The circuits described as examples in this catalog and the "delivery specifications" are featured in order to show the operations and usage of our products, however, this fact does not guarantee that the circuits are available to function in your equipment systems.
We are not in any case responsible for any failures or damage caused by the use of information contained herein.
You should examine our products, of which the characteristics are described in the "delivery specifications" and other documents, and determine whether or not our products suit your requirements according to the specifications of your equipment systems. Therefore, you bear final responsibility regarding the use of our products.
Please make sure that you take appropriate safety measures such as use of redundant design and malfunction prevention measures in order to prevent fatal accidents and/or fires in the event any of our products malfunction.

1 The performance of varistors may deteriorate, the inside elements may be damaged, and they cause the varistors to smoke or catch fire, if the following precautions are not observed.

(1) Do not use varistors in places whose temperature exceeds their rated operating temperature due to direct sunlight or heating objects.
(2) Do not use varistors in a humid place directly exposed to the weather or steam.
(3) Do not use varistors in places filled with dust, salt-mist or corrosive gas.
(4) The soldering method is flow soldering and iron soldering. The recommended conditions are as follows.
- Flow soldering : Pre-heat 100±20°C, 60 to 90 sec., Soldering 260±5°C, 10±1sec.
- Iron soldering : 350±10°C, less than 4sec.

(5) Do not use solvents such as thinner and acetone which dissolve or make the exterior covering of varistors deteriorate.
Ultrasonic cleaning shall be so set that the vibration can not travel the assembly boards.
(6) Do not expose varistors to intense vibration, shock (drop shock etc.) or pressure making the exterior covering or inside element crack.
(7) Do not apply high voltage exceeding the rated maximum applying voltage to varistors.
In the case of automotive jump starts, however, use the varistors within short-term allowable voltage limits prescribed in the catalog.
If voltage wave form is not complete DC, a maximum value of peak voltages shall not exceed the rated maximum applying voltage.
(8) Do not apply peak currents exceeding the rated maximum energy.
(9) When peak currents are repeatedly applied to varistors, do not exceed the pulse life time ratings prescribed in the catalog.
(10) When peak currents are intermittently applied to varistors at short intervals, do not exceed the rated wattage.
(11) Using varistors in circuits whose frequency exceeds 1kHz may damage their elements by heat generation due to dielectric loss.
(12) In the case of coating or molding varistors with resin, do not use the resin which makes the varistors deteriorate.
(13) Do not install varistors in places near by flammable substances.

2 Varistors may blow up, if the following precautions are not observed.

(1) Do not use varistors in circuits applied peak currents exceeding the specified limits.
(2) Do not exceed the rated maximum applying voltage.

3 Varistors do not function but damages devices, if the following precautions are not observed.

(1) Hold the root of the varistor lead when bending or cutting the lead.
(2) The lead close to insulation cover shall not be bent or applied to outer force.
(3) When soldering the lead, do not damage a solder material and insulator fabricating the varistor.

4 The following preventive measures should be made for avoiding unexpected accident.

(1) When using a varistor in between circuits, connect an earth leakage breaker (ground-fault circuit interrupter) or current fuse in series with the varistor.
(2) When using a varistor in between a circuit and ground, connect an earth leakage breaker (ground-fault circuit interrupter) or both of a current fuse and thermal fuse in series with the varistor. Also, in case of excessive voltage due to ground short circuit accident, use the varistor with the rated voltage higher than the excessive voltage.

5 Store varistors in their packages in an environment with a temperature of –10 to + 40°C and a relative humidity of less than 75%.
Avoid storing in an environment subject to rapid changes in temperature, direct sunlight, corrosive gases, or dust.
The storage life is two years from the time of purchase as a general rule.

6 Follow safety standards such as Electrical, UL, CSA and so forth, which specify the use of varistors.

7 Catalogs

Product specifications in this catalog are subject to change without notice.
Please request and make sure our product specifications before purchase and/or use.
Parformance test data in the catalogs show typical values, which are not assured in the catalogs.

8 Response to the Substances of Concern

(1) Nippon Chemi-Con aims for developing products that meet laws and regulations concerning substances of concern.
(Some products may contain regulated substances for exempted application.)
Please contact us for more information about law-compliance status.
(2) According to the content of REACH handbook (Guidance on requirements for substances in articles which is published on May 2008), our electronic components are "articles without any intended release". Therefore they are not applicable for "Registration" for EU REACH Regulation Article 7 (1).
Reference: Electrolytic Condenser Investigation Society
"Study of REACH Regulation in EU about Electrolytic Capacitor" (publicized on 13 March 2008)