

POSCAP is uniquely structured solid electrolytic capacitor.

Please note the following points in order to take full advantage of the POSCAP's performance and ensure the most stable quality possible.

■ Crucial Precautions

(1) Polarity

POSCAP is a conductive polymer capacitor with positive and negative electrodes. Do not reverse the polarity when using. If it is used with the polarities reversed, increased leakage current or a short circuit may result.

(2) Prohibited circuits

Since problems can be expected, the POSCAP cannot be used on the following circuits.

- (1) High impedance voltage retention circuits
- (2) Coupling circuits
- (3) Time constant circuits
- (4) Circuits greatly affected by leakage current
- (5) The circuit in which two or more POSCAP are connected in a series so as to raise the endurance voltage.

(3) Over voltage prohibited during design

Over voltage exceeding the rated voltage may not be applied even for an instant as it may cause a short circuit.

(4) Sudden charge and discharge restricted

Sudden charge and discharge are restricted (for maintainance of high-proof reliability).

A protection circuit is recommended for when a sudden charge or discharge causes excessive rush current since this is main cause of short circuit and large leakage current.

Use protection circuits in case the rush current value exceeds 20A.

Be sure to insert a protection resistor of about 1kΩ for charge and discharge when measuring the leakage current.

(5) Considerations when soldering

The soldering conditions are to be within the range prescribed in this delivery specification. If the specifications are not followed, there is the possibility of the appearance becoming defective when soldering is conducted under conditions that are harsher than those stipulated.

(6) Considerations when using in industrial equipment

To insure reliability when POSCAP is used in industrial equipment, allow wider margin of capacitance, impedance and other characteristics.

(7) Using in equipment regarding human life

In case of using in equipment regarding human life (e.g. Space equipment, aeronautic equipment, military equipment and atomic equipment etc.), be sure to talk over the matter with SANYO.

Don't use without a recognition document of SANYO.

■ Circuit designing cautions

(1) Check the rated performance

After checking the operation and installation environments, design the circuit so that it falls within the rated performance range stipulated in this delivery specification.

(2) Operating temperature and ripple current

(a) Set the operating temperature so that it falls within the range stipulated in this delivery specification.

(b) Do not supply current that exceeds the allowable ripple current. When excessive ripple current is supplied, internal heat increases and reduces the POSCAP's life span.

(3) Leakage current

Even when the soldering conditions fall within the range of this delivery specifications, leakage current increases a little on occasion. It also increases a little during high temperature storage, high humidity storage and temperature cycling with no voltage applied. In cases such as these, leakage current will decrease by applying voltage under the condition of below the POSCAP's maximum operating temperature. The speed at which the leakage current is restored is increased by applying voltage when the POSCAP's temperature is close to the maximum operating temperature.

(4) Applied voltage for designing

- (a) Less than 90% of the rated voltage or category voltage is recommended. If the rated voltage is 10V, and over less than 80% of the rated voltage or category voltage is recommended.
- (b) The sum of the DC voltage plus the peak AC voltage shall not exceed the rated voltage or category voltage.
- (c) The sum of the DC voltage plus the negative peak AC voltage shall not allow a voltage reversal.

(5) Reduction of failure stress

When POSCAP is used within the rated voltage, it shows a stable characteristic, but it may be damaged in a short circuit when an overvoltage, for instance, is applied.

The time to reach the failure mode can be extended by using POSCAP with reduced ambient temperature, ripple current and applied voltage.

[Failure rate]

- In the case of the endurance which is 105°C×2,000h.
0.5%/1,000h (Environment temp. : 105°C, Rated voltage or Category voltage applied)
- In the case of the endurance which is 105°C×1,000h or 125°C×1,000h.
1.0%/1,000h (Environment temp. : 105°C, Rated voltage or Category voltage applied)
- In the case of the endurance which is 85°C×1,000h.
1.0%/1,000h (Environment temp. : 85°C, Rated voltage applied)

(6) Operating environment restrictions

Do not use the POSCAP in the following environments.

- (a) Places where water, salt water or oil can directly fall on it and places where condensation may form.
- (b) Places filled with noxious gas for capacitors (hydrogen sulfide, sulfuric acid, chlorine, ammonia, etc.).
- (c) Places susceptible to ozone, ultraviolet rays and radiation.

(7) Land pattern

When mounting the POSCAP on the PC board, match the POSCAP's land pattern dimension. (See P16.)

(8) Parallel connection

A large amount of ripple current may be applied to the POSCAP when it is used in parallel connection with another capacitor.

Carefully select the type of capacitor.

(9) Protect circuit

The failure mode of POSCAP is the short mode. When it breaks down, short electric current flows to it. POSCAP gives off heat by this short current. Do the following consideration in design fully for the safety because it has a bad influence on the part around POSCAP due to this heat.

: A protection circuit and a protection device are set up, and it is made safer as a system.

: A diffuse circuit and so on is set up, and a safe system is taken so that a machine may not break down as to the single trouble.

(10) Others

Design circuits after checking the following items.

Electrical characteristics are affected by temperature and frequency fluctuations.

Design circuits after checking the amount of fluctuation.

We are confident that the practical configurations and examples listed in this document will ensure the maximum benefit from the characteristics and performance features of our products and that these application examples are accurate and reliable. However, we cannot accept any liability for any problems in connection with industrial property rights and concerning any difficulties arising in the use of these circuits. It should also be noted that as part of our ongoing policy of product improvement, the specifications given herein may be changed or modified at any time without prior notice. Copyright, All or portions of this publication are protected against copying or other reproduction.

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Storage Conditions

It is necessary to set an environment to prevent a trouble at the time of soldering by the degradation of solder ability or moisture's getting into the molding resin when POSCAP are stored.

- (1) Please make the storage of POSCAP sealing up in the reel and storage bag.
- (2) Do not store the POSCAP at high temperature and high humidity.
Store it in a location that is not subject to direct sunlight, has temperatures less than 35°C (Generally 15 to 35°C), and relative humidity less than 75%RH (45 to 75%RH) generally.
- (3) The storage period is one year or shorter under the condition that it is unopened the storage bag.
(TQC series : 9 months from the pass mark on the label)
- (4) Do not store the POSCAP in damp conditions such as with water, salt spray, or oil spray, and dew condensation.
- (5) Do not store the POSCAP in places filled with noxious gas (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, etc.).
- (6) Do not store the POSCAP in places susceptible to ozone, ultraviolet rays and radiation.
- (7) Please unseal storage bag just before mounting and be conscious that POSCAP not remain. When remainder occurs reluctantly, return them to storage bag once again and, please seal the unsealing division by adhesive tape etc., including desiccants. More over, once open the storage bag, it should be followed the table of (8)'s Floor Life "Time" and "conditions".
- (8) The moisture level of POSCAP is the following.

LEVEL	Floor Life		Applicable scope	
	Time	Conditions	Size code	Series
2a	4 weeks	≤ 30°C/60%RH	D2E,D2,D2T, D3L,D3,D4,D4D	TPB,TPC,TPE,TPD, TH*,TPL,TPLF
3	168hours	≤ 30°C/60%RH	S08,S11,A09,B09, B1,B1G,B15G,B2,C1,C3,C,C2	TPB,TPC,TPE,TPG, TPU,TA,TQC (All sizes)
4	72hours	≤ 30°C/60%RH	D2	APC
5	48hours	≤ 30°C/60%RH	D1,D2E,D2,D3L,D4	TH,APD

NOTE:The model of MSL "2a" is changed into MSL "3" with the 260°C reflow soldering.

(Conform to IPC/JEDEC J-STD-020C)
★Use at 105°C or less

Compensation coefficient of maximum allowable ripple current

It takes advantage in ripple current value of characteristics list and the following coefficient.

(For questions regarding TQC series, please ask separately.)

Frequency compensation coefficient

(TPB,TPC,TPD,TPE,TPF,TPG,TPL,TPLF,TPU,TA,THseries)

	120Hz≤f<1kHz	1kHz≤f<10kHz	10kHz≤f<100kHz	100kHz≤f<1MHz
22μF≤C≤100μF	0.20	0.60	0.85	1.00
100μF≤C≤330μF	0.25	0.70	0.85	1.00
330μF≤C≤1000μF	0.30	0.75	0.90	1.00

Temperature compensation coefficient

(TPB,TPC,TPD,TPE,TPF,TPG,TPL,TPLF,TPU,TA,TH,APseries)

	Case size code	
	S08, S11, A09, B09, B1,B1G,B15G, B2, C, C1, C2, C3, D2, D2E, D2T, D3L, D3, D4(THD), D4D	D4
T≤45°C	1.00	1.00
45°C<T≤85°C	0.70	0.50
★85°C<T≤105°C	0.25	0.25

T :Environment temperature
★THseries :85°C<T≤125°C