

### 塑胶薄膜电容器使用注意事项

在选用薄膜电容器时, 请注意以下事项。  
此外, 商品目录所记载的规格、材质及其他记载内容, 可能会在没有预先通知的情况下发生变更, 敬请谅解。  
商品目录所记载的数据为参考值, 不作为性能保证的数据。

#### ■ 订购时

在订购薄膜电容器时, 请查询确认以下事项。

1. 使用电压: DC, AC
2. 静电容量及允许差
3. 工作温度范围
4. 特殊使用条件: 电压/电流波形、波峰值及有效值、频率、脉冲等
5. 预测故障模式: 电容器的故障对其他部件的影响, 以及其他部件、电路的异常对电容器的影响等。
6. 焊接条件
7. 使用环境
8. 其他

另外, 请事先向本公司索取相应电容器的缴纳规格书, 在确认满足上述内容后、再购买使用。

#### ■ 使用时

##### 1. 额定电压

额定电压为在额定温度下, 可以连续施加于电容器的峰值电压 (直流电压与个别规格所规定的交流电压峰值之和) 的最大值。除特殊电容器外, 电子设备用电容器的额定电压通常以DC值表示。

- 1) DC额定品使用于AC电路 (除去跨电源线电容器) 中时, 会有发热、放电等情况, 请在Table 1的额定电压范围内使用。

### CAUTION FOR PROPER USE OF FILM CAPACITORS

Please consider the following information when selecting and using capacitors.  
Specifications, materials and so on in the catalog may be subject to change without notice.  
Data in the catalog is not guaranteed value, but typical value only.

#### ■ ORDERING INFORMATION

Please confirm and inform us of the following information when ordering capacitors.

1. Working voltage : AC or DC
2. Capacitance and capacitance tolerance
3. Operating temperature range
4. Special operating condition : waveform, effective value, crest value, frequency, pulse, etc.
5. Expected failure mode : Influence to other components, when the capacitor gets failure, or influence to the capacitor, when the other component or the circuit works irregularly.
6. Soldering condition
7. Operating environmental condition
8. Others

Ask for our technical specifications of the capacitor and confirm it to be suitable for the application before purchase and/or use.

#### ■ PROPER USE INFORMATION

##### 1. RATED VOLTAGE

Rated voltage is the maximum peak voltage (sum of D.C. voltage and peak A.C. voltage which is no more than the value specified in the individual specification) which may be applied to a capacitor continuously at its rated temperature.  
Rated voltage of capacitors for electronic equipment is usually DC voltage. (Unless otherwise specified)

- 1) When a D.C. rated capacitor is used in an A.C. circuit, the capacitor generates heat except for an across the line capacitor. We recommend using capacitors below the voltage shown in Table 1.

Table 1

DC额定电压 DC Rated Voltage	AC额定电压 AC Rated Voltage [Vrms(50, 60Hz)]									
	MPB	MPK	MPN	MPH	MPE	MMB	MMK	F2D	P2S	H2D
50V	-	-	-	-	-	-	-	30	-	30
100V	-	-	-	※	-	50	50	50	50	50
200V	-	-	-	-	-	-	-	100	-	-
250V	125	-	-	125	-	125	-	-	125	-
400V	-	-	-	-	-	200	-	-	-	-
450V	200	150	100	200	-	-	200	-	-	-
630V	250	200	150	250	-	250	250	-	-	-
800V	-	※	-	※	250	-	-	-	-	-
1250V	-	-	-	-	400	-	-	-	-	-
1600V	-	-	-	-	700	-	-	-	-	-

※根据品种不同, AC额定电压会稍有不同, 详情敬请咨询。

For AC rated voltage of this item, please consult our sales offices.

•关于这个产品的AC额定电压, 敬请咨询。

AC rated voltage of Table 1 is not applicable to all kinds of capacitors. Please inquire us to details.

•关于系列, 请另外查询。

For other series, please consult our sales offices.

2) 工作温度引起的额定电压的降低

在高温下使用电容器时, 因高温劣化, 会导致寿命减短。若在高温下使用, 请按照以下图表降低工作电压。(Fig1~2)

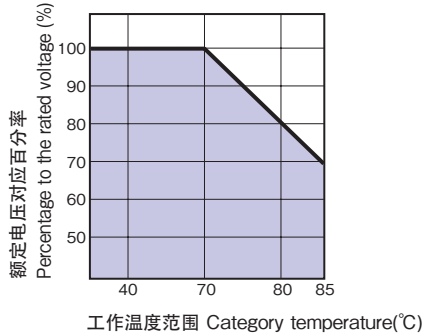


Fig 1  
适用品种 / Application series  
P2S

2) Rated voltage derating by category temperature

Use of the capacitors at high temperature shortens the capacitor life due to thermal deterioration. When operating capacitors at high temperature, please derate the operating voltage in conformance with the graphs below. (Fig1~2)

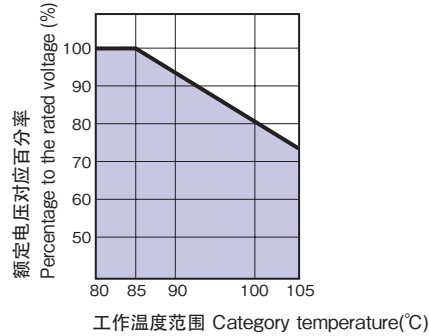


Fig 2  
适用品种 / Application series  
MPK, PCK, MMB, MMG, MMK, F2D

3) 高频使用中额定电压的降低

在高频下使用电容器, 因其自身发热会导致寿命减短。若在高频下使用, 请在确认规格书后, 降低使用电压。

4) 特殊波形中使用时

在正弦波以外的特殊波形中使用, 有效值各不相同。请在确认电流波形后, 咨询详情。

(注) 含有DC偏压时, 用DC额定电压减去偏压后的交流电压作为允许值, 根据各频率, 降低此电压后使用。

3) Rated voltage derating by high frequency

Using a capacitors at high frequency will shorten its life due to the generation of heat. When operating capacitors at high frequency, please reduce the operating voltage according to specification sheet.

4) Use in special wave form

If you want to use the capacitor with a special wave-form other than a sine wave, please inquire to us for details after identifying the wave-form with which the capacitor is required to be used, because the effective value varies with wave-form.

(NOTE) Where a DC bias is voltage included, the DC rated voltage minus the DC bias voltage becomes the permissible AC voltage, and this AC voltage shall be derated depending on the frequency.

2. 允许电流

1) 对应频率的允许电流

在交流电中使用电容器时, 请在各系列标明的频率允许电流的有效电流值以下使用。(各记载页)

2. PERMISSIBLE CURRENT

1) PERMISSIBLE CURRENT FOR FREQUENCY

When using capacitors with an alternating current, effective current should not exceed the value of permissible current for frequency shown in the graph of each series.(individual page)

### 2) 允许峰值电流值(脉冲电流)

在正弦波以外的波形中使用, 请确保有效电流值在允许范围内, 并且在Table 2中标明的各系列的单发允许峰值以下。

### 2) Permissible peak current (pulse current)

When in use for non-sine current wave, effective current should not exceed the permissible value and also, peak current should not exceed the following permissible peak current value shown in each series in Table 2.

**Table 2**

(A0-p)

静电容量 ( $\mu$ F)	MPB			MPK			MPH				MPE			MMB				MMK			
	250Vdc	450Vdc	630Vdc	450Vdc	630Vdc	800Vdc	100Vdc	250Vdc	450Vdc	630Vdc	800Vdc	800Vdc	1250Vdc	1600Vdc	100VDC	250Vdc	400Vdc	630Vdc	100Vdc	450Vdc	630Vdc
0.001	—	—	—	—	—	—	—	—	—	—	—	6	6	6	—	—	—	—	—	—	—
0.0012	—	—	—	—	—	—	—	—	—	—	—	7	7	7	—	—	—	—	—	—	—
0.0015	—	—	—	—	—	—	—	—	—	—	—	9	9	9	—	—	—	—	—	—	—
0.0018	—	—	—	—	—	—	—	—	—	—	—	10	10	10	—	—	—	—	—	—	—
0.0022	—	—	—	—	—	—	—	—	—	—	—	9	9	13	—	—	—	—	—	—	—
0.0027	—	—	—	—	—	—	—	—	—	—	—	12	12	16	—	—	—	—	—	—	—
0.0033	—	—	—	—	—	—	—	—	—	—	—	14	14	19	—	—	—	—	—	—	—
0.0039	—	—	—	—	—	—	—	—	—	—	—	17	17	22	—	—	—	—	—	—	—
0.0047	—	—	—	—	—	—	—	—	—	—	—	20	20	27	—	—	—	—	—	—	—
0.0056	—	—	—	—	—	—	—	—	—	—	—	24	24	32	—	—	—	—	—	—	—
0.0068	—	—	—	—	—	—	—	—	—	—	—	29	29	39	—	—	—	—	—	—	—
0.0082	—	—	—	—	—	—	—	—	—	—	—	24	24	47	—	—	—	—	—	—	—
0.01	9	9	9	—	—	—	—	—	—	—	—	29	29	58	—	—	—	5	—	—	—
0.012	10	10	10	—	—	—	—	—	—	—	—	35	35	69	—	—	—	6	—	—	—
0.015	13	13	13	—	—	—	—	—	—	—	—	43	43	86	—	—	—	8	—	—	—
0.018	16	16	16	—	—	—	—	—	—	—	—	52	52	104	—	—	—	10	—	—	—
0.022	19	19	14	—	—	—	—	—	—	—	—	53	63	127	—	—	—	10	—	—	—
0.027	24	24	18	—	—	—	—	—	—	—	—	65	78	155	—	—	—	12	—	—	—
0.033	15	15	22	—	—	—	—	—	—	—	—	79	95	190	—	—	—	15	—	—	—
0.039	18	18	25	—	—	—	—	—	—	—	—	93	112	224	—	—	10	17	—	—	—
0.047	22	22	16	—	—	—	—	—	—	31	—	113	135	270	—	—	12	21	—	19	—
0.056	26	26	19	—	—	—	—	—	—	37	—	134	161	230	—	—	14	13	—	23	—
0.068	25	32	23	—	—	—	—	—	—	44	—	163	196	279	—	—	17	16	—	27	—
0.082	30	38	28	—	—	—	—	—	—	54	—	197	236	337	—	—	20	19	—	33	—
0.1	31	21	34	—	35	—	—	50	60	66	—	240	288	411	—	25	25	23	—	40	—
0.12	37	25	41	—	42	—	—	60	72	79	—	288	345	—	—	30	17	28	—	48	—
0.15	46	31	51	—	52	—	—	75	56	98	—	360	431	—	—	37	21	35	—	60	—
0.18	45	38	62	—	63	—	—	90	67	118	—	431	518	—	—	30	25	42	—	44	—
0.22	54	46	75	—	77	—	—	88	81	144	111	527	452	—	—	37	31	51	—	54	—
0.27	67	56	63	—	41	—	—	108	100	93	136	647	555	—	—	45	38	38	—	67	63
0.33	81	69	77	—	50	—	—	132	122	113	167	565	678	—	—	55	47	46	—	81	77
0.39	54	81	90	—	59	—	—	96	144	134	197	668	—	—	—	37	55	54	—	96	90
0.47	66	98	109	47	72	60	—	116	174	161	283	805	—	—	—	44	66	65	—	116	109
0.56	78	81	130	55	85	72	—	138	117	192	343	959	—	—	61	53	49	78	—	138	130
0.68	95	99	158	67	103	87	—	167	142	233	414	—	—	—	74	64	60	95	—	167	158
0.82	114	119	190	81	75	105	—	202	171	281	238	—	—	—	89	77	72	89	—	202	190
1	139	145	232	99	91	128	—	246	209	343	507	—	—	—	108	94	88	108	—	246	232
1.2	167	174	—	119	110	119	—	295	250	279	—	—	—	—	85	113	105	130	—	295	—
1.5	146	218	—	149	137	149	—	369	313	348	—	—	—	—	106	141	104	162	—	209	—
1.8	175	262	—	179	164	179	—	250	375	418	—	—	—	—	127	105	124	195	—	250	—
2.2	213	320	—	219	201	219	—	306	459	511	—	—	—	—	155	129	152	238	—	306	—
2.7	262	—	—	269	—	—	—	375	393	—	—	—	—	—	191	158	187	—	—	262	—
3.3	320	—	—	329	—	—	—	459	480	—	—	—	—	—	233	193	228	—	—	320	—
3.9	378	—	—	389	—	—	—	542	567	—	—	—	—	—	171	228	270	—	—	378	—
4.7	455	—	—	469	—	—	—	457	653	683	—	—	—	—	206	275	325	—	—	332	455
5.6	—	—	—	—	—	—	—	545	543	—	—	—	—	—	246	258	—	—	—	396	—
6.8	—	—	—	—	—	—	—	661	659	—	—	—	—	—	298	313	—	—	—	480	—
8.2	—	—	—	—	—	—	—	798	794	—	—	—	—	—	360	378	—	—	—	579	—
10	—	—	—	—	—	—	—	973	969	—	—	—	—	—	439	461	—	—	—	706	—
12	—	—	—	—	—	—	—	814	—	—	—	—	—	—	—	—	—	—	—	527	—
15	—	—	—	—	—	—	—	1017	—	—	—	—	—	—	—	—	—	—	—	659	—
18	—	—	—	—	—	—	—	1220	—	—	—	—	—	—	—	—	—	—	—	790	—
22	—	—	—	—	—	—	—	1492	—	—	—	—	—	—	—	—	—	—	—	966	—

·电流值超过上表中所示的值时, 请联系我们。 / In case operating current may exceed the above values, please consult us.

·关于系列, 请另外查询。 / For other series, please consult our sales offices.

### 3.自身温度上升

因纹波电流、交流电压、高频电路等导致的温度上升等导致电容器自身发热。若发热较大时，会有电容器性能劣化、损伤的可能。使用时请控制电容器自身温度上升在Table3所示的范围之内。

### 3.SELF HEAT RISE

Due to ripple current, A.C. voltage, and/or high frequency circuit, capacitors generate heat. Capacitors may degrade or damage themselves in case of excessive self heat rise. We recommend self heat rise limits of Table 3.

Table 3

电容器品种 Type of capacitors	自身温度上升 Self heat rise limits	适用品种 Application Series
聚酯塑胶薄膜电容器 Polyester Film Capacitor	10°C以内 Within 10°C	F2D
金属熔射型聚酯塑胶薄膜电容器 Metallized Polyester Film Capacitor	15°C以内 Within 15°C	MMB, MMG MMK, MMBA
聚丙烯塑胶薄膜电容器 Polypropylene Film Capacitor	8°C以内 Within 8°C	P2S
金属熔射型聚丙烯塑胶薄膜电容器 Metallized Polypropylene Film Capacitor	8°C以内 Within 8°C	MPK, MPN, MPKA
	10°C以内 Within 10°C	MPB, MPH, MPE
	15°C以内 Within 15°C	PCK
聚苯硫醚塑胶薄膜电容器 Polyphenylene Sulfide Film Capacitor	15°C以内 Within 15°C	H2D

### 4.工作温度范围

电容器可以连续使用的环境温度范围。

### 4.CATEGORY TEMPERATURE

Atmospheric temperature range at which a capacitor may be used continuously.

#### 1)工作温度上限

电容器可以连续使用的环境温度的最高值。但是，电容器因受到其他热源的放射、传导，或者是包含交流电压或直流电压的交流部分(纹波电流)而导致其温度上升时，电容器表面的最高温度才被认为是工作温度上限。

#### 1)Upper category temperature

The maximum ambient temperature at which a capacitor may be used continuously. However, when the temperature of the capacitor goes up due to radiation or conduction from other heat sources, and/or A.C. components included in A.C. voltage or in D.C. voltage (ripple), the maximum temperature at the surface of the capacitor shall be considered as the upper category temperature.

#### 2)工作温度下限

电容器可以连续使用的环境温度的最低值。

#### 2)Lower category temperature

The minimum ambient temperature at which a capacitor may be used continuously.

### 5.充放电电路中使用

急速充放电会导致电容器的特性劣化或损坏，请事先联系我们。

### 5.FOR CHARGE AND DISCHARGE

Rapid charge and discharge to capacitors under heavy condition may result in failure of capacitors. For this application, consult us in advance.

### 6.蜂鸣音

根据使用条件，在电容器的端子间施加交流电压时，因库仑力的作用，介电质薄膜会产生机械振动，可能发出蜂鸣音。根据电源电压的失真，高频成分可能会造成较大的声音。若蜂鸣音影响使用时，请联系我们。

### 6.BUZZ

During AC operation, as the case may be, the capacitor may make buzzing noise due to mechanical vibration of the film caused by the coulomb force which exists between electrodes opposite polarity. A louder buzz is made when applied voltage waveform has distortion, and/or higher frequency component, etc. Consult us if buzz made by the capacitor influence as the application.

7. 在使用时间常数电路等时

电容器的特性会根据环境条件而发生变化。即使在一般的使用状态下，也会因空气中的湿度而产生一些容量变化。此时的变化量根据介电质不同会有所差异。  
时间常数电路等需要容量变化少的产品时，推荐选用以聚丙烯为介电质的P2S系列。

7. USE IN CIRCUITS SUCH AS TIME-CONSTANTS

The characteristics of a capacitor vary with environmental conditions. Even in the general working state, its electrostatic capacity varies somewhat with the level of humidity in the air, and this change in electrostatic capacity varies with the dielectric used. Rubycon recommend to use P2S series when use in circuits require stable capacity such as time-constants.

8. 在使用高湿度环境等时

在高湿环境中长时间使用时，元件通过外包装吸收湿气，这是导致电容器故障的主要原因。若在高湿条件下使用电容器，请联系我们。

8. USE IN HUMID ENVIRONMENT

When used for a long time in humid environment, the capacitor elements absorb moisture. As a result, the capacitor might break down. When used under the humid condition, please consult us.

9. 焊接作业

请在下图所示的时间及温度范围内进行焊接作业。否则，会导致外包装龟裂、短路、容量下降。若需进行反复焊接作业，请在电容器主体温度充分下降后，再进行下一次焊接。对引线型电容器，请不要进行回流焊接。

9. SOLDERING OPERATION

When capacitors are sustained at high temperature in soldering operations, it invites short circuits or other failures due to deteriorations of the film so please observe the limitations specified in the graphs below. Avoid reflow soldering the lead type.

※) P2S即使在fig5的条件下，也会因电路板厚度、预热条件等而产生问题，请予以注意。

※) Even under the conditions shown in fig 5, types P2S, may pose problems according to circuit board thickness and preheating conditions. So, please pay attention to this point.

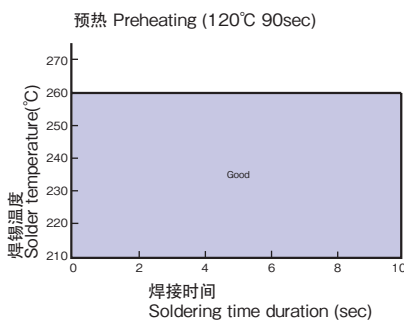


Fig 3  
适用品种 Application series  
MMB, MMG, MMK, MMBA  
F2D, H2D

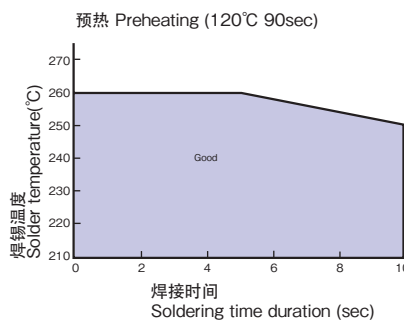


Fig 4  
适用品种 Application series  
MPB, MPK, MPN, MPH  
MPE, MPKA, PCK

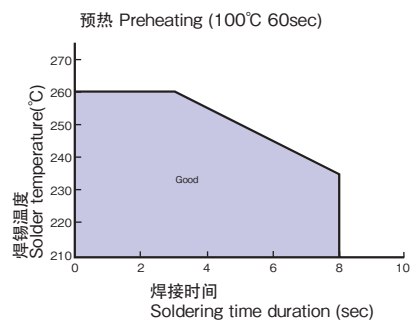


Fig 5  
适用品种 Application series  
P2S

在使用电烙铁进行焊接时，电烙铁温度350°C，每次加热在3秒以内。烙铁直径应在3mm以内。

When using soldering iron, temperature of iron shall be 350°C, applied duration within 3sec as 1 time.

10. 关于清洗 (溶剂)

请使用乙醇类等影响较小的溶剂清洗电路板。(溶剂、清洗方法等具体内容，敬请咨询我们了解详情。)

10. CLEANING SOLVENTS

When a solvent is used for cleaning etc., inactive material such as alcohol, etc. should be used. (For a more technical information, consult our engineering)

11. 保管条件

请保管在温度30°C以下，相对湿度75%以下，无剧烈温度变化，无直射阳光，无腐蚀性气体的室内环境中。按照上記条件，原则上保管期限是生产后一年以内。

11. STORAGE CONDITION

A storage needs to be kept indoors at less than 30°C and relative humidity of under 75% without any sudden temperature changes, direct sunlights and corrosive gas around. Storage period in the above conditions is within one year in principle.

### 12.废弃处理

在废弃电容器时，请交给专业的工业废弃物处理工厂，由其代为处理。

### 13.其他

- 参考文献: 电子设备用固定塑胶薄膜电容器使用注意事项指南 (电子信息技术产业协会技术报告JEITA RCR-2350D)
- 关于其他使用条件, 请通过以下方式咨询。  
Rubycon株式会社 各营业点(记载于封底)或  
Rubycon电子株式会社  
技术·品质部产品技术组  
TEL 0265-36-3312 / FAX 0265-36-5954  
E-mail techfilm@rubycon.co.jp

### 12.DISPOSAL

In case of rejecting capacitors, please seek for professionals who deal with the industrial wastes treatment.

### 13.OTHERS

- Quoted documents: Guideline of notabilia for fixed plastic film capacitors for use in electronic equipment (Technical Report of Japan Electronics and Information Technology Industries Association, JEITA RCR-2350C)
- For further particulars, please apply to our sales offices.