.2 times , Causes it to give off heat blows out , Regards it to blow out whether from rubber stopper or aluminum shell base breakage . 檢驗方法：加上逆間額定電壓 1.2 倍，使其發熱爆出，視其爆出是否從橡皮塞或鋁殼底部破裂。
Hardness of Rubber 橡膠硬度	★ Material hardness standard of Panasonics 松下電子材質硬度標準 . Material: EPT / HR/EPT / HR/PV / HR/RE Hardness: 73±3 or 75+5/-3 / 77±3 / 75±3 / 84±3

■ Load Live (Endurance) 耐候性

Scope 範圍	Assurance method contents 保證方式項目
Low temp. Stability Impedance Ratio (Max) 低溫特性阻抗比	★ Measured in accordance with JIS C 5141 試驗方法依據 JIS C5141 ★ The Capacitor in low-temperature cabinet , After achieves the temperature balance(80%) , Measures its Impedance value at －25℃ or －40℃ , the following specifications request is as follows: (f:120Hz). 將電容容器於低溫箱中, 達到溫度平衡後(至少 80%), 測其 Impedance 值, 對其-25℃或 40℃時之 impedance 值比較，其要求如下：（f：120Hz）。 Rated Voltage (V): 6.3 / 10 / 16 / 25-100 / 160-250 / 350-450 -25 ℃ / +20℃: 4 / 3 / 2 / 2 / 4 / 4 -40 ℃ / +20℃: 8 / 6 / 4 / 3 / 6 / 8
High temperature 高溫特性	★ Measured in accordance with JIS C 5141 試驗方法依據 JIS C5141 ★ Deposits the capacitor after the rated temperature 105℃±3℃ air returns to in the circle thermostat 1 hour to determine it. 將電容器存放在額定溫度 105℃±3℃空氣迴流恒溫箱中 1 小時後測定之。 Capacitance Change: Less than ±20 % of initial value Dissipation Factor: Less than 200% of initial specified value Leakage Current: Less than initial specified value Appearance: No remarkable defect.
Moisture resistance 耐濕性(低溫)	★ Measured in accordance with JIS C 5141 試驗方法依據 JIS C5141 ★ The Capacitor of without applying any voltage shall be deposited at temperature 40±2℃ and the relative humidity 90~95% backflow type thermostat in 240±8 hours .And the Capacitor shall be stored at normal atmospheric condition for 16 hours before the measurements . he following specifications request is as follows : 將無負載任何電壓的電容器存放在溫度 40±2℃ ， 相對濕度 90~95%RH 的迴流式恒溫箱中放置 240±8 小時 ， 且測試前置於常溫常濕環境下 16 小時後測定 ， 滿足下列條件. Capacitance Change: Less than ±10 % of initial value Dissipation Factor: Less than 150% of initial specified value Leakage Current: Less than initial specified value Appearance: No remarkable defect.

■ Load Live (Endurance) 耐候性

<table>
<tr><th>Scope
範圍</th><th>Assurance method contents
保證方式項目</th></tr>
<tr><td>High temperature load life
高溫負荷壽命</td><td>★ Measured in accordance with JIS C 5141 試驗方法依據 JIS C5141
★ Adds 1KΩ the protective resistor and the rated voltage to the capacitor . Then the capacitor shall be deposited at temperature 105℃of backflow type thermostat for 1000±12 hours . Then the capacitor shall be take out . And the Capacitor shall be stored at normal atmospheric condition for 16 hours before the measurements .
將電容器加上 1KΩ保護電阻，然後放置在溫度 105℃迴流式恒溫箱中，加額定電壓 1000±12 小時後取出，且測試前置於常溫常濕環境下 16 小時後測定 .
<table>
<tr><td>Capacitance Change</td><td>Less than ±20 % of initial value</td></tr>
<tr><td>Dissipation Factor</td><td>Less than 200% of initial specified value</td></tr>
<tr><td>Leakage Current</td><td>Less than initial specified value</td></tr>
<tr><td>Appearance</td><td>No remarkable defect.</td></tr>
</table>
</td></tr>
<tr><td>High temperature Shelf life
高溫無負荷壽命</td><td>★ Measured in accordance with JIS C 5141 試驗方法依據 JIS C5141
★ The Capacitor of without applying any voltage shall be deposited at temperature 105℃ and the relative humidity 90~95% backflow type thermostat in 1000±12 hours .And the Capacitor shall be stored at normal atmospheric condition for 16 hours before the measurements . he following specifications request is as follows :
將無負載任何電壓的電容器存放在溫度 105℃、相對濕度 90~95%RH 的迴流式恒溫箱中放置 1000±12 小時 ，且測試前置於常溫常濕環境下 16 小時後測定 ，滿足下列條件.
<table>
<tr><td>Capacitance Change</td><td>Less than ±20 % of initial value</td></tr>
<tr><td>Dissipation Factor</td><td>Less than 200% of initial specified value</td></tr>
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