High performance achieved through high reliability.

The Nichicon Group has a proven track record in developing products that are both highly reliable and of high performance. These products include aluminum electrolytic capacitors, film capacitors, and circuit products. Among these are the company's positive thermistors, made at Nichicon Kameoka Corporation. Sold under the brand name Posi-R, these positive thermistors stand up to repeated use and offer rapid increases in resistance value in response to temperature rise.

There are three main types of positive thermistor: for heaters, for in-rush current limitation, and for overcurrent protection. Positive thermistors for heaters heat up quickly and evenly until they reach the desired temperature. Positive thermistors for in-rush current limitation come in two types: space-efficient lead type and case type, with both capable of handling continuous current better than cement resistors. The third type is for overcurrent protection are present in the small motors that are ubiquitous in today's automobiles. Particularly popular on the market have been Nichicon’s positive thermistors for in-vehicle supplemental heaters and case-type positive thermistors for in-rush current limitations. Thanks to their solid performance, these products have received zero complaints from users and have helped Nichicon form a strong bond of trust with customers.

Used in an increasing number of fields, these positive thermistors are used in; automobiles, air conditioners, lighting products, and office equipment. Discover for yourself the practically unlimited possibilities of Nichicon’s Posi-R positive thermistors.
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There are three main types of positive thermistor: for heaters, for in-rush current limitation, and for repeated use and offer rapid increase in resistive value in response to temperature rise. Positive thermistors for heaters heat up quickly and evenly until they reach the desired temperature. Positive thermistors for in-rush current limitation come in two types: space-efficient lead type and case type, with both capable of handling continuous current better than ceramic resistors. The third type is for overcurrent protection are present in the small motors that are ubiquitous in today’s automobiles. Particularly popular on the market have been Nichicon’s space-efficient lead type and case type, with both capable of handling continuous current better than ceramic resistors. The third type is for overcurrent protection are present in the small motors that are ubiquitous in today’s automobiles. Particularly popular on the market have been Nichicon’s space-efficient lead type and case type, with both capable of handling continuous current better than ceramic resistors.

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Positive Thermistors “Posi-R”

Specifications
- **Resistance value changes at rated voltage**
  - Rated Voltage: 12 to 220V

**Heater**
- Defrost heaters for refrigerators
- Office equipment
- Facial massage heaters

**Applications**
- Users can select their desired temperatures.
- Function ensures power savings.
- Posi-R’s self-temperature-control effect
- Quickly heats up to desired temperature.
- Eco-cars.
- Heaters used in hybrid vehicles and other secondary electronic equipment.
- Even in-vehicle supplemental heaters.

**Features**
- In-rush current limitation requires a high level of reliability. In these applications, the Posi-R is used as the heat generating element in heater units.
- Posi-R’s self-temperature-control effect prevents excessive heating.
- The Posi-R’s self-temperature-control function ensures power savings.
- Users can select their desired temperatures.

**Case type and lead type**

**Highly durable case type**

Space-efficient lead type
- Two types for in-rush current limitation

**How it works**

**R**

- Voltage application time and product temperature
- Circuit is protected
- Compared to conventional resistors, will not melt or short even when voltage is continuously applied after the current returns to normal. The Posi-R is thus superior to fuses and polymer-based PTC’s.

**Applications**

- Door locks, air conditioners, etc.
- Door locks
- Vacuum cleaner power brushes
- Telephones
- Air conditioners
- Car audio systems

**Hard at work in small automobile motors, positive thermistors bring comfort to passengers.**

Protects the motors in door locks, power windows and other small motors used in automotive applications.

**Current limitation**

- As of April 2017; according to Nichicon

**Breakdown**
- **Small circuits**
  - Posi-R is mainly used to protect small motors for in-vehicle applications (door mirrors, door locks, etc.), where products must withstand repeated use, and in air conditioner circuits (unusual control circuit boards, outdoor and fan motors, etc.).
  - Ability to withstand repeated use means there’s no need to replace it like fuses.
  - Offers superior repeated use since it’s non-contact.
  - Usage conditions won’t change even after repeated usage.
  - No noisy operation due to noise.

**Applications**

- Door locks
- Door mirrors
- Vacuum cleaner power brushes
- Telephones
- Air conditioners
- Car audio systems
This type thermistor heats up quickly and evenly until reaching the desired temperature.

One of the main types of thermistors, those used for heaters, has a proven track record in in-vehicle supplemental heaters.

[Subsection]
Thermistors for heaters require safety and power saving performance. The Posi-R quickly heats up when current flows through it. The Posi-R reaches the heating temperature evenly throughout the entire structure. The heating temperature can be controlled by adjusting the construction of Posi-R’s material makeup. In addition, because Posi-R maintains a constant temperature thanks to a balance between heat generation and heat dissipation, it will not exceed the heating temperature.

[Subsection]
Posi-R has a proven track record for in-vehicle supplemental heaters used in hybrid vehicles and other eco-cars.

Applications
• In-vehicle supplemental heaters
• Facial massage heaters
• Condensation-prevention heaters for office equipment
• Clothes drying heaters
• Defrost heaters for refrigerators

![Graph showing temperature changes and power usage over time]

Case type and lead type
Superior to the competition in durability and space efficiency

Highly durable case type
Space-efficient lead type

Two types for in-rush current limitation

[Graph showing in-rush current limitation]

In-rush current limitation requires a high level of reliability. In these applications, the Posi-R is used in switch parts and parallel connections. When the power circuit is turned on and in-rush current is applied to the Posi-R, the current is quickly contained, thus protecting the secondary electronic equipment. Even during irregularities of continuous application of voltage, the Posi-R provides stability and safety by ensuring a constant temperature.

Applications
• Inverter control circuit boards, outdoor unit of air conditioner systems, in-rush current protection

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Applications
• Door locks
• Door mirrors
• Vacuum cleaner power brushes
• Telephones
• Air conditioners
• Car audio systems

Specifications
• Rated Voltage: 12 to 220V
• Resistance: 0.5 to 2kΩ

How it works

Quickly heats up to desired temperature
- As its temperature is uniform and lower gets colder, making it very safe.
- If the area’s self-temperature control function is not working, users can detect their desired temperature.

Applications
• In-vehicle supplemental heaters
• Facial massage heaters
• Condensation-prevention heaters for office equipment
• Clothes drying heaters
• Defrost heaters for refrigerators

Specifications
• Rated Voltage: 12 to 220V
• Resistance: 15 to 100kΩ

In-rush current limitation requires a high level of reliability. In these applications, the Posi-R is used in switch parts and parallel connections. When the power circuit is turned on and in-rush current is applied to the Posi-R, the current is quickly contained, thus protecting the secondary electronic equipment. Even during irregularities of continuous application of voltage, the Posi-R provides stability and safety by ensuring a constant temperature.

Applications
• Commercial air conditioners
• Indoor and outdoor units for commercial air conditioners
• Indoor and outdoor units for room air conditioners
• Lighting products for offices
• EcoCut systems
• Switching power supplies

Specifications
• Rated Voltage: 12 to 220V
• Resistance: 0.3 to 1kΩ

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Applications
• Door locks
• Door mirrors
• Vacuum cleaner power brushes
• Telephones
• Air conditioners
• Car audio systems
This type thermistor heats up quickly and even until reaching the desired temperature.

One of the main types of thermistors, those used for heaters, has a proven track record in in-vehicle supplemental heaters.

**[Standard model]**

Thermistors for heaters require safety and power saving performance. The Posi-R quickly heats up when current flow through it. The Posi-R reaches the heating temperature evenly throughout the entire structure.

The heating temperature can be controlled by adjusting the construction of Posi-R's material makeup. In addition, because Posi-R maintains a constant temperature thanks to a balance between heat generation and heat dissipation, it will not exceed the heating temperature.

**[To be noted]**

Posi-R has a proven track record in heater units. Posi-R is used as the heat generating element in supplemental heaters used in hybrid vehicles and other eco-cars.

**[Features]**

- Quickly heats up to desired temperature
- Its temperature is uniform and never gets too hot, making it very safe.
- Posi-R's self-temperature-control effect prevents excessive heating.
- The Posi-R's self-temperature-control function ensures power savings.
- Users can select their desired temperatures.

**Applications**

- In-vehicle supplemental heaters
- Facial massage heaters
- Condensation-prevention heaters for office equipment
- Clothes drying heaters
- Defrost heaters for refrigerators

**Case type and lead type**

**Superior to the competition in durability and space efficiency**

- **For in-rush current limitation**

  In-rush current limitation requires a high level of reliability. In these applications, the Posi-R is used in switch parts and power converter. When the power circuit is turned on and in-rush current is applied to the Posi-R, the current is quickly contained, thus protecting the secondary electronic equipment. Even during irregularities of continuous application of voltage, the Posi-R provides stability and safety by ensuring a constant temperature.

**How it works**

- Unlike cement resistors, these thermistors will not melt or short even when voltage is continuously applied after a switch part breaks down.
- Space efficient.
- Because the thermistors have recovery properties, they can withstand continuous use.

**Applications**

- Indoor and outdoor units for air conditioners
- Indoor and outdoor units for room air conditioners
- Lighting products for offices
- EcoCute systems
- Switching power supplies

**Hard at work in small automobile motors, positive thermistors bring comfort to passengers.**

Protects the motors in door locks, power windows and other small motors used in automotive applications.

**[Features]**

- Able to withstand repeated usage means there's no need to replace it like with fuses.
- Offers superior repeated usage since it's non-contact.
- Usage conditions won't change even after repeated usage.
- No noisy operation due to noise.

**Applications**

- Door locks
- Door mirrors
- Vacuum cleaner power brushes
- Telephones
- Air conditioners
- Car audio systems

**Specifications**

- Rated Voltage: 12 to 220V
- Resistance: 0.5 to 2kΩ
- Temperature range: 50° to 240°C

**Specifications**

- Rated Voltage: 120 to 240V
- Resistance: 15 to 100kΩ
- Temperature range: 50° to 240°C

**Specifications**

- Rated Voltage: 12 to 220V
- Resistance: 0.5 to 2kΩ
- Temperature range: 50° to 240°C

**Specifications**

- Rated Voltage: 120 to 240V
- Resistance: 15 to 100kΩ
- Temperature range: 50° to 240°C

**Certifications**

- UL/ETL, CE, VDE, CCC, CB, KC, CB, SEV, BSMI, SABS, CB, VDE, VBG, VDA, IEC, VDE, CB, UL/ETL, CE, VDE, CCC, CB, SEV, BSMI, SABS, CB, VDE, VBG, VDA, IEC, VDE, CB
Reliable

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