

## CAUTION FOR PROPER USE OF PMLCAP®

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Upon using PMLCAP®, please pay attention to the points listed below.  
Catalog may be subject to change without notice.

### 1. APPLIED VOLTAGE

#### 1) Rated voltage

As for applied voltage to capacitors, sum of DC voltage and peak AC voltage should not exceed their own DC rated voltage.

#### 2) Voltage derating

Within category temperature range, capacitors can be used without voltage derating.

#### 3) Use in high frequency

Using capacitors at high frequency will be shortened its life due to the generation of heat. Please consult us in this case.

#### 4) Use in special wave-form

If you want to use capacitors 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.

### 2. GUARANTEE OF CAPACITANCE TOLERANCE

PMLCAP® characteristics may fluctuate by surroundings. Even if left in natural condition, capacitance may fluctuate by humidity. By considering it, the product shall be shipped with special care at factory. But the guarantee of capacitance tolerance shall be applied once before opening the humidity proof bag. It shall not be applied when individual agreement is exchanged.

### 3. PERMISSIBLE CURRENT

#### 1) Permissible current for frequency

Please contact us in advance.

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

If you want to use capacitors 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.

### 4. SELF HEAT RISE

Please confirm self heat rise within 10°C.

## 5. OPERATING TEMPERATURE

Use capacitors within the specified temperature range.

If used outside the specified temperature range, then the electrical characteristics may deteriorate significantly, leading to failure.

The temperature referred to here includes the ambient temperature including heat produced by heat generating devices (power transistors, resistors, etc.), self heating due to ripple current.

## 6. SOLDERING

### 1) Soldering method

#### ●MU series, MS series, MR series

MU series, MS series and MR series shall be used in reflow soldering and flow soldering method. Do not use in VPS soldering method.

#### ●ST series

ST series shall be used in only reflow method. Do not use in flow, dipping and VPS soldering method. Please confirm your reflow conditions (reflow time, temperature). Soldering conditions should be according as recommended reflow temperature profile.

#### ●LDT series

LDT series shall be used in only flow method. Do not use in reflow and VPS soldering method.

### 2) MSL

Moisture Sensitive Level (MSL) which is based on IPC/JEDEC J-STD-020D is showed in the following table.

Chip size	1608	2012	3216	3225	4532	5750	1632	3245
MSL	3	3	3	4	5	5	4	5
Floor life time <sup>**</sup> (hours)	168	168	168	96	48	48	72	48

<sup>\*\*</sup>Floor life time is the case of humidity control under 30°C60%RH.

### 3) Solder paste (Chip type)

A recommended thickness of solder paste is between 0.1mm to 0.2mm. The content of halogen in the soldering flux should be 0.1wt% or less.

### 4) Tentative mounting (Chip type)

This product can not be used again when the double-stick tape is used for tentative mounting.

### 5) Using soldering iron

However, please refer to the following conditions if soldering by iron is necessary.

Items	Conditions
Temperature	350°C Max
Time	4 seconds Max
Power	30W Max
Other	No preheat

- Soldering under above conditions should not be repeated for a same part.
- Please keep above conditions when reworking is need after reflow soldering.
- Do not hit the tip of soldering iron to the capacitor directly.
- Do not reuse the capacitor.
- Please contact us in advance if your condition is different with above.

### 7. CLEANING SOLVENTS

Please contact us in advance when cleaning of the PC board after soldering is necessary. If used improper cleaning agent and/or ultrasonic, the capacitor may be damaged.

### 8. STORAGE CONDITION

①MU series/MS series/MR series/ST series: Please store capacitors under the normal temperature (5~30°C) and normal humidity(70%RH or less) without operating of moisture-proof bag.

Storage time limit (the state that a zipper of a moisture-proof bag was closed with dry silica gel) is within 1 month from opening of moisture proof bag (Temperature: 5 to 30°C, Relative humidity: 70% or less). But, when the humidity of the ambient environment keeps below 5%RH, it's possible to treat as the unopened position of moisture proof bag.

②LDT series: Please store capacitors under the normal temperature (5~30°C) and normal humidity(70%RH or less) .

### 9. CONDITION OF USE

The following environment should be avoided when using capacitors.



- ①Damp conditions such as water, saltwater spray, or oil spray or fumes. High humidity or humidity condensation situations.
- ②Hazardous gas/fumes (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, bromine, etc.)
- ③Exposure to ozone, ultraviolet rays or radiation

### 10. DISPOSAL

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

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